

Glen Canyon Dam Adaptive Management Work Group
Agenda Item Information
August 24-25, 2011

Agenda Item

Basin Hydrology and Operations

Action Requested

✓ Information item only.

Presenter

Rick Clayton, Hydraulic Engineer, Bureau of Reclamation

Previous Action Taken

N/A

Relevant Science

N/A

Background Information

The presentation is intended to provide pertinent information to AMWG members on current water supply and forecasted hydrologic conditions within the Upper Colorado River Basin. The presentation will focus on projected reservoir conditions and operations at Lake Powell/Glen Canyon Dam during the remainder of water year 2011 and provide a general outlook for 2012.

The presentation will cover the implementation of the *Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations of Lake Powell and Lake Mead* and the potential for equalization releases from Lake Powell in water year 2012. Such information is provided to assist the AMWG in developing recommendations to the Secretary on the operation of Glen Canyon Dam for water year 2012.

RECLAMATION

Managing Water in the West

Upper Basin Hydrology and Projected Operations Water Year 2012

Adaptive Management Work Group
August 24-25, 2011



U.S. Department of the Interior
Bureau of Reclamation

Rick Clayton

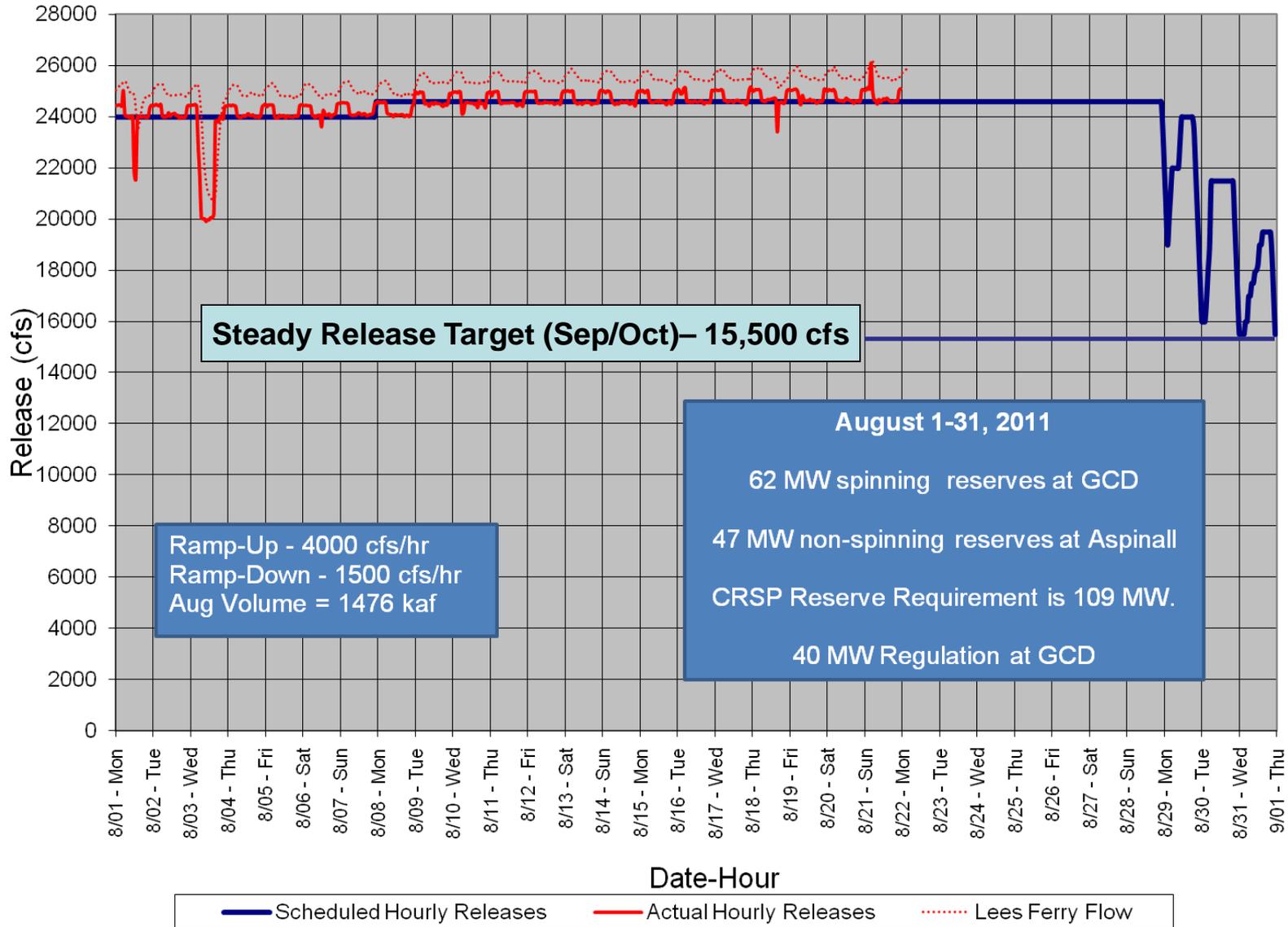
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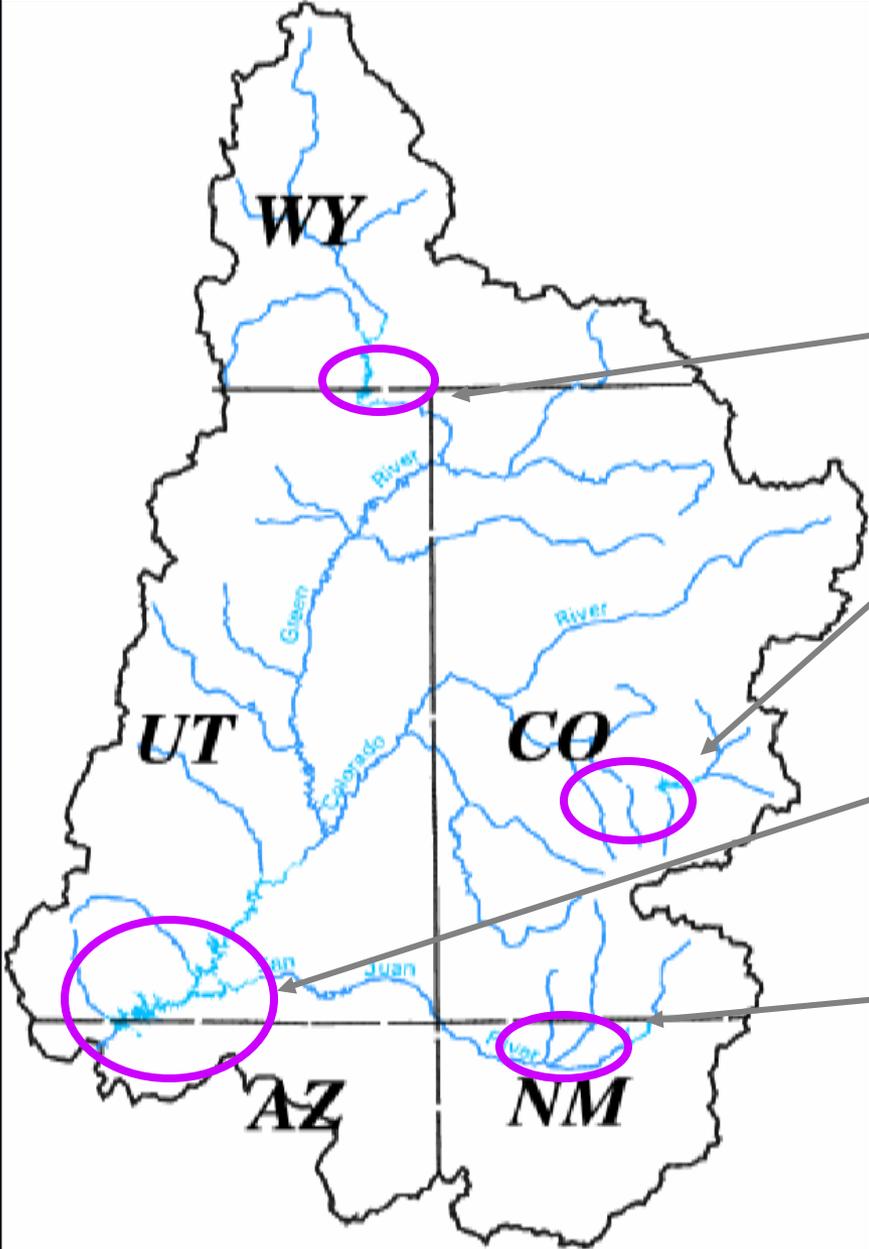
(801)524-3710

Hydraulic Engineer/Glen Canyon
Reclamation/UC Region
Resource Management Division
Water Resources Group

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Glen Canyon Dam Hourly Release Pattern AUG 2011





CRSP Storage

Water Year 2011 Storage Levels
(Initial/Final)

Flaming Gorge	84% (3.15 maf)	92% (3.47 maf)
Blue Mesa	73% (0.61 maf)	85% (0.70maf)
Lake Powell	63% (15.27 maf)	74% (18.10 maf)
Navajo	83% (1.41 maf)	81% (1.37 maf)

Annual Operating Plan

Lake Powell Unregulated Inflow Scenarios

Scenario	2011 AOP WY 2011	2012 AOP WY 2012 <small>Developed August 2011</small>
Minimum Probable	4.85 maf (40 %)	7.00 maf (58 %)
Most Probable	10.75 maf (89 %)	12.60 maf (105 %)
Maximum Probable	17.10 maf (142 %)	19.50 maf (162 %)

Lake Powell & Lake Mead Operational Diagrams for 2012

Lake Powell			Lake Mead		
Elevation (feet)	Operations According to Interim Guidelines	Live Storage (MAF)	Elevation (feet)	Operations According to Interim Guidelines	Live Storage (MAF)
3,700	Equalization Tier Equalize, Avoid Spills or Release 8.23 MAF	24.3	1,220	Flood Control, 70R or ICS Surplus	25.9
3,636 - 3,666 (2008-2026)		15.5 - 19.3 (2008-2026)	1,200		22.9
3,646 1/1/12 Projection	Upper Elevation Balancing Tier ¹ Release 8.23 MAF; if Lake Mead < 1,075 feet, balance contents with a min/max release of 7.0 and 9.0 MAF	16.7 1/1/12 Projection	1,145	Domestic or ICS Surplus	15.9
3,575		9.5	1,134 1/1/12 Projection	Normal Operations or ICS Surplus	14.8 1/1/12 Projection
3,525	Mid-Elevation Release Tier Release 7.48 MAF; if Lake Mead < 1,025 feet, Release 8.23 MAF;	5.9	1,075	Shortage 333 KAF ²	9.4
3,490	Lower Elevation Balancing Tier Balance contents with a min/max release of 7.0 and 9.5 MAF	4.0	1,050	Shortage 417 KAF ²	7.5
3,370		0	1,025	Shortage 500 KAF ² and Consultation ³	5.8
			1,000		4.3
			895		0

¹ Subject to April adjustments that may result in balancing releases or releases according to the Equalization Tier.

² These are amounts of shortage (i.e., reduced deliveries in the United States).

³ If Lake Mead falls below elevation 1,025 ft, the Department will initiate efforts to develop additional guidelines for shortages at lower Lake Mead elevations.

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WY2012 Operations under Interim Guidelines

as projected in August 2011 24-Month Study

Scenario	Initial Operational Tier	Projected Annual Release Volume
Minimum Probable	Equalization	9.96* maf
Most Probable		13.56 maf
Maximum Probable		14.48** maf

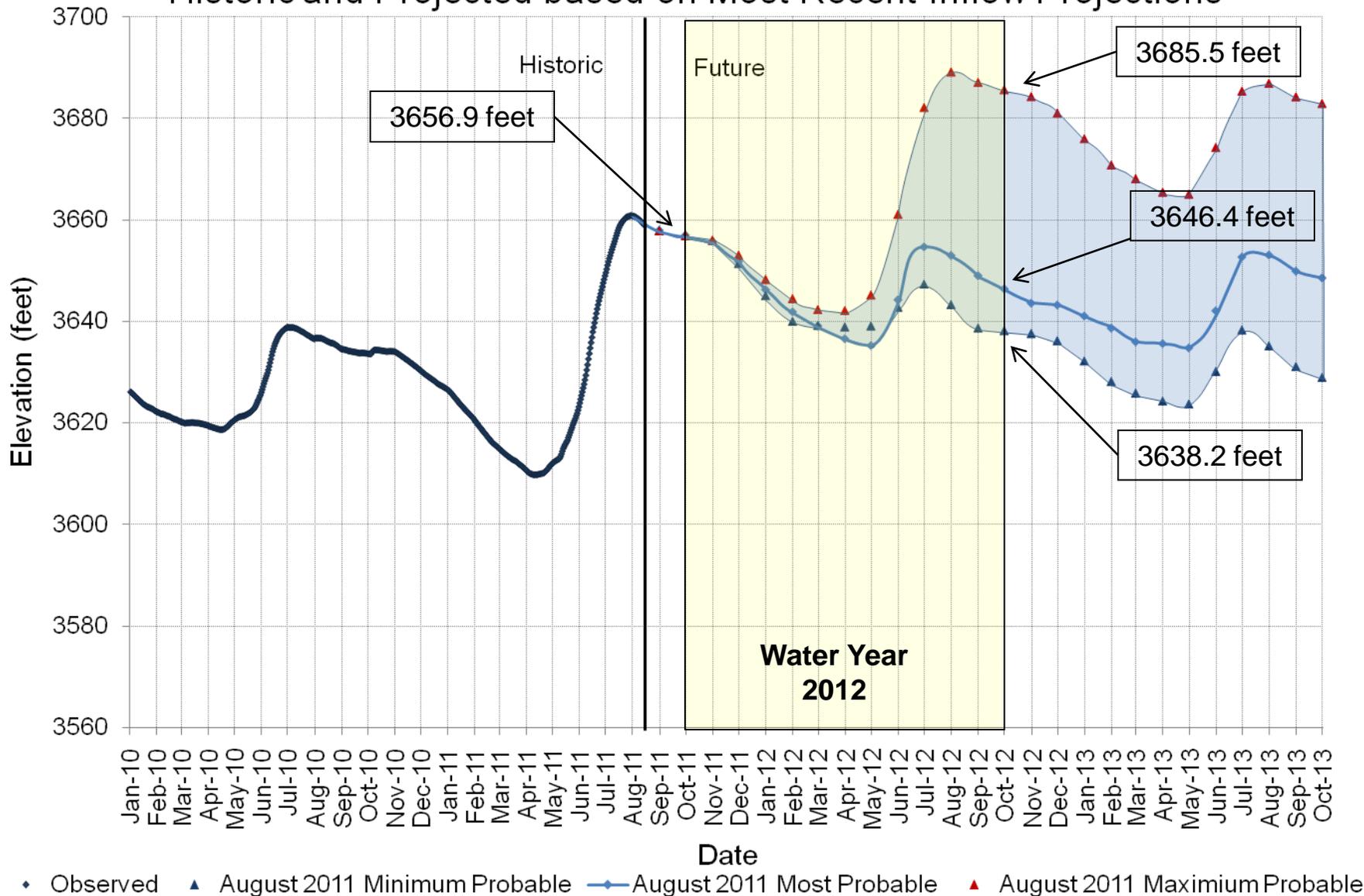
*This volume is greater than 8.23 maf as a result of the August 24-Month Study projecting that Equalization for 2011 will not be achieved by September 30, 2011. Under this scenario, additional water would be released in water year 2012 to complete Equalization for 2011.

**This is volume of release is projected to be the maximum powerplant capacity during water year 2012. The actual volume of release that would achieve Equalization by September 30th is 16.69 maf under the Maximum Probable Inflow Scenario.

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Lake Powell Elevations

Historic and Projected based on Most Recent Inflow Projections



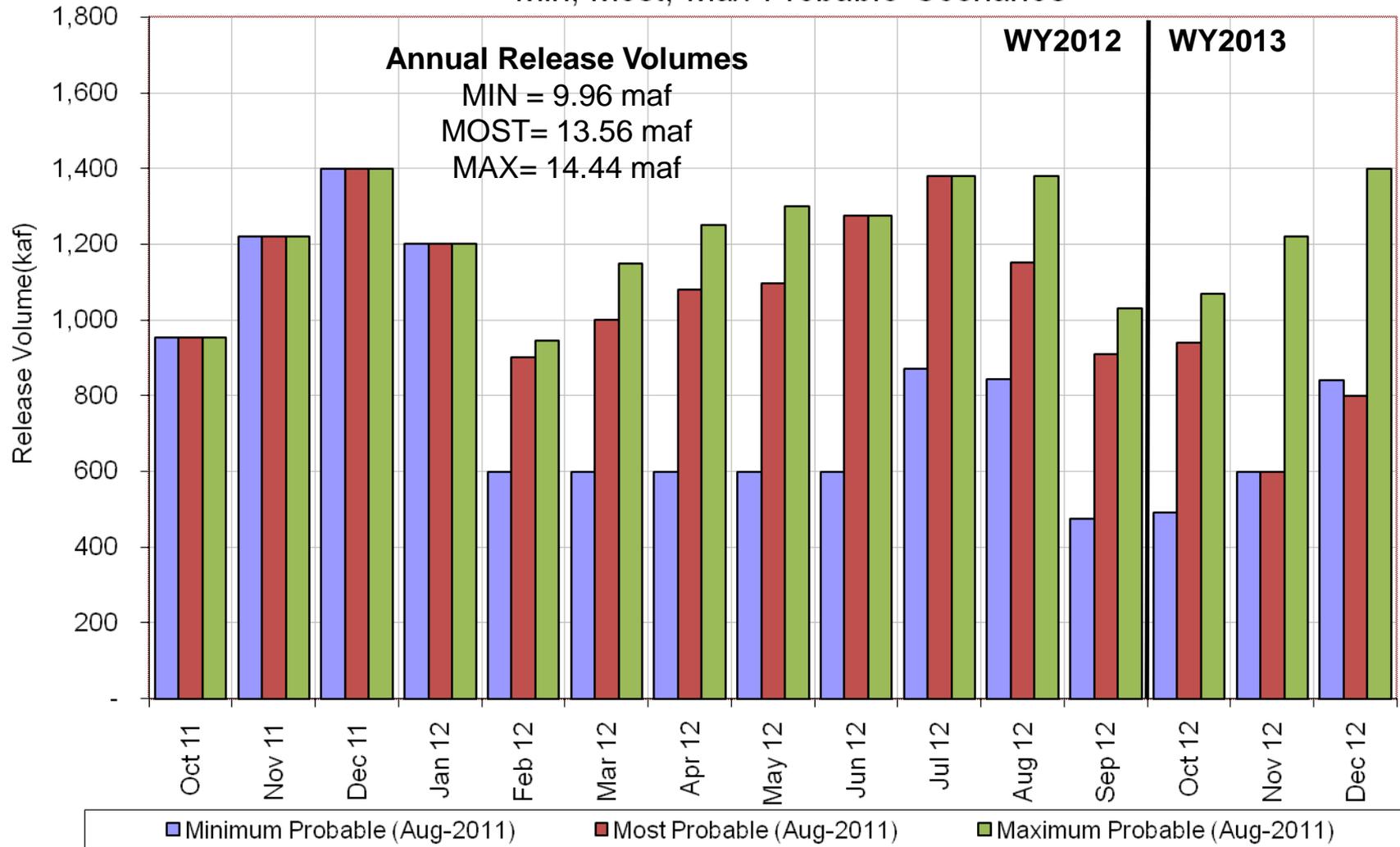
**Glen Canyon Power Plant Planned Unit Outage Schedule for Water Year 2012
(updated 8-16-2011)**

Unit Number	Oct 2011	Nov 2011	Dec 2011	Jan 2012	Feb 2012	Mar 2012	Apr 2012	May 2012	Jun 2012	Jul 2012	Aug 2012	Sep 2012
1	[Red Bar]											[Red Bar]
2	[Red Bar]											
3						[Red Bar]						
4						[Red Bar]						
5	[Red Bar]											[Red Bar]
6 (3/4 Unit)	[Red Bar]											
7					[Red Bar]							
8					[Red Bar]							
Units Available	5	6.75	6.75	6.75	4.75	4.75 / 6.75	6.75	6.75	6.75	6.75	6.75	4.75
Capacity (cfs)	15,500	23,800	23,000	23,000	14,400	14,400 / 23,800	23,000	23,000	23,000	23,800	23,800	14,800
Capacity (kaf/month)	1070	1220	1400	1380	980	1150	1250	1300	1275	1380	1380	1030
Max (kaf)	951	1220	1400	1200	980	1150	1250	1300	1275	1380	1380	1030
Most (kaf)	951	1220	1400	1200	900	1000	1080	1096	1275	1380	1151	910
Min (kaf)	951	1220	1400	1200	600	600	600	600	600	870	843	476

Lake Powell Monthly Release Volume Distribution

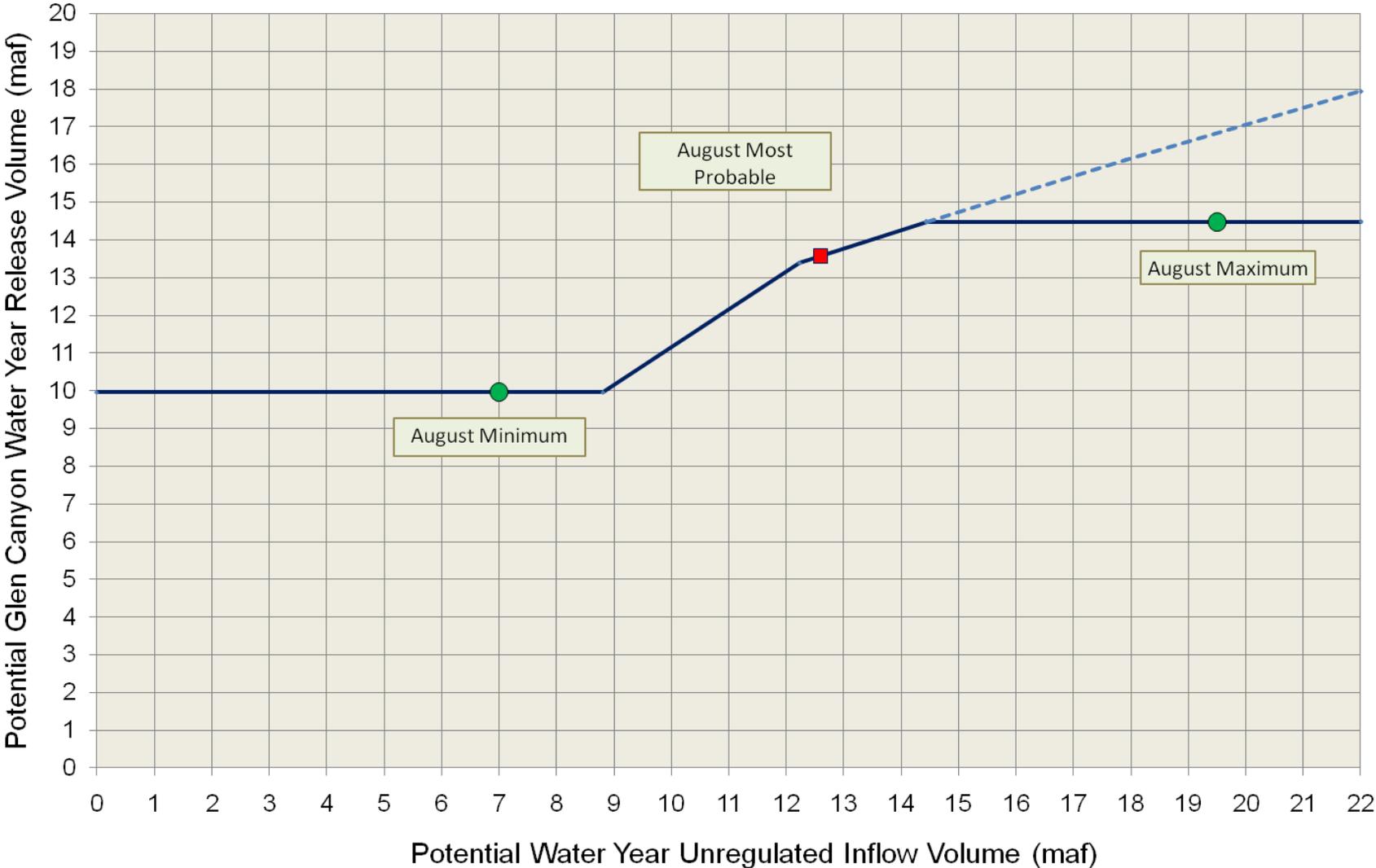
August 2011 24-Month Study

Min, Most, Max Probable Scenarios



Coordinated Operations of Lake Powell and Lake Mead

Water Year 2012 Release Volume as a Function of Unregulated Inflow Volume
based on August 24-Month Study Conditions



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