



## COLORADO

### Colorado Water Conservation Board

Department of Natural Resources

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**TO:** Colorado Water Conservation Board Members

**FROM:** Amy Ostdiek and Michelle Garrison

**DATE:** September 20, 2023

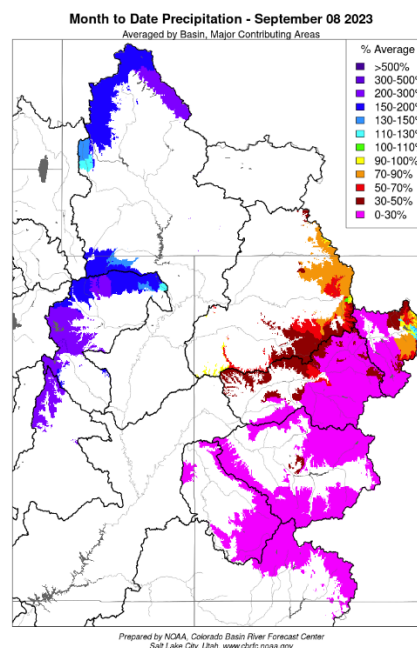
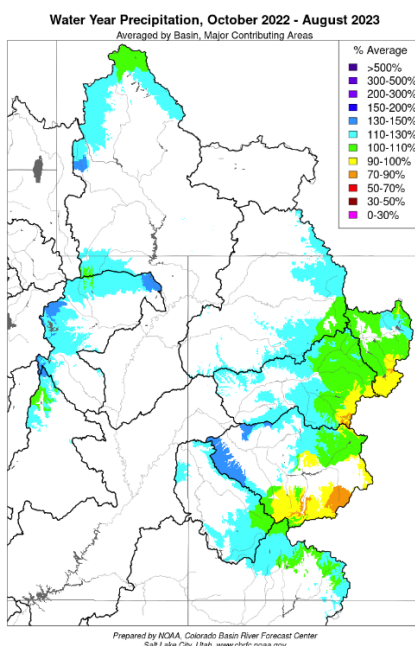
**SUBJECT:** Agenda Item 14: Colorado River Hydrology and Other Updates

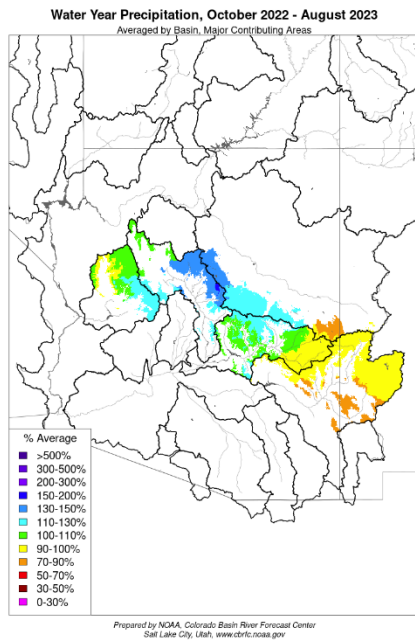
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This is an informational item with no board action requested.

### 1. Hydrology and operations update

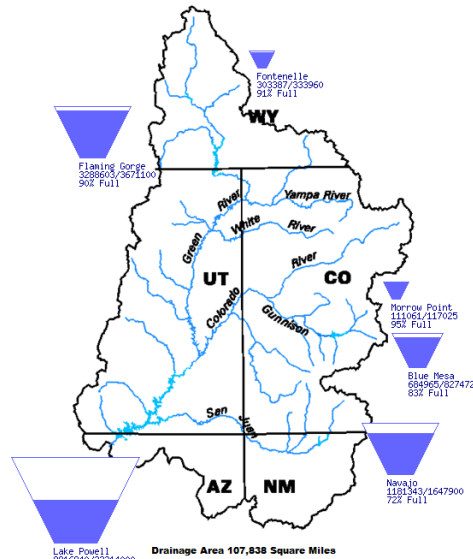
Streamflow for Water Years 2021 and 2022 was well below average throughout the basin, placing significant strain on basin storage and on water users in the Upper Basin. WY 2023 precipitation has been slightly above average. Snowpack was well above average throughout most of the Upper Basin and areas of the Lower Basin. Spring runoff was above average throughout most of the basin, with drier conditions in a few headwater areas. Summer conditions were drier than normal in portions of the basin. Drought and reservoir storage conditions have improved; however, long-term impacts from depleted storage are expected to continue, as indicated in current forecasts for reservoir operations.



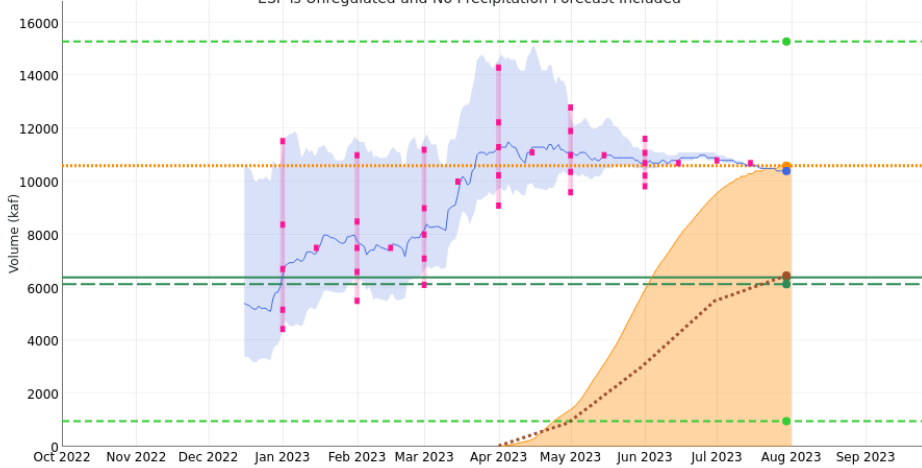


Data Current as of:  
09/07/2023

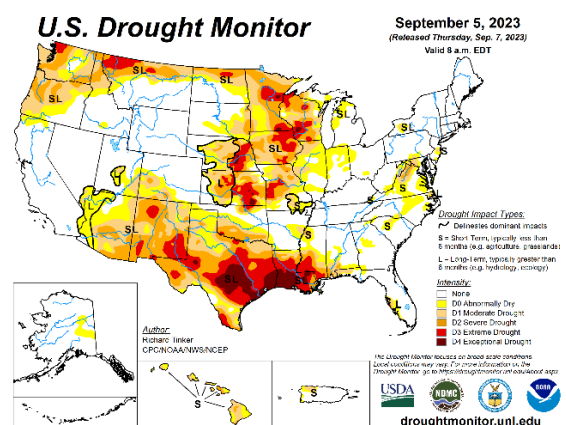
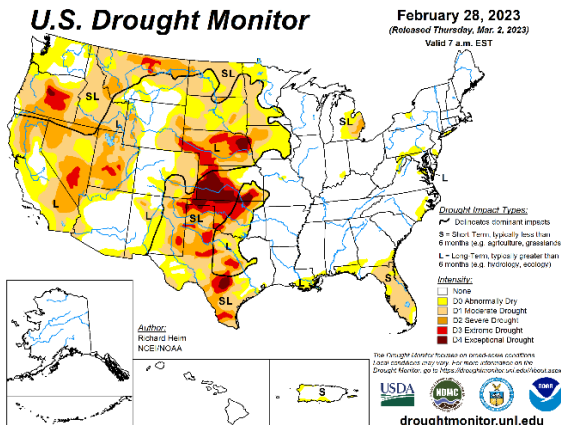
### Upper Colorado River Drainage Basin



**Colorado - Lake Powell, Glen Cyn Dam, At (GLDA3)**  
Period: Apr-Jul, Observed Volume: 10600 kaf (166% Average, 173% Median)  
ESP is Unregulated and No Precipitation Forecast Included

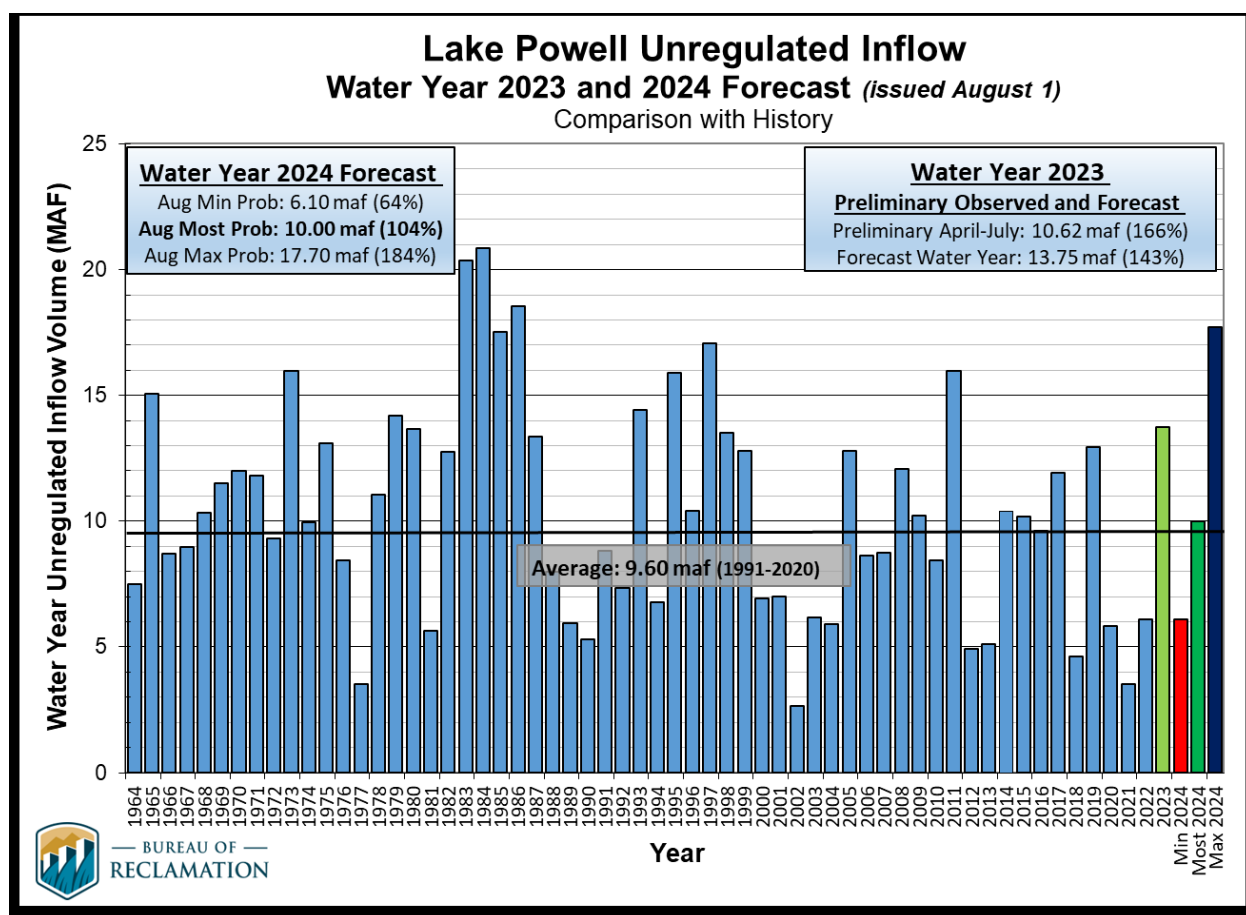


2023/07/30:  
**Max 1984:** 15285.64  
**Min 2002:** 963.96  
**Average:** 6390  
**Median:** 6130  
**Observed Accumulation:** 10600  
**Observed Total:** 10600  
**Normal Accumulation:** 6460  
**ESP:** 10400



Lake Powell was scheduled to release 7.48 MAF in WY 2022, as determined by Reclamation's August 2021 24-Month Study. Projected Lake Powell elevations triggered planning activities pursuant to the Upper Basin Drought Contingency Plan (DCP). The Drought Response Operations Plan for May 2022 through April 2023 described a planned release of an additional 500,000 acre-feet of water from Flaming Gorge reservoir to help protect critical infrastructure at Lake Powell. In May 2022 Reclamation announced a reduction in the WY 2022 Lake Powell release to 7.0 MAF as an additional infrastructure protection measure. Lake Powell rose above elevation 3525' in May 2022 and fell below that threshold elevation in December 2022. Due to improved hydrologic conditions, Lake Powell elevations rose above 3525' in April 2023 and are now projected to remain above that threshold through 2024. This increase in forecasted inflow and storage elevation resulted in several actions in spring 2023, including the cessation of DROA releases in early March, changing focus to recovery of previously released DROA water for the May 2023 - April 2024 DROA plan, and a substantial increase in WY 2023 releases from Lake Powell. WY 2023 is the first year in which Lake Powell has operated in the Lower Elevation Balancing Tier. In that tier, releases from Lake Powell are initially set to 7.0 MAF but can be adjusted in April through September up to a maximum of 9.5 MAF based on inflow forecasts. Lake Powell releases are currently forecasted to be approximately 8.66 MAF for WY 2023, including release of the 480,000 acre-feet withheld in Lake Powell in WY 2022.

As determined by Reclamation's August 2023 24-Month Study, Lake Powell will operate in the Mid-Elevation Release Tier in WY 2024 with an annual release of 7.48 MAF.



Projected Lake Mead elevations from Reclamation's August 2022 24-Month Study triggered a 2023 Tier 2a shortage condition for the Lower Basin and reduced deliveries to Mexico pursuant to Minute 323, totaling 721,000 acre-feet as shown in the table below. Water conservation measures under the Lower Basin Drought Contingency Plan and Binational Water Scarcity Plan are also required in 2023.

As determined by the Reclamation August 2023 24-Month Study, Lake Mead will operate in a Tier 1 shortage condition for 2024, as it did in 2022. As described in the table below, 2024 Lake Mead operations will incorporate a combined total of 613,000 acre-feet of Lower Basin shortages, reduced deliveries to Mexico pursuant to Minute 323, and water conservation measures under the Lower Basin Drought Contingency Plan and Binational Water Scarcity Plan.

2007 Interim Guidelines, Minute 323, Lower Basin Drought Contingency Plan,  
and Binational Water Scarcity Contingency Plan  
Total Volumes (kaf)

| Lake Mead<br>Elevation<br>(feet msl) | 2007 Interim<br>Guidelines<br>Shortages |    | Minute 323<br>Delivery<br>Reductions | Total<br>Combined<br>Reductions      | DCP Water<br>Savings<br>Contributions |    |     | Binational<br>Water<br>Scarcity<br>Contingency<br>Plan Savings | Combined Volumes by Country<br>US: (2007 Interim Guidelines Shortages +<br>DCP Contributions)<br>Mexico: (Minute 323 Delivery Reductions +<br>Binational Water Scarcity Contingency Plan<br>Savings) |             |             |                                   |                 | Total<br>Combined<br>Volumes         |
|--------------------------------------|---|----|--------------------------------------|--------------------------------------|---------------------------------------|----|-----|--|--|-------------|-------------|-----------------------------------|-----------------|--------------------------------------|
|                                      | AZ                                      | NV | Mexico                               | Lower<br>Basin<br>States +<br>Mexico | AZ                                    | NV | CA  | Mexico   | AZ<br>Total  | NV<br>Total | CA<br>Total | Lower<br>Basin<br>States<br>Total | Mexico<br>Total | Lower<br>Basin<br>States +<br>Mexico |
| 1,090 - 1,075                        | 0                                       | 0  | 0                                    | 0                                    | 192                                   | 8  | 0   | 41   | 192  | 8           | 0           | 200                               | 41              | 241                                  |
| 1,075 - 1,050                        | 320                                     | 13 | 50                                   | 383                                  | 192                                   | 8  | 0   | 30   | 512  | 21          | 0           | 533                               | 80              | 613                                  |
| 1,050 - 1,045                        | 400                                     | 17 | 70                                   | 487                                  | 192                                   | 8  | 0   | 34   | 592  | 25          | 0           | 617                               | 104             | 721                                  |
| 1,045 - 1,040                        | 400                                     | 17 | 70                                   | 487                                  | 240                                   | 10 | 200 | 76   | 640  | 27          | 200         | 867                               | 146             | 1,013                                |
| 1,040 - 1,035                        | 400                                     | 17 | 70                                   | 487                                  | 240                                   | 10 | 250 | 84   | 640  | 27          | 250         | 917                               | 154             | 1,071                                |
| 1,035 - 1,030                        | 400                                     | 17 | 70                                   | 487                                  | 240                                   | 10 | 300 | 92   | 640  | 27          | 300         | 967                               | 162             | 1,129                                |
| 1,030 - 1,025                        | 400                                     | 17 | 70                                   | 487                                  | 240                                   | 10 | 350 | 101  | 640  | 27          | 350         | 1,017                             | 171             | 1,188                                |
| <1,025                               | 480                                     | 20 | 125                                  | 625                                  | 240                                   | 10 | 350 | 150  | 720  | 30          | 350         | 1,100                             | 275             | 1,375                                |

The Secretary of the Interior will take affirmative actions to implement programs designed to create or conserve 100,000 acre-ft per annum or more of Colorado River System water to contribute to conservation of water supplies in Lake Mead and other Colorado River reservoirs in the lower basin. All actions taken by the United States shall be subject to applicable law, including availability of appropriations.



In addition to the shortages agreed to pursuant to the 2007 Guidelines and 2019 Drought Contingency Plans, in December 2021 the Lower Division States also committed to creating an additional 500,000 acre-feet of water per year in 2021-2022, and 2023, of conserved water to remain in Lake Mead on a voluntary basis. The amount of water modeled for each year pursuant to the "500+ Plan" is included in the table below. Planned conservation in late 2022 and 2023 increased almost 600,000 AF from August 2022 projections, which reflects the improved hydrology in the Lower Basin. Similar to shortage conditions, the amount of water conserved in Lake Mead under the "500+ Plan" may be partially offset by other withdrawals.



## Additional Water Modeled Under 500 Plus Plan (as anticipated to be modeled in the April 2023 Most Probable 24-Month Study)

| Conservation Activity<br>(volumes in AF) | 2021           | 2022<br>(Provisional) | 2023<br>(Projected) |
|--|----------------|-----------------------|---------------------|
| CAP ICS delivery offset                  | 6,147          | 15,876                | -10,900             |
| GRIC System Conservation                 | 40,000         | 58,837                | 125,000             |
| GRIC ICS creation                        | 0              | 78,565                | 0                   |
| CRIT System Conservation                 | 4,685          | 4,685                 | 0                   |
| CAWCD System Conservation                | 0              | 87,794                | 0                   |
| YMIDD System Conservation                | 0              | 8,523                 | 13,670              |
| MVIDD System Conservation                | 0              | 9,531                 | 12,819              |
| FMYN System Conservation                 | 0              | 0                     | 13,933              |
| MWD ICS delivery offset and/or creation  | 58,134         | 58,211                | 107,347             |
| PVID System Conservation                 | 12,305         | 52,789                | 58,400              |
| CVWD System Conservation                 | 0              | 9,083                 | 0                   |
| SNWA ICS creation                        | 12,832         | 28,330                | 44,000              |
| <b>Annual Total (Non-Shortage/DCP)</b>   | <b>134,103</b> | <b>412,224</b>        | <b>364,269</b>      |
| <b>Cumulative Total</b>                  | <b>134,103</b> | <b>546,327</b>        | <b>910,596</b>      |

- 2023 volumes reflect executed agreements under the 500+ Plan and LC Conservation Program and current operational projections and are subject to change.
- Additional conservation activities are being considered. After new agreements are finalized and executed, these additional activities will be included in Reclamation's operational planning and modeling.



26

## 2. Drought Response Operations Updates and 2023 Agreement

On May 17, the Upper Colorado River Commission adopted the 2023 Drought Response Operations Agreement (DROA) Plan. This Plan is focused on recovery of water previously released from Flaming Gorge and Blue Mesa reservoirs in 2021 and 2022. Reclamation estimates that 588,000 acre-feet of storage will be recovered at Flaming Gorge and 36,000 acre-feet will be recovered at Blue Mesa.

Maintaining water higher in the Colorado River System provides the advantages of reduced evaporation and increased flexibility and security for potential future operations. In addition to the 161,000 acre-feet released from Blue Mesa Reservoir and Flaming Gorge Reservoir in 2021, Flaming Gorge has released over 460,000 acre-feet as part of the 2022 DROA Plan.

At the special meeting of the Upper Colorado River Commission on August 29, the UCRC discussed concerns regarding the release of DROA water from Lake Powell to the Lower Division States. At this time, it appears approximately 130,000 acre-feet of DROA water will be released from Powell due to operations under the 2007 Guidelines. While no formal action was taken, the Commissioners expressed a desire to continue this discussion and consider conditions under which future DROA releases may be made. It is anticipated this will be a topic at a future meeting.

## 3. Supplemental Environmental Impact Statement for Near-Term Operations

*Note: The information below has not been updated since the July board meeting and is provided for reference only.*

### Background





On October 28, 2022, The Bureau of Reclamation published a Notice of Intent to prepare a Supplemental Environmental Impact Statement (SEIS). This purpose of the SEIS is to adjust the current operating guidelines for Glen Canyon and Hoover Dams and to provide options for the Bureau of Reclamation to adapt to potentially dry years in the next few water years.

On January 30, 2023, the states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming jointly submitted the Consensus-Based Modeling Alternative (CBMA) to the Bureau of Reclamation. The CBMA was intended to serve as a framework for Reclamation to analyze in its SEIS process.

Key components of the CBMA include:

- Assessment of evaporation and transit losses in the Lower Basin States in the amount of 1.5 million acre-feet each year.
- Additional shortages at higher Mead elevations for Lower Basin States.
- Upper Basin contributions included recognition of hydrologic shortages that Upper Basin water users routinely face, and additional voluntary conservation measures as possible, subject to approval by the Upper Division States and fully voluntary participation by water users.

On January 31, California provided to the Bureau of Reclamation an alternative proposal in response to the SEIS. California's proposal differed from the six-state CBMA in several ways and called for higher reservoir releases and much lower levels of conservation, to be achieved on a priority basis.

On April 11, 2023, the Bureau of Reclamation released a Draft Supplemental Environmental Impact Statement (DSEIS). The DSEIS included three alternatives, described below:

- No Action Alternative: Continuation of the 2007 Guidelines as written.
  - Lower Basin reductions continue to include shortages as determined by the 2007 Interim Guidelines and additional contributions as determined by the 2019 Lower Basin Drought Contingency Plan.
  - No additional conservation action or reservoir operational changes to protect critical reservoir elevations.
- Action Alternative 1:
  - In addition to reductions under the 2007 Interim Guidelines and the 2019 Lower Basin Drought Contingency Plan, additional reductions in Lower Basin State water deliveries distributed based on priority are contemplated, beginning in 2024. Reductions would be borne entirely by junior contractors.
  - These additional reductions begin at Mead elevation <1,090'.
  - Total Lower Basin reductions are capped at 2.083 million acre-feet in 2024.
  - In 2025-2026, additional reductions increase at Mead elevation <1,040', up to 4.0 million acre-feet of reductions at Mead elevation 950'.
  - Lake Powell operations modified to create the Lower Elevation Release tier (as opposed to "Balancing Tier") at elevation 3,500 - 3575', with the initial release set at 6.0 million acre-feet and adjusted in April based on the End-of-Water Year projection, for a release of up to 8.23 million acre-feet.
- Action Alternative 2:
  - In addition to the reductions under the 2007 Interim Guidelines and the 2019 Lower Basin Drought Contingency Plan, additional Lower Basin reductions are



contemplated in the same volume and elevation triggers as in Alternative 1 but are distributed based on a pro-rata additional reduction to each contractor. For example, a reduction of 1 million acre-feet would be distributed as a 13% reduction for every contractor.

- Lake Powell operations modified consistent with Action Alternative 1.

The DSEIS did include potential contributions from Upper Basin reservoirs through the Drought Response Operations Agreement in Alternative 2 and stated that any such contributions would occur consistent with the DROA and Framework agreements, which remain in place and are not modified by this DSEIS.

Following release of the DSEIS, the Lower Division States submitted a proposal to conserve at least 3 million acre-feet of water by 2026, in lieu of Reclamation taking either of the actions identified in the DSEIS. In a letter sent to the Bureau of Reclamation on May 22, the Basin States requested Reclamation further analyze the Lower Basin proposal and urged Reclamation to immediately turn to planning for long-term operations at Lake Powell and Lake Mead. Commissioner Mitchell and staff await additional information from the Lower Division States and analysis from the Bureau of Reclamation that show how this proposal would perform relative to the other alternatives previously identified. The letter simply requests additional information and analysis and is not an endorsement of the Lower Division States' proposal.

In response to this submission, the Bureau of Reclamation withdrew the previously released DSEIS and is now expected to release a revised DSEIS, which will include an analysis of the Lower Division States' proposal. Commissioner Mitchell and staff will analyze this information once it becomes available.

#### **4. Colorado's Comments on the Notice of Intent for Development of Post-2026 Operational Guidelines for Lake Powell and Lake Mead**

In June, the Department of Interior announced the initiation of the formal process to develop future operating guidelines for Lake Powell and Lake Mead. The new guidelines will replace the 2007 Colorado River Interim Guidelines, which govern the operations of Lake Powell and Lake Mead through 2026. The 2007 Guidelines are set to expire in 2026. The formal process was announced through a Notice of Intent published in the Federal Register.

On August 15, 2023, Colorado, through Commissioner Becky Mitchell and Director Lauren Ris, provided [official comments](#) to the Department of Interior. The letter highlighted Colorado's negotiating priorities and "irrefutable truths" that Commissioner Mitchell has developed based on input from and discussions with water users, key stakeholders, Tribal Nations, and others across the State. In summary, the letter states that Post-2026 operations should:

- Acknowledge climate change and include operations that adapt and respond to a drier and more variable future;
- Include mechanisms to rebuild depleted storage at Lake Mead and Lake Powell;
- Recognize that Lower Basin overuse is unsustainable and puts the entire system at risk;
- Not interfere with the right of any state to administer and distribute waters within its boundaries;
- Ensure operations do not favor one basin over the other and recognize the Upper and Lower Basins' equal apportionments to the river;



- Acknowledge that Colorado River Basin Tribes have water rights and that development of strategies for post-2026 operations depend upon participation by the Tribes

Colorado also joined [a letter with the other Upper Division States](#), as well as a [letter sent on behalf of the seven Basin States](#).

