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RECLAMATION

Managing Water in the West

Environmental Assessment

Keswick, Shasta, and Whiskeytown Fault Trenching Study – Group 1

CGB-EA-2021-029
Shasta County, California

U.S. Department of the Interior
Bureau of Reclamation
California Great-Basin
Sacramento, California

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Mission Statements

The Department of the Interior conserves and manages the Nation's natural resources and cultural heritage for the benefit and enjoyment of the American people, provides scientific and other information about natural resources and natural hazards to address societal challenges and create opportunities for the American people, and honors the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities to help them prosper.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

The mission of the Bureau of Land Management is to sustain the health, diversity, and productivity of public lands for the use and enjoyment of present and future generations.

The mission of the Western Area Power Administration is to safely provide reliable, cost-based hydropower and transmission to our customers and the communities we serve.

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Section 1 Introduction

Section 1.1 Project Background

The Bureau of Reclamation's (Reclamation) Technical Service Center (TSC) proposes to conduct a study to obtain data from previously unstudied seismic faults in the Keswick, Whiskeytown, and Shasta areas within Shasta County and Tehama County. Reclamation proposes to obtain this data by conducting trenching along identified fault lines. Trenching will allow Reclamation to study a fault's geologic seismic history, including the frequency and magnitude of historic seismic activity. Studying the trenches will involve visual observations and core sampling.

Reclamation has previously undertaken limited geomorphic mapping using Landsat, world hillshade and topographic maps, lidar, and aerial photographs with field surveys to identify lineaments and map Quaternary- and Holocene-age faults in the region. Among the identified active faults in surface mapping, the kinematics, location, and extent of these structures were also analyzed, correlated, and confirmed using seismicity, InSAR, GPS, stress directions, and seismic profiles.

After identifying the faults in lineaments Reclamation conducted a 7-day field investigation in November 2020 in order to identify the locations of the fault-related geomorphic features and identify sites for their suitability for further study via trenching. Reclamation obtained permission from landowners within the area, including the City of Redding's Parks Department, the Bureau of Land Management (BLM), Evergreen Union School District, and private individuals.

Reclamation identified at least six faults and lineaments through these studies. These faults are dominantly strike-slip with possible reverse component for the northeast trending structures. The northwest-trending faults, on the other hand, are most probably normal with right-lateral component. Based on their location, kinematics, and distribution, these faults are deformational structures due to the regional stress being experienced in the area. After the 2020 field survey, several trench sites were identified for excavation and studies along these several faults.

The preferred locations identified from the field investigation are the focus of this Environmental Assessment (EA), with the intent to study the seismic history of the faults by digging trenches along various fault lines in the area. Reclamation has prepared this EA to evaluate and disclose the environmental effects of these proposed trenches. Reclamation is the lead agency under NEPA for this action, BLM is a cooperating agency under NEPA for trenches located on BLM-administered lands (TS02.1, TS13, TS13.2, TS15, and TS15.2) and the Western Area Power Administration (WAPA) is a cooperating agency under NEPA for the trench located on WAPA-administered lands (TS01).

BLM Redding Field Office would issue a Land Use Permit 2920 pursuant to of the Federal Land Policy and Management Act [43 U.S.C. 1732 Section 302(b)] to authorize access and seismic trenching on BLM-owned lands described within this EA. All environmental commitments, mitigation measures, and Best Management Practices (BMPs) developed for this EA would be considered for incorporation into the BLM authorization.

WAPA would issue a letter of concurrence to Reclamation that will include the conditions for backfill and compaction, fencing, and requirements for working around the nearby transmission lines and tower at location TS01.

Section 1.2 Project Need and Purpose

Reclamation's TSC needs to study previously unidentified seismic faults in the Keswick, Whiskeytown, and Shasta area in order to gain a better understanding of the seismic history of the area. This knowledge is integral to Reclamation's operations in the Keswick, Whiskeytown, and Shasta areas. Trenches are necessary in order for Reclamation to gather better information and lower uncertainties about recurrence interval and slip rates for these faults.

The purpose of the Proposed Action is to conduct trenching along the identified seismic faults, enabling Reclamation to study these faults through analysis of exposed soils and rock layers. Reclamation will also gather organic materials and soil samples for age determination.

Section 2 Alternatives Including the Proposed Action

This EA considers two possible actions: the No Action Alternative and the Proposed Action. The No Action Alternative reflects future conditions without the Proposed Action and serves as a basis of comparison for determining potential effects to the human environment.

Section 2.1 No Action

Under the No Action Alternative, Reclamation would not conduct trenching in order to study previously unidentified seismic faults in the Keswick, Whiskeytown, and Shasta area. Reclamation would not gain a better understanding of the seismic history of the area and would continue its operations in the nearby geographic area without this knowledge.

Section 2.2 Proposed Action

Under the Proposed Action, Reclamation would conduct trenching in order to study previously unidentified faults in the Keswick, Whiskeytown, and Shasta area. Reclamation would conduct visual observations and core sampling at each trench, gaining knowledge of the previous geologic seismic history of the area.

Section 2.2.1 Proposed Action Description

Reclamation would dig eight trenches in total in two phases. The first four trenches would be dug in August 2021 and closed in September / October 2021. The next four trenches would be dug at the same time the first four are being closed, in September / October 2021, and then closed in November / December 2021.

The maximum size of each trench would be up to 65-feet wide, 262-feet long, and up to a depth of 10-feet. The minimum size is approximately 20-feet wide, by 40-feet long, and a depth of 10-feet. Reclamation would use a backhoe to excavate the soil to the desired depth. Each trench would take approximately 1-3 days to excavate.

Each trench would be dug using a "benching" methodology, in which the depth of the trench gets progressively deeper with each bench step. For example, a bench step could be 3.3-feet deep and 6-feet wide, allowing for three bench steps in order to reach a desired depth of 10'. The exact depth and width of each step will be dependent on soil conditions. It is not expected that every trench will reach 65-feet in width; this measurement has been provided as a theoretical maximum width in order to reach the desired depth.

Trenching would only occur in soil. If bedrock is encountered before the desired depth is reached, trenching would stop at bedrock. Trenching would stop if groundwater is encountered.

After excavation the trench would be surrounded with a barrier to restrict access to the site, either an orange safety fencing for trenches located in rural areas or locked metal chain-link fencing for trenches located in more populated areas, such as TS01. No trespassing signs will be clearly visible. All tools and equipment except for the excavator will be removed from the site at the end of each day to prevent theft. Excavated material will be covered with plastic sheeting.

Each trench would remain open for up to four months. During this time Reclamation would clean the trench and outline a grid within the trench. Reclamation would conduct photo documentation, soil and lithologic analyses, stratigraphic study, and sampling. The sampling would be done in two parts: first, samples would be taken in bulk 1 – 2 lb bags of soil to study the organic composition of the soil. Second, cores would be taken using 6-inch coring tubes. Cores would be sent to Denver, CO for evaluation and further study.

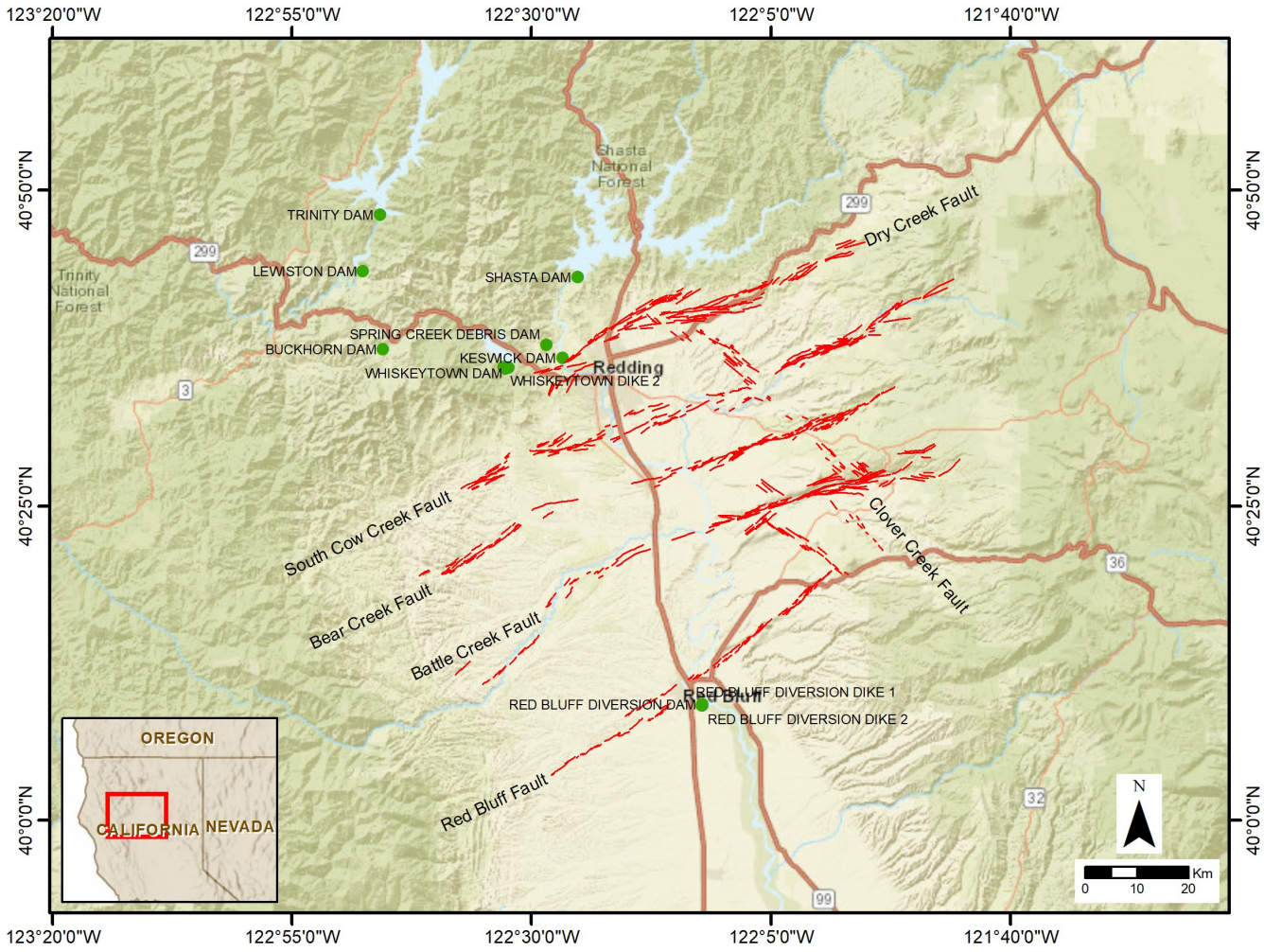
After Reclamation has finished studying the trench, Reclamation would place the soil back into the trench using an excavator. The topsoil which was previously set aside would be placed atop the refilled trench. Re-seeding would be performed using a BLM-approved native seed mix. It would take approximately 2 – 4 hours to recover each trench.

Section 2.2.2 Proposed Action Area

Under the Proposed Action Reclamation would conduct trenching at a total of eight trenching sites spread across the Keswick, Shasta, and Whiskeytown areas within Shasta County and Tehama County. Some of the trenching sites include alternate trenching sites, for a total of 14 trenching sites evaluated within this EA. Each proposed trenching location is associated with a mapped fault line, including the

Dry Creek fault, South Cow Fault, Bear Creek Fault, Battle Creek fault, and Red Bluff fault (Figure 1). Collectively the faults are referred to as the Northern Central Valley fault system.

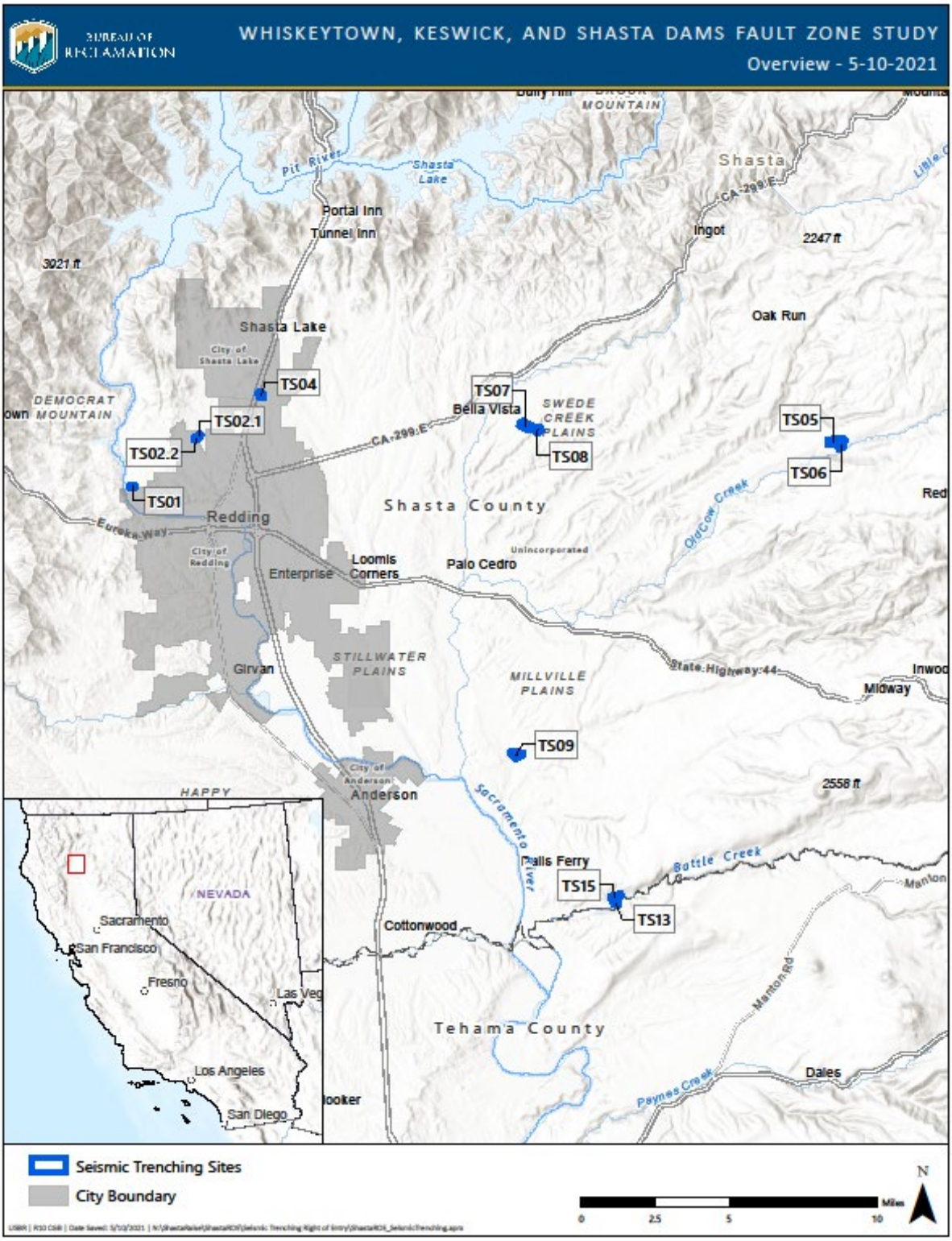
Figure 1. Overview of Seismic Faults



There are 14 potential excavation sites in total, each associated with a different fault line (Figure 2):

- Dry Creek fault: Trenching Site (TS) 01, TS02.1, and TS04.
- South Cow Creek fault: TS05 and TS06
- NW-Trending fault: TS07 and TS08
- Bear Creek fault: TS09, TS10, and TS11
- Battle Creek fault: TS13, TS13.2, TS15, and TS15.2

Figure 2. Overview of Trenching Site Locations[1]



[1] TS02.2 has been removed from consideration within this EA and may be re-considered as part of a separate action and separate NEPA compliance at a later time.

Dry Creek Fault
The Dry Creek fault trenching locations are located west of Redding, CA and east of Keswick Dam. TS01 and TS02.1 are the preferred trenching locations, with TS04 as a backup trenching location.

TS01 is located approximately 4 miles west of Redding, CA, on the east side of the Sacramento River and one -quarter mile east of WAPA's Keswick substation adjacent to the Keswick Dam The potential trenching location is approximately 1,000 feet east of the Sacramento River, , at an elevation of 700 feet. The trenching location is in a relatively level and undisturbed location adjacent to a powerline access road. WAPA towers and transmission lines are located about 200 feet north of the site, with non-WAPA distribution lines closer to the site.

TS02.1 is located approximately 2.5 miles northwest of Redding, CA. The potential trenching location is approximately 1,000 feet east of Buckeye Park, on the west side of the adjacent railway at an elevation of 720 feet. A swale exists at the northern end of the site. The trenching site would avoid trenching in the swale, and would observe the 50-foot setback described within this EA. The area is generally flat along the train track with temporary and permanent housing developments and local park-related activities. There is access to the trenching areas behind a vehicle access gate off of Oasis Road.

TS04 is located approximately 4.5 miles north of Redding, CA, to the east of I-5, across the interstate from the "Oasis Fun Center" at an elevation of 660 feet. The area closest to the interstate is generally flat with hills to the southeast. Some housing developments and industrial activities have influenced the land surface. There are two ways to access the site: from the north through a residential, unpaved road and from the south on an industrial, unpaved road.

South Cow Creek Fault
The South Cow Creek fault trenching locations are located approximately 3 miles west of Whitmore and on the north side of Whitmore Road. The area is generally a southeast-facing hill with several southeast-facing scarps, with irrigation ditches running parallel to the mapped fault traces. TS06 is the preferred trenching location with TS05 as a backup trenching location.

TS05 is located a quarter mile north of Whitmore Road, along a southeast-facing hill at an elevation of 1,440 feet. The trenching area avoids an irrigation canal to the west and an irrigation canal running east-west along the southern border of the potential trenching area.

TS06 is located 600 feet southeast of TS05, also north of Whitmore Road, along a southeast-facing hill at an elevation of 1,390 feet. The action area is set back 25 feet from an ephemeral stream to the west and set back 100 feet from an irrigation canal to the east.

NW-Trending Fault
The NW-Trending fault is located approximately 4 miles east of Bella Vista town and 5.5 miles

northeast of Palo Cedro town. The area is a gently-sloping flat surface facing to the southwest. TS07 is the preferred trenching location with TS08 as a backup trenching location.

TS07 is located 4 miles east of Bella Vista between Little Cow Creek and Stagecoach Road. The site is located 1,000 feet west of an unnamed intermittent stream at an elevation of 750 feet. Access to the site is by unpaved roads connecting to Stagecoach Road.

TS08 is located 2,000 feet west of TS07 at an elevation of 590 feet. The site is set back a minimum of 25 feet west of an unnamed intermittent stream at an elevation of 590 feet. Similar to TS07, there are no paved roads in the area and access to the site is by unpaved roads connecting to Stagecoach Road.

Bear Creek Fault

The Bear Creek Fault TS09, TS10 and TS11 are located along the eastern slopes of the Central Valley, approximately 6 miles south of Palo Cedro and 5 miles east-northeast of Anderson on the corner of Dersch and Parkville Roads. The area is a gently-sloping flat surface facing to the southeast. TS09 is the preferred trenching location with TS10 and TS11 as backup trenching locations. The area is under a Conservation Easement with the Shasta Land Trust, known as Fenwood Ranch.

TS09 is located 200 feet southwest of the intersection of Dersch Road and Parkville Road at an elevation of 470 feet. Cow Creek is located 1,200 feet to the southwest of the trenching site. Both of the roads are paved. Access to the site is most likely provided by Parkville Road.

TS10 is located 700 feet southwest of the intersection of Dersch Road and Parkville Road at an elevation of 470 feet. Cow Creek is located 750 feet to the west of the trenching site. Access is also provided by Parkville Road with additional unpaved overland travel of approximately 500 feet to the west.

TS11 is located 1,400 feet to the southwest of the intersection of Dersch Road and Parkville Road at an elevation of 470 feet. Cow Creek is located 100 feet to the west of the trenching site. Access is also provided by Parkville Road, with additional unpaved overland travel of approximately 1,200 feet to the west.

Battle Creek Fault

TS13, TS13.2, TS15, and TS15.2 are located along the southeastern slopes of the Central Valley, approximately 8 miles east of Cottonwood, CA and 13 miles west of Manton, CA. The area is hilly with slopes facing to the southeast towards the Battle Creek and its tributaries. The Coleman Fish Hatchery is located nearby these two trenching sites. TS13 and TS15 are both preferred trenching locations with TS13.2 and TS15.2 as backups.

TS13 is located 0.8 miles east of Coleman Fish Hatchery, south of Coleman Fish Hatchery Road and north of Battle Creek. There is a man-made channel used to provide the Coleman Fish Hatchery with

water located 50 feet to the south of the trenching site. TS13.2 is located 75 feet to the east of TS13 and 150 feet north of the man-made channel. The elevation for both trenching sites is 450 feet. Both trenching sites avoid the channel area and Battle Creek.

TS15 is located 0.9 miles northeast of Coleman Fish Hatchery, approximately 150 feet east of Coleman Fish Hatchery Road and 200 feet northwest of Battle Creek. A PG&E powerline traverses the area near the far end of the site. The proposed trench would avoid any impacts to the powerline and the nearby ravine. TS15.2 is located 500 feet west of TS15, on the other side of Coleman Fish Hatchery Road. PG&E powerlines traverse the area and would not be impacted by trenching. Access is provided by Coleman Fish Hatchery Road, a paved road with restricted, gated access. Access to TS15.2 would require additional overland travel to avoid steep areas. The elevation for the trenching sites range from 510 feet to 580 feet.

Section 3 Affected Environment and Environmental Consequences

The affected environment is the existing environmental condition of the trenching locations, associated staging and work areas, and access routes for the Proposed Action and adjacent lands, collectively referred to as the Action Area for the purposes of this EA. This Action Area is the area of analysis for each resource that may be affected by the Proposed Action or No Action Alternative. The impact analyses include identifying the context and intensity of any effects (*e.g.*, environmental consequences).

Section 3.1 Resources Eliminated from Further Review

Reclamation analyzed the affected environment and determined that the Proposed Action did not have the potential to cause effects to the resources listed in Table 1. Brief explanations for their elimination from further consideration are provided in Table 1.

Table 1. Resources Eliminated from Detailed Analysis.

Resource	Reason Eliminated
Climate Change	The equipment list and construction schedule for the Proposed Action is limited, requiring the use of one excavator for 1-2 days each at 8 trenches. Because the project is temporary, there would be no ongoing greenhouse gas releases associated with the project, and the use of greenhouse gas generating equipment used to complete the project is minimal.
Environmental Justice	The Proposed Action would not have any disproportionately negative impacts on low-income or minority individuals within the Action Area.
Energy	The Proposed Action would have no impact on the energy resources in the area. While Reclamation does operate dams that provide hydroelectric power to the area, the Proposed Action would have no impact upon those operations. There

	are powerlines located near TS01, TS02.1, TS15, and TS15.2. Reclamation would avoid any impacts to these powerlines by avoiding trenching near the lines.
Hydrology and Water Quality	The location of each potential trenching site was specifically chosen to avoid impacts to wetlands and other waters of the U.S. Each site also follows a setback from any intermittent or perennial streams. Any potential runoff from each site would be managed under Best Management Practices under the project's Stormwater Pollution Prevention Plan and have minimal to no impact on nearby water quality.
Noise	The construction schedule would take place during daytime hours and only require the use of an excavator. Any localized noise impacts would be minimal.
Recreation and Public Safety	A majority of the trenching sites are located in rural uninhabited areas far from major population centers. Regardless, any trenching site will be properly fenced off from public access including locked metal fencing at trenches located near populated areas (such as TS01), no trespassing signs will be displayed to discourage the public, and all equipment will be removed from the sites at the end of the day except for the excavator.
Socioeconomic Impacts	Reclamation will conduct a majority of the operations internally using Reclamation's resources. Any external contracts would be minor and for a limited time period.
Transportation	Each trenching site is located off-road from transportation corridors, and the Proposed Action would have no impact to local transportation roads and traffic.
Visual Resources	The Proposed Action would not permanently alter visual resources, and most trenching occurs outside of the public view. Any fencing placed around trenches would be temporary, and Reclamation has located the trenching sites in order to minimize the removal of woody vegetation.

Section 3.2 Air Quality

Section 3.2.1 Affected Environment

The Proposed Action is located in Shasta County and Tehama County, which are located in the northern end of the Sacramento Valley Air Basin (SVAB). The SVAB is bordered by the Coastal Mountain Range on the west and north, and the Sierra Nevada range on the east, leading to the trapping of pollutants between the two ranges. This can be exacerbated by a temperature inversion layer and northern winds that transport pollutants from urban areas from the south, such as the San Francisco Bay Area and Sacramento Valley. Shasta County is regulated by the Shasta County Air Quality Management District (SCAQMD) and Tehama County is regulated by the Tehama County Air Pollution Control District (TCAPCD).

The U.S. Environmental Protection Agency and California Air Resources Board developed federal and state health-based air quality standards, known as National and California ambient air quality standards (NAAQS and CAAQS), for criteria air pollutants. Criteria air pollutants consist of carbon monoxide, ozone, sulfur dioxide, nitrogen dioxide, (NOX) inhalable particulate matter between 2.5 and 10 microns in diameter (PM10), particulate matter less than 2.5 microns in diameter (PM2.5), and lead. The CAAQS also set standards for sulfates, hydrogen sulfide and visibility.

Section 176(c) of the Clean Air Act (42 U.S.C. 7506(c)) requires that any entity of the federal

government that engages in, supports, or in any way provides financial support for, licenses or permits, or approves any activity, to demonstrate that the action conforms to the applicable State Implementation Plan before the action is otherwise approved. The U.S. Environmental Protection Agency (EPA) promulgated the General Conformity Rule to ensure that such federal actions are consistent with a State Implementation Plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS for criteria air pollutants and achieving expeditious attainment of those standards. If an action does not conform to the State Implementation Plan, the federal agency must submit a conformity determination to EPA, State and local air pollution control agencies, and to the public. Federal actions that are exempt from the General Conformity Regulations include, but are not limited to, actions with associated emissions clearly at or below specified de minimis levels (EPA 2020).

Shasta County and Tehama County are in unclassified or attainment status for all criteria pollutant NAAQS (CARB 2021). Regarding CAAQS, the entire SVAB which includes Shasta County and Tehama County is in nonattainment for ozone (and its precursors of VOC and NOx). Additionally, Tehama County is in nonattainment for PM10 and is Unclassified for PM2.5 Shasta Count is in attainment for PM10 and PM2.5. Table 2 summarizes the CAAQS attainment status for Shasta County and Tehama County.

Table 2. CAAQS Attainment Status for Shasta and Tehama County

	Ozone	PM2.5	PM10
Shasta County	Nonattainment	Attainment	Attainment
Tehama County	Nonattainment	Unclassified	Nonattainment

Table 3 below presents the criteria pollutants Shasta County or Tehama County is in nonattainment status with for CAAQS and local SCAQMD significance thresholds. The SCAQMD adopted local significance thresholds to determine impact significance of a project during CEQA review. The SCAQMD follows a uniform method of applying mitigation measures, such as Standard Mitigation Measures (SMM) and Best Available Mitigation Measures (BAMM), which are recommended if emissions for a stationary source exceed Level "A" thresholds. If Level "B" thresholds are exceeded, SMM, BAMM, and special BAMM as determined with the SCAQMD are to be implemented. These thresholds and measures seek to reduce long-term emissions associated with stationary type projects and reduce cumulative impacts. Pollutant emissions associated with the Proposed Action would be limited to fugitive dust and mobile source emissions released during equipment operation and ground disturbing trenching activities. There are no mitigation thresholds currently established for mobile source emissions. Regardless, these thresholds can be used to help describe and assess potential impacts to air quality that may result from the Proposed Action.

Table 3. CAAQS Attainment Status and Local Significance Thresholds for Shasta County

Pollutant	CAAQS Attainment Status	SCAQMD Level "A" Significance Threshold[1,2] (lbs/day)	SCAQMD Level "B" Significance Threshold[1,3] (lbs/day)
VOC (as ozone precursor)	Nonattainment	25	137
NOx (as ozone precursor)	Nonattainment	25	137
PM10	Nonattainment[4]	80	137

[1] SCAQMD General Plan (2004).

[2] If emissions exceed level "A" thresholds, SMM and appropriate BAMM would be applied to reduce emissions below the threshold.
[3] If application of SMM and BAMM cannot reduce emissions to below Level "B" thresholds, emission offsets would be required.
[4] Tehama County only.

Section 3.2.2 Environmental Consequences

No Action
Under the No Action Alternative there would be no impacts to the current air quality status in Shasta and Tehama County. No emissions would be emitted as a result of the project.

Proposed Alternative
The Proposed Action is in an area classified as in attainment with all criteria pollutant NAAQS; therefore, the Proposed Action would neither conflict with nor obstruct the California SIP, and the Federal general conformity regulations do not apply. A qualitative analysis would be used to analyze potential effects to air quality in regard to CAAQS.

Trenching require use of excavators that would temporarily contribute to air pollution in Shasta and Tehama County in the form of ozone precursors and PM10. Operating excavators, hauling the excavators on unpaved road surfaces, and general transportation on unpaved road surfaces would be temporary sources of fugitive dust emissions (PM10). Fugitive dust resulting from excavators would occur over a two-day period twice for each of the eight trenches; first when the trench is being excavated, and second when the trench is being refilled.

Diesel and gasoline powered vehicles used to access the site during construction would also temporarily emit VOC and NOx and would occur more frequently as each group of trenches are studied over a four-month period.

Reclamation calculated anticipated daily NOx emissions from the excavator based on EPA's non-road Tier 3 diesel Emission Factor (EF) rates for NOx of 3 grams per break horsepower per hour. A large excavator of up-to 300 hp, operating for 8 hours, would generate 7.2 kg (15.9 lbs) of NOx, below the SCAQMD Level "A" daily significance thresholds.

$$Daily\ Lbs\ NOx = 300\ HP\ \times \frac{3g\ NOx}{HP \times hour} \times 8\ hours\ \times \frac{1\ kg}{1{,}000\ g} \times \frac{2.2\ lbs}{1\ kg} = 15.9\ lbs\ NOx$$

Similarly, Reclamation calculated anticipated daily PM emissions from the excavator based on EPA's non-road Tier 2[2] diesel Emission Factor (EF) rates for NOX of 0.15 grams per break horsepower per hour. A large excavator of up-to 300 hp, operating for 8 hours, would generate 0.36 kg (0.79 lbs) of PM, below the SCAQMD Level "A" daily significance thresholds.

2 EPA non-road Tier 3 diesel Emission Factor for PM was not adopted, therefore Tier 2 diesel Emission Factor remains in effect

$$Daily\ Lbs\ PM = 300\ HP\ \times \frac{0.15g\ PM}{HP \times hour} \times 8\ hours\ \times \frac{1\ kg}{1{,}000\ g} \times \frac{2.2\ lbs}{1\ kg} = 0.79\ lbs\ NOx$$

Considering the implementation of the Proposed Action would only result in minor temporary emissions as a result of project actions, the Proposed Action's incremental contribution to localized emissions is minimal.

Section 3.3 Biological Resources

Section 3.3.1 Affected Environment

The Proposed Action area includes the area of the trenches, the area surrounding the trenches to be used for storing equipment and excavated soil, and any unpaved roads used to access the trenching sites. The action area also includes any areas that may be indirectly affected by the federal action and not only the immediate area involved in the action. Indirect effects may include effects that are caused by or would result from the Proposed Action and may occur at a later time but are still reasonably certain to occur.

All of the trenching sites occur in Northern Californian oak woodland, oak savanna, or annual grassland habitats. The trenching site locations were chosen to avoid direct impacts to any riparian areas or wetlands.

Special Status Species

A species list for the potentially affected area was generated on April 6, 2021 from the U.S. Fish and Wildlife Service (USFWS) website at http://ecos.fws.gov/ipac_US/ (USFWS 2021). Reclamation also searched the California Natural Diversity Database for occurrences of federally listed endangered species, California threatened and endangered species, California Native Plant Society 1B Rare Plants, and BLM Sensitive Species to determine what special status species may occur within dispersal distance of the Proposed Action. There were no occurrences found within the project action area.

During the November 2020 site visit, Reclamation biologists visited every proposed site included within this EA to determine the potential for endangered, rare, or sensitive species, as well as the habitat quality found within the proposed trenching sites. Where possible, Reclamation biologists advised TSC on avoidance of sensitive areas such as wetlands, ecologically diverse areas, and vernal pools. In all cases Reclamation was able to move and adjust proposed trenching sites to avoid impacts to ecologically diverse and sensitive areas. Reclamation biologists did not note any rare or endangered plants during the November 2020 site visits.

Reclamation's biologist and BLM's biologist, botanist, geologist, and archeologist conducted a site visit at BLM-administered properties at TS02.1, TS13, TS13.2, TS15, and TS15.2 on June 16, 2021. No rare or endangered species were noted during the site visit, with each trenching site dominated primarily by invasive annual grasslands.

A special-status species list is summarized in Table 4, which includes plants and wildlife that are Federally-listed as threatened or endangered (or candidates for listing) under the Federal Endangered Species Act (ESA). All migratory birds are protected by the federal Migratory Bird Treaty Act. There is

no designated critical habitat within the Action Area.

Table 4. Federal and State Listed Special Status Species

Species	Federal / State Status	Species and Habitat Known to Occur in Project Area	Potential Impact to Species
Birds			
Bald Eagle *(Haliaeetus leucocephalus)*	Protected / Endangered	None	None
Bank swallow *(Riparia riparia)*	- / Threatened	None	None
Greater Sandhill Crane *(Antigone canadensis tabida)*	- / Threatened	None	None
Northern Spotted Owl *(Strix occidentalis caurina)*	Threatened / -	None	None
Swainson's hawk *(Buteo swainsoni)*	- / Threatened	Not likely	Not likely
Tricolored Blackbird *(Agelaius tricolor)*	- / Threatened	Possible	Not likely
Yellow-billed Cuckoo *(Coccyzus americanus)*	Threatened / Endangered	Possible	Not likely
Willow flycatcher *(Empidonax traillii)*	- / Endangered	Not likely	Not likely
Amphibians			
California red-legged frog *(Rana draytonii)*	Threatened / -	Possible	Not likely
Foothill yellow-legged frog *(Rana boylii)*	- / Endangered	Possible	Not likely
Fishes			
Chinook Salmon – Central Valley spring-run *(Oncorhynchus tshawytscha pop. 11)*	Threatened / Threatened	None	None
Chinook Salmon – Sacramento River winter-run *(Oncorhynchus tshawytscha pop. 7)*	Endangered / Endangered	None	None
Delta Smelt *(Hypomesus transpacificus)*	Threatened / -	None	None
Rough sculpin *(Cottus asperrimus)*	- / Threatened	None	None
Steelhead – Central Valley DPS *(Oncorhynchus mykiss irideus pop. 11)*	Threatened / -	None	None
Insects			
Valley Elderberry Longhorn Beetle *(Desmocerus californicus dimorphus)*	Threatened / -	Possible	Not likely
Crustaceans			

Conservancy Fairy Shrimp *(Branchinecta conservation)*	Endangered / -	None	None
Shasta Crayfish *(Pacifastacus fortis)*	Endangered / -	None	None
Vernal Pool Fairy Shrimp *(Branchinecta lynchi)*	Threatened / -	None	None
Vernal Pool Tadpole Shrimp *(Lepidurus packardi)*	Endangered / -	None	None
Mammals			
California wolverine *(Gulo gulo)*	- / Threatened	None	None
Plants			
Slender Orcutt Grass (Orcuttia tenuis)	Threatened / -	None	None

The Bald Eagle is protected by the Bald and Golden Eagle Protection Act. A take permit from USFWS is required if a project would result in disturbance to Bald Eagles or Golden Eagles. This project would not disturb Bald Eagles and would not disturb any Bald Eagle nests.

Non-special status species
Shasta and Tehama County contain a rich diversity of bird species, such as various woodpeckers and songbirds. Species present nearby the Action Area may include flycatchers, sparrows, warblers, towhees, and others. Deer are known to graze in oak savanna habitats, with the acorns from oak trees providing habitat and food for rodents. Wild turkeys are also common. Bat species may forage or roost temporarily within the Action Area, but no roosts were observed during the November 2020 site visits to the trenching sites.

Section 3.3.2 Environmental Consequences

No Action
There would be no new impacts to biological resources under the No Action Alternative. Existing conditions would continue.

Proposed Alternative
Impacts to Vegetation
The Proposed Action Alternative will excavate trenches in habitat used by plants and animals within the trenching sites. The Proposed Action will displace soil at each trenching site, uprooting plants at the trenching site and depositing the soil adjacent to the trench. For most trenches this will primarily involve the uprooting of annual grasslands that will be dry during the summer. Reclamation will place the topsoil separate from the underlying soil, replacing the topsoil last to preserve the vegetation and seeds present within the soil, decreasing the amount of time necessary the area will need to return to pre-Proposed Action status.

There is a potential for the Proposed Action to include the removal of oak trees present at trenching sites. Because the final trenching site locations are dependent upon field conditions and the avoidance of various resources such as wetlands and oak trees, Reclamation cannot determine how many trees may be impacted. Any oak trees impacted by trenching will be removed and hauled out, potentially

removing habitat from any species utilizing the tree. Reclamation has utilized on-site surveys and GIS maps to choose trenching sites with minimal woody vegetation, avoiding the removal of trees whenever possible.

Even if oak trees are not directly impacted, the action could cause stress and harm to oak trees by trenching adjacent to the trees. The trenching action may damage and remove roots utilized by the trees, causing the trees stress, possibly resulting in the death of the tree.

Impacts to Waters of the United States

No impacts to fishes or species that utilize wetlands, swales, streams, vernal pools, and other waters of the U.S. is expected. Reclamation chose trenching sites specifically to avoid wetlands and other waters of the U.S., using a combination of field surveys conducted in November 2020 and review of satellite imagery. Final trenching sites will be dependent on surveying for, avoiding, and observing setbacks from any wetlands, streams, or vernal pools present in order to avoid impacts to these habitats and species that utilize these habitats.

Impacts to Special-status Species

Reclamation has entered into ESA Section 7 informal consultation with the USFWS for the Valley Elderberry Long-horn Beetle (VELB), California Red-legged frog (CRLF), and Western Yellow-billed Cuckoo Western DPS (cuckoo). Reclamation determined that the Proposed Action may affect, but is not likely to adversely affect these species and is seeking USFWS concurrence on that determination.

Valley Elderberry Longhorn Beetle

The VELB's current range includes Shasta County down to Fresno County, typically below 500 feet of elevation (USFWS 2017a). The elderberry shrubs VELB depend on are common throughout California's Central Valley, preferring higher riparian areas along rivers, canals, ditches, and any area where subsurface flows provide water to elderberry roots. The elderberry bush can also be found outside of riparian areas in valley oak woodland, blue oak woodland, and annual grasslands. Populations declined significantly due to vegetation loss from agricultural and urban development throughout California's Central Valley (USFWS 2006, USFWS 2017b).

The action area contains potential VELB habitat with sites below 500 feet of elevation, located adjacent to riparian areas that may have subsurface flows sufficient for the VELB's host plant, the elderberry bush. No VELB critical habitat is present within the action area.

The minimum elevation for each trenching site roughly correlates with the description of VELB's range typically occurring below 500 feet of elevation (USGWS 2017a) and the IPaC results for VELB shown in Table 5. Of the TS#s IPaC reported VELB had the potential to be present in (TS01, TS09, TS10, TS11, TS13, TS15, and TS16) only two (TS01 and TS16) are located above an elevation of 500 feet. Reclamation evaluated potential habitat for elderberry bushes for TS01, TS09, TS10, TS11, TS13,

TS15, and TS16 by examining satellite photography from Google Earth and identifying any rivers, canals, ditches, or any areas where greenery indicated the presence of subsurface flows. Reclamation did not evaluate satellite imagery for TS02, TS04, TS05, TS06, TS07 and TS08 due to the high elevation of these sites combined with IPaC not listing VELB as a potential species in the area.

Reclamation cross-referenced its plans to perform trenching in half of the sites in June/July and the second half in September/October with the VELB's typical adult stages of emergence in March through July to identify which sites could have activity and trenching during VELB emergence. Table 5 presents the results of IPaC, elevation profile, habitat potential, and excavation activity during emergence months for VELB.

Table 5. Summary of VELB Habitat and Trenching Activity

	TS01	TS02	TS04	TS05	TS06	TS07	TS08	TS09	TS10	TS11	TS13	TS15	TS16
IPaC	X							X	X	X	X	X	X
Elev. (Feet)	700	720	660	1440	1390	750	590	470	470	470	450	510	460
Habitat Potential	Low	N/A	N/A	N/A	N/A	N/A	N/A	High	High	High	High	Medium	Medium
Trenching in Flight Months (Yes/No)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No

The highest potential for VELB occurrence is at TS09, TS10, TS11, TS13, TS15, and TS16. Reclamation plans to perform trenching at these sites as part of the second group of trenches, beginning in September/October outside of the VELB adult emergence season.

Reclamation will implement environmental commitments to survey for VELB at trenching sites that have the highest probability of VELB occurring. Reclamation is committed to observing setbacks from any identified elderberry bushes within the Action Area, preventing the removal of any elderberry bushes.

California Red-legged frog

The CRLF non-breeding season is defined as July 1 – September 30 with the breeding season occurring outside of that range (October 1 – June 30) (USFWS 2005). Habitat for the CRLF ranges in elevation from sea level to 5,000 feet and can be found in a variety of different habitats, including various wetland systems, riparian, and upland habitats. Habitats for the CRLF are generally defined as two distinct habitats: aquatic habitat and terrestrial habitat.

Breeding habitat for the CRLF require aquatic habitats, such as streams, creeks, ponds, marshes, lagoons, and estuaries. The CRLF frequently utilizes artificial impoundments such as stock ponds. Optimum breeding habitat is associated with dense riparian or emergent vegetation adjacent to areas with deep still or slow-moving water (Hayes and Jennings 1988). However, CRLF has been found to

breed successfully in artificial ponds with no emergent vegetation with the absence of aquatic predators.

CRLF can be found moving as far as 1.7 miles from breeding sites to upland habitat (Fellers and Kleeman 2007). Most overland movement occurs at night. This upland refugia habitat includes rodent burrows, boulders, rocks, and organic debris such as downed trees or logs. All habitats with suitable cover and moisture may serve as suitable summer refugia habitat. When perennial aquatic habitat is available, CRLF will occupy the site year-round.

All excavation sites are located below 5,000 feet in elevation, and all project activity will take place during the non-breeding months. There is no designated critical habitat for CRLF within the action area. Reclamation reviewed satellite imagery from Google Earth from various months in order to identify potential CRLF habitat within 2,000 feet (600 m) of each trenching site. Because IPaC indicated CRLF had the potential to be present at all TS#s, Reclamation reviewed satellite imagery for every trenching site.

The compiled satellite imagery with close-ups of potential CRLF habitat can be found in Appendix B. TS01, TS04, TS05, TS06, TS13, TS15, and TS16 contained potential CRLF habitat within 600 meters. TS02, TS07, TS08, TS09, TS10, and TS11, did not have any potential CRLF habitat within 600 meters. Table 6 summarizes CRLF aquatic habitat identified within 600 meters of each trenching site.

Table 6. CRLF Aquatic Habitat

	TS01	TS02	TS04	TS05	TS06	TS07	TS08	TS09	TS10	TS11	TS13	TS15	TS16
Within 600m	X		X	X	X						X	X	X
No habitat within 600m		X				X	X	X	X	X			

Reclamation will implement environmental commitments to survey for CRLF at trenching sites that have potential CRLF habitat within 600 meters of the trenching site. Reclamation is also committed to surveying for any CRLF which may utilize the trenching sites as habitat after a rain event, preventing trenching activity from resuming until these surveys have been completed.

Western Yellow-billed Cuckoo Western DPS

TS09, TS10, TS11, TS13, and TS15 have the potential to contain suitable habitat for the cuckoo. TS09, TS10, and TS11 are located near an unnamed seasonal tributary to the Sacramento River. TS13 and TS15 are located near Battle Creek, a tributary with connecting riparian area to the Sacramento River. Due to the timing of the project from July through December the cuckoo may be present within these areas during its summer seasonal migration to northern California.

The primary risk to the cuckoo would be the potential disturbance or destruction of riparian habitat, specifically in the form of the removal of trees the cuckoo uses for nesting. The cuckoo prefers woodland habitat with cottonwoods and willows for its nest. During the November 2020 ground survey Reclamation identified oak trees and manzanita bushes in some of the excavation areas. Reclamation did not conduct a formal survey for cottonwoods and willows but did not note any within the action area.

Reclamation will avoid impacts to the cuckoo allowing trenching in TS09, TS10, TS11, TS13, and TS15 only as part of the second group of trenches, scheduled to begin trenching in September 2021 or later. By delaying trenching activity in these areas until September it avoids potential impacts to the cuckoo, as the cuckoo begins its migration to South America by late August (Gaines and Laymon 1984).

Non-federally listed species

Of the non-federally listed species, the tri-colored blackbird, Swainson's hawk, and foothill yellow-legged frog are the three species with potential habitat and occurrences within the action area. Both species have been known to occur within the Redding area and foothills east of Redding. While neither have been specifically recorded within the California Natural Diversity Database (CNDDB) within a mile of any of the trenching sites, presence or absence of a species within CNDDB does not necessarily indicate presence or absence of species in that area.

The tri-colored blackbird is protected under the California Fish and Game Code (Sections 3503 and 3800). The species is common locally throughout the Central Valley, preferring to nest within emergent wetland near fresh water (USFWS 2019). Their breeding season is March 1 through July 31 (Cornell 2018). The Proposed Action specifically avoids trenching in wetlands, avoiding direct impacts to tri-colored blackbird nests or breeding habitat. Operation of excavators may cause a noise disturbance to nesting birds nearby. The noise disturbance would only last one to two days per trenching site and be minimal.

The Swainson's hawk is listed as a Threatened species by the State of California. It is a migratory bird, preferring to nest near riparian areas during the spring and summer (USFWS 2018). The Swainson's Hawk breeds in areas with few trees such as juniper-sage flats, riparian areas, and oak savanna. It requires suitable foraging areas nearby, such as grasslands that support robust rodent populations. They can forage up to 18 miles from their nest site, but more commonly they prefer to forage within 10 miles of its nest (Cornell 2010). CDFW recommends evaluating projects for foraging habitat impacts when the project is located within 10 miles of a known nest site. There are no known Swainson's hawk nests within more than 20 miles from the Project Action Area, so no impacts are expected.

The foothill yellow-legged frog can occupy a diverse range of ephemeral streams, rivers, and adjacent suitably moist terrestrial habitats. A review of surveys reviewed and reported in the CDFW 2019 report

shows the foothill yellow-legged frog occurring in the most northern and easterly parts of Shasta Count and eastern Tehama County. Unlike the CRLF, the foothill yellow-legged frog prefers to stay close to its water source, typically within 10 feet (CDFW 2019). The foothill yellow-legged frog migrates from its overwintering sites to breeding habitats in the spring.

TS05 and TS06 are the most easterly trenching sites and closest to the known geographic range of the foothill yellow-legged frog. The likelihood of the foothill yellow-legged frog being present in the trenching site prior to trenching is low, as trenching sites have been chosen to avoid wetlands, stream channels, and other moist areas that the foothill yellow-legged frog prefers.

Analysis of Northwest Forest Plan Survey and Managed species ranges and impacts is documented in Appendix C.

Impacts to Non-special Status Species

Bird species possibly present in the Project Action Area, such as various woodpeckers, flycatchers, sparrows, warblers, towhees, and others, in addition to other species such as deer and wild turkeys, may be temporarily impacted by noise from the excavator during trenching. The noise disturbance would last one to two days per trenching site and be minimal. If oak trees need to be removed in order to conduct trenching, there could be an impact to any bird species using the tree as habitat. As described above in Impacts to Vegetation, Reclamation has committed to minimizing the necessary removal of oak trees by selecting trenching sites with the fewest number of affected trees. In addition. if trees are to be removed, Reclamation will conduct a biological survey for nests in advance of removal.

The trenching action will displace soil and groundcover deer, wild turkeys, and other birds may use for foraging. These areas may also be used as habitat by various rodents. Any soils displaced as part of the excavation will be returned to pre-Proposed Action status at the end of the project, causing a temporary loss of potential foraging area for up to 4 months per trench. Any rodents present within the soils at the time of excavation would be displaced. Escape ramps will be provided to prevent the entrapment of wildlife. Trenches and holes will be inspected for entrapped wildlife before being filled. Any entrapped animals will be allowed to escape voluntarily before activities resume, or they may be removed by qualified personnel, with an appropriate handling permit if necessary.

Section 3.4 Land and Soil Resources

Section 3.4.1 Affected Environment

The purpose of the Proposed Action is to study geologic seismic faults within the Keswick, Shasta, Whiskeytown areas; therefore, the proposed trenching activities are located on geologic seismic fault lines. These fault lines include the Dry Creek fault, South Cow Fault, Bear Creek Fault, Battle Creek fault, and Red Bluff fault (Figure 1). Collectively Reclamation refers to the faults as the Northern Central Valley fault system. Reclamation's geologic study of the faults would include photo

documentation, soil and lithologic analyses, stratigraphic study, and sampling.

The affected area includes the physical dimensions of the trench as well as the area that will be used around each trench to stockpile soil. For each TS# Reclamation has provided a map in Appendix A showing the following areas of interest:

- Blue Box: Maximum area suitable for trenching. The trench would be excavated within this area. The trench will not be the total size of the white box, but will be located within.
- Yellow Box: Approximate dimensions of an excavated trench area. The location of this box may move within the confines of the white box depending on site conditions.
- Green Box: Disturbed area surrounding the excavated trench. This area is where the backhoe would operate while digging and where excavated material would be temporarily collected and stockpiled.

Table 7 summarizes the acreage affected at each trenching site (Appendix A, Green Boxes). Note that Reclamation will not be trenching at every trenching site, as only 8 trenches will be excavated.

Table 7. Trenching Site Acreage

Trenching Site	Affected Area (acre)	Land Owner
TS01	0.26	Western Area Power Administration
TS02.1	0.37	Southern Pacific Railroad and Bureau of Land Management
TS04	0.21	Private Owner
TS05	0.44	Private Owner
TS06	0.74	Private Owner
TS07	0.56	Private Owner
TS08	0.31	Private Owner
TS09	0.51	Private Owner
TS10	0.63	Private Owner
TS11	0.69	Private Owner
TS13	0.26	Bureau of Land Management
TS13.2	0.34	Bureau of Land Management
TS15	0.49	Bureau of Land Management
TS15.2	0.60	Bureau of Land Management

WAPA administers lands along the Sacramento River between Shasta Dam and Keswick Dam, including the land in and around TS01.

BLM's Redding Field Office administers lands along the Sacramento River, including lands between Keswick Dam and the City of Redding, as part of the 23,000 acre Interlakes Special Recreation Management Area. TS02.1 is located within this area.

The 1993 Redding Resource Management Plan and ROD (BLM 1993) include a discussion of the general condition of natural and cultural resources within the RMP area and describes a proposed

management direction for BLM-administered lands within the Redding Resources Area, totaling approximately 250,000 acres of land within north-central California. The 1993 Redding RMP states that "Land use authorizations (rights-of-way, leases, permits) will continue to be issued on a case-by-case basis and in accordance with decisions established in [the] RMP." The Interlakes Special Recreation Management Area is part of this managed area. No specific guidance for the Interlakes Special Recreation Management Area precludes issuance of the land use authorization.

TS13, TS13.2, TS15, and TS15.2 are located within BLM lands administered by the BLM Redding Field Office. These lands were also included under the 1993 Redding RMP, specifically under the Sacramento River Management Area. No specific guidance from the 1993 Redding RMP precludes issuance of the land use authorization. BLM's Redding Office refers to this area under the Sacramento River Bend Area, and provides public access to BLM lands located near the Coleman Fish Hatchery adjacent to Battle Creek.

The approximate size of each trench would be a maximum of 65-feet wide, 262-feet long, and up to a depth of 10-feet, for a maximum total displaced volume of 3,150 cubic yards at an average depth of 5 feet due to the benching process. Across 8 trenching sites, this is a maximum total of 25,200 cubic yards of displaced soil.

The soil types vary across the trenching sites from flat, sandy loams to steep, stony loams (USDA 2019). It is unlikely for trenching to occur in any steep areas due to access for the excavator and concerns of erosion in the area.

Table 5. Trenching Site Soils

Trenching Site	Soil(s)	Description
TS01	GdD	Goulding very stony loam, 10 to 30% slopes
TS02.1	GbD	Gaviota very rocky sandy loam, 0 to 30% slopes
	NeD	Newtown gravelly loam, 15 to 30% slopes
	PoB	Perkins gravelly loam, moderately steep, 3 to 8% slopes
TS04	GbD	Gaviota very rocky sandy loam, 0 to 30% slopes
TS05	SuD	Supan very stony loam, 0 to 30% slopes
TS06	SuD	Supan very stony loam, 0 to 30% slopes
TS07	ThA	Tuscan cobbly loam, 0 to 3% slopes
	ThB	Tuscan cobbly loam, 3 to 8% slopes
TS08	HhA	Honn gravelly sandy loam, 0 to 3% slopes
	NfE2	Newtown stony loam, 8 to 50% slopes, eroded
TS09	KdB	Keefers gravelly loam, 3 to 8% slopes
	StD	Supan gravelly loam, 15 to 30% slopes
	ThA	Tuscan cobbly loam, 0 to 3% slopes
TS10	KdA	Keefers gravelly loam, 0 to 3% slopes
	KdB	Keefers gravelly loam, 3 to 8% slopes
	StD	Supan gravelly loam, 15 to 30% slopes
TS11	KdA	Keefers gravelly loam, 0 to 3% slopes
	StD	Supan gravelly loam, 15 to 30% slopes

	StE ThA	Supan gravelly loam, 30 to 50% slopes Tuscan cobbly loam, 0 to 3% slopes
TS13	KdA	Keefers gravelly loam, 0 to 3% slopes
TS13.2	KdA	Keefers gravelly loam, 0 to 3% slopes
TS15	IdE	Inks very stone loam, 30 to 50% slopes
TS15.2	IdE ThB	Inks very stone loam, 30 to 50% slopes Tuscan cobbly loam, 3 to 8% slopes

Section 3.4.2 Environmental Consequences

No Action
Under the No Action Alternative there would be no impacts to soils within the Project Action Area. Reclamation would not gain a better understanding of the seismic history of the area and would continue its operations in the nearby geographic area without this knowledge.

Proposed Alternative
Trenching would directly impact up to 4.29 acres of land and a minimum of 2.75 acres of land, dependent upon which eight trenching sites listed in Table 5 are suitable for trenching. Trenching includes potential soil compaction from the movement of vehicles and the excavator, as well as soil disturbance from excavation and stockpiling. Increased erosion during rain events could occur, especially in areas with steeper slopes. Steeply sloped areas are generally unsuitable for trenching, however, and trenching sites will be chosen in part for their level slopes. Erosion will be avoided and minimized with the implementation of environmental commitments listed in Section 5.

Trenching on BLM-administered lands will temporarily restrict public access to the land being trenched and the immediate surrounding area. The restriction would be temporary, lasting up to four months per trench as Reclamation conducts its seismic investigations. The restrictions would not prevent the public from accessing important features nearby the trenching sites, such as access to the Sacramento River near Keswick Dam or access to Battle Creek near the Coleman Fish Hatchery, as the trenching sites are set back from these aquatic features in order to have no impact to waters of the U.S.

Section 3.5 Cultural Resources

Cultural resources is a broad term that includes prehistoric, historic, architectural, and traditional cultural properties. Title 54 U.S.C. 300101 et seq., formerly and commonly known as the National Historic Preservation Act (NHPA) is the primary legislation for Federal historic preservation. Section 106 of the NHPA (54 U.S.C. 306108) requires Federal agencies to take into consideration the effects of their undertakings on historic properties and to afford the Advisory Council on Historic Preservation an opportunity to comment.

Historic properties are those cultural resources that are listed on or eligible for inclusion in the National Register of Historic Places (National Register). The implementing regulations at 36 CFR § 800 for Section 106 describe the process that the Federal agency takes to identify historic properties within the

area of potential effects and to assess the effects that the proposed undertaking will have on those historic properties, through consultations with the State Historic Preservation Officer (SHPO), Indian Tribes, and other identified consulting and interested parties.

Reclamation is proposing to authorize its geologists to perform trenching as part of fault line mapping studies in southern Shasta and northern Tehama Counties. For portions of the proposed project, WAPA and BLM are underlying landowners. The funding, permitting, and implementation of the project constitutes an undertaking that requires compliance with Title 54 U.S.C. § 306108, commonly known as Section 106 of the NHPA, and its implementing regulations found at 36 CFR Part 800. BLM and WAPA have designated Reclamation as Lead Federal Agency for the Section 106 process pursuant to 36 CFR § 800.2(a)(2).

Cultural environmental commitments will include a cultural monitor during active trenching at TS13 and TS13.2.

Section 3.5.1 Affected Environment

The area of potential effect (APE) is comprised of 11 discontiguous locations and includes all ground disturbing activities defined above. Each trenching location is larger than the actual proposed trenches to afford on-the-ground adjustments of the trench locations as well as to accommodate peripheral disturbances including spoils placement, backhoe maneuvering, and off-road travel.

The discontiguous APE locations range in area from 3.6 to 57 acres for a cumulative total of 232 acres. The vertical APE will have a maximum depth of approximately 10 feet to account for the trench depth. The remaining vertical APE will be up to one foot to account for backhoe travel disturbances. The legal description for the project location is Sections 14, and 21, T. 32 N., R. 5 W., Sections 5, 6, and 7, T. 32 N., R. 4 W., Sections 10, 14, and 15, T. 32 N., R. 3 W., Section 16, T. 32 N., R. 1 W., Sections 9, and 10, T. 30 N., R. 3 W., Section 31, T. 30 N., R. 2 W., Section 6, T. 29 N., R. 2 W., Section 21, T. 29 N., R. 4 W., Mount Diablo Base and Meridian, as depicted on the Shasta Dam, Redding, Project City, Bella Vista, Whitmore, Inwood, Balls Ferry, and Hooker U.S. Geological Survey 7.5’ topographic quadrangles.

In an effort to identify cultural resources in the APE, Reclamation conducted a cultural resources inventory, which included a records search at the California Historic Information Services, a review of archival information, and a pedestrian survey of the APE .

In addition, pursuant to the regulations at 36 CFR § 800.3(f)(2), Reclamation initiated consultation with the Estom Yumeka Maidu Tribe of the Enterprise Rancheria, Greenville Rancheria of Maidu Indians, Mechoopda Indian Tribe, Paskenta Band of Nomlaki Indians, Pit River Tribe of California, Quartz Valley Indian Community, and Redding Rancheria were identified as tribes who might attach religious and cultural significance to historic properties within the APE. Reclamation sent a letter to each of these tribes on April 30, 2021, to invite their participation in the Section 106 process pursuant to 36 CFR § 800.4(a)(4). Reclamation also sent letters to Nor-Rel-Muk Wintu Nation, Shasta Indian Nation, The Shasta Nation, Inc., Winnemem Wintu Tribe, and the Wintu Tribe of Northern California who were identified as Native American individuals or organizations likely to have knowledge or concerns with cultural resources in the area, requesting assistance in identifying historic properties which may be affected by the proposed undertaking pursuant to 36 CFR § 800.4(a)(3).

Through the above efforts two potential historic properties were identified within the APE. These resources are P 45 002461, a prehistoric lithic scatter, and P-45-001447 (CA-SHA-001447H), also known as the Sacramento River Road. The lithic scatter is recorded as six pieces of debitage over a 25-meter-diameter area. Due to the sparse and ephemeral nature of the site it was not relocated during this current survey. To avoid any potential impacts to the site, Reclamation applied a 15-meter buffer to the site boundary, as recorded, and removed that area from the APE. P-45-001447 is currently an actively used dirt road that intersects a corner of one of the study areas and is the proposed ingress/egress route for that location. This site is believed to have been the route of a wagon road from the 1850s to the 1880s. Aside from its current status and condition as a dirt road, there is no other physical expression of the site (i.e., artifacts, landscape modifications, wagon wheel ruts, etc.) within the APE. This resource has never been evaluated for inclusion on the National Register of Historic Places (National Register) and given that only a small segment of the road intersects a corner of the current APE, it is beyond the scope and scale of this project to fully evaluate the resource. For the purposes of this undertaking only, this resource was treated as eligible for the National Register under Criterion A, for its association with the goldrush era and the western migration's contribution to the development of California.

Pursuant to 36 CFR § 800.5(a)(1), Reclamation applied the criteria of adverse effects for the proposed undertaking and has found that it will result in no adverse effects to historic properties pursuant to 36 CFR § 800.5(b). None of the proposed activities will adversely affect the characteristics that qualify the resource as potentially eligible for the National Register under Criterion A. As the project's intended use of the resource is consistent with how it is actively used (as a dirt road) with no modifications, the project will not affect the character-defining features; the ability to convey significance; or the integrity of location, design, setting, materials, workmanship, feeling, and association that contribute to the potential National Register eligibility of the historic property.

Pursuant to 36 CFR § 800, Reclamation as lead federal agency for Section 106 of the NHPA, initiated consultation with the California State Historic Preservation Officer (SHPO) by letter dated July 1, 2021 requesting concurrence with a finding of no adverse effect. Pursuant to the regulations at 36 CFR §800.5(c), SHPO has 30 days from receipt to review an agency finding. The SHPO has yet to respond to Reclamation's finding of effect. If after 30 days the SHPO has not responded, the regulations state that "…the agency official shall then carry out the undertaking in accordance with paragraph (d)(1) of this section" [§800.5(c)(1)]. Because the SHPO has failed to comment on Reclamation's finding within the period of time provided to them pursuant to the Section 106 regulations, Reclamation moved on to the next step and completed the Section 106 process.

The proposed action would have no significant impacts on properties listed, or eligible for listing, on the National Register of Historic Places.

Section 3.6 Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in assets that are held in trust by the United States for federally recognized Indian tribes or individuals. Reclamation performed a search for all ITAs located nearest to each of the potential 15 trenching sites on May 19, 2021.

The closest ITAs to any of the potential 15 trenching sites are public land allotments (parcels of land or

real estate holding that may or may not be affiliated with a particular tribe or is in the process of being recorded). These public land allotments are located approximately 1.5 – 9 miles from the potential trenching sites.

Based on the nature of the planned work it does not appear to be in an area that will impact Indian hunting or fishing resources or water rights, nor is the proposed activity on actual Indian lands. It is reasonable to assume that the proposed action will not have any impacts on ITAs.

Section 4 Consultation and Coordination

Reclamation mailed certified letters on June 30, 2021, to landowners adjacent to TS02.1 due to the proximity of this trenching site to private housing. Landowners were provided with the approximate dates of trenching, the purpose of Reclamation's study, and the estimated duration of having the trenches open.

WAPA is a cooperating agency for this EA and will issue a letter of concurrence and permit for conducting trenching at TS01. WAPA administered lands include the land in and surrounding TS01. Reclamation has coordinated with WAPA in the development of this EA.

BLM is a cooperating agency for this EA. BLM-administered lands include the lands for TS02.1, TS13, TS13.2, TS15, and TS15.2. Reclamation has coordinated with BLM in the production of this EA. BLM and Reclamation conducted a joint site-visit to BLM-owned properties on June 16, 2021.

In order for Reclamation to conduct trenching on BLM lands, Reclamation will require an LUP from BLM. The LUP will be issued after completion of the NEPA process and is required prior to the start of any trenching on BLM-administered lands.

Reclamation coordinated with the Shasta Land Trust for TS09, TS10, and TS11, which are located on a Conservation Easement. Reclamation conducted a site-visit with the Shasta Land Trust on July 2, 2021, and coordinated the proposed placement of trenches to minimize impacts to visual and biological resources.

Reclamation has prepared a Biological Assessment (BA) for this action. Reclamation submitted the BA to USFWS on May 7, 2021, requesting concurrence with Reclamation's assessment that this action may affect, but is not likely to adversely affect the VELB, CRLF, and cuckoo. Reclamation completed informal consultation with the USFWS and received a letter of concurrence on June 7, 2021. The letter of concurrence includes several species-specific mitigation measures that were included within the BA. These mitigation measures are listed within Section 5 – Environmental Commitments of this EA. BLM and WAPA reviewed the BA and determined it adequately covers BLM's and WAPA's area of responsibility for Endangered Species Act compliance and therefore did not pursue separate consultation for this project.

Section 5 Environmental Commitments

As part of the Proposed Action, Reclamation would implement the following environmental commitments to avoid and minimize potential environmental impacts associated with implementing the Proposed Action. Many of these environmental commitments are consistent with the conservation measures included in the BA submitted to USFWS associated with this federal action.

Table 5. Environmental Commitments

Resource	Number	Environmental Commitment
Air Quality	AQ-1	Operate excavator at a maximum 8 hours per day in order to emit emissions that are de minimis and exempt from the General Conformity Regulation and in compliance with the SCAQMD and TCAPCD.
Biological Resources	BIO-1	A qualified biologist will conduct environmental awareness training for all individuals conducting field work before work begins. A qualified biologist is defined as someone with training, knowledge, or experience with the species this document is concerned with. The education program will cover the life history, habitat requirements, and conservation measures for VELB, CRLF, and Cuckoo. The training will also include information on federal and state regulatory protections, restrictions, and guidelines that must be followed by crews to avoid and minimize impacts to threatened and endangered species and their habitat. The training will include the definition of “take”, potential penalties for violating environmental regulations, the benefits of compliance, and required reporting for sightings of potential listed species. Upon completion of training, crews will sign a form stating that they attended the training and understand all conservation measures. If new personnel are added to the project, the new personnel shall receive the training prior to starting work.
Biological Resources	BIO-2	All project personnel will have stop work authority in the event VELB, CRLF, or cuckoo are identified within the action area. Upon stop work, a qualified biologist will be summoned to identify the species. If a VELB, CRLF, or cuckoo is identified within the action area it will be allowed to leave the action area under its own volition. The occurrence will be reported to USFWS within 1 business day. If the species does not leave the action area of its own volition, work that could result in take will not occur until the USFWS and Reclamation have made a determination on how to proceed.
Biological Resources	BIO-3	Prior to the state of any on-the-ground activities at all trenching sites, Reclamation will perform a survey for vernal pools, wetlands, intermittent streams, and any other waters of the U.S. within 300 feet of the preferred trenching area. If any features are identified, no excavation or placement of fill material will occur within these areas. In addition, Reclamation will observe the following setbacks for all trenching sites and storage of fill material: 250 feet from vernal pools and 50 feet from any other wetland or intermittent stream.
Biological Resources	BIO-4	Prior to the start of any on-the-ground activities at TS09, TS11, TS13, TS15, and TS16, the action area and a minimum 200-foot buffer will be surveyed by a qualified biologist for elderberry shrubs and exit holes on the shrubs. If any elderberry shrubs are found the locations will be marked and remain undisturbed during the duration of the site visit. Trenching sites will be located a minimum of 200 feet from any elderberry shrubs.

Biological Resources	BIO-5	Reclamation will conduct pre-construction non-breeding surveys for CRLF at TS01, TS04, TS05, TS06, TS13 TS15, and TS16 following the protocol for non-breeding presence/absence surveys based on the Revised Guidance on Site Assessment and Field Surveys for the California Red-legged Frog (USFWS 2005). Non-breeding presence/absence surveys require 1 day and 1 night survey taken at least 7 days apart. If a CRLF is identified within the action area during the pre-construction non-breeding surveys, Reclamation will: - Notify USFWS within 3 business days of the occurrence. - Require a USFWS-approved biologist to be present during excavations occurring within 0.5 miles of the occurrence. - During and within 24 hours of a rain event (defined as 0.25" of rain or greater within a 24 hour period), no work will be performed on-site for the following 24 hours. A qualified biologist will inspect any pending and open trenching sites prior to beginning excavations or the day's geologic work for the presence of CRLF. - If at any time a CRLF is identified within the action area after pre-construction surveys, Reclamation will notify USFWS within 1 business day.
Biological Resources	BIO-6	Trenching in TS09, TS10, TS11, TS13, and TS15 will be restricted to September through December 2021 in order to avoid potential impacts to the cuckoo. No trenching activity, defined as the movement and use of excavator or other soil-moving equipment, will be performed outside of this time period. Reclamation personnel and geologists may still access the site outside of these months by foot to perform ground-surveys for VELB and CRLF, as described above, or to ground-truth the potential trenching location.
Biological Resources	BIO-7	Trenching will stop if groundwater is encountered. No dewatering will be performed within the excavated trench.
Biological Resources	BIO-8	When handling or storing chemicals (fuel, hydraulic fluid, etc.) necessary for equipment, applicable Best Management Practices will be followed to prevent spills and contamination. Appropriate materials will be stored and accessible on-site to prevent and manage spills. Reclamation will follow all procedures required within its Stormwater Pollution Prevention Plan. Refueling will be located at least 50 feet from any identified water or wetland feature, and will be performed on level-grade areas.
Biological Resources	BIO-9	Excavation and access to the trenching sites will be restricted to daylight hours, defined as one-half hour before sunrise and one-half hour after sunset.
Biological Resources & Geology and Soils	BIO-10	Vehicle access to the sites will be restricted to existing access roads and trails, where available.
Biological Resources	BIO-11	All food-related trash items, such as wrappers, cans, bottles, and food scraps, shall be removed daily from the project site.
Biological Resources	BIO-11	No pets will be permitted in the action area.
Biological Resources	BIO-12	Select final trenching locations on-site in order to minimize impacts to woody vegetation, avoiding tree removal whenever feasible. Nest surveys will be conducted in advance of any tree removals.

Biological Resources	BIO-13	In order to prevent the spread of invasive species, a qualified biologist will assess each trenching site prior to trenching for non-native invasive species. If the invasive species are uncommon for the area, the species will be marked for avoidance by equipment and personnel. In addition, machinery will be cleaned of plant parts and soil between locations to prevent the spread of non-native invasive species between trenching sites.
Biological Resources	BIO-14	After refilling each trench, trenches will be re-seeded using a BLM-approved native species plant mix.
Cultural Resources	CLT-1	A qualified cultural monitor will be present during the trenching excavations of TS13 and TS13.2.
Geology and Soils	GEO-1	Obtain and follow permit requirements outlined within the NPDES Construction General Permit, including but not limited to following Best Management Practices for storm-water management, erosion control, and sediment control.
Geology and Soils	GEO-2	Develop and follow BMPs within a Stormwater Pollution Prevention Plan.
Geology and Soils	GEO-3	Obtain and follow permit requirements outlined within the BLM Land Use Permit.

Reclamation would obtain all applicable federal, state, and local permits and authorizations required to implement the Proposed Action. Reclamation would ensure compliance with all of the conditions included in those permits and authorizations. Where appropriate, permit and authorization conditions will be incorporated into contract requirements and specifications. These permits and authorizations may include, but would not be limited to:

- Endangered Species Act as emended in 1973, Letter of Concurrence and its associated Conservation Measures
- National Pollution Discharge Elimination System Construction General Permit and its associated Storm Water Pollution Prevention Plan
- Bureau of Land Management Land Use Permit

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