LCRA WATER MANAGEMENT PLAN

Participant Meeting
Oct. 25, 2018
Agenda

• Timeline
• Activity since last meeting on Oct. 4
• Comments received since Oct. 4
• Updates to WMP model
• Model results
• Criteria for Drought Worse Than Drought of Record
• Discussion
Timeline

- May 21 – First participant meeting
- July 12 – Second participant meeting
- Sept. 6 – Third participant meeting
- Oct. 4 – Fourth participant meeting
- Oct. 25 – Fifth participant meeting
- Nov. 8 – Sixth participant meeting
- December – WMP before LCRA Board for approval
- Early 2019 – Plan submitted to TCEQ
Activity Since Last Meeting

• Meetings with participants
• Technical paper on firm yield model
• Updated WMP model and results
Comments Received – CWIC

• Lower trigger for entering Less Severe Drought from 1.6 to 1.4 million acre-feet

• Lower trigger for entering partial curtailment of second crop in Normal conditions from 1.55 to 1.4 million acre-feet

• Allow unused first season allocation, as of July 1, to be added to the second season allocation, up to the full second season allocation
Comments Received – Jordan Furnans

- Request for CWIC material
- Request for firm yield modeling
Comments Received – Environmental Stewardship

• Clarify terminology with regard to “base flows” and “reliable flows”

• Consider using estimated groundwater contributions to river flows in a prior study instead of the reliable flows used in the WMP model
Comments Received – CTWC

- Request for firm yield modeling
- Consider concerns with CWIC proposed approach
- Consider firm customer diversion points
- Consider impact of allocated interruptible sales on actual water availability for firm water customers
- Add a safety reserve in firm yield process
- Develop procedures related to released but not diverted interruptible stored water
UPDATES TO THE WAM MODEL
Updates to WAM Model Since Oct. 4

- Added additional test for entering Extraordinary Drought
  - Further response to 2011 conditions
- Raised combined storage for “anytime cutoff” of interruptible water
  - Increased to 1 million acre-feet
- Added limit on release of stored water
  - Includes ordered-not-diverted and interruptible stored water
Updates to WAM Model Since Oct. 4

• Revised interruptible stored water allocation tables
  - Normal conditions
    - No allocation below 1.1 million acre-feet
    - Adjusted second season allocation
  - Less Severe Drought conditions
    - Adjusted entry test downward to 1.5 million acre-feet
    - Adjusted allocations
Updates to WAM Model Since Oct. 4

• Adjusted the combined storage for entering Bay freshwater inflow criteria OP-3 on Nov. 1

• Modified a provision to limit storable inflow releases to meet bay inflow requirements when combined storage above 1.5 million acre-feet

• Added interim steps and limits for storable inflow releases to meet bay inflow requirements
# Model Results Recap

<table>
<thead>
<tr>
<th></th>
<th>Oct. 4 WAM</th>
<th>Oct. 25 WAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum combined storage (acre-feet)</td>
<td>624,654</td>
<td>659,903</td>
</tr>
<tr>
<td>Percent of months storage is above 900,000 acre-feet</td>
<td>97 percent</td>
<td>97 percent</td>
</tr>
</tbody>
</table>
## Model Results Recap

**Water for agricultural irrigation:**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Oct. 4 WAM</th>
<th>Oct. 25 WAM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(years out of 77)</td>
<td>(years out of 77)</td>
</tr>
<tr>
<td>Full supply both 1st and 2nd season</td>
<td>51</td>
<td>58</td>
</tr>
<tr>
<td>Full supply 1st season</td>
<td>58</td>
<td>61</td>
</tr>
<tr>
<td>Curtailed 1st season</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>No stored water 1st season</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Mid-crop cutoff</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Full supply second season</td>
<td>51</td>
<td>58</td>
</tr>
<tr>
<td>Curtailed 2nd season</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>No stored water second season</td>
<td>14</td>
<td>15</td>
</tr>
</tbody>
</table>
## Model Results Recap

### Attainment of instream flows at Wharton:

<table>
<thead>
<tr>
<th></th>
<th>Oct. 4 WAM (percent)</th>
<th>Oct. 25 WAM (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base-Average</td>
<td>56</td>
<td>56</td>
</tr>
<tr>
<td>Base-Dry</td>
<td>77</td>
<td>77</td>
</tr>
<tr>
<td>Subsistence</td>
<td>99.7</td>
<td>99.8</td>
</tr>
</tbody>
</table>

### Attainment of bay inflows:

<table>
<thead>
<tr>
<th></th>
<th>Oct. 4 WAM (percent)</th>
<th>Oct. 25 WAM (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBHE-4</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>MBHE-3</td>
<td>43</td>
<td>43</td>
</tr>
<tr>
<td>MBHE-2</td>
<td>55</td>
<td>53</td>
</tr>
<tr>
<td>MBHE-1</td>
<td>69</td>
<td>69</td>
</tr>
<tr>
<td>Threshold</td>
<td>95</td>
<td>95</td>
</tr>
</tbody>
</table>
CRITERIA FOR DROUGHT WORSE THAN DROUGHT OF RECORD
Drought Worse Than Drought of Record Declaration

- Required by TCEQ
- Real-time tracking of water supply conditions
- Identifies hydrology potentially worse than historical hydrology
- Basis for pro-rata curtailment of firm water uses
Proposed DWDR Criteria

Enter DWDR conditions if either test is met.

• Intensity test:
  - Updated cumulative inflow test, based on 2008-2016 drought
    \textit{AND}
  - 24 months or more since lakes last full
    \textit{AND}
  - Combined storage below 600,000 acre-feet

• Duration test:
  - Current drought longer than 84 months
    \textit{AND}
  - Combined storage below 600,000 acre-feet
1950s Drought Cumulative Inflow

Cumulative Inflow Since Drought Start (acre-feet)

Months of Drought
DWDR Intensity Test in 2015 WMP

Cumulative Inflow Since Drought Start (acre-feet)

1950s Cumulative Inflow

2015 WMP Intensity Test

Inflow = $846,940 \times (0.0184 \times m)$
2008 to 2016 Drought Cumulative Inflow

Cumulative Inflow Since Drought Start (acre-feet)

Months of Drought
Proposed DWDR Intensity Test

- Cumulative Inflow Since Drought Start (acre-feet)
- Months of Drought

Evaluation Curve

- 24-Month Minimum for Declaration
- 84-Month Proposed Declaration

Cumulative Inflow
DWDR Intensity in 2015 WMP and Updated Test

Cumulative Inflow Since Drought Start (acre-feet)

Months of Drought

- 24-Month Minimum for Declaration
- 84-Month Proposed Declaration
- 2015 Intensity Test
- Updated Intensity Test
Proposed DWDR Criteria

Enter DWDR conditions if either test is met.

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  - Combined storage below 600,000 acre-feet
DISCUSSION
Next Steps

• Comments requested by Nov. 1
  - Submit comments to LCRAWMP@lcra.org

• Nov. 8 – Sixth participant meeting
  - Discuss proposal we plan to present to LCRA Board