## Alameda County Water District Rubber Dam #3 Fish Ladder



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Geographic Area of Project

#### List of Acronyms

AF	Acre-feet
AFY	Acre-feet per year
ВА	Biological Assessment
BMP	Best Management Practices
CEQA	California Environmental Quality Act
CIP	Capital Improvement Plan
CUWCC	California Urban Water Conservation Council
EPA	U.S. Environmental Protection Agency
IRWMP	Integrated Regional Water Management Plan
NEPA	National Environmental Policy Act
NMFS	National Marine and Fisheries Service
NOAA Fisheries	National Oceanic Administration, National Marine Fisheries
USACE	U.S. Army Corps of Engineers
UWMP	Urban Water Management Plan

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#### Technical Proposal and Evaluation Criteria

#### Executive Summary

Date: February 14, 2017 Applicant: Alameda County Water District Applicant City, County, State: Fremont, Alameda, California Project Location: Alameda Creek; nearest cross street: 3rd St. and Chase Ct., Fremont, CA Project Name: Rubber Dam #3 Fish Ladder Construction Project Estimated Project Completion: 6/30/2019 Funding Group: Tier II Project Summary:

The Project is to construct a fish ladder for endangered anadromous fish at Rubber Dam #3 on Alameda Creek; which will allow the District to increase the capture of stormwater to recharge and sustainably manage the Niles Cone groundwater basin, reducing reliance on imported water supplies and reducing energy consumption. The Project will prevent Alameda County Water District from needing to lower the dam during fish migration periods when rainfall events occur thereby optimizing the capture of surplus stormwater during rainfall run-off events while providing sufficient bypass flows for migrating steelhead. This project provides drought resiliency against climate change and improves the ecosystem for *O. mykiss* (aka Rainbow Trout) traveling up/downstream and has been identified in the National Marine Fisheries Service Multi-Species Recovery plan. The increased local capture and groundwater recharge is estimated to provide up to an additional 2,000 AF/year, reduce energy consumption by up to 2.660 Million kWhrs every year, and reduce greenhouse gas emissions up to 648,140 kg CO2e/year.

#### Background

The Alameda County Water District is a retail water purveyor with a service area of approximately 100 square miles generally encompassing the Cities of Fremont, Newark, and Union City, providing water to more than 344,000 residents. The District was established in 1914 under the California County Water District Act and is governed by a five-member Board of Directors. It was originally created to protect the groundwater basin, conserve the waters of the Alameda Creek Watershed and develop supplemental water supplies, primarily for agricultural use. In 1930, urban distribution became an added function of the District. Today, the District provides water primarily to urban customers: approximately 70% of supplies are used by residential customers, with the balance (approximately 30%) utilized by commercial, industrial, institutional and large landscape customers.

The District currently has three primary sources of water supply: (1) the State Water Project (SWP), (2) San Francisco's Regional Water System (RWS) and (3) local supplies. The SWP and RWS supplies are imported into the District service area through the South Bay Aqueduct (SBA) and Hetch Hetchy Aqueduct, respectively. Local supplies include fresh groundwater from the Niles Cone Groundwater Basin, desalinated brackish groundwater from portions of the groundwater basin previously impacted by saltwater intrusion, and surface water from the Del Valle Reservoir.

The Niles Cone Groundwater Basin was the principal source of water supply for the District until 1962. Up to that time, groundwater use by the District and numerous private pumpers exceeded recharge, and this imbalance permitted saltwater from the Bay to intrude into the basin, severely limiting its use. In 1962, the District was the first state contractor to receive water from the State Water Project (SWP). The District's State Water Project supply was originally used solely to recharge the groundwater basin. As a result, groundwater levels rose and prevented additional saltwater intrusion. However, certain areas within the groundwater basin remain brackish due to past years of saltwater intrusion. The principal source of recharge to the basin is the westerly flowing Alameda Creek, which drains the 700 square-mile Alameda Creek Watershed to the east before it reaches the Niles Cone Basin. The reach of Alameda Creek within the geographic area of the NCGB was reconstructed in the 1970s as the Alameda Creek Flood Control Channel. The channel extends through the Above Hayward Fault aquifer and then the Below Hayward Fault aquifer subbasins, before finally reaching San Francisco Bay. Percolation of creek water into the basin is greatly enhanced by ACWD's two inflatable rubber dams, Rubber Dam 1 (RD1) and Rubber Dam 3 (RD3), which when inflated, increase the rate of percolation in the impounded channel segments and enable diversion of impounded water to adjacent recharge ponds. RD3 and RD1 principally serve recharge needs for the subbasins. These two dams allow ACWD to maximize capture of local Alameda Creek Watershed drainage and other storm water for recharge; however, they also form barriers that impede the upstream migration of anadromous fish which requires the District to lower the dams and reduce groundwater recharge.

A portion of the District's SWP supplies are also used for supplemental groundwater recharge when Alameda Creek supplies are insufficient or when groundwater levels fall below critical thresholds. Infiltration of rainfall and applied water also contribute to local groundwater recharge.

Before being supplied to District customers via the District's nearly 900 mile-long potable water distribution system to serve over 84,000 service accounts, the source water supplies are treated to meet and surpass all state and federal drinking water standards. The District operates two surface water treatment plants that treat SWP and local surface water from Del Valle Reservoir. The Newark Desalination Facility treats brackish groundwater to remove salts and other impurities, and the Blending Facility blends San Francisco water with relatively high hardness groundwater in order to provide a blended supply with lower overall hardness. Over the FY2005/06 -FY2014/15 period, 29% of the total in-District water demands (distribution system and groundwater system demands) have been met by SWP supplies, 17% from San Francisco Public Utilities Commission (SFPUC) supplies and 54% from local supplies. When considering only the distribution system demands (treated water), over the same time period, about 39% of the District's distribution system water supply was from the SWP. Water from the SFPUC provided approximately 24% of the distribution system water supply and local supplies accounted for the balance (about 38%) of the distribution system supplies. Identify potential shortfalls in water supply and/or provide info on reductions in supply under historical drought conditions.

As a result of four successive years of low rainfall, the State is currently experiencing a severe drought. Due to the record-dry conditions, Governor Edmund G. Brown proclaimed a drought emergency on January 17, 2014 ordering, amongst other actions, State agencies to execute a statewide conservation campaign to reduce water usage by 20%. On March 13,

2014, the District's Board of Directors adopted Ordinance No. 2014-01 declaring a water shortage emergency and adopting water use regulations, restrictions and guidelines for the water shortage emergency, designed to achieve a 20% service area-wide reduction in water use by prohibiting wasteful uses of water and limiting landscape irrigation. On July 29, 2014, the State Water Resources Control Board (SWRCB) adopted statewide emergency conservation regulations that largely mirrored the District's Ordinance prohibitions. As the drought entered its fourth year, the State passed additional emergency conservation regulations on March 27, 2015 which extended and expanded the regulations adopted in 20142. These regulations were further expanded and adopted on May 5, 2015. During the intervening month, the Governor issued another Executive Order on April 1, 2015 which included, for the first time ever, a mandate to reduce statewide water use, specifically by 25% from 2013 levels. In response, the SWRCB replaced the statewide target established in July of 2014 with agency-specific goals based on each agency's average residential gallons per capita per day (R-GPCD), as reported to the State, for July 2014 – September 2014; the District's target reduction is 16% from its baseline use between July 2013-December 2013, and January/February 2013. The SWRCB also expanded water agency reporting requirements and added additional end-user prohibitions including prohibiting irrigation with potable water of ornamental turf on public medians and called for new standards for irrigation of landscaping in new development.

The District's Ordinance is consistent with the revised State goal for the District and therefore has not been changed, even though the savings target was reduced from 20% to 16%. Water demand for FY 2014-2015 was 38,500 AF, or roughly 27% less than the pre-drought demand. Despite mandated reductions in demand, it was necessary for the District to seek additional imported water in 2014; however, SWP supplies were also curtailed causing the District to import water from the CVP via the Contra Costa Water District intertie planning additional strain on Reclamation CVP supplies. During dry periods, the groundwater basins are threatened by sea water intrusion. This has occurred in the past as mentioned previously, causing the affected aquifer to become permanently brackish and requires additional treatment for distribution. It is important that the District protect the Niles Cone Basin by maintaining levels above sea level.

## Identify any past working relationships with Reclamation, dates, description of the relationship, and a description of the project.

1. ACWD is currently participating in the Bay Area Regional Reliability Drought Contingency Plan (DC Plan), which received \$200,000 in funding from the U.S. Bureau of Reclamation. The DC Plan is a joint effort by eight of the San Francisco Bay Area's water agencies, collectively serving more than 6 million people in seven counties. The purpose of the DC Plan is to integrate drought planning efforts developed by eight individual agencies to address the drought needs of the Bay Area as a region.

ACWD is currently participating with this same consortium of water agencies in the preparation of another WaterSmart Grant application for the Bay Area Regional Water Marketing Program, as an early implementation measure from the DC Plan.

2. ACWD is currently participating as a partner in the Los Vaqueros Reservoir Expansion studies. In March 2010 the Contra Costa Water District (District) and the Bureau of Reclamation (Reclamation) completed the Final Environmental Impact

Statement/Environmental Impact Report (EIS/EIR) for the Los Vaqueros Reservoir Expansion Project (Project). In 2012 the District completed the first phase of reservoir expansion from 100,000 acre-feet to 160,000 acre-feet. ACWD is working with CCWD, other local water agencies, and Reclamation to jointly study the potential further expansion of Los Vaqueros Reservoir up to 275,000 acre-feet and related conveyance facilities.

ACWD executed the Los Vaqueros Memorandum of Understanding in 2001 (Reclamation is also a signatory to the MOU in addition to the local water agencies as well as other state and federal agencies). In 2016 ACWD executed a Cost Share Agreement with CCWD for providing funding support and in-kind services for preparation of the Draft Supplemental EIS/EIR and the California Water Commission (CWC) Proposition 1 funding application and provide non-federal matching funds for the ongoing Federal Feasibility Study that Reclamation is preparing for the project. As a result of this effort, ACWD has been directly involved in coordination with Reclamation Mid-Pacific Region staff since 2001 in activities such as development of project operations, coordination with operations of the Central Valley Project, review of draft engineering feasibility studies, evaluation of project impacts and benefits, and preparation of text for the Draft Supplemental EIS/EIR.

3. In 2014, ACWD executed the "One-time storage and exchange demonstration project for the use of the Los Vaqueros Reservoir between ACWD and CCWD". This exchange required coordination with the Bureau of Reclamation via the Coordinated Operations unit with the California State Water Project to execute a one-for-one exchange that utilized Central Valley Project water which was taken through the State Water Project's Banks Pumping Plant.

4. In 2015, ACWD submitted and was granted a petition for change in the point of diversion/rediversion for the "Petition for Change Involving Water Transfers For a One-For-One Exchange of ACWD and Zone 7 SWP Water for CCWD CVP Water". This effort was to deliver water originating from the State Water Project to a Central Valley Project place of use for a later return of said water to ACWD. The exchanges would utilize Central Valley Project water, which was taken through the State Water Project's Banks Pumping Plant.

#### Project Description

#### Work to be completed in detail, including specific activities that will be accomplished.

The Alameda Creek Watershed is the largest drainage in the South San Francisco Bay region. Alameda Creek historically supported a number of native fish species, including anadromous steelhead currently listed as a threatened species under the Federal Endangered Species Act. The watershed has been identified as a priority for regional fisheries restoration as it drains a relatively undeveloped watershed with high quality aquatic habitat in the upstream reaches of the creek and its tributaries. Alameda County Water District (ACWD) owns and operates two existing inflatable dams (Rubber Dam #1 and Rubber Dam #3) in the Creek channel in Fremont. The dams, along with other infrastructure, converted the Creek from a natural watercourse to a trapezoidal cross-sectioned flood control channel with little habitat for fish species since the 1960s. Once the fish ladders have been completed at both dams, the steelhead upstream migration will be restored, allowing fish passage between the San Francisco Bay and historic upstream spawning and rearing habitats and provide habitat connectivity to allow species a better chance to adapt and habitats to survive. The scope of this project is limited to the fish ladder at Rubber Dam #3, and the fish ladder at Rubber Dam #1 will be completed after the Rubber Dam #3 fish ladder in the future.

The Rubber Dam #3 is critical to ACWD's conjunctive use groundwater management program and is used to divert local stormwater runoff to off-stream ponds in order to recharge the Niles Cone Groundwater Basin, a coastal aquifer system subject to saline intrusion from the San Francisco Bay. The supply is later pumped at ACWD well fields, treated, and distributed as drinking water for the cities of Fremont, Newark, and Union City, and constitutes approximately 40% of ACWD's total water supply. Thus, Rubber Dam #3 is a key facility in ACWD's water supply/groundwater recharge and groundwater basin management operations.



Figure 1: Geographic Area of Project

The project will be constructed within an existing man-made trapezoidal flood control channel with rip-rapped embankments, concrete flood control structures and rail bridges. Due to the complex hydraulics of the project (i.e., ladder flow control necessary to operate per the approved bypass flow schedule, as noted below) and location within the flood control channel necessitating the need to minimize potential for affecting flood carrying capacity of the channel, alternative options considering natural materials (such as boulders, tree trunks or plantings) are not viable in this stream segment. Thus, the project will be constructed using conventional construction materials (i.e., reinforced concrete and mechanical control equipment). These materials would be consistent with the existing urbanized character of the area.

The fish ladder will be operated to provide flows downstream of the Rubber Dam 3 in compliance with a bypass flow release schedule developed in consultation with the National Marine Fisheries Service (NMFS) and the California Department of Fish and Wildlife (CDFW). Compliance with the agreed upon flow release schedule requires the ladder to operate during the dam raising and lowering process to maximize the opportunity for fish passage. To accommodate this operational approach while efficiently managing water supply, the design incorporates a series of gates and automated controls to synchronize gate operation to

provide the necessary degree of flow control into the ladder. This operational complexity necessitates the use of manmade materials.

Removal of the dam or modifying operations is not feasible and would greatly impair ACWD's ability to manage the groundwater basin and maintain water supplies, and would cause ACWD to become more reliant upon imported water supplies.

The design and environmental work will be completed by the time of a potential award. The following is a work plan outline of the work that will be performed during the grant period of performance.

- A. Construction of temporary access road to provide site access during construction
- B. Placement of temporary streamflow diversion measures to dewater the construction site and manage streamflow during construction
- C. Demolition, excavation and site preparation for placement of concrete formwork, reinforcing steel, and concrete for vertical slot fish ladder
- D. Demolition, excavation and site preparation for placement of concrete formwork, reinforcing steel, and concrete for plunge pool construction
- E. Site clearing, excavation and preparation for placement of concrete and rock in area downstream of ladder entrance.
- F. Installation of entrance gates, jib crane and trash rack for fish passage, debris control
- G. Installation of grating, handrail and fencing for public safety
- H. Installation of electrical power and instrumentation for remote operation and monitoring of ladder entrance gates
- I. Relocation/reconnection of existing utilities
- J. Site clean-up and restoration
- K. On-going construction tasks to ensure that project is constructed to the specified quality and design and is on schedule
- L. Preparation of record drawings
- M. Grant administration (reporting, etc.)
- N. Equipment and performance testing

#### Performance Measures

#### Monitoring the efficacy and success of the project

(1) Promote Groundwater Recharge and Water Reuse

In application, this objective will be maximized by (a) optimizing fish ladder operations; and (b) maximizing annual diversions to AHF recharge facilities from Rubber Dam #3. Therefore, ACWD's monitoring will address these two factors:

(a) Monitoring of Optimized fish ladder operations.

ACWD and National Marine Fisheries Service (NMFS) have established bypass flows and operations that will provide for the needs of migratory fish. By optimizing operations and not exceeding those flows, ACWD will be able to monitor the efficacy of the Project for promoting groundwater recharge. At times ACWD will need to exceed flows for other reasons (i.e. poor water quality or high suspended sediment levels not desirable for diversion to recharge ponds; creek flows in excess of recharge capacity). ACWD proposes to monitor the efficacy of the Project using the Annual NMFS and CDFW Monitoring Reports. ACWD will utilize annual monitoring reports prepared for NMFS and CDFW, which detail compliance of the Project with bypass flow requirements, and supplement

with a qualitative discussion of how optimal the bypass flows were met and whether surplus flows were bypassed.

(b) Monitoring maximized recharge of the AHF Aquifer

With the Project in place, ACWD anticipates that is will be able to fully recharge the AHF aquifer in most years using local stormwater run-off. ACWD proposes to monitor for the efficacy of the Project to achieve this objective by providing an "Annual AHF Recharge Report". This proposed report will document the efficacy of the Project by:

- Reporting spring groundwater levels and answering the simplest question: "Did ACWD fill the AHF aquifer?"
- Report total diversions from RD3 facilities.
- Level of reliance on imported supply to supplement recharge, if any.
- In years when AHF does not fully recharge, provide a qualitative analysis as to why it did not. For example, some examples from past history include: despite optimal operations, insufficient rainfall run-off available; intentional dewatering of the aquifer to accommodate construction projects; pervasive poor water conditions.
- Annual groundwater recharge is estimated from a combination of physically metered diversions, exercised under ACWD's existing water rights, plus modelled recharge from direct rainfall and applied water using ACWD's Integrated Groundwater-Surface water Model (IGSM). The model is validated with groundwater monitoring well levels.
- (2) Reduce Energy Consumption

ACWD is situated south of the Sacramento/San Joaquin River Delta which requires water to be pumped at the Harvey O. Banks pumping plant in Byron to Bethany reservoir. From Bethany reservoir, the water must be pumped once more into the South Bay Aqueduct (SBA) which delivers the water over the Diablo mountain range.

The Project will reduce reliance on imported State Water Project (SWP) supplies and those reductions will have the direct benefit of avoided energy consumption and GHG production at the pumping plants. As part of the "Annual AHF Recharge Report", ACWD will be reporting the level of reliance on imported supply to supplement recharge of the AHF. This report will also include an approximation of the amount of imported water that was not imported for AHF recharge as a direct result of the Project. The avoided SWP delivery will be used to calculate the annual values for:

- Kilowatt-hours of energy saved based on DWR's published Bulletin B132
- Reduced fossil fuel consumption, based on PG&E's published energy generation
- Reduced GHGs

#### Evaluation Criteria

#### Evaluation Criterion A – Project Benefits

- 1.1.1 How the proposed project will improve drought resiliency
- Will the project make additional water supplies available? Yes

## • What is the estimated quantity of additional supply the project will provide and how was this estimate calculated?

Up to 2,000 acre-feet of additional water supply will be recharged into the Niles Cone Groundwater Basin. This estimated value was determined using ACWD's Integrated Resources Planning Model (IRPM) that simulates groundwater recharge operations on a daily time-step.

 Percentage of the total water supply the additional water supply represents and how was this estimate calculated?

In FY 2015/2016 ACWD supplied 36,300 AF of water to its customers, of which the Project's benefit would represent 5%. Long-term average groundwater recharge is approximately 22,000 AF/yr., and thus the Project's benefit would be up to 10% of total groundwater supplies.

• Brief qualitative description of the degree/significance of the benefits associated with the additional water supplies.

The Project will help optimize stormwater capture for local groundwater recharge and is estimated to provide up to 1,000 to 2,000 AF/year versus a no-Project alternative. This is enough water to supply between 3,500 and 7,000 homes for a year. The modelled benefit of up to 1,000 to 2,000 AF/yr. was made using ACWD's Integrated Resources Planning Model (IRPM) which spans 83 years of hydrology based on historic actual conditions between 1920 and 2003. The IRPM includes a daily operations module to estimate stormwater capture and groundwater recharge. The range reflects the influence of several external factors including timing of storms, available off-stream storage to receive captured water, and differences in reoperation of ACWD's other water supply sources in both the Project and "no-Project" alternatives.

• How will the project build long-term resilience to drought? How many years will the project continue to provide benefits?

The Project will help optimize stormwater capture for local groundwater recharge and will specifically maximize the use of the AHF aquifer. AHF, being protected from salt water intrusion from the San Francisco Bay, provides the most resilient local groundwater storage, providing drought reserves as well as emergency supply if the State Water Project is disrupted by a natural disaster. As sea-level rise occurs, this storage will become increasingly important.

Without the Project, the District would have to substantially reduce use of RD3 during the migration season (January through April) limiting the capture of stormwater run-off for local groundwater recharge. Lost recharge would have to be made up with imported water from the State Water Project delivered on Alameda Creek for supplemental recharge of the NCGB. With State supplies currently projected to decrease as a result of climate change and sea-level rise, the availability of supplemental recharge water is expected to decline.

The Project will provide benefit for the duration of its design life, which is expected to be at least 20 to 25 years.

• How will the project improve the management of water supplies? If so, how will the project increase efficiency or operational flexibility?

The proposed Project is to construct a fish ladder for endangered anadromous fish at Rubber Dam #3 (RD3) on Alameda Creek, which will allow the District to better manage water supplies and improve ecological conditions.

RD3 is an inflatable dam that is used to capture stormwater to recharge and sustainably manage the Niles Cone groundwater basin (NCGB). Currently, the District is required to

lower the dam during fish migration periods when rainfall events occur, which results in the loss of the opportunity to store water and recharge the aquifer when it would be most advantageous to do so. Instead, the Project will allow ACWD to optimize the capture of surplus stormwater during rainfall run-off events while providing sufficient bypass flows for migrating steelhead. The increased local capture and groundwater recharge is estimated to provide up to 1,000 to 2,000 AF/year versus a no-Project alternative. Enabling the additional capture and groundwater storage will increase operational flexibility and improve the ability to deliver water during drought and potentially reduce the need to rely on State Water Project water. Without the project, ACWD would need to import an equivalent amount of water, as much as 1,000 to 2,000 AF/year, on Alameda Creek from the State Water Project (SWP) to offset the lost recharge.

• Will the project make new information available to water managers? If so, what is that information and how will it improve water management?

The fish ladder is designed to provide passage past an inflatable rubber dam. Inflation and deflation of the rubber dam causes large changes in water surface elevations. A vertical slot type fish ladder was selected based to incorporate a series of gates and automated controls to synchronize gate operation to provide the necessary degree of flow control into the ladder. Other designs have used horizontally actuated gates and have had problems with efficient water management and efficacy of the ladder for fish passage. The fish ladder design for RD3 will use vertical gates in an attempt to improve on this operation. This project may become the model for other fish ladder with similar operating parameters. Unlike many fish ladders on waterways of the State of California that are set in remote and rarely visited locations, this ladder will be located in a high traffic parks and recreation urban river setting. The Project will also be at the heart of ACWD's groundwater recharge operations and will be designated as a critical water supply facility, plus the ACWD offers tours of the facility. Therefore, it will be easy for other agencies and the general public to observe the benefits of the ladder and that there are methods that can be employed that provide ecological benefits while preserving, and in this case, improving water supply reliability, reducing impacts to regional water supplies, improving groundwater recharge, and support water recreation. In addition to the unique design criteria and urban setting, the RD3 fish ladder project will be incorporated into a larger multi-agency watershed wide steelhead recovery monitoring plan. The RD3 fish ladder project will be incorporated into a larger multi-agency watershed wide steelhead recovery monitoring plan. Items of this plan (currently in development with the Fisheries Workgroup) will have the opportunity to serve as a model for collaboration and coordination of multi- agency species recovery monitoring for other locations around the state. The data collected may be used to develop educational materials for distribution in schools to encourage interest in environmental stewardship. ACWD believes these many innovative features will serve as a model for future fish ladder projects.

• Will the project have benefits to fish, wildlife, or the environment? If so, please describe those benefits.

Upon completion, the project will support restoration of a historic migratory corridor for steelhead trout (*Oncorhynchus Mykiss*) an anadromous species which once inhabited the Alameda Creek watershed in significant numbers prior to the construction of dams and

other development in the watershed. At the time ACWD constructed its groundwater diversion facilities, the fisheries had declined to the point that resource agencies believed anadromous fisheries no longer existed in Alameda Creek, therefore, no provisions for fish passage were included in the designs. However, anecdotal reports and field trappings document presence of steelhead, Coho, and Chinook salmon at a flood control drop structure approximately 0.75-miles downstream of RD3 (Kidd 2006) The Alameda Creek watershed is the largest local tributary to San Francisco Bay and large portions of the watershed remain undeveloped. In-migrant steelhead will gain access to miles of available spawning and rearing habitat in the watershed for the first time since the 1970s after the fish ladders have been completed at both the RD3(current project scope) and RD1 (near future project phase). Anadromous fish have been identified as being very important in transporting marine derived nitrogen to nitrogen poor riparian ecosystems (Source: Salmon, Wildlife, and Wine: Marine-Derived Nutrients in Human-Dominated Ecosystems of Central California. Joseph Merz, and Peter Moyle, 2006).

By building the RD3 ladder and allowing the upstream migration of steelhead, riparian ecosystem enhancement will extend throughout the watershed. Also NMFS has characterized Alameda Creek as having regional importance on salmonid restoration activities in neighboring watersheds due to Alameda fish potentially straying and repopulating outside of the watershed.

Because of the unique opportunity for species recovery in the watershed, the National Marine Fisheries Service has given the Alameda Creek watershed a high priority for steelhead restoration.

• The estimated quantity of water better managed as a result of this project? How was this estimate calculated?

In 1995, ACWD adopted an Integrated Resources Plan that manages the entirety of our supply in an integrated fashion. Therefore, an improvement in the management of one source, such as groundwater recharge, improves the management of all the District's water supplies are better managed. Based on early discussion with NMFS, it is assumed that, without the Project, RD3 would be expected to remain deflated for upwards of 5 days after rainfall run-off events in-order for steelhead to move either upstream or downstream. The Project will allow RD3 to remain in service during the post-storm runoff and improve ACWD's ability to capture local stormwater runoff for groundwater recharge by up to 1,000 to 2,000 AF/yr. These numbers were estimated using ACWD's Integrated Resources Planning Model (IRPM) that simulates groundwater recharge operations on a daily time-step.

The model also shows without the Project and the additional stormwater capture, ACWD will need to import more water from the State Water Project which reduces surpluses needed for groundwater banking for dry year reserves

100% of the District's water supplies are better managed. This calculation is based on the fact that by allowing the District to retain more water in the Alameda Creek and recharge the Niles Cone Basin, reliance is lessened on other water sources and also provides the District more flexibility to manage its water supply to adjust to varying conditions in such supplies.

• The degree/significance of anticipated water management benefits.

The increased local capture and groundwater recharge is expected to preserve ACWD's use of a vital component of our water supply portfolio. Without the project, ACWD would need to import an equivalent amount of water, up to 1,000 to 2,000 AF/year, on Alameda Creek from the State Water Project (SWP) to offset the lost recharge. 1,000 to 2,000 AF of additional import from the Sacramento- San Joaquin River Delta would constitute between a 5% and 10% increase in the District's Delta imports and reliance. If this project does not occur, ACWD will not be able to maximize the efficient capture of surplus stormwater flows, when this surplus water is not required to meet environmental flows. Therefore, ACWD will not be able to maximize its groundwater recharge potential; resulting in, at a minimum, continued reliance on imported water and increased reliance on imported water during dry periods. The Project will allow ACWD to maximize conjunctive use, whereby ACWD could capture this surplus stormwater flow during wet periods, recharge the groundwater basin, and make use of that stored water during dry periods.

#### 1.1.2 Additional Benefits

<u>Salt Water Barriers</u>.—What supply of water is the barrier protecting and to what degree is it comprehensive protection? What is the protected water supply mainly used for?

Sea level rise. The Project is a central part of the District's Climate Change adaption planning as it maximizes utilization of groundwater storage in an area that is not subject to saline intrusion (Above Hayward Fault) and therefore not impacted by the projected increase in sea-level. Thus, this project will help mitigate the impacts of sea level rise to the ACWD local water supply.

Increased temperatures and extreme events (wildfires, flooding, etc.). Large scale General Circulation Models (GCMs) used to model and anticipate the effects of Climate Change are very large and cannot be used on the scale of the Alameda Creek watershed. However, the generalized conclusion is that regionally, and therefore the watershed will likely become more extreme with higher intensity rainfall events as well as extended dry periods. The Project will help with both of those extremes:

1) Improve the Rubber Dam's ability to handle run-off events as the ladder will function as a by-pass facility, creating a more natural hydrograph in the process. Without the Project, higher frequency run-off events due to climate change may result in increased days of non-operations of the facility.

2) On the opposite extreme, longer duration dry periods will increase stress on the local water supply. The project increases capture of surplus storm water when it is available for more efficient storage in the AHF aquifer and use during dry periods and manage effects of climate change.

<u>New Water Marketing Tool or Program</u> — The Project will prevent ACWD from needing to lower the dam during fish migration periods when rainfall events occur. Instead, the Project will allow ACWD to optimize the capture of surplus stormwater during rainfall run-off events while providing sufficient bypass flows for migrating steelhead. The increased local capture and groundwater recharge is estimated to provide up to 1,000 to 2,000 AF/year versus a no-Project alternative.

Without the project, ACWD would need to import an equivalent amount of water, as much as 1,000 to 2,000 AF/year, on Alameda Creek from the State Water Project (SWP) to offset the lost recharge. ACWD is situated south of the Sacrament/San Joaquin River Delta which requires water to be pumped at the Harvey O. Banks pumping plant in Byron to Bethany reservoir. From Bethany reservoir, the water must be pumped once more into the South Bay Aqueduct (SBA) which delivers the water over the coastal mountain range. Therefore, the Project may reduce ACWD demands for future SWP supplies by up to 1,000 to 2,000 AF/year, freeing up that same volume for use by other agencies served by the SWP. To the extent there are some agencies that are served by both the SWP and CVP, these marginal benefits may be realized by all CVP and SWP contractors.

#### Environmental/Wildlife Projects

What are the types and quantities of environmental benefits provided (i.e. types of species and numbers benefited, acreage of habitat improved, restored or protected, or the amount of flow provided? How was this estimate calculated?

ACWD's fisheries bypass flows, developed in consultation with NMFS, considers January 1 through May 31 as the period when steelhead are moving through The Alameda Creek system, grossly characterized as adult in-migration during the winter months and smolt outmigration during spring months. Over the past three years (2014-2016) RD3 was inflated and a barrier to fish migration 94% of days during this period; therefore, RD3 was deflated and passable 6% of the time. Completion of the Rubber Dam #3 fish ladder will allow safe passage of both life stages 100% of the time. With improved passage at RD 3, steelhead will have access to spawning and rearing habitat within the 633 square mile watershed. Studies conducted by the Alameda Creek Fisheries Workgroup indicate that the most viable habitat for all life stages of CCC steelhead in Alameda Creek are located upstream of the RD 3 location, and providing passage at RD 3 is a critical component to re-establishing a self-sustaining steelhead run within Alameda Creek.

## What is the status of the species of interest (i.e. endangered, threatened, etc.? How has the drought impact the species?

Central California Coastal steelhead & Central Valley steelhead (*Onchorynchus mykiss*) are threatened species that will benefit from the Project. The drought effects are related to increased water temperature and reduced flows in Alameda Creek, which can lead to a decrease in habitat quality and a decrease in surface water connectivity.

Under current conditions, ACWD releases water downstream of its water diversion facilities to maintain a surface water flow connection down to the San Francisco Bay. Working with NMFS and CDFW, ACWD has developed a time of year based bypass flow schedule for fish ladder operation. This flow regime is designed to provide sufficient passage conditions for migrating steelhead during all year types. Under this bypass flow agreement, ACWD has agreed to meet with NMFS and CDFW to determine potential adjustments to the downstream bypass requirements that will minimize detriment to fish in the event that drought conditions are encountered in the future, and the ACWD Board of Directors declares a Water Supply Emergency.

If the proposed project will benefit federally listed threatened or endangered species please consider the following elements:

#### Is the species subject to a recovery plan or conservation plan under the ESA?

The National Marine Fisheries Species Recovery Plan identifies restoration of the Alameda Creek Central California Coast Steelhead population as "essential" to recovery of the species, and identifies the RD 3 ladder as a specific project that needs to be constructed to allow full recovery of the population.

What is the relationship of the species to water supply?

These fish species use Alameda Creek for habitat and passage. Upon completion, the project will support restoration of a historic migratory corridor for steelhead trout (*Oncorhynchus Mykiss*) an anadromous species which once inhabited the Alameda Creek watershed in significant numbers prior to the construction of dams and other development in the watershed.

## What is the extent of the proposed project that would reduce the likelihood of listing, or would otherwise improve the status of the species?

By building the RD3 ladder and allowing the upstream migration of steelhead, riparian ecosystem enhancement will extend throughout the watershed. Also NMFS has characterized Alameda Creek as having regional importance on salmonid restoration activities in neighboring watersheds due to Alameda fish potentially straying and repopulating outside of the watershed.

#### Is the species adversely affected by a Reclamation project?

There are no known Reclamation projects in this portion of Alameda Creek that would adversely affect the species.

#### Evaluation Criterion B – Drought Planning and Preparedness

#### • Explain how the applicable plan addresses drought.

This project is consistent with multiple local and regional plans, including the 2015-2020 Alameda County Water District Urban Water Management Plan (2015-2020 UWMP), the Alameda Creek Watershed Steelhead Restoration Plan, the 2013 Bay Area Integrated Regional Water Management Plan, NMFS Central California Coast Steelhead Multispecies Recovery Plan, the ACWD Groundwater Management Policy, and the California Water Action Plan 2016 Update.

*2015-2020 Alameda County Water District Urban Water Management Plan:* This project increase groundwater recharge of the Niles Cone Basin, reducing the need for imported water for recharge and increasing drought resiliency. The RD3 Fish Ladder Project is consistent with Chapters 3.3 and 4.5, Management and Distribution of Water Supplies and Groundwater Recharge and Production, respectively.

Chapter section 3.3, Management and Distribution of Water Supplies, lists the District's water management objectives, of which the following: Maximizing total usable supply; protecting groundwater resources from further saltwater intrusion; and achieving these objectives with the lowest possible operating costs.

The project is also consistent with Chapter 4.5, Management and Distribution of Water Supplies and Groundwater Recharge and Production, by increasing the resiliency of the local groundwater supplies and providing a solution that supports the endangered species act without negatively impacting the District's water supply.

District water supply planning is coordinated with other agencies throughout the Bay Area region. Examples of the District's participation in regional integrated planning include the following:

#### Bay Area Integrated Regional Water Management Plan: Water Quality and Water Supply

**Element:** The District participates with a diverse group of water supply, water quality, wastewater, stormwater, flood management, watershed and habitat agencies, local governments, environmental groups, business groups and other interested parties to develop a Bay Area Integrated Regional Water Management Plan (Bay Area IRWMP). The purpose of this Bay Area planning effort is to (1) facilitate regional cooperation in water management

planning and (2) foster coordination, collaboration, and communication among the participating agencies to achieve greater efficiencies, enhance public services and build public support for vital plans and projects. The Bay Area IRWMP was completed in 2006 and updated in 2013, and it served as the basis for Proposition 50, Chapter 8 grant funding within the nine-county Bay Area region.

This project is included in the *2013 Bay Area Integrated Regional Water Management* Plan (BAIRWMP) and meets 4 of the 5 overarching objectives, specifically:

- o Promote environmental, economic and social sustainability
- o Improve water supply reliability and quality
- o Protect and improve watershed health and function and Bay water quality

o Create, protect, enhance, and maintain environmental resources and habitats Consistent with the ACWD Groundwater Management Policy, the proposed project increases groundwater replenishment capability, improves water supply reliability to meet baseload and peak distribution system demands, provides an emergency source of supply, and reserves storage to augment dry year supplies.

The California Water Action Plan 2016 Update identified drought and water scarcity as one of the top "Challenges for Managing California's Water Resources," and the

"plan includes both immediate steps as well as actions that will better prepare Calif ornia for future droughts."

Bay Area Regional Reliability Drought Contingency Plan (DC Plan): ACWD is currently participating in the development of a regional drought contingency plan funded in part by a \$200,000 grant from the U.S. Bureau of Reclamation under a Drought Preparedness Grant. The DC Plan is a joint effort by eight of the San Francisco Bay Area's water agencies, collectively serving more than 6 million people in seven counties. The purpose of the DC Plan is to integrate drought planning efforts developed by eight individual agencies to address the drought needs of the Bay Area as a region. It is expected that this project will support the objectives of this plan and be identified as a local District project towards achieving drought resiliency.

o **Stakeholder Involvement** Yes, ACWD's Drought Contingency Plan was updated on 2016 as part of the 2015-2020 UWMP, which was developed through a transparent process that involved public outreach. Please reference Appendix I of the 2015-2020 UWMP for detailed description of that process.

Similarly, while the document is still in the draft stages, the BARR DC Plan is being developed with a collaborative process involving a task force comprised of many stakeholders, including environmental, non-profit, and intra-governmental organizations.

o Does the drought plan include consideration of climate change impacts to water resources or drought? Yes. Section 3.5, beginning on page 3-14, of the 2015-2020 UWMP begins with a summary chart indicating potential impacts to each water supply source, including climate change, and then follows with a more detailed discussion of the impacts. Impacts to the imported water sources have a direct effect on the District; however, little can be done to influence the management of such water supplies.

A survey of literature conducted by the Pacific Institute for Studies in Development, Environment and Security for DWR summarized recommendations for coping with and adapting to climate change as it specifically relates to groundwater. This information was incorporated into this section of the UWMP. Based on these studies, the Bay Area Region could experience the following types of impacts:

- Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low and medium elevation zones and a shift in snowmelt runoff to earlier in the year;
- Changes in the timing, intensity and variability of precipitation, and an increased amount of precipitation falling as rain instead of as snow;
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality and quantity;
- Sea-level rise and an increase in the potential for saltwater intrusion in the Delta and Coastal aquifers such as the Niles Cone;
- Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality;
- Increases in evaporation and transpiration (irrigation need); and
- Changes in urban and agricultural water demand.

Describe how your proposed drought resiliency project is supported by an existing drought plan. The proposed project is supported by the plans described in the previous section, and will be supported by the completed drought plan currently in development. All of these Plans have identified increasing groundwater recharge and storage as an effective strategy to manage resources and increase flexibility, and protection against sea water intrusion.

Does the drought plan identify the proposed project as a potential mitigation or response action? The proposed project is supported by all of the Plans noted in the previous section and is specifically noted in the Bay Area Integrated Regional Water Management Plan. Furthermore, the District plans to include it in the Bay Area Regional DC Plan that is currently being developed.

o Does the proposed project implement a goal or need identified in the drought plan? The Project is consistent with both ACWD's Drought Contingency Plan, as part of the 2015-2020 UWMP, and the draft BARR DC Plan, which is currently being developed under a Reclamation Drought Preparedness Planning Grant. Due to the fact this DC Plan is its early stages, a public draft is not available as of the date of this application.

While the Project is not identified by name in the DC Plans, the ACWD projects contemplated in the DC Plan rely on groundwater recharge optimization assuming the Project is constructed. The Project is listed in the Bay Area IRWMP. Therefore, construction of the Project implements the groundwater recharge operational flexibility that is necessary to achieve the broader objectives of the plans. The Project is consistent with the goals of "high priority projects for grant funding" identified in Chapter 3.2, Alameda Watershed Management Area, of the San Francisco Regional Water Quality Control Board Water Management Initiative.

Furthermore, the Project meets the following goal set forth in the California Water Action Plan 2016 Update: #4 – Restore important ecosystems (o Eliminate Barriers to Fish Migration, Enhance Water flows in Streams Statewide, Achieve Ecological Goals through Integrated Regulatory and Voluntary efforts. This project is voluntary;), #6 – Expand water storage capacity and improve groundwater management; and #9 – Increase operational/regulatory efficiency.

The Project is consistent with the ACWD 2015-2020 Urban Water Management Plan, Chapters 3.3 and 4.5, Management and Distribution of Water Supplies and Groundwater Recharge and Production, respectively.

Chapter section 3.3, Management and Distribution of Water Supplies, lists the District's water management objectives, of which the following: Maximizing total usable supply; protecting groundwater resources from further saltwater intrusion; and achieving these objectives with the lowest possible operating costs.

The project is also consistent with Chapter 4.5, Management and Distribution of Water Supplies and Groundwater Recharge and Production, by increasing the resiliency of the local groundwater supplies and providing a solution that supports the endangered species act without negatively impacting the District's water supply.

• Describe how the proposed project is prioritized in the referenced drought plan? The Project is listed in the Bay Area IRWMP and is consistent with the goals of "high priority projects for grant funding" identified in Chapter 3.2, Alameda Watershed Management Area, of the San Francisco Regional Water Quality Control Board Water Management Initiative. The Project is not specifically referenced in the other planning documents cited.

## Evaluation Criterion C –Severity of Actual or Potential Drought Impacts to be Addressed by the Project

#### Describe the severity of the impacts that will be addressed by the project:

Failure to utilize RD3 as a result of not having the Project in place will have cumulative impacts on groundwater levels during locally dry periods. The net impact of this will be (a) reduced supply availability during droughts resulting in increased shortages and (b) groundwater levels too low to safely run production wells, resulting in a loss of production capacity which may have impacts on public health and safety, particularly in meeting high-flow needs for firefighting. This last occurred in 2007 when the Judge Wanger Decision curtailed deliveries of State Water Project water and ACWD experienced the compounded effect of (a) increased dependence on local water production and (b) lack of access to imported water for supplemental groundwater recharge.

ACWD IRPM analysis indicates that without the project, assuming RD3 to remain deflated for 5-days after every rainfall runoff event, that ACWD would utilize a greater amount of water annually from the State Water Project to supplement local recharge. This increased annual need for imported water leaves less water available for ACWD's dry year reserves in the Semitropic groundwater bank. The net result is that without the project, ACWD would expect:

- 33% less water in dry year reserves at the end of the multiple dry year scenario, modeled after the 1987-1992 drought,
- Two years with zero reserves remaining in the water bank
- Increased operating costs in 1 of 8 years of over \$400,000 due to increased need to purchase costly imported water

## The ongoing or potential drought impacts to specific sectors in the project area if no action is taken and severity to:

#### Public Health Concerns/Social Concerns Associated With Current Or Potential Drought Conditions

If groundwater levels decrease to a point that production wells are unable to draw water due to a lack of water recharge, this can result in a water shortage creating a greater need for imported water supplies and also puts the aquifer at risk for sea water intrusion, which could cause water quality problems as discussed previously.

#### Ongoing or potential environmental impacts

The project is an integral part of a multiple agency effort to restore a steelhead fishery to the watershed. Steelhead, a federally listed threatened species, once thrived in the Alameda Creek watershed. However, the construction of several dams and flood control facilities between 1916 and the 1970, all but destroyed the fishery. Despite these obstacles, a native population of *O. Mykiss* still survives in the watershed. Without the project, the continued lack of an active steelhead fishery would be perpetuated.

## Ongoing, past or potential, local, or economic losses associated with current drought conditions (e.g., business, agriculture, reduced real estate values)

ACWD's primary groundwater recharge facilities at the Quarry Lakes Regional Recreational Area are a series of rehabilitated quarry pits which were converted by ACWD and East Bay Regional Park District into a joint water resources and recreational facility. The recreational area provides water supply reliability, swimming, fishing, boating and hiking amongst other activities. During the recent drought, low run-off and available water supply for diversion into the Quarry Lakes resulted in:

- Closure of the swimming facilities due to low lake levels,
- Closure of the ADA fishing dock due to low lake levels, and
- Toxic Bluegreen algae blooms resulting in curtailment of human and animal (dog) contact and restricted fishing.

All of these impacts had financial implications for the East Bay Regional Park District as well as their concessionaires. ACWD does not have access to their data to quantify those economic impacts. In addition, ACWD estimates that during the recent drought, State and local ordinance restrictions on outdoor water use for irrigation resulted in between \$10 to \$25M worth of reduced real estate value due to dead or severely damaged landscaping.

### Describe existing or potential drought conditions in the project area. Is the project in an area that is currently suffering from drought or which has recently suffered from drought?

At the time of preparation of this application, the State of California is in the sixth year of a prolonged drought; accordingly, total distribution system water use (including non-revenue water) was approximately 36,300 AF Acre-Feet in fiscal year 2016-2017, or approximately 74% of pre-drought demands in FY2012/2013. The Project area, along with the entire ACWD service area and most of the State of California, has recently suffered from drought. As a result of four successive years of low rainfall, Governor Edmund G. Brown proclaimed a drought emergency on January 17, 2014, ordering, amongst other actions, State agencies to execute a statewide conservation campaign to reduce water usage by 20%. On March 13, 2014, ACWD's Board of Directors adopted Ordinance No. 2014-01 declaring a water shortage emergency designed to achieve a 20% service area-wide reduction in water use by prohibiting wasteful uses of water and limiting landscape irrigation.

Due to improved local conditions and our diversified water supply portfolio, in June of 2016 ACWD was able to prove sufficiency of supply by passing the State's water supply "stress-test". In response, ACWD's Board of Director's rescind the Water Shortage Emergency Ordinance on June 9, 2016. Despite ACWD's improved water supply conditions and successful stress-test results, the State of California remains in a Drought State of Emergency and ACWD is still subject to the specific emergency regulations contained in the Executive Order. Reference Attachment E, map from the National Drought Monitor Center, for an example of the recent drought in the Project area.

## Describe any projected increases to the severity or duration of drought in the project area resulting from climate change.

At 750 square miles, the Alameda Creek Watershed is too small to generate predicted changes in rainfall runoff due to climate change using any of the current Global Circulation Models (GCMs). However, the Niles Cone is a coastal aquifer subject to saltwater intrusion. As sea-level rise occurs, ACWD will lose access to freshwater storage in the Niles Cone which will directly translate into increased shortages during droughts.

#### . Evaluation Criterion D – Project Implementation

1.1.3	Implementation Plan, including estimated schedule.	

Task #	General Description	Start Date	End Date
1	Project Management	Oct. 2017	June 2019
1.1	Contract Procurement	Dec. 2017	Feb. 2018
1.2	Environmental Review (USACE NEPA)	Oct. 2017	Dec. 2017
1.3	Grant Administration	Dec. 2017	June 2019
2	Construction In-Channel	May 2018	Oct. 2018
3	Environmental Assistance	April 2018	Oct. 2018
4	Construction Management/Inspections	Feb 2018	Nov. 2018
5	Post-Construction Performance Testing	Dec. 2018	Mar. 2019

\*The schedule is an estimate and dates are not fixed.

Task 1: Project Management Overall project management includes contract procurement, environmental review, grant administration, overseeing all the contracts for contractors and consultants retained by the District, and project performance monitoring.

#### Task 1.1: Contract Procurement – Dec. 2017 through February 2018

- Amend GHD, Inc. contract for design assistance during construction.
- Prepare plans and specifications for bid package
- Procure a qualified consultant for construction management services.
- Advertise and solicit bids from qualified contractors to construct the project.
- Procure a qualified consultant for specialty inspection and testing services.
- Procure a qualified consultant for Environmental Assistance services
- Procure a qualified consultant for Labor Compliance Monitoring services. This task is required in the state of California.
- Receipt and review of critical submittals 2/18-4/18

**Task 1.2:** Environmental Review The U.S. Army Corps of Engineers (USACE) is the lead Federal agency for this project since this is a flood control facility. This task is the continued coordination with the USACE to complete the NEPA review and coordination with USBR.

Task 1.3: Grant Administration – December 2017 through June 2019 Execute the agreement with the USBR; provide progress reports at least semi-annually or as requested by the USBR; request grant funds for reimbursement of project costs; and prepare the final report.

Task 2: Construction in-channel – May 2018 through October 2018 (as allowed by permit)

- A. Construction of temporary access road to provide site access during construction 5/18
- B. Placement of temporary streamflow diversion measures to dewater the construction site and manage streamflow during construction 5/18
- C. Demolition, excavation and site preparation for placement of concrete formwork, reinforcing steel, and concrete for vertical slot fish ladder 6/18-9/18
- E. Demolition, excavation and site preparation for placement of concrete formwork, reinforcing steel, and concrete for plunge pool construction 6/18-9/18
- F. Site clearing, excavation and preparation for placement of concrete and rock in area downstream of ladder entrance. 6/18-9/18
- G. Installation of entrance gates, jib crane and trash rack for fish passage and debris control 6/18-9/18
- H. Installation of grating, handrail and fencing for public safety6/18-9/18
- I. Installation of electrical power and instrumentation for remote operation and monitoring of ladder entrance gates 6/18-9/18
- J. Relocation/reconnection of existing utilities 6/18-9/18
- K. Site clean-up and restoration 9/18-11/18
- L. Preparation of record drawings 11/18

#### Task 3: Environmental Monitoring Assistance – April 2018 through October 2018

- Pre-construction training of construction site personnel
- o Species surveys: Pre-construction
- o Environmental monitoring (species) during construction

Task 4: Construction Management/Inspections – February 2018 through November 2018 On-going construction tasks to ensure that project is constructed to the specified quality and design and is on schedule.

- a. Construction management
- b. Construction inspection
- c. Specialty testing and inspection 6/18-9/18

#### Task 5: Post-Construction Performance Testing – December 2018 through March 2019

Post construction equipment and performance testing and monitoring.

**Permits Required.** The project will be constructed on land owned by the Alameda County Flood Control and Water Conservation District (ACFCD). ACWD operates its water diversion facilities under a perpetual Easement for groundwater replenishment from ACFCD. Covered activities include construction, installation, operation, maintenance and repair of such facilities. ACFCD and ACWD have an agreement in place for ACFCD to provide the necessary temporary easements for construction and to modify the existing groundwater replenishment easement to include operation of the RD3 fish ladder. The fish ladder will encroach within the Union Pacific Rail Road right of way adjacent to the rubber dam. ACWD has received an Encroachment agreement from the Union Pacific Railroad (UPRR). Review of the UPRR Encroachment agreement is in progress.

As the project will be constructed within a federally constructed flood control channel, US Army Corps Readiness Command (USACE) Section 408 review and approval is needed. ACWD is working closely with the USACE to complete the process as efficiently as possible. As noted in the following schedule, it is anticipated that the permits will be secured prior to the scope of work for which funding is requested.

Permitting Agency Type of Requirement	Required	Applied	Acquired	Date Anticipated
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State Agenc	ies:				
CDFW	Streambed Alteration (Sec. 1600)	Y	Y	Ν	August 2017
RWQCB	401 Water Ouality Certification or Waste Discharge Requirement	Y	Y	Ν	August 2017
SWRCB	General Industrial Storm Water Permit	Y	Y	Ν	August 2017
Federal Age	encies				
(USFWS)	Section 7 consultation if federal nexus (see ACOE), or Section 10 Permit	Y	Y	Ν	August 2017
(USACE)	Clean Water Act, Section 404 Permit, will consult w/USFWS & NMFS Section 7	Y	Y	Ν	August 2017
(USACE)	Section 408 Approval	Y	Ý	Ν	Aug. 2017
Describe an	y potential delays due to permittir	ng (indicate	specific per	<b>mits)</b> : None	Anticipated

The District will utilize consultants to assist with preparation of specialized technical information required to support permit applications (e.g., Biological Assessment, wetland delineation, etc.). However, the District will prepare and submit all permit applications and work directly with permit agencies to obtain the necessary approvals.

#### 1.1.4 Engineering and Design Worked Performed.

Design plans and specifications are 95% complete. Final plans and specification are scheduled to be completed in November of 2017.

#### 1.1.5 New policies or administrative actions required to implement the project

Operation of the fish ladder and dam will be as described in the NMFS Biological Opinion. No other policy changes will be made.

#### Evaluation Criterion E – Nexus to Reclamation

#### 1.1.6 Nexus between the proposed project and a Reclamation project or activity

The Project is an integral part of the conjunctive use management of the Niles Cone Groundwater Basin (Niles Cone) which includes the importing of supplemental water for recharge during periods of excess surface water and/or low groundwater conditions. This operation has two connections with Reclamation:

- Present Nexus: ACWD has pursued multiple transfers with CCWD whereby ACWD receives CVP water. Most recently, during the critically dry conditions of 2014, ACWD received a critical 5,000 AF of water which was partly used to recharge the Niles Cone basin in addition to being taken to treatment plants.
- Future Nexus: ACWD is partnering in CCWD's Los Vaqueros Reservoir Expansion Project; Reclamation is the federal lead for this project. If implemented, the reservoir will be used to capture and store CVP water as well as surplus Delta water under CCWD's existing water rights. ACWD and Reclamation will be partners in the same reservoir with greater potential for future exchanges of supplies which will be utilized by the Proposed Project for even greater conjunctive use of the Niles Cone.

#### Does the applicant receive Reclamation project water?

As mentioned above, ACWD has exercised agreements to transfer and exchange Reclamation project water from the CVP with CCWD. As a State Water Project contractor, ACWD benefits from Combined Place of Use of the CVP and SWP projects as well as the Joint Point of Diversion (JPOD) decision. This project is not located on Reclamation lands, does not involve Reclamation facilities, is not located in the same basin as a Reclamation project or activity, and will not help meet trust responsibilities with any Tribes.

#### Environmental and Cultural Resources Compliance

Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.

The District, working with the U.S. Army Corps of Engineers (USACE), prepared and circulated a combined CEQA-NEPA document in the form of an Initial Study/Mitigated Negative Declaration – Environmental Assessment/Finding of No Significant Impact.

The District completed the CEOA process, adopting the Initial Study/Mitigated Negative Declaration (IS/MND) and filing the Notice of Determination in December 2016. The USACE will be the lead agency for NEPA. A complete discussion of the potential environmental impacts from the project and the mitigation measures that will be implemented is included in the IS/MND. A summary of this information is provided below.

Construction of the project includes the following activities:

- 1. Mobilization and isolation of the construction area from the active stream, which includes: (a) delivery of equipment, materials, temporary buildings, and fencing to the site,
  - (b) grading of storage areas as needed,
- (c) isolating construction activities in the channel from the active channel utilizing gravel bags, fiber mats, and temporary cofferdams, or other methods, to ensure that fish will be excluded from the construction area, and that runoff from the construction area will be fully contained during construction activity. The temporary cofferdams may consist of a plastic barrier fence, k-rail barrier, an earthen levee with plastic sheeting to protect it from erosion, interlocking steel sheet-pile and piping for control of water, or another similar type of barrier. Location of these temporary facilities may be channel spanning or for isolation of smaller localized areas of the Project.
- (d) Fish rescue: Aquatic species in the isolated construction zone would be removed and relocated to the active stream and the construction area would be dewatered (drained).
   Fish collection and relocation will follow the standard procedures for fish rescue that have been employed in prior ACWD in-channel construction projects. A fish rescue and

relocation plan will be provided as required by NMFS and CDFW. Dewatering may be ongoing;

(e) Access Road Construction: Construction equipment access to the work area may require a temporary roadway from the levee maintenance road/trail into and through the channel.

Demolition, which includes:

- (a) selective demolition of designated portions of existing structures,
- (b) removal of demolition debris from the site, and
- (c) disposal of debris at an appropriate landfill or, if feasible, stockpiled for future disposal.
- 2. Grading and excavation, which includes:
  - (a) grading of the construction site and channel access road,
  - (b) stockpiling and/or removal of materials, and
  - (c) installation of underground utilities, including piping and electrical conduit and wiring.
- 3. Concrete Installation, which includes:
  (a) installation of concrete forms for the various concrete elements of the Project,
  (b) concrete hauling and delivery,
  - (c) pouring concrete (approximately 735 yds<sup>3</sup>),
  - (d) curing and removal of forms, and
- 4. In-channel Rip-Rap construction, which includes:
  - (a) hauling of stone for rip-rap to the site, and
  - (b) installing sections of stone rip-rap, including grouting in some areas.
- 5. Equipment installation, which includes:
  - (a) installation of operational equipment, such as gates, screens, cranes, pole mounted and surface mounted electrical lighting, pole mounted security cameras and radio/cellular antennas, small storage cabinets with data logging, monitoring and transmission equipment, security fencing, motors, instrumentation and control equipment, piping, conduit, and other appurtenances.
- 6. Backfill, which includes:
  - (a) Backfilling of excavated areas and restoration of levee rip-rap slope protection.
- 7. Site Restoration, which includes:
  - (a) restoration, to pre-construction condition, all areas not covered by permanent improvements. Reconnection of the active channel,
  - (b) in-kind surface restoration of the recreational trails affected by construction, i.e., crushed rock will be added to gravel areas, paved sections will be repaved. Minor realignment of trails past the new facilities, and
  - (c) demobilization and final site clean-up, following initial testing of the rubber dam, fishway and fish screen operations, and hauling of debris to an appropriate landfill for disposal.

Construction activities could affect air quality through the generation of emissions from construction equipment and potential fugitive dust emissions from material excavated or otherwise disturbed from the channel side slopes and the channel. Construction activity occurring adjacent to and within the channel itself could result in fluid leaks (e.g., fuels or

lubricants) or spills from construction equipment or construction materials (e.g., concrete or grout). This could affect both soil and water quality if the spill percolates through the soil and enters the groundwater or reaches flows in the channel and continues downstream. Animals and plants in the construction area and further downstream could be affected by the dewatering of the channel, suspended sediment and spills that could potentially result from construction activity. These impacts include habitat loss, injury, or even death. Measures that will be incorporated into the construction contract to minimize the potential impacts are summarized in Table A, below.

After construction is complete, impacts from routine, small scale, maintenance activities (e.g., inspection of moving parts and lubrication, painting, sealing, cleaning, and replacement of moveable parts) are expected to be minor. However, larger maintenance efforts may result in impacts similar to that of the initial construction. Measures described in Table A Biological Resources – Operations and Maintenance Phase will be implemented to minimize impacts.

Operation of the fish ladder may result in migration delays and subject species, steelhead in particular, to temperature effects. However, these effects will be minimized as ladder operation will be as specified in the Biological Opinion to be issued by the National Marine Fisheries Service, and will include the measures described in Table A, Bio Biological Resources – Operations and Maintenance Phase.

#### Table A

#### Mitigation Measures

#### Air Quality

- AQ1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- AQ2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- AQ3. All visible mud or dirt tracked-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- AQ4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
- AQ5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- AQ6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 2 minutes to the extent feasible (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- AQ7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.
- AQ8. Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

AQ9. Minimizing the idling time of diesel powered construction equipment to 2 minutes to
the extent feasible.
in all construction equipment to the extent feasible.
Water Quality
HH1.Fuel Management. ACWD and ACFCD will implement BMPs to ensure that fluid leaks
during construction in the creek channel do not contaminate groundwater at
adjacent facilities.
HWQ1. Water Quality. ACWD and ACFCD will implement appropriate BMPs for all work to
auality
HWQ2. Channel protection. ACWD and ACFCD will isolate the construction zone from the
active Alameda Creek channel and/or adjacent recharge ponds, using sand bags,
hay bales, fiber mats, sheet pile, silt screens, and/or other methods.
HWQ3. Concrete management. ACWD and ACFCD will wash and cure all concrete work
aquatic resources
HWQ4. Leak containment. Before beginning work each day, ACWD and/or ACFCD will
inspect all construction equipment to ensure that oil and/or gas/diesel fuel are not
leaking from equipment.
HWQ5. Storage. ACWD and ACFCD WII ensure that secondary containment for fueling and chemical storage areas will be provided during construction and joint Fish Passage
Project operation.
HWQ6. Wash water containment. ACWD and ACFCD will ensure that secondary
containment for equipment wash water will be provided to ensure that wash water
is not allowed to run off the site.
mwQ7. Sill containment. ACWD and ACFCD will ensure that sill traps, ponds, sediment management methods, and/or other means will be provided to prevent runoff from
the construction site.
HWQ8. Stockpile runoff. ACWD and ACFCD will ensure that materials stockpiles will be
covered to prevent runoff.
HWQ9. Soil erosion. ACWD and ACFCD will ensure that loose soils will be protected from
HWO10 Leaks. When construction equipment is used within the river channel. ACWD and
ACFCD will ensure that the equipment will be fitted with secondary containment
materials at potential oil/fuel leakage sites.
Biological Resources – Construction Phase
C1. Channel protection. ACWD and ACFCD will isolate in-channel construction areas from
the active creek channel with sand bags, fiber mats, cofferdams, or other methods
C2 Riparian vegetation ACWD and ACECD will access the channel via areas where no
riparian vegetation will be affected.
C3. Runoff. ACWD and ACFCD will control potential downstream runoff from the site with

sand bags, fiber mats, or other methods. C4. Fuel containment. ACWD and ACFCD will fuel and maintain construction equipment out of the channel. If this is not feasible, containment materials will be used

- C5. Concrete containment. ACWD and ACFCD will provide washout areas for vehicles outside of the channel and isolate these areas to ensure that concrete materials do not runoff into the channel or to recharge ponds.
- C6. Equipment leaks. When working in the channel or where there may be runoff to the channel, ACWD and ACFCD will ensure that construction equipment will be fitted with absorbent materials at potential fuel, oil, and other fluid leak spots.
- C7. Spill containment and isolation. During construction and post-construction maintenance involving use of equipment in or adjacent to the channel, ACWD and ACFCD will stockpile sand bags on site so that they may be immediately filled and placed around any spill. In addition, any spills not contained within the maintenance area will immediately be isolated from the active channel
- C8. Re-grading. ACWD and ACFCD will restore disturbed areas to pre-project contours.
- C9. Monitoring. A qualified biologist will (a) be retained to monitor construction, and (b) will conduct mandatory contractor/worker awareness training for construction personnel if special-status species are found.
- C10. Site survey. Prior to construction, ACWD and ACFCD will provide for a qualified biologist to survey the site to determine whether special-status species are present.
- C11. Fish rescue. Following installation of barriers to isolate the construction site from the active channel, a qualified fisheries biologist and team will conduct a fish rescue program for stranded fish prior to initiation of construction activities. Fish removed from the site will be immediately returned to the active channel. A fish rescue and relocation plan will be provided to NMFS and CDFW for review and approval prior to initiating the fish rescue; and

Prior to completion of all facilities, ACWD/ACFCD will monitor steelhead and salmon migrations from January through May. If steelhead are found to be migrating and operations of dams or unscreened diversions could adversely affect migrating steelhead, ACWD/ACFCD would consult with NMFS/CDFW and implement impact avoidance protocols which may include "trap and truck" of adults moving upstream, releasing them upstream of Mission Boulevard (in conjunction with EBRPD which currently conducts adult steelhead trap and truck efforts). Adult steelhead will not be allowed volitional passage into Alameda Creek until the RD1 and RD3 fish passage facility construction is completed and the facilities are fully functional.

- C12. Burrowing owls. To avoid impacts to nesting burrowing owls, ACWD and ACFCD will initiate burrowing owl surveys at proposed site with suitable habitat conditions when all possibility of nesting is over. Potential nest burrows will be located and observed to determine whether owls are present. If owls are not present, the burrows will be filled to prevent nesting. If owls are present, a qualified biologist, in consultation with CDFW, will passively relocate the owls to avoid any loss of individuals. Burrows will then be filled. Pre-construction survey and relocation will be on-going so that no burrowing owls will occur at the proposed construction site.
- C13. Western pond turtle. Within 15 days prior to construction activities, a qualified biologist will survey for western pond turtles. If turtles are found the biologist shall relocate the pond turtle to suitable habitat and an exclusion fence will be installed to prevent movement of turtles back into the construction area.
- C14. Disturbance of nesting birds. Within 15 days prior to construction activities, a qualified

biologist will survey for raptor nests in areas within 500 feet of the proposed construction site. If nesting raptors are found, ACWD will consult with CDFW to establish appropriate no disturbance buffers around the nest sites. No construction will be initiated within the buffers until young have fledged as determined by a qualified biologist. To address potential for work in the vicinity of the lower dam to affect downstream nesting birds, a qualified biologist will conduct pre-construction surveys of downstream areas to identify nesting by special-status and/or migratory birds. If these species are found nesting within 100 yards of the lower dam, ACWD will consult with CDFW to establish appropriate no disturbance buffers around the nest sites until young have fledged. These buffers will be clearly marked to exclude construction equipment and personnel.

C15. California horned lizard. Within 15 days prior to construction activities, a qualified biologist will survey for California horned lizard. If horned lizards are found in the proposed construction area, they will be removed by a qualified biologist and a fine mesh exclusion fence will be installed around the construction site to prevent them from reentering the site during construction.

Biological Resources – Operations & Maintenance Phase

- O&M1. Operations and Maintenance Manual: The NMFS/CDFW-approved Operations and Maintenance Manual for the Project will include protocols for performance monitoring and impact avoidance & minimization during O&M. Proposed measures include measures described below.
- O&M2. Avoidance and Minimization Measures. For on-going maintenance, ACWD/ACFCD will apply construction measures, similar to C1-C14 (above), as detailed in the NMFS/CDFW-approved Operations and Maintenance Manual.
- O&M3. Scheduling. To the extent feasible, ACWD/ACFCD will avoid scheduling maintenance which requires taking either fishway out of service in the period from January 1 through May 31.
- O&M4. Monitoring. ACWD/ACFCD will monitor operations of the fish passage and screening facilities.
- O&M5: If rubber dams are lowered during periods of juvenile outmigration, to the extent feasible ACWD/ACFCD will visually monitor the ponds to determine if juvenile steelhead are present and will ensure that juveniles are not stranded as pond elevations decline.

O&M6. On-going Measures to protect steelhead.

- Routine monitoring at the fishways would include monitoring for adult and juvenile outmigration, and ACWD/ACFCD would, to the extent feasible, to schedule maintenance outside of the period when juveniles and adults may be migrating.
- When maintenance requires isolation of the active channel from the maintenance area, ACWD/ACFCD will engage a qualified biologist to monitor for the presence of steelhead. If steelhead are found anywhere in the reach from Mission Boulevard to downstream of Rubber Dam 1, juvenile steelhead will be captured and released to (a) the downstream fishway or (if preferable) the active channel downstream of the maintenance area.
- If adult steelhead are in the maintenance area, they will be (a) diverted to the isolated

active channel or (b) captured and transported to the reach upstream of Mission Boulevard.

- In an emergency/unplanned maintenance event, ACWD/ACFCD will notify NMFS and CDFW as soon as possible, and immediately (a) make all feasible and necessary efforts to isolate the maintenance area from the active stream as rapidly as possible.
- O&M7. Minimizing Migration Effects
  - Minimize maintenance requiring closing of the fishways in the period from December 1 through May 31 to the extent feasible.
  - Evaluate the condition of fishways and fish screens immediately before the projected migration periods (January 1 through May 31) and take any remedial actions necessary.
  - To the extent feasible, manage operations to meet Fish Bypass Flows and minimize flow over rubber dams.

O&M8. Minimizing SBA Turnout at Vallecitos Temperature Effects

- Subject to operational, facility and other constraints, during the months of April, May, September and October, ACWD will, as a first priority, utilize the Bayside Turnouts for direct deliveries of SBA water to the ACWD service area prior to utilizing the Vallecitos Turnout for SBA deliveries via Alameda Creek.
- During NORMAL and WET years (as classified per section 3.4.2 in the IS/MND), ACWD will not utilize the SBA Turnout at Vallecitos for SBA deliveries during the months of April and May. ACWD may utilize the Vallecitos Turnout for SBA deliveries via Alameda Creek during the months of April and May if the hydrologic conditions in the Alameda Creek watershed are classified as DRY, per section 3.4.2 om the IS/MND, or if the ACWD Board of Directors declares a Water Supply Emergency.
- Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?

See Table B for a list of Federally listed threatened or endangered species with suitable habitat in the project area; and Table C for potential sensitive species of concern. The potential for special status species present in the project area to be impacted by the project will be mitigated during construction, operations and maintenance activities by implementing the measures shown in Table A.

**Springs USGS 7-minute quadrangle maps**. (UPSTREAM = the watershed upstream of Mission Boulevard; CONST = the reach from Mission Boulevard to 2,400 feet downstream of the Drop Structure; ACFCD = 2,400 Potential for the proposed project to affect listed species in the Niles, Newark, and Mendenhall feet downstream of the Drop Structure to Ardenwood Blvd. ESTUARY = Alameda Creek from Alvarado Table B.

BOUIEVAIA 10 SAI		1y.	Potential for	Rijbher Dam N	In 3 Fish Ladd	er Proiect Effects	
-	ſ		Occurrence	Critical Habitat or	Direct or	Avoidance &	
Species	Status <sup>∠</sup>	Suitable habitat?	in Project	Included in	Indirect	Minimization	Conclusion
			Areasi	a kecover Plan?	ETTECTS /	ixequirea (	
			Fish				
Green Sturgeon ( <i>Acipenser medirostris</i> )	T: NMFS	YES ESTUARY Potential ACFCD	YES ESTUARY Potential ACFCD	yes Estuary Potential ACFCD	Potential ESTUARY ACFCD	YES	May Affect – not likely to adversely affect
Central California Coastal steelhead & Central Valley steelhead ( <i>Onchorymchus</i> <i>mykis</i> )	T: NMFS	YES CONST Potential ACFCD	YES CONST NILES UPSTREAM Potential ACFCD	YES CONST NILES Potential ACFCD	YES NILES UPSTREAM Potential ACFCD	YES	May Affect – not likely to adversely affect
			Amphibiar	SL			
California red-legged frog ( <i>Rana draytonii</i> )	T: USFWS	Potential UPSTREAM	yes Upstream	0 Z	Potential UPSTREAM	YES	May affect – not likely to adversely affect
			Birds				
Western snowy plover ( <i>Charadrius alexandrines</i> nivosus)	T: USFWS	YES ESTUARY Potential ACFCD	YES ESTUARY Potential ACFCD	YES ESTUARY Potential ACFCD	yes Estuary Potential ACFCD	YES	May affect – no significant effects

2017 USBR Drought Resiliency Projects Alameda Creek Rubber Dam #3 Fish Ladder Project

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			Potential for	Rubber Dam N	Vo. 3 Fish Ladd	er Project Effects	
Species	Status <sup>2</sup>	Suitable habitat?	Occurrence in Project Areas?	Critical Habitat or Included in a Recover Plan?	Direct or Indirect Effects?	Avoidance & Minimization Required?	Conclusion
California clapper rail ( <i>Rallus longirostris</i> obsoletus)	E: USFWS E: CA	Potential ESTUARY ACFCD	yes estuary acfcd	Potential ESTUARY ACFCD	Potential ESTUARY ACFCD	YES	May affect – no significant effects
California least tern ( <i>Sternula antillarum</i> brown)	E: USFWS E: CA	Potential ESTUARY ACFCD	YES ESTUARY Potential ACFCD	Potential ESTUARY ACFCD	Potential ESTUARY ACFCD	YES	May affect – no significant effects
			Mammal	S			
Salt marsh harvest mouse ( <i>Reithrodontomys</i> <i>raviventris</i> )	E: USFWS E: CA	Potential ESTUARY	YES ESTUARY	0 N	Potential ESTUARY	YES	May affect – no significant effects
Notes:							

1. USFWS Sacramento Fish and Wildlife Office. Federal Endangered and Threatened Species that occur or may be affected by projects in the USGS Niles, Newark, and Mendenhall Springs 7.5-Minute Quads.

T: Threatened Ņ.

E: Endangered

NMFS: National Marine Fisheries Service

USFWS: United States Department of Interior, Fish and Wildlife Service

CA: California Department of Fish and Game

Project reach and downstream areas of potential water quality direct effects. Avoidance and minimization measures Table C. Summary of potential sensitive species of concern (not ESA listed) that may occur in the Joint Fish Passage

Species	Status <sup>12</sup>		Potential for Rubber	Dam No. 3 Fish Ladder F	Project Effects	
		Suitable habitat?	Known Occurrence	Direct or	Avoidance &	Conclusion
			In Project Area?	Indirect Effects?	minimization required?	
			Reptiles			
Western pond turtle	FSC/CSC	YES	ON	Potential	Yes <sup>4</sup>	No significant
(Emmys marmorata		CONST		CONST		effect
marmorata)		UPSTREAM				
California horned	FSC/CSC	Potential	ON	Potential	Yes <sup>4</sup>	No significant
lizard ( <i>Phrynosoma</i>		CONST		CONST		effect
coronatum frontale)						
			Fish			
Pacific lamprey	FSC/SCS	YES	YES	Potential	YES <sup>4</sup>	No significant
(Lampetra		CONST	NILES	CONST		effect
tridentada)		UPSTREAM	UPSTREAM	UPSTREAM		
			Birds			
Loggerhead shrike	FSC/CSC	VEC	Potential	Potential	ςON	No significant
(Lanius			CONST	CONST		effect
ludovicianus)						
Western burrowing	FSC/CSC		ON	Potential	YES <sup>4</sup>	No significant
0W		Potential		CONST		effect
(Athene cunicularia		CONST				
hypugea)						
Notes:						

1. FSC: Federal Species of Concern

2. CSC: California Species of Concern

3. Avoidance and Minimization: Construction management to avoid construction effects related to downstream water quality.

4. Avoidance and minimization: Pre-construction monitoring and rescue and relocation if found in potential construction zone

5. Species is not sensitive to construction activity and noise and would disperse to adjacent park habitats.

• Are there wetlands or other surface waters inside the project boundaries that potentially fall under Clean Water Act (CWA) jurisdiction as "Waters of the United States?" If so, please describe and estimate any impacts the proposed project may have.

The Alameda Creek Flood Control Channel is considered "Waters of the United States." Construction activities could affect water quality by increasing suspended sediment when excavating or otherwise disturbing the channel side slopes and bottom. Construction activity occurring adjacent to and within the channel itself could result in fluid leaks (e.g., fuels or lubricants) or spills from construction equipment or construction materials (e.g., concrete or grout).

- When was the water delivery system constructed? The existing Rubber Dam #3 was constructed in 1985.
- Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously. There is no irrigation system in the area of the proposed project. Therefore, this question is not applicable.
- Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.

There are no know any buildings, structures, or features listed or eligible for listing on the National Register of Historic Places located within the vicinity of the Project.

• Are there any known archeological sites in the proposed project area?

There are no known archeological sites in the proposed project area. Although the project area was probably utilized by pre-European peoples for thousands of years, substantial excavation and re-grading of the area (to depths of 30 to 60 feet in some locations) was undertaken by the USACE when the Flood Control Channel levees were constructed in 1969-1972. This substantially disturbed all of the area that would be impacted by the Rubber Dam #3 fish ladder construction project. Flood Control channel construction activities, along with on-going channel maintenance, obliterated any potential surface evidence of archeological resources, likely to depths below those where use by pre-historic peoples is probable. Therefore, the presence of archeological resources is not likely.

 Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?

There are no low income or minority populations in the area of the proposed project. Therefore this question is not applicable.

- Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands? There are no known Indian sacred sites or tribal lands in the area of the proposed project. Therefore, this question is not applicable.
- Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?

The Alameda Creek Flood Control Channel was constructed by the US Army Corps of Engineers. The Alameda County Flood Control and Water Conservation District is responsible for maintaining the channel in accordance with the USACE Maintenance & Operations manual. This includes managing sediment, debris and vegetation to maintain the flood carrying capacity of the channel. Thus, the presence of invasive and non-native plant species is not likely as they are most likely removed part of the County's vegetation management activities. However, should it be necessary to perform any planting as part of the project, e.g. as part of site restoration activities, every effort will be made to utilize only native species, subject to the approval of jurisdictional agencies. Therefore, the proposed project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native species.

#### Letters of Support

ACWD received letters of support, included in Attachment A, from the following:

- Alameda County Flood Control and Water Conservation District
- Alameda Creek Alliance
- East Bay Regional Park District
- Trout Unlimited, John Muir East Bay Chapter

#### Required Permits or Approvals

The project will be constructed on land owned by the Alameda County Flood Control and Water Conservation District (ACFCD). ACWD operates its water diversion facilities under a perpetual Easement for groundwater replenishment from ACFCD. Covered activities include construction, installation, operation, maintenance and repair of such facilities. ACFCD and ACWD have an agreement in place for ACFCD to provide the necessary temporary easements for construction and to modify the existing groundwater replenishment easement to include operation of the RD3 fish ladder. The fish ladder will encroach within the Union Pacific Rail Road right of way adjacent to the rubber dam. ACWD has received an Encroachment agreement from the Union Pacific Railroad (UPRR). Review of the UPRR Encroachment agreement is in progress.

As the project will be constructed within a Federally constructed flood control channel, US Army Corps Readiness Command (USACE) Section 408 review and approval is needed. ACWD is working closely with the USACE to complete the process as efficiently as possible.

Permit applications were submitted for California Department of Fish and Wildlife 1600, San Francisco Regional Water Quality Control Board 401, Division of Safety of Dams, and USACE Regulatory Branch 404 approval in 2013. ACWD is coordinating with the permitting agencies to provide any updates and revisions to the applications needed due to the additional time needed to complete the CEQA process, including the revision and recirculation of the IS/MND.

#### Official Resolution

The Alameda County Water District Board of Directors approved a resolution on February 9, 2017 authorizing the general manager to submit a grant application to and execute an agreement with Reclamation for the implement of the proposed project. The resolution agrees to use the funds identified in this funding plan for the proposed project. The official ACWD resolution is attached in Attachment B.

#### Funding Plan and Letters of Commitment

Non-Reclamation funds will be provided by the Alameda County Water District. These funds consist of monetary contributions from water revenues and/or local bond funds.

No other federal funds or state funds have been received as of the date of this proposal; however, state funds have been requested under the California Resources Agency Urban River Grant in the amount of \$3,000,000. If these other requested funds are not received, the District will use more of its capital reserves and/or bond funds to complete the project with the assistance of the Reclamation funds requested herein.

The funds requested from Reclamation will allow the ACWD to complete the Alameda Creek Rubber Dam #3 Fish Ladder Project and create better resiliency against future drought conditions.

FUNDING SOURCES	AMOUNT
Non Federal Entities	
1. Alameda County Water District Capital Funds	\$6,371,600
2.	
3.	
Non-Federal Subtotal	\$6,371,600
Other Federal Entities	
1. None secured at this time	\$0
2.	
3.	
Other Federal Subtotal	
REQUESTED RECLAMATION FUNDING	\$750,000

#### Table D: Summary of Non-Federal and Federal Funding Sources

as of February 2017. The District typically implements a negotiated cost of living increase at the beginning of each fiscal year (July 1). Over the past five years the increase has ranged between 2%-3%. The increase for FY 17-18 is 3%.

#### Fringe Benefits

The District's Fringe Rate is based on employee retirement, benefits (medical, dental, vision, LTD, STD, etc.), and current OPEB costs. The Fringe Rate is 59.3% and is used for application purposes only.

Travel – no travel is required to complete this project

**Equipment** –All equipment needed for completion of the Rubber Dam #3 Fish Ladder project will be provided/furnished by the contractor as part of the construction contract. No separate equipment is being purchased by the District for the purpose of completing the project.

Materials and Supplies – All materials and supplies needed for completion of the Rubber Dam #3 Fish Ladder project will be provided/furnished by the contractor as part of the construction contract. No separate materials or supplies are being purchased by the District for the purpose of completing the project

#### Contractual

**Construction Management**: Consultant will assist the District in contract administration during construction of the Rubber Dam 3 Fish Ladder. Scope includes provisions of a field office, meeting coordination, pre- and post- construction photo and video documentation; management of contractor submittals, RFIs, change order requests; and monitoring construction progress. The construction management firm will be evaluated and selected through a competitive proposal process that adheres to the District's procurement policies. Evaluation criteria will include consultant experience working on projects of similar size and scope. \$939,794 is included in the budget for construction management services; or 15% of construction costs.

**Specialty Inspection and Testing**: Special inspection and testing is required to ensure concrete is properly reinforced/placed and reaches specified strength. \$6,000 (75 hrs @ \$80/hr) is budgeted for inspection time. \$4,000 (80 tests @ \$50/test) is budgeted for testing. Costs include travel time to the site and preparation and submittal of written reports. The company hired to perform specialty testing and inspection services will be selected through a selection process that adheres to the District's procurement policies.

**Environmental Assistance**: \$80,000 is included for environmental assistance to cover compliance with environmental permit conditions including pre-construction training of construction site personnel, and species surveys pre- and during construction. Selection of the firm to provide environmental assistance will be evaluated and selected through a competitive proposal process that adheres to the District's procurement policies. Evaluation criteria will include consultant experience working on projects of similar size and scope.

**Design Assistance**: Consultant services for design assistance during construction. Scope includes responding to contractor Requests for Information (RFIs), submittal reviews, and attending project meetings. The Rubber Dam #3 fish ladder is being designed by GHD, Inc. The District's typical practice is to retain the services of the design engineer to provide assistance during construction. \$684,425 is budgeted for design assistance; or 10% of construction costs. The contracted design consultant was selected using a competitive proposal solicitation process.

Labor Compliance: Consultant services to update ACWD's Labor Compliance program as needed to meet grant funding requirements; provide monitoring and enforcement services during construction. The District will select the firm to provide labor compliance using a selection process that adheres to the District's procurement policies. Labor compliance is typically ranges between 0.25%-0.75% of construction costs. \$30,000 is estimated for this contract, or approximately 0.57%.

**Construction**: The cost to construct the Rubber Dam #3 fish ladder is provided in the attached budget proposal. The construction contract will be competitively bid, and the contractor's capabilities evaluated based on experience working on projects of similar size and scope.

#### Environmental and Regulatory Compliance Costs

**Environmental Compliance:** The District, working with the U.S. Army Corps of Engineers (USACE), prepared and circulated a combined CEOA-NEPA document. The District completed the CEOA process, adopting the Initial Study/Mitigated Negative Declaration and filing the Notice of Determination in December 2016. The USACE will be the lead agency for NEPA. \$20,000 is included as a line item to cover costs incurred by Reclamation for review of environmental compliance documentation. It is anticipated that permitting fees will be paid prior to availability of the grant. Therefore, no permitting costs are included in the estimate.

Other Expenses – No other expenses are needed to complete this project.

Indirect Costs - No other expenses are needed to complete this project.

#### Total Costs

Funding Sources	Funding Amount
Non-Federal Entities:	\$6,371,600
Non-Federal Entities Subtotal	\$6,371,600
Other Federal Entities:	0
Requested Reclamation Funding	\$750,000
Total Project Funding:	7,121,600

#### References

#### Attachments

Attachment A – Letters of Support

Attachment B – Official ACWD Resolution

Attachment C – Referenced Drought Plans

Attachment D – Project Site Plans

Attachment E – Map from the National Drought Monitor Center

#### Attachment A - Letters of Support

ACWD received letters of support from the following:

- Alameda County Flood Control and Water Conservation District
- Alameda Creek Alliance
- East Bay Regional Park District
- Trout Unlimited, John Muir East Bay Chapter



Daniel Woldesenbet, Ph.D., P.E., Directon

399 Elmhurst Street • Hayward, CA 94544 • (510) 670-5480 • www.acgov.org/pwa

February 10, 2017

Mr. Matthew Reichert Bureau of Reclamation Financial Assistance Services Mail Code: 84-274852 P.O. Box 25007 Denver, Colorado, 80225

RE: Support for Alameda County Water District's Urban Rivers Grant Application for The Alameda Creek Rubber Dam #3 Fish Ladder

Dear Mr. Reichert and Application Review Committee members:

As an active member of the Alameda Creek Fisheries Restoration Work Group, the Alameda County Flood Control & Water Conservation District is writing in support of the grant application submitted by the Alameda County Water District (ACWD) for the Alameda Creek Rubber Dam #3 Fish Ladder Project (RD3 Ladder).

Steelhead once inhabited the Alameda Creek watershed in significant numbers prior to the construction of dams and other development in the watershed. Because large portions of the watershed remain undeveloped and because the watershed is the largest local tributary to San Francisco Bay, resource agencies have given the Alameda Creek Watershed a high priority for steelhead restoration. The Alameda Creek Fisheries Restoration Workgroup, comprised of local community organizations, resource agencies, environmental organizations, and local water supply, flood control and recreation agencies, was formed in 1999 to coordinate steelhead restoration efforts. The Workgroup has developed the necessary technical studies to support the steelhead restoration activities, including both a watershed assessment and a Restoration Action Plan.

The RD3 Ladder is one of two such projects ACWD is pursuing in the lower Alameda Creek Channel. In combination, these two projects will allow in-migrant steelhead access to miles of spawning and rearing habitat in the watershed while allowing ACWD to sustainably manage the Niles Cone groundwater basin as a conjunctive use storage facility. The proposed project is recommended as one of the key restoration projects in the Workgroup's Restoration Action Plan for overall restoration in the watershed. Funding for the proposed Project will also complement the local Alameda Creek restoration projects that have already received funding or funding commitments from the DWR, Prop. 13, California Department of Fish and Game, National Fish and Wildlife Foundation, U.S. Army Corps of Engineers, California Coastal Conservancy and local agencies.

The proposed project and the efforts put forth to restore an anadromous fishery on Alameda Creek are consistent with criteria and goals established for the San Francisco Bay Salmonid Habitat Restoration Fund. Specifically, the proposed project for the Alameda Creek Anadromous Fishery Restoration Program will help support salmonid habitat restoration and fish passage in the largest watershed draining to San Francisco Bay. As such, we request your approval of funding for this important project.

Please don't hesitate to contact me if you need any additional information.

Sincerely,

Hank Ackerman Flood Control Program Manager Alameda County Flood Control & Water Conservation District

### Alameda Creek Alliance



P.O. Box 2626 • Niles, CA • 94536 Phone: (510) 499-9185 E-mail: alamedacreek@hotmail.com Web: www.alamedacreek.org

February 9, 2017

Mr. Matthew Reichert Bureau of Reclamation Financial Assistance Services Mail Code: 84-274852 P.O. Box 25007 Denver, Colorado, 80225

#### RE: Support for Alameda County Water District Urban Rivers Grant Application for Alameda Creek Rubber Dam Fish Ladder

Dear Mr. Reichert and Application Review Committee members:

The Alameda Creek Alliance strongly supports the Alameda County Water District (ACWD) grant application for the Alameda Creek Rubber Dam #3 Fish Ladder Project. The Alameda Creek Alliance has worked closely with the Alameda County Water District since 1999 on fish passage projects in Alameda Creek, through the Alameda Creek Fisheries Restoration Workgroup.

The RD3 Fish Ladder project is a critical fish passage project for restoring steelhead trout to the Alameda Creek watershed. The Alameda Creek watershed is the largest local tributary to San Francisco Bay. Due to historic steelhead habitat and continued presence of adult steelhead below the project area, and because large portions of the watershed remain undeveloped, resource agencies have given the watershed a high priority for steelhead restoration.

The RD3 Fish Ladder is one of two such projects ACWD is pursuing in lower Alameda Creek. In combination, these two projects will allow in-migrating adult steelhead to access up to many miles of significant spawning and rearing habitat in the watershed, while allowing ACWD to sustainably manage the Niles Cone groundwater basin as a conjunctive use storage facility.

The Alameda Creek Fisheries Restoration Workgroup is a cooperative stakeholder group of local community organizations, resource agencies, environmental organizations, and local water supply, flood control and recreation agencies. The group has been working since 1999 to coordinate steelhead restoration efforts in the watershed. The Workgroup has developed a watershed assessment and a restoration action plan, which identify the RD3 Fish Ladder as a high priority project.

The RD3 Fish Ladder project and other Fisheries Restoration Workgroup efforts to restore anadromous fish to Alameda Creek are consistent with the criteria and goals established for the San Francisco Bay Salmonid Habitat Restoration Fund. The RD3 Fish Ladder project will help support salmonid habitat restoration and fish passage in the largest watershed draining to San Francisco Bay. For these reasons, we request your approval of funding for this important project. Please don't hesitate to contact me if you need any additional information.

Sincerely,

Alter L

Jeff Miller Director Alameda Creek Alliance



2950 PERALTA OAKS COURT P.O. BOX 5381 OAKLAND CALIFORNIA 94605-0381 T: 1-888-EBPARKS F: 510-569-4319 TRS RELAY: 711 WWW.EBPARKS.ORG February 8, 2017

Mr. Matthew Reichert Bureau of Reclamation Financial Assistance Services Mail Code: 84-274852 P.O. Box 25007 Denver, Colorado, 80225

RE: Support for Alameda County Water District's Urban Rivers Grant Application for The Alameda Creek Rubber Dam #3 Fish Ladder

Dear Mr. Reichert and Application Review Committee members:

As an active member of the Alameda Creek Fisheries Restoration Work Group, East Bay Regional Park District is writing in support of the grant application submitted by the Alameda County Water District (ACWD) for the Alameda Creek Rubber Dam #3 Fish Ladder Project (RD3 Ladder).

Steelhead once inhabited the Alameda Creek watershed in significant numbers prior to the construction of dams and other development in the watershed. Because large portions of the watershed remain undeveloped and because the watershed is the largest local tributary to San Francisco Bay, resource agencies have given the Alameda Creek Watershed a high priority for steelhead restoration. The Alameda Creek Fisheries Restoration Workgroup, comprised of local community organizations, resource agencies, environmental organizations, and local water supply, flood control and recreation agencies, was formed in 1999 to coordinate steelhead restoration efforts. The Workgroup has developed the necessary technical studies to support the steelhead restoration activities, including both a watershed assessment and a Restoration Action Plan.

The RD3 Ladder is one of two such projects ACWD is pursuing in the lower Alameda Creek Channel. In combination, these two projects will allow in-migrant steelhead access to miles of spawning and rearing habitat in the watershed while allowing ACWD to sustainably manage the Niles Cone groundwater basin as a conjunctive use storage facility.

The proposed project is recommended as one of the key restoration projects in the Workgroup's Restoration Action Plan for overall restoration in the watershed. Funding for the proposed Project will also complement the local Alameda Creek restoration projects that have already received funding or funding commitments from the DWR, Prop. 13, California Department of Fish and Game, National Fish and Wildlife Foundation, U.S. Army Corps of Engineers, California Coastal Conservancy and local agencies.

The proposed project and the efforts put forth to restore an anadromous fishery on Alameda Creek are consistent with criteria and goals established for the San Francisco Bay Salmonid Habitat Restoration Fund. Specifically, the proposed project for the Alameda Creek Anadromous Fishery Restoration Program will help support salmonid habitat restoration and fish passage in the largest watershed draining to San Francisco Bay. As such, we request your approval of funding for this important project.

**Board of Directors** 

Please don't hesitate to contact me if you need any additional information.

Beverly Lane President Dennis Waespi Vice-President

Ayn Wieskamp Treasurer Ellen Corbett Secretary Whitney Dotson Ward I Dee Rosario Ward 2 Robert E. Doyle General Manager



2950 PERALTA OAKS COURT P.O. BOX 5381 OAKLAND CALIFORNIA 94605-0381 T: 1-888-EBPARKS F: 510-569-4319 TRS RELAY: 711 WWW.EBPARKS.ORG

Sincerely,

NO

Joe Sullivan Fisheries Program Manager East Bay Regional Park District

Beverly Lane President Dennis Waespi Vice-President

lespi Ayn Wieskamp dent Treasurer Ellen Corbett Secretary

Whitney Dotson Ward I

Board of Directors

Dee Rosario Ward 2 Colin Coffey Ward 7 Robert E. Doyle General Manager



February 13, 2017

Mr. Matthew Reichert Bureau of Reclamation Financial Assistance Services Mail Code: 84-274852 P.O. Box 25007 Denver, Colorado, 80225

RE: Support for Alameda County Water District's Urban Rivers Grant Application for The Alameda Creek Rubber Dam #3 Fish Ladder

Dear Mr. Reichert and Application Review Committee members:

As an active member of the Alameda Creek Fisheries Restoration Work Group, the John Muir East Bay Chapter of Trout Unlimited is writing in support of the grant application submitted by the Alameda County Water District (ACWD) for the Alameda Creek Rubber Dam #3 Fish Ladder Project (RD3 Ladder).

Steelhead once inhabited the Alameda Creek watershed in significant numbers prior to the construction of dams and other development in the watershed. Because large portions of the watershed remain undeveloped and because the watershed is the largest local tributary to San Francisco Bay, resource agencies have given the Alameda Creek Watershed a high priority for steelhead restoration. The Alameda Creek Fisheries Restoration Workgroup, comprised of local community organizations, resource agencies, environmental organizations, and local water supply, flood control and recreation agencies, was formed in 1999 to coordinate steelhead restoration efforts. The Workgroup has developed the necessary technical studies to support the steelhead restoration activities, including both a watershed assessment and a Restoration Action Plan.

The RD3 Ladder is one of two such projects ACWD is pursuing in the lower Alameda Creek Channel. In combination, these two projects will allow in-migrant steelhead access to miles of spawning and rearing habitat in the watershed while allowing ACWD to sustainably manage the Niles Cone groundwater basin as a conjunctive use storage facility.

The proposed project is recommended as one of the key restoration projects in the Workgroup's Restoration Action Plan for overall restoration in the watershed. Funding for the proposed Project will also complement the local Alameda Creek restoration projects that have already received funding or funding commitments from the DWR, Prop. 13, California Department of Fish and Game, National Fish and Wildlife Foundation, U.S. Army Corps of Engineers, California Coastal Conservancy and local agencies.



The proposed project and the efforts put forth to restore an anadromous fishery on Alameda Creek are consistent with criteria and goals established for the San Francisco Bay Salmonid Habitat Restoration Fund. Specifically, the proposed project for the Alameda Creek Anadromous Fishery Restoration Program will help support salmonid habitat restoration and fish passage in the largest watershed draining to San Francisco Bay. As such, we request your approval of funding for this important project.

Please don't hesitate to contact me if you need any additional information.

Sincerely et Mangarella

Peter Mangarella / President John Muir East Bay Chapter of Trout Unlimited

#### Attachment B - Official Resolution

The Alameda County Water District Board of Directors approved the following resolution, Resolution 17-014, on February 9, 2017, authorizing the general manager to submit a grant application to and execute an agreement with Reclamation for the implement of the proposed project.

#### RESOLUTION NO. 17-014

#### OF THE BOARD OF DIRECTORS OF THE ALAMEDA COUNTY WATER DISTRICT AUTHORIZING SUBMITTING A WATERSMART DROUGHT RESPONSE PROGRAM GRANT APPLICATION TO, AND ENTERING INTO A GRANT AGREEMENT WITH, THE U.S. BUREAU OF RECLAMATION

WHEREAS, the U.S. Bureau of Reclamation has been delegated the responsibility for the administration of the WaterSMART Drought Response Program, establishing necessary procedures; and

WHEREAS, said procedures require a resolution certifying the approval of application by the Applicant's governing board before submission of said application; and

WHEREAS, the Applicant, if selected, will enter into an agreement with the U.S. Bureau of Reclamation to carry out the Project described below.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of ALAMEDA COUNTY WATER DISTRICT:

- That the District General Manager or his designee is hereby authorized and directed to sign and file, for and on behalf of the Alameda County Water District ("District"), a WaterSMART Drought Response Program: Drought Resiliency Projects Application for a grant from the U.S. Bureau of Reclamation in the amount not to exceed \$750,000.
- 2. That the District General Manager or his designee is hereby authorized to acknowledge and approve of the application and the information submitted for consideration, and is further authorized to certify that the District has and will provide the amount of funding and/or in-kind contributions specified in the funding plan.

1

- 3. That the Board hereby agrees and further does authorize the General Manager or his designee to certify that the District has and will comply with all statutory and regulatory requirements related to any grant funds.
- 4. That the General Manager or his designee is hereby authorized to negotiate and execute a grant agreement and, any amendments or change order thereto, on behalf of the District and to work with the U.S. Bureau of Reclamation to meet established deadlines for entering into a grant agreement.

PASSED AND ADOPTED this 9<sup>th</sup> day of February, 2017, by the following vote:

AYES:Directors Sethy, Akbari, Gunther, Huang, and WeedNOES:NoneABSENT:None

John H. Weed, President Board of Directors Alameda County Water District

ATTEST:

Andrew Warren, Assistant District Secretary Alameda County Water District (Seal)

APPROVED AS TO FORM:

Patrick T. Miyaki, General Counsel Alameda County Water District

2

#### Attachment D – Project Site Plans

The attached site plans provide supporting information on the Project scope and location.

Alameda Creek Rubber Dam #3 Fish Ladder Project





Alameda County Water District



Alameda County Water District

Alameda Creek Rubber Dam #3 Fish Ladder Project





Alameda Creek Rubber Dam #3 Fish Ladder Project



Rendering of the completed RD3 fish ladder.

#### Attachment E – Map from the National Drought Monitor Center

The attached map from the National Drought Monitor Center provides an example of the recent drought experienced in the Project area.

# U.S. Drought Monitor California

# (Released Thursday, Sep. 25, 2014) September 23, 2014

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	2	ngin O	הווחווח			ca)
	None	D0-D4	D1-D4	D2-D4	D3 D4	D4
Current	0.00	100.00	100.00	95.34	81.92	58.41
Last Week 9/16/2014	0.00	100.00	100.00	95.42	81.92	58.41
<b>3 Months Ago</b> 6/24/2014	0.00	100.00	100.00	100.00	76.69	32.98
Start of Calendar Year 12/31/2013	2.61	97.39	94.25	87.53	27.59	0.00
Start of Water Year 10/1/2013	2.63	97.37	95.95	84.12	11.36	0.00
<b>One Year Ago</b> 9/24/2013	2.63	97.37	96.04	89.84	11.36	0.00

## Intensity:

D1 Moderate Drought D0 Abnormally Dry

D4 Exceptional Drought D3 Extreme Drought

D2 Severe Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

**Richard Heim** NCDC/NOAA Author:



http://droughtmonitor.unl.edu/