

# RECLAMATION

*Managing Water in the West*

## FY 2014 Hydrograph

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June 20, 2012



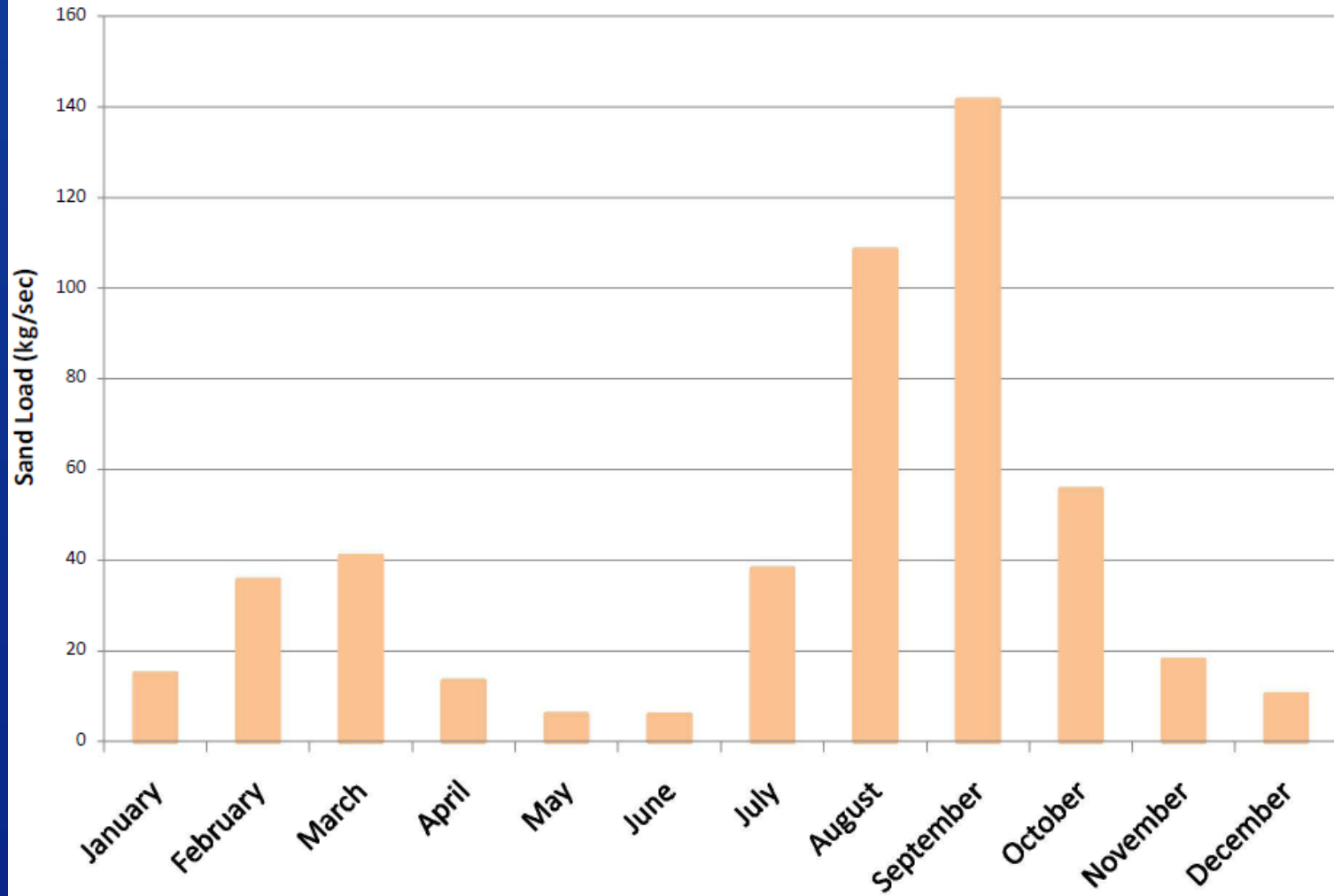
U.S. Department of the Interior  
Bureau of Reclamation

# 2014 Hydrograph Development

- Start with 2012/13 Hydrograph
- Consider operating experiences
- Take advantage of current conditions
- Not intended to be precedent setting
- Continue to work within existing environmental compliance

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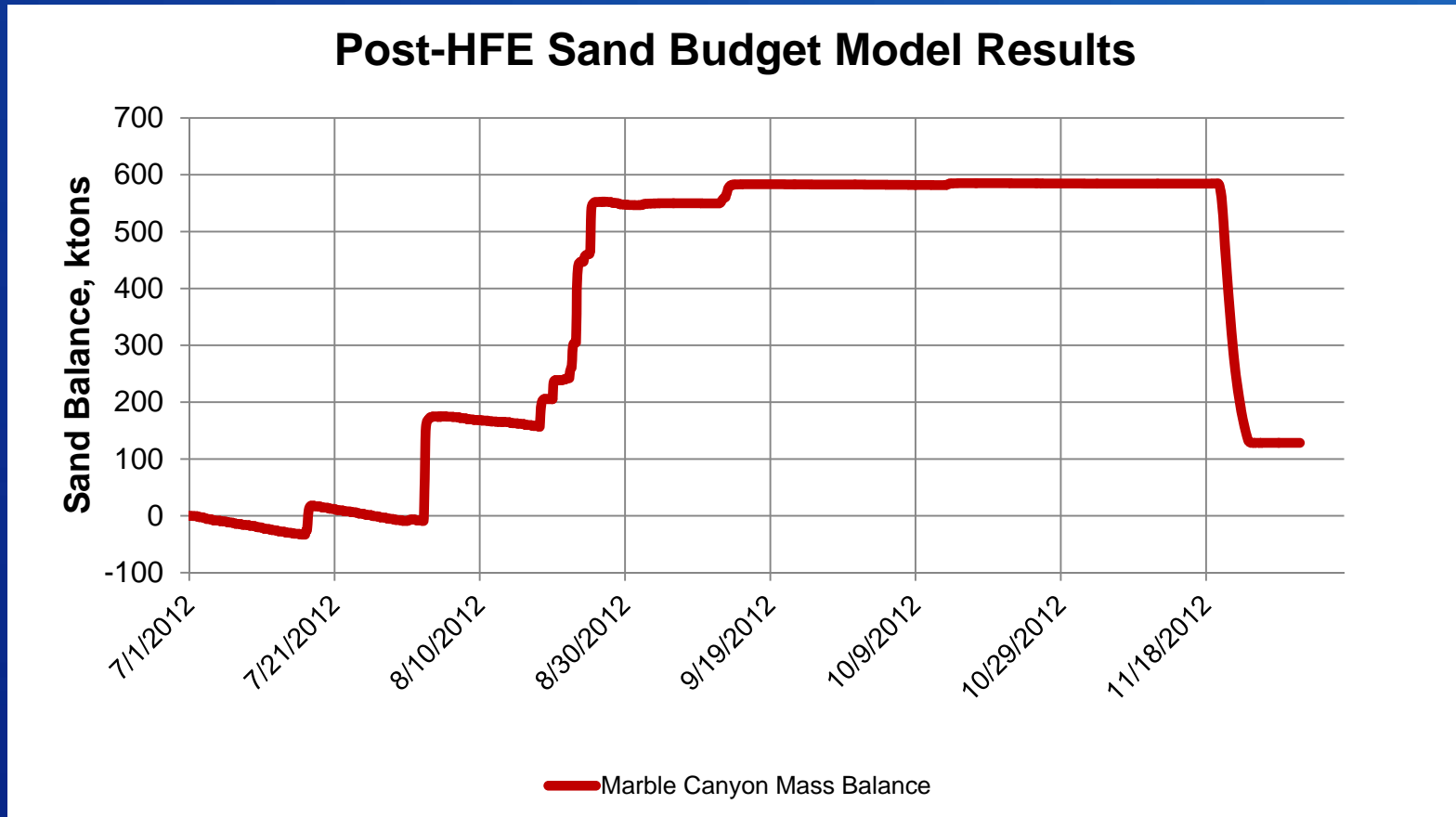
Average Sand Inputs



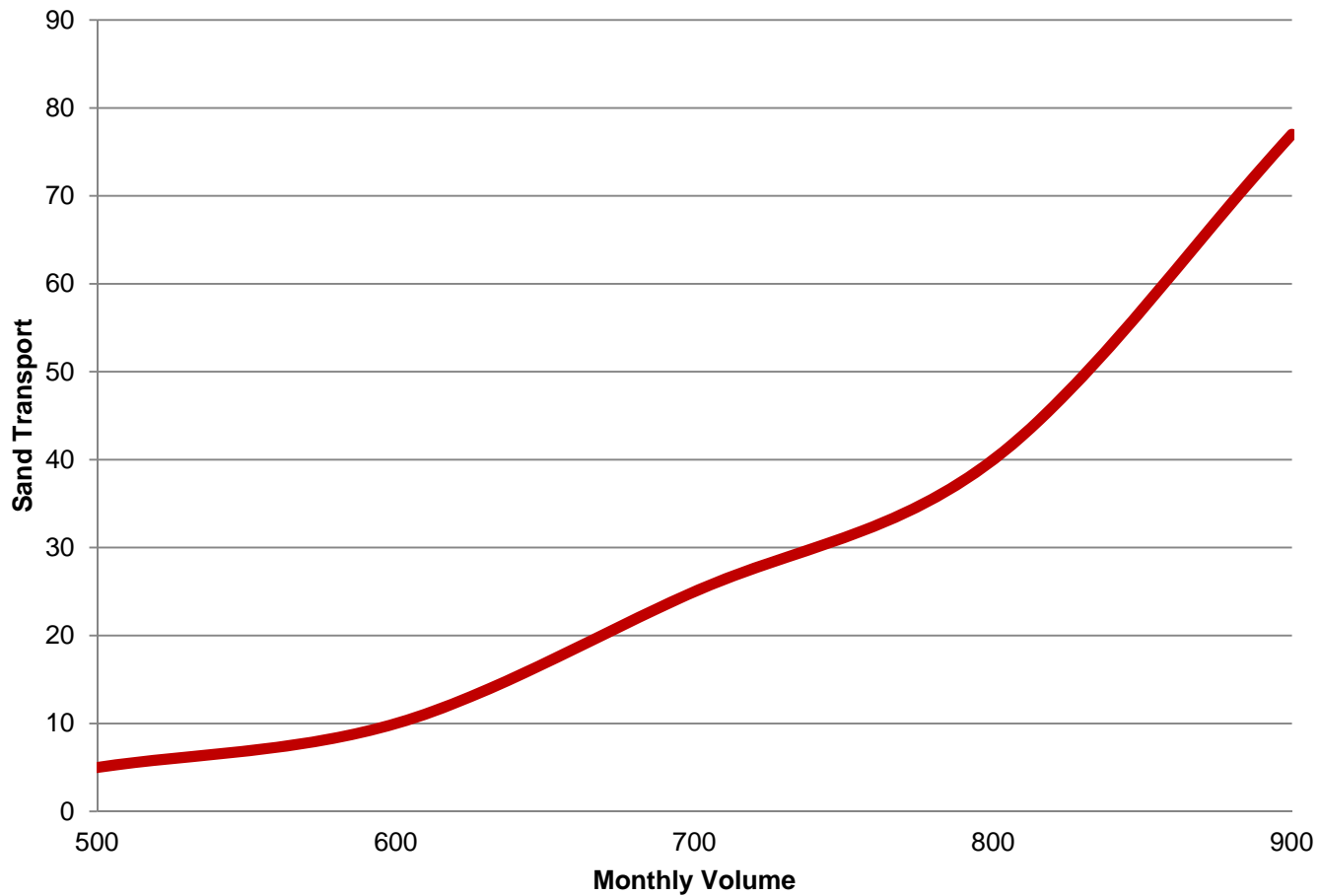
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# Lessons Learned

The 2012 HG worked very well at retaining sediment inputs high in the system in anticipation of an HFE



## Sand Transport Model (based on median inputs)



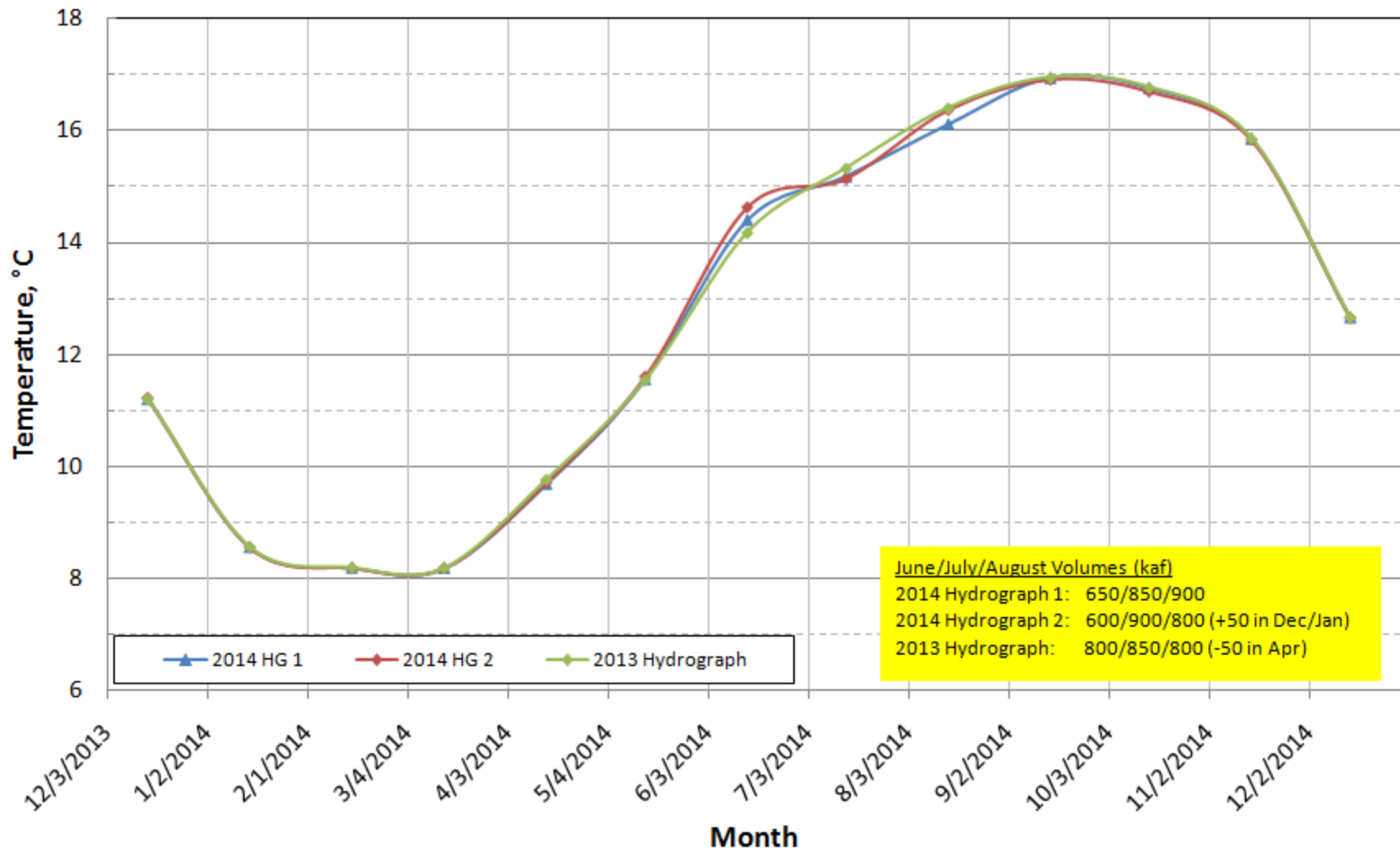
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## **Additional Objective Identified**

- **FWS suggested we look at ways to increase LCR temperatures early in the season (June)**
- **Looked at attempting to entrain warmer reservoir water into releases with high flows (no change found this year)**
- **LCR temperatures were found to drop by about 0.5 deg C as releases are increased from 600 to 800 kaf**
- **Discontinue moving Aug volumes to June**

## Colorado River-LCR Confluence 2014 Water Temperatures

Operations: 2014 Hydrograph 1, 2014 Hydrograph 2, & 2013 Hydrograph



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# Hydrograph Concepts

- Continue to target lower August – October releases to retain late summer/fall sediment inputs
- Avoid shifting “extra” water to June (which cools temperatures at the mouth of the LCR)
- Move water from Aug to other equal value months for power



# Draft DOI/DOE 2014 Hydrograph

- Annual Release Volumes will be determined by the 2007 Interim Guidelines and shall be reviewed and adopted through the normal annual operating plan process.
- Monthly release Volumes are anticipated to shift depending upon the Annual Release Volume and the magnitude of a potential High Flow Experiment.
- Release objective for June of 600 kaf to 650 kaf is intended to provide warmer river temperatures at the mouth of the Lower Colorado River early in the season for endangered fish.
- Release objective for August of 800 kaf is intended to reduce the erosion of August sediment inputs in anticipation of a potential HFE.
- Release objective for September and October of 600 kaf (or less) is intended to reduce sediment transport in anticipation of a potential HFE and maintain warmer river temperatures for endangered fish.
- Monthly Release Volumes will generally strive to maintain 600 kaf levels in the shoulder months (spring and fall) and 800 kaf in December/January and July/August timeframes to meet Western's minimum power needs.
- Additionally, the Bureau of Reclamation will continue to apply best professional judgment in conducting actual operations and in response to changing conditions throughout the water year. Such efforts will continue to be undertaken in coordination with the DOI/DOE agencies to consider changing conditions and adjust projected operations in a manner consistent with the objectives of these parameters as stated above and pursuant to the Law of the River.

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## WY14 Hydrologic Conditions

- GCD annual release will be determined in August
- About equal probability GCD annual release will be set at either 7.48 maf or 8.23 maf
- Very minor chance of balancing (higher than 8.23)
- Unlike the higher tier operations, monthly volumes will be far less volatile and established early in the year

## Example of 7.48 maf release

	No HFE	96 hr HFE	72 hr HFE	60 hr HFE	48 hr HFE	36 hr HFE
Oct	480	480	480	480	480	480
Nov	500	630	577	551	524	497
Dec	600	600	600	600	600	600
Jan	800	800	800	800	800	800
Feb	600	600	600	600	600	600
Mar	600	470	523	549	576	603
Apr	500	500	500	500	500	500
May	600	600	600	600	600	600
Jun	600	600	600	600	600	600
Jul	800	800	800	800	800	800
Aug	800	800	800	800	800	800
Sep	600	600	600	600	600	600
	7480	7480	7480	7480	7480	7480

\* assumes MLFF ramp rates and minimums on shoulders

4,000 cfs/hr upramp and 1,500 cfs/hr downramp

5,000 cfs nighttime and 8,000 cfs daytime

\* assumes max release = 33,400cfs (current estimate w/ 6 units)

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## Example of 8.23 maf release

	No HFE	96 hr HFE	72 hr HFE	60 hr HFE	48 hr HFE	36 hr HFE
Oct	600	600	600	600	600	600
Nov	600	630	600	600	600	600
Dec	800+50	800+20	800+50	800+50	800+50	800+50
Jan	800+50	800+50	800+50	800+50	800+50	800+50
Feb	600	600	600	600	600	600
Mar	600	570+30	600	600	600	600
Apr	600	600	600	600	600	600
May	600	600	600	600	600	600
Jun	650	650	650	650	650	650
Jul	850	850	850	850	850	850
Aug	900-100	900-100	900-100	900-100	900-100	900-100
Sep	630	630	630	630	630	630
	8230	8230	8230	8230	8230	8230

\* assumes MLFF ramp rates and minimums on shoulders

4,000 cfs/hr upramp and 1,500 cfs/hr downramp

5,000 cfs nighttime and 8,000 cfs daytime

\* assumes max release = 33,400cfs (current estimate w/ 6 units)

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# Alternative Hydrograph

- Monthly Release Volumes will be adjusted each month based on the **most current forecast of the annual release required by the 2007 Interim Guidelines.**
- Monthly Release Volumes are anticipated to vary within the targets identified below. This monthly operational flexibility will be used for existing power production operations under the Modified Low Fluctuating Flow (MLFF) alternative selected by **the 1996 ROD and contained in the 1995 FEIS.** The targeted operation will also be adjusted as necessary to accommodate a targeted release volume for the month of August 2014 based on the schedule below:
  - **August 2014 Volume target set to 800 kaf.**
  - **September and October 2014 Volume targets set to 600 kaf to 630 kaf.**
- Monthly Release Volumes will be modified each month in consultation with Western Area Power Administration.
- **Additionally, the Bureau of Reclamation will continue to apply best professional judgment in conducting actual operations and in response to changing conditions throughout the water year. Such efforts will continue to be undertaken in coordination with the DOI/DOE agencies, and after consultation with the basin states as appropriate, to consider changing conditions and adjust projected operations in a manner consistent with the objectives of these parameters as stated above and pursuant to the Law of the River.**

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# DOI/DOE Proposed 2014 Hydrograph

- Annual Release Volumes will be determined in compliance with the 2007 Interim Guidelines (in consultation with the Basin States as appropriate).
- Monthly release Volumes are anticipated to shift depending upon: (1) the Annual Release Volume, and (2) the magnitude of a potential High Flow Experiment.
- Monthly Release Volumes may vary within the targets identified below. Any remaining monthly operational flexibility will be used for existing power production operations under the Modified Low Fluctuating Flow (MLFF) alternative selected by the 1996 ROD and contained in the 1995 FEIS and in compliance with all applicable NEPA compliance documents (HFE EA, NNFC EA, 2007 IG).
- Release objective for June is 600 kaf to 650 kaf .
- Release objective for August is 800 kaf.
- Release objective for September and October is 600 kaf to 630 kaf.
- Monthly Release Volumes will generally strive to maintain 600 kaf levels in the spring/fall timeframe and 800 kaf in December/January and July/August timeframe.
- Additionally, the Bureau of Reclamation will continue to apply best professional judgment in conducting actual operations and in response to changing conditions throughout the water year. Such efforts will continue to be undertaken in coordination with the DOI/DOE agencies, and after consultation with the Basin States as appropriate, to consider changing conditions and adjust projected operations in a manner consistent with the objectives of these parameters as stated above and pursuant to the Law of the River.

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