Purpose

• Awareness of Drought Contingency Plans
• 2012/13 Reservoir Operations
• Drought Management Measures
• Scenario Analysis
Reservoir Summary

Began Operations in: 1958 (Coralville)
1968 (Red Rock)
1977 (Saylorville)

Primary Authorized Purpose: Flood Risk Management on the Des Moines, Iowa, and Mississippi Rivers

Other Authorized Purposes: Provide low flow augmentation, recreational opportunities, and natural resource management opportunities.
Storage Allocation

- **Spillway Design Flood**
- **Full Flood Control Pool**
- **Normal Conservation Pool (all year, except fall pool raise)**
- **Surcharge Capacity**

**Flood Control Storage**
- 88.4 to 93.3% of Total Storage Volume

**Conservation Storage and Contracted Water Supply (Saylorville only)**
- 6.7 to 11.6% of Total Storage Volume
Saylorville Water Supply Contract

• Contracted storage sold to the State of Iowa (1982). Sub-allocated to the Des Moines Water Works (2/3) and Alliant Energy (1/3).

• Provides for an undivided 18.86% of the usable storage between elevation 812 and 836 ft (projected to be 14,900 acre-ft after 25 years of sedimentation). Based on most recent survey, contracted storage is 12,300 acre-ft.

• State can order releases through outlet works or could construct facilities to directly withdraw from the lake.
Drought Management

- Integrated Component of the Water Control Manuals
- Drought schedule developed in coordination with State of Iowa
- Water supply has priority over water quality/conservation releases
Conservation Release Targets

- Coralville Lake: 150 cfs
- Lake Red Rock: 300 cfs
- Saylorville Lake: 200 cfs
- Des Moines River: 270 cfs
- Iowa River: 150 cfs
- Mississippi River
- Raccoon River
## Drought Response Activities

<table>
<thead>
<tr>
<th>Level</th>
<th>Activity</th>
</tr>
</thead>
</table>
| I     | Monitor- stream flow, storage, rainfall, climate  
***Normal Reservoir Operations*** |
| II    | Reduce release to base, activate CDMC, increase flow measurements, evaluate gate leakage and reservoir facilities, notify concession operators  
***Actively Augmenting Releases*** |
| III   | Further reduction of release, increase CDMC meetings, activate IDMC, evaluate storage for emergency water needs  
***Reduced Water Quality / Conservation Release with Full Water Supply Release*** |
| IV    | Further reduction of release, allocate water for emergency needs, increase meetings of IDMC  
***Water Supply Release Only*** |
### Drought Index Levels – Triggers

#### Condition Today

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>Coralville</th>
<th>Saylorville</th>
<th>Red Rock</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Always</td>
<td>Always</td>
<td>Always</td>
</tr>
<tr>
<td>II</td>
<td>Inflow &lt; 150</td>
<td>Inflow &lt; 200</td>
<td>Inflow &lt; 300</td>
</tr>
<tr>
<td>III</td>
<td>Pool &lt; 678</td>
<td>Pool &lt; 827</td>
<td>Pool &lt; 734</td>
</tr>
<tr>
<td>IV</td>
<td>Pool &lt; 677</td>
<td>Pool &lt; 823.5</td>
<td>Pool &lt; 730</td>
</tr>
</tbody>
</table>
## Hedging Rules for Saylorville Reservoir

<table>
<thead>
<tr>
<th>Condition</th>
<th>Recommended Reservoir Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pool elevation &gt; 827</td>
<td>Release all water supply and water quality demands.</td>
</tr>
<tr>
<td>826 &lt; Pool Elevation &lt; 827</td>
<td>Release 100 percent of water supply, maintain 175 cfs at dam, and 245 cfs at SE 14th Street.</td>
</tr>
<tr>
<td>825 &lt; Pool Elevation &lt; 826</td>
<td>Release 100 percent of water supply, maintain 150 cfs at dam, and 220 cfs at SE 14th Street.</td>
</tr>
<tr>
<td>824 &lt; Pool Elevation &lt; 825</td>
<td>Release 100 percent of water supply, maintain 125 cfs at dam, and 195 cfs at SE 14th Street.</td>
</tr>
<tr>
<td>823.5 &lt; Pool Elevation &lt; 824</td>
<td>Release 100 percent of water supply; maintain 100 cfs at dam, and 170 cfs at SE 14th Street.</td>
</tr>
<tr>
<td>819 &lt; Pool Elevation &lt; 823.5</td>
<td>Release 100 percent of water supply; no water quality releases made.</td>
</tr>
<tr>
<td>816 &lt; Pool Elevation &lt; 819</td>
<td>Release 75 percent of water supply; no water quality releases made.</td>
</tr>
<tr>
<td>Pool Elevation &lt; 816</td>
<td>Release 50 percent of water supply; no water quality releases made.</td>
</tr>
</tbody>
</table>
Deviation Directive

- In response to low-water on the Mississippi River, directed to deviate from the water control plan to store additional water (up to 10% of flood storage) to be used for future augmentation of Mississippi River flows to support navigation.
- Due to low inflows at all projects, no significant storage was possible.
- Did not impact water available for conservation releases.
- Directive suspended prior to flood season.
El evation (feet)

Aug Sep Oct Nov Dec Jan Feb Mar

Flow (cfs)

Coralville Pool

Coralville Inflow

Coralville Outflow
Drought Management Measures

Deviations from Hedging Rules

- Deviation to Retain Fall Pool Raise or Minimal Pool Raise
  - Recommend maintaining any pool rise due to precipitation, NTE 0.5 ft above conservation pool
- Long Term - No Spring drawdown of Coralville?
- Reduction in Outflows prior to Trigger Point

Sale of Water for Consumptive Use

- Requires State Emergency Declaration
- Approval level depends on amount:
  - < 100 Acre-ft - District
  - 100-500 Acre-ft - Division
  - 500+ - ASA (CW)
- Historical Perspective – No requests
• “The target releases are not prescriptive, but rather intended as general guidance in setting reservoir releases. The releases are subject to revision during any particular drought event should a different response prove more beneficial.”

• Recognize need to coordinate departures from Drought Contingency Plan hedging rules with State of Iowa.

**BLUF for Winter 2012/2013**

• Scenario Analysis and climate conditions indicated no major changes to current water management operations were needed.
Saylorville “Reasonable” Worst Case

Note: late April cut to 90 cfs – plan calls for 0 cfs water quality release.
Identification of Water Users and Potential Impacts

• Users Identified from:
  • Historical reports
  • Existing knowledge/relationships
  • Iowa DNR withdrawal permits

• Users contacted to determine:
  • Nature of constraint (flow, stage, etc.)
  • Critical Threshold
  • Nature of Impact
  • Possible River Alternatives
  • Current actions or condition (are needs being met)
Downstream Water Users
Identification of Water Users and Potential Impacts

• Users Identified from:
  • Historical reports
  • Existing knowledge/relationships
  • Iowa DNR withdrawal permits

• Users contacted to determine:
  • Nature of constraint (flow, stage, etc.)
  • Critical Threshold
  • Nature of Impact
  • Possible River Alternatives
  • Current actions or condition (are needs being met)
Saylorville Lake

“Worst Case” / Inflow Recession

Trigger for reducing outflow

832.31 → 836.11
7 days

832.63 → 836.25
7 days

Storage between 829.5 and 836.0 → ~ 15,000 cfs-days
(~ 0.1” of runoff from 5,823 sq. mi. basin)
Monthly rainfall distribution for Fort Dodge, IA
For More Information:

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