Overview

- Purpose of the Scoping Webinars:
  - Summarize information in the Notice of Intent to Prepare a Supplemental Environmental Impact Statement (SEIS) for December 2007 Record of Decision Entitled Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead published in the Federal Register on November 17, 2022 (87 FR 69042)
  - Present a range of hydrology and operational scenarios that will inform the SEIS analysis
  - Provide an overview of potential alternatives currently being considered
  - Provide information on the SEIS schedule
- Two webinars scheduled (with same content)
  - Tuesday, November 29, 2022, at 10:00 a.m. to 12:00 p.m. MST
  - Friday, December 2, 2022, at 11:00 a.m. to 1:00 p.m. MST

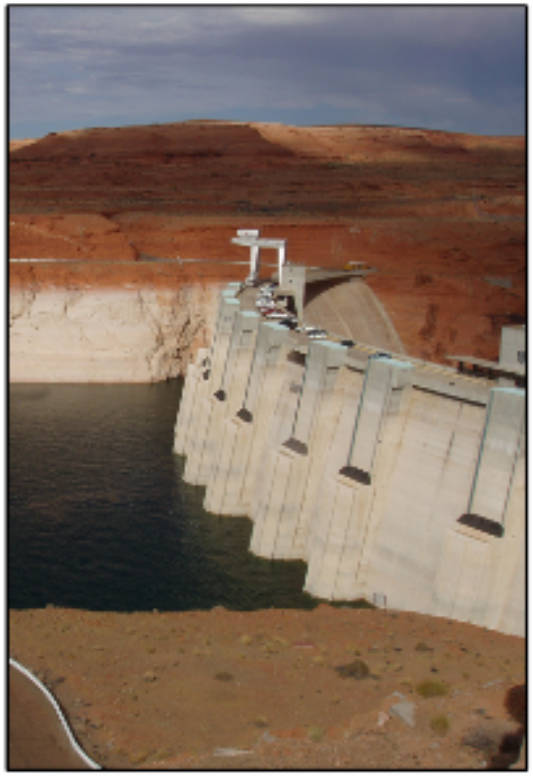
Purpose of the Federal Register Notice

- Due to critically-low current reservoir conditions, and the potential for worsening drought which threatens critical infrastructure and public health and safety, the Department recognizes that operational strategies must be revisited
- Potential impacts of low runoff conditions in the coming winter (2022-23) pose unacceptable risks to operations of Glen Canyon and Hoover Dams
- Accordingly, modified operating guidelines need to be expeditiously developed through a Supplemental Environmental Impact Statement (SEIS)
- Development of modified operating guidelines will inform operations in 2023-24; and may also inform potential operations in 2025-26

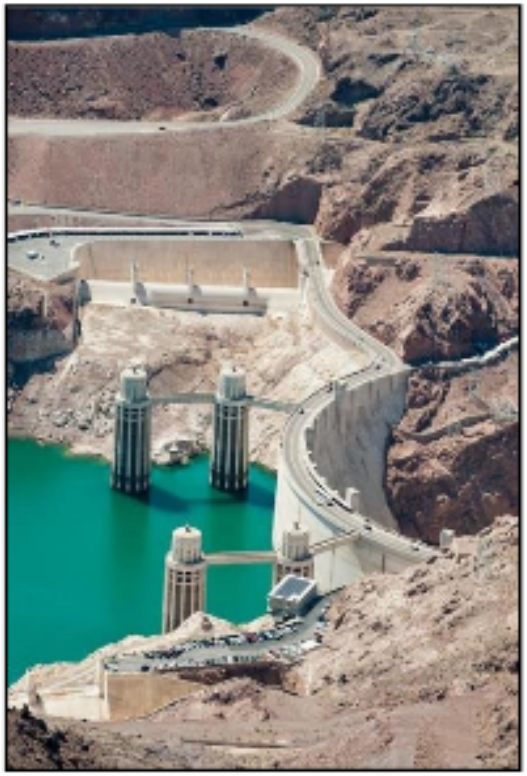
Purpose of the Federal Register Notice, continued

- The Notice formally announces the request for input on the scope of the analysis, potential alternatives, and identification of relevant information and studies by December 20, 2022
- It does not interfere with, supplant, or supersede the separate post-2026 guidelines development process announced in a Federal Register Notice published on June 24, 2022 (87 FR 37884)

Colorado River – Current Conditions
(as of November 28, 2022)



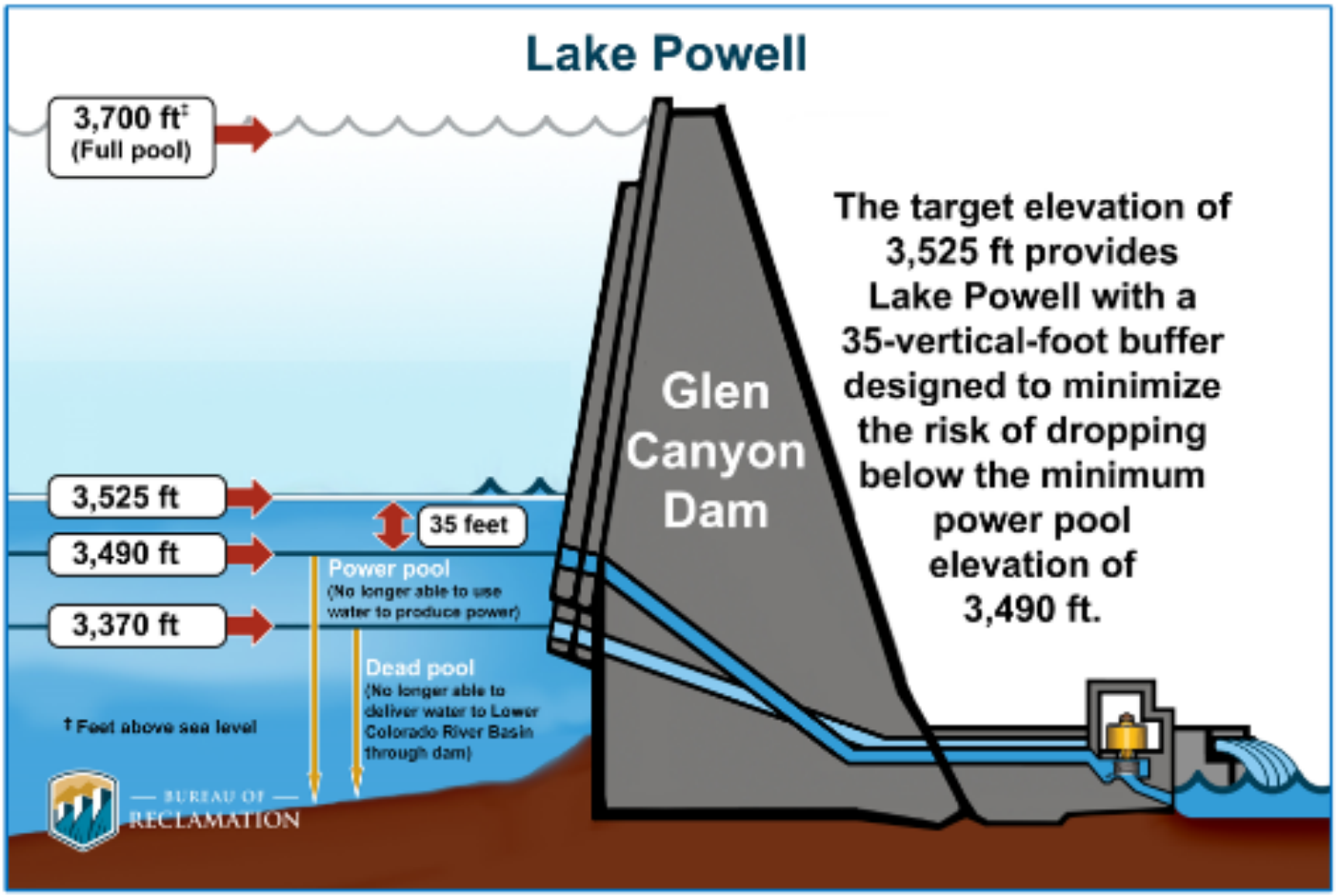
Lake Powell near Glen Canyon Dam



Lake Mead near Hoover Dam

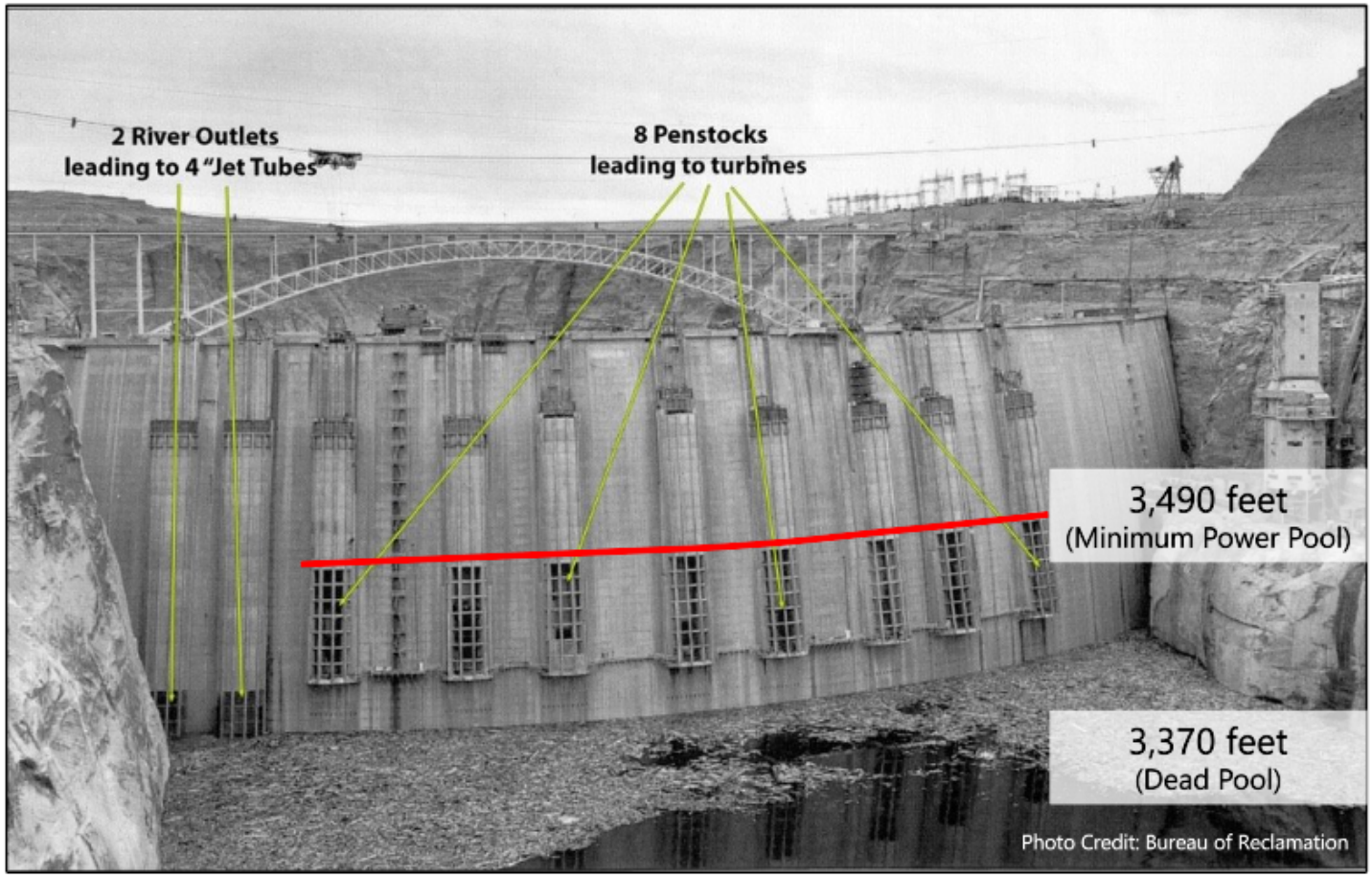
- Driest 23-year period on record (2000-2022)
- Low inflows 4 of the past 5 years (37 to 63% of average)
- Lake Powell and Lake Mead at historically low water levels
  - Lake Powell current elevation is 3,528 feet at 25% of capacity
  - Lake Mead current elevation is 1,043 feet at 28% of capacity

Lake Powell Key Elevations

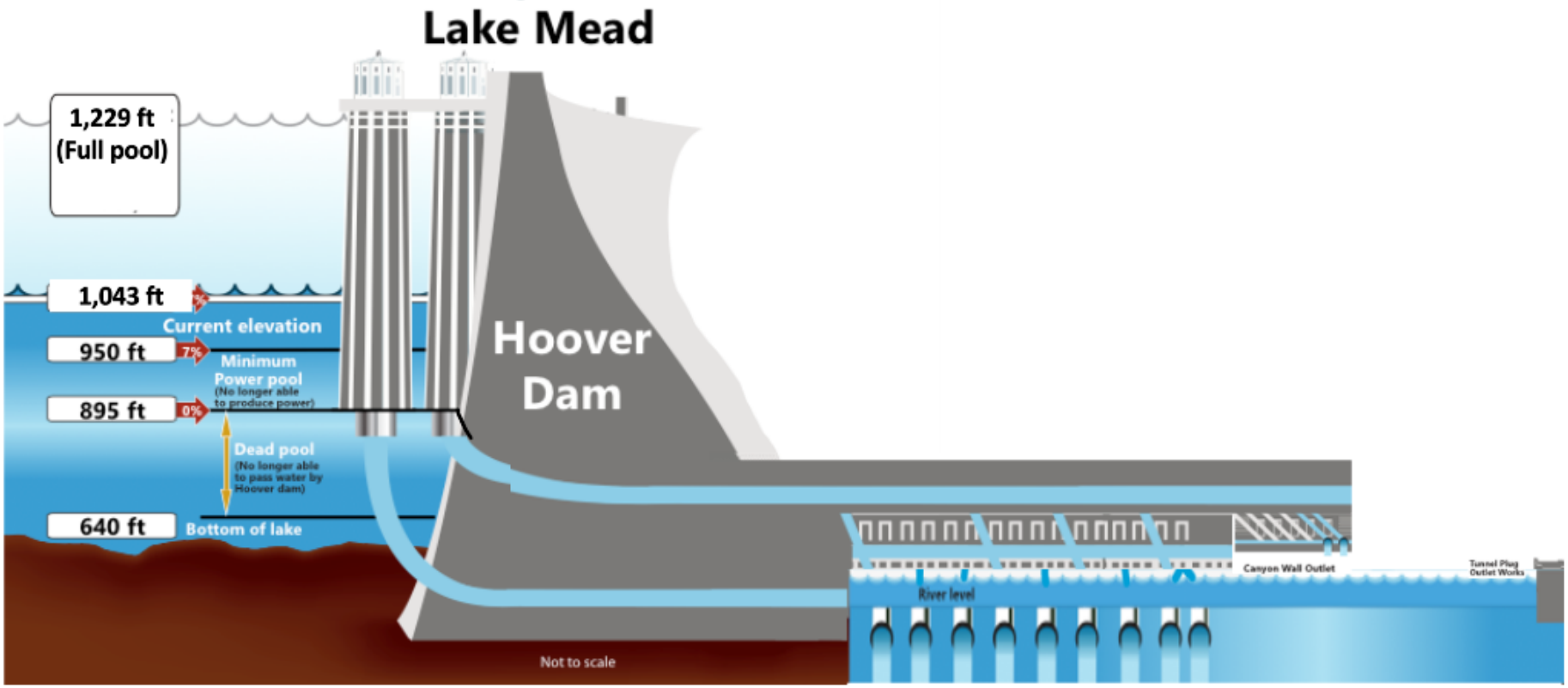


Model projections show river could drop below 3490 spring/summer 2023 under current op rules.

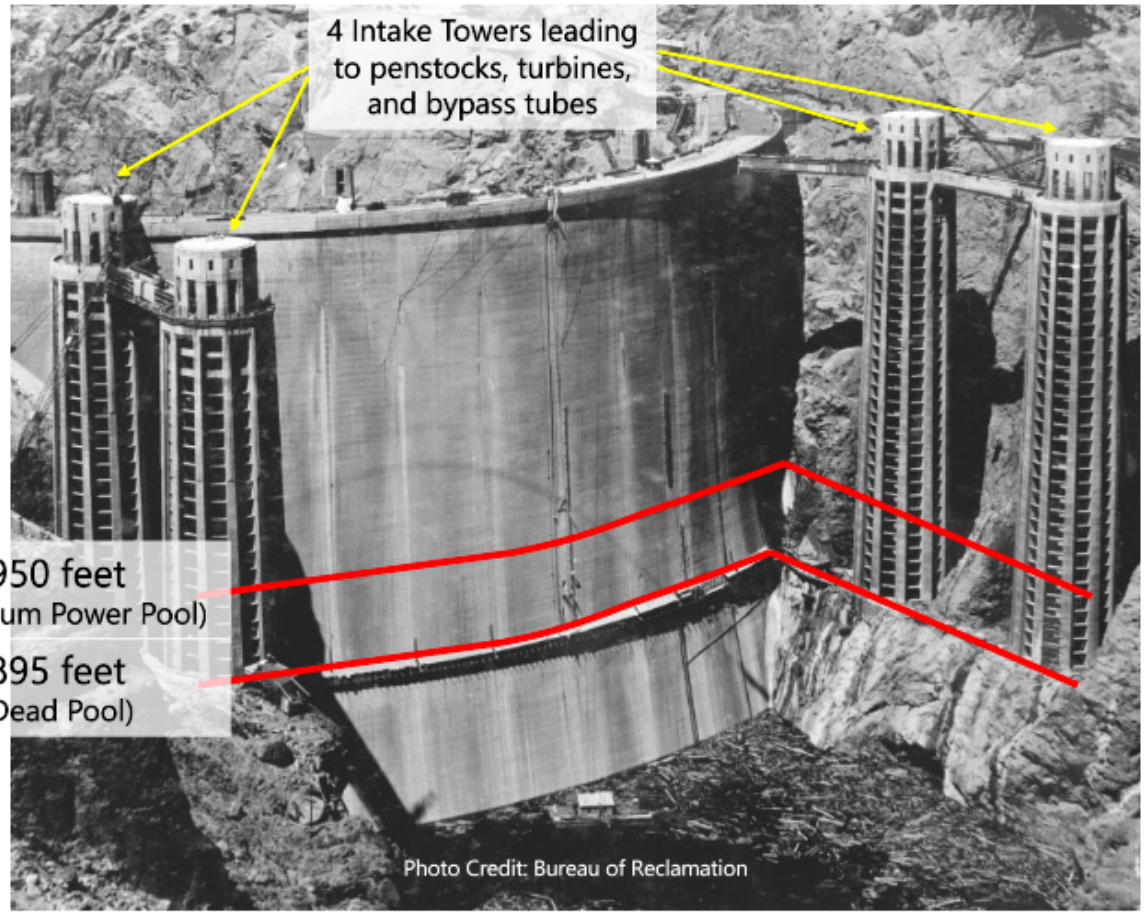
Glen Canyon Dam - November 21, 1963



Lake Mead Key Elevations



Hoover Dam – May 27, 1935



Overview of Preliminary Proposed Action

- Reclamation anticipates proposing modifications for the 2023-24 period (and potentially for subsequent years) to the following sections of the 2007 Interim Guidelines published at 73 FR 19881-92 (April 11, 2008):
  - Section 2D. Determination of Lake Mead Operation "Shortage Conditions"
  - Section 6C and 6D. Coordinated Operation of Lake Powell and Lake Mead "Mid-Elevation Release Tier" and "Lower Elevation Balancing Tier"
  - Section 7C. Implementation of Guidelines "Mid-Year Review"

Preliminary Alternatives

- No Action
  - Continued implementation of existing agreements that control operations of Glen Canyon and Hoover Dams
- Framework Agreement Alternative
  - Additional consensus-based actions that build on commitments and obligations developed by the Basin States, Tribes and non-governmental organizations as part of the 2019 DCPs
- Reservoir Operations Modification Alternative
  - A set of actions adopted pursuant to Secretarial authority under applicable federal law; could complement a consensus-based alternative that may not sufficiently mitigate current and projected risks to Colorado River System reservoirs

Sarah Baker

Low-flow Hydrology & Operational Scenarios

The following slides on low-flow hydrology and operational scenarios do not show alternatives to be analyzed, but instead show scenarios and trade-offs related to protecting various elevations at Lake Mead and Lake Powell to be considered as alternatives are developed for analysis in the SEIS.

Modeling Assumptions

- Modeling performed in the Colorado River Mid-term Modeling System (CRMMS) - September 2022
  - Future hydrology per September 2022 forecast using 30 Ensemble Streamflow Prediction (ESP) traces
- Modeling Assumptions for Approved Drought Response Actions
  - Drought Response Operations releases are 500 kaf from Flaming Gorge May 2022 through April 2023 from the Most Probable 24-Month Study
  - 2022 reduced Powell release of 480 kaf is operationally neutral (treated "as if" in Mead not Powell for tier determination and balance release)
  - 2022 DROA Plan (500 kaf through April 2023) is included in tier determination and balancing releases

Modeling Scenarios

- Baseline – Official September 2022 CRMMS-ESP
- Protect 3,490′ at Lake Powell
  - Protect 3,490′ by reducing Powell's release each month during the water year (WY) so that Powell's elevation is at or above min power pool; method tries to release volume held back later in the WY
- Protect 3,490′ at Lake Powell and 950′ at Lake Mead
  - Protect 3,490′ by reducing Powell's release months during the WY so that Powell's elevation is at or above min power pool; the method tries to release volume held back later in the WY
  - Protect 950′ by reducing Mead's release each month so that Mead's elevation is at or above 950′; method does not try to release volume held back later in the calendar year (CY)
- Protect 3,490′ at Lake Powell until Lake Mead reaches 950′, then balance Powell and Mead storage with no minimum release
  - Once Mead reaches 950′, Powell will not protect 3,490′ and instead balance with no minimum release. After balancing, Mead will release balanced water downstream for Lower Basin and Mexico use.

Individual Streamflow Trace Analyzed: 2002-2005
Lowest Powell EOCY 2023 Storage in this 30-year period

- Ensemble Streamflow Prediction (ESP) trace uses climate (temperature and precipitation) timeseries from 2002-2005
  - 2023 ~ 2002 climate
  - 2024 ~ 2003 climate
  - 2025 ~ 2004 climate
  - 2026 ~ 2005 climate
- 80% of the ESP 2002-2005 streamflow trace is used to provide a lower trace than available in ESP

Lake Powell WY Unregulated Inflow

	2023	2024	2025	2026
% of Avg. (1991-2020)	24%	58%	61%	125%
WY Volume (kaf)	2,350	5,610	5,820	10,750

80% ESP Analysis – 2002-2005 Trace
Lowest Powell EOCY 2023 Storage in this 30-year period

Lake Powell WY Unregulated Inflow

	2023	2024	2025	2026
% of Avg. (1991-2020)	24%	58%	61%	125%
WY Volume (kaf)	2,350	5,610	5,820	10,750

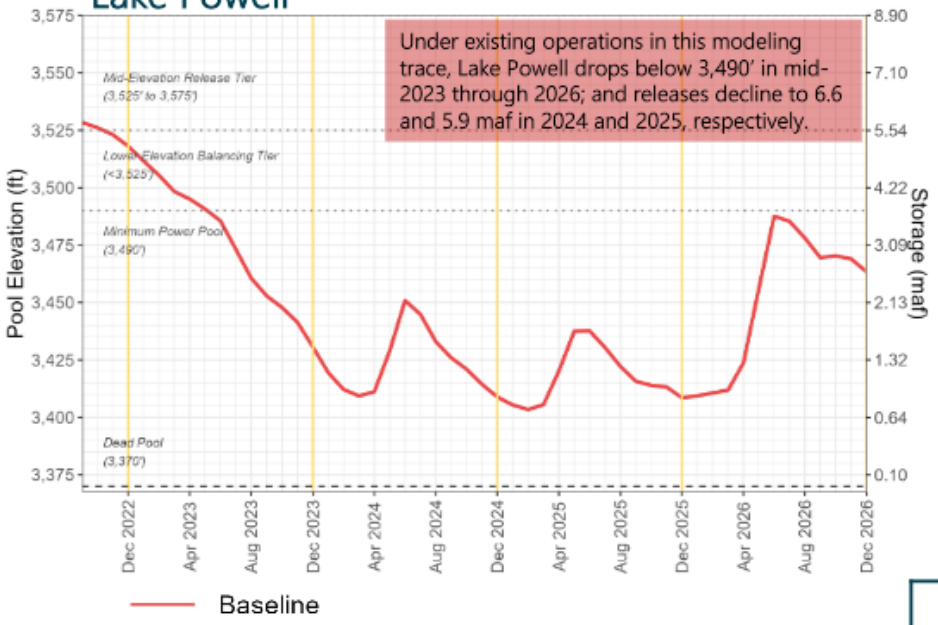
2023 is similar to:
2021 (3,500 kaf)

2024 and **2025** are similar to:
2020 (5,850 kaf) &
2022 (6,370 kaf)

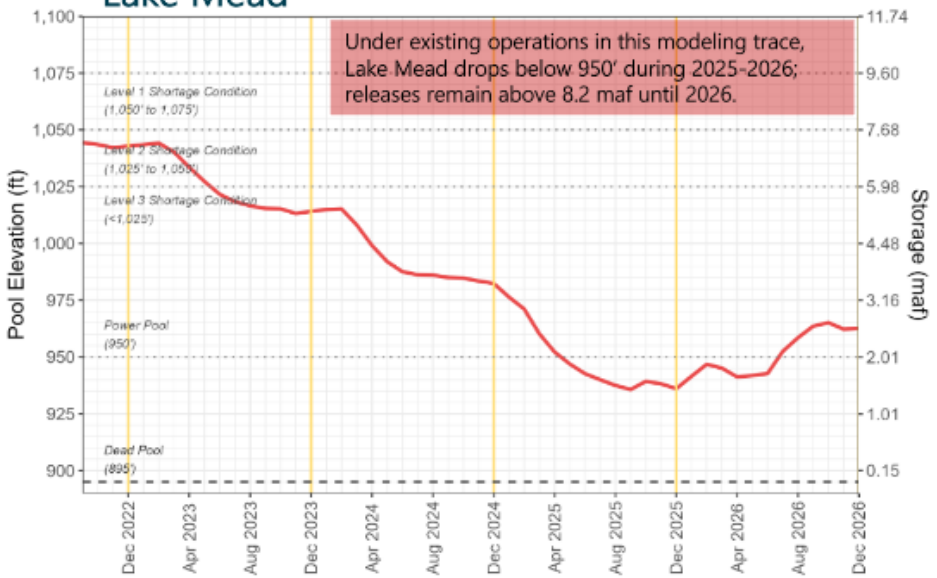
80% ESP Analysis – 2002-2005 Trace
Lowest Powell EOCY 2023 Storage in this 30-year period

End-of-Month (actual) Pool Elevation

Lake Powell



Lake Mead



% of Avg. WY Powell Unreg. Inflow	2023	2024	2025	2026
	24%	58%	61%	125%

Scenario	Powell WY Release (maf)				Lees Ferry 10-yr Volume (maf)				Mead CY Release (maf)			
	23	24	25	26	23	24	25	26	23	24	25	26
Baseline	7.0	6.6	5.9	7.6	84.4	83.5	80.4	79.0	8.7	8.2	8.3	7.7

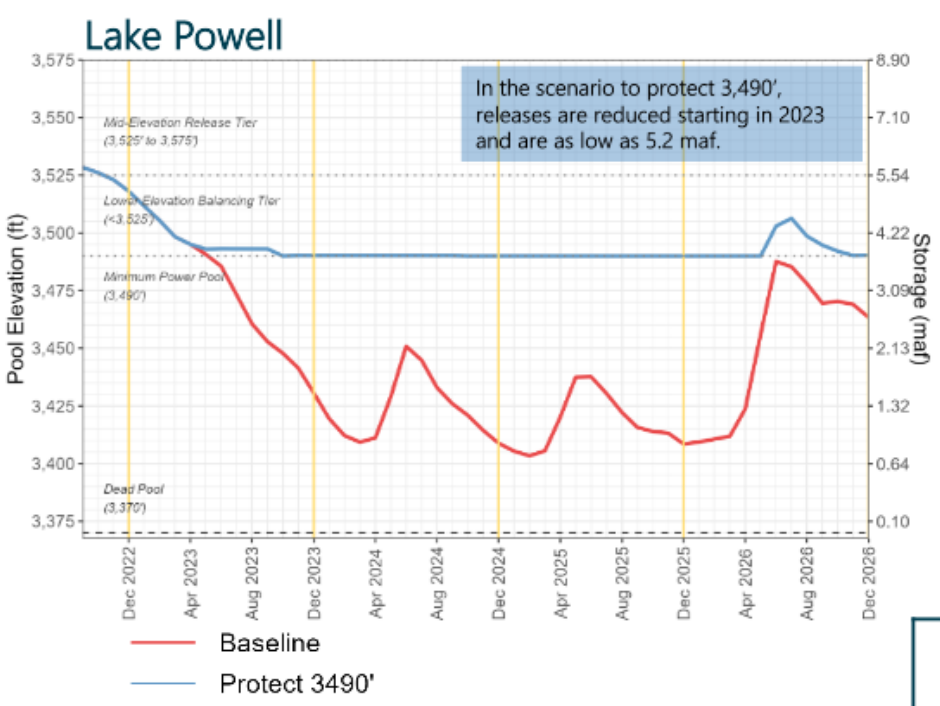
21 - 2007 Interim Guidelines SEIS Public Informational Webinars, November 29 and December 2, 2022

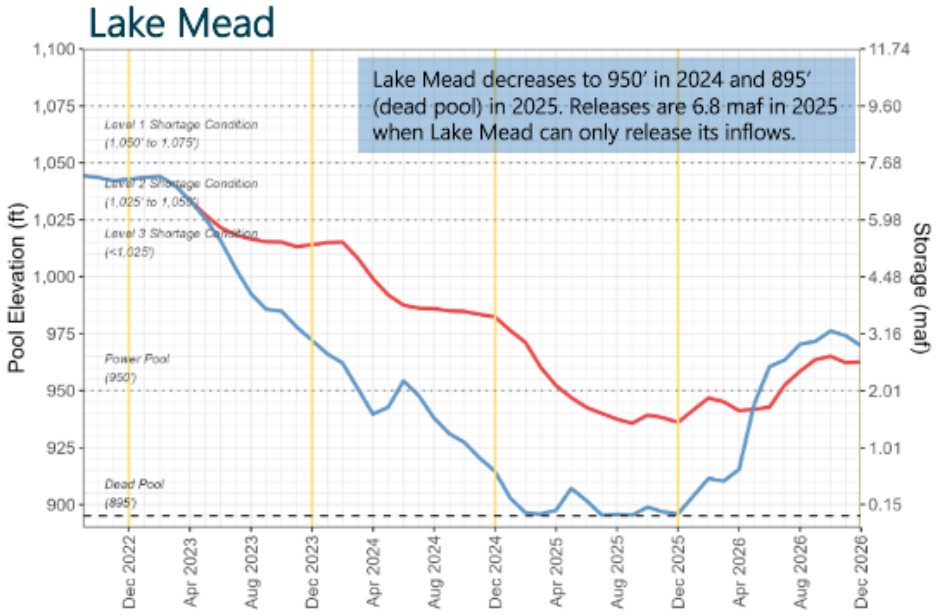
Powell drops below 2490 in mid 2023 and remains below thru 2026. Release declines to 6.6 and 5.9 in 2023 and 2025, due to physical restraints at GCD and amount of inflow received to Powell.

Scenario 2

80% ESP Analysis – 2002-2005 Trace
Lowest Powell EOCY 2023 Storage in this 30-year period

End-of-Month (actual) Pool Elevation





% of Avg. WY Powell Unreg. Inflow	2023	2024	2025	2026
	24%	58%	61%	125%

Scenario	Powell WY Release (maf)				Lees Ferry 10-yr Volume (maf)				Mead CY Release (maf)			
	23	24	25	26	23	24	25	26	23	24	25	26
Baseline	7.0	6.6	5.9	7.6	84.4	83.5	80.4	79.0	8.7	8.2	8.3	7.7
Protect 3,490'	5.2	5.7	5.5	9.2	82.6	80.9	77.4	77.6	8.7	8.2	6.8	7.7

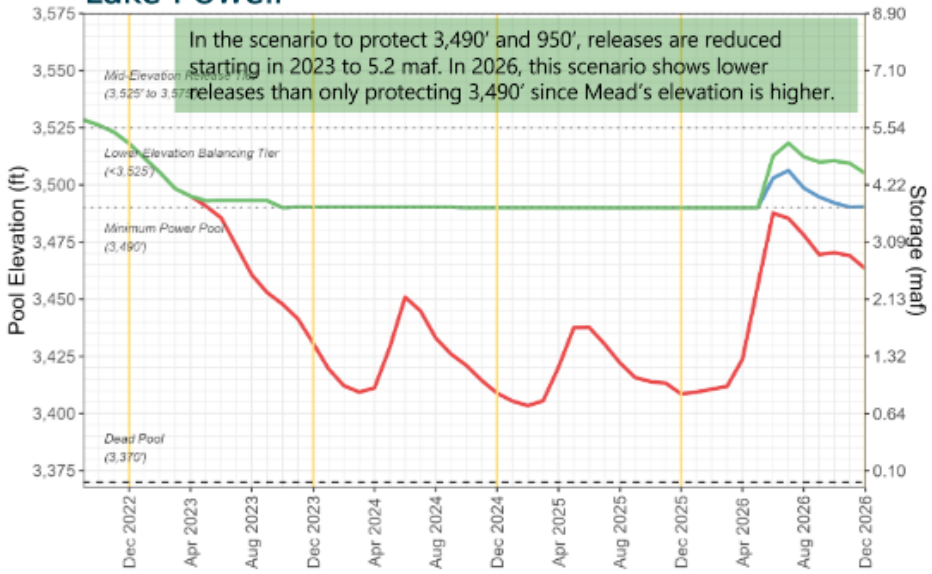
Mead drops below Deadpool in 2025. Releases can only release its inflows in 2025.

Scenario 3, now protecting min power pool at both lakes:

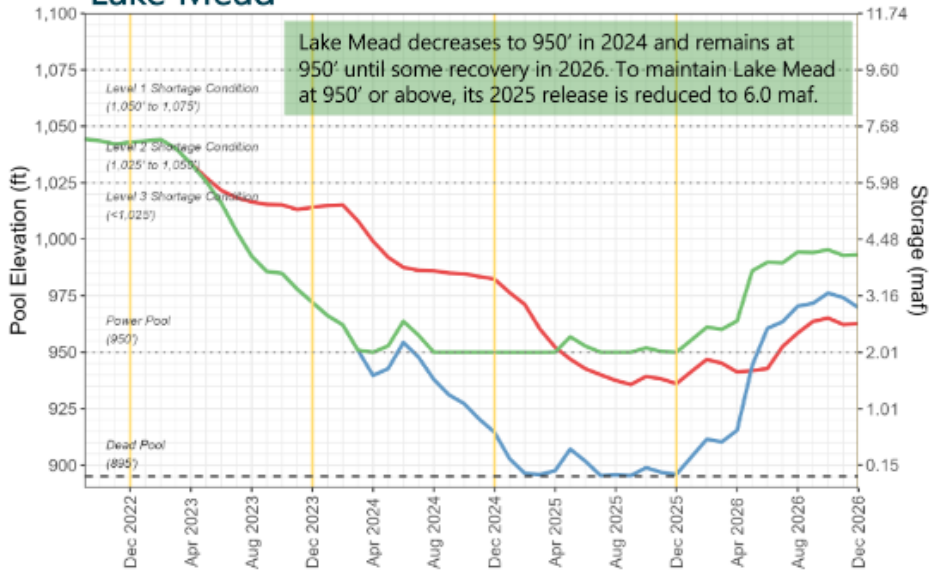
80% ESP Analysis – 2002-2005 Trace
Lowest Powell EOCY 2023 Storage in this 30-year period

End-of-Month (actual) Pool Elevation

Lake Powell



Lake Mead



Baseline
Protect 3490'
Protect 3490',950'

% of Avg. WY Powell Unreg. Inflow	2023	2024	2025	2026
	24%	58%	61%	125%

Scenario	Powell WY Release (maf)				Lees Ferry 10-yr Volume (maf)				Mead CY Release (maf)			
	23	24	25	26	23	24	25	26	23	24	25	26
Baseline	7.0	6.6	5.9	7.6	84.4	83.5	80.4	79.0	8.7	8.2	8.3	7.7
Protect 3,490'	5.2	5.7	5.5	9.2	82.6	80.9	77.4	77.6	8.7	8.2	6.8	7.7
Protect 3,490', 950'	5.2	5.7	5.5	8.4	82.6	80.9	77.4	76.8	8.7	6.7	6.0	7.7

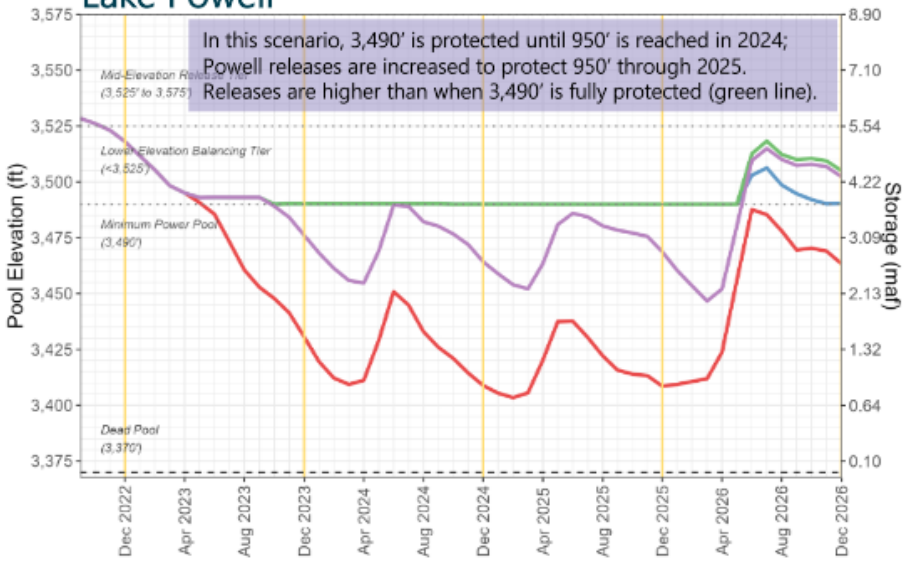
Lower releases than when we only protect 3490 in scenario 2. Because mead requires more.

Scenario 4: protects 3490 and then balancing.

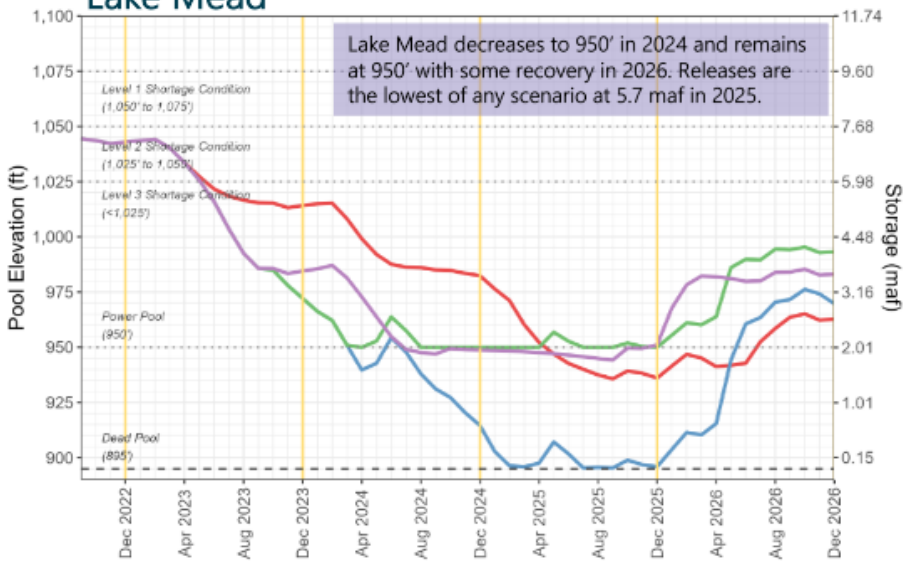
80% ESP Analysis – 2002-2005 Trace
Lowest Powell EOCY 2023 Storage in this 30-year period

End-of-Month (actual) Pool Elevation

Lake Powell



Lake Mead



- Baseline
- Protect 3490'
- Protect 3490',950'
- Protect 3490',until 950' is Reached

% of Avg. WY Powell Unreg. Inflow	2023	2024	2025	2026
	24%	58%	61%	125%

Scenario	Powell WY Release (maf)				Lees Ferry 10-yr Volume (maf)				Mead CY Release (maf)			
	23	24	25	26	23	24	25	26	23	24	25	26
Baseline	7.0	6.6	5.9	7.6	84.4	83.5	80.4	79.0	8.7	8.2	8.3	7.7
Protect 3,490'	5.2	5.7	5.5	9.2	82.6	80.9	77.4	77.6	8.7	8.2	6.8	7.7
Protect 3,490', 950'	5.2	5.7	5.5	8.4	82.6	80.9	77.4	76.8	8.7	6.7	6.0	7.7
Protect 3,490', until 950'	5.2	6.2	5.6	8.0	82.6	81.4	78.0	77.0	8.7	8.0	5.7	7.5

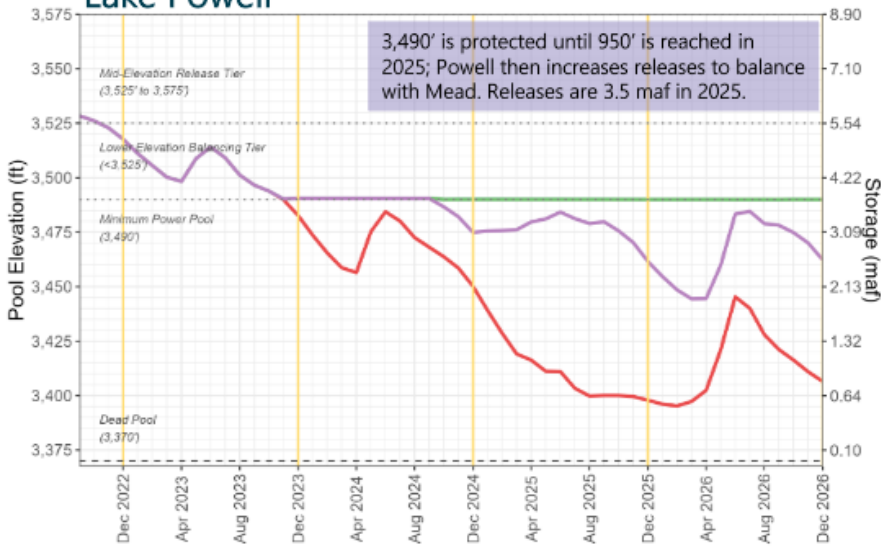
Mead releases are the lowest of any scenario.

Another example: they chose bc lowest combined Mead/Powell storage at end-2026.

Another example: Individual Streamflow Trace Analyzed – 80% ESP, 2000-2003 Trace Lowest Combined Powell + Mead Storage at EOCY 2026 in this 30-year period

End-of-Month (actual) Pool Elevation

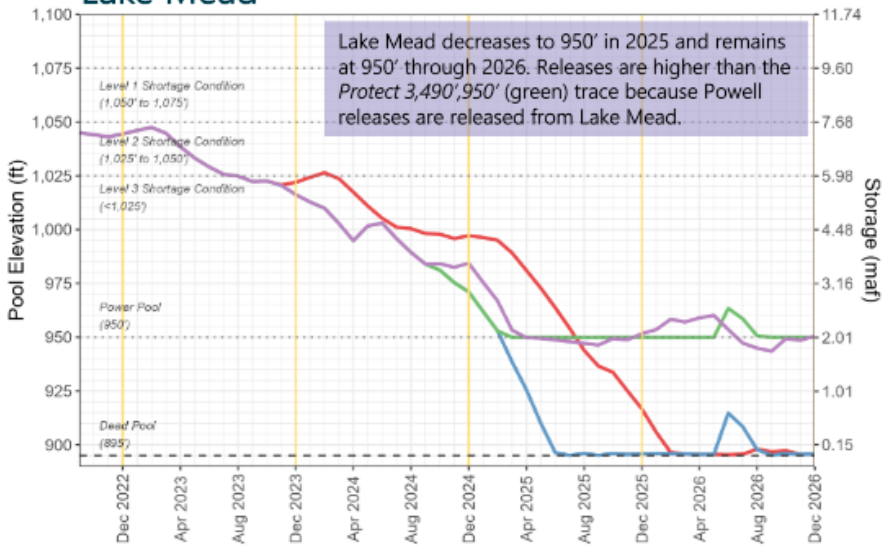
Lake Powell



Baseline
Protect 3490'
Protect 3490',950'
Protect 3490',until 950' is Reached

% of Avg. WY Powell Unreg. Inflow	2023	2024	2025	2026
	47%	61%	26%	59%

Lake Mead



Scenario	Powell WY Release (maf)				Lees Ferry 10-yr Volume (maf)				Mead CY Release (maf)			
	23	24	25	26	23	24	25	26	23	24	25	26
Baseline	7.0	7.0	5.4	5.0	84.5	84.0	80.3	76.3	8.4	8.5	8.3	6.3
Protect 3,490'	7.0	6.0	3.0	5.5	84.5	82.9	76.9	73.4	8.4	8.2	6.0	5.7
Protect 3,490', 950'	7.0	6.0	3.0	5.5	84.5	82.9	76.9	73.4	8.4	8.2	3.8	5.6
Protect 3,490', until 950'	7.0	6.0	3.5	5.6	84.5	82.9	77.4	74.0	8.4	8.2	5.0	5.6

Summary:

Summary of Modeling Scenarios

- Baseline – Current Operations
  - Lake Powell declines below min power pool (3,490') as early as spring/summer 2023 and Lake Mead declines below min power pool (950') with a risk of continued declining elevations at both reservoirs.
- Protect 3,490' at Lake Powell
  - By reducing Lake Powell's releases, Powell remains above min power pool; however, Lake Mead declines below min power pools and continues to decline to dead pool (895').
- Protect 3,490' at Lake Powell and 950' at Lake Mead
  - Remain above key elevations at Lake Powell and Lake Mead; however, reduced reservoir releases, and increased reductions in Lower Basin water deliveries would be needed
- Protect 3,490' at Lake Powell until Lake Mead reaches 950', then balance Powell and Mead storage with no minimum release
  - Key elevations are maintained with more flexibility in operations; however, reduced reservoir releases, and increased reductions in Lower Basin water deliveries would be needed

No Action Alternative

- Continued Full Implementation through 2026 of:
  - 2007 Interim Guidelines for operation of Lake Powell & Lake Mead
  - 2017 Minute 323 with Republic of Mexico
  - 2019 Drought Contingency Plan Contributions for Lower Basin States (AZ, CA, NV)
  - 2019 Drought Contingency Plan for the Upper Basin
  - 2019 Binational Water Scarcity Plan with Republic of Mexico

Anticipated Impacts of No Action

- Critically low elevations at Lakes Powell and Mead
- Water delivery and operations limitations
- Loss of hydropower production
- Flow limitations in the Grand Canyon
- Limited flows for ecological programs
- Reduced water availability to water users basin-wide
- U.S.-Mexico Water Treaty obligation

Framework Agreement Alternative overview

- An additional consensus-based set of actions that would build on existing commitments and obligations developed by the Basin States, Tribes, and non-governmental organizations as part of the 2019 DCP
- Reclamation would analyze any Framework Agreement Alternative in light of drier hydrology and extreme low flow scenarios
- Reclamation is hopeful that a "consensus alternative" could be developed as soon as possible

Framework Agreement Alternative components

- Reclamation would evaluate scoping comments as part of this alternative
- Comments could focus on issues such as:
  - What elevations might be protected in Lake Powell and Lake Mead
  - How much water might be released from Lake Powell
  - How much water might be released from Lake Mead
  - How shortages might be defined for Lower Basin States

Preliminary Alternatives

- No Action
- Framework Agreement Alternative
- Reservoir Operations Modification Alternative
  - A set of actions adopted pursuant to Secretarial authority under applicable federal law
    - Could complement a consensus-based alternative that may not sufficiently mitigate current and projected risks to Colorado River System reservoirs

Components of Reservoir Operations Modification Alternative

Considering protecting critical infrastructure and the range of potential poor hydrology, Reclamation could, for example, propose to:

- Protect elevation 3,500' at Lake Powell & elevation 1,000' at Lake Mead
  - Section 2D. Raise operating determination elevations and/or increase shortage reduction amounts in Lower Basin by as much as 2 maf (or more)
  - Section 6C. Release less than 7.0 million acre-feet (maf) of water from Lake Powell - initial estimates are to analyze releases reduce by 2 to 3 maf (or more)
  - Section 7C. Provide for potential mid-year reductions in the Lower Basin