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Via electronic filing

RE: Comments on the Draft Environmental Impact Report for the Long Term Operation of the State Water Project

Dear Mr. Chao:

The California Sportfishing Protection Alliance, the California Water Impact Network, AquAlliance, and California Water Research (collectively, CSPA et al.) respectfully submit comments on the Department of Water Resources' (DWR) Draft Environmental Impact Report for the Long Term Operation of the State Water Project (DEIR).[1]

CSPA et al. supports and incorporates by reference the comments on the DEIR of National Resources Defense Council (NRDC) et al. More specifically, CSPA et al. concurs with NRDC et al. that the DEIR:

- Fails to provide an accurate and consistent project description;
- Fails to consider a reasonable range of alternatives;

[1] Department of Water Resources, *Draft Environmental Impact Report for the Long Term Operation of the State Water Project*, State Clearinghouse No. 2019049121, November 22, 2019.

- Fails to adequately analyze the effects of implementing the addendum to the Coordinated Operating Agreement, notwithstanding DWR's Notice of Preparation;
- Fails to adequately disclose likely environmental impacts during droughts, including by failing to consider the effects of climate change;
- Fails to consider the whole of the action under CEQA, because it fails to analyze the effects of coordinated operations of the State Water Project (SWP) and Central Valley Project (CVP) upstream of the Delta;
- Fails to adequately analyze environmental impacts and fails to disclose the significant adverse impacts of the Proposed Project; and
- Violates the California Endangered Species Act.

CSPA et al. adds the following additional lines of commentary:

- The Proposed Project substitutes process for clear enforceable measures.
- Commitments by the State of California in the 2000 CALFED Record of Decision for flow improvements in the Delta largely failed to occur.
- None of the alternatives analyzed in the DEIR is adequate under CESA or is sufficient to protect other public trust fishery resources.
- The DEIR mischaracterizes the results of studies of the Pelagic Organism Decline and ignores the need for increases in Delta outflow.
- The DEIR fails to adequately describe or address the collapse in primary production in the Bay-Delta.
- Regulatory requirements on which the DEIR relies are either not adequately protective or are not complied with.
- The DEIR fails to adequately analyze the effects of implementing the addendum to the Coordinated Operating Agreement.
- The DEIR fails to adequately disclose likely environmental impacts during droughts.
- The DEIR fails to analyze the baseline and reasonably foreseeable future conditions of the water supply operation of Oroville Reservoir.
- The DEIR's finding that the impacts of the Proposed Project to Delta water quality are less than significant ignores substantial evidence to the contrary.
- The DEIR fails to consider the mandates of the 2009 Delta Reform Act.
- The DEIR fails to consider the constitutional mandate to prevent the waste and unreasonable use of water.
- The DEIR's exclusion of an analysis of the impacts of the Proposed Project on recreation and harmful algal blooms as not having potential significant impacts is unwarranted.

These comments of CSPA et al. supplement the legal and factual arguments of NRDC et al. on the shortcomings of the DEIR.

The analysis of CSPA et al. finds that the DEIR is inadequate under CEQA. CSPA et al. recommends that DWR withdraw the DEIR and recirculate a legally sufficient DEIR that corrects the inadequacies that both CSPA et al. and NRDC et al. identify in their respective comments.

I. The Proposed Project substitutes process for clear enforceable measures.

On multiple issues and topics, the DEIR describes a Proposed Project that would substitute process for clear, enforceable measures. Indeed, much of the premise of the DEIR is that "real-time operations" and adaptive management, along with physical habitat improvements, will improve conditions for pelagic and anadromous fish in the Bay-Delta estuary.

In place of defined Old and Middle River (OMR) protections, the DEIR proposes an elaborate decision making protocol that would allow "flexible" OMR operation.[2] The protocol involves eight "physical checks" and six potential "off-ramps."

DWR and the California Department of Fish and Wildlife (CDFW) would evaluate a large suite of factors in evaluating management for each of the four covered species in order to choose from a suite of possible OMR operations. One of these factors includes whether annual entrainment has exceeds 90% of the greatest annual entrainment numbers for each species from the 2010-2018 time period. This threshold itself is not a valid standard of protection, particularly for smelt, considering the decline of species since 2010. A far smaller number of smelt entrained in 2020 may account for a much higher percentage of the overall population of smelt than the maximum entrainment figures represented when populations were more abundant.

Many of the processes designed to protect fish involve participation from entities other than DWR and CDFW, whose cooperation is not certain. For example, a "food subsidy action" relies on "partnerships with local water users."[3]

Additionally, "The federal government is proposing a Real-Time Operations Charter to facilitate federal coordination with the State."[4] However, the federal government has not yet produced such a charter. It is unknown whether the federal government will produce such a Charter, whether it will acceptable on its face, and whether the Bureau of Reclamation (Reclamation) will change it unilaterally, consistent with its recent behavior.[5]

A real-world example of real-time management of OMR operations similar to those in the Proposed Project occurred in December 2019. The SWP and CVP maintained very high pumping levels, and salinity in the south and central Delta increased substantially, moving spawning smelt into fresh water closer to the Delta pumps.[6] Neither the Smelt Working Group, nor the Water Operations Management Team, nor the Director of the Department of Fish and Wildlife intervened to correct these hazardous conditions for smelt that were spawning in the central Delta.

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[2] DEIR, p. 3-19.
[3] DEIR, p. 3-31.
[4] DEIR, p. 3-33.
[5] *See*, for example, discussion of Reclamation's 2017 decision not to comply with flow requirements at Vernalis, later in this document.
[6] *See* figures and analysis at: http://calsport.org/fisheriesblog/?p=2981.

The public and decision makers cannot rely on the production of promised measures, their implementation, or their effectiveness. In addition, the public will be largely shut out of oversight of their implementation. DWR must recirculate the DEIR and ground the Proposed Project in clear and enforceable measures that are reasonably certain to occur.

II. Commitments by the State of California in the 2000 CALFED Record of Decision for flow improvements in the Delta largely failed to occur.

The California Secretary of Natural Resources was a signatory to the 2000 CALFED Programmatic Record of Decision (CALFED ROD).[7] A cornerstone of the 2000 CALFED ROD was an environmental water budget of 1.18 million acre-feet. Page 57-58 of the CALFED ROD documents the assumed commitments:

> **Tier 1** is baseline water, provided by existing regulation and operational flexibility as described above. The regulatory baseline consists of the biological opinions on winter-run salmon and delta smelt, 1995 Delta Water Quality Control Plan, and 800 TAF of CVP Yield pursuant to CVPIA Section 3406(b)(2).
>
> **Tier 2** consists of the assets in the EWA combined with the benefits of the ERP and is an insurance mechanism that will allow water to be provided for fish when needed without reducing deliveries to water users. (These assets are shown in the table on page 58 of the ROD). Tier 1 and Tier 2 are, in effect, a water budget for the environment and will be used to avoid the need for Tier 3 assets as described below.
>
> **Tier 3** is based upon the commitment and ability of the CALFED Agencies to make additional water available should it be needed. It is unlikely that assets beyond those in Tier 1 and Tier 2 will be needed to meet ESA requirements. However, if further assets are needed in specific circumstances, the third tier will be provided. In considering the need for Tier 3 assets, the fishery agencies will consider the views of an independent science panel. Although the CALFED Agencies do not anticipate needing access to Tier 3 of water assets, the CALFED Agencies will prepare an implementation strategy for Tier 3 by August 2001, establishing a timely scientific panel process and identifying tools and funding should implementation of Tier 3 prove necessary.

As described in Appendix A to these comments, *Disappearance of Environmental Water Budgets in the CALFED Programmatic Record of Decision*, the promised 800,000 acre-feet of water annually dedicated to fish and wildlife under CVPIA section 3406(b)(2) has vanished, as

[7] CALFED Bay-Delta Program, Programmatic Record of Decision, August 28, 2000. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=5075. The full set of attachments is available at: https://www.dfg.ca.gov/erp/envcomp_rod.asp, including Attachment 1: California Environmental Quality Act Requirements.

has the 380,000 acre-feet of water that was to be provided annually by the Environmental Water Account.

In 19 years of implementation since the CALFED Record of Decision, and 25 years since the 1994 Bay-Delta Agreement, the CALFED Ecosystem Restoration Program has failed to achieve its objectives. DWR's contemporary EcoRestore Program is basically a rebranding of the CALFED Ecosystem Restoration Program, which was only partially implemented.

Contrary to commitments in the CALFED Programmatic Record of Decision, its Adaptive Management Program has never made additional water available under Tier 3 to protect ESA-listed species, and has failed to achieve the stated objectives in the CALFED ROD.

Based on the historical practice of the State of California, vague promises in the instant DEIR of future flow augmentation or other measures to be potentially supplied under real-time operations or adaptive management are not reasonably certain to occur as required under CEQA.

III. None of the alternatives analyzed in the DEIR is adequate under CESA or is sufficient to protect other public trust fishery resources.

A. The Proposed Project and other Project Alternatives do not meet the requirements of CESA.

Neither the Proposed Project nor the other alternatives that the DEIR analyzes would meet the requirements of California Endangered Species Act. Thus, they are not reasonable alternatives.

Much of the DEIR uses a degraded baseline under CEQA to say that there would be no significant impacts because the Proposed Project or other project alternatives would leave conditions equal to or slightly better than the No Project alternative. The DEIR states::

> The DEIR addresses the incremental contribution of the Proposed Project in combination with other related past, present, and future plans and projects. As discussed in Section 4.6.1, the DEIR finds that while ecological conditions in the Delta have been degraded because of past actions and activities, the Proposed Project's contribution to this cumulative impact is not cumulatively considerable, and the Proposed Project would not contribute to cumulatively significant impacts when viewed in combination with other reasonably foreseeable plans or projects.[8]

The simple fact is that the Delta ecosystem has collapsed under the operation of the SWP and CVP, and the Proposed Project would not reverse this collapse and put listed species on a trajectory for recovery. For this reason, the Proposed Project is not a reasonable alternative. Each of the other project alternatives suffers from the same failure to meet a threshold trajectory for recovery. CEQA mandates "that public agencies should not approve projects as proposed if

[8] DEIR, p. 1-9.

there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects." PRC § 21002. Further, "[e]ach public agency shall mitigate or avoid the significant effects on the environment of projects that it carries out or approves whenever it is feasible to do so." PRC §§ 21002.1(b), 21081; CEQA Guidelines §§ 15091, 15093.

The failure to define alternatives that would reverse the collapse in the Delta ecosystem and the impending extinction of one or more species renders the DEIR deficient as a CEQA document and inadequate for CESA.

B. The Proposed Project's changes in OMR and related operations would increase the certainty that San Joaquin River salmonids would not be successful in volitionally emigrating through the Delta.

The DEIR states: "DWR, in coordination with Reclamation, proposes to operate the SWP in a manner that maximizes exports while minimizing direct and indirect impacts on state and federally listed fish species."[9] This is not accurate. What DWR proposes to do is keep impacts no worse than the existing impacts. That is different than "minimizing" impacts.

The DEIR uses much of the "new science" that it brings to bear to show that Proposed Project will not perform any more poorly than the recent operation of the SWP under the 2008 and 2009 BiOps.

For example, the Proposed Project would do away with use of the Head of Old River Barrier (HORB). HORB is a protective feature designed to reduce passage of juvenile salmonids from the San Joaquin River watershed out of the San Joaquin River into Old River and other south Delta channels that are in close proximity to the SWP and CVP export pumps. The DEIR acknowledges that without HORB, both spring-run salmon and fall-run salmon from the San Joaquin watershed are much more likely to enter "the Old River route" than when HORB is deployed.[10]

However, rather than seeking to improve success of passage through the San Joaquin River (away from the SWP and CVP export pumps) with flow or by identifying other feasible measures, the DEIR concludes that the almost certain adverse impact of routing juvenile salmonids past the pumps is acceptable, on the grounds that survival of outmigrants in routes other than Old River is low anyway. The DEIR states:

> While this routing increases entrainment risk for these fish, available coded-wire-tagging and acoustic-tagging studies indicate survival in this region is very poor generally and not adversely influenced by export rates (SST 2017). Entrainment at the CVP has been observed to yield higher through-Delta survival (via trucking) than volitional migration through the Delta by other routes, even with positive OMR conditions (Buchanan et al.

[9] DEIR p. 3-18.
[10] DEIR, p. 4-211, 4-223.

2018; SJRGA 2011, 2013). Though entrainment has the potential to increase during April and May due to increased exports under the Proposed Project scenario in these months, through-Delta survival of juvenile Fall-run Chinook Salmon originating from the San Joaquin River basin may not be impaired by these operations, relative to the Existing Conditions scenario.[11]

There is no rational basis for saying that this approach is "minimizing" impacts. It is, rather, using science conducted under degraded conditions to justify making adverse impacts more certain. The fact that entrainment leads to salvage and higher survival via trucking is sorry consolation for the fact that the Proposed Project does nothing to improve the success of salmonids volitionally outmigrating from the San Joaquin watershed. The DEIR uses "new science" as the science of surrender.

The DEIR offers the additional consolation for San Joaquin River spring-run: "Spring-run Chinook Salmon juveniles may receive some ancillary protection during April and May from the risk assessment-based approach for OMR flow management included in the Proposed Project that would be undertaken for other species."[12] Absent explicit protection, the DEIR again relies on process in place of substance to provide "ancillary protection."

In sum, the DEIR is misleading in stating that it will minimize impacts to listed species. It will also not minimize impacts to fall-run salmon. Instead, the DEIR uses scientific study to justify increasing water supply by increasing the certainty that San Joaquin salmonids will not succeed in volitional outmigration through the Delta. This increased certainty of unsuccessful salmonid outmigration is, moreover, a significant impact under CEQA.

IV. The DEIR mischaracterizes the results of studies of the Pelagic Organism Decline and ignores the need for increases in Delta outflow.

The DEIR shows graphs of the CDFW's Fall Midwater Trawl (FMWT) indices for Delta smelt and longfin smelt.[13] Graphs of the indices for other species, including striped bass, American shad, splittail, and threadfin shad are available on the CDFW FMWT website.[14] The FMWT indices establish that, between 1967-1971 and 2014-2018, populations of striped bass, Delta smelt, longfin smelt, American shad, splittail and threadfin shad have declined 98.5, 99.4, 99.9, 52.6, 98.6 and 93.3 percent, respectively. This collapse is known as the Pelagic Organism Decline (POD). This collapse is continuing. Survey results for Delta smelt led U.C. Davis fisheries professor Peter Moyle to warn state officials in 2018 to prepare for the extinction of Delta smelt.[15]

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[11] DEIR, p. 4-223. Tracking studies of San Joaquin watershed salmon focus on fall-run because they are more abundant and available for study than spring-run.
[12] DEIR, p. 211.
[13] DEIR, pp. 4-59 and 4-57, respectively.
[14] CDFW FMWT Monthly Abundance Indices, available at: http://www.dfg.ca.gov/delta/data/fmwt/indices.asp.
[15] *See* http://www.capradio.org/44478, http://californiawaterblog.com/2015/03/18/prepare-for-extinction-of-delta-smelt/, http://news.nationalgeographic.com/2015/04/150403-smelt-california-bay-delta-extinction-endangered-species-drought-fish/.

The DEIR refers to the Interagency Ecological Program (IEP) team that studied the Pelagic Organism Decline as the "POD-Modeling Team."[16] This description fails to communicate the scope of the large interdisciplinary, multi-agency scientific team that was formed to study the Pelagic Organism Decline. Sommer et. al. characterized the Pelagic Organism Decline Management Team as follows:

> In response to the POD, the IEP formed a work team in 2005 to evaluate the potential causes of the decline (IEP 2005, 2006). The team organized an interdisciplinary, multi-agency effort including staff from DFG, California Department of Water Resources, Central Valley Regional Water Quality Control Board, U.S. Bureau of Reclamation, U.S. Environmental Protection Agency, U.S. Geological Survey, CALFED, San Francisco State University, and the University of California at Davis. A suite of 47 studies was selected based on the ability of each project to evaluate the likely mechanisms for the POD, and the feasibility of each project in terms of methods, staffing, costs, timing, and data availability.[17]

The last report of the IEP POD work team was the 2010 *Pelagic Organism Decline Work Plan and Synthesis of Results* (2010 POD Synthesis Report) (Baxter et al., 2010.)[18] The 2010 POD Synthesis Report was comprehensive, citing hundreds of scientific studies. While the DEIR mentions the 2010 POD Synthesis Report, it mischaracterizes the conclusions in the report.

The DEIR states that the 2010 POD Synthesis Report identified the nine drivers of the Pelagic Organism Decline as

> (1) mismatch of larvae and food; (2) reduced habitat space; (3) adverse water movement/transport; (4) entrainment; (5) toxic effects on fish; (6) toxic effects on fish food items; (7) harmful cyanobacteria *Microcystis aeruginosa* blooms; (8) non-native overbite clam (*Potamocorbula amurensis*) effects on food availability; and (9) disease and parasites."[19]

However, the 2010 POD Synthesis Report cites these factors as having been *evaluated* in the 2005 POD conceptual models, stating further:

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[16] DEIR, p. 4-44.

[17] Sommer, Ted & Armor, Chuck & Baxter, Randall & Breuer, Richard & Brown, Larry & Chotkowski, Mike & Culberson, Steven & Feyrer, Fredrick & Gingras, Marty & Bruce, Herbold & Kimmerer, Wim & Mueller-Solger, Anke & Nobriga, Matthew & Souza, Kelly. (2007). The Collapse of Pelagic Fishes in the Upper San Francisco Estuary: El Colapso de los Peces Pelagicos en La Cabecera Del Estuario San Francisco. Fisheries. 32. 270-277. 10.1577/1548-8446(2007)32[270:TCOPFI]2.0.CO;2. P. 275. Available at: https://water.ca.gov/LegacyFiles/iep/docs/pod/sommers_fish.pdf.

[18] Baxter, R., R. Breuer, L. Brown, L. Conroy, F. Feyrer, S. Fong, K. Gehrts, L. Grimaldo, B. Herbold, P. Hrodey, A. Mueller-Solger, T. Sommer, and K. Souza. 2010. *Pelagic Organism Decline Work Plan and Synthesis of Results*. Interagency Ecological Program for the San Francisco Estuary. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/FOTR/for_60.pdf.

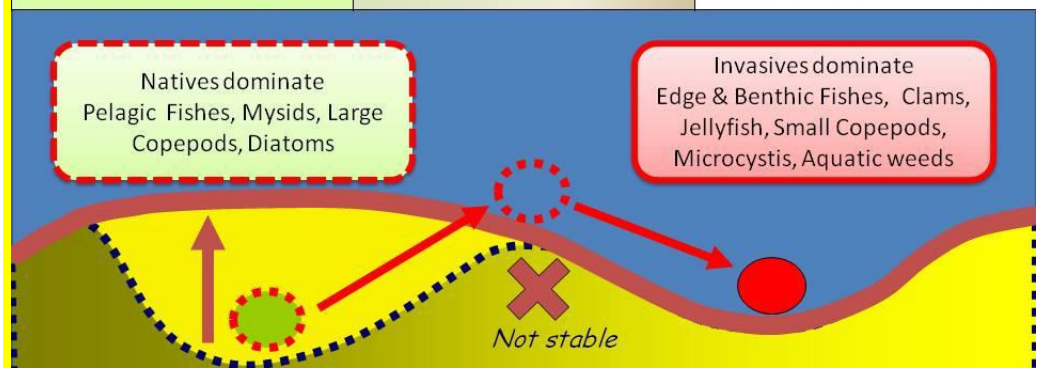
[19] DEIR p. 4-44, citing p. 18 at 676 of the 2010 POD Synthesis Report.

> These earlier conceptual models provided a useful way to: (1) summarize understanding of factors that may have contributed to the POD and (2) design the initial suite of research studies; however, they had several shortcomings. They did not adequately reflect spatial and temporal variation in the nine drivers evaluated, new data showed several assumptions to be incorrect, and the initial models were relatively cumbersome.[20]

The DEIR does not mention one of the central hypotheses in the 2010 POD Synthesis Report: that there has been a regime shift in the Delta ecosystem, and that the primary driver of the regime shift is Delta outflow.

The POD Management Team hypothesized that "drivers that changed slowly over decades (slow drivers) contributed to the slow erosion of ecological resilience of the system. This made the system more vulnerable to the effects of drivers that changed more rapidly around the time of the POD and/or have greater species specificity."[21] The POD Management Team hypothesized that the slow drivers of the POD regime shift, in order of their hypothesized importance to the resilience of the system and approximate rate of change were: 1) Delta outflow, 2) salinity, 3) landscape, 4) temperature, 5) turbidity, 6) nutrients, 7) contaminants, and 8) harvest.[22] The POD Management Team illustrated regime shift and the drivers of this shift in the figure reproduced below.[23]

Old Regime	Environmental Drivers	New Regime
Variable, High	Outflow	*Variable, Lower*
To the west, Variable	Salinity gradient	*To the east, Constricted*
Complex, Variable	Landscape	*Simplified, Rigid*
Low, Variable	Temperature	*High, Uniform*
High, Variable	Turbidity	*Low, Less variable*
High P, low N	Nutrients	*Low P, High N (NH_4+)*
Few, Low	Contaminants	*Many, High*
Predation, Fishing	"Harvest"	*Predation and Entrainment*



[20] POD Synthesis Report, p. 18 at 672.
[21] *Id*., p. 11 at 379.
[22] *Id*., p. 11 at 383.
[23] POD Synthesis Report, Figure 8, pdf p. 144.

Of these slow abiotic drivers, the SWP and CVP operations strongly influence outflow, and salinity, and also influence temperature. Without addressing these fundamental drivers of change in the Delta ecosystem, the DEIR's proposal to restore 30,000 acres of tidal wetland, floodplain habitat, and riparian habitat[24] and reintroduce hatchery-bred smelt is inadequate.

A December 2019 review of the future of Delta smelt by noted fisheries biologist Peter Moyle and others stated:

> While water users hope that restoration provides an alternative to water use, this is not realistic. Successful restoration requires water flowing across the landscape. Moving water promotes the exchange of nutrients, controls introduced species, distributes food production, and creates habitat structure. Flows help restorations mimic natural environments and improves their effectiveness. Flows give managers better control of where Delta smelt end up during the spring, summer and fall. Habitat with minimal outflow is an empty promise.[25]

V. The DEIR fails to adequately describe or address the collapse in primary production in the Bay-Delta.

The DEIR cites a 2015 paper by Hammock et. al. However, the DEIR fails to cite a more recent 2019 paper by Hammock et. al., which found a 97% decline in production of chlorophyll in the estuary a due to invasion by *Potambcorbula amurensis* and the effects of Delta exports. [26] As discussed by fisheries expert Tom Cannon:[27]

> The [2019 Hammock et al.] paper concludes there is "a growing consensus that the decline in pelagic fish abundance in the SFE [San Francisco Estuary] is at least partially due to a trophic cascade, triggered by declining phytoplankton (Feyrer et al. 2003; Sommer et al. 2007; Hammock et al. 2017; Hamilton and Murphy 2018)".
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> The authors noted that "the suppression of phytoplankton abundance due to exports cannot be reversed with equivalent releases from upstream reservoirs. Releasing water in late summer/fall increases flow, which decreases residence time, and therefore suppresses phytoplankton abundance (Table 2, Fig. 6)." This finding is extremely important because the primary form of mitigation for Delta exports has been maintaining outflow by increasing inflow with reservoir releases.

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[24] DEIR, p. 4-68.

[25] Moyle, P., Bork, K., Durand, J. , Hung, T., Rypel, A., *Futures for Delta Smelt*, https://californiawaterblog.com/2019/12/15/futures-for-delta-smelt/

[26] Hammock, B.G., Moose, S.P., Solis, S.S. et al., "Hydrodynamic Modeling Coupled with Long-term Field Data Provide Evidence for Suppression of Phytoplankton by Invasive Clams and Freshwater Exports" *San Francisco Estuary Environmental Management* (2019) 63: 703. https://doi.org/10.1007/s00267-019-01159-6. Available at https://link.springer.com/article/10.1007/s00267-019-01159-6.

[27] Tom Cannon, The Delta's Trophic Collapse Explained, blog post, April 17, 2019. Available at http://calsport.org/fisheriesblog/?p=2570.

> The study's analyses strongly indicate that the decline in estuary productivity is associated with the clam invasion and increasing exports over the past five decades. The effects are most pronounced in non-wet years when fish production is most negatively affected.

The DEIR describes the collapse in primary production only qualitatively, and does not discuss the new research tying the decline to Delta exports. The Proposed Project consequently fails to adequately address the issue. The DEIR proposes to address food web effects by running water from the Colusa Basin Drain down the Yolo Bypass in the summer and fall, titling this action the "North Delta Food Subsidies and Colusa Basin Drain Project**."** The DEIR states: "Initial results suggest that a target pulse of 27 TAF over a 4-week period would improve downstream transport of phytoplankton."[28] But the analysis fails to quantify the scale of the action in comparison to the total volume of the estuary and the massive deficit in primary production.

The decline of primary production in the Delta has been a long-standing issue. The 1983 Interagency Ecological Program Annual Report documents that there was an "apparent lack of a spring algal bloom in the lower San Joaquin River near Antioch since 1976."[29] During the 1976-1977 drought, salinity in the estuary increased greatly due to relaxation of salinity standards by the State Water Resources Control Board.

The DEIR fails to analyze an alternative that would sufficiently restore the natural hydrograph, although this was specifically requested in scoping comments by California Water Research. Restoring the natural hydrograph in spring was also one of the main conclusions of the State Water Resources Control Board's (SWRCB or Water Board) report from the 2010 Delta flow criteria informational hearing,[30] discussed in Section XI of these comments. Restoring the natural hydrograph in spring is also proposed in the State Water Resources Control Board's 2018 Framework for the ongoing update of the Bay-Delta Water Quality Control Plan.[31] The Water Board's 2018 Framework proposed Delta outflow requirements of 55% of unimpaired flow from the Sacramento River and tributaries, with an adaptive range of up to 65% of unimpaired flow, and 40% of unimpaired flow from the San Joaquin River and tributaries, with an adaptive range of up to 50% of unimpaired flow. See SWRCB Framework at 14-18.

As documented by American Rivers in a presentation to the State Water Resources Control Board's 2012 Bay-Delta Water Quality Control Plan workshop, there has been a

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[28] DEIR, p. 3-31.

[29] Interagency Ecological Program, 1983 Annual Report, p. 32. Electronic copies taken offline by the California Department of Water Resources and the US Bureau of Reclamation.

[30] State Water Resources Control Board, *Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem*, 2010. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/swrcb_25.pdf

[31] State Water Resources Control Board, July 2018 *Framework for the Sacramento/Delta Update to the Bay-Delta Plan*. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/sed/sac_delta_framework_070618%20.pdf.

dramatic shift in releases from Oroville Reservoir from the spring to the summer, turning the natural hydrograph on its head.[32] Figure 1 from that presentation, showing the change in Feather River flows for above normal, below normal, and dry years, before and after Decision 1641, is shown below.[33]

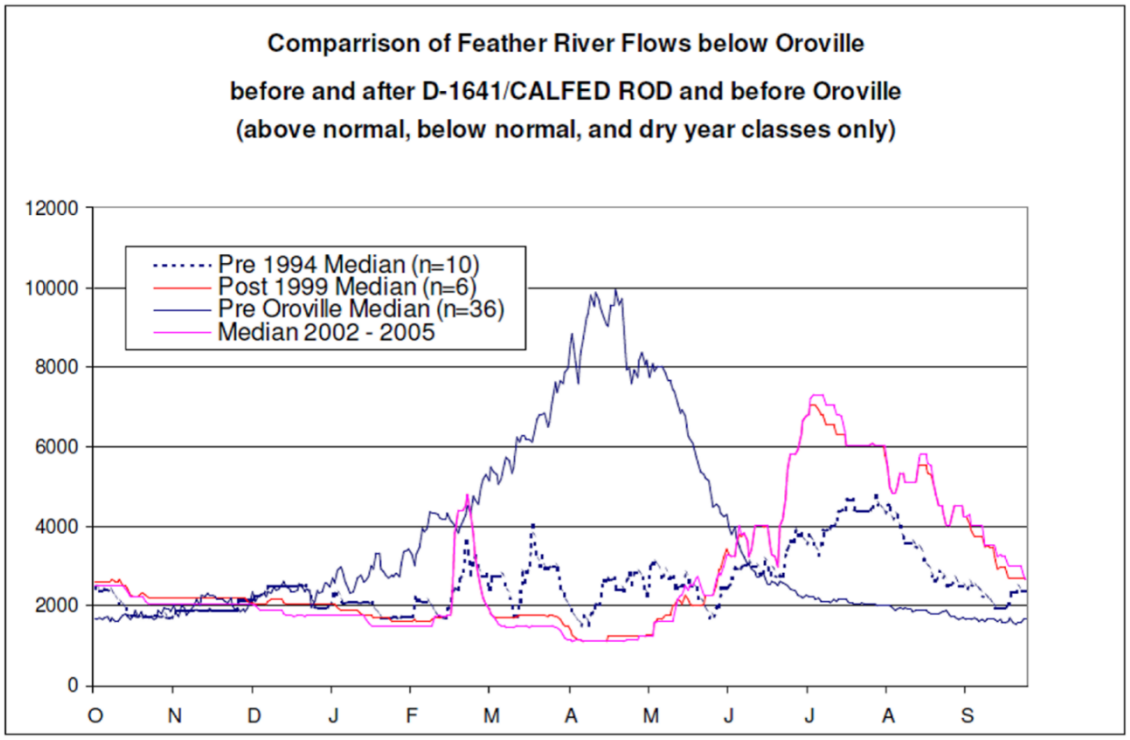

Figure 1: Influence of the Sacramento-San Joaquin Delta Regulations on Feather River Hydrograph. The blue line depicts pre-Oroville median flows and approximates the natural flow regime. In 1995 the Water Quality Control Plan tightened restrictions on the timing of Delta diversions. The pre-1994 hydrograph compared to the post-1999 hydrograph illustrates how the hydrograph shifted spring flows to summer releases to optimize water diversions with the Delta export/inflow requirements.

These operations of Oroville Dam and releases to the Feather River avoid triggering the increased spring outflow requirements in Table 4 of the Bay-Delta Water Quality Control Plan (p. 21.) [34] The operations maximize exports, but at the cost of fisheries and the estuarine food web.

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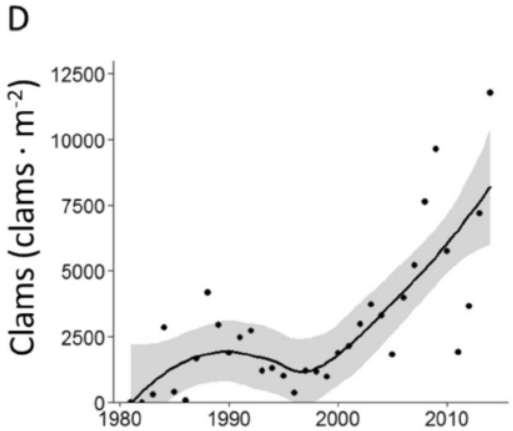
[32] American Rivers, letter and report to State Water Resources Control Board, *RE: Bay-Delta Workshop 2: Bay-Delta Fishery Resources*. Available at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/cmnt091412/john_cain.pdf.
[33] *Id* at p. 5.
[34] Part 2 Testimony of Deirdre Des Jardins for Pacific Coast Federation of Fishermen's Associations in the WaterFix Change in Point of Diversion Hearing, pp. 14-17. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/PCFFA&IGFR/part2/pcffa_161.pdf

The DEIR discusses the invasion of the overbite clam, *Potamcorbula amurensis*, and its effects on the food web, in the section on Nutrients and Food Web Support.[35] However, the DEIR does not mention the outcome of the IEP Pelagic Organism Decline study on *P. amurensis*. In a 27-year retrospective, Peterson and Vayssieres found that "benthic assemblages [in the Bay-Delta] were not geographically static, but shifted with salinity, moving down-estuary in years with high delta outflow, and up-estuary during years with low delta outflow." [36]

Greg Gartrell also observed that Delta smelt populations increased between 1995 and 2000, an extended period when Suisun Bay freshened.[37] Hammock et. al. (2019) shows a temporary reduction in the density of *P. amurensis* from about 1995 to 2000 (Figure "D", shown below).[38]



The DEIR fails to consider operations to freshen Suisun Bay for multiple years for suppression of *P. amurensis*, although California Water Research requested such an evaluation in scoping comments. DWR's failure to analyze this alternative violates CEQA. Under CEQA, lead agencies may not dismiss from consideration "any alternatives that feasibly might reduce the environmental impact of a project on the unanalyzed theory that such an alternative might not prove to be environmentally superior to the project." *Habitat & Watershed Caretakers v. City of Santa Cruz* (2013) 213 Cal.App.4th 1277, 1305 (emphasis omitted). ("The purpose of an EIR is to provide the facts and analysis that would support such a conclusion so that the decision maker can evaluate whether it is correct.") *Id.* Omission of this discussion "fail[s] to satisfy the informational purpose of CEQA." *Id.*

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[35] DEIR, p. 4-168.

[36] Peterson HA, Vayssieres M (2010) "Benthic assemblage variability in the upper San Francisco Estuary: a 27-year retrospective.*" San Francisco Estuary Watershed Sci* 8:1–27.Available at: http://www.escholarship.org/uc/item/4d0616c6

[37] Gartrell, G. PE, *Will Increasing Outflow in the Summer Increase Delta Smelt Survival?* Public Comment on Bay-Delta Phase 2 Working Draft Report, December 15, 2016. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/comments121616/docs/greg_gartrell.pdf.

[38] Hammock et. al. (2019), *op cit.* Figure 3D, p. 8.

VI. Regulatory requirements on which the DEIR relies are either not adequately protective or are not complied with.

A. The 2006 Bay-Delta Water Quality Control Plan did not address the Pelagic Organism Decline.

The DEIR relies in part on compliance with the 2006 Bay-Delta Water Quality Control Plan for protection of fish and wildlife (*see* Section 4.4.5, Regulatory Limitations on Operations of Water Project Diversions, subsection 4.4.5.1, Decision 1641). But the 2006 Bay-Delta Water Quality Control Plan was issued before the reports of the Pelagic Organism Decline Management Team were available, and did not address the POD.

The Plan Amendment Report, Appendix 1 to the 2006 Bay-Delta Water Quality Control Plan[39] states:

> The reasons for the POD are still unknown, and water project operations are included in the conceptual model for many of the POD studies as a possible factor/cause for the decline. The study results are expected in 2007, and may have an impact on the Delta Outflow objective and its implementation. The study results could help staff assess when the current Delta outflow objective must be met to protect the beneficial uses and whether the objective can be relaxed without causing an additional negative impact to sensitive species. In light of this, the State Water Board did not change this objective in the 2006 Plan. The State Water Board will not consider changing the Delta Outflow objective until the POD studies are completed or the Board receives other reliable technical information, warranting a change.[40]

The Water Board held two workshops in 2007 and 2008 to receive information on the Pelagic Organism Decline.[41,42] But the Water Board deferred consideration of the results presented in the two workshops until the Pelagic Organism Decline studies were completed. The initial Pelagic Organism Decline studies have since been completed, and academic papers from the POD studies have been published and peer-reviewed.

The Proposed Project cannot rely on compliance with the 2006 Bay-Delta Water Quality Control Plan to assure protection of pelagic fish and other organisms in the Delta.

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[39] SWRCB, SWRCB, Plan Amendment Report, Appendix 1 to the 2006 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta, December 13, 2006. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/wq_control_plans/2006wqcp/docs/2006_app1_final.pdf.

[40] *Id.*, pp. 45-46.

[41] SWRCB, 2007 Pelagic Organism Decline Workshop Notice is available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/pelagic_organism/docs/pn_pod.pdf.

[42] SWRCB, January 2008 Pelagic Organism Decline Workshop Notice is available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/pelagic_organism/docs/pod_wkshop_notice.pdf.

B. The SWP and CVP have not complied with the narrative salmon protection standard in the Bay-Delta Water Quality Control Plan.

The State Water Project and Central Valley Project have not complied with the narrative salmon protection standard in Table 3 of the SWRCB's Bay-Delta Plan. The objective states: "Water quality conditions shall be maintained together with other measures in the watershed, sufficient to achieve a doubling of natural production of Chinook salmon from the average production of 1967-1991, consistent with the provision of State and federal law."[43] This salmon doubling provision is also mandated in the California Fish and Game Code (FGC §6902) and the CVPIA.

The U.S. Fish and Wildlife Service's (USFWS) Anadromous Fisheries Restoration Program (AFRP) documents that, since the 1967-1991 baseline period, natural production of Sacramento River mainstem winter-run Chinook salmon and spring-run Chinook salmon have declined by 88.8 and 97.96 percent, respectively, and are only at 5.5 and 1.02 percent, respectively, of doubling levels mandated by the California Water Code (CWC), California Fish & Game Code, and the Central Valley Project Improvement Act. Natural production of San Joaquin River System fall-run Chinook salmon has declined since 1967-1991 by 54.5% and is only 22.7% of doubling levels.[8] Natural production since the 2008 USFWS and 2009 NMFS Biological Opinions (BiOps)[9] were issued is significantly below production in the initial 15 years of the doubling period (1992-2007).

The Proposed Project makes no effort to comply with the requirements of the salmon doubling goal. On the contrary, it uses a standard of existing conditions as the yardstick by which it measures salmon protection under proposed SWP Delta operations.

C. The SWP and CVP have not complied with the D-1641 requirement for a fisheries protection plan prior to use of Stage 2 of the JPOD.

Subsection 4.4.5.1 of the DEIR states that the use of Stage 2 of the Joint Point of Diversion requires completion of a fisheries response plan.[44] However, the DEIR does not acknowledge the Bureau of Reclamation's failure to update the fisheries response plan since 2006, although such an update was required by the Executive Director of the State Water Resources Control Board in approving the plan submitted in 2006.[45] The Department of Water

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[43] SWRCB, Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, December 13, 2006, p. 14. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/swrcb_27.pdf.

[44] DEIR, p. 4-110.

[45] Part 2 Testimony of Deirdre Des Jardins for Pacific Coast Federation of Fishermen's Associations, Section 3, Decision 1641 Operations Plan, p. 9-11. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/PCFFA&IGFR/part2/pcffa_161.pdf; U.S. Bureau of Reclamation and California Department of Water Resources, December 26, 2006 Plan for Protection of Fish, Wildlife, and Other Legal Users of Water During Stage 2 Joint Point of Diversion. Available at:

Resources has never submitted an acceptable plan for use of Joint Point use of Reclamation's pumping plant, and requested an exemption in 2017 after the intake structure for Clifton Court Forebay was damaged.[46] The exemption was denied.[47]

Section 4.4.5.1 of the DEIR also discusses circumstances in which the JPOD might be used, but does not discuss the impacts on such use of the 2018 *Addendum to the Agreement Between the United States of America and the Department of Water Resources of the State of California for Coordinated Operation of the Central Valley Project and the State Water Project*[48] (2018 COA Addendum). Amendment #2 of the 2018 COA Addendum allocates 65% of the SWP and CVP joint export capacity to the CVP during balanced water conditions, and 60% during excess water conditions.[49] Instead, the DEIR addresses the export sharing formula only as a modeling assumption.[50]

DWR should issue a recirculated DEIR that analyzes the impacts of Reclamation's sharing of the export capacity at Banks Pumping Plant under Amendment #2 to the 2018 COA Addendum and discuss potential mitigations.

D. The CVP has stopped complying with D-1641 minimum instream flow requirements at Vernalis.

The description of the Proposed Project in Table 1-1 on p. 1-5 of the DEIR fails to mention the fact that the Bureau of Reclamation is currently refusing to comply with the minimum instream flows required at Vernalis under Decision 1641. On February 15, 2017, Richard Woodley, Reclamation's Resources Manager, sent a letter to the California State Water Resources Control Board stating that Reclamation will not comply with the Bay-Delta Water Quality Control Plan's 2006 Table 3 requirements for minimum instream flows at Vernalis, but only those in Appendix 2E of the National Marine Fisheries Services Biological Opinion.[51] The

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http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/jpod/docs/fish_plan_122606.pdf; February 8, 2007 letter From Tom Howard to U.S. Bureau of Reclamation and California Department of Water Resources, titled, *Fishery Protection Plan for Joint Point Of Diversion*. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/jpod/docs/fish_plan_approval020807.pdf.

[46] April 19, 2017 letter from Department of Water Resources to SWRCB Executive Director Tom Howard, titled, *Request for a Short-Term Exemption from JPOD limits*. Obtained from: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/jpod/docs/04192017_dwrltr.pdf

[47] May 4, 2017 letter From Tom Howard to John Leahigh, Chief, Water Operations Office, California Department of Water Resources, titled Joint Points of Diversion Request. Obtained from: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/jpod/docs/05042017_swbltr.pdf

[48] US Bureau of Reclamation and California Department of Water Resources, *Addendum to the Agreement Between the United States of America and the Department of Water Resources of the State of California for Coordinated Operation of the Central Valley Project and the State Water Project*, December 12, 2018. Available at: http://calsport.org/news/wp-content/uploads/Signed-COA-Addendum-121218.pdf.

[49] *Id.*, p. 2.

[50] DEIR, p. H-1-1-5.

[51] The February 15, 2017 letter from Richard Woodley to Tom Howard, Executive Director of the State Water Resources Control Board is available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/tucp/docs/woodley_ltr02152017.pdf.

project has not been operated to meet the 2006 Bay-Delta Water Quality Control Plan's minimum instream flows at Vernalis since that time.

As described by Delta Watermaster Michael George in a 2018 presentation to the Delta Protection Commission, [52] the south Delta has had serious deterioration of water quality, including reduced net flow in channels, reduced dissolved oxygen, and impeded navigation, as well as increased water temperature, increased harmful algal blooms, and build-up of salinity hot spots. While Mr. George cites buildup of sediment, the failure of Reclamation to provide adequate flows at Vernalis is a major contributing factor.

Subsection 4.4.5.1 of the DEIR (addressing Decision 1641) fails to discuss the reduction in inflows at Vernalis since the expiration of the San Joaquin River Agreement in December of 2009.[53] The conclusion that water quality would be protected by compliance with Decision 1641 requirements is not supported. By this omission, the DEIR fails to address the continuing decline in water quality conditions in the south Delta.

The DEIR also fails to discuss impacts of the reduced San Joaquin River flows on entrainment of pelagic and anadromous fish. The 2007 report of the Interagency Ecological Program Pelagic Organism Decline Management Team noted that increases in entrainment in the winter were correlated with reductions in San Joaquin River inflow as a fraction of total inflow[54]:

> In trying to evaluate the mechanism(s) for increased winter-time salvage, POD studies by USGS made three key observations (IEP 2005). First, there was an increase in exports during winter as compared to previous years (Figure 16). Second, the proportion of tributary inflows shifted. Specifically, San Joaquin River inflow decreased as a fraction of total inflow around 2000, while Sacramento River increased (Figure 17). Finally, there was an increase in the duration of the operation of barriers placed into south Delta channels during some months. These changes may have contributed to a shift in Delta hydrodynamics that increased fish entrainment.
> (p. 18-19.)

Juvenile San Joaquin River fall-run Chinook salmon are also not surviving migration through the Delta. From 2010 through 2015, annual estimates of the probability of surviving through the Delta ranged from 0 to 0.05, based on acoustic-telemetry data. Over half the

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[52] Michael Patrick George, Delta Water Master. Update of Activities, July 18, 2019. Presentation to the Delta Protection Commission, pdf p. 13-16. Available at: https://cah2oresearch.com/wp-content/uploads/2020/01/2019-07-18-Item-8a-Delta-Watermaster.pdf.

[53] San Joaquin River Agreement, 2000. Available at: http://www.sjrg.org/agreement.htm.

[54] Baxter, R., R. Breuer, L. Brown, M. Chotkowski, F. Feyrer, M. Gingras, B. Herbold, A. Mueller-Solger, M. Nobriga, T. Sommer, and K. Souza. 2008. *Pelagic Organism Decline Progress Report: 2007 Synthesis of Results*. Technical Report 227. Interagency Ecological Program for the San Francisco Estuary. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/pelagic_organism/docs/pod_ieppodmt_2007synthesis_011508.pdf.

surviving fish were salvaged at the CVP facilities.[55] The near-zero survival rate is likely tied to entrainment as well as reduced flows since the expiration of the San Joaquin River Agreement.

The DEIR's failure to disclose Reclamation's non-compliance with D-1641 flow requirements for Vernalis and the impacts of this non-compliance fails to meet CEQA's standard for fair disclosure.

VII. The DEIR fails to adequately analyze the effects of implementing the 2018 Addendum to the Coordinated Operating Agreement.

The Environmental Impact Report / Environmental Impact Statement for the April 1986 Coordinated Operating Agreement (1986 COA EIR/EIS) between the US Bureau of Reclamation and the California Department of Water Resources was 556 pages long.[56] It analyzed effects on carryover storage in Oroville Reservoir, on critical year operations, on water temperatures, on Delta water quality, and on fish and wildlife.

The Public Review Section of the 1986 COA EIR/EIS indicated that copies of the 1986 COA EIR/EIS were distributed for comment to the state and federal fish and wildlife agencies; to the State Water Resources Control Board; to the two U.S. Senators from California and the California Congressional delegation; to all of the relevant water agencies, including the Delta water agencies; and to environmental and fishing groups.

The only CEQA document DWR issued prior to signing the 2018 *Addendum to the Agreement Between the United States of America and the Department of Water Resources of the State of California for Coordinated Operation of the Central Valley Project and the State Water Project*[57] (2018 COA Addendum) was a Notice of Exemption.[58]

The ability of the State Water Project to meet the requirements in Decision 1641 and the Bay-Delta Water Quality Control Plan since 1986 has been largely based on the storage releases in the 1986 Coordinated Operations Agreement (1986 COA).[59] Article 6(c) in the 1986 COA[60] provided:

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[55] Buchanan, R., Brandes, P., Skalski, J. "Survival of Juvenile Fall-Run Chinook Salmon through the San Joaquin River Delta, California, 2010–2015." North American Journal of Fisheries Management, Volume38, Issue 3, June 2018. Pages 663-679. Available at: https://afspubs.onlinelibrary.wiley.com/doi/abs/10.1002/nafm.10063.

[56] The EIR/EIS for the 1986 COA is available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/FOTR/for_103.pdf

[57] US Bureau of Reclamation and California Department of Water Resources, *Addendum to the Agreement Between the United States of America and the Department of Water Resources of the State of California for Coordinated Operation of the Central Valley Project and the State Water Project*, December 12, 2018. *Op. cit.*

[58] Notice of Exemption is available at: http://calsport.org/news/wp-content/uploads/NOE-COA-Addendum-12102018_12142018-signed.pdf. The US Bureau of Reclamation issued an Environmental Assessment under the National Environmental Policy Act for the 2018 COA Addendum dated December 10, 2018, two days before the document was signed. It is available at: https://www.usbr.gov/mp/nepa/includes/documentShow.php?Doc_ID=36503.

[59] US Bureau of Reclamation and California Department of Water Resources, *Agreement Between the United States of America and the Department of Water Resources of the State of California for Coordinated Operation of the*

(c) Sharing of Responsibility for Meeting Sacramento Valley Inbasin use With Storage Withdrawals During Balanced Water Conditions: Each party's responsibility for making available storage withdrawals to meet Sacramento Valley inbasin use of storage withdrawals shall be determined by multiplying the total Sacramento Valley inbasin use of storage withdrawals by the following percentages:

United States	State
75%	25%

The 75%/25% ratio of obligations for storage releases in the 1986 COA is roughly proportional to the CVP and SWP share of the projects' reservoir storage in the Sacramento Valley, plus Trinity Reservoir. According to the California Data Exchange Center, the CVP and SWP reservoirs have the following capacities (shown in million acre-feet):

Project	Reservoir	Capacity (MAF)
CVP	Shasta	4.55
CVP	Folsom	0.98
CVP	Trinity	2.45
SWP	Oroville	3.54
	Total	11.52

Oroville Reservoir has about 31% of the joint project storage capacity, and Shasta, Folsom, and Trinity have about 69%. The 1986 Coordinated Operating Agreement obligations for storage withdrawals for inbasin needs roughly followed the projects share of joint storage capacity.

But the amendment of Article 6(c) in the 2018 COA Addendum significantly increased the obligation of the State Water Project in dry and critically dry years. Amendment #1[61] provided that "[e]ach party's responsibility for making available storage withdrawals to meet Sacramento Valley inbasin use of storage withdrawals shall be determined by multiplying the total Sacramento Valley inbasin use of storage withdrawals by the following percentages:

	United States	State
Wet Years	80%	20%
Above Normal Years	80%	20%
Below Normal Years	75%	25%
Dry Years	65%	35%
Critical Years	60%	40%

Central Valley Project and the State Water Project, November 24, 1986. Available at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/petitioners_exhibit/glenn/gcid_1.pdf.

[60] 1986 COA, pp. 9-10.

[61] 2018 COA Addendum, p. 1.

Model output in the DEIR shows increased drawdown of Oroville Reservoir due to the 2018 Coordinated Operating Agreement Addendum, but fails to discuss potential mitigation for the impact, such as increased carryover storage targets.[62]

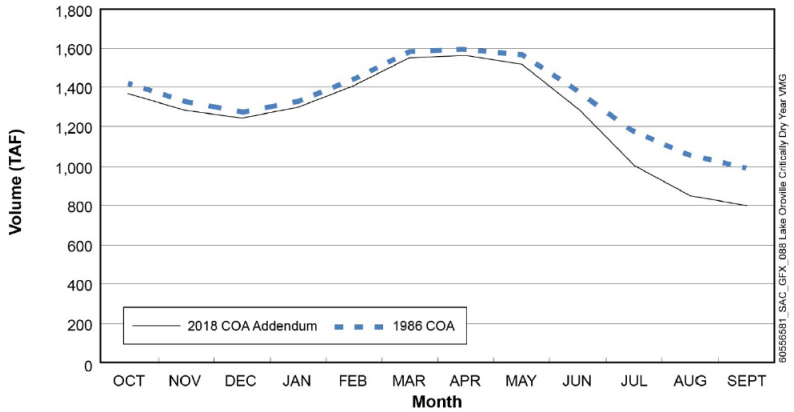

Figure 8. Lake Oroville, Critically Dry Year Average Storage

DWR and Reclamation's January 29, 2014 Temporary Urgency Change Petition (TUCP) stated that a primary reason for the TUCP was that Oroville carryover storage was very low at 1.2 million acre-feet (MAF):

> Extremely low reservoir storage levels are forecasted for this year in Northern California, in some cases surpassing prior record low levels. At this time, total storage at the SWP's Lake Oroville is roughly 1.2 million acre-feet (MAF), and the total combined storage at the CVP's Shasta and Folsom reservoirs is also very low at about 1.8 MAF. Storage in all three reservoirs is below what they were at this time in 1977 when the state was in a severe drought (see http://cdec.water.ca.gov/cgi-progs/products/rescond.pdf).[63]

This language in the 2014 TUCP strongly suggests that DWR would submit a TUCP whenever end-of-September storage levels below 1.2 million acre-feet are followed by a critically dry year.

The DEIR also fails to consider drawdown in multiple dry and critically dry years. The Amendment to Article 6(c) in the 2018 COA Addendum further states that the obligation of the SWP for meeting the Bay-Delta Water Quality Control Plan standards under such conditions is undefined:

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[62] DEIR, p. B-13, Figure 8.

[63] DWR and Reclamation, Temporary Urgency Change Petition, January 29, 2014, Attachment 1, p. 4 (pdf p. 13) [link shown in quote is in original].Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/docs/tucp/bd_tucp.pdf

> In a Dry or Critical Year following two Dry or Critical Years, the United States and State will meet to discuss additional changes to the percentage sharing of responsibility to meet inbasin use.[64]

A dry or critically dry year following two dry or critically dry years occurs 11 times in the historic record: 1926, 1931, 1932, 1933, 1934, 1989, 1990, 1991, 1992, 2009, 2015. The modelling for the Proposed Project assumes, without justification, that the obligations for the projects will not be changed (DEIR, Table 1, p. H-1-1-4.) The DEIR also does not consider alternatives for meeting the Water Quality Control Plan standards in a dry or critical Year following two critically dry years. Because this obligation is essentially undefined in the 2018 COA Addendum, and no alternatives are considered in the DEIR, the statements in the DEIR that the COA Addendum has no impact on Delta hydrology is unsupported insofar as it applies to extended droughts.

Furthermore, absent discussion of how it will operate to meet Delta standards and other water right permit requirements during droughts, the Proposed Project fails as a successor to the 2006 plan prepared by the Department of Water Resources to meet Decision 1641 requirements, which DWR submitted to the State Water Resources Control Board as directed by Water Code 138.10:

> (a) On or before January 1, 2006, the director, in collaboration with the Secretary of Interior or his or her designee, shall prepare a plan to meet the existing permit and license conditions for which the department has an obligation, as described in the State Water Resources Control Board Decision No. 1641.

Such a plan is a legal obligation of the State Water Project.

VIII. The DEIR fails to adequately disclose likely environmental impacts during droughts.

The DEIR fails to consider alternatives to the 1500 cfs minimum export rate in Section 3.3.2, or to justify the need for minimum export rates.

The DEIR also fails to consider carryover storage targets that would meet the 1500 cfs minimum export rate during a series of dry and critically dry years without the need for TUCPs. For this reason, the DEIR is inadequate under CEQA. Thus, it fails to show how "existing supplies can meet future demands for water" in the context of "minimum streamflow requirements." *Friends of the Eel River v. Sonoma County Water Agency* (2003) 108 Cal.App.4th 859, 871.

Appendix B to these comments, "*Pattern and Practice: Carryover Storage*," discusses how the DEIR's failure to adequately analyze impacts of carryover storage policies continues a

[64] COA Addendum, p. 1.

long-standing pattern and practice by the Department of Water Resources of inadequately analyzing the impacts of risk-taking with carryover storage.

IX. The DEIR fails to analyze the baseline and reasonably foreseeable future conditions of the water supply operation of Oroville Reservoir.

The DEIR states: "DWR is not requesting an ITP from CDFW for the following actions: … Oroville Dam and Feather River operations. … These facilities and operations activities are already covered under existing permits or addressed by other legal authorities."[65]

This is not true. The SWP's water supply operations for Oroville Dam and the Feather River are not conditioned under the existing hydropower license or the pending new license for the hydropower operation of the "Oroville Facilities." The SWP's water supply operations for Oroville Dam and the Feather River are not covered under any ESA or CESA permit. The SWP's water supply operations for Oroville Dam and the Feather River are not conditioned in the water quality certification for the relicensing of the Oroville Facilities. The SWP's consumptive water rights (applications 5630 and 14443) for the operation of Oroville Reservoir place no specific conditions on the storage operation there other than maximum annual diversion and season of diversion.[66]

Further, there has never been a CEQA analysis of the SWP's water supply operations for Oroville Dam and the Feather River, and there is none in the instant DEIR. There is no baseline analysis in for this operation. There is no quantification of the operation. There is no analysis of how this operation has changed or could reasonably be expected to change in the future. Thus, the DEIR cannot disclose the impacts of the Proposed Project on the water supply operations of Oroville Reservoir and the Feather River downstream of Oroville Dam. As a result, the DEIR also cannot disclose the environmental impacts of changes to the water supply operations of Oroville Reservoir and changes to the Feather River downstream of Oroville Dam.

A. The FERC relicensing of the Oroville Facilities does not cover water supply operations at Oroville Reservoir.

The Federal Energy Regulatory Commission's (FERC) relicensing of the "Oroville Facilities" explicitly excluded the water supply operation of Oroville Dam and Reservoir and the Feather River downstream to the Sacramento River. The Final Environmental Impact Statement for the Oroville relicensing (Oroville FEIS) states: "Water rights in California are regulated

[65] DEIR, p. 3-18/pdf p. 62.

[66] The power generation water rights for Oroville Reservoir, application numbers 5629 and 14444, also do not place any restrictions on storage other than maximum annual diversion and season of diversion. All permits retrieved from SWRCB's "eWRIMS" database at: https://ciwqs.waterboards.ca.gov/ciwqs/ewrims/EWServlet?Redirect_Page=EWWaterRightPublicSearch.jsp&Purpose=getEWAppSearchPage

under the Water Board's Division of Water Rights. The Commission does not have jurisdictional authority to resolve California's water rights issues."[67]

The Oroville FEIS concludes:

> The Proposed Action would slightly increase flows in the low flow channel; however, such changes would not be expected to produce a major shift in flows downstream of the Oroville Facilities. Under all the alternatives, we would expect average annual Feather River service area deliveries under existing conditions and year 2020 conditions to remain 994,000 acre-feet, and average annual South Delta deliveries to increase from the existing 3,051,000 acre-feet to 3,247,000 acre-feet in year 2020.[68]

The Oroville relicensing simply did not address the water supply operation of Oroville Reservoir, including carryover storage. In fact, the operations model that DWR developed for use in relicensing did not include carryover storage as a variable input; relicensing participants were thus not able to model different possible carryover requirements.

The Draft Environmental Impact Report ("Oroville DEIR") that DWR prepared for the relicensing and in support of the State Water Resources Control Board's water quality certification for the relicensing stated:

> The objective of the Proposed Project is the continued operation and maintenance of the Oroville Facilities for electric power generation, including implementation of any terms and conditions to be considered for inclusion in a new FERC hydroelectric license.
>
> As an integral part of the SWP, water stored in Lake Oroville is released from the Oroville Facilities to meet a variety of statutory, contractual water supply, flood management, and environmental commitments. These contractual, flood management, fishery, water quality, and other environmental obligations are defined in numerous operating agreements that specify timing, flow limits, storage amounts, and/or constraints on water releases. The Proposed Project is consistent with these existing commitments and no changes to the contractual obligations or to the general pattern of these releases are anticipated.[69]

The subsequent Final Environmental Impact Report ("Oroville FEIR") that DWR prepared for the relicensing and in support of the State Water Resources Control Board's water quality certification for the relicensing stated:

> The principal actions in the SA and analyzed in the DEIR are potential physical changes to the Oroville Facilities, environmental restoration actions in the lower Feather River,

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[67] FERC, *Final Environmental Impact Statement, Oroville Facilities California (FERC Project No. 2100)* (May 18, 2007), p. 98. Available at: https://elibrary.ferc.gov/idmws/file_list.asp?accession_num=20070518-4001.
[68] *Id.*, p. 104.
[69] DWR, Oroville Facilities Relicensing, FERC Project No. 2100, Draft Environmental Impact Report (May 2007) (Oroville DEIR), p. ES-2.

> and recreational improvements in the Project area. None of the SA actions analyzed in the DEIR would affect net flow releases into the Feather River, and thus could be considered independent of OCAP.[70]

The Oroville FEIR also declares:

> Changes in water supply and water quality in the No-Project Alternative as compared to the baseline are presented in Section 5.2 of the DEIR [for the Oroville relicensing]. Effects on the cold water pool volume in the Proposed Project as compared to baseline are the same in the DEIR as in the PDEA [Preliminary Draft Environmental Assessment, a relicensing document] because the same assumptions regarding future demand, operations, water temperature requirements, and net facilities flow releases are made in the operations modeling studies conducted for both documents. Analysis of future changes to the State Water Project (SWP) statewide operations is outside the scope of this EIR.[71]

The National Marine Fisheries Services' 2016 Biological Opinion for the relicensing of the Oroville Facilities (Oroville Relicensing BiOp) makes explicit that that Opinion and the overall relicensing had a hands-off approach to water supply:

> The proposed action analyzed in this Opinion is FERC's proposed relicensing of the Oroville Facilities (FERC Project No. 2100-134). The Oroville Facilities were developed as part of the SWP, a water storage and delivery system of reservoirs, aqueducts, power plants, and pumping plants. The SWP stores and distributes water to supplement the needs of urban and agricultural water users in Northern California, the San Francisco Bay Area, the San Joaquin Valley, Central Coast, and Southern California. As part of the SWP, the Oroville Facilities are also operated for flood management, power generation, water quality improvement in the Delta, recreation, and fish and wildlife enhancement. The FERC relicensing only applies to the facilities and operations authorized under the Federal Power Act. The operations and features that are only for the delivery of water are not part of the FERC relicensing, and therefore not part of proposed action analyzed in this Opinion.[72]

As described in the Oroville Relicensing BiOp, spring-run Chinook salmon are present in the Feather River downstream of Oroville Dam. Spring-run Chinook are listed under both the federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA). Yet as the document explicitly states as quoted above, there is no ESA coverage under the Oroville

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[70] DWR, Oroville Facilities Relicensing, FERC Project No. 2100, Final Environmental Impact Report (June 2008) ("Oroville FEIR"), p. 6-15. The Oroville FEIR incorporated the entire Oroville DEIR.
[71] *Id*., p. 4-51.
[72] *Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Response and Fish and Wildlife Coordination Act Recommendations*; Oroville Facilities Hydroelectric Project Relicensing (Project No. 2100-134); National Marine Fisheries Service (NMFS) Consultation Number: 15I422-WCR2015-SA00115, p. 5 (pdf p. 26). Available at: https://elibrary.ferc.gov/idmws/file_list.asp?accession_num=20161205-5420

Relicensing BiOp for these species in the Feather River as they are affected by DWR's water supply operations. Equally, there is no incidental take permit or consistency determination that covers the water supply operations of Oroville Reservoir under CESA.

In sum, there are no rules or enforceable conditions under the ESA, CESA, or Federal Power Act that govern, condition or permit water supply operations at Oroville Reservoir.

B. The State Water Resources Control Board has placed no condition on storage operations at Oroville Reservoir other than maximum annual diversion to storage and season of diversion.

The (SWRCB's water quality certification for the relicensing of the Oroville Facilities does not address the water supply and storage operations of Oroville Reservoir. It places no conditions on the storage operations of Oroville Reservoir. In contrast, the certification simply acknowledges the "normal operation" of the project:

> Normal operation is the operation of the State Water Project (SWP) based on standard factors such as hydrology, storage, routine maintenance and SWP obligations. Changes in operation that are a result of unusual events such as flood control releases, accidents, project failures, and major or unusual maintenance are not considered normal operation.[73]

The water rights that give DWR the right to store water for water supply operation at Oroville Reservoir (Applications 5630 and 14443) contain no restrictions on storage operations other than maximum annual diversion to storage and season of diversion.[74] Specifically, they include no explicit carryover storage requirements. The corresponding water rights for power generation at Oroville Reservoir equally place no condition on carryover storage (Applications 5629 and 14444).

C. Testimony in the hearings for the "California Waterfix" is the closest public definition to date of water supply operation of Oroville Reservoir.

During the 2015-2018 "California WaterFix" hearings before the SWRCB for a change in point of diversion of SWP water rights,[75] SWP operator John Leahigh testified under oath about DWR's carryover storage operations at Oroville. Under cross examination on May 9, 2017, SWP operator John Leahigh stated that "[O]ur monthly water operations report to State Water Contractors" contains an equation within it that embodies a "policy" by which DWR sets storage

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[73] SWRCB, Final Water Quality Certification for the relicensing of the Oroville Facilities, p. 10. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/docs/oroville_ferc2100/121510/401certification.pdf.

[74] Water rights retrieved from SWRCB eWRIMS database at: https://ciwqs.waterboards.ca.gov/ciwqs/ewrims/EWServlet?Redirect_Page=EWWaterRightPublicSearch.jsp&Purpose=getEWAppSearchPage

[75] General webpage for the California WaterFix hearings is available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/water_right_petition.html

targets for Oroville Reservoir annually.[76] Mr. Leahigh subsequently produced an example of that monthly report, which became Exhibit DWR-902.[77] Important admissions from Mr. Leahigh's testimony under cross-examination about this report include:

- The monthly "report" that embodies DWR's policy on carryover storage in Oroville Reservoir is not available on the internet or generally available to the public.[78]
- DWR has changed the "floor" carryover storage target for Oroville Reservoir several times in the previous decade.[79]
- Within the previous decade, DWR's has changed the "floor" carryover storage target for Oroville Reservoir by as much as 500,000 acre-feet per year.[80]
- There are no enforceable requirements in DWR's "policy" for carryover storage at Oroville Reservoir.[81]

DWR's Application for an Incidental Take Permit for the Long Term Operation of the State Water Project reaffirms the lack of enforceable conditions that might govern water supply operations at Oroville. The Application states: "DWR and Reclamation shall retain sole discretion for … Water Operations of the SWP and CVP, including allocations, under Reclamation Law and the State Water Project, as appropriate."[82] This description of "sole discretion" provides no more clarity than the DEIR concerning how DWR will conduct its water supply operations at Oroville Reservoir.

D. DWR must withdraw the DEIR and issue a recirculated DEIR that includes a description of baseline and future water supply operations at Oroville Reservoir.

Absent a description and analysis of the existing or proposed rules and practices that characterize DWR's operation of Oroville Reservoir for water supply, the DEIR defaults to model output to demonstrate that storage conditions at Oroville Reservoir are unlikely to change under the Proposed Project.

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[76] WaterFix Hearing Transcript, May 5, 2017, p. 160, ll. 19, 22-24. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/docs/transcripts/20170505_transcript.pdf.

[77] WaterFix exhibit DWR-902. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/petitioners_exhibit/dwr/dwr_902_swp.pdf.

[78] WaterFix Hearing Transcript, May 9, 2017, p. 21, ll. 2-12. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/docs/transcripts/20170509_transcript.pdf.

[79] *Id.*, pp. 15-17.

[80] *Id.*, pp. 15-16.

[81] WaterFix Hearing Transcript, May 5, 2017, p. 161, ll. 14-17.

[82] DWR, *Incidental Take Permit Application for Long-Term Operation of the California State Water Project* (Dec. 13, 2019), p. 3-35/pdf p. 91. Available at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Files/1_DWR_LTO_ITP_Application_2019-12-13_a_y19.pdf.

This reliance on model output confuses the map and the territory. The model of course will perform whatever the inputs to the model instruct to perform.

But even more fundamentally, it provides an answer without explaining its work. This violates CEQA.

In *County of Amador et al*. v. *El Dorado County Water Agency et al.* (1999) 76 Cal.App.4th 931 [91 Cal.Rptr.2d 66], a California court of appeals laid out basic requirements for describing reservoir operations in a CEQA document. The court stated at pp. 955-956:

> We agree that a mere recitation of end-of-month lake levels does not provide an adequate description of the existing environment or how PG&E determined water releases. The hydrologist himself referred to this data as a "a presentation of historical observations, rather than an operational analysis."
>
> The month-end water level is only one element of the operation. Just as important to fisheries, river habitation, and recreational users is how those lake levels were determined. When were releases made and at what rate? What were the factors that determined when releases would be made? Are those factors equally applicable for purposes of power generation and inelastic consumptive use? ... Reliance on lake levels alone is insufficient to describe the current release program or to assess the impacts of the proposed project.
>
> Nor does the FERC license describe existing conditions. Minimum stream flow requirements do not describe actual water releases. An EIR must focus on impacts to the existing environment, not hypothetical situations. [*internal citation omitted*] The fact that water flow must be kept at a certain minimum level does not reveal what flows were actually maintained; higher water flows would comport with FERC requirements, but might adversely affect lake levels and/or the downstream environment.

The underlying message of *Amador v. El Dorado* is that it is inadequate to say that reservoir operations will not change with a Proposed Project. A CEQA document has to *describe and analyze* both the baseline operation and the operation under the Proposed Project.

Such description and analysis is simply absent in the instant DEIR.

DWR must withdraw the DEIR and issue a recirculated DEIR that discloses the baseline condition of the water supply operations at Oroville Reservoir and the impacts of the Proposed Project on those operations and the aquatic resources in the lower Feather River that those operations affect. If the recirculated DEIR shows that the Proposed Project could result in operations that could cause take of CESA-listed species in the lower Feather River, DWR must also revise its application for an incidental take permit to cover those species.

X. The DEIR's finding that the impacts of the Proposed Project to Delta water quality are less than significant ignores substantial evidence to the contrary.

The DEIR acknowledges that modeling indicates possible exceedances of water quality standards in the Delta required under Water Rights Decision 1641 (D-1641).[83] However, in addition to dismissing this model output as a modeling artifact, the DEIR relies on testimony of DWR operator John Leahigh in the California WaterFix hearings to find that predicted exceedances would not be significant. The DEIR states:

> DWR does not anticipate that these exceedances would occur in real time. SWP and CVP have a high degree of success in meeting D-1641 requirements, as demonstrated by the historical record (Leahigh, 2016). Therefore, D-1641 compliance under the Proposed Project is similar to D-1641 compliance under the Existing Conditions scenario.[84]

However, this characterization of DWR's compliance record is contradicted by the record, both prior to and under D-1641.

The SWRCB's D-1485 established Delta water quality and flow standards applicable to the SWP/CVP between 1978 and 1994. Those standards were violated 61 times in 1979 and 319 times between 1988 and 1994.[85] The violations cited only involve standards for which both the SWP and CVP are jointly responsible and exclude violations applicable to only one project, e.g. Vernalis standards. SWRCB D-1641 established new Delta water quality standards applicable to the SWP and CVP. Between 1995 and 2015, standards were violated 1,886 times, and violations occurred in 15 of the 20 years.[86] The SWRCB never issued enforcement actions for these violations.

The DEIR acknowledges that electrical conductivity (EC) and chloride levels would increase under the Proposed Project as compared to the No Project Alternative.

> As compared to the Existing Conditions scenario, modeled electrical conductivity increased average electrical conductivity at Emmaton by 47 µmhos/cm (11%), 260 µmhos/cm (19%), and 160 µmhos/cm (18%) in January, November, and December, respectively, with electrical conductivity remaining similar in other months. …

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[83] DEIR, p. 4-27.

[84] Id. Reference "Leahigh 2016" in the DEIR is to Exhibit DWR-61, testimony of Mr. Leahigh during the California WaterFix hearings. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/petitioners_exhibit/dwr/dwr_61.pdf.

[85] Exhibit DWR-401, Bay-Delta Objectives Exceedance Metrics (Joint SWP/CVP responsibility), presented during the WaterFix Hearing. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/petitioners_exhibit/dwr/dwr_401.pdf

[86] Exhibit DWR-402, Bay-Delta Objectives Exceedance Metrics (Joint SWP/CVP responsibility), presented during the WaterFix Hearing. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/petitioners_exhibit/dwr/dwr_402.pdf

> As compared to the Existing Conditions scenario, modeled electrical conductivity increased average electrical conductivity at Jersey Point by 92 µmhos/cm (14%), 377 µmhos/cm (29%) and 360 µmhos/cm (32%) in January, November, and December, respectively, and remains similar in other months.[87]

The DEIR relies on Leahigh (2016) to state that each of its alternatives would have "less than significant" impacts on water quality because each of those alternatives would have about the same number of exceedances of Delta water quality standards as existing conditions.[88]

However, this contradicts the DEIR's stated criterion for significance:

> If a water quality constituent declines because the Proposed Project scenario is implemented rather than the Existing Conditions scenario, the impact would not be potentially significant unless it would result in exceeding applicable limits and would violate a standard or other requirement.[89]

The prediction is that exceedances will occur. Thus they would be significant. The contention that they would occur with roughly the same frequency as in the No Project Alternative does not make them any less significant.

The citation in the DEIR to Mr. Leahigh's assertion of a "high degree of success in meeting D-1641 requirements" is also misleading because this asserted success does not include periods when the SWRCB granted the SWP and CVP Temporary Urgency Change Petitions (TUCP's). This is important. The SWRCB has succumbed to a pattern and practice of waiving (*i.e.*, weakening) water quality, flow and temperature criteria whenever requested in TUCP's. Prior to 1991, the SWRCB simply didn't enforce violations of water quality standards. In 1992, Reclamation and DWR intended to submit a TUCP, but CDFW wouldn't agree to approval; the SWRCB chose not to take enforcement action for some 218 violations.[90] In June of 1992, the SWRCB relaxed D-1485 Suisun Marsh salinity and Contra Costa Canal chloride standards.[91] The SWRCB conducted a February 2009 hearing on a joint petition by Reclamation and DWR to relax Delta water quality standards, but miracle March rains made relaxation unnecessary.[92]

In 2013, the SWRCB allowed Reclamation and DWR to operate to critical year water quality standards in a dry year, effectively weakening the standards.[93] In 2014 and 2015, the

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[87] DEIR, pp. 4-25 and 4-26.
[88] DEIR, pp. 5-11, 5-43, 5-79.
[89] DEIR, p. 4-25.
[90] SWRCB letter to USBR and DWR regarding D-1485 water quality violations, June 1992, pp. 1-2 and 4. https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/CSPA%20et%20al/part2/cspa_252.pdf
[91] Order 92-02, Order Establishing Drought-Related Requirements for the Bay-Delta During 1992, p. 30-32. https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/1992/wro92-02.pdf
[92] Order WR 2009-0013-EXEC, Order Denying Temporary Urgency Change, February 24, 2009, p. 6. https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/2009/wro2009_0013.pdf
[93] Letter from SWRCB Executive Director Tom Howard to Ronald Milligan and David Roose, Actions to Conserve Cold Water Pool in Shasta Reservoir for Fishery Resources, May 29, 2013, p. 3.

SWRCB weakened water quality, flow and/or temperature criteria some 35 times.[94] Between January 2014 and December 2015, the SWRCB issued a series of fourteen orders largely granting TUCPs submitted by Reclamation and DWR for the Delta and San Joaquin River.[95] In 2014, SWRCB staff observed that the TUCP orders reduced regulatory Delta outflow by 43% and increased Delta exports by 18%. In 2015, SWRCB actions reduced regulatory outflow by 78% in order to increase exports by 32%. These changes shifted more than one million acre-feet of water from fisheries protection to agricultural and urban use.[96]

The DEIR's reliance on Mr. Leahigh's testimony in the WaterFix hearings to make a finding that exceedances of D-1641 water quality standards will be less than significant is not a reliable basis for this finding.

In addition, the crash of CESA-listed pelagic and anadromous fish species in the Delta is essential context for considering whether the DEIR's stated criterion for significance (violation of a water quality standard) sets too high a bar. Many of the D-1641 water quality standards are standards for salinity. Salinity directly affects habitat conditions for Delta smelt. Moving the habitat of Delta smelt further into the Delta by increasing salinity is likely to reduce available habitat for that species, even when no standards are exceeded. The months of December and January, in which the DEIR acknowledges that increases in salinity will occur, are key months in the Delta smelt's spawning and larval life stages.

Finally, the Proposed Project would weaken salinity standards in "Fall X2" months in Wet years. By definition, a standard won't be violated if it is weakened so that a violation under previous standard is no longer a violation.

A recirculated DEIR should re-evaluate the level of significance of changes in water quality under the Proposed Project.

XI. The DEIR fails to consider the mandates of the 2009 Delta Reform Act.

Increasing degradation of the Delta's water quality and fisheries led the California Legislature to adopt the 2009 Delta Reform Act.[97] California Water Code (CWC), Division 35

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https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/sacramento_river/docs/05292013swrcb.pdf

[94] Pubic Policy Institute of California, *What if California's Drought Continues?* August 2015, page 7: http://www.ppic.org/content/pubs/report/R_815EHR.pdf and the Technical Appendix at page 6: http://www.ppic.org/content/pubs/other/815EHR_appendix.pdf

[95] State Water Project and Central Valley Project Temporary Urgency Change Petition page, 2015 and 2015. https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/tucp/

[96] SWRCB, staff presentation at the 20 May 2015 public workshop on drought activities in the Bay-Delta. Available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/docs/workshops/swrcb_staff_pres_session1b.pdf

[97] California Legislative Information, Senate Bill No. 1, Chapter 5, (2009-2010). Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/CSPA%20et%20al/cspa_26.pdf

(Sacramento-San Joaquin Delta Reform Act of 2009), General Provisions, Sections 85000-85067 establishes a state water policy for the Delta. The Legislature found and declared that:

> The Sacramento-San Joaquin Delta watershed and California's water infrastructure are in crisis and existing Delta policies are not sustainable. Resolving the crisis requires fundamental reorganization of the state's management of Delta watershed resources. (§ 85001(a).)
>
> The Sacramento-San Joaquin Delta, referred to as the Delta in this division, is a critically important natural resource for California and the nation. It serves Californians concurrently as both the hub of the California water system and the most valuable estuary and wetland ecosystem on the west coast of North and South America. (§ 85002.)
>
> It established a policy of the State of California to:
>
> Restore the Delta ecosystem, including its fisheries and wildlife, as the heart of a healthy estuary and wetland ecosystem. (§ 85020(c)) Promote water conservation, water use efficiency, and sustainable water use. (§ 85020(d)) Improve water quality to protect human health and the environment consistent with achieving water quality objectives in the Delta. (§85020(e).)
>
> It further found and declared:
>
> The policy of the State of California is to reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency. (c) The Delta is a distinct and valuable natural resource of vital and enduring interest to all the people and exists as a delicately balanced estuary and wetland ecosystem of hemispheric importance. (§ 85022(c)(1).) The permanent protection of the Delta s natural and scenic resources is the paramount concern to present and future residents of the state and nation. (§ 85022(c)(2).) The longstanding constitutional principle of reasonable use and the public trust doctrine shall be the foundation of state water management policy and are particularly important and applicable to the Delta. (§ 85023.)

The DEIR fails to adequately discuss or analyze the requirements of state law as mandated by the Delta Reform Act and relevant sections of the CWC, particularly insofar as the DEIR fails to even acknowledge the requirement to "reduce reliance on the Delta in meeting California's future water supply needs." *See* DEIR, p. 4-105. The Proposed Project, by contrast, would increase water supply deliveries from the Delta. Failure to consider state policy and law regarding the Delta renders the DEIR deficient with respect to fair disclosure and environmental setting. The DEIR must be revised and recirculated to address these shortcomings.

CWC, Division 35 (Sacramento-San Joaquin Delta Reform Act of 2009, Part 2, (Early Actions), Section 85084.5 required:

> The Department of Fish and Game, in consultation with the United States Fish and Wildlife Service and the National Marine Fisheries Service and based on the best available science, shall develop and recommend to the board Delta flow criteria and quantifiable biological objectives for aquatic and terrestrial species of concern dependent on the Delta.

Following an extensive public proceeding including a peer-review process, CDFW issued a report titled *Quantifiable Biological Objectives and Flow Criteria for Aquatic and Terrestrial Species of Concern Dependent on the Delta*.[98] The report found that "recent Delta flows are insufficient to support native Delta fishes in habitats that now exist in the Delta" and recommended numerous biological and goals and objectives and specific recommendations for instream flow necessary to protect public trust fisheries. It also included the specific flow recommendations by the expert panel, fishery agencies and NGOs in the SWRCB's 2010 flow hearing.[99] The DEIR fails to acknowledge, discuss or analyze the findings and recommendations in the legislatively-directed CDFW report. None of the alternatives in the DEIR incorporate the findings and recommendations in the report. Failure to consider the report and the scientific findings buttressing the report renders the DEIR deficient with respect to reasonable alternatives, fair disclosure and environmental setting. The DEIR must be revised and recirculated to address these shortcomings.

CWC, Division 35 (Sacramento-San Joaquin Delta Reform Act of 2009, Part 2, (Early Actions), Section 85086(c)(1) required the SWRCB to:

> Pursuant to its public trust obligations, develop new flow criteria for the Delta ecosystem necessary to protect public trust resources. In carrying out this section, the board shall review existing water quality objectives and use the best available scientific information. The flow criteria for the Delta ecosystem shall include the volume, quality, and timing of water necessary for the Delta ecosystem under different conditions.

Section 85086(c)(2) also required that:

> Any order approving a change in the point of diversion of the State Water Project or the federal Central Valley Project from the southern Delta to a point on the Sacramento River shall include appropriate Delta flow criteria and shall be informed by the analysis conducted pursuant to this section.

Pursuant to legislative direction, the SWRCB conducted an extensive public proceeding to determine flow criteria for the Delta necessary to public trust resources, using best available scientific information. The SWRCB's proceeding to develop instream flows protective of public trust resources was the most intense and comprehensive effort to determine necessary flows to

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[98] California Department of Fish and Game, *Quantifiable Biological Objectives and Flow Criteria for Aquatic and Terrestrial Species of Concern Dependent on the Delta*, Nov. 23, 2010. https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/swrcb_66.pdf

[99] *Id.*, pp. 94, 97-104, 105-107.

protect public trust fish and wildlife resources in the 52-year history of the Board. The Board appointed an illustrious group of recognized experts to serve as an expert and reference 325 technical documents. Twenty-four parties to the proceeding provided 84 expert witnesses and 488 exhibits, plus exhibits from previous Bay-Delta hearings.[100]

The resulting SWRCB report, titled *Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem*, found that "[t]he best available science suggests that current flows are insufficient to protect public trust resources" and that "recent Delta flows are insufficient to support native Delta fishes for today's habitats." It recommended flow criteria, crafted as percentages of unimpaired flows, of "75% of unimpaired Delta outflow from January through June, 75% of unimpaired Sacramento River inflow from November through June and 60% of unimpaired San Joaquin River inflow from February through June."[101] The report also included the specific flow recommendations of an expert panel, fishery agencies, and NGO's in the hearing.[102] The DEIR fails to acknowledge, discuss or analyze the findings and recommendations in the legislatively directed SWRCB Flow Criteria report. Nor do any of the alternatives in the DEIR incorporate the findings and recommendations in the report. Failure to consider the report and the scientific findings buttressing the report renders the DEIR deficient with respect to reasonable alternatives, fair disclosure and environmental setting. The DEIR must be revised and recirculated to address these shortcomings.

Together, the legislatively mandated SWRCB and CDFW 2010 proceedings represent the most comprehensive and scientifically robust effort to determine necessary flows to protect fishery resources in a watershed in the state's history. The DEIR's failure to disclose, discuss and analyze declared state policy and CWC requirements or to discuss and include the findings and recommendations of the SWRCB and CDFW reports in a project alternative is inexplicable and fails to meet the fair disclosure requirements of CEQA. It effectively sabotages the selection of alternatives and any effects analysis. The DEIR must be revised and recirculated for additional public review.

XII. The DEIR fails to consider the constitutional mandate to prevent the waste and unreasonable use of water.

The Proposed Project will increase average annual water deliveries by an estimated 373,000 acre-feet on average.[103] With respect to the increased water deliveries, the DEIR states:

> As discussed in Section 4.6.2, while the Proposed Project has the potential to increase average annual water supply yields, any potential additional water supply would be within the historic range of water supply deliveries. In addition, any increase in water

[100] SWRCB, Delta Flow Criteria Program website: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/.
[101] SWRCB, *Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem*, 2010, p. 5, https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/swrcb_25.pdf
[102] *Id.*, pp. 153-177.
[103] DEIR, Volume II: Appendices, Table 1-2, pdf pp. 665-666.

> would be allocated between the 24 SWP water agencies south of the Delta and would not significantly increase water deliveries within areas serviced by these agencies. Thus, the Proposed Project would not remove a water-related obstacle to growth and would not induce growth in the areas served by SWP water agencies beyond what is already planned by the various local jurisdictions.[104]

The DEIR fails to consider whether these increased deliveries are a reasonable use of water under the California Constitution. Increased deliveries will perpetuate the chronic overappropriation of water.

DWR, as a state agency, is required to comply with the California Constitution. Article 10, Section 2 of the Constitution states:

> It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare. The right to water or to the use or flow of water in or from any natural stream or water course in this State is and shall be limited to such water as shall be reasonably required for the beneficial use to be served, and such right does not and shall not extend to the waste or unreasonable use or unreasonable method of use or unreasonable method of diversion of water.

California has a Mediterranean climate that experiences frequent droughts. The state also has an over appropriated water supply where demands for water exceed supply. It is beyond reasonable that the DEIR, for a Proposed Project that would supply more water for consumptive purposes and thereby reduce water available to support a seriously degraded aquatic ecosystem, should analyze whether the increased diversion of water is reasonable and whether the water would be put to a reasonable and beneficial use.

California agriculture comprises 2% of the state's GDP and uses an estimated 29 MAF of water annually. Scientists connected with the U.C. Davis Center for Watershed Sciences conducted a study of agricultural water use. They found that the top revenue producing and job creating commodities use the least water. Vegetables, horticulture, non-tree fruits, deciduous fruits, cucurbits (melons, squash, cucumbers, watermelon, zucchini, etc.), tomatoes, vine (wine and table grapes), onions, potatoes, etc. produce 81.8% of the jobs and 62.7% of the revenue but use 21.5% of the water. By comparison, irrigated pasture, alfalfa, corn, almonds, pistachios and cotton use 53.7% of water but only provide 19.6% of the revenue and 13.9% of the jobs.[105]

A recirculated DEIR must discuss and analyze whether the additional water to be diverted by the Proposed Project would be put to a reasonable and beneficial use and whether the state's

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[104] DEIR, p. 1-10.
[105] UC Davis Center for Watershed Science, Jobs per drop irrigating California crops, 2015. https://californiawaterblog.com/2015/04/28/jobs-per-drop-irrigating-california-crops/

economic and social interests would be best served by leaving that water in rivers to serve the aquatic ecosystem. Failure to conduct such an analysis renders the DEIR deficient as a fair disclosure documents and deprives the public and decision-makers of information necessary to make an informed decision.

XIII. The DEIR's exclusion of an analysis of the impacts of the Proposed Project on recreation and harmful algal blooms as not having potential significant impacts is unwarranted.

There is an immense body of evidence that SWP operations have significant impacts on recreation and aesthetics, including recreational fishing[106] and the recent proliferation of Harmful Algal Blooms (HABs) in the Delta.[107] However, the DEIR excludes analysis of the impacts of the Proposed Project on these beneficial uses of the Delta.

The condition of these resources is likely to worsen under the Proposed Project. A recirculated DEIR should analyze and propose mitigations for these potentially significant impacts.

XIV. Conclusion

DWR should withdraw the DEIR and issue a recirculated DEIR that corrects the deficiencies described in these comments and in those of NRDC et al.

Respectfully submitted,

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[106] See testimony of Bill Jennings, Dan Bacher, and David Hurley in the WaterFix hearing on the decline of Delta recreational fisheries. Available at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/CSPA%20et%20al/part2/cspa_200.pdf, https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/CSPA%20et%20al/part2/cspa_214.pdf, and https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/CSPA%20et%20al/part2/cspa_216.pdf. Supporting exhibits are available at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/cspa_et_al.html.

[107] [107] See testimony of Erik Ringelberg in the WaterFix Hearing on Harmful Algal Blooms (HABs), Available at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/COSJ%20et%20al/SJC_004.pdf. Supporting exhibits are available at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/cosj_et_al.html.

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Appendix A

The Disappearance of Environmental Water Budgets in the 2000 CALFED Programmatic Record of Decision

As described in Section II of these comments, a cornerstone of the 2000 CALFED Programmatic Record of Decision (CALFED ROD) was an environmental water budget of 1.18 million acre-feet.[108] Page 57-58 of the Record of Decision documents the assumed commitments:

> **Tier 1** is baseline water, provided by existing regulation and operational flexibility as described above. The regulatory baseline consists of the biological opinions on winter-run salmon and delta smelt, 1995 Delta Water Quality Control Plan, and 800 TAF of CVP Yield pursuant to CVPIA Section 3406(b)(2).
>
> **Tier 2** consists of the assets in the EWA combined with the benefits of the ERP and is an insurance mechanism that will allow water to be provided for fish when needed without reducing deliveries to water users. (These assets are shown in the table on page 58 of the ROD). Tier 1 and Tier 2 are, in effect, a water budget for the environment and will be used to avoid the need for Tier 3 assets as described below.

The table on page 58 of the CALFED ROD shows 380,000 feet of Environmental Water Account Assets, including 185,000 acre-feet / year of purchases of environmental water. The water budget for the environment assumed in the CALFED Record of Decision thus totaled 1.18 million acre-feet.

1. Central Valley Project Improvement Act section 3406(b)(2) water

Section 3406(b)(2) of the Central Valley Project Improvement Act (Pub. L. No. 102-575, tit. 34, 106 Stat. 4600 (1992) dedicated 800 TAF of CVP yield to fish, wildlife, and habitat restoration, stating:

> "dedicate and manage annually 800,000 acre-feet of Central Valley Project yield for the primary purpose of implementing the fish, wildlife, and habitat restoration purposes and measures authorized by this title; to assist the State of California in its efforts to protect the waters of the San Francisco Bay/Sacramento-San Joaquin Delta Estuary; and to help meet such obligations as may be legally imposed upon the Central Valley Project under state or federal law following the date of enactment of this title, including but not limited to additional obligations under the federal Endangered Species Act."

[108] CALFED Bay-Delta Program, Programmatic Record of Decision, August 28, 2000. Previously cited.

In the 2005 report, *Finding the Water: New Water Supply Opportunities To Revive The San Francisco Bay-Delta Ecosystem* (*Finding the Water*),[109] the Environmental Defense Fund described how accounting changes for the water dedicated to fish and wildlife in CVPIA section 3406(b)(2) largely negated benefits of the 800 TAF federal water budget for the environment. *Finding the Water* states in part:

> Though it was incorporated as a cornerstone of the CALFED Plan, the Interior Department's 1999 Decision for administering CVPIA Sections B1 and B2 jointly was in force for only two years— 2000 and 2001—after it was signed.
>
> […] In 1997,CVP contractors initiated litigation against the United States challenging the Interior Department's initial interpretation of Section 3406(b)(2). Various environmental groups, including Environmental Defense, and fishing groups joined the suit soon thereafter. The U.S. District Court eventually ruled on a complex series of issues involving various Department of Interior decisions over a five-year period. In January 2002,the court issued key rulings that forced Interior to revise its policies for "offset" and "reset." As a result, virtually all operational changes implemented to improve fisheries would be charged to the B2 account, even if the changes had no effect on contractors.
>
> The ruling did not address how Interior should apply the fishery provisions in Section 3406(b)(1) which authorize the Secretary "to provide flows of suitable quality, quantity, and timing to protect all life stages of anadromous fish" as long as they "do not conflict with fulfillment of the Secretary's remaining contractual obligations to provide Central Valley Project water for other authorized purposes". In addition, the court ruled that the Interior Department had no discretion to limit how much of the B2 account could be used in meeting its share of WQCP obligations. The effect of these rulings meant that, in many years, the entire B2 account might be applied to meet the WQCP obligations within the Delta, leaving no water to enhance spawning and outmigration of anadromous fish. (p. 10, footnotes omitted.)

An independent peer review of the CVPIA Anadromous Fish Restoration Program was conducted in 2008, and was highly critical of Reclamation's implementation of the 3406(b)(2) water budget. The report of the independent peer review was titled *Listen to the River: An Independent Review of the CVPIA*.[110] The report stated that the reviewers were "flabbergasted" to learn that none of the 800 TAF of water dedicated to fish and wildlife in CVPIA section 3406(b)(2) was reaching San Francisco Bay:

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[109] Rosekrans, S., Hayden, H. *Finding the Water: New Water Supply Opportunities to Revive the San Francisco Bay-Delta Ecosystem, Environmental Defense Fund*, 2005. Available at: https://www.edf.org/sites/default/files/4853_FindingtheWater_0.pdf.

[110] Cummins, K, Furey, J.D.: Giorgi, A., Lindley, S., Nestler, J., Shurts, J., *Listen to the River: An Independent Review of the CVPIA Fisheries Program* Prepared under contract with Circlepoint for the U.S. Bureau of Reclamation and the U.S. Fish and Wildlife Service, December 2008. Available at: https://www.usbr.gov/mp/cvpia/docs_reports/indep_review/FisheriesReport12_12_08.pdf.

> When viewed in combination with the broad directive in Section 3406(b)(1)(B) to "modify Central Valley Project operations to provide flows of suitable quality, quantity, and timing to protect all life stages of anadromous fish," for which the 800 kaf is one explicit tool, the panel expected to find that implementation of 3406(b)(2) had occurred in this way: The agencies identify 800 kaf of dedicated storage in the system – essentially, a water volume budget – and then consistent with an identified system-wide flow regime to improve conditions for anadromous fish, Reclamation would release this stored water in requested amounts at the call of the fish managers and then protect that amount of altered flow through the rivers, through the Delta, and into the bay.
> We were flabbergasted to learn this is not how the agencies implement this provision. The agencies have not identified a system-wide flow regime and set of system flow objectives. Worse, Reclamation does not dedicate and manage 800 kaf of water from headwaters storage through the Delta. Instead, Reclamation releases approximately *400* kaf from CVP storage each year, aimed at supporting the needs of particular life stages at particular locations. These augmented amounts are then *diverted out of the system* at a later point. The 800 kaf accounting then includes approximately 400 kaf realized in pump restrictions in the Delta. This approach seems fundamentally at odds with the intent and language of the legislation.

The summary above basically describes how water has been managed by the Bureau of Reclamation under CVPIA section 3406(b)(2.) But with Reclamation's new operations, even water released from storage for supporting "particular life stages" of salmon may be going away. Reclamation's *Final Environmental Impact Statement for Coordinated Long Term Operation of the Central Valley Project and State Water Project*[111] states on p. 3-3 :

> Reclamation would operate in accordance with its obligations under the CVPIA. This includes exercising discretion to take actions under CVPIA 3406 (b)(2).
>
> The Secretary of Interior may make water available for other purposes if the Secretary determines that the 800,000 AF identified in 3406(b)(2) is not needed to fulfill the purposes of Section 3406.

2. State Water Project Environmental Water Account

The instant *Draft Environmental Impact Report for the Long Term Operation of the State Water Project* states on p. H-1-1-5:

> The EWA was initially identified as a 4-year cooperative effort intended to operate from 2001 through 2004 but was extended through 2007 by agreement between the EWA agencies. It is uncertain, however, whether the EWA will be in place in the future and

[111] US Bureau of Reclamation, *Final Environmental Impact Statement for Coordinated Long Term Operation of the Central Valley Project and State Water Project*, December 2019. Available at: https://www.usbr.gov/mp/nepa/includes/documentShow.php?Doc_ID=41664.

what actions and assets it may include. Because of this uncertainty, the EWA has not been included in the current CalSim II implementation.

One element of the EWA available assets is the Lower Yuba River Accord (LYRA) Component 1 water. In the absence of the EWA and implementation in CalSim II, the LYRA Component 1 water is assumed to be transferred to South of Delta (SOD) State Water Project (SWP) contractors to help mitigate the impact of the NMFS BO and D1641 on SWP exports during April and May. An additional 500 cfs of capacity is permitted at Banks Pumping Plant from July through September to export this transferred water.

The 2008 Final Supplemental Environmental Impact Statement / Environmental Impact Report for the Environmental Water Account (Final Supplemental EIS/EIR for the EWA)[112] described two alternatives for implementation of the EWA, the Flexible and Fixed Purchase alternatives. The Final Supplemental EIS/EIR for the EWA concluded that these alternatives would have a less than significant reduction on Delta outflow from October through December and X2 location during June through December, stating:

> • The Flexible and Fixed Purchase Alternatives would result in a less than significant reduction of Delta outflow in October through December, due in part to the conservation measures included as part of the project.
> • The Flexible Purchase Alternative would have a less than significant impact on X2 location during June through December. The Fixed Purchase Alternative would have a less than significant impact on X2 location during April through December.
> (p. ES-9.)

The Final Supplemental EIR/EIS also stated that these alternatives would have a beneficial effect on Delta outflow in January through February, and on X2 location during January through May, as well as on entrainment:

> ***Beneficial Impacts***
> • The Flexible and Fixed Purchase Alternatives would have a beneficial effect on Delta outflow during the most critical periods of the year, January and February.
> • The Flexible Purchase Alternative would have a beneficial effect on X2 location during January through May. The Fixed Purchase Alternative would have a beneficial effect on X2 location during January through March.
> • The Flexible and Fixed Purchase Alternatives would have a beneficial

[112] US Bureau of Reclamation and California Department of Water Resources, *Final Supplemental Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) for the Environmental Water Account (EWA) Final EIS/EIR*, 2008. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/CSPA%20et%20al/part2/aqua_249.pdf.

> effect on entrainment indices for all listed species and most native species.
> (p. ES-10.)

However, investigations by environmental groups and journalist Mike Taugher showed the Environmental Water Account was being gamed by Stewart Resnick and the Kern County Water Agency. The Environmental Working Group's investigation in 2005[113] found:

> From 2001-2004, KCWA sold 277,400 af of water to the EWA at an average price of $198 per af, for a total of $54.9 million. The Agency's *profit* was $38.6 million — an average of $9.6 million per year. Overall, KCWA has received more than one-third of the total expenditures by the EWA, and by far more money of any other individual water agency. KCWA has perfected a scam in which taxpayers subsidize its below-market purchase of a public resource (water), then must pay much more to buy the water back in an attempt to restore another public resource (fish).
> (footnotes omitted.)

Taugher's 2009 article[114] found that "[r]oughly one-fifth of all the money spent to buy water for the program went to companies owned or controlled by Resnick, one of the state's largest farmers." As a result of these critiques, funding for purchases of water for the Environmental Water Account was discontinued by the state legislature.

3. Conclusion

The 1.18 million acre-feet of water for the environment in the CALFED Record of Decision has basically vanished.

The instant DEIR fails to consider or address the hydrologic impacts of the changes in Reclamation's management of 3406(b)(2) water from the 2000 CALFED ROD through the 2019 operations, and the resulting impacts on fish and wildlife. The DEIR also fails to consider or address the impacts of the discontinuation of the Environmental Water Account. The cumulative impacts of the disappearance of the 1.18 million acre-feet of water for the environment and the new proposed operations of the State Water Project and Central Valley Project are considerable. Cumulative impacts that should be considered include impacts to Delta outflow as well as changes to Old and Middle River flows in combination with the changes in pumping restrictions described in Section I of these comments.

Under CEQA, the cumulative impacts of the Proposed Project on river flows and the dependent fisheries, together with other ongoing diversions, must be included in an accurate and comprehensive cumulative impacts analysis. *Friends of the Eel River v. Sonoma County Water*

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[113] *Taking from the Taxpayers: Reselling Subsidized Water*, Environmental Working Group, February 10, 2005. Available at: https://www.ewg.org/research/taking-taxpayers/reselling-subsidized-water.
[114] Mike Taugher, "Gaming the water system," East Bay Times, May 24, 2009. Available at: https://www.eastbaytimes.com/2009/05/24/gaming-the-water-system/.

Agency (2003) 108 Cal.App.4th 859, 871-872. A recirculated DEIR should also consider an alternative that would restore more natural flows.

An EIR must consider a reasonable range of alternatives and "should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects." *North Coast Rivers Alliance v. Kawamura* (2015) 243 Cal.App.4th 647, 666. Clearly such an alternative was found to be feasible in the CALFED Record of Decision.

Appendix B

Pattern and Practice: Carryover Storage

The failure to consider or analyze alternative carryover storage targets is part of a long term "pattern and practice" by the Department of Water Resources of inadequately analyzing the impacts of risk-taking with carryover storage.

DWR's 1983 California Water Plan, published as Bulletin 160-83,[115] documents that Oroville reservoir was designed for long-term carryover storage in case of a repeat of the six year drought from 1928-1934. Bulletin 160-83 states:

> A few major reservoirs were developed for long-term carryover storage (water stored for use over several dry years), which means that storage capacity is several times the firm annual yield. Examples of such facilities are Shasta, Oroville, Berryessa, and New Melones. (p. 23)

But DWR proposed to take greater risks with State Water Project carryover storage to increase average deliveries. This was done on the basis that the 1928-1934 drought only had a probability of recurrence of 1 in 200 to 400 years. Not only is this analysis wrong, the risky carryover storage policy appears not to have been changed after the 1987-1992 drought, which happened a few years later.

Bulletin 160-83 states:

> **Supply Dependability and Risk**
> The thrust in California water development over the past few decades has been to increase water supplies to match needs, and in many areas, to increase the dependability of supplies. Much attention has been given to this by the SWP and the CVP which were designed to withstand reoccurrence of the 1928-1934 drought. Projects, facilities, and programs of other agencies have similar built-in-risks. <u>But uncertainty regarding the capability of increasing developed supplies over the next several decades may justify and in fact may require taking greater risks in delivering water to customers</u>.
>
> Selection of the 1928-1934 drought to evaluate yield was not based on the relation of drought frequency to cost of facilities. Rather, it was based on the fact that both the CVP and SWP received popular support following the 1928-1934 drought, and Californians wanted the projects to provide essentially a full supply during the entire drought, regardless of its frequency of reoccurrence. Of course, during normal and above-normal years, projects can deliver much more water than is defined as yield under this criterion.

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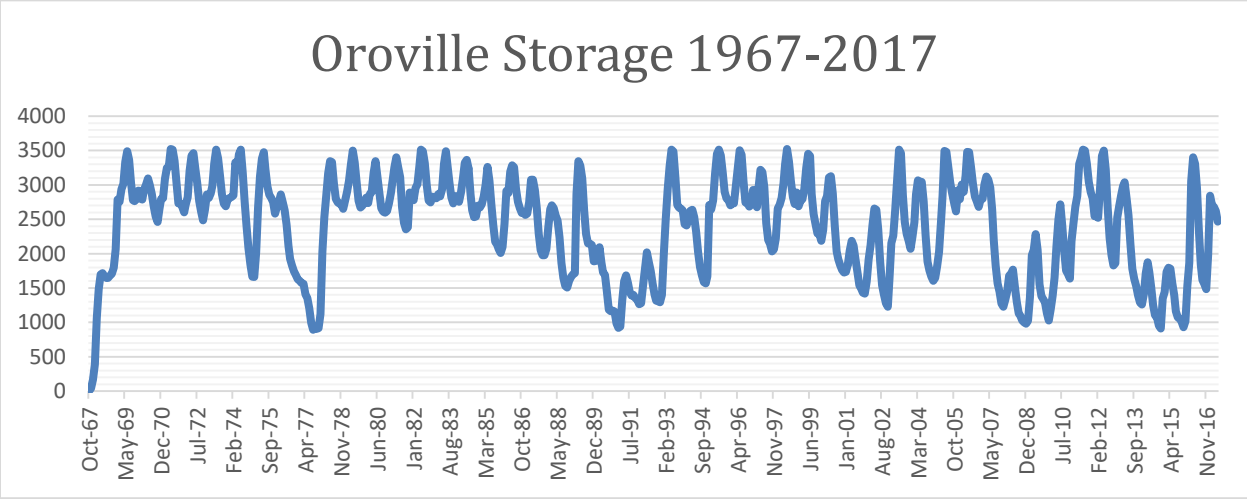
[115] California Department of Water Resources, Bulletin 160-83, The California Water Plan, Projected Use and Available Water Supplies to 2010. Available from DWR's Water Data Library at http://wdl.water.ca.gov/waterdatalibrary/docs/historic/Bulletins/Bulletin_160/Bulletin_160-83__1983.pdf. Accessed on January 3, 2020.

> Surface water projects of other agencies use different yield-determining dry periods, but the concept is the same. This operational procedure works well where adequate water supplies are already developed to meet existing and future uses. Unfortunately, the State's water uses are outpacing the rate at which increased supplies are being added.
>
> Some water projects would take greater risks by delivering a higher annual supply, leaving less carryover storage in case of drought. This would allow growing needs to be met in normal years. While the final answer lies in what nature will actually provide, there is a good argument that, in the present era of uncertainty regarding future water development, given the frequency of reoccurrence of droughts, existing facilities may be operating in a more conservative manner than is necessary. The 1928-1934 dry period is estimated to have a reoccurrence of one in 200 to 400 years. However, such dry periods could occur in successive decades. Nevertheless, with such a small frequency probability, it may be that projects should take a greater risk and deliver a higher annual average supply. (p. 255-256, underlining added)

Data from the California Data Exchange Center (CDEC) [116] shows a marked change in minimum storage in Oroville, starting around 1985. The graph below shows monthly storage in Oroville reservoir from October 1967, when the reservoir construction was completed, and May 2017.



Drought Recurrence

The estimate in the 1983 California Water Plan that the 1928-1934 dry period has a recurrence rate of one in 200 to 400 years is not supported by the Sacramento Valley hydrology reconstructed from tree rings by David Meko. The reconstruction was discussed by David Meko et. al. in 2001 article in the Journal of the American Water Resources Association.[117] A table in

[116] Monthly storage data for ORO sensor. Available at http://cdec.water.ca.gov/.

[117] Meko, D. M., Therrell, M. D., Baisan, C. H. and Hughes, M. K. (2001), Sacramento River Flow Reconstructed to A.D. 869 from Tree Rings. Journal of the American Water Resources Association, 37: 1029–1039. doi:10.1111/j.1752-1688.2001.tb05530.x. Available at:

the article shows that six year droughts of similar severity to the 1928-34 drought occurred in the 1840s and 1780s,[118] giving a frequency of once every 100 years in the past 3 centuries. Six year droughts of lesser severity occur with greater frequency in Meko's tree ring construction. Four years after the issuance of Bulletin 160-83, the 1987-92 drought began.

Documented changes to the State Water Project Rule Curves

The 1983 California Water Plan, Bulletin 160-83, did not disclose what the actual changes to carryover storage rules. But these changes were disclosed in a 1988 paper in the academic journal Climatic Change by William E. Riebsame, "Adjusting Water Resources Management to Climate Change"[119] Riebsame cited an unpublished 1985 report by DWR, "Evaluation of the State Water Project Rule Curve Procedure," and an unpublished report in 1988, "State Water Project Rule Curve for 1988." The new and old rule curves for total end of year system storage was reproduced by Riebsame on p. 84, and are shown on the following page.

As a result of this change, the State Water Project began to systematically leave insufficient water in storage to meet both minimum export demands and water quality standards in dry and critically dry years.[120]

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http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/PCFFA&IGFR/PCFFA_74_Meko01.pdf.

[118] *Id.*, p. 7, Table 2.

[119] Riebsame, W.E., Adjusting Water Resources Management to Climate Change, Climatic Change (1988) 13: 69-97. doi:10.1007/BF00140162 Available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/dd_jardins/DDJ_210.pdf.

[120] See also Part 1 Surrebuttal testimony of Deirdre Des Jardins in the WaterFix hearing. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/dd_jardins/ddj_208_errata.pdf. Supporting exhibits are available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/deirdre_des_jardins.html

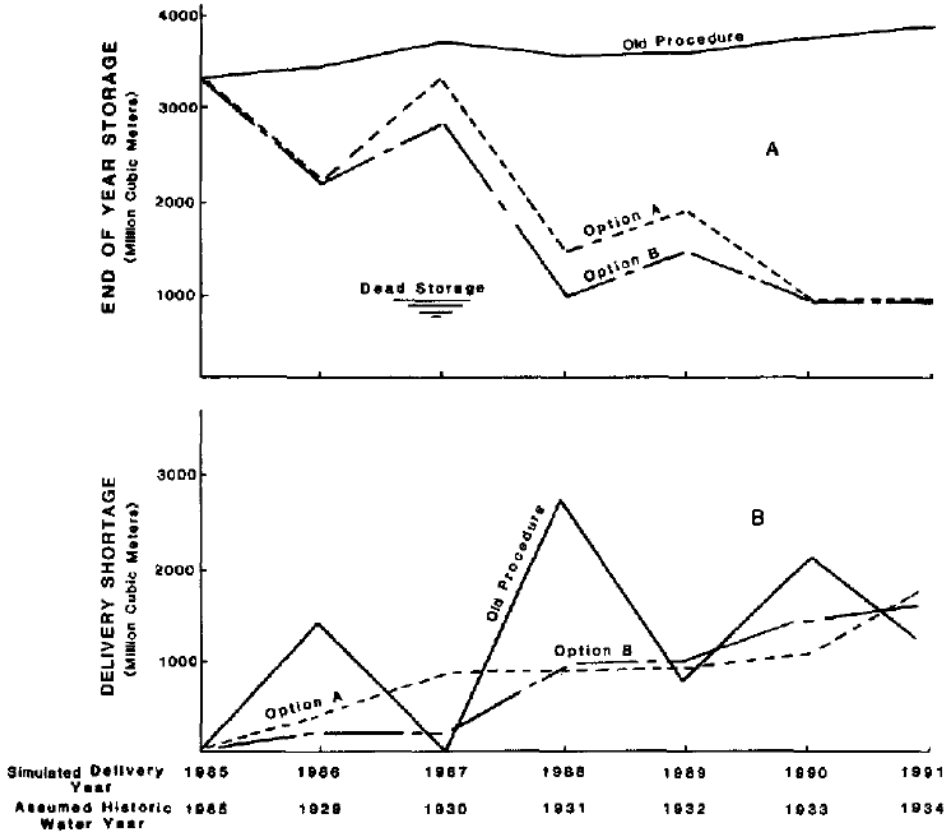

Fig. 5. Simulated SWP operations based on the 1977 rule curve and two alternatives proposed in 1985, for a hypothetical drought beginning with 1985 precipitation and storage conditions, and following the pattern of the 1929–34 design drought: (a) Total project storage at the end of each simulated year; (b) Delivery shortfalls from contract amounts. Source: California Department of Water Resources.

1 DWR's unpublished 1985 rule curve analysis, reproduced in Riebsame, p. 84.