

Appendix D

Biological Resources

Appendix D.1

2081-2017-011-03 L131 ITP



California Department of Fish and Wildlife
Bay Delta Region
2825 CORDELIA ROAD, SUITE 100
FAIRFIELD, CA 94534

California Endangered Species Act
Incidental Take Permit No. 2081-2017-011-03

R649, R700, AND R707 NATURAL GAS TRANSMISSION PIPELINE 131 REPLACEMENT PROJECT

Authority: This California Endangered Species Act (CESA) Incidental Take Permit (ITP) is issued by the California Department of Fish and Wildlife (CDFW) pursuant to Fish and Game Code section 2081, subdivisions (b) and (c), and California Code of Regulations, Title 14, section 783.0 et seq. CESA prohibits the take¹ of any species of wildlife designated by the California Fish and Game Commission as an endangered, threatened, or candidate species.² CDFW may authorize the take of any such species by permit if the conditions set forth in Fish and Game Code section 2081, subdivisions (b) and (c) are met. (See Cal. Code Regs., tit. 14, § 783.4).

Permittee: Pacific Gas and Electric Company
Principal Officer: Adam Cleary, Manager (925) 328-5028
Contact Person: Mallory Hughes, Senior Land Planner, (925) 328-5108
Mailing Address: 6111 Bollinger Canyon Road
San Ramon, CA 94583

Effective Date and Expiration Date of this ITP:

This ITP shall be executed in duplicate original form and shall become effective once a duplicate original is acknowledged by signature of the Permittee on the last page of this ITP and returned to CDFW's Habitat Conservation Planning Branch at the address listed in the Notices section of this ITP. Unless renewed by CDFW, this ITP's authorization to take the Covered Species shall expire on **December 31, 2019**.

Notwithstanding the expiration date on the take authorization provided by this ITP, Permittee's obligations pursuant to this ITP do not end until CDFW accepts as complete the Permittee's Final Mitigation Report required by Condition of Approval 7.8 of this ITP.

¹ Pursuant to Fish and Game Code section 86, "'Take' means hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." See also *Environmental Protection Information Center v. California Department of Forestry and Fire Protection* (2008) 44 Cal.4th 459, 507 (for purposes of incidental take permitting under Fish and Game Code section 2081, subdivision (b), "'take' ... means to catch, capture or kill").

² The definition of an endangered, threatened, and candidate species for purposes of CESA are found in Fish and Game Code sections 2062, 2067, and 2068, respectively.

Project Location:

The Natural Gas Transmission Pipeline 131 (L131) Replacement Project for R649, R700, and R707 (Project) is located in eastern Alameda County, north of the City of Livermore, between Interstate 580 (I-580), immediately east of Isabel Avenue and extending northeast to Vasco Road. The Project includes portions of the Altamont, Byron Hot Springs, Livermore, and Mt. Diablo United States Geological Survey (USGS) 7.5-minute quadrangles. The majority of the project is located north of the City of Livermore in an unincorporated part of Alameda County. At the northern terminus, the Project extends from Vasco Valve Station (37.761230 N, -121.736744 W) west of Vasco Road (1.24 miles north of Rooney Ranch Road) for approximately 5 miles southwest to the Shea Homes housing development between I-580 and Portola Avenue (37.701488 N, -121.794396 W).

The Project is composed of three separate pipeline segments, all of which are located in the same area and require replacement:

- R649Segments: Replace two short segments of L131, as follows: 1) approximately 300 feet between pipeline mile post (MP) 31.83 and MP 31.90, beginning at the south end of R700 and extending to immediately north of Portola Avenue; and 2) approximately 100 feet north of I-580 at MP 32.29 between a residential development and Arroyo Las Positas.
- R700Segment: Replace an approximately 4-mile segment of L131 between MPs 28.00 and 31.83, beginning at the south end of R707 and extending south to the north end of R649 north of Portola Avenue. R700 crosses Hartman Road, North Livermore Avenue, May School Road, and Dagnino Road as it continues northeast from Portola Avenue to R707.
- R707 Segment: Replace an approximately 1-mile segment of L131 between MPs 27.02 and 28.00, extending from the Vasco Crossover Station adjacent to Vasco Road in the north to a location just east of the end of Dagnino Road to the southwest, at the north end of R700.

Project Description:

The Project includes the replacement of approximately 5 miles of natural gas transmission pipeline L131. The Project is composed of three separate pipeline segments, all of which are located in the same area and require replacement. The existing natural gas transmission pipeline L131 is a 24-inch-diameter pipeline originally installed in 1944. Recent studies have determined that portions of the original asphalt pipe coating are in poor condition, and corrosion engineering assessments have concluded that a 5-mile section of L131 cannot be adequately protected by the existing cathodic protection (CP) system³. The Permittee will replace the 5-mile section of L131 with new 24-inch-diameter pipe. The Project is scheduled to be completed by the end of 2018, with any remaining portions to be completed in spring and summer 2019 as needed.

The work corridor will be approximately 150 to 200 feet wide along the replacement pipeline alignment and typically will provide sufficient space for pipe installation (trenching/boring, pipe stringing, welding operations), a passing lane for construction vehicles, and activities for pipeline retirement and CP system replacement. The Project consists of the following activities:

³ Cathodic protection is a technique used to control pipeline corrosion by connecting the pipeline to a direct current power source (rectifier) with an insulated anode cable.

Trenching

The existing L131 pipeline will be located using potholing, which involves the use of high-pressure water from a truck to break apart the soil while a vacuum removes the water/soil mix to expose the top of the underground pipelines. After the pipeline has been located, excavators will be used to expose the pipe through trenching. Except where noted for mechanical boring, the entire pipeline replacement will be installed by trenching. Trenching will begin by removing approximately 6 to 12 inches of topsoil and segregating it on the edge of the construction area for replacement following construction. The excavated subsoil will be maintained in a separate windrow, or linear pile, to be used as trench backfill. Trenches excavated for installation of the new pipe will typically be 10 feet deep and extend to approximately 3 feet below the bottom of the pipe to allow for adequate construction access.

Mechanical Boring

Mechanical (trenchless) boring will be used for the installation of pipe beneath May School Road as part of R700 to avoid potential impacts to an ephemeral drainage (Drainage W-2). Mechanical boring may also be used at other road crossings including Hartman Road, North Livermore Avenue, and Dagnino Road, to avoid temporarily impacting roadways. Each bore will require excavation of entry and exit pits down to the new pipeline depth and installation of pipe following a horizontal auger bore. Bore pits will be excavated to approximately 3 feet below the bottom of the pipe to allow for adequate construction access. After installation of the pipeline, excavated subsoil will be placed into the bore pits followed by placement of segregated topsoil to restore the original grade to approximate pre-Project contours and grade.

Welding and Coating

Pipe-stringing trucks will be used to transport segments of pipeline from the shipment point or storage yards to the Project site. Side-boom tractors or vacuum lifts will unload the pipe from the stringing trucks and lay them end to end beside the trench line for line-up and welding. The pipe will be placed over a mandrel on the bending machine and bent a few degrees to fit the contours of the trench. The pipe segment is then removed from the bending machine by excavator and a welding crew will join weld pipeline segments in place.

After the pipeline has been welded and inspected, state-of-the-industry pipe coating, such as epoxy, will be applied to protect the pipeline from corrosion. Polyken tape, wax tape, and tape primer; or other appropriate coating material may be used to coat the welds or fittings.

Hydrostatic Testing

The newly installed pipe segments will be hydrostatically pressure-tested (hydrotested) with water. The hydrostatic test process involves filling the pipe with water and slowly raising the pressure to the test pressure for a minimum of eight hours. At the end of the test, the piping will be emptied of water and the water will be collected in temporary storage tanks. The water will then be tested before being hauled off-site to an appropriate disposal site, discharged to a sewer drain connecting to a publicly-owned treatment network, or used on-site for dust control. If hydrostatic test water is used for on-site dust control, free standing water will be managed so as not to collect on-site or enter wetlands. Hydrostatic testing is anticipated to require approximately 670,000 gallons of water. Hydrostatic testing water will be obtained through a local water supply municipality/company and trucked to the work area.

Backfilling

After installing the pipeline, excavated subsoil will be placed into the trenches followed by placement of topsoil to restore approximate pre-Project contours, grade and local plant seed base. Backfill material will be composed primarily of the excavated trench spoils. Imported material may be used as backfill if determined necessary for installation and safety of the pipeline. Unusable spoils material or contaminated soils shall be disposed of according to applicable regulations. Previously segregated topsoil will be placed on top of the trench spoils to promote revegetation.

New Pipeline Connection and Inspection

A segment of the existing L131 will be temporarily taken out of service when connecting the newly installed pipeline to the existing pipeline. Approximately 5.5 miles of the existing pipeline will be isolated and purged of natural gas from points on the line located south of I-580. This natural gas will not be flared. Once the pipeline is fully isolated and the purging or release of the remaining gas has concluded, the newly installed pipeline will then be extended and welded to the existing pipeline at both ends of the Project. Gas will then be conveyed into the new pipeline segment for operation.

To ensure that natural gas is not leaking out of the pressurized portion of L131, the Permittee will excavate a sniff hole at MP 27.2, just west of Vasco Road along the existing pipeline north of the northern tie-in point and within the construction area. At the sniff hole location, a probe with an electronic gas detector will be inserted into the existing pipeline to detect gas leaks. The probe will be removed, and the sniff hole excavation backfilled after the new pipeline is operational.

CP System Replacement

Retirement of the CP system consists of excavating and removing existing CP cables along the existing pipeline alignment and extending to rectifiers and removing existing electronic testing stations (ETS) and rectifier equipment attached to wood poles. New CP cables will be installed with the new pipeline in the same trench. New cathodic testing stations (CT Stations) will be installed and located adjacent to fence lines and roadways to the extent possible. New rectifiers will be installed on existing wooden poles where the existing rectifiers are being removed, along roadways, and adjacent to the pipeline alignment. Existing and proposed CP cabling is approximately one-inch-wide and buried approximately three feet deep. ETS/CT Stations consist of small plastic tubing extending from the pipelines up to four feet above-ground.

Pipeline Cleaning

Retired sections of L131 may require cleaning to remove contaminants, such as mercury, that may have built up inside the pipe. If cleaning is necessary, pipeline inspection gauge (PIG) launchers and receivers will be temporarily installed on the deactivated pipe to insert PIGs and liquids (water or cleaning fluids) into the pipeline. Air compressors staged at both the launching and receiving ends of each cleaning section will propel the PIGs and liquids through the pipeline. Multiple cleaning runs may be necessary to remove all contaminants. Upon completion of each PIG run, the PIGs and liquids will be removed from the pipeline and collected in temporary storage tanks connected to PIG receivers by temporary pipes/hoses. Secondary containment such as rubber berms with lips, larger layflat hose, or other materials will be used. PIGs and liquids will be sampled and disposed of off-site. Pipeline cleaning is anticipated to require approximately 42,500 gallons of water.

Pipeline Segmentation

After cleaning, the retired pipeline will be cut into segments up to approximately 3,200 to 4,000-feet in length for inspection. A section of above-ground pipeline will be segmented and removed from Cayetano Creek, an ephemeral drainage. To expose the segmenting points, excavations by equipment or by hand will be made at pipeline transitions at both banks of the creek. An approximately 10-foot wide by 10-foot long by 10-foot deep excavation will be made at both ends of the pipe within the creek banks. The above-ground portion of the pipe will be removed by fixing to the pipe a strap attached to an excavator or crane arm. After removal, the cut ends of the pipe in the bank will be capped by welding a steel plate, and the ends will be reburied. All contours of the creek bank will be restored to existing conditions, as practicable.

Bell holes (small excavations) will be used at intermittent locations to expose the remaining portions of buried pipe within the construction area, and those will be sited to avoid drainages and roadways. At those intermittent locations, a minimum 24-inch segment will be removed, and the pipeline interior will be inspected. The removed sections of pipe will be sampled and disposed of off-site. The remaining segments of retired pipe will be abandoned in-place and may be filled with cellular concrete slurry beneath roadways and ephemeral drainages, where determined necessary to prevent potential settling due to long-term corrosion of the deactivated pipe. The remaining buried portions of the pipeline will be filled with inert gas to maintain pressure inside the pipeline. The cut pipeline sections will then be capped by welding a steel plate at the end and reburied beneath the ground surface.

Covered Species Subject to Take Authorization Provided by this ITP:

This ITP covers the following species:

Name	CESA Status
California tiger salamander (<i>Ambystoma californiense</i>)	Threatened ⁴

This species and only this species is the "Covered Species" for the purposes of this ITP.

Impacts of the Taking on Covered Species:

Project activities and their resulting impacts are expected to result in the incidental take of individuals of the Covered Species. The activities described above expected to result in incidental take of individuals of the Covered Species include operating machinery and heavy equipment, movement of equipment and vehicles, staging of equipment, storage of materials, clearing, trenching, excavating, potholing and filling, welding, hydrostatic testing, pipeline and CP installation, grading, and placement of fill (Covered Activities).

Incidental take of individuals of the Covered Species in the form of mortality ("kill") may occur as a result of Covered Activities such as unearthing Covered Species during augering holes, trenching, and excavation; crushing during all earthmoving activities, hydrotesting or operating heavy equipment, and movement of vehicles and materials; and trampling by construction workers. Incidental take of individuals of the Covered Species may also occur from the Covered Activities in the form of pursue, catch, capture, or attempt to do so of the Covered Species from capture and relocation. The areas where authorized take of the Covered Species is expected to occur include those where Covered

⁴ See Cal. Code Regs. tit. 14 § 670.5, subd. (b)(3)(G).

Activities will take place for the ROWs of the R-649, R-700 and R-707 segments, as well as access routes (Figure 1; collectively, the Project).

The Project is expected to cause the temporary loss of 56.15 acres of upland habitat for the Covered Species. Impacts of the authorized taking also include adverse impacts to the Covered Species related to temporal losses, increased habitat fragmentation and edge effects, and the Project's incremental contribution to cumulative impacts (indirect impacts). These impacts include: stress resulting from noise and vibrations from construction and capture and relocation, and long-term effects due to displacement from preferred habitat, increased competition for food and space, and increased vulnerability to predation.

Incidental Take Authorization of Covered Species:

This ITP authorizes incidental take of the Covered Species and only the Covered Species. With respect to incidental take of the Covered Species, CDFW authorizes the Permittee, its employees, contractors, and agents to take Covered Species incidentally in carrying out the Covered Activities, subject to the limitations described in this section and the Conditions of Approval identified below. This ITP does not authorize take of Covered Species from activities outside the scope of the Covered Activities, take of Covered Species outside of the Project Area, take of Covered Species resulting from violation of this ITP, or intentional take of Covered Species except for capture and relocation of Covered Species as authorized by this ITP.

Conditions of Approval:

Unless specified otherwise, the following measures apply to all Covered Activities within the Project Area, including areas used for vehicular ingress and egress, staging and parking, and noise and vibration generating activities that may/will cause take. CDFW's issuance of this ITP and Permittee's authorization to take the Covered Species are subject to Permittee's compliance with and implementation of the following Conditions of Approval:

- 1. Legal Compliance:** Permittee shall comply with all applicable federal, state, and local laws in existence on the effective date of this ITP or adopted thereafter.
- 2. CEQA Compliance:** Permittee shall implement and adhere to the mitigation measures related to the Covered Species in the Biological Resources section of the Mitigated Negative Declaration and Initial Study (SCH #2018062074) adopted by the California Department of Fish and Wildlife as lead agency for the Project pursuant to the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). For purposes of this ITP, where the terms and conditions for the Covered Species in the Mitigated Negative Declaration are less protective of the Covered Species or otherwise conflict with this ITP, the conditions of approval set forth in this ITP shall control.
- 3. LSA Agreement Compliance:** Permittee shall implement and adhere to the terms and measures and conditions related to the Covered Species in the Lake and Streambed Alteration Agreement (LSAA) (Notification No. 1600-2017-041-R3) for the Project executed by CDFW pursuant to Fish and Game Code section 1600 et seq. For purposes of this ITP, where the terms and conditions for the Covered Species in the streambed alteration agreement are less protective of the Covered Species or otherwise conflict with this ITP, the conditions of approval set forth in this ITP shall control.

- 4. ESA Compliance:** Permittee shall implement and adhere to the terms and conditions related to the Covered Species in the Intra-Service Biological Opinion on the Issuance of a Section 10(a)(1)(B) Incidental Take Permit to the Pacific Gas and Electric Company for the Pacific Gas and Electric Company Bay Area Operations & Maintenance Habitat Conservation Plan (No. 08ESMF00-2013-F-0102-04) for the Project pursuant to the Federal Endangered Species Act (ESA). For purposes of this ITP, where the terms and conditions for the Covered Species in the federal authorization are less protective of the Covered Species or otherwise conflict with this ITP, the conditions of approval set forth in this ITP shall control.
- 5. ITP Time Frame Compliance:** Permittee shall fully implement and adhere to the conditions of this ITP within the time frames set forth below and as set forth in the Mitigation Monitoring and Reporting Program (MMRP), which is included as Attachment 1 to this ITP.

6. General Provisions:

- 6.1. Designated Representative. Before starting Covered Activities, Permittee shall designate a representative (Designated Representative) responsible for communications with CDFW and overseeing compliance with this ITP. Permittee shall notify CDFW in writing before starting Covered Activities of the Designated Representative's name, business address, and contact information, and shall notify CDFW in writing if a substitute Designated Representative is selected or identified at any time during the term of this ITP.
- 6.2. Designated Biologist(s). Permittee shall submit to CDFW in writing the name, qualifications, business address, and contact information of the biological monitor(s) (Designated Biologist(s)) at least 20 days before starting Covered Activities. Information included in this notification should include, at a minimum: (1) relevant education; (2) relevant training on species identification, survey techniques, handling individuals of different age classes, and handling of different life stages by a permitted biologist or recognized species expert; (3) a summary of field experience conducting requested activities; (4) a summary of Incidental Take Permits of U.S. Fish and Wildlife Service (USFWS) biological opinions under which they were authorized to work with the listed species and at what level (e.g. construction monitoring versus handling); this should also include the names and qualifications of persons under which the work was supervised as well as the amount of work experience on the actual project; (5) any relevant professional references with contact information. Permittee shall ensure that the Designated Biologist(s) is knowledgeable and experienced in the biology and natural history of the Covered Species. At least one Designated Biologist(s) who is legally authorized to collect and handle the Covered Species shall be on-site or on-call within 30 minutes of travel time from active Work Areas at all times during Covered Activities. Authorizations from CDFW for biologists that lack collecting and handling experience may be limited to working under the supervision of more experienced biologists. The Designated Biologist(s) shall be responsible for monitoring Covered Activities to help minimize and fully mitigate or avoid the incidental take of individual Covered Species and to minimize disturbance of Covered Species' habitat. Permittee shall obtain CDFW approval of the Designated Biologist(s) in writing before starting Covered Activities, and shall also obtain written approval in advance if the Designated Biologist(s) must be changed.

- 6.3. Designated Biologist(s) Authority. To ensure compliance with the Conditions of Approval of this ITP, the Designated Biologist(s) shall have authority to immediately stop any activity that does not comply with this ITP, and/or to order any reasonable measure to avoid the unauthorized take of an individual of the Covered Species.
- 6.4. Education Program. Permittee shall conduct an education program for all persons employed or otherwise working in the Project Area before performing any work. The program shall consist of a presentation from the Designated Biologist(s) that includes a discussion of the biology and general behavior of the Covered Species, information about the distribution and habitat needs of the Covered Species, sensitivity of the Covered Species to human activities, its status pursuant to CESA including legal protection, recovery efforts, penalties for violations and Project-specific protective measures described in this ITP. Permittee shall provide interpretation for non-English speaking workers, and the same instruction shall be provided to any new workers before they are authorized to perform work in the Project Area. Permittee shall prepare and distribute a fact sheet containing this information for workers to carry in the Project Area. Upon completion of the program, employees shall sign a form stating they attended the program and understand all protection measures. This training shall be repeated at least once annually for long-term and/or permanent employees that will be conducting work in the Project Area.
- 6.5. Construction Monitoring Binder. The Designated Biologist(s) shall maintain a construction-monitoring binder on-site throughout the construction period, which shall include a copy of this ITP with attachments and a list of signatures of all personnel who have successfully completed the education program. Permittee shall ensure a copy of the construction-monitoring binder is available for review at the Project site upon request by CDFW.
- 6.6. Trash Abatement. Permittee shall initiate a trash abatement program before starting Covered Activities and shall continue the program for the duration of the Project. Permittee shall ensure that trash and food items are contained in animal-proof containers and removed at least once a week to avoid attracting opportunistic predators such as ravens, coyotes, and feral dogs. Permittee shall ensure that no trash remains at any site after daily construction.
- 6.7. Dust Control. Permittee shall implement dust control measures during Covered Activities to facilitate visibility for monitoring of the Covered Species by the Designated Biologist(s). Permittee shall keep the amount of water used to the minimum amount needed, and shall not allow water to form puddles or enter adjacent tributaries, swales, or wetlands. Chemical additives used for dust suppression must be reviewed and approved by CDFW prior to use.
- 6.8. Equipment and Invasive Plant Species. Permittee shall ensure off-road equipment is clean of mud, soil, and plant parts prior to being brought to the Project Area. Permittee shall ensure off-road equipment moved from areas of known and targeted noxious weeds are to be cleaned prior to being moved to another site not in the immediate vicinity. If Permittee operates on-road equipment on contaminated, vegetated surfaces, Permittee shall ensure the equipment is cleaned prior to departing areas with known weed populations.
- 6.9. Erosion Control. Permittee shall utilize erosion control measures throughout all phases of the Project. No phase of the Project may be started if its associated erosion control measures

cannot be completed prior to the onset of a storm event. Permittee shall monitor erosion control measures before, during, and after each storm event and repair and/or replace ineffective measures immediately. Permittee shall consult 72-hour weather forecasts from the National Weather Service prior to starting any phase of the Project that may result in sediment runoff to aquatic habitat.

- 6.10. Erosion Control Materials. Permittee shall prohibit use of erosion control materials potentially harmful to Covered Species and other species, such as monofilament netting (which may be in erosion control matting or straw wattles) or similar material.
- 6.11. Delineation of Project Boundaries. Before starting Covered Activities Permittee shall clearly delineate the boundaries of that Work Area with fencing, stakes, or flags. Permittee shall restrict all Covered Activities within the fenced, staked, or flagged areas. Permittee shall maintain stakes and flags until the completion of Covered Activities in that area.
- 6.12. Delineation of Habitat. Permittee shall clearly delineate habitat of the Covered Species within the Project Area with posted signs, posting stakes, flags, and/or rope or cord, and place barriers as necessary to minimize the disturbance of Covered Species' habitat and minimize risk to Covered Species. Permittee shall remove barriers and delineation materials as soon as possible, after cessation of construction activity and in accordance with Condition of Approval 8.3 (Exclusion Barrier), unless otherwise authorized by CDFW. Permittee shall maintain all signage and delineation materials in working order until it is removed.
- 6.13. Project Access. Project-related personnel shall access the Project Area using routes identified in Figures 2-0 through 2-9 and shall not cross Covered Species' habitat outside of or en route to the Project Area. Permittee shall restrict Project-related vehicle traffic to established roads, designated overland travel routes, staging, and parking areas. Vehicles will not exceed a speed limit of 15 mph on unpaved roads within natural land-cover types, or 5 mph during off-road travel. If Permittee determines construction of routes for travel are necessary outside of the Project Area, the Designated Representative shall contact CDFW for written approval before carrying out such an activity. CDFW may require an amendment to this ITP, among other reasons, if additional take of Covered Species will occur as a result of the Project modification.
- 6.14. Staging Areas. Permittee shall confine all Project-related parking, storage areas, laydown sites, equipment storage, and any other surface-disturbing activities to the Project Area using, to the extent possible, previously disturbed areas. Additionally, Permittee shall not use or cross Covered Species' habitat outside of the marked Project Area.
- 6.15. Hazardous Waste. Permittee shall immediately stop and, pursuant to pertinent state and federal statutes and regulations, arrange for repair and clean up by qualified individuals of any fuel or hazardous waste leaks or spills at the time of occurrence, or as soon as it is safe to do so. Permittee shall limit the storage and handling of hazardous materials within the Project Area to sites approved by the Designated Biologist(s) and reported to CDFW, and shall properly contain and dispose of any unused or leftover hazardous products off-site.

- 6.16. CDFW Access. Permittee shall provide CDFW staff with reasonable access to, and within, the Project Area and shall otherwise fully cooperate with CDFW efforts to verify compliance with or effectiveness of mitigation measures set forth in this ITP.
- 6.17. No Pets or Firearms. Permittee shall not allow pets or firearms within the Work Areas. This shall not apply to authorized security personnel, or local, state, or federal law enforcement officials.
- 6.18. Refuse Removal. Upon completion of Covered Activities, Permittee shall remove from that Work Area and properly dispose of all temporary fill and construction refuse, including, but not limited to, broken equipment parts, wrapping material, cords, cables, wire, rope, strapping, twine, buckets, metal or plastic containers, and boxes.

7. Monitoring, Notification and Reporting Provisions:

- 7.1. Notification Before Commencement. The Designated Representative shall notify CDFW 14 calendar days before starting Covered Activities and shall document compliance with all pre-Project Conditions of Approval before starting Covered Activities.
- 7.2. Notification of Non-compliance. The Designated Representative shall immediately notify CDFW in writing if it determines that the Permittee is not in compliance with any Condition of Approval of this ITP, including but not limited to any actual or anticipated failure to implement measures within the time periods indicated in this ITP and/or the MMRP. The Designated Representative shall report any non-compliance with this ITP to CDFW within 24 hours.
- 7.3. Documentation of Project Area and Covered Activities. Permittee shall conduct photo monitoring of the Project Area. Photo points shall provide comprehensive views of the Project Area including areas where Covered Activities will occur. Prior to commencement of work, Permittee shall identify representative views of all portions of the Project Area where impact to Covered Species upland habitat could occur, at intervals of no less than 1,200 feet. Permittee shall photograph the project area from flagged points, noting the direction and magnification of each photo. On a monthly basis, Permittee shall photograph the Project Area from the established photo points using the same direction and magnification as pre-construction photos. Permittee shall provide labeled copies of photographs taken at each photo point to CDFW as a component of Monthly Compliance Reports (see Condition of Approval 7.5). Upon completion of construction, Permittee shall photograph post-project conditions from the flagged photo points using the same direction and magnification as pre-project photos. Labeled digital copies of pre- and post-project photographs shall be sent to CDFW within forty-five (45) days of completion of the project.
- 7.4. Daily Compliance Monitoring. Unless otherwise authorized by CDFW in writing, the Designated Biologist(s) shall be on-site daily when Covered Activities occur within habitat for Covered Species. The Designated Biologist(s) shall conduct compliance inspections to (1) minimize incidental take of the Covered Species; (2) prevent unlawful take of species; (3) check for compliance with all measures of this ITP; (4) check all exclusion zones (see Conditions of Approval 8.2-8.4); and (5) ensure that signs, stakes, and fencing are intact, and that Covered Activities are only occurring in the Project Area. A Designated Biologist(s)

shall prepare daily written observation and inspection records summarizing: oversight activities and compliance inspections, weather conditions (including rainfall and humidity), observations of Covered Species and other wildlife species, and their sign, survey results, and monitoring activities required by this ITP.

- 7.5. Monthly Compliance Report. The Designated Representative or Designated Biologist(s) shall compile the observation and inspection records identified in Conditions of Approval 7.4 into a Monthly Compliance Report and submit it to CDFW along with a copy of the MMRP table with notes showing the current implementation status of each mitigation measure. Monthly Compliance Reports shall be submitted to CDFW's offices listed in the Notices section of this ITP and via e-mail to CDFW's Regional Representative and Headquarters CESA Program by the 10th working day of the following month. At the time of this ITP's approval, the CDFW Regional Representative is Serge Glushkoff, Senior Environmental Scientist (Specialist), (Serge.Glushkoff@wildlife.ca.gov) and Headquarters CESA Program email is CESA@wildlife.ca.gov. CDFW may at any time increase the timing and number of compliance inspections and reports required under this provision depending upon the results of previous compliance inspections. If CDFW determines the reporting schedule must be changed, CDFW will notify Permittee in writing of the new reporting schedule.
- 7.6. Annual Status Report. Permittee shall provide CDFW with an Annual Status Report (ASR) no later than January 31 of every year beginning with issuance of this ITP and continuing until CDFW accepts the Final Mitigation Report identified below. Each ASR shall include, at a minimum: (1) a brief description of previously submitted Monthly Compliance Reports for the previous calendar year; (2) a general description of the current status of the Project Area and Covered Activities, including actual or projected completion dates, if known; (3) a copy of the table in the MMRP with notes showing the current implementation status of each mitigation measure; (4) an assessment of the effectiveness of each completed or partially completed mitigation measure in avoiding, minimizing and mitigating Project impacts; (5) all available information about Project-related incidental take of the Covered Species; (6) an accounting of the number of acres subject to both temporary and permanent disturbance, both for the prior calendar year, and a total since ITP issuance; and (7) information about other Project impacts on the Covered Species.
- 7.7. CNDDDB Observations. The Designated Biologist(s) shall submit all observations of Covered Species to CDFW's California Natural Diversity Database (CNDDDB) within 30 calendar days of the observation and the Designated Biologist(s) shall include copies of the submitted forms with the next Monthly Compliance Report or Final Mitigation Report, whichever is submitted first relative to the observation.
- 7.8. Final Mitigation Report. No later than 45 days after Project completion and completion of all mitigation, monitoring measures, and success criteria included in this ITP, Permittee shall provide CDFW with a Final Mitigation Report. The Designated Biologist(s) shall prepare the Final Mitigation Report which shall include, at a minimum: (1) a summary of all Monthly Compliance Reports; (2) a copy of the table in the MMRP with notes showing when each of the mitigation measures was implemented; (3) all available information about Project-related incidental take of the Covered Species; (4) information about other Project impacts on the Covered Species; (5) beginning and ending dates of all Covered Activities; (6) an

assessment of the effectiveness of this ITP's Conditions of Approval in minimizing and fully mitigating Project impacts of the taking on Covered Species; (7) recommendations on how mitigation measures might be changed to more effectively minimize take and mitigate the impacts of future projects on the Covered Species; and (8) any other pertinent information.

- 7.9. Notification of Take or Injury. Permittee shall immediately notify the Designated Biologist(s) if a Covered Species is taken or injured by a Project-related activity, or if a Covered Species is otherwise found dead or injured within the vicinity of the Project. The Designated Biologist(s) or Designated Representative shall provide initial notification to CDFW by calling the CDFW Representative at (707) 339-6191, and email notification if direct contact is not immediately established. The initial notification to CDFW shall include information regarding the location, species, and number of animals taken or injured and the ITP Number. Following initial notification, Permittee shall send CDFW a written report within two calendar days. The report shall include the date and time of the finding or incident, GPS location of the animal or carcass, photographs of the location and the animal if possible, explanation as to cause of take or injury, and any other pertinent information.

- 7.9.1. If the Covered Species is found recently deceased, the Designated Biologist(s) shall immediately bag, label, and preserve the carcass in a freezer. The label shall include time and date of discovery, GPS location, circumstances surrounding death (if known), and ITP tracking number. Permittee shall deliver specimens to the CDFW Wildlife Investigations Lab, Attention: Deana Clifford, 1701 Nimbus Road Suite D, Rancho Cordova, CA 95670 within two calendar days of the discovery.

- 7.10. Temporary Impact Criteria. To be considered a temporary impact, all temporary impacts must meet the following criteria: (1) recontouring and seeding of each temporary impact area shall occur by October 31 of the year of the temporary impact; and (2) temporary impact sites have achieved vegetation success as described in the Vegetation Restoration Plan (Condition of Approval 9.6).

8. Take Minimization Measures:

The following requirements are intended to ensure the minimization of incidental take of Covered Species in the Project Area during Covered Activities. Permittee shall implement and adhere to the following conditions to minimize take of Covered Species:

- 8.1. Pre-activity Covered Species Surveys. Prior to the commencement of Covered Activities, the Designated Biologist(s) shall survey all Work Areas for presence of Covered Species, and shall follow earthmoving equipment to look for Covered Species during initial site staging and grading. If the Designated Biologist(s) or anyone else discovers a Covered Species, Permittee shall cease all activity in the vicinity of the occurrence until relocation has been completed in accordance with Condition of Approval 8.15.
- 8.2. Covered Species Exclusion Plan. At least 15 days prior to commencing Covered Activities, Permittee shall submit to CDFW a Covered Species Exclusion Plan for CDFW review and approval. The plan shall evaluate each Work Area based on, planned work activities, season of work, Covered Species occurrence to date, duration of site activity, and potential Covered

Species breeding locations. The plan shall include the locations of the exclusion barrier and indicate when the barrier will be erected and removed.

The exclusion barrier shall not include plastic monofilament netting in its construction. The plan shall include multiple escape funnels, ramp, or other methods to allow Covered Species to leave the Project Area unharmed.

- 8.3. Exclusion Barrier Installation. The Designated Biologist(s) will supervise the installation of the exclusion barrier. The bottom six inches of the barrier shall be buried, if feasible, or otherwise adequately secured to prevent Covered Species movement into the Work Area. Following barrier installation, the qualified biologist(s) shall block holes or burrows entrances within Work Areas, of burrows avoided by construction activities, if any, that appear to extend under the barrier to minimize Covered Species movement into the Project Area. The exclusion barrier shall remain in place until the Permittee completes all Covered Activities and all construction equipment has been removed from the Work Area. Any Covered Species found along the barrier shall be relocated in accordance with Condition of Approval 8.16. Permittee shall provide refuge opportunities such as natural cover objects (e.g., fallen logs, leaf litter, and branches), or artificial cover boards along or near the outside of the barrier. The Permittee shall avoid damage to small mammal burrows to the maximum extent possible during installation of the barrier. When the Permittee cannot avoid burrows, burrows shall be hand excavated (see Condition of Approval 8.6) prior to trenching activities. Covered Species found during excavation shall be relocated (see Condition of Approval 8.15). Following excavation, the Designated Biologist(s) shall block holes or burrows which appear to extend under the fencing to minimize Covered Species movement into the Project Area.
- 8.4. Exclusion Barrier Inspection and Maintenance. The Permittee shall maintain the exclusion barrier to ensure that it is functional and without defects. The Designated Biologist(s) shall inspect the barrier at least three times per week, as well as during and after a storm event, until it is removed to look for Covered Species and to ensure barrier integrity. If the barrier is damaged, Permittee shall repair the exclusion barrier immediately. CDFW may require increased inspection intervals based upon planned construction activities at each site, recent and forecasted weather events, and the results of pre-construction surveys and previous inspections. Permittee shall maintain the exclusion barrier continuously until all construction activities are completed within the Work Areas. Permittee will remove the exclusion barrier as soon as possible, but no later than 7 days after activities have ceased, unless the barrier is required to remain longer to ensure Stormwater Pollution Prevention Plan compliance.
- 8.5. Pre-construction Burrow Identification. The Designated Biologist(s) shall mark all burrows that the Designated Biologists determines can be avoided within all suitable habitat areas no less than seven (7) days prior to earthmoving activities in those areas. Permittee shall stake and flag burrows that will not be graded or excavated but that are within the active suitable habitat area for the duration of Project activities to ensure construction personnel are aware of their location, and to facilitate avoidance of these areas where possible.
- 8.6. Burrow Excavation and Avoidance. Permittee shall submit a burrow excavation protocol to CDFW for review and approval prior to Covered Activities. After marking suitable burrows in accordance with Condition of Approval 8.5, the Designated Biologist(s) shall inspect all

identified burrows in areas to be graded or excavated for presence of Covered Species. If Covered Species are observed, they shall be relocated as described in Condition of Approval 8.15.

- 8.7. Dry Weather and Dry Season Restriction. Permittee shall ensure that Covered Activities involving ground disturbance and heavy equipment use (such as excavation, grading, and contouring) are limited to the period from April 15 to October 15 of each year (Dry Season) until the expiration of this ITP. Should work need to occur outside of this period, Permittee will request authorization from CDFW at least 10 days prior to the date of the proposed extension, for intervals of up to one (1) week. Work will only be conducted in accordance with CDFW approval and shall be subject to weather conditions. Covered Activities that do not require ground disturbance (i.e., inspections, welding, etc.) are not subject to this condition.

The Permittee shall monitor the National Weather Service (NWS) 72-hr forecast for the Project Area. If a 30% or more chance of rain is predicted within 72 hours during Covered Activities, Permittee shall cease all Covered Activities until no further rain is forecast. Ground disturbing activities may resume 48 hours after the rain ceases when there is a less than a 40% chance of precipitation in the 24-hour forecast.

The Designated Biologist(s) shall keep records of both rainfall and humidity on-site and subject to inspection (see Condition of Approval 7.4).

- 8.8. Time of Day Work Restriction. Permittee shall terminate all major construction activities 30 minutes before sunset and shall not resume them until 30 minutes after sunrise. Permittee shall use sunrise and sunset times established by the U.S. Naval Observatory Astronomical Applications Department. If an activity has been started that cannot be finished during daylight hours, Permittee may conduct nighttime work for up to a total of seven nights at each individual grassland or riparian Work Area while this ITP is valid and will notify CDFW prior to each night of work. Permittee shall limit nighttime work in extent, duration, and brightness to the maximum extent possible. Permittee shall face lighting downward and will only use lighting in the immediate workspace. The Designated Biologist(s) will continue to be present during all night work. Permittee shall not conduct any nighttime work if a 40% or more chance of rain is predicted within 72 hours (see Condition of Approval 8.7).
- 8.9. Structure Inspection. Permittee shall ensure that all construction pipes, culverts, or similar structures that are stored in the Project Area for one or more overnight periods are either securely capped prior to storage or thoroughly inspected by the Designated Biologist(s) before the pipe is buried, capped, or otherwise used or moved in any way. If a Covered Species is discovered, it shall be relocated according to the Covered Species Relocation Plan, Condition of Approval 8.15.
- 8.10. Open Construction Excavation, Trenches, and Inspection. To prevent the accidental entrapment of Covered Species, Permittee shall cover all excavated holes or trenches deeper than 6 inches with plywood or similar material with no cracks or open spaces, at the end of each workday. Edges of plywood shall be sealed with dirt and plywood shall be weighted down to prevent it from moving. At the end of each workday, Permittee shall ramp trenches or large excavations that cannot easily be covered to allow trapped animals an escape method.

The ramp may be constructed of either dirt fill or wood planking or other suitable material placed at an angle no greater than 30 degrees. The Designated Biologist(s) shall inspect holes, trenches, and ramps each morning that Covered Activities occur, or otherwise at intervals of no less than 24 hours. The Designated Biologist(s) will thoroughly inspect such holes or trenches for trapped Covered Species. If a Covered Species is discovered, it shall be relocated according to the Covered Species Relocation Plan, Condition of Approval 8.15. Protection of Covered Species within excavations made by biologists around burrows shall be in accordance with the burrow excavation protocol in Measure 8.6.

- 8.11. Vehicle and Equipment Inspections. The Permittee shall inspect all equipment and vehicles at the beginning of every workday, prior to commencement of work activities. Prior to movement, the Permittee shall inspect areas beneath all vehicles and equipment that have remained stationary for ten minutes or longer. If a Covered Species is discovered, Permittee shall not move equipment until the animal has left voluntarily or is removed by the Designated Biologist(s) according to the Covered Species Relocation Plan, Condition of Approval 8.15.
- 8.12. Spoils Piles. Permittee shall place spoils piles away from concentrations of small mammal burrows. Permittee shall place all spoils piles within demarcated Work Areas identified in Figures 2-1 through 2-13.
- 8.13. Prohibited Plant Species. Permittee shall not plant, seed or otherwise introduce invasive exotic plant species. Prohibited exotic plant species include those identified in the California Exotic Pest Plant Council's database, which is accessible at: <http://www.cal-ipc.org/paf/>
- 8.14. Notification of Non-Native Tiger Salamanders or Hybrids. The Designated Biologist(s) shall immediately notify CDFW if a barred tiger salamander (*Ambystoma tigrinum mavortium*) or an *Ambystoma* hybrid or individual with unusual or unique characteristics of coloration or size is found within the Project Area within 24 hours of discovery. In consultation with the Permittee, CDFW shall determine what additional measures are necessary to address local non-native or *Ambystoma* hybrid populations.
- 8.15. Covered Species Relocation. Permittee shall submit a Covered Species Relocation Plan to CDFW for its approval prior to the start of Covered Activities. The Relocation Plan will include relocation site selection criteria, and may be combined with an Excavation Protocol document. When Covered Species are observed, the Designated Biologist(s) shall relocate any individuals found to an active rodent burrow system located no more than 300 feet outside of the Project Area, or the nearest suitable burrow beyond that distance. The Covered Species shall be released as soon as possible. A suitable burrow should be at least 3 inches in depth and have moist and cool conditions. If burrow density allows, the Designated Biologist(s) shall only release one animal per burrow. Covered Species may be encouraged to enter the burrows by gently nudging if they do not enter on their own. If the animal repeatedly walks away from the burrow, or partially enters it and then turns around, the Designated Biologist(s) shall remove it and find another burrow.

The Designated Biologist(s) shall document occurrence and relocation sites by photographs and GPS positions. When handled, the Designated Biologist(s) will photograph and measure (snout-vent) the Covered Species for identification purposes prior to relocation. The

Designated Biologist(s) shall monitor the Covered Species until it is determined that it is not imperiled by predators or other dangers. The Designated Biologist(s) shall release individual Covered Species one at a time rather than as a group. Permittee shall provide all documentation to CDFW within 48 hours of Covered Species relocation.

- 8.16. **Covered Species Handling and Injury.** The Designated Biologist(s) shall capture, handle, and assess Covered Species according to the Restraint and Handling of Live Amphibians Protocol, USGS, National Wildlife Health Center (D. Earl Greene, ARMI SOP NO. 100; 16 February 2001; Attachment 2).

The Designated Biologist(s) shall place captured Covered Species individually into a dark, clean plastic container of suitable size with enough room so the animal can move freely. The Designated Biologist(s) shall ensure that hands are thoroughly washed and free of lotions, oils, repellents, or solvents prior to handling Covered Species, and shall keep the container moist with damp paper towels, soft foam rubber, or natural or synthetic sponge free of soaps and antibacterial/antifungal treatments. Containers used for holding or transporting shall not contain any standing water. The lids of the containers shall have small air holes for ventilation. Sponges shall not be reused and all other housing materials shall be disinfected between occupants according to the Fieldwork Code of Practice (Attachment 3).

If an injured Covered Species is found during the Project term, the individual shall be evaluated by the Designated Biologist(s). Permittee shall contact the CDFW Regional Representative immediately, via email and telephone, to discuss the next steps. If the CDFW Regional Representative cannot be contacted immediately, the Designated Biologist(s) shall place the injured Covered Species in a shaded container and keep it moist. If the CDFW Regional Representative is not available or has not responded within two hours of initial attempts then the following steps shall be taken:

- a) If the Designated Biologist(s) determines the injury is minor or healing and the Covered Species is likely to survive, the Covered Species shall be released immediately in accordance with the Condition of Approval 8.16.
- b) If the Designated Biologist(s) determines that the Covered Species has major or serious injuries as result of Project-related activities, it shall be transported immediately to the Lindsay Wildlife Museum or another CDFW approved facility. If taken into captivity, the individual shall remain in captivity and shall not be released into the wild unless it has been kept in quarantine and the release is authorized by CDFW and USFWS. Permittee shall bear any costs associated with the care or treatment of such injured Covered Species. Permittee shall document the circumstances of the injury, the procedure followed, and the final disposition of the injured animal in a written incident report as described in Condition of Approval 7.8.

9. Habitat Management Land Acquisition and Restoration:

CDFW has determined that permanent protection and perpetual management of compensatory habitat is necessary and required pursuant to CESA to fully mitigate Project-related impacts of the taking on the Covered Species that will result with implementation of the Covered Activities. This determination is based on factors including an assessment of the importance of the habitat

in the Project Area, the extent to which the Covered Activities will impact the habitat, and CDFW's estimate of the acreage required to provide for adequate compensation.

To meet this requirement, the Permittee shall either purchase a total of 56.15 acres of Covered Species credits from a CDFW-approved mitigation or conservation bank (Condition of Approval 9.2) within the East Alameda County Conservation Strategy (EACCS) CTS North mitigation area (Chapter 3, Figure 3-10, dated October 2010) OR shall provide for both the permanent protection and management of 56.15 acres of Habitat Management (HM) lands pursuant to Condition of Approval 9.3 below and the calculation and deposit of the management funds pursuant to Condition of Approval 9.4 below.

- 9.1. Cost Estimates. CDFW has estimated the cost of acquisition, protection, and perpetual management of the HM lands and the restoration of temporarily disturbed habitat as follows:
- 9.1.1. Purchase of 56.15 acres of California tiger salamander credits from a CDFW-approved mitigation or conservation bank is estimated at **\$2,228,000**.
- 9.1.2. Restoration of on-site temporary effects to Covered Species habitat as described in Condition of Approval 9.6 is estimated at **\$188,000**.
- 9.2. Covered Species Credits. Permittee shall purchase 56.15 acres of Covered Species credits from a CDFW-approved mitigation or conservation bank prior to initiating Covered Activities, or no later than 18 months from the issuance of this ITP if Security is provided pursuant to Condition of Approval 10 below.

OR

- 9.3. Habitat Acquisition and Protection. To provide for the acquisition and perpetual protection and management of the HM lands, the Permittee shall:
- 9.3.1. Fee Title/Conservation Easement. Transfer fee title to the HM lands to CDFW pursuant to terms approved in writing by CDFW. Alternatively, CDFW, in its sole discretion, may authorize a governmental entity, special district, non-profit organization, for-profit entity, person, or another entity to hold title to and manage the property provided that the district, organization, entity, or person meets the requirements of Government Code sections 65965-65968, as amended. If CDFW does not hold fee title to the HM lands, CDFW shall act as grantee for a conservation easement over the HM lands or shall, in its sole discretion, approve a non-profit entity, public agency, or Native American tribe to act as grantee for a conservation easement over the HM lands provided that the entity, agency, or tribe meets the requirements of Civil Code section 815.3. If CDFW does not hold the conservation easement, CDFW shall be expressly named in the conservation easement as a third-party beneficiary. The Permittee shall obtain CDFW written approval of any conservation easement before its execution or recordation. No conservation easement shall be approved by CDFW unless it complies with Government Code sections 65965-65968, as amended and includes provisions expressly addressing Government Code sections 65966(j) and 65967(e);

- 9.3.2. HM Lands Approval. Obtain CDFW written approval of the HM lands before acquisition and/or transfer of the land by submitting, at least three months before acquisition and/or transfer of the HM lands, a formal Proposed Lands for Acquisition Form (see Attachment 4B) identifying the land to be purchased or property interest conveyed to an approved entity as mitigation for the Project's impacts on Covered Species. HM lands shall meet the minimum habitat requirements for the Covered Species including, but not limited to one or more aquatic features on-site which have been documented to support successful California tiger salamander breeding in an average or below average rainfall year (abundance and distribution) or adjacent to aquatic features which have been documented to support successful California tiger salamander breeding in an average or below average rainfall year (abundance and distribution) and already conserved and managed to the satisfaction of CDFW for California tiger salamander; no less than 100 acres of suitable upland or adjacent to suitable upland already conserved and managed for the Covered Species.
- 9.3.3. HM Lands Documentation. Provide a recent preliminary title report, initial hazardous materials survey report, and other necessary documents (see Attachment 4A). All documents conveying the HM lands and all conditions of title are subject to the approval of CDFW, and if applicable, the Wildlife Conservation Board and the Department of General Services;
- 9.3.4. Land Manager. Designate both an interim and long-term land manager approved by CDFW. The interim and long-term land managers may, but need not, be the same. The interim and/or long-term land managers may be the landowner or another party. Documents related to land management shall identify both the interim and long-term land managers. Permittee shall notify CDFW of any subsequent changes in the land manager within 30 days of the change. If CDFW will hold fee title to the mitigation land, CDFW will also act as both the interim and long-term land manager unless otherwise specified.
- 9.3.5. Start-up Activities. Provide for the implementation of start-up activities, including the initial site protection and enhancement of HM lands, once the HM lands have been approved by CDFW. Start-up activities include, at a minimum: (1) preparing a final management plan for CDFW approval (see <https://www.wildlife.ca.gov/Conservation/Planning/Banking>); (2) conducting a baseline biological assessment and land survey report within four months of recording or transfer; (3) developing and transferring Geographic Information Systems (GIS) data if applicable; (4) establishing initial fencing; (5) conducting litter removal; (6) conducting initial habitat restoration or enhancement, if applicable; and (7) installing signage;
- 9.3.6. Interim Management (Initial and Capital). Provide for the interim management of the HM lands. The Permittee shall ensure that the interim land manager implements the interim management of the HM lands as described in the final management plan and conservation easement approved by CDFW. The interim management period shall be a minimum of three years from the date of HM land acquisition and protection and full funding of the Endowment and includes expected management following start-up activities. Interim management period activities described in the final management plan shall include fence repair, continuing trash removal, site monitoring, and vegetation and

invasive species management. Permittee shall either (1) provide a security to CDFW for the minimum of three years of interim management that the land owner, Permittee, or land manager agrees to manage and pay for at their own expense, (2) establish an escrow account with written instructions approved in advance in writing by CDFW to pay the land manager annually in advance, or (3) establish a short-term enhancement account with CDFW or a CDFW-approved entity for payment to the land manager.

- 9.4. Endowment Fund. The Permittee shall ensure that the HM lands are perpetually managed, maintained, and monitored by the long-term land manager as described in this ITP, the conservation easement, and the final management plan approved by CDFW. After obtaining CDFW approval of the HM lands, Permittee shall provide long-term management funding for the perpetual management of the HM lands by establishing a long-term management fund (Endowment). The Endowment is a sum of money, held in a CDFW-approved fund that provides funds for the perpetual management, maintenance, monitoring, and other activities on the HM lands consistent with the management plan(s) required by Condition of Approval 9.3.5. Endowment as used in this ITP shall refer to the endowment deposit and all interest, dividends, other earnings, additions and appreciation thereon. The Endowment shall be governed by this ITP, Government Code sections 65965-65968, as amended, and Probate Code sections 18501-18510, as amended.

After the interim management period, Permittee shall ensure that the designated long-term land manager implements the management and monitoring of the HM lands according to the final management plan. The long-term land manager shall be obligated to manage and monitor the HM lands in perpetuity to preserve their conservation values in accordance with this ITP, the conservation easement, and the final management plan. Such activities shall be funded through the Endowment.

- 9.4.1. Identify an Endowment Manager. The Endowment shall be held by the Endowment Manager, which shall be either CDFW or another entity qualified pursuant to Government Code sections 65965-65968, as amended. Permittee shall submit to CDFW a written proposal that includes: (i) the name of the proposed Endowment Manager; (ii) whether the proposed Endowment Manager is a governmental entity, special district, nonprofit organization, community foundation, or congressionally chartered foundation; (iii) whether the proposed Endowment Manager holds the property or an interest in the property for conservation purposes as required by Government Code section 65968(b)(1) or, in the alternative, the basis for finding that the Project qualifies for an exception pursuant to Government Code section 65968(b)(2); and (iv) a copy of the proposed Endowment Manager's certification pursuant to Government Code section 65968(e). Within thirty days of CDFW's receipt of Permittee's written proposal, CDFW shall inform Permittee in writing if it determines the proposal does not satisfy the requirements of Fish and Game Code section 2081(b)(4) and, if so, shall provide Permittee with a written explanation of the reasons for its determination. If CDFW does not provide Permittee with a written determination within the thirty-day period, the proposal shall be deemed consistent with Section 2081(b)(4).;
- 9.4.2. Calculate the Endowment Funds Deposit. After obtaining CDFW written approval of the HM lands, long-term management plan, and Endowment Manager, Permittee shall

prepare a Property Analysis Record (PAR) [or PAR-equivalent analysis (hereinafter "PAR")] to calculate the amount of funding necessary to ensure the long-term management of the HM lands (Endowment Deposit Amount). The Permittee shall submit to CDFW for review and approval the results of the PAR before transferring funds to the Endowment Manager.

9.4.2.1. Capitalization Rate and Fees. Permittee shall obtain the capitalization rate from the selected Endowment Manager for use in calculating the PAR and adjust for any additional administrative, periodic, or annual fees.

9.4.2.2. Endowment Buffers/Assumptions. Permittee shall include in PAR assumptions the following buffers for endowment establishment and use that will substantially ensure long-term viability and security of the Endowment:

9.4.2.2.1. 10 Percent Contingency. A 10 percent contingency shall be added to each endowment calculation to hedge against underestimation of the fund, unanticipated expenditures, inflation, or catastrophic events.

9.4.2.2.2. Three Years Delayed Spending. The endowment shall be established assuming spending will not occur for the first three years after full funding.

9.4.2.2.3. Non-annulized Expenses. For all large capital expenses to occur periodically but not annually such as fence replacement or well replacement, payments shall be withheld from the annual disbursement until the year of anticipated need or upon request to Endowment Manager and CDFW.

9.4.3. Transfer Long-term Endowment Funds. Permittee shall transfer the long-term endowment funds to the Endowment Manager upon CDFW approval of the Endowment Deposit Amount identified above. The approved Endowment Manager may pool the Endowment with other endowments for the operation, management, and protection of HM lands for local populations of the Covered Species but shall maintain separate accounting for each Endowment. The Endowment Manager shall, at all times, hold and manage the Endowment in compliance with this ITP, Government Code sections 65965-65968, as amended, and Probate Code sections 18501-18510, as amended.

9.5. Reimburse CDFW. Permittee shall reimburse CDFW for all reasonable expenses incurred by CDFW such as transaction fees, account set-up fees, administrative fees, title and documentation review and related title transactions, expenses incurred from other state agency reviews, and overhead related to transfer of HM lands to CDFW.

9.6. Habitat Restoration. Permittee shall restore on-site the 56.15 acres of Covered Species habitat that will be temporarily disturbed during construction to pre-project or better conditions. Within one month of issuance of this ITP, the Permittee shall prepare a Vegetation Restoration Plan to facilitate revegetation of 56.15 acres of temporary construction disturbance on-site, and shall ensure that the contractor successfully implements the Plan. The Plan shall include detailed specifications for restoring all temporarily disturbed areas, such as seed mixes and application methods. The seed mix

shall be a naturalized combination of rangeland non-invasive grasses and forbs. The plan shall also indicate the best time of year for seeding to occur, and three years of monitoring and success criteria. Plantings undertaken between April 15 and October 15 shall include regular watering to ensure adequate growth if necessary. Permittee shall not plant, seed, or otherwise introduce invasive plant species. Prohibited exotic plant species include those identified in the California Invasive Plant Council's Inventory Database, which is accessible at: <http://www.cal-ipc.org/paf/>.

- 9.6.1. Conserve Top Soil. The Permittee shall remove and stockpile separately, the top six (6) to twelve (12) inches of soils within any excavated swales or channels and disturbed annual grasslands. Permittee shall place this stockpiled top soil material back to replicate the original soil stratigraphy at the end of construction, and return the swale to pre-project grade.
- 9.6.2. Restore Tributaries and Swales. Permittee shall return tributary and swale contours as near as possible to pre-project grade and conditions.
- 9.6.3. Genetic Material for Mitigation Plantings. Permittee shall locally source plant material used for re-vegetation; plant material shall consist of native vegetation. Permittee shall ensure original genetic material (i.e., plants or seeds) for all local mitigation plantings was collected from within 50 miles of the project site. However, the plants/seed may have been propagated by a grower outside of this area.
- 9.6.4. Revegetation. Permittee shall complete revegetation as soon as possible after Covered Activities are completed. Permittee shall cover seeding placed between October 15 and April 15 with broadcast straw, jute netting, coconut fiber blanket, or similar erosion control blanket. Permittee shall not use monofilament or woven plastic strands.
- 9.6.5. Soil Pathogens – Pre-Construction. All vehicular equipment moving onto the access road shall be pressure washed prior to entry to reduce the risk of transporting vegetation pathogens and other invasive agents. Prior to entry to any project area for the first time, equipment must be free of soil and debris on tires, wheel wells, vehicle undercarriages, and other surfaces (a high pressure washer and/or compressed air may be used to ensure that soil and debris are completely removed).
- 9.6.6. Phytophthora – Post-Construction. Permittee shall implement measures to avoid using plant stock that may be infected with the plant pathogen *Phytophthora* spp. Measures to avoid contamination with *Phytophthora* spp. may include, but are not limited to, avoiding collection of propagules 1) from known or likely infected areas; 2) during wet conditions; 3) when soil is muddy; or 4) from within 0.5 meter of the soil surface. Measures may also include implementing heat or chemical treatments to collected seeds prior to installation. Such measures shall be included in the planting plan in the Vegetation Restoration Plan that Permittee shall submit to CDFW for review and approval.
- 9.6.7. Interim Restoration Obligation. Permittee is responsible for monitoring and maintaining the restored areas until the Vegetation Restoration Plan success criteria have been met.

10. Performance Security

The Permittee may proceed with Covered Activities only after the Permittee has ensured funding (Security) to complete any activity required by Condition of Approval 9 that has not been completed before Covered Activities begin. Permittee shall provide Security as follows:

- 10.1. Security Amount. The Security shall be in the amount of **\$2,416,000**. This amount is based on the cost estimates identified in Condition of Approval 9.1 above.
- 10.2. Security Form. The Security shall be in the form of an irrevocable letter of credit (see Attachment 5) or another form of Security approved in advance in writing by CDFW's Office of the General Counsel.
- 10.3. Security Timeline. The Security shall be provided to CDFW before Covered Activities begin or within 30 days after the effective date of this ITP, whichever occurs first.
- 10.4. Security Holder. The Security shall be held by CDFW or in a manner approved in advance in writing by CDFW.
- 10.5. Security Transmittal. If CDFW holds the Security, Permittee shall transmit it to CDFW with a completed Mitigation Payment Transmittal Form (see Attachment 6) or by way of an approved instrument such as escrow, irrevocable letter of credit, or other.
- 10.6. Security Drawing. The Security shall allow CDFW to draw on the principal sum if CDFW, in its sole discretion, determines that the Permittee has failed to comply with the Conditions of Approval of this ITP.
- 10.7. Security Release. The Security (or any portion of the Security then remaining) shall be released to the Permittee after CDFW has conducted an on-site inspection and received confirmation that all secured requirements have been satisfied, as evidenced by:
 - Written confirmation from the CDFW approved Mitigation and/or Conservation Bank of its receipt of the full payment for mitigation credits;
 - Written documentation of successful restoration; and
 - Timely submission of all required reports

Even if Security is provided, the Permittee must complete the required the required acquisition, protection and transfer of all HM lands and record any required conservation easements or complete the required purchase of Covered Species Credits no later than 18 months from the effective date of this ITP. CDFW may require the Permittee to provide additional HM lands or purchase of Covered Species Credits and/or additional funding to ensure the impacts of the taking are minimized and fully mitigated, as required by law, if the Permittee does not complete these requirements within the specified timeframe.

Amendment:

This ITP may be amended as provided by California Code of Regulations, Title 14, section 783.6, subdivision (c), and other applicable law. This ITP may be amended without the concurrence of the

Permittee as required by law, including if CDFW determines that continued implementation of the Project as authorized under this ITP would jeopardize the continued existence of the Covered Species or where Project changes or changed biological conditions necessitate an ITP amendment to ensure that all Project-related impacts of the taking to the Covered Species are minimized and fully mitigated.

Stop-Work Order:

CDFW may issue Permittee a written stop-work order requiring Permittee to suspend any Covered Activity for an initial period of up to 25 days to prevent or remedy a violation of this ITP, including but not limited to the failure to comply with reporting or monitoring obligations, or to prevent the unauthorized take of any CESA endangered, threatened, or candidate species. Permittee shall stop work immediately as directed by CDFW upon receipt of any such stop-work order. Upon written notice to Permittee, CDFW may extend any stop-work order issued to Permittee for a period not to exceed 25 additional days. Suspension and revocation of this ITP shall be governed by California Code of Regulations, Title 14, section 783.7, and any other applicable law. Neither the Designated Biologist(s) nor CDFW shall be liable for any costs incurred in complying with stop-work orders.

Compliance with Other Laws:

This ITP sets forth CDFW's requirements for the Permittee to implement the Project pursuant to CESA. This ITP does not necessarily create an entitlement to proceed with the Project. Permittee is responsible for complying with all other applicable federal, state, and local law.

Notices:

The Permittee shall deliver a fully executed duplicate original ITP by registered first class mail or overnight delivery to the following address:

Habitat Conservation Planning Branch
California Department of Fish and Wildlife
Attention: CESA Permitting Program
Post Office Box 944209
Sacramento, CA 94244-2090

Written notices, reports and other communications relating to this ITP shall be delivered to CDFW by registered first class mail at the following address, or at addresses CDFW may subsequently provide the Permittee. Notices, reports, and other communications shall reference the Project name, Permittee, and ITP Number (2081-2017-011-03) in a cover letter and on any other associated documents.

Original cover with attachment(s) to:

Gregg Erickson, Regional Manager
California Department of Fish and Wildlife – Bay Delta Region
2825 Cordelia Road, Suite 100
Fairfield, CA 94534
Telephone (707) 428-2002

And a copy to:

Incidental Take Permit
No. 2081-2017-011-03
Pacific Gas and Electric Company
R649, R700, and R707 Natural Gas Transmission Pipeline 131 Replacement Project

Habitat Conservation Planning Branch
California Department of Fish and Wildlife
Attention: CESA Permitting Program
Post Office Box 944209
Sacramento, CA 94244-2090

Unless Permittee is notified otherwise, CDFW's Regional Representative for purposes of addressing issues that arise during implementation of this ITP is:

Serge Glushkoff
2825 Cordelia Road, Suite 100
Fairfield, CA 94534
Telephone (707) 339-6191
Serge.Glushkoff@wildlife.ca.gov

Compliance with CEQA:

CDFW's issuance of this ITP is subject to CEQA. CDFW is a lead agency pursuant to CEQA with respect to this ITP. (See generally Pub. Resources Code, § 21067). CDFW's environmental review of the Project is set forth in the R649, R700, and R707 Natural Gas Transmission Pipeline 131 Replacement Project Mitigated Negative Declaration and Initial Study (SCH No. 2018062074) dated June 2018, that CDFW adopted for the R649, R700, and R707 Natural Gas Transmission Pipeline 131 Replacement Project.

This ITP, along with CDFW's related CEQA findings, which are available as a separate document, provide evidence of CDFW's independent judgment and analysis and the determination that based on the whole record before it, including the Mitigated Negative Declaration for the Project and comments received, that there is no substantial evidence that the Project will have a significant effect on the environment.

Findings Pursuant to CESA:

These findings are intended to document CDFW's compliance with the specific findings requirements set forth in CESA and related regulations. [Fish and Game Code § 2081, subs. (b)-(c); Cal. Code Regs., tit. 14, §§ 783.4, subds. (a)-(b), 783.5, subd. (c)(2)].

CDFW finds based on substantial evidence in the ITP application, the results of site visits consultations, and the administrative record of proceedings, that issuance of this ITP complies and is consistent with the criteria governing the issuance of ITPs pursuant to CESA:

- (1) Take of Covered Species as defined in this ITP will be incidental to the otherwise lawful activities covered under this ITP;
- (2) Impacts of the taking on Covered Species will be minimized and fully mitigated through the implementation of measures required by this ITP and as described in the MMRP. Measures include: (1) permanent habitat protection; (2) establishment of avoidance zones; (3) worker education; and (4) Monthly Compliance Reports. CDFW evaluated factors including an assessment of the importance of the habitat in the Project Area, the extent to which the Covered Activities will impact the habitat, and CDFW's estimate of the acreage required to

provide for adequate compensation. Based on this evaluation, CDFW determined that the protection and management in perpetuity of 56.15 acres of compensatory habitat that is contiguous with other protected Covered Species habitat and/or is of higher quality than the habitat being destroyed by the Project, along with the minimization, monitoring, reporting, and funding requirements of this ITP minimizes and fully mitigates the impacts of the taking caused by the Project;

- (3) The take avoidance and mitigation measures required pursuant to the conditions of this ITP and its attachments are roughly proportional in extent to the impacts of the taking authorized by this ITP;
- (4) The measures required by this ITP maintain Permittee's objectives to the greatest extent possible;
- (5) All required measures are capable of successful implementation;
- (6) This ITP is consistent with any regulations adopted pursuant to Fish and Game Code sections 2112 and 2114;
- (7) Permittee has ensured adequate funding to implement the measures required by this ITP as well as for monitoring compliance with, and the effectiveness of, those measures for the Project; and
- (8) Issuance of this ITP will not jeopardize the continued existence of the Covered Species based on the best scientific and other information reasonably available, and this finding includes consideration of the species' capability to survive and reproduce, and any adverse impacts of the taking on those abilities in light of (1) known population trends; (2) known threats to the species; and (3) reasonably foreseeable impacts on the species from other related projects and activities. Moreover, CDFW's finding is based, in part, on CDFW's express authority to amend the terms and conditions of this ITP without concurrence of the Permittee as necessary to avoid jeopardy and as required by law.

Attachments:

FIGURE 1	Project Location Map
FIGURES 2-1 to 2-9	Project Location Detail Map
ATTACHMENT 1	Mitigation Monitoring and Reporting Program
ATTACHMENT 2	Restraint and Handling of Live Amphibians
ATTACHMENT 3	Declining Amphibian Task Force Fieldwork Code of Practice
ATTACHMENT 4A, 4B	Habitat Management Lands Checklist; Proposed Lands for Acquisition Form
ATTACHMENT 5	Letter of Credit Form
ATTACHMENT 6	Mitigation Payment Transmittal Form

ISSUED BY THE CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE


on 8-28-18.



Gregg Erickson, Regional Manager
BAY DELTA REGION

ACKNOWLEDGMENT

The undersigned: (1) warrants that he or she is acting as a duly authorized representative of the Permittee, (2) acknowledges receipt of this ITP, and (3) agrees on behalf of the Permittee to comply with all terms and conditions

By:  Date: 8/28/18

Printed Name: Adam Cleary Title: Manager,
Environmental

Appendix D.2

Wildlife Report



Biological Constraints Report – Wildlife Species

L-131 Combined Pipeline Replacement
Projects and D-915 Dig Project

Interstate-580/Arroyo Las Positas Crossing
Replacement Project

DRAFT

March 21, 2019

Prepared for:

Pacific Gas and Electric Company

Prepared by:

Stantec Consulting Services Inc

Table of Contents

1.0	INTRODUCTION	1
2.0	PROJECT DESCRIPTION	1
2.1	ORIGINAL STUDY AREA (R-649, R-700, AND R-707)	1
2.2	R-893 STUDY AREA.....	2
2.3	D-915 STUDY AREA.....	2
3.0	REGULATORY CONTEXT	3
3.1	FEDERAL.....	3
3.1.1	Endangered Species Act.....	3
3.1.2	Migratory Bird Treaty Act.....	3
3.1.3	Bald and Golden Eagle Protection Act	3
3.1.4	Clean Water Act.....	4
3.2	STATE.....	4
3.2.1	California Endangered Species Act.....	4
3.2.2	California Fish and Game Code	4
3.2.3	California Fully Protected Species.....	5
3.2.4	California Species of Special Concern	5
3.2.5	California Environmental Quality Act	5
3.2.6	California Streambed Alteration Notification/Agreement.....	5
3.2.7	California Regional Water Quality Control Board.....	6
3.3	LOCAL	6
3.3.1	East Alameda County Conservation Strategy.....	6
3.3.2	Alameda East County Area Plan	6
3.3.3	Livermore General Plan	6
4.0	METHODS	8
4.1	LITERATURE AND DATABASE REVIEW	8
4.2	DEFINITIONS.....	9
4.2.1	Special-Status Species	9
4.3	RECONAISSANCE-LEVEL SURVEY	10
4.3.1	R-893 Study Area Survey.....	10
4.3.2	D-915 Study Area Survey.....	10
5.0	ENVIRONMENTAL SETTING.....	10
5.1	SITE CONDITIONS AND LAND USE	10
5.2	DOMINANT HABITATS.....	11
5.2.1	Native and Non-native Grassland.....	11
5.2.2	Developed	12
5.2.3	Ruderal	12
5.2.4	Cropland	13
5.2.5	Seasonal Alkali Wetland.....	13
5.2.6	Perennial Stream (Arroyo Las Positas)	13
5.3	WETLAND AND AQUATIC RESOURCES	13

BIOLOGICAL CONSTRAINTS REPORT

6.0	RESULTS	14
6.1	SPECIAL-STATUS WILDLIFE SPECIES	14
6.1.1	Federally Listed Species	24
6.1.2	State Listed Species	26
6.1.3	Wildlife Corridors	32
7.0	RECOMMENDED AVOIDANCE AND MINIMIZATION MEASURES	32
7.1	BAY AREA HCP FIELD PROTOCOLS	33
7.2	AVOIDANCE AND MINIMIZATION MEASURES FROM THE ORIGINAL PROJECT INITIAL STUDY MITIGATED NEGATIVE DECLARATION (ISMND) REPORT	35
7.2.1	Applicant Proposed Measures (APMs)	36
7.2.2	Mitigation Measures (MMs)	38
7.3	AVOIDANCE AND MINIMIZATION MEASURES FROM THE ORIGINAL PROJECT INCIDENTAL TAKE PERMIT (ITP)	47
8.0	CONCLUSIONS	49
9.0	REFERENCES	51
	APPENDIX A FIGURES	A-1

LIST OF TABLES

Table 1. Special-status wildlife species with potential to occur within the Study Area	15
Table 2. PG&E Bay Area HCP: Relevant Field Protocols and Avoidance and Minimization Measures to Reduce Impacts on Covered Species	33

LIST OF FIGURES

Figure 1 Project Vicinity	A-2
Figure 2 Project Location	A-3
Figure 3a R-893 Habitat Map	A-4
Figure 3b D-915 Habitat Map	A-5
Figure 4 CNDDB and Critical Habitat Map	A-6
Figure 5 R-893 Mapped Burrow Locations	A-7

1.0 INTRODUCTION

This Biological Constraints Report (Report) was produced for Pacific Gas and Electric (PG&E) as part of their Combined Line 131 (L-131) Pipeline Replacement Projects and D-915 Dig Project (Amended Project) to supplement the previously prepared report, Wildlife Constraints Analysis Report for the PG&E Gas Line 131 R-649, R-700, and R-707 Replacement Project, Alameda County, California prepared by Swaim Biological (January 2017) in order to include two additional Study Areas that are being added to the Amended Project. The PG&E L-131 R-649, R-700, and R-707 (Original Project), has already completed the permitting process and construction has been initiated. Therefore, the information included in this Report will be focused only on the two new Study Areas, R-893 and D-915. The Amended Project is located in Alameda County in and near the City of Livermore, California. The R-893 Study Area is located in the City of Livermore and begins at the terminus of the R-649 segment of the Original Project, adjacent to Shea Homes Sage, a residential development, travels under the Interstate 580 (I-580) and ends at a private property adjacent to East Airway Boulevard. The R-893 Study Area is about 0.25 miles east of Isabel Avenue, and 0.25 miles west of Portola Avenue (Figure 1). The D-915 site is located in unincorporated Alameda County, 1.6 miles north of I-580, 0.5 mile west of North Vasco Road, and approximately 500 feet north east from the corner of Raymond Road and Ames Street.

2.0 PROJECT DESCRIPTION

2.1 ORIGINAL STUDY AREA (R-649, R-700, AND R-707)

The Original Project is located north of I-580 in Alameda County (Figure 1). The activities associated with the Original Project will upgrade an approximately 5-mile section of L-131 that cannot be adequately protected by the existing cathodic protection (CP) system. The Original Project consists of installing a new pipeline parallel to the existing pipeline, retiring the existing pipeline along the replacement segments, and replacing the CP system. New pipe will be 24 inches in diameter located along approximately the same alignment as the existing pipeline. The existing pipeline will be retired and sealed in segments following PG&E's standard procedures and remain buried except for an above-ground span removed as part of the R-700 Project. To replace the CP system, existing CP cable and electronic testing stations will be removed, new cathodic testing stations will be installed, and rectifiers will be replaced. New pipeline markers will be installed along the new alignment.

An overview of each project is provided below:

- R-649 Project. PG&E previously relocated a segment of L-131 to accommodate a new residential housing development between I-580 and the City of Portola. PG&E now plans to replace portions of L-131 on either side of the segment that was relocated for the housing development, between Mile Posts (MPs) 31.83 and 31.90 and at MP 32.29. The new pipe will be buried approximately 5 feet below ground surface (bgs) as part of the R-649 Project. Retired pipe will be cut in sections and remain buried in place.
- R-700 Project. PG&E will replace an approximately 4-mile segment of L-131 between MPs 28.00 and 31.93, beginning at the north end of R-649 and extending north where it intersects at Dagnino Road, and terminating at the south end of the R-707 Project. Moving southwest to northeast, the R-700 Project crosses

BIOLOGICAL CONSTRAINTS REPORT

Harman Road, North Livermore Avenue, May School Road, and Dagnino Road. The R-700 Project also will include a route deviation around the existing residence located at 4011 North Livermore Avenue, whereby the new pipe will run parallel to North Livermore Avenue approximately 350 feet and cross the road at a 90-degree angle, north of the residence. The new pipeline will be primarily installed approximately 5 feet bgs, increasing to approximately 10 feet bgs when crossing certain roads, drainages, and swales. As part of the R-700 Project, an approximately 100-foot-long pipe span will be removed from Cayetano Creek (W-4) and replaced with new pipeline approximately 10 feet bgs. Retired pipe for the rest of the R-700 Project will be cut in sections and retired in place.

- R-707 Project. PG&E will replace an approximately 1-mile segment of L-131 between MPs 27.02 and 28.00, extending northeast from the north end of the R700 Project adjacent to Dagnino Road, to the existing Vasco Crossover Station adjacent to Vasco Road. The new pipeline segment will be installed approximately 5 feet bgs and parallel to the existing pipe, except crossing the Greenville Fault northeast of Dagnino Road, where the alignment will be adjusted to cross the fault at a 90-degree angle. Retired pipe will be cut in sections and retired in place.

2.2 R-893 STUDY AREA

The R-893 Study Area includes replacement of an approximately 825-foot section of L-131. Pipeline upgrades will consist of installing a new pipeline approximately 80 to 150 feet west and parallel to the existing pipeline and retiring the existing pipeline along the replacement segment. New pipe will be 24 inches in diameter and located along approximately the same alignment as the existing pipeline between MPs 32.29–32.39. The existing pipeline will be retired and sealed following PG&E's standard procedures and retired in place. New pipeline markers will be installed along the new alignment.

Above ground work on the R-893 Study Area is located in two areas, north of I-580, adjacent to Shea Homes Sage and south of I-580 adjacent to Airport Boulevard. The northern end of the new pipe will tie into the R-649 segment of the Original Project. The new pipe will be buried approximately 5-10 feet bgs. From the south side of I-580 an auger bore will be used to install the pipe under the freeway. The pipe will be approximately 24 feet bgs under the freeway. The new pipe will be installed and tied-into the gas system after venting gas from the existing pipeline. Retirement of the existing pipeline will occur after the new pipeline is tied into the gas system.

2.3 D-915 STUDY AREA

The D-915 Study Area, which includes dig locations D-915A and B, involves the excavation, visual assessment, and potential repairs on approximately 24 feet of the D-915 pipeline. The work associated with this Study Area will consist of exposing two 12-foot-long sections of pipe by excavating two 12x8-foot-wide bell holes at MPs 28.73 and 28.88. Examination of the pipeline will include removing pipeline coating, performing an inspection to identify corrosion, dents, manufacturing anomalies, and pipe body and weld cracks. Pipeline repairs will be made as designated by the In-Line Inspection (ILI) engineer. The site will be backfilled and restored to the approximate pre-Project condition.

3.0 REGULATORY CONTEXT

The following subsections provide a summary of the relevant federal, state, and local laws/regulations that apply to wildlife resources within the Study Area.

3.1 FEDERAL

3.1.1 Endangered Species Act

The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over plants and wildlife species listed as threatened or endangered under the Federal Endangered Species Act (FESA). The ESA protects plants and wildlife that are listed as endangered or threatened by USFWS while the National Marine Fisheries Service (NMFS) has jurisdiction over all federally listed anadromous and marine fish, marine mammals, and sea turtles. Section 9 of ESA prohibits the taking of endangered wildlife, where “take” is defined as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct” (50 Code of Federal Regulations [CFR] 17.3). A species in danger of becoming extinct throughout all or a significant portion of its range is considered to be endangered. A species likely to become endangered in the foreseeable future is considered threatened. Any activity that could result in the “take” of a federally listed species requires either a Section 10 Incidental Take Permit from the USFWS or a Section 7 consultation with the USFWS in conjunction with a federal permit process. Under Section 7 FESA requires a federal agency consult with the USFWS and/or NMFS when there is a discretionary federal involvement or control over an action that may affect a listed species or critical habitat. Through consultation and the issuance of a biological opinion, USFWS may issue an incidental take statement allowing take of the species that is incidental to an otherwise lawful activity, provided the action will not jeopardize the continued existence of the species.

3.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements international treaties between the U.S. and other nations and was devised to protect migratory birds, any of their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. As authorized by MBTA, USFWS may issue permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, education, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. The regulations governing migratory bird permits can be found in 50 CFR Part 13 General Permit Procedures and 50 CFR Part 21 Migratory Bird Permits. California has incorporated the protection of birds of prey in Sections 3800, 3513, and 3503.5 of the California Fish and Game Code (CFGC).

3.1.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) prohibits the take, possession, and commerce of both bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*), including their parts, eggs, or nests. The BGEPA defines “take” as “pursue, shoot, shoot at, poison, will, kill capture, trap, collect, molest or disturb” these species. Additionally, the BGEPA defines “disturb” as activities which “agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a

BIOLOGICAL CONSTRAINTS REPORT

decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." Beyond immediate impacts this Act also includes any disturbance resulting from human-induced alterations to a previously used nest even if the activities are conducted during a time when the nest is unoccupied. The act details criminal penalties and fines for these prohibited acts.

3.1.4 Clean Water Act

The purpose of the Clean Water Act (CWA) is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." CWA Section 404 prohibits the discharge of dredged or fill material into "waters of the United States" without a permit from the U.S. Army Corps of Engineers (USACE). The definition of waters of the United States includes rivers, streams, estuaries, the territorial seas, ponds, lakes, and wetlands. Wetlands are defined as those areas "that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3[b]). The Environmental Protection Agency (EPA) also has authority over wetlands and may override a USACE permit.

Substantial impacts to wetlands may require an individual USACE permit. Projects that only minimally affect wetlands may meet the conditions of one of the existing USACE Nationwide Permits. A Water Quality Certification or waiver pursuant to CWA Section 401 is required for Section 404 permit actions; this certification or waiver is issued by the applicable Regional Water Quality Control Board (RWQCB).

3.2 STATE

3.2.1 California Endangered Species Act

The California Endangered Species Act (CESA) generally parallels the main provisions of Federal Endangered Species Act (FESA), but unlike its federal counterpart, CESA applies the take prohibitions to species proposed for listing (defined as "candidates" by the state). CFGC Section 2085 provides the same legal protection to species that are candidate for listings as to an endangered or threatened species. CFGC Section 2080 prohibits the taking, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless otherwise authorized by permit or in the regulations. Take is defined in CFGC Section 86 as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful activities. Project proponents wishing to obtain incidental take permits can do so through a permitting process outlined in California Code of Regulations section 783.

3.2.2 California Fish and Game Code

Section 1602 of the CFGC requires that a Streambed Alteration Application be submitted to California Department of Fish and Wildlife (CDFW) for "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake." CDFW reviews the proposed actions and, if necessary, submits to the applicant a proposal for measures to protect affected fish and wildlife resources.

3.2.3 California Fully Protected Species

California first began to designate species as “fully protected” prior to the creation of CESA and FESA. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction, and included fish, mammals, amphibians, reptiles, and birds. Most fully protected species have since been listed as threatened or endangered under CESA and/or FESA. The regulations that implement the Fully Protected Species Statute (FGC Section 4700) provide that fully protected species may not be taken or possessed at any time. Furthermore, CDFW may authorize take of fully protected species only in very limited circumstances, such as for necessary scientific research.

3.2.4 California Species of Special Concern

California Species of Special Concern is an administrative designation, which has no formal legal status, referring to a species, subspecies, or distinct population of wildlife native to California and which meets one or more of the following criteria:

- is extirpated from the State or, in the case of birds, is extirpated in its primary season or breeding role;
- is listed as Federally-, but not State-, threatened or endangered; meets the State definition of threatened or endangered but has not formally been listed;
- is experiencing, or formerly experienced, serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status;
- has naturally small populations exhibiting high susceptibility to risk from any factor(s), that if realized, could lead to declines that will qualify it for State threatened or endangered status.

Section 15380 of the California Environmental Quality Act (CEQA; California Public Resources Code §§ 21000-21177) Guidelines clearly indicates that species of special concern should be included in an analysis of project impacts if they can be shown to meet the criteria of sensitivity outlined therein.

3.2.5 California Environmental Quality Act

CEQA requires state agencies, regional and local agencies, and special districts to evaluate and disclose impacts from “projects” in the state. Projects for which CEQA apply are defined as those actions that have the potential to have physical impact on the environment. CEQA aims to evaluate these projects environmental impacts and mandates that these impacts be avoided or reduced, when feasible, the significant environmental impacts of their decisions. If a project requires approval from more than one public agency, CEQA then dictates that one of these agencies act as the Lead Agency. As per Section 15380, CEQA presently requires applicants undertaking projects subject to CEQA to consider de facto endangered (or threatened) and rare species to be subject to the same protections under CEQA as though they are already listed in Section 670.2 or 670.5 of Title 14, California Code of Regulations.

3.2.6 California Streambed Alteration Notification/Agreement

Section 1602 of the CFGC requires that a Streambed Alteration Application be submitted to CDFW for “any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river,

stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.” CDFW reviews the proposed actions and, if necessary, submits to the applicant a proposal for measures to protect affected fish and wildlife resources.

3.2.7 California Regional Water Quality Control Board

Waters of the state, as regulated by the State Water Resource Control Board (SWRCB) or RWQCB under the State Water Quality Certification Program, regulate the discharge of dredged or fill material under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. Wetlands and waters meeting the definition as described in the Porter-Cologne Water Quality Control Act (California Water Code, Division 7, §13050(e)) are preliminarily determined to be waters of the state. The Porter-Cologne Water Quality Control Act defines “waters of the State” as any surface water or groundwater, including saline waters, within the boundaries of the State.

Section 401 of the CWA requires that an applicant for a federal permit to discharge dredged or fill material into a water of the U.S. must obtain a water quality certification. The SWRCB and RWQCB have a special responsibility for isolated wetlands and headwaters that may not be regulated by other programs.

3.3 LOCAL

3.3.1 East Alameda County Conservation Strategy

The East Alameda County Conservation Strategy (EACCS) provides a framework for the long-term conservation and management of 19 focal species, including nine state and/or federal species and the habitats that support them. The EACCS is also intended to streamline and simplify the issuance of permits, establish priorities for mitigation and conservation, and help maintain biological and ecological diversity in eastern Alameda County. The EACCS aims to standardize avoidance, minimization, mitigation, and compensation requirements to comply with federal, state, and local laws and regulations relating to biological and natural resources in the Study Area. The Amended Project spans EACCS Conservation Zones 2 and 4.

3.3.2 Alameda East County Area Plan

Relevant policies from the Land Use Goals, Policies, and Programs Biological Resources of the East County Area Plan (2011) are listed below, numbered as they appear in the Area Plan:

- Policy 125: The County shall encourage preservation of areas known to support special status species
- Policy 126: The County shall encourage no net loss of riparian and seasonal wetlands.

3.3.3 Livermore General Plan

Relevant policies from the Goals, Objectives, Policies, and Programs for Biological Resources sections in the Open Space and Conservation Element in the City of Livermore General Plan are listed below, numbered as they appear in the Open Space and Conservation Element in the City of Livermore General Plan.

- **Goal OSC-1:** to conserve the value and function of Livermore’s open space as a biological resource.

BIOLOGICAL CONSTRAINTS REPORT

- Objective OSC-1.1: Maintain biodiversity within the Planning Area with special emphasis on species that are sensitive, rare, declining, unique or represent valuable biological resources.
 - P4. The City shall require all projects that impact a federal or State listed threatened or endangered species, federal or State listed candidate species, State species of special concern, or State designated sensitive habitats, to mitigate for identified impacts in a way consistent with mitigation and avoidance measures published and distributed by the federal and/or State resource agencies at the time of the specific plan or project-level review. Monitoring requirements also shall be consistent with published requirements for each species or habitat. For listed or candidate species, species of special concern, or sensitive habitats for which no mitigation or avoidance measures have been published, the City shall require evidence of coordination with the responsible agencies prior to acceptance of mitigation or avoidance measures or monitoring requirements.
- Action A1: Require all development to comply with State and federal regulations to preserve and protect the habitats of rare and endangered species.
- Objective OSC-1.2 Minimize impacts to sensitive natural habitats including alkali sinks, riparian vegetation, wetlands and woodland forest.
 - P1. Habitats of rare or endangered species shall be preserved.
 - P3. Require appropriate setbacks, to be determined in coordination with resource agencies, Livermore Area Recreation and Park District, East Bay Regional Park District, and other responsible agencies, adjacent to natural streams to provide adequate buffer areas that ensure the protection of plant and animal communities.
 - P4. Riparian woodlands and freshwater marshes shall be preserved. Developers shall be required to mitigate possible adverse impacts upon these resource areas. Consistent with the North Livermore Urban Growth Boundary Initiative, no development shall be allowed that will have a substantial adverse impact or significant effect on such areas.
 - P5. Grading and excavation in woodland areas shall avoid disturbances to subsurface soil, water or rooting patterns for natural vegetation.
 - P6 The City shall require all development to comply with State and federal regulations to preserve and protect the habitats of rare and endangered species.
 - P7. The City shall require project proponents to identify and map sensitive biological and wetland resources on each development parcel and identify the measures necessary to avoid and/or minimize impacts on sensitive biological and wetland resources prior to approving the development. Mitigation for impacts to sensitive biological and wetland resources shall replace the functions and values of the resources as well as gross acreage.
 - P8. The City shall require development to avoid take of species listed as threatened, endangered, or candidate under federal and state endangered species acts by implementing measures determined in consultation with the USFWS and CDFW.

BIOLOGICAL CONSTRAINTS REPORT

- Objective OSC-1.3 Conserve Livermore's native trees and vegetation, which are important biological resources within the Planning Area. Policy
 - P1. Require new developments to incorporate native vegetation into their landscape plans, and prohibit the use of invasive non-native plant species. Propagules (seeds or plants) of native plants shall be from native sources.
- **Goal OSC-2** Conserve Livermore's waterways, tributaries and associated riparian habitats.
 - Objective OSC-2.1 Continue efforts to ensure that development does not harm the quality or quantity of Livermore's surface or ground water.
 - P1. Require the implementation of Best Management Practices (BMPs) to minimize erosion, sedimentation, and water quality degradation resulting from the construction of new impervious surfaces.

4.0 METHODS

4.1 LITERATURE AND DATABASE REVIEW

Prior to conducting the reconnaissance-level field survey in the Study Area, Stantec Consulting Services, Inc. (Stantec) reviewed existing information on special status wildlife resources in the Study Area and surrounding areas. The following sources were reviewed:

- CDFW BIOS Natural Diversity Database (CNDDDB; CDFW 2019a);
- CDFW RareFind 5 Natural Diversity Database (CNDDDB; CDFW 2019b);
- U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC; USFWS 2019); and
- USFWS National Wetlands Inventory Wetlands Mapper (NWI; USFWS 2018).

A list of special-status wildlife species with potential to occur in the R-893 and D-915 Study Areas was compiled by performing a CNDDDB search and reviewing the USFWS IPaC species list for the Study Area. The CNDDDB search consisted of a 5-mile buffer around the Study Area and included the following U.S. Geological Survey (USGS) quadrangles: Diablo, Tassajara, Byron Hot Springs, Clifton Court Forebay, Dublin, Livermore, Altamont, Midway, Niles, La Costa Valley, Mendenhall Springs, and Cedar Mountain.

Reconnaissance-level wildlife surveys of the R-893 Study Area were conducted by Stantec wildlife biologist Katrina Belanger-Smith on December 8, 2017 to identify potential habitat for special-status wildlife species. The Study Area included the proposed work areas, temporary staging and laydown areas, and a larger Study Area around these project components which totaled a Study Area of approximately 14 acres. Burrow locations were also mapped within the study area boundaries per a request made by PG&E. On November 26, 2018 Stantec biologist Andrew Sorci re-visited the site to assess any changes in the baseline conditions described in the Report

BIOLOGICAL CONSTRAINTS REPORT

and to re-map the existing burrows occurring within the site. The 2018 survey determined that conditions were consistent with the data gathered during the 2017 survey; the findings and determinations are reflected in the Report.

On March 6, 2018 Stantec wetland biologist John Holson visited the D-915 Study Area to assess the study area for potentially jurisdictional wetlands and other waters of the U.S. One feature, a seasonal alkali wetland, was mapped and a kmz of the mapped feature boundaries was compiled and sent to PG&E.

Reconnaissance-level wildlife surveys of the D-915 Study Area were conducted by Surf 2 Snow Environmental Resource Management (S2S ERM) wildlife biologist Jennifer Flohr on December 18, 2018. The purpose of this survey was to identify potential habitat for special-status wildlife species in the D-915 Study Area. The Study Area Study Area included the proposed work areas, access roads, and an approximate 50-foot buffer around these areas. An additional buffer of approximately 200 feet was observed visually using binoculars due to lack of landowner permission for direct access. Burrow locations were observed and counted but were not mapped at this Project location.

4.2 DEFINITIONS

4.2.1 Special-Status Species

Special-status wildlife species were defined in accordance with the CEQA Guidelines, Section 15380, and included species that are:

- listed, proposed for listing, or candidates for listing as threatened or endangered under the FESA;
- listed or candidates for listing as threatened or endangered under the California Endangered Species Act;
- designated as Species of Special Concern by the CDFW;
- included on the CDFW “Special Animals” list (CDFW 2019); or
- otherwise meet the definition of rare, threatened, or endangered, as described in the CEQA Guidelines, Section 15380.

Special-status wildlife species documented or with suitable habitat in the R-893 or D-915 Study Areas or vicinity are summarized below in Table 1. The R-893 Study Area does not pass through designated critical habitat however there is critical habitat within 2 miles of the Study Area. California tiger salamander critical habitat is 0.8 miles northwest of the Study Area, California red-legged frog critical habitat is 0.86 miles northwest of the Study Area and vernal pool fairy shrimp critical habitat is 1.84 miles northeast of the Study Area.

The D-915 Study Area overlaps with two designated critical habitat areas; vernal pool fairy shrimp critical habitat and California red-legged frog critical habitat. Longhorn fairy shrimp critical habitat is also in the Study Area vicinity and is located approximately 3.0 miles to the northeast of the Study Area.

4.2.1.1 Potential to Occur

The likelihood of occurrence (low, moderate, or high) is based on habitat requirements (e.g., substrate, hydrology, vegetation community, and disturbance factors) and range, and was applied by using the following general guidelines:

- **High** – Habitat within the Study Area and/or Study Area vicinity meets most or all of the species' requirements, and known locations for the species are found within 1 mile of the Study Area.
- **Moderate** – Habitat within the Study Area and/or Study Area vicinity meets some of the species' requirements, and known locations for the species are found in the vicinity of the Study Area.
- **Low** – Habitat within the Study Area and/or project vicinity satisfies very few of the species' requirements and/or the range of the species does not overlap the Study Area itself. The species' presence within the Study Area is unlikely.

4.3 RECONNAISSANCE-LEVEL SURVEY

4.3.1 R-893 Study Area Survey

As discussed in Section 4.1, a reconnaissance-level survey of the R-893 Study Area was conducted on December 8, 2017 by a Stantec biologist and was revisited on November 26, 2018. The purpose of these surveys was to assess and identify potential habitat for special status wildlife species. In addition, visible burrows within the Study Area were mapped using a handheld Trimble Geo 7x Global Positioning System (GPS) device (Figure 5). Approximately 222 burrows were mapped during the 2017 site survey and 304 burrows were mapped during 2018 site survey within the Study Area, of the majority of which are located north of I-580. Due to the height and density of vegetation within the Study Area, the number of burrows within the Study Area has likely been underestimated.

4.3.2 D-915 Study Area Survey

As discussed in Section 4.1, a reconnaissance-level survey of the D-915 Study Area was conducted on December 18, 2018 by a S2S ERM biologist. The purpose of these surveys was to assess and identify potential habitat for special status wildlife species. In addition, visible burrows within the Study Area were noted but were not mapped. Approximately 96 burrows were observed during the survey, many of which showed sign of active ground squirrel activity. Due to the height and density of vegetation within the Study Area, the number of burrows within the Study Area was likely underestimated.

5.0 ENVIRONMENTAL SETTING

5.1 SITE CONDITIONS AND LAND USE

The R-893 Study Area is located within the City of Livermore in Alameda County and is centered at an approximate latitude of 37.70099 and longitude of -121.795294. The Study Area runs on both the north and south sides and parallel to I-580 and is accessed from the south via East Airway Blvd and from the north via Tranquility Circle. The D-915 study area is located in unincorporated Alameda County outside of the City of Livermore, California, near the

BIOLOGICAL CONSTRAINTS REPORT

corner of Ames Street and Raymond Road, and is centered at a latitude of 37.73322 and longitude of 121.73306. The D-915 study area is accessed from the south via PG&E's Dalton Crossover Station.

Both the R-893 and D-915 Study Areas are situated in an area 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. These areas lie within the Livermore U.S. Geological Survey 7.5-minute quadrangle maps, Section 6, Township 3S, Range 2E and is located within Conservation Zone 4 of the EACCS. Elevation on the Study Area ranges from approximately 407 feet to 431 feet above mean sea level.

The soils in the R-893 Project Study Area are mapped by the U.S Department of Agriculture (USDA) as Zamora silt loam, 0 to 4 percent slopes (Map Unit Symbol Za), which makes up the entire Study Area to the south of I-580. The project Study Area to the north of I-580 is mapped as Diablo clay, very deep, 3 to 15 percent slopes (Map Unit Symbol DvC), Linne clay loam, 3 to 15 percent slopes (Map Unit Symbol LaC), Riverwash (Map Unit Symbol Rh), and Zamora silt loam, 0 to 4 percent slopes (Map Unit Symbol Za) (USDA 2016).

The soils in the D-915 Study Area are mapped by the U.S Department of Agriculture (USDA) as Altamont clay, 15 to 30 percent slopes, Gaviota rocky sandy loam, 5 to 40 percent slopes, Positas gravelly loam, and Solano fine sandy loam (USDA 2018).

The majority of the primary land use within the Amended Project Study Areas is medium-density residential and urban farming. Other adjacent land use includes industrial, agricultural primarily cattle grazing, as well as riparian habitat along Arroyo Las Positas. Wildlife habitats within the R-893 Study Area and D-915 Study Area and immediately surrounding areas are described below.

5.2 DOMINANT HABITATS

The R-893 and D-915 sites support seven generalized habitat types consisting of five upland habitats (native grassland, non-native grassland, developed, ruderal, cropland, and two aquatic habitats (Riverine [Arroyo Las Positas], and seasonal alkali wetland).

5.2.1 Native and Non-native Grassland

Non-native annual grassland represents the dominant vegetation type within both the R-893 and D-915 Study Areas. This herbaceous plant community composed primarily of non-native annual grasses and forbs, such as wild oat (*Avena barbata*), ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis*), and soft chess brome (*Bromus hordeaceus*). In addition, nonnative weedy vegetation, such as thistles (*Carduus spp.*), mustards (*Brassica spp.*), and a variety of other weedy forbs, are also common in this plant community. Native grassland communities represent a smaller percentage of the R-893 site and are present along Arroyo Las Positas. Native grasslands in the R-893 Study Area are dominated by salt grass (*Distichlis spicata*), wild oats (*Avena sp.*), blue wildrye (*Elymus glaucus* subsp. *glaucus*), bristly ox-tongue (*Helminthotheca echioides*), perennial pepperweed (*Lepidium latifolium*), California mugwort (*Artemisia douglasiana*), poison hemlock (*Conium maculatum*), and fennel (*Foeniculum vulgare*) (Nomad Ecology, 2019).

Open annual grasslands can support a variety of small mammals and provide foraging habitat for raptors and other birds. Birds commonly found foraging in annual grasslands include the red-tailed hawk (*Buteo jamaicensis*), American

BIOLOGICAL CONSTRAINTS REPORT

kestrel (*Falco sparverius*), and turkey vulture (*Cathartes aura*). Common seed eaters such as California quail (*Callipepla californica*), mourning dove (*Zenaida macroura*), and meadowlarks (*Sturnella neglecta*) often use grasslands for nesting. Insect eaters such as scrub jays (*Aphelocoma californica*), barn swallows (*Hirundo rustica*) and mockingbirds (*Mimus polyglottos*) use the habitat for foraging. Common mammals of annual grassland habitats include the California ground squirrel (*Otospermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), California vole (*Microtus californicus*), broad-footed mole (*Scapanus latimanus*), and black tailed jackrabbit (*Lepus californicus*). These small mammals utilize open grassland for both foraging and nesting opportunities. Burrows of California ground squirrels can provide important refuge sites for other species. Wildflowers in grasslands also provide foraging resources for butterflies, bees and other insects. Mule deer can use grasslands for grazing and resting at night.

5.2.2 Developed

Developed areas include paved or other hardscaped areas, graveled roads, structures, and landscaped areas. In the R-893 Study Area, which is south of I-580, developed areas include paved roads, graveled lot and outbuildings associated with an urban farm (corn maze and pumpkin patch) located along East Airway Boulevard and north of I-580 developed areas include a residential development with paved walking paths located along Tranquility Circle. Developed areas within the D-915 Project study area are isolated to the southern end of the study area and consist of the paved areas and structure that comprises the Dalton Crossover Station.

Developed areas, particularly areas with landscaped vegetation, can provide moderate habitat value for wildlife. The planting and maintenance of shrubs, trees, and other ornamental plants in developed and landscaped areas can enhance this habitat for opportunistic animal species that can coexist with humans. Examples of species found in this habitat type are the Northern mockingbird, house finch (*Carpodacus mexicanus*), Brewer's blackbird (*Euphagus cyanocephalus*), raccoon (*Procyon lotor*), and opossum (*Didelphis virginianus*). Also, buildings and structures such as bridges, overpasses and electric transmission and distribution towers can provide shelter or roosting sites for species such as cliff swallow (*Petrochelidon pyrrhonota*), barn swallow, rock dove (*Columba livia*), and small mammals such as mice, rats, and a variety of bat species.

5.2.3 Ruderal

Ruderal habitat generally consists of non-native annual grasses and forbs that are regularly disturbed (i.e. either mowed or sprayed with herbicide) and occur along the edges of the road right-of-way and areas adjacent to urban or disturbed habitat. In the R-893 Study Area ruderal habitat occurs along established roads, and developed areas, as well as adjacent to managed drainages due to the creation of reinforced banks. At the D-915 Study Area, ruderal habitat is present adjacent to the Dalton Crossover Station. Species common to this community within the R-893 and D-915 Study Areas include, black mustard (*Brassica nigra*), redstem filaree (*Erodium cicutarium*), whitestem filaree (*Erodium moschatum*), wild oats (*Avena occidentalis*), Italian thistle (*Carduus pycnocephalus* subsp. *pycnocephalus*), poison hemlock (*Conium maculatum*), fennel (*Foeniculum vulgare*), stinkwort (*Diditrichia graveolens*), spiny sowthistle (*Sonchus asper* subsp. *asper*), English plantain (*Plantago lanceolata*), hoary mustard (*Hirschfeldia incana*), bullthistle (*Cirsium vulgare*), and bristly ox-tongue (*Helminthotheca echinoides*).

Ruderal communities provide habitat value for many of the same wildlife species that Native and Non-native Grassland and Developed, described in Sections 5.2.1 and 5.2.2, would support.

5.2.4 Cropland

Cropland habitat generally consists of farmed or cultivated plants, shrubs, or trees that are regularly managed and disturbed. This vegetation community is only present at the R-893 Study Area where it is located in the southern portion of the Study Area (on the south side of I-580). Based on aerial imagery, this area appears to be planted seasonally in either alfalfa/hay or corn.

Cropland communities provide habitat value for many of the same wildlife species that Native and Non-native Grassland, Developed, and Ruderal, described in Sections 5.2.1, 5.2.2 and 5.2.3, would support.

5.2.5 Seasonal Alkali Wetland

Seasonal alkali wetland is a seasonally-inundated wetland feature that occurs on soils with supports a vegetation community that has a high tolerance for salinity. This community is only located in the D-915 Study Area within a swale depression located approximately 170 feet north of the Dalton Crossover Station (Figure 3b). Two vegetative communities are interspersed throughout this habitat type: salt grass flats and alkali heath marsh. Dominant species in salt grass flats community include, saltgrass, and alkali heath (*Frankenia salina*). Other species include sand spurry (*Spergularia media*) and alkali plagiobothrys (*Plagiobothrys leptocladus*). Dominant species in the alkali heath marsh community consist of: Dominated by Baltic rush (*Juncus balticus*), saltgrass, and alkali heath.

Alkali grasslands provide habitat value for many of the same wildlife species as will support Annual Grasslands, described in Section 5.2.1.

5.2.6 Perennial Stream (Arroyo Las Positas)

Arroyo de Las Positas is a perennial drainage that runs east to west through the Study Area. Within the ordinary high-water mark of this drainage, the dominant vegetative community is freshwater emergent marsh which supports dense small patches of emergent vegetation dominated by either by tule (*Schoenoplectus acutus* var. *occidentalis*) or chairmakers's bulrush (*Schoenoplectus americanus*). Other species observed within this community in the R-893 Study Area includes common lippia (*Phyla nodiflora*), salt heliotrope (*Heliotropium curassavicum* var. *oculatum*), reed fescue (*Festuca arundinacea*), harding grass (*Phalaris aquatica*), perennial pepperweed, yerba mansa (*Anemopsis californica*), annual beard grass (*Polypogon monspeliensis*), stinging nettle (*Urtica dioica* subsp. *holosericea*), tall cyperus (*Cyperus eragrostis*), and broadleaf cattail (*Typha latifolia*) (Nomad Ecology, 2019).

Alkali grasslands provides habitat value for many of the same wildlife species that that Native and Non-native Grassland, described in Section 5.2.1, would support.

5.3 WETLAND AND AQUATIC RESOURCES

At the R-893 site, Arroyo Las Positas is a perennial drainage (jurisdictional other waters of the U.S.) that flows east to west and crosses through the Study Area north of I-580, traveling west of the Study Area and then south under I-580. Arroyo Las Positas eventually joins Arroyo de la Laguna, and finally Niles Canyon and Alameda Creek as it flows southward towards the San Francisco Bay (Zone 7 Water Agency 2006). A wetland delineation was conducted in December 2017 for this project and is presented in a separate report.

At the D-915 site, the only aquatic resources present, as mapped during a preliminary wetland assessment survey performed by Stantec on March 6, 2018, is one seasonal alkali wetland. This feature occurs in a swale between the Dalton Crossover Station and the transmission tower. These findings were not incorporated into a formal wetland delineation, however PG&E revised their project footprint and access strategy to establish complete avoidance of this feature.

6.0 RESULTS

6.1 SPECIAL-STATUS WILDLIFE SPECIES

Thirty-nine special status wildlife species were identified in the literature and database review with potential to occur in the Study Area or in the vicinity (Table 1). Based on the assessment of wildlife habitats conducted during the reconnaissance field surveys, 16 of these species were determined to have moderate or high potential to occur within the Amended Project. These species are described in further detail below in Sections 6.1.1 – 6.1.2.

BIOLOGICAL CONSTRAINTS REPORT

Table 1. Special-status wildlife species with potential to occur within the Study Area.

Scientific Name	Common Name	Status ² Federal, State	Habitat Requirements	Potential to Occur in the Study Area ³
Invertebrates				
<i>Callophrys mossii bayensis</i> ^{1b}	San Bruno elfin butterfly	FE, SA	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; <i>Sedum spathulifolium</i> . Uses a variety of nectar.	Low potential to occur. No suitable habitat is present in the Study Area. Additionally, the nearest CNDDDB recorded occurrences are approximately 14 miles northwest of the R-893 Study Area.
<i>Desmocerus californicus dimorphus</i> ^{1b}	Valley elderberry longhorn beetle	FT, SA	Elderberry shrubs over 1" diameter in riparian and upland habitats in the Central Valley up to 3,000' elevation	Low potential to occur. No suitable habitat is present in the Study Area. Additionally, the nearest CNDDDB recorded occurrences are approximately 15 miles southeast of the R-893 Study Area.
Crustaceans				
<i>Branchinecta conservatio</i> ^{1b}	Conservancy fairy shrimp	FE, SA	Large turbid vernal pools and other seasonal wetlands. Within vernal pool complex, conservancy shrimp are sporadic in their distribution, often inhabiting one or a few pools within a widespread complex.	Low potential to occur. No suitable habitat (large vernal pools with long hydroperiod) occur on either Study Area. The nearest CNDDDB recorded occurrences are approximately 30 miles southeast of the R-893 Study Area.
<i>Branchinecta longiantenna</i> ^{1b}	Longhorn fairy shrimp	FE, SA	Small, clear-water depressions in sandstone and clear-to-turbid clay /grass-bottomed vernal pools and shallow swales.	Moderate potential to occur. The seasonal alkali wetland within the D-915 Study Area may provide suitable habitat. The nearest CNDDDB recorded occurrences is approximately 1.1 miles north of the D-915 Study Area.
<i>Branchinecta lynchi</i> ^{1a,1b}	Vernal pool fairy shrimp	FT, SA	Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	Moderate potential to occur. The seasonal alkali wetland within the D-915 Study Area may provide suitable habitat. The nearest CNDDDB recorded occurrences is approximately 0.04 mile south of the D-915 Study Area.
<i>Lepidurus packardii</i> ^{1a,1b}	Vernal pool tadpole shrimp	FE, SA	Occurs in freshwater, ephemeral alkaline pools, clay flats, vernal lakes, vernal pools, vernal swales, and other seasonal wetlands with long hydroperiod, clear to highly turbid water, water temperature range of 50-84°F, and pH range of 6.2-8.5.	Low potential to occur. No suitable habitat (deep pools with long hydroperiod) occur on either Study Area. The closest occurrence is approximately 16 miles north of the D-915 site.

BIOLOGICAL CONSTRAINTS REPORT

Scientific Name	Common Name	Status ² Federal, State	Habitat Requirements	Potential to Occur in the Study Area ³
Fish				
<i>Hypomesus transpacificus</i> ^{1b, 1c}	Delta smelt	FT, SE	Occurs in the Sacramento–San Joaquin Delta, seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay. Seldom found at salinities > 10 ppt. Most often occurs at salinities < 2ppt.	Low potential to occur. No suitable aquatic habitat is present at either Study Area. The nearest CNDDDB recorded occurrences are approximately 13.88 miles northeast of the Study Area. No records of delta smelt occur within Arroyo Las Positas.
<i>Spirinchus thaleichthys</i> ^{1c}	Longfin smelt	FC, ST, SSC	Occurs in the San Francisco Bay Estuary, Sacramento-San Joaquin Delta, Humboldt Bay, and estuaries of the Eel and Klamath Rivers. Occupy the middle or bottom water columns in bays and estuaries with water temperature range of 60-65°F and salinity range of 15-30 ppt.	Low potential to occur. No suitable aquatic habitat is present at either Study Area. The nearest CNDDDB recorded occurrences are approximately 11.5 miles northeast of the Study Area. No records of longfin smelt occur within Arroyo Las Positas.
<i>Oncorhynchus mykiss irideus</i> pop. 11 ^{1c}	Steelhead – Central Valley DPS	FT	Spawn and rear juveniles in freshwater, gravel-bottomed, fast-flowing, well oxygenated, streams and rivers with water temperature range of 46-52°F. Juveniles migrate to the ocean where they live until they return to the streams as breeding adults.	Low potential to occur. No suitable aquatic habitat is present at either Study Area. The nearest CNDDDB recorded occurrences are approximately 8.9 miles northeast of the Study Area. No records of Central Valley steelhead occur within Arroyo Las Positas.
<i>Oncorhynchus mykiss irideus</i> pop. 8 ^{1c}	Steelhead – Central California Coast DPS	FT	Spawn and rear juveniles in freshwater, gravel-bottomed, fast-flowing, well oxygenated, streams and rivers with water temperature range of 46-52°F. Juveniles migrate to the ocean where they live until they return to the streams as breeding adults.	Low potential to occur. No suitable aquatic habitat is present at either Study Area. The nearest CNDDDB recorded occurrences are approximately 9.8 miles southwest of the Study Area. No records of Central California Coast steelhead occur within Arroyo Las Positas.

BIOLOGICAL CONSTRAINTS REPORT

Scientific Name	Common Name	Status ² Federal, State	Habitat Requirements	Potential to Occur in the Study Area ³
Amphibians				
<i>Ambystoma californiense</i> ^{1a,1b}	California tiger salamander	FT, ST	Vernal pools and/or seasonal water sources for breeding habitat; requires underground refuges in adjacent upland areas, especially ground squirrel burrows.	High potential to occur. Suitable breeding habitat is present within approximately 0.5 mile of the D-915 Study Area. Suitable aquatic breeding habitat is present within one mile of the D-915 Study Area. Suitable upland habitat is present in the annual grasslands that have many rodent burrows that will support underground refugia. There are numerous CNDDDB occurrences within 5-miles, with the nearest CNDDDB occurrence located approximately 0.6 mile north of the R-893 site and 0.05 mile southwest of the D-915 Study Area.
<i>Rana boylei</i> ^{1a}	Foothill yellow-legged frog	SCT, SSC	Streams and rivers with clear water, open, solar exposed banks, riffles, shallow areas, and rocky substrate surrounded by a variety of habitats. Eggs are typically deposited on cobble-sized or larger rocks, submerged logs, and bedrock and occasionally directly on the sandy/silt substrate in non-rocky areas.	Low potential to occur. Arroyo las Positas does not contain open, solar exposed banks, clear water, riffles with shallow areas, and the preferred rocky substrate for egg mass deposition. The associated CNDDDB record for this species is from an undefined area measuring approximately 15 acres and overlaps the R-893 Study Area however it is dated from 1973.
<i>Rana draytonii</i> ^{1a,1b}	California red-legged frog	FT, SSC	Breeds in ponds and pools in slow-moving streams with emergent vegetation; adjacent upland habitats, especially ones with small mammal burrows, are often used for temporary refuges or dispersal movements.	High potential to occur. Possible breeding habitat and suitable upland habitat and recorded observations are present within close vicinity of the D-915 Study Area. At the R-893 Study Area; suitable upland habitat and possible breeding habitat are present at the site and in the project vicinity (e.g., emergent wetlands and slow-moving stream, with deep pools) and suitable upland habitat present in the vicinity of the suitable aquatic habitat. There are numerous CNDDDB occurrences within 5-miles. The nearest CNDDDB occurrence is approximately 175 feet east of the R-893 Study Area in a perennial stock pond. A portion of the Amended Project Area falls within critical habitat as designated by USFWS for the species, unit CCS-2B.

BIOLOGICAL CONSTRAINTS REPORT

Scientific Name	Common Name	Status ² Federal, State	Habitat Requirements	Potential to Occur in the Study Area ³
<i>Spea hammondi</i> ^{1b}	Western spadefoot	SSC	Breeds in vernal playas, vernal pools, stock tanks, and other seasonal wetlands and intermittent streams with isolated pools; adjacent upland habitats with sandy or gravelly soils are used for refuges and dispersal movements.	Moderate potential to occur. There is suitable aquatic habitat and upland habitat at the D-915 Study Area. The nearest occurrence is approximately 4.0 miles southeast of the D-915 Study Area.
Reptiles				
<i>Arizona elegans occidentalis</i>	California glossy snake	SSC	Occurs in arid scrub, desert, sagebrush, grassland, and chaparral habitats with open areas and loose soil for burrowing or small mammal burrows and rocky outcrops for refuge.	Moderate potential to occur. There is suitable open grassland habitat within and surrounding the D-915 Study Area; however, the closest CNDDDB occurrence is approximately 8.0 miles southeast of the D-915 Study Area.
<i>Emys marmorata</i> ^{1a,1b}	Western pond turtle	SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams, and irrigation ditches, usually with aquatic vegetation. Need basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 300 feet from water for egg laying.	Moderate potential to occur. There is suitable aquatic habitat within the R-893 Study Area. Several CNDDDB occurrences are located within 5 miles, and the nearest occurrence is approximately 1.5 miles east and are within Arroyo del Positas.
<i>Masticophis flagellum ruddocki</i> ^{1a}	San Joaquin coachwhip	SSC	Occurs in open, dry, treeless grassland, desert, chaparral, and scrub habitats with small mammal burrows, rock outcrops, and surface objects for refuge.	Moderate potential to occur. There is suitable open grassland habitat within D-915 and areas surrounding the Study Area. The closest CNDDDB occurrence is approximately 4.6 miles southeast of the D-915 Study Area.
<i>Masticophis lateralis euryxanthus</i> ^{1a,1b}	Alameda whipsnake	FT; ST	Typically found in chaparral and scrub habitats but will also use adjacent grassland, oak savanna and woodland habitats. Often in south-facing slopes and ravines, with rock outcrops, deep crevices or abundant rodent burrows.	Low potential to occur. Suitable habitat is present in the habitats surrounding the Study Areas; however, the Study Areas and their adjacent habitats do not contain the chaparral or scrub habitats nor are the immediately adjacent to these habitats. There are numerous CNDDDB occurrences within 5-miles of the Study Area and the closest occurrence is approximately 1.2 miles north of the D-915 Study Area; however, there are mapped as full quadrangles instead of individual locations.
<i>Phrynosoma blainvillii</i>	Coast horned lizard	SSC	Occurs in open areas in valley-foothill hardwood, coniferous, riparian, and grassland habitats with loose soil for burrowing or small mammal burrows rock outcrops, and surface objects for refuge.	Moderate potential to occur. There is suitable open grassland habitat within D-915 and areas surrounding the Study Area; however, the closest CNDDDB occurrence is approximately 8.1 miles southeast of the D-915 Study Area.

BIOLOGICAL CONSTRAINTS REPORT

Scientific Name	Common Name	Status ² Federal, State	Habitat Requirements	Potential to Occur in the Study Area ³
Birds				
<i>Agelaius tricolor</i> ^{1a}	Tricolored blackbird	SCE	Highly colonial species that typically nests in freshwater marshes containing emergent vegetation such as cattails and tules but will also use blackberry thickets and dense patches of ruderal vegetation such as thistles and mustard adjacent to marshes or wetlands.	Moderate potential to occur. Suitable nesting habitat occurs at the R-893 Study Area (dense areas of tules, thistle, and mustards) and adjacent foraging habitat is present. Additionally, open water habitat is present within 1.5 miles. There are numerous CNDDDB occurrences within 5 miles of the Study Area, with the nearest occurrence located approximately 0.9 miles northwest of the R-915 Study Area.
<i>Ammodramus savannarum</i> ^{1a}	Grasshopper sparrow	SSC	Found in dense grasslands on rolling hills, lowland plains, in valleys and on hillsides on lower mountain slopes. Favors native grasslands with a mix of grasses, forbs and scattered shrubs. Can be loosely colonial when nesting.	Medium potential to occur. Suitable breeding and foraging habitat present in the vicinity of the R-893 and D-915 Study Areas (e.g., moderately open grasslands with scattering of shrubs). The nearest CNDDDB occurrence is approximately 1.1 miles northwest of the D-915 Study Area.
<i>Aquila chrysaetos</i> ^{1a}	Golden eagle	FP	Occurs in open and semi-open habitats in grassland, chaparral, desert, tundra, coniferous forest, and shrubland and nest on cliffs, steep escarpments, and large trees with large horizontal branches.	Low potential to occur (nesting). Suitable foraging habitat is present in the vicinity of the Study Areas (e.g., moderately open grasslands). The presence of residential/industrial development reduces the quality of the habitat within the Study Areas and no suitable nesting habitat occurs within or immediately adjacent to the Study Areas. The nearest CNDDDB occurrence is approximately 3.8 miles northwest of the D-915 Study Area.
<i>Asio flammeus</i> ^{1a}	Short-eared owl	SSC	Inhabit large, open areas with low vegetation in prairie, grassland, meadows, savanna, tundra, dunes, and agricultural fields. Nests on the ground amid grasses and low vegetation.	Moderate potential to occur. Suitable foraging and nesting grassland habitat is present at both the R-893 and D-915 Study Areas. The nearest CNDDDB occurrence is approximately 24 miles west of the R-893 Study Area.
<i>Athene cunicularia hypugea</i> ^{1a}	Western burrowing owl	BCC, SSC	Nests in burrows (often constructed by ground squirrels) and forages in low-growing grasslands and other open, semi-arid habitats.	Moderate potential to occur. Suitable foraging habitat is present at both of the Study Areas. Suitable nesting habitat (e.g. California ground squirrel burrows) were found within the Study Areas. The nearest CNDDDB occurrence is approximately 1.1 miles north of the R-893 project Study Area.

BIOLOGICAL CONSTRAINTS REPORT

Scientific Name	Common Name	Status ² Federal, State	Habitat Requirements	Potential to Occur in the Study Area ³
<i>Buteo swainsonii</i> ^{1a}	Swainson's hawk	ST	Inhabits open prairie, grassland, agricultural field, and grazing pasture habitats and nests in scattered trees in and near these habitats.	Low potential to occur (nesting). Suitable foraging habitat is present in the Study Areas; however, suitable trees for nesting are not present in the Study Areas. The nearest CNDDDB occurrence is approximately 3.3 miles south of the D-915 Study Area.
<i>Circus hudsonius</i>	Northern harrier	SSC	Occurs in open wetland, grassland, meadows, tundra, high desert, agricultural fields, and prairie habitats with low, dense vegetation. Nests on the ground amid dense vegetation.	Moderate potential to occur. Suitable foraging and nesting habitat is present in and surrounding the Study Areas in the grassland habitats. The nearest CNDDDB occurrence is approximately 5.2 miles northwest of the R-893 Study Area.
<i>Elanus leucurus</i> ^{1a}	White-tailed kite	FP	Open grasslands, meadows, or marshes for foraging. Nests and perches in dense topped trees near open habitats.	Low potential to occur (nesting). Suitable foraging habitat is present in the Study Areas; however, suitable nesting habitat is not present. The nearest CNDDDB occurrence is a nesting pair approximately 2.8 miles south of the D-915 Study Area.
<i>Falco peregrinus anatum</i> ^{1a,1b}	American peregrine falcon	FP, BCC	Found near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	Low potential to occur (nesting). Suitable foraging habitat is present in the Study Areas; however, no suitable nesting habitat is present. The nearest CNDDDB occurrence is approximately 1.5 miles northwest of the D-915 Study Area. The nearest bridge structure is too low to be considered suitable peregrine nesting habitat.
<i>Haliaeetus leucocephalus</i>	Bald eagle	FD, SE	Nest in the canopy of large trees or cliff faces adjacent to large waterbodies including sea coasts, costal estuaries, lakes, and rivers.	Low potential to occur. There is no suitable nesting or foraging habitat within the Study Areas. Additionally, the nearest CNDDDB recorded occurrences are approximately 8.9 miles southeast of the R-893 Study Area.
<i>Lanius ludovicianus</i>	Loggerhead shrike	SSC, BCC	Occur in open agricultural field, pasture, desert, shrubland, prairie, and savanna habitats with short vegetations and shrubs, trees, or other structures with spines, thorns, or barbs. Nests in vegetation with thorns or spines.	Low potential to occur (nesting). Suitable foraging habitat is present in the Study Areas; however, suitable nesting habitat is absent. The nearest CNDDDB occurrence is a nesting pair approximately 4.2 miles south of the D-915 Study Area.

BIOLOGICAL CONSTRAINTS REPORT

Scientific Name	Common Name	Status ² Federal, State	Habitat Requirements	Potential to Occur in the Study Area ³
<i>Laterallus jamaicensis coturniculus</i>	California black rail	ST, FP, BCC	Occurs and nests in tidal salt marshes, freshwater marshes, and wet meadows with dense vegetation in the San Pablo Bay, Suisun Bay, San Francisco Bay, Outer Coast of Marin County, Sierra Nevada foothills, and the Colorado River Area.	Low potential to occur (nesting). There is no suitable nesting habitat within the Study Area. Additionally, the nearest CNDDDB recorded occurrences are approximately 13.0 miles southwest of the R-893 Study Area.
<i>Melospiza melodia</i>	Song sparrow ("Modesto" population)	SSC	Occurs in habitats with dense vegetation and a water source including emergent freshwater marshes, riparian willow thickets, riparian Valley oak forest, and vegetated irrigation canals and levees. Nests in dense vegetation.	Low potential to occur. Amended Project Area is outside of the of the known populations documented for this species and the closest CNDDDB occurrence is 11.5 miles northwest of the Study Area.
<i>Melospiza melodia pusillula</i>	Alameda song sparrow	SSC	Inhabits tidal salt marshes with dense vegetation for nesting and predator avoidance and exposed ground for foraging along the southern edges of the San Francisco Bay.	Low potential to occur (nesting). There is no suitable nesting habitat within the Study Areas. Additionally, the nearest CNDDDB recorded occurrences are approximately 19.0 miles west of the R-893 Study Area.
<i>Sterna antillarum browni</i> ^{1b}	California Least Tern	FE, SE, FP	Nests along the coast from San Francisco Bay south to northern Baja California. Known to be a colonial breeder, prefers bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, landfills, or paved areas for nesting.	Low potential to occur (nesting). There is no suitable foraging or nesting habitat within the Study Areas. Additionally, the nearest CNDDDB recorded occurrences are approximately 20 miles west of the R-893 Study Area.
Mammals				
<i>Antrozous pallidus</i>	Pallid bat	SSC	Occurs in arid regions with rocky outcrops, open, sparsely-vegetated grassland, pine and oak forests, and farmlands. Roosts and hibernates in attics, shutters, buildings, caves, bridges, mines, hollow trees, and rock outcrops.	Low potential to occur. There is suitable habitat for foraging at both project Study Areas, however there are no caves, crevices, hollow trees, or buildings that will provide suitable day or night roosting habitat for this species. The nearest CNDDDB occurrence is located approximately 7.2 miles west of the R-893 Study Area.

BIOLOGICAL CONSTRAINTS REPORT

Scientific Name	Common Name	Status ² Federal, State	Habitat Requirements	Potential to Occur in the Study Area ³
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	SSC	Occurs in all but subalpine and alpine habitats and roosts in caves, cliffs, rock ledges, tree hollows, bridges, tunnels, and abandoned mines and other man-made structures.	Low potential to occur. There is suitable habitat for foraging at both project Study Areas, however there are no caves, crevices, hollow trees, or other human-made structure that will provide suitable day or night roosting habitat for this species. The nearest CNDDDB occurrence is located approximately 5.4 miles southwest of the R-893 Study Area.
<i>Neotoma fuscipes annectens</i>	San Francisco dusky-footed woodrat	SSC	Found in forest habitats with moderate canopy and moderate to dense understory, also found in chaparral habitats. Constructs nests with nests, shredded vegetation, and miscellaneous materials typically at the base of trees and shrubs.	Low potential to occur. There is no suitable chaparral or woodland habitat present at either the R-893 or D-915 project Study Areas. The nearest CNDDDB occurrence is located approximately 9.3 miles southwest of the R-893 Study Area.
<i>Taxidea taxus</i> ^{1a,1b}	American badger	SSC	Prefers dry open stages of most shrub, forest, and herbaceous habitats. Requires sufficient food (feeds mostly on burrowing rodents), friable soils and open, uncultivated ground.	Moderate potential to occur. There is suitable habitat within both the R-893 Study Area and the D-915 Study Area as there is ground squirrel activity and other burrowing rodents in the area. However, the presence of residential and industrial development adjacent to the R-893 Study Area reduces the quality of suitable foraging and denning habitat in the vicinity of the Study Area. The nearest CNDDDB occurrence is approximately 2.1 miles north the D-915 Study Area.
<i>Vulpes macrotis mutica</i> ^{1a,1b}	San Joaquin kit fox	FE, ST	Annual grassland or grassy open stages with scattered shrubby vegetation. Need loose-textured sandy soils for burrowing and suitable prey base.	Moderate potential to occur. There is suitable habitat within both the R-893 Study Area and the D-915 Study Area as there is ground squirrel activity and other burrowing rodents in the area. However, the presence of residential and industrial development adjacent to the R-893 Study Area reduces the quality of suitable foraging and denning habitat in the vicinity of the Study Area. The nearest CNDDDB occurrences are approximately 3.2 miles northeast of the D-915 Study Area.

BIOLOGICAL CONSTRAINTS REPORT

Notes:

DPS = distinct population segment; ESU = evolutionarily significant unit

¹. Sources

- 1a California Natural Diversity Database (RareFind 5, version 5.2.14). Electronic database. Sacramento, CA. (CDFW 2018b)
- 1b Sacramento Fish and Wildlife Office, Endangered Species Program. Endangered and Threatened Species List (USFWS 2018).
- 1c National Oceanic and Atmospheric Administration. Endangered and Threatened Wildlife and Plants; Critical Habitat Determination for the Delta Smelt. (NOAA 1994).

². Status designations:

Federal

BGEPA	Bald and Golden Eagle Protection Act
FE	Listed as Endangered under the Federal Endangered Species Act
FT	Listed as Threatened under the Federal Endangered Species Act
FC	Listed as Candidate under the Federal Endangered Species Act
FD	Delisted
PT	Proposed for listing as threatened
BCC	Birds of Conservation Concern
–	No Listed Status

State of California

FP	California Fish and Game Code Fully Protected Species
SA	California Department of Fish and Wildlife Special Animals List
SCE	Candidate for listing as endangered
SD	Delisted
SE	California Fish and Game Code Endangered Species
SSC	California Fish and Wildlife Species of Special Concern
SCT	Candidate for listing as threatened
ST	California Fish and Game Code Threatened Species
WL	California Fish and Wildlife Watch List

6.1.1 Federally Listed Species

Longhorn fairy shrimp - Federally Endangered

Longhorn fairy shrimp (*Brachinecta longiantenna*) require freshwater vernal pool ecosystems that remain inundated for up to 43 days for the shrimp to reach maturity (Helm 1998). This species has been recorded within a range of vernal pool habitats. In the Livermore Vernal Pool Region in Contra Costa and Alameda Counties, this species inhabits sandstone pools with clear water, neutral pH, low alkalinity, low conductivity and water temperatures between 50-64°F (Helm 1998, Eriksen and Belk 1999). In the San Joaquin, Fresno County, and Carrizo Vernal Pool Regions, they inhabit grassland pools with clear to turbid water and water temperatures between 50-82°F (Helm 1998, Eriksen and Belk 1999). Longhorn fairy shrimp have also been documented in roadside ditch in the San Joaquin Vernal Pool Region (USFWS 2005 and 2012). This species has been recorded at elevations ranging for 75 feet to 2,900 feet. Urban developments, energy and wind developments, and conversion of vernal pool habitats to agriculture lands are the primary threats for longhorn fairy shrimp (Eng et al. 1990, USFWS 2005 and 2012).

There is one CNDDDB record of longhorn fairy shrimp within 5 miles of the Amended Project Area. This record is a 1985 observation approximately 1.1 miles north of the D-915 Study Area. The only locations within the Amended Project Area that may provide suitable habitat for this species are the emergent wetland adjacent to the R-893 Study Area and the season alkali wetland adjacent to the D-915 Study Area. Both wetlands may have connectivity to additional seasonal wetlands outside of the Study Areas that may also provide suitable habitat for longhorn fairy shrimp. Ephemeral wetlands surrounding the Study Areas may also contain suitable habitat for longhorn fairy shrimp.

Vernal pool fairy shrimp - Federally Threatened

Vernal pool fairy shrimp (*Branchinecta lynchi*) require freshwater vernal pools and vernal pool-like habitats. They primarily occur in clear, cool-water, small, shallow vernal pool habitats with relatively short inundation periods and low to moderate turbidity and alkalinity (Collie and Lathrop 1976, Keeley 1984, Syrdahl 1993, Helm 1998; Eriksen and Belk 1999). However, this shrimp has been recorded within turbid, large, deep, alkaline pools (Eng et al. 1990, Eriksen and Belk 1999, USFWS 2005 and 2007a). Vernal pool fairy shrimp require water temperatures of 50°F or below to hatch from cysts (Helm 1998; Eriksen and Belk 1999) and immature and adult shrimp have been documented perishing when water temperatures reach 75°F (Helm 1998). This species has been recorded at elevations ranging from 30 feet to 5,600 feet. Urban developments, water supply and flood control activities, and conversion of vernal pool habitats to agriculture lands are the primary threats for vernal pool fairy shrimp (USFWS 2005 and 2007a).

There are two CNDDDB records of vernal pool fairy shrimp within 5 miles of the R-893 and D-915 Study Areas. The closest record is a 1996 observation approximately 0.04 miles southwest of the D-915 Study Area and the other record is a 2010 observation approximately 0.8 miles southeast of the D-915 Study Area. The only locations within the Study Area that may provide suitable habitat for this species are the emergent wetland adjacent to the R-893 Study Area and the season alkali wetland adjacent to the D-915 Study Area. Both wetlands may have connectivity to additional seasonal wetlands outside of the Study Area that may also provide suitable habitat for vernal pool fairy shrimp. Ephemeral wetlands surrounding the Study Area may also contain suitable habitat for vernal pool fairy shrimp.

BIOLOGICAL CONSTRAINTS REPORT

California tiger salamander – Federally Threatened

California tiger salamander (*Ambystoma californiense*; CTS) breed in vernal pools and other seasonal or permanent ponds and spends up to 90 percent of its life underground in upland habitats. These salamanders typically occur in grassland and oak savanna habitats and utilize rodent burrows or deep soil crevices as long-term refuge sites. Individuals may move as far as 1.3 miles between breeding ponds and upland refuge sites (USFWS 2003). Adults migrate from upland habitats to breeding ponds during late fall and early winter. The aquatic larvae hatch and develop in pools during winter and spring and require about ten weeks of inundation to complete their aquatic development. The juvenile metamorphs leave the pools to disperse into upland habitats during mid- to late spring. Adults and juveniles may also undergo dispersal movements within and between upland habitats at any time during the wet season, typically on rainy nights

There are 51 CNDDDB occurrences of CTS within 5 miles of the R-893 and D-915 Study Areas, with the nearest occurrence approximately 0.5 miles north of the R-893 Study Area and 0.06 miles southwest of the D-915 Study Area (Figure 3). Suitable breeding and upland habitat for California tiger salamander is absent from the R-893 Study Area but is present at the D-915 Study Area. During the December 2018 site assessment, a total of four ponds within 500 feet of the D-915 Study Area (with the closest approximately 200 feet to the east) that could provide suitable aquatic breeding habitat for California tiger salamander. In addition, the D-915 Study Area is less than one mile from the Springtown Preserve and the Lin Dublin Ranch Preserve where the species is known to occur. A total of six potentially suitable breeding ponds are within less than 1 mile of the Study Area. Suitable upland habitat is also present in the adjacent grassland habitat which supports a large ground squirrel population. During the site visit, a total of 96 burrows were counted within D-915 Study Area which will provide suitable underground refugia for California tiger salamander.

California red-legged frog– Federally Threatened

California red-legged frog (*Rana draytonii*; CRLF) occur primarily in ponds or pools of intermittent stream courses that retain water long enough for breeding and development of young. The adults prefer dense emergent or shoreline riparian vegetation closely associated with deep, still or slow-moving water and may disperse upstream, downstream or upslope from their breeding habitat (Jennings and Hayes 1994). Key habitat features for CRLF include good water quality and absence of introduced bullfrogs and predatory fish. Adults and sub-adults can estivate in small mammal burrows and moist leaf litter generally found within 300 feet of aquatic habitat. However, during wet periods CRLF can move long distances between aquatic features, traversing up to 2 miles from ponds and ephemeral drainages (Bulger *et al.* 2003).

There are 49 CNDDDB occurrences of CRLF within 5 miles of the R-893 and D-915 Study Areas, with the closest occurrence approximately 0.26 miles east of the R-893 Study Area in Cayetano Creek, a tributary to Arroyo Las Positas. (Figure 3). Suitable breeding and upland habitat for California red-legged frog is present at both R-893 and D-915 Study Areas. At the R-893 Study Area, suitable aquatic dispersal habitat and breeding habitat is present along Arroyo Las Positas (a drainage that runs adjacent to R-893) as well as suitable upland foraging habitat. California red-legged frog is known to occur in Cayetano Creek, which is a tributary to Arroyo Las Positas, a drainage that runs adjacent to the R-893 site. Suitable aquatic dispersal habitat and possible breeding habitat is present along Arroyo Las Positas as well as suitable upland habitat (dense emergent vegetation). The D-915 site is located within California red-legged frog Critical Habitat Unit ALA-1A. Suitable aquatic habitat for this species, as identified during literature searches and the December 2018 survey, is abundant in the vicinity with a total of six ponds present within

BIOLOGICAL CONSTRAINTS REPORT

less than 1 mile of the D-915 site. The closest is a small, spring-fed, permanent stock pond with sparse emergent vegetation that is located approximately 250 feet northeast of the R-915 Location B. Suitable upland habitat is also present in the adjacent grassland habitat which supports ample insect and small rodent prey species for red-legged frog, as well as ground squirrel burrows which could provide the frogs with refuge during overland foraging movement.

San Joaquin kit fox - Federally Endangered

San Joaquin kit fox (*Vulpes macrotis mutica*) is the largest of the kit fox species and prefers desert-like habitats with loose, sandy soils and sparse to no shrubs, sparse ground cover, and short vegetation where present (USFWS 2010). Typically found in alkali scrub/shrub and arid grassland habitats with either level terrain or gradual slopes and an abundance of rodent prey, especially kangaroo rates, white-footed mice, pocket gophers, and ground squirrels (USFWS 2010). This species constructs burrows for refugia and rearing offspring and is absent for areas with high water tables, shallow soils, or impenetrable hardpans (McCue et. al 1981, USFWS 2010).

There are four CNDDDB records of San Joaquin kit fox within 5 miles of the Study Area. The closest record is a 2002 observation located approximately 3.2 miles northeast of the D-915 Study Area. There is suitable habitat within both the R-893 Study Area and the D-915 Study Area as there is ground squirrel activity and other burrowing rodents in the area. However, the presence of residential and industrial development adjacent to the R-893 Study Area reduces the quality of suitable foraging and denning habitat in the vicinity of the Study Area.

6.1.2 State Listed Species

Western pond turtle – State species of special concern

Western pond turtle (*Actinemys marmorata*) (WPT) occur in both permanent and seasonal waters, including marshes, streams, rivers, ponds and lakes. They are also found in irrigation canals and agricultural drains. This species favors habitats with suitable sites for emergent basking, as they spend a significant amount of time engaging in this type of thermo-regulatory behavior. They use a variety of sites for emergent basking, including rocks, sand, mud, downed logs, submerged branches of near-shore vegetation, and emergent or submerged aquatic vegetation (Holland and Bury, 1998; Holland 1985).

There are nine CNDDDB occurrences of WPT within 5 miles of the R-893 Study Area. The closest occurrence, within Arroyo del Positas, is located approximately 1.44 miles southeast of the R-893 Study Area. There is suitable aquatic habitat, suitable nesting habitat, and suitable basking habitat for the species within the R-893 Study Area.

Western spadefoot - State species of special concern

Western spadefoot (*Spea hammondi*) adults and juveniles prefer grassland, oak woodland, coastal sage scrub, and chaparral habitats with sandy and gravelly soils. Adults and juveniles typically remain in burrows they dig burrows with the small wedged shaped spade on each hind foot or use small mammal burrows during hot, dry periods. Adults migrate during rain events to freshwater seasonal wetlands and vernal pools (Lannoo 2005, Stebbins and McGinnis 2012, Thomson et al. 2016). This species has also been documented breeding in intermittent streams with isolated pool (Lannoo 2005) and artificial stock ponds (Thomson et al. 2016). This species has been recorded at elevations ranging from sea level to 4,500 ft (Stebbins and McGinnis 2012). Urban developments and conversion of upland and

BIOLOGICAL CONSTRAINTS REPORT

aquatic breeding habitats to agriculture lands are the primary threats for western spadefoot (Lannoo 2005, Stebbins and McGinnis 2012, Thomson et al. 2016).

There are two CNDDDB records of western spadefoot within 5 miles of the Study Area. Both records are 2004 observations with the closest being approximately 4.0 miles southeast and the second being approximately 4.2 miles southeast of the D-915 Study Area. Suitable upland habitat and aquatic breeding habitat is present at D-915. Suitable aquatic habitat and upland habitat at the D-915 Study Area and the surrounding habitats around the Study Area may also contain suitable upland and breeding habitat for this species.

California glossy snake - State species of special concern

California glossy snake (*Arizona elegans occidentalis*) resides in a variety of light shrubby to barren areas surrounded by denser vegetation in grassland, desert, shrubland, chaparral, and woodland habitats with loose sandy or loamy soils (Stebbins and McGinnis 2012, Thomson et. al 2016, CDFW 2019b). This snake also occurs in rocky areas in these habitats (CDFW 2019b). This species is mainly nocturnal and resides in small mammal burrows, under rocks, or in burrows it excavates (Stebbins and McGinnis 2012, Thomson et. al 2016, CDFW 2019b). California glossy snake has been recorded at elevations ranging from sea level to 6,000ft (CDFW 2019b). Loss of habitat to urban and agriculture developments is the primary threat for California glossy snake (Thomson et. al 2016).

There are no CNDDDB records of California glossy snake within 5 miles of the Study Area. The closest record is a 2010 observation approximately 8.0 miles southeast of the D-915 Study Area. Suitable open grassland habitat does occur within the D-915 Study Area and the areas surrounding the Study Area.

Western pond turtle – State species of special concern

Western pond turtle (*Actinemys marmorata*) (WPT) occur in both permanent and seasonal waters, including marshes, streams, rivers, ponds and lakes. They are also found in irrigation canals and agricultural drains. This species favors habitats with suitable sites for emergent basking, as they spend a significant amount of time engaging in this type of thermo-regulatory behavior. They use a variety of sites for emergent basking, including rocks, sand, mud, downed logs, submerged branches of near-shore vegetation, and emergent or submerged aquatic vegetation (Holland and Bury, 1998; Holland 1985).

There are 12 CNDDDB occurrences of WPT within 5 miles of the Study Area, with the closest occurrences approximately 1.5 miles east of the Study Area, these occurrences are within Arroyo las Positas. There is suitable aquatic habitat, nesting habitat, and basking habitat within the R-893 Study Area.

San Joaquin coachwhip - State species of special concern

San Joaquin coachwhip (*Masticophis flagellum ruddocki*) prefer open, dry areas with little to no vegetation cover in desert, grassland, pasture, and scrubland habitats. This snake is an active diurnal species and prefers warmer temperatures. San Joaquin coachwhips will use mammal burrows for overwintering or when surface temperatures become too high. This species will also climb into shrubs, bushes, and trees to scan for prey, seek shade, or bask (CDFW 2019c, Stebbins and McGinnis 2012, Thomson et. al 2016). San Joaquin coachwhip has been recorded at elevations ranging from sea level to 7,700 ft (CDFW 2019c). Loss of habitat to urban and agriculture developments is the primary threat for San Joaquin coachwhip (CDFW 2019c, Stebbins and McGinnis 2012, Thomson et. al 2016).

BIOLOGICAL CONSTRAINTS REPORT

There is one CNDDDB record for San Joaquin coachwhip within 5 miles of the Study Area. This record is a 2000 observation approximately 4.6 miles south of the D-915 Study Area. Suitable open grassland habitat does occur within the D-915 Study Area and the areas surrounding the Study Area.

Coast horned lizard - State species of special concern

Coast horned lizard (*Phrynosoma blainvillii*) require loose, fine soils in open areas with scattered shrubs and abundant ant and invertebrate prey in a variety of habitats including scrubland, dunes, grassland, chaparral, and woodland. This species uses the loose, soils for thermoregulation by burrowing into the substrate and uses vegetation, surface objects, and small mammal burrows for shade and overwintering (CDFW 2019a, Stebbins and McGinnis 2012, Thomson et. al 2016). Coast horned lizard has been recorded at elevations ranging from sea level to 4,000ft in the Sierra Nevada foothills and to 6,000 ft in the mountains of southern California (CDFW 2019a). Loss of habitat to urban and agriculture developments, flood control activities, and the introduction of nonnative ant species are the primary threats for coast horned lizard (Stebbins and McGinnis 2012, Thomson et. al 2016).

There are no CNDDDB records of coast horned lizard within 5 miles of the Study Area. The closest record is a 1893 observation approximately 8.1 miles southeast of the D-915 Study Area. Suitable open grassland habitat does occur within the D-915 Study Area and the surrounding areas.

Tricolored blackbird – State Threatened

Tricolored blackbirds (*Agelaius tricolor*) are largely restricted to California, where they occur throughout the Central Valley and along the coast in Southern California from Santa Barbara County to the Mexican Border (Beedy and Hamilton 1999). They are colonial nesters, breeding in dense colonies from which they may travel several miles to forage in grasslands and agricultural fields. Males arrive at breeding sites before females and initiate singing from late February through March. Nesting occurs from late March to early August. Individuals within breeding colonies may nest synchronously and lay eggs within one week of each other (Beedy and Hamilton 1999). They breed within wetland habitats but prefer freshwater marshes dominated by cattails (*Typha* spp.) or bulrushes (*Schoenoplectus* spp.). Nesting has also been documented in willows (*Salix* spp.), blackberries (*Rubus* spp.), thistles (*Cirsium* and *Centaurea* spp.), and nettles (*Urtica* sp.) (Beedy and Hamilton 1999).

There are 13 CNDDDB occurrences of tricolored blackbird within 5 miles of the Study Area, with the closest occurrence approximately 0.9 miles northwest of the D-915 Study Area. Suitable nesting habitat was observed in the R-893 Study Area during the reconnaissance surveys along the Arroyo Las Positas (Figure 3) and suitable foraging habitat for this species is present in open grasslands both within and adjacent to the Study Area.

Short-eared owl – State Species of Special Concern

Short-eared owls (*Asio flammeus*) occur throughout North America and can be found in open country, such as annual and perennial grasslands, prairies, dunes, meadows, irrigated lands, and saline and fresh emergent wetlands (Wiggins et al. 2006). This species requires dense vegetation (tall grasses or brush) for nesting and open foraging grounds with an abundance of small mammal prey (Clark 1975). This species nests on dry ground often on slight ridges or mounds if present. Nests consist of depression scrapped out by the females, lined with grasses and feathers and concealed in vegetation. Primary threats to this species include, degradation of habitat due to conversion of open habitat to agriculture, grazing, and development. This species is particularly susceptible to habitat

BIOLOGICAL CONSTRAINTS REPORT

fragmentation as they require relatively large tracts of grassland and as fragmented habitats and rural development also lead to increased predation pressure particularly for ground nesters (Wiggins et al. 2006).

There are no CNDDDB occurrences documented within 5-miles of the Study Areas (locations R-893 and D-915). The nearest occurrences include a 2011 occurrence approximately 24 miles to the west and 1987 occurrence approximately 27 miles to the north. Study Area R-893 provides only marginal breeding and foraging habitat, however there is suitable foraging and nesting habitat for this species in the annual grasslands and pastures adjacent to the Study Area; and overwintering owls could occur the Study Area. Therefore, while the Study Area provides only marginal breeding habitat and the presence of urban development around the Study Area may reduce the quality of the habitat, there remains potential for this species to be present within the Study Area. The Study Area D-915 provides potentially suitable breeding and foraging habitat for short-eared owls. Therefore, there is potential for this species to occur the D-915 Study Area.

Tricolored blackbird – State Threatened

Tricolored blackbirds (*Agelaius tricolor*) are largely restricted to California, where they occur throughout the Central Valley and along the coast in Southern California from Santa Barbara County to the Mexican Border (Beedy and Hamilton 1999). They are colonial nesters, breeding in dense colonies from which they may travel several miles to forage in grasslands and agricultural fields. Males arrive at breeding sites before females and initiate singing from late February through March. Nesting occurs from late March to early August. Individuals within breeding colonies may nest synchronously and lay eggs within one week of each other (Beedy and Hamilton 1999). They breed within wetland habitats but prefer freshwater marshes dominated by cattails (*Typha* spp.) or bulrushes (*Schoenoplectus* spp.). Nesting has also been documented in willows (*Salix* spp.), blackberries (*Rubus* spp.), thistles (*Cirsium* and *Centaurea* spp.), and nettles (*Urtica* sp.) (Beedy and Hamilton 1999).

There are six CNDDDB occurrences of tricolored blackbird within 5 miles of the R-893 Study Area, with the closest occurrences approximately 1.25 miles southwest of the R-893 Study Area. Suitable nesting habitat was observed in the Study Area during the reconnaissance surveys along the Arroyo Las Positas within the emergent vegetation (Figure 3) and suitable foraging habitat for this species is present in open grasslands both within and adjacent to the R-893 Study Area.

Western burrowing owl – State species of special concern

Western burrowing owls (*Athene cunicularia hypugea*) prefer open, flat, or gently sloped grasslands and require burrows for nesting. Burrowing owl nesting habitat consists of open areas with mammal burrows (Klute et al. 2003). Habitats include dry open rolling hills, grasslands, fallow fields, sparsely vegetated desert scrub with gullies, washes, arroyos, and edges of human-disturbed lands. They have been known to inhabit golf courses, airports, cemeteries, vacant lots, and road embankments, wherever there is sufficient friable soil for a nesting burrow. Favored nest burrow sites are those in relatively sandy sites (possibly for ease of modification and drainage), areas with low vegetation around the burrows (to facilitate the owl's view and hunting success), holes at the bottom of vertical cuts with a slight downward slope from the entrance, and slightly elevated locations to avoid flooding. In addition to burrows, the owls also require perching locations and frequently use fence posts or the top of mounds outside the burrow. Burrowing owls typically use burrows created by other animals such as prairie dogs, kangaroo rats, ground squirrels — especially burrows constructed by California ground squirrels and kit foxes. Primary threats across the North American range of the burrowing owl are habitat loss and fragmentation primarily due to intensive agricultural and

BIOLOGICAL CONSTRAINTS REPORT

urban development, and habitat degradation due to declines in populations of colonial burrowing mammals (Klute *et al.* 2003).

There are 19 CNDDDB records of western burrowing owl within 5 miles of the Study Area, and the closest occurrence to the R-893 Study Area is located approximately 0.28 south of the Study Area. The D-915 Study Area provides suitable burrowing and foraging habitat in the annual grasslands habitat and existing nesting habitat in the ground squirrel burrows that have been observed on the site.

The R-893 Study Area only provides marginal habitat, there is suitable foraging and nesting habitat for this species in the annual grasslands and pastures adjacent to the R-893 Study Area; and overwintering owls could occur. Western burrowing owls have been observed in small, less than 1 acre lots, surrounded almost entirely by development. Therefore, while the small patch of suitable habitat within the Study Area and the presence of urban development around the R-893 Study Area may reduce the quality of the habitat, there remains potential for this species to be present within the R-893 Study Area.

Western burrowing owl – State species of special concern

Western burrowing owls (*Athene cunicularia hypugea*) prefer open, flat, or gently sloped grasslands and require burrows for nesting. Burrowing owl nesting habitat consists of open areas with mammal burrows (Klute *et al.* 2003). Habitats include dry open rolling hills, grasslands, fallow fields, sparsely vegetated desert scrub with gullies, washes, arroyos, and edges of human-disturbed lands. They have been known to inhabit golf courses, airports, cemeteries, vacant lots, and road embankments, wherever there is sufficient friable soil for a nesting burrow. Favored nest burrow sites are those in relatively sandy sites (possibly for ease of modification and drainage), areas with low vegetation around the burrows (to facilitate the owl's view and hunting success), holes at the bottom of vertical cuts with a slight downward slope from the entrance, and slightly elevated locations to avoid flooding. In addition to burrows, the owls also require perching locations and frequently use fence posts or the top of mounds outside the burrow. Burrowing owls typically use burrows created by other animals such as prairie dogs, kangaroo rats, ground squirrels — especially burrows constructed by California ground squirrels and kit foxes. Primary threats across the North American range of the burrowing owl are habitat loss and fragmentation primarily due to intensive agricultural and urban development, and habitat degradation due to declines in populations of colonial burrowing mammals (Klute *et al.* 2003).

There are 19 CNDDDB records of western burrowing owl within 5 miles of the Study Area, the with the closest occurrence a 2017 observation of one adult approximately 1.1 miles north of the R-893 Study Area and a 1993 observation of a pair of owls 0.2 miles south of the D-915 Study Area. There are also recorded occurrences of breeding pairs as recently as 2016 within 4 miles of Study Area. While the Study Area itself provides marginal habitat, there is suitable foraging and nesting habitat for this species in the annual grasslands and pastures adjacent to the Study Area; and overwintering owls could occur the Study Area. Western burrowing owls have been observed in small, less than 1 acre lots, surrounded almost entirely by development. Therefore, while the small patch of suitable habitat within the Study Area and the presence of urban development around the Study Area may reduce the quality of the habitat, there remains potential for this species to be present within the Study Area. During the reconnaissance field surveys, suitable habitat (i.e., open grassland land with abundant California ground squirrels' colonies present) were noted in the Study Area north of I-580.

BIOLOGICAL CONSTRAINTS REPORT

Tricolored blackbird – State Threatened

Tricolored blackbirds (*Agelaius tricolor*) are largely restricted to California, where they occur throughout the Central Valley and along the coast in Southern California from Santa Barbara County to the Mexican Border (Beedy and Hamilton 1999). They are colonial nesters, breeding in dense colonies from which they may travel several miles to forage in grasslands and agricultural fields. Males arrive at breeding sites before females and initiate singing from late February through March. Nesting occurs from late March to early August. Individuals within breeding colonies may nest synchronously and lay eggs within one week of each other (Beedy and Hamilton 1999). They breed within wetland habitats but prefer freshwater marshes dominated by cattails (*Typha* spp.) or bulrushes (*Schoenoplectus* spp.). Nesting has also been documented in willows (*Salix* spp.), blackberries (*Rubus* spp.), thistles (*Cirsium* and *Centaurea* spp.), and nettles (*Urtica* sp.) (Beedy and Hamilton 1999).

There are six CNDDDB occurrences of tricolored blackbird within 5 miles of the R-893 Study Area, with the closest occurrences approximately 1.25 miles southwest of the R-893 Study Area. Suitable nesting habitat was observed in the Study Area during the reconnaissance surveys along the Arroyo Las Positas within the emergent vegetation (Figure 3) and suitable foraging habitat for this species is present in open grasslands both within and adjacent to the R-893 Study Area.

Northern harrier – State Species of Special Concern

Northern harriers (*Circus cyaneus*) nest on the ground in marshes or dense fields and generally use grasslands for foraging. Their diet consists mostly of small mammals (up to the size of small rabbits) and small birds (Kaufman 1996). Northern harrier nests are usually situated on the ground in shrubby vegetation, usually along marsh edges (Brown and Amadon 1968). Threats to this species habitat includes degradation of freshwater and estuarine wetlands and conversion of grasslands to agriculture. Northern harriers generally avoid urban areas but have been known to forage along roadsides (Hager 2009).

There is one CNDDDB occurrence (1992) located approximately 5.2 miles northwest of the R-893 Study Area. This occurrence consisted of a possible breeding pair documented in tall annual grassland in a remote location relatively secluded from human. Study Area R-893 does not provide suitable breeding habitat, however there is suitable foraging and nesting habitat for this species in the annual grasslands and pastures adjacent to the Study Area. Therefore, while the Study Area provides only marginal foraging habitat, there remains potential for this species to be present within the Study Area. Study Area D-915 provides potentially suitable habitat for breeding and foraging. Therefore, there is potential for this species within the D-915 Study Area.

American badger - State species of special concern

American badger (*Taxidea taxus*) require loose soils in open areas and with abundant rodent prey, especially ground squirrels and prairie dogs, in prairie, desert, grassland, chaparral, pasture, woodland, and alpine meadow habitats. This species is a proficient digger and constructs large burrows that may be up to 30 ft long for refugia, rearing offspring, food storage, and overwintering (Sullivan 1996, Reid 2006). During the summer, American badger may excavate and use a new den each day. This species has been recorded at elevations ranging from sea level to 12,000 ft (Sullivan 1996).

BIOLOGICAL CONSTRAINTS REPORT

There are five CNDDDB records of American badger within 5 miles of the Study Area. The closest record is a 1995 observation approximately 2.1 miles north of the D-915 Study Area. There is suitable habitat within both the R-893 Study Area and the D-915 Study Area as there is ground squirrel activity and other burrowing rodents in the area. However, the presence of residential and industrial development adjacent to the R-893 Study Area reduces the quality of suitable foraging and denning habitat in the vicinity of the Study Area.

6.1.3 Wildlife Corridors

There are no known wildlife corridors within the R-893 or D-915 Study Areas (CDFW 2019d, CDFW 2014, CDFW 2010). However, any vegetated river, stream, slough or canal provides a potential migration corridor for wildlife. Therefore, the Arroyo Las Positas watershed could act as a corridor allowing for wildlife movement. The habitat south of I-580 is primarily a mixture of commercial, industrial, and residential urban development, while north of I-580 the habitat largely consists of open space, consisting of agricultural, primarily cattle grazing. The riparian habitat along Arroyo Las Positas, passes via a t-beam bridge underneath I-580. The lack of a riparian tree canopy along Arroyo Las Positas, and the amount of human disturbance in the surrounding habitat, lowers the habitat value as a migration corridor. The project may temporarily disturb movements along this Arroyo Las Positas during the construction phase, however there will be no permanent change to the existing conditions with respect to wildlife movements.

7.0 RECOMMENDED AVOIDANCE AND MINIMIZATION MEASURES

The following section discusses potential biological resource constraints related to the project and recommends measures to reduce the likelihood and magnitude of adverse temporary and/or permanent impacts to biological resources that could result from implementation of this project. Specific mitigation agreements have been developed through consultation with the resource agencies (ACOE, USFWS, CDFW, etc.) for the Original Project prior to project implementation. Permit amendments will be processed to incorporate the Amended Study Areas and any new permit terms will be implemented during construction at the R-893 and D-915 sites. Prior to construction at these sites, responsibility of each mitigation effort should be expressly assigned.

The following section discusses potential biological resource constraints related to the project and recommends measures to reduce the likelihood and magnitude of adverse temporary and/or permanent impacts to biological resources that could result from implementation of this project. These include project specific recommended avoidance and minimization measures (AMMs) as well as measures implemented under PG&E's Bay Area Habitat Conservation Plan (BAHCP). Specific mitigation agreements have been developed through consultation with the resource agencies (ACOE, USFWS, CDFW, etc.) for the Original Project prior to project implementation. Permit amendments will be processed to incorporate the Amended Study Areas and any new permit terms will be implemented during construction at the R-893 and D-915 Study Areas. Prior to construction at these sites, responsibility of each mitigation effort should be expressly assigned.

Study Areas, R-893 and D-915, are both within the BAHCP which provides federal take authorization for all gas and electric operations and maintenance located within the plan area this HCP is not associated with a 2081(b) Incidental Take permit from the California Department of Fish and Wildlife (CDFW) and take of individuals of state-listed species is not covered. Per the BAHCP, Field Protocols 1 through 18 are to be implemented for all covered work activities (see Field Protocols attached below). The D-915 portion of this project is considered a small activity under the

BIOLOGICAL CONSTRAINTS REPORT

BAHCP (G3b) and therefore both temporary and permanent impacts on modeled habitat are estimated to be 0.06 acres per project and will not require a post-construction field assessment of actual impacts. The Study Area associated with D-915 overlaps the following BAHCP modeled habitat; California tiger salamander (Potential Upland Habitat), California red-legged frog (Potential Dispersal and Potential Breeding Habitat), vernal pool fairy shrimp (Habitat), vernal pool tadpole shrimp (Habitat), San Joaquin kit fox (Low Quality Habitat). Implementation of standard BAHCP Field Protocols as well as AMM-3 and AMM-4 (listed below) will minimize potential impacts to these species.

The R-893 portion of this project is considered a large activity under the BAHCP (G11) and therefore a post-construction assessment will be required to determine the actual impacts both temporary and permanent, on modeled habitat. Reporting of impact acreage through a Project Data Impact Collection Form will be required. The Study Area associated with R-893 is within BAHCP modeled habitat for California tiger salamander (Potential Upland Habitat) and California red-legged frog (Potential Dispersal Habitat). Implementation of standard BAHCP Field Protocols as well as measures established in existing documents for the Original Project including, the CDFW Incidental Take Permit (ITP) and the Initial Study Mitigated Negative Declaration (ISMND), listed below, will further avoid and minimize adverse effects to these species.

7.1 BAY AREA HCP FIELD PROTOCOLS

The following measures are general protocols under the BAHCP which should be implemented at the R-893 and D-915 sites.

Table 2. PG&E Bay Area HCP: Relevant Field Protocols and Avoidance and Minimization Measures to Reduce Impacts on Covered Species

Staff Responsible	Code	Description of Measure	Applicable Covered Species
Field Protocols			
Training			
HCP Team	FP-01	Hold annual training on habitat conservation plan requirements for employees and contractors performing covered activities in the Plan Area that are applicable to their job duties and work.	All covered species
Access and Worksite Management			
Field Crew	FP-02	Park vehicles and equipment on pavement, existing roads, or other disturbed or designated areas (barren, gravel, compacted dirt).	All covered species
Field Crew	FP-03	Use existing access and ROW roads. Minimize the development of new access and ROW roads, including clearing and blading for temporary vehicle access in areas of natural vegetation.	All covered species
Field Crew	FP-04	Locate off-road access routes and work sites to minimize impacts on plants, shrubs, and trees, small mammal burrows, and unique natural features (e.g., rock outcrops).	All covered species

BIOLOGICAL CONSTRAINTS REPORT

Staff Responsible	Code	Description of Measure	Applicable Covered Species
HCP Team, Land Planners	FP-05	Notify conservation land owner at least 2 business days prior to conducting covered activities on protected lands (state and federally owned wildlife areas, ecological reserves, or conservation areas); more notice will be provided if possible or if required by other permits. If the work is an emergency, as defined in PG&E's Utility Procedure ENV-8003P-01, PG&E will notify the conservation land owner within 48 hours after initiating emergency work. While this notification is intended only to inform conservation land owner, PG&E will attempt to work with the conservation land owner to address landowner concerns.	All covered species
Field Crew	FP-06	Minimize potential for covered species to seek refuge or shelter in pipes and culverts. Inspect pipes and culverts, of diameter wide enough to be entered by a covered species that could inhabit the area where pipes are stored, for wildlife species prior to moving pipes and culverts. Immediately contact a biologist if a covered species is suspected or discovered.	All covered amphibians, reptiles and mammals
Field Crew	FP-07	Vehicle speeds on unpaved roads will not exceed 15 miles per hour.	All covered species
Field Crew	FP-08	Prohibit trash dumping, firearms, open fires (such as barbecues), hunting, and pets (except for safety in remote locations) at work sites.	All covered species
Field Crew	FP-09	During fire season in designated State Responsibility Areas, equip all motorized equipment with federally approved or state-approved spark arrestors. Use a backpack pump filled with water and a shovel and fire-resistant mats and/or windscreens when welding. During fire "red flag" conditions as determined by Cal Fire, curtail welding. Each fuel truck will carry a large fire extinguisher with a minimum rating of 40 B:C. Clear parking and storage areas of all flammable materials.	All covered species
Field Crew	FP-10	Minimize the activity footprint and minimize the amount of time spent at a work location to reduce the potential for take of species.	All covered species
Erosion Control			
Field Crew	FP-11	Utilize standard erosion and sediment control BMPs (pursuant to the most current version of PG&E's <i>Stormwater Field Manual for Construction Best Management Practices</i>) to prevent construction site runoff into waterways.	All covered aquatic species
Field Crew	FP-12	Stockpile soil within established work area boundaries and locate stockpiles so as not to enter water bodies, stormwater inlets, other standing bodies of water. Cover stockpiled soil prior to precipitation events.	All covered species
Natural Resource Protection			

BIOLOGICAL CONSTRAINTS REPORT

Field Crew	FP-13	Fit open trenches or steep-walled holes with escape ramps of plywood boards or sloped earthen ramps at each end if left open overnight. Field crews will search open trenches or steep-walled holes every morning prior to initiating daily activities to ensure wildlife are not trapped. If any wildlife are found, a biologist will be notified and will relocate the species to adjacent habitat or the species will be allowed to naturally disperse, as determined by a biologist.	Covered amphibians, reptiles, and mammals
Land Planner or Biologist, and Field Crew	FP-14	If the covered activity disturbs 0.1 acre or more of habitat for a covered species in grasslands, the field crew will revegetate the area with a commercial "weed free" seed mix.	All covered grassland species
Field Crew	FP-15	Prohibit vehicular and equipment refueling 250 feet from the edge of vernal pools, and 100 feet from the edge of other wetlands, streams, or waterways. If refueling must be conducted closer to wetlands, construct a secondary containment area subject to review by an environmental field specialist and/or biologist. Maintain spill prevention and cleanup equipment in refueling areas.	Vernal pool species, California freshwater shrimp, California red-legged frog, California tiger salamander (both Central California and Sonoma County DPSs), San Francisco garter snake
Land Planner or Biologist, and Field Crew	FP-16	Maintain a buffer of 250 feet from the edge of vernal pools and 50 feet from the edge of wetlands, ponds, or riparian areas. If maintaining the buffer is not possible because the areas are either in or adjacent to facilities, the field crew will implement other measures as prescribed by the land planner, biologist, or HCP administrator to minimize impacts by flagging access, requiring foot access, restricting work until dry season, or requiring a biological monitor during the activity.	Vernal pool species, California freshwater shrimp, California red-legged frog, California tiger salamander (both Central California and Sonoma County DPSs), San Francisco garter snake
Field Crew	FP-17	Directionally fell trees away from an exclusion zone, if an exclusion zone has been defined. If this is not possible, remove the tree in sections. Avoid damage to adjacent trees to the extent possible. Avoid removal of snags and conifers with basal hollows, crown deformities, and/or limbs over 6 inches in diameter.	All covered species
Land Planner or Biologist, and Field Crew	FP-18	Nests with eggs and/or chicks will be avoided: contact a biologist, land planner or the Avian Protection Program manager for further guidance.	All nesting bird species

7.2 AVOIDANCE AND MINIMIZATION MEASURES FROM THE ORIGINAL PROJECT INITIAL STUDY MITIGATED NEGATIVE DECLARATION (ISMND) REPORT

Applicable Applicant Proposed Measures (APMs) and Mitigation Measures (MMs) that were included in the Original Project ISMND and will apply to the Amended Project.

7.2.1 Applicant Proposed Measures (APMs)

APM BIO-1: Worker Education and Training. PG&E will develop a construction employee education program which covers all sensitive environmental resources potentially onsite and the measures and regulations associated with their protection (i.e., from APMs, MMs, statute and regulation). The training will be a component of weekly Project meetings and will be provided to everyone working onsite. At minimum, the training program will include:

- A sign-in sheet to document the attendance for all employees who attend.
- A brief presentation, to be conducted by persons knowledgeable in the sensitive environmental resources described in the project ISMND or protected by statute or regulation, to explain necessary protections to contractors, their employees, and agency personnel involved in the project.
- For biological resources, the program will include:
 - A description of local and special-status species and their habitat needs;
 - An explanation of the status of each special-status species and their protection under ESA and CESA and a list of measures being taken to reduce effects during construction and implementation and penalties for non-compliance.
 - Fact sheets conveying this information and an educational brochure containing color photographs of all special-status species in the project area will be prepared for distribution to the training attendees and anyone else who may enter the project area.

APM BIO-2: Pipe Storage and Inspection. Pipes, culverts and similar materials shall be stored so as to prevent wildlife from using these as temporary refuges (i.e., securely capped where possible). These materials will be inspected each morning for the presence of animals prior to being moved, buried or capped.

APM BIO-3: Prohibited Activities. The following shall not be allowed in or near the project area for Project activities: trash dumping, firearms, open fires (such as barbecues), hunting, and pets.

APM BIO-4: Debris Abatement. All trash and debris within the project area shall be placed in containers with secure lids before the end of each work day to reduce the likelihood of wildlife 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 overflow. All trash will be disposed of at an appropriate off-site location.

APM BIO-5: Vehicle Parking. Vehicles and equipment shall be parked on pavement, existing roads, and previously disturbed areas or areas approved by the biological monitor after determining wildlife or habitat resources will not be adversely affected.

APM BIO-6: Off-Road Travel. Off-road vehicle travel shall be minimized. If off-road vehicle travel is necessary, it will be confined to the PG&E-designated overland access routes.

APM BIO-7: Speed Limits. Vehicles shall not exceed a speed limit of 15 mph in undeveloped portions of the workspaces (i.e., unpaved access roads).

APM BIO-8: Vehicle Cleaning. Vehicles shall arrive in sensitive vegetation habitats (i.e., sensitive natural communities and areas with special status plant populations) clean of muddy debris. If work occurs in Project areas with heavy weed

BIOLOGICAL CONSTRAINTS REPORT

infestation, vehicles will be cleaned before moving to a sensitive habitat if that area does not contain a substantial weed component. Degree of infestation by noxious weeds (defined as those that are listed on the Cal-IPC high or moderate lists) across the entirety of the Project alignment shall be determined by a biologist prior to construction (see MM BIO-1). Cleaning will occur by brushing, washing, or other means of manual or mechanical removal and shall be confirmed clean by a biological monitor before entering sensitive habitats.

APM BIO-9: Night Work Restriction. All construction activities shall cease 30 minutes before sunset and will not begin prior to 30 minutes after sunrise. If construction cannot be avoided because of safety or emergency reasons, it shall proceed only for the minimum time necessary to abate the risk to safety or emergency. If standard nighttime construction cannot be avoided, night work will be limited to a maximum of a total of 7 nights at each individual grassland or riparian Work Area. Night work shall be limited in extent, duration, and brightness. Prior to commencing night work, PG&E will provide CDFW with notice of where and when work will occur, and measures implemented to protect sensitive biological resources. If more than 7 total nights of work are necessary at any Work Area with habitats that support nesting birds or sensitive species, due to requirements in local permits or unforeseen circumstances, additional nights of work will only occur if approved by CDFW. Lighting shall be faced downward and will only be used in the immediate workspace to achieve a safe working environment. A CDFW- and USFWS-approved biologist will be present during all construction activities in areas with sensitive species habitat including all night work and will ensure that lighting is used to the minimum extent feasible.

APM BIO-10: Refueling and Equipment Maintenance. Vehicle and equipment fueling, and maintenance operations shall be conducted in designated areas only; these will be equipped with appropriate spill control materials and containment. Vehicles or equipment shall not be refueled within 150 feet of a wetland, stream, or other waterway unless a bermed and lined refueling area is constructed.

APM BIO-11: Erosion Control Materials. 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 that are non-toxic and approved by CDFW.

APM BIO-12: Stockpiling. Stockpiling of material shall occur outside of seasonal swales and ephemeral drainages.

APM BIO-13: Access Across Jurisdictional Features. Access across the ephemeral drainage along the D-915 Location B access route will occur using temporary bridges. Equipment will be operated from on top of the channel bank to install/remove bridges. Matting/plating/bridges shall not be installed within 24 hours of significant rain events (defined as $\frac{1}{4}$ of inch of rain or more within a 24-hour period).

APM BIO-14: Work Area Delineation. The project area shall be delineated with high visibility temporary flagging or other barriers, such as T-post and rope (where cattle are not present), to prevent encroachment of construction personnel and equipment outside of the project area. Flagging or other materials will be inspected and maintained daily until completion of the project. The materials will be removed only when all construction equipment is removed from the site.

APM BIO 15: Seasonal Work Restriction. Grading and construction activities shall be conducted during the dry season, between April 15 and October 15, to the extent possible. Should work need to occur outside of this period, PG&E will request authorization from the and CDFW at least 10 days prior of the date of the proposed extension, for intervals

BIOLOGICAL CONSTRAINTS REPORT

of up to 1 week. Work will only be conducted in accordance with CDFW and approval and shall be subject to weather conditions.

7.2.2 Mitigation Measures (MMs)

APM BIO-1: Worker Education and Training. PG&E will develop a construction employee education program which covers all sensitive environmental resources potentially onsite and the measures and regulations associated with their protection (i.e., from APMs, MMs,

Mitigation Measure BIO-1: Prepare and Implement Vegetation Restoration Plan: PG&E shall prepare and implement a Vegetation Restoration Plan (VRP) prepared by a qualified restoration specialist, which shall be submitted to CDFW for review and approval within 30 days of start of construction. PG&E shall restore on-site all of the native vegetation, and ground cover, that shall be disturbed during construction to as close to pre-project conditions as possible. The table below describes the proposed restoration success criteria for grassland habitat beginning in "Year 1," the first year upon completion of construction.

Restoration Success Criteria and Reporting for Grassland Habitat		
Overall Success Criteria	Year 1*	Year 2 and Year 3, if applicable
A minimum of 70% vegetation cover relative to baseline conditions, and less than 5% absolute cover of invasive plants listed as high or moderate in the Cal-IPC database and mapped in the work area during the baseline conditions assessment.	<p>Take photos from designated photo stations</p> <ul style="list-style-type: none">▪ In Year 1, an annual restoration monitoring report shall be submitted to CDFW with a qualitative assessment of vegetation cover and a comparison to the baseline conditions assessment for the work areas. Annual monitoring report shall document restoration success and shall be submitted to the permitting agencies by September 1. The first report shall provide a species list of the seed mix used at each restoration area. If success criteria, are met in Year 1, no additional monitoring or reporting is required, and restoration is considered complete.	<p>Take photos from designated photo stations</p> <ul style="list-style-type: none">▪ If success criteria are not met in Year 1, a Year 2 annual restoration monitoring report shall be submitted to CDFW by September 1, containing the same information as the Year 1 report.▪ If success criteria are not met in Year 2, a final report shall be submitted to CDFW by September 1, containing the same information as the Year 1 and 2 reports.

* Year 1 is first year of post-construction operation.

The success criteria may be adjusted annually based on reference site plant counts observed outside of the area impacted by the Project to account for drought, herbivory, fire, and unanticipated landowner impacts to the property, among other factors.

BIOLOGICAL CONSTRAINTS REPORT

The VRP shall include specifications for restoring all temporarily disturbed areas, such as seed mixes, timing, and application methods. Non-native invasive species shall not account for the absolute cover for restoration success. The California Invasive Plant Council (Cal-IPC) database (<http://www.cal-ipc.org/paf/>) shall be consulted when determining noxious and invasive plants. The Vegetation Restoration Plan shall contain the following components:

Disturbed Annual Grassland

- **Topsoil and Seed Salvage** The top 6 to 12 inches of shall be scraped prior to excavation. Scraped topsoil will be stored separately from other spoils piles and restored to its original location over backfilled material. The stockpiles shall be protected from non-native plant propagules and protected with weed-free straw mulch, jute netting, or other suitable cover such as hydroseed/hydromulch without fertilizer added.
- **Baseline Conditions Assessment.** Prior to initiating ground disturbance, PG&E shall identify baseline vegetation conditions in any project area within suitable habitat for California tiger salamander or California red-legged frog or any sensitive natural community. Documentation shall identify: (1) the vegetation species; (2) an estimate of average ground cover density; (3) an overall estimate of the density of native and non-native species compositions; and (4) weed mapping of all Cal-IPC's California Invasive Plants listed as high or moderate.
- **Seeding.** Seed shall be applied after completion of construction in the late fall and early winter when rainfall and temperatures are sufficient to trigger germination and growth. This will avoid the need for irrigation in most cases. If the timing of construction activities precludes seeding during the late fall or early winter during a given year, the site will be temporarily stabilized, and the site will be seeded in the following fall.
- **Seed Mix.** A seed mix shall be identified considering species found in the baseline conditions assessment and include only native species, with an emphasis on native bunchgrasses and other grassland species.
- **Invasive Plants.** In the baseline conditions assessment, PG&E shall perform preconstruction weed mapping of all Cal-IPC's California Invasive Plants listed as high or moderate to document baseline Cal-IPC invasive plants present in the project area prior to construction. The restored project area shall consist of no more than 5 percent of the existing baseline Cal-IPC invasive plants observed in the same project area. If the presence of invasive species exceeds this threshold, PG&E is responsible for conducting appropriate control activities during monitoring, up to three years after implementation of restoration.
- **Monitoring.** To ensure that site restoration and erosion control measures are successful, PG&E shall be required to monitor site conditions for up to three years following project completion or until success criteria are satisfied prior to the end of three years. Site visits shall be conducted at least once after the first significant rain event after project completion to evaluate site stability and during the spring and summer to evaluate revegetation efforts. If PG&E or CDFW determines there is an increase in erosion or bank instability, PG&E shall consult with CDFW on corrective actions.
- **Photographs from Flagged Points.** Prior to commencement of work, PG&E shall identify representative views of the project area that will be identified in the CDFW Streambed Alteration Agreement and Incidental Take Permit for this project, will impact California tiger salamander or California red-legged frog upland habitat, or will impact special-status plant species or sensitive natural communities (i.e., alkali grassland,

BIOLOGICAL CONSTRAINTS REPORT

native grassland, and wildflower fields). PG&E shall photograph the project area from each of the flagged points, noting the direction and magnification of each photo.

- Upon completion of construction, PG&E shall photograph post-project conditions from the flagged photo points using the same direction and magnification as pre-project photos. Labeled digital copies of pre- and post-project photographs shall be sent to CDFW within forty-five (45) days of completion of the project.
- Additional Revegetation. Regrowth will be evaluated on an annual basis. If success criteria (see Table) are not met during annual monitoring, weeding and/or further seeding shall be conducted as determined necessary by a qualified botanist to attain regrowth targets of local ground cover.
- Regrowth will be evaluated on an annual basis. If success criteria are not met during annual monitoring, weeding will be conducted as determined necessary by a qualified botanist to attain regrowth targets of local ground cover.

Restoration of Special Status Plants and Sensitive Natural Communities

The VRP shall address the following components for onsite restoration of special status plants (Congdon's tarplant and hogwallow starfish) and sensitive natural communities (alkali grassland, native grassland, and wildflower fields) that will be disturbed during construction:

- Seed Collection and Replanting. Seed from the special status plants (Congdon's tarplant and hogwallow starfish) and sensitive natural communities to be impacted will be collected, stored, and replanted onsite after construction. If construction of the project begins prior to the availability of seed, collection of seed for special status plant species and sensitive communities shall be from populations in the vicinity of the project area.
- Seed Collection: Timing. Areas of special status plants and sensitive natural communities mapped during surveys shall be revegetated with seed collected prior to construction (or during construction from adjacent sites), and other native species found in the Project region, if necessary.
- Restoration Site Selection. The restoration site assessment for special-status plants shall support the VRP selection of restoration sites. Reseeding should be done at the exact site where individuals were removed if at all possible. If it is known that a location will be subject to tilling before 2021, an alternate suitable location as close as possible to the impact, shall be identified. If this is not possible, the VRP shall either: 1) propose an offsite location in Alameda or Contra Costa County (offsite locations must be secured within a conservation easement that will be in effect in perpetuity) or 2) outline how the seed harvested from two annual CRPR-listed plants (Congdon's tarplant and hog- wallow starfish) shall be grown out and amplified at a licensed native plant nursery. The bulk of the amplified seed shall be provided to one or more nature preserves (or similar) within Alameda or Contra Costa County for use in restoration or habitat enhancement projects, and some seed shall remain with the nursery to enable future propagation.
- A statement of number of trees proposed for removal and proposed restoration locations shall be included in the VRP.

BIOLOGICAL CONSTRAINTS REPORT

Mitigation Measure BIO-3: Pre-Activity Surveys. Within 14 days prior to any construction or staging activities, a qualified USFWS- and CDFW-approved biologist shall conduct a preconstruction survey for special-status wildlife species (except California tiger salamander and California red legged frog, covered by MM BIO-9 below) in the active construction work areas. Survey results may be documented in a brief memo or monitoring form and shall note the occurrence, location, or indication (e.g. active nest, occupied burrow of any special- status species or If a special-status wildlife species is observed, work shall not begin until the species departs the construction area or is moved, if necessary permits have been obtained, out of the construction area to a CDFW-approved relocation site. If at any point construction activities cease for more than 7 days, additional surveys shall be conducted prior to the resumption of these actions.

Mitigation Measure BIO-4: Work in Dry Weather. During the dry season (April 15 – October 14), Permittee shall limit Covered Activities to periods of low rainfall (less than 0.10 inch per 24-hour period). Ground disturbing activities may resume 48 hours after the rain ceases when there is a less than 40% chance of precipitation in the 24-hour forecast.

Mitigation Measure BIO-5: Biological Monitoring. A qualified USFWS- and CDFW-approved biological monitor (“approved biologist”) shall be present onsite during vegetation removal and initial ground disturbing activities within habitat for special status wildlife and plant species. Once ground is disturbed, including scraping of soil and excavation by construction equipment, an approved biologist will inspect and clear sites for wildlife prior to beginning of construction each day and may move between construction sites. An approved biologist must be within the overall Project area at all times when construction is occurring. The approved biologist shall:

- Observe ground disturbing activities and make sure all appropriate protections are in place and permit conditions are followed
- Have experience with the species being surveyed for
- Have the authority to stop any work that may impact wildlife species
- Have the authority to suggest alternative work practices after consultation with construction personnel, as appropriate, if construction activities are likely to impact sensitive biological resources, and to make those suggestions known to CDFW. If the approved biologist exercises this authority, the PG&E project biologist shall be notified immediately, and PG&E shall notify, by telephone or electronic mail, USFWS and CDFW within 1 working day
- Be the contact for any employee or contractor who might inadvertently kill or injure a special status species or anyone who finds a dead, injured, or entrapped special status species
- In active construction areas, inspect the area beneath equipment and vehicles for wildlife at the beginning of every work day and prior to beginning of ground disturbing activities
- Possess a working wireless/mobile phone. This phone number, in addition to the PG&E project biologist’s phone number, shall be provided to CDFW and USFWS.
- Document all APM, MM, and permit condition compliance and any corrective actions and include these records in regular reporting to CDFW.

BIOLOGICAL CONSTRAINTS REPORT

Mitigation Measure BIO-6: Entrapment Avoidance. To prevent the accidental entrapment of wildlife during construction, all excavated holes or trenches deeper than 6 inches shall be covered at the end of each work day with plywood or similar materials and completely buried or otherwise sealed around the perimeters. Larger excavations that cannot easily be covered shall be ramped at the end of the work day to allow trapped animals to escape and must be checked at intervals of no less than 24 hours. Ramps for open excavations shall be soil and/or rough plank ramps with a maximum 45-degree angle and shall be installed at intervals of no less than 30- to 45-inches apart unless otherwise authorized by CDFW. Trenches shall be backfilled as soon as possible. Construction personnel shall inspect open holes and trenches for wildlife prior to backfilling for trapped wildlife. If a special-status species is discovered in a trench or excavation, work in the area shall be redirected, and the animal shall be allowed to leave the trench and the area of its own accord or be relocated by the approved biologist in accordance with agency approvals. In the event a California tiger salamander is trapped in a trench or an excavation and unable to leave on its own accord, it shall be relocated according to MM BIO-10.

Mitigation Measure BIO-7: Amphibian Capture Best Practices. CDFW/USFWS approved biologists shall use their bare hands to capture California tiger salamander and California red-legged frog, CDFW/USFWS-approved biologists shall not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within 2 hours before and during periods when they are capturing and relocating individual California tiger salamander/California red-legged frog. To avoid transferring disease or pathogens from handling of the amphibians, CDFW/USFWS-approved biologists shall follow the Declining Amphibian Populations Task Force's Code of Practice. Captured California tiger salamanders shall be placed individually into a dark, clean plastic container of suitable size with enough room, so the animal can move freely and shall keep the container moist with damp paper towels, soft foam rubber, or natural or synthetic sponge free of soaps and anti-bacterial/antifungal treatments. Containers used for holding or transporting shall not contain any standing water. The lids of the containers shall have small air holes for ventilation. Sponges shall not be reused, and all other housing materials shall be disinfected between occupants according to the Task Force's Code of Practice.

Mitigation Measure BIO-8: Restraint and Handling of Live Amphibians. California tiger salamander and California red-legged frog shall be handled and assessed according to the Restraint and Handling of Live Amphibians USGS, National Wildlife Health Center (D. Earl Creene, ARMI SOP No. 100; 16 February 2001). CDFW/USFWS-approved biologist shall move special-status species to appropriate locations within 300 feet of the project boundary pursuant to the Relocation Plan (MM BIO-10). If an injured California tiger salamander or California red-legged frog is found during the project term, the individual shall be evaluated by the approved biologist who shall then immediately contact the PG&E project biologist who shall then contact the CDFW and USFWS, via email and telephone, to discuss the next steps. If the representatives cannot be contacted immediately, the injured amphibian shall be placed in a shaded container and kept moist. If the representatives are not available or do not respond within 2 hours of initial attempts, then the following steps shall be taken:

- a. If the injury is minor or healing and the amphibian is likely to survive, the amphibian shall be released immediately as follows. The approved biologist shall relocate any California tiger salamander and California red-legged frog found within the work area to an active rodent burrow or burrow system located no more than 300 feet outside of the work area. California tiger salamander and California red-legged frog shall be monitored until it is determined that it is not imperiled by predators or other dangers. Relocation areas shall be identified by the approved biologist based on best suitable habitat available and approved by the agencies prior to the start of project activities. The approved biologist shall document both locations by

BIOLOGICAL CONSTRAINTS REPORT

photographs and GPS positions. The California tiger salamander and California red-legged frog shall be photographed and measured (snout-vent and total length) for identification purposes prior to relocation. All documentation shall be provided by PG&E to CDFW and the USFWS within 24 hours of relocation.

- b. If it is determined that the California tiger salamander or California red-legged frog has major or serious injuries as a result of project-related activities, the CDFW/USFWS-approved biologist shall immediately take it to the Lindsay Wildlife Museum or another agency-approved facility. If taken into captivity, the individual shall remain in captivity and not be released into the wild unless it has been kept in quarantine and the release is authorized by the agencies. The circumstances of the injury, procedure followed, and final disposition of the injured animal shall be documented in a written incident report, as described above.

Mitigation Measure BIO-9: Conduct Preconstruction Surveys for Special-Status Amphibians and Avoid Impacts to Burrows. A CDFW- and USFWS-approved biologist shall survey the project area with potential habitat for California tiger salamander and California red-legged frog immediately prior to ground-disturbing activities. Surveys shall include all potentially suitable upland habitat such as rodent burrows, cracks, ruts, holes near root structures, foundations, abutments, and leaf litter within the project area that contain potential habitat for these species. If any California tiger salamander or California red-legged frog are found, the approved biologist shall contact CDFW and the USFWS to determine if moving any of these life stages is appropriate. In making this determination, CDFW and USFWS shall consider if an appropriate relocation site exists as provided in the Relocation Plan (MM BIO-10). If CDFW and the USFWS approve moving animals, the CDFW- and USFWS- approved biologist will be allowed sufficient time to move California tiger salamander and California red-legged frog from the project area before work activities begin. Only CDFW- and USFWS-approved biologists shall participate in activities associated with the capture, handling, and monitoring of California red-legged frog and California tiger salamander.

The approved biologist shall mark all burrows within the project area no less than 7 days prior to earthmoving activities in those areas. All burrows shall be avoided to the maximum extent practicable during earthmoving activities. Areas with high concentrations of burrows shall be avoided by earthmoving activities to the maximum extent possible. In addition, when concentrations of burrows or large burrows are observed within the site, and if it is possible to avoid these burrows during construction activities, these areas shall be staked and/or flagged to ensure construction personnel are aware of their location and to facilitate avoidance of these areas when possible.

Mitigation Measure BIO-10: California tiger salamander / California red-legged frog Relocation. A Relocation Plan for California tiger salamander and California red-legged frog shall be submitted to CDFW for approval five days prior to the start of construction in any area with suitable breeding or estivation habitat for those two species. The Relocation Plan shall include relocation site selection criteria. When either species is observed within work areas, the qualified biologist approved by USFWS and CDFW to handle and relocate them, shall do so. The approved biologist shall relocate any individual to an active rodent burrow system no greater than 300 feet from work area boundaries unless no suitable burrow systems are present within the area. If no suitable burrows are available within 300 feet of the work area, then the California tiger salamander/California red-legged frog will be released at the nearest suitable burrow system. If burrow density allows, the designated biologist shall only release one animal per burrow. Relocation burrows will be chosen based on the presence of similar characteristics to the burrows inside the work area to the extent possible. A suitable burrow should be at least 3 inches in depth and have moist and cool conditions. All relocation burrows will be away from roads and pavement/graveled areas to the extent possible. The biologist shall capture, handle, and assess Covered Species according to the Restraint and Handling of Live

BIOLOGICAL CONSTRAINTS REPORT

Amphibians Protocol, USGS, National Wildlife Health Center (D. Earl Greene, ARMI SOP NO. 100; 16 February 2001; Attachment 2). California tiger salamander shall be released as soon as possible. If the animal repeatedly walks away from the burrow, or partially enters it and then turns around, the qualified biologist shall remove it and find another burrow. A qualified and approved biologist will be identified who is within 30 minutes of the project area to ensure prompt relocation.

The qualified biologist shall document occurrence and relocation sites by photographs and GPS positions. When handled, California tiger salamander and California red-legged frog shall be photographed and measured (snout-vent and total length) for identification purposes prior to relocation. The individual shall be monitored until it is determined that it is not imperiled by predators or other dangers. The qualified biologist shall release individuals one at a time rather than as a group. All documentation shall be provided to CDFW and USFWS within 48 hours of relocation.

Mitigation Measure BIO-11: Implement Wildlife Barriers. At least 15 days prior to commencing any ground disturbing Project activities, PG&E shall submit to CDFW a barrier proposal that shall address the level of need for wildlife exclusion fencing at all project areas within suitable California tiger salamander/California red-legged frog habitat for CDFW approval. The Qualified Biologist shall evaluate site and planned work activities to determine the wildlife exclusion barrier proposal and consider season of work, special-status species occurrence to date, time duration of site activity, and implications for wildlife movement in the proposal. A recommendation not to install fencing may be made if the effects of fencing installation could be greater in extent or duration than those associated with planned work activities. 15.

Fencing will be installed prior to ground disturbing activities (mowing is not considered ground disturbance). Fencing will be installed using a trencher or hand digging. Fences will be made from silt fence, geotextile fabric, plastic mesh, or other similar materials and will not use plastic monofilament netting. The fencing shall include multiple escape funnels, ramp, or another method if approved by CDFW to allow wildlife to leave the project area. Fencing will be at least 3 feet in height, with the lower edge buried 6 inches underground. The remaining 2.5 feet will be left above ground to serve as a barrier for animals moving on the ground surface.

Gates will be installed within exclusion fencing where necessary for access. Gates will not be buried but will include a flexible rubber strip extending from its lower edge so that it lies flat against the ground when the gate is closed. Materials such as gravel bags will be placed on the edge of the gate when closed to form a seal with the ground.

PG&E shall maintain the barrier, and repair openings as soon as possible to ensure that it is functional and without defects. Any California tiger salamander and California red-legged frog found along the barrier shall be relocated in accordance with the Relocation Plan. Location and design of the barriers shall be included within the proposal. The barrier shall be installed under the supervision of a qualified biologist. Following fence installation, the qualified biologist(s) shall block holes or burrows entrances within project area, of burrows avoided by construction activities, if any, that appear to extend under the barrier to minimize California tiger salamander and California red-legged frog movement into the project area. The barrier shall be checked regularly (not less than three times per week) to look for animals and to ensure barrier integrity. Inspection intervals shall be based upon the planned construction activities at each site, recent and forecasted weather events, and the results of preconstruction surveys and previous inspections. The barriers shall be continuously maintained until all construction activities are completed, and then removed as soon as possible, but no later than 7 days after activities have ceased, unless required to remain longer to ensure SWPPP compliance. The barrier shall continue to be checked regularly until it is removed.

BIOLOGICAL CONSTRAINTS REPORT

Mitigation Measure BIO-12: California tiger salamander & California red-legged frog Habitat Compensation.

Prior to construction, or no later than 18 months from issuance of an Incidental Take Permit by CDFW, assuming financial assurance is provided to CDFW (see MM BIO-13), PG&E shall purchase credits at a USFWS/CDFW-approved Conservation Bank to compensate for unavoidable temporary impacts to upland California tiger salamander and California red-legged frog habitat at a ratio approved by the CDFW and USFWS during the permitting processes for this project. It is estimated approximately 57 acres of California tiger salamander upland habitat credits and approximately 19 acres of California red-legged frog upland habitat need to be mitigated as compensation for temporary impacts; however, the final area of temporary impacts and compensatory mitigation may differ.

Mitigation Measure BIO-13: Financial Security. Prior to initiating project activities, and if proof of payment has not been submitted to CDFW and USFWS, PG&E shall provide CDFW with a form of performance security, approved in advance in writing, in an amount comprised of funds necessary for: a) onsite restoration, and 2) offsite mitigation credits.

Alternatively, PG&E may provide, prior to initiating project activities, habitat compensation through the acquisition and commitment for management in perpetuity of suitable habitat, approved by CDFW. Such a purchase will then be subject to a Fee Title/Conservation Easement transfer to CDFW pursuant to terms approved in writing by CDFW.

Mitigation Measure BIO-14: Invasive Plant and Plant Pathogen Abatement. A CDFW/USFWS-approved 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 area shall be removed. Prior to entry to any project area for the first time, equipment must be free of soil and debris on tires, wheel wells, vehicle undercarriages, and other surfaces (a high-pressure washer and/or compressed air may be used to ensure that soil and debris are completely removed).

Mitigation Measure BIO-15: Conduct Preconstruction Surveys for Nesting Birds. If construction activities are scheduled to occur between February 1 and August 31, preconstruction nesting bird surveys shall be conducted by a qualified biologist no more than 7 days prior to the start of construction activities at any location, covering a radius from the work area boundary of 0.5 mile for golden eagles, 500 feet for raptors and 250 feet for passerines. If any active nests containing eggs or young are found, an appropriate nest exclusion zone shall be established by the qualified biologist in accordance with *PG&E Draft Avian Conservation Strategy: Guidelines for Bird Protection and Mitigation* (ICF International 2013) and in coordination with CDFW. No project vehicles or heavy equipment shall be operated in this exclusion zone until the biologist has determined that the nest is no longer active and/or the young have fledged.

MM BIO-16: Conduct Preconstruction Surveys for Burrowing Owl and Implement Impact Avoidance, Minimization and Mitigation. Prior to construction at any time of the year, a qualified biologist shall conduct a survey consistent with CDFW's Staff Report on Burrowing Owl Mitigation (Mitigation Guidelines; CDFW, 2012) in areas with suitable habitat for burrowing owl to determine the presence/absence of active burrowing owl nesting or wintering burrows within 250 feet of any ground disturbance. Results of nest surveys and planned no-disturbance set-backs shall be submitted to CDFW.

- If burrowing owls are present within 250 feet of the project area, work shall not commence or resume in this zone until one of the following occurs:

BIOLOGICAL CONSTRAINTS REPORT

1. An Avoidance Plan shall be approved by CDFW and implemented by PG&E. The objective of the PG&E-prepared Avoidance Plan shall be to identify what, if any, level of work can begin or resume without disruption of nesting activity or burrow occupancy. The Avoidance Plan shall consider the type and extent of the proposed activity, the duration and timing of the activity, the nesting status of the owls, the sensitivity and habituation of the owls, and the dissimilarity of the proposed activity with background activities, significant aspects of site such as topography or prevailing wind direction etc. to minimize the potential to affect the reproductive success of the owls. Further steps shall be coordinated with CDFW. The Plan shall include monitoring to be conducted prior to, during, and after initiation or re-initiation of project activity sufficient to ensure take is avoided. The biologist shall monitor all work activities in these zones daily when construction is occurring and assess their effect on the nesting birds. If the biologist observes any indication that behaviors are changing relative to baseline behaviors observed prior to project activity (e.g. female flapping of wings in an agitated manner, extended concentrated staring at project activities, distress calls, continuous circling over the area of disturbance), or otherwise determines that particular activities pose a risk of disturbing an active nest, project activity shall cease immediately. Permittee efforts to minimize nest abandonment does not eliminate or reduce the risk of prosecution in case nest abandonment occurs. The biologist may then recommend additional measures to minimize the risk of nest disturbance and those measures shall be implemented. If work cannot proceed without disturbing the nesting birds, or signs of disturbance are observed by the monitor, work shall be halted or redirected to other areas until the nesting is completed.
2. A PG&E Biologist submits a Burrowing Owl Exclusion Plan (see Appendix E of the Staff Report on Burrowing Owl Mitigation, Department of Fish and Game, March 2012) and a Burrowing Owl Impact Mitigation Plan based on Appendix F of the Staff Report on Burrowing Owl Mitigation (Department of Fish and Game, March 2012) to CDFW and the plans are approved by CDFW prior to project commencement or re-initiation. Exclusion of nesting burrowing owls is not allowed.

Mitigation Measure BIO-17: American Badger Impact Avoidance, Minimization and Mitigation. If potential American badger dens are located within the project area and cannot be avoided during construction, a biologist shall determine if the dens are active. If active, a 250-foot no- activity buffer (or smaller, if approved by CDFW) shall be observed around the den, if possible. If the den cannot be avoided, the entrances of the dens will be blocked with soil, sticks, and debris for 3 to 5 days to discourage the use of these dens prior to project disturbance activities. The den entrances will be blocked to an incrementally greater degree over the 3 to 5-day period. No disturbance of active dens will take place when cubs may be present and dependent on parental care, as determined by the qualified biologist.

Mitigation Measure HWQ-1: Prepare and Implement a Water Diversion and Dewatering Plan. Although flowing water is generally not expected at any work areas, there is some possibility for water to be present at W-1 and W-4. A Water Diversion and Dewatering Plan shall be prepared and provided to CDFW for review and approval 15 days prior to the start of construction near any drainage that may have water during the work period. The Plan shall include specific provisions for each site where dewatering or diversion could possibly be necessary and measures to maintain natural flows to the greatest extent feasible and minimize erosion. Water diversions (e.g., coffer dam, sand bags) around channel bank work areas will be installed if there is a 30 percent or greater chance of precipitation forecasted as shown in the National Oceanic and Atmospheric Administration (NOAA) website at www.NOAA.gov.

Mitigation Measure HWQ-2: Restore Swale and Channel Contours. Upon completion of excavation burial, and prior to October 15 in any construction year, swale and channel contours shall be restored to previous contours.

7.3 AVOIDANCE AND MINIMIZATION MEASURES FROM THE ORIGINAL PROJECT INCIDENTAL TAKE PERMIT (ITP)

Applicable Take Minimization Measures that were included in the Original Project Incidental Take Permit (ITP) and will apply to the Amended Project are listed below:

8.1. Pre-activity Covered Species Surveys. Prior to the commencement of Covered Activities, the Designated Biologist(s) shall survey all Work Areas for presence of Covered Species and shall follow earthmoving equipment to look for Covered Species during initial site staging and grading. If the Designated Biologist(s) or anyone else discovers a Covered Species, Permittee shall cease all activity in the vicinity of the occurrence until relocation has been completed in accordance with Condition of Approval 8.15.

8.2. Covered Species Exclusion Plan. At least 15 days prior to commencing Covered Activities, Permittee shall submit to CDFW a Covered Species Exclusion Plan for CDFW review and approval. The plan shall evaluate each Work Area based on, planned work activities, season of work, Covered Species occurrence to date, duration of site activity, and potential Covered Species breeding locations. The plan shall include the locations of the exclusion barrier and indicate when the barrier will be erected and removed.

The exclusion barrier shall not include plastic monofilament netting in its construction. The plan shall include multiple escape funnels, ramp, or other methods to allow Covered Species to leave the Project Area unharmed.

8.3. Exclusion Barrier Installation. The Designated Biologist(s) will supervise the installation of the exclusion barrier. The bottom six inches of the barrier shall be buried, if feasible, or otherwise adequately secured to prevent Covered Species movement into the Work Area. Following barrier installation, the qualified biologist(s) shall block holes or burrows entrances within Work Areas, of burrows avoided by construction activities, if any, that appear to extend under the barrier to minimize Covered Species movement into the Project Area. The exclusion barrier shall remain in place until the Permittee completes all Covered Activities and all construction equipment has been removed from the Work Area. Any Covered Species found along the barrier shall be relocated in accordance with Condition of Approval 8.16. Permittee shall provide refuge opportunities such as natural cover objects (e.g., fallen logs, leaf litter, and branches), or artificial cover boards along or near the outside of the barrier. The Permittee shall avoid damage to small mammal burrows to the maximum extent possible during installation of the barrier. When the Permittee cannot avoid burrows, burrows shall be hand excavated (see Condition of Approval 8.6) prior to trenching activities. Covered Species found during excavation shall be relocated (see Condition of Approval 8.15). Following excavation, the Designated Biologist(s) shall block holes or burrows which appear to extend under the fencing to minimize Covered Species movement into the Project Area.

8.4. Exclusion Barrier Inspection and Maintenance. The Permittee shall maintain the exclusion barrier to ensure that it is functional and without defects. The Designated Biologist(s) shall inspect the barrier at least three times per week, as well as during and after a storm event, until it is removed to look for Covered Species and to ensure barrier integrity. If the barrier is damaged, Permittee shall repair the exclusion barrier immediately. CDFW may require increased inspection intervals based upon planned construction activities at each site, recent and forecasted weather events, and the results of pre-construction surveys and previous inspections. Permittee shall maintain the exclusion

BIOLOGICAL CONSTRAINTS REPORT

barrier continuously until all construction activities are completed within the Work Areas. Permittee will remove the exclusion barrier as soon as possible, but no later than 7 days after activities have ceased, unless the barrier is required to remain longer to ensure Stormwater Pollution Prevention Plan compliance.

8.5. Pre-construction Burrow Identification. The Designated Biologist(s) shall mark all burrows that the Designated Biologists determines can be avoided within all suitable habitat areas no less than seven (7) days prior to earthmoving activities in those areas. Permittee shall stake and flag burrows that will not be graded or excavated but that are within the active suitable habitat area for the duration of Project activities to ensure construction personnel are aware of their location, and to facilitate avoidance of these areas where possible.

8.6. Burrow Excavation and Avoidance. Permittee shall submit a burrow excavation protocol to DFW for review and approval prior to Covered Activities. After marking suitable burrows in accordance with Condition of Approval 8.5, the Designated Biologist(s) shall inspect all identified burrows in areas to be graded or excavated for presence of Covered Species. If Covered Species are observed, they shall be relocated as described in Condition of Approval 8.15.

8.7. Dry Weather and Dry Season Restriction. Permittee shall ensure that Covered Activities involving ground disturbance and heavy equipment use (such as excavation, grading, and contouring) are limited to the period from April 15 to October 15 of each year (Dry Season) until the expiration of this ITP. Should work need to occur outside of this period, Permittee will request authorization from CDFW at least 10 days prior to the date of the proposed extension, for intervals of up to one (1) week. Work will only be conducted in accordance with CDFW approval and shall be subject to weather conditions. Covered Activities that do not require ground disturbance (i.e., inspections, welding, etc.) are not subject to this condition.

The Permittee shall monitor the National Weather Service (NWS) 72-hr forecast for the Project Area. If a 30% or more chance of rain is predicted within 72 hours during Covered Activities, Permittee shall cease all Covered Activities until no further rain is forecast. Ground disturbing activities may resume 48 hours after the rain ceases when there is a less than a 40% chance of precipitation in the 24-hour forecast.

The Designated Biologist(s) shall keep records of both rainfall and humidity on-site and subject to inspection (see Condition of Approval 7.4).

8.8. Time of Day Work Restriction. Permittee shall terminate all major construction activities 30 minutes before sunset and shall not resume them until 30 minutes after sunrise. Permittee shall use sunrise and sunset times established by the U.S. Naval Observatory Astronomical Applications Department. If an activity has been started that cannot be finished during daylight hours, Permittee may conduct nighttime work for up to a total of seven nights at each individual grassland or riparian Work Area while this ITP is valid and will notify CDFW prior to each night of work. Permittee shall limit nighttime work in extent, duration, and brightness to the maximum extent possible. Permittee shall face lighting downward and will only use lighting in the immediate workspace. The Designated Biologist(s) will continue to be present during all night work. Permittee shall not conduct any nighttime work if a 40% or more chance of rain is predicted within 72 hours (see Condition of Approval 8.7).

8.9. Structure Inspection. Permittee shall ensure that all construction pipes, culverts, or similar structures that are stored in the Project Area for one or more overnight periods are either securely capped prior to storage or thoroughly inspected by the Designated Biologist(s) before the pipe is buried, capped, or otherwise used or moved in any way. If

BIOLOGICAL CONSTRAINTS REPORT

a Covered Species is discovered, it shall be relocated according to the Covered Species Relocation Plan, Condition of Approval 8.15.

8.10. Open Construction Excavation, Trenches, and Inspection. To prevent the accidental entrapment of Covered Species, Permittee shall cover all excavated holes or trenches deeper than 6 inches with plywood or similar material with no cracks or open spaces, at the end of each workday. Edges of plywood shall be sealed with dirt and plywood shall be weighted down to prevent it from moving. At the end of each workday, Permittee shall ramp trenches or large excavations that cannot easily be covered to allow trapped animals an escape method.

The ramp may be constructed of either dirt fill or wood planking or other suitable material placed at an angle no greater than 30 degrees. The Designated Biologist(s) shall inspect holes, trenches, and ramps each morning that Covered Activities occur, or otherwise at intervals of no less than 24 hours. The Designated Biologist(s) will thoroughly inspect such holes or trenches for trapped Covered Species. If a Covered Species is discovered, it shall be relocated according to the Covered Species Relocation Plan, Condition of Approval 8.15. Protection of Covered Species within excavations made by biologists around burrows shall be in accordance with the burrow excavation protocol in Measure 8.6.

8.11. Vehicle and Equipment Inspections. The Permittee shall inspect all equipment and vehicles at the beginning of every workday, prior to commencement of work activities. Prior to movement, the Permittee shall inspect areas beneath all vehicles and equipment that have remained stationary for ten minutes or longer. If a Covered Species is discovered, Permittee shall not move equipment until the animal has left voluntarily or is removed by the Designated Biologist(s) according to the Covered Species Relocation Plan, Condition of Approval 8.15.

8.12. Spoils Piles. Permittee shall place spoils piles away from concentrations of small mammal burrows. Permittee shall place all spoils piles within demarcated Work Areas identified in Figures 2-1 through 2-13.

8.0 CONCLUSIONS

The results of this analysis indicate that 16 special-status wildlife species have medium to high potential to occur in the R-893 and D-914 Study Area, including: Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool fairy shrimp, California tiger salamander, California red-legged frog, western spadefoot, California glossy snake, Western pond turtle, San Joaquin coachwhip, coast horned lizard, tricolored blackbird, short-eared owl, Western burrowing owl, northern harrier, American badger, and San Joaquin kit fox.

Potential impacts to these species can be reduced by implementing the avoidance and minimization measures described under Section 7 of this report.

Special status wildlife that were identified as having the highest potential to occur in the R-893 and D-915 Study Areas were California tiger salamander and California red-legged frog. The likelihood of encountering California red-legged frog 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 overland migrating California tiger salamander, although individuals may be encountered in subterranean burrows or soil crevices at any time during the year. Avoidance and minimization measures for California tiger salamander and California red-legged frog along with other general avoidance measures will also reduce the likelihood of impacts to other special-status species.

BIOLOGICAL CONSTRAINTS REPORT

8.13. Prohibited Plant Species. Permittee shall not plant, seed or otherwise introduce invasive exotic plant species. Prohibited exotic plant species include those identified in the California Exotic Pest Plant Council's database, which is accessible at: <http://www.cal-ipc.org/paf/>

8.14. Notification of Non-Native Tiger Salamanders or Hybrids. The Designated Biologist(s) shall immediately notify CDFW if a barred tiger salamander (*Ambystoma tigrinum mavortium*) or an *Ambystoma* hybrid or individual with unusual or unique characteristics of coloration or size is found within the Project Area within 24 hours of discovery. In consultation with the Permittee, CDFW shall determine what additional measures are necessary to address local non-native or *Ambystoma* hybrid populations.

8.15. Covered Species Relocation. Permittee shall submit a Covered Species Relocation Plan to CDFW for its approval prior to the start of Covered Activities. The Relocation Plan will include relocation site selection criteria and may be combined with an Excavation Protocol document. When Covered Species are observed, the Designated Biologist(s) shall relocate any individuals found to an active rodent burrow system located no more than 300 feet outside of the Project Area, or the nearest suitable burrow beyond that distance. The Covered Species shall be released as soon as possible. A suitable burrow should be at least 3 inches in depth and have moist and cool conditions. If burrow density allows, the Designated Biologist(s) shall only release one animal per burrow. Covered Species may be encouraged to enter the burrows by gently nudging if they do not enter on their own. If the animal repeatedly walks away from the burrow, or partially enters it and then turns around, the Designated Biologist(s) shall remove it and find another burrow.

The Designated Biologist(s) shall document occurrence and relocation sites by photographs and GPS positions. When handled, the Designated Biologist(s) will photograph and measure (snout-vent) the Covered Species for identification purposes prior to relocation. The Designated Biologist(s) shall monitor the Covered Species until it is determined that it is not imperiled by predators or other dangers. The Designated Biologist(s) shall release individual Covered Species one at a time rather than as a group. Permittee shall provide all documentation to CDFW within 48 hours of Covered Species relocation.

8.16. Covered Species Handling and Injury. The Designated Biologist(s) shall capture, handle, and assess Covered Species according to the Restraint and Handling of Live Amphibians Protocol, USGS, National Wildlife Health Center (D. Earl Greene, ARMI SOP NO. 100; 16 February 2001; Attachment 2).

The Designated Biologist(s) shall place captured Covered Species individually into a dark, clean plastic container of suitable size with enough room, so the animal can move freely. The Designated Biologist(s) shall ensure that hands are thoroughly washed and free of lotions, oils, repellents, or solvents prior to handling Covered Species, and shall keep the container moist with damp paper towels, soft foam rubber, or natural or synthetic sponge free of soaps and antibacterial/antifungal treatments. Containers used for holding or transporting shall not contain any standing water. The lids of the containers shall have small air holes for ventilation. Sponges shall not be reused, and all other housing materials shall be disinfected between occupants according to the Fieldwork Code of Practice (Attachment 3).

If an injured Covered Species is found during the Project term, the individual shall be evaluated by the Designated Biologist(s). Permittee shall contact the CDFW Regional Representative immediately, via email and telephone, to discuss the next steps. If the CDFW Regional Representative cannot be contacted immediately, the Designated Biologist(s) shall place the injured Covered Species in a shaded container and keep it moist. If the CDFW Regional

BIOLOGICAL CONSTRAINTS REPORT

Representative is not available or has not responded within two hours of initial attempts, then the following steps shall be taken:

- a. If the Designated Biologist(s) determines the injury is minor or healing and the Covered Species is likely to survive, the Covered Species shall be released immediately in accordance with the Condition of Approval 8.16.
- b. If the Designated Biologist(s) determines that the Covered Species has major or serious injuries as result of Project-related activities, it shall be transported immediately to the Lindsay Wildlife Museum or another CDFW approved facility. If taken into captivity, the individual shall remain in captivity and shall not be released into the wild unless it has been kept in quarantine and the release is authorized by CDFW and USFWS. Permittee shall bear any costs associated with the care or treatment of such injured Covered Species. Permittee shall document the circumstances of the injury, the procedure followed, and the final disposition of the injured animal in a written incident report as described in Condition of Approval 7.8.

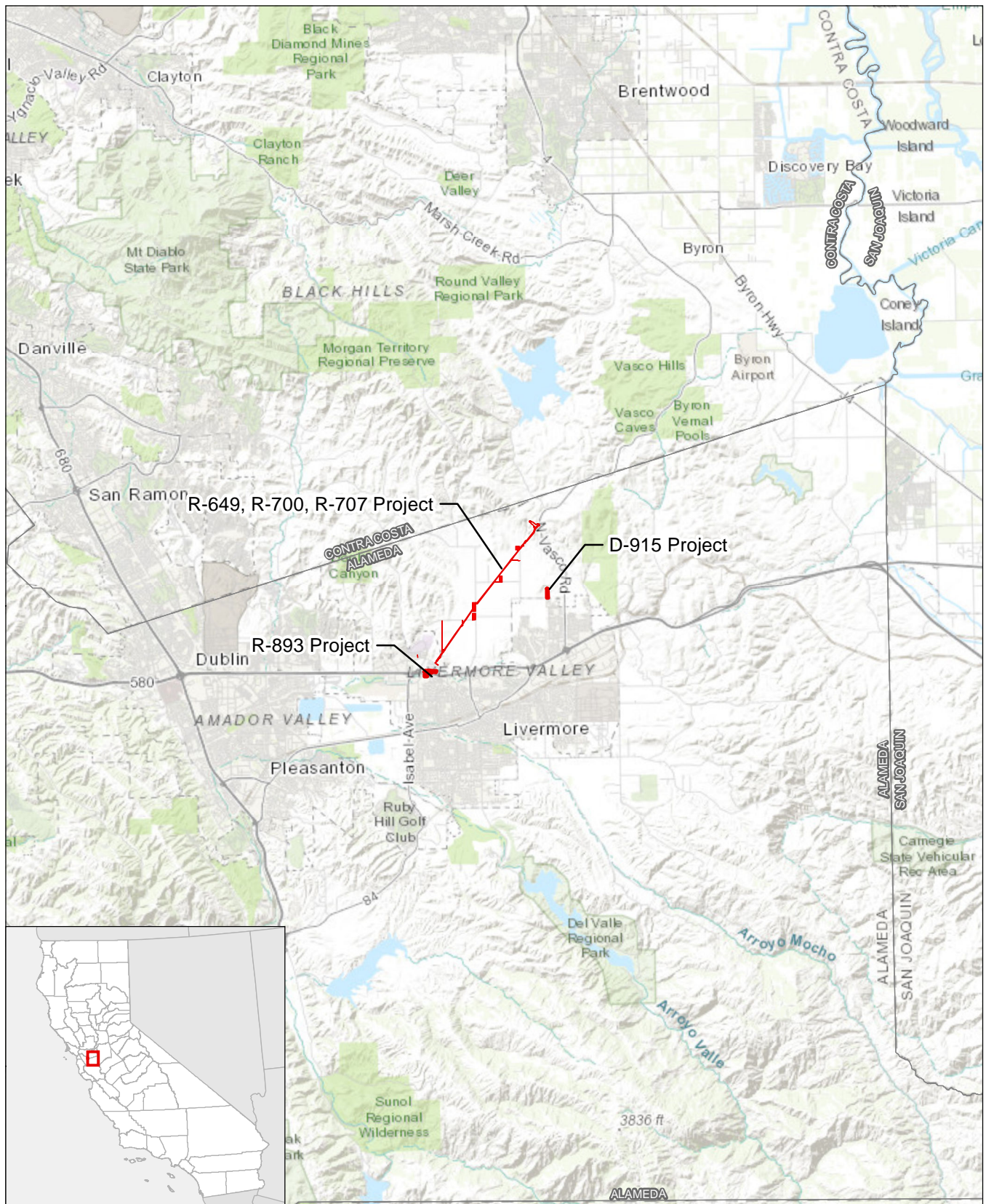
9.0 REFERENCES

- Beedy, E. C. and W. J. Hamilton, III. 1999. Tricolored Blackbird (*Agelaius tricolor*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/423doi:10.2173/bna.423>
- Bulger, John B., Norman J. Scott, and Richard B. Seymour. "Terrestrial activity and conservation of adult California red-legged frogs *Rana aurora draytonii* in coastal forests and grasslands." Biological conservation 110.1 (2003): 85-95.
- CBOC (California Burrowing Owl Consortium). 1993. Burrowing Owl Survey Protocol and Mitigation Guidelines. April 1993.
- California Department of Fish and Wildlife (CDFW)
- 2019a. California Natural Diversity Database (BIOS, version 5.74.07). Electronic database. Sacramento, CA.
- 2019b. California Natural Diversity Database (RareFind 5, version 5.74.07). Electronic database. Sacramento, CA.
- 2019c. Special Animals. California Natural Diversity Database. January.
- 2019d. Natural Landscape Blocks. California Essential Habitat Connectivity. (BIOS, version 5.74.07). Electronic database. Sacramento, CA.
2019. Essential Connectivity Areas. California Essential Habitat Connectivity. (BIOS, version 5.74.07). Electronic database. Sacramento, CA.
- California Native Plant Society (CNPS), Rare Plant Program. 2019. Inventory of Rare and Endangered Plants (online edition, v8-03 0.39). California Native Plant Society, Sacramento, CA. Website <http://www.rareplants.cnps.org> [accessed March].

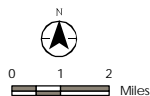
BIOLOGICAL CONSTRAINTS REPORT


- Holland, D. C., and R. B. Bury. 1998. *Clemmys marmorata* (Baird and Girard 1852) Western Pond Turtle. In P.C.H. Pritchard and A. G. J. Rhodin (eds.) The Conservation Biology of Freshwater Turtles. Chelonian Research Monographs 2(2).
- Holland, D. C. 1985. An ecological and quantitative study of the western pond turtle (*Clemmys marmorata*) in San Luis Obispo County, California. M.S. Thesis, Calif. State Univ., Fresno.
- Jennings, M.R. and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. California Department of Fish and Game, Sacramento, CA.
- Klute, David S.; Ayers, Loren W.; Green, Michael T.; Howe, William H.; Jones, Stephanie L.; Shaffer, Jill A.; Sheffield, Steven R.; and Zimmerman, Tara S., "Status Assessment and Conservation Plan for the Western Burrowing Owl in the United States" (2003). US Fish & Wildlife Publications. 483.
<http://digitalcommons.unl.edu/usfwspubs/483>
- National Oceanic and Atmospheric Administration (NOAA). 1994. Endangered and Threatened Wildlife and Plants; Critical Habitat Determination for the Delta Smelt. Federal Register, I Vol. 59, No. 242, 50 CFR Part 17.
- Nomad Ecology. 2019. Botanical Resource Survey Report, North Livermore R893 Gas Line 131 Replacement Project, Alameda County , California. October 2018.
- Pacific Gas and Electric. 2016. Nesting Bird Management Plan: Biologist Guidelines for PG&E Utility Operations, Maintenance, and Projects. February. Page 5-33.
- United States Department of Agriculture (USDA). 2017. Soil Survey Staff, Natural Resources Conservation Service. Web Soil Survey. Electronic database: <https://websoilsurvey.sc.egov.usda.gov/>. Accessed [11/01/2017].
- United States Fish and Wildlife Service (USFWS).
2019. USFWS Sacramento Fish and Wildlife Office, Endangered Species Program. Endangered and Threatened Species List website. www.fws.gov/endangered/ January.
2003. Endangered and Threatened wildlife and plants; determination of endangered status for the Sonoma County Distinct Population Segment of the California tiger salamander; Final rule. Federal Register 68 (53):13497-13520. March 19, 2003.
- Zone 7 Water Agency. 2006. Zone 7 Stream Management Master Plan. Prepared by RMC Water and Environment. August.

Appendix A Figures



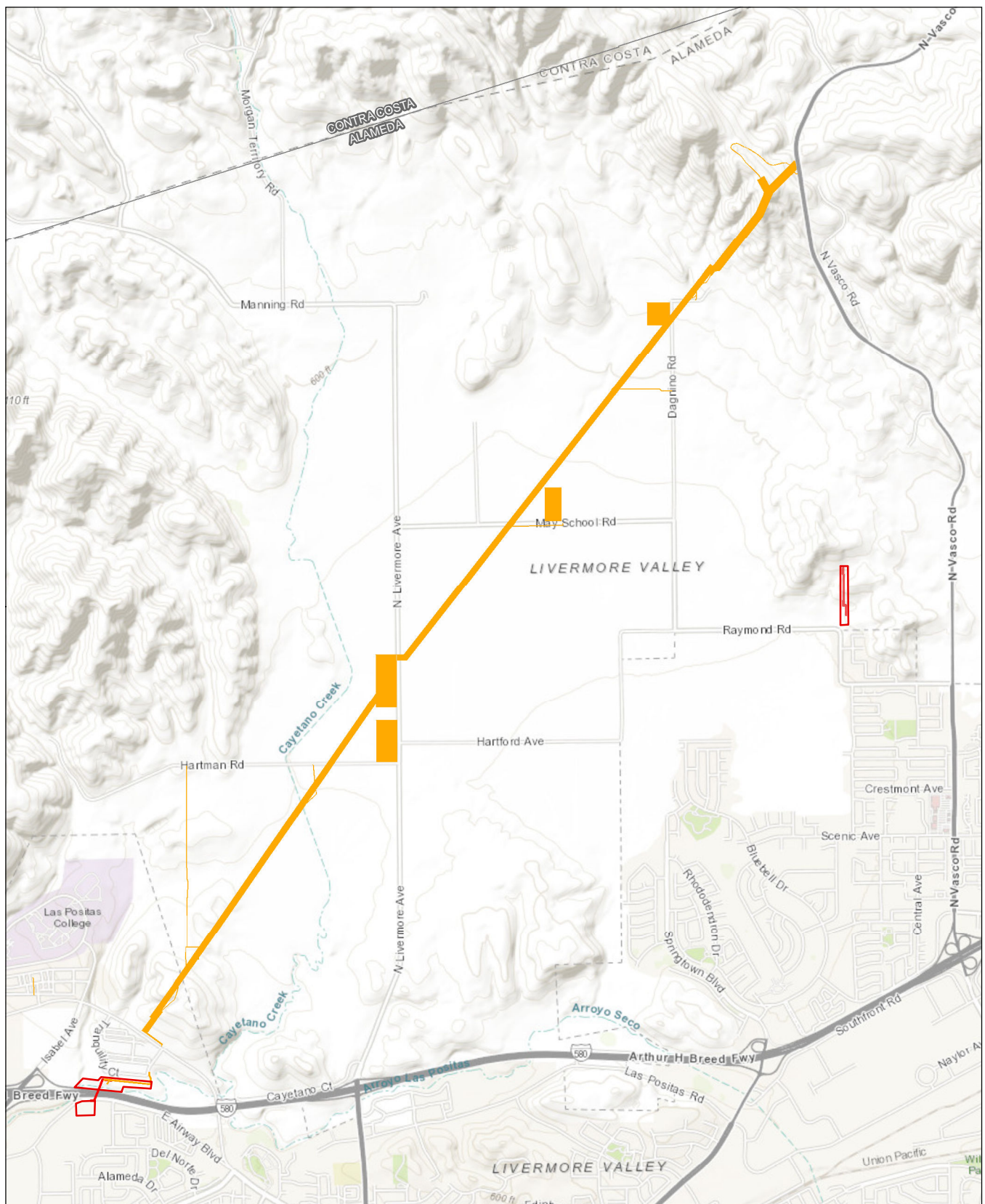
Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.



 Amended Project Area

Pacific Gas and Electric
L-131 Combined Pipeline Replacement
and D-915 Dig Project
(Order No. 74008389)
Alameda County, California

Figure 1. Project Vicinity



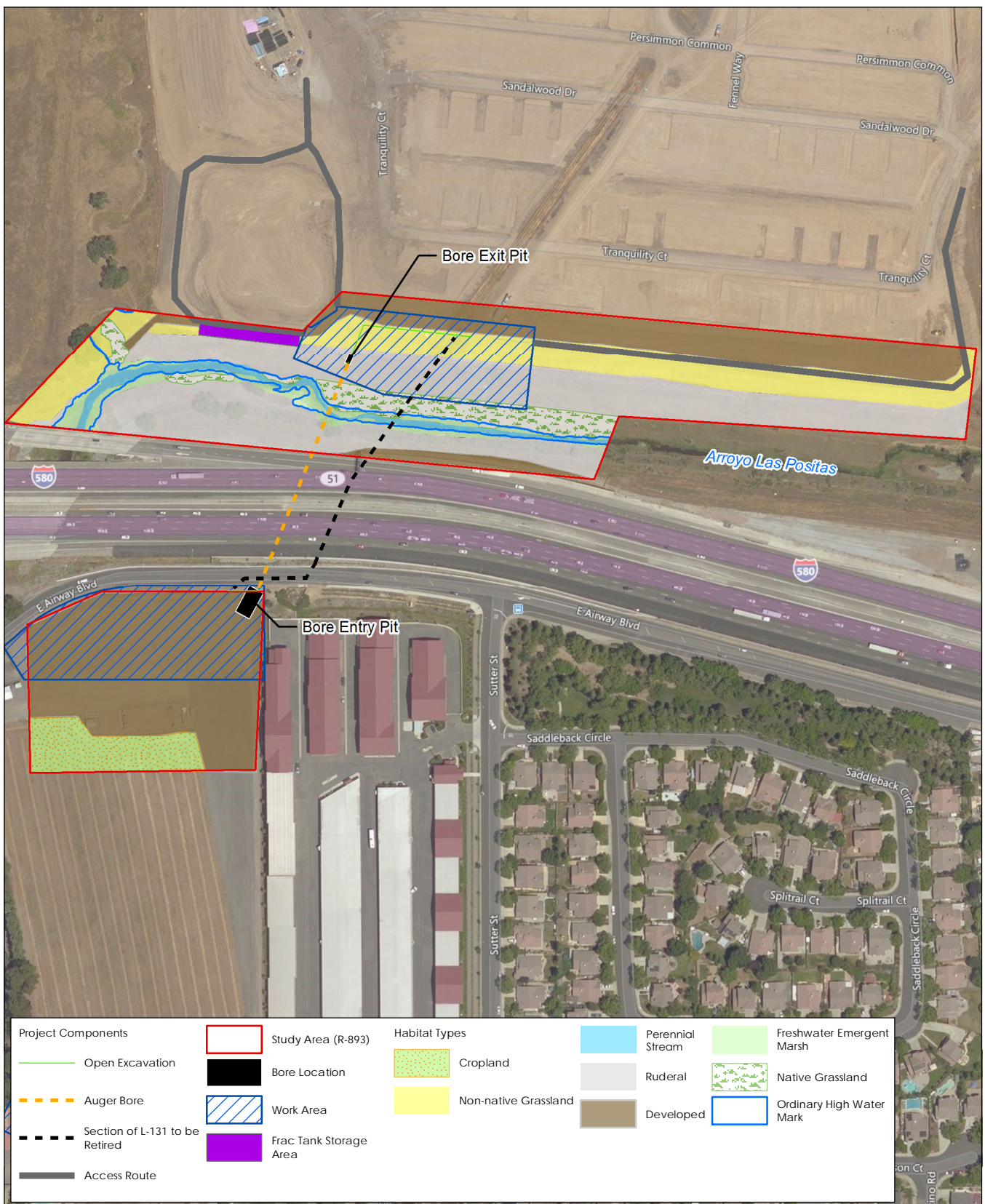
Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.



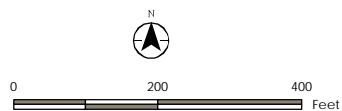
- R-893 and D-915 Project Area
- Original Project Area

Pacific Gas and Electric
L-131 Combined Pipeline Replacement
and D-915 Dig Project
(Order No. 74008389)
Alameda County, California

Figure 2. Project Location

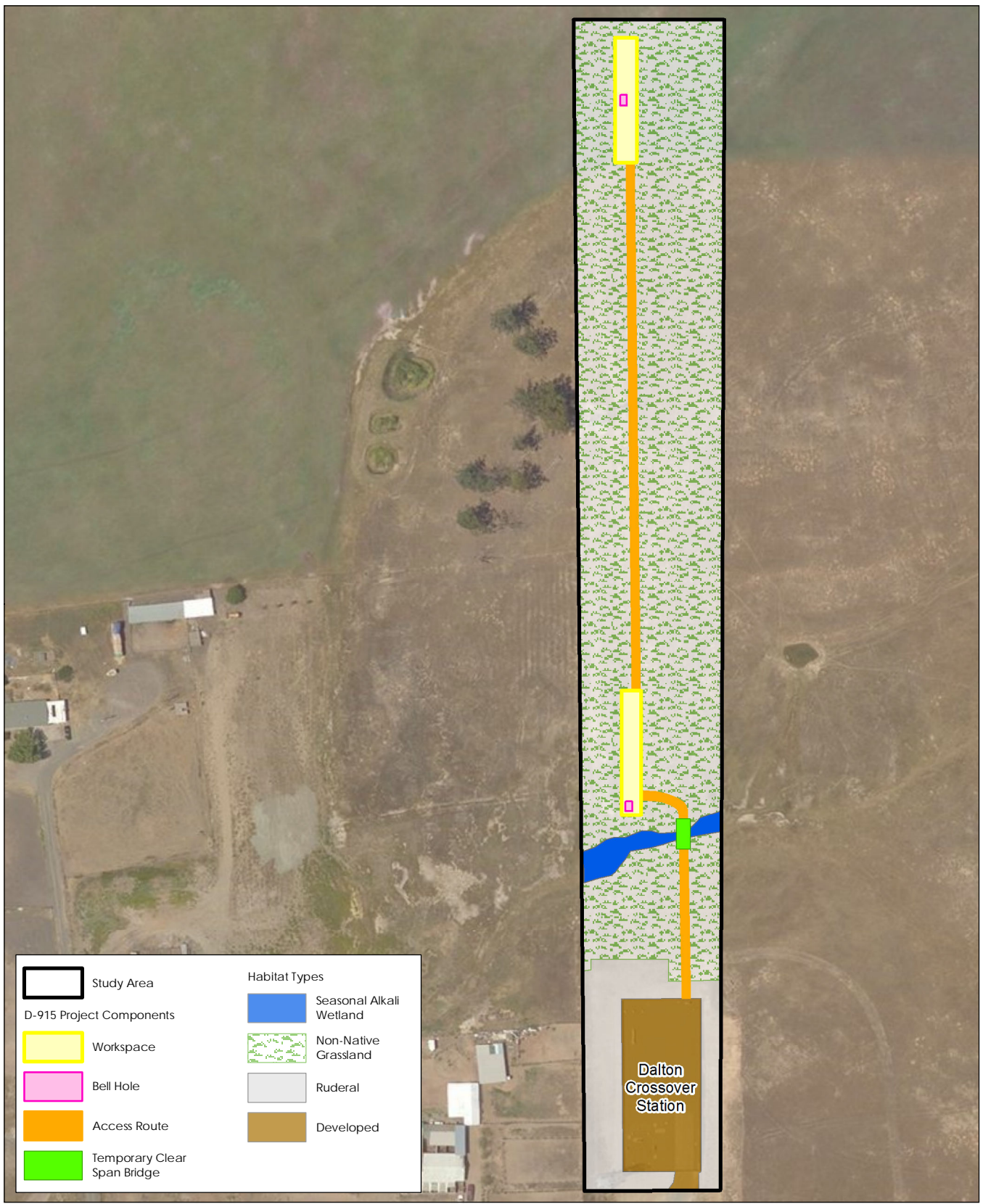


Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

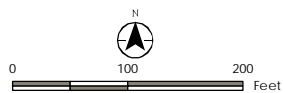


Pacific Gas and Electric
 L-131 Combined Pipeline Replacement
 and D-915 Dig Project
 (Order No. 74008389)
 Alameda County, California

Figure 3a. R-893 Project Habitat Map

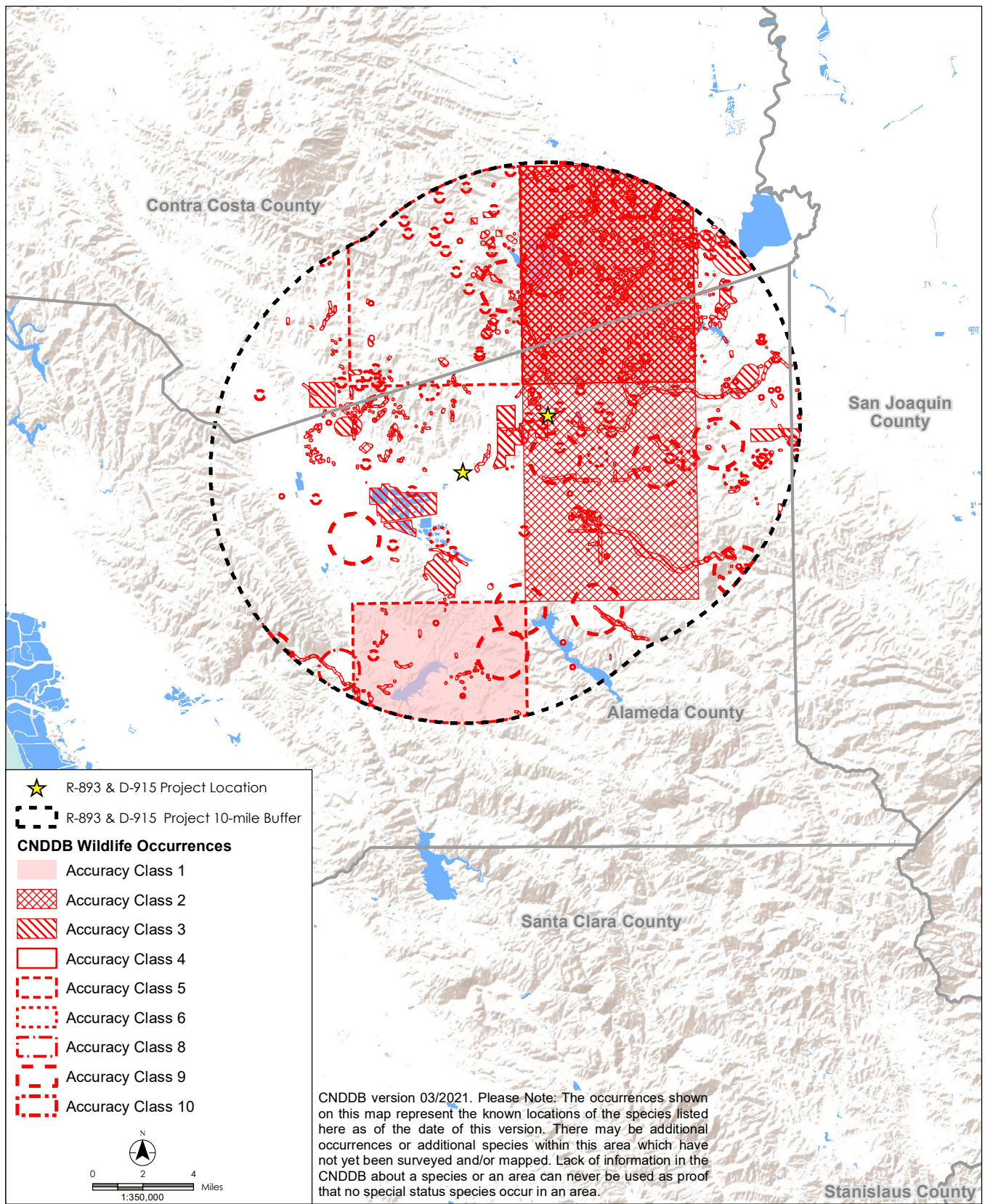


Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.



Pacific Gas and Electric
L-131 Combined Pipeline Replacement
and D-915 Dig Project
(Order No. 74008389)
Alameda County, California

Figure 3b. D-915 Project Habitat Map



Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Pacific Gas and Electric Company
L-131 Combined Pipeline Replacement
and D-915 Dig Project
(Order No. 74008389)
Alameda County, California

Figure 4: CNDDB Wildlife Occurrences within 10 Miles of the Project Site



Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Pacific Gas and Electric
**L-131 Combined Pipeline Replacement
 and L-114 Dig Sites Project**
 (Order No. 74008389)
 Alameda County, California

Figure 4. R-893 Mapped Burrow Locations

Appendix D.3

R893 Rare Plant Survey Report

BOTANICAL RESOURCE SURVEY REPORT

NORTH LIVERMORE
R893 GAS LINE 131 REPLACEMENT PROJECT
ALAMEDA COUNTY, CALIFORNIA



OCTOBER 2018

Prepared for



**Pacific Gas and
Electric Company®**

Environmental Services
Technical and Project Support
3401 Crow Canyon Road
San Ramon, California 94583



822 MAIN STREET
MARTINEZ, CA 94553
(925) 228-1027

TABLE OF CONTENTS

Section 1.	Introduction	4
1.1.	Purpose of the Report	4
1.2.	Project Description	7
Section 2.	Study Methods	8
2.1.	Definitions	8
2.2.	Data Resources	9
2.3.	Identification of Target Species	10
2.4.	Regulatory Framework	10
2.5.	Personnel and Field Investigation	12
2.6.	Resource Documentation and Mapping	13
2.7.	Reference Sites and Herbarium Specimens	14
2.8.	Limitations	15
Section 3.	Environmental Setting	17
3.1.	Setting	17
3.2.	Vegetation Communities	19
Section 4.	Results	28
4.1.	Sensitive Natural Communities	28
4.2.	Special-Status Plants	29
4.3.	Noxious/Invasive Weeds	31
Section 5.	Summary	33
5.1.	Summary	33
Section 6.	References	34

LIST OF TABLES

Table 1.	Focal Plant Species of the EACCS	12
Table 2.	2018 Survey Effort Details for Target Plant Species	13
Table 3.	Reference Population Observation Details	14
Table 4.	Herbaria Specimen Collection Dates and Correspondence of Survey Timing	15
Table 5.	Soil Mapping Units in the Study Area	18
Table 6.	Land Cover Types in the Study Area	21
Table 7.	Vegetation Community Classification Systems Comparison	21
Table 8.	Sensitive Natural Communities in the Study Area	29
Table 9.	Ranking Criteria for Rare, Unusual, and Significant Plants of the East Bay	30
Table 10.	Locally Rare, Unusual, and Significant Plants Observed within the Study Area	31
Table 11.	Noxious/Invasive Plants Observed in the Study Area	32
Table 12.	Summary of Sensitive Communities and Special-Status Plants within the Study Area	33

LIST OF FIGURES

Figure 1. Location of the Study Area	5
Figure 2. Aerial Photograph of the Study Area	6
Figure 3. Vegetation Communities in the Study Area	20

LIST OF APPENDICES

APPENDIX A	Laws, Ordinances & Regulations	36
APPENDIX B	Special-Status Plant Species Known to Occur or Potentially Occurring in the Study Area	39
APPENDIX C	Plant Species Observed On Site	52

Section 1. INTRODUCTION

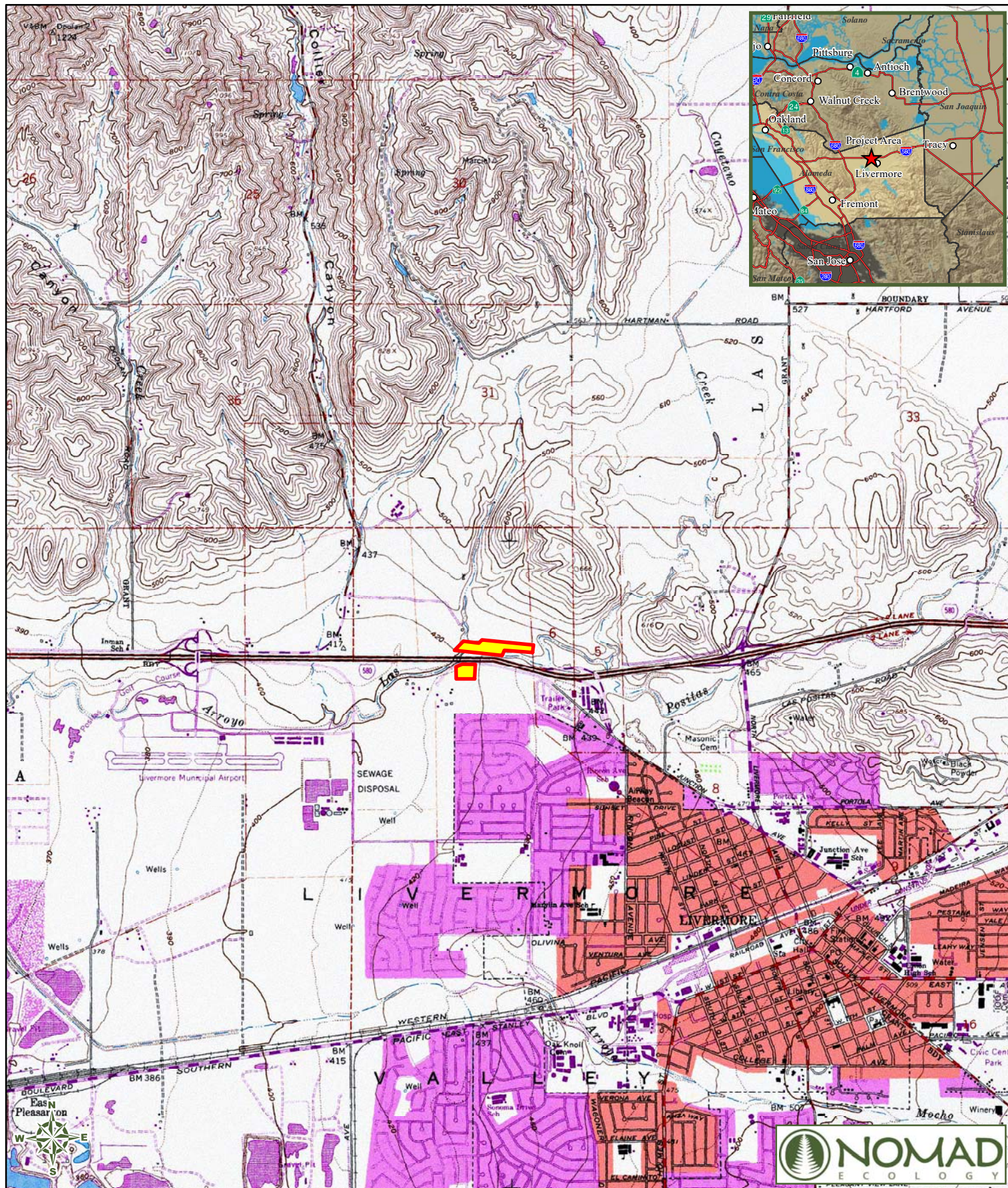
At the request of Pacific Gas & Electric Company (PG&E), Nomad Ecology, LLC (Nomad) conducted protocol-level botanical surveys for PG&E's R893 Gas Line 131 Replacement Project (Project) which is located in Livermore Valley, Alameda County, California. The study area is represented by two distinct areas within the City of Livermore in, one north of Interstate 580 (I-580) and the other south of I-580 (Figure 1 and 2). Together these two study areas total 12.9-acres. The portion of the study area north of I-580 stretches approximately 0.3 miles, oriented east to west, and is adjacent to Arroyo Las Positas Creek. The portion of the study area south of I-580 is a relatively small area that is developed. The study area lies within the Central Valley Coast Ranges ecoregion (USDA 1997). It is also located within the San Joaquin Valley subregion of the California Floristic Province (Baldwin et al. 2012) and is inside the boundaries of the East Alameda County Conservation Strategy (ICF International 2010).

1.1. PURPOSE OF THE REPORT

The purpose of this Botanical Resource Survey Report is to present the results of protocol-level botanical surveys that targeted eight special-status plant species. Protocol-level botanical surveys were conducted by a Nomad Ecology botanist in March, April, May, and July of 2018. Additionally, these surveys were intended to inform impact assessment for California Environmental Quality Act (CEQA) and regulatory permitting.

This document provides: (1) a description of study methodologies; (2) a discussion of the regulatory context; (3) an assessment of the existing conditions and natural communities; (4) the results of protocol-level and floristic surveys for special-status botanical resources including the numbers, size, and condition of all listed species occurrences observed; potential threats and impacts to these occurrences; and photographs of special-status plant occurrences encountered; (5) a brief discussion of threats posed by non-native plant species; (6) recommendations for impact avoidance, minimization, and/or mitigation, as necessary; (7) a comprehensive list of all vascular plants observed; and (8) maps that identify the locations of sensitive natural communities and special-status plant species found on site.

Based on the results of these studies, further botanical surveys are not considered necessary within the study area presented in this report. If any additional project features are identified outside of the current study area, these areas should be evaluated to determine if they contain suitable habitat for special-status plant species. Additional surveys may be required to adequately address all potential impacts in these areas.



October 2018

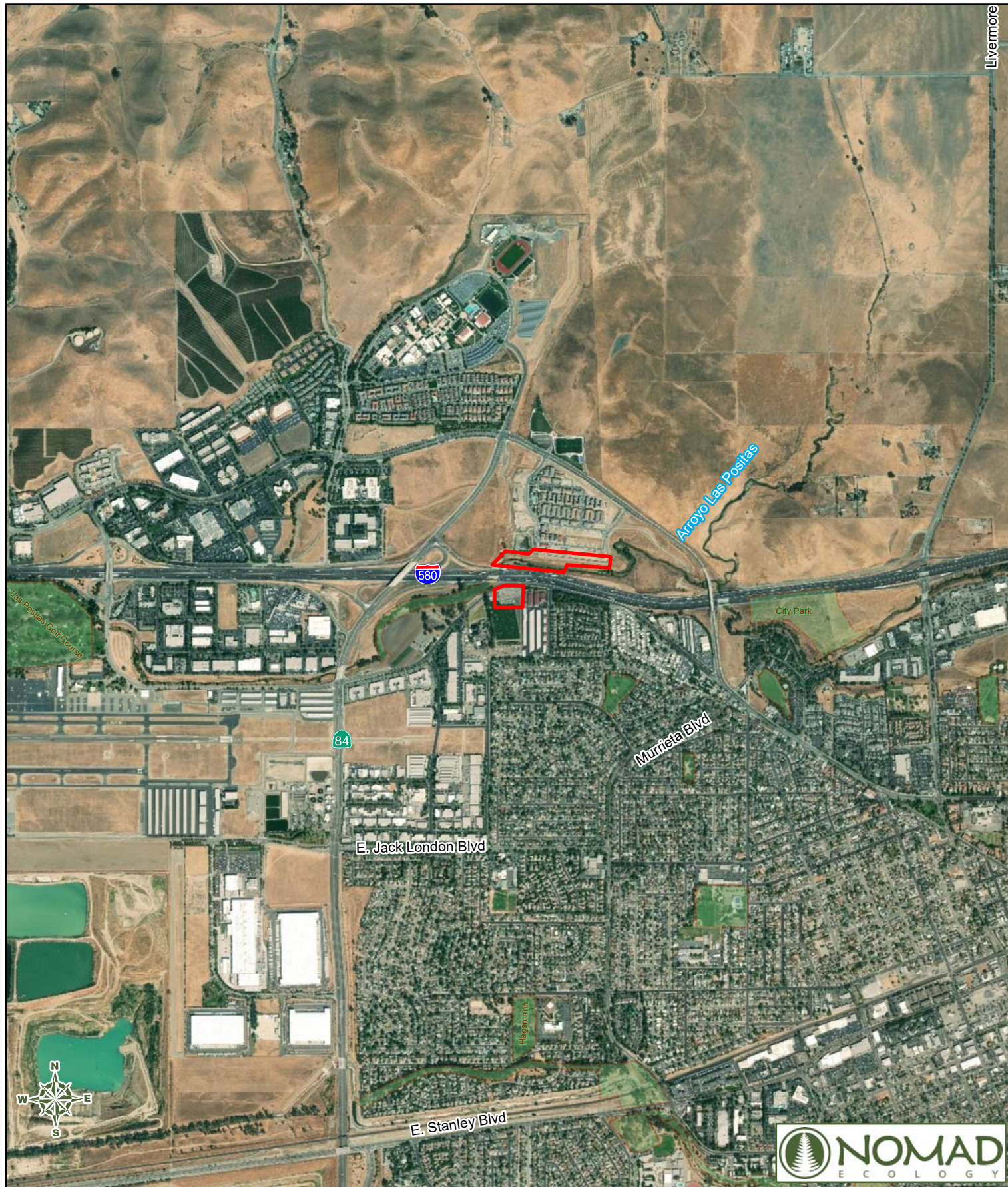
Botanical Resources Survey Report

Legend

Study Area

Figure 1
Location of Study Area
 Gas Line 131 R893 Replacement Project
 Pacific Gas & Electric

1:36,000
 0 1,500 3,000
 Feet



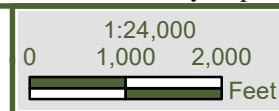
October 2018

Botanical Resources Survey Report

Legend

Study Area

Figure 2
Aerial Photo of the Study Area
 Gas Line 131 R893 Replacement Project
 Pacific Gas & Electric



1.2. PROJECT DESCRIPTION

The R893 Project includes replacement of an approximately 825 foot section of L131 that is not adequately protected by the existing pipeline. Pipeline upgrades would consist of installing a new pipeline approximately 80 to 150 feet west and parallel to the existing pipeline and retiring the existing pipeline along the replacement segment. New pipe would be 24 inches in diameter and located along approximately the same alignment as the existing pipeline between Mile Posts 32.29–32.39. The existing pipeline would be retired and sealed following PG&E's standard procedures and remain buried. New pipeline markers would be installed along the new alignment.

Above ground work on the R893 Project is located in two areas, north of I-580, adjacent to Shea Homes Sage and south of I-580 adjacent to Airport Boulevard. The northern end of the new pipe would tie into the R649 segment of the Original Project. The new pipe would be buried approximately five (5) to ten (10) feet below ground surface (bgs). From the south side of I-580 an auger bore would be used to install the pipe under the freeway. The pipe will be approximately twenty-four (24) feet bgs under the freeway. The new pipe would be installed and tied-into the gas system after venting gas from the existing pipeline. Retirement of the existing pipeline would occur after the new pipeline is tied into the gas system.

Construction is planned to occur in 2020 in the dry season (typically April 15-October 15) over a 3-month period.

Section 2. STUDY METHODS

2.1. DEFINITIONS

The following terms were used to evaluate the sensitivity of on-site biological resources and potential impacts of the proposed project. Terms and definitions are derived from the CEQA Guidelines and regulatory agencies, where applicable (Appendix A).

Study Area	The two study areas total approximately 12.9 acres with the section north of I-580 including 9.5 acres and the section south of I-580 including 3.4 acres.
Project Footprint	The area on which the project physically stands. For the purposes of this report, the project footprint is as described above in Section 1.2 and in PG&E's project description.
Direct Impact	Impacts (or primary effects) which are caused by the project and occur at the same time and place [CEQA Guidelines, Title 14 CCR, Section 15358(a)(1)].
Indirect Impact	Impacts (or secondary effects) which are caused by the project and are later in time or farther removed in distance but are still reasonably foreseeable. These may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems [CEQA Guidelines, Title 14 CCR, Section 15358(a)(2)].
Cumulative Impact	Two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time [CEQA Guidelines, Title 14 CCR, Section 15355].
Critical Habitat	Defined by the Endangered Species Act (ESA), as amended (Code of Federal Regulations, Title 50, Section 17), as "a specific geographic area(s) that is essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery." Critical habitat designations are published in the Federal Register. The final boundaries of the critical habitat area are also published in the Federal Register for federally listed species by U.S. Fish and Wildlife Service and National Marine Fisheries Service.

2.2. DATA RESOURCES

Background information for listed and special-status plant and wildlife species, and sensitive natural communities was compiled through a review of the following resources:

U.S. Fish and Wildlife Service (USFWS):

- Endangered and Threatened Wildlife and Plants (USFWS 1999, 2014)
- Federal Endangered and Threatened Species that Occur in or May Be Affected by Projects in Alameda County (USFWS 2018)

California Department of Fish and Wildlife (CDFW):

- California Natural Communities List (CDFW 2018a)
- State and Federally Listed Endangered, Threatened, and Rare Plants of California (CDFW 2018b)
- Special Vascular Plants, Bryophytes, Lichens List (CDFW 2018c)
- California Natural Diversity Database (CNDDDB) Query for the Altamont, Byron Hot Springs, Diablo, Dublin, La Costa Valley, Livermore, Mendenhall Springs, Niles, and Tassajara USGS 7 ½ Minute Quadrangles (CDFW 2018d)

Other Sources:

- The Jepson Manual, 2nd Edition (Baldwin et al. 2012)
- The California Native Plant Society's Inventory of Rare and Endangered Plants of California (CNPS 2018)
- A Manual of California Vegetation (Sawyer et al. 2009)
- Consortium of California Herbaria (CCH 2018)
- East Alameda County Conservation Strategy (ICF International 2010)
- Annotated Checklist of the East Bay Flora (CNPS 2013)
- Unusual and Significant Plants of Alameda and Contra Costa Counties. Eighth Edition (Lake 2010)
- North Livermore Resource Conservation Study (Nomad 2009)
- Alameda Area Soil Survey, California (USDA 1966)

Botanical taxonomy and nomenclature conforms to *The Jepson Manual, 2nd Edition* (Baldwin et al. 2012) and recent circumscriptions in the Jepson eFlora (Jepson Flora Project 2018). Common names of plant species are derived from The Calflora Database (Calflora 2018). Nomenclature for special-status plant species conforms to the *Inventory of Rare and Endangered Plants of California* (CNPS 2018) and *Special Vascular Plants, Bryophytes and Lichens List* (CDFW 2018c).

Vegetation communities described herein conform to *California Vegetation* (Holland and Keil 1995), the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986), and/or *A Manual of California Vegetation* (Sawyer et al. 2009) and are crosswalked to other commonly used vegetation classifications such as those used in the EACCS (ICF International 2010). Wetland and deepwater habitat classifications conform to *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979), where appropriate.

2.3. IDENTIFICATION OF TARGET SPECIES

The identification of target species for this protocol-level survey effort is based on a background review of available databases and literature (USFWS 1999, 2014, 2018; CDFW 2018b,c,d; CNPS 2018; CCH 2018; Baldwin et al. 2012) and familiarity with the regional flora. This background review resulted in the determination that eight special-status plant species, out of 67 known from the region, had the potential to occur within the study area based on the presence of suitable habitat. None of these are considered focal plant species of the EACCs. All eight species are given conservation status by the California Native Plant Society (CNPS 2018) and are included as target species for the purpose of CEQA review, if necessary.

2.4. REGULATORY FRAMEWORK

Sensitive Natural Communities

Sensitive natural communities are characterized as plant assemblages that are unique in constituent components, restricted in distribution, supported by distinctive edaphic conditions, considered locally rare, potentially support special-status plant or wildlife species and/or receive regulatory protection from municipal, county, state and/or federal entities. The regulatory framework that protects sensitive natural communities is derived from local, state and federal laws and regulations including Section 10 of the federal Rivers and Harbors Act, Sections 401 and 404 of the federal Clean Water Act, Section 1600 et seq. of the California Fish and Game Code, Section 15065 of the CEQA guidelines, and various other city or county codes. Implementation and enforcement of these regulations are conducted by their respective regulatory entities such as the U.S. Army Corps of Engineers, California Regional Water Quality Control Board, CDFW, lead agency and/or various cities or counties. The CNDDDB treats a number of natural communities as rare, which are given the highest inventory priority (Holland 1986; CDFW 2018a).

Special-Status Species

Special-status plant species are defined as those species listed as endangered or threatened, are proposed or candidates for listing under one or more of the following regulatory statutes: ESA, as amended (Code of Federal Regulations, Title 50, Section 17); California Endangered Species Act (CESA) (California Code of Regulations Title 14, Section 670.5); California Fish and Game Code (Sections 1901, 2062, 2067); and the Native Plant Protection Act (NPPA) of 1977. Special-status species may also include locally rare species defined by CEQA guidelines 15125(c) and 15380, which may include species that are designated as sensitive, declining, rare, locally endemic or as having limited or restricted distribution by various federal, state, and local agencies, organizations, and watchlists. Their status is based on their rarity and endangerment throughout all or portions of their range. Such species are referred to as special-status species or “target species” herein.

The California Native Plant Society (CNPS) has developed and maintains an inventory of rare, threatened and endangered plants of California. This information is published in the *Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2001a; 2016). The rarity ranking contained in the CNPS inventory is endorsed by the CDFW and effectively serves as its list of “candidate” plant species. The following identifies the definitions of the CNPS California Rare Plant Ranks:

- Rank 1A: Plants presumed to be extinct in California;
- Rank 1B: Plants that are Rare, Threatened, or Endangered in California and elsewhere;
- Rank 2A: Plants Presumed Extirpated in California, But More Common Elsewhere;
- Rank 2B: Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere;
- Rank 3: Plants about which more information is needed (a review list); and

- Rank 4: Plants of limited distribution (a watch list).

California Rare Plant Rank 1B and 2B species are considered eligible for state listing as Endangered or Threatened pursuant to the California Fish and Game Code. As part of the CEQA process, such species should be fully considered, as they meet the definition of Threatened or Endangered under the NPPA and Sections 2062 and 2067 of the California Fish and Game Code. California Rare Plant Rank 3 and 4 species are considered to be either plants about which more information is needed or are uncommon enough that their status should be regularly monitored. Such plants may be eligible or may become eligible for state listing, and CNPS, and CDFW recommend that these species be evaluated for consideration during the preparation of CEQA documents (CNPS 2018), as some of these species may meet NPPA and CESA criteria as threatened or endangered.

East Alameda County Conservation Strategy (EACCS)

The primary goal of the East Alameda County Conservation Strategy (EACCS) is to “develop a coordinated and biologically sound approach to mitigation that will both support conservation and/or recovery of listed species and streamline state and federal permitting by providing guidance on avoidance, minimization, and mitigation for projects.” The EACCS assesses areas across east Alameda County for their habitat conservation value and establishes guidelines for conducting conservation in this part of the County.

The Conservation Strategy has two purposes. First, it is designed to convey the project-level permitting and environmental compliance requirements of the Endangered Species Act (ESA), California Endangered Species Act (CESA), California Environmental Quality Act (CEQA), and the National Environmental Protection Act (NEPA), as well as other applicable laws, for all projects within the study area with impacts on biological resources. Second, it is intended to create a vision for how biological resources in the study area should be conserved through the project permitting process and through non-regulatory conservation actions. However, the EACCS itself does not provide regulations.

To support the project permitting process, the EACCS identifies a set of mitigation standards, which include avoidance and minimization measures and a compensation program to offset impacts expected from projects in the study area. It also includes a set of specific management prescriptions to benefit natural communities and focal species. The EACCS is designed to contribute to species recovery to help to delist the listed focal species and prevent the listing of non-listed focal species through the protection, restoration, and enhancement of natural communities and species habitat. By focusing on conservation at the natural community level as well as at the focal species level, the EACCS will also ensure that common habitats and common species continue to be common in the strategy area. There are 6 plant species that are included as focal species, listed below in Table 1.

Table 1. Focal Plant Species of the EACCS

<u>FOCAL PLANT SPECIES</u>	
<u>PLANT SPECIES</u>	<u>LISTING STATUS</u>
<i>Blepharizonia plumosa</i> big tarplant	Federal: None CA: None CNPS: 1B.1
<i>Centromadia parryi</i> subsp. <i>congdonii</i> Congdon's tarplant	Federal: None CA: None CNPS: 1B.2
<i>Chloropyron palmatum</i> palmate-bracted bird's beak	Federal: Endangered CA: Endangered CNPS: 1B.1
<i>Deinandra bacigalupii</i> Livermore Valley tarplant	Federal: Endangered CA: None CNPS: 1B.1
<i>Delphinium recurvatum</i> recurved larkspur	Federal: None CA: None CNPS: 1B.2
<i>Extriplex joaquinana</i> San Joaquin spearscale	Federal: None CA: None CNPS ¹ : 1B.2

¹ CNPS: California Native Plant Society Ranking. 1B: Rare or endangered in California and elsewhere.
Threat Rankings: .1: Seriously threatened in California; .2: Fairly threatened in California

Locally Rare Plant Species

Locally rare plants are botanical resources that include, but are not limited to, peripheral populations and disjunct subpopulations. These are informal terms that refer to those species that might be declining or are in need of concentrated conservation actions to prevent decline, but have no legal protection of their own. Locally rare species tracked by the East Bay Chapter of CNPS (Lake 2010). Their status is based on their rarity and endangerment throughout all or portions of their range.

2.5. PERSONNEL AND FIELD INVESTIGATION

The following personnel conducted the field investigations:

Brian Peterson
Botanist and GIS Specialist
Nomad Ecology, LLC
822 Main Street
Martinez, CA 94553
(925) 228-1027

Protocol-level rare plant surveys were conducted by Nomad botanist Brian Peterson (BP). These surveys were conducted during the months of March, April, May, and July. Table 2 details the dates and personnel for these studies. This report was prepared by Mr. Bartosh and Mr. Peterson.

Table 2. 2018 Survey Effort Details for Target Plant Species

SURVEY TIMING			TARGETS	PERSONNEL
Month	Day(s)	Year		
March	23	2018	diamond-petaled poppy stinkbells	BP
April	23	2018	big-scale balsamroot small-flowered morning glory	BP
May	22	2018	big-scale balsamroot adobe navarretia shining navarretia prostrate vernal pool navarretia small-flowered morning glory	BP
July	20	2018	hispid bird's-beak	BP

The purpose of these surveys was to conduct an inventory of vascular plants of the study area to document occurrences of rare, threatened or endangered species and other special-status plants and vegetation communities. All vegetation communities within the study area, which included all proposed impact areas known to date, were visited and evaluated for their potential to support sensitive botanical resources. Surveys for target species were conducted by walking transects up to 10 meters apart depending on the target species, topography, or subject plant community, which covered 100 percent of the study area. Surveys were conducted on foot and on each date. Surveys typically began at the western end of the study area and concluded at the eastern portion of the study area. All plant species in bloom, or otherwise recognizable, were identified to a level necessary (floristic) to determine their regulatory status. During these surveys, an inventory of plant species observed was recorded (Appendix C).

Botanical surveys were conducted in accordance with the California Native Plant Society's *Botanical Survey Guidelines* (CNPS 2001), California Department of Fish and Game's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2018e), and the U.S. Fish and Wildlife Service's *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS 2000).

2.6. RESOURCE DOCUMENTATION AND MAPPING

Field data, including locations of special-status and locally rare plant species occurrences, were collected using a handheld Trimble GeoXT Global Positioning System (GPS), Backcountry Navigator Pro on an Android device, or hand-drawn on paper maps. A data point was collected for each aforementioned feature. These data points were then transferred to a desktop computer Geographic Information System (GIS) platform operating ESRI ArcGIS 10.1 for creating polygons, where necessary, and populating attribute tables.

2.6.1 SPECIAL-STATUS SPECIES OCCURRENCES

Special-status plants, if encountered within the study area, were recorded using California Natural Diversity Database Field Survey Forms. A GPS data point was recorded for each occurrence that included fewer than 10 individuals. For occurrences that were greater than 10 individuals a polygon was created that included the outer extent of the population observed. Digital photographs were also taken. If

applicable, voucher specimens were collected and will be donated to the Jepson Herbarium at the University of California Berkeley.

2.6.2 HERBARIUM VOUCHERS

In addition to the collection of special-status species voucher specimens, other plant species with regional significance were collected during the course of our study. Plant species considered as having regional significance include those not previously known as occurring in Alameda County. A GPS data point was recorded for each of these locations.

2.7. REFERENCE SITES AND HERBARIUM SPECIMENS

To ensure the timing of botanical surveys coincided with the flowering phenology of the target species, reference populations and collection dates of herbaria specimens were examined. Information on known populations of the target species were visited at reference sites with similar characteristics to the study area such as habitat, topography, and climate to determine appropriate survey timing. Table 3 depicts the details of reference population observations and provides an optimal survey timing by which surveys for the subject taxon should be completed by, based on observed phenology. For the remaining taxa, examination of herbaria specimens was performed using the Consortium of California Herbaria Database (CCH 2018).

Table 3. Reference Population Observation Details

SPECIES NAME / COMMON NAME	DATE VISITED	LOCATION	CNDDDB OCCURRENCE (Y/N)	PRESENT (Y/N)	# OF INDIVIDUALS	WINDOW TO CONDUCT SURVEY
CALIFORNIA RARE PLANT RANK SPECIES						
<i>Convolvulus simulans</i> small-flowered morning glory	4/20/18	Horse Valley (East Contra Costa County)	No	Yes	7 individuals over half in flower	1 month

For target species that did not have accessible reference populations or were not visited, an estimation of blooming periods was attained by averaging the collection dates of herbarium specimens by month (CCH 2018). Duplicate collections and specimens with label information lacking a collection month were not included in the averages. The purpose of this analysis is to ensure survey timing corresponds with flowering and reproductive maturation since plant species are typically collected at peak flowering phenology. Herbaria specimen collection dates and corresponding survey timing are presented in Table 4. All of the species appearing in Table 4, which were considered targets for this survey, have peak blooming periods during the months of March, April May, and July match the months during which the botanical survey was conducted for this project.

Table 4. Herbaria Specimen Collection Dates and Correspondence of Survey Timing

SPECIES	HERBARIA SPECIMEN COLLECTIONS AVERAGED BY MONTH											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
CALIFORNIA RARE PLANT RANK SPECIES												
<i>Balsamorhiza macrolepis</i> big-scale balsamroot	3%	0%	6%	36%	42%	9%	3%	0%	0%	0%	0%	0%
<i>Chloropyron molle</i> subsp. <i>hispidum</i> hispid bird's-beak	0%	0%	0%	4%	0%	10%	18%	42%	13%	13%	0%	0%
<i>Eschscholzia rhombipetala</i> diamond-petaled California poppy	7%	36%	36%	21%	0%	0%	0%	0%	0%	0%	0%	0%
<i>Fritillaria agrestis</i> stinkbells	1%	3%	44%	30%	19%	2%	0%	0%	0%	0%	0%	0%
<i>Navarretia nigelliformis</i> subsp. <i>nigelliformis</i> adobe navarretia	0%	0%	0%	23%	70%	7%	0%	0%	0%	0%	0%	0%
<i>Navarretia nigelliformis</i> subsp. <i>radians</i> shining navarretia	0%	0%	3%	16%	63%	18%	0%	0%	0%	0%	0%	0%
<i>Navarretia prostrata</i> prostrate vernal pool navarretia	4%	0%	0%	36%	49%	10%	1	0%	0%	0%	0%	0%

Note: Shaded areas indicate months when botanical surveys were conducted. Bolded numbers denote peak period(s) for survey. Species flowering phenology represented as a percent (%) by month, percentages are rounded; months where collection dates have not been reported are designated as 0%.

2.8. LIMITATIONS

Survey efforts were carefully designed to maximize the likelihood that the timing and effort of the surveys coincided with the optimum timing of phenology and were conducted in appropriate locations for each of the target species. This subsection discusses the unavoidable limitations inherent in rare plant surveys, with respect to specifics of this project. This report only presents the results of protocol-level rare plant surveys within the entire study area. Although wetland areas were investigated for rare plants they were not classified, mapped, or delineated.

Based on the timing of this assessment, a determination of presence within the study area was possible for special-status plant species with blooming periods corresponding to the March, April, May, and July, 2018 surveys or with vegetative or fruiting material that would have been detectable during the survey as described above. Based on the timing of the survey, all plant species possibly growing within the study area may not have been observed due to varying floral phenology and life forms, such as bulbs, biennials, and annuals. Annuals may be absent in some years due to annual variations in temperature and rainfall, which influence germination and plant phenology. Colonization of new populations within an area may also occur from year to year.

Since vegetation descriptions are based on survey dates described above, vegetation descriptions and their associate species may be subject to change if additional data are collected, as species dominance, with regard to annuals, may change depending on the sample season or year. The phrase “in part” is used to signify that vegetation descriptions may include additional annual species present if surveyed during other seasons or years. Other potentially dominant species within vegetation communities or sensitive natural communities on site may be present or identified during other times of the year.

Some specific plant species identifications in this report may be tentative due to the absence of morphological characters, resulting from immature reproductive structures or seasonal desiccation, which may be required to make species level determinations, however, all plant species in bloom or otherwise recognizable were identified to a level necessary to determine their regulatory status. In these cases *cf* (compares to) is used to indicate provisional species identification based on gestalt, vegetative morphology, and/or its known range. It is highly unlikely that any of the provisional species identifications would be revised to recognize a sensitive taxon.

The proposed activities and work areas evaluated in this report are based on the study area provided by PG&E. Significant changes in the project design may warrant further analysis.

Section 3. ENVIRONMENTAL SETTING

3.1. SETTING

The approximately 12.9-acre study area is located in the northern portion of the Livermore Valley within the City of Livermore in north-central Alameda County, California. The mid-point of the study area is approximately 2.5 miles northwest of downtown Livermore and approximately 14 miles southeast of the summit of Mount Diablo. It lies within the San Joaquin Valley Subregion of the California Floristic Province and Alameda Creek Watershed. The study area appears on the Livermore (37121F7) 7.5-minute USGS topographic quadrangle.

3.1.1 REGIONAL SETTING

Regionally, this part of the interior East Bay supports a large number of special-status plant species and is floristically considered more similar to the San Joaquin Valley than the surrounding Diablo Range foothills.

As described in the *Ecological Subregions of California* (USDA 1997), the area is located within the Fremont-Livermore Hills and Valleys subsection of the Central Valley Coast Section. This subsection is described in detail below. The *Ecological Subregions of California* form the basis for describing regional variation in California alliance descriptions in *A Manual of California Vegetation* (Sawyer et al. 2009).

Fremont-Livermore Hills and Valleys

The Fremont-Livermore Hills and Valleys consist of the Livermore/San Ramon Valley and the hills around it, between the Greenville and Calaveras faults, and hills southeast of Fremont that are between the Calaveras fault and Santa Clara Valley. In this subsection the climate is hot and sub-humid.

This subsection includes a late Quaternary alluvial plain running east to west across the middle of the Livermore/San Ramon Valley with moderately steep to steep hills with flat summits south of the alluvial plain and moderately steep to steep hills along the Calaveras fault and between the fault and the Santa Clara Valley. Elevation ranges from 300 feet to 1,200 feet in Livermore Valley to 2,594 feet on Monument Peak, which lies west of the Alameda Watershed boundary. Mass wasting and fluvial erosion are the main geomorphic processes. This subsection contains mainly Miocene marine sediments along the Calaveras fault south of the Livermore/San Ramon Valley and Plio-Pleistocene nonmarine sediments in the south end of the Livermore Valley (USDA 1997). The older soils are leached free of carbonates, but calcium carbonates accumulate in the subsoils of many others. The soils are well-drained, except for small areas of somewhat poorly drained soils on alluvial plains.

For this region, the mean annual precipitation ranges from 15 to 20 inches and most of the precipitation is rainfall. The mean annual temperature is generally between 55° and 60°F and the mean freeze-free period is from 250 to 275 days. Hydrologically, runoff to the alluvial plain is rapid and all but the larger streams are dry through most of the summer (USDA 1997).

3.1.2 LOCAL SETTING

The study area is located near the northern limits of the City of Livermore in Alameda County. The gas line runs in an east to west alignment along Arroyo Las Positas Creek on the eastern side of the northern study and turns south to cross I-580. The gas line alignment then heads west along the northern section of the southern study area and exits the study area heading west.

Topography and Climate

Topography of the northern portion of the study area includes Arroyo Las Positas Creek with its associated flood plain and upland slopes ranging from 410 feet (125 meters) to 440 feet (134 meters) in elevation. The flood plain and upland banks are severely altered throughout the study area that is confined by high banks, a housing development to the north, and I-580 to the south. Significant grading, as well as erosion control structures, characterize a majority of the upper banks. The steep topography of the upper banks quickly flattens out to a small flood plain which quickly drops off into Arroyo Las Positas Creek. Vegetation in this ecosystem can change significantly due to a strong moisture gradient over a short distance.

Topography of the southern portion of the study area is a uniform area with little to no slope that consists of urban development and a small agriculture field.

Locally the climate of the study area is characterized as Mediterranean with cool wet winters and warm, dry summers. However, the low precipitation received in the Valley and summer temperatures trend the climate towards semi-arid. The Valley is oriented west to east and receives consistent evening winds through the summer as the cool air from the Pacific Ocean is drawn into the Central Valley.

Geology and Soils

The underlying geology mainly comprises surficial deposits of Quaternary origins (Graymer et al. 1996). A total of four soil mapping units are located within the study area as described by *Soil Survey of the Alameda Area* (USDA 1966). Each soil mapping unit and the represented acreage in the study area is shown in Table 5. The symbol column in this table refers to the abbreviation for this soil type used in the soil survey (USDA 1966). None of soil mapping units found in the study area support sensitive natural communities that require edaphic alkaline soils, including alkali grassland, alkali wetland, and in some cases vernal pools. Several special-status plant species in the area are also considered alkaline soil obligates. Despite the lack of these edaphic conditions within the study areas, species with the ability to grow in alkaline soils were present on-site indicating soils that Holland (1986) refers to as subalkaline. This is likely due to seasonal flooding and evaporation processes and does not indicate the presence of the underlying soils necessary to support edaphic vegetation communities or species requiring alkaline soils.

Table 5. Soil Mapping Units in the Study Area

SYMBOL	SOIL MAPPING UNIT	ACREAGE	ALKALINE
DvC	Diablo clay, very deep, 3 to 15 percent slopes	8.8	no
LaC	Linne clay loam, 3 to 15 percent slopes	0.3	no
Rh	Riverwash	0.3	no
Za	Zamora silt loam, 0 to 4 percent slopes	3.6	no

The four soil mapping units found in the study area include soils of the Diablo, Linne, Riverwash and Zamora series. These soils range from clay, silty clay, clay loam and silty loam that are moderately to very deep (USDA 1966).

Hydrology Characteristics

Hydrology onsite is influenced by precipitation, surface water runoff, geologic stratigraphy, topography, soil permeability, and plant cover. Much of the study area is defined by Arroyo Las Positas Creek, which runs through the whole portion of the study area on the northern side of I-580.

Land-Use

The study area traverses mostly through Arroyo Las Positas Creek on the north side of the freeway where the Creek is surround by development. To the north is a housing development and to the south is I-580. The portion of the study area that is on the south side of I-580 consists of developed and industrial land that includes a small agricultural field.

3.2. VEGETATION COMMUNITIES

This section describes vegetation utilizing three vegetation classification systems developed by Holland (1986) or Holland and Keil (1995) and Sawyer et al. (2009). Holland (1986) or Holland and Keil (1995) provide a generalized natural community-level description for natural communities present within the study area which include crop land (Agrestal), Ruderal, Non-Native Grassland, Native Grassland, and Coastal and Valley Freshwater Marsh (Table 6; Figure 3). In some cases, more detail is included for these natural community-levels by providing a description of the alliance¹, association², stand³, or mapping unit⁴ based on the *Manual of California Vegetation* (Sawyer et al. 2009) system. These vegetation communities are described below.

Another land cover type, Developed, is not considered a vegetation community and is therefore not discussed further. This area is mapped to include subdivisions, paved roadways, parking lots, and graveled road shoulders.

Wetland vegetation types within the study area are not based on a wetland delineation, but rather are only intended to inform the evaluation of sensitive natural communities within the study area.

¹ A classification unit of vegetation, containing one or more associations and defined by one or more diagnostic species, often of high cover, in the uppermost layer or the layer with the highest canopy cover.

² A vegetation classification unit defined by a diagnostic species, a characteristic range of species composition, physiognomy, and distinctive habitat conditions.

³ An actual area of vegetation that is homogenous in species composition and structure and in a uniform habitat.

⁴ This term is used for stands of vegetation that were recurring on the landscape with an obvious dominant species but have not yet been described by CDFW/CNPS.



October 2018

Botanical Resources Survey Report



Figure 3
Vegetation Communities
North Livermore
Gas-Line 131 R893 Replacement Project
Pacific Gas & Electric

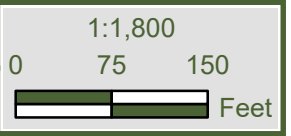


Table 7 relates vegetation types identified within the study area to other commonly used vegetation classification systems including *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986), *Manual of California Vegetation*, *East Alameda County Conservation Strategy* (ICF 2010), *Second edition* (Sawyer et al. 2009), *CNPS Inventory of Rare and Endangered Plants of California* (CNPS 2001a, 2017), and *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). The codes used in Table 7 reflect those associated with Holland (1986) types and the *California Natural Communities List* (CDFG 2018a).

Table 6. Land Cover Types in the Study Area

LAND COVER	ACREAGE
<u>Cultivated Lands</u>	
Cropland	0.62
<u>Upland Herbaceous Dominated Vegetation Types</u>	
Creeping Ryegrass Turfs (<i>Elymus triticoides</i> Herbaceous Alliance)	0.70
Non-Native Grassland	2
Ruderal	4
<u>Wetland Herbaceous Dominated Vegetation Types</u>	
Coastal and Valley Freshwater Marsh	0.39
Total:	7.32

Table 7. Vegetation Community Classification Systems Comparison

<u>VEGETATION COMMUNITY CLASSIFICATION SYSTEMS</u>				
TERRESTRIAL COMMUNITIES⁵	CALIFORNIA VEGETATION⁶	EAST ALAMEDA COUNTY CONSERVATION STRATEGY⁷	CNPS INVENTORY⁸	WETLANDS & DEEPWATER HABITATS⁹
<u>CULTIVATED LANDS</u>				
Crop Land (Agrestal) (Holland and Keil 1995)	Not Described	Cropland	Valley and Foothill Grassland	Upland
<u>UPLAND HERBACEOUS DOMINATED VEGETATION TYPES</u>				
Valley Wildrye Grassland (41140)	<i>Elymus triticoides</i> Herbaceous Alliance (creeping ryegrass turfs) (41.080.00) (S3)	Non-serpentine Native Bunchgrass Grassland	Valley and Foothill Grassland	Upland

⁵ List of California Natural Communities (CDFGW 2018a)

⁶ A Manual of California Vegetation (Sawyer et al. 2009)

⁷ East Alameda County Conservation Strategy (ICF International 2010)

⁸ CNPS Inventory of Rare and Endangered Plants of California Habitat Types (CNPS 2001A)

⁹ Classification of Wetlands & Deepwater Habitats of the U.S. (Cowardin et al. 1979)

VEGETATION COMMUNITY CLASSIFICATION SYSTEMS

TERRESTRIAL COMMUNITIES ⁵	CALIFORNIA VEGETATION ⁶	EAST ALAMEDA COUNTY CONSERVATION STRATEGY ⁷	CNPS INVENTORY ⁸	WETLANDS & DEEPWATER HABITATS ⁹
Non-native Grassland (42200)	<i>Avena fatua</i> Semi-Natural Herbaceous Stand (wild oats grassland) (44.150.00), in part <i>Bromus hordeaceus</i> Semi-Natural Herbaceous Stand (soft chess grassland) (42.026.00), in part	California Annual Grassland	Valley and Foothill Grassland	Upland
Ruderal (Holland and Keil 1995)	Not Described	Ruderal	Not Described	Upland
<u>Wetland Herbaceous Dominated Vegetation Types</u>				
Coastal and Valley Freshwater Marsh (52410)	<i>Schoenoplectus acutus</i> Herbaceous Alliance (Hardstem bulrush marsh) (52.122.00) <i>Schoenoplectus americanus</i> Herbaceous Alliance (American bulrush marsh) (52.111.00)	Perennial Freshwater Marsh	Meadows and Seeps	Palustrine non-persistent emergent wetland

3.2.1 CULTIVATED LANDS

Cropland (Agrestal)

In Cropland, agricultural practices vary. Often tillage occurs every year and the area is highly disturbed. Within the study area this land cover type includes a single parcel that was tilled and planted. At the time of the field survey, the dominant crop was pumpkin. It is highly unlikely any native plants exist in this agriculture field due to the intensive cultivation practices.

3.2.2 UPLAND HERBACEOUS VEGETATION TYPES

Valley Wildrye Grassland

Valley wildrye grassland is dominated by dense cover of *Elymus triticoides*. This community occurs on moist sites that are often adjacent to freshwater marshes of low elevations. Soils in this vegetation type are frequently subalkaline and often subject to seasonal overflow (Holland 1986). This community usually occurs between 0-2300 meters (Sawyer et al. 2009).

Within the study area, valley wildrye grassland is represented by one vegetation alliances: *Elymus triticoides* Herbaceous Alliance which is described below.

*Elymus triticoides*¹⁰ (Creeping Rye Grass Turfs) Herbaceous Alliance

This alliance is described with creeping rye being dominant to co-dominant in the herbaceous layer with other native grasses and herbs. Herbs are less than 3.3 feet (1 meter) and the canopy is open to continuous. The membership rule for this alliance is creeping rye is greater than 50% relative cover in the herb layer. Habitat for this alliance is poorly drained floodplains, drainage and valley bottoms, mesic flat to sloping topography, and marsh margins between 0 to 7,546 feet (0-2,300 meters) in elevation (Sawyer et al. 2009). Within the study area this alliance was observed on both sides of Arroyo Las Positas Creek in flood plains immediately adjacent to fresh water marshes flanking the river's edge.

This community is characterized by salt grass (*Distichlis spicata*), wild oats (*Avena* sp.), blue wildrye (*Elymus glaucus* subsp. *glaucus*), bristly ox-tongue (*Helminthotheca echioides**), perennial pepperweed (*Lepidium latifolium**), California mugwort (*Artemisia douglasiana*), poison hemlock (*Conium maculatum**), and fennel (*Foeniculum vulgare**).

¹⁰ Based on recent taxonomic changes in Baldwin et al. (2012) *Leymus triticoides* is now recognized as *Elymus triticoides*

* Denotes a species that has an origin other than California.



Photo 1. Creeping rye growing at the foot of the hill.

Non-Native Grassland

Non-native grassland is dominated by a sparse to dense cover of non-native grasses and weedy annual and perennial forbs, primarily of Mediterranean origin, that have replaced native perennial grasslands as a result of human disturbance. However, where not completely out-competed by weedy non-native plant species, scattered native wildflower species and native perennial grass species considered remnants of the original vegetation, may also be common (Holland 1986). This community occurs on fine-textured, usually clay soils, which are moist or waterlogged during the winter rainy season and very dry during the summer and fall. Germination occurs with the onset of the late fall rains while growth, flowering, and seed-set occur from winter through spring. With a few exceptions, the plants are dead through the summer and fall dry season, persisting as seeds. This community usually occurs below 3,000 feet (914 meters) but reaches 4,000 feet (1,219 meters) in the Tehachapi Mountains and interior San Diego County, and intergrades with coastal prairie along the Central Coast (Holland 1986).

This vegetation type in the study area is characterized by a high density and abundance of non-native annual grasses and is found on the upland banks of Arroyo Las Positas Creek where disturbance was relatively minimal, compared to adjacent ruderal areas. Though it did not constitute a mappable vegetation type it should be noted there were small patches of well-developed purple needle grass (*Stipa pulchra*) bunchgrass among non-native grassland stands. These areas are represented as point data in Figure 3.

This community is characterized by wild oats, soft chess (*Bromus hordeaceus**), Italian ryegrass (*Festuca perennis**), common gumplant (*Grindelia camporum*), rose clover (*Trifolium hirtum**), fiddleneck dock (*Rumex pulcher**), black mustard (*Brassica nigra**), blue wildrye, lambs quarter (*Chenopodium album**) jointed charlock (*Raphanus* sp.*), annual yellow sweetclover (*Melilotus indicus*), willow herb (*Epilobium brachycarpum*), Italian thistle (*Carduus pycnocephalus* subsp. *pycnocephalus**), slender flowered thistle (*Carduus tenuiflorus**), wild geranium (*Geranium dissectum**), spiny sowthistle (*Sonchus asper* subsp. *asper**), whitestem filaree (*Erodium moschatum**), western blue eyed grass (*Sisyrinchium bellum*), and California poppy (*Eschscholzia californica*).



Photo 2. Non-native grassland occupying a thin band at the top of the hill.

Ruderal

Based on the description by Holland and Keil (1995), ruderal vegetation is an assemblage of plants, often a mixture of both native and nonnative weed species that thrive in waste areas, heavily grazed pastures, cultivated and fallow fields, roadsides, parking lots, footpaths, around residences and similar disturbed sites in towns and cities and along rural roadways. Ruderal communities are difficult to characterize and are often temporary assemblages. In areas of frequent human disturbance, the majority of wild plants are often introduced weeds rather than natives. Some urban weeds are ornamentals that have escaped from cultivation. Ruderal species may at times be integrated into various other communities (Holland and Keil 1995).

Within the study area ruderal vegetation is located in areas that have been disturbed by intensive grading and creation of reinforced banks. In this site, bank reinforcement mostly consists of concrete bag retaining walls. Non-native plant species typical of ruderal vegetation within the study area include black mustard*, redstem filaree*, whitestem filaree*, wild oats*, Italian thistle*, poison hemlock*, fennel*, stinkwort (*Dittrichia graveolens**), spiny sowthistle*, English plantain (*Plantago lanceolata*), hoary mustard (*Hirschfeldia incana**), bullthistle (*Cirsium vulgare**), and bristly ox-tongue*.



Photo 3. Ruderal vegetation growing on cement bag bank reinforcement and consisting predominantly of fennel.

3.2.3 WETLAND HERBACEOUS DOMINATED VEGETATION TYPES

Coastal and Valley Freshwater Marsh

Although a wetland delineation had not been undertaken as a part of Nomad's studies, field surveys completed in 2018 found perennial wetland vegetation types on the margins of Arroyo Las Positas Creek.

Coastal and valley freshwater marshes are dominated by perennial monocots up to 4-5 meters that typically form a closed canopy (Holland). This vegetation type forms freshwater sites lacking significant currents.

Within the study area coastal and valley freshwater marsh is found along the banks of Arroyo Las Positas Creek in dense small patches typically dominated by either by tule (*Schoenoplectus acutus* var. *occidentalis*) or chairmakers' bulrush (*Schoenoplectus americanus*). Species typical of this vegetation type in the study area include common lippia (*Phyla nodiflora*), salt heliotrope (*Heliotropium curassavicum* var. *oculatum*), reed fescue (*Festuca arundinacea**), Harding grass (*Phalaris aquatica**), perennial pepperweed*, yerba mansa (*Anemopsis californica*), annual beard grass (*Polypogon monspeliensis**), stinging nettle (*Urtica dioica* subsp. *holosericea*), tall cyperus (*Cyperus eragrostis*), and broadleaf cattail (*Typha latifolia*).



Photo 4. Costal and valley freshwater marsh.

Section 4. RESULTS

During this study, a total of 76 plant species were observed within the study areas. Of these species, 47 (approximately 62%) observed are considered non-native species, that have an origin other than California. Generally, native species comprised higher cover and abundance than non-native plant species within the Creeping Ryegrass Turfs and Costal and Valley Fresh Water Marsh vegetation communities. Where grasslands and ruderal vegetation are present, non-native species were more abundant. A complete list of plant species observed within the study area is presented in Appendix C.

In evaluating habitat suitability and occurrence potential for special-status plant species within the study area, relevant literature, knowledge of regional biota, and observations made during the field investigations were applied to analysis criteria. Criteria determinations for occurrence potential of special-status plant species are divided into the five categories described below. These determination categories appear in Appendix B which provides a summary of the status, habitat affinities, flowering phenology, habitat suitability, and local distribution and potential for occurrence for each of the target special-status species. It should be noted that local distribution references refer to the CNDDDB Element Occurrence Index (EONDX) number. The EONDX is an integer primary key (unique for each record) used within the CNDDDB for GIS relational databases. Although the EONDX is assigned sequentially, gaps may appear as records are merged or updated. Factors influencing which determination criteria are applied to target species are described below.

- None denotes a complete lack of habitat suitability, local range restrictions, and/or regional extirpations.
- Not Expected denotes situations where suitable habitat or key habitat elements may be present but may be of poor quality or isolated from the nearest extant occurrences. Incompatible habitat suitability refers to elevation, soil chemistry and type, vegetation communities, microhabitats, and degraded/significantly altered habitats. These factors create unsuitable ecological conditions for the consideration of even a low occurrence potential within the study area.
- Not Observed refers to plant species that were considered to have a potential to occur within the study area but were not observed during the course of the botanical surveys. This designation is primarily used for annual plant species that may not be present every year.
- Absent indicates specified taxa not observed during field investigations and were consequently ruled out. This category refers to diagnostic vegetative material of shrubby perennial or tree species not observed on site.
- Present indicates the target species was observed directly during field investigations.

4.1. SENSITIVE NATURAL COMMUNITIES

A total of two sensitive communities were observed within the study area: Creeping Ryegrass Turfs and Costal and Valley Fresh Water Marsh. These communities appear in Table 8 and are described below. The locations of these communities are depicted in Figure 3.

Table 8. Sensitive Natural Communities in the Study Area

VEGETATION TYPE	NUMBER OF POLYGONS	ACREAGE
<u>UPLAND HERBACEOUS DOMINATED VEGETATION TYPES</u>		
Creeping Ryegrass Turfs (<i>Elymus triticoides</i> Herbaceous Alliance) (S3)	3	0.70
<u>WETLAND HERBACEOUS DOMINATED VEGETATION TYPES</u>		
Coastal and Valley Fresh Water Marsh (S3)	11	0.39
Total	14	1.09

As recognized by Sawyer et al. (2009) Creeping Rye Grass Turfs on-site is expressed as *Elymus triticoides* Herbaceous Alliance. This alliance may be considered of high inventory priority as it has a Subnational Conservation Status Rank of S3 (CDFW 2018a). A rank of S3 indicates a vegetation alliance or association is “Vulnerable” meaning it is at moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors (NatureServe 2018).

Coastal and Valley Fresh Water Marsh as a Holland type contains multiple vegetation associations recognized by Sawyer et al. (2009). For this project the two recognized alliances under this category include *Schoenoplectus acutus* Herbaceous Alliance (S4) and *Schoenoplectus americanus* Herbaceous Alliance (S3). It should be noted however, that there is a currently a provisional vegetation association under the *Schoenoplectus americanus* Herbaceous Alliance that includes *Schoenoplectus acutus* in the description. This provisional association best describes the Coastal and Valley Fresh Water Marsh vegetation within the study area and is considered, under the *Schoenoplectus americanus* Herbaceous Alliance, a high inventory priority having Subnational Conservation Status Rank of S3.

4.2. SPECIAL-STATUS PLANTS

Based on the field studies, a review of available databases and literature (USFWS 1999, 2014, 2016; CDFW 2018, b, c,d; CNPS 2018; CCH 2018; Baldwin et al. 2012) and familiarity with the regional flora, a total of eight special-status plant species are known to occur within the vicinity of the study area and were considered to have the potential to occur. These 9 target species were the subject of protocol-level botanical surveys conducted during the appropriate blooming periods in 2018. However, no special status plants were observed during the 2018 protocol level survey.

4.2.1 FEDERAL- AND/OR STATE-LISTED AND CALIFORNIA RARE PLANT SPECIES

Based on the field investigations, review of available databases and literature, familiarity with local flora, and on-site habitat suitability, no federal- and/or State-listed and California rare plant species were observed. Please refer to Appendix B for a treatment on potential for occurrence based on habitat suitability and local distribution.

4.2.2 CALIFORNIA RARE PLANT RANK SPECIES

Based on the field investigations, review of available databases and literature, familiarity with local flora, and on-site habitat suitability, no California Rare Plant Rank species were observed within the study area. Please refer to Appendix B for a treatment on potential for occurrence based on habitat suitability and local distribution

4.2.3 LOCALLY RARE PLANT

Locally significant plant species, also known as “peripheral populations” are those considered to be at the outer limits of their known distribution, a range extension, a rediscovery, or rare or uncommon in a local context (CNPS 2001, CDFG 2010). These species are not regarded as special-status species by the USFWS or CDFW. However, the East Bay Chapter of CNPS has a program, started in 1991, that tracks rare, unusual, and significant plants that occur within Contra Costa and Alameda counties. East Bay CNPS has three ranked designations for these species: A (which includes ♦A1, A1, *A1x, A1x, *A2, and A2); B; and C. This determination is partially based on the number of botanical regions the subject taxon occurs in. The criteria of each ranking are presented in Table 9.

Table 9. Ranking Criteria for Rare, Unusual, and Significant Plants of the East Bay

RANKING	DEFINITION
♦A	This category includes ♦A1, ♦A1x, and ♦A2. The asterisk indicates that these species in Alameda and Contra Costa counties are listed as rare, threatened, or endangered by federal or state agencies or by the state level of CNPS.
A1	Species from 2 or less botanical regions in Alameda and Contra Costa counties, either currently or historically.
A1x	Species previously known from Alameda or Contra Costa counties, but now believed to have been extirpated and no longer occurring here.
A2	Species is currently known from 3 to 5 regions in the two counties, or if more, meeting other important criteria such as small populations, stressed or declining populations, small geographical range, limited or threatened habitat, etc.
B	A high-priority watch list: Species currently known from 6 to 9 regions in the two counties, or if more, meeting other important criteria as described for A2.
C	A second-priority watch list: Species is currently known from 10 or more regions in the two counties, but potentially threatened if certain conditions persist such as over-development, water diversions, excessive grazing, weed or insect invasions, etc.

The East Bay Chapter, which includes Contra Costa and Alameda counties, has been divided into 40 botanical regions based on vegetation, geology, habitats, soil types, and other factors. The study area is included within the Livermore area botanical region (Lake 2010).

A single plant species treated as locally rare by the East Bay Chapter of CNPS that may have regulatory significance was observed within the study area. This species, common lippia, has a locally rare rank of A1 (Table 10). This species should be considered in local planning and management efforts, however including them in environmental review documents is up to the discretion of the lead agency (Lake 2010).

♦ A diamond indicates that the plant species is also listed statewide as rare.

Table 10. Locally Rare, Unusual, and Significant Plants Observed within the Study Area

SCIENTIFIC NAME	COMMON NAME	NUMBER OF OCCURRENCES	GENERAL LOCATIONS
A1-Ranking			
<i>Phyla nodiflora</i>	common lippia	1	-in the flood plain of Arroyo Las Positas Creek

Source: Lake 2010. All plants with a CNPS East Bay Chapter ranking of A are protected under CEQA in Sections 15380 and 15125(a) which address species of local concern and environmental resources that are rare or unique to a region.

Common Lippia (*Phyla nodiflora*)

Common lippia [*Phyla nodiflora* (L.) Greene] is an A1-ranked species. This taxon is a perennial herb species of the Vervain family (Verbanaceae). The type locality for this species is from a 1753 collection in the State of Virginia (Tropicos 2018). The name *Phyla* is a diminutive of a Greek word meaning clan or tribe, due to the clustered flowers (Baldwin et al. 2012).

Common lippia is a perennial herb that reaches from 3.9 to 10.6 inches (15 cm) in height and is branched from the base (Baldwin et al. 2012). The corolla is white to red (Baldwin et al. 2012). This taxon flowers from May to November (Baldwin et al. 2012). Common lippia occurs in wetlands or on margins of ponds from 0 to 1300 feet (400 meters) in elevation in the Coast Ranges, Great Valley, Central West, and South Coast Subregions (Baldwin et al. 2012). Locally this species is known from few places in the East Bay including the Carquinez, San Pablo Reservoir, Briones Hills, Lake Chabot, Lime Ridge and Emeryville.

Within the study area this taxon co-occurred with yerba mansa and salt heliotrope in moist habitat adjacent to Arroyo Las Positas Creek. Construction activities associated with pipeline replacement could potentially impact this species in the study area if it is directly harmed by machinery or earth moving operations. Appropriate avoidance measures should be undertaken.

4.3. NOXIOUS/INVASIVE WEEDS

During the course of this study, 47 (approximately 62%) of the plant species observed within the study area were non-native plant species. A non-native plant species is defined as a species that is occurring outside of its native distributional range and the species has arrived there by human activity. Some of the non-native plant species encountered on-site are tracked by the California Department of Food and Agriculture (CDFA 2018) and the California Invasive Plant Council (Cal-IPC 2018) due to their noxious/invasive weedy behavior. Species tracked by these organizations are given a certain rating based on criteria such as ecological impacts, treatment or eradication priority, and threats they pose to agricultural economics. Rating classifications given by Cal-IPC and CDFA are shown in Table 11.

Of the non-native plant species tracked by Cal-IPC and CDFA, the following discussion only includes those that were dominant on the landscape in a given area, serve as a record of existing infestations, pose a potential threat to adjacent botanical resources, or have the potential to be more widely spread during project related activities. A total of 13 plant species with elevated threat rankings were observed within the study area (Table 11). The majority of these species were observed throughout the study area, but especially in ruderal areas that were severely altered by embankment engineering by It should be noted that trace individuals of other non-native plant species with weed ratings were also observed within the study area. Because of the low number, limited location, and lack of perceived threats these species are not included below.

Table 11. Noxious/Invasive Plants Observed in the Study Area

SPECIES NAME	COMMON NAME	California Invasive Plant Council Rank (Cal-IPC 2017)*	California Department of Food and Agriculture Noxious Weed List (CDFA 2018)**
<i>Brassica nigra</i>	black mustard	Moderate	---
<i>Carduus pycnocephalus</i> subsp. <i>pycnocephalus</i>	Italian thistle	Moderate	On List
<i>Carduus tenuiflorus</i>	slender flowered thistle	Limited	On List
<i>Centaurea solstitialis</i>	yellow star thistle	High	On List
<i>Cirsium vulgare</i>	bull thistle	Moderate	On List
<i>Convolvulus arvensis</i>	bindweed	---	On List
<i>Dittrichia graveolens</i>	dittrichia	Moderate	---
<i>Festuca arundinacea</i>	tall fescue	Moderate	---
<i>Foeniculum vulgare</i>	fennel	High	---
<i>Helminthotheca echioides</i>	bristly ox-tongue	Limited	---
<i>Hirschfeldia incana</i>	hoary mustard	Moderate	---
<i>Lepidium latifolium</i>	perennial pepperweed	High	On List
<i>Phalaris aquatica</i>	Harding grass	Moderate	---

*Cal-IPC Weed Ranking Definitions:

High: These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate: These species have substantial and apparent - but generally not severe - ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited: These species are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic (Cal-IPC 2017).

** Species considered a noxious weed by CDFA are listed on the California Noxious Weed List (CDFA 2017).

Section 5. SUMMARY

5.1. SUMMARY

The following table summarize the results associated with the protocol-level botanical surveys for the North Livermore Gas Line 131 R893 Replacement Project.

Table 12: Summary of Sensitive Communities and Special-Status Plants within the Study Area

SPECIES NAME	COMMON NAME	STATUS ^{1,2}	LOCATION IN THE STUDY AREA
<u>SENSITIVE NATURAL COMMUNITIES¹</u>			
<i>Elymus triticoides</i> Herbaceous Alliance	Creeping Ryegrass Turfs	S3	- In the small and confined flood plain of Arroyo Las Positas
<i>Schoenoplectus americanus</i> Herbaceous Alliance <i>Schoenoplectus acutus</i> Herbaceous Alliance (Hardstem bulrush marsh) (52.122.00)	Coastal and Fresh Water Marsh	S3 & Potential Jurisdictional Wetlands	- Intermittently along the banks of Arroyo Las Positas
<u>LOCALLY RARE PLANTS²</u>			
<i>Phyla nodiflora</i>	common lippia	CEQA, A1	-in the flood plain of Arroyo Las Positas

¹Explanation of Sensitive Natural Communities Status

Subnational Conservation Status Ranks (Nature Serve 2016):

- S2 "Imperiled"
- S3 "Vulnerable"

²Explanation of Locally Rare Ranks:

- A1 Species is known from 2 or less botanical regions in Alameda and Contra Costa Counties, either currently or historically.

Section 6. REFERENCES

- Baldwin, B. G., D. H. Goldman, D. J. Keil, R. Patterson, T. J. Rosatti, and D. H. Wilken, editors. 2012. *The Jepson manual: vascular plants of California, second edition*. University of California Press, Berkeley.
- Calflora Database, The. 2018. *Information on Wild California Plants for Conservation, Education, and Appreciation*. Accessed from <http://www.calflora.org/>.
- California Invasive Plant Council (Cal-IPC). 2018. *California Invasive Plant Inventory*, online. Accessed from <http://cal-ipc.org/paf/>.
- California Department of Food and Agriculture (CDFA). 2018. *Noxious Weed Encyclopedias*. Accessed from http://www.cdfa.ca.gov/phpps/ipc/encyclopedia/encyclopedia_hp.htm
- California Department of Fish and Game (CDFW). 2018a. *California Natural Communities List*. The Vegetation Classification and Mapping Program. Wildlife and Habitat Data Analysis Branch. January.
- _____. 2018b. *State and Federally Listed Endangered, Threatened and Rare Plants of California*. California Natural Diversity Database. Biogeographic Data Branch.
- _____. 2018c. *Special Vascular Plants, Bryophytes, Lichens List*. California Natural Diversity Database. Habitat Conservation Division. Wildlife and Habitat Data Analysis Branch.
- _____. 2018d. California Natural Diversity Database (CNDDDB). Version 3.1.0. Database Query for the Big Basin, Castle Rock Ridge, Cupertino, Franklin Point, La Honda, Mindero Hill, Mountain View, Palo Alto, and Woodside USGS 7-½ minute Quads. Wildlife and Habitat Data Analysis Branch.
- _____. 2018e. *Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural communities*. Wildlife and Habitat Data Analysis Branch
- California Native Plant Society (CNPS). 2001. *CNPS Botanical Survey Guidelines*, CNPS Inventory, 6th Ed. Revised June 2.
- _____. 2013. *Annotated Checklist of the East Bay Flora: Native and naturalized plants of Alameda and Contra Costa Counties, California*. East Bay Chapter of the California Native Plant Society, 2nd Ed.
- _____. 2018. *Inventory of Rare and Endangered Plants* (online edition, v8). California Native Plant Society. Sacramento, CA. Accessed from <http://rareplants.cnps.org/>
- Consortium of California Herbaria (CCH). 2018. Consortium database: Data provided by the participants of the Consortium of California Herbaria. Accessed from <http://www.ucjeps.berkeley.edu/consortium/>.
- Cowardin, L.M., V. Carter, F.C. Golet and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 131 pp.
- Graymer, R.W., D.L. Jones, and E.E. Brabb. 1996. *Preliminary geologic map emphasizing bedrock formations in Alameda County, California: A digital database*. U.S. Geological Survey Open-File Report 96-252.

- Holland, R. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. California Department of Fish and Game, The Resources Agency. 156 pp.
- Holland, V.L. and D.J. Keil. 1995. *California Vegetation*. Kendall/Hunt Pub. Co. Dubuque, Iowa. 516 pp.
- ICF International (ICF). 2010. Final Draft - East Alameda County Conservation Strategy. Accessed from: <http://www.eastalco-conservation.org/>
- Jepson Flora Project (eds.) 2018. *Jepson eFlora*, Accessed from <http://ucjeps.berkeley.edu/eflora/>
- Lake, D. 2010. *Unusual and Significant Plants of Alameda and Contra Costa Counties*. Eighth Edition. California Native Plant Society, East Bay Chapter.
- NatureServe. 2018. Interpreting NatureServe Conservation Status Ranks. NatureServe Explorer [Online] and NatureServe Central Databases, Arlington, VA. Accessed from: <http://www.natureserve.org/explorer/>.
- Nomad Ecology. 2009. North Livermore Resource Conservation Study.
- Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. *A Manual of California Vegetation*. Second edition. California Native Plant Society, Sacramento. 1300 pp.
- Tropicos, 2018. Missouri Botanical Garden. 10 Oct 2018. Accessed from: <http://www.tropicos.org/Name/33700513>
- U.S. Department of Agriculture (USDA). 1966. *Soil Survey of Alameda County*. Natural Resources Conservation Service
- _____. 1997. *Ecological Subregions of California, Section and Subsection Descriptions*. USDA, Forest Service Pacific Southwest Region. R5-EM-TP-005. September.
- U.S. Fish and Wildlife Service (USFWS). 1999. *Endangered and Threatened Wildlife and Plants*. 50 CFR 17.11 & 17.12. December 31.
- _____. 2000. *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants*. Ventura Fish & Wildlife Office. January.
- _____. 2014. *Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions*. December 5.

APPENDIX A LAWS, ORDINANCES & REGULATIONS

FEDERAL

FEDERAL ENDANGERED SPECIES ACT (FESA)

The Federal Endangered Species Act of 1973, as amended (FESA), was created to “conserve the ecosystems upon which Endangered and Threatened species depend.” The U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration, National Marine Fisheries Service have authority over projects that may result in a “take” of a species listed as Threatened or Endangered under the FESA. Under the FESA, plant and wildlife species, including all lower taxa including subspecies and varieties, are listed Threatened or Endangered based on (A) the present or Threatened destruction, modification, or curtailment of their habitat or range, (B) overutilization for commercial, recreational, scientific, or educational purposes, (C) disease or predation, (D) the inadequacy of existing regulatory mechanisms, or © other natural or manmade factors affecting their continued existence. FESA listing categories include Endangered, Threatened and candidates for listing. FESA provides protection for species listed as Endangered and prohibits the “take” of such species in areas under federal jurisdiction or in violation of state law. A “take” is defined as any action to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Species listed as Threatened do not warrant listing as Endangered and are not provided the same protection under Section 9; however, USFWS often applies the same protection as authorized by Section 4(d) of the FESA. Section 4(d) also allows for exceptions to the take rule under special circumstances. If a project would result in a take of a federally listed species, either an incidental take permit, under Section 10(a) of the FESA, or a federal interagency consultation under Section 7 of FESA, is required prior to the take. Current inventories published for species listed under the FESA include the *Endangered and Threatened Wildlife and Plants*, *Endangered and Threatened Wildlife and Plants; Review of Native Species That are Candidates or Proposed for Listing as Endangered or Threatened*; *Annual Notice of Findings on Resubmitted Petitions*; *Annual Description of Progress on Listing Actions*; *Proposed Rule, Endangered and Threatened Species*; *Establishment of Species of Concern List, Addition of Species to Species of Concern List, Description of Factors for Identifying Species of Concern, and Revision of Candidate Species List Under the Endangered Species Act*.

CLEAN WATER ACT OF 1977

The U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency (EPA) have jurisdiction over “Waters of the United States,” which include navigable waters of the United States, interstate waters, all other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries. Waters of the United States include marine waters, tidal areas, and stream channels. Under federal regulations, wetlands are defined as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas” [33 C.F.R. §328.3(b)]. Presently, to be considered a wetland, a site must exhibit three criteria: hydrophytic vegetation, hydric soils, and wetland hydrology existing under the “normal circumstances” for the site.

Wetlands that are nonnavigable, isolated, and intrastate only may not be subject to USACE jurisdiction under Section 404 of the CWA, pursuant to the “SWANCC” decision, *Solid Waste Agency of Northern*

Cook County vs. United States Army Corps of Engineers (2001) 531 U.S. 159. Although isolated wetlands may not be subject to USACE jurisdiction under Section 404, they are considered “waters of the State” under California’s Porter-Cologne Water Quality Control Act (Cal. Water Code §§ 13020, et seq.) and, as such, are subject to regulation by Regional Water Quality Control Boards (RWQCBs). There are nine RWQCBs under the State Water Resources Control Board.

STATE

CALIFORNIA ENDANGERED SPECIES ACT (CESA)

The California Endangered Species Act of 1984, administered by the California Department of Fish and Game (CDFG), recognizes that certain species of fish, wildlife and plants are in danger of, or Threatened with, extinction because their habitats are Threatened with destruction, adverse modification, or severe curtailment, or because of overexploitation, disease, predation, or other factors. The Legislature recognized that these species of fish, wildlife and plants are of ecological, educational, historical, recreational, aesthetic, economic and scientific value to the people of the state, and the conservation, protection and enhancement of these species and their habitat is of statewide concern. The CESA built on the California Native Plant Protection Act (NPPA) (discussed below) and increased regulatory protection for plant species to parallel the CESA. Listing categories under the CESA include Endangered, Threatened, rare or candidate for listing (Cal. Fish and Game Code §§ 2062, 2067 and 2068). The current inventories published for plants listed under the CESA are the *State and Federally Listed Endangered, Threatened and Rare Plants of California* and the *Special Vascular Plants, Bryophytes and Lichens List* CDFG. Current inventories for fish and wildlife species include *State and Federally Listed Endangered and Threatened Animals of California* and the *Special Animals*.

CESA requires state agencies to consult with the CDFG when preparing California Environmental Quality Act (CEQA) documents to ensure that the state lead agency actions do not jeopardize the existence of listed species. It directs agencies to consult with CDFG on projects or actions that could affect listed species, directs CDFG to determine whether jeopardy would occur, and allows CDFG to identify “reasonable and prudent alternatives” to the project consistent with conserving the species.

CESA prohibits the taking of state-listed Endangered or Threatened plant and wildlife species. CDFG exercises authority over mitigation projects involving state-listed species, including those resulting from CEQA mitigation requirements. CDFG may authorize a taking through an incidental take permit, if the impacts of the take are minimized and fully mitigated. Mitigation often takes the form of an approved habitat management plan or management agreement that avoids or compensates for possible jeopardy. CDFG requires preparation of mitigation plans in accordance with published guidelines.

CALIFORNIA FISH AND GAME CODE

The California Department of Fish and Game (CDFG) administers §1600-1603 of the Fish and Game Code which pertains to wetland and riparian resources associated with rivers, streams, and lakes. Pursuant to §1600-1603, CDFG regulates activities that divert or obstruct the natural flow of, or substantially change or use any material from the bed, bank, or channel of any river, stream, or lake, or its associated riparian vegetation, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. The jurisdiction of CDFG with respect to a river, stream, or creek is considered to be with the limits measured from the top-of-bank or the outermost edges of riparian vegetation.

NATIVE PLANT PROTECTION ACT (NPPA)

The Native Plant Protection Act of 1977, which is implemented by the CDFG, was created to “preserve, protect and enhance rare and Endangered plants in this State.” The NPPA gave the CDFG the authority to designate native plants as Endangered or rare and to regulate, through permits, activities such as collecting, transporting, or selling plants protected by the NPPA. The NPPA also provides the definitions of native, Threatened and Endangered plants in Section 1901 of the California Fish and Game Code.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

The California Environmental Quality Act of 1970 requires public agencies to evaluate the environmental implications of their actions, and to prevent environmental effects by avoiding or reducing significant impacts of their decisions, where feasible. CEQA was intended to assist public agencies in systematically identifying both the significant effects of proposed projects and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects. In enacting CEQA, the Legislature expressed a policy that public agencies should not approve projects as proposed if there are such feasible alternatives or mitigation measures. Among its goals, CEQA was intended “to preserve for future generations representations of all plant and animal communities” (Cal. Pub. Res. Code §21001c). Through this process impacts and mitigation to state and federally listed plant species are discussed.-

The California Native Plant Society (CNPS) has developed and maintains an inventory of rare, Threatened and Endangered plants of California. This information is published in the Inventory of Rare and Endangered Vascular Plants of California. The inventory presents a ranking system for rare plants within the state known as California Rare Plant Ranks. The CNPS inventory is endorsed by the CDFG and effectively serves as its list of “candidate” plant species. The following identifies the definitions of the California Rare Plant Ranks:

- Rank 1A: Plants presumed to be extinct in California;
- Rank 1B: Plants that are rare, Threatened, or Endangered in California and elsewhere;
- Rank 2A: Plants presumed extirpated in California, but more common elsewhere;
- Rank 2B: Plants that are rare, Threatened, or Endangered in California, but are more common elsewhere;
- Rank 3: Plants about which more information is needed (a review list): and
- Rank 4: Plants of limited distribution (a watch list).

Rank 1B and 2 species are considered eligible for state listing as Endangered or Threatened pursuant to the California Fish and Game Code. As part of the CEQA process, such species should be fully considered, as they meet the definition of Threatened or Endangered under the NPPA and Sections 2062 and 2067 of the California Fish and Game Code. Rank 3 and 4 species are considered to be either plants about which more information is needed or are uncommon enough that their status should be regularly monitored. Such plants may be eligible or may become eligible for state listing, and CNPS and CDFG recommend that these species be evaluated for consideration during the preparation of CEQA documents (CNPS 2001), as some of these species may meet NPPA and CESA criteria as Threatened or Endangered.

APPENDIX B SPECIAL-STATUS PLANT SPECIES KNOWN TO OCCUR OR POTENTIALLY OCCURRING IN THE STUDY AREA

SPECIES NAME COMMON NAME	FEDERAL, STATE, CNPS LISTING	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES*	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
FEDERAL/STATE ENDANGERED OR THREATENED AND CALIFORNIA RARE SPECIES					
<i>Amsinckia grandiflora</i> large-flowered fiddleneck	FE CEQA 1B.1	Occurs in cismontane woodland and valley and foothill grassland between 275 and 550 meters. Known from fewer than 5 natural occurrences around ALA and SJQ counties. Presumed extirpated from CCA.	April-May annual herb	Although suitable vegetation associations are present the only known natural populations known (either extant or extirpated) are from vicinities of Corral Hollow and Black Diamond Mines. This species has also never been recorded from valley bottomlands. The nearest CNDDDB occurrence (EONDX 5817, from 1992) is 7.5 miles north of the study area, at Los Vaqueros Reservoir. This occurrence is a failed reintroduction site.	Not Expected
<i>Arctostaphylos pallida</i> pallid manzanita	FT SE 1B.1	Occurs on siliceous shale, sandy, or gravelly sites in broadleaf upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, and coastal scrub between 185-465 meters. Known only from ALA and CCA counties.	December-March evergreen shrub	No suitable vegetation associations or substrates are present.	None
<i>Chloropyron palmatum</i> palmate-bracted bird's-beak	FE SE 1B.1	Occurs on alkaline soils in chenopod scrub and valley and foothill grassland, between 5-155 meters. Known from ALA, COL, FRE, GLE, MAD and YOL counties. Presumed extirpated from SJQ.	May-October annual herb (hemiparasitic)	Although suitable vegetation associations and suspected host, saltgrass (<i>Distichlis spicata</i>) (Coats et al. 1988; Chuang and Heckard 1973), are present, the preferred alkaline soils are absent. The nearest CNDDDB occurrence (EONDX 3037, from 2012) is about 13 miles northeast of the study area, at Springtown Wetlands Reserve.	Not Expected
<i>Chorizanthe robusta</i> var. <i>robusta</i> robust spineflower	FE CEQA 1B.1	Occurs on sandy or gravelly soils in maritime chaparral, cismontane woodland, coastal dunes and coastal scrub between 3 and 300 meters. Known from MNT, SCR, SFO counties; presumed extirpated from ALA, SCL, and SMT counties.	April-September annual herb	No suitable vegetation associations or substrates are present.	None

Appendix B Special-Status Plant Species Known to Occur or Potentially Occurring in the Study Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, CNPS LISTING	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES*	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Clarkia franciscana</i> Presidio clarkia	FE SCE 1B.1	Occurs on serpentine sites in coastal scrub, valley and foothill grassland between 25 and 335 meters. Known from ALA and SFO counties.	May-July annual herb	Although suitable vegetation associations are present the preferred serpentine substrate is absent. The nearest CNDDDB occurrence (EONDX 13632, from 2004) is about 22 miles west of the study area, at Redwood Regional Park.	Not Expected
<i>Deinandra bacigalupii</i> Livermore tarplant	None SCE 1B.2	Occurs in alkaline meadows and seeps between 150 and 185 meters. Known only from ALA county.	June-October annual herb	No suitable vegetation associations or substrates are present.	None
<i>Holocarpha macradenia</i> Santa Cruz tarplant	FT SE 1B.1	Occurs in coastal prairie, coastal scrub and valley and foothill grassland often on clayey and sandy substrates. Last remaining natural population in the San Francisco Bay area extirpated by development in 1993.	June-October annual herb	Although suitable vegetation associations are present this species only occurs in with a coastal or bay side influence. The nearest CNDDDB occurrence (EONDX 48966, from 1915) is about 16.5 miles west of the study area, near Hayward.	Not Expected
<i>Lasthenia conjugens</i> Contra Costa goldfields	FE CEQA 1B.1	Occurs in cismontane woodland, alkaline playas, valley and foothill grassland, and vernal pools. Occurs on mesic sites counties from between 0-470 meters. Known from ALA, CCA, MNT, NAP, and SOL. Presumed extirpated from MEN, SBA, and SCL counties.	March-June annual herb	Although suitable vegetation communities are present, vernal pool hydrology is absent. The nearest CNDDDB occurrence (EONDX 30917, from 2010) is about 17 miles southwest of the study area, in Fremont.	Not Expected
<i>Sanicula saxatilis</i> rock sanicle	None SR 1B.2	Occurs on rocky soils in broadleaf upland forest, chaparral, and valley and foothill grassland between 620-1,175 meters. Known from CCA and SCL counties.	April-May perennial herb	Although suitable vegetation associations are present the preferred rocky substrate is absent. This species has also never been recorded from valley bottomlands. The nearest CNDDDB occurrence (EONDX 4529 2013) is about 14 miles north of the study area on the summit of Mount Diablo.	Not Expected
<i>Suaeda californica</i> California seablite	FE CEQA 1B.1	Occurs in marshes and swamps, margins of coastal salt marshes from 0-15 meters. Known from SLO county, presumed extirpated from ALA, CCA, SCL, and SFO counties.	July-October perennial evergreen shrub	No suitable vegetation associations or tidally influenced habitat are present.	None
CALIFORNIA NATIVE PLANT SOCIETY LISTED AND LOCALLY RARE SPECIES					
<i>Acanthomintha lanceolata</i> Santa Clara thorn-mint	None CEQA 4.2	Occurs in rocky soils and sometimes serpentine sites in chaparral, cismontane woodland, and coastal scrub between 80 and 1200 meters. Known from ALA, FRE, MER, MNT, SBT, SCL, SJQ, and STA counties.	March-June annual herb	No suitable vegetation associations or substrates are present.	None

Appendix B Special-Status Plant Species Known to Occur or Potentially Occurring in the Study Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, CNPS LISTING	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES*	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Amsinckia lunaris</i> bent-flowered fiddleneck	None CEQA 1B.2	Occurs in coastal bluff scrub, cismontane woodland and valley and foothill grassland between 3-500 meters. Many collections are old. Known from ALA, CCA, COL, LAK, MRN, NAP, SCR, SMT and SON counties. May be present in SIS and SHA counties.	March-June annual herb	Although suitable vegetation associations are present this taxon prefers the ecotone where scrub, woodland and grassland meet, which does not occur within the study area. The nearest CNDDDB occurrence (EONDX 62466, from 2008) is about 16.5 miles northwest of the study area, near Rocky Ridge.	Not expected
<i>Androsace elongata</i> subsp. <i>acuta</i> California androsace	None CEQA 4.2	Occurs in chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, and valley and foothill grassland between 150 and 1200 meters. Known from throughout California, Baja, and Oregon.	March-June annual herb	Although suitable vegetation associations are present this species prefers exposed slopes and cut banks in the vicinity of the study area. The closest herbarium record is at the Ertter collection (Accession# UC1606382) from Mines Rd.	Not expected
<i>Anomobryum julaceum</i> slender silver moss	None CEQA 4.2	Occurs on damp rock and soil on outcrops, usually on roadcuts, in broadleaved upland forest, lower montane coniferous forest, and North Coast coniferous forest between 100-1000 meters. Known in BUT, CCA, HUM, LAX, MPA, SBA, SCR, SHA, and SON counties.	Wet Season moss	No suitable vegetation associations or substrates are present.	None
<i>Arctostaphylos auriculata</i> Mt. Diablo manzanita	None CEQA 1B.3	Occurs on sandstone in chaparral and cismontane woodland between 135 and 650 meters. Known only from CCA county.	January-March perennial evergreen shrub	No suitable vegetation associations or substrates are present. This species is endemic to Contra Costa County.	None
<i>Arctostaphylos manzanita</i> subsp. <i>laevigata</i> Contra Costa manzanita	None CEQA 1B.2	Occurs on rocky soils in chaparral between 430 and 1100 meters. Known only from CCA county.	January-April perennial evergreen shrub	No suitable vegetation associations or substrates are present. This species is endemic to Contra Costa County.	None
<i>Astragalus tener</i> var. <i>tener</i> alkali milk-vetch	None CEQA 1B.2	Occurs on alkaline substrates in playas, valley and foothill grassland on adobe clay, and vernal pools between 1-60 meters. Known from ALA, MER, NAP, SOL and YOL counties. Presumed extirpated from CCA, MNT, SBT, SCL, SFO, SJQ, SON, and STA counties.	March-June annual herb	Although suitable vegetation associations are present the preferred alkaline substrates are absent. The nearest CNDDDB occurrence (EONDX 6925, from 1958) is a nonspecific location mapped about 4 miles east of the study area, at the East end of the Livermore Valley.	Not Expected

Appendix B Special-Status Plant Species Known to Occur or Potentially Occurring in the Study Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, CNPS LISTING	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES*	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Atriplex cordulata</i> var. <i>cordulata</i> heartscale	None CEQA 1B.2	Occurs on saline or alkaline soil in chenopod scrub, meadows and seeps, and sandy valley and foothill grassland between 0 and 560 meters. Known from ALA, BUT, CCA, COL, FRE, GLE, KRN, MAD, MER, SLO, SOL, counties in elevation. Presumed extirpated from SJQ, STA, and YOL counties.	April-October annual herb	No suitable vegetation associations or substrates are present.	None
<i>Atriplex coronata</i> var. <i>coronata</i> crownscale	None CEQA 4.2	Occurs in alkaline, often clay soils in chenopod scrub, valley and foothill grassland, and vernal pools between 1 and 590 meters in elevation. Known from ALA, CCA, FRE, GLE, KNG, KRN, MER, MNT, SLO, SOL and STA counties.	March-October annual herb	Although suitable vegetation associations are present the preferred alkaline substrates are absent. The closest herbarium record is an Ertter collection (Accession# UC2031481) from Spring Town Wetlands.	Not Expected
<i>Atriplex depressa</i> brittsescale	None CEQA 1B.2	Occurs on alkaline and clay soils in chenopod scrub, meadows and seeps, playas, valley and foothill grassland, and vernal pools between 1 and 320 meters in elevation. Known from ALA, CCA, COL, FRE, GLE, KRN, MER, SOL, STA, TUL and YOL counties.	April-October annual herb	Although suitable vegetation associations are present the preferred alkaline substrates are absent. There is a cluster of several CNDDDB occurrences just east of the study area, with the nearest one (EONDX 51025, from 2000) being within 1.5 miles.	Not Expected
<i>Atriplex minuscula</i> lesser saltscale	None CEQA 1B.1	Occurs on alkaline and sandy soils in chenopod scrub, playas, and valley and foothill grassland. Known from ALA, BUT, FRE, KRN, MAD, MER, and TUL counties between 15 and 200 meters. Presumed extirpated from STA county.	May-October annual herb	Although suitable vegetation associations are present the preferred alkaline substrates are absent. There is a CNDDDB occurrence (EONDX 83626, from 2010) within 3 miles of the study area, just south of the Hartford Avenue and Lorraine St intersection.	Not Expected
<i>Balsamorhiza macrolepis</i> big-scale balsamroot	None CEQA 1B.2	Occurs often on serpentine sites in chaparral, cismontane woodland, and valley and foothill grassland. Known from ALA, AMA, BUT, COL, ELD, LAK, MPA, NAP, PLA, SCL, SHA, SOL, SON, TEH, and TUO counties between 90-1555 meters.	March-June perennial herb	Suitable vegetation associations are present. In the Livermore Valley this species occurs in non-serpentine habitat. The nearest CNDDDB occurrence (EONDX 32783), from 1993) is 7 miles southeast of the study area, near Poppy Ridge.	Not Observed Would have been detectable during the 2018 protocol-level surveys
<i>Blepharizonia plumosa</i> big tarplant	None CEQA 1B.1	Occurs in valley and foothill grassland. Known from ALA and CCA, KRN, MNT, SBT, SJQ, SLO, and STA counties between 30-505 meters. Presumed extirpated in SOL county.	July-October annual herb	Although suitable vegetation associations are present, this taxon prefers Altamont series soils found on the east side of the Diablo Range crest, east of the Greenville fault. The nearest CNDDDB occurrence (EONDX 90694, from 2007) is from 9.5 miles northeast of the study area, near Vasco Caves Regional Preserve.	Not Expected

Appendix B Special-Status Plant Species Known to Occur or Potentially Occurring in the Study Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, CNPS LISTING	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES*	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Calochortus pulchellus</i> Mt. Diablo fairy-lantern	None CEQA 1B.2	Occurs in chaparral, cismontane woodland, riparian woodland, and valley and foothill grassland between 30-840 meters. Known from ALA and CCA counties.	April-June perennial herb (bulbiferous)	Although suitable vegetation associations are present this taxon has never been recorded from the Livermore Valley, and it prefers the ecotone where chaparral, woodland and grassland meet, which does not occur within the study area. The nearest CNDDB occurrence (EONDX 84606, from 2003) is 7.5 miles northeast, at the Los Vaqueros Reservoir.	Not Expected
<i>Calochortus umbellatus</i> Oakland star-tulip	None CEQA 4.2	Occurs in chaparral, cismontane woodland, riparian woodland, and valley and foothill grassland between 30 and 840 meters. Known from ALA, CCA, and SOL counties.	April-June perennial bulbiferous herb	Although suitable vegetation associations are present this taxon has never been recorded from the Livermore Valley, and it prefers the ecotone where chaparral, woodland and grassland meet, which does not occur within the study area. The closest herbarium record is a Bowerman collection (Accession# UC691991) from north face of Mount Diablo.	Not Expected
<i>Campanula exigua</i> chaparral harebell	None CEQA 1B.2	Occurs in rocky and serpentine soils in chaparral from 275-1250 meters in elevation. Known from ALA, CCA, MER, SBT, SCL, and STA counties.	May-June annual herb	No suitable vegetation associations or substrates are present.	None
<i>Centromadia parryi</i> subsp. <i>congdonii</i> Congdon's tarplant	None CEQA 1B.2	Occurs on alkaline soils in valley and foothill grassland. Known from ALA, CCA, MNT, SCL, SLO, and SMT counties between 1-230 meters. Presumed extirpated from SCR and SOL counties.	June-November annual herb	Although suitable vegetation associations are present the preferred alkaline substrates are absent. There nearest CNDDB occurrence (EONDX 42350, from 1998) is within 2.5 miles northeast of the study area, near Hartford Avenue.	Not Expected
<i>Chloropyron molle</i> subsp. <i>hispidum</i> hispid bird's-beak	None CEQA 1B.1	Occurs on alkaline soils in meadows and seeps, playas, and valley and foothill grassland between 1 and 155 meters. Known from ALA, FRE, KRN, MER, PLA, and SOL counties.	June-September annual herb (hemiparasitic)	Although suitable vegetation associations and necessary host suspected for this species, saltgrass (<i>Distichlis spicata</i>) (Coats et al. 1988; Chuang and Heckard 1973), are present, the preferred hydrology is absent. There is a CNDDB occurrence (EONDX 4686, from 2003) from 3.5 miles northeast of the study area, from Springtown Wetlands Reserve.	Not Observed Would have been detectable during the 2018 protocol-level surveys

Appendix B Special-Status Plant Species Known to Occur or Potentially Occurring in the Study Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, CNPS LISTING	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES*	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Clarkia concinna</i> subsp. <i>automixa</i> Santa Clara red ribbons	None CEQA 4.3	Occurs in chaparral and cismontane woodland between 90 and 1500 meters. Known from ALA, SCL, and SCR counties.	April-July annual herb	No suitable vegetation associations or substrates are present.	None
<i>Convolvulus simulans</i> small-flowered morning glory	None CEQA 4.2	Occurs on clay soils and serpentine seeps in chaparral, coastal scrub, and valley and foothill grassland between 30 and 700 meters in elevation. Known from CCA, FRE, KRN, LAX, ORA, RIV, SBA, SBT, SCM, SCT, SCZ, SDG, SJQ, SLO, and STA counties.	March-July annual herb	Suitable vegetation associations and substrates present. The closest herbarium record is a Taylor collection (Accession# JEPS100237) from Byron Hot Springs.	Not Observed Would have been detectable during the 2018 protocol-level surveys
<i>Delphinium californicum</i> subsp. <i>interius</i> Hospital Canyon larkspur	None CEQA 1B.2	Occurs in openings of chaparral, mesic cismontane woodland, and coastal scrub between 195 and 1095 meters in elevation. Known from ALA, CCA, MER, MNT, SBT, SCL, SJQ, and STA counties.	April-June perennial herb	No suitable vegetation associations or substrates are present.	None
<i>Delphinium recurvatum</i> recurved larkspur	None CEQA 1B.2	Occurs on alkaline soils in chenopod scrub, cismontane woodland, and valley and foothill grassland between 3 and 790 meters in elevation. Known from ALA, CCA, FRE, GLE, KNG, KRN, MAD, MER, MNT, SJQ, SLO, SOL, SUT, and TUL counties. Presumed extirpated from BUT and COL counties.	March-June perennial herb	Although suitable vegetation associations are present, the preferred alkaline substrates are absent. The nearest CNDDDB occurrence (EONDX 2452, from 1991) is 12.5 miles northeast, on the county line.	Not Expected
<i>Dirca occidentalis</i> western leatherwood	None CEQA 1B.2	Occurs on mesic sites in broadleaved upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, and riparian woodland between 50-395 meters. Known from ALA, CCA, MRN, SCL, SMT, and SON counties.	January-April deciduous shrub	No suitable vegetation associations or substrates are present.	None
<i>Eriogonum truncatum</i> Mt. Diablo buckwheat	None CEQA 1B.1	Occurs in sandy soils in chaparral, coastal scrub, and valley and foothill grassland between 3 and 350 meters in elevation. Known from CCA counties. Presumed extirpated from SOL county.	April-December annual herb	No suitable vegetation associations are present, and this taxon has never been recorded from the Livermore Valley and it prefers the ecotone where chaparral/sage and grassland meet or on highly erosive soils in grassland habitats, which do not occur within the study area.	Not Expected

Appendix B Special-Status Plant Species Known to Occur or Potentially Occurring in the Study Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, CNPS LISTING	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES*	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Eriophyllum jepsonii</i> Jepson's woolly sunflower	None CEQA 4.3	Occurs occasionally on serpentine sites in chaparral, cismontane woodland, and coastal scrub between 200 and 1025 meters in elevation. Known from ALA, CCA, KRN, MNT, SBT, SCL, STA, and VEN counties.	April-June subshrub	No suitable vegetation associations or substrates are present.	None
<i>Eryngium spinosepalum</i> spiny-sepaled button-celery	None CEQA 1B.2	Occurs in valley and foothill grassland and vernal pools between 80 and 975 meters in elevation. Known from CCA, FRE, KRN, MAD, MER, SLO, STA, TUL, and TUO counties.	April-June annual/perennial herb	Although suitable vegetation associations are present, vernal pool hydrology is absent. The nearest CNDDDB occurrence (EONDX 92244, from 2007) is from 12.5 miles northeast of the study area, near Byron Airport.	Not Expected
<i>Eschscholzia rhombipetala</i> diamond-petaled California poppy	None CEQA 1B.1	Occurs on alkaline and clay soils in valley and foothill grassland between 0 and 975 meters in elevation. Known from ALA, SJQ, SLO counties. Presumed extirpated from CCA, COL and STA counties.	March-April annual herb	Suitable vegetation associations and substrates present. The nearest CNDDDB occurrence (EONDX 96884, from 2015) is from 12 miles northeast of the study area, near Bethany Reservoir.	Not Observed Would have been detectable during the 2018 protocol-level surveys
<i>Extriplex joaquinana</i> San Joaquin spearscale	None CEQA 1B.2	Occurs in alkaline soils in chenopod scrub, meadows and seeps, playas and valley and foothill grasslands between 1 and 835 meters in elevation. Known from ALA, CCA, COL, FRE, GLE, MER, MNT, NAP, SBT, SOL and YOL counties. Presumed extirpated from SCL, SJQ and TUL counties.	April-October annual herb	Although suitable vegetation associations are present, the preferred alkaline substrate is absent. There are several CNDDDB occurrences near the study area, with the nearest (EONDX 6756, from 2006) being about 2 miles north, near the Doolan Canyon.	Not Expected
<i>Fritillaria agrestis</i> stinkbells	None CEQA 4.2	Occurs on clay, sometimes serpentine soils, in chaparral, cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland between 10 and 1555 meters in elevation. Known from ALA, CCA, FRE, KRN, MEN, MER, MNT, MPA, PLA, SAC, SBA, SBT, SCL, SLO, STA, TUO, VEN and YUB counties. Presumed extirpated from SCR and SMT counties.	March-June perennial bulbiferous herb	Suitable vegetation associations and substrates present. The nearest CNDDDB occurrence (EONDX 6292, from 1992) is 4 miles northeast of the study area, about 0.6 miles west of Vasco road.	Not Observed Would have been detectable during the 2018 protocol-level surveys
<i>Fritillaria liliacea</i> Fragrant fritillary	None CEQA 1B.2	Occurs on clay or serpentine sites in cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland near the coast between 3-410 meters. Known from ALA, CCA, MNT, MRN, SBT, SCL, SFO, SMT, SOL and SON counties.	February-April perennial herb (bulbiferous)	Although suitable vegetation associations are present this taxon does not occur east of Mount Diablo as it is associated with the coastal fog incursion zone and the study areas is beyond this zone. The nearest CNDDDB occurrence (EONDX 94652) is a historical, nonspecific point 15.5 miles northwest of the study area, near Danville.	Not expected

Appendix B Special-Status Plant Species Known to Occur or Potentially Occurring in the Study Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, CNPS LISTING	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES*	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Helianthella castanea</i> Diablo helianthella	None CEQA 1B.2	Occurs in broadleaved upland forest, chaparral cismontane woodland, coastal scrub, riparian woodland, and valley and foothill grassland between 60-1,300. Known from ALA, CCA, and SMT counties. Presumed extirpated from MRN and SFO counties.	March-June perennial herb	Although suitable vegetation associations are present this taxon has never been recorded from the Livermore Valley and it prefers the ecotone forest, chaparral, woodland, and/or grassland, which does not occur in the study area. The nearest CNDDDB occurrence (EONDY 851, from 1988) is 6.4 miles northeast of the study area, near Los Vaqueros Reservoir.	Not Expected
<i>Hesperovax caulescens</i> hogwallow starfish	None CEQA 4.2	Occurs sometimes on alkaline soils in mesic valley and foothill grassland and shallow vernal pools between 0 and 505 meters in elevation. Known from ALA, AMA, BUT, CCA, COL, FRE, GLE, KRN, MER, MNT, SAC, SJQ, SLO, SOL, STA, SUT, THE, and YOL counties. Presumed extirpated from NAP and SDG counties.	March-June annual herb	Although suitable vegetation associations are present the preferred alkaline substrates are absent. The closest herbarium record is a Hoover collection (Accession# UC766278) from the east side of Altamont Pass.	Not expected
<i>Hesperolinon breweri</i> Brewer's western flax	None CEQA 1B.2	Occurs often in serpentine soils in chaparral, cismontane woodland and valley and foothill grassland. Known from CCA, NAP and SOL counties between 30 and 945 meters in elevation.	May-July annual herb	Although suitable vegetation associations are present this taxon has never been recorded from the Livermore Valley and it prefers the ecotone of chaparral, woodland, and/or grassland, which does not occur in the study area. The nearest CNDDDB occurrence (EONDY 9470, from 1988) is 6.5 miles north of the study area, near Morgan Territory Rd.	Not Expected
<i>Legenere limosa</i> legenere	None CEQA 1B.1	Occurs in vernal pools between 1 and 880 meters. Known from ALA, LAK, MNT, NAP, PLA, SAC, SCL, SHA, SJQ, SMT, SOL, SON, TEH and YUB counties; presumed extirpated from STA county.	April-June annual herb	No suitable vegetation associations or substrates are present.	None
<i>Leptosiphon acicularis</i> bristly leptosiphon	None CEQA 4.2	Occurs in chaparral, cismontane woodland, coastal prairie, and valley and foothill grassland between 55 and 1500 meters. Known from ALA, BUT, FRE, HUM, LAK, MEN, MRN, NAP, SCL, SMT, and SON counties.	April-July annual herb	Although suitable vegetation associations are present this species has only been recorded west of the Oakland/Berkeley Hills in the East Bay counties. The closest herbarium record is an Ertter collection (Accession# UC2014597) from Pleasanton Ridge.	Not Expected

Appendix B Special-Status Plant Species Known to Occur or Potentially Occurring in the Study Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, CNPS LISTING	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES*	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Leptosiphon ambiguus</i> serpentine leptosiphon	None CEQA 4.2	Occurs often in serpentine soils in cismontane woodland, coastal scrub, and valley and foothill grassland between 120 and 1,130 meters. Known from ALA, CCA, MER, SBT, SCL, SCR, SJQ, SMT, and STA counties.	March-June annual herb	Although suitable vegetation associations are present, this species prefers serpentine habitat and has never been recorded from the Livermore Valley. The closest herbarium record is an Ertter collection (Accession# RSA721361) from Rancho Los Mochos Boy Scout Camp.	Not Expected
<i>Leptosyne hamiltonii</i> Mt. Hamilton coreopsis	None CEQA 1B.2	Occurs in rocky soils in cismontane woodland between 550 and 1300 meters. Known from ALA, SCL, and STA counties.	March-May annual herb	No suitable vegetation associations or substrates are present.	None
<i>Malacothamnus hallii</i> Hall's bush-mallow	None CEQA 1B.2	Occurs in chaparral and coastal scrub between 10 and 760 meters in elevation. Known from CCA, MER, SCL, SMT, and STA counties.	May-October perennial evergreen shrub	No suitable vegetation associations or substrates are present.	None
<i>Monardella antonina</i> subsp. <i>antonina</i> San Antonio Hills monardella	None CEQA 3	Occurs in chaparral and cismontane woodland from 320-1000 meters. Known from MNT and FRE, possibly ALA, CCA, SCL and SBT counties. This taxon is no longer recognized in TJM2, it has been synonymized with <i>Monardella villosa</i> subsp. <i>villosa</i>	June-August perennial rhizomatous herb	No suitable vegetation associations or substrates are present.	None
<i>Monolopia gracilens</i> woodland woollythreads	None CEQA 1B.2	Occurs on serpentine soil in broadleaved upland forest, chaparral, cismontane woodland, North Coast coniferous forest, and valley and foothill grassland between 100 and 1200 meters in elevation. Known from ALA, CCA, MNT, SBT, SCL, SCR, SLO, and SMT counties.	February-July annual herb	Although suitable vegetation associations are present this species is a fire follower and the study areas have not burned within the last five years. The nearest CNDDDB occurrence (EONDX 80189, from 1935) is 13.8 miles northwest of the study area, from Mt. Diablo State Park.	Not expected
<i>Myosurus minimus</i> subsp. <i>apus</i> little mouse-tail	None CEQA 3.1	Occurs in valley and foothill grassland and alkaline vernal pools between 20 and 640 meters. Known from ALA, CCA, COL, LAK, MER, RIV, SBD, SDG, SOL, TUL, and YOL counties.	March-June annual herb	Although suitable vegetation associations are present the preferred hydrology is absent. The closest herbarium record is a Greenhouse collection (Accession# JEPS107030) from Springtown Wetland Preserve.	Not Expected
<i>Navarretia nigelliformis</i> subsp. <i>nigelliformis</i> adobe navarretia	None CEQA 4.2	Occurs in clay, sometimes serpentine soils in valley and foothill grassland and vernal pools between 100 and 1000 meters. Known from ALA, BUT, CCA, COL, FRE, KRN, MER, MNT, PLA, SUT, and TUL counties.	April-June annual herb	Suitable vegetation associations and substrates present. The closest herbarium record is a Gowen collection (Accession# JEPS116990) from the west end of Horse Valley.	Not Observed Would have been detectable during the 2018 protocol-level surveys

Appendix B Special-Status Plant Species Known to Occur or Potentially Occurring in the Study Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, CNPS LISTING	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES*	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Navarretia nigelliformis</i> subsp. <i>radians</i> shining navarretia	None CEQA 1B.2	Occurs in clay soils in cismontane woodland, valley and foothill grassland and vernal pools between 76 and 1000 meters. Known from ALA, CCA, COL, FRE, MAD, MER, MNT, SBT, SJQ and SLO counties.	April-July annual herb	Suitable vegetation associations and substrates present. The nearest CNDDB occurrence (EONDX 12242, from 2010) is 12.7 miles northwest of the study area on north side of Fossil Ridge.	Not Observed Would have been detectable during the 2018 protocol-level surveys
<i>Navarretia prostrata</i> prostrate vernal pool navarretia	None CEQA 1B.1	Occurs in mesic soils in coastal scrub, meadows and seeps, alkaline valley and foothill grassland, and vernal pools between 3 and 1210 meters. Known from ALA, FRE, LAX, MER, MNT, ORA, SBT, SCL, SDG, and SLO counties.	April-July annual herb	Suitable vegetation associations and substrates present. The nearest CNDDB occurrence (EONDX 84401, from 2010) is 3 miles west of the study area, near Dublin.	Not Observed Would have been detectable during the 2018 protocol-level surveys
<i>Phacelia phacelioides</i> Mt. Diablo phacelia	None CEQA 1B.2	Occurs on rocky substrates in chaparral and cismontane woodland counties between 500-1,370 meters. Known from CCA, SBT, SCL, and STA. This taxon is a fire-follower.	April-May annual herb	No suitable vegetation associations or substrates are present.	None
<i>Plagiobothrys glaber</i> Hairless popcorn flower	None CEQA 1A	Occurs in alkaline meadows and seeps and coastal salt marshes and swamps between 15 and 180 meters. Presumed extirpated from ALA, MRN, SBT, and SCL counties- last confirmed sighting in 1954.	March-May annual herb	No suitable vegetation associations or substrates are present.	None
<i>Polemonium carneum</i> Oregon polemonium	None CEQA 2B.2	Occurs in coastal prairie, coastal scrub, and lower montane coniferous forest between 0 and 1830 meters. Known from ALA, DNT, HUM, MRN, SFO, SMT, SIS, and SON counties.	April-September perennial herb	No suitable vegetation associations or substrates are present.	None
<i>Puccinellia simplex</i> California alkali grass	None CEQA 1B.2	Occurs in alkaline and vernal mesic soils, sinks, flats and lake margins in chenopod scrub, meadows and seeps, valley and foothill grassland and vernal pools between 2 and 930 meters in elevation. Known from ALA, BUT, CCA, COL, FRE, GLE, KRN, LAK, LAX, MAD, MER, NAP, SBD, SCL, SCR, SLO, SOL, STA, TUL, and YOL counties. Presumed extirpated from KNG county.	March-May annual herb	Although suitable vegetation associations and present the preferred substrate and hydrology are absent. The closest herbarium record is a Jensen collection (Accession# UCD92246) near the town of Altamont.	Not Expected
<i>Senecio aphanactis</i> rayless ragwort	None CEQA 2.2	Occurs on alkaline soils in coastal scrub, chaparral, and cismontane woodland between 15-800 meters. Known from ALA, CCA, FRE, LAX, MER, MNT, ORA, RIV, SBA, SCL, SCT, SCZ, SDG, SLO, SOL, SRO, and VEN counties.	January-April annual herb	No suitable vegetation associations or substrates are present.	None

Appendix B Special-Status Plant Species Known to Occur or Potentially Occurring in the Study Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, CNPS LISTING	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES*	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Streptanthus albidus</i> subsp. <i>peramoenus</i> most beautiful jewelflower	None CEQA 1B.2	Occurs on serpentine soils in chaparral, cismontane woodland, and valley and foothill grassland from 95-1,000 meters elevation. Known from ALA, CCA, MNT, SCL and SLO counties. This species is no longer recognized in TJM2, as it has been synonymized with <i>Streptanthus glandulosus</i> subsp. <i>glandulosus</i>	March-October annual herb	Although suitable vegetation associations are present the preferred serpentine substrate is absent. This species has also never been recorded as occurring in Livermore Valley. The nearest CNDDDB occurrence (EONDX 2886, from 2009) is 12.8 miles south of the study area, 13 miles northwest of the study area, in Sunol Regional Wilderness Area.	Not Expected
<i>Streptanthus hispidus</i> Mt. Diablo jewelflower	None CEQA 1B.3	Occurs in rocky soils in chaparral and valley and foothill grassland between 365 and 1200 meters in elevation. Known from CCA county.	March-June annual herb	Although suitable vegetation associations are present the preferred rocky substrate is absent. This species has also never been recorded as occurring in Livermore Valley. It is also a strict endemic to Mount Diablo. The nearest CNDDDB occurrence (EONDX 4878, from 2010) is 14.5 miles northwest of the study area, at Mount Diablo.	Not Expected
<i>Stuckenia filiformis</i> subsp. <i>alpina</i> slender-leaved pondweed	None CEQA 2B.2	Occurs in assorted shallow freshwater marshes and swamps from 300-2,150 meters elevation. Known from ALA, BUT, CCA, ELD, LAS, MER, MNO, MOD, MPA, NEV, PLA, SCL, SHA, SIE, SMT, SOL, and SON counties.	May-July perennial rhizomatous herb	No suitable vegetation associations or substrates are present.	None
<i>Trifolium hydrophilum</i> saline clover	None CEQA 1B.2	Occurs in marshes and swamps, alkaline and mesic valley and foothill grassland, and vernal pools between 0 and 300 meters. Known from ALA, CCA, LAK, MNT, NAP, SAC, SBT, SCL, SCR, SJQ, SLO, SMT, SOL, SON, and YOL counties.	April-June annual herb	No suitable vegetation associations or substrates are present.	None
<i>Triquetrella californica</i> coastal triquetrella	None CEQA 1B.2	Occurs on soil in coastal bluff scrub and coastal scrub between 10-100 meters. Known from CA, DNT, MEN, MRN, SDG, SFO, SMT, and SON counties.	Moss wet season	No suitable vegetation associations or substrates are present.	None

Appendix B Special-Status Plant Species Known to Occur or Potentially Occurring in the Study Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, CNPS LISTING	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES*	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Tropidocarpum capparideum</i> caper-fruited trepidocarpum	None CEQA 1B.1	Occurs on alkaline sites in valley and foothill grassland between 1-455 meters elevation. Known from FRE, MNT, and SLO counties. Presumed extirpated from ALA, CCA, GLE, SCL, SJQ counties.	March-April annual herb	Although suitable vegetation associations are present, the preferred alkaline substrate is absent. The nearest CNDDDB occurrence (EONDX 31866) is a historical, nonspecific point mapped as 4 miles east of the study area.	Not Expected
<i>Viburnum ellipticum</i> oval-leaved viburnum	None CEQA 2B.3	Occurs on chaparral, cismontane woodland, and lower montane coniferous forest between 215-1,400 meters. Known from CCA, FRE, ELD, GLE, HUM, MEN, NAP, SHA, and SON counties.	May-June shrub (deciduous)	No suitable vegetation associations or substrates are present.	None

¹Explanation of State and Federal Listing Codes and HCP/NCCP Coverage

Federal listing codes:

FE Federally listed as Endangered
 FT Federally listed as Threatened
 FPE Federally proposed for listing as Endangered

FPT Federally proposed for listing as Threatened
 FPD Federally proposed for delisting
 FC Federal candidate species (former Category 1 candidates)
 SC Species of Concern – No longer maintained by USFWS
 SLC Species of local concern or conservation importance – No longer maintained by USFWS

California Native Plant Society Threat Codes:

.1 Seriously Endangered in California (over 80% of occurrences Threatened / high degree and immediacy of threat)
 .2 Fairly Endangered in California (20-80% occurrences Threatened)
 .3 Not very Endangered in California (<20% of occurrences Threatened or no current threats known)

*Notes: CNPS List 1A and some List 3 plant species lacking any threat information receive no threat code extension.
 CNPS R-E-D Codes have been discontinued*

California listing codes:

SE State listed as Endangered
 ST State listed as Threatened
 SR State listed as Rare

SCE State candidate for listing as Endangered
 SCT State candidate for listing as Threatened

California Rare Plant Ranks:

1A Presumed extinct in California
 1B Rare or Endangered in California and elsewhere
 2 Rare or Endangered in California, more common elsewhere
 3 Plants for which we need more information - Review list
 4 Plants of limited distribution - Watch list

Survey Recommendation Determinations Based On

- Observed phenology at the time of reconnaissance
- Seasonal weather patterns
- Collection dates of herbarium specimens
- Blooming times given by the CNPS Inventory

EONDX # is the CNDDDB Element Occurrence Index Number which corresponds to unique records in the California Natural Diversity Database (CDFW 2018d).

Abbreviations

Appendix B Special-Status Species Known to Occur or Potentially Occurring in the Study Area

AMA Amador
BUT Butte
CAL Calaveras
CCA Contra Costa
CNDDB CA Natural Diversity Database
CNPS CA Native Plant Society
COL Colusa
DNT Del Norte
ELD El Dorado
FRE Fresno
GLE Glenn
HUM Humboldt
KRN Kern
LAK Lake
LAS Lassen
LAX Los Angeles
LCP Local Coastal Plan
MAD Madera
MOD Modoc
MEN Mendocino

MER Merced
MNT Monterey
MPA Mariposa
MRN Marin
NAP Napa
NEV Nevada
ORA Orange
PLA Placer
PLU Plumas
RIV Riverside
SAC Sacramento
SBA Santa Barbara
SBD San Bernardino
SBT San Benito
SCL Santa Clara
SCR Santa Cruz
SCT Santa Catalina Island
SCZ Santa Cruz Island
SDG San Diego
SFO San Francisco

SHA Shasta
SIE Sierra
SIS Siskiyou
SJQ San Joaquin
SMI San Miguel Island
SMT San Mateo
SNI San Nicolas Island
SOL Solano
SON Sonoma
SRO Santa Rosa Island
TEH Tehama
TJM The Jepson Manual
TJMII The Jepson Manual, 2nd. Ed.
TRI Trinity
TUL Tulare
VEN Ventura
YOL Yolo
YUB Yuba

APPENDIX C PLANT SPECIES OBSERVED ON SITE

SPECIES NAME	COMMON NAME	ORIGIN	COLLECTION	LOCALLY RARE	CAL-IPC RATING	CDFR RATING
EUDICOTS						
Apiaceae – Carrot Family						
<i>Apium graveolens</i>	Celery	Non-Native	---	---	---	---
<i>Conium maculatum</i>	poison hemlock	Non-Native	---	---	Moderate	---
<i>Foeniculum vulgare</i>	fennel	Non-Native	---	---	High	---
Asteraceae – Sunflower Family						
<i>Artemisia douglasiana</i>	mugwort	Native	---	---	---	---
<i>Baccharis pilularis</i> subsp. <i>consanguinea</i>	coyote brush	Native	---	---	---	---
<i>Carduus pycnocephalus</i> subsp. <i>pycnocephalus</i>	Italian thistle	Non-Native	---	---	Moderate	On List
<i>Carduus tenuiflorus</i>	slender flowered thistle	Non-Native	---	---	Limited	On List
<i>Centaurea melitensis</i>	toalote	Non-Native	---	---	Moderate	---
<i>Centaurea solstitialis</i>	yellow star thistle	Non-Native	---	---	High	On List
<i>Cirsium vulgare</i>	bull thistle	Non-Native	---	---	Moderate	On List
<i>Dittrichia graveolens</i>	dittrichia	Non-Native	---	---	Moderate	---
<i>Erigeron canadensis</i>	horseweed	Native	---	---	---	---
<i>Grindelia camporum</i>	Great Valley gumweed	Native	---	---	---	---
<i>Helminthotheca echioides</i>	bristly ox-tongue	Non-Native	---	---	Limited	---
<i>Hypochaeris glabra</i>	smooth cat's ear	Non-Native	---	---	Limited	---
<i>Lactuca serriola</i>	prickly lettuce	Non-Native	---	---	---	---
<i>Lagophylla ramosissima</i>	hare's ear	Native	---	---	---	---
<i>Silybum marianum</i>	milk-thistle	Non-Native	---	---	Limited	---
<i>Sonchus asper</i> subsp. <i>asper</i>	prickly sowthistle	Non-Native	---	---	---	---
<i>Sonchus oleraceus</i>	common sowthistle	Non-Native	---	---	---	---
<i>Xanthium strumarium</i>	cocklebur	Non-Native	---	---	---	---
Boraginaceae – Borage Family						
<i>Heliotropium curassavicum</i> var. <i>oculatum</i>	salt heliotrope	Native	---	---	---	---
Brassicaceae – Mustard Family						
<i>Brassica nigra</i>	black mustard	Non-Native	---	---	Moderate	---

SPECIES NAME	COMMON NAME	ORIGIN	COLLECTION	LOCALLY RARE	CAL-IPC RATING	CDEFA RATING
<i>Hirschfeldia incana</i>	hoary mustard	Non-Native	---	---	Moderate	---
<i>Lepidium latifolium</i>	broadleaf peppergrass	Non-Native	---	---	High	On List
<i>Nasturtium officinale</i>	water cress	Native	---	---	---	---
<i>Raphanus sativus</i>	wild radish	Non-Native	---	---	---	---
<i>Sinapis arvensis</i>	charlock	Native	---	---	Limited	---
Chenopodiaceae – Goosefoot Family						
<i>Chenopodium album</i>	lamb's quarters	Non-Native	---	---	---	---
Convolvulaceae – Morning Glory Family						
<i>Convolvulus arvensis</i>	bindweed	Non-Native	---	---	---	On List
Crassulaceae – Stonecrop Family						
<i>Crassula connata</i>	pygmy weed	Native	---	---	---	---
Fabaceae – Legume Family						
<i>Lotus corniculatus</i>	birdfoot trefoil	Non-Native	---	---	---	---
<i>Lupinus succulentus</i>	succulent lupine	Native	---	---	---	---
<i>Melilotus albus</i>	white sweet clover	Non-Native	---	---	---	---
<i>Melilotus indicus</i>	sourclover	Non-Native	---	---	---	---
<i>Trifolium hirtum</i>	rose clover	Non-Native	---	---	Moderate	---
<i>Vicia villosa</i> subsp. <i>varia</i>	smooth vetch	Non-Native	---	---	---	---
Fagaceae – Oak Family						
<i>Quercus lobata</i>	valley oak	Native	---	---	---	---
Geraniaceae – Geranium Family						
<i>Erodium brachycarpum</i>	foothill filaree	Non-Native	---	---	---	---
<i>Erodium cicutarium</i>	red-stemmed filaree	Non-Native	---	---	Limited	---
<i>Erodium moschatum</i>	white-stem filaree	Non-Native	---	---	---	---
<i>Geranium dissectum</i>	cut-leaf geranium	Non-Native	---	---	Moderate	---
Juglandaceae – Walnut Family						
<i>Juglans hindsii</i> (waif)	Northern California black walnut	Native	---	---	---	---
Lythraceae – Loosestrife Family						
<i>Lythrum hyssopifolia</i>	hyssop loosestrife	Non-Native	---	---	Limited	---
Malvaceae – Mallow Family						
<i>Malvella leprosa</i>	alkali mallow	Native	---	---	---	---
Myrtaceae – Myrtle Family						

SPECIES NAME	COMMON NAME	ORIGIN	COLLECTION	LOCALLY RARE	CAL-IPC RATING	CDEFA RATING
<i>Eucalyptus globulus</i>	bluegum	Non-Native	---	---	Moderate	---
Onagraceae – Evening Primrose Family						
<i>Epilobium brachycarpum</i>	tall annual willow-herb	Native	---	---	---	---
Papaveraceae – Poppy Family						
<i>Eschscholzia californica</i>	California poppy	Native	---	---	---	---
Plantaginaceae – Poppy Family						
<i>Plantago lanceolata</i>	English plantain	Non-Native	---	---	Limited	---
Polygonaceae – Buckwheat Family						
<i>Rumex crispus</i>	curly dock	Non-Native	---	---	Limited	---
<i>Rumex pulcher</i>	fiddle dock	Non-Native	---	---	---	---
Rubiaceae – Madder Family						
<i>Galium aparine</i>	bedstraw	Native	---	---	---	---
Salicaceae – Willow						
<i>Salix laevigata</i>	red willow	Native	---	---	---	---
Saururaceae – Lizard's Tail Family						
<i>Anemopsis californica</i>	yerba mansa	Native	---	---	---	---
Solanaceae – Nightshade Family						
<i>Nicotiana glauca</i>	tree tobacco	Non-Native	---	---	Moderate	---
Urticaceae – Nettle Family						
<i>Urtica dioica</i>	stinging nettle	Native	---	---	---	---
Verbenaceae – Vervain Family						
<i>Phyla nodiflora</i>	common lippia	Native	---	A1	---	---
MONOCOTS						
Agavaceae – Agave Family						
<i>Chlorogalum pomeridianum</i> var. <i>pomeridianum</i>	soap plant	Native	---	---	---	---
Arecaceae – Palm Family						
<i>Washingtonia robusta</i>	Mexican fan palm	Non-Native	---	---	Moderate	---
Cyperaceae – Sedge Family						
<i>Cyperus eragrostis</i>	tall flatsedge	Native	---	---	---	---
<i>Schoenoplectus acutus</i> var. <i>occidentalis</i>	common tule	Native	---	---	---	---
<i>Schoenoplectus americanus</i>	chairmaker's bulrush	Native	---	---	---	---
Iridaceae – Iris Family						

SPECIES NAME	COMMON NAME	ORIGIN	COLLECTION	LOCALLY RARE	CAL-IPC RATING	CDFA RATING
<i>Sisyrinchium bellum</i>	blue-eyed grass	Native	---	---	---	---
Poaceae – Grass Family						
<i>Avena barbata</i>	slender oats	Non-Native	---	---	Moderate	---
<i>Bromus carinatus</i> var. <i>carinatus</i>	California brome	Native	---	---	---	---
<i>Bromus diandrus</i>	ripgut brome	Non-Native	---	---	Moderate	---
<i>Bromus hordeaceus</i>	soft chess	Non-Native	---	---	Limited	---
<i>Bromus madritensis</i> subsp. <i>rubens</i>	foxtail chess	Non-Native	---	---	High	---
<i>Dactylis glomerata</i>	orchard grass	Non-Native	---	---	Limited	---
<i>Distichlis spicata</i>	saltgrass	Native	---	---	---	---
<i>Elymus glaucus</i> subsp. <i>glaucus</i>	blue wildrye	Native	---	---	---	---
<i>Elymus triticoides</i>	creeping wildrye	Native	---	---	---	---
<i>Festuca arundinacea</i>	tall fescue	Non-Native	---	---	Moderate	---
<i>Festuca perennis</i>	Italian ryegrass	Non-Native	---	---	Moderate	---
<i>Hordeum murinum</i> subsp. <i>leporinum</i>	hare barley	Non-Native	---	---	Moderate	---
<i>Phalaris aquatica</i>	Harding grass	Non-Native	---	---	Moderate	---
<i>Polypogon monspeliensis</i>	rabbitsfoot grass	Non-Native	---	---	Limited	---
Typhaceae – Cattail Family						
<i>Typha latifolia</i>	broad-leaf cattail	Native	---	---	---	---

Appendix D.4

D915 Rare Plant Survey Report

2018 Rare Plant Survey Report
for the
Line 114 ID-103-1 and 2 Project



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

&
Stantec
555 Capitol Mall Suite 650
Sacramento CA 95814-4583

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

March 2019

Introduction

This document describes the environmental conditions, methods, and results of botanical surveys conducted by Swaim Biological Incorporated (SBI) at the Pacific Gas & Electric Company Line 114 ID-103-1 and 2 Project in Livermore, CA. Surveys were floristic and conducted in March, May, and July 2018, within the blooming periods of special-status plant species with potential to occur.

Federally- and state-endangered species with potential to occur included Contra Costa goldfields (*Lasthenia conjugens*) (FE/CRPR 1B.1), which has a blooming period between March and June; palmate-bracted bird's beak (*Chloropyron palmatum*) (FE/CE/CRPR 1B.1), which has a blooming period between May and October; and Livermore tarplant (*Deinandra bacigalupi*) (CE), which has a blooming period between June and October.

Livermore tarplant and the CRPR List 1B.2 plant brittlescale (*Atriplex depressa*) were observed within the survey area. Three California Department of Fish and Wildlife-designated Sensitive Natural Communities also were present in the survey area: Needle Grass - Melic Grass Grassland, Alkali Heath Marsh, and Salt Grass Flats. Other CRPR species that were determined to have the potential to occur in the survey area are listed in **Appendix A**.

Survey Areas

The survey area is in northern Livermore, Alameda County, CA (**Figure 1**). It includes the existing Dalton Crossover Station valve lot on the corner of Ames St. and Raymond Rd. in Livermore, CA and the transmission corridor right-of-way (ROW) north of the valve lot, measuring approximately 100 feet wide and extending to the fence line approximately 0.44-mile distant (**Figure 2**). A larger area was surveyed for Survey 1 (**Figure 3**) but in subsequent survey was reduced to the 100-foot ROW at the landowner's request. The Survey 1 area includes the area shown in Figure 2 as well as an approximately 500-foot-wide corridor extending to the northern fence line, plus the east-west dirt roadway paralleling the fence line and a 25-foot buffer on the south side of the road, plus an approximately 20-foot by 100-foot seasonal wetland along the dirt roadway. Survey 1 was conducted in March 2018 while Surveys 2 and 3 were conducted in May and July.

Environmental Setting

The survey area is in the Altamont 7.5-minute U.S. Geological Survey quadrangle, north of Interstate 580 at the border between the northeastern edge of the Livermore Valley and the western edge of the foothills of the Diablo Range. Land use consists mainly of cattle grazing. The surrounding quadrangles are identified in **Table 1**.

Table 1. Quadrangles Included in CNPS Database Search

Tassajara	Byron Hot Springs	Clifton Court Forebay
Livermore	Altamont	Midway
La Costa Valley	Mendenhall Springs	Cedar Mountain

Topography and Hydrology

The topography of the survey area and immediate surrounding vicinity is low hills and narrow, shallow valleys that spread out into the larger Livermore Valley at the southwestern end of the survey area. Springtown Preserve and Alkali Sink is located southwest across Ames Street from the survey area. Although there are some similarities in soil types and alkali-dominated vegetation, the survey area is at a higher elevation than Springtown, and is not part of the alkali sink ecosystem. However it is part of the Altamont Creek Watershed uplands, through which rainwater passes and flows into Springtown as surface runoff (Friends of Springtown Preserve 2013). Elevations in the survey area range from approximately 500 feet to 715 feet.

Soil

Four soil types occur (USDA 2018) in the survey area shown in Figure 3:

1. *Altamont clay, 15 to 30 percent slopes, MLRA 15 (AaD)*—consists of well drained upland soils that occur on hillslopes.
2. *Gaviota rocky sandy loam, 5 to 40 percent slopes, eroded (GaE2)*—consists of somewhat excessively drained upland soils that occur on hillslopes (at higher elevations than Sf).
3. *Positas gravelly loam (PoC2)*—consists of well drained non-saline upland soils derived from sandstone and shale and found at the toeslopes of fluvial terraces.
4. *Solano fine sandy loam (Sf)*—consists of somewhat poorly drained saline-alkali soils derived from sandstone and shale and found at the toeslopes of fluvial terraces.

Vegetation Communities

Vegetation communities are described according to California's expression of the National Vegetation Classification System, developed and maintained by the California Department of Fish and Wildlife (CDFW). Four vegetation communities/alliances occur in the survey area. With the exception of Annual Brome Grassland, all are CDFW Sensitive Natural Communities (CDFW, 2018c).

1. *Annual brome grassland*—found in the majority of the survey area and access path. Dominated by ripgut brome (*Bromus diandrus*), foxtail barley (*Hordeum murinum*), slender wild oat (*Avena barbata*), and red-stemmed filaree (*Erodium cicutarium*). Relatively few native forbs are present except for the eastern revegetation area that was sprayed with a native seed mix during restoration of the Dalton Crossover Valve Automation Project.
2. *Needle grass - melic grass grassland*—stand of purple needlegrass (*Stipa pulchra*=*Nassella pulchra*) found in the transmission corridor right-of-way. Growing in a large stand among the annual brome grassland. May have been included in revegetation hydroseeding for past PG&E project.
3. *Alkali heath marsh*—seasonal wetland in the swale between the Dalton Crossover valve lot and the first transmission tower, and in the swale between the first and second transmission towers. Dominated by Baltic rush (*Juncus balticus*), saltgrass (*Distichlis spicata*), and alkali heath (*Frankenia salina*).
4. *Salt grass flats*—found in the transition zone between the seasonal alkali wetland and the annual brome grassland. Dominated by saltgrass (*Distichlis spicata*) and alkali heath (*Frankenia salina*). Other species include sand spurry (*Spergularia media*) and alkali plagiobothrys (*Plagiobothrys leptocladus*).

Methods

In addition to aligning vegetation community descriptions with California’s expression of the National Vegetation Classification System, methods were aligned mid-year with the new rare plant survey protocol issued by CDFW in March 2018 (CDFW, 2018a). In June 2018, our survey methods began to incorporate the additional items identified by the new protocol and to systematically structure the survey results accordingly. Methods also generally followed protocols described in prior botanical survey guidelines: California Department of Fish and Game (2009), the U.S. Fish and Wildlife Service (USFWS; 2000), and the California Native Plant Society (CNPS; 2001).

Background Research

Prior to the rare plant surveys, research was conducted to identify special-status plant species with potential to occur in the study area. Sources consulted included SBI’s rare plant survey reports for the L-303 SCDDA Digs Project (2018, 2017, 2016) and Dalton Station Valve Automation Project (2014); CNDDDB (CDFW 2018b); USFWS official species list (USFWS 2018); CNPS quadrangle search (CNPS 2018), and Springtown Preserve’s plant list (Friends of Springtown Preserve 2013).

The CNPS 9-quadrangle search listed 62 special-status* plant species that are known to occur within the general vicinity of the project area. This list was further refined by restricting the search results to plants that occur within or overlapping an elevation range above 500 feet and below 715 feet, which is representative of the elevation range of the survey area. This reduced the list to 48 special-status plants (Appendix A). By comparing geographic range and habitat preferences for each species with the geographic location, habitat types, and soil types found within the survey area, 26 special-status plant species were identified to have a potential to occur in the survey area, shown in Table 2. Three rounds of surveys were deemed necessary—in March, May, and July—to account for the blooming periods of the target species.

Table 2. FESA, CESA, CR, and/or CRPR List 1 & 2[†] Plants with Potential to Occur in the Survey Area

Scientific Name	Common Name	Status [†]	Bloom Period												Occurrence Potential
			J	F	M	A	M	J	J	A	S	O	N	D	
<i>Amsinckia grandiflora</i>	large-flowered fiddleneck	SE, FE, 1B.1													Low
<i>Astragalus tener</i> var. <i>tener</i>	alkali milk-vetch	1B.2													Low
<i>Atriplex cordulata</i> var. <i>cordulata</i>	heartscale	1B.2													Moderate
<i>Atriplex coronata</i> var. <i>vallicola</i>	Lost Hills crownscale	1B.2													Low

[†] FESA=Federal Endangered Species Act; CESA=California Endangered Species Act; CR=California Rare; CRPR=California Rare Plant Rank 1&2

*Special-status plants are defined as 1) plant species that are listed as state or federally threatened or endangered (including proposed and candidate species); and/or 2) plants with a California Rare Plant Rank (CRPR) of 1A, 1B, 2A or 2B, as defined by the California Native Plant Society (www.rareplants.cnps.org/glossary.html#lists). CRPR 3 and 4 plants were not included.

Scientific Name	Common Name	Status [‡]	Bloom Period												Occurrence Potential
			J	F	M	A	M	J	J	A	S	O	N	D	
<i>Atriplex depressa</i>	brittlescale	1B.2													PRESENT
<i>Atriplex minuscula</i>	lesser saltscale	1B.1													Low
<i>Balsamorhiza macrolepis</i>	big-scale balsamroot	1B.2													Moderate
<i>Blepharizonia plumosa</i>	big tarplant	1B.1													Low
<i>Centromadia parryi</i> ssp. <i>Congdonii</i>	Congdon's tarplant	1B.1													Low
<i>Chloropyron molle</i> ssp. <i>hispidum</i>	hispid bird's-beak	1B.1													Moderate
<i>Chloropyron palmatum</i>	palmate-bracted bird's-beak	SE, FE, 1B.1													High
<i>Deinandra bacigalupii</i>	Livermore tarplant	SE, 1B.1													PRESENT
<i>Delphinium recurvatum</i>	recurved larkspur	1B.2													Low
<i>Eryngium spinosepalum</i>	spiny-sealed button-celery	1B.2													Low
<i>Eschscholzia rhombipetala</i>	diamond-petaled California poppy	1B.1													Low
<i>Extriplex joaquinana</i>	San Joaquin spearscale	1B.2													Low
<i>Lasthenia conjugens</i>	Contra Costa goldfields	FE, 1B.1													High
<i>Legenere limosa</i>	legenere	1B.1													Low
<i>Madia radiata</i>	showy golden madia	1B.1													Low
<i>Navarretia nigelliformis</i> ssp. <i>radians</i>	shining navarretia	1B.2													Low
<i>Navarretia prostrata</i>	prostrate vernal pool navarretia	1B.1													Low
<i>Plagiobothrys glaber</i>	hairless popcornflower	1A													Low
<i>Puccinellia simplex</i>	California alkali grass	1B.2													High
<i>Spergularia macrotheca</i> var. <i>longistyla</i>	long-styled sand spurry	1B.2													High
<i>Trifolium hydrophilum</i>	saline clover	1B.2													High
<i>Tropidocarpum capparideum</i>	caper-fruited tropidocarpum	1B.1													Low

Dark shading = typical blooming period; lighter shading = occasional blooming period extension

Reference Site Visits and Herbarium Specimens

Off-site reference location visits were conducted in August 2018 after annual surveys were completed. However, in 2017 SBI Biologists Natasha Dvorak and Hailey Pexton visited known populations, and in 2016 SBI Biologists Sarah Willbrand and Natasha Dvorak visited known populations, of the following special-status plant species in **Table 3**.

Table 3. Reference Population Visits

Species	Location	Comments	Month/Year Observed
<i>Atriplex cordulata</i> var. <i>cordulata</i> Heartscale	Springtown Preserve	Growing on a dirt path near dry vernal pools.	May 2016
<i>Atriplex depressa</i> Brittlescale	Dalton Crossover Station	Growing on open rocky soil on the upper margins of dry vernal pools.	March 2016 July 2016 April 2017 July 2017 March 2018 May 2018 Aug 2018
	Springtown Preserve		March 2016 May 2016 July 2016 March 2017 Aug 2018
<i>Atriplex miniscula</i> Lesser saltscale	Springtown Preserve	Growing in small salt scalds.	March 2016 April 2017
<i>Blepharizonia plumosa</i> Big tarplant	Site 300	Growing in annual grassland slopes.	Sept 2016
	CCWD Mitigation		Sept 2017
<i>Chloropyron palmatum</i> Palmate-bracted bird's beak	Springtown Preserve	Growing in salt scalds/dry vernal pools and on the margins of grassland.	March 2016 May 2016 July 2016 March 2017 April 2017 Aug 2018
<i>Deinandra bacigalupii</i> Livermore tarplant	Dalton Crossover Station	Growing in alkali grassland and annual brome grassland.	May 2016 July 2016 April 2017 July 2017 Aug 2018
	Springtown Preserve		Aug 2018
<i>Extriplex joaquinana</i> San Joaquin spearscale	Springtown Preserve	In a large salt scald/dry vernal pool.	March 2016
<i>Navarretia prostrata</i> Prostrate vernal pool navarretia	Springtown Preserve	No <i>N. prostrata</i> were observed.	--

Rare Plant Surveys

On March 7[§] & 8, May 9, and July 16, 2018, SBI biologists N. Dvorak and H. Pexton, and Wood Biological botanist C. Rogers surveyed (**Table 4**) the proposed project area. The surveyors walked parallel transects spaced approximately 40 feet apart or less depending on the seasonal growth conditions affecting line-of-sight. All live plants were identified to the taxonomic level necessary to determine rarity and listing status. Dead plants were identified to the most specific taxonomic level possible.

Table 4. 2018 Survey Schedule

March 7&8	May 9	July 16
Completed	Completed	Completed
Target: Early Season Table 1 species	Target: Mid-season Table 1 species	Target: Late Season Table 1 Species Livermore tarplant Big tarplant

Survey Results

Two rare plant species and three Sensitive Natural Communities were observed in the survey area as shown in **Table 5**. Rare plant and Needle Grass—Melic Grass Grassland locations are shown on **Figures 4 and 5**. Alkali Heath Marsh and Salt Grass Flat community boundaries were not specifically delineated in the field but are shown generally on **Figure 5** based on 2013 delineated wetlands.

- Livermore tarplant (*Deinandra baccigalupii*; State Endangered, CRPR 1B.1)
- Brittscale (*Atriplex depressa*; CRPR 1B.2)
- CDFW Sensitive Natural Community: Needle Grass—Melic Grass Grassland
- CDFW Sensitive Natural Community: Alkali Heath Marsh
- CDFW Sensitive Natural Community: Salt Grass Flat

Livermore tarplant was observed in the annual brome grassland communities near the Dalton Substation entrance in May 2018 in an early growth stage; at that time, it was not detected in other onsite areas. By July 2018 it was observed in full bloom throughout the locations shown in Figures 4 and 5. Brittscale was observed in the seasonal alkali wetland and the alkali grassland communities during all three surveys, and the population continued to expand. Purple needle grass (*Stipa pulchra*) was observed in all three surveys and had prominent inflorescences in May and July 2018. Alkali heath (*Frankenia salina*) and salt grass (*Distichlis spicata*) were observed during all three surveys.

Table 5. Rare Plant/Sensitive Natural Community Observations by Survey Date

[§] On March 7, only SBI Biologists N. Dvorak and H. Pexton surveyed the site, to become familiar with the overall survey area and prepare an initial floristic list.

Survey Date	Rare Plants Observed
March 7 & 8	<i>Atriplex depressa</i> Salt Grass Flat Alkali Heath Marsh
May 9	<i>Atriplex depressa</i> <i>Deinandra bacigalupi</i> Needle Grass—Melic Grass Grassland Salt Grass Flat Alkali Heath Marsh
July 16	<i>Atriplex depressa</i> <i>Deinandra bacigalupi</i> <i>Needle Grass—Melic Grass Grassland</i> <i>Salt Grass Flat</i> <i>Alkali Heath Marsh</i>

During 2018 surveys, purple needlegrass was observed across areas mapped in 2016 and 2017, as well as across additional hillsides in the Survey #1 Area. In accordance with the new 2018 guidelines (CDFW, 2018a), purple needlegrass areas will be documented during any future surveys with a Combined Vegetation Rapid Assessment and Relevé Field Form 20 and submitted to VegCAMP, as appropriate depending on percent cover and assuming land access issues are resolved with the owner. Alkali Heath Marsh and Salt Grass Flats will also be documented in future surveys with a Combined Vegetation Rapid Assessment and Relevé Field Form 20 and submitted to VegCAMP.

Appendix B contains photos of Livermore tarplant in various growth stages among annual brome grassland, and brittlescale in various growth stages among the alkali wetland and scalds.

A list of all identified plant species in the survey area is provided in **Appendix C**.

Survey Limitations

Weather conditions during the year that surveys were conducted may have resulted in atypical blooming periods of some of the target plant species. The late-season rains that extended through May 2018 which could have delayed or stunted the growing season for some species and created false negative survey results (see **Table 2** for species with potential to occur). The presence of one plant species, California androsace (*Androsace elongata* ssp. *acuta*; CRPR 4.2) could not be definitively confirmed or ruled out based on the results of the field surveys. About 20 individuals of a similar-looking species were observed in the firebreak, however the plants had already flowered and gone to seed by the May survey and species was undetectably senescent by the July survey. A possible alternative identification is common microcalis (*Cicendria quadrangularis*; no CRPR status).

The July survey occurred prior to the blooming period for big tarplant in 2018. Conditions for identifying big tarplant would have been more favorable in October, however, if it were present the surveyors likely would have observed pre-flowering growth during the July survey.

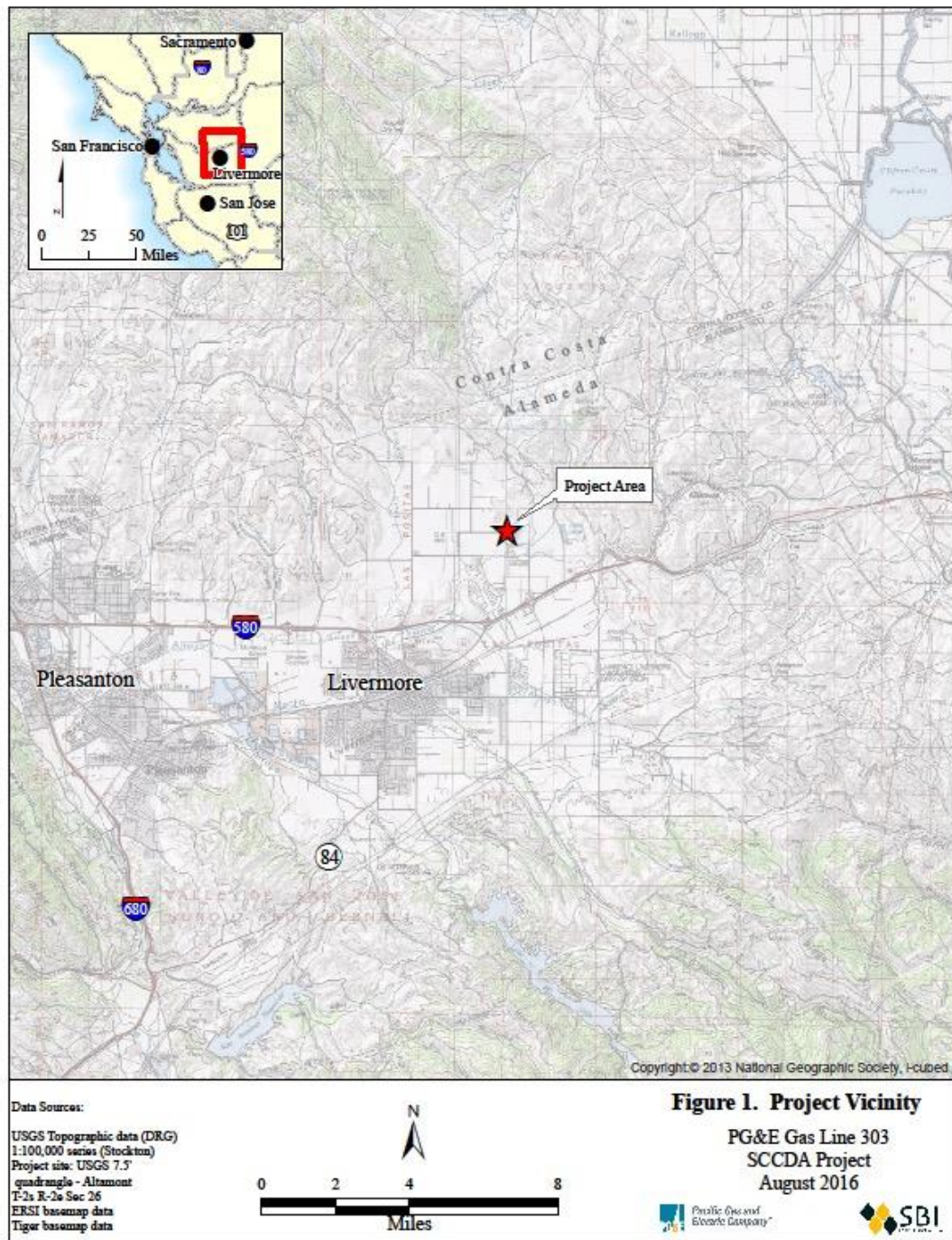
The survey area is subject to ongoing cattle grazing and firebreak tilling which affect the vegetation in the survey area. Although it did not appear to have been grazed between March and July in 2018, it has shown

signs of heavy grazing during past annual surveys. The firebreak is tilled annually and has impacted occupied Livermore tarplant and brittlescale habitat (although the brittlescale population has expanded since the author began surveys in 2016, despite— or perhaps because of— tilling). Adjacent pasture horses graze the fence line where Livermore tarplant has been observed to grow. Both grazing and tilling may affect the presence and abundance of rare plant species.

References

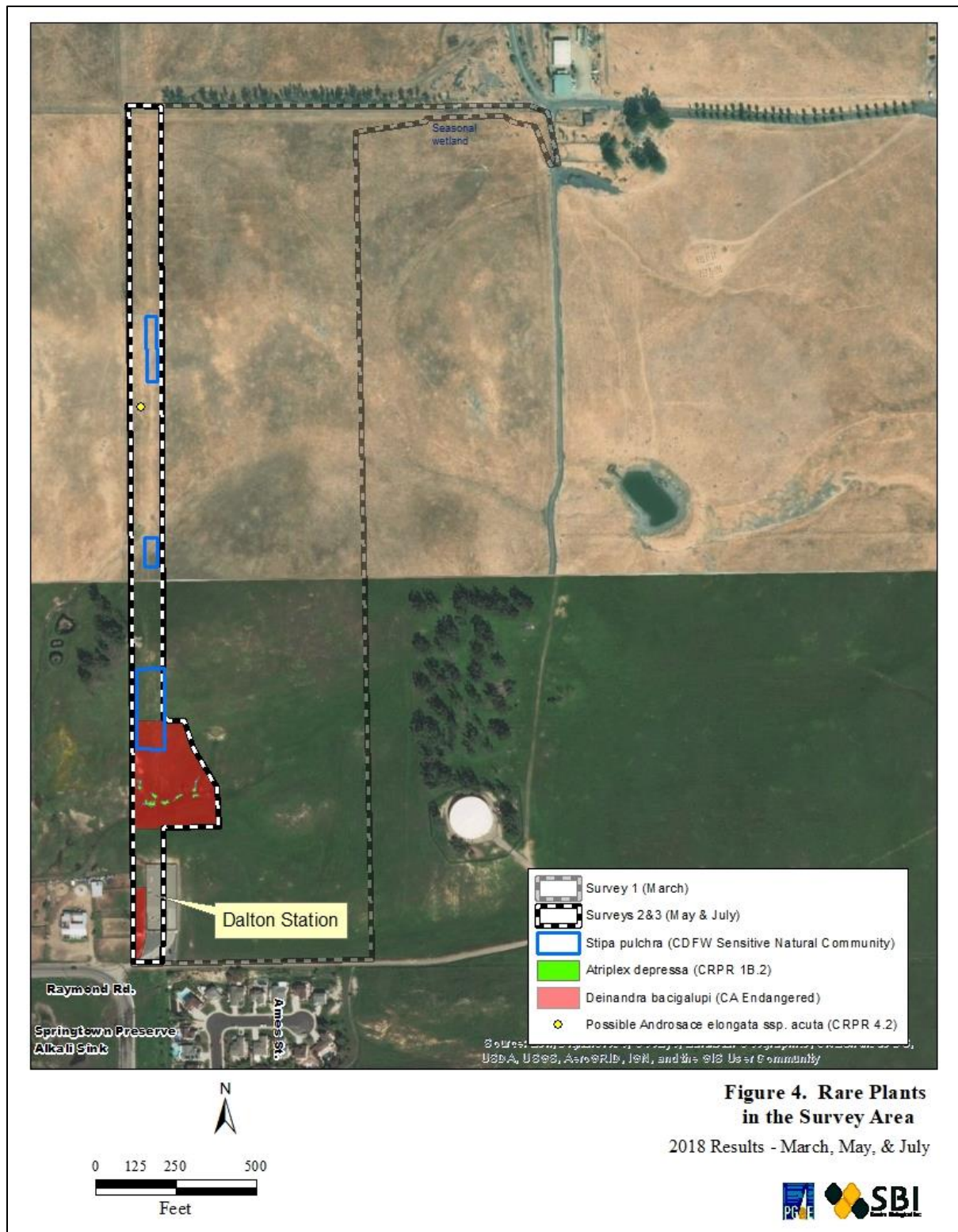
- Baldwin, B. G., Goldman, D. H., Keil, D. J., Patterson, R., Rosatti, T. J., & Wilken, D. H. (Eds.). (2012). *The Jepson Manual* (Second ed.). Berkeley, Los Angeles, London: University of California Press.
- Beidleman, L. H., & Kozloff, E. N. (2003). *Plants of the San Francisco Bay Region*. Berkeley and Los Angeles: University of California Press.
- California Department of Fish and Wildlife (CDFW). (2009). *Protocols For Surveying And Evaluating Impacts To Special Status Native Plant Populations And Natural Communities*. Wildlife and Habitat Data Analysis Branch.
- California Department of Fish and Wildlife (CDFW). (2018a). *Protocols For Surveying And Evaluating Impacts To Special Status Native Plant Populations And Natural Communities*. Wildlife and Habitat Data Analysis Branch.
- California Department of Fish and Wildlife (CDFW). (2018b). California Natural Diversity Database. *Update May 2018*. Biogeographic Data Branch. Retrieved May 2018.
- California Department of Fish and Wildlife (CDFW). (2018c). California Sensitive Natural Communities List. *Update October 15, 2018*. Available online at wildlife.ca.gov/data/vegcamp/natural-communities#sensitive%20natural%20communities. Retrieved February 2019.
- California Native Plant Society (CNPS). (2001). CNPS Botanical Survey Guidelines.
- California Native Plant Society (CNPS), Rare Plant Program. (2018). Inventory of Rare and Endangered Plants (online edition, v8-03 0.45). Sacramento, CA. Retrieved May 2018, from <http://www.rareplants.cnps.org>.
- Consortium of California Herbaria (CCH). (2016). *Consortium database: Data provided by the participants of the Consortium of California Herbaria*. Retrieved from www.ucjeps.berkeley.edu/consortium/.
- Friends of Springtown Preserve. (2013). *Springtown Ecology Primer*.
- Sawyer, J. O., Keeler-Wolf, T., & Evens, J. M. (2008). *A Manual of California Vegetation* (Second ed.). Sacramento, CA: CNPS Press.
- The Calflora Database. (2018). *Calflora: Information on California plants for education, research and conservation*. Retrieved from <http://www.calflora.org/>.
- U.S. Department of Agriculture. (2018). *Web Soil Survey*. National Resource Conservation Service. Retrieved May 2018.

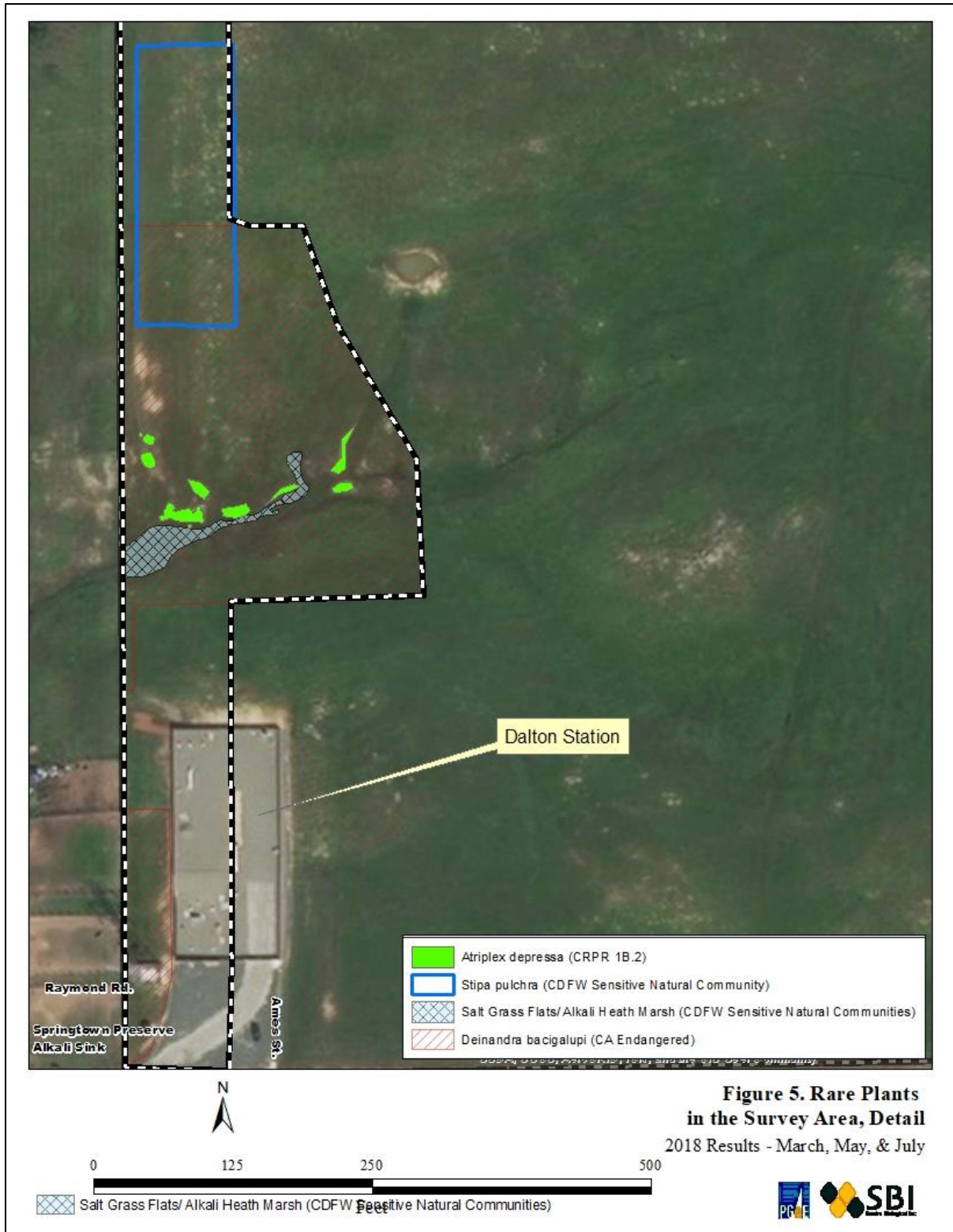
U.S. Fish and Wildlife Service (USFWS). (1996). *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants*. Retrieved from http://www.fws.gov/sacramento/es/documents/listed_plant_survey_guidelines.pdf











Appendix A. 9-quadrangle Search Results for FESA/CESA/CR/ CRPR 1 & 2 Species within Elevations 500'-715'

Scientific Name	Common Name	Status ¹	Habitat	Occurrence Potential
<i>Allium sharsmithiae</i>	Sharsmith's onion	1B.3	Chaparral and cismontane woodland, in serpentinite and rocky soil.	None. No suitable habitat present in survey area.
<i>Amsinckia grandiflora</i>	large-flowered fiddleneck	FE/CE 1B.1	Occurs on deep loamy soils of sedimentary origin on mesic; north facing slopes in valley grassland and foothill woodland.	Low. Limited suitable habitat and soils present in survey area.
<i>Amsinckia lunaris</i>	bent-flowered fiddleneck	1B.2	Coastal bluff scrub, cismontane woodland, valley and foothill grassland.	None. No suitable habitat present in survey area.
<i>Androsace elongata</i> ssp. <i>acuta</i>	California androsace	4.2	Chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, valley and foothill grassland.	Unknown. Approximately 20 plants observed in the tilled firebreak could not be positively identified.
<i>Arctostaphylos auriculata</i>	Mt. Diablo manzanita	1B.3	Grows on sandstone derived soils in chaparral. Known from fewer than 20 occurrences.	None. No suitable habitat present in survey area.
<i>Arctostaphylos manzanita</i> ssp. <i>laevigata</i>	Contra Costa manzanita	1B.2	Occurs on rocky soils in chaparral.	None. No suitable habitat present in survey area.
<i>Astragalus tener</i> var. <i>tener</i>	alkali milk-vetch	1B.2	Alkali playa, valley and foothill grassland, vernal pools. Low ground, alkali flats, and flooded lands. In annual grassland or in playas or vernal pools.	Low. Moderately suitable habitat conditions in seasonal alkali wetland, but it's most likely extirpated from the area. All nearby occurrence records are very old.
<i>Atriplex cordulata</i> var. <i>cordulata</i>	heartscale	1B.2	Chenopod scrub, meadows and seeps, and valley and foothill grassland in sandy soil. Usually in saline or alkaline soils.	Moderate. Suitable soil type present in seasonal alkali wetland, but the habitat type is only moderately suitable. <i>Chenopod scrub habitat</i> is absent from survey area.

Scientific Name	Common Name	Status ¹	Habitat	Occurrence Potential
<i>Atriplex coronata</i> var. <i>vallicola</i>	Lost Hills crownscale	1B.2	Alkaline soils in chenopod scrub, valley and foothill grassland and vernal pools.	Low. Survey area is at edge of range. Suitable soil type present in seasonal alkali wetland, but chenopod scrub habitat is absent from survey area.
<i>Atriplex depressa</i>	brittlescale	1B.2	Alkaline clay soils; barren areas within alkali grassland; alkali meadow; and alkali scrub. Occasionally on the margins of alkali vernal pools.	PRESENT. Hundreds to thousands of plants observed in the seasonal alkali wetland.
<i>Atriplex minuscule</i>	lesser saltscale	1B.1	Sandy soils in alkaline areas; often in association with slough systems and river floodplains. Only in microhabitats that are not inundated year-round. Chenopod scrub, playas, valley and foothill grassland.	Low. Suitable soil type in seasonal alkali wetland, but the habitat type is only moderately suitable. Chenopod scrub habitat is absent from survey area.
<i>Balsamorhiza macrolepis</i>	big-scale balsamroot	1B.2	Chaparral, valley and foothill grassland and cismontane woodland. Open grassy or rocky slopes, valleys. Sometimes on serpentinite soil.	Moderate. Suitable habitat present in main work area. No occurrence records within 2 mi of survey area.
<i>Blepharizonia plumosa</i>	big tarplant	1B.1	Valley and foothill grassland. Dry hills and plains in annual grassland. Clay to clay-loam soils; usually on slopes and often in burned areas.	Low. Suitable habitat present in survey area, limited suitable soil areas.
**<i>California macrophylla</i>	round-leaved filaree	1B.1	Clay soils in valley grassland; often on disturbed bare soil.	Moderate. Suitable habitat present in survey area. No occurrence records within 2 mi.
<i>Calochortus pulchellus</i>	Mt. Diablo fairy-lantern	1B.2	On north aspect wooded and brushy slopes. Chaparral, cismontane woodland, riparian woodland, valley and foothill grassland.	None. No suitable habitat present in survey area.
<i>Campanula exigua</i>	chaparral harebell	1B.2	Chaparral; usually on rocky, serpentinite soils.	None. No suitable habitat present in survey area.

** *California macrophylla* has been removed from the Statewide CRPR List (CNPS, 2018) and is no longer considered special-status.

Scientific Name	Common Name	Status ¹	Habitat	Occurrence Potential
<i>Caulanthus lemmonii</i>	Lemmon's jewelflower	1B.2	Pinyon and juniper woodland; valley and foothill grassland.	None. No suitable habitat present in survey area.
<i>Centromadia parryi</i> ssp. <i>congdonii</i>	Congdon's tarplant	1B.1	Valley and foothill grassland. Alkaline soils, sometimes described as heavy white clay.	Low. Suitable habitat in the survey area, but heavy clay soils are absent.
<i>Chloropyron molle</i> ssp. <i>hispidum</i>	hispid bird's-beak	1B.1	Meadows and playas in alkali sink; valley grassland, and wetland riparian communities.	Moderate. Suitable habitat in seasonal alkali wetland. Occurs nearby at Springtown Preserve.
<i>Chloropyron palmatum</i>	palmate-bracted bird's-beak	SE, FE, 1B.1	Occurs in alkali sink, alkali grassland, vernal pools, and alkali wetlands and seeps, typically along the edges of drainages.	High. Suitable habitat in seasonal alkali wetland. Occurs nearby at Springtown Preserve.
<i>Cirsium fontinale</i> var. <i>campylon</i>	Mt. Hamilton fountain thistle	1B.2	Restricted to seeps on serpentine substrates. These seeps are located within chaparral, cismontane (foothill) woodland, and valley and foothill grassland communities.	None. No suitable habitat present in survey area.
<i>Deinandra bacigalupii</i>	Livermore tarplant	SE, 1B.1	Poorly drained, seasonally dry, highly alkaline Pescadero and Solano series soils of sedimentary parent material. It occurs in alkaline meadows and grasslands in the vicinity of barren alkali scalds, alkali vernal pools, and playa-like pools.	PRESENT. Approximately 1900 plants observed in the survey area.
<i>Delphinium californicum</i> ssp. <i>interius</i>	Hospital Canyon larkspur	1B.2	Occurs in openings in chaparral; mesic areas in cismontane woodland; and coastal scrub.	None. No suitable habitat present in survey area.
<i>Delphinium recurvatum</i>	recurved larkspur	1B.2	Alkaline soils in chenopod scrub; valley and foothill grassland; cismontane woodland. Often in valley saltbrush or valley chenopod scrub.	Low. Suitable soil type in seasonal alkali wetland, but the habitat type is only moderately suitable. Chenopod scrub habitat is absent from survey area. No occurrence records within 2 mi.

Scientific Name	Common Name	Status ¹	Habitat	Occurrence Potential
<i>Eryngium spinosepalum</i>	spiny-sepaed button-celery	1B.2	Vernal pools, depressions, and swales predominantly within Valley Grassland communities; extending into Douglas oak woodland communities in Kern County, CA. Often found within Northern claypan vernal pools, which form after winter rains where drainage is impeded by claypans. In the vicinity of these pools, soil is neutral to alkaline, silica-cemented hardpan and often saline; pool water chemistry is mixo-saline to fresh.	Low. Seasonal alkali wetland does not hold water long enough to support this species.
<i>Eschscholzia rhombipetala</i>	diamond-petaled California poppy	1B.1	Occurs on alkaline clay soils in valley and foothill grassland.	Low. Soil in survey area is sandy. Plant is extremely rare and was believed to be extinct until 1992. Closest (rediscovered) population is at Lawrence Livermore Lab.
<i>Extriplex joaquinana</i>	San Joaquin spearscale	1B.2	Chenopod scrub; meadows and seeps; playas; valley and foothill grassland; clay soils; often in areas of high alkalinity.	Low. Moderately suitable habitat conditions in seasonal alkali wetland, but clay soils and chenopod scrub are absent from survey area.
<i>Fritillaria falcata</i>	talus fritillary	1B.2	Serpentine, often talus. Chaparral, cismontane woodland, and lower montane coniferous forest.	None. No suitable habitat present in survey area.
<i>Helianthella castanea</i>	Diablo helianthella	1B.2	Broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, and valley and foothill grassland. Usually in chaparral/oak woodland interface in rocky azonal soils. Often in partial shade.	None. No suitable habitat present in survey area.
<i>Hesperolinon breweri</i>	Brewer's western flax	1B.2	Usually serpentine soils in chaparral; cismontane woodland; and valley and foothill grassland.	None. No suitable habitat present in survey area.
<i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>	woolly rose-mallow	1B.2	Marshes and swamps (freshwater).	None. No suitable habitat present in survey area.

Scientific Name	Common Name	Status ¹	Habitat	Occurrence Potential
<i>Hoita strobilina</i>	Loma Prieta hoita	1B.1	Usually serpentinite; mesic. Chaparral; cismontane woodland; and riparian woodland.	None. No suitable habitat present in survey area.
<i>Lasthenia conjugens</i>	Contra Costa goldfields	FE, 1B.1	Vernal pools, swales, and other depressions in open grassland and woodland communities, often in alkaline soils.	High. Suitable habitat in seasonal alkali wetland.
<i>Legenere limosa</i>	legenere	1B.1	Vernal pools and similar seasonal wetlands, including seasonal marshes and the margins of small lakes or stock ponds. Most commonly found in vernal pools which also contain <i>Eleocharis macrostachya</i> and <i>Lasthenia glaberrima</i> . These indicator species are generally indicative of pools with long inundation periods.	Low. Seasonal alkali wetland does not hold water long enough to support this species.
<i>Leptosyne hamiltonii</i>	Mt. Hamilton coreopsis	1B.2	Rocky areas in cismontane woodland.	None. No suitable habitat present in survey area.
<i>Lilaeopsis masonii</i>	Mason's lilaeopsis	CR, 1B.1	Grows in regularly flooded tidal zones on mud banks; sloughs; and rivers. Often found in estuarine wetlands; and occasionally found along riprap lined levees. Associated with tule.	None. No suitable habitat present in survey area.
<i>Limosella australis</i>	Delta mudwort	2B.1	Usually mud banks; marshes and swamps (freshwater or brackish); riparian scrub.	None. No suitable habitat present in survey area.
<i>Madia radiata</i>	showy golden madia	1B.1	Open, grassy slopes and hillsides, in friable clay soils that are calcium-rich, gypseous, and/or ultra-fine (dry bog). Found within Valley and Foothill Grassland and Foothill/Cismontane Woodland communities.	Low. Suitable habitat types present in survey area, but suitable soil type is absents.
<i>Navarretia nigelliformis ssp. radians</i>	shining navarretia	1B.2	Sometimes clay; vernal pools, cismontane woodland, valley and foothill grassland.	Low. Marginally suitable habitat present in seasonal alkali wetland. However, it may not hold water long enough to support the species.

Scientific Name	Common Name	Status ¹	Habitat	Occurrence Potential
<i>Navarretia prostrata</i>	prostrate vernal pool navarretia	1B.1	Mesic areas; vernal pools, coastal scrub, meadows and seeps, valley and foothill grassland (alkaline).	Low. Marginally suitable habitat present in seasonal alkali wetland. However, it may not hold water long enough to support the species.
<i>Plagiobothrys glaber</i>	hairless popcornflower	1A	Wet soils in low elevation, alkaline flats, meadows and seeps; coastal salt marshes. Presumed extinct.	Low. Marginally suitable habitat present in seasonal alkali wetland. Presumed extinct.
<i>Polemonium carneum</i>	royal sky pilot	2B.2	Northern coastal scrub, coastal prairie, yellow pine forest.	Absent. No suitable habitat present in survey area.
<i>Puccinellia simplex</i>	California alkali grass	1B.2	Alkaline, vernal mesic; sinks, flats, and lake margins. Chenopod scrub; meadows and seeps; valley and foothill grassland; vernal pools.	High. Suitable habitat present in survey area. Observed in Springtown Preserve, across the street from the survey area.
<i>Senecio aphanactis</i>	chaparral ragwort	2B.2	Occurs in foothill woodland; northern coastal scrub; and coastal sage scrub.	None. No suitable habitat present in survey area.
<i>Spergularia macrotheca</i> var. <i>longistyla</i>	long-styled sand spurry	1B.2	Alkaline meadows and seeps, marshes and swamps.	High. Suitable habitat present in survey area.
<i>Streptanthus albidus</i> ssp. <i>peramoenus</i>	most beautiful jewelflower	1B.2	Occurs on serpentine soils in chaparral; cismontane woodland; and valley and foothill grassland.	None. No suitable habitat present in survey area.
<i>Trifolium hydrophilum</i>	saline clover	1B.2	Salt marshes, open areas in alkaline soils, alkaline grassland.	High. Suitable habitat present in survey area. Old CNDDDB record in Springtown Preserve, across the street from the survey area.
<i>Tropidocarpum capparideum</i>	caper-fruited tropidocarpum	1B.1	Occurs on alkaline clay soils in valley and foothill grassland.	Low. Suitable habitat present in survey area. Species was thought to be extinct until rediscovered at Fort Hunter Liggett in 2000.

Scientific Name	Common Name	Status ¹	Habitat	Occurrence Potential
<i>Viburnum ellipticum</i>	oval-leaved viburnum	2B.3	Chaparral; cismontane woodland; and lower montane coniferous forest.	None. No suitable habitat present in survey area.

¹California Native Plant Society (CNPS) California Rare Plant Rank (CRPR):

(1A) Presumed extinct in California; (1B) Rare, threatened, or endangered in California and elsewhere; (2A) Presumed extirpated in California but more common elsewhere; (2B) Rare, threatened, or endangered in California, but more common elsewhere; (3) More information is needed; (4) Limited distribution, watch list

Threat Rank:

- 0.1 Seriously threatened in California (more than 80% of occurrences threatened / high degree and immediacy of threat)
- 0.2 Fairly threatened in California (20 to 80% occurrences threatened / moderate degree and immediacy of threat)
- 0.3 Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Appendix B. Site Photos



Photo 1. Early growth of Livermore tarplant near substation entry lot.



Photo 2. Early growth of Livermore tarplant near substation entry lot, among annual brome grassland.



Photos 3 and 4. Livermore tarplant and other tarweeds growing among annual brome grassland and needlegrass.



Photo 5. Livermore tarplant upper extent.



Photo 6. Mature Livermore tarplant by substation.



Photo 7. Livermore tarplant in full bloom at substation gate fence line.



Photo 8. Livermore tarplant bloom.



Photo 9. Alkali wetlands favored by brittlescale.



Photo 10. Alkali wetlands favored by brittlescale.



Photo 11. Brittlescale, saltgrass, and common spikeweed in alkali scald during mid-season.



Photo 12. Brittlegrass, saltgrass, and common spikeweed in alkali scald during mid-season. The once bare scalds are encroached upon by saltgrass and annual bromes later each season.



Photo 5. Closeup of brittlegrass. in an alkali scald in July. The salt grass has seasonally overgrown the once-bare scalds.

Appendix C. Plants Identified in the Survey Area

Native (N) or Introduced (I)	Scientific Name	Common Name	Family	Survey 1 Mar 7&8	Survey 2 May 9	Survey 3 July
N	<i>Acmispon americanus</i>	American bird's foot trefoil	Fabaceae		x	
N	<i>Acmispon wrangelianus</i>	Chilean trefoil	Fabaceae	x	x	x
I	<i>Agapanthus africanus</i>	lily of the Nile	Liliaceae	x		
N	<i>Agoseris</i> sp.	native dandelion	Asteraceae		x	
N	<i>Amaranthus blitoides</i>	<i>prostrate mat amaranth</i>	<i>Amaranthaceae</i>			x
N	<i>Amsinckia intermedia</i>	common fiddleneck	Boraginaceae		x	
N	<i>Amsinckia menziesii</i>	fiddleneck	Boraginaceae		x	
N	<i>Androsace elongata</i> ssp. <i>acuta</i> **possible- could not be certainly identified**	California androsace	Primulaceae		x	
N	<i>Aphanes occidentalis</i>	western lady's mantle	Rosaceae	x		
N	<i>Asclepias fascicularis</i>	narrow leaf milkweed	Apocynaceae	x	x	x
N	<i>Atriplex depressa</i>	brittlescale	Chenopodiaceae	x	x	x
I	<i>Avena barbata</i>	slender wild oat	Poaceae	x	x	x
I	<i>Brassica nigra</i>	black mustard	Brassicaceae	x	x	x
N	<i>Brodiaea elegans</i>	harvest brodiaea	Themidaceae		x	
I	<i>Bromus diandrus</i>	ripgut brome	Poaceae		x	x
I	<i>Bromus hordeaceus</i>	soft chess	Poaceae	x	x	x
I	<i>Bromus madritensis</i>	foxtail brome	Poaceae	x	x	x
N	<i>Bulboschoenus</i> sp.	bulrush	Cyperaceae	x		
I	<i>Calandrinia menziesii</i>	red maids	Montiaceae	x	x	
I	<i>Carduus pycnocephalus</i>	Italian thistle	Asteraceae		x	x
N	<i>Castilleja densiflora</i>	dense flower owl's clover	Orobanchaceae		x	
I	<i>Centaurea solstitialis</i>	<i>yellow star thistle</i>	<i>Asteraceae</i>			x

Native (N) or Introduced (I)	Scientific Name	Common Name	Family	Survey 1 Mar 7&8	Survey 2 May 9	Survey 3 July
N	<i>Centromadia pungens</i> ssp. <i>pungens</i>	common spikeweed	Asteraceae		x	x
I	<i>Cerastium glomeratum</i>	mouse ear chickweed	Caryophyllaceae	x		
	<i>Chenopodium</i> sp.	goosefoot	Chenopodiaceae		x	x
	<i>Chenopodium</i> sp.	goosefoot	Chenopodiaceae			x
	<i>Chenopodium</i> sp.	goosefoot	Chenopodiaceae			x
N	<i>Chlorogalum pomeridianum</i> var. <i>pomeridianum</i>	common soap plant	Liliaceae	x		
I	<i>Cirsium vulgare</i>	bull thistle	Asteraceae	x		
N	<i>Clarkia affinis</i>	Chaparral fairyfan	Onagraceae		x	
N	<i>Crassula connata</i>	sand pygmyweed	Crassulaceae	x	x	
I	<i>Crepis</i> sp.	hawkbit	Asteraceae	x		
I	<i>Croton setiger</i>	turkey mullein	Euphorbiaceae		x	x
	<i>Cryptantha</i> sp.	cryptantha	Boraginaceae		x	
N	<i>Deinandra bacigalupii</i>	Livermore tarplant	Asteraceae		x	x
N	<i>Distichlis spicata</i>	saltgrass	Poaceae	x	x	x
I	<i>Elymus caput-medusae</i>	Medusa head grass	Poaceae		x	x
N	<i>Elymus glaucus</i>	blue wildrye	Poaceae	x	x	
N	<i>Elymus triticoides</i>	beardless wildrye	Poaceae	x	x	x
N	<i>Eriogonum fasciculatum</i>	California buckwheat	Polygonaceae	x		
I	<i>Erodium botrys</i>	longbeak stork bill	Geraniaceae	x	x	x
I	<i>Erodium cicutarium</i>	red-stemmed filaree	Geraniaceae	x	x	x
N	<i>Erodium moschatum</i>	white-stemmed filaree	Geraniaceae	x	x	x
N	<i>Eschscholzia californica</i>	California poppy	Papaveraceae	x	x	x
	<i>Euphorbia</i> sp.	spurge	Euphorbiaceae			x
I	<i>Festuca bromoides</i>	brome fescue	Poaceae		x	x

Native (N) or Introduced (I)	Scientific Name	Common Name	Family	Survey 1 Mar 7&8	Survey 2 May 9	Survey 3 July
N	<i>Festuca microstachys</i>	small fescue	Poaceae	x	x	x
I	<i>Festuca myuros</i>	rattail fescue	Poaceae		x	x
I	<i>Festuca perennis</i>	Italian rye grass	Poaceae		x	x
N	<i>Frankenia salina</i>	alkali heath	Frankeniaceae	x	x	x
N	<i>Galium trifidum</i>	three petaled bedstraw	Rubiaceae	x	x	x
I	<i>Geranium dissectum</i>	cut leaf geranium	Geraniaceae	x	x	
I	<i>Hirschfeldia incana</i>	Mediterranean hoary mustard	Brassicaceae		x	
I	<i>Holcus lanatus</i>	velvet grass	Poaceae	x		
N	<i>Holocarpha heermannii</i>	Heermann's tarweed	Asteraceae		x	x
N	<i>Holocarpha virgata</i>	narrow tarplant	Asteraceae	x	x	x
I	<i>Hordeum marinum</i>	seaside barley	Poaceae		x	
I	<i>Hordeum murinum</i>	foxtail barley	Poaceae	x	x	x
I	<i>Hypochaeris glabra</i>	smooth cat's ear	Asteraceae	x	x	
N	<i>Juncus balticus</i>	Baltic rush	Juncaceae	x	x	x
N	<i>Juncus bufonius</i>	toad rush	Juncaceae		x	
I	<i>Lactuca serriola</i>	prickly lettuce	Asteraceae			x
N	<i>Lagophylla ramosissima</i>	common hareleaf	Asteraceae			x
N	<i>Lasthenia californica</i>	California goldfields	Asteraceae		x	
N	<i>Lasthenia glabrata</i>	yellow-rayed goldfields	Asteraceae	x	x	
N	<i>Leptosiphon liniflorus</i>	narrowflower flaxflower	Polemoniaceae	x	x	x
N	Sphaerocarpos sp.? Geothallus sp?	Liverwort	Sphaerocarpaceae	x		
I	<i>Logfia gallica</i>	narrowleaf cottonrose	Asteraceae		x	x
N	<i>Lupinus bicolor</i>	bicolored lupine	Fabaceae		x	
	<i>Lupinus nanus</i>	lupine	Fabaceae	x		
I	<i>Lysimachia arvensis</i>	scarlet pimpernel	Myrsinaceae	x	x	x

Native (N) or Introduced (I)	Scientific Name	Common Name	Family	Survey 1 Mar 7&8	Survey 2 May 9	Survey 3 July
I	<i>Lythrum hyssopifolium</i>	Hyssop loosestrife	Lythraceae		x	
I	<i>Medicago polymorpha</i>	bur clover	Fabaceae		x	x
I	<i>Melilotus indicus</i>	annual yellow sweetclover	Fabaceae		x	x
N	<i>Micropus sp.</i>	qtip	Asteraceae	x		
N	<i>Microseris acuminata</i>	Sierra foothills microseris	Asteraceae	x		
N	<i>Muilla maritima</i>	common muilla	Themidaceae	x		
I	<i>Oxalis sp.</i>		Oxalidaceae	x		
N	<i>Plagiobothrys stipitatus</i> var. <i>micranthus</i>	vernal pool alyocara	Boraginaceae	x	x	
N	<i>Plagiobothrys sp.</i>	popcorn flower	Boraginaceae		x	
N	<i>Plantago erecta</i>	California plantain	Plantaginaceae	x		
I	<i>Poa annua</i>	annual bluegrass	Poaceae		x	
I	<i>Polypogon monspeliensis</i>	rabbitsfoot grass	Poaceae			x
I	<i>Rumex acetosella</i>	common sheep sorrel	Polygonaceae		x	x
I	<i>Rumex crispus</i>	curly dock	Polygonaceae	x	x	x
I	<i>Rumex pulcher</i>	fiddle dock	Polygonaceae		x	
	<i>Rumex sp.</i>	dock	Polygonaceae	x	x	
N	<i>Sanicula bipinnatifida</i>	purple sanicle	Apiaceae	x		
N	<i>Sherardia arvensis</i>	field madder	Rubiaceae	x		
I	<i>Silene gallica</i>	windmill pink	Caryophyllaceae		x	
N	<i>Sisyrinchium bellum</i>	blue eyed grass	Iridaceae	x		
N	<i>Solanum americanum</i>	small flowered nightshade	Solanaceae			x
N	<i>Spergula arvensis</i>	corn spurry	Caryophyllaceae		x	
I	<i>Spergularia media</i>	sand spurry	Caryophyllaceae	x	x	x
I	<i>Stellaria media</i>	chickweed	Caryophyllaceae		x	
N	<i>Stipa pulchra</i>	purple needle grass	Poaceae	x	x	x

Native (N) or Introduced (I)	<i>Scientific Name</i>	Common Name	Family	Survey 1 Mar 7&8	Survey 2 May 9	Survey 3 July
I	<i>Trifolium campestre</i>	hop clover	Fabaceae		x	x
I	<i>Trifolium hirtum</i>	rose clover	Fabaceae	x	x	
I	<i>Trifolium tomentosum</i>	woolly clover	Fabaceae		x	
N	<i>Trichostema lanceolatum</i>	vinegarweed	Lamiaceae		x	x
I	<i>Vicia sativa</i> ssp. <i>sativa</i>	spring vetch	Fabaceae	x	x	
N	<i>Viola</i> sp., potentially <i>pedunculata</i>	violet	Violaceae	x		

Appendix D.5

R893 Arborist Report



Subject: R-893 Livermore, Arborist Report

Date: February 20, 2019

Project Order Number: 74008389

Prepared by: Dale Manischalchi- Consulting Forester & Certified Arborist- Davey Resource Group

Prepared for: Dean Kolnes- Project Manager- PG&E; Mallory Hughes- Land Planner- PG&E; Chris Pachan- Land Consultant- PG&E

Per: Site visit on February 14, 2019 and kmz file

Summary of Scope of Work: Remove fifty one (51) landscape trees and shrubs, Remove approximately 20,000 sq. ft. of landscape brush

- The following recommendations are based on workspace map and site walk approximating work plan. If construction plan changes as it relates to tree protection then site should be re-assessed by an arborist to maintain the integrity of these recommendations.
- Tree protection recommendations are based on the *International Society of Arboriculture Best Management Practices for Managing Trees during Construction*. Tree trimming & protection recommendations are also based on ANSI A300 Standards (parts 1 & 5). Any work performed outside of these BMPs & Standards is solely the decision of construction management. Any work in reference to the gas line right-of-way is based on PG&E utility standard TD-4490S.
- See associated tree inventory and aerial photo with tree mark-ups below for further location information.

PG&E plans to replace a section of gas pipe line 131 in Livermore, CA. The plants to be removed are in a recently planted landscape in a new housing development. The workspace was unmarked in the field and, therefore, estimated by the arborist. Recommendations for the number of removals may vary once the actual workspace is delineated in the field. The following recommendations are made to mitigate any potential damage to vegetation in the area:

- Assorted trees and brush should be removed to accommodate excavation and workspace requirements.. See attached list and photos.
- One tree (Protect 1) is listed as an option. At the time of this report it was undecided whether or not this area would be part of the project scope.

Property Ownership

According to PG&E parcel layer, this project appears to be located on parcel APN #903-0014-002 in Alameda Co.

Notifications

All appropriate notifications should be made to all affected parties before vegetation work commences.

As a utility, PG&E is exempt from the discretionary permitting process, as work is being performed to comply with the safety regulations of the California Public Utilities Commission (CPUC).

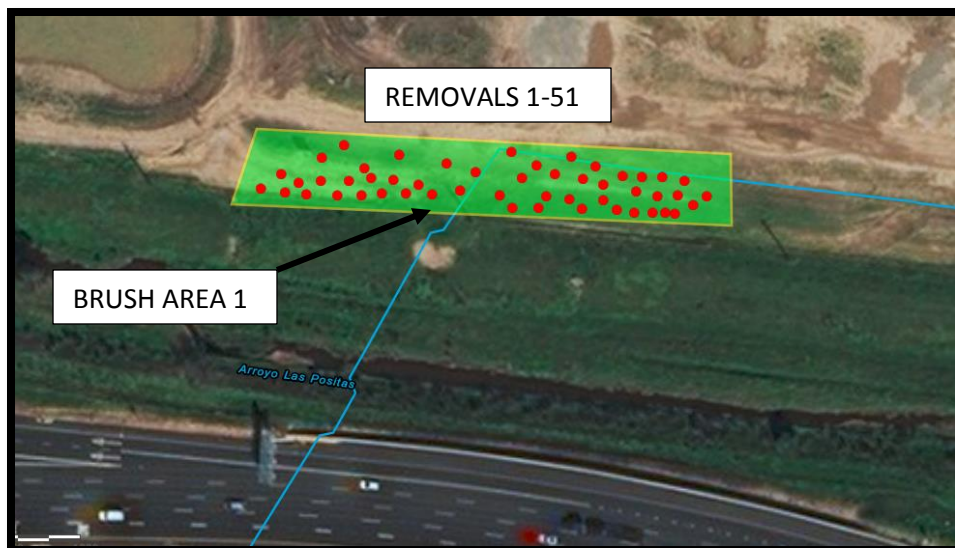
Per the City of Livermore's website (www.cityoflivermore.net) several of the trees at this site are considered "Protected Trees" by the city, due to being California Natives.

Also, Any tree approved as part of a site plan approval, or required as a condition of approval for a development project, zoning use permit, use permit or other site development review, This condition may cover all the trees on the site.

R-893 LIVERMORE



DETAIL



INVENTORY

OBJECTID	FEATURE ID	SPECIES	DIAMETER (in)	HEIGHT (ft)	COMMENTS
13259	Removal 1	Oak, Live	4	8	2XSTEM
13269	Removal 2	Oak, Live	4	8	
13271	Removal 3	Willow, Australian	4	6	XSTEM
13272	Removal 4	Willow, Australian	4	6	XSTEM
13273	Removal 5	Willow, Australian	4	6	XSTEM
13275	Removal 6	Oak, Live	4	8	
13278	Removal 7	Strawberry Tree	4	6	
13280	Removal 8	Strawberry Tree	4	8	
13282	Removal 9	Strawberry Tree	4	6	
13283	Removal 10	Strawberry Tree	4	6	
13284	Removal 11	Strawberry Tree	4	6	
13286	Removal 12	Strawberry Tree	4	6	
13288	Removal 13	Strawberry Tree	4	6	
13290	Removal 14	Strawberry Tree	4	6	
13292	Removal 15	Sycamore, Western	4	8	
13294	Removal 16	Sycamore, Western	4	8	
13295	Removal 17	Sycamore, Western	4	8	
13296	Removal 18	Sycamore, Western	4	8	
13297	Removal 19	Sycamore, Western	4	8	
13299	Removal 20	Sycamore, Western	4	8	
13307	Removal 21	Redbud, Eastern	4	8	
13309	Removal 22	Redbud, Eastern	4	8	
13310	Removal 23	Redbud, Eastern	4	8	
13311	Removal 24	Redbud, Eastern	4	8	
13313	Removal 25	Redbud, Eastern	4	8	
13315	Removal 26	Redbud, Eastern	4	8	

INVENTORY (con't)

OBJECTID	FEATURE ID	SPECIES	DIAMETER (in)	HEIGHT (ft)	COMMENTS
13316	Removal 27	Redbud, Eastern	4	8	
13317	Removal 28	Redbud, Eastern	4	8	
13318	Removal 29	Redbud, Eastern	4	8	
13323	Removal 30	Oak, Live	4	8	
13324	Removal 31	Oak, Live	4	8	
13325	Removal 32	Oak, Live	4	8	
13326	Removal 33	Oak, Valley	4	8	
13327	Removal 34	Oak, Valley	4	8	
13328	Removal 35	Oak, Valley	4	8	
13329	Removal 36	Oak, Valley	4	8	
13330	Removal 37	Toyon	4	6	XSTEM
13332	Removal 38	Toyon	4	6	XSTEM
13333	Removal 39	Toyon	4	6	XSTEM
13334	Removal 40	Toyon	4	6	XSTEM
13335	Removal 41	Toyon	4	6	XSTEM
13336	Removal 42	Toyon	4	6	XSTEM
13337	Removal 43	Toyon	4	6	XSTEM
13338	Removal 44	Toyon	4	6	XSTEM
13339	Removal 45	Toyon	4	6	XSTEM
13340	Removal 46	Toyon	4	6	XSTEM
13341	Removal 47	Toyon	4	6	XSTEM
13342	Removal 48	Toyon	4	6	XSTEM
13343	Removal 49	Toyon	4	6	XSTEM
13344	Removal 50	Toyon	4	6	XSTEM
13345	Removal 51	Toyon	4	6	XSTEM
13347	Protect Tree 1	Eucalyptus, Blue Gum	50	60	Inventoried for optional work
OBJECTID	FEATURE ID	SPECIES	AREA (sq ft)	HEIGHT (ft)	COMMENTS
1652	Brush Area 1	Roses, Coyote Brush, Manzanita	20000	2	3' centers

PHOTOS





Definitions

Arborist: professional who possesses the technical competence gained through experience and related training to provide for, or supervise, the management of trees and other woody plants in residential, commercial, and public landscapes.

Critical Root Zone (CRZ): area of soil around a tree where the minimum amount of roots considered critical to the structural stability or health of the tree are located. CRZ determination could be based on the **Drip-line** or a multiple of **DBH**, but because root growth can be asymmetric due to site conditions, on-site investigation may be required.

Crown (Canopy) Raising: in pruning, the selective removal of lower limbs from a tree crown to provide clearance.

Diameter at Breast Height or DBH: an arborist standard of measure for a tree. The trunk(s) diameter is measured at 4.5ft above natural grade. If there are multiple trunks, they are measured individually and added together.

Drip-line: imaginary line defined by the branch spread of a single tree or group of trees.

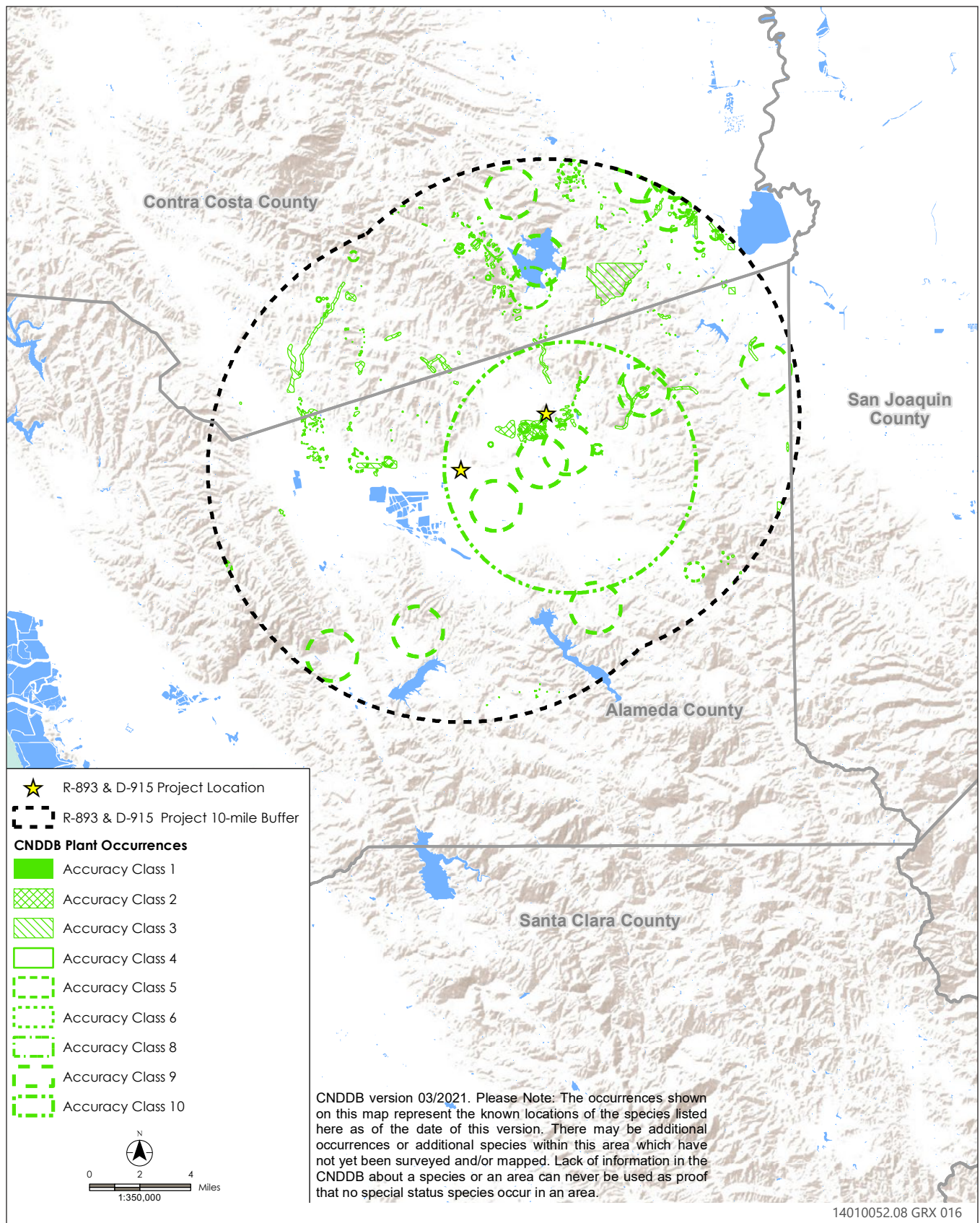
Project Arborist: PG&E assigned Arborist to the project. Duties may include, but not limited to, assessing and providing recommendations on tree issues, tree permitting with agencies, scheduling and overseeing tree work, site monitoring, spot checking, etc.

Root Pruning: in tree conservation and preservation, the process of cutting roots cleanly behind the line of a planned excavation to prevent tearing and splintering of remaining roots.

Tree Protection Zone (TPZ): defined area within which certain activities are prohibited or restricted to prevent or minimize potential injury to designated trees, especially during construction or development.

Appendix D.6

CNDDDB Special-Status Plants



Source: Image provided by Stantec in 2021

3/16/2021

Figure: CNDDDB Plant Occurrences within 10 Miles of the Project Site

DRAFT

Appendix D.7

CTS Data Tables 2018 and 2019

**R-649, R-700, and R-707 Natural Gas Transmission
Pipeline L-131 Replacement Project**

California Tiger Salamander
Relocation Results Tables
Monitoring Years 2018 – 2019

Table D-1
R649, R700, and R707 Natural Gas Transmission Pipeline 131 Replacement Project
2018 CTS Discovery and Relocation Results

CTS # ¹	Construction/ Evening Survey	Measurements and Condition: SVL/TL in mm	Coordinates of Discovery Location		Coordinates of Relocation Site		Discovery Location Segment No./ Staging Area	Comments
			Lat.	Long.	Lat.	Long.		
1002_1	Burrow Excavation	89/173; good condition	37.745564	-121.752428	37.745436	-121.75227	17	Observed at 1347 hours during burrow excavation; relocated to burrow east of ROW
1003_1	Burrow Excavation	likely male; 88/153; good condition	37.745564	-121.752428	37.745436	-121.75227	17	Observed at 0945 hours during burrow excavation; relocated to burrow east of ROW
1003_2	Burrow Excavation (same burrow as 1003_1)	possible male (vent moderately swollen); 86/170; good condition	37.745564	-121.752428	37.745436	-121.75227	17	Observed at 1005 hours during burrow excavation; relocated to burrow east of ROW
1003_3	Burrow Excavation	no swollen vent; 90 SVL; 85 tail; no swollen vent; good condition	37.745564	-121.752428	37.745228	-121.752286	17	Observed at 1315 hours during burrow excavation; relocated to burrow east of ROW
1003_4	Burrow Excavation (same burrow as 1003_3)	no swollen vent; 93 SVL; 79 tail; no swollen vent; good condition	37.745564	-121.752428	37.745228	-121.752286	17	Same as above
1017_1	Burrow Excavation	89/162; good condition	37.745	-121.753	37.745	-121.752	17	Observed at 1440 hours during burrow excavation; relocated to burrow east of ROW

¹ Note: First portion of CTS # is date of discovery.

CTS # ¹	Construction/ Evening Survey	Measurements and Condition: SVL/TL in mm	Coordinates of Discovery Location		Coordinates of Relocation Site		Discovery Location Segment No./ Staging Area	Comments
			Lat.	Long.	Lat.	Long.		
1029_1	Construction	94/163; good condition	37.759856	-121.738611	37.760139	-121.739969	23	Observed in trench at 0900 hours; relocated to burrow east of ROW
1107_1	Construction	95/140; end of tail missing, otherwise good condition	37.761197	-121.736758	37.760053	-121.736939	23	Observed at 0945 hours. Relocated to ground squirrel burrow after monitoring by Designated Biologist, and CDFW approval based on normal behavior observed
1127_1	Evening Survey	91/164; good condition	37.7546594	-121.7436044	37.754134	-121.7434106	21	Observed at 2100 hours. Relocated to ground squirrel burrow
1128_1	Construction	99/178; good condition	37.7566437	-121.7414392	37.756737	-121.742178	21	Found under stored jute netting outside silt fence, but inside project limits during routine monitoring activities at 1110 hours. Relocated to ground squirrel burrow
1128_2	Evening Survey	89/181; good condition	37.750881	-121.747433	37.750533	-121.747076	18	Observed at 2024 hours. Relocated to ground squirrel burrow
1128_3	Evening Survey	Not handled; appeared to be in good condition	37.750467	-121.747118	N/A	N/A	18	Observed at 2130 hours. Not relocated
1129_1	Evening Survey	88/190; male; roadkill	37.749364	-121.746943	N/A	N/A	Dagnino Rd.	Roadkill on Dagnino Rd.; found @ 1905 hours; collected for deposition at Cal Academy. Unrelated to project activities.
1129_2	Evening Survey	103/204; male; good condition	37.749	-121.7493	37.7473	-121.7469	17	Observed along silt fencing on W edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area

CTS # ¹	Construction/ Evening Survey	Measurements and Condition: SVL/TL in mm	Coordinates of Discovery Location		Coordinates of Relocation Site		Discovery Location Segment No./ Staging Area	Comments
			Lat.	Long.	Lat.	Long.		
1129_3	Evening Survey	105/209; male; good condition	37.749	-121.7493	37.7473	-121.7469	17	Same as above
1129_4	Evening Survey	82/173; male; good condition	37.7487	-121.7498	37.7473	-121.7469	17	Same as above
1129_5	Evening Survey	94/206; male; good condition	37.7487	-121.7498	37.7473	-121.7469	17	Same as above
1129_6	Evening Survey	108/230; male; good condition	37.7484	-121.7499	37.7473	-121.7469	17	Same as above
1129_7	Evening Survey	97/214; male; good condition	37.7484	-121.7499	37.7473	-121.7469	17	Observed along silt fencing on W edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Areas
1129_8	Evening Survey	94/197; male; good condition	37.7484	-121.7499	37.7473	-121.7469	17	Same as above
1129_9	Evening Survey	97/205; male; good condition	37.7468865	-121.7514586	37.7473	-121.7469	17	Same as above
1129_10	Evening Survey	97/176; female; good condition	37.74594	-121.7524114	37.7473	-121.7469	17	Same as above
1129_11	Evening Survey	94/192; female; good condition	37.7449981	-121.7533968	37.7473	-121.7469	17	Same as above
1129_12	Evening Survey	Adult; unknown gender; good condition	37.751264	-121.746965	37.751264	-121.746965	18/Dagnino Rd.	Found alive on Dagnino Rd. relocated to E side off the road to safety
1129_13	Evening Survey	114/265; male; good condition	37.742246	-121.747016	37.742246	-121.747016	Dagnino Rd.	Found alive on Dagnino Rd. relocated to E side off the road to safety
1130_1	Evening Survey	101.5/190.5; female; good condition	37.744	-121.754	37.746	-121.747	16	Observed along silt fence on W edge of Seg. 16, relocated on E edge of Dagnino Rd near ponds at Lin Conservation Area

CTS # ¹	Construction/ Evening Survey	Measurements and Condition: SVL/TL in mm	Coordinates of Discovery Location		Coordinates of Relocation Site		Discovery Location Segment No./ Staging Area	Comments
			Lat.	Long.	Lat.	Long.		
1130_2	Evening Survey	101.6/209.5; male; good condition	37.749	-121.75	37.746	-121.747	17	Observed along silt fencing on W edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
1201_1	Evening Survey	93/197; male; good condition	37.7486	-121.7496	37.7467	-121.7469	17	Observed along silt fencing on W edge of Seg. 17; relocated to E side of Dagnino Road near ponds on Lin Conservation Area
1202_1	Evening Survey	101.0/180; male; good condition	37.749	-121.75	37.746	-121.747	17	Observed along silt fence on W edge of segment 17, relocated on E edge of Dagnino Rd near ponds at Lin Conservation Area
1202_2	Evening Survey	114.3/190.5; female; good condition	37.748	-121.751	37.746	-121.747	17	Observed along silt fence on W edge of Seg. 17, relocated on E edge of Dagnino Rd near ponds at Lin Conservation Area
1202_3	Evening Survey	107.9/184.15; male; good condition	37.748	-121.751	37.746	-121.747	17	Observed along silt fencing on W edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
1203_1	Evening Survey	73/124; subadult; good condition	37.74324	-121.75475	37.74333	-121.75458	16	Observed along the E side of the silt fencing of Seg. 17; relocated to a ground squirrel burrow approximately 20 meters (m) north of the original location, on the east side of the Project alignment
1205_1	Evening Survey	97/190; male; good condition	37.74751	-121.75085	37.746751	-121.746876	17	Observed along silt fencing on W edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area

CTS # ¹	Construction/ Evening Survey	Measurements and Condition: SVL/TL in mm	Coordinates of Discovery Location		Coordinates of Relocation Site		Discovery Location Segment No./ Staging Area	Comments
			Lat.	Long.	Lat.	Long.		
1205_2	Evening Survey	98/209; female; good condition	37.74743	-121.75092	37.746751	-121.746876	17	Observed along silt fencing on W edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
1216_1	Evening Survey	93/190; male; good condition	37.74931	-121.749	37.746751	-121.746876	17	Observed along silt fencing on W edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
1216_2	Evening Survey	92/198; male; good condition	37.74794	-121.75041	37.746751	-121.746876	17	Observed along silt fencing on W edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
1216_3	Evening Survey	99/165; female; good condition	37.74535	-121.75306	37.746751	-121.746876	17	Observed along silt fencing on W edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
1216_4	Evening Survey	93/159; female; good condition	37.74274	-121.75568	37.746751	-121.746876	16	Observed along silt fencing on W edge of Seg. 16; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
1216_5	Evening Survey	72/145; subadult; good condition	37.74328	-121.75471	37.7433	-121.75458	16	Observed along silt fencing on E edge of Seg. 16; relocated to squirrel burrow approx. 20 m N
1216_6	Evening Survey	97/172; female; good condition	37.743677	-121.754719	37.746751	-121.746876	16	Observed along silt fencing on W edge of Seg. 16; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
1216_7	Evening Survey	104/186; female; good condition	37.747628	-121.750737	37.746751	-121.746876	17	Observed along silt fencing on W edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area

CTS # ¹	Construction/ Evening Survey	Measurements and Condition: SVL/TL in mm	Coordinates of Discovery Location		Coordinates of Relocation Site		Discovery Location Segment No./ Staging Area	Comments
			Lat.	Long.	Lat.	Long.		
1216_8	Evening Survey	85/191; male; good condition	37.7498	-121.74805	37.746751	-121.746876	17	Observed along silt fencing on W edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
1216_9	Evening Survey	100/168; female; good condition	37.752036	-121.749119	37.746751	-121.746876	700E	Observed along silt fencing on W edge of staging area R700E; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
1217_1	Evening Survey	110/230; male; good condition	37.7483833	-121.750081	37.74677	-121.74691	17	Found along W side of the fence, near a funnel; relocated near ponds at Lin Conservation Area; crawled into a crevice
1217_2	Evening Survey	103/178/female ; good condition	37.74798	-121.75034	37.74677	-121.74691	17	Found along W side of the fence, burrowed under a funnel; relocated near ponds at Lin Conservation Area; walked East
1218_1	Evening Survey	83/157; male; good condition	37.747756	-121.750574	37.746751	-121.746876	17	Observed along silt fencing on W edge of Seg. 17 in a small rodent burrow; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
1218_2	Evening Survey	92/169; male; good condition	37.7467	-121.7515	37.746751	-121.746876	17	Observed along silt fencing on W edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
1219_1	Construction	93/198; female; good condition	37.746909	-121.751504	37.745501	-121.752388	17	Observed along silt fencing on W edge of Seg. 17 at 0745 hours; relocated on to ground squirrel burrow E of fencing

Table D-2
R649, R700, and R707 Natural Gas Transmission Pipeline 131 Replacement Project
2019 CTS Discovery and Relocation Results

CTS # ¹	Construction/ Evening Survey	Measurements and Condition: SVL/TL in mm	Coordinates of Discovery Location		Coordinates of Relocation Site		Discovery Location Segment No./ Staging Area	Comments
			Lat.	Long.	Lat.	Long.		
0106_1	Evening Survey	101/228; male; good condition	37.750266	-121.748136	37.748581	-121.746906	18	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0106_2	Evening Survey	98/202; male; good condition	37.748661	-121.749687	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0106_3	Evening Survey	101/211; male; good condition	37.748573	-121.749791	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0106_4	Evening Survey	97/218; male; good condition	37.748577	-121.749799	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0106_5	Evening Survey	97/207; male; good condition	37.748488	-121.749931	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0106_6	Evening Survey	85/200; male; good condition	37.748421	-121.74994	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area

¹ Note: First portion of CTS # is date of discovery.

CTS # ¹	Construction/ Evening Survey	Measurements and Condition: SVL/TL in mm	Coordinates of Discovery Location		Coordinates of Relocation Site		Discovery Location Segment No./ Staging Area	Comments
			Lat.	Long.	Lat.	Long.		
0106_7	Evening Survey	95/191; male; good condition	37.748319	-121.750038	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0106_8	Evening Survey	84/191; female; good condition	37.748333	-121.749998	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0106_9	Evening Survey	84/191; male; good condition	37.748313	-121.750022	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0106_10	Evening Survey	84/186; male; good condition	37.746904	-121.751538	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0106_11	Evening Survey	93/175; female; good condition	37.746843	-121.751586	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0106_12	Evening Survey	91/193; male; good condition	37.74662	-121.751778	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0106_13	Evening Survey	94/180; female; good condition	37.74565	-121.752804	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0106_14	Evening Survey	100/186; female; good condition	37.744927	-121.753516	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area

CTS # ¹	Construction/ Evening Survey	Measurements and Condition: SVL/TL in mm	Coordinates of Discovery Location		Coordinates of Relocation Site		Discovery Location Segment No./ Staging Area	Comments
			Lat.	Long.	Lat.	Long.		
0106_15	Evening Survey	94/212; male; good condition	37.748102	-121.750279	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0106_16	Evening Survey	84/182; male; good condition	37.748223	-121.750129	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0106_17	Evening Survey	96/195; male; good condition	37.748475	-121.749907	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0106_18	Evening Survey	96/189; female; good condition	37.749059	-121.749318	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0106_19	Evening Survey	100/186; female; good condition	37.749728	-121.748676	37.748581	-121.746906	17	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0107_1	Evening Survey	90/160; male; good condition	37.74713	-121.75076	37.746757	-121.746844	17	Observed walking along E edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area; walked towards pond after 5 minutes
0107_2	Evening Survey	N/A; male; good condition	37.74649	-121.7519	N/A	N/A	17	Observed along W edge of silt fencing under a piece of wood; escaped container during transport and not relocated

CTS # ¹	Construction/ Evening Survey	Measurements and Condition: SVL/TL in mm	Coordinates of Discovery Location		Coordinates of Relocation Site		Discovery Location Segment No./ Staging Area	Comments
			Lat.	Long.	Lat.	Long.		
0108_1	Evening Survey	83/178; male; good condition	37.750702	-121.748219	37.74677	-121.74691	18	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0108_2	Evening Survey	73/124; female; good condition	37.744029	-121.754388	37.74677	-121.74691	16	Same as above
0108_3	Evening Survey	102/162; female; good condition	37.742735	-121.755267	37.74677	-121.74691	16	Same as above
0108_4	Evening Survey	83/133; female; good condition	37.743163	-121.754824	37.74677	-121.74691	16	Same as above
0108_5	Evening Survey	105/181; female; good condition	37.747313	-121.750631	37.74677	-121.74691	17	Observed along E edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0110_1	Evening Survey	105/206; male; good condition	37.752258	-121.747812	37.74677	-121.74691	700E	Observed along W edge of silt fencing; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0112_1	Evening Survey	78/128; female; juvenile; good condition	37.7466333	-121.751725	37.7455694	-121.7522694	17	Observed along E edge of silt fencing; relocated to burrow on E side of silt fencing
0115_1	Evening Survey	76/141; subadult; good condition	37.74578	-121.75217	37.74632	-121.75252	17	Observed along silt fencing on E edge of Seg. 17; relocated W of ROW into a gopher burrow
0115_2	Evening Survey	89/165; female (gravid); good condition	37.74665	-121.75176	37.746751	-121.746876	17	Observed along silt fencing on W edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area

CTS # ¹	Construction/ Evening Survey	Measurements and Condition: SVL/TL in mm	Coordinates of Discovery Location		Coordinates of Relocation Site		Discovery Location Segment No./ Staging Area	Comments
			Lat.	Long.	Lat.	Long.		
0115_3	Evening Survey	95/173; female (gravid); good condition	37.748702	-121.749636	37.746751	-121.746876	17	Observed along silt fencing on E edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0116_1	Evening Survey	73/117; subadult; good condition	37.743144	-121.754854	37.74369	-121.75476	16	Observed along silt fencing on E edge of Seg. 16; Released into burrow W of fencing/ROW
0116_2	Evening Survey	84/165; female; good condition	37.746799	-121.751163	37.74677	-121.74691	17	Observed along silt fencing on E edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0116_3	Evening Survey	83/159; female; good condition	37.748714	-121.749172	37.74677	-121.74691	17	Observed along silt fencing on E edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0117_1	Construction	88/192; female (gravid); good condition	37.749321	-121.749073	37.74555	-121.752301	17	Observed along silt fencing on W edge of Seg. 17 at 0645 hours; relocated E of ROW into a burrow
0117_2	Construction	99/196; female (gravid); good condition	37.749286	-121.749056	37.745353	-121.752262	17	Observed along silt fencing on W edge of Seg. 17 at 0645 hours; relocated E of ROW into a burrow
0117_3	Construction	90/194; male; good condition	37.749217	-121.749155	37.745237	-121.752277	17	Observed along silt fencing on W edge of Seg. 17 at 0645 hours; relocated E of ROW into a burrow

CTS # ¹	Construction/ Evening Survey	Measurements and Condition: SVL/TL in mm	Coordinates of Discovery Location		Coordinates of Relocation Site		Discovery Location Segment No./ Staging Area	Comments
			Lat.	Long.	Lat.	Long.		
0117_4	Evening Survey	85/169; female (gravid); good condition	37.74769	-121.75064	37.746751	-121.746876	17	Observed along silt fencing on W edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0117_5	Evening Survey	94/190; male; good condition	37.74619	-121.75223	37.746751	-121.746876	17	Observed along silt fencing on W edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0117_6	Evening Survey	111/194; female (gravid); good condition	37.748044	-121.75025	37.746751	-121.746876	17	Observed along silt fencing on W edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0117_7	Evening Survey	94/177; female (gravid); good condition	37.748787	-121.749528	37.746751	-121.746876	17	Observed along silt fencing on W edge of Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0118_1	Construction	102/173; female; good condition	37.748419	-121.749974	37.74805	-121.74903	17	Observed along silt fencing on W edge of Seg. 17 at 0740 hours; relocated to a burrow on east side of fencing/ROW
0118_2	Evening Survey	108/205; male; good condition	37.7504972	-121.7475306	37.7462056	-121.7469222	18	Observed on east side of work area next to wattle in Seg. 18; no exclusion fence in area; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area

CTS # ¹	Construction/ Evening Survey	Measurements and Condition: SVL/TL in mm	Coordinates of Discovery Location		Coordinates of Relocation Site		Discovery Location Segment No./ Staging Area	Comments
			Lat.	Long.	Lat.	Long.		
0118_3	Evening Survey	100/180; female; good condition	37.7485583	-121.749225	37.7462056	-121.7469222	17	Observed on east side of work area inside fence, next to the gate in exclusion fencing in Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0118_4	Evening Survey	110/190; female; good condition	37.7434722	-121.75465	37.7462056	-121.7469222	16	Observed on east side of work area inside of fence in Seg. 16; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0118_5	Evening Survey	100/188; female; good condition	37.7472507	-121.7510999	37.7462056	-121.7469222	17	Observed on west side of work area outside fence in Seg. 17; relocated on E edge of Dagnino Road near ponds at Lin Conservation Area
0119_1	Construction	105/208; female (gravid); good condition	37.74731	-121.75105	37.74689	-121.75097	17	Observed along silt fencing on W edge of Seg. 17 at 0845 hours; relocated to a ground squirrel burrow approx. 50 m south, located E of ROW
0119_2	Evening Survey	97/182; female (gravid); good condition	37.746741	-121.75168	37.74677	-121.74691	17	Observed along silt fencing on W edge of Seg. 17; relocated to ponds at Lin Conservation Area

CTS # ¹	Construction/ Evening Survey	Measurements and Condition: SVL/TL in mm	Coordinates of Discovery Location		Coordinates of Relocation Site		Discovery Location Segment No./ Staging Area	Comments
			Lat.	Long.	Lat.	Long.		
0119_3	Evening Survey	103/183; female (gravid); good condition	37.745374	-121.752995	37.74677	-121.74691	17	Observed along silt fencing on W edge of Seg. 17; relocated to ponds at Lin Conservation Area
0120_1	Evening Survey	93/165; female; good condition	37.7484361	-121.7494139	37.7462056	-121.7469222	17	Captured on east side of work area in Seg. 17; relocated to ponds at Lin Conservation Area
0120_2	Evening Survey	100/190; female; good condition	37.7468778	-121.7511306	37.7462056	-121.7469222	17	Captured east side of work area, inside fence in Seg. 17; relocated to ponds at Lin Conservation Area
0120_3	Evening Survey	100/190; male; good condition	37.7465861	-121.7513361	37.7462056	-121.7469222	17	Captured outside fence on east side of work area, on top of funnel in Seg. 17; relocated to ponds at Lin Conservation Area
0120_4	Evening Survey	115/195; female; good condition	37.749398	-121.749001	37.7462056	-121.7469222	17	Captured on west side of work area, outside fence in Seg. 17; relocated to ponds at Lin Conservation Area
0120_5	Evening Survey	80/125; female; good condition	37.7431528	-121.7550639	37.7462056	-121.7469222	16	Captured east side of work area outside fence in Seg. 16; relocated to ponds at Lin Conservation Area

CTS # ¹	Construction/ Evening Survey	Measurements and Condition: SVL/TL in mm	Coordinates of Discovery Location		Coordinates of Relocation Site		Discovery Location Segment No./ Staging Area	Comments
			Lat.	Long.	Lat.	Long.		
0122_1	Evening Survey	90/164; female (appeared spent, no swollen vent); good condition	37.74742	-121.75052	37.74811	-121.75074	17	Observed along silt fencing on E edge of Seg. 17; relocated to a gopher burrow located ~85 m N of original location, W of the ROW
0123_1	Evening Survey	98/186; female (gravid); good condition	37.74633	-121.75163	37.746751	-121.746876	17	Observed along silt fencing on E edge of Seg. 17; relocated to the Lin Conservation Area on the E side of Dagnino Rd
0126_1	Construction	96/215; female; good condition	37.722376	-121.775871	37.721411	-121.776686	9	Observed under plywood in Seg. 9 at 1400 hours; relocated to burrow west of ROW in Seg. 8
0128_1	Construction	92/176; female; good condition	37.748076	-121.749883	37.748026	-121.749113	17	Observed under a funnel on the eastern fence in Seg. 17 at 0814 hours; relocated to a burrow east of ROW
0129_1	Construction	110/190; female; good condition	37.75151	-121.748741	37.74613	-121.744416	700E	Observed in Staging Area 700E at 0700 hours; relocated to ponds at Lin Conservation Area
0130_1	Construction	102/187; male; good condition	37.7611252	-121.7367064	37.761544	-121.737244	23	Observed in Segment 23 under a straw wattle at 0945 hours; relocated to burrow west of ROW

CTS # ¹	Construction/ Evening Survey	Measurements and Condition: SVL/TL in mm	Coordinates of Discovery Location		Coordinates of Relocation Site		Discovery Location Segment No./ Staging Area	Comments
			Lat.	Long.	Lat.	Long.		
0130_2	Evening Survey	92/146; gravid female; deceased	37.752222	-121.7472417	N/A	N/A	700E	Observed along Staging Area 700E exclusion fence at 1922 hours; found entrapped in a post hole on the outside of the fence; collected for CDFW
0130_3	Evening Survey	89/152; unknown sex; good condition	37.747002	-121.7469903	37.749023	-121.7497711	Dagnino Rd.	Observed crossing Dagnino Road, moving west; relocated to west side of ROW
0130_4	Evening Survey	99/164; female (spent); good condition	37.749558	-121.7483433	37.749832	-121.7487586	17	Observed along east side of Segment 17 ROW crawling along wattle; relocated west directly across ROW and released; animal observed crawling into a small burrow post release
0209_1	Evening Survey	Adult; not handled	37.74676	-121.746959	N/A	N/A	Dagnino Rd.	Observed at 1845 hours on east shoulder of Dagnino Rd. ~500 M south of work area, moving toward the Lin Conservation Area on the E side of Dagnino Rd. Did not handle.

CTS # ¹	Construction/ Evening Survey	Measurements and Condition: SVL/TL in mm	Coordinates of Discovery Location		Coordinates of Relocation Site		Discovery Location Segment No./ Staging Area	Comments
			Lat.	Long.	Lat.	Long.		
0210_1	Evening Survey	95/--; female; good condition	37.75225146	-121.7481128	37.74665434	-121.7469224	700E	Observed 6 inches north of R700E fencing in a puddle. Relocated to area near Lin pond. Observed CTS moving toward the Lin Conservation Area on the E side of Dagnino Rd. until the CTS was out of site
0213_1	Construction	93/183; male; good condition	37.752356	-121.7454016	37.750443	-121.7468755	19	Observed at 1030 hours along PGE access driveway east of Dagnino Road, across from R700E Staging Area. Animal was under water in the culvert area, and was captured before being swept into the heavy rain runoff. CTS was relocated to the nearest burrow on the east side of Dagnino Road, away from the culvert area.
0225_1	Construction	100/180; female; good condition	37.7459472	-121.7526294	37.74812	-121.75185	17	Observed at 0830 hours under a wattle in Segment 17; relocated to a burrow along the east side of W-1, west of the Project alignment.
0423_1	Construction	Likely Adult; not handled	37.7563	-121.74149	N/A	N/A	21	Observed at 1405 hours under a wattle in Segment 21; no handling or relocation occurred

Appendix D.8

Declining Amphibian Task Force
Fieldwork COP

The Declining Amphibian Task Force Fieldwork Code of Practice

A code of practice, prepared by the Declining Amphibian Task Force (DAPTF) to provide guidelines for use by anyone conducting field work at amphibian breeding sites or in other aquatic habitats. Observations of diseased and parasite-infected amphibians are now being frequently reported from sites all over the world. This has given rise to concerns that releasing amphibians following a period of captivity, during which time they can pick up unapparent infections of novel disease agents, may cause an increased risk of mortality in wild populations. Amphibian pathogens and parasites can also be carried in a variety of ways between habitats on the hands, footwear, or equipment of fieldworkers, which can spread them to novel localities containing species which have had little or no prior contact with such pathogens or parasites. Such occurrences may be implicated in some instances where amphibian populations have declined. Therefore, it is vitally important for those involved in amphibian research (and other wetland/pond studies including those on fish, invertebrates and plants) to take steps to minimize the spread of disease and parasites between study sites.

1. Remove mud, snails, algae, and other debris from nets, traps, boots, vehicle tires and all other surfaces. Rinse cleaned items with sterilized (e.g. boiled or treated) water before leaving each study site.
2. Boots, nets, traps, etc., should then be scrubbed with 70% ethanol solution (or sodium hypochlorite 3 to 6%) and rinsed clean with sterilized water between study sites. Avoid cleaning equipment in the immediate vicinity of a pond or wetland.
3. In remote locations, clean all equipment as described above upon return to the lab or "base camp". Elsewhere, when washing machine facilities are available, remove nets from poles and wash with bleach on a "delicates" cycle, contained in a protective mesh laundry bag.
4. When working at sites with known or suspected disease problems, or when sampling populations of rare or isolates species, wear disposable gloves and change them between handling each animal. Dedicate sets of nets, boots, traps, and other equipment to each site being visited. Clean and store them separately and the end of each field day.
5. When amphibians are collected, ensure the separation of animals from different sites and take great care to avoid indirect contact between them (e.g. via handling, reuse of containers) or with other captive animals. Isolation from un-sterilized plants or soils which have been taken from other sites is also essential. Always use disinfected/disposable husbandry equipment.
6. Examine collected amphibians for the presence of diseases and parasites soon after capture. Prior to their release or the release of any progeny, amphibians should be quarantined for a period and thoroughly screened for the presence of any potential disease agents.
7. Used cleaning materials (liquids, etc.) should be disposed of safely and if necessary taken back to the lab for proper disposal. Used disposable gloves should be retained for safe disposal in sealed bags.

Appendix D.9

Restraint & Handling of
Live Amphibians

APPENDIX D. Restraint and Handling of Live Amphibians

Citation:

Green, D. E. 2001. Restraint and handling of live amphibians. Amphibian Research and Monitoring Initiative Standard Operating Procedure, No. 100. National Wildlife Health Center. Available from http://www.nwhc.usgs.gov/publications/amphibian_research_procedures/handling_and_restraint.jsp (accessed Month Year).

STANDARD OPERATING PROCEDURE

ARMI SOP No. 100

Revised, 16 February 2001

I. PURPOSE:

Provide guidelines for humane handling of amphibians so that injury and distress to the amphibian are minimized.

II. SCOPE:

These guidelines apply to larvae and tadpoles, as well as adult frogs, toads, salamanders and neotenes. Because of their anatomically different and very delicate skin, tadpoles and larvae must be handled differently than post-metamorphic amphibians.

III. EQUIPMENT and SUPPLIES:

- a. Standard capture equipment (seine nets, dip nets, minnow traps)
- b. Clear plastic bags (half liter or full liter size)

IV. BACKGROUND:

There are three main hazards associated with handling live amphibians: two to the amphibian and one to the handler. To amphibians, the main dangers of being handled are skin damage that could result in secondary skin infections, and bone and muscle injuries caused by struggling when being held. For the handler, the main danger comes from toxic skin secretions produced by some amphibians (in the USA, this is mostly newts and the introduced giant/marine toad).

Tadpoles and larvae have thin delicate skin that is very easily damaged by the slightest handling. The skin of larvae lacks keratin and has fewer cell layers than adult amphibian skin. Therefore, direct contact handling of tadpoles and larvae is to be avoided; instead, these amphibian stages are examined through clear flexible plastic bags containing water. Although the skin of adult (post-metamorphic) amphibians has keratin and is less delicate than larval skin, their skin is still much more delicate than the skin of reptiles,

birds and mammals. Rough handling of adult amphibians can easily result in skin abrasions, small tears, punctures, erosions and ulcers; normally, minor skin wounds heal quickly, but if contaminants, sewage or high levels of microorganisms are present in the pond or other environment, then wound infections are possible.

Frogs and Toads: All amphibians can be expected to struggle following capture. For anurans, there is a danger that vigorous kicking with the hind limbs can cause joint dislocations or a broken (fractured) back; broken backs are a well-documented and major problem in another species that moves by hopping--rabbits. Therefore, proper restraint of anurans, first and foremost involves inhibiting their ability to kick.

Salamanders: For salamanders, there are three major dangers associated with handling: 1) loss (automizing) of the tail, 2) damage to the very delicate external gills (in neotenes), and 3) back injury during whip-like thrashing movements.

V. METHODS OF PHYSICAL RESTRAINT:

- a. Anurans: Medium and large size frogs and toads (those about 5 grams and larger) should be grasped around the waist with the hind limbs fully extended. The animal should not be allowed to bend (flex) its hip and knee joints, since this would allow it to kick.
- b. Caudates: Medium and large size salamanders (those about 5 grams and larger) should be grasped in the middle of the body between the forelimbs and hind limbs. Larval and neotenic salamanders should never be grasped around the head or neck, because the gills can be easily damaged. Under no circumstances should salamanders be grasped by the tail or picked up by the tail.
- c. Larvae: All larvae (including tadpoles) should be handled with nets or scoops. For examinations, the larvae should be placed in a clear plastic bag with a mild amount of water. Alternatively, larvae may be sedated with an anesthetic and examined in a dish or bowl of water. As much as possible, larvae should be examined only while they are in water. Larvae should not be grasped with bare hands.

VI. MISHAPS:

- a. Skin wounds: If an amphibian suffers a skin wound during handling, it is recommended that the wound be sprayed with the over-the-counter product, Bactine® (See the SOP on Toe Clipping of Frogs and Toads, NWHC ACUC Protocol 2001-004). All other topical antiseptics and disinfectants (sprays and ointments) are CONTRAINDICATED in amphibians. If possible, the animal should then be released on land rather than into water, since the antiseptic spray would be quickly washed off in water.

- b. Broken back: If a frog or toad suffers a broken back during capture or handling, it should be promptly euthanized. It would be inhumane to release such a crippled animal. An animal with a broken back will have serious damage to the spinal cord and should show almost immediate paralysis of the hind limbs and tail. Recommended methods of humane euthanasia include (see NWHC ACUC Protocol 1999-009, Methods of Euthanasia):
 - i. Pithing
 - ii. Overdosing in anesthetic solutions of MS222 or benzocaine
 - iii. Application of a benzocaine-based topical ointment (as used by humans to relieve toothaches) to the top of the head and dorsum of the body.
- c. Broken leg: If a major bone of a limb is broken during capture or handling, the animal should be euthanized or taken to a wildlife rehabilitation center or veterinarian for treatment. A broken leg bone typically is recognized as an abnormal bend in the leg where there is no joint; other signs of a broken leg bone are protrusion of a bone fragment through the skin, inability of the animal to move a limb or position a leg in its normal resting posture. After treatment, amphibians with broken bones might be given to a zoo or placed in a captive breeding program. Only if the injured amphibian is kept isolated from all other fish, amphibians and reptiles (e.g., in a separate cage) during treatment, can it later be considered for release at the point of capture. Injuries to digits (toes and fingers) generally are not life threatening; if the skin of the injured toe also is wounded, then treatment with Bactine® prior to immediate release is acceptable. If a toe bone is broken and protruding through the skin, the affected toe may be amputated just proximal to the site of the fracture, the stump should be sprayed with Bactine®, and the animal may be released.
- d. Automized tail: If a salamander automizes (detaches) its tail during capture or handling, the stump should be treated (sprayed) with Bactine®; the salamander can then be promptly released.
- e. Crushing injuries to head and body: Amphibians that have serious injuries to skin, muscles and bones should be promptly euthanized. Crushing injuries that are limited to a limb or tail will require treatment at a wildlife rehabilitation center or a veterinary clinic; alternatively, the animal may be euthanized, but it would be inhumane to release a seriously injured amphibian.
- f. Snout abrasions: Amphibians that are held in glass or clear plastic containers may jump headfirst into the glass, or may rub their snout

against the container in attempts to burrow out. If amphibians are held for more than an hour in a clear container (bottle, aquarium, etc.), they should be examined for evidence of skin injury at the tip of the snout and elsewhere around the head prior to release. If abrasions are detected, they should be sprayed with Bactine® prior to release.

- g. Toxic skin secretions: All amphibians have glands in their skin that secrete a vast number of chemicals; some of which are merely noxious and repellant-like, while others may cause skin or eye irritation, and some may actually kill. The poison-dart frogs of Central America are an example of a frog with toxic secretions that can kill a human. Among the native amphibians of the United States, the two amphibians of greatest concern are giant toads (also called cane toads, marine toads, aka toads; *Bufo marinus*) and western newts of the genus, *Taricha*.

Giant toads secrete a potent white mucoid substance from their parotid glands (large warts just behind the eyes) that affects the heart, but it is not absorbed through the intact human skin; however, the toxin is readily absorbed through the eyes and mouth. Hence, the best way to prevent poisoning is to carefully avoid rubbing the eyes or putting fingers in the mouth after handling a giant toad. If skin secretions of giant toads contact the eye or mouth, then flush promptly with generous amounts of clean fresh water or contact lens wetting solution, and then seek emergency care at a clinic or hospital if stinging or numbness of the eye or mouth develops.

Newts of the genus, *Taricha*, also secrete toxins from their skin; it is presumed that the entire body of these newts secretes toxins (newts and other salamanders do not have parotid glands). Their skin secretions are very irritating to the eyes and mouth. Temporary blindness (lasting about 24 hrs) has been reported by field biologists that handled newts and then rubbed their eyes. If sensations of blurred vision, or burning or stinging of the eyes occur after handling any genus or species of newt, wash the eyes with copious amounts of fresh clean water (or contact lens wetting solutions) and promptly seek medical care. Persons with newt skin secretions in their eyes are advised not to drive a vehicle or operate other dangerous or heavy equipment.

Finally, it is possible that other amphibian species in the USA besides giant toads and newts, could produce skin secretions that are irritants to the eyes. Furthermore, amphibians may carry some bacteria in their intestines and feces that are human pathogens, such as the bacteria, *Salmonella* and *Leptospira*. Hence, it is always best to practice good personal hygiene after handling any amphibian (namely, thoroughly wash your hands with soap and water).

VII. CITED LITERATURE:

1. MARTIN, D., and H. HONG. 1991. The use of Bactine® in the treatment of open wounds and other lesions in captive anurans. *Herpetol Rev* 22: 21.