



SOUTHERN NEVADA
WATER AUTHORITY

STATE OF NEVADA



COLORADO RIVER COMMISSION
OF NEVADA

December 20, 2022

The Honorable Tanya Trujillo
Assistant Secretary, Water & Science
U. S. Department of the Interior
Washington, DC 20240

Re: Notice of Intent to Prepare a Supplemental Environmental Impact Statement

Dear Assistant Secretary Trujillo:

Over the past 20 years, the Southern Nevada Water Authority (Authority) has been a leader in conserving Colorado River water supplies and planning for a future with less water. The majority of Nevada's 300,000 acre-foot allocation is used within the Authority's service area and makes up 90 percent of the water supply for 2.3 million Nevadans (approximately 70 percent of our state's population) and the more than 42,000,000 people that visit Las Vegas each year. By investing in conservation programs and anticipating future water-supply problems, Nevada has reduced its consumptive use by almost 100,000 acre-feet per year (afy) over the last 20 years, despite adding approximately 750,000 people. The Authority and Colorado River Commission of Nevada (CRCNV) (collectively, "Nevada") further recognize that there is simply far less water for use in the Colorado River Basin (Basin) than has been allocated. This imbalance must be addressed, which will require reductions in use by all water users in all sectors. Nevada is committed to working with the other states, the country of Mexico, and various other stakeholders and water users to achieve an equitable and sustainable water-use and operations solution for the Basin.

On November 17, 2022, the Bureau of Reclamation (Reclamation), under the Department of the Interior's (Interior) direction, issued a Notice of Intent To Prepare a Supplemental Environmental Impact Statement for December 2007 Record of Decision Entitled Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations For Lake Powell and Lake Mead (Notice). 87 FR 69043 (November 17, 2022) (collectively referred to as "SEIS" or "2007 Guidelines" for the existing operations under the preceding Record of Decision). Nevada appreciates and supports this effort to act quickly to stabilize the Colorado River through modified reservoir operations and reductions in consumptive uses. The Notice identifies the need for a SEIS that is directed at three sections of the 2007 Guidelines – specifically Section 2(D) (Determination of Lake Mead Operation under Shortage Conditions), Section 6 (the Coordinated Operation of Lake Powell and Lake Mead as to the Mid-Elevation Release and Lower Elevation Balancing tiers), and Section 7(C) (Implementation of Guidelines concerning the Mid-Year Review). The Notice also

states that the “Department currently lacks analyzed alternatives and measures that may be necessary to address such projected conditions,” while identifying “Preliminary Alternatives.” These are described as (1) No Action, (2) Framework Agreement Alternative, and (3) Reservoir Operations Alternative.

Through separate correspondence, the Authority has joined Central Arizona Water Conservation District (CAWCD) and The Metropolitan Water District of Southern California (MWD) to elaborate on specific concerns and unidentified consequences. Nevada offers the following comments and proposed Framework Agreement Alternative for Reclamation to consider for this SEIS.

Urgency in Adopting New and/or Modified Management Actions

At the time the 2007 Guidelines were developed, water managers were just beginning to quantify the impacts of climate change and warming temperatures on the Basin. Since that time, numerous scientists, academia, and agency staff have all concluded the future of the Colorado River is significantly hotter and drier than the hydrology used to arrive at the shortage reductions in the 2007 Guidelines. The primary hydrology used in the 2007 Guidelines was based on an average natural flow at Lees Ferry of 15.07 million acre-feet (maf)¹. From 2000 to 2022, the average annual natural flow was approximately 12.19 maf², representing an annual reduction in supply of more than 12 times Nevada’s current Colorado River use. Furthermore, recent studies suggest the Basin may continue to warm by 2.5 to 5 degrees Fahrenheit by mid-century³ and each degree of warming represents approximately a 5 percent decrease in runoff. Observed intervening inflows significantly below the range of uncertainty of the analyzed hydrology combined with water use that has exceeded the natural supply has pushed the river to a breaking point. Reclamation modeling shows that within the next 3 years the status quo could result in losses of critical federal infrastructure, uncertainty in the ability to release water from Lake Powell to Lake Mead, and significant hydropower impacts — particularly for grid stability and more acutely for small power users that rely heavily on hydropower, and unpredictable timing and scale of future shortages — undermining a key objective in the development of the original 2007 Guidelines. Reclamation must act as swiftly as possible if the water users that are reliant upon the Colorado River are to have any certainty regarding the magnitude and quantity of future water use, even in the short term. Understanding the magnitude and timing of water supply reductions is critical to successfully managing water resource portfolios and ensuring reliable water delivery to customers. Failing to act in 2023 to further reduce water use could result in the loss of over 1.97 maf of reservoir storage in Lake Mead, a 30 foot vertical decline. And if Lake Powell’s release is reduced to protect the ability to release water through the power plant, the reduction in Lake Mead could be 5.36 maf, a 70 foot vertical decline⁴. These declines represent the loss of large volumes of critical reservoir storage that will not be easily refilled. Further depletion of reservoir storage is directly increasing risk and uncertainty about future supply reliability.

Scope

The scope of the SEIS should not be substantively different from that of the 2007 Guidelines. The three sections identified by Reclamation fundamentally form the basis of actions that can be implemented in a

¹ Final EIS-Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead: Volume I, Chapter 3 – Affected Environment, U.S Bureau of Reclamation, October 2007.

² Provisional Natural Flow Data 1906-2022 Based on April, 2022 24-Month Study, Accessed May 2, 2022.

³ Lukas, Jeff, and Elizabeth Payton, eds. 2020. Colorado River Basin Climate and Hydrology: State of the Science. Western Water Assessment, University of Colorado Boulder. DOI: <https://doi.org/10.25810/3hcv-w477>.

⁴ Notice of Intent to Prepare a Supplemental Environmental Impact Statement, 80% ESP Analysis – 2002 to 2005 Trace, Public Information Webinar per 87 FR 69042, November 29, 2022. Presentation available at: <https://www.usbr.gov/ColoradoRiverBasin/SEIS.html>.

timely matter to meet the current crisis. While broader, and more inclusive, operating regimes are desired by many in the Basin, neither the 40,000,000 people that depend upon Colorado River water nor the environment through which it flows can afford to wait the several years it takes to negotiate such matters.

While not altering the scope of the SEIS, there are numerous complimentary actions that should be taken within the Basin to bolster the effectiveness of the 2007 Guidelines. The actions identified in the Drought Contingency Plans, the System Conservation Pilot Program, the 500+ Plan, and the Upper Basin's Five Point Plan all contribute to the stability of reservoir elevations. Their collective and interrelated nature require sufficient and accurate modeling to understand the range of impacts of the action alternatives that will be proposed in the SEIS.

Finally, other methods that help secure the water supply of the Basin have been proposed by Reclamation, Nevada, and others. These additional actions should be pursued with alacrity and in parallel with the operational changes contemplated by the SEIS. These include beneficial use definitions and determinations under 43 C.F.R. Part 417 (Procedural Methods for Implementing Colorado River Water Conservation Measures with Lower Basin Contractors and Others). It is well past time to prohibit the inefficient delivery, application, or use of water within all sectors and by all users; there simply is no water in the Colorado River System left to waste and each industrial, municipal, and agricultural user should be held to the highest industry standards in handling, using, and disposing of water. We further request that Reclamation act on the items articulated in the Authority's August 15, 2022, letter to Secretary of Interior Haaland, Assistant Secretary Trujillo, and Commissioner Touton⁵. It is critical that Reclamation pursue all options that will help reduce consumptive uses in the Basin and provide water supply reliability. To that end, Nevada strongly encourages Reclamation to immediately begin independent NEPA and ESA compliance for these activities.

Hydrology

The fundamental driver for the SEIS is changed hydrology. The success of the SEIS in curtailing future risk, balancing reservoir elevations, and protecting the water supply of 40 million people will depend on evaluating potential alternatives against hydrologic scenarios that encompasses the full range of future hydrologic risk, specifically including sequences of drier than observed historical flows. Nevada's internal modeling with the Colorado River Simulation System Model uses a Direct Natural Flow adjusted to an annual average of 11.0 maf, compared to the observed annual average of 14.7 maf. Reclamation has recently used 80 percent of the ensemble stream flow projections for modeling with the Colorado River Mid-term Operations Model. Using the appropriate tools and hydrologic assumptions will help ensure that the full range of risk is analyzed.

Operational Objectives

The purposes of the 2007 Guidelines as described in Section 4 of the Record of Decision are to:

- improve Reclamation's management of the Colorado River by considering 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, and on water supply, power production, recreation, and other environmental resources;

⁵ Letter from Southern Nevada Water Authority General Manager John J. Entsminger to Secretary of Interior Debra Haaland, Assistant Secretary for Water and Science Tanya Trujillo, and Commissioner of the Bureau of Reclamation Camille Calimlim Touton, Dated August 15, 2022.

- 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
- 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 objectives have not changed and continue to drive the need for the SEIS. Water supply and future operational certainty are paramount for water users, particularly our highly populated, river dependent urban areas. In order to successfully manage a water resource portfolio, water managers need to understand how and when water supplies will be reduced. Reducing available water supplies with little or no notice and predictability is significantly more likely to create economic disruptions. The Lower Colorado River Basin and the communities that the river serves are some of the most urbanized and arid regions of the United States. Nevada offers the following operational objectives for inclusion in the SEIS as a direct response to changed hydrology, operating Lake Powell and Lake Mead at levels previously un contemplated, and to protect the water supply for the 40 million people that rely on the river for municipal use.

Ensure water can be released from Glen Canyon Dam

Reclamation has offered several presentations and briefings on risks associated with losing the ability to release water through the Glen Canyon Dam power plants. These risks fundamentally harm water supply reliability for all those that rely upon water in the Lower Basin. The inability to reliably release water from Glen Canyon Dam imposes unacceptable risk to Lower Basin water supply and the predictability of that supply. These risks are well documented and well understood in the exchange of letters between Assistant Secretary for Water and Science, Tanya Trujillo, and the Seven Basin States that occurred in April and May of 2022⁶.

Any preferred alternative must ensure water deliveries from Glen Canyon Dam are not compromised, in turn requiring that sufficient elevations be maintained in Lake Powell.

Protection of ICS

Modifications to the 2007 Guidelines must uphold the contractual commitments of the Secretary of Interior to only deliver Intentionally Created Surplus (ICS) to the party that created such ICS. Many contractors, including the Authority, have spent years and invested hundreds of millions of dollars to conserve water that has helped to keep Lake Mead elevations higher than they otherwise would have been through the creation of ICS. Currently, ICS accounts for approximately 51 feet of Lake Mead's elevation. This storage must be preserved for the agencies that stored it.

Furthermore, under extremely limited circumstances, ICS that is stored in Lake Mead should be made available when Lake Mead is below elevation 1,025 feet to the contractor that stored the water if sufficient protections can be provided to satisfy the public health, safety, and welfare needs described below.

⁶ Letter from Assistant Secretary for Water and Science Tanya Trujillo to Governor's Representative for State of Nevada John J. Entsminger dated April 8, 2022; Letter from Colorado River Basin States Representatives of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming to Assistant Secretary for Water and Science Tanya Trujillo dated April 22, 2022; and Letter from Assistant Secretary for Water and Science Tanya Trujillo to Governor's Representative for State of Nevada John J. Entsminger dated May 3, 2022

Protection of water supply for public health, safety, and welfare

Given the risk identified by Reclamation's recent modeling that Lakes Mead and Powell will decline below their respective power pools, and the consequent risk to public health, safety, and welfare, the preferred alternative should protect sufficient storage in Lake Mead to ensure that 18 months of deliveries necessary to meet public health, safety, and welfare can be made by Reclamation. As noted in the Notice:

[T]he Department has concluded that immediate development of additional operational alternatives and measures for Lake Powell and Lake Mead are necessary to ensure continued "operations that are prudent or necessary for safety of dams, public health and safety, other emergency situations ..." 2007 Interim Guidelines at Section 7.D. 87 FR 69044

For domestic uses, the river in the Lower Basin provides water to approximately 27 million people. For some of these communities, the Colorado River is their exclusive source of water, or other domestic sources are insufficient to cover public health, safety, and welfare needs. It is imperative that these water supplies are offered the highest protection under the preferred alternative.

Reclamation should also consider the impact of further reductions in hydropower generation on the regional electric grid. A reliable supply of electricity is an important element in public health, safety, and welfare considerations. Electric supply is decreasing, particularly in the Southwest region. Impacts to hydropower generation should therefore be considered under any alternative, as this resource staves off energy emergencies, limits critical outages, and helps stabilize the grid. Accordingly, CRCNV has provided more detailed comments in **Attachment 1**.

Related actions and considerations

Inclusion of Mexico

Mexico has been a progressive and dependable partner to the United States and Colorado River water users within the United States even as the worsening supply/demand imbalance has depleted storage within the system. In 2017's Minute 323 to the "United States-Mexico Treaty on Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande" signed February 3, 1944 ("1944 Water Treaty") for example, the United States and Mexico agreed on the "importance of aligning operations for both countries" and the need for their respective "governments and stakeholders to seek mechanisms to avoid reaching critically low reservoir elevations." Glen Canyon dam's infrastructure is currently threatened by significantly reduced inflows over the past two decades, in turn threatening to make deliveries to users in the Lower Basin difficult or impossible. Accordingly, the proposed Framework Agreement Alternative discussed below and in Attachment 2 hereto contemplates continued alignment of operations for users in both countries. Specifically, while the Tier 3 shortage volumes discussed below as a replacement for Section 2.D.1 of the 2007 Guidelines (500,000 combined acre-feet when Lake Mead is below 1,090 feet) do not expressly signal a revised shortage volume for Mexico to stay within the scope of the SEIS, to maintain alignment between the two countries Mexico's allocation would not exceed 1.375 maf when Lake Mead is below 1,090 feet and the overall Lower Basin allocation would not exceed 8.375 maf. Similarly, Mexico's Binational Water Scarcity Plan storage requirements set forth within Section IV of Minute 323 would be made as if Lake Mead is below 1,030 feet anytime Lake Mead is below 1,090 feet. And finally, Attachment 2 (discussing the assessment of evaporation and system losses to Lower Basin users) contemplates that such losses would be equitably assessed to all users, including Mexico.

Compliance

The Lower Colorado River Multi-Species Conservation Program provides Endangered Species Act compliance for operations of the Lower Colorado River, including water deliveries and hydropower. The actions contemplated in the preferred alternative will likely necessitate expanded compliance for lower Lake Mead elevations and reduced deliveries to all water users, including reductions to only those volumes necessary to meet public health, safety, and welfare requirements. It is imperative this compliance moves swiftly and in parallel with this SEIS.

Proposed Framework Agreement Alternative

This section introduces an alternative developed by the Authority to meet the stated “purpose” (modifying the operating guidelines to address drought and aridity) and “need” (avoiding critically low elevations) identified in the SEIS. The alternatives demonstrate how the system can effectively and safely operate through more restrictive shortage conditions (at 1,090 feet), equitable sharing of evaporation and system losses, continued DROA actions and additional reductions in use in the Upper Basin. The Authority believes these actions are implementable under this federal action, previous related federal actions and federal law. While the magnitude of water use reduction is striking, it is necessary, achievable, equitable, and effective.

The elements of this proposed alternative are articulated below.

Lower Basin Shortage

Section 2.D.1 of the 2007 Guidelines shall be stricken and replaced with the following:

Deliveries to Lower Division States during Shortage Conditions shall be implemented in the following manner:

- a. The Lake Mead Protection Elevation for the year shall be set at the live storage volume in Lake Mead that is equivalent to the sum of the quantity of water stored as ICS (including any applicable ICS, DCP ICS, and Mexican Water Reserve) and 18 months of public health, safety, and welfare requirements for the Lower Basin and Mexico’s municipal water users.
- b. In years when Lake Mead content is projected to be at or below elevation 1,090 feet but above the Lake Mead Protection Elevation, a quantity of up to 7.0 maf shall be apportioned for use in the Lower Division States, of which 2.32 maf shall be apportioned for use in Arizona, 280,000 af shall be apportioned for use in Nevada, and 4.4 maf shall be apportioned for use in California; provided, however, that if 7.0 maf cannot be apportioned to the Lower Division States without reducing Lake Mead’s elevation to something below the Lake Mead Protection Elevation, then such amounts shall be reduced. This apportionment shall be dynamic throughout the calendar year and apportionments may be further reduced, but not increased from the initial determination made by the Secretary. Water deliveries for public health, safety, and welfare shall be prioritized.

Lower Basin Drought Contingency Plan Contributions

Lower Basin Drought Contingency Plan Contributions shall be made each year Lake Mead is at or below elevation 1,090 feet as if Lake Mead is at or below elevation 1,030 feet.

The corresponding reductions from this modification and the previous modifications for Lower Basin Shortages shall result in the reductions summarized in the table below.

Projected January 1 Lake Mead Elevation (feet msl)	2007 Interim Shortage Guidelines Shortages		DCP Contributions			Combined Volumes (2007 Interim Guidelines Shortages & DCP Contributions)			
	Arizona	Nevada	Arizona	Nevada	California	Arizona	Nevada	California	Lower Division States Total
	(thousand acre-feet)								
At or below 1,090 and above Lake Mead Protection Elevation	480	20	240	10	350	720	30	350	1,100

ICS Deliveries

Under Section 3.C, modifications should be made under extremely limited circumstances such that ICS that is stored in Lake Mead is available when Lake Mead is below elevation 1,025 feet to the contractor that stored the water if sufficient protections can be provided to satisfy the public health, safety, and welfare needs of municipal water users.

Evaporation and Storage Losses or Equivalent Equitable Reductions

Annually, the Secretary shall assess 1.543 maf of system losses in a manner that ensures water apportioned for use does not exceed the volume listed in modified section 2.D.1 above (including applicable DCP contributions) minus 1.543 maf per year. One equitable proposal is to use the methodology described in **Attachment 2** to this letter, noting that reductions are intended to apply to each individual water user based upon the user’s recent history of consumptive use. Because these losses occur without regard to priority, they should NOT be implemented in a manner that applies reductions exclusively to junior priority users.

Modified releases from Glen Canyon Dam

Operational experience has shown the balancing releases identified in Section 6 of the 2007 Guidelines are not practical or achievable in the face of changing hydrologic conditions and the desired reliability of water releases from Glen Canyon Dam. This alternative proposes that the following changes be made to Section 6, including within the table entitled Lake Powell Operational Tiers.

- Section 6.B.1 and 6.B.4 shall be stricken
- Section 6.B.2 balancing releases shall be not more than 10.0 maf and not less than 8.0 maf
- Replace Section 6.C.1 with the following: In Water Years when the projected January 1 Lake Powell elevation is below 3,575 feet and at or above 3,550 feet, the Secretary shall release 7.48 maf from Lake Powell in the Water Year unless Lake Powell is projected to drop below elevation 3,510 feet in that Water Year. If Lake Powell is projected to drop below elevation 3,510 feet in that Water Year, releases shall be reduced to protect elevation 3,510 feet.
- Change Section 6.D title to Lower Elevation Release Tier
- Replace Section 6.D.1 with the following: In Water Years when the projected January 1 Lake Powell elevation is below 3,550 feet, the Secretary shall release 7.0 maf from Lake Powell unless Lake Powell is projected to drop below elevation 3,510 feet in that Water Year. If Lake Powell is

projected to drop below elevation 3,510 feet in that Water Year, releases shall be reduced to protect elevation 3,510 feet.

Upper Basin Actions

In addition to those actions previously articulated in the Upper Basin DCP and Five Point Plan, whenever Lake Powell is projected to begin a calendar year at or below elevation 3,550 feet, the following additional actions should occur: 1) the Upper Basin states shall collectively reduce water use by 500,000 af; and 2) the Secretary shall use emergency authorizations within applicable DROA Agreements and associated Records of Decision to ensure a 500,000 acre-foot release is made to Lake Powell to the extent sufficient water exists in upstream storage.

In conclusion, Nevada strongly desires that this alternative be further refined through cooperation with the other Colorado River Basins States and river stakeholders. However, given the lack of progress achieving consensus on these issues previously, we felt it prudent to introduce the concepts and framework that are necessary to stabilize reservoir elevations and provide increased water supply reliability to the desert southwest. Nevada continues to stand ready to work with any of our partners to refine this alternative as quickly as possible for immediate implementation.

Sincerely,



John J. Entsminger
Governor's Representative
State of Nevada
&
General Manager
Southern Nevada Water Authority



Eric P. Witkoski
Executive Director
Colorado River Commission of Nevada

cc: Camille Calimlim Touton, Commissioner, Bureau of Reclamation
David M. Palumbo, Deputy Commissioner-Operations, Bureau of Reclamation
Reclamation 2007 Interim Guidelines SEIS Project Manager, Upper Colorado River Basin Region
via email: CRinterimops@usbr.gov

Attachments

Attachment 1

The Colorado River Commission of Nevada (“CRCNV”) is required to protect and safeguard the State of Nevada’s allocation of Colorado River water and power resources granted to it by Congress. CRCNV has a significant interest in water matters impacting the Colorado River as well as hydropower resources from the Boulder Canyon Project, the Parker-Davis Generation Project, and the Salt Lake City Area Integrated Projects. The CRCNV provides hydropower from these projects to 23 contractors in southern Nevada including electric utilities (investor owned and public), municipalities, educational institutions, Nevada state agencies, and companies that produce goods and services.

Scope of the Analysis

The scope of the Bureau of Reclamation’s (“Reclamation”) analysis needs to consider the impact of further reductions in hydropower generation on the regional electric grid. Electricity is not a convenience good. It is a critical element of public health, safety, and welfare that is in short supply. Over the next few years, as demand on the electricity grid increases, energy supplies are expected to tighten even further.

During the past few years, the Western electric grid has demonstrated its vulnerability to energy shortages, particularly during the summer months when it is subject to extreme heat events and natural disasters such as wildfires. The region relies on hydropower resources on the Colorado River to support the reliability of the electric grid. As highlighted by the North American Reliability Corporation (NERC) in its Summer Reliability Assessment study for 2022:

Energy output from hydro generators throughout most of the Western United States is being affected by widespread drought and below-normal snowpack. Dry hydrological conditions threaten the availability of hydroelectricity for transfers throughout the Western Interconnection. Some assessment areas, including WECC’s California-Mexico (CA/MX) and Southwest Reserve Sharing Group (SMSG), depend on substantial electricity imports to meet demand on hot summer evenings and other times when variable energy resource (e.g., wind, solar) output is diminishing. In the event of wide-area extreme heat event, all U.S. assessment areas in the Western Interconnection are at risk of energy emergencies due to the limited supply of electricity available for transfer.

Hydropower resources have recently been called on to stave off energy emergencies like the ones referenced in the WECC report. Between August 14 and August 19 of 2020, Western Area Power Administration (“WAPA”) and the Reclamation generated and transmitted additional hydropower energy in response to a heat-related energy emergency in the State of California. This action limited outages and helped stabilize the grid.

Hydropower has also been recently called on to respond to scarcity events exacerbated by regulatory and policy decisions affecting the electric grid’s reliability. Under a Federal Energy Regulatory Commission Order, the State of California, during periods of high demand, can intercept electricity generated in the Pacific Northwest that would otherwise be delivered to other states, including Arizona and Nevada, during times when these states are also experiencing high demand for energy. See FERC Order Docket No. ER21-1790. The intercept of power by California that would otherwise have been imported to other States happened as recently as September of 2022, straining power deliveries into Nevada and Arizona. During these shortage events, both Glen Canyon Dam and Hoover Dam were called on to provide as much power as possible to avoid rolling blackouts in the region.

Ideally, the scope of Reclamation's analysis should be broad enough to allow for detailed technical studies to be completed that assess the impact of reduced hydropower resources on the reliability of the electric grid in the Colorado River Basin. The technical scope should focus on hydropower's contribution toward resource adequacy, possible impacts to the transmission grid, and the risk that load will go unserved in the region. Given the short time frame for this SEIS process and the pressing need to implement measures that protect the water and power resources on the river, there may not be sufficient time to conduct such detailed studies. In that case, Reclamation should, at a minimum, consult with a broad range of industry experts and review existing reports, data and information concerning the risk of resource shortages during the next few years. At a minimum, Reclamation should consult with WAPA about its ability to operate the electric grid under a reduced generation scenario as well as WAPA's ability to respond to regional emergencies. Reclamation should also carefully review technical reports and analyses already completed by reliability organizations such as the Western Electric Coordinating Council, grid operators such as the California Independent System Operator (CAISO), electricity suppliers, and other experts in the region.

The drought has already taken a major toll on WAPA's contractors financially, particularly customers that are heavily dependent on hydropower resources. These contractors are not only paying more per MWh for their resources, but they are also having to replace lost hydropower generation with more expensive resources, resulting in substantial annual rate increases. Ideally, the scope of this SEIS should address the financial impact of losing hydropower resources on WAPA's customers including the impact to resource rates and the cost to customers to replace lost hydropower generation with other resources. Once again, given the short time frame for this SEIS process, consultation with WAPA's contractors, particularly those that are heavily reliant on hydropower resources, is warranted.

Operational Considerations

Given the increasing demand for electricity and the need for energy in the region during 2023 and 2024, Reclamation needs to consider protecting the elevations of both Lake Powell and Lake Mead so that a reasonable amount of hydropower generation can be preserved. For every 25 feet further decline in elevation at Lake Mead, it is estimated that approximately 250,000 MWh of energy and 125 MW of capacity will be lost at Hoover Dam. This is in addition to the approximately 2.3 million MWh of energy that Hoover contractors have lost since the start of the drought.

Elevation 1,000 feet in Lake Mead is the minimum elevation for which the wide head turbines at Hoover Dam are rated and it is expected that approximately 1,000 MWs of capacity would remain available at that elevation. Although minimum power pool is believed to be 950 feet, it is important to recognize that we have no operating history at these lower lake elevations and a margin is needed to avoid possible technical difficulties that may arise at lower elevations. Further, at a level of 950 feet, Hoover generating capacity is expected to drop to 30 percent of rated capacity versus 50 percent of rated capacity at an elevation of 1,000 feet. Consequently, the amount of power that Hoover Dam provides and its contribution to Western Grid reliability is significantly reduced at an elevation of 950 feet. The ability to protect these elevations is a critical component of any preferred alternative and should be considered in the SEIS. CRCNV believes the proposed Nevada alternative will perform well for meeting these objectives.

Identification of Relevant Information and Studies

Reliable generation forecasts are important to Reclamation's customers. Utility managers need to have a thorough understanding of the range of generation outcomes (energy and capacity) at varying levels of Lake elevations and releases so that they can plan for different outcomes. During this SEIS, it is recommended that Reclamation model a wide range of operating alternatives and publish the

hydropower generation resulting from those model runs. This will allow utility managers to plan for the future and secure replacement resources if necessary.

As noted above, with the short period allotted for the SEIS and the need to take action sooner rather than later, the CRCNV recommends that Reclamation rely heavily on consultation with experts in the electric industry including WAPA, a cross section of WAPA's customers, particularly those that are heavily dependent on hydropower resources, energy suppliers, and grid operators as well as a review of existing data and information to fully understand the energy supply and demand picture for 2023 and 2024 and weigh the risk of further reductions in hydropower resources.

More detailed technical studies and analysis should be undertaken to inform future decisions. These studies should assess the impact of reduced hydropower resources on the reliability of the electric grid in the Colorado River Basin and focus on hydropower's contribution toward resource adequacy, possible impacts to the transmission grid, possible impacts to market power prices, and the risk that load will go unserved in the region. These studies should be conducted over a longer period and under different supply and demand scenarios. In addition, more analysis needs to be done to quantify the financial impact of losing hydropower generation on WAPA and WAPA's customers. This financial analysis should include future resource rate projections under a wide range of generation outcomes as well as a quantification of replacement costs considering all benefits hydropower provides, including energy, capacity, ancillary services, and renewable benefits.

Attachment 2

SNWA Methodology to Assessing Lower Basin System Losses

In the Lower Basin (LB), system losses occur primarily as open-water evaporation and riparian evapotranspiration (ET). From Lee's Ferry to the Northerly International Boundary (NIB), SNWA estimates these losses to be approximately 1.543 million acre-feet per year. SNWA's objective is to develop an equitable method of assessing these system losses to LB water users that rely on the reservoirs and river system for the storage and transmission of water deliveries. The general approach to estimate system-loss assessments consisted of the following:

1. System losses were estimated for five reaches along the Colorado River from Lee's Ferry to the NIB:
 - Reach 1 Lee's Ferry to Hoover Dam*
 - Reach 2 Hoover Dam to Davis Dam*
 - Reach 3 Davis Dam to Parker Dam*
 - Reach 4 Parker Dam to Imperial Dam, and*
 - Reach 5 Imperial Dam to the NIB*
2. For each reach, water user groups were assembled to represent the water users that rely on the reach to store and/or transmit water deliveries and their average annual consumptive uses were estimated. These users would share in the system loss estimated for the reach.
3. For each reach, the estimated system loss was assessed proportionally to each state and corresponding water users based on their fraction of the total water deliveries within the reach.

Reservoir evaporation for lakes Mead, Mojave and Havasu and riparian ET for downstream reaches were estimated based on input data and relationships used in the CRSS model (Version 5 release, January 2022). For Lake Mead, the reservoir elevation-evaporation relationship was used to estimate evaporation at an elevation of 1,100 feet. For lakes Mohave and Havasu, the reservoir evaporation was computed by multiplying the monthly evaporation rates by the monthly target reservoir elevations described in Appendix B of the Interim Guidelines FEIS⁷. Losses between Davis Dam and Parker Dam were computed by summing the input values for the monthly depletions of the "Phreatophytes" object. Similarly, losses between Parker and Imperial dams were computed using the "Native Vegetation" object, and losses between Imperial Dam and the NIB were computed using the "Phreatophytes Imperial to NIB" object. The total system loss for each reach was estimated by summing the reservoir evaporation, if the reach included a reservoir, and the losses by riparian ET.

⁷ Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead – Final Environmental Impact Statement, U.S. Bureau of Reclamation, Lower Colorado River Region, Boulder City, NV, November 2007.

To assess system losses, the average annual consumptive use for each water user was computed for the period 2019-2021 using data reported in the USBR Decree Accounting Reports⁸. These values were used to estimate each state's proportion of water use within a given reach. Water user groups were formed by water user and state for each reach. A water user group represents all the water users who rely on a reach to store or transmit deliveries. So, a water user at the bottom of the system would rely on the storage and transmission of all five reaches and would have representation in all five water user groups. The water user groups were subdivided by state and state totals were computed for each reach.

State-assessment fractions were computed by dividing the total state consumptive use by the total consumptive use of the reach. State assessments were then computed by multiplying these fractions by the system loss estimated for the reach. State assessments were proportionally assigned to the individual water users of the corresponding state based on their proportion of the state's consumptive use for the reach.

The following tables represent summary assessments for each state and Mexico and the individual water user assessments for large water users. SNWA is happy to provide more detailed documentation and methodology upon request.

SUMMARY OF ASSESSMENTS BY STATE / MX

State	afy
AZ	401,018
CA	771,486
NV	17,570
MX	352,926
TOTAL	1,543,000

SUMMARY OF WATER USER ASSESSMENTS

Reach	State	Major Water Users	afy
1	NV	LVVWD/SNWA - SNWP	15,514
3	AZ	Central Arizona Water Conservation District	190,474
3	CA	The Metropolitan Water District of Southern California	110,464
4	AZ	AZ Colorado River Indian Reservation	45,378
4	AZ	Wellton-Mohawk I.D.D.	51,654
4	AZ	Yuma County Water Users' Association	47,611
4	AZ	Yuma Mesa I.D.D.	28,657
4	CA	Coachella Valley Water District	70,074
4	CA	Imperial Irrigation District	509,508
4	CA	Palo Verde Irrigation District	71,335
5	MX	Mexico	352,926
<i>Subtotal</i>			1,493,596
Reach	State	Remaining Water Users	afy
All	AZ	Other Users in AZ	37,243
All	CA	Other Users in CA	10,105
All	NV	Other Users in NV	2,056
<i>Subtotal</i>			49,404
TOTAL			1,543,000

¹ Major users considered to have losses greater than 10,000 afy

⁸ Lower Colorado River Water Accounting and Water Use Report: Arizona, California, and Nevada, Calendar Years 2019-2021, U.S. Bureau of Reclamation, Interior Region 8: Lower Colorado Basin, Boulder City, NV.