



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

August 15, 2023

Bureau of Reclamation
Attn: Post-2026
Mail Stop 84-55000,
P.O. Box 25007,
Denver, CO 80225
crbpost2026@usbr.gov

Cc: The Bureau of Reclamation CRinterimops@usbr.gov; cnra-saltonsea@resources.ca.gov;
Karla Nemeth, Director of the California Department of Water Resources
lea.garrison@water.ca.gov (assistant for Karla Nemeth).

Joaquin Esquivel, Chair of the California State Water Resources Control Board
joaquin.esquivel@waterboards.ca.gov;

James Newcomb, SSMP Lead for Long-Range Planning and Asst. Dep. Dir., California Dept. of
Water Resources. James.Newcomb@water.ca.gov;

Vivien Maisonneuve, SSMP Lead for the California Department of Water Resources
Vivien.Maisonneuve@water.ca.gov;

Tonya Marshall, Salton Sea Program Manager, California Department of Fish and Wildlife.
tonya.marshall@wildlife.ca.gov

Christopher Harris, Executive Director, Colorado River Board of California.
csharris@crb.ca.gov ;

Wade Crowfoot, Secretary for California Natural Resources Agency secretary@resources.ca.gov

Governor Gavin Newsom gavin@gavinnewsom.com;

Yana Garcia, Secretary for Environmental Protection Yana.Garcia@calEPA.ca.gov;
SectyGarcia@calEPA.ca.gov;

David Hochschild - chair of the California Energy Commission
David.Hochschild@Energy.ca.gov;

J. Andrew McAllister, California Energy Commission. Andrew.McAllister@Energy.ca.gov;

Kourtney Vaccaro, California Energy Commission.
Ollie.Awolowo@Energy.ca.gov; - Administrative assistant.

California Attorney General Rob Bonta info@oag.ca.gov;

Eduardo Garcia, Assemblymember, AssemblyMember.EduardoGarcia@assembly.ca.gov;



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Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

Raul Ruiz, M.D. Congressman (Shayra Hernandez, Director at Office of Congressman Raul Ruiz,
Shayra.Hernandez@mail.house.gov;

Col. Julie Balten, commander of the U.S. Army Corps of Engineers Los Angeles District
sally.m.desimone@usace.army.mil; - administrative assistant
DeSimone, Sally M CIV USARMY CESPL (USA).

Brig. Gen. Antoinette Gant, Commander, South Pacific Division.
(nancy.e.allen@usace.army.mil; honey.e.nixon@usace.army.mil;
Public Affairs representatives)

Thomas Tortez Jr., Tribal Chairman, Torres Martinez (Desert Cahuilla Indians)
Thomas.Tortez@torresmartinez-nsn.gov;

Assemblymember Eloise Gomez Reyes, Majority Leader, 50th Assembly District,
Assemblymember.Reyes@assembly.ca.gov; (Marina Espinoza, Legislative Director,
Marina.Espinoza@asm.ca.gov).

Miguel Hernández, Public Affairs Officer, California Natural Resources Agency,
Salton Sea Management Program, Miguel.Hernandez@resources.ca.gov;

Patty.Monahan@Energy.ca.gov; Michelle.Sinclair@calEPA.ca.gov ;
CRB-info@usbr.gov (Bureau of Reclamation);

J.B. Hamby, Chair, Colorado River Board of California. Commissioner of the Bureau of
Reclamation jbhamby@iid.com.

Steve Padilla, California State Senator, District 18. Senator.Padilla@Senate.ca.gov.

Alex Padilla, U.S. Senator for California Senator_Padilla@senate.gov.

Deb Haaland, U.S. Secretary of the Interior (Doug Hendrix dhendrix@usbr.gov)

Dianne Feinstein, U.S. Senator for California (Paige_Dolby@feinstein.senate.gov)

Tanya Trujillo, Assistant Secretary for Water and Science, U.S. Department of Interior.
ttrujillo@crb.ca.gov.

Tracy Stone-Manning - Director of the Bureau of Land Management (apautz@BLM.gov
Secretary for BLM Director); CESPL-Imperial-Streams-Salton-Sea@usace.army.mil;
kenos@iplawusa.com;

Subject: Comment in response to the Bureau of Reclamation, Interior - “request for comments” regarding “Post-2026 Operation” – Nikola Lakic

To the Bureau of Reclamation:



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I am thankful for the opportunity to comment in response to the Bureau of Reclamation / Department of the Interior - “request for comments” regarding “Post-2026 Operation”.

Although the request for comments is aimed for the Development of Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead, I respectfully urge the Department of the Interior / Bureau of Reclamation to include the Salton Sea in consideration for the Development of Post-2026 Operational Guidelines and Strategies.

Including the Salton Sea for the Development of Post-2026 Operational Guidelines and Strategies is very important issue because the Salton Sea is part of the Colorado River Basen and is facing incoming environmental disaster with toxic dust storms with serious consequences to the public health, and economy in general.

Another important reason for needed involvement of the Department of the Interior - Bureau of Reclamation, is because there is an obvious noticeable disconnect between - higher officials (Governor, Secretaries of California Natural Resources Agency (CNRA), California Environmental Protection Agency (CalEPA), California Energy Commission) that enforces the fundamental policies of the State - and several local agencies that promotes their own policy that leads towards smaller, saltier, smellier and more polluted Lake - which means destruction of the Salton Sea - that contradicts the State and Federal policies.

By the way, the ‘current course of action’ which is the ‘Perimeter/Brine Lake” with related dust suppression projects recently renamed to the “In-basin long-range plan” is based on false assumption that importation of the seawater is not a feasible concept. That false assumption was/is based on several old studies done by people without architectural background or creativity. No intend to insult anyone ... but that is just hard reality. Finding a solution to a complex problem such as the Salton Sea requires architectural expertise and creativity.

Randomly appointing an agency or a person to find a solution to a difficult problem, especially if such an agency or a person has no necessary expertise, is the wrong approach to solving a very serious problem. That was/is a problem of the current grave situation of the Salton Sea.

Each of the mentioned Lakes is in a different location (situation) and has different conditions and each Lake requires serious study to find the right solution.



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Because I studied the situation of the Salton Sea for many years and have found the solution (See Segment 5.0 below), I will use this opportunity and elaborate further below only about the Salton Sea.

1.0 INTRODUCTION

Since I respectfully urge the members of the Bureau of Reclamation / Department of the Interior to include the Salton Sea in consideration for the Development of Post-2026 Operational Guidelines and Strategies, it is important that members are informed about unnormal situation and the reason that stagnate the process of the restoration of the Salton Sea.

Although the information presented in this letter is related to my case, it is helpful for understanding the whole situation and the wrongdoing (scam) that has been going on for quite a few years. Since I am directly involved in this case and have firsthand experience for 10 years, of which an average person (outsider) has no such experience and information, it is my moral and legal obligation to expose wrongdoings. I am using the word “scam” reluctantly, but it is appropriately used in this case because the current grave situation is intentionally created. I will elaborate on it furthermore.

Without going into details about the history of the Salton Sea – here is in short – The Salton Sea is a dying Lake. The Lake was accidentally formed between 1905 – 1907 when one berm (dike) burst near the border with Arizona, California, and Mexico, and water from the Colorado River surged and filled a depression that is about 85 meters below sea level stabilizing water level at about 70 meters (220 feet) below sea level. The Salton Sea is in a desert about 200 miles from the Gulf of California (Sea of Cortez) in the south and about 200 miles from the Pacific Ocean in the northwest. In the 1950s and 60s, the Lake was a recreational center and tourist attraction. Now, the Lake is saltier by 50% than the Ocean. Because of drought and the implementation of the Quantification Settlement Agreement (QSA), the Lake is shrinking, and an ecological disaster is inevitable with tremendous consequences to the environment, the health of the population, and the economy with enormous liabilities to the State.

1.1 An overview of the current course of action:

The “current course of action” consists of two main projects (concepts in development or consideration) that are in serious conflict. Those two projects are not coexistent (synchronized):

- a)** Extraction of lithium from geothermal brine that is based on a smaller Lake that has exposed lakebed (playa) and requires related dust suppression projects, and



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b) Restoration of the Salton Sea that is based on the importation of seawater.

Those two concepts are in conflict because there is no logical explanation for continuing with a smaller Lake that would have 200 square miles of the exposed lakebed (playa) and related expensive dust suppression projects that are doomed to fail because there is no water to support such dust suppression projects, and at the same time talking about importing seawater that would flood those dust suppression projects. Also, there is no logical explanation for continuing with a smaller Lake and related dust suppression projects and having (achieved soon) importation of seawater.

1.2 The Problem of the situation:

The Imperial Irrigation District (IID) owns the most land in the southern part of the Salton Sea and promotes and supports the Smaller Lake concept so that they (IID) can use exposed lakebed (playa) for leasing their land to companies for harnessing geothermal energy, which is prevalent in the area, and for the cultivation of new land to be used for agriculture. There is also in the area a known geothermal reservoir with brine that can be used for the extraction of lithium.

Two companies “Tetra-Tech”, and “Pacific Institute” are consulting companies for the State of California and are also under the strong influence of the IID and SSA.

1.3 After a request for information (RFI) for the restoration of the Salton Sea by the State through the California Natural Resource Agency (CNRA) in 2017, there have been 11 proposals submitted by the deadline on March 9, 2018. Presentations were made on May 21, 2018. According to the letter (memorandum) from Mr. Bruce Wilcox, Assistant Secretary for the CNRA, - the SSMP Long Range Planning Committee reviewed my proposal, along with ten (10) other submittals. The SSMP Long Range Planning Committee and the Evaluation group (of which names and their expertise was not disclosed) did not find my submittal to be a clear description of a proposed course of action. Here is the link to that letter (Memorandum):

<https://drive.google.com/file/d/1L6hDCm6H0WAEJzoDtHNVKFsgfN05iRrO/view?usp=sharing>.

1.3.1 **NOTE:** Please visit Segment 3.0, in which I included numerous links to important correspondence that includes additional important information including my response to Mr. Bruce Wilcox letter above. My response (11 pages) to Mr. Bruce Wilcox’s letter is under subsegment (3.5). Here is the link too:

<https://drive.google.com/file/d/1ZCKncH0DjO834opjXmCZSKbjX27JE7a/view?usp=sharing>.



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1.4 In the 2021 the re-examination of the 11 initial proposals has been initiated by the State, rightfully so, and with the assistance of the California University of Santa Cruz (CUSC) had been formed the Panel of independent reviewers and was chaired by Dr. Rominder Suri and the principal investigator Professor Dr. Brant Haddad. The authors of the initial 11 proposals had an opportunity to update their original proposals if needed. Also was an opportunity for new proposals if there are. An additional 7 new proposals were submitted by the deadline of October 12, 2021. Since the authors of each proposal believe that its design is the best and needs to be implemented, the main purpose of the Panel was/is to evaluate all proposals and select the best one that is feasible, economical, and most beneficiary to the restoration of the Salton Sea, environment, and nearby communities.

1.5 In October 20-22, 2021, the CUSC Panel offered all participants a short vide presentation, about 30 minutes each, with additional Q and A segment. Here is the link to my presentation (video) in front of CUSC Panel: [Geothermal Worldwide Zoom.mp4 - Google Drive](#). (About an hour (52:02). Please watch this short presentation. Optional link: https://drive.google.com/file/d/1aFacKaq-jppZuNF-00v88mYAiNa3vUAk/view?usp=drive_link.

My proposal contains a substantial material that includes – an architectural plan, a system for the importation of seawater, a system for harnessing hydro power, a system for harnessing solar energy, a system for harnessing geothermal energy, a system for drilling deeper and wider wellbores, a system for generating surfing waves, recreational parks, and fisheries. Although I needed several hours for all five segments presentation, I was pleased with the opportunity and my presentation summarizing it in less than hour. For more information of my proposal (all five segments), please visit Segment 5.0.

I have commented about CUSC Panel's respond furthermore in the Segment 3.0 where are included letters with links to my correspondence with the UCSC Panel, especially, my letter (62 pages) to Honorable Wade Crowfoot, Secretary for California Natural Resources Agency, on December 30, 2022. Here is the link:

https://drive.google.com/file/d/1wzN6xylytehWJu0Nz_wZFkTtAi9mYC-S/view?usp=sharing.

The letter to Honorable Wade Crowfoot, Secretary for CNRA has a substantial amount of information including my correspondence with the Panel of independent reviewers. Also, have the links to a recorded meeting in which principal investigator Professor Dr. Brant Haddad explained the reasons for not reviewing my proposal (See page 14 out of 62). Please read it. It is unbelievable.

It is important to say that, unfortunately, besides a good effort of some people working towards saving and restoring the Salton Sea, there is also a group of



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influential people – most of the members of the Salton Sea Authority (SSA), Imperial Irrigation District (IID), Coachella Valley Water District (CVWD), Tetra-Tech, Pacific Institute, Imperial County, Riverside County, and CNRA - California Department of Water Resources / Salton Sea Management Program (SSMP) that work systematically towards just the opposite - getting rid of the Salton Sea for the pitiful interest of the IID. The IID is a public agency that owns land at the southern part of the Lake (lakebed and nearby areas) and plans to lease it to be used for farmland and/or geothermal power plants that includes extraction of lithium from the known geothermal reservoir in the area. I am aware that it is hard for an average person (outsider/observer) to believe that such conduct is in process, but my accusation is based on my personal experience. It is documented, and it is an unfortunate reality that needs to be dealt with and confronted. I have commented about it in numerous public comments of which some are included in Segment 3.0. Please read it.

The group of influential people, which are members of agencies mentioned above, openly promote, and support the “current course of action” which is the concept of a “Smaller, *Sustainable* Lake” also called the “Perimeter/Brine Lake” or recently renamed to “In-Basin Solution” or “In-basin long-range plan”. The concept was designed by the leading engineers from Tetra-Tech, although all mentioned agencies are taking credit for their suggestions and contributions. The Perimeter/Brine Lake has been accepted and approved by several agencies in 2016. Here is the link to the report:

[Microsoft Word - SS Benchmark 7 5-11-16 \(saltonseaaauthority.org\).](#)

1.6 The most vocal members of the group that support the “current course of action” and have been openly against the concept of the importation of seawater are:

Mr. Ryan E. Kelley, Director at SSA and Supervisor of District 4 at Imperial County, also was co-Chair at Blue Ribbon Commission.

Mr. Patrick O’Dowd, Executive Director and GM of SSA, and Director at CVWD.

Mr. Manuel Perez, Director at SSA and Supervisor of District 4 in Riverside County.

Mr. Jeff Geraci, Sr. Environmental Scientist, California Water Boards;

Mr. Roy Sujoy, Engineer, at Tetra-Tech which is a consulting company to the State of California.

Mr. William R. Brownlie, Chief Engineer at Tetra-Tech.

Mr. Michael Cohen, from Pacific Institute, which is also a consulting company to the State; and

Mr. James Newcomb, SSMP Lead for Long-Range Planning and Asst. Dep. Dir., California Dept. of Water Resources.

In this document, hereinafter, I will refer to them as “**GROUP**” or “**them**”, or “**their**” or “**they**”.



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1.6.1 **NOTE:** I would like to clarify that I do have nothing personally against any member of the 'GROUP' ... I shake hands and spoke with most of them they seem to be nice people ... but I strongly disagree with 'their' view of how the Salton Sea should look like in the future and with 'their' manipulative tactic.

1.7 The 'group's tactic is playing the role of authority, being ignorant, and avoiding direct answers as much as possible. Also, "they" are counting on evading individual accountability by hiding behind "crowd psychology" and "plausible deniability". I have elaborated on their mission and their documented statements against the importation of seawater.

Furthermore, "they" strongly oppose the importation of seawater concept which is the key factor for the feasible solution for the restoration of the Salton Sea. "They" promote the nonsensical concept of the 'Perimeter/Brine Lake' recently renamed to 'In-basin long-range plan' which leads to smaller, saltier, smellier, and more polluted Lake that would accelerate (speed up) an incoming ecological disaster with tremendous consequences to the Salton Sea, the environment, the health of the nearby population, the wildlife, and the economy in general. Unfortunately, "they", despite my numerous presentations and several in their offices, still do not understand that the 'current course of action' is a drive in the 'wrong direction'. Possibly "their" tactic includes some other intent that might surface later. That remains to be seen.

2.0 **STATEMENT**

I respectfully urge the Department of the Interior / Bureau of Reclamation to include the Salton Sea in consideration for the Development of Post-2026 Operational Guidelines and Strategies.

In support of my accusation about disconnect between higher officials and local agencies mentioned in previous segment, I will elaborate here on that because it is a relevant issue and because my accusations are reinforced with the information from an official special report.

Although I have pointed out in many public comments about the disconnect and wrongdoing of a group of influential people, "group" at this time, I will elaborate shortly on a special report that recently came to my attention, prepared for policymakers and stakeholders by the UNIVERSITY OF CALIFORNIA RIVERSIDE SALTON SEA TASK FORCE Sponsored by the EDGE Institute and the Center for Science to Policy published on July 2021. Titled "CRISIS AT THE SALTON SEA" subtitle: "The Vital Role of Science".



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2.1 Here is the link to the document:

https://www.saltonseataskforce.ucr.edu/files/ugd/0d73bf_f8133ee80a30473ca565ecab181e31a1.pdf. Please read it.

Although I commented once, shortly, on this report in my letter (5-pages) to (now deceased) Dr. Marilyn L. Fogel, Chair of the Salton Sea Task Force on July 30, 2020 (See Segment 3.0), I will comment again because it has a statement about the mismanagement and competition among federal, state, and local agencies which reinforces my assertions that I made in many of my written and oral comments.

Without analyzing point by point of each segment of the report, I am copy/paste a few essential points of the report and will comment on it.

Here is an excerpt from the Executive Summary of the report. (Underlining added).

2.2 The Vital Role of Science in a Successful Salton Sea Policy

The Salton Sea—a hypersaline, terminal lake in southern California—is in crisis. A combination of mismanagement and competition among federal, state, and local agencies has hindered efforts to address declining lake levels and unstable water chemistry. This delay has heightened the public health threat to regional communities as retreating shorelines expose dry lakebed - a source of potentially toxic dust - while aquatic ecosystems face collapse due to rising salinity and oxygen loss. Although state agencies are making efforts to mitigate the problems, the scientific assumptions informing current management practices are outdated or lacking entirely, making outcomes unpredictable at best.

THE ABSENCE OF AN ADAPTIVE, SCIENCE-BASED approach to addressing the environmental and human health challenges at the Salton Sea prompted UC Riverside’s Environmental Dynamics and GeoEcology (EDGE) Institute and Science to Policy Center to launch an independent Salton Sea Task Force to identify critical scientific research necessary to guide policymakers in making decisions about the region’s future.

As an interdisciplinary group of scientists, engineers, medical experts, and economists, we considered three potential, realistic scenarios facing the Salton Sea over the coming decade: (1) ongoing decline, where lake levels continue to decrease without intervention, (2) stabilization, where enough water is directed to the Sea to slow the decline and potentially stabilize the lake at a level lower than it is today, and (3) recovery, where enough water is brought in from the ocean or local freshwater sources to stabilize, and possibly increase, lake levels.

Based on our expertise and first-hand research at the Salton Sea, we identified substantial challenges and opportunities in seven interconnected areas: water policy, watershed hydrology, water quality, air quality, ecology, human health, and geothermal resources. This report devotes a chapter to each of these areas of concern and provides specific suggestions for research tasks



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that would provide the necessary clarity to evaluate outcomes of current Salton Sea management policies and help make necessary adjustments moving forward.

Urgency PRAGMATIC URGENCY drives the research outlined in this report. We are keenly aware of the limited funding currently allocated for mitigation efforts at the Salton Sea, and we duly focused our scientific curiosity about this dynamic region through the lens of the two primary goals the state of California identifies in its current Salton Sea management plan: (1) improve air quality for the communities surrounding the Salton Sea and (2) provide critical environmental habitat for birds along the Pacific Flyway. Furthermore, we evaluated these goals using four criteria used commonly to determine the success or failure of a policy: effectiveness, efficiency, equity, and sustainability. (Underlining added). Please read the whole report.

2.2.1 **NOTE:** The report analyzes fairly the problems of the Salton Sea and clearly stated, rightfully so, the following: *“A combination of mismanagement and competition among federal, state, and local agencies has hindered efforts to address declining lake levels and unstable water chemistry”*.

2.2.2 **My Comment:** That is a truthful statement. Mismanagement among state and local agencies exists. In my numerous public comments, I pointed out the mismanagement of some local agencies, the lack of synchronization between state and local agency’s projects, and most importantly I criticized the process of continuing to spend time and money on projects that are doomed to fail and lack (not acceptance) of a master plan to follow. Also, I pointed out the manipulative conduct of some agencies to achieve their relatively small interest at the expense of the environment, the health of the nearby population, and the economy which contradicts the fundamental state and federal policies.

2.2.3 **NOTE:** The report also mentions recovery, where enough water is brought in from the ocean or local freshwater sources to stabilize, and possibly increase, lake levels.

2.2.4 **My Comment:** Although the report mentions, as a third option, the importation of seawater as a solution to recovery - to stabilize, and possibly increase lake water level. That is a simplified statement that has existed for the last 100 years. ‘How’ to do it is missing and that is an important factor. Just importing seawater would not solve the problem and would not be a long-term solution because pollution of the Salton Sea would continue with contaminated runoff waters with pesticides and fertilizers from nearby farmlands and partially treated sewer from Mexicali. Finding a solution that successfully deals with several very important issues such as - **a)** How to import seawater into the Salton Sea efficiently; **b)** How to import salty seawater into an already salty Lake and be profitable and environmentally friendly; **c)** How to provide huge wildlife sanctuaries with potable water from Colorado River and have filled Lake to the water level of the 1950s and 60s despite restricted inflow from the Colorado river;



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d) How to provide recreational parks with circulating lakes and fisheries with no additional water from Colorado River; How to desalinate the Salton Sea efficiently and in the process provide electricity, potable water, and salty brine that can be used for the production of lithium - is a job for someone who is creative and has a background in architecture, civil engineering, planning, mechanical engineering, etc. That is not the job of an environmental scientist, biologist, geologist, or agricultural scientist who has no background in designing anything.

No insult intended to anyone, but an environmental scientist, biologist, chemist, or geologist is not the best selection to judge or design an engineering project that could be considered a 'project of the century' that requires technical knowledge and/or expertise in mechanical engineering, civil engineering, and architecture (art) — in addition to being environmentally conscious. That was/is the problem in management — the lack of appropriate personnel and furthermore, the reason why we are in a current grave situation today.

For example, it would be highly inappropriate to select (allocate) a dentist to perform thorax surgery (heart bypass surgery) on a needed patient although that dentist might be a good man and a great dentist. I am sure that patients would not like such an arrangement either.

Again, no intent to insult anyone but that is a truthful statement and explains the reason behind the current problem and related mismanagement. Assigning the CNRA – Water Boards to find a solution for the dying Lake was a serious and expensive mistake. The CNRA – Water Board – SSMP failed to submit a feasible long-term solution for the restoration of the Salton Sea at the deadline on December 31, 2022, as required by Order WRO 2017-0134.

Therefore, the task of finding ('designing') a long-term solution by the CNRA – Water Board – SSMP was/is officially finished on December 31, 2022.

Here is the link to the SSMP report: [Salton-Sea-Long-Range-Plan-Public-Draft-Dec-2022.pdf \(ca.gov\)](#).

2.2.5 **NOTE:** The report identified substantial challenges and opportunities in seven interconnected areas: water policy, watershed hydrology, water quality, air quality, ecology, human health, and geothermal resources devoted chapters to each of these areas of concern and provides specific suggestions for research tasks that would provide the necessary clarity to evaluate outcomes of current Salton Sea management policies and help make necessary adjustments moving forward. In each of those devoted chapters, the report indicates that more money and study is needed, etc.



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2.2.6 My Comment: There is also a segment “SALTON SEA TASK FORCE — ASK THE EXPERTS” in which reputable experts explain the Water Policy, Watershed Hydrology, Water Quality, Air Quality, Ecology, Human Health, Geothermal Resources and suggest options for some improvements, monitoring. The report, although did identify substantial challenges, and indicated that more study is needed, the reputable members of the Salton Sea Task Force did not find the solution.

By the way, by the implementation of my architectural plan for the restoration of the Salton Sea, the mentioned challenges with water quality, air quality, ecology, human health, would be reduced or eliminated.

Also, at the bottom on page 23 of the report, it states the following: “*Recovery schemes that rely on imported water would take at least ten years to implement, so actions to mitigate human health hazards and ecological collapse must be made in the meantime*”.

NOTE: Such statements have been repeated frequently in the last dozen years that I am aware of. Such statements are an excuse for doing nothing productive and defending undefendable which is the ‘current course of action’. If my proposal was accepted in 2013 when I disclosed my concept or after my presentation on May 21, 2018, in El Centro, CA we would have by now functional Salton Sea with generated revenue at least of \$500,000,000 per year just from clean renewable energy – out of blue – literally.

3.0 LINKS TO SEVERAL OF RELEVANT CORRESPONDENCES:

I noticed that some links that I included in my previous letters are not functional. Therefore, I am including this chapter with google drive links. Please read it. It shows my struggle in the last 10 years to get the attention of people in charge and failure of the people in charge to respond, which reinforces my accusations.

3.1 Here is the link to the letter (62 pages) that I sent to **Honorable Wade Crowfoot**, Secretary for California Natural Resources Agency, on **December 30, 2022**, in response to the Salton Sea Independent Review Panel Summary Report published on or around September 29, 2022, and Request for its abolishment.

https://drive.google.com/file/d/1wzN6xylytehWJu0Nz_wZFkTtAi9mYC-S/view?usp=sharing.

This letter has a substantial amount of information including my correspondence with the Panel of independent reviewers. Also, have the links to a recorded meeting in which principal investigator Professor Dr. Brant Haddad explained the



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reasons for not reviewing my proposal (See page 14 out of 62). Please read it. It is unbelievable.

3.2 Here is the link to the letter (15 pages) that I sent in response to the “**Salton Sea Long Range Plan Public Draft**” prepared by the California Natural Resources Agency - SSMP Long-Range Plan on **March 10, 2023**.

<https://drive.google.com/file/d/19xYLJDAoiNUvbzziX1t-2oUJY-thLF8g/view?usp=sharing>.

In that letter, I pointed out the ridiculous projects of which they are proud of. I pointed out that using a faulty UCSC Panel Report leads to a ‘drive in the wrong direction’. I pointed out several very important facts. Please read it.

3.3 Here is the link to the letter (20 pages) that I sent to the **California Energy Commission** Docket Unite, MS-4 Docket No. 17-GRDA-01 on **July 11, 2023**, in Response to Pre-Solicitation Workshop conducted at San Diego State University (SDSU) - Imperial Valley Camus - in Calexico on June 27, 2023 – Nikola N. Lakic.

https://drive.google.com/file/d/1u2R6iTXjTH_QPYg_bTW0sGpAOMAqEYqa/view?usp=sharing

In that letter, I pointed out that the ‘current course of action’ is not synchronized. That many contractors are asking for funding for their individual projects which are not synchronized into a bigger project which is an architectural plan for the restoration of the Salton Sea. Also, I mentioned that a voice of unity is missing and the formation of a mechanism for dealing specifically with the Salton Sea is needed. Therefore, it is imperative that the architectural plan (my proposal) is accepted and then focuses on its implementation which includes many synchronized projects (hydro, solar, geothermal, desalinization, etc.). Also, I mentioned that my system for desalinization of the Salton Sea can be used in many different locations including our coasts.

3.4 Here is a link to Mr. **Bruce Wilcox’s letter** (memorandum) to me explaining the reasons for rejecting my proposal:

<https://drive.google.com/file/d/1L6hDCm6H0WAEJzoDtHNVKFsgfN05iRrO/view?usp=sharing>.



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

3.5 Here is the link to **my response** (11 pages) to **Bruce Wilcox's** memorandum explaining why he is wrong in rejecting my proposal which I sent to him on **October 12, 2018**. Please read it.

<https://drive.google.com/file/d/1ZCKncH0DjO834opjCxmCZSKbjX27JE7a/view?usp=sharing>.

3.6 Here is the link to the letter (20 pages) that I sent to the **California Energy Commission** Docket Unite, MS-4, Docket No. 17-GRDA-01 on **July 11, 2023**, in response to Pre-Solicitation Workshop conducted at San Diego State University (SDSU) - Imperial Valley Camus - in Calexico on June 27, 2023.

https://drive.google.com/file/d/1u2R6iTXjTH_QPYg_bTW0sGpAOMAqEYqa/view?usp=drive_link.

In that letter, I pointed out that the 'current course of action' is not synchronized. Many contractors are asking for funding for their individual projects which are not synchronized into a bigger project which is an architectural plan for the restoration of the Salton Sea. Therefore, it is imperative that the architectural plan (my proposal) is accepted and then focuses on its implementation which includes many synchronized projects (hydro, solar, geothermal, desalinization, etc.).

I also mentioned that my system for desalinization of the Salton Sea can be used in many different locations including our coasts.

Also, I have respectfully proposed that after my proposal is thoroughly reviewed and hopefully accepted, to be formed a special counsel or Committee/Commission (mechanism) from the members of the CNRA, EPA, CEC, and several relevant agencies and stakeholders to deal strictly with the implementation of the project for the restoration of the Salton Sea until its completion in 5-6 years. After its completion, the Committee can be abolished or reduced to overseeing maintenance issues and alike.

3.7 Here is the link to the letter (18 pages) that I sent to the **State Water Resources Control Board** on **July 28, 2023**, in response to the Draft Desalination Siting and Streamlining Report to Expedite Permitting.

https://drive.google.com/file/d/14TUXunA12gfkJWydGUMZUiGs55bql2tw/view?usp=drive_link.

In that letter, I pointed out that the 'current course of action' is not synchronized. Many contractors are asking for funding for their individual projects which are not synchronized into a bigger project which is an architectural plan for the restoration of the Salton Sea. Therefore, it is imperative that the architectural plan (my proposal) is accepted and then focuses on its implementation which



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

includes many synchronized projects (hydro, solar, geothermal, desalinization, etc.).

It is important to mention that my system for desalinization of the Salton Sea can be used in many different locations including our coasts.

In my comment, I have respectfully proposed that after my proposal is thoroughly reviewed and hopefully accepted, to be formed a special counsel or Committee/Commission (mechanism) from the members of the CNRA, EPA, CEC, and several relevant agencies and stakeholders to deals strictly with the implementation of the project for the restoration of the Salton Sea until its completion in 5-6 years. After its completion, the Committee can be abolished or reduced to overseeing maintenance issues and alike.

3.8 Here is the link to the letter (18 pages) that I sent to the **Environmental Justice** (EJ) Action Grants which I sent on **July 28, 2023**.

https://drive.google.com/file/d/1P6141RA6OVY-jn8PbOXqBOMxMBQdqDD8/view?usp=drive_link.

In that letter, as in the letter to the State Water Resources Control Board above, that I sent the same day, I pointed out that the 'current course of action' is not synchronized. Many contractors are asking for funding for their individual projects which are not synchronized into a bigger project which is an architectural plan for the restoration of the Salton Sea. Therefore, it is imperative that the architectural plan (my proposal) is accepted and then focuses on its implementation which includes many synchronized projects (hydro, solar, geothermal, desalinization, etc.).

It is important to mention that my system for desalinization of the Salton Sea can be used in many different locations including our coasts.

In the letter, I elaborated on a recent meeting (video) in which a representative of Controlled Thermal Resources, Mr. Jim Turner COO, insinuated about shrinking the Salton Sea as a positive development.

In my comment, I have respectfully proposed that after my proposal is thoroughly reviewed and hopefully accepted and formed a special counsel or Committee/Commission (mechanism) from the members of the CNRA, EPA, CEC, and several relevant agencies and stakeholders to deals strictly with the implementation of the project for the restoration of the Salton Sea until its completion in 5-6 years. After its completion, the Committee can be abolished or reduced to overseeing maintenance issues and alike.



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

3.9 Here is the link to the letter to **Dr. Marilyn L. Fogel**, Chair of the Salton Sea Task Force (5-pages) – **July 30, 2020**.
https://drive.google.com/file/d/1HqMpHx9gVTIr5cjQhV9QZLbWU_C7wtyy/view?usp=sharing. In that letter, I have summarized problems and a solution. Please read it.

3.10 Here is the link to the letter to the **Salton Sea Task Force Members** (6 pages) – **September 7, 2022**.
https://drive.google.com/file/d/1HizXsctbKWLnh_PPGa_Mmp6N1I5SlqYp/view?usp=sharing.

In that letter, I have summarized problems and a solution. Please read it.

3.11 Here is the link to the letter (7 pages) that I sent on January 25, 2023, to the Salton Sea Long-Range Plan Review California Natural Resources Agency in response to the "Salton Sea Long Range Plan Public Draft" prepared by the California Natural Resources Agency - SSMP Long-Range Plan.
<https://drive.google.com/file/d/1AltUljibJUCSS5IsetQyUsyNARRFhALI/view?usp=sharing>.

In the letter, I urge the California Natural Resources Agency not to use the UCSC Panel's report as a reference because it is a fraudulent report. Please read it.

3.12 Here is the link to the letter (36 pages) that I sent on **June 6, 2023**, to the **U.S. Army Corps of Engineers** in response to the State Water Board Salton Sea Workshop and Public Meetings for the Imperial Streams Salton Sea and Tributaries Feasibility Study conducted on May 18, 2023.
<https://drive.google.com/file/d/13iey9OWKNkKDP7h9ATrjALHs1iEFe2TW/view?usp=sharing>.

In the letter, I urged the U.S. Army Corps of Engineers to study my proposal thoroughly and not succumb to the pressure of a group of influential people from several local agencies who openly talks about getting rid of the Salton Sea.

3.13 Here is the link to the letter (6 pages) that I wrote to Secretary **John Laird**, Natural Resource Agency on **September 7 (12), 2016**, asking him to consider terminating Memorandum of Understanding (MOU) before September 30, 2016, which was signed on August 31, 2016, based on new information that has been presented neither to the Secretary, Sally Jewell, DOI nor to him nor to Deputy Secretary Michael L. Connor, prior or during signing the MOA agreement.



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

<https://drive.google.com/file/d/1RSoHljbyrnqDwPLSupwXnJZFdJ4EWPgn/view?usp=sharing>.

3.14 Here is the link to the letter (8 pages) that I wrote to Secretary **John Laird**, Natural Resource Agency on **June 6, 2017**, asking him to inform Governor Brown about the existence of my proposal.

<https://drive.google.com/file/d/1jH-qLL6VobdyfhGD0LyDsQ-z6KzW3LrZ/view?usp=sharing>.

3.15 Here is the link to the letter (16 pages) that I wrote to **California Regional Water Quality Control Board** - Colorado River Basin Region - c/o Maria Davydova in response to “2020 Triennial Review Proposal” on **May 26, 2020**.

<https://drive.google.com/file/d/1VmMBH03qiRsHnNSqWsTfNWSbXnezPGYK/view?usp=sharing>.

In that letter, I let them know about my proposal and pointed out my struggle to get their attention. I included several notes that I read at SSA Board meeting. Also, I told them that it is difficult to come to any other conclusion but that there is a group of influential people who would like to get rid of the Salton Sea for their relatively small interest and that they are working very hard in achieving their goal through the “current course of action”.

3.16 Here is the link to the letter (13 pages) that I wrote to the CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD COLORADO RIVER BASIN REGION in response to the Notice of opportunity for the “**Public Comment**” regarding the water quality control plan for the Colorado River Basin Region on **October 21, 2020**.

https://drive.google.com/file/d/1iSfU_RcNRADIYiGwTuXvW6ZHDt9L92jg/view?usp=sharing.

In that letter, as in previous ones, I reminded them about the existence of my proposal and what it does and about the paragraph on their website reinforcing my statement: “The Water Quality Control Plan for the Colorado River Basin (Basin Plan) is designed to preserve and enhance water quality in the Region and to protect the beneficial uses of all regional waters for the benefit of present and future generations”.

3.17 Here is the link to the letter (6 pages) that I sent on **September 23, 2022**, to the **Lithium Valley Commission** convened by the California Energy



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

Commission (CEC) to review, investigate, and analyze eight specific topics relating to lithium extraction meetings and facilitated by the U.S. Army Corps of Engineers.

https://drive.google.com/file/d/1g-5ZVt-M9L_tGlmb2F7pN8iFI4Zeobzo/view?usp=sharing.

In that letter, I wrote that my proposal does not interfere with the extraction of lithium from geothermal brine if there is a dike built around the desired area for the extraction of lithium. In fact, my proposal unites those two contradictory projects (a) and (b) successfully and provides the needed water for the extraction of lithium which obviously with the current plan (or lack of plan) is lacking.

Knowing that the Chair of the Lithium Valley Commission was Silvia Paz a close associate of Michael Cohen from Pacific Institute who is a strong opponent of the importation of seawater and that the co-Chair was Ryan E. Kelley also a strong opponent of the importation of seawater, it is understandable why I have not been invited to make presentation to the Lithium Valley Commission despite my frequent offers.

3.18 Here is the link to the letter (12 pages) that I wrote to **California Natural Resources Agency** / Salton Sea Management Program (SSMP) in response to the “Community Input Sought for SSMP Projects”, on **September 29, 2020**.

https://drive.google.com/file/d/1kb-YN-siYd4iwcS7iast2nS6fmzy_5sj/view?usp=sharing.

In that letter, I strongly oppose the “Current Course of Action” which is the “Perimeter Lake” and related dust suppression projects because those projects are based on the false assumption that importing seawater is not a feasible concept and contributes to incoming ecological disaster. I pointed out that I watched several of their workshops (presentations) and that I watched the recent hearing “FEDERAL AND STATE EFFORTS TO RESTORE THE SALTON SEA” televised on September 24, 2020, and criticized their acceptance of the destruction of the Salton Sea.

3.19 Here is the link to the letter (7 pages) that I sent on **January 25, 2023**, to the **Salton Sea Long-Range Plan Review** - California Natural Resources Agency as a Public Comment in response to the “Salton Sea Long Range Plan Public Draft” prepared by the California Natural Resources Agency - SSMP Long-Range Plan.

https://drive.google.com/file/d/1AltUljibJUCSS5IsetQyUyNARRFhALI/view?usp=drive_link.



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

In the letter, I have pointed out that the “current course of action” for the restoration of the Salton Sea is a “drive in the wrong direction”. I pointed out the facts and urged CNRA – SSMP to stop “driving in the wrong direction”.

4.0 LINKS TO SEVERAL RELEVANT OFFICIAL DOCUMENTS:

The State and Federal policies are clear in supporting initiatives towards a clean environment, clean air, clean water, resiliency to climate change, reducing greenhouse gas emissions, improving public health, clean renewable energy, and strengthening the economy.

Unfortunately, many documents related to the restoration of the Salton Sea have questionable provisions that indicates the limitation of the water to the Salton Sea as a given factor and planting on an exposed lakebed which is correlated with the concept of the ‘Perimeter/Brine Lake’ and therefore exclusion of the importation of seawater and restoration of the Salton Sea.

In this segment I have included the links, to be handy, to several documents that are relevant to the environment and the restoration of the Salton Sea.

Without analyzing each document - provision by provision - let it be known that all provisions that indicates mediating exposed lakebed of the shrinking Lake are questionable, and very possible initiated and crafted by member(s) of the ‘GROUP’ because it correlates with the concept of the ‘Perimeter/Brine Lake’ and therefore exclusion of the importation of seawater and restoration of the Salton Sea which contradicts initial intend (purpose) of the documents and fundamental policy of the State and Federal government.

- 4.1 The State Water Resources Control Board (Water Board) Order WR 2002-0013 (Order), Condition 26 of the Order requires the California Natural Resources Agency (CNRA) to issue a long-term plan no later than December 31, 2022. The Plan must be consistent with the requirements of the Order and the Salton Sea Restoration Act (Act) (Fish and Game Code § 2930, et seq.), including the statutory restoration objectives set forth in Fish and Game Code Section 2931, subdivision (c).
- 4.2 The State Water Resources Control Board Order WR 2017-0134 is relevant to the restoration of the Salton Sea and subsequently to clean air, clean water, and clean energy.
- 4.3 The [State Water Resources Control Board](#) (State Water Board) and the nine Regional Water Quality Control Boards (Regional Water Boards) - collectively



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

known as the [California Water Boards](#) - are dedicated to a single vision: abundant clean water for human uses and environmental protection to sustain California's future.

4.4 Under the federal [Clean Water Act \(CWA\)](#) and the state's pioneering [Porter-Cologne Water Quality Control Act](#), the State and Regional Water Boards have regulatory responsibility for protecting the water quality of nearly 1.6 million acres of lakes, 1.3 million acres of bays and estuaries, 211,000 miles of rivers and streams, and about 1,100 miles of exquisite California coastline.

4.5 The Panel of Independent Reviewers (Panel) was formed by the University of California, Santa Cruz (UCSC) in 2021 on the initiative of the State (California Natural Resource Agency (CNRA) – DWR to evaluate 11 original proposals for the restoration of the Salton Sea which have been submitted in March 2018 after a Request for Information (RFI) by the State - California Natural Resources Agency (CNRA) in 2017. The long-term plan for the Salton Sea restoration is mandated by State Water Resources Control Board (SWRCB) Water Right Order (WRO) 2017-0134.

4.5.1 **NOTE:** The UCSC Panel was convened as part of Agreement # 4600014042 between the State of California's Salton Sea Management Program (SSMP) and the University of California, Santa Cruz (Brent Haddad, Ph.D., PI). Completed in September 2022. For clarification – The concepts collected by the SSMP or advice by the “experts” from Tetra-Tech or Pacific Institute do not represent policies of the State of California. They are just advices and, in this case, “wrongful advice” because policy of state of California is clear in supporting initiatives towards a clean environment, clean air, clean water, resiliency to climate change, clean renewable energy, protection of the health of the population, and economy.

4.6 The Blue-Ribbon Commission on Lithium Extraction in California (Blue Ribbon Commission, or Commission), also known as the Lithium Valley Commission, was established pursuant to Assembly Bill 1657 (AB 1657, E. Garcia, Chapter 271, Statutes of 2020). The Commission was established and convened by the California Energy Commission (CEC) to review, investigate, and analyze eight specific topics relating to lithium extraction (also referred to as lithium recovery) in California and submit a report to the Legislature documenting its findings and any recommendations developed after conducting the required review and analyses. The Report of the Blue Ribbon Commission on Lithium Extraction in California (Report) was announced by the Blue Ribbon Commission at its November 17, 2022, meeting.

4.7 In addition to Order WR 2002-0013 and related WRO 2017-0134, I am also referring as a violation to several relevant Executive Orders: N-10-19, California



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

Executive Order B-10-11 - orders that executive-level state agencies and departments communicate and consult with California Indian Tribes for input on policies that impact Tribal communities.

4.7.1 **NOTE:** Tribal communities would suffer the most if the “current course of action” that promotes “In-land Solution” is not abolished. Tribal communities did not have a chance to see nor review my proposal from which they would benefit because my proposal was systematically suppressed therefore violating Executive Orders: N-10-19 and Executive Order B-10-11.

4.8 SENATE BILL NO. 701 [Bill Text - SB-701 Salton Sea Obligations Act of 2018. \(ca.gov\)](#) Introduced by Senator Hueso (Principal coauthor: Assembly Member Eduardo Garcia) February 17, 2017. An act to add Division 45 (commencing with Section 75500) to the Public Resources Code, relating to the Salton Sea, by providing the funds necessary therefor through an election for the issuance and sale of bonds of the State of California and for the handling and disposition of those funds, and declaring the urgency thereof, to take effect immediately.

4.8.1 **NOTE:** The SB-701 is full of contradicting provisions. Basically, the Senate Bill (SB-701) starts by explaining the situation of the Salton Sea and surrounding area and desperate need for something to be done. But then have provisions initiating a concept of smaller Lake and dust suppression projects which have nothing to do with restoration of the Salton Sea.

4.9 [Executive Order S-3-05](#), coordinates California’s statewide climate efforts. The CAT comprised of 22 state agency members, develops, evaluates, and implements climate change emission reduction strategies in accordance with the California Global Warming Solutions Act of 2006.

4.9.1 **NOTE:** The “current course of action” regarding the “restoration” of the Salton Sea leads to smaller, saltier, smellier, and more polluted Lake, therefore violating the Executive Order S-3-05.

4.10 Executive Order 14008 – Tackling the Climate Crisis at Home and Abroad – promotes agency actions to accelerate clean energy development in an environmentally, economically, and socially responsible manner. This includes advancing environmental justice through programs and policies that alleviate disproportionate negative human, environmental, and economic impacts on underserved communities.

4.10.1 **NOTE:** The “In-land Solution” or “Perimeter/Brine Lake” is just the opposite of tackling the Climate Crisis. It leads to a smaller, saltier, smellier, and more polluted Lake, therefore violating Executive Order 14008.



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

4.11 AB 617 and AB 32 by designing and executing projects that build capacity in communities through supporting community-based organizations' and community members' participation in the Community Air Protection Program.

4.11.1 **NOTE:** As a community member, I have provided an architectural plan that prevents incoming ecological disaster and provides the restoration of the Salton Sea with clean environment, clean air, clean water, etc. Unfortunately, my architectural plan has been intentionally ignored since 2013 by some state officials therefore violating AB 617 and AB 32.

5.0 **A few words about MY WORK and the PROPOSAL for the RESTORATION of the SALTON SEA:**

My proposal for the restoration of the Salton Sea – terminal Lake in California - involves an architectural plan which incorporates several breakthrough technologies in the energy industry which I have invented and modified to incorporate local conditions of the Salton Sea area with the final product – the self-sustained long-term solution for the restoration of the Salton Sea. It might be considered a project of the century costing only about \$15 billion and generating at least \$500,000,000 in revenue per year just from clean renewable energy – in addition to revenue from other activities including tourism.

Here I will just summarize the subjects of my breakthrough methodologies:

- I am the inventor of the new system for harnessing geothermal energy (a completely closed-loop system) which is not limited to geothermal reservoirs.
- I am also the inventor of the new system for drilling deeper and wider wellbores.
- I am also the inventor of the new system for harnessing solar energy (thermo-optical solar system) having the “power unit” with pistons, which is at least several times more efficient than Photo Voltaic (PV) systems.
- I am also the inventor of the new system of cross-country pipelines for importing seawater or other fluids, having the “in-line pump” as segments of the pipeline for uphill routes, and having the “in-line generator” as segments of the pipeline for downhill routes with the “Delta Power Plant” at the last section.
- I am also the inventor of the new system for using the pipeline as a foundation for solar panels which eliminates expenses for purchasing or



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

leasing huge sections of land, which is an expensive requirement for conventional solar facilities on an industrial scale. My system decentralizes the conventional centralized systems.

- I am also the inventor of the new system for the desalinization of salty water using solar and/or geothermal energy to generate electricity and having potable water as a free byproduct, and concentrated brine to be used to produce Lithium.
- After the accident offshore of Louisiana in the Gulf of Mexico on April 20, 2010, and a failure of the "Blow Out Preventer" (BOP) in the Macondo well, it became a challenge how to stop uncontrollable bursts of crude oil in the Gulf of Mexico and prevent disasters of epic proportions. Out of over 3,000 proposals and many universities and laboratories participating, my proposal for controlling dysfunctional "Blow out Preventer" was used to stop uncontrollable bursts of crude oil. By July 15, 2010, the Macondo well was successfully sealed, if only temporarily, for the first time in 87 days. That was only 34 days after my submission. The implementation of the control valve on top of the dysfunctional BOP was televised on CNN.
- I graduated from the School of Architecture, University Cyril and Methodius, Skopje, North Macedonia, in 1982, and immigrated to the United States in 1983, as a student at the Frank Lloyd Wright School of Architecture, Taliesin West in Arizona, and Taliesin East in Wisconsin. The University Cyril and Methodius – School of Architecture - consists of nine semesters, around 38 exams, plus graduate work which takes an additional 5-6 months. I am proud to say that my graduate work scored 10 out of 10, which is rarely given.

My mission is global – which is licensing technologies worldwide to capable companies/contractors with means. The Salton Sea project is a small part of it, but it is an important part. It is imperative to save the Salton Sea and our environment despite unreasonable opposition. I am providing a solution and the "know-how" to the desperate situation.

Also, I am including links and a summary of my proposal for the restoration of the Salton Sea to where they are divided into five segments for easier understanding. Each of the segments (phases) is essential for the final product of the self-sustained Salton Sea.

On February 6-8, 2023, Stanford University hosted Geothermal Workshop (SGW 2023). I made three presentations at the SGW 2023. The subject of the SGW 2023 was 'Geothermal' and had limited time for presentations, therefore, I did not submit two papers about harnessing the solar and hydropower in more detail.



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

Here below are links to my papers from the Stanford Geothermal Workshop (SGW 2023) where I made three presentations on February 7, 2023, each lasting 30 minutes including Q & A. Although 90 minutes was a short time for a substantial material, I am thankful for such an opportunity. It is a summary of the larger material ... It is worth seeing it.

Papers - Segment (I) - Harnessing Energy and Water in the Salton Sea.

[Click here to see](#) or click the link below:

https://drive.google.com/file/d/1oowNJNodUNifT_Jg5byczZTKbm1z9glW/view?usp=sharing.

Papers – Segment (II) – Harnessing Geothermal Energy in the Salton Sea Area.

[Click here to see](#) or click the link below:

<https://drive.google.com/file/d/1W8Au4FTwwJf8NaBBxfFTDfub5golqLtv/view?usp=sharing>.

Papers – Segment (III) – System for Drilling Deeper and Wider Wellbores.

[Click here to see](#) or click the link below:

<https://drive.google.com/file/d/1BgS5RzXerJym0YGVajK7HFEyKbr-O3XL/view?usp=sharing>.

PowerPoint Presentation – Slides – are bigger files. I am including links to them below.

The slides are summaries of the papers and are easy to review after the papers are read. In the text of the papers, I referred to certain illustrations (See Fig. so and so), which are in a separate segment. In the PPT files, the illustrations are smaller, and on the right side of the slide, there is a short description (summary – power points).

I have included all files on my website www.GeothermalWorldwide.com => OUR TECHNOLOGY => Presentation at Stanford University.

PowerPoint Presentation – Slides – Segment (I) – Harnessing Energy and Water in the Salton Sea. Click the link below:

[PowerPoint Presentation – Slides – Segment \(I\) – Harnessing Energy and Water in the Salton Sea.](#)



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

PowerPoint Presentation - Slides - Segment (II) - Harnessing Geothermal Energy in the Salton Sea Area. Click the link below:

[PowerPoint Presentation – Slides - Segment \(II\) - Harnessing Geothermal Energy in the Salton Sea Area.](#)

PowerPoint Presentation - Slides - Segment (III) - System for Drilling Deeper and Wider Wellbores. Click the link below:

[PowerPoint Presentation - Slides - Segment \(III\) - System for Drilling Deeper and Wider Wellbores.](#)

For more information and for those two additional segments about harnessing **solar** and **hydropower** please visit the page [PRESENTATION AT EL CENTRO.](#) It is just above the link “Presentation at Stanford University”.

Here are all five links from my website to be handy. Here are Segments I-V.

The segment about Harnessing Hydro Power is presented here as Segment II.

The segment about Harnessing Solar Energy is presented here as Segment III.

The segment about Harnessing Geothermal Energy is presented here as Segment IV. And

The segment about System for Drilling Deeper and Wider Wellbores is presented here as Segment V.

Here are the links:

Harnessing Energy and Water in The Salton Sea (**Segment I**) (System for Importing Seawater). Here is the link:

[6+\(I\) Importing Seawater - May, 2019.pdf - Google Drive.](#)

or:

[https://drive.google.com/file/d/1PWZblnYIV2dHnFXQqVwZwV56P6rqPZHI/view?usp=sharing.](https://drive.google.com/file/d/1PWZblnYIV2dHnFXQqVwZwV56P6rqPZHI/view?usp=sharing)

Harnessing Energy and Water in The Salton Sea (**Segment II**) (Harnessing Hydro Power).

[https://drive.google.com/file/d/1wEoi3VNNscX6SkH7dWlrmNMZO7oRb5vu/view?usp=sharing.](https://drive.google.com/file/d/1wEoi3VNNscX6SkH7dWlrmNMZO7oRb5vu/view?usp=sharing)



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

Harnessing Energy and Water in the Salton Sea (**Segment. III**) (System for Harnessing Solar Energy).

https://drive.google.com/file/d/1ZLuZbt6RsLo3x19x2sKB_XVPjkJJuNwv/view?usp=sharing.

Harnessing Geothermal Energy with the Self Contained In-Ground Geothermal Generator and Self Contained In-Ground Geothermal Heat Exchanger (**Segment IV**) Harnessing Geothermal Energy in The Salton Sea Area.

https://drive.google.com/file/d/1wqRUgmib_Si-odYmWV8F5TILOL-U7R7I/view?usp=sharing.

Harnessing Energy and Water in The Salton Sea (**Segment V**) (System for Drilling Deeper and Wider Wellbores).

<https://drive.google.com/file/d/1Aig8tuELSdkvfFakK-SEMvyW-bUQd76r/view?usp=sharing>.

The architectural plan is a comprehensive design. In order to be understood it needs to be studied as a whole by people preferably with an engineering background. Also, it is an art.

5.1 The summary of the summary of the proposal:

The architectural plan successfully restores and refills the Salton Sea to the level of the 1950s and the '60s and reestablishes huge wildlife sanctuaries despite reduced inflow of water from the Colorado River.

By redirecting the New River and Alamo River back to Mexico before it gets polluted with fertilizers and pesticides, it provides an option for filling up the Laguna Salada – dry Lake in Mexico - and reestablishing flaw in the Gulf of California (Sea of Cortez). Everyone should love that. In return, through negotiation by the 'International Boundary and Water Commission' (IBWC) and their counterparts in Mexico, through a treaty to negotiate a corridor with a service road for a pipeline for importing seawater into the central section of the Salton Sea. Since such a solution is of great interest to us (USA) and to Mexico, the negotiation should not be a difficult task. We could exchange at least the same amount of water, although, through negotiation, we could have an opportunity to get 1,000,000 acre-feet of seawater and to keep a certain amount from the Colorado River. Also, it would be an opportunity to negotiate 100 years



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

deal with an option to renew the deal after 100 years. This solution would save us around \$100,000,000 per year that otherwise we would need to pay for importing 1,000,000 acre-feet of seawater. I elaborated on it in more detail in original papers submitted in 2018 following the Request for Information (RFI) issued by the State in 2017.

Also, it is important to mention, that I, as the author of the Architectural Plan and the inventor of a new system for the desalinization of salty water using geothermal and/or solar energy, should be included as a part of the team of the IBWC as a contributing consultant during a negotiation with Mexico because my presence would improve our leverage because by using my system (methodology) Mexico can provide potable water for nearby city Mexicali that desperately needs potable water and concentrated brine that can be used to produce lithium. Both elements are in demand. The same system that I am proposing for the Salton Sea.

Also, an essential part of my proposal is that by dividing the Salton Sea into three sections, we would need water from the Colorado River only for farmlands and for balancing the evaporation of the North Lake and South Lake. That is in harmony with the reduced inflow of water from the Colorado River as required by the Quantification Settlement Agreement (QSA) and possible additional reductions in the future because of drought.

Also, it is important to mention, that an essential factor of my proposal is utilizing a dike around the desired area allocated for the extraction of lithium to provide dry land and prevent destruction of the Salton Sea as would be the case with the current course of action.

Also, it is important to mention that the implementation of my proposal for the restoration of the Salton Sea would cost only about \$15,000,000,000. It can be completed in about 5-6 years and would generate at least \$500,000,000 in revenue per year - out of the blue – literally. The revenue numbers in my papers are conservative. A more realistic revenue estimate would be about \$1,000,000,000 per year. That is in addition to achieving a clean environment, a substantial amount of potable water, lithium, tourism, and other activities that generate revenue.

5.2 **NOTE:** Those who make policies need to understand that the Salton Sea situation is unique in the whole World. The depression of over - 220 feet below sea level is in a desert about 200 miles from both - the Gulf of California (San Felipe) and the Pacific Ocean (Long Beach). In the area, there is a prevalent geothermal source and many sunny days throughout the year.



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

Importing seawater and using those natural sources (geothermal and solar), as I explained in my proposal, the Salton Sea can and should become a hub to produce potable water that can be used in many applications. Although I have explained the function of the feasible concept with a pipeline diameter of 48", through which can be imported about 1,000,000 acre-feet of seawater from the Sea of Cortez and about 2,000,000 acre-feet from Long Beach, the system can be multiplied – something for future generations to do.

Think for a moment about the alternative – the current course of action – the disappearance of the Salton Sea – exposed lakebed (playa) – toxic dust storms, degrading environment, the health of the population, and economy.

This is a rare opportunity that should not be ignored as was the case in the last 10 years.

6.0 RECOMMENDATIONS

Because of obvious disconnect and wrongdoing of a group of influential people, (See Segment 1.0 - Subsegments 1.1 - An overview of the current course of action and 1.2 - The Problem of the situation), I am suggesting that the Department of Interior in cooperation with Bureau of Reclamation open an investigation of this case with cooperation with California State agencies CNRA, EPA, and CEC, based on provided verifiable evidence (information).

To speed up the investigation process and to clarify the situation, I am suggesting a simple following step – sending a request to all those key people who promote destruction of the Salton Sea and oppose the restoration of the Salton Sea, including all members of the CUSC Panel, to make a written statement explaining their position. Also, I am suggesting sending a request for short written comment to all consulting firms that have been involved in evaluation of any phase for the restoration of the Salton Sea including firm Kennedy Jenks and Kennedy Jank's sub-consultants to comment on my proposal even if it covers only their specialty – hydrology - importation of seawater. With a written answer "they" (all participants) would need to speak their mind individually and would not be able to hide anymore or transfer the blame on someone else.

At the same time my proposal for the restoration of the Salton Sea can be reviewed, separately by several universities, laboratories, and companies (preferably potential contractors / producers). That way negative influence, as it was with the UCSC Panel, can be minimized. The proper evaluation should not take more than one month.



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

Formation of a special body (commission) formed by members of Department of Interior, Bureau of Reclamation, CNRA, EPA, CEC, and DOE - a mechanism - to work specifically on the implementation of the architectural plan for the restoration of the Salton Sea – is needed.

Many companies such as AECOM, FLUOR, ORMAT, TENGDI MACHINERY, EQT, FUJI, GENERAL ELECTRIC, SIEMENS, ABB, MITSUBISHI, etc., to mention just a few, would be able to mass-produce and implement all proposed elements including the pipelines, new solar panels, geothermal power plants, etc. As the author of architectural plan and a new technology involved, I would be glad to help the selected contractors with additional information, several prototypes, and a final design.

By the way, the essence of my proposal for the restoration of the Salton Sea is an architectural plan that contains the solution and function. Presented technologies for harnessing hydropower, solar energy and geothermal energy are based on 'law of physics'... there is nothing mysterious about it. An average high school student can understand it after reading my proposal.

I would like to mention that regardless of the Salton Sea project, my patented systems can be used in many different applications such as the desalinization of seawater by using solar energy to produce electricity, potable water, and concentrated salty brine which can be frequently collected and used to produce lithium. The system can be used in many locations on east coast and west coast or for example Cabo San Lucas, etc., and any coastal cities that have many sunny days, seawater nearby, and are lacking potable water.

I am so confident in the validity of my concept for the restoration of the Salton Sea that I would welcome initiation of the contest in which all capable companies around the world could compete provided that all competing companies will respect the patent law.

After providing an overview of the situation the criteria for the contest should be very simple. Here is a sample:

- A)** Solution must be viable and technically sound for the importation of seawater whether from the Sea of Cortez or the Pacific Ocean or both.
- B)** Solution must be viable in stopping pollution of the Salton Sea.
- C)** Solution must be viable in respecting the Quantification Settlement Agreement (QSA) because of the limited inflow from the Colorado River.



- D)** Solution must be viable in providing wildlife sanctuaries.
- E)** Solution must be viable in reducing the salinity of the Salton Sea.
- F)** Solution must be viable in providing conditions for tourism and other activities to benefit the local population, employment, and economy.
- G)** Solution must be viable in harmonizing existing projects for the extraction of lithium from the geothermal brine and the restoration of the Salton Sea which includes the importation of seawater.
- H)** Solution must be economically viable having a positive ratio of cost expense for the project and revenue generated from the project.
- I)** If there are several proposals having similar but different parts or technologies, then, they should be evaluated by comparison on each difference including cost, feasibility, efficiency, and revenue generated.

7.0 IN CLOSING

The restoration of the Salton Sea is of enormous importance not just for the local population but for the environment and the State of California and United States of America. We have already lost a lot of time and money unnecessarily - just because of the incompetence of a few officials.

After the obvious 'collapse' of the UCSC Panel of independent reviewers (by losing their impartiality) the appropriate way forward would be that the honorable top officials of the State and Federal governments initiate the speedy evaluation of my proposal with the new team of professionals that have the necessary expertise in all issues involved and that are independent with a 'backbone'.

7.1 A few Additional Information:

I am very disappointed that I had to fight (argue) for 10 years (since 2013) trying to convince members of the SSA and some state officials about the existence of my proposal that would provide a clean environment, a substantial amount of potable water, and revenue of at least \$500,000,000 per year just from clean renewable energy. The arrogance and ignorance continue despite my numerous letters and several presentations.

This should be a simple case if the situation was/is normal. An appropriate person with adequate knowledge on the subject at the level of Assistant



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

Secretary for the CNRA that works closely with Secretary Wade Crowfoot and subsequently with Governor Gavin Newsom should be able to see the situation, recognize and separate faulty and “wishful thinking” proposals from solid ones, and inform the higher official about it and proceed in the right direction towards the fulfillment of fundamental State’s policy (not IID’s policy) towards the restoration of the Salton Sea.

Unfortunately, that was not the case. We (the society/community) lost precious time and money, unnecessarily, and still are losing because ‘they’ are continuing to ‘drive in the wrong direction’. Several State’s agencies are involved in ignoring my comments which makes this case more difficult to resolve.

The State policy is clear in supporting initiatives towards a clean environment, clean air, clean water, resiliency to climate change, reducing greenhouse gas emissions, improving public health, clean renewable energy, and strengthening the economy. (See Segment 4.0 “Links to Several Relevant Official Documents”).

The violation of the State policy, by a relatively small group of influential people that are working (are spread) in several agencies, is also clear by promoting projects that lead to smaller, saltier, smellier, and more polluted Lake.

The State Water Resources Control Board Order WR 2002-0013 and related WRO 2017-0134 are full of contradictive provisions and loopholes that its creator(s) inserted (especially with revisions - provisions) to achieve legal destruction of the Salton Sea and make California State Government pay for it. I would not be surprised if those questionable provisions were initiated and carefully crafted by members of the ‘GROUP’. That was/is manipulative conduct ... it is a scam in process. (See Segment 4.0 - “Links to Several Relevant Official Documents”).

I am positive that my proposal for the restoration of the Salton Sea will be accepted and implemented whether it will be during the current leadership or the next one, or during our generation of future generations. How do I know that? Because money talks. Only fools can proceed with projects that are doomed to fail and accelerate (speed up) an incoming ecological disaster and rejects the proposal that can provide a clean environment, a substantial amount of potable water in the desert, and generate revenue in billions of dollars per year.

I am doing my best to save and restore the Salton Sea. My work is well documented. The “genie is out of the bottle”. There are several steps that I must follow at this time, but there is always an option to file a motion in court and request temporally “Injunctive Relief” until reputable experts, that are not corrupted, can evaluate my proposal and compare it with the messy situation that ‘GROUP’ created.



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

Because there is an indication that some people are in process of ‘borrowing’ some elements of my proposal, I am hoping that the Department of the Interior / Bureau of Reclamation and USACE will respect the patent law and priority dates.

7.2 A few Additional Information regarding potential Investigation:

The mismanagement, competition, and disconnect among federal, state, and local agencies is obvious. There is a limit to what I can do alone in this situation other than expose wrongdoing and provide a solution for the restoration of the Salton Sea. Therefore, I respectfully urge the DEPARTMENT OF THE INTERIOR / Bureau of Reclamation, as higher authority, to get engaged in solving the problem of the Salton Sea relevant to mismanagement, competition, disconnect among federal, state, and local agencies.

In preparation for this letter - “request for comments” regarding “Post-2026 Operation” – In search for one document (information), I tried to access the page with 11 original proposals submitted on March 2018 in response to Request for Information (RFI) by the CNRA in 2017 and I stumble on the following page: Here is the link to the page and content:
[2021 Salton Sea Water Importation Proposals – Salton Sea Management Program \(ca.gov\)](#).

2021 Salton Sea Water Importation Proposals

Proposals Submitted by:

Agess Inc ([zip](#))
Cordoba Corporation Inc ([zip](#))
E2Eden LLC ([zip](#))
Geothermal Worldwide Inc ([zip](#))
Global Premier Development Inc ([pdf](#))
Jeff B Geraci ([zip](#))
New Water Group LLC ([pdf](#))
Online Land Planning LLC ([zip](#))
Quantum Consultations ([zip](#))
Sephton Water Technology Inc ([zip](#))
Transoceanic LLC ([zip](#))
Water Train Inc ([zip](#))



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

To my surprise, I was not able to access 11 original proposals including my own – third from the top (Geothermal Worldwide, Inc.).

When I click on “zip”, I am getting following message:

“This shared file or folder link has been removed or is unavailable to you.”

A simple question arises: Why the proposals for the importation of seawater are not easily accessible?

If transparency and objectivity are guidelines in this important and expensive process, then should not be any secrecy about proposals for the restoration of the Salton Sea. During, the initial presentations of all (11) proposals in the initial presentations in El Centro on May 21, 2018, the most of those competing proposals (their authors) talked about the canal and tried to please (now deceased) Mr. Bruce Wilcox (present at the room at that time) with smaller Perimeter Lake, so that efforts up to 2018 would not be lost. Again, here is the link for the recording of that meeting:

http://imperial.granicus.com/MediaPlayer.php?view_id=2&clip_id=1274

Also, it is important to mention that contacting Kennedy Jenks company was after UCSC Panel supposedly reviewed my proposal and have seen my presentation in front of the UCSC Panel on October 22, 2021.

Again, here is the link: [Geothermal Worldwide Zoom.mp4 - Google Drive](#). (It is about an hour (52:02). Please watch this short presentation.

It is mindboggling that the UCSC Panel, after seeing my short presentation succumbed to the pressure of a few leaders of those several local agencies (SSA, IID, Water Boards – SSMP, Tetra-Tech and Pacific Institute) who promote the destruction of the Salton Sea (smaller, saltier, smellier, and more polluted Lake) and excluded my proposal from further evaluation of the proposals for the restoration of the Salton Sea based on two fatal flaws. (See my letter (62 pages) that I sent to Honorable Wade Crowfoot, Secretary for California Natural Resources Agency, on December 30, 2022, in response to the Salton Sea Independent Review Panel Summary Report published on or around September 29, 2022, and Request for its abolishment. Here is the link: https://drive.google.com/file/d/1wzN6xylytehWJu0Nz_wZFkTtAi9mYC-S/view?usp=sharing. (Specifically on this subject see page 10, Chapter 2.5 - Table 3-3: Fatal Flaw Criteria).

Here is the link to the website that contains videos of three meetings of the UCSC Panel.



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

[Water Importation Independent Review Panel – Salton Sea Management Program \(ca.gov\).](#)

Please watch all three videos. It reinforces my assertions of how incompetent the CUSC Panel (represented by principal investigator Professor Dr. Brant Haddad) was/is. He was not able to give a straight answer on numerous simple questions. His answers are extended, vague, and transparent about faultiness of the process for which the State paid \$2.500,000.

Video: Independent Review Panel Summary Report Evaluation of Water Importation Concepts for Long-Term Salton Sea Restoration (September 2022). It is about two hours (1:56:10). Here is the report too: [Summary Report 9-29-22 Final \(ucsc.edu\).](#)

Video: Independent Review Panel Fatal Flaw Report Public Meeting – July 20, 2021. It is about 2 hours (2:02:08).

Video: Independent Review Panel Screening Report Public Meeting – April 11, 2021. It is about 2 hours (1:52:50)

I elaborated on that in more detail in my extended letter (62 pages) to **Honorable Wade Crowfoot**, Secretary for California Natural Resources Agency, which I sent on December 30, 2022. Here again is the link to the letter: [https://drive.google.com/file/d/1wzN6xylytehWJu0Nz_wZFkTtAi9mYC-S/view?usp=sharing.](https://drive.google.com/file/d/1wzN6xylytehWJu0Nz_wZFkTtAi9mYC-S/view?usp=sharing)

All information provided reinforces my accusation about systematic ignorance of my proposal by several influential people in several local agencies for their pitiful benefits and loyalty to each other.

I would like to hear directly from the Kennedy Jenks company, in writing, or preferably through taped conversation (cross-examination) if they did review my proposal and what they think specifically about my proposal even if the scope of conversation is just limited to their specialty of importation of seawater?

7.3 **NOTE:** It is very important that a zoom recording of all (11+7) presentations in front of the UCSC Panel on or around October 22, 2021, be released. There is no logical reason, in this case, to withhold the recorded presentation of 18 participants. If there is proprietary issue involved for certain technology such as desalination etc., then those details could be blocked. The essence of the concepts was the concept.

Disclosing the Zoom presentations (videos) of all proposals (11 original from 2018 and 7 additional) is important because it summarizes each presentation in about 30 minutes so whoever reviews the presentations can see in a relatively



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

short period of time which proposal makes sense and which does not make sense. That would also shed some light on the faultiness of the process of evaluation and how we lost a whole year and \$2,500,000 for the evaluation of 18 proposals. By the way, the evaluation process of 18 proposals should not take more than a week or two.

Refusal by the University of California Santa Cruz (UCSC) Panel to review my proposal using ridiculous criteria is inappropriate and highly irresponsible especially after charging \$2.5 million for their 'faulty service' and losing (stagnating) two years and billion dollars in potential revenue for the communities.

Manipulative conducts, corruption, ego, prestige, personal interest, and special interest must be taken out of the equation when dealing with important issues such as the restoration of the Salton Sea, the clean environment, the health of the population, and economy that future generations depend on.

7.4 **NOTE:** I remember around 30 years ago, watching news showing dozen reputable "experts" answering the reporter's question: "*Is nicotine addictive*"?

All of them, looking straight in the camera, answered separately: "*No nicotine is not addictive*". I always wondered - how much money each of the 'experts' received from tabaco companies to say knowingly untruthful statement.

7.5 **NOTE:** I would like to use this opportunity to mention for the record a possible cause of the current unpleasant situation. The truth is that architectural fees, which are an essential part of any project, are determined between 5-10-12% based on the value of the project. In this case that is a substantial amount of money. Tetra-Tech and their supporters know that very well because they have charged the State for their 'designing fees' for 20 years. That might explain why they wanted me out of the picture. Stealing concept of such magnitude - peace by peace – with time being no factor is an option for them, but that is not an easy task especially having overwhelming evidence against them.

To reduce the lent of this letter and repetitions, I included separate Segment 3.0 with numerous links to important letters that I wrote to State, Federal, and local officials. I respectfully urge members of the Department of the Interior – Bureau of Reclamation to, beside main request to include the Salton Sea in consideration for the Development of Post-2026 Operational Guidelines and Strategies, to read all links and consider it as an essential part and evidence of this letter.

Again, I respectfully urge members of the Bureau of Reclamation – Department of the Interior to include the Salton Sea in consideration for the Development of



Geothermal Worldwide, Inc.,
78-365 Hwy 111, #402, La Quinta, CA 92201,

Email: nlakic@GeothermalWorldwide.com
Ph: 760-347-1609

Post-2026 Operational Guidelines and Strategies. Because the federal government is a major stakeholder in this important case, and because of emergency and obvious wrongdoing of local agencies, I respectfully urge members of the Bureau of Reclamation / Department of the Interior to organize speedy evaluation of my proposal. That can be done in a month with appropriate experts that will hopefully not succumb to pressure from anyone as was the case with the UCSC Panel. Also, opening an investigation would be a proper step. Countability matters otherwise the same wrongdoing will continue with tremendous consequences and liabilities - unnecessarily.

I hope that the honorable top officials from the Department of the Interior / Bureau of Reclamation, USACE, CNRA, EPA, and CEC will conduct its task fairly and will not engage (participate) in any illegal conduct. That would save us (the people) precious time and money.

I would be glad to answer any questions.

Sincerely,

Nikola N. Lakic

Graduate Engineer Architect / Inventor
Geothermal Worldwide, Inc.
78-365 Hwy 111, #402
La Quinta, CA 92253
01-760-347-1609
01-760-333-3851 cell
www.GeothermalWorldwide.com
nlakic@Geothermalworldwide.com





August 15, 2023

Via Electronic Delivery
Bureau of Reclamation
crbpost2026@usbr.gov

Re: The Bureau of Reclamation's request for comments on the Colorado River Post 2026 Operations.

Dear Bureau of Reclamation,

Thank you for the opportunity to publicly comment on the Colorado River Post 2026 Operations. We offer the following comments for your consideration.

By way of background, the Getches-Wilkinson Center is a research and policy center housed within the Colorado School of Law dedicated to natural resource, water, and energy issues. The center was founded in 2013 to expand upon the 30-year legacy of Colorado Law's Natural Resources Law Center's focus of engaging in collaborative natural resource management. Our mission focuses on the sustainability of the Western United States and this comment allows us to highlight an unpublicized issue that will likely impact the hydrology of the entire Colorado River Basin.

Colorado, unlike a majority of western states within the basin, allows for conditional water rights. Conditional water rights are those water rights which have been judicially decreed by the court but have never been put to beneficial use by the owner. Owners of these conditional rights are often allowed by water courts in Colorado to repeatedly extend the deadline to perfect their conditional rights thanks to the low bar they must meet to show they are "diligently" working to put their right to a beneficial use. On top of low standards, the water courts in Colorado are hesitant to cancel conditional water rights for economic infeasibility despite having anti-speculation laws on the books.

One industry, in particular, has taken advantage of these weak rules to hold onto conditional rights for decades. The old saying goes, "Oil shale is the next big thing, and it always will be." Oil shale companies in Colorado, with the blessing of the state water courts, have been repeatedly extending the deadline to perfect conditional rights, in some cases, for nearly 70 years. The main issue here is not how old some of these rights are, but the sheer volume of water associated with these rights.

A study conducted by Western Resource Advocates in 2009¹ found that nearly two-million acre-feet of water was being held in a conditional status by oil shale production companies (greater than the entitlement owed to Mexico)². If all of these rights begin diverting water, it will be an issue for Colorado, and potentially the entire Colorado River Basin. Conditional water rights could greatly

¹ Lawrence J. MacDonnell, Water on the Rocks: Oil Shale Water Rights in Colorado, Western Resource Advocates, (2009), at 50-54, https://westernresourceadvocates.org/wp-content/uploads/dlm_uploads/2015/05/wotrreport.pdf (last visited Aug. 14, 2023).

² T.S. No. 994.

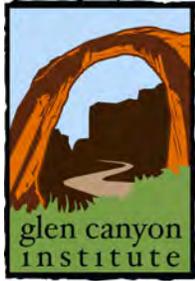
complicate the ability of Colorado to adhere to its allotment and meet its obligations under the Colorado River Compact.

We encourage the Bureau to discuss the issue of conditional water rights with Colorado to understand how Colorado is planning for the potential that those rights could be put to beneficial use in the years to come. We also suggest that the NEPA analysis for the post-2026 operating guidelines should clearly disclose this issue and describe how it has been addressed in the alternatives and analysis of environmental impacts.

Thank you very much for your time and consideration of these comments. Please feel free to contact me if you have any questions or concerns.

Sincerely,

Andrew Teegarden
Water Law Fellow
Getches-Wilkinson Center for Natural Resources, Energy, and the Environment
Colorado School of Law



Eric Balken
Glen Canyon Institute
3090 East 3300 South, Suite 400
Salt Lake City, UT 84109

August 15th, 2023

Comments on Proposed Development of Post 2026 Colorado River Operational Strategies
Sent via email to crbpost2026@usbr.gov

Dear Bureau of Reclamation:

Thank you for the opportunity to comment on the scoping of the Post-2026 Colorado River Reservoir Operational Strategies for Lake Powell and Lake Mead.

1. Introduction

The fate of the entire Colorado River system is in a drastic state of uncertainty. While the circumstances we face as a basin are unprecedented, they are not unpredicted. The scientific and water user community has long acknowledged that the Colorado River is over allocated, and that consumption/demand has outstripped supply for most of the past two decades¹. Furthermore, the deleterious effects of climate change have compounded this supply/demand imbalance, with numerous studies expounding the impacts of a warming basin and modeling future scenarios². Every climate study that has been done on the Colorado River Basin predicts there will be less runoff in the years to come. Leading climate scientists Jonathan Overpeck and Brad Udall have stated that “Half of the flow of the Colorado River may be lost due to climate change by mid-century.”

Even after the biggest snowpack and runoff in over a decade, which yielded 170% average runoff into Lake Powell, the reservoir stands at a mere 40% full³. The combined storage of Powell and Mead this summer was 36% full or 17.5 million acre feet⁴—which isn't even enough

¹ <http://www.inkstain.net/fleck/2022/08/how-we-got-into-this-mess-on-the-colorado-river/>

² https://scholar.colorado.edu/concern/parent/8w32r663z/file_sets/ng451j49n

³ https://www.usbr.gov/uc/water/hydrodata/reservoir_data/site_map.html

⁴ Colorado River Post 2026 EIS Webinar, BOR, 2023

to fill Lake Mead to 70% full. It's clear that even after a historically wet year, the system's decline is far from averted. Now is the time for actively addressing alternatives that can provide options for water managers while protecting environmental resources.

Changing Hydrologic Conditions

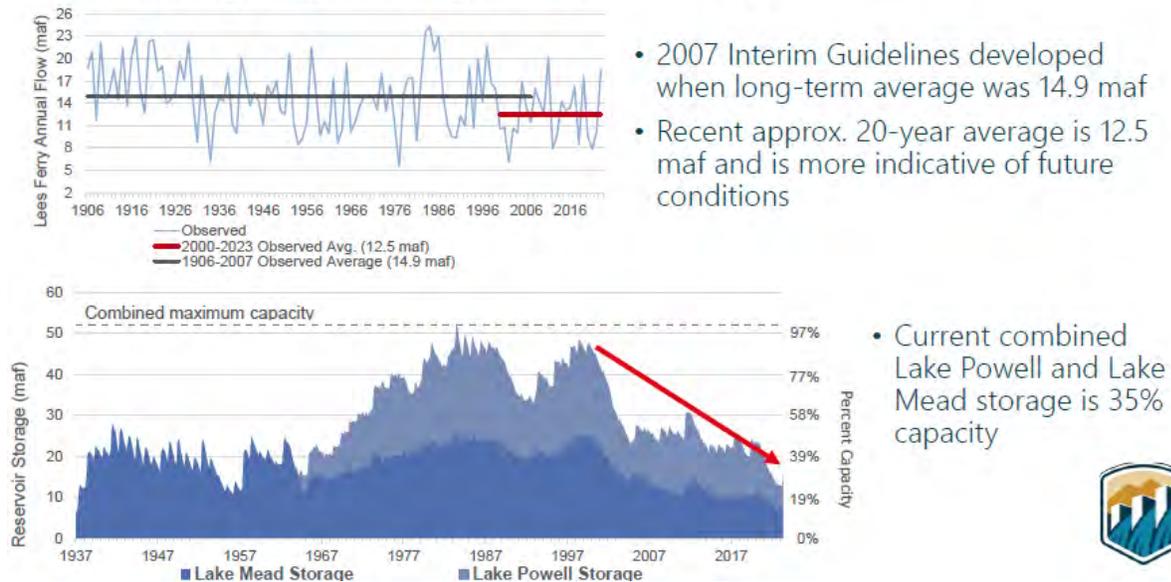


Figure from Colorado River Post-2026 Webinar, BOR 2023

In 2022, the prospect of Lake Powell dropping below minimum power pool within 1-2 years entered the realm of possibility, based on Reclamation's August 24-month study⁵, even with the extensive efforts to prop up the reservoir in 2021 and 2022⁶. While the tremendous water year of 2023 has boosted water storage at Powell by approximately 4.3 million acre feet⁷, we must not forget how close we came to reaching that threshold, and how likely it is to happen again given long-term climate models. The Post 2026 Operational Guidelines process provides an opportunity for Reclamation to lead the States forward with options that are based on science-based risk assessments.

The Post-2026 NOI states that the new guidelines, "must be capable of both withstanding a broad range of future hydrologic and operating conditions and minimizing system vulnerability." This requires all parties to look at both hydrologic and operational risk and to develop operational guidelines that provide both flexibility and a balancing of all demands on the system. No one-size-fits-all approach will work. What is needed is leadership in structuring an array of options that reflect the variability of hydrology and the abilities of the states and federal government to step forward with realistic approaches. The range of future hydrologic conditions should anticipate and plan for the worst-case scenario, i.e. the 40-50% reduction alluded to by

⁵ <https://www.usbr.gov/lc/region/g4000/24mo/2022/AUG22.pdf>

⁶ <https://www.kuer.org/health-science-environment/2022-05-03/feds-roll-out-extraordinary-actions-to-prop-up-lake-powell>

⁷ https://www.usbr.gov/uc/water/hydrodata/reservoir_data/site_map.html

Dr. Overpeck. But without structural modifications to river infrastructure, namely Glen Canyon Dam, the system will not be equipped to handle these scenarios.

An analysis⁸ released by Glen Canyon Institute, Utah Rivers Council, and Great Basin Water Network shows that if the Colorado River system experienced a series of water years like 2000-2004 or even 2017-2021, Lake Powell could drop within the range of deadpool elevation. The big water year of 2023 has avoided that outcome (for now), but the buffer could very well be temporary. Managing Lake Powell near deadpool comes with a host of challenges, many of which have been identified by Reclamation. These challenges include structural challenges of operating Glen Canyon Dam solely with the use of the river outlet works, managing recreation and safety at a wildly fluctuating reservoir, and serious impacts to the environmental resources, including endangered fish species in the Grand Canyon downstream. But the most important consideration is that at elevation 3,430 feet above sea level, Glen Canyon Dam cannot release enough water to meet its downstream delivery obligations to the Lower Basin⁹. Meeting that delivery obligation is one of the main reasons Glen Canyon Dam was built in the first place.

For these reasons, it's imperative that the Post-2026 Operational Guidelines EIS include an alternative where Glen Canyon dam is re-engineered so that it can be operated as a "run of river" facility, allowing for the full downstream release capabilities at any elevation. While this concept is controversial to some, it will provide the greatest flexibility with the lowest compact requirement risk option under future hydrologic circumstances. To not include such an alternative for analysis would be a major flaw in an EIS meant to carry the basin decades into a drier future and ignore potentially devastating impacts to the Grand Canyon National Park ecosystem and downstream resources.

The "run of river" alternative should include an in-depth analysis of the many considerations that that type of management regime would entail, including but not limited to:

- Engineering costs and timeline
- Policy framework options for Upper Basin water storage—including rethinking downstream delivery obligations past Lee Ferry and the ability of Upper Basin States' potential to store water in Lake Mead in the form of Intentionally Created Storage.
- Potential water savings from reduced ground seepage and evaporation
- Recreational opportunities and impacts in Glen Canyon and Grand Canyon
- Environmental impacts and benefits in Glen Canyon and Grand Canyon
- Use of Glen Canyon Dam facilities for flood protection
- Implications for the thirty Colorado River Basin Tribes
- Impacts and implications to meeting the requirements of the 1944 Treaty regarding the Colorado River supply to the Republic of Mexico.

- Cultural resources emerging in restoring sections of Glen Canyon that were once inundated by the reservoir.

⁸ <https://www.glencanyon.org/wp-content/uploads/2022/08/Final-Antique-Plumbing-at-Glen-Canyon-Dam.pdf>

⁹ https://qcnr.usu.edu/coloradoriver/files/CCRS_White_Paper_1.pdf, Page 10

It is imperative that the engineering costs and timeline allow for the retrofitting of the hydropower turbines via either full bypass or another engineering solution. The forthcoming water delivery crisis because of the outdated design inside Glen Canyon Dam will prevent the full delivery of Compact water downstream if/when Lake Powell levels drop in the future. The Department of Interior still has time to address this looming crisis, but time is quickly running out.

2. The hydrologic reality of the Colorado River, and the need to forecast for even lower flows

The impacts of climate change on the Colorado River have been widely studied for decades, with almost every study indicating that warming temperatures in the basin have already and will continue to reduce runoff¹⁰. The question isn't whether or not this trend will continue, but by how much. With a wide range of future impacts, scientists have concluded that we have not yet seen the worst, with the potential to see an additional 40% of flow reductions by mid-century¹¹.

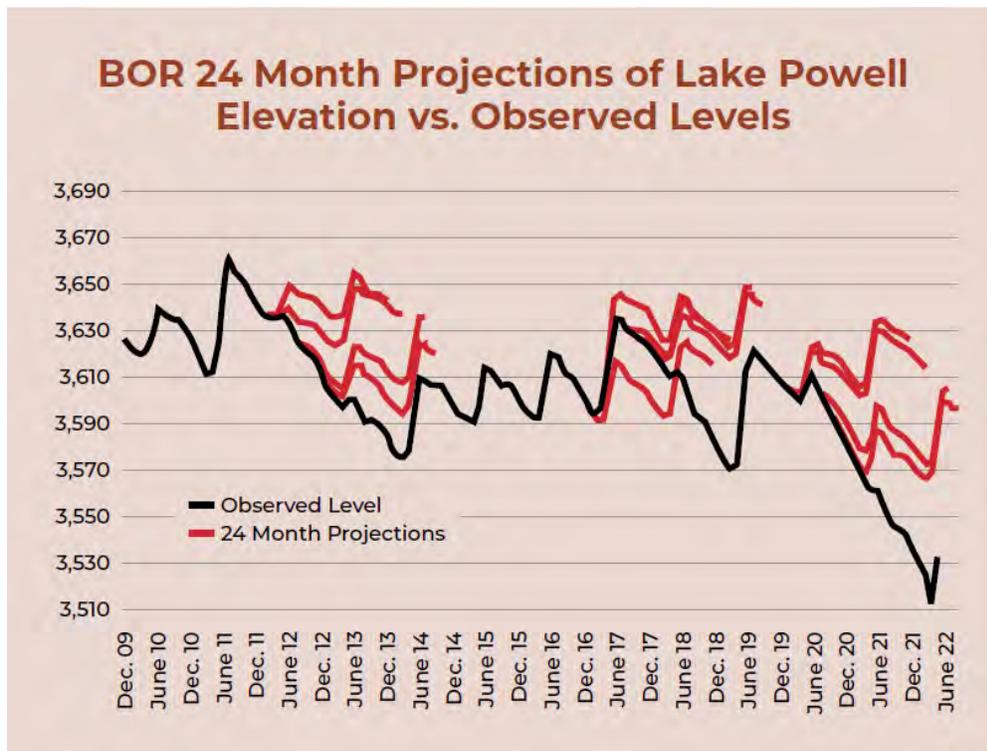
The impacts being experienced in the Colorado River are unlike anything that's been seen in this millennium, which is one of the reasons current modeling used by Reclamation, the Colorado River Mid-term Modeling System (CRMMS), informed by Colorado River Forecast Center, has proven to be overly optimistic for most of the past decade. A 2021 white paper The Futures of the Colorado Group evaluated Colorado River projections used by the Bureau and found that the agency has consistently underestimated the impacts of climate change and overestimated the amount of water projected to flow in the Colorado River, specifically into Lake Powell.

As described in the Futures of the Colorado River Project's White Paper #7¹², Reclamation's 24-month studies have **consistently overestimated runoff** of the studies' 2nd year "most probable" projection. The study found that the Bureau's "most probable projected inflows were higher than what actually occurred by as much as ~7 million acre feet (maf) in some years, and predicted reservoir elevations were also higher than what occurred in some years." This is most aptly demonstrated by White Paper #7's Figure 7, which has been reproduced below as a single graph.

¹⁰ https://www.usu.edu/colorado-river-research-group/files/crrg_reflections_on_two_decades.pdf

¹¹ Milly, P. C., & Dunne, K. A. (2020). Colorado River flow dwindles as warming-driven loss of reflective snow energizes evaporation. *Science*, 367(6483), 1252-1255. Bradley Udall & Jonathan Overpeck, The Twenty-first Century Colorado River Hot Drought and Implications for the Future, 53 WATER RESOURCES RES. 2404 (2017)

¹² https://qcnr.usu.edu/coloradoriver/files/WhitePaper_7.pdf



The above figure, showing levels of Lake Powell between December 2009 and June 2022, demonstrates how far Lake Powell water levels have declined over time, (shown in black). The red lines are Bureau of Reclamation 24 month “most probable” forecasts demonstrate a bias to overestimating the amount of water that will be in Lake Powell. Reproduced from White Paper #7, Figure 7.

The use of the 30-year statistical modeling is historically the standard for water managers, but in the Colorado River Basin it has proven to be outdated and leaves water managers and stakeholders unprepared when a series of dry years reduces the volume of supply to the reservoirs. We believe Reclamation should incorporate a wider set of data, like those used and suggested by the Futures of the Colorado Group¹³ and Western Water Assessment¹⁴, in 24-month and 60-month projections.

3. The likelihood of future declines at Lake Powell

Climate change has already reduced the Colorado River’s average annual flow roughly 20% over the past two decades, compared to the 20th Century average, resulting in dramatic water level declines at Lake Powell¹⁵.

¹³ <https://www.science.org/doi/10.1126/science.abo4452>

¹⁴ <https://scholar.colorado.edu/concern/reports/8w32r663z>

¹⁵ Bureau of Reclamation. Natural Flow and Salt Data. (2022).

Water Flow Scenario

Flow reduction of the Colorado River at Lee Ferry	Naturalized flow at Lee Ferry
20th Century Average (1906-1999)	15.2
5% Decrease	14.4
21st Century Average 19% Decrease	12.4
20% Decrease	12.2
40% Decrease	9.1

Table 3. From 2000 to 2018, the Colorado River flowed at an average 12.4 million acre-feet per year, a roughly 20% drop in flows from the 15.2 million acre-feet experienced for most of the 20th century.

The table above summarizes the range of Colorado River flow declines projected by multiple peer-reviewed scientific papers. This material is reproduced from *A Future on Borrowed Time*¹⁶, an analysis of Upper Colorado River Basin water budgets. Flow declines are shown as a percent decrease from the 20th Century Average of **15.2 million acre-feet**, and both the 20th and 21st Century. Under a 40% decrease, the flow of the river is a mere **9.1 million acre-feet**.

In 2022, Reclamation took drastic steps to increase the elevation of Lake Powell, by releasing an additional 500,000 acre feet of water from Flaming Gorge Reservoir and holding back 480,000 acre feet of water from being released to Lake Mead downstream¹⁷. Even with these efforts, Reclamation projected that, under its most probable scenario, Lake Powell's elevation could drop to approximately 3,508 fasl by April 2023, 14 feet lower than the reservoir's 2022 low point¹⁸. With the combined results of increased upstream dam releases, reduced downstream releases, and a 2023 snowpack that was 170% of average, the low reservoir level outcome was narrowly averted. But crucially It's important to take stock of how close Lake Powell came to hitting minimum power pool.

¹⁶

<https://static1.squarespace.com/static/5a46b200bff2007bcca6fc4/t/620a935ebcb00a3f5258e71b/1644860263000/Future+on+Borrowed+Time.pdf>

¹⁷ Trujillo, Tanya. Letter to Colorado River Basin State Managers on Coordinated Actions & DROA. (May 2, 2022)

¹⁸ <https://www.usbr.gov/lc/region/g4000/24mo.pdf>

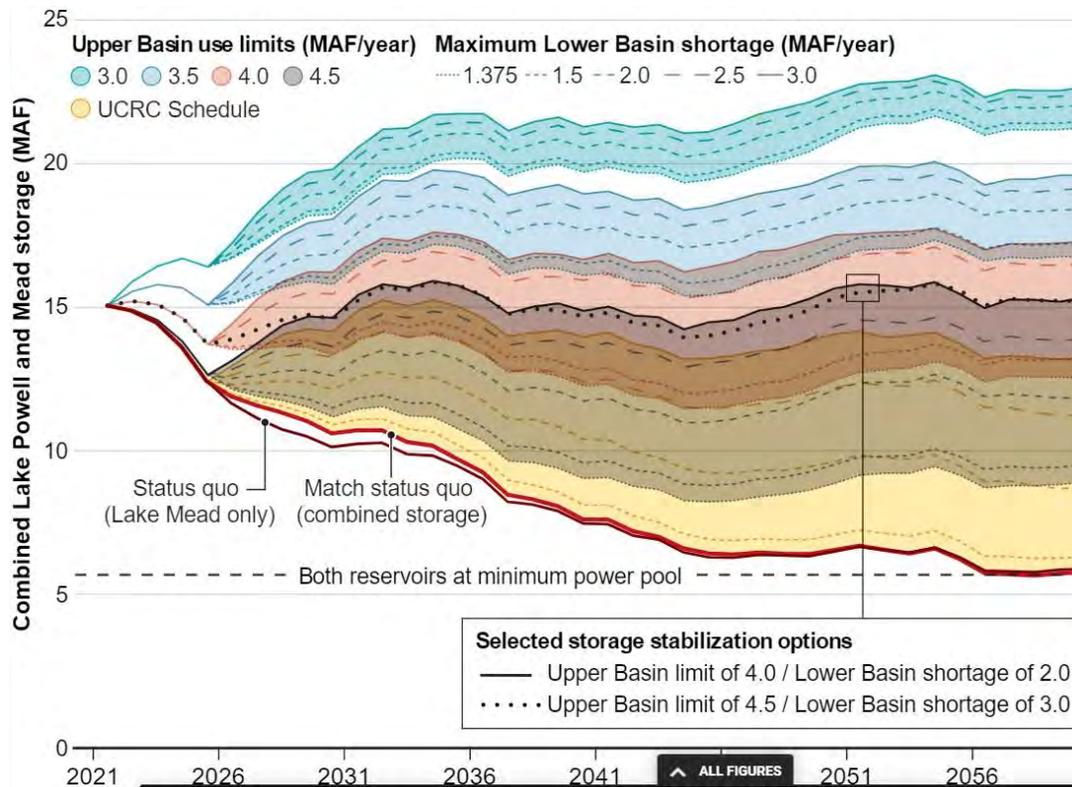


Figure from “What will it take to stabilize the Colorado River?”, *Science Magazine*

The figure above, from Wheeler et al. in *Science*¹⁹, shows an array of future possibilities of combined storage totals between Powell and Mead, based on existing shortage curtailment schedules and different Upper Basin depletion (demand/use) scenarios. The figure shows that with climate impacts not getting worse, and significant reductions implemented from the Upper and Lower Basin, system storage **will still only stabilize, not increase**.

Based on the Wheeler et al. projections, if Basin states cannot come to an agreement on widespread reductions of consumptive use and/or climate continues to reduce runoff, storage at Powell and Mead will drop precipitously in the near future. As stated earlier, climate science predicts that runoff will get worse. Whether Basin states can agree to widespread cuts remains to be seen. The recent agreement reached by California and Arizona was a step in the right direction, but relies on extensive federal funding—a model that likely won’t be sustainable in the future²⁰.

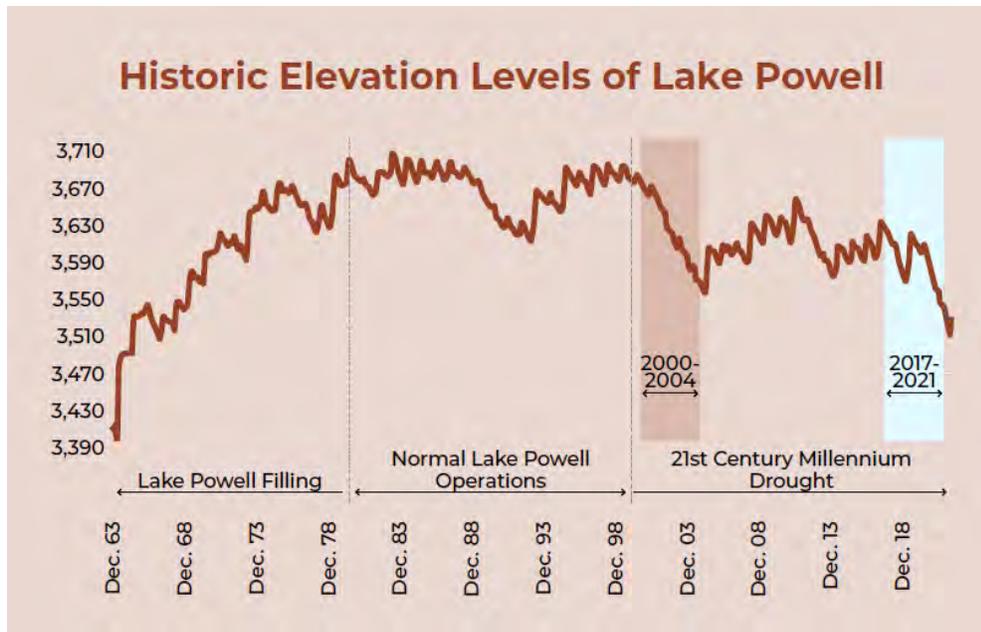
For another perspective of what the reservoir’s future could look like and provide another possible prediction of what could happen in the years ahead, the analysis conducted by Utah Rivers Council, Glen Canyon Institute, and the Great Basin Water Network²¹ projected potential future Lake Powell water levels by simply using observed historical data. Two historical five-year periods were chosen and examined what Lake Powell’s water level would be if future conditions

¹⁹ <https://www.science.org/doi/10.1126/science.abo4452#>

²⁰ <https://www.inkstain.net/2023/05/deadpool-diaries-nice-river-basin-ya-got-there/>

²¹ <https://www.glencanyon.org/wp-content/uploads/2022/08/Final-Antique-Plumbing-at-Glen-Canyon-Dam.pdf>

resembled those observed in either of these periods²² The figure below shows the entire history of Lake Powell’s water levels and illustrates the two color-coded periods used by the report to project future Lake Powell levels, from 2000-2004 and from 2017-2021.



Historic elevations of Lake Powell and the two historic periods chosen to forecast possible future declines

	Average unregulated inflow to Lake Powell	Change in Lake Powell Storage	Change in Lake Powell Storage	Average Natural Flow at Lees Ferry	Decline in Natural flow from 20th Century Average
2000-2004	5.8 million ac-ft	-120 feet	-13.8 million ac-ft	9.4 million ac-ft	38%
2017-2021	7.8 million ac-ft	-65 feet	-5.5 million ac-ft	12.2 million ac-ft	20%

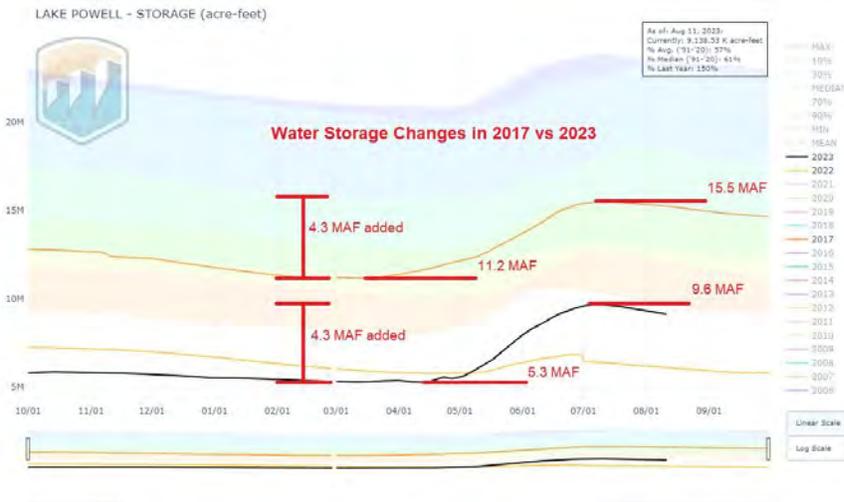
Summary statistics for two historical time periods used in analysis.

These two periods were chosen because they represent good ‘new normal’ and ‘low end’ projections for the Colorado River System. The 2000-04 period roughly conforms with the low-end projection of a 40% decline in Colorado River flows predicted by the current scientific

²² Bureau of Reclamation. Annual Operating Plan. (2021). <https://www.usbr.gov/uc/water/rsrvs/ops/aop/AOP21.pdf>. Bureau of Reclamation. Natural Flow and Salt Data. (2022). Bureau of Reclamation. 24 Month Study. (June 2022). https://www.usbr.gov/uc/water/crsp/studies/24Month_06.pdf

literature²³. The 2017-21 is similar to the 21st century average Colorado River flow of 12.3 million acre-feet and could be thought of as the recent new normal. The figure below shows Lake Powell's projected elevation level using these two historical periods.

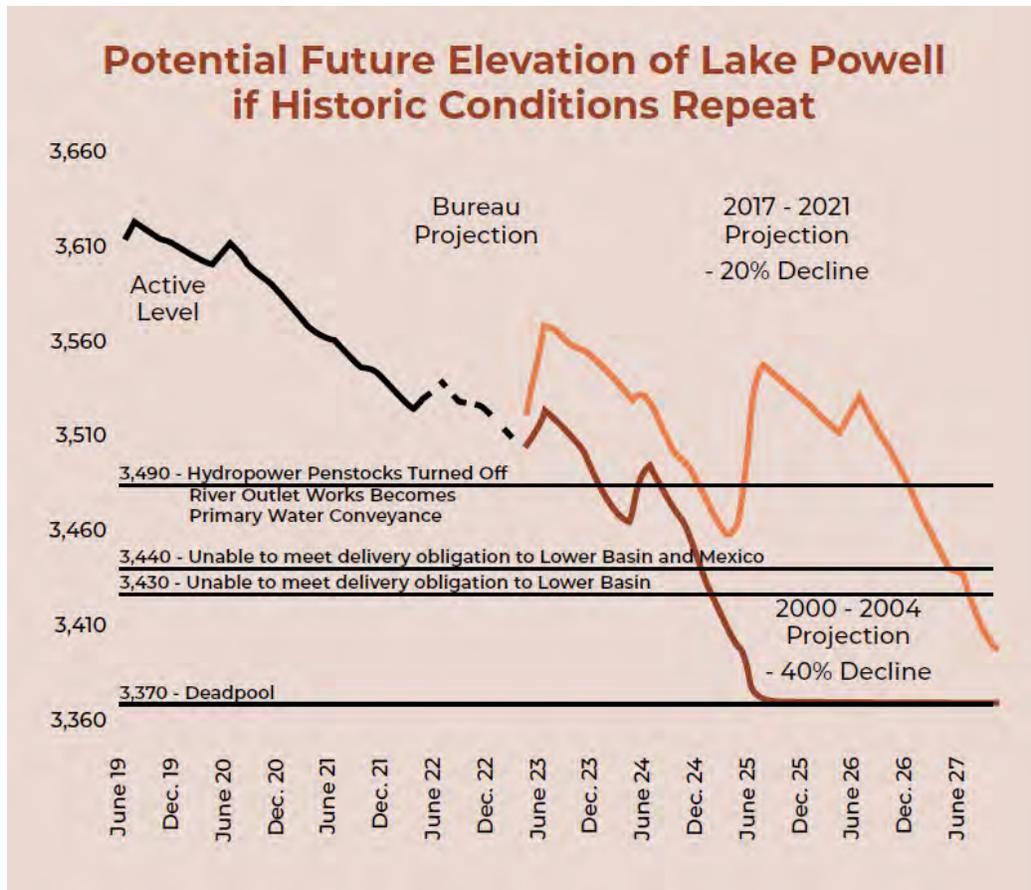
It must be noted that these projections do not include the historic water year of 2023. However, they are still relevant, especially when considering the 2017-2021 projection window. In 2017, Lake Powell experienced an increase of 4.3 million acre feet in storage volume, an almost exact match of storage in 2023. (See graph below).



USBR graph with overlay text by Glen Canyon Institute

The study forecasted into the future using the two historic periods of 2000-2004 and 2017-2021, and projected that Lake Powell quickly drops to levels well below the critical elevation thresholds of 3,440 and 3,430 feet above sea level. This exercise was not meant to be a prediction that Lake Powell will follow either of these paths over this time frame. Projecting Lake Powell's future water levels with a high degree of certainty is very difficult, especially without incorporating potential future curtailments. **This exercise demonstrates it is very possible that Lake Powell could drop to critical elevation thresholds in the near future.**

²³ Milly, P. C., & Dunne, K. A. (2020). Colorado River flow dwindles as warming-driven loss of reflective snow energizes evaporation. *Science*, 367(6483), 1252-1255. Bradley Udall & Jonathan Overpeck, The Twenty-first Century Colorado River Hot Drought and Implications for the Future, 53 *WATER RESOURCES RES.* 2404 (2017).



Projected elevation of Lake Powell reservoir levels into the future from WY 2022 forward, given observed historical hydrologic periods of both 2000–2004 and 2017–2021.

4. The need to study full bypass of Glen Canyon Dam and model operations with low and no reservoir scenarios at Lake Powell

As demonstrated by the charts above and acknowledging Reclamations' own 5-year projections²⁴, there is a significant enough likelihood of Powell dropping below power pool and near deadpool that Reclamation should have every operational tool available to manage the system in low system hydrologic scenarios. Currently those tools are unavailable, because of infrastructure limitations at Glen Canyon Dam, and the lack of predictive modeling utilizing alternative scenarios where Lake Powell is hydrologically drawn down to low levels or run-of-river level.

In an announcement on August 16th, 2022²⁵, Reclamation outlined a number of actions it would take to address falling levels at Lake Powell. One of these actions states Reclamation will, "Take administrative actions needed to authorize a reduction of Glen Canyon Dam releases below 7 million acre-feet per year, if needed, to protect critical infrastructure at Glen Canyon Dam."

²⁴ <https://www.usbr.gov/lc/region/g4000/riverops/crss-5year-projections.html>

²⁵ <https://www.usbr.gov/newsroom/news-release/4294?filterBy=year&year=2022>

This action highlights one of the structural limitations at Glen Canyon Dam, specifically its ability to operate and move water downstream to the Lower Basin States and Mexico solely through use of the river outlet works for months or years at a time. Tanya Trujillo, former Assistant Secretary for Water and Science, in an announcement stated, “Glen Canyon Dam was not envisioned to operate solely through the outlet works for an extended period of time and operating at this low lake level increases risks to water delivery and potential adverse impacts to downstream resources and infrastructure.” It’s unclear that the physical structure of the river outlet works are capable of safely operating at full capacity for long periods of time.

The recent strategy from Reclamation²⁶ is centered around propping up Lake Powell enough to meet legal requirements through increased releases from upstream reservoirs, and reduction of releases downstream. These efforts will only work in the short-term and don’t address the important structural problem of Glen Canyon Dam’s inability to meet legal delivery requirements downstream.

Even with the significant efforts to prop up Lake Powell, the Drought Response Operations Agreement (DROA) acknowledges that these efforts may not be enough to avoid dropping below minimum power pool. Line 453²⁷ of the DROA document states that “if dry conditions persist or worsen, available storage volumes for potential adjustments or releases may be insufficient to protect the Target Elevation at Lake Powell. As such, Drought Response Operations may be ineffective and therefore futile.”

In February of 2023, Reclamation hosted a webinar describing possible alternatives to re-engineer Glen Canyon Dam so that it may provide limited hydropower generation and continue delivering water at lower levels²⁸. The effort by Reclamation to have a discussion demonstrates there is an urgent need to begin the process of modifying Glen Canyon Dam. If the Colorado River is to survive the decades to come, we have to think about more than salvaging some hydropower at Glen Canyon Dam. **Reclamation’s ongoing efforts to study the structural modification of Glen Canyon Dam must be incorporated into the analysis and process of the Post-2026 Operational Guidelines.** The implications of structural modifications should be vetted thoroughly, especially in consideration to its effects on the environment. Both upstream of the dam in Glen Canyon and downstream in Grand Canyon National Park.

a. Engineering limitations of Glen Canyon Dam

When Reclamation designed Glen Canyon Dam, it prioritized two things: (1) water storage to allow the Upper Basin States to store their unused apportionment of Colorado River water while

²⁶ <https://www.usbr.gov/dcp/droa.html>

²⁷ [https://www.usbr.gov/uc/DocLibrary/Plans/20220103-Draft-2022DroughtResponseOperationsPlan-508-UCRO.pdf?ct=t\(October_Lowdown10_20_2016_COPY_01\)](https://www.usbr.gov/uc/DocLibrary/Plans/20220103-Draft-2022DroughtResponseOperationsPlan-508-UCRO.pdf?ct=t(October_Lowdown10_20_2016_COPY_01))

²⁸ <https://www.glencanyon.org/wp-content/uploads/2023/02/GCD-Low-Head-Hydropower-Modifications-alternatives-presentation.pdf>

meeting their delivery requirements, and (2) hydropower generation²⁹. The dam was not designed to run at the low reservoir levels we face in the era of aridification.

The eight hydropower penstocks collect reservoir water at elevation 3,470 feet above sea level are the primary means of moving water downstream. Once the reservoir dips below minimum power pool, elevation 3,490 feet above sea level, the only way for the dam to release water is through the river outlet works located at elevation 3,374. The outlet works have a much more limited structural ability to release water, with diminishing capacity as the reservoir drops closer to them, a function of reduced head pressure³⁰. The figure below, from *Futures of the Colorado White Paper #1*, breaks down the maximum release capacity of the outlet works, assuming they are run at full capacity.

Maximum rate of discharge through the river outlets as a function of Lake Powell elevation³⁰

Reservoir elevation, in feet above sea level	Maximum discharge through river outlets, in cubic feet per second	Maximum discharge rates through bypass tubes, in acre feet per year
3,500	15,000	10,900,000
3,490	14,650	10,600,000
3,450	12,600	9,090,000
3,440	11,400	8,280,000
3,430	10,200	7,410,000
3,420	8,800	6,370,000
3,400	4,800	3,470,000

Table from White Paper #1 demonstrating limited release capacity of river outlet works

b. Glen Canyon Dam is incapable of meeting delivery obligations at low levels

At elevation 3,430, the dam is physically incapable of releasing enough water annually to meet Upper Basin delivery obligations, based on current interpretations of the Law of the River³¹. Failure to deliver these agreed upon amounts could result in technical, legal, engineering, and environmental problems for all members of the Basin.

While the Upper Basin Delivery obligation of 7.5 million acre feet per year (and 75 million acre feet over ten years), is a cornerstone of the Law of the River, it should be noted that ongoing

²⁹ Bureau of Reclamation. Technical Record of Design and Construction: Glen Canyon Dam and Powerplant. (1966). <http://www.riversimulator.org/Resources/USBR/GCDtechnicalData.pdf>

³⁰ Bureau of Reclamation. Technical Record of Design and Construction: Glen Canyon Dam and Powerplant. (1966). <http://www.riversimulator.org/Resources/USBR/GCDtechnicalData.pdf>

³¹ Schmidt, John. White Paper #1: Fill Mead First – A Technical Assessment. (2016). https://qcnr.usu.edu/coloradoriver/files/CCRS_White_Paper_1.pdf

policy discussions around the Law of the River argue that this interpretation should be updated and that it is unrealistic for the “75 in 10” policy to continue as is³². Nevertheless, it is unclear what changes the Law of the River may undergo in the future, and it’s likely that Glen Canyon Dam’s structural limitations hinder the system’s ability to adapt to those changes.

c. Additional problems with operation of Lake Powell at or near deadpool

The river outlet works intakes are located nearly 240 above the bottom of the dam, meaning that a large pool of approximately 1.7 million acre-feet of water is effectively ‘stranded’ behind the dam³³. This large pool of water, commonly referred to as “deadpool”, could become a common occurrence in the near future at Lake Powell. In addition to the inability to access the 1.7 million acre-feet of water, operating near deadpool at Lake Powell would create a number of problems for the reservoir managers, Colorado River Basin water users, and other constituencies. Not the least would be a stagnant body of water sitting in a desert environment that would be conducive to stimulating harmful algal blooms and other water quality problems. Toxic algal blooms have already begun to emerge in Lake Mead, with one swimmer being killed by a brain-eating amoeba in 2022.³⁴

At deadpool, the reservoir is subject to rapid changes in elevation, due to the martini glass-like shape of Lake Powell’s vertical cross section. Nearly half of the reservoir’s capacity resides above 3,600 feet³⁵, meaning that when water levels drop to deadpool elevation ranges, even moderate inflows can cause water levels to rise over 100 feet in one season³⁶. This could create numerous problems for both reservoir visitors and the National Park Service recreation managers at Lake Powell.

These rapid elevation changes would force the National Park Service to move marinas and extend boat ramps, which is costly and increases safety risks. For most of 2021 and 2022, the majority of National Park Service and Tribally managed launch ramps were unusable. Current plans to adapt to declining reservoir levels include abandoning the current Bullfrog Marina site and moving those facilities into the main channel at an estimated cost of \$25 million dollars³⁷. With the significant cost of extending boat ramps, walking ramps and marina utility infrastructure, there may come a point of diminishing returns on increasingly large and frequent taxpayer investments. After such investments are made to adapt to deadpool elevations, a subsequent medium or large water runoff year could lead to significant damage to this new

³² <http://www.inkstain.net/fleck/2021/07/reverence-or-pragmatism-the-upper-colorado-river-basins-compact-dilemma/>

³³ Bureau of Reclamation. Technical Record of Design and Construction: Glen Canyon Dam and Powerplant. (1966). <http://www.riversimulator.org/Resources/USBR/GCDtechnicalData.pdf>

³⁴ USBR DSEIS, April 2023, Page 293

<https://www.usbr.gov/ColoradoRiverBasin/documents/NearTermColoradoRiverOperations/20230400-Near-termColoradoRiverOperations-DraftEIS-508.pdf>

³⁵ Root, J. C., & Jones, D. K. (2022). Elevation-area-capacity relationships of Lake Powell in 2018 and estimated loss of storage capacity since 1963 (No. 2022-5017). US Geological Survey

³⁶ Root, J. C., & Jones, D. K. (2022). Elevation-area-capacity relationships of Lake Powell in 2018 and estimated loss of storage capacity since 1963 (No. 2022-5017). US Geological Survey

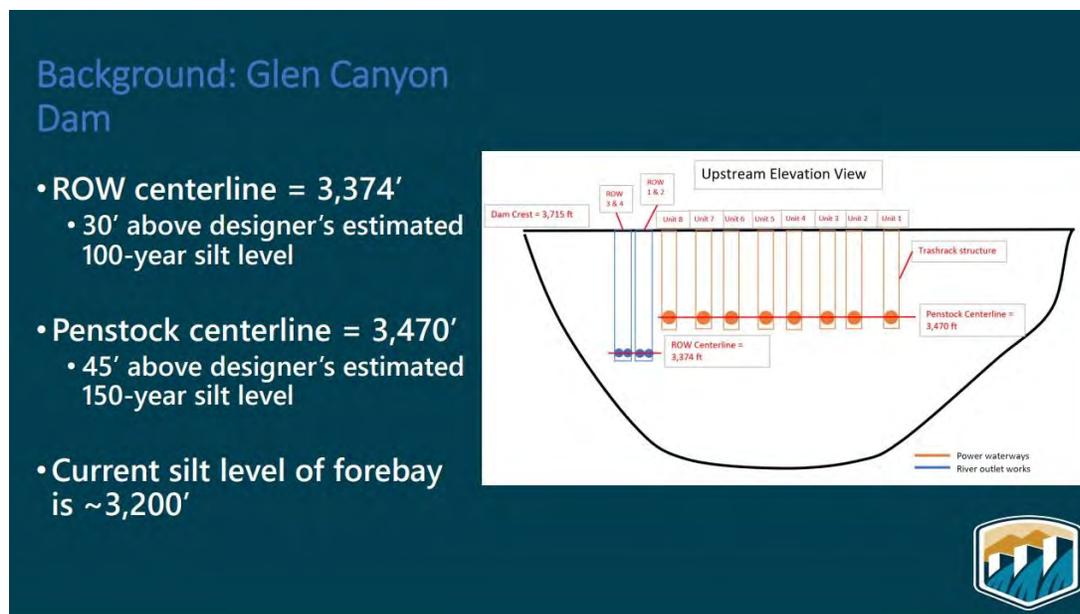
³⁷ Returning Rapids Project. Field Binder: The River Persists. (2022).

<https://www.glencanyon.org/product/2022-returning-rapids-field-binder-the-river-persists/>

infrastructure. This could create infrastructure challenges for the National Park Service, which is already suffering from a large backlog of maintenance projects.

In a scenario where the reservoir nears deadpool without subsequent engineering modifications to Glen Canyon Dam, its lifespan would dramatically decrease due to its storage volume being displaced with sediment. The Colorado River has the second largest natural sediment load of any large river in North America, moving an estimated 54-60 million metric tons of sediment per year into Lake Powell³⁸. When the reservoir is full, this amount of sediment displaces a relatively small portion of the reservoir. But when the reservoir is low, that proportion of sediment displacement will more quickly diminish the reservoir's smaller storage volume as sediment moves closer to the dam. According to the findings of Schmidt et al. (2016), if the reservoir were to remain at levels between power pool and deadpool, sedimentation will eventually reach the dam and directly affect flow into the River Outlet Works³⁹.

Sediment has been accumulating in the upper reaches of the reservoir for nearly 60 years, totaling a loss of 6.8% reservoir storage capacity since 1963⁴⁰. As the reservoir and its volume of stored water has declined, the rate of siltation has increased relative to its overall size.



Slide from USBR webinar on Glen Canyon Dam modifications, Feb 2023⁴¹

³⁸ Schmidt, John. White Paper #1: Fill Mead First – A Technical Assessment. (2016). https://qcnr.usu.edu/coloradoriver/files/CCRS_White_Paper_1.pdf

³⁹ Schmidt, John. White Paper #1: Fill Mead First – A Technical Assessment. (2016). https://qcnr.usu.edu/coloradoriver/files/CCRS_White_Paper_1.pdf

⁴⁰ Root, J. C., & Jones, D. K. (2022). Elevation-area-capacity relationships of Lake Powell in 2018 and estimated loss of storage capacity since 1963 (No. 2022-5017). US Geological Survey

⁴¹ <https://www.glencanyon.org/wp-content/uploads/2023/02/GCD-Low-Head-Hydropower-Modifications-alternatives-presentation.pdf>

Even without the depleted storage of Lake Powell, the dam was designed with an operational end date, exemplified by the estimated silt levels highlighted in the slide above. The slide shows that the original design of Glen Canyon Dam anticipated a silt level of ~3,344 ft by the year 2063. Currently, there is approximately 70 feet of silt behind the dam, which will continue to accumulate over time. As the reservoir has dropped, sediment has encroached farther downstream toward the dam⁴². **The above graphic highlights the reality that Glen Canyon Dam will have to be modified eventually, or become clogged with sediment.**

Should Lake Powell water levels drop down toward deadpool, the maximum water flow release capacity out of Glen Canyon Dam drops from 15,000 cfs to below 5,000 cfs. The reduction in water release capacity could have adverse effects on the Grand Canyon ecosystem. Below elevation 3,440 ft, downstream releases would likely need to be maximized to get water to the Lower Basin, meaning flows in the Grand Canyon could be constant over long periods of time—a flow scenario that would be damaging to the Grand Canyon’s ecosystem and beaches. These reduced flow capacities would limit the ability to conduct High Flow Experiments downstream and aggravate restoration efforts to improve sediment deficits in Grand Canyon National Park. Under these flow conditions, the fate of the Grand Canyon’s ecosystem would be in jeopardy, and would likely violate key provisions of the Grand Canyon Protection Act⁴³.

d. The need to model alternative scenarios where Lake Powell operating at low or run-of-river levels, including environmental benefits and costs

In addition to examining physical modifications at Glen Canyon Dam to allow water releases from low or run-of-river levels, there is a need to use CRSS or similar modeling tools to test how the entire Colorado River system would operate under such scenarios. The primary method of modeling Colorado River reservoirs is the Colorado River Simulation System (CRSS) system, which by design, only models reservoir storage scenarios conceptualized under existing operating criteria of the 2007 Interim Guidelines, 2019 Drought Contingency Plans, and DROA operations. **As stakeholders of the Basin develop operational strategies for Lake Powell and Lake Mead beyond 2026, it’s imperative that Reclamation model a wide range of scenarios, including ones in which Lake Powell is at low or run-of-river levels.**

The Futures of the Colorado Group has taken steps in this direction by modeling an array of scenarios⁴⁴ outside the limitations of existing operating criteria, but even this selection of scenarios do not represent a wide enough range to explore every storage regime available on the Colorado River. Using the CRSS tool to model alternatives outside of the current reservoir operating criteria, White paper #6 models and analyzed several different scenarios including variations of prioritizing storage Lake Mead over Lake Powell and vice versa. These analyses were an important step in the right direction building the data around informed discussions of new alternatives, but they didn’t go far enough, as they did not model the full drawdown of Lake Powell—a scenario which was once incomprehensible, but is now increasingly possible within a

⁴² <https://www.sltrib.com/news/2022/04/28/it-feels-like-dying/>

⁴³ Grand Canyon Protection Act of 1992, P.L. 102-575, Sec. 1802(a).

⁴⁴<https://qcnr.usu.edu/coloradoriver/files/news/white-paper-6.pdf>

scale of years as a function of reduced snowpack and a consistent supply/demand deficit. The focus of White Paper #6 was stabilization of the broader system, not averting the impending problems at Glen Canyon Dam.

A 2023 paper by Schmidt, Yackulic, and Kuhn⁴⁵ **highlights the potential benefits of fully bypassing Glen Canyon Dam**, stating:

”Another option for reservoir management is to entirely abandon reservoir storage in Lake Powell by drilling river-level diversion tunnels around Glen Canyon Dam. Diversion tunnels could be designed with emergency valves that could be closed in the unlikely event that large runoff filled Lake Mead and storage in Lake Powell was needed. Such an action would restore a natural stream flow and sediment regime to the Grand Canyon and might benefit some pre-dam elements of the Colorado River ecosystem, although there would likely be a multi-decadal period of ecosystem adjustment to the new flow and sediment conditions.”

The paper highlights the **potential benefits to native fish species**, several of which are endangered, as well as **a possible solution to the growing threat of nonnative fish** in the Grand Canyon.

“This management option would also lead to increases in water temperature and changes in the fish community, including elimination of the nonnative, tailwater trout fishery. Such a strategy would increase turbidity and favor some nonnative fish species like carp and channel catfish over other nonnative fish species such as smallmouth bass. Carp and channel catfish coexisted with native fish species in the Grand Canyon for decades prior to construction of Glen Canyon Dam (Mueller & Marsh, [2002](#)) and may represent a lesser threat to the continued persistence of native fish species than do smallmouth bass.”

In order to have an informed discussion among Basin stakeholders, it's imperative to understand the benefits and tradeoffs of potentially phasing out Lake Powell entirely. As such, discussions around Post-2026 Operating Guidelines must utilize CRSS modeling of scenarios that includes Glen Canyon Dam being operated at levels below what the dam is physically capable of currently.

5. The need to include an assessment of emerging ecological, cultural, and recreational resources in Glen Canyon, Cataract Canyon, Narrow Canyon, and the San Juan River.

Since the 2007 Interim Shortage Guidelines, new resources have emerged in Glen Canyon that were not accounted for in the previous NEPA analysis. Given the significance of these resources under NPS responsibilities and the mandates of the Grand Canyon Protection Act,

⁴⁵ <https://wires.onlinelibrary.wiley.com/doi/10.1002/wat2.1672>

the Post-2026 Operational Guidelines NEPA analysis must recognize and include an analysis of the importance of the emerging recreational resources in the tributary rivers and canyons, including rafting and hiking in Glen Canyon, and recognize the impact that operational strategies will impact environmental resources including vegetation, wildlife, and archeological/cultural sites in Glen Canyon. Many of these resources were unaccounted for when Glen Canyon Dam was constructed and today require a different perspective on their management and protection.

a. NPS Mandates, Grand Canyon Protection Act, and Endangered Species Act

Similar to the 2007 Interim Shortage Guidelines, the Post-2026 Guidelines will require extensive cooperation with the National Park Service (NPS). With ten national park units directly affected by Colorado River operations, NPS should be an official cooperating agency in developing and assessing operational strategies. They were in the Glen Canyon Environmental Studies (1982-1996) and should be afforded the same level of engagement now. The decisions made around how Glen Canyon Dam is operated will have widespread effects on areas and resources that fall under the jurisdiction of NPS. As NPS is responsible for “conservation of natural and cultural resources and administers visitor use”⁴⁶, it is essential that decisions around how to manage Lake Powell, Glen Canyon, Grand Canyon, and Canyonlands incorporate up-to-date information on changing and emerging resources in those park units.

Additionally, Public Law 102-575, which includes the Grand Canyon Protection Act requires that Glen Canyon Dam be managed “in such a way as to protect, mitigate adverse impacts to and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established, including, but not limited to natural and cultural resources and visitor use⁴⁷.” Public Law 102-575 has not been repealed and as such has to be acknowledged and used to establish the parameters of the Post-2026 analysis.

Reclamation must plan and manage for Endangered Species Act compliance not just in Grand Canyon national park, but for Glen Canyon National Recreation Area. With thus far minimal species monitoring in the “restoration zone” of GCNRA (above reservoir level and below 3,700), **the extensive emerging ecosystems could provide habitat for threatened and endangered species**, something that was highlighted in the Draft SEIS⁴⁸, which stated, “Declining lake levels would likely expand or increase habitat for Colorado pikeminnow, razorback sucker, flannelmouth sucker, and bluehead sucker in the inflows to Lake Powell as riverine habitat would increase in the San Juan River and Colorado River inflows.” Additionally, a Mexican Spotted Owl (threatened species) was seen in an emerged side canyon in GCNRA in 2022.⁴⁹

⁴⁶ <https://www.usbr.gov/lc/region/programs/strategies/RecordofDecision.pdf>, page 3

⁴⁷ Grand Canyon Protection Act of 1992, P.L. 102-575, Sec. 1802(a).

⁴⁸

<https://www.usbr.gov/ColoradoRiverBasin/documents/NearTermColoradoRiverOperations/20230400-Near-termColoradoRiverOperations-DraftEIS-508.pdf>

⁴⁹ <https://www.sitrib.com/news/environment/2022/08/28/glen-canyons-side-canyons-spring/>

b. Emerging Resources in Glen Canyon tributary canyons

Geologic Wonders

Glen Canyon National Recreation Area has experienced extreme changes in the past 20 years as Lake Powell water levels have receded. As of spring 2023, over 100,000 acres of land that were once inundated under Lake Powell had emerged⁵⁰. Unique geologic and natural features like Cathedral in the Desert, Gregory Bridge, La Gorce Arch, and countless waterfalls, grottos, alcoves, and other natural wonders once again became highlight features of the park unit.

These one-of-a-kind features are what inspired former Interior Secretary Harold Ickes to propose making Glen Canyon the central part of a larger Escalante National Monument in the 1930's, and what inspired countless western writers like Wallace Stegner, who said Glen Canyon would have made a "superb national park". The emergence of these emerging treasures have garnered attention from national⁵¹ and international media outlets, and have even been used for tourism promotions by GCNRA concessionaires⁵². When the level of Lake Powell rises, these features are submerged by the reservoir, and are effectively lost to visitors.

The Post-2026 Guidelines must acknowledge the negative impacts the reservoir has on these unique geologic features and the intrinsic value that they have to both American and global citizens alike.

Reestablishing Vegetation

As the reservoir levels have dropped, a large-scale ecological succession is taking place in Glen Canyon and its side canyons, tributary rivers, and streams. In Spring of 2023, with over 40 new miles of the Colorado River flowing once again in what used to be the northern reach of Lake Powell, 40 miles on the San Juan River, 13 miles flowing on the Escalante River, 10 Miles on the Dirty Devil River, and hundreds of linear miles of creeks and stream flowing in the 100-plus side canyons of Glen Canyon, the ecosystems surrounding Glen Canyon are rebounding⁵³.

In many once-drowned tributary canyons of Glen Canyon, well-established groves of native species like Goodings Willow, Coyote Willow, and Fremont Cottonwoods are thriving⁵⁴. These riparian forests are of great significance in many places throughout the Colorado River Basin, with resource managers going to great lengths to restore and protect them. Recent research has documented the return of plant life in the emerged canyons, which in many places has an abundance of native plant species such as globemallow, wirelettuce, scorpion weed, sacred datura, four wing salt bush, matted crinkle mat, wooly plantain, Jone's blue star, woody aster, desert trumpet, milkvetch, sticky brittle bush, purple three awn, common pepperweed, threadleaf sunflower, Indian rice grass, sand sage, and prickly pear cactus⁵⁵.

⁵⁰ Root, J. C., & Jones, D. K. (2022). Elevation-area-capacity relationships of Lake Powell in 2018 and estimated loss of storage capacity since 1963 (No. 2022-5017). US Geological Survey.

⁵¹ <https://www.newyorker.com/magazine/2021/08/16/the-lost-canyon-under-lake-powell>

⁵² <https://marketing.revinate.com/public/promotion/view-in-browser/message-log/97e341cc-9266-4408-9b84-e434c4f437c8>

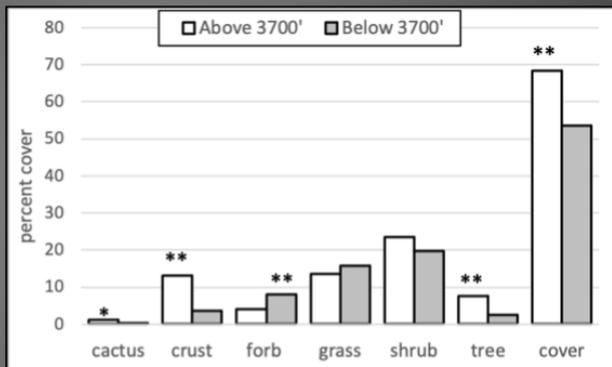
⁵³ <https://www.sltrib.com/news/environment/2022/08/28/glen-canyons-side-canyons-spring/>

⁵⁴ <https://content.jwplatform.com/previews/6H3H1RhH>

⁵⁵ Babtiz, Kendra, MPP. The Botanical Recovery of 50-Mile Canyon, *Hidden Passage: The Journal of Glen Canyon Institute*, issue XXV, Fall 2019 <https://www.glencanyon.org/wp-content/uploads/2020/02/Hidden-Passage-25.pdf>

Functional groups - all 2022 sites

- 40 sites
 - 14 above 3,700', 26 below 3,700'
- Above 3,700'
 - Greater plant cover
 - Greater cover of cactus, crust, trees
- Below 3,700'
 - More forbs, but no difference between annual and perennial
 - More bare ground



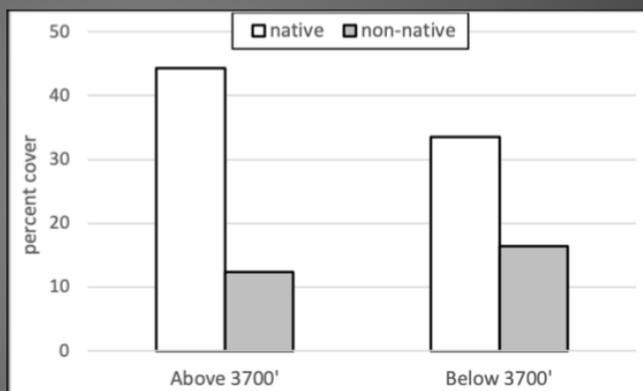
* Significant difference at $p < 0.1$
 ** Significant difference at $p < 0.05$

Graph by Seth Arens, WWA 2023⁵⁶

A new and ongoing vegetation survey⁵⁷ led by researcher Seth Arens of Western Water Assessment is looking at the vegetation composition in emerged areas in Glen Canyon, and has found that areas that have been out of water for more than 2-3 years are generally dominated by native plant species like willow and cottonwoods⁵⁸. As of summer 2023, the survey has established 89 transects in 20 locations throughout Glen Canyon.

Native vs. non-native - all sites

- Sites that have been exposed for longer periods trend toward more native coverage
- Most abundant non-native species:
 - Tamarisk (*Tamarix ramosissima*)
 - Russian Thistle (*Salsola tragus*)
 - Cheat Grass (*Bromus tectorum*)
 - Awned Barnyard Grass (*Echinochloa crus-galli*)
 - Ravenna Grass (*Saccharum ravannae*)



Graph by Seth Arens, WWA 2023⁵⁹

⁵⁶ <https://www.youtube.com/watch?v=Yfyb6dNLsx0>

⁵⁷ https://www.colorado.edu/sites/default/files/2023-06/CataractCanyonPoster_051123.pdf

⁵⁸ <https://www.youtube.com/watch?v=Yfyb6dNLsx0>

⁵⁹ <https://www.youtube.com/watch?v=Yfyb6dNLsx0>

It should be noted that the findings of this vegetation survey are a stark contrast to the descriptions of emerging ecosystems in the 2023 DSEIS. The impact analysis of that EIS acknowledges on page 233 that **the agencies lack any reliable data on new vegetation in Glen Canyon**, stating, "Vegetation monitoring does occur in the upland areas of the recreation area, but no studies have been conducted on the riparian habitat along the lakeshore."⁶⁰ Then it contradictingly claims, "currently, tamarisk and Russian thistle are the dominant vegetation type along the shores of Lake Powell. Dense stands of tamarisk displace native plants, degrade wildlife habitat, reduce livestock forage, limit human access, interfere with the natural fluvial process, and increase the risk of severe wildfires."

This description of new vegetation and ecological succession in Glen Canyon is woefully inaccurate, and based on outdated, anecdotal, or non-existent data. In order for decision makers to accurately weigh the impacts of water operations on the ecosystems in Glen Canyon, a thorough study of its ecosystems must be incorporated into the decision making assessment and process.

New Wildlife Habitat

The DSEIS also erroneously claims the emerging vegetation is harming wildlife. This couldn't be further from the truth. Abundant wildlife has been documented in emerged canyons of Glen Canyon including bighorn sheep, mule deer, coyote, bobcat, beaver, river otter, numerous birds, lizards and snakes⁶¹. Dozens of invertebrate species such as bees, beetles, and dragonflies have also been documented in the emerged areas⁶². These emerging landscapes provide native species the ability to compete with non-native species and to add to the ecological integrity of the Colorado River system. They may also be providing streamside habitat for threatened or endangered species such as the Willow Flycatcher or Yellow Billed Cuckoo. The western United States has lost thousands of acres of habitat for native species due to various forms of development and use. Recognizing Glen Canyon's unique place in the landscape for both human and non-human species must be considered in the analysis of the new operational guidelines.

Archeology

Glen Canyon is home to thousands of archeological sites that have been inundated by the water behind Glen Canyon Dam. Many of these culturally significant archaeological sites, including structures and rock art, have emerged along with other resources^{63,64}. The Post-2026 Guidelines must recognize impacts of reservoir operations on these socially and culturally important resources. With the 65 foot rise of Lake Powell in Summer 2023, 30,000 acres⁶⁵ of lake shore

⁶⁰

<https://www.usbr.gov/ColoradoRiverBasin/documents/NearTermColoradoRiverOperations/20230400-Near-termColoradoRiverOperations-DraftEIS-508.pdf>

⁶¹ McGivney, Annette, *Resurrection: Glen Canyon and a New Vision for the American West*, 2009, Braided River Publishing

⁶² <https://www.glencanyon.org/13220-2/>

⁶³ <https://www.sltrib.com/news/2022/10/24/cultural-sites-are-being/>

⁶⁴ <https://www.knau.org/knau-and-arizona-news/2022-05-12/archaeological-sites-once-thought-lost-under-lake-powell-reappear-as-water-drops>

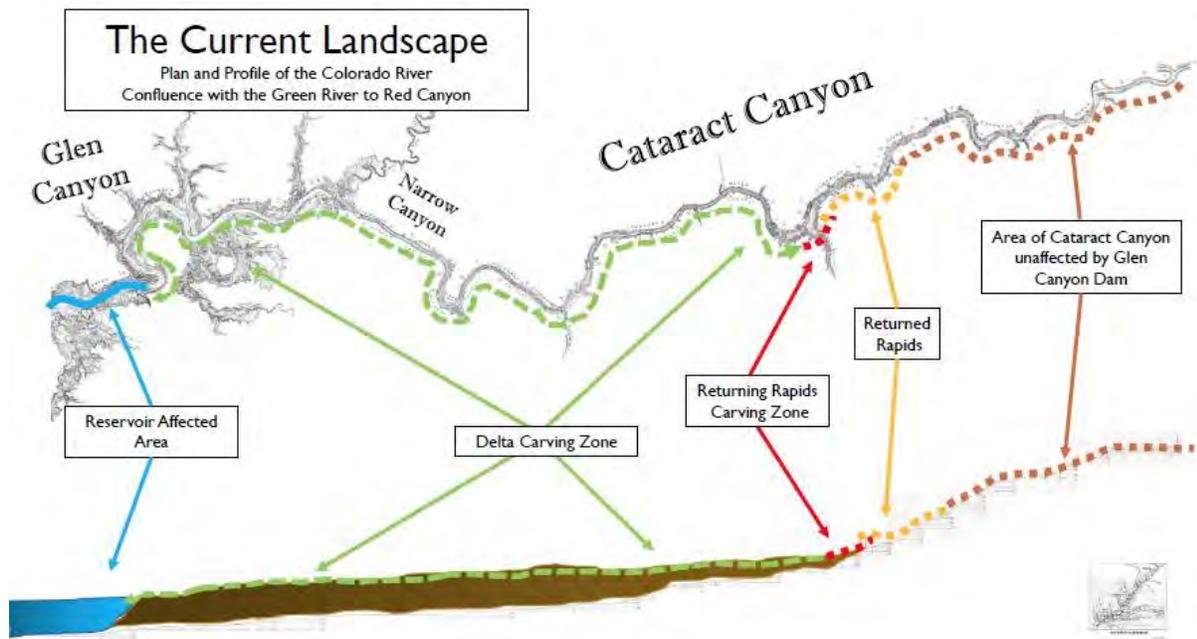
⁶⁵ Root, J. C., & Jones, D. K. (2022). Elevation-area-capacity relationships of Lake Powell in 2018 and estimated loss of storage capacity since 1963 (No. 2022-5017). US Geological Survey.

and tributary canyon were once again submerged, which re-drowned exposed archaeological sites, likely causing additional damage beyond what occurred when the reservoir first filled.

The Glen Canyon landscape has cultural, social, and historical significance to multiple Colorado River Basin indigenous tribes, early Mormon settlers, and to many early explorers and river runners. The future management of these resources should include a different approach than was used in the late 1950's and early 1960's when the Department of the Interior only focused on 'recovery of artifacts'. The Post-2026 Guidelines need to include active and consistent tribal input on the management of reservoir operations to protect all resources, not just the water.

c. Emerging resources in Colorado and San Juan Rivers

Cataract Canyon, located below the confluence of the Green and Colorado Rivers, is home to some of the most notorious whitewater in North America. It is known by many river rafters and guide companies as "Utah's Grand Canyon". When Lake Powell was full, the flowing river and whitewater rapids of Cataract Canyon ended below Big Drop 3 Rapid, which is also the boundary between Canyonlands National Park and Glen Canyon National Recreation Area. Since Lake Powell's decline from its most recent peak in 1999, the Colorado River in Cataract Canyon has reestablished itself in what used to be a reservoir.



Map and cross section of emergent sections of Colorado River entering Glen Canyon. Returning Rapids 2022 Field Binder.

What was left behind from Lake Powell's retreat are massive sediment deposits in the Cataract, Narrow Canyon (just downstream), and upper Glen Canyon. Over the years, a large amount of reservoir sediment in Cataract has been scoured away, and the natural characteristics of the Colorado have begun to reestablish. This transformation has been documented extensively by

The Returning Rapids Project⁶⁶, which has conducted numerous research trips in the reemergence area with coordination from NPS, USGS, GCMRC, and multiple researchers from the University of Utah and Utah State University.

Cataract Canyon is 41 miles long and historically had 49+ rapids in its approximately 400 feet of gradient. Out of those 41 miles, 24 were affected by the reservoir and its resulting sediment delta. Out of the 49+ rapids, all but 23 were impacted by the reservoir and then covered by the sediment delta. Since the retreat of the reservoir beginning in the mid 2000s, 7 major rapids have since reemerged. In spring of 2023, there were approximately 44 miles of flowing river in the mainstem Colorado River that were once inundated⁶⁷.

In Cataract Canyon, the return of the river and its whitewater rapids have created a recreational experience that hasn't been available since the reservoir first drowned the canyon. **3,000 to 4,000 visitors to the park unit raft down this section of river every year**⁶⁸. The prospect of a returning river rafting economy to Glen Canyon has been discussed publicly by former GCNRA superintendent Billy Shott⁶⁹. The rapids that have returned in lower Cataract Canyon add a significant experiential value to a Cataract Canyon trip — one of Utah's most popular rafting destinations and most popular expeditions from outfitting companies around the region. For most of the past 5 years, there has been river current all the way to the Hite area, and parties can run Cataract without the use of motors — which reduces the overall carbon footprint of this recreational activity.

There has also been significant ecological succession on the mainstem Colorado River in Cataract Canyon below full pool elevation. Vegetation surveys by Seth Arens of Western Water Assessment⁷⁰ have shown a snapshot of what those plant assemblages look like from survey work at several sites at tributary canyons within Cataract. A summary of the study states:

“Across all sites and years, 44 vascular plant species were observed in belt transects. At sites above 3,700 feet and not flooded by Lake Powell, 41 plant species were observed; at sites below 3,700 feet, 28 plant species were observed. Plant species present in transects were generally typical to Colorado Plateau upland desert and riparian ecosystems. Several previously flooded sites were dominated by native shrub species (coyote willow and seep willow), had lower abundance of non-native plants and native shrubs were generally more abundant than the non-native tamarisk.”

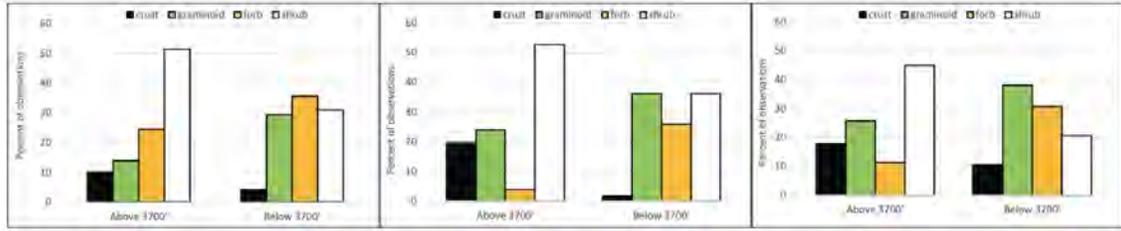
⁶⁶ <https://www.returningrapids.com/>

⁶⁷ Returning Rapids 2023 Field Binder

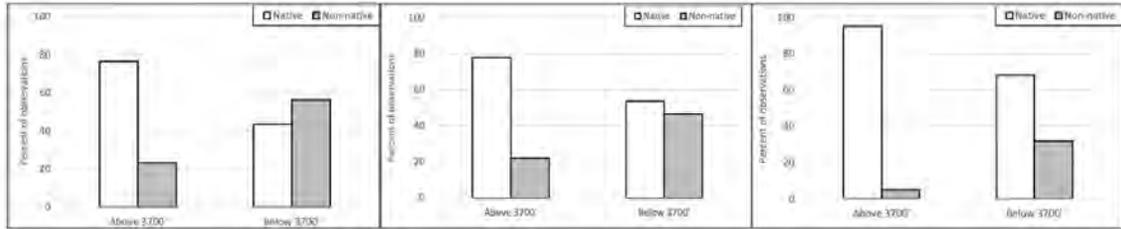
⁶⁸ Returning Rapids 2023 Field Binder

⁶⁹ <https://lakepowellchronicle.com/article/the-future-of-gcnra-lake-powell>

⁷⁰ https://www.colorado.edu/sites/default/files/2023-06/CataractCanyonPoster_051123.pdf



Percent of plant species observations by plant functional group, including a category for cryptobiotic crust and site elevation from belt transects at all sites in 2019 (left), 2020 (center) and 2021 (right).



Percent of native and non-native plant species observations grouped by site, above (not flooded) or below (flooded) 3,700 feet, from belt transects at all sites in 2019 (left), 2020 (center) and 2021 (right).

Charts on Cataract Canyon vegetation above and below elevation 3700 ft. Seth Ares, WWA.

On the San Juan River, a similar emergence of the river corridor has taken place with the retreat of Lake Powell. In Spring of 2023, there were approximately 45 miles of flowing river into areas once submerged by Lake Powell. The geographic characteristics of the San Juan River are different from the mainstem Colorado: the river gradient is less steep, and the pre-dam river channel was much wider with areas where the river braided through wide shallow reaches.



A group of river boaters camped at the mouth of Nokai Canyon on the San Juan River in April 2023 - an area that used to be submerged by Lake Powell. Returning Rapids 2023 Field Binder. Elliot Ross Photo.

At full pool in the 1980s-2000, the reservoir backed the river up all the way to Grand Gulch. As the reservoir level receded in the 2000s, the aggradation of sediment did not. It's possible that the full pool level being near Paiute Farms greatly amplified the area's ability to trap sediment. The continued backfill traveled upstream several more miles, covering the river corridor and rapids with sediment up to 40 feet **above Lake Powell's full pool line**⁷¹.

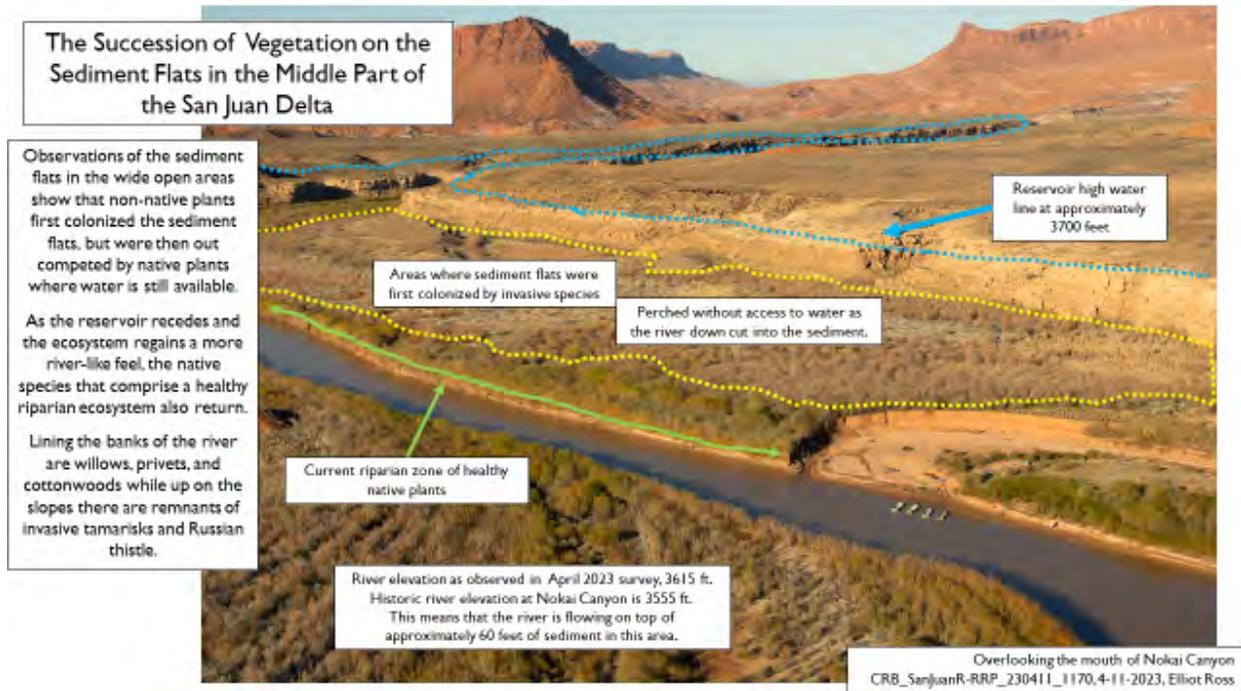


Image highlighting new vegetation on the emerged riparian corridor of the San Juan River near Nokai Canyon. Returning Rapids 2023 Field Guide. Elliot Ross Photo.



Rafter floats next to a large grove of cottonwood trees on the San Juan River at elevation ~3,630 ft.

⁷¹ Returning Rapids 2023 Field Binder

The rapidly changing river corridors of the Colorado and San Juan Rivers are providing new recreational opportunities in GCNRA that didn't exist in the 2007 Interim Guidelines, as well as large-scale ecological succession. These emerging areas are enhancing the ecosystem and helping to provide habitats for listed and endangered species.

On page 296 of the Draft SEIS released by Reclamation in 2023, the document states, "Whitewater boating is the key recreational activity in the Grand Canyon from Lees Ferry to the Diamond Creek or Pearce Ferry take-outs. Other reaches are not predominantly whitewater localities; therefore, they will not be discussed in this section." It fails to list anything about the returned river corridor in Cataract Canyon and flowing river on the San Juan. Referring to this area solely as "Lake Powell" and not Glen Canyon demonstrates that reservoir recreation is favored over river ecosystems. This section solely discusses the potential impacts to reservoir and reservoir-based recreation. There is no mention of how to manage both the rivers *and* the reservoir. **In order to fully understand the environmental and recreational impacts of reservoir operations on these sections of river, these significant resources must be taken into consideration in the Post-2026 EIS. The American public deserves to get an accurate assessment of the recreational resource values that Glen Canyon can and does supply.**

6. The need to consult tribes on impacts to Glen Canyon Resources

According to the National Park Service, 19 American Indian tribes and bands have an association and cultural affiliation with Glen Canyon — including contemporary descendants of the people who left behind the thousands of archeological sites in the canyon⁷². The Navajo, Hopi, Ute, Southern Paiute, Zuni and Puebloan tribes all have deep connections to Glen Canyon, and consider it to be part of their ancestral homelands. When the canyon was flooded, hundreds of tribal members were displaced⁷³ — their homes, farms and sacred sites drowned⁷⁴. As more ancestral lands emerge from the reservoir, there is an opportunity for the federal government to develop cooperative tribal management associated with their historical use of the area. There could be recreational economic opportunities for guiding, like the Hualapai tribe does in the Grand Canyon, or the Navajo Nation does in Antelope Canyon. The Post-2026 EIS should consult tribal leadership on management of Glen Canyon's emerging archeological, ecological, and recreational resources.

7. The need to for a sediment management plan in Glen and Grand Canyon

With the combination of Lake Powell's retreat and the massive amounts of sediment accumulating in Glen Canyon every year, massive sediment deltas are emerging and consistently moving in Glen Canyon, and deserve careful consideration in operational strategies under the Post-2026 NEPA process.

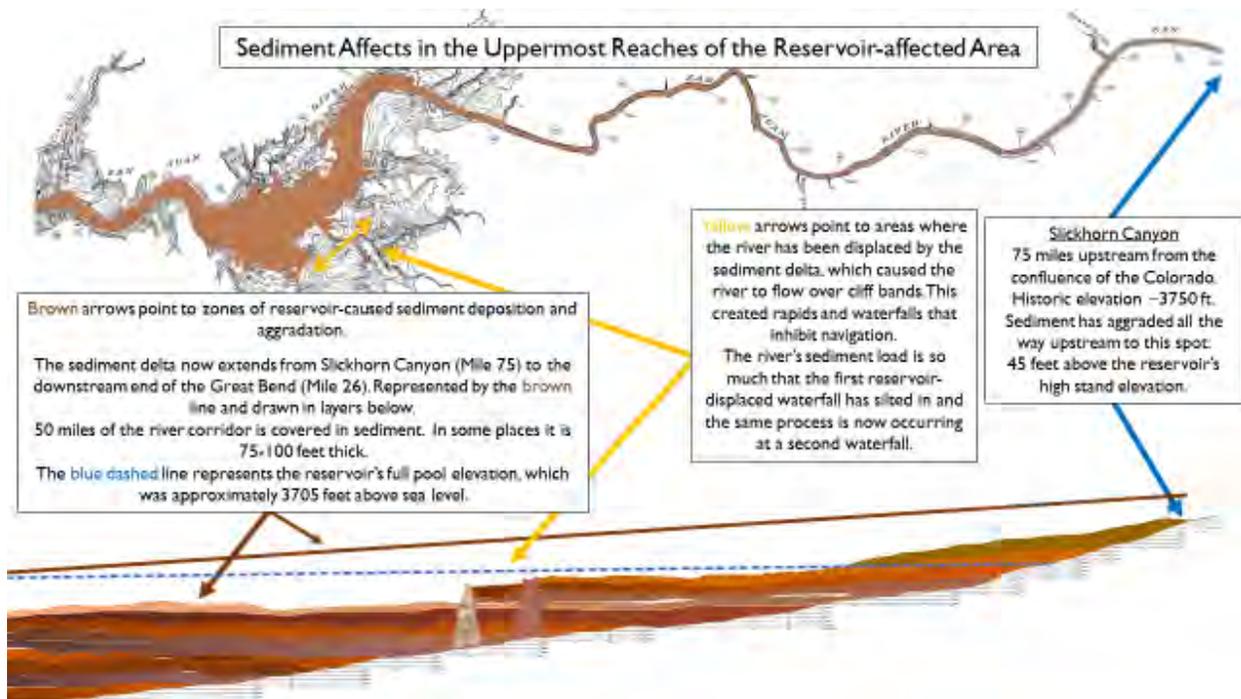
⁷² <https://www.nps.gov/glca/learn/management/foundation-document.htm>

⁷³ https://digitalrepository.unm.edu/hist_etds/21/

⁷⁴ Graham, Taylor. Oral Histories: Charley Bullets on Glen and Grand Canyon, *Hidden Passage: The Journal of Glen Canyon Institute*, issue XXVI, Fall 2020 <https://www.glencanyon.org/wp-content/uploads/2021/02/Hidden-Passage-Final-Version-2021.pdf>

These deltas are moving down through the mainstem river canyons. In the coming 20-50 years these “mud glaciers”⁷⁵ will greatly affect the viability of the reservoir’s storage capacity. In areas where the reservoir once was, mitigation efforts need to be taken where the sediment is damaging resources.

On the San Juan River, the original river channel has been displaced causing a waterfall at Paiute Farms, which will create challenges for future rafting recreation and ecological challenges. The lack of riverine ecosystem connectivity at the falls has impacts on native fish populations. The waterfall has blocked upstream sediment from the San Juan, impacting not just the newly flowing sections of river below Lake Powell’s full pool level, but even causing river sediment to back up farther upstream⁷⁶. A sediment management plan should include some monitoring of the Paiute Farms waterfall and how it is impacting resources above the 3,700 elevation level.



Graphic showing sediment cross sections and waterfall formations on the San Juan River. Returning Rapids 2023 Field Binder.

It’s believed a similar waterfall may soon develop near Hite at the end of Narrow Canyon⁷⁷. The emergence of such a waterfall would create a significant safety hazard and impact the recreation opportunities for private boaters and outfitters who utilize that section of river. If a

⁷⁵<https://www.kunc.org/environment/2022-08-04/a-mud-caked-terra-incognita-emerges-in-glen-canyon-as-lake-powell-declines-to-historic-low>

⁷⁶ Gene Stevenson, March 2000

⁷⁷ <https://www.sltrib.com/news/2022/04/03/waterfall-could-soon-form/>

reservoir-caused waterfall forms near the Hite area, Reclamation must assess the feasibility of dredging or directing the river back in its original channel.

Any long term operation plans must include development of a comprehensive sediment plan in Glen Canyon. This plan should address issues related to waterway access (river or reservoir), resource impacts, and resource remediation above areas where the reservoir will likely not be anymore. Understanding the sediment dynamics will allow the National Park Service, the Bureau of Reclamation and the State of Utah to actively manage infrastructure and public safety programs within Glen Canyon National Recreation Area. The recently completed USGS sediment survey of Lake Powell should form one of the elements of this assessment.

8. The need to assist NPS in planning for a Glen Canyon in the 21st century

With conditions changing so rapidly on the ground in Glen Canyon National Recreation Area, it will be vital for the Post-2026 NEPA process to provide the resources to assist NPS in planning for adapting to new physical realities at the park. GCNRA's management plan has not been updated since 1979⁷⁸. GCNRA develops its facilities planning based on projections and guidance from Reclamation⁷⁹. The recreation landscape at the park is changing at speeds that are almost impossible for the park to keep up with. Last year, there was a two month period where nearly every boat ramp at the reservoir was non-operational, with boat ramps being extended and marinas being moved as quickly as possible. Hite and Dangling rope marinas have closed indefinitely.

GCNRA has stated recreational use on the emerged Colorado River in Cataract Canyon/North Glen Canyon has increased dramatically, as has land based recreation around the park⁸⁰. Yet, the takeout ramp for Cataract Canyon rafting trips near Hite, UT has repeatedly degraded in recent years, creating a safety hazard as well as deterring recreational visitation to the area. Recent communications from GCNRA have indicated possible plans for this access point, but with no timeline, which could mean this serious safety issue could persist for years. Public safety in a National Park cannot be left unattended or ignored.

If Lake Powell is to be managed at low levels moving forward, the Post-2026 NEPA analyses must include planning for a permanent solution for the Hite boat ramp and the broader recreation area. Without a more comprehensive approach to the evolving recreation characteristics in the park, GCNRA will be forced to simply react to problems or ignore them as they come. While the disappearance of Lake Powell creates big challenges for many stakeholders, it has nonetheless created significant recreation opportunities in the park. The Post-2026 analyses and resource planning need to optimize management for this reality, pursuant to the mission of the NPS and Grand Canyon Protection Act.

⁷⁸ <https://parkplanning.nps.gov/parkHome.cfm?parkID=62>

⁷⁹ <https://www.nps.gov/glca/learn/changing-lake-levels.htm>

⁸⁰ Glen Canyon Gazette, volume 2, issue 1, August 5th, 2022

9. The need to study operational alternatives that include reservoir consolidation and prioritization of Lake Mead

Many leading scientists and policy experts along the Colorado River have advocated for a management approach where Lake Powell and Mead are viewed as one unit of water storage, rather than two separate storage facilities⁸¹. Some experts have even made the point that since Upper Basin users don't actually pull water from the reservoir, it is effectively a Lower Basin reservoir. Given the reality that Lake Powell narrowly avoided dipping below minimum power pool last year, and Reclamation is currently assessing re-engineering the dam to operate below deadpool, and a tremendous amount of emerged resources exist in Glen Canyon below its full pool elevation, the Post-2026 EIS should model alternatives where Lake Powell is operated at low or even run-of-river levels. **These alternatives should include reservoir consolidation, and prioritization of Lake Mead as the Colorado River's primary storage facility.** The scenarios modeled should include a rule that utilizes Lake Powell as a backup facility, not to be filled past 3,550 except for emergency situations.

From a perspective of maximizing water supply, the two-reservoir concept might have made sense in the 1956 Colorado River Storage Project Act and again in the 1968 Colorado River Basin Act. The underlying assumption was that the system would be operated and managed at a near full level. The realities of climate change and the impacts it is having on basin hydrology now requires us to assess those assumptions of the original basin development and determine if they are still valid for looking forward. The Federal government is supposed to be forward looking for its citizens and this is an opportunity to do that.

A 2013 legal analysis by Larry McDonnell explored the concept, stating "There may be opportunities to put in place measures that would reduce the likelihood of a 75/10 shortfall such as using an accounting system to smooth out the annual variability of flows and even a relaxation of the requirement under certain circumstances⁸²." Additionally, it's crucial that the Post-2026 NEPA analysis assess options for Upper Basin states to store water in Lake Mead in the form of an Intentionally Created Surplus (ICS). Similar ICS tools were essential in the 2007 Interim Guidelines and provided a framework and incentive for water users to conserve⁸³.

Some policy experts have recently argued that the Upper Basin's delivery obligation is unsustainable in a dwindling river system. If the delivery obligation is changed, the primary purpose of Glen Canyon Dam will change as well. As Eric Kuhn, former Director of the Colorado River Water Conservation District, said at the Getches Wilkinson Annual Summer Conference in 2023⁸⁴, "If the risk of a curtailment on the Upper Basin... is off the table, then the purpose of Lake Powell becomes very different". In an operational scenario where the Upper Basin is no longer required to release 75 million acre feet every ten years at Lee Ferry, the Upper Basin

⁸¹ <https://qcnr.usu.edu/coloradoriver/files/news/fs-white-paper-6.pdf>

⁸² McDonnell, Larry, Potential Legal Issues under the Law of the River Associated with the Fill Mead First Proposal, *The Water Report*, Issue 112: June 15, 2013

⁸³ <https://www.usbr.gov/lc/region/programs/strategies/RecordofDecision.pdf>

⁸⁴ <https://www.youtube.com/watch?v=OLXX8vyMf50>, minute 1:21:00

could then be allowed to count its delivery further downstream at Lake Mead. Even in amounts lower than 7.5 million acre feet, the omission of the delivery obligation would open up more flexibility to consolidate storage in one reservoir versus the other in an effort to minimize evaporative and seepage losses, and optimize environmental conditions in Glen Canyon and Grand Canyon.

An accounting approach that prioritizes water storage in Lake Mead could offer flexibility to the system, encourage conservation in the Upper Basin, and may save 30,000-50,000 acre feet a year by avoiding higher ground-seepage rates in Glen Canyon⁸⁵. Though such an idea was considered outside the scope of previous NEPA analyses, it is now essential to look at as one of the potential options considering the current and anticipated hydrology of the Colorado River. Analyzing options for Upper Basin storage in Lake Mead in the Post-2026 NEPA process will provide all stakeholders in the Basin the information needed to assess the best approach to water storage in the decades ahead.

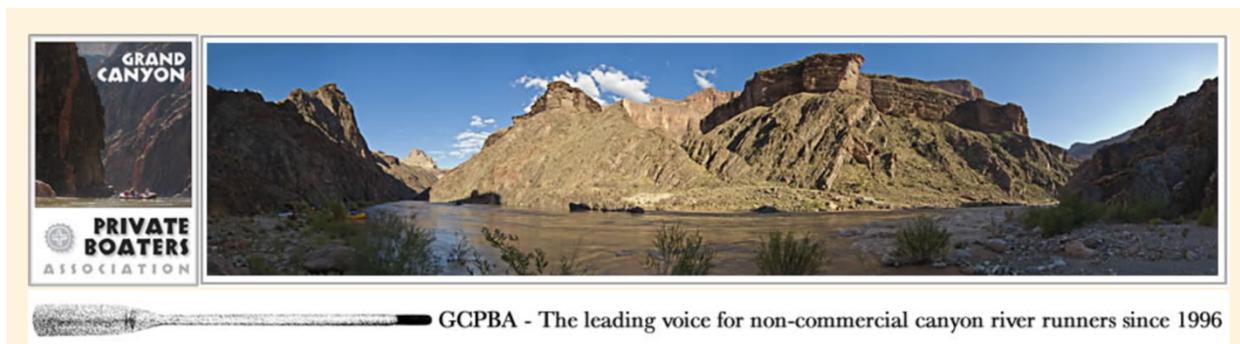
Glen Canyon Institute and other signers to this letter support a scientific approach to assessing the impacts of Glen Canyon Dam on the resources of Glen Canyon and the Grand Canyon. We stand ready to support a scientifically based, transparent, and forward looking approach to future operations of the Colorado River. We encourage the Bureau of Reclamation to meaningfully include Colorado River Tribes in ensuring that in the process all aspects are considered equally and without bias.

Thank you for taking the time to consider our comments.

Sincerely,

Eric Balken, Glen Canyon Institute
Zach Frankel, Utah Rivers Council
Mike DeHoff, Returning Rapids Project
Kyle Roerink, Great Basin Water Network
John Weisheit, Living Rivers
Erika Pollard, National Parks Conservation Association

⁸⁵ <https://qcnr.usu.edu/coloradoriver/news/wp1>



August 8, 2023

Bureau of Reclamation

Attn: Post-2026 (Mail Stop 84-55000)
P.O. Box 25007
Denver, CO 80225

Subject: Comments by Grand Canyon Private Boaters' Association on Notice of Intent to prepare a SEIS concerning the scope of specific operational guidelines, strategies and any other issues that should be considered in the development of post-2026 operations for Lake Powell and Lake Mead.

GCPBA was established in 1996 as a non-profit 501(c3) organization to provide the self-outfitted boating public with an advocate and a clear voice seeking to achieve fair access for the non-commercial river runner in Grand Canyon and the rivers of the Colorado Plateau region. GCPBA's goal is to ensure the ability for all to obtain, on an equal and timely basis, an opportunity to experience a float trip through the Grand Canyon while protecting the resource.

GCPBA coordinates its efforts with the Grand Canyon National Park leadership, American Whitewater Association, Grand Canyon Trust, Grand Canyon River Guides Association, Grand Canyon Commercial Outfitters Association as well as the four private outfitters; Moenkopi, Ceiba, Canyon REO and Grand Canyon Professional River Outfitters. The total yearly economic impact from the private boating community on the Arizona economy is estimated to be \$3.4 million based on a 2001 study and adjusted for inflation.

The following comments were written as input to the supplemental environmental impact statement for near-term Colorado river operations. The comments have been modified for input to the SEIS for post 2026 operations:

Comment #1

The Purpose and Need section for short term operations stated; *"In order to ensure that Glen Canyon Dam continues to operate under its intended design, Reclamation may need to modify current operations and reduce Glen Canyon Dam downstream releases, thereby impacting downstream riparian areas and reservoir elevations at Lake Mead"* GCPBA challenges the assertion that Glen Canyon Dam should continue to operate

under its intended pre-1956 design. The premise that the intended design is inviolate is fallacious. As such, post 2026 operations should evaluate the purpose of Glen Canyon Dam as conditions due to climate change have drastically changed since 1956.

Comment #2

It should be made clear that the Western Area Power Administration's interest is to produce and maximize the economics of hydroelectric power and that this intent drives the Bureau's operation of the dam. Hence, alternatives listed in the "Framework Agreement Alternative and the Reservoir Operations Modification Alternatives" reduce water deliveries so that the generation of hydropower is maintained. These alternatives are based on an interpretation of the "intended design" that generation of hydropower supersedes the delivery water. Thus, if not modified, it is imperative that the SEIS for post 2026 operations publicly and clearly state that this is the case.

Comment #3

Previously, the draft SEIS stated that alternatives for short term operation "*....may consider potential effects on wildlife, threatened and endangered species habitat, recreation, water supplies (agricultural, municipal, environmental), water resources, air quality, cultural resources, hydropower resources, social and economic conditions, and other resources and uses.*" These aspects have been considered in the past and relegated to a lower value than the value attributed to hydropower. To wit, the Long Term Experimental Management Program (LTEMP) for the Operation of Glen Canyon Dam Draft EIS of December 2015. One of the EIS's primary objectives was to "*.....Maintain or increase Glen Canyon Dam electric energy generation, load following capability, and ramp rate capability,*"

LTEMP's preferred alternative maintained a daily fluctuation of flows even though it was found that eliminating these had the highest potential for building sandbars and retaining sand in the system and providing the greatest benefit to the aquatic ecology. Furthermore, the recreational benefit was found to be enhanced by eliminating these fluctuations. Despite all these benefits, the selected alternative continued the fluctuation of daily flow and thereby satisfy maintaining or increasing Glen Canyon Dam's electric energy generation. Post 2026 operations need to incorporate these findings in any future plan and reconsider the tradeoff of peaking flows at the cost of the river's aquatic ecology and recreational use.

Comment #4

A brief historical summary of releases from Glen Canyon Dam whereby the impact on recreational use and aquatic ecology of the river corridor was deemed irrelevant would be helpful for the public to understand the Bureau's mindset of operating Glen Canyon Dam. Flows would be reduced to a minimum during off-peak hours and maximized during on-peak hours. These swings in flows were later reduced to what they are now. This summary should be contrasted with any proposed flow reductions for post 2026 operations and the impact on recreational use and aquatic ecology quantified.

Recreational use of the river corridor is set forth in the Colorado River Management Plan. Use is quantified by the daily number of trips launching (TAOT) and daily number of people launching (PAOT). TAOT was determined by the availability of campsites, which have severely degraded over time by the daily fluctuation of flows eroding beaches. The High Flow Experiments (HFE) have not and cannot make up for this beach erosion. Thus, continued daily flow fluctuations will negatively affect recreational use and enjoyment of the river corridor and may require a reduction in TAOT in the future.

Comment #5

A cost/benefit analyses of the generation of hydropower should compare the cost of reducing water deliveries, the damage done to and degradation of the river corridor's ecosystem by continuing the fluctuation of flows.

Comment #6

A list of alternative electrical power resources to mitigate the loss of hydro power should Lake Powell's elevation drop to a level such that it precludes hydro power generation as well as the elimination of daily peaking flows. One alternative is to collaborate with the Navajo Nation to expand their Kayenta Solar Project in Navajo County. The Navajo Nation has the available land and plenty of sun. The electrical energy generated would offset the reduction of power lost by eliminating daily peaking flows. This potential should be explored with the primary stakeholders such as WAPA, USBR, Salt River Project and the Navajo Tribal Utility Authority (NTUA) as part of post 2026 operations.

This alternative should be compared to the February 2023 conceptual proposal for low-head-hydropower modifications of Glen Canyon Dam. A comparison should focus on cost and time for construction.

GCPBA is appreciative of the opportunity to provide the foregoing comments for input to the SEIS for post 2026 operation of Lake Powell and Lake Mead.



John Vrymoed, President
Grand Canyon Private Boaters' Association



PO Box 1934
Flagstaff, AZ 86002
(928) 773-1075
info@gcrg.org
www.gcrg.org

To: Amanda Erath, Colorado River Post-2026 Program Coordinator, Bureau of Reclamation
Via email: crbpost2026@usbr.gov

From: Grand Canyon River Guides, Inc.

Lynn Hamilton, Executive Director on behalf of the Officers and Directors of GCRG
David Brown, Glen Canyon Dam Adaptive Management Work Group representative
Ben Reeder, Glen Canyon Dam Technical Work Group representative

Re: Scoping Comments for the Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead

Date: August 15, 2023

Grand Canyon River Guides, Inc., (GCRG) founded in 1988, is unique in that it provides a unified voice for river guides and river runners in defense of the Colorado River through Grand Canyon. Our non-profit educational and environmental 501(c)(3) organization is comprised of over 1,700 individuals who are passionately dedicated to the continuing preservation of this national icon. Consequently, Grand Canyon River Guides' goals are to:

Protect the Grand Canyon
Provide the best possible river experience
Set the highest standards for the guiding profession
Celebrate the unique spirit of the river community

As the recreational river running stakeholder for the Glen Canyon Dam Adaptive Management Program, and as a longtime Grand Canyon defender, Grand Canyon River Guides respectfully submits the following scoping comments, clarifying questions, and recommendations for consideration in the development of Post-2026 Operational Guidelines and Strategies for Lakes

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Powell and Mead. Our comments are grounded in the mandates of the Grand Canyon Protection Act of 1992 which states, *“The Secretary shall operate Glen Canyon Dam... in such a manner as to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established, including, but not limited to natural and cultural resources and visitor use.”* (Section 1802, GCPA). **Indeed, GCRG and the broader public view the Colorado River through Grand Canyon National Park, not as a pipeline between two reservoirs, but as a sacred place and living river with complex and interrelated resources and associated values that must be protected in perpetuity.**

Furthermore, the legal obligations of the Grand Canyon Protection Act (GCPA), the Endangered Species Act (ESA), the National Park Service Organic Act, and National Historic Preservation Act (NHPA) underpin the Long Term Experimental and Management Plan (LTEMP) EIS, that outlines resource goals and objectives, management actions, and experimental options for adaptively managing Glen Canyon Dam over a 20 year timeframe. It is within this overarching context that the Bureau of Reclamation, as a federal agency, must move forward towards developing sustainable, holistic, and environmentally responsible post-2026 Operational Guidelines and Strategies for Lakes Powell and Mead that also preserve the values of the Colorado River through Grand Canyon including:

- a healthy ecosystem based on the preservation of critical habitats and natural patterns and processes, to the extent possible,
- healthy native fish populations, including the federally listed Humpback Chub, supported by a sustainable, diverse and productive aquatic food base,
- preservation of archaeological, cultural resources, and traditional cultural properties along the river corridor, sacred to the eleven tribes of Grand Canyon,
- sufficient base flows that ensure safety and navigability for the 20,000+ people who run the river each year, and
- numerous sandbars, camping beaches, and associated habitats, distributed throughout the Colorado River ecosystem.

With these values and resource goals in mind, there are a number of questions that Grand Canyon River Guides would like the Bureau of Reclamation to consider and analyze through this EIS process:

1. Considering that High Flow Experiments (HFE) are the ONLY tool for managing the sediment resource in Grand Canyon by replenishing sandbars and camping beaches as well as protecting cultural sites, how can HFE's (in particular, naturally timed HFE's under sediment enriched conditions) be ensured and optimized through this EIS considering our low water future?
2. What are the lowest flows that can be safely navigated, given the inherent risks of river running, in different types of craft, especially large motor boats which enable underserved segments of the public to experience Grand Canyon?

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3. At what point will flow levels through Grand Canyon negatively impact the Colorado River Management Plan (CRMP) which is the visitor use plan that balances recreational opportunities with conserving park resources?
4. How will this EIS ensure the quality of the recreational river running experience, the viability of the thriving recreational river running industry in Grand Canyon, and its significant economic benefits to the state of Arizona?
5. How can we best protect the health and long term viability of native fish populations in Grand Canyon, in particular the federally listed Humpback Chub, in the face of the recent invasion of predatory smallmouth bass, an alarming consequence of lower lake levels and rising water temperatures?
6. Given the challenges of creating a sustainable future the entire Colorado River Basin and with careful consideration of the benefits and tradeoffs of managing the two largest reservoirs in the United States, Lakes Powell and Mead, how can this EIS best protect the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were created?
7. Considering that the combined storage of Lake Mead and Lake Powell may rarely exceed 50% of capacity (Wheeler et al, 2022), what are the environmental, recreational, and hydropower tradeoffs when analyzing alternatives for preferential storage of water in Lake Powell or Lake Mead?

In addition to these clarifying questions, Grand Canyon River Guides offers the following recommendations for the development of the post-2026 Operational Guidelines and Strategies, for Lake Powell and Lake Mead:

Resolve the water supply/consumptive use imbalance

Balancing and stabilizing the system so that long term average consumptive uses and losses do not exceed the natural supply is absolutely imperative for the long-term sustainability of the Colorado River system and must serve as a primary goal of the Post-2026 Guidelines. GCRG advocates that the BOR include an alternative in the EIS that focuses on maintaining this balance to avoid the current predicament. In our view there is a clear need to avert a future human and ecological catastrophe by meeting this goal. Therefore the purpose of the 2026 Operational Guidelines and Strategies should include a management regime to these ends.

As Colorado River Basin experts explain, "...it is no surprise that the 21-year average (2000 – 2020) rate of water consumption and losses that exceeded the natural supply by approximately 1.2maf/yr led to today's crisis." (Schmidt, Fleck, and Kuhn, 2022). Their blunt assessment of how we got into this crisis offers a sobering cautionary tale that the Bureau of Reclamation must heed when developing this EIS:

- When the Colorado's flow was up, we used it all.
- When it was down, we drained the reservoirs.
- The river's natural flows have been down for a long time.

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- And during the few stretches of somewhat higher flows, we did not significantly refill the reservoirs.

Thankfully, the strong snowpack from this past winter gave us a brief reprieve, but must in no way minimize the magnitude of the Colorado River crisis or the urgency with which we address it. As Brad Udall, senior water and climate researcher at CSU's Colorado Water Institute stressed, the hydrology from the last 23 years indicates that *"one bad year will return the nation's two largest reservoirs to 25 % capacity."* Udall goes on to say that in order to fill Powell and Mead, we would need about six consecutive years just like 2023. (Goodland, 2023)

As Jocelyn Gibbon, river guide and water lawyer, explained in her blog for American Rivers, *"If we want to continue to have water to support the millions who rely on it, if we hope to take care of Grand Canyon and its river, if we want to even have a choice about what flows looks like in the future, we need to stabilize this system. We can't continue to deny the reality of simple numbers, and we can't rely on year after year of hurried emergency measures to get us by. That's not planning, that's triage."* (Gibbon, 2022)

A possible path forward is explained in an April 2023 paper by Jack Schmidt, Charles Yackulic, and Eric Kuhn, which concludes by saying, *"If Basin-wide long-term average water consumption is reduced by 13 – 20%, reservoir storage could be maintained and potentially increased, providing a buffer against interannual variability in water supply that has supported economic and population growth in the Basin. Over longer time scales, water supply allocations will likely need to continue to be adaptive and responsive to changes in runoff under future climate change."*

Strengthen the Purpose and Need statement

The first sentence of the "Purpose" segment of the Notice of Intent begins by stating, *"To assure the continued stability of the Colorado River system into the future, Reclamation announces its intent to prepare an EIS for post-2026 operations...."* GCRG contends that the Colorado River system is no longer stable or predictable -- it is in crisis because of the past decisions we've elucidated above which have led to significant imbalances and instabilities that are untenable, unsustainable, and must be rectified immediately. Throughout the 21st century, basin-wide consumptive use has so far exceeded the natural supply that the combined contents of Powell and Mead declined by 33.5 million acre feet between January 2000 and April 2023 – going from roughly 95% full to 22% full in that timeframe. (Schmidt, Yackulic, Kuhn, 2023) Consider this EIS process a "do-over" where it is imperative that we live within our means in regards to the Colorado River. The Purpose and Need statement must be clear-eyed about the profound crisis that faces us all, the hard choices that must be made, the urgency of the timeline for this EIS process, and the absolute necessity of using the best available science and resource-impact models for a robust EIS.

Furthermore, the Purpose and Need Statement for the post-2026 Operational Guidelines EIS must acknowledge and utilize the terms **climate change** and **aridification**, defined as "the

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gradual change of a region from a wetter to a drier climate.” We find it disturbing that these key words are entirely lacking throughout the June 16, 2023 Federal Register Notice of Intent – a significant oversight. Semantics matter! Simply put, drought is temporary, aridification is permanent. The phrase “prolonged period of drought” is no longer adequate to express the Colorado River crisis that has been building since 2000, making this period one of the driest in the last 1200 years. This is especially remarkable when in consideration of the record-setting global heat records experienced in 2023 and the prolonged periods of extreme heat experienced in central Arizona. We urge the Bureau of Reclamation to utilize the correct terminology which 1) underscores our new reality resulting from human-caused climate change and 2) highlights the absolute necessity of developing forward-thinking paradigms based on the best available science (including climate science) to manage the Colorado River wisely, sustainably, and proactively for our low water future.

The National Park Service should be a cooperating agency

The NPS manages, protects, and conserves resources and the quality of the visitor experience in nine park units distributed throughout the Colorado River Basin: Dinosaur National Monument, Curecanti National Recreation Area, Black Canyon of the Gunnison National Park, Canyonlands National Park, Arches National Park, Glen Canyon National Recreation Area, Rainbow Bridge National Monument, Grand Canyon National Park, and Lake Mead National Recreation Area. The NPS has requested (and should be granted) cooperating agency status for the forthcoming National Environmental Policy Review (NEPA) process, pursuant to 40 CFR 1501.8. As per Council of Environmental Quality regulation ([40 CFR 1508.5](#)), "cooperating agency" means any Federal agency, other than a lead agency, that has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposed project or project alternative. Clearly the NPS is more than qualified to serve as a cooperating agency for this EIS and not including them would be a black mark on the legitimacy of the EIS itself. Furthermore, the multiple sovereign Tribes that have expressed interest should also be extended an opportunity to participate as cooperating agencies.

Tribal involvement in Post-2026 negotiations and planning

There are 30 federally recognized tribes in the Colorado River Basin -- some have adjudicated water rights, while others have water claims that remain unresolved. Many tribes lack the infrastructure and money to use their full allotments. And shamefully, many tribal communities lack access to clean water; a profound failure of the trust and treaty responsibilities of our federal government. To date, the tribes of the Colorado River Basin have been largely excluded from discussions on how the river is shared and managed. They now demand a seat at the table, and rightly so. Prioritizing inclusion and access to clean water for all Colorado River Basin tribes is an absolute necessity for this EIS process and a keen responsibility on the part of the federal agencies to usher in a new era of cultural justice based on tribal involvement and respect for tribal needs, perspectives, and traditional ecological knowledge.

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Safe whitewater boating threshold

The BOR needs to reconsider what it concludes as a “safe whitewater boating threshold” of 5,000 cubic feet per second (cfs) which “would be no change in exposure to unsafe boating conditions caused by changes in water levels.” (Draft SEIS, Page 3-230). We would encourage the EIS authors to navigate through Badger, Hance, Grapevine, Horn Creek, Deubendorff, Upset, or several other rapids in Grand Canyon at 5,000 cfs before making that conclusion. We understand releases would mirror the 8.23 model which assigns more water in summer months (the peak commercial months) and we encourage the EIS analysis to be revised so minimum flows of 8,000 cfs would be preserved from April 1- September 22.

Alternative paradigm for managing Powell and Mead as one reservoir

To date, Lake Mead has been used to trigger consumptive use reductions to the Lower Basin and Mexico, however it is clear that current policies are inadequate to stabilize the system. Going forward, the Upper and Lower Basins need to share equitably in the reductions of flows due to climate change. Managing Lake Powell and Lake Mead *as one facility* is the innovative and forward thinking concept born out of discussions between some of the foremost experts on Colorado River management and our warming climate: Jack Schmidt, Eric Kuhn, Kevin Wheeler, and Brad Udall. This combined volume approach to water management has become the consensus idea of the Future of the Colorado River Project, and is clearly articulated in White Paper #6 (Alternative Management Paradigms for the Future of the Colorado and Green Rivers), and in the Wheeler et al paper published in Science in 2022. As described in White Paper #6, this new metric “*focuses attention of the public and of water managers on the status of the actual resource being managed – the stored available water supply.*” This option would also allow for better resource protection for Grand Canyon, which we wholeheartedly support.

Minimize non-native fish passthrough at Glen Canyon Dam

In the Upper Basin, smallmouth bass are considered the greatest threat to native fish and have been linked to declines in the federally listed humpback chub. We now face one of the most serious consequences of our current and future low water situation in Lake Powell – an increase in smallmouth bass and other predatory nonnative fish passing through Glen Canyon Dam, along with warmer water temperatures sufficient for these species to reproduce. The establishment of these warm water non-native fish invaders could permanently shift Grand Canyon’s aquatic ecosystem away from the fish assemblage typical of the last 50 years. (Schmidt, Yackulic and Kuhn, 2023). Due consideration must be made to keeping Lake Powell above the 3525’ threshold to minimize passthrough and reduce warming of the river below Glen Canyon Dam. Please note that warmer water temperatures can also threaten the viability of the recreational rainbow trout fishery in the Glen Canyon reach.

The profound negative effects of low reservoir conditions in Lake Powell and increased water temperatures on the future of Grand Canyon’s fish populations cannot be overstated. All possible measures should be assessed immediately, including screens, barriers, and other physical means, as well as examining the efficacy of a temperature control device. From

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predatory invasive species, to low dissolved oxygen and warmer water temperatures, the potential threats and stressors abound to the fish community we currently have in Grand Canyon. Mitigating those threats by whatever manner(s) possible and with great expediency must be an important focus for this EIS.

Grand Canyon protection

The mandate of the Grand Canyon Protection Act, as well as the goals and objectives of the Long Term Experimental and Management Plan (LTEMP), are the litmus test against which all draft alternatives of the Post-2026 Operational Guidelines EIS must be modeled, measured, and analyzed. In fact, the magnitude of this responsibility to protect and preserve the crown jewel of our national park system and the values that it encompasses is so great, we urge the Bureau of Reclamation to consider developing a “Protect Grand Canyon” alternative as part of the suite of alternatives for this EIS which includes (but is not limited to) the elements discussed earlier in this comment letter: ensuring High Flow Experiments, safe and navigable flows, a healthy ecosystem including protecting the sediment resource and our native fish, and preserving precious cultural resources in this sacred landscape.

Worst-case scenario

In order to shift from a reactive mode when crises arrive to a proactive mode, this EIS must seek out the best available science and climate modeling to fully examine a “worst case scenario,” including all of its ramifications, in order to develop an adaptive, transparent plan for addressing those dire conditions as nimbly as possible. We caution that environmental projections based on the last 30 years may not be sufficient to address the harsh realities of our low water future. Furthermore, having accurate data for evaporative losses from our reservoirs (which is a significant consumptive use in and of itself) is a necessity as part of this EIS, and must also be factored in to water availability in our ever-warming climate. The necessity of including a worst case scenario underscores the pressing need for the EIS to be as adaptive as possible in order to be prepared for all future hydrologic conditions.

Accordingly, should the BOR entertain a worst case alternative, then GCRG would suggest that it rely on hydrologic modeling of a *greater than 20 percent reduction in flows and the inclusion of an operational option to release where outflow matches inflow*. If anything, climate change has demonstrated that what once was ‘reasonably foreseeable’ is no longer the case. The historical flow data demonstrates that a 20 percent change in flows is not uncommon at all and therefore highly vulnerable to being inaccurate, especially coming on the heels of one of the best water years of the last two decades. Furthermore, relegating the operational floor to matching outflows to inflows *minus losses* diminishes what should be the most valid operational floor – establishing minimum base flows below Grand Canyon that match the inflows regardless of the losses.

GCRG encourages BOR to examine a range of alternatives that considers up to 50 percent reduced flows and an operational floor that does not penalize downstream resources for Lake

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Powell's losses. This would better represent the reality of the situation and properly disclose to the public the results of BOR's actions. It could also disclose potential consequences that lead to a more thoughtful and effective planning process.

In closing, we thank you for this opportunity to provide scoping comments for this important process. We can only imagine the magnitude of work involved as the Bureau of Reclamation embarks on developing adaptive, equitable, sustainable, and proactive operational guidelines and strategies for Lakes Powell and Mead, for 2027 and beyond. Grand Canyon River Guides would be happy to be of assistance in any way, and please let us know if you have any questions. We look forward to our continued involvement as we work together on behalf of the Colorado River.

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August 15, 2023

Commissioner Touton
U.S. Bureau of Reclamation
Attention: Post-2026
Upper Colorado Region
125 South State Street, Suite 8100
Salt Lake City, Utah 84138
crbpost2026@usbr.gov

Sent via email

RE: Notice of Intent to Prepare an Environmental Impact Statement and Notice to Solicit Comments and Hold Public Scoping Meetings on the Development of Post-2026 Operational Guidelines and Strategies for Lake Powell and Mead dated June 16, 2023 (88 Fed. Reg. 39455)

Dear Commissioner Touton,

The Grand Canyon Trust (“Trust”) submits this letter to provide scoping comments on the U.S. Bureau of Reclamation’s notice of intent to develop *Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead* (“Post-2026 Guidelines”) and prepare an Environmental Impact Statement (“Post-2026 EIS”).

The Grand Canyon Trust is a 501(c)(3) non-profit advocacy organization founded in 1985 with a mission to safeguard the wonders of the Grand Canyon and the Colorado Plateau, while supporting the rights of its Native peoples. We are headquartered in Flagstaff, Arizona and have more than 3,000 members and supporters. For decades, we have worked across the four corners region to secure protections for important cultural landscapes, safeguard water from uranium mining pollution, defend the unsustainable withdrawal of groundwater for development, protect the Grand Canyon ecosystem, and restore healthy forests and springs. We appreciate the opportunity to comment on the scope and development of the post-2026 operating guidelines and strategies for Lake Powell and Lake Mead. We look forward to working with you and others to improve and sustain the quality of life and healthy environment for all communities in the Colorado River Basin.

On June 16, 2023, U.S. Bureau of Reclamation (“Reclamation”) announced the start of a formal process under the National Environmental Policy Act (“NEPA”) to develop new guidelines for post-2026 operations of the Colorado River “[t]o assure the continued stability of the Colorado

River system into the future.” Reclamation requests feedback on “the scope of the operational guidelines, strategies, and other related issues.”¹ The new rules are needed to replace the existing 2007 Guidelines, 2019 Drought Contingency Plans, and other related agreements, which are all set to expire at the end of 2026. *Id.*

The scoping process—and ultimately what (or whom) gets included or excluded from the guidelines—may be one of the most important factors influencing the effectiveness, sustainability, and longevity of the post-2026 guidelines. Historically, rules and allocations related to the Colorado River’s waters were narrow, exclusive, and have proven unsustainable to meet changing conditions. This existing foundation upon which the current system was built is widely acknowledged to be flawed and climate change is revealing those weaknesses in ways that expose communities, economies, cultures, and environments to unacceptable risks and outcomes.

The warnings and urgency expressed describing the Colorado River system at the brink of collapse in 2022 were not an overstatement of the predicament that we still find ourselves in. With just a few dry years, we risk another steep decline in reservoir levels at the two largest reservoirs in the U.S. pushing both close or past critical levels where there is real uncertainty regarding the safety of the infrastructure to pass water through the dam and the ability of the reservoir to pass water at flow rates necessary to meet the water, cultural, environmental, recreational, community, and economic needs downstream.

These new guidelines will directly impact the water flowing between Lake Powell and Lake Mead through the Grand Canyon. The Colorado River is integral to the cultural landscape of the Grand Canyon and the ancestral and current homelands of at least a dozen tribes. The Grand Canyon is not just recognized locally, regionally, and nationally, but was designated by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) as a World Heritage Site in 1979². The Grand Canyon is described by UNESCO as

among the earth’s greatest on-going geological spectacles. Its vastness is stunning, and the evidence it reveals about the earth’s history is invaluable. The 1.5-kilometer (0.9 mile) deep gorge ranges in width from 500 m to 30 km (0.3 mile to 18.6 miles). It twists and turns 445 km (276.5 miles) and was formed during 6 million years of geological activity and erosion by the Colorado River on the upraised earth’s crust. The buttes, spires, mesas and temples in the canyon are in fact mountains looked down upon from the rims. Horizontal strata exposed in the canyon retrace geological history over 2 billion years and represent the four major geologic eras.

¹ 88 Fed. Reg. 39456, June 16, 2023.

² Grand Canyon National Park, UNESCO World Heritage Site: <https://whc.unesco.org/en/list/75/>

“To be included on the World Heritage List, sites must be of outstanding universal value and meet at least one out of ten selection criteria.”³ The Grand Canyon meets four of the criteria including:

Criterion (vii): Widely known for its exceptional natural beauty and considered one of the world's most visually powerful landscapes, the Grand Canyon is celebrated for its plunging depths; temple-like buttes; and vast, multihued, labyrinthine topography. Scenic wonders within park boundaries include high plateaus, plains, deserts, forests, cinder cones, lava flows, streams, waterfalls, and one of America's great whitewater rivers.

Criterion (viii): Within park boundaries, the geologic record spans all four eras of the earth's evolutionary history, from the Precambrian to the Cenozoic. The Precambrian and Paleozoic portions of this record are particularly well exposed in canyon walls and include a rich fossil assemblage. Numerous caves shelter fossils and animal remains that extend the paleontological record into the Pleistocene.

Criterion (ix): Grand Canyon is an exceptional example of biological environments at different elevations that evolved as the river cut deeper portraying five of North America's seven life zones within canyon walls. Flora and fauna species overlap in many of the zones and are found throughout the canyon.

Criterion (x): The park's diverse topography has resulted in equally diverse ecosystems. The five life zones within the canyon are represented in a remarkably small geographic area. Grand Canyon National Park is an ecological refuge, with relatively undisturbed remnants of dwindling ecosystems (such as boreal forest and desert riparian communities), and numerous endemic, rare or endangered plant and animal species.

It should go without saying that water flowing into and through the Grand Canyon in the Colorado River is integral to the health of the landscape and the Native peoples that have deep spiritual and cultural connections to the land and water in and around the canyon. These important cultural and environmental resources need to be front and center in the development of the post-2026 guidelines.

We appreciate the efforts being made at the federal and state levels to be more inclusive and equitable in this process; however, we also recognize that to remedy a century of historical exclusion and injustice for tribes, the environment, and likely others there is a difficult unlearning process that takes time, serious intention, and much awareness and course correction along the way. We believe the development of the post-2026 guidelines is a key

³ See <https://whc.unesco.org/en/criteria/>.

opportunity to acknowledge the errors in the foundational underpinnings of the Law of the River, begin the process to transition away from those rules, and redefine the river’s long-term management into the future. We hope the Secretary and the representatives of the seven basin states, Mexico, 30 basin tribes, and other stakeholders will seize this moment to resolve uncertainty and make compromises that will sustain the river, its communities, economies, cultures, and ecosystems for many generations to come.

We understand that every issue will not be addressed by the post-2026 guidelines, but a strong effort is needed to plan for a transition to a new approach that recognizes, values, and honors: 1) the health and integrity of the Colorado River and its tributaries; 2) tribal sovereignty and water security of the 30 tribal nations; 3) equity for both people and nature; 4) the importance of and need to conserve groundwater resources; and 5) sustainability for present and future generations. These concepts should not only be acknowledged, but reflected, in the purpose and need of the proposed action and as part of the goals and objectives of this new iteration of guidelines.

The Trust details its specific comments below:

- I. **ENSURE THE SUSTAINABILITY OF THE COLORADO RIVER AND ITS TRIBUTARIES. The post-2026 guidelines must go beyond the operation of Lakes Powell and Mead and include provisions that acknowledge and ensure the sustainability of the Colorado River and its tributaries.**

Reclamation requests comments “concerning the scope of specific operational guidelines, strategies, and any other issues that should be considered” as well as “specific input on how the purpose and the elements of the 2007 Interim Guidelines should be retained, modified or eliminated to provide greater stability to water users and the public throughout the Colorado River Basin through robust and adaptive operational guidelines.” 88 Fed. Reg. at 39455 and 39457. Generally, the Trust recommends that the post-2026 guidelines have a broader scope than the 2007 Guidelines to ensure a more holistic view of the basin and that incorporates environmental and cultural values of the river. This was widely supported concept in the pre-scoping process.⁴ The following principles and considerations should guide the development of the post-2026 guidelines:

A. SUSTAIN THE COLORADO RIVER. Integrate protections for the health of the Colorado River and its tributaries into the new guidelines.

- 1. *The purpose and need of the post-2026 guidelines must include maintaining the sustainability of the Colorado River and its tributaries.***

⁴ Summary of Pre-Scoping Comments for Development of Post-2026 Colorado River Reservoir Operations dated January 2023 at 1. https://www.usbr.gov/ColoradoRiverBasin/documents/Post-2026_Pre-Scoping%20Comment%20Summary%20Final_Updated1.30.2023_508.pdf

The Colorado River and its tributaries are waterways with ecological, spiritual, and cultural significance since time immemorial. While providing incredible benefits to society, the Colorado River has its own intrinsic value as a river. As an example, the Quechan Indian Tribe⁵ stated in its pre-scoping comment letter

The Colorado River has been the lifeblood of the Quechan people since time immemorial, and we have a deep and abiding responsibility to be good stewards of the River—for the Tribe and its members, for the species and ecosystems that it sustains, and for the benefit of our fellow tribes and non-Indian neighbors throughout the Basin.

This captures just a few of the values that should be elevated in the post-2026 process.

Further, we believe some vital statements already submitted to Reclamation about how the river is valued and the requests of some of the basin tribes need to be highlighted and considered in developing the purpose and need for the new guidelines, including the quotes below:

- ◆ The highest priority must be given to keeping the Colorado River flowing as a living river. -Quechan Indian Tribe
- ◆ The Life of the River and all that depend on its waters must be preserved and protected. -The Colorado River Indian Tribes
- ◆ The Nation encourages focus on the long-term goal—stabilizing and protecting the river for years to come. -Jicarilla Apache Nation
- ◆ The low water at Lake Powell is a direct result of drought conditions also faced by the Navajo Nation. These circumstances reflect an environmental imbalance that threatens the physical and spiritual wellbeing of Navajo People. Our effort to inform your agency of the effects of drought on the Navajo Nation requires us to impart impacts to both material and traditional cultural lifeways. -Navajo Nation
- ◆ The Post-2026 Operating Guidelines should not only deal with management of Lake Mead and Lake Powell but should also consider the integrity and health of the Colorado River and its tributaries. -Southern Ute Indian Tribe
- ◆ With respect to the management strategies, recognizing the value of the river as a river and its spiritual, cultural, and ecological significance to Tribes and others can be part of the purpose and need in the NEPA process(es), and

⁵ Quechan Indian Tribe Pre-Scoping Comment Letter at page 1.

https://www.usbr.gov/ColoradoRiverBasin/documents/post2026/pre-scoping/PS_653_QIT_AZ.pdf

accounting for and modeling the full extent of Tribal water rights could be integrated into the NEPA evaluation. -Water and Tribes Initiative

We agree with the statements above and believe that the only way to acknowledge and honor the Colorado River as a river with intrinsic value is to incorporate into the purpose and need of the post-2026 guidelines. The post-2026 guidelines can no longer exclude consideration for and protections of the Colorado River and its tributaries.

The purpose of the 2007 Guidelines does not reflect the inherent value of the river or recognize the full range of the basin tribes' interests:

The purpose of the proposed federal action is to: 1) improve Reclamation's management of the Colorado River by considering the trade-offs between the frequency and magnitude of reductions of water deliveries, and considering the effects on water storage in Lake Powell and Lake Mead, water supply, power production, recreation, and other environmental resources; 2) provide mainstream United States users of Colorado River water, particularly those in the Lower Division states, a greater degree of predictability with respect to the amount of annual water deliveries in future years, particularly under drought and low reservoir conditions; and, 3) provide additional mechanisms for the storage and delivery of water supplies in Lake Mead.

88 Fed. Reg. 39456-39457. This above purpose statement is centered on the mandates of the Colorado River Compact and the Law of the River to ensure the satisfaction of water entitlements and does not reflect the value of the river itself or operating it in a sustainable manner. The purpose only requires "considering the effects on water shortage in Lake Powell and Lake Mead, water supply, power production, recreation and other environmental resources," but provides no protection of any of these resources or interests.

Further, even the purpose statement in the most recent NOI "to assure the continued stability of the Colorado River system into the future" fails to capture the nuance of protecting the sustainability of the river itself. 88 Fed. Reg. at 39456. The sustainability of the "system" and the sustainability of the "river" are not the same thing.

If we want to transition away from the old guidelines that were deemed "insufficient" to protect against system collapse,⁶ the purpose of the post-2026 guidelines need to be reassessed or at a minimum expanded. A goal or purpose of the new guidelines should include a statement regarding the need to, "protect the long-term sustainability of the Colorado River and its tributaries." Some examples of language based on the suggestions above from some of the tribes could include: to "preserve and protect" the river, "to keep it flowing as a living river," "to stabilize and protect it for years to come," "to restore balance and protect the spiritual and physical wellbeing of native peoples and cultures," "consider the integrity and

⁶ 87 Fed. Reg. 69042 (November 17, 2022).

health of the river and its tributaries,” or to “recognize the value of the river as a river and its spiritual, cultural, and ecological significance to Tribes and others.” With this as a central theme, it allows the post-2026 decision framework to incorporate and include these considerations that are now only an afterthought.

We request integrating and prioritizing the intrinsic value and health of the river and its tributaries into the goals and objectives of the post-2026 guidelines as well as specifically including it in the scope of the EIS analysis. Reclamation should engage the 30 basin tribes to help craft such a purpose as these communities have lived in the basin and sustained the river since time immemorial.

2. The foundational objectives of the post-2026 guidelines must be modified to ensure the sustainability of the Colorado River and its tributaries.

Reclamation needs to expand the objectives of the post-2026 guidelines beyond the narrow and outdated goals of the Law of the River to ensure equity and sustainability in the basin for both people and nature for generations to come. The 2007 Guidelines established four foundational objectives designed to collectively meet the 3-fold purpose and need of the 2007 Guidelines, two of the four are included below:

Shortage Guidelines: Determines those conditions under which the Secretary would reduce the annual amount of water available for consumptive use from Lake Mead to the Lower Division states below 7.5 million acre-feet pursuant to the Consolidated Decree.

Coordinated Reservoir Operations: Defines the coordinated operations of Lake Powell and Lake Mead to provide improved operation of these two reservoirs, particularly under low reservoir conditions. As described in Section XI.G.6. of the Record of Decision, the objective of the operation of Lake Powell and Lake Mead is “to avoid curtailment of uses in the Upper Basin, minimize shortages in the Lower Basin and not adversely affect the yield for development available in the Upper Basin.”

88 Fed. Reg. at 39457. These guidelines were established to protect the entitlements of water users under the Colorado River Compact and Law of the River, but maintaining these objectives has proven unsustainable given the impacts of climate change on water supply. See discussion in Section I.B on Demand below.

For example, Section 6 of the 2007 Interim Guidelines establishes that the objective for operating the reservoirs “is to avoid curtailment of uses in the Upper Basin, minimize shortages in the Lower Basin and not adversely affect the yield for development available in the Upper

Basin.”⁷ However, continuing to prioritize these objectives simply perpetuates the unsustainable use and management of water in the Basin that got us into this crisis in the first place. In fact, the objectives that are being protected here are those principles that need to be fundamentally reformed. In crafting these new objectives, Reclamation should consider the values we articulated above including: 1) the health and integrity of the Colorado River and its tributaries; 2) tribal sovereignty and water security of the 30 tribal nations; 3) equity for both people and nature; 4) the importance of and need to conserve groundwater resources; and 5) sustainability for present and future generations. New objectives will need to address the existing imbalance of supply and demand in the basin and will certainly require reducing demand to a sustainable level. Reclamation and the basin states need to rethink the historically exclusive, consumptive, and narrowly tailored way in which we manage and value the Colorado River.

3. *Specific environmental goals need to be established and incorporated into the post-2026 guidelines.*

One of the primary omissions from the 1922 Colorado River Compact is the fact that the health of the river itself was not mentioned, allocations were not made or reserved for the 30 tribal nations in the basin, nor to protect and preserve the environment. Likewise, the Law of the River itself typically does not include or integrate the value of the river, the environment, or incorporate specific protections that are based in the law. For example, the Grand Canyon Protection Act of 1992⁸ is not typically considered as part of the “Law of the River,” nor are other environmental and cultural protections (e.g. the Endangered Species Act, the Natural Historic Preservation Act, the Clean Water Act, the Wild and Scenic Rivers Act, among others). These laws were all passed much later in time—in response to the consequences this omission (e.g. species extinction, pollution, etc.). It is time that these two parallel worlds are intermingled. We can’t keep creating policies on one hand to meet the needs of water users and on the other hand create different laws that help mitigate the damage being done. What if the laws that allocated and managed water also integrated buffers and mandates to ensure cultural values were honored and the river would continue to flow and thrive? This should be the goal of the post-2026 guidelines.

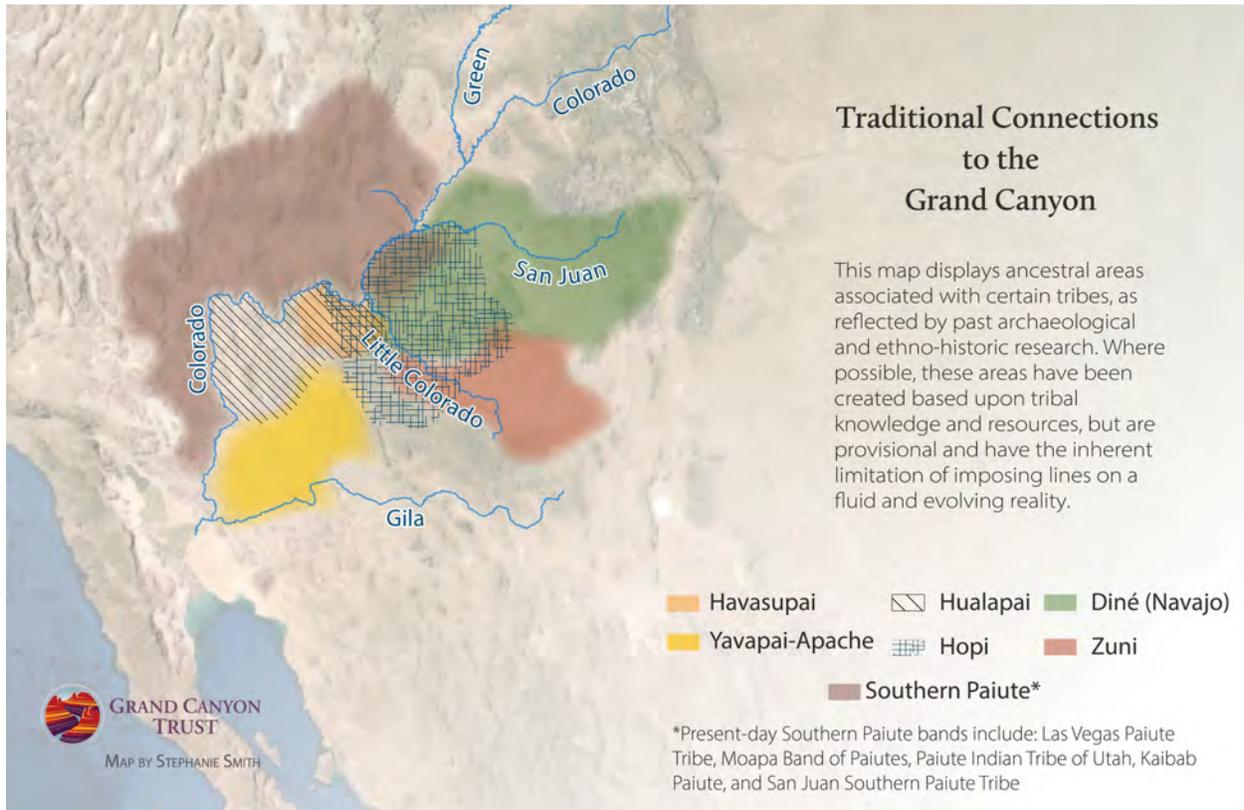
We appreciate that values are changing and that there is more acknowledgement of these inherent environmental and cultural importance of the river and its tributaries; however, the effort to incorporate these values into the laws, policies, rules, and guidelines that ultimately determine the management and operation of the river and its infrastructure on a day-to-day and year-to-year basis lags behind. Incorporating these values into the purpose and need of the guidelines would be a great first step, but ultimately these values need to be incorporated objectively into specific environmental and cultural goals that guide management, much the same as the tiered shortage tables guide water deliveries or shortages in the Lower Basin or the releases from Lake Powell.

⁷ U.S. Bureau of Reclamation. 2007. Record of Decision: Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead: Final Environmental Impact Statement. Washington, D.C. : U.S. Bureau of Reclamation. December 13.

⁸ Grand Canyon Protection Act of 1992, Pub. L. No. 102-575, 106 Stat. 4600 (1992).

4. The health of the Grand Canyon and its affiliated tribal communities are inextricably linked to the operational decisions and annual volumes of water that will be determined as a part of the post-2026 guidelines.

The Colorado River is integral to the cultural landscape of the Grand Canyon and the ancestral and current homelands of at least a dozen tribes.⁹



Schmidt *et al.* (2023) found that

Whereas environmental conditions between Yuma and Hoover Dam are mostly decoupled from reservoir operations, the future of the Grand Canyon ecosystem is tightly linked with decisions regarding reservoir operations and water use. In the context of the Law of the River, flow through Grand Canyon represents the delivery of water from the Upper Basin to the Lower Basin. In the context of environmental conditions in Grand Canyon, the magnitude of annual volumes as well as the amount of water stored in both reservoirs are significant drivers of ecosystem conditions.

Id. at 6. This is important because the post-2026 guidelines in the context of reservoir operations and water deliveries will have either significant consequences or benefits to the

⁹ Map of ancestral areas of associated with certain tribes with connections to the Grand Canyon. <https://www.grandcanyontrust.org/traditional-connections-grand-canyon-map>.

Grand Canyon ecosystem and tribal interests in the canyon. Schmidt *et al.* (2023) discuss in detail the consequences of when Lake Powell's water levels fall below elevation 3,490 feet or minimum power pool.

When water storage in Lake Powell is less than 4.0 million af (4.93 billion m³) (16% of capacity), the elevation of the reservoir is too low to safely withdraw water through the penstocks into the turbines of the power plant. The capacity of the turbines is approximately 31,000 ft³/s (approximately 880 m³/s). If water cannot be withdrawn through the penstocks, the only way to release water is through the river outlets whose maximum capacity is between 5000 and 15,000 ft³ (140 and 420 m³/s), depending on reservoir elevation. When reservoir storage drops below the elevation of the river outlets, no water can be released downstream (i.e., dead pool). As the total annual release decreases, it will be more difficult to provide sufficient base flows that ensure safe river navigation by large, motorized rafts through Grand Canyon's rapids. Low water storage in Lake Powell also jeopardizes implementation of controlled floods (administratively called High Flow Experiments) (Bruckerhoff *et al.*, 2022). If reservoir releases are steady without hydropeaking or controlled floods, vegetation encroachment onto sand bars used as campsites is likely (Sankey *et al.*, 2015).

Id. at 6.

The Long-Term Environmental Management Plan (LTEMP) and the Adaptive Management Working Group (AMWG) were created to help balance, mitigate, and inform management of releases from Glen Canyon Dam to ensure compliance with the Grand Canyon Protection Act of 1992.¹⁰ The role of LTEMP and AMWG serves to make monthly and daily operational parameters and decisions to benefit the canyon environment and cultural resources. However, it is the post-2026 guidelines that will set the stage for these decision by determining target reservoir elevation for Lake Powell and the annual release amount from Glen Canyon Dam, which will have a significant impact on the opportunities available for these purposes of LTEMP and AMWG. See Bruckerhoff *et al.*, 2022.

It is our understanding that certain provisions of the LTEMP may be reviewed and an environmental impact statement prepared in 2024 related narrowly to adjusting the sediment accounting window for triggering high flow experiments and to consider operations of Glen

¹⁰ The GCPA provides that:

The Secretary shall operate Glen Canyon Dam in accordance with the additional criteria and operating plans specified in section 1804 and exercise other authorities under existing law in such a manner as to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established, including, but not limited to natural and cultural resources and visitor use.

Canyon Dam to prevent non-native fish species from passing through the dam and establishing in the Grand Canyon to the detriment of native fish. While we appreciate the effort to move forward with these adjustments to LTEMP, a more comprehensive review of LTEMP seems warranted given the development of the post-2026 guidelines. The decisions regarding the framework for the post-2026 guidelines are too important to the future of the Grand Canyon not to integrate the discussion and massive amounts of science that have been generated over the past decade through LTEMP and AMWG into parallel if not simultaneous discussions. It is important to integrate discussions about how operations under the new guidelines can serve not just the interests of water users downstream or the generation of power, but also create the most flexibilities and opportunities for protecting one of the most recognized and valuable cultural landscapes in the world.

B. REDUCE DEMAND. Develop a plan to significantly reduce water demand to stabilize and recover reservoir levels in the short-term and create a more balanced and sustainable system in the long-term.

Over the past 20 years, the natural flow in the Colorado River at Lees Ferry has declined by nearly 20 percent from the 20th century average (15.2 million acre-feet (MAF) per year).¹¹ The annual average flow from 1906-1999 of 15.2 MAF is almost enough to meet the 15.4 MAF of demand per year, which includes annual use of 4 MAF in Upper Basin, 9 MAF in the Lower Basin and Mexico, and 2.4 MAF of evaporation losses. *Id.* Since 2000, however, the natural flow has declined to 12.3 MAF per year, leaving a significant deficit each year (about 3.1 MAF per year) that must either be made up for out of withdrawing water from reservoir storage or reducing demand. *Id.*

Between January 2000 and April 2023, the combined reservoir storage in Lake Powell and Lake Mead fell by 65 percent (from 95% to 30% of combined capacity). Schmidt et al. at 4. This is a loss of more than 33.5 MAF of water in storage, which is twice the average annual demand in the basin (or 2.8 MAF deficit each year for 12 years). This occurred and continued to occur even after the 2007 Guidelines took effect, the DCPs were finalized and implemented, and other emergency measures such as releases from upstream reservoirs under the Drought Response Operations Agreements. These measures did not work.

There appear to be two options for how to proceed: 1) develop post-2026 guidelines that acknowledge the high risk to the system if we proceed under the status quo and implement deep cuts to uses across all sectors and in all states that prioritize recovering reservoir storage in the short term and a sustainable allocations over the long-term, or 2) the basin states with the U.S., Mexico and 30 basin tribes work to revise and renegotiate the fundamental and unsustainable fixed allocations agreed upon in the Colorado River Compact and the Law of the River. Either path requires care and consideration for the many communities, cultures, environments, economies, and livelihoods that will be affected.

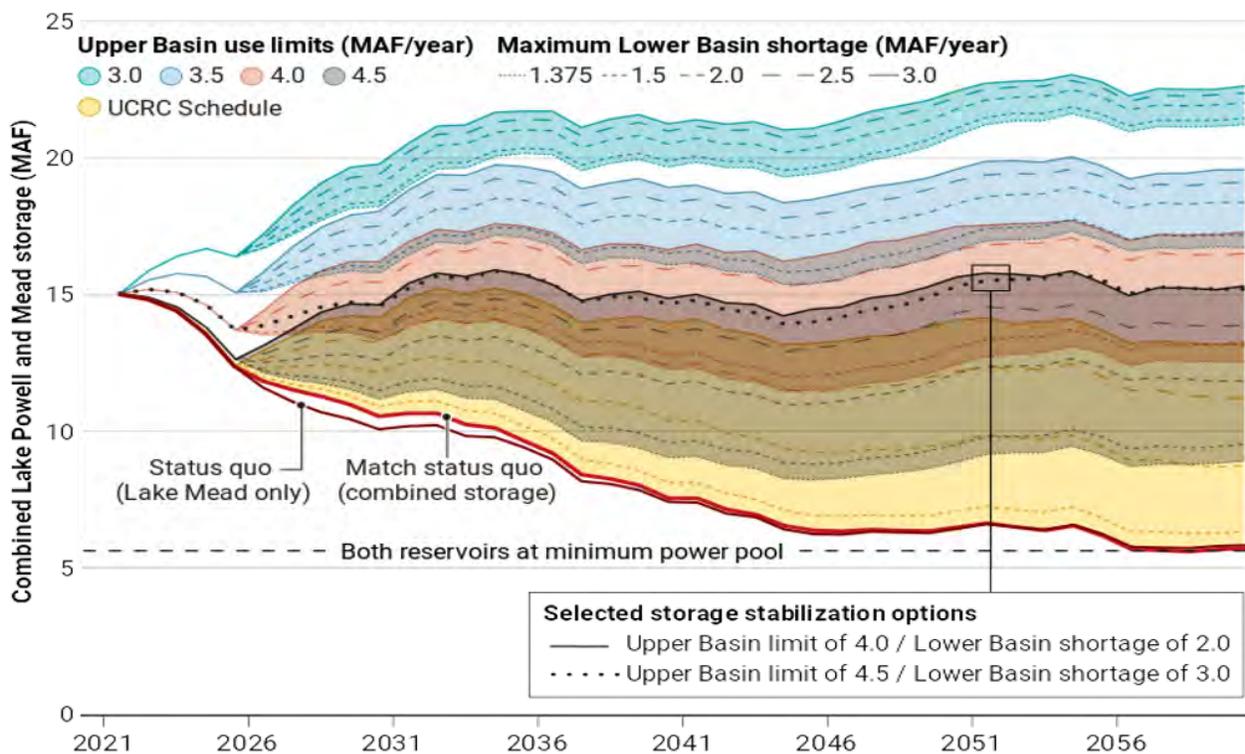
¹¹ Wheeler, K., Udall, B., Wang, J., Kuhn, E., Salehabadi, H., & Schmidt, J. C. (2022). What will it take to stabilize the Colorado River? *Science*, 377(6804), 373–375. <https://www.science.org/stoken/author-tokens/ST-631/full>

1. The post-2026 guidelines must permanently reduce demand in the basin.

“The Colorado River cannot provide a sustainable water supply unless consumptive use is reduced to match declining supply.” Schmidt *et al.* at 7. However, to recover reservoir storage and raise reservoir elevations to add flexibility and safeguard the system, greater reductions in use will be needed. *Id.* at 7-8. One way to reduce demand is to include evaporation and seepage losses below Lees Ferry in the allocations of the Lower Basin states (Arizona, California, and Nevada). See **Section I.D.** below for a more detailed discussion of this strategy. However, the discussion around this issue is just a smaller scale discussion over the true issue of how to address “systemwide overallocation and the reduction of flows due to climate change.” Fleck and Kuhn 2023 at 2.

a. To stabilize Lake Powell and Lake Mead, basin-wide water use must be reduced by about 13-20% of the 21st century average (2-3 million acre-feet per year).

Schmidt *et al.* (2023) notes that while it may “easy to articulate the general principal [sic] that use must match supply, it is more difficult to precisely define the magnitude of the needed reduction.” *Id.* at 7-8. K. Wheeler *et al.* (2022) conducted an analysis and produced a graph “showing average end-of-year combined Lake Powell and Lake Mead storage, assuming hydrologic conditions of the Millennium Drought continue.” *Id.* at 7, Figure 5; Wheeler *et al.* at 374. This Figure shows a range of scenarios including combinations of upper basin use limits and reductions in use by the lower basin and the resulting impact on combined storage in Lakes Powell and Mead. *Id.*



Based on the analysis, Schmidt et al. (2023) concluded that

Assuming persistence of conditions like those of the past 20 years, use would have to be reduced by 1.5 million af/yr . . . to match supply, but an additional 1 million af/yr . . . of reduction would be needed to recover lost reservoir storage. Thus, to stabilize the reservoirs, Basin-wide use would have to be reduced to 12-13 million af/yr . . . , 13-20% less than the average during the 21st century. Reduction in Basin-wide use by 2-3 million af/yr . . . is equivalent to eliminating the combined consumptive use of Colorado and Utah or the total use of Arizona.

Id. at 8,. The scale of the reductions is immense.

The analysis by Wheeler et al. (2022) “used the combined storage of the two reservoirs to trigger consumptive use reductions to the Lower Basin and Mexico. [This] approach acknowledges the hydrologic reality that water stored in both reservoirs is consumed almost exclusively in the Lower Basin and Mexico.” Id. at 375. Such a change would simplify the post-2026 guidelines and also provide additional flexibility for the operation of Lake Powell and Lake Mead.

b. Both basins play an important role in not increasing (upper basin) or reducing (lower basin) water use to bring the system back into balance.

It is important to recognize the balance between lower basin reductions and upper basin limitations on water use. To balance these, Wheeler *et al.* (2022) “identified combinations of Upper Basin consumptive use limitations and Lower Basin reductions to maintain reservoir levels if the Millennium Drought continues.” Id at 374. For example, in one scenario:

If the Upper Basin commits to limit water uses to 4.5 MAF/year (60% of their 7.5 MAF/year allocation, approximately 0.8 MAF/year higher than recent use), then the Lower Basin and Mexico must commit to more than doubling their current maximum reductions in existing use to 3.0 MAF/year []. In this scenario, the Lower Basin and Mexico receive 66.7% of their allocation, nearly matching the Upper Basin percentage.

Id. at 375. Alternatively,

If the Upper Basin limits their depletions to 4.0 MAF/year (53.3% of their allocation, 0.3 MAF/year higher than recent use), then the Lower Basin and Mexico would need to decrease uses by approximately 2.0 MAF/year to stabilize the reservoirs [], assuring 77.8% of their allocation. This is close to recently proposed maximum Lower Basin and Mexico commitments to reduce existing use, which would not be invoked until Lake Mead declines further by 3 MAF.

Id. These scenarios are reflected in the figure above where reservoir levels hover around 15 MAF. Id. at 374.

This analysis highlights the Upper Basin’s significant role in helping stabilize and recover reservoir storage. Lower basin reductions in use are inconsequential if they are offset by increases in demand by the upper basin. Further, it is unrealistic to think, given where we are today, that there is or will be enough water in the Colorado River and its tributaries to support the full upper basin development of their 7.5 MAF allocation under the Colorado River Compact. Therefore, the two basins will have to work together to find a compromise on what their respective allocations should be going forward.

- c. *The gap between supply and demand will only increase given the need to recover reservoir storage, account for climate change, and satisfy unfulfilled tribal water entitlements.*

Notwithstanding the increasing demand for water to recover reservoir storage, account for climate warming, and meet the unfulfilled promises of water for the tribes, climate scientists predict runoff will decline by an additional 1-3 million acre-feet per year by 2050.¹² This further reduction in supply and increasing demands only widens the supply-demand gap.

Kuhn and Jacobs (2022) noted this predicament and acknowledged that due to the historic imbalance of supply and demand “[w]e are now engaged in a stressful balancing act due to the historical commitments.” *Id.* at 46. The authors note the “great deal of ingenuity” that has gone into developing “work arounds” to making any change to the original allocations. *Id.* at 47. However, “future conditions are expected to be much more challenging, and the existing management framework is inconsistent with what is now known about hydrologic realities and economic consequences.” *Id.* at 47. Thus, it may be time for the basin states in concert with the U.S., Mexico and 30 basin tribes to come together to finally update or modify the original compact allocations, resolve some of the uncertainties that have remained for a century, and move toward a new system.

Kuhn and Jacobs (2022) suggest “[a] nonstationary allocation scheme is needed because the river system is now very unpredictable and inherently dynamic, and the stakes are extremely high. The vise-grip created by the Colorado River Compact’s flow obligations and climate change’s impacts on the basin’s hydrology benefits the Lower Basin states at the expense of the Upper Basin states, tribal sovereigns, and the river system’s ecosystems.” *Id.* at 66.

- d. *Equity principles should apply as water use reductions are evaluated.*

Fundamentally we need to balance supply and demand by making water use reductions in all states and in all sectors; however, in doing so, Reclamation should apply equity principles. All communities in the basin are not similarly situated and Reclamation has an obligation to ensure critical needs are met, that public health is safeguarded, and fundamental access to drinking water exists. For example, the Draft SEIS for near-term operations set out two vastly different approaches to allocating reductions—one largely based on the existing system of priority and the other allocating a pro rata share of the reductions to each water user regardless of priority.

¹² Udall, B., and J. Overpeck (2017). The twenty-first century Colorado River hot drought and implications for the future. *Water Resources Research*, 53, 2402-2418, doi:10.1002/2016WR019638. <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/2016WR019638>

However, given the historic exclusion of the tribes and their later in time development of their water entitlements (e.g. sometimes settling for more junior rights such as CAP), equity principles could be applied to not include tribal water rights and entitlements in mandatory reductions, as an example. However, instead tribal water rights and entitlement mechanisms should be developed to ensure that tribes can realize the value of their entitlement through voluntary contributions of water and for their non-use.

Finally, Reclamation should prepare a full analysis of tradeoffs of demand reductions on communities, cultures, environment, economies, etc. that should be evaluated and then inform equitable decision making. This might be similar to a vulnerability assessment that is used to evaluate how climate change risks are distributed in communities.¹³

2. Reclamation needs to develop methods for improving the accuracy of its 24-month forecasts of reservoir elevations.

Wang et al. (2021)¹⁴ conducted a comprehensive review of the accuracy of Reclamation’s 24-month studies to determine how to improve them going forward and found that the studies overestimated inflows into Lake Powell and as a result often predicted reservoir elevations that were higher than what occurred in those years. In a warming and drying climate such overestimations lead to higher releases from Lake Powell and a false sense of security for water managers. We strongly recommend that Reclamation consider the findings of this study and incorporate its learnings into its development of the post-2026 guidelines.

3. Reclamation must prioritize water conservation and demand reduction as part of any solution.

Reclamation must prioritize water use reductions and conservation to maximize management options and flexibility. Bruckerhoff *et al.* (2021) used environmental metrics to compare “the outcome of combinations of water storage scenarios and consumptive use limits.”¹⁵ The study determined that where water was stored “was less important when less water was available, highlighting the importance of keeping water in the system to provide flexibility for achieving ecosystem goals.” *Id.* at 1. The authors concluded

Reservoir levels of both Lake Powell and Lake Mead will likely continue to decline regardless of where water is stored unless consumptive use is limited, so limiting consumptive use may provide the most flexibility in managing ecosystem drivers.

¹³ Grand Canyon Trust’s Scoping Comments on the SEIS for Near-Term Operations of Lake Powell and Lake Mead dated December 20, 2023 at 11-12. These comments are incorporated herein by this reference.

<https://www.grandcanyontrust.org/scoping-comments-operations-lake-powell-and-lake-mead>

¹⁴ Wang, J., Udall, B., Kuhn, E., Wheeler, K., and Schmidt, J.C. (2021). Evaluating the Accuracy of Reclamation’s 24-month Study Lake Powell Projections. Utah State University Center for Colorado River Studies, White Paper No. 7. <https://qcnr.usu.edu/coloradoriver/files/news/White-Paper-7.pdf>

¹⁵ Bruckerhoff, L.A., Wheeler, K., Dibble, K.L, Mihalevich, B.A., Neilson, B.T., Wang, J., Yackulic, C., and Schmidt, J.C. 2022. Water Storage Decisions and Consumptive Use May Constrain Ecosystem Management under Severe Sustained Drought, *Journal of the American Water Resource Association* 58 (5): 654-72.

<https://doi.org/10.1111/1752-1688.13020>

Id. at 16. We reiterate this point to encourage Reclamation to do everything in its power to reduce water use within the basin to levels that allow reservoirs to recover and increase flexibilities for water management at least in the short-term.

- C. PROTECT GROUNDWATER. Evaluate and address how surface water shortages stress groundwater resources in the Lower Colorado River Basin and create or incentivize policies to protect groundwater resources basin-wide.

Groundwater is a significant source of water in the Colorado River Basin.¹⁶ It contributes to surface flows in the Colorado River and its tributaries through baseflows and enters rivers through springs and seeps.¹⁷ As surface water supplies are reduced, water users will shift their use to groundwater, especially where regulations are not in place to ensure conjunctive (or joint) management of surface and groundwater resources.¹⁸ The Secretary of the Interior, and its bureaus and offices, are uniquely situated to play an important role in incentivizing and acknowledging the connection between groundwater and surface water throughout the basin and should show strong leadership on this issue.

1. Reclamation must take a holistic view of the basin and account for and protect groundwater and baseflow contributions to the Colorado River.

- a. *Baseflows originating in the Upper Colorado River Basin are a critical source of water basin-wide and are projected to decrease due to climate change by 33 percent.*

Baseflows are an important source of water that supports streamflow in the Upper Colorado River Basin.¹⁹ However, climate change in headwater areas is also influencing “basin-wide hydrology and water availability,” including water availability in the Lower Basin. *Id.* at 7. “Approximately 85%-90% of the total water year runoff in the [Colorado River Basin] starts in the [Upper Colorado River Basin].” *Id.* at 2. Further, over half the streamflow in the Upper Colorado River Basin begins as baseflow—groundwater discharge into streams—that help maintain surface water flows. *Id.* “Projected reductions in baseflow may affect future surface water availability, given the reliance of streamflow on baseflow, that may impact a range of water users including human (e.g., agriculture or municipal and industrial systems) and environmental users.” *Id.* at 7. This could also impact the Upper Basin’s ability to meet its delivery obligation to the Lower Basin. *Id.* at 7.

¹⁶ Miller, O. L., Miller, M. P., Longley, P.C., Alder, J. R., Bearup, L. A., Pruitt, T., et al. (2021). How will baseflow respond to climate change in the Upper Colorado River Basin? *Geophysical Research Letters*, 48, e2021GL095085. <https://doi.org/10.1029/2021GL095085>

¹⁷ Miller *et al.* and Wang, J., and Schmidt, J.C. 2020. *Stream flow and Losses of the Colorado River in the Southern Colorado Plateau*, White Paper No. 5, The Future of the Colorado River Project, Quinney College of Natural Resources, Utah State University at 10. <https://qcnr.usu.edu/coloradoriver/futures>

¹⁸ Kuhn, E., & Jacobs, K. L. (2022). Science and apportionment: Alternative futures for the Colorado River system. In J. A. Robison (Ed.), *Cornerstone at the confluence: Navigating the Colorado River's Compact's next century* (pp. 45–69). The University of Arizona Press. <https://uapress.arizona.edu/book/cornerstone-at-the-confluence>

¹⁹ Miller, *et al.* at 2.

Miller *et al.* (2021) estimated the response of baseflows to climate change. *Id.* at 1. The study concluded that “water originating as baseflow supplied to the Lower [Colorado River Basin] is **projected to decline by up to 33%.**” *Id.* at 9, emphasis added. “The percentage of baseflow lost during in-stream transport is projected to increase by 1%-5% relative to historical conditions” due to increased evapotranspiration that reduces the amount of water that reaches the upper basin tributary streams. *Id.* “The projected baseflow changes are expected to impact both human and ecological users with the greatest declines occurring under the [hot/dry] scenario.” *Id.* “Study findings suggest that ongoing water availability challenges in the [Colorado River Basin] may continue and be exacerbated in the future.” *Id.*

Kuhn and Jacobs 2022²⁰ identified a

serious science gap, primarily impacting the watershed of Lower Basin tributaries, is the failure to acknowledge groundwater’s role in supporting the river system’s flows, both directly and indirectly. The hydrologic connectivity between groundwater systems and surface flows throughout the basin needs to be acknowledged and quantified to manage increasing stresses.

Id. at 47. It is evident from this study that climate warming is impacting groundwater in similar ways as it impacts surface flows. Given the connectivity between surface and groundwater and the significance of the cumulative impacts of those reductions on overall flows in the Colorado River, the Secretary of the Interior needs to make research in this area a priority and incorporate groundwater issues more intentionally into the development of the post-2026 guidelines. Further, based on the impacts that have occurred to water supplies already due to climate change, Reclamation should prioritize and plan for worst-case hydrologic scenarios to determine the amount of water that can responsibly be allocated in the Colorado River Basin for use and maintain water needed to sustain ecological, tribal, and other unaccounted for needs in the Basin.

b. Significant groundwater contributions to the Colorado River within the Grand Canyon need to be understood and protected from depletion.

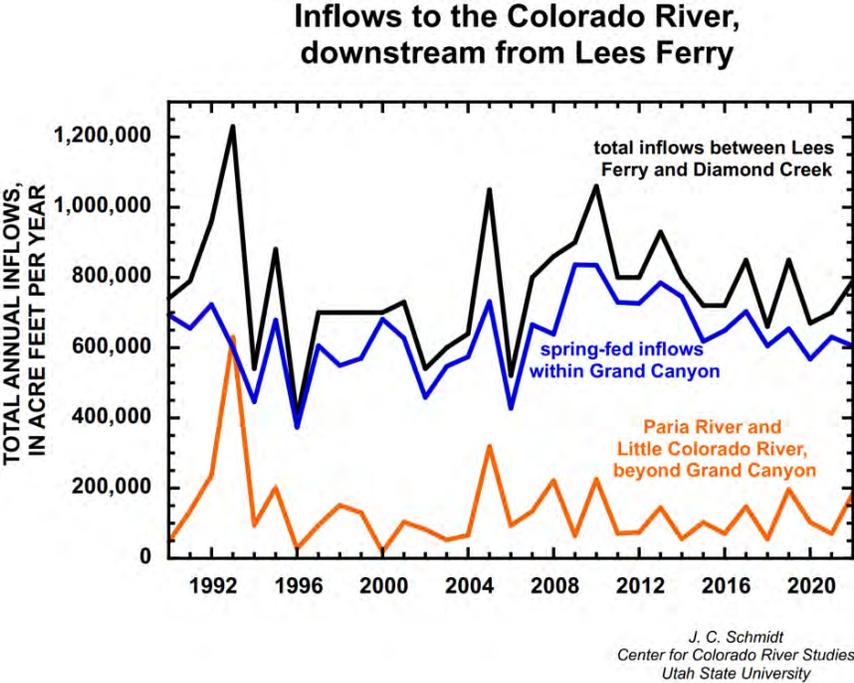
The Colorado River downstream of Lees Ferry receives significant intervening flows from tributary streams as well as from large springs within the Grand Canyon that contribute to ground and surface water in the region.²¹ Between 1990 and 2018, 768,000 acre-feet of water per year entered the Colorado River between the Lees Ferry and the Diamond Creek gauges. *Id.* at 11. The Paria and Little Colorado rivers contributed 17 percent (133,000 acre-feet per year) of these intervening flows and the remaining 83 percent (635,000 acre-feet per year) came from groundwater within the Grand Canyon. *Id.* Similarly, flow data collected from 2007 to

²⁰ Kuhn, E., & Jacobs, K. L. (2022). Science and apportionment: Alternative futures for the Colorado River system. In J. A. Robison (Ed.), *Cornerstone at the confluence: Navigating the Colorado River's Compact's next century* (pp. 45–69). The University of Arizona Press. <https://uapress.arizona.edu/book/cornerstone-at-the-confluence>

²¹ Wang, J., and Schmidt, J.C. 2020. *Stream flow and Losses of the Colorado River in the Southern Colorado Plateau*, White Paper No. 5, The Future of the Colorado River Project, Quinney College of Natural Resources, Utah State University at 10. <https://qcnr.usu.edu/coloradoriver/futures>

2018 showed intervening flows in the Grand Canyon averaged 710,000 acre-feet per year. *Id.* at 13. Importantly, the study concluded “gaging measurements between 2007 and 2018 suggest that most of the intervening inflows came from spring sources within the Grand Canyon that directly drain to the Colorado River or its perennial tributaries. *Id.* Springs in the lower part of the Little Colorado River canyon are a large source of water.” *Id.*

A graph of these inflows developed by J.C. Schmidt, Center for Colorado River Studies, Utah State University, August 2023 shows the total inflows between the Lees Ferry and Diamond Creek in black, spring-fed inflows within Grand Canyon in blue, and tributary contributions from the Paria River and Little Colorado River in red.



The 1990-2022 data shows a decline in spring-fed inflows within the Grand Canyon between 2009 to 2022. The flows of these Grand Canyon springs and seeps that contribute water to the Colorado River may also be influenced by climate change, as shown by Miller et al. (2021) for Upper Basin baseflows, but additional assessments should be made to confirm and assess this trend.

Kuhn and Jacobs also recommend “improved data related to groundwater use, storage, and recharge rates in the context of alternative scenarios of surface water availability in a changing climate is a critical science need for the Colorado River Basin.” *Id.* at 65. We agree with Kuhn and Jacobs assessment that more research is vital to understanding the impacts of climate change on these groundwater inflows and the impact of those declines on surface flows in the Colorado River and its tributaries and believe that both western science and incorporating traditional knowledge from the basin tribes is also crucial to this effort. Reclamation should incorporate this analysis into development of the post-2026 guidelines.

Further, Reclamation and other basin partners should make every effort to ensure that these flows are protected from unregulated groundwater pumping for development in and around the Grand Canyon in Arizona. Groundwater withdrawals in this area threaten flows into the Colorado River, the Grand Canyon ecosystem, and the water source as well as cultural and spiritual interests of tribes. As water supplies dwindle, Reclamation needs to account for and consider valuable every drop of water in the basin including that from groundwater sources and advocate for its protection.

- c. *Reclamation can no longer ignore the vital role of groundwater in supporting flows in the Colorado River and its tributaries and must ensure it is protected basin wide.*

The significant contributions of groundwater to the Colorado River and its tributaries and its vulnerability due to climate change and unregulated use should raise a red flag regarding the future of groundwater management in the Colorado River Basin. As described by Kuhn and Jacobs (2022)

Because groundwater management within the United States and Mexico is conducted by the states (outside of federal authority), it has been relatively easy to ignore groundwater management issues in the Colorado River Basin other than quantifying groundwater use that directly influences mainstem flows. However, climate change may raise the visibility of these issues at multiple scales.

Id. at 65. While some states manage surface and groundwater together (Colorado), other states manage groundwater as a separate regulatory system (California and Arizona). Arizona only manages groundwater in designated, mostly urban areas leaving the rural parts of the state without any regulation of groundwater resources. Groundwater basins in northern and western Arizona adjacent to the Colorado River and its tributaries are not regulated under Arizona's 1980 Groundwater Management Act, except for the newly formed Hualapai Valley Irrigation Non-expansion Area designated in October of 2022.²²

This is particularly problematic because groundwater is commonly "used as a backup during drought and or surface water shortages, and the consequences of managing the water rights regimes separately can be devastating." *Id.* at 65. Thus, reductions in surface water use will likely translate into increased use of groundwater. This has already happened in the context of the negotiations on the Drought Contingency Plans (DCPs) in Arizona where "agricultural users were authorized to 'mine' additional groundwater in the Pinal Active Management Area to offset reduced availability of Central Arizona Project water for agriculture stemming from the DCP. *Id.* This is likely to happen on a much larger scale if additional water cuts are made to water users that receive allocations from the Central Arizona Project. This would just shift the crisis from surface water to groundwater resources.

²² See Arizona Department of Water Resources Map showing Active Management and Irrigation Non-Expansion Areas regulated under the 1980 Groundwater Management Act. https://new.azwater.gov/sites/default/files/AMAs%20and%20INAs_2023%20%283%29.pdf

As a part of the development of the post-2026 guidelines, Reclamation needs to consider the impact of any surface water use reductions on groundwater resources within the basin. Reclamation needs to devise a method for understanding these effects on communities, the availability of groundwater, and the environment. Further, on the flip side, Reclamation needs to ensure that water users are not getting two bites at the same apple by taking water out of the Colorado River and its tributaries through wells and outside of the surface water allocation system. This is especially important when states and water users are making substantial cuts to their surface water supplies to benefit the entire system.

For example, if an unregulated groundwater well in Arizona were to pump groundwater that is connected hydrologically to the Colorado River (groundwater that would eventually end up in the river), that would be a depletion to the Colorado River that is unaccounted for as a part of Arizona's allocation. If the well is located upstream of Lake Mead (e.g. adjacent to the Grand Canyon) that water user would be taking part of Arizona's allocation before that allocation was made based on the post-2026 guidelines. Thus, Arizona would be using its allocation plus this unregulated use of groundwater that is hydrologically connected to the Colorado River and its tributaries. This hypothetical illustrates the concept that it is hard to conserve water if the bucket has a hole in it. Arizona's lack of groundwater regulation is a giant hole in the bucket of the Colorado River Basin that given the challenging hydrology can no longer be ignored.

In summary, the Secretary, unlike the individual states, has the ability to 1) view the watershed holistically and weigh the impacts of specific state policies on the basin as a whole, 2) mobilize its bureaus and offices to develop scientific resources to better understand the interaction between groundwater and surface water in the basin, and 3) engage to protect groundwater throughout the basin especially where it is hydrologically connected to the Colorado River and its tributaries. We strongly recommend the Secretary step into this role and prioritize and incorporate considerations of and protections for groundwater resources into the scope and objectives of the post-2026 guidelines.

D. UNIFORMLY ASSESS AND ALLOCATE SYSTEM LOSSES. Account for and allocate seepage, evaporation, and other system losses to water users.

The foundational accounting and allocation of losses from the Colorado River and its tributaries is one key element in balancing supply and demand in the Basin. Reclamation identified "assessing how to account for and allocate system losses due to evaporation, seepage and other losses" as an administrative priority in September 2022²³; however, it remains unclear the status of that analysis, how or if it will be integrated into or align with the development of the post-2026 guidelines, and if the basin states will be able to agree to the accounting system and allocations proposed. The evaporation study was not mentioned in the June 16, 2023 Notice in the Federal Register. More transparency, communication, and alignment regarding this ongoing

²³ U.S. Department of the Interior Press Release dated 8/16/2022 *Interior Department Announces Actions to Protect Colorado River System, Sets 2023 Operating Conditions for Lake Powell and Lake Mead.* <https://www.doi.gov/pressreleases/interior-department-announces-actions-protect-colorado-river-system-sets-2023>

action is needed from Reclamation. We believe this analysis is critical to development of the post-2026 guidelines and is directly within the scope of the EIS to be prepared.

1. Seepage losses must be measured and allocated as upper basin deliveries.

Seepage losses around Glen Canyon Dam contribute a significant amount of water to the Lower Basin, but are not measured, accounted for, or assessed as a delivery from the Upper Basin. Wang and Schmidt (2020) assessed seepage losses from Lake Powell finding “[a] significant amount of water seeps around Glen Canyon Dam and enters the Colorado River upstream from Lees Ferry.”²⁴ Based on water years 2005 to 2019, streamflow between Glen Canyon Dam and Lees Ferry is about 150,000 acre-feet per year. *Id.* This amount is about half of Nevada’s total Colorado River allocation. *Id.* “This amount of seepage is significant, and is a transfer of water from the Upper Basin to the downstream river.” *Id.* The authors recommend

There should be renewed study of the magnitude of inflows to the Colorado River that occur between Glen Canyon Dam and Lees Ferry. Measurements since 2005 consistently indicate that flow increases between these two points, and the magnitude of this difference is of the same order as the annual consumptive uses of the state of Nevada. This study should include ground-water modelling of seepage around Glen Canyon Dam and independent analysis of the accuracy of measurements of Glen Canyon Dam releases and gaging at Lees Ferry.

Id. at 2 and 23. We agree that Reclamation should study and determine a method to account for and allocate the seepage amount as a water delivery from the Upper to the Lower Basin of the Colorado River. It is only fair that this amount of water entering the lower basin is accounted for as an upper basin delivery. The amount of water now entering the canyon as seepage (an additional unaccounted for and unallocated delivery) can now be stored in Lake Powell for later delivery downstream (e.g. ten years of seepage losses is about 1.5 million acre-feet of water).

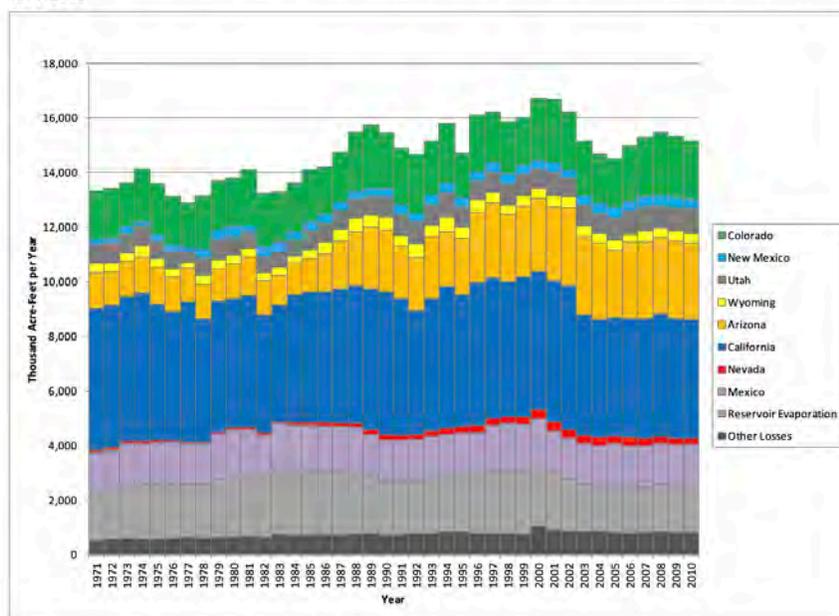
2. Evaporation losses are significant and must be fully accounted for and allocated.

The amount of water lost to evaporation and other system losses is substantial. (Fleck and Kuhn at page 16.) “Depending on the level of storage, the loss of water is in the range of 1.5 – 2 million acre-feet per year, more than the annual consumptive use of four of the seven individual basin states.” *Id.* Reservoir evaporation accounts for “about 20% of the available water supply for mainstream users on the Lower Colorado River.” *Id.* at 17. Figure C-2²⁵, below, shows the reservoir evaporation in light gray from 1971-2010.

²⁴ Wang, J., and Schmidt, J.C. 2020. *Stream flow and Losses of the Colorado River in the Southern Colorado Plateau*, White Paper No. 5, The Future of the Colorado River Project, Quinney College of Natural Resources, Utah State University at 8. <https://qcnr.usu.edu/coloradoriver/futures>

²⁵ Colorado River Basin Water Supply and Demand Study, Technical Report C – Water Demand Assessment, December 2012, Figure C-2, at page C-7. https://www.usbr.gov/lc/region/programs/crbstudy/finalreport/Technical%20Report%20C%20-%20Water%20Demand%20Assessment/TR-C-Water_Demand_Assessmemt_FINAL.pdf

FIGURE C-2
 Historical Colorado River Water Consumptive Use¹ and Loss by State, Mexico, Reservoir Evaporation², and Other Losses³,
 1971–2010



¹ Excluding consumptive use in Lower Basin tributaries.

² Reservoir evaporation losses are accounted differently in the Upper and Lower Basin. In the Upper Basin, reservoir evaporation losses are accounted as part of each state's total uses. In the Lower Basin, reservoir evaporation losses are accounted separately from each state's uses. Reservoir evaporation losses from Upper and Lower Basin reservoirs have been aggregated for this presentation.

³ Phreatophyte and operational inefficiency losses.

Wang and Schmidt (2020) also recently assessed post-2010 data regarding evaporation losses from Lake Mead. The 2020 study found that from 2010-2015, the annual evaporation losses from Lake Mead were about “559,000 acre-feet per year and were 5.4 percent of the total outflows and losses from Lake Mead.” *Id.* at 17. On average about 6 feet of water is lost out of Lake Mead each year.²⁶ These losses are still significant even when Lake Mead is at only a fraction of its capacity. In July 2010, Lake Mead was only 38 percent of capacity²⁷ and its water levels were even lower in 2015.²⁸ “Evaporation losses from Lake Mead [alone] were more than twice the consumptive uses by the state of Nevada.” *Id.*

Despite the 1.5 million acre-feet of estimated water lost from the Colorado River through reservoir evaporation annually, “there is no common basin-wide approach to measuring and reporting evaporation.” (Fleck and Kuhn, page 16.) Fleck and Kuhn suggest that “[t]he development of a comprehensive method to assess Lower Basin reservoir evaporation and, if

²⁶ USGS, Nevada Water Sciences Center, May 26, 2017. <https://www.usgs.gov/centers/nevada-water-science-center/science/evaporation-lake-mead-and-lake-mohave-lower-colorado>

²⁷ Las Vegas Review Journal, July 3, 2022, *Lake Mead through the decades* by Taylor Lane. <https://www.reviewjournal.com/local/local-las-vegas/lake-mead-through-the-decades-photos-2602149/>

²⁸ Earp, Katherine J., and Michael T. Moreo, USGS, 2021, *Evaporation from Lake Mead and Lake Mohave, Nevada and Arizona, 2010-2019*. <https://pubs.usgs.gov/of/2021/1022/ofr20211022.pdf>

appropriate, conveyance system losses is long overdue.” (Fleck and Kuhn 2023 at 4.) Likewise, Wang and Schmidt recommend

maintaining the long-term program to measure evaporation from Lake Mead and make the present experimental program at Lake Powell a permanent monitoring program. Total, or gross, evaporation should be regularly reported for both reservoirs, because that is the actual amount of water lost to the atmosphere.

(Wang and Schmidt at 2 and 23.) We agree with these suggested approaches and encourage Reclamation to develop and fund a long-term and uniform program for monitoring evaporation losses throughout the Colorado River Basin.

Further, in addition to inconsistent and varied accounting methods, evaporation losses below Glen Canyon Dam, are not assessed as a part of the water allocations to the Lower Basin States of Arizona, Nevada, and California. Thus, as climate change reduces water availability and demand outpaces supply, these evaporation losses work (outside of those allocations) as a major additional depletion of water in the system. In fact, estimated reservoir evaporation losses have matched the decline of Lake Powell and Lake Mead—an average of 1.5 million acre-feet a year—since the onset of the Millennial drought in 2000.²⁹

As discussed in more detail by Fleck and Kuhn, the Lower Basin states acknowledge the need to distribute reservoir evaporation and system losses going forward and two very different approaches were proposed by California and the remaining six basin states as a part of Reclamation’s near-term revisions of the 2007 Guidelines. (Fleck and Schmidt 2023 at 1, 2, and 17.) This is what Fleck and Kuhn had to say about the choice to be made

These two approaches expose the fundamental problem on the river. There is not enough river water to meet the needs of Arizona, California, and Nevada on the Lower River, to meet the current needs and future aspirations of the Upper Division States, to address the unmet senior rights of the Basin’s Native Americans, and to satisfy the 1944 Treaty obligations to Mexico. **The simple reality is that the three Lower Division States need to cut their collective mainstream uses by at least 1.5 million acre-feet per year, the only questions are which entities are cut and by how much.** Both proposals accomplish the necessary cuts, but the way each distributes the pain is different.

(Fleck and Kuhn at 18, Emphasis added.)

A suggested vehicle for future agreements around how to allocate evaporation and other system losses include the negotiation of a Lower Basin Compact to address unresolved issues from the 1922 Colorado River Basin Compact. *Id.* at 18. Allocation of evaporation losses is just

²⁹ Fleck and Kuhn, pages 2, 8 and 17; *See also*, Brad Udall’s presentation *Current and Projected Hydrology: A Dangerous Trajectory* at the 43rd Annual Colorado Law Conference, June 8, 2023, <https://www.youtube.com/watch?v=egKHhNzk3Hk> at 19:30.

one of several issues left unsettled over the past 100 years that would benefit from forward looking and proactive agreements by the Lower Basin states. Fleck and Kuhn suggest that

without such a compact, critical allocation and management questions such as the definition of consumptive use, the status and meaning of article III(b) of the 1922 Compact, and the assessment of evaporation and system losses remain unanswered and subject to dispute.

Id. at 4.

A recent analysis by the Southern Nevada Water Authority estimated 1.5 million acre-feet of water is lost each year from evaporation and system losses from Lee’s Ferry to the northern international boundary with Mexico and developed a proposed methodology to allocate these losses among individual water users “based upon the user’s recent history of their consumptive use.”³⁰ The Southern Nevada Water Authority reasoned that “[b]ecause these losses occur without regard to priority, they should NOT be implemented in a manner that applies reductions exclusively to junior priority users.” This analysis is an important starting point for serious negotiations between the basin states on this issue. We would caution that equity principles, as discussed above, should still apply with regard to the basin tribes in this context.

It is not the responsibility of the Department of the Interior to resolve all the outstanding disputes among stakeholders in the Colorado River Basin. It is long past time that the basin states show leadership and reach agreement on longstanding issues that are at the foundation of the water crisis before us. These agreements should be the foundation of the balancing of supply and demand in the basin. Based on lessons from the past, these negotiations will need to include the 30 basin tribes, U.S., Mexico and include discussions with other interested parties; however, the states must be willing to make hard choices that benefits the system in the long run and reconcile miscalculations made in the past. It is because the states cannot reach an agreement that the Secretary of Interior is left in the role of trying to clean up the mess that has been created.

“A consistent and accurate method of measuring and assessing reservoir evaporation” is needed and is “critical to future water management in the Basin.” (Fleck and Kuhn 2023 at 16.) We agree with this assessment and encourage Reclamation to lead this effort to determine how to uniformly and accurately measure and report evaporation, seepage, and other system losses throughout the Basin. A Reclamation evaporation study needs to be completed and its methods affirmed by the other sovereigns in the basin (e.g. 30 basin tribes, Mexico, and the seven basin states) as soon as possible, but definitely before the Draft EIS for the post-2026 guidelines is released in 2024. Further, the Lower Basin States need to consider the best vehicle for permanently ensuring that these losses are accurately divided among existing water users in the lower basin and execute an agreement resolving this (and hopefully other) outstanding issues clouding the interpretation of the Colorado River Compact of 1922 and leading to continued disagreement between the states. The reprieve of 2023 is not likely to buy the basin

³⁰ Fleck and Kuhn at 3; *See also*, Letter from Southern Nevada Water Authority and Colorado River Commission of Nevada to Interior regarding the revised guidelines for near-term Colorado River Operations at page 7 and Attachment 2 at pages 12-13. <https://s3.documentcloud.org/documents/23590432/2022-12-20-snwa-letter.pdf>

more time to resolve these complicated and longstanding issues, so the time is now to come together and make the hard choices need to sustain the Colorado River and its tributaries long into the future.

II. PROMOTE MEANINGFUL INCLUSION OF TRIBES. Meaningfully consult with and provide each of the 30 tribal nations in the Colorado River Basin an opportunity to participate as equal sovereigns directly in post-2026 negotiations between the U.S., the seven basin states (Arizona, California, Colorado, Nevada, New Mexico, Utah, Wyoming), and Mexico.

- A. PROPOSE AND IMPLEMENT A PROCESS. Reclamation should propose and implement a process to promote meaningful inclusion of the 30 basin tribes as soon as possible.

Reclamation indicates that it “intends to develop an approach that facilitates inclusion at multiple levels and enhances tribal engagement and inclusivity . . . including individual outreach, leverage existing groups and forums, create new groups and forums, and provide for clear and timely communication with the public.” 88 Fed. Reg. at 39457. We appreciate the intention and work Reclamation is putting into developing these processes. Given the “resounding consensus advocating for increased tribal participation in the post-2026 process” from the pre-scoping comments, we were hopeful that Reclamation would have a suggested process or would have provided additional thoughts on what that process might look like in the scoping notice. See Pre-Scoping Report at 10.

Now that the formal NEPA process has begun, we recommend Reclamation propose and implement a process to promote meaningful inclusion of the basin tribes. This process needs to be in place as soon as possible to ensure those engagement opportunities are available throughout the process.

Further, it would be helpful to understand what existing or new groups Reclamation is planning to utilize or form as a part of the post-2026 process, what the composition of the existing groups are, and what tribes or individuals participate. Some questions to consider include: Are there barriers to participation that Reclamation might be able to help overcome with resources or other support? Is there a way non-governmental organization could help provide resources if federal support is not available? Are there new voices or tribes that are interested in engaging? Is Reclamation visiting each of the tribes in person? What is each tribe’s preference for engaging (e.g. written comments, in person meetings)? Where are the meetings being held?

- B. OPPORTUNITY FOR TRIBES TO PARTICIPATE AS EQUAL SOVEREIGNS. Reclamation should seriously consider the request by many tribes to be given the opportunity to participate as equal sovereigns with the U.S., basin states and Mexico directly in the post-2026 negotiations.

The Summary of the Pre-Scoping Comments for “Tribal outreach and involvement” provides that

Throughout the stakeholder and tribal letters, there was a resounding consensus advocating for increased tribal participation in the post-2026 process.

Recommendations included inviting tribes to participate directly in federal-state negotiations and establishing regularly scheduled meetings; meaningfully considering, integrating, and responding to tribal input; clearly and explicitly specifying opportunities and timeframes for tribal input; directly involving DOI or other federal agency personnel involved with tribal coordination; and initiating Section 106 (pursuant to the National Historic Preservation Act) government-to-government consultation with tribes early in the process. Stakeholders further recommended using Indigenous Traditional Ecological Knowledge to inform the decision-making process.

Id. at 9-10.

Many stakeholders in the basin attended the Getches-Wilkinson Center Conference: Crisis on the Colorado River on June 8, 2023.³¹ The tribal water panel coordinated by the co-chairs of the Water and Tribes Initiative elicited very specific requests and the expression of concerns by individual tribal representatives about the development of the post-2026 guidelines. That presentation was recorded and we attach the link and incorporate those request by reference into these comments.

A very specific request was made by the Governor Lewis of the Gila River Community as well as other tribes to be included as equal sovereigns in any meetings between the United States and the seven basin states in an effort to provide “all basin tribes need [the opportunity] to be at the table.” Governor Lewis’s request was as follows :

the table should include representatives from all 38 sovereign governments in the United States’ portion of the basin. So that is of course the United States, the seven basin states, and the 30 basin tribes. Now some basin tribes may not want to participate for whatever reason but nonetheless they should have a seat if they want one. And I strongly believe that this group of 38 sovereigns should meet whenever the United States feels it has to meet with all of the principals of the seven basin states. And as we develop a post-2026 plan it’s no longer acceptable for the United States to meet with seven basin states separately and then come to basin tribes after the fact with post-hoc explanation or rationalization of what was discussed or even worse what was decided. . . . Only when US decides to meet with all basin states principals would the requirement to include all tribes at that time would be triggered. This new inclusion plan should be done as soon as possible so it can be used as we start this post-2026 process. I strongly believe it should be established and in place before the post-2026 scoping comment period deadline. (Minute 1:07-1:10)

Other tribes that made similar requests:

- ◆ “We must be a part of the discussions as they occur” - **Jicarilla Apache Nation**, Pre-scoping Letter dated September 1, 2022 at 1.

³¹ Getches-Wilkinson Center Conference: Crisis on the Colorado River, [Tribal Water Panel](https://www.youtube.com/watch?v=yzzLTnhgHFM), Minute 1:02:45, June 8, 2023. <https://www.youtube.com/watch?v=yzzLTnhgHFM>

- ◆ “The Tribe wants to be at the table *during* discussions and negotiations. As a sovereign in the Basin, the Tribe does not want to be updated on the negotiations between the States and the Federal team after decisions are made; the Tribe wants to be at the table during discussions and negotiations.” - ***Southern Ute Indian Tribe***, Pre-scoping Letter dated September, 1 2022 at 2.
- ◆ “The Tribe is ready and eager to engage at the highest levels of the discussions and negotiations that will be necessary both to create a sustainable post-2026 future and to address the crisis the Basin is already facing. We will show up wherever we are invited- and will seek to interject ourselves even when we are not - because the health of the River, and our ability to continue to utilize our hard-won water rights for the benefit of our members, are of existential importance to the Tribe.” - ***Quechan Indian Tribe***, Pre-scoping Letter dated August 29, 2022
- ◆ “The Secretary must ensure that the Nation and other tribes with CAP allocations are able to equitably participate in any operational strategies that may be adopted for Post-2026 operations. This includes not only ensuring that tribes may legally participate, but also ensuring that any practical barriers to participation are addressed given the fact that tribes have a unique legal and jurisdictional status within the Colorado River system. - ***Yavapai-Apache Nation***, Pre-scoping Letter dated September 1, 2022 at 2.
- ◆ “We strongly request that (1) the Ute Indian Tribe be seated as a participant on the Upper Colorado River Commission; and (2) the Bureau of Indian Affairs have visible and active representation as a federal partner in Reclamation’s leadership role in working to develop strategies for the post-2026 management of the Colorado River.” - ***Ute Indian tribe***, Pre-scoping Letter dated August 30, 2022 pre-scoping at 2.
- ◆ “I repeat my hope that the United States will fully implement its commitment to engage in pre- decisional, government- to- government consultation with Ak-Chin and other Basin Tribes as it works to develop post-2026 Colorado River operating guidelines and to identify and implement interim conservation measures. It is vital that the federal government both hear from Tribes and provide them with information and assistance necessary to understand and evaluate any proposals that will affect tribal rights and interests will in advance of such proposals being adopted.” - ***Ak-Chin Indian community***, Pre-scoping Letter dated September 1, 2022 at 2.
- ◆ “This process should not be difficult. The Tribes should be included in all substantive meetings to develop the next set of operational guidelines. The CRIT do not want to be informed of the decisions made or agreements reached with the Basin States. It is critical that we be in the meetings and provide our voices to shape those decisions and agreements. Because our water use is accounted for as part of each state’s apportionment, does not mean we are state water users, within the jurisdiction of state water laws, or that the states know or understand

our interests in the Colorado River.” - *Colorado River Indian Tribes*, Pre-scoping Letter dated September 1, 2022 at 1.

III. **CLIMATE RESILIENCE PLANNING IS CRITICAL. In a parallel timeframe to the post-2026 guidelines, Reclamation must continue to conduct additional climate resilience planning and implement solutions.**

The Trust appreciate Reclamation’s efforts to conduct a series of actions simultaneously to address the challenges the basin faces due to low runoff and reservoir elevations. These actions—from the near-term revisions to the 2007 Guidelines to the infrastructure review and assessment of Glen Canyon and Hoover Dams—are all vital to addressing the immediate crisis as well as planning for alternatives and scenarios to address foreseeable and untenable future problems. Given the breadth of these actions, it would be helpful if Reclamation was more transparent, communicative, and coordinated in updating the public on the status of those studies. For example, we understand that an evaporation and seepage study is underway, but it is unclear when it will be released and how it will inform (both related to timing and substance) the development of the post-2026 guidelines. The process to develop the post-2026 guidelines can only be enhanced and supported by these other actions and studies. We encourage Reclamation to develop a central location to provide such status updates and information for the public and stakeholders to access.

A. ALIGN/INTEGRATE OTHER ACTIONS BY RECLAMATION. Reclamation must coordinate the alignment of other actions it is undertaking in the basin with the development of the post-2026 guidelines.

In August of 2022, the Department of the Interior announce “a number of administrative actions” it intends to take in the Basin³² in addition to the development of the post-2026 guidelines, including the following:

- *Prepare Draft Supplemental Environmental Impact Statement for Near-Term Colorado River Operations* to revise 2007 Interim Guidelines—including “actions needed to authorize a reduction of Glen Canyon Dam releases below 7 million acre-feet per year, if needed, to protect critical infrastructure at Glen Canyon Dam” and “actions needed to further define reservoir operations at Lake Mead, including shortage operations at elevations below 1,025 feet to reduce the risk of Lake Mead declining to critically low elevations.”
- *Prepare Studies of River Outlet works at Glen Canyon Dam*—including “accelerate ongoing maintenance actions and studies to determine and enhance projected reliability of the use of the river outlet works, commonly referred to as the bypass tubes, at Glen Canyon Dam for extended periods.”

³² U.S. Department of the Interior Press Release dated 8/16/2022 *Interior Department Announces Actions to Protect Colorado River System, Sets 2023 Operating Conditions for Lake Powell and Lake Mead.*
<https://www.doi.gov/pressreleases/interior-department-announces-actions-protect-colorado-river-system-sets-2023>

- *Investigate Physical Modifications at Glen Canyon Dam*—including “support technical studies to ascertain if physical modifications can be made to Glen Canyon Dam to allow water to be pumped or released from below currently identified critical and dead pool elevations.”
- *Drought Response Operation Agreement*—including “work with the Basin states, Basin Tribes, stakeholders and partners to be prepared to implement additional substantial releases from Upper Basin Reservoirs to help enhance reservoir elevations at Lake Powell under the Drought Contingency Plan’s Drought Response Operations Agreement.”
- *Evaporation and System Loss Study*—including “prioritize and prepare for additional administrative initiatives that would ensure maximum efficient and beneficial use of urban and agricultural water, and address evaporation, seepage and other system losses in the Lower Basin.”
- *Investigate Physical Modification at Hoover Dam*—including “support technical studies to ascertain if physical modifications can be made to Hoover Dam to allow water to be pumped/released from elevations below currently identified dead pool elevations.”

In addition to these actions announced last year, additional investigations or efforts on the horizon include:

- *LTEMP Review and Amendment*—Evaluate alternatives for operating Glen Canyon Dam to prevent passage and establishment of non-native fish species in the Grand Canyon and to review a change to the sediment accounting window for determining when to conduct high flow experiments in the canyon.
- *Feasibility Study of Fish Barrier in Lake Powell*—Evaluate feasibility of installing fish barrier in Lake Powell to prevent the passage of non-native species into the Grand Canyon.
- *Quantify and settle tribal water rights*—Negotiate and implement settlements of unfulfilled tribal water rights.

While we understand that every issue or investigation cannot fall within the scope of the post-2026 guidelines, at a very minimum, all the actions listed above should be timed and coordinated with the development of the post-2026 guidelines. It would also be incredibly helpful to have a little more insight into that status of these processes and how Reclamation sees them as integrated with or separate from the post-2026 guidelines.

B. WORST-CASE SCENARIO PLANNING. Reclamation needs to conduct worst-case scenario planning to address low runoff conditions and avoid or mitigate critical reservoir elevations.

1. Reclamation should reassess dam infrastructure and develop alternatives for passing water through the dam at low reservoir elevations.

Reclamation has identified, as have other stakeholders in the basin,³³ their concerns regarding the infrastructure challenge of passing water through Glen Canyon and Hoover Dams at low

³³ The Southern Nevada Water Authority also expressed its concern regarding “the risks associated with losing the ability to release water through the Glen Canyon Dam power plants.” SNWA SEIS comments (12-20-2022) at p. 4.

reservoir elevations. In the Draft Supplemental EIS for Near-term Colorado River Operations, Reclamation provides

In recent months, a primary concern for the Department has been to identify and implement actions to ensure that Glen Canyon Dam continues to provide downstream water deliveries as designed and intended (i.e., remains above elevations at/about 3,490 feet above mean sea level). While additional analysis may find that water can be released through the hydropower units when Lake Powell is at slightly lower levels, at this time, 3,490 feet is the cutoff for routine operations. Below this elevation, all water could only be released through Glen Canyon Dam's four river outlet works (reducing operational redundancy and, thus, increasing operational risk for downstream releases). This would create a risk of water supply interruptions to water users that rely on Lake Powell for drinking water supplies; hydropower interruptions to users that rely on Glen Canyon Dam for power supplies; and increased uncertainty regarding downstream releases should Lake Powell continue to decline. As discussed herein, if strategies are adopted to reduce Glen Canyon Dam releases to protect the reliability of routine operations, Lake Mead's water levels will decline at an accelerated rate, increasing risk of Lake Mead declining to critically low levels and threatening water deliveries to those that rely on Lake Mead for water supplies.

(DSEIS at 1-8, footnote 9.)

This issue is important in terms of water deliveries, hydropower operations, but also for the cultural, environmental, and recreational interests in the Grand Canyon. See Schmidt and Kuhn (2023) at 6. The Trust is concerned that if conditions remain warm and dry and reservoir levels again decline that there is not a plan in place or underway to ensure that water can pass through Glen Canyon Dam in a way that protects the canyon's resources, downstream water users, and the safety of the dam itself.

We believe that this type of climate resilience planning at Glen Canyon and Hoover Dams is critical and should occur alongside the development of the post-2026 guidelines. This planning should be public and inclusive and should look not only at the immediate problem, but incorporate other related concerns such as passing of non-native fish through the dam, operations to prevent the establishment of non-natives in the canyon, lack of sediment passage through the dam, water temperature, inability to conduct high flow experiments at low reservoir levels at sufficient magnitude, inability to generate hydropower, vegetation

The SNWA states that "[t]hese risks fundamentally harm water supply reliability for all those that rely upon water in the Lower Basin. The inability to release water from Glen Canyon Dam imposes unacceptable risk to Lower Basin water supply and the predictability of that supply" and requests that "[a]ny preferred alternative must ensure water deliveries from Glen Canyon Dam are not compromised, in turn requiring that sufficient elevations be maintained in Lake Powell." *Id.*

encroachment, etc. Schmidt and Kuhn (2023) at 6. This is the type of integrated planning that is likely required in a drier and more uncertain future.

We understand that Reclamation has presented some initial summary of its investigations in a presentation titled *Glen Canyon Dam Low-Head Hydropower Modifications*. It is unclear, however, the status of these investigations and if and when this process becomes more public. This process could benefit from public scoping or informal pre-scoping to identify the issues and investigations that are most important and relevant to stakeholders and the public.

2. Reclamation should investigate the costs and benefits of how storage is distributed between Lake Powell and Lake Mead under low reservoir elevations.

The 2007 Guidelines prioritized the balancing of reservoir elevations at Lake Powell and Lake Mead. This may not be feasible given the worst-case scenario that these reservoirs remain at only a fraction of their capacity or fall even further below where they are today. Schmidt and Kuhn (2023) warn that “[t]he likelihood that the combined storage in Lake Mead and Lake Powell will rarely exceed 50% of capacity (K. Wheeler et al., 2022) suggests a need to evaluate the environmental and hydropower trade-offs associated with policy alternatives that emphasize storage of water in Lake Powell or Lake Mead.” Id at 8. We agree that it may be time to investigate the scenario of low reservoir storage and evaluate the costs, benefits and impacts of different reservoir elevations and storage alternatives for the worst-case scenario. Such climate resilience planning would allow Reclamation and the basin stakeholder to get ahead of the next emergency on the river and develop a plan forward.

In summary, worst-case scenario planning could ensure that the infrastructure and operations of Lake Powell and Lake Mead can withstand low flows and reservoir elevations. In the future, it is possible that the Grand Canyon Protection Act of 1992 may mandate that some of these worst-case scenario plans are implemented if the existing mitigation and balancing choices fail to meet the mandates of “protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established.” It is possible that at very low reservoir levels many of the mitigation measures set forth in LTEMP (e.g. high flow experiments) to offset and improve conditions in the Grand Canyon may be very difficult if not impossible to conduct. Thus, this type of investigation may prove important given the mandates of the Grand Canyon Protection Act of 1992 going forward.

IV. RELEVANT STUDIES TO CONSIDER.

The following studies may provide insights into the environmental review process for development of the post-2026 guidelines:

- Bruckerhoff, L.A., Wheeler, K., Dibble, K.L, Mihalevich, B.A., Neilson, B.T., Wang, J., Yackulic, C., and Schmidt, J.C. 2022. Water Storage Decisions and Consumptive Use May Constrain Ecosystem Management under Severe Sustained Drought, *Journal of the American Water Resource Association* 58 (5): 654-72. <https://doi.org/10.1111/1752-1688.13020>

- Connor, Michael. June 1994. Extracting the Monkey Wrench from Glen Canyon Dam: The Grande Canyon Protection Act – An Attempt at Balance. 15 *Pub. Land L. Rev.* 135. <https://scholarworks.umn.edu/cgi/viewcontent.cgi?article=1313&context=plrlr>
- Fleck, John and Kuhn, Eric, An Historical Perspective on the Accounting for Evaporation and System Losses in the Lower Colorado River Basin (June 1, 2023). Science Be Dammed Working Paper #4 (June 2023), Available at SSRN: <https://ssrn.com/abstract=4466530> or <http://dx.doi.org/10.2139/ssrn.4466530> (Fleck and Kuhn 2023)
- Kuhn, E., & Jacobs, K. L. (2022). Science and apportionment: Alternative futures for the Colorado River system. In J. A. Robison (Ed.), *Cornerstone at the confluence: Navigating the Colorado River's Compact's next century* (pp. 45–69). The University of Arizona Press. <https://uapress.arizona.edu/book/cornerstone-at-the-confluence>
- Miller, O. L., Miller, M. P., Longley, P.C., Alder, J. R., Bearup, L. A., Pruitt, T., et al. (2021). How will baseflow respond to climate change in the Upper Colorado River Basin? *Geophysical Research Letters*, 48, e2021GL095085. <https://doi.org/10.1029/2021GL095085>
- Udall, B., and J. Overpeck (2017). The twenty-first century Colorado River hot drought and implications for the future. *Water Resources Research*, 53, 2402-2418, doi:10.1002/2016WR019638. <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/2016WR019638>
- Wang, J., and Schmidt, J.C. 2020. Stream flow and Losses of the Colorado River in the Southern Colorado Plateau. *The Future of the Colorado River Project*, Quinney College of Natural Resources, Utah State University, White Paper No. 5. <https://qcnr.usu.edu/coloradoriver/files/news/White-Paper-5.pdf>
- Wang, J., Udall, B., Kuhn, E., Wheeler, K., and Schmidt, J.C. (2021). Evaluating the Accuracy of Reclamation’s 24-month Study Lake Powell Projections. Utah State University Center for Colorado River Studies, White Paper No. 7. <https://qcnr.usu.edu/coloradoriver/files/news/White-Paper-7.pdf>
- Wheeler, K., Kuhn, E., Bruckerhoff, L., Udall, B., Wang, J., Gilbert, L., Goeking, S., Kasprak, A., Mihalevich, B., Neilson, B., Salehabadi, H., & Schmidt, J. C. (2021). Alternative management paradigms for the future of the Colorado and Green Rivers. Utah State University Center for Colorado River Studies, White Paper No. 6. https://qcnr.usu.edu/coloradoriver/files/CCRS_White_Paper_6.pdf
- Wheeler, K., Udall, B., Wang, J., Kuhn, E., Salehabadi, H., & Schmidt, J. C. (2022). What will it take to stabilize the Colorado River? *Science*, 377(6804), 373–375. <https://www.science.org/stoken/author-tokens/ST-631/full>

We appreciate the opportunity to provide scoping comment on the development of the post-2026 guidelines. We look forward to working with you and others in the basin to find solutions

to the complex and critically important challenges facing Colorado River Basin and work toward a more just and sustainable future for the river and its communities.

Sincerely,

A handwritten signature in black ink, appearing to be 'Jen Pelz', with a long horizontal flourish extending to the right.

Jen Pelz
Water Advocacy Director
Grand Canyon Trust



Grand Canyon Wildlands Council
PO Box 1315
Flagstaff, AZ 86002
admin@wildarizona.org

To: Amanda Erath, Colorado River Post-2026 Program Coordinator, Bureau of Reclamation
Via email: crbpost2026@usbr.gov

From: Wild Arizona: Grand Canyon Wildlands Council
-Dr. Larry Stevens, Senior Ecologist, Glen Canyon Dam Adaptive Management Work Group and Technical Work Group Representative
-Kelly Burke, Executive Director, AMWG and TWG Alternate

Re: Scoping Comments for the Development of Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead (Post-2026 Operations)

Date: August 15, 2023

Introduction

Thank you for the opportunity to comment on scoping for the Development of Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead EIS process, particularly in light of the potential socio-environmental impacts of Glen Canyon Dam operating protocols, on the cultural and ecological values of the Colorado River Ecosystem in Glen and Grand canyons.

Grand Canyon Wildlands Council (GCWC, of Wild Arizona) is a conservation organization dedicated to the conservation and restoration of native species and natural ecosystems of the Colorado River and its tributaries through Glen Canyon and Grand Canyon. The community of members we serve includes citizens who treasure the Colorado River Ecosystem (CRE) for its native biological diversity and its cultural importance as a living cultural landscape, as well as its geographic complexity. Many actively hike and raft in Grand Canyon for recreation, creative pursuits, river-based livelihoods, or scientific research and ecological restoration purposes. For more information about GCWC, please see our website at www.wildarizona.org/grand-canyon-wildlands-council.

GCWC staff serve on the Adaptive Management Work Group (AMWG) FACA committee representing conservation interests, and we have strongly emphasized the need to base dam operations and Colorado River stewardship on clearly defined desired future conditions, high quality scientific understanding, well-reasoned planning, and conscientiously conducted adaptive management. With more than 40 years of experience in the region and more than 50 peer-reviewed scientific publications on the ecology and management of the Grand Canyon region by our staff, we offer these scoping comments from both the standpoints of science and management. We present policy and science scoping issues that appear to us to be important

considerations for the Bureau of Reclamation as they undertake the development of this EIS. We also generally support the recommendations presented by our colleagues and GCDAMP AMWG stakeholders among Grand Canyon River Guides, American Rivers, and Trout Unlimited.

Statement of Purpose and Need

GCWC recommends the following Purpose and Need language:

The purpose of developing the Post-2026 operational guidelines and strategies for Lake Powell and Lake Mead is to ensure the long-term and dynamic integrity of the natural, cultural, and sustainable economic community values of the Colorado River Ecosystem, from its headwaters to its delta in Mexico, and additionally to support climate resilience and holistic management flexibility and adaptability for this river system. The need to develop new environmentally just guidelines, strategies, and ultimately paradigms for Colorado River management/stewardship is extremely urgent. That urgency is to implement actions within the next 2-3 years, to prevent system collapse ecologically, economically, and socially, that would result from failing to recognize, adaptively anticipate, and proactively prepare for extreme conditions and climate instability. These guidelines and strategies necessarily involve in-stream flows; water storage and delivery; basis in scientific reality; managing for the most productive riparian habitat throughout the Colorado River basin (e.g. cottonwood and tree willow, riparian gallery forest) to support climate resilience; and inclusivity of Tribal perspectives, their cultural connection to water, and their traditional ecological knowledge—because the basin is already experiencing rapid and even accelerating climate change effects, especially the number and duration of excessive heat waves and long term aridification.

Recommendations to guide construction of Post-2026 Operations EIS Alternatives and the analysis of potential impacts.

1. Manage with the water we get, not the water we wish to get. Design alternatives that address appropriate forecasting (over multiple nested timeframes) of available water inflows minus evaporative losses, and which explicitly incorporate robust climate data and modeling into an annual release implementation decision process that is conservative, flexible, and adaptive. Such a process should be transparent, directly engage NPS, Tribes, and the AMWG of the GCDAMP, in making release implementation recommendations to the Secretary of Interior, such that we store water during wet years, so that we maintain appropriate surface elevations and in-stream flows during extended periods of low water.

2. Construct alternatives to allow for HFE's—especially spring-timed; for flows to prevent smallmouth bass and other eruptive predatory nonnative fish establishment, and other flow options arising out of adaptive management under accelerating climate change effects, as well as high enough flows for river running/recreation.

3. Construct alternatives which conserve or enhance the natural, cultural, and scientific values for which the designations leading up to and including establishment of Grand Canyon National Park in 1919 (prior to the Colorado River Compact of 1922), followed by Park expansion and the

creation of the Glen Canyon and Lake Mead National Recreation Areas, provided protection. Similarly consider protected resources and associated goals under the Grand Canyon Protection Act of 1992, the Colorado River Management Plan for Grand Canyon National Park, the LTEMP ROD, the administrative Colorado River protections of suitability for Wild and Scenic Rivers and Proposed Potential Wilderness within the National Park, and ESA listed species recovery plans and goals. Analyze alternatives for cumulative impacts to all of the above.

4. Construct alternatives which will provide flows to maintain or enhance the important recreation and tourism economy afforded by a healthy CRE and reliable safe flows for river running as climate impacts accelerate.

5. Prioritize incentives within the alternatives for water conservation, cooperative agreements, creative economic exchanges, engineering solutions to hydropower infrastructure, cooperative steps toward grid stability under lowering water level scenarios, and installation of barriers to fish passage through Glen Canyon Dam. Consider external factors and actions that could lessen conflict over water release volumes and patterns.

6. Include design of transparent stakeholder- and Tribal Nation-engaged decision-making processes for implementing actions according to the guidelines and strategies under the various alternatives.

7. At a minimum, include NPS as a cooperating agency for this EIS. Seek to engage all 30 Colorado River-affiliated Tribal Nations, and again at a minimum, the 13 Grand Canyon-affiliated Tribes of the recently formed Grand Canyon Tribal Coalition, in the development of the EIS as co-stewards of the Colorado River, and to provide recommendations to the Secretary of Interior. Likewise, engage the GCDAMP, its GCMRC scientific expertise and resources, and engage the AMWG as a body, to provide recommendations to the Secretary of Interior for the EIS alternatives and impacts analysis.

8. Frame the alternatives through the lens of securing Colorado River flows and a healthy CRE with associated benefits and impacts to the full array of natural, cultural, and socioeconomic resources, rather than a glorified plumbing system of water storage and delivery, which externalizes the costs to natural and human communities, and ignores both the foundational overuse of the Colorado River and the global context of human-caused rapid climate change.

Resolve the water supply/consumptive use imbalance

In closing we here repeat and re-emphasize the important comment from our colleagues at Grand Canyon River Guides: 'Balancing and stabilizing the system so that long term average consumptive uses and losses do not exceed the natural supply is absolutely imperative for the long-term sustainability of the Colorado River system and must serve as a primary goal of the Post-2026 Guidelines. GCRG advocates that the BOR include an alternative in the EIS that focuses on maintaining this balance to avoid the current predicament. In our view there is a clear need to avert a future human and ecological catastrophe by meeting this goal. Therefore

the purpose of the 2026 Operational Guidelines and Strategies should include a management regime to these ends. A possible path forward is explained in an April 2023 paper by Jack Schmidt, Charles Yackulic, and Eric Kuhn, which concludes by saying, *“If Basin-wide long-term average water consumption is reduced by 13 – 20%, reservoir storage could be maintained and potentially increased, providing a buffer against interannual variability in water supply that has supported economic and population growth in the Basin. Over longer time scales, water supply allocations will likely need to continue to be adaptive and responsive to changes in runoff under future climate change.”*

We welcome any questions about our scoping comments and greatly appreciate the work of BOR staff toward developing, analyzing, and compiling comments for this important EIS.

Sincerely,

A handwritten signature in cursive script that reads "Kelly Burke".

Ms. Kelly Burke

A handwritten signature in cursive script that reads "L. Stevens".

Dr. Larry Stevens



SENT VIA ELECTRONIC MAIL

August 15, 2023

Bureau of Reclamation
Attn: Post-2026 (Mail Stop 84-55000)
P.O. Box 25007
Denver, CO 80255

RE: EIS Scoping Process for Post 2026 Operational Guidelines

To Whom it May Concern:

On behalf of the Home Builders Association of Central Arizona (HBACA) and the Southern Arizona Home Builders Association (SAHBA), we submit this letter as our comments during the Public Scoping Process for the Post 2026 Operational Guidelines (the Guidelines). Collectively HBACA and SAHBA represent over 900 member companies doing business throughout Maricopa, Pima and Pinal Counties. These member companies comprise the full spectrum of the planned residential development industry including landowners, land developers, home builders, general contractors, construction trade partners, engineers, planners, suppliers, financial service providers and many more.

This dynamic industry will be responsible for building homes for nearly 30,000 Arizona families this year alone. In addition, it will create tens of thousands of jobs, contributing billions of dollars to the economy. Moreover, and from the standpoint of preserving and augmenting water supplies in the Colorado Basin, housing development that displaces agriculture has allowed Arizona and other Basin states to prosper. In Arizona specifically, the growth in the municipal sector has reduced water use to the point where we use about the same amount of water today as we did in the late 1950's. Healthy economic growth in the municipal sector displaces higher water use activities, generates reclaimed water supplies that can be used to meet certain water needs and creates a tax base that can fund augmentation activities essential to the Colorado Basin.

Our ability to continue meeting the housing needs of our growing population, to generate this substantial economic impact and to continue to produce these water savings is dependent upon adequate and reliable water service. While as an industry we have played an important role in implementing policies and practices to reduce water consumption in our homes and communities, the future of the Central Arizona Project, and thus the Post 2026 Operational Guidelines, are of critical importance to our future success. Should the Guidelines fail to properly ensure there is adequate water for growth, it would be devastating for our state.

With this in mind, we ask that the EIS consider the specific impacts that the Guidelines will have on our housing industry and our economy, and the indirect effects to water supplies that could occur if housing is disrupted and higher water intensive uses are allowed to remain in place. We further ask that the Bureau prioritize in-depth analysis in these areas including consultation with industry experts. It will be imperative to take a comprehensive system-wide approach that accounts for water uses throughout the Upper and Lower Basin in order to gain a full understanding of supply and demand needs. A framework for augmentation and exchange should also be considered. This type of comprehensive analysis would provide opportunities to match resources with beneficial uses in a way that is not in place today.

In conclusion, we understand the significance of the task at hand and value the efforts of the Bureau, Basin states and all stakeholders in developing the Guidelines to properly manage long-term Colorado River Operations. Our organizations are vested stakeholders and are committed to staying engaged to assist and provide expertise throughout the process.

Sincerely,



Spencer Kamps
VP of Legislative Affairs
HBACA



David Godlewski
President/CEO
SAHBA



1000 Broadway
El Centro, Ca 92243
Office (760) 352-3831
Fax (760) 352-2011
Info@icfb.net

August 15, 2023

Ms. Amanda Erath
Colorado River Post-2026 Program Coordinator
U.S. Bureau of Reclamation
Attn: Post-2026
Mail Stop 84-55000
P.O. Box 25007
Denver, CO 80225

Delivered via email: Crbpost2026@usbr.gov

Re: Comments on Notice of Intent to Prepare an Environmental Impact Statement and Notice to Solicit Comments on the Development of Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead

Dear Ms. Erath,

This letter provides comments from Imperial County Farm Bureau (ICFB) on the Bureau of Reclamation's Notice of Intent to Prepare an Environmental Impact Statement and Notice to Solicit Comments on the Development of Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead. ICFB is a 501(c)(5) nonprofit, voluntary membership organization. Our purpose is to protect and promote agricultural interests in Imperial County as well as the state and the nation.

As noted in the Federal Register notice, the period from 2000 to 2023 is the driest period in more than a century and one of the driest periods in the last 1,200 years. ICFB welcomes this opportunity to share organizational priorities for consideration in the post-2026 Colorado River reservoir operational guidelines which we believe will maximize system flexibility and resilience during this period of challenging hydrology.

One of the primary components of the 2007 Interim Guidelines was improved Reclamation management of the Colorado River. They provide additional mechanisms for the storage and delivery of water supplies in Lake Mead to increase flexibility in meeting water use needs from Lake Mead, particularly under drought and low reservoir conditions. In light of the current hydrologic conditions, we believe this will remain a primary component of post-2026 operating guidelines. To enhance system flexibility, ICFB requests the Bureau of Reclamation consider and evaluate additional Intentionally Created Surplus (ICS) storage behind Hoover Dam for the Imperial Irrigation District (IID).

Imperial Valley farmers are leaders in water conservation. We utilize integrated technology, irrigation innovation, and water reuse opportunities to grow more food with less water. To continue being the best steward of scarce and valuable resources, ICFB requests the Bureau evaluate additional Intentionally Created Surplus (ICS) exhibits for IID water users.

To fully incentivize water saving efforts, there must be recognition and credit for as-of-yet unrecognized, on-farm conservation efforts. Progressive policy changes should allow for flexible management of water generated through efficiency-based conservation measures. To this end, IID should pursue Basin recognition of known, verifiable, intentionally created conserved water, such as, but not limited to, cascading, well pod seepage recovery, crop rotation, organic cropping, cultural practices such as but not limited to drip irrigation, on-farm seepage recovery, solid set sprinklers, overhead sprinklers, center pivots, etc. ICFB does not support fallowing as a considerable method of conservation due to its social, economic, and environmental impacts.

To best support elevations in Lake Mead, we believe IID should have named storage for Intentionally Created Surplus (ICS) water with no cap or restriction on storage of conserved water. Any ICS water stored by IID should not be considered top water in the event of an overflow at Lake Mead/Lake Powell. While in this time of drought this is highly unlikely, we need to ensure our efforts are not wasted.

Over the last 20 years, California's urban/rural partnerships in on-farm water conservation, known as the Quantification Settlement Agreement, has become a model of success in creating dependable domestic water supplies while enhancing the efficient production of fruit, vegetable, and forage products that feed America. Because of these efforts, the Imperial Irrigation District now conserves over 500,000 acre-feet of water every year, totaling over 7 million acre-feet since 2003. The water savings represent a 28 percent reduction in IID's annual usage and transfer to urban users within California. The QSA illustrates how on-farm conservation in California's Imperial Valley is already helping to provide dependable water supplies for California cities and we've pledged even more to protect Colorado River reservoirs. Utilizing California's experience, other states need to implement aggressive intra-state conservation partnerships. Urban/rural partnerships which invest in on-farm conservation free up water supplies that should have been developed to meet the increased demands from population growth. Solving the Colorado River's looming shortage with urban-funded on-farm water conservation in the seven Basin States will be smarter, faster and more predictable than a chaotic effort to change priority rights dating back more than 100 years.

ICFB believes the Imperial Irrigation District has no obligation for further reduction in its water allocation and we oppose any modification of our water rights. Therefore, it is our opinion that future Colorado River reservoir operating guidelines must follow and respect the priority system. Several months ago, the Bureau proposed a Supplemental Impact Statement (SEIS) for near-term Colorado River Operations. ICFB took issue with several alternatives proposed. Action Alternative 2 utilized the terms "pro rata," "fair and equitable" which are not terms used in legal interpretation of Colorado River water rights. We discourage the Bureau from evaluating future operating guidelines which resemble Action Alternative 2 which disregard the priority system, a tested principle of water law. As landowners in the Imperial Valley, we view any action that infringes upon our Present Perfected Rights (PPR) as an unconstitutional "taking."

We also object to the use of the term "Concept of Priority" in the Bureau of Reclamation's four public webinars associated with the SEIS for near-term Colorado River Operations. How can you refer to an act of Congress which has been adjudicated at all levels of the U.S. court system simply as a concept? During the Bureau webinars, tribal water rights were referred to as a matter of settled law. Imperial Valley landowners have the same water rights standing as Native American Tribes with pre-1922 water rights. Why then relegate PPRs, with the same interpretation of water law, simply as a "concept of priority?" This illustrates a deliberate attempt to diminish the Law of the River as it pertains to the priority system. We request the Bureau maintain the integrity of Law of the River in developing post-2026 Colorado River operating guidelines.

Regarding water accounting, we suggest the Bureau evaluate implementation of a July-June water year. This timing better suits Colorado River Basin agriculture production seasonality and crop planning needs. Furthermore, we ask that the Bureau consider providing a ten-year rolling average of IID's water allocation offering credit for unused water which is made available to junior priority users and avoiding single year overrun payback.

We also ask the Bureau avoid consideration of misleading hydrology projections. "Effective" reservoir elevation is clearly double counting to facilitate manipulation of Junior water in dry years. The Imperial Valley, holders of Senior water rights, is effectively subsidizing urban economic expansion by holders of Junior water right. Also, while

modeling addresses economic impacts, it fails to evaluate impacts on domestic food production, food supply and food prices. Modeling also doesn't address negative impacts, including economic impacts, air quality, loss of electric power generation and environmental degradation, to predominantly agricultural communities from conservation measures such as fallowing. Finally, we point out environmental impact analysis must take into consideration impacts to Salton Sea or nearby wildlife reserve due to major curtailments in water deliveries to Imperial Irrigation District (IID) customers.

The 2007 Interim Guidelines for Lower Basin Shortages and Coordinated Operations of Lake Powell and Lake Mead offered valuable experience in reservoir management and recognition that more specific management tools need to be implemented for future operational decisions. As we work together with our neighboring states and the Federal government on Post-2026 Colorado River operations providing long-term solutions to sustaining the Colorado River, we are equally committed to upholding the law and being responsible water users, doing our part to keep the river healthy enough to meet the needs of all seven states.

Thank you for consideration of ICFB's comments.

Sincerely,



Scott Emanuelli
President

Cc: President Alex Cardenas IID Board of Directors
Vice President J.B. Hamby, IID Board of Directors
Director Gina Dockstader, IID Board of Directors
Director Karin Eugenio, IID Board of Directors
Director Javier Gonzalez, IID Board of Directors
Ms. Jamie Asbury, General Manager, IID
Ms. Tina Shields, Water Department Manager, IID
Mr. Mike Pacheco, Water Department Manager, IID



IRRIGATION & ELECTRICAL DISTRICTS'
ASSOCIATION OF ARIZONA



ARIZONA MUNICIPAL POWER
USERS' ASSOCIATION



GRAND CANYON STATE ELECTRIC
COOPERATIVE ASSOCIATION

E-MAILED ONLY

August 15, 2023

Bureau of Reclamation
Attn: Post-2026 (Mail Stop 84-55000)
P.O. Box 25007
Denver, CO 80225
Crbpost2026@usbr.gov

Re: Post-2026 Operating Guidelines

Dear Commissioner Touton:

The Irrigation and Electrical Districts' Association, the Arizona Municipal Power Users' Association, and the Grand Canyon State Electric Association, collectively "We" or "Associations", appreciate the opportunity to provide comment on Reclamation's Notice of Intent to Prepare an Environmental Impact Statement and Notice to Solicit Comments and Hold Public Scoping Meetings on the Development of Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead ("Post-2026 NOI"), as published in Fed. Reg. Vol. 88, No. 116, No. 39445 (June 16, 2023).

IEDA is an Arizona, statewide association of public bodies that are involved in the delivery of water and electricity to agricultural, municipal, and industrial customers throughout Arizona since 1962.

AMPWA is an association of Arizona public and consumer-owned power including irrigation districts, electrical districts, electric cooperatives, municipally owned electric systems, Salt River Project, and Central Arizona Project.

The Grand Canyon State Electric Cooperative Association (GCSECA) is a membership trade organization consisting of six Electric Distribution Cooperatives and the Arizona Generation and Transmission Cooperatives who collectively serve approximately 450,000 rural residents across 12 counties in Arizona. GCSECA's member cooperatives are rural, not-for-profit utilities that are owned and governed by the people they serve.

Ensuring Equitable Solutions Amongst Upper and Lower Basin States

During the creation of the Colorado River Compact, the Upper and Lower Basins made a major step forward in the formation of the compact by deciding to split the allocation equitably. We are requesting that the continuation of equitable allocations be at the forefront in the Post-2026 Operating Guidelines, as well as to adhere to the Law of the River.

Case in point, prior to the recent agreement of the Lower Basin, the Draft Supplemental Environmental Impact Statement proposed a 4 MAF reduction to the Lower Basin. This would have restricted the Lower Basin to 3.5 MAF while the Upper Basin had no limitations from ultimately topping out at 7.5 MAF of consumptive use. The Associations fully understand that the Upper Basin has historically not utilized their full allocation, but setting a cap on the Lower Basin with no correlating offsets for the Upper Basin does not provide equity.

In addition, the DROA seemed more like a plan for a plan than something comparable to DCP or the 500+ plans. We are asking the Bureau to ensure drought mitigation plans are also equitable in the future.

Along those same lines, system losses should be treated equitably. This has been a significant reason for the drawdown of the reservoirs, as system losses were not included in consumptive use calculations. By not counting system losses, certain recipients have not invested in improving their systems to reduce losses. If system losses were counted in allocations, system improvements would be sure to follow.

Utilizing IRA Funding to Restore Eco-System and Address Invasive Species

Another major reason for losses is non-native vegetation along the riverbanks. Tamarisks were introduced to the Colorado River by the federal government during the 19th century. They have spread downstream (continue to be transported by HFEs) and are choking out native vegetation and consuming precious water resources.

Eliminating tamarisks would help preserve the amount of water for consumptive use downstream. Part of the IRA includes funds for eco-system restoration. We are asking that the Bureau of Reclamation pursue the funds in the IRA for the following:

- Removal of the tamarisks to restore riverine habitat.
- Thinning the forests in the watershed to improve runoff, therefore, impacting ecosystem system restoration.

Continuing Compensated Conservation Programs as a Tool for Stabilizing Water Levels

The Colorado River is shared by the Basin States but has been used creatively in supply needs in those states, even outside the basin. Therefore, the Associations encourage the Bureau look for creative ways to move water around without punishing participating parties.

For example, the Bureau should consider permitting the leasing of water between states/basins while preserving their long-term rights. Compensated contributions from the Upper Basin may be an aid in transitioning the Lower Basin away from a consumptive use utilization for their allocation.

We appreciate the efforts that have gone into the \$4 billion in IRA funding for compensated conservation, but multiple members were leery of participating in long-term conservation programs that may result in loss of water rights. These issues should be addressed at both a federal and state level if compensated conservation will continue to be a tool in the Colorado River toolbox.

As mentioned earlier, uncontrolled system losses should be penalized. This would force certain parties to invest in their systems and not waste the precious water that others would love to have available to them. Multiple joint projects have occurred in the past where participating members received some of the benefits of water savings. We encourage these types of projects to continue in the future.

Regional Water Infrastructure Considerations

While possibly outside of the scope of the Post-2026 guidelines, a regional water plan may be necessary to protect the system and more fully utilize the waters Basin States receive. California has an elaborate water infrastructure, which allows it to bring water from the north into the southern part of the state. It also benefits from significant wet seasons, but it is unable to capture the runoff due to lack of storage and because it sends a significant amount of the precipitation to the ocean to protect the environment. While a state issue and likely outside the scope of the Notice of Intent, California sends more water to the ocean than the entire Lower Basin Allocation, including Mexico's amount. A regional water plan may provide opportunities for regional collaboration of water projects (desal, importation, etc.) that could benefit the Basin States as a whole.

Regarding Operating Tiers in the Post-2026 Guidelines, the Associations would continue to encourage releases based on storage but should integrate more tiers, especially to protect the critical elevations to prevent the system from crashing.

We understand that the Post-2026 Operating Guidelines stressed the domestic aspect, but IEDA would encourage the Bureau to work with the International Boundary & Water Commission to renegotiate the 1944 Water Treaty. Some would claim that the treaty has priority over present perfected rights. Prior to the initial negotiations, Mexico was using only 750,000

AC-FT. If Mexico's treaty amount of 1.5 MAF is protected and prioritized, what once was roughly 10% of the allocation is now approximately 25% of the runoff of the last three years. At a minimum, IEDA would encourage a reduction to 1 MAF until such time as normal hydrology returns.

The activities in the Ukraine have highlighted the importance of food security and agriculture. Arizona agriculture has put the Colorado River to beneficial use, providing food and fiber on a regional and national basis. For example, Pinal County Agriculture accounts for 45% of all Arizona Cattle and calf sales and 39% of all Arizona milk sales (2018 University of Arizona study) and Yuma County is responsible for 90% of the winter leafy green vegetables grown in the United States (Yuma Fresh Vegetable Association). Any actions taken should balance the food security issue with the efforts to protect the river system.

Protecting Hydropower to Ensure Energy Reliability

Finally, protect hydropower to the extent possible given the existing drought. Despite receiving above average runoff this year, Lake Powell and Lake Mead are still below average. Continued conservation on the river has reduced water volume through the dams resulting in increased costs for hydropower customers. Hoover customers signed 50-year contracts in 2016, before DCP and other conservation programs were put in place. The same can be said for CRSP customers, many of whom renewed their contracts before major reductions in releases from Glen Canyon Dam occurred. In Arizona, most of the power from these dams provide cheaper input costs for farmers to provide affordable food for Americans.

Since DCP, the cost for Arizona customers has increased significantly. For example, Boulder Canyon Project rates have increased 4.7%, while available energy has decreased by 10.6% (2019-2022). Similar stories can be told for Colorado River Storage Project (35.8% available energy decrease [2016-2022]) and Parker-Davis (48.7% composite rate increase [2016-2022]). Federal hydropower contractors have experienced multiple impacts with higher rates, reduced energy, reduced surface water, shift to groundwater and higher replacement power costs.

We support the comments in the CREDA letter highlighting the need to address the power component of Reclamation's mission, as well as clarifying the true intention of the CRSP Act and subsequent legal decisions. We understand that the Bureau is responsible for balancing a "complex set of interests", but it seems to have forgotten the importance that hydropower is for the Reclamation states.

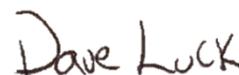
Sincerely,



Ed Gerak
IEDA



Russell D. Smoldon
AMPUA



Dave Lock
GCSECA

August 15, 2023

Bureau of Reclamation
Attn: Post-2026 (Mail Stop 84–55000)
P.O. Box 25007
Denver, CO 80225
CRBpost2026@usbr.gov

Re: Comments to Bureau of Reclamation’s “Notice to Solicit Comments and Hold Public Scoping Meetings on the Development of Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead.”

On behalf of the Gadsden Company, Sonoran Wines, Cruz Farm, the Greater Kingman Area Chamber of Commerce, the Bullhead City Chamber of Commerce, and the Greater Flagstaff Chamber of Commerce, we thank you for the opportunity to provide input and comment on the scope of the National Environmental Policy Act (NEPA) process for the Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead as published in Federal Register Notice – 88 FR 39455 on June 16, 2023 (Scoping Notice).

This letter outlines several critical principles that we urge the Bureau of Reclamation to incorporate into the process to create Post 2026 Strategies to guide operations on the lower Colorado River. We wish to convey our keen interest in seeing a collaborative Colorado River community develop solutions for managing the Colorado River under hotter, drier, and increasingly unpredictable conditions. To this end, we encourage the Bureau of Reclamation to approach this work using the following principles:

- 1. The Post-2026 Guidelines should plan for the River we have and not expect the River we want:** Successful operational and management strategies must plan for full range of plausible hydrologic extremes brought on by climate change. Plans must provide for and accommodate the flexibility required to deliver predictable and reliable water supplies under diverse circumstances and scenarios.
- 2. The Post-2026 Guidelines must move beyond managing from year to year—or crisis by crisis:** The long-term stability and predictability of Colorado River water supply is the goal, and the Bureau’s metrics for the Colorado River water supply should prioritize managing the system to achieve reliability, predictability, and stability over the long-term.
- 3. The environment is important:** Post 2026 guidelines should consider and value a broad range of environmental benefits and impacts with a goal of supporting ecosystems that contribute to water resilience in the Basin, including sensitive species and habitats in the Grand Canyon and Colorado River Delta.
- 4. The post-2026 Guidelines must work in concert with parallel strategies that benefit the Basin:** The Guidelines will not be the sole answer to challenges afflicting the Colorado River Basin. Reinforcing and parallel activities will be critical to support the Basin’s overall stability. The

Bureau's post-2026 process should anticipate and reinforce parallel processes led by states, agencies, NGOs, Tribes, and others.

4. **The post-2026 Guidelines should recognize the sovereign roles, rights, and interests of Tribal Nations as fundamental to the fabric and longevity of the Colorado River Basin.** It is imperative that Tribal Nations are afforded their rightful role in negotiations and decision-making processes that will influence and/or affect their rights, authorities, and interests.

It's clear that we need to rethink how we manage the Colorado River in order for it to continue to provide for the 40 million people who depend on it. Hotter and drier conditions are the new normal in the Colorado River Basin. A wet winter, along with short-term agreements to reduce water use, have kept the river from the brink of collapse. But we cannot continue to do only enough to bridge from one crisis to the next.

The effects of drought and increasing temperatures due to climate change over the past two decades continue to impact river flows, affect storage supplies and impose additional uncertainty for communities of the Colorado River Basin. This means there is even greater urgency to develop and implement solutions as soon as possible.

Thank you for the opportunity to comment.

The Gadsden Company
Sonoran Wines
Cruz Farm
The Greater Area Kingman Chamber of Commerce
The Bullhead City Chamber of Commerce
The Greater Flagstaff Area Chamber of Commerce

[Link to Federal Register](#)



August 15, 2023

Amanda Erath
Colorado River Post-2026 Program Coordinator
Bureau of Reclamation
Attn: Post-2026 (Mail Stop 84–55000)
P.O. Box 25007
Denver, CO 80225

CRBpost2026@usbr.gov

Re: Upper Basin Dialogue Participants’ Shared Comments to Bureau of Reclamation’s
“Notice to Solicit Comments and Hold Public Scoping Meetings on the Development of Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead.”

The six Upper Basin Tribal Nations and ten conservation groups with a shared vision in the resilience of the Upper Colorado River Basin have formed a group referred to as the Upper Basin Dialogue (“UBD”). The UBD facilitates sharing of information and resources to help pursue common goals related to water rights and resources in the Upper Colorado River Basin. As part of our Upper Basin collaboration, we, the undersigned, which comprise a majority of UBD members, submit these comments in response to the Bureau of Reclamation’s (Bureau) *“Notice to Solicit Comments and Hold Public Scoping Meetings on the Development of Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead”* as published in Federal Register Notice, 88 FR 39455 on June 16, 2023.

First, we would like to thank the Bureau for acknowledging the serious situation we face as a Colorado River Basin community. As we work with the Bureau to develop river policy that will govern in years to come, it is imperative that we acknowledge that the river has never had the volume originally apportioned under the 1922 Colorado River Compact, that the current volume

is declining rapidly, and that we may never return to the flows that we have been accustomed to experiencing in previous decades. While the Colorado River community as a whole has to learn to live with less, Tribal Nations must also be allowed the same opportunities to develop their federal reserved water rights to provide clean drinking water, adequate sanitation, clean energy, and economic opportunities that have been historically prioritized to the rest of the Basin community.

We also want to thank the Bureau for recognizing the importance of active and meaningful involvement by all sovereigns – including the thirty Colorado River Basin Tribal Nations and Mexico – in developing and implementing river management policy from the outset of the development of the Post-2026 Colorado River operational strategies. The Basin’s Tribal Nations have recognized rights to use water rights to approximately twenty-five percent of Colorado River water (under senior or high priority, reserved rights), and many of these Tribal Nations are in the process of quantifying additional rights to Colorado River water. Given this volume of Tribal water, it is imperative that Tribal Nations be involved in crafting workable solutions with the federal government and the states and it is time to correct the historical wrong of Tribal exclusion. Indeed, we will need to bring all expertise and interests to bear to meet the challenges we face going forward.

The solicitation for comments on the Post-2026 NEPA process seeks input and recommendations “concerning the scope of specific operational guidelines, strategies, and any other issues that should be considered on or before August 15, 2023.” The solicitation recognizes that “circumstances have changed” in the Colorado River Basin since adoption of the 2007 Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead (2007 Interim Guidelines). Entities relying on the Colorado River face increased individual and collective risk of water supply interruptions that will inevitably impact society, economies, and the environment in the southwestern United States. Management systems have also started to evolve. Policies to recognize and incorporate Tribal values and self-determined study and analysis of Tribal needs (e.g., Colorado River Basin Ten Tribes Partnership Tribal Water Study) and environmental analyses to protect, improve, or enhance river assets in key areas (e.g., Upper Colorado River Endangered Fish Recovery Program, San Juan River Basin Recovery Implementation Program, Glen Canyon Dam Long-Term Experimental Management Program) provide information on the need to acknowledge and integrate Tribal rights and ecological, spiritual, and cultural values when considering strategies for stabilizing storage and operating infrastructure at Lake Powell. As such, as the Bureau is planning to develop a modernized operational and management framework, we encourage the agency to use an inclusive and transparent process that will allow states, Tribal Nations, and other Basin partners to explore operational strategies under highly variable and uncertain conditions and to address challenges with an eye toward garnering broad-based support.

It is with these understandings that the undersigned participants outline the following principles, purpose, and strategies to inform the scope of the Post-2026 Guidelines for the Colorado River.¹

¹This joint comment letter focuses on the shared interests of the undersigned parties as they relate to the Upper Colorado River Basin. Additional comments that address different or broader perspectives may be submitted by any or all the undersigned parties under separate cover.

Touchstone Principles to Guide Development of Post-2026 Framework

Integrity: An overarching goal of the Post-2026 Guidelines should be to help ensure the overall integrity of the Colorado River and its tributaries while providing water for Tribal Nations and for other human and environmental uses.

Ethic Toward Resilience: The future of the Colorado River and its tributaries depends on whether the Basin can adapt and adjust to the hotter, drier, and more extreme climate conditions confronting the Basin. To be successful, future management strategies and operations must incorporate resilience principles that focus on using modern science as well as Indigenous Knowledge to establish the sustainable use of the Colorado River and its tributaries for people and the rest of nature for years to come.

Managing Beyond Crisis Mode: The Post-2026 Guidelines must move beyond managing from crisis to crisis. To provide greater water security for the Colorado River community, management operations must consider and be nimble enough to anticipate and buffer the possible extremes in hydrology, reservoir storage, and Basin conditions to implement actions that are both known and expected to provide predictability and stability for all water users, uses, and ecological, spiritual, and cultural resources within the Basin.

Purpose for the Post-2026 Guidelines

The Purpose and Need of the Environmental Impact Statement for the 2007 Interim Guidelines failed to address the Colorado River Basin's operational and management needs for the 21st Century. The purpose of the next guidelines must be to establish a framework that will direct how the Basin will be managed and operated proactively to help provide water security for Tribal Nations, water users, communities, and economies. Such actions must account for hydrologic extremes and variable storage conditions due to drought and climate change conditions, and work to support the continued integrity of the Colorado River Basin's ecological, spiritual, and cultural resources. This purpose is achieved only if the Post-2026 Guidelines are developed in a manner that acknowledges and incorporates the rights and authorities of all Basin sovereigns and provides opportunities for considering and incorporating the varied interests of the full Colorado River community.

At minimum, achieving the contemporary goals and needs of the Basin community will require measures that go beyond the purpose of the 2007 Interim Guidelines to:

- I.* Recognize Tribal sovereignty by:
 - a.* Providing Tribal Nations their rightful role in negotiations and decision-making processes that influence and/or affect their rights, authorities, and interests in Colorado River water;
 - b.* Acknowledging Tribal rights to self-determination; and
 - c.* Protecting and providing pathways for the realization of all Tribal apportionments in the Colorado River Basin.

2. Provide opportunities to steward and support ecological, spiritual, and cultural values to ensure the environmental integrity of watersheds and spiritual connection to Basin resources;
3. Provide solutions and strategies for preserving long-term stability and sustainability;
4. Develop strategies that contribute to the Basin’s resilience to unpredictable water futures in order to guard against Colorado River system failures in a manner that protects ecological, spiritual, and cultural values;
5. Plan to minimize the vulnerability of the Colorado River water supply and of ecological, spiritual, and cultural resources; and
6. Reduce the threat of litigation.

Strategies for Accomplishing the Purpose for the Post-2026 Guidelines

Conceptual strategies for accomplishing a useful purpose for Post-2026 Guidelines require process and substantive measures.

Process Measures:

1. Establish a governance structure that provides Tribal Nations a shared role in decision-making processes – consistent with their sovereign status – that implicate and/or affect their respective rights, interests, and resources within the Basin;
2. Develop a transparent and robust process for meaningfully engaging with Upper Basin Colorado River stakeholders to fully consider and inform operational and management decisions based on the contemporary diversity of needs, interests, priorities, historical use patterns, and the realities of drought and climate change;
3. Respond to the realities of a changing climate and the resulting hydrology;
4. Provide for flexible water management strategies that contribute to and reflect unique legal, geographical, practical, and political characteristics of both Lower and Upper Basin water security and that accommodate human use of and reliance on the natural systems and the Basin environment;
5. Identify stewardship principles that recognize environmental, spiritual, and cultural values that contribute to the long-term integrity of the Basin;
6. Coordinate operational and management decisions with separate but parallel efforts to build resiliencies that are needed to help the Basin survive and thrive going forward; and
7. Identify and analyze the full extent of benefits and impacts of potential operational and management actions on all Basin communities and resources.

Substantive Measures:

1. Advance proactive, comprehensive, and holistic practices that withstand a broad range of future conditions to provide:
 - a. Operational and planning stability for all water users; and
 - b. Support Colorado River ecological, spiritual, and cultural values that are foundational to the integrity of the Basin.
2. Incorporate flexible tools that help reliably manage the Colorado River reservoir system and sustain the integrity of the Basin’s resources;
3. Provide reliable access to clean drinking water and adequate sanitation for all Tribal Nations and Colorado River communities;

4. Integrate environmental stewardship practices into operational and management decisions that ensure respect for and protection of ecological, spiritual, and cultural values within the Basin; and
5. Allow for adaptation to changing conditions by advancing mechanisms that will help accommodate future arrangements/agreements in furtherance of Basin stability and resilience.

Specific Strategies:

At minimum, specific strategies for implementing the goals and concepts for Post-2026 Guidelines will have to incorporate:

1. Measures to protect the Basin's physical infrastructure;
2. Clarity and transparency on:
 - a. Full participation of Tribal Nations as coequal sovereign governments, in support of self-determination, in the negotiations and decisions for the implementation of the future strategies that will work to protect Tribal water and water-related resources, rights, and interests in the Colorado River.
 - b. How Colorado River water supply and demand will be balanced for actual water availability conditions within the Basin;
 - c. How reservoir systems will be collectively operated under variable and unpredictable hydrology and changing demands;
 - d. Whether and how Upper Basin reservoirs will be utilized in Basin management systems; and
 - e. Whether, when, and under what authorities reductions in consumptive uses may be planned in the Upper Basin,
 - f. Federal processes to account for and deduct Tribal Nations' federal reserved water rights from the state apportionments of system water used for decision making.
3. How currently developed, undeveloped, and unresolved Tribal reserved water rights will be accounted for in operational and decision-making considerations;
4. Consideration of continuing and growing needs for sustainable energy supplies, especially for Tribal, rural, and otherwise disadvantaged communities;
5. Flexible tools that advance basin integrity and proactive management of the system in a manner that fully represents the rights and interests of Tribal Nations;
6. Resource protection and mitigation practices into operational and management decisions; and,
7. Opportunities to leverage parallel processes (current/future) to help build resilience and mitigate the effects of drought in the Basin.

We value the opportunity to inform the scoping process for the NEPA efforts related to the Colorado River's Post-2026 Guidelines. The undersigned conservation groups and Tribal Nations stand ready to support strategies outlined above and look forward to working with you in the months and years to come.

Sincerely,

[Signatures on Next Page]

Melvin J. Baker
Chairman, Southern Ute Indian Tribe

Corina Bow
Chairwoman, Paiute Indian Tribe of Utah

Manuel Heart
Chairman, Ute Mountain Ute Tribe

Edward Velarde
President, Jicarilla Apache Nation

Taylor Hawes
The Nature Conservancy

Bart Miller
Western Resource Advocates

Kevin Moran
Environmental Defense Fund

Jennifer Pitt
National Audubon Society

Alex Funk
Theodore Roosevelt Conservation Partnership

Matt Rice
American Rivers

Sara Porterfield
Trout Unlimited

John Shepard
Sonoran Institute

John Weisheit
Living Rivers

Garrit Voggesser
National Wildlife Federation

cc: Camille Calimlim Touton, Commissioner, US Bureau of Reclamation
David Palumbo, Deputy Commissioner, US Bureau of Reclamation
Wayne Pullan, Regional Director, Upper Colorado River, US Bureau of Reclamation
Jaci Gould, Regional Director, Lower Colorado River, US Bureau of Reclamation



August 15, 2023

Amanda Erath
Colorado River Post-2026 Program Coordinator
Bureau of Reclamation
Attn: Post-2026 (Mail Stop 84-55000)
P.O. Box 25007
Denver, CO 80225
CRBpost2026@usbr.gov

Re: Conservation Groups' Shared Comments to Bureau of Reclamation's "Notice to Solicit Comments and Hold Public Scoping Meetings on the Development of Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead."

On behalf of our respective organizations, thank you for the opportunity to provide input and comment on the scope of the NEPA process for the "Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead" as published in Federal Register Notice – 88 FR 39455 on June 16, 2023 (Scoping Notice).

This letter outlines the undersigned conservation groups' joint interests and detailed recommendations for specific stages of the post-2026 NEPA process. It is intended to demonstrate our keen interest, varied knowledge, and deep commitment to coordinate and engage with the Colorado River community to develop workable solutions for managing the Colorado River under hotter, drier, and more unpredictable conditions. Overarching principles that drive our detailed comments include:

- 1. The post-2026 Guidelines must prepare for the River we have, not the River we want.** Downward trending hydrology influenced by climate change will continue to erode the stability of the Colorado River water supply. Successful operational and management strategies must plan for the full range of plausible hydrologic extremes brought on by climate change and accommodate flexible mechanisms that will help advance greater water security and ecological goals in the Basin.
- 2. The post-2026 Guidelines must move beyond managing from crisis to crisis.** The stability of the Colorado River water supply is of paramount importance, both to water users who value certainty and to the environment, which depends on the political will of decision-makers who will be challenged to integrate environmental resource considerations in times of water supply crises. The Bureau's metrics for the Colorado River water supply should prioritize system stability over maximizing deliveries to water users.



3. **The post-2026 Guidelines must consider and protect environmental priorities.** Stresses and uncertainties in the Colorado River water supply and Basin resources are inevitable amid the 20+ year drought that has been accelerated by climate change. Such reality, however, is no excuse for exacerbating the impacts of drought and climate change when determining appropriate actions to stabilize the system. The environment is not a luxury to be sacrificed in the name of expediency. It is an essential component to the overall health and safety of the Basin and a responsibility for us all to protect. To this end:
- i. The post-2026 Guidelines should consider and address a broad range of environmental impacts from the scenarios and actions contemplated with the goal, wherever possible, of supporting the preservation and restoration of ecosystems that contribute to water resilience in the Basin, including, but not limited, sensitive species and habitats, and ecosystems in the Grand Canyon and Colorado River Delta.
 - ii. Metrics for evaluating post-2026 operational and management strategies must be able to assess impacts to: habitats managed for endemic and endangered species including the tributary flows in the Upper Basin, the Upper Colorado River Basin and San Juan Recovery Implementation Programs, and the Lower Colorado River Multi-Species Conservation Program; the Grand Canyon; National Wildlife Refuges on the Lower Colorado River; the Salton Sea; the Cienega de Santa Clara; and habitat values of irrigated agriculture (which provides forage in many locations where native vegetation has disappeared).
 - iii. The post-2026 NEPA evaluation should include mitigation and stewardship measures as part of proposed action alternatives to help avoid or minimize impacts to resources critical to the health and ecological integrity of the Colorado River Basin.
4. **The post-2026 Guidelines must work in concert with parallel processes to benefit the Basin.** The Guidelines will not be the sole answer to the challenges afflicting the Colorado River Basin. Parallel activities will also be critical to the Basin's overall stability and sustainability. The Bureau of Reclamation's (Bureau) post-2026 process should be developed with an eye toward anticipating parallel processes such as extension of elements of the Drought Contingency Plan, the successor to Minute 323, durable conservation programs, investment in restoration and protection of watershed health, and other tools to provide greater water supply reliability for human uses and for nature.
5. **The post-2026 Guidelines must recognize the sovereign roles, rights, and interests of Tribal Nations as fundamental to the fabric and longevity of the Colorado River Basin.** It is imperative that Tribal Nations be afforded their rightful role in negotiations and decision-making processes that influence and/or affect their rights, authorities, and interests in the Colorado River supply.
6. **The post-2026 Guidelines development process must be transparent and meaningfully inclusive.** The credibility and longevity of effective operations and strategies depend on the extent to which leadership at the federal, state, and tribal levels can exercise their respective roles as public water rights holders, conveners, guardians of a transparent and inclusive process, science and Indigenous Knowledge providers and administrators of effective programs to integrate perspectives from the full range of affected stakeholders into future operational and management strategies.

Introduction: Colorado River conditions have changed dramatically since adoption of the 2007 Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead (Interim Guidelines). The Colorado River community should expect that conditions will continue to change in unexpected ways. Growing demands alongside protracted drought and the effects of climate change have become more entrenched in the Colorado River Basin, necessitating actions beyond the Interim Guidelines to overcome significant vulnerabilities to the system. Moreover, there has been an evolution and growing recognition that Tribal rights, roles, and interests as well as the value of natural and cultural resources are fundamental to the Colorado River Basin’s fabric and can no longer be minimized or ignored. The future of the Colorado River and its tributaries hinges on whether the Colorado River community can adapt and adjust to hydrologic extremes and hotter, drier conditions. To be successful, the post-2026 Guidelines will have to acknowledge and consider the full range of future conditions throughout the Basin and execute strategies and operations that are geared toward a sustainable use of the Colorado River for people and the natural environment for years to come.

The Scoping Notice emphasizes that the Bureau plans to pursue “robust and adaptive guidelines” for a new interim period in the post-2026 operational and management era. It specifically seeks input and recommendations by August 15, 2023, on how the purpose and elements of the Interim Guidelines should be retained, modified, or eliminated to provide greater stability to water users and the public throughout the Colorado River Basin. The Notice further clarifies that the Bureau will consider the input as it develops the proposed federal action, purpose and need, and scope of the analysis (e.g., affected area, geographic scope, time horizon/term). With this understanding, the undersigned organizations jointly submit the following comments on purpose and need, scope of analysis, scope of alternatives analysis, and process considerations to integrate into the upcoming NEPA effort. Each undersigned organization may provide additional comments and recommendations specific to their respective interests at this scoping phase and at appropriate times throughout the formal NEPA process.

Purpose and Need: The record setting drought that started in the early 2000s caused precipitous declines in Colorado River flows and storage while demand for Colorado River water continued to grow. Such circumstances in 2005 compelled the Secretary of the Interior to pursue Interim Guidelines to:

- i. improve the Bureau’s management of the Colorado River by considering trade-offs between the frequency and magnitude of reductions of Lower Basin water deliveries and considering the effects on water storage in Lake Powell and Lake Mead, and on water supply, power production, recreation, and other environmental resources.
- ii. provide mainstream United States users of Colorado River water a greater degree of predictability with respect to the amount of annual water deliveries in future years, particularly under drought and low reservoir conditions; and
- iii. provide additional mechanisms for the storage and delivery of water supplies in Lake Mead to increase the flexibility of meeting water use needs from Lake Mead, particularly under drought and low reservoir conditions.

These actions were to be accomplished in a manner that “avoided curtailment of uses in the Upper Basin, minimized shortages in the Lower Basin and not adversely affect the yield for development available in the Upper Basin.” (2007 Interim Guidelines)

Two decades later, the Colorado River system is increasingly unstable and unpredictable, and the Interim Guidelines have not been responsive or flexible enough to maintain a reasonable level of reliability in the

available Colorado River supply (See Bureau of Reclamation's [7.D] Review of the Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead, (December 2020)). The Basin has required additional efforts in reaction to on-the-ground conditions that considered a more representative range of possible hydrologic conditions as well as needs and concerns from the broader Colorado River community upstream of Lake Powell and downstream of Lake Mead. Because these additional actions were not anticipated in 2007, and the federal government and basin states had to define them in the face of considerable and immediate risk to the stability of Colorado River water supplies, they were not developed with broad stakeholder input. Considering these deficiencies, and the need for proactive decision making that moves beyond reacting to crises after crisis, the Purpose and Need for the post-2026 NEPA process must be bold enough to:

- i. help minimize the vulnerability of the Colorado River supply for water users as well as the natural and cultural environment to the instability caused by the Basin's water supply and demand imbalance and the reality of hotter and drier and yet unpredictable water futures.
- ii. help preserve the integrity of the Colorado River against system failure in a manner that considers and does not sacrifice the natural and cultural environment in the face of heightened uncertainty going forward.
- iii. support opportunities for building adaptation and resilience of both the Colorado River operational and environmental systems.

The focus of the Purpose and Need, however, cannot stop there. Robust and adaptive guidelines must also recognize the role that Colorado River operations and strategies have in either complementing or obstructing parallel actions that can work to address the varied and complex challenges confronting the Basin. Overall, the Purpose and Need for the post-2026 Guidelines must expand the focus beyond managing a dwindling water supply to also identify and leverage efforts to provide water security for Tribal Nations, water users, economies, and the environment under unpredictable drought and climate change conditions in a manner that works to support the continued integrity of the Colorado River Basin's ecological, spiritual and cultural resources. Instructive directives and strategies for achieving these purposes are in Table 1 (attached).

Scope of Analysis: The "scope of the analysis" refers to the content and extent of the environmental impact evaluation. Our comments specifically emphasize considerations regarding: Term/Timeline; Geographic Scope; Affected Areas; and Causal and Cumulative Effects.

Term/Timeline – The post-2026 Guidelines' term must remain interim. The history of Colorado River management demonstrates that actions authorized in perpetuity are inadequate at addressing the evolving conditions, needs and values of the Basin. The appropriate term for the interim period depends on the policies and tools that are to be included in the guidelines. It must be long enough to accomplish the operational and planning stability that forms the basis of the Bureau's actions. It must also be of sufficient duration to allow the Colorado River community to gain experience with the tools and practices that will comprise the guidelines. Finally, the term must help provide the confidence needed to incentivize investments in durable practices and resilience building efforts for the benefit of the Basin. However, the interim period must also be informed by what will promote agreement and have the greatest level of support within the Basin. Because such a term cannot be readily definable at the scoping phase, the NEPA analyses should include a variable range of term durations to consider, including the option for multi-decadal duration with interval and meaningful check-ins to adapt the strategies as needed. The Bureau

can then pinpoint the preferred interim period based on the results of that analysis and a better understanding of the tools and practices to be considered.

Geographic Scope – The geographic scope involves two different considerations. First is the scope of the federal action. The 2007 Interim Guidelines’ scope was limited to the mainstem from Lake Powell to the U.S. border with Mexico. However, the actions needed to preserve the guidelines and meet the needs of the Basin exceeded that geographic scope to include water sharing agreements with Mexico, the Upper Basin’s Initial Units from the Colorado River Storage Project, and voluntary system conservation activities throughout the Basin (i.e., Treaty Minutes, 2019 Colorado River Drought Contingency Plans, and Emergency Measures in 2021 and 2022). Going forward, the geographic scope of actions must be comprehensive enough to incorporate the full breadth of operations and strategies, wherever they are located, that will be needed to accomplish the purpose and need for the post-2026 Guidelines. For any actions deemed relevant but beyond the Bureau’s purview for this NEPA process (actions covered under separate regulatory decision process -- i.e., Treaty, NEPA, ESA, CWA, GCPA, etc. -- or that involve discretionary regional, Tribal, or state authorities, or individual, voluntary actions), the Bureau should still recognize the action(s) and detail how the practices and procedures for those actions will be tiered to or coordinated with the post-2026 Guidelines.

Second is the geographic scope of analysis. The Bureau’s environmental impact analysis must be broad enough to consider the wide range of possible future conditions and strategies to provide operational and planning clarity, and granular enough to identify the reasonably foreseeable impacts of any proposed activities wherever they may occur – i.e., connected tributaries and watersheds, downstream of CRSP facilities, Grand Canyon, Salton Sea, Mexico, groundwater resources, economies at the local, state, Tribal, and regional scale. Comments on the “affected areas” below further clarify the extent needed for the scope of the analysis.

Affected Areas – The need to provide operational and planning stability as emphasized in the Scoping Notice involves more than considering possible operations and actions to implement. It also requires predictions of how the proposed alternatives would affect the human and natural environment. It is not enough to consider the comparative change in resource conditions among the proposed action alternatives. Rather, the impacts must be compared to a representative baseline condition in order to have context. In other words, to afford decision makers and the public an opportunity to understand and weigh the consequences of any proposed action and incorporate measures to avoid or mitigate them, the NEPA process for the post-2026 Guidelines must identify the baseline conditions for relevant resources and assess the full range of impacts to those resources as a result of taking no action or implementing any of the proposed alternatives. This includes, but may not be limited to, identifying the baseline status and assessing impacts for the following structural and resource categories:

- i. Hydrologic Resources: Water Storage and Supply (including groundwater interactions), Water Quality (Salinity, Temperature, Sediment, Oxygen, Algae/Nutrients, Metals, etc.); Flow rates and volumes along river reaches
- ii. Air Resources: Air Quality, Visual Resources
- iii. Land Resources: Geology, Sand, Soils, Watershed/Landscapes
- iv. Biological / Ecosystem Resources: Flora, Wildlife, Special Status Species, Habitat, Ecological Systems, Biodiversity, National Park/Monument Resources, Wildlife Refuge Resources
- v. Tribal Assets and Rights, Sovereignty, Self-Determination, and Resource Considerations

- vi. Socio-Economic Resources: Tribal, Urban, Rural, Municipal, Basin, Agricultural, Industrial, Recreational
- vii. Energy Resources: Power Supplies, Funds, Customers
- viii. Cultural/Spiritual Resources
- ix. Environmental Justice Considerations: See Executive Order 12898
- x. Climate Change Considerations

For each resource category the Bureau must determine what to evaluate. At minimum, the Bureau should make sure to include consideration of the benefits and effects as compared to baseline conditions of proposed operations and strategies on Colorado River water availability and the following:

- i. *Ecological integrity and functionality within the Basin.* This will require consideration of environmental co-benefits like carbon sequestration and flood attenuation, and how operations may affect, among other things, biodiversity, natural processes, watershed health, flows within key river reaches, and important aquatic habitats. This may be accomplished by, among other things, considering natural habitat of the region, direct flow metrics (e.g., average flow, peak flow, minimum flow, and water deliveries to Mexico, including flows to the Cienega de Santa Clara via the Main Outlet Drain), derived flow metrics (e.g., salinity, stream temperature, sediment transport), and resources-specific metrics (e.g., native and invasive fish, aquatic parasites, vegetation) that can pinpoint viability and vulnerabilities of ecosystem elements under the full range of conditions.
- ii. *Effective recovery programming and species protection.* Programs like the Upper Colorado River Endangered Fish Recovery Program, San Juan River Basin Recovery Implementation Program, and Lower Colorado River Multi-Species Conservation Program (LCR MSCP) will be important to the overall functionality of the river system as it continues to experience changes due to climate conditions. It will, therefore, be important to identify how the post-2026 Guidelines will implicate these programs and provide opportunity to apply innovative solutions that accommodate continued protection, mitigation, and recovery of species and habitats at a broad scale within the Colorado River Basin. For example, the LCR MSCP partners require a secure water supply for the existing MSCP habitat sites to fortify the federal – and state and water user – responsibility to the dozens of native and imperiled species, even as diversions from the river are reduced. The post-2026 NEPA analysis should identify the effects of alternative actions on the LCR MSCP program and identify the path that will be followed to develop additional sites as needed and to secure sufficient water supplies or mitigate the effects of a reduced water supply to assure Lower Basin consistency with the ESA going forward. Similar considerations for ESA compliance in the Upper Basin will need to be developed for any Upper Basin operations that fall within the scope of actions for the post-2026 process.
- iii. *Grand Canyon Resources.* The post-2026 NEPA analysis must identify the impacts of potential changed releases from Glen Canyon Dam on Grand Canyon resources to fully inform decision makers and the interested public of the possible consequences of a proposed action. Specifically, the NEPA analyses need to go beyond mentioning how annual release volumes will be managed consistent with the Long-Term Experimental Management Plan (LTEMP) “to the extent possible,” and identify what will happen to

resources if the LTEMP cannot function as contemplated under the 2016 LTEMP EIS. As part of this process, the Bureau should address: (1) How the NEPA analyses will itemize the cumulative effects that any proposed changes to Glen Canyon Dam releases have on Grand Canyon resources to inform decision makers and the public; (2) Whether additional actions will be incorporated into the post-2026 Guidelines to fill the void between when regular LTEMP operations can occur and when the proposed timing and volume of releases from Glen Canyon Dam under the proposed action alternatives fall outside the modeling used to inform the LTEMP Record of Decision; or (3) Whether the LTEMP itself will be updated through a separate process to fold the post-2026 framework for changed annual releases at Glen Canyon Dam into the LTEMP process consistent with the Grand Canyon Protection Act. Ongoing experimental and management efforts pursued by the Glen Canyon Adaptive Management Program due to low flow and storage conditions also need to be factored into but not delayed by the post-2026 NEPA process. These efforts, which may result in cumulative impacts relevant to the environmental impact statement, currently include evaluation of adjustments to triggering windows for High Flow Experiments as well as investigation of appropriate measures to minimize small mouth bass entrainment below Glen Canyon Dam.

- iv. *Salinity changes on Lake Mead storage or water deliveries to Mexico.* The post-2026 NEPA analysis should identify whether the proposed action alternatives will affect salinity in the Lower Colorado River, and whether deliveries to Mexico or storage conditions at Lake Mead will be influenced as a result. Impacts considered should include the ability of the United States to comply with Minute 242, the Bureau's ability to use Yuma-area pumped return flows as a component of delivery to Mexico, the Bureau's ability to deliver water to Mexico at the rates and times requested (a key area of binational cooperation identified in Minute 323), and implications for the volume of water the Bureau must release from Lake Mead for Mexico's delivery. The Bureau should identify, analyze, and describe each of these impacts to ensure the United States and Mexico can continue to work collaboratively, with shared information, to maintain the benefits achieved under the terms of recent binational Colorado River agreements.
- v. *Salton Sea.* The Imperial Valley's participation in innovative Colorado River strategies is imperative to the successful development of workable solutions to a dwindling water supply in the Basin. Such participation, however, will only be secured by identifying a workable path for addressing the impacts to public health and wildlife associated with reduced flows to the Salton Sea. The post-2026 NEPA analysis should identify any impacts to the Salton Sea, including biological resources and air quality changes expected from changes to shoreline dust emissions, as the basis for mitigation discussions.
- vi. *Stability of interconnected systems.* The Colorado River system cannot effectively operate to stabilize conditions at the expense of other watersheds going forward. Additionally, understanding the demands and constraints of adjacent watersheds/systems could directly or indirectly impact supplies (i.e., transmountain or transbasin diversions) and inform the stability of the Colorado River Basin going forward. As basin stakeholders work to implement river policies and management decisions that will sustain the system over the long-term, it will be important to consider and avoid harm to systems that are interconnected and/or dependent on, but separate from, the consideration of the annual water supplies within the Colorado River Basin. Such interconnected systems, include: (a)

groundwater supplies; and (b) transbasin connections like the San Juan Chama/Rio Grande; Colorado River/South Platte/Arkansas to name a few.

Causal and Cumulative Effects - Application of the post-2026 Guidelines will likely have reverberating impacts throughout the Basin. The NEPA analysis will have to acknowledge and assess the causal and cumulative impact of the proposed post-2026 actions on the full breadth of resources within the Basin. This includes the resources in addition to Lake Powell, Lake Mead, and the Colorado River mainstem that may have to adjust because of significant changes in water availability.

If it is not possible for the Bureau to pinpoint the direct or indirect impacts to specific water users, communities or resources within the Basin, the environmental impact statement still needs to identify and describe as best it can the breadth and extent of the potential consequences, including consequences off the river where water supply will change – i.e., a general discussion on the range of possible consequences that the Basin should be prepared to absorb. This could include generalities where necessary to describe impact possibilities on the human environment (communities, economies, cultural values, livelihoods) and natural resources (soils, surface and groundwater sources, air, vegetation, wildlife, habitats, etc.) if significant reductions to available water supplies are not mitigated going forward. It could also identify current and potential mitigation opportunities (such as incentives to maintain cover crops) that may help minimize the general effects. To this end, the Bureau recently announced an agreement to provide significant funds to help mitigate the impacts of the worsening drought crisis impacting the Salton Sea. The Bureau should expressly identify and consider this and other current or foreseeable actions that will complement the post-2026 Guidelines to fully characterize the benefits and impacts in the Basin.

Scope for Policy/Alternatives Considerations: The post-2026 Guidelines must identify and analyze policies and operating alternatives that will consider Basin storage and hydrologic conditions on a more holistic basis. During the Interim Guidelines, the Bureau and Basin States had to explore approaches that went beyond adjusting storage and releases from Lake Powell and Lake Mead to ride out a cyclical drought. They have also contemplated operations and strategies that consider the broader Colorado River system, employ mid-term hydrological forecasts and trends, and incorporate cooperative efforts to temporarily reduce demands because of extended drought accelerated by climate change. For the post-2026 NEPA process, it will be critical to learn from these and other experiences to anticipate system conditions and explore proposed operations and strategies that do more than review historical hydrology to inform relative changes to water allocation and storage between the Upper and Lower Basin and among the Basin states.

Going forward, actions must move away from reactively responding to immediate circumstances based on limited forecasts and modeling. They must rely on the best available science, trending hydrology and demands, and actual resource conditions to identify operations and strategies with adequate lead time that work to overcome vulnerabilities and allow people and ecosystems to (i) recover from current conditions and (ii) adapt to possible extremes in the water demand and supply imbalance in the future. This requires more than simple tweaks to the current guidelines. It calls for a comprehensive look at system operations to develop robust approaches to variable circumstances in both the Upper and Lower Basins for the years to come. We are particularly encouraged by the Bureau's proposed use of robust decision-making approaches in the NEPA process, including its emphasis on identification of vulnerabilities and strategies to address them in lieu of more traditional, scenario-driven approaches to planning.

Key considerations for the scope of post-2026 Guidelines alternatives analysis include:

- i. *Being proactive not reactive:* Measures that work to proactively avoid and recover from the risk of the worst-case scenarios and provide a cushion against vulnerabilities and extremes going forward.
- ii. *Looking beyond Lakes Powell and Mead:* Proposed operations and strategies that go beyond coordinated operation of Lake Powell and Lake Mead to consider alternative paradigms, e.g., basing reservoir operations on combined reservoir or system storage, should be explored.
- iii. *Relying on realistic and actual hydrology trends:* Integration of realistic and actual hydrology trends (recent drought trends, temperature adjusted hydrologies, reliable demands, actual storage conditions, and no assumption of “miracle water” arriving at Lee Ferry) into the operational and strategic decision-making considerations.
- iv. *Analyzing a full range of alternatives:* Including a full range of alternatives, including one that prioritizes flows for the environment to contrast operations and strategies within the range of possible future conditions.
- v. *Incentivizing adaptive and flexible strategies:* Thoughtful and measured strategies and operations for all parts of the system to adapt instead of break. The new strategies and operations must build on the flexibility we have exercised over the past decades (e.g., Intentionally Created Surplus, Intentionally Created Mexican Allotment, Binational Intentionally Created Surplus, Drought Response Operations, System Conservation, etc.) or enable new opportunities (e.g., Demand Management Storage Program) to pursue innovative policies that will recognize and responsibly address the various interests and needs on the river going forward, including the environment.
- vi. *Integrating and accommodating mitigation and stewardship measures:* Incorporating environmental mitigation and management strategies into the decision-making processes. Environmental laws have expanded the Bureau’s responsibilities beyond managing the federal infrastructure to allocate water supplies. They further require the Bureau to consider how to best accomplish that responsibility in an environmentally sound manner. To that end, the post-2026 Guidelines should integrate, where possible, mitigation and stewardship measures as part of the proposed actions to help minimize impacts to resources critical to the continued functioning and character of the Colorado River Basin.

Since the post-2026 management strategies and operations cannot be the sole answer to all challenges afflicting the Colorado River Basin, parallel activities, in addition to those contemplated by the Bureau’s NEPA analyses, will be critical to the Basin’s overall stability and sustainability. The scope of the alternatives analyses should, therefore, anticipate tools and agreements that will be necessary to effectuate essential and foreseeable parallel processes to ensure the longevity of workable operations going forward. Some key parallel activities to consider include concerted actions regarding:

- a. Mexico/Delta – Post-2026 operational strategies and Minutes to the 1944 Water Treaty are interrelated. One will not be able to fully work without the other. Maintaining water and life within the system will depend in part on how binational relationships and opportunities will be considered and cultivated as throughout the NEPA processes.

- b. Access to clean water – Access to reliable, clean, and drinkable water is an essential human need. However, it is not ubiquitous in the Colorado River Basin, especially among tribal nations. Post-2026 strategies must operate in a manner to promote reliable access to clean drinking water and adequate sanitation for all Tribal members along with other Colorado River Basin residents.
- c. Groundwater storage – As the availability of Colorado River decreases, there is increased reliance on groundwaters supplies, which in turn affects baseflows to the river. Thus, depletion and mining of groundwater is not a sustainable solution for the Basin. Impacts of NEPA alternatives on groundwater supplies will remain a critical part of the overall analysis for developing workable strategies and operations for the Basin.
- d. Resilience building activities – The scale and pace of climate-related changes in the Colorado River Basin are affecting availability and reliability of water supplies for agricultural operations, rural and urban water demands, energy use, wildlife, and watershed health. Post-2026 operational strategies for the Colorado River must work in tandem with, and not impede, ongoing efforts to build resilience and adapt to hotter, drier conditions in the West.
- e. National historic preservation considerations – The Colorado River Basin’s cultural resources are an integral part of the Basin’s history and identity. Consideration of how to preserve these resources should not be minimized as the Colorado River community develops post- 2026 operational strategies for the Basin.
- f. Satellite agreements linked to Colorado River management – Agreements that are separate from but linked to the Interim Guidelines will influence strategies and operations in the post-2026 world. To the extent such agreements are not directly part of the post-2026 Guidelines, they should still be identified and analyzed to the extent they are critical to the Guidelines’ operational success.

Modeling Considerations – Modeling is central to post-2026 Guidelines’ development. Successful Guidelines will depend on the ability of the Colorado River modeling to adapt to a system in crisis by advancing updated modeling practices under deep uncertainty mechanisms. These mechanisms must go beyond narrowly avoiding system failure to proactively create water security so that both water users and ecological, spiritual, and cultural resources can thrive under increasingly unpredictable hydrologic futures. The post-2026 Guidelines must further be built on a modeling framework that avoids or disincentivizes efforts to take advantage of strategies and operations for the benefit of some at the expense of others. Recommendations for guiding these modeling advancements as they relate to the Colorado River Simulation System (CRSS) and Colorado River Mid-term Management System (CRMMS) Riverware models are detailed in Exhibit 1, and summarized as follows:

- i. *Hydrology ensembles included in Colorado River modeling must address the full range of potential futures and sufficiently represent the compounding influence of climate change and aridification.* Although climate modeling is inherently uncertain, we can be virtually certain that the Colorado River Basin will be substantially warmer, on average, over the 21st century

than it has been to date. Hydrology ensembles used for Colorado River modeling must incorporate in some way the near-certain future trend of warming and drying in the Colorado River Basin. At minimum, this means it will be important that the CRSS and Decision-Making under Deep Uncertainty (DMDU) processes not only include hydrology ensembles that reach reasonably low flows with realistic multi-year patterns, but also enough traces within those ensembles that occur at reasonably low flows to provide an appropriate distribution.

- ii. *Post-2026 Guidelines and associated CRSS assumptions must provide a pathway for treating the Upper Basin storage system holistically.* While Lake Powell is the largest of the Upper Basin reservoirs, over 20% of the total Upper Basin storage capacity lies in other reservoirs in the Colorado River Storage Project (CRSP) units. The Bureau will need to identify how it will consider Upper Basin storage in the post-2026 Guidelines development process. To this end, it may want to clarify how it will utilize CRSS rulesets and modeling frameworks to allow for operating these Upper Basin reservoirs as a fully integrated system and accounting for storage across all of them in long-term planning to provide a more accurate picture of total water availability.
- iii. *Post-2026 Guidelines must be informed by CRSS demand schedules that:*
 - a. Consider the full range of Tribal demands (used and unused entitlements). There is general consensus within the Colorado River community that the management of the Colorado River system cannot be accomplished on the backs of the Tribal Nations. The Colorado River modeling, therefore, should explain how it will account for all entitlements to Tribal water or risk making the post-2026 guidelines Basin vulnerable to factors that are within our control to account for and plan accordingly.
 - b. Represent accurate water depletion schedules. Methods used to estimate runoff/return/efficiency should also be clarified to ensure they account for the hotter, drier environment that the Basin is experiencing because of changing climate. The post-2026 Guidelines' planning process should also investigate ways of coupling anticipated demand schedules with hydrologic conditions. Rather than only developing scenarios for what will happen if demands do not adapt to available water, the Colorado River community should be looking toward characterizing what will be possible if they do.
 - c. Account for non-consumptive use needs for priority natural resources. While future hydrology is largely out of our control, the Colorado River community still has the ability to make demand decisions, and, therefore, can plan for non-consumptive use for priority natural resources in the Basin. At present, a robust way of evaluating CRSS outputs that relate to environmental priorities below Lake Mead, or salinity dynamics at the US - Mexico border are lacking. We recommend the Bureau articulate how and to what extent environmental demand will be incorporated into Colorado River models, such that we can help refine these demands appropriately through additional comments. A demand cushion could be provided for non-consumptive priority natural resources for the system to not only survive, but ensure the environment is able to thrive.
- iv. *Short-term (annual) operational mechanisms must be updated to align with observed hydrology at logical points in the calendar year and informed by CRMMS modeling that accounts for climate change impacts.* Post-2026 short-term operational mechanisms must also be advanced to operate effectively under a variable future dictated by climate change

impacts. Before turning directly to operational forecasting, we recommend that the Bureau update short-term operational decision scheduling, (which is currently aligned with operational rules being set in August and adjusted as needed in April) to better inform monthly hydrologic forecasting and allow for more accurate and adaptive operational decisions.

- v. *Key CRSS output performance metrics and associated thresholds must be identified and regularly evaluated for environmental priorities to inform NEPA evaluations and operational and management strategies.* Priority natural resources that capture a broad range of environmental values at locations throughout the Basin need to be incorporated into the performance and impact modeling for post-2026 Guidelines. Key performance indicators include identifying how much water is needed to meet target flow rates/volumes, and thresholds that specify how often identified indicators are met. Starting points for these thresholds are studies used to inform prior Records of Decisions in relevant regions of the Basin as well as the Colorado River Basin Water Supply and Demand Study, with updates to reflect more recent observations and advancements. While the resolutions of CRSS and CRMMS are not ideal for monitoring many specific environmental performance metrics, proxy metrics can stand in for priority resources and be regularly evaluated relative to appropriate thresholds either directly from model outputs, or through secondary models and analysis that incorporate CRSS or CRMMS outputs. Suggested metrics to include in the modeling are based on currently available CRSS outputs to account for environmental priorities according to region as follows:

Upper Colorado

- Monthly Peak/Base Flow Attainment (*Locations:* Green River near Greendale, UT; Green River near Jensen, UT; Green River at Green River, UT; Gunnison River near Grand Junction, CO; San Juan River near Bluff, UT; Colorado River near Cameo, CO; Yampa River near Maybell, CO; White River near Watson, UT; and Duchesne River near Randlett, UT).

• **Grand Canyon**

- Grand Canyon Flows
- Lake Powell Storage
- Annual Hydropower Generation Capacity

Lower Colorado River Multi-Species Conservation Program (MSCP)

- Reach Flows Below Hoover Dam
- Lower Colorado River MSCP Habitat Site Water Deliveries

Salton Sea

- Salton Sea Inflows (Imperial Irrigation District delivery used to estimate inflows)

Ciénega de Santa Clara

- Ciénega de Santa Clara Water Deliveries (Wellton-Mohawk Irrigation and Drainage District deliveries)

- vi. *Post-2026 modeling must consider a sufficiently comprehensive geographic area, relevant system functions, and range of impacts.* As the Colorado River system is increasingly stressed, impacts are becoming more pronounced and localized. We already know reservoir management strategies can directly influence conditions throughout the Basin. However, recent years have also revealed that actions and conditions in various parts of the Basin can affect management of federal reservoir system. A NEPA analysis that informs useful operations going forward will strongly benefit from a modeling framework and metrics that:

(a) extend the focus and analysis beyond storage conditions and static trigger levels at Lakes Powell and Mead; (b) extend beyond those developed for the Basin Study; and (c) consider the benefits and impacts of essential environmental resources.

For example, parallel programs that help improve Basin conditions (i.e., restore watershed health, improve federal land management, protect Grand Canyon conditions) can enhance water availability, improve water quality and/or reduce risks associated with water-related disasters and climate change such as wildfire and drought. In so doing, they may also restore lost hydrologic function to watersheds and underlying groundwater resources for surrounding communities that could inform and affect overall operations within the Basin. The Bureau may want to consider how parallel actions could be integrated into the modeling platforms for the post-2026 NEPA analyses.

- vii. *Post-2026 Guidelines' modeling should integrate the ability to include additional rules for flexible management tools and systems as they come online.* New mechanisms that allow the Colorado River community to manage water supplies more flexibly will be critical to enhancing water security in the Basin. Just as the Intentionally Created Surplus mechanism was built into reservoir management and system operations under the 2007 Interim Guidelines, so too should new and updated mechanisms to enhance flexibility throughout the Basin be incorporated into the NEPA analyses for post 2026 operations. From an ecological context, part of this flexibility will necessarily involve efforts to restore and maintain environmental values at levels that exceed bare minimums to protect endangered species or meet other mandatory limits; doing so will help ensure that these can provide helpful co-benefits for the region as well as absorb inevitable impacts from changes to water management in response to extreme conditions.

Robust Process Considerations: Leadership by federal, state, and Tribal governments is critical to an effective management framework. But these entities cannot operate in a vacuum to balance the needs and interests of the entire Basin community. The credibility and longevity of effective operations and strategies also depend on the extent that each of these governments can exercise their respective roles as public water rights holders, conveners, guardians of a transparent and inclusive process, science and Indigenous Knowledge providers, and administrators of effective programs to integrate perspectives from the full range of affected stakeholders into future resource management and decision-making processes.

We are encouraged by the Bureau's initial efforts to build new pathways for acknowledging Tribal Nations, maintaining strong relationships with Mexico, and expanding participation to discuss and explore a broad range of operational strategies. (See *Scoping Notice*). They are the important steps to ensuring the rights and interests of the Colorado River community are sufficiently considered and included in the new Colorado River management strategies. Going forward, the process should continue to be refined to, among other things:

- i. *Preserve Tribal Nations' roles and rights to self-determination throughout the NEPA process.* As the NEPA process develops, federal agencies should continually confirm that Tribal Nations agree with the processes that have been established for including them in decision-making and coordinating and identifying their respective needs and perspectives into future operational strategies and the decision-making process.

- ii. *Build upon existing relationships with Mexico.* We appreciate the Scoping Notice’s recognition that parallel planning with Mexico remains critical to the process. We strongly encourage an approach that ensures the binational process both moves forward with and meaningfully informs the development of management alternatives in the domestic NEPA process – both as a means to better coordinate domestic and international management of the river, and to ensure that the NEPA process includes sufficiently broad analysis to anticipate binational management initiatives and avoid limiting the scope of what may be possible in a future Minute. To this end, we recommend that the process also afford dedicated stakeholders with demonstrated record of helping advance binational solutions the opportunity to work with the federal and state governments to build upon the relationships between the US and Mexico and develop workable solutions that includes accounting for improving flows in the Cienega de Santa Clara and for restoring the Delta system’s hydrologic connectivity and community values over the long-term.

- iii. *Afford opportunities to work directly with state, Tribal and federal agencies on the NEPA efforts for stakeholders, including the undersigned conservation groups, with a demonstrated commitment and willingness to address the Basin’s water challenges.* In previous Colorado River NEPA processes, conservation groups who were committed to the process introduced an alternative that was incorporated into the overall analysis and parts of which were subsequently integrated into the Preferred Alternative. We look forward to working with the Bureau and other stakeholders again to develop one or more alternatives that help explore the full range of reasonable strategies and allow the Colorado River community to pinpoint useful and robust operational and decision-making frameworks for the Basin going forward. This process may call for more than singling out a consensus driven (Preferred) alternative at the draft stage of the Environmental Impact Statement. Considering deep uncertainties in future Colorado River hydrology, and the need for multiple strategic considerations, it may be advisable for the Bureau to work with and allow for engaged stakeholders to explore a broader range of creative and useful opportunities than might otherwise be conducted in other NEPA investigations, or than were conducted in developing the 2007 Interim Guidelines.

- iv. *Demonstrate the Bureau is listening and that stakeholders are being heard.* Not surprisingly, Colorado River stakeholders want more than to be informed. They want to know they are being heard and understood. Meaningful engagement for the post-2026 NEPA process will require both informing and listening to the Colorado River community, by finding ways to account for:
 - a. Timing – Providing information, possible considerations, obstacles, etc. as early as possible allows the public time to absorb, consider, and provide useful information going forward. The less time provided, the more likely the public will be forced to simply react on the fly or conclude they have been left out of the process. To this end, it will be important to *maintain the mechanisms for keeping the interested public informed of progress and developments from the NEPA effort in a timely manner.* This includes things like: (1) updating the dedicated website to include all relevant information, key contacts, and calendar for impactful communication and feedback opportunities; (2) a mechanism for broadcasting important updates and notices of meetings, conferences, and webinars (e.g., through social media among other sources); (3) consultations, public meetings, and webinars to provide substantive updates.

- b. Communication – Communicating information, developments, and possible responses as they arise goes a long way to promoting transparency, which helps combat cynical or negative assumptions as to what happened and why. To help this process, we recommend designating points of contact for specific groups and individuals to directly discuss possible content, outcomes, and changes to the NEPA analysis as it progresses. This may be particularly important as the community works to identify vulnerabilities and solutions relevant to a robust decision-making process, which should take advantage wherever possible of local stakeholder knowledge to better inform the understanding of risks and issues that can result from conditions that may develop in the face of increasing uncertainty. It will require scheduling outreach at relevant, timely intervals to provide a reasonable opportunity for gaining an understanding of the NEPA analysis. It will also require making Bureau staff readily available to interested stakeholders (and not just one group or water user sector) to encourage iterative discussions and feedback.

- c. Responsiveness – It will not be enough to provide information, explain the situation and receive feedback. Responding to input and/or demonstrating that the audience has been heard is integral to building an inclusive process. Points of contact to discuss feedback and relay circumstances as set forth in (b) above could advance the responsiveness requirement as well.

We appreciate the opportunity to inform the post-2026 NEPA analyses as the Bureau embarks on this incredibly significant process. We look forward to working together to inform the Colorado River Basin’s future operations and management strategies to help advance water security for individuals, communities, economies, and ecosystems throughout the Basin.

Signed:

Taylor Hawes
 Colorado River Program Director
 The Nature Conservancy

Bart Miller
 Director, Healthy Rivers Program
 Western Resource Advocates

Kevin Moran
 Associate Vice President, Regional Affairs
 Environmental Defense Fund

Jennifer Pitt
 Colorado River Program Director
 National Audubon Society

Alex Funk
 Senior Counsel & Director of Water Resources
 Theodore Roosevelt Conservation Partnership

Matt Rice
 Director, Colorado River Basin Program
 American Rivers

Sara Porterfield
 Western Water Policy Advisor
 Trout Unlimited

cc: Camille Calimlim Touton, Commissioner, US Bureau of Reclamation
 David Palumbo, Deputy Commissioner, US Bureau of Reclamation
 Wayne Pullan, Regional Director, Upper Colorado River, US Bureau of Reclamation
 Jaci Gould, Regional Director, Lower Colorado River, US Bureau of Reclamation

TABLE 1

Directives and Strategies for Accomplishing the Purpose and Need for the Post-2026 Guidelines

Both instructive directives and specific strategies are needed to guide successful completion of the post-2026 Guidelines NEPA process. The directives identify key processes and substantive considerations that should be used to inform development of useful post-2026 Guidelines. The specific strategies identify measures that can and should be instituted to fulfill the directives and fully achieve the Purpose and Need of the post-2026 Guidelines.

<i>Process Directives</i>		
1	Transparent/Robust	Develop a transparent and robust process for meaningfully engaging with a wider range of Colorado River stakeholders to fully consider and inform operational and management decisions based on the contemporary diversity of needs, interests, priorities, and historical use patterns, and the realities of drought and climate change.
2	Governance	Establish a governance structure that: <ol style="list-style-type: none"> a. Provides Tribal Nations their rightful role in negotiations and decision-making processes that influence and/or affect their rights, authorities, and interests in Colorado River water; b. Acknowledges Tribal rights to self-determination; and c. Respects opportunities for realizing Tribal apportionments in the Colorado River Basin.
3	Mexico Relationships	Develop a transparent and robust process for meaningfully engaging with Colorado River stakeholders to fully consider and inform operational and management decisions based on the contemporary diversity of needs, interests, priorities, historical use patterns, and the realities of drought and climate change.
4	Modeling Platforms	Adopt comprehensive modeling platforms that integrate a full range of plausible future conditions because of drought and climate change - including environmental metrics that capture a broad range of environmental values at locations throughout the basin - to assess performance of different operating alternatives and capture the risk or vulnerability under a wide range of Basin conditions.
5	Analyses	Identify and analyze the full extent of benefits and impacts of possible operational and management strategies on people and resources, wherever they are located (watershed, state, region, country).
6	Coordination with Parallel Efforts	Coordinate operational and management decisions with parallel efforts to build resiliencies that help the Basin thrive.
7	Legal/Policy Framework	Consider whether and how the legal and policy framework for the Colorado River Basin should be updated to advance the Purpose and Need of the post-2026 process for the Basin.

Substantive Directives		
1	Proactive, comprehensive, holistic operations and strategies	Identify and advance proactive, comprehensive, and holistic reservoir operations and management strategies that withstand a broad range of future conditions to: <ul style="list-style-type: none"> a. Provide operational and planning stability for water uses and those who depend on Colorado River resources; and b. Support ecological, spiritual, and cultural values that are connected to the Colorado River and foundational to the integrity of the Basin.
2	Accommodating of Binational Opportunities	Accommodate opportunities for discussion and strategies that promote agreement with Mexico on use of Colorado River resources post-2026, including extension of the binational, collaborative program to restore habitat in the Colorado River Delta.
3	Incentivize Flexible Tools	Incentivize flexible water management strategies that contribute to water security.
4	Access to drinking water, clean energy, and adequate sanitation	Afford opportunities for reliable access to clean drinking water, clean energy, and adequate sanitation by all Tribal Nations and Colorado River community.
5	Cultural, Spiritual and Natural Systems	Protect the Basin’s ecological priorities, spiritual and/or cultural values.
6	Resilience and Adaptation	Support adaptation to changing conditions by advancing mechanisms that will help accommodate future arrangements/agreements in furtherance of Basin stability and resilience.
Specific Strategy Considerations		
1	Focus for Operations and Strategies	Identify and include operations and practices that: <ul style="list-style-type: none"> a. Protect the Colorado River system’s infrastructure by including metrics and identifying signposts that can be used to implement flexible operations to avoid violating critical thresholds. b. Encourage flexible tools that advance water security by helping to reliably and proactively manage the system for water users and the environment. c. Allow for adaptation as needed by providing opportunity to incorporate future arrangements/agreements that can fit within the Guidelines’ operational and management framework and to leverage parallel actions that help the Colorado River community mitigate and build resiliencies to the effects of drought and climate change in the Basin. d. Reduce threat of litigation.
2	Clarity and Transparency	Provide clarity and transparency on: <ul style="list-style-type: none"> a. Full participation of Tribal Nations as coequal sovereign governments, in support of self-determination, in the negotiations and decisions for the implementation of the future strategies that will work to protect Tribal water and

		<p>water-related resources, rights and interests in the Colorado River.</p> <ul style="list-style-type: none"> b. How Colorado River water supply, including potentially significant reductions due to climate change, and demand, including estimates of the full range of Tribal water entitlements, will be balanced based on predictable and/or actual water availability conditions within the Basin. c. Coordinated operation of reservoir systems will be accomplished under variable and unpredictable hydrology and changing demands. d. Shortage implementation in the Lower Basin. e. The role that Upper Basin reservoirs will play in basin management systems. f. Whether, when, and under what authorities reductions in consumptive uses may be triggered in the Upper Basin.
3	Modelling	Update the CRSS modeling platform to accommodate more comprehensive analysis of operational strategies and basin conditions under varied and unpredictable conditions.
4	Reserved Water Rights	Detail how developed, undeveloped, and unresolved Tribal reserved water rights will be considered in operational and decision-making considerations.
5	Energy Supplies	Quantify needs and incorporate sources for meeting continuing and growing demands for sustainable energy supplies, especially for Tribal Nations, rural, and otherwise disadvantaged communities.
6	Environmental Stewardship	Integrate stewardship and mitigation practices into operational actions and management decisions that ensure respect for and protection of ecological, spiritual, and cultural values within the Basin
7	Flexible Strategies	Provide for flexible water management strategies that contribute to and reflect unique legal, geographical, practical, and political characteristics of both Lower and Upper Basin water security and that accommodate human use of and reliance on the natural systems and the Basin environment.
8	Leveraging of Parallel Opportunities	Leverage parallel opportunities (current/future) to help build resilience and mitigate the effects of drought in the Basin.
9	Decision-Making Processes	Develop decision-making process related to 1-7 above that will accommodate the sovereign role of Tribal Nations and be transparent and inclusive of the Colorado River community.