UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

OCT 30 2014

David G. Murillo
Regional Director
Bureau of Reclamation, Mid-Pacific Region
2800 Cottage Way
Sacramento, CA 95825-1898

Subject: Upper San Joaquin River Basin Storage Investigation Draft Environmental Impact Statement, Fresno and Madera Counties, California [CEQ# 20140260]

Dear Mr. Murillo:

The U.S. Environmental Protection Agency has reviewed the Draft Environmental Impact Statement for the Upper San Joaquin River Basin Storage Investigation. Our review and comments are pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act. This DEIS tiers from the CALFED Record of Decision signed in 2000, and analyzes one of the five surface water storage studies recommended in the 2000 ROD, a dam and reservoir at Temperance Flat River Mile 274.

The DEIS evaluates five action alternatives that vary in terms of the carryover storage targets of Temperance Flat Reservoir and Millerton Lake, allocation and conveyance routing of water among various users, and intake feature configurations. We understand that Reclamation plans to identify a preferred alternative in the Final EIS.

Based on our review of the DEIS, we have rated all the Action Alternatives and the document as *Environmental Objections – Insufficient Information* (EO-2). Please see the enclosed "Summary of EPA Rating Definitions." Our rating is based on the project's significant impacts to aquatic resources and water quality. The DEIS identifies that the project would impact 245 acres of waters of the United States, 9 miles of riverine habitat, and 5,757 acres of oak woodland; however, the DEIS does not identify or discuss sufficient mitigation for these impacts. EPA recommends that the FEIS include additional information about impacts to waters of the U.S., an update to the impact analysis for aquatic resources and surface water quality, and identification of additional appropriate mitigation measures. Because the upper San Joaquin River is a vital part of California's water supply, economy, and environment, it is critical that impacts be further avoided and minimized, and that mitigation be proposed for those impacts that cannot be avoided. While Reclamation has chosen not to synchronize the NEPA analysis with the requirements of the Clean Water Act Section 404 process, we note that Reclamation will be required to demonstrate compliance with the CWA Section 404(b)1 Guidelines prior to obtaining a CWA Section 404 permit for this project.

Further, since the project tiers to the 2000 CALFED ROD, EPA recommends that the FEIS provide a discussion of past, current, and future projects and achievements under the ROD, along with updated analyses of current environmental conditions, water supply, and projected demand. The additional context and updated analyses are needed to demonstrate that the current project remains a timely and viable component of an overarching program to meet the goals of CALFED, including restoring ecological health and improving water management with beneficial uses of the Bay-Delta System. Our detailed comments further describing these recommendations are enclosed.

We appreciate the opportunity to review and comment on this DEIS, and are available to discuss the recommendations provided. When the FEIS is released for public review, please send one hard copy and one CD to the address above (Mail Code: ENF 4-2). Should you have any questions, please contact me at (415) 972-3854, or contact Jean Prijatel, the lead reviewer for the project. Jean can be reached at (415) 947-4167 or prijatel.jean@epa.gov.

Sincerely,

Lisa B. Hanf, Assistant Director
Strategic Planning, Enforcement Division

Enclosures: Summary of EPA Rating Definitions
EPA Detailed Comments

cc: Michael Nepstad, U.S. Army Corps of Engineers
Mark Littlefield, U.S. Fish and Wildlife Service
Rhonda Reed, National Oceanic and Atmospheric Administration, West Coast Region
Tracy Rowland, Department of the Interior, Bureau of Land Management

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

ADEQUACY OF THE IMPACT STATEMENT

"Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

U.S. EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR UPPER SAN JOAQUIN RIVER BASIN STORAGE INVESTIGATION, FRESNO AND MADERA COUNTIES, CA OCTOBER 30, 2014

Tiering to CALFED

The Upper San Joaquin River Basin Storage Investigation DEIS is tiered from the CALFED Bay-Delta Program Final Programmatic Environmental Impact Statement/Environmental Impact Report and Record of Decision, signed in 2000. The DEIS acknowledges that the CALFED ROD states "developed plans should address the goals, objectives, and programs of the CALFED ROD" (p. 2-13). The DEIS addresses the CALFED goals and guidance for the surface water storage aspects of the program, but does not address how surface water storage currently fits within the overall implementation of CALFED programs.

The program outlined in the CALFED ROD was a set of goals and spending priorities designed to resolve longstanding conflicts over ecological health and water management in the Delta by addressing an interlocking set of problem areas: water quality, ecosystem quality, water supply reliability, and levee integrity. The CALFED ROD also laid out a complex governance mechanism to assure that programs in all four areas would move forward together as it acknowledged "problems in any one program area cannot be solved effectively without addressing problems in all four areas at once" (p. 10). Although significant projects were funded under the CALFED umbrella, it has been documented that support for the CALFED process and governance mechanisms dissipated with federal and state administration changes and reductions in anticipated funding.[1] [2] Nevertheless, the CALFED PEIS and related Appendices contain a wealth of analyses. These analyses are, however, over fifteen years old, raising the issue of the current validity of those analyses for projects intending to tier to the ROD.

EPA is specifically interested in a status update of the CALFED programs that would describe current water efficiency programs, ecosystem restoration, conveyance improvements, groundwater and surface water storage programs, and studies of current water supply and demand to provide context for the current proposal's purpose and need for action. The Cumulative Effects analysis on page 27-2 states that the DEIS takes into account CALFED projects that have been implemented, but this section does not identify which projects are CALFED programs and does not relate the projects back to the purpose and need or alternatives development of the DEIS. The action alternatives developed for this DEIS "fundamentally consist of constructing new surface water storage facilities" (p. 2-4) in the Upper San Joaquin River, as increased surface water storage is the program component tiered from CALFED.

> ***Recommendation:*** Assess if substantive new and/or more current data, since the conclusion of the 2000 CALFED process, is available to update prior analyses and characterizations of Delta and San Joaquin River watershed conditions. In the FEIS, include any new findings of current data, and update analyses where applicable. The Council on Environmental Quality has provided guidance for federal agencies on implementing NEPA, including how to used dated EIS material in subsequent decision-making (Question 32 of the CEQ's "Forty Most Asked Questions Concerning CEQ's NEPA Regulations).[3]

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[1] The Little Hoover Commission's *Still Imperiled, Still Important* (Nov. 2005) www.lhc.ca.gov/studies/183/report183.html

[2] California Department of Finance Report A Fiscal Review: *CALFED Bay-Delta Program Summary of Expenditures Implementation Status of the CALFED Bay-Delta Program, Years 1-5* (Oct. 2005), available at www.calwater.ca.gov/content/Documents/CBDA_Fiscal-Review_Final%20.pdf

[3] http://energy.gov/sites/prod/files/G-CEQ-40Questions.pdf

The FEIS should also include the implementation status and an evaluation of proposed actions for the CALFED ROD programs addressing all four problem areas. CALFED Bay-Delta Program Plans were published annually until 2009 and provide updates on program implementation through that time.[4] EPA recommends that Reclamation use these Plans as the foundation for further evaluation in the FEIS.

The FEIS should provide an update and evaluation of CALFED programs, objectives, and analysis to validate the narrow purpose and need and focused range of alternatives for the project. The effectiveness (e.g., efficiency, cost-benefit) of the action alternatives in meeting the purpose and need for the project should be evaluated against other projects and programs under CALFED.

Clean Water Act, Section 404

EPA agrees with the DEIS's assessment that a Clean Water Act, Section 404 permit will be required for any of the action alternatives described. The action alternatives will result in 245 acres of direct impacts to waters of the U.S., due to the inundation of riverine, ephemeral and intermittent drainages, vernal pools, swales, seasonal wetlands, and seeps. EPA typically encourages integration of the NEPA and CWA Section 404 permitting process to reduce overall project review timelines and to provide more thorough analysis of potential aquatic resource impacts through the NEPA process.

We understand that Reclamation intends to provide a summary of this DEIS to the U.S. Army Corps of Engineers and EPA to satisfy the terms of the CALFED PEIS/R CWA Section 404 Memorandum of Understanding (p. 28-12). Consistent with the MOU, EPA believes additional information not included in the DEIS will ultimately be necessary for the Corps to make any findings of compliance with the 404(b)(1) Guidelines[5] and issue an individual permit. The DEIS is unclear about what additional information Reclamation will provide to demonstrate compliance with the Guidelines, and when that information is anticipated to be provided. We have identified several issues that will require further review for a Section 404 permit evaluation.

Recommendations: A Section 404 permit analysis will need to evaluate the extent to which the previous CALFED PEIS analysis is still valid. Such an evaluation will also need to include a discussion of how the analysis and current conditions relate to the CALFED CWA Section 404 MOU. The FEIS should describe Reclamation's expectations for how the FEIS and/or future documents will be used for the CWA compliance processes.

While NEPA requires a discussion of mitigation options, Section 404 will require demonstration of avoidance and minimization of impacts, as well as mitigation commitments secured, prior to permit issuance. EPA recommends that Reclamation make every effort to list and evaluate all practicable Section 404 mitigation actions in the FEIS. Section 404 permitting will also require a formal delineation of waters of the U.S. EPA further recommends that Reclamation include a map of delineated waters of the U.S. and impacts in the FEIS to streamline future Section 404 compliance efforts.

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[4] http://calwater.ca.gov/calfed/plans/index.html

[5] The purpose of the Section 404(b)(1) Guidelines (Guidelines) is to restore and maintain the chemical, physical, and biological integrity of waters of the United States through the control of discharges of dredged or fill material. These goals are achieved, in part, by prohibiting discharges of dredged or fill material that would result in avoidable or significant adverse impacts to the aquatic environment. The responsibility to demonstrate compliance with the Guidelines rests with the permit applicant.

The Plan Formulation Appendix of the DEIS will be useful in determining the least environmentally damaging practicable alternative for the Section 404 permit. Water conservation and efficiency measures that were dismissed in the Plan Formulation phase of the DEIS should be explained in detail in the FEIS. EPA recommends the use of the American Water Works Association Free Water Audit Software to conduct a top-down water audit to identify opportunities for conservation. More information regarding water efficiency measures and their implementation can be found on EPA Region 9's website,[6] and are also described in the "EPA Region 4 Guidelines on Water Efficiency Measures for Supply Projects in the Southeast, 2010."[7]

EPA recommends that Reclamation minimize impacts to native aquatic life upstream of Millerton Lake, and provide information to support the beneficial impacts to salmon and native fish downstream of Friant Dam expected by the purpose statement.

The project is estimated to impact a total of 245 acres of waters of the United States. Because of the large quantity of acres lost, it is critical that mitigation for these resources be described in the FEIS. Pursuant to the Section 404(b)(1) Guidelines, mitigation of project impacts begins with the avoidance and minimization of direct, indirect, and cumulative impacts to the aquatic ecosystem, followed by compensatory measures if a loss of aquatic functions and/or acreage is unavoidable. The DEIS commits to developing a draft wetland mitigation and monitoring plan for the project to be approved by the U.S. Army Corps of Engineers and the Central Valley Water Board prior to the issuance of a Section 404 permit (p. 6-93). Under the current proposal, significant impacts to aquatic resources such as native fish are unmitigated, because the DEIS states opportunities to mitigate are unavailable. EPA is available to assist Reclamation in scoping appropriate and practicable mitigation.

Recommendations: In the FEIS, provide a draft of the detailed mitigation and monitoring plan that complies with the 2008 Mitigation Rule.[8]

For mitigation planning purposes, describe in the FEIS potential measures that are likely practicable and which should be explored, including the permanent protection and/or restoration of other ecologically comparable riverscapes that support similar assemblages of fishes and other native aquatic organisms. There are likely many available mitigation opportunities in the foothills of the southern Sierra Nevada. Opportunities could be explored to partner with local agencies and organizations to identify and acquire conservation easements from willing sellers on natural lands in the vicinity of the proposed project, where large tracts are at risk of being subdivided, and where induced growth from the proposed project is likely. Opportunities for restoration of riparian corridors, springs, and meadows in the watershed should also be explored.

The degradation of salmon habitat downstream of Friant Dam by increasing temperatures in the spring and reducing flows should also be minimized and mitigated in these segments. Appropriate mitigation could include riparian restoration and/or other habitat enhancement measures above and beyond what the San Joaquin River Restoration Program has funding to achieve.

[6] www.epa.gov/region9/waterinfrastructure/waterconservation
[7] www.epa.gov/region4/water/wetlands/documents/guidelineso_wate_efficienc_measures.pdf
[8] water.epa.gov/lawsregs/guidance/wetlands/upload/2008_04_10_wetlands_wetlands_mitigation_final_rule_4_10_08.pdf

Water Quality Impacts

EPA is concerned that the DEIS does not clearly define criteria for determining significant effects to water quality. The terms "substantially degrading water quality," "substantial water quality changes," and "substantive undesirable impacts" should be defined. For some parameters where the waterbodies in question are already violating water quality standards (such as temperature and electrical conductivity in some stretches of the river), the waterbody does not have any additional assimilative capacity for further degradation.

> ***Recommendation:*** The FEIS should clearly define criteria of significance for water quality impacts. For areas where waterbodies are already violating water quality standards, identify measures to minimize and avoid further degradation as much as possible. EPA recommends that further degradation in these instances should be characterized as "significant."

Water quality in the primary study area for all action alternatives will likely be impacted by inundation of three abandoned gold mines and increased sedimentation from regular filling and drawdown of the proposed reservoir. Impact SWQ-4 suggests that it is not possible to estimate the increase in sedimentation because there are too many variables to consider (p. 15-37), but does conclude that impacts are potentially significant. The DEIS analysis of Impact SWQ-4 also cites a survey indicating that there is a very low probability of "substantial toxic contamination" from the inundated mine sites, but states that further site investigation is necessary to confirm the survey results (p. 15-37).

> ***Recommendation:*** The FEIS should include estimates of sedimentation from regular drawdown and refilling for the Temperance Flat Reservoir using data from existing Friant Dam and Millerton Lake operations. The FEIS should also include the results of a further investigation into the three abandoned mines that will be inundated, and should provide mitigation for any related negative impacts to water quality from acid mine drainage and/or introduction of heavy metals such as mercury.

Kerckhoff dam is currently being periodically sluiced (p. 5-1), which allows sediment to flow downstream. The proposed action alternatives would discontinue this practice, which would potentially lead to increased sedimentation in the San Joaquin River above Kerckhoff dam. These impacts on the aquatic ecosystem have not been evaluated.

> ***Recommendation:*** Analyze the effects of discontinued sluicing of Kerckhoff dam on aquatic ecosystems in the lake and river above the dam, including a description of any increased sedimentation in the San Joaquin River.

While one of the stated project purposes is to enhance water temperature conditions in the San Joaquin River downstream from Friant Dam, the extended study area is likely to have at least a potentially significant effect from temperature degradation during the spring (Impact SWQ-5). It is unclear how the criteria cited in the text that temperatures should not be "increased more than 5°F above the natural receiving-water temperature" (p. 15-43) was analyzed. EPA believes it is unlikely that "natural receiving water temperatures," i.e., temperatures that would exist without any water diversions, are currently being altered by no more than 5°F under existing conditions, in which case there is no assimilative capacity to allow any additional degradation. Determining the "natural receiving water temperature" is a complex modeling exercise. Rather than using this modeling technique, EPA used the protection of beneficial use to justify listing of several downstream segments of the San Joaquin River on the 2010 CWA 303(d) impaired bodies list. Impacts further degrading the temperatures in these impaired segments of the Extended Study Area would be significant.

Recommendation: The FEIS should clarify the assumptions and analysis provided for Impact SWQ-5. Significant impacts to water temperature that violate water quality standards would prevent the project from achieving its objectives and purpose and need.

The Plan Formulation Appendix (p. 40) and alternatives development summary in the DEIS (p. 2-29) state that a temperature control device on Friant Dam was considered as a method to manage cold-water pools and releases into the San Joaquin River. The temperature control device was eliminated from consideration when the Draft Feasibility and Plan Refinement Phase showed that a selective-level intake structure on the proposed Temperance Flat Dam would be more effective. Only Action Alternative 4 includes a SLIS, while it was determined that a SLIS was not cost effective for the action alternatives with lower minimum carryover levels. Alternatives 1-3 and 5 propose a low-level intake structure instead. It is unclear how the LLIS would compare to a temperature control device in terms of effective cold-water pool management.

Recommendation: Discuss effectiveness of a LLIS on Temperance Flat Dam as compared to a temperature control device on Friant Dam to manage cold-water pools and temperature of releases to the San Joaquin River below Friant Dam.

The DEIS indicates that salinity levels will not go up more than 2% on a long term average basis in the Delta (p. 15-44). The analysis does not examine whether or not the D-1641 objective and other salinity water quality standards including X2 (enumerated in Table 15-5), will be achieved on a shorter term basis. The text also indicates that the actual operations of the system will achieve D-1641, but does not describe what actions will be taken to do so.

Recommendation: Include an analysis of the action alternatives' ability to meet the D-1641, X2, and other salinity water quality standards on a shorter term basis. The selected alternative should demonstrate that these water quality standards are met.

Aquatic Resources

Habitat and Communities in Primary Study Area

EPA is concerned about the characterizations of existing habitat and fish communities in Millerton Lake and in the proposed dam and reservoir site on the San Joaquin River between Millerton Lake and Kerckhoff Dam.

While the DEIS concludes that gravel in this reach of the San Joaquin River is "probably fairly highly embedded" and therefore of reduced quality and unavailable to fish for spawning (p. 5-2), it appears that no specific stream reach data in the project area has been collected to support this conclusion.

The DEIS classifies and quantifies native fish habitat use in the San Joaquin River between the reservoirs based on stream gradient (greater than or less than 3%) (p. 5-47, 48). The native fishes discussed are known to migrate past and/or use stream reaches with gradients of greater than 3 percent depending on local geomorphic conditions and life history variables. It is not unreasonable to assume that all stream reaches, except perhaps waterfalls or cascades, have the potential to support these native fish species. More information to support this conclusion is needed.

The DEIS discusses how lotic habitat was calculated and evaluated (p. 5-47). Stream fish will utilize lotic habitat when a reservoir pool is at its minimum; fish will then move back upstream as the reservoir pool rises. For this reason, stream length at minimum inundation should also be calculated. EPA recommends using the lengths and areas of different stream habitats (i.e., pools riffles, glides, runs)

along this reach of the San Joaquin River as a metric. This will give a quantitative measure of habitat type lost for native fishes and allow calculations for mitigation that may be required to offset these losses.

The DEIS states that freshwater pearlshell clam was not selected for evaluation because it is known to occur below Friant Dam while at the same time stating its overall distribution and abundance is poorly known (p. 5-4). EPA believes the occurrence of freshwater pearlshell clams is important because native freshwater mussels in California are very restricted in distribution and their occurrence reflects high quality habitat conditions, especially high water quality. This species is listed as a Special Animal by California Department of Fish and Wildlife.

> ***Recommendations:*** Provide data or describe uncertainty about quality of spawning gravel between Millerton Lake and Kerckhoff Dam. Revise Table 5-4 and the associated discussions to more accurately characterize locations of fish species in the primary study area. Provide additional calculations for lotic habitat estimates, including length, area, and gradient. Include freshwater pearlshell clams in the evaluation of species in the study area.

Effects in Extended Study Area

The DEIS relies on the EDT model to evaluate the effect of the alternatives on spring-run Chinook salmon habitat potential (p. 5-52). This tool is informative and provides continuity with the analysis conducted for the San Joaquin River Restoration Program; however, prior sensitivity analyses have shown that the "EDT productivity and capacity predictions lack the precision needed for many management applications."[9] It appears to be more appropriate for use in prioritizing reaches for restoration which is more in line with the San Joaquin River Restoration Programs' use of the model than the current DEIS. It is a very simplified model that does not look at population trajectories over time; in a more complex model the importance of flood flows in wet years for population recovery would be noticeable. Additionally, the impacts of the project to fall-run Chinook populations should also be analyzed as they are also included in the San Joaquin River Restoration Program. Spring-run are intended to be reintroduced, but fall-run are abundant in the lower San Joaquin and major tributaries and regularly make it around barriers set up to redirect them from heading up towards the upper San Joaquin. Once connectivity is re-established with the delta they will be present in significant numbers.

The Salsim model (http://www.salsim.com/) can predict population responses for fall-run Chinook. Additionally, a life cycle model developed for winter-run Chinook salmon in the Sacramento River by Hendrix et al.[10] may also be applicable to this system.

> ***Recommendation:*** In addition to the EDT model, EPA recommends the impact analysis in the FEIS incorporates a model that better forecasts impacts. Impacts to fall and spring-run Chinook salmon should be analyzed and include a sensitivity analysis of each model and its results and appropriate caveats regarding its use.

Temperature conditions downstream of Friant Dam were modeled using the SJRQ5 model to generate estimates of minimum, maximum, and average daily temperatures; however the analysis uses a simulated 7-day running average temperature (p. 5-54). A 7-day average can disguise lethal spikes in temperature for salmonids in various life stages.

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[9] McElhany, P, E.A. Steel, K. Avery, N. Yoder, C. Busack and B. Thompson, 2010. Dealing with uncertainty in ecosystem models: lessons from a complex salmon model.

[10] https://swfsc.noaa.gov/publications/TM/SWFSC/NOAA-TM-NMFS-SWFSC-530.pdf

Recommendation: In addition to the analysis of average daily temperatures, the maximum daily temperatures from SJRQ5 should be used to compare to the EPA Region 10 Temperature Guidance[11] values for the various life stages of salmonids present in the Extended Study Area. EPA Region 10 Temperature Guidance is expressed as running 7-day average daily maximum values and accounts for the peak temperatures experienced by fish.

The DEIS uses a reduction in river flow of 10% or greater as its threshold of significance for the stretch of river between the Merced River and the Delta (p. 5-60). EPA believes that the basis for choosing a reduction in flow of 10% or above is not supported and that any reduction in flow should be analyzed. The value of flood pulses and flood plain connectivity is important for species survival over multi-year timeframes that include combinations of wet and dry years.

Recommendation: Provide an explanation for the use of a 10% reduction in flow as the basis of significance or include analysis of a reduction of flow less than 10% across all segments of the San Joaquin River below Friant Dam.

In evaluating the impacts of the alternatives on the Delta, the DEIS uses a percentage of months method to analyze dissolved oxygen, inflow:export ratios, and combined pumping rates to look for an impact to fish migration in a 3-month window (p. 5-63, 64, 65). It states that dissolved oxygen depletion in the Stockton Deep Water Ship Channel is correlated with flows of less than 2,000 cubic feet per second. EPA agrees that this flow metric is useful, but believes the migration blockage and mortality threat that this situation constitutes is underestimated by using the percentage of months method.

Recommendation: Analyze dissolved oxygen, inflow:export ratios, and combined pumping rates on a daily time step basis, rather than on a percentage of months method.

Impacts and Mitigation Measures

All action alternatives will significantly impact 9 miles of riverine habitat in the San Joaquin River above Millerton Lake used by native fishes (p. 5-68). Although rainbow trout, hardhead, pikeminnow, sucker, and hitch use the reservoir, they cannot reproduce and persist in the absence of stream habitat. The DEIS states that no feasible mitigation is available to reduce this impact to riverine habitat for lotic fish species to a less than significant level. Under EPA's 404(b) (1) Guidelines, unavoidable impacts must be fully mitigated. Impacts that cannot be mitigated below the level of significant degradation of the aquatic ecosystem cannot receive a CWA Section 404 permit.

Recommendation: Include appropriate mitigation measures in the discussion of Impact FSH-1. EPA is available for consultation. Potential mitigation measures that are likely practicable include the permanent protection and/or restoration of other ecologically comparable riverscapes that support similar assemblages of fishes and other native aquatic organisms. There are likely many available mitigation opportunities in the foothills of the southern Sierra Nevada that may offset proposed project impacts to this reach of the San Joaquin River.

The impacts to habitat potential for spring-run Chinook salmon (Impact FSH-10, p. 5-89 to 94) are based on the EDT model discussed above. EPA's concerns about the EDT model also apply to the conclusion that the model results suggest the action alternatives 1-4 will benefit spring-run Chinook because they significantly *increase* minimum habitat potential during the most extreme conditions. As

[11] http://www.epa.gov/region10/pdf/water/final_temperature_guidance_2003.pdf

seen in Tables 5-7 and 5-8, the model also demonstrates significant *decreases* in habitat productivity, habitat capacity, and equilibrium abundance under several low and high smolt-to-adult return rate (SAR) scenarios for the action alternatives. A different model, such as Salsim, would provide more accurate estimates and conclusions by taking into account the total life history of the population, allowing for exposure to different flow years and physical conditions sequentially.

As written using the EDT model, the DEIS does not contain an analysis of the potential cumulative effects of the alternatives of multiple-year scenarios (e.g., the cumulative population response and impact from three decades of dam operations) or a confidence interval for the model's high and low SAR results. California's climate often contains many dry years clustered together which has important impacts on salmon populations as they typically return to their natal stream three years later. An alternative model or method should use a typical sequence of water years rather than a simple averaging as conducted with the EDT. The DEIS states that EDT abundance results should not be viewed as actual predictions of future population size (p. 5-93), but it then suggests that Alternative Plans 1 through 4 could improve habitat conditions in the San Joaquin River and enhance potential population. Based on the DEIS, an opposite conclusion is also suggested.

> ***Recommendation:*** Revise the analysis of habitat potential for spring and fall-run Chinook salmon using a more complex model, such as Salsim. Impact analysis and mitigation should be revised to correspond to the new model's output. Discuss cumulative effects of multiple-year scenarios.

The action alternatives will reduce duration of peak and annual average annual flows between 4,000 and 8,000 cfs and above 8,000 cfs relative to the No Action Alternative. These are the types of flows that inundate floodplains. The DEIS states that "the ecological significance of changes in flood pulse frequency exceeding this threshold is unclear" (Impact FSH-14, p. 5-107); however, the DEIS concludes that the reduction in peak flows and flood pulses will have a less than significant impact on spawning and rearing habitat. While it is true that minimum restoration flows in the San Joaquin River Restoration Program would have benefits to salmonids, EPA believes flood pulses at levels higher than the minimum flows set in the San Joaquin River Restoration Program would have added benefits to the salmonids. The benefits to aquatic life from high flows include the flushing of gravels used for spawning and the creation of nursery habitat for juveniles in floodplains.

Juvenile salmon will rear on seasonally inundated floodplains when available. This has been found to increase growth and survival in the Central Valley, specifically in the Yolo Bypass and the Cosumnes River floodplain.[12] [13] Those additional benefits would be removed with suppression of peak flows and flood pulses. The modeled peak flows exceeding 8,000 cfs occur in 7 of 82 years under the No Action Alternative and would be reduced by 43% under Alternative Plan 1 (p. 5-106) to only occur in 4 of 82 years with a smaller magnitude and duration. Reducing these peak flows could result in a significant impact on the population that is already flow-limited. According to the State Board,[14] U.S. Fish and

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[12] T. R. Sommer, M.L Nobriga, W.C. Harrell, W. Batham, and W.J. Kimmerer. 2001. Floodplain rearing of juvenile Chinook salmon: evidence of enhanced growth and survival. Can. J. Fish. Aquat. Sci. 58: 325-333.

[13] C. A. Jeffres, J. J. Opperman, and P. Moyle. 2008. Ephemeral floodplain habitats provide best growth conditions for juvenile Chinook salmon in California river. Environmental Biology of Fishes. Published online June 6, 2008: www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/exhibits/usdoi/spprt_docs/doi_jeffres_2008.pdf

[14] State Water Resources Control Board, 3 Aug. 2010, Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem Prepared Pursuant to the Sacramento-San Joaquin Delta Reform Act of 2009, (2010 Flows Report), available at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/final_rpt080310.pdf

Wildlife Service,[15] NMFS,[16] and the California Department of Fish and Wildlife,[17] existing conditions in the San Joaquin River basin are already not adequately protecting aquatic life. All three fisheries agencies identified salmon and steelhead populations as declining under current flow conditions.

> ***Recommendation:*** The FEIS should include a discussion of the remaining uncertainty surrounding the impacts of reduced frequency of flood pulses. EPA recommends that the FEIS describe the benefits of increased flows to aquatic life, including the flushing of gravels used for spawning and the creation of nursery habitat for juveniles in floodplains. Further, we recommend that the FEIS correct the conclusion that the reduction in peak flows and flood pulses will have a "less than significant impact on spawning and rearing habitat", based on possible benefits to salmonids from additional high flows and flood pulses.

The DEIS concludes that there would be significant impacts under the action alternatives that would increase the duration of exposure to water temperatures that inhibit smolting transformation (Impact FSH-11, p. 5-97). However, the DEIS proposed no mitigation to offset these impacts to a less than significant level. Again, under EPA's 404(b) (1) Guidelines, unavoidable impacts must be fully mitigated. Impacts that cannot be mitigated below the level of significant degradation of the aquatic ecosystem cannot receive a CWA 404 permit. In addition, the DEIS fails to analyze how significant impacts under FSH-11 might interact cumulatively with impacts discussed under FSH-10 to further negatively affect spring-run Chinook salmon populations.

> ***Recommendation:*** Propose mitigation to reduce impacts to water temperature conditions for juvenile salmon and steelhead migration to less than significant. Analyze how significant impacts under FSH-11 might interact cumulatively with impacts discussed under FSH-10 to further negatively affect spring-run Chinook salmon populations.

The DEIS uses average temperature conditions across all years for all alternative plans when evaluating habitat for moderately and highly tolerant fish species (Impact FSH-12 and 13), which may result in underestimating temperature impacts on these species. Tule perch and riffle sculpin are rarely found, or do well in, temperatures that exceed 77 degrees Fahrenheit for prolonged periods. EPA believes the average 77 degrees Fahrenheit (range 75-84 degrees Fahrenheit) threshold cited in the DEIS as optimal for these species to be too high on average. Similarly, optimal temperatures for hardhead, pikeminnow and, to some extent, splittail ranges from 71-82 degrees Fahrenheit, while the DEIS cites a range of 83-86 degrees Fahrenheit (average 84 degrees Fahrenheit) for these species.

> ***Recommendation:*** Reevaluate the average temperature thresholds for moderately and highly tolerant fish species and update the discussion of expected impacts based on these thresholds.

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[15] "Interior remains concerned that the San Joaquin Basin salmonid populations continue to decline and believes that flow increases are needed to improve salmonid survival and habitat." USFWS May 23, 2011 Phase I Scoping Comments:http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/cmmnts052311/amy_aufdemberge.pdf

[16] "Inadequate flow to support fish and their habitats is directly and indirectly linked to many stressors in the San Joaquin river basin and is a primary threat to steelhead and salmon." NMFS Feb. 4, 2011 Phase I Scoping Comments: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/cmmnts020811/010411dpowell.pdf

[17] "...current Delta water flows for environmental resources are not adequate to maintain, recover, or restore the functions and processes that support native Delta fish." Executive Summary of California Department of Fish and Game, November 23, 2010, Quantifiable Biological Objectives and Flow Criteria for Aquatic and Terrestrial Species of Concern Dependent on the Delta.

Air Quality Impacts

The Air Quality analysis and General Conformity determination in the DEIS use a worst-case scenario approach and select the action alternative – Alternative 4 – with the most impacts to analyze (p. 4-26). Other action alternatives are assumed to have fewer impacts due to the different intake structure to be constructed, but the scale of those impacts is not discussed. This does not provide a useful comparison for disclosure and informed decision-making. Additionally, the discussion of alternatives references estimates of fuel use, equipment use, and truck trips from the Draft Feasibility Report (p. 2-85, 87), but does not provide a summary of the Report's analysis and discussion.

Construction, operation, and recreational use of the proposed dam and reservoir are expected to result in significant and unavoidable impacts to greenhouse gas emissions (p. 4-38), even after proposed mitigation measures are implemented. The largest impacts to GHG emissions would be from increased pumping and removal of vegetation that currently provides sequestration benefits. The significance threshold used is the minimum for reporting requirements for some sources under California's AB32. The DEIS concludes that additional appropriate mitigation would be to use solar power for the project, but states that there is not enough available space to install the required solar panels to offset impacts.

> ***Recommendation:*** Analyze air impacts for Action Alternatives 1-3 and 5 separately from Alternative 4 and present the results in a comparable table format. Provide a summary table of fuel use, equipment use, and truck trips from the Feasibility Report. Evaluate possible additional mitigation for GHG emissions through power purchase agreements or emissions offsets.

Oak Woodland Habitat

The DEIS acknowledges that oak woodland is an important and sensitive habitat type that provides habitat to numerous common and special-status wildlife species (p. 6-70). The DEIS further acknowledges that loss of approximately 5,757 acres of oak woodland habitat from the project's construction and inundation areas is considered a substantial loss of this habitat. As mitigation for this loss, the DEIS proposes to preserve and protect existing oak woodland habitat in Madera and Fresno Counties in the vicinity of the project area through conservation easements with an emphasis on opportunities to restore, establish, enhance and preserve habitats with high conservation values (p. 6-92). EPA agrees that this habitat is important and sensitive and agrees with the approach to seek mitigation with high conservation values. The document states that it is unknown if the required mitigation acreage is available for purchase.

> ***Recommendation:*** Availability of mitigation acreage and locations for oak woodland should be identified in the FEIS. EPA recommends coordinating with local agencies and organizations with knowledge of the availability of oak woodland habitat and their land ownership status in order to develop the discussion in the FEIS.

Consultation and Coordination with Tribal Governments

Executive Order 13175, Consultation and Coordination with Indian Tribal Governments (November 6, 2000), directs federal agencies to establish tribal consultation and collaboration processes for the development of federal policies that have tribal implications, and is intended to strengthen the United States government-to-government relationships with Indian tribes. The DEIS mentions that Reclamation has been providing updates about the project and soliciting input from tribal representatives for the tribes located in the area, but states that tribal consultation for the project is pending (p. 9-20). The DEIS does not document any input that has been received during the update meetings.

The DEIS acknowledges that there are potentially significant adverse impacts to traditional cultural properties and sacred sites within the primary study area that would be inundated by the proposed project reservoir. The only mitigation proposed for these potential impacts is to take "precautions for limiting post-construction vandalism to cultural resources." It is expected that tribal consultation will identify further avoidance and mitigation requested by the tribes.

> ***Recommendation:*** The FEIS should discuss the status of consultation with tribes affected by the project and the impacts and mitigation measures identified through that consultation. The tribes should be included in the distribution list of the FEIS and Record of Decision.

Beneficiary Pays

The CALFED ROD states that a "fundamental philosophy of the CALFED Program is that costs should, to the extent possible, be paid by the beneficiaries of the program actions." EPA has long supported the concept of "beneficiary pays" because the proper identification and assignment of costs and benefits are critical to making efficient decisions about water resource management. The Feasibility Report associated with this DEIS was developed to provide detailed information on the potential project benefits and costs and the allocation of those costs. Following only a cursory review of the Draft Feasibility Report by EPA staff, it appears that the cost-benefit analysis relies on large ecosystem benefits in order for the project's benefits to exceed its costs. Ecosystem benefits appear to be calculated based on the projected changes to the salmon populations in the San Joaquin River. This calculation seems problematic for two primary reasons: 1) it does not account for the cost of ecosystem impacts in the inundation areas and 2) overestimates benefits to salmon. Additionally, since not all mitigation measures have been identified, the costs of mitigation cannot be fully accounted for in the analysis.

> ***Recommendation:*** The FEIS and Final Feasibility Report should include a more accurate accounting of costs and benefits to ecosystems to apply appropriate "beneficiary pays" principles from the CALFED ROD. Costs should also be updated to reflect known and potential mitigation expenses. To ensure full public disclosure to support decision-making, we recommend that the conclusions of the Feasibility Report be summarized in the body of the FEIS, and the Report be included as an appendix in the FEIS.

Induced Growth

The Land Use Planning and Agricultural Resources and Cumulative Effects chapters of the DEIS do not analyze or propose mitigation for the induced growth impacts from creating an additional lake recreation area. Chapter 28, Other NEPA and CEQA Considerations, states that none of the action alternatives reduces or eliminates obstacles to development, and uses this metric to conclude that the action alternatives would not induce growth (p. 28-99). A number of residential developments are already in the planning stages and are accounted for in the discussion of cumulative effects, but none include development along the Temperance Flat reservoir. The development of Friant Dam induced development of primary and secondary homes near the lake into areas that had previously been predominantly open space. The DEIS estimates an increase in visitor days of between 113,600 and 130,400 based on boating activity alone and EPA believes these additional visits could translate into increased development pressure.

The area immediately adjacent to most of the proposed new reservoir is managed by the Bureau of Land Management, but there are also privately-owned parcels nearby.

> ***Recommendation:*** Analyze potential for near-lake and lakeside development at the proposed Temperance Flat reservoir. Describe how the proposed project may influence the timing and

location of future growth in the area adjacent to the project site. Discuss habitat quality of adjacent private property parcels and consider their suitability as potential areas for conservation easements to mitigate for habitat loss, particularly oak woodland (p. 6-92), and avoidance of induced growth impacts. Given the challenge of finding suitable oak woodland habitat it is critical that consideration of increased development pressures be acknowledged and incorporated into mitigation planning.