From: Morgan, Joseph
To: EIR-EIS-Comments@SitesProject.org
Cc: Dekar, Melissa D; King, Vanessa M
Subject: EPA Comments on Sites Reservoir SDEIS 28 January 2022
Date: Friday, January 28, 2022 2:44:54 PM
Attachments: EPA Comments on the Sites Reservoir SDEIS 1.28.2022_signed.pdf

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Hello,

Please see attached for the EPA's comments on the Sites Reservoir RDEIR/SDEIS. Please feel free to contact me with any questions.

Sincerely,
Joe Morgan

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Joseph A. Morgan
NEPA Reviewer
Environmental Review Branch (on detail from Wetlands Section)
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
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January 28th, 2022

Ernest Conant
Regional Director
U.S. Bureau of Reclamation
California-Great Basin Office
2800 Cottage Way
Sacramento, California 95825-1898

Subject: Supplemental Draft Environmental Impact Statement/Recirculated Draft Environmental Impact Report for the Sites Reservoir Project, Glenn and Colusa Counties, CA (EIS No. 20210172)

Dear Ernest Conant:

The U.S. Environmental Protection Agency has reviewed the Sites Reservoir Project Supplemental Draft Environmental Impact Statement (SDEIS) pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act. The EPA is a cooperating agency for this SDEIS and provided comments on chapters of the Administrative SDEIS on April 21st and May 28th, 2021.

According to the SDEIS, the Sites Project Authority has modified their proposal to construct and operate a new off-stream surface storage reservoir ten miles west of Maxwell, California, and the Bureau of Reclamation continues to participate in the development of the project to consider the environmental impacts of coordinating the use of federal facilities that would be used to supply water to the reservoir. Reclamation is also examining the possibility of investing in Sites reservoir storage up to 25% to improve operational flexibility of the Central Valley Project (CVP). The EPA recognizes the need for improved water management in California and welcomes the opportunity to assist Reclamation in ensuring that federal decision making concerning new water storage facilities appropriately considers environmental impacts associated with siting, design, construction, and operation of such facilities.

The EPA has identified several topics or resource areas in the SDEIS that would benefit from additional information or analysis in the Final EIS, including project operations, scope of analysis, climate impacts and greenhouse gas emissions, impacts to streams and wetlands, sediment management, and surface water quality. We have enclosed detailed comments and recommendations on these and other resource topics, and we have included a brief summary below. Please note that because the SDEIS does not identify Reclamation’s Preferred Alternative, our comments apply to all alternatives.

The EPA is concerned about the approach to project operations in the SDEIS, which have not yet been finalized but are critical to understanding the environmental impacts of Sites Reservoir. Operations are modeled using historical hydrology data that may not reflect current and future conditions, and diversion criteria are based on regulatory requirements that are currently being revised. While important components of the originally proposed project have been altered, none of these project changes explain why the Trinity River and lower Klamath basin were excluded from the scope of analysis. Finally, the

SDEIS uses a 2035 scenario for analysis of potential climate impacts; however, the project would not begin operating until at least 2030, making the 2035 scenario unhelpful to the analysis for operations.

Sufficient information on wetlands and other aquatic resources to support permitting under Section 404 of the Clean Water Act is not included in the SDEIS, and appropriate testing procedures and plans for sediment management and beneficial reuse have not been specified. The EPA has additional concerns about the effects of Sites Reservoir on water quality. The SDEIS identifies substantial adverse effects that can be expected from mercury methylation in the proposed reservoir; the EPA is concerned that this impact could disproportionately affect tribal and subsistence fishing communities. The SDEIS finds that evapoconcentration of aluminum, copper, and iron would likely contribute to exceedance of water quality objectives to protect aquatic life. The SDEIS also acknowledges that conditions in the proposed reservoir would be conducive to the formation of harmful algal blooms, but the EPA has concerns that the analysis presented may mischaracterize the likelihood and severity of blooms. Furthermore, the EPA believes that the proposed mitigation measures to manage these water quality concerns would not be effective and, in many cases, would conflict with each other. Finally, we have concerns about the modeling approach and presentation of results assessing the effects of Sites Reservoir operations and CVP exchanges on temperature-dependent mortality of listed fish species, including Chinook salmon.

EPA appreciates the opportunity to review this SDEIS. When the Final EIS is released for public review, please send one copy to the address above (mail code: TIP-2). If you have any questions, please contact me at 415-947-4167, or contact Joe Morgan, the lead reviewer for this project, at 415-972-3309 or morgan.joseph@epa.gov.

Sincerely,

Jean Prijatel
Manager, Environmental Review Branch

Enclosure: EPA's Detailed Comments

cc: Melissa Dekar, U.S. Bureau of Reclamation
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Evan Sawyer, NOAA Fisheries
Diane Riddle, State Water Resources Control Board
Erin Foresman, State Water Resources Control Board
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EPA's DETAILED COMMENTS ON THE SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE SITES RESERVOIR PROJECT, GLENN AND COLUSA COUNTIES, CALIFORNIA, JANUARY 28, 2022

Operations Modeling and Diversion Criteria

As noted in our 2018 comment letter on the Draft EIS, important components of the Sites Project remain undefined pending outcomes of state funding processes, such as the California Proposition 1 Water Storage Investment Program, including a final Operations Plan. While the impacts of constructing the reservoir are significant, a thorough description of project operations is critical to guiding the environmental analysis presented in the SDEIS, as well as guiding other federal and state permit decisions. The analysis presented in the SDEIS is based on modeled project operations generated by the California Department of Water Resources CalSim-II model, which is modified to include the proposed Sites Reservoir and conveyance facilities operating under specified diversion criteria (p. 2-31). The EPA is concerned that the modeling approach presented in the SDEIS does not represent the best available information on project operations. CalSim-II only evaluates historical hydrology through 2003 and does not include the more recent severe 2012-2016 drought. CalSim-II was replaced by CalSim 3.0 in 2017, which includes historical data through 2015, improved supply and demand estimation, finer spatial resolution, and a daily rainfall-runoff model. These factors suggest that CalSim 3.0 may be more a more appropriate operations model, and better suited to assessing potential effects of climate change on the proposed Sites Reservoir. Additionally, the EPA has concerns that the operating criteria identified on p. 2-31 used to model diversions to Sites are based on state and federal requirements that are currently being revisited.

Recommendations:

In the FEIS, fully describe the finalized operations of the proposed project and ensure that any operations not contemplated in the diversion criteria or CalSim-II results are reflected in the water supply, surface water quality, and aquatic biological resources chapters. Consider using CalSim 3.0 (or most current version) to evaluate whether modeled operations are affected by a longer temporal scope and other improvements over CalSim-II. Conduct a sensitivity analysis to evaluate the sensitivity of operations model results to reasonably foreseeable climate change impacts such as reduced and altered timing of runoff and increased crop and vegetation evapotranspiration.

Consider modifying one alternative to include more stringent diversion criteria to meet Delta outflow objectives and protect Delta beneficial uses. In the 2018 Framework for the Sacramento/Delta Update to the Bay-Delta Plan[1], the State Water Resources Control Board states that existing requirements are insufficient to protect the Bay-Delta ecosystem and proposes new inflow-based Delta outflow objectives of 55% of unimpaired flow withing an adaptive range of 45-65%.

Consider modifying the Bend Bridge Pulse Protection diversion criterion (p. 2-31) to initiate pulse protection proactively using leading indicators, such as river stage forecasts from the National Oceanic and Atmospheric Administration's California-Nevada River Forecast Center, rather than lagging indicators such as visual observation of fish migration.

[1] https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/sed/sac_delta_framework_070618%20.pdf

Scope of Analysis

While the 2017 DEIS/DEIR analyzed potential impacts of the project on the Trinity River and lower Klamath River, the SDEIS states on p. 2-30 that "the Project would not affect or result in changes in operation of the CVP, [or] Trinity River Division [sic] facilities (including Clear Creek)." It is unclear how this statement is supported. As noted above, diversions and releases from Sites Reservoir would be coordinated with CVP operations, which include the Trinity River Diversion. Proposed CVP exchanges with Lake Shasta would alter CVP operations, which in turn could affect operations of the Trinity River Diversion. Reclamation investment in the project, as high as 25% in Alternative 3, could result in significant amounts of new north-of-Delta CVP storage, utilization of which would likely result in impacts to north-of-Delta CVP operations.

Recommendations:

In the FEIS, analyze and disclose how CVP exchanges could alter Trinity River Diversion operations, and how these changes may affect water supply, surface water quality, aquatic biological resources, and tribal trust resources in the Trinity River and lower Klamath basin.

Provide an update on consultation between Reclamation and Klamath Basin tribal governments. Discuss issues that were raised, how those issues were addressed in relation to the proposed project, and how impacts to tribal or cultural resources would be avoided or mitigated, consistent with Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, Section 106 of the National Historic Preservation Act, and Executive Order 13007 *Indian Sacred Sites*.

Wetlands and Clean Water Act Section 404

As noted in the EPA's 2018 letter on the Sites Reservoir DEIS, the proposed project would require a permit for the discharge of fill material into waters of the U.S. under Section 404 of the Clean Water Act. The information in Chapter 9 (Vegetation and Wetland Resources) and Appendix 9B (Vegetation and Wetland Methods and Information) of the SDEIS indicates that the estimates of direct (fill) and indirect (inundation) impacts to waters of the U.S. were assessed primarily using interpretation of aerial imagery, and that a protocol-level aquatic resource delineation has not been conducted in the proposed reservoir footprint in over 20 years. Based on the information presented, construction of the reservoir and appurtenant facilities under Alternatives 1 or 3 would result in permanent impacts to approximately 425 acres of wetlands and 234 acres of streams, with impacts under Alternative 2 slightly lower due to a smaller reservoir footprint (p. 9-19, 9-29). These impacts to waters of the United States are jurisdictional under Section 404 of the Clean Water Act and require analyses and findings, such as the determination of a least environmentally damaging practicable alternative (LEDPA), that cannot currently be supported without additional site-specific information which is not provided in Chapter 9. The EPA encourages concurrent analysis of alternatives under NEPA and CWA Section 404 to ensure that the LEDPA is included in NEPA alternatives and can be selected in the Record of Decision. Under the 2008 Mitigation Rule (40 CFR 230.91-98), avoidance, minimization, and compensation for impacts are required for compliance with Section 404 in that order, and compensatory mitigation should be sited properly using a watershed approach to ensure that impacts are appropriately offset. The extent of the impacts to aquatic resources from construction of Sites Reservoir would far exceed any other recent project in the Sacramento Valley; it may prove difficult to compensate for such impacts.

Chapter 9 does not present information on how project operations would affect wetlands along the Sacramento River downstream of water conveyance facilities and in the Sutter and Yolo bypasses other than to conclude that they would not be substantially affected. However, the bypass flow and weir spill analysis in Appendix 11M (Inundated Floodplain and Side-Channel Habitat Analysis, including Yolo and Sutter Bypasses) suggests that project operations would reduce the area of inundated areas in both bypasses and in Sacramento side channel habitat. These areas also include extensive areas of riparian and floodplain wetlands, including pending and approved mitigation banks providing CWA Section 404 mitigation credits.

Recommendations:
In the FEIS, disclose steps taken to achieve compliance with Section 404 of the Clean Water Act and implementing regulations (40 C.F.R. Part 230).

- Using approved protocols, delineate all waters to be affected by the construction of Sites Reservoir and associated facilities, and work with the US Army Corps of Engineers and the EPA to obtain a formal jurisdictional determination.
- To support a LEDPA determination, conduct a formal and reproducible assessment of the condition of aquatic resources in the reservoir footprint using an approved conditional assessment such as the California Rapid Assessment Method (CRAM).[2]
- Identify potential opportunities for compensatory mitigation in the Sacramento River watershed to support development of a Mitigation Plan (40 CFR 230.94(c)) following LEDPA determination.

In the FEIS, update Chapter 9 to include a description of how changes in timing and reductions in bypass and side-channel inundation caused by project operations may affect wetland function outside of the construction footprint.

<u>Sediment Management</u>
As discussed in Chapter 6 (Surface Water Quality), a large proportion of total concentrations of metals and pesticides in Sacramento River water under high discharge conditions are associated with sediments. Construction of the reservoir, access roads, and recreational facilities is also likely to result in erosion and mobilization of sediments in runoff. Sediments from the Sites watershed and Sacramento River would likely accumulate in Sites Reservoir and conveyance facilities, requiring active management and removal of sediment deposits. Conversely, waterbodies such as the Colusa Basin Drain (CBD) used to convey Sites deliveries, would experience higher flows that may increase mobilization of contaminated sediments into sensitive waterbodies like the Yolo Bypass and lower Sacramento River. Movement and resuspension of contaminated sediments can result in longer term ecological impacts via several mechanisms: sediment bioaccumulation into the food web such as for methylmercury and some pesticides, and acute and chronic toxicity resulting from discrete flushes (e.g., fall flush of the CBD through the Yolo Bypass containing higher concentrations of heavy metals and pesticides would directly impact sensitive fish and other aquatic species). The SDEIS proposes best management practices in Appendix 2D (Best Management Practices, Management Plans, and Technical Studies) to ameliorate potential impacts from the project on water and sediment quality. Appendix 2D.3.3 (Metals) also discusses measurement of water quality metal concentrations; it does not specifically call for testing of metal concentrations in sediment or sediment elutriates. Appendix 2D.5 (Sediment Technical Studies Plan), discusses the sediment monitoring program but does not include background screening for potential contaminants of concern (PCOCs) and toxicity.

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[2] California Wetland Monitoring Workgroup (CWMW). 2019. Using the California Rapid Assessment Method (CRAM) for Project Assessment as an Element of Regulatory, Grant, and other Management Programs. Technical Bulletin – Version 2.0, 85 pp. https://www.cramwetlands.org/sites/default/files/2019CRAM_TechnicalBulletin.pdf

The Delta Long Term Management Strategy[3] (LTMS) includes a goal of maximizing beneficial reuse of dredged material in the Delta. Appendix 2D includes dredged material testing and disposal commitments. BMP-11 (Management of Dredged Material) states "Prior to dredging, a chemical evaluation of Funks Reservoir water and sediment will be conducted to determine contaminant concentrations. This will help evaluate the suitability of dredged material for beneficial use and determine compliance with water quality standards."

Recommendations:

In the FEIS, include additional design BMPs that hydrologically disconnect, on a permanent basis, the associated existing and proposed new roads from the immediate reservoir watershed to prevent sediment erosion runoff into the reservoir.

To inform the development of a sediment monitoring plan, include an initial screening of metal concentrations in sediments as part of the project's assessment of the presence and movement of metals. Sediment monitoring in the Sacramento River at the Red Bluff Pumping Plant and Hamilton City Pump Station intakes should include a minimum level of sediment quality characterization for conventional contaminants, known PCOCs (especially bioaccumulative compounds), and baseline suspended sediment and solid-phase bioassays. Consider additional sediment monitoring locations at critical waterbody junctions along the project route to establish background levels, such as where Stony Corral Creek outflows and at the furthest downstream point of the CBD before entering the Yolo Bypass.

In the FEIS, set specific dredged material beneficial reuse goals consistent with the LTMS, and commit to placing material in accessible sites to promote beneficial reuse of material. Commit to testing sediment quality according to standardized and acceptable protocols, i.e., the Inland Testing Manual,[4] and evaluated against relevant sediment criteria, such as those used by the SF Bay Dredged Material Management Office for upland beneficial reuse sites. Discuss how placement of dredged material on peat soils would affect subsidence and levee stability. Proactively identify potential sites for dredged material acceptance, including already established sites such as Antioch Dunes, Montezuma Wetland Restoration Project, Cullinan Ranch Restoration Project, and Sherman Island (owned by DWR).

Climate Change

Climate change is already causing severe stresses on California's water supply infrastructure and ecosystems, with hydrologic extremes (both floods and droughts) expected to worsen as storms become more infrequent and intense, and a higher proportion of precipitation occurs as rainfall in important source water basins in the Sierra Nevada mountains.

Climate Effects on Project Operations

While the SDEIS acknowledges the constraints California is already experiencing due to climate change, the EPA is concerned that the analysis in Chapter 28 (Climate Change) does not fully assess the effects of future climate change or support many of its assertions that climate change is likely to result in minor

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[3] Delta LTMS is an official Regional Dredging Team established to implement the National Dredging Policy: http://water.epa.gov/type/oceb/oceandumping/dredgedmaterial/aboutactionagenda.cfm

[4] https://dots.el.erdc.dren.mil/guidance.html

changes in Sites Reservoir storage and operations. The analysis uses a model centered on 2035 for hydrology and sea level rise, which, while appropriate for assessing near-term climate effects for analysis of operations of existing water infrastructure, offers less relevant insights for a proposed reservoir which is not expected to begin operating until 2030.

> ***Recommendation:*** In the FEIS, include an assessment of effects of climate change on project operations using a planning horizon that reflects the timeline of the project, such as the "mid-century" scenario (2045-2074, centered on 2060) analyzed by DWR's Bay-Delta Office for California's Fourth Climate Change Assessment.[5] As noted above, CalSim 3.0 is likely better-suited to assess impacts of climate change on project operations than CalSim-II.

Greenhouse Gases

Man-made reservoirs are a globally important source of anthropogenic greenhouse gas emissions, particularly methane. Chapter 21 (Greenhouse Gases) of the SDEIS states that quantifying greenhouse gas (GHG) emissions generated from land use change to inundated areas requires site-specific assessments which are not available until the Sites Project Authority takes control of the lands. The EPA disagrees that insufficient information is available to estimate GHG emissions from land use change; these GHG emissions may be estimated in the absence of site-specific data, using default emission factors from the International Panel on Climate Change's Guidance for National Greenhouse Gas Inventories and other publicly available data. The 2019 Refinement to the IPCC Guidance for National Greenhouse Gas Inventories[6] includes guidance on calculating carbon dioxide and methane emissions from land converted to flooded lands (Ch. 7.3.2, p.7.20), which can be compared to estimated emissions from land-cover types already known to exist in the reservoir footprint, including wetlands and grazing lands.

> ***Recommendation:*** In the FEIS, include an estimate of greenhouse gas emissions generated as a result of inundating the lands in the reservoir footprint. If site access prevents collection of site-specific data to quantify net GHG emissions, estimate net emissions using default emissions factors and other available data.

<u>Surface Water Quality</u>

The water quality analysis presented in Chapter 6 indicates that once constructed, Sites would likely experience impaired water quality conditions with high levels of metals, as well as warm and still water conditions conducive to the formation of harmful algal blooms (HABs).

Mercury and Other Metals

Methylmercury production and bioaccumulation is likely in the reservoir, Funks Creek, and Stone Corral Creek; all three waterbodies are expected to exceed the California Office of Environmental Health Hazard Assessment's 0.2 mg/kg wet weight sport fish objective (p. 6-73, 6-74). Modeling results presented in Appendix 6E suggest that Sites Reservoir concentrations of aluminum, copper, and iron would routinely approach or exceed water quality objectives for aquatic life protection, limiting the ability of Sites to provide environmental flows and benefits to receiving waterbodies as proposed. Mitigation measure WQ-1.1 outlines the proposed management of impacts of methylmercury on Sites

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[5] Wang, J., H. Yin, J. Anderson, E. Reyes, T. Smith, and F. Chung. 2018. *Mean and Extreme Climate Change Impacts on the State Water Project*. A report for California's Fourth Climate Change Assessment CCCA4-EXT-2018-004. Accessed 21 January 2021 from https://www.energy.ca.gov/sites/default/files/2019-12/Water_CCCA4-EXT-2018-004_ada.pdf

[6] https://www.ipcc.ch/report/2019-refinement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/

Reservoir and receiving waters and relies on recommendations from a draft staff report[7] that has not yet been approved. Additionally, many of the proposed mitigation measures would conflict with other measures meant to adaptively manage HABs, such as adding nitrate to stimulate algal growth or releasing water from the epilimnion (upper reservoir). The SDEIS also proposes to delay fish stocking to mitigate methylmercury bioaccumulation in reservoir fish; however, we note that delays of planned fish stocking will likely not reduce bioaccumulation unless other measures are taken to significantly inhibit methylmercury production. We further note that unauthorized fish stocking is common in United States and may not be easily preventable once recreational facilities become operational.

Recommendations:
In the FEIS, consider the effects of higher methylmercury concentrations in Sites Reservoir and receiving waters on tribal and subsistence fisherpersons who may not be protected by the 0.2 mg/kg wet weight sport fish objective.

Consider actions under mitigation measure WQ-1.1 that would prevent or inhibit mercury methylation, such as minimizing the frequency of water surface fluctuations which are known to contribute to mercury methylation, or installation of oxygenation systems in the reservoir at construction to better enable hypolimnetic oxygenation.[8]

Provide information regarding the likelihood that Sites Reservoir would not thermally stratify due to low storage in a given year, limiting the ability to mitigate releases of methylmercury and other metals under mitigations measures WQ-1.1 and WQ-2.1

Harmful Algal Blooms
While the EPA concurs with Chapter 6's finding that construction and operation of Sites Reservoir is likely to create conditions conducive to the formation of HABs, the conclusion that there would be no adverse effect does not appear to be supported by the analysis of HAB risks. The SDEIS characterizes HABs as dependent on specific conditions (p. 6-24); we note that these conditions only represent the optimal conditions for planktonic HABs, which can occur outside of optimal conditions, in flowing waters, and can alter buoyancy to obtain nutrients from deep waters.[9] The SDEIS does not consider the potential for benthic HABs which could occur in a reservoir such as Sites.[10] In addition to human health risks, HABs may contribute to degradation of ecosystem structure and function by causing anoxia, bioaccumulation of cyanotoxins in organisms, or directly causing fish mortality.[9]

Table 6-20 presents unadjusted average monthly temperatures derived from CalSIM outputs to assess when warm reservoir temperature conditions would support HABs; we note that this data is inappropriately applied since stratification would support warmer surface temperatures from early summer well into the fall. The SDEIS also incorrectly asserts that microcystin and other cyanotoxins

[7] *Draft Staff Report for Scientific Peer Review for the Amendment to the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California, Mercury Reservoir Provisions – Mercury TMDL and Implementation Program for Reservoirs* (State Water Resources Control Board 2017b)
[8] Statewide methylmercury control program for reservoirs factsheet. California Water Boards 2013. https://www.waterboards.ca.gov/water_issues/programs/mercury/reservoirs/docs/factsheet.pdf
[9] Graham, J.L., Dubrovsky, N.M., and Eberts, S.M., 2017, Cyanobacterial harmful algal blooms and U.S. Geological Survey science capabilities (ver 1.1, December 2017): U.S. Geological Survey Open-File Report 2016–1174, 12 p., https://doi.org/10.3133/ofr20161174.
[10] FAQ on toxic algal mats. My Water Quality: California Harmful Algal Blooms Portal. https://mywaterquality.ca.gov/habs/resources/benthic_education.html

would undergo rapid photodegradation and would be unlikely to affect downstream waters (p. 6-92); cyanotoxins produced in reservoir HABs commonly persist for weeks or months, and cyanobacteria released into downstream waters can travel downstream to inoculate receiving waterbodies.[11] No separate mitigation measures are proposed to manage HAB impacts, although the Reservoir Management Plan (p. 2D-30) describes a general HAB monitoring plan and actions to be taken to protect public health if trigger criteria are exceeded, including releasing water from deeper in the reservoir. Throughout the bloom season, monitoring for cyanobacteria species and cyanotoxins is critical to ensure appropriate protective measures are in place to address the cyanobacteria species and cyanotoxin concentrations present.

Recommendations:
In Chapter 11 of the FEIS, update Impact FISH-18 to include an assessment of the effects of HABs and resulting anoxia on reservoir fish in Sites Reservoir.

Revise the Reservoir Management Plan to improve HAB monitoring. We recommend monitoring occur more frequently than monthly near the start of the bloom season to identify blooms, implement management measures as quickly as possible and extend monitoring until the bloom ends, usually occurring upon reservoir turnover in late fall/early winter (not October as speculated on p. 2D-31). Base the assessment of the presence of cyanobacteria on:

- cell density OR cyanotoxin concentrations as trigger levels (not "and" as is proposed).
- both planktonic (water column) and benthic HABs;
- other indicators of benthic HABs, beyond confirmation by microscopy, such as the observation of benthic HABs or detached mats, or the detection of cyanotoxins characteristic of benthic HABs (e.g., anatoxin-a).
- California Cyanobacteria and Harmful Algal Bloom Network Trigger Levels,[12] as amended, or updated. The California Water Quality Monitoring Council periodically updates the guidelines and trigger levels to reflect evolving understanding of HABs.

In the FEIS, identify criteria to determine the appropriate depth to avoid HAB releases and describe how these multiple factors will be balanced and prioritized if no single depth interval meets release criteria for temperature, HABs, and metals. Describe how appropriate depth levels for water releases from the Sites I/O works will be determined in a way that allows for providing warm epilimnetic water for rice production while avoiding releasing cyanobacteria and cyanotoxins (likely to occur in the epilimnion during rice growing season) and avoiding releases of methylmercury and other metals (likely to occur in higher concentrations in the hypolimnion).

Temperature Effects on Native Salmonids

As noted in the EPA's 2018 letter on the Sites DEIS, operation of the proposed reservoir could affect temperature-dependent mortality of Endangered Species Act (ESA) listed fish species in the Sacramento River and its tributary streams, including Chinook salmon. Exchanges with Lake Shasta and Lake Oroville could help maintain the cold water pool needed to support salmonid spawning and rearing

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[11] Otten, T.G., Crosswell, J.R., Mackey, S. and Dreher, T.W., 2015. Application of molecular tools for microbial source tracking and public health risk assessment of a Microcystis bloom traversing 300 km of the Klamath River. Harmful Algae, 46, pp.71-81.

[12] California Guidance for Cyanobacteria HABs in Recreational Inland Waters, https://mywaterquality.ca.gov/habs/resources/habs_response.html

habitats, and a robust analysis of the project's potential effects on temperature-dependent mortality is critical for understanding potential benefits of improved temperature conditions for salmonids.

The EPA is concerned that the temperature analysis presented in Chapter 11 (Aquatic Biological Resources) and Appendix 11D (Fisheries Water Temperature Assessment) relies on models – Interactive Object-Oriented Simulation (IOS) and Oncorhynchus Bayesian Analysis (OBAN) – that are proprietary and not transparent and may not be as robust as other available models, such as NOAA's Winter Run Life Cycle Model (WRLCM). There also appear to be multiple instances where Appendix 11D gives apparently conflicting results with a higher number of days exceeding temperature thresholds yet lower or unchanged average temperatures, or vice versa (for example, see Tables 11D-3, 11D-80, 11D-86, 11D-164). As noted above, EPA also has concerns about the robustness and responsiveness of the CalSim-II operations modeling approach which underlies much of the analysis presented in the SDEIS. Understanding the effects of climate change on temperature-dependent mortality in ESA listed salmonids is critical to understanding the potential effects of the project, but CalSim-II modeling has a temporal scale ending in 2003, prior to the 2012-2016 drought and ongoing drought which have resulted in significant salmon mortality.

The SDEIS concludes that there would be no adverse effect on native salmonid species, which appears to be unsupported by the modeling results presented in Chapter 11 and Appendix 11D. The modeling results are presented as monthly averages, which may reduce the impact of high values and could suppress real temperature trends, in particular trends occurring across temperature transition months (e.g., April-May and October-November). We are also concerned that the modeling results are presented as single values without confidence intervals – all models have inherent uncertainty and knowing the range of plausible values is critical for risk evaluation and disclosure to the public and decision-makers.

Although the tables in Appendix 11D and the assessment in Chapter 11 consider the relative increase of thermal stress of the Alternatives, there does not appear to be a robust quantitative description of the level of thermal stress expected on salmon or the other fish species under the no action alternative. Such information provides critical context on the overall impact that would occur as a result of the alternatives. While it is useful to understand how project alternatives will affect temperature relative to the no-action alternative, understanding baseline and future temperature stress on native fish is crucial to contextualizing project impacts and evaluating potential tipping points.

Recommendations:

Clarify the apparently conflicting model results in Appendix 11D and consider analyzing temperature effects on fisheries using an alternative modeling approach, such as the WRLCM. The WRLCM's strengths include significant transparency (including documentation of stakeholder input on model development and applications), state of the art temperature dependent mortality modeling, highly detailed modeling of Yolo Bypass, and high frequency data of Delta tidal and export conditions in assessing passage and survival.

Conduct a temperature analysis over the period from 2003 to present, in addition to the period presented in Chapter 11 and Appendix 11D. This more recent hydrograph information is likely more representative of future conditions and could provide more accurate information on instream temperature and extent and frequency of temperature impacts. Additionally, given the greater resolution of a shorter period, analysis of 2003 to present would likely provide greater model response.

Present modeling results averaged over a shorter timeframe in the FEIS for April-May and October-November. Regardless of which biological models are used, include in the assessment results an analysis of uncertainty with confidence intervals or some other measure of the range of plausible output values.

Describe the level of thermal stress expected under the no-action alternative (NAA) as compared to known species life stage temperature thresholds used in the Appendix 11D. Such an analysis of existing thermal stress (i.e., comparison of the temperatures under the NAA to the temperature thresholds) should also be considered for the more recent period of 2003 to the present (see above comment).