



UPPER COLORADO RIVER COMMISSION

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May 17, 2023

Secretary Deb Haaland
U.S. Department of the Interior
1849 C Street, NW
Washington, DC 20240

Dear Madam Secretary:

The Upper Division States and the Bureau of Reclamation, signatories to the 2019 Drought Response Operations Agreement (DROA), together with the Upper Colorado River Commission (collectively, the DROA Parties), have prepared this 2023 Drought Response Operations Plan (2023 Plan) in accordance with the DROA. The 2023 Plan consists of the Framework document and Attachments A through H to the Framework and covers the period from May 1, 2023 to April 30, 2024 (2023 Plan Year). At the 302nd Special Meeting of the Upper Colorado River Commission, each Commissioner to the Upper Colorado River Commission voted for the Commission to approve the 2023 Plan. Accordingly, I am pleased to submit the 2023 Plan for your consideration and approval.

The 2023 Plan takes advantage of the favorable and above normal Colorado River flows this year to recover water released from Flaming Gorge and Blue Mesa Reservoir through DROA in 2021 and 2023. In total, Reclamation estimates that 588,000 acre-feet of storage will be recovered to Flaming Gorge and 36,000 acre-feet recovered to Blue Mesa.

The 2023 Plan was developed through engagement and participation by Reclamation, Upper Division States, the Jicarilla Apache Nation, Navajo Nation, Southern Ute Indian Tribe, and Ute Mountain Ute Tribe, as well as water users and resource managers. The 2023 Plan included consultation with the Lower Basin States consistent with DROA.

The 2023 Plan will adapt to changing conditions over the coming year to respond to the actual hydrologic conditions. The DROA Parties acknowledge that the 2023 Plan is a temporary measure to balance risks to key infrastructure at Glen Canyon Dam with resources at the Colorado River Storage Project Initial Units. We recognize that there is substantial, continuing vulnerability in the Colorado River system to climate change, drought, and basin-wide depletions. Therefore, the Upper Division States seek engagement and partnerships with federal partners, Tribes, and the Lower Basin States to build new long-term solutions that adapt the Colorado River system to a future with reduced water supplies.

Sincerely,

Charles Cullom
Executive Director
Upper Colorado River Commission

cc: Tanya Trujillo, Assistant Secretary for Water and Science,
David Palumbo, Deputy Commissioner of Operations, Reclamation,
Rodney Smith, Office of the Solicitor,
Wayne Pullan, Region Director, Reclamation Upper Colorado Region Office,
Jacklynn Gould, Region Director, Reclamation Lower Colorado Region Office,
Upper Colorado River Commissioners

2023 Drought Response Operations Plan

Executive Summary

The Upper Division States and the Bureau of Reclamation, signatories to the 2019 Drought Response Operations Agreement (DROA), together with the Upper Colorado River Commission (collectively, the DROA Parties), have developed this 2023 Drought Response Operations Plan (2023 Plan) in accordance with the DROA. The 2023 Plan consists of the Framework document and Attachments A through H to the Framework and covers the period from May 1, 2023 to April 30, 2024 (2023 Plan Year).

The 2023 Plan includes the following key elements:

1. Anticipate full recovery of DROA release volumes at Flaming Gorge and Blue Mesa through the term of the 2023 Plan.
2. No additional action is anticipated during the 2023 Plan; the DROA Parties will continue monitoring hydrological conditions and, if needed, will make adjustments, first at Glen Canyon Dam, and then at the upstream Initial Units (Flaming Gorge, Aspinall, and Navajo).

In developing the 2023 Plan, the DROA Parties considered operational adjustments at Glen Canyon Dam and potential release and recovery scenarios for each upstream Initial Unit. The 2023 Plan complies with the project-specific criteria for each Initial Unit, including applicable Records of Decision and Biological Opinions, as well as the authorized purposes for each Initial Unit. Moreover, the 2023 Plan complies with all applicable laws, rules and regulations, in particular the legal obligations at the Initial Units, including existing and future contracts related to water and/or hydropower, and the Upper Division States' water right administration requirements and decrees.

While developing the 2023 Plan, the DROA Parties evaluated its effectiveness in achieving the goals and intent of the DROA and considered potential impacts of the Plan on natural resources, the Upper Colorado River Basin Fund, and the western Interconnected Bulk Electric System. Finally, the DROA Parties consulted with the Governor's Representatives of the Lower Division States, the Upper Colorado River Basin Tribes, other Tribes throughout the Colorado River Basin, federal agencies, water users and non-governmental organizations as required by the DROA.

Development of the 2023 Plan indicates there is no need to make adjustments at Glen Canyon Dam or to release water from the upstream Initial Units to protect Lake Powell elevations. Rather, the 2023 Plan is focused on recovering the volumes of water released from the upstream Initial Units of Flaming Gorge and Aspinall under DROA in 2021 and 2022. The effectiveness of the 2023 Plan will be evaluated throughout the Plan Year as provided for in the DROA and the 2023 Plan. The 2023 Plan may be modified as agreed to by the DROA Parties.

In November 2022, the Department of the Interior initiated a supplemental environmental impact statement (SEIS) analysis to consider changes to selected portions of the December 2007 Record of Decision for the Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead. The SEIS does not include any changes to DROA.

1. Introduction and Background

A Drought Response Operations Plan (Plan) for a given Plan year covers the period from May 1 to April 30 of the following year (Plan Year). A Plan describes planning procedures and processes needed to support a proposed Drought Response Operation under the Drought Response Operating Agreement (DROA).¹ A Plan is divided into two general components: 1) this Framework document (Framework) contains provisions the DROA Parties will use to develop yearly Plans and will remain relatively unchanged from year to year; and 2) attachments to this Framework (Attachments) identify Drought Response Operations for the year's Plan and will be updated annually and modified as needed during each Plan Year. This Framework and its Attachments together constitute the Plan for that Plan Year. The DROA Parties may amend Plans as necessary based upon changing conditions. Drought Response Operations described in any Plan include operational adjustments, releases, and recovery within or from the Colorado River Storage Project Initial Units (Lake Powell, Flaming Gorge, Aspinall, and Navajo) under DROA. This Framework and its 2023 Attachments together constitute the 2023 Plan.

All Plans will describe annual Drought Response Operations for the Plan Year, unless otherwise specified.

This Framework is organized as follows:

- Section 2 briefly describes the authorities that govern Drought Response Operations, including the basis for any proposed Drought Response Operations.²
- Section 3 incorporates the summary of the information to be included in Attachment A Part 1. Attachment A Part 1 describes the current and projected hydrology for the applicable Plan.
- Section 4 incorporates the summary of the information to be included in Attachment A Part 2. Attachment A Part 2 describes the proposed Drought Response Operations for the applicable Plan.
- Section 5 explains how DROA's criteria and principles are applied to develop Drought Response Operations.

¹ DROA is one element of the package of documents known as the 2019 Colorado River Drought Contingency Plan (DCP). The DCP agreements in both the Upper Basin and Lower Basin provide tools to address the ongoing historic drought in the Colorado River Basin. The seven Colorado River Basin States submitted the DCP agreements to Congress, resulting in the "Colorado River Drought Contingency Plan Authorization Act," 2019 DCP Act, Pub. L. No. 116-14, 133 Stat. 850 (Apr. 16, 2019) ("the 2019 DCP Act"). Consistent with the 2019 DCP Act, the DCP agreements were executed in May of 2019, and the various DCP agreement parties have been implementing the agreements in the Upper and Lower Colorado River Basins since their execution.

² If there is a conflict between the content of this Plan and the provisions of DROA, the provisions of DROA control.

- Section 6 describes the methods that will be used to account for water released and recovered pursuant to any implemented Plan.
- Section 7 describes the consultation, coordination, and outreach that the DROA Parties will conduct when developing and before finalizing a Plan.
- Section 8 describes monitoring and the process for potential Plan amendments during implementation of a Plan.

This Framework does not address “emergency action” under DROA. In DROA, the Department of the Interior (Department) committed to conduct any emergency action, “to the greatest extent practicable, with advance consultation and coordination with the Upper Division States, through the [Upper Colorado River] Commission, and following consultation with the Governors’ Representatives of the Colorado River Basin States.”³ The Department “retains all applicable authority to make release from [Colorado River Storage Project Act] Initial Units and perform subsequent recovery of storage operations if actual hydrology or actual operating experience demonstrate an imminent need to protect the Target Elevation at Lake Powell.”⁴ Any releases made under an emergency action are subject to recovery pursuant to DROA.

2. DROA Authorities

The operating principle of DROA is to minimize the risk of Lake Powell falling below a minimum “Target Elevation,” expressly defined as a water surface elevation of 3,525 ft.⁵ The Target Elevation was adopted to “minimiz[e] the risk of Lake Powell declining below minimum power pool (approximately elevation 3,490 feet msl) and to assist in maintaining Upper Division States’ compliance with the Colorado River Compact.”⁶ DROA states that the Target Elevation “appropriately balances the need to protect infrastructure, compact obligations, and operations at Glen Canyon Dam, as storage approaches minimum power pool with the Upper Division States’ rights to put Colorado River System water to beneficial use.”⁷ Section II of DROA further describes the purposes of the Target Elevation, and Section II(A)(2) specifically describes minimizing the risk of falling below elevation 3,490 feet msl at Lake Powell as one of the goals of DROA.

Maintaining Lake Powell elevation above the Target Elevation helps allow the upstream Initial Units (Flaming Gorge, Aspinall, and Navajo) to continue to serve their Congressionally authorized purposes. Those purposes are articulated in the authorizing Colorado River Storage Project Act of 1956 (CRSPA):

³ DROA §§ II(A)(3)(j) & II(A)(4)(e).

⁴ DROA §§ II(A)(3)(j).

⁵ DROA § II(A)(2) (defining “Target Elevation”).

⁶ DROA § II(A)(2).

⁷ DROA § II(A)(2).

In order to initiate the comprehensive development of the water resources of the Upper Colorado River Basin, for the purposes, among others, of regulating the flow of the Colorado River, storing water for beneficial consumptive use, making it possible for the States of the Upper Basin to utilize, consistently with the provisions of the Colorado River Compact, the apportionments made to and among them in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, providing for the reclamation of arid and semiarid land, for the control of floods, and for the generation of hydroelectric power, as an incident of the foregoing purposes, the Secretary of the Interior is hereby authorized (1) to construct, operate, and maintain the following initial units of the Colorado River storage project, consisting of dams, reservoirs, powerplants, transmission facilities and appurtenant works: Curecanti, Flaming Gorge, Navajo (dam and reservoir only), and Glen Canyon

The purposes first articulated in the CRSPA were reinforced by Congress' approval of DROA as part of the 2019 Colorado River Drought Contingency Plan Authorization Act ("2019 DCP Act").⁸ DROA's expressly stated "primary goals"⁹ concern "ensur[ing]" compact compliance, "while exercising [Upper Division States'] rights to develop and utilize the Upper Colorado River Basin's ("Upper Basin") Colorado River System compact apportionment,"¹⁰ "[m]aintain[ing] the ability to generate hydropower at Glen Canyon Dam" for a variety of purposes,¹¹ and "[m]inimiz[ing] adverse effects to resources and infrastructure in the Upper Basin."¹² In support of these authorized purposes and primary goals, DROA authorities and considerations attempt to ensure that the purposes of the authorized facilities are not negatively affected by Lake Powell falling below the Target Elevation and that actions taken to implement DROA minimize negative impacts to the operation of the Initial Units and those who depend on the operation of those units.¹³

3. Summary of Hydrologic Conditions and Projections

To formulate a yearly Plan, the DROA Parties rely on the most current and projected hydrological information which is outlined in Attachment A, Part 1 and includes the following:

⁸ 2019 DCP Act, Pub. L. No. 116-14, 133 Stat. 850 (Apr. 16, 2019).

⁹ DROA § I(A).

¹⁰ DROA § I(A)(1): "Help ensure the Upper Division States will continue fulfilling their interstate water compact obligations while exercising their rights to develop and utilize the Upper Colorado River Basin's ("Upper Basin") Colorado River System compact apportionment."

¹¹ DROA § I(A)(2): "Maintain the ability to generate hydropower at Glen Canyon Dam so as to protect: a. Continued operation and maintenance of the Initial Units and participating projects authorized under the [1956 Act]; b. Continued funding and implementation of environmental and other programs that are beneficial to the Colorado River System; c. Continued electrical service to power customers, including municipalities, cooperatives, irrigation districts, federal and state agencies and Native American Tribes, and the continued functioning of the western Interconnected Bulk Electric System that extends from Mexico to Canada and from California to Kansas and Nebraska; and d. Safety contingencies for nuclear power plant facilities within the Colorado River Basin."

¹² DROA § I(A)(3): "Minimize adverse effects to resources and infrastructure in the Upper Basin."

¹³ DROA § II(A)(3)(b) (scope).

- 3.1 Current and projected elevations at Lake Powell, including graphic representation from the Bureau of Reclamation's (Reclamation) multi-year projections;
- 3.2 Reclamation's most recent Colorado River Mid-term Modeling System 24-Month Study (24-Month Study);
- 3.3 Identification of the first months when the 24-Month Study Minimum Probable inflow¹⁴ and the Most Probable inflow each projected Lake Powell to be at or below the Target Elevation;
- 3.4 Current and projected elevations and the associated volumes at each of the Initial Units for the following 24 months, including any difference in volume from the projected elevations and the Target Elevation at Lake Powell, according to the 24-Month Study Minimum Probable inflow and Most Probable inflow;
- 3.5 Availability of water for Drought Response Operations at each of the Initial Units and the timing of such water availability;
- 3.6 Summary of estimated effect on Lake Powell from Drought Response Operations concerning operational adjustments to monthly Lake Powell release volumes; and
- 3.7 Summary of previous Drought Response Operations at each Initial Unit, if any. The summary includes:
 - 3.7.1 Previous Drought Response Operation Releases
 - 3.7.2 Estimated effect on Lake Powell from previous Drought Response Operation Releases and operational adjustments based upon best available information
 - 3.7.3 Status of Recovery from previous Drought Response Operation Releases, including any releases pursuant to Emergency Actions

4. Summary of Proposed Drought Response Operations:

As part of yearly Plans, the DROA Parties provide a summary of Drought Response Operations in Attachment A, Part 2, and that summary includes the following:

¹⁴ In the 24-Month Study, the first year of the Most Probable inflow trace is based on the 50th percentile of Colorado Basin River Forecast Center forecasts and the second year is based on the 50th percentile of historical flows. To represent dry and wet future conditions, the Minimum Probable and Maximum Probable traces use the 10th and 90th forecast percentiles in the first year and the 25th and 75th percentiles of historical flows in the second year, respectively.

- 4.1 Projections for the Drought Response Operations incorporated in the Minimum, Maximum, and Most Probable inflow traces.
- 4.2 A description of operational adjustments at Glen Canyon Dam, if any, which includes a comparison of such operational adjustments to operations when no adjustments are made. This comparison may be provided through text, tables, figures, and graphs as needed.
- 4.3 A description of Drought Response Operations releases and recovery at affected Initial Units, as applicable, as set forth in Attachments C through E. This includes the amount of Drought Response Operations water (rate, volume, and timing) a description of each reservoir's projected water level over the following 24 months.

5. **Application of DROA's Process and Principles for Drought Response Operations**

This section describes how a Plan is developed to be consistent with the DROA provisions and principles, ensuring that the Plan meets the obligations imposed by the 2019 DCP Act.

5.1 DROA Planning Timeline

DROA relies on hydrologic projections and establishes a timeframe of approximately two years to plan for and implement Drought Response Operations with as much advance notice as possible to avoid Lake Powell declining below the Target Elevation.¹⁵ The process begins when any Minimum Probable inflow trace of the 24-Month Study projects Lake Powell falling to or below the Target Elevation within the upcoming 24-month period of the study. This begins a process for more frequent monitoring, data collection, and coordination.¹⁶

The next phase of DROA planning occurs when any Most Probable inflow trace of the 24-Month Study shows Lake Powell declining to or below the Target Elevation in the upcoming 24-month study period.¹⁷ When this occurs, the DROA Parties begin to develop a Plan pursuant to DROA¹⁸ and this Framework, and then seek approval¹⁹ and implementation²⁰ of that Plan, starting as early as the April²¹ before Lake Powell is projected to decline below the Target Elevation. Attachment A Section 2 describes the proposed Drought Response Operations for the applicable Plan.

¹⁵ See DROA § II(A)(4).

¹⁶ DROA § II(A)(4)(a).

¹⁷ DROA § II(A)(4)(a)(iv)(2).

¹⁸ DROA § II(A)(4)(b).

¹⁹ DROA § II(A)(4)(c).

²⁰ DROA § II(A)(4)(d).

²¹ DROA § II(A)(4)(b)(iv)(2).

The process is completed only after each upstream Initial Unit has fully recovered water released under Drought Release Operations.²² If an outstanding recovery balance exists at an upstream Initial Unit the DROA Parties will prepare a DROA Plan.

5.2 Scope of Drought Response Operations at the Initial Units

DROA calls for Drought Response Operations that fit within the flexibilities allowed by existing Initial Unit operations.²³ The proposed Drought Response Operations are designed to work within the existing authorities and operational flexibilities of each of the Initial Units, which are described generally for each Initial Unit in this Section 5.2 and in the applicable Attachments.

5.2.1 *General Release and Recovery Principles*

DROA requires consideration of all the Initial Units for a Drought Response Operation.²⁴ Lake Powell operations and releases from the upstream Initial Units reservoirs are each governed by one or more Record of Decision under the National Environmental Policy Act as well as authorized purposes dictating constraints and flexibilities. For each Initial Unit, Reclamation’s reservoir operator determines a release rate that meets prescribed criteria within an allowable range. For Drought Response Operations, three possible types of reservoir operations are considered:

- Operations without Drought Response – Reservoir operations absent Drought Response Operations. These operations will continue to be within each reservoir’s allowable range. The allowable range is governed by physical constraints, regulatory constraints, dam safety considerations, safe channel capacity, public safety, and applicable state and federal law, among other things.
- Drought Release Operations – In addition to the constraints and flexibilities identified above, DROA²⁵ dictates that Drought Release Operations comport with authorizing legislation and agreements and consider, among other things,

²² DROA § II(A)(3)(e).

²³ DROA § II(A)(3)(b): “Scope of Drought Response Operations: Any drought response operation, including drought response releases and recovery of storage operations, at a CRSPA Initial Unit will be managed with the maximum flexibility practicable consistent with: the Colorado River Compact; the Upper Colorado River Basin Compact; the Colorado River Storage Project Act; the Colorado River Basin Project Act; the San Juan-Chama Project Act (P.L. 87-483); the Northwestern New Mexico Rural Water Projects Act (P.L. 111-11); the project-specific criteria for each CRSPA Initial Unit, including the relevant Records of Decision, Biological Opinions and authorized purposes for each Unit (see Section I.C.2); legal obligations, including existing and future contracts related to water and/or hydropower; states’ water right administration requirements and decrees; and all applicable rules and regulations promulgated thereunder.”

²⁴ DROA § II(A)(3)(c): “Participation from all CRSPA Initial Units: Recognizing the shared risk of extended drought and acknowledging the Upper Division States’ continuing responsibilities to maintain compact compliance within the Upper Basin, a drought response operation contemplated by this Drought Response Operations Agreement shall ensure that ALL CRSPA Initial Units will be considered for drought response operations”

²⁵ DROA § II(A)(3)(b).

applicable existing and future contracts²⁶ related to water and/or hydropower, and each State's water rights administration and decrees. Drought Release Operations will occur within each upstream Initial Unit's allowable range of releases, and above the range of releases that would occur pursuant to Operations without Drought Response.

- Drought Response Recovery – Recovery is necessary whenever water has been released under either a prior Plan or an emergency action. Recovery of releases occurs by storing more water and/or reducing releases. Recovery under Drought Response Recovery will occur within each upstream Initial Unit's allowable range of operations. When operational releases reach the low end of the allowable operational range and cannot be reduced further, recovery cannot occur until conditions allow. Recovery is further addressed in Section 6.

As described above, any Drought Response Operation must be consistent with any constraint on Initial Unit operations,²⁷ including the Law of the River, Records of Decision, Biological Opinions, authorized purposes for individual Initial Units, states' water right administration requirements, contracts, and any other constraints and flexibilities that affect operation of the Initial Units. Additionally, impacts to river flows and upstream Initial Unit reservoir water levels related to recreation visitation and the economic value of recreation will be considered, along with potential downstream flooding risks. To determine what flexibilities may be available, the DROA Parties will work with the existing entities and processes that govern Initial Unit operations to develop a Plan that will both minimize the risk of Lake Powell falling below the Target Elevation and maintain consistency with Initial Unit operation. Depending on the Initial Unit, these entities include Federal agencies, Tribes, States, contractors, water users, applicable advisory groups, non-governmental organizations, and the public. Early communication with such entities is critical and will occur as described in Section 7 of this Framework. The DROA Parties will also maintain a long-term focus to ensure appropriate operation of Initial Units for their authorized purposes into the future.

Nothing in this Framework or the Attachments is intended to interpret the provisions of the Colorado River Compact (45 Stat. 1057); the Upper Colorado River Basin Compact (63 Stat. 31); the Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande, Treaty Between the United States of America and Mexico (Treaty Series 994, 59 Stat. 1219); the United States/Mexico agreements in Minute No. 242 of August 30, 1973 (Treaty Series 7708; 24 UST 1968), Minute No. 322 of

²⁶ DROA Section II(A)(3)(b) states that "future contracts" are among the parameters considered in any Drought Response Operation. Accordingly, the DROA Parties will consider contracts that have been executed after the effective date of DROA. Any contract executed after a Drought Response Operation has begun will be addressed in an amendment to the applicable Plan, if necessary.

²⁷ DROA § II(A)(3)(b).

January 19, 2017 (as it may be extended), or Minute No. 323 of September 21, 2017; the Consolidated Decree entered by the Supreme Court of the United States in *Arizona v. California* (547 U.S. 150 (2006)); the Boulder Canyon Project Act (45 Stat. 1057; 43 U.S.C. 617); the Boulder Canyon Project Adjustment Act (54 Stat. 774; 43 U.S.C. 618a); the Colorado River Storage Project Act (70 Stat. 105; 43 U.S.C. 620); the Colorado River Basin Project Act (82 Stat. 885; 43 U.S.C. 1501); the Colorado River Basin Salinity Control Act (88 Stat. 266; 43 U.S.C. 1951); the Hoover Power Plant Act of 1984 (98 Stat. 1333); the Hoover Power Allocation Act of 2011 (125 Stat. 777); the Colorado River Floodway Protection Act (100 Stat. 1129; 43 U.S.C. 1600); the Grand Canyon Protection Act of 1992 (Title XVIII of Public Law 102-575, 106 Stat. 4669); the Decree Quantifying the Federal Reserved Right for Black Canyon of the Gunnison National Park (Case No. 01CW05, District Court, Colorado Water Division No. 4, 2008); the Colorado River Drought Contingency Plan Authorization Act (Public Law 116-14); the principles of DROA, including, but not limited to, Section II(A)(3)(b); or the rules, criteria, guidelines, and decisions referenced within this Framework and the Attachments.

5.2.2 Lake Powell Monthly Operational Adjustments

Glen Canyon Dam provides 26.2 million acre-feet of water storage capacity in Lake Powell. As Glen Canyon Dam fulfills its authorized purposes, Lake Powell's elevation fluctuates depending on the amount of spring runoff from the mountains, releases required under current law, and the amount of water carried over from the previous year. Each year, the lake level typically increases between May and July from runoff followed by a decrease in lake level throughout the remainder of the year.

DROA states that “[o]perational adjustments in monthly volumes at Glen Canyon Dam will be considered first to minimize the risk of Lake Powell declining below the Target Elevation consistent with the Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs, which is currently implemented through the 2007 Interim Guidelines.”²⁸ LTEMP determines monthly releases under

a framework for adaptively managing Glen Canyon Dam operations and other management and experimental actions over the next 20 years, consistent with the Grand Canyon Protection Act (GCPA) and other provisions of applicable Federal Law. The LTEMP identified specific options for dam operations (including hourly, daily, and monthly release patterns), non-flow actions, and appropriate experimental and management actions that meet the GCPA's requirements, and maintain or improve hydropower production to the greatest extent practicable, consistent with improvement of downstream resources, including those of importance to American Indian tribes. Under the LTEMP, water will continue to be

²⁸ DROA § II(A)(3)(c)(i).

delivered in a manner that is fully consistent with and subject to the Colorado River Compact, the Upper Colorado River Basin Compact, the Water Treaty of 1944 with Mexico, the decree of the Supreme Court in *Arizona v. California*, and the provisions of the Colorado River Storage Project Act of 1956 (CRSPA) and the Colorado River Basin Project Act of 1968 that govern allocation, appropriation, development, and exportation of the waters of the Colorado River Basin, and consistent with applicable determinations of annual water release volumes from Glen Canyon Dam made pursuant to the Long-Range Operating Criteria (LROC) for Colorado River Basin Reservoirs, which are currently implemented through the 2007 Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead.²⁹

These operational parameters determine the flexibility for any Drought Response Operation. The 2007 Interim Guidelines control annual release volumes, and any monthly adjustments to Glen Canyon Dam releases consistent with the Grand Canyon Protection Act do not alter the annual release volume requirements and cannot change the annual release volumes.

LTEMP expressly provides for modifications to Glen Canyon Dam monthly releases “to respond to low reservoir conditions as a result of drought in the Colorado River Basin.”³⁰ LTEMP requires Reclamation to make such adjustments “in coordination with the Basin States,”³¹ through a process described in LTEMP,³² including a Glen Canyon Monthly Operations Call, along with updates to the Glen Canyon Dam Adaptive Management Program (GCDAMP). Explanations for monthly operational adjustments consistent with the Grand Canyon Protection Act may include an analysis pursuant to the parameters defined under LTEMP.³³

The DROA Parties will consider the following criteria, without limitation and subject to existing law and regulation, when assessing operational adjustments at Lake Powell:

1. Glen Canyon Dam monthly volume calculations as projected by Reclamation prior to Drought Response Operations.
2. During years when early forecasts indicate that operational adjustments at Glen Canyon Dam may be needed to maintain the Target Elevation, smaller incremental

²⁹ LTEMP ROD at 2.

³⁰ LTEMP ROD, Attachment B, § 1.2, p. B-7: “In addition, Reclamation may make modifications under circumstances that may include operations that are prudent or necessary for the safety of dams, public health and safety, other emergency situations, or other unanticipated or unforeseen activities arising from actual operating experience (including, in coordination with the Basin States, actions to respond to low reservoir conditions as a result of drought in the Colorado River Basin).”

³¹ LTEMP ROD, Attachment B, § 1.2, p. B-7.

³² LTEMP ROD, Attachment B, § 1.1.

³³ LTEMP ROD, Attachment B, § 1.2 Operational Flexibility Under Alternative D.

monthly adjustments shall be considered before the April 24-Month Study forecast in order to have sufficient time to maintain the required volume needed in Lake Powell and to minimize effects to monthly flow volumes later in the water year.

3. Any monthly release volume adjustments made under a Plan will be incorporated into Glen Canyon Dam operations and will be offset to ensure the Dam's required annual release volume is not modified.³⁴
4. Consistency with the implementation of the Grand Canyon Protection Act.

Attachment B to the Plan in effect addresses Glen Canyon Dam.

5.2.3 Flaming Gorge

Flaming Gorge is the largest upstream Initial Unit and is situated high in the Upper Colorado River Basin across the Utah and Wyoming border. When the reservoir is full at elevation 6,040 feet above mean sea level, it has a total capacity of 3,788,800 acre-feet with an active capacity of 3,749,000 acre-feet and a surface area of 42,020 acres. The Flaming Gorge Annual Operation Plan (FG AOP) may be amended and releases made within the flexibility of the 2006 Flaming Gorge Record of Decision and within the provisions of DROA.

Flaming Gorge is operated for authorized purposes, including water storage, contract releases, power production, recreation, and environmental conditions downstream of the reservoir for endangered fish recovery pursuant to the 2005 Biological Opinion and 2006 Flaming Gorge Record of Decision. In accordance with the EIS, Flaming Gorge is operated to “protect and assist in recovery of the populations and designated critical habitat of the four endangered fishes, while maintaining all authorized purposes of the Flaming Gorge Unit of the Colorado River Storage Project (CRSP), including those related to the development of water resources in accordance with the Colorado River Compact.”³⁵ Operating criteria have been developed to produce the necessary environmental parameters under a variety of hydrologic conditions.³⁶ Water under contract is not available for Drought Response Operations.

The allowable range of Flaming Gorge operations is a function of the period of the

³⁴ Under the 2007 Interim Guidelines Section XI.G.7.D. “The Secretary will base annual determinations regarding the operations of Lake Powell and Lake Mead on these Guidelines, unless extraordinary circumstances arise. Such circumstances could include operations that are prudent or necessary for safety of dams, public health and safety, other emergency situations, or other unanticipated or unforeseen activities arising from actual operating experience.”

³⁵ Record of Decision, Operation of Flaming Gorge Dam, Final Environmental Impact Statement (February 2006) at 1.

³⁶ These criteria are found in several documents, including the Environmental Impact Statement, Record of Decision, Biological Opinion, and the FG AOP, among others.

year, hydrologic conditions, and ongoing or planned studies related to adaptive management in support of the endangered fish recovery program. Current operations at Flaming Gorge reflect ongoing experimentation that has been coordinated by and through the Flaming Gorge Technical Working Group and with the Flaming Gorge Working Group stakeholders.

5.2.3.1. Flaming Gorge Operations

Flaming Gorge operations are established in the spring based on forecasted runoff for the upcoming 12 months. The year is broken into three periods: Spring, Base Flow, and Transition.

Specific operations for the Spring Period are established in the FG AOP for each given year and its timing varies depending on yearly hydrology. The Base Flow Period follows the Spring Period and typically constitutes flows from mid-July through the end of February. The Transition Period runs from March 1st through the beginning of the Spring Period or peak release. Details of potential flows during each of the periods can be found in Attachment C and the FG AOP.

5.2.3.2. Flaming Gorge Operating Range during Drought Response Operations

The range of flows required to comply with the dam's authorized purposes and to assist in the recovery of ESA listed fish species downstream of the dam for each hydrologic condition is included in tables in Appendix 1 to Attachment C.

Drought Response Operations must remain within the range prescribed in the tables for the corresponding hydrologic conditions within the authorized flexibilities. Further, pursuant to DROA Section II(A)(5), any proposed changes in release targets (release and recovery flow) will be coordinated with the Flaming Gorge Working Group.

Attachment C to the Plan in effect addresses Flaming Gorge.

5.2.4 Aspinall

The Wayne N. Aspinall Unit is a series of three consecutive dams and reservoirs on the Gunnison River in Colorado: Blue Mesa, Morrow Point, and Crystal. Blue Mesa Reservoir is the most upstream facility of the Aspinall Unit and serves as its primary storage reservoir. Blue Mesa Reservoir has a total capacity of 938,469 acre-feet at elevation 7,519.4 feet above mean sea level, including an active pool of 747,898 acre-feet. Key reservoir elevations are described in Attachment D.

5.2.4.1. Aspinall Current Reservoir Operations

The Aspinall Unit (Aspinall) operates in accordance with its federally authorized purposes, multiple state-decreed water rights and agreements, executed contracts and pursuant to the Biological Opinion and the 2012 Aspinall Record of Decision.

Blue Mesa storage peaks late in the spring runoff period and reservoir elevations decline as releases are made to satisfy States' water rights administration and decrees, to meet authorized purposes including power generation, for flood control, for downstream target flows pursuant to the 2012 Aspinall Record of Decision, and to meet the December 31 target elevation of 7,490 feet to prevent icing issues upstream of the reservoir.

Downstream target flows vary by hydrologic year type and are determined by May 1 forecasts of April through July inflow into Blue Mesa Reservoir as detailed in Attachment D.

5.2.4.1.1. Contracted Water at Aspinall

Aspinall currently has various amounts of water under contract for delivery downstream, or for augmentation of depletions upstream in any given year. Current contracts are listed in Attachment D. Water under contract is not available for Drought Response Operations.

5.2.4.1.2. Taylor Park Exchange Agreement

The Taylor Park Reservoir Operation and Storage Exchange Agreement (1975) allows for the exchange of water stored in Taylor Park Reservoir and Blue Mesa Reservoir to improve utilization and management of available water supplies under the water rights of the Uncompahgre Project and Blue Mesa. The maximum amount of Taylor Park Reservoir exchange water that can be stored within Blue Mesa Reservoir at any time throughout the year is 106,230 acre-feet. The amount of Taylor Park Reservoir exchange water stored in Blue Mesa Reservoir is for diversion by the Uncompahgre Project at the Gunnison Tunnel and is determined through accounting managed by the Colorado Division of Water Resources. This water is not available for release pursuant to DROA.

5.2.4.1.3. Aspinall Subordination Agreement

The Subordination Agreement, dated June 1, 2000, formalizes the commitment made by the United States during the planning of the Aspinall Unit to allow subordination of Aspinall Rights up to 60,000 acre-feet per year to in-basin water

users so that Aspinall would not interfere with future water development in the Upper Gunnison River Basin. A decree entered in Case No. 03CW263 (October 10, 2006), Water Court, Water Division No. 4, for a plan for augmentation permitted the subordination of Aspinall Rights to augment existing and future water rights exercised for all decreed beneficial purposes within the Gunnison River Basin through any decreed structure or facility upstream of the Crystal Reservoir Dam. Accounting for the plan for augmentation is the responsibility of the State of Colorado Division Engineer's Office, Water Division No. 4. Water utilized pursuant to this agreement does not reach the Aspinall Unit and therefore is not available for release pursuant to DROA.

Attachment D to the Plan in effect addresses Aspinall.

5.2.5 Navajo Reservoir

Navajo Dam is located in San Juan County, New Mexico, and the reservoir extends upstream from New Mexico into Colorado. The reservoir has a total capacity of 1,647,940 acre-feet, including an active capacity of 1,021,910 acre-feet.³⁷ Maximum active storage is at elevation 6,085 ft above mean sea level. Minimum active storage is elevation 5,990 ft, which is the minimum operating level for the Navajo Indian Irrigation Project (NIIP) and the Navajo-Gallup Water Supply Project Cutter Lateral intake.

5.2.5.1. Current Navajo Reservoir Operations

5.2.5.1.1. Contracted Water at Navajo Reservoir

Water under contract is not available for Drought Response Operations. Navajo Reservoir contracted water volumes are described below. These volumes represent the full allocation of water contracts and may differ from actual annual use.

- i. Williams Gas Processing (expires 3/31/28): 50 af/yr.
- ii. Navajo Nation Settlement Contract (no expiration): 508,000 af/yr for NIIP, which includes 22,650 af/yr of diversion (20,780 af/yr of depletion) for the Navajo-Gallup Water Supply Project.
- iii. Jicarilla Apache Nation Settlement Contract (no expiration): not to exceed 33,500 af/yr diversion (25,500 af/yr of depletion) from the Navajo Reservoir Supply for use by the Nation or for subcontracting outside the reservation, in accordance with the Jicarilla Apache Tribe Water Rights Settlement Act of 1992.

³⁷ Reclamation Technical Report, ENV-2021-002, Navajo Reservoir 2019 Sedimentation Survey

- iv. Hammond Conservancy District Contract: 23,000 af/yr of depletion.

Shortages to contracts at Navajo Reservoir will be handled according to the provisions of Public Law No. 87-483, as amended by Public Law No. 111-11.³⁸ In the case of severe drought with anticipated shortages to the Navajo Reservoir water users, the Navajo Reservoir Operations ROD allows for consideration of a temporary revision to spring peak release criteria or lowering of baseflow targets in the critical habitat reach.

5.2.5.1.2. Navajo Reservoir Requirements related to Endangered Species

Navajo Reservoir is operated consistent with the Navajo Reservoir Operations Biological Opinion issued for the Animas-La Plata Project and the flow recommendations of the San Juan River Recovery Implementation Program (SJRIP). Those require operating the reservoir to mimic the natural hydrograph of the river and to maintain certain flow targets. Further detail is provided in Attachment E.

5.2.5.1.3. Other Reclamation Operations at Navajo Reservoir

Reclamation makes other releases for the purposes of channel maintenance, downstream channel work, requests from downstream coal power plants, requests from other agencies, or other activities as needed. Modifying such operations could be used for DROA recovery, so long as such actions do not interfere with Navajo Reservoir's authorized purposes. Water available for Drought Response Operations may include Spring Peak Releases and Excess Water as those terms are defined in Attachment E.

Attachment E to the Plan in effect addresses Navajo Reservoir.

5.3 Effectiveness

DROA requires consideration of whether a proposed release will be effective in maintaining the Target Elevation at Lake Powell, or minimizing the risk of Lake Powell declining below elevation 3,490 ft. This includes the discretion to proceed or not to proceed with releases that may not completely maintain the Target Elevation or eliminate the risk of falling below elevation 3,490 ft.³⁹ The effectiveness of any Drought Response Operation must be assessed throughout the Plan Year to ensure the Drought Response Operation continues to achieve the intent and goals of DROA.

³⁸ Pub. L. No. 111-11, § 10402, 123 Stat. 991, 1372 (Mar. 30, 2009).

³⁹ DROA § II(A)(3)(d): "Effectiveness: The Parties agree that a drought response release from a CRSPA Initial Unit may be recommended even if it is determined that such release would not, by itself, fully achieve the intent or goals of this Drought Response Operations Agreement. Such releases, however, may not be recommended if they are ultimately determined to be futile to achieve the goals or intent of this Drought Response Operations Agreement."

DROA states that “[o]perational adjustments in monthly volumes at Glen Canyon Dam will be considered first...”, and then relies on water available pursuant to DROA § II(A)(3)(b) in all upstream Initial Units to reduce the risk of Lake Powell dropping below the Target Elevation. If dry conditions persist or worsen, the available water for potential adjustments or releases may be insufficient to maintain the Target Elevation or eliminate the risk of falling below elevation 3,490 ft. at Lake Powell. As such, Drought Response Operations may be ineffective and therefore futile.

The effectiveness of a Plan is difficult to predict prior to knowing actual hydrologic conditions. The forecasts on which modeling projections rely can be highly variable and may not reflect future hydrologic conditions.

In certain years, volumes of storage available in the Initial Units for potential adjustments or releases may be insufficient to maintain the Target Elevation or eliminate the risk of falling below elevation 3,490 ft at Lake Powell.

Before the DROA Parties can assess the effectiveness or futility of any Drought Response Operation, the Plan must first meet the requirements established in the “Scope of Drought Response Operations”⁴⁰ provision, including, among other things, the following:

- a. applicable laws and regulations;
- b. intrastate water rights administration requirements and decrees; and
- c. ability to meet contractual obligations related to any upstream Initial Unit.

If a proposed Plan meets DROA requirements, the DROA Parties will assess the effectiveness or futility of a Drought Response Operation based on whether, and to what extent, the Drought Response Operation will reduce the risk of Lake Powell falling below the Target Elevation during the next 12-month period, as projected by the most recent 24-Month Study. In making such an assessment, the DROA Parties may rely on current or projected operations at Lake Powell, and other information that any DROA Party deems relevant. The DROA Parties will specifically consider the following criteria, on an ongoing basis, without limitation:

1. The likelihood that the Drought Response Operation will increase the risk of a net decrease in the elevation at Lake Powell over any consecutive 12-month period based on the most recent 24-Month Study;
2. The extent to which conducting a Drought Response Operation for certain durations and at certain times during the water year might affect the ability of the released water to reach Lake Powell;

⁴⁰ DROA § II(A)(3)(b).

3. The extent to which a Drought Response Operation changes the risk of Reclamation being unable to meet obligations related to an upstream Initial Unit in subsequent years following a Drought Response Operation;⁴¹
4. The degree to which a Drought Response Operation minimizes, to the extent practicable, impacts of the Drought Response Operation to natural resource conditions;⁴²
5. The degree to which a Drought Response Operation minimizes, to the extent practicable, impacts to the Upper Colorado River Basin Fund, contracts for hydropower and CRSP firm electric service customers, and impacts to the reliability of the Western Interconnected Bulk Electrical System;⁴³
6. The extent to which a Drought Response Operation minimizes adverse effects to resources and infrastructure in the Upper Basin⁴⁴ and provides additional certainty on Colorado River water management,⁴⁵ including but not limited to associated economic implications; and
7. The extent to which a Drought Response Operation recovery at a particular Initial Unit will occur or has occurred by October 1, 2026.⁴⁶

Attachment A contains an overview of effectiveness and an explanation of how a determination was made.

5.4 Natural Resources Considerations

Subject to specific considerations for each Initial Unit that might be affected by Drought Response Operations, general natural resource considerations include the following:

To the extent practicable, Drought Response Operations should be made to mimic the natural timing of streamflow. Most Initial Unit operations, for example, contain an option for releasing additional water at times that coincide with natural high flows in the spring. Releasing water during these windows will generally align with existing operations, provide ecological benefits, and may support operational flexibilities related to retaining water in storage until more information about runoff is known in the spring.

In addition to other limitations described herein, including but not limited to Framework

⁴¹ DROA § II(A)(3)(b).

⁴² DROA § II(A)(3)(f).

⁴³ DROA § II(A)(3)(g).

⁴⁴ DROA § I(A)(3).

⁴⁵ DROA § I(B)(3).

⁴⁶ DROA § II(A)(6): “Operations to recover storage after a drought response operation has been implemented will continue as long as necessary to recover from any drought response operations taken before October 1, 2026.”

Section 5, specific considerations for each Initial Unit participating in Drought Response Operations were provided by relevant natural resource agencies and include the following:

Lake Powell and Glen Canyon Dam:

- minimizing reservoir elevation drop to address considerations of non-native predators potentially passing through Glen Canyon Dam and the potential effects on listed species;
- transferring most of the withheld winter volume as a spring peak flow in May or June; and
- considering sediment erosion and summer river temperatures related to warm water non-native fish breeding below the Dam.

Flaming Gorge:

- releasing most of the Drought Response Operation volume during a naturally timed spring peak;
- following, among other things, experimental recommendations of the Upper Colorado River Endangered Fish Recovery Program as allowable in the Flaming Gorge ROD and outlined in the annual flow request letter; and
- not exceeding recommended baseflows between December and March.

Aspinall:

- limiting the overall volumes used from Blue Mesa;
- releasing most of the Drought Response Operation volume during a naturally timed spring peak, with the next preference for releases in fall and least preferred released Jan-April; and
- maintain consistency with shoulder month flows described in the Aspinall ROD.

Navajo Reservoir:

- consistency with the hydrograph recommended by the SJRIP;
- meeting recommended high spring flows when available; and
- ensuring the ability to meet future releases recommended by the SJRIP.

Attachment F contains an overview of the consideration of natural resource conditions and an explanation of how a determination was made for each specific Plan.

5.5 Impacts to the Basin Fund and Bulk Electrical System

DROA requires consideration of Drought Response Operations that “help minimize, to the extent practicable, impacts to the Upper Colorado River Basin Fund and impacts to the

reliability of the Western Interconnected Bulk Electrical System,”⁴⁷ and consideration of “continued electrical service to power customers.”⁴⁸ Maintaining the ability to generate hydropower at Glen Canyon Dam helps maintain water facility operations and maintenance, environmental and other programs, electrical service to CRSPA power customers, and functioning of the Western Interconnected Bulk Electric System.⁴⁹

Concerns about the Upper Colorado River Basin Fund's (Basin Fund) solvency and the viability of hydropower have grown as the current drought has persisted. The Western Area Power Administration (WAPA) is the agency responsible for marketing the power produced from the Initial Units, of which approximately 75% is produced at Glen Canyon.

WAPA supports Drought Response Operations when they are necessary to protect the Target Elevation at Lake Powell. In general, when Drought Response Operations are necessary, WAPA has proposed specific considerations for mitigation to hydropower generation and the Basin Fund, when practicable, as follows:

- a. *Operations at Glen Canyon Dam:* Planning for monthly volume releases should consider maximizing hydropower production during winter and summer peak electrical demand. For fall operations, October through November, releases from Glen Canyon Dam should be reduced. Reduced releases in December and January should be avoided. For spring operations, monthly release volumes should be modified to retain water in storage until after spring runoff thereby allowing larger release volumes in July through September to maximize the value of hydropower and reduce days spent below the Target Elevation.
- b. *Operations at Flaming Gorge:* Drought Response Operations from Flaming Gorge should primarily be scheduled during the summer months, June through September. Bypasses should be avoided whenever possible unless essential to avoid Lake Powell dropping below the minimum power pool elevation.
- c. *Operations at the Aspinall Unit:* Drought Response Operations from the Aspinall Unit should primarily be scheduled during the summer months, June through September, and secondarily during the winter months, December through February. Bypasses should be avoided whenever possible unless essential to avoid Lake Powell dropping below the minimum power pool elevation.
- d. *Operations at Navajo Dam Reservoir:* There is no CRSP power generation at Navajo Dam and therefore WAPA provided no recommendations.

⁴⁷ DROA § II(A)(3)(g): “Impacts to Basin Fund and Bulk Electric System: Drought response operations at CRSPA Initial Units will consider the timing, duration, and magnitude of water releases to help minimize, to the extent practicable, impacts to the Upper Colorado River Basin Fund and impacts to the reliability of the western Interconnected Bulk Electrical System, within the scope identified in Section II.A.3.b.”

⁴⁸ DROA § I(A)(2)(c).

⁴⁹ DROA § I(A)(2).

The general proposals described here are considered, in addition to other DROA considerations, in Attachment G, which contains an overview of impacts to the Basin Fund and Bulk Electrical System and an explanation of how a determination was made for each specific Plan.

5.6 Released Water Distribution and Transit Loss

5.6.1. Released Water Distribution

Drought Response Operations releases from the upstream Initial Units need to occur for the duration and at times of year identified by the Upper Division State(s) to optimize the amount of released water that reaches Lake Powell. Optimization includes, but is not limited to, consideration of intervening uses. Notice to the downstream Upper Division State(s) will be provided prior to the initiation of such releases. Each Upper Division State, through the exclusive authority vested in each for the administration and distribution of its waters, will ensure that released water is directed to each state line or to Lake Powell pursuant to state law, as applicable.

5.6.2. Transit Loss

Transit losses are generally factored in as part of Reclamation's existing models, which estimate loss and gain volumes related to water conveyance from the Upper Basin to Lake Powell. Using those existing models, Reclamation can estimate the adjustments to Lake Powell elevation levels based on any Drought Response Operations from the upstream Initial Units. Therefore, the DROA Parties will not separately estimate transit losses above and beyond the relationships that are captured in the existing models. The Upper Division States will not be bound to relationships assumed in Reclamation's models for other operational activities.

6. Accounting and Recovery

DROA requires monitoring of Drought Response Operations, including releases from or recovery at the upstream Initial Units.⁵⁰ One purpose of monitoring is to determine when to conclude Drought Response Operations, including the recovery of released water.

6.1. Accounting

Monitoring will be achieved through the development, implementation, and maintenance of a monthly water accounting system that exhibits the functional requirements and salient characteristics described hereafter:

⁵⁰ DROA § II(A)(3)(h).

- 1) Definitions:
 - a. Account: A ledger of credit and debit entries kept individually for each upstream Initial Unit to record the release or recovery of Drought Response Operation water. The DROA Parties have established Accounts beginning with the initial adjustment of releases from each upstream Initial Unit.
 - b. Account Balance: The status of releases or recovery of Drought Response Operation water in each upstream Initial Unit reservoir portrayed in each Account. This is calculated as the sum of all Drought Response Operation released volumes minus the sum of all Drought Response Operation recovered volumes to date.
 - c. Credit and Debit: For accounting purposes, the terms Credit and Debit are used to reflect released (Credit) and recovered (Debit) volumes of water, respectively, from each Initial Unit.
 - d. Actual Condition: This reflects the condition of each upstream Initial Unit under Drought Response Operations and is the observed reservoir elevation, storage, and discharge from each Unit.
 - e. Regular Operating Target Elevation: Established elevations for each Initial Unit that indicates full recovery when met as described in Attachment C through E.
 - f. Operations Without Drought Response Operations: Facility operations had the Storage Condition Without Drought Response been the Actual Condition. Operations Without Drought Response require operational judgement and will be consistent with historical operations and current operational policy at each upstream Initial Unit reservoir.
 - g. Storage Condition Without Drought Response: This is the storage condition of each upstream Initial Unit had Drought Response Operations not been implemented. The Storage Condition Without Drought Response for each upstream Initial Unit is its observed storage plus its current Drought Response Operation Account Balance.
- 2) The accounting platform will be integrated into Reclamation's monthly operations modeling.
- 3) Monthly accounting will include forward-looking projections and backward-looking calculations:
 - a. Forward-looking projection: Through modeling, a projection for each Account Balance will be determined for planning purposes only. An upstream Initial Unit's

actual Account Balance can only be updated in the backward-looking mode (below). Forward-looking projections will not prevent facility operators from making necessary operational adjustments in response to emerging information.

- b. Backward-looking calculation: This calculates each month's Credit or Debit to each Account Balance by subtracting the release volume that would have occurred without Drought Response Operations from the actual volume released (with Drought Response Operations). Each month's Credit or Debit is added to the prior Account Balance to calculate the current month's Account Balance.

4) Monthly Reporting:

- a. Monthly reports are available for each upstream Initial Unit Account and contains the following:
 - i. Drought Response Operation Credits;
 - ii. Drought Response Operation Debits; and
 - iii. End of month Account Balance.
- b. Monthly reporting will continue for each upstream Initial Unit until recovery is completed, and will resume each time an Account Balance accrues.

Accounting for release and recovery volumes is based on releases measured according to the established method at each upstream Initial Unit. Entries in the appropriate Account for each upstream Initial Unit will be fully documented and supportable. Ledger values (Credits and Debits) will be traceable to their origination, including as available: meter readings through powerplants and bypasses, modeling rulesets, annual operation plans including EISs, RODs, and approved experimental releases and/or documentation of decision-making related to the Condition Without Drought Response Operations.

The monthly operations model and the accounting results are available to the public on Reclamation's website. Reclamation will consider timely feedback from the public on accounting results.

6.2. Recovery

An essential element of any Drought Response Operation is recovering any water released as part of a Plan.⁵¹ Full recovery occurs when the Initial Unit has either "recovered the

⁵¹ DROA § II(A)(3)(e): "Recovery of Storage at CRSPA Initial Units: Recovery of storage at the CRSPA Initial Units is essential to any drought response operation. Consistent with Section II.A.3.b-c, the drought response operations process will be completed only after each CRSPA Initial Unit has recovered the storage as defined below."

cumulative volume of water that was released” from a Drought Response Operation⁵² or when the Initial Unit “has reached the regular operating target elevation”⁵³ based on hydrologic conditions and actual operating experience at each Initial Unit at the time of recovery. Each proposed Plan will describe how recovery will be achieved under the current or any future Plan, taking into consideration the status of recovery of each Initial Unit from previous Drought Response Operation releases.

To minimize the risk of Lake Powell falling below the Target Elevation, recovery of Drought Response Operations at the upstream Initial Units should occur after water storage conditions at Lake Powell have improved.⁵⁴ However, this does not preclude the potential for Dual Operations, in accordance with DROA⁵⁵.

DROA specifies that operations to recover storage after a Drought Response Operation has been implemented will continue as long as necessary to recover from any Drought Response Operations conducted before October 1, 2026.⁵⁶

Specifics regarding recovery for each upstream Initial Unit are in Attachments C through E.

7. Consultation, Coordination, & Outreach

DROA contains various provisions for consultation, coordination, and outreach from the DROA Parties to non-DROA entities during the development and implementation of Plans.⁵⁷ In years when Plans are needed, the DROA Parties anticipate developing draft Plans during the late winter and early spring (February to April) of each year as more reliable hydrologic information

⁵² DROA § II(A)(3)(e)(i)(1): “The CRSPA Initial Unit, operating consistent with Section II.A.3.b, has recovered the cumulative volume of water that was released for implementation of drought response operations to minimize the risk of Lake Powell declining below the Target Elevation.”

⁵³ DROA § II(A)(3)(e)(i)(2): “The water elevation at the CRSPA Initial Unit has reached the regular operating target elevation for that facility, for example, deicing target elevation at the Aspinall Unit, the current end-of- water-year storage target at Navajo Reservoir, or the May 1 Upper Level Drawdown Elevation target at Flaming Gorge Reservoir.”

⁵⁴ DROA § II(A)(3)(e)(i): “Storage at a CRSPA Initial Unit is recovered when the first of either of the following occurs: (1) The CRSPA Unit...has recovered the cumulative volume of water that was released for implementation of drought response operations...; or (2) the water elevation at the CRSPA Initial Unit has reached the regular operating target elevation for that facility”

⁵⁵ DROA § II(A)(3)(e)(ii): “Hydrologic variability within the Upper Basin may render releases from a CRSPA Initial Unit ineffective in achieving the intent and goal of this Drought Response Operations Agreement... Moreover, drought response releases from any CRSPA Initial Unit do not preclude recovery of storage actions at another Unit simultaneously.”

⁵⁶ DROA § II(A)(6): “...Operations to recover storage after a drought response operation has been implemented will continue as long as necessary to recover from any drought response operations taken before October 1, 2026.”

⁵⁷ During “Emergency Action,” as defined in DROA, DROA §§ II(A)(3)(j) & II(A)(4)(e). The Department committed to conduct any Emergency Action, “to the greatest extent practicable, with advance consultation and coordination with the Upper Division States, through the Commission, and following consultation with the Governors’ Representatives of the Colorado River Basin States consistent with the Agreement Concerning Colorado River Drought Contingency Management and Operations (“Companion Agreement”).”

becomes available. The DROA Parties anticipate the finalization of yearly plans in April of each year, with implementation occurring throughout the year until April of the following year. As such, the consultation, coordination, and outreach described in this section will need to occur during the February to April time period each year. The DROA Parties intend to provide draft Drought Response Operations concepts and Plans as they become available,⁵⁸ usually during this February to April time period each year.

Consistent with the DROA provisions, the DROA Parties will conduct consultation, coordination, and outreach as described in Section 7 of this Framework below. Because the timeframes for developing or modifying a Plan will be limited and the data that informs development or modification of a Plan will change frequently, a Plan or amendment may need to be implemented quickly due to changing hydrology. Given time constraints, the DROA Parties will use their best efforts to satisfy the consultation, coordination, and outreach provisions as described in Section 7 of this Framework, but anticipate that consultation, coordination and outreach will not be as extensive for an amendment as during the development of the DROA Plan for a given year.

7.1. Consultation with the Lower Division States

DROA requires consultation with the Lower Division States several times. First, prior to finalizing a Plan, DROA requires providing the terms of a draft Plan to the Governors' Representatives of the Lower Division States.⁵⁹ DROA then requires the DROA Parties to consider and address, as appropriate, any questions or concerns regarding the terms of the draft Plan.⁶⁰

Second, when implementing a Plan, the DROA Parties will “[b]e available to respond to the Lower Division States’ questions or concerns, should they arise, regarding ongoing implementation of Drought Response Operations.”⁶¹

Third, the DROA Parties will consult with the Lower Division States when “the Parties agree that the finalized Drought Response Operations Plan needs to be modified, amended, or supplemented for the purpose of more specifically clarifying the scope and detail of recovery of storage.”⁶²

7.2. Participation of Upper Basin Tribes

Each Upper Basin Tribe (Ute Indian Tribe, Paiute Indian Tribe of Utah, Southern Ute Indian Tribe, Ute Mountain Ute Tribe, Navajo Nation, and Jicarilla Apache Nation) may separately designate one representative to participate in and provide recommendations to any working group established by the DROA Parties to help draft, develop, implement,

⁵⁸ DROA § II(A)(5).

⁵⁹ DROA § II(A)(4)(b)(iii).

⁶⁰ DROA § II(A)(4)(b)(iii).

⁶¹ DROA § II(A)(4)(d)(ii).

⁶² DROA § II(A)(4)(d)(iv).

analyze proposals for, or monitor any Drought Response Operation. Each Upper Basin Tribe may designate different representatives for any group in which that Tribe has chosen to participate, or multiple Tribes may designate the same, single representative to participate in any group. The representatives designated by the Upper Basin Tribes shall be referred to collectively as the Upper Basin Tribal Representatives. Participation by any Upper Basin Tribe in any working group shall be wholly voluntary. Participation in the groups shall be in addition to, and shall not be construed to replace, opportunities that any individual Tribe, in the Upper Basin or otherwise, has for formal consultation with the United States regarding drought response, operations of Initial Units, or any other matter.

7.3 Outreach and consultation with Native American Tribes

DROA requires outreach and notification to Native American Tribes “relevant to the respective CRSPA Initial Units of plans and concepts for drought response operations as they become available.”⁶³ The DROA Parties will provide regular updates on the status of Drought Response Operations planning for Native American Tribes as information becomes available.

The DROA Parties will offer opportunities for all Colorado River Basin Native American Tribes to participate. Participation may include providing written input on the development of a Plan, exchanging background documents and data, and meeting for individual informal discussions.

Additionally, the Department will offer informal and formal Government-to-Government consultations with Tribes. Discussions between the Tribes and the Department do not preclude other DROA Parties from discussing potential Plans with Tribes as appropriate.

Any DROA discussions with Native American Tribes are in addition to and do not replace opportunities that Tribes may have for input and consultation regarding operations of Initial Units or other authorities that govern the Tribal-federal government relationships.

DROA requires that water rights and other interests of Tribal Nations, often memorialized in settlements and contracts, be considered as part of Initial Unit Operations that cannot change as part of Drought Response Operations.⁶⁴ As part of development of this Framework, several Tribal Nations commented on the need to protect their water rights and other aspects of Initial Unit operations as part of any Plan. Tribal involvement in the development of Drought Response Operations will ensure that Tribal rights remain protected and that Drought Response Operations consider the preferences of individual

⁶³ DROA § II(A)(5): “public outreach regarding drought response operations will include, but may not be limited to, notifying Native American Tribes, local governments, interested stakeholders, and operational and technical workgroups relevant to the respective CRSPA Initial Units of plans and concepts for drought response operations as they become available.”

⁶⁴ DROA § II(A)(3)(b).

Tribes within the flexibilities available for a particular Drought Response Operation.

7.4. Coordination within the Department of the Interior

Reclamation will arrange for discussions and coordination among agencies within the Department regarding Drought Response Operations, as appropriate. Such discussions and coordination are in addition to and do not replace coordination with Departmental agencies that occur as part of the Initial Units' operations.

7.5. Coordination with WAPA

Reclamation has an agreement to consult with WAPA⁶⁵ regarding Drought Response Operations and will coordinate with WAPA and WAPA's firm electric service customers and representatives pursuant to that agreement. Such coordination is in addition to and does not replace discussions with WAPA that occur as part of the Initial Units' operations.

7.6. Coordination with Initial Unit Workgroups

The DROA Parties will coordinate with the appropriate workgroups involved with Initial Unit operations including, but not limited to the Glen Canyon Dam Adaptive Management Work Group, Flaming Gorge Technical Work Group, San Juan River Basin Recovery Implementation Program, and Upper Colorado River Endangered Fish Recovery Program, and utilize existing Initial Unit processes to address operations.

7.7. Outreach to other stakeholders and interested entities

The DROA Parties will provide regular updates on the status of Drought Response Operations planning for water users, NGOs, other stakeholders, and interested entities. The DROA Parties will also offer opportunities for such entities and stakeholders to provide written comments on any draft Plan. The Upper Division States have the primary responsibility to conduct outreach to water users within their respective state, while the Federal government retains responsibility to conduct outreach concerning Federal contracts.

7.8. Coordination among the DROA Parties

DROA requires that the DROA Parties "will coordinate on any public outreach for drought response operations at the CRSPA Initial Units" and that "[s]uch coordination will begin prior to outreach activities with the goal of streamlining discussions and avoiding or resolving differences."⁶⁶ A DROA Party conducting public outreach activity will notify the other DROA Parties in advance of such outreach and, if applicable, be

⁶⁵ Contract No. 19-WC-40-746, dated June 7, 2019 between Bureau of Reclamation and Western Area Power Administration.

⁶⁶ DROA § II(A)(5).

prepared to describe the anticipated scope of such outreach. Public outreach under this provision does not include internal communications within an individual DROA Party's organization necessary for that DROA Party's internal consideration of a proposed Plan.

Pursuant to DROA, the Upper Division State Commissioners and the Upper Colorado River Commission (UCRC) will review and consider a final Plan after consultation with the Governors' Representatives of the Lower Division States. Upon approval of the final Plan by both the Upper Division State Commissioners and the UCRC, the UCRC will forward the final Plan to the Secretary for consideration and approval.⁶⁷

Attachment H describes consultation, coordination, and outreach that was conducted. It may not be possible for all concerns raised during Outreach to be mitigated.

8. Monitoring and Potential Amendments During Plan Implementation

DROA requires monitoring activities as appropriate as part of any Plan.⁶⁸ Modeling projections relied upon for a Plan cannot predict precise conditions at a given time in the Upper Basin. Accordingly, the DROA Parties intend for any Plan to provide sufficient flexibility to begin, end, or adjust Drought Response Operations as needed based on actual hydrologic conditions.

During the implementation of a Plan, the DROA Parties will coordinate weekly, or at such intervals as otherwise agreed to, to conduct monitoring activities related to the Drought Response Operations. Monitoring activities will include consideration of the most current hydrologic conditions and projections as described in Section 3 herein, as well as application of the principles described in Section 5 herein. The DROA Parties may amend Plans as necessary based upon changing conditions.

Based upon monitoring activities, and only upon mutual agreement of the DROA Parties,⁶⁹ any Plan may be modified, adjusted, or ended through the adoption of an amendment to the applicable Attachment(s). Amendments to Attachments will include all of the types of information included in the original Attachment(s) and will incorporate a description of monitoring activities and monitoring activity results. Amendments to Attachments will describe the reasons for the amendment(s) and will supersede the original Attachment(s) or any preceding amendments to the extent identified in the Amendment.

Any Plan amendments may need to be implemented quickly due to changing hydrology to achieve the purpose and intent of a Plan.⁷⁰ Given time constraints, the DROA Parties will use

⁶⁷ DROA § II(A)(4)(c).

⁶⁸ DROA § II(A)(3)(h): "Monitoring: The Parties agree to include monitoring activities as appropriate as part of any drought response operations (release or recovery of storage). The Parties will incorporate the results of such monitoring into consideration of whether to begin, end, or modify drought response operations."

⁶⁹ The Secretary retains all applicable authority as described in DROA § II(A)(4)(e).

⁷⁰ DROA § II(A)(4)(b)(ii): Plans will "Provide for timely adjustments in drought response operations based upon actual monthly hydrology to achieve the purpose and intent of this Drought Response Operations Agreement."

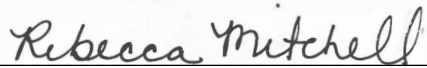
their best efforts to satisfy the consultation, coordination, and outreach provisions as described in Section 7 of this Framework, but anticipate that consultation, coordination and outreach will not be as extensive as during the development of the DROA Plan for a given year.

In addition to the monitoring activities described in this Section, any DROA Party may request a meeting with other DROA Parties to consider any Plan amendments.

9. **Approval by Upper Division States Commissioners and the Upper Colorado River Commission**

On the date and year written below, the Upper Division States Commissioners and the Upper Colorado River Commission have approved this 2023 Plan and direct the Upper Colorado River Commission to forward this final 2023 Plan to the Secretary for consideration and approval.

THE STATE OF COLORADO



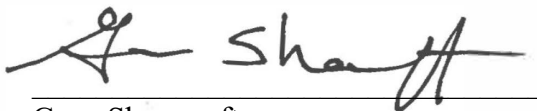
Rebecca Mitchell
Colorado Commissioner, Upper Colorado
River Commission
Governor's Representative

THE STATE OF NEW MEXICO



Estevan R. López
State of New Mexico Commissioner,
Upper Colorado River Commission

THE STATE OF UTAH



Gene Shawcroft
State of Utah Commissioner,
Upper Colorado River Commission

THE STATE OF WYOMING

A handwritten signature in blue ink, appearing to read "Brandon Gebhart", written over a horizontal line.

Brandon Gebhart
State of Wyoming Commissioner,
Upper Colorado River Commission

UPPER COLORADO RIVER COMMISSION

A handwritten signature in blue ink, appearing to read "Chuck Cullom", written over a horizontal line.

Chuck Cullom
Executive Director
Upper Colorado River Commission

Attachments to the Framework
2023 Drought Response Operations Plan

Index

1. Attachment A – Summary of 2023 Drought Response Operations Plan
2. Attachment B – Operational Adjustments at Glen Canyon Dam
3. Attachment C – Operations at Flaming Gorge
4. Attachment D – Operations at the Aspinall Unit
5. Attachment E – Operations at Navajo Reservoir
6. Attachment F – Natural Resources Consideration
7. Attachment G – Impacts to the Basin Fund and Bulk Electrical System
8. Attachment H – Consultation, Coordination and Outreach

Attachment A

Summary of 2023 Drought Response Operations Plan

1. Current (as of April 2023) and Projected Hydrological Information:

1.1 Insert current and projected elevations at Lake Powell, including graphic representation from the Bureau of Reclamation's (Reclamation) multi-year projections;

The April forecast for water year 2023 (October 2022-September 2023) ranges from a Minimum probable of 12.27 million acre-feet (maf) (128 percent of average⁷¹) to a Maximum probable of 17.86 maf (186 percent of average) with the Most probable forecast for water year 2023 of 14.47 maf (151 percent of average) (Figure 1). There is a 10 percent chance that inflows could be higher than the current Maximum probable forecast and a 10 percent chance that inflows could be lower than the minimum probable forecast.

Based on the April 2023 forecast of 14.47 maf unregulated inflow for water year 2023, the Colorado River Mid-term Modeling System 24-Month Study (24-Month Study) projects Lake Powell will end water year 2023 near elevation 3,576.50 feet with approximately 9.02 maf in storage (39 percent of capacity). Note that projections of elevation and storage for water year 2023 have considerable uncertainty at this point in the season. Projections of end of water year 2023 Powell elevations using the April 2023 24-Month Study Minimum Probable and Maximum Probable inflow forecast results model runs are 3,564.55 feet (35 percent of capacity) and 3,606.71 feet (50 percent of capacity), respectively (Figure 2). The annual release volume from Lake Powell during water year 2023 is 7.0 maf as determined under Section 6.C.1 of the 2007 Interim Guidelines. Consistent with this operating approach and based on the most probable inflow forecast, the April 2023 24-Month Study projects a balancing release of 9.50 maf from Lake Powell in water year 2023; however, the actual release in water year 2023 will range between 7.00 and 9.50 maf and will depend on actual hydrology and reservoir conditions at Lake Powell and Lake Mead during the remainder of the water year. The projected release from Lake Powell in water year 2023 will be updated each month throughout the remainder of the water year.

Powell elevation as of April 20, 2023, is 3,522.94 feet (23 percent of capacity). The projected elevation based on the April 2023 24-Month Study for December 2023 is 3,573.47 feet (38 percent of capacity) under the Most Probable scenario and 3,559.34 feet (33 percent of capacity) under the Minimum Probable projection.

⁷¹ Percent of average is based on the historical unregulated inflow for the period of record between October 1, 1990 through September 30, 2020 comprising the 1991 through 2020 water years.

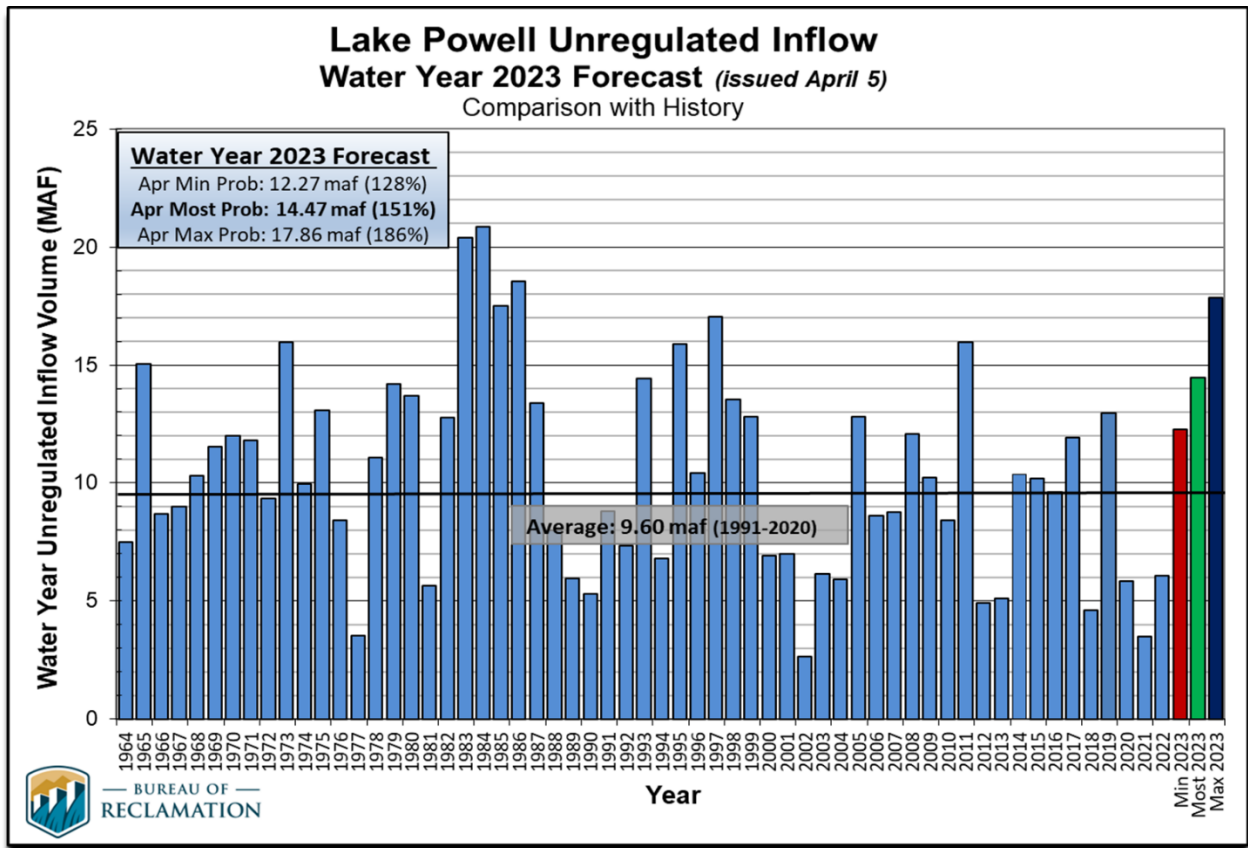


Figure 1. Lake Powell unregulated inflow for Water Year 2023 with the forecast issued April 5, 2023, for Minimum, Maximum and Most probable forecasts as compared against chronological historical water year unregulated inflow forecasts.

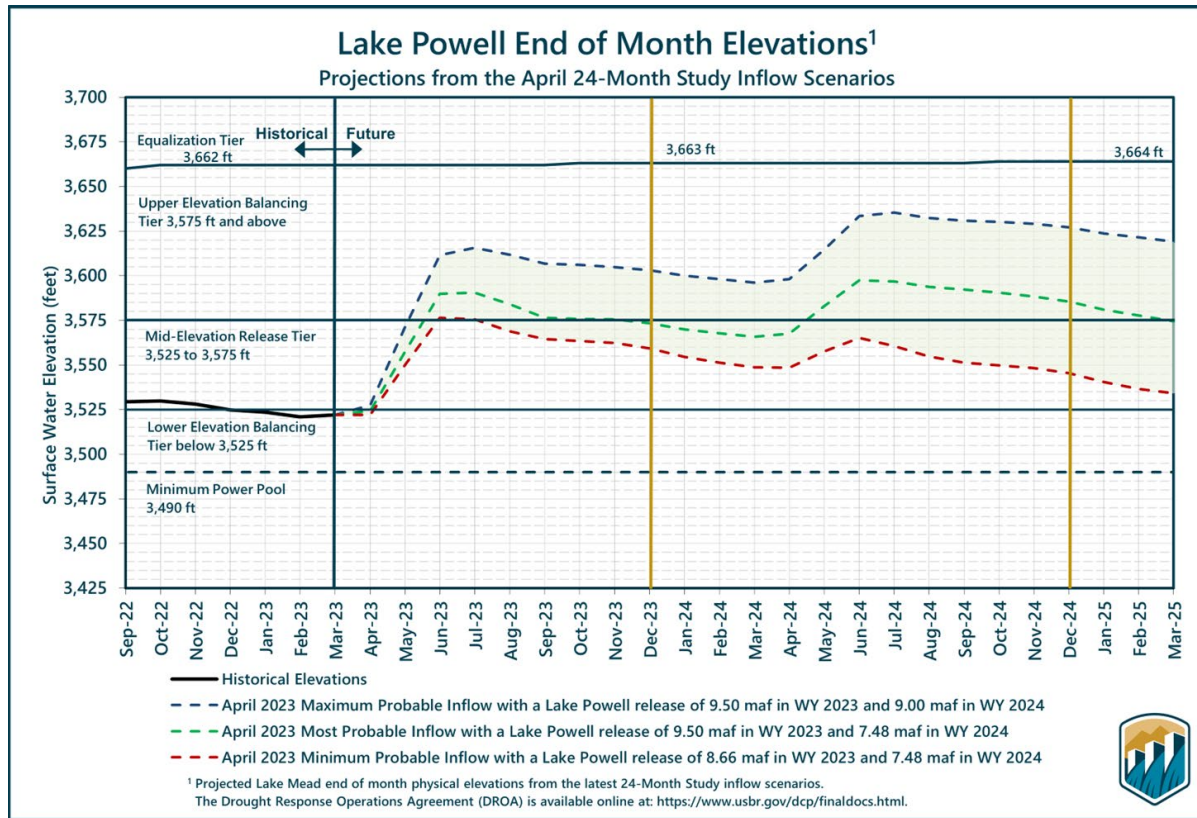


Figure 2. Lake Powell historical and projected end of month elevations using the Maximum, Minimum and Most Probable forecasts from the April 2023 24-Month Study.

1.2 Insert Reclamation's most recent Colorado River Mid-term Modeling System 24-Month Study (24-Month Study);

Reclamation's April 2023 24-Month Study Most Probable scenario can be found using this hyperlink: https://www.usbr.gov/uc/water/crsp/studies/24Month_04.pdf

Reclamation's April 2023 24-Month Study Minimum Probable scenario can be found using this hyperlink: https://www.usbr.gov/lc/region/g4000/24mo/2023/APR23_MIN.pdf.

Reclamation's April 2023 24-Month Study Maximum Probable scenario can be found using this hyperlink: https://www.usbr.gov/lc/region/g4000/24mo/2023/APR23_MAX.pdf.

1.3 Insert identification of months when the 24-Month Study Minimum Probable inflow and the Most Probable inflow each projected Lake Powell to be at an elevation below the Target Elevation;

Powell elevations based on the April 2023 24-Month Study are below the Target Elevation in April 2023, and rebound above the Target Elevation beginning May 2023

for the remainder of 2023 and through 2024, under the Minimum, Maximum, and Most probable forecasts in the April 2023 24-Month Study.

1.4 Insert current and projected elevations at each of the Initial Units for the following 24 months;

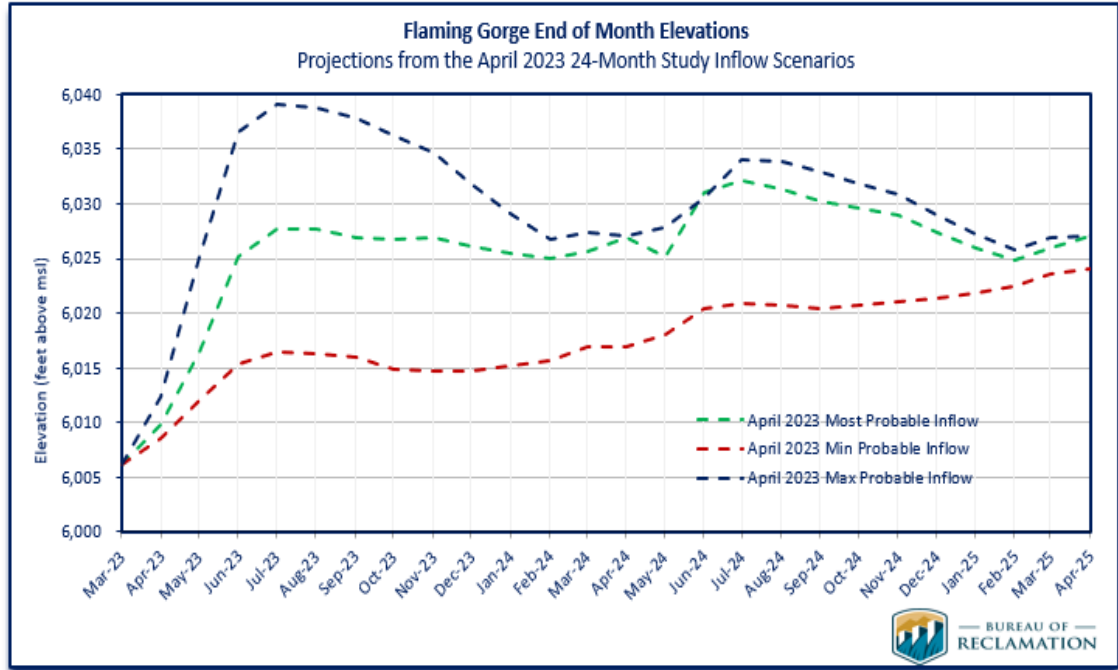


Figure 3. Flaming Gorge projected end of month elevations using the Maximum, Minimum and Most Probable forecasts from the April 2023 24-Month Study.

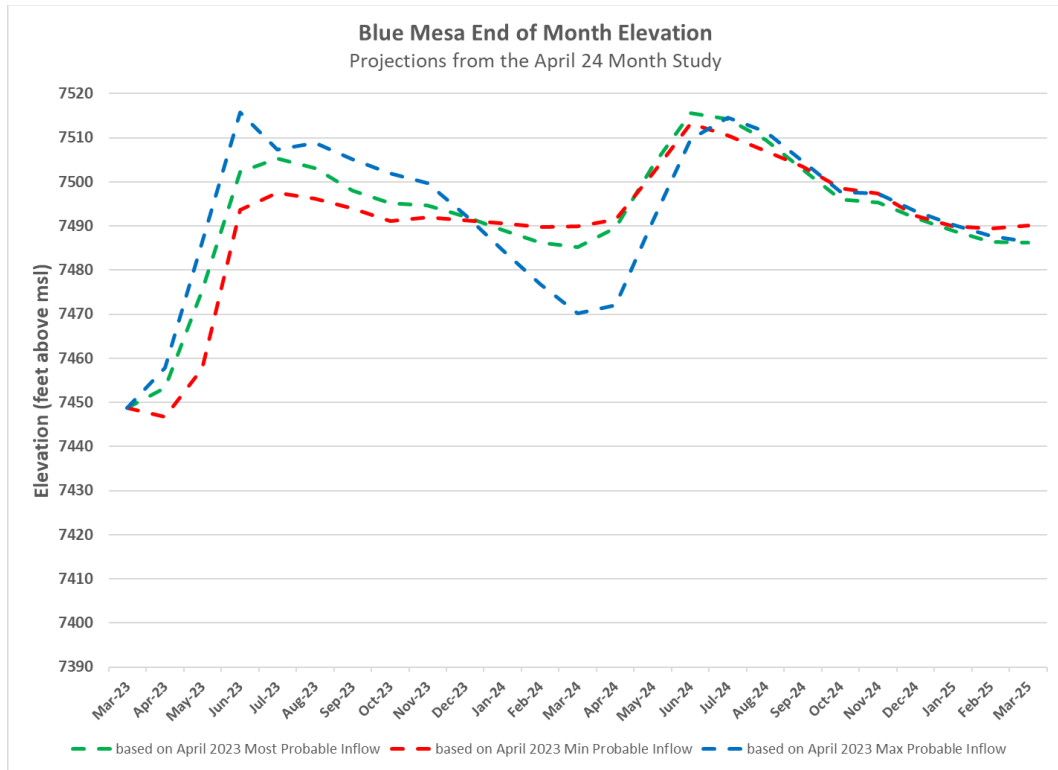


Figure 4. Blue Mesa projected end of month elevations using the Maximum, Minimum and Most Probable forecasts from the April 2023 24-Month Study.

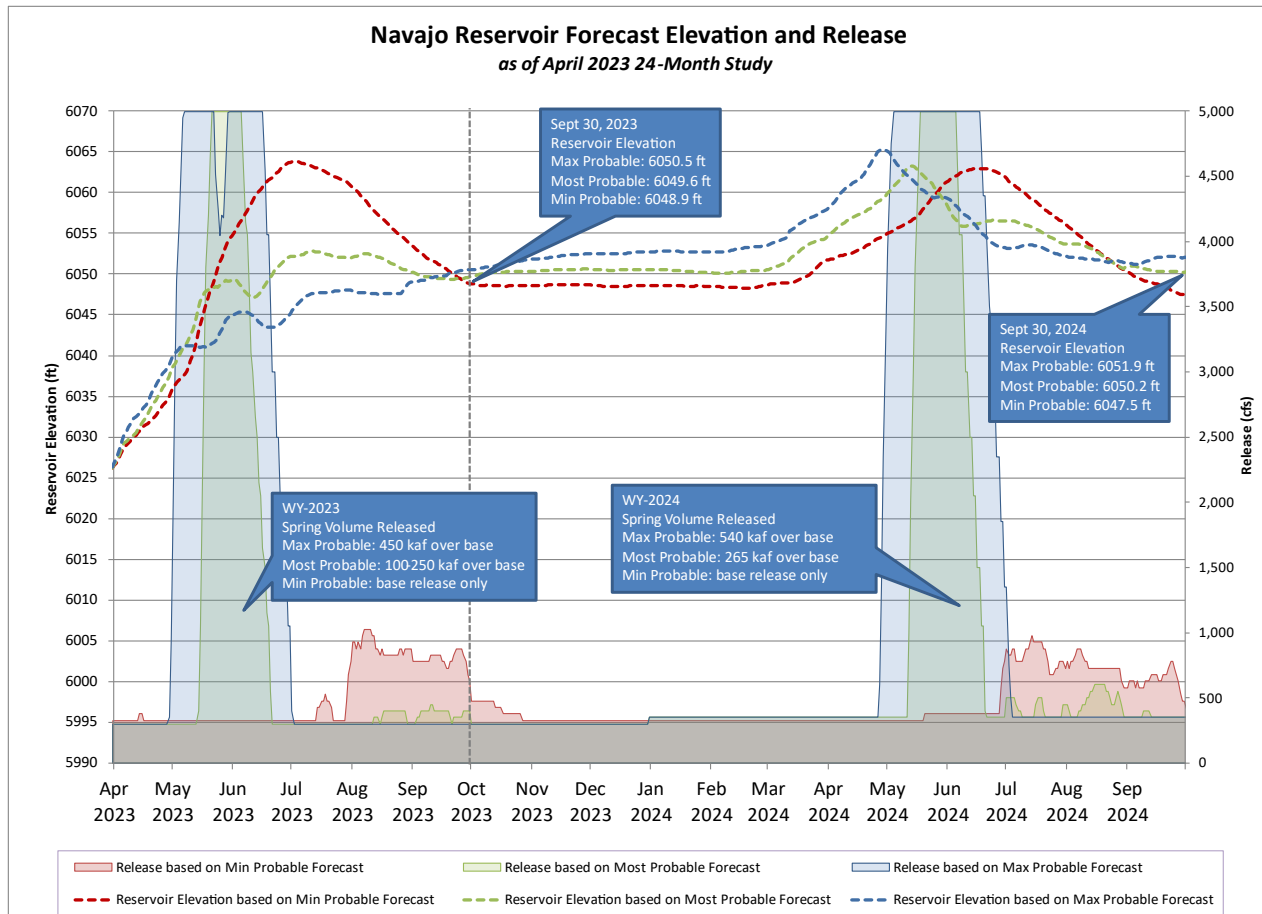


Figure 5. Navajo projected end of month elevations using the Maximum, Minimum and Most Probable forecasts from the April 2023 24-Month Study.

1.5 Insert availability of water for Drought Response Operations at each of the Initial Units and the timing of such water availability;

- i. Glen Canyon: Glen Canyon Dam operational adjustments during winter 2023 or spring 2024 will be evaluated pursuant to 2023 Drought Response Operations Plan Section 5.2.2, Lake Powell Monthly Operations Adjustments.
- ii. Flaming Gorge: At this time there is no plan to release DROA water from Flaming Gorge through the 2023 DROA year to protect critical elevations at Lake Powell. However, based on current hydrological conditions, a Drought Response Recovery operation to recover the 125,000 acre-feet DROA release volume in 2021 and the 463,000 acre-feet DROA release volume in 2022 for a total of 588,000 acre-feet is anticipated during the 2023 DROA year as follows:

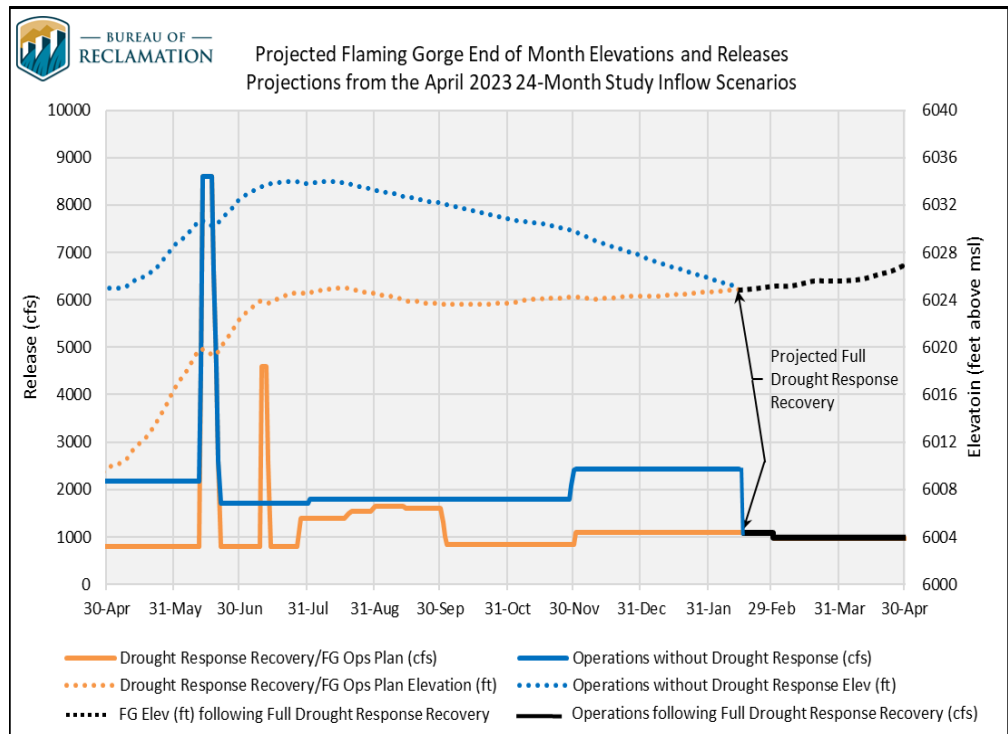


Figure 6. Projected Flaming Gorge End of Month Elevations and Releases - Projections from the April 24-Month Study Inflow Scenarios, Average above Median hydrologic classification with and without DROA operations.

- iii. Aspinall: At this time there is no plan to release DROA water from the Aspinall Unit through the 2023 DROA year to protect critical elevations at Lake Powell. However, it is necessary to recover the 35,810 ac-ft DROA release volume from Blue Mesa Reservoir that occurred in 2021. Recovery of prior Drought Response Operations Releases is anticipated during the 2023 DROA year as follows:

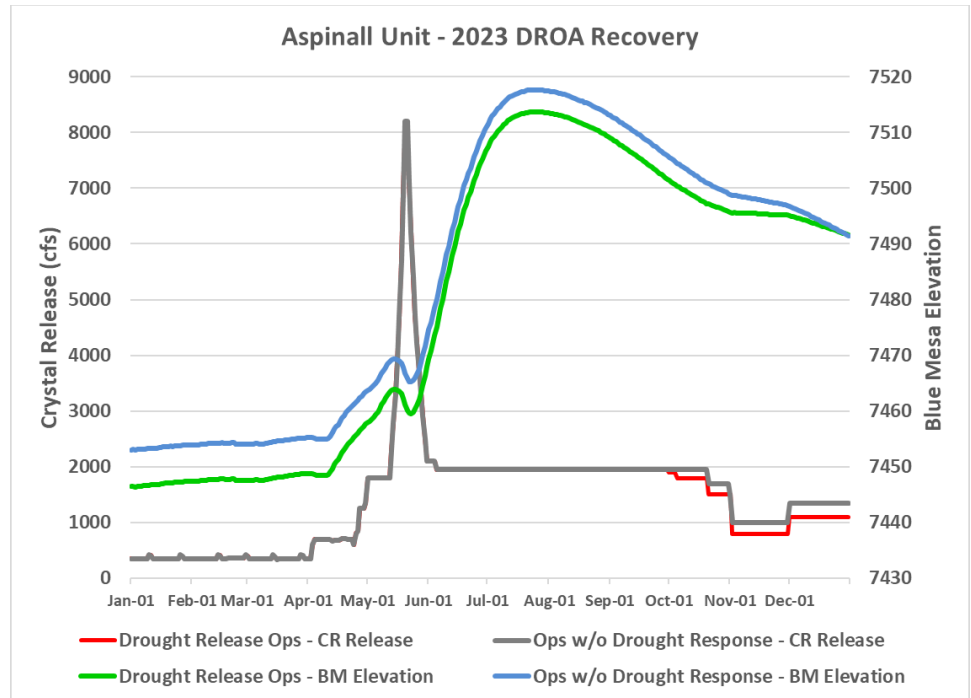


Figure 7. Graph illustrating projected Drought Response Recovery at Aspinall Unit

- iv. Navajo: At this time there is no plan to release DROA water from Navajo Reservoir through the 2023 DROA year to protect critical elevations at Lake Powell. The volume of available DROA water will be re-evaluated at the beginning of water year 2024. No releases have been made from Navajo Reservoir to date pursuant to DROA. Therefore, no recovery is necessary as of April 30, 2023.

1.6 Insert summary of previous Drought Response Operations at each Initial Unit (Glen Canyon, Flaming Gorge, Aspinall, Navajo), if any. The summary will include:

1.6.1 Previous Drought Response Operation Agreement Actions Prior to Current Plan

1.6.1.1 Previous Drought Response Operation Agreement Actions Prior to current plan at Glen Canyon Dam

Based upon the November 2022 24-Month Study, Powell elevations under the Minimum, Maximum and Most Probable scenarios were expected to decrease below the Target Elevation beginning in March and April 2023, with the CRMMS probabilistic range reaching levels 6 inches above minimum power pool before rebounding above the Target Elevation in May 2023. Accordingly, Reclamation adjusted monthly release volume patterns for Glen Canyon Dam under the

2022 Plan to hold back a total of 523 thousand acre-feet (kaf) in Lake Powell from December 2022 through April 2023. The same amount of water (523 kaf) is scheduled to be released to Lake Mead between May 2023 and September 2023. The annual volume of water released from Glen Canyon Dam is unchanged by these adjustments.

1.6.1.2 Previous Drought Response Operation Agreement Actions prior to current plan at upstream Initial Units

In addition to the operational adjustments at Glen Canyon Dam described in 1.6.1.1 above, in 2021 during the months of July, August, September, and October, releases were made from upstream Initial Units based on a determination of imminent need by Reclamation as provided for in DROA II(A)(3)(j). These releases totaled 161,000 acre-feet from Flaming Gorge and Aspinall Unit (Blue Mesa) as follows:

DROA Releases Completed in 2021

	Jul	Aug	Sep	Oct	Nov	Dec	Sum
Flaming Gorge	12	45	44	24	0	0	125
Blue Mesa	0	17	16	3	0	0	36
Navajo	0	0	0	0	0	0	0
Sum:	12	62	60	27	0	0	161

** All releases in thousand acre-feet*

In 2022, the DROA Parties entered into a DROA Plan for the release of 500,000 acre-feet from Flaming Gorge. The 2022 DROA Plan was subsequently amended, and the releases were suspended in early March 2023, due to improving hydrology and the opportunity to prepare for future dry conditions by preserving and retaining storage in upstream initial units consistent with DROA. Actual releases made under the 2022 DROA Plan, as amended, were as follows:

DROA Releases Completed under 2022 DROA Plan

	May	June	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Sum
Flaming Gorge	97	19	15	25	36	55	51	55	56	51	3	463

** All releases in thousand acre-feet*

1.6.2 Estimated effect on Lake Powell from Drought Response Operation Releases based upon best available information

Reclamation estimates, based on its existing models, that the DROA Release Operations that occurred in 2021 increased Lake Powell’s elevation between 2.43 feet and 2.68 feet. Reclamation estimates that the releases made under the 2022 DROA Plan increased Lake Powell’s elevation between approximately 7.08 feet and 7.85 feet. For 2021 and 2022, the total estimated increase is 9.51 feet to 10.53 feet. Additional analysis will continue that could improve estimates of the effect of Drought Response Operations releases on Lake Powell.

1.6.3 Status of Recovery from previous Drought Response Operation Releases, including any releases pursuant to Emergency Actions

To date, the amounts listed above have not been recovered at Blue Mesa. The following has been recovered for Flaming Gorge:

DROA Recovery Completed

	Mar 23	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Sum
Flaming Gorge	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5

** All releases in thousand acre-feet*

2. Insert summary of 2023 Drought Response Operations. This summary will include the following:

2.1 Projections for the Drought Response Operations incorporated for the Minimum, Maximum, and Most Probable inflow traces.

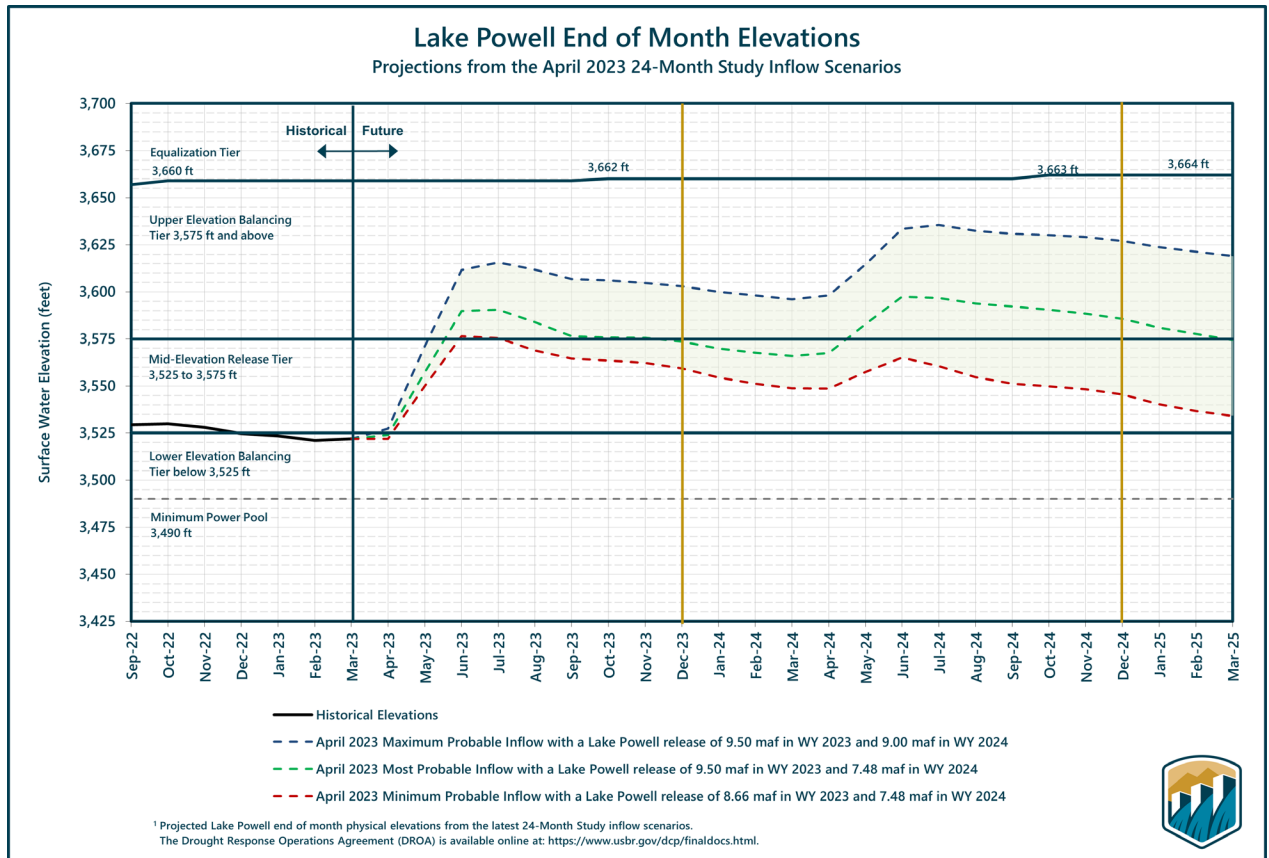


Figure 8.

2.2 A description of operational adjustments at Glen Canyon Dam, if any, which will include a comparison of such operational adjustments to operations when no adjustments are made. This comparison may be provided through text, tables, figures, and graphs as needed.

Glen Canyon Dam operational adjustments during spring 2024 will be evaluated pursuant to 2023 Drought Response Operations Plan Section 5.2.2, Lake Powell Monthly Operations Adjustments. These operational adjustments will be based on projections of the Target Elevation at Lake Powell during winter and spring 2024 and may be similar to the adjustments seen during 2023, if necessary.

2.3 A description of Drought Response Operations releases and recovery at affected Initial Units, as applicable, as set forth in Attachments C through E. This will include the amount of water involved (rate, volume, and timing), a description of each reservoir's water level over the following 24 months.

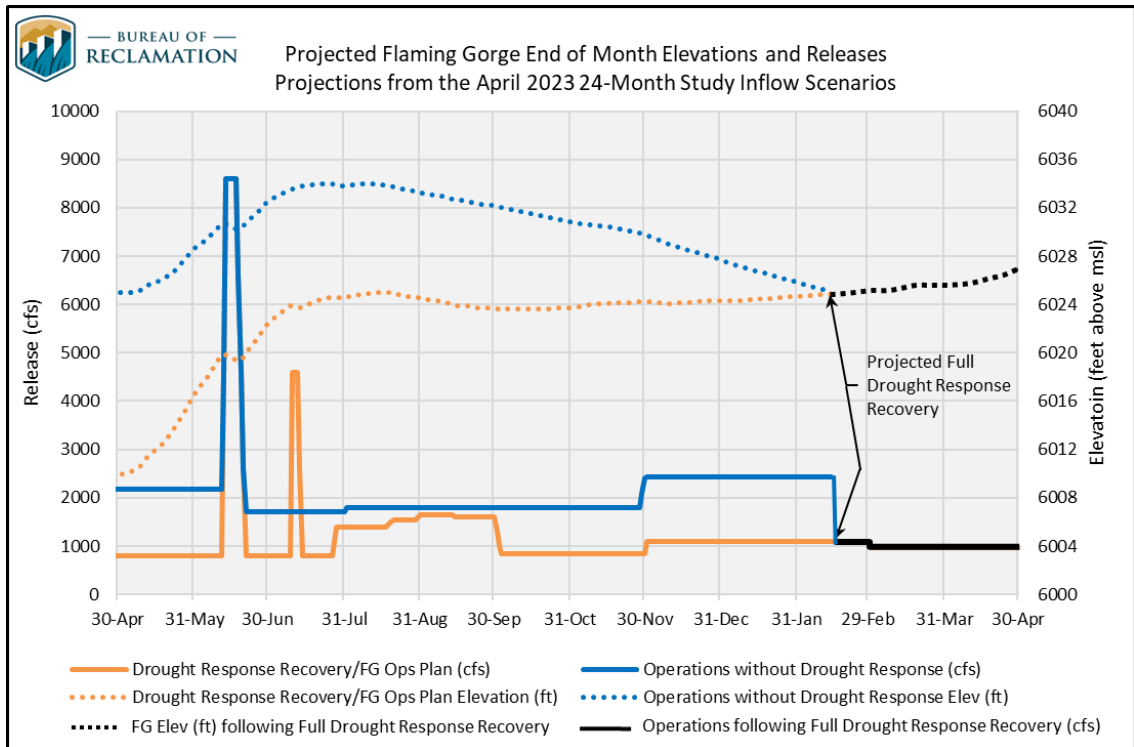


Figure 9. Projected Flaming Gorge End of Month Elevations and Releases - Projections from the April 24-Month Study Inflow Scenarios, Average above Median hydrologic classification with and without DROA operations.

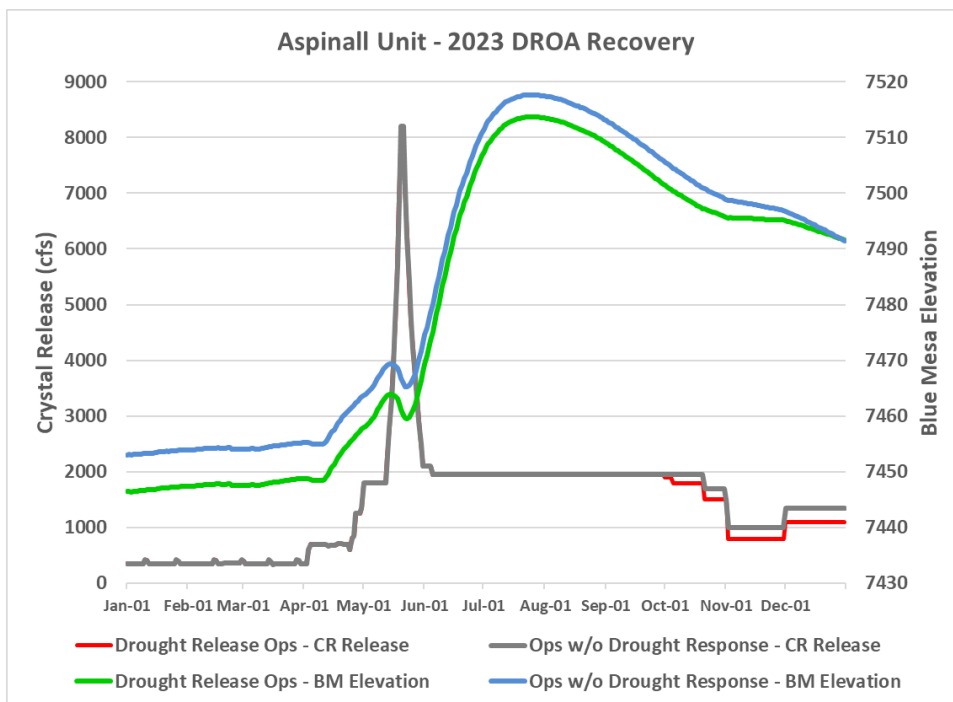


Figure 10. Graph illustrating projected Drought Response Recovery at Aspinall Unit.

No releases have been made from Navajo Reservoir to date pursuant to DROA. Therefore, no recovery is necessary as of April 2023.

3. *Insert summary describing application of the effectiveness criteria described at Section 5.3. These criteria include, without limitation:*

The evaluation of effectiveness considers the DROA Target Elevation of 3,525 ft. at Lake Powell and also the critical infrastructure elevation of 3,490 ft. The DROA identifies the target elevation of 3,525 ft. as the level at which to begin to take proactive measures to protect Lake Powell from declining below elevation 3,490 ft. Actual hydrologic conditions indicate that DROA releases are not currently needed to protect the critical elevations at Lake Powell. The projected wet conditions provide a critical opportunity to prepare for future dry conditions by preserving and retaining storage in upstream Initial Units consistent with DROA. The DROA Parties will consider additional Drought Response Operations, if necessary, during the course of their monitoring activities, which will be documented through an Amendment.

Attachment B

2023 Drought Response Operations Plan

Operational Adjustments at Glen Canyon Dam

1. Glen Canyon Dam Operations Without Drought Response

The 2007 Interim Guidelines control annual release volumes. Any monthly adjustments to Glen Canyon Dam releases cannot and do not change annual release volumes. Monthly releases from Glen Canyon Dam are determined by the 2016 Record of Decision for the Glen Canyon Dam Long-Term Experimental and Management Plan (LTEMP), which addresses hourly, daily, monthly, and experimental releases from Glen Canyon Dam and a variety of resources below Lake Powell in accordance with the Grand Canyon Protection Act of 1992. These operational parameters determine the flexibility for any Drought Response Operation.

2. Current Hydrology

The April forecast for water year 2023 ranges from a Minimum probable of 12.27 million acre-feet (maf) (128 percent of average⁷²) to a Maximum probable of 17.86 maf (186 percent of average) with the Most Probable forecast for water year 2023 of 14.47 maf (151 percent of average) (Figure 1). There is a 10 percent chance that inflows could be higher than the current Maximum probable forecast and a 10 percent chance that inflows could be lower than the Minimum probable forecast.

Based on the April 2023 forecast of 14.47 maf unregulated inflow for water year 2023, the Colorado River Mid-term Modeling System 24-Month Study (24-Month Study) projects Lake Powell elevation will end water year 2023 near 3,576.50 feet with approximately 9.02 maf in storage (39 percent of capacity). Note that projections of elevation and storage for water year 2023 have considerable uncertainty at this point in the season. Projections of end of water year 2023 Powell elevations using the April 2023 24-Month Study Minimum Probable and Maximum Probable inflow forecast results model runs are 3,564.55 feet (35 percent of capacity) and 3,606.71 feet (50 percent of capacity), respectively (Figure 2). Under these scenarios, there is a 10 percent chance that inflows will be higher, resulting in higher elevation, and 10 percent chance that inflows will be lower, resulting in lower elevation. Consistent with this operating approach and based on the Most Probable inflow forecast, the April 2023 24-Month Study projects a balancing release of 9.50 maf from Lake Powell in water year 2023; however, the actual release in water year 2023 will range between 7.00 and 9.50 maf and will depend on actual hydrology and reservoir conditions at Lake Powell and Lake Mead during the remainder

⁷² Percent of average is based on the historical unregulated inflow for the period of record between October 1, 1990 through September 30, 2020 comprising the 1991 through 2020 water years.

of the water year. The projected release from Lake Powell in water year 2023 will be updated each month throughout the remainder of the water year.

Powell elevation as of April 20, 2023, is 3,522.89 feet (23 percent of capacity). The projected elevation based on the Probable April 2023 24-Month Study for December 2023 is 3,573.47 feet (38 percent of capacity) under the Most Probable scenario and 3,559.34 feet (33 percent of capacity) under the Minimum Probable projection.

Based upon the April 2023 24-Month Study, Powell elevations under the Minimum and Most Probable scenarios are expected to increase above the Target Elevation (3,525 feet) beginning May 2023 and remain above the Target Elevation through the 24-Month Study time frame under both the Most and Minimum Probable scenarios.

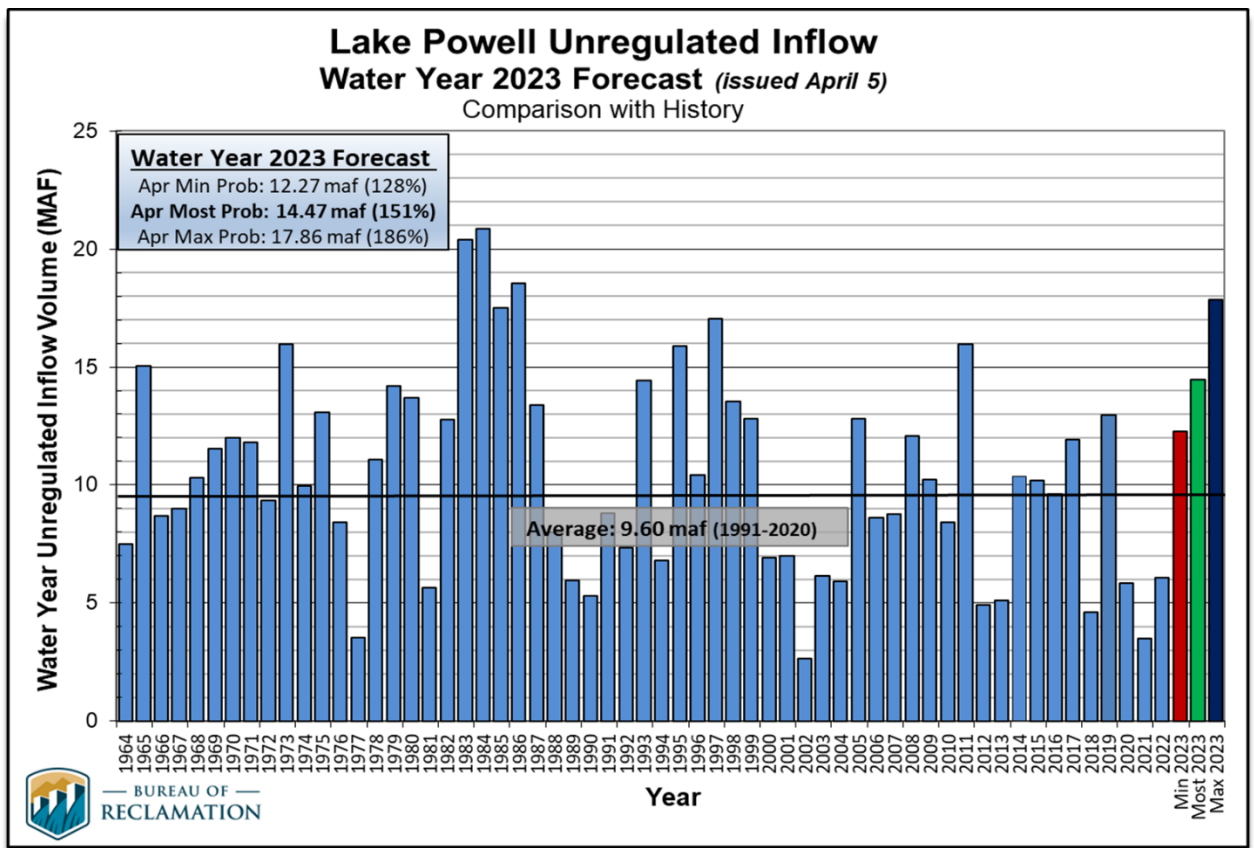


Figure 1. Lake Powell unregulated inflow for Water Year 2023 with the forecast issued April 5, 2023, for Minimum, Maximum and Most probable forecasts as compared against chronological historical water year unregulated inflow forecasts.

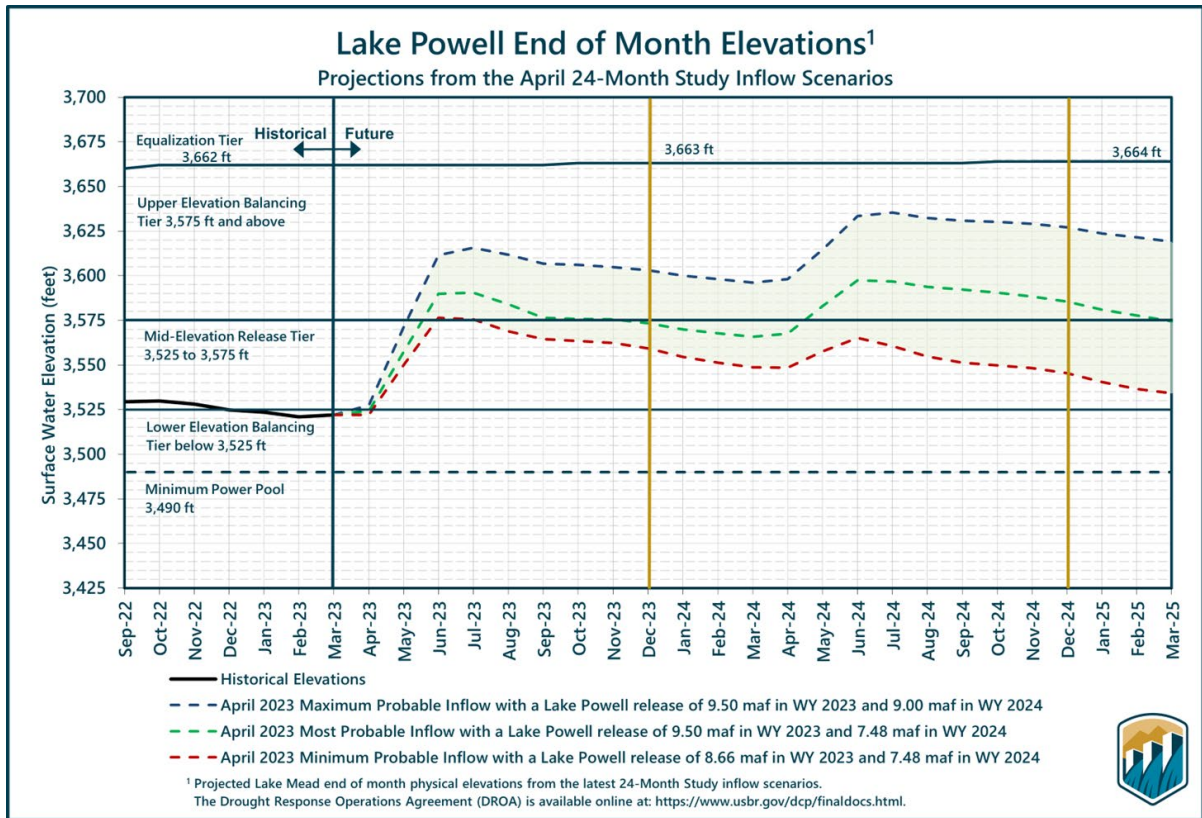


Figure 2. Lake Powell historical and projected end of month elevations using the Maximum, Minimum and Most Probable forecasts from the April 2023 24-Month Study.

3. Glen Canyon Dam without Drought Response during Plan year

The operation of Lake Powell in the April 2023 24-Month Study is pursuant to the Interim Guidelines and reflects the 2023 Annual Operating Plan (AOP). Pursuant to the Interim Guidelines, the August 2022 24-Month Study projections of the January 1, 2023, system storage and reservoir water surface elevations set the operational tier for the coordinated operation of Lake Powell during 2023.

The August 2022 24-Month Study projected the January 1, 2023 Lake Powell elevation to be less than 3,525 feet. Consistent with Section 6.D.1 of the Interim Guidelines, Lake Powell's operation in water year 2023 is governed by the Lower Elevation Balancing Tier with an initial projected water year release volume of 7.00 million acre-feet (maf). However, the actual release in water year 2023 will range between 7.00 and 9.50 maf and will depend on actual hydrology and reservoir conditions at Lake Powell and Lake Mead during the remainder of the water year. The projected release from Lake Powell in water year 2023 will be updated each month throughout the remainder of the water year.

As described in the 2019 Drought Response Operations Agreement and the 2023 Drought Response Operations Plan Section 5.2.2, Lake Powell Monthly Operations Adjustments, Lake Powell monthly release volumes are determined by the 2016 Record of Decision for the Glen Canyon Dam Long-Term Experimental and Management Plan (LTEMP), which addresses hourly, daily, monthly, and experimental releases from Glen Canyon Dam. The

standard monthly release volume patterns for a range of annual flows, including for a 7.00 maf water year release volume, is contained in Attachment B of the LTEMP ROD. (Figure 3)

Monthly Release Volume (thousand ac-ft) ^a										
Total Annual	7,000	7,480	8,230	9,000	9,500	10,500	11,000	12,000	13,000	13,000
October	480	480	643	643	643	643	643	643	643	643
November	500	500	642	642	642	642	642	642	642	642
December	600	600	716	716	716	716	716	716	716	716
January	664	723	763	857	919	1,041	1,102	1,225	1,347	1,470
February	587	639	675	758	813	921	975	1,083	1,192	1,300
March	620	675	713	801	858	973	1,030	1,144	1,259	1,373
April	552	601	635	713	764	866	917	1,019	1,121	1,223
May	550	599	632	710	761	862	913	1,014	1,116	1,217
June	577	628	663	745	798	905	958	1,064	1,171	1,277
July	652	709	749	842	902	1,022	1,082	1,202	1,322	1,443
August	696	758	800	899	963	1,091	1,156	1,284	1,413	1,537
September	522	568	600	674	722	819	867	963	1,059	1,160

^a Release volumes in October, November, and December typically do not vary in years with annual volumes ≥ 8.23 maf because the forecasted annual release volume is not known in the beginning of the water year. In other months, release volumes generally follow the proportions shown in the third column of Table 2, up to the maximum and minimum flow constraints presented in Table 1. Within a year, monthly operations may be increased or decreased based on factors referenced in Section 1.2 and 1.3.

Figure 3. LTEMP Attachment B, Table 3 setting forth the monthly volume releases for each water year release monthly release volume determined under the 2007 Interim Guidelines.

4. Glen Canyon Dam Drought Response Operations

a. Previous Drought Response Operations Agreement Actions Prior to Current Plan – Spring 2022 and 2023

Based upon the November 2022 24-Month Study, Powell elevations under the Minimum, Maximum and Most Probable scenarios were expected to decrease below the Target Elevation beginning in March and April 2023, with the CRMMS probabilistic range reaching levels 6 inches above minimum power pool before rebounding above the Target Elevation in May 2023. Accordingly, Reclamation adjusted monthly release volume patterns for Glen Canyon Dam under the 2022 Plan to hold back a total of 523 thousand acre-feet (kaf) in Lake Powell from December 2022 through April 2023.

Reclamation began monthly adjustments at Glen Canyon Dam on December 1, 2022, taking initial steps to protect Lake Powell dropping below the Target Elevation. The adjusted releases were designed to help protect the Target Elevation at Lake Powell until spring runoff materialized. Lake Powell’s spring elevation increased approximately 10 feet with the 523 kaf operational adjustment. The same amount of water (523 kaf) is scheduled to be released to Lake Mead between May 2023 and September 2023. The

annual volume of water released from Glen Canyon Dam is unchanged by these adjustments. (Figure 4).

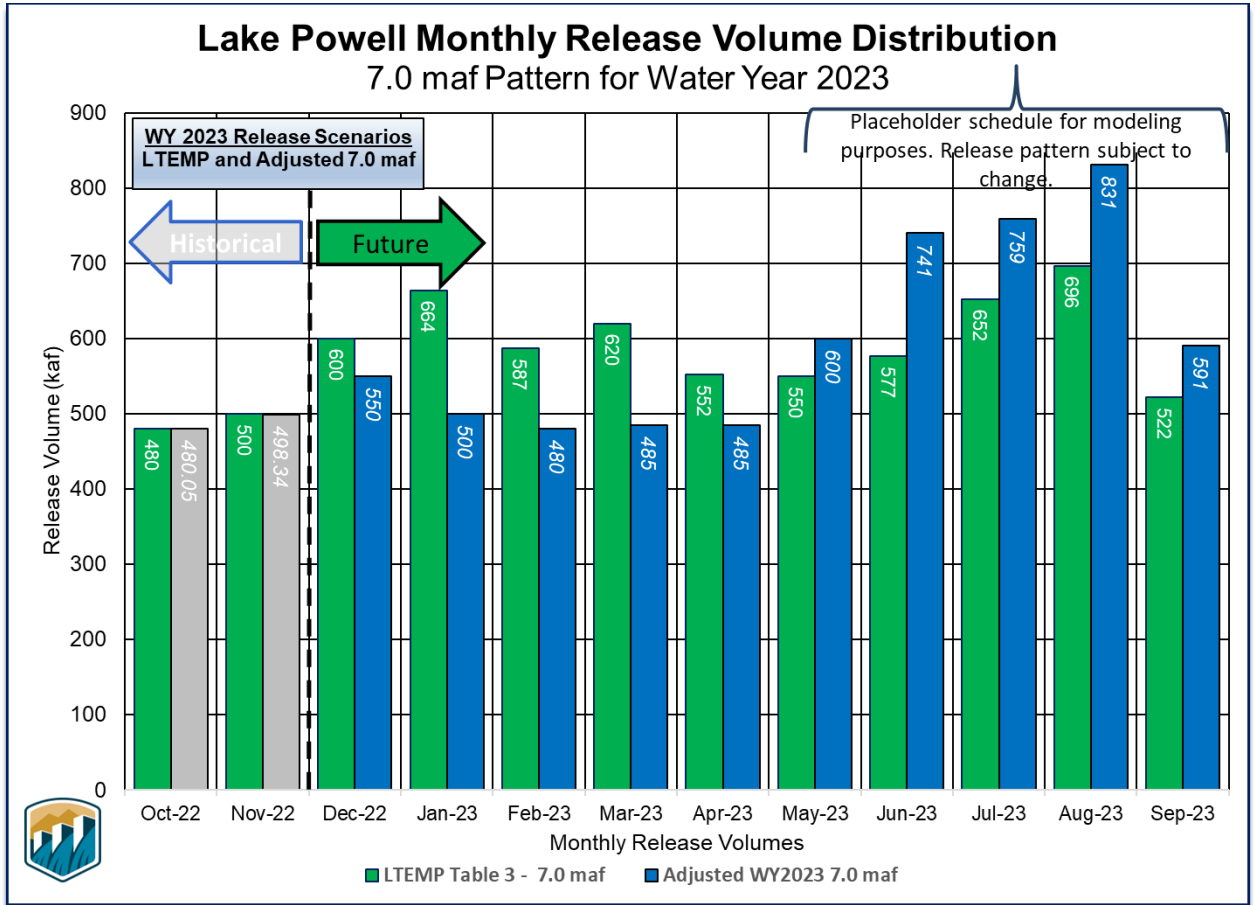


Figure 4. Lake Powell monthly release volume distribution for Water Year 2023 illustrating the standard LTEMP release pattern in green and the adjusted LTEMP release pattern holding back 523 kaf during December 2022 through April 2023. The adjusted pattern during the months of May through September 2023 is for modeling purposes to meet the operational requirements of releasing 7.0 million acre-feet (maf) under the Interim Guidelines Section 6.D.1. during Water Year 2023.

The adjusted monthly release patterns during the December 2022 through April 2023 period for Glen Canyon Dam were discussed during the Glen Canyon Dam operational coordination meeting pursuant to LTEMP ROD, Attachment B, § 1.1, and the analysis performed above was provided during the discussion. Further, the operational adjustments of monthly release patterns during the December 2022 through April 2023 period, as contemplated in DROA, were discussed during the Glen Canyon Dam Adaptive Management Work Group hydrology and operations discussion held in January 2023.

Based on the Most Probable inflow forecast, the April 2023 24-Month Study projects a balancing release of 9.50 maf from Lake Powell in water year 2023; however, the actual release in water year 2023 will range between 7.00 and 9.50 maf and will depend on actual hydrology and reservoir conditions at Lake Powell and Lake Mead during the remainder of the water year. The projected release from Lake Powell in water year 2023 will be updated each month throughout the remainder of the water year. The 2.5 maf increase includes the 523,000 acre-feet operational adjustment to monthly Glen Canyon Dam releases. Glen Canyon Dam unit availability during the remainder of water year 2023 limits power plant capacity releases to six units. It is anticipated that, if the annual release volume remains at 9.5 maf, Glen Canyon Dam will release power plant capacity from May through September 2023. (Figure 5)

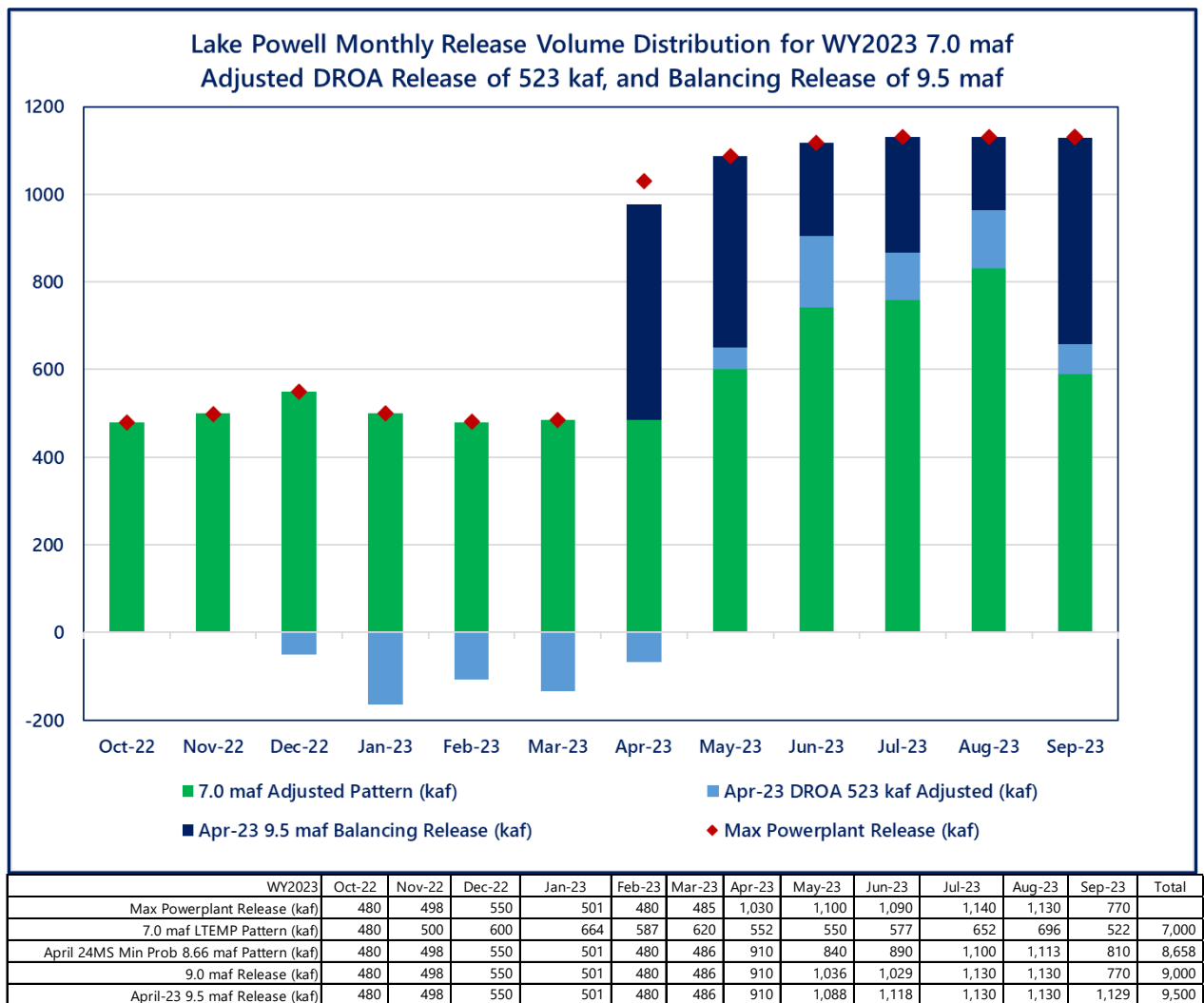


Figure 5. Glen Canyon Dam monthly release volumes showing the Drought Response Operations adjusted monthly volume release pattern in green, the monthly volume adjustments in light blue, the balancing release in dark blue and full power plant capacity release with the red diamond. The monthly release volumes for water year 2023 are shown in the data table above and include the April Minimum Probable 8.66 maf monthly release volume pattern.

b. Current Drought Response Operations (May 2023-April 2024)

Glen Canyon Dam operational adjustments during spring 2024 will be evaluated pursuant to 2023 Drought Response Operations Plan Section 5.2.2, Lake Powell Monthly Operations Adjustments. If any operational adjustments are required, they will be based on projections of the Target Elevations at Lake Powell during winter and spring 2024 and may look similar to the adjustments seen during winter and spring 2022 and 2023.

5. Contracts

Existing water supply contracts and agreements at Glen Canyon Dam are described below. Any future contracts which become executed will be described here. Water supply contracts and agreements are not impaired by monthly release volumes.

- i. City of Page: 2,740 af/yr.
- ii. Navajo Nation – LeChee Chapter (expires 12/23/2049): 950 af/yr.
- iii. Salt River Project (expires 12/22/2024): 1,500 af/yr.

6. Coordination regarding Glen Canyon operations

LTEMP Attachment B, Section 1.3 resource impacts were analyzed and specifically discussed for water delivery, sediment, hydropower production and WAPA's assessment of the Basin Fund, and Tribal concerns.

Attachment C

2023 Drought Response Operations Plan

Operations at Flaming Gorge

1. Flaming Gorge Operations Without Drought Response

Flaming Gorge is operated for authorized purposes including water storage, flood control, contract releases, power production, recreation, and environmental conditions downstream of the reservoir for endangered fish recovery pursuant to the 2005 Biological Opinion and 2006 Flaming Gorge Record of Decision (FG ROD). Operating criteria have been developed to produce the necessary environmental parameters under a variety of hydrologic conditions⁷³.

The allowable range of Flaming Gorge operations is a function of the period of the year, hydrologic conditions, and ongoing or planned studies related to adaptive management in support of the endangered fish and the Upper Colorado River Endangered Fish Recovery Program (Recovery Program). Current operations at Flaming Gorge reflect ongoing experimentation that has been coordinated by and through the Flaming Gorge Technical Working Group and with the Flaming Gorge Working Group stakeholders.

Flaming Gorge operations are established in the spring based on forecasted runoff for the upcoming 12 months. The year is broken into three periods: Spring, Base Flow, and Transition.

The Flaming Gorge Annual Operation Plan (FG AOP) describes specific annual operations and releases made within the flexibility of the 2006 FG ROD. Specific operations for the Spring Period are established in the FG AOP for each given year and its timing varies depending on yearly hydrology. The Base Flow Period follows the Spring Period and typically constitutes flows from mid-July through the end of February. The Transition Period runs from March 1st through the beginning of the Spring Period or peak release. The FG AOP may be amended. Details of potential flows during each of the periods can be found in the FG AOP.

The Spring Period marks the beginning of the Annual Operation Plan for Flaming Gorge. It is characterized by the timing of the spring runoff and typically includes the months of April – July. The timing of the spring runoff period varies depending on yearly hydrology of the basin and is established in the Annual Operation Plan. The Base Flow Period is further categorized by the Summer, Autumn, and Winter Base Flows which vary according to downstream targets (Muth et al, 2000) which are established in approved

⁷³ These criteria are found in several documents, including the Environmental Impact Statement, Record of Decision, Biological Opinion, and the FG AOP, among others.

study plans and are dependent on Yampa River flows and Flaming Gorge reservoir surface elevation. The Transition Period comprises releases from March 1st through mid-May.

Paragraph II of the February 2006 Record of Decision for Operations of Flaming Gorge Dam Final EIS indicates Reclamation's "decision includes the potential for refinement of the flow and temperature recommendations if relevant new information gained through adaptive management supports that possibility." Current operations at Flaming Gorge reflect ongoing experimentation that has been coordinated with the Flaming Gorge Working Group stakeholders and vary from the flow recommendations included in the Final EIS (Table 2.1, Recommended Magnitudes and Duration of Maximum Spring Peak and Summer-to-Winter Base Flows and Temperatures for Endangered Fishes in the Green River Downstream from Flaming Gorge Dam as identified in the 2000 Flow and Temperature Recommendations).

2. Current Hydrology

Reclamation's April 2023 24-Month Study forecast for the April through July inflow into Flaming Gorge Reservoir is 1.20 million acre-feet, or 124 percent of average. The hydrologic classification for the Upper Green is average per the 2006 FG ROD. Forecasted exceedance flow volumes from the Yampa River Basin indicate a wet hydrologic condition. Based on factors listed in Table 2-5 (FEIS), particularly Yampa River conditions, among others, the flexibility in the Record of Decision allows for a change in hydrologic classification (spring operations); two higher and one lower than that designated by the forecasted unregulated inflow volume on May 1. Evaluating Table 2-5 (FEIS), including the water surface elevation of Flaming Gorge Reservoir and the May 1 forecasted unregulated inflow and Yampa River conditions (based on the April 2023 24-Month Study forecast), the hydrologic classification is average.

Monthly 24-Month Study Reports present hydrological descriptions and projected operations for the Colorado River system reservoirs for the next two years. The 24-Month Study projects future reservoir conditions and potential dam operations for the system reservoirs given existing reservoir conditions; inflow forecasts and projections; and a variety of operational policies and guidelines. Monthly reservoir inflow forecasts and projections are produced by the National Weather Service, Colorado Basin River Forecast Center (CBRFC).

More information on 24-month studies can be found on the Upper Colorado Basin Operations website here: <https://www.usbr.gov/uc/water/crsp/studies/index.html>.

3. Flaming Gorge Operations without Drought Response during the 2023 Drought Response Operations Plan Year

The Operations without Drought Response scenario is a theoretical operation representing operations that would be planned, or that would occur, in the absence of past or planned DROA operations. This scenario represents operations as though the combined Drought

Response Operations volume released under the 2021 Secretarial action and the 2022 DROA Plan had remained in Flaming Gorge. The hydrologic scenario chosen for this theoretical operation is the moderately-wet scenario. This option was chosen due to the Upper Green River and Yampa River April 1st forecasts as well as the theoretical Flaming Gorge water surface elevation had Drought Response Releases not occurred in 2021 and 2022. Theoretical operations are subject to monitoring and adjustment due to hydrology.

The Operations without Drought Response scenario includes a Larval Trigger Study Plan (LTSP) and Colorado pikeminnow (CPM) flow experiment, along with autumn and winter base flow operations and transition period operation. These operations are described in the following paragraphs.

Spring Peak Releases – During the spring peak flow period, an LTSP (LaGory et al. 2019) release would be optimized to achieve a flow greater than 18,600 cfs in Reach 2 for 5 or more days after the larval razorback sucker have been detected. Only 5 days were estimated to achieve flow over 18,600 in Reach 2. This is due to the estimated emergence of Razorback Sucker larvae, which is estimated to occur following the spring peak on the Yampa River during the 2nd week of June. This operation may include 4,600 cfs ramp up on one day followed by 4,000 cfs ramp up using bypass the following day, with a sustained ~8,600 cfs for 5 days followed by a ramped-down at 2,000 cfs/day to 1,700 cfs until the summer base flow begin.

Base Flow Period – During the base flow period (late July 2023 – Feb 29, 2024), releases from the dam would be ~1,800 cfs to achieve CPM experimental flows for a moderately wet operation (2,200-2,800 cfs) at the lower range. The lower range is targeted to meet ROD temperature objectives. The moderately wet (autumn and winter base flow) range of 2,400-2,800 per Muth et al. would be achieved. This may include being within the +/-40% and +25% respective Reach 2 ranges. Autumn releases would target the lower range to achieve 2,400 cfs in Reach 2. Winter releases will target ~3,000 cfs in Reach 2.

Transition Period (March 2023 through middle to late May 2023) – The transition period would occur between March 1 to April 30, 2024. During this transition period, average releases would be increased or decreased to achieve the May 1 Upper Limit Drawdown elevation (EIS Table 2-3, see below). Under normal operations during the transition period, releases would be limited to a range from 800 cfs to powerplant capacity (4,600 cfs). Under current projections, the anticipated release would be 1,175 cfs. The target pool elevation for May 1, 2024 is between 6023'-6027' (see table 2) due to the uncertainty and extended operation, with a high uncertainty for spring 2024 forecast.

4. Flaming Gorge Operations with Drought Response (Recovery) during the 2023 Drought Response Operations Plan Year

Drought Response Recovery operations for DROA 2023 were considered as part of the established process for the Flaming Gorge Annual Operation Plan. The Flaming Gorge

Technical Working Group flow proposal was considered and, based on current projections, can be achieved under reduced releases associated with the Drought Response Recovery operations. Drought Response Recovery operations were also considered and reviewed by the Flaming Gorge Working Group. Generally, the magnitude and duration of Drought Response Recovery operations will depend in part on the Yampa River contributions for Reach 2 targets.

To meet the ROD, the acceptable range of flows meeting environmental conditions downstream of the dam for each hydrologic condition are included in Appendix 1 to this Attachment.

The Drought Response Recovery scenario was developed according to the current hydrologic conditions to achieve a reservoir elevation within the upper drawdown limit by April 30, 2024 (subject to hydrologic variability).

Drought Response Recovery operations will be performed within the operating range for the year's hydrologic classification conditions. To meet ROD objectives, monthly operations during spring releases may be modified by changing the hydrologic classification up two levels, or down one level. The hydrologic classification for base flow operations may also be changed up one level, or down one level. This flexibility to operate up or down hydrologic classifications is based on specific considerations within the FG ROD, which do not include Drought Response Operations or conditions at other reservoirs. Drought Response Recovery operations must remain within the range prescribed for the corresponding hydrologic conditions within the authorized flexibilities. Operations with Drought Response are subject to monitoring and adjustment due to hydrology.

Spring Peak Releases – The LaGory et al (2019) refined study plan (LTSP) is an approved experimental study plan and is expected to be fully implemented. The spring peak flow period includes a LTSP (LaGory et al., 2019) scenario for moderately dry, average below/above median hydrologic condition, moderately wet, and wet, which will be sustained for multiple days until targets are achieved. Under the most likely scenario bypass tubes may be used with a ramp-down rate of 2000 cfs/day. Following the LTSP period, releases will be ramped down to 800-850 cfs.

Smallmouth Bass Flow Spike -- The smallmouth bass (SMB) flow spike is an approved experimental study plan and may be implemented following the spring peak releases depending on hydrologic and biological conditions. This flow spike will consist of a ramp-up to full power plant capacity (about 4,600 cfs) in one day, an experimental flow of 72-hours' duration maintained at full power plant capacity, and a down-ramp at 2,000 cfs per day, to a release rate of 800-850 cfs. The smallmouth bass flow spike is predicted to occur between mid-June and early July 2023. If the May final forecast changes the Upper Green hydrologic classification to Moderately Wet, this SMB study plan will not be implemented.

Base Flow Period (early-mid July 2023 – Feb 29, 2024) -- The Colorado pikeminnow base flow is an approved experimental study plan and is expected to be implemented. LaGory et al., 2019 allows for 300 cfs/day transition between seasons, and this refinement to Muth et al. will be used. Colorado pikeminnow base flows occur in early through late summer. Colorado pikeminnow base flow rates as well as the autumn and winter base flow rates will be derived from the spring LTSP spring release target as described in Table 1. below. The autumn and winter releases will be set to achieve the Muth et al. respective ranges which are expected to result in a reservoir elevation near 6025 feet at the end of February 2024.

Transition Period (March 2024 through middle to late May 2024) – During this transition period, average releases are increased or decreased to achieve the Upper Limit Drawdown (EIS Table 2-3, see below). Releases under normal operations during the transition period are limited to a range from 800 cfs to powerplant capacity (4,600 cfs).

Table 1. Difference between without Drought Response Operations and with Drought Response Recovery operations.

Operation Period	Operations Without Drought Response*	Drought Response Recovery Operations*
Spring Peak LTSP Release– Release Volume (thousands of acre-feet or kaf) / Peak Release Rate (cfs) Duration (days) – ramp down rate	122 kaf / 8,600 cfs 5 days – 2,000 cfs/day ramp down	122 kaf / 8,600 cfs 5 days – 2,000 cfs/day ramp down
SMB Release Volume (kaf) / Peak Release Rate (cfs) Duration (days) -- Ramp Down	NA / NA	33 kaf / 4,600 cfs 3 days – 2,000 cfs/day ramp down
Base Flow Release Volume (kaf) / Average Release Rate (cfs) / Duration (July through February)	878 kaf / 2,069 cfs	501 kaf / 1,158 cfs
Transition Period Release Volume (kaf) / Average Release Rate (cfs) / Duration (March through April) (days)	139 kaf / 1,150 cfs	118 kaf / 975 cfs
Release Volume from above / TOTAL	1,139 kaf / 1,459 kaf	774 kaf / 891 kaf

**Release volumes dependent on Yampa River flows to achieve Reach 2 targets.*

Table 2. End of Month Flaming Gorge Elevations for the scenarios: Operations without Drought Response and with Drought Response Recovery operations.

	Flaming Gorge Elevation – Operations without Drought Response (feet)	Flaming Gorge Elevation - Drought Response Recovery operations (feet)
April-23	6025.00	6,009.78
May-23	6028.63	6,016.46
Jun-23	6032.55	6,022.26
Jul-23	6033.79	6,024.35
Aug-23	6033.25	6,024.36
Sep-23	6032.22	6,023.55
Oct-23	6030.82	6,023.61
Nov-23	6029.77	6,024.10
Dec-23	6027.72	6,024.21
Jan-24	6025.85	6,024.57
Feb-24	6024.22	6,024.99
Mar-24	NA*	6,025.57
Apr-24	NA*	6,026.85

**Note: Elevations for the “Operations without Drought Response” scenario will match the Drought Response Recovery operations once recovery has been completed.*

Figures 1 and 2 below represent graphically the Flaming Gorge Drought Response Operations Volume to be recovered and Flaming Gorge Elevations respectively based on projections from the April 2023 24-Month Study inflow scenarios.

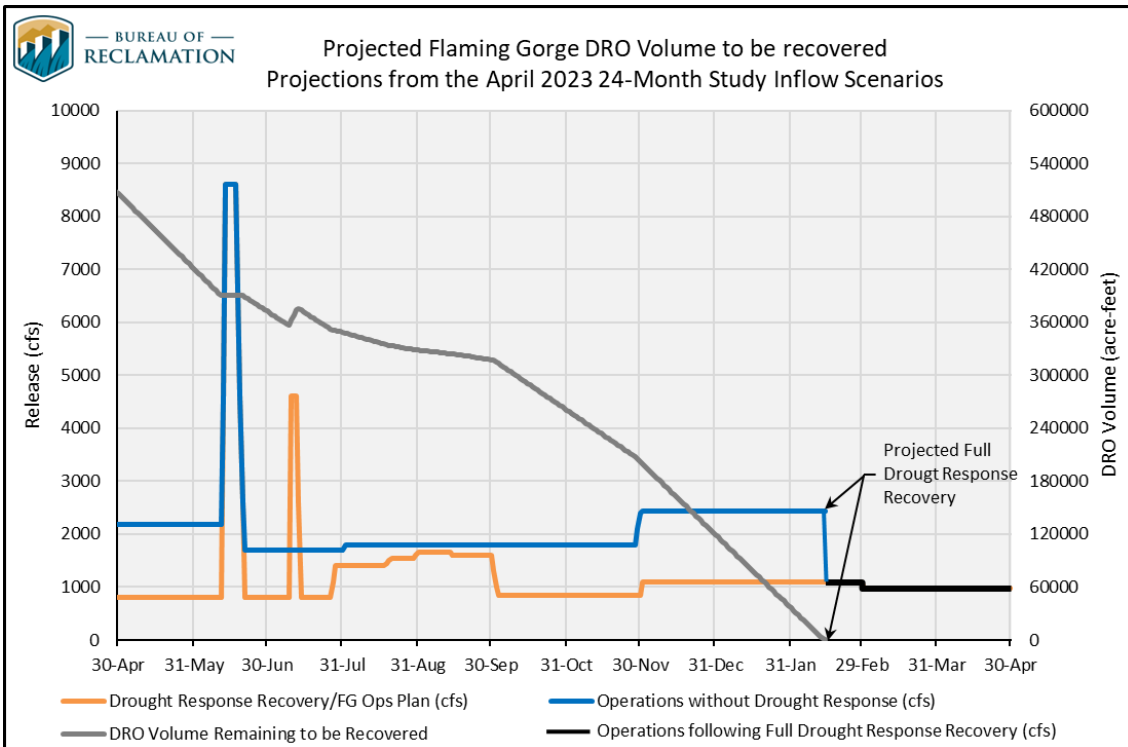


Figure 3. Projected Flaming Gorge DRO Volume to be recovered - Projections from the April 2023 24-Month Study Inflow Scenarios, Average above Median hydrologic classification

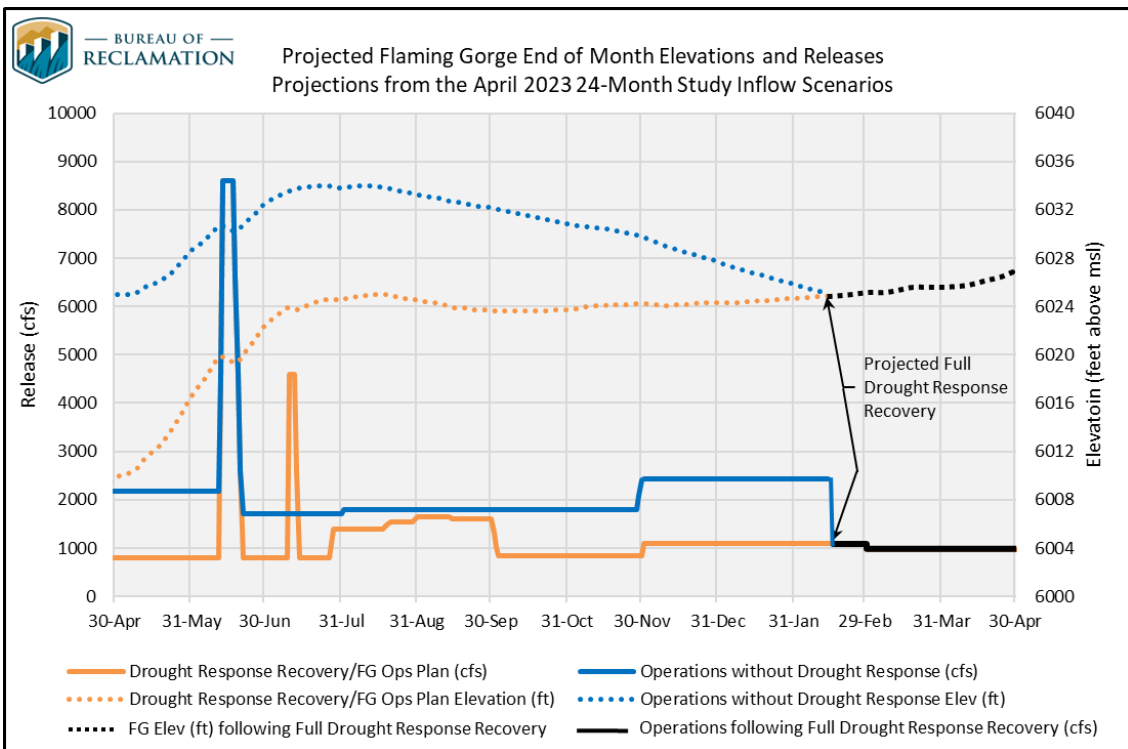


Figure 4. Projected Flaming Gorge End of Month Elevations and Releases - Projections from the April 2023 24-Month Study Inflow Scenarios, Average above Median hydrologic classification

5. Upper Limit Drawdown Level

In addition to the operating ranges identified in the tables in Appendix 1 to this Attachment, Flaming Gorge has a range of operating elevations that correspond to hydrologic conditions. The Upper Limit Drawdown Level is defined in the 2005 EIS, Table 2-3, provided here in Table 3, and was established to provide safe operation of the reservoir. Generally, to provide adequate flood storage space, Flaming Gorge must be drawn down to at least the elevations in Table 3 by May 1 of each year.

Table 3 –Upper Limit Drawdown Levels for Flaming Gorge Reservoir (2005 EIS Table 2.3)

Unregulated Inflow Forecast Percentage Exceedance Range	May 1 Upper Limit Drawdown Elevation Level (feet)
1 to 10	6023
10.1 to 30	6024
30.1 to 40	6025
40.1 to 59.9	6027

6. Lower Drought Response Operations Limit

The lower Drought Response Operations limit is a function of hydrologic conditions and storage water demands necessary on May 1st. At Flaming Gorge, these demands are primarily releases made for the Recovery Program. Using the same unregulated inflow forecast percentage exceedance range used in Table 3, the DROA Parties will determine the minimum acceptable drawdown elevation levels to fulfill the 2006 Flaming Gorge Record of Decision requirements and water supply agreements.

7. Drought Response Recovery at Flaming Gorge

Recovery of water released under DROA is essential to completing any DROA action. As a result of the improved hydrologic conditions, the DROA Parties agree that aggressive recovery of prior Drought Response Releases by April 30, 2024 is appropriate. Reclamation accordingly plans to operate Flaming Gorge within the confines of the FG ROD and, to the extent possible, fully recover the DROA water that has been previously released.

Drought Response Recovery at Flaming Gorge will be complete only when the first of either of the following occurs:

- a. The Flaming Gorge Account Balance as defined in Section 6 of the Framework has a

zero balance; or

- b. On May 1, 2024 Flaming Gorge elevation reaches the May 1 Upper Limit Drawdown Level. However, this Upper Limit Drawdown Level represents the maximum allowable elevation for dam safety purposes and operators have typically held a buffer from the maximum elevation as a prudent reservoir management measure. An evaluation of operations from 2006 to 2021 demonstrates the regular operating threshold is typically one-half foot below the May 1 Upper Limit Drawdown Level as shown in Table 4.

Recovery will be complete and Drought Response Operations will be concluded when either the exact amount of water released in 2021 and 2022 under DROA operations (588,267 acre-feet) is recovered or Flaming Gorge reaches the target elevation shown in Table 4 on May 1, 2024.

Table 4 – Regular Operation Target Elevation (2005 EIS Table 2.3)

Unregulated Inflow Forecast Percentage Exceedance Range	Recovery May 1 Elevation Level (feet)
1 to 10	6023 (+/-0.5)
10.1 to 30	6024 (+/-0.5)
30.1 to 40	6025 (+/-0.5)
40.1 to 59.9	6027 (+/-0.5)
60.0 to 70	6027 (+/-0.5)
70.1 to 90	6026.75 (+/-0.75)
90.1 to 100	6026.5 (+/-1.0)

8. Contracts

Existing water supply contracts and agreements at Flaming Gorge are described below. Any future contracts which become executed will be described here. Water supply contracts and agreements are not impaired by any Drought Response Operations because the water under contract or agreement is considered unavailable under DROA.

- i. Daggett County (expires 3/6/2026): 1,000 af/yr

9. Coordination

The Recovery Program provided its flow request to Reclamation on February 28, 2023, regarding 2023 FG Operations and generally identified considerations for potential Drought Response Operations at Flaming Gorge.

The Flaming Gorge Technical Work Group discussed Drought Response Operations during its March 2023 meetings. The Flaming Gorge Technical Work Group Proposal, which included experiments that supported Drought Response Recovery scenarios, was shared with the Flaming Gorge Working Group on March 16, 2023.

The Flaming Gorge Working Group met on March 16th and again on April 20th. Multiple Drought Response scenarios were presented to the Working Group.

10. Accounting

Accounting for release and recovery volumes for Flaming Gorge are accomplished by comparing actual releases with Drought Response Operations against theoretical Operations without Drought Response (backward-looking calculations). This accounting of release and recovery volumes will be included with the 24-Month Study projections and posted to Reclamation's website. A table for Flaming Gorge 2021 and 2022 Drought Response Releases and a table for the 2023 Drought Response Recovery are included in Section 1.6.1.2 of Attachment A.

a. Drought Release Operation (release)

In 2021, during the months of July, August, September and October, additional releases were made based on a determination of imminent need by Reclamation as provided for in DROA II(A)(3)(j), which resulted in additional releases of 125,000 acre-feet from Flaming Gorge.

For DROA year 2022, the DROA Parties developed a Drought Response Operations Plan to release an additional 500,000 acre-feet from Flaming Gorge. In response to improved hydrology, the DROA Parties amended the 2022 DROA Plan to suspend Drought Release Operations for the remainder of the 2022 Plan Year (May 1, 2022 – April 30, 2023) on March 6, 2023. Reclamation accordingly reduced Flaming Gorge releases to 1,175 cubic feet per second (cfs) beginning March 7, 2023. Actual Drought Response Operations resulted in Flaming Gorge releasing a total of 463,267 acre-feet in additional releases as explained below in Section 10.b.

b) Drought Response Recovery (recovery)

The DROA Parties acknowledged the importance of beginning recovery as soon as possible. Therefore, after the suspension of releases described above, Reclamation determined on March 16, 2023 that it would be prudent, based on hydrology and reservoir conditions, to further reduce releases to 925 cfs to begin DROA recovery operations. This reduction in releases below the theoretical Operations without Drought Response scenario, or baseline operations, resulted in roughly 5,000 acre-feet of Drought Response Recovery in March of the 2022 Operation/DROA year. Additional Drought Response Recovery volume from April 2023 is expected to be accounted for when the May 24-Month Study is published.

Attachment D

2023 Drought Response Operations Plan

Operations at the Aspinall Unit (Aspinall)

1. Aspinall Operations Without Drought Response

Aspinall operates in accordance with multiple state-decreed water rights and agreements and pursuant to the 2012 Aspinall Record of Decision (Aspinall ROD).

At all times, Aspinall must meet Colorado water administration requirements as determined by the Division 4 Engineer, including the required amount of flow-through necessary to meet downstream water rights senior to Aspinall. Releases above the aforementioned flow-through requirements may be made for various purposes according to the water right decrees for the Aspinall Unit reservoirs and their power plants.

As the primary storage facility for the Aspinall Unit, Blue Mesa Reservoir is operated to store water during the spring runoff period while also releasing water for the Aspinall ROD. Reservoir elevations typically peak late in the spring runoff and then decline as releases are made to satisfy authorized purposes including power generation, for flood control, for downstream target flows pursuant to the 2012 Aspinall ROD and to meet the December 31 target elevation of 7,490 feet. Inflow is bypassed to meet downstream senior water rights.

Downstream target flows pursuant to the Aspinall ROD are divided into spring peak and baseflow periods. These targets vary by hydrologic year type and are determined by May 1 forecasts of April through July inflow into Blue Mesa Reservoir as detailed in Figure 1.

Operations for spring peak flows are typically timed to match the spring peak from the North Fork of the Gunnison River. Releases during the baseflow period meet multiple purposes including power generation and baseflow targets and to draw the reservoir down to 7,490 feet by December 31 to prevent icing issues upstream of the reservoir.

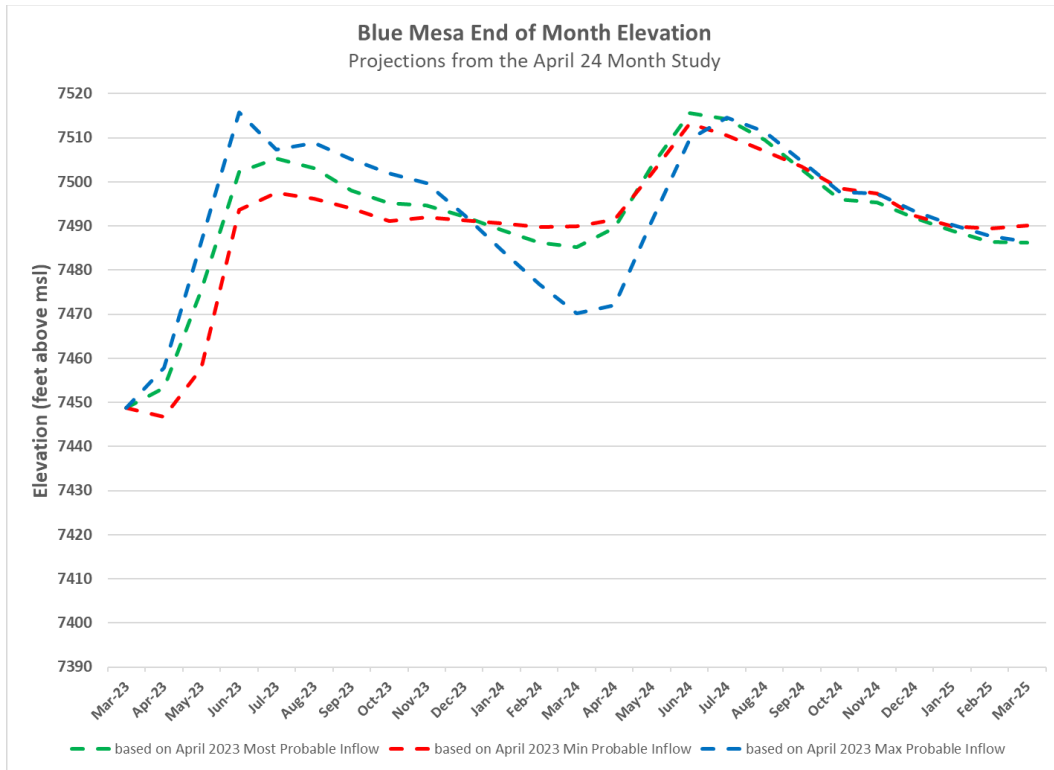


Figure 1. Projections of Blue Mesa end of month Elevation from the April 2023 24-Month Study.

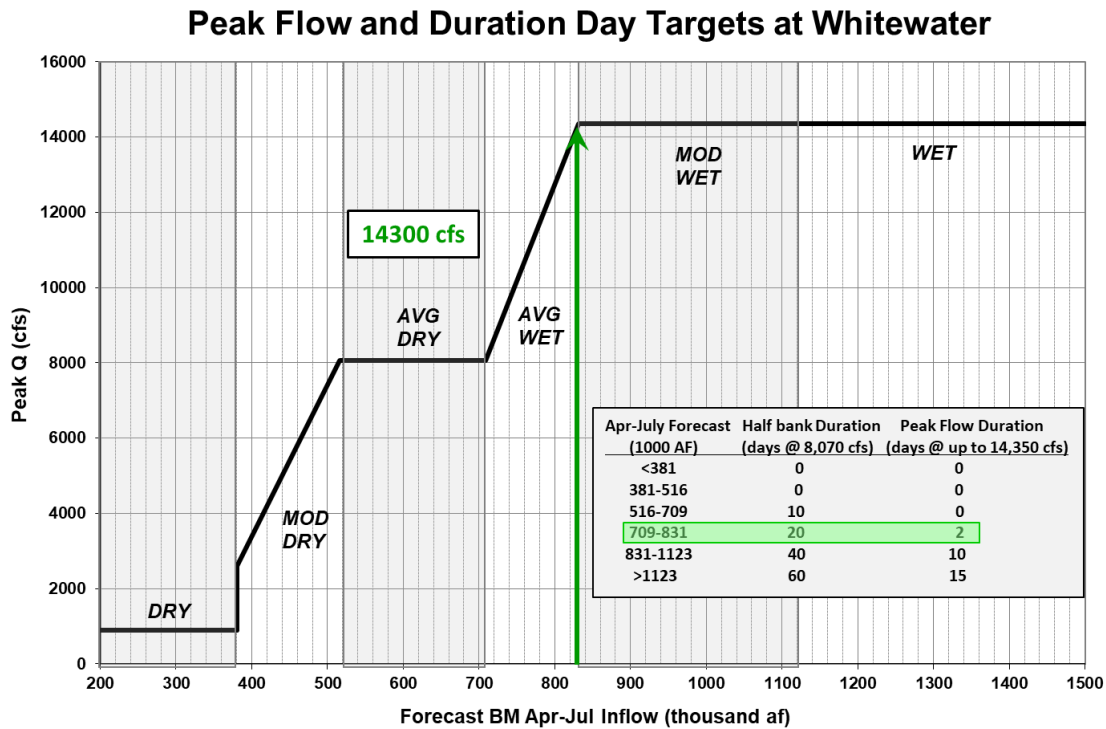


Figure 2. Aspinnall ROD Peak Flow and Duration Day Target determination.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wet	1050	1050	1050	1050	1050	1500	1500	1500	1050	1050	1050	1050
Mod Wet	1050	1050	1050	1050	1050	1500	1500	1500	1050	1050	1050	1050
Avg Wet	1050	1050	1050	1050	1050	1500	1500	1050	1050	1050	1050	1050
Avg Dry	1050	1050	1050	1050	1050	1500	1500	1050	1050	1050	1050	1050
Mod Dry*	750	750	750/790	750/890	750/890	1050	1050	1050	750/890	750/790	750/790	750
Dry*	750	750	750/790	750/890	750/890	1050	1050	750/890	750/890	750/790	750/790	750

*During March through November in Moderately Dry and Dry type years, additional releases will be made as necessary to provide flows above the 750 cfs anticipated to be diverted by the Redlands Water and Power Company, for the fish ladder and fish screen as shown.

Figure 3. Aspinall ROD Baseflow Target determination table.

2. Current Hydrology

a. April 2023 24-Month Study

The total live capacity at Blue Mesa Reservoir is 828,000 acre-feet. The active capacity at Blue Mesa Reservoir is above elevation 7393 ft, and totals 748,000 acre-feet. Below the elevation of 7393 ft, no releases through the power plant can be made.

As of April 10, 2023, Blue Mesa Reservoir is at 7448.5 ft of elevation, with 301,000 acre-feet of live storage (36% of live capacity) and 221,000 acre-feet of active storage (30% of active capacity). The active content, less various commitments described further below, determines water available for a potential Drought Response Operations Release.

The April unregulated inflow forecast for Blue Mesa Reservoir in water year 2023 ranges from a minimum probable of 725,000 acre-feet (114 percent of average) to a maximum probable of 1,120,000 acre-feet (176 percent of average) with the most probable forecast for water year 2023 of 850,000 acre-feet (134 percent of average). There is a 10 percent chance that inflows could be higher than the current maximum probable forecast and a 10 percent chance that inflows could be lower than the minimum probable forecast.

Under the most probable unregulated inflow scenario, Blue Mesa Reservoir content is projected to peak at 615,000 acre-feet (elevation 7495 feet) and drop to a content of 590,000 acre-feet at the end of 2023 (elevation 7491 and 71 percent of live capacity). This corresponds to an active content of 510,000 acre-feet (68 percent of active capacity). Proposed operations have been updated from the April 2023 24-Month Study based upon more recent hydrological projections described in 2.b. below.

b. April 2023 Mid-Month Forecast

The April 2023 Mid-Month forecast shows that Aspinall will operate in the average wet hydrological category. Aspinall 2023 Drought Recovery Operations described below, including applicable figures and graphs, are based on the April 2023 Mid-Month forecast. Current hydrological projections, as of May 1, indicate that this hydrological classification is not anticipated to change. However, operations will continue to be reviewed and be subject to modification based on the most current forecasts.

3. Aspinall Operations without Drought Response during Plan year

Under the most probable unregulated April-July inflow scenario, releases from Crystal Dam will be made to deliver water to the Gunnison Tunnel for diversion to the Uncompahgre Valley Water Users Association starting in early April and continuing through October 2023.

Releases through the Black Canyon may meet or exceed the targets described in the Black Canyon Reserved Water Right Decree. Based on the current forecast under the Black Canyon Reserved Water Right Decree, flows in the Black Canyon will be maintained above 300 cfs until a spring peak release is made in May or early June which may cause flows to exceed 6,400 cfs in the Gunnison River through the Black Canyon.

Releases from Crystal Dam will be made to help meet the Aspinall ROD (2012) spring peak and base flow targets at the Whitewater gage on the Gunnison River. Under the current forecast, the Aspinall ROD (2012) target for baseflows prior to the spring peak is 1,050 cfs in the Whitewater reach. The spring peak target is currently 14,300 cfs for a duration of 2 days at the Whitewater gage. There is also a half bankfull target of 8,070 cfs for 20 days at the Whitewater gage of the Gunnison River. Following the spring operation, baseflows at the Whitewater gage will be maintained above 1,500 cfs from June through July and then drop to 1,050 cfs for the remainder of 2023. The spring operation targets will be reviewed and subject to modification based on the most current forecasts. Releases made to satisfy the Aspinall ROD (2012) may result in Gunnison River flows that meet or exceed the flows described in the Black Canyon water rights decree.

4. Aspinall Drought Response Operations

The available water for a potential Drought Response Operations Release is determined to be the active content of Blue Mesa Reservoir excluding the volume of Taylor Park water stored within Blue Mesa Reservoir (see below for explanation of the Taylor Park Exchange Agreement) and excluding 1,300 acre-feet designated to contracts. Opportunity for recovery of prior Drought Response Operations Releases will be affected by factors including the active content of Blue Mesa Reservoir, inflow forecasts, and projected

operations that consider downstream senior water rights and target flows. Flexibility exists during the baseflow period to increase releases pursuant to DROA.

The calculation of available water for Drought Response Recovery operations can vary daily and will be directly affected by several factors including changes to inflow forecasts throughout spring 2023 and Whitewater gage flow targets from the May 2023 forecasts which may meet or exceed Black Canyon flow targets. Therefore, the official volume available for any future potential Drought Response Operations will be calculated after May 2023 and regularly updated.

Based on the current conditions and inflow forecast and existing contractual and release obligations, no Drought Response Operations Release will occur throughout the 2023 DROA year. Recovery of prior Drought Response Operations Releases is anticipated during the 2023 DROA year.

a. Releases

No Drought Response Operations Release is contemplated in the 2023 DROA year.

b. Recovery

Recovery of prior Drought Response Operations Releases is anticipated during the 2023 DROA year.

Recovery options are hydrology/year type dependent. For years with longer duration targets (such as moderately wet), opportunities to reduce durations to recover water will be pursued. This would require consultation with and concurrence from the Upper Colorado River Endangered Fish Recovery Program (Recovery Program).

If Drought Response Operations Releases result in Blue Mesa Reservoir elevation being below the spillway elevation when it otherwise would have been at or above the spillway elevation, the reductions in spring releases based upon elevation limitations can be accounted as recovered water.

Recovery of Drought Response Operations Release volume occurs by storing more water when hydrology allows, and/or reducing releases when hydrology does not allow, to achieve Recovery Plan target elevations. There are two elevation targets, which, if either is reached, will constitute “recovery” for some or all prior Drought Response Operation releases:

- 7517.4 - 7519.4 feet (full reservoir)
- Dec. 31: 7490.0 feet (icing target)

5. Contracts

Existing water supply contracts and agreements at Aspinall are described below. Any future contracts which become executed will be described here. Water supply contracts and agreements are not impaired by any Drought Response Operations because the water under contract or agreement is considered unavailable under DROA.

a. Contract Deliveries

Aspinall currently has 1,300 acre-feet of water under contract for delivery downstream, or for augmentation of depletions upstream in any given year. Water under contract is not available for Drought Response Operations pursuant to DROA.

b. Taylor Park Exchange Agreement

The Taylor Park Reservoir Operation and Storage Exchange Agreement (1975) allows for the exchange of water stored in Taylor Park Reservoir and Aspinall (Blue Mesa Reservoir) to improve utilization and management of available water supplies under the water rights of the Uncompahgre Project and Blue Mesa Reservoir. The maximum amount of Taylor Park Reservoir exchange water that can be stored within Blue Mesa Reservoir at any time throughout the year is 106,230 acre-feet. The amount of Taylor Park Reservoir exchange water stored in Blue Mesa Reservoir is for diversion by the Uncompahgre Project at the Gunnison Tunnel and is determined through accounting managed by the Colorado Division of Water Resources. This water is not available for release pursuant to DROA.

c. Subordination Agreement

The Subordination Agreement, dated June 1, 2000, formalizes the commitment made by the United States during the planning of the Aspinall Unit to allow subordination of Aspinall Rights up to 60,000 acre-feet per year to in-basin water users so that Aspinall would not interfere with future water development in the Upper Gunnison River Basin. A decree entered in Case No. 03CW263 (October 10, 2006), Water Court, Water Division No. 4, for a plan for augmentation permitted the subordination of Aspinall Rights to augment existing and future water rights exercised for all decreed beneficial purposes within the Gunnison River Basin through any decreed structure or facility upstream of the Crystal Reservoir Dam. Accounting for the plan for augmentation is the responsibility of the State of Colorado Division Engineer's Office, Water Division No. 4. Water utilized pursuant to this agreement does not reach the Aspinall Unit and therefore is not available for release pursuant to DROA.

6. Coordination

Aspinall Unit stakeholder coordination meetings are held three times annually in January, April, and August. DROA plans were presented for comment and feedback at the April meeting to all interested parties. Additionally, Reclamation reaches out to stakeholders as needed for input and coordination on operations outside of regularly scheduled meetings.

7. Accounting

a. 2021 Releases

In 2021 during the months of August, September and October, additional releases were made based on a determination of imminent need by Reclamation, which resulted in Aspinall releasing a total of an additional 35,810 acre-feet. A table accounting for these 2021 additional Aspinall releases is included in Section 1.6.1.2 of Attachment A. Reclamation calculated the total additional release volume in 2021 to be 35,810 acre-feet.

Below is a table and graph illustrating the 2021 Drought Release Operations:

2021 Aspinall Unit DROA Release Accounting

Date 2021	Operations Without Drought Response	Drought Release Operations	Drought Release Operations Monthly Volume	Accumulated Drought Release Operations Total Volume
Aug	83,000	100,100	17,170	17,170
Sept	79,900	95,700	15,830	33,000
Oct	64,700	67,500	2,810	35,810
Nov	21,900	21,900	0	35,810
Dec	20,700	20,700	0	35,810

* All units acre-feet

Figure 4. Table illustrating the difference in monthly releases at Aspinall Unit with and without DROA operation.

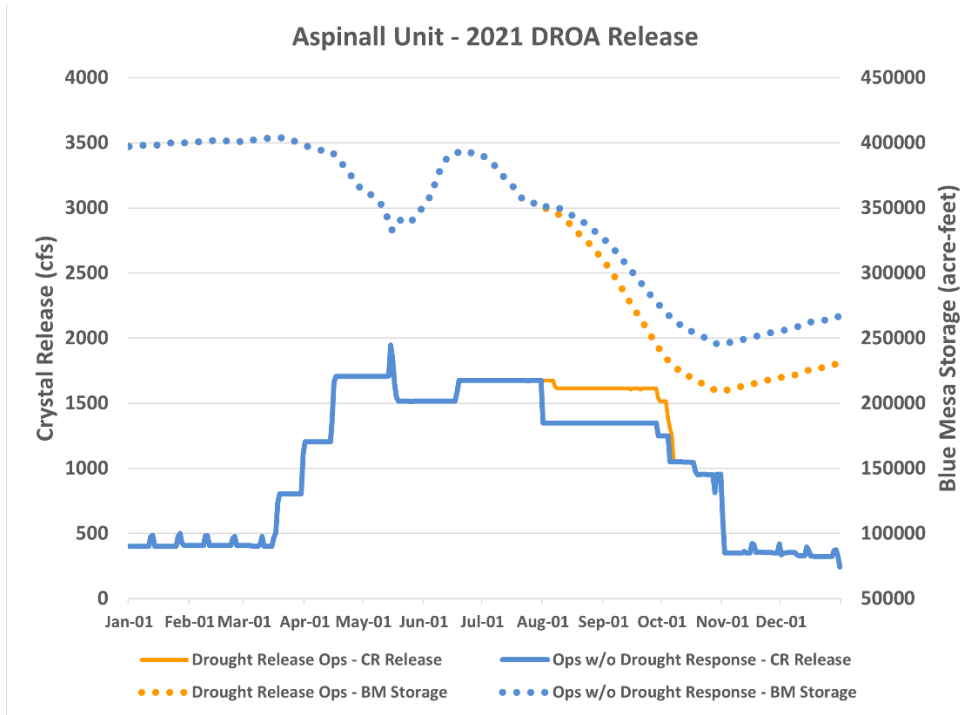


Table 5. Graph illustrating 2021 Drought Response Operations at Aspinall Unit

Below is a table and graph of 2022 Operations without Drought Response:

2022 Aspinnall Unit DROA Accounting - No Release / No Recovery

Date 2022	Operations Without Drought Response	Operations following Drought Response Release	Drought Release Operations Monthly Volume	Accumulated Drought Release Operations Total Volume
Jan	20,500	20,500	0	35,810
Feb	18,400	18,400	0	35,810
Mar	32,300	32,300	0	35,810
Apr	54,452	54,452	0	35,810
May	105,725	105,725	0	35,810
June	81,222	81,222	0	35,810
July	89,941	89,941	0	35,810
Aug	92,598	92,598	0	35,810
Sept	80,336	80,336	0	35,810
Oct	62,662	62,662	0	35,810
Nov	22,839	22,839	0	35,810
Dec	22,461	22,461	0	35,810

* All units acre-feet

Figure 6. Table illustrating 2022 Operations at Aspinnall Unit without Drought Response.

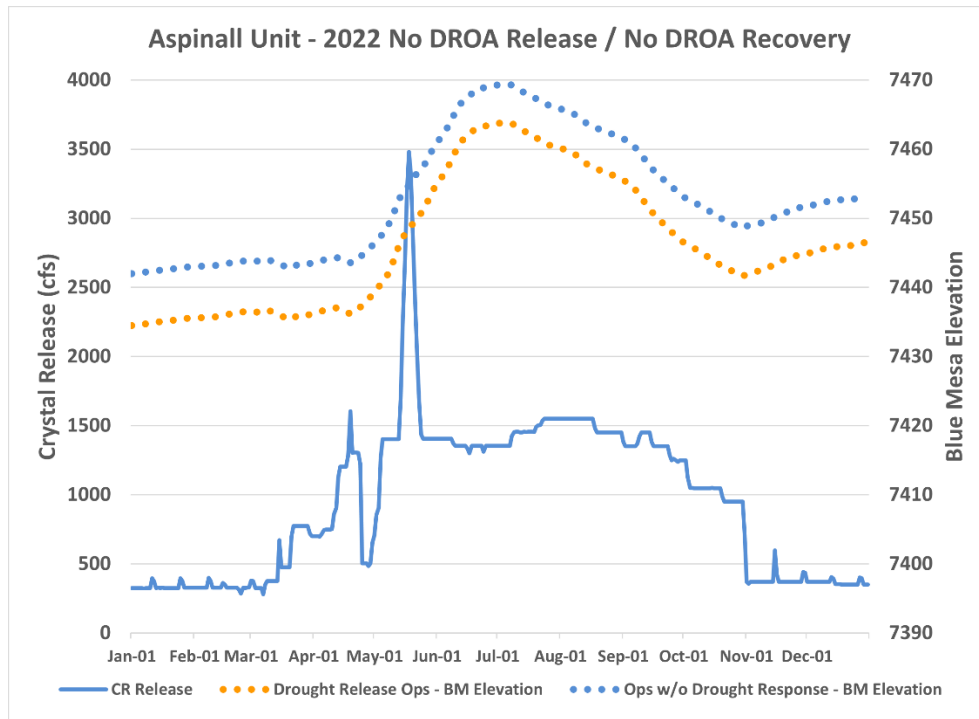


Figure 7. Graph illustrating 2022 Operations at Aspinnall Unit without Drought Response.

b. Recovery

Accounting for recovery shall include data that documents how operations, with and without DROA, would result in Blue Mesa Reservoir elevation returning to the December 31 icing target, and shows the volumetric difference as recovered. This accounting shall also include documenting active operation efforts that result in conserving storage in Blue Mesa

As of April 2023, no recovery for the 2021 DROA release volume has occurred and the plan for recovery of this volume in DROA year 2023 is described in Section 8. The accounting for the recovery of these releases is described above in Section 7.a. In the event full recovery for the 2021 DROA release volume does not occur in the term of the 2023 DROA year, recovery will continue into DROA year 2024 and beyond, until such time as the 2021 DROA release volume is fully recovered.

8. 2023 Recovery Plan

At this time there is no plan to release DROA water from the Aspinall Unit through the 2023 DROA year to protect critical elevations at Lake Powell. However, it is necessary to recover the 35,810 ac-ft DROA release volume from Blue Mesa Reservoir that occurred in 2021. Therefore, the 2023 DROA Plan includes a focus on recovery of the 2021 release volumes from Blue Mesa Reservoir through the term of the 2023 DROA year.

Drought Response Recovery during the 2023 DROA Plan is projected to occur as described in Figures 8 and 9. As shown in Figures 8 and 9 releases beginning in October and through December of 2023 will be lower than what would have occurred without DROA operations in order to reach the icing target on December 31st. This will return the reservoir to the level it would have been at had there been no release for DROA in 2021.

Based upon existing forecasts and target flows that project an average wet year type, recovery in the 2023 DROA year will occur when the Aspinall Unit is at or above the icing target on December 31, 2023.

Below is a table and graph illustrating 2023 Drought Recovery Operations:

2023 Aspinal Unit DROA Recovery Accounting

Date	Operations w/o Drought Response	Drought Recovery Operations	Projected Drought Response Recovery Monthly Volume	Accumulated Drought Recovery Operations Total Volume
Jan	22,100	22,100	0	35,810
Feb	20,000	20,000	0	35,810
Mar	22,100	22,100	0	35,810
Apr	47,800	47,800	0	35,810
May	217,600	217,600	0	35,810
June	117,200	117,200	0	35,810
July	119,900	119,900	0	35,810
Aug	119,900	119,900	0	35,810
Sept	116,000	116,000	0	35,810
Oct	0	0	0	35,810
Nov	0	0	0	35,810
Dec	0	0	0	35,810

* All units acre-feet

Figure 8. Table illustrating projected accounting for Drought Response Recovery at Aspinal Unit.

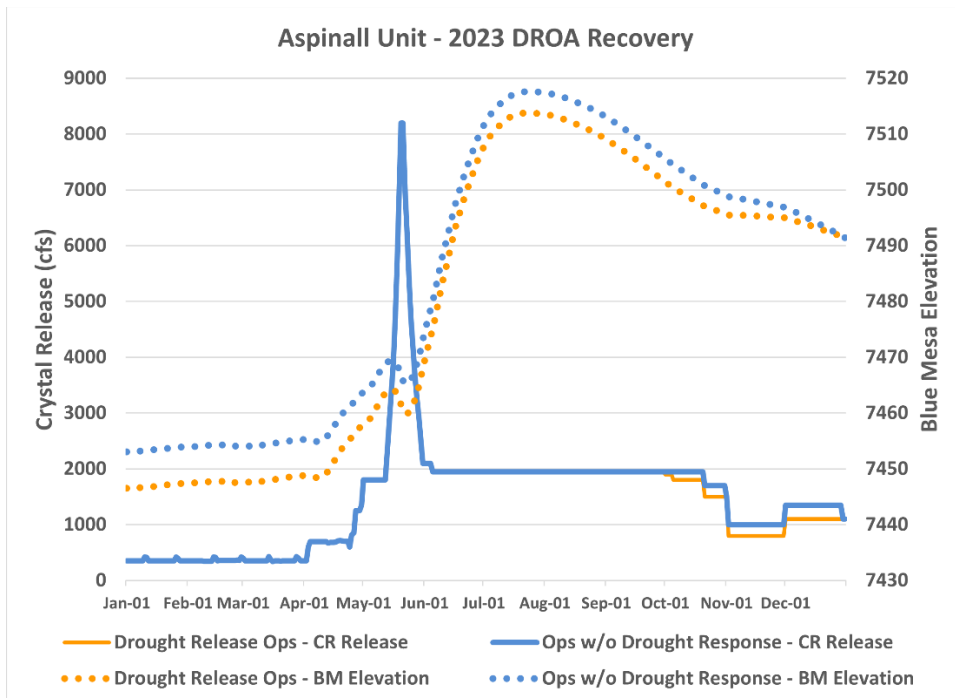


Figure 9. Graph illustrating projected Drought Response Recovery at Aspinall Unit.

Attachment E

2023 Drought Response Operations Plan

Operations at Navajo Reservoir

1. Navajo Reservoir Operations Without Drought Response

Navajo Reservoir Operations are guided by the Record of Decision (ROD) for Navajo Reservoir, Navajo Unit which implements the operating criteria contained in the Preferred Alternative of the 2006 Navajo Reservoir Operations Final Environmental Impact Statement (FSEIS).

The U.S. Fish and Wildlife Service transmitted to the U.S. Bureau of Reclamation (Reclamation) the Final Biological Opinion for Navajo Reservoir Operations on January 5, 2006, which outlined the intent for Reclamation through the proposed operations in the preferred alternative to mimic the San Juan River's natural hydrograph downstream from its confluence with the Animas River.

The ROD provides for potential refinement of the flow recommendations based on relevant new information that may be gained over time through an adaptive management process. The range of downstream releases specified in the Navajo Reservoir Operations ROD can vary from 250 to 5,000 cfs.

The Navajo Dam Operating Procedures for implementing the operating criteria are evaluated and revised as needed. The most recent operating procedures were adopted by the San Juan Recovery Implementation Program (SJRIP) in 2018. The Revised Operating Procedures document prescribe a year-round target baseflow in the San Juan of 500 to 1000 cfs in the critical habitat reach (from Farmington, NM to Lake Powell).

The flow recommendations recommend mimicry of a natural hydrograph in terms of flow magnitude, duration, and frequency during the spring runoff period. Duration and frequency minimums are specified in the Flow Recommendations document and are based on modeling of hydrology from 1928 to 1993. A spring peak release is considered every year to meet recommended flow targets in the critical habitat reach, based on water availability forecasts, projected contract water use, and releases to meet the target baseflow. A spring peak release calls for 5,000 cfs of water to be released continuously, over a period varying from 21 to 60 days.

The End of Water Year Storage Target (EWYST) is one of two target reservoir elevations on September 30th of each year. The lower EWYST, 6,050 ft, is used to forecast available water for a spring peak release to benefit endangered fish and critical habitat. If there is not enough available water for a spring peak release, or after the spring peak release occurs, then the EWYST changes to 6,063 ft for the calculation of Excess Water (Excess Water). If there is water in the reservoir above 6,063 ft, that water is considered Excess Water. If Excess Water is available in a given year, it could be released based on a request

from the SJRIP to meet a variety of goals of the SJRIP.

Spring Peak Releases and Excess Water are both examples of water which release is timed to benefit the goals of the SJRIP.

In case of severe drought with anticipated shortages to the Navajo Reservoir water users, the ROD allows for consideration of a temporary revision to the spring peak release criteria or lowering of baseflow targets in the critical habitat reach.

2. Current Hydrology

As of April 10, 2023, Navajo Reservoir is at 6,029.83 ft of elevation, or 958 kaf of live storage (58% of live capacity) and 332 kaf of active storage (32% of active capacity).

The April modified unregulated inflow forecast for Navajo Reservoir in water year 2023 ranges from a minimum probable of 972 thousand acre-feet (kaf) (107 percent of average) to a Maximum probable of 1,492 kaf (164 percent of average) with the most probable forecast for water year 2023 of 1,195 kaf (131 percent of average). There is a 10 percent chance that inflows could be higher than the current Maximum probable forecast and a 10 percent chance that inflows could be lower than the minimum probable forecast.

3. Navajo Reservoir Operations without Drought Response during Plan year

Based on the April 2023 most probable forecast of 1,195 kaf modified unregulated inflow for water year 2023, the Colorado River Mid-term Modeling System 24-Month Study (24-Month Study) projects Navajo Reservoir elevation will end water year 2023 near 6049.6 feet with approximately 1,166 kaf in live storage (71 percent of live capacity), or 540 kaf in active storage (53 percent of active capacity). The total live capacity at Navajo Reservoir is 1,647,940 acre-feet. The active capacity at Navajo Reservoir is above elevation 5,990 ft, and totals 1,021,910 acre-feet. Below the elevation of 5,990 ft, contract deliveries can no longer be made.

Note that projections of elevation and storage for water year 2023 have considerable uncertainty at this point in the season. Projections of end of water year 2023 Navajo elevations using the April 2023 24-Month Study Minimum Probable (drier hydrology) and Maximum Probable (wetter hydrology) inflow forecasts are 6,048.9 feet (70 percent of live capacity, 52 percent of active capacity) and 6,050.5 feet (71 percent of live capacity, 54 percent of active capacity), respectively (Figure 1). Under these scenarios, there is a 10 percent chance that inflows will be higher, resulting in higher elevation, and 10 percent chance that inflows will be lower, resulting in lower elevation.

During water year 2023, Navajo Reservoir will be operated in accordance with the 2006 Navajo Reservoir ROD.

Based on the April 2023 Minimum Probable April through July modified unregulated inflow forecast of 800 kaf, the April 2023 24-Month Study projects no spring peak release would be recommended by the SJRIP for water year 2023.

Based on the April 2023 Most Probable April through July modified unregulated inflow forecast of 945 kaf, the April 2023 24-Month Study projects no spring peak release would be recommended by the SJRIP for water year 2023.

However, a spring maintenance release of up to 250 kaf will be conducted for a shorter duration by Reclamation. The SJRIP Biology Committee has concurred with this planned release.

Based on the April 2023 Maximum Probable April through July modified unregulated inflow forecast of 1,170 kaf, the April 2023 24-Month Study projects a 450 kaf spring peak release would be recommended by the SJRIP for water year 2023.

The release throughout the remainder of water year 2023 will be the minimum required to maintain the downstream target baseflow as specified in the ROD.

Based on the April 2023 Most Probable forecast of 904 kaf modified unregulated inflow for water year 2024, the Colorado River Mid-term Modeling System 24-Month Study (24-Month Study) projects Navajo Reservoir elevation will end water year 2024 near 6,050.2 feet with approximately 1,173 kaf in live storage (71 percent of live capacity), or 547 kaf in active storage (54 percent of active capacity). Note that projections of elevation and storage for water year 2024 have considerable uncertainty. Projections of end of water year 2024 Navajo elevations using the April 2023 24-Month Study Minimum Probable and April 2023 24-Month Study Maximum Probable inflow forecast results model runs are 6,047.5 feet (69 percent of live capacity, 50 percent of active capacity) and 6,051.9 feet (72 percent of live capacity, 56 percent of active capacity), respectively (Figure 1). Under these scenarios, there is a 25 percent chance that inflows will be higher, resulting in higher elevation and/or releases, and 25 percent chance that inflows will be lower, resulting in lower elevation and/or releases.

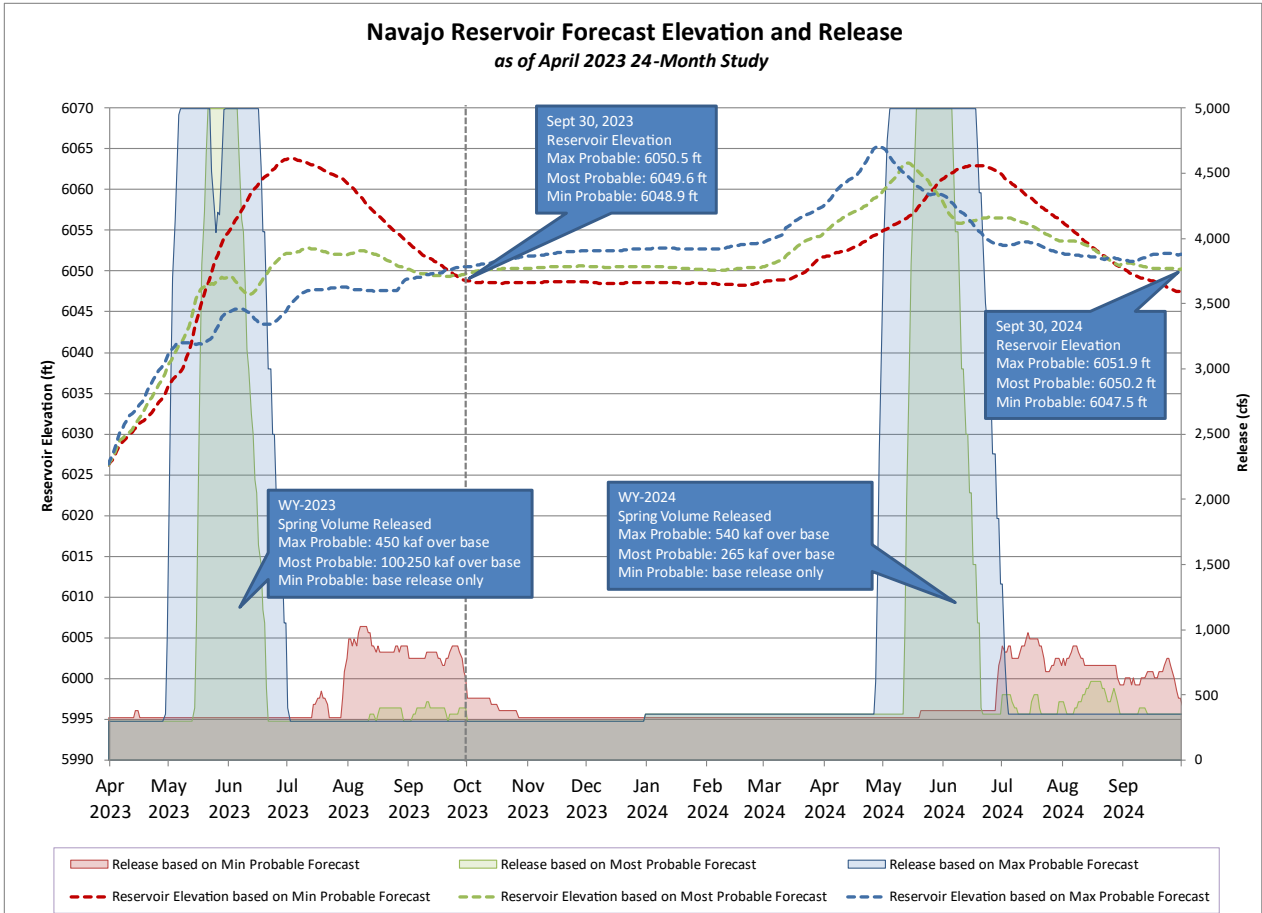


Figure 1.

4. Navajo Reservoir Drought Response Operations

When conducting probabilistic modeling using the operational model used for the San Juan portion of the 24-Month Study with the Ensemble Streamflow Prediction (ESP) traces, none of the 30 traces fall into inactive storage under normal operations without DROA in water years 2023 or 2024. The ESP traces represent hydrologic conditions that would occur if the water years 1991 – 2020 repeated from our current starting point. They are not a stress test nor an exhaustive analysis of potential extreme droughts that are predicted to be more common with increasing aridification in the San Juan River Basin.

a. Releases

No Drought Response Operations Release from Navajo Reservoir is contemplated for water year 2023. The volume of available DROA water will be re-evaluated at the beginning of water year 2024. If a release is to be made before May 1, 2024, it may be released as an augmentation of fall or winter baseflows, staying within the confines of the ROD. In the event of such a consideration, Reclamation will seek input from tribes, contractors, SJRIP, and other stakeholders in formulating the

schedule. Such a consideration would also require an amendment to the 2023 DROA Plan.

b. Recovery

No releases have been made from Navajo Reservoir to date pursuant to DROA. Therefore, no recovery is necessary as of April 30, 2023.

Operational Flexibilities for Drought Response Recovery

a. Recovery Tools Under the Navajo Reservoir Operations:

i. Recovery of the Cumulative Volume of the Drought Response Operation Release

Recovery of the total Drought Response Operations volume can occur in one operation, or over several operations with partial recovery. The following are examples of potential operations that result in recovery. All recovery scenarios are dependent upon hydrological conditions. Recovery would not occur under any of the described scenarios if below-average hydrology persists in future years. Any reduction in Operations without Drought Response may count towards recovery. It should be noted that some of these scenarios for recovery may have an impact on the volume, frequency and duration of releases as specified in the Revised Operating Procedures document.

The variables used in the equations for these scenarios are as follows:

D_{tot} = Total Drought Response Operations volume released in prior release(s)

D_o = Drought Response Operations volume recovered under any of these recovery scenarios. If D_o is less than or equal to zero, no Drought Response Operations volume is recovered.

D_{rem} = Remaining Drought Response Operations Volume to be Recovered = $D_{tot} - \sum D_{oi}$ ($i=1..n$, representing total number of events that have resulted in the recovery of Drought Response Operations releases). Once D_{rem} is reduced to zero, full recovery has occurred.

S_{6063} = Storage volume at 6063 ft (End of water year storage target)

S_{6085} = Storage volume at 6085 ft (maximum active storage)

S_{fcm} = Maximum flood control storage as defined by the USACE water control manual, based on forecast inflows and date.

S = Observed storage

AW = Available Water = Projected available water volume for a spring peak release

SPR = minimum volume required to make a spring peak release

SPRING OPERATIONS: A spring peak release (Spring Peak) from Navajo Reservoir, as recommended and described by the SJRIP, will occur when, after accounting for forecast inflows, regular releases and contract uses, and evaporation, it is projected that there will be enough Available Water over the lower EWYST of 6050 ft to make a spring peak release for the recommended duration. There is opportunity for partial or full Drought Response Operations recovery under this scenario. The equation below illustrates how such recovery would be calculated.

$$Do = AW + Drem - SPR$$

FALL OPERATIONS: If Excess Water is available, withholding some, or all of that Excess Water could result in partial or full Drought Response Operations recovery. If Excess Water is not available, there could still be a potential for partial recovery depending on the storage in the reservoir. The equation below illustrates how such recovery would be calculated.

$$Do = S + Drem - S6063$$

FLOOD CONTROL OPERATIONS: The US Army Corps of Engineers (USACE) defines variable flood control space to allow for forecast inflows without spilling during runoff season. This flood control space is based on the inflow forecast and day of the year. Partial or full Drought Response Operations recovery could occur if the difference between the maximum flood control storage volume and the actual storage is less than or equal to Drem. The equation below illustrates how such recovery would be calculated.

$$Do = S + Drem - Sfc$$

Similarly, partial or full Drought Response Operations recovery could occur if the difference between the top of active storage and the actual storage is less than or equal to Drem.

$$Do = S + Drem - S6085$$

There are four elevation targets, which, if reached, will “recover” all prior Drought Response Operation releases. These elevation targets are also used in the previous section for incremental recovery by tracking volumes.

- September 30th: 6063 ft or higher regardless of any previous spring or

summer operations. This elevation is the maximum recommended winter carryover by the SJRIP's Flow Recommendations.

- September 30th: 6050 ft or higher – Recovery complete (only if a spring peak release was made that calendar year).
- January 1st – July 15th: If the reservoir elevation intersects the maximum flood control elevation allowed by the U.S. Army Corps of Engineers at any point in this timeframe.
- Jan 1st – Dec 31st: 6085 ft

5. Contracts

Existing water supply contracts and agreements at Navajo Reservoir are described below. Any future contracts which become executed will be described here. Water supply contracts and agreements are not impaired by any Drought Response Operations because the water under contract is considered unavailable under DROA.

Navajo Reservoir contracted water volumes listed below represent the full allocation of water contracts:

- i. Williams Gas Processing (expires 3/31/28): 50 af/yr.
- ii. Navajo Nation Settlement Contract (no expiration): 508,000 af/yr for NIIP which includes 22,650 af/yr of diversion (20,780 af/yr of depletion) for the Navajo-Gallup Water Supply Project.
- iii. Jicarilla Apache Nation Settlement Contract (no expiration): not to exceed 33,500 af/yr diversion (25,500 af/yr of depletion) from the Navajo Reservoir Supply for use by the Nation or for subcontracting outside the reservation, in accordance with the Jicarilla Apache Tribe Water Rights Settlement Act of 1992.
- iv. Hammond Conservancy District Contract (no expiration): 23,000 af/yr of depletion.

Shortages to contracts at Navajo Reservoir will be handled according to the provisions of Public Law No. 87-483, as amended by Public Law No. 111-11.

6. Coordination

Navajo Unit stakeholder coordination meetings are held three times annually in January, April, and August. Operational plans are presented for comment and feedback at these meetings to all interested parties. Additionally, Reclamation reaches out to stakeholders

as needed for input and coordination on operations outside of regularly scheduled meetings.

There is a formal process for coordination between Reclamation and the SJRIP on spring peak releases from Navajo Reservoir. Reclamation provides an available water calculation by April 1st to the SJRIP, and a recommendation for the size and shape of a spring peak release is made by mid-April. This process can also be used for any Drought Response Operation releases that may occur as a spring peak. Outside of the spring, direct coordination between Reclamation and the SJRIP is conducted through updates at Biology Committee and Coordination Committee meetings, which are scheduled regularly throughout the year. Additional meetings with the SJRIP will be conducted as needed with each Drought Response Operation from Navajo Reservoir.

7. Accounting

No releases have been made from Navajo Reservoir to date pursuant to DROA. Therefore, no accounting or recovery at Navajo Reservoir has been necessary as of April 30, 2023.

Attachment F

2023 Drought Response Operations Plan

Natural Resources Consideration

Overview of consideration of Natural Resource Conditions, as applicable:

Lake Powell:

- Humpback Chub: Maintaining reservoir elevations at levels that disadvantage nonnative passthrough at Glen Canyon Dam remains a priority to protect the humpback chub and other native species in the Grand Canyon.

Flaming Gorge:

- Razorback Sucker: Floodplain wetland habitats provide important ecological functions to benefit endangered fishes of the Green River if those habitats are hydrologically connected to the main channel at a frequency and duration to meet life history needs. Operations to extend the duration or augment the magnitude of spring peak flows can benefit razorback sucker recruitment if the Operations are scheduled according to the Larval Trigger Study Plan experiment. Operations from Flaming Gorge Dam should occur after razorback sucker larvae first presence is documented in the Green River, based on real-time capture information. Augmenting the magnitude or duration of spring peak flows increases the likelihood of inundating floodplain wetland habitats and entraining larval razorback sucker into those nursery habitats. Floodplain wetlands are important nursery habitats for early life stages of the razorback sucker, and it is assumed that peak flows of sufficient magnitude, duration, and frequency that occur when larval suckers are drifting and can be entrained in wetlands also benefit other endangered fishes.
- Colorado Pikeminnow: Operations under the Flaming Gorge Operating Plan to augment base flows in summer through autumn could benefit Colorado pikeminnow larvae and juveniles by assisting in larval transport from the spawning bar to nursery habitats, and by maintaining those habitats through summer. Years of moderate summer baseflows consistent with the ranges described in the Flaming Gorge Record of Decision tend to be years with higher abundance of Colorado pikeminnow. Operations under the Flaming Gorge Operating Plan, timed to create suitable habitat conditions prior to Colorado pikeminnow arrival from the Yampa River downstream into Green River nursery habitat, could enhance the survival of Colorado pikeminnow larvae. Suitable timing involves implementing baseflows up to one week prior to arrival of Colorado pikeminnow larvae. These types of Operations could also increase and maintain backwater nursery habitats. Operations extended through the winter at the summer release volumes or less could extend the presence of the backwater nursery habitat through the fall and winter when the species may be vulnerable. Operations higher than summer through winter base flow ranges described in the Flaming Gorge Record of Decision may substantially reduce nursery habitats and displace small Colorado pikeminnow

during a vulnerable time of year, which is why the U.S. Fish and Wildlife Service recommends Operations remain in the suggested pikeminnow baseflow release targets after summer.

- Smallmouth Bass: A smallmouth bass flow spike is considered part of this year's Drought Response Operations. This experiment is intended to reduce the reproductive success of this invasive, nonnative predator, which will benefit endangered fishes by reducing predation.
- Channel complexity and vegetation: Operations to extend the duration or augment the magnitude of spring peak flows can help to maintain channel complexity and reduce vegetation encroachment; however, Operations that augment base flows could have the opposite effect. Targeting flow levels different from previous years is expected to limit this effect (e.g., >200 cfs in difference). Multiple years of low-flow conditions may increase vegetation encroachment, a condition that may be stopped or reversed by higher spring peak flows.
- Consideration of experimental recommendations of the Upper Colorado River Endangered Fish Recovery Program: Drought Response Operations at Flaming Gorge in the form of a spring peak flow, summer base flows to benefit Colorado pikeminnow, and a smallmouth bass flow spike, and will address all three experimental priorities from the Recovery Program's 2023 flow request letter, assuming average above median hydrology. The currently proposed Drought Response Operations from Flaming Gorge attempt to meet these experimental requests and are within the range of flows recommended by the Recovery Program to benefit ESA-listed fish species.

Aspinall:

- Effects of Drought Response Operations involving Blue Mesa will be described in potential modifications to the 2023 Drought Response Operations Plan, if applicable.

Navajo Reservoir:

- Effects of Drought Response Operations involving Navajo Reservoir will be described in potential modifications to the 2023 Drought Response Operations Plan, if applicable.

Attachment G

2023 Drought Response Operations Plan

Impacts to the Basin Fund and Bulk Electrical System

1. Overview of effects to the Basin Fund

- a. Describe the estimated financial impacts to the Upper Colorado River Basin Fund (Basin Fund) if Drought Response Operations do not occur. This description will include the underlying operational assumptions and other factors upon which the estimate is based, for each Initial Unit.

Assumptions:

- The CRSP powerplants are electrically integrated, so impacts described below are for the system of and for individual CRSP units.
- The firm rate assumed to be in place during this period is WAPA-199 through December, 2023⁷⁴. Western Area Power Administration (WAPA) proposes to replace this rate with WAPA-206, which, as proposed, will have a similar structure to WAPA-199. Since the CRSP project makes up the majority of powerplants in the SLCA/IP, in this document, we will refer to the CRSP rate.
- Possible hydrological scenarios throughout this period consist of Reclamation’s modeled hydrologies for the period.
 - i. WAPA expects that Lake Powell will remain above the minimum power pool during this period.
- Currently, the Basin Fund balance is \$160 million and is anticipated to total \$201 million by the end of fiscal year 2023.
- For the impacts “with Drought Response Operations”, Reclamation will implement 2023 Drought Response Operation May 2023 to April 2024, as proposed.

Impacts to the Basin Fund without Drought Response Operations:

- The Basin Fund is expected to maintain relatively stable levels in all but the driest hydrological scenarios, mostly due to the WAPA-199/206 rate construct.
- Under WAPA-199/206, WAPA is expecting firming expenses to be relatively small.
- Experimental releases at Glen Canyon in WY 2023 and 2024 may have a significant effect on the Basin Fund, depending on the experiments implemented by Reclamation. Experiments currently authorized under the LTEMP ROD are expected to reduce the Basin Fund balance by \$1 to \$3 million per year, depending

⁷⁴ WAPA-206 is proposed to replace WAPA-199. As proposed, WAPA-206 will have a similar structure to WAPA-199. WAPA-199 was implemented in December 2021. WAPA-199 is a firm electric service rate for SLCA/IP federal electric power. Because of the current drought affecting the Colorado River and projected high prices for firming electrical power in 2021 and 2022, WAPA, in consultation with its customers, developed and implemented WAPA-199. Under this rate, sales are limited to the deliverable sales amount (DSA) that can be generated. WAPA will make firming purchases to meet the projected DSA amount. Customers must provide the difference between the DSA and contractual allocations. This rate largely avoids negative impacts on the Basin Fund for firming expenses.

on the number and design of experiments.

- b. Describe the estimated financial impacts to the Basin Fund if the proposed Drought Response Operations occur. This description will include the underlying operational assumptions and other factors upon which the estimate is based, for each Initial Unit.*

Impacts to the Basin Fund with Drought Response Operations:

- Reclamation’s proposed DROA plan for Water Year 2023 and 2024 is similar to the No DROA operation in terms of water release at Flaming Gorge. A small mouth bass “spike flow” is under consideration-n as part of the DROA and is not included in the No DROA scenario. Implementation of this spike flow will have a small, potentially beneficial impact on the Basin Fund. Whether the impact is beneficial or deleterious depends on whether it will be conducted on the weekend. A weekend spike flow would likely reduce the balance in the Basin Fund.
- If the proposed DROA Recovery operation at Flaming Gorge is implemented, electrical power generation will be less under the proposed DROA plan. All other things equal, this will cause a small reduction in the Basin Fund. WAPA does not anticipate a significant change in terms of CRSP Basin Fund balance.
- Under the CRSP rate, WAPA is expected to have low firming expenses.
- As with the No DROA scenario, the potential for experimental releases or other bypass flows exists at the Initial Units with or without Drought Response Operations. The Basin Fund may be required to fund experimental flows within the Plan year. Based on currently authorized experiments, this may reduce the Basin Fund balance by approximately \$1 to \$3 million depending on the number and design of experiments.

2. Overview of effects to the Bulk Electrical System

- a. Describe the potential effects if Drought Response Operations do not occur. This description will include the underlying operational assumptions and other factors upon which the estimate is based, for each Initial Unit.*

Assumptions:

- WAPA’s CRSP Management Center (CRSP MC) will remain with its current marketing structure throughout this time period.
- WAPA operates the WACM Balancing Authority (BA) with the CRSP MC participating. CRSP makes 40 MW available to this BA from the CRSP powerplants for regulation purposes. Regulation means keeping the electrical grid within tolerances (i.e. maintaining 60 Hz) in the BA geographic scope by modifying electrical output in response to changing in electrical supply and use.
- Glen Canyon Powerplant has a “black start and emergency shut down” contract with Arizona Public Service for the Palo Verde nuclear generating station, and Glen Canyon has “black start” responsibilities within the Western Electric Coordinating Council (WECC), (a Western US reliability council).

- The CRSP MC participates in emergency reserve sharing which requires that CRSP powerplants respond to electrical emergencies when they occur.

Impacts to the bulk electrical system without Drought Response Operations:

- Over the hydrological conditions modeled by Reclamation, WAPA is able to meet its BA, reliability, reserve pool and black-start conditions.
- b. Describe the potential effects if Drought Response Operations occur. This description will include the underlying operational assumptions and other factors, including timing, upon which the estimate is based, for each Initial Unit.*

Impacts to Bulk Electrical System with Drought Response Operations:

- Over the hydrological conditions modeled by Reclamation, WAPA is able to meet its BA, reliability, reserve pool and black-start conditions.
3. *Overview of effects to the CRSP contracted power deliveries*
- a. Describe the estimated effects to the Electrical Power Customers if Drought Response Operations do not occur. This description will include the underlying operational assumptions and other factors upon which the estimate is based, for each Initial Unit*

Assumptions:

- During the time frame described, firm electric service customers will receive WAPA's contractual delivery of available CRSP power and energy as forecasted by WAPA under the CRSP rate.

Impacts without Drought Response Operations:

- Under the CRSP rate (as explained above), firm electric service contract customers are voluntarily taking reductions of their contracted CRSP power and energy. Reductions have been up to one third of CRSP energy – compared to historic power deliveries by WAPA (pre WAPA-199). The reductions are greater in the winter months than in the summer months.
 - These reductions in energy deliveries to customers are expected to continue through the scheduled time frame of WAPA-199/206, which is proposed to expire December 2025.
- b. Describe the estimated effects to the Electrical Power Customers if the proposed Drought Response Operations occur. This description will include the underlying operational assumptions and other factors upon which the estimate is based, for each Initial Unit.*

Impacts with Drought Response Operations:

WAPA does not anticipate significant change as a result of the proposed DROA plan in WY 2023/24.

Attachment H

2023 Drought Response Operations Plan

Consultation, Coordination, and Outreach

1. Describe how Consultation, Coordination, and Outreach occurred for the Plan.

- a. The Drought Response Operations draft Framework and Attachments were developed by the DROA Parties in accordance with DROA. Together, the Framework and Attachments form the 2023 Drought Response Operations Plan.

On May 10, 2023, a public webinar was held to outline the contents of the 2023 Drought Response Operations Plan. Invitations were sent to a large number of individuals representing a variety of entities including Tribes, Federal agencies, States, stakeholders and other interested parties.

During this webinar, participants were provided a link to the draft documents and opportunity to provide written comments.

- b. The following describes the consultation, coordination, and outreach that occurred, as referenced in Section 7 of the Framework, for the development of the 2023 Drought Response Operations Plan, in addition to the May 10, 2023, public webinar described above.

- i. Consultation with the Lower Division States

The DROA Parties consulted with Arizona, California and Nevada regarding the contents of the draft 2023 DROA Plan.

- ii. Outreach to and Consultation with Native American Tribes

Since 2021, Reclamation and the Tribes have participated in regular weekly meetings on the status of DROA efforts.

In addition, representatives from the Upper Division States conducted targeted outreach to the Tribes on May 11, 2023 to share information and receive input about the DROA process and the DROA Plans.

- iii. Coordination within the Department of the Interior

Since 2021, DOI agencies have held regular meetings on the status of DROA efforts.

iv. Coordination with WAPA

Since 2021, Reclamation and WAPA have held regular meetings on the status of DROA efforts.

v. Coordination with Initial Unit Workgroups

Workgroups with special expertise regarding each Initial Unit met at various times throughout the development of each DROA Plan to discuss issues specific to each Initial Unit. Description of specific coordination with each initial unit workgroup is contained in Attachments B through E, which provide information for each Initial Unit.

vi. Outreach to other stakeholders and interested entities

Other stakeholders and interested entities were invited to participate in the public webinar held on May 10, 2023.