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December 16, 2016

VIA ELECTRONIC MAIL

Jeanine Townsend, Clerk of the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814
commentletters@waterboards.ca.gov

Re: Comment Letter – Bay-Delta Phase II Working Draft Science Report

Dear Ms. Townsend:

On behalf of Stockton East Water District, we appreciate the opportunity to comment on the State Water Resources Control Board's (State Water Board) Bay-Delta Phase II Working Draft Scientific Basis Report (Draft Report). By way of background, Stockton East Water District holds rights to water held in New Hogan Reservoir located on the Calaveras River. New Hogan Reservoir is the Stockton East's primary source of agricultural and municipal water for the District which serves 155,000 acres and over 300,000 residents. Stockton East serves as Watermaster for New Hogan Dam at all times except flood control operations when the Army Corps of Engineer's operates New Hogan Dam.

The Calaveras River is unlike most eastside tributaries to the Delta. It is a very small "flashy" rain driven stream that flows high during short durations in the winter, with little to no flow during the late spring, summer and fall. It is because of Stockton East's operations that the river does not run dry every year. Because of the flashy nature of the flows, it is only rarely connected to the San Joaquin River, which interestingly, has kept predators out of the river. Stockton East operations has created a vibrant *O. mykiss* population that would otherwise not exist under natural unimpaired conditions. Water is stored during the winter and Stockton releases it during the summer time which creates suitable temperatures for the over-summering *O. mykiss*.

We requested our fishery consultant, FishBio, review the Draft Report as they have been the exclusive entity conducting research and monitoring on the fisheries in the Calaveras River for the past 16 years. As you will see from FishBio's comments, they have some grave concerns with the Draft Report and its treatment of the Calaveras River. We hope the State Water Board will give serious consideration to the issues contained in the FishBio Technical Memorandum.

Once again, we appreciate the opportunity to comment on the Draft Report, and invite the State Water Board to reach out to the District to obtain a more thorough understanding of the Calaveras River. Please do not hesitate to contact me if you have any questions.

Very truly yours,

KARNA E. HARRIGFELD
Attorney-at-Law

Enclosure

cc: Scot A. Moody
FishBio

FISHBIO

TO: Karna Harrigfeld
FROM: FISHBIO
DATE: December 16, 2016
SUBJECT: Comments on State Water Resources Control Board's Working Draft Scientific Basis Report on the Phase II Update of the 2006 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

TECHNICAL MEMORANDUM

The State Water Resource Control Board (State Water Board) is conducting a comprehensive review of the Bay-Delta Water Quality Control Plan ("Plan"). The Plan establishes measures for protection of beneficial uses of water in Bay-Delta watersheds. There are four phases to the review process, of which Phase II, "…involves other comprehensive changes to the Bay-Delta Plan to protect beneficial uses not addressed in Phase I," (State Water Board 2016). The State Water Board identifies eight areas that Phase II addresses that include, "(1) Delta outflow objectives, (2) export/inflow objectives, (3) Delta Cross Channel Gate closure objectives, (4) Suisun Marsh objectives; (5) potential new reverse flow objectives for Old and Middle Rivers; (6) potential new floodplain habitat flow objectives; (7) potential changes to the monitoring and special studies program, and (8) other potential changes to the program of implementation," (State Water Board 2016).

Phase II of the review is currently underway, and over the past few months several documents were made available and meetings were held. Specifically, the "Working Draft Scientific Basis Report for New and Revised Flow Requirements on the Sacramento River and Tributaries, Eastside Tributaries to the Delta, Delta Outflow, and Interior Delta Operations" ("Draft Report") was released October 19, 2016. A preliminary draft of the report was released to solicit early input from stakeholders. Additionally, a workshop was conducted as a follow-up to the report on December 7, 2016 to allow for a general presentation and public comment.

The stated purpose of the Draft Report is to research, support, and scientifically address four categories of requirements. These four categories include: "…(1) new inflow requirements for the Sacramento River, its tributaries, and eastside tributaries to the Delta; (2) changes to Delta outflow requirements; (3) new and modified interior Delta flow requirements; and (4) new requirements for cold water habitat." The Draft Report is intended to provide the scientific basis to determine these requirements. This report purports to describe the State Water Board's scientific basis for developing flow requirements for the Calaveras River. However, from a thorough review of the Draft Report there is absolutely no science to support the inflow requirements suggested in the Draft Report for the Calaveras River.

The State Water Board continually references the 2012 Bay-Delta Plan Workshops as a basis of information collection and review. A thorough search for a reference to the "Calaveras River" was missing in all the State Water Board documents regarding Phase II and all documents submitted as part of the 2012 workshops. The document titled, "Comprehensive (Phase II) Review and Update to the Bay-Delta Plan Final Bay-Delta Plan Workshops Summary Report," also offered no mention of the Calaveras River. Upon reviewing the Draft Report and attending

the workshop, it is clear that the State Water Board lacks a fundamental understanding of the Calaveras River and the suggestion of mimicking the natural hydrograph based on a set unimpaired flow is an inappropriate, harmful approach that would have a devastating impact on the Calaveras River biological resources. This memorandum raises a number of issues with incorrect statements and/or justification provided in the Draft Report, and presents clarifying information.

Issue 1
The Calaveras River is a Seasonal River and Cannot Be Managed on an Unimpaired Flow Basis

When considering flow requirements, it is important to understand that the Calaveras River is different from most all tributaries to the Bay Delta. The Calaveras River watershed is low-elevation with no snowpack, making it a completely rain-fed system. Elevations in the basin range from near sea level at the confluence with the San Joaquin River to 130 feet at Bellota, and 500 feet at New Hogan Dam. Only about 5% of the basin is above 4,000 feet in elevation.

The Calaveras River Basin climate is characterized by cool, relatively wet winters, and hot, dry summers. Winters are characterized as short and mild with relatively frequent rains, with snow only occurring in negligible amounts within the upper reaches of the watershed. Due to the low elevation of the upper watershed, snow pack does exist in any measurable amount. Summers are long and hot with little to no rainfall. Seasonal rainfall is variable, ranging from less than 16 inches to over 45 inches (USAED 1981). In normal years, more than 90% of the precipitation occurs between November and April and normal annual precipitation for above New Hogan Dam is 33.3 inches, ranging from 24 inches at New Hogan reservoir to 50 inches in the upper basin.

The Calaveras River should not be considered in the Phase II process as a river that should be a managed source of inflow for the Delta due to the small size of the watershed and the fact that in many months there is simply no inflow into New Hogan Reservoir. Average annual runoff in the basin is 157,000 acre feet (years 1907 to 1980). This represents *only 0.5%* of the overall outflow to the Delta (pg. 2-64). Due to its relatively small drainage area and limited snow pack, the hydrology of the Calaveras River is indicative of many North Coast California streams and rain-driven systems in California. These systems characteristically have unimpaired or natural flows that range from low to non-existent during the dry season (late spring, summer, and early fall) to moderately high with sporadic peaks during the wet season (late fall through spring). Prior to Stockton East Water District's operations, the lower river would frequently dry up during the late spring and summer. Now, water stored in New Hogan Reservoir during the wet season is released year-round to the Calaveras River, which results in approximately 18 miles of sustained year-round flows and quality aquatic habitat.

This river was not historically perennial and became disconnected from the San Joaquin River for much of the year. The upper river, above New Hogan Dam, lacks habitat to historically support salmonids. These relatively unique characteristics result in the Draft Report making inaccurate or concerning assumptions. To manage the Calaveras River based on its natural pre-dam hydrograph (i.e. mimicking the natural hydrograph) would allow for the river to dry to pools

and eliminate the 18 miles of quality aquatic habitat between New Hogan Reservoir and the Bellota Diversion that currently exists during the late spring, summer, and early fall. In addition, it would significantly impact the most reliable source of surface water in the surrounding area for agricultural and municipal use.

Issue 2
Stanislaus River Water is Not Imported Into the Calaveras River

On page 2-37 of the Draft Report the State Water Board makes two separate statements suggesting that New Melones Reservoir water from the Stanislaus River is imported into the Calaveras River. The statements are as follows:

> *"Imports of up to 105 TAF may occur annually from New Melones Reservoir and is used for irrigation, groundwater recharge, and drinking water from March to November (DWR 2007). "*
>
> *"The primary controls on channel flows are the Calaveras Headworks which prevents New Melones flood control releases from entering the Old Calaveras River, the Bellota Weir near the head of Mormon Slough which controls irrigation releases during the April through October irrigation season, and the Stockton Diversion Channel which shunts local runoff from the Old Calaveras River to Mormon Slough (DWR 2007)."*

Water from the Stanislaus River is not imported and does not enter the Calaveras River. This type of statement is concerning, given it is both a significant error and has notable implications if it were not called out for revision. The lower Calaveras River between New Hogan Dam (RM 42) and the San Joaquin River confluence consists of seven visually distinct reaches. Provided below is a description of each reach to improve the State Water Board's knowledge of the Calaveras river:

- **Reach 1-** New Hogan Dam to Canyon (RM 41.0 to 42.0) is characterized by a relatively low gradient with a broad floodplain. Riparian vegetation is characterized by trees and shrubs, with an obvious absence of large woody debris within the wetted channel.
- **Reach 2-** Canyon to Jenny Lind (RM 34.6 to 41.0) is the highest gradient section of the river, dropping approximately 300 feet in elevation over the course of a few miles. The reach is characterized by high gradient riffles and plunge-pools.
- **Reach 3-** Jenny Lind to Shelton Road (RM 29.3 to 34.6) consists of a moderate gradient that meanders through a relatively unused and inaccessible area. The floodplain throughout the reach is relatively undisturbed, with agricultural interests somewhat separated from the immediate riparian area. An abundance of large trees provides shade cover. This reach has been subject to historical gravel mining and the floodplain continues to be mined near Jenny Lind. The gravel is surprisingly free of silt, possibly due to the abundance of gravel recruitment from tailing piles. Instream woody debris, undercut banks, and overhanging vegetation are typical.
- **Reach 4-** Shelton Road to Bellota (RM 23.8 to 34.6) is characterized by low gradient, which meanders through the valley, consisting mostly of glides with only an occasional

riffle. Bank vegetation is brush with agriculture frequently abutting the stream. The Bellota Diversion is at the base of this reach and is operated year-round.

- **Reach 5-** Old Calaveras River Channel (secondary channel) is one of two reaches below the Bellota Diversion. The Old Calaveras River is used for water conveyance. At the headworks, fish are diverted away from the Old River channel into the primary channel (Mormon Slough). The Old Calaveras River Channel is characterized by a narrow channel with ample vegetative cover and large instream woody debris. Much of the vegetative cover consists of agricultural and non-native invasive plant species, such as Himalayan Blackberry. The Old Calaveras River becomes more channelized with less cover as it reaches the valley floor.
- **Reach 6-** Mormon Slough/Stockton Diverting Canal (primary channel - RM 5.6 to RM 23.8) is the second channel below the Bellota Diversion. The 12,500 cfs flow-control channel protects the City of Stockton from flooding. The channel is a migratory corridor (when wetted) for fish. This reach comprises a wide channel with steep contoured banks and little to no usable cover or structure.
- **Reach 7-** Junction of Old Calaveras River/Stockton Diverting Canal to Confluence (RM 0 to RM 5.6) begins where the narrow, low capacity Old Calaveras River Channel joins with the much wider, higher capacity channel of the Stockton Diverting Canal. The channel continues to exhibit the same characteristics of steep levee banks confining a wide low gradient streambed with little natural riparian cover as the maintenance practices of the San Joaquin County Flood Control and Water Conservation District prevent the growth of shrubs and trees larger than one inch in diameter. The river shows signs of tidal influence within about four miles of the confluence with the San Joaquin River Stockton Deep Water Channel.

Issue 3
Spring-Run Chinook Do Not Historically or Currently Occur in the Calaveras River

The Draft Report incorrectly states on page 3-21 that "Spawning habitat for Central Valley spring-run Chinook salmon also includes the main stem of the Sacramento (between Keswick Dam and RBDD), Feather, Yuba, and Calaveras Rivers and Cottonwood, Antelope, Thomes, Big Chico, Battle, Butte, Deer and Mill Creeks (NMFS 2014)". At the December 7, 2016 workshop the State Water Board acknowledged and corrected the mistake. While we appreciate the State Water Board acknowledgment that the error will be corrected, we provide the following information in support of correction.

This statement was an error acknowledged at the Workshop and existing research and agency documents overwhelmingly support correction. First, this sentence from the Draft Report cites the National Marine Fisheries Service Recovery Plan (NMFS 2014), but in the recovery plan the Calaveras is explicitly not listed as a river with historical spring-run habitat (Figure 2-4, NMFS 2014). Clark (1929, as cited in Yoshiyama et al. 2001) reported that the Calaveras was mostly dry in the summer and fall. Furthermore, the river lacks holding habitat at high elevations where it is cool enough to support the spring-run populations during the summer. According to Yoshiyama et al. (2001), "This river [i.e., Calaveras River] was probably always marginal for salmon, and it lacks suitable habitat for spring-run fish (E.R. Gerstung, personal observation)." Most government agency documents cite the main source of historical spring-run data as

Yoshiyama et al. (2001). NMFS Historical salmonid distribution dataset relies on Yoshiyama et al. (2001), and thus does not include Calaveras in the spring-run historical habitat (Schick et al. 2005, Plates 2 and 6). Lindley et al. (2004) also lists historical populations of spring-run Chinook salmon in the Central Valley (Table 2), and does not include Calaveras River.

Regulatory documentation further confirms that spring-run Chinook were not considered for recovery in the Calaveras River. The Recovery Plan (NMFS 2014) does not include the Calaveras River on the map of spring-run Designated Critical Habitat and Distribution (Figure 2-8 in NMFS 2014), and it points to the Final Rule "Endangered and Threatened Species; Designation of Critical Habitat for Seven Evolutionarily Significant Units of Pacific Salmon and Steelhead in California" on September 2, 2005 (70 FR 52488) as the source for the spring-run critical habitat map. A review of the 2005 Final Rule on designation of critical habitat indicates that Calaveras River is NOT listed as critical habitat for Spring-run. Furthermore, a 2000 Federal Register Final Rule notice on critical habitat designation for spring-run (65 FR 7764) states that NMFS had: "removed Nimbus, San Pablo, Shasta, and Calaveras Dams from Table 11 since they do not delimit the upstream extent of river reaches inhabited by this ESU". Table 11 in the 2000 Final Rule ("Hydrologic Units and Counties Containing Critical Habitat for Central Valley California Spring-run Chinook Salmon, and Dams/Reservoirs Representing the Upstream Extent of Critical Habitat") does not include any reference to Calaveras River.

Issue 4
The Calaveras River Does Not Follow Stated 'Principles' that the Draft Report Cites

On page 3-2 the Draft Report cites the principles upon which it is basing environmental flow management for natural resources. The report states, "Bunn and Arthington (2002) present four key principles underlying the links between hydrology and aquatic biodiversity and the impacts of altered flow regimes: 1) flow is a major determinant of physical habitat; 2) aquatic species have evolved life history strategies based on natural flow regimes; 3) upstream-downstream and lateral connectivity are essential to organism viability; and 4) invasion and success of nonnative species is facilitated by flow alterations." These concepts are based on mechanisms that occur in unmodified, relatively pristine, large river-floodplain systems that are very different from the Calaveras River watershed. The physical habitat of the Calaveras River has been significantly modified. Mormon Slough was created as a wide flood control channel, which is now the principal fish migration route instead of the historic Old Calaveras River channel.

Prior to New Hogan Dam, the river would run dry and only residual pools would remain in the Canyon Reach, where deep pools and shading may have sustained native fish assemblage like minnows and sucker species. The Canyon, which is found below New Hogan Dam, maintains its deep pools even at very low base flows. This is because the channel is small in dimension and overall capacity. Upstream of New Hogan Dam, there is minimal suitable salmonid habitat. As anecdotal evidence, historical stocking of fish in the upper watershed ceased because the habitat could not support them. After the New Hogan Dam was built, the persistent available cold water between the dam and Bellota has allowed for a significant *O. mykiss* population to establish that would have not been present based on the historical hydrograph and absence of snowpack that otherwise would have provided cool spring runoff. Furthermore, the continued intermittent

connection of the lower Calaveras River with the San Joaquin River during only the winter months has reduced the non-native warm water predator population.

Issue 5
Variable Flows from New Hogan Reservoir Releases Do Not Result in Turbidity in the Calaveras River

On page 3-4 the Draft Report states that, "Increasing turbidity events from more variable flows and the associated geomorphic processes also decreases predation and provides environmental cues needed to stimulate migration (Gregory and Levings 1998; Baxter et al. 2008; NMFS 2009)." Turbidity has been identified as one of several potential contributing factors to stimulating downstream movement. However, it is important to examine the relationship between flow source and turbidity. Research on the Calaveras River has indicated that elevated water releases from New Hogan Reservoir are negatively correlated to turbidity. Natural precipitation events that register even small amounts of flow from nearby Cosgrove Creek quickly elevate turbidity reflecting a positive relationship (Figure 1). A positive correlation with downstream movement from *O. mykiss* was seen at the rotary screw trap from natural events ranging from 5 to 10 NTU. Increased turbidity and correlated movement were not seen from releases only coming from New Hogan Dam with no associated rain event.

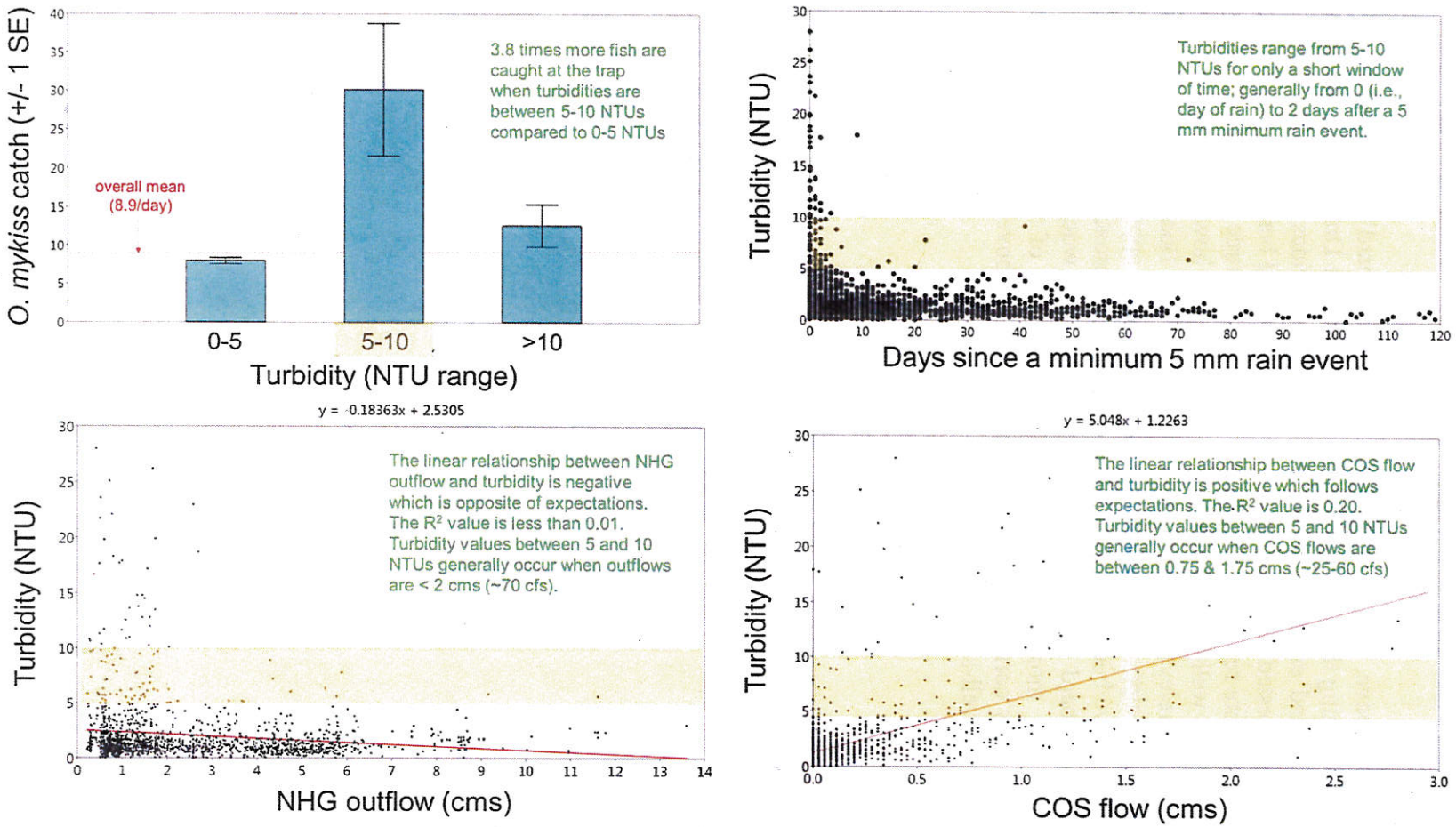

Figure 1. Top left figure reflects the positive correlation of turbidity with *O. mykiss* downstream movement. Top right figure displays the occurrence of turbidity events based on precipitation in the Calaveras River. The bottom two inset figures show the positive relationship of turbidity with Cosgrove Creek outflow (left) and negative relationship with New Hogan Reservoir outflow (right).

Issue 6
There is No Evidence that Mimicking the Natural Hydrograph Would Benefit the Calaveras River Fishery

From the issues identified above, it is clear that the State Water Board's understanding of and proposed approach for managing the Calaveras River presented in the Draft Report is misguided. In addition to those issues and errors, the State Water Board provides no statistically-backed justification for how the suggested flow management approach would benefit the local fishery or any specific species. Any future revision or suggestion to revise resource management should be followed with an explicit and well-supported analyses as to why and how much the revision will benefit the local fishery (or relevant species). Had the State Water Board conducted rigorous analyses, provided statistical support, and scientifically justified their approach specifically to the Calaveras River, it would have been clear that the recommended approach was both invalid and harmful. The State Water Board would have understood that this would lead to a dry river-channel during the summer months and inevitably the collapse of the current *O. mykiss* population. Regardless of any corrections based on the comments above, future versions of the Draft Report should provide well-supported analyses.