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Adán Ortega, Chairman
Board of Directors
Metropolitan Water District of Southern California
700 Alameda St
Los Angeles, CA 90012
Sent via email

October 16, 2024

RE: Support for reinstatement of General Manager Adel Hagekhalil and working relationship with Delta organizations.

Dear Chair Ortega,

I am writing to voice collective concerns from the Delta as to recent comments made by Board Members of Metropolitan Water District (Metropolitan) regarding expertise and community leadership from the Sacramento-San Joaquin Delta and reflections on how these comments line up with the challenges we are witnessing in the investigation of General Manager Adel Hagekhalil's leadership at Metropolitan. In this letter, we will recount for you and Metropolitan Board Members who we are as an organization, the need for collaboration with Delta experts, and how these first two items intersect with Adel Hagekhalil's effective leadership for Metropolitan.

First, Restore the Delta continues to be misidentified as simply an anti-tunnel advocacy organization, a false positioning of our work that unfortunately several Metropolitan Board Members insist on advancing. Restore the Delta has six science and technology-based programs in the areas of land and water restoration; Tribal, youth, and community engagement; Delta water quality science; sustainable Delta agriculture; policy and advocacy; and carbon sequestration and clean energy development. Our diverse full-time staff all hold degrees in STEM majors or public policy, with several managers holding advanced degrees. Drawing on their education and on-the ground expertise:

1) We provide water quality testing data for harmful algal blooms, salinity, and water temperature to the State Water Resources Control Board, Regional Water Quality Control Board, Department of Water Resources (DWR), United States Geological Survey (USGS), and the National Oceanic and Atmospheric Administration six months of the water year;
2) We are partners for advanced Delta water quality research in over a dozen grants with academics and state agencies pending funding;

3) We collaborate on research and community outreach for carbon sequestration, direct air capture, and carbon removal projects with Lawrence Livermore National Labs, private industry, and the US Department of Energy;
4) We partner with our regional flood control agency on major land and water restoration projects and coordinate a planning coalition of 15 national, state, and local non-governmental organization partners in major restoration planning efforts;
5) We have been cited in research by the University of North Carolina for on the ground testing and data collection regarding the links between toxic algae in the Delta and particulate matter denigrating area air quality;
6) We serve as environmental justice experts in the COEQWAL and Just Transitions processes, and in collaboration on government reports and Science for Communities events with the Delta Stewardship Council;
7) We serve on college curriculum committees, in green economy planning cohorts, and with urban nonprofit organizational boards to develop ag tech workforce programs serving Delta agricultural interests including drone programs, rice and carbon sequestration farming, and agricultural energy reduction programs;
8) We serve as the Delta organization representative on the Delta Protection Advisory Committee for the Delta Protection Commission;
9) We feed workforce pipelines through our climate-water advocacy internship program, having trained over 450 interns who now work for state and federal agencies, in law, land conservation, and various social justice organizations throughout California;
10) We serve on the Steering Committee for the San Joaquin County Office of Emergency Services for flood response planning, and the AB617 air quality monitoring committee for the Delta;
11) We convene and coordinate the Delta Tribal Environmental Coalition (DTEC) which includes Buena Vista Rancheria, Shingle Springs Band of Miwok Indians, Winnemem Wintu Tribe, and Little Manila Rising to advance our Title VI complaint against the State Water Resources Control Board presently under investigation by US Environmental Protection Agency;
12) And we engage collaboratively as an ally and advocate for Tribal repossession of land back and water rights for all Indigenous communities that are connected to the Sacramento-San Joaquin Delta, while working on and honoring the needs of local Delta landowners.

Restore the Delta envisions the Sacramento-San Joaquin Delta as a place where a vibrant local economy, tourism, recreation, farming, wildlife, and fisheries thrive as a result of resident efforts to protect our waterways. We seek water quality protections for all communities, particularly environmental justice communities and California Tribes, as well as community protections from flood and drought impacts. Ultimately, our goal is to connect communities to our regional rivers and to empower communities to become the guardians of the estuary through participation in government planning, community science and waterway monitoring, and a sustainable local economy. We are emphasizing the depth and breadth of our work so that the Metropolitan Board understands fully the

level of expertise and care that forms the foundation of the three-minute comments we are allotted when addressing the Board.

Furthermore, Restore the Delta works in collaboration with civil engineering experts, fishery scientists, academics, Tribal leaders, hydrologists, climate scientists, and environmental economists because we understand the need for robust expertise as we formulate our fact-based policy positions needed to advocate for a healthy estuary and Delta communities.

We are dismayed about comments made by Metropolitan Board leadership regarding Delta expertise and leadership after recent presentations made by Metropolitan staff in regard to the Delta Conveyance Project (DCP).

Specifically, at a recent One Water Committee meeting, Delta engineer Emily Pappalardo addressed the committee regarding inaccuracies made in a presentation by staff on the seismic threat to the Delta. A leading Board member reinterpreted Ms. Pappalardo's comments as some type of denial rather than using the opportunity to learn more about who Ms. Pappalardo is and her credentials. Ms. Pappalardo holds a Master of Civil and Environmental Engineering from UC Davis and has over 18 years of experience working on Delta levee engineering, becoming a Principal at DCC Engineering. One of her major job responsibilities is monitoring Delta levees during and after seismic events to aid in the protection of community and Metropolitan's water supply and handling emergency levee responses during high water events. Consequently, Ms. Pappalardo qualifies under the law as a technical expert regarding Delta levee engineering.

Ms. Pappalardo pointed out to the One Water Committee during the above-mentioned meeting that the presentation made by Metropolitan staff did not account for attenuation when determining impacts to levees due to earthquakes. This is an important point as the 7.2 earthquake reference by Metropolitan staff did not reference the location of the earthquake, and the map provided by the Department of Water Resources identified a large area outside of the Delta for evaluating the earthquake threat. Nowhere was attenuation described to the committee which is essential for understanding seismic impacts. Ms. Pappalardo pointed out this omission in the presentation so that Board Members could ask for additional information. In fact, the entire Metropolitan Board should be aware of a letter to the Department of Water Resources from the Delta Independent Science Board (Delta ISB) dated September 20, 20204 that states the following:

> *Seismic risk may be overstated*
>
> The Delta ISB remains concerned that the EIR discussion of the seismic hazard in the Delta is misleading, as explained in our original comments. The potential overestimation of seismic risk may distort the project's potential benefits. The primary issue is the EIR's references to the U.S. Geological Survey reports of the 30- year probability of a magnitude 6.7 or greater earthquake in the San Francisco Bay Area. This probability applies to the greater Bay Area and not to the Delta, which the EIR implies. Citing the Bay Area earthquake probability

> misleads the reader that the Delta has a higher seismic hazard than Delta-specific studies have documented. In particular, the Delta Risk Management Strategy investigation supported by DWR concluded that: (1) the seismic hazard in the Delta derived primarily from blind thrusts in the Delta and (2) the major seismic sources in the Bay Area were too distant and unlikely to have a major impact (DWR 2008). The probability of the blind thrust faults beneath the Delta seismically rupturing was concluded to be much lower than the major Bay Area seismic sources. (Page 6.)

While this is just one example of factual concerns regarding the DCP that Delta experts wish to communicate with the Metropolitan Board, an accurate accounting of seismic risk should matter to the Metropolitan Board when considering spending hundreds of millions of additional dollars for Delta Conveyance planning. The Board should be asking if there are more cost-effective ways to protect Metropolitan's water supply in the Delta from seismic risk and compare an accurate Delta assessment to the need for system improvements in areas along the entire length of the State Water Project. In summary, if Metropolitan Board leadership would have chosen to engage further in a respectful manner with Ms. Pappalardo, recognizing her expertise and collaborative nature, a dialogue for real solutions could have commenced. Unfortunately, her comments were dismissed, echoing the type of treatment our community received from Metropolitan leadership prior to the time General Manager Hagekhalil was hired.

This entire exchange that occurred with Ms. Pappalardo also illustrates why Restore the Delta is deeply troubled by efforts to remove General Manager Hagekhalil from his role at Metropolitan Water District. General Manager Hagekhalil was the first Metropolitan Water District leader to acknowledge leadership, expertise, and the value of collaboration with all parties in the Delta watershed from sovereign Tribal nations to Delta farmers, from environmental justice community leaders to Delta engineers. Ironically, not once during any collaborative work with General Manager Hagekhalil did we hear him express opposition to the Delta Conveyance Project. Agreement on the project was not the basis for our collaborative working relationship. Our collaboration was based on mutual respect and robust dialogue. We understand that the executive officer for Met's Board serves at the pleasure of the Board, and we did not expect him to advance policies contrary to the direction of the Board. What we did gain from our collaborative work, meetings, and robust discussions with General Manager Hagekhalil and his staff was respectful and courteous engagement, honesty, and a deep desire to solve the challenges of Delta environmental health along with securing Metropolitan's water supply from the Delta. As we have watched the poor public vetting of the investigation into the complaints made against General Manager Hagekhalil, and we hear the discounting of Delta expertise once again, we are growing alarmed that Metropolitan Water District is slipping backwards into a leadership style that does not serve present day California.

To expand on this point, the same Metropolitan Board Member in that One Water Committee meaning decided to take a quote out of context a written comment from an elder Delta leader to the State Water Board about why the Board should not consider climate change impacts when evaluating Delta Conveyance. The Delta, just like Southern California, stands on the shoulders of great water

leaders, like this man, who see the world through the lens of their decades of experience. Like within the Metropolitan Board, the Delta is not a monolith, and at times it requires next-generation leaders to respectfully carry forward the work of our elders so as to address the need for climate water planning. Unfortunately, this Metropolitan Board Member made a hasty generalization about Delta residents and decided to laugh at the region for not believing in climate change. The written comments were taken out of context to weaponize Restore the Delta's public comment made to the One Water Committee about DWR's inadequate operations plan regarding drought water availability for the project.

In a UC Davis/Sea Grant study conducted for the Delta Stewardship Council and published in 2023, 5,000 Delta residents from our extensive environmental justice community, indicated that the impacts of climate change, both from floods and sea level rise, as well as drought impacts turning Delta waters into green toxic sludge, were the primary environmental concern for residents along with Delta Conveyance. Disadvantaged urban Delta communities have also voted overwhelmingly for increased parcel taxes to meet local financial matches for federal flood protection funding. Additionally, Restore the Delta, as indicated in the opening of this letter, spends a great deal of staff time and resources on climate water planning, related Delta science, and collaborating with local flood control and emergency preparedness partners for climate protection. We are the only Delta organization, including Delta government agencies, that translated flood and levee warnings into Spanish in real time for the entire Delta region during 2023 high water events. The survey, voting records, and the public record of Restore the Delta's work all indicate that climate water policy, planning, and advocacy are at the center of life for both urban and rural communities in the Delta. When we offer a comment to the Metropolitan Board, it is rooted in documented facts based on research and on-the-ground observations. We face Delta issues directly and do not find that sophistry advances robust discussion about the type of water operations planning needed for the Delta or Metropolitan water customers.

In contrast, General Manager Hagekhalil understood our concerns around drought impacts and water quality and the deep body of our work regarding flood advocacy for the 4 million residents of the Delta after our first in-person meeting. He built these concerns for our environmental justice community into his comprehensive leadership at Metropolitan Water District, and he urged staff to be in conversation with us when appropriate regarding these issues to work toward solutions. Sadly, what we have heard from Metropolitan Board's leadership, since General Manager Hagekhalil's administrative leave, is a reconstituted effort to dismiss sincere, fact-based comments made to the Board regarding the impacts of climate to our region and future water supplies for Metropolitan Water District. Like General Manager Hagekhalil, we know that all parties in California must work together to solve our climate water challenges and that gathering information from as many regional experts as possible is what will move us all closer to real solutions and accurate fact-based decision making for the future. Our dialogue with Metropolitan about the Delta Conveyance Project has been, and will continue to be, rooted in a fact-based understanding of the project and our genuine concerns that the project will fail California in a drier future. We afford Metropolitan staff and Board

Members respect when discussing these difficult topics and expect this level of respect in return. That is the tone that has been set by General Manager Hagekhalil.

Moreover, while Restore the Delta does not speak for California Tribes, we have heard during our collaborative efforts and discussions with several Tribal leaders that General Manager Hagekhalil was the first Metropolitan leader to engage directly with Delta Tribal nations and to acknowledge their expertise regarding Tribal stewardship and Tribal uses of water. We want to remind this Board that Traditional Ecological Knowledge held by California Tribes is considered expert knowledge by the Federal Government equal to the expertise of Delta civil engineers, water export districts, and credentialed flood and water quality science experts who collaborate with and support federal, state, and local government agencies.

In conclusion, Restore the Delta fully supports the reinstatement of General Manager Adel Hagekhalil as the executive officer of Metropolitan Water District and urge public accountability and transparency as allowed under employment law as to how and why he was placed on leave from his position. We see the trumped-up accusations against General Manager Hagekhalil that have been left to linger behind closed doors for nearly a year, yet leaked to the press by someone at Met, as parallel to the alienation campaign once again being leveled Delta water leaders – when we should be working in partnership. It is clear that an element at Metropolitan is advancing an agenda that wants to go back to an imperialist leadership style, where Southern California ratepayers and Delta watershed advocates were equally dismissed as unworthy of engagement, all to advance a water agenda that could possibly fail in a changing climate. General Manager Hagekhalil was hired and directed by the Metropolitan Board to bring new solutions, to plan for the future, and to make water security as affordable as possible for Metropolitan water customers. He and his team have been asking the right questions so that the Board could make the best-informed decisions. A return to dismissing employees, ratepayers, and watershed partners to favor ramping up wholesale water sales will be a disaster for Metropolitan ratepayers and for all Californians with extended droughts in the future.

We, at Restore the Delta, and our extensive list of regional and statewide partners, want to see the best outcomes for the Delta and for Southern California. We are deeply saddened by what we have been seeing, hearing, and experiencing from the Metropolitan Water District's Board since June, and we fear that this institution is not seeking the best answers by becoming fully informed.

It is, however, never too late to do the right thing. We sincerely want to see Adel Hagekhalil reinstated as General Manager. We hope that the collaborative working relationship that we and our partners started to build in recent years with this institution, as a result of his leadership, is also reinstated. Snark, pettiness, and vilification do not serve Metropolitan employees, ratepayers, or those who should be your partners in the Delta watershed.

Now is the time for greatness, as our collective water future depends on fact-based leadership, honesty, transparency, respect, and collegiality.

Please find various attachments to this letter that corroborate our assertions around seismic concerns and expertise of assessments.

Sincerely yours,

Barbara Barrigan-Parrilla
Executive Director
Restore the Delta

EMILY A. PAPPALARDO
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Phone: 916-205-0770
Email: epappalardo@dcceng.net

OBJECTIVE

Working in Sacramento-San Joaquin Delta on levee maintenance and rehabilitation projects has provided me considerable experience to aide in the reduction of flood risk in the region. Working and living in the Delta has also fueled my passion for flood and water resources management and policy within the State.

PROFESSIONAL EXPERIENCE

DCC Engineering Co. Inc., Walnut Grove, CA

Principal Engineer **2023 to Present**

Leading team to facilitate and develop levee maintenance and rehabilitation projects for several Delta reclamation districts. Tasks include project planning and cost estimation, permitting, and implementation through funding and construction scheduling. Emergency repairs and recovery from high water events.

Oversight of coordination with State and Federal permitting agencies for encroachments within the State Plan of Flood Control.

MBK Engineers

Senior Engineer **2017 to 2023**

Performed levee maintenance and erosion control projects for several Delta reclamation districts, project planning and cost estimation, engineering, permitting, and implementation through funding and construction. Coordinated emergency recovery with FEMA and Cal OES.

Developed feasibility studies for flood risk reduction studies for the small communities within the Delta. Oversaw funding agreement for the update of emergency operations plans. Attended agency meetings and reviewed regulatory documents related to levee projects and other in-water work.

DCC Engineering Co. Inc., Walnut Grove, CA

Project Manager **2005 to 2017**

Levee maintenance and erosion control projects for several Delta reclamation districts, project planning and cost estimation, permitting, and implementation through funding and construction scheduling.

Developed Five-year plans of proposed projects and maintenance for reclamation districts for Department of Water Resources. Attended agency meetings and review regulatory documents related to levee projects and other in-water work.

Develop proposals, produce construction documents, perform engineering calculations, and manage permitting process that involves interface with regulatory agencies, clients and contractors for small residential and commercial projects located in waterways and flood prone areas.

EDUCATION

University of California, Davis, CA

Masters of Civil and Environmental Engineering 2014

Focus: Water Resources

Thesis: The Condition of the levees in the Sacramento-San Joaquin Delta and developing appropriate levee standards based on risk vulnerability of rural communities.

California Polytechnic State University, San Luis Obispo, CA

Bachelor of Architecture 2009

Thesis: A resilient built environment in the Sacramento-San Joaquin Delta

Honors: Magna Cum Laude

MEMBERSHIP/COMMUNITY SERVICE

Board Member for Delta Leadership Foundation **2023-Present**

Planning and coordinating events to promote the Sacramento-San Joaquin Delta and develop leaders who can advocate for the Delta.

Member of the Delta Citizens Municipal Advisory Council **2023-Present**

Citizen's oversight of projects proposed in the Sacramento-San Joaquin Delta.

Rotary Club of Walnut Grove **2011-Present**

Volunteering in fundraising events to support scholarships and community activities.

Committee member to organize the Delta Pear Fair in Courtland, Ca. **2010-Present**

Assisted in planning the annual event and specifically coordinated vendors for children's activities.

Board Member for Restore the Delta **2010-2013**

Planning and coordinating fundraising events. Studying future water conveyance facility projects and their effects on the Delta community.

Delta Independent Science Board
DELTA STEWARDSHIP COUNCIL

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Sacramento, CA 95814

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DELTACOUNCIL.CA.GOV

MEMORANDUM

Date: September 20, 2024

To: California Department of Water Resources
Sent via email: deltaconveyance@water.ca.gov

From: Delta Independent Science Board

Subject: Comments on the Final Environmental Impact Report for the Delta Conveyance Project

As part of its legislative mandate to provide scientific oversight of the scientific research, monitoring, and assessment programs that support adaptive management of the Delta, the Delta Independent Science Board (Delta ISB) provided a review of the draft Environmental Impact Report (EIR) for the Delta Conveyance Project to the California Department of Water Resources (DWR) in December 2022. In December 2023, DWR released its final EIR and certified it. The Delta ISB reviewed the final EIR and would like to bring forward some concerns to help inform DWR on its analysis as the project goes through other regulatory processes.

Priority concerns

Although some minor changes were made in response to our comments, the responses generally did not lead to meaningful changes to the EIR for the Delta Conveyance Project and the Delta ISB stands by many of its original concerns of the draft EIR. We detail some substantive concerns in the second section of this letter, “Major themes of Delta ISB concerns.” In this section, we take issue with three recurring responses, as detailed below.

1. The first recurring response that concerns the Delta ISB is, *"The Delta Conveyance Project EIR has been prepared in compliance with CEQA and evaluates the full range of potential impacts that may result from construction, maintenance, and operation of the proposed project and alternatives."* While more detailed responses to some comments were provided in the Common Reponses documents, the general theme remained that a common DWR reaction to Delta ISB comments was that no revisions were needed because the original analyses in the EIR complied with the California Environmental Quality Act (CEQA). We are not commenting on CEQA compliance, rather, we are concerned about the lack of attention to sources of uncertainty including changing system conditions that lead to questions about the application of the analysis to understand future conditions. Further, many DWR response comments say that conducting analyses to represent conditions that diverge from average or typical conditions would be too "speculative." Omitting analysis of atypical conditions may provide inaccurate and ineffective scientific information for decision support under a rapidly changing environment, as historically atypical conditions become more common.

2. The second recurring response of concern to the Delta ISB is that review comments, even when they have merit, fall outside of CEQA requirements and therefore can be dismissed. However, we note that the EIR includes analyses that DWR says go beyond CEQA requirements, such as evaluating flood risks to the year 2072 and including climate change drivers in the analyses. In some cases, the Delta ISB comments that were dismissed were intended to improve these extra analyses by capturing an appropriate range of potential future conditions.

   Similarly, the comment that "adaptive management is not required under CEQA" is concerning given the certain challenge of adapting operations and restoration to achieve the coequal goals for the Delta. We understand that other policies will address adaptive management requirements (e.g., the Delta Plan), but some environmental risks can only be bounded by evaluating the quality of the adaptive management plan. Adaptive management plans that included data collection and analysis processes, decision triggers, stakeholder engagement methods, funding, and other details would provide

more confidence in the conclusions regarding impacts to biota (Wiens et al. 2017, Kotamaki et al. 2024).

3. The third recurring response of concern is that "CEQA requires a discussion of socioeconomic effects only if they would result in physical changes to the environment." While we acknowledge CEQA may not require it, we note that separating people from the environment is inconsistent with fully assessing impacts on people that may result from environmental change. As represented in the efforts of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, "…the NCP [Nature Contributing to People] approach recognizes the central and pervasive role that culture plays in defining all links between people and nature" (Diaz et al. 2018). Environmental impacts arise from human activities and behaviors and ecosystem changes can profoundly influence the ability of people to thrive socially and economically.

Major themes of Delta ISB concerns

The following themes represent the high priority improvements to the environmental analyses that would be needed to address major Delta ISB comments as the Delta Conveyance Project continues to progress through the regulatory process. The Delta ISB acknowledges that these priorities do not reflect the adequacy of the final EIR's compliance with CEQA. Instead, addressing these would significantly increase confidence that uncertainties and potential model biases were well explored.

A few of the Delta ISB comments included here were also made in a separate detailed review (Rose et al. 2024), conducted by the Delta Science Program (DSP), that examined a draft version of the Effects Analysis being used by the U.S. Bureau of Reclamation (Reclamation) as part of their preparation of an Environmental Impact Statement (EIS) and Biological Assessment (BA) for the Long-term Operations of the Central Valley Project (CVP) and the State Water Project (SWP). Many of the models and analyses performed for the EIR to assess effects on listed fish species use the same models and methods that were used in the Reclamation's Effects Analysis. For example, both analyses used the same models, and in some cases the same runs, of: CALSIM-3; DSM2; HEC-5Q; several egg-mortality models; and species-specific salvage-density, salvage-OMR, and abundance-outflow correlation relationships. Further, in both analyses, CALSIM-3 outputs were used as

inputs to the effects models, and effects were presented with predictions grouped into water-year types and compared across alternatives for each type.

We have included comments from the Effects Analysis review, which occurred after the EIR review, when they were similar to Delta ISB comments or when they provided elucidating details for prior Delta ISB comments. We find the review relevant because when two independent scientific peer reviews that involve different expert reviewers generate the same comments, it adds credence and weight to those concerns. The comments in common between the two independent reviews are noted where relevant.

Climate change is not realistically represented when projecting watershed hydrologic and ecosystem responses

Common Response 9 says that the *"EIR recognizes that climate conditions in California are nonstationary, and that past climate conditions and weather sequences are not good indicators of future (2040) conditions."* Yet, the methods used to project climate change effects on future water inflows, which were used to modify historical time series by monthly change factors ("perturbations"), are not providing a realistic representation of the future, given the expected implications of climate change. For instance, under warmer conditions, seasonal patterns of tributary inflows would change and have significant implications for operations of the upstream reservoirs. Other examples are that an increased frequency of drought periods within a year and more years of severe drought are not represented with this method.

The Delta ecosystem has undergone, and continues to undergo, changes in its productivity and structure, both from proximate stressors and from climate change. It is possible that a model developed from an earlier period was built upon relationships that no longer apply as strongly as they once did or other factors that were previously unimportant may have increased in their importance. While improving future projections is a major challenge, at minimum, the effect of uncertainty should be clearly documented and used to interpret results. The potential range of future conditions can be represented using a variety of climate scenarios that are plausible over the project lifespan and represent changing system conditions. This same concern was raised in the DSP peer review of the Draft Effects Analysis for the EIS/BA as part of Comment 6 and Model Reviews (A)

and (C) where reviewers noted that using monthly-level outputs to determine fish habitat conditions can misrepresent relevant habitat changes.

Time and space scales of the models and analyses used to project important ecological outcomes are mismatched

The disparity in temporal scale between the primary regional hydrologic model, CALSIM 3, and other ecological modeling tools, such as DSM2, HEC-5Q, LTGEN, and SALMOD, creates a major source of uncertainty and potential bias (underestimation) in the projected effects on fish. For instance, the ecological modeling tools necessitate that flows and water levels be depicted at a higher temporal resolution than the monthly time step used to generate flows by CALSIM 3. Simply adjusting CALSIM 3 to daily or subdaily time steps by assuming the same values every day or per time step within the month, termed "downscaling" in the EIR, does not capture the temporal variability that is often crucial for using the flows as inputs to fish effects models and other models. Flow variability that might be represented as maximums or minimums, variance, and autocorrelation of the within-month distribution, are needed to accurately predict ecological effects. A good illustration of this concept is provided by Vasseur et al. (2014) who show that the same shift in mean temperature, with different variances around the means, generates very different responses in the physiological performance of fish. Labeling this issue merely as a modeling limitation fails to instill the necessary confidence in the scientific validity of the results. Ways of statistically adding realistic variability to the monthly values generated by CALSIM 3, and further application of other models in use (e.g., DSM2), to convert monthly values to daily and finer, should be explored to more realistically and more accurately represent potential effects on fish.

The issue of needing high resolution predictions as inputs to fish effects models is widely recognized and has been addressed elsewhere. Regional models of large-scale water systems with higher temporal resolutions (e.g., daily) are routinely employed for regulatory and planning purposes in other systems. For instance, in the Everglades, a system comparable in complexity to the California Bay-Delta system, regional hydrologic models equipped with the ability to simulate rainfall-runoff processes, system-wide flows, and crucially, operational rules of water control systems at a daily time step, are extensively utilized (SFWMD 2005). This

concern is also discussed in the DSP peer review of the Draft Effects Analysis for the EIS/BA as Comment 11.

Seismic risk may be overstated

The Delta ISB remains concerned that the EIR discussion of the seismic hazard in the Delta is misleading, as explained in our original comments. The potential overestimation of seismic risk may distort the project's potential benefits. The primary issue is the EIR's references to the U.S. Geological Survey reports of the 30-year probability of a magnitude 6.7 or greater earthquake in the San Francisco Bay Area. This probability applies to the greater Bay Area and not to the Delta, which the EIR implies. Citing the Bay Area earthquake probability misleads the reader that the Delta has a higher seismic hazard than Delta-specific studies have documented. In particular, the Delta Risk Management Strategy investigation supported by DWR concluded that: (1) the seismic hazard in the Delta derived primarily from blind thrusts in the Delta and (2) the major seismic sources in the Bay Area were too distant and unlikely to have a major impact (DWR 2008). The probability of the blind thrust faults beneath the Delta seismically rupturing was concluded to be much lower than the major Bay Area seismic sources.

The seismic hazard in the Delta is described and remains unedited in three chapters. Chapter 1 (Introduction) cites a 72% Bay Area 30-year probability of a magnitude 6.7 or greater earthquake and implies this applies to the Delta. Chapter 10 (Geology and Seismicity) cites the 72% probability and does a better job of portraying the true seismic hazard in the Delta, although the text is still misleading as it refers to the Bay Area sources. Also confusing is the description of seismic potential in Chapter 7 (Flooding) that references an outdated U.S. Geological Survey report that concluded there was a 62% Bay Area 30-year probability of a magnitude 6.7 or greater earthquake. Chapter 7 compounds the misinformation by stating there is a 30-year probability of 62% of a magnitude 6.7 or greater earthquake in the Delta. The Delta ISB also is not aware of the source for the sentence: "*Seismologists believe it is likely that the Delta will experience periodic moderate to large earthquakes (magnitude 6.5 or greater) in the next 50 years"* (page 10-15 of Chapter 10). Because of the significance of the claim, its source(s) should be documented.

Important effects on fish species and aquatic ecosystem functions may be mischaracterized or missing

The EIR analyses generated few (if any) project effects that are deemed ecologically significant after mitigation. However, we question whether effects are fully captured by the methods used. A specific concern is that there is insufficient synthesis of how the life stage-specific effects will combine to result in population and higher level (community, food web) responses, potentially mischaracterizing impacts. The approach to examining fish population effects of listing the significance of combined effects of stressors for a life stage and then effects over life stages for a species, falls short of an effective synthesis of the effects over a fish lifespan. The life cycle models provide a partial solution but not all effects are included in the life cycle models, and no life cycle models were used for most of the species. This comment also appears in the DSP peer review of the Draft Effects Analysis for the EIS/BA as Comment 15.

Similarly, while some fish effects synthesis is presented using the "significance of impacts" approach, it uses universally applied thresholds (e.g., 5%) and stops before population and higher-level responses can be determined. Using a more ecologically meaningful community or food web perspective might alter species responses and generate different results, as effects often depend on food web interactions, feedback between trophic levels, and other changes in patterns and processes that can affect species and their habitats. This broader ecological analysis approach will also allow for assessing effects on other ecosystem interactions besides population dynamics of selected fish species, such as nutrient cycling, energy transfer pathways, pelagic-benthic coupling, and measures of community and food web structure.

Water quality effects on biota and people lacked some important details. Operations and climate change have the potential to change Sacramento River flow, and associated source water contributions, during summer and fall. These changes may affect transport, dilution (concentrations), and distribution of contaminants from upstream, in-Delta and downstream sources. In addition, changes in conductivity and water temperature due to project operations can change absorption and toxicity of contaminants in aquatic species (Brooks et al. 2011, DeLorenzo 2015).

Further, water diversions can impact ecological productivity, decomposition, and resilience through the Sacramento River ecosystem. Flow supports primary and secondary productivity that is essential for maintaining biological organisms and essential ecosystem interactions. Diverting water can alter functions such as decomposition and biogeochemical processes regulating nutrient availability and underpinning ecological productivity. Such characteristics are essential in establishing environmental resiliency but are not addressed in the final EIR.

Similarly, dissolved oxygen concerns were not comprehensively analyzed across sections. Section 9.1.5.2 of the final EIR, entitled “Dissolved Oxygen” only refers to low oxygen in wetlands (p. 9-13) and not other waterbodies. Further, the section on Organic Carbon (Section 9.1.5.6) does not discuss impacts on dissolved oxygen. For harmful algal blooms (HABs), our comment on Cyanobacteria and brackish water was addressed but HAB effects on biota and humans through pathways other than drinking water was not.

Effects on terrestrial biological resources have high uncertainty due to missing information about mitigation plans and cumulative effects

The Compensatory Mitigation Plan still does not reflect the reality that restoration is not an exact science. While the restoration goal may be to establish environmental conditions favorable to target species, the reality is that it may or may not occur in a reasonable time frame (~5 to 8 years, if ever) and it often requires remedial actions and maintenance for many years thereafter at considerable costs. For example, our comments that the uncertainty of vernal pool restoration and the potential for long term lags in performance were not well described nor reflected in monitoring plans. In support of our concern, Sueltenfuss and Cooper (2019) found that vernal pools only achieved hydrological similarity to reference pools after 9 years, indicating that the length of monitoring should be based on ecosystem status relative to meaningful targets, rather than set time frames.

Criteria used to assess wetland mitigation performance remain weak. While vegetation is commonly used as a criterion for evaluating the ecosystem function of mitigated wetlands, it has been recognized for over three decades that it is not often the best indicator of ecological function (Reinartz and Warne 1993). Flood storage and water quality improvement are two key wetland functions but, in the past, have been required to be replaced in <10% of California wetland mitigation

permits (Turner et al. 2001). Additionally, multiple criteria should be used to determine success and suitability. For instance, California coastal wetlands require a combination of soil, nutrient, and vegetation metrics to predict if a mitigated site would be (or not) suitable for clapper rail nesting (Zedler and Callaway 1999).

Our concern about the Compensatory Mitigation Plan being vague has not been fully addressed. It is not clear if the models used to establish the Compensatory Mitigation Plan for individual species considered home ranges (as opposed to species ranges) or if genetically viable population sizes could be maintained at the new restoration sites (Bouldin Island and I-5 ponds) for species of interest. These are important issues for long-term viability and should be addressed in the Compensatory Mitigation Plan. A related concern is that the analysis of project effects on special-status plant and wildlife species considers the direct effects of project construction, but little quantitative consideration is given to indirect effects. For example, the final EIR notes permanent changes to topography, subsurface hydrology, or the amount of impervious surface within 250 feet of habitat of special-status vernal pool aquatic invertebrates that could result in changes to the hydroperiod of that habitat and thus its ability to support special-status vernal pool aquatic invertebrates (lines 23-27 on page13-57). Overall, it is difficult to determine the true effectiveness of the proposed CMP.

Our comments about the weakness of the cumulative impacts were also incompletely addressed. Cumulative impacts are discussed qualitatively but a thorough cumulative effects assessment (CEA) would quantify potential synergistic or antagonistic interactions between the proposed alternatives and the terrestrial landscape. Existing CEA methods are suitable for complex projects with varying degrees of qualitative and quantitative data such as species-stressor models (Hodgson and Halpern 2019), network analysis (Harker et al. 2021), and scenario-building (Mahon and Pelech 2021). It is not clear why these methods or any number of frameworks available to structure a more thorough CEA (e.g., Stelzenmüller et al. 2020, Sutherland et al. 2022) were not used.

Report presentation remains difficult to use

The large number of effects analyzed in the EIR, combined with multiple alternatives and multiple life stages and species, makes the results challenging to interpret, especially when cumulative effects (over multiple impacts and life stages) are discussed. The addition of graphical presentations of the results as a tool for

integration would improve interpretability. Saying that the document cannot be made clearer in presenting results is contradicted by the work of Sunding and Browne (2024) who clearly present risks and tradeoffs in the Cost-Benefit Analysis for the Delta Conveyance Project.

Clearly presenting tradeoffs among the species' responses to alternatives and identifying whether tradeoffs (or win-win situations) differ across alternatives would clarify impacts. Tradeoffs among the species' responses to alternatives and whether they differ across alternatives would improve decision support. This comment on presentation of the results also appears in the DSP peer review of the Draft Effects Analysis for the EIS/BA as Comments 1 and 10.

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