Showcase of Other Initiatives
WATER FOR 2060 IN ACTION ACROSS OKLAHOMA

John Rehring, P.E.
2016 Governor’s Water Conference
October 11, 2016
Norman, Oklahoma
A long time ago in a conference room far, far away...

Episode XI
A NEW SUPPLY

It is a time of extreme drought. Brave Water Providers and Users are desperate to stave off crisis.

Banding together with regulators, they fill the WATER SUPPLY gap with local supplies.
What’s possible 44 years from now... in 2060? Consider the past 44 years of progress!

- 1972: 3.5 gpf
- 2016: 1.6 gpf
- 2060: ???

1.28 gpf

WaterSense
U.S. Environmental Protection Agency
SUSTAINABILITY

RELIABILITY
## Water Reuse “Yield” Varies with the Type of Reuse

<table>
<thead>
<tr>
<th>Type of Reuse</th>
<th>Typical Water Supply Benefit</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigation</td>
<td><img src="image" alt="Water Drop" /></td>
<td>• Seasonal demand</td>
</tr>
<tr>
<td><strong>Non-Potable</strong></td>
<td></td>
<td>• Limited sites</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Infrastructure</td>
</tr>
<tr>
<td>Commercial / Industrial</td>
<td><img src="image" alt="Water Drops" /></td>
<td>• Limited sites</td>
</tr>
<tr>
<td><strong>Non-Potable</strong></td>
<td></td>
<td>• Infrastructure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Supply/demand proximity</td>
</tr>
<tr>
<td>Water Supply Augmentation</td>
<td><img src="image" alt="Water Drops" /></td>
<td>• Supply &gt; demand</td>
</tr>
<tr>
<td><strong>Potable</strong></td>
<td></td>
<td>• Public outreach/acceptance</td>
</tr>
<tr>
<td></td>
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<td>• Regulations &amp; treatment</td>
</tr>
</tbody>
</table>

ALL CONTRIBUTE TO WATER FOR 2060 GOALS
Water Reuse: Cost vs. Cost-Effectiveness

Cost

- Conveyance Cost
- Recovery Wells Cost
- Treatment Cost
- Recovered Water

Water Recovered

Non-potable  Exchange  Potable Reuse Alternatives
Water Reuse: Cost vs. Cost-Effectiveness

- Every situation is unique (your results may vary!)
- Potable reuse isn’t the right answer for everyone

<table>
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<tr>
<th>Cost per Acre-Foot</th>
<th>Non-potable</th>
<th>Exchange</th>
<th>Potable Reuse Alternatives</th>
</tr>
</thead>
</table>
Water for 2060 Showcase

- Paving the Road to Efficiency in Oklahoma
- Walking the Walk
- Water for 2060 Innovation
Paving the Way for Water Efficiency in Oklahoma
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Paving the Way for Water Efficiency in Oklahoma

ASR Workgroup

ODEQ / OCC MOU
- Management of drinking water treatment residuals

ODEQ Reuse Regulations
- Non-potable reuse
- Category 6 and Oil & Gas Uses
- Developing potable reuse regs (Category 1)
Water for 2060 Showcase

Paving the Road to Efficiency in Oklahoma

Walking the Walk

Water for 2060 Innovation
Walking the Walk
Walking the Walk: Water Reuse Across Oklahoma

- Golf course irrigation
- Cooling tower water supply
- Industrial water supply
- Reuse of flowback and produced water
Walking the Walk:
Water Reuse and Marginal Quality Water Use Planning

- Reuse Feasibility Study
- Planning for brackish groundwater use and water reuse
- Lake Thunderbird augmentation
- Well field water quality management
Walking the Walk: OWRB Financial Assistance Division
Support and New Water Partnerships

Drought Relief Grants
(Guymon, Hollis, Altus, Tipton)

Water for 2060 Grants
(Shattuck, Fort Supply, Boise City, Frontier DA)

Automated Meter Reading projects under CWSRF
(Broken Arrow, Eufaula, Perkins, Tuttle, Porum)

Regional treatment plant - Flint Ridge RWD
(to serve Flint Ridge, West Siloam Springs, Kansas, and Delaware Co. #11)

Support for advanced treatment facilities to use marginal quality supplies

Cooperative Planning Tool
Walking the Walk: Water Efficiencies in Agriculture

Yield per acre

“Yield per acre-foot”

Drought tolerant crop research

- Low-Energy Precision Application nozzles
- Technology-enabled controls
- Micro-irrigation at roots
- Demonstration and full scale
- Yield optimization
Walking the Walk: Collaborative Planning for Multiple-Benefit Water Management
Water for 2060 Showcase

Paving the Road to Efficiency in Oklahoma

Walking the Walk

Water for 2060 Innovation
Water for 2060 Innovation:
Edmond Splash Pad Reuse
Water for 2060 Innovation:
Norman Groundwater Quality Management

Industry-leading research on Chromium-6 removal
Biological removal and two other technologies

Well Field Optimization

biottta
RECLAMATION
Managing Water in the West
Takeaways: Water for 2060 in Action Across Oklahoma

- Providing the framework to implement alternative sources and management strategies
- Water providers and users are “walking the walk” like never before
- Innovative ideas for ways to reuse water and employ marginal quality water supplies
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