



CREDA
Colorado River Energy Distributors Association

March 24, 2024

ARIZONA

Arizona Municipal Power Users Association

Arizona Power Authority

Arizona Power Pooling Association

Irrigation and Electrical Districts Association

Navajo Tribal Utility Authority (also New Mexico, Utah)

Salt River Project

COLORADO

Colorado Springs Utilities

CORE Cooperative

Holy Cross Energy

Platte River Power Authority

Tri-State Generation & Transmission Association, Inc. (also Nebraska, Wyoming, New Mexico)

Yampa Valley Electric Association, Inc.

NEBRASKA

Municipal Energy Agency of Nebraska (also Colorado)

NEVADA

Colorado River Commission of Nevada

Silver State Energy Association

NEW MEXICO

Farmington Electric Utility System

Los Alamos County

UTAH

City of Provo

City of St. George

South Utah Valley Electric Service District

Utah Associated Municipal Power Systems

Utah Municipal Power Agency

WYOMING

Wyoming Municipal Power Agency

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Bureau of Reclamation

Attn: LTEMP SEIS Project Manager

125 South State Street, Suite 800

Salt Lake City, UT 84138

Via Email only – LTEMPSEIS@usbr.gov

RE: GLEN CANYON DAM LONG-TERM EXPERIMENTAL AND MANAGEMENT PLAN (LTEMP) DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT (DSEIS) – 89 FR 28, February 9, 2024

The Colorado River Energy Distributors Association (CREDA) appreciates the opportunity to provide comments on the DSEIS, issued February 9, 2024.

CREDA and CREDA Member Interests

As a member of the Glen Canyon Dam (GCD) Adaptive Management Work Group (AMWG) and Adaptive Management Program (AMP), CREDA is one of the representatives of contractors who purchase federal hydropower and resources from the GCD, a primary feature of the Colorado River Storage Project (CRSP). CREDA is also a longstanding participant in the Upper Colorado River Endangered Fish Recovery Program. CREDA members serve over 4.1 million consumers in the states of Arizona, Colorado, Nebraska, Nevada, New Mexico, Utah, and Wyoming, and represents the majority of the firm electric service (FES) customers of the CRSP. As such, CREDA and its members have a unique interest and role in issues associated with Colorado River and CRSP operations, specifically GCD operations. CREDA members are all non-profit entities, composed of municipalities, rural electric cooperatives, irrigation and electrical districts, state agencies, political subdivisions and tribal utilities and communities. Each CREDA member is an FES customer with a long-term firm electric service contract with the Western Area Power Administration (WAPA or Western) for the purchase of CRSP resources. These resources are used by CREDA member utilities to meet their obligation to serve the electrical needs of their customers. Electric service is not discretionary or a convenience. This service is essential to health and human safety.

CREDA has participated in all NEPA processes associated with the LTEMP and this DSEIS, and specifically incorporates by reference comment letters dated May 9, 2016, November 14, 2016, March 10, 2023 and November 3, 2023 (attached).

THE DSEIS IS LEGALLY INADEQUATE TO ALLOW THE DECISION MAKER AND THE PUBLIC TO UNDERSTAND WHAT IS PROPOSED AND WHAT THE FULL ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION AND ANALYZED ALTERNATIVES ARE EXPECTED TO BE. THE DSEIS SHOULD BE REVISED TO INCLUDE A HARD LOOK AT ALL NECESSARY INFORMATION AND ANALYSES AND REISSUED FOR PUBLIC COMMENT PRIOR TO ISSUANCE OF A FINAL SEIS, RECORD OF DECISION, OR IMPLEMENTATION OF ANY EXPERIMENTS.

This statement and request are supported by the following discussion. The following are selected DSEIS section discussions. Following these discussions are specific comments on the DSEIS, referenced by page number.

PURPOSE OF AND NEED FOR ACTION

The Purpose and Need Statement in the DSEIS has been revised from what was included in Reclamation’s 2023 Environmental Assessment,¹ indicating what appears to be a change from a “prevention” standard to a “disruption” standard in the overall need for the Proposed Action. DSEIS at 1-6. However, the Proposed Action also is described as a measure needed to “ensure the *prevention* of population establishment” of smallmouth bass and other warmwater nonnative invasive fish species (SMB). DSEIS at 1-5. Is it Reclamation’s desire to *prevent* establishment of invasive species or to *disrupt* establishment? How is disrupt defined, and how would the experiment’s results be judged a success or a failure?

The DSEIS acknowledges that Reclamation and the AMP are aware of non-flow “mid-term” actions which can and should be implemented in addition to flow-only actions. The Purpose and Need Statement’s focus on “flow options” is too narrow to achieve an objective to “limit recruitment.” Given the ongoing willingness of the National Park Service to consider -12 mile slough modifications and other non-native fish control actions in the near future, particularly since the slough is “the more heavily populated area[]”, **consider broadening the Purpose and Need Statement to address an objective to prevent and management establishment of the smallmouth bass, and to incorporate any requisite compliance for such actions into a redrafted Purpose and Need Statement and DSEIS.** CREDA’s March 10, 2023 comments noted that the Upper Basin State Technical Work Group representatives have stated that operational alternatives are not a panacea; fish exclusion should be an immediate priority. These statements appear to support a more comprehensive Purpose and Need Statement and Proposed Action, which would address a comprehensive adaptive approach to both the prevention of establishment and management of (established) populations of SMB.

DESCRIPTION OF ALTERNATIVES

The range of alternatives included in the DSEIS is impermissibly narrow. As stated in Reclamation’s Notice of Intent,² “Flow actions alone are insufficient to “prevent the establishment of smallmouth bass below the Glen Canyon Dam.” As rapidly as the system has been changing during the current extreme drought, the question of *whether* the SMB are already established (or not) below Glen Canyon Dam is secondary to the need to address the issue in a comprehensive manner, as outlined in the Strategic Plan (Plan). This Plan, as well as the most current available monitoring and independent science panel-informed information, should be considered as the best available science and should be incorporated into a broad range of alternatives most likely to address establishment and management of the invasive fish species addressed in the DSEIS. Proposed alternatives should not be limited to flow-only treatments, should include structural elements, and should be revised to include at a minimum all actions included in Table 1 of the Invasive Species Strategic Plan.³

With respect to any experiment undertaken under this DSEIS, in order to fully inform the analysis of its direct, indirect, and cumulative effects, an experiment must include a *description of the proposed experiment, the time or frequency of implementation of the experiment, and the triggers or other conditions that must exist prior to implementation of the experiment.* Each experiment must also include a description of the *hypotheses that will be tested by the experiment and benchmarks or other identifiable criteria* that will

¹ Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (EA), February 24, 2023, p. 1-5.

² 88 Fed. Reg. 68667, 68668 (Oct. 4, 2023).

³ “Fisheries Actions Within Current Compliance”, Plan approved by AMWG February 2023.

allow the Secretary and interested parties to assess the experiments' *success or lack thereof*, and *when an experiment or action must be terminated* because of *unacceptable impacts (as specifically defined)* to the threatened humpback chub, other legally protected resources, or the electrical grid. The experiments also fail to describe any *monitoring* included in an implementation plan or experimental design, which is necessary to implement adaptive management as a part of the LTEMP. See "Adaptive Management – The US Department of the Interior Technical Guide."⁴ The Description of Alternatives (Chapter 2) should be revised to include these elements.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES/ENERGY AND POWER

The Notice of Intent (88 Fed. Reg. 68667, 68668) issued November 4, 2023, states that the SEIS will be further informed and built upon by "relevant analyses" and information from the 2016 LTEMP Final EIS. Notwithstanding significant electric grid, environmental, and drought-related changed conditions since the 2016 Record of Decision (ROD), and focusing in large part on Section 3.3 of the DSEIS, the DSEIS fails to adequately and fully analyze "Power and Energy" and the affected environment:

- The DSEIS focuses on "economic value" as an impact indicator, along with energy (GWh) impacts. Based on information and discussion presented at the January 23-24, 2024, GCDAMP Annual Reporting meeting, it is CREDA's understanding that the model used to develop this analysis has been neither peer-reviewed nor published. Further, the description of "economic value" is inconsistent with the LTEMP analysis that this DSEIS is supplementing. LTEMP and its Appendix K provide analysis that is "measured in terms of changes in the value of regional power system capacity (the power system comprised of Western's long-term firm (LTF) customers) and overall system-level electricity production costs (the entire Western Interconnection). The second analysis (presented in Section K.2) studied how system resources and operations under LTEMP alternatives affect the wholesale electricity rates paid by utility entities that receive federal preference power produced by Glen Canyon Dam. The third analysis (presented in Section K.3) studied the effects of alternatives on electricity rates paid by retail customers."⁵ **Section 3.3 of the DSEIS should be revised to include analysis undertaken by WAPA, using its GTMax and other models, consistent with the analysis and impacts described in the LTEMP.**

- **The impact of experiments on replacement power and transmission availability and grid reliability during the summer months of the experiment must be assessed in the DSEIS analysis.** Significant changes in the Western Interconnection from both a resource mix and hydrologic condition have occurred since the LTEMP ROD was issued that require assessment in the SEIS. See the NERC Summer Reliability Assessment 2022 at pp.5-6: "Drought conditions create heightened reliability risk for the summer. Drought exists or threatens wide areas of North America, resulting in unique challenges to area electricity supplies and potential impacts on demand: Energy output from hydro generators throughout most of the Western United States is being affected by widespread drought and below-normal snowpack. Dry hydrological conditions threaten the availability of hydroelectricity for transfers throughout the Western Interconnection. Some assessment areas, including WECC's California-Mexico (CA/MX) and Southwest Reserve Sharing Group (SRSG), depend on substantial electricity imports to meet demand on hot summer evenings and other times when variable energy resource (e.g., wind, solar) output is diminishing." In light of these challenging conditions, the DSEIS's effects analysis must include analysis of the impacts on replacement power and transmission availability and grid reliability.

- **Impacts to CRSP customers in their capacity as electric service providers who have an obligation to provide reliable electricity to retail customers must be added to the DSEIS's effects analysis. These impacts are distinct from impacts to WAPA and the Upper Colorado River Basin**

⁴ See: (<https://www.doi.gov/sites/doi.gov/files/migrated/ppa/upload/TechGuide.pdf>) Williams, B. K., R. C. Szaro, and C. D. Shapiro. 2009. Adaptive Management: The U.S. Department of the Interior Technical Guide. Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC. See also United States Department of the Interior Environmental Statement Memorandum No. ESM 13-11, January 7, 2013 (ESM13-11.pdf (doi.gov)).

⁵ LTEMP FEIS, Appendix K, DOI 2016a, K-4.

Fund, although *those* impacts also potentially affect CRSP customers. Depending on the nature of the Alternative or elements thereof, whether the action is a management action or an experiment, **resource adequacy and availability of replacement power and transmission** could result in financial or economic impacts that **must be disclosed and avoided or, if unavoidable, mitigated**. The analysis should include the impact on those customers that count their CRSP generation toward meeting their resource adequacy requirements, as well as include their CRSP generation in their greenhouse gas and Renewable Energy Certificates (RECs) reporting. Reduced and/or bypassed generation at Glen Canyon Dam/CRSP has implications and impacts to both direct contracts of those resources, as well as exchange agreements that rely on the output of CRSP resources.

- Impacts to underserved and disadvantaged rural and tribal communities should be updated. Nearly half of Colorado River Storage Project (CRSP) power customers (including CREDA members) are electric service providers for areas that could be classified as disadvantaged communities. The DSEIS recognizes this fact in Sections 3.15 and 3.16, but the analysis should be expanded to include specific impacts to these environmental justice communities.

- Financial impacts to the Upper Colorado River Basin Fund (Basin Fund) and the programs it funds are not assessed or disclosed. Hydropower operations are not the cause of SMB incursion and should not be relied on to bear the costs of mitigation. In the event WAPA must purchase power to replace resources that are unavailable or lost due to bypass operations for non-native fish control or HFEs, these costs are non-reimbursable⁶ and should not be borne by WAPA or WAPA's hydropower customers. The Basin Fund is the primary funding source for Reclamation's and WAPA's CRSP operations. In addition to funding operation and maintenance expenses of CRSP generation and transmission infrastructure, the Basin Fund repays the federal CRSP investment (with interest), provides irrigation assistance, provides funding to the Upper Basin States' Memorandum of Agreement projects, and supports the Colorado River Salinity Control Program. In the event federal non-reimbursable funding is not provided for implementation of this SEIS, the Basin Fund may be insufficient to continuing funding the above listed programs, including the operation and maintenance of Glen Canyon Dam infrastructure, and the federal government may be unable to fulfill its contractual obligations to the Salt Lake City Area/Integrated Projects (SLCA/IP) firm electric service customers. **Analysis of the Basin Fund impacts should be developed in cooperation with WAPA and must be included in the DSEIS.**

- Rate and contractual impacts are not assessed or disclosed. The DSEIS recognizes this omission,⁷ but also notes that "a Cost Recovery Charge (CRC) cannot be implemented to cover non-reimbursable purchase power expenses."⁸ Since issuance of the LTEMP ROD, significant SLCA/IP rate design changes have been implemented, which, coupled with the potentially significant hydropower, financial and operational impacts posed by the Proposed Action, requires that **SLCA/IP firm electric service rate and contract impacts be developed by WAPA and included in the DSEIS.**

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES/NON-NATIVE FISH/SMALLMOUTH BASS

Key information in the DSEIS about SMB begins at page 3-66. The fundamental premise behind the proposed action is smallmouth bass data and models. Unfortunately, as the DSEIS itself states: "(s)pecific data on these fish have been collected but are not available or citable at this time." DSEIS at 3-68. Given the relationship and hypotheses related to smallmouth bass, humpback chub and temperature, it is imperative that the data and tools employed to analyze impacts and make decisions be linked and the results disclosed in the DSEIS. Public technical review of the preliminary model and its assumptions is necessary prior to issuance of a final SEIS. "A detailed evaluation of model uncertainties, such as how available habitat changes under different alternatives, the influence of turbidity, prey resources, and the entrainment rate of smallmouth bass would help to characterize *uncertainty of the model*." DSEIS at 3-97 (emphasis added).

⁶ Grand Canyon Protection Act, PL. 102-575, Sec. 1807.

⁷ DSEIS, page 3-34 "Rate Impacts."

⁸ DSEIS, pages 3-19, 3-223.

“These modeling efforts for the Colorado River ecosystem below Glen Canyon Dam are not completed; thus, they are not included in this evaluation.” DSEIS at 3-135. CREDA understands that an independent science panel has been engaged by WAPA and Reclamation as part of the SEIS process. Has the panel been tasked with reviewing the preliminary model work by Eppehimer and Yackulic (DSEIS at 3-97 and Appendix A)? CREDA strongly supports that course and reiterates its request on the February 22, 2024 public webinar that **information produced by the panel be made available to the public and be included in in this section (through and including p. 3-97) and reissued for public comment prior to the issuance of a Final EIS or ROD.**

DETAILED COMMENTS

CREDA offers specific comments on the DSEIS on a section-by-section basis, referenced to page numbers in the DSEIS.

- 1) 1-5: Consider including in reference that in 2015, green sunfish were present in the upper slough, hence one of the considerations in the decision being made to not implement an HFE in that year. That year distinguishes itself from other HFE years in that the presence of a non-native species and lack of control thereof was important enough to not implement an HFE.
- 2) 1-7/1-8: Regarding the Scope: Please ensure that the analysis includes an evaluation of whether the alternatives are expected to prevent spawning and/or establishment in the whole of the project area, not just down to 15 mile or the LCR. Ensure that the risk assessment and impacts analysis undertaken in the DSEIS, and any decision-making process, include the contribution of the western Grand Canyon humpback chub population (estimated at between 66,000⁹ and 97,000¹⁰), since this population was considered and factored into the recent trigger review of this species.¹¹
- 3) 1-7: To be consistent with other agency authorities and obligations, consider clarifying WAPA’s description to the CRSP region of WAPA’s marketing of “cost-based hydropower from federal multiple purpose projects” as opposed to the entire 15-state region comprising all WAPA’s marketing areas.
- 4) 1-8: Given Reclamation’s recent 24-month study results and forecasts suggesting that DSEIS temperature triggers may not occur, if at all, until late summer or early fall, Reclamation should re-evaluate its Timing Considerations and project timeline, and reissue a public DSEIS following revision of section 3.3 as described above. Reissuance of a more complete DSEIS should result in a more complete disclosure and analysis of effects, including cumulative effects, as opposed to “the information used in this analysis,” which merely allows a limited “comparison among the alternatives.”
- 5) 1-9: Section 1.8 also should be revised to clearly state that any action taken under the SEIS to address SMB/non-native issues must be done in a manner consistent with the Colorado River Storage Project Act¹² and other applicable provisions of federal law. The description of LTEMP releases in this section should be reviewed. *Hourly, daily, and monthly* are the appropriate descriptors given to LTEMP operational parameters. This section has added “experimental timescales”, which requires more explanation, and confusingly states in the last paragraph that “LTEMP instead controls the timing of *annual* releases....”
- 6) 1-10: Revise Table 1-1’s “Energy and Hydropower” component description when section 3.3 Energy and Power has been revised.
- 7) 2-2: Operational flexibility, as defined in LTEMP ROD page B-7, section 1.2 should be included as an Assumptions Common to All Action Alternatives: “Reclamation also will make specific adjustments to daily and monthly release volumes, in consultation with other entities as appropriate, for a number of reasons, including operational, resource-related, and hydropower-

⁹ Reclamation Public Webinar, February 22, 2024.

¹⁰ GCDAMP Annual Reporting Meeting, January 23-24, 2024.

¹¹ Five Year Review of Action Triggers for Management of Humpback Chub, BOR to USFWS, December 17, 2021.

¹² 43 U.S.C. 620 et seq.

related issues. Examples of these adjustments may include, but are not limited to, the following: ... For hydropower-related issues, adjustments may occur to address issues such as electrical grid reliability, actual or forecasted prices for purchased power, transmission outages, and experimental releases from other Colorado River Storage Project dams.” In addition, specific reference to the Operating Criteria should be included.¹³

- 8) 2-4: The last bullet in the Assumptions Common to All Action Alternatives should be removed and replaced with a description of the GTMax, PLEXOS and other models utilized by WAPA.
- 9) 2-5: During development of the proposed accounting window changes to the HFE protocol, CREDA did not support scenarios or alternatives that include carrying over sediment from one year to the next year. It is unclear from the description of the third bullet whether this was intended in the “General high flow implementation modeling details.” On page 2-6 (final paragraph of 4th bullet), revise the description to be clear that “actual borrowing month order” is to be determined by Reclamation and WAPA.
- 10) 2-9: Hydropower Modeling Assumptions/GTMax should be rewritten by WAPA. The Power and Energy analysis included in the DSEIS does not appropriately disclose a full effects analysis required for either public comment or decision by the Secretary of the Interior. The GCMRC section should be removed from the DSEIS. Including competing models, competing tables and competing results for Power and Energy is a disservice to the public and the CRSP hydropower customers and prevents disclosure of clear information about each alternative’s effects on Power and Energy. The Power and Energy analysis should be undertaken by WAPA with its protocols and models, consistent with previous Reclamation CRSP NEPA processes (Flaming Gorge, Aspinall, LTEMP). CREDA’s participation and comments offered in the GCDAMP Annual Reporting, TWG, and most recently the DSEIS public webinars have underscored this request. The “constrained optimization model” as CREDA understands it, does not include capacity, rate, or Basin Fund analysis, which is inconsistent with the LTEMP, nor does it address electric grid impacts in any manner. Further, as CREDA understands the GCMRC model and results, it includes all 30 traces from the CRSS model, whether or not an experiment is triggered in a specific trace, and averages all those traces. This is an incorrect analysis and results in misinterpretation of the experiment’s effects. Instead, the analysis should analyze the traces IN WHICH AN EXPERIMENT OCCURS, and assess the effects of EACH EXPERIMENT, not an average of 30 traces, many of which do not include or trigger an experiment. CREDA has raised specific concerns in these recent meetings and is willing to make its hydropower subject matter expert members available to discuss further.
- 11) 2-11: CREDA assumes the paragraph beginning “In practice, flow implementation....” applies to all bypass alternatives (and not just the Cool Mix Alternative described in section 2.6). Please confirm this assumption and consider including this paragraph within “Implementation” as opposed to in the description of only one of the bypass alternatives. If you do not confirm this assumption, please explain why the statement only applies to the Cold Mix Alternative.
- 12) 2-11: In describing the flow alternatives, the language stating, “To align with actual implementation without necessitating multiple weeks of hydropower maximization (that is, the operation of the hydropower system to generate the maximum amount of electrical power)...” flies in the face of the LTEMP hydropower objective, as well as express statutory requirements.¹⁴ As the Basin States have noted, “The U.S. District Court for the District of Arizona further clarified that the broadly worded provisions of the Colorado River Storage Project Act (CRSPA) and GCPA impose on the Secretary an obligation to balance many different interests in operating Glen Canyon Dam. The Secretary must continue to recognize that power production is a primary

¹³ Operating Criteria for Glen Canyon Dam In accordance with the Grand Canyon Protection Act of 1992 and the Record of Decision for the Glen Canyon Dam Long-Term Experimental and Management Plan Final Environmental Impact Statement, December 2016, June 7, 2018 (WAPA and Reclamation).

¹⁴ CREDA raises here the issue of omission of an express statutory requirement – generation of hydroelectric power - from the bypass alternatives identified in this NEPA analysis and reserves the right to litigate the compliance with applicable statutory requirements.

- purpose of the Dam that must be balanced against other purposes, statutory requirements, and water delivery obligations as (s)he considers actions to implement the GCPA.”¹⁵
- 13) 2-17: The Non-Bypass Alternative (as well as in Table 2-1) is described as including “substantial” river stage changes. Yet, the bypass flow alternatives also include release components that are extreme (or “substantial”). Consider replacing the description of the Non-Bypass Alternative with one provided by WAPA and the hydropower Cooperating Agencies. Please remove subjective descriptors, as they could reflect pre-decisional bias.
 - 14) 3-4: The third bullet under “Assumptions” is incorrect and should be modified or removed. See comment 13) above.
 - 15) 3-16/3-17: The description of Affected Environment associated with WAPA’s marketing area should be revised to reflect the CRSP region, not the entire WAPA territory. Reference to emergency assistance to California provided by WAPA in 2020 should be expanded to similar assistance in 2001, and 2022. Finally, the sentence describing authorization of power revenues should either remove reference to the Grand Canyon Protection Act (as it is not the only Act that refers to power revenues) or revise the text to state “as authorized”, as opposed to “as dictated by”. The GCPA does not mandate the use of CRSP power revenues for the GCDAMP.
 - 16) 3-17 through 3-21: These sections should be revised by WAPA to address omissions such as reference to the June 6, 2018 Operating Criteria between WAPA and Reclamation; correct the description of reserves and regulation; include analysis of impacts to Renewable Energy Credits (RECs); remove reference to a “subset of customers”; and remove irrelevant reference to WAPA sales of electric power.
 - 17) 3-21: As described above, reference and use of the GCMRC models should be removed from the DSEIS. CREDA questions the GCMRC’s model sufficiency for the effects analysis required in the DSEIS. CREDA understands the model has not been peer-reviewed or published, and therefore is not the best available science/tool available for power and energy assessment in the DSEIS, as described in comment 10) above.
 - 18) 3-24 through 3-35: This information should be withdrawn and revised by WAPA based on its GTMax, PLEXOS and other modeling results. As drafted, there are incorrect statements such as “Overall, the effects described above may be most likely for power consumers in the surrounding counties and states”; more severe impacts in the immediate areas around Glen Canyon Dam and less severe impacts farther away from the dam” (p. 3-31). Those statements do not reflect the contractual and operational reality of CRSP firm electric service marketing and are misleading as to power and energy effects, as well as rate impacts to CRSP firm electric service customers.
 - 19) 3-37: Reference to the April 2023 event should be referred to as an “action” or “flow” or some other descriptor; it was by its terms not an HFE.
 - 20) 3-48 through 3-54: The question of whether or not Glen Canyon Dam operations impact the abundance and diversity of aquatic insects in the Colorado River downstream of Glen Canyon Dam remains an open question, even after years of bug flow experiments. For purposes of this DSEIS, CREDA recommends removal of this information, or revise it to brief references or citations, as it is secondary to the specific resources and issues being analyzed.
 - 21) 3-129: CREDA appreciates the paragraph describing the vegetation model used and simplifications made regarding threatened and endangered bird analysis. Given the DSEIS is intended to supplement the LTEMP FEIS/ROD with relevant new information, please consider removing any impact analysis that is repetitive from the LTEMP documentation.
 - 22) 3-141: The paragraph referring to the SunZia Wind facility should be removed as it is inappropriate to single out one project and speculate as to its impact on the grid. It would be appropriate to merely state that the analysis utilized two scenarios in the emissions/air quality assessment.

¹⁵ See Colorado River Basin State Representatives to LTEMP EIS Scoping, January 31, 2012.

- 23) 3-188/3-189: The discussion on impacts on boating and camping for the bypass flow alternatives is confusing. It is described as the same as under No Action, because these alternatives allegedly “operate flows within the current range of operations...” Refer to comment 11) above.
- 24) 3-191: Is the conclusion that the Non-Bypass Alternative would adversely affect whitewater boating opportunities in Grand Canyon National Park and the Hualapai River Runners based on the assumption that the 2,000 cfs flow occurs between 9 p.m. and 1 a.m. on Sunday evenings? Is whitewater boating occurring between those hours? The analysis and conclusions for the bypass alternatives seem incongruous with the analysis and conclusions for the non-bypass alternative. These paragraphs should be clarified, and the use of “temporary” and references to “minimum flows of 2,000 cfs” should be consistently described and applied. CREDA questions the cumulative effects statement that only the Non-Bypass Alternative would not result “in a reduction of navigation concerns”.
- 25) 3-199: As discussed in a previous comment, the SEIS is intended to supplement information already existing in the LTEMP. Consider either a) removing the Nonuse Values subsection, as it is limited in its scope, or b) adding reference and description to “Estimating Non-Use Values for Alternative Operations of the Glen Canyon Dam: An Inclusive Value Approach, Phase 3B Project Research and Findings”¹⁶ as significant information directly relevant to LTEMP. Unlike previous non-use valuation studies (such as the 1987 Bishop study cited in the DSEIS) that were limited in their application to only a small subset of downstream resources, this study describes all resources considered in the LTEMP DEIS, including tribal communities. The study estimates the non-market, non-use values for an inclusive set of impacts that result from changing the operation (i.e., hydropower generation) of Glen Canyon Dam. To accomplish this, the research team developed an integrated, multi-stage protocol to identify the valued impacts and to estimate the balance of the negative and positive valuations of those impacts by a representative sample of the US public. The study found that the median household value for retaining the current pattern of GCD operations (i.e., hydropower generation) would be nearly \$20 per year - amounting to approximately \$2.5 billion per year over all US households.
- 26) 3-209: See comment 23) above regarding Non-Bypass Alternative boating impacts.
- 27) 3-210: CREDA disagrees with the statement that “Additionally, individuals owning property in the region around Glen Canyon Dam are considerably more likely to support continuation of dam operations.. These people are more likely to receive the benefits of Glen Canyon Dam hydropower at their property....” This statement is a mischaracterization of Jones et al. 2016, as well as technically incorrect (see comment 18), and should be removed.
- 28) 3-219: The word “end-use” is incorrect and should be revised to “wholesale.” WAPA does not market directly to end-use customers. That obligation lies with WAPA’s firm electric service customers (see first bullet, page 3 hereof). The word “benefit” should be revised to “benefit-crediting” in the last paragraph on this page.
- 29) 3-220: The paragraph describing tribal benefit crediting arrangements should be revised by WAPA. Specifically, references to the types of utilities who have entered into benefit crediting arrangements should be corrected, “lower cost power” should be removed, and the last sentence attempting to describe the history of benefit crediting should be removed as inflammatory, or rewritten based on the public record associated with WAPA’s SLCA/IP post-2004 resource pool public process.¹⁷
- 30) 3-222: Remove the following sentence, as it is premature to include pending outcome of rate analysis: “However, the cost of additional capacity required under the action alternatives to replace lost capacity at Glen Canyon Dam would have negligible impacts on electric bills paid by residential consumers.

¹⁶ University of Oklahoma (Hank C. Jenkins-Smith, Principal Investigator; Carol L. Silva, Co-Principal Investigator; Deven Carlson, Kuhika Gupta, Benjamin Jones, Joseph Ripberger, Wesley Wehde); University of New Mexico (Robert Berrrens); Sept. 2016.

¹⁷ See 64 Fed. Reg. No. 173 (Sept. 8, 1999).

- 31) 4-2: The third bullet should be replaced with a description of WAPA models and impact indicators provided by WAPA.
- 32) A-1: Shouldn't footnote a refer to all FIVE options? CREDA assumes that the Non-Bypass Alternative also includes the change to the sediment accounting window. Please confirm or revise the footnote accordingly.

OTHER ISSUES

The Basin Fund is the primary funding source for Reclamation and WAPA's CRSP operations. In addition to funding operation and maintenance expenses of CRSP generation and transmission infrastructure, the Basin Fund repays the federal CRSP investment (with interest), provides irrigation assistance, provides funding to the Upper Basin States' Memorandum of Agreement projects, and supports the Colorado River Salinity Control Program. Federal non-reimbursable funding must be provided to implement and mitigate the costs and impacts of the SEIS.

Section 1.4 of the LTEMP ROD establishes a decision-making/recommendation process associated with experiments undertaken under LTEMP. Given the potential direct and immediate impacts of actions being considered by this DSEIS to CRSP electric service customers, CREDA recommends that all LTEMP Cooperating Agencies be afforded the opportunity to participate in any decision-making/recommendation process associated with actions under this DSEIS.

CREDA appreciates Reclamation holding three public webinars following issuance of the DSEIS. During the February 22, 2024, webinar, the presenter noted that "Resources Analyzed in Detail – Chapter 3" of the DSEIS are listed in order based on number of comments received by Reclamation on the 2023 Environmental Assessment. Energy and Power was the resource category receiving the most public comments, which demonstrates the public's interest in the hydropower resource.

CREDA appreciates the opportunity to provide comments on the DSEIS and urges Reclamation to update and reissue a public draft SEIS as recommended herein. Should there be any questions or concerns regarding this letter or any aspect of CREDA's or CREDA member interests, please contact me at your earliest convenience.

Leslie James

Leslie James
Executive Director

Att: Referenced letters

Cc: CREDA Board
WAPA Administrator Tracey LeBeau
Wayne Pullan – Reclamation UC Region
Rodney Bailey – WAPA CRSP Management Center



CREDA
Colorado River Energy Distributors Association

ARIZONA
 Arizona Municipal Power Users Association

Arizona Power Authority
 Arizona Power Pooling Association
 Irrigation and Electrical Districts
 Association

Navajo Tribal Utility Authority
 (also New Mexico, Utah)

Salt River Project

COLORADO
 Colorado Springs Utilities

Holy Cross Energy

Intermountain Rural Electric Association

Platte River Power Authority

Tri-State Generation & Transmission
 Association, Inc.
 (also Nebraska, Wyoming, New Mexico)

Yampa Valley Electric
 Association, Inc.

NEBRASKA
 Municipal Energy Agency of Nebraska
 (also Colorado)

NEVADA
 Colorado River Commission
 of Nevada

Silver State Energy Association

NEW MEXICO
 Farmington Electric Utility System

Los Alamos County

UTAH
 City of Provo

City of St. George

South Utah Valley Electric Service District

Utah Associated Municipal Power Systems

Utah Municipal Power Agency

WYOMING
 Wyoming Municipal Power Agency

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March 10, 2023

Sarah Bucklin
 Regional NEPA Coordinator
 U.S. Bureau of Reclamation, Upper Colorado Basin Region
 Via Email only – sbucklin@usbr.gov

RE: Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental
 Assessment (EA)

The Colorado River Energy Distributors Association (CREDA) appreciates the
 opportunity to provide comments on the EA, issued February 24, 2023.

CREDA and CREDA Member Interests

As a member of the Glen Canyon Dam (GCD) Adaptive Management Work Group (AMWG) and Adaptive Management Program (AMP), CREDA is one of the representatives of contractors who purchase federal hydropower and resources from the GCD, a primary feature of the Colorado River Storage Project (CRSP). CREDA is also a longstanding participant in the Upper Colorado River Endangered Fish Recovery Program. CREDA members serve over 4.1 million consumers in the Colorado River basin states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming, and represents the majority of the firm electric service (FES) customers of the CRSP. As such, CREDA and its members have a unique interest and role in issues associated with Colorado River and CRSP operations, specifically GCD operations. CREDA members are all non-profit entities, composed of municipalities, rural electric cooperatives, irrigation and electrical districts, state agencies, political subdivisions and tribal utilities and communities. Each CREDA member is an FES customer with a long-term contract with the Western Area Power Administration (WAPA) for the purchase of CRSP resources. These resources are used in part by CREDA member utilities to meet their obligation to serve the electrical needs of their customers. Electric service is not discretionary or a convenience. This service is essential to health and human safety.

CREDA appreciates the inclusion of our December 13, 2022 comment letter as part of the EA documentation. We offer the following general and specific comments for your consideration.

General Comments and Conclusions

- A. The impacts of the Proposed Action (Action) to the human environment will be significant and cannot be supported by an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the following reasons:
 - The impact of bypassing hydropower production will cause a significant increase in replacement power costs for CREDA members with firm electric service (FES) contracts for power from CRSP facilities.

from CRSP facilities.

- The result of the Action will require WAPA and FES customers to purchase replacement power on the market, yet current projections indicate there may be little to no power availability on the market when the replacement power is needed.
 - The source of replacement power, should any be available, will not be carbon free; thus the Action will further exacerbate the impacts of a warming climate.
- B. The analysis in the EA is wholly inadequate in its identification and analysis of potential impacts from the Action.
- There is no analysis on the availability of replacement power or on the impacts to the environment of purchasing replacement power (including impacts to the power grid and a warming climate).
 - The EA fails to meaningfully identify or analyze the impacts on the Upper Colorado River Basin Fund (Basin Fund) and the implications those impacts have on the ongoing operation of the CRSP facilities and programs it funds.
 - The EA fails to meaningfully identify or analyze the affordability of replacement power for FES customers (many of which are at risk or tribal communities).
 - The EA is solely limited to alternatives regarding variations of flows bypassing power production. There is no discussion of potential non-flow alternatives.
 - The EA fails to use the most current information regarding future hydrology and its impacts on hydropower production. Potential impacts of the Action cannot be analyzed in a vacuum. NEPA requires a disclosure of the cumulative impacts of the Action. In this case, Reclamation must analyze the impacts of the Action in light of the ongoing impacts to FES customers from the last 20 years of limited hydropower production and the resulting increased reliance on purchased power.
- C. The EA fails to acknowledge how the impacts of this Action will be inconsistent with the “beneficiary pays” construct that has been the cornerstone of Reclamation law and policy for 120 years. Smallmouth bass were not introduced into the CRSP at either the request of, or to benefit, hydropower customers, yet the costs of actions to limit the range and impacts of these fish on native populations are being placed wholly at the feet of WAPA and its FES customers. This must be disclosed.

For these reasons, CREDA believes that the EA is legally inadequate and cannot be the basis for a FONSI.

Specific Comments

Chapter 1. Introduction

- 1) Section 1.2, page 1-1 describes uses of Lake Powell. As this EA targets operations of GCD, please revise the Background section to refer specifically to GCD’s authorizing legislation and stated purposes – the 1956 Colorado River Storage Project Act (see also comment 3) below).
- 2) Section 1.2, page 1-3 refers to the Secretary’s Designee’s charge directing Reclamation and GCMRC to work with the Adaptive Management Work group “to develop flow options to disrupt or prevent spawning of smallmouth bass.....”. Please include the additional charge in that directive, which was “to minimize impacts to other resources.” (May 2022 Directive). None of flow options within the Action include an attempt to minimize impacts to the hydropower resource, notwithstanding viable option(s) were proposed by biologists and hydropower experts from WAPA during the summer and fall of 2022 (WAPA November 18, 2022 and December 15, 2022 letters).
- 3) Section 1.3, page 1-5. The Purpose and Need Statement is broad enough to include “changes in flow velocity” along with temperature-only focused hypotheses and experiments. (See also comment 9) below regarding alternatives.) As the EA describes an *experimental* action, and the Action is based solely on modeling, please consider reinstating the word “help” prior to “prevent the establishment of...”. As Upper Division States TWG

representatives have stated, operational alternatives are not a panacea; fish exclusion should be an immediate priority; the EA is deficient in that more than a single focus (bypass flows) alternative should have been included. Reclamation should prioritize and expedite installation of its preferred prevention technology, and NPS should take action regarding the slough at RM 12, and continue addressing nonnative invasive species as required in its Expanded Non-Native Aquatic Species Management Plan.¹

- 4) Section 1.4, page 1-5, 6. Supplementing comment 1) above, please broaden the description of the Colorado River Storage Project Act to refer to its authorized purposes and Section 5, and not just reference to the creation of the Basin Fund. In referring to the Grand Canyon Protection Act of 1992 (GCPA), please include the full mandate of the GCPA, which includes not only Section 1802(a) but Section 1802(b), which requires the protection, mitigation and improvement be done “in a manner fully consistent with and subject to the Colorado River Compact, the Upper Colorado River Basin Compact, the Water Treaty of 1944 with Mexico, the decree of the Supreme Court in Arizona v. California, and the provisions of the Colorado River Storage Project Act of 1956 and the Colorado River Basin Project Act of 1968 that govern allocation, appropriation, development, and exportation of the waters of the Colorado River Basin.” Reference to the GCD AMWG should be corrected to refer to that body’s responsibility to “Advise GCDAMP and the Secretary of Interior or their designee.... regarding GCDAMP priorities and policies, proposed changes to the criteria and operating plans for Glen Canyon Dam, and the implementation of resource management objectives, research studies, and environmental or cultural commitments” (ROD, page 14). The AMWG does not have any responsibility to “organize and coordinate dam operations.” Finally, in describing the GCD LTEMP EIS, please revise the current text to reflect language from p.1 of the ROD: “The LTEMP will provide a framework for adaptively managing Glen Canyon Dam operations and other management and experimental actions over the next 20 years, consistent with the Grand Canyon Protection Act (GCPA) **and other provisions of applicable Federal law.**” (emphasis added).
- 5) Section 1.7, p. 1-7: CREDA recommends including in Operational Guidelines, the text from the LTEMP ROD, page B-7, section 1.2: “Reclamation also will make specific adjustments to daily and monthly release volumes, in consultation with other entities as appropriate, for a number of reasons, including operational, resource-related, and hydropower-related issues. Examples of these adjustments may include, but are not limited to, the following: ... For hydropower-related issues, adjustments may occur to address issues such as electrical grid reliability, actual or forecasted prices for purchased power, transmission outages, and experimental releases from other Colorado River Storage Project dams.”
- 6) Section 1.8, page 1-8: The EA refers to Reclamation’s close coordination with USFWS through the EA process, which is important. However, in reviewing the USFWS letter (Appendix C), we question whether the statement in the EA that refers to “a potential future decline in humpback chub that **would** occur if smallmouth bass are allowed to establish” (emphasis added) accurately reflects the Service’s description of risk and threats (i.e., uncertainty).

Chapter 2. Proposed Action and Alternatives

- 7) The EA should be clear in its Purpose and Need Statement that the duration of the EA/Action is “up to three years”, which is not stated until Chapter 2, section 2.2.1. CREDA’s understanding is that since the Table 3-2 impacts are only for 5 months in 2023, the EA only analyzed impacts over the 5 summer months of 2023, and not over the period of the EA, three years. For all resources analyzed, that level of analysis is insufficient.

¹ See: [ParkPlanning - Expanded Non-Native Aquatic Species Management Plan/EA \(nps.gov\)](#)

- 8) Section 2.2, p. 2-1: The description of the Proposed Action with Flow Options (Action) was challenging to understand. Assuming that the last three bullets on page 2-2 are the key drivers, we have the following questions:
- Implementation of the experiment appears to be determined by temperatures at the Little Colorado River (LCR). Is it a model that makes that critical determination? Is that the referenced “adapted” model, and has that model been peer reviewed?
 - Is it feasible, since such a significant experiment is being considered, to use actual temperature data as the trigger? As opposed to projections based on mean daily air temperature from Page, Arizona (77 miles from the LCR), and mean solar radiation from Williams, Arizona (90 miles from the LCR).
 - Flow Option A, p. 2-4: what percentage of time does “almost always” refer to in achieving the target temperature with all 4 bypass tubes in use?
 - If “no smallmouth bass have been detected below RM 0, then why not target RM 45. And how is “effective” quantified?
 - Flow Option B, p. 2-6: this section refers to two flow spikes; yet, page 2-4 refers to “up to three 36-hour flow spikes”. Please clarify.
 - Flow Option C, p. 2-6: is there more recent data (besides 1945, 1957 and 1963) available? And to what degree of certainty can the statement be made that “achieving a cold shock down to RM 0 or RM 15 **would** still be effective at disrupting spawning (emphasis added). How is “effective” defined?
 - Flow Option D, p. 2-8: What is the science basis (or data supporting) the statement “even if it is not possible to achieve a temperature of 13 C, the flow would likely disrupt spawning, even though data from the Yampa and Green Rivers suggests that smallmouth bass can continue to spawn when temperatures drop to 13.9 C”.
 - An adaptively managed experiment of this significance and uncertainty must include a *description of the proposed experiment, the time or frequency of implementation of the experiment, and the triggers or other conditions that must exist prior to implementation of the experiment*. The experiment must also include a description of the *hypotheses that will be tested by the experiment and benchmarks or other identifiable criteria* that will allow the Secretary and interested parties to assess the *success or lack thereof, when an experiment or action must be terminated because of unacceptable impacts (as specifically defined)* to the listed humpback chub or other legally protected resources. Finally, any *monitoring* included in an implementation plan or experimental design must meet legal standards necessary to implement adaptive management, including monitoring of impacts to LTEMP resources².
- 9) Section 2.3, p. 2-9: Please describe the science basis for concluding without detailed analysis that a penstock only release “does not meet the project’s purpose and need.” A penstock only release *could* meet the purpose and need if the purpose had remained as it was provided to the AMWG Stakeholders, with the word “help” as a modifier to “prevent”. Further, it appears this option was rejected for including one of the same objectives as the Action options: abandoning nests v. disrupting/disturbing spawning. Disrupting/disturbing spawning may have the potential of “high mortality of offspring”, which is a secondary objective of disrupting/disturbing spawning. Page 3-7, describing the Action impacts on nonnative fish, is very clear: “All flow options are designed to inhibit smallmouth bass spawning, displace male smallmouth bass from guarding nests, or both”. The EA should clearly explain why Option E was rejected for analysis based on the same criteria that is included in all flow options of the Proposed Action.

Chapter 3. Affected Environment and Environmental Consequences

- 10) Section 3.2.1, page 3-1: Has the population of humpback chub observed in the western Grand Canyon been factored into a risk assessment of smallmouth bass impacts to the chub? From the numbers of fish reported out

at the recent TWG and AMWG meetings, it seems logical that although the dynamics are not fully understood, that sheer numbers should moderate the risk.

- 11) Page 3-3: Since over 250 juvenile smallmouth bass were found throughout the Glen Canyon reach in 2022, and this number “suggests successful spawning”, does that translate to “establishment”, and if so, the Purpose and Need as drafted should be reconsidered. In addition, some less impacting actions/operations could be considered, assuming there is already establishment.
- 12) Section 3.2.2, page 3-6: This section also states that under Options C and D, the cold temperatures **would reach downstream** to the confluence of the LCR. How does that risk to the humpback chub compare to the risk of smallmouth bass traveling down to the LCR? Finally, how can effects to razorback suckers be characterized as “minor” if flow changes “inundate or desiccate backwaters”?
- 13) Page 3-8: Fish dispersal is a concern inherent to all flow options and “an important consideration for establishment”. Flow spikes are identified with dispersal. We know from previous high-flow experiments (HFEs) that dispersal is a key concern. In fact, a decision was made in the fall of 2022 to not undertake an HFE due in large part to concern about nonnative fish dispersal. Is the statement that “green sunfish already occur throughout the Grand Canyon **in low numbers** accurate? Just because there may be “an overall lack of quantitative research on green sunfish movement or dispersal in response to flows”, we know that green sunfish is a predator/competitor of humpback chub, and actions that will disperse more of this species should be reconsidered.
- 14) Page 3-9: The impacts of Flow Options C and D appear to be contrary to the objective of the last 3 years of the bug flow experiment. The flow spikes....”represent a disturbance that would scour benthic substrates and reduce the food-base abundance and biomass.” How is this trade-off assessed and evaluated?
- 15) Section 3.3, page 3-11: CREDA submitted extensive comments during the LTEMP process regarding the cited 1987 Bishop study. CREDA’s November 16, 2016 letter states in part: “The Fluctuation Index utilizes information derived from a 1987 study (Bishop et al),³ which addressed recreational user preference for fluctuating flow levels. In that study, however, 10,000 cfs (*not* 8,000 cfs) was defined as “constant flows”. We recommend reference to the 1987 study be removed, as it was mischaracterized in LTEMP, in favor of the work done in 2016 by Bari.
- 16) Section 3.4.2, page 3-20: We question whether volume of water released during flow spikes “would be within the range analyzed in the LTEMP Final EIS”, if the analysis included “up to three years” of flow options B and D and the frequency of flow spikes contained therein.
- 17) Section 3.6, page 3-27: Please include reference to the September 2022 emergency power supply from GCD to California. Please remove the incorrect reference to the Grand Canyon Protection Act in the last sentence.
- 18) Page 3-30: Please remove the following sentence which is implied to be a citation from DOI 2016a, p. 3-204): “This type of operation creates large fluctuations in water releases, which has negative impact on environmental resources”. The prior three sentences of that paragraph are accurate cites from page 3-204 of DOI 2016a. This last sentence is not.

² See: [TechGuide.pdf \(doi.gov\)](#), p. 9; Interior Environmental Statement Memorandum No. ESM 13-11, January 7, 2013, p. 5

³ See FEIS Appendix C, P. C-27, section 4.5

- 19) Page 3-31: The Power Marketing section of the EA and Section 3.6.2 Environmental Consequences Analysis should disclose the impacts based on WAPA's implementation of WAPA-199 on December 1, 2021. The EA must also address the Action's impact on replacement power availability during the summer months of the experiment. See NERC Summer Reliability Assessment 2022 at pp.5-6: "Drought conditions create heightened reliability risk for the summer. Drought exists or threatens wide areas of North America, resulting in unique challenges to area electricity supplies and potential impacts on demand: Energy output from hydro generators throughout most of the Western United States is being affected by widespread drought and below-normal snowpack. Dry hydrological conditions threaten the availability of hydroelectricity for transfers throughout the Western Interconnection. Some assessment areas, including WECC's California-Mexico (CA/MX) and Southwest Reserve Sharing Group (SMSG), depend on substantial electricity imports to meet demand on hot summer evenings and other times when variable energy resource (e.g., wind, solar) output is diminishing. In the event of wide-area extreme heat event, all U.S. assessment areas in the Western Interconnection are at risk of energy emergencies due to the limited supply of electricity available for transfer." This is not just an issue for WAPA, but for the FES customers and all other utilities in the West. A significant loss of generation from GCD will have significant financial impacts on WAPA and economic and financial impacts on WAPA's FES customers and *their* customers. The EA analysis does not quantify the impact of customers having to replace GCD generation with other resources. The analysis should include the impact on those customers that count their CRSP generation toward meeting their resource adequacy requirements, as well as include their CRSP generation in their greenhouse gas and Renewable Energy Certificates (RECs) reporting. Reduced and/or bypassed generation at GCD/CRSP has implications and impacts to both direct contracts of that/those resources as well as exchange agreements that rely on the output of that/those resources. Consideration of resource adequacy requirements, replacement resource availability, and contractual impacts impacting utilities' obligation to serve customers are essential elements that must be addressed in the EA's effects analysis. On September 28, 2022, CREDA submitted comments to Reclamation regarding potential fall experiments under LTEMP. These comments apply to every experiment or changed operation that may be considered for CRSP generating units.
- 20) Page 3-33: Please consider revising the last sentence to the following: The replacement power purchased by WAPA and its customers would likely be from carbon-emitting resources and would increase GHG emissions in the region. The EA should assess the impact of the Action on GHG emissions. Previous analysis showed that without GCD, an additional 2.4 million metric tons per 1,000 GWh would be emitted by the WECC."⁴ Given the Departments of the Interior and Energy's commitments to maintain and expand renewable generation capacity, the importance of hydropower capacity to the overall power supply for the western United States, and the existing benefits of hydropower that avoids alternate fossil fuel greenhouse gas production⁵, strong consideration should be given to the air emission impacts resulting from the Action. Please also include a sentence stating that WAPA and its customers may not be able to find replacement power, whether or not the Basin Fund has sufficient funds available, given resource scarcity during summer months. The paragraph referring to additional analysis for Flow Option A is based on outdated data, as confirmed at the AMWG meeting on February 16, 2023. A more likely scenario, based on recent market prices, is that the values included in the EA on hydropower/Basin Fund impacts are understated. Finally, the discussion of transmission congestion should be modified to remove statements about "reverse direction of historical operations" and "reversal of power;" these statements are confusing and inaccurate. New text should be provided by WAPA to reflect more current modeling by WAPA/NREL/Argonne and should state that societal effects **will** be felt across the Western Power Grid based on that analysis (emphasis added).

⁴ See Scientific Certification Systems, Life Cycle Impact Assessment (LCIA) of Glen Canyon Hydropower Generation System Compared to the WECC Baseline; Conducted in accordance with ISO 14044 LCIA Framework and the Draft SCS-002 Life Cycle Metrics Standard, Type III Life-Cycle Impact Profile Declarations for Materials, Products, Services and Systems, March 2009, p ii

⁵ See New Energy Frontier. Balancing Energy Development on Federal Lands. A Joint Report to Congress on Siting Energy Development Projects on Federal Lands. U.S. Department of Interior and U.S. Department of Agricultural. May 2011, pp. 28-31

- 21) Section 3.7, page 3-34: CREDA disagrees that *only* the recreation resource should be analyzed for environmental justice impacts. Impacts to CRSP hydropower customers, particularly the smaller municipal, rural and tribal customers, should be analyzed in the context of environmental justice. The Proposed Action may disproportionately affect these customers as they will be paying more for an essential service that is necessary for human health; the GHG emissions impacts resulting from replacement power sources may also have a disproportionate impact on these communities. This analysis is required by the EA. The LTEMP Appendix K included a fair amount of impact analysis to tribal customers, in particular. As post-WAPA-199 impacts are direct and immediate to these (and all other) FES customers, the EA should analyze those impacts.
- 22) Page 3-38: The affected environment should be revised to include the environmental justice populations represented by CRSP FES customers. See section D. of CREDA's December 13, 2022 letter, which is included in the Appendix to this EA.
- 23) Page 3-39: In a post-WAPA-199 world, direct and immediate impacts are likely borne by *all* WAPA FES customers, not just the "largest of WAPA's customers". The impact assessment should be based not only on the size of an FES customer's CRSP allocation, but also the proportion of its CRSP allocation to its total resource mix. In addition, the ability of an FES customer to access market resources for replacement power is also a factor.

As representative of the Secretary of the Interior, Reclamation has the responsibility to fulfill the Secretary's obligation to meet multiple and sometimes competing statutory requirements applicable to the operation of GCD and the exercise of other authorities as required by the provisions of the GCPA. The United States has described the relationship between the objectives of the GCPA and the CRSP as being "in addition to rather than in substitution of the Secretary's obligations concerning the operations of Glen Canyon Dam for hydropower and other project purposes."⁶ "The U.S. District Court for the District of Arizona further clarified that the broadly worded provisions of the Colorado River Storage Project Act (CRSPA) and GCPA impose on the Secretary an obligation to balance many different interests in operating Glen Canyon Dam. The Secretary must continue to recognize that power production is still a primary purpose of the Dam that must be balanced against other purposes, statutory requirements, and water delivery obligations as (s)he considers actions to implement the GCPA."⁷ In fact, the failure to incorporate within the EA an experiment that provides a less impacting and more balanced approach to smallmouth bass experimentation is arbitrary and capricious given statutory requirements.⁸ As Judge David Campbell stated in the *Grand Canyon Trust v. United States* case: "The Bureau of Reclamation, as the operator of the Dam, has a complex set of interests it must balance in operating the Dam. Those interests include not only the endangered species below the Dam, but also tribes in the region, the seven Colorado River basin states, large municipalities that depend on water and power from Glen Canyon Dam, agricultural, Grand Canyon National Park and national energy needs at a time when clean energy production is becoming increasingly important."

Leslie James

Leslie James
Executive Director

Cc: CREDA Board
Commissioner Camille Touton
WAPA Administrator Tracey LeBeau
Wayne Pullan – Reclamation UC Region
Rodney Bailey – WAPA CRSP Management Center

⁶ See *Grand Canyon Trust v. US Bureau of Reclamation*, 623 F.Supp.2d 1015, 1036, Federal Defendants' Reply Memorandum In Support of Cross Motion for Summary Judgment on Claims 6-8 at p. 26, lines 25-27, (February 20, 2009)

⁷ See Colorado River Basin State Representatives to LTEMP EIS Scoping, January 31, 2012

⁸ CREDA raises here the issue of omission of a statutory requirement from the alternatives identified in a NEPA analysis and reserves the right to litigate the compliance with applicable statutory requirements.



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November 3, 2023

Bureau of Reclamation

Attn: LTEMP SEIS Project Manager

125 South State Street, Suite 800

Salt Lake City, UT 84138

Via Email only – LTEMPSEIS@usbr.gov

RE: NOTICE OF INTENT TO PREPARE A SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE DECEMBER 2016 RECORD OF DECISION ENTITLED GLEN CANYON DAM LONG-TERM EXPERIMENTAL AND MANAGEMENT PLAN (NOI) – 88 FR 191, October 4, 2023

The Colorado River Energy Distributors Association (CREDA) appreciates the opportunity to provide comments on the NOI, issued October 4, 2023.

CREDA and CREDA Member Interests

As a member of the Glen Canyon Dam (GCD) Adaptive Management Work Group (AMWG) and Adaptive Management Program (AMP), CREDA is one of the representatives of contractors who purchase federal hydropower and resources from the GCD, a primary feature of the Colorado River Storage Project (CRSP). CREDA is also a longstanding participant in the Upper Colorado River Endangered Fish Recovery Program. CREDA members serve over 4.1 million consumers in the Colorado River basin states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming, and represents the majority of the firm electric service (FES) customers of the CRSP. As such, CREDA and its members have a unique interest and role in issues associated with Colorado River and CRSP operations, specifically GCD operations. CREDA members are all non-profit entities, composed of municipalities, rural electric cooperatives, irrigation and electrical districts, state agencies, political subdivisions and tribal utilities and communities. Each CREDA member is an FES customer with a long-term contract with the Western Area Power Administration (WAPA) for the purchase of CRSP resources. These resources are used in part by CREDA member utilities to meet their obligation to serve the electrical needs of their customers. Electric service is not discretionary or a convenience. This service is essential to health and human safety.

CREDA offers the following comments on the topics contained in the NOI, focusing on “specific operational guidelines, strategics, and any other issues that should be considered on or before November 3, 2023.” These comments supplement CREDA’s letter of March 10, 2023 (attached with this transmittal).

BACKGROUND

The NOI describes the process the Glen Canyon Dam Adaptive Management Work Group (AMWG) undertook over the past year in its development of the

Invasive Species Strategic Plan (Plan), which was approved by the AMWG at its February 2023 meeting. CREDA urges Reclamation to consider all three phases, rapid response (short-term), mid-term and long-term actions in its consideration of elements included in SEIS Alternatives, and to utilize the Plan as guidance in its preparation of the SEIS. As noted by the Colorado River Basin States in their March 10, 2023 letter, “We continue to believe that flow-related actions are *only one tool* to address the issue and that additional actions like the installation of fish exclusion device(s) are necessary and urgently needed for the long-term prevention of establishment of nonnative species from Lake Powell into the reach below Glen Canyon Dam.” (emphasis added). It is CREDA’s understanding that following the April high flow release, and notwithstanding chemical treatment of the -12 mile slough, there is evidence of increased SMB presence and spawning in the system. Referring to the Colorado River Ecosystem, the Executive Summary of the Plan recommends: “To prevent the establishment of invasive fish species in the CRe, a combination of long-term, mid-term, and short-term actions will be required.” CREDA recommends that Reclamation consider incorporating Appendix F from the Plan in its consideration of supplemental actions that were proposed by members of the Smallmouth Bass Ad Hoc Group and cooperating agencies to be considered in the management of invasive species. These actions, including temperature control device(s), generators on the bypass tubes, and modification of nursery and spawning habitat are recommended to complement identification and prevention actions and should be considered now.

PURPOSE AND NEED/PRELIMINARY PROPOSED ACTION

As proposed, the “Need” cannot be achieved by the stated “Purpose”. Flow actions alone are insufficient to “prevent the establishment of smallmouth bass below the Glen Canyon Dam”. (NOI at 68668). In addition, the stated Purpose and Need do not align with the noted Secretary’s Designee’s guidance from May 2022, which directive was to “*help prevent*” invasive fish establishment, “while minimizing potential adverse effects to other resources”. The NOI is also lacking in that it makes no mention of mitigation, as stated in the guidance. As rapidly as the system has been changing during the current extreme drought, the question of *whether* the SMB are already established (or not) below Glen Canyon Dam is secondary to the need to address the issue in a comprehensive manner, as outlined in the Strategic Plan. All actions included in Table 1 of the Plan “Fisheries Actions Within Current Compliance”, should be considered and available to the Department through this SEIS to address SMB prevention and management.

The Purpose and Need statements and Proposed Action should be broadened to address a comprehensive adaptive approach to both the prevention of and management of (established) populations of SMB.

ALTERNATIVES TO BE CONSIDERED

CREDA appreciates the inclusion of a “Non-Bypass” Flow Option along with Bypass-Only Options. CREDA also supports Reclamation’s collaboration with fisheries experts in the development of alternatives to be considered in the SEIS. As a general statement, CREDA recommends Reclamation develop alternatives that are focused on addressing all aspects of SMB management: entrainment (reservoir elevation/curtain), habitat (-12 mile slough/backwaters), spawning (temperature/disturbance). Pending review of proposed alternatives in the draft SEIS, CREDA recommends the following elements be included as Elements Common to All Alternatives:

- Implementation of a spring High Flow Experiment (HFE) would require use of water from month(s) *prior to* the spring HFE (as opposed to spring/summer/fall months following the experiment).
- Identification and mitigation of financial, economic, electric grid and Tribal impacts associated with each Alternative.

- Establishment of on- and off-ramps addressing both operational and financial impacts (which requires appropriate monitoring and criteria for decision-making).
- Emergency operations requirements as described in WAPA’s March 10, 2023, letter, pages 11-12.
- Identified funding on a non-reimbursable basis to mitigate the financial impacts of the experiment on the Upper Colorado River Basin Fund (Basin Fund). This funding would assist WAPA in meeting its contractual delivery obligations required as a result of the experiment. Failure to do so could also impair federal repayment obligations and ongoing operation and maintenance requirements of Reclamation and WAPA for the CRSP.

SUMMARY OF EXPECTED IMPACTS

The NOI states (at 68668) that the initial analysis performed for the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (February 2023) (EA) will be further informed and built upon by “relevant analyses” and information from the 2016 LTEMP Final EIS. CREDA recommends that in addition to the “potential effects on the resources below Glen Canyon Dam, including natural and cultural resources, endangered species, recreation, water resource, hydropower resources” (NOI at 68668), that the SEIS consider:

- The impact on replacement power availability and grid reliability during the summer months of the experiment. See NERC Summer Reliability Assessment 2022 at pp.5-6: “Drought conditions create heightened reliability risk for the summer. Drought exists or threatens wide areas of North America, resulting in unique challenges to area electricity supplies and potential impacts on demand: Energy output from hydro generators throughout most of the Western United States is being affected by widespread drought and below-normal snowpack. Dry hydrological conditions threaten the availability of hydroelectricity for transfers throughout the Western Interconnection. Some assessment areas, including WECC’s California-Mexico (CA/MX) and Southwest Reserve Sharing Group (SRSG), depend on substantial electricity imports to meet demand on hot summer evenings and other times when variable energy resource (e.g., wind, solar) output is diminishing.”
- Greenhouse gas emission impacts associated with each Alternative. **The SEIS cannot rely on analysis performed for the LTEMP EIS given significantly changed conditions**, due in part to implementation of revised WAPA rate schedules, regional electric grid resource changes, and regional replacement power availability.
- Impacts to underserved and disadvantaged rural and tribal communities. Nearly half of Colorado River Storage Project (CRSP) power customers (including CREDA members) are electric service providers for areas that could be classified as disadvantaged communities. Impacts to these environmental justice communities should be evaluated in the SEIS.
- **Impacts to CRSP customers in their capacity as electric service providers** who have an obligation to provide reliable electricity to retail customers. **These impacts are distinct from impacts to WAPA and the Upper Colorado River Basin Fund**, although those impacts also potentially affect CRSP customers. Depending on the nature of the Alternative or elements thereof, whether the action is a management action or an experiment, resource adequacy requirements and availability of replacement power, could result in financial or economic impacts that **must be disclosed and mitigated**.
- Funding sources for mitigation. Hydropower operations are not the cause of SMB incursion, and should not be relied on for mitigation. In the event WAPA must purchase power to replace resources that are unavailable or lost due to bypass operations for non-native fish control or HFEs, these costs should be considered non-reimbursable and should not be borne by WAPA or WAPA’s hydropower customers. Potential sources of funding should be identified during the scoping process.

SCHEDULE

CREDA acknowledges the NOI's proposal that the "duration of the flow options would potentially run through 2027," while the HFE protocol revisions "are anticipated to run through the duration of the LTEMP Record of Decision." (NOI at 68668). CREDA recommends Reclamation may reconsider these differing timetables following review of comments received on the NOI and consideration of input from fisheries experts and Cooperating Agency input on Alternative development.

COOPERATING AGENCIES

CREDA supports Reclamation's inclusion of LTEMP EIS co-lead and cooperating agencies in development of alternatives and the draft SEIS. Most, if not all, of these entities were also engaged in development of the AMWG Plan referenced above, and the federal and State agencies all have significant roles and responsibilities associated with SMB and other nonnative species issues.

OTHER ISSUES

Section 1.4 of the LTEMP ROD establishes a decision-making/recommendation process associated with experiments undertaken under LTEMP. Given the potential direct and immediate impacts of actions being considered by this SEIS to CRSP electric service customers, CREDA recommends that all LTEMP Cooperating Agencies be afforded the opportunity to participate in any decision-making/recommendation process associated with actions under this SEIS.

CREDA encourages Reclamation to consider additional public webinar opportunities at appropriate times during the SEIS process, particularly given the extremely short timeframe currently being considered.

CREDA appreciates the opportunity to provide comments on the NOI. Should there be any questions or concerns regarding this letter or any aspect of CREDA's or CREDA member interests regarding the NOI, please contact me at your earliest convenience.

Leslie James

Leslie James
Executive Director

Att: 3/10/2023 Letter

Cc: CREDA Board

WAPA Administrator Tracey LeBeau

Wayne Pullan – Reclamation UC Region

Rodney Bailey – WAPA CRSP Management Center



CREDA
Colorado River Energy Distributors Association

May 6, 2016

Glen Canyon Dam LTEMP Draft EIS
Argonne National Laboratory
9700 South Cass Avenue -EVS/240
Argonne IL 60439

VIA US MAIL/RETURN RECEIPT REQUESTED

The Colorado River Energy Distributors Association (CREDA) submits the following comments on the Long-Term Experimental and Management Plan (LTEMP) Draft Environmental Impact Statement (DEIS), (81 FR 963, January 8, 2016). General and topical comments are addressed herein, including supporting documentation. Additional detailed questions and comments are included in redline/strike-add versions of some of the DEIS Chapters and Appendices which are also included in this submittal (see Table B). Given the restrictions associated with public comment submittal on the DEIS, CREDA materials were unable to be submitted on the online website and are therefore being mailed in paper copy via the US Mail, and a DVD containing all the documents has been sent via FedEx overnight delivery.

Notwithstanding the comment deadline of May 9, 2016, given the magnitude and complexity of the documents submitted to the public for review (over 2,000 pages) and the relatively short review period, CREDA reserves the right to supplement these comments, and request that this complete set of materials be included in the administrative record for the LTEMP EIS. Materials cited in the footnotes are incorporated within these comments as if they were quoted in full. Assuming only a 30-day period between issuance of the Final EIS and the Record of Decision, as well as the length and complexity of the DEIS, CREDA requests that any revisions to the DEIS included in the final EIS be made available to the public in a track changes version concurrently with issuance of the Final EIS.

CREDA Background

CREDA's mission is "To preserve and enhance the availability, affordability, and value of Colorado River Storage Project facilities while promoting responsible stewardship of the Colorado River System." CREDA is a non-profit, Colorado corporation, also authorized to do business in Arizona, formed in 1978 as an association of non-profit entities who are long-term wholesale customers for resources of the Colorado River Storage Project (CRSP). CREDA members serve over 4.1 million consumers in six states: Arizona, New Mexico, Nevada, Colorado, Utah and Wyoming. CREDA members include joint action agencies, state agencies, political subdivisions, tribal utility authorities, municipalities, rural electric cooperatives and irrigation and electrical districts.

CRSP customers (who are non-profit entities), pay all the power costs of the CRSP, which includes construction (with interest), operation, maintenance and replacements, transmission as well as irrigation assistance costs beyond the ability of the irrigators to pay. CRSP power revenues also fund non-power programs such as the Salinity Control Program, Glen Canyon Dam Adaptive Management Program (GCDAMP) and the Upper Colorado River (UCRIP) and San Juan River (SJRRIP) Endangered Fish Recovery Implementation Programs. CREDA has represented “contractors for the purchase of Federal power produced at Glen Canyon Dam” pursuant to the section 1805 (c)(4) of the Grand Canyon Protection Act of 1992 (GCPA) on the Glen Canyon Dam Adaptive Management Work Group (AMWG) and the Technical Work Group (TWG) since inception, and is a partner in the UCRIP. CRSP power revenues are currently the primary funding source of these non-power environmental programs. Three CREDA members are Cooperating Agencies in the LTEMP process.

CREDA and its individual members (see Table B) are key stakeholders in this process and have a unique, direct and economic interest that cannot be represented by any other stakeholder or participant in the LTEMP process. Given these interests, CREDA requests that these comments and individual CREDA member comments be given serious consideration in this process.

SUMMARY POINTS

- I. Of the Alternatives considered in the DEIS, CREDA recommends that the Secretary of the Interior select Alternative B, (Balanced Resource), in the Final EIS. Alternative B as analyzed outperforms all other action alternatives for nearly all resources, and is the only action alternative that addresses the stated hydropower objective of the LTEMP EIS.

If the Secretary selects an alternative other than Alternative A (No Action), issues raised in this letter, including the following, must be addressed:

- a. Eliminate the low summer flow experiments;
- b. Revise the daily fluctuation factors to reflect those contained in Alternative E (Resource Targeted Condition Dependent Alternative);
- c. Do not include the 8,000 cfs cap on daily fluctuations;
- d. Reduce High Flow Experiment (HFE) frequency to a level such as is contained in Alternative B (no more than one HFE every other year).

These and other requirements will be described in more detail, and are based on the following reasons, among others:

- A. Alternatives A (No Action) and B (Balanced Resource) are the only Alternatives that address the stated hydropower objective of the LTEMP EIS. Moreover, Alternative B increases the endangered Humpback Chub (HBC) population and represents significantly less air emissions than Alternative D (Preferred).

- B. Alternative D includes elements that violate the requirements of the Endangered Species Act because they are not based on sound science and will cause jeopardy to the HBC.
 - C. Alternative D increases air emissions compared to Alternatives A and B, while further restricting carbon-free Glen Canyon Dam hydropower generation.
 - D. The DEIS analysis significantly understates the impacts to the Glen Canyon Dam hydropower resource.
- II. The DEIS does not meet the requirements of the National Environmental Policy Act (NEPA) because it is based on a systemic and positive bias in the description and analysis of sediment, and a systemic and negative bias in the description and analysis of hydropower. These biases are evident in all aspects of the DEIS process, including scoping, the Structured Decision Analysis (SDA) process, the assumptions and metrics utilized in the selection of alternatives and analysis of the environmental impacts of the alternatives. DEIS. This systemic bias results in a skewed and fundamentally flawed analysis that does not provide the “hard look” at the alternatives considered for the proposed action.
- III. Alternative D violates the requirements of NEPA because it contains experiments or other proposed actions that are not adequately defined or analyzed. The use of adaptive management without definite, certain, or enforceable criteria or standards for each experiment is arbitrary and capricious. References to “adaptive management” cannot substitute for a full and accurate disclosure and analysis of the environmental and other impacts of all of the elements of the proposed action. The DEIS is also legally inadequate because experiments must be defined by a description of the proposed experiment, the time or frequency of implementation of the experiment, and the triggers or other conditions that must exist prior to implementation of the experiment. In addition, the DEIS fails to consider the cumulative impacts of experiments or combinations of experiments and the relationship between experiments and reasonably foreseeable hydrologic conditions. Each experiment must also include a description of the hypotheses that will be tested by the experiment and benchmarks or other identifiable criteria that will allow the Secretary and interested parties to assess the results of the experiment or when an experiment must be terminated because of unacceptable impacts to the endangered HBC or other legally protected resources. Finally, any monitoring included in the description of Alternative D is so poorly defined that it fails to meet legal standards necessary to implement adaptive management as a part of the LTEMP. See “Adaptive Management – The US Department of the Interior Technical Guide” (<https://www.doi.gov/sites/doi.gov/files/migrated/ppa/upload/TechGuide.pdf>) and United States Department of the Interior Environmental Statement Memorandum No. ESM 13-11, January 7, 2013.
- IV. The “Purpose and Need” (Section 1.2) is legally flawed because it identifies objectives that are not defined in a quantitative manner or use metrics or other numeric criteria that allows decision makers and the public to understand the nature of the “conditions” that

are to be “improved” or to assess the success or failure of experiments or management measures implemented as a part of a “Long-term Experimental and Management Plan”.

- V. The Alternatives Analysis in the DEIS is legally deficient because it fails to include all reasonable alternatives or improperly excluded alternatives from further consideration in the DEIS. For example, non-flow alternatives to the objectives of the proposed actions are either not considered or were improperly eliminated from further consideration in the DEIS, including mechanical means of sediment augmentation that are used elsewhere in the Colorado River basin; the use of a temperature control structure to manage temperature as is used on a number of large dams in other locations, sediment augmentation on Colorado River tributaries located downstream of Glen Canyon Dam, or the use of stocking or other management techniques to enhance the foodbase for endangered HBC and rainbow trout. Moreover, the DEIS fails to include and fully analyze the alternative of either maximum hydropower releases or an experiment that would test maximum hydropower releases and provide a means to compare the impacts on resources from other measures included in the Preferred Alternative.
- VI. The DEIS is legally deficient because it fails to identify and analyze all direct and indirect effects of the Alternatives included in the DEIS. For example, while “passive use” valuation for recreation is included in the analysis, the LTEMP DEIS fails to include and analyze available information on passive use valuation for hydropower and water resources.
- VII. The DEIS is legally deficient because it relies on an inadequate and incomplete analysis of hydropower developed for the SDA process.

Hydropower and the Hydropower Objective

“Hydropower provides a wide range of benefits to the country. It is a clean, low-cost source of energy that can be relied upon for long-term, stable production of domestic energy.”¹ Over the past 25 years, electrical demand in the West rose at nearly twice the rate (140%) of the population growth (71%), with the population expected to increase another 54% by the year 2030.² “If we are to achieve any of the low-carbon goals we have set out for 2030 and beyond, hydropower must increase significantly....”³ At the 2015 National Hydropower Association (NHA) annual conference, DOE Secretary Moniz “agreed, saying ‘hydropower can double its contributions by the year 2030. We have to pick up the covers off of this hidden renewable that’s right in front of our eyes and continues to have significant potential.’”⁴ Hydropower has been labeled the “most successful form of renewable energy.”⁵ Now is not the time to further reduce or continue to unnecessarily restrict generating capacity at Glen Canyon Dam.

¹ See CREDA LTEMP EIS Scoping Comments, January 31, 2012, p. 5, citing: Memorandum of Understanding for Hydropower Among the Department of Energy, the Department of the Interior and the Department of the Army, March 24, 2010,

² See Energy Information Administration, Annual Energy Outlook 2006 with Projections to 2030, (Feb. 2006),

³ See Conca, James (contributor), Could Hydro Flood America with New Power?, Forbes, November 20, 2015, p. 1

⁴ *Ibid*, p. 2

⁵ See Report of the Energy Policy Development Council, May, 2001, pp. 5-19

However, as currently constructed, “all but one of the LTEMP EIS alternatives chosen for analysis result in degradation of the value of the Glen Canyon Dam as a renewable hydropower resource.”⁶, and there is no consideration of enhancing the resource to its full capacity. Yet, Section 101(b) of the National Environmental Policy Act (NEPA) provides:

(I)t is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may:

6. enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources. (42.U.S.C. 4331(b) (6).)

A stated objective of the DEIS is to “maintain (or/and)⁷ improve hydropower” stemming from the “generation of hydropower” contained in the Purpose and Need Statement (76 FR 129, July 6, 2011), which reflects the Secretary’s obligation to fulfill multiple and sometimes competing statutory requirements applicable to the operation of Glen Canyon Dam and the exercise of other authorities as required by the provisions of the Grand Canyon Protection Act (GCPA). The United States has described the relationship between the objectives of the GCPA and the Colorado River Storage Project Act (CRSPA) as being “in addition to rather than in substitutions of the Secretary’s obligations concerning the operations of Glen Canyon Dam for hydropower and other project purposes.”⁸ The U.S. District Court for the District of Arizona further clarified that the broadly worded provisions of the Colorado River Storage Project Act (CRSPA) and GCPA impose on the Secretary an obligation to balance many different interests in operating Glen Canyon Dam. The Secretary must continue to recognize that power production is still a primary purpose of the Dam that must be balanced against other purposes, statutory requirements, and water delivery obligations as (s)he considers actions to implement the GCPA.⁹

Sediment is Not a Legally Protected Resource

The Department of the Interior has directed, facilitated and recognized Desired Future Conditions (DFCs) for managing resources, including a Power DFC, which includes “maintaining *and* increasing” (emphasis supplied) the hydropower resource.¹⁰ A DOI objective stated “Phase 1 objectives will provide the objectives against which to test alternatives in the EIS process for the LTEMP.”¹¹ The “final Desired Future Conditions for the Glen Canyon Dam Adaptive Management Program (AMP) constitute the goals for the operations of Glen Canyon Dam, and will provide essential guidance for the AMWG as it develops recommendations for the

⁶ See Sullivan, John F. (SRP) letter to Michael A. Connor, August 8, 2014, p. 3

⁷ “And/or” appear to be used interchangeably in the LTEMP DEIS. The Power DFC, (approved by AMWG and recognized by Secretary Salazar in early 2012), contained “and”.

⁸ See *Grand Canyon Trust v. US Bureau of Reclamation*, 623 F.Supp.2d 1015, 1036, Federal Defendants’ Reply Memorandum In Support of Cross Motion for Summary Judgment on Claims 6-8 at p. 26, lines 25-27, (February 20, 2009)

⁹ See Colorado River Basin State Representatives to LTEMP EIS Scoping, January 31, 2012

¹⁰ See LTEMP EIS, Appendix A, A-11, line 37

¹¹ See Glen Canyon Dam Adaptive Management Work Group Agenda Item Information Form (AIF), February 3-4, 2010, p. 2

Secretary of the Interior.”¹² The Colorado River Basin States described the DFC process outcome: “The DFCs are the result of extensive stakeholder consultation and reflect both the ideas and wording to balance the conflicting interests represented by the AMWG.”¹³

During development of the AMWG’s DFCs there was discussion about whether sediment should be a separate DFC, as proposed by DOI.¹⁴ The DFC Ad Hoc Group, which included representatives of all DOI AMWG representatives, concluded that it should not; rather, sediment is a “means to an end” for protecting and improving downstream resources, and sediment is one aspect of the Colorado River Ecosystem (CRE). The “ecosystem is generally an area within the natural environment in which physical (abiotic) factors and processes of the environment, such as geology, climate, and soil development, function along with interdependent (biotic) organisms, such as plants and animals, in the same habitat and create a dynamic and interconnected system.”¹⁵ Notwithstanding this history and the lack of any legal basis for identifying sediment as an independent resource, the DEIS inappropriately identifies sediment as an independent and priority resource.

The DEIS is Legally Inadequate because it Relies on Flawed Structured Decision Analysis

The SDA that was performed during the LTEMP EIS process “helped inform the analysis of the joint-lead agencies.”¹⁶ Appendix C of the LTEMP EIS describes the SDA process undertaken by DOI during 2013 and 2014. CREDA participated throughout the process, continuing to express concern that “many or most of those alternatives would additionally restrict hydropower generation for the purpose of attaining sediment objectives that are not adequately supported by available science or required and authorized by applicable law.”¹⁷

Specific to the hydropower Performance Metric, because of the varying degrees to which “swings” and “weights” are established for the various performance metrics, the hydropower metric is automatically given less weight than other metrics. The swing weighting is set up in such a way that sediment is weighted far more importantly than hydropower. Hydropower has a swing range of \$80 million, while the differences between alternative mean values is \$9.4 million, or 12% of the total swing range. Sand Load Index has a swing range of 0.6, while differences between alternative mean values is .5, or 88% of the total swing range.¹⁸ Since swing range is multiplied by weight, the greater the swing range, the more weight a metric will ultimately have. The end result of this selection of swings and weights is that, if hydropower is valued at 100% and sediment at 50%, with all other metrics set at 0, the best option for hydropower, (B2), is ranked 12th out of 19 alternatives.

¹² See Glen Canyon Dam Adaptive Management Work Group Agenda Item Information Form (AIF) and attachment, August 24-25, 2011, p. 2

¹³ See Colorado River Basin State Representatives letter and attachments to Ass’t. Secretary Castle, April 15, 2013

¹⁴ *Ibid*, AIF, 2010

¹⁵ See, Castle, Anne memo to Salazar, February 23, 2012, p. 4, citing attached August 19, 2011 memo to AMWG, p. 2

¹⁶ See LTEMP EIS, Chapter 1, p. 18

¹⁷ See CREDA letter and attachment to LTEMP EIS Team, April 14, 2013

¹⁸ See LTEMP DEIS, Appendix C, Table 1

A “system of ranks and scores oversimplifies complex interactions of components within each alternative and does not fully account for nuances of some alternatives.”¹⁹ As recommended by Western Area Power Administration, “the consequence tables could be modified to more clearly reflect stakeholder values.”²⁰ The caveats noted on page 69 of Appendix C are fair, but a clear statement such as that contained on page 68: “Among the participating agencies, three alternatives rose to the top: Alternatives B, D, and G.” should be highlighted as a key result of the SDA process. This statement clearly reflects the viewpoints of those stakeholders participating in the SDA processes. The swings and weights attributed to sediment and hydropower resources and the depiction of SDA results clearly show a bias in favor of sediment and against hydropower; the fact that Alternative B still performed “on top” despite the heavily favored sediment metrics shows the strength of Alternative B.

The DEIS is legally deficient because it does not accurately characterize a study used to support the flow factor/fluctuation index utilized in Performance Metric 12 of swing weighting. The Fluctuation Index utilizes information derived from a 1987 study (Bishop et al),²¹ which addressed recreational user preference for fluctuating flow levels. In that study, however, 10,000 cfs (*not* 8,000 cfs) was defined as “constant flows”. And yet, there appears throughout the DEIS what CREDA believes to be misinterpretation of these data, and a reliance on this misinterpretation as justification for including an artificial 8,000 cfs cap on fluctuations as part of Alternative D, in order to benefit the sediment resource. In addition, the difference in sediment transport between, for instance, 8,000 cfs and 10,000 cfs is negligible and within the error of the model forecasting error. However, the difference in impact on hydropower between an 8,000 cfs cap and a 10,000 cfs cap is material. A confounding factor in determining sediment “benefit” ascribed to the flow fluctuation factor is monthly volumes. Higher monthly volumes increase transport. However, “It was not possible to reconcile the relative importance of daily fluctuations and monthly volume allocations without additional modeling”.²² In fact, in the Bishop study, “moderate daily fluctuations” of 8,000–25,000 cfs were the most preferred of four different flow scenarios.”²³ The flow factor/fluctuation index analysis used in the DEIS is unsupported scientifically and results in an unnecessary restriction on hydropower operations.²⁴ This restriction cannot be shown as necessary to achieve the CRE DFC to “maintain adequate sand bars (including camping beaches) for recreation in” GCNRA and GCNP.²⁵

Basing DEIS analysis on simplified models and metrics for some (but not all) of the resources analyzed in the DEIS renders it inadequate. Specifically for the hydropower resource, Appendix C “acknowledges that it was not complete.”²⁶ Indeed, the DEIS continued to use the SDA analysis in some cases, which CREDA believes demonstrates the bias against hydropower and results in understated results for hydropower. At least for the hydropower resource, the SDA analysis cannot and should not supplant robust analysis that utilizes a realistic set of assumptions and produces a range of results.

¹⁹ See Western Area Power Administration letter to LTEMP EIS Team, August 23, 2013, p. 5, B.2

²⁰ *Ibid*, p. 5, B.5.

²¹ *Ibid*, Appendix C, P. C-27, section 4.5

²² See LTEMP DEIS, Appendix E, p. 14

²³ See Bishop, et.al. (1987), Grand Canyon Recreation and Glen Canyon Dam Operations: An Economic Evaluation, p. 67

²⁴ See SRP, Bishop Study vs. DEIS Representation, transmitted November 18, 2015

²⁵ *Ibid*, AIF DFC attachment, August 24-25, 2011, p. 3

²⁶ See CREDA letter to LTEMP EIS Team, August 23, 2013

Alternative D Effects on Downstream Resources

During development of Alternative D, information was presented to the AMWG and TWG in early 2015. Based on the conceptual and descriptive information provided at that time, CREDA provided comments, expressing concern that not only did the hydropower resource appear to be negatively impacted, but that Alternative D “does not appear to benefit any resource compared to current dam operations other than resources associated with Sand Load Index.”²⁷

Even some resources purported to be protected and improved by greater Sand Load Index may not benefit from sand on beaches. The DEIS states that “there is no published research for the direct impact of wind transport of sediment under MLFF on archaeological sites within the river corridor,”²⁸ and “Research would be needed to determine the number of days of high flow that would produce noticeable or extensive impacts on cultural sites,”²⁹ Still, Sand Load Index is touted as a metric that is important in Aeolian or windborne sediment transport to benefit cultural sites. Considering this and other modeling assumption issues, and using LTEMP EIS data (with page references), Table A displays the relative performance among Alternatives A, B and D for DEIS resources.

Table A highlights the fact that the selection of Alternative D as the Preferred Alternative is arbitrary and capricious. Alternative D requires trout removal in over half the years to achieve a very small improvement in HBC, which raises cultural issues identified by the Pueblo of Zuni (and other Tribes).³⁰ Alternative D is worse than No Action for reducing both recreation value and number of annual rafting visitors. Alternative D increases GHG emissions *four times more* than Alternative B.

Table A
Key Resource Comparison – Alternatives D and B to No Action

Orange=Worse than No Action (A)
Green=Better than No Action (A)

Resource/(DEIS page)	Alternative A	Alternative D (“Preferred Alternative”)	Alternative B
Humpback Chub (4-108)	5,000 average minimum adult population of humpback chub without need for trout culling	Slightly more humpback chub with 5,200, but need to cull trout 53% of years to get the higher humpback chub population	More humpback chub with 5,400, but need to cull trout 15% of years to get the higher humpback chub population

²⁷ See CREDA letter to LTEMP EIS Team and attachment, May 1, 2015, Appendix A

²⁸ See LTEMP DEIS Appendix H, p. H-5

²⁹ *Ibid*, p. H-9

³⁰ See Panteah Sr., Val, letter to Glen Canyon Dam LTEMP Draft EIS (Argonne National Laboratory), May 4, 2016

Resource/(DEIS page)	Alternative A	Alternative D ("Preferred Alternative")	Alternative B
Other Fish (4-107-109)	No change from current levels	Slightly more nonnative and native fish	Slightly fewer nonnative fish; similar levels of native fish
Air Emissions (4-373, http://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator)	No change from current emissions	22,908 MT per year increase in air emissions: equivalent to 24.6 million pounds of coal burned per year, or 492 million pounds of coal burned over the 20 year period.	5,900 per year increase in air emissions: equivalent to 6.3 million pounds of coal burned per year, or 127 million pounds of coal burned over the 20 year period
Trout (4-106-4-107, 4-245, 4-259)	95,000 average trout population; 770 large trout; need to cull trout <1 out of 20 years; 37,000 trout emigrate from Glen Canyon	Slightly smaller trout population with 93,000 average; slightly more large trout with 810; need to cull trout 10.5/20 years; slightly lower angler satisfaction; 41,000 trout emigrate from Glen Canyon	Smaller trout population with 74,000 average; more large trout with 870; need to cull trout 3/20 years; slightly lower angler satisfaction; 30,000 trout emigrate from Glen Canyon
Archeological Resources (4-221-223)	Some additional sand for wind transport to archeological resources; No change in detrimental values to Spencer Steamboat; No additional slumping of terraces on which archeological resources are located	More additional sand for wind transport to archeological resources; Potentially increases risk of degradation of Spencer Steamboat; Possibility of destabilization of terraces on which archeological resources are located	Some additional sand for wind transport to archeological resources; No change in detrimental values to Spencer Steamboat; No additional slumping of terraces on which archeological resources are located
Camping Beaches (4-261)	Camping beaches would be similar to how they are today; would continue long-term decline	Would help expand camping beaches, with an index from .14 to .36 (no explanation of what the index means.)	Camping beaches would be similar to how they are today; would continue long-term decline, but better than No Action

Resource/(DEIS page)	Alternative A	Alternative D ("Preferred Alternative")	Alternative B
Recreation Value (4-336, 4-262, 4-246)	\$14,619 Million per year mean annual net economic value	\$32.2 Million per year decrease in net economic value; From increased HFES: detriments to tribal recreation - detrimental sediment impacts in lower Grand Canyon and detrimental impacts on park facilities at Pearce Ferry from increased HFES. Negligible decrease in marina income.	\$21.8 Million per year decrease in net economic value; From slightly increased HFES: detriments to tribal recreation – slightly detrimental sediment impacts in lower Grand Canyon and slightly more detrimental impacts on park facilities at Pearce Ferry from slightly increased HFES.
Rafting (4-283-284, 4-260)	Baseline	Decreased crowding at beaches; increased disturbance from non-flow actions; reduce rafting visitors by 299	Similar to Alternative A for crowding at beaches; more possibility for encounters with other groups at rapids due to low flows; more daily fluctuations; slightly increased disturbance from non-flow actions
Retail Rates (4-332, 4-309, Appendix K-175)	No change in hydropower value, retail rates, or capacity expansion	.39% increase in average retail rates (4-309), with tribal utility rates having a greater increase than the average customer (4-332); Total tribal impact is a detriment of \$609,463. Loss of capacity would result in an extra gas turbine being built, which is bad for the environment but good for the economy (4-332).	.27% decrease in average retail rates, with tribal utility rates having a greater decrease than the average customer; Total tribal impact is a benefit of \$336. No extra gas turbine needs to be built, which is good for the environment but bad for the economy (4-332).
Hydropower Value (4-308)	No change	\$104 million detriment	\$16 million benefit
Sediment (4-69)	.21 Sand Load Index; -1,010 Sand Mass Balance	.53 Sand Load Index; -1,480 Sand Mass Balance (decrease of 470 kilotons)	.23 Sand Load Index; -1,810 Sand Mass Balance (decrease of 800 kilotons)
Vegetation (4-159-161)	55.2 acre decrease in native plant community cover; 1.3 acre decrease in wetland community; 2% decrease in native diversity; 5% increase in ratio of native to	39.5 acre decrease in native plant community cover; 0.8 acre decrease in wetland community; 2% increase in native diversity; 5% decrease in ratio of native to nonnative vegetation; 10% decrease in arrowweed	48.3 acre decrease in native plant community cover; 0.9 acre decrease in wetland community; 3% increase in native diversity; 15% increase in ratio of

Resource/(DEIS page)	Alternative A	Alternative D ("Preferred Alternative")	Alternative B
	nonnative vegetation; 25% increase in arrowweed		native to nonnative vegetation; 19% increase in arrowweed
Special Status Plant Species (4-161)	Negative impact on wetland species	Decline compared to Alternative A; negative impact on wetland species and potential impacts on active floodplain species from HFES	Similar to Alternative A
Foodbase (4-104)	No change until 2020; after 2020 fewer HFES may lower blackfly and midge production, and decrease drift	Potential increase in blackfly and midge production; potential increase in productivity and diversity; Increased drift	Slightly lower benthic activity; may decrease blackfly and midge production; increased drift
Water Quality (4-16)	Baseline	Increased for bacteria and pathogens from increased water temperature <i>Note: water temperature increase is 0.4°C</i>	Negligible difference

Alternatives A and B are the only Alternatives that currently address the stated hydropower objective of the LTEMP EIS. During development of Alternative D by the Department, CREDA repeatedly raised concerns about Alternative D performance for many resources.³¹

Humpback Chub and Flows

In a 2005 USGS publication, based on research by the Grand Canyon Monitoring and Research Center (GCMRC), it was hypothesized that a downward trend in the HBC population may have coincided with initiation of interim operating criteria and ROD flows.³² However, since publication of that report, significant new science and information has been developed and which indicates the humpback chub population is “a persistent and increasing reproducing population...in the Grand Canyon.”³³ In the most recent AMP Report to Congress, “it is apparent that abundance of adult chub has increased or remained stable at all aggregations since sampling began in the 1990s”.³⁴ One of the likely sources consulted in developing that Report was USGS’ Fact Sheet³⁵, describing the continuing upward trend of HBC. “This continuing upward trend should be a major factor in assessing any experimental or management action which could negatively impact this endangered species.”³⁶

³¹ See CREDA letter to LTEMP EIS Team, Appendix B, July 8, 2014

³² See SCORE Report, USGS Circular 1282 (Oct. 2005), page 45, Figure 12

³³ See LTEMP Public Scoping document “Aquatic Ecology”, November 2011; www.ltempeis/anl.gov (accessed May 5, 2016)

³⁴ See <http://www.usbr.gov/uc/envdocs/reports/GCDam/GC-Report-to-Congress2013-2014.pdf>

³⁵ See USGS Humpback Chub Status and Trends Fact Sheet, 2009/3035, <http://pubs.usgs.gov/fs/2009/3035/>

³⁶ *Ibid*, CREDA letter, January 31, 2012, p. 3

Alternatives and elements of alternatives containing steady flows should be rejected, as they increase threats to the endangered HBC. Steady(ier) flows following HFEs and a proposed low summer flow experiment (LSF) contained in Alternative D fall into this category. These flow regimes also negatively impact the hydropower resource and air emissions.

Potential threats to the endangered HBC must be assessed and compared to any demonstrated benefit from steady flows. “A summary of some of the supporting science relating flows and temperature to HBC habitat, food base and predation/competition (including sources) includes:

- Prior to the 2008-2012 Grand Canyon Near Shore Ecology Study, it was believed that high flow experiments (HFEs) were necessary to create backwater habitats for HBC. The Near Shore study included steady flows in the fall timeframe over a 5-year period. The study disproved this prior scientific assumption; HBC neither need nor desire backwater habitat. Habitat is a necessary element for HBC success. HBC occupy eddy habitats and talus shorelines, but are apparently selective for backwater habitats, and there are similar daily movements and habitat use between flow events” (Pine). As a result of this study, it appears efforts specifically directed at creating backwater habitat for HBC is unnecessary.
- The science shows that steady flows slow the growth rates of the HBC, introducing additional predation risk. The Near Shore results demonstrated “juvenile HBC survival in the mainstem is very high; no obvious changes in survival occurring during flow experiment.” (Pine). Fall steady flows don’t increase HBC survival. In fact, “fish growth rate actually *declined* during fall (steady flows) from summer (fluctuating flow).” (Pine). Steady flows slow HBC growth rate.
- Sufficient food base is necessary for HBC success. “Sediment effects on food base causes decreased autotrophic production.” (Yard). “Further constraining hydropeaking may not lead to measurable benefits to fish.” (Kennedy). Steady flows may not benefit fish due to impacts to the food base.
- Appropriate water temperature is necessary for HBC success. “No significant difference in release water temperature has been recorded whether the releases are steady or fluctuating.” (Anderson and Wright). Volume, not fluctuations, is the strongest factor in downstream temperatures. In addition, the 2000 Low Steady Summer Flow Experiment resulted in high survival of young-of-year trout (Speas), which means that low steady flows adversely affect HBC.”³⁷

The risk to endangered HBC from warm water nonnative fish has long been acknowledged. The 2005 Knowledge Assessment found that “improvements in young-of-year survival rate or adult growth could be offset by an increased incidence of disease or an increase

³⁷ See CREDA letter to the Department, February 17, 2012, p. 1; and CREDA letter to the Department, April 9, 2014, p. 2

in the abundance of warm water nonnative fish which compete with and prey on humpback chub and other native fishes”³⁸ .

A recently published report using results of the AMP’s 2008-2012 Nearshore Ecology study, concludes “We found that juvenile humpback chub mean daily growth rates in the Colorado River were lower during steady flows than fluctuating flows when they occurred in the same season”.³⁹ It is not clear that this, and other publications stemming from the Nearshore Ecology study, were available and considered at the time the LSF experiment or other steady flow regimes were incorporated into Alternative D. Additional publications by Finch et al. from this study were cited by the Colorado River Basin States in materials supporting development of Alternative E. “Fall steady flows (2008-2012) showed reduced growth and no significant difference in survival of juvenile humpback chub during the FSF compared to other flows” (Finch 2012), and “Low steady flows could benefit warmwater nonnative fish and result in a rapid expansion of unwanted species throughout the canyon. (Valdez and Speas 2007)”⁴⁰ “The risk to humpback chub and other native fishes viability is high if a highly predaceous or competitive species were to suddenly expand in abundance and range in the Colorado River through Grand Canyon. We strongly urge the LTEMP Team to give strong consideration to minimizing the possibility for such an event.”⁴¹

During development of the NPS’ Comprehensive Fisheries Management Plan Environmental Assessment, CREDA objected to the inclusion of “low summer flows” for multiple reasons, including lack of support by peer-reviewed science and continued uncertainty around the relationship between ‘warmer water to enhance Humpback Chub (HBC) spawning rearing, and survival in the mainstem Colorado River’.⁴²

A growing body of science prior to and since the 1996 Record of Decision supports CREDA’s concerns associated with steady (ier) flows and their impacts on endangered HBC. In 2012, CREDA expressed similar concerns associated with the Finding of No Significant Impact (FONSI) issued for the High Flow Experiment (HFE) Protocol. These concerns remain regarding continuation and expansion of HFEs, both in terms of frequency and duration, as well as other proposed experiments and operations included in Alternative D. “HFEs scour and remove the food base and it takes one to one and one half years for it to recover to pre-HFE levels. This is a result of the loss of the main algal base, *Cladophora*, which provides the base on which diatoms are nurtured. The Diatoms form the food for *Gammarus* (scuds) which have been the main food source for trout and downstream HBC. If it takes one to one and one half years for the food base to build back up and we have recurring HFEs every year or even every six months, there is little opportunity for the *Cladophora/ Gammarus* food base to recover. Steady flows are also a contributor to the food base concern. Without periodic higher flows, as under steady flows, the *Cladophora* productivity rate declines as the algae can become senescent. These old growths

³⁸ See, 2005 Knowledge Assessment of the Effects of Glen Canyon Dam on the Colorado River Ecosystem: an experimental planning support document; prepared by Theodore S. Melis, Scott A. Wright, Barbara E. Ralston, Helen C. Fairley, Theodore A. Kennedy, Matthew E. Andersen and Lewis G. Coggins, Jr. (GCMRC), in cooperation with Josh Korman, Ecometric Research, Inc., final draft, August 30, 2006, p. 37

³⁹ See Finch, C., Pine III, W., and Limburg, K.E., “Do Hydropeaking Flows Alter Juvenile Fish Growth Rates? A Test with Juvenile Humpback Chub in the Colorado River”, pub. River Research and Applications (2013).

⁴⁰ See Responses to July 8, 2013 DOI Comments on RTCD Revisions, Colorado River Basin States, September 9, 2013, p. 4

⁴¹ See Science Panel Evaluation of Performance Criteria and SDM, April 12, 2013, p. 7

⁴² See CREDA letter to National Park Service PEPC, re EA/Plan, June 10, 2013, p. 2; Appendix A, June 27, 2012

occupy space and yet grow at a slow rate. Ideally, we want young growths which are healthier and grow at a faster rate. Steady flows provide less drift and that, combined with the HFEs, means much less daily drift supplying food to downstream humpback chub.”⁴³ Any selected Alternative should include no more than one HFE every other year.

Given the legal mandate to protect endangered species, CREDA fails to understand how the LTEMP EIS record of decision can include experiments, operations or management actions that are “quite likely to come at the expense of negative impacts to an endangered species. This legal mandate should take precedence over the anticipated and uncertain benefits to resources that lack protection under the Endangered Species Act”⁴⁴ (such as sediment). The DEIS also fails to address in detail a topic that was included during scoping, that of consideration of a recovery plan for the HBC. The HBC is the subject of a Species Status Assessment (SSA) process underway and being led by Region 6 of the USFWS. One of the potential uses for the SSA is the downlisting/delisting of the HBC. Several organizations that are participants in the AMP are also participating in various areas of the SSA, including both Regions 2 and 6 of the USFWS. Because any actions proposed to be undertaken through the LTEMP could have direct or indirect impacts to the development of and assumptions contained in the SSA, it is imperative there be close coordination between the SSA and the LTEMP EIS. To that end, both processes would be informed and improved if DOI would **seek input from the expertise existing in the AMWG and TWG representatives on the draft Biological Assessment, as was done by Reclamation in 2008 for the LTEMP (the predecessor to the LTEMP). This input could also improve and refine experimental treatments in the Preferred Alternative to clarify triggers, off ramps, monitoring and definitions of “success”.**

Alternative D includes elements that pose an unacceptable risk to the endangered HBC. **Low summer flow experiment(s), steady flows following HFEs, and fluctuation factors that are steadier than No Action should not be included in any selected Alternative.**

Air Quality Impacts and Climate Change

Glen Canyon “(D)am operations can affect air emissions and ambient air quality over the 11-state Western Interconnection, comprising Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming, because hydropower generation offsets generation from other non-hydropower generating facilities in the SLCA/IP and in the Western Interconnection”.⁴⁵ “The WECC has the lowest greenhouse gas loading per 1,000 GWh of any NERC region in the US solely because of the large fraction of hydropower constituting the overall power mix (28 percent). Without Glen Canyon, an additional 2.4 million metric tons per 1,000 GWh would be emitted by the WECC.”⁴⁶ Given the commitments of the Departments of the Interior and Energy to maintain and expand renewable generation capacity, the importance of hydropower capacity to the overall power supply for the western United

⁴³ Personal electronic communication, William E Davis, EcoPlan Associates, to Leslie James, March 31, 2016

⁴⁴ See CREDA letter to Reclamation, May 11, 2012, p. 2

⁴⁵ See LTEMP DEIS Appendix M, p. M-3

⁴⁶ See Scientific Certification Systems, Life Cycle Impact Assessment (LCIA) of Glen Canyon Hydropower Generation System Compared to the WECC Baseline; Conducted in accordance with ISO 14044 LCIA Framework and the Draft SCS-002 Life Cycle Metrics Standard, Type III Life-Cycle Impact Profile Declarations for Materials, Products, Services and Systems, March 2009, p ii

States, and the existing benefits of hydropower that avoids alternate fossil fuel greenhouse gas production⁴⁷, strong consideration should be given to the air emission impacts resulting from HFEs. Hydropower is a very efficient way to produce electricity, showing emission factors between one and two orders of magnitude lower than the thermal alternatives.⁴⁸ CREDA renews concerns that were expressed during Reclamation's development of the HFE Protocol Environmental Assessment,⁴⁹ and previously in 2008.⁵⁰

The more frequent the number and duration of HFEs, the more greenhouse gas emissions are created, due to the unavailability of carbon-free Glen Canyon Dam hydropower when water bypasses the generators. Replacement power must be purchased, and carbon-free hydropower is not a resource that is available on the spot market to replace lost Glen Canyon Dam generation. Because HFEs are included in the DEIS baseline, all Alternatives increase greenhouse gas emissions. The increase ranges from 5,900 to 44,542 metric tons per year.⁵¹ Alternative D, which averages *more than 1 HFE per year* for the 20-year DEIS period⁵², increases greenhouse gas emissions by 22,908 metric tons per year, nearly *four times*⁵³ the level associated with Alternative A (the lowest greenhouse gas-producing Alternative due to the lowest frequency of HFEs).

Given the heightened awareness and public interest in climate impacts, neither the LTEMP public information materials and presentation⁵⁴ nor the US GHG emission metrics used to display results, is sufficient to fully disclose to the public or the Secretary a clear impact analysis. The reader and decision-maker should be able to determine, for example, whether the equivalent of burning an estimated 26.6⁵⁵ million pounds of coal is a "negligible" result, or an acceptable tradeoff for the number of HFEs included in Alternative D, which may or may not achieve the intended outcome. Analysis and disclosure of air quality results in the DEIS should be on the same basis as are other analyzed resources, e.g., regional or local, and not at a national level. Appendix M, Tables M-3 through M-8 should be summarized and included in Chapter 4 of the Final EIS.

LTEMP Hydropower Analysis

As previously noted and discussed below, the treatment of hydropower in the DEIS demonstrates significant bias against the hydropower resource. CREDA continues to disagree with some of the analysis and data assumptions utilized in the hydropower analysis, as well as the presentation of results. From an alternative-to-alternative comparative standpoint, *some of*

⁴⁷ See New Energy Frontier. Balancing Energy Development on Federal Lands. A Joint Report to Congress on Siting Energy Development Projects on Federal Lands. U.S. Department of Interior and U.S. Department of Agricultural. May 2011, pp. 28-31, <https://www.doi.gov/sites/doi.gov/files/migrated/whatwedo/energy/upload/NewEnergyFrontier050511.pdf>

⁴⁸ See The Issue of Greenhouse Gases from Hydroelectric Reservoirs: From Boreal to Tropical Regions, Tremblay, et al., Abstract, p. 1; http://www.un.org/esa/sustdev/sdissues/energy/op/hydro_tremblaypaper.pdf

⁴⁹ See CREDA letter to Larry Walkoviak (BOR), March 17, 2011, p. 4

⁵⁰ See CREDA letter to Larry Walkoviak (BOR), February 22, 2008

⁵¹ See LTEMP DEIS, Chapter 4, Table 4.16.1

⁵² *Ibid*, Table E-9

⁵³ *Ibid*, Table 4.16.1.

⁵⁴ See http://ltempeis.anl.gov/documents/docs/LTEMP_DEIS_presentation.pdf (accessed April 13, 2016)

⁵⁵ See Calculations from EPA: <http://www.epa.gov/cleanenergy-resources/calculator.html#results>

the data assumptions may be less impacting than others. However, it is imperative that the public and the Secretary be fully apprised of the best available information and results so that informed trade-off decisions may be made in the development of a Final EIS and Record of Decision.

Rather than attempting to summarize highly technical information herein, CREDA is attaching specific comments on various DEIS Chapters and Appendices in redline/strike-add format, as well as attaching previously submitted information that was developed in large part through CREDA utility members, who are subject matter experts in utility planning, operations, modeling and rate design. CREDA members Salt River Project and Utah Associated Municipal Power Systems are Cooperating Agencies in the LTEMP process; based on their feedback, their expertise and input was generally neither sought nor considered during development of alternatives or hydropower analysis. These utility expert cooperating agency members as well as other CREDA members have unique roles and customer load serving responsibilities that are not inherent or identical to those of federal agencies involved in LTEMP.

Modeling Assumptions

As stated earlier, CREDA believes that a combination of data inputs used in modeling, along with how and whether results of analysis are presented in the DEIS, demonstrate a clear bias against the hydropower resource. Examples include:

A. Capacity Cost: DEIS assumptions utilized for capacity cost represent the most significant potential for impacting and disclosing hydropower impacts. Beginning with data used in the SDA process, the capacity cost assumptions have been significantly understated and not representative of what the utility subject matter experts have recommended be used in LTEMP. In the SDA process, “The replacement cost used was \$50,100/MW-year based on a natural gas combustion turbine.”⁵⁶ Yet, at the April 10, 2014 SDA workshop, participants were advised that “a capacity value of \$65,000/MW-year”⁵⁷ would be used. At the workshop and immediately thereafter, CREDA recommended that “a more accurate estimate of the capacity value for a large natural gas combined cycle facility is in the range of \$82,000/MW-year to \$132,000/MW-year, based on utility and EPRI (industry) standards.”⁵⁸ CREDA has been advised that due to time and cost restrictions, Argonne National Labs was not directed to provide sensitivity analysis including the utility-recommended capacity cost information prior to issuance of the DEIS. **CREDA has been advised this information could be developed through post-model processing by the Western Area Power Administration and the utility cooperating agencies for inclusion in the final LTEMP EIS. A full range of hydropower impacts using at a minimum the hydropower utility experts’ capacity cost assumptions should be utilized in analysis and disclosed to the public and the Secretary prior to finalizing the LTEMP EIS.**

⁵⁶ See LTEMP DEIS, Appendix C, p. C-27, Section 4.3

⁵⁷ See CREDA letter to USGS and LTEMP Co-Leads, April 18, 2014, p. 2

⁵⁸ *Ibid*, Appendix C, p. 41.

B. Other Hydropower Assumptions: Reserve/regulation level, exceedance level, and discount rate are all factors that are part of the wholesale power analysis. Individually, they may have modest impacts to the “bottom line”, but when taken together, they can potentially impact the ranking of Alternative performance results. The DEIS, unfortunately, uses as the “primary” data assumption for each category, the value that has the lowest impact on hydropower performance. Collectively, these choices continue to understate the impacts of Alternative performance on the hydropower resource. For example:

i. CREDA expressed concern about the assumption and base level of ancillary services as described by Argonne National Labs at the February 2015 AMWG meeting. We appreciate that the MW level has been corrected and would not object to a range being displayed, if in fact the full hydropower analysis has been performed on both the 67 MW and 130 MW levels.

ii. CREDA has continued to express concern about the assumptions used regarding exceedance level. “It seems more reasonable for a sensitivity analysis to be based on a 50% to 99% range, so that the study can provide an upper bound economic impact associated with the alternative operating criteria.” Results showing exceedance levels ranging from 50-99% should be shown together in one place in the DEIS.⁵⁹

iii. CREDA continues to believe that it is inappropriate that a federal discount rate be used as the “baseline” for discounting new capacity construction, since it would not be the federal government constructing the capacity. Alternatively, the DEIS could display results utilizing the federal rate alongside the results utilizing a non-federal/utility rate for comparative purposes. This approach would be consistent with what Reclamation utilized in its Aspinall EIS; the DEIS approach is contrary to what was done in the Aspinall analysis and Final EIS.⁶⁰

iv. Similar to the artificial 8,000 cfs cap on fluctuations, the proposal to suspend load following during the entire month after a fall HFE has neither sufficient scientific basis nor analysis to support inclusion in an alternative. “This is ambiguous and should be formally defined with scientific reasoning.”⁶¹ This restriction should be removed from any selected Alternative.

One of the “Significant Findings” contained in a study assessing the environmental attributes of Glen Canyon Dam hydropower on a life-cycle impact assessment basis finds “There is no evidence that allowing Glen Canyon power production to follow load would increase environmental impacts, including those to habitats and key species. In fact, removing generating restrictions would reduce WECC greenhouse gas emissions.”⁶² This experiment should not be included in the LTEMP and the 8,000 cfs cap on fluctuations should be removed from Alternative D.

⁵⁹ See Poch and Veselka, Argonne National Laboratory, Responses to Peer Review Comments on the Hydropower Analysis Methodology for the Glen Canyon Dam Long-Term Environmental and Management Plan Draft Environmental Impact Statement, March 2016, p. 6

⁶⁰ See Reclamation, Aspinall Unit Operations FEIS, Appendix E, 2012

⁶¹ See Buckeye Water Conservation & Drainage District letter to LTEMP Draft EIS, March 30, 2016, p. 2

⁶² *Ibid*, Scientific Certification Systems, p. ii

The DEIS methodology includes no escalation of the overnight capital cost of replacement capacity construction, yet the total costs are discounted to net present value. “Discounting is to be used to convert future monetary values to present values”⁶³ Further, the analysis results assume that new capacity would be needed as early as 2017 due to operational change anticipated by the DEIS. Escalation should be included in the analysis; in reality, however, the type of capacity assumed by the wholesale power analysis to be constructed cannot be done by 2017. The result of both these issues is an understatement of costs in both cases.

Consistent with previously completed Reclamation EISs, CREDA requests that the full range of sensitivity analysis be disclosed for these factors, similar to what was done for the sediment resource (utilizing low, medium and high sediment conditions).

Hydropower Impacts are Incomplete or Understated

CREDA believes that the hydropower impacts reported in the DEIS are understated in all cases, and in some cases are incomplete or erroneous. Given that the HFE Protocol is intended to be part of all Alternatives, but expanded in terms of frequency and duration, CREDA would have expected DEIS hydropower impacts to be significantly higher. “The Department’s analysis completed for the HFE Protocol reported that the hydropower impact could be \$8M-\$122M over the Protocol period; yet the operational aspects of alternatives developed by the co-lead agencies in this DEIS contain significantly more potential negative effects to the hydropower resource. Previous analysis (USGS/GCMRC) associated with a prior EIS process (the LTEMP) indicated the impact of a steady flow regime would average between \$24M and \$29M *per year*. This demonstrates the significant financial impact associated with steady flows and bypasses, and is *in addition* to the Argonne post-1996 ROD study finding that implementation of the 1996 Record of Decision has resulted in an average additional cost of \$50M per year.”⁶⁴

In addition, the DEIS must consider the impact of changed operations due to Interim Flows in 1991.⁶⁵ Although the DEIS states that “Past and present (ongoing) actions in the project area have been accounted for in the baseline conditions described for each resource in Chapter 3”⁶⁶, the cumulative effects at least for the hydropower resource are either a) not analyzed, b) not disclosed, c) disclosed in a manner to be unidentifiable even to hydropower utility cooperating agency experts, or d) some combination of the above. In any event, the DEIS does not sufficiently address these cumulative impacts to the hydropower resource, resulting in further underestimating of the DEIS impacts to the hydropower resource.⁶⁷ This is the same concern CREDA described in comments on the Aspinall Unit EIS.

Additional topics contained in the DEIS associated with hydropower impacts should be considered and revised:

⁶³ See LTEMP DEIS, Appendix K, p. K-94.

⁶⁴ See CREDA letter to the Department of the Interior, June 12, 2014, p. 3

⁶⁵ *Ibid*, CREDA LTEMP EIS Scoping letter, January 31, 2012, p. 7.

⁶⁶ See LTEMP DEIS, Chapter 4, p. 4-382

⁶⁷ See CREDA letter to Reclamation (Reclamation), March 12, 2012, p. 1

- i. Hoover power impact analysis is outside the geographic scope⁶⁸ of the DEIS and should be removed. If, however, there is reference retained to the relationship between Glen Canyon Dam releases and Lake Mead levels, there should be no reference or inferred relationship to Hoover hydropower impacts as an offset or mitigation for CRSP hydropower impacts. The projects are statutorily separate and the federal contracts and customers are entirely separate and distinct between the CRSP (Glen Canyon) and Boulder Canyon (Hoover) projects.
- ii. The DEIS must clearly state that there is no direct data relationship between the wholesale power analysis and the retail rate analysis. The retail rate analysis was completed in advance of the wholesale analysis and the data utilized in the retail rate analysis is not derived from or related to the wholesale power analysis. CREDA has continually expressed concern about the need for and inclusion of the retail rate analysis in this DEIS given the time, funding constraints, and lack of utility subject matter expertise associated with the analysis.⁶⁹
- iii. Incomplete and in process passive use valuation survey work for recreation resources has been included in the DEIS, but currently there is no inclusion of this type of valuation for the hydropower or water resources. Information prepared for inclusion in the AMP's Socioeconomic Ad Hoc Group (SEAHG)'s work plan, which is an integral part of the Budget and Work Plan associated with the AMP, was presented to the TWG and AMWG during 2015.⁷⁰ "With changing circumstances (e.g., population growth, drought, climate change) and social concerns, resource management confronts questions of potential re-purposing of river systems or operational changes of existing hydroelectric dams. Inherent trade-offs often exist between, say, riverine protection and renewable hydropower production".⁷¹ During discussions in various forums, including the TWG, SEAHG and AMWG meetings, the DOI questioned applicability of the Paperwork Reduction Act to this project. The authors confirmed in several forums that it was not subject to the Paperwork Reduction Act,⁷² and that the results have been peer reviewed and accepted for publication. **This information is significant new information and must be considered and included in the DEIS.** Thirty year-old, and data from projects that are not comparable to Glen Canyon Dam analysis contained in Appendix L should be superseded with more current peer-reviewed information that is directly relevant to Glen Canyon Dam.

⁶⁸ See Colorado River Basin States scoping letter, January 31, 2012, p. 6

⁶⁹ *Ibid*, CREDA letter to USGS et al., April 18, 2014

⁷⁰ See a) "Market and Non-Market Values of Water Resources and Non-Market Values of Hydropower Associated With Glen Canyon Dam"; b) "Non-Market Values for Alternative Operations of the Glen Canyon Dam: Explorations in Choice and Valuation" http://www.usbr.gov/uc/rm/amp/twg/mtgs/15apr21/Attach_10a.pdf and http://www.usbr.gov/uc/rm/amp/twg/mtgs/15apr21/Attach_10b.pdf

⁷¹ See Jones, Berrens, Jenkins-Smith, Silva, Carlson, Ripberger, Gupta and Carlson, Valuation in the Anthropocene: Confronting Multiple Value Dimensions Surrounding Complex Dam, Hydroelectric and River System Operations., in print spring 2016

⁷² See Minutes from SEAHG meeting, August 20, 2015, Q&A 10.

- iv. Impacts to the Upper Colorado River Basin Fund must be assessed and considered. Referring back to development of this DEIS' predecessor, the LTEP, CREDA wrote to then-DOI Deputy Secretary Lynn Scarlett: "Given the significant potential impacts to the Upper Colorado River Basin Fund as well as to federal budgets, we felt it important that financial/fiscal considerations be addressed at the outset of, and throughout, the environmental impact statement process for the long-term experimental program (LTEP)."⁷³

- v. DEIS Chapter 4, page 4-425 recognizes that experiments cause an irretrievable loss of hydropower production. However, there is no analysis included which would meet the requirement of 40 CFR 1506.1, which requires that no resources be committed during the process that would foreclose a hard look at all the alternatives. This conclusion is drawn based on CREDA's understanding that neither bug flow (low steady summer weekend flows) nor the LSF experiment impacts have been analyzed to the same degree as have HFE impacts on the hydropower resource. In addition, inclusion of the 8,000 cfs cap on fluctuations experiment in Alternative D is not identified as an irretrievable commitment of the hydropower resource, and should be.

Adaptive Management and Experiments

The adoption of the Preferred Alternative, or other Alternatives that rely on similar but undefined elements of an experimental and management plan violates NEPA because any Record of Decision would be based on a flawed EIS that contained inadequate disclosure and analysis of the environmental and other impacts of these Alternatives. The required, but missing, elements of an adaptive management program are identified in Paragraph III of the Summary at the beginning of this letter. DOI's proposed implementation of adaptive management as a part of the LTEMP does not meet the legal requirements of the National Environmental Policy Act.

To further explain, there is insufficient detail and information included in the DEIS regarding experimental triggers or "adaptively managing" under LTEMP, as stated in the Purpose and Need Statement. In describing the experimental regime under the preferred alternative, the LTEMP Draft EIS proclaims that "DOI intends to retain sufficient flexibility in implementation of experiments to allow for response to unforeseen circumstances or events that involve any other resources not listed here."⁷⁴ However, NEPA requires that specific triggers and metrics describing initiation, completion, off ramps and success/acceptability measurement be included in the description of each experiment contemplated in the LTEMP EIS.

The DEIS has also failed to properly identify the hypothesis to be tested in each experiment or to define appropriate triggers, baselines, and objectives for each experiment. Table

⁷³ See CREDA letter to Lynn Scarlett, September 18, 2007, pp.1-2

⁷⁴ See LTEMP DEIS, Chapter 2, p.2-247

2-9 of the LTEMP DEIS (page 2-49), which purportedly contains the [i]mplementation criteria for condition-dependent experimental treatments, provides stark examples. For example, Alternative D proposes a spring HFE up to 45,000 cfs and less than 96 hours will be performed so long as the DOI determines, on an annual basis, that there are no

*potential unacceptable impacts on water delivery or key resources such as humpback chub, sediment, riparian ecosystems, historic properties and traditional cultural properties, Tribal concerns, hydropower production and the Basin Fund, the rainbow trout fishery, recreation and other resources; unacceptable cumulative effects of sequential HFEs...(emphasis supplied)*⁷⁵.

Additionally, the DEIS provides the DOI the ability to terminate treatments prior to completion if certain undefined “off ramp conditions” are present. Again using Sediment Treatments as an example, the DOI describes the potential off ramp as a determination that the “HFEs were *not effective* in building sandbars; or unacceptable adverse impacts on the trout fishery, humpback chub population, or *other resources*.” Table 2-9. The same or substantially similar annual considerations and off ramps are found in Table 2-9 for Proactive Spring HFEs, Fall HFEs, and Fall HFEs longer than 96 hours. For the “load following curtailment” Sediment Treatment, the potential off ramp is at least somewhat descriptive: “resulting sandbars were no bigger than those created without reduced fluctuation,” but also includes the same vague “unacceptable adverse impacts” language as other Sediment Treatments.

Other experimental designs are also insufficiently defined. One of the off ramp considerations for trout management flows is “Little or no reduction in trout recruitment.” One of the annual considerations for implementing low summer flows is “potential unacceptable impacts on [enumerated resources] and other resources.” Chapter 2 of the LTEMP Draft EIS and, in particular, Table 2-9, is full of similar vague conditions regarding the DOI’s future experimental framework for Glen Canyon Dam.

The DOI has agreed that “[a]ll experiments would be closely monitored for adverse side effects on important resources.”⁷⁶ DOI proposed to engage in a “formal process of stakeholder engagement to ensure that decisions are made with sufficient information.”⁷⁷ And while the DOI will consider the consensus recommendations of the “planning group” DOI “retains sole discretion to decide how best to accomplish operations and experiments in any given year pursuant to the ROD and other binding obligations.”⁷⁸

These poorly defined experimental conditions, coupled with the unquantified discretion of the DOI, create tremendous uncertainty for CRSP customers as well as other resource users. CREDA’s member utilities and other CRSP customers are held to high standards of reliability. Part of meeting those reliability standards is creating short and long-term generation planning forecasts. The ability to forecast CRSP hydropower is made that much more difficult if the DOI, in its “sole discretion” can determine that there are “adverse effects” on “other resources.” These

⁷⁵ *Ibid*, p. 2-30

⁷⁶ *Ibid*, p. 2-55

⁷⁷ *Ibid*.

⁷⁸ *Ibid*.

flaws also render any EIS legally inadequate because it does not contain the required “hard look” at the environmental and other impacts of the proposed action.

The DEIS also fails to define its “annual implementation considerations.” Nearly every experimental treatment will be undertaken unless there are “potential unacceptable impacts” on certain defined and undefined resources. The law requires greater specificity than this. Likewise, elements of Alternative D include overly flexible adaptive management that is incompatible with the ESA, in part because there are no binding obligations or criteria or required mitigation in Alternative D that protect the endangered HBC.

CREDA requests acknowledgement of receipt of these comments and supporting documentation and that they be made part of the administrative record for the LTEMP EIS. We appreciate consideration by DOI of these comments and recommendations.

Sincerely,

Leslie James

Leslie James
Executive Director

ljr

Cc: Katrina Grantz, BOR, LTEMP Co-Lead
Rob Billerbeck, NPS, LTEMP Co-Lead

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TABLE B

CREDA MEMBERS

Following is a detailed listing of the Members of the Colorado River Energy Distributors Association, Inc. (CREDA) and systems that are associated with or comprise such Members for purposes of participation in CREDA.

<u>CREDA Member</u>	<u>Associated Systems</u>
Arizona Municipal Power Users Association	Avra Valley Irrigation and Drainage District; Cortaro- Marana Irrigation District, Pima County; Eastern Arizona Preference Pooling Association; HoHoKam Irrigation and Drainage District, Pinal County; City of Page; City of Safford; Town of Marana; Town of Gilbert; Town of Thatcher; Town of Wickenburg; City of Williams.
Arizona Power Authority	Chandler Heights Citrus Irrigation District; Queen Creek Irrigation District; San Tan Irrigation District
Arizona Power Pooling Association	City of Mesa, AZ; Electric District No. 2, Pinal County; Arizona Electric Power Cooperative, Inc. (Members: Anza Electric Cooperative, Duncan Valley Electric Cooperative, Graham County Electric Cooperative, Mohave Electric Cooperative, Sulphur Springs Valley Electric Cooperative, Trico Electric Cooperative).
Colorado River Commission of Nevada	Boulder City, NV; Overton Power District No. 5; Lincoln County Power District No. 1; Valley Electric Association
Colorado Springs Utilities	[Not Applicable]
City of Farmington, New Mexico	[Not Applicable]
Intermountain Rural Electric Association, Colorado	[Not Applicable]
Irrigation & Electrical Districts Association of Arizona	Aguila Irrigation District; Ak-Chin Energy Services; Buckeye Water Conservation & Drainage District; Central Arizona Water Conservation District; Electrical District No. 3, Pinal County, Arizona; Electrical District No. 4, Pinal County, Arizona; Electrical District No. 5, Pinal County, Arizona; Electrical District No. 6, Maricopa and Pinal Counties, Arizona; Electrical District No. 7, Maricopa County, Arizona; Electrical District No. 8, Maricopa County, Arizona; Harquahala Valley Power District; Hohokam Irrigation & Drainage District; Maricopa County Municipal Water Conservation District No. 1; McMullen Valley Water Conservation and Drainage District; Page Electric Utility; Roosevelt Irrigation District; The City of Safford; Salt River Project; San Carlos Irrigation

CREDA Member

Associated Systems

Project; The Town of Thatcher; Tonopah Irrigation District; Wellton-Mohawk Irrigation and Drainage District; Yuma County Water Users Association; Yuma Irrigation District; Yuma-Mesa Irrigation and Drainage District

Los Alamos County, New Mexico

[Not Applicable]

Municipal Energy Agency of Nebraska (MEAN)

Aspen, Delta, Fleming, Fort Morgan, Glenwood Springs, Gunnison, Haxtun, Holyoke, Oak Creek, Wray, Yuma (Colorado); Torrington (Wyoming)

Navajo Tribal Utility Authority, Arizona and New Mexico

[Not Applicable]

Platte River Power Authority, Colorado

Cities of Estes Park, Ft. Collins, Longmont, Loveland

Provo City, Utah

[Not Applicable]

Salt River Project Agricultural Improvement and Power District (Arizona)

[Not Applicable]

Silver State Power Association, Inc. (Nevada)

Valley Electric Association, Inc.; Overton Power District No. 5; Lincoln County Power District No. 1; Boulder City

St. George City (Utah)

[Not Applicable]

South Utah Valley Electric Service District (Utah)

Cities of Payson and Springville

Tri-State Generation and Transmission Association (Colorado, Nebraska, New Mexico, Wyoming)

Big Horn Rural Electric Company; Carbon Power & Light; Central New Mexico Electric Cooperative; Chimney Rock Public Power District; Columbus Electric Cooperative; Continental Divide Electric Cooperative; Delta-Montrose Electric Association; Empire Electric Association; Garland Light & Power Company; Gunnison County Electric Association; High Plains Power; High West Energy; Highline Electric Association; Jemez Mountains Electric Cooperative; K.C. Electric Association; Kit Carson Electric Cooperative; LaPlata Electric Association; The Midwest Electric Cooperative Corp.; Mora-San Miguel Electric Cooperative; Morgan County Rural Electric Association; Mountain Parks Electric; Mountain View Electric Association; Niobrara Electric Association; Northern Rio Arriba Electric Cooperative; Northwest Rural Public Power District; Otero County Electric Cooperative; Panhandle Rural Electric Membership Association; Poudre Valley Rural Electric Association; Roosevelt

CREDA Member

Associated Systems

Public Power District; San Isabel Electric Association; San Luis Valley Rural Electric Cooperative; San Miguel Power Association; Sangre De Cristo Electric Association; Sierra Electric Cooperative; Socorro Electric Cooperative; Southeast Colorado Power Association; Southwestern Electric Cooperative; Springer Electric Cooperative; United Power, Inc.; Wheat Belt Public Power District; Wheatland Rural Electric Association; White River Electric Association; Wyrulec Company; Y-W Electric Association

City of Truth or Consequences, New Mexico

[Not Applicable]

Utah Associated Municipal Power Systems (UAMPS)

Cities of Beaver, Blanding, Bountiful, Enterprise, Ephraim, Fairview, Fillmore, Heber Light & Power, Holden, Hurricane, Hyrum, Kanosh, Kaysville, Lehi, Logan, Monroe, Morgan, Mt. Pleasant, Murray, Oak City, Paragonah, Parowan, Santa Clara, Spring City, Town of Meadow and Washington; Central Utah Water Conservancy District; Weber Basin Water Conservancy District

Utah Municipal Power Agency (UMPA)

Cities of Manti, Nephi, Salem, Spanish Fork; Town of Levan

Yampa Valley Electric Association, Colorado

[Not Applicable]

Wyoming Municipal Power Agency

Cities of Cody and Powell; Towns of Fort Laramie, Guernsey, Lingle, Lusk, Pine Bluffs, Wheatland

TABLE C

ACCOMPANYING DOCUMENTS

- I. NOTEBOOK 1: Footnote documentation – Footnotes 1-27

- II. NOTEBOOK 2: Footnote documentation – Footnotes 28-73

- III. NOTEBOOK 3: LTEMP DEIS Chapters – strike/add comments
Chapters 1, 2, 3, 4, 5, 8

LTEMP DEIS Appendices – strike/add comments
Appendices C, E, H, I, J, K, L, M



CREDA
Colorado River Energy Distributors Association

November 14, 2016

LTEMP EIS Co-Leads
Katrina Grantz – BOR
Rob Billerbeck - NPS

Via email only

The Colorado River Energy Distributors Association (CREDA) submits the following comments on the Long-Term Experimental and Management Plan (LTEMP) Final Environmental Impact Statement (FEIS) (October 7, 2016), as requested at the October 18, 2016 Technical Work Group (TWG) meeting. CREDA understands that comments are due not later than November 14, 2016, so given the short period of time allowed for review of a nearly 2,500 page document, these initial comments will focus on key areas, and we will submit additional information at a later date.

These comments focus on: a) changes made following the DEIS, b) continuing issues of concern that have not been adequately addressed, or c) new information that was not previously available for public review and comment (most significantly Appendices O and P). CREDA also incorporates by reference its May 9, 2016 comment letter with attachments, and all prior comments, and requests that this information be included in the Administrative Record for the LTEMP.

KEY POINTS

- I. **PURPOSE AND NEED:** As the FEIS recognizes, the “Purpose and Need” for the Proposed Action has changed over time (FEIS 1-6). “The purpose of the proposed action is to provide a comprehensive framework for adaptively managing Glen Canyon Dam over the next 20 years consistent with the GCPA and other provisions of applicable federal law.” (FEIS 1-5); and “The need for the proposed actions stems from the need to use scientific information developed since the 1996 ROD to better inform DOI decisions on dam operations and other management and experimental actions”. (FEIS 1-6). This statement of the Purpose and Need is fatally flawed because it essentially proposes a “Purpose” of meeting applicable federal laws, which is a purpose that is so broad as to be meaningless. Likewise, the identified “Need” to “better inform” future decisions is devoid of substance. The “Objectives and Resource Goals of the LTEMP” listed in Chapter 1.4 do not provide any meaningful definition of the Purpose and Need because they are a laundry list of resources deemed important by the Department, but lack discernable objectives that can be measured for the purpose of defining an identifiable objective for the agency action. The Department cannot frame its Purpose and Need, or its objectives, in a manner so unreasonably broad that an infinite number of alternatives would accomplish its goals. Consequently, the adoption of this “Purpose and Need” is arbitrary and capricious and violates the requirements of NEPA.

The flawed “Purpose and Need” is at times explained as a program to implement concepts of adaptive management. If adoption of an adaptive management *plan* is the objective, the alternatives are improperly defined and narrowed because they do not include or analyze a No Action Alternative of “No Adaptive Management”. If, however, the adoption of adaptive management is the objective, the FEIS and the Preferred Alternative fail to do so because the program does not even remotely comply with common definitions of adaptive management, including those contained in “Adaptive Management – The U.S. Department of the Interior Technical Guide”, found at <https://www.doi.gov/ppa/upload/TechGuide.pdf>. While portrayed as “scientific experiments”, the lack of defined hypotheses that will be tested, or controls or baselines for comparison with the results of an experiment make it clear that the proposed adaptive management plan is fatally flawed from a scientific perspective. Section 2.2.2.3 attempts to justify these failures by asserting that it is difficult to control for specific conditions, there is a wide variability in conditions, there are risks of certain experiments, there are conflicting multiple use values and objectives, and that there is a low expected value of information. None of these justifications provide a rational explanation of why the proposed experiments lack defined hypotheses that can be tested with meaningful criteria.

Moreover, in describing the experimental regime under the Preferred Alternative, the FEIS proclaims that “DOI intends to retain sufficient flexibility in implementation of experiments to allow for response to unforeseen circumstances or events that involve any other resources not listed here.” (FEIS ES-37 and elsewhere). This reservation of undefined discretion, when combined with the lack of specific criteria to define “Experiment Triggers and Primary Objective[s],” conditions for replication of the experiment, “Annual Implementation Considerations,” “Long Term Off-Ramp Conditions,” and “Action if Successful” for each of the alternatives, (Table 2-9, FEIS 2-50-54), confirms that the Proposed Action and the FEIS fail to provide the disclosure and analysis required by NEPA. Likewise, the failure to identify a quantitative standard or qualitative analysis that will be used to measure and respond to the results of experiments or to define success, failure, or to decide to replicate or to terminate an experiment constitutes a Proposed Action that will be arbitrary and capricious.

Table 2-9 is replete with undefined terms that make it impossible for the Department and the public to understand what experiments or management actions will be implemented and when, or to assess the impacts of and risks associated with the preferred action. Examples of undefined terms in Table 2-9 that render the FEIS disclosure and analysis invalid include “achieve a positive sand balance,” “rebuild sandbars,” “protect sand,” “dependent on resource condition and response,” “potential short-term unacceptable impacts,” “unacceptable cumulative effects,” “could be shorter depending on results of first tests,” “HFEs are not effective in building sandbars,” “long-term unacceptable adverse impacts on the resources listed in Section 2.2.4.3 are observed,” “implement ... when triggered and existing resource conditions allow,” “little or no effect,” “long-term unacceptable adverse impacts,” “determined ineffective,” “increase humpback chub growth,” “improve food base,” and “improve vegetation conditions.” Footnote “a” to Table 2-9 confirms the lack of criteria, stating that “Triggers will be modified as needed during the 20-year LTEMP period in an adaptive manner through processes including ESA consultation and based on the best available science utilizing the experimental framework for each alternative”. References to implementation conditions found elsewhere in Chapter 2 do not provide meaningful definition of these terms. Many of these terms are also rendered meaningless because the FEIS and the Proposed Action do not sufficiently describe the monitoring of specific data that could be used to determine the success or failure of an experiment. Vague commitments to monitoring as contained in the science plan described at the August 2016 AMWG meeting are not legally sufficient.

Taken as a whole, it is impossible to conclude that the FEIS takes the required “hard look” at the alternatives because they are not defined, the success or failure of the experiments is not defined, the “off-ramps” for experiments are not defined, and the response to additional information provided by an experiment is not defined. No amount of modeling can cure the failure to define the Proposed Action with sufficient specificity to allow the decision maker and the public to understand what is proposed or to make a reasoned choice among alternatives.

In sum, the FEIS is legally inadequate because experiments must include a *description of the proposed experiment, the time or frequency of implementation of the experiment, and the triggers or other conditions that must exist prior to implementation of the experiment*. Each experiment must also include a description of the *hypotheses that will be tested by the experiment and benchmarks or other identifiable criteria* that will allow the Secretary and interested parties to assess the *success or lack thereof, when an experiment or action must be terminated because of unacceptable impacts (as specifically defined)* to the endangered HBC or other legally protected resources. Finally, any *monitoring* included in an implementation plan or experimental design must meet legal standards necessary to implement adaptive management as a part of the LTEMP. See “Adaptive Management – The US Department of the Interior Technical Guide”¹

The ROD should state that prior to implementation of any experiment or management action under the LTEMP, the elements *highlighted* in the above paragraph will be included in an implementation plan.

As indicated in Table 2-9 and elsewhere in the FEIS, some of the proposed actions already meet these criteria, while others are unduly vague and unquantifiable and require additional definition. CREDA will continue to be an active participant in the AMP committees and processes to support this important requirement. CREDA is encouraged by recent discussions at the TWG meeting and with the Science Advisors regarding an upcoming Knowledge Assessment process and believe it could inform and expedite completion of this requirement.

A stated objective of the DEIS is to “maintain (or/and)² improve hydropower” stemming from the “generation of hydropower” contained in the Purpose and Need Statement (76 FR 129, July 6, 2011), which reflects the Secretary’s obligation to fulfill multiple and sometimes competing statutory requirements applicable to the operation of Glen Canyon Dam and the exercise of other authorities as required by the provisions of the Grand Canyon Protection Act (GCPA). The United States has described the relationship between the objectives of the GCPA and the Colorado River Storage Project Act (CRSPA) as being “in addition to rather than in substitution of the Secretary’s obligations concerning the operations of Glen Canyon Dam for hydropower and other project purposes.”³ The U.S. District Court for the District of Arizona further clarified that the broadly worded provisions of the Colorado River Storage Project Act (CRSPA) and GCPA impose on the Secretary an obligation to balance many different interests in operating Glen Canyon Dam. The Secretary must continue to recognize that power production is still a primary purpose of the Dam that must be balanced against other purposes, statutory requirements, and water delivery obligations as (s)he considers actions to implement the GCPA.⁴ In fact, the failure to incorporate within the Preferred Alternative an experiment

¹ See: (<https://www.doi.gov/sites/doi.gov/files/migrated/ppa/upload/TechGuide.pdf>) and United States Department of the Interior Environmental Statement Memorandum No. ESM 13-11, January 7, 2013.

² “And/or” appear to be used interchangeably in the LTEMP DEIS. The Power DFC, (approved by AMWG and recognized by Secretary Salazar in early 2012), contained “and”.

³ See *Grand Canyon Trust v. US Bureau of Reclamation*, 623 F.Supp.2d 1015, 1036, Federal Defendants’ Reply Memorandum In Support of Cross Motion for Summary Judgment on Claims 6-8 at p. 26, lines 25-27, (February 20, 2009)

⁴ See Colorado River Basin State Representatives to LTEMP EIS Scoping, January 31, 2012

that tests the impact of hydropower improvement flows is arbitrary and capricious given statutory requirements.⁵ There is no rational basis for a refusal to test such flows, particularly when the Preferred Alternative includes experiments that are designed to provide information on management of resources, such as sediment, which are not the subject of express statutory requirements.

II. LTEMP and BIOLOGICAL ASSESSMENT (BA): Appendix O is legally and scientifically flawed and cannot be the basis for any decision. If incorporated into the ROD as drafted, Appendix O violates the requirements of NEPA because it contains experiments or other proposed actions that are not adequately defined or analyzed, and that may be likely to adversely impact the endangered HBC. Appendix O includes conclusory statements⁶ with regard to flows that are at best, premature and not fully supportable, and at worst, incorrect.⁷ A key example of a broad conclusory statement is on O-96: “In summary, under base operations, continued hydropeaking flows with increased downramp rates compared to the existing condition under coldwater conditions will continue to degrade nearshore rearing habitats, prevent the establishment of aquatic invertebrates (food base), and increase the risk of stranding juvenile humpback chub.” Contradictory statements include: “The potential for, and the effect of, stranding on individual humpback chub survival has not been directly investigated,” (FEIS O-94), “it is unclear how important backwater or embayment habitats are to humpback chub throughout other reaches of the Grand Canyon...their overall abundance in the Little Colorado River reach was higher in talus” (FEIS O-98), and “no current published research is available to show what factors may have correlated to the decline in invertebrate drift at the Little Colorado River in 2014 and 2015.” (FEIS O-100). **Kennedy et al (2016) cannot be the basis for repeated definitive statements about the effects of fluctuating (or “hydropeaking”) flows or ramp rates and the BO should describe it as an initial investigation which merits additional observation and flow tests as described in Attachment B.**

Throughout LTEMP Alternative analyses as well as under MLFF operations, a consistent observation is the likely *positive* linkage between the fluctuating flow operations and experiments contained in Alternatives B and E and the endangered HBC⁸. Appendix D of Appendix O describes the approach to developing BA/BO action triggers was to manage HBC as opposed to managing predators (FEIS O-176). Testing flow regimes that have been demonstrated or hypothesized (and not yet tested) to be positive to HBC is consistent with that approach. The science associated with foodbase effects is less mature and needs additional research and testing,⁹ as do issues associated with the growing emergence of brown trout and green sunfish in the Lee Ferry reach. In order to establish accurate resource relationships within the CRE associated with various treatments contained in Appendix O, and to further learning associated with the impacts ascribed to temperature versus flow, it is necessary to test a wider range of flow conditions than are described in the Preferred Alternative. These flow levels have already been analyzed under NEPA in the LTEMP EIS.

⁵ CREDA raises here the issue of omission of a statutory requirement from the alternatives identified in a NEPA analysis, and reserves the right to litigate the compliance with applicable statutory requirements.

⁶ See esp. FEIS O-96, summary statement, and multiple cites to Kennedy (2016).

⁷ See Attachment A, initial comments of W.E. Davis, EcoPlan Associates, Inc., Nov. 7, 2016

⁸ See Finch, et al (2013)

⁹ See HFE Environmental Assessment, Ch. 2, p. 48: “• Research Question #9: What is the relationship of high-release magnitude and duration on the extent of foodbase scouring in the Lees Ferry reach? Summary: High-flow releases of 41,000 to 45,000 cfs were shown to scour about 90 percent of the foodbase on sediments and much of the foodbase on rock substrates in the Lees Ferry reach. The relationship of the extent of scouring and flow magnitude is important information as a potential management tool for stimulating production. Hence, *flow magnitude of less than 41,000 cfs should be evaluated* to determine the scouring effect on the foodbase.” (emphasis added). Also, (same cite): “Impacts of a consecutive fall and spring event could be severe on the foodbase and trout population”

Any LTEMP implementation plan must include flow tests¹⁰ along with a technical team evaluation to develop refined hypotheses, triggers and off-ramps associated with the experimental treatments contained in Appendix O and any successor BO.

Including these tests in the ROD provides necessary flexibility, compliance and robustness to undertake flow-related experimental actions and treatments associated with HBC. It also meets a necessary requirement under Section 1.2.4.3 in assessing the efficacy of a temperature control device “in both high-and low-flow discharge scenarios”. Equally important, inclusion of these flows comports with “*science and modeling methods to further consider the impacts of a variety of dam operations on power generation and capacity, and considers operations that can maintain or increase hydropower generation*” (emphasis added) (FEIS 1-9).

III. BASING SELECTION OF A PREFERRED ALTERNATIVE ON MISCHARACTERIZED INFORMATION IS ARBITRARY AND CAPRICIOUS. The DEIS, and now the FEIS, continue to inaccurately characterize data from a study used to support the flow factor/fluctuation index initially utilized in Performance Metric 12 of swing weighting in the SDA process. The Fluctuation Index utilizes information derived from a 1987 study (Bishop et al),¹¹ which addressed recreational user preference for fluctuating flow levels. In that study, however, 10,000 cfs (not 8,000 cfs) was defined as “constant flows”. And yet, there appears throughout the DEIS, with additional references added to the FEIS, what CREDA believes to be misinterpretation of these data, and a reliance on this misinterpretation as justification for including an arbitrary 8,000 cfs cap on fluctuations as part of Alternative D, in order to benefit the sediment resource. In addition, the difference in sediment transport between, for instance, 8,000 cfs and 10,000 cfs is negligible and within the error of the model forecasting error. However, the difference in impact on hydropower between an 8,000 cfs cap and a 10,000 cfs cap is material. A confounding factor in determining sediment “benefit” ascribed to the flow fluctuation factor is monthly volumes. Higher monthly volumes increase transport. However, “It was not possible to reconcile the relative importance of daily fluctuations and monthly volume allocations without additional modeling”.¹² In fact, in the Bishop study, “moderate daily fluctuations” of 8,000-25,000 cfs were the most preferred of four different flow scenarios.”¹³ The flow factor/fluctuation index analysis used in the DEIS is unsupported scientifically and results in an unnecessary restriction on hydropower operations. Use of 8,000 cfs as a reference point for angler preference in the FEIS is also an incorrect inference to the most recent study by Bair et al¹⁴. Just as the HFE Protocol initially used a “cap” of 96 hours, and now the “cap” is being extended to 250 hours in the FEIS, the 8,000 cfs “cap” is merely a number that has been used in previous environmental processes, with no prior or subsequent science that definitively supports its continued use as an absolute requirement. **LTEMP documentation should not construe the use of the arbitrary 8,000 cfs as being science based.**

IV. SIGNIFICANT NEW INFORMATION: “Estimating Non-Use Values for Alternative Operations of the Glen Canyon Dam: An Inclusive Value Approach, Phase 3B Project Research and Findings”¹⁵. A significant new study, funded and led by the University of Oklahoma Center for Energy, Security and Society and including other experts, has direct relevance to the LTEMP EIS and

¹⁰ See Attachment B, developed by LTEMP utility cooperating agencies and CREDA, Aug. 31, 2016

¹¹ See FEIS Appendix C, P. C-27, section 4.5

¹² See LTEMP DEIS, Appendix E, p. 14

¹³ See Bishop, et.al. (1987), Grand Canyon Recreation and Glen Canyon Dam Operations: An Economic Evaluation, p. 67

¹⁴ See Lucas S. Bair, David L. Rogowski & Chris Neher (2016) Economic Value of Angling on the Colorado River at Lees Ferry: Using Secondary Data to Estimate the Influence of Seasonality, North American Journal of Fisheries Management, 36:6, 1229-1239, DOI:10.1080/02755947.2016.1204388; <http://dx.doi.org/10.1080/02755947.2016.1204388>

¹⁵ See University of Oklahoma (Hank C. Jenkins-Smith, Principal Investigator; Carol L. Silva, Co-Principal Investigator; Deven Carlson, Kuhika Gupta, Benjamin Jones, Joseph Ripberger, Wesley Wehde); University of New Mexico (Robert Berrens); Sept. 2016

the Secretary's decisions in the ROD. Unlike previous non-use valuation studies¹⁶ that were limited in their application to only a small subset of downstream resources, this study describes all resources considered in the LTEMP DEIS, including tribal communities. The study estimates the non-market, non-use values for an inclusive set of impacts that result from changing the operation of Glen Canyon Dam. To accomplish this, the research team developed an integrated, multi-stage protocol to identify the valued impacts and to estimate the balance of the negative and positive valuations of those impacts by a representative sample of the US public. *The study found that the median household value for retaining the current pattern of GCD operations would be nearly \$20 per year - amounting to approximately \$2.5 billion per year over all US households. This study is the best available science on the topic, and it is arbitrary and capricious for the FEIS and any ROD to rely on a less current and far more superficial study.*¹⁷

Sincerely,

Leslie James

Leslie James
Executive Director
ljr

Cc: Thomas Iseman, DOI
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¹⁶ *Ibid*, Bishop, et.al.

¹⁷ See Nehr, et al (2016) at FEIS 4-378; Appendix L.

ATTACHMENT A
INITIAL COMMENTS
TEMP FEIS-APPENDIX O
BIOLOGICAL ASSESSMENT

These comments reflect CREDA's initial comments on five topics that are included in FEIS Appendix O:

1. Stranding of humpback chub or razorback sucker
 2. Desiccation of benthic invertebrates
 3. Backwater habitat use and need
 4. Impact of steady flows on drift and nonnative fish reproduction
 5. Impact of high flow experiments on aquatic food base
-

1. Stranding of young humpback chub or razorback sucker during daily hydropower operations at Glen Canyon Dam (GCD) is not proven, and unlikely because:

- Grand Canyon is essentially like a pipe transmitting water from Lake Powell to Lake Mead. As a narrow canyon, it naturally has few backwaters or shallow areas and the vast majority of backwaters drain completely as flows decrease. Of the few backwaters, there are even fewer that form isolated ponds after flows ebb to trap fish.
- Downramp rates since implementation of MLFF have been no greater than 1,500 cfs/hour which is about 6-8 inches drop in stage elevation over an hour, depending on location. Proposed new downramp rates of 2,500 cfs/hour would mean about 12 inches drop over an hour. Both these drops in stage elevation are sufficiently slow to allow any fish within the vast majority of backwaters to return to the river's mainstem.
- Previous stranding work below GCD Dam has demonstrated negligible stranding of fish under current fluctuating flows. Minor trout mortalities were shown only in a couple isolated pools during summer high temperatures but none during winter conditions.
- Trout management flows would artificially encourage small fish to reside in shallow, near shore areas and then suddenly reduce the flow in an attempt to strand fish. This is not a pattern consistent with daily hydropower operations.
- Five years of work by Pine et al. in the Near Shore Ecology (NSE) studies on the Colorado River below the Little Colorado River confluence determined that "flow type did not affect habitat selection or daily movements (of young humpback)" and "survival (of young humpback) was similar between flow treatments."
- The Nagrodski work cited in the BA as the basis for predicting stranding of humpback chub and razorback suckers inventoried a variety of hydropower facilities. This reference is not appropriate for assessing what could happen at GCD because Colorado River fish are uniquely adapted to survive in highly variable flow conditions. As the work in the NSE study has shown, these fish are quite capable of managing to grow and prosper under the meagre stage changes seen each day under current fluctuating flows.

2. Desiccation of benthic invertebrates during daily GCD operations is not proven; these operations are likely not the reason for the absence of invertebrates below GCD because:

- Six other tailwaters on the Colorado River (Navajo, Libby, Ennis, Kerr, Flaming Gorge and Fontenelle) studied for impacts showed 25-40% EPT richness; however, GCD's tailwaters showed 0% richness (BLM/USU National Aquatic Monitoring Center (BugLab)).

- The other tailwaters studied had similar EPT richness as Grand Canyon tributaries (i.e. Havasu, Shinumo, Bright Angel) and Cataract Canyon on the Colorado (20-55%).
- Recent and ongoing research on the river bottom below GCD by Dr. Larry Stevens indicates anoxic conditions, in the narrow water boundary layer between bottom muds, gravels and rocks, may be a cause for a lack of insect production.
- Preliminary work on tributary inflows by Dr. Larry Stevens looking at what he terms the Hofknecht transition at Tapeats Creek in Grand Canyon noted that aquatic insect diversity and abundance declined in Grand Canyon tributaries as they transition to areas influenced by the mainstem. Hofknecht found there is still a decline in diversity and abundance in the transition from the tributary to the mainstem which indicates there is something else going on with foodbase in Grand Canyon besides flow fluctuations and egg desiccation.
- Some insects lay eggs over open water while others lay eggs near shore; yet, none of the open water forms that would be unaffected by fluctuating flows are successfully reproducing below GCD.
- During fluctuating flows, eggs lain when flows are low, even if in smaller numbers than eggs lain during high flows, would not become desiccated; yet, despite this opportunity, no successful reproduction is occurring.
- It is too early to conclude that the reason we do not see insect production below Glen Canyon Dam is due to desiccation under fluctuating flows. The Ted Kennedy work has prompted additional research and this is raising many new and interesting questions about causes-and-effects and should delay any decision to alter flow regimes, i.e. instituting “bug flows.”

3. The effect of daily GCD hydropower operations on backwater habitat used by humpback chub and razorback sucker is not critical to their growth, reproduction and survival because:

- Backwater habitats are rare in Grand Canyon as would be expected in this deep, narrow canyon environment, as describe in the NSE research.
- According to the NSE research, juvenile humpback abundance was highest in talus and lowest in backwaters.
- Although young humpback positively selected backwaters, due to the lack of these habitats the fish survive and rear without requiring them. Obviously, if humpback were dependent on backwaters to rear their young, the chub would likely have been extirpated long ago due to lack of these habitats in Grand Canyon.

4. The effect of steady flows on drift and nonnative fish reproduction would be detrimental to humpback chub and razorback sucker because:

- The Lees Ferry reach is the only consistently clear section of the river below GCD. As a result, this section is capable of producing an autochthonous (in stream) food source to supply the entire river whereas increasing turbidity downstream reduces the possibility of food production.
- Fluctuating flows are known to produce more drifting food than what occurs under steady flows, as each change in flows dislodges some invertebrates and algae from the Lees Ferry reach that move downstream with the flow downstream.
- Both humpback and razorback downstream utilize the drift as a primary source of food.
- A reduction in drift would jeopardize humpback and razorback growth, reproduction and, ultimately, their survival.

- Steady flows and low summer flows are both intended to enhance temperatures and the production of invertebrates; yet, any benefits to humpback chub and razorback sucker from these flows would likely be more than offset by a decline in drift, a critical food supply.
- In addition to a reduction in drift, low summer flows could lead to a proliferation of warm water nonnative reproduction. For example, green sunfish reproduction on shallow shorelines could increase and occur throughout the canyon if low summer flows are instituted in lieu of fluctuating flows.

5. High flow experiments (HFEs) scour the river bottom and remove large quantities of the food base. This has lasting effects on food supplies for trout and humpback chub because:

- Critical components of the foodbase, including primary producers, like the alga Cladophora and scud Gammarus, take many months to return to pre-HFE levels.
- During the extensive period after an HFE until the food base recovers from scouring, competition for food among fish intensifies resulting in a loss of body condition and possible death.

ATTACHMENT B
LTEMP EIS – UTILITY COOPERATING AGENCY PROPOSAL – 8/31/16

As currently described, the Preferred Alternative *further* restricts the Glen Canyon Dam hydropower resource beyond the No Action Alternative. This was a further reduction in usable capacity of approximately one-third as a result of the 1996 Record of Decision. These losses of hydropower are not mitigation requirements of the Endangered Species Act.

This new proposed loss of hydropower capacity is not consistent with the Administration’s initiatives related to climate change, climate resilience, and the deployment of renewable energy, such as the President’s Climate Action Plan, the recent Presidential Memorandum entitled Building National Capabilities for Long-Term Drought Resilience, and the accompanying federal action plan on drought, and the August 2 Council on Environmental Quality NEPA climate change guidance¹⁸. Glen Canyon hydropower also provides critical redundancies for the Western power grid. These losses of additional hydropower capacity reduce the availability and benefit of this critical redundancy.

The UCAs request that Interior include in the EIS, Science Plan, and/or ROD, additional experiments that could help ensure that generation at the Glen Canyon Dam is “**maintain[ed] (or/and) improve[d]**,” as required by the Purpose and Need Statement of the LTEMP EIS (76 FR 129, July 6, 2011).

Test Hydropower Improvement Flows as Described in Alternative B¹⁹ in the First 5 Years of the Plan, during *low volume years* (8.23MAF and below): *Maximum daily flow: 25,000 cfs (Dec.– Feb., Jun.–Aug.); 20,000 cfs (Sep.–Nov.); 15,000 cfs (Mar.–May). Minimum daily flow all months: 5,000 cfs. Ramp rate up and down: 5,000 cfs/hr.*

This experiment is required and will provide data regarding the relationship between hydropower operations and other resources.

Test the Daily Fluctuation Range as Described in Alternative E²⁰ in the First 5 Years of the Plan: *Equal to 12 x monthly volume (in kaf) in Jun.–Aug., and 10 x monthly volume (in kaf) in other months.*

This experiment tests hypotheses related to the benefit of slightly greater fluctuations to the endangered humpback chub and other native fish.

Considering Frequency and Duration, the Total Number of HFEs in a 12-Month Period Not to Increase Air Emissions Above 25,000 Metric Tons. Produce Written Evaluation of Resource Impacts after 10 Years. *This is consistent with climate change and carbon reduction policies, while still including HFEs to benefit sediment. This is a compromise among Alternatives A, B, C, E and the evaluation is consistent with the HFE Protocol.*

This experiment and evaluation are necessary to study resource impacts and test the hypotheses that the biological impacts of consecutive HFEs are negative (e.g. to food base, scouring, HBC), and that a lower frequency and duration will result in less air emissions and less impact to recreation, fishing, tribal and hydropower resources.

The UCAs’ proposed experiments have already been modeled for the EIS and will not require additional NEPA analysis.

¹⁸ Available at: <https://www.whitehouse.gov/the-press-office/2013/06/25/fact-sheet-president-obama-s-climateaction-plan>
<https://www.whitehouse.gov/the-press-office/2016/03/21/presidential-memorandum-buildingnational-capabilities-long-term-drought>
https://www.whitehouse.gov/sites/default/files/docs/drought_resilience_action_plan_2016_final.pdf
https://www.whitehouse.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf

¹⁹ Source key: http://ltempeis.anl.gov/documents/docs/LTEMP_Alternatives_Matrix_Feb2016.pdf

²⁰ Ibid.