Managed Aquifer Recharge
Issues and Perspective
Three Questions:

• What is Winter Water Savings?
• Why did Winter Water Savings happen?
• What happened this year?

Followed by some Observations
What Makes Reclamation Tick?

- Federal Reclamation Law
- Project Authorizations
- Repayment Contracts
- State Water Law
1902 Reclamation Act

- Reclamation gets its water rights from the State
- Reclamation honors senior rights
- Junior rights honor Reclamation’s rights
Palisades Authorization

• First Authorized by the Secretary in 1941
• Reauthorized by the Congress in 1950
• Section 4 of 1950 reauthorization:
  Irrigation Organizations must agree to curtail winter diversions of water for construction to continue
Spaceholder Contracts

• Certain Spaceholders agreed to make no diversions for 150 consecutive days between November 1 through April 1 of each storage season
• Those Spaceholders get preferred Reservoir space – that always fills
State Water Law (Eagle Decrees):

“The contracts … constitute a common plan for administering the operation of the Snake River.”

- Implemented preferred (WWS) Reservoir Space
Palisades w/out WWS:

Average Yield would be 125,000 acre-feet
• Would eliminate shortages from 1918 to 1930
• Shortages would occur in 1931, 1932, 1933, 1934, 1935, 1937 (data range = 1918-1939)
Palisades with WWS:

Average Yield would be about 500,000 acre-feet
- Would eliminate all shortages 58 years out of 60
- Shortages would only occur in 1934 and 1935 (1949 Report)
Winter/Spring Operations

• Reclamation’s main objective is to fill the reservoirs
• Reclamation bases reservoir operation decisions on historic hydrology data, reservoir content, system needs, and run off forecasts
• Flood Control and power are authorized project purposes that contribute toward project costs and must be considered in decisions
### What do we Know?

<table>
<thead>
<tr>
<th>Things we Know</th>
<th>Things we Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snow Pack</td>
<td>Future Weather Conditions</td>
</tr>
<tr>
<td>Past Weather Conditions</td>
<td>How the Run Off will Occur</td>
</tr>
<tr>
<td>Historic Hydrologic Conditions</td>
<td>Future Water Use</td>
</tr>
<tr>
<td>Historic Weather Conditions</td>
<td></td>
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<tr>
<td>Historic Water Use Practices</td>
<td></td>
</tr>
</tbody>
</table>
## Decision Making

<table>
<thead>
<tr>
<th>What We Use</th>
<th>What We Don’t Use</th>
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<tbody>
<tr>
<td>Snow Pack Data</td>
<td>Astrology</td>
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<td>Historic Hydrologic Data</td>
<td>Witchcraft</td>
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<tr>
<td>Historic Weather Data</td>
<td>Anecdotal Information</td>
</tr>
<tr>
<td>Historic Water Use Data</td>
<td></td>
</tr>
</tbody>
</table>
When are Decisions Made?

- Before We Know What Will Happen
Water Year 2007:

- Started with Relatively Good Carryover Storage
- Precipitation through December was OK
- January Precipitation was poor
- February Precipitation was OK
- Posed on March 1 to Fill and Spill
- March through July Precipitation was Poor
- Major Reservoirs failed to fill
How Big was the Miss?

- Perfect Operation (based on Hindsight) = 135 kaf extra Palisades Storage
- 135 kaf = Less than ½ Inch Precipitation over the Watershed
March-July Critical Time

- Record or Near Record Low Precipitation
- Temperatures Inefficient to Provoke Run Off
- Early and Strong Irrigation Demand
March-July Precipitation
Lewis Lake Divide

- Average = 18 Inches
- Previous Low = 10 Inches
- 2007 = 8.7 Inches
# Annual Runoff & System Storage

Minidoka & Palisades Projects Reservoirs – Water Supply Comparisons Only

<table>
<thead>
<tr>
<th>Reservoir Storage (Nov. 1 content of prior year)</th>
<th>Water Year Category (April-September Heise Unregulated Flow)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Less than 3.0 MAF</td>
</tr>
<tr>
<td>Low</td>
<td>Red</td>
</tr>
<tr>
<td>1.3 MAF or lower</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>Red</td>
</tr>
<tr>
<td>1.3 – 2.5 MAF</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>Yellow</td>
</tr>
<tr>
<td>Above 2.5 MAF</td>
<td></td>
</tr>
</tbody>
</table>

- **Red** – no water available for recharge
- **Yellow** – caution; water *might* be available for recharge
- **Green** – Water *could* be available for recharge, if institutional constraints are addressed
### Annual Runoff & System Storage
#### Minidoka & Palisades Projects Reservoirs, 1990 – 2007

<table>
<thead>
<tr>
<th>Reservoir Storage (Nov. 1 content of prior year)</th>
<th>Low Less than 3.0 MAF</th>
<th>Medium 3.0 – 5.0 MAF</th>
<th>High More than 5.0 MAF</th>
</tr>
</thead>
</table>

**Water Year**

(April – September Heise Unregulated Flow)