Colorado River Water Supply Update

Arizona Department of Water Resources

Colorado River Management

Presented by: Bret Esslin

11/12/2019
COLORADO RIVER SYSTEM
RESERVOIR STATUS

TOTAL SYSTEM CONTENTS – 51% or 29.02 MAF
(Total system contents last year 44% or 25.35 MAF)

November 2019
Updated as of November 7, 2019

Lake Powell
53% 12.994 MAF
3,657 ft, WY 2020 Equalization Level

Lake Mead
39% 10.238 MAF
1,082.73 ft
1,075 ft, First Tier Shortage

Data Source: United States Bureau of Reclamation
End of Calendar Year 2019 Projections
October 2019 24-Month Study Most Probable Inflow Scenario

Based on a Lake Powell release of 9.00 maf in WY 2019 & 8.23 maf in WY 2020

Not to Scale

1 WY 2020 unregulated inflow into Lake Powell is based on the CBRFC forecast dated 10/1/19.
Powell Elevations

Lake Powell End of Month Elevations
Historic and Projected based on October 2019 Modeling

Equalization Tier (ET)
3,655'

Upper Elevation Balancing Tier (3575'-ET)

Mid-Elevation Release Tier (3525'-3575')

Most Probable End of CY 2019
Projection: 3,609.83 feet (53% full)
Min/Max Range: 3,609.8 to 3,610.4 feet

Lower Elevation Balancing Tier (<3525')

Minimum Power Pool 3,490'

Most Probable End of CY 2020
Projection: 3,618.12 feet (56% full)
Min/Max Range: 3,585.4 to 3,657.97 feet

- Oct 2019 Max Probable - Lake Powell release of 11.89 maf in WY2020
- Oct 2019 Most Probable - Lake Powell release of 8.23 maf in WY2020
- Oct 2019 Min Probable - Lake Powell release of 9.0 maf in WY2020
- Historical Elevations
- Oct 2019 Max Probable WY2020 8.23 Exhibit for WY2020

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Lake Mead End of Month Elevations

Projections from the October 2019 24-Month Study Inflow Scenarios

- **Surplus Conditions**: 1,145 ft and above
- **Normal Condition**: 1,145 ft to 1,075 ft
- **Level 1 Shortage Condition**: 1,075 ft to 1,050 ft
- **Level 2 Shortage Condition**: 1,050 ft to 1,025 ft
- **Level 3 Shortage Condition**: 1,025 ft and below

### Historical Elevations

#### Most Probable End of CY 2019
- Projection: 1,088.59 feet (41% full)
- Min/Max Range: 1,088.4 to 1,088.8 feet

#### Most Probable End of CY 2020
- Projection: 1,081.25 feet (39% full)
- Min/Max Range: 1,081.25 to 1,121.36 feet

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- **October 2019 Maximum Probable Inflow** with a Lake Powell release of 11.89 maf in WY 2020 and 13.33 maf in WY 2021
- **October 2019 Most Probable Inflow** with a Lake Powell release of 8.23 maf in WY 2020 and 9.00 maf in WY 2021
- **October 2019 Minimum Probable Inflow** with a Lake Powell release of 9.00 maf in WY 2020 and 8.71 maf in WY 2021

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RECLAMATION
Managing Water in the West
Lake Powell Inflow

Lake Powell Unregulated Inflow
Water Year 2020 Forecast (issued October 2)
Comparison with History

Water Year 2020 Forecast
Oct Most Prob: 9.5 maf (88%)
Oct Min Prob: 6.7 maf (62%)
Oct Max Prob: 18.0 maf (166%)

Water Year 2019
Observed WY: 12.95 maf (120%)
Observed April-July: 10.41 maf (145%)

Average: 10.83 maf (1981-2010)
# Lower Basin Side Inflows - WY/CY 2019¹,²

Intervening Flow from Glen Canyon to Hoover Dam

<table>
<thead>
<tr>
<th>Month in WY/CY 2019</th>
<th>5-Year Average Intervening Flow (KAF)</th>
<th>Observed Intervening Flow (KAF)</th>
<th>Observed Intervening Flow (% of Average)</th>
<th>Difference From 5-Year Average (KAF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2018</td>
<td>82</td>
<td>100</td>
<td>122%</td>
<td>18</td>
</tr>
<tr>
<td>November 2018</td>
<td>54</td>
<td>67</td>
<td>124%</td>
<td>13</td>
</tr>
<tr>
<td>December 2018</td>
<td>51</td>
<td>52</td>
<td>102%</td>
<td>1</td>
</tr>
<tr>
<td>January 2019</td>
<td>83</td>
<td>106</td>
<td>128%</td>
<td>23</td>
</tr>
<tr>
<td>February 2019</td>
<td>91</td>
<td>126</td>
<td>138%</td>
<td>35</td>
</tr>
<tr>
<td>March 2019</td>
<td>57</td>
<td>200</td>
<td>351%</td>
<td>143</td>
</tr>
<tr>
<td>April 2019</td>
<td>49</td>
<td>118</td>
<td>241%</td>
<td>69</td>
</tr>
<tr>
<td>May 2019</td>
<td>30</td>
<td>108</td>
<td>360%</td>
<td>78</td>
</tr>
<tr>
<td>June 2019</td>
<td>17</td>
<td>69</td>
<td>406%</td>
<td>52</td>
</tr>
<tr>
<td>July 2019</td>
<td>80</td>
<td>19</td>
<td>24%</td>
<td>-61</td>
</tr>
<tr>
<td>August 2019</td>
<td>100</td>
<td>65</td>
<td>65%</td>
<td>-35</td>
</tr>
<tr>
<td>September 2019</td>
<td>91</td>
<td>60</td>
<td>66%</td>
<td>-31</td>
</tr>
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<td>October 2019³</td>
<td>82</td>
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<td>35%</td>
<td>-53</td>
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<tr>
<td>December 2019</td>
<td>51</td>
<td></td>
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</tr>
<tr>
<td><strong>WY 2019 Totals</strong></td>
<td><strong>785</strong></td>
<td><strong>1090</strong></td>
<td><strong>139%</strong></td>
<td><strong>305</strong></td>
</tr>
<tr>
<td><strong>CY 2019 Totals</strong></td>
<td><strong>785</strong></td>
<td><strong>900</strong></td>
<td><strong>115%</strong></td>
<td><strong>220</strong></td>
</tr>
</tbody>
</table>

¹ Values were computed with the LC's gain-loss model for the most recent 24-month study.

² Percents of average are based on the 5-year mean from 2014-2018.

³ Preliminary data, not officially reported as of November 12, 2019.
End of Water Year 2020 Projections
October 2019 24-Month Study Most Probable Inflow Scenario

Projected Lake Powell Unregulated Inflow = 9.50 maf (88% of average)

Lake Powell
- 24.3 maf
- 18.1 maf
- 9.5 maf
- 5.9 maf
- 1.9 maf Dead Storage
- 3,623.17 feet
- 14.10 maf in storage (58% of capacity)

Lake Mead
- 26.1 maf
- 16.2 maf
- 10.9 maf
- 9.6 maf
- 6.0 maf
- 0.0 maf Dead Storage
- 1,076.67 feet
- 9.74 maf in storage (37% of capacity)

Not to Scale

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Thank you... Questions?