

# RECLAMATION

*Managing Water in the West*

## **Interim Guidelines for the Operation of Lake Powell and Lake Mead**

**NWRA Annual Conference  
Mesquite, Nevada  
March 6, 2008**



U.S. Department of the Interior  
Bureau of Reclamation

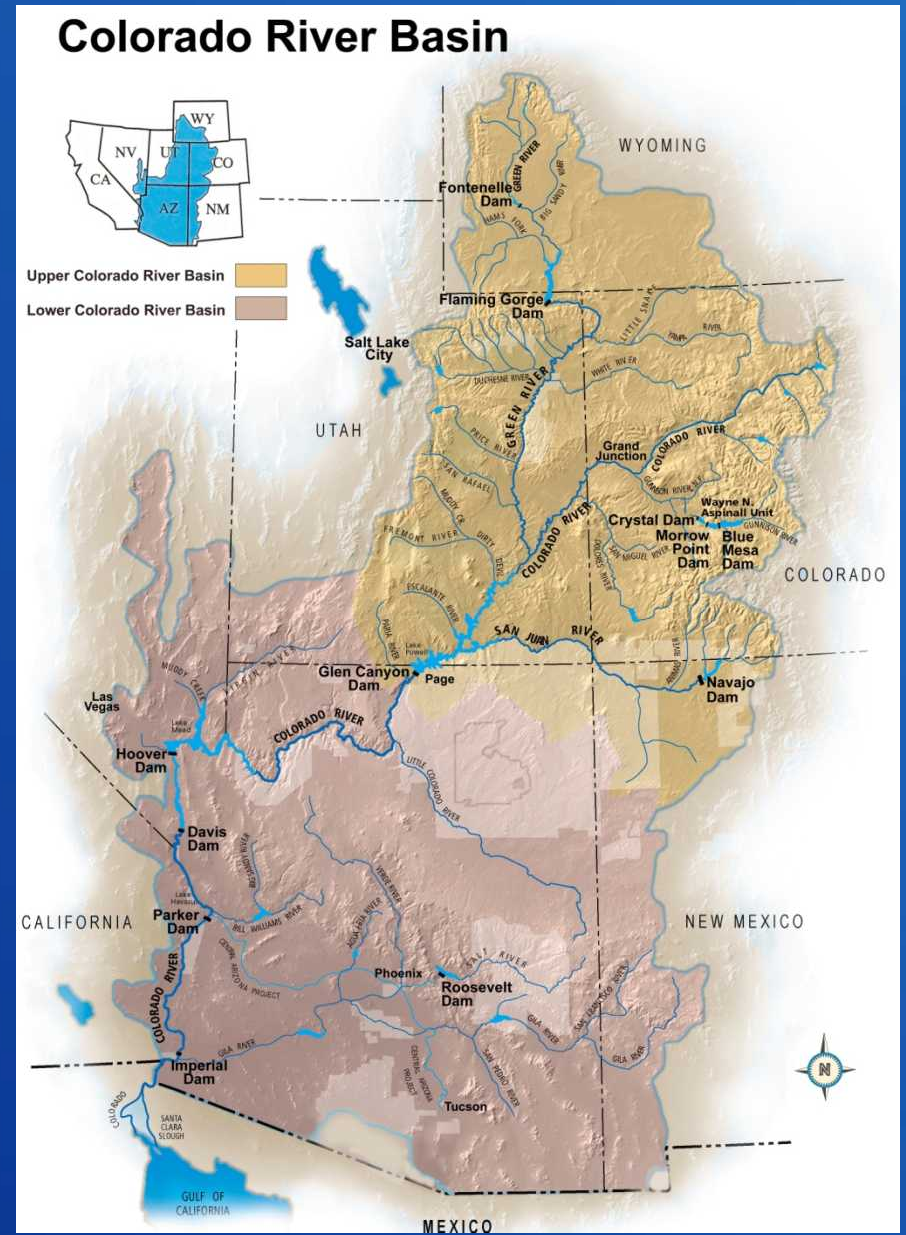
# Interim Guidelines for the Operation of Lake Powell and Lake Mead

- Background and need for additional guidelines
- Overview of the Interim Guidelines
- Implementation of the Interim Guidelines
- Current and Projected System Conditions
- Questions

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# Colorado River Basin Hydrology

- 16.5 million acre-feet (maf) allocated annually
- 13 to 14.5 maf of consumptive use annually
- 60 maf of storage
- 15.1 maf average annual “natural” inflow into Lake Powell over past 100 years
- Inflows are highly variable year-to-year

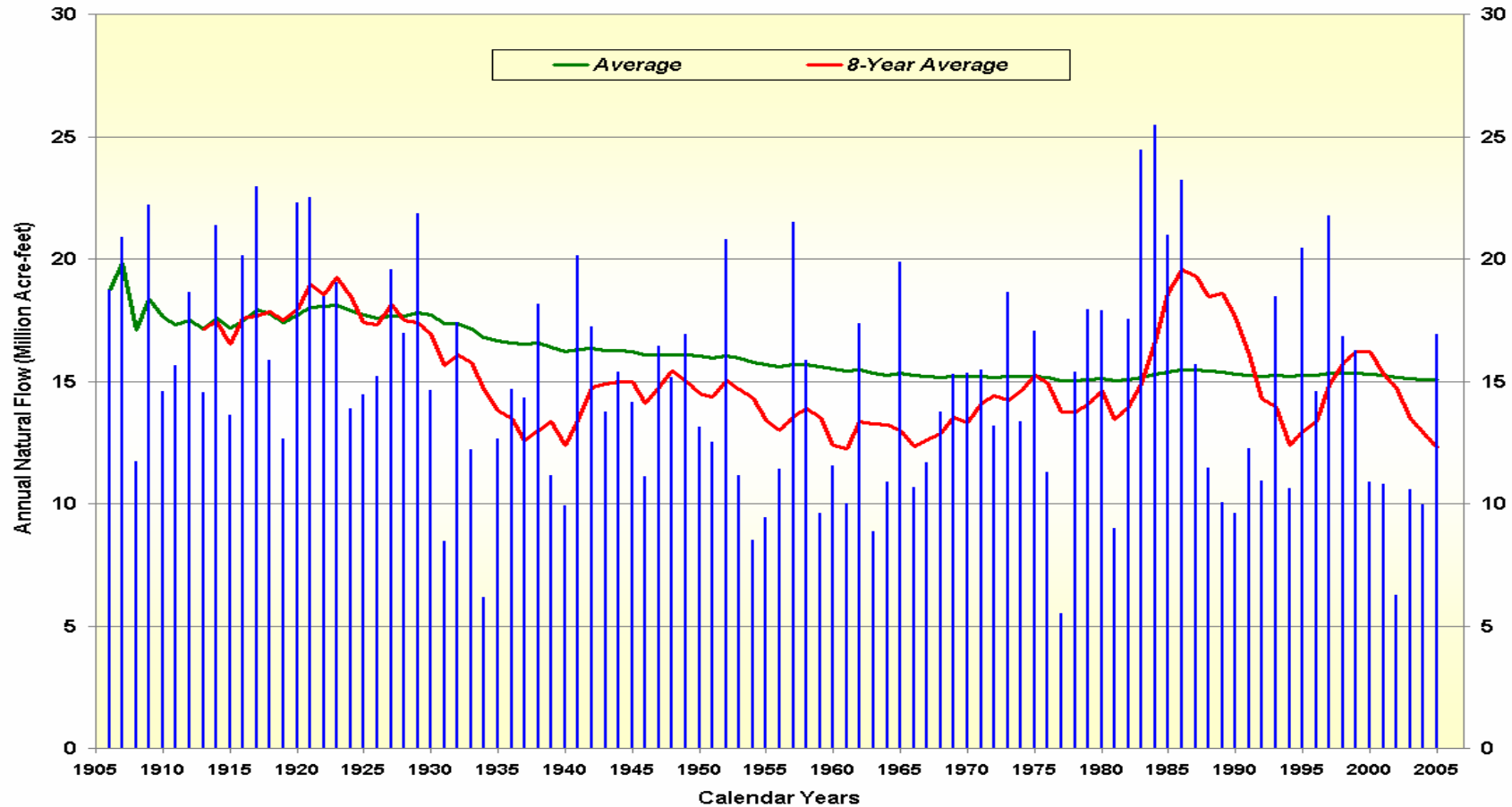


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# Natural Flow

## Colorado River at Lees Ferry Gaging Station, Arizona

### Calendar Year 1906 to 2005



*Provisional data, subject to change*

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# State of the System (1999-2008)

WY	Unregulated inflow into Powell % of Average	Powell and Mead Storage, maf	Powell and Mead % Capacity
2000	62	43.38	86
2001	59	39.01	78
2002	25	31.56	63
2003	52	27.73	55
2004	51	23.11	46
2005	105	27.24	54
2006	73	25.80	51
2007	68	24.43	49
*2008	111	27.43	55

\* Based on February 24 Month Study

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# Impetus for the New Interim Guidelines

**Lake Mead Delta - 1999**



**Lake Mead Delta - 2006**



- Eight years of unprecedented drought
- Increased water use
- To date, there has never been a shortage in the Lower Basin and there were no shortage guidelines
- Operations between Lake Powell and Lake Mead were coordinated only at the higher reservoir levels (“equalization”)
- Note: these Guidelines do not directly affect deliveries to Mexico

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# Key Considerations in Developing the Interim Guidelines

(Identified through NEPA Scoping Process)

- Importance of encouraging conservation of water
- Importance of considering reservoir operations at all operational levels
- Guidelines for an interim period (2008 through 2026)

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# Elements of the Interim Guidelines<sup>1</sup>

- Shortage strategy for Lake Mead and the Lower Division states
- Coordinated operation of Lakes Powell and Mead
- Mechanism for the storage and delivery of conserved system and non-system water in Lake Mead
- Modified and extended elements of existing Interim Surplus Guidelines

<sup>1</sup> Issued in Record of Decision, dated December 13, 2007; available at <http://www.usbr.gov/lc/region/programs/strategies.html>

# Elements of the Interim Guidelines

- Key Elements
  - A shortage strategy tied to Lake Mead elevations
    - 333, 417, 500 kaf at elevations 1075, 1050, and 1025 feet (amounts of shortage for US only)
    - Initiate efforts to develop additional guidelines for shortages if Lake Mead falls below elevation 1,025 (includes re-consultation)
  - Release from Lake Powell determined by storage of Powell and Mead
    - Under high reservoir conditions, minimum objective release of 8.23 maf from Lake Powell unless storage equalization releases are required
    - Under lower reservoir conditions, either reduce Lake Powell release or balance volumes depending upon elevations at Lake Powell and Lake Mead

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# Elements of the Interim Guidelines

## (continued)

- Key Elements (continued)
  - Storage and delivery of conserved system and non-system water through Intentionally Created Surplus (ICS)
    - Implemented a maximum total ICS credits of 2.1 maf
    - Analyzed a maximum quantity of up to 4.2 maf
    - System assessment of 5% when ICS is created
    - Forbearance and Delivery Agreements required to create and deliver ICS
  - ISG modified to eliminate Partial Domestic Surplus condition and extended through 2026

# Operational Diagrams for Lake Powell and Lake Mead

Lake Powell Elevation (feet)	Lake Powell Operational Tiers	Lake Powell Storage (maf)	Lake Mead Elevation (feet)	Lake Mead	Lake Mead Storage (maf)
3,700	<b>Equalization Tier</b> Equalize, Avoid Spills or Release 8.23 maf	24.3	1,220	Flood Control or 70R Surplus	25.9
3,636 - 3,666 (2008-2026)		15.5 - 19.3 (2008-2026)	1,200		Domestic Surplus
3,595	<b>Upper Elevation Balancing Tier</b> Release 8.23 maf, if Lake Mead < 1,075 feet, balance contents with a min/max release of 7.0 and 9.0 maf	11.3	1,145	Normal Operations	15.9
			3,575		1,125
3,560	<b>Mid-Elevation Release Tier</b> Release 7.48 maf, if Lake Mead < 1,025 feet, release 8.23 maf	9.5	1,100		11.5
3,525		8.3	1,075	9.4	
3,490	<b>Lower Elevation Balancing Tier</b> Balance contents with a min/max release of 7.0 and 9.5 maf	5.9	1,050	Shortage 333 kaf <sup>1</sup>	7.5
		4.0	1,025	Shortage 417 kaf <sup>1</sup>	5.8
3,370		0	1,000	Shortage 500 kaf <sup>1</sup> and Consultation <sup>2</sup>	4.3
			895		0

<sup>1</sup> These are amounts of shortage (i.e., reduced deliveries in the United States).

<sup>2</sup> If Lake Mead falls below elevation 1,025 ft msl, the Department will initiate efforts to develop additional guidelines for shortages at lower Lake Mead elevations.

# Implementing Agreements Signed Concurrent with ROD

- Lower Basin States Forbearance Agreement (multiple parties to allow delivery of ICS in accordance with Consolidated Decree)
- CA ICS Agreement (multiple parties within CA allocating ICS within the state)
- Delivery Agreements (agreement with Secretary for delivery of ICS)
  - IID ICS Delivery Agreement (Reclamation-IID)
  - SNWA ICS Delivery Agreement (Reclamation-SNWA-CRCN)
  - MWD ICS Delivery Agreement (Reclamation-MWD)
- Other Agreements
  - Drop 2 Funding Agreement (Reclamation-SNWA-CRCN)
  - Confluence Agreement (Reclamation-IID-SNWA-CRCN)

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# Colorado River Basin Storage

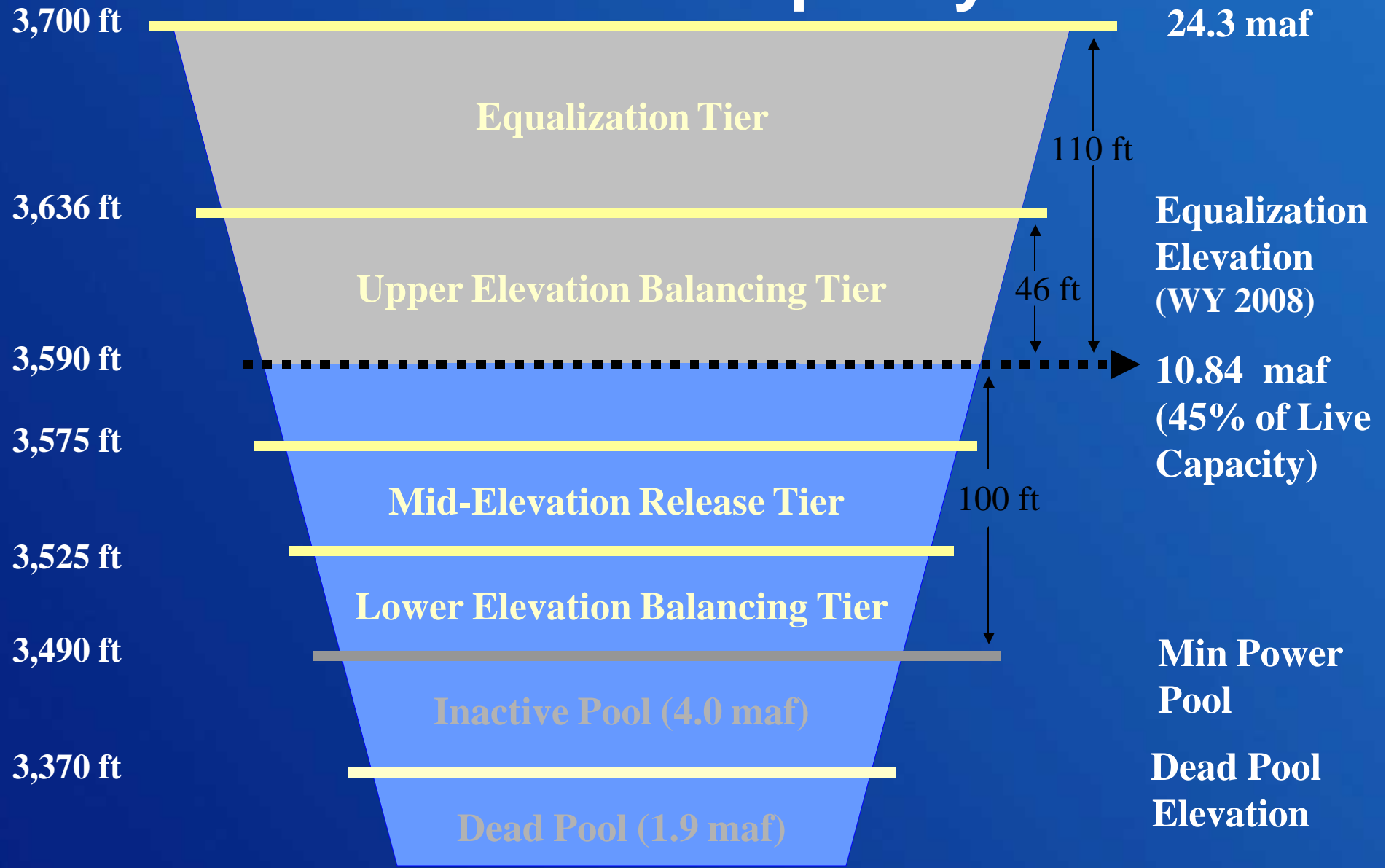
(as of Feb 21, 2008)

<b>Current Storage</b>	<b>Percent Full</b>	<b>MAF</b>	<b>Elevation (Feet)</b>
<b>Lake Powell</b>	<b>45%</b>	<b>10.84</b>	<b>3590</b>
<b>Lake Mead</b>	<b>51%</b>	<b>13.09</b>	<b>1117</b>
<b>Total System Storage</b>	<b>53%*</b>	<b>31.21</b>	<b>NA</b>

**\*Total system storage was 33.53 maf or 56% this time last year**

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# Lake Powell Capacity

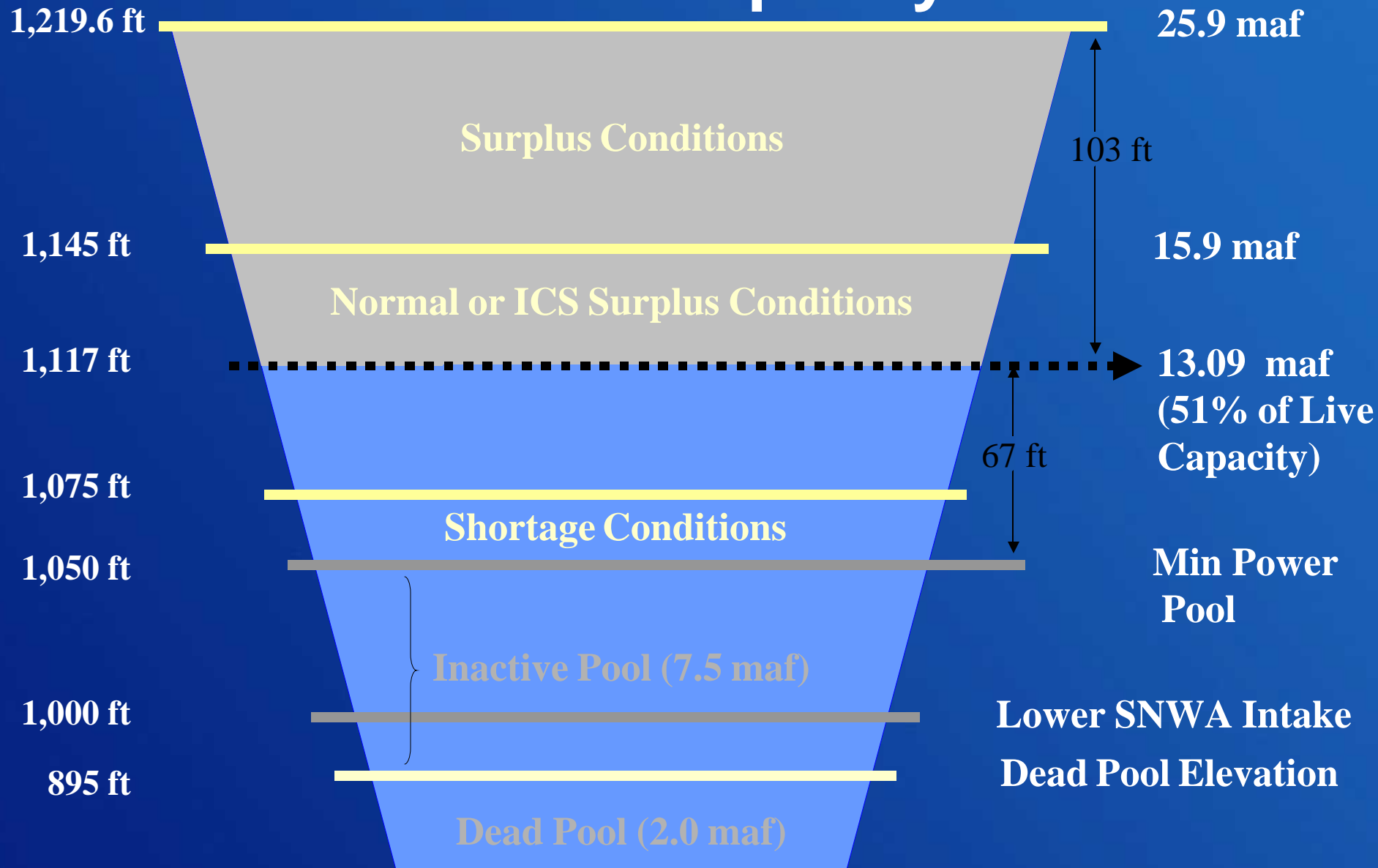


Not to scale

As of Feb 21, 2008

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# Lake Mead Capacity

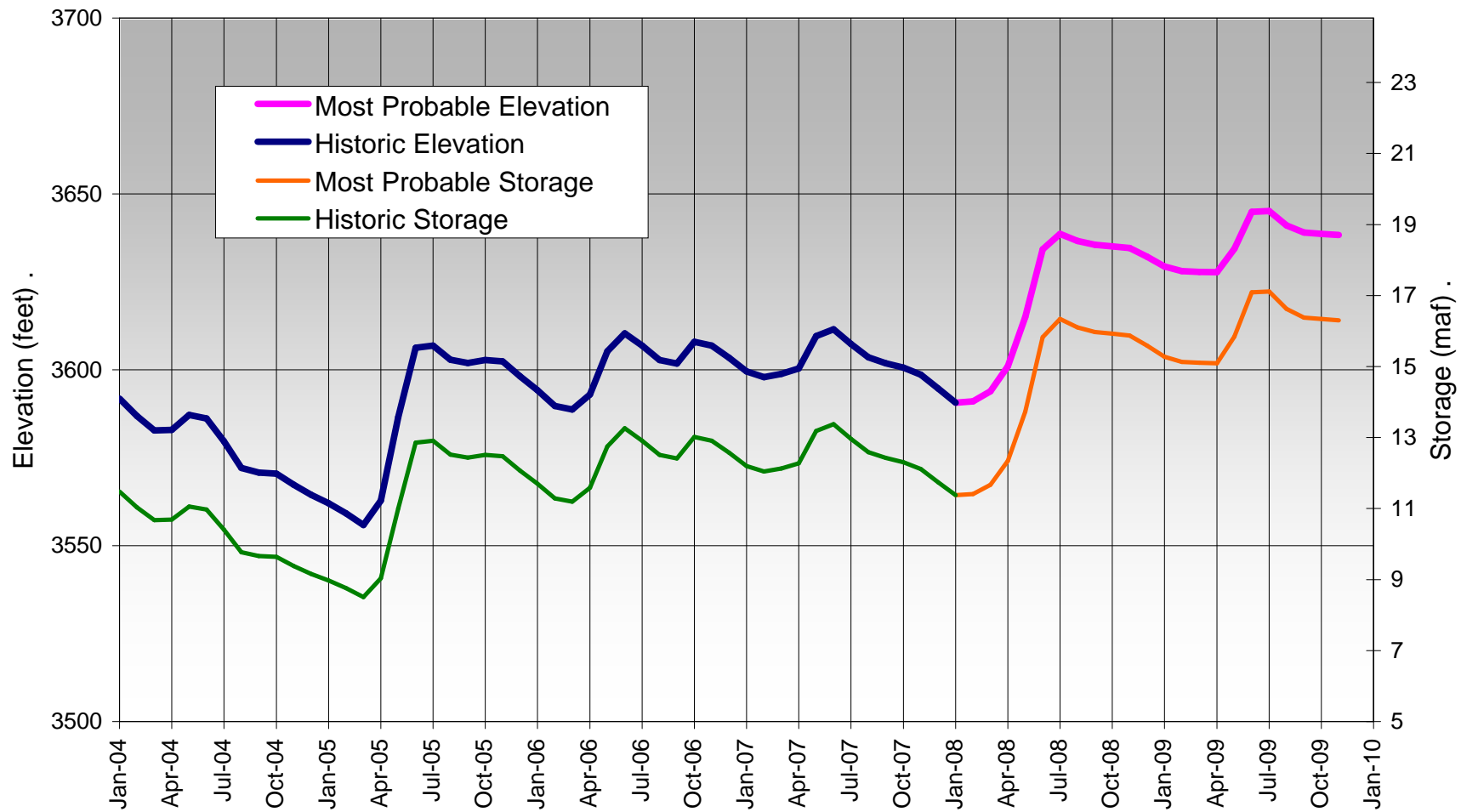


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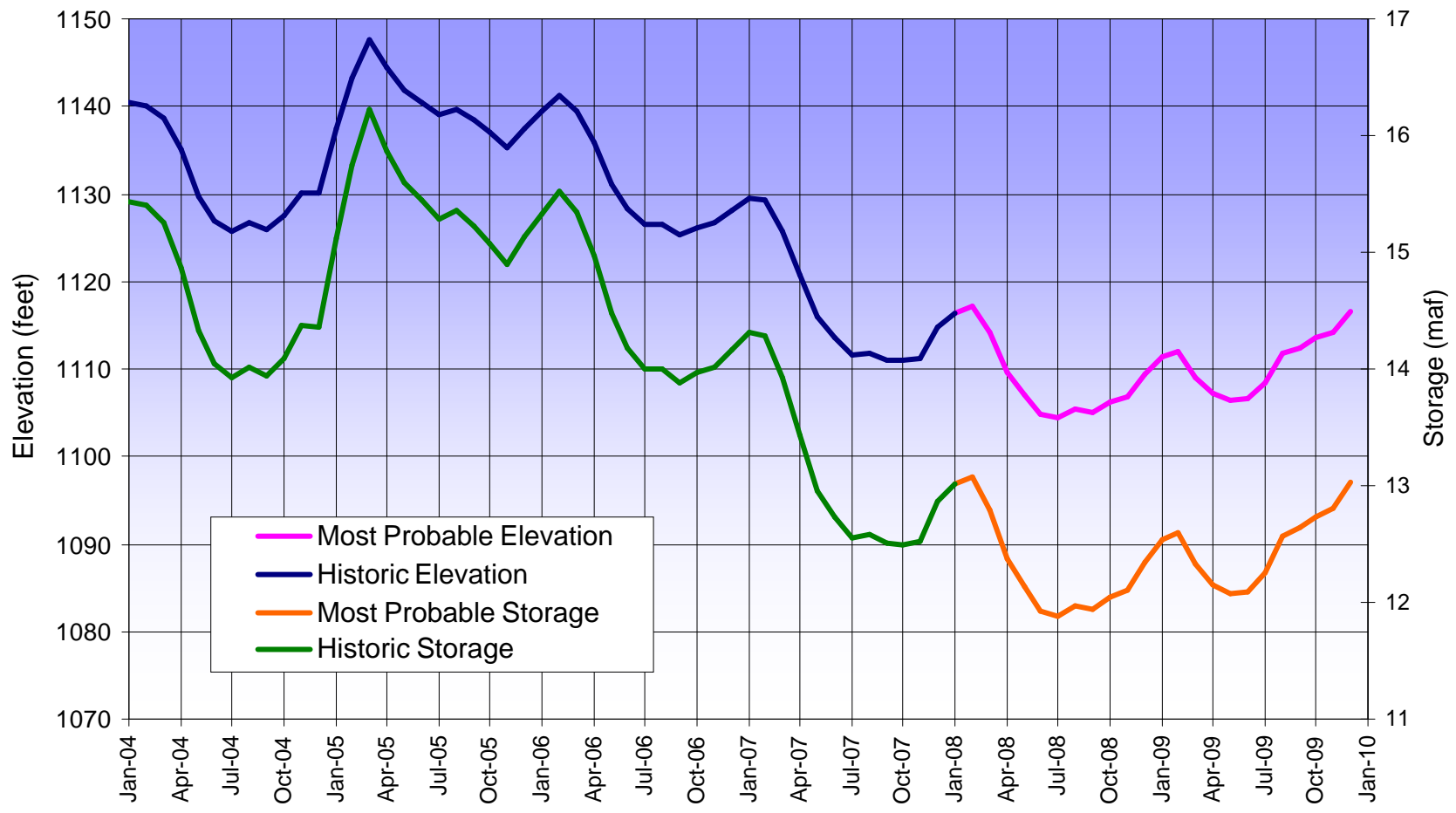
As of Feb 21, 2008

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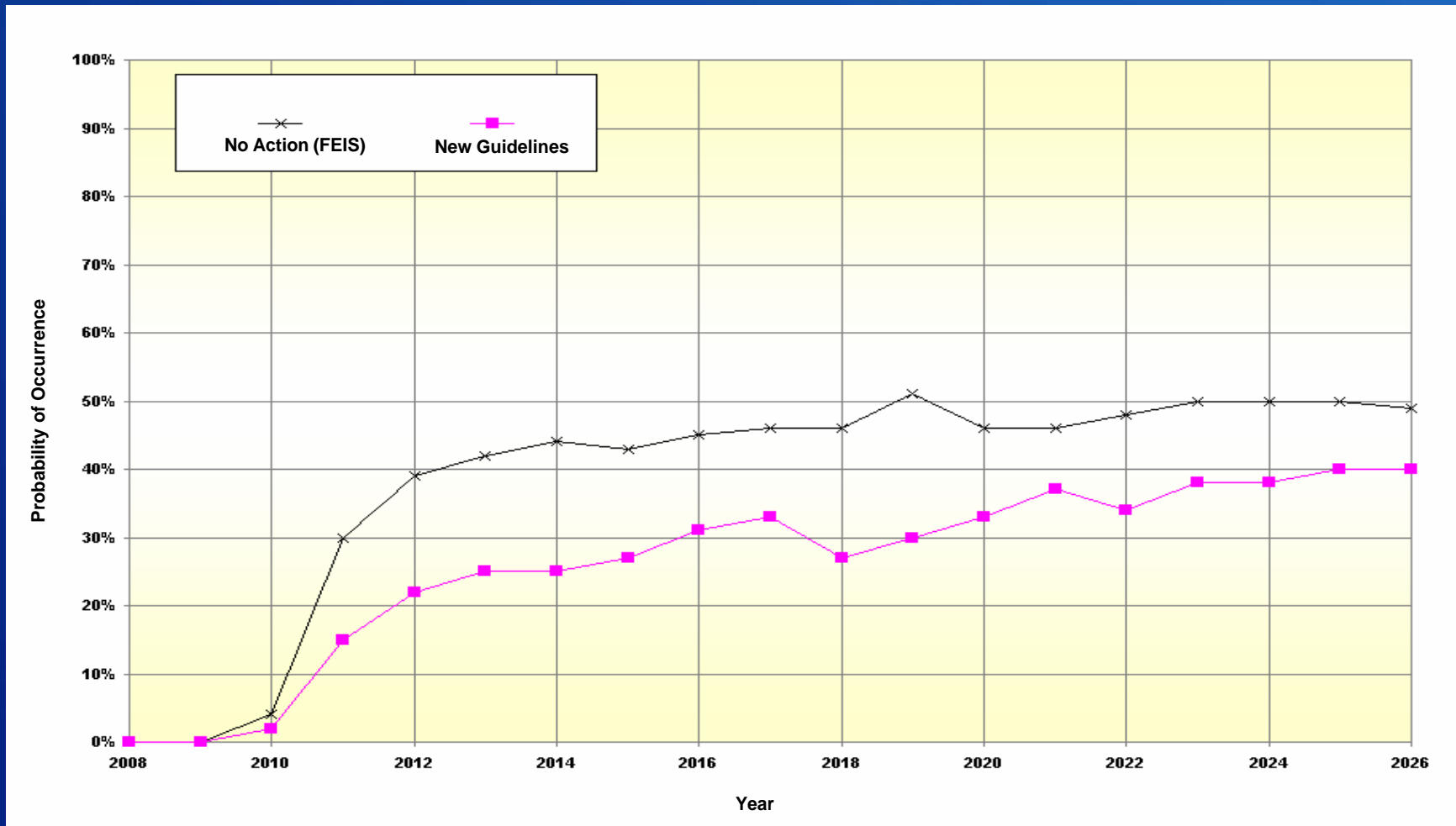
## Lake Powell Projected EOM Water Surface Elevation and Storage February 24 Month Study



### Lake Mead Projected EOM Water Surface Elevation and Storage February 24 Month Study



# Lower Basin Shortages No Action (FEIS) & New Interim Guidelines Probability of Occurrence of Any Amount



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# Interim Guidelines - A Robust Solution

- In place for an interim period (through 2026) to gain valuable operational experience
- Operations specified through the full range of operation for Lake Powell and Lake Mead
- Strategy for shortages in the Lower Basin, including a provision for additional shortages if warranted
- Encourage efficient and flexible use and management of Colorado River water through the ICS mechanism
- Basin States agree to consult before resorting to litigation

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An aerial photograph showing a large concrete dam in the foreground, with a winding road on top. Behind the dam is a large reservoir of blue water, which is Lake Powell. The surrounding landscape is rugged and mountainous, with some greenery and a few buildings visible near the dam. The sky is clear and blue.

# Interim Guidelines for the Operation of Lake Powell and Lake Mead

**For further information:**

<http://www.usbr.gov/lc/region/programs/strategies.html>

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