Comment Letters Received subsequent to the Workshop

for the

2018 Triennial Review

of the

San Francisco Bay Basin

Water Quality Control Plan

(Basin Plan)

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ALAMEDA COUNTY WATER DISTRICT

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June 7, 2018

Mr. Richard Looker
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street
Oakland, CA 94612

Dear Mr. Looker:

Subject: Alameda County Water District Comments on the San Francisco Bay Basin Water Control Plan (Basin Plan) 2018 Triennial Review

Thank you for the opportunity to provide input on the San Francisco Bay Regional Water Quality Control Board's (Regional Board's) 2018 Basin Plan Triennial Review. The Alameda County Water District (ACWD) provides retail water service to a population of 356,000 within the Cities of Fremont, Newark, and Union City ("Tri-Cities"). ACWD's geographic area encompasses approximately 105 square miles and its groundwater statutory service area includes the Tri-Cities as well as the southern portion of the City of Hayward. ACWD holds a water right permit from the State Water Resources Control Board to divert from Alameda Creek, downstream of Niles Canyon, for groundwater recharge into the Niles Cone Subbasin 2-09.01 (Niles Cone). The water percolated at ACWD's recharge facilities is subsequently recovered either through ACWD's groundwater production wells as a potable water supply for distribution system customers or through private wells. In addition, ACWD's brackish groundwater desalination facility in the city of Newark produces additional potable supply while simultaneously removing excess salinity from the Niles Cone. Groundwater in the Niles Cone currently furnishes approximately 40% of the water supply for the Tri-Cities area and provides over 60% of the supply during dry years. As the above discussion implies, ACWD is strongly committed to protecting and preserving water quality and water supply in the Alameda Creek watershed and the Niles Cone.

Under the Sustainable Groundwater Management Act (SGMA), ACWD is identified as one of 15 agencies that were created by statute to manage groundwater, and as a result, ACWD was deemed the exclusive local agency to comply with SGMA. ACWD's groundwater management activities under pre-existing authority have included both groundwater and source water protection. These activities have sought to preserve beneficial uses within the Niles Cone and have fostered collaboration between ACWD and the Regional Board, as evident in the cooperative agreement between the Regional Board and ACWD for groundwater protection and

ACWD's work with the Regional Board to eliminate wastewater discharges in tributaries of Alameda Creek.

ACWD's mission includes a commitment to environmental stewardship, and ACWD operates water supply infrastructure on Alameda Creek for the benefit of native fish species. As one of the founding members of the Alameda Creek Fisheries Restoration Workgroup, ACWD has collaborated with multiple stakeholders since 1999 on efforts to benefit Central Coast Steelhead, a federally-listed, threatened species. Over the last two decades, ACWD has worked closely with federal, state, and local agencies and has committed millions of dollars to construct a variety of enhancements for salmonids migrating on Alameda Creek, including the removal of a rubber dam, the installation of three fishways (one built and two others currently in progress), and full fish screening of all off-stream diversion points. Come 2022, with the completion of the final fish ladder, steelhead will have full access to the Alameda Creek watershed for the first time in 50 years.

In response to the Regional Board's April 2018, "Brief Issue Descriptions for the 2018 Triennial Review of the San Francisco Bay Basin Water Quality Control Plan," ACWD has prepared specific comments on the items noted below.

2.5 Modification of Groundwater Sub-Basin Boundaries

ACWD strongly supports updating the Basin Plan to correctly identify groundwater basin boundaries to ensure consistency with the California Department of Water Resources' (DWR) Final 2016 Bulletin 118 Groundwater Basin Boundaries and promote proper basin identification for planning and other groundwater-related programs or actions.

ACWD's groundwater statutory service area boundary approximately coincides with the Niles Cone Sub-basin (2-09.01) as defined by DWR, which describes the basin as being the southern portion of the east bay area bounded on the south by the Alameda-Santa Clara County boundary and on the north by the boundary of ACWD and southern portions of the City of Hayward (DWR, 2003). The map with the graphical representation included in DWR's Bulletin 118-Update 2003 did not match the written description of the northern boundary as it did not extend all the way to the northern boundary of ACWD and failed to include detached areas located within the City of Hayward over which ACWD had expressly retained groundwater management authority. As a result, ACWD submitted a Basin Boundary Modification Request to correct the Niles Cone boundary on March 31, 2016. On July 1, 2016, ACWD received notice from DWR that the Basin Boundary Modification Request had been approved, as modified by DWR. On October 18, 2016, DWR released the approved Final 2016 Bulletin 118 Groundwater Basin Boundaries.

3.1 Review and Refine Dissolved Oxygen Objectives for San Francisco Bay

ACWD supports the Regional Board's reevaluation of existing dissolved oxygen objectives as part of the 2018 Basin Plan Triennial Review. Specifically, ACWD has interest in exploring the

possibilities of developing dissolved oxygen objectives for site-specific inland surface waters. We share the concern that dissolved oxygen objectives may not be attainable or applicable.

3.11 Develop Flow Criteria for Selected Bay Area Streams and Rivers

ACWD appreciates that the Regional Board is considering new objectives for in-stream flow on a tributary- or watershed-specific basis as part of the 2018 Basin Plan Triennial Review. As a water service provider, ACWD relies on diversions from Alameda Creek to recharge the Niles Cone Groundwater Basin and provide critical water supply to the Tri-Cities area. Such diversions are authorized under ACWD's water rights permit issued by the State Water Resources Control Board and are essential to ACWD's sustainable management of the Niles Cone. ACWD's diversion infrastructure consists of two inflatable rubber dams that can impound water on Alameda Creek and divert water to a network of recharge ponds. In order to promote recovery of steelhead within the Alameda Creek watershed, ACWD has committed to the installation of two fish ladders to bypass the rubber dams and the full fish screening of ACWD's off-stream diversion points. Throughout this process, ACWD has worked closely with federal, state, and local regulatory agencies to develop diversion and in-stream flow criteria that benefit native species.

In October 2017, the National Marine Fisheries Service (NMFS) issued a Biological Opinion for ACWD's Joint Lower Alameda Creek Fish Passage Improvements Project (JLACFP), which specifically outlined diversion and in-stream flow regimes for ACWD's soon-to-be-constructed fish ladders and fish screening projects on Alameda Creek. The Biological Opinion analyzed the best available scientific information to inform its findings and therefore represents the most comprehensive analysis of fisheries flow requirements on Alameda Creek to date.

Due to the unique opportunity for species recovery in the watershed, NMFS has given the Alameda Creek watershed a high priority for steelhead restoration. Furthermore, the JLACFP is identified as a top priority project in the NMFS Recovery Plan for the California Central Coast Steelhead and is considered a critical component of the regional restoration effort. In addition, ACWD's current fish screening project is consistent with the California Department of Fish and Wildlife's (CDFW) Steelhead Restoration and Management Plan for California Task CC-16-225-01 and is listed in the Coastal Multispecies Final Recovery Plan produced by the National Oceanic and Atmospheric Administration.

ACWD supports the development of scientifically-driven flow objectives that can benefit fisheries restoration while simultaneously protecting critical local water supply. Accordingly, ACWD respectfully requests that any in-stream flow criteria be developed in conjunction with existing scientific studies characterizing the Alameda Creek watershed and that the updated Basin Plan not contradict ACWD's previously issued Biological Opinions and/or CDFW operating agreements.

3.13 Clarify Implementation Requirements for Municipal Supply and Agricultural Supply Water Quality Objectives

ACWD supports revising the Basin Plan language to clarify appropriate implementation measures for the secondary maximum contaminant levels (MCLs) as long as the MUN and AGR objectives continue "to be applied at the tap," thus allowing for various levels of blending or water treatment within a larger system.

4.1 Environmental Screening Levels (ESLs) for Groundwater Cleanups

In 1988, ACWD began to informally provide assistance to the Regional Board in overseeing the investigation and remediation at Leaking Underground Fuel Tank (LUFT) and Site Cleanup Program (SCP) sites as an extension of ACWD's Groundwater Protection Program. This relationship was formalized in a Cooperative Agreement between ACWD and the Regional Board that was executed on June 27, 1996. As a result of this Cooperative Agreement, ACWD has followed the development of the ESLs and has used ESLs for soil, soil gas, and groundwater cleanup levels. ACWD has found the ESLs to be a very valuable tool that is protective of groundwater beneficial uses. ACWD supports updating the Basin Plan to memorialize the approach for deriving and applying ESLs to cleanup sites.

4.2 Using Wastewater to Create, Restore, and Enhance Wetlands

If the Regional Board selects this item as part of its Triennial Review, ACWD would support an expansion of the term "treated wastewater" to include other potential sources of discharge, such as brine discharge from brackish desalination or brackish groundwater discharge from aquifer protection wells. As climate change causes sea levels to rise, freshwater aquifer protection along the San Francisco Bay will become an increasing challenge. Broadening the existing definitions of beneficial use to include brackish water discharges to habitat transition zones dependent on saline inflow could lay the groundwork for a virtuous cycle where the cleanup of coastal drinking water aquifers could simultaneously support critical wetland habitat for birds and wildlife.

The San Francisco Bay Salt Pond Restoration Project, mentioned in the Brief Issue Description 4.2, recently issued a Draft Environmental Impact Statement/Environmental Impact Report for Phase 2, Eden Landing Reserve, which contains a proposed alternative (Alternative Eden B, Section 2.2.4) that would leverage ACWD's Aquifer Reclamation Program wells to deliver brackish groundwater to habitat transition zones in several reclaimed salt ponds. Such collaboration could help sustain the target salinity gradient for the transitional ponds while furthering ACWD's long-term effort to remove excess salinity from the underlying groundwater basin. Such a program would also echo the goals outlined in the Baylands Ecosystem Habitat Goals 2016 Science Update, which seeks to "[i]dentify and implement opportunities for taking advantage of treated wastewater and stormwater to create salinity gradients and maximize peat accumulation in the baylands, while protecting water quality and minimizing nutrient loading."

ACWD hopes that any updates to NPDES permitting requirements would evaluate and provide guidance for brine and brackish water discharge to wetlands where the beneficial use to wetland habitat can be demonstrated.

5.2 Climate Change and Water Resources Policy

ACWD recommends that saltwater intrusion into coastal aquifers due to sea level rise be included as one of the physical impacts of climate change listed in the narrative. Additionally, ACWD would like to reiterate the request to expand the definition of "highly treated wastewater" to include brine discharge from brackish water desalination and brackish water discharge from aquifer protection wells as sources of supplemental water to nourish tidal marshes under beneficial use, as previously discussed under the response to Brief Issue Description 4.2. ACWD supports the development of policy surrounding such a redefinition and would seek to participate in preliminary policy discussions.

Again, ACWD appreciates the opportunity to provide input at this stage of the Basin Plan review process. Should you have any questions about our comments or need more information, please contact Steven Inn, Manager of Water Resources, at (510) 668-4441, or by e-mail at steven.inn@acwd.com.

We look forward to working with Regional Board staff during the Triennial Review to explore these issues further and learn more about the proposed changes to the Basin Plan. Thank you for your consideration of our comments.

Sincerely,

Robert Shaver
General Manager

db/mh
By E-mail
cc: Steven Inn, ACWD
Laura Hidas, ACWD
Thomas Niesar, ACWD
Evan Buckland, ACWD
Michelle Myers, ACWD

June 8, 2018

Richard Looker
1515 Clay Street, Suite 1400
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(510) 622-2451

VIA EMAIL: rlooker@waterboards.ca.gov

Subject: Comments on the 2018 Triennial Review for the Water Quality Control Plan, San Francisco Bay Basin

Dear Mr. Looker:

The Bay Area Clean Water Agencies (BACWA) appreciates the opportunity to comment on the 2015 Triennial Review of the San Francisco Bay Basin Water Quality Control Plan (Basin Plan). BACWA is a joint powers agency whose members own and operate publicly-owned treatment works (POTWs) and sanitary sewer systems that collectively provide sanitary services to over 7.1 million people in the nine-county San Francisco Bay (SF Bay) Area. BACWA members are public agencies, governed by elected officials and managed by professionals who protect the environment and public health.

BACWA supports the triennial review process and applauds the improvements made to the Basin Plan through this process in recent years. The current list of issues proposed for review in the *Brief Issue Descriptions for the 2018 Triennial Review of the San Francisco Bay Basin Water Quality Control Plan* (Issue Descriptions) that was developed by the San Francisco Bay Regional Water Quality Control Board (Water Board) addresses more than two dozen topics that affect broad sections of the residents, businesses, and public agencies of the San Francisco Bay Area. Because the Water Board has limited resources to address each of these issues, BACWA is limiting its substantive comments to six of the issues. The comments below are made with reference to, and in order of the Issue numbers in the Issue Descriptions.

1. ***Issue 3.1 – Review and Refine Dissolved Oxygen Objectives for San Francisco Bay***

   The Basin Plan includes a minimum water quality objective of 5.0 mg/L for dissolved oxygen in all tidal waters downstream of the Carquinez Bridge and 7.0 mg/L upstream of the Carquinez Bridge and also includes a requirement that the median dissolved oxygen concentration for any three consecutive months shall not be less than 80 percent of the dissolved oxygen content at saturation. These dissolved oxygen water quality objectives have been interpreted to be applicable at all times, at all depths, and in all locations. As described in the Issue Descriptions, this approach does not make sense for shallow habitats on the SF Bay's margins. The objectives also do not account for natural

variability due to diurnal cycling and stratification. Setting a rigid objective that applies throughout the Region fails to consider the beneficial uses attained in a diversity of habitats in the SF Bay's margins.

BACWA and its member agencies support research on appropriate dissolved oxygen levels in the SF Bay through the Nutrient Management Strategy and other initiatives. BACWA agrees with the narrative in the Issue Descriptions that the recently adopted Suisun Marsh TMDL is a good starting point for developing DO objectives throughout the SF Bay. However, the studies informing the Suisun Marsh TMDL used laboratory data, and published literature on laboratory studies of DO sensitivity for individual fish species, rather than actual presence and abundance of fish under various real-world DO scenarios in the Suisun Marsh. There are more extensive DO and wildlife data available for SF Bay margins that could be used to link DO levels with beneficial uses.

Since the 2015 Triennial Review, Dr. Jim Hobbs of UC Davis has continued to conduct monthly trawls at Artesian Slough, Pond A19, and Upper Coyote Creek in the Lower South Bay with the cooperation of staff at the San Jose/Santa Clara Regional Wastewater Facility. The aim of these studies is to determine what levels of dissolved oxygen impact different fish species, and DO levels are measured at the time of fish collection. There are also now DO data via moored sensors deployed in a number of the sloughs in the Lower South Bay which are maintained by SFEI, USGS, and City of San Jose. BACWA recommends using a robust analysis of fish presence and abundance under measured DO conditions to develop site-specific DO Objectives.

Recommendation: Amend the Basin Plan to identify and implement site-specific dissolved oxygen objectives that are linked to beneficial use attainment for shallow habitats in the SF Bay.

2. Issue 3.2 - Update the Basin Plan's Toxicity Testing Requirements

The State Water Board has been working on a Plan to address toxicity testing statewide (State Toxicity Plan). The proposed State Toxicity Plan will establish numeric chronic toxicity limits and require a new statistical approach, the Test of Significant Toxicity (TST), for evaluation of toxicity tests. This new statistical approach is calibrated with a built-in "false positive" rate and the null hypothesis is inverted: instead of testing to see if effluent is "toxic," under the new method, dischargers will be demonstrating that effluent is "not toxic."

In addition to mandating a new statistical test, the State Toxicity Plan is expected to mostly standardize toxicity testing implementation throughout the State. However, previous drafts of the State Toxicity Plan still gave Regional Water Boards some discretion in determining instream waste concentration for toxicity testing, and in determining reasonable potential for acute toxicity testing, assuming the chronic toxicity

tests continue to be performed on a regular basis. These two areas are elements to explore as part of a future Basin Plan modification.

Recommendation: BACWA has no recommendations at this time since the content of the State Toxicity Plan is still uncertain. When there is clarity, BACWA will engage with Water Board staff to develop a toxicity implementation plan for Region 2 and discuss a future Basin Plan Amendment.

3. Issue 3.6 Incorporate Recreational Water Quality Objectives (RWQC) for Bacteria

Basin Plan Table 3-1 establishes the water quality objectives for bacterial indicators, and Table 4-2A implements effluent limitations for bacterial indicators. Historically, most NPDES permits implement enterococcus limits as an end-of-pipe limit, irrespective of the fact that contact recreation does not take place within the outfall's mixing zone. This results in overprotective bacterial effluent limits, requiring overuse of chlorine, and therefore sodium bisulfite (SBS) to dechlorinate the effluent (see comments on Issue 4.4, below), with ancillary environmental impacts in terms of chemical production, transport, and disinfection byproduct production.

Recommendation: When the State Water Board adopts the new bacterial objectives for REC-1 and they are incorporated into the Basin Plan, Table 4-2A should be amended to specify that the limit applies outside the outfall mixing zone, not at end-of-pipe.

4. ***Issue 4.4 - Revise instantaneous chlorine limit***

In Basin Plan Table 4-2, chlorine is given an instantaneous limit of 0.0 mg/L in effluent, which is an interpretation of the Basin Plan's narrative toxicity objective. POTWs that use chlorine for disinfection dechlorinate using SBS. To avoid violations, operators routinely overdose the effluent with SBS, needlessly costing agencies millions of dollars per year in aggregate, and exerting oxygen demand in the receiving water, with no water quality benefit.

Over the past year, BACWA has been working with the Water Board on an approach to revising the Basin Plan's instantaneous limit. BACWA is providing funding for expert support of this initiative.

Recommendation: Continue to work with BACWA to develop a strategy for implementing chlorine residual limitations that minimizes the risk of a momentary exceedance and does not compromise receiving water quality.

5. Issue 4.2 - Using Wastewater to Create, Restore, and Enhance Wetlands

BACWA sees merit in encouraging the use of wetlands to provide additional water quality enhancement of treated effluent while concurrently increasing the amount of wetlands habitat around the Bay. Preliminary monitoring results from treatment wetlands in the Region and beyond suggest that treatment wetlands can remove nutrients from wastewater effluent. Additionally, wetlands are an important piece in developing resiliency to sea level rise.

As part of the Nutrient Watershed Permit, BACWA has begun discussions with its member agencies and Regional stakeholders about what kinds of wetlands projects are foreseen in the future. Having regulatory certainty about the conditions under which these projects may be permitted is a key factor in determining their feasibility, and eventually, design criteria.

Recommendation: BACWA recommends that Basin Plan revisions be developed and incorporated to recognize that treated wastewater can enhance beneficial uses in wetlands, and to provide implementation language for encouraging and permitting such discharge.

6. Issue 5.2 Climate Change and Water Resources Policy

BACWA supports the incorporation of Climate Change into the Basin Plan. BACWA and its member agencies have already begun to examine the vulnerability of our facilities to sea level rise, as well as our ability to help reduce anthropogenic greenhouse gas emissions with a broad portfolio of waste to energy programs.

The Water Board is reviewing how existing policies regulating wetland fill, ecosystem restoration and flood protection can best incorporate consideration of sea level rise; the need for a new policy to facilitate the use of highly treated wastewater and stormwater as a source of freshwater to nourish tidal marshes; as well as sediment management to enhance flood control, support baylands restoration and promote shoreline resilience. One additional component of these efforts that the Water Board should not overlook is the potential use of biosolids as material to restore, sustain, or develop marshland habitats, in upstream locations such as horizontal levies, or in salt marshes. While the concept needs further study for successful physical implementation and risk management, biosolids are an organic carbon-rich and nutrient-rich resource that is reliably available. Biosolids could be used to promote vegetative growth for stabilizing marshland, or for raising land elevations over time. They may be an important tool to address the sediment deficit around the bay margins for developing natural flood protection. BACWA's member agencies would be pleased to participate in pilot studies to further explore this concept.

Recommendation: Consider biosolids beneficial reuse when reviewing sediment management policies to enhance flood control, support baylands restoration and promote shoreline resilience.

In addition to the substantive comments above, BACWA encourages the Regional Water Board to update the Basin Plan with the items identified in the Issue Description that clarify ambiguous areas in the text, or incorporate into the Basin Plan elements that are already in NPDES permits. They could be incorporated into the Basin Plan as time and resources allow. These items are:

- Issue 2.1 - Add Unnamed Water Bodies that Receive Discharges
- Issue 2.3 Align Ocean Plan and Basin Plan for Recreational Contact Use
- Issue 3.13 Clarify Implementation Requirements for Municipal Supply and Agricultural Supply Water Quality Objectives
- Issue 4.3 Update Cyanide Dilution Credits
- Issue 6.1 Clarify Turbidity Water Quality Objective

BACWA appreciates the opportunity to comment on the 2018 Triennial Review and thanks you for considering our input.

Respectfully Submitted,

David R. Williams

David R. Williams
Executive Director
Bay Area Clean Water Agencies

cc: BACWA Executive Board

SAN FRANCISCO BAYKEEPER®

June 8, 2018

Richard Looker
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Transmitted via email to rlooker@waterboards.ca.gov

Re: 2018 Triennial Review of the Water Quality Control Plan for the San Francisco Bay Basin Plan

Dear Mr. Looker:

On behalf of San Francisco Baykeeper and our over 5,000 members and supporters, we submit these comments on the 2018 Triennial Review proposed priorities.

Project 3.1: Review and Refine Dissolved Oxygen (DO) Objectives for San Francisco Bay

Baykeeper recognizes DO conditions vary in sloughs and channels and some accommodation for natural variability should be recognized. This issue is being addressed in part through the Nutrient Management Strategy - with the intention of analyzing habitat-specific DO ranges in portions of the South Bay. We have reservations over utilizing the approach adopted in Suisun Bay for all subembayments, particularly in the South and Lower South Bay, which hosts critical habitat for endangered salmonids and is Essential Fish Habitat for a number of species. We ask that staff work in consultation with the Nutrient Management Strategy to minimize duplication of efforts and utilization of best available science if site specific DO objectives are developed anywhere in the Bay.

Project 3.10: Temperature Limits to Protect Salmonids

Baykeeper supports efforts to update temperature criteria for Region 2 streams. However, as part of this project, the Regional Board should also review available data to determine where the current temperature limits are being exceeded and take appropriate action to enforce existing criteria. In particular, Baykeeper is aware of several streams and rivers in the South Bay that are designated critical habitat for steelhead but are not meeting current temperature criteria. However, we know of no efforts by the Regional Board or other agencies to address these exceedances.

Project 3.11: Develop Flow Criteria for Selected Bay Area Streams and Rivers

This is a high-priority need for a number of Bay Area streams and rivers, notably those designated as critical habitat for steelhead and/or known to support other salmonids. Flow criteria for several South Bay streams have languished for decades or are operating through unprotective flow criteria as the Santa Clara Valley Water District unsuccessfully develops management plans for these streams. The need to address lack of flow in South Bay streams, as well as streams region-wide, as soon as possible is imperative. A recent study by San Jose State University Professor Jerry Smith found that, despite high rain years, no juvenile steelhead were found on Coyote Creek in August and October 2017. *See* Jerry J. Smith, Fish Population Sampling in 2017 on Coyote Creek (December 17, 2017), attached hereto as Attachment A. Dr. Smith states that "unsuitable flow conditions, and the barrier at Singleton Road, have resulted in passage bottlenecks that have eliminated most or all steelhead production for the past five years, potentially extirpating steelhead." Attachment A at 2. It is clear that the Santa Clara Valley Water District and other resource management agencies have failed to develop and/or implement flow criteria that protects vulnerable native fish populations, and the Regional Board needs to take a more active role to protect the full range of beneficial uses in these critical water bodies. We urge the Regional Board to adopt Project

3.11 as a priority project this triennial review. Any more delay in developing a protective flow regime threatens the local extirpation of protected fisheries in critical streams and rivers.

Baykeeper appreciates the opportunity to comment on the Regional Board's priorities during the triennial review period. Thank you for considering these comments. If you have any questions, do not hesitate to contact me at ian@baykeeper.org or (510) 735-9700, x108.

Sincerely,

Ian Wren
Staff Scientist

Transmitted via email

June 8, 2018

Richard Looker
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Re: 2018 Triennial Review – Designate Tribal Tradition and Culture, Tribal Subsistence Fishing, and Subsistence Fishing Beneficial Uses in the San Francisco Bay Region

Dear Mr. Looker:

On behalf of the Environmental Justice Coalition for Water, Clean Water Action, and San Francisco Baykeeper (collectively, "Commenters"), we write to urge the San Francisco Bay Regional Water Quality Board ("Regional Board") to adopt Project 2.6, "Designate Tribal Traditional and Culture, Tribal Subsistence Fishing, and Subsistence Fishing Beneficial Uses in the San Francisco Bay Region," as a priority project in the 2018 Triennial Review. The Commenters strongly believe that recognizing that tribal and non-tribal subsistence fishing, as well as tribal cultural uses (collectively referred to herein as "tribal and subsistence uses"), are occurring in the San Francisco Bay reflects an existing reality and is a key step in working towards protecting the public health of all users of the Bay and other regional waters.

In May 2017, the State Water Resources Control Board ("State Board") adopted Resolution No. 2017-0027, which, among other things, officially recognized that tribal and subsistence uses are potential beneficial uses of California waters. The State Board did not designate any particular waterbody with these uses but left it up to the Regional Boards to evaluate whether these uses are properly designated in their watersheds. In recognizing these potential uses, the State Board acknowledged that tribal and non-tribal subsistence fishers consume much higher amounts of fish than that of sport or recreational fishers. *See* State Water Resources Control Board, Final Staff Report for Part 2 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California—Tribal and Subsistence Fishing Beneficial Uses and Mercury Provisions ("Staff Report"), May 22, 2017, at 23, 104-106, *available at* https://www.waterboards.ca.gov/water_issues/programs/mercury/docs/hg_SR_final.pdf. Whether people are fishing for cultural reasons or due to economic need, "the fishing rate is not optional or elective as the recreational term connotes, and the amount of fish consumed can be greater than that consumed by recreational fishers." *Id.* at 105. Thus, the tribal and subsistence uses "are necessary because existing beneficial uses do not take into account the greater consumption of finfish and shellfish by some cultures or individuals." *Id.* at 24; *see also id.* at 104-106.

Numerous studies, as well as Commenters' first-hand knowledge and experience, find that people regularly use the Bay and other waters in Region 2 for subsistence fishing. Every day, people are out on local piers fishing and bringing that fish home to cook for themselves and their families, and the basin plan should acknowledge and work to protect these users.

Several studies have been conducted over the last couple decades that show that subsistence fishing in the Bay occurs regularly. The Staff Report refers to at least three fish consumption and other studies from the Bay Area. *See* Staff Report at Appendix G, Table G-1 (citing San Francisco Estuary Institute 2000), G-10 (citing Ma-at Youth Academy, *Fish Consumption and Methylmercury Contamination in Contra Costa County*), and Table G-4 (citing SFEI 2000, Ma-at Youth Academy, and Contra Costa Boater Survey, 2005). In addition, the Asian Pacific Environmental Network conducted a study in 1998 that documented consumption of Bay fish in the Laotian community in West Contra Costa County. Audrey Chiang, Asian Pacific Environmental Network, *A Seafood Consumption Survey of the Laotian Community in West Contra Costa County, California* (1998). This list of fish consumption studies is not exhaustive; however, this limited list of studies indicates that there are readily available sources that prove that people are subsistence fishing in the Bay.

Further, studies of fish contamination are premised on the fact that people are eating fish out of the Bay for subsistence purposes. For example, the San Francisco Estuary Institute ("SFEI"), from 2005-2009, conducted the Fish Mercury Project ("FMP"), which was a pilot program for monitoring, stakeholder involvement, and risk communication relating to mercury in fish in the Bay-Delta watershed. *See* SFEI website, Fish Mercury Project, *available at* http://www.sfei.org/cmr/fishmercury/index.php#sthash.7ahji8sV.rJYsUlTJ.dpbs. Although the FMP did not study fish consumption levels directly, the purpose of the FMP was to study mercury contamination in fish, develop safe consumption guidelines, and reduce exposure, in particular in environmental justice communities. *See* FMP, Final Project Goals and Objectives at 1, *available at* http://www.sfei.org/sites/default/files/project/Final%20Goals%20and%20Objectives_final_28June05.pdf. The FMP refers specifically to subsistence anglers as a stakeholder group, separate and distinct from recreational anglers. *See id.* at 2.

In addition to non-tribal subsistence fishing, tribal people historically and presently use the Bay for subsistence fishing and cultural practices. The Ohlone people were the original inhabitants of San Francisco Bay and the original subsistence fishers. In fact, tribes have led the efforts to recognize tribal and subsistence uses statewide.

> *Beginning in 2012, while new statewide water quality objectives for mercury were under development, California tribes began addressing the State Water Board and the U.S. EPA with concerns regarding the lack of consideration of tribal input in water quality decisions made in California. Many California tribes consume much higher amounts of fish for traditional, cultural, and subsistence reasons, meaning that the consumption rates assumed in existing criteria for mercury underestimates use by these groups. U.S. EPA commissioned a study by UC Davis researchers who found, through a survey of 40 California tribes and tribal groups, that fish consumption was approximately 5 to 25 times higher for tribal fishers, greatly increasing the risk of methylmercury exposure.*

Staff Report at 23. The Ohlone tribe is the best source of information about its current and historical uses in San Francisco Bay in particular, and Commenters, as well as their coalition partners, such as the California Indian Environmental Alliance, will work with Regional Board staff to acquire any necessary information. The Staff Report importantly noted that "[f]or Tribal uses, the Water Boards should consider both current and documented past practices, especially in areas where tribal practices have been limited due to lack of access." Staff Report at 109. This is certainly true for the Ohlone people in the Bay Area and important to keep in mind as this project moves forward.

In sum, readily-available evidence exists for the Regional Board to review and to determine that the tribal and subsistence uses should be designated for San Francisco Bay. "Beneficial uses from the cornerstone of water quality management and protection in California." Staff Report at 22. Thus, it is important for the Regional Board to review this literature and to consider designating tribal and subsistence uses in order to meet its duty to protect all users of Bay waters.

While we strongly believe that the Regional Board should prioritize designating tribal and subsistence beneficial uses, the Commenters also recognize that protecting these uses is a long-term project, as the Bay is already impaired by legacy pollutants, such as mercury and PCBs, that impact these uses. Therefore, in order to protect Regional Board resources, the Commenters suggest that adopting the tribal and subsistence uses be conducted in a two-step process: (1) designating the uses; and (2) adopting appropriate water quality objectives and implementation plan that will protect the uses. During the 2018 Triennial Review, the Commenters only ask the Regional Board to conduct Step 1 (*i.e.*, consider whether the tribal and subsistence uses should be designated as beneficial uses of the Bay). Step 2 will require further work from the Regional Board to adopt appropriate water quality objectives and an implementation plan, which is likely appropriate for a future triennial review process.

When adopting tribal and subsistence uses, the State Board acknowledged that some regional boards have adopted mercury TMDLs and noted that the implementation requirements in the State Board action do not supersede mercury TMDLs. *See* Staff Report at 34-37. Mercury and PCBs, which accumulate in fish tissue and can impact public health, are persistent in the environment, and Commenters recognize that reducing the levels of these pollutants to meet existing water quality standards, let alone more stringent water quality standards that would be necessary to protect tribal and subsistence uses, will take decades and potentially requires techniques or technologies that are not yet available. Thus, at least for PCBs and mercury, Commenters do not see the need to automatically modify the TMDL or other permits or plans as a result of designating these new uses.

However, the fact that cleaning up persistent pollutants like mercury and PCBs is a long-term effort does not lessen the Regional Board's duty to consider whether tribal and subsistence uses are beneficial uses of the Bay. First, setting a goal – however, long-term it may be – to protect all users of the Bay is important as a matter of policy and responsibility to environmental justice and other impacted communities and individuals. Second, designating tribal and subsistence uses may be leveraged by the Regional Board, other agencies, or non-governmental organizations, like the Commenters, to acquire funds to study whether technologies exist to reduce these persistent pollutants or to reduce exposures to impacted communities. Third, the designated uses would not only apply to persistent pollutants like mercury and PCBs, but other contaminants that can affect public health. Some of these contaminants may be emerging or will occur in the future, and efforts

to ensure the Bay is not impaired by these contaminants should consider all users of the Bay, including tribal and subsistence users. Without designating the Bay for these uses, those users would not be considered in planning efforts.

Finally, this project should rank high considering the criteria the Regional Board considers in determining its priority projects.

1. **Water Board Mission (Protect Beneficial Uses) (15 points available)** – Recognizing tribal and subsistence uses as beneficial uses that are occurring in the Bay directly implements the Regional Board's mission to protect beneficial uses. Without recognizing these uses, the uses will continue to occur – as they have been – yet the Regional Board would not have any tools to protect these uses. Thus, the project should receive **15 points for this category**.

2. **Staff Resources Already Invested (10 points available)** – Because the State Board has recently adopted tribal and subsistence uses, Regional Board staff has not invested much time in this project. However, Commenters have met and been engaged in an ongoing discussion with Regional Board staff about this project, so some time and effort has already been spent. Considering the low investment of time necessary for this project, however, the fact that Regional Board has not invested considerable resources should not dissuade the Regional Board from adopting this project as a priority in this triennial review. This project should receive **at least 3 points for this category**.

3. **External Resources Already Invested (5 points available)** – Considerable external resources have been invested in the long-term project of protecting subsistence fishers. As mentioned above, several external studies of fish consumption and fish contamination have occurred over the last couple decades to study the impact of fish consumption on subsistence fishers. Moreover, Commenters themselves have worked for the last several years to advocate for tribal and subsistence uses at the state and local level. Thus, the project should receive **5 points for this category.**

4. **External Resources Likely Available (10 points available)** – Commenters are committed to working with Regional Board staff to effectively reach out to impacted communities to acquire any additional information about tribal and subsistence uses needed for the Regional Board's consideration of these uses. Commenters are already working to acquire the resources and staff time necessary to support the Regional Board as this project moves forward. Thus, the organizations represented by Commenters are committed to working with the Regional Board. For instance, Commenters have received some funding to do outreach to community-based organizations and other entities to identify impacted communities fishing out of San Francisco Bay in order to provide guidance to the Regional Board on efficient data gathering. This project should receive **10 points for this category**.

5. **Public Interest (10 points available)** – Commenters represent 6 organizations that have spent decades both individually and collectively working to ensure that the Bay

is safe for Bay area communities, including environmental justice communities and tribal people. Our interest is indicative of the significant level of public interest in this issue, but it is not exhaustive. Several local organizations have historically been concerned with protecting subsistence fishers, and we expect that, if the Regional Board, were to adopt this as a priority project, that these organizations would have interest and would support the Regional Board's work. Thus, the project should receive **10 points for this category**.

6. **Input from Internal Divisions (5 points available)** – It is unclear at this point whether a Regional Board division has identified this as a priority project.

7. **Implement State Water Board Policy (15 points available)** – This project expressly implements a recent State Water Board policy adopted in May 2017. Thus, this project should receive **15 points for this category**.

8. **U.S. EPA Priority (15 points available)** – Although EPA has not directly commented on tribal and subsistence uses when reviewing California water quality standards, one of EPA's priorities is environmental justice. *See* EPA website, Environmental Justice, https://www.epa.gov/environmentaljustice. In fact, the National Environmental Justice Advisory Council issued a report in 2002, Fish Consumption and Environmental Justice, which focused on the importance of setting water quality standards that protect subsistence fishers. *Available at* https://www.epa.gov/sites/production/files/2015-02/documents/fish-consump-report_1102.pdf. In addition, EPA, as well as all federal agencies, have trust responsibilities to tribes that require them to provide government-to-government consultation and to protect treaty rights of tribal people. In recent years, EPA objected to water quality standards approved by Washington and Maine specifically because they did not protect tribal treaty and other reserved fishing rights. Staff Report at 114. Moreover, EPA has already approved of California's recognition of these beneficial uses into our water quality standards. Thus, EPA's legal and policy obligations to tribes and environmental justice indicate that tribal and subsistence uses are an EPA priority, and thus, this project should receive **at least 10 points for this category**.

9. **Geographic Scope (5 points available)** – This project is not limited to a specific section of the region but would look to see what waterbodies or waterbody segments region-wide should be designated for tribal and subsistence uses. Thus, the project should receive **5 points for this category**.

10. **Low Controversy and Low Technical Complexity (5 points available)** – As noted above, considerable data and preexisting studies are available and are likely sufficient to provide support for the Regional Board to designate waterbodies or segments for tribal and subsistence uses without complicated or resource-intensive studies. Thus, this project would require very little Regional Board resources. Further, because this effort is a first step and will not impact existing TMDLs or NPDES permits, Commenters expect little opposition to recognizing tribal and

subsistence uses. Commenters are also committed to working with stakeholders in the discharger community as the project moves forward. Because of the limited Regional Board resources required and the lack of controversy expected, the project should receive **5 points for this category**.

In conclusion, this project should be adopted as a priority in the next triennial review because recognizing tribal and subsistence uses reflects a reality that exists in our watershed, and water quality standards should be set to protect all users of local waters. Moreover, considerable literature already exists documenting these uses; thus, Regional Board staff will have to use little resources to review whether these uses should be designated. In short, Commenters strongly believe that the Regional Board should and can complete this limited project in the next three years, and we urge the Regional Board to adopt this project as a priority.

Thank you for your time and consideration. If you have questions, please do not hesitate to contact any of us for further discussion.

Sincerely,

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17 May 2018

Attn: Richard Looker
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Dear Mr. Looker:

Thank you for the opportunity to comment on the 2018 Triennial Review process for the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan). California Trout has been based in San Francisco since 1971, and has advocated for balancing the needs of wild fish and people for a better California since its inception. We recognize that watersheds full of wild, abundant fish indicate healthy waters that all Californians depend upon. Please find below a summary of the concerns and suggestions we have to improve the Triennial Review process.

To provide context, San Francisco Bay Basin watersheds are now highly altered, with little of their historical nursery and rearing habitats left intact or functional for native threatened Central California Coast steelhead (*Oncorhynchus mykiss irideus*), potentially extirpated Chinook salmon (*Oncorhynchus tshawytscha*), and extirpated Central California Coast coho salmon (*Oncorhynchus kisutch*). These native species are key indicators of watershed health and have been largely extirpated or reduced to populations that are entire orders of magnitude less than their historical abundance in the Basin. The watersheds upon which these species depend have been largely impacted by a variety of human stressors and many watersheds, including the San Francisco Bay itself, are often inhabited by non-native predators and rendered inhospitable for native salmonids in its current state. As a result, the remaining populations of Central California Coast steelhead in the Basin are on an extirpation trajectory, and are likely to be lost in the next century if present trends in water management, among others, continue unabated (https://watershed.ucdavis.edu/library/state-salmonids-status-californias-emblematic-fishes-2017). In fact, some watersheds in the Basin may have had their populations of

once-diverse *O. mykiss* extirpated just over the last few years as a result of historic drought and poor water management practices (Smith 2017).[1]

Additional work is needed to help restore and recover populations of these native species in the Basin, and the San Francisco Bay Regional Water Quality Control Board, with its jurisdiction over regulating uses and quality of water in the Basin, plays a critical role in these efforts. Toward that goal, we commend the Regional Board for amending the Stream and Wetland Systems Protection Policy (Section 2.4) to include water quality enhancement and flood peak attenuation/flood water storage as beneficial uses to be considered in permitting decisions. We also suggest that the Regional Board consider adding language to help protect another critical beneficial use of floodplains and estuaries in their Basin Plan Amendment: the high rates of production of quality food resources for numerous listed and non-listed avian, plant, amphibian, and fish species that are currently not explicitly considered. If the goal of the stated amendment is

> "*to help protect and restore the physical characteristics of these systems, including their connectivity and natural hydrologic regimes, in order to protect beneficial uses…"* pg. 2

then we would argue that protecting the *functions* of the wetlands and floodplain habitats is a key missing piece that should be added to Basin Plan amendment language.

Historically, these floodplain and wetland/estuarine habitats functioned on a seasonal and/or perennial basis to provide rich primary production of phytoplankton and zooplankton, and in turn, critical feeding, rearing, refuge, and salinity acclimation opportunities for native salmon and steelhead not only from the San Francisco Bay Basin, but also now-listed salmon and steelhead runs from California' Central Valley and multiple resident and migratory species of fish, birds, amphibians, and others. Every juvenile salmonid migrating to the Pacific Ocean must pass through San Francisco Bay, and likely historically utilized the Bay as a key feeding ground to put on weight for their arduous migration to saltwater. Floodplain, wetland, and estuarine habitats provide critical feeding and growth opportunities that have been linked to rapid juvenile salmonid growth rates that would likely result in higher marine survival and survival to adulthood (Sommer et al. 2001[2], Bond et al. 2008[3], Jeffries et al. 2008[4]). The multi-species benefits conferred by the primary productivity supported in these habitats, especially when they are inundated in winter and spring months, should be formally recognized to wholly account for the ecosystem benefits they provide to multiple species.

[1] Smith, J. 2017. "Fish Population Sampling in 2017 on Coyote Creek." 39pp.
[2] Sommer, T., Nobriga, M. and W. Harrell et al. 2001. "Floodplain Rearing of Juvenile Chinook Salmon: Evidence of Enhanced Growth and Survival." *Canadian Journal of Fisheries and Aquatic Sciences* 58(2): 325-333.
[3] Bond, M. Hayes, S., and C. Hanson et al. 2008. "Marine Survival of Steelhead (*Oncorhynchus mykiss*) Enhanced by a Seasonally Closed Estuary." *Canadian Journal of Fisheries and Aquatic Sciences* 65(10): 2242-2252.
[4] Jeffries, C., Opperman, J. and P. Moyle. 2008. "Ephemeral Floodplain Habitats Provide Best Growth Conditions for Juvenile Chinook Salmon in a California River." *Environmental Biology of Fishes* 83(4): 449-458.

In Section 3.3, "Revise Pentachlorophenol (PCP) Water Quality Objectives for Salmonids" of the proposed amendment, we encourage the Regional Board to approve funds to study the aquatic conditions that occur in the Region that might pose a risk to salmonids from exposure to PCP or related compounds.

In Section 3.5, "Review and Implement Biological Assessment Tools," we agree with the intent of the project and establishing condition assessments using California Stream Condition Index (CSCI) data for engineered or modified channels as a tool in Clean Water Act section 401 certifications, and suggest including presence and habitat use of (*Oncorhynchus mykiss irideus*) as an indicator species of ecosystem function and health on top of benthic macroinvertebrate community assessments in Basin assessments of anadromous waters tributary to San Francisco Bay. Every major tributary of San Francisco Bay historically supported this species, and they should be maintained to support the persistence of these species in order to facilitate recovery of threatened Central California Coast Distinct Population Segment of *O. mykiss* (NMFS 2017[5]). While assemblages and relative abundances of benthic macroinvertebrates may change significantly from one watershed to another, presence of a top predator in freshwater systems, such as *O. mykiss* in a waterway, indicates significant and intact habitat function from multiple facets of consideration, including healthy macroinvertebrate communities. An added benefit of including this species in watershed assessments is that these are coldwater species that are sensitive to changes in pH, temperature, dissolved oxygen, salinity, nutrient levels, pollutants, toxic materials, and other abiotic water quality measures, and they range throughout coastal systems spanning California.

In Section 3.8, "Lake Merced Dissolved Oxygen and pH Objectives," California Trout commends the Regional Board for prioritizing evaluation of opportunities to restore lake levels and increase water quality through improved dissolved oxygen levels and reduced nutrient inputs from stormwater runoff into Lake Merced. Our organization has been involved for over a decade in these discussions, and we believe that restoration of lake levels and water treatment and storage options discussed with the City and County of San Francisco and Daly City will improve conditions to support native species, including a fishery for *O. mykiss* in the lake once again and an important urban fishing opportunity for the local public.

In Section 3.10, "Temperature Limits to Protect Salmonids," we encourage the Regional Board to set appropriate temperature thresholds and acceptable temperature ranges to protect native salmonids based upon NMFS Intrinsic Potential model, so long as it is ground-truthed with direct observations from the field. It is important to recognize that while *O. mykiss* in particular are capable of withstanding elevated temperatures for short periods of time if sufficient food is present and they are able to effectively sight and drift feed, such conditions take an energetic toll on individuals and may cause sub-lethal

[5] National Marine Fisheries Service. 2016. *Final Coastal Multispecies Recovery Plan.* National Marine Fisheries Service, West Coast Region, Santa Rosa, California.

impacts over time, such as reduced swimming performance and feeding effectiveness (Jain and Farrell 2003[6], Sloat et al. 2014[7]).

Therefore, we recommend that temperature thresholds be adjusted seasonally to account for the hot, dry conditions that predominate in most Basin watersheds during summer and fall months. We also suggest that temperature thresholds be set to be adequately precautionary in their acceptable range to allow for continued growth and to support good body condition (measured by metrics such as K-factor, for example) to help sustain the species during thermally stressful periods. It is our opinion that current temperature ranges associated with operation of water conveyance structures and facilities by municipalities, water districts, and others in some parts of the Basin are inadequate and should be re-visited, especially in hot and arid South Bay watersheds that have drastic declines in *O. mykiss* populations during the past decade.

In Section 3.11, "Develop Flow Criteria for Selected Bay Area Streams and Rivers," is perhaps the most impactful amendment to the Basin Plan from our perspective during this Triennial Review and should be prioritized. In some Basin watersheds with settlement agreements or National Marine Fisheries Service-issued Biological Opinions, streamflow regimes may be adequate to support populations of native salmonids, but many others are currently inadequate, and in some cases current water conveyance and delivery operations and inadequate streamflows directly contribute to the continued trend toward extirpation of populations, for example, in Coyote Creek (Smith 2017). Our native CCC *O. mykiss* populations require sufficient streamflows year-round for summer rearing and growth in most years in order to persist and thrive, and as it stands now this most basic requirement is not being adequately met throughout much of the Basin. We encourage the Regional Board to closely consult with the National Marine Fisheries Service, California Department of Fish & Wildlife, and other fisheries and wildlife advocacy organizations to develop adequate streamflow proposals in coordination with permittees and other stakeholders to find workable solutions during these complex discussions. We look forward to engaging further in these discussions, and can bring to bear the latest science and research from our close partners at the UC Davis Center for Watershed Sciences and expertise from across the state to bear on these discussions.

In Section 5.1, "Priority Ranking for TMDL Development," we agree with prioritizing watersheds in the greatest need for amelioration of stressors for Total Maximum Daily Load evaluation. We especially agree with a closer evaluation of Pescadero Marsh for dissolved oxygen TMDL development as a priority over the next three years, and would encourage the Regional Board to take a preliminary look at the Coyote Creek and Guadalupe River watersheds as well for both temperature and dissolved oxygen levels.

[6] Jain, K. and A. Farrell. 2003. "Influence of Seasonal Temperature on the Repeat Swimming Performance of Rainbow Trout (*Oncorhynchus mykiss*)." *Journal of Experimental Biology* 206: 3569-3579.
[7] Sloat, M. and G. Reeves. 2014. "Individual Condition, Standard Metabolic Rate, and Rearing Temperature Influence Steelhead and Rainbow Trout (*Oncorhynchus mykiss*) Life History." *Canadian Journal of Fisheries and Aquatic Sciences* 71(4): 491-501.

In Section 6.1, "Clarify Turbidity Water Quality Objective," we believe the water quality objective needs further clarification that to the extent practicable, turbidity levels should not exceed thresholds to a degree and duration that they adversely affect beneficial uses, including effective feeding habits, predator avoidance, and territorial behavioral displays of native salmonids, such as *O. mykiss*. In addition, these operations must be reviewed regularly and enforced to adequately protect beneficial uses, including supporting populations of *O. mykiss*. For example, current water conveyance and delivery management practices at multiple reservoirs across the Basin, in particular in Coyote Creek downstream of Anderson Dam, regularly contribute to elevated turbidity levels for extended periods of time, which is known to impair visual feeding effectiveness and/or increase metabolic stress of *O. mykiss* and may have other negative consequences on benthic macroinvertebrate assemblages as well (Shaw and Richardson 2011).[8]

Thank you for the opportunity to comment on the proposed Basin Plan amendments and your consideration of our comments in this process. We look forward to engaging with you in the future as the Basin Plan amendment discussions continue.

Respectfully,

Patrick Samuel

/s/ Patrick Samuel

Bay Area Program Manager
California Trout

Cc: Gary Stern, NMFS
Sean Cochran, CDFW
Richard Roos-Collins, Water & Power Law Group
Stephanie Moreno, Guadalupe-Coyote RCD
Noah Oppenheim, Pacific Coast Federation of Fishermen's Associations
Redgie Collins, California Trout
Brian Johnson, Trout Unlimited
Matt Clifford, Trout Unlimited
Richard McMurtry, Santa Clara County Creeks Coalition
Steve Holmes, South Bay Clean Creeks Coalition

[8] Shaw, E. and J. Richardson. 2011. "Direct and Indirect Effects of Sediment Pulse Duration on Stream Invertebrate Assemblages and Rainbow Trout (*Oncorhynchus mykiss*) Growth and Survival." *Canadian Journal of Fisheries and Aquatic Sciences* 58(11): 2213-2221.

CITY OF DALY CITY

Department of Water and Wastewater Resources
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Thomas J. Piccolotti, Director

June 8, 2018

VIA EMAIL: rlooker@waterboards.ca.gov

Mr. Richard Looker
Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subject: Comments on April 2018 Brief Issues Descriptions for the 2018 Triennial Review of the Basin Plan Regarding Project 3.8 Lake Merced DO and pH Objectives – Recommended Continued High Ranking and External Support Commitment

Dear Mr. Looker:

The City of Daly City (City) is pleased that Project 3.8 *Lake Merced Dissolved Oxygen and pH Objectives* was carried forward from the San Francisco Regional Water Quality Control Board's (RWB) 2015 Triennial Review into the "Brief Issues Descriptions for the 2018 Triennial Review of the San Francisco Bay Basin Water Quality Control Plan (Basin Plan) April 2018." This same project was ranked high (tied for fifth with 60 points) in the October 2015 Staff Report for the San Francisco Bay Basin Regional Water Quality Control Plan 2015 Triennial Review.

The project has been undergoing the required CEQA/NEPA review and we are pleased to report that the final EIR/EIS document received all the required approvals pursuant to CEQA in December 2017, and we expect a final Record of Decision to complete the NEPA process shortly. The City is now progressing with securing authorizations/permits from relevant federal and state agencies, at the local, regional, and national level. The project is at approximately the 60% design level, with construction currently anticipated to begin in the Fall of 2019. The City looks forward to working with RWB staff to complete the Lake Merced Basin Plan Amendment in a timely fashion.

The overall Lake Merced project being pursued by Daly City, in cooperation with the San Francisco Public Utilities Commission (SFPUC) and other watershed stakeholders, would address storm-related flooding in the Vista Grande Watershed Drainage Basin, while simultaneously restoring hydrologic connection to Lake Merced. The overall Lake Merced project would include enhanced stormwater management via capture, treatment, and beneficial reuse of Vista Grande stormwater consistent with provisions of the State Water Board's (SWB) Stormwater Strategic Initiative Proposal and other Green Infrastructure initiatives.

Storm water (and authorized non-storm water) flows, currently routed to the Pacific Ocean, would be rerouted from the Vista Grande Canal to Lake Merced, a waterbody that appears on the California 2010 Section 303(d) list for dissolved oxygen (DO) and pH. The proposed Lake Merced Basin Planning activities would provide the framework and Basin Plan implementation provisions needed to help resolve the 303(d) listing for the Lake. These actions, together with the City's Lake

Management Plan actions will, over time, help achieve the long-term goal of maintaining and improving Lake Merced water quality.

The basic strategies for how to address the DO and pH issues in Lake Merced have already been identified through joint efforts by City and RWB staff. These strategies are believed to be relatively straight-forward and non-controversial given that there are precedents for the proposed DO and pH regulatory changes based on approaches adopted in other States and approved by USEPA. These strategies are documented in the City's March 12, 2013 letter to the RWB "*Proposed Regulatory Process for the Vista Grande Drainage Basin Improvement Project*" and supported by the RWB's May 9, 2013 letter to the City "*Concurrence with Proposed Regulatory Process for the Vista Grande Drainage Basin Improvement Project, Lake Merced Alternative*."

The October 2015 Triennial Review Staff Report had estimated approximately 1.8 personnel-years would be required from other Water Board Divisions or external sources to accomplish the Lake Merced project. The City has stated previously, and reaffirms here, that it together with SFPUC, stands ready to provide resources to help address the Lake Merced related Basin Planning issues, in partnership with RWB staff. The City provided detailed comments supporting this same project and its high ranking during the 2015 Triennial Review process. A copy of that August 18, 2015 letter is attached and its contents incorporated herein by reference.

The City believes that much of the regulatory alternatives analysis and technical background work necessary to support Basin Plan Amendments to provide refined water quality objectives and implementation provisions for DO and pH in Lake Merced, has already been completed. The City believes that portions of the CEQA/NEPA work completed for the overall Vista Grande Drainage Basin Improvement Project (Lake Merced Project) will be applicable to the required Basin Plan Amendment actions.

The City is committed to provide technical and, as appropriate, administrative support to RWB staff to enable preparation of a complete Basin Plan amendment package addressing the Lake Merced DO, pH, and related issues for RWB consideration. The City would continue to support RWB staff as appropriate, in following up with subsequent Basin Plan Amendment approvals required by the SWB, the Office of Administrative Law (OAL), and the USEPA.

The City looks forward to continuing to work collaboratively with RWB staff on focused Basin Plan Amendments to address site specific DO and pH issues in Lake Merced. If you have any questions, please feel free to contact me.

Sincerely,

Thomas J. Piccolotti, Director
Department of Water and Wastewater Resources

Attachment: Daly City August 18, 2015 Comments on 2015 Basin Plan Triennial Review – Lake Merced DO and pH Objectives

L18-036

CITY OF DALY CITY

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Patrick Sweetland, Director

August 18, 2015

VIA EMAIL: Rlooker@waterboards.ca.govc

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Subject: Comments on 2015 Basin Plan Triennial Review – Lake Merced DO and pH Objectives

Dear Mr. Looker:

The City of Daly City (Daly City) appreciates the opportunity to comment on the 2015 Triennial Review of the San Francisco Bay Basin Water Quality Control Plan (Basin Plan). Daly City supports the triennial review process and the inclusion of Project 3.9 Lake Merced Dissolved Oxygen and pH Objectives in the current list of issues proposed for review in the Brief Issue Descriptions for the 2015 Triennial Review of the San Francisco Bay Basin Water Quality Control Plan (Issue Descriptions). Project 3.9 would assess water quality standards actions and implementation provisions for DO and pH necessary to address the unique, site-specific characteristics of Lake Merced and Clean Water Act Section 303(d) impaired waterbodies listing of Lake Merced by USEPA in 2003.

Daly City, in cooperation with the San Francisco Public Utilities Commission (SFPUC) and other watershed stakeholders, is pursuing the Vista Grande Drainage Basin Improvements Project to address storm-related flooding in the Vista Grande Watershed Drainage Basin, while simultaneously restoring hydrologic connection to Lake Merced and improving lake level management. The City and County of San Francisco, owner and operator of Lake Merced, as well as several local non-governmental groups including CalTrout, have expressed an interest in managing Lake Merced levels within a preliminary target range of 5.0 to 9.5 feet San Francisco City Datum (target levels are not yet finalized). The proposed Vista Grande project would allow the City and County of San Francisco to operate Lake Merced within desired water levels, help to reduce local flooding and partially restore Lake Merced's historic drainage conditions. The project would include diversion of storm water (and authorized non-storm water) flows from the Vista Grande Canal to Lake Merced, a waterbody that appears on the California 2008-2010 Section 303(d) list for dissolved oxygen (DO) and pH. Other engineering alternatives that would continue to convey all Vista Grande Drainage Basin flows to the Pacific Ocean have been considered but are not currently proposed as the preferred Project because they provide minimal if any benefits to Lake Merced.

In a related action, Daly City is working with the San Francisco Public Utilities Commission (SFPUC) and San Francisco Bay Regional Water Quality Control Board (RWB) staff to develop a two part strategy for reassessing the status of the 303(d) listings for Lake Merced that would be pursued under separate, but related actions. First, a Lake Management Plan (LMP) is being developed that provides an implementation plan of measures that will be taken to maintain and, over time, improve water quality in Lake Merced. The Lake Management Plan is included as part of the proposed project. Second, as noted above, given the unique, site-specific characteristics of Lake Merced, the Basin Plan implementation provisions for how the water quality objectives (WQOs) for DO and pH are assessed are proposed to be revised, as indicated in 2015 Triennial Review Project 3.9. Together, these actions are intended to achieve the long-term goal of maintaining and improving water quality, while acknowledging the distinct nature of Lake Merced.

The purpose of this letter is to affirm the need for the Basin Plan modifications outlined in Project 3.9 to facilitate moving forward with the win-win-win Vista Grande Lake Merced Alternative Project. The Project is a win for Daly City since it would alleviate long-standing localized flooding problems, a win for SFPUC and other stakeholders such as CalTrout interested in having Lake levels increased and maintained, and for the Regional Water Board and other regulatory agencies in resolving the 303(d) listing for the Lake and for supporting enhanced stormwater management via the capture, treatment, and beneficial reuse of Vista Grande stormwater that would otherwise be simply discharged to the Pacific Ocean. This latter action is consistent with provisions of the State Water Board's (SWB) 2009 Recycled Water Policy to increase state-wide capture and reuse of stormwater, and more recently with the SWB's Stormwater Strategic Initiative Proposal. Guiding Principle 1 of that Initiative is that the Water Boards' Programs treat stormwater as a valuable water resource.

Daly City has stated previously, and again in this Triennial Review forum, that it, together with SFPUC, stand ready to provide resources to help address the above Basin Planning issues in partnership with RWB staff. Daly City understands that the RWB has limited staff resources to address the myriad of potential Basin Planning issues identified in this Triennial Review. Daly City believes that it can provide technical and as appropriate administrative support to RWB staff beginning in January 2016 to enable preparation of a complete Basin Plan amendment package addressing the Lake Merced DO, pH, and related issues, for RWB consideration by the end of calendar year 2016. The basic strategies for how to address each of these issues have already been identified through joint efforts by Daly City, SFPUC, and RWB staff.

Daly City would continue to support RWB staff, as appropriate, during the first half of 2017, in following up with the subsequent Basin Plan Amendment approvals required by the SWB, the Office of Administrative Law (OAL), and the USEPA. During the latter part of 2017, the City would work with RWB and USEPA staff to develop and complete a regulatory package, consistent with EPA guidance. This effort is expected to provide regulatory certainty in moving ahead on construction improvements associated with the Vista Grande Drainage Basin Improvements Project.

Daly City believes that Project 3.9 should be given a high priority ranking based on the ranking criteria and scoring provisions used in the 2012 Triennial Review, summarized below.

1) Water Board Mission (Protect Beneficial Uses) – Project 3.9 would provide the RWB with refined water quality objectives and implementation provisions for DO and pH to more precisely assess maintenance and protection of beneficial uses in Lake Merced and potentially in other waterbodies throughout the Region (*i.e.,* there may be some synergy between work conducted for Project 3.9 and Project 3.1 "Consider Refinement and/or Development of Site-Specific Objectives for Dissolved Oxygen in San Francisco Bay")

2) Staff Resources Already Invested – RWB staff have been working with the City and SFPUC on various aspects of the Vista Grande Lake Merced Alternative Project since at least mid-2011.

3) External Resources Already Invested – Daly City has invested considerable resources to date coordinating technical information collection (*e.g.,* grab sample and continuous monitoring water quality data), stakeholder outreach, and into investigations into how other States and agencies regulate DO and pH in seasonally stratified lakes like Lake Merced.

4) External Resources Likely Available - As noted above, Daly City intends to continue to provide significant support during the Project 3.9 Basin Plan amendment development and approval processes. Daly City is also funding CEQA/NEPA work for the Project, portions of which will be applicable to the proposed Basin Plan Amendment actions. The draft EIR/EIS is scheduled for release in November 2015.

5) Public Interest – There has been considerable public interest for over a decade in measures to improve lake levels in Lake Merced. California Trout, Inc. filed a petition in January 2001 with the State Water Resources Control Board regarding actions needing to be taken to re-establish and maintain lake levels and

protect beneficial uses. The Lake Merced Alternative Project would help achieve many of the goals cited in the CalTrout Petition.

6) Input from Internal Divisions – Daly City has been coordinating this Project with the Watershed Management/Stormwater NPDES group, the Basin Planning/TMDL group, and with RWB management. The RWB provided a letter of concurrence to Daly City in May 2013 indicating their support for the Basin Plan Amendment and 303(d) process strategy proposed by Daly City for the Vista Grande Project.

7) Implement State Water Board Policy – As noted above, the Lake Merced Alternative Project would capture, treatment and beneficially reuse Vista Grande stormwater that would otherwise by discharged unused to the Pacific Ocean. This is consistent with the SWB Recycled Water Policy, Stormwater Strategic Initiative, and other Green Infrastructure initiatives by the SWB and USEPA.

8) U.S. EPA Priority – Daly City and its consultants have contacted USEPA staff and obtained their general concurrence with the proposed approaches to addressing the DO and pH 303(d) listings of Lake Merced. It was USEPA that added Lake Merced in 2003 to the 303(d) list. However, EPA established "a low priority for this listing based on the considerations that no specific beneficial use impairments have been associated with DO and pH problems in the Lake, and that additional monitoring is warranted to verify these listings prior to developing TMDLs."

9) Geographic Scope – Triennial Review Project 3.9 would be specific to Lake Merced, recognizing the site specific conditions unique to the Lake:

- **Terminal Lake.** No outflow and elevated alkalinity
- **Polymictic.** Intermittent stratification and mixing
- **Coastal influence**. Low temperatures, prevailing winds, fog
- **Artificially maintained coldwater fishery.** CDFW stock rainbow trout
- **Self-sustaining warmwater recreational fishery.** Native and non-native species
- **Potential emergency water supply for San Francisco.** Fire flow and sanitation

However, some aspects of the DO and pH Basin Plan Amendment modifications may help inform related work on refining DO objectives for other waterbodies in the Region (*e.g.,* Project 3.1).

10) Low Controversy and Low Technical Complexity – Much of the background work necessary to support the Basin Plan Amendment changes that would be conducted under Project 3.9 has already been completed. There are precedents for the proposed DO and pH regulatory changes based on approach adopted in other States (DO measured in epilimnion) and by USEPA (pH freshwater quality criteria of 8.5 to 9.0). Therefore it is not believed that Project 3.9 would be considered controversial or technically complex.

In conclusion, Daly City appreciates the opportunity to provide these comments on the 2015 Triennial review and looks forward to working with RWB staff on Project 3.9. If you have any questions, please feel free to contact me.

Sincerely,

Patrick Sweetland, Director
Department of Water and Wastewater Resources

L15-067

June 7, 2018

San Francisco Bay Regional Water Quality Control Board
Attention: Richard Looker
1515 Clay Street, Suite 1400
Oakland, CA 94612

VIA ELECTRONIC MAIL: rlooker@waterboards.ca.gov

Re: Comments - 2018 Triennial Review of the Water Quality Control Plan for the San Francisco Bay Basin

Dear Chair Young and Board Members:

On behalf of the Earth Law Center (ELC) and Living Rivers Council (LRC), we welcome the opportunity to submit these comments in support of the San Francisco Bay Regional Water Quality Control Board's (SFRWQCB) prioritization to develop flow criteria for select Bay Area stream and rivers, as described in Section 3.11 of the 2018 Triennial Review of the San Francisco Bay Basin Water Quality Control Plan ("2018 Triennial Review"). While we strongly support the inclusion of Section 3.11 in the 2018 Triennial Review, we do have two requests to strengthen and focus efforts to protect flows. First, we ask the SFRWQCB to elevate Section 3.11's flow criteria development to a "high priority" item. Second, we ask that the Napa River (or Napa River Watershed) be the first to receive the aforementioned flow criteria, followed by other priority waterways that suffer from low flows.

The Napa River (or Napa River Watershed) should be the first to receive such flow criteria due to its severe flow challenges and resulting ecosystem harms. The Napa River suffers from severe dewatering due in large part to excessive groundwater pumping as well as surface water diversions and multiple periods of low rainfall.[1] The excessive groundwater pumping in the area, and the hydrologically connected surface water, has led to severely reduced instream flows, often leaving parts of the Napa River nearly or completely dry. This altered flow results in negative impacts on, at minimum, the following beneficial uses of the Napa River: cold freshwater habitat, warm freshwater habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, commercial and sport fishing, and contact and non-contact water recreation.

Of the impacted beneficial uses in the Napa River, one of particular concern is the adverse effect the dewatering has had on aquatic life. Examples of negatively affected species are: steelhead

[1] See e.g. Napa River Flow Enhancement Study, "Center for Ecosystem Management and Restoration" (2013).

trout, fall-run Chinook salmon, and the endangered California freshwater shrimp[2]. The steelhead trout, a "threatened" species according to the Endangered Species Act, once averaged approximately 6,000 to 8,000 fish, and now are estimated to be up to only 1,000 fish.[3] As for the Chinook salmon, while they may have originated as strays from other basins,[4] it appears they are recolonizing to the Napa River, and they require adequate river flows to survive.[5] If action is not taken, these species could end up completely eradicated from the Napa River. This is what happened to the Coho salmon, which at one point numbered in the thousands, but by the 1960s had been extirpated from the Napa River.[6]

In addition, according to both fisheries biologist Patrick Higgins and the National Marine Fisheries Service (NMFS), flow data shows stream flows in the Napa River have been decreasing since the 1960s. According to Mr. Higgins' research, minimum 30-day average stream flows and minimum 7-day averages have shown a declining trend between 1960-2013.[7] The NMFS's data shows that the Napa River has experienced an increase in zero-flow days over time.[8]

We believe that the 2018 Triennial Review offers an opportunity to focus needed attention of SFRWQCB staff to address the decades-long trend of flow-related harms in the Napa River. Section 3.11 of the SFRWQCB's 2018 Triennial Review calls upon staff to look at which "anthropogenically reduced flows may be harming beneficial uses related to aquatic life" and to "determine which water bodies in the region have beneficial uses at risk from reduced flows."[9]

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[2] Napa County Resource Conservation District, "Northern Napa Watershed Plan" (Report prepared for the California Department of Fish and Game) (Apr. 2002), at: http://naparcd.org/wp-content/uploads/2014/10/NorthernNapaRiverWatershedProjectFinalReport2002.pdf.

[3] Napa River Watershed Steelhead and Salmon Monitoring Program, Napa County Resource Conservation District, at: http://naparcd.org/wp-content/uploads/2016/09/Fish-monitoring-fact-sheet-2016.pdf.

[4] Jonathan Koehler & Paul Blank, "Napa River Steelhead and Salmon Monitoring Program - 2015-16," Napa County Resource Conservation District, p. 8 (Sept. 2016), at: http://naparcd.org/wp-content/uploads/2016/09/2016- Napa-River-Fish-Monitoring-Report-and-Attachments.pdf.

[5] Stillwater Sciences and W.E. Dietrich, "Napa River Basin Limiting Factors Analysis. Technical Report," Prepared for the San Francisco Regional Water Quality Control Board and California State Coastal Conservancy (2002), at: http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/napasediment/lfa_tech_report.pdf; see also Napa County RCD, "Napa River Watershed Steelhead and Salmon Monitoring Program," at: http://naparcd.org/wp-content/uploads/2016/09/Fish-monitoring-fact-sheet-2016.pdf.

[6] Watershed Information & Conservation Council, "Native Fish," at: www.napawatersheds.org/app_pages/view/126.

[7] As noted by fisheries biologist Patrick Higgins, "Anderson (1969) chronicled problems with insufficient tailwater flows to support steelhead trout below [Napa Valley] dams, a condition that persists to this day." See letter from Patrick Higgins to San Francisco Bay Regional Water Quality Control Board, "Re: Proposal to Remove the Napa River and Sonoma Creek from the California Impaired Water Bodies (303d) List for Nutrient Pollution" (Jan. 10, 2014), at: www.waterboards.ca.gov/sanfranciscobay/board_info/agendas/2014/February/6C.pdf.

[8] NMFS notes that "[s]ome of the increase may be due to the St. Helena gauge being relocated in 2005." See Letter from National Marine Fisheries Service (NMFS) to the California Department of Water Resources (DWR), Re: "Napa County's December 26, 2016 submission of an Alternative Groundwater Sustainability Plan (Napa Alternative Plan) to the DWR pursuant to the Sustainable Groundwater Management Act (SGMA) of 2014 and Subsequent Emergency Regulations," p. 3 (Feb. 15, 2017).

[9] San Francisco Bay Regional Water Quality Control Board, "San Francisco Bay Basin Water Quality Control Plan's 2018 Triennial Review, Section 3.11 (April 2018), at: https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/planningtmdls/ basinplan /web/docs/Triennial_Review/Brief_Issue_Description_2018_Triennial_4-18-18%20post.pdf.

Provided the multiple beneficial uses of waterways like the Napa River and those waterways' negatively impacted state, we ask the SFRWQCBV to elevate Section 3.11's flow criteria to a "high priority" for the 2018 Triennial Water Quality Control Plan. In addition to this elevated priority, we recommend that, in accordance with SFRWQCB's prioritization to develop flow criteria for selected bay area stream and rivers, the Napa River (or Napa River Watershed) be the first to receive such flow criteria.

Thank you for the opportunity to submit these comments. If you have any questions or would like additional information, please do not hesitate to contact us.

Sincerely,

Grant Wilson
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510-566-1063

Michael A. DeLorenzo
Water Law Associate, Earth Law Center
adelorenzo@earthlaw.org

Chris Malan
Manager, Living Rivers Council

June 8, 2018

California Regional Water Quality Control Board, San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612
Attn: Richard Looker

Submitted via email: rlooker@waterboards.ca.gov

Subject: Triennial Review Comments

Thank you for the opportunity to provide comments on the 2018 Triennial Review of the Water Quality Control Plan for the San Francisco Bay Region. These comments include proposals to add several additional issues to the list of priority projects to be investigated during the review period.

The comments address issues potentially impacting stormwater permittees, including the municipalities subject to the Phase I and Phase II permits, industries regulated by the Industrial General Permit, and construction projects subject to the Construction General Permit.

The comments focus on current Basin Plan objectives that potentially cause waterways to be identified as impaired or that result in potential permit violations when, in fact, no environmental harm or public health risk is present. Modifying these objectives by adopting U.S. EPA recommended water quality criteria and by making other science-based changes will allow the regulated community to focus on pollutants and water quality conditions with demonstrated adverse effects on water quality. Hopefully, these comments are useful as the Regional Board considers revisions to the Basin Plan.

My comments are attached. They are not submitted on behalf of any organization or government agency. If you have any questions, please contact me at (510) 843-7889 or fkrieger@msn.com.

Sincerely,

Fred Krieger

Attachment A: Comments on the Triennial Review for the San Francisco Bay Region

Attachment B: Natural Background Concentrations during Wet Weather in Several California Creeks

Attachment A - Comments on the Triennial Review for the San Francisco Bay Region

Comment 1: Adoption of the U.S. EPA 2007 recommended freshwater criteria for copper (related to Issue 3.9)

The Regional Water Board should consider adoption of U.S. EPA's 2007 recommended water quality criteria for copper as the applicable freshwater copper objectives in the San Francisco Bay Region. These EPA criteria are based on the Biotic Ligand Model (BLM) which more thoroughly takes into account local water chemistry compared to the current copper criteria which are based on the 2000 California Toxics Rule.

As discussed in the *Brief Issue Descriptions*, a review for possible adoption of updated U.S. EPA criteria is required by the 2015 modifications to the federal water quality standards (WQS) regulations. Updating the Basin Plan with the 2007 copper criteria will potentially save dischargers the considerable expenditures needed to complete Water Effect Ratio (WER) studies. These studies are currently necessary to produce scientifically-based objectives in the absence of objectives based on EPA's 2007 recommended criteria. Permittees will substantially benefit from adoption of the U.S. EPA criteria. In addition, the Board will be able to more accurately evaluate waterways with respect to copper impairment under section 303(d) of the Clean Water Act.

The potential savings from application of the 2007 copper criteria were also been identified by U.S. EPA when they promulgated the criteria: "We expect that application of this [BLM] model will result in more appropriate criteria and eliminate the need for costly, time-consuming site-specific modifications using the water effect ratio."[1]

The current freshwater objectives for copper in the Region are based on the criteria promulgated by U.S. EPA in the May 18, 2000, California Toxics Rule (CTR). The CTR values are based on U.S. EPA's recommended copper criteria issued in 1984. U.S. EPA revised the freshwater aquatic life copper criteria with the 2007 update. The current CTR copper standards consider only the effects of hardness on the bioavailability and toxicity of copper. Because these standards do not account for the effects of pH, natural organic matter, and other characteristics they can be overly stringent or underprotective (or both, at different times).[2]

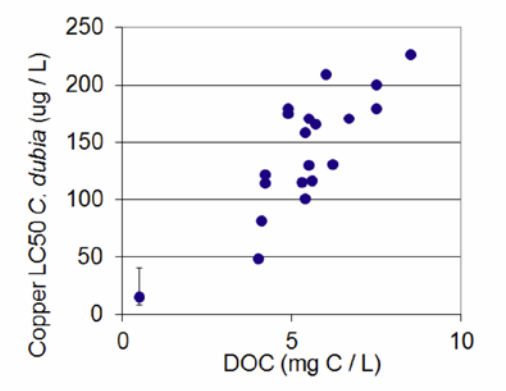
The outdated CTR standards for copper negatively impact many stormwater permittees without providing a benefit to water quality. Available monitoring data indicates that copper frequently exceeds the hardness-based CTR copper standards at the point of discharge from MS4 outfalls and this conclusion is supported in the National Stormwater Quality Database. Most stormwater permits require the discharge to not *cause or contribute to exceedances of water quality standards* in the receiving water. Exceedances identified by monitoring can result in permit violations. The permits also require stormwater dischargers to implement revised programs or best management practices to address exceedances. Unfortunately, treatment BMPs to adequately reduce copper concentrations are generally not feasible. Consequently, permittees must develop site-specific objectives to help bring their discharges into compliance.

[1] U.S. EPA. *Aquatic Life Ambient Water Quality Criteria - Copper, 2007 Revision*. EPA-822-R-07-001. February 2007, available here. The model being referred to is the biotic ligand model which is the basis for the EPA criteria.
[2] U.S. EPA Office of Science and Technology, Presentation, Water Quality Standards Academy. *Biotic Ligand Model and Copper Criteria*. March 2016, available here.

Development of site-specific objectives typically requires several million dollars in permittee expenditures and many years of effort.

For most waterways, the problem of exceedances and apparent risk to aquatic organisms could be resolved with adoption of the U.S. EPA 2007 criteria which are based on the BLM. As discussed, the BLM takes into account more local water chemistry parameters compared to the current CTR criteria. Dissolved organic carbon (DOC), pH, and other parameters used in the BLM significantly affect toxicity and the BLM approach presents a better assessment of risk to aquatic organisms. For example, DOC by itself can have a very significant impact on toxicity:[3]

Variability of Copper Toxicity with Dissolved Organic Carbon (DOC)



(LC50 is the lethal concentration of a chemical that will kill 50% of the sample population under scrutiny.)

In addition, U.S. EPA's Science Advisory Board (SAB) has found that, in general, the BLM can "significantly improve predictions of the acute toxicity of certain metals across an expanded range of water chemistry parameters compared to the WER".[4]

The copper exceedance problem is being at least partially addressed by source control, especially controls directed at copper released from brake pads which are a major source. SB 346 (2010, Kehoe), established a program that will eventually eliminate copper use in brake pads. While the changeover in brake pad constituents will significantly reduce copper concentrations in stormwater runoff, the full reductions will occur many years in the future due to the lag time for changing out on-road brakes. In addition, the brake pad phase-out is unlikely to completely solve the problem of exceedances of the current CTR criteria. Full implementation of the copper phase-out has been estimated to remove up to roughly 60% of the copper from urban runoff. This estimate is supported by the CASQA report, *Estimated Urban Runoff Copper Reductions Resulting from Brake Pad Copper Restrictions*.[5] Consequently, more reductions—beyond those resulting from the brake pad phase out—will be needed to comply with current, non-updated, CTR standards. The costs for site-specific standards and related compliance problems will be avoided if the Regional Water Board adopts the U.S. EPA 2007 updated criteria for copper.

[3] EPA Presentation, Water Quality Standards Academy, *Biotic Ligand Model and Copper Criteria*, March 2016, available here.

[4] U.S. EPA. *An SAB Report: Review of the Biotic Ligand Model of the Acute Toxicity of Metals*, EPA-SAB-EPEC-00-006. February 2000, available here.

[5] CASQA. *Estimated Urban Runoff Copper Reductions Resulting from Brake Pad Copper Restrictions*. 2016, posted here.

The discussion in the *Brief Issue Descriptions* for Item 3.9 suggests that adoption of EPA's revised criteria is best done at the state level:

> *Moreover, it is often the case that adopting any new or revised 304(a) criteria is more appropriately and efficiently accomplished by the State Board because the criteria should apply statewide rather than to a single region.*

However, adoption of statewide criteria often takes many years because of the many stakeholders. For example the statewide toxicity provisions (public notice released in 2010) have still not been adopted.

Suggestion:

1. Prioritize the adoption and incorporation into the Basin Plan of the U.S. EPA 2007 recommended criteria for copper (freshwater).

***Comment 2*: Reconsideration of Drinking Water Standards applied as surface water standards (related to Issue 3.13)**

The San Francisco Bay Region Basin Plan currently incorporates key primary and secondary drinking water standards (i.e., maximum contaminant levels, MCLs) as water quality objectives (WQO). These are shown in Table 3-5 and are also included by reference to Title 22, California Code of Regulations. These objectives apply to waterways with the municipal and domestic supply beneficial use (MUN). Most freshwaters in the Basin Plan are designated as MUN waterways. Several of the MCLs are natural constituents (or parameters) including aluminum, iron, and turbidity, and are consistently exceeded during wet weather even in natural (un-impacted) waterways. This results in stormwater discharges exceeding the standards even when no risk exists to aquatic organisms or human health.

The problematic primary MCL is aluminum (MCL = 1 mg/L) and the problematic secondary MCLs are aluminum, (MCL = 0.2 mg/L), iron, and turbidity. Other MCLs, such as the secondary MCLs for copper, manganese, silver, and zinc may also cause exceedances in some situations due to natural sources. The secondary MCLs are "Consumer Acceptance Contaminant Levels" and were developed for finished drinking water. The secondary MCLs are not federally enforceable by EPA with respect to drinking water. However, because the Board has adopted the MCLs as surface water standards, these MCLs are fully enforceable for discharges into these waterways.

Exceedances of iron and aluminum objectives

Typically, many natural surface waters exceed several of the secondary MCL-based objectives during wet weather and also in dry weather depending on the waterway. These exceedances occur during wet weather because turbidity in waterways becomes naturally elevated and surface soils are mobilized at higher concentrations. For example, iron and aluminum together constitute roughly 11% of natural surface soils in California. As shown in Table 1, very low concentrations of these soils in waterways or in urban stormwater runoff result in non-compliance with water quality objectives derived from the secondary MCLs.

Table 1 – Estimated Concentration and Potential Exceedances when Suspended Solids in Waterways are Composed of Natural Soils

Constituent	Background Concentration in California Soils (1)	Concentration (assuming total suspended solids = 100 mg/l) (2)	Water Quality Objectives Based on Secondary MCLs
Aluminum	7.3%	7.3 mg/l	**0.2 mg/l**
Iron	3.7%	3.7 mg/l	**0.3 mg/l**

(1) Average; UC Riverside, 1996, available here

(2) Additionally assuming that most or all of the Al and Fe is in particulate form.

A total suspended solids (TSS) concentration of 100 mg/L was used in the table because waterways un-impacted by human activity will often have TSS concentrations above 100 mg/L during wet weather. In addition, 100 mg/L is a typical value in stormwater runoff from highways and urban areas. This value is also used as the annual numeric action level (NAL) in the Industrial General Permit (IGP). It is clear from the table that exceedances of the MCL-

based objectives due to natural soils in stormwater runoff will be common even when TSS levels are much lower than 100 mg/L.

The likelihood of exceedances of Fe and Al MCLs in natural (i.e., un-impacted) waterways are also suggested by research conducted by the Southern California Coastal Water Research Project. The researchers assessed seventeen natural southern California creeks during wet weather and found a median TSS of 184 mg/L (see Attachment B). Using an estimated TSS value of 100 mg/L is therefore likely conservative.

The secondary drinking water standards were developed to apply to drinking water after treatment. In fact, most drinking water treatment plants often add iron or aluminum salts or both to promote coagulation, flocculation and precipitation. For example, aluminum sulfate (alum) is typically added in a 50% solution at about 20 mg/L.

The primary MCL (1 mg/L) is higher than the secondary MCL (0.2 mg/L) but also creates a compliance problem. This is demonstrated by a historical evaluation of aluminum concentrations in Ventura County waterways during wet weather. The Ventura Countywide Stormwater Quality Management Program (VCSQMP) prepared an assessment of aluminum in three major watersheds.[6] This assessment found that 74.2 percent of all wet weather water quality samples collected by the VCSQMP exceeded 1 mg/L. However, in natural watersheds upstream from anthropogenic activities, 100% of wet weather samples exceeded 1 mg/L.

Exceedances of turbidity objective

The secondary MCL for turbidity is 5 NTU. This parameter is also a major concern when used as a surface water objective because it is often exceeded due to natural sources. In dry weather turbidity levels can be below 10 NTU, but turbidity levels of 100 NTU or higher are not unusual during wet weather.

Suggestions:

1. Focus implementation of MCL-based standards on those pollutants or parameters which will potentially impact finished drinking water, i.e., those constituents not adequately controlled by standard drinking water treatment (e.g., dissolved constituents such as TDS, chloride, sulfate).
2. Consider alternative approaches for regulating the problematic constituents or parameters identified above. For example, an alternative approach for addressing the secondary MCLs is being considered by the Central Valley Board during their Triennial Review. Their *Issue 6: Secondary Maximum Contaminant Levels (MCLs) as Water Quality Objectives for Surface and Ground Waters* will assess the option of determining compliance with secondary MCLs by using a filtered water sample for metals, color and turbidity. If MCLs must be applied to surface waters this may be an appropriate approach because it will eliminate most of the problems caused by natural constituents normally present in waterways, especially during wet weather.

[6] Larry Walker Associates. *Historical Data Evaluation of Aluminum in the Ventura River, Santa Clara River, and Calleguas Creek Watersheds*. 2014.

Comment 3: **Update zinc criteria using the Biotic Ligand Model**

Similar to copper, the water quality objectives for zinc should be updated based on a Biotic Ligand Model. The BLM more accurately assesses the risk of aquatic toxicity compared with the current objective which is only hardness dependent. Similar to copper, zinc in stormwater runoff is caused by sources outside the control of MS4s. These sources include tires which typically contain about 1% zinc and also galvanized surfaces. The on-road abrasion of tire tread results in both airborne and surface particulates containing zinc. Much of this zinc remains on road surfaces or nearby and eventually is washed away by rain and carried by stormwater runoff into waterways containing aquatic organisms. Aerially transported zinc particles are deposited onto land surfaces and may also be carried by stormwater into waterways. During wet weather, most of the zinc loadings are in particulate form in the storm water runoff.

Updating the zinc objective is particularly critical because of the difficulty of dischargers complying with the current zinc objectives at the point of discharge. CASQA has submitted a petition regarding zinc in tires to the California Department of Toxic Substances Control (DTSC) Safer Consumer Products program. However, zinc is not currently on the DTSC CalSAFER Priority Products list and placing it on the list is a multi-year process. If zinc is listed, a significant amount of time will be needed for industry to complete the necessary studies to evaluate the potential for replacing zinc in tires. If ultimately approved by DTSC, the changeover in the zinc composition of tires will also take many years similar to the copper phase-out from brake pads. In addition, reductions in zinc from tires may not be adequate to bring urban discharges into compliance.

Suggestion:

1. Apply available versions of the BLM for zinc in developing a new water quality objective for zinc..

Attachment B - Natural background concentrations of total suspended solids during wet weather in southern California creeks

(*Flow weighted mean concentrations*)

Site name	TSS mg/L
Arroyo Seco	107.03
Arroyo Sequit	461.24
Bear Creek Matilija	242.25
Bear Creek WFSGR	6.29
Bell Creek	93.41
Chesebro Creek	200.85
Cattle Creek EFSGR	223.76
Coldbrook NFSGR	54.25
Cristianitos Creek	4,689.18
Fry Creek	11.08
Mill Creek	0.25
Piru Creek	5,454.92
Runkle Canyon	2,375.17
Santiago Creek	13.97
Sespe Creek	51,969.43
Silverado Creek	38.70
Tenaja Creek	184.15
Median	***184***

Excerpted from: Stein, E. and V. Yoon. 2007. Assessment of Water Quality Concentrations and Loads from Natural Landscapes. Southern California Coastal Water Research Project Technical Report 500. February 2007. Appendix VIII: Wet weather concentrations, loads, and fluxes for each study site; available: ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/500_NL_APPENDIX_VIII.pdf

PUBLIC WORKS
CITY OF PALO ALTO
2501 Embarcadero Way
Palo Alto, CA 94303
650.329.2598

June 7, 2018

Attn: Richard Looker
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

VIA EMAIL: rlooker@waterboards.ca.gov

Subject: City of Palo Alto Comments on the 2018 Triennial Review for the San Francisco Bay Basin Water Quality Control Plan

Dear Mr. Looker,

The City of Palo Alto appreciates the opportunity to comment on the 2018 Triennial Review of the San Francisco Bay Basin Water Quality Control Plan (Basin Plan). The City of Palo Alto owns and operates the Regional Water Quality Control Plant (RWQCP), a wastewater treatment plant that serves approximately 220,000 residents from the communities of the East Palo Alto Sanitary District, the City of Mountain View, City of Los Altos, Town of Los Altos Hills, City of Palo Alto, and Stanford University. The RWQCP discharges highly treated wastewater to the South San Francisco Bay.

The City of Palo Alto supports the triennial review process and applauds the improvements made to the Basin Plan through this process in recent years. The current list of issues proposed for review in the Brief Issue Descriptions for the 2018 Triennial Review of the San Francisco Bay Basin Water Quality Control Plan that was developed by the San Francisco Bay Regional Water Quality Control Board (Regional Board) addresses roughly two dozen topics that affect broad sections of the residents, businesses, and public agencies of the San Francisco Bay Area.

The City of Palo Alto offers the following comments made with reference to the issues in the order of the Triennial Review for consideration:

Issue 2.1 – Add Unnamed Water Bodies that Receive Discharges
As with the 2015 Triennial Review, the City remains in support of naming these water bodies and in particular is interested in naming the outfall channel from the RWQCP to the South Bay under this effort.

Issue 3.1 – Review and Refine Dissolved Oxygen Objectives for San Francisco Bay
The City supports reviewing the applicability of the current dissolved oxygen standard for tidal sloughs and other San Francisco Bay margin habitats. The City supports the

approach of developing allowable exceedances or site-specific objectives for these unique ecosystems that naturally fluctuate in dissolved oxygen levels routinely below the current Basin Plan's objective of 5.0 mg/L.

Issue 3.4 – Develop Numeric Nutrient Endpoints (NNEs) in Freshwater Streams and Estuaries

The City supports the Regional Board's continued commitment to informing management decisions by science.

Issue 4.2 – Using Wastewater to Create, Restore, and Enhance Wetlands

The City supports the use of wetlands to provide additional water quality treatment while concurrently increasing wetland habitat and sea level rise resiliency. As such, the City supports the Regional Board's efforts to clarify permitting requirements that could be a hindrance to the reuse of wastewater effluent for restoration and enhancement of wetland habitats.

Issue 4.3 – Update Cyanide Dilution Credits

The City of Palo Alto agrees and strongly recommends that Table 4-6 be updated to add cyanide dilution credits for shallow water dischargers and other discharge locations that are not listed in the table.

Thank you for the opportunity to comment on the 2018 Triennial Review and for considering our input. The City of Palo Alto is available for any discussion and further participation in this process.

Sincerely,

FOR PB

Phil Bobel
Assistant Director of Public Works, Environmental Services Division

April 24, 2018

Mr. Richard Looker
Regional Water Quality Control Board
By email

Re: Trienniel Review

Dear Mr., Looker,

The Creeks Coalition urges the Regional Board to place issues related to our streams at the top of your priorities for the coming three years. The streams tributary to San Francisco Bay have suffered greatly by not being a higher priority with respect to water quality objective development and clarification and with respect to basin plan implementation strategies considering recent case law.

I would like to commend the Regional Board on the inclusion of the following issues as candidates for the triennial review:

1. Issue 3.10: Temperature Limits to Protect Salmonids
2. Issue 3.11: Develop Flow Criteria for Selected Bay Area Streams and Rivers
3. Issue 6.1: Clarify Turbidity Water Quality Objective

With respect to turbidity, I would recommend that the Issue be expanded to include looking at trigger levels below 50 NTU since at least one technical study has cited sublethal adverse impacts at 30 NTU. In "Effects of Turbidity and Suspended Solids on Salmonids", Jeff Bash, Cara Berman, Susan Bolton, Nov 2001, the following impacts of turbidity were cited:
a. Salmonid populations not normally exposed to high levels of natural turbidity or exposed to anthropogenic sediment sources may be deleteriously affected by levels of turbidity considered to be relatively low (18-70 NTU) (Gregory 1992). Low levels of turbidity appear to correspond to sediment concentrations that may adversely affect coldwater salmonids (Lloyd 1987).
b. The presence of suspended sediments in the water column has been shown to produce gill trauma in sockeye underyearlings (Servizi and Martens 1987); gill flaring in response to short term sediment pulses (Berg 1928; Bern and Northcote 1985) and increased coughing frequency (Servizi andMartens 1992).
c. Cough frequency is a sub lethal effect that impairs the respiratory ability of salmonids. Servizi and Martens (1992) examine the effect of sub lethal concentrations of Fraser River suspended sediments on underyearling coho salmon. Cough frequency was elevated eightfold over control levels at turbidity of 30 NTUs.

With respect to Issue 5.1 (Priorities for TMDL Development), I strongly urge that you include the Los Gatos Creek Temperature TMDL as a priority TMDL and the Coyote Creek Temperature TMDL. Since the Regional Board staff have gone to the trouble of evaluating the Los Gatos Creek Temperature Data and are in the process of preparing a recommendation for temperature impairment for Los Gatos Creek, I strongly urge you to make the Los Gatos Creek Temperature

Santa Clara County Creeks Coalition. PO Box 1266 Healdsburg, CA 95448 email: info@sccreeks.org · www.sccreeks.org

TMDL a high priority. Similarly, Dr. Jerry Smith's December 2017 report on steelhead sampling in Coyote Creek indicates that temperature problems at Ogier Ponds on Coyote Creek was one of several key factors leading to the extirpation of steelhead trout in Coyote Creek during the recent drought. (See Attachment 1).

With respect to Category 4 (Update Implementation Plans), I would strongly urge that you include the following issues:
4.5: Clarify definition of "discharge" with respect to discharges from instream impoundments

We propose that the Regional Board consider the following clarification:
"Discharges from instream impoundments that result in exceedances of Basin Plan Water Quality objectives downstream of the impoundments constitute "discharge of waste" under the Porter Cologne Water Quality Act.

Current practice has been to assume that discharges from instream impoundments are not discharges under the Porter Cologne Water Quality Act and therefore not subject to regulation by the Regional Board.

In Lake Madrone Water District v. State Water Resources Control Board, the court held that because the flushing of sediment from a recreational lake that contained a dam into a creek constituted a discharge of waste under the Porter-Cologne Act, the State Water Resources acted properly in ordering the operator to refrain from flushing accumulated sediment into the creek and to submit a cleanup plan. The Court of Appeal affirmed, holding that the collected sediment constituted "waste" under § 13050(d) of the California Water Code and the District had "discharged" it under § 13304. The court explained that the collected sediment constituted "waste" because the dam was "built by humans in aid of habitation" and, by concentrating silt, "change[ed] [an] innocuous substance into one that is deadly to aquatic life." Id. at 169. The court further explained that the District "discharged" the waste because CWA's definition of "discharge" does not control its meaning in § 13304 of the California Water Code, which contains a "broader definition" of "discharge." Id. at 171-72.

Clarification of the definition of "discharge" with respect to discharges from instream impoundments and clarification of the division of responsibility for issue investigation, development of proposed remedies, and appropriate regulatory process for requiring implementation will facilitate the resolution of water quality problems not currently being address under existing programming."

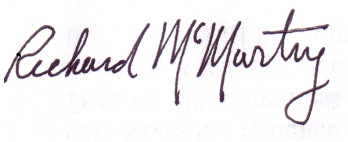
4.6: Clarify the programmatic relationship between the Regional Board and the Division of Water Rights with respect to discharges from instream impoundments

It has been the practice of the Regional Board to defer to the Division of Water Rights all issues with respect to discharges from instream impoundments due to their superior authority to regulate such discharges. However, there is evidence that there are many water quality problems caused by instream impoundments that are not on workplans of the Division of Water Rights and there is evidence that recent case law empowers the Regional Board to use its Porter Cologne authority to address such discharges. One implementation strategy to be investigated during the triennial review is that the Regional Board use its Porter Cologne authority to investigate water quality

issues related to discharges from impoundments, develop proposed remedial actions and make recommendations to the Division of Water Rights for implementation.

Clarification of the division of responsibility between the Regional Board and the Division of Water Rights would facilitate resolution of water quality problems from instream impoundments not currently being addressed.

Sincerely



Richard McMurtry

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Santa Clara Valley Water District

June 8, 2018

Delivered via e-mail to rlooker@waterboards.ca.gov

Mr. Richard Looker
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subject: Comments Regarding 2018 Triennial Review of the Water Quality Control Plan for the San Francisco Bay Basin

Dear Mr. Looker:

The Santa Clara Valley Water District (District) appreciates the opportunity to comment on the 2018 Triennial Review of the San Francisco Bay Basin Water Quality Control Plan (Basin Plan). The list of issues proposed for review in the Brief Issue Descriptions developed by the Regional Water Quality Control Board (Regional Board) addresses topics that affect the District's responsibilities for managing water supply, flood protection, and environmental stewardship. Our recommendations are based on our mission to provide Silicon Valley safe, clean water for a healthy life, environment, and economy.

The District respectfully submits the following comments on the Triennial Review of the Basin Plan. Comments are organized by the numbering used in the Issue Descriptions but ranked in descending order of the District's assignment of importance.

Item 5.2 Climate Change and Water Resources Policy

The District supports constructive policy development on critical issues pertaining to climate change in the San Francisco Bay Area. This important goal warrants regional, statewide, and global attention to guide future local water-related development.

Item 3.12 Incorporate Statewide Mercury Objectives into the Basin Plan

The District supports incorporation of statewide mercury water quality objectives into the Basin Plan. We look forward to clarification of the applicability of new objectives to various waterbodies.

Item 2.4 Stream and Wetland Systems Protection Policy

As a stakeholder with interests in the jurisdictions of several Regional Water Boards, the District supports consistency of stream and wetland system policy across the state. Given the highly modified and developed nature of many waters of the State (e.g., urban storm water channels), we hope the State and Regional Boards do not neglect practical considerations which often preclude enhancement to natural hydrologic regimes. Careful language will be needed to ensure that a beneficial use designated for "enhancement" is appropriately and predictably

applied in regulatory actions, consistent with applicable legal requirements for mitigation of a project's adverse impacts.

Item 2.6 Designate Tribal Tradition and Culture, Tribal Subsistence Fishing, and Subsistence Fishing Beneficial Uses in the San Francisco Bay Region

Although not mentioned in the Issue Description, valid stakeholder input must also consider owners and operators of potentially affected waterbodies, many of whom, like the District, can provide valuable insight and data into existing conditions. The District encourages the Regional Board to reach out to owners and operators of the waterbodies being considered for designation with these new beneficial uses.

Item 4.4 Revise Instantaneous Chlorine Limit

The District supports Regional Board efforts to explore options to address chlorine residual limits.

Item 3.5 Review and Implement Biological Assessment Tools

The District supports this proposal and recommends that input from qualified local stakeholders with professional knowledge be used to develop effective and practical assessment tools. Clarification of the extent of Regional Board authority would be appreciated, but it is equally important to ensure that assessment tools avoid potentially duplicative or inconsistent regulatory determinations among natural resource agencies with overlapping jurisdictions.

Item 3.10 Temperature Limits to Protect Salmonids

The District is concerned how temperature thresholds and temperature ranges will be established since District streams are located at the southern extent of the central California coast steelhead range and in an arid climate. Since published research and data are lacking about salmonid adaptations to local conditions, the District is concerned about the reliance on other out of basin systems as a reference that does not correlate to District streams. District streams are small and flashy and the use of large North Coast or Central Valley rivers as reference data are not representative of local conditions and will not extrapolate well for our region. We respectfully request that the regional Board defer to National Marine Fisheries Service and California Department of Fish and Wildlife on this issue.

The District is very familiar with the Intrinsic Potential model. The proposed model's applicability to local waterbodies is flawed and an associated publication admitted to a "high bias" for our region. The District does not recommend further use of this model due to its applicability to a broad geographic area that does not suit our urban environment at the peripheral range for steelhead.

Item 3.11 Develop Flow Criteria for Selected Bay Area Streams and Rivers

Environmental flow targets are being discussed in many regional forums. The District feels these efforts under the basin plan would be redundant and may in fact conflict with other ongoing efforts regionally. In addition, CDFW, NMFS and the State Board already regulate and advise on environmental flow issues. This seems to go beyond the charge of the Regional Board and potentially conflict with other regulatory direction and water rights.

We respectfully request that the Regional Board consider these comments as it develops appropriate amendments to the Basin Plan. Thank you for this opportunity to participate in the Triennial Review process. Please feel free to contact Kurt Lueneburger on my staff if you have any questions at 408.630.3055 (klueneburger@valleywater.org).

Sincerely,

Melanie Richardson, P.E.,
Chief Operating Officer, Watersheds

Fish Population Sampling In 2017 on Coyote Creek

Jerry J. Smith, Emeritus Professor
Department of Biological Sciences
San Jose State University

17 December 2017

ABSTRACT

Severe drought and cut-backs in the delivery of imported water via the San Felipe Pipeline resulted in substantial reductions in reservoir and pipeline releases to Coyote Creek from early February 2014 through March 2016. Despite the flow cut-backs, adult steelhead (*Oncorhynchus mykiss*) had access and spawned in Coyote Creek between Ogier Ponds and Anderson Reservoir during the very brief passage window in early February 2014; however, the brief and very early passage window would have prevented almost all steelhead smolts reared in 2013 or 2012 from successfully emigrating in 2014. In 2015, despite more rain and runoff into Anderson Reservoir, the reduced pipeline and reservoir releases that began in February 2014 were continued, and there was no downstream flow continuity to provide adult fish passage. No young-of-year (YOY) steelhead were captured in 2015, and most steelhead reared in 2014 were not found at sampled sites and therefore likely smolted and attempted to emigrate. However, considering the persistent lack of suitable flow conditions in downstream reaches of Coyote Creek, any steelhead smolts that attempted to emigrate would have been trapped in the dry-back zone and/or lost to bass (*Micropterus* spp.) predation in the Ogier Ponds. In 2016, the lack of connectivity continued until the end of March, when large reservoir releases were made for groundwater percolation and to provide for potential immigration of steelhead adults. However, no juvenile steelhead were captured during fall 2016 sampling. In 2017, despite the flood flows in February and high flows through summer, adult access to spawning and rearing areas upstream of Metcalf Pond would have been possible (although difficult) prior to the flood, during very brief windows during the flood, and after 30 March due to damage at the Metcalf Dam. In addition, poor flow/velocity passage conditions at the Singleton Road apron and culverts would have hindered or prevented adult upstream access during much of the migration period.

Spring-fall stream flows in 2017 were mostly between 30 and 70 cfs in the potential spawning and rearing habitat. Most of the flow come from releases from Anderson Reservoir because of seismic-related reservoir storage limits, rather than from a more equal combination of reservoir and San Felipe Pipeline releases as in previous years. Therefore, water temperatures between the reservoir and the Ogier Pond complex were somewhat cooler than in 2014-2016. Releases warmed over the summer as the reservoir was drawn down towards the mid-level release port. The heating effect of Ogier Ponds maintained very warm water temperatures downstream of the ponds (22-25+°C) as observed in 2014-2016. Temperatures downstream of the ponds were

3-6°C warmer than upstream, because of the large heat capacity within the ponds and the discharge of warm surface water from the ponds. The large amount of stored storm water in Anderson Reservoir atypically resulted in relatively turbid releases throughout summer and fall.

Despite brief windows of potential adult steelhead access and suitable rearing conditions in summer and fall 2017, no juvenile steelhead were captured during sampling at four sites in August or October. Apparently, the last potential smolts to successfully emigrate in Coyote Creek were in 2013. The unsuitable flow conditions, and the barrier at Singleton Road, have resulted in passage bottlenecks that have eliminated most or all steelhead production for the past five years, potentially extirpating steelhead.

Improvements to the steelhead population will require removal of the Singleton Road passage barrier and modification of current release strategies during late winter and spring to provide for adult and smolt passage. Stream flow connectivity for successful migration would improve substantially if releases for aquifer recharge were maintained at a level (30-50 cfs) sufficient to reach Metcalf Pond, particularly when leading up to and during larger storm events. In addition to providing aquifer recharge, these releases would connect with storm runoff from Fisher Creek and from substantial suburban runoff, which would then provide connectivity into and through lower Coyote Creek. Additionally, mid-summer through fall releases similar to those in 2016 or early summer 2017 (30-40 cfs), rather than the much smaller releases in 2014 and 2015, would provide more rearing habitat extent and more optimal fast-water feeding habitat. Cooler water, based upon source (reservoir versus San Felipe Pipeline) and release port elevation in Anderson Reservoir, during all or most of summer and fall, would also improve rearing habitat quality. Finally, re-directing the stream around Ogier Ponds is needed to eliminate the water temperature and predation effects of the ponds.

INTRODUCTION

Summer or fall investigations into the distribution and abundance of rainbow trout/steelhead had not been conducted for decades on Coyote Creek in the reach between Anderson Reservoir and Metcalf Pond until electrofishing was conducted between Anderson Reservoir and Ogier Ponds in September and November 2014 (Leicester and Smith 2014b). Despite the dry conditions in 2014, and the substantial reduction in releases to the stream after early February, presence of rearing YOY indicated that adult steelhead accessed and spawned in the reach between Ogier Ponds and Anderson Reservoir. The streambed dried downstream of Ogier Ponds by late June. YOY steelhead were captured at all three sample sites in both September and November, and despite warm late-summer water conditions, they were large enough to smolt and emigrate by spring 2015, especially with good conditions for growth in most of winter and spring 2015.

However, winter and spring conditions were extremely dry again in 2014-15, so stream connectivity was not restored and adult and smolt migration was not possible. Sampling was

repeated in late June-early July, and in November 2015. Almost all YOY fish reared in 2014 had emigrated, but would have been lost during the attempt to the drying stream farther downstream and/or to predatory bass in the Ogier Ponds (Leicester and Smith 2015). A very few yearling steelhead were still present in June. The attempted emigration by *O. mykiss* indicates that the fish were steelhead; there is no resident rainbow trout population in Coyote Creek downstream of Anderson Reservoir. In 2016, connectivity was not restored to allow potential adult or smolt migration until very late March, when high releases were made for groundwater percolation and to potentially allow late-migrating steelhead adults to access upstream spawning and rearing areas. No juvenile steelhead were captured by fall sampling at four sites in 2016.

In 2017, high stream flows provided some windows in January, February and April for potential adult steelhead to access spawning and rearing habitat upstream of Metcalf Pond and the Ogier Pond Complex. However, few adult steelhead were likely because of the impacts of flow conditions in 2014-2016. Electrofishing sampling was conducted in late August and late October to see if there was successful adult spawning and juvenile steelhead rearing in 2017, following two years without steelhead.

METHODS

Data on stream flow and Anderson Reservoir storage were obtained from the Santa Clara Valley Water District (SCVWD) Automated Local Evaluation in Real Time ("ALERT") website (Anderson reservoir storage, Madrone and Edendale stream gages), and conditions in the streambed were visually assessed irregularly through June. In addition, stream flow conditions upstream of Coyote Reservoir were obtained from the USGS ("near Gilroy") gage, as an index to upper watershed runoff.

Onset Hobo temperature recorders, that recorded every 30 minutes, were installed in the stream at locations in November 2016, but all but one were lost in the February flood. Seven new loggers were installed prior to 1 May 2017 (Figure 1):

1) in Coyote Creek County Park immediately downstream of Anderson Reservoir, installed to start recording on 1 May;
2) in the Park downstream of the San Felipe Pipeline discharge location, to reflect the combination of reservoir and pipeline discharges, installed to start 1 May;
3) upstream of the Ogier Ponds complex, downstream of the Model Airplane Park, installed to start 1 May;
5) immediately downstream of the Ogier Pond Complex, installed to start 1 May;
6) downstream of the dead end Golf Course Road, installed to start 1 May; and
7) downstream of Coyote Creek Ranch Road, installed to start 1 May.

Temperature recorders 2-7 were removed on 18 November, but recorder #1 had apparently been stolen. An air temperature recorder was installed to start on 1 May near the Highway 152

crossing of Uvas Creek in Gilroy as part of a separate study of the Uvas Creek watershed; it was retrieved on 15 November. This recorder was used as an indicator of air temperatures in south Santa Clara County.

On 28 August, two previously sampled sites (Leicester and Smith 2014b and 2015b; Smith 2016), upstream of the Correctional Facility downstream of the Reservoir, and the site immediately downstream of Anderson Reservoir were sampled by electrofishing. On 26 October two other previous sites, upstream of Ogier Pond #1 and downstream of the Golf Course Road (downstream of Ogier Ponds), were also sampled, to assess fish populations, primarily in the habitat upstream of Ogier Ponds where steelhead were captured in 2014. Stream flow during the August sampling was approximately 45 cfs, and stream flow during October sampling was approximately 70 cfs (Figure 5). Two pass electrofishing was conducted to provide depletion population estimates, but no *O. mykiss* were captured. Approximately the same habitats were sampled at three of the resampled sites as in 2014, 2015, and 2016, but some slower, deep habitats could not be sampled because of the much higher stream flows in 2017. At the site upstream of Ogier Pond #1, the stream had abandoned its previous channel at the sample site and was braided farther downstream, so new and more extensive representative habitats were sampled in both habitats. A total of 1440 feet of stream was sampled among the four sites.

Fish were identified to species, lengths (fork length, FL) measured, and were released in or near the habitat in which they were collected.

RESULTS AND DISCUSSION

Streamflow Conditions

Stream flow Conditions in 2017. In early January through February extremely large storms produced record runoff in the upper Coyote Creek watershed (Figure 2). From October through 9 January releases from Anderson Reservoir slowly declined from about 50 to 20 cfs (Figure 4) to conserve water following the severe 2013-2015 drought, with the reservoir having only about 27,000 acre-ft of storage at the start of the intense storms. With the start of the storms the SCVWD began releasing at the maximum capacity of the outlet, increasing releases to about 370 and then to 525 cfs as the reservoir depth (and hydraulic head) increased (Figure 4). Runoff from the upper watershed far outpaced the ability to release water from the reservoir, and the reservoir filled and began to spill on 18 February (Figures 3 and 4), with spilling (and bottom release) reaching approximately 7,300 cfs on 21 February. Flows from the reservoir declined to 600 cfs by 27 February and gradually declined to 400 cfs (with the maximum bottom release) through late April (Figures 4 and 5); seismic rules required lowering the reservoir storage. Two brief reductions of releases were made: the first in early February to lower or remove dam panels at Metcalf Pond and the second in late May to modify the fish ladder at the dam for fish passage at the reduced pond water level (Figure 4). Releases from the reservoir and the San Felipe Pipeline gradually declined to almost 30 cfs by early July before

increasing to about 45 cfs from mid-July through most of September. Releases then fluctuated between 50 and 70-90 cfs in October and November to accommodate infrastructure repair and pond filling at Metcalf Pond and to draw down the reservoir by December to provide very conservative flood capacity (Figure 5; Photos 7-9). The flood flows washed out the road downstream of Ogier Pond #1 (to the Model Airplane Park; Photo 16) and severely damaged the bridge at Coyote Ranch Road. In addition, it rerouted the main channel and produced braided channels upstream of Ogier Pond #1 (Photos 14 and 15) and greatly widened the outlet channel from Ogier Pond #4 (Photo 17)

The releases in January would have provided potential passage through the ladder at Metcalf Pond. However, the unprecedented storm flows in February required lowering the dam panels and opening the radial gates at Metcalf Dam ("Coyote Percolation Pond"). The fish ladder operated briefly during the peak on 21 February, but adult steelhead would have been unlikely to locate the ladder during the peak. Fish passage would probably not have been possible over the apron or through the radial gates at the Metcalf Dam between 19 February and 30 March, when the fish ladder was modified to function with the lowered pond level. Even after 30 March, steelhead might have had problems locating the ladder among the high flows dispersed among the dam apron and the left bank ladder in April. In October the dam panels were reinstalled, the damage to the supporting apron was buttressed with grouted boulders, and a set of grouted boulder weirs were constructed between the down-cut channel downstream of the dam and the fish ladder (see photos 1-9).

Early January through mid-April stream flows farther downstream on Coyote Creek would have provided potential adult steelhead passage everywhere except at Singleton Road which is a major steelhead passage barrier (Figures 6 and 7). The high releases from the reservoir probably restricted passage at Singleton Road because of high velocities over the apron of the road crossing and through the two culverts. Only fish moving during the peak of the flood, which submerged the crossing, would have been likely to pass easily. Only in late April and May, after the migration/spawning period, would flows have declined enough to allow potentially marginal passage through the culverts (see photos 10-12). Even without the passage problems at Metcalf Pond, steelhead access to spawning and rearing habitat would have been very difficult during and after January.

Streamflow Conditions 2014-2016. -- All late spring through fall stream flow, and almost all of the winter stream flow, in the potential steelhead rearing reaches downstream of Anderson Reservoir is provided by releases from Anderson Reservoir and from imported water from the San Felipe Pipeline (San Luis Reservoir water). Year-round releases from these sources are used for groundwater percolation, and in April through September of 2013, releases were usually 37 – 55 cubic feet per second [cfs] (as reported by the SCVWD Alert Gage for the Madrone stream gage); that magnitude of releases had been typical of operations for the last 15 years. However, the releases after February 2014 and in 2015 were substantially curtailed because of severe reductions in Bureau of Reclamation deliveries to the San Felipe Pipeline due to the ongoing severe state-wide drought (Leicester and Smith 2014b and 2015b). A State Water Board decree restricted all Delta contract water to municipal and industrial use, stopping agricultural

deliveries and general groundwater recharge. For the Coyote Creek watershed, this meant a shift from groundwater percolation to direct pipeline delivery of water to the water treatment plant for distribution to water retailers. This resulted in stream flows that were reduced from an average of 30 – 37 cfs in December 2013 - January 2014, to 13-15 cfs from early February 2014 through mid-June, and 8.0 – 9.0 cfs from mid-June through November 2014 (Leicester and Smith 2014b). Except for storms in December 2014 and February 2015, stream flows then remained in the 8 – 9 cfs range through mid-November 2015 (Leicester and Smith 2015b). Releases then increased slightly in mid-November to 14-15+ cfs, when the San Felipe water not imported during the pipeline interruption was recovered for SCVWD use. Those flows continued through late March 2016.

Storms in mid-December 2014 produced stream flows above Coyote Reservoir of more than 2000 cfs, and a brief storm in early February produced stream flows of approximately 1800 cfs (Leicester and Smith 2015b). Runoff increased Anderson Reservoir storage from about 34,000 acre feet (AF) to 46,000 AF from December through May. Despite the increased storage, releases from the reservoir and from the San Felipe Pipeline remained unchanged through winter and spring 2014-15 at 8-9 cfs. Local runoff from the December and February storms only slightly increased stream flow at the Madrone stream gage 1.5 miles downstream of the reservoir to 16 cfs in December and 12 cfs in February (Leicester and Smith 2015b). A small amount of local runoff was added farther downstream, and surface flow in Coyote Creek extended to downstream of the Golf Course. However, monitoring of the streambed after the storms indicated that neither storm resulted in extension of surface flow to Bailey Avenue. The Edenvale stream gage farther downstream, which is subject to runoff from Fisher Creek near Bailey Avenue and to flashy suburban runoff during storms, recorded brief runoff of approximately 200 cfs in late November, 165 cfs in December, and 40 cfs in February (Leicester and Smith 2015b). However, the low and steady releases from the reservoir and the pipeline did not provide a surface flow connection to the downstream storm runoff. In addition, the radial gate at the Metcalf Pond was closed during the late portion of the February runoff; therefore passage was not possible through the fish ladder at the partially filled pond. No potential adult steelhead or smolt passage was possible in winter/spring 2014-15 (Leicester and Smith 2015b).

In 2014, stream flow downstream of the Ogier Pond complex was eliminated by 20 June, but in 2015, flow below the Ogier Ponds was eliminated by 20 April. The most downstream Ogier Pond (#4) dried in both years.

In 2015, releases to Coyote Creek were generally about 2/3 from the San Felipe Pipeline and 1/3 from the reservoir (Leicester and Smith 2015b). However, the San Felipe Pipeline had to be shut down for repair from 1 August through 12 September. During that period, the 8-9 cfs discharge to the creek was maintained, but came entirely from the reservoir.

In winter 2016 there were two storms in January and two larger storm periods in early to mid-March (Smith 2016). The January runoff increased water stored in Anderson Reservoir from

about 30, 000 AF to 40,000 AF. The larger March storms increased storage to over 55,000 AF, and additional water was stored during both periods farther upstream in Coyote Reservoir. Despite the large gains in storage in January and March, releases from the reservoir and the San Felipe Pipeline to Coyote were maintained at only about 15-17 cfs until the end of March. The releases into Coyote Creek produced surface flow only downstream to about 1 mile upstream of Bailey Avenue. During both January and early March, runoff from imperious surfaces in the suburbs near and downstream of Metcalf Pond produced brief and modest (38 and 49 cfs) runoff peaks at the Edenvale Gage, with larger stream flow increases farther downstream from more extensive suburbs. In addition, runoff was produced in January and March in Fisher Creek, which discharges to Coyote Creek upstream of Metcalf Pond, but downstream of the dry streambed up and downstream of Bailey Avenue during the storm periods. If releases from the reservoir had extended flows to fill Metcalf Pond during those periods, connectivity throughout Coyote Creek would have allowed potential adult steelhead immigration.

Large releases (which reached 140 cfs) from the Reservoir and the San Felipe Pipeline for groundwater recharge and adult steelhead passage were begun in late March (Smith 2016), with releases recharging the upstream aquifer and progressively extending surface flow downstream. Metcalf Pond was nearly full on 26 March and spilling about 25 cfs through the fish ladder on 28 March. By 1 April stream flow sufficient to allow adult steelhead passage had reached throughout the lower Coyote Creek channel, and connecting flow was maintained for much of April. Late-migrating adult steelhead should have been able to reach spawning and rearing areas upstream of the Ogier Ponds, although the culverts at Singleton Road may have made passage difficult.

Releases were cut back to about 60 cfs in mid-April and gradually declined to about 50 cfs by the end of October (Smith 2016). Much of the released water over the summer was from Anderson Reservoir, because of interrupted deliveries of Central Valley (San Felipe Pipeline) water. The reduced releases after the large release for adult passage maintained the flow to downstream of Metcalf Pond (which has a bypass requirement), but connectivity for potential smolt or adult emigration passage ceased by late April. The summer releases were generally similar to those that supported large-scale groundwater recharge prior to drought-induced flow cutbacks in February 2014 (Leicester and Smith 2014b).

Water Temperature Conditions

Temperature Conditions in 2017. Anderson Reservoir releases directly downstream of the dam and through the pipeline a short distance downstream (dominated by reservoir water throughout the summer) varied by only 0.5-1.5°C daily, but showed a major seasonal shift (Figure 7). Mean temperature was less than 15°C in May, but gradually increased to 18°C in mid-September. Temperature increased more quickly to 19.5°C in late September and early October, before declining to less than 18C in late October (Figure 7); the decline coincided with exclusive releases from the reservoir while the San Felipe Pipeline was off-line for inspection. There was a one week spike in temperature to 18.5°C in late May when the source of releases

was being adjusted. (Figure 7). Peak temperatures of releases were about 1.5°C cooler than in 2015 and 2016 and occurred for a somewhat briefer period.

Farther downstream above the Ogier Pond complex water temperatures varied 2-3°C daily and had warmed somewhat, despite the relatively high stream flows that buffered against warming (Figure 8). The daily variation was less than in in 2014 and 2015, when variation was 5°C, with much lower releases Leicester and Smith 2015b). Rather than climbing gradually throughout the summer, mean temperature climbed from 16°C in early May to 18.5°C by mid-June and only to 19°C by September, before declining to 17°C by the end of October (Figure 8). This same general pattern of early rise and relatively stable over the June to September period occurred for all downstream sites (Figures 8-11) and was similar to that of air temperature (Figure 7), which apparently controls seasonal temperature progression in the stream. Mean temperatures were only 0.5-1.0°C warmer than below the reservoir in May through August, and the seasonal peak was actually lower, with air cooling downstream in September (Figure 8).

Immediately downstream of the Ogier Pond complex daily temperature variation was substantially lower (1-1.5°C) and mean temperatures were substantially higher (Figure 9), due to the heating effects in the pond, especially at the pond surface, the source of outflow from the pond. Mean water temperatures were 19°C in May and climbed to 25°C by mid-June (with maximums above 26°C) and then declined to 23.5°C by mid-September and 17-19°C in October (Figure 9). The was no overlap in water temperatures up and downstream of the Ogier Pond complex before mid-September, and mean temperatures were 3°C to more than 6°C higher downstream of the ponds (Figure 9), even more than the heating effect in 2016 (Smith 2016). As in 2016, the temperatures downstream of the ponds are likely to be consistently 22-25°C in summer regardless of the water temperature upstream of the ponds because of the large heat capacity and heating effect within the ponds(Leicester and Smith 2014b and 2015b; Smith 2016). The lower daily variation in outflow temperature in 2017 may be related to the wider opening at Ogier Pond #4 eroded by the February flood (Photo 17).

Farther downstream of the ponds, at the Golf Course Road, diurnal variation was 3-4°C, and mean water temperatures were 22-25°C from mid-June to mid-September. With maximums above 26°C in June (Figure 10). These were similar to those in the pond outflow, although in 2016 means were actually slightly lower (0.5-1.0°C) then the pond outflow temperatures. Even farther downstream, at Coyote Ranch Road, the water temperatures were nearly identical to those at the Golf Course Road (Figure 11). The effects of the ponds makes water temperatures downstream of the Ogier Ponds unsuitable for rearing steelhead unless food is unusually abundant and available.

The major water temperature issue in 2014 (Leicester and Smith 2014b) and 2015 (Leicester and Smith 2015b) was the sustained release of relatively warm water to Coyote Creek from the San Felipe pipeline and/or from Anderson Reservoir. This occurred despite a pool of cool water in the lower level of the reservoir that could have been utilized to maintain much cooler stream temperatures if the inflow to Coyote Creek had come solely from the near the bottom of the reservoir. With the additional stream flow and much longer wetted channel in 2016 and 2017

(and prior to 2014), then the additional major water temperature issue is the heating effect of the Ogier Ponds. If release temperatures are reduced in late summer, the warm surface water outflows from these large ponds will still result in temperatures downstream that would be similar to those seen in 2016 and 2017. Those temperatures would severely affect rearing quality for juvenile steelhead in the long reach between the Ogier Ponds and Metcalf Pond.

Temperature Conditions in 2014-2016. In 2014 and 2015, with the cut backs in releases and stream flow extending only as far as Ogier Ponds in summer, the temperature analysis was limited to that of releases and changes down to and through the first two Ogier Ponds for most of the years (Leicester and Smith 2014b and 2015b). In 2016 and 2017, the restored percolation releases allowed analysis under higher flow conditions and downstream through all four Ogier Ponds and to just above Metcalf Pond.

Air temperature patterns were similar in all three years (and in 2017), with general increases from April through June, relatively level means through August, and then gradual declines through October (Figure 6). Throughout the study period there were alternating periods of cooler and warmer conditions, with sharp contractions of temperature ranges during cooler, more overcast conditions. Peak air temperatures during warm periods were 30°C to more than more than 35°C, with maximums in 2015 generally somewhat higher than in 2016 (Leicester and Smith 2015b and Smith 2016). Air temperature means during June through August in both years were 20-21°C.

Water temperatures downstream of Anderson Reservoir and the San Felipe Pipeline had narrow (1°C) temperature ranges in all three years (Leicester and Smith 2015b and Smith 2016). In 2015 mean water temperatures increased from 14°C in mid-April to 16°C by early August, then increased sharply to above 20°C for early September through October, before declining sharply after late October (Leicester and Smith 2015b). In 2016 mean temperature increased from 13 °C in mid-April to 14.5°C at the beginning of July, then increased very sharply to 20°C, before sharply declining to 16.5°C a week later, as releases shifted from predominantly San Felipe water to a blend of Anderson Reservoir water and San Felipe water that was both discharged to the stream and delivered to the water treatment plant (Smith 2016). Temperatures then climbed to 20°C by the beginning of August, one month earlier than in 2015, as the draw-down of Anderson Reservoir lowered the thermocline to the level of the mid-elevation multiport release (Smith 2016). Means stayed 20-20.5°C until a slow decline to 19°C through October. The similar water temperatures in September of the three years provide the best month to compare downstream temperature changes.

In 2015, temperature ranges in summer at the site upstream of Ogier Ponds were usually about 5°C (Leicester and Smith 2015b). In 2016, with stream flow increased from about 9 to more than 50 cfs, the temperature range was less than 3°C (Smith 2016). In 2015, means upstream of the Ogier Ponds were 20-21°C in June through September, with maximums often 23-24°C (Leicester and Smith 2015b). In 2016, with the greater flow volume, the means and maximums were cooler; the mean in July was 17.5°C, the mean in August through September was 19.5°C, 0.5-1.5°C cooler than in 2015. Maximums were usually less than 21.5°C, 1.5-2.5°C cooler than in

2015 (Smith 2016). Means in August and September were actually 0.5-1°C cooler than at the site near the reservoir and pipeline discharges (Smith 2016).

In 2015, in the outflow from Ogier Pond #2, mean water temperatures were 17°C in early April, climbing to 22°C in May (Leicester and Smith 2015b). Mean temperatures reached 24-25°C in mid-June through August, and didn't drop below 20 °C until late October. In 2016, mean temperature climbed from 17°C at the beginning of May to 20°C by June and 22.5°C by the beginning of July (Smith 2016). By the beginning of August the mean was 22°C and declined to 21 °C by late September; means in October were 18-18.5°C (Smith 2016). Temperatures downstream of the first two Ogier Ponds were about 3-4°C warmer than upstream of the ponds in 2015 (Leicester and Smith 2015b) and 2-2.5°C warmer in 2016 (Smith 2016), due to discharge of surface-heated pond water, while the cooler (and denser) inflows to the ponds went to lower levels in the pond. Warming through the first two ponds was apparently somewhat reduced by the substantially higher stream flow in 2016 (and slightly cooler air temperatures). However, the thermal effects of the ponds have sufficient surface heating capacity to overcome much of the thermal mass of the inflow at most operational flows. Diurnal variation was less below the ponds than at upstream stream sites due the larger volume of warm water in the ponds which had a buffering effect against nighttime cooling (Leicester and Smith 2015B and Smith 2016).

In 2015, immediately downstream of the fourth pond in the Ogier Pond sequence, water temperatures during March and April were about 1°C warmer than below Pond #2, before the pond level dropped and the stream dried (Leicester and Smith 2015b). In 2016, mean water temperatures below the fourth pond reached 22-24°C in August through September (Smith 2016), and were 1-1.5°C higher than in the outflow from Ogier Pond #2. Therefore, more of the heating by the Ogier Pond complex occurred in the first two ponds, but the overall heating by the four ponds was 3-4°C in June – October.

Farther downstream in 2016, near the Golf Course, diurnal temperature variation increased to about 2°C, but mean water temperatures (21-23°C in June through August) actually cooled 0.5-1°C compared to the outflow from the ponds (Smith 2016). Maximum water temperatures were similar (23-24 °C) to the site immediately downstream of the ponds. Upstream of Metcalf Pond at Coyote Ranch Road, diurnal variation increased to 3-4°C, mean temperatures were similar to those at the golf course, but maximum temperatures reached 24-25°C (Smith 2016).

Substrate and Turbidity

Turbidity level in Coyote Creek was relatively clear (visibility > 120 cm) in 2014-2016 compared to that of other Santa Clara Valley streams downstream of reservoirs (Casagrande 2010; 2014; Leicester and Smith 2014a). In the smaller reservoirs, like Uvas and Stevens Creek, turbid storm water makes up most of the volume and remains suspended in the reservoir for much of the spring and is deposited on the streambed downstream with releases in spring. Sediment can also be deposited from turbid releases in late summer and fall, when the reservoirs are substantially drawn down. Anderson Reservoir is an order of magnitude larger than either of

the smaller reservoirs, has usually been more than one-third full at the start of winter, and in most years winter runoff less than doubles the stored volume. Fine sediment in storm water tends to be diluted and settled in spring, and spring turbidity is therefore much lower in releases from Anderson Reservoir. Release water was observed to be clear in March 2014, February 2015, and April 2016; on 15 April 2016, even with significant winter storms, visibility downstream of the reservoir was 65 cm and at the Golf Course it was 89 cm. In addition, the usually high summer releases in 2016, and prior to 2014, apparently rinsed most fine sediments off the streambed, at least in most habitats except large pools. In 2014-2016, substrate in riffles and fast runs was clean, and slower runs, glides and smaller pools had much less fine sediment than observed in Stevens Creek and much of Uvas Creek. The relatively clean substrate can potentially maintain much higher numbers of aquatic invertebrates (Kaller and Hartman 2004; Foster 2014). In particular, Hydropsychid (net-spinning) caddisflies and Baetid mayflies were abundant in 2016. The relatively clear water should also improve fish feeding efficiency (Barret et al. 1992).

In 2017, the near record winter runoff to Anderson Reservoir was more than four times the storage prior to the storms, so the entire stored volume of the reservoir was atypically turbid, similar to the usual annual condition in the smaller reservoirs. Even though the peak of the storm runoff in the upper watershed was over by March, turbidity in the reservoir persisted into summer. On 2 May visibility in Coyote Creek immediately downstream of the reservoir releases was only 15 cm, and downstream of Ogier Ponds at the Golf Course visibility was only 17 cm. By 23 July visibility below the reservoir had only improved to 40 cm and visibility at the Golf Course to only 48 cm. Even by 18 November visibility had only improved to 50 cm below the reservoir and 85 cm at the Golf Course; water in November 2017 was still more turbid than on 15 April 2016.

There are no significant tributaries between Anderson Reservoir and Metcalf Pond, and Anderson Reservoir has blocked gravel recruitment for more than 60 years. Gravels in the range of 25 – 75 mm were relatively scarce in 2014-2016, and spotty in their distribution, including at the tails of pools and glides where steelhead spawning normally occurs. Large cobbles were common at pool tails and in riffles and runs, but they are too large to provide suitable spawning substrate. Suitable spawning gravels were present in the floodplain, but they are normally not available for spawning or recruitment to the active channel except during severe floods, which were largely prevented by the dam. However, the 2017 flood was sufficient to spread over the flood plain, move bank gravels into the channel to improve spawning conditions, and rearrange some channel configurations. Upstream of Ogier Pond #1, a significant part of the main channel was moved to an old flood plain channel (Photo 14). The unshaded but reoccupied old channel has abundant cobbles and well-distributed gravels. Even where the stream generally remained in the vegetated recent channel, it occasionally braided into multiple channels (Photo 15).

Shade and Algal Growth

The usually perennial flows, and scarcity of significant floods and scouring flows occurring downstream of Anderson Reservoir, have allowed the density of riparian trees to increase substantially (Grossinger et al. 2006). The original sparse sycamore alluvial woodland has been converted to a dense mixed riparian forest. Western sycamores (*Platanus racemosa*) are still present along the stream, but are now joined, and far outnumbered, primarily by willows (*Salix* spp.), but also by box elder (*Acer negundo*), and cottonwood (*Populus balsamifera*). The resulting shade reduces water temperatures, but has other potentially undesirable effects on aquatic habitat. Densely shaded habitats can reduce feeding efficiency by steelhead, just as turbidity can. Shading also reduces growth of algae, which provides food and substrate for aquatic invertebrates (Hill et al. 1995; Foster 2014). Algae was generally only a thin coating on the rocks at the sites sampled in 2014-2016. Algae was more abundant at Coyote Ranch Road in 2016. However, even in sunnier areas algae appeared relatively scarce, which might also be due to low nutrient levels in the controlled releases from the reservoir and from the pipeline. Anderson Reservoir may have low nutrient levels, at least in the middle water column where the releases have come from, because of its depth and because Coyote Reservoir, upstream, may trap many of the nutrients coming from upper Coyote Creek.

The turbid water in 2017 probably reduced the sparse and shaded algae. However, the new unshaded channel upstream of Ogier Pond #1 is likely to provide greatly enhanced algae and invertebrates next year; it may provide the best potential steelhead rearing habitat.

***O. mykiss* Sampling Results**

All captured *O. mykiss* in 2014 (*n* = 52) were found to be young-of-year (YOY) based on scale analysis. Sizes ranged from 85 to 124 mm SL long (Leicester and Smith 2014b and Figure 13). These were judged to be steelhead, because all were good-sized YOY. They were expected to grow enough in winter and spring to smolt and attempt to emigrate in spring 2015 (Leicester and Smith 2014b).

No YOY *O. mykiss* were captured or observed during sampling of the same three sites in 2015, reflecting the lack of adult steelhead access in either the December or February storm events. Most of the fish present in 2014 were apparently gone; only a single large yearling (250 mm) was captured (Figure 13) and a similar-size fish observed, but not captured. The large size of the single yearling captured in 2015 supports the prediction made in the 2014 report that fish captured in 2014 would grow well enough over winter and spring to be able to smolt and emigrate the following spring. The lack of additional captures or observations of larger fish indicates that almost all of the 2014 YOY steelhead attempted to emigrate. However, because there was no stream flow continuity through the passage corridor, emigrating smolts would have been lost to predation by bass (*Micropterus* spp.) in the Ogier Ponds or trapped and killed by the dry-back in the disconnected channel downstream of the ponds. In 2014 a single *O. mykiss* estimated at 300 mm SL was observed but not caught (Leicester and Smith 2014b). Based upon the size of the yearling captured in 2015, that 2014 fish was probably also a

yearling steelhead. Adult steelhead access, spawning, and rearing probably occurred in 2013, based upon stream flow conditions. Therefore, the scarcity of yearling fish in 2014 indicates that most fish reared in 2013 also smolted and attempted to emigrate in 2014 (Leicester and Smith 2015b). The attempts would have been unsuccessful because of flow cut-backs after mid-February.

In 2016 and 2017, no *O. mykiss* were captured or seen at any of the four sampled sites. Therefore, although potential passage stream flows had been provided in early April in 2016 and possibly in January, briefly in February, and April in 2017, apparently no adults accessed and/or spawned in the habitats used in 2014. The available passage in April 2016 and 2017, compared to the dominant late December to early April migration period (Shapovalov and Taft 1954), may have been a problem. Steelhead studies on the central coast found lower adult numbers and few late migrating and spawning steelhead in 2016 (Joseph Kiernan, NOAA Southwest Fisheries Science Center; and Jon Jankovitz, California Dept. Fish and Wildlife, pers. comm.). However, it may also be that with smolt or adult passage problems in 2014-2015 there were few or no potential returning adults produced in either 2016 or 2017. The very few yearlings present in 2015 may have able to emigrate during the brief passage window provided by the pulse flows in April 2016.

Other Fishes

In 2014-2016, prickly sculpin (*Cottus asper*) and Sacramento sucker (*Catostomus occidentalis* were the only native fish caught at all three sites upstream of Ogier Ponds, but hitch (*Lavinia symmetricus*) were present at the two sites nearest Anderson Reservoir (Leicester and Smith 2014b and 2015b; Smith 2016). Hitch were more common at the upstream sites in 2016. In 2017, all three native species appeared to be less abundant, except in calmer secondary channels; they were probably reduced by the flood.

Juvenile spotted bass (*Micropterus punctulatus*) and largemouth bass (*M. salmoides*), were present at all three sample sites in 2014 and 2015, but were less abundant in 2015 (Leicester and Smith 2015b). In 2016, bass were almost absent at the three sites upstream of the Ogier Ponds, apparently because of the pulse flow in late March and April and the higher flows throughout the remainder of the year (Smith 2016). Common carp (*Cyprinus carpio***)** and bass (115-275 mm FL) were common at the Golf Course sample site in 2016. The site was dry in summer 2014 and 2015, and the fish had apparently been rinsed down from the Ogier Ponds with the higher stream flows. In 2017, non-native fishes were absent during sampling at all sites upstream of Ogier Ponds and very scarce at the site below the ponds.

The 2017 flood, and the substantial draining and flushing of Metcalf Pond, probably reduced the predatory bass in the pond.

MANAGEMENT IMPLICATIONS

Adult Passage.—Some adult steelhead accessed the spawning and rearing habitat in 2014 despite a only about a 2-3 day window of flow continuity through the passage corridor in February (Leicester and Smith 2014b). It is likely that access by most adults was severely constrained by the single small window of potential suitable stream flow. In 2015, the drought continued, as did severely reduced releases to Coyote Creek, despite improved runoff into Coyote and Anderson reservoirs compared to 2014 (Leicester and Smith 2015b). The continued reduced releases to Coyote Creek were insufficient to provide passage corridor connectivity. Increased releases from Anderson Reservoir during the February storm would have provided suitable adult passage through the dry gap in surface flow at and upstream of Bailey Avenue. The storm runoff from Fisher Creek, and urban runoff downstream of Metcalf Road, would have completed the connection to spawning and rearing habitat upstream of the Ogier Ponds. In 2016 potential passage was provided by large (up to 140 cfs) releases, but not until early April, which may have been too late. Spawning and rearing habitat upstream of Ogier Ponds was under-utilized in 2014, and unused in 2015, 2016 and 2017. Releases in years prior to February 2014 had maintained continuous stream flow downstream to below the Metcalf Pond, and adult access was probably regularly available during even small winter storms, due to Fisher Creek and suburban runoff. A February or early March pulse flow release strategy that would provide or improve adult steelhead access, even *or especially* in drier years, should be considered as a vital tool to restore and maintain a viable steelhead population.

The Singleton Road low flow crossing, with its perched culverts and concrete apron, makes passage past this location difficult except during periods of sustained moderate storm flows. Down-cutting of the channel downstream of the crossing has reduced the back-flooding of the apron and culverts, increasing the jump height into the culverts and the length of the inclined apron that must be negotiated. The high flows in 2017 demonstrated the severe velocity problems of high flows. The potential flow windows for passage are few. Removal of this crossing as soon as possible should be a priority, because it jeopardizes (and may have already crippled) the steelhead run. A plan is being developed by a consortium of local municipalities to modify the Singleton Road crossing for fish passage. It is hoped that this will continue to move forward expeditiously.

Smolt Passage.—Restored late winter and early spring stream flows would create suitable stream flow conditions for smolt emigration. The narrow window during and prior to the February storm in 2014 probably prevented most smolts reared in 2013 from emigrating, as it occurred prior to the peak smolt emigration period (Shapovalov and Taft 1954; Fukushima and Lesh 1998). However, if Coyote Creek regularly produces large smolts, that emigrate early, some smolts might have been able to use the small, early passage window. Smolts reared in 2014 had no chance to successfully emigrate in 2015 and were lost to the surface flow dry-back downstream of Ogier Ponds and/or to predation in Ogier Ponds. Since no YOY steelhead were apparently reared in 2015, 2016, and 2017, four consecutive years of steelhead production were eliminated, and smolt emigration substantially reduced in a fifth year, extirpating the

steelhead population in Coyote Creek or putting it at very significant risk of extirpation. Similar passage issues in Upper Penitencia Creek, the only tributary stream that has been recently documented to support steelhead, put the steelhead population in the entire watershed at great risk of extirpation (Leicester and Smith 2016). A strategy needs to be developed to provide for smolt emigration, even in some drought years, if a viable steelhead population is to be restored and maintained.

All of the steelhead juveniles produced in the rearing habitat upstream of Ogier Ponds must emigrate through the Ogier Pond complex, with its abundant predatory largemouth and spotted bass. Taking the ponds off-channel, by rerouting the stream around the ponds, is a necessary action to prevent predation loss of many of the smolts. Unlike Metcalf Pond, which can be periodically and temporarily drained (an unintended result of the 2017 flood) to remove predatory non-native fish, the task of significantly reducing the predators in the Ogier Ponds is not feasible without reducing or eliminating stream flow into the ponds for an extended period (which would require severe reductions in stream flows upstream). Routing Coyote Creek around the Ogier Pond complex and taking them off-channel would allow for management actions that would not be possible under current conditions. A seasonal (April through November) sport fishing season presently exists on Coyote Creek, and on other South Bay streams, despite the closure of all coastal steelhead streams to fishing during this period. A proposal should be made to the California Department of Fish and Wildlife Commission to close the stream to fishing during this period to better protect steelhead. The seasonal fishery, with allowable take of "hatchery" trout and steelhead, presents an enforcement problem and a threat to maintaining the precarious steelhead populations. However, the open season also allows fishing for bass and other species in the Ogier Ponds and at Metcalf Pond, as well as in the stream. If the Ogier Ponds are taken off line to eliminate the temperature and predatory threats to steelhead, fishing could continue in the off-channel Ogier Ponds, even if the fishing regulations are changed to exclude fishing in the creek.

Stream Flow.—The sites sampled in 2014 and 2015 were atypical of the general habitat conditions in Coyote Creek, in that they were specifically chosen to include riffles and shallow run habitats that provide fast-water feeding habitat preferred by drift-feeding juvenile steelhead downstream from reservoirs in Santa Clara County (Casagrande 2010; Smith 2011; Leicester and Smith 2014a and 2015b). All of the *O. mykiss* caught in 2014 were from fast-water habitats (Leicester and Smith 2014b). The majority of Coyote Creek between Anderson Reservoir and Metcalf Pond is low gradient, and dominated by pools. Riffles and runs with coarse substrate are relatively scarce. Higher stream flows are necessary to increase width, depth, and velocity of riffles and runs and to increase the amount of fast-water "head of pool" habitat in pools located downstream of these coarse-bottomed riffle and run areas (Casagrande 2010) where aquatic invertebrates are abundant (Casagrande 2010; Foster 2014). However, those fast habitats would still be relatively scarce in the context of the entire system, and slow to moderate velocity pool habitat would still be the predominant habitat feature, even at high stream flows like those in 2016 and summer 2017. The operational flows observed in 2014 and 2015 were atypical due to the drought. Under operations prior to 2014 and in 2016 and 2017, with higher augmented flow rates, the amount and quality of juvenile steelhead rearing habitat

increases substantially. Even where coarse substrates are absent or scarce, fast-water areas can make substantial numbers of terrestrial invertebrates available to drift-feeding steelhead (Foster 2014).

In years prior to 2014, dry season stream flows in Coyote Creek downstream of Anderson Reservoir were typically between 30 and 50 cfs. Most of this flow percolated between the reservoir and Blossom Hill Boulevard and recharged the underground aquifer, which the Santa Clara Valley heavily depends upon for its water supply. These flows would have also provided suitable fast-water rearing habitat for juvenile steelhead. Habitat appears to have been better in 2016 and 2017 in the areas that supported summer flow in 2014 and 2015, and potentially suitable physical (but warm) habitat existed downstream in 2016 and 2017 in areas that were dry in both years. Higher stream flows also reduced the relatively abundant juvenile spotted and largemouth bass that were common at the three sites sampled in 2014 and 2015, although bass and carp from the Ogier Ponds were present downstream of the ponds in 2016.

Water Temperature.—Quality of potential rearing habitat depends heavily on the food available and upon the water temperature of stream flows, as higher water temperature increases the metabolic rate of fish and increases their food demands for survival and growth (Myrick and Cech 2005). When food is readily available, the best growth rates occur at warmer temperatures (e.g., 19°C), because assimilation rate also increases at higher temperatures (Myrick and Cech 2005). However, at lower food availability the increased metabolic cost of higher temperature reduces growth (Weber et al. 2014). For drift-feeding steelhead, higher water temperatures cause fish to use faster microhabitats, where food is more abundant (Smith and Li 1983); therefore, stream flow and water temperature are not independent in determining steelhead abundance, growth and habitat selection.

For Coyote Creek the two main factors potentially affecting stream temperature are the temperatures of reservoir and pipeline releases to the stream and the warming effect of the Ogier Pond complex on water temperature downstream of the ponds. With most reservoirs operated by SCVWD, water is released from the bottom, which is normally cool in summer, at least until the reservoir is drawn down (Casagrande 2010 and 2014; Leicester and Smith 2014a). However, Anderson Reservoir on Coyote Creek has a multiport release system; water can be released from the bottom where it remains cool year-round, or it can be released from higher in the reservoir water column where temperatures are much warmer, especially in late summer. The San Felipe Pipeline also brings in Bureau of Reclamation water from San Luis Reservoir for potential distribution to Anderson Reservoir by pumping up into the reservoir, when no reservoir withdrawals are being made, for direct release to Coyote Creek, or for distribution to other locations in northern Santa Clara County. In 2014-2016, releases to Coyote Creek were usually more from the pipeline than the reservoir and were quite warm for most of the late summer and fall. The moderate size of the YOY steelhead captured in 2014, their lack of significant growth between late September and late November, and the indications of slower growth and growth interruptions on their scales in late summer indicated that the water temperatures were too high for the food available for late summer growth (Leicester and Smith 2014b). Conversely, the large size of the single yearling steelhead captured in in early summer

of 2015 indicates that growth in late fall through spring is good, and may be attributable to warmer and clearer water than is typically present in most local streams during that period. In 2017, a larger share of the stream flow was provided by reservoir releases, because of the seismic need to lower the reservoir storage level. Water temperatures were slightly lower, but increased later in summer as the reservoir was drawn down, sending warmer water through the mid-level release port.

If substantially cooler water was released for all or part of the summer, steelhead growth and survival would likely be much better, at least in the reach between the dam and the Ogier Ponds. However, this would potentially require sending more warm imported water to the treatment plants, blended with cool bottom reservoir water (rather than from the mid-elevation release port), which could impact treatment costs or drinking water quality. Operations might have to depend upon monitoring the temperature of pipeline and reservoir releases. In non-drought years, providing cooler (and greater) releases should be pursued to improve conditions for threatened steelhead.

The Ogier Pond complex causes substantial increases in water temperatures downstream, because warmed surface water is progressively shuttled through the four ponds. The outflow temperature from the ponds in summer is likely to average 22-25°C, regardless of inflow temperature because of the high heat capacity of the ponds and the outflow of warm surface water. Such temperatures will have severe effects on steelhead growth and survival downstream of the ponds, regardless of the release temperatures at the reservoir. Elevated water temperatures in the ponds also create another indirect effect by increasing the food requirements of the predatory bass. This would be especially problematic during the late spring smolt emigration period. Predation impacts caused by the ponds and their substantial heating effect on water temperatures constitute very strong justification to reroute the stream around the ponds as soon as possible.

Spawning Gravels and Other Channel Enhancements.—Future investigations should evaluate the need for gravel augmentation to improve spawning success, especially since there are probably relatively few returning adult steelhead. Fast-water feeding habitats are important for steelhead abundance and growth in low gradient streams (Casagrande 2010). The step-run and riffle habitat created by boulders immediately downstream of Anderson Reservoir (the upper sample site) may provide a viable example of channel enhancement for juvenile steelhead feeding (Leicester and Smith 2015b).

Fish Sampling.—NOAA guidelines since 2015 for electrofishing limit sampling to water temperatures of 18°C or less. Unless water temperatures are reduced from those encountered in 2014-2017, sampling for juvenile steelhead would be extremely restricted both as to timing and location. In 2015-2017, fall sampling was not possible until October or November, and early morning sampling in late June and early July was conducted to meet the requirements in 2015. In 2017, morning sampling in August was conducted just prior to the sampling temperature cut-off at the two sites closest to the reservoir; sampling the two warmer sites farther downstream was delayed until late October. Future sampling at the warmer sites

downstream of Ogier Ponds could probably not be sampled to determine their utilization by steelhead until late October or later. November sampling can only be conducted if it is prior to rains which might allow adult access. Sampling prior to June is not allowed because adults and smolts might still be present, and although sampling in June would occur after smolts had left, YOY would then be too small to be efficiently captured. In addition, sampling at most sites prior to June would still be prevented by high water temperatures produced by the Ogier Pond complex. This conflict for necessary population monitoring will persist as long as the 18°C cap is in place.

The more typical high summer/fall stream flows present in 2016, 2017, and prior to 2014 are desirable for rearing steelhead, but in 2016 and 2017 the high flows made electrofishing more difficult. Coordinated, brief (1-2 day) reductions in flows, if they could be conducted without resulting in stream dry-back, might improve electrofishing effectiveness.

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Figure 1. Coyote Creek downstream of Anderson Reservoir, showing locations of temperature recorders (orange circles) and fish sampling reaches (red squares) in 2017. An additional temperature recorder was just upstream of Metcalf Pond, farther north.

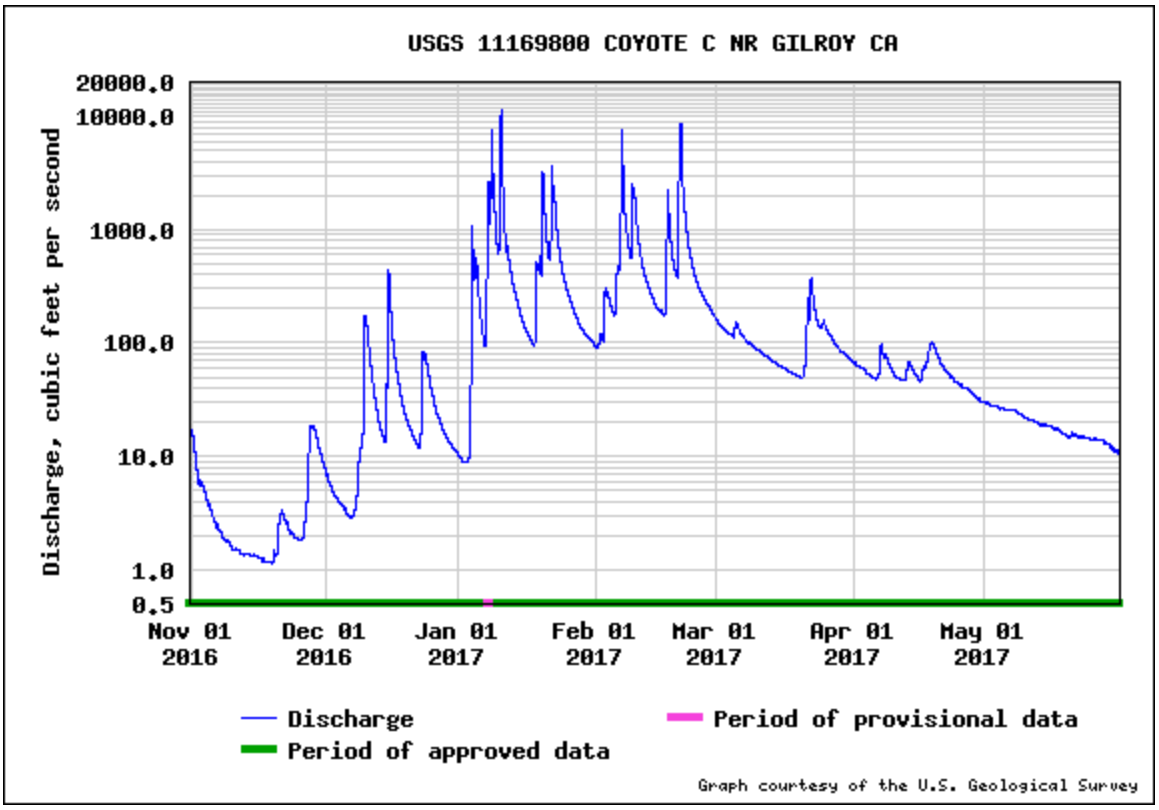

Figure 2. Stream flow on Coyote Creek at the USGS gage upstream of Coyote Reservoir From 1 November 2016 through May 2017.

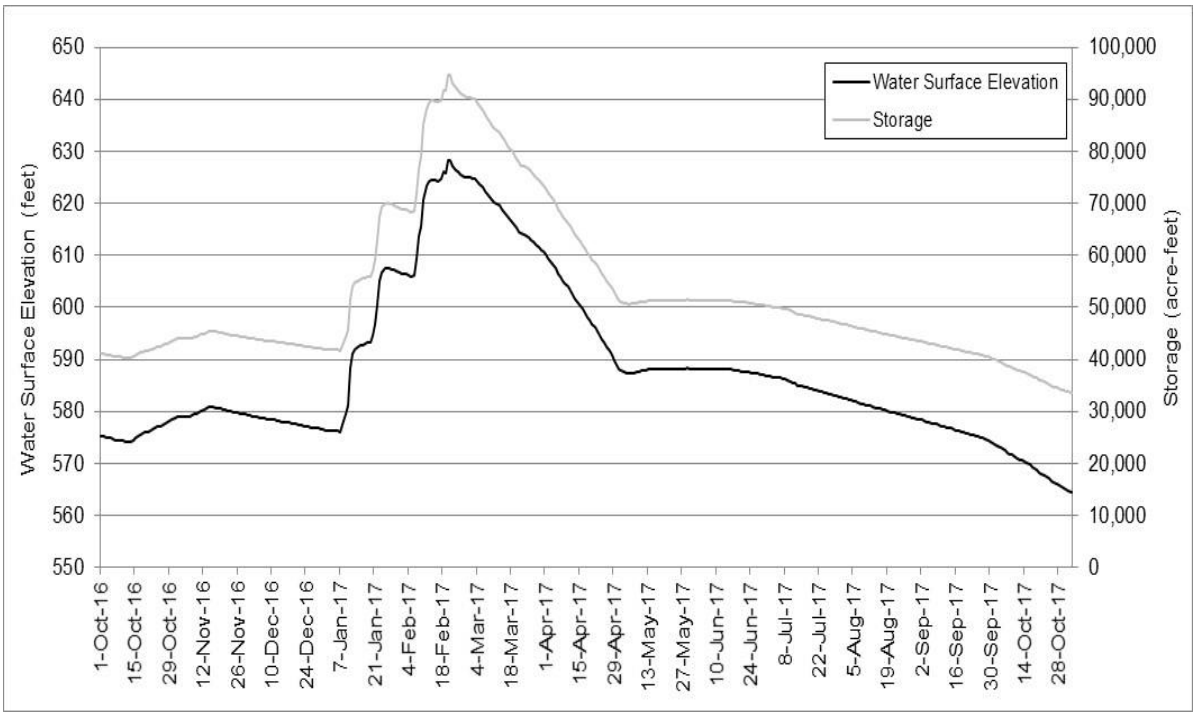

Figure 3. Anderson Reservoir water surface elevation and storage from 1 Oct 2016 through 1 Nov 2017.

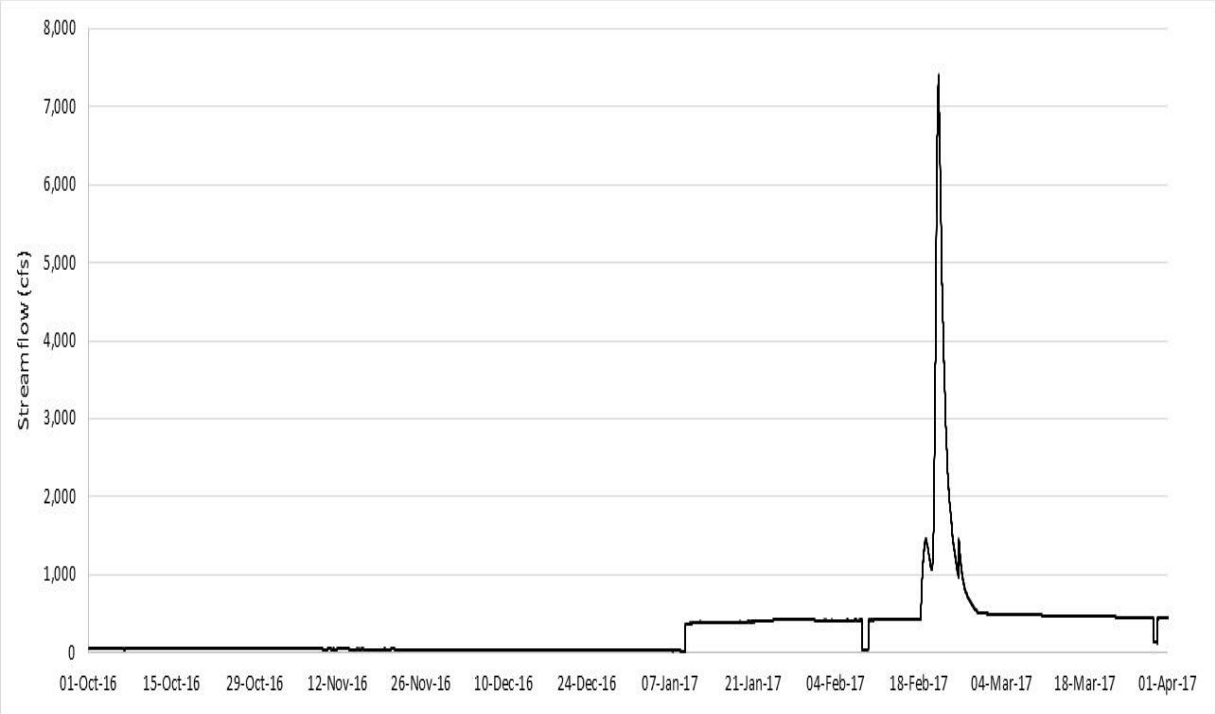

Figure 4. Mean daily stream flow at the SCVWD Madrone Gage (1.5 miles downstream of Anderson Reservoir) from 1 October 2016 through 1 April 2017. The brief drop in Reservoir release in February was to lower or remove Metcalf Pond dam panels, and the Drop on 30 March was to modify the fish ladder for passage at the lower pond level.

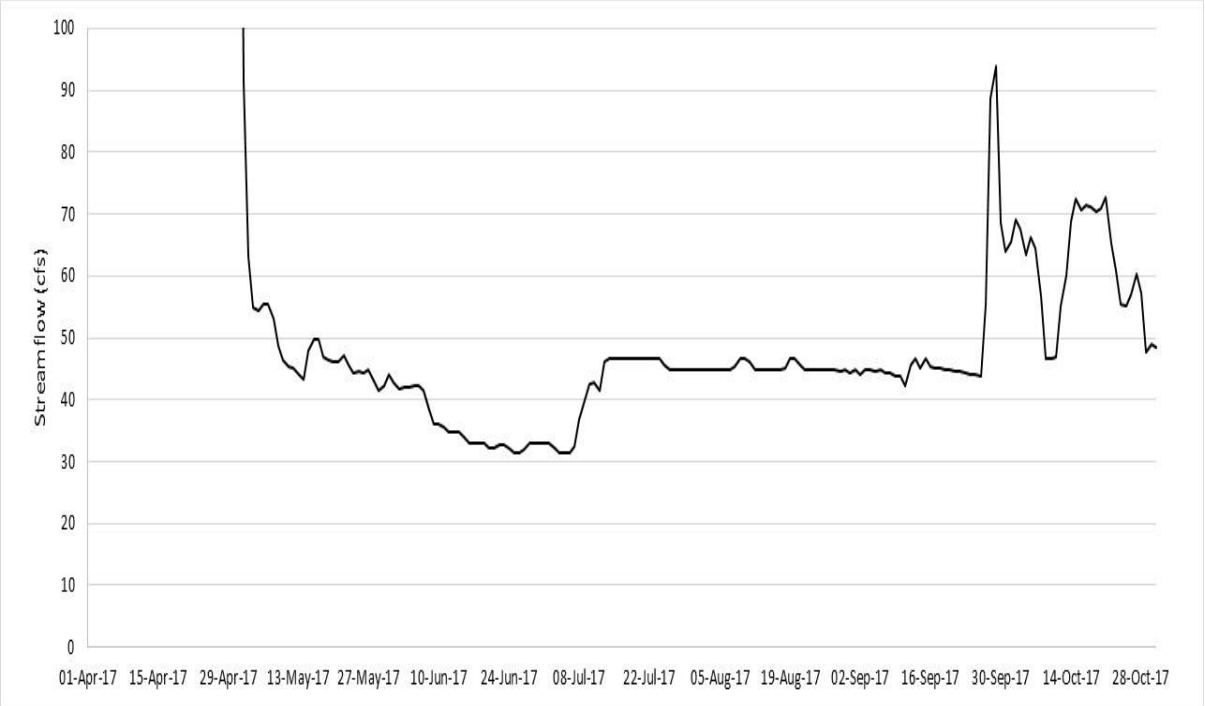

Figure 5. Mean daily stream flow at the SCVWD Madrone Gage (1.5 miles downstream of Anderson Reservoir) from 1 April through 1 November 2017.

Figure 6. Mean daily stream flow at the SCVWD Edendale gage (in the urban area downstream of Metcalf Percolation Pond) from 1 October 2016 through 1 April 2017.

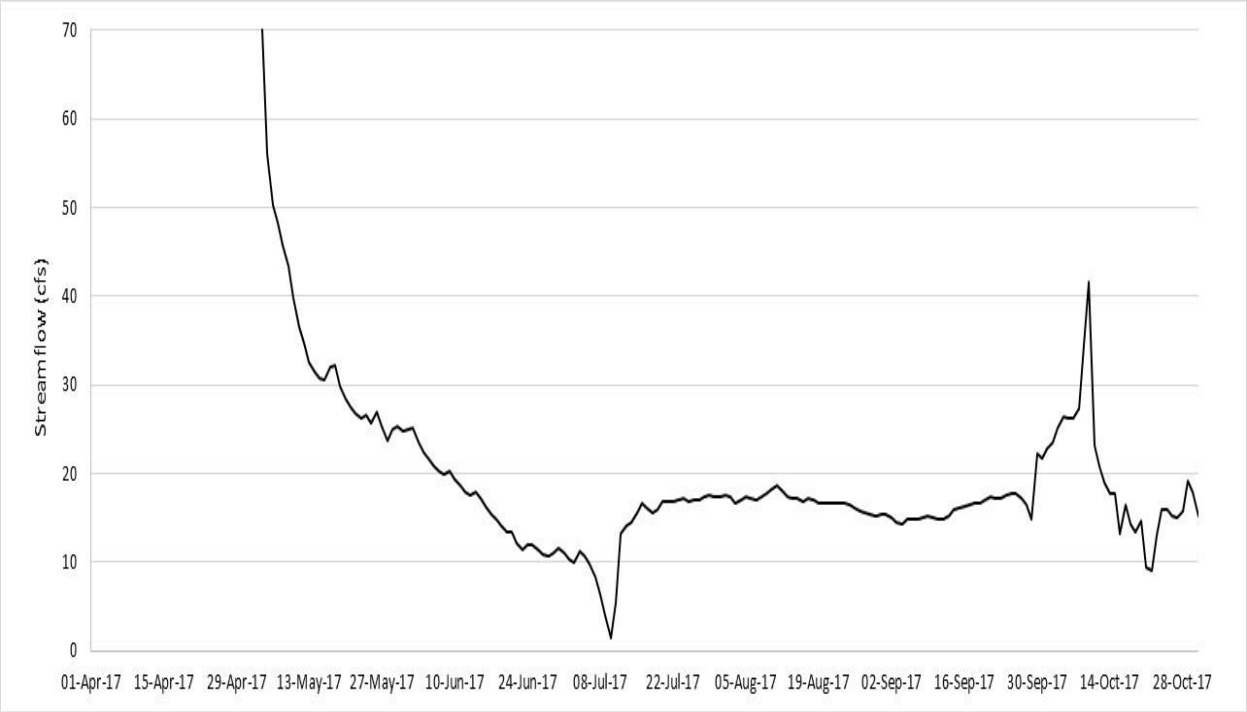

Figure 7. Mean daily stream flow at the SCVWD Edendale gage (in the urban area downstream of Metcalf Percolation Pond) from 1 April through 1 November 2017.

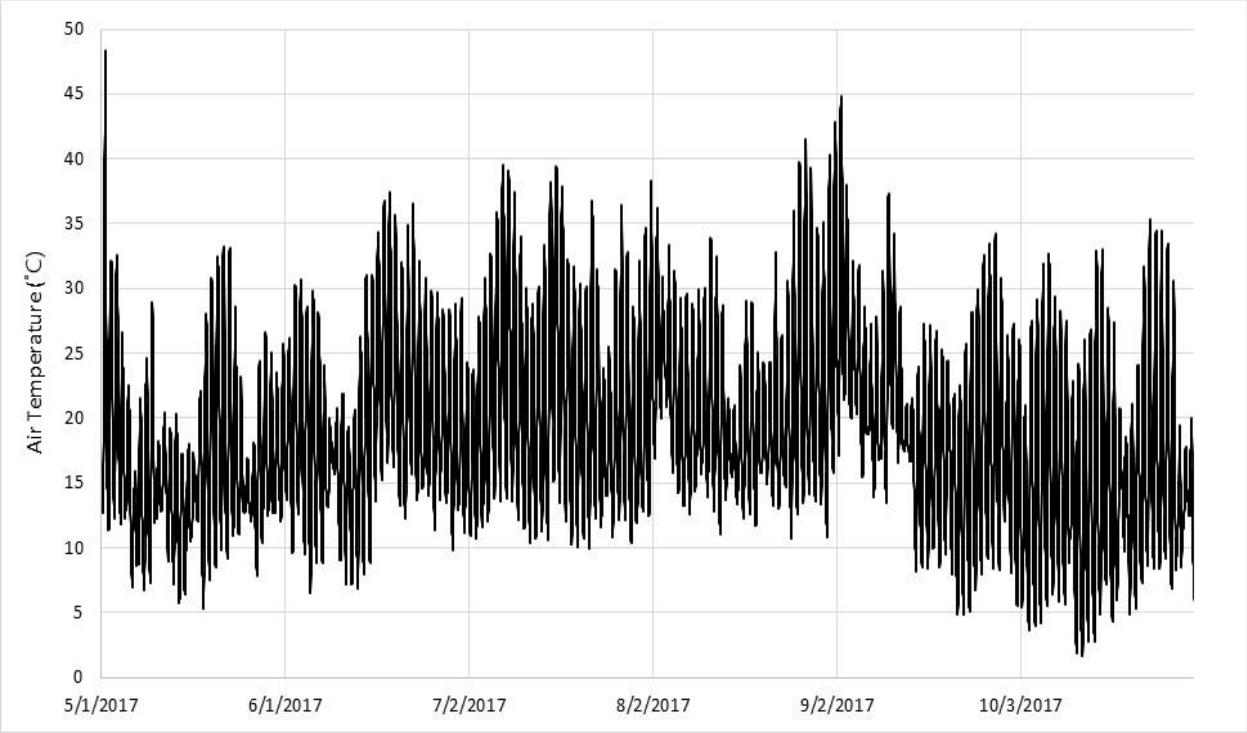

Figure 6. Air temperatures near Highway 152 west of Gilroy from 1 May through 1 November 2017.

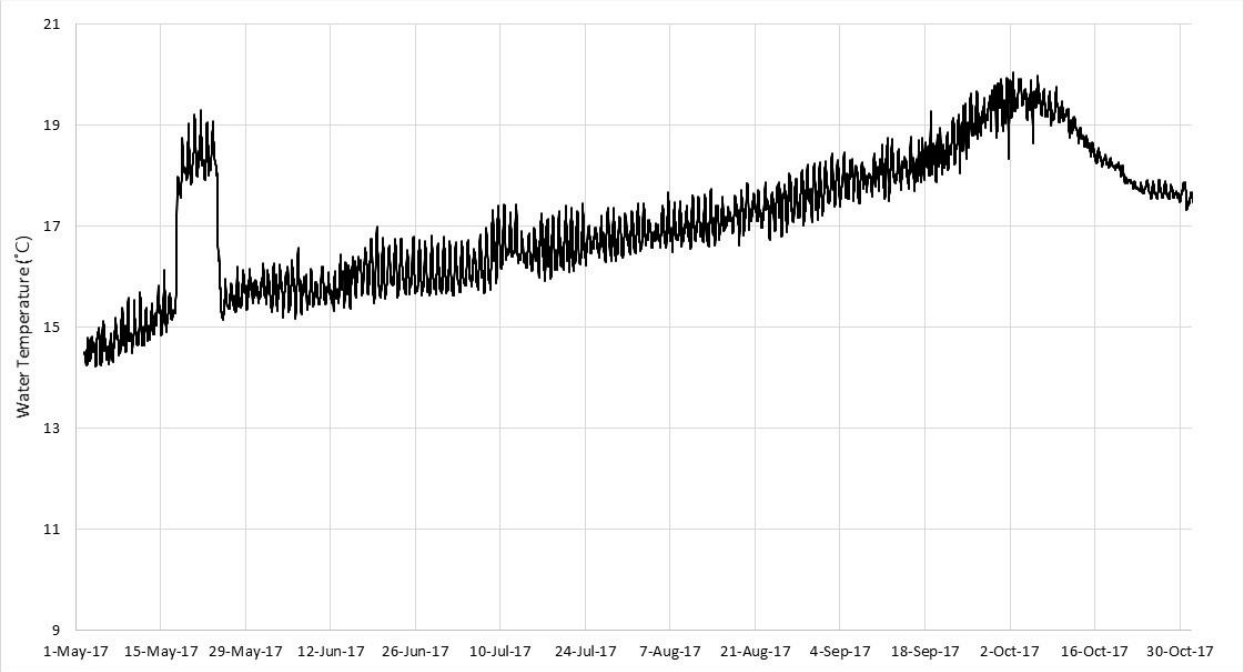

Figure 7. Water temperatures in Coyote Creek in the park downstream of the pipeline and reservoir discharges from 1 May through 1 November 2017.

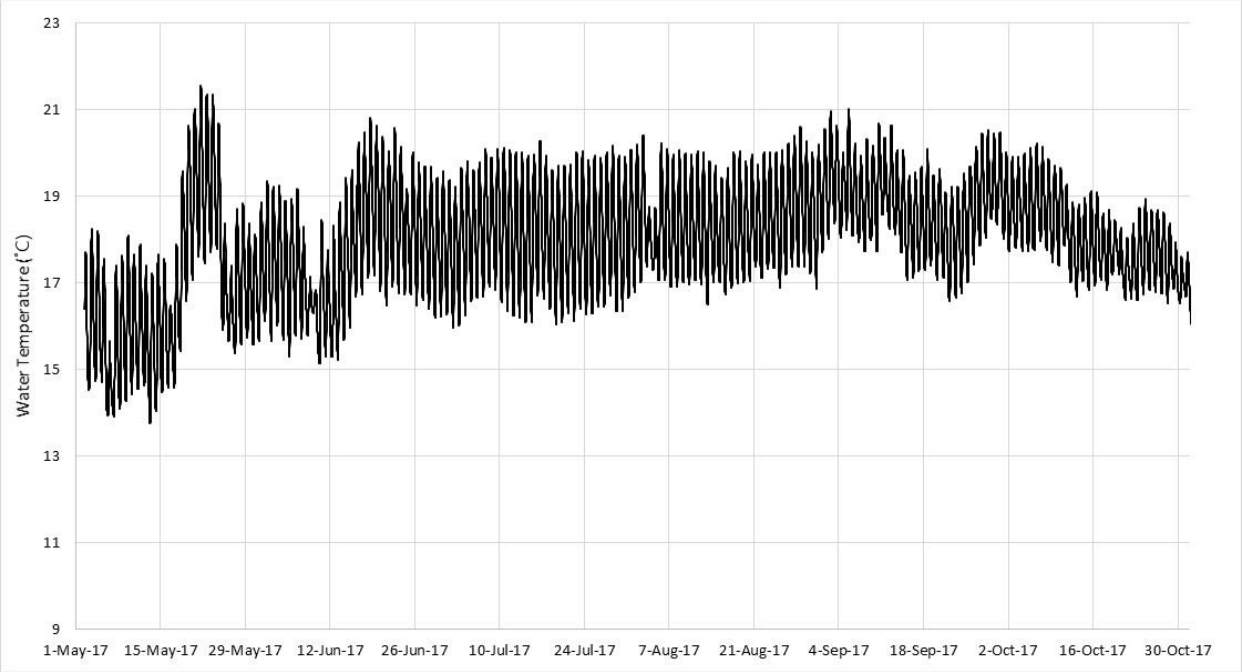

Figure 8. Water temperatures in Coyote Creek upstream of the Ogier Ponds Complex from 1 May through 1 November 2017.

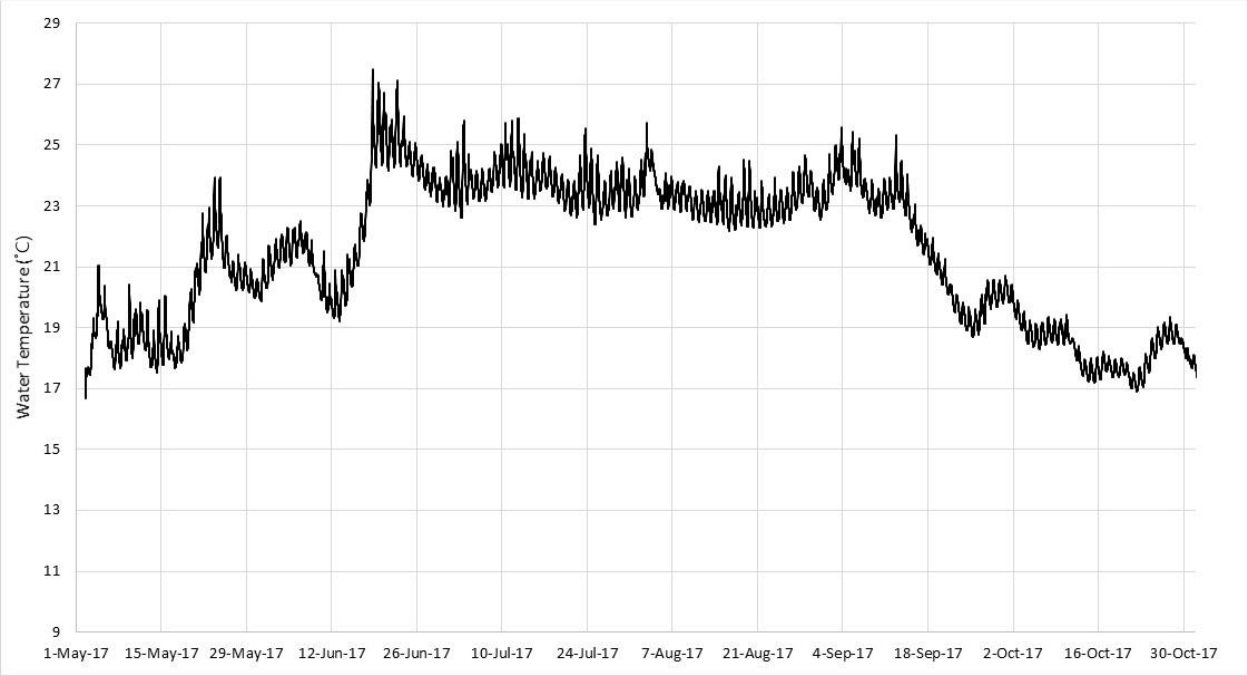

Figure 10. Water temperatures in Coyote Creek immediately downstream of the Ogier Pond complex (downstream of Ogier Pond #4) on Coyote Creek from 1 May through 1 November 2017.

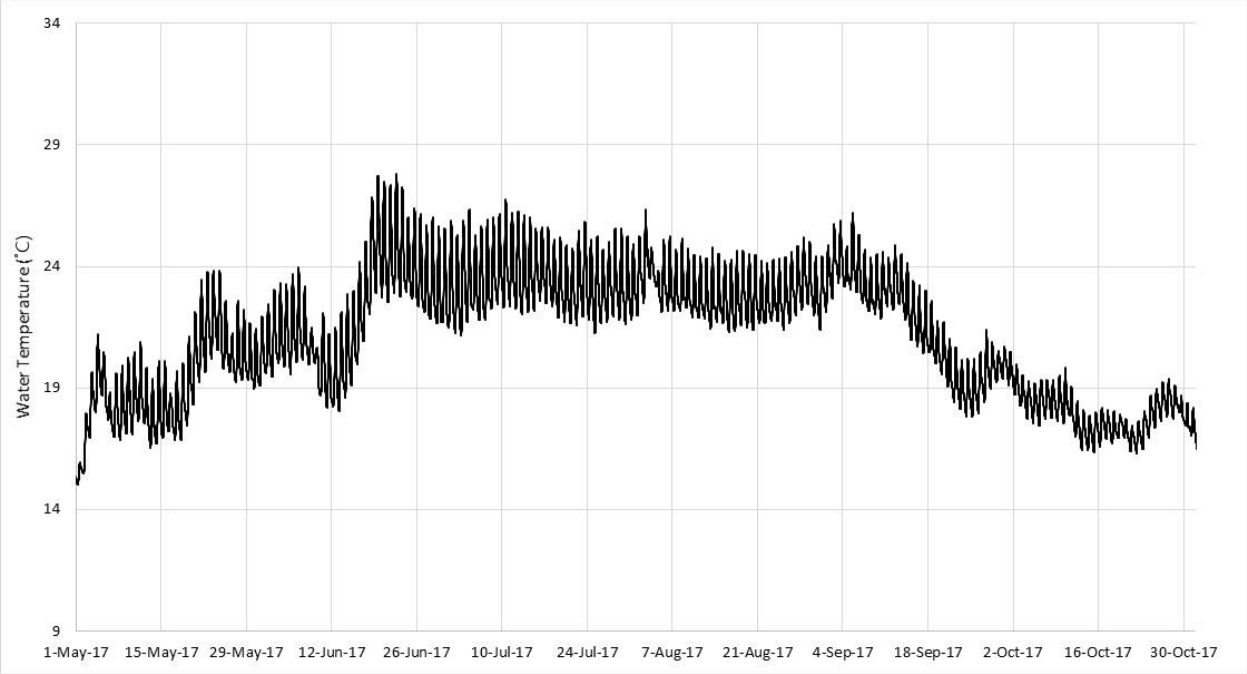

Figure 11. Water temperatures in Coyote Creek immediately downstream the Golf Course Road from 1 May through 1 November 2017.

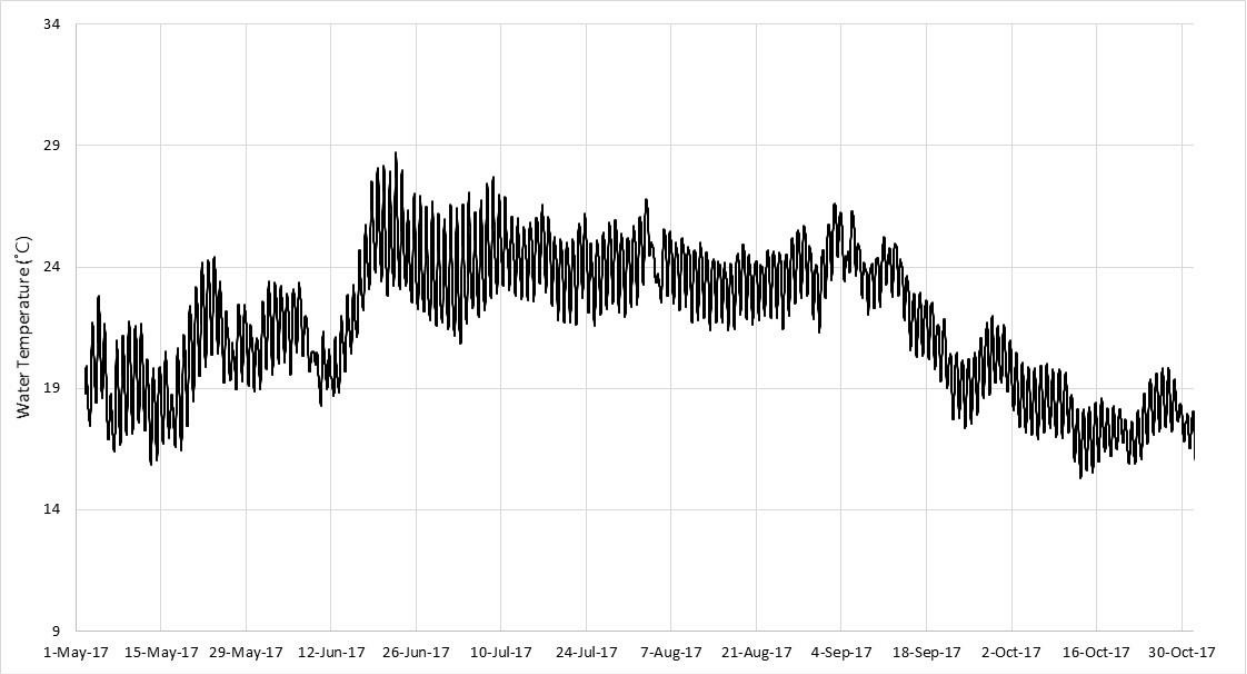

Figure 12. Water temperatures in Coyote Creek immediately downstream of Coyote Ranch Road (upstream of Metcalf Pond) from 1 May through 1 November 2017.

Figure 13. Standard lengths (mm) of *O. mykiss* captured by electrofisher at three sites on Coyote Creek on 29 September/24 November 2014; and 28 June 2015. No *O. mykiss* were captured in 2016 or 2017.

Standard Length (mm)	Upstream of Ogier Ponds 2014 9/29 (n=9)	11/24 (n=3)	US Boys Ranch DS of Anderson Res. 2014 11/24 (n=30)	Immediately DS Anderson Reservoir 2014 9/29 (n=12)	11/24 (n=7)
80 – 84			XXX		
85 – 89	XXX		XXXXXXXXXXX		
90 – 94	XX		XXXXX	X	
95 – 99	X		XXXXX	XX	XXX
100-104	X	XX	XXXX	XXX	X
105-109	X	X	X	XXX	X
110-114				XXX	X
115-119	X				
120-124			X		X

	US Boys Ranch DS of Anderson Res. 28 June 2015
225 -229	X

Table 1. Amount of habitat sampled, number of *O. mykiss* captured, and estimated density from depletion at sites on Coyote Creek in September and November 2014 and 28 June, 3 July and 14 November 2015, 21 October 2016 , and 28 August and 26 October 2017 (2017 data in bold).

Site and Date	Distance Sampled (feet)	*O. mykiss* Captured	Estimated Density (number per 100 feet)
Downstream of Reservoir			
29 September 2014	175	12	7.1 / 100 feet
24 November 2014	175	7	4.1
3 July 2015	175	0	0
21 October 2016	175	0	0
28 August 2017	**185**	**0**	**0**
Upstream of Correctional Facility			
24 November 2014	422	30 (+ 1 yearling missed)	8.2
28 June 2015	425	1 (+ 1 missed)	0.4 (yearlings)
14 November 2015	425	0	0
21 October 2016	365	0	0
28 August 2017	**425**	**0**	**0**
Upstream of Ogier Ponds near Model Airplane Park			
29 September 2014	524	10	1.9
24 November 2014	275	3	1.1
28 June 2015	475	0	0
21 October 2016	285	0	0
26 October 2017	**710**	**0**	**0**

Table 1 (continued)

Site and Date	Distance Sampled (feet)	*O. mykiss* Captured	Estimated Density (number per 100 feet)
Downstream of Golf Course Road			
21 October 2016	95	0	0
26 October 2017	**120**	**0**	**0**

Appendix: Photos

Photo 1. Metcalf Pond dam on 18 February 2017 at 1300 cfs. Radial gates were open and the fish ladder was not passable.

Photo 2. Metcalf Pond dam on 21 February 2017 at 6500+ cfs. Very turbid water from storm flows that filled and spilled from Anderson Reservoir.

Photo 3. Metcalf Pond ladder and radial gates on 21 February 2017 at 6500+ cfs. The pond water level was high enough that even with the dam panels down there was potential passage in the fish ladder.

Photo 4. Metcalf Pond dam on 26 February 2017 at approximately 700 cfs, with impassable apron and lowered dam panels.

Photo 5. Metcalf Pond radial gates and impassable (no flow) fish ladder on 26 February 2017.

Photo 6. Metcalf Pond Dam on 15 April 2017, with a functioning fish ladder that had been modified for passage by 30 March.

Photo 7. Metcalf Pond dam panels reinstalled and dam apron buttressed with grouted boulders on 3 October 2017. Flow bypassed in pipeline to allow grouted boulder weir construction that was necessitated by channel down-cutting during flood.

Photo 8. Boulder weir fishway construction leading to fish ladder on 3 October 2017.

Photo 9. Grouted boulder weirs on 15 October 2017, with pipeline removed and flow through radial gates. Gates were slowly closed (to maintain a live stream downstream) raising the Metcalf Pond water level, and allowing flow to spill through the fish ladder 1 week later.

Photo 10. Singleton Road on 26 February 2017 at 650++ cfs, with no adult steelhead passage possible because of high velocity in the two submerged culverts and on the steeply inclined apron.

Photo 11. Singleton Road at approximately 450 cfs on 15 April 2017, impassable due to high velocity in the culverts and on the inclined apron.

Photo 12. Singleton Road on 18 November 2017 at approximately 50 cfs. Possibly marginally passable through the culverts. Note the damage to culvert on the right in the picture.

Photo 13. Immediately downstream of the outflow from Anderson Reservoir on 2 May 2017. Due to the seismic need to lower the water level in the reservoir and to recharge the aquifer, stream flows were high in Coyote Creek all summer and fall, and most of the water came from the reservoir rather than from a more equal combination of imported San Felipe Pipeline water and reservoir releases. This resulted in cooler stream water temperatures upstream of Ogier Ponds than in 2014-2016. Releases were usually turbid (visibility 15 cm on 2 May and 50 cm on 18 November) because of the abundant stored storm runoff.

Photo 14. Realigned channel between the Model Airplane Park and Ogier Pond #1 at 70 cfs on 26 October 2017. The channel was moved during the February flood 300 feet to the east to an old stream channel. Less than 1 cfs was flowing in the bypassed old channel.

Photo 15. The stream rejoined and braided 4+ channels through the forested old channel location upstream of Ogier Pond #1. 26 October 2017.

Photo 16. Washed out road and culvert immediately downstream of Ogier Pond #1 on 2 May 2017 at approximately 150 cfs. Stream flow was still turbid (16 cm visibility) from storm water stored in Anderson Reservoir. Visibility had cleared to 75 cm by 26 October 2017.

Photo 17. Outlet to Ogier Pond #4 on 18 November 2017 at approximately 70 cfs. The narrow outlet was widened from about 25 feet to 85 feet (including 45 feet above the present water surface).

From:	Fleck, Diane
To:	Looker, Richard@Waterboards
Cc:	Hashimoto, Janet; Feger, Naomi@Waterboards
Subject:	Comments: 2018 Triennial Review for San Francisco Bay Basin Plan
Date:	Thursday, June 07, 2018 4:30:07 PM

Hi Richard,
Thank you for the opportunity to comment on the San Francisco Bay Region's document, "Brief Issue Descriptions for the 2018 Triennial Review of the San Francisco Bay Basin Water Quality Control Plan (Basin Plan)." The Triennial Review document includes many excellent proposals for projects to enhance the Basin Plan and improve water quality within the Region.

We strongly support two proposals concerning beneficial uses: 2.6, *Designate Tribal Tradition and Culture, Tribal Subsistence Fishing, and Subsistence Fishing Beneficial Uses in the San Francisco Bay Region*, and 2.2 *Addition of Sport Fishing Beneficial Uses to Lakes*. Both are important for the protection of human health through fish consumption. Since they are similar in nature, it may be efficient to combine the proposals.

During the Board's 2015 Triennial Review, a proposal to develop nutrient water quality objectives for San Francisco Bay was included as a priority but was not addressed during the cycle. Nutrient objectives for the Bay are important; we recommend you consider including the proposal for this cycle.

Our regulations at 40 CFR part 131.20 concerning Triennial Reviews require states to include an explanation if the State does not intend to adopt new or revised criteria for parameters for which EPA has published new or updated Clean Water Act (CWA) section 304(a) criteria recommendations. Tables containing the most recent 304(a) aquatic life and human health criteria recommendations can be found at our website: https://www.epa.gov/wqc/national-recommended-water-quality-criteria. Proposal 3.9, *Consider incorporating Clean Water Act section 304(a) criteria in the Basin Plan*, includes a proposal to update Basin Plan objectives where appropriate. If this proposal is not a priority in the final Triennial Review, please include an explanation as to why the Board decided not to address the project.

If you have any questions, please do not hesitate to contact me at (415) 972-3527 or Fleck.Diane@EPA.gov.

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