



**REQUEST FOR PROPOSAL
FOR
CITY OF ROSEVILLE
SECRET RAVINE FISH PASSAGE
IMPROVEMENT PROJECT**

CITY OF ROSEVILLE
ENVIRONMENTAL UTILITIES DEPARTMENT
ENGINEERING DIVISION
August 1, 2011

I - INTRODUCTION

The City of Roseville (City) is seeking bids from qualified contractors to assist staff in the improvement of fish passage in Secret Ravine. A barrier including a foot bridge, its supporting structures, a concrete apron and several abandoned utility pipes, will be removed by the City. The Contractor will be responsible for the installation and maintenance of temporary best management practices and controls prior to the demolition of the barrier as well as remediation of the creek afterwards. Work includes installation of temporary fencing and stormwater best management practices, stream dewatering and fish relocation, surveying, clearing and grubbing, grading, stripping and grading, fill, in-stream installation of rock and log structures, and seeding and planting. The successful bidder will be required to mobilize and demobilize all necessary materials and equipment.

II - BACKGROUND

The City of Roseville in conjunction with Dry Creek Conservancy proposes to improve fish passage in Secret Ravine in western Placer County, California. Secret Ravine is a perennial stream that supports spawning, seasonal rearing and migration of steelhead, and spawning, juvenile rearing and emigration of Chinook salmon. An abandoned bridge and utility crossing on Secret Ravine presents a migration obstacle to all species of salmonids. The Secret Ravine Fish Passage Improvement Project proposes to remove the abandoned bridge and utility lines, and modify the channel bed to improve fish passage under all expected flow conditions. The total area of construction related activities is approximately 19,880 square feet and project reach is approximately 250 linear feet of Secret Ravine. The site is located immediately east of the entrance to Sunsplash Waterpark at 1893 Taylor Road, Roseville, CA (Longitude 121°15' 23.142" west and Latitude 38° 45' 36.758" north).

Secret Ravine splits in two at the project site forming an east and west channel. A well-vegetated island separates the two channels. Approximately 75 feet downstream of the flow split, the east channel crosses under a bridge. The bridge is constructed of steel I-beams with wooden decking and an asphalt surface. On the downstream end of the bridge crossing, the channel spills on to a sloping concrete apron which was presumably installed to protect the abandoned water utility lines that currently bisect the project site. These structures (the bridge, abutments, concrete apron, and abandoned utility pipes) will be removed by the City's Environmental Utilities Department staff. Prior to commencement of the demolition work, the selected Restoration Contractor will install the temporary controls and best management practices, dewater the channels and relocate any stranded fish. City crews will plate the dirt entrance off of N. Sunrise as well as the bike path to accommodate access and egress of heavy equipment. This plating will remain in place the entire duration of construction. The City will also fill in the large depression immediately adjacent to the bridge to allow heavy equipment to move across. Once the structures are removed, the portion of the east channel directly upstream of the bridge crossing will be lowered approximately 1 to 3 feet to ensure that this is the low flow channel. Portions of the stream banks adjacent to the bridge abutments will be graded to improve floodplain function. Large woody structures will be placed in the channel to protect streambanks, provide habitat and induce scour. Large boulders will be placed in the upstream end of the west channel to control grade and ensure that the east channel is the preferred low flow path. At high flows, both channels will be active. Large woody structures will be placed along the west channel as well to provide habitat and prevent bank erosion. The portion of the bridge spanning the west channel will also be removed, but the concrete abutment on the right bank will remain in place to reduce the possibility of bank erosion under the existing retaining

wall. The 16-inch diameter steel and the concrete encased pipe will remain in place in the west channel to control grade. When this project is complete, the east channel is expected to accommodate passage of all species of salmonids at all flows. Low flow barriers will remain in the west channel.

III - SCOPE OF WORK

The contractor selected for this project will be required to provide equipment, materials, labor and expertise to perform the work listed below in accordance with technical specifications attached and the conditions of permits and agreements listed in *Additional Information* below.

1. Mobilization and demobilization to and from the site.
2. Installation and maintenance of temporary fencing and best management practices.
3. Dewatering of the creek including fish relocation in accordance with Appendix B of the Biological Assessment dated February 2009, and removal of the dewatering system.
4. Surveying of the site for grading.
5. Clearing and grubbing of the site.
6. Grading the east creek bed and bank, and the west channel bank.
7. Installation of log structures and sill as well as boulders in the stream.
8. Installation of erosion and sediment control best management practices.
9. Installation of native seed and relocation of the native willow trees.
10. Maintain the minimum insurance requirement as listed in Attachment 1 of the Request for Proposal.
11. Provide traffic control in accordance with the 2006 Manual on Uniform Traffic Control Devices at the site as necessary.

Additional resources deemed necessary by the consulting firm to complete this work should also be listed in the bid and shall be clearly identified as additional items.

Proposal Format

1.1 Vendor Required Information

- **Cover Letter** – The proposal must include an introductory letter attesting to the accuracy of the proposal, signed by an individual authorized to execute binding legal documents on behalf of the vendor. The letter should present the vendor's understanding of the equipment and services requested in the RFP, a summary of the approach to be taken in performing the services, highlights of the vendor's expertise and history, as well as any previous work with the City of Roseville.
- **Contact Person** – Provide a contact person for the RFP process, including name, title, mailing address, telephone number, fax number and e-mail address.

- **General Information** – List the vendor name, address, fax number, phone number, e-mail and the name and title of the authorized negotiator.
- **Company Description**, including the following:
 - o Brief Company History
 - o List the address and telephone number of every officer that will be serving this account.
 - o List the name and address of any subcontractors that will be utilized on this account and state which services they will provide.
- **References** – The proposal must include a minimum of three accounts that are of a similar size and scope to the City of Roseville. The list must include each reference's name, address, contact person, length of the relationship and a description of the services provided.
- **Contract Consideration / Litigation Warranty** – The City of Roseville will negotiate a contract with the successful vendor. The vendor, by proposing, warrants that it is not currently involved in litigation or arbitration concerning the materials or vendor's performance in supplying the same or similar services, unless such fact is disclosed in the proposal. Disclosure will not automatically disqualify the vendor. The City of Roseville reserves the right to evaluate the proposal with consideration for any litigation or arbitration by the vendor.
- **Subcontractors** – If subcontractors will be used to administer any portion of the services, then identify the name and address of the subcontractor, as well as the services they will provide.
- **Cost Proposal(s)** - Delineate all the costs both hourly and stand-by for the staff and resources listed above. The cost breakdown should be in a clear format that specifies the hourly rate for each job title, response equipment and clean-up materials. Specify any call-out minimums in terms of both hours and total cost.

Additional Information

To assist respondents in their bid proposals, the following information is available for review on the City's website at www.roseville.ca.us or the Environmental Utilities Department office located at 2005 Hilltop Circle in Roseville:

- Sample City Service Agreement
- Technical Specifications for Secret Ravine Fish Passage Improvement Plan, 100% Submittal, July 8, 2011
- Biological Assessment: Secret Ravine Fish Passage Improvement Project *Swanson Hydrology and Geomorphology*, February, 2009
- Final Lake or Streambed Alteration Agreement Notification No. 1600-20009-0075-R2
- Clean Water Act 401 Technically Conditioned Water Quality Certification for Discharge of Dredged and/or Fill Material for Secret Ravine Fish Improvement Project (Wdid#5A31CR00266) Placer County
- U.S Army Corps of Engineers 404 Permit Identification # SPK-2099-00416
- Engineer's Estimate of Probable Construction Costs

Questions regarding this project must be received in writing prior to Wednesday, August 10th (fax and e-mail are acceptable). Efforts will be taken to share questions and responses to all interested firms. Please send inquiries to:

City of Roseville
Environmental Utilities Department
2005 Hilltop Circle
Roseville, CA 95747
Attn.: Delyn Ellison-Lloyd,
Senior Civil Engineer
916-746-1748
FAX: 916-746-1750
E-Mail: dellison-lloyd@roseville.ca.us

This contract is contingent on the award of a Proposition 84 Grant from the State of California Department of Water Resource.

VI - SELECTION OF CONSULTANT

The bids will be rated as follows:

- | | |
|--|-----|
| ◆ Cost of staff, equipment and materials: | 20% |
| ◆ Ability of the contractor to perform the work in the allotted time: | 20% |
| ◆ Resources available to the contractor.: | 15% |
| ◆ Experience and qualifications of the contractor and its representatives. | 30% |
| ◆ Information obtained from references.: | 15% |

The firm submitting the most highly rated bids will be selected to enter in to a service agreement with the City for services for the project. In the event there are no successful bidders, staff reserves the right to re-issue this bid request and enter into negotiations with other firms.

VII - SUBMITTAL OF PROPOSALS

Please submit your written bids to (one original proposal and two copies of the proposal are required):

City of Roseville
Attn: Sonia Orozco, City Clerk
311 Vernon Street
Roseville, CA 95678

Re: Request for Proposal for Secret Ravine Fish Passage Improvement Project

The bidder is also directed to place the bid in the enclosed pre-labeled envelope, without alteration, so that the label is visible when delivered to the City.

The deadline for submittal is 4:00 PM on Wednesday, August 17, 2011.

Late submissions will not be accepted.

The City is not responsible for misdelivered bids, and the bidder is strictly liable for its chosen method of delivery. It is the bidder's sole responsibility to make sure that its bid arrives at the proper location. Any bid which does not actually arrive in the City Clerk's Office by the date and time indicated above will be rejected as non-responsive, even if properly addressed or delivered to another City Department.

VIII - PROPOSAL TERMS AND CONDITIONS

The City will not pay any costs incurred by the firm in preparing or submitting the proposal. The City reserves the right to modify or cancel, in part or in its entirety, this RFP. The City reserves the right to reject any or all proposals, to waive defects or informalities, and to offer to contract with any firm in response to any RFP. This RFP does not constitute any form of offer to contract.

VIII - GENERAL INFORMATION

The successful bidder will be awarded a service agreement (see sample) for the duration of this project (approx. August, 2011 through November, 2011) and must comply with all terms and conditions located on page 2 of the document. Alterations to the terms and conditions of that agreement will not be allowed. Pricing shall not vary through the term of that agreement. The successful bidder shall furnish a bond that secures the payment of the claims of laborers, mechanics or materialmen employed on the Work under the service agreement.

The vendor who is chosen to perform the work must provide the City of Roseville, and keep in full force and effect during the term of this contract, insurance certificates issued by an insurance company authorized to do business in California. (Insurance requirements listed below).

Insurance requirements:

The City of Roseville must be named as an additional insured, with regards to the general liability insurance, and must be issued (as a separate document) an Additional Insured Endorsement Form as follows:

Certificate holder:
City of Roseville
Attn: Risk Management
311 Vernon Street
Roseville, CA 95678

The successful bidder shall comply with Labor Code Sections 1770 et seq., General Prevailing Wage Rates. Pursuant to Labor Code Section 1773.2, General Prevailing Wage Rates shall be posted by the Contractor at a prominent place on the work site.

ATTACHMENT A

STANDARD INSURANCE REQUIREMENTS

The contractor shall provide at its' own expense and maintain at all times the following insurance with insurance companies licensed in the State of California:

COVERAGE	LIMITS OF LIABILITY
General Liability Coverage must include the City of Roseville, its officers, agents and employees as named additional insureds on an endorsement issued to the City. Coverage must be primary insurance as to the City of Roseville. Companies issuing such policies shall be liable up to the total amount of liability without right of contribution from the City of Roseville or its insurers.	Bodily Injury: • \$1,000,000 each occurrence • \$2,000,000 aggregate Property Damage: • \$1,000,000 each occurrence Personal Injury: • \$1,000,000 each occurrence • \$2,000,000 aggregate
Automobile Liability with: • Comprehensive • Owned • Hired • Non-owned Coverage must be primary insurance as to the City of Roseville. Companies issuing such policies shall be liable up to the total amount of liability without right of contribution from the City of Roseville or its insurers.	Bodily Injury: • \$300,000 each occurrence • \$500,000 aggregate Property Damage: • \$150,000 each occurrence
Workers' Compensation All States The Workers Compensation policy shall contain the insurer's waiver of subrogation in favor of the City, its officer, agents and employees.	Statutory
Professional Liability (Errors and Omissions)	\$1,000,000 each occurrence

The contractor shall submit a certificate evidencing such coverage in a form satisfactory to the City Attorney prior to submitting an agreement to Council for approval. Said certificate shall provide at least thirty (30) days written notice to the City prior to cancellation or modification of any insurance required for this project (10 day non-payment is OK). Any insurance written on a "claims made" basis is subject to approval of the City Attorney. Insurance coverage in the minimum amounts set forth shall not be construed to relieve the consultant of liability in excess of such coverage, nor shall it preclude the City from taking such other actions as are available to it under any other provisions of the law.



PURCHASING
CITY OF ROSEVILLE

2005 HILLTOP CIRCLE, ROSEVILLE, CA 95747
(916) 774-5720 • TDD (916) 774-5220 • FAX (916) 774-5736

SERVICE AGREEMENT

SERVICE AGREEMENT

No: _____

SERVICE LOCATION: _____

REQ. NO.: _____ DATE: _____

SUBMIT ALL INVOICES TO:
CITY OF ROSEVILLE
Finance Department
311 Vernon Street
Roseville, CA 95678

Contractor No.: _____
Telephone No.: _____

Fax: _____

Department: _____

Contractor: _____

Acct. Code: _____

Buyer: _____
Phone: _____

Start Date	Terms	Completion Date	Insurance Limits	Contact
			Approved by Risk Mgt.	

The contractor shall furnish all labor, equipment and materials necessary to accomplish the following:

SAMPLE

NOTE: Prevailing wage laws and fair employment practices apply to this agreement. Certified payroll documents must be submitted with your invoice(s) to the City's Accounts Payable office (see item 8 of the attached provisions).

Contractor License No.: _____

Total Cost of Service: _____

Business License No.: _____

\$ _____

ATTENTION: Total cost of service not to exceed the above amount without prior approval of the Purchasing Office.

The Contractor named hereon by the acceptance of this order agrees to the provisions on page 2 of this document titled "Service Agreement".

CITY OF ROSEVILLE,
A MUNICIPAL CORPORATION:

CONTRACTOR:

By: _____

By: _____

Title: _____

Ray Kerridge
City Manager

By: _____

Distribution: 1- Purchasing, 1 - Contractor, 1 - Originating Dept

Title: _____

1. Contractor shall hold harmless, defend and indemnify the City of Roseville and its officers, officials, employees and volunteers from and against all claims, damages, losses and expenses including attorney fees arising out of the work described herein, caused in whole or in part by any negligent act or omission of the contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts of any of them may be liable, except where caused by the active negligence, sole negligence, or willful misconduct of the City of Roseville.
2. Contractor is an independent contractor, and shall not be considered an officer, agent, or employee of City.
3. Without the written consent of the City, this Agreement is not assignable by Contractor either in whole or in part.
4. Time is of the essence of this Agreement.
5. At any time during the term of this Agreement, the City has the right to terminate this Agreement provided vendor is given a 30 day notice.
6. This Agreement may only be amended or modified in writing. It is integrated and contains the complete understanding of the parties.
7. All equipment, supplies and services sold to the City of Roseville shall conform to the general safety orders of the State of California.
8. Unless notified to the contrary, in writing, the City assumes that the Contractor has accepted the work in accordance with the plans and specifications (if any) and agrees to do the work in compliance with this Agreement.
9. All prevailing wages and fair employment practices will be adhered to. For prevailing wage contracts over \$25,000, copies of certified payroll must be submitted with invoices. Prevailing wage rates may be obtained from the State Department of Industrial Relations and/or the following website address: <http://www.dir.ca.gov/dlsr/DPreWageDetermination.htm>.
- 10a. Unless otherwise specified, the Contractor shall maintain the following policies of insurance in full force and effect during the term of this Agreement in the amount shown below. The City of Roseville retains sole discretion in determining the types and proper levels of insurance coverage.

Commercial General Liability Insurance (policy to be as broad as the standard ISO form)	\$1,000,000 per occur/ \$2,000,000 aggregate
Automobile Liability Insurance including owned, hired, and non-owned vehicles.	\$500,000 per person/ \$1,000,000 per accident
Workers' Compensation	Statutory

- 10b. All insurance coverages of Contractor are primary insurance as to City. City shall not be required to contribute to any loss through its insurance policies and/or self-insured programs.
- 10c. The limits of insurance coverages specified above in no way limit the liability of Contractor for full payment and resolution of any claim resulting from Contractor's performance of services under this Agreement.
- 10d. A certificate of insurance, in a form approved by the Risk Management Division, shall be provided by Contractor prior to the execution of this agreement. The City requires at least 30 days prior written notice to the City of any material change or cancellation (10 day for non-payment). The certificate shall include an endorsement naming the City of Roseville, its officers, agents, employees and volunteers as an Additional Insured for on-going and completed operations. In addition, the insurance policy may not contain language which prohibits additional insureds or other insurers from satisfying the self-insured retention or deductible.
- 10e. The Workers' Compensation policy shall contain the insurer's waiver of subrogation in favor of the City, its officers, agents and employees.
11. Contractor shall comply with all federal, state and local laws and ordinances, including but not limited to the City's storm water regulations, as may be applicable to the performance of services under this agreement. Failure to comply with local ordinances may result in monetary fines and cancellation of this agreement. Refer to www.roseville.ca.us/stormwater for links to more information on the City's storm water regulations.
12. In the event that the terms of any attachment or exhibit conflict with any terms of this Service Agreement, the terms of this Service Agreement shall control.

City reserves the right to withhold any payments to Contractor in the event of noncompliance with insurance requirements.

Technical Specifications

For

Secret Ravine Fish Passage Improvement Plan

**Prepared for
City of Roseville, Open Space Division**

100% Submittal

July 8, 2011



**FOR USE IN CONNECTION WITH
STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION STANDARD
SPECIFICATIONS, CURRENT EDITION**

**City of Roseville, Open Space Division
Secret Ravine Fish Passage Improvement Plan
Technical Specifications
100% Submittal**

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SECTION 01500
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS
(a.k.a. Mobilization)

1. GENERAL

1.1 Description

- A. The work covered by this section consists of the construction facilities and temporary controls, including mobilization and demobilization, as specified herein, as shown on the Drawings, or as otherwise directed by the Engineer. Work includes traffic control, temporary fencing – type ESA, silt fencing, and erosion control items not specifically addressed under other pay items.
- B. Mobilization shall consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the site; for the establishment of all offices, and other facilities necessary for work on the project; and for all other work and operations which must be performed, or costs incurred prior to beginning work, on the various items on the project site.
- C. Demobilization shall consist of work and operations necessary to disband all mobilized items and cleanup the site. The removal of all temporary crossings, ramps, access ways, roads, signs, and fencing; dewatering facilities; and temporary facilities or works, and the restoration of surfaces to an equal or better than existing condition shall also be included as part of demobilization.

1.2 Related Sections

- 1. ***Temporary Fence – Type ESA***, Section 01560
- 2. ***Silt Fence***, Section 02378

1.3 References

- A. California Regional Water Quality Control Board Central Valley Region, “Clean Water Act Section 401 Technically Conditioned Water Quality Certification for Discharge of Dredged and/or Fill Materials for the Secret Ravine Fish Passage Improvement Project (WDID#5A31CR00266) Placer County”, dated April 22, 2011.

2. PRODUCTS – Not Used

3. EXECUTION

3.1 Contractor’s Plant and Equipment

- A. Security. Contractor shall, at all times, be responsible for security of their plant and equipment. Owner shall not be responsible for missing or damaged equipment, tools, or personal belongings.

- B. Construction Power and Communication Facilities. Contractor shall be responsible for providing sufficient electrical power and communication facilities to construct the work.
- C. Storage Facilities.
 - 1. Provide storage facilities for the protection of materials and supplies from weather, and shall keep the facilities clean and in proper order at all times.
 - 2. Provide a storage area for lubricants, oils, and hazardous materials with sufficient means to contain spills. Facilities, handling, and any required cleanup will comply with all current local, state, and federal standards. Petroleum products stored on the site shall be secured from vandalism.
- D. Sanitary Facilities. Maintain adequate toilet facilities at or near the work site.
- E. Solid Waste Handling. Provide sufficient solid waste handling facilities to maintain site in a clean, orderly condition.

3.2 Mobilization and Demobilization

- A. General. Perform mobilization and demobilization activities in accordance with Drawings, and as specified.

3.3 Project Signs

- A. General. Erect project, safety and hard hat signs at each work site within five (5) days after commencement of work at that site.

3.4 Excavation

- A. The Contractor, and any subcontractor, is required to notify U.S.A. forty-eight hours in advance of performing excavation work, by calling the toll free number (800) 642-2444.

3.5 Protective Barriers

- A. Protective barriers shall be erected around sensitive areas as designated on the Drawings or as directed by the Engineer. Barriers shall be constructed using bright orange plastic safety fencing (type ESA). The limits will be flagged in the filed by the Engineer.
- B. Owner shall be instructed to remain out of flagged off areas.
- C. Temporary fencing shall be maintained during construction. Except as directed by the Engineer, barriers shall remain in place after completion of work.

3.6 Bulletin Board

Provide a bulletin board at the project site, or in a location approved by the Engineer. The bulletin board shall be easily accessible at all times and shall contain wage rates, equal opportunity notice, and other items required to be posted.

3.7 Staging Areas

- A. General. Staging areas at the project site are provided for the Contractor's use. By making this area available to the Contractor, the Engineer, and any other person or agency connected with the properties shall in no way be responsible or liable for any activity of the Contractor, subcontractors, or any individual or organization connected with the project.
- B. Alternative Staging Areas. Alternative sites must be acceptable to Owner, and the Contractor must make all arrangements for their use at the Contractor's expense, and in accordance with all local, State and Federal regulations.
- C. Additional Storage Areas. Should the Contractor require space in addition to that available on-site, the Contractor shall make arrangements for storage of materials and equipment in locations off the construction site, and shall provide the Engineer a copy of the letter of authorization for storage from the property owner.

3.8 Dust Control

- A. General. Before starting work on the project, the Contractor shall submit for acceptance by the Engineer, a Dust Suppression Plan. The Contractor shall be responsible for the control of dust within the limits of the project at all times. The Contractor shall take whatever steps are necessary to eliminate the nuisance of blowing dust. Responsibility for any damage to property, crops, or orchards from dust caused by the Contractor's operations shall be borne by the Contractor.
- B. Dust Control. Periodically, water or otherwise treat access roads and haul roads, as required to suppress dust. Cover or control water content of earthen materials being hauled, as required to control dust emissions. Cover or otherwise stabilize soil stockpiles to prevent erosion by wind.
- C. Cleanup. The Contractor shall keep all streets, roadways, and easements, as well as all ground adjacent to the project site, clean and free of dust, mud and debris resulting from the Contractor's operations. Daily cleanup throughout the project shall be required as the Contractor progresses with the work. Spillage of earth, gravel, concrete, asphalt, or other materials resulting from hauling operations along or across any public street or private driveway or access road shall be removed immediately by the Contractor.

3.9 Hazardous Materials Control and Spill Prevention Plan

- A. General. Before starting work on the project, the Contractor shall submit for acceptance by the Engineer a Hazardous Materials Controls and Spill Prevention Plan. Plan shall include provisions for preventing hazardous materials from contaminating soil or entering water courses and shall establish a Spill Prevention and Countermeasure Plan.
- B. Facilities. Provide staging and storage areas for equipment, as required to contain contaminants away from water courses. Provide a contained, locked storage facility for fuels, lubricants, construction chemicals and other hazardous materials and supplies stored at site.
- C. Equipment Maintenance. Clean and maintain equipment to prevent any leakage of fuel and lubricants. Establish a designated equipment refueling area. All fueling and maintenance of

vehicles and other equipment and staging area shall occur at least 20 meters from any riparian habitat or water body.

- D. Spills Countermeasures. Isolate work areas during in-water construction activities in using oil containment booms. Maintain a supply of oil booms, sorbent pads and other supplies to contain and clean spills. Contain and cleanup any hazardous material spills immediately and notify Engineer.

3.10 Construction Site Housekeeping

Remove rubbish, trash, and debris from site on a regular basis. Transport and dispose of all rubbish and debris in accordance with all local regulations. Maintain staging area in an orderly manner. Regularly clean mud and debris, resulting from work at the site, from roadways; Section 401 Water Quality Certification governing pollution from construction activities, sweeping and washing construction site sediment tracked onto roadways into roadside ditches is a violation.

3.11 Protection of Existing Improvements

Existing facilities, utilities, and property shall be protected from damage resulting from the Contractor's operations. Roadways and other improved surfaces shall be protected from damage by vehicles with tracks or lugs. Any damage resulting from the Contractor's operations shall be repaired by the Contractor to the condition which existed prior to the damage, and to the satisfaction of the Engineer, at no additional cost to the Owner.

3.12 Restoration of Structures and Surfaces

- A. Structures, Equipment, and Pipework. The Contractor shall remove such existing structures, equipment, and pipework as may be necessary for the performance of the work, and shall rebuild, or replace, the items thus removed in as good a condition as found. Contractor shall repair any existing structures that were damaged as a result of the Work.
- B. Roads and Streets. Roadways used by the Contractor for hauling materials, equipment, supplies, etc., shall be cleaned and repaired if the condition of the roadway is damaged, or otherwise affected, due to the Contractor's operations.
- C. Curbs, Gutters, Driveways, and Sidewalks. All curbs, gutters, driveways, sidewalks, and similar structures that are broken, or damaged, by the installation of the work shall be reconstructed by the Contractor. Reconstruction shall be of the same kind of materials with the same finish, and in not less than the same dimensions as to original work. Repairs shall be made by removing and replacing the entire portions between joints or scores, and not merely refinishing any damaged part. All restoration work shall match the appearance of the existing improvements, as nearly as possible.
- D. Cultivated Areas and Other Surface Improvements. All cultivated and natural areas, either agricultural or lawns, and other surface improvements which are damaged by actions of the Contractor, shall be restored, including roadside drainage ditches, as nearly as possible, to their original conditions.

3.13 Storage of Materials and Equipment

Materials and equipment shall be stored so as to ensure the preservation of their quality and fitness for the work. Stores of equipment and materials shall be located so as to facilitate inspection. The Contractor shall be responsible for all damages that occur in connection with the care and protection of all materials and equipment, supplied by the Contractor, until completion and final acceptance of the Work by the Owner.

3.14 Traffic Control

- A. General. The Contractor shall be responsible for public safety and traffic control at all times.
- B. The Contractor shall furnish, install, and maintain temporary construction warning signs, flaggers, barricades, and other devices necessary to safeguard the general public and the work, and to provide for the safe and proper routing of all vehicular and pedestrian traffic within and through the limits of the project during the performance of the work.
- C. Traffic Control Plan. The Contractor will provide a traffic control plan to the Engineer for review and approval prior to project construction including: access points to Sunrise Avenue, staging areas, dump sites, operating hours, project duration, scheduling and phasing, and total number of construction vehicles and their respective haul routes, per project phase.
- D. All work shall comply with the 2010 Caltrans Manual on Uniform Traffic Control Devices, available on the internet at:

<http://www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/pdf/camutcd2010/Part6.pdf>

4. MEASUREMENT AND PAYMENT

4.1 Measurement

- A. Work under this section will not be separately measured for payment.

4.2 Payment

- A. The lump sum contract price for Construction Facilities and Temporary Controls, also known as Mobilization and Demobilization, will include full compensation for the furnishing of all labor, materials, tools, equipment, administrative costs, and incidentals for mobilization; demobilization; and temporary facilities and controls.
- B. Attention is directed to Sections 9-1.06, "Partial Payments," and 9-1.07, "Payment After Acceptance." Of the Standard Specifications.
- C. Payments for mobilization will be made as follows:
- D. When the monthly partial payment estimate of the amount earned, not including the amount earned for mobilization, is 5 percent or more of the original contract amount, 50

percent of the contract item price for mobilization or 5 percent of the original contract amount, whichever is the lesser, will be included in the estimate for payment.

- E. When the monthly partial payment estimate of the amount earned, not including the amount earned for mobilization, is 10 percent or more of the original contract amount, the total amount earned for mobilization shall be 75 percent of the contract item price for mobilization or 7.5 percent of the original contract amount, whichever is the lesser, and that amount will be included in the estimate for payment.
- F. When the monthly partial payment estimate of the amount earned, not including the amount earned for mobilization, is 20 percent or more of the original contract amount, the total amount earned for mobilization shall be 95 percent of the contract item price for mobilization or 9.5 percent of the original contract amount, whichever is the lesser, and that amount will be included in the estimate for payment.
- G. When the monthly partial payment estimate of the amount earned, not including the amount earned for mobilization, is 50 percent or more of the original contract amount, the total amount earned for mobilization shall be 100 percent of the contract item price for mobilization or 10 percent of the original contract amount, whichever is the lesser, and that amount will be included in the estimate for payment.
- H. After acceptance of the contract pursuant to Section 7-1.17, "Acceptance of Contract," the amount, if any, of the contract item price for mobilization in excess of 10 percent of the original contract amount will be included for payment in the first estimate made in conformance with the provisions in Section 9-1.07.
- I. The contract lump sum price paid for mobilization shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in mobilization as specified herein.
- J. The adjustment provisions in Section 4-1.03, "Changes," and the retention of funds provisions in Section 9-1.06, "Partial Payments," shall not apply to the contract lump sum item of mobilization.
- K. When other contract items are adjusted as provided in Section 4-1.03, "Changes," if the costs applicable to an item of work include mobilization costs, those mobilization costs will be deemed to have been recovered by the Contractor by the payments made for mobilization, and will be excluded from consideration in determining compensation under Section 4-1.03.
- L. When the contract does not include a contract pay item for mobilization as above specified, full compensation for any necessary mobilization required shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.
- M. No separate payment will be made for compliance with the conditions of the permits identified in the Contract Documents. The lump sum price for mobilization-demobilization will include full compensation for these costs.

N. Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Construction Facilities and Temporary Controls (a.k.a. Mobilization)	Lump Sum

END OF SECTION

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SURVEYS

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**SECTION 01502
CONSTRUCTION SURVEYING**

1. GENERAL

1.1 Description

- A. The work required under this Section shall include, but is not limited to, all labor, tools, materials, equipment and incidentals required to perform construction surveying, as shown on the Drawings, described in these Specifications or as directed by the Engineer.

1.2 Work Included

- B. The Contractor shall be responsible for procuring professional land surveying services as necessary to construct this project. A California licensed Land Surveyor, or Civil Engineer authorized to practice land surveying as defined in the Professional Land Surveyors Act, shall be in responsible charge of all survey work to be performed in conjunction with the scope of work of this project.
- A. The Contractor shall save and protect all project survey control and reference points shown on the Drawings and located outside the limits of Disturbance.
- B. The Work shall include the provision of all materials, equipment and apparatus not specifically mentioned herein or noted on the Drawings, but which are necessary to complete the Work specified.

1.3 Quality Assurance

- A. All Work shall be done to the satisfaction of the Engineer.
- B. The Engineer may, at his sole discretion, perform his own surveys for: verification of project control points, verification of lines and grades, and inspection of survey monument preservation.

2. PRODUCTS (Not Used)

3. EXECUTION

- A. The Engineer has established the survey monuments and elevation bench marks shown on the Drawings. From this information, the Contractor shall establish the baseline control points for horizontal and vertical control and make all additional detailed surveys and measurements necessary for the construction of the work as dimensioned on the Drawings.
- B. Quality control surveys shall be performed by the Contractor to document compliance with the construction Drawings and Specifications.
- C. The Engineer may spot check the Contractor's surveys. The Contractor shall provide a minimum of two (2) working days notice to the Engineer prior to the date the Engineer's

survey check is requested. The Contractor shall provide unrestricted access to the areas to be surveyed and shall allow two (2) working days for the Engineer to perform the surveys. Any discrepancies between the Contractor's survey and the Engineer's spot check shall be resolved to the Engineer's satisfaction prior to continuing with the affected work.

- A. Survey monuments shall conform to the provisions of Section 81, "Monuments," of the Standard Specifications.

4. MEASUREMENT AND PAYMENT

4.1 Measurement

- A. Construction Surveying shall not be independently measured for payment.

4.2 Payment

- A. No separate payment will be made for the work covered under this section. Full compensation for all costs in connection with Construction Surveying shall be included in the contract price for related work.

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TEMPORARY FENCE – TYPE ESA

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SECTION 01560
TEMPORARY FENCE – TYPE ESA

1. GENERAL

1.1 Description

- A. Work under this section includes furnishing all labor, materials, equipment, and incidentals to install, maintain, and remove Temporary Fence – Type ESA , as shown on the Drawings, as specified, or as otherwise directed by the Engineer.

1.2 Related Sections

1. ***Construction Facilities and Temporary Controls***, Section 01500
2. ***Clearing and Grubbing***, Section 02110
3. ***Stripping and Excavation***, Section 02222

1.3 Submittals

- A. Submit to the Engineer, for review, the following:
1. Manufacturer's data for proposed fencing fabric.
 2. Manufacturer's data or descriptive literature for proposed fence posts.

2. PRODUCTS

2.1 Materials

- A. High Visibility Fabric. High visibility fabric shall be machine produced, orange colored mesh manufactured from polypropylene or polyethylene. High visibility fabric may be made of recycled materials. Materials shall not contain biodegradable filler materials that can degrade the physical or chemical characteristics of the finished fabric. High visibility fabric shall be fully stabilized ultraviolet resistant and a minimum of four feet in width with a maximum mesh opening of 2" x 2". High visibility fabric shall be furnished in one continuous width and shall not be spliced to conform to the specified width dimension.
- B. Posts. Posts for temporary fence (Type ESA) shall be of one of the following:
1. Wood posts shall be fir or pine, shall have a minimum cross section of 2" x 2", and a minimum length of 5.25 feet. The end of the post to be embedded in the soil shall be pointed. Wood posts shall not be treated with wood preservative.
 2. Steel posts shall have a "U," "T," "L," or other cross sectional shape that resists failure from lateral loads. Steel posts shall have a minimum weight of 0.75 pounds per linear foot and a minimum length of 5.25 feet. One end of the

steel post shall be pointed and the other end shall have a high visibility colored top.

- C. Fasteners. Fasteners for attaching high visibility fabric to the posts shall be as follows:
 - 1. The high visibility fabric shall be attached to wooden posts with commercial quality nails or staples, or as recommended by the manufacturer or supplier. Maximum spacing of nails or staples shall be 24 inches along the length of the wooden post.
 - 2. Tie wire or locking plastic fasteners shall be used for attaching the high visibility fabric to steel posts. Maximum spacing of tie wire or fasteners shall be 24 inches along the length of the steel post.
- D. Used materials may be installed provided the used materials conform to these Specifications.

3. EXECUTION

3.1 Installation

- A. All fence construction activities shall be conducted from the work side of the ESA as shown on the Drawings or as flagged in the field by the Engineer.
- B. Posts shall be embedded in the soil a minimum of 16 inches. Post spacing shall be eight feet maximum from center to center and shall at all times support the fence in a vertical position.
- C. Temporary fence (Type ESA) shall be constructed prior to clearing and grubbing work, shall enclose the foliage canopy (drip line) of protected plants, and shall not encroach upon visible roots of the plants.
- D. Temporary fence (Type ESA) shall be located so that it is clearly visible, as determined by the Engineer.

3.2 Maintenance

- A. Temporary fence (Type ESA) that is damaged during the progress of the work shall be repaired or replaced by the Contractor the same day the damage occurs.

3.3 Removal

- A. When Type ESA fence is no longer required, as determined by the Engineer, it shall be removed and disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the State Specifications, except when reused as provided in this section.
- B. Holes caused by the removal of temporary fence (Type ESA) shall be backfilled in conformance with the provisions in Section 15-1.02, "Preservation of Property," of the State Specifications.

4. MEASUREMENT AND PAYMENT

4.1 Measurement

- A. Temporary Fence – Type ESA will not be separately measured for payment.

4.2 Payment

- A. No separate payment will be made for Temporary Fence – Type ESA. Full compensation for all costs associated with this work shall be included in the contract price for Construction Facilities and Temporary Controls in accordance with Section 01500.

END OF SECTION

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CLEARING AND GRUBBING

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**SECTION 02110
CLEARING AND GRUBBING**

1. GENERAL

1.1 Description

- A. The work covered by this section consists of furnishing all labor, equipment, and materials necessary to perform the clearing and grubbing, the removal or disposal of all cleared and grubbed materials, and the filling of all grubbing holes, as specified herein, as shown on the plans, or as otherwise directed by the Engineer.
- B. Related Sections
 - 1. ***Construction Facilities and Temporary Controls***, Section 01500
 - 2. ***Demolition and Reuse of Materials***, Section 02050
 - 3. ***Stripping and Excavation***, Section 02222
 - 4. ***Engineered Fill***, Section 02226

2. PRODUCTS - Not Used

3. EXECUTION

3.1 Clearing

- A. General. All work shall comply with Section 16, Clearing and Grubbing of the Standard Specifications. All trees, stumps, down timber, snags, brush, vegetation, old piling, stone, concrete rubble, abandoned structures, and similar debris shall be cleared within the limits of the construction extents, unless otherwise shown on the Drawings. In areas where grubbing is not required, the clearing operations shall consist of the complete removal of all obstructions above the ground surface.
- B. Trees. Certain trees, as designated on the Drawings by the Engineer, shall be removed. Trees shall be felled in such a manner as to avoid damage to trees left standing, to the existing structures and installations, as well as with due regard for the safety of employees and others. Trees located beyond the limits for clearing and grubbing that are not marked for removal, shall be protected from damage, as indicated on the Drawings
- C. Willow Trees and Shrubs. Willow trees and shrubs within the clearing limits shall be salvaged for reuse in accordance with Section 02950, Planting.
- D. Vegetation. Vegetation to be removed shall consist of all heavy growth of brush and woody vegetation, unless shown otherwise on the Drawings.
- E. Debris Removal. Abandoned foundations, rip rap, drainage materials, debris, and other unsuitable material and any other debris designated for removal on the drawings shall be

removed and disposed, of in accordance with this section. Buried unsuitable debris encountered during excavations shall be removed and disposed of in accordance with **Section 02222**.

3.2 Grubbing

- A. General. Grubbing shall consist of the removal of all stumps, roots, buried logs, old piling, old paving, concrete, abandoned utilities, timbers, fencing, and other objectionable matter encountered.
- B. Limits. Except as noted on the Drawings, the entire area within the limits of the footprint of improvements shall be thoroughly grubbed.
- C. Filling of Holes. All holes caused by grubbing operations, except in borrow areas, shall be excavated with 3 to 1 (horizontal to vertical) side slopes in conformance with **Section 02222**. The excavation shall then be backfilled with compacted embankment material in conformance with **Section 02226**.

3.3 Disposal of Debris

- A. Cleared and Grubbed Materials. Except as herein specified, all logs, brush, concrete, asphalt, timbers, slash, and other debris which are the products of the clearing and grubbing operations shall be disposed of. Remove any or all of the products of clearing and grubbing operations from the site and dispose of the material at other locations or through other sources arranged for, by, and at the expense of the Contractor and approved by the Engineer.

4. MEASUREMENT AND PAYMENT

4.1 Measurement

- A. Clearing and Grubbing will not be separately measured for payment.

4.2 Payment

- A. Clearing and Grubbing will be paid for at the lump sum contract price, which price will be payment in full for furnishing all labor, materials, tools, equipment and incidentals, and doing all work necessary to complete the clearing and grubbing operation as specified, including disposal or salvage of materials, and restoration of ground surfaces.
- B. Removal and disposal of buried debris, not encountered during grubbing operations, will be paid for in accordance with Excavation – Unsuitable Debris, **Section 02222**.
- C. Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Clearing and Grubbing	Lump Sum

END OF SECTION

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DEWATERING

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**SECTION 02140
DEWATERING**

1. GENERAL

1.1 Description

- A. Furnish all labor, materials, equipment, and incidentals necessary to relocate fish and design, construct, operate, maintain, and remove all cofferdams, flumes shoring, diversions, filtration systems and/or other measures, including pumping, to dewater the construction site and temporary excavations and to divert streamflow and other surface waters through or around the project area 24 hours a day during the entire field construction period, as shown on the Drawings and as specified, or as otherwise directed by the Engineer.
- B. Dewatering details on the Drawings are schematic. The design and implementation of the Dewatering Plan is the sole responsibility of the Contractor.
- C. Dewatering and diversion shall comply with all project permit conditions.

1.2 Related Sections

- 1. ***Construction Facilities and Temporary Controls***, Section 01500
- 2. ***Stripping and Excavation***, Section 02222
- 3. ***Rock Slope Protection***, Section 02270

1.3 References

- A. California Regional Water Quality Control Board Central Valley Region, "Clean Water Act Section 401 Technically Conditioned Water Quality Certification for Discharge of Dredged and/or Fill Materials for the Secret Ravine Fish Passage Improvement Project (WDID#5A31CR00266) Placer County", dated April 22, 2011.

1.4 Submittals

- A. The Contractor shall submit to the Engineer for review the following:
 - 1. A Fish Removal and Dewatering Plan listing materials, method of work, equipment to be used, methods for disposal of pumped water, provisions to prevent scour and erosion, and the proposed schedule. Approval of the Engineer shall be required before the Contractor proceeds with water control measures.
 - 2. Product data for:
 - pumps
 - silt control filter fabric
 - washed rock
 - impervious liners
 - cofferdam material

- other materials used in dewatering
- block nets for excluding fish

1.5 Quality Assurance

- A. Comply with all applicable permits and regulations.
- B. Notify Engineer 48 hours in advance of block net installation and fish removal, and installation of temporary cofferdam(s) or diversion.
- C. Notify Engineer 48 hours in advance of removal of temporary cofferdam(s) or diversion.

2. PRODUCTS

2.1 Materials

- A. General. The Contractor shall be responsible for sizing and design of temporary cofferdams, well points, pumps, drains, pipes and other diversion and dewatering facilities. Comply with Drawings and regulatory requirements.
- B. Imported Rock. Use only clean washed rock. Other materials, if used, shall be removed from river channel when dewatering work is complete.
- C. Dewatering Facilities. Provide and operate dewatering facilities of suitable size and capacity. The use of equipment shall be consistent with the manufacturer's recommendations.
- D. Silt Filter Fabric. Material for silt filter fabric shall be propylene, nylon, polyester, or ethylene yarn with an apparent opening size (AOS) no greater than U.S. Sieve No. 40, and a minimum tensile strength of fifty (50) pounds per linear foot at twenty percent (20%) maximum elongation.
- E. Block Nets. Block Nets shall be 1/4 inch opening nylon mesh net.

3. EXECUTION

3.1 General

- A. Contractor is responsible for the design, construction, and maintenance and monitoring of the dewatering facilities. The City of Roseville is responsible for the maintenance and monitoring of the dewatering facilities during the demolition work. Comply with the Drawings, Specifications, and applicable permit conditions.

3.2 Fish Removal

Contractor is responsible for providing Fish Removal by a qualified fisheries biologist as specified on the Drawings and as outlined in the project permits.

3.3 Sediment Control

- A. General. Comply with Section 401 Water Quality Certification.
- B. Materials. Earthen materials shall not be used within the flowing channel of Secret Ravine, with the exception of clean, washed rock.
- C. Cofferdam Construction. During construction of the cofferdam, install silt barrier(s) along the water side of the installation, as necessary to minimize mobilization and entrainment of disturbed soils within the active flowing channel, to a level in accordance with the permit conditions.
- D. Discharge of Seepage/Groundwater. Discharge of water from the dewatered construction site, either by gravity or pumping, shall be performed in a manner to prevent excessive turbidity from entering Secret Ravine and to prevent scour and erosion outside of the construction site. Pumped water should be pre-filtered with sand/gravel pack around sumps for subsurface flows and a silt fence or hay bales around pumps for surface flow. Pumped water shall be discharged into adjacent gravel bars, isolated local depressions, or temporary sediment basins. Where water to be discharged into the river will create excessive turbidity, the water shall be routed through a sediment interceptor or other facilities to remove sediment from water.
- E. Isolation of Construction Area. Place silt fences, hay bale barriers, or cofferdams between construction area and flowing river channel, at all locations.

3.4 Hazardous Material Control

- A. General. Comply with the approved Hazardous Materials Control and Spill Prevention Plan (HMC&SPP) in accordance with **Section 01500**.
- B. Equipment and Lubricants. Steam clean all equipment prior to being brought to site. Inspect all equipment for cleanliness and fluid leaks prior to use and monitor during its use. Maintain equipment as required. Equipment refueling shall only take place in a designated, contained area.
- C. Isolation of Construction Area. Prior to performing work within flowing water, outside of cofferdams, install oil containment booms downstream of the work area. Maintain booms until completion of the work within the channel is complete.
- D. Spills. Maintain a supply of oil spill booms, sorbent pads, and other supplies to contain and clean spills. Comply with approved HMC&SPP should spills occur.

3.5 Cofferdams

- A. General. The Contractor is solely responsible for the design, construction, maintenance, and monitoring of cofferdams, dikes and other isolation facilities. Cofferdams with an exposed height greater than 10 feet shall be designed by a Professional Engineer registered in the State of California, based on available soil data.
- B. Configuration. Cofferdam alignments, as shown on the Drawings, reflect the maximum allowable encroachment into the channel. Construct cofferdam alignments as shown on

the Drawings, unless otherwise approved by Engineer. Provide cofferdams high enough to account for water surface fluctuations.

- C. Secondary Dikes/Seepage Control. Secondary dikes within the isolated construction area can be used to control seepage and groundwater around excavations, provided all dike materials are removed from the exposed channel upon completion, prior to re-watering the work area.

3.6 Flow Bypass

- A. Capacity. Bypass water around construction site using a cofferdam and bypass pipe as shown on the Drawings or similar facility, as approved by the Engineer. The bypass system shall be capable of passing the flows present at the time construction begins, with a minimum of 12 inches of freeboard. Bypass pipes shall have a minimum diameter of 10 inches to minimize the likelihood of clogging by debris.
- B. Storm Events. During the designated period for instream work, the Contractor shall be solely responsible for the integrity of the dewatering system. If rain is predicted, the Contractor shall perform flood fighting activities as directed by the Engineer and regulatory agencies.
- C. Unless otherwise specified, a diversion must discharge into the same natural drainage way in which its headworks are located.

3.7 Dewatering

- A. General. Remove water from construction area using pumping, well points, drains, or other approved methods. Discharge of water shall comply with 3.2.D. Construction water shall be segregated from seepage water and routed through sediment interceptors or other facilities to remove contaminants and sediment. Excavated slopes in the saturated soils may need to be retained, tied back, or otherwise stabilized.
- B. Well Points. Well points shall be designed to preclude the loss of fine soil by sand/gravel packing or other suitable means.
- C. Pumping Facilities. Pumps and discharge piping shall be suitable for the type of service provided and shall be a sufficient size and capacity to satisfactorily dewater work areas. Engines shall be muffled to avoid excess noise and pump intakes shall be fitted with screens as required.
- D. Power Supply. Contractor shall consider the availability and reliability of power sources for dewatering operation in dewatering system design, and make provisions for temporary or backup power supply as deemed necessary.
- E. Groundwater. Dewatering shall maintain water surfaces below the base of temporary excavations or trenches, to allow for visual inspection of the work, if requested by the Engineer. Lower groundwater tables within excavations for structures to a minimum of two (2) feet below foundations or as otherwise required to establish a firm, stable

foundation. Control groundwater within excavation until completion of backfill operations.

3.8 Water Levels During the Construction Period

- A. Secret Ravine. High water levels in Secret Ravine during the construction window are generated by summer rainstorms. Flows are unregulated.

3.9 Cleanup

- A. Prior to removal of dewatering the facilities, thoroughly cleanup area to remove debris and contaminated materials. Remove fine sediments and restore disturbed area. Clean, round, river run cobbles or gravels, if used in cofferdam construction, may be spread in the creek channel in lieu of removal, provided grading will not interfere with facility operation.

3.10 Removal of Dewatering Facilities

- A. Prior to removal of dewatering facilities, complete the following activities:
 - 1. Complete required tests and inspections.
 - 2. Thoroughly cleanup work site.
 - 3. Perform final walkthrough with Engineer.
- B. Prior to removal of cofferdams, equalize the water surface levels on both sides of the dams.

3.11 Removal of Block Nets

- A. Block Nets shall be removed by the fisheries biologist after the dewatering facilities are removed and the in channel work area is re-watered.

4. MEASUREMENT AND PAYMENT

4.1 Measurement

- A. Dewatering will not be separately measured for payment.
- B. Fish Removal will not be separately measured for payment.

4.2 Payment

- A. Dewatering will be paid for at the lump sum contract price per facility, which price will be payment in full for furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the dewatering operations, as specified herein, including temporary cofferdams, well points, pumping, silt control, filter fabric, sediment control, erosion control, removal of muck, disposal of materials, and removal of dewatering facilities.
- B. No separate payment will be made for Fish Removal. Full compensation for all costs associated with this work, as shown on the Drawings, or as specified, shall be paid for under Dewatering.

<u>Pay Item</u>	<u>Pay Unit</u>
Dewatering	Lump Sum

END OF SECTION

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SLOPE PROTECTION FABRIC

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SECTION 02201
Slope Protection Fabric

1. GENERAL

1.1 Description

- A. Work under this section includes furnishing all labor, materials, equipment, and incidentals to install and maintain Slope Protection Fabric to protect newly constructed or excavated and seeded soil slopes, as shown on the Drawings, as specified herein, or as otherwise directed by the Engineer.

1.2 Related Sections

1. ***Construction Facilities and Temporary Controls***, Section 01500
2. ***Stripping and Excavation***, Section 02222
3. ***Coir Rolls***, Section 02379
4. ***Planting***, Section 02950

1.3 References

- A. American Society for Testing and Materials (ASTM):
1. D 570 - Standard Test Methods for Water Absorption of Plastics.
 2. D 5199 - Standard Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes.
 3. D 1907 - Test Method for Yarn Number by Skein Method.
 4. D 1388 – Test Method for Stiffness of Fabrics
 5. D 2256 - Test Method for Breaking Strength and Elongation of Yarn by Single Strand Method.
 6. D 3786 - Standard Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics.
 7. D 4354 - Practice for Sampling of Geosynthetics for Testing.
 8. D 4355 - Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus).
 9. D 4439 - Terminology for Geotextiles.
 10. D 4595 - Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
 11. D 4632 - Test Method for Grab Breaking Load and Elongation of Geotextiles.
 12. D 4759 - Practice for Determining the Specification Conformance of Geosynthetics.
 13. D 4873 - Guide for Identification, Storage, and Handling of Geotextiles.
 14. D 5035 - Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Force).
 15. D 5261 - Test Method for Measuring Mass Per Unit Area of Geotextiles.
 16. Federal Test Method of America (FTMA) CCC-5-191B - Smolder Resistance of

Textile Materials.

17. Geosynthetic Accreditation Institute (GAI) - Laboratory Accreditation Program (LAP).
18. International Standards Organization (ISO) 9002 - Quality System Certification.
19. Light Projection Analysis - Limited Test Method for Measuring Light Projection through Fabric.

1.4 Submittals

- A. Submit to the Engineer, for review, the following:

Manufacturer's Data and Certification's:

1. The Contractor shall provide the Engineer a certificate stating the name of the Slope Protection Fabric manufacturer, product name, style, chemical compositions of filaments or yarns and other pertinent information to fully describe the geotextile.
2. The Manufacturer is responsible for establishing and maintaining a quality control program to assure compliance with the requirements of the Specification. Documentation describing the quality control program shall be made available upon request.
3. The manufacturer's certificate shall state that the furnished products meet requirements of the Specification as evaluated under the manufacturer's quality control program. The certificate shall be attested to by a person having legal authority to bind the Manufacturer.
4. Independent Performance Test Results shall be provided upon request.

1.5 Delivery, Storage, and Handling

- A. Slope Protection Fabric labeling, shipment and storage shall follow ASTM D 4873.
- B. Product labels shall clearly show the manufacturer or supplier name, style name, and roll number.
- C. Each shipping document shall include a notation certifying that the material is in accordance with the manufacturer's certificate.
- D. Each Slope Protection Fabric roll shall be wrapped with a material that will protect the geotextile from damage due to shipment, water, sunlight, and contaminants.
- E. The protective wrapping shall be maintained during periods of shipment and storage.
- F. During storage, Slope Protection Fabric rolls shall be elevated off the ground and adequately covered to protect them from the following: Site construction damage, extended exposure to ultraviolet (UV) radiation, precipitation, chemicals that are strong acids or strong bases, flames, sparks, temperatures in excess of 71 deg C (160 deg F) and any other environmental condition that might damage the Slope Protection Fabric.

1.6 Quality Assurance

- A. Slope Protection Fabric shall be subject to sampling and testing to verify conformance with this Specification. Sampling for testing shall be in accordance with ASTM D 4354.
- B. Acceptance shall be in accordance with ASTM D 4759 based on testing of either conformance samples obtained using Procedure A of ASTM D 4354, or based on manufacturer's certifications and testing of quality control samples obtained using Procedure B of ASTM D 4354.
- C. Sewn Seams (if required):
 - 1. For seams that are to be sewn in the field, the Contractor shall provide at least a 2 meter (six-foot) length of sewn seam for sampling by the Engineer before the geotextile is installed.
 - 2. For seams that are sewn in the factory, the Engineer shall obtain samples of the factory seams at random from a roll of geotextile that is to be used on the project.
 - 3. If seams are to be sewn in both directions, samples of seams from both directions shall be provided.
 - 4. For seams that are field sewn, the seams sewn for sampling shall be sewn using the same equipment and procedures as will be used for the production seams.
 - 5. The seam assembly description shall be submitted by the Contractor along with the sample of the seam. The description shall include the seam type, sewing thread, and stitch density.

2. PRODUCTS

2.1 Slope Protection Fabric

- A. Fabric. Slope Protection Fabric shall be North American Green C125BN, or equivalent, meeting the following Specifications:
- B. The Slope Protection Fabric shall meet requirements established by the Erosion Control Technology Council (ECTC) Specification and the U.S. Department of Transportation, Federal Highway Administration's (FHWA) Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, FP-03 2003 Section 713.17 as a Type 4. Long-term Erosion Control Blanket.
- C. Slope Protection Fabric shall be a long-term erosion control blanket, constructed of 100% biodegradable materials containing a 100% coconut fiber matrix, with a functional longevity of up to 24 months. The coconut fiber shall be evenly distributed over the entire area of the blanket. The blanket shall be covered on the top and bottom with 100% biodegradable natural organic fiber netting woven into an approximate 0.50 x 1.00 inch (1.27 x 2.54 cm) mesh. The blanket shall be sewn together with biodegradable thread on 1.50 inch (3.81 cm) centers.

Property	Test Method	Typical
Thickness	ASTM D5199/ECTC	0.26 in (6.60 mm)
Resiliency	ECTC Guidelines	85%
Mass per Unit Area	ASTM D6475	8.83 oz/yd ² (300 g/m ²)
Water Absorption	ASTM D1117/ECTC	155%
Swell	ECTC Guidelines	40%
Stiffness/Flexibility	ASTM D1388/ECTC	0.11 oz-in (1,218 mg-cm)
Light Penetration	ECTC Guidelines	16.40%
Smolder Resistance	ECTC Guidelines	Yes**
MD Tensile Strength	ASTM D5035	342.00 lbs/ft (4.98 kN/m)
MD Elongation	ASTM D5035	7.60%
TD Tensile Strength	ASTM D5035	211.00 lbs/ft (3.08 kN/m)
TD Elongation	ASTM D5035	11.10%

**Material is smolder resistant according to specified test

MD – Machine Direction

TD – Transverse Direction

2.2 Stakes

- A. Stakes shall be shaped hardwood pins designed to safely and effectively secure the slope stabilization fabric. The wood stake must exhibit ample rigidity to enable being driven into hard ground, with sufficient flexibility to resist breakage. The wood stake shall be the North American Green Eco-Stake or approved equal, with the following dimensions:

Leg Length:	11.00 in
Head Width:	1.25 in.
Head Thickness:	0.40 in.
Leg Width:	0.60 in. (tapered to a point)
Leg Thickness	0.40 in.
Total Length:	12.0 in

3. EXECUTION

3.1 Preparation

- A. Grade and compact areas to be treated with Slope Protection Fabric and compacted as indicated or as directed by Engineer.
- B. Remove large rocks, soil clods, vegetation, and other sharp objects that could keep Slope Protection Fabric from intimate contact with surface.
- C. Prepare seedbed by loosening 50 to 75 mm (two to three inches) of soil above final grade, or as directed in Section 02932, Seeding.
- D. Select and apply soil amendments, fertilizer, and seed in accordance with Section 0932, Seeding, to scarified surface prior to installation of Slope Protection Fabric.
- E. Construct 150 x 150 mm (six-inch x 6-inch) anchor trench at top of slope.

3.2 Installation

- A. Install Slope Protection Fabric at elevation and alignment indicated.
- B. Extend Slope Protection Fabric two to three feet over crest of slope, secure into a six-inch x six-inch trench with a row of staples/stakes approximately 12 inches apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to compacted soil and fold remaining 12 inch portion of Slope Protection Fabric's back over seed and compacted soil. Secure Slope Protection Fabric over compacted soil with a row of staples/stakes spaced approximately 12 inches apart across the width of the Slope Protection Fabric
- C. Unroll Slope Protection Fabric downslope. Consecutive rolls spliced down the slope must be placed end over end (shingle style) with an approximate three inches overlap. Staple through overlapped area, approximately 12 inches apart across entire Slope Protection Fabric's width.
- D. Secure Slope Protection Fabric to slope with ground anchoring devices in accordance with the manufacturer's recommendations for the application (slope or channel).
- E. Where Slope Protection Fabric abuts against rock slope protection or other rock placements, the Slope Protection Fabric shall be placed under the first course of adjacent rock and also staked per section 3.2d.
- F. Alternate installation methods must be approved by Engineer prior to execution.

3.3 Inspection and Maintenance

- A. The Contractor shall inspect Slope Protection Fabric immediately after each rainfall, and at least daily during prolonged rainfall. Any deficiencies shall be immediately corrected by the Contractor.
- B. The Contractor shall also make a daily review of the location of Slope Protection Fabric in areas where construction activities have altered the natural contour and drainage runoff to ensure that the Slope Protection Fabric is properly located for effectiveness. Where deficiencies exist as determined by the Engineer, repairs or replacement shall be performed as directed by the Engineer.
- C. Damaged or otherwise ineffective Slope Protection Fabric shall be repaired or replaced promptly.

4. MEASUREMENT AND PAYMENT

4.1 Measurement

Slope Protection Fabric will be measured by the square yard of slope protection fabric installed in accordance with the Drawings, as specified, or as directed by the Engineer. Measurements will be taken parallel to the finished surface. No additional payment will be made for seams, overlaps, anchor trenches, or wastage.

4.2 Payment

Slope Protection Fabric will be paid for at the contract unit price per square yard, which price will be payment in full for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing fabric, complete in place, including trench excavation and backfill, and maintenance, as shown on the Drawings, as specified herein, or as directed by the Engineer.

<u>Pay Item</u>	<u>Pay Unit</u>
Slope Protection Fabric	Square Yard

END OF SECTION

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SECTION 02222
STRIPPING AND EXCAVATION

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SECTION 02222
STRIPPING AND EXCAVATION

1. GENERAL

1.1 Description

- A. The work covered by this section consists of furnishing all labor, equipment, materials, and performing all operations necessary for the following work, as specified herein, as shown on the Drawings, or as otherwise directed by the Engineer.
 - 1. Stripping for removal of vegetation and surface organics.
 - 2. Excavation for removal of unsuitable material.
 - 3. Channel Excavation
 - 4. Topsoil salvage, storage and replacement
 - 5. Construction Staking
 - 6. Other miscellaneous excavation incidental to the construction of the improvements.
- B. Over-excavation for placement of rsp is not included within this section, but is considered incidental to the work for which it is required.
- C. Related Sections
 - 1. ***Clearing and Grubbing***, Section 02110
 - 2. ***Engineered Fill***, Section 02226

1.2 References

- A. State of California, Department of Transportation (CALTRANS)

State Standard Specifications, current edition
- B. Surveys. All construction surveying and staking shall be performed by the Contractor, in accordance with Section 01502. The Owner shall provide control points at the locations shown on the Drawings. Control points disturbed by the Contractor shall be replaced by the Contractor, at his sole expense.

1.3 Quality Assurance

- A. Comply with all applicable permits and regulations.

- B. Contractor shall provide necessary construction staking and references points, as required to meet the specified tolerances for the work.

2. PRODUCTS

2.1 Materials

- A. Section not used.

3. EXECUTION

3.1 General

- A. The Contractor shall locate and protect existing utilities prior to performing any excavation work. Call 1-800-Cal-Digg to coordinate utility locations, prior to work.
- B. The Contractor shall comply with all permit conditions in performing any excavation work.
- C. Excess or unsuitable materials shall be disposed off site, at locations to be arranged and paid for by the Contractor.

3.2 Stripping

- A. Stripping. Strip surfaces of excavations and fill foundations of heavy growth of crops, grass weeds and other vegetation as specified in Section 02110, Clearing and Grubbing. Greater depths of stripping may be necessary in selected areas to remove vegetation, as determined by the Engineer.
- B. Unless otherwise specified, the stripped materials shall be disposed of off-site, at locations to be arranged and paid for by the Contractor.

3.3 Topsoil

- A. Topsoil work shall consist of excavating, windrowing or stockpiling topsoil, removing from windrows or stockpiles, spreading, and compacting topsoil as shown on the Drawings, as specified, or as directed by the Engineer.
- B. Topsoil shall be obtained from sources within the project as shown on the Drawings, as specified, or as directed by the Engineer.
- C. Attention is directed to Section 02110, Clearing and Grubbing, regarding the clearing of vegetation. Excavating topsoil shall not be performed in an area until clearing and grubbing has been completed in that area.
- D. Topsoil shall be obtained by excavating the top 6 inches of material from proposed excavation and embankment areas where shown on the plans or designated by the Engineer. Topsoil shall be stockpiled onsite at locations approved in writing by the Engineer and shown on the Drawings. Rocks and plant material in excess of four inches in greatest dimension shall be removed from the excavated topsoil.

- E. Upon completion of the rough grading operations for the areas to receive topsoil, the topsoil shall be spread to a uniform depth of not less than 4 inches and compacted to the finished grade elevations shown on the Drawings, or stabilized in a manner that retains the material in place on the slopes. The topsoil shall not be compacted or stabilized to the degree that the topsoil is not maintained as a viable growing medium.
- F. Topsoil shall be placed on the designated areas and amended as specified before seeding or erosion control materials are applied.

3.4 Excavation

- A. General. Excavations shall extend into firm, undisturbed native soils. Excavation shall consist of removal of material for embankment foundation preparation, mass excavation and finish grading of the channel and slope improvements, and other miscellaneous excavations to the lines and grades shown on the Drawings, or as directed by the Engineer. In the event that organic materials, yielding sub-grade (pumping) or other deleterious materials are encountered during foundation excavations, they shall be removed as directed by the Engineer.
- B. Control of Water. Water control shall be performed in accordance with project permit conditions and Section 02140, Dewatering of these Specifications. When water is encountered, either ground water or surface runoff, the Contractor shall furnish, install, maintain, and operate all necessary machinery and equipment required to keep the excavation reasonably free from water, as approved by the Engineer, until the placement of concrete or backfill material has been completed, inspected, and approved, and all danger of flotation and other damage is removed. Water pumped from the excavation shall be disposed of in such manner as will not cause injury to public or private property, or constitute a nuisance or menace to the public, and the disposal method shall be subject to the approval of the Engineer. Water shall be controlled until work is complete.
- C. Excess Excavation. Care shall be exercised by the Contractor not to excavate below the grades shown on the Drawings, except as specified herein, and as directed by the Engineer. All excavations in excess of the grades shown on the Drawings which are not directed by the Engineer shall be backfilled with compacted embankment at the Contractor's expense, per Section 02226, Engineered Fill.
- D. Excavation of Unsuitables. Areas of unsuitable in-place soils, as determined by the Engineer, may also be encountered. Material shall not be classified as unsuitable solely based on moisture content. The Contractor shall anticipate having to over-excavate these areas as directed by the Engineer and dispose of materials. The actual locations of these excavations will be determined in the field by the Engineer. The side slopes of the excavations shall be no steeper than 1 to 1 (horizontal to vertical). The over-excavations shall be backfilled with embankment materials in accordance with Section 02226, Engineered Fill.
- E. Disposition of Unsuitable Materials. The excavated materials that are considered unsuitable based solely on moisture content shall be processed as necessary to meet

specification requirements for suitability and used as embankment material. Materials which are unsuitable based on organic content will be ordered wasted and shall be disposed of off-site in a commercial landfill.

- F. Temporary Excavations. With exposure and drying, on-site soils may experience progressive sloughing if excavated near vertical and left un-shored during construction. Engineer suggests that the soils on-site should be considered Type C when applying OSHA regulations.
- G. Tolerances. The excavation tolerance shall typically be +0.1 feet to -0.2 feet from the grades shown on the Drawings, except within the low flow channel, where excavation tolerance shall be +0.1 feet to -0.1 feet from the elevations shown on the Drawings.

4. MEASUREMENT AND PAYMENT

4.1 Measurement

- A. Stripping. Stripping will not be separately measured for payment.
- B. Topsoil. Topsoil will not be separately measured for payment.
- C. Excavation. Excavation is a Final Pay Item in accordance with Section 9-1.015 "Final Pay Items" of the Standard Specifications. Where the dimensions of any portion of the work are revised by the Engineer, or a portion of the work is eliminated, the change will be measured by the cubic yard.
- D. Excavation - Unsuitable Materials. Excavation to remove materials that are designated by the Engineer as unsuitable for reuse will be measured by the cubic yard from the stripped foundation. Measurement will be based on surveyed cross sections before and after the excavation.
- E. Other Miscellaneous Excavations. All other excavations will not be measured for payment.
- F. Surveys: Construction staking will not be separately measured for payment.

4.2 Payment

- A. Stripping. No separate payment will be made for stripping. All costs in connection with this work will be considered incidental to the contract price for Excavation.
- B. Topsoil. No separate payment will be made for excavating, windrowing or stockpiling, removing from windrows or stockpiles, spreading, and compacting topsoil. All costs in connection with this work will be considered incidental to the contract price for Excavation.
- C. Excavation will be paid for at the contract unit price per cubic yard, which price will be payment in full for furnishing all labor, materials, tools, equipment and incidentals, and doing all work necessary to complete excavation, as specified, including mass excavation and finish grading of channel banks and low flow channel, to the lines and grades shown on the Drawings.

- D. Excavation - Unsuitable Materials, measured as specified above, will be paid for at the contract unit price per cubic yard, which price will be payment in full for furnishing all labor, materials, tools, equipment and incidentals, and doing all work necessary to complete the excavation as specified, including dewatering, all handling of materials, and disposal of unsuitable materials.
- E. No separate payment will be made for other miscellaneous grading incidental to the work. All costs in connection with this work will be considered incidental to the cost of construction of associated improvement.
- F. Surveys: No separate payment will be made for surveys or construction staking. All costs in connection with this work will be considered incidental to the contract price per cubic yard for Excavation.
- G. Mixing and off-haul of suitable materials for reuse shall be paid for under **Section 02226**.
- H. Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Excavation	Cubic Yard (F)
Excavation – Unsuitable Materials	Cubic Yard

END OF SECTION

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ENGINEERED FILL CONSTRUCTION

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SECTION 02226
ENGINEERED FILL CONSTRUCTION

1. GENERAL

1.1 Description

- A. The work covered by this section consists of furnishing all plant, labor, and materials, and performing all operations necessary for the construction of Engineered fills, including surveying, foundation preparation, furnishing and hauling of materials from a borrow source, placement of Engineered Fill materials, construction of ramps, and other incidental earthwork as may be necessary to complete the Engineered Fills, as shown on the Drawings, as specified, or as otherwise directed by the Engineer.
- B. **All grading shall comply with Section 19 of the Standard Specifications.** It shall be the responsibility of the Contractor to visit the site and make his own interpretations with regard to materials, methods and equipment necessary to perform the work required for this project.

1.2 Related Sections

- 1. ***Stripping and Excavation***, Section 02222
- 2. ***Clearing and Grubbing***, Section 02110

1.3 References

- A. American Society for Testing of Materials (ASTM) Standards:
 - D1556 Test Method for Density of Soil in Place by the Sand Cone Method
 - D1557 Test Method for Moisture-Density Relations of Soils and Soil-Aggregate Moistures Using 10 lb (4.54 kg) Rammer and 18-inch (457 mm) Drop
 - D2974 Test Method for the Organic Content of Soils
 - D2922 Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth)
 - D3017 Test Method for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shall Depth)
 - D4318 Test Method for the Liquid Limit and Plastic Limit of Soils
 - D422C Particle-Size Analysis of Soils
- B. State of California, Department of Transportation (CALTRANS)
 - State Standard Specifications, current edition
- C. Surveys. All construction staking shall be performed by the Contractor. Survey control points are shown on the Drawings.

2. PRODUCTS

2.1 Materials

- A. Engineered Fill Materials. To the extent they are needed, all suitable materials from the specified excavations shall be used in the construction of required permanent earthfill. The suitability of materials for specific purposes will be determined by an Engineer, in conformance with these specifications. Only those soils having an organic content of less than 3 percent by volume may be used as Engineered Fill material. All fill material shall be free of perishable material and rocks or lumps larger than six inches in greatest dimension with not more than 15 percent larger than 2.5 inches. Fill materials shall contain no sod, brush, roots, or other perishable or unsuitable material. All fill material shall be approved by the Engineer prior to use.
- B. All surplus or unsuitable excavated materials will be designated as waste and shall be disposed of at the locations shown on the drawings or at sites remote from the project.
- C. If a disagreement between the Contractor and the Engineer occurs over the suitability of materials, the Contractor shall perform laboratory testing to demonstrate compliance with the specifications. The failure of the Contractor to perform the testing shall not relieve the Contractor from the obligation to provide suitable materials.

3. EXECUTION

3.1 Engineered Fill Construction

- A. General. Compacted Engineered Fill in Engineered Fills shall be placed in the dry and compacted as specified herein.
- B. Subgrade Preparation. The subgrade surfaces shall be graded to remove surface irregularities and shall be scarified parallel to the axis of the fill and loosened to a minimum depth of 2 inches. The moisture content of the loosened material shall be controlled as specified for the Engineered Fill, and the surface materials of the subgrade shall be compacted and bonded with the first layer of Engineered Fill. Earth abutment surfaces shall be free of loose, uncompacted earth in excess of two inches in depth normal to the slope and shall be at such a moisture content that the Engineered Fill can be compacted against them to ensure a good bond between the fill and the abutments. Subgrade and abutment surfaces shall not be steeper than 1 horizontal to 1 vertical. The sites of the borrow area shall be stripped to sufficient depth to remove all vegetation, roots, brush, sod and other objectionable material. Clearing and disposal methods shall be in accordance with applicable state and county laws with due regards to the safety of persons and property. Fill shall not be placed until the required excavation and subgrade preparation has been completed. Fill shall not be placed upon a frozen surface, nor shall snow, ice, or frozen material be incorporated in the fill.
- C. Horizontal Layer Construction. The compacted Engineered Fill shall be constructed to a sufficient section so as to achieve the required compaction throughout the finished section. Materials to be compacted shall be placed or spread in layers not more than eight (8) inches in thickness prior to compaction. Materials excavated to form keyways and overexcavations, and suitable for use as Engineered Fill, shall be blended uniformly with

other excavated soils or disposed of as directed by the Engineer. All fill placed on slopes steeper than 5 horizontal to 1 vertical shall be keyed and benched as specified in Section 19 of the Standard Specifications. If the surface of any layer becomes too hard and smooth for proper bond with the succeeding layer, it shall be scarified parallel to the axis of the fill to a depth of not less than 2 inches before the next layer is placed. Fill placed around structures will be brought up at approximately uniform height on all sides of the structure.

- D. Compaction. When, in the opinion of the Engineer, the surface of any compacted layer is too smooth to bond properly with the succeeding layer, it shall be scarified to a depth of 6 inches before the succeeding layer is placed thereon. The degree of compaction required is expressed as a percentage of the maximum dry density, based on laboratory test procedure, ASTM D 1557. The Engineered Fill shall be compacted to a minimum of 90% of the maximum dry density. Construction equipment shall be operated over each layer of fill to ensure that the required compaction is obtained. Special equipment shall be used if needed to obtain the required compaction. Heavy compaction equipment shall not be operated within 2 feet of any structure. Fill adjacent to structures, pipe, conduits, and anti-seep collars shall be compacted to a density equivalent to that of the surrounding fill by means of hand tampers or plate vibrators. Hand directed tampers or compactors shall be used on areas not accessible to heavy compaction equipment, fills compacted in this manner shall be placed in layers not greater than 4 inches in thickness before compaction, and shall meet the same density requirement as for the adjacent area.
- E. Compaction of backfill adjacent to structures shall not be started until after the expiration of the following minimum time interval after placement of the concrete:

Counterforts, vertical or near-vertical walls with earth loading on one side only	14 days
Walls and counterforts, backfilled on both sides simultaneously	7 days
Anti-seep, collars, conduits, and cantilever outlet bents	3 days

- F. Moisture Control. The moisture content required is expressed as a percentage, based on laboratory test procedure ASTM D 1557. The moisture shall be uniformly distributed throughout the layer prior to compaction and shall be at least 1% above the optimum moisture content. If the material is not within the required moisture content, the Contractor will be required to moisture condition the soil. The moisture conditioning of fill materials shall be performed prior to placement in the section. The final minor moisture conditioning may be made on the fill, as required. Harrowing, or other approved methods will be required to work the moisture into the material until a uniform distribution of moisture is obtained. Water applied on a layer of fill shall be accurately controlled in amount and distribution so that free water will not appear on the surface during or subsequent to rolling. If the material is too wet for proper compaction or soft and yielding sub-grade is experienced (pumping), the Contractor will be required to aerate the material to a moisture content within the desired limits prior to compaction. If the top surface of the preceding layer of compacted fill or a subgrade or abutment surface in the zone of contact with the fill becomes too dry to permit suitable bond, it shall either be removed or scarified and moistened to an acceptable moisture content prior to placement of the next layer of fill.

- G. Dressing. Engineered Fill slopes shall be dressed by over-building and cutting back to the required grade. The Contractor may compact the shoulder of each lift during the placement of fill materials to assist in the subsequent dressing of the slopes.

3.2 Cross Sections and Zoning of Materials

- A. Standard Engineered Fill Sections. The dimensions, slopes, and zoning of materials shall conform to the sections shown on the Drawings and specified herein.
- B. Zoning of Materials. The new Engineered Fill materials shall be homogeneous. The Engineered Fill shall be free of pockets, lenses, streaks, layers, etc. of different materials.

3.3 Finish

- A. Finish. After the placement of the engineered fills and spoils, the sides and top shall be dressed by final passage of compaction equipment or by dragging to give a smooth surface. The surface area shall be graded to provide surface drainage to flow to desired locations.

3.4 Roads and Ramps

- A. Roads. At locations where access roads to fields or buildings are destroyed because of the work required under this contract, the Contractor shall provide temporary roads, if directed by the Engineer, to give access to fields and buildings during the construction period. Such facilities shall be removed to the extent required by the Engineer.
- B. Temporary ramps to be constructed for the Contractors convenience need not comply with these foundation preparation and Engineered Fill construction requirements. Unless otherwise directed by the Engineer, temporary ramps shall be removed prior to completion of the work.

3.5 Grade Tolerances

- A. Engineered Fill:
 - 1. General. Engineered Fills shall be constructed to the net grade and cross section shown on the Drawings.
 - 2. Grade Tolerances. At all points a tolerance of 0.2 (two-tenths) foot above, and 0.1 (zero) foot below the prescribed grade will be permitted in the final dressing, provided that any excess material is so distributed that the crown of the Engineered Fill drains channelward and that there are no abrupt humps or depressions in surfaces. However, this tolerance above grade may be modified at locations where, in the opinion of the Engineer, such modifications will not impair the design or appearance of the project.

3.6 Slides

- A. In the event of the sliding of any part of the Engineered Fill during its construction, or during the one year period after acceptance, the Contractor shall, upon written order of the Engineer, cut out and remove the slide and then rebuild that portion of the Engineered Fill.

3.7 Temporary Haul Roads and Temporary Channel Crossings

- A. Temporary haul roads shall be constructed as required to transport materials from borrow source or excavation to Engineered Fill site.

3.8 Special Measures

- A. Measures and construction methods shall be incorporated as needed and practical that enhances fish and wildlife values. Special attention shall be given to protecting visual resources and maintaining key shade, food, and den trees.

4. MEASUREMENT AND PAYMENT

4.1 Measurement

- A. Engineered Fill. Engineered Fill will not be separately measured for payment.

4.2 Payment

- A. No separate payment will be made for the work covered under this section. Full compensation for all costs in connection with Cast-in-Place Concrete shall be included in the contract price for related work.
- B. No payment will be made for the Engineered Fill foundation preparation, shrinkage of material or materials placed above the net grades and slopes as allowance for shrinkage.
- C. No separate payment will be made for incidental grading beyond the projected toe of the Engineered Fill cross section.
- D. No payment will be made for construction or removal of temporary roads or ramps.
- E. No additional payment will be made for costs associated with stabilizing unstable materials

END OF SECTION

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ROCK SLOPE PROTECTION

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**SECTION 02270
ROCK SLOPE PROTECTION**

1. GENERAL

1.1 Description

- A. Work within this section shall include furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in placing Engineered Streambed Material, Ballast Boulders, ESM Boulders, and backfill where shown on the Drawings, as specified herein, or as otherwise directed by the Engineer.
- B. Related sections:
 - 1. ***Log Structures***; Section 02272
 - 2. ***Dewatering***; Section 02140
 - 3. ***Stripping and Excavation***, Section 02222

1.2 Submittals

- A. Submit to the Engineer, for review, the following:
 - 1. Certified weights of the rock delivered to the site.
 - 2. Quarry source and statement of materials and gradation tests on the rock source(s).
 - 3. A representative 5 cubic yard sample of the proposed Engineered Streambed Material shall be provided to the Engineer for approval, prior to delivery of Engineered Streambed Material to the project site.
 - 4. Sampling and Testing Assistance. Any difference of opinion between the Engineer and the Contractor shall be resolved by dumping and checking the gradation of the two random truck loads of rock. Mechanical equipment, a sorting site and labor needed to assist in checking gradation shall be provided by the Contractor at no additional cost to the Client.

1.3 Quality Assurance

- A. Tolerances. Place rock and concrete slope protection to the satisfaction of the Engineer, within a tolerance of minus 0 to plus 3 inches.
- B. Subgrade Preparation. Prior to placement of rock, Engineer shall verify subgrade preparation for rock.

2. PRODUCTS

2.1 Materials

- A. Imported Rock. Rock materials and gradation shall conform to Section 72-2.02 Materials of the State Standard Specifications. Rock size classes not designated below, shall be as shown on the Drawings, or as directed by the Engineer.
- Ballast Boulders. Ballast Boulders shall be sub-rounded to sub-angular. Minimum weight of Ballast Boulders shall be 4 tons.
 - ESM Boulders. ESM Boulders shall be sub-rounded to sub-angular with a y-axis dimension of 18-28 inches.
- B. Engineered Streambed Material. Engineered Streambed shall consist of dense, hard, durable non-friable stone free of organic debris and other deleterious substances. The rock shall have a minimum specific gravity of 2.5. Volcanic cinder material shall not be acceptable. Engineered Streambed Material shall conform to the gradation requirements of Table 2, below.

Table 2: Gradation requirements for Engineered Streambed Material, inches or sieve size

Percent of Mix Passing (by weight)	Size Range (inches)
100	18
75-85	12
55-75	9
40-55	6
20-40	3
8-25	.08-2
0-8	< .08

3. EXECUTION

3.1 Ballast Boulders

- A. Place Ballast Boulders within the boulder field to the elevations shown on the drawings. Placement locations shall be as determined in the field by the Engineer.

3.2 Engineered Streambed Material

- A. Engineered Streambed Material shall be placed to the lines, grades and depths shown on the Drawings, or as directed by the Engineer. Uniformly distribute large stones to produce the required gradation of rock. After placing Engineered Streambed Material, individually place ESM Boulders throughout the Engineered Streambed Material at the direction of the Engineer. ESM Boulders to protrude above finished Engineered Streambed Material grade 4-18 inches. Prevent contamination of rock materials by excavation and/or earth materials. Subgrade shall be uniform with no soil clumps or rocks greater than two inches.
- B. Following placement, rock surface shall be jetted with water to improve compaction and embed the fines within the mix. Jetting shall start at the upstream limits of placement and progress downstream. Jetting shall continue until the turbidity levels of runoff produced

from the jetting process have reached an acceptable level. All sediment-laden runoff generated by the jetting operations shall be pumped to a settling tank or similar device to reduce turbidity to acceptable levels, in compliance with permit conditions, prior to discharge to the creek. Comply with Section 02140, Dewatering.

4. MEASUREMENT AND PAYMENT

4.1 Measurement

- A. Ballast Boulders will not be independently measured for payment.
- B. Engineered Streambed Material will not be independently measured for payment.
- C. ESM Boulders will not be independently measured for payment.

4.2 Payment

- A. Ballast Boulder installation will be paid for at the lump sum contract price, which price will be payment in full for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing the Ballast Boulders within the "Boulder Field", complete in place, including excavation and backfill, and rock placement as shown on the Drawings, as specified herein, or as directed by the Engineer. Ballast Boulder used in association with "Log Structures" will be measured and paid for in accordance with Section 02272, Log Structures.
- B. Engineered Streambed Material will be paid for at the lump sum contract price, which price will be payment in full for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing Engineered Streambed Material, complete in place, including excavation and backfill, and rock placement, as shown on the Drawings, as specified herein, or as directed by the Engineer.
- C. No separate payment will be made for placement of ESM Boulders. All costs in connection with this work will be considered incidental to the cost of construction of the associated Engineered Streambed Material.
- D. Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Ballast Boulders	LS
Engineered Streambed Material	LS

END OF SECTION

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LOG STRUCTURES

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SECTION 02272
LOG STRUCTURES

1. GENERAL

1.1 Description

- A. Work within this section includes furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the Log Structures, complete in place, including excavation, and backfilling, cable connections, log and ballast boulder supply, preparation, and placement, and backfill of voids, as specified, as shown on the Drawings, or as otherwise directed by the Engineer.
- B. Log Structures includes all logs shown on the Drawings for use as Log Groins.
- C. Related Sections
 - 1. ***Dewatering***, Section 02140
 - 2. ***Stripping and Excavation***, Section 02222
 - 3. ***Rock Slope Protection***, Section 02270

1.2 Submittals

- A. Submit to the Engineer, for review, the following, prior to delivering materials to the work site:
 - 1. Product data sheet for cable and connectors
 - 2. Product data sheet for epoxy
 - 3. Quarry source for the ballast boulders
 - 4. Photos of all logs. Each log shall be tagged with a number, referenced in the photos.

2. PRODUCTS

2.1 Materials

- A. Ballast Boulders. Conform to the material requirements of Section 02270, Rock Slope Protection.
- B. Cable. Cable shall be 5/8 inch diameter galvanized wire rope with a minimum breaking strength of 25,000 lbs, conforming to ASTM A475.
- C. Fasteners. Fasteners shall be forged and galvanized single-saddle wire rope clips, sized to match the cable diameter.

- D. Epoxy. Anchoring adhesive shall be a two-component 100% solids epoxy based system supplied in manufacturer's standard cartridge and dispensed through a static-mixing nozzle supplied by the manufacturer. Epoxy shall meet the minimum requirements of ASTM C-881 specification for Type I, II, IV, and V, Grade 3, Class B and C and must develop minimum 12,650 psi compressive yield strength after 7 day cure. Epoxy must have a heat reflection temperature of a minimum 136 degrees Fahrenheit (58 degrees Celsius). Adhesive shall be Epoxy-Tie SET from Simpson Strong-Tie, Dublin, CA, or approved equivalent.
- E. Logs.
 - 1. Logs shall meet the material specifications and size classes shown on the Drawings.
 - 2. All logs shall be inspected for approval by the Engineer, prior to installation.
- F. Backfill. Backfill shall consist of "Engineered Streambed Material", per Section 02270, Rock Slope Protection.

3. EXECUTION

3.1 General

- A. Prior to the start of work, the Engineer shall designate representatives authorized to observe the Contractor's placement of Log Structures. The Contractor shall notify the authorized representative 72 hours prior to placement of Log Structures. Construct all Log Structures in the presence of the authorized representative.
- B. The construction of Log Structures requires equipment which can place rock and logs in precise locations. An excavator of a suitable size and containing a thumb is suggested.
- C. Placement of the logs and rocks is critical to the success of the Log Structures. To ensure proper placement, the Contractor shall provide a portable pump or other method to de-water excessive ground water from the excavation, as necessary.
- D. Rock connections. Holes for cabling into rock shall be drilled into sound material. Hole diameter shall be not more than 1/8 inch greater than that of the cable. Holes shall be drilled to align with the final orientation of the tensile forces in the cable, so as to minimize bending of the cable at the rock surface. Holes shall be cleaned of all dust and debris, prior to installation of cable. Cable shall be thoroughly cleaned with a solution of muriatic acid or with acetone to remove all grease or oil from bonded length. Fill the hole approximately 2/3 with epoxy before inserting the cable to the bottom of the hole. Allow adhesive to set up overnight before applying tension to cable.
- E. Cable connections. Each cable connection shall be secured with a minimum of 3 wire clips, tightened to the manufacturer's recommended torque. Prior to clipping wire in place, all slack shall be removed from the cable, as approved by the Engineer.
- F. Log Placement. Log placement locations shown on the Drawings are approximate. Exact locations shall be as approved by the Engineer, or his authorized representative.

- G. Place rootwads at an elevation where the majority of the root mass is below ordinary low water, as approved by the Engineer.

3.2 Field Quality Control

- A. Tolerances. Log and boulder placements shall be as approved by the Engineer.
- B. Logs. All logs shall be inspected for approval by the Engineer, prior to installation.

4. MEASUREMENT AND PAYMENT

4.1 Measurement

- A. Log Structures. Log Structures will not be separately measured for payment

4.2 Payment

- A. Log Structures. Log Structures will be paid for at the lump sum contract price, which price will be payment in full for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing Log Structures, complete in place, including excavation and backfill, rock placement, and connections, as shown on the Drawings, as specified herein, or as directed by the Engineer.

<u>Pay Item</u>	<u>Pay Unit</u>
Log Structures	LS

END OF SECTION

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SECTION 02378
SILT FENCE

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SECTION 02378
SILT FENCE

1. GENERAL

1.1 Description

- A. Work under this Section includes furnishing all labor, materials, equipment, and incidentals to install, maintain, and remove silt fence, as shown on the Drawings, as specified herein, or as otherwise directed by the Engineer.
- B. This Specification is applicable to the use of a geotextile as a vertical, permeable interceptor designed to remove suspended soil from overland water flow. The function of a temporary silt fence is to filter and allow settlement of soil particles from sediment-laden water. The purpose is to prevent the eroded soil from being transported off the construction site by water runoff.
- C. Temporary silt fence shall be furnished, installed, maintained, and later removed at the locations shown on the Drawings, as specified, and as directed by the Engineer.
- D. Temporary silt fence shall be one of the water pollution control practices for sediment control.

1.2 Related Sections

- 1. ***Dewatering***, Section 02140
- 2. ***Construction Facilities and Temporary Controls***, Section 01500
- 3. ***Stripping and Excavation***, Section 02222

1.3 References

- A. American Association of State Highway and Transportation Officials (AASHTO) "Standard Specification for Geotextile Specification for Highway Applications" Designation M 288-96
- B. American Society for Testing and Materials (ASTM):
 - 1. D 123 – Standard Terminology Relating to Geotextiles
 - 2. D 276 – Standard Test Method for Identification of Fibers in Textiles
 - 3. D 3786 - Standard Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics.
 - 4. D 4354 - Practice for Sampling of Geosynthetics for Testing.
 - 5. D 4355 - Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus).
 - 6. D 4439 - Terminology for Geotextiles.
 - 7. D 4491 - Test Methods for Water Permeability of Geotextiles by Permittivity.
 - 8. D 4533 - Test Method for Index Trapezoid Tearing Strength of Geotextiles.
 - 9. D 4632 - Test Method for Grab Breaking Load and Elongation of Geotextiles.

10. D 4759 - Practice for Determining the Specification Conformance of Geosynthetics.
 11. D 4751 - Test Method for Determining Apparent Opening Size of a Geotextile.
 12. D 4833 - Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.
 13. D 4873 - Guide for Identification, Storage, and Handling of Geotextiles.
- C. Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP).
- D. International Standards Organization (ISO) 9002 – Quality System CERTIFICATION.

1.4 Definitions

- A. Minimum Average Roll Value (MARV): Property value calculated as typical minus two standard deviations. Statistically, it yields a 97.7 percent degree of confidence that any sample taken during quality assurance testing will exceed value reported.
- B. Typical Roll Value: Property value calculated from average or mean obtained from test data.

1.5 Submittals

- A. Submit to the Engineer for review, the following:
- B. Manufacturer's Data and Certification:
1. The Contractor shall provide the Engineer a certificate stating the name of the geotextile manufacturer, product name, style, chemical compositions of filaments or yarns and other pertinent information to fully describe the geotextile.
 2. The Manufacturer is responsible for establishing and maintaining a quality control program to assure compliance with the requirements of the Specification. Documentation describing the quality control program shall be made available upon request.
 3. The manufacturer's certificate shall state that the furnished geotextile meets MARV requirements of the Specification as evaluated under the manufacturer's quality control program. The certificate shall be attested to by a person having legal authority to bind the Manufacturer.
 4. Manufacturing Quality Control (MQC) test results shall be provided upon request.

1.6 Delivery, Storage, and Handling

- A. Geotextile labeling, shipment and storage shall follow ASTM D 4873.
- B. Product labels shall clearly show the manufacturer or supplier name, style name, and roll number.

- C. Each shipping document shall include a notation certifying that the material is in accordance with the manufacturer's certificate.
- D. Each geotextile roll shall be wrapped with a material that will protect the geotextile from damage due to shipment, water, sunlight, and contaminants.
- E. The protective wrapping shall be maintained during periods of shipment and storage. If the wrapping is damaged prior to installation, the outer wrap of geotextile material must be discarded before installation.
- F. During storage, geotextile rolls shall be elevated off the ground and adequately covered to protect them from the following: Site construction damage, extended exposure to ultraviolet (UV) radiation, precipitation, chemicals that are strong acids or strong bases, flames, sparks, temperatures in excess of 71 deg C (160 deg F) and any other environmental condition that might damage the geotextile.

1.7 Quality Assurance

A. Geotextile:

- 1. Geotextiles shall be subject to sampling and testing to verify conformance with this Specification. Sampling for testing shall be in accordance with ASTM D 4354.
- 2. Acceptance shall be in accordance with ASTM D 4759 based on testing of either conformance samples obtained using Procedure A of ASTM D 4354, or based on manufacturer's certifications and testing of quality control samples obtained using Procedure B of ASTM D 4354.
- 3. Quality Assurance Sampling and Testing will be waived for ISO 9002 Certified Manufacturing Facilities. Documentation of ISO 9002 Certification shall be provided upon request.

B. Sewn Seams (if required):

- 1. For seams that are to be sewn in the field, the Contractor shall provide at least a two meter (six feet) length of sewn seam for sampling by the Engineer before the geotextile is installed.
- 2. For seams that are sewn in the factory, the Engineer shall obtain samples of the factory seams at random from a roll of geotextile that is to be used on the project. If seams are to be sewn in both directions, samples of seams from both directions shall be provided.
- 3. For seams that are field sewn, the seams sewn for sampling shall be sewn using the same equipment and procedures as will be used for the production seams.
- 4. The seam assembly description shall be submitted by the Contractor along with the sample of the seam. The description shall include the seam type, sewing thread, and stitch density.

2. PRODUCTS

2.1 Materials

- A. At the Contractor's option, temporary silt fence shall be prefabricated or constructed with silt fence fabric, posts, and fasteners.
- B. Silt Fence Fabric. Silt fence fabric shall be geotextile manufactured from woven polypropylene or polymer material. Silt fence fabric may be virgin, recycled, or a combination of virgin and recycled polymer materials. No virgin or recycled polymer materials shall contain biodegradable filler materials that can degrade the physical or chemical characteristics of the finished fabric. The Engineer may order tests to confirm the absence of biodegradable filler materials in conformance to the requirements in ASTM Designation: E 204 (Fourier Transformed Infrared Spectroscopy-FTIR).

Silt fence fabric shall conform to the following requirements:

Specification	Requirements
Width, inches, min.	36
Grab tensile strength (one inch grip), pounds, min. in each direction ASTM Designation: D 4632*	124
Elongation, percent minimum in each direction ASTM Designation: D 4632*	15
Permittivity, 1/sec., min. ASTM Designation: D 4491	0.05
Flow rate, gallons per minute per square foot, min. ASTM Designation: D 4491	10
Ultraviolet stability, percent tensile strength retained after 500 hours, min. ASTM Designation: D 4355 (xenon-arc lamp and water spray weathering method)	70

* or appropriate test method for specific polymer

- C. Posts. Posts for temporary silt fence shall be one of the following:
1. Untreated fir or pine, a minimum of 2" x 2" in size, and four feet in length. One end of the post shall be pointed.
 2. Steel and have a "U," "T," "L," or other cross sectional shape that can resist failure from lateral loads. The steel posts shall have a minimum weight of 0.8-pound per foot and a minimum length of 4 feet. One end of the steel posts shall be pointed and the other end shall be capped with an orange or red plastic safety cap which fits snugly to the steel post. The Contractor shall submit to the Engineer for approval a sample of the capped steel post prior to installation.
- D. Fasteners. Fasteners for attaching silt fence fabric to posts shall be as follows:
1. When prefabricated silt fence is used, posts shall be inserted into sewn pockets.
 2. Silt fence fabric shall be attached to wooden posts with nails or staples as shown on the Drawings or as recommended by the manufacturer or supplier. Tie wire or locking plastic fasteners shall be used to fasten the silt fence fabric to steel posts.

Maximum spacing of fasteners shall be eight inches along the length of the steel post.

3. EXECUTION

3.1 Preparation

A. Field Assembly:

1. The silt fence fabric shall be installed on the side of the posts facing the slope.
2. The geotextile at the bottom of the fence shall be buried in a "J" configuration to a minimum depth of 150 mm (six inches) in a trench so that no flow can pass under the silt fence. Mechanically pushing 12 inches of the silt fence fabric vertically through the soil may be allowed if the Contractor can demonstrate to the Engineer that the silt fence fabric will not be damaged and will not slip out of the soil resulting in sediment passing under the silt fence fabric.
3. The trench shall be backfilled and the soil compacted over the geotextile.
4. The geotextile shall be spliced together with a sewn seam only at a support post, or two sections of fence may be overlapped instead.
5. The Contractor must demonstrate to the satisfaction of the Engineer that the geotextile can withstand a sediment load of $\frac{1}{3}$ the height of the fence.
6. The posts shall be placed at a spacing as shown on the project Drawings. Post should be driven or placed a minimum of 450 mm (18 inches) into the ground. Depth shall be increased to 600 mm (24 inches) if fence is placed on a slope of 3:1 or steeper. Where 450 mm (18 inches) depth is impossible to attain, the posts should be adequately secured to prevent overturning of the fence due to sediment loading.
7. The support fence shall be fastened securely to the upslope side of the fence post. The support fence shall extend from the ground surface to the top of the geotextile.
8. When self-supported fence is used, the geotextile shall be securely fastened to fence posts.
9. Temporary silt fence shall be installed parallel with the slope contour in reaches not to exceed 500 feet. A reach is considered a continuous run of temporary silt fence from end to end or from an end to an opening, including joined panels. Each reach shall be constructed so that the elevation at the base of the fence does not deviate from the contour more than $\frac{1}{3}$ of the fence height. The fence shall be placed such that water cannot runoff around the end of the fence; this may be accomplished by constructing end-returns that angle up the slope.
10. The silt fence should be limited to handle an area equivalent to 90 square meters (100 sy) per three meters (ten feet) of fence. Caution should be used where the

site slope is greater than 1:1 and water flow rates exceed three liters (0.8 gallons) per second per three meters (ten feet) of fence.

3.2 Inspection

- A. The Contractor shall inspect all temporary silt fences immediately after each rainfall, and at least daily during prolonged rainfall. Any deficiencies shall be immediately corrected by the Contractor.
- B. The Contractor shall also make a daily review of the location of silt fences in areas where construction activities have altered the natural contour and drainage runoff to ensure that the silt fences are properly located for effectiveness. Where deficiencies exist as determined by the Engineer, additional silt fence shall be installed as directed by the Engineer. Damaged or otherwise ineffective silt fences shall be repaired or replaced promptly.
- C. Sediment deposits shall either be removed when the deposit reaches one third the height of the fence, or a second silt fence shall be installed as directed by the Engineer.

3.3 Removal

- A. The silt fence shall remain in place until the Engineer directs it be removed. Upon removal, the Contractor shall remove and dispose of any excess sediment accumulations, recontour the area to blend smoothly with adjacent grades, and revegetate all bare areas in accordance with contract requirements. Trimming the silt fence fabric and leaving it in place will not be allowed.
- B. Removed silt fence may be used at other locations provided the geotextile and other material requirements continue to be met to the satisfaction of the Engineer.
- C. Ground disturbance caused by the installation and removal of the temporary silt fence shall be backfilled and repaired in conformance with the provisions in Section 15-1.02, "Preservation of Property," of the Standard Specifications.

4. MEASUREMENT AND PAYMENT

4.1 Measurement

- A. Temporary silt fence will not be separately measured for payment.

4.2 Payment

- A. No separate payment will be made for temporary silt fence. Full compensation for all costs associated with this work, as shown on the Drawings, or as specified herein, shall be paid for under Construction Facilities and Temporary Controls 01500.

END OF SECTION

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COIR ROLL

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SECTION 02379
COIR ROLL

1. GENERAL

1.1 Description

- A. Work under this Section includes furnishing all labor, materials, equipment, and incidentals to install and maintain Coir Roll, as shown on the Drawings, as specified herein, or as otherwise directed by the Engineer.
- B. Coir Roll shall be furnished, installed, and maintained at the locations shown and in conformance with details on the Drawings and these Specifications. Coir Roll shall be installed on excavation and embankment slopes and other disturbed soil areas, active or non-active. Coir Roll shall be one of the water pollution control practices for sediment control. At the option of the Contractor, Coir Roll shall be Type 1 or Type 2.

1.2 Related Sections

- 1. ***Construction Facilities and Temporary Controls***, Section 01500
- 2. ***Stripping and Excavation***, Section 02222

1.3 Submittals

- A. Submit to the Engineer, for review, the following:
- B. Manufacturer's Data and Certification's:
 - 1. A certificate stating the name of the Coir Roll manufacturer, product name, style compositions of filaments or yarns and other pertinent information to fully describe the geotextile, along with the manufacturer's certification of compliance with the material specifications contained herein.
 - 2. The Manufacturer is responsible for establishing and maintaining a quality control program to assure compliance with the requirements of the Specification. Documentation describing the quality control program shall be made available upon request.

2. PRODUCTS

2.1 Materials

- A. Coir Roll. Coir Roll shall be either:
 - 1. Constructed with a pre-manufactured blanket consisting of coconut fibers. The blanket shall be between six feet and eight feet in width and between 65 feet and 95 feet in length. Wood excelsior shall be individual fibers, of which 80 percent shall be six inches or longer in length. The blanket shall have a

biodegradable jute, sisal, or coir fiber netting on at least one side. The blanket shall be rolled along the width and secured with jute twine spaced six feet apart along the full length of the roll and placed six inches from the ends of each roll. The finished roll shall be between eight inches and ten inches in diameter, a minimum of 20 feet in length, and shall weigh a minimum of 0.5 pound per linear foot. More than one blanket may be required to achieve the finished roll diameter. When more than one blanket is required, blankets shall be jointed longitudinally with an overlap of six inches along the length of the blanket.

2. A pre-manufactured roll coconut fiber encapsulated within a biodegradable jute, sisal, or coir fiber netting. The netting shall have a minimum durability of one year after installation. The netting shall be secured tightly at each end of the roll. Rolls shall be between eight inches and 12 inches in diameter. Rolls between eight inches and ten inches in diameter shall have a minimum weight of one pound per linear foot and a minimum length of 20 feet. Rolls between ten inches and 12 inches in diameter shall have a minimum weight of three pounds per linear foot and a minimum length of 10 feet.

B. Stakes. Stakes shall be untreated fir, redwood, cedar, or pine, and cut from sound timber. They shall be straight and free of loose or unsound knots and other defects which would render them unfit for the purpose intended. Metal stakes shall not be used.

1. Stakes used for Type 1 installation shall be a minimum of 1" x 2" x 24" at the top, and tapered evenly along their length to a point at the base.
2. Stakes used for Type 2 installation shall be a minimum of 1" x 1" x 24".

C. Rope. Rope shall be biodegradable, such as sisal or manila, with a minimum diameter of 1/4 inch.

3. EXECUTION

3.1 Installation

A. Coir Roll shall be installed as follows:

1. Coir Roll (Type 1): Furrows shall be constructed to a depth between two inches and four inches, and to a sufficient width to hold the Coir Roll. Stakes shall be installed 36 inches apart along the length of the Coir Roll and stopped at 12 inches from each end of the rolls. Stakes shall be driven until a maximum of two inches of stake remains above the top of the roll.
2. Coir Roll (Type 2): Rope and notched stakes shall be used to restrain the Coir Rolls against the slope. Stakes shall be driven into the slope until the notch is even with the top of the Coir Roll. Rope shall be knotted at each stake and laced between stakes. After installation of the rope, stakes shall be driven into the slope such that the rope will hold the Coir Roll tightly to the slope. Furrows will not be required.

3. Coir Roll shall be placed ten feet apart along the slope for slope inclination (horizontal:vertical) of 2:1 and steeper, 15 feet apart along the slope for slope inclination between 2:1 and 4:1, 20 feet apart along the slope for slope inclination between 4:1 and 10:1, and a maximum of 50 feet apart along the slope for slope inclination of 10:1 and flatter.
4. The bedding area for the Coir Roll shall be cleared of obstructions including rocks, clods, and debris greater than one inch in diameter before installation.
5. Coir Roll shall be installed parallel to the slope contour.
6. Coir Roll shall be installed prior to seeding and following the application of slope stabilization fabric in the same area.

3.2 Maintenance

- A. The Contractor shall inspect all Coir Roll immediately after each rainfall, and at least daily during prolonged rainfall. Any deficiencies shall be immediately corrected by the Contractor.
- B. The Contractor shall also make a daily review of the location of Coir Roll in areas where construction activities have altered the natural contour and drainage runoff to ensure that the Coir Rolls are properly located for effectiveness. Where deficiencies exist as determined by the Engineer, additional Coir Rolls shall be installed as directed by the Engineer.
- C. Damaged or otherwise ineffective Coir Roll shall be repaired or replaced promptly. Coir Roll shall be maintained to disperse concentrated water runoff and to reduce runoff velocities. Split, torn, or unraveling rolls shall be repaired or replaced. Broken or split stakes shall be replaced. Sagging or slumping Coir Roll shall be repaired with additional stakes or replaced. Locations where rills and other evidence of concentrated runoff have occurred beneath the rolls shall be corrected. Coir Roll shall be repaired or replaced within 24 hours of identifying the deficiency.

3.3 Removal

- A. Coir Rolls shall remain in place after project completion, and be allowed to naturally degrade.

4. MEASUREMENT AND PAYMENT

4.1 Measurement

- A. Coir Roll will be measured by the linear foot of Coir Roll installed at the locations indicated on the Drawings, as specified, or as directed by the Engineer.

4.2 Payment

- A. Coir Roll will be paid for at the contract price per linear foot, which price will be payment in full for furnishing all labor, materials, tools, equipment, and incidentals necessary to install, maintain throughout the construction, and, where specified, to remove Coir Roll after site stabilization.
- B. Payment shall be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Coir Roll	Linear Foot

END OF SECTION

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SECTION 02932
SEEDING

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SECTION 02932
SEEDING

1. GENERAL

1.1 Description

- A. Work within this section includes furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in performing seeding as specified herein, as shown on the Drawings, or as directed by the Engineer.
- B. Establishment Period: The intent of the Establishment Period is to produce a uniform stand of the specified grasses in the seeded areas shown on the Drawings. The Establishment Period shall begin not before September 1 and no later than October 1 in the year of construction. The Establishment Period shall be complete when the Contractor has established the desired stand of vegetation. The Contractor shall be responsible for establishing the desired stand of vegetation by December 1 of the year of construction.

1.2 Related Work

- A. The work described under this section is related to the following sections of the Specifications:
- B.
 - 1. *Stripping and Excavation, Section 02222*
 - 2. *Slope Protection Fabric, Section 02201*
 - 3. *Planting, Section 02950*

1.3 Performance

- A. Establishment Period:
 - 1. Seeded Area Cover: The cover requirement shall be 80 percent ground cover by vegetation on all slopes, as estimated by the Engineer. All areas not achieving the cover requirement within the designated Establishment Period shall be reseeded in accordance with **Section 02932** at no additional cost to the Owner.
- B. Maintenance Period:
 - 1. Seeded Area Cover: The cover requirement for the Maintenance Period shall be 80 percent ground cover by vegetation on all slopes, as estimated by the Engineer. All areas not achieving the minimum cover requirement shall be reseeded in accordance with Section 02932 at no additional cost to the Owner.

1.4 Submittals

- A. Submit to the Engineer, for review, the following:

1. List of origin/collection location for each seed species
2. A representative one-ounce sample of each seed mixture supplied for the job, labeled as to content, purity, and germination percentage.
3. Duplicate copies of invoices for all materials. Invoices for fertilizer shall show the grade furnished.

1.5 Quality Assurance

- A. All seed shall be labeled in accordance with the California Food and Agricultural Code and shall be delivered to the site in sealed individual, unmixed bags with the vendor's certificate attached. Seed shall be sampled and tested in accordance with the State Standard Specifications. Seed treated with mercury compounds shall not be used.
- B. Fertilizer shall be delivered in containers labeled in accordance with applicable state regulations and bearing the warranty of the producer for the grade furnished.
- C. Seed which has become wet, moldy, or otherwise damaged in transit or in storage, will not be acceptable.

2. PRODUCTS

2.1 Materials

- A. Seed Source. Seed shall be collected or propagated from source populations within the Central Valley region of the California Floristic Province.
- B. Seed shall be pre-mixed, as appropriate, by the supplier before shipment to the Project site. At no time shall the seed mix contain noxious weed seed. Seed shall be maintained in optimal health and be protected at all times from animal damage; vandalism; inclement weather conditions, including drought, wind, and frost; toxic water; sunlight; moisture; or contact with vehicles, equipment, and tools and any other conditions that would damage or reduce the viability of the seed.
- C. Seed Mix. The seed mix and application rates are as shown on the Drawings. No substitutions are allowed without written consent of the Engineer.
- D. Fertilizer. Fertilizer shall be Sustane® fertilizer (or approved equal) and shall contain a minimum of 5 percent nitrogen, 2 percent phosphorus, 4 percent potash, uniform in composition, dry and free flowing. Fertilizer shall be delivered in containers labeled in accordance with applicable State regulations and bearing the warranty of the producer for the grade furnished.
- E. Wood Fiber Mulch. Wood Fiber Mulch shall be dyed virgin wood cellulose fiber specially prepared for Hydro-Mulching.
- F. Compost Mulch. Compost mulch shall be Hydropost™, or an approved equivalent.

- G. Straw Mulch. Straw mulch shall be derived from wheat or barley. The Contractor shall furnish evidence that clearance has been obtained from the County Agricultural Commissioner, as required by law, before straw obtained from outside the county in which it is to be used is delivered to the site of the work. Straw that has been used for stable bedding shall not be used. Straw shall be free of mold. Straw shall be cured and dry with no water added after baling. Source must meet or exceed state certification standards for “weed free”.
- H. Water. Water shall be furnished by the Contractor and shall be free of chemicals detrimental to the seed mixture.

3. EXECUTION

3.1 Preparation

- A. General. Seed the areas disturbed by construction activities, as specified herein or as directed by the Engineer.
- B. Debris Removal. Prior to ground surface preparation operations remove and dispose of all wire, rubbish, stones, and other material which might hinder proper grading, and subsequent maintenance.
- C. Surface Preparation. Surfaces which are too hard and smooth to accept the seeding, as determined by the Engineer, shall be broken up to a minimum depth of 6 inches, by methods approved by the Engineer, until the condition of the soil is acceptable. When conditions are such, by reason of excessive moisture or other factors, that satisfactory results are not likely to be obtained, the work shall be stopped and shall be resumed only when directed. Slopes in excess of 25% shall be prepared by track-walking or equivalent method approved by the Engineer.

3.2 Application of Seed

- A. Existing Features. During seeding operations, care shall be taken to avoid damaging existing facilities, vegetation to remain, or any other items on or around the planting areas.
- B. Seeding Areas: Apply seed to areas indicated on the Drawings, or as directed by the Engineer.
- C. Time of Seeding
 - 1. Perform all seeding between September 15th and October 1st of the year construction begins. The seeding operation shall be halted when, in the opinion of the Engineer, conditions of high winds, excessive moisture or other factors are not conducive to satisfactory results. Upon written request of the Contractor, and upon written approval of the Engineer, seeding may be done during off seasons provided that:
 - a. The resulting stand of grass shall be at least equal to the stand that might be expected from planting during the normal season; and

- b. The establishment period shall be lengthened, as required, to produce the above specified stand at no additional cost to the Owner.
 2. Perform seeding prior to placement of erosion control fabric, where specified.
- D. Method of Seeding: Seeding may be performed mechanically in a dry condition or with hydro-seeding equipment, at the Contractor's option.
- E. Hydro-seeding. The seed and fertilizer (if specified) shall be mixed with cellulose fiber and water to form a slurry. Mix the slurry in tanks having continuous agitation so that a homogeneous mixture is discharged hydraulically through hoses on the area to be seeded. Seed species shall be added to the hydro-seeder in the Engineer's presence to ensure a seeding rate and quality as specified on Drawings. Seed shall be discharged within 2 hours. If mixture remains in tank for more than 2 hours, it shall be removed from the job site and replaced at the Contractor's expense. The Contractor shall employ the following two-step Hydro-seeding process.
 1. Step 1: Apply a complete mixture as follows: Apply Seed mix at the rate specified on the Drawings, compost mulch at a rate of 450 pounds per acre, and Wood Fiber Mulch at a rate of 150 pounds per acre.
 2. Step 2: Apply a complete mixture as follows: Apply compost mulch at a rate of 900 pounds per acre, Wood Fiber Mulch at a rate of 300 pounds per acre, and stabilizing emulsion at a rate of 100 pounds per acre.
- F. Broadcast Seeding. Broadcast seeding may be used in lieu of hydro-seeding or to reseed any previously hydro-seeded areas disturbed during planting operations. Seed shall be dry-applied by the following method:
 1. Broadcast seed and fertilizer (if specified), at the rates specified on the Drawings, uniformly by hand, mechanical hand seeder, combination seed spreader and cultipacker, or other approved equipment. Where seed is broadcast by hand or mechanical hand seeder, half the seed shall be sown with the sower moving in one direction, and the remainder sown with the sower moving at right angles to the first sowing. Broadcast seeding shall not be done during windy weather.
 2. Rake seed into the soil to achieve a sowing depth of approximately 1/8 inch to 1/4 inch.
 3. Following the application of seed, straw mulch shall be pneumatically applied or hand broadcast at the rate of 3,000 pounds per acre, where erosion control fabric is not specified, and 500 lbs per acre where erosion control fabric will be used.
 4. Following the application of mulch, Apply stabilizing emulsion with Hydro-seeding equipment at a rate of 100 pounds per acre.

3.3 Establishment

- A. Watering. Following seed application, apply irrigation at rates and times approved by the Engineer to meet the performance requirements detailed in this Section. Keep the seeded areas constantly moist during the period of the Contractor's responsibility. Apply water so as not to gully the soil, using agricultural sprinklers or other means approved by the Engineer.
- B. Period. The Contractor shall be responsible for the proper care of the seeded areas from the time of seeding until the desired stand of vegetation is established. The need for repair and reseeding (as described herein) within the establishment period shall be as determined by the Engineer.
- C. Protection. Protect areas susceptible to vehicular or heavy foot traffic by erecting suitable barricades immediately after seeding is completed and/or by placing warning signs of a type approved by the Engineer.

3.4 Repair

- A. General. When any portion of the ground surface becomes gullied or otherwise damaged following seeding within the period of Contractor's responsibility, repair the affected portion to re-establish the condition and grade of the soil prior to planting and then reseed as specified for initial planting, all at no cost to the Owner.
- B. Reseeding. When it becomes evident that the seeding has been unsuccessful, the Engineer will require that these areas be reseeded with the same seed and quantity as specified for the initial seeding. Complete reseeding within fifteen (15) days following notification and these areas shall be maintained by watering, as specified above, until the successful grass is established. Prepare the area to be reseeded as directed by the Engineer, to receive the reseeding.

3.5 Field Quality Control

- A. During the course of work or upon completion of the project, a check of the quantities of materials will be made against the areas treated, and if the minimum rates of application have not been met, the Engineer will require the distribution of additional quantities of those materials to make up the minimum applications specified.

4. MEASUREMENT AND PAYMENT

4.1 Measurement

- A. Seeding will be measured on a per acre basis for each acre of native seed mix furnished and installed by the Contractor and approved by the Engineer (as shown on the Drawings).
- B. Seeding of areas disturbed by the Contractor, in addition to what is shown on the Drawings, will not be measured for payment.

4.2 Payment

- A. Payment for seeding will be paid at the contract unit price for each acre seeded, which price will include all costs in connection therewith.
- B. No separate payment will be made for the seeding of areas disturbed by the Contractor, in addition to what is shown on the Drawings. Areas seeded in addition to those shown on the Drawings shall be seeded according to the specifications at the Contractor's own expense.
- C. Payments for Seeding will be made as follows:
 - 1. Following the Engineer's review and approval of the completed seeding installation, 80% of the contract price for seeding will be included in the estimate for payment.
 - 2. Following the Engineer's review and approval of established seeding, meeting the specified coverage requirements, the remaining 20% of the contract price for seeding will be included in the estimate for payment.

<u>Pay Item</u>	<u>Pay Unit</u>
Seeding	Acre

END OF SECTION

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PLANTING

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**SECTION 02950
PLANTING**

1. GENERAL

1.1 Description

- A. The work required under this Section shall include, but is not limited to, all labor, tools, materials, equipment and incidentals required to salvage and relocate willow transplants, as shown on the Drawings, described in these Specifications or as directed by the Engineer.
- B. Container plants will be supplied and installed by the Owner and are not part of this work item.

1.2 Related Sections

- A. The work described under this Section is related to the following Sections of the Specifications:
 - 1. ***Slope Protection Fabric***, Section 02201
 - 2. ***Seeding***, Section 02932

1.3 Submittals

- A. Written description and map of the willow transplant collection locations to be used to salvage willows for the project.

1.4 Quality Assurance

- A. Proper Installation. The Contractor shall be responsible for proper installation of the willow transplants to ensure healthy and vigorous growth and development according to the Plans, these Specifications and the Engineer's direction.
- B. Responsibility. It is the responsibility of the Contractor to carefully salvage and relocate all willow transplants.

2. PRODUCTS

2.1 General

- A. Willow Transplant Storage. Plants shall be maintained and be protected at all times from animal damage; vandalism; inclement weather conditions, including drought, wind, and frost; toxic water; sunlight; moisture; or contact with vehicles, equipment, and tools and any other conditions that would damage or reduce the viability of the plants. Plants may be stored on the site in the Contractor's staging area provided a temporary fence is erected for plant protection, or at another location approved by the Engineer in writing. Shade, frost, and wind protection may be used if necessary to protect the health of the

transplants. Transplants shall be maintained moist at all times before planting and shall be watered 1- hour or less before installation and shall be moist when installed.

2.2 Materials

- A. Willow Transplants. Willow Transplants are live willow plants with intact rootwads excavated from the project area. Plant materials shall be sound, healthy specimens salvaged per the notes on the Drawings, as described in these Specifications and as directed by the Engineer.
- B. Wood Fiber Mulch. Wood Fiber Mulch shall be dyed virgin wood cellulose fiber specially prepared for Hydro-Mulching.

3. EXECUTION

3.1 General

- A. Drawings. The Drawings are partially diagrammatic for graphic clarity and, therefore, do not show the exact individual planting locations for each species to be installed. The Contractor shall be responsible for the installation of plants at the typical spacing and layouts shown on the Drawings and described in these Specifications, and as directed by the Engineer.
- B. Existing Trees. The Contractor shall be responsible for providing soil amendment and mulch to the existing trees that will have grading disturbance within their drip lines.

3.2 Preparation

- A. Laws, Codes, Ordinances and Regulations. All local, municipal and State laws, codes, ordinances and regulations governing or relating to any part of this work are considered a part of these Specifications and shall be conformed to by the contractor. These Specifications and the Drawings shall take precedence whenever they call for a higher quality or larger size than is required by the aforementioned codes, ordinances, and regulations. The Contractor shall be responsible for conformance to all applicable codes governing the materials and work at this Project site. Manufacturer's specifications shall govern should their directions and detailed drawings address information not included in these Specifications and the Drawings.

3.3 Site Conditions

- A. Site Conditions. The contractor shall verify site conditions and be familiar with existing grade conditions, locations of existing features to be preserved, and all existing vegetation to remain. Field adjustments may be necessary to avoid disturbances to existing vegetation to remain. Before ordering materials or proceeding with work, the Contractor shall verify all dimensions and quantities between the Drawings, these Specifications and field conditions; any and all discrepancies shall be reported immediately to the Engineer.

- B. Field Adjustments. Field Adjustments necessary to accommodate or to minimize disturbances to existing site conditions shall be done at the Contractor's expense. Work shall be postponed in any area of discrepancy with the Drawings or these Specifications until the Engineer has provided a written resolution to the conflict. The Contractor shall assume full responsibility for proceeding with work without written approval.
- C. Coordination. The Contractor shall coordinate the planting installation to avoid conflicts with roads, utilities, other construction, and any existing features.

3.4 Plant Installation

- A. The Contractor shall be responsible for providing and installing each of the plant species and related quantities, as indicated on the Drawings.
- B. Installation Procedure. The plant installation shall conform to the Drawings and these Specifications. If planting adjustments are necessary, the Contractor shall proceed only after receiving approval from the Engineer for such adjustments. Plants shall be set out daily, ensuring that the number of plants distributed to the planting areas can actually be installed and watered. To assure quality installation, onsite workers shall be trained and supervised until satisfactory planting techniques are achieved according to the satisfaction of the Engineer.
- C. Plant Layout. Individual planting locations shall be field marked (e.g. staked or flagged) per plant species by the Contractor. Field marked plant locations must be approved by the Engineer before the start of any plant installation operations. Plants shall be distributed throughout the Project site according to the locations and quantities indicated and as detailed on the Drawings. At no time shall plants be located within the access road locations indicated on the Drawings. At all times, plants will be located 5 feet clear of any access roads, ramps, or other structures.
- D. Weed Removal. Before plant installation, weeds shall be removed within a 4-foot radius, minimum, of individual planting sites by mechanical or manual methods. At no time shall herbicides be used for weed control. At all times, native volunteer plants shall be preserved as directed by the Engineer.

3.5 Willow transplants rootwad salvage and replanting

- A. Salvage.
 - 1. All willow shrubs/trees within the area to be disturbed by grading operations shall be salvaged and replanted.
 - 2. All plants to be removed shall be flagged for approval by the Engineer.
 - 3. Prior to removal, stems shall be lopped to 12-18 inches above the root crown, using sharp, clean tools.
 - 4. The rootwad and a minimum twelve inch layer of roots and soil shall be removed from the ground and relocated in such a manner as to minimize disturbance to the soil bound by the roots.
 - 5. If the rootwad is to be stored for more than 4 hours prior to replanting, it shall be immediately covered with a single layer of saturated burlap to prevent desiccation of the roots. Contractor shall maintain saturation of the burlap and

soil mass.

6. Rootwads shall not be stacked during storage, and shall be placed under shade covering when ambient temperatures exceed 75 degrees.
7. In no event shall salvaged rootwads be stored for periods exceeding 72 hours.

C. Installation

1. Transplanted willow shall be placed at the locations shown on the Drawings, or as Directed by the Engineer. Placement locations and quantity shall be adjusted in the field to accommodate available material quantities.
2. The excavated rootwad shall be placed in a prepared hole. The hole shall be filled with water approximately 1 hour (not more than 2 hours) prior to planting. The sides of the planting hole shall be scarified prior to planting.
3. Remove burlap prior to planting. Backfill the hole half way with native soil and jet with water to remove voids. Continue to add soil and water until the saturated backfill material covers the top of the root crown to a maximum depth of 2 inches.
4. Rootwads shall be hand watered weekly until the onset of winter rains, or the installation of the irrigation system (to be performed by the Owner).

3.6 Clean Up

- A. Daily Cleanup. Site cleanup shall occur on a daily basis. All garbage, construction debris, excess plants and dirt, other discarded materials, and extraneous equipment caused by or due to the Contractor shall be removed offsite at the Contractor's expense and in accordance with State and local regulations.

3.7 Observation and Testing

- A. Observations. The Contractor shall provide the Engineer with 48-hours advance notification for the following required planting stage acceptance observations.
1. Field marking of individual willow salvage and relocation sites.

4. MEASUREMENT AND PAYMENT

4.1 Measurement

- A. Willow Transplanting. Willow Transplanting will not be measured for payment.

4.2 Payment

- A. Willow Transplanting. Willow Transplanting will be paid for at the contract lump sum price for Willow Transplanting, which price will include all costs in connection therewith.

<u>Pay Item</u>	<u>Pay Unit</u>
Willow Transplanting	Lump Sum

END OF SECTION

BIOLOGICAL ASSESSMENT

Secret Ravine Fish Passage Improvement Project

Submitted by

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1.0 PROJECT DESCRIPTION

1.1 INTRODUCTION

The Dry Creek Conservancy (DCC), in conjunction with the City of Roseville and the California Department of Fish and Game (CDFG) Office of Spill Prevention and Response (OSPR), proposes to improve fish passage on Secret Ravine in western Placer County, California (Figure 1). Secret Ravine is a perennial stream that supports spawning, seasonal rearing and migration of the California Central Valley Distinct Population Segment (DPS) of steelhead (*Oncorhynchus mykiss*) and spawning, juvenile rearing and emigration of the Central Valley Evolutionarily Significant Unit (ESU) of fall-run Chinook salmon (*Oncorhynchus tshawytscha*). An abandoned bridge and utility crossing on Secret Ravine presents a migration obstacle to all species of salmonids. The Secret Ravine Fish Passage Improvement Project (project) proposes to remove the abandoned bridge and modify the channel bed to improve fish passage under all expected flow conditions.

1.2 REPORT ORGANIZATION

This report is organized into 4 sections. This section provides an introduction and description of the proposed project; Section 2 describes the environmental setting at the project site; Section 3 describes the potential temporary and permanent effects of implementing the proposed project; and Section 4 provides references for documents cited in this report.

1.3 SCOPE OF BIOLOGICAL ASSESSMENT

1.3.1 Federally threatened or endangered or candidate species

The purpose of this Biological Assessment (BA) is to review the project in sufficient detail to determine to what extent the proposed action may affect the sensitive species listed below. This BA is prepared in accordance with legal requirements set forth under section 7 of the Endangered Species Act (ESA) (16 U.S.C. 1536 (c)).

The species considered in this document are:

- California Central Valley DPS steelhead (*Oncorhynchus mykiss*), threatened (70 FR 52488)
- Central Valley ESU fall-run Chinook salmon (*Oncorhynchus tshawytscha*), species of concern (69 FR 19975)

1.3.2 Critical habitat

The action addressed within this biological assessment falls within designated critical habitat for the California Central Valley DPS of steelhead (Valley American Hydrologic Unit, Lower American Hydrologic Sub-area). There is no designated critical habitat for Central Valley fall-run Chinook salmon.

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1.3.3 Other resources considered

In addition to federally listed species this document also evaluates potential impacts to:

- State threatened, endangered or species of concern species as defined in the California Endangered Species Act (CESA);
- California Native Plant Society (CNPS) List 1 and 2 species; and
- Jurisdictional wetlands and other waters of the United States as defined in section 404 of the Clean Water Act (CWA).

1.4 CONSULTATION TO DATE

To be Done- Gregg/Derek- Please provide a brief record of communication you've had with NOAA or USFWS regarding this project

1.5 PURPOSE AND NEED

The purpose of the project is to improve fish passage by removing a man-made barrier that crosses Secret Ravine. This barrier presents a migration obstacle for salmonid species under low and moderate flow conditions; the site may be passable under high flow conditions. The project is needed to aid in the recovery of these species. The Secret Ravine Adaptive Management Plan (Dry Creek Conservancy, 2001) identifies migration barrier removal as a priority management action to improve fish habitat conditions in the stream. Removal of the migration barrier at the project site would improve access to approximately 10 miles of potential spawning and rearing habitat upstream of the project site.

1.6 CURRENT MANAGEMENT DIRECTION

Several management plans or policy directives recommend this type of project be implemented in the Secret Ravine and Dry Creek watersheds. Below is a list of associated watershed plans:

- ***Secret Ravine Adaptive Management Plan*** (Dry Creek Conservancy, 2001): The project will support this plan's goal of "restoring instream and riparian habitats for native terrestrial and aquatic species, particularly salmonids".
- ***Roseville Creek and Riparian Management and Restoration Plan*** (Foothill Associates, 2005): The project is consistent with several of the goals established in the plan including the specific policy to "identify, preserve, protect and enhance a significant system of interconnected natural habitat areas, including creek and riparian corridors, oak woodlands, wetlands, and adjacent grassland areas."
- ***Dry Creek Coordinated Resource Management Plan*** (ECORP, 2003): This Plan identifies fish passage improvement as a "Tier II" priority for managing fisheries resources in the watershed.

1.7 LOCATION AND SETTING

The project is located along a segment of Secret Ravine within the City of Roseville, California, which is approximately 18 miles northeast of downtown Sacramento and approximately 2 miles due

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east of downtown Roseville (Figure 1). The project area is bound by Taylor Road to the east and Eureka Road to the South. The project area is located in the SW $\frac{1}{4}$ of the NE $\frac{1}{4}$ of Section 36, Township 11N and Range 6E.

Secret Ravine at the project site is a low gradient (~1% slope), sand and gravel bed stream flowing through white alder riparian forest bounded by oak woodland. The watershed area at the project site is approximately 20 square miles. Approximately 300 feet downstream of the project site Secret Ravine conflues with Miners Ravine; Miners Ravine and Antelope Creek join to form Dry Creek; Dry Creek flows into Steelhead Creek (formerly the Natomas East Main Drainage Canal) a tributary to the Sacramento River that enters just upstream of the mouth of the American River. The Sacramento River drains into the San Francisco Bay-Delta.

1.8 LAND USE AND OWNERSHIP

Land use in the Secret Ravine watershed is predominately residential and commercial development with some industrial and transportation uses. There is an open space corridor along portion of Secret Ravine in the project area with recreational trails that receive a relatively high level of use. The City of Roseville owns the property on which the project is located (APN 015-450-022); this parcel is zoned OS-Open Space.

1.9 DESCRIPTION OF PROPOSED ACTION

1.9.1 Action Area

Figure 2 shows the project Action Area, which encompasses all construction-related activities including access, staging, grading and stockpile areas. The total action area is approximately 19,880 square feet. Construction personnel, equipment and materials would enter the Action Area from Sunrise Avenue. Access to the channel would be established in the vicinity of the abandoned bridge. The construction staging area would be in northeast portion of the Action Area, in the upland area adjacent to the channel.

1.9.2 Existing Conditions

The project reach covers approximately 250 linear feet of Secret Ravine. Near the upstream end of the project site Secret Ravine splits into two channels forming what is referred to here as the East and West Channels; a well-vegetated island separates the two channels (Figure 2). Approximately 75 feet downstream of the flow split, the East Channel crosses under a bridge (Photo 1); the bridge is constructed of steel I-beams with wooden decking and an asphalt surface. At the downstream end of the bridge crossing the channel spills on to a sloping concrete apron (Photo 1), which was presumably constructed to protect abandoned water utility lines that bisect the protect site. Downstream of the concrete apron there is a large pool; the drop height from the concrete apron to the waters surface of the pool varies, but was approximately 2 feet at low flow in October 2008. There is approximately 120 feet of riffle-run habitat between the tail of large pool and the confluence with the West Channel (Photo 2).

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Approximately 100 feet downstream of the flow split the West Channel crosses under a bridge (Photos 3 and 4) similar to the East Channel Bridge. Approximately 75 feet downstream of the bridge a 16-inch diameter steel pipe crosses perpendicular to the channel; this pipe is partially embedded in the channel. Approximately 15 feet further downstream a second steel pipe crosses the channel (Photo 5); this pipe is encased in concrete, which has been notched through the center portion of the channel, presumably to improve fish passage. There are a series of step-pools downstream of the concrete-encased pipe that are formed by hand-built rock weirs. These weirs are constructed of cobble and small boulders and are not likely capable of withstanding a moderate flood event. Downstream of the step-pools there is approximately 50 feet of riffle-run habitat leading to the confluence with the East Channel (Photo 6).

The concrete apron in the East Channel and pipes in the West Channel present obstacles that migrating fish must negotiate. It was unclear whether passage was possible in the West Channel under the flow conditions present at the time of our inspection. There was no water flowing over the apron in the East Channel at that time, making passage infeasible. Field observations from previous years indicate that when flow is active in the East Channel it is typically shallow with high velocities over the sloped concrete apron and may result in injury to fish due to the abrasive surface of the apron (Dry Creek Conservancy, 2001). At higher flows, the pipes and apron may present less of a passage barrier, due to backwatering from downstream. However, removing or modifying these features would eliminate substantial delays and possible injury to migrating fish.

1.9.3 Proposed Action

Figure 3 shows a schematic drawing of the proposed fish passage improvement plan for the project area. A complete set of engineering design plans are included in Appendix A. Improved fish passage would be achieved by removing the bridge, abutments, concrete apron and abandoned utility pipes from the East Channel. Once these features are removed, the portion of the East Channel upstream of the bridge crossing would be lowered by approximately 1 to 3 feet below the current bed elevation to ensure that this channel becomes the dominant flow path. Portions of the streambanks adjacent to the bridge abutments would be graded to improve floodplain function. Large woody debris (LWD) structures would be placed in the channel to provide habitat and induce local scour.

Large boulders would be placed at the upstream end of the West Channel to control grade and ensure that the East Channel is the favored flow path; at high flows both channels would be active. A series of LWD structures would be placed along the West Channel to provide backwater habitat and high flow refugia. These structures would provide the additional benefit of protecting the right bank from erosion. The West Channel Bridge would be removed, but the concrete abutment on the right bank would remain in place to reduce the potential for bank erosion along the base of the existing concrete block retaining wall located adjacent to the channel. The 16-inch diameter steel pipe and concrete-encased pipe would remain in place to control grade in the West Channel. When complete, the East Channel is expected to accommodate passage for all species of salmonids at all flows; low flow migration barriers may remain in the West Channel.

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1.9.4 Construction

Implementing the proposed project would require demolition of the existing bridges; excavation of the concrete apron; placement of LWD and rock in the channel; grading of channel bed and banks; and temporary dewatering during construction. A temporary staging area would be located on the left bank of the East Channel. Construction would involve use of a track excavator/backhoe operating along the streambanks and in the bed of the channel. Any debris generated during construction would be removed from the channel and disposed off site. Portions of the channel bed and banks would be re-graded and restored as part of the construction (Figure 3). The LWD structures would be constructed of 2 to 3 ton (approximately 4 feet in diameter) quarry rock and large logs. The total volume of large rock placed in the channel would be approximately 50 cubic yards. Approximately 60 cubic yards of stream substrate (i.e., cobble and gravel) would be placed in the East Channel to improve aquatic habitat.

The channel in the project area would be dewatered during construction and streamflow would be diverted around the construction site. The dewatering system would encompass approximately 575 feet¹ of channel beginning upstream of the flow split and extending just downstream of the East-West Channel confluence (Appendix A, Sheet C4). A temporary sand bag coffer dam (or equivalent) would be constructed at the upstream end of the diversion and a pipe would be used to bypass streamflow through the construction area. If further dewatering is required in isolated areas of the construction site, water may be pumped out of the channel and discharged to upland locations. Dewatering activities would comply with protocols established by the National Marine Fisheries Service (NMFS) to minimize the impacts of these actions (Section 1.9.5 and Appendix B).

By-Pass Pumping

The sequence of construction activities would be as follows:

- installation of appropriate BMPs;
- fish relocation and dewatering (in accordance with NMFS procedures)
- demolition of existing structures (i.e., the concrete apron, bridges, pipes, etc.)
- grading of East Channel bed and banks
- grading of West Channel bank
- Installation of LWD structures and log sill
- installation of erosion protection and native seed
- removal of dewatering system and fish blocknets
- revegetation with container stock

Table 1 provides the footprint of the various project components.

Table 1. Surface Area of Proposed project Components	
project Component	Area (ft ²)
Staging Area and Temporary Access	3,000
Fish Passage and Habitat Improvements (demolition of existing materials, construction of LWD structures, floodplain grading, dewatering)	26,600
Total Limits of Work	29,600

< 43,500 ft²

¹ The total length of the dewatering system would be approximately 250 linear feet, but encompasses approximately 575 linear feet of channel because it would include both the East and West Channels.

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1.9.5 Impact Minimization and Conservation Measures

The following impact minimization and conservations measures would be implemented as part of the proposed project:

Timing

Construction of the proposed project is anticipated to take 45 calendar days. All non-revegetation associated earthmoving activities would occur between July 1 and October 1. If work begins prior to August 1 a pre-construction survey for nesting migratory bird species would be completed within 200 feet of the project area. If nesting birds are detected, then construction would begin after August 1 or when the offspring have fledged. Revegetation activities would be completed by December 31.

Construction of the proposed project would require temporary dewatering of the channel in the project area. Central Valley fall run chinook salmon and Central Valley ESU steelhead are not likely to be present in the project area at the time of construction because the chinook migrate, spawn, incubate and emerging during the winter rainy season, and high summer time water temperatures at the site likely preclude the presence of steelhead. Thus, by constructing the project in summer and early fall the potential to incur “take²” of salmonid species is unlikely.

Dewatering and Fish Removal

To further minimize the potential harm to listed salmonids and other native fishes the project would implement protection and minimization measures recommended by NMFS for dewatering channels and relocating fish. These measures are listed in Appendix B.

Best Management Practices

Temporary Best Management Practices (BMPs) would include installation of silt fence, staking of the construction staging area and limits of work, installation of erosion control fabric on exposed soils, and revegetation of disturbed areas (Appendix A). These BMPs are designed to limit the discharge of sediment to the channel and minimize the area of disturbance. In addition, the project design incorporates geomorphically appropriate channel geometry (e.g., bankfull width and depth) in accordance with data collected in the project vicinity (SH+G, 2000). This design approach will minimize long-term maintenance requirements and reduce the likelihood of erosion problems. The construction contractor will also abide by a Spill Prevention and Response Plan, which is included in Appendix C.

² The ESA defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.”

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2.0 ENVIROMENTAL SETTING

2.1 GEOLOGY, SOILS AND GEOMORPHOLOGY

2.1.1 Geology

The Secret Ravine watershed is underlain by granitic rocks of Mesozoic age [248 to 65 million years before present (ybp)] and is capped unconformably by volcanic and volcanoclastic rocks of the Miocene (23 to 5.3 ybp) Merhten Formation (occurring primarily in the lower watershed) and by Pleistocene (1.8 million to 11,550 ybp) alluvial fan and fluvial deposits of the Turlock Lake and Riverbank Formations. In the watershed hillslopes, Mehrten volcanic bedrock units develop shallow soils that generally have very high runoff rates. The granitic soils vary from a shallow veneer over bedrock to deeper soils over zones of deeply weathered and decomposed granite (Dry Creek Conservancy, 2001).

2.1.2 Soils

The soils in the project area are mapped as *Xerofluvents, frequently flooded* along the creek corridor, and *Rubble land* in the adjacent upland areas. The xerofluvents are a broadly defined soil unit with limited pedogenic differentiation. Shallow soil pits (approximately 10 inches) excavated along the banks of Secret Ravine by SH+G in 2008 revealed alluvial sand with limited profile development and no hydric soil indicators. The Rubble land soils are the gravel and cobbly remnants from historic dredging and hydraulic mining, which completely disturbed the native soil profile. These soils do have some accumulation of mineral and organic materials, which enable them to support vegetation.

2.1.3 Geomorphology

Secret Ravine flows within a narrow valley underlain by recent alluvial deposits. The valley width expands in places to over 1,000 feet likely as the result of geologic controls. The central alluvial valley is bound by hills that are composed of granitic rock in the upper watershed and volcanic cap rock in the lower watershed. The Secret Ravine channel is entrenched within the alluvial valley floor. This appears to be the result of: 1) historical filling of the alluvial valleys with re-deposited placer and quarry mining spoils; and 2) possible channelization for subsequent agricultural use and urban development. A large range of flows are contained within the channel which leads to lateral and vertical erosion. In addition, the ability of the channel to deposit sediment onto the floodplain in overbank flows is diminished. The incised channel places the summer groundwater table well below the valley floor. This, combined with the historically deposited surface layer of mining spoils, makes conditions highly unfavorable for the development of riparian vegetation (Dry Creek Conservancy, 2001).

2.2 HYDROLOGY

Secret Ravine is a perennial stream in the project vicinity. Wet season (October and May) discharge is largely associated the magnitude and duration of precipitation events, while summer base flow is augmented by an unknown volume of tailwater delivered by Placer County Water Agency's irrigation

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releases. No continuous recording stream gage exists on Secret Ravine, but there is a flood activated warning gage operated by Roseville located in Rocklin near Sierra College Boulevard. The Placer County Flood Control and Water Conservation District modeled peak flows for flood events at Sierra College Blvd and determined that 10-year peak flows would approximate 1,729 cfs and 100-year peak flows would be approximately 3,814 cfs at full build-out (ECORP, 2003).

2.3 BIOLOGICAL RESOURCES

A field survey at the project site was conducted by SH+G on October 1, 2008. The purpose of the survey was to: 1) characterize existing biotic habitats, 2) assess the site for the potential to support special status plant and wildlife species, and 3) identify potential jurisdictional wetlands and other waters of the U.S. The survey was conducted by ecologist Kevin Fisher, M.S. The survey covered an area that included the bed and banks of Secret Ravine extending approximately 200 feet in all direction from the project site. The sections below describe the biological resources observed in the project area. Survey results from previous investigations conducted by others are also referenced below.

2.3.1 Vegetation

The vegetation communities in the project area include White Alder Riparian Forest, Oak Woodland and Non-native Grassland (Holland, 1986). The White Alder Riparian Forest community occupies the riparian corridor. White alder (*Alnus rhombifolia*) forms a dense canopy and Himalayan blackberry (*Rubus discolor*) forms dense thickets in the understory. Willow (*Salix* spp.), buttonbush (*Cephalanthus occidentalis*), and rushes (*Juncus* spp.) are common along the margins of the channel. Oak Woodland and Non-native Grassland are interspersed in the uplands adjacent to the channel. The Oak Woodland community includes interior live oak (*Quercus wislizeni*), blue oak (*Q. douglasii*) and valley oak (*Q. lobata*). The Non-native Grasslands are dominated by star thistle (*Centaurea solstitialis*) and brome species (*Bromus diandrus*, *B. madritensis*, et al.).

2.3.2 Terrestrial Wildlife

Riparian forest and adjacent oak woodlands in the project vicinity provides habitat for small to medium sized mammals such as raccoon (*Procyon lotor*), beaver (*Castor canadensis*) and black-tailed deer (*Odocoileus hemionus*). Trees in the project area provide roosting, foraging and potentially nesting habitat for hawks and various passerine bird species; some wading and aquatic birds such as herons and ducks may forage in and around the Secret Ravine. Amphibians and reptiles that are likely to occur in the project vicinity include tree frog (*Hyella regilla*), bullfrog (*Rana catesbeiana*) and western fence lizard (*Sceloporus occidentalis*).

2.3.3 Aquatic organisms

As mentioned previously Secret Ravine supports spawning, seasonal rearing and migration of Central Valley steelhead and spawning, juvenile rearing and emigration of Central Valley fall-run Chinook salmon. The project area is primarily a migratory reach for salmonids, though some spawning and rearing may occur. Several other species of fish may be resident in the project area including largemouth bass (*Micropterus salmoides*), spotted bass (*Micropterus punctulatus*) and green

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sunfish (*Lepomis cyanellus*). Coarse substrate, organic matter and nutrients in the project reach support aquatic macroinvertebrate production, which provides a source of food for fish and various bird species.

3.0 EFFECTS OF THE PROPOSED ACTION

3.1 SPECIAL STATUS SPECIES

For the purposes of this document special status species are those that are listed as species of concern, rare, candidate, threatened or endangered by federal, state and non-governmental agencies (i.e., CNPS)³. Listed species with potential to occur in the project vicinity were identified from the following sources:

- The California Natural Diversity Database (CNDDB) records within the following nine USGS 7.5-minute quadrangles that include the project area and vicinity: Sheridan, Lincoln, Gold Hill, Pleasant Grove, **Roseville**, Rocklin, Rio Linda, Citrus Heights and Folsom.
- Species lists for Placer County from the U.S. Fish and Wildlife Service (USFWS) Sacramento Field Office website.

This section evaluates the likelihood of these species to occur at the project site or be indirectly impacted by project-related activities.

3.1.1 Special Status Plant Species

No threatened or endangered plant species are known to occur on the project site. Appendix D lists the special status plant species known to occur in the vicinity of the project site and Figure 4a shows the location of occurrences within a five-mile radius of the project site. Special status plant species were evaluated as having potential to occur, not likely to occur or no potential to occur at the project site based on habitat descriptions and the known distribution or range of the species. The plants shown on Figure 4a are either “not likely to occur” or have “no potential to occur” on the project site because suitable habitat is not present or the plants distribution is extremely limited. Most of the plants listed in Appendix D are associated with vernal pool habitat, which does not exist at the project site. A few of the species listed in Appendix D are associated with foothill woodland or grassland habitats, but these species are rare and not likely to occur in project area given the relatively high level of disturbance (e.g., hydraulic mining, dredging, development).

No additional plant surveys or protection measures are proposed.

3.1.2 Special Status Terrestrial and Aquatic Wildlife Species

Appendix D lists the special status **terrestrial** and aquatic wildlife species known to occur in the vicinity of the project site and Figure 4b shows the location of occurrences within a five-mile radius of the project site. Species were evaluated as having potential to occur, **not likely to occur** or **no potential to occur** in the project area based on habitat descriptions, the known distribution or range of the species and any known nearby occurrences of the species.

Table 2 lists the special-status terrestrial and aquatic wildlife species **with potential to occur** at the project site. Species that do not have the potential to occur in the project area because of lack of

³ Plants on the CNPS List 3 and List 4 are not considered in this evaluation.

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suitable habitat, species range, or other considerations are listed in Appendix D but are not considered further in this document.

Table 2. Special Status Terrestrial Wildlife and Aquatic Species with the Potential to Occur at the project Site

Name	Status	Habitat description	Likelihood of occurrence on site
Federal Endangered, Threatened or Species of Concern			
Steelhead – Central Valley DPS (<i>Oncorhynchus mykiss</i>)	FT	Populations spawning in the Sacramento & San Joaquin rivers and their tributaries.	Known to occur. Species has been observed at the project site.
Chinook salmon – Central Valley Fall-run ESU (<i>Oncorhynchus tshawytscha</i>)	FSC, SSC	Populations spawning in the Sacramento & San Joaquin rivers and their tributaries.	Known to occur. Species has been observed at the project site.
State Endangered, Threatened or Species of Concern			
Swainson's hawk <i>Buteo swainsoni</i>	ST	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, & agricultural or ranch. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Potential to occur. Suitable nesting habitat occurs in the project area, but the area surrounding the project site provides limited suitable foraging habitat.
western pond turtle <i>Actinemys (=Clemmys) marmorata</i>	SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams & irrigation ditches with aquatic vegetation. Need basking sites and suitable (sandy banks or grassy open fields) upland habitat for egg-laying.	Potential to occur. Suitable habitat exists, though upland areas are disturbed, fragmented with a high level of human activity.
Notes: FE = Federally listed Endangered FT = Federally listed Threatened FSC = State Species of concern SE = State-listed Endangered ST = State-listed Threatened SSC = State Species of concern			

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California Central Valley DPS Steelhead

The California Central Valley DPS of steelhead is the only threatened or endangered species known to occur at the project site. This DPS of steelhead was listed as threatened in 1998 and reaffirmed in 2006; Secret Ravine is designated as critical habitat for this DPS (70 FR 52488). The steelhead population in Secret Ravine is considered winter-run; they move from the ocean into freshwater in August, peaking in late September through October. They remain in the larger streams (e.g., Sacramento River) until discharge in tributaries such as Secret Ravine is sufficient for migration and spawning. This typically occurs around the beginning of the year (DWR, 2002), but can vary substantially on an inter-annual basis. Steelhead egg incubation takes about 25 days (Barnhart, 1991) and emergence requires about four to six weeks (Shapovalov and Taft, 1954). Assuming that the spawning peak occurs in January and February, the peak period for incubation and emergence would occur from February through mid-May. Steelhead juvenile rearing in the upper Dry Creek watershed was most recently monitored by CDFG during periods of 1998 through 2000. This survey found that Secret Ravine does provide perennial rearing habitat for steelhead, primarily in sections of the creek upstream of the project area (Dry Creek Conservancy, 2001).

The project area is primarily a migratory reach for steelhead moving to and from higher quality habitat upstream of the project site, though some spawning and juvenile rearing may occur. Spawning habitat is limited because of the abundance of fine sediment that buries gravel and cobble substrate in the streambed. Steelhead are not likely to occur in this section of Secret Ravine during the time of construction because high summer water temperature in the project reach likely precludes their presence (Citation needed). If steelhead are present in the project reach at the time of construction then implementation of the proposed project, specifically dewatering activities, has the potential to result in take of this species. Protection and minimization measures listed in Appendix B will be implemented to reduce the potential for the project to adversely affect Central Valley ESU steelhead.

Central Valley ESU Fall-run Chinook Salmon

The Central Valley ESU of fall-run Chinook salmon was classified as a federal species of concern in 2004 (69 FR 19975). It is also a state of California species of concern (CNDDDB, 2008). In the Dry Creek system fall-run Chinook typically migrate upstream from September to December, depending on climate (precipitation and temperature); spawning usually occurs from October through December (DWR, 2002). Fall-run Chinook typically spawn in shallow, fast moving water, with coarse gravel and cobble substrate. Eggs incubate for about 43 days at 52°F, whereas cooler temperatures increase the incubation period. After hatching, the alevins remain in the gravel until most of their yolk sac has been absorbed, which requires from 45 to 90 days after hatching (EA Engineering, Science, and Technology 1991). Incubation and alevin development occurs from late October through March in most Central Valley rivers. Juvenile fall-run Chinook salmon emigrate from the rivers to the Delta as fry in February through March, and as smolts from mid April through early June.

The project area is primarily a migratory reach for fall-run Chinook moving to and from higher quality habitat upstream of the project site, though some spawning and juvenile rearing may occur. Spawning habitat is limited because of the abundance of fine sediment that covers gravel and cobble in the streambed; in locations where the velocity increases the fines are scoured and higher quality riffle habitat is exposed.

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Fall-run Chinook are not likely to occur in Secret Ravine during the time of construction because juveniles have likely emigrated out of the system by June and adults have not begun the late-fall migration. In the unlikely event that Chinook salmon are present, then implementation of the proposed project, specifically dewatering activities, has the potential to result in take of this species. Protection and minimization measures listed in Appendix B will be implemented to reduce the potential for the project to adversely affect fall-run Chinook salmon.

Swainson's hawk

The swainson's hawk (*Buteo swainsoni*) is a state-listed threatened species. It nests in North America (Canada, western United States, and Mexico), and winters in South America (mainly Argentina). However, recent telemetry studies indicate that some or all of Swainson's hawk nesting in California migrate only as far as Mexico or Southern California, or stay within the Central Valley region during winter months. In California, the Swainson's hawk nesting season ranges between mid-March and late August.

Swainson's hawks nest within tall trees in a variety of wooded communities including riparian, oak woodland, roadside landscape corridors, urban areas, and agricultural areas, among others. Foraging habitat includes open grassland, savannah, low-cover row crop fields, and livestock pastures. The typical dietary composition of Swainson's hawks within the Central Valley include California vole (*Microtus californicus*), California ground squirrel (*Spermophilus beecheyi*), ring-necked pheasant (*Phasianus colchicus*), many passerine birds, and grasshoppers (*Melanoplus* spp.).

The project area provides marginal nesting habitat for the Swainson's hawk, primarily because there is limited adjacent foraging habitat. However, there is a possibility that Swainson's hawk could breed in the vicinity of the project area. If construction work for the project begins prior to August 1 a pre-construction survey for nesting Swainson's hawks would be completed within a 0.5 mile radius of the project area. If nesting birds are detected, then construction would not begin until the offspring have fledged (typically by August 1), or a CDFG biologist determines that the project activities are not likely to affect the nesting birds.

Western Pond Turtle

Western pond turtles (*Actinemys marmorata*), including both the northwestern (ssp. *marmorata*) and southwestern (ssp. *pallida*) subspecies, are a California species of concern. Western pond turtles occur in a variety of permanent and intermittent aquatic habitats, such as ponds, marshes, rivers, streams, and ephemeral pools. Pond turtles require suitable basking and haul-out sites, such as emergent rocks or floating logs, which they use to regulate their temperature throughout the day (Holland, 1994). In addition to appropriate aquatic habitat, these turtles require an upland oviposition site in the vicinity of the aquatic habitat, often within 200 m (656 ft). Nests are typically dug in grassy, open fields with soils that are high in clay or silt fraction. Egg laying usually takes place between March and August (Zeiner et al., 1988).

Recent fieldwork has demonstrated that this species might spend the winter in an inactive state, on land or in the water, and in other cases might remain active and in the water throughout the year (Jennings and Hayes, 1994). While the turtles might be active all year along the coast, at interior locations such as the Central Valley, pond turtles are more likely to be active between April and

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October. Western pond turtles have been documented hibernating up to 1,100 ft from a watercourse, immediately adjacent to a watercourse (Jennings and Hayes 1994), and underwater in mud (Zeiner et al., 1988). Upland hibernaculae could include any type of crack, hole, or object that a turtle seeking cover might squeeze into or burrow under.

The project area may provide suitable aquatic habitat for western pond turtles, but nesting areas in the adjacent uplands would be considered marginal habitat because the grassy areas are regularly disturbed by human activity. For this reason, Secret Ravine in the project area is not likely to support western pond turtle, but they do have the potential to occur. In the unlikely event that western pond turtle are present, then implementation of the proposed project, including dewatering and earthmoving activities, has the potential to result in take of this species. The protection and minimization measures recommended for salmonid species will be implemented to reduce the potential for the project to adversely affect western pond turtle.

3.2 WATERS OF THE U.S.

The DCC intends to apply for use of the CWA Section 404 Nationwide Permit (NWP) 27, which authorizes discharge of fill to waters of the U.S. for habitat restoration purposes. While NWP 27 does not require that a wetland delineation be submitted to the USACE, an informal assessment of jurisdictional waters was performed to facilitate the communication of information and assessment of impacts. The assessment was based on the USACE Arid West Supplement wetland delineation procedures (USACE, 2006). The DCC does not request that the USACE verify the delineation, thus all information presented in this document is assumed to be potential jurisdictional waters of the U.S.

Non-wetland Waters. Secret Ravine is a perennial stream marked with a solid “blue line” on the USGS quadrangle thus the channel is subject to CWA Section 404 regulations. The stream in the project reach is not navigable or tidal and is therefore not subject to Section 10 jurisdiction. Ordinary High Water (OHW) was delineated based on scour lines (i.e., bankfull indicators) and vegetation. Figure 5 shows a typical channel cross-section in the project area with OHW indicated on the drawing. The area of the channel below the elevation of OHW is considered non-wetland waters of the U.S. The total potential jurisdictional non-wetland waters of the U.S. in the project area is 12,280 square feet (Figure 5).

Wetlands. The creek supports a narrow corridor of hydrophytic vegetation along the channel banks and on the island separating the East and West Channels. This vegetation community is dominated by white alder (FACW) and Himalayan blackberry (FACW*). Soils in the project area are sandy and lack hydric indicators (e.g., mottles, oxidized rhizospheres). However, the soil series *Xerofluvents*, frequently flooded is included on the National Hydric Soils List (NRCS, 2008) and since the area is frequently flooded it is possible that the soils have not had sufficient time to develop hydric indicators. It is conservatively estimated that there are approximately of 10,000 square feet of potential jurisdictional wetlands in the project area (Figure 5). All areas shown on Figure 5 that are not designated wetlands or non-wetland waters either lack hydrophytic vegetation and/or have existing fill (e.g., the concrete island connecting the bridge segments).

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Temporary Impacts. The project would dewater up to 12,280 square feet of potential jurisdictional non-wetland waters of the U.S. Dewatering activities would include discharge of temporary fill (e.g., sand bags) to create coffer dams. Dewatering activities would be conducted in accordance with protection and minimization measures described in Appendix B and are therefore not likely to result in significant adverse impacts to waters of the U.S.

Construction activities such as grading of the channel banks, removal of fill and installation of LWD structures may temporarily impact less than 0.01 acres of potential jurisdictional wetlands. All wetland areas that are impacted would be restored in accordance with the revegetation and erosion control plans shown in Appendix A. Therefore, construction activities are not likely to result in significant adverse impacts to jurisdictional wetlands.

Permanent Impacts. The project would result in discharge of fill material (i.e., rock, channel substrate and large woody debris) to potential jurisdictional wetlands and non-wetland waters of the U.S. The project would also re-contour portions of the channel bed. The project will not result in conversion of waters to wetlands or waters to uplands. The project will result in creation of approximately 2,100 square feet of jurisdiction wetlands through removal of fill (i.e., bridge crossing and abutments) and grading of upland areas to expand the floodplain. The project is expected to have beneficial effects on fish passage and aquatic habitat continuity, therefore no mitigation is proposed.

3.3 COUNTY AND CITY ORDINANCES

The proposed project is subject to the following local ordinances:

- Placer County Grading Ordinance (Chapter 15, Placer County Code)
- City of Roseville Tree Preservation Ordinance (Chapter 19.66, City Municipal Code)

Implementation of the proposed project will require application for a grading permit from Placer County. It is anticipated that the engineering plans and environmental review included in this document will be sufficient to comply with Placer County requirements for a grading permit to be issued. The City of Roseville Tree Preservation Ordinance protects native oak trees equal to or greater than six inches diameter at breast height. No oak trees would be removed as a result of the proposed project; therefore a tree removal permit will not be required.

3.4 SUMMARY OF IMPACTS

Implementing the proposed project would have a beneficial effect on aquatic habitat continuity by improving fish passage during all stream flows. The project design also incorporates habitat enhancement features such as LWD that will provide additional cover and induce local scour, which will improve spawning habitat in the project reach. The project would also create approximately 2,100 square feet of jurisdictional wetlands. The project would have some potentially adverse temporary impacts associated with construction. Environmental protection measures that have been incorporated directly into the project description include:

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- Protection and minimization measures for aquatic organisms (Appendix B)
- Calendar avoidance (i.e., time of construction)
- Pre-construction bird surveys if construction begins prior to August 1
- Best Management Practices including silt fence and erosion control materials
- Revegetation with native species

By implementing the measures listed above and detailed in Section 1.9.5, the project is not likely to cause disturbance that will adversely affect the long-term viability of a rare, endangered, threatened, or locally unique species or any part of a sensitive habitat. No additional mitigation is proposed.

3.5 CUMULATIVE IMPACTS

Two other projects in close proximity to the Secret Ravine Fish Passage project are scheduled for implementation in the next few years. These projects include:

- **Royer Park Storm Damage Repair Project:** The City of Roseville will be replacing a damaged portion of stream bank slope protection at Royer Park. This project will likely require dewatering/diversion of the channel and is scheduled to take place in 2009.
- **Eureka Road Widening Project:** The City of Roseville will be expanding the bridge over Miner's Ravine at Eureka Road. This project will likely require dewatering/diversion of the channel and is scheduled to take place in 2010.

The cumulative impacts of implementing these projects are likely to be less than significant. NMFS is currently reviewing these projects individually and cumulatively and will make recommendations or establish conditions for implementing these projects. Cumulative impacts of the projects may be mitigated through coordination and sequencing of the construction schedules to minimize the amount of stream dewatered at one time.

3.6 CONCLUSION AND DETERMINATION

Implementing the proposed project will have temporary and permanent impacts on habitat for California Central Valley DPS steelhead and Central Valley ESU fall-run Chinook salmon. These species are known to occur in the project area, but are not likely to be present at the time of construction. By implementing the avoidance, minimization and habitat enhancement measures described above the project is *not likely to adversely affect* the long-term viability of a rare, endangered, threatened, or locally unique species or any part of a sensitive habitat. Implementing the proposed project will *likely benefit* California Central Valley DPS steelhead and Central Valley ESU fall-run Chinook salmon that use Secret Ravine as spawning, rearing and migratory habitat.

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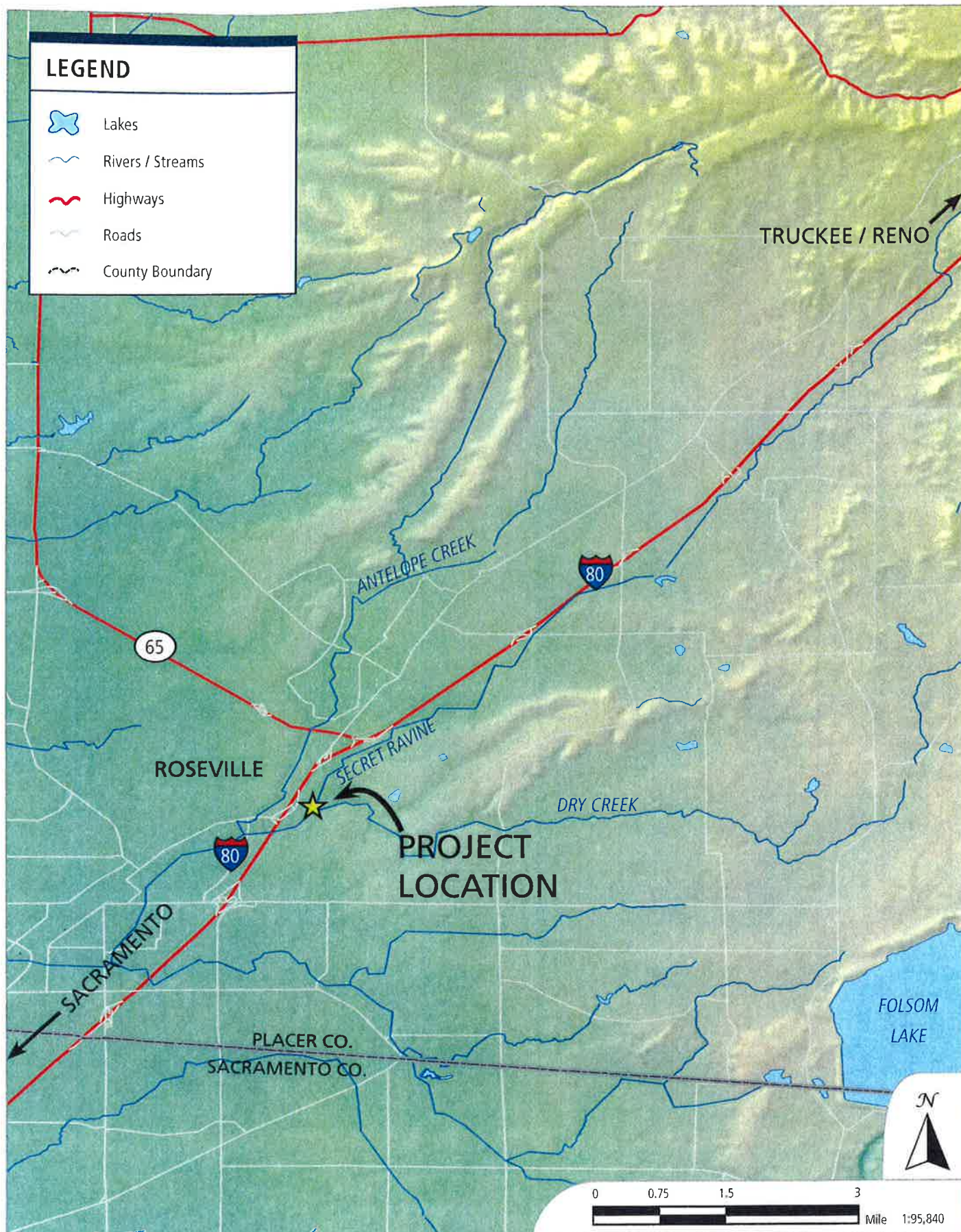
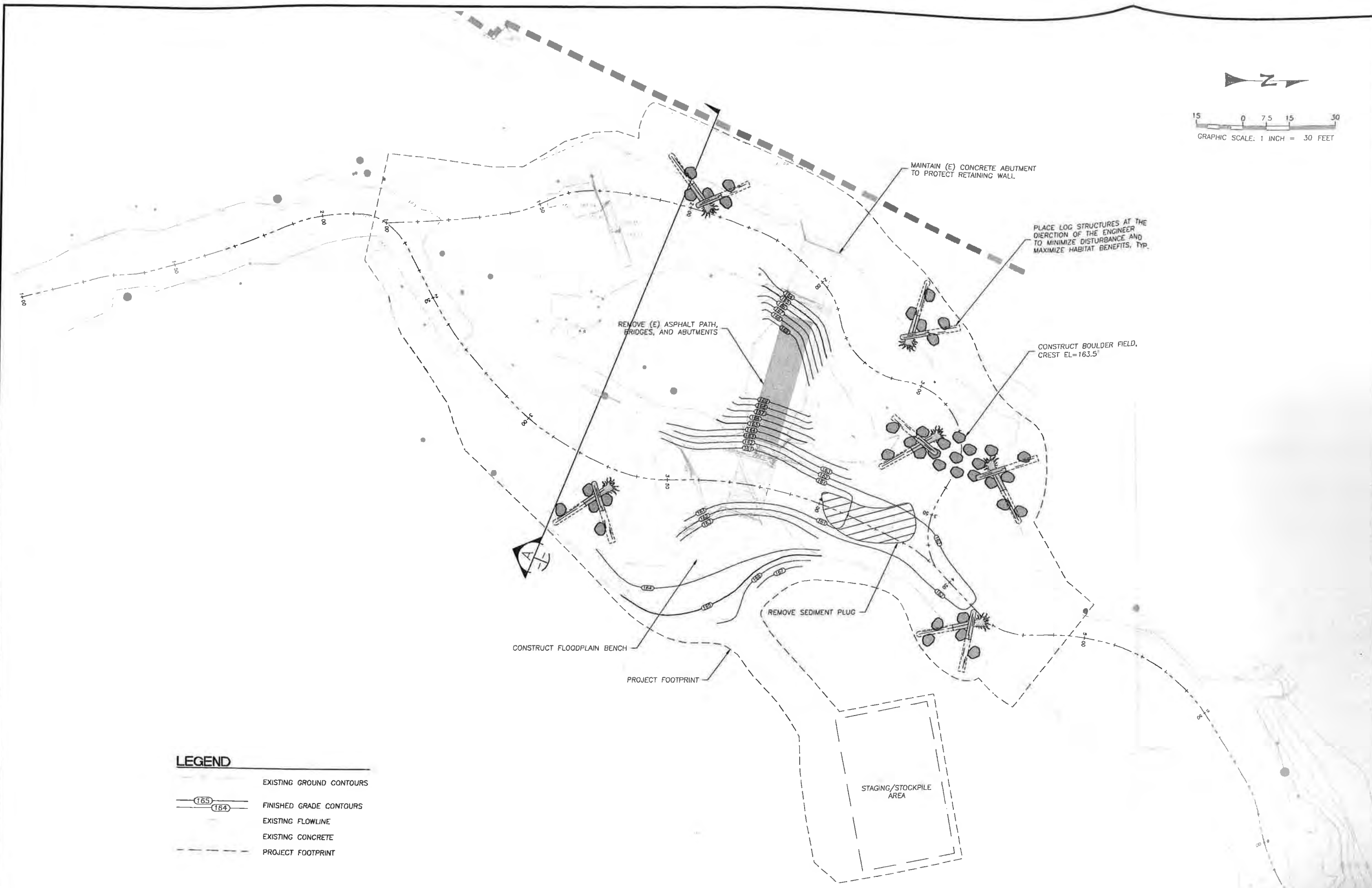
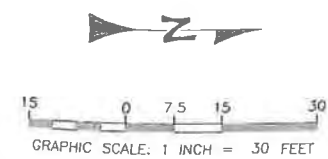


FIGURE 1: Project vicinity.



- LEGEND**
- EXISTING GROUND CONTOURS
 - FINISHED GRADE CONTOURS
 - EXISTING FLOWLINE
 - EXISTING CONCRETE
 - PROJECT FOOTPRINT

SITE PLAN
SCALE: 1"=30'



SH+G ENGINEERING 500 SEABRIGHT AVE., SUITE 202 SANTA CRUZ, CA 95062 (831)-427-0288 A Division of Swanson Hydrology • Geomorphology	DRAFT NOT FOR CONSTRUCTION	PREPARED AT THE REQUEST OF: DRY CREEK CONSERVANCY P.O. BOX 1311 ROSEVILLE, CA 95747	PROPOSED SITE PLAN	SECRET RAVINE FISH PASSAGE IMPROVEMENT PROJECT	DESIGNED BY: DRAWN BY: C.M.R. CHECKED BY: M.W.B. DATE: 10/04/08 JOB NO.: 08-729
		FIG. 3			

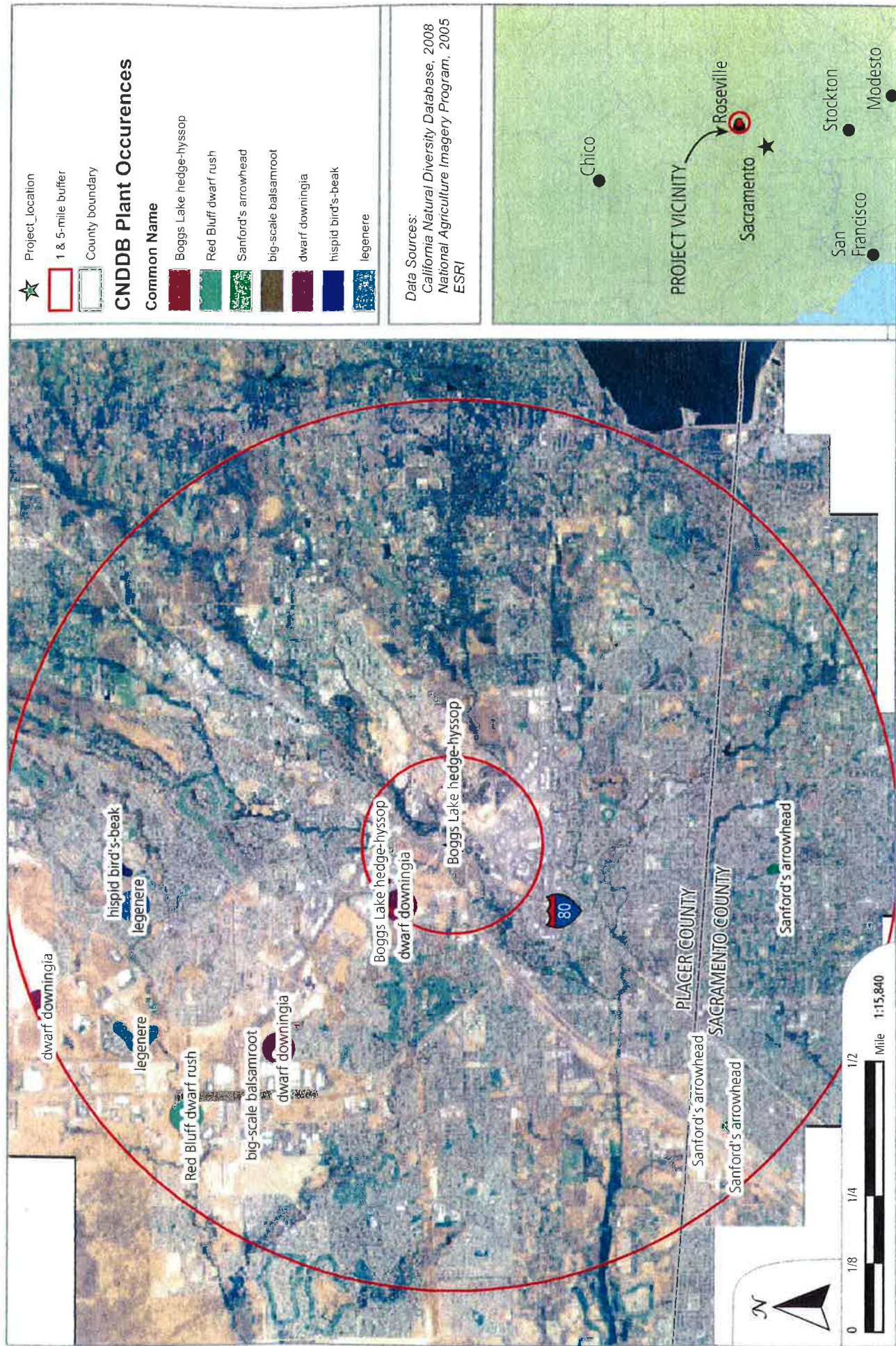


FIGURE 4a: Map of CNDDDB sensitive plant occurrences within a 5-mile radius of the project site.

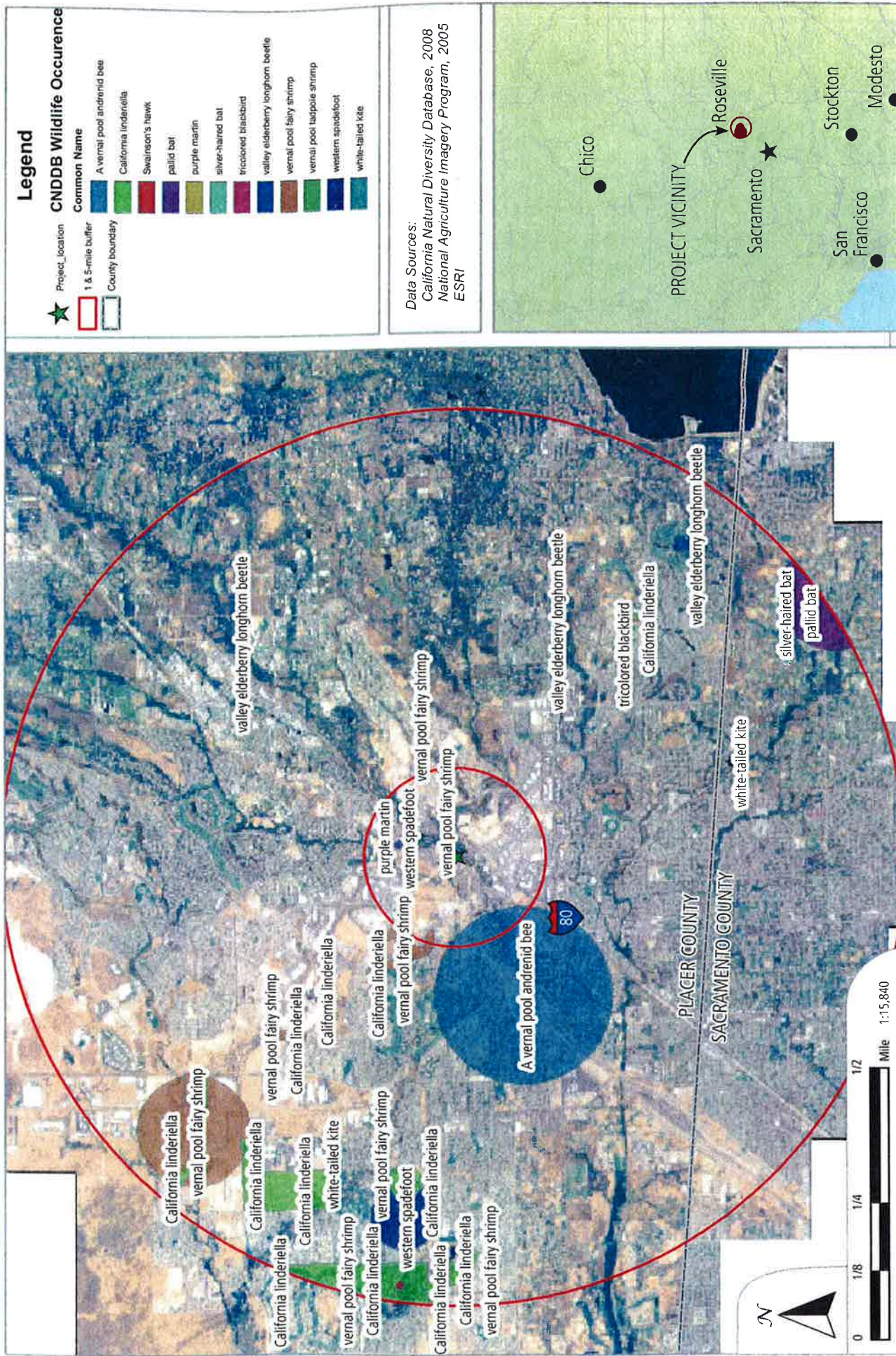


FIGURE 4b: Map of CNDDB sensitive wildlife occurrences within a 5-mile radius of the project site.



Photo 1



Photo 2

SWANSON HYDROLOGY + GEOMORPHOLOGY
500 Seabright Ave, Suite 202 Santa Cruz CA 95062
PH 831 427 0288 FX 831 427 0472

PHOTO 1: Bridge over East Channel (looking upstream).

PHOTO 2: Riffle-run habitat downstream of the East Channel bridge crossing.



SWANSON HYDROLOGY + GEOMORPHOLOGY
500 Seabright Ave, Suite 202 Santa Cruz, CA 95062
PH 831.427.0288 FX 831.427.0472

PHOTO 3: Bridge crossing over west channel (looking downstream).

PHOTO 4: Bridge crossing over west channel (looking upstream).

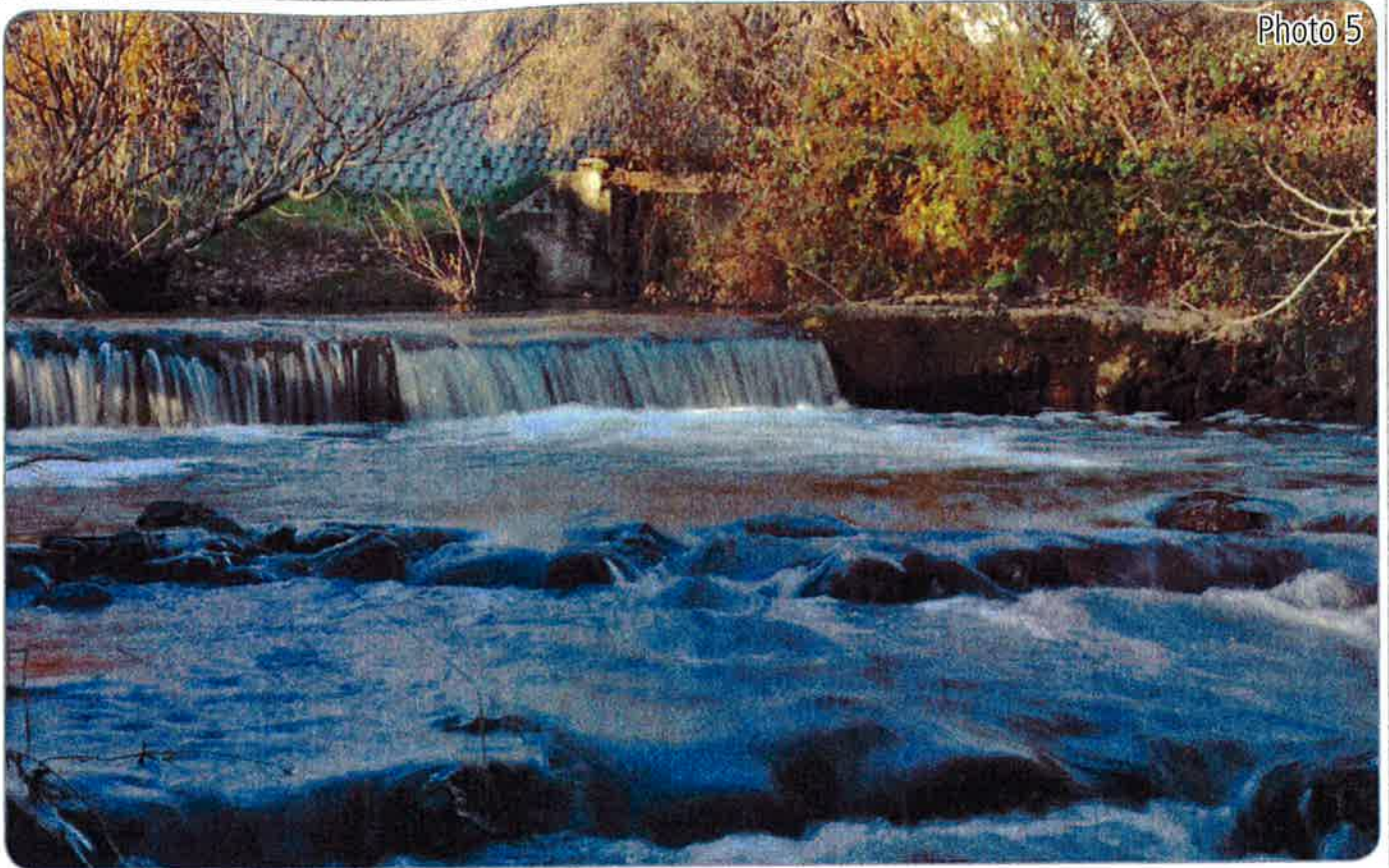


Photo 5

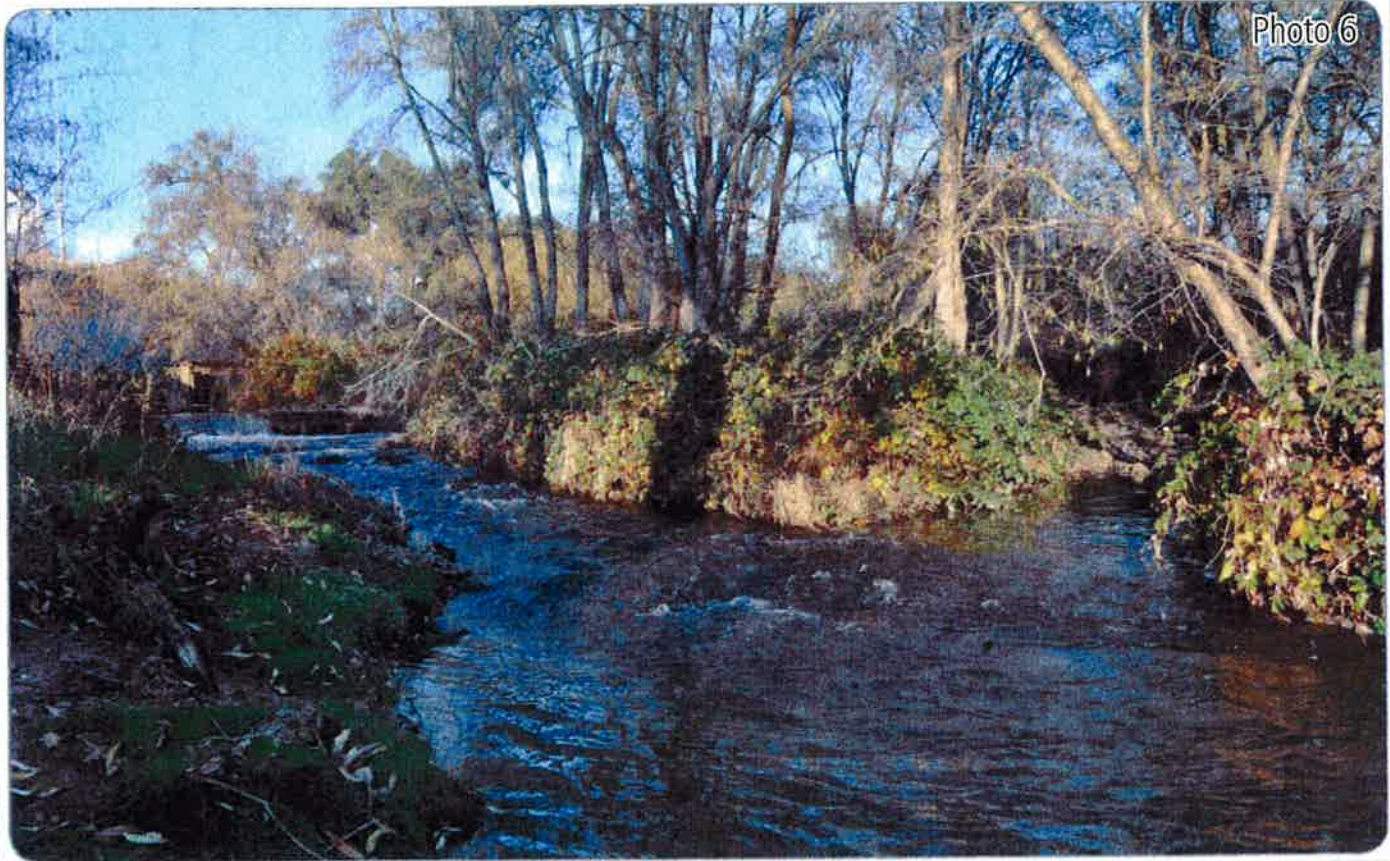


Photo 6

SWANSON HYDROLOGY + GEOMORPHOLOGY
500 Seabright Ave, Suite 202 Santa Cruz, CA 95062
PH 831 427.0288 FX 831 427.0472

PHOTO 5: Abandoned utility crossing in West Channel.

PHOTO 6: Confluence of East and West Channels (looking upstream).

SECRET RAVINE
FISH PASSAGE IMPROVEMENT PROJECT

BIOLOGICAL ASSESSMENT

APPENDIX B

PROTECTION AND MINIMIZATION MEASURES FOR LISTED FISHES

APPENDIX B

Requirements for Fish Relocation and Dewatering Activities¹

I. Guidelines for Dewatering:

- a. In those specific cases where it is deemed necessary to work in a flowing stream/creek, the work area shall be isolated and all the flowing water shall be temporarily diverted around the work site to maintain downstream flows during construction. Dewatering will likely not be necessary for most LWD enhancement activities.
- b. Exclude fish from reentering the work area by blocking the stream channel above and below the work area with fine-meshed net or screens. The bottom of the seine must be completely secured to the channel bed to prevent fish from reentering the work area prior to dewatering. Exclusion screening must be placed in areas of low water velocity to minimize fish impingement. Screens must be checked periodically and cleaned of debris to permit free flow of water. Block net mesh shall be sized to ensure salmonids upstream or downstream do not enter the areas proposed for dewatering between passes with the electrofisher or seine.
- c. Prior to dewatering, determine the best means to bypass flow through the work area to minimize disturbance to the channel and avoid direct mortality of fish and other aquatic vertebrates (as described more fully below under *General Conditions for Fish Capture and Relocation*). The project applicant shall bypass stream flow around the work area and concurrently maintain the stream flow to channel below the construction site.
- d. Coordinate project site dewatering with a **qualified biologist** to perform fish and amphibian relocation activities. The qualified biologist(s) will possess a valid State of California Scientific Collection Permit as issued by CDFG and will be familiar with the life history and identification of listed salmonids and listed amphibians within the action area.
- e. Prior to dewatering a construction site, qualified individuals will capture and relocate fish and amphibians to avoid direct mortality and minimize take. This is especially important if listed species are present within the project site.
- f. Any temporary **dam** or other artificial obstruction constructed shall only be built from materials such as **sandbags or clean gravel** which will cause little or no siltation or turbidity. **Visqueen** shall be placed over sandbags used for construction of cofferdams to minimize water seepage into the construction areas. The visqueen shall be firmly anchored to the streambed to minimize water seepage. **Cofferdams and the stream diversion systems shall remain in place and fully functional throughout the construction period.**
- g. **Downstream flows** adequate to prevent stranding will be maintained at all times during dewatering activities.
- h. When cofferdams with bypass pipes are installed, **debris racks** will be placed at the **bypass pipe inlet**. Bypass pipes will be monitored a **minimum of two times per day, seven days a week**, during the construction period. All accumulated debris shall be removed by the contractor or project applicant.
- i. **Bypass pipe diameter will be sized to accommodate, at a minimum, twice the summer baseflow.**

¹ Guidelines are adapted from the Programmatic Biological Opinion for permitting Fisheries Restoration Projects in the within the Geographic Boundaries of NMFS' Santa Rosa, California, Field Office (NMFS, 2006)

APPENDIX B

- j. The work area may need to be periodically pumped dry of seepage. Place pumps in flat areas, well away from the stream channel. Secure pumps by tying off to a tree or stake in place to prevent movement by vibration. Refuel in an area well away from the stream channel and place fuel absorbent mats under pump while refueling. Pump intakes shall adhere to NMFS' *Fish Screening Criteria for Anadromous Salmonids* (NMFS 1997a). Check intake periodically for impingement of fish or amphibians.
- k. When pumping is necessary to dewater a work site temporary siltation basin are required to ensure sediment does not re-enter the wetted channel. Screens on pumps will adhere to NMFS' *Fish Screening Criteria for Anadromous Salmonids* (NMFS 1997a).
- l. When construction is completed, the flow diversion structure shall be removed as soon as possible in a manner that will allow flow to resume with the least disturbance to the substrate. Cofferdams will be removed so surface elevations of water impounded above the cofferdam will not be reduced at a rate greater than one inch per hour. This will minimize the risk of beaching and stranding of fish as the area upstream becomes dewatered.

II. General Conditions for all Fish Capture and Relocation Activities

Overview

All seining, electrofishing, and relocation activities shall be performed by a qualified fisheries biologist. The qualified fisheries biologist shall capture and relocate listed salmonids prior to construction of the water diversion structures (e.g., cofferdams). The qualified fisheries biologist shall document the number of salmonids observed in the affected area, the number and species of salmonids relocated, and the date and time of collection and relocation. The qualified fisheries biologist shall have a minimum of three years field experience in the identification and capture of salmonids, including juvenile salmonids, considered in the biological opinion. The qualified biologist will adhere to the following requirements for capture and transport of salmonids:

- a. Determine the most efficient means for capturing fish. Complex stream habitat generally requires the use of electrofishing equipment, whereas in deep pools, fish may be concentrated by pumping-down the pool and then seining or dipnetting fish.
- b. Notify Madelyn Martinez at (916) 930-3615, madelyn.martinez@noaa.gov of NMFS two weeks prior to capture and relocation of salmonids to provide NMFS an opportunity to attend.
- c. Initial fish relocation efforts will be conducted several days prior to the start of construction. This provides the fisheries biologist an opportunity to return to the work area and perform additional electrofishing passes immediately prior to construction. In many instances, additional fish will be captured that eluded the previous day's efforts.
- d. During dewatering, a fisheries biologist will remain at the project work site to net and rescue any additional fish that may have become stranded throughout the dewatering process.
- e. In regions of California with high summer water temperatures, perform relocation activities during morning periods.
- f. Prior to capturing fish, determine the most appropriate release location(s). Consider the following when selecting release site(s):
 - i. similar water temperature as capture location;
 - ii. ample habitat availability prior to release of captured fish; and

APPENDIX B

- iii. low likelihood of fish reentering work site or becoming impinged on exclusion net or screen
- g. Periodically measure air and water temperatures. Cease activities when measured water temperatures exceed 17.8 degree Celsius (0C) (or 18.4aC in areas where coho salmon are not present). Temperatures will be continuously measured at the head-of-riffle tail-of pool interface during relocation activities.

Electrofishing Guidelines

The following methods shall be used if fish are relocated via electrofishing:

- a. All electrofishing will be conducted according to NMFS' *Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act*, June 2000.
- b. The backpack electrofisher shall be set as follows when capturing fish:
Voltage setting on the electrofisher shall not exceed 300 volts.

	<u>Initial</u>	<u>Maximum</u>
Voltage:	100 Volts	300 Volts
Duration:	500 ~s (microseconds)	5 ms (milliseconds)
Frequency:	30 Hertz	70 Hertz

- c. A minimum of three passes with the electrofisher shall be utilized to ensure maximum capture probability of salmonids within the area proposed for dewatering.
- d. No electrofishing shall occur if water conductivity is greater than 350 microSiemens per centimeter (~S/cm) or when instream water temperatures exceed 17.8° C (or 18.40 C in areas where coho salmon are not present). Water temperatures shall be measured at the pool/riffle interface. Only direct current (DC) shall be used.
- e. A minimum of one assistant shall aid the fisheries biologist by netting stunned fish and other aquatic vertebrates

Seining Guidelines

The following methods shall be used if fish are removed with seines:

- a. A minimum of three passes with the seine shall be utilized to ensure maximum capture probability of salmonids within the area.
- b. All captured fish shall be processed and released prior to each subsequent pass with the seine.
- c. The seine mesh shall be adequately sized to ensure fish are not gilled during capture and relocation activities.

Guidelines for Relocation of Salmonids

The following methods shall be used during relocation activities associated with either method of capture (electrofishing or seining):

- a. Fish shall not be overcrowded into buckets; allowing approximately six cubic inches per 0+ individual and more for larger/older fish.
- b. Every effort shall be made not to mix (including use of separate containers) 0+ (young of the year) salmonids with larger salmonids, or other potential predators, which may consume the smaller salmonids. Have at least two containers and segregate 0+ fish from larger age-classes. Place larger amphibians, such as Pacific-giant salamanders (*Dicamptodon ensatus*), in container with larger fish.

APPENDIX B

- c. Salmonid predators, such as sculpins (*Cottus* sp.) and Pacific-giant salamanders, collected and relocated during electrofishing or seining activities shall not be relocated so as to concentrate them in one area. Particular emphasis shall be placed on avoiding relocation of sculpins and Pacific-giant salamanders into the steelhead and coho salmon relocation pools. To minimize predation on salmonids, these species shall be distributed throughout the wetted portion of the stream so as to not concentrate them in one area.
- d. All captured salmonids shall be relocated, preferably upstream, of the proposed construction project and placed in suitable habitat. Captured fish shall be placed into a pool, preferably with a depth of greater than two feet and with available instream cover (undercut banks, complex LWD features).
- e. All captured salmonids will be processed and released prior to conducting a subsequent electrofishing or seining pass.
- f. All native captured fish will be allowed to recover from electrofishing before being returned to the stream.
- g. Minimize handling of salmonids. However, when handling is necessary, always wet hands or nets prior to touching fish. Handlers will not wear DEET-based insect repellants during relocation activities.
- h. Temporarily hold fish in cool, shaded, aerated water in a container with a lid. Provide aeration with a battery-powered external bubbler. Protect fish from jostling and noise and do not remove fish from this container until time of release.
- i. Place a non-mercury thermometer in holding containers and, if necessary, periodically conduct partial water changes to maintain a stable water temperature. If water temperature reaches or exceeds those allowed by CDFG and NMFS, fish shall be immediately released.
- j. If instream temperatures exceed authorized temperature limits, capture and relocation will cease.
- k. In areas where aquatic vertebrates are abundant, periodically cease capture, and release at predetermined locations.
- l. Visually identify species and estimate year-classes of fish at time of release. Count and record the number of fish captured. Avoid anesthetizing or measuring fish.

SECRET RAVINE
FISH PASSAGE IMPROVEMENT PROJECT

BIOLOGICAL ASSESSMENT

APPENDIX C

SPILL PREVENTION AND RESPONSE PLAN

APPENDIX C

Spill Prevention and Response Plan

1. **Prohibition of Storage of Heavy Equipment Fuel, Oil and Hydraulic Fluid.** No fuel, oils, or hydraulic fluid may be stored within the 100 feet of the stream channel. Fuel, oils, or hydraulic fluid may be stored in weatherproof containers, which are not in direct contact with the ground, in the designated staging area.
2. **Prohibition of Refueling and Servicing Heavy Equipment within the Stream Area.** No refueling or servicing of heavy equipment shall be performed within 100 feet of the stream channel. All refueling or servicing of heavy equipment must be performed in the designated staging area.
3. **Parking and Storage of Equipment.** All motorized equipment shall be parked overnight and on weekends and other periods of shutdown in the staging area.
4. **Operation and Refueling of Dewatering Pumps.** Place pumps in flat areas away from stream channel. Refuel pumps away from stream channel. Sorbent pads must be installed underneath pumps when refueling.
5. **Prohibition of Use of Leaking Equipment.** The site engineer, California Department of Fish and Game staff, or National Marine Fisheries Service Staff, at its discretion, may prohibit the operation of any equipment that is leaking fuel, oil, or hydraulic fluid. No contract time adjustment shall be made for equipment not allowed to operate. Contractor may not resume operation of repaired equipment until its use is authorized in writing by the reporting agency or site engineer.
6. **Spill Cache.** Contractor shall store within the designated staging area a spill cache consisting of sorbent pads approved by the California Department of Fish and Game and National Marine Fisheries Service with a total surface area of at least 500 square feet. No construction operations are allowed until the spill cache is on site. The spill cache must be stored in a weatherproof container. Any used sorbent materials must be replaced within 10 days. California Department of Fish and Game or National Marine Fisheries Service staff may shut down operations if the spill cache is not replenished within 10 days. All used sorbent materials may not be stored within the project area, and must be disposed in accordance with all Federal, state, and local laws and regulations.
7. **Spill Notification.** Any spill of fuel or lubricants must be reported immediately to the California Department of Fish and Game and National Marine Fisheries Service, either by reporting to the on-site Inspector, or by calling the California Department of Fish and Game at (916) 445-9338 and Madelyn Martinez of the National Marine Fisheries Service at (916) 930-3615, and other numbers listed on the permits.
8. **Spill Response.** Contractor shall cease all operations and devote all on-site personnel to the containment and clean up of any spill until such time as all reasonable measures have been taken.

SECRET RAVINE
FISH PASSAGE IMPROVEMENT PROJECT

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APPENDIX D

SPECIAL STATUS PLANT AND WILDLIFE SPECIES

Appendix B. Special status plant species known to occur in the project vicinity¹

Name	Status	Habitat description	Potential for occurrence on site
<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i> big-scale balsamroot	1B	Valley and foothill grassland, cismontane woodland. Sometimes on serpentine.	Not likely to occur. Grasslands in project area are dominated by non-native, invasive species.
<i>Clarkia biloba</i> ssp. <i>brandegeeae</i> Brandegee's clarkia	1B	Chaparral, cismontane woodland. Often in roadcuts.	Not likely to occur. Grasslands in project area are dominated by non-native, invasive species.
<i>Cordylanthus mollis</i> ssp. <i>hispidus</i> hispid bird's-beak	1B	Meadows, playas, valley and foothill grassland. In damp alkaline soils, especially in alkaline meadows and alkali sinks with <i>distichlis</i> .	No potential to occur. No suitable habitat present.
<i>Gratiola heterosepala</i> Boggs Lake hedge-hyssop	SE, 1B	Marshes and swamps (freshwater), vernal pools. Clay soils; usually in vernal pools, sometimes on lake margins.	No potential to occur. No suitable habitat present.
<i>Juncus leiospermus</i> var. <i>ahartii</i> Ahart's dwarf rush	1B	Restricted to the edges of vernal pools.	No potential to occur. No suitable habitat present.
<i>Juncus leiospermus</i> var. <i>leiospermus</i> Red Bluff dwarf rush	1B	Chaparral, valley and foothill grassland, cismontane woodlands, vernal pools. Vernal mesic sites. Sometimes on edges of vernal pools.	No potential to occur. No suitable habitat present.
<i>Legenere limosa</i> legenere	1B	In beds of vernal pools. Many historical occurrences are extirpated.	No potential to occur. No suitable habitat present.
<i>Navaretia myersii</i> ssp. <i>myersii</i> pincushion navaretia	1B	Vernal pools, valley and foothill grassland. Clay soils within nonnative grassland.	No potential to occur. No suitable habitat present.
<i>Orcuttia viscida</i> Sacramento orcutt grass	FE, SE, 1B	Vernal pools.	No potential to occur. No suitable habitat present.
<i>Sagittaria sanfordii</i> Sanford's arrowhead	1B	Marshes and swamps.	No potential to occur. No suitable habitat present.

1. Vicinity refers to the Roseville USGS 7.5' quadrangle and the 8 surrounding quadrangles.

Notes:

FE = Federally listed Endangered

FT = Federally listed Threatened

SE = State-listed Endangered

ST = State-listed Threatened

SR = California rare

1A = CNPS List 1A Plants presumed extinct in California

1B = CNPS List 1B Plants rare, threatened or endangered in California and elsewhere

Appendix D. Special status wildlife species known to occur in the project vicinity¹

Name	Status	Habitat description	Potential for occurrence on site
<i>Agelaius tricolor</i> tricolored blackbird	SC	Highly colonial species, most numerous in central valley & vicinity. Largely endemic to California. Requires open water, protected nesting substrate, & foraging area with insect prey within a few km of the colony.	Not likely to occur. No suitable habitat present.
<i>Ammodramus savannarum</i> grasshopper sparrow	SC	Dense grasslands on rolling hills, lowland plains, in valleys & on hillsides on lower mountain slopes. Favors native grasslands with a mix of grasses, forbs & scattered shrubs. Loosely colonial when nesting.	Not likely to occur. No suitable habitat present.
<i>Antrozous pallidus</i> pallid bat	SC	Deserts, grasslands, shrublands, woodlands & forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Not likely to occur. No suitable habitat present.
<i>Athene cunicularia</i> burrowing owl	SC	Open, dry annual or perennial grasslands, deserts & scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Not likely to occur. No burrows were observed in the project area and there is limited suitable habitat available in the project vicinity.
<i>Branchinecta lynchi</i> vernal pool fairy shrimp	FT	Endemic to the grasslands of the central valley, central coast mountains, and south coast mountains, in astatic rain-filled pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	No potential to occur. No suitable habitat present.
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	SC	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls & ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	Not likely to occur. No suitable habitat present.
<i>Desmocerus californicus dimorphus</i> valley elderberry longhorn beetle	FT	Occurs only in the central valley of California, in association with blue elderberry (<i>Sambucus mexicana</i>). Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for "stressed" elderberries.	No potential to occur. There are no elderberry shrubs in the vicinity of the action area.
<i>Laterallus jamaicensis coturniculus</i> California black rail	ST	Inhabits freshwater marshes, wet meadows & shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that does not fluctuate during the year & dense vegetation for nesting habitat.	No potential to occur. No suitable habitat present.

Appendix D. Special status wildlife species known to occur in the project vicinity¹

Name	Status	Habitat description	Potential for occurrence on site
<i>Lepidurus packardii</i> vernal pool tadpole shrimp	FE	Inhabits vernal pools and swales in the Sacramento valley containing clear to highly turbid water. Pools commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed & highly turbid.	No potential to occur. No suitable habitat present.
<i>Progne subis</i> purple martin	SC	Inhabits woodlands, low elevation coniferous forest of Douglas fir, ponderosa pine, & Monterey pine. Nests in old woodpecker cavities mostly, also in human-made structures. Nest often located in tall, isolated tree/snag.	Not likely to occur. No suitable habitat present.
<i>Spea hammondi</i> western spadefoot	SC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	No potential to occur. No suitable habitat present.
<i>Thamnophis gigas</i> giant garter snake	FT, ST	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals & irrigation ditches. This is the most aquatic of the garter snakes in California.	Not likely to occur. The project area may provide marginal habitat for this species, but the species is not likely to occur given the nature of the habitat and high level of disturbance.

1. Vicinity refers to the Roseville USGS 7.5' quadrangle and the 8 surrounding quadrangles.

Notes:

FE = Federally listed Endangered
 FT = Federally listed Threatened
 FC = Federal listing candidate
 SE = State-listed Endangered
 ST = State-listed Threatened
 SC = CDFG Species of Concern



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

October 9, 2009

Regulatory Division (SPK-2009-00416)

Gregg Bates
Dry Creek Conservancy
P.O. Box 1314
Roseville, California 95678

Dear Mr. Bates:

We are responding to your request for a Department of the Army permit for the Secret Ravine Fish Passage Improvement Project dated March 15, 2009. This approximately 250 linear foot project involves activities, including discharges of dredged or fill material, in waters of the United States to improve fish passage on Secret Ravine, a perennial stream that supports the spawning, seasonal rearing, and migration of central valley steelhead (*Oncorhynchus mykiss*) and essential fish habitat for Pacific salmon. The project is located on or near Secret Ravine, Section 25, Township 11 North, Range 6 East, Latitude 38.770106°, Longitude -121.253515°, Roseville, Placer County, California.

Based on the information you provided, the proposed activity in approximately 250 linear feet of Secret Ravine would be authorized by Nationwide Permit Number 27. However, the California State Water Resources Control Board denied state water quality certification for Nationwide Permit Number 27 on May 1, 2007. Until Section 401 Water Quality Certification for the activity has been issued or waived, our authorization is denied without prejudice. Once you have provided us evidence of water quality certification, the activity is authorized and the work may proceed subject to the conditions of certification and the Nationwide Permit. Your work must comply with the general terms and conditions listed on the enclosed Nationwide Permit information sheets (enclosure 1), the State's Water Quality Certification and the following special conditions:

Special Conditions

1. You shall limit in-water work to low flow periods (i.e. July 1 through October 1);
2. You shall improve habitat by installing large boulders, large woody debris structures and approximately 46 cubic meters of cobble and gravel in the east channel of Secret Ravine;
3. You shall have a qualified biologist on-site to assist in rescue and relocation of any fish or amphibians found on the site using the protocols specified in Appendix B of the Biological Assessment dated March 2009;
4. You shall install and maintain exclusionary screening to block fish access to the site on both the upstream and downstream borders of the site;
5. You shall maintain downstream flows sufficient to avoid the stranding of fish during dewatering activities;
6. You shall grade and re-vegetate channel banks;

7. You shall protect existing riparian buffer zones;
8. You shall, during construction, temporarily fence setback areas to avoid disturbance of natural riparian vegetation and maintain riparian functions for the Essential Fish Habitat; and
9. You shall use best management practices in all construction and maintenance operations, such as: avoiding ground disturbing activities during the wet season, minimizing the time disturbed lands are left exposed, using erosion prevention and sediment control methods, minimizing vegetation disturbance, maintaining buffers of vegetation around wetlands, streams and drainage ways, and avoiding construction activities in areas of steep slopes with highly erodible soils. Use methods such as sediment ponds, sediment traps, or other facilities designed to slow water runoff and trap sediment and nutrients.

You must sign the enclosed Compliance Certification (enclosure 2) and return it to this office within 30 days after completion of the authorized work.

This verification is valid for two years from the date of this letter or until the Nationwide Permit is modified, reissued, or revoked, whichever comes first. Failure to comply with the General Conditions of this Nationwide Permit, or the project-specific Special Conditions of this authorization, may result in the suspension or revocation of your authorization.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey*.

Please refer to identification number SPK-2009-00416 in any correspondence concerning this project. If you have any questions, please contact James Robb at our California North Branch Office, 1325 J Street, Room 1480, Sacramento, California 95814-2922, email James.T.Robb@usace.army.mil, or telephone 916-557-7610. For more information regarding our program, please visit our website at www.spk.usace.army.mil/regulatory.html.

Sincerely,



Nancy A. Haley
Chief, California North Branch

Enclosures

Copy furnished without enclosure(s):

Ms. Madelyn Martinez, NOAA National Marine Fisheries Service, 650 Capitol Mall, Suite 8-300, Sacramento, California 95814-4706

Mr. Derek Ogden, Open Space Division, City of Roseville, 2005 Hilltop Circle, Roseville, California 95678

Mr. Greg Vaughn, Regional Water Quality Control Board, Central Valley Region, 11020 Sun Center Drive, Suite 200, Rancho Cordova, California 95670

COMPLIANCE CERTIFICATION

Permit File Number: SPK-2009-00416

Nationwide Permit Number:

Permittee: Gregg Bates
Dry Creek Conservancy
P.O. Box 1314
Roseville, California 95678

County: Placer

Date of Verification: October 9, 2009

Within 30 days after completion of the activity authorized by this permit, sign this certification and return it to the following address:

U.S. Army Corps of Engineers
Sacramento District

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with the terms and conditions of the permit your authorization may be suspended, modified, or revoked. If you have any questions about this certification, please contact the Corps of Engineers.

* * * * *

I hereby certify that the work authorized by the above-referenced permit, including all the required mitigation, was completed in accordance with the terms and conditions of the permit verification.

Signature of Permittee

Date



California Regional Water Quality Control Board Central Valley Region

Katherine Hart, Chair



Linda S. Adams
Acting Secretary for
Environmental Protection

11020 Sun Center Drive #200, Rancho Cordova, California 95670-6114
(916) 464-3291 • FAX (916) 464-4645
<http://www.waterboards.ca.gov/centralvalley>

Edmund G. Brown Jr.
Governor

22 April 2011

Gregg Bates
Dry Creek Conservancy
PO Box 1311
Roseville, CA 95678

**CLEAN WATER ACT §401 TECHNICALLY CONDITIONED WATER QUALITY
CERTIFICATION FOR DISCHARGE OF DREDGED AND/OR FILL MATERIALS FOR THE
SECRET RAVINE FISH PASSAGE IMPROVEMENT PROJECT (WDID#5A31CR00266),
PLACER COUNTY**

This Order responds to your 7 April 2009 application submittal for the Water Quality Certification of a stream restoration project impacting approximately 0.48 acre of waters of the United States.

WATER QUALITY CERTIFICATION STANDARD CONDITIONS:

1. This Order serves as a Water Quality Certification (Certification) action that is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to §13330 of the California Water Code and §3867 of Title 23 of the California Code of Regulations (23 CCR).
2. This Certification action is not intended and shall not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent Certification application was filed pursuant to 23 CCR subsection 3855(b) and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.
3. The validity of any non-denial Certification action shall be conditioned upon total payment of the full fee required under 23 CCR §3833, unless otherwise stated in writing by the certifying agency.
4. This Certification is valid for the duration of the described project. This Certification is no longer valid if the project (as currently described) is modified, or coverage under Section 404 of the Clean Water Act has expired.
5. All reports, notices, or other documents required by this Certification or requested by the Central Valley Regional Water Quality Control Board (Central Valley Water Board) shall be signed by a person described below or by a duly authorized representative of that person.
 - (a) For a corporation: by a responsible corporate officer such as (1) a president, secretary, treasurer, or vice president of the corporation in charge of a principal

California Environmental Protection Agency

business function; (2) any other person who performs similar policy or decision-making functions for the corporation; or (3) the manager of one or more manufacturing, production, or operating facilities if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

- (b) For a partnership or sole proprietorship: by a general partner or the proprietor.
- (c) For a municipality, State, federal, or other public agency: by either a principal executive officer or ranking elected official.

6. Any person signing a document under Standard Condition number 5 shall make the following certification, whether written or implied:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

ADDITIONAL TECHNICALLY CONDITIONED CERTIFICATION CONDITIONS:

In addition to the above standard conditions, Dry Creek Conservancy shall satisfy the following:

1. Dry Creek Conservancy shall notify the Central Valley Water Board in writing 7 days in advance of the start of any work within waters of the United States or State. The notification should include the name of the project and the WDID number, and should be sent to the Central Valley Water Board contact person shown on page 5 of this Certification.
2. Except for activities permitted by the U.S. Army Corps under §404 of the Clean Water Act, soil, silt, or other organic materials shall not be placed where such materials could pass into surface water or surface water drainage courses.
3. All areas disturbed by project activities shall be protected from washout or erosion.
4. Dry Creek Conservancy shall maintain a copy of this Certification and supporting documentation (Project Information Sheet) at the Project site during construction for review by site personnel and agencies. All personnel (employees, contractors, and subcontractors) performing work on the proposed project shall be adequately informed and trained regarding the conditions of this Certification.
5. An effective combination of erosion and sediment control Best Management Practices (BMPs) must be implemented and adequately working during all phases of construction.
6. All temporarily affected areas will be restored to pre-construction contours and conditions upon completion of construction activities.

7. Dry Creek Conservancy shall perform surface water sampling: 1) When performing any in-water work; 2) In the event that project activities result in any materials reaching surface waters or; 3) When any activities result in the creation of a visible plume in surface waters. The following monitoring shall be conducted immediately upstream out of the influence of the project and 300 feet downstream of the active work area. Sampling results shall be submitted to this office within two weeks of initiation of sampling and every two weeks thereafter. The sampling frequency may be modified for certain projects with written permission from the Central Valley Water Board.

Parameter	Unit	Type of Sample	Frequency of Sample
Turbidity	NTU	Grab	Every 4 hours during in water work
Settleable Material	ml/l	Grab	Same as above
Visible construction related pollutants	Observations	Visual Inspections	Continuous throughout the construction period

8. Activities shall not cause turbidity increases in surface water to exceed:
- (a) where natural turbidity is less than 1 Nephelometric Turbidity Units (NTUs), controllable factors shall not cause downstream turbidity to exceed 2 NTU;
 - (b) where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU;
 - (c) where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent;
 - (d) where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs;
 - (e) where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.
- Except that these limits will be eased during in-water working periods to allow a turbidity increase of 15 NTU over background turbidity as measured in surface waters 300 feet downstream from the working area. In determining compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses will be fully protected. Averaging periods may only be assessed by prior permission of the Central Valley Water Board.
9. Activities shall not cause settleable matter to exceed 0.1 ml/l in surface waters as measured in surface waters 300 feet downstream from the project.
10. The discharge of petroleum products or other excavated materials to surface water is prohibited. Activities shall not cause visible oil, grease, or foam in the work area or downstream. Dry Creek Conservancy shall notify the Central Valley Water Board immediately of any spill of petroleum products or other organic or earthen materials.
11. Dry Creek Conservancy shall notify the Central Valley Water Board immediately if the above criteria for turbidity, settleable matter, oil/grease, or foam are exceeded.
12. Dry Creek Conservancy shall comply with all California Department of Fish and Game requirements for the project.

13. The use of netting material (e.g., monofilament-based erosion blankets) that could trap aquatic dependent wildlife is prohibited within the Project Area.
14. Dry Creek Conservancy must obtain coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board for any project disturbing an area of 1 acre or greater.
15. The Conditions in this Certification are based on the information in the attached "Project Information." If the information in the attached Project Information Sheet is modified or the project changes, this Certification is no longer valid until amended by the Central Valley Water Board.
16. In the event of any violation or threatened violation of the conditions of this Certification, the violation or threatened violation shall be subject to any remedies, penalties, process, or sanctions as provided for under State and Federal law. The applicability of any State law authorizing remedies, penalties, process, or sanctions for the violation or threatened violation constitutes a limitation necessary to ensure compliance with this Certification.
 - (a) If Dry Creek Conservancy or a duly authorized representative of the project fails or refuses to furnish technical or monitoring reports, as required under this Certification, or falsifies any information provided in the monitoring reports, the applicant is subject to civil, for each day of violation, or criminal liability.
 - (b) In response to a suspected violation of any condition of this Certification, the Central Valley Water Board may require Dry Creek Conservancy to furnish, under penalty of perjury, any technical or monitoring reports the Central Valley Water Board deems appropriate, provided that the burden, including cost of the reports, shall be in reasonable relationship to the need for the reports and the benefits to be obtained from the reports.
 - (c) Dry Creek Conservancy shall allow the staff(s) of the Central Valley Water Board, or an authorized representative(s), upon the presentation of credentials and other documents, as may be required by law, to enter the project premises for inspection, including taking photographs and securing copies of project-related records, for the purpose of assuring compliance with this Certification and determining the ecological success of the project.
17. Dry Creek Conservancy shall provide a Notice of Completion (NOC) no later than 30 days after the project completion. The NOC shall demonstrate that the project has been carried out in accordance with the project's description (and any amendments approved). The NOC shall include a map of the project location(s), including final boundaries of any in situ restoration area(s), if appropriate, and representative pre and post construction photographs. Each photograph shall include a descriptive title, date taken, photographic site, and photographic orientation.
18. All Avoidance and Minimization Measures identified in the 2 October 2009 National Marine Fisheries Service's consultation letter (Reference #2009/01996) must be implemented as a requirement of this Certification.

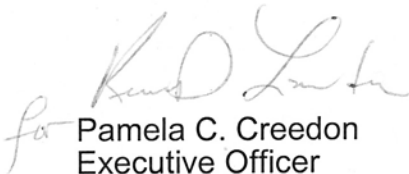
CENTRAL VALLEY WATER BOARD CONTACT:

Daniel Worth, Environmental Scientist
11020 Sun Center Drive #200
Rancho Cordova, California 95670-6114
dworth@waterboards.ca.gov
(916) 464-4709

WATER QUALITY CERTIFICATION:

I hereby issue an Order certifying that any discharge from the Dry Creek Conservancy, Secret Ravine Fish Passage Improvement Project (WDID#5A31CR00266) will comply with the applicable provisions of §301 ("Effluent Limitations"), §302 ("Water Quality Related Effluent Limitations"), §303 ("Water Quality Standards and Implementation Plans"), §306 ("National Standards of Performance"), and §307 ("Toxic and Pretreatment Effluent Standards") of the Clean Water Act. This discharge is also regulated under State Water Resources Control Board Water Quality Order No. 2003-0017 DWQ "Statewide General Waste Discharge Requirements For Dredged Or Fill Discharges That Have Received State Water Quality Certification (General WDRs)".

Except insofar as may be modified by any preceding conditions, all Certification actions are contingent on (a) the discharge being limited and all proposed mitigation being completed in strict compliance with Dry Creek Conservancy's project description and the attached Project Information Sheet, and (b) compliance with all applicable requirements of the *Water Quality Control Plan for the Sacramento River and San Joaquin River*, Fourth Edition, revised September 2009.


for Pamela C. Creedon
Executive Officer

Central Valley Regional Water Quality Control Board

Enclosure: Project Information

cc: See enclosure, page 8

PROJECT INFORMATION

Application Date: 7 April 2009

Applicant: Gregg Bates
Dry Creek Conservancy
PO Box 1311
Roseville, CA 95678

Project Name: Secret Ravine Fish Passage Improvement Project

Application Number: WDID#5A31CR00266

Type of Project: Stream Restoration Project

Approximate Timeframe of Project Implementation: Construction of the project is anticipated to take 45 calendar days. All project activities, except for the re-vegetation, would occur between 1 July and 1 October to avoid salmonid migration period and the nesting season of various bird species. Re-vegetation activities would be completed by December 15. The project is scheduled to be constructed in 2011, pending availability of funds.

Project Location: Section 36, Township 11 North, Range 6 East, MDB&M. Latitude: 38°45'35" and Longitude: -121°15'24".

County: Placer County

Receiving Water(s) (hydrologic unit): Secret Ravine, Sacramento Hydrologic Basin, Valley-American Hydrologic Unit #519.21, Lower American HAS

Water Body Type: Wetlands, Streambed

Designated Beneficial Uses: The *Water Quality Control Plan for the Sacramento River and San Joaquin River*, Fourth Edition, revised September 2009 (Basin Plan) has designated beneficial uses for surface and ground waters within the region. Beneficial uses that could be impacted by the project include, but are not limited to: Municipal and Domestic Water Supply (MUN); Agricultural Supply (AGR); Industrial Supply (IND); Hydropower Generation (POW); Groundwater Recharge, Water Contact Recreation (REC-1); Non-Contact Water Recreation (REC-2); Warm Freshwater Habitat (WARM); Cold Freshwater Habitat (COLD); and Wildlife Habitat (WILD). A comprehensive and specific list of the Beneficial Uses applicable for the project area can be found at http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/

303(d) List of Water Quality Limited Segments: The project is not located within a water quality limited segment. The most recent list of approved water quality limited segments can be found at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/r5_06_303d_reqtmlds.pdf

Project Description (purpose/goal): The Secret Ravine Fish Passage Improvement Project is designed to improve fish habitat and passage within Secret Ravine. The applicant proposes to remove two small (10 meters long by 4 meters wide) abandoned bridges and their associated abutments, before modifying the channel bed to improve fish passage under all

expected flow conditions. The bridges are constructed of wooden planks over twin steel I-beams, and the abutments are made of rebar reinforced concrete. The total volume of material to be removed is approximately 425 cubic yards. The proposed project also involves grading the stream channel and bank slopes, and installing six large rock weirs and six large woody debris structures to increase habitat and complexity.

Construction is scheduled to take place in the low flow months of the summer (1 July through 1 October) and will take approximately 45 days to complete. Secret Ravine Creek will be diverted around the proposed construction site by using sand bags lined with plastic and piping. The bed of the channel where construction activities will take place will remain in a dewatered condition for the duration of construction activities. After construction activities have been completed, the stream banks will be re-vegetated and seeded with an appropriate mix of native trees, shrubs, grasses, and forbs.

Preliminary Water Quality Concerns: Construction activities may impact surface waters with increased turbidity and settleable matter.

Proposed Mitigation to Address Concerns: Dry Creek Conservancy will implement Best Management Practices (BMPs) to control sedimentation and erosion. All temporary affected areas will be restored to pre-construction contours and conditions upon completion of construction activities. Dry Creek Conservancy will conduct turbidity and settleable matter testing during in-water work, stopping work if the Basin Plan criteria are exceeded or are observed.

Fill/Excavation Area: Approximately 150 cubic yards of rock and large woody debris will be placed into 0.48 acres of waters of the United States.

Dredge Volume: Approximately 425 cubic yards of wood, concrete, metal, soil, and rock will be removed from waters of the United States.

U.S. Army Corps of Engineers Permit Number: Nationwide Permit #27

Department of Fish and Game Streambed Alteration Agreement: The Department of Fish and Game signed a Streambed Alteration Agreement on 28 March 2011.

Possible Listed Species: Central Valley steelhead

Status of CEQA Compliance: The Department of Fish and Game determined that the Secret Ravine Passage Improvement Project is exempt from the California Environmental Quality Act and filed a Notice of Exemption on 28 March 2011. The Central Valley Water Board concurs that this project meets CEQA Categorical Exemption under Class 33.

Compensatory Mitigation: This project is a restoration project and will enhance approximately 0.48 acre of Waters of the United States. No compensatory mitigation is required by the Central Valley Water Board.

Application Fee Provided: Total fees of \$640.00 have been submitted to the Central Valley Water Board as required by 23 CCR §3833b(3)(A) and by 23 CCR §2200(e).

DISTRIBUTION LIST

United States Army Corp of Engineers
Sacramento District Office
Regulatory Section, Room 1480
1325 J Street
Sacramento, CA 95814-2922

United States Fish & Wildlife Service
Sacramento Fish & Wildlife Office
2800 Cottage Way
Sacramento, CA 95825

Jeff Drongesen
Department of Fish and Game
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670

Bill Jennings
CA Sportfishing Protection Alliance
3536 Rainier Avenue
Stockton, CA 95204

(Electronic copy only) Bill Orme
State Water Resources Control Board
401 Certification and Wetlands Unit Chief

(Electronic copy only) Dave Smith
Wetlands Section Chief (W-3)
United States Environmental Protection Agency



March 28, 2011

Gregg Bates
Dry Creek Conservancy
P.O. Box 1311
Roseville, CA 95678-8311

Subject: Final Lake or Streambed Alteration Agreement
Notification No. 1600-20009-0075-R2
Secret Ravine Fish Passage Improvement Project

Dear Mr. Bates:

Enclosed is the final Lakebed Alteration Agreement ("Agreement") for the Secret Ravine Fish Passage Improvement Project ("Project"). Before the Department of Fish and Game ("Department") may issue an Agreement, it must comply with the California Environmental Quality Act ("CEQA"). In this case, the Department, acting as a responsible agency, determined your project is exempt from CEQA and filed a notice of exemption ("NOE") on the same date it signed the Agreement.

Under CEQA, filing a NOE starts a 35-day period within which a party may challenge the filing agency's approval of the project. You may begin your project before the 35-day period expires if you have obtained all necessary local, state, and federal permits or other authorizations. However, if you elect to do so, it will be at your own risk.

If you have any questions regarding this matter, please contact Bob Hosea, Environmental Scientist, at (916) 704-9156 or bhosea@dfg.ca.gov.

Sincerely,

 Kent Smith
Regional Manager

ec: Bob Hosea

bhosea@dfg.ca.gov

SIGNATURE PAGE

The Operator, as designated by the signature on this agreement, shall be responsible for the execution of all elements of this agreement. A copy of this agreement must be provided to contractor and subcontractors and must be in their possession at the work site.

Failure to comply with the provisions of this agreement and with other pertinent Code Sections, including but not limited to Fish and Game Code Sections 5650, 5652 and 5948, may result in prosecution.

Nothing in this agreement authorizes the Operator to trespass on any land or property, nor does it relieve the Operator of responsibility for compliance with applicable federal, state, or local laws or ordinances.

This agreement is not valid and work may not begin until the agreement is signed by a representative of the Department of Fish & Game.

Operator: Gregory Bates
 Title: Executive Director
 Organization: Dry Creek Conservancy

Date 3/24/11

Contractor: _____
 Title: _____
 Company: _____

Date _____

Department Representative: Jill Dungen
~~Sandra Morey, Regional Manager~~
h Kent Smith

Date 3/28/11

Initials: GAB

AGREEMENT REGARDING PROPOSED STREAM ALTERATION

THIS AGREEMENT, entered into between the State of California, Department of Fish and Game, hereinafter called the Department, and Dry Creek Conservancy of Roseville, State of California, hereafter called the Operator, is as follows:

WHEREAS, pursuant to California Fish and Game Code, Section 1602, the Operator, on July 6, 2009, notified the Department that he intends to substantially divert or obstruct the natural flow of, or substantially change the bed, channel, or bank of, or use material from the streambed of, the following water: Secret Ravine Creek, in the County of Placer, State of California, Section 36, Township 11 North, Range 6 East, USGS Map Roseville MDB&M.

WHEREAS, the Department, represented by Robert Hosea, has determined that such operations may substantially adversely affect existing fish and wildlife resources including: anadromous salmonid species, warm water fish species, amphibians, and other aquatic and terrestrial plant and wildlife species.

THEREFORE, the Department hereby proposes measures to protect fish and wildlife during the Operator's work. The Operator hereby agrees to accept the following recommendations as part of his work:

This agreement pertains to a phased project intended to enhance fish passage habitat on Secret Ravine Creek. The bridge on the east channel of the creek is to be removed except for one of the concrete abutments to minimize bank erosion. The concrete apron associated with the east channel bridge will be removed because it represents a fish passage barrier. Large rocks will be placed at the upstream end of the west channel to redirect flows primarily into the east channel of the creek. The bed of the east channel will be lowered between one and three feet above the confluence of the two channels to maintain the east channel as the primary channel. A riffle section will be added to the east channel along with selected large woody debris to create resting pools and enhance habitat within the east channel. A large tree blocking water flow into the east channel will be moved to reopen the channel.

Stream Zone Defined: The stream zone is that portion of the stream channel that restricts lateral movement of water. The stream zone is delineated at the top of the bank or the outer edge of any riparian vegetation, whichever is more landward.

1. The notification, together with all supporting documents submitted with the notification, including the site maps, site photographs, engineering plans and habitat improvement plan descriptions, is hereby incorporated into this agreement to describe the location and features of the proposed project. The Operator agrees that all work shall be done as described in the notification and supporting documents, incorporating all project modifications, wildlife resource protection features, mitigation measures, and provisions as described in this agreement. Where apparent conflicts exist between the notification and the provisions listed in this agreement, the Operator shall comply with the provisions listed in this agreement. The Operator further agrees to notify the Department of any modifications made to the project plans submitted to the Department. At the discretion of the Department, this agreement will be amended to accommodate modifications to the project plans submitted to the Department and/or new project activities. Please see the current fee schedule to determine the appropriate amendment fee.

2. Documents, plans, surveys, notifications, and requests pertaining to this project or required by this agreement may be sent via email to Robert Hosea at bhosea@dfg.ca.gov or delivered to the Department of Fish and Game at 1701 Nimbus Road, Suite A, Rancho Cordova, CA 95670. Refer to Notification Number 1600-2009-0075-R2 when submitting documents to the Department.
3. The time period for completing the work within the stream zone of Secret Ravine Creek shall be restricted to periods of low stream flow and dry weather and shall be confined to the period of April 15th to October 15th. Construction activities shall be timed with awareness of precipitation forecasts and likely increases in stream flow. Construction activities shall cease until all reasonable erosion control measures have been implemented prior to all storm events. Weather forecasts shall be documented upon request by the Department. Revegetation, restoration and erosion control work is not confined to this time period.
4. If the Operator finds more time is needed to complete the authorized activity, the Operator shall submit a written request for a work period time extension to the Department. The work period extension request shall provide the following information: 1) Describe the extent of work already completed; 2) Provide specific detail of the activities that remain to be completed within the stream zone; and 3) Detail the actual time required to complete each of the remaining activities within the stream zone. The work period extension request should consider the effects of increased stream conditions, rain delays, increased erosion control measures, limited access due to saturated soil conditions, and limited growth of erosion control grasses due to cool weather. Time extensions are issued at the discretion of the Department. The Department will review the written request to work beyond the established work period. The Department will have ten calendar days to approve the proposed work period extension. The Department reserves the right to require additional measures designed to protect natural resources.
5. The Operator is responsible for obtaining all required permits and authorizations from local, state and federal agencies. The Operator shall notify the Department where conflicts exist between the provisions of this agreement and those imposed by other regulatory agencies. Unless otherwise notified, the Operator shall comply with the provision that offers the greatest protection to water quality, species of special concern and/or critical habitat.
6. A copy of this agreement shall be provided to the Contractor(s) who works within the stream zone of this project. A copy of this agreement and a copy of the project description, as submitted to the Department, must be available upon request at the work site. The Contractor(s) shall sign this agreement prior to working within the stream zone. The Contractor(s) or a designated crew supervisor(s) shall be on site the entire time a work crew is working near the stream zone. The supervisor(s) shall be completely familiar with the terms and conditions of this agreement and shall ensure compliance with all terms and conditions. The Department reserves the right to enter the project site at any time to ensure that there is compliance with the terms/conditions of this Agreement.
7. The Operator shall notify the Department within two working days of beginning work within the stream zone of Secret Ravine Creek. In addition, the Operator/Contractor shall notify the Department within two working days of the completion of work within the stream zone on this project.

Initials: _____

8. When work in a flowing stream is unavoidable, the entire stream flow shall be diverted around or through the work area during the excavation and/or construction operations. Stream flow shall be diverted using gravity flow through temporary culverts/pipes or pumped around the work site with the use of hoses. When any dam or other artificial obstruction is being constructed, maintained, or placed in operation, sufficient water shall at all times be allowed to pass downstream to maintain aquatic life below the dam pursuant to Fish and Game Code section 5937. Any temporary dam or other artificial obstruction constructed shall only be built from clean materials such as sandbags, gravel bags, water dams, or clean/washed gravel which will cause little or no siltation. No other diversion method shall be used without prior authorization by the Department. If another diversion method is preferred, the operator must submit a plan detailing the desired diversion method. Authorization of any other diversion method shall be at the discretion of the Department. The temperature of the diverted water will not be allowed to become elevated such that it may be deleterious to aquatic organisms downstream. The dissolved oxygen concentration of the diverted water will not be allowed to drop to a level that may be deleterious to downstream aquatic life.
9. No trees that contain active nests of birds that are protected by the Migratory Bird Act shall be disturbed until all eggs have hatched and young birds have fledged without prior consultation and approval of a Department representative.
10. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations. No native trees with a trunk diameter at breast height (DBH) in excess of four (4) inches shall be removed or damaged without prior consultation and approval of a Department representative. Using hand tools (clippers, chain saw, etc.); trees may be trimmed to the extent necessary to gain access to the work sites. All cleared material/vegetation shall be removed out of the riparian/stream zone.
11. Precautions to minimize turbidity/siltation shall be taken into account during project planning and implementation. This may require the placement of silt fencing, coir logs, coir rolls, straw bale dikes, or other siltation barriers so that silt and/or other deleterious materials are not allowed to pass to downstream reaches. Passage of sediment beyond the sediment barrier(s) is prohibited. If any sediment barrier fails to retain sediment, corrective measures shall be taken. The sediment barrier(s) shall be maintained in good operating condition throughout the construction period and the following rainy season. Maintenance includes, but is not limited to, removal of accumulated silt and/or replacement of damaged silt fencing, coir logs, coir rolls, and/or straw bale dikes. The use of monofilament netting based erosion control blankets **is prohibited** within the stream zone or associated riparian areas. The Operator is responsible for the removal of non-biodegradable silt barriers (such as plastic silt fencing) after the disturbed areas have been stabilized with erosion control vegetation (usually after the first growing season). The Operator will remove the mesh or netting used to contain coir logs or rolls once the disturbed area has been stabilized if these logs or rolls are to left in the field to decompose. This netting poses an entrapment risk to native snake and raptor species that may be present in the area. Upon Department determination that turbidity/siltation levels resulting from project related activities constitute a threat to aquatic life, activities associated with the turbidity/siltation, shall be halted until effective Department approved control devices are installed, or abatement procedures are initiated.

Initials: _____

12. Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, resulting from project related activities, shall be prevented from contaminating the soil and/or entering the waters of the state. Any of these materials, placed within or where they may enter a stream or lake, by the Operator or any party working under contract, or with the permission of the Operator, shall be removed immediately. The Department shall be notified immediately by the Operator of any spills and shall be consulted regarding clean-up procedures.
13. During construction, the contractor shall not dump any litter or construction debris within the stream zone. All construction debris and associated materials shall be removed from the work site upon completion of this project.
14. All exposed/disturbed areas and access points within the stream zone left barren of vegetation as a result of the construction activities shall be restored using native vegetation. Successful restoration efforts depend on proper site preparation, timing of seed/plug application; placement of plants; placement of erosion protection materials; supplemental watering and post application maintenance. Site preparation may include the application of an herbicide designed to kill weed seeds in the soil. Post seed application may include the use of broadcast straw punched into the soil with the use of a sheep's foot roller or other device. It is recommended that the Operator consult a native plant specialist for restoration planning. The California Native Grassland Association maintains a list of businesses that specialize in native grass products and services <http://www.cnqa.org/>.
15. This agreement is not valid and work may not begin until the agreement is signed by a representative of the Department of Fish & Game. Stream alteration work authorized by this agreement expires five years following the date this agreement is signed by the Department. This agreement shall remain in effect for that time necessary to satisfy all required mitigation and monitoring measures.
16. Requests for Extensions (agreement renewal), Minor Amendments, and Major Amendments must be submitted in writing prior to expiration of the agreement or commencement of work on modified project plans. Extensions and Amendments are issued at the discretion of the Department. Please see the current fee schedule to determine the appropriate fee.
17. The Department may take enforcement action and reserves the right to suspend and/or revoke this agreement if the Department determines that the circumstances warrant. The circumstances that could require these Department actions include, but are not limited to, the following: A) Failure to comply with the terms/conditions of this agreement. B) The information provided by the operator in support of the agreement/notification is determined by the Department to be incomplete, or inaccurate. C) When new information becomes available to the Department representative(s) that was not known when preparing the original terms/conditions of this agreement. D) The project as described in the notification, agreement, or amendment has changed, or conditions affecting fish and wildlife resources change.
18. If, in the opinion of the Department, conditions arise or change in such a manner as to be considered deleterious to aquatic life, operations shall cease until corrective measures are taken.

Initials: _____

19. It is understood that the Department enters into this agreement for purposes of establishing protective features for fish and wildlife, in the event that a project is implemented. The decision to proceed with the project is the sole responsibility of the Operator, and is not required by this agreement. It is agreed that all liability and/or incurred costs related to or arising out of the Operator's project and the fish and wildlife protective conditions of this agreement, remain the sole responsibility of The Operator. The Operator agrees to hold harmless and defend the State of California and the Department of Fish and Game against any related claim made by any party or parties for personal injury or other damage.

Initials: _____

SIGNATURE PAGE

The Operator, as designated by the signature on this agreement, shall be responsible for the execution of all elements of this agreement. A copy of this agreement must be provided to contractor and subcontractors and must be in their possession at the work site.

Failure to comply with the provisions of this agreement and with other pertinent Code Sections, including but not limited to Fish and Game Code Sections 5650, 5652 and 5948, may result in prosecution.

Nothing in this agreement authorizes the Operator to trespass on any land or property, nor does it relieve the Operator of responsibility for compliance with applicable federal, state, or local laws or ordinances.

This agreement is not valid and work may not begin until the agreement is signed by a representative of the Department of Fish & Game.

Operator: _____ Date _____

Title: _____

Organization: _____

Contractor: _____ Date _____

Title: _____

Company: _____

Department
Representative: _____ Date _____
Sandra Morey, Regional Manager

Initials: _____



SECRET RAVINE FISH PASSAGE IMPROVEMENT PLAN
ENGINEER'S ESTIMATE OF PROBABLE CONSTRUCTION COSTS

Job No. 08-729

DATE: 7/28/2011

100% SUBMITTAL

Bid Item	ITEM	SPEC. SECTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	COST
1	MOBILIZATION	01500	1	LS	\$15,000.00	\$15,000
2	CLEARING & GRUBBING	02110	1	LS	\$15,000.00	\$15,000
3	DEWATERING	02140	1	LS	\$20,000.00	\$20,000
4	SLOPE PROTECTION FABRIC	02201	370	SY	\$6.50	\$2,406
5	EXCAVATION	02222	350	CY(F)	\$35.00	\$12,250
6	ENGINEERED STREAMBED MATERIAL	02270	1	LS	\$9,003.78	\$9,004
7	BALLAST BOULDERS	02270	1	LS	\$1,500.00	\$1,500
8	LOG STRUCTURES	02272	1	LS	\$49,230.00	\$49,230
9	COIR ROLL	02379	250	LF	\$8.00	\$2,000
10	SEEDING	02932	0.37	AC	\$3,000.00	\$1,110
11	WILLOW TRANSPLANTING	02950	1	LS	\$1,250.00	\$1,250
				SUBTOTAL		\$128,750
				CONTINGENCY (10%)		\$12,875
				TOTAL		\$141,624

NOTES:

- Quantities shown are approximate only; the Contractor shall be responsible for all work indicated on the Drawings and prescribed in the Specifications.
- In the event that the product of a unit price and an estimated quantity does not equal the extended amount stated, the unit price will govern and the correct product of the unit price and the estimated quantity shall be deemed to be the bid amount.
- Excavation estimate assumes excess soil will be off-hauled and disposed of off-site.
- City of Roseville shall be responsible for project demolition, revegetation, irrigation and long-term vegetation maintenance. Costs for this work are not included in estimate.