Appendix C Biological Opinion

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
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Ventura, California 93003

IN REPLY REFER TO:
08EVEN00-2014-F-0297

February 11, 2014

Memorandum

To: Supervisory Wildlife Biologist, Bureau of Reclamation, South-Central California Area Office, Fresno, California

From: Field Supervisor, Ventura Fish and Wildlife Office, Ventura, California

Subject: Biological Opinion for the West Hills Water Treatment Plant, San Benito County, California

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the proposed West Hills Water Treatment Plant project and its effects on the federally endangered San Joaquin kit fox (*Vulpes macrotis mutica*), and the federally threatened California red-legged frog (*Rana draytonii*) and California tiger salamander (*Ambystoma californiense*), in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). We received your May 15, 2014, request for formal consultation on May 19, 2014.

We based this biological opinion on information that accompanied your May 15, 2014, request for consultation, including the biological assessment (Bureau of Reclamation 2014); information requested by our office on May 27, 2014, received on June 3, 2014 (Bureau of Reclamation, in litt. 2014); and correspondence and phone conversations between our office and the Bureau of Reclamation. A complete record of this consultation can be made available at the Ventura Fish and Wildlife Office.

Consultation History

We received your initial request for formal consultation (dated February 26, 2014) in our office on March 7, 2014. We responded to this request by letter, dated April 3, 2014, stating that the biological assessment (BA) for the proposed project did not contain sufficient information regarding on-site species information. The habitat and species occurrence information presented in the biological assessment was very minimal, and there was no discussion about why your agency determined that this project would not affect federally threatened vernal pool fairy shrimp (*Branchinecta lynchi*). On April 9, 2014, Jennifer Lewis of your office sent an email to Kirstina Barry of my staff containing site photos of the project area, and on April 14, 2014, Ms.

Lewis provided a rationale for why this project would not affect vernal pool fairy shrimp. You resubmitted your consultation request to our office on May 15, 2014, with the remainder of the requested information.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Bureau of Reclamation (Reclamation) proposes to issue a permit to San Benito County Water District (SBCWD) to connect to the Hollister Conduit in association with the construction of a new water treatment plant. The proposed West Hills Water Treatment Plant is a new surface water treatment plant that would serve the City of Hollister and adjacent unincorporated areas of northern San Benito County. The primary construction site of the proposed water treatment plant is located in an unincorporated area of San Benito County just outside of the southwestern boundary of the City of Hollister in the hills north of Union Road.

The main components of the proposed action include construction and operation of the West Hills Water Treatment Plant, a raw water pump station, and raw and treated water transmission pipelines. The existing Hollister Conduit would be connected to the proposed raw water pipeline at a turn-out structure off Union Road. Water would be pumped from the Hollister Conduit to the plant via the proposed raw water pump station. The water treatment plant would be comprised of treatment facilities, solids handling facilities (including drying beds), treated water storage tanks, an administration and operations building and associated facilities. Once on-site, the primary treatment processes, storage tank, and the distribution system would be fed by gravity.

Chemical use and storage

The SBCWD would construct a pretreatment and filtration process facility consisting of tanks, pipes, and equipment housed within an approximately 5,500-square-foot area on the eastern portion of the site. An approximately 2,700-square-foot chemical storage area would be located directly west of the pretreatment and filtration processes. All chemicals would be stored in tanks and would have either a fill station to receive bulk delivery or means to access the tanks in order to fill it directly. A concrete curb would enclose the storage and blending area to confine chemicals in the case of a spill. A silo feed system would store up to 25 tons of dry powder activated carbon, which would be injected directly into the pretreatment system. The silo feed system would be approximately 14 feet in diameter and would rise approximately 38 feet above ground.

The chemical systems at the proposed plant site would include preoxidants, sulfuric acid, powder activated carbon, polymer, coagulant (ferric chloride), sodium hydroxide, and sodium hypochlorite. Sodium permanganate would be stored and fed at the proposed raw water pump station site. The bulk chemical storage tanks are double-walled with secondary containment between the two walls. These tanks would be located outdoors stored on an approximately 3,000-square-foot concrete slab, which would be covered by a metal canopy adjacent to the

chemical feed pumps and systems. All chemical piping located outside of the chemical containment area would be installed in double-contained piping; tubing would be used within the contained piping to simplify removal for repairs.

Solids handling process
The solids handling process would entail treatment and storage of sludge generated from the pretreatment system and backwash water (i.e., water that contains suspended solids from the source water and the reaction products of chemicals added in the treatment process and residual filter material). Proposed solids handling facilities would include two 7,000-square-foot wash water basins located north of the pretreatment and filtration components; two reclaimed water pumps at the northern end of the wash water basins; and three 10,000-square-foot drying beds sited at the northwestern end of the project site to support the initial design capacity. The wash water basins would be approximately 12 feet deep. The drying beds would be approximately 4 feet deep. If the water treatment plant is expanded to a capacity of 9 million gallons per day in the future, a fourth 10,000-square-foot drying bed would be constructed at the same location. Reclamation and/or SBCWD will notify the Service prior to the start of any expansion construction.

Sludge mixture would be introduced to the drying beds every 3 to 4 weeks and water may pond slightly in the beds for several hours up to 2 days as it decants off. At the end of the 3- to 4-week drying period, the dried material would be removed using a front-end loader. An under drain would be installed beneath each drying bed to provide additional water removal.

An administration and operations building would accommodate the plant operators and maintenance staff. The approximately 5,000-square-foot building would house a control room, lab, and other facilities. A septic system with a leach field would be installed to handle sewer flows from the administration and operations building at the plant, and would measure approximately 1,000 square-feet in area.

Treated water storage tank
A pre-stressed concrete treated water storage tank is proposed east of the administration and operations building. This tank would have an approximate capacity of 550,000 gallons and, due to the sloped terrain of the tank site, would likely be partially buried 16 feet below ground. The above ground height of the tank would range between 10 feet (on the side facing Richardson Road) and 34 feet (on the side facing Riverside Road). If the water treatment plant is expanded in the future, a second tank would be constructed at the same location. Reclamation and/or SBCWD will notify the Service prior to the start of any expansion construction.

Access
Access to the water treatment plant would be provided through Union Road and Richardson Road. Currently, Richardson Road is an actively utilized, compacted gravel access road that varies between 16 and 20 feet in width. This road provides access to two residences east of the proposed water treatment plant, ranch facilities, and vehicle storage. Richardson Road would be expanded to a 20-foot wide paved road. The paved driveway within the plant would be at least

24 feet wide and would loop past the administration building, filter area, and solids lagoon and back to the entrance. During operation, the volume of traffic visiting the water treatment plant is expected to be minor. Most employees and visitors are expected to arrive by automobile; however, large trucks would arrive for periodic deliveries, maintenance, and construction.

Pipelines

A 20-inch diameter, approximately 3,500-foot long pressurized raw water pipeline would extend northeast from the pump station site within Richardson Road to the treatment plant. The approximately 1.6-mile long pipeline would extend from the water treatment plant within an existing right-of-way and driveway on private land to Riverside Road, south along Riverside Road, northeast along Nash Road, and then tie in with the existing water distribution system at the intersection of Nash Road and Line Street. At the Nash Road Bridge crossing over the San Benito River, the pipeline would be installed within the existing bridge box. The trenches for both pipelines would be approximately 4 feet wide and approximately 5 feet deep, and the pipeline would be installed at a depth of approximately 4 feet.

Construction

Project construction is estimated to last approximately 2 years. The additional expansion components (i.e., a fourth drying bed and a second treated water storage tank) would occur approximately 4 years later, with construction lasting less than 1 year. Installation of the treated water pipeline at the Nash Bridge crossing would occur outside of the nesting bird season (May 1 through August 31). Following construction, final testing and startup is estimated to last an additional 3 months. Construction work would be between the hours of 8:00 a.m. and 5:00 p.m. Staging of construction equipment, materials, spoils, and construction worker parking would be provided within the water treatment plant site. Throughout the majority of the water treatment plant construction period, the proposed drying beds site would be used as a main staging area and the drying beds would be built at the end of the construction phase. In addition, some areas adjacent to the raw water pump station, raw water pipeline, and treated water pipeline may also be used for temporary staging.

At any given point, the maximum number of construction workers at the project site would be 30 workers. Approximately 50,000 cubic-yards of excavation would be required for the two main water treatment pipelines, water treatment plant, treated water storage tanks, filters, drying beds, and administration building. Stormwater quality best management practices would be implemented during this phase of construction. Project activities would not occur within the river or riverbank.

For all new pipelines, construction would include site clearing, excavation, trenching, and shoring. Pipeline installation within unpaved areas would occur at a rate of up to 200 feet per day, and pipeline installation in paved areas would occur at an average rate of 100 feet per day. Once pipelines have been installed, the excavated areas would be backfilled and compacted, and paved areas would be re-surfaced.

Avoidance and Minimization Measures

Reclamation and SBCWD propose a variety of avoidance and minimization measures for the California tiger salamander, California red-legged frog, and San Joaquin kit fox. In addition to the avoidance and minimization measures, SBCWD also proposes compensation for impacts to suitable California tiger salamander upland habitat as described below. All of the proposed measures will be implemented during the initial construction as well as during any potential future expansion.

California tiger salamander and California red-legged frog

1. A Service-approved biologist will conduct preconstruction burrow inspections to identify California tiger salamanders and/or California red-legged frogs in underground burrows. The name(s) and credential(s) of the biologist(s) will be submitted to the Service for approval at least 30 days prior to the commencement of work.

2. All animal burrows occurring within the proposed exclusion fence area will be visually scoped and hand excavated by the Service-approved biologist.
   a. The first burrow inspection will occur after survey stakes are installed to identify the location of exclusion fencing, and before any other activity in the proposed work area.
   b. The second burrow inspection will occur after installation of exclusion fence.

3. The work area will be delineated by installing amphibian exclusion fencing around the perimeter of the proposed action.
   a. Preconstruction surveys will be conducted before exclusion fences are installed around work areas.
   b. The perimeter fence will be constructed according to Service recommendations, consisting of 5-foot tall, 0.25-inch wire mesh keyed 6 inches into the ground with one-way amphibian doors installed every 100 feet of fenceline to provide egress opportunities.
   c. Installation of exclusion fencing will be completed prior to any other activities.
   d. The biological monitor will monitor the work area for sensitive species as the perimeter exclusion fence is installed. Trenching for fence installation will be immediately preceded by a visual inspection of the area by the biological monitor.
   e. The exclusion fence will remain in place until construction is completed and hydroseeding of temporarily-disturbed grasslands is complete.
   f. The Service-approved biologist will ensure that the exclusion fence is constructed in such a manner as to lead the animals to an area of suitable habitat that is not near project activities or a road.

4. If a California tiger salamander or California red-legged frog is found within the project area and is in harm's way, a Service-approved biologist will capture and relocate them from the work area in accordance with the Capture, Storage, and Release/Relocation Plan. The Capture, Storage, and Release/Relocation Plan will be submitted to the Service for approval at least 10 days prior to the onset of work.

San Joaquin kit fox

5. A Service-approved biologist will conduct preconstruction den inspections within 200 feet of work areas no more than 14 days before work begins. The name(s) and credential(s) of the biologist(s) will be submitted to the Service for approval at least 30 days prior to the proposed commencement of work.

6. All identified potential dens will be monitored for evidence of kit fox use by placing an inert tracking medium at den entrances and monitoring for at least 3 consecutive nights.

7. For dens that occur within the construction footprint, if no activity is detected at these den sites, they will be closed following guidance established in the 2011 U.S. Fish and Wildlife Service Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance (Service 2011).
   a. No active kit fox dens will be destroyed.
   b. Potential dens (that have been determined to not be in use by the methods described above) in proximity to the construction area, but are outside the construction footprint, may be covered with plywood to prevent use.

8. To prevent accidental entrapment of San Joaquin kit fox or other animals during construction, all excavated holes or trenches greater than 2 feet deep will either be suitably covered at the end of each work day, fenced, or escape routes constructed of earthen materials or wooden planks will be put in place. Before filling, such holes will be thoroughly inspected for trapped animals.

9. If at any time San Joaquin kit fox individuals or den occupancy is identified in the action area, the biological monitor has authority to halt work and will immediately notify SBCWD or its contractor to halt work within 200 feet of the den or San Joaquin kit fox. SBCWD or the biological monitor will immediately contact the Service and Reclamation.

General protective measures

10. A Service-approved biologist will train an on-site biological monitor to oversee work areas for the duration of the project.
    a. The biological monitor will ensure project compliance with wildlife protective measures.
    b. The biological monitor will be able to identify California tiger salamanders and California red-legged frogs, as well San Joaquin kit fox and their burrows.
    c. If at any time California tiger salamander or California red-legged frog occupancy is identified in the proposed action area, the biological monitor will immediately notify SBCWD. SBCWD will halt localized work activities with potential to affect the species, and SBCWD or the biological monitor will contact the Service and Reclamation. The individual animal/s will then be managed according to the provisions of the Service-approved Capture, Storage, and Release/Relocation Plan and project permits, and the Service-approved biologist will perform any capture or relocation.

11. Prior to the start of daily activities, the biological monitor will inspect the work area and the exclusion fenceline for amphibians and reptiles, and will relocate any non-listed amphibians outside of the active work area. Only a Service-approved biologist will capture and relocate California tiger salamanders and California red-legged frogs and all such activities will be conducted according to the Service-approved Capture, Storage, and Release/Relocation Plan.

12. Construction related activities, vehicle operation, material and equipment storage, and other ground-surface disturbing activities will be restricted to the limits of work identified in construction plans.

13. A Service-approved biologist will conduct a training session for all on-site personnel. At a minimum, the training will include a description of California tiger salamanders, California red-legged frogs, and San Joaquin kit fox and their habitats; the importance of these species and their habitat; the general measures that are being implemented to conserve them as they relate to the activity; and the boundaries within which the work will occur.

14. If work requires on-site personnel and equipment to encroach within 100 feet of the San Benito River, all personnel will limit the number of access routes and the total area of activity to the minimum necessary to achieve the goal. All fueling and maintenance of vehicles and other equipment and staging areas will occur at least 65 feet from the San Benito River.

15. All food-related trash items (e.g., wrappers, cans, bottles, and food scraps) will be disposed of in closed containers and removed daily from the work area. After completion of the work, SBCWD or its contractor will remove all trash and construction debris from work area.

16. Vehicles will observe a maximum 20 miles per hour daytime speed limit. Nighttime vehicle traffic will be kept to a minimum. Off-road traffic outside the designated work area is prohibited.

17. The Service, Reclamation, and the California Department of Fish and Wildlife (CDFW) will be notified immediately in the case of a dead or injured California tiger salamander, California red-legged frog, or San Joaquin kit fox. If bodily harm to a California tiger salamander or California red-legged frog occurs during implementation of the proposed action, injured specimens will be transported to the nearest cooperating wildlife rehabilitation center; dead individuals will be deposited with the Museum of Vertebrate Zoology at Berkeley, the California Academy of Sciences, or as directed by the Service.

18. All pipes with a diameter of 1 inch or greater will be capped, plugged, taped, or otherwise covered at both ends. Tubular structures with a diameter of 1 inch or greater (such as rolls of fencing) and chamber-like structures (such as culvert or vaults) with an opening that is 1 inch or greater will also be covered at entrances. Pipes greater than 1 inch in diameter will be capped upon delivery immediately after unloading. Capping or plugging will remain in place until installation is imminent.

19. Any pipe left open overnight will be inspected by the biological monitor prior to being handled. If a California tiger salamander or California red-legged frog is discovered inside a pipe, the pipe will remain undisturbed until the Service-approved biologist relocates the species outside the construction area. If a San Joaquin kit fox is discovered inside a pipe, the pipe will not be handled until the Service has been consulted. If a San Joaquin kit fox, construction personnel, or project equipment is at immediate risk of injury, the pipe may be moved once to remove it from the path of activity, until the fox has escaped; if this occurs, it must be under direct supervision of the Service-approved biologist and the Service must be contacted immediately.

Operational avoidance measures

20. Maintenance actions will not impact surrounding grassland habitat during regular facility operations.

21. The SBCWD proposes to install temporary amphibian exclusion fencing around the water treatment plant entrance road and main facility.

22. The SBCWD proposes to direct bio-filtered stormwater runoff to the relict seasonal wetland through an approximately 100-foot vegetated buffer.

23. Any maintenance activities within the relict wetland will be restricted to the dry season or when no water is present, and be limited to activities that are designed to preserve the health and function of the wetland for sensitive or rare species. Except for the maintenance activities described in this measure, the relict wetland would be off limits to all persons. No one will be allowed to enter the wetland when there is standing water.

24. During the rainy season, the SBCWD will restrict periodic large-truck deliveries to daytime hours between 1 hour after sunrise and 1 hour before sunset.

25. The SBCWD will minimize the effects of nighttime lighting.

Habitat Compensation

The SBCWD proposes to compensate for the temporary and permanent loss of suitable California tiger salamander upland habitat to minimize the effects to the species; this is proposed to satisfy the State requirement for all impacts to be fully mitigated. Habitat compensation is not proposed for the California red-legged frog or San Joaquin kit fox, although these species may benefit from the California tiger salamander mitigation lands. California tiger salamander habitat compensation would be achieved by purchasing mitigation credits from a CDFW-approved conservation bank. It is expected that California tiger salamander mitigation credits can be purchased from the Ohlone West Conservation Bank, which is pending CDFW approval. Ohlone Conservation Bank's general service area maps for California tiger salamander indicate that the bank would be appropriate for the project area. SBCWD will negotiate compensation with CDFW at mitigation ratios varying from 0.5:1 to 2:1 for temporary and permanent impacts

occurring in habitat zones. Reclamation estimates that this should equate to about 12 acres of total land conservation.

ANALYTICAL FRAMEWORK FOR THE JEOPARDY DETERMINATION

Jeopardy Determination

Section 7(a)(2) of the Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02).

The jeopardy analysis in this biological opinion relies on four components: (1) the Status of the Species, which describes the range-wide condition of the California red-legged frog, California tiger salamander, and San Joaquin kit fox, the factors responsible for those conditions, and their survival and recovery needs; (2) the Environmental Baseline, which analyzes the condition of the California red-legged frog, California tiger salamander, and San Joaquin kit fox in the action area, the factors responsible for those conditions, and the relationship of the action area to the survival and recovery of the California red-legged frog, California tiger salamander, and San Joaquin kit fox; (3) the Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the California red-legged frog, California tiger salamander, and San Joaquin kit fox; and (4) the Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on the California red-legged frog, California tiger salamander, and San Joaquin kit fox.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the current status of species, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the California red-legged frog, California tiger salamander, or San Joaquin kit fox in the wild.

STATUS OF THE SPECIES

California red-legged frog

The California red-legged frog was federally listed as threatened on May 23, 1996 (61 Federal Register (FR) 25813, Service 1996). Revised critical habitat for the California red-legged frog was designated on March 17, 2010 (75 FR 12816, Service 2010). The Service issued a recovery plan for the species (Service 2002). A detailed description of California red-legged frogs can be found in Storer (1925), Stebbins (2003), and Jennings and Hayes (1994).

The historical range of the California red-legged frog extended coastally from southern Mendocino County and inland from the vicinity of Redding, California, southward to northwestern Baja California, Mexico (Jennings and Hayes 1985, Schafer et al. 2004, Storer

1925). The California red-legged frog has sustained a 70 percent reduction in its geographic range as a result of several factors acting singly or in combination (Carlos et al. 2001).

The California red-legged frog uses a variety of habitat types, including various aquatic systems, riparian, and upland habitats. California red-legged frogs have been found at elevations that range from sea level to about 5,000 feet. California red-legged frogs use the environment in a variety of ways, and in many cases they may complete their entire life cycle in a particular area without using other components (i.e., a pond is suitable for each life stage and use of upland habitat or a riparian corridor is not necessary). Populations appear to persist where a mosaic of habitat elements exists, embedded within a matrix of dispersal habitat. Adults are often associated with dense, shrubby riparian or emergent vegetation and areas with deep (greater than 28 inches) still or slow-moving water; the largest summer densities of California red-legged frogs are associated with deep-water pools with dense stands of overhanging willows (*Salix* spp.) and an intermixed fringe of cattails (*Typha latifolia*) (Jennings 1988). California red-legged frogs spend considerable time resting and feeding within dense riparian vegetation; it is believed the moisture and camouflage provided by the riparian plant community provide good foraging habitat and riparian vegetation provides cover during dispersal (Rathbun et al. 1993).

Breeding sites of the California red-legged frog are in aquatic habitats; larvae, juveniles, and adult frogs have been collected from streams, creeks, ponds, marshes, deep pools and backwaters within streams and creeks, dune ponds, lagoons, and estuaries. California red-legged frogs frequently breed in artificial impoundments such as stock ponds, given the proper management of hydro-period, pond structure, vegetative cover, and control of exotic predators. While frogs successfully breed in streams and riparian systems, high spring flows and cold temperatures in streams often make these sites risky egg and tadpole environments. An important factor influencing the suitability of aquatic breeding sites is the general lack of introduced aquatic predators. When riparian vegetation is present, California red-legged frogs spend considerable time resting and feeding in it; the moisture and camouflage provided by the riparian plant community likely provide good foraging habitat and may facilitate dispersal in addition to providing pools and backwater aquatic areas for breeding. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting population numbers and distribution.

During periods of wet weather, starting with the first rains of fall, some individual California red-legged frogs may make long-distance overland excursions through upland habitats to reach breeding sites. In Santa Cruz County, Bulger et al. (2003) found marked California red-legged frogs moving up to 1.7 miles through upland habitats, via point-to-point, straight-line migrations without apparent regard to topography, rather than following riparian corridors. Most of these overland movements occurred at night and took up to 2 months. Similarly, in San Luis Obispo County, Rathbun and Schneider (2001) documented the movement of a male California red-legged frog between two ponds that were 1.78 miles apart; this was accomplished in less than 32 days. However, most California red-legged frogs in the Bulger et al. (2003) study were non-migrating frogs and always remained within 426 feet of their aquatic site of residence (half of the frogs always stayed within 82 feet of water). Rathbun et al. (1993) radio tracked several

California red-legged frogs near the coast in San Luis Obispo County at various times between July and January; these frogs also stayed rather close to water and never strayed more than 85 feet into upland vegetation. Nine California red-legged frogs radio-tracked from January to June 2001, in East Las Virgenes Creek in Ventura County remained relatively sedentary as well; the longest within-channel movement was 280 feet and the furthest movement away from the stream was 30 feet (Scott 2002). Hayes and Tennant (1985) found juveniles to be active diurnally and nocturnally, whereas adults were largely nocturnal.

After breeding, California red-legged frogs often disperse from their breeding habitat to forage and seek suitable dry-season habitat. Cover within dry-season aquatic habitat could include boulders; downed trees; logs; agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or hay-ricks; and industrial debris. California red-legged frogs use small mammal burrows and moist leaf litter (Jennings and Hayes 1994, Rathbun et al. 1993); incised stream channels with portions narrower and deeper than 18 inches may also provide habitat (61 FR 25813). This type of dispersal and habitat use, however, is not observed in all California red-legged frogs and is most likely dependent on the year-to-year variations in climate and habitat suitability and varying requisites per life stage. For the California red-legged frog, this habitat is potentially all aquatic and riparian areas within the range of the species and includes any landscape features that provide cover and moisture (61 FR 25813).

Although the presence of California red-legged frogs is correlated with still water deeper than approximately 1.6 feet, riparian shrubbery, and emergent vegetation (Jennings and Hayes 1985), there are numerous locations in the species' historical range where these elements are well represented yet California red-legged frogs appear to be absent. The cause of local extirpations does not appear to be restricted solely to loss of aquatic habitat. The most likely causes of local extirpation are thought to be changes in faunal composition of aquatic ecosystems (i.e., the introduction of non-native predators and competitors) and landscape-scale disturbances that disrupt California red-legged frog population processes, such as dispersal and colonization. The introduction of contaminants or changes in water temperature may also play a role in local extirpations. These changes may also promote the spread of predators, competitors, parasites, and diseases.

Over-harvesting, habitat loss, non-native species introduction, and urban encroachment are the primary factors that have negatively affected the California red-legged frog throughout its range (Jennings and Hayes 1985, Hayes and Jennings 1988). Habitat loss and degradation, combined with over-exploitation and introduction of exotic predators, were important factors in the decline of the California red-legged frog in the early to mid-1900s. Continuing threats to the California red-legged frog include direct habitat loss due to stream alteration and loss of aquatic habitat, indirect effects of expanding urbanization, competition or predation from non-native species including the bullfrog (*Rana catesbeiana*), catfish (*Ictalurus* spp.), bass (*Micropterus* spp.), mosquitofish (*Gambusia affinis*), red swamp crayfish (*Procambarus clarkii*), and signal crayfish (*Pacifastacus leniusculus*). Chytrid fungus (*Batrachochytrium dendrobatidis*) is a waterborne fungus that can decimate amphibian populations, and is considered a threat to California red-legged frog populations.

Recovery Plan for the California Red-legged Frog
The recovery plan for the California red-legged frog identifies eight recovery units (Service 2002), which are based on the assumption that various regional areas of the species' range are essential to its survival and recovery. The status of this species is considered within the smaller scale of recovery units as opposed to the overall range. These recovery units are delineated by major watershed boundaries as defined by U.S. Geological Survey hydrologic units and the limits of the range of the California red-legged frog. The goal of the recovery plan is to protect the long-term viability of all extant populations within each recovery unit.

Within each recovery unit, core areas have been delineated and represent contiguous areas of moderate to high California red-legged frog densities that are relatively free of exotic species such as bullfrogs. The goal of designating core areas is to protect metapopulations that, combined with suitable dispersal habitat, will allow for the long-term viability within existing populations. This management strategy will allow for the recolonization of habitat within and adjacent to core areas that are naturally subjected to periodic localized extinctions, thus assuring the long-term survival and recovery of California red-legged frogs.

California tiger salamander
The Service recognizes three distinct population segments (DPS) of the California tiger salamander: Sonoma County, Central California, and northern Santa Barbara County. On August 4, 2004, we published a final rule listing the California tiger salamander as threatened range-wide, including the previously identified Sonoma and Santa Barbara DPS (Service 2004). On August 19, 2005, U.S. District Judge William Alsup vacated the Service's downlisting of the Sonoma and Santa Barbara populations from endangered to threatened. Thus, the Sonoma and Santa Barbara DPS are listed as endangered, and the Central California DPS is listed as threatened. Those individuals addressed in this opinion are part of the Central California DPS.

The central California tiger salamander is endemic to the grassland community found in California's Central Valley, the surrounding foothills, and coastal valleys (Fisher and Shaffer 1996). The historic distribution for the California tiger salamander in the Central Valley and surrounding foothills included northern Yolo County southward to northwestern Kern County and northern Tulare County. Currently, the central California tiger salamander is known to occupy the Bay Area (central and southern Alameda, Santa Clara, western Stanislaus, western Merced, and the majority of San Benito Counties), Central Valley (Yolo, Sacramento, Solano, eastern Contra Costa, northeastern Alameda, San Joaquin, Stanislaus, Merced, and northwestern Madera Counties), southern San Joaquin Valley (portions of Madera, central Fresno, and northern Tulare and Kings Counties), and the Central Coast Range (southern Santa Cruz, Monterey, northern San Luis Obispo, and portions of western San Benito, Fresno, and Kern Counties).

The California tiger salamander has an obligate biphasic life cycle (Shaffer et al. 2004). Although the larvae develop in the vernal pools and ponds in which they were born, the species is otherwise terrestrial and spend most of their post-metamorphic lives in widely dispersed underground retreats (Shaffer et al. 2004; Trenham et al. 2001). Subadult and adult central

California tiger salamanders typically spend the dry summer and fall months in the burrows of small mammals, such as California ground squirrels (*Spermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*) (Storer 1925; Loredo and Van Vuren 1996; Petranka 1998; Trenham 1998). Movement of California tiger salamanders within and among burrow systems continues for at least several months after juveniles and adults leave the ponds (Trenham 2001). California tiger salamanders cannot dig their own burrows, and as a result, their presence is associated with burrowing mammals (Seymour and Westphal 1994). California tiger salamanders depend on persistent small mammal activity to create, maintain, and sustain sufficient underground refugia for the species. Loredo et al. (1996) found that California ground squirrel burrow systems collapsed within 18 months following abandonment by, or loss of, the mammals. California tiger salamanders may also use landscape features such as leaf litter or desiccation cracks in the soil for upland refugia. Because they spend most of their lives underground, this species is rarely encountered even in areas where central California tiger salamanders are abundant.

Upland burrows inhabited by California tiger salamanders have often been referred to as aestivation sites. The term "aestivation" implies a state of inactivity; however, most evidence suggests that individuals remain active in their underground dwellings. Researchers have long inferred that they are feeding while underground, and this inference has been confirmed by a number of direct observations (Trenham 2001; Hattem 2004). Hattem (2004) found that California tiger salamanders move, feed, and remain active in their burrows. Thus, the term "upland habitat" more accurately describes those terrestrial areas used by California tiger salamanders. This upland component of California tiger salamander habitat typically consists of grassland savannah, but includes grasslands with scattered oak trees, and scrub or chaparral habitats (Shaffer et al. 1993, Service 2000). California tiger salamanders spend the majority of their lives in upland habitats and cannot survive without them (Trenham and Shaffer 2005).

California tiger salamanders typically emerge from their underground refugia at night during the fall or winter rainy season (November-May) to migrate to their breeding ponds (Stebbins 1985, 1989; Shaffer et al. 1993; Trenham et al. 2000). The breeding period is closely associated with the rainfall patterns in any given year with less adults migrating and breeding in drought years (Loredo and Van Vuren 1996; Trenham et al. 2000). Males migrate to the breeding ponds before females (Twitty 1941, Shaffer et al. 1993, Loredo and Van Vuren 1996, Trenham 1998). Males usually remain in the ponds for an average of about 6 to 8 weeks, while females stay for approximately 1 to 2 weeks. In dry years, both sexes may stay for shorter periods (Loredo and Van Vuren 1996, Trenham 1998). Historically, natural vernal pools were the primary breeding habitats for California tiger salamanders (Twitty 1941, Fisher and Shaffer 1996, Petranka 1998). However, with the loss of many vernal pools and ephermerally inundated features from farmland conversion and urban and suburban development, ephemeral and permanent ponds created for livestock watering are now frequently used by the species (Fisher and Shaffer 1996, Robins and Vollmar 2002). Ideal breeding ponds are typically absent of fish, free of non-native predators, and seasonal or semi-permanent in water duration (Barry and Shaffer 1994, Petranka 1998). After breeding and egg-laying is complete, adults leave the pool and return to their refugia in upland habitat (Loredo et al. 1996; Trenham 1998). Adult California tiger salamanders often continue to emerge nightly for the next 2 weeks to feed upland habitat (Shaffer et al. 1993).

Following metamorphosis in the late spring or early summer, juvenile California tiger salamanders leave their pools and move to upland habitat, where they live for several years. This emigration into upland habitat occurs in both wet and dry conditions (Loredo and Van Vuren 1996; Loredo et al. 1996). Wet conditions are more favorable for upland travel, but rain events seldom occur after metamorphosis is complete and warm, summer weather causes ponds to dry. As a result, juveniles may be forced to leave their ponds on rainless nights. The peak emergence of these metamorphs in ponds is typically between mid-June and mid-July (Loredo and Van Vuren 1996, Trenham et al. 2000). Juveniles remain active in their upland habitat, emerging from underground refugia during rainfall events to disperse or forage (Trenham and Shaffer 2005).

In a study in Monterey County, it was found that upon reaching sexual maturity, 78 percent of individuals returned to their natal/birth pond to breed (Trenham et al. 2001). After breeding, adult California tiger salamanders return to upland habitats, where they may live for 1 or more years before attempting to breed again (Trenham et al. 2000). In addition to traveling long distances during juvenile dispersal and adult migration, salamanders may reside in burrows far from their associated breeding ponds.

California tiger salamanders are known to travel long distances between breeding ponds and their upland refugia. While it is difficult to establish the maximum distances traveled by any individual, California tiger salamanders in Santa Barbara County have been recorded dispersing up to 1.3 miles from their breeding ponds (Sweet 1998). As a result of a 5-year capture and relocation study in Contra Costa County, Orloff (2007) estimated that captured California tiger salamanders traveled a minimum of 0.5 mile to the nearest breeding pond and that some individuals were likely traveling more than 1.3 miles to and from breeding ponds. California tiger salamanders are also known to travel between breeding ponds. One study found that 20 to 25 percent of the individuals captured at one pond were recaptured later at other ponds between 1,900 and 2,200 feet away (Trenham et al. 2001).

The central California tiger salamander is imperiled throughout its range due to a variety of human activities (Service 2004). Current factors associated with declining central California tiger salamander populations include continued habitat loss and degradation due to agriculture and urbanization; hybridization with the non-native eastern tiger salamander (*Ambystoma tigrinum*) (Fitzpatrick and Shaffer 2004; Riley et al. 2003); and predation by introduced species. Central California tiger salamander populations are likely threatened by multiple factors but continued habitat fragmentation and colonization of non-native salamanders may represent the most significant current threats. Habitat isolation and fragmentation within many watersheds have precluded dispersal between sub-populations and threatened the viability of metapopulations (i.e., multiple subpopulations that occasionally exchange individuals through dispersal and are capable of colonizing extirpated habitat patches). Other threats include disease, predation, interspecific competition, urbanization and population growth, exposure to contaminants, destructive rodent-control techniques (e.g., deep-ripping of burrow areas, use of fumigants), reduced survival due to the presence of mosquitofish (*Gambusia affinis*), road-crossing mortality, and hybridization with non-native salamanders (Service 2000, Service 2003,

Leyse and Lawlor 2000). Currently, these various threats are largely not offset by existing Federal, State, or local regulatory mechanisms. The central California tiger salamander is also prone to chance environmental or stochastic events, to which small populations are particularly vulnerable.

Recovery objectives for the California tiger salamander
A recovery plan for the central California population of the California tiger salamander has not been completed; however, the 2004 listing rule (Service 2004) outlines these conservation measures for protection and recovery of the species. The Service believes that protection and recovery of the California tiger salamander will require reduction of the threats from destruction, fragmentation, and degradation of wetland and associated upland habitats due to urban development, conversion of habitat to intensive agriculture, predation by nonnative species, disease, contaminants, agricultural and landscaping contaminants, rodent and mosquito control, road-crossing mortality, hybridization with nonnative tiger salamanders, and some livestock grazing practices. Threats from pesticide drift also must be reduced. These threats should be considered when management actions are taken in habitats currently and potentially occupied by the California tiger salamander, and areas deemed important for dispersal and connectivity or corridors between known locations of this species. Monitoring also should be undertaken for any management actions or scientific investigations designed to address these threats or their impacts.

Development of a recovery plan will bring together Federal, State, and regional agency efforts for the conservation of the California tiger salamander. A recovery plan will establish a framework for agencies to coordinate their recovery efforts. The plan will set recovery priorities and estimate the costs of the tasks necessary to accomplish the priorities. It also will describe the site-specific actions necessary to achieve conservation and survival of the species (Service 2004).

San Joaquin kit fox
The San Joaquin kit fox was federally listed as endangered on March 11, 1967 (Service 1967), and State listed as threatened on June 27, 1971. Critical habitat has not been designated for this subspecies.

The San Joaquin kit fox is the larger of two subspecies of kit fox (*Vulpes macrotis*), the smallest canid species in North America. The San Joaquin kit fox weighs 5 pounds on average and stands 12 inches tall. It has a small slim body, large close-set ears, and a long bushy tail that tapers at the tip. Depending on location and season, the fur coat of the San Joaquin kit fox varies in color and texture from buff to tan or yellowish-grey. The tail is distinctly black-tipped.

The San Joaquin kit fox is primarily nocturnal. Although the subspecies was thought to subsist primarily on kangaroo rats (*Dipodomys* spp.) historically (Laughrin 1970), and populations appear to be most robust where kangaroo rats persist (Cypher et al. 2000), the San Joaquin kit fox diet currently varies geographically, seasonally, and annually. It includes nocturnal rodents such as kangaroo rats, white-footed mice and pocket mice (*Peromyscus* spp.), California ground

squirrels, rabbits (*Sylvilagus* spp.), hares (*Lepus* spp.), San Joaquin antelope squirrels (*Ammospermophilus nelsoni*), and ground-nesting birds (Scrivner et al. 1987). Insects appear to be important seasonal prey items for some populations (Briden et al. 1992; see also Cypher et al. 2000).

San Joaquin kit fox utilize subsurface dens, which may extend to 6 feet or more below ground surface, for shelter and for reproduction (Laughrin 1970). Kit fox subspecies are absent or scarce in areas where soils are shallow due to high water tables, impenetrable hardpans, or proximity to parent material, such as bedrock (Jensen 1972; Morrell 1972, O'Farrell and Gilbertson 1979, O'Farrell et al. 1980, McCue et al. 1981, all as cited in Service 1983). The kit fox also does not den in saturated soils or in areas subjected to periodic flooding (McCue et al. 1981, as cited in Service 1983).

Although some yearling female kit fox will produce young, most do not reproduce until 2 years of age (Spencer et al. 1992; Spiegel and Tom 1996; Cypher et al. 2000). The young are born in large natal dens, and generally disperse in August or September, when 4 or 5 months old. Reproductive success appears to be correlated with prey abundance (Egoscue 1975, as cited in Service 1998) and may be negatively affected by weather conditions that are either too wet or too dry.

Kit fox establish home ranges that are extensive, but home range sizes vary among locations. Home range size is thought to be related to prey abundance (White and Ralls 1993; White and Garrott 1999). At the Naval Petroleum Reserves[1], Cypher et al. (2001) determined the mean adult home range size to be 1,071.7 acres, while the mean home range for pups was 525.4 acres. Kit fox on the Carrizo Plains establish home ranges estimated to average approximately 2,866 acres in size (White and Ralls 1993). In western Merced County, Briden et al. (1992) found that denning ranges (the area encompassing all known dens for an individual) average 1,169 acres (1.8 square miles) in area. However, at Camp Roberts Army National Guard Training Site (Camp Roberts) the average home range was found to be 5,782 acres, based on a radio-telemetry study (Root and Eliason 2001, as cited in California Air National Guard 2008). In the Bakersfield vicinity, kit fox selection of den sites appears to be associated with areas of open space, or areas having light or infrequent disturbance, such as canal right of ways and detention basins (Bjurlin et al. 2005). Urban kit fox have access to anthropogenic food sources and kit fox in this urban area have smaller home ranges than those in non-urban areas.

San Joaquin kit fox are an arid-land-adapted subspecies and typically occur in desert-like habitats (Cypher 2006). Such areas have been characterized by sparse or absent shrub cover, sparse ground cover, and short vegetative structure (Cypher 2006). The subspecies historically ranged in alkali scrub/shrub and arid grasslands throughout the level terrain of the San Joaquin Valley floor from southern Kern County north to Tracy in San Joaquin County, and up into more

[1] At the time this study was conducted, the study area was within the federally designated Naval Petroleum Reserves. Subsequently the reserve units have changed management or ownership, and are no longer known as the Naval Petroleum Reserves; however, they are referred to by this name in this species account, as they are in the research documents cited.

gradual slopes of the surrounding foothills and adjoining valleys of the interior Coast Range. Within this range, the San Joaquin kit fox has been associated with areas having open, level, sandy ground (Grinnell et al. 1937) that is relatively stone-free to depths of about 3 to 4.5 feet.

By 1998, when the recovery plan was completed, local surveys, research projects, and incidental sightings indicated that the San Joaquin kit fox inhabited a portion, but not all, of the areas of suitable habitat remaining in the San Joaquin Valley and lower foothills of the coastal ranges, Sierra Nevada, and Tehachapi Mountains. The boundaries of the San Joaquin kit fox's range still extended from southern Kern County north to Contra Costa, Alameda, and San Joaquin Counties on the west, and to the La Grange area, Stanislaus County, on the east side of the Valley (Williams 1990, as cited in Service 1998). The most northerly sighting was made at the Black Diamond Mines Regional Preserve near Antioch, Contra Costa County in the early 1990s (Bell et al.1994). The largest extant populations were known from western Kern County on and around the Elk Hills area and Buena Vista Valley, and the nearby Carrizo Plain Natural Area (Service 1998) where relatively level terrain is separated by narrow rugged ranges. Within the range, occupied habitat included some of the larger scattered islands of natural land on the Valley floor in Kern, Tulare, Kings, Fresno, Madera, and Merced Counties. Occurrences were known from the valleys of the interior Coast Range in Monterey, San Benito, and Santa Clara Counties (Pajaro River watershed); in the Salinas River watershed of Monterey and San Luis Obispo Counties; and in the upper Cuyama River watershed of northern Ventura and Santa Barbara Counties and southeastern San Luis Obispo County. San Joaquin kit fox were also known to live within the city limits of the city of Bakersfield in Kern County (Laughrin 1970; Jensen 1972; Morrell 1975; Service 1983; Swick 1973, Waithman 1974, Service 1998).

Currently, the entire range of the San Joaquin kit fox appears to be similar than what it was at the time of the 1998 recovery plan, and population structure has become more fragmented, at least some of the resident satellite subpopulations, such as those at Camp Roberts, Fort Hunter Liggett, Pixley National Wildlife Refuge (NWR), and the San Luis NWR, have apparently been locally extirpated (White et al. 2000; Moonjian 2007; P. Williams, Kern NWR, in litt. 2007; B. Cypher in litt. 2007; B. Parris, San Luis NWR, in litt. 2007; M. Moore, Camp Roberts, in litt. 2008), and portions of the range now appear to be frequented by dispersers rather than resident animals (Moore in litt. 2008; M. Mueller, Contra Costa Water District, in litt. 2008; Cypher in litt. 2009). For example, at Fort Hunter Liggett, although approximately 36,000 acres is considered to be potential kit fox habitat, the greatest number of kit fox observed in one year was 22 in 1990, and no kit fox have been observed since 2000 (Service 2007). Kit fox abundance appears to be below detection levels in much of San Luis Obispo County outside of the Carrizo Plains (Moonjian 2007).

In the years since the San Joaquin kit fox was listed, loss of natural habitat to agricultural development has continued on the floor of the San Joaquin Valley and in the associated valleys of the Coast Range. Agricultural and urban development now threaten remaining foraging and dispersal habitat along the east and west sides of the valley. Additional threats to kit fox populations have been identified since listing, including competitive exclusion by coyotes (*Canis latrans*) and red fox (*Vulpes vulpes*), which may be occurring over portions of the range.

Pesticide and anticoagulant rodenticide use pose an unquantified, but potentially significant threat to kit fox populations, both through direct mortality and through loss of prey species. Kangaroo rats, preferred prey for the San Joaquin kit fox, have declined throughout much of the San Joaquin kit fox's range, and several of the kangaroo rat species are also federally endangered.

Agricultural development of kit fox habitat remains the largest threat to the San Joaquin kit fox. Although San Joaquin kit fox were once thought able to inhabit established agricultural fields, subsequent research has shown that kit fox are unable to maintain long-term occupancy in these areas, although they forage into fields at night. Research has also shown that agricultural crops do not generally sustain the prey species and numbers needed to sustain subpopulations of kit fox. Consistent with research, kit fox appear to be excluded from most of the San Joaquin Valley floor. Lands along the periphery of the valley have been increasingly converted to agriculture or developed, leading to loss of additional kit fox habitat and increasing the barriers to movement of kit fox between areas of suitable habitat. Thus, during the time since listing, San Joaquin kit fox distribution has become more fragmented, and subpopulations and family groupings, including subpopulations at Fort Hunter Liggett and Pixley National Wildlife Refuge, appear to become locally extinct in areas of extant natural, and protected, habitat. Habitat fragmentation appears to preclude the recolonization of these areas. Therefore, San Joaquin kit fox currently appear to be rare throughout much of their former range.

San Joaquin kit fox subpopulations in the Western Kern County and Carrizo Plains core areas appear to be most robust, but even these populations have been shown to fluctuate greatly in abundance on an inter-annual basis, depending on climatic conditions. Population modeling using long-term monitoring data has indicated that these subpopulations are at risk of extirpation in as little as 3 or 4 years under poor conditions, such as the poor environmental conditions that reduce prey populations. In these core areas, new development, including expanded oil and gas development and the construction of solar farms, threaten new areas of suitable habitat for the subspecies, which may further strain these source populations.

The kit fox continues to be threatened by loss of habitat to agricultural and urban development, the continued threats from pesticide exposure, competitive exclusion by other canids, the highly fluctuating population dynamic of most kit fox populations, and the isolation and loss of small subpopulations due to stochastic events and habitat fragmentation, and due to threats identified since listing, such as off-road vehicle use and loss of prey.

Recovery objectives for the San Joaquin kit fox

The Recovery Plan for the San Joaquin kit fox focuses on this species' recovery within California's Central Valley, which makes up most of this species' historical and current range. San Joaquin kit fox is the umbrella species for the recovery of numerous other grassland species in the Central Valley. Recovery includes the establishment of a viable kit fox metapopulation through protection and management of a system of core and satellite populations on public and private lands throughout its range. The Service and cooperating public, non-profit, and private stakeholders are working to conserve habitat that will adequately sustain the kit fox through the

establishment of preserves, conservation banks, and conservation easements. Habitat Conservation Plans (HCP) have been completed to protect kit fox habitat, while additional HCPs are currently in development, but are not yet complete. However, because the kit fox is a wide-ranging predator, providing habitat conditions that will sustain kit fox populations is complex and also involves maintaining needed prey components that often requires additional restoration activities. Currently, many protected holdings are too small and are too disjunct to support a kit fox family. Also, to date, the recovery potential of the Land Retirement Program has not been realized as it was envisioned in the 1998 Recovery Plan. In their current condition, retirement lands have limited value for kit fox due to their existing vegetative structure and absence of prey, and consequently, kit fox do not appear to be utilizing these lands. In conclusion, there may be too many uncertainties with implementation to count on land retirement as a core part of the recovery strategy at this time (B. Cypher, pers. comm. 2008).

ENVIRONMENTAL BASELINE

Action Area

The implementing regulations for section 7(a)(2) of the Act define the "action area" as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 Code of Federal Regulations 402.02). For the purposes of this biological opinion, we consider the action area to include the footprint of a new water treatment plant, the raw water pipeline construction corridor, the raw water pump station footprint, the treated water pipeline construction corridor, the paved access road and construction corridor, the relict seasonal wetland, and a 100-foot grassland buffer surrounding these areas.

General habitat assessment surveys were conducted on September 28, 2012, and February 6, 2013, to characterize wildlife habitat types and evaluate the potential for occurrence of special-status wildlife species in the action area. No species occurrence or evidence of California red-legged frog, California tiger salamander, or San Joaquin kit fox was detected during these habitat assessments; however daytime habitat assessments were not intended to locate these cryptic or nocturnal species. The general habitat assessment surveys were conducted by two wildlife biologists walking transects across the accessible area, including 100 percent of the construction footprint, the West Hills property, and the adjacent property. Habitat suitability was noted for California red-legged frog, California tiger salamander, and San Joaquin kit fox during the general habitat assessment surveys. The habitat suitability evaluation for these species is described below.

Habitat suitability for the California tiger salamander and California red-legged frog

The action area is predominantly comprised of grazing lands and rural housing in foothills. The project footprint for the water treatment plant, the raw water pipeline alignment, and the first segment of the treated water pipeline alignment would be constructed within annual grassland habitat. Wild oat (*Avena* spp.) is the dominant species, and the grasslands are grazed by cattle, a practice that would continue with the construction of this facility.

Trees occasionally occur in isolation, but are otherwise limited to locations near rural residences or along steep ephemeral drainages. California ground squirrel burrow complexes occur at the base of steep slopes parallel to Richardson Road along the proposed raw water pipeline alignment, and in fields and roadsides along Riverside Road in the eastern project area. Small mammal burrows occur throughout these grasslands.

Aquatic features identified on or near the proposed project site included the San Benito River and a relict seasonal wetland, which may provide suitable breeding habitat for California tiger salamanders and California red-legged frogs in some wet years. In 1998, it was a nearly 2-acre vegetated pond that appeared to be palustrine, but the feature has not ponded water since 2006 (based on observations of satellite imagery). On an annual or semi-annual basis, ponding may occur that is not visible on imagery or was not present on the imagery date. A neighboring landowner commented that approximately 10 years had passed since ponding occurred. The feature was dry and mostly barren during the February 2013 survey, supporting a few plants that are distinct from the surrounding uplands including alkali mallow (*Malvella leprosa*) and an unidentified sedge. The biological assessment identified an additional six potential existing or relict aquatic breeding sites within 1.2 miles of the proposed water treatment plant.

The California Natural Diversity Database (CNDDB) (CDFW 2013) documents seven observations of the California tiger salamander within 3.1 miles of the proposed action area's boundaries; one within 1.0 mile and the remaining six between 1.24 and 3.1 miles. The nearest location was recorded 0.4 mile south of the project area within an ephemeral seasonal pool that no longer exists. At this location, one adult was observed in March 2005, followed by a drift fence study that captured three adults in December 2005 and one adult in February 2006. California tiger salamander breeding has been documented at ponds within 1.5 miles of the proposed project site in 1999, 2005, and 2006. Most of the recorded California tiger salamander locations exist on the other side of Union Road, a regularly traveled thoroughfare within 1 mile of the action area; road noise may be a potential crossing deterrent for frogs and being killed by vehicle traffic is a possibility, but this two-lane highway is probably not a substantial barrier to salamander or frog movement.

The CNDDB documents only one observation of the California red-legged frog within 1 mile of the proposed project area. There are an additional four relevant observations between 1.24 and 3.1 miles. The nearest record is 0.7 mile north, measured from the proposed water treatment plant. The habitat consists of a pooled area of San Benito River, surrounded by willows. An adult and juvenile were observed at this location in October 2000, and one juvenile was observed in September 2001. Bullfrogs were also noted at this location.

Recovery of the California red-legged frog and California tiger salamander
The action area is within the Diablo Range and Salinas Valley Recovery Unit (Recovery Unit 6) described in the recovery plan for the California red-legged frog (Service 2002). The action area is outside of any identified core areas, but it located between two; the action area is east of the Santa Clara Valley Core Area (Core Area 17) and west of the East San Francisco Bay Core Area (Core Area 16) within the Diablo Range and Salinas Valley Recovery Unit. Core areas are locations targeted for development and implementation of management and protection plans for

the California red-legged frog. Conservation needs identified for the Santa Clara Valley Core Area include: protect existing populations; control non-native predators; study effects of grazing in riparian corridors, ponds, and uplands; reduce impacts associated with livestock grazing; protect habitat connectivity; minimize effects of recreation and off-road vehicle use; avoid and reduce impacts of urbanization; and protect habitat buffers from nearby urbanization. Conservation needs identified for the East San Francisco Bay Core Area include: protect existing populations and control non-native predators. Although the action area is not located in either of these core areas, the conservation needs identified for each core area may still inform appropriate management actions within the action area.

The Service has not published a recovery plan for the California tiger salamander so we default to basic conservation biology principles when looking at the species' recovery. As identified in the 2004 listing rule (Service 2004), the Service believes that protection and recovery of the California tiger salamander will require reduction of the threats from: destruction, fragmentation, and degradation of wetland and associated upland habitats due to urban development; conversion of habitat to intensive agriculture; predation by nonnative species; disease; contaminants; rodent and mosquito control; road-crossing mortality; hybridization with nonnative tiger salamanders; and some livestock grazing practices. To generalize, the Service believes it is critical to maintain existing habitat and connectivity between that habitat and to reduce threats.

Habitat suitability for the San Joaquin kit fox

Grasslands in the action area provide suitable foraging and dispersal habitat for San Joaquin kit foxes, as well as ground squirrels and other fossorial rodents that provide potential prey. Much of the action area consists of steeply sloped grasslands (greater than 20 percent) that are not favored by San Joaquin kit foxes for regular use, but flatter areas among the slopes may be used as movement corridors and provide suitable foraging and dispersal habitat, or could potentially be used as denning locations. A few ground squirrel burrow complexes were identified in the action area, but no burrow complexes were observed on the water treatment plant property and no San Joaquin kit fox dens were observed during transect surveys. Grasslands are grazed and vegetation is fairly low to the ground, though not sparse. No kangaroo rat burrows were observed, but ground squirrels are present and fossorial rodent burrows are abundant.

The CNDDB documents eight separate San Joaquin kit fox observations within 10 miles of the proposed action. One location from 1992, is shown on the subject property, and was described as a breeding female presumed to have died leaving behind five juveniles at a den location. Three of the juveniles died and two were observed alive. The next closest record is located 2.8 miles east of the proposed action where, in 1971, a sighting or road kill observation was documented. The rest of the observations are also from the 1970s.

No significant barriers to movement occur in the surrounding area to prevent San Joaquin kit foxes from entering the action area. The nearby San Benito River could be a movement corridor, and only represent a formidable barrier during peak flows. Hollister Valley is densely populated in some areas, such as east of the Nash Road Bridge, but overall much of Hollister Valley is

permeable because of the large amount of land used in agricultural production. The Gabilan Mountains west of Hollister Valley are connected to the mountains east of Hollister Valley on the southern end, with only two-lane Highway 156 bisecting the area.

Recovery of the San Joaquin kit fox
Threats to the species have reduced the quality of kit fox habitat and the amount of resources available to the species in San Benito County. San Joaquin kit foxes in the action area are subject to direct and indirect effects of human activities including roads and vehicles, rodenticide, and habitat loss and fragmentation due to urbanization and agriculture expansion. The species is also affected by increased numbers of native and non-native predators and competitors (e.g., coyote, red fox). Most recently, development of a large-scale solar facility is proposed in eastern San Benito County and would, as proposed, impact approximately 4,000 acres of San Joaquin kit fox habitat in the Ciervo-Panoche core area. This may include loss of known dens, and could constrict a major habitat corridor between kit fox habitats in the northern and southern parts of the core area. As part of the solar facility project, the project proponent would preserve more than 20,000 acres. This preservation is expected to result in a net gain in suitable habitat for the species.

EFFECTS OF THE ACTION

California red-legged frog and California tiger salamander
Planned construction activities are anticipated to result in permanent loss of 5.3 acres of suitable upland habitat and temporary impacts to 5.5 acres of suitable upland habitat for the California red-legged frog and California tiger salamander. These impacts would be reduced with implementation of proposed conservation measures to avoid and minimize temporary and permanent effects to California red-legged frogs and California tiger salamanders. The applicant's proposal to purchase mitigation credits at a conservation bank would preserve approximately 12 acres of California tiger salamander habitat in perpetuity for the species.

All California red-legged frogs and California tiger salamanders that occur in the action area could be adversely affected by project activities. Injury or mortality could occur from animals being crushed by earth-moving equipment, debris, and worker foot traffic. Work activities, including resultant noise and vibration, could cause California tiger salamanders or California red-legged frogs to leave or avoid suitable habitat. This disturbance and displacement may increase the potential for predation, desiccation, competition for food and shelter, or strike by vehicles on roadways. Individuals in burrows may be killed or injured by the large machinery used to dig the drying beds or place silos in the ground; by project filling or grading activities; or they may become trapped and die if the entrance to their upland sheltering habitat is crushed or covered. The expansion and paving of the existing Richardson Road could lead to the destruction of small mammal burrow complexes near the existing road, which reduces the availability of potential shelters in the area, and any individuals in burrows may be killed or injured by the grading activities or if the entrances are crushed or covered. Pre-construction surveys that will hand excavate any small mammal burrows within the exclusion zone and the relocation of individuals by a Service-approved biologist would reduce these impacts.

We expect traffic on the existing access road, Richardson Road, to slightly increase during regular operation of the proposed water treatment plant. Although only a minor increase in traffic is proposed, the existing gravel road would be paved with asphalt, which would allow vehicles to travel at higher speeds. The higher speeds could increase the chance of injury or mortality to individuals crossing the road. The applicant's proposal to limit worker traffic to 20 miles per hour should increase a vehicle driver's ability to detect any individuals crossing the road and reduce the likelihood of injury or mortality to the species.

California red-legged frogs and California tiger salamanders can disperse overland in mesic conditions if substantial rainfall (greater than 0.5 inch of rain in a 24-hour period) occurs. During such periods of rainfall, we expect a higher likelihood of California red-legged frogs or California tiger salamanders occurring in the project area. Any amphibians moving through the project site would be at risk of injury or death caused by vehicles, equipment, or workers.

Capture and relocation of California red-legged frogs and California tiger salamanders could result in injury or death. The applicant proposes to reduce the risk of injury or death by using Service-approved biologists, by limiting the duration of handling, and requiring the proper transport of these species. Although survivorship for translocated California red-legged frogs and California tiger salamanders has not been estimated, survivorship of translocated wildlife, in general, is reduced due to intraspecific competition, lack of familiarity with the location of potential breeding, feeding, and sheltering habitats, and increased risk of predation.

Observations of diseased and parasite-infected amphibians are now frequently reported. Releasing amphibians following a period of captivity, during which time they can be exposed to infections, may cause an increased risk of mortality in wild populations. Amphibian pathogens and parasites can also be carried between habitats on the hands, footwear, or equipment of fieldworkers, which can spread them to localities containing species which have had little or no prior contact with such pathogens or parasites. Chytrid fungus is a water-borne fungus that can be spread through direct contact between aquatic animals and by a spore that can move short distances through the water. The fungus only attacks the parts of an animal's skin that have keratin (thickened skin), such as the mouthparts of tadpoles and the tougher parts of adults' skin, such as the toes. It can decimate amphibian populations, causing fungal dermatitis, which usually results in death in 1 to 2 weeks. Infected animals may spread the fungal spores to other ponds and streams before they die. Once a pond has become infected with chytrid fungus, the fungus stays in the water for an undetermined amount of time. Relocation of individuals captured from the project area could contribute to the spread of chytrid fungus. In addition, infected equipment or footwear could introduce chytrid fungus into areas where it did not previously occur.

Trash left during or after project activities could attract predators to work sites, which could, in turn, prey on California red-legged frogs and California tiger salamanders. For example, raccoons (*Procyon lotor*) and feral cats (*Felis catus*) are attracted to trash and also prey

opportunistically on the California red-legged frog and California tiger salamanders. This potential impact would be reduced or avoided by careful control of waste products at all work sites.

Accidental spills of hazardous materials or careless fueling or oiling of vehicles or equipment could degrade water quality or upland habitat to a degree where California red-legged frogs or California tiger salamanders are adversely affected or killed. The potential for this effect to occur would be reduced by thoroughly informing workers of the importance of preventing hazardous materials from entering the environment, locating staging and fueling areas away from riparian areas or other water bodies, and by having an effective spill response plan in place.

The use of chemicals during the operation of the water treatment plant can have potentially lethal impacts to amphibians if not used and stored properly. California tiger salamander or California red-legged frog could experience reproductive anomalies or disfigurations, disease, or death from continued exposure to chemicals in the environment. The applicant's proposal to encase the chemicals in double-walled storage facilities upon a concrete slab should reduce the likelihood and severity of potential spills. The applicant's proposal to have a spill response plan in place should expedite the cleanup and reduce the potentially lethal effects of chemicals lingering in the environment.

Uninformed workers could disturb, injure, or kill California red-legged frogs and California tiger salamanders. The potential for this to occur would be reduced by educating workers on the presence and protected status of these species and the measures that are being implemented to protect them during project activities by a Service-approved biologist. The use of fences around environmentally sensitive areas would reduce these potential impacts by preventing workers from encroaching into adjacent habitat, and by preventing California red-legged frogs and California tiger salamanders from entering the construction area.

Operation of the water treatment plant could cause long-term or permanent avoidance of the area by wildlife due to operational noise, nighttime lighting, vehicular traffic, and increased human presence. Activities occurring in or near the relict wetland could result in species avoidance of the area, modification of the habitat, or injury to the species potentially occupying the wetland. The proposed measures to moderate nighttime lighting using design and landscaping, and restricting large truck deliveries to daylight hours, should minimize some of these effects. In addition, the measure to minimize activities in the relict wetland should reduce the possibility of humans contaminating or altering the habitat.

In summary, the proposed action could adversely affect California red-legged frogs and California tiger salamanders due to the nearby occurrences of the species and the presence of dispersal and aestivation habitat; however, SBCWD and Reclamation have proposed avoidance and minimization measures to reduce these impacts and they are working with the CDFW to conserve habitat that will be will be preserved and managed for the benefit of California tiger salamander in perpetuity. Based on these factors, we anticipate that few California red-legged frogs and California tiger salamanders are likely to be killed or injured during this work and the

long-term operation of the facility. We anticipate that effects on recovery of the California red-legged frog and California tiger salamander will be minimal. Project impacts will result in minimal change in population numbers and distribution. The project's effect on amphibian habitat will be small, and will be balanced by the proposed mitigation plans.

San Joaquin kit fox

Construction activities such as staging, grading, and excavation are likely to result in temporary or permanent impacts to suitable San Joaquin kit fox habitat. These construction activities are anticipated to temporarily affect 5.5 acres of annual grassland in areas identified as suitable kit fox habitat. Construction of new structures and new access roads would permanently affect 5.3 acres of annual grassland habitat. Implementation of proposed conservation measures to avoid and minimize temporary and permanent effects to the San Joaquin kit fox, including adherence to the Service's Standardized Recommendations for Protection of the San Joaquin kit fox (Service 2011), and the indirect benefit of the conservation of habitat for California tiger salamander, would minimize these impacts.

The human presence, noise, and activity associated with project construction and operation could cause San Joaquin kit foxes to temporarily avoid the project area or permanently avoid the proposed water treatment plant. Such avoidance could displace them into adjacent areas where they could experience increased exposure, starvation, or stress through disorientation; reduced fitness; and intra- and inter-specific competition. Displacement into adjacent areas could also result in increased exposure of San Joaquin kit fox to predators such as coyote (*Canis latrans*) and red fox (*Vulpes vulpes*). The project proponent's proposal to halt work if any San Joaquin kit foxes are seen in the action area should minimize these indirect effects to the species during construction.

Construction activities within the project site could result in disturbance, injury, or mortality to San Joaquin kit foxes caused by movement of equipment or vehicles, construction debris, and worker foot traffic. Potential dens may be damaged by project-related filling or grading activities. Work activities, including associated vibration, may cause San Joaquin kit foxes to leave the work site and surrounding areas. This disturbance and displacement may increase the potential for hazards such as competition for food and shelter, or strike by vehicles on roadways. Preconstruction surveys to identify and demarcate potential dens or other refugia in and around surrounding work areas by a Service-approved biologist, minimization of nighttime vehicle traffic, prohibiting off-road traffic outside the designated project area, and observing a maximum daytime speed limit of 20 miles per hour would reduce these impacts.

Project and den closure activities could adversely affect San Joaquin kit foxes if dens are occupied. Because seasonal limitations on project construction at the site (i.e., avoiding the spring-summer pupping season) may not be possible for this project, establishing a construction exclusion zone around occupied sites, and immediately halting den closure activities and contacting the Service if occupancy is determined would reduce these impacts.

San Joaquin kit foxes could become trapped in project-related excavated holes, trenches, pipes, culverts, or other similar structures. Inspecting and covering excavated holes or trenches greater than 2 feet deep at the end of each work day with suitable materials; providing escape routes constructed of earthen materials or wooden planks; thoroughly inspecting holes before filling; and inspecting and capping pipes, culverts, or similar structures when not in use would minimize the likelihood of these impacts.

Vehicle traffic on the existing access road, Richardson Road, is expected to increase only slightly during regular operation of the proposed water treatment plant. Although only a slight increase in traffic is proposed, the existing gravel road would be paved, which would allow vehicles to travel at higher speeds. The higher speeds could increase the chance of injury or mortality to individuals crossing the road. The applicant's proposal to limit worker traffic to 20 miles per hour should increase the vehicle driver's ability to detect any individuals crossing the road and reduce the likelihood of injury or mortality to the species.

Trash left during or after project activities could attract predators to work sites, which could, in turn, prey on San Joaquin kit foxes, or introduce competition for food and shelter. This potential impact would be reduced or avoided by careful control of waste products at all work sites.

Accidental spills of hazardous materials or careless fueling or oiling of vehicles or equipment could degrade water quality or habitat to a degree where San Joaquin kit foxes are adversely affected or killed. The potential for this effect to occur will be reduced by thoroughly informing workers of the importance of preventing hazardous materials from entering the environment, locating staging areas away from riparian areas or other water bodies, and by having an effective spill response plan in place.

The treated material in the drying beds could potentially have lingering noxious chemical or biological properties that could harm small mammals living or foraging nearby. San Joaquin kit fox could become ill from preying upon diseased small mammals. However, the drying beds would be constructed of a soil-cement mixture, a hard surface that would discourage use of the land by burrowing mammals.

Uninformed workers could disturb, injure, or kill San Joaquin kit foxes. The potential for this to occur would be reduced by educating workers as to the presence and protected status of this species and the measures that are being implemented to protect it during project activities by a Service-approved biologist.

In summary, the proposed action could adversely affect San Joaquin kit foxes due to the possible presence of the species and the presence of suitable habitat; however, Reclamation and SBCWD have proposed avoidance and minimization measures to reduce these impacts. Based on these factors, we anticipate that few, if any, San Joaquin kit foxes are likely to be killed or injured during this work. We anticipate that effects on recovery of the San Joaquin kit fox will be

minimal. Project impacts will result in minimal if any change in population numbers and distribution. The project's effect on San Joaquin kit fox habitat will be small, and will be balanced by the proposed mitigation plans.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. We are not aware of any non-Federal activities that are reasonably certain to occur in action area.

CONCLUSION

After reviewing the current status of California red-legged frog, California tiger salamander, and San Joaquin kit fox; the environmental baseline for the action; the effects of the proposed West Hills waste water treatment plant and the cumulative effects; it is the Service's biological opinion that Reclamation's permitting of the project, as proposed, is not likely to jeopardize the continued existence of the California red-legged frog, California tiger salamander, or San Joaquin kit fox.

We have based this conclusion on the following:

1. Reclamation and SBCWD have proposed measures to reduce the adverse effects of the proposed work on the California red-legged frog, California tiger salamander, and San Joaquin kit fox.

2. Few California red-legged frogs and/or California tiger salamanders are likely to be killed or injured as a result of project activities. The project would have very little effect on the likelihood of recovery of the species.

3. San Joaquin kit foxes have not been documented using the area in recent years, so few, if any, San Joaquin kit foxes are likely to be killed or injured as a result of project activities. The project would have very little effect on the likelihood of recovery of the species.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened wildlife species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood

of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be undertaken by Reclamation so that they become binding conditions of any grant or permit issued to SBCWD, as appropriate, for the exemption in section 7(o)(2) to apply. Reclamation has a continuing duty to regulate the activity covered by this incidental take statement. If Reclamation (1) fails to assume and implement the terms and conditions or (2) fails to require SBCWD to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, Reclamation or SBCWD must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR 402.14(i)(3)].

The Service anticipates all California red-legged frogs and California tiger salamanders in construction areas would be subject to take as a result of project activities. Take would occur in the form of capture during relocation activities and in the form of harassment, harm, injury, or death as a result of construction activities if they are accidentally wounded during relocation or are unable to be collected for relocation and remain in active construction areas. The probability of these risks may be increased if substantial rainfall (greater than 0.5 inch of rain in a 24-hour period) occurs, and California red-legged frogs and/or California tiger salamanders are dispersing through the area during work activities. Incidental take of California red-legged frogs and California tiger salamanders will be difficult to detect because of their small body size and use of underground burrows or dense cover; therefore, finding a dead or injured specimen may be unlikely. California red-legged frogs and California tiger salamanders injured or killed during translocation efforts are likely to be observed; however, mortality from other sources, including the indirect effects of translocation or displacement from the action area, would be difficult to observe. The observed number of California red-legged frogs and California tiger salamanders taken may be lower than the actual number taken.

Project construction is anticipated to take approximately 2 years for the initial construction, and less than 1 year for the future expansion. Based on CNDDB data and project-specific surveys and evaluations, we expect few California red-legged frogs or California tiger salamanders to be observed in the action area during the initial and future expansion construction periods. Therefore, we anticipate that few, if any, California red-legged frogs or California tiger salamanders will be found dead or injured; we also expect that few individuals of either species will be captured and relocated. If during project implementation two adult California red-legged frogs or two adult California tiger salamanders are found dead or injured, or five California red-legged frog adults or five adult California tiger salamanders are relocated, Reclamation or SBCWD must contact our office immediately so we can review the project activities to

determine if additional protective measures are needed. If any other life stages of the California red-legged frog or California tiger salamander are identified in the action area that are completely dependent on water, such as egg masses, tadpoles, or larvae, Reclamation or SBCWD must contact our office immediately so we can review the project activities to determine if additional protective measures are needed. Project activities that are likely to cause additional take should cease during this review period because the exemption provided under section 7(o)(2) would lapse and any additional take would not be exempt from the section 9 prohibitions.

The Service anticipates all San Joaquin kit foxes in construction areas could be affected as a result of this proposed action. The incidental take is expected to be in the form of harassment and harm from ground disturbing activities, destruction of dens, noise disturbance, heavy equipment use, and vehicle and foot traffic. Incidental take of San Joaquin kit foxes will be difficult to detect because they are primarily nocturnal, have extensive home ranges, and utilize subsurface dens that may extend up to 6 feet underground.

Based on CNDDB data and other project-specific surveys and evaluations, we anticipate a low probability of a San Joaquin kit fox being observed in the action area. If one San Joaquin kit fox is observed on the project site or there is an active den within the action area, Reclamation or SBCWD must contact our office immediately so we can review the project activities to determine if additional protective measures are needed. Project activities that do not affect the San Joaquin kit fox may continue during this review period, provided that all protective measures proposed by Reclamation and the terms and conditions of this biological opinion have been and continue to be implemented.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the impacts of the incidental take of the California red-legged frog, California tiger salamander, and San Joaquin kit fox:

1. Reclamation must ensure that the level of incidental take that occurs during project implementation is commensurate with the analysis contained herein.

2. Biologists must be authorized by the Service before they survey for San Joaquin kit fox, California red-legged frog, and California tiger salamander, and before they capture and move California red-legged frogs and California tiger salamanders in the action area.

3. Effects to the California red-legged frog, California tiger salamander, and San Joaquin kit fox must be minimized in the project area.