

NOTICE OF ENVIRONMENTAL COMMITTEE MEETING

Responsible for matters of stewardship of the District's property including: Urban Water Management Plans; Water Conservation Programs; Classis Watershed Education Grants; Watershed Management; Resource Management and other environmental related matter.

NOTICE IS HEREBY GIVEN that the San Lorenzo Valley Water District has called a regular meeting of the Environmental Committee to be held Thursday, **April 11, 2019 at 9:30 a.m.** at the Operations Building, 13057 Highway 9, Boulder Creek, California.

AGENDA:

1. Convene Meeting/Roll Call
2. Oral Communications:
This portion of the agenda is reserved for Oral Communications by the public for items that are not on the Agenda. Any person may address the Committee at this time, on any subject that lies within the jurisdiction of this committee. Normally, presentations must not exceed three (3) minutes in length, and individuals may only speak once during Oral Communications. No actions may be taken by the Committee on any Oral Communications presented; however, the Committee may request that the matter be placed on a future agenda. Please state your name and town/city of residence at the beginning of the statement for the record.
3. Old Business: None
Members of the public will be given the opportunity to address each scheduled item prior to Committee action. The Chairperson of the Committee may establish a time limit for members of the public to address the Committee on agenda items.
4. New Business:
Members of the public will be given the opportunity to address each scheduled item prior to Committee action. The Chairperson of the Committee may establish a time limit for members of the public to address the Committee on agenda items.
 - A. UPPER ZAYANTE STREAM WOOD ENHANCEMENT PROJECT COOPERATIVE AGREEMENT
Discussion and possible action by the Committee regarding Upper Zayante Large Stream Wood Project.
 - B. EDUCATION COMMISSION AND CLASSIC WATERSHED GRANT PROGRAM FUNDING OPPORTUNITIES
Discussion by the Committee regarding funding for Education Commission and Classic Watershed Grant Program.
 - C. WATER CONSERVATION REQUIREMENTS/REBATE PROGRAM UPDATE
Discussion by the Committee regarding Water Conservation Program update.
5. Informational Material: None
6. Adjournment

In compliance with the requirements of Title II of the American Disabilities Act of 1990, the San Lorenzo Valley Water District requires that any person in need of any type of special equipment, assistance or accommodation(s) in order to communicate at the District's Public Meeting can contact the District Office at (831) 338-2153 a minimum of 72 hours prior to the scheduled meeting.

Agenda documents, including materials related to an item on this agenda submitted to the C o m m i t t e e after distribution of the agenda packet, are available for public inspection and may be reviewed at the office of the District Secretary, 13060 Highway 9, Boulder Creek, CA 95006 during normal business hours. Such documents may also be available on the District website at www.slvwd.com subject to staff's ability to post the documents before the meeting.

Certification of Posting

I hereby certify that on April 8, 2019, I posted a copy of the foregoing agenda in the outside display case at the District Office, 13060 Highway 9, Boulder Creek, California, said time being at least 72 hours in advance of the meeting of the Environmental Committee of the San Lorenzo Valley Water District in compliance with California Government Code Section 54956.

Executed at Boulder Creek, California, on April 8, 2019.

Holly B. Hossack, District Secretary
San Lorenzo Valley Water District

MEMO

TO: Environmental Committee

From: Environmental Programs Manager

SUBJECT: Upper Zayante Stream Wood Enhancement Project Cooperative Agreement

DATE: April 11, 2019

RECOMMENDATION:

It is recommended:

1. That the Environmental Committee review this memo and discuss the Upper Zayante Stream Wood Enhancement Project with the Resource Conservation District.
<http://www.rcdsantacruz.org>
2. Re-Authorize the District Manager to sign the Cooperative Agreement to proceed with the Upper Zayante Stream Wood Enhancement Project.

BACKGROUND

October 2, 2014 your Board authorized the Upper Zayante Stream Wood Enhancement Project to take place on District property located on Upper East Zayante Road, Felton California.

January 2017 the District submitted a Letter of Commitment and Support to the Regional Water Quality Control Board as part of a grant application to fund the Upper Zayante Stream Wood Enhancement Project.

October 18, 2018 the Board authorized the District Manager to execute the Access Agreement with the Resource Conservation District of Santa Cruz County to provide access to the District's property on Upper Zayante for the installation of large wood in the stream to enhance habitat for threatened and endangered salmonid species.

Additionally, at that same October 2, 2018 meeting, the Board Authorized the District Manager to enter into a cooperative agreement associated with the actual permitting and implementation of the project as required by the grant funding the project. It was noted that the Agreement would be included in board packet when available. The Cooperative agreement is now available and is available for the Environmental Committee to review prior to executing the Cooperative Agreement.

The proposed project builds on previous efforts, including stream surveys conducted in 2014, and the installation of 15 in-creek habitat structures completed in 1994 on a City of Santa Cruz property. The Project was identified as a high priority through the San Lorenzo River 2025 partnership in conjunction with the county-wide Integrated Watershed Restoration Program (IWRP), and through IWRP. The Coastal Conservancy

has provided a grant to fund the design and permitting phase of the Project.

The San Lorenzo Valley Water District owns about 0.5 mile of Zayante Creek upstream of the Mountain Charlie Gulch confluence. This stream reach has the potential to serve as extremely valuable spawning and rearing habitat for both steelhead and Coho salmon. With the District's ownership, this reach is not impacted by residential development, which is prevalent in lower Zayante Creek, and is down stream of multiple obstructions that limit steelhead access into upper Zayante Creek.

Timeline:

1. October 2, 2014: The Board permission for the project to take place on District property.
2. July 2018: Resource Conservation District received a grant from State Water Resources Control Board for the Upper Zayante Creek Stream Wood Enhancement Project, and are in the process of mobilizing to begin work.
3. October 25, 2018 District executed Access Agreement.
4. 2019: District to enter into cooperative agreement associated with permitting and implementation of the project.
5. 2018-19: Acquire Permits from State and Federal agencies, under the direction of the RCD.
6. Summer 2019: Upper Zayante Stream Wood Enhancement Project Installation Scheduled.

2015 STRATEGIC PLAN:
Strategic Element 2.0 - Watershed Stewardship

FISCAL IMPACT:
Cost: \$0 Grant Funded 100%

COOPERATOR AGREEMENT

TERMS OF ASSISTANCE AND NOTIFICATION REGARDING THE PROCEDURES FOR CONFORMANCE WITH MULTIPLE PERMITS

between the
UNITED STATES DEPARTMENT OF AGRICULTURE - NATURAL RESOURCES CONSERVATION SERVICE
and the
RESOURCE CONSERVATION DISTRICT OF SANTA CRUZ COUNTY
and the following Cooperator(s):

Property Owner: _____ Address: _____

Property Owner: _____ Address: _____

Contractor: _____ Address: _____
_____ Zip: _____

Property Location: _____ (the "Property")
(Assessor's Parcel Number, street address, or narrative description: see attached map)

USDA Tract #: _____ Photo No: _____ Quad Sheet: _____

Acres: _____ Major Land Use: _____
(Orchard, Row Crops, Range, Woodland, etc.)

This agreement is freely entered into by the United States Department of Agriculture, Natural Resources Conservation Service (NRCS) and the Santa Cruz County Resource Conservation District (RCDSCC) for the Santa Cruz Countywide Partners in Restoration Permit Coordination Program, referred to hereinafter as the "**Program**", and the "**Cooperator(s)**" identified above.

I. THE PROGRAM AGREES TO AUTHORIZE PROJECTS AND FURNISH INFORMATION, TECHNICAL and/or OTHER ASSISTANCE (as may be available) TO:

1. Help solve conservation problems;
2. Assist in the design, installation and monitoring of appropriate conservation practices,
3. Offer the Cooperator the coverage of multiple permits which provide for the design, installation and monitoring of specified conservation practices under the Program as issued by the public agencies including: Department of the Army, Corps of Engineers; United States Fish and Wildlife Service; National Marine Fisheries Service; California Coastal Commission; California Department of Fish and Game; Regional Water Quality Control Board; and County of Santa Cruz (collectively, the "Permitting Agencies").
4. Provide the Cooperator with information and support from qualified Program staff to answer questions regarding the procedures for the design, installation and monitoring of the conservation practices in terms of the specific protective measures to be followed to avoid or minimize the impacts of projects to natural resources and water quality.
5. Authorize participation of projects that are consistent with the parameters of the Program and to remove projects from the Program if the Cooperator or their agents (e.g. contractors, labor) do not carry out work consistent with the procedures for the design, installation and monitoring of the conservation practices covered by the permits as described under Section III.4 on the following page.

II. THE COOPERATOR(S) AGREES:

1. To fully conform with the procedures for the design, installation and monitoring of the conservation practices developed by the Program with the Permitting Agencies under their various permitting authorities. These procedures are documented in the project conditions, conservation plan, design and construction and maintenance specifications (collectively, the "Project") provided to the Cooperator by the NRCS and RCDSCC, which documents shall be dated and initialed by Cooperator, NRCS and RCDSCC prior to commencement of construction and shall be part of this Cooperator Agreement.

Cooperator Agreement
Santa Cruz Countywide Partners in Restoration Permit Coordination Program

2. To allow the NRCS and RCDSCC to include information about the benefits of the project, including photographs, a mid-construction season (Oct. 1) project status report and an annual report provided to the Permitting Agencies.
3. To the best of Cooperator's knowledge, the Project is taking place on the Property.
4. Cooperator has provided the NRCS and RCDSCC with information about all existing easements and other restrictions on their property that could be affected by the proposed Project. If the landowner fails to provide this information to the NRCS and RCDSCC, and a conflict with the terms and conditions of any existing easements/restrictions occurs as a result of Project implementation, Cooperator will be responsible to rectify the situation consistent with the terms and conditions of the easement/restrictions.

III. IT IS AGREED THAT:

1. The Program is not obligated to determine the size and boundary lines of the Property, or any water rights connected to the Property,
2. Cooperator will obtain all necessary permits, if any, beyond the permits issued to NRCS and RCDSCC by the Permitting Agencies, and pay associated costs in order to comply with all laws and ordinances. The Conservation Plan implemented under this Agreement, as part of the Program provides the Cooperator with the authorizations described in the permits checked off below:

- Master Permit issued by the County of Santa Cruz - complies with the Federal Coastal Zone Management Act, the Santa Cruz County Local Coastal Program (in conjunction with the California Coastal Commission), the California Environmental Quality Act, and the following County ordinances:

County Code Sections:

- 9.70 – Encroachment Permit Regulations
 - 12.10 – Building Regulations
 - 13.10 – Zoning Ordinance
 - 13.20 – Coastal Zone Regulations
 - 16.10 – Geologic Hazards Ordinance
 - 16.20 – Grading Regulations
 - 16.22 – Erosion Control Ordinance
 - 16.24 – Water Quality Control Ordinance
 - 16.30 – Riparian Corridor and Wetlands Protection Ordinance
 - 16.32 – Sensitive Habitat Protection Ordinance
 - 16.34 – Significant Trees Protection Ordinance
 - 16.40 – Native American Cultural Sites Ordinance
 - 16.44 – Paleontological Resource Protection Ordinance
- Regional General Permit with the U.S. Army Corps of Engineers, San Francisco, CA -complies with Section 404 and Section 10 of the Clean Water Act.
- Water Quality Certification issued by the Regional Water Quality Control Board, Region III, San Luis Obispo, CA - complies with Section 401 of the Clean Water Act.
- Memorandum of Agreement with the California Department of Fish and Game, Yountville, CA - complies with Section 1602 of the Fish and Game Code when associated Streambed Alteration Agreement is issued by DFG.
- Potential impacts on historic or archeological sites covered by the Programmatic Agreement (PA) between the Advisory Council on Historic Preservation, the National Council of State Historic Preservation Officers and NRCS, Washington, DC - complies with Section 106 of the National Historic Preservation Act.
- Biological opinions and incidental take statements, issued by the United States Fish and Wildlife Service, Ventura, CA and/or the National Marine Fisheries Service, Santa Rosa, CA - complies with the Federal Endangered Species Act.
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Cooperator Agreement
Santa Cruz Countywide Partners in Restoration Permit Coordination Program

3. The Cooperator or their agents (e.g. contractors, labor) will perform work in compliance with the terms and conditions of the permits checked above, any additional permits required to be obtained by Cooperator, and the Project.
4. If the Cooperator or their agents (e.g. contractors, labor) do not carry out work consistent with the procedures for the design, installation and monitoring of the conservation practices covered by the permits with the public agencies indicated in #2 above, the Program shall notify the Cooperator and work directly with them to resolve the problem. If the Cooperator still fails to conform, the Program shall notify the Cooperator that their activities are inconsistent with the procedures contained in permits and that the Cooperator's actions are no longer covered by the permits. The Program will revoke authorization for the project and will not reimburse contract funds to Cooperators who install conservation practices in a manner inconsistent with NRCS Project Plans and Specifications and the permits and approvals issued for the Program,. The Program shall have no further responsibility to enforce the conditions and shall not be held responsible as the permittee. The Cooperator shall be held directly liable for all violations and will have to individually obtain all necessary permits and/or rights, and to comply with all law and ordinances.
5. Cooperator agrees to indemnify, defend and hold harmless RCDSCC and the Permitting Agencies from and against any and all demands, claims, liabilities, losses, or causes of action (including, without limitation, negligence, active or passive), fines, penalties, and expenses (including all costs and attorney's fees) caused by, or arising out of, or in any way connected with the Project.
6. During the term of this Agreement, NRCS and RCDSCC shall have access over those portions of the Property as reasonably necessary to perform monitoring and any other actions described in the Project to be performed by them.
7. This Agreement shall bind and inure to the benefit of the respective heirs, personal representatives, assigns and successors in interest of Cooperator, who shall notify such parties of the existence of this Agreement and shall also notify NRCS and RCDSCC when the Property is being offered for sale or lease. All notices and other communications under this Agreement shall be in writing, addressed to the parties at the addresses set forth below, and delivered by personal service, or by Federal Express or other overnight delivery service, or by registered or certified mail, postage prepaid, return receipt requested:

Kelli Camara
Resource Conservation District of Santa Cruz County
820 Bay Ave, Suite 136
Capitola, CA 95010

Any such notice shall be deemed delivered as follows: (a) if personally delivered, the date of delivery to the address of the person to receive such notice; (b) if sent by Federal Express or other courier service, the date of delivery to the address of the person to receive such notice; (c) if mailed, three (3) calendar days after depositing same in the mail. Any notice sent by facsimile transmission must be confirmed by personally delivering or mailing a copy of the notice sent by facsimile transmission. Any party may change its address for notice by written notice given to the other at least five (5) calendar days before the effective date of such change in the manner provided in this Section.

8. This Agreement shall become effective on the date of the last signature and shall terminate in accordance with the terms of the Project.
9. This Agreement and any subsequent amendments may be executed in any number of counterparts, each of which shall be deemed to be an original, but all of which together shall constitute one and the same instrument.
10. Cooperator certifies that the following easements and/or restrictions on the property:

Owner(s) initials: _____

COOPERATOR(S):

Property _____

Cooperator Agreement
Santa Cruz Countywide Partners in Restoration Permit Coordination Program

Owner: _____ Date _____

Operator: _____ Date _____

Contractor: _____ Date _____

Santa Cruz County Resource Conservation District Date _____

United States Department of Agriculture,
Natural Resources Conservation Service Date _____

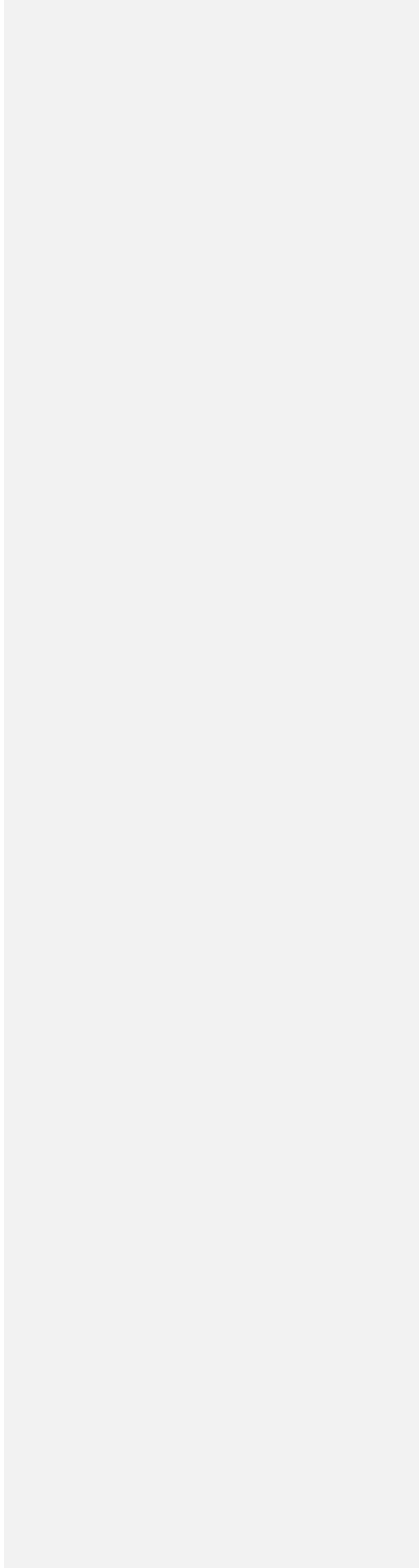


Exhibit A - Description of Property

See attached parcel map/deed

Ari Rettinger 3/27/2019 1:07 PM

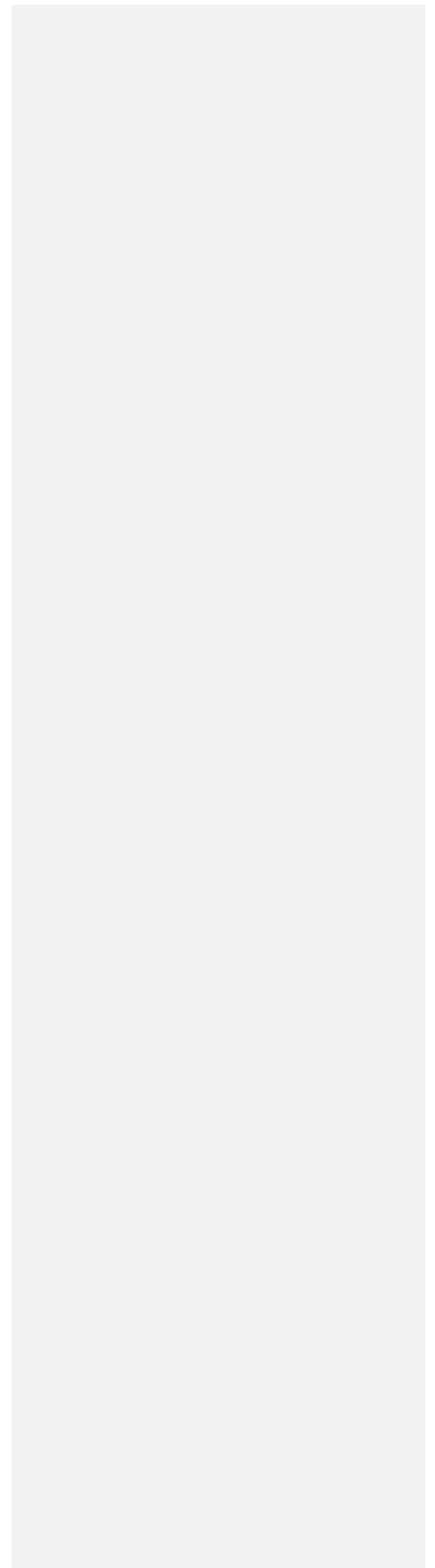
Comment [1]: Did not find any record at the County. Follow-up up with Jen @ SLVWD to locate.



Exhibit B

Project Design, Practice Requirements, Construction and Maintenance Specifications

100% Project Designs prepared by Waterways Consulting Inc, dated 1/1/18 (10 pages)
100% Project Specifications prepared by Waterways Consulting Inc, dated 1/16/18 (63 pages)



BASIS OF DESIGN MEMORANDUM

To: Kelli Camara, RCD of Santa Cruz County
From: John Dvorsky, Waterways Consulting, Inc.
Date: December 30, 2016
Re: Zayante Creek Habitat Enhancement Project

Introduction

The City of Santa Cruz (City) and the San Lorenzo Valley Water District (SLVWD) own large, mostly contiguous tracts of land in the Zayante Creek watershed, a major tributary to the San Lorenzo River. These properties are forested and include ownership of the stream corridor and associated riparian and forest buffers. The forest is dominated by second or third growth redwood and douglas fir with riparian corridors dominated by a mix of alder and maple. In the early 1990's the City worked with Santa Cruz County to implement habitat enhancement measures on their property that focused on installation of wood and rock "pinch" structures that were designed to create localized bed scour and increase the depth and frequency of pool habitat (Photo 1). In addition to the pinch structures, opportunistic stabilization of large wood recently recruited into the stream corridor occurred on the SLVWD district. These logs were secured to live, standing trees using cable. The timing and history of these activities on SLVWD property is not known.

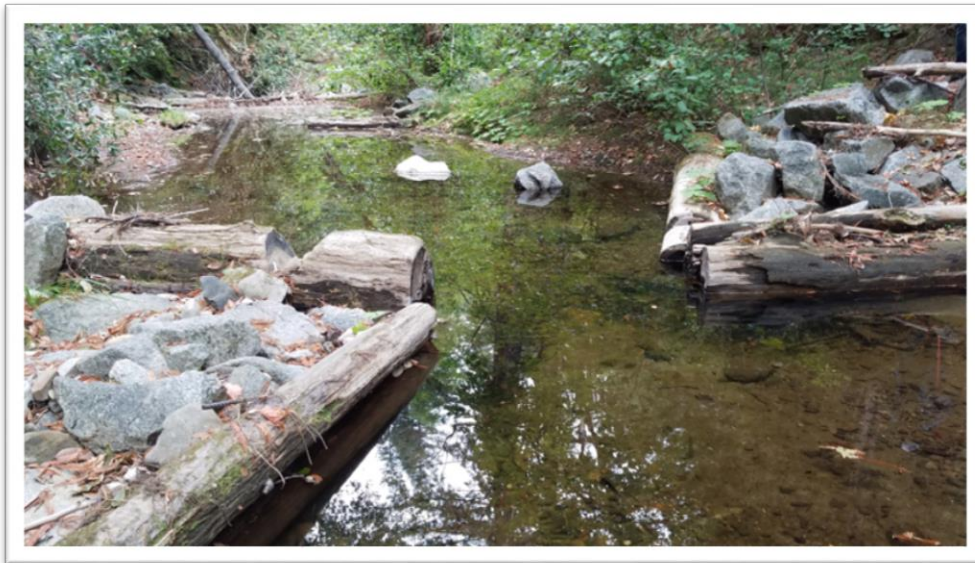


Photo 1: Example of a habitat structure constructed in 1994 within the City owned portion of upper Zayante Creek.

Historically, Zayante Creek was known to be a very productive tributary for salmonids in the San Lorenzo River watershed. Impacts such as road development, clearing of large wood from the channel, past

forest management practices, floodplain disconnection, and water diversions have greatly impacted salmonid habitat. The listing of both steelhead and coho salmon, and the completion of recovery plans for these species by the National Marine Fisheries Service (NMFS), has led to renewed interest in restoration actions that seek to address key limiting factors.

The proposed project focuses on habitat enhancement measures on publicly held properties, owned by the City and the SLVWD, with the objective of developing cost-effective restoration actions that attempt to restore historic functions that created and maintained the physical habitat necessary to support key life stages for these listed species. The design process to date has included technical review, site visits, and collaboration with the City, SLVWD, the City's consulting forester, County of Santa Cruz, Santa Cruz County Resource Conservation District, National Marine Fisheries Service, and California Department of Fish and Wildlife.

Existing Site Conditions

PROJECT LOCATION

The project area encompasses approximately one mile of the mainstem of upper Zayante Creek (See Appendix A, Sheet C1 and C2). Mountain Charlie Gulch, a primary tributary of upper Zayante Creek, enters at approximately the midpoint and is the dividing line between the City ownership at the downstream end, and the SLVWD ownership at the upper end. East Zayante Road parallels Zayante Creek along the entire length of the project area and crosses Zayante Creek across bridges in two locations. One additional private bridge crosses Zayante Creek just downstream of the Mountain Charlie Gulch confluence.

GEOMORPHOLOGY

Upper Zayante Creek flows within a narrow, incised canyon that is a result of relatively rapid uplift of the Santa Cruz Mountains and rainfall intensities that allow rapid incision into a landscape dominated by sedimentary rock. Hillslopes are steep and are prone to landslides and debris flow events that historically have delivered sediment and organic material to tributary and mainstem channels. These mass-wasting events are episodic in response to earthquakes and high intensity, long duration rainfall events. They have produced cycles of aggradation and reincision, resulting in development of a series of terraces that persist in wider portions of the narrow valley. Historically, downed trees and accumulation of mobilized large wood into persistent log jams has enhanced aggradation, creating a wider and more dynamic valley floor that provided the diversity of habitat required to support multiple species and life stages of salmonids.

Over the past 150 years, resource extraction and continued human use of the watershed has significantly modified the landscape and altered the physical forces that created and maintained the physical habitat that supported these biological functions. Past logging, the direct removal of large wood from Zayante Creek, and road and rail development along the inner gorge and floodplain had a profound impact on the channel. One of the most significant impacts was incision of the channel into sediments stored behind large and persistent log jams. Without large wood to provide a persistent and redundant source of grade control, much of this portion of Zayante Creek scoured to a condition typified by a thin layer of alluvial material overlying bedrock. The result is an active channel that is narrower and less complex, and unable to create variability in the profile to develop deep pools and provide for meaningful hyporheic exchange. Even if roughness elements are present, the depth of scour and associated pool depth is muted by the depth of the alluvial layer.

Historically, downed trees from adjacent, mature, coniferous forests would have provided roughness at a range of peak discharges, creating obstructions and local backwater effects, resulting in deposition and storage of coarse bedload in extensive bar deposits, riffles, and even secondary channels where the valley is broad. It is this mechanism that allows for variability in the bed profile, creates a more natural pool and riffle sequence and reduces summer water temperatures by enhancing hyporheic flow and water temperature stratification in large, deep pools.

Our field investigations divided the project area into two reaches that are separated by the Mountain Charlie Gulch confluence. This dividing line is tectonic and lithologic in nature in that Mountain Charlie runs along the axis of the Zayante Fault Zone, resulting in differences in bedrock material, channel gradient, and mass wasting characteristics. The portion of the project area downstream of Mountain Charlie is much more confined by adjacent hillslopes with very little meander of the valley floor. This condition resulted in placement of East Zayante Road, and the adjacent fill slope, within the inner gorge, which directly impinges upon the channel. This contrasts with the portion of the project area that is upstream of Mountain Charlie where, in most cases, the road was developed further up the hillslope and generally has less impact on Zayante Creek, except at crossings.

LIMITING FACTORS

In similar ways to other salmonid bearing streams, large wood plays an important role in defining the morphology of the channel and the quality of aquatic habitat. Individual pieces of wood provide local escape cover to improve rearing habitat and refuge areas under high flow conditions (Photos 2). Accumulations of large wood in log jams provide obstructions and constrictions at high flow events that are critical elements in allowing for the deposition of coarse bedload, creating bar forms and riffles and enhancing pool and riffle sequences that are critical for all life stages of salmonids.



Photo 2: Example of a single log creating a plunge pool, storing a small amount of sediment upstream, and improve escape cover habitat. This site is located in the SLVWD reach.

Log jams are formed when entire trees fall into and span the channel, providing key pieces to recruit additional large wood and debris that, over time, eventually build into a log jam capable of influencing

the hydraulics and sediment transport dynamics. When a log jam is large enough and exhibits a vertical component, high flow events capable of mobilizing coarse bed material are affected. These jams cause localized flow constrictions that result in backwater conditions upstream, deposition of coarse bed material in bars and riffles, and high velocity conditions downstream that scour deeper pools.

The work completed in the early 1990's was designed to enhance development of pools. Those designers focused on pools, or the lack of pool habitat, because they considered that habitat element to be missing from the system, resulting in inadequate juvenile rearing habitat. By adding pool habitat, the designers were hoping to improve juvenile rearing habitat and remove that as a limiting factor to the survival of the juvenile salmonid life stage through this reach.

In 2002, the San Lorenzo River Salmonid Enhancement Plan was published and sought to identify key limiting factors to salmonids in the mainstem and primary tributaries of the San Lorenzo River (Dvorsky, Alley, and Smith, 2002). That document identified juvenile rearing habitat as being the prime limiting factor on Zayante Creek. Secondary limiting factors included downstream adult passage impediments and streamflow quantity issues associated with water diversions. Key elements of juvenile rearing habitat that were identified as limiting included excessive fine sediment inputs, a lack of habitat depth, and limited availability of escape cover. The last two were linked to a lack of roughness elements such as large wood. The presence of adequate adult spawning habitat was not considered to be a limiting factor in Zayante.

Development of Preliminary Design Approach for Peer Review

The evaluation of site conditions and enhancement opportunities consisted of a three-step process that led to development of the conceptual level drawings. The three-step process can be summarized as follows:

- ***Step 1 - Preliminary Evaluation and Site Selection:*** Waterways staff, including John Dvorsky and Matt Weld, walked the entire project reach to map existing enhancement structures, identify site specific and reach-scale enhancement opportunities and constraints, select potential project sites and determine the field data that would be needed to prepare the preliminary designs. In addition to evaluating the locations where structures were built in 1994, sites identified by Kristen Kittleson and Jon Jankovitz during a previous field evaluation were assessed. Factors such as site access, the functional intent of each enhancement action, and the materials that would be required at each site was considered, along with whether local resources could be used or if the material would need to be imported from off-site. In general, the focus of the assessment was to understand opportunities, constraints, risks, and an overall enhancement strategy.
- ***Step 2 – Survey:*** This step consisted of collecting all of the relevant information, identified in Step 1, needed to develop the preliminary designs, cost estimates, and to support later phases of design and permitting. Based on the proposed approach for each reach it was determined that a more detailed survey of the City property was required given the higher level of risk associated with the proximity of the channel to East Zayante Road and the power line. On the City property, the survey consisted of a longitudinal profile of the entire reach, detailed topographic survey in the proposed project locations, locations of infrastructure, such as the road and power line, locations of the existing enhancement structures, locations of significant trees within the proposed project locations, and proposed staging and access areas. On the SLVWD property, the focus of the survey was to locate the potential project locations and map

previously used logging roads that would be used to access project sites. Future site assessment work was anticipated at these locations to specifically identify wood sources based on the outcome of the Team and TAC meetings and to assess potential impacts to existing resources along access routes and staging areas.

- **Step 3 – Wood Sourcing and Placement Strategies:** This task consists of visiting representative sites within each reach with the City of Santa Cruz’s consulting forester to discuss opportunities and constraints associated with sourcing wood locally and moving the wood to the desired location. In addition, the consulting forester had valuable knowledge about how the existing structures were built and what type of equipment could feasibly be used to construct the range of structures that were being considered. He also had information about several stumps and logs that had been opportunistically stored by the City to support future projects of this type. That wood was evaluated and inventoried.

CITY OF SANTA CRUZ REACH RESTORATION APPROACH

The City reach consists of approximately ½ mile of Zayante Creek that flows in a narrow, relatively low gradient channel directly adjacent to the road. A total of 17 existing enhancement structures were identified along this reach. The enhancement structures consist primarily of a set of log and boulder pinch structures that extend from each bank toward the center of the channel, forming a triangle with the vertex pointing toward the center of the channel to constrict the overall channel width (see Photo 1). The two edges of the triangle that extend from the bank were constructed from cut logs that are held in place using rebar that was drilled through the log and into the underlying substrate. The void space between the two logs was filled with rock. According to the consulting forester, all of the structures were constructed by hand using prison labor crews. Sites were selected based on proximity to the road and in locations where existing trees did not inhibit opportunities to dump large rock and logs out of a truck, down the bank, and to the structure locations. Since all of the structures were constructed using human labor and hand tools, the size of the logs and rocks were limited by the ability to move them short distances for placement.

In general, it appears that overall, the structures achieved their limited goal of creating localized pool habitat. Approximately half of the structures were still completely intact and functioning as localized flow constrictions and creating local bed scour and pool formation. About one quarter of the structures were failing (e.g. – logs mobilized) but were still providing some of the desired function because the rock was still present (Photo 3). The remaining structures were failing or had other issues that limited their ability to perform as intended. In addition to many of the structures still functioning as intended, a few of the structures were providing an added benefit of enhancing bedload deposition upstream by causing a constriction that had enough of a vertical component to result in backwatering upstream during discharge events when a significant amount of bedload was mobilizing (Photo 4). It is these structures that interested us the most.

The primary deficiency of the existing structures is that they are low profile structures that lack a vertical component. They function as forcing structures but only do so under moderate flow conditions. At high flow conditions, when the depth of flow is 5 or more feet above the bed of the channel, these structures are essentially hydraulically invisible. Their location may generate localized bed scour for pool development and they may enhance aggradation upstream, but the pools being generated were observed to be, at best, up to two feet deep and the extent of aggradation upstream was limited. To achieve significant improvements to these desired functions, while also at the same time creating habitat that meets other requirements of rearing, such as high flow refugia and escape cover, more

robust large wood structures need to be constructed. The proposed structures would include a significant vertical component, take advantage of existing roughness elements such as bedrock outcrops, and have elements such as rootwads that provide habitat complexity.



Photo 3: Example of habitat enhancement structure that was intact along one bank but not the other.

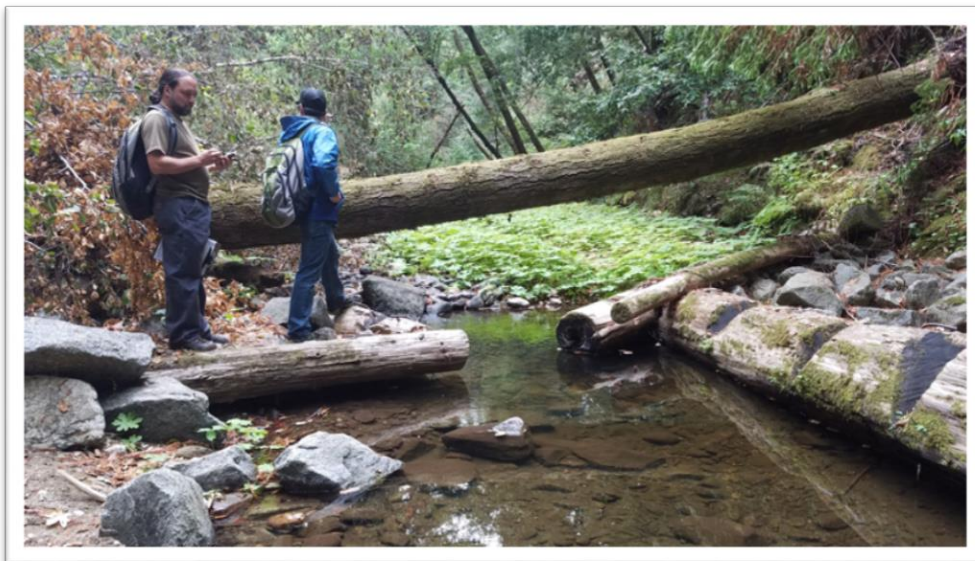


Photo 4: Example of an enhancement structure that was still providing some localized pool scour but was also resulting in bedload aggradation upstream.

The challenge with introducing large wood structures of this size to the channel is that they can present significant risk to existing infrastructure and require robust ballasting techniques to prevent the wood from floating and causing potential damage to downstream infrastructure due to erosion or flooding.

The most common ballasting techniques include boulders, sometimes secured to the rock with cable or chain, or vertical pile elements. Furthermore, their construction requires use of heavy equipment, such as large excavators or cranes that can directly access the location where the structure is being built. The potential for these structures to create localized bank erosion, higher water surface elevations upstream of the structure, and accumulations of additional wood limits their placement directly adjacent to a steep road embankment. Sites have to be selected that are a moderate distance from the road and provide lower slope embankments off of the road that allows for heavy equipment access where a significant number of trees won't be impacted. These constraints limit the number of potential project locations within the City reach. The criteria for selecting a site turns out to be the opposite of the criteria used to select the sites for the existing structures. Although there appeared to be opportunity to enhance several of the existing structures to meet the desired habitat objectives, the inability to get heavy equipment to these sites and the risk to East Zayante Road was determined to be too high and they were dropped from consideration.

Given the constraints, only two project sites were identified in the City reach with a total of four large wood structures proposed. The proposed sites are shown on Sheet C3 of the Preliminary Engineering Drawings (Appendix A) with typical details of the proposed large wood structures shown on Sheet C5. Site selection was ultimately limited to two locations due to an inability to ensure that heavy equipment could get to additional locations along with risks to the road. These two factors ultimately drove site selection. There is a high likelihood that the installed structures will recruit additional wood with the potential for creation of a fully channel spanning structure. Depending on how the structure develops over time, flanking of the structure could result in erosion of the adjacent hillslope. Although the design approach will favor hydraulic forcing toward the left bank and opposite of the road embankment, the alignment and extent of recruitment and jam development is unknown. Consequently, the sites were chosen in locations where the road sits a considerable distance back from the top of bank and some right bank erosion could be tolerated.

Each structure in the City-owned reach, referred to as a Type 1 Habitat Enhancement Features, would consist of two logs with rootwads attached, up to five logs without a rootwad, and an appropriate number of ballast boulders that will be buried in the bed and bank. The first course of logs would be anchored to the ballast boulders with the remaining horizontal and vertical members secured to the anchored members with log to log connections consisting of threaded rebar at log cross-over points. Slash from local harvested material and overexcavated substrate will also be integrated into the structure to increase complexity and to make the structure less porous (think landslide). Where opportunities exist, some of the logs would be keyed into the adjacent bank or extend up onto the higher portions of the bank.

The sites will be accessed by two separate staging areas consisting of large turnouts along the edge of E. Zayante Road. At the downstream staging site access to the channel for construction will be at two points along the streambank. The access points are fairly open and only limb removal may be required to move equipment and materials down to the bed of the channel. At the upstream access point, some grubbing and earthwork will be required to develop the staging area and move equipment and materials down to the channel. The staging area is currently being used as a spoils placement area for an active landslide located across the road from the stage area. Consequently, the staging area is uneven and is vegetated with ground cover. Only a portion of the spoils storage area will be needed for staging. Limbing of some existing trees will be required to access the channel from the staging area. Based on conditions observed at each of the sites in October 2016, use of heavy equipment within wetted

portions of the channel will not be required and therefore no dewatering is proposed. Log placement will temporarily impact wetted portions of the channel but the impact is expected to be restricted to placement of the lowest course of logs and would not justify the amount of disturbance and turbidity that would be created by setting up and dismantling a diversion system.

A total of four Type 1 Habitat Enhancement Features are proposed in the City-owned reach with a total of 8 logs with rootwads attached and 18 logs without rootwads. All of the logs without rootwads will be harvested on site from City-owned property, across the creek from the access points. A total of 11 trees will be cut from the adjacent forest, felled away from the creek, cut to size, and then yarded to the structure locations. The 11 felled trees are expected to provide 18 logs with diameters ranging from 20" to 30" and lengths ranging from 30 feet to 40 feet. The rootwads will be imported to the site with diameters ranging from 20" to 30" and lengths ranging from 25 feet to 35 feet. Individual logs will be selected for placement during construction to maximize use in the structure and to adjust to specific site conditions.

SAN LORENZO VALLEY WATER DISTRICT REACH

The SLVWD reach consists of approximately ½ mile of Zayante Creek upstream of the confluence of Mountain Charlie Gulch and downstream of the Fern Ridge Road Bridge. East Zayante Road crosses the creek approximately half way through the project reach and there are a few private inholdings within the SLVWD property. In addition, the City of Santa Cruz owns a large inholding at the upper end of the SLVWD reach just downstream of Fern Ridge Road. The SLVWD reach is much more meandering and not as confined by the valley walls as the City reach. Historic terraces and floodplain abandoned by channel incision are present throughout the reach and East Zayante Road only impinges on the channel in a few locations. A network of logging roads that were used to access the areas when it was last logged by SLVWD are still evident on the landscape (Figure 3). Although these roads are currently blocked from access at East Zayante Road and have some vegetation currently growing on them, most of the vegetation consists of invasive weeds, such as French broom, and the access from East Zayante Road is blocked by structures that can be temporarily moved and replaced following construction. Previously graded logging landings are present along each of the access roads and will be used as staging and material stockpile locations during construction.

Given that there are fewer risks to infrastructure and an existing road network already exists across gentler terrain, the SLVWD reach provides significantly more opportunities for enhancement. Based on the desire to achieve similar enhancement objectives through this reach, a total of 16 project sites were identified (see Sheet C4 in Appendix A). Twelve of the potential sites were determined to be accessible using the mapped road network, and four sites were identified as opportunities for enhancement that would require an approach based solely on use of hand held tools involving direct felling of standing trees into the stream corridor. The lower risk to existing infrastructure, the presence of large conifers near or adjacent to the channel, and the desire to experiment with a more natural approach to large wood placement, led us to include whole tree placement into the conceptual design approach. Waterways staff have experience with this design approach on streams in the Pacific Northwest with projects that have been implemented in the past few years, showing the significant benefits that can be achieved at a relatively low cost. Three types of Habitat Enhancement Features have been developed for the SLVWD that reflects site conditions such as the level of access to each site, availability of material locally, and the intent of the feature (see Sheets C4, C6, and C7 in the Appendix).

The first type of enhancement site, referred to as Type 2, is based on the same approach as the structures proposed for the City reach, with the addition of whole tree placements at, or adjacent to, the ballasted structure. Integration of an entire tree, including branches where feasible, into the structure would improve the complexity of the structure, provide an opportunity for the structure to span the channel, and enhance the likelihood that the structure will recruit additional wood. The base structure would be constructed in a similar manner and at a similar location as described in the City reach discussion for a Type 1 structure. Following completion of the base structure, one to two trees, harvested locally with the rootwad and branches intact, would be dragged to the site and placed on top of the existing structure. The rootwad would extend into the deepest portion of the existing bedrock scour pool and the top of the tree would be positioned between existing trees and extend well beyond the floodprone area. Where the opportunity exists, a log to log connection would be used to tie the placed to an existing tree.

Out of the 16 sites proposed within the SLVWD reach, 5 are Type 2 structures. At the five sites a total of 10 logs with rootwads attached and 18 logs without rootwads will be used (see Log Quantities Table on Sheet C4 in the Appendix) in the Type 2 structures. Almost all of the material will be harvested locally, except for two rootwads, which will be imported for use at Site 23. All of the trees to be harvested are located along the identified access roads or adjacent to existing staging areas. The specific trees have been identified but will not be marked for use until prior to construction. The trees with rootwads attached will be dug out using an excavator. Disturbed areas will be roughened, seeded, and mulched, and replanted following construction.

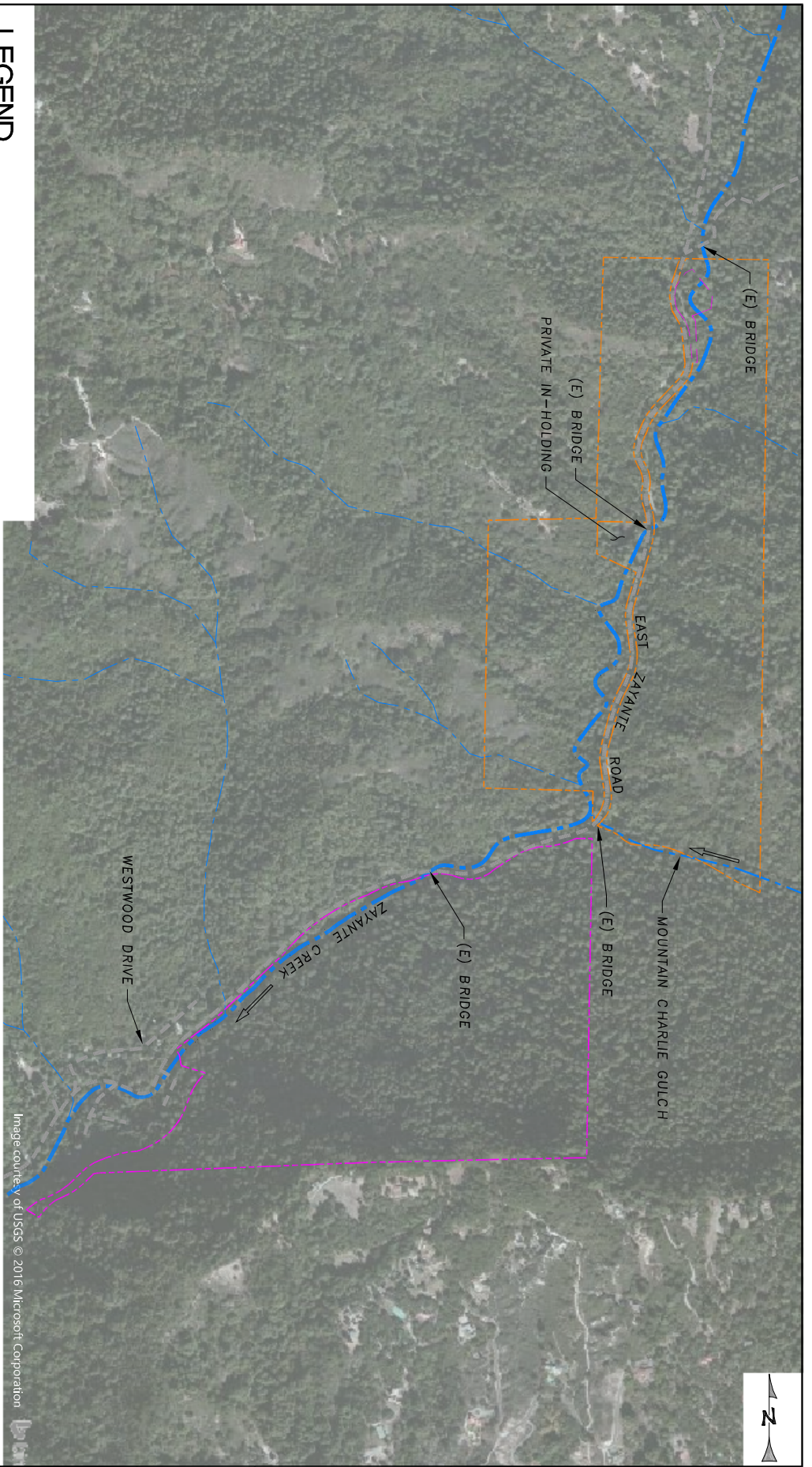
The second type of enhancement site, referred to as Type 3, were identified along sections of the channel where we determined that the presence of large wood could greatly enhance habitat conditions, but the location was not accessible by heavy equipment. A total of four stream segments were identified for this approach through the SLVWD reach (see Sheet C4 in the Appendix). An ample supply of large conifers are available along the identified segments of stream corridor and there was little to no risk to infrastructure from erosion or flood concerns. The enhancement approach will consist of selecting a short reach, on the order of 200-300 feet long and felling trees from the corridor into the stream channel (see Sheet C7 in the Appendix). The bankfull width through this reach is on the order of 25 to 30 feet and the trees that would be felled into the channel may exceed 100 feet tall. Restoration guidelines recommend that introduced wood be at least 1.5 times the bankfull width. In this case the trees would be 2.5 to three times the bankfull width. Even if the trees were to mobilize they would not move very far.

Based on past experience, the intent would be to fell the trees in the upstream direction, where feasible. Since the top of the tree tends to float first, if they are felled in the upstream direction they will typically rotate and get jammed into the bank and into adjacent riparian vegetation. The felling would only be conducted by an experienced logger with the intent of maximizing the amount of tree that contacts the active channel. If sufficient trees are present along the corridor, this approach has been shown to be very cost effective and allows the channel, and wood, an opportunity to randomly adjust to site conditions during high flow events, creating a variety of habitat types and functions. Somewhere between 4 and 6 trees would be felled in each reach, depending upon the availability of appropriately-sized trees at each stream segment. Individual trees will be identified prior to construction and approved by the SLVWD forester.





The third type of enhancement site, referred to as Type 4, was selected in locations where the site is accessible, adequate local wood is available for harvesting, and the riparian corridor contains a high density of standing trees that could be used to “weave” and secure the downed wood into a complex configuration. The Type 4 structure was developed during Project Team and Technical Advisory Committee field visits and represents a hybrid approach between Type 2 and Type 3 structures. Equipment access would allow a range of techniques to be used to create a complex assemblage of large wood including keying in of some logs and use of threaded rebar connections between placed logs and existing standing trees (see Sheet C7 in the Appendix). A total of 7 sites were identified to install Type 4 structures (see Sheet C4 in the Appendix). A total of 24 logs with a rootwad attached and 6 logs without the rootwad will be used at the 7 sites. All of the logs will be harvested locally from each of the sites using the same tree and rootwad harvesting techniques described for the Type 2 structures. Where appropriate, additional pieces of wood may be used at each of the sites consisting of the “tops” of the harvested trees. The trees to be harvested have already been identified at each of the sites and will be marked prior to construction.

APPENDIX A

65% Engineering Drawings Zayante Habitat Enhancement Project



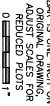

LEGEND

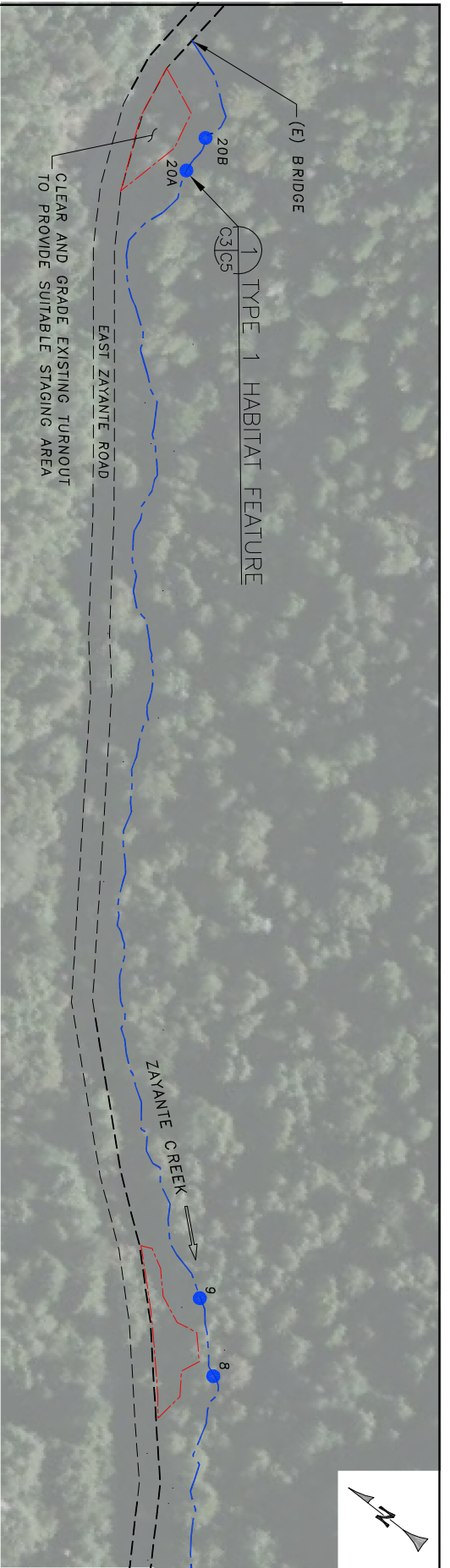
-  EXISTING CREEK FLOW LINE
-  EXISTING ROADS
-  CITY OF SANTA CRUZ PROPERTY
-  SAN LORENZO VALLEY WATER DISTRICT

PROJECT AREA OVERVIEW
SCALE: 1" = 400'

Image courtesy of USGS © 2016 Microsoft Corporation

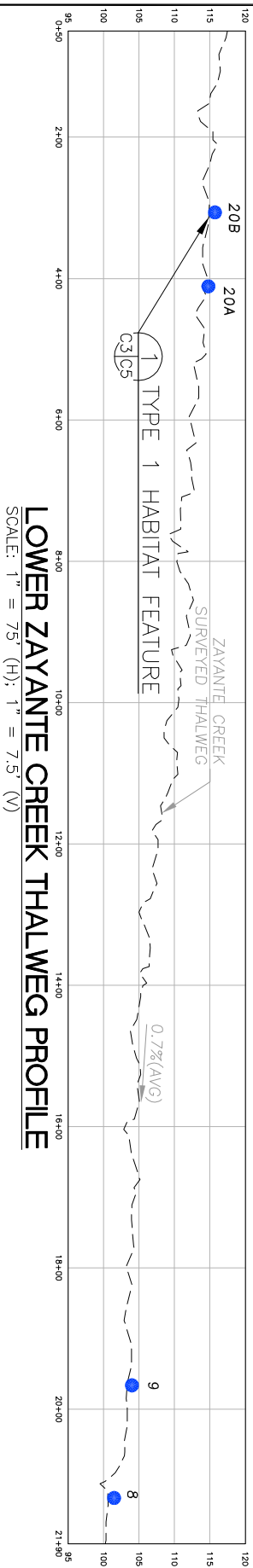


	DESIGNED BY: J.O.H. CHECKED BY: M.W.K. DATE: 12/29/16 JOB NO.: 16-002	PROJECT OVERVIEW	PREPARED AT THE REQUEST OF: RESOURCE CONSERVATION DISTRICT OF SANTA CRUZ COUNTY	DRAFT NOT FOR CONSTRUCTION	 WATERWAYS CONSULTING INC. <small>309A SWIFT ST. SANTA CRUZ, CA 95060 PH:(831)421-9291 // FAX:(888)819-6847 WWW.WATWAYS.COM</small>
	ORIGINAL DRAWING ADJUST SCALES FOR REDUCED PRINTS				



LOWER ZAYANTE HABITAT FEATURE PLACEMENT PLAN

SCALE: 1" = 75'



LOWER ZAYANTE CREEK THALWEG PROFILE

SCALE: 1" = 75' (H); 1" = 7.5' (V)

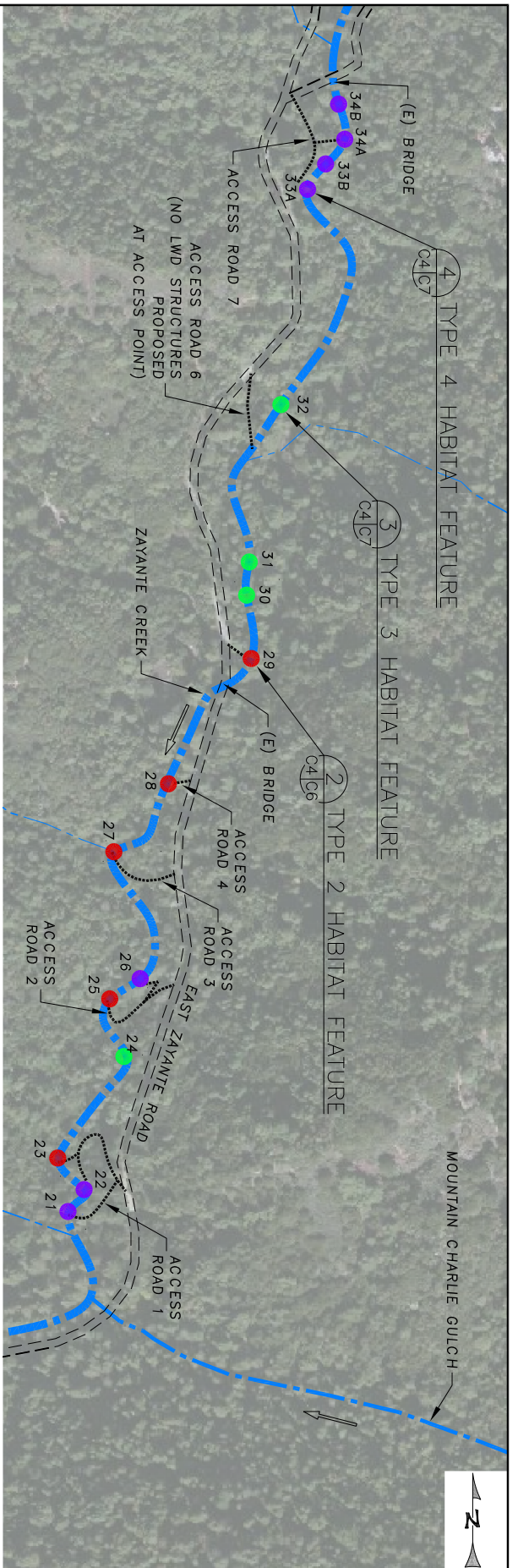
LEGEND

- EXISTING EDGE OF PAVEMENT
- EXISTING FLOW LINE
- 8
- PROPOSED TYPE 1 HABITAT FEATURE WITH SITE I.D.
- PROPOSED STAGING AND ACCESS LOCATIONS (AT EXISTING TURNOUTS)

LOG SUPPLY SUMMARY TABLE

SITE I.D.	IMPORTED LOGS W/ ROOTWADS	HARVESTED LOGS W/O ROOTWADS
8	2	5
9	2	5
20A	2	4
20B	2	4
TOTAL	8	18

	<h2 style="margin: 0;">DRAFT</h2> <p style="margin: 0;">NOT FOR CONSTRUCTION</p>	<p style="margin: 0; font-size: small;">309A SWIFT ST. SANTA CRUZ, CA 95060 PH: (831) 421-9291 // FAX: (888) 819-6847 WWW.WATWAYS.COM</p>
<p style="margin: 0; font-size: small;">DESIGNED BY: J.O.H. CHECKED BY: M.W.W. DATE: 12/29/16 JOB NO.: 16-032</p>	<p style="margin: 0; font-size: small;">LOWER ZAYANTE HABITAT FEATURE PLACEMENT PLAN</p>	<p style="margin: 0; font-size: small;">PREPARED AT THE REQUEST OF: RESOURCE CONSERVATION DISTRICT OF SANTA CRUZ COUNTY</p>
<p style="margin: 0; font-size: x-small;">DESIGNED BY: J.O.H. CHECKED BY: M.W.W. DATE: 12/29/16 JOB NO.: 16-032</p>	<p style="margin: 0; font-size: small;">YAYANTE CREEK HABITAT ENHANCEMENT PROJECT 65% DESIGN SUBMITTAL</p>	<p style="margin: 0; font-size: x-small;">DESIGNED BY: J.O.H. CHECKED BY: M.W.W. DATE: 12/29/16 JOB NO.: 16-032</p>



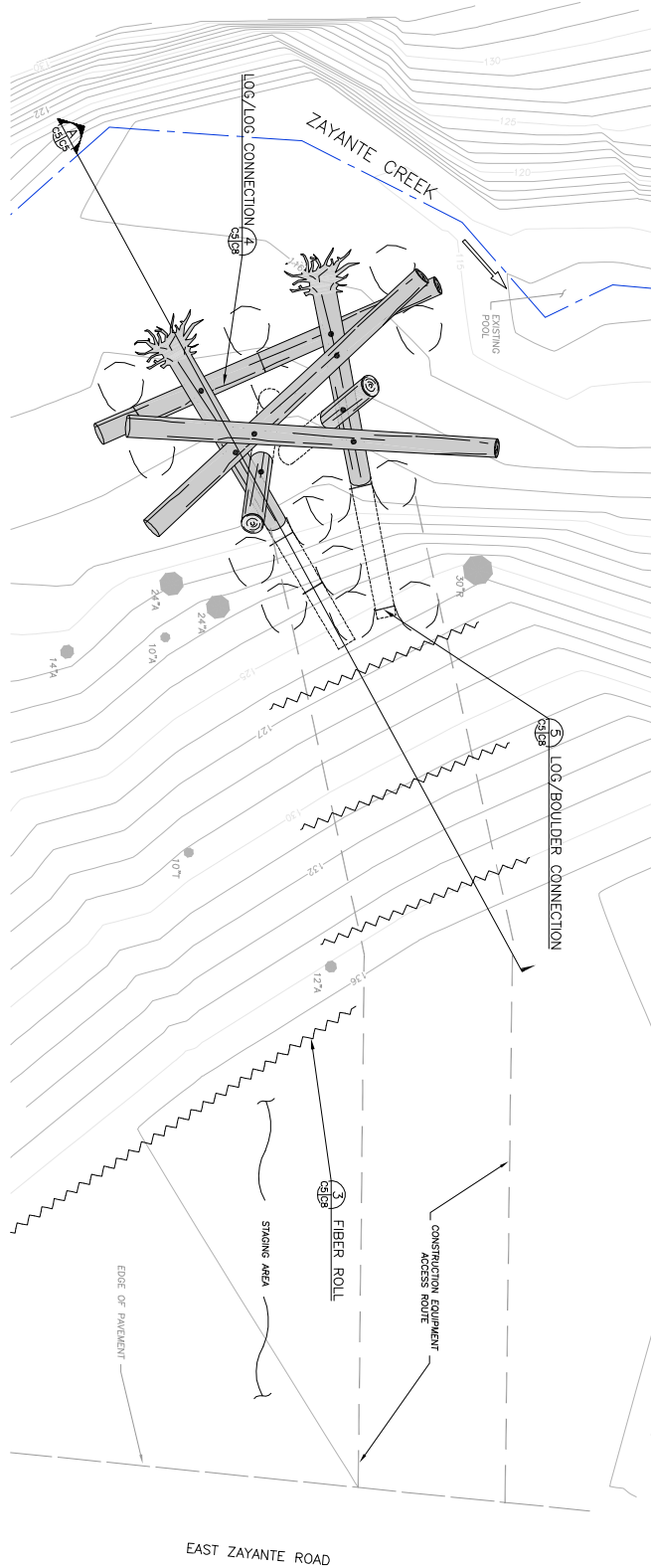
UPPER ZAYANTE CREEK HABITAT FEATURE PLACEMENT PLAN
 SCALE: 1" = 200'

LEGEND

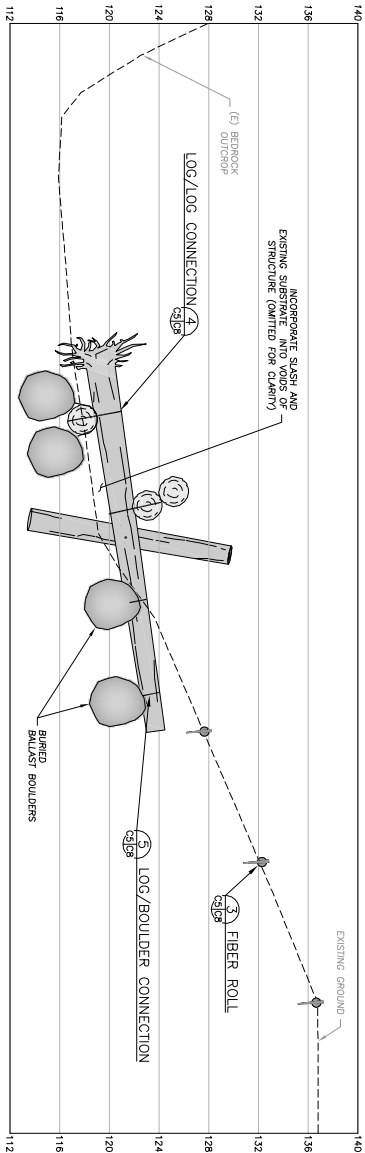
- (E) CREEK FLOW LINE
- (E) EDGE OF PAVEMENT
- (E) UNIMPROVED CREEK ACCESS ROUTE
- 23 TYPE 2 HABITAT FEATURE WITH SITE I.D.
- 24 TYPE 3 HABITAT FEATURE WITH SITE I.D.
- 33A TYPE 4 HABITAT FEATURE WITH SITE I.D.

UPPER ZAYANTE LOG QUANTITIES TABLE

SITE I.D.	TYPE	LOGS W/ ROOTWADS		LOGS W/O ROOTWADS	
		IMPORTED	HARVESTED	IMPORTED	HARVESTED
21	4	-	3	-	-
22	4	-	3	-	-
23	2	2	-	-	3
24	3	-	-	-	4
25	2	-	2	-	5
26	4	-	3	-	6
27	2	-	2	-	2
28	2	-	2	-	6
29	2	-	2	-	2
30	3	-	-	-	4
31	3	-	-	-	4
32	3	-	-	-	4
33A	4	-	6	-	-
33B	4	-	3	-	-
34A	4	-	3	-	-
34B	4	-	3	-	-
TOTAL		2	32	0	40



TYPICAL TYPE 1 HABITAT FEATURE PLACEMENT PLAN
SCALE: 1" = 5'



TYPICAL TYPE 1 HABITAT FEATURE SECTION
SCALE: 1" = 5'

LEGEND

- Existing Contours
- Existing Flow Line
- Construction Access Path
- Silt Fence
- ESA Fence
- Fiber Roll
- Existing Tree

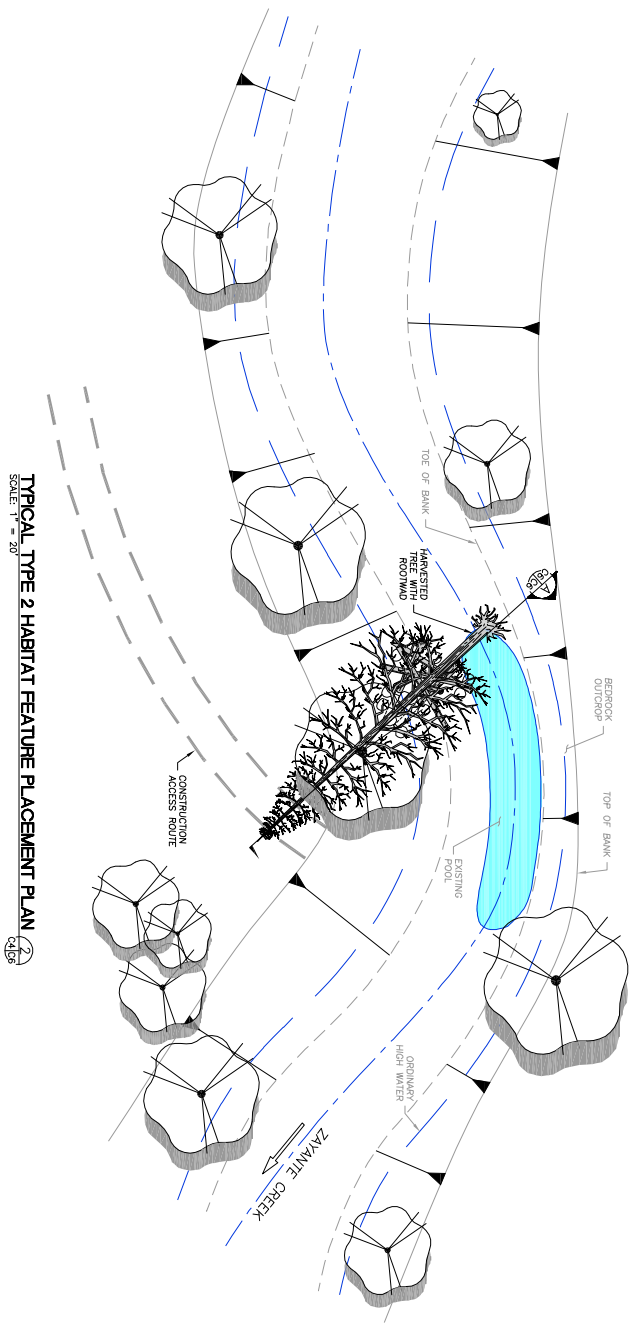
NOTES:

1. INTENT OF TYPE 1 HABITAT FEATURES IS TO:
 - 1.1. ENHANCE SCOUR AT EXISTING POOLS
 - 1.2. PROVIDE WINTER HIGH FLOW REFUGIA FOR SALMONIDS
 - 1.3. PROVIDE WINTER HIGH FLOW REFUGIA FOR SALMONIDS
 - 1.4. ENCOURAGE RECRUITMENT OF ADDITIONAL LARGE WOOD ONTO FEATURE
2. TYPE 1 LOGS STRUCTURE QUANTITIES:
 - 2.1. IMPACTED LOGS WITH ROOT MASS = 2
 - 2.2. IMPACTED LOGS WITH ROOT MASS = 4-5
3. BULWASTING REGION FOR TYPE 1 LOG STRUCTURES SHALL MEET A FACTOR OF SAFETY OF 1.5 FOR BULWASTING REGION BE ACHIEVED TO THE MAXIMUM PRACTICABLE EXTENT USING EXISTING TREES, STUMPS, AND BOULDERS AT EACH SITE SUPPLEMENTED WITH IMPORTED BALLAST BOULDERS. ALL BALLAST TO LOG CONNECTIONS SHALL BE MADE USING CHAIN.
4. AVOID IMPACTS TO EXISTING TREES FROM CONSTRUCTION ACCESS.
5. AVOID LOW FLOW CHANNEL DURING CONSTRUCTION TO LIMIT NEED FOR DEWATERING/OVERFLOW.
6. SEED AND MULCH ALL DISTURBED SOILS IMMEDIATELY FOLLOWING CONSTRUCTION ACTIVITIES.

C5 OF 9	<p>ZAYANTE CREEK HABITAT ENHANCEMENT PROJECT 65% DESIGN SUBMITTAL</p>	<p>TYPICAL TYPE 1 HABITAT FEATURE PLACEMENT DETAIL</p>	<p>PREPARED AT THE REQUEST OF: RESOURCE CONSERVATION DISTRICT OF SANTA CRUZ COUNTY</p>	<p>DRAFT NOT FOR CONSTRUCTION</p>	<p>WATERWAYS CONSULTING INC. 309A SWIFT ST. SANTA CRUZ, CA 95060 PH: (831) 421-9291 // FAX: (888) 819-6847 WWW.WATWAYS.COM</p>
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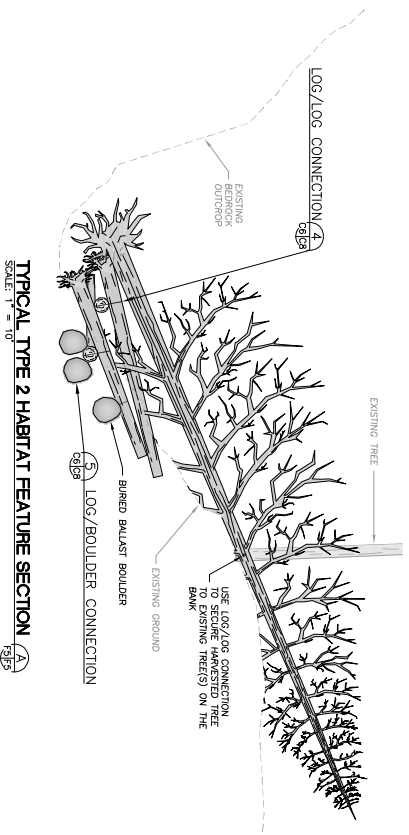
LEGEND

	EXISTING FLOW LINE
	CONSTRUCTION ACCESS PATH
	ORDINARY HIGH WATER
	TOE OF BANK
	TOP OF BANK
	FIBER ROLL
	EXISTING TREE

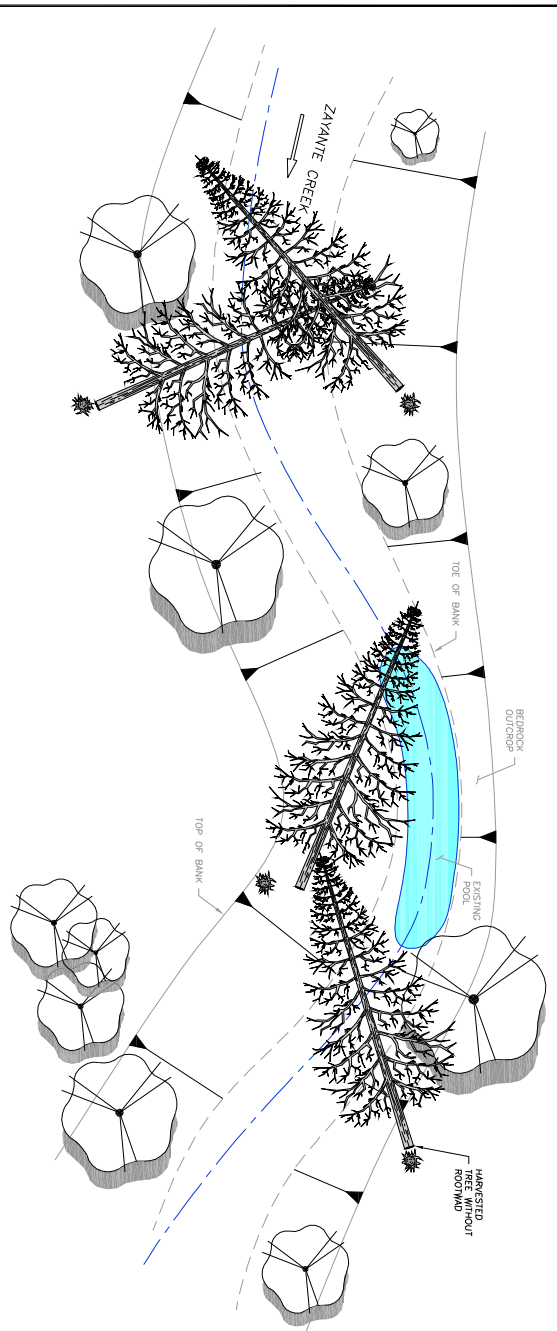


TYPICAL TYPE 2 HABITAT FEATURE PLACEMENT PLAN
SCALE 1" = 30'

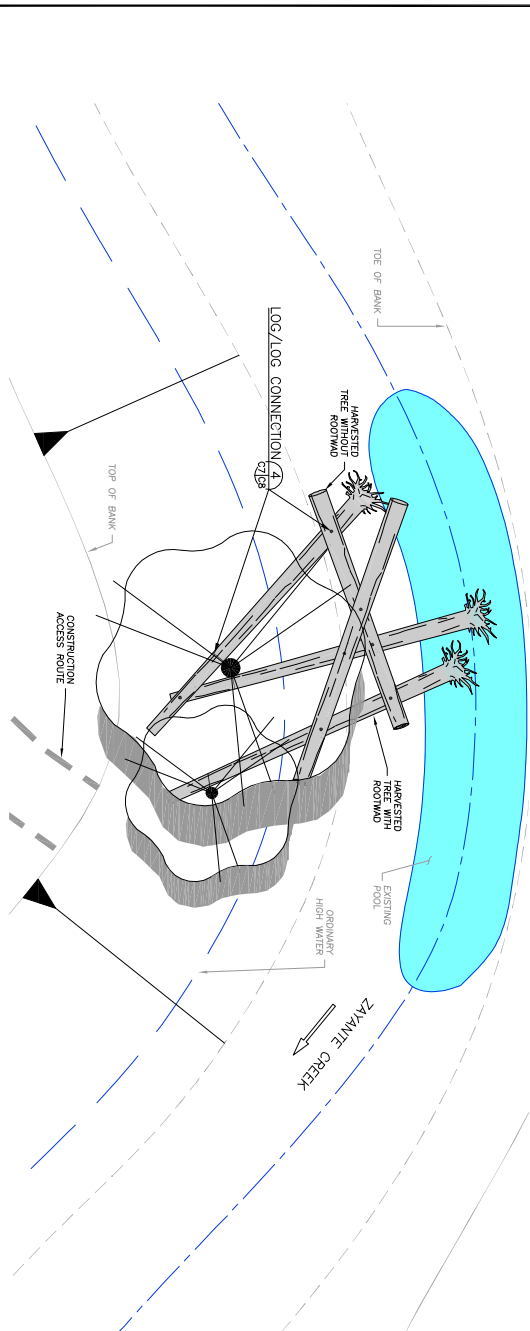
- NOTES:**
1. INTENT OF TYPE 2 HABITAT FEATURES ARE TO:
 - 1.1. PROVIDE ADEQUATE LOGS/BALUSTS ELEMENTS TO ENHANCE SALMONID REPRODUCTION AT UPSTREAM BRIFLE SALMONIDS
 - 1.2. PROVIDE ADEQUATE LOGS/BALUSTS ELEMENTS TO ENHANCE SALMONID REPRODUCTION AT DOWNSTREAM BRIFLE SALMONIDS
 - 1.3. PROVIDE ADEQUATE LOGS/BALUSTS ELEMENTS TO ENHANCE SALMONID REPRODUCTION AT JUVENILE SALMONIDS
 - 1.4. ENCOURAGE REPERMUTATION OF ADDITIONAL LARGE WOOD ON/OFF FEATURE
 2. TYPE 2 LOGS STRUCTURES QUANTITIES:
 - 2.1. TYPE 2 LOGS STRUCTURES QUANTITIES: 0-2
 - 2.2. HARVESTED LOGS WITH ROOMWARD = 1-2
 - 2.3. HARVESTED LOGS WITHOUT ROOMWARD = 4-6
 3. BALUSTS DESIGN FOR TYPE 2 LOG STRUCTURES SHALL MEET A PORTION OF SPECIFIC TO 1.3 FOR BALUSTS. BALUSTS SHALL BE DESIGNED TO PROVIDE ADEQUATE PRACTICABLE EXTENT USING EXISTING TREES, STUMPS, AND BALUSTS/BOULDER. BALUSTS/BOULDER SHALL BE SUPPLEMENTED WITH IMPORTED LOGS/BOULDER.
 4. CONSTRUCTION ACCESS SHALL AVOID IMPACTS TO EXISTING TREES.
 5. AVOID LOW FLOW CHANNEL DURING CONSTRUCTION TO LIMIT NEED FOR DEWATERING/DIVERSION.
 6. INSTALL EROSION CONTROL BARRS INCLUDING Silt FENCE AND FIBER ROLLS TO PREVENT SEDIMENT FROM ENTERING THE CREEK.
 7. SEED AND MULCH ALL DISTURBED AREAS FOLLOWING CONSTRUCTION.



TYPICAL TYPE 2 HABITAT FEATURE SECTION
SCALE 1" = 10'

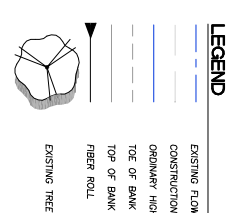


TYPICAL TYPE 3 HABITAT FEATURE PLACEMENT PLAN
SCALE: 1" = 20'

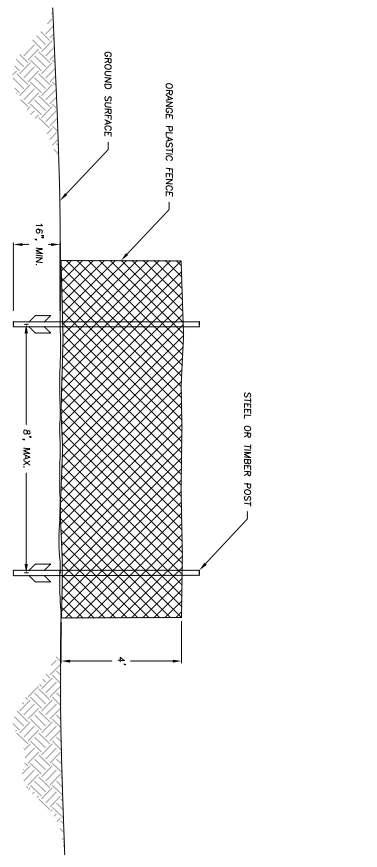


TYPICAL TYPE 4 HABITAT FEATURE PLACEMENT PLAN
SCALE: 1" = 10'

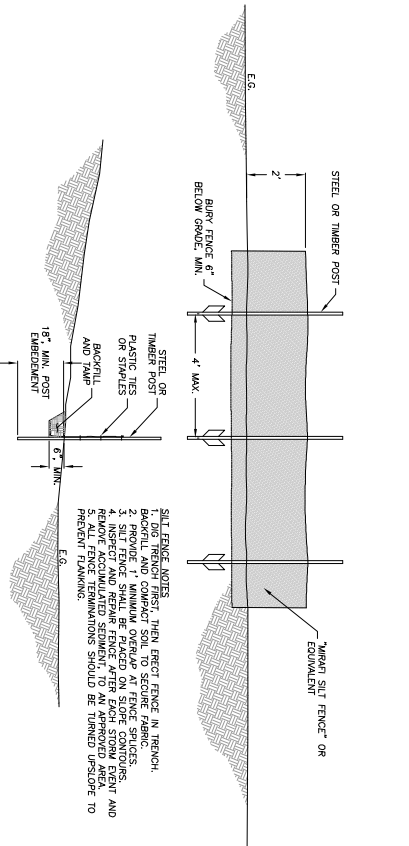
- TYPE 3 HABITAT FEATURE NOTES:**
1. INTENT OF TYPE 3 HABITAT FEATURES IS TO PROVIDE STRUCTURE FOR FISH AND OTHER AQUATIC LIFE.
 2. TYPE 2 LOSS STRUCTURES QUANTITIES:
 - 2.1. HARVESTED LOGS WITHOUT ROOTWAD = 4-6
 3. CERTAIN TREES WILL REQUIRE RELOCATION FROM FIELD POSITION USING CABLES AND WINCHES TO OPTIMIZE INTERACTION WITH THE ACTIVE CHANNEL.



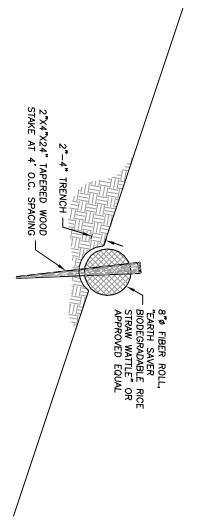
- TYPE 4 HABITAT FEATURE NOTES:**
1. NUMBER OF TYPE 4 HABITAT FEATURES IS TO BE DETERMINED BY THE DESIGNER.
 2. PROVIDE VERTICAL ROUGHNESS ELEMENTS TO ENHANCE FLOW CHARACTERISTICS.
 3. PROVIDE WINTER HIGH FLOW REFUGIA FOR AVIFAUNA.
 4. SALMONID RECRUITMENT OF ADDITIONAL LARGE WOOD ONTO FEATURE.
- TYPE 4 LOSS STRUCTURES QUANTITIES:**
- 2.1. HARVESTED LOGS WITH ROOTWAD = 1-3
 - 2.2. HARVESTED LOGS WITHOUT ROOTWAD = 2-4
3. BALLAST BY SECURING THE HARVESTED TREES TO EACH OTHER AND TO EXISTING TREES ALONG THE BANKS OF THE CHANNEL.
 4. SEED AND MULCH ALL DISTURBED AREAS FOLLOWING CONSTRUCTION.



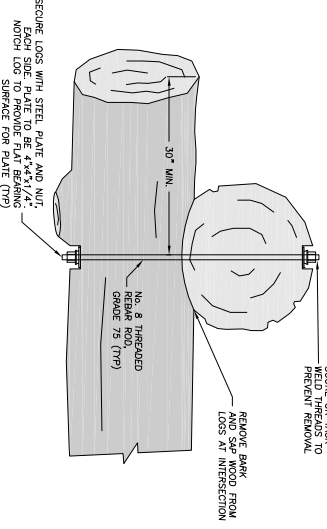
BOUNDARY FENCE
SCALE: 1" = 2'



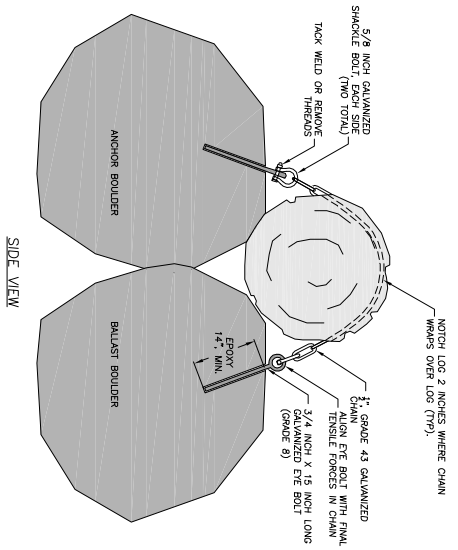
SILT FENCE
SCALE: 1" = 2'



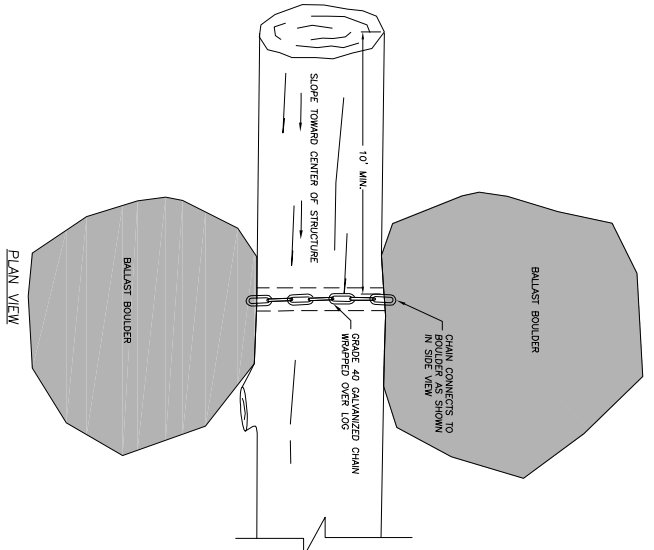
FIBER ROLL
SCALE: 1" = 1'



LOG/LOG CONNECTION
SCALE: 1" = 1'



LOG/BOULDER CONNECTION
SCALE: 1" = 1'



LOG/BOULDER CONNECTION
SCALE: 1" = 1'

GENERAL NOTES

1. NOTIFY THE ENGINEER AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THE ENGINEER OR A DESIGNATED REPRESENTATIVE SHALL OBSERVE THE CONSTRUCTION PROCESS AS NECESSARY TO ENSURE PROPER INSTALLATION PROCEDURES.
2. EXISTING UNDERGROUND UTILITY LOCATIONS:
 - a. CALL UNDERGROUND SERVICE ALERT (1-800-442-2444) TO LOCATE ALL UNDERGROUND UTILITY LINES PRIOR TO COMMENCING CONSTRUCTION.
 - b. PRIOR TO BEGINNING WORK, CONTACT ALL UTILITIES COMPANIES WITHIN RANGE TO VERIFY DEPT. NUMBER OR AROUND EXISTING FACILITIES AND TO OBTAIN INFORMATION REGARDING RESTRICTIONS THAT ARE REQUIRED TO PREVENT DAMAGE TO THE FACILITIES.
 - c. EXISTING UTILITY LOCATIONS SHOWN ARE COLLATED FROM INFORMATION SUPPLIED BY THE APPROPRIATE UTILITY AGENCIES AND FROM FIELD MEASUREMENTS TO ABOVE GROUND FEATURES READILY VISIBLE AT THE TIME OF SURVEY. LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND DEPTH OF UNDERGROUND UTILITIES.
 - d. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE LOCATION AND/OR PROTECTION OF ALL EXISTING AND PROPOSED PIPING, UTILITIES, TRAFFIC SIGNAL EQUIPMENT (BOTH ABOVE GROUND AND BELOW GROUND), STRUCTURES, AND ALL OTHER EXISTING IMPROVEMENTS THROUGHOUT CONSTRUCTION.
 - e. PRIOR TO COMMENCING FABRICATION OR CONSTRUCTION, DISCOVER OR VERIFY THE ACTUAL DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND ELEVATIONS OF ALL EXISTING UTILITIES AND PROTECT THOSE AREAS WHERE POTENTIAL CONFLICTS ARE LIKELY OR DATA IS OTHERWISE INCOMPLETE.
 - f. TAKE APPROPRIATE MEASURES TO PROTECT EXISTING UTILITIES DURING CONSTRUCTION OPERATIONS. CONTRACTOR IS SOLELY RESPONSIBLE FOR THE COST OF REPAIR/REPLACEMENT OF ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.
 - g. UPON LEARNING OF THE EXISTENCE AND/OR LOCATIONS OF ANY UNDERGROUND FACILITIES NOT SHOWN OR SHOWN INACCURATELY ON THE PLANS OR NOT PROPERLY MARKED BY THE UTILITY OWNER, IMMEDIATELY NOTIFY THE UTILITY OWNER AND THE CITY BY TELEPHONE AND IN WRITING.
 - h. UTILITY RELOCATIONS REQUIRED FOR THE CONSTRUCTION OF THE PROJECT FACILITIES WILL BE PERFORMED BY THE UTILITY COMPANY, UNLESS OTHERWISE NOTED.
3. DISCREPANCIES ARE DISCOVERED BETWEEN THE CONDITIONS EXISTING IN THE FIELD AND THE INFORMATION SHOWN ON THESE DRAWINGS, NOTIFY THE ENGINEER IMMEDIATELY IN WRITING.
4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY AWARE OF AND TO COMPLY WITH ALL LAWS, ORDINANCES, CODES, REQUIREMENTS AND REGULATIONS OF THE CITY OF SAN JOSE AND THE COUNTY OF SANTA CLARA REGARDING CONSTRUCTION OF THIS PROJECT. THESE SHALL BE SHOWN ON DRAWINGS OR OTHERWISE.
5. ANY TESTS, INSPECTIONS, SPECIAL OR OTHERWISE, THAT ARE REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS, OR THESE PLANS, SHALL BE DONE BY AN INDEPENDENT INSPECTION COMPANY. JOB SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE AN OFFICIAL INSPECTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE REQUIRED TESTS AND INSPECTIONS ARE PERFORMED.
6. PROJECT SCHEDULE PRIOR TO COMMENCEMENT OF WORK, SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL. A DETAILED CONSTRUCTION SCHEDULE, DO NOT BEGIN ANY CONSTRUCTION WORK UNTIL THE PROJECT SCHEDULE AND WORK PLAN IS APPROVED BY THE ENGINEER. ALL CONSTRUCTION SHALL BE COMPLETED BY THE DATE SPECIFIED ON THE PROJECT SCHEDULE. PROJECT SCHEDULE SHALL BE SUBMITTED TO THE ENGINEER IN A CONTINUOUS AND DILIGENT MANNER TO ENSURE A TIMELY COMPLETION OF THE PROJECT.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, PERMITTING, INSTALLATION, AND MAINTENANCE OF ANY AND ALL TRAFFIC CONTROL MEASURES DEMAND NECESSARY.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GENERAL SAFETY DURING CONSTRUCTION. ALL WORK SHALL CONFORM TO PERTINENT SAFETY REGULATIONS AND CODES. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING, INSTALLING, AND MAINTAINING ALL WARNING SIGNS AND DEVICES THROUGHOUT THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE PROVISIONS OF OSHA IN THE CONSTRUCTION PROJECTS FOR ALL EMPLOYEES DIRECTLY INVOLVED IN THE CONSTRUCTION OF THIS PROJECT.
9. CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT INCLUDING HOLES, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HAZARDOUS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT. RECEIVING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF CONTRACTOR OR CONTRACTOR'S EMPLOYEES, AGENTS, SUBCONTRACTORS, SUPPLIERS, AND VENDORS. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS, APPROVALS, AND CONSTRUCTION MEANS, METHODS, SPECIFICATIONS, TECHNIQUES AND PROCEDURES NECESSARY FOR PERFORMANCE, SUPERVISION AND CONTROL, BUT NOT LIMITED TO, CONSTRUCTION OF THIS PROJECT. CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONDUCT, REGULATION AND PROTECTION OF ALL SITE OPERATIONS OF ALL REGULATORY AGENCY OR OF STATE LAW.
10. MAINTAIN A CURRENT, COMPLETE, AND ACQUAINT RECORD OF ALL AS-BUILT DEVIATIONS FROM THE CONSTRUCTION AS SHOWN ON THESE DRAWINGS AND SPECIFICATIONS, FOR THE PURPOSE OF PROVIDING THE ENGINEER OF RECORD WITH A BASIS FOR THE PREPARATION OF RECORD DRAWINGS.
11. MAINTAIN THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS. STORE ALL MATERIALS WITHIN APPROVED STAGING AREAS, REQUIREMENTS.
12. PROTECT AT CONTRACTOR'S SOLE EXPENSE, ALL MATERIALS, LABOR AND EQUIPMENT REQUIRED TO COMPLY WITH ALL APPLICABLE PERMIT CONDITIONS AND REQUIREMENTS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING AND LAYOUT, UNLESS OTHERWISE SPECIFIED.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND PRESERVATION OF ALL SURVEY MONUMENTS OR PROPERTY CORNERS, DISTURBED OR DAMAGED DURING THE CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND PRESERVATION OF THE SOLE EXPENSE OF THE CONTRACTOR.
15. TREE DIMENSIONS, TRUNK DIAMETERS SHOWN REPRESENT DIAMETER AT GREATEST HEIGHT (DBH). MEASURED 4.5 FT ABOVE GROUND FOR SINGLE TRUNKS AND TRUNKS THAT SPLIT INTO SEVERAL STEMS CLOSE TO THE GROUND. THE DBH FOR TREES THAT SPLIT INTO SEVERAL STEMS CLOSE TO THE GROUND MAY BE CONSOLIDATED INTO A SINGLE DBH BY TAKING THE SQUARE ROOT OF THE SUM OF ALL SQUARED STEM DBH'S BELOW THE POINT OF SPLIT ON A SCALE. BREAST HEIGHT IS REFERENCED FROM THE UPPER SIDE OF THE STOLE. FOR LEANING TREES, BREAST HEIGHT IS MEASURED ON THE SIDE THAT THE TREE LEANS TOWARD. TREES WITH DBH LESS THAN 8" ARE TRICHOILY NOT SHOWN.
16. TREE SPACING ARE IDENTIFIED WHEN KNOWN, HOWEVER, FINAL DETERMINATION SHOULD BE MADE BY A QUALIFIED BOTANIST. REFER TO THE LEGEND FOR TREE SPECIES SYMBOLS.
17. TREE TRUNK DIMENSIONS MAY BE SHOWN ON A 1/8" SCALE FOR PROTECT CLARITY. CAUTION SHOULD BE TAKEN IN DESIGNING NEAR TREE TRUNKS. THERE ARE LIMITATIONS ON FIELD ACCURACY, MEASUREMENT ACCURACY, MEASUREMENT TECHNIQUE, OR "TAPER" OF TREES. REQUEST ADDITIONAL TOPOGRAPHIC DETAIL WHERE CLOSE TOLERANCES ARE ANTICIPATED. INDIVIDUAL TREES ARE NOT TRICHOILY LOCATED WITHIN DRIVING CANOPY AREAS SHOWN.
18. ALL STANDARD STREET MONUMENTS, LOT CORNER PEGS, AND OTHER PERMANENT MONUMENTS DISTURBED DURING THE PROCESS OF CONSTRUCTION SHALL BE REPLACED AND A RECORD OF SURVEY FOR CORNER RECORD FOR THE PROFESSIONAL LAND SURVEYOR ACTED UPON BEFORE ACCEPTANCE OF THE APPROVED PLAN BY THE REAL PARTIES OF A RECORD OF SURVEY ON CORNER RECORDS SHALL BE SUBMITTED TO THE REAL PARTIES.
19. CONTRACTOR IS REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND PRESERVATION OF ALL EXISTING UTILITIES AND PROTECT THOSE AREAS WHERE POTENTIAL CONFLICTS ARE LIKELY OR DATA IS OTHERWISE INCOMPLETE.
20. THE CONTRACTOR SHALL CONFORM TO THE RULES AND REGULATIONS OF THE CONSTRUCTION SAFETY ORDERS OF THE CALIFORNIA DIVISION OF OCCUPATIONAL SAFETY AND HEALTH PERTAINING TO EXCAVATION AND TRENCHES OF THE CALIFORNIA CODE OF REGULATIONS TITLE 8, SUBCHAPTER 4 CONSTRUCTION SAFETY ORDERS, ARTICLE 6.
21. THE EVENT THAT HUMAN REMAINS AND/OR CULTURAL MATERIALS ARE FOUND, ALL PROJECT-RELATED CONSTRUCTION SHALL CEASE WITHIN A 100'-FOOT BUFFER OF THE CONSTRUCTION PROJECT. THE SANITARY PROVISIONS OF THE CALIFORNIA CODE OF REGULATIONS TITLE 8, SUBCHAPTER 4 CONSTRUCTION SAFETY ORDERS OF THE STATE OF CALIFORNIA, SHALL BE STRICTLY ENFORCED. CONTACT THE SANITARY COUNTY COUNSEL IMMEDIATELY.

ACCESS AND STAGING AREA NOTES

1. USE ONLY THE APPROVED ACCESS POINTS AS SHOWN ON THE DRAWINGS. STOCKPILE MATERIALS WITHIN AN EXISTING FILL AND PERIODICALLY DISTURBED AREA.
2. ALL PROPOSED VEHICULAR ACCESS SHALL FOLLOW EXISTING ACCESS ROUTES WHERE AVAILABLE.
3. THE ACCESS PLAN SHOWN ON THE DRAWINGS IS SCHEDULED. SCHEDULE A SITE ACCESS PLAN FOR APPROVAL BY THE ENGINEER PRIOR TO MOBILIZATION.
4. CONTAIN THE COMPOSITE FENCEMENT OF STAGING OR STOCKPILE AREAS WITH SILT FENCE.
5. STONE, MAINTAIN AND REFUEL ALL EQUIPMENT AND MATERIALS IN A DESIGNATED STAGING AREA.
6. LIMIT NUMBER OF OPERATORS ON ACCESS ROAD TO 12 PER MILE AND PROVIDE THREE FEET PROTECTIVE BUFFER ZONE BETWEEN ACCESS ROAD AND EXISTING UNDERGROUND UTILITIES.
7. FURNISHING COMPLETION OF CONSTRUCTION, REMOVE ALL EXISTING SILENT AND NOISE EXPOSED SOILS. INSTALL FIBER OPTICS AS DIRECTED BY THE ENGINEER AND RELOCATE ANY STRUTTED BARRIERS (CONCRETE BLOCKS, BOLLARDS) TO PRECONSTRUCTION CONDITIONS.

CONSTRUCTION SCHEDULE / PHASING NOTES

1. CONSTRUCTION PHASING SHALL BE GENERALLY ACCOMPLISHED AS FOLLOWS:
 - a. CONTACT UNDERGROUND SERVICE ALERT (USA) TO LOCATE ALL UNDERGROUND UTILITIES.
 - b. ESTABLISH AN EQUIPMENT STAGING AREA AND ROCKED ENTRANCES AT LOCATIONS SHOWN ON THE DRAWINGS OR AS APPROVED BY THE ENGINEER. PROTECT EXISTING INFRASTRUCTURE AND ADJACENT LANDSCAPING. THIS PROTECTION SHALL AT A MINIMUM, CONSIST OF INSTALLATION OF ESA FENCING WITHIN STAGING.
 - c. INSTALL SILT FENCES AND OTHER PROTECT BARRIERS.
 - d. PERFORM CLEANING AND TREE SALVAGE OPERATIONS.
 - e. PLACE HABITAT FEATURES.
 - f. INSTALL PERMANENT EROSION CONTROL MEASURES.
 - g. SEED AND MULCH ALL DISTURBED SOILS ON SITE.
 - h. DEBRIS/PILE.

EARTHWORK NOTES

1. EARTHWORK SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SANTA CRUZ COUNTY GRADING ORDINANCE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VISIT THE SITE AND MAKE HIS OWN INVESTIGATIONS WITH REGARD TO MATERIALS, METHODS AND EQUIPMENT NEEDED FOR THE PROJECT.
2. PROPOSED CONSTRUCTION WORK SHALL BE SUBJECT TO EROSION CONTROL MEASURES AS SPECIFIED IN THE DRAWINGS.
3. DO NOT DISTURB AREAS OUTSIDE OF THE DESIGNATED LIMITS OF ASSIGNMENT, UNLESS AUTHORIZED IN WRITING BY THE ENGINEER. THE COST FOR WORK ASSOCIATED WITH DISTURBANCE AND REVEGETATION OF DISTURBED AREAS OUTSIDE THE DESIGNATED LIMITS OF ASSIGNMENT, AS SHOWN ON THE DRAWINGS, SHALL BE BORN SOLELY BY THE CONTRACTOR.
4. ALL EXCESS SOILS SHALL BE REMOVED TO AN APPROVED DUMP SITE OR DEPOSITED ON SITE IN ACCORDANCE WITH THE REQUIREMENTS OF THE ENGINEER. IN A MANNER THAT WILL NOT CAUSE DISTURBANCE TO ADJACENT AREAS.
5. CLEANING AND GRASSING, SUGGESTED PREPARATION AND DRAINAGE SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 19 OF THE STANDARD SPECIFICATIONS, THESE DRAWINGS, AND THE TECHNICAL SPECIFICATIONS.
6. PRIOR TO STARTING WORK ON THE PROJECT, THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE ENGINEER A PROPOSAL WITH DETAILS CONCERNING ALL PREVENTATIVE MEASURES TO MAINTAIN SOIL ON EXISTING WETTER CONDITIONS, AND SHALL ESTABLISH A SILT PREVENTION AND CONTROL MEASUREMENT PLAN.
7. UNDESIRABLE SOIL OR MATERIALS NOT TO BE INCLUDED IN THE WORK INCLUDE:
 - a. ORGANIC MATERIALS SUCH AS PEAT, MUD, OR MUCK.
 - b. SOILS CONTAINING EXPANSIVE CLAYS.
 - c. ROCKS OR OTHER MATERIALS OF UNDESIRABLE SIZE IN EXCESS OF 6 INCHES.
 - d. ROCKS, COBBLES, OR OTHER MATERIALS OF UNDESIRABLE SIZE OR BEHAVIOR.
8. THE GRADING ELEVATIONS AND SLOPES NOT SHOWN SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD TO OBTAIN DRAINAGE, IN THE DIRECTION INDICATED, ALL FINAL CONSTRUCTION SHALL BE STABLE TO APPROVAL BY THE ENGINEER.

EROSION CONTROL NOTES

1. THE EROSION CONTROL DETAIL SHOWN IS INTENDED FOR THE SUMMER MONTHS OF CONSTRUCTION. EROSION CONTROL MEASURES SHALL BE MODIFIED AND DISTURBED AREAS STABILIZED BY OCTOBER 1ST. CONSULT THE ENGINEER FOR ADDITIONAL RAINY SEASON EROSION CONTROL MEASURES.
2. PRIOR TO COMMENCING WORK, PROTECT AREAS TO REMAIN UNDISTURBED WITHIN THE DESIGNATED LIMITS OF ASSIGNMENT. EROSION CONTROL FENCING MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.
3. BETWEEN OCTOBER 15 AND APRIL 15, EXPOSED SOIL SHALL BE PROTECTED FROM EROSION BY MULCHING AND/OR PLANTING OF NATIVE VEGETATION OR DISBURSED SLOPES FROM EROSION BEFORE COMPLETION OF THE PROJECT.
4. DURING THE RAINY SEASON (OCTOBER 15 THROUGH APRIL 15), TAKE NECESSARY MEASURES TO PREVENT EROSION OF EXPOSED SOILS. TAKE NECESSARY TEMPORARY EROSION CONTROL MEASURES AS SHOWN ON THIS PLAN AND/OR AS DIRECTED BY THE ENGINEER TO CONTROL DRAINAGE WHICH MAY BE CAUSED BY SWAGING AND/OR REVEGETATION OPERATIONS.
5. ADOPT APPROPRIATE EROSION CONTROL PROCEDURES DURING THE CONSTRUCTION OF THE PROJECT. EROSION CONTROL MEASURES SHALL BE SUBJECT TO THE DISCRETION OF THE ENGINEER.
6. CONSIDER AND MAINTAIN EXISTING EROSION CONTROL MEASURES TO PROTECT THE PROJECT FROM EROSION. EROSION CONTROL MEASURES SHALL BE SUBJECT TO THE DISCRETION OF THE ENGINEER.
7. CONSIDER AND MAINTAIN EXISTING EROSION CONTROL MEASURES TO PROTECT THE PROJECT FROM EROSION. EROSION CONTROL MEASURES SHALL BE SUBJECT TO THE DISCRETION OF THE ENGINEER.
8. INSTALL ALL PROTECTIVE DEVICES AT THE END OF EACH WORK DAY WHEN THE FIVE-DAY RAIN PROBABILITY EQUALS OR EXCEEDS 50 PERCENT AS DETERMINED FROM THE NATIONAL WEATHER SERVICE FORECAST OFFICE: WWW.NWS.NOAA.GOV.
9. REMOVE ALL SILT AND DEBRIS FROM CHECK BERMS AND PUMP SEDIMENTATION BASIN DAILY AFTER A RAINSTORM.
10. THE EROSION CONTROL DEVICES ON THIS PLAN ARE A SCHEDULED CONSTRUCTION MEASURE. THE EROSION CONTROL DEVICES MAY BE RELOCATED, DELETED, OR ADDITIONAL ITEMS MAY BE REQUIRED DEPENDING ON THE ACTUAL SOIL CONDITIONS ENCOUNTERED. AT THE DISCRETION OF THE ENGINEER.
11. THE CONTRACTOR IS RESPONSIBLE TO KEEP IN PROPER ALL EROSION CONTROL DEVICES AND NOTIFY THE ENGINEER IMMEDIATELY IN WRITING OF ANY ONGOING EROSION.
12. STORMS AND WINDS? THEY IN ORDER TO PREVENT PROGRESS OF ANY ONGOING EROSION.
13. THE CONTRACTOR IS RESPONSIBLE FOR CLEANING ANY EROSION OR DEBRIS SPILLED ONTO A PUBLIC STREET.
14. THE CONTRACTOR SHALL CONTACT THE ENGINEER IN THE EVENT THAT THE EROSION CONTROL PLAN AS DESIGNED REQUIRES ANY SUBSTANTIAL REVISIONS.
15. CONSTRUCTION SHALL BE FAILURE WITH THE CONDITIONS OF APPROVAL, OF ALL REQUIRED PROJECT PERMITS AND SHALL IMPLEMENT ALL REQUIRED BMP'S PRIOR TO COMMENCING GRADING OPERATIONS.

DUST CONTROL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUOUS DUST CONTROL THROUGHOUT THE CONSTRUCTION PROCESS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REGULAR CLEANING OF ALL VEHICLES, EQUIPMENT, AND ALL ADJACENT ROADS AND DRIVEWAYS. ALL VEHICLES SHALL BE CLEANED AT LEAST EVERY 24 HOURS WHEN OPERATIONS ARE OCCURRING.
2. ALL DRIVING ACTIVITIES, INCLUDING IMPAVED ACCESS ROADS OR STORAGE PILES, SHALL BE LIMITED TO THE MINIMUM NECESSARY TO COMPLETE THE PROJECT. ALL DRIVING SHALL BE LIMITED TO 15 MPH.
3. ALL GRADING-RELATED ACTIVITIES (E.G., CLEANING, GRASSING, STAKING, AND GRASSING) SHALL BE LIMITED TO THE MINIMUM NECESSARY TO COMPLETE THE PROJECT. ALL GRADING SHALL BE LIMITED TO 15 MPH.
4. ALL MATERIALS TRANSPORTED OFFSITE SHALL BE COVERED OR EFFECTIVELY WRAPPED TO PREVENT DUST EMISSIONS.
5. FOLLOWING THE ADDITION OF MATERIALS TO, OR THE REMOVAL OF MATERIALS FROM, THE SURFACES OF OUTDOOR STORAGE PILES, SAID PILES SHALL BE COVERED OR EFFECTIVELY WRAPPED TO PREVENT DUST EMISSIONS.
6. ON-SITE VEHICLE SPEED ON UNPAVED SURFACES SHALL BE LIMITED TO 15 MPH.
7. DISTURBED AREAS SHALL BE SEEDED PRIOR TO OCTOBER 15TH OR EARLIER AS REQUIRED BY THE APPLICABLE PERMIT CONDITIONS.

<p>WATERWAYS CONSULTING INC.</p> <p>309A SWIFT ST. SANTA CRUZ, CA 95060 PH: (831) 421-9291 // FAX: (868) 819-6847 WWW.WATERWAYS.COM</p>	<p>DRAFT</p> <p>NOT FOR CONSTRUCTION</p>	<p>PREPARED AT THE REQUEST OF: RESOURCE CONSERVATION DISTRICT OF SANTA CRUZ COUNTY</p>	<p>NOTES</p>
<p>ZAYANTE CREEK HABITAT ENHANCEMENT PROJECT 65% DESIGN SUBMITTAL</p>	<p>DESIGNED BY: J.D.H. CHECKED BY: M.W.K. DATE: 12/29/16 JOB NO.: 16-0022</p>	<p>ORIGINAL DRAWING ADJUST SCALES FOR REVISIONS</p>	<p>C9</p> <p>9 of 9</p>



**ZAYANTE CREEK HABITAT ENHANCEMENT PROJECT
65% DESIGN SUBMITTAL
ENGINEER'S ESTIMATE OF PROBABLE CONSTRUCTION COSTS**

Job No: 16-032

12/28/2016

ITEM NO.	SPECIFICATION	ITEM	ESTIMATED QUANTITY	UNIT	UNIT COST		TOTAL
1	015000	MOBILIZATION	1	LS	\$25,647	\$25,647	\$25,647
2	015626	TEMPORARY FENCE - TYPE ESA	200	LF	\$5	\$1,000	\$1,000
3	311100	CLEARING AND GRUBBING (FOR ACCESS)	0.9	AC	\$15,000	\$13,500	\$13,500
4	354200	TYPE 1 HABITAT FEATURE (4 LOCATIONS TOTAL)	1	LS	\$52,157		\$52,157
		SUPPLY LOGS WITH ROOTWADS	8	EA	\$1,500	\$12,000	
		CHAINED BALLAST BOULDERS	26	EA	\$500	\$13,000	
		LOG/LOG THREADED REBAR CONNECTIONS	22	EA	\$100	\$2,200	
		LABOR TO SALVAGE LOGS ON-SITE CONSTRUCT HABITAT FEATURE	8	DAYS	\$3,120	\$24,957	
5	354200	TYPE 2 HABITAT FEATURE (5 LOCATIONS TOTAL)	1	LS	\$41,457		\$41,457
		SUPPLY LOGS WITH ROOTWADS	2	EA	\$1,500	\$3,000	
		CHAINED BOULDER CONNECTIONS	28	EA	\$400	\$11,200	
		LOG/LOG THREADED REBAR CONNECTIONS	23	EA	\$100	\$2,300	
		LABOR TO SALVAGE LOGS ON-SITE CONSTRUCT HABITAT FEATURE	8	DAYS	\$3,120	\$24,957	
6	354200	TYPE 3 HABITAT FEATURE (4 LOCATIONS TOTAL)	1	LS	\$2,437		\$2,437
		LABOR TO CUT LOGS WITHOUT ROOTWADS INTO CREEK AND POSITION	3	DAYS	\$812	\$2,437	
7	354200	TYPE 4 HABITAT FEATURE (7 LOCATIONS TOTAL)	1	LS	\$48,076		\$48,076
		LABOR TO CUT LOGS WITHOUT ROOTWADS INTO CREEK AND POSITION	14	DAYS	\$3,120	\$43,676	
		LOG/LOG THREADED REBAR CONNECTIONS	44	EA	\$100	\$4,400	
8	015713.02	SILT FENCE	400	LF	\$5	\$2,000	\$2,000
9	015713.01	FIBER ROLL	600	LF	\$5	\$3,000	\$3,000
10	329000	SEEDING AND MULCHING	0.9	ACRE	\$8,000	\$7,200	\$7,200
					SUBTOTAL	\$196,624	\$196,624
					CONTINGENCY (20%)	0.2	\$39,325
					TOTAL		\$235,948

NOTES:

1. Labor rates assumed for the project are based on the State of California Department of Industrial Relations Index 2016-2 Northern California basic trade Journeyman rates.

MEMO

TO: Environmental Committee

From: Environmental Programs Manager

SUBJECT: Education Commission and Classic Watershed Grant Program
Funding Opportunities

DATE: April 11, 2019

RECOMMENDATION:

It is recommended that the Environmental Committee review this memo and discuss the Education Commission and Classic Watershed Grant Program Funding Opportunities.

BACKGROUND

On June 5, 2003 the Board approved District Ordinance No. 100, which established the San Lorenzo Valley Water District Education Program Advisory Commission. The Purpose of the Commission is to advise the Board of Directors regarding the selection and allocation of Education Program grants. The mission of the Education Program is to provide funding for educational and other projects that enhance the understanding of the San Lorenzo River watershed or improve the watershed's environmental health. Each year since 2004, the District has budgeted \$17,500 to fund education grants that advance the mission of the District's education program. See [2015 memo](#).

Waterman Gap Sale

In 2000, the District sold its 1,400 acre Waterman Gap holdings to Sempervirens Fund, for the sum of \$10.9 million, with the understanding that the land would be transferred to Castle Rock State Park. The District had given up plans to build a dam there. Furthermore, the District had no surface water sources downstream of the property. After receiving the proceeds from the Waterman Gap property, the District purchased the 206-acre Hulse-Cook property, between Malosky and Clear Creeks, which does have value as surface water source watershed. The additional funds were used to help fund District expenses including the Education Grant Program beginning in 2003.

Attached documents provided for supplemental information and details on history of grant program.

2015 STRATEGIC PLAN:

Strategic Element 2.4 Watershed Education
Strategic Element 2.0 - Watershed Stewardship

FISCAL IMPACT:

\$15,000 to \$17,500 to fund Classic Watershed Education grants
\$10,000 for Data Collection/Restoration grants

Watershed Education Grant Program

Watershed Nature Walks Project Quote:

"I have lived in this area for 17 years, and have never heard of local educational walks of this quality and uniqueness before. I hope that this series might be repeated next year, with greater advertising at the beginning so I don't miss out! Many thanks to the SLV Water District for making this unique and valuable ecological education possible."

These grants motivate local schools, camps, community groups, and individuals to engage with the District and create projects that help improve the knowledge and environmental health of the San Lorenzo River watershed.



The Watershed Education Grant Program has assisted the District in meeting the CA Department of Water Resources' Urban Water Management Plan Demand Management Measure (DMM) 9.2.4 Public education and outreach

Watershed Education Grant Program Outcome

- Number of Grants Awarded Since 2004: **95 Projects**
- Number of Grants Awarded to District Schools: **51**
- Number of Grants Awarded to Community Watershed Education: **31**
- Number of Grants Awarded for Land Management: **13**

- Average Number of SLV Students Reached: **1633 per year**
- Average Number of SLV Adults Reached: **3219 per year**
- Average Cost to fund Annually: **\$16,564 to reach 4852 people/year**
Cost: **\$2.09 per connection per year**



Project title	Project description	Funds to be used for:	Institution	Contact	Amount requested
Long Term Monitoring of San Lorenzo Watershed Amphibian Population with San Lorenzo Valley High School's Watershed Academy	Catalog abundance of amphibians; identify monitoring sites in the SLR watershed and select survey methods for monitoring amphibians	621.13 for materials; \$1875 for staff time	SLV High School Watershed Academy	Valentine Hemingway	2,496.13
San Lorenzo River Watershed Educational Display	Construction of environmental kiosk overlooking the SL River	Display materials \$2,100.00; shipping fees, \$200.00; educational materials, \$200.00	YMCA Camp Campbell	Kara Walker	2,500.00
Protecting City Creeks and the San Lorenzo Watershed	Printing of 4,500 color brochures emphasizing watershed protection; brochures mailed with Scotts Valley & SLV Water District bills	Printing costs	City of Scotts Valley	Brenda Stevens	2,499.83
Invasive Plant Education and Eradication implementation in the San Lorenzo River Watershed	Invasive plant eradication and community education about invasive species and how to control them	Project leader salaries	SCC Resource Conservation District	Jen Stern	2,475.66
Sea Odyssey Watershed Model	Enhance watershed education through construction of a new watershed model	Purchase of Enviroscape model; staff training time.	O'Neill Surf	Dan Haifley	788.00
Monitoring the Wetlands- Sewage Ponds at San Lorenzo Valley High School	Instruction of students in monitoring water quality of SLV High School's leach fields	Field and lab equipment	SLV High School	Terry Umstead	2,256.00
An Introduction to Riparian Hydrology & vegetation Sampling in the Rare and Unique Plant Communities of the San Lorenzo Valley Watershed	Three educational slideshows for the SLV High School Watershed Academy focusing on riparian plant communities & their relation to watershed hydrology	Research and preparation of slideshows; staff time for training students; copies, mileage, supplies	SLV High School Watershed Academy	Casey Stewman	2,500.00
Educational Labels for Plants in the Watershed Environment	Increase public awareness of native plants by making and placing interpretive signs in Linear Park's Nature Trail	Design & production of waterproof labels for 277 plants	Monterey Bay Master Gardeners	Sheryl McEwan	2,500.00

One Day Educational Watershed Conference: "Healthy Rivers, Happy Fish"	One day conference with invited speakers expert in the areas of fisheries, hydrology, watershed management	Speaker honorariums, facility rental, publicity, taping,	Citizens for Responsible Forest Management	Jodi Frediani	2,500.00
San Lorenzo Valley High School Watershed Academy	Monitoring the Wetlands-Sewage Ponds at San Lorenzo Valley High School	Instruction of students in monitoring water quality of SLV High School's leach fields	SLV High	Jane Orbuch	2,651.00
Creek Exploration Curriculum Enhancement for Improved Watershed Health	Development of the school's watershed and creek curriculum.	Purchase of books, water quality sampling materials, and work gloves	Mt. Hermon Outdoor Science School	Tim Folkert	1,898.00
Design and Install Interpretive Panels Describing the Santa Cruz Sandhills	Design, create, and install two interpretive panels, describing the uniqueness, fragility, and rarity of the Santa Cruz Sandhills.	Design and Install of Interpretive Panels Describing the Santa Cruz Sandhills	Sandhills Alliance for Natural Diversity	Jodi McGraw	2,440.00
"Watershed Cruzin' Teachers Workshops for San Lorenzo Valley and Scotts Valley Teachers in Grades 4-8"	Series of 2-hr. teacher workshops to introduce watersheds of Santa Cruz County, and how to use Watershed Cruzin' guide and CD-ROM	Workshop materials and teacher staff time.	SCCRCD	Jennifer Stern	3,863.75
BOULDER CREEK ELEMENTARY LOVES THE SAN LORENZO RIVER	To create reports of outdoor watershed research.	Purchased four computers and used multi-media software	Boulder Creek Elementary	Rita Peddy	2,500.00
Smart Gardening Faire	Public outreach event to educate area residents about water-wise gardening and drought resistant plants	Booth materials, information, plants, and staff time.	Monterey Bay Master Gardeners	Sheryl McEwan	2,500.00
The Outdoors as a Contest for Cultivating Little Learners in the San Lorenzo Valley Watershed	Implementation of watershed curriculum for pre-school children	Materials and teacher staff time.	Little People's School of Boulder Creek	Stacia Fletcher	2,492.50

San Lorenzo Watershed Tributary Contamination Study	Science fair project focused on studying contamination in the San Lorenzo river.	\$200 for project materials.	Caitlyn Christensen	Caitlyn Christensen	200.00
Water Quality Testing for Watershed Studies	Teaching concepts of chemistry, lab techniques, through water quality testing	Water quality kits & supplies	SLV high school; Watershed Academy	Allison Birkhead	1,718.00
Exploring Watersheds	6th grade educational program to promote watershed knowledge; classroom & field research	Field equipment & classroom supplies	SLV middle school	Erin Mongiello & Tina Andes	2,097.00
Smart Gardening Faire	Sponsor educational booth for District at public educational event; focus on landscaping to conserve water, native plants, reduced pesticide/herbicide use	Sponsor educational booth	Monterey Bay Master Gardeners, Inc.	Sheryl McEwan	2,500.00
Wireless Weather Station for Watershed Studies	Monitor real-time weather data collection from the classroom to teach natural science & environmental concepts	Wireless weather station equipment	SLV high school; Watershed Academy	Jane Orbuch	2,181.80
Runoff to the River: Informational brochure on nonpoint source pollution	Create & distribute 5,000 copies of informational brochure on non-point source pollution	Writing, design & printing of 5,000 copies	Valley Women's Club	Nancy Macy	2,500.00
Distribution & Nesting Ecology of Yellow Warblers (<i>Dendroica petechia</i>) on the Central Coast of California	Study of the distribution and nesting ecology of yellow warblers in the region, including the SLR watershed, to help conserve the species	Materials	San Jose State University	Matthew Strusis-Timmer, graduate student	1,460.00
Water quality study of feeder streams leading into the San Lorenzo River	Experienced kayaker to visit, document & test various tributaries of the SLR, not normally accessible, for water quality.	Materials and time	Carl Reuter, kayaker	Carl Reuter, kayaker	1,000.00

Henry Cowell Redwoods State Park Anadromous Fish Education Program	Create an anadromous fish exhibit & school curriculum to educate a wide spectrum of park visitors; hands-on curriculum specific to the SLR focused on ecosystem connections & demo of practical preservation methods	Staff time, materials, and exhibit installation	Mountain Parks Foundation	Jeannie Kegebein, Executive Director	2,500.00
Smart Gardening Faire	3rd annual fair in Skypark, public education promoting gardening & landscaping practices to conserve water thru use of native plants & water-saving technologies	Booth materials, information, plants, and staff time.	Monterey Bay Master Gardeners	Sheryl McKewan, master gardener	1,400.00
Healthy Salmonid Habitats	Hands-on project for 4th & 5th graders to learn about life cycle & habitat requirements of steelhead, and to assess health of watershed for salmon thru water quality testing.	Materials and teacher staff time.	Boulder Creek Elementary	Tammy Osharow, teacher	3,000.00
Bean Zayante Creek Initiative Phase I	Survey/mapping by 6th/7th grade students of woody material in stream corridors of Bean and Zayante Creeks on property owned by Mount Hermon Association. Mapping will be part of a creek habitat assessment.	20 laminated topo maps; 5 Garmin Rhino 2-way radio GPS units; 5 tape measures, project coordinator staff time; web page development for public outreach	Mount Hermon Outdoor Science School	Suzanne Clark	2,800.00
Benthic macroinvertebrates in the upper reaches of the San Lorenzo Valley watershed: establishing baseline data and educating citizens	UCSC researcher & team of undergraduate interns to assess abundance and diversity of benthic macroinvertebrates in 3 of SLVWD diversion streams; establish baseline data for these source water streams & share information about what this means for water quality with citizens in the watershed.	Sampling and identification equipment; travel expenses; 5 stipends; film & event supplies for public outreach	Dr. Katie Monsen	Dr. Katie Monsen	3,000.00
Watershed Nature Walks	Create a series of 6 watershed nature walks free and open to the public, guided by local experts in local natural and historical resources. Several local experts have already agreed to participate.	Stipends for expert guides; staff time for walk director;	Valley Women's Club Environmental Committee	Nancy B. Macy	2,300.00

Project Protect It: Rivers of the Redwoods	5 scholarships to SLV low-income families for an outdoor summer science camp program; campers will test water, study the water cycle, learn water conservation techniques, map watersheds & plants; Clean-Up Day to engage families & friends in pick up trash & remove invasive plant species.	Water testing equipment; 5 scholarships; plant mapping/removing equipment; clean-up day materials; video camera	HOWL Science Program, Inc.	Sarah C. Brummel	2,985.00
Environmental Monitoring Course	Funding would continue the Environmental Monitoring course offered for 10 years at SLVHS; the program lost its funding from the State Dept. of Education. The course gives 10-15 juniors & seniors an opportunity to apply their skills in science, math, English & aquaculture, working on a one-year long field project, with a professional mentor in the field. Projects are displayed at SCC Science Fair, Monterey Bay Sanctuary Symposium and Environmental Monitoring Symposium.	\$2,500 to fund \$1000 stipend for course instructor Orbuch; \$400 for mentor stipends; honorariums for state science fair projects; gas for school van, display supplies & printing; misc. equipment & kits to support student projects	SLV High School	Jane Orbuch, Science Teacher	3,500.00
Wetland Pond Monitoring	Funding would contribute to a SLVHS Aquaculture class project to monitor the wetland pond near the aquaculture facility. The pond was developed to successfully treat campus sewage. Water will be tested for pollutants such as nitrates, and for pH and temperature. The project was part of the Environmental Monitoring Course that lost state funding.	\$2,700 includes \$800 stipend for course instructor, \$400 for mentor stipends, \$200 for computer software, \$250 for calculators, \$1050 for water quality testing equipment	SLV High School	Terry Umstead, Aquaculture teacher	2,700.00

San Lorenzo River Water Temperature Record Project	The project would analyze and format stream temperature data collected in 2005-2006 by SLVHS students under direction of fisheries biologist Don Alley (data collection was previously funded by SLVWD Education Grant), and research other data collected by City of Santa Cruz; prepare sampling maps; write report and send to SWQCB. Public education component to emphasize importance of temperature to water quality and fishery health.	\$2,500 includes \$1,900 for Alley's time to review, research, compile, graph, map and prepare report; and \$600 for Conservancy's time to research, review, and distribute report.	Lompico Watershed Conservancy 501 c (3)	Lompico Watershed Conservancy	3,500.00
Riparian Corridor Wood Survey within SLVWD Lands along Zayante Creek, 2010	Fisheries biologist Alley would mentor one or more SLVHS Watershed Academy students in project to survey large wood on ~ 1 mile of Zayante Creek riparian corridor adjoining District-owned land. Results will be compared to other surveys on other creeks that used same methods. Results to be related to existing fish habitat; recommendations will be made for improving conditions. Project designed to fill data gap in District Existing Conditions Report.	\$2,500 to fund fishery biologist survey time, data analysis & graphing, report preparation, misc. supplies.	D.W. Alley & Associates	Donald Alley, D.W. Alley & Associates	3,000.00
Preserve and Protect: Helping the Wildlife of Our Watershed	Local children to learn about the importance of a clean healthy river through the day camp experience including researching causes of pollution in Fall Creek using GPS units to track animals, performing water quality testing, picking up trash, and creating journals & posters to show what they learned.	\$2,494 for day camp expenses includes \$200 scholarships for 5 low-income children, \$300 for GPS units, \$700 for printing of water education journals, and misc. equipment. An additional \$1,200 would fund 6 additional such scholarships.	HOWL Science Program 501 c(3)	HOWL Science Program	4,654.00

Watershed Nature Walks	Create a series of six Watershed Nature Walks, free & open to the public, accessible to all ages and physical abilities. Well known guides, experts in their fields, will lead the 2+ hour walks, which will occur regularly on Saturday mornings.	\$1,800 to fund a \$1,200 stipend for grant applicant to organize walks and recruit guides. \$600 to fund 6 \$100 stipends for expert guides.	n.a.	Carol Carson	2,800.00
Walking in the Watershed: Kindergarten - 5th Grade Field Trips & Cross-Curricular Watershed Classroom Lessons	Lead six watershed field trips to Fall Creek State Park, one trip for each grade level K-5 at SLV Elementary. Instruction to include 6 hours of lessons & experiential learning per class, serving a total of 150-175 students in fall 2010. The goal of the program is to strengthen the connection between child and watershed through discovery-based and teacher-directed curricula, as described.	\$2,496.45 to fund a \$2,250 stipend for applicant, who will organize, and lead the program in coordination with SLVUSD Charter School, Kay Mendoza, Manager. Remainder to be used for field equipment including monitoring kits and thermometers.	n.a.	Kristen M. VanKlootwyk	2,496.00
6th Grad Labs and Exploring Watersheds	Project to help turn middle school classrooms into science laboratories by purchasing lab equipment used in the two-year-old Exploring Watershed Program for sixth grade students. The program promotes classroom and field research to increase student knowledge of conserving, improving, protecting, and sustaining watershed functions and values.	\$2,481.36 to fund \$2,036 in lab equipment and \$445.36 in additional equipment.	San Lorenzo Valley Middle School	San Lorenzo Valley Middle School	2,481.00
Map Sandhills Plants at the Olympia Watershed	Collect baseline data thru survey of special-status plant species on District-owned Olympia Watershed property, compile GPS data and provide to District GIS Tech for mapping; compile identification handbook for District staff to be aware of "hot spots"	\$110 for handbook materials; remainder (\$2,740) to fund field work and handbook preparation by Schettler & Moore	Greening Associates	Suzanne Schettler, Principal Greening Associates	2,850.00

The Western Pond Turtles of Santa Cruz County	20 minute educational video to profile Western Pond turtles of SLR Watershed and Santa Cruz County, with brief overview of habitat, life cycle, & new findings re: this unique population. Video to highlight threats to their survival & management efforts to promote the long-term welfare of turtles and their habitat.	\$2,500 to fund production, editing and animation of the video.	Jordan Plotsky Productions	Jordan Plotsky Productions	2,500.00
Environmental Monitoring Course	Continue this ongoing course at SLVHS to enable 10-15 juniors & seniors to conduct a year-long field-based environmental science projects. Instructor meets w/student groups after school & via email. Each project has a professional mentor. Students submit monthly project reports & develop multimedia presentation at end of course. Students enter projects in Monterey Bay Sanctuary Symposium, Santa Cruz County Science Fair & Science Academy Symposium.	\$1,000 to fund staff time for applicant; \$600 for 2-6 mentor stipends; \$300 for Science Night; \$475 project materials; \$225 poster board printing; see budget for other items.	San Lorenzo Valley High School	Jane Orbuch, Science Teacher, San Lorenzo Valley High School	3,000.00
Olympia Wellfield Education & Broom Control Program	Applicant to lead & organize a volunteer program to facilitate the removal of French and Portuguese broom at Olympia Wellfield while providing comprehensive education to participants about the importance of this site's habitat & its role as key source of water for the San Lorenzo Valley.	\$2,400 to fund applicant's time supervising 8 events; 4 hrs per event @ \$75/hr; \$600 to fund public outreach for volunteer recruitment	Wildlands Restoration Team	Ken Moore, principal	3,000.00

Olympia Wellfield Invasive Species Mapping Project	Applicant to map, using GPS, invasive plant species impacting rare sand hills habitat at Olympia Wellfield (including French broom, Portuguese broom, acacia, eucalyptus, black locust, yellow starthistle, Italian thistle, milk thistle & fennel); applicant to provide management plan for District to control each species.	Reconnaissance and GPS mapping: \$1,650; Report and management plan preparation: \$300.00	Wildlands Restoration Team	Ken Moore, principal	1,950.00
Camp KA-POW: Kids Actions Protect Our Water	HOWL Science Camp exposes children to the San Lorenzo River thru outdoor exploration; this project enables HOWL to offer two sessions of summer camp with 4 scholarships per session. At camp, children are engaged in trash removal, river hikes, & educating the community about the health and conservation of the SLR.	8 Camp scholarships, \$1,600; portable projector, \$425; transportation, \$320; misc. supplies; \$500 public outreach includes elementary school visits/hikes to Fall Creek	HOWL Science Program, Inc.	Sarah Brummel, Executive Director, HOWL Science Program	2,955.00
Watershed Nature Walks	Create a series of six watershed nature walks, free & open to the public; walks to be led by local experts; this year's experts include Chris Berry, SCWD water resource manager; Frank Perry, geologist; Kristsen Kittleson, county fisheries biologist; 2 UCSC grad students involved in the puma project; Jodi McGraw, sandhills expert	\$1200 stipend for applicant to organize walks; \$600 stipend for each expert guide; \$500 stipend for public outreach component	n.a.	Carol Carson	2,300.00

Environmental Monitoring	Honors Biology prepares sophomores for a future year-long monitoring project. Environmental Monitoring involves juniors & seniors in conducting a year long field-based environmental science project. Each project has a mentor (a professional in the field). Students enter projects in the Monterey Bay Sanctuary Symposium, Santa Cruz County Science Fair & the SLVHS Science Symposium.	Materials and staff time	SLV High School	Jane Orbuch, Science Teacher	
We All Live Downstream, Watershed Education Through Music	Highly interactive and engaging performances that integrate music, theater, movement & puppetry to teach watershed education to elementary school students and teachers. (Website: www.BananaSlugStringband.com)	Travel costs and musician hours.	Banana Slug String Band	Larry Graff,	3,000.00
Henry Cowell Redwoods State Park River Education Program	Provides education to students & the public about ecosystem interconnections & demonstrates practical ways to preserve native anadromous fish of the San Lorenzo River. Provides 4-hour field study for 4 th - 6 th grade students to learn about aquatic life in the watershed; the program also includes the anadromous fish exhibit in the Henry Cowell Redwoods SP Visitor Center.	Materials, bus costs, and staff time	Mountain Parks Foundation	Brenda Holmes	2,500.00
Watershed Nature Walks	Series of six 2+ hour long watershed walks, led by local experts, free and open to all, held on Saturdays, beginning April 28 thru fall (All six experts have been recruited & walks are arranged)	Materials and expert staff hours.	n.a.	Carol Carson	2,500.00

San Lorenzo Valley Schools Watershed Education and Outreach	Develop & present Watershed Education Modules for SLV Middle School & SLV Elementary School; conduct field trips focusing on watershed education & basic ecology; builds on ongoing successful programs of CWC working with local schools. Program to cover 2012/13 school year.	Travel costs and materials	Coastal Watershed Council	Greg Pipping	2,940.00
The Butt Stops Here	Ongoing project to improve health of watershed & educate adults & youth. Project has three components: To develop & distribute cigarette butt litter prevention brochure; to purchase & place receptacles at key locations in the valley; to paint pix of watershed aquatic life on curbside drain openings to discourage improper litter disposal	Brochure printing and design. Cost to disseminate	Valley Women's Club	Nancy Macy	3,000.00
"Acacia removal at Olympia Wellfield in area of Well #2"	Treatment and removal of invasive exotic acacia trees in mapped area.	GPS and team removal	n.a.	Ken Moore	3,500.00
Inventory and interpretation of Olympia Watershed mining relics"	Identification, mapping, description, and photos of historic mining relics on the property	Materials, travel, and student time.	n.a.	Jordan Plotsky	3,500.00
Monitor Change in Sand Specialty Plant Populations within Sandhills/Sand Parkland Communities at the Olympia Watershed"	Baseline sampling and mapping of sandhills plants, continuing work completed in 2011 by grantee.	To fund field work and handbook preparation by Schettler & Moore	Greening Associates	Suzanne Schettler	3,500.00

Environmental Monitoring	Honors Biology prepares sophomores for a future year-long monitoring project. Environmental Monitoring involves juniors & seniors in conducting a year long field-based environmental science project. Each project has a mentor (a professional in the field). Students enter projects in the Monterey Bay Sanctuary Symposium, Santa Cruz County Science Fair & the SLVHS Science Symposium.	\$1,000 to fund staff time for applicant; \$600 for 2-6 mentor stipends; \$200 for Science Night;	SLV High School	Ned Hearn	2,000.00
"We All Live Downstream, Watershed Education Through Music"	Highly interactive and engaging performances that integrate music, theater, movement& puppetry to teach watershed education to elementary school students and teachers. To fund one 45 minute performance at each of 3 elementary schools in SLV & Scotts Valley in the 2013/14 school year, plus one public show at the Boulder Creek Library (Website: www.BananaSlugStringband.com)	Travel and musicians time	Banana Slug String Band	Larry Graff	3,000.00
San Lorenzo River Education Program	Provides education to docents & elementary school students about ecosystem interconnections& demonstrates practical ways to preserve native anadromous fish of the San Lorenzo River. Hand-held objects (fish model, steelhead egg display, etc.); class to be led down to the river to test water quality (D.O., clarity, temperature, flow etc.) ; the program also includes the anadromous fish exhibit in the Henry Cowell Redwoods SP Visitor Center.	Materials, bus costs, and staff time	Mountain Parks Foundation	Brenda Holmes	3,500.00

Watershed Nature Walks	Series of six 2+ hour long watershed walks, led by local experts, free and open to all, held on Saturdays, beginning April 28 thru fall.	\$1,900 to fund a \$1,200 stipend for grant applicant to organize walks and recruit guides. \$600 to fund stipends for expert guides.	n.a.	Carol Carson	3,000.00
Education & Conservation in the Unique & Fragile Sandhills of the San Lorenzo Watershed"	Classroom presentation, education kits & field trip to Randal Morgan Sandhills Preserve	Materials, bus costs, and staff time	Santa Cruz Museum of Natural History	n.a	2,500.00
Creation of a Special Exhibit on the Natural & Cultural History of Limestone Deposits in the San Lorenzo River Watershed"	Special exhibit "Crystals, Caves & Kilns," in fall/winter 13/14 at SC Museum of Natural History & SLV Museum to focus on how lime was quarried, how the industry impacted natural resources and how nature is healing; 3 field trips with experts include one to SLV Felton watershed	Materials, bus costs, and staff time	n.a.	Frank Perry	2,500.00
Monitor change in sandhills plant species on the Olympia Watershed Property	Introduce selected species to sites where they are currently absent, evaluate initial germination, and keep records such that the introduction sites can be revisited in the future to determine whether new stands of Sand Specialty plants expand or shrink over time.	Materials and stipen for expert researchers	Greening Associates	Suzanne Schettler	4,000.00
"French broom management & monitoring plan for the Olympia Watershed site"	Comprehensive Management and Monitoring Plan for the control of French broom at the District's Olympia Watershed property	Materials and stipen for expert researchers	Ecological Concerns, Inc.	n.a	7,500.00

Environmental Monitoring	Honors Biology prepares sophomores for a year-long monitoring project. Environmental monitoring involves juniors & seniors in conducting a year long field-based environmental science project. Each project has a mentor (a professional in the field). Students enter projects in the Monterey Bay Sanctuary Symposium, Santa Cruz County Science Fair & the SLVHS Science Symposium.	To fund staff time for applicant; \$600 for 2-6 mentor stipends; \$200 for Science Night	SLV High School	Jane Orbuch & Ned Hearn	2,500.00
Watershed Nature Walks	Series of six 2+ hour long watershed walks, led by local experts, free and open to all, held on Saturdays, beginning April 28 thru fall. (All six experts have been recruited & walks are arranged.)	Stipend for grant applicant to organize walks and recruit guides	n.a.	Carol Carson	3,000.00
Watershed Education Program	Museum program teaches students about their local watersheds, water quality, and water conservation through classroom and field activities.	Materials, bus costs, and staff time	Santa Cruz Museum of Natural History	n.a	2,500.00
Watershed Warriors	Watershed Warriors is an 8 week course were students will hike, bike and climb in various areas throughout the Santa Cruz Mountains. During these recreational explorations, students will conduct hands on scientific investigation that will facilitate a deeper understanding of their relationship with the watershed, teaching about personal responsibility, care of the watershed, gaining an understanding of the interdependence between human activities and the riparian habitat. Students will share information they gather to help further educate their community.	Materials, bus costs, and staff time	YMCA Camp Campbell	Lilianna Keller	2,500.00

Fifth Graders to Science Camp	To lower the costs for families of fifth grade students attending the Camp Campbell Outdoor Science School (CCOSS) June 2-5, 2014.	To lower the costs for families of fifth grade students attending the Camp Campbell Outdoor Science School (CCOSS) June 2-5, 2014.	Boulder Creek Elementary Parents Club	n.a.	3,500.00
Water and Environmental Awareness through Science Literacy: K-3 Science Enrichment at San Lorenzo Valley Elementary School	Match Bobcat Club funding of a Science Enrichment Teacher for grades K-3; Provide Science Notebooks to students 1st - 3rd grades to record observations and collect data and conduct experiments as well as journal observations; Support the Science Enrichment Teacher in coordination of the school Science Fair; Enable the Science Enrichment Teacher to be trained in the Salmon and Trout Education Program to bring lessons back to the students.	Materials, bus costs, and staff time	San Lorenzo Valley Elementary Bobcat Club	n.a.	2,500.00
Environmental Monitoring	Honors Biology prepares sophomores for a year-long monitoring project. Environmental monitoring involves juniors & seniors in conducting a year long field-based environmental science project. Each project has a mentor (a professional in the field). Students enter projects in the Monterey Bay Sanctuary Symposium, Santa Cruz County Science Fair & the SLVHS Science Symposium.	To fund staff time for applicant; for 2-6 mentor stipends; \$200 for Science Night	SLV High School	Jane Orbuch	3,000.00
Watershed Nature Walks	Series of six 2+ hour long watershed walks, led by local experts, free and open to all, held on Saturdays, summer and fall. (All six experts have been recruited & walks are being arranged.)	Stipend for applicant to organize walks; Stipend for each expert guide; \$500 stipend for public outreach component	n.a.	Carol Carson	3,000.00

Water and Environmental Awareness through Science Literacy: K-3 Science Enrichment at San Lorenzo Valley Elementary School	Deliver 4 water science lessons to approx 400 students at SLVE grades K-3; Provide Science Notebooks to students to record observations and collect data and conduct experiments as well as journal observations; Support coordination of the school Science Fair.	Materials, bus costs, and staff time	San Lorenzo Valley Elementary Bobcat Club		2,500.00
Banana Slug String Band	Interactive and Engaging performances that intregrate music, theater, movement & Pupperty to teach watershed education to elementary school students and teachers.	Travel and musicians time	Banana Slug String Band	Larry Graff	3,000.00
Fall Creek Watershed Video	Production of a 5-10 minute video about the Fall Creek watershed that will include interesting natural history of the area as well as the story of where the District intakes for water are and how they have recently been restored to meet the needs for fish passage.	Video production and editing	n.a.	Fred McPherson	3,000.00
Watershed Studies Program	Field trip for Santa Cruz City fifth grade students to visit the San Lorenzo River, Loch Lomond and Neary Lagoon with pre and post trip cassroom education to train students to be environmental stewards of the San Lorenzo River.	Materials, bus costs, and staff time	Santa Cruz City Schools	n.a	2,500.00

Environmental Monitoring	Honors Biology prepares sophomores, juniors and seniors for a year-long monitoring project. Environmental monitoring involves juniors & seniors in conducting a year long field-based environmental science project. Each project has a mentor (a professional in the field). Students enter projects in the Monterey Bay Sanctuary Symposium, Santa Cruz County Science Fair & the SLVHS Science Symposium.	\$1500 Mentor Stipends; \$450 Poster Boards; \$250 refreshments/supplies for poster review session; \$200 for honorariums to students w/financial need; \$600 Equipment, kit refills etc.	SLV High School	Jane Orbuch Science Teacher	3,000.00
Watershed Nature Walks	Series of six 2+ hour long watershed walks, led by local experts, free and open to all, held on Saturdays, summer and fall. (All six experts have been recruited & walks are being arranged.)	\$100 each as stipend for 6 experts; \$1900 Grant Directors Duties; \$500 Public Outreach	n.a.	Carol Carson	3,000.00
Water and Environmental Awareness through Science Literacy: K-3 Science Enrichment at San Lorenzo Valley Elementary School	Deliver 4 water science lessons to approx 400 students at SLVE grades K-3; Provide Science Notebooks to students to record observations and collect data and conduct experiments as well as journal observations; Support coordination of the school Science Fair.	Water Science Lessons \$25 /hr. @ 56 hours = \$1400; Science Journals \$2.00 X 300 students = \$600; Science Fair Coordination \$25/hr. X 20 hours = \$500	San Lorenzo Valley Elementary Bobcat Club	n.a	2,500.00
Banana Slug String Band	Interactive and Engaging performances that integrate music, theater, movement & Pupperty to teach watershed education to elementary school students and teachers.	\$600 - \$800 Assembly Cost (per school) Public Show \$600	Banana Slug String Band	Larry Graff Co-Manager	3,000.00
Fifth Graders to Science Camp	To lower the costs for families of fifth grade students attending the Camp Campbell Outdoor Science School (CCOSS) May 24-27, 2016.	\$2500 used to reduce cost of Camp Campbell Outdoor Science School.	Boulder Creek Elementary Parents Club	Nicole Berridge	2,500.00

Family Science Night at SLVE	Family Science Night is an engaging and fun event where students, siblings, and parents learn about science, as it is related to water and watersheds.	Family Science Night Package from Childrens Discovery Museum \$1000; Coordinator Stipens \$700; Supplies \$400; Activity Stations \$400	SLV Elementary School	Hilde Largay	2,500.00
Watershed Rangers	In an after-school program, 15 SLVMS students will enhance understanding of watershed issues including watershed dynamics, endangered/ invasive species and water quality to develop leadership skills necessary to engage the SLV community in the preservation and protection of the San Lorenzo River watershed.	Project oversight \$100; Teachers & lesson planning \$300; Classroom & Field instruction & Travel \$1925; Evaluation \$100; advertising materials \$500; Mileage \$75	Coastal Watershed Council	Greg Pipping	3,000.00
Fall Creek Fish Ladder & Salmonid Cycle Educational Rail Signage	This sign will illustrate the relationship of salmonids, the fish ladders, and the environment of Fall Creek as part of the San Lorenzo watershed. Whereby enhancing the understanding of human impact of watershed stewardship and environmental health of it's water customers.	\$200 Reasearch & Writing; \$1920 Design; \$140 fact-checking; \$240 Illustration; \$100 Photography; \$400 Promotional efforts	Nina Moore	Nina Moore	3,000.00
Fifth Graders to Science Camp	To lower the costs for families of fifth grade students attending the Camp Campbell Outdoor Science School (CCOSS) May 23-26 2017.	\$2500 used to reduce cost of Camp Campbell Outdoor Science School.	Boulder Creek Elementary Parents Club	n.a.	2,500.00
Banana Slug String Band	Interactive and Engaging performances that integrate music, theater, movement & Puppetry to teach watershed education to elementary school students and teachers.	Assembly cost (per school) \$600-800 Public Show \$600	Banana Slug String Band	Larry Graff Co-Manager	3,000.00
Family Science Night at SLVE	Family Science Night is an engaging and fun event where students, siblings, and parents learn about science, as it is related to water and watersheds.	Family Science Night Package from Children's Discovery Museum \$1065; Coordinator Stipends \$700; Supplies \$335	SLV Elementary School	Hilde Largay	2,100.00

Water and Environmental Awareness through Science Literacy: K-3 Science Enrichment at San Lorenzo Valley Elementary School	Deliver 4 water science lessons to approx 400 students at SLVE grades K-3; Provide Science Notebooks to students to record observations and collect data and conduct experiments as well as journal observations; Support coordination of the school Science Fair.	Water Science Lessons \$30 /hr. @ 43.3 hours = \$1300; Science Journals \$2.00 X 300 students = \$600; Science Fair Coordination \$30/hr. X 20 hours = \$600	San Lorenzo Valley Elementary Bobcat Club	n.a.	2,500.00
Exploring the San Lorenzo River	The Museum will create a series of free educational walks and a culminating Bio Blitz event along the upper and lower San Lorenzo River to educate the community and inspire stewardship about this important wildlife habitat, with a special outreach effort to San Lorenzo Valley residents. SCMNH will work alongside the Coastal Watershed Council (CWC) to coordinate these expert-led walks, including several along the upper portion of the river.	\$1570 Education Personnel; Expert Guides \$250; Supplies \$1,180	Santa Cruz Museum of Natural History	Ami Davis	3,000.00
The Water W.I.S.E. (Water Information Serving Educators) Project	A series of six lessons in the 4th and 5th grade science class at Boulder Creek Elementary. Students will learn about watersheds, the water cycle, aquifers, the impacts of climate change, how humans clean water and what happens to water after it goes down a drain. They will explore the many ways that people in the San Lorenzo Valley can enhance the health of their watersheds. Develop a public outreach campaign to share their new knowledge.	Education staff \$40/hr X 53 hrs = \$2120 and \$230 supplies. \$150 for bus transportation	MBEL	Stew Jenkins	3,000.00

MEMO

TO: Environmental Committee

From: Environmental Programs Manager

SUBJECT: Water Conservation Requirements/2019 Rebate Program Update

DATE: April 11, 2019

RECOMMENDATION:

It is recommended that the Environmental Committee review this memo and discuss the District's Water Conservation Requirements/ Recommended Rebate Program Updates.

BACKGROUND

On February 6, 2014 the Board Approved Resolution No. 20 (13-14) Declaring a Stage 2 Water Shortage and calling for an immediate voluntary 20% reduction in water use by all District Customers.

According to the DWR 2015 UWMP, retail water agencies need to promote public awareness and education of the District's water supply sources, and the public's role in conserving water and protecting its shared resource.

Since 2014, on an annual basis the District has reassessed its water supply and the District Manager has elected to maintain the Stage 2 water shortage due to over-drafted aquifers, and below normal rainfall with the exception of 2017, and temporary impacts to water availability due to infrastructure construction projects.

In Summer 2018 the District sent a post card to south system customers calling for a 20% reduction of water consumption due to infrastructure replacement projects temporarily impact water supply.

According to the District's 2010 UWMP water consumption between 2000 - 2010 was between 85 - 100 GPCPD (Gallons Per Capita Per Day).

According to the 2015 UWMP the Districts target for 2020 is 84 GPCPD.
In 2018 the average water consumption per capita per day was 55 gallons.
Summer average consumption = 68 GPCPD
Winter Average =

2015 STRATEGIC PLAN:
Strategic Element 2.4 Water Supply Management
Strategic Element 2.0 - Watershed Stewardship

FISCAL IMPACT:

\$10,000 Residential Water Conservation Rebate Program
\$6,000 Commercial Water Conservation Rebate Program
\$3,000 Free Conservation Devices
\$1000 Water Conservation Outreach
\$5,300 Water Conservation Coalition
Total Proposed Budget FY 19/20 \$25,300

REQUIRED DEMAND MANAGEMENT MEASURES



The Demand Management Measures (DMM) provide a comprehensive description of the water conservation programs that the District has implemented for the past five years, is currently implementing, or can implement in order to meet the 2020 urban water use reduction targets.

UWMP must be complete to apply for grants or loans funded by state.

[Read about requirements here.](#)

Last Updated

03/28/2019

DEMAND MANAGEMENT MEASURES

PROJECT DETAILS

9.2.1 Water waste prevention ordinances

A water waste ordinance explicitly states that the waste of water is to be prohibited. The ordinance may prohibit specific actions that waste water, such as excessive runoff from landscape irrigation, or use of a hose outdoors without a shut off nozzle.

PROGRAM NAME	STATUS	DESCRIPTION	PROGRAM PURPOSE	Average Annual Cost
District's Ordinance 106	On-going	On February 6, 2014, the Board approved Resolution No. 20(13-14) declaring a state of drought and calling for an immediate voluntary 20% reduction in water use by all District customers.	The ordinance lists the prohibited uses of water supplied by the District and defines water waste during a declared water shortage. The ordinance also states violations and penalties for customers.	\$0
Drought Risk Assessment	Not Yet Started	Executive Order B-37-16 added SEC. 6. Section 10612 to the Water Code stating, "Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information"	To examine water shortage risks for the next five or more consecutive years based on the driest 5-year historic sequence for the agency's water supply.	\$0
Water Shortage Contingency Plan	Not Yet Started	Executive Order B-37-16 that includes, directive #10 specifying that, "Each urban water supplier shall develop its own water shortage contingency plan as part of its urban water management plan". To be completed by 2020	To demonstrate preparation, planning and response to water shortages.	\$0

9.2.4 Public Education and Outreach

According to the DWR 2015 UWMP Guidebook, retail water agencies need to promote public awareness and education of the District's water supply sources, and the public's role in conserving water and protecting its shared resource.

PROGRAM NAME	STATUS	DESCRIPTION	PROGRAM PURPOSE	Average Annual Cost
Conservation Rebate Program	On-going	Administer conservation rebate program. Including rebates for home appliances such as toilets, greywater, washer machines, and irrigation controllers	The majority of the District's customer accounts are residential; therefore, the District targets indoor and outdoor water savings programs toward these customers. Residential water conservation is promoted by disseminating technical information on methods to reduce indoor and outdoor water use and by offering credits on customer bills for installation and/or replacement of appliances and lawns with approved water saving appliances and plantings.	\$5,000
Residential Plumbing Retrofit	On-going	The District offers free water saving devices for customers to install in their homes.	The District provides low-flow shower heads, faucet-aerators, leak detection tablets and hose nozzles to residential customers to encourage at home water saving.	\$3,000
Social Media Sites	In Progress	The District Facebook and Nextdoor page are updated regularly (2-3 times per week) with water conservation information.	Social media provides an easy to access platform for customers to learn about conservation and the District's conservation efforts.	\$0
Water Conservation Coalition of Santa Cruz County	On-going	The Water Conservation Coalition is a partnership between all the local Water Districts in Santa Cruz County as well as the County Water Resources Division, Ecology Action and other groups who share a passion for water conservation and public education.	As a member of the Water Conservation Coalition of Santa Cruz County, the District uses its website www.watersavingtips.org to provide water saving tips, information on County-wide rebate programs, and educational materials (e.g., drought-tolerant plants suitable for local conditions). The Water Conservation Coalition of Santa Cruz County also works collaboratively to produce press releases, newspaper ads, radio ads, and informational booths at local events. SLVWD disseminates public information regarding water conservation	\$5,000
Boothing Local Events	In Progress	Promoting water conservation at local events.	Attending local events to distribute water conservation devices, informational materials, and expert in-person advice.	0
Watershed Education Grants	Reoccurring	The District has included approximately \$17,500 in its annual budget to fund watershed education program grants, and an additional \$15,000 for data collection and restoration program grants. These grants are awarded to local schools, camps, community groups, and individuals whose projects help improve the knowledge and environmental health of the San Lorenzo River watershed.	The mission of the Education Grant Program is to provide funding for educational and other projects that enhance the understanding of the San Lorenzo River watershed or improve the watershed's environmental health.	\$17,500

9.1.5 DMM – Water Loss Control

According to the DWR 2015 UWMP Guidebook, retail water agencies need to detect and repair distribution system leaks

PROGRAM NAME	STATUS	DESCRIPTION	PROGRAM PURPOSE	Average Annual Cost
Customer Service Leak & High Use Investigation	On-going	Administer "spike in consumption" outreach and support.	When customers experience a sudden spike in water use compared to previous years, staff will reach out and help customers identify the reason for the spike and assist in reducing water consumption.	\$0
Leak Adjustments	On-going	The District allows customers a one time bill adjustment after a leak on their side of the meter. This encourages customers to review their bill and usage regularly.	In the case of a leak on the customer's side of the meter, the District provides opportunity and incentive for customers to review their bills and promptly repair leaks through leak adjustment requests. The District reviews leak adjustment requests for evidence of leak repairs, and applies a credit to the water usage portion of a customer's bill.	\$30,000

9.2.2 Residential Programs

PROGRAM NAME	STATUS	DESCRIPTION	PROGRAM PURPOSE	Average Annual Cost
Residential Water Survey Assistance	On-going	Customers who would like assistance in lowering their water consumption will be able to receive a free water audit or water conservation advice.	SLVWD provides technical instruction to help customers manage their water use, and performs on-site residential surveys. The District's website provides a menu of customer services that include instruction and assistance on how to locate and read a water meter, how to conduct a leak test, and assistance in finding a leak once one is suspected. The District website provides a checklist of suggested water saving tips for inside the home and outdoors, and provides a contact phone number for customer questions. How water audits can also be scheduled by contacting the District via phone.	\$0

FY 17/18 Q1 Ending Sept. 30, 2017

Code	Type	Water Savings by type	# Rebates	Amount	Water SavedGallons per year
RBDRIP sqft	Drip	4,500 gpy/ 500sf	0	\$ -	0
RBHECW	Clothes Washers	5100GPY	1	\$ 100.00	5100
RBHWRS	Recirculation System	7800GPY	0	\$ -	0
RBLAWN	Lawn	6 ft/sqft or 7.48*6=44.88 gpy/sqft	0	\$ -	0
RBT1.6	Toilet 1.6	1280 gpy	1	\$ 129.00	1280
RBT3.5	Toilet 3.5	5000gpcy	8	\$ 2,165.59	160000
RBWBICSI	Irrigation Controler	1.7g/sqft/y	1	\$ 125.00	618.8
RBGWLL	Greywater Irrigation	14,565 gpy	1	\$ 150.00	14565

Grand Total 12 \$2,669.59 181563.8

FY 17/18 Q2 Ending Dec. 31, 2017

Code	Type	Water Savings per year	# Rebates	Amount	Gallons/y saved
RBDRIP 1247	Drip	4,500 gpy/ 500sf	0	\$0.00	0
RBHECW	Clothes Washers	5100GPY	3	\$300.00	15300
RBHWRS	Recirculation System	7800GPY	0	\$0.00	0
RBLAWN	Lawn	6 ft/sqft or 7.48*6=44.88 gpy/sqft	0	\$0.00	0
RBT1.6	Toilet 1.6	1280 gpy	2	\$243.00	2560
RBT3.5	Toilet 3.5	5000gpcy	7	\$1,322.00	140000
RBWBICSI	Irrigation Controler	1.7g/sqft/y	0	\$0.00	0
RBGWLL	Greywater Irrigation	14,565 gpy	0	\$0.00	0

12 \$1,865.00 157860

FY 17/18 Q3 Ending March 31, 2018

Code	Type	Water Savings by type	# Rebates	Amount	Water SavedGallons per year
RBDRIP sqft	Drip	4,500 gpy/ 500sf	0	\$0.00	0
RBHECW	Clothes Washers	5100GPY	4	\$400.00	20400
RBHWRS	Recirculation System	7800GPY	0	\$0.00	0
RBLAWN	Lawn	6 ft/sqft or 7.48*6=44.88 gpy/sqft	0	\$0.00	0
RBT1.6	Toilet 1.6	1280 gpy	0	\$0.00	0
RBT3.5	Toilet 3.5	5000gpcy	6	\$1,379.00	120000
RBWBICSI	Irrigation Controler	1.7g/sqft/y	0	\$0.00	0
RBGWLL	Greywater Irrigation	14,565 gpy	0	\$0.00	0

10 \$1,779.00 140400

FY 17/18 Q4 Ending June 30, 2018

Code	Type	Water Savings by type	# Rebates	Amount	Water Saved Gallons per year
RBDRIP sqft	Drip	4,500 gpy/ 500sf	0	\$0.00	0
RBHECW	Clothes Washers	5100GPY	1	\$100.00	5100
RBHWRS	Recirculation System	7800GPY	0	\$0.00	0
RBLAWN	Lawn	6 ft/sqft or 7.48*6=44.88 gpy/sqft	0	\$0.00	0
RBT1.6	Toilet 1.6	1280 gpy	4	\$430.00	5120
RBT3.5	Toilet 3.5	5000gpcy	7	\$2,538.00	140000
RBWBICSI	Irrigation Controler	1.7g/sqft/y	0	\$0.00	0
RBGWLL	Greywater Irrigation	14,565 gpy	0	\$0.00	0
			12	\$3,068.00	150220

Annual Summary FY 17/18					
Code	Type	Water Savings by type	# Rebates	Amount	Water Saved GPY
RBDRIP sqft	Drip	4,500 gpy/ 500sf	0	\$ -	0
RBHECW	Clothes Washers	5100GPY	9	\$ 900.00	45900
RBHWRS	Recirculation System	7800GPY	0	\$ -	0
RBLAWN	Lawn	6 ft/sqft or 7.48*6=44.88 gpy/sqft	0	\$ -	0
RBT1.6	Toilet 1.6	1280 gpy	7	\$ 802.00	8,960
RBT3.5	Toilet 3.5	5000gpcy	28	\$ 7,404.59	560,000
RBWBICSI	Irrigation Controler	1.7g/sqft/y	1	\$ 125.00	618.8
RBGWLL	Greywater Irrigation	14,565 gpy	1	\$ 150.00	14565
			46	\$ 9,381.59	630,044

FY 18/19 Q1 Ending Sept. 30, 2018

Code	Type	Water Savings by type	# Rebates	Amount	Water Saved Gallons per year
RBDRIPsqft	Drip	4,500 gpy/ 500sf	0	\$ -	0
RBHECW	Clothes Washers	5100GPY	3	\$ 300.00	15300
RBHWRS	Recirculation System	7800GPY	0	\$ -	0
RBLAWN	Lawn	6 ft/sqft or 7.48*6=44.88 gpy/sqft	0	\$ -	0
RBT1.6	Toilet 1.6	1280 gpy	2	\$ 150.00	2560
RBT3.5	Toilet 3.5	5000gpcy	3	\$ 568.00	60000
RBWBICSI	Irrigation Controler	1.7g/sqft/y	0	\$ -	0

RBGWLL	Greywater Irrigation	14,565 gpy	0	\$ -	0
			8	\$ 1,018.00	77860

FY 18/19 Q2 Ending Dec 31, 2018

Code	Type	Water Savings by type	# Rebates	Amount	Water SavedGallons per year
RBDRIP sqft	Drip	4,500 gpy/ 500sf	0	\$ -	0
RBHECW	Clothes Washers	5100GPY	3	\$ 300.00	15300
RBHWRS	Recirculation System	7800GPY	0	\$ -	0
RBLAWN	Lawn	6 ft/sqft or 7.48*6=44.88 gpy/sqft	0	\$ -	0
RBT1.6	Toilet 1.6	1280 gpy	3	\$ 225.00	3840
RBT3.5	Toilet 3.5	5000gpcy	7	\$ 1,211.99	140000
RBWBICSI	Irrigation Controler	1.7g/sqft/y	0	\$ -	0
RBGWLL	Greywater Irrigation	14,565 gpy	0	\$ -	0
			13	\$ 1,736.99	159140

FY 18/19 Q3 Ending March 31, 2019

Code	Type	Water Savings by type	# Rebates	Amount	Water SavedGallons per year
RBDRIP sqft	Drip	4,500 gpy/ 500sf		\$ -	0
RBHECW	Clothes Washers	5100GPY	2	\$200	10200
RBHWRS	Recirculation System	7800GPY	0	\$ -	0
RBLAWN	Lawn	6 ft/sqft or 7.48*6=44.88 gpy/sqft	0	\$ -	0
RBT1.6	Toilet 1.6	1280 gpy	0	\$ -	
RBT3.5	Toilet 3.5	5000gpcy	1	\$200	20000
RBWBICSI	Irrigation Controler	1.7g/sqft/y	0	\$ -	0
RBGWLL	Greywater Irrigation	14,565 gpy	0	\$ -	0
			3	\$ 400.00	30200

FY 18/19 Q4 Ending June 30, 2019

Code	Type	Water Savings by type	# Rebates	Amount	Water SavedGallons per year
RBDRIP sqft	Drip	4,500 gpy/ 500sf		\$ -	0
RBHECW	Clothes Washers	5100GPY			
RBHWRS	Recirculation System	7800GPY	0	\$ -	0
RBLAWN	Lawn	6 ft/sqft or 7.48*6=44.88 gpy/sqft	0	\$ -	0
RBT1.6	Toilet 1.6	1280 gpy		\$ -	0

RBT3.5	Toilet 3.5	5000gpcy			
RBWBICSI	Irrigation Controler	1.7g/sqft/y	0	\$ -	0
RBGWLL	Greywater Irrigation	14,565 gpy	0	\$ -	0
			0	\$ -	0

Annual Summary FY 18/19					
Code	Type	Water Savings by type	# Rebates	Amount	Water Saved GPY
RBDRIP sqft	Drip	4,500 gpy/ 500sf	0	\$ -	0
RBHECW	Clothes Washers	5100GPY	8	\$ 800.00	40800
RBHWRS	Recirculation System	7800GPY	0	\$ -	0
RBLAWN	Lawn	6 ft/sqft or 7.48*6=44.88 gpy/sqft	0	\$ -	0
RBT1.6	Toilet 1.6	1280 gpy	5	\$ 375.00	2,560
RBT3.5	Toilet 3.5	5000gpcy	11	\$ 1,979.99	220,000
RBWBICSI	Irrigation Controler	1.7g/sqft/y	0	\$ -	1856.4
RBGWLL	Greywater Irrigation	14,565 gpy	0	\$ -	0
Grand Total			24	\$ 3,154.99	265,216

\$/Gallon	
\$	-
\$	0.02
\$	-
\$	-
\$	0.09
\$	0.01
\$	-
\$	-



\$/Gallon	
\$	-
\$	0.02
\$	-
\$	-
\$	0.15
\$	0.01
\$	-
\$	-
\$	0.18

Fiscal Year	17/18				Total FY:
Quaterly	Q1	Q2	Q3	Q4	
Rebates Issued:	12	12	10	12	46
Total Gallons Saved:	181,564	157860	140400	150220	630,044

1st Quarter Ending September 30, 2017

Type	# Rebates	Amount	Gallons/y saved
Drip	0	\$0.00	0
Clothes Washers	1	\$100.00	5,100
Recirculation System	0	\$0.00	0
Lawn	0	\$0.00	0
Toilet 1.6	1	\$129.00	1,280
Toilet 3.5	8	\$2,165.59	160,000
Irrigation Controller	1	\$125.00	619
Greywater Irrigation	1	\$150.00	14,565
Totals	12	\$2,669.59	181,564

1.65AFY

2nd Quarter Ending December 31, 2017

Type	# Rebates	Amount	Gallons/y saved
Drip	0	\$0.00	0
Clothes Washers	3	\$300.00	15300
Recirculation System	0	\$0.00	0
Lawn	0	\$0.00	0
Toilet 1.6	2	\$243.00	2560
Toilet 3.5	7	\$1,322.00	140000
Irrigation Controller	0	\$0.00	0
Greywater Irrigation	0	\$0.00	0
Totals	12	\$1,865.00	157860

1.65AFY

3rd Quarter Ending March 31, 2018

Type	# Rebates	Amount	Gallons/y saved
Drip	0	\$0.00	0
Clothes Washers	4	\$400.00	20400
Recirculation System	0	\$0.00	0
Lawn	0	\$0.00	0
Toilet 1.6	0	\$0.00	0
Toilet 3.5	6	\$1,379.00	120000
Irrigation Controller	0	\$0.00	0
Greywater Irrigation	0	\$0.00	0
Totals	10	\$1,779.00	140400

1.65AFY

4th Quarter Ending June 30, 2018

Type	# Rebates	Amount	Gallons/y saved
Drip	0	\$0.00	0
Clothes Washers	1	\$100.00	5100
Recirculation System	0	\$0.00	0
Lawn	0	\$0.00	0
Toilet 1.6	4	\$430.00	5120
Toilet 3.5	7	\$2,538.00	140000
Irrigation Controller	0	\$0.00	0
Greywater Irrigation	0	\$0.00	0
Totals	12	\$3,068.00	150220

1.65AFY

1st Quarter Ending September 30, 2018

Type	# Rebates	Amount	Gallons/y saved
Drip	0	\$0.00	0
Clothes Washers	3	\$300.00	15,300
Recirculation System	0	\$0.00	0
Lawn	0	\$0.00	0
Toilet 1.6	2	\$150.00	2,560
Toilet 3.5	3	\$568.00	60,000
Irrigation Controller	0	#REF!	#REF!
Greywater Irrigation	0	\$0.00	0
Totals	8	#REF!	#REF!

1.65AFY

2nd Quarter Ending December 31, 2018

Type	# Rebates	Amount	Gallons/y saved
Drip	0	\$0.00	0
Clothes Washers	3	\$300.00	15300
Recirculation System	0	\$0.00	0
Lawn	0	\$0.00	0
Toilet 1.6	3	\$ 225.00	3840
Toilet 3.5	7	\$ 1,211.99	140000
Irrigation Controller	0	\$0.00	0
Greywater Irrigation	0	\$0.00	0
Totals	13	\$1,736.99	159140

1.65AFY

3rd Quarter Ending March 31, 2019

Type	# Rebates	Amount	Gallons/y saved
Drip	0	\$0.00	0
Clothes Washers	2	\$200.00	10200
Recirculation System	0	\$0.00	0
Lawn	0	\$0.00	0
Toilet 1.6	0	\$0.00	0
Toilet 3.5	1	\$200.00	20000
Irrigation Controller	0	\$0.00	0
Greywater Irrigation	0	\$0.00	0
Totals	3	\$400.00	30200

1.65AFY

Annual Summary FY 17/18					
Code	Type	Water Savings by type	# Rebates	Amount	Water Saved
RBDRIP sqft	Drip	4,500 gpy/ 500sf	0	0	0
RBHECW	Clothes Washers	5100GPY	9	900	45900
RBHWRS	Recirculation System	7800GPY	0	0	0
RBLAWN	Lawn	6 ft/sqft or $7.48 * 6 = 44.88$ gpy/sqft	0	0	0
RBT1.6	Toilet 1.6	1280 gpy	7	802	8960
RBT3.5	Toilet 3.5	5000gpcy	28	7404.59	560000
RBWBICSI	Irrigation Controler	1.7g/sqft/y	1	125	618.8
RBGWLL	Greywater Irrigation	14,565 gpy	1	150	14565
Grand Total			46	9381.59	630043.8

\$/Gallon
0
0.01960784
0
0
0.08950893
0.01322248
0
0