

October 6, 2015



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Chairman | Governor

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**Jim Bachmann** • Tulsa  
**Lauren Brookey** • Tulsa  
**Tom Buchanan** • Altus  
**Bob Drake** • Davis  
**Dan Galloway** • Stillwater  
**Roger Griffin** • Broken Bow  
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The Honorable Mary Fallin, Governor  
The Honorable Jeffrey Hickman, Speaker of the House  
The Honorable Brian Bingman, Senate President Pro Tempore  
Members of the Oklahoma Legislature  
Citizens of Oklahoma

Fellow Oklahomans:

When the Oklahoma Legislature passed the Water for 2060 Act (House Bill 3055) in 2012, it set forth an unprecedented goal of using no more fresh water in 2060 than was used in 2012, while supporting Oklahoma's continued growth and prosperity. No state has ever before set such an ambitious goal for water efficiency, conservation, recycling and reuse. We are proud to have served as your appointed Water for 2060 Advisory Council members, fulfilling our duties under the Act to identify incentives and education-based programs to help Oklahoma meet this unprecedented goal.

We are pleased to submit the Advisory Council's final report, summarizing our findings and recommendations for encouraging efficient water use across all of Oklahoma's major water use sectors, including public water supply, crop irrigation, and energy and industrial uses. The 12 key recommendations comprising this report are the product of technical investigations, interactive dialogue with water users across Oklahoma, and collaborative decision-making to determine approaches that can effectively promote and reward water efficiency efforts by all Oklahomans. The Advisory Council looked both within Oklahoma and outside the state's borders for examples of best practices already in place as a foundation for enhanced efficiency, then built on those successes with new and innovative approaches for implementation across our state.

Implementing the Council's recommendations can be accomplished in some cases under existing authorities, but many recommendations will require the financial and policy support of the Legislature and Governor to be fully successful. We appreciate the opportunity to serve as Council members and look forward to working with you to become the nation's most water-efficient state.

For a Prosperous Oklahoma,

J. D. Strong  
Chairman, Water for 2060 Advisory Council

Report of the

# Oklahoma Water for 2060 Advisory Council

October 2015



**WATER FOR 2060**  
EFFICIENCY • CONSERVATION • RECYCLING • REUSE

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## Acronyms

AFY	Acre Foot per Year
CI	Crop Irrigation
CWSRF	Clean Water State Revolving Fund
DWSRF	Drinking Water State Revolving Fund
EI	Energy and Industry
EPA	U.S. Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ODAFF	Oklahoma Department of Agriculture, Food and Forestry
ODEQ	Oklahoma Department of Environmental Quality
OWRB	Oklahoma Water Resources Board
PWS	Public Water Supply
USACE	U.S. Army Corps of Engineers
USBOR	U.S. Bureau of Reclamation

# Executive Summary

The Oklahoma Legislature’s Water for 2060 Act, passed in 2012, establishes a statewide goal of consuming no more fresh water in 2060 than was consumed in 2012. Water for 2060 emphasizes the use of education and incentives, rather than mandates, to achieve this ambitious goal without limiting Oklahoma’s future growth and prosperity.

A fifteen-member Water for 2060 Advisory Council was appointed in 2013 and tasked with studying and recommending appropriate water conservation practices, incentives, and educational programs to moderate statewide water usage while supporting Oklahoma’s population growth and economic development goals. The Advisory Council met seven times from late 2013 to early 2015 to discuss and develop its recommendations.

The Advisory Council based its recommendations on an investigation of best practices in use in Oklahoma and incentive programs in place in other states. This information was supplemented with an analysis of data from the 2012 Update of the Oklahoma Comprehensive Water Plan and estimates of the cost-effectiveness of various measures for enhancing water use efficiency and use of alternative sources of supply.

This report fulfills the Advisory Council’s duties and responsibilities for submitting its findings to the Governor and the Legislature. The report contains 12 recommendations developed by the Advisory Council and prioritized for each major group of water users as listed in the table below. The cost of each recommendation ranges from less than \$50,000 per year under existing authorities to \$1,000,000 or more for other recommended programs.

## Water for 2060 Advisory Council Recommendations

<b>All Water Use Sectors (A)</b>	A-1 Develop public education and outreach materials, a statewide resources conservation campaign, and an Oklahoma water efficiency portal.
<b>Public Water Supply (PWS)</b>	<p>PWS-1 Develop an Oklahoma public water supply system water efficiency best practices guide.</p> <p>PWS-2 Develop a state recognition and rewards program for highly efficient public water supply systems.</p> <p>PWS-3 Develop an Oklahoma water system loss reduction best practices guide.</p> <p>PWS-4 Provide state funding and financing for water system loss reduction.</p> <p>PWS-5 Encourage regionalization and supply sharing.</p>
<b>Crop Irrigation (CI)</b>	<p>CI-1 Apply state financing programs to water-efficient crop irrigation equipment conversion and practices.</p> <p>CI-2 Develop an Oklahoma crop irrigation best practices guide.</p> <p>CI-3 Actively support federal crop insurance reform.</p>
<b>Energy &amp; Industry (EI)</b>	<p>EI-1 Facilitate increased sharing of information and supplies between energy and industry water users.</p> <p>EI-2 Develop an energy and industry water use best practices guidance and recognition program.</p> <p>EI-2 Promote industrial use of marginal quality waters.</p>



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## Advisory Council

J.D. Strong, Chair

Jim Bachmann (Tulsa)

Lauren Brookey (Tulsa)

Tom Buchanan (Altus)

Bob Drake (Davis)

Dan Galloway (Stillwater)

Roger Griffin (Broken Bow)

Charlette Hearne (Broken Bow)

Mark Helm (Oklahoma City)

Nathan Kuhnert (Oklahoma City)

Phil Richardson (Minco)

Kevin Smith (Enid)

Trent Smith (Choctaw)

Joe Taron (Shawnee)

Jerry Wiebe (Hooker)



# Background

The Advisory Council was specifically tasked with the following responsibilities:

1. *“Recommend incentives to encourage improved irrigation and farming techniques, more efficient infrastructure, use of water recycling/reuse systems, promotion of ‘smart’ irrigation techniques, control of invasive species, artificial recharge of aquifers, and increased use of marginal quality and brackish waters;”*
2. *“Make recommendations regarding the expansion of education programs that modify and improve consumer water-use habits;” and*
3. *“Enhance existing, or develop new, financial assistance programs that encourage Oklahoma water systems to implement leak detection and repair programs that result in reduced loss and waste of water, as well as encourage consolidation and regionalization of smaller systems in order to utilize limited resources most efficiently.”*

To address water shortages forecast in the 2012 Update of the Oklahoma Comprehensive Water Plan (OCWP), as well as to avoid the costly development of new supplies and infrastructure, one of the primary recommendations of the OCWP was to maintain current levels of fresh water use through 2060. Subsequently, with passage of the Water for 2060 Act (HB 3055) in 2012, Oklahoma became the first state in the nation to establish a statewide goal of consuming no more fresh water in 2060 than was consumed in 2012. Water for 2060 emphasizes the use of education and incentives, rather than mandates, to achieve this ambitious goal without limiting Oklahoma’s future growth and prosperity.

Created in 2013, the fifteen-member Water for 2060 Advisory Council met quarterly through early 2015 to guide analyses and develop the group’s recommendations. The Advisory Council was chaired by J.D. Strong, Oklahoma Water Resources Board (OWRB) Executive Director, and was comprised of fourteen additional members appointed by the Governor, Speaker of the House, and President Pro Tempore of the Senate. The members were well-versed in the areas of municipal, rural residential, agricultural, industrial, oil and gas, and recreational water uses, as well as water efficiency, water supply and water reuse, and marginal quality and brackish water use practices and technologies.

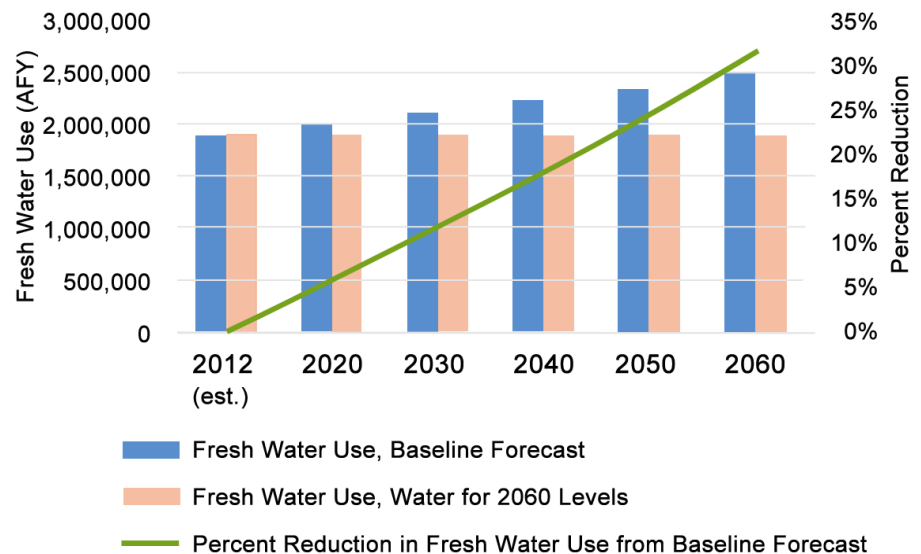
This report fulfills the Advisory Council’s duties and responsibilities for reporting its findings to the Governor and the Legislature.

## Water Efficiency Savings

The Advisory Council recognized that meeting the Water for 2060 goal will require effort on the part of water users across all sectors, from day-to-day habits and choices made at home, to the practices and equipment employed in crop irrigation, energy production, and industry. Accordingly, the Water for 2060 Act and the Water for 2060 Advisory Council did not set out specific targets for individual water use sectors. Instead, the Council considered the overall savings of all water use sectors needed to meet the goal.

The OCWP provided projections of water demands through 2060 for each of the state’s seven major water use sectors. Those projections indicate that fresh water use would need to be reduced by about 33% to meet the Water for 2060 goal.

Efficiency Targets to Achieve  
Water for 2060 Goal

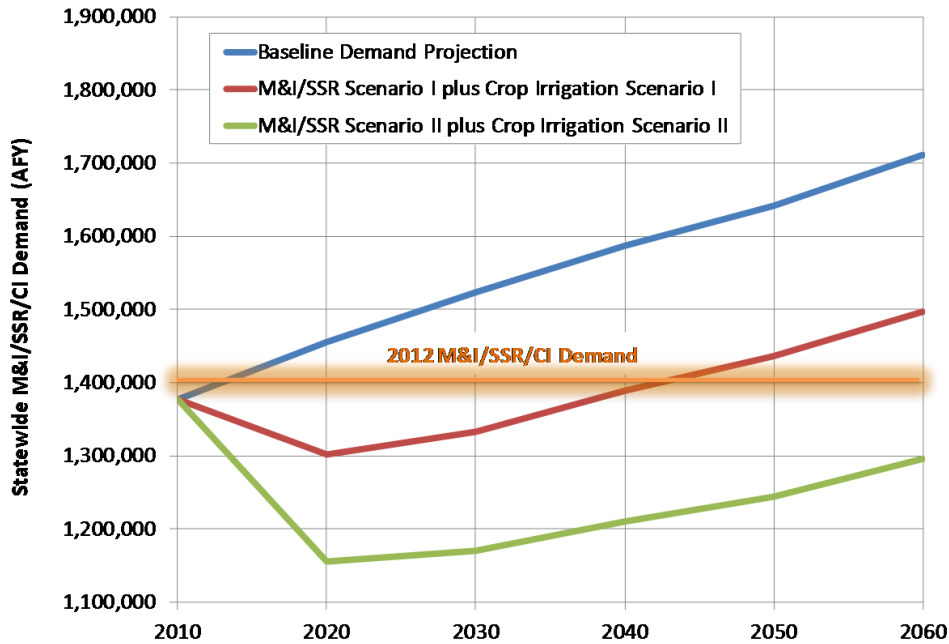




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The OCWP also examined the potential to reduce projected demands with additional efficiencies in the state’s two largest water use sectors—Municipal and Industrial (also referred to as Public Water Supply) and Crop Irrigation—which make up more than two-thirds of Oklahoma’s total water use. This included two potential levels of statewide conservation for these two sectors relative to current practices—moderately expanded conservation, “Scenario I,” and significantly expanded conservation, “Scenario II.”

## Demand Projections Conservation Scenarios I & II



*The forecast for water demand in Oklahoma shows a steady increase in demand from 2010 to 2060.*

Those analyses indicate that it is indeed possible for increased conservation and use of nontraditional sources to offset growth in demand. Statewide adoption of conservation measures somewhere between Scenario I and Scenario II would offset growth in Public Water Supply and Crop Irrigation water demands from 2010 through 2060.

Additional analyses of OCWP Public Water Supply conservation options were conducted to support Advisory Council dialogue. Those analyses were summarized in a presentation to the Advisory Council at the November 18, 2014, Council meeting and are appended to the meeting minutes included in the appendix. The Advisory Council built upon the OCWP and other analyses to identify incentives toward achieving the Water for 2060 goal.

*Total fresh water use will need to be reduced by more than 30% by 2060 to maintain 2012 levels of use.*



## Advisory Council Process

*Meeting the Water for 2060 goal will require effort on the part of all water users across all sectors.*

*Water for 2060 is focused on encouraging efficiency through incentives, rather than mandates.*

The OWRB and consultants developed the Water for 2060 Background Report to provide initial technical support for the Advisory Council. The report summarizes the conservation measures and findings of the OCWP Water Demand Forecast Report (2011), and examines state-level conservation programs of selected crop irrigation districts and municipalities in Oklahoma, as well as state-level conservation programs in Colorado and California.

The experiences from local and out-of-state programs were used to identify local conservation practices that are being implemented and to demonstrate potential state-level incentives for conservation efforts. The full Background Report is available on the Water for 2060 website at [www.owrb.ok.gov/2060](http://www.owrb.ok.gov/2060).

The Advisory Council met seven times to review information and discuss strategies for meeting the goal of Water for 2060. The meetings are summarized below, and meeting minutes are included in the appendix. Presentations and other meeting materials are available on the Water for 2060 website. Prior to the last Advisory Council meeting, three separate teleconferences were held with subgroups of the Council to refine recommendations for consideration at the final meeting.

### **Meeting 1**

(August 20, 2013) Advisory Council members introduced themselves and gave brief descriptions of their interest/representation in the water community. The Council's responsibilities, incentive targets, and potential efficiency goals as specifically mentioned in HB 3055 were outlined. Conservation findings from the OCWP were reviewed, primarily focusing on the state's largest water use sectors, Public Water Supply and Crop Irrigation. Members developed ideas for encouraging efficiency through incentives, rather than through mandates.

### **Meeting 2**

(November 19, 2013) Public water suppliers (both municipal and rural water) shared insights and ideas regarding water efficiency practices, programs already in place that help support water efficiency in the Public Water Supply sector, and the types of activities and incentives that would be most useful to public water suppliers. Meeting participants created lists of opportunities for water efficiency as well as constraints/obstacles. Guest speakers gave an overview of existing programs to assist public water suppliers with the implementation of water efficiency projects. The group identified key areas for which Public Water Supply efficiency incentives could be developed.

### **Meeting 3**

(February 18, 2014) Agriculture producers from western Oklahoma provided insights on existing conservation and reuse practices. Speakers stressed the importance of existing advanced technology, as well as emerging technologies, and identified possible incentives for water efficient practices in crop irrigation as well as roadblocks to additional conservation practices. An overview of the Panhandle Regional Water Plan was presented, including an analyses of the economics of OCWP conservation scenarios. An overview of NRCS conservation initiatives was also presented.

### **Meeting 4**

(May 20, 2014) The Advisory Council focused on development of a short-list of recommendations for Public Water Supply systems and Crop Irrigation programs and incentives for water efficiency. For these sectors, the Council mapped out desired results, potential programs or measures, prioritization of each program or measure, and considerations.

### **Meeting 5**

(August 19, 2014) The Advisory Council turned their attention to water use sectors other than Public Water Supply and Crop Irrigation. Industry panelists provided perspectives of the aggregate industry, oil and gas production, and electric and power generation. Existing practices in conservation and reuse were discussed, followed by a discussion on the potential impediments to additional conservation and reuse. The group developed a list of potential opportunities for incentives and outreach programs specifically geared toward encouraging and incentivizing additional water efficiencies in industrial water use applications.



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## Meeting 6

(November 18, 2014) The discussion focused on developing and refining the Advisory Council’s draft recommendations. It also included a discussion of existing financial assistance programs and potential enhancements toward greater water use efficiency, a discussion of changes to the current water management framework that could facilitate additional conservation, and the Water for 2060 Hot Spot Basin studies.

## Subgroup Teleconferences

(January 27, 2014) The OWRB and consultant team developed draft text for each of the recommendations discussed at the November 18 Council meeting. As discussed at the meeting, subgroups were established to hold teleconferences for feedback. Advisory Council members were assigned to one of three subgroups—Public Water Supply, Crop Irrigation, or Industry/Other—to review the draft text. Feedback from the subgroups was incorporated into the draft recommendations report, which was sent back to all members for review prior to the April 21, 2015 meeting.

## Meeting 7

(April 21, 2015) The Advisory Council focused its efforts on further developing its recommendations and documenting its findings for inclusion in this report.

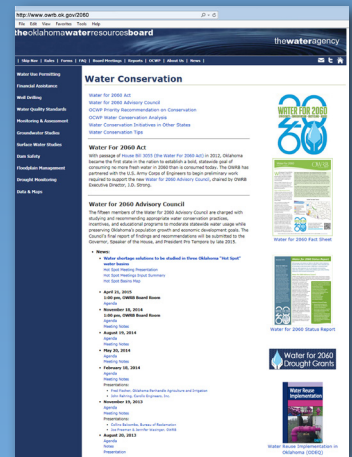
## Recommendations

The Advisory Council’s recommendations were organized into three categories—Public Water Supply (PWS), Crop Irrigation (CI), and Energy and Industry (EI)—to increase opportunities for analysis and facilitate future implementation.

The recommendations are detailed on the following pages of this report. The Advisory Council did not prioritize the recommendations of any one category over another. However, the Advisory Council did prioritize its recommendations within each category. For example, Crop Irrigation Recommendation CI-1 was deemed a higher priority than Crop Irrigation Recommendation CI-2, but Crop Irrigation Recommendation CI-1 has the same priority as Public Water Supply Recommendation PWS-1 and Energy and Industry Recommendation EI-1.

Recommendation A-1 was separated from the other categories because it applies to all citizens and businesses in Oklahoma and has the potential to affect water use across all water sectors. The Advisory Council developed initial estimates of the potential cost of each of its recommendations. To facilitate implementation, the Advisory Council recommends that voluntary and cooperative mechanisms for local cost-sharing be explored as part of implementing each recommendation. The Advisory Council also identified a need for periodic evaluation of the effectiveness of each recommendation in order to determine the value of continuing the actions and/or implementing modifications to enhance the effectiveness of each strategy.

The Advisory Council expressed its support for ongoing efforts related to invasive species control and aquifer recharge as additional means of enhancing statewide water use efficiency, but did not develop detailed recommendations for such measures. Efforts to eradicate invasive species can decrease water loss (or depletion), making additional water available for beneficial use. Artificial recharge of alluvial and bedrock aquifers can help buffer differences between the timing of supply availability and demand for that supply, without evaporation losses that are inherent to surface storage options.



Water for 2060 fact sheets, background reports, meeting presentations and summaries, and other related information are available online at

[www.owrb.ok.gov/2060](http://www.owrb.ok.gov/2060)



## Goal

*Best practices and information sharing*

## Applicability

*All water use sectors statewide*

## Legislative Action

*Support Water for 2060 Coordinator position and provide authority and funding for its activities; provide funding for development and maintenance of the portal.*

## Estimated Cost

*\$300,000-1,000,000 per year depending on extent of outreach*

## Action Required for Implementation

*The recommendation could be implemented via a new Water for 2060 Coordinator position at an existing agency—such as the OWRB or ODEQ—but would still require appropriations to support the expenditures such that water users across the state can leverage the benefits of combined expertise and outreach materials.*

## All Water Use Sectors (A-1)

### ***Develop public education and outreach materials, a statewide resources conservation campaign, and an Oklahoma water efficiency portal.***

#### **Water Efficiency Overview and Benefits**

The goal of this recommendation is to leverage the experience and expertise of many public water suppliers, crop irrigators, and industries in support of education and outreach regarding water efficiency. Recognizing that most PWS providers provide conservation information to customers, and that many industries have water efficiency goals and programs, the Advisory Council saw opportunities for the sectors to share materials and best practices for education and outreach. The Council recommends developing an Oklahoma “water efficiency portal,” a web-based information hub for water efficiency best practices in the PWS, CI, and EI water use sectors. (Information for populating the portal is provided in the sector-specific recommendations.) The Advisory Council further recommends that the information contained in the portal be continuously updated.

Development of a statewide water resources conservation campaign through use of public media (television, radio, newspaper, etc.) would promote use of the portal and communicate the need for and benefits of permanent conservation measures, including other associated opportunities for saving energy and other resources.

Recent evidence reinforces the concept that public awareness and education can significantly impact water use habits. For example, awareness of drought conditions in southwest Oklahoma during recent years, coupled with outdoor watering restrictions, has been shown to have a significant impact on indoor water demands as well. While no two communities or industries are the same, there clearly are opportunities to leverage investments made at the state level to be applied and used at the local level.

#### **Overview of Recommended Action**

The Advisory Council identified the following specific actions that can be taken to unify efforts in support of public education and outreach expanding on existing conservation successes:

- Designate a Water for 2060 Coordinator staff position to serve as a resource and central hub of public education/outreach materials for water efficiency.
- Provide funding and authority to the Water for 2060 Coordinator to, among other duties, develop a web-based Oklahoma water efficiency portal to serve as a central hub for water efficiency best practices in the PWS, CI, and EI water use sectors.
- Seek opportunities to coordinate water efficiency public outreach efforts with statewide energy efficiency outreach to promote resource efficiency across all utilities.
- Provide funding and authority for the Water for 2060 Coordinator to develop downloadable and customizable public education and outreach materials (school program materials, brochures, public service announcements, etc.) to establish and expand messaging regarding water efficiency measures and benefits. Materials should be developed through consultation with PWS efficiency leaders and incorporate or refer to available materials from national organizations (e.g., the American Water Works Association, WaterReuse Association, EPA WaterSense, Mesonet Simple Irrigation Plan, Envision Rating System, etc.).
- Develop and conduct a statewide public awareness campaign that extends across all water use sectors.
- Develop and implement an Oklahoma Water Reuse Communication Plan to increase awareness and foster acceptance of nonpotable and potable water reuse.
- Encourage and consider requiring the use of water conservation curriculum in grade schools.
- Consider promoting the use of Clean Water State Revolving Fund (CWSRF) and Drinking Water State Revolving Fund (DWSRF) Loans to support local roll-out of public education materials.



### *Develop an Oklahoma public water supply system water efficiency best practices guide.*

#### **Water Efficiency Overview and Benefits**

The Advisory Council concluded that one of the most cost-effective approaches to increasing PWS efficiency would be to increase efforts to identify, define, and share information between providers. This approach allows providers to learn from one another and leverage water-saving experiences and expertise. With a relatively small state investment, systems could have ready access to guidance on programs they could implement locally.

#### **Overview of Recommended Action**

Drawing on input from leaders of several Oklahoma PWS systems, the Advisory Council recommends developing a best practices guide and distributing the information via the Oklahoma water efficiency portal (Recommendation A-1) to document successful programs and measures for increasing water use efficiency. The guide can be distributed in multiple forms and through multiple venues, much like the OCWP PWS Planning Guide, which is available in both print and electronic (via website) formats. Development of the guide should rely heavily on other efforts and “lessons learned” from communities in Oklahoma and other states, but be tailored to the unique and varied characteristics of PWS systems across Oklahoma. The Advisory Council identified the following concepts for the best practices guide:

- Draw on proven strategies employed by cities that are “leading the way” in water conservation, such as San Antonio, Las Vegas, Denver, and others.
- Draw on other efforts and resources, such as the conservation guidance being developed by Oklahoma State University extension staff specific to Oklahoma.
- Group recommendations by system size, recognizing differences between rural water districts, small communities, and larger cities.
- Provide examples of conservation rate structures and guidance for their implementation, including references for communities that developed such structures while remaining revenue-neutral and decreasing per-capita demands.
- Provide a sample high-efficiency plumbing ordinance that could be tailored for local use.
- Provide examples of community metering programs with positive returns on investment.
- Provide an overview of water reuse opportunities and planning guidance, drawing on the findings of the Water for 2060 Hot Spot Basin pilot studies.
- Demonstrate methods for calculating and communicating the true cost of water (e.g., previous investments in infrastructure and their anticipated rehabilitation or replacement costs, operation and maintenance costs, or regulatory-related costs).
- Reference the use of the System Loss Best Practices Guide (PWS-3).
- Identify other best practices for consideration (e.g., metering of all customer accounts and usage, penalties for wasting water, or awards for identifying leaks).
- Establish water efficiency benchmarks for use in the administration of recognition programs as described in PWS-2.
- Include information on successful water reuse projects and opportunities for Oklahoma.
- Include information on successful green infrastructure and stormwater management projects, including their impacts on water recharge, etc.

#### **Goal**

*Developing strategies and benchmarks for PWS water efficiency*

#### **Applicability**

*PWS systems statewide*

#### **Legislative Action**

*Provide funding for development and distribution of the guide.*

#### **Estimated Cost**

*\$200,000 initial cost plus annual updating*

#### **Action Required for Implementation**

*The best practices guide can be developed by the OWRB under existing authorities, but development, distribution, and periodic updating is not funded under its existing budget. Therefore, the Oklahoma Legislature can support this initiative with appropriation of necessary funds.*

*Partnerships with the US Army Corps of Engineers (USACE), and Bureau of Reclamation (USBOR), or other agencies may also provide funding in support of this effort.*

*The OWRB will lead the development of the best practices guide while coordinating closely with the Oklahoma Department of Environmental Quality (ODEQ), Oklahoma Municipal League (OML), Oklahoma Rural Water Association (ORWA), and other key stakeholders instrumental to ensuring an informative and useful end product. The OWRB will also be responsible for making the guide readily available to PWS systems across the state, and may conduct targeted PWS system outreach (possibly with the assistance of OML and ORWA) to increase awareness and use of the guide.*



## Goal

*Recognizing PWS systems with high levels of efficiency and reuse*

## Applicability

*PWS systems statewide*

## Legislative Action

*Establish the program, annually recognize efficient communities and PWS systems, and provide funds for administration of the program.*

## Estimated Cost

*\$30,000-50,000 per year (plus implications of lower interest rates and statewide PWS rating)*

## Action Required for Implementation

*The Oklahoma Legislature can support the Oklahoma Water-Wise Community program by adopting legislation supporting its establishment, annually recognizing communities achieving and maintaining this status, and allocating the necessary funding for ongoing administration of the program. It is anticipated that administration of the program could be accomplished by the OWRB through funding of 50 percent of a full-time equivalent position after initial establishment of the program. This recommendation could also be implemented via the Water for 2060 Coordinator as outlined under Recommendation A-1.*

## Public Water Supply Recommendation 2 (PWS-2)

### ***Develop a state recognition and rewards program for highly efficient public water supply systems.***

#### **Water Efficiency Overview and Benefits**

To further expand public awareness and incentivizing additional conservation efforts by PWS systems and their customers, the Advisory Council identified a low-cost approach to promote, recognize, and reward Oklahoma's highly-efficient PWS systems. Recognition programs have proven successful in incentivizing progressive behavior in other industries, such as the U.S. Green Building Council's Leadership in Environmental and Energy Design (LEED) program that establishes certain levels and accompanying signage for facilities meeting established design criteria. Although it is difficult to quantify the water efficiency that would result from such a program, the Advisory Council believes that this would form an important and low-cost component of enhancing public awareness of water conservation and encourage additional efficiency measures by PWS systems.

#### **Overview of Recommended Action**

The Advisory Council contemplated several possible means for recognizing systems that have achieved high levels of water efficiency and recommended the following approaches:

- Set criteria for designation as an Oklahoma Water-Wise Community (or Rural Water System). Examples of criteria that could be used include reduced water loss or other non-revenue water, implementation and operation of water reuse systems, adoption of a state-approved water conservation plan, implementation of water efficiency ordinances (e.g., requiring WaterSense-labeled products for all new construction), becoming an EPA WaterSense partner, implementation of OCWP Water/Wastewater Planning Guides, or implementation of a Fiscal Sustainability Plan.
- Design signage for posting in award-winning communities (or rural water systems).
- Give annual recognition to highly-efficient PWS systems by the Legislature and issue accompanying press releases. Consider developing "efficiency challenges" to incentivize participation.
- Provide economic incentives by providing additional criteria or points in the evaluation of applications for state financing and grants to designated Oklahoma Water-Wise Communities. Consider providing lower interest rates for Water-Wise Communities or projects that will result in increased water use efficiency, recognizing the impacts of these lower rates on the availability of financing to other potential users of the program.
- Explore development of a system for rating each PWS in the state (top-rated PWS systems would be recognized with Oklahoma Water-Wise Community status).
- Recognize the unique challenges associated with rural water systems, and work with the Oklahoma Rural Water Association (ORWA) to include additional classes for system managers, operators, and board members regarding water efficiency.



### *Develop an Oklahoma water system loss reduction best practices guide.*

#### **Water Efficiency Overview and Benefits**

A typical Oklahoma PWS system uses dozens of miles of transmission and distribution piping to deliver potable water to its customers. Many systems also use significant infrastructure to convey water from one or more sources to treatment and distribution facilities. Increased efforts to detect, locate, and repair leaks in PWS pipelines can reduce water losses in these systems and improve the delivery efficiency of PWS systems. Based on analyses in the 2012 Oklahoma Comprehensive Water Plan (OCWP), investments by 2020 of between about \$6 million and \$11 million in leak reduction could save 12,000 to 22,000 AFY and with continued funding could grow to as much as 27,000 AFY by 2060.

#### **Overview of Recommended Action**

While system losses vary significantly from one water system to another, OCWP data suggest that a prioritized approach to identifying systems with the highest levels of non-revenue water and systematically repairing the most significant leaks can be a cost-effective approach for increasing water use efficiency. The OWRB should develop, publish, and periodically update an Oklahoma water system loss reduction best practices guide and distribute the information via the Oklahoma water efficiency portal (Recommendation A-1). This guide will serve as a unified reference for water providers seeking to reduce losses and increase efficiency through system loss reduction.

The Advisory Council recommends the following approaches for the PWS best practices guide:

- Reference available water system audit tools such as those published by the American Water Works Association.
- Develop and define a standard method for calculating non-revenue water and estimating system losses.
- Establish recommended standards for metering and monitoring of water production and water use in PWS systems. PWS systems should also be encouraged to calibrate meters used for water produced and sold in their system on a regular basis.
- Describe system inspection and repair methods drawing on best practices from PWS systems in Oklahoma and elsewhere as applicable.
- Include case studies of returns on investment realized by public water suppliers who have implemented leak reduction programs.
- Coordinate with related resources and initiatives of other agencies, such as the ODEQ, ORWA, and Oklahoma Municipal League (OML).

#### **Goal**

*Reducing water loss in transmission/distribution systems*

#### **Applicability**

*PWS systems statewide*

#### **Legislative Action**

*Provide funding for development and distribution of the guide.*

#### **Estimated Cost**

*\$200,000*

#### **Action Required for Implementation**

*The best practices guide can be developed by the OWRB under existing authorities, but its development and periodic updating is not funded under its existing budget. Therefore, the Oklahoma Legislature can support this initiative by appropriating the necessary funds. Partnerships with the USACE, the USBOR, or other agencies may also provide funding in support of this effort. The OWRB will coordinate with the ODEQ on the development of the guide with stakeholder input and review at key milestones. The OWRB and ODEQ will also be responsible for making the guide readily available to PWS systems across the state and may conduct targeted PWS system outreach to increase awareness and use of the document in order to leverage the investment.*



## Goal

*Reducing water loss in transmission/distribution systems*

## Applicability

*PWS systems statewide—focused on systems with high non-revenue water*

## Legislative Action

*Provide funds for state matching-fund grant program.*

## Estimated Cost

*\$1,000,000*

## Action Required for Implementation

*The OWRB can serve as the implementing agency for this recommendation. Legislative funding would be required to implement a new System Loss Reduction matching-fund grant program. OCWP analyses show that leak detection and repair programs can cost an average of \$520 for each AFY saved. At that level, a state investment of \$1 million matched with local investments of \$3 million (at an assumed 25/75 state/local cost share) could result in a reduction in losses of about 8,000 AFY. Funding would also be required for administration of this matching-fund grant program. Modifying the criteria for awarding OWRB/ODEQ water project financing could be accomplished under existing authorities, programs, and funding, but would require rule changes and/or changes to the administrative protocol for reviewing and selecting projects for financing.*

## Public Water Supply Recommendation 4 (PWS-4)

### ***Provide state funding and financing for water system loss reduction.***

#### **Water Efficiency Overview and Benefits**

As described in Recommendation PWS-3, the Advisory Council found that reducing leaks in water supply infrastructure could significantly enhance water use efficiency in PWS systems across the state. OCWP data include self-reported non-revenue water estimates from hundreds of PWS systems. Some systems reported non-revenue water levels upwards of 30 percent. These data could be used to develop potential priority areas for reducing leaks and achieving goals for industry-accepted levels of non-revenue water.

Input from water providers at Water for 2060 Advisory Council workshops indicated that some providers aggressively pursue leak detection and repair programs, while many others are constrained from implementing systematic leak detection and repair programs by the financial investment required—even if there is a relatively quick payback associated with reductions in system losses. By providing state funding and financing to support these efforts, more water providers will be incentivized to implement system loss reduction programs and will be more financially capable of achieving increased water delivery efficiencies. Based on available industry information, the recommended \$1,000,000 state investment alone has the potential to result in about 625,000,000 gallons per year of water saved. That amount of water savings can meet the entire water needs of a water-efficient Oklahoma community of about 12,000 people.

#### **Overview of Recommended Action**

Several different approaches could be taken to financially support and incentivize water providers to implement or expand water loss detection and reduction programs. Recognizing that state funding cannot directly support all needs, the Advisory Council identified opportunities to leverage state contributions through matching-fund and financing programs. The Advisory Council recommends the following actions for the state:

- Develop and commit legislative funds to a new System Loss Reduction matching-fund grant program.
- Coordinate efforts through the state/federal Funding Agencies Coordinating Team.
- Expand existing criteria for evaluating OWRB/ODEQ water project financing applications to encourage System Loss Reduction projects.
- Expand existing criteria for evaluating OWRB/ODEQ water project financing applications to reward utilities that have achieved low levels of Non-Revenue Water.
- Expand existing criteria for evaluating OWRB/ODEQ water project financing applications to reward utilities that have been designated as an Oklahoma Water-Wise Community (see Recommendation PWS-2).
- Expand the ODEQ Water Loss Audit Pilot funded under the Drinking Water State Revolving Fund (DWSRF) program.
- Explore opportunities for private investment in water loss, based on anticipated return on investment (e.g., public/private partnerships).



### *Encourage regionalization and supply sharing.*

#### **Water Efficiency Overview and Benefits**

Across Oklahoma, hundreds of PWS systems are physically interconnected through their water transmission and distribution infrastructure. The reasons for establishing interconnections vary, as do the operations of the connections. Some provide an ongoing “wholesale” supply of water from one system to another, while other systems have chosen to build interconnections for mutual aid or emergency-only use to enhance reliability by sharing supplies when necessary. The Advisory Council recognized the value of such water supply “regionalization” measures in providing improved reliability as well as opportunities for meeting Water for 2060 efficiency objectives. Depending on system-specific conditions, the cost of making interconnections and sharing supplies can in many cases be offset by economies of scale. Therefore, the Advisory Council recommends that the State of Oklahoma further encourage and incentivize the voluntary interconnection of additional PWS systems to promote sharing of water supplies and related treatment and delivery infrastructure.

#### **Overview of Recommended Action**

The Advisory Council acknowledges that there can be significant capital costs needed for interconnecting systems and that making such connections requires the mutual agreement of two or more adjoining PWS systems. To cost-effectively promote further water supply regionalization, the Advisory Council recommends the following actions:

- The OWRB and ODEQ should establish and document categories of supply regionalization, using case studies from existing interconnected systems. This will distinguish between “mutual aid” (sharing supplies intermittently between separate water providers and/or providing central water supply sources or treatment facilities for water providers) vs. consolidation (merging water providers).
- The OWRB and ODEQ should identify and document typical benefits of supply regionalization, such as supply reliability, cost savings associated with economies of scale, and opportunities for enhanced efficiency such as sharing best practices and programs for water conservation.
- The OWRB, in partnership with the USACE and other funding partners, should conduct additional local-level demonstration projects for supply regionalization, similar to the Water for 2060 Hot Spot Basin demonstration study being conducted in southwest Oklahoma.
- Encourage use of principal forgiveness programs available under the Drinking Water State Revolving Fund program to support implementation of PWS regionalization.
- Expand the OWRB water infrastructure mapping project to assist with identifying locations/ systems that may be appropriate for regionalization, possibly through a local/state cost-sharing arrangement.

#### **Goal**

*Best practices and information sharing*

#### **Applicability**

*PWS systems statewide—focused on systems with opportunities for interconnections*

#### **Legislative Action**

*Continue gross production tax funding for OCWP implementation.*

#### **Estimated Cost**

*\$200,000 plus annual allocations for infrastructure mapping*

#### **Action Required for Implementation**

*The OWRB can implement the Advisory Council's recommendations for encouraging PWS regionalization and supply sharing under existing authorities. Legislative support for conducting additional demonstration studies can be provided by continuing to provide gross production tax funding to the OWRB for OCWP implementation, which in turn allows the OWRB to leverage the state funding with federal dollars.*



## Goal

*Providing financial incentives and mechanisms for irrigators to implement efficient technologies and practices and increase crop yields*

## Applicability

*CI water use statewide*

## Legislative Action

*Allocate annual funding for program costs and authorize expansion of the Oklahoma Agricultural Linked Deposit Program.*

## Estimated Cost

*Funds for Oklahoma EQIP program and matching-grant programs; linked deposits from funds currently available within the OWRB Financial Assistance Program*

## Action Required for Implementation

*The OWRB should use existing authorities under the CWSRF program to establish a linked deposit program, specifically granting authority to the Financial Assistance Program to provide indirect financial assistance to private parties with the express intent of supporting higher-efficiency irrigation equipment and related practices. The OWRB could assess fees to support the administration and necessary oversight of the linked deposit program. The Oklahoma Legislature should authorize the Oklahoma State Treasurer to expand the Oklahoma Agricultural Linked Deposit Program to CI equipment conversion as an eligible expense. Rule changes would also be necessary to implement the other recommendations.*

## Crop Irrigation Recommendation 1 (CI-1)

### **Apply state financing programs to water-efficient crop irrigation equipment conversion and practices.**

#### **Water Efficiency Overview and Benefits**

The OCWP estimated that surface irrigation technologies are 64 percent efficient, while newer high-efficiency sprinkler systems are 85 percent efficient and drip irrigation systems are about 89 percent efficient. The OCWP also provides a county-level tabulation of irrigation technologies in use across the state. Counties with a high CI water use and high use of lower-efficiency technologies provide the greatest opportunity to increase efficiency. The OCWP estimated that certain shifts to higher-efficiency irrigation systems could result in water savings of nearly 68,000 AFY by 2060. However, input by crop irrigators to the Advisory Council indicated that capital costs of converting to higher-efficiency technologies are a significant deterrent to widespread adoption. The Advisory Council found that it would be cost-prohibitive to make meaningful grant funds available to irrigators across the state. Instead, the state can help incentivize the use of higher-efficiency irrigation technologies by adapting and leveraging existing state financing programs.

#### **Overview of Recommended Action**

The Advisory Council recommends that the OWRB, through its Financial Assistance Program, establish a “linked deposit” program to allow the use of low-interest state financing for private investments in CI technologies. The EPA has encouraged states to broaden the types of projects eligible for financing under the CWSRF program, which is administered in Oklahoma by the OWRB, and other states have established linked deposit programs to accomplish similar goals. Under a linked deposit loan approach, the state would work with local private lending institutions to provide assistance for water efficiency projects. The term “linked” refers to the relationship between the below-market rate of interest investment agreement provided to a participating lender by OWRB, and the below-market rate of interest loan that is passed on to the borrower to fund certain capital water projects. The below-market interest rate loan the borrower receives is “linked” to the below-market rate of interest investment OWRB makes with a participating lender. Linked deposit programs are most attractive to the end user when prevailing interest rates are higher. Any financial institution that meets established qualifications could be eligible to participate in the program.

The Advisory Council also recommends the following:

- Consider supporting some form of tax incentives to further encourage the adoption of efficient irrigation equipment.
- Expand the Oklahoma State Treasurer’s existing Oklahoma Agricultural Linked Deposit program to include water efficient CI equipment conversion as an eligible item. Currently, the linked deposit loans are available to at-risk farm or ranch operations or to alternative agricultural products operations who are residents of Oklahoma and whose business operation is located in the state.
- Consider developing an Oklahoma matching-grant program as an additional resource for facilitating implementation of efficient irrigation equipment, similar to the Natural Resources Conservation Service Environmental Quality Incentives Program (EQIP).

### *Develop an Oklahoma crop irrigation best practices guide.*

#### **Water Efficiency Overview and Benefits**

Data summarized in the OCWP suggest that the CI technology commonly used (e.g., sprinklers, drip irrigation) varies significantly from one part of Oklahoma to another. Similarly, input that the Advisory Council received from crop irrigators suggests that significant innovations in water-efficient technologies and practices are being implemented in some areas, but not widely adopted. The Advisory Council concluded that one of the most cost-effective approaches to increasing CI water use efficiency would be to better identify, define, and share “best practices” information between irrigators. This approach allows irrigators to learn from one another and leverage others’ experiences and expertise without reinventing water-saving measures and programs. With a relatively small state investment, irrigators across the state could have ready access to guidance on technologies and measures they could implement locally. Efforts to increase CI efficiency should be made in the context of continuing to maintain a strong and growing agricultural economy.

#### **Overview of Recommended Action**

The Advisory Council recommends the following approaches for the CI best practices guide:

- Demonstrate the return on investment potential for each technology and practice; encourage focus on profit, not only on yield; assess efficiency for technologies and practices in terms of unit water use (e.g., gallons of water per bushel of yield).
- Identify water use “benchmarks” for irrigation of various types of crops in various regions of Oklahoma and establish recognition programs for achieving them. Consider developing “efficiency challenges” to incentivize participation.
- Distribute information via the Oklahoma water efficiency portal (A-1). The portal will provide reports of recent efficiencies (e.g., gallons of water per bushel of yield for various areas and crops to demonstrate potential for high yields with low water use); information on water levels in aquifers and OCWP demand/shortage projections; and information sharing on local/state/federal programs and opportunities that support best irrigation practices.
- Identify better ways to leverage existing Mesonet data similar to the lawn irrigation Simple Irrigation Plan or “SIP” program (<http://sip.mesonet.org/>) via the portal, and possibly develop stronger links to on-farm irrigation technology.
- Conduct targeted outreach to crop irrigators in lower-efficiency areas of the state.
- Encourage agricultural users to self-regulate water use (or develop guidelines). The state should work with agricultural interests to develop self-regulating systems for long-term sustainable agricultural production. Any such processes should be operated within the bounds of existing water law and in concert with previous studies in the local watershed or groundwater basin.

#### **Goal**

*Best practices and information sharing*

#### **Applicability**

*CI users statewide*

#### **Legislative Action**

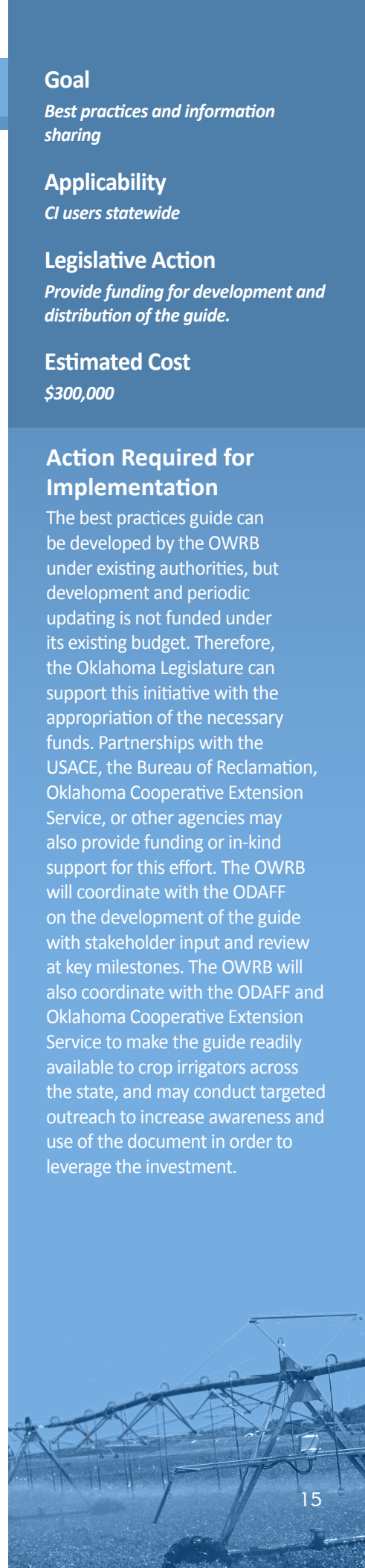
*Provide funding for development and distribution of the guide.*

#### **Estimated Cost**

*\$300,000*

#### **Action Required for Implementation**

The best practices guide can be developed by the OWRB under existing authorities, but development and periodic updating is not funded under its existing budget. Therefore, the Oklahoma Legislature can support this initiative with the appropriation of the necessary funds. Partnerships with the USACE, the Bureau of Reclamation, Oklahoma Cooperative Extension Service, or other agencies may also provide funding or in-kind support for this effort. The OWRB will coordinate with the ODAFF on the development of the guide with stakeholder input and review at key milestones. The OWRB will also coordinate with the ODAFF and Oklahoma Cooperative Extension Service to make the guide readily available to crop irrigators across the state, and may conduct targeted outreach to increase awareness and use of the document in order to leverage the investment.





## Goal

*Reducing or eliminating water waste required to prove out crop insurance claims*

## Applicability

*CI water use statewide*

## Legislative Action

*Introduce legislative resolution seeking relief at the federal level.*

## Estimated Cost

*Negligible*

## Action Required for Implementation

*Work with Oklahoma's Congressional Delegation and agency staff to share a common understanding of the issue. Introduce and pass an Oklahoma state legislative resolution seeking federal assistance in addressing this policy-level challenge.*

## Crop Irrigation Recommendation 3 (CI-3)

### ***Actively support federal crop insurance reform.***

#### **Water Efficiency Overview and Benefits**

The Advisory Council sought practical approaches for building on existing successes in efficient water use in the CI sector, the largest water use sector in Oklahoma. Crop irrigators provided input to the Advisory Council indicating that current crop insurance rules can at times encourage or require unnecessary and wasteful application of water. In order to “prove out” an irrigator’s attempt to raise a crop in drought or other conditions and qualify for an insurance payment, irrigators are sometimes required to irrigate a field even beyond the point of certain failure regarding the ability to raise a crop that season. Quantities of water wasted through these requirements are difficult to quantify and will vary from area to area and year to year. However, based on crop irrigator input, the Advisory Council identified crop insurance reform as one way of reducing waste and increasing water use efficiency in support of the Water for 2060 goals.

#### **Overview of Recommended Action**

Crop insurance is governed at the federal level. As such, Oklahoma’s legislature and agricultural industry have no direct control over desired modifications to crop insurance rules to end the need for wasting water to prove out attempts at failed crops. Instead, Oklahoma can be a leader at the federal level in calling attention to the issue and advocating for crop insurance reform. Recommended actions include the following:

- Approach Oklahoma’s Congressional delegation for assistance in resolving the issue.
- Demonstrate the need for change using case studies and quantification of how much water has been wasted in previous drought years.
- Pass state legislative resolution seeking relief at the federal level.

### *Facilitate increased sharing of information and supplies between energy and industry water users.*

#### **Water Efficiency Overview and Benefits**

The EI water use sector spans a wide range of applications in Oklahoma. Despite differences between industries and even within a given industry, the Advisory Council identified opportunities to share information and best practices between EI water users. Input by representatives from water users in the oil and gas industry, aggregates industry, power generation industry, and others was used to develop and shape this recommendation. The Advisory Council also identified the potential for EI water users to share water supplies and more effectively use available marginal quality water supplies.

#### **Overview of Recommended Action**

The Advisory Council recommends that the state build on existing efforts at the office of the Oklahoma Secretary of Energy and Environment to assemble an EI water efficiency committee comprised of EI water use representatives and key state and federal agency representatives. The Advisory Council recommends the following goals for the committee:

- Actively promote/facilitate shared use of water resources between oil and gas operators per recent rule changes that avoid classification of water management as a “commercial” operation.
- Collaborate with the Oklahoma Corporation Commission to further understand the permitting process and to ensure there are no disincentives for water sharing between oil and gas producing operators.
- Establish benchmarks and share data on the amount of water used for power generation (e.g., gallons per megawatt of power produced and/or percent of water consumptively used).
- Use the the Oklahoma water efficiency portal (A-1) to disseminate output from the Oklahoma Secretary of Energy and Environment’s collaborative meetings and other IE information—possibly also via trade groups like the Oklahoma Independent Petroleum Association (OIPA), Oklahoma Energy Resources Board (OERB), etc.
- Support additional brackish water mapping and research.
- Develop and periodically update an atlas of Oklahoma fresh water and marginal quality water supplies, building on the OWRB’s previously-issued Oklahoma Water Atlas (e.g., alluvial and bedrock groundwater, municipal water reclamation facilities, brackish groundwater, other marginal quality sources, etc.).
- Identify and apply public/private partnerships to improve municipal effluent water quality and treatment reliability to increase the value of municipal effluent for EI reuse, and/or use the OWRB Financial Assistance Programs to facilitate improvements.
- Create intra-state and inter-state forums for water efficiency best practices information sharing.
- Document case studies illustrating the success stories of EI use efficiency efforts.

#### **Goal**

*Facilitating the sharing of best practices and more efficient shared use of supplies between EI water users*

#### **Applicability**

*EI water use statewide*

#### **Legislative Action**

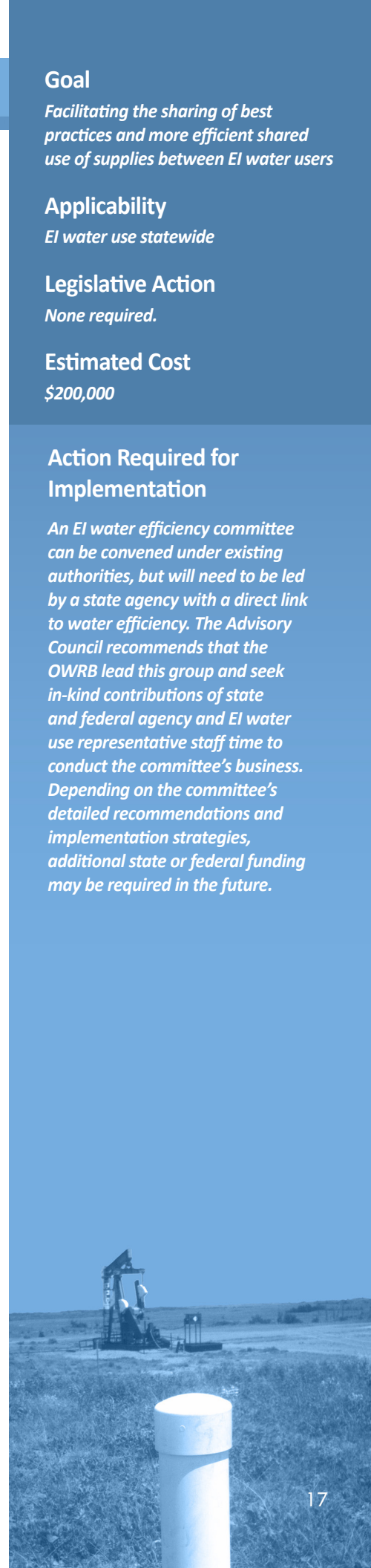
*None required.*

#### **Estimated Cost**

*\$200,000*

#### **Action Required for Implementation**

*An EI water efficiency committee can be convened under existing authorities, but will need to be led by a state agency with a direct link to water efficiency. The Advisory Council recommends that the OWRB lead this group and seek in-kind contributions of state and federal agency and EI water use representative staff time to conduct the committee’s business. Depending on the committee’s detailed recommendations and implementation strategies, additional state or federal funding may be required in the future.*



## Goal

*Increasing awareness and recognition of efficient EI water use practices*

## Applicability

*EI water users statewide*

## Legislative Action

*Establish the program, annually recognize efficient EI water users, and provide funds for development of guidance and administration of the program.*

## Estimated Cost

*\$30,000-\$50,000 per year*

## Action Required for Implementation

*The Legislature can support the Oklahoma Water-Wise Industry program by adopting legislation supporting its establishment, annually recognizing communities achieving and maintaining this status, and by allocating the necessary funding for ongoing administration of the program. It is anticipated that administration of the program could be accomplished by the OWRB, with funding of 50 percent of a full-time equivalent position after initial establishment of the program. This recommendation could also be implemented in combination with PWS-2.*

## Energy and Industry Recommendation 2 (EI-2)

### ***Develop an energy and industry water use best practices guidance and recognition program.***

#### **Water Efficiency Overview and Benefits**

To further incentivize conservation and marginal quality water use, the Advisory Council identified a low-cost approach to promote, recognize, and reward Oklahoma's highly-efficient EI water users. Recognition programs have proven successful in incentivizing progressive behavior in other industries (e.g., establishing desired criteria/standards and accompanying recognition for meeting or exceeding those criteria, such as the U.S. Green Building Council's Leadership in Energy and Environmental Design [LEED] program and others). Although it is difficult to quantify the water efficiency that would result from such a program, the Advisory Council believes that this would form an important and low-cost component of enhancing EI water user awareness of water efficiency practices and encourage additional efficiency measures by EI water users statewide.

#### **Overview of Recommended Action**

The Advisory Council contemplated several possible means for recognizing industrial water users that have achieved high levels of water efficiency. The following approaches are recommended:

- Identify and document best practices for onsite water management within various categories of EI (e.g., power generation, concrete and aggregate facilities, oil and gas production) to adopt elsewhere. The results of this effort can be disseminated to industrial entities statewide using the mechanisms described under Recommendation EI-1.
- Award LEED-type points for sustainable site development.
- Develop recognition programs for water-efficient EI users, such as designation as an Oklahoma Water-Wise Industry. Quantify and recognize financial savings associated with water efficiency measures implemented by Oklahoma Water-Wise Industries. Consider developing "efficiency challenges" to incentivize participation.
- Identify opportunities for EI facilities with large water storage abilities (aggregate sites and others) to be used for recharge purposes at facilities that are in place long-term.
- Document case studies illustrating the success stories of EI user efficiency efforts.

### *Promote industrial use of marginal quality waters.*

#### **Water Efficiency Overview and Benefits**

Achieving Water for 2060 goals can be met with a combination of demand reduction through increased efficiencies and through the use of non-traditional “marginal quality water” sources. These sources include reuse of treated effluent from municipal water reclamation facilities, stormwater runoff, oil and gas produced and flowback water, brackish groundwater supplies, and other nontraditional sources, as defined in the OCWP Marginal Quality Water Issues and Recommendations report (2011). Opportunities for increasing marginal quality water use in industrial applications (e.g., oil and gas, aggregates, pulp and paper, power generation, etc.) were identified as an area of focus by the Advisory Council.

#### **Overview of Recommended Action**

The Advisory Council identified the following actions that could be undertaken to incentivize and expand the use of marginal quality waters in industrial facilities and operations in Oklahoma:

- Identify, characterize, and remove regulatory impediments to the reuse of municipal water reclamation facility effluent.
- Support initiatives to develop alternatives to water for fracking or lower-water fluids.
- Support development of evolving treatment technology for flowback water.
- Establish recognition based on shifts from percent of fresh water use to percent of marginal quality water use, as more fully described under EI-2.
- Develop user guidance to assist water users in navigating the regulatory process for marginal quality water (e.g., water reuse).
- Model and document case studies of the economics of alternative water sources for power generation and other industries to encourage broader use of marginal quality waters.
- Identify and document the “true” water quality requirements for industrial products (e.g., concrete) rather than needlessly requiring potable water, and seek approval by the engineering industry to change standard specifications.

This broad range of activities will necessarily require input, engagement, and buy-in by representatives of a diverse group of EI water uses. For initial implementation, the Advisory Council recommends that the EI water efficiency committee described under EI-1 be provided the authority and resources to initiate these activities.

#### **Goal**

*Increasing the use of marginal quality water supplies in industrial applications*

#### **Applicability**

*Industrial water users statewide*

#### **Legislative Action**

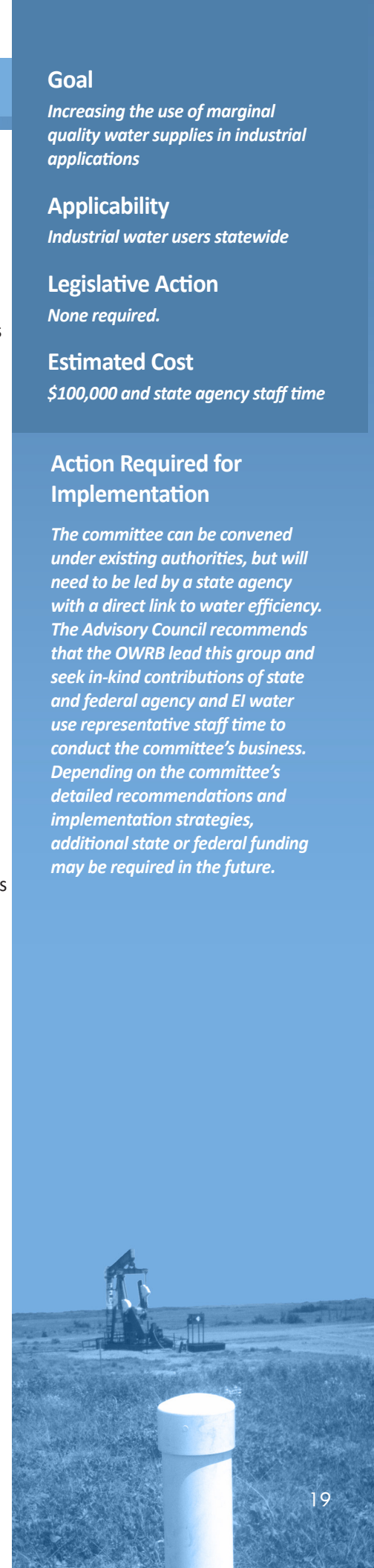
*None required.*

#### **Estimated Cost**

*\$100,000 and state agency staff time*

#### **Action Required for Implementation**

*The committee can be convened under existing authorities, but will need to be led by a state agency with a direct link to water efficiency. The Advisory Council recommends that the OWRB lead this group and seek in-kind contributions of state and federal agency and EI water use representative staff time to conduct the committee’s business. Depending on the committee’s detailed recommendations and implementation strategies, additional state or federal funding may be required in the future.*



## **APPENDIX**

### **WATER FOR 2060 ADVISORY COUNCIL MEETING MINUTES**

# Water for 2060 Advisory Council

Minutes of First Meeting, 1:30 P.M., August 20, 2013

OWRB Board Room, 3800 N. Classen Blvd., Oklahoma City, Oklahoma

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## **ATTENDEES:**

### ***Advisory Council Members:***

Lauren Brookey, Tulsa Metropolitan Utility Authority  
Tom Buchanan, Lugert-Altus Irrigation District (Altus)  
Bob Drake, Agriculture (Davis)  
Danny Galloway, City of Stillwater  
Roger Griffin, Weyerhaeuser, (Broken Bow)  
Charlette Hearne, Oklahomans for Responsible Water Policy (Broken Bow)  
Mark Helm, Dolese (Oklahoma City)

Nathan Kuhnert, Devon (Oklahoma City)  
Phil Richardson, Agriculture (Minco)  
Trent Smith, Small Business (Choctaw)  
Kevin Smith, Ward Petroleum (Enid)  
J. D. Strong, Chair, Oklahoma Water Resources Board (Oklahoma City)  
Joe Taron, Pottawatomie County Development Authority (Shawnee)  
Jerry Wiebe, Oklahoma Panhandle Agriculture & Irrigation (Hooker)

### ***OWRB Staff and Consultants:***

Joe Freeman, OWRB  
Jennifer Wasinger, OWRB  
Mary Schooley, OWRB  
Owen Mills, OWRB  
Amanda Storck, OWRB  
Brian Vance, OWRB  
Kent Wilkins, OWRB  
Jerry Barnett, OWRB

Sara Gibson, OWRB  
Julie Cunningham, OWRB  
Ed Fite, OWRB Board Member  
Terri Sparks, OWRB  
John Rehring, Carollo Engineers  
Anna Childers, CH2M Hill  
Bryan Mitchell, CH2M Hill

### ***Others:***

Ana Stagg, Meshek & Associates  
Arnella Karges, State Chamber of Oklahoma

Josh McClintock, Creative Capitol Strategies  
Mike Mathis, Chesapeake Energy

## **Introduction of Council Member and Meeting Participants, Overview of Responsibilities, and Potential Strategies**

Mr. J.D. Strong, OWRB Executive Director and Advisory Council Chairman, opened the meeting by noting that it is meant to be an orientation to provide members with an opportunity to meet each other and to start laying the foundation for future activities as envisioned under the Council's enacting legislation, HB 3055. Advisory Council members introduced themselves and gave a brief description of their interest/representation in the water community as well as any goals/initiatives perceived for the Council's future work. Other meeting participants were also given the opportunity to introduce themselves.

Mr. Strong briefly went over the Council’s responsibilities, incentive targets, and potential efficiency goals as specifically mentioned in HB 3055. He also stressed that the specific goals and objectives as stated in the legislation should not limit the Council from consideration of other worthwhile initiatives.

Mr. Strong then introduced a potential roadmap for consideration by the Advisory Council, including examples of what might be beneficial activities in the years to come. Mr. Strong noted that the OWRB secured funding through the Corps of Engineers Planning Assistance to States Program, which allowed the Corps to contract with consultants to help provide support to the OWRB and Council. He reminded Council members that CH2M Hill and Carollo Engineers have already put together a “Background Report” to help facilitate discussion with the group. This report was e-mailed to Council members and is provided along with other relevant information on the [Water for 2060 Website](#).

### **Review of OCWP Conservation Findings**

Mr. John Rehring, Carollo Engineers, indicated that we wanted to provide the Council with a little more than an orientation, but also wanted to help get thoughts and ideas flowing by providing examples of what is being done in Oklahoma and other states. He noted that the group is challenged to come up with a broad range of ideas because Oklahoma is a state with a wide diversity in rainfall and water availability issues, which in turn geographically influences the type of uses to which water is applied.

Mr. Rehring provided an overview of the water conservation scenarios that were investigated in the *2012 OCWP Update*, which primarily targeted water used in the state’s largest water use sectors: Municipal and Industrial (M&I) and Crop Irrigation. He noted that two suites of conservation measures were investigated for both water use sectors: Scenario I encompassed moderate increases in conservation measures, while Scenario II included more substantial increases in conservation. Mr. Rehring showed a graph indicating that the goal of the Water for 2060 Act could be achievable in the combined M&I and Crop irrigation sectors under the substantial (Scenario II) conservation measures. Mr. Strong noted that he was particularly impressed with the slides showing the potential impacts that the conservation scenarios could have on Oklahoma’s identified “hotspots”, or most water-short areas of the state.

### **Examples of Water Efficiency and Incentive Programs in Oklahoma and Other States**

Mr. Bryan Mitchell, CH2M Hill, then explained that the consulting team had interviewed representatives from the following:

- Lugert-Altus Irrigation District (Oklahoma)
- Oklahoma Panhandle Agriculture and Irrigation
- City of Norman, Oklahoma
- City of Shawnee, Oklahoma
- State of Colorado
- State of California

The basic goals of the interviews were to provide the Advisory Council members with some ideas of ongoing conservation practices in Oklahoma, as well as conservation incentive programs currently in place in other states. The Lugert-Altus Irrigation District represents surface water users, while the Panhandle Agriculture and Irrigation primarily represents groundwater users. The City of Norman provides water to a large service area population, while the City of Shawnee provides water to a smaller population. The State of Colorado focused on incentives to promote water efficiency, while California focused on regulation and mandates to accomplish conservation goals. The results of the interviews

provide Council members with a foundation from which to work as they consider and build upon programs that would provide Oklahomans with the most appropriate incentives to conserve water.

### **Initial Concepts for Incentives and Education Programs/Brainstorming/Research for Next Meeting**

Mr. Rehring then facilitated a brainstorming session to solicit potential concepts for conservation incentives and to identify questions/topics that the group might have that could be researched and discussed at subsequent meetings. Some of the concepts and ideas identified include:

- Reducing leaks should be a major goal; maybe promote education as 1<sup>st</sup> stage; water audits might be helpful.
- Lost water is lost revenue; this should be a substantial incentive for municipalities to save.
- Smaller Systems—if have large leakage, what is best option to find leaks; identify technology (leak detection/audits); funding to repair leaks is important.
- Need different options/motivation that appeal to large and small systems.
- What is the status of financial programs authorized by past legislation? Where is implementation? [Joe Freeman, Chief of Financial Assistance Division, noted they have been working with bond rating agencies since passage of 764 to leverage additional funds and are in the process of trying to upgrade to a AAA rating; what can we do to help with small systems is key.]
- Are there existing programs that we are not aware of? [Mr. Rehring mentioned that consultants could look at existing state programs, and federal programs too; for example, Bureau of Reclamation’s WaterSmart grants.]
- Need to have people representing other agencies (e.g., Bureau of Reclamation) participate in future meetings and talk about different programs.
- If city water revenues are used to run city, how can we ask them to use less water, i.e., lose needed revenues?
- Water providers have a moral obligation to find and fix leaks—it is the right thing to do; need to find balance between saving water and lost revenues.
- When looking at conservation pricing, need to look at ways to use less water while investigating other options to maintain revenues.
- The costs associated with fixing leaks are also a consideration; there is a diminishing return as the percentage of leakage goes down; costs of fixing smaller leaks may outweigh the advantages.
- Costs of construction to bring new water can deter adversary to conservation water pricing.
- Would education help communities know when to replace vs. repair?
- Water short areas will look at saving water.
- Water efficiency can be accomplished through regional systems; can be more cost effective, but there is reluctance for RWD and cities to work together; no incentives other than actual water shortage.
- Even if everyone had a water conservation plan, it will not accomplish anything without user buy-in; emphasis should be on education—through education, the City of Shawnee has incentivized (motivated???) industry, i.e., Mobil Chemical and Hospital are rewarding employees who come up with conservation ideas; local incentives and local education is key; voc-tec came up with 55 suggestions on how to educate people on water issues.
- Are there financial incentives for regionalization? Need resource guide to get the word out on available programs.



- Crop irrigation water saved by conservation will be used to irrigate additional lands; i.e., the incentive to save 20% of the amount of water normally used is the ability to use it to irrigate additional lands.
- There has to be a balance between saving water and economic incentive to use.
- You can normally expect to lose efficiency when you change crops; for example, some crops suppress weeds; if change crops, lose this control.
- Panhandle is using less water while producing more crops; need to look at how that works.
- Garber-Wellington is becoming less feasible to use because of arsenic; need to learn to treat water instead of building pipelines to bring more water in; need to figure out how to use what we have; why not incentivize to clean up Red River?
- More and more land is going out of production; inherited by others who let it grow up with cedar trees, etc.
- Are there any available surveys looking at public perception in reuse? Or conservation? Better to save rather than use new sources.
- What about uses other than Crop irrigation and M&I, i.e. power and self-supplied industry? Any incentives there? Or is it fair to focus on M&I and crop irrigation since they are the highest users of water?
- Have 3 or 4 cities that use conservation pricing to come in and tell how they are set up [including revenue flows?] and how they determined charges.
- What encourages other cities to look at different conservation plans?
- Review presentations at Governor's Water Conference; i.e. San Antonio and author of *Thirst*.

Overall, the group concurred with the Legislature's expressed intent to encourage efficiency through incentives, rather than through mandates.

### **Content, Timing and Location of Future Advisory Council Meetings**

The topic then turned to a discussion of future meetings and processes. The consensus was that quarterly meetings would be appropriate. Mr. Strong mentioned that staff thought it might be helpful to have an Irrigation/Agriculture Workshop and an M&I/Other Uses Workshop to narrow down on some informed ideas for incentives and obtain feedback and validation from additional water providers/users regarding the effectiveness of proposed incentives. It was decided that an M&I/Other Workshop would be held in Oklahoma City, and the Irrigation/Agriculture Workshop location will be determined.

It was questioned whether agriculture was an appropriate place to focus, with one member opining that that sector is already doing all it can economically do to conserve water. This remark was countered by stressing that irrigation remains one of Oklahoma's largest water users, and that it probably was not prudent to ignore opportunities in this sector or to wait until we have no option but to conserve before we started evaluating options. Moreover, if agriculture is already fully maximizing its reuse potential, that needs to be documented and demonstrated to the Legislature through this process.

Another question was whether we had an obligation to look at using marginal quality water, such as produced/flowback water from oil and gas operations. It was noted that additional legislation/statute changes would be needed to use many sources of marginal quality water, but that consideration of marginal waters was certainly within the goals set out in H.B. 3055.

The next question for consideration was, after the workshops, should follow-up meetings be in Oklahoma City or should we hold Regional Meetings outside the metro area? It was suggested that if we

were going to come up with incentives as a group, we need to listen to other use sectors to understand and empathize with their needs, which might be a good reason to have Regional Meetings. However, budget limitations would need to be considered as H.B. 3055 did not provide any funding for per diem or lodging. For now, we could consider holding the first follow-up meeting in Oklahoma City to review/synthesize the results of the two workshops, and then discuss the need for Regional Meetings. It was noted that Regional Meetings could also be held as late as 2015.

### **Next Steps and Group Resources**

In closing, OWRB staff and consultants' follow-up actions include getting information to help Advisory Council members consider logistics for future meetings. Homework for the Advisory Council is to review materials sent to them and provide feedback as needed.

Pertinent information will be e-mailed to the Advisory Council members and/or placed on the [Water for 2060 Website](#).

# Water for 2060 Advisory Council

Minutes of Second Meeting, 1:00 P.M., November 19, 2013

OWRB Board Room, 3800 N. Classen Blvd., Oklahoma City, Oklahoma

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## **ATTENDEES:**

### ***Advisory Council Members and representation (from Sign In and/or Introductions):***

Lauren Brookey, Tulsa Municipal Utility Auth.  
Tom Buchanan, Lugert-Altus Irrig. Dist. (Altus)  
Bob Drake, Agriculture (Davis)  
Danny Galloway, City of Stillwater  
Roger Griffin, Weyerhaeuser, (Broken Bow)  
Charlette Hearne, Oklahomans for Responsible  
Water Policy (Broken Bow)  
Mark Helm, Dolese (Oklahoma City)  
Phil Richardson, Agriculture (Minco)

Trent Smith, Small Business (Choctaw)  
Kevin Smith, Ward Petroleum (Enid)  
J. D. Strong, Chair, Oklahoma Water Resources  
Board (Oklahoma City)  
Joe Taron, Pottawatomie County Development  
Authority (Shawnee)  
Jerry Wiebe, Oklahoma Panhandle Agriculture  
& Irrigation (Hooker)

### ***OWRB Staff and Consultants:***

Mary Schooley, OWRB  
Owen Mills, OWRB  
Darla Whitley, OWRB  
Brian Vance, OWRB  
Julie Cunningham, OWRB

Ed Fite, OWRB Board Member  
Terri Sparks, OWRB  
John Rehring, Carollo Engineers  
Bryan Mitchell, CH2M Hill

### ***Speakers:***

Kris Neifing, City of Edmond  
Murali Katta, City of Enid  
Afsaneh Jabbar, City of Lawton  
Ken Komiske, City of Norman  
Shawn Leopard, representing City of Guymon

Jimmy Seago, Osage County RWD #15  
Collins Balcombe, Bureau of Reclamation  
James Gammill, Oklahoma Rural Water Assoc.  
Joe Freeman, OWRB  
Jennifer Wasinger, OWRB

### ***Others:***

Josh McClintock, Creative Capitol Strategies

Mike Mathis

## **Introductions and Goals for Today**

Mr. J.D. Strong, OWRB Executive Director and Advisory Council Chairman, opened the meeting by welcoming the attendees, providing a brief background of the Council's responsibilities and goals, and an overview of the discussion from the first Water for 2060 Advisory Council meeting held in August 2013. Mr. Strong then asked the Council members and attendees to introduce themselves. Mr. John Rehring facilitated the meeting. He reviewed the agenda and logistics for the meeting, noting that the primary goal for today's meeting was to gain insights and ideas from public water suppliers (both municipal and rural water districts) regarding water efficiency practices across Oklahoma, programs already in place that help support water efficiency in the public water supply sector, and the types of activities and incentives that would be most useful to public water suppliers.

## **Existing Practices and Programs in Conservation and Reuse**

Several speakers were invited to participate in the meeting, starting with public water suppliers that provided insights on the following:

- Existing conservation/reuse practices: What’s working for you now?
- Current incentives/disincentives for water-efficient practices and education programs
- Additional conservation: What’s holding you back?

The six public water supply representatives included:

- Mr. Kris Neifing, City of Edmond
- Mr. Murali Katta, City of Enid
- Ms. Afsaneh Jabbar, City of Lawton
- Mr. Ken Komiske, City of Norman
- Mr. Shawn Lepard, on behalf of the City of Guymon
- Jimmy Seago, Osage County Rural Water District #15

The presentations and related discussions resulted in the following lists of opportunities for water efficiency as well as constraints/obstacles:

### Opportunities

- Education about the value of water
- State-led public outreach programs
- Use of high efficiency fixtures
- Indirect potable reuse (IPR) incentives
- Direct potable reuse (DPR) opportunities
- Additional non-potable reuse
- Water loss repair through capital improvement plans (CIPs) and/or sales tax funding
- Repair of distribution lines
- Replacing old lines
- Meter replacement
- Conversion to non-potable sources
- Conservation rate structures/billing systems
- Irrigation/ ordinances
- Legislative appropriations (financial incentives)
- Hydraulic analyses for water loss
- Rebates for high-efficiency fixtures
- Rewards for finding/reporting leaks
- Improved accounting for leaks, fire use, and other non-revenue water
- Regionalization/consolidation

### Constraints

- Cost of infrastructure for reuse
- Willingness to pay, recognition of the value of water
- Lack of support for any mandates tied to state funding (e.g., requirement for an approved conservation plan)
- Impacts of reuse on downstream users
- Performance of high efficiency fixtures
- Revenue implications of reduced use
- Priorities for funding “optional” reuse projects vs. basic minimum requirements
- Lack of mechanisms for regional funding
- Water rights forfeiture laws (use it or lose it disincentive)
- Objection to statewide tap fees to generate funding
- Geographic constraints to regionalization
- Regulations for household gray water reuse

Next, invited speakers provided an overview of existing programs that are available to assist public water suppliers implement water efficiency projects and programs.

Collins Balcombe, Bureau of Reclamation, gave a PowerPoint presentation on Reclamation's WaterSmart grants, and focused on a new authority under their Water and Energy Efficiency Grants—"On-The-Ground Conservation and Efficiency Projects." Access to the grants, eligibility and types of projects allowed are summarized in the PowerPoint presentation accessible on the OWRB's Water for 2060 website: [http://www.owrb.ok.gov/supply/2060council/BalcombeUSBR\\_11-19-13.pdf](http://www.owrb.ok.gov/supply/2060council/BalcombeUSBR_11-19-13.pdf).

James Gammill, Oklahoma Rural Water Association, talked about programs they have to assist small communities and rural water districts. He noted that they have 11 "circuit riders" in the field providing water, wastewater and source water assistance. Staff helps check meters for accuracy and can get a good indication of water loss by looking at the amount of water that is withdrawn or otherwise taken into the system vs. amount of water sold. They have several methods to try and isolate leaks, which employ different methods of varying degree of difficulty. He emphasized that many systems have miles of lines in rural areas, with one person in the office and one person out in the field, making it very difficult to quickly locate system leaks. The Oklahoma Rural Water Association is able to provide assistance to these systems free of charge. The Association also provides water and wastewater certification training for system operators and Board Member training.

Joe Freeman and Jennifer Wasinger, Oklahoma Water Resources Board, provided an overview of loan and grant programs administered through the Water Board and the Drinking Water SRF which is jointly administered between OWRB and ODEQ. It was noted that some of these programs have provisions applicable to water conservation, water reuse and regionalization projects. A brief introduction to management tools available for water and/or wastewater system operations was also given. Additional information is included in the PowerPoint presentation available on OWRB's website: [http://www.owrb.ok.gov/supply/2060council/Freeman-WasingerOWRB\\_11-19-13.pdf](http://www.owrb.ok.gov/supply/2060council/Freeman-WasingerOWRB_11-19-13.pdf).

The speakers each answered questions from the Advisory Council and other meeting participants through the course of their presentations.

### **Brainstorming: Incentives and Education Programs**

Mr. Rehring then encouraged the group to identify key areas for which public water supply efficiency incentives could be developed, drawing on the information presented and discussed earlier in the meeting. Among the focus areas and concepts discussed were:

- Non-revenue Water Reduction
  - Prepare and distribute a "best practices" manual for reducing non-revenue water
  - Identify leak detection methods and document examples of return on the investment made in identifying/repairing leaks
  - Increase awareness of ORWA field services
  - Identify water loss audit methods (e.g., free audit software at <http://www.awwa.org/resources-tools/water-knowledge/water-loss-control.aspx>) and increase awareness/use thereof

- Public Outreach
  - Public outreach and education materials; focus on schools
  - Promote the Water’s Worth It campaign (see <http://www.waters-worth-it.org/>) or similar initiatives
  - Proclamation for Water Awareness Month
  - Establish a state-level recognition program for water-efficient communities
  - Develop a model web page for public awareness of water source (conservation tips, lake levels, groundwater levels, etc.)
  - Education needs to be diverse to target specific motivations to save, i.e. avoidance of penalties, scare water supply, reuse to resolve discharge limitations, etc.
  
- Funding/Monetary Incentives
  - Dedicated water conservation fund
  - Penalties for wasting water, awards for identifying leaks
  - Conservation-based pricing (e.g., increasing block rate structure): provide examples

The group discussed each of these items, with certain pros and cons for each. One Advisory Council member inquired about the relative cost-effectiveness of each item (e.g., dollars spent per unit of water conserved), as one way of potentially ranking the options for further consideration. The group also discussed how “one size won’t fit all,” and that public water suppliers need a portfolio or “toolbox” of efficiency practices and programs to choose from, as appropriate to suit their individual systems and customers. Finally, the group discussed how there are many additional measures that could be considered by the Advisory Council, but time did not allow full discussion of all topics and incentives at this meeting. OWRB noted that the next Advisory Council meeting will focus on the Crop Irrigation water use sector, following a similar pattern as today’s workshop. The meeting after that may be a good time to summarize ideas discussed at the public water supply and crop irrigation meeting.

**Next Steps and Group Resources**

Following a schedule of holding Advisory Council meetings approximately once per quarter, the Crop Irrigation meeting may be scheduled to coincide with the February 18, 2014 OWRB Board Meeting. OWRB will firm up the date and send confirmation to the Council members. OWRB will also develop an agenda for that meeting and circulate it in advance.

Additional pertinent information will be e-mailed to the Advisory Council members and/or placed on the Water for 2060 Website (<http://www.owrb.ok.gov/supply/conservation.php>) as it becomes available.

## Water for 2060 Advisory Council

Minutes of Crop Irrigation Efficiency Workshop, 1:00 P.M., February 18, 2014  
OWRB Board Room, 3800 N. Classen Blvd., Oklahoma City, Oklahoma

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### ATTENDEES:

#### **Advisory Council Members and Representation:**

Bob Drake, Agriculture (Davis)  
Dan Galloway, City of Stillwater  
Russ Doughty for Charlette Hearne,  
Oklahomans for Responsible Water Policy  
(Broken Bow)  
Mark Helm, Dolese (Oklahoma City)  
Trent Smith, Small Business (Choctaw)  
Kevin Smith, Ward Petroleum (Enid)

J. D. Strong, Chair, Oklahoma Water Resources  
Board (Oklahoma City)  
Joe Taron, Pottawatomie County Development  
Authority (Shawnee)  
Jerry Wiebe, Oklahoma Panhandle Agriculture  
& Irrigation (OPAI) (Hooker)  
Nathan Kuhnert, Devon Energy

#### **OWRB Staff and Consultants:**

Cole Perryman, OWRB  
Lauren Sturgeon, OWRB  
Jennifer Wasinger, OWRB  
Owen Mills, OWRB  
Darla Whitley, OWRB  
Sara Gibson, OWRB  
Derek Smithee, OWRB  
Rick Wicker, OWRB

Kent Wilkins, OWRB  
Brian Vance, OWRB  
Julie Cunningham, OWRB  
Terri Sparks, OWRB  
John Rehring, Carollo Engineers  
Anna Childers, CH2M Hill  
Bryan Mitchell, CH2M Hill

#### **Speakers:**

Fred Fischer, Panhandle (OPAI)  
Jerry Wiebe, Panhandle (OPAI)  
Mark Nichols, Lugert-Altus Irrigation District

Chris Stoner, State Conservation Engineer, NRCS  
John Rehring, Carollo Engineers

#### **Other Attendees:**

Michael Taylor, ODEQ  
Jeff Moore, OPAI  
Gina Long, OPAI  
Pat Long, OPAI  
Jason Becker, OPAI  
Reid Shrauner, Self  
Darren Buck, OPAI  
Johnathan Moore, Farmer  
Johnny Moore, Farmer

Ryan Hall, Rockwater Energy Solutions  
Russell Isaacs, OPAI  
Alice Isaacs, OPAI  
Marla Peek, Oklahoma Farm Bureau  
Bonita Hammontree, Self  
James Hammontree, Self  
Scott Arthaud, OPAI  
John Grunewald, Farm Credit  
Leon Richards, OPAI

## **Introductions and Goals for Today**

Mr. J.D. Strong, OWRB Executive Director and Advisory Council Chairman, opened the meeting by welcoming the attendees and noting that the last meeting was to inform and solicit ideas on public water supply, while this meeting would focus on crop irrigation efficiencies. Mr. Strong then asked the Council members and attendees to introduce themselves. Mr. John Rehring, Carollo Engineers, facilitated the meeting. He gave a brief update on previous meetings and went over today's agenda and logistics for the meeting.

## **Existing Practices and Programs in Crop Irrigation Conservation and Reuse**

Several speakers were invited to participate in the meeting, starting with agriculture producers from southwest and northwest Oklahoma that provided insights on the following:

- Existing conservation/reuse practices: What's working for you now?
- Current incentives/disincentives for water-efficient practices and education programs
- Additional conservation: What's holding you back?

PowerPoint presentations from Mr. Fischer and Mr. Rehring are posted to the Water for 2060 website (<http://www.owrb.ok.gov/supply/conservation.php>).

**Mr. Fred Fischer**, from Oklahoma's Panhandle region, gave a slide presentation and shared information regarding his irrigation practices and water-efficient technologies. In his presentation and subsequent group discussion, Mr. Fischer covered the following issues.

- Stressed the importance of the advanced technology already available and being used by many agriculture producers
- Discussed his on-farm demonstration project using drip irrigation
  - GPS technology is being used to guide tractor when putting in hose for drip
  - Potential problems in germinating seeds with a drip system, especially in sandy soils – Mr. Fischer shared practices he employed to deal with this issue
  - Resulting crop yields were average or a little better than with center pivot sprinkler systems
  - Still using as much water as with sprinkler system, and potentially more at times
- Reviewed center pivot sprinkler nozzle technology including “wobbly” nozzles that simulate large raindrops
  - Less loss of water from wind
  - Can throw water long distances
  - Reduces ponding and evaporation losses
- Talked about emerging satellite technology to guide practices by specific management zones
  - Incentive to cut back on fertilizer and water in lower production areas
  - Using variable rate technology, can program sprinkler arm to reduce amount of water applied to specific areas (e.g., lowland areas where less water is needed)
  - Cost about \$200 per sprinkler drop-down to install
  - Telemetry technology (cell phone and web-based) allows monitoring of areas being watered and center pivot position and pressures



- Identified incentive needs for additional water efficiencies
  - More advanced technology
  - New efficient application techniques
  - Monitoring equipment helps efficiency
  - One size does not fit all
- Water saving ideas
  - Genetic engineering (e.g., drought resistant crops)
  - Group insurance restructure—for example, had to continue watering to secure crop insurance payment, even after crop was ruined by hail
  - Install hot water circulating pump in houses
- Question—How does “no till” relate as a practice in western Oklahoma?
  - No till is prevalent, but it is more “minimum till.” Many producers are also doing strip till, which is a great improvement; they do not till if they do not have to, because of water loss.

**Jerry Wiebe**, also from the Panhandle, followed up with a short presentation on the history of sprinkler technology.

- Incentives
  - No one wants to see the Ogallala depleted, so there is an inherent incentive for water efficiency
  - No longer any tail pits in the region; there is essentially no runoff from today’s center pivot and drip irrigation systems

**Mark Nichols**, Lugert-Altus Irrigation District and Tillman County, talked about cotton irrigation in southwest Oklahoma.

- Lugert-Altus irrigation history
  - Producers could do more to help with efficiencies than the District management
  - Canals and concrete ditches—some lined and some not—are not very efficient
  - More producers started looking at drip irrigation
    - About 30-40 percent of irrigated lands in the district are now using drip
    - Goal—no water leaves the district, it’s fully utilized for beneficial uses
  - There are tail water pits in the district, but that water is pumped back up to use
  - Overall, the district members are not using less water, but yields are much larger, i.e., using the same amount of water to increase yields
  - Lugert-Altus Lake is now at 16 percent capacity—no water available from the lake for irrigation in 2011 and 2013.
- Tillman County irrigation practices
  - Primary systems are center pivot irrigation
  - NRCS has helped replace many antiquated systems, especially over the last five years
  - Bubbler systems on flatter land work well
  - Very sandy soils, so drip might not work as well as in other areas
  - Water is very shallow—50 to 60 foot wells—often must connect several wells together to get enough yield for irrigation
  - NRCS has spent \$5 million in Jackson County over the last six years to help with conservation (drip irrigation, tail water recovery, other improvements)
- Incentives

- NRCS pays up to 40% of system improvements—such incentives have been a tremendous help in water efficiency improvement
- Goal is to get all of Lugert-Altus converted to drip
- Question—please clarify how using the same amount of water with drip results in better yields
  - Drip is more efficient, so the plant is able to use a greater percentage of the water applied, which results in larger yields.
- Question—are “no-till” practices used in southwest Oklahoma?
  - All land in drip irrigation is no-till; not able to till the land, so no-till is primarily used where furrow or flooding systems are used for irrigation

**John Rehring**, Carollo Engineers, gave a presentation relating his experience in working on the *Panhandle Regional Water Plan (PRWP)*.

- Vision was to take the 2012 OCWP Update down to the Panhandle region level
- Water use has tapered off since the late 1960s due to advances in irrigation technology
- Public water supply needs are projected to greatly increase in Texas County
- USGS & USDA data show that water use has decreased, irrigated acres have remained flat, yet the market value of agricultural products from the Panhandle has increased—this indicates that efficient water management strategies can support a vibrant economy
- What works/does not work – PRWP looked at economics of OCWP conservation scenarios
  - Costs of converting to drip irrigation are equivalent to \$4.60/1,000 gallons saved
  - Switching to different crops—corn to wheat and sorghum—have enormous economic impacts, even if water saved is used to plant additional water-efficient crops
  - Conclusion of the PRWP – efforts to build on past successes and further enhance efficiencies are key strategies in meeting the region’s long-term water needs

**Chris Stoner**, State Conservation Engineer, talked about NRCS’s conservation initiatives.

- Current focus is on increasing application efficiencies, whereas past emphasis was on increasing sprinkler system efficiencies, which accomplished an increase in savings from 70 to 90 percent
- NRCS is encouraging producers to focus more on the net profit per acre, rather than yield per acre, which in some cases may result in changes to crop selection and water use practices while maintaining or increasing economic vitality
- Opportunities to increase efficiency in irrigation water management
  - Additional outreach and education
  - Soil monitoring
  - Best utilization of equipment and tools
  - Incentives to take land out of irrigated production and plug wells, where that makes sense
- Look beyond borders of one farm; just because one person doesn’t use it, doesn’t mean the next person won’t
- NRCS promotes
  - Less intensive using crops or genetically improved
  - Focusing more on net profit per acre, rather than yield per acre, which in some cases may result in changes to crop selection and water use practices while maintaining or increasing economic vitality
  - Energy efficiency in pumps
- Conservation Innovation Grants—not research but demonstration technology; not necessarily conservation priority—also energy, soil management, etc.

- Irrigation is greatest user of water, but what do we get in return from other sectors' water use? One gallon has cumulative effort through other industries, i.e. manufacturing, fertilizer, etc.
- Environmental Quality Incentives Program (EQIP) -- \$1.5 million in funds for irrigation/agriculture conservation in Oklahoma; need is significantly greater than available funds

### **Brainstorming: Incentives and Education Programs**

The group discussed potential incentives and education programs for enhancing water efficiency in crop irrigation, building on the information presented and discussed above.

#### Potential Incentives

- Manage water supply/aquifer for long-term viability; most irrigators want to have viable water supplies available for future generations
- Operations: energy use and energy costs are correlated to water use
- Increased crop yields through efficiencies (e.g., drip systems)
- Drought can serve as a reminder and incentive to manage supplies efficiently
- Economics will drive how much water is used—"necessity is the mother of invention"
- Cost of pumping water is going to be a stronger incentive as the price of energy goes up
- Support promotion of profit-based rather than yield-based farming practices
- Recognition that water quality will decrease with decreasing supply availability

#### Information Sharing Opportunities

- Alternate crops
- Financial incentives
- Revise insurance requirements to not require irrigation after it's known a crop won't make a yield
- Rehabilitate, repair, and replace infrastructure with more efficient equipment (e.g., nozzles): cost share programs, best management practices

#### Existing Obstacles to Increasing Efficiency

- Upfront costs
- Farmers' lack of confidence in performance of higher-efficiency equipment and practices; may work well in some areas, but not others — local validation needed
- Available irrigation efficiency technology already in place in many areas; need to come up with something else to drive incentives
- Water ownership – groundwater is a property right, but stream water laws may encourage water use to protect water rights
- Invasive species: salt cedar is a big problem, but it is not very cost-effective for ranchers to eradicate individually, and benefits of eradication may have more benefit to downstream users
- Some meeting attendees noted that irrigation efficiencies are already high in the Panhandle, so there is no need for additional incentives

#### Needs

- Validation that technology works
- Benefit/cost analyses of adopting conservation measures
- Organizational/financial

- Grant technical assistance important; quality of request/proposal can influence approval
  - Education needed on grant process
  - Consider mechanism to provide assistance
  - Need mechanism to track available grants and distribution/application process
  - Pre-development planning grants from USDA may be available
- Link deposit program through OWRB's Clean Water SRF Program could be a "creative" option to match grant funds from other sources and/or provide another option for funding energy and water efficiency
  - Producers can access loans at below market interest rates from local participating banks
  - Has been successful in states like Iowa, Arkansas, Ohio and Texas
  - Program never launched in Oklahoma due to extremely low interest rates at the time it was considered
  - OWRB needs to reevaluate the program based on today's environment
- Technology
  - Many in the Panhandle are using irrigation systems that are already 80-95% efficiency, i.e. reaching diminishing returns
  - Achieving the last 5% to reach 100% water efficiency is challenging and expensive
  - Need structural change in technology that is not there right now
  - Need more information on variable rate technology—only four years old so may hold potential for future savings
  - Most producers in Panhandle/Western Oklahoma are already using available technology
  - Review OCWP's conservation background information to see where use of irrigation efficiencies are not being widely used; consider focusing efforts in those areas

Mr. Rehring emphasized that the goal of the Water for 2060 Advisory Council is to develop incentives to help save water, not mandates. While some of the participants indicated that they were already saving as much water as practically possible, he asked that the group concentrate on incentives that might induce others to engage in more water efficient practices, for example, what happened or what circumstances induced you to save water? How did you get there? He encouraged the group to think about further incentives and to e-mail him with any additional ideas they might have.

### **Next Steps and Group Resources**

Mr. Rehring suggested that the next meeting be dedicated to pulling all of the public water supply and Irrigation conservation ideas together, and possibly think about other water use sectors as well. He noted that it is time to start thinking about what to present to the Legislature for consideration. The group will be asked to help identify the best date for the next meeting, which will be set for May or June 2014.

# Water for 2060 Advisory Council

Meeting Minutes – 1:00 P.M., May 20, 2014

OWRB Board Room, 3800 N. Classen Blvd., Oklahoma City, Oklahoma

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## ATTENDEES:

### **Advisory Council Members and Representation:**

Bob Drake, Agriculture (Davis)

Charlette Hearne, Oklahomans for Responsible  
Water Policy (ORWP) (Broken Bow)

Mark Helm, Dolese (Oklahoma City)

Trent Smith, Small Business (Choctaw)

Kevin Smith, Ward Petroleum (Enid)

Roger Griffin, Weyerhaeuser (Broken Bow)

Phil Richardson, Agriculture (Minco)

J. D. Strong, Chair, Oklahoma Water Resources  
Board (Oklahoma City)

Joe Taron, Pottawatomie County Development  
Authority (Shawnee)

Jerry Wiebe, Oklahoma Panhandle Agriculture  
& Irrigation (OPAI) (Hooker)

Nathan Kuhnert, Devon Energy (Oklahoma City)

### **OWRB and USACE Staff and Consultants:**

Cole Perryman, OWRB

Jennifer Wasinger, OWRB

Owen Mills, OWRB

Brian Vance, OWRB

Julie Cunningham, OWRB

Joe Freeman, OWRB

Kylee Wilson

Terri Sparks, OWRB

John Rehring, Carollo Engineers

Anna Childers, CH2M Hill

Bryan Mitchell, CH2M Hill

Bryan Taylor, USACE

### **Other Attendees:**

Michael Taylor, ODEQ

Barry Bolton, ODWC

Russ Doughty, ORWP

## **Introductions and Goals for Today**

Mr. J.D. Strong, OWRB Executive Director and Advisory Council Chairman, opened the meeting by welcoming the attendees and asking audience/observers to introduce themselves. Mr. Strong then went over the agenda and noted that the primary goal of the meeting was to start prioritizing recommendations to go in the report to the legislature.

## **Where We've Been and Where We're Headed**

Mr. John Rehring, Carollo Engineers, facilitated the meeting. He gave a brief summary of the March 10 memo from J.D. Strong (attached), which recapped the Council's activities to date and recommended a path forward for accomplishing the Council's legislative directives. He also briefly summarized the four Hot Spot Basin Public meetings and the status of selecting basins for more detailed analyses. He emphasized that the goal of today's meeting is to begin to develop a short-list of recommendations for Public Water Supply (PWS) and Crop Irrigation programs/incentives for water efficiency. He noted that he had not received any feedback from the Council relative to the March memo, but asked if anyone had any comments or suggestions, especially as regards future activities/work sessions. Some of the remarks included:

- Concern that recommendations will not get buy-in without education.
- Comfortable with the path, but not sure that enough knowledge has been gained to make recommendations.
- “Low hanging fruit” is PWS sector; may want to have those speakers [presenting at the November 19, 2013 Council meeting] come back in and listen to the ideas presented.
- Consider sending ideas out to those not able to attend (PWS speakers) and get feedback.
- Can we look at how to quantify potential water savings for the different measures?
- Any performance measures to know if options are successful and cost/benefits?
- We have covered a lot of information, but how do we present it? Need to prioritize.
- Consolidation of ideas would make it easier to facilitate recommendations.

Mr. Rehring then brought the group’s attention to information he had emailed to them on previously-identified PWS and Crop Irrigation programs (attached). The information was tabulated for PWS and Crop Irrigation using four columns:

- “Desired Results” – the types of water use efficiencies we want to result from our recommended incentives or programs
- “Potential Program or Measure” – candidate incentives or programs we could implement to help achieve those “Desired Results”
- “Council Priority” – the Advisory Council’s relative priority for recommending the listed program or measure
- “Considerations” – additional information that could shape whether we recommend the listed programs and measures

The agenda allowed for an hour discussion on PWS topics followed by an hour on Crop Irrigation concepts.

### **Review of Public Water Supply Concepts**

Mr. Rehring suggested that the Council members first look at the “Desired Results” column for PWS to see if there were any that might not be applicable or not a high priority to accomplish at this time, then look at prioritizing potential programs. Discussion included:

- Reduce system losses
  - Make more affordable for small towns
  - Provide matching funds
  - Funding
  - State technical support – ODEQ/BOR currently developing?
  - Not all system losses are leaks; there are many contributors to “non-revenue water”
- Reducing leaks and potable water reuse will provide the greatest volume of water, but we do not know the actual costs/benefits
- Best practices (guidance and recognition) – group by system size; develop best practices document then grade/rank cities according to what is adopted; publicize results as an incentive to adopt best practices
  - Conservation pricing
  - Conservation planning
  - State recognition program
  - High-efficiency plumbing codes
  - Public awareness/action/education

- Potable and non-potable reuse
  - Reuse is important, especially in arid areas
- Statewide education/outreach – applies to all water use sectors (not just PWS)
- Add best practices information-sharing for billing information
- Consider implementing through non-profit partnerships
- Awareness programs – put on best practices list and provide “go-by’s”
- Conservation pricing – put on best practices list
- Technical support person does not have to be state employee – could be ORWA or others

### **Review of Crop Irrigation Concepts**

Mr. Rehring then led a discussion of how we could incentivize or otherwise achieve efficiencies in the Crop Irrigation sector. Using the tabulated 4-column table for guidance, points discussed included:

- Crop insurance – recommend supporting federal initiatives to revamping RMA rules, but this is a national issue that is out of our direct control
- Recognition programs not likely effective for Crop Irrigators
- Best Practices for operations (soil management, etc.) already available from Extensions
- Information sharing on technologies and equipment more beneficial than practices – provide economic benefit information to show return on investment
- Funding/grants may not be practical at approximately \$300K for quarter circle center pivot system; also may be impractical to replace existing high-efficiency sprinkler systems with drip irrigation technologies relative to actual water savings (~5% increase in efficiency)
- Sprinkler system equipment life is generally 10-15 years; incentivize replacing systems at end of useful life with higher-efficiency technology rather than using same technology
- Lower-efficiency sprinkler heads/equipment are not widely sold anymore
- Financing programs may be viable – link to return on investment
- Drought-tolerant crop research already in progress by seed manufacturers; already have market-based incentives
- Consider sharing information on best practices/reporting for recent acre-feet/bushel data to demonstrate potential for high yields with low water use
- Information sharing on water levels in aquifers and OCWP demand/shortage projections
- Use Vo-tech resources for information sharing

### **Next Steps and Group Resources**

Mr. Rehring indicated that there is sufficient input from the Council to develop draft recommendations for the PWS and Crop Irrigation water use sectors. The plan for the next workshop, which will be on August 19, 2014, is to start work on efficiency incentives for other water use sectors such as oil and gas, industrial uses and power generation.

Mr. Strong and Mr. Rehring also extended an invitation from the Oklahoma Panhandle Agriculture and Irrigation group to tour irrigation systems and practices in the Panhandle. Several Council members expressed an interest, so Mr. Rehring will follow-up with additional details.



## Water for 2060 Advisory Council

**To:** Water for 2060 Advisory Council Members  
**From:** J.D. Strong, Advisory Council Chair  
**Date:** March 10, 2014  
**Subject:** Advisory Council Status and Next Steps

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The Water for 2060 Advisory Council has taken significant steps toward understanding the many ways Oklahomans are using water efficiently from across our state and across many uses. Importantly, we have also heard from leaders in public water supply, irrigated agriculture, and state and federal agencies about opportunities to build on those successes in concert with the Water for 2060 initiative. I wanted to take this opportunity to thank you for your participation thus far, share a brief recap of where we've been, and look ahead to how we will be drawing on your expertise and perspectives to meet the Advisory Council's legislative directive.

Key steps along this path have included:

- Development of a Background Report (July 2013, available at <http://www.owrb.ok.gov/supply/2060council/BackgroundReport.pdf>) recapping the Oklahoma Comprehensive Water Plan findings regarding potential statewide water conservation savings, highlighting some of the best practices for water efficiency in Oklahoma and across the country, and describing some initial concepts for potential measures to incentivize additional efficiencies.
- Advisory Council Kickoff Meeting (August 2013), where we reviewed and discussed the Advisory Council's legislative charge, discussed highlights of the Background Report, and brainstormed concepts for increasing water efficiency in Oklahoma.
- Advisory Council Public Water Supply Workshop (November 2013), where we focused on the Public Water Supply sector and discussed measures that would be attractive to, and effective for, water providers across our state and discussed ways of further incentivizing municipal and rural water district efficiencies.
- Advisory Council Crop Irrigation Workshop (February 2014), which focused on Crop Irrigation successes to date and opportunities to increase water efficiency. This meeting also provided a forum for identifying additional incentives for increasing water conservation and other efficiency measures.

Agendas, presentations, and summaries for each of the Water for 2060 Advisory Council meetings are posted to OWRB's Water for 2060 website (<http://www.owrb.ok.gov/supply/conservation.php>).

Looking ahead, I want to relay to you our next steps toward fulfilling the Advisory Council's duties. To provide a framework for that, I'm providing an excerpt from House Bill 3055 that set the authority and responsibilities for the Advisory Council:



*Section 4.E: The Advisory Council shall have the following duties and responsibilities:*

*1. Recommend incentives to encourage improved irrigation and farming techniques, more efficient infrastructure, use of water recycling/reuse systems, promotion of "smart" irrigation techniques, control of invasive species, artificial recharge of aquifers, and increased use of marginal quality and brackish waters;*

*2. Make recommendations regarding the expansion of education programs that modify and improve consumer water-use habits; and*

*3. Enhance existing, or develop new, financial assistance programs that encourage Oklahoma water systems to implement leak detection and repair programs that result in reduced loss and waste of water, as well as encourage consolidation and regionalization of smaller systems in order to utilize limited resources most efficiently.*

*4.F: The Advisory Council shall submit a final report of its findings and recommendations to the Governor, Speaker of the House of Representatives, and President Pro Tempore of the Senate no later than three (3) years following the effective date of this act [November 1, 2012].*

*4.G: Activities of the Advisory Council shall terminate no later than December 31, 2015.*

In related work, OWRB has partnered with the U.S. Army Corps of Engineers to conduct an in-depth analysis of the potential roles of water conservation, marginal quality water use, and regionalization of public water supply systems in three OCWP-designated "Hot Spot" basins in western Oklahoma. By demonstrating the potential for efficiency at a local level, the Hot Spot basin studies will be used to further the Water for 2060 goals and may help serve as models for implementation of additional efficiencies for water users statewide. Analyses will be ongoing throughout 2014, and will be initiated following a series of public meetings (March 2014). This work is being conducted separately from the Advisory Council's legislatively-directed duties, but Advisory Council members can be briefed on the Hot Spot basin analyses during the 2014-2015 Advisory Council workshops described below.

OWRB plans on convening four additional Advisory Council meetings, each of which will be used to shape the recommendations we make back to the Governor and the Legislature in 2015. We propose the following framework for taking the input we've received to date, and generating and vetting potential recommendations to the Governor and the Legislature:

- May 2014: Advisory Council Workshop to synthesize input received in the Public Water Supply and Crop Irrigation Workshops and develop a short-list of recommendations we can include in our report back to the Governor and the Legislature regarding incentives for irrigation techniques, infrastructure improvements, water reuse and marginal quality water use, and other measures such as invasive species control. Council members will be asked to review information on the Water for 2060 website and come prepared with some recommendations to discuss. OWRB staff will post additional reference sources (such as case studies/examples relating to conservation in other states) on the website as time and resources allow, so please check back periodically.
- Third Quarter 2014: Advisory Council Workshop to consider other water use sectors, such as oil and gas, industrial uses, and power generation, and methods for encouraging and facilitating increased water efficiency in those sectors. As with the

previous Public Water Supply and Crop Irrigation workshops, representatives from these water use sectors will be asked to participate in the workshop to help develop and validate measures and incentives for further consideration by the Advisory Council.

- Fourth Quarter 2014: Advisory Council Workshop to discuss existing financial assistance programs and potential enhancements toward greater water use efficiency; to discuss necessary statutory or regulatory changes to the current water rights administration framework that would facilitate additional conservation; to review preliminary findings from the Hot Spot Basin analyses regarding regionalization of public water supply systems; and to refine the working list of recommendations to be included in the Council's 2015 report to the Governor and the Legislature.
- First/Second Quarter 2015: Develop Draft Advisory Council Report and hold an Advisory Council Workshop to review and refine the draft report.
- Third Quarter 2015: Submit final Advisory Council Report to the Governor and the Legislature.

We encourage you to provide feedback on this framework, to help ensure that the OWRB team is providing you with the information and framework you need to complete your Advisory Council duties. Again, thank you for your continued participation and input.



## Water for 2060 Advisory Council

### Compilation of Previously-identified Public Water Supply & Crop Irrigation Programs for Advisory Council Consideration and Prioritization

May 2014

The Water for 2060 Advisory Council is responsible for making recommendations to the Governor and Legislature in 2015 regarding incentives and programs to increase the efficient use of Oklahoma's water resources.

The information presented below was compiled based on presentations and discussions at the first three Water for 2060 Advisory Council workshops. These workshops focused on Public Water Supply systems and suppliers (PWS) and Crop Irrigation. Other sectors will be discussed at future Advisory Council meetings. Previous workshop agendas, presentations, and summaries are posted to the OWRB Water for 2060 website ([www.owrb.ok.gov/2060](http://www.owrb.ok.gov/2060)).

This document is intended to support discussions and prioritization of potential programs and incentives the Advisory Council could recommend to the Governor and the Legislature, as will be discussed at the May 20, 2014 Advisory Council workshop.

Information below is tabulated for PWS and Crop Irrigation using the following columns:

- Desired result ("what" we want the incentives or programs to ultimately accomplish with respect to increased water efficiency and related Water for 2060 goals)
- Potential program or measure (different ways for "how" we could incentivize or otherwise help promote/achieve those efficiencies)
- Advisory Council assessment of whether we should recommend the program or measure to the Governor and Legislature (to be rated as High/Medium/Low priority for inclusion in our list of recommendations via discussions at the May 20, 2014 workshop, with documented rationale for each rating)
- Considerations (potential issues that could affect whether or how we implement the indicated programs or measures)

Desired results and potential programs and measures are presented in no particular order. Information listed here does not necessarily represent approval or concurrence by the Advisory Council, pending further discussion and refinement of the items to be recommended to the Governor and Legislature.

**PUBLIC WATER SUPPLY**

Desired Result	Potential Program or Measure	Council Priority (Hi/ Med/ Low)	Considerations
Reduce distribution system losses (system leaks, metering, etc.)	<ul style="list-style-type: none"> <li>• Develop state-level guidance documents (“best practices” with case studies of return on investment) for finding and fixing system leaks, metering, etc.</li> <li>• Provide state technical support to PWS</li> <li>• Provide state funding/financing support</li> <li>• Use sales tax funding for system repairs</li> <li>• State financial incentive/reward/recognition for decreasing system losses</li> </ul>		<ul style="list-style-type: none"> <li>• ORWA already has programs for its members</li> <li>• AWWA offers free water loss audit software</li> <li>• There’s already a financial incentive (lost revenue) to reduce losses</li> <li>• 80/20 rule – small leaks can be expensive to find &amp; fix</li> <li>• Not all non-revenue water is leaks</li> </ul>
Public awareness and action (conservation, value of water)	<ul style="list-style-type: none"> <li>• Develop statewide public education and outreach materials (brochures, public service announcements, etc.)</li> <li>• Develop best practices manual (penalties for wasting water, awards for identifying leaks)</li> <li>• Develop model website for conservation tips, lake levels, groundwater levels, etc.</li> <li>• Develop school program materials</li> <li>• Proclamation of Water Awareness Month</li> <li>• Develop criteria and state award program for designated Water-Efficient Communities</li> </ul>		<ul style="list-style-type: none"> <li>• Existing toolkits from national organizations</li> <li>• Leverage existing local programs</li> <li>• Existing “SIP” website for landscape irrigation and related tools</li> <li>• Need diverse set of incentives (penalties, scarce supply, cost of outdoor water use)</li> </ul>
Conservation pricing	<ul style="list-style-type: none"> <li>• Develop state-level guidance documents (“best practices”)</li> <li>• State outreach/education to PWS</li> </ul>		<ul style="list-style-type: none"> <li>• Design rate structure for no net impact on revenues</li> </ul>
Regionalization/interconnecting systems	<ul style="list-style-type: none"> <li>• Use as criterion/bonus for state funding/financing</li> <li>• Develop state funding/financing program specific to regionalizing infrastructure</li> <li>• State outreach/education to PWS</li> </ul>		<ul style="list-style-type: none"> <li>• Practicality depends on distance between systems</li> <li>• Indirect effect on efficiency and conservation</li> <li>• OWRB/DEQ already have some bonus incentives</li> </ul>

**PUBLIC WATER SUPPLY**

<b>Desired Result</b>	<b>Potential Program or Measure</b>	<b>Council Priority (Hi/ Med/ Low)</b>	<b>Considerations</b>
Local water conservation plans	<ul style="list-style-type: none"> <li>• Use as criterion/bonus for state funding/financing</li> <li>• State outreach/education to PWS</li> <li>• Develop state-level guidance documents (“best practices”)</li> <li>• Provide state technical support to PWS</li> <li>• Provide funding/financing support for developing and/or implementing plans (State Conservation Fund?)</li> <li>• State financial incentive/reward/recognition for decreasing per capita water use as result of implementing a plan</li> </ul>		<ul style="list-style-type: none"> <li>• Focus on incentives vs. mandates for funding/financing</li> <li>• Availability of funding to support state roles</li> </ul>
High-efficiency fixtures	<ul style="list-style-type: none"> <li>• State legislation requiring WaterSense products statewide</li> <li>• Tax incentives for installation of WaterSense products</li> <li>• Develop state-level guidance documents for local ordinance or rebates (“best practices”)</li> <li>• Provide state funding to match local rebates</li> </ul>		<ul style="list-style-type: none"> <li>• Legislative approach may be considered a “mandate”</li> <li>• Statewide approach eliminates need for local rebates or standards</li> <li>• Consistent requirements in all communities</li> <li>• WaterSense requires performance testing</li> </ul>
Increased nonpotable reuse	<ul style="list-style-type: none"> <li>• Develop state-level public education/outreach programs</li> <li>• Use as criterion/ bonus for state funding/financing</li> <li>• State outreach/education to PWS</li> <li>• Develop state-level guidance documents (“best practices”)</li> <li>• Provide state technical support to PWS</li> <li>• Provide state funding/financing support</li> <li>• Create user-friendly regulatory process</li> </ul>		<ul style="list-style-type: none"> <li>• Downstream water rights implications</li> <li>• Cost to comply with ODEQ regulations</li> <li>• Cost relative to other supply options</li> </ul>

**PUBLIC WATER SUPPLY**

Desired Result	Potential Program or Measure	Council Priority (Hi/ Med/ Low)	Considerations
Increased potable reuse	<ul style="list-style-type: none"> <li>• Develop state-level public education/outreach programs</li> <li>• Use as criterion/ bonus for state funding/financing</li> <li>• State outreach/education to PWS</li> <li>• Develop state-level guidance documents (“best practices”)</li> <li>• Provide state technical support to PWS</li> <li>• Provide state funding/financing support</li> <li>• Create user-friendly regulatory process</li> </ul>		<ul style="list-style-type: none"> <li>• Indirect potable reuse regs under development (surface water augmentation)</li> <li>• No regs yet for groundwater recharge or direct potable reuse</li> </ul>
Increased gray water use (household level)	<ul style="list-style-type: none"> <li>• Develop state-level public education/outreach programs</li> <li>• Use as criterion/ bonus for state funding/financing</li> <li>• State outreach/education to PWS</li> <li>• Develop state-level guidance documents (“best practices”)</li> <li>• Provide state technical support to PWS</li> <li>• Provide state funding/financing support</li> </ul>		<ul style="list-style-type: none"> <li>• Downstream water rights implications</li> <li>• Regulations and enforcement</li> <li>• Costs relative to other supply options</li> </ul>
OTHER:  _____	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>		<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>

**CROP IRRIGATION**

<b>Desired Result</b>	<b>Potential Program or Measure</b>	<b>Council Priority (Hi/ Med/ Low)</b>	<b>Considerations</b>
Adoption of efficient irrigation technologies	<ul style="list-style-type: none"> <li>• State funding/financing for conversion to higher-efficiency irrigation equipment (drip systems, sprinkler nozzles, variable rate technology, telemetry, etc.)</li> <li>• State technical assistance for grant applications</li> <li>• Identify and focus state efforts on areas in Oklahoma where efficient irrigation equipment is not widely used</li> <li>• Link deposit program through OWRB's Clean Water SRF Program to match grant funds from other sources and provide lower cost financing options</li> <li>• Information sharing clearinghouse on no-till, tail water recovery, and other water-saving practices</li> <li>• Increase soil monitoring data collection network</li> <li>• Develop portal for sharing information on experience with water use and yields using high-efficiency equipment</li> <li>• Education/outreach regarding links between water use and energy costs</li> <li>• State funding for research on maximizing effectiveness of drip systems for different soil types and crops, no-till, etc.</li> <li>• State funding of pilot projects to demonstrate applicability of new technology to Oklahoma's irrigated agricultural environments</li> </ul>		<ul style="list-style-type: none"> <li>• Significant costs to replace existing irrigation equipment with higher-efficiency equipment</li> <li>• Existing NRCS and other USDA programs, although they typically only pay for upfront costs, not ongoing O&amp;M</li> <li>• Coordination with existing research programs addressing similar issues</li> <li>• Challenges in changing irrigators' practices based on long-term history of existing practices</li> </ul>
Reduction in fresh water use	<ul style="list-style-type: none"> <li>• All potential programs or measures</li> </ul>		<ul style="list-style-type: none"> <li>• Conserved water may be used to irrigate additional land, resulting in no net savings</li> </ul>
Low water-use and drought-tolerant crops	<ul style="list-style-type: none"> <li>• State funding for drought-tolerant crop research</li> <li>• State education programs for maximizing profit, not yield</li> </ul>		<ul style="list-style-type: none"> <li>• Potential lower yields</li> <li>• Some crops suppress weeds, changing crops could impact</li> <li>• Existing NRCS and other USDA programs</li> <li>• Market-driven crop decisions</li> </ul>

**CROP IRRIGATION**

Desired Result	Potential Program or Measure	Council Priority (Hi/ Med/ Low)	Considerations
Avoid wasting water to prove out crop insurance	<ul style="list-style-type: none"> <li>Revamp crop insurance rules and protocol</li> </ul>		<ul style="list-style-type: none"> <li>Federal-level issue; limited state ability to make an impact</li> </ul>
Increased unit water efficiency (e.g., gallons used per bushel of crop)	<ul style="list-style-type: none"> <li>Document best practices for irrigation from irrigators' experience</li> <li>Document best practices for soil management from irrigators' experience</li> <li>Develop state-level education materials and programs for crop irrigators</li> <li>State financial incentive/reward/recognition for decreasing unit water use as result of implementing a plan</li> </ul>		<ul style="list-style-type: none"> <li>Coordination with existing research programs addressing similar issues</li> </ul>
Manage supplies for long-term viability	<ul style="list-style-type: none"> <li>State-level education and outreach using OCWP data on demands and projected shortages</li> <li>Encourage/support voluntary management of shared aquifer supplies (max. water table declines)</li> </ul>		<ul style="list-style-type: none"> <li>Texas Panhandle Groundwater District uses self-implemented water table level management system</li> </ul>
OTHER:  _____	<ul style="list-style-type: none"> <li></li> <li></li> <li></li> <li></li> </ul>		<ul style="list-style-type: none"> <li></li> <li></li> <li></li> <li></li> </ul>

**ADDITIONAL CONCEPTS DISCUSSED (NOT SPECIFIC TO A USE SECTOR)**

- Salt cedar eradication programs
- Aquifer recharge opportunities
- Marginal quality water opportunities



# Water for 2060 Advisory Council

Meeting Minutes – 1:00 P.M., August 19, 2014

OWRB Board Room, 3800 N. Classen Blvd., Oklahoma City, Oklahoma

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## ATTENDEES:

### ***Advisory Council Members and Representation:***

Bob Drake, Agriculture (Davis)

Charlette Hearne, Oklahomans for Responsible  
Water Policy (ORWP) (Broken Bow)

Mark Helm, Dolese (Oklahoma City)

Trent Smith, Small Business (Choctaw)

Kevin Smith, Ward Petroleum (Enid)

Lauren Brookey, Tulsa Municipal Utility  
Authority

J. D. Strong, Chair, Oklahoma Water Resources  
Board (Oklahoma City)

Joe Taron, Pottawatomie County Development  
Authority (Shawnee)

Jerry Wiebe, Oklahoma Panhandle Agriculture  
& Irrigation (OPAI) (Hooker)

Nathan Kuhnert, Devon Energy (Oklahoma City)

Dan Galloway, City of Stillwater

### ***OWRB and USACE Staff and Consultants:***

Cole Perryman, OWRB

Jennifer Wasinger, OWRB

Jerri Hargis, OWRB

Derek Smithee, OWRB

Julie Cunningham, OWRB

Lindy Clay, OWRB

Darla Whitley, OWRB

Mary Schooley, OWRB

Lauren Sturgeon, OWRB

Terri Sparks, OWRB

John Rehring, Carollo Engineers

Anna Childers, CH2M Hill

Bryan Mitchell, CH2M Hill

### ***Other Attendees:***

Michael Taylor, ODEQ

Kent Fletcher, Western Farmers Electric Coop

Betsy Craytor, ORWP

Mike Mathis, Continental Resources

Bud Ground, Public Service Company of  
Oklahoma

Russ Doughty, ORWP

## **Introductions and Goals for Today**

Mr. J.D. Strong, OWRB Executive Director and Advisory Council Chairman, opened the meeting by welcoming the attendees and asking audience/observers to introduce themselves. Mr. Strong thanked Council Member Jerry Wiebe and the Oklahoma Panhandle Agriculture and Irrigation Association for sponsoring the recent tour of conservation initiatives in the Panhandle region. He reminded the members that their charge was to prepare a final report to the Legislature next year, and that the goal of this meeting is to look at water user groups other than Municipal and Industrial (M&I) and Crop Irrigation. He introduced the Industry Panelists, noting that Mr. Roger Griffin was unable to attend due to prior commitments: Mark Helm, Dolese; Kevin Smith, Ward Petroleum; Nathan Kuhnert, Devon; Kent Fletcher, Western Farmers Electric Coop; and Bud Ground, Public Service Company of Oklahoma.

Mr. John Rehring, meeting facilitator from Carollo Engineers, noted that the process for exploring industrial water use conservation would be a little different from that followed for the Advisory

Council's previous M&I and Crop Irrigation workshops. Instead of the Panelists giving presentations and then answering questions, the entire panel discussion would be in a question and answer format.

### **Industrial Panel Discussion: Existing Practices in Conservation and Reuse**

#### Characteristics of Industrial Water Use

- Some facility-specific issues, needs, and approaches to efficiencies in water use
- Once-through cooling systems used in power plants have lower consumptive use – 85-90% returned to stream and about 15% evaporates
- Closed-loop power plants use cooling towers and evaporate more than once-through cooling systems
- Some power generation facilities produce their own potable water
- Steam turbines for power generation require water of a quality greater than potable quality
- Oil and gas (O&G) operations use water for drilling and fracking, but not daily operations
- Shift toward oil-based muds for drilling in the O&G industry; horizontal fracking uses a greater amount of water
- Woodford Shale flowback water quality is often better than that from traditional wells —best suited for reuse after treatment; frack fluid technology has allowed use of higher TDS water

#### What's Working Now?

- Older generation power plants used 60 thousand gallons of water per megawatt of electricity produced (kgal/mw)—newer plants use 20 kgal/mw with advancements in technology
- Coal units use more water than gas-fired; industry is moving toward gas-fired plants
- Environmental regulations have been driving these changes, rather than water use
- PSO plant at Lawton is re-using Lawton effluent from their treatment plant; similar at OG&E facilities using treated effluent from Oklahoma City
- O&G reuse of flowback/produced water can be limited by proximity of next well
- Industry is significantly increasing its reuse of O&G flowback water
- Corporation Commission enacted new rules allowing operators to store large amounts of flowback water in pits (Flowback Pit Rule)
- Some concrete batch plants are implementing total retention of stormwater; driven by discharge requirements
- Shifted to dry cleanup systems at some concrete plants; increasing onsite reuse
- Shift toward using MgCl for dust suppression instead of water
- Quarry mine planners use onsite water balance to minimize fresh water use

### **Industrial Panel Discussion: Additional Conservation and Reuse**

#### Potential Impediments

- Ability to discharge water sourced from municipal effluent; if the municipal effluent has poor water quality, the industry reusing that water may be in a situation where they cannot discharge it after using it
- Economic drivers
- Large O&G companies design storage pits to only meet their needs, so cannot accommodate smaller O&G drilling operations
- Proximity of wells to one another for potential O&G reuse of produced/flowback water
- Alternative frack fluids bring tradeoffs in cost and performance
- Some O&G leases specify use of fresh water supplies first

- More piping to accommodate water conveyance may increase security concerns (e.g. vandalism)
- Inconsistency from county-to-county on granting rights-of-way
- Managing high waste loads of salt
- Redundancy and reliability of water disposal and management
- Discharge limits may be limiting factor for efficient water reuse
- Concrete specifications mandate potable water even if non-potable would suffice
- Often is quicker and easier to develop fresh water for fracking
- When water is plentiful, there is no incentive to save
- Maximum number of cooling tower “cycles” (internal reuse within the cooling tower) is driven by TDS, etc. in discharge permit; treatment would be very expensive
- Reliability of municipal effluent supply and quality
- Disclosure of competitive/sensitive industry information; maybe address via third-party collector of information

### **Industrial Panel Discussion: Incentives and Outreach Programs**

#### Potential Opportunities

- Shared water resources between O&G operators was recently made easier by Oklahoma Corporation Commission rule change avoiding classification as “commercial” operation
- Oklahoma Secretary of Energy and Environment is facilitating collaboration between water users
- Alternatives to water for fracking or lower-water fluids: support more brackish water mapping and research on its use
- Identify best practices for onsite water management at concrete and aggregate facilities to employ elsewhere; get Leadership in Energy and Environmental Design (LEED) type points for sustainable site development
- Evolving treatment technology for flowback
- Make the process for approving site-specific stream standards easier
- Improve municipal effluent water quality reliability; consider partnerships between power generators and municipalities to improve treatment; use OWRB Financial Assistance Programs?
- Model the economics of alternative water sources for power generation; would also apply to large industrial users
- Inventory and mapping of sources of municipal effluent in relation to large industry demand
- Need flexible approaches because there is no “one size fits all” for our diverse uses and supplies across Oklahoma
- Develop recognition programs for water-efficient industries
- Create intra-state and inter-state forums for water efficiency best practices info-sharing
- Regulatory reform to address disincentives for O&G water sharing
- Identify true water quality requirements for concrete (not just “potable”) and get engineering industry to change specifications
- Identify opportunities for aggregate sites to be used for recharge purposes as plants are in place long-term

### **Next Steps and Group Resources**

Mr. Rehring noted that he would send out information he put together on potential public water supply efficiency savings and costs, which were primarily based on a review of the 2012 Oklahoma Comprehensive Water Plan reports. Based on input received from the Council, draft recommendations

for the PWS, Crop Irrigation, and other water use sectors will be developed for the Council to consider prior to the next meeting, scheduled for 1:00 p.m., November 18, 2014 at the OWRB's offices.

# Water for 2060 Advisory Council

Meeting Minutes – 1:00 P.M., November 18, 2014

OWRB Board Room, 3800 N. Classen Blvd., Oklahoma City, Oklahoma

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## ATTENDEES:

### **Advisory Council Members and Representation:**

Bob Drake, Agriculture (Davis)  
Russ Doughty for Charlette Hearne,  
Oklahomans for Responsible Water Policy  
(ORWP) (Broken Bow)  
Mark Helm, Dolese (Oklahoma City)  
Trent Smith, Small Business (Choctaw)  
Kevin Smith, Ward Petroleum (Enid)  
Phil Richardson, Agriculture (Minco)

J. D. Strong, Chair, Oklahoma Water Resources  
Board (Oklahoma City)  
Joe Taron, Pottawatomie County Development  
Authority (Shawnee)  
Jerry Wiebe, Oklahoma Panhandle Agriculture  
& Irrigation (OPAI) (Hooker)  
Nathan Kuhnert, Devon Energy (Oklahoma City)  
Roger Griffin, Weyerhaeuser (Broken Bow)

### **OWRB and USACE Staff and Consultants:**

Cole Perryman, OWRB  
Jennifer Wasinger, OWRB  
Owen Mills, OWRB  
Julie Cunningham, OWRB  
Darla Whitley, OWRB  
Mary Schooley, OWRB  
Lauren Sturgeon, OWRB

Terri Sparks, OWRB  
Kylee Wilson, OWRB  
John Rehring, Carollo Engineers  
Anna Childers, CH2M Hill  
Bryan Mitchell, CH2M Hill  
Bryan Taylor, USACE

### **Other Attendees:**

Brandon Bowman, ODEQ  
Kent Fletcher, Western Farmers Electric Coop

Mike Mathis, Continental Resources

## **Introductions and Goals for Today**

Mr. J.D. Strong, OWRB Executive Director and Advisory Council Chairman, opened the meeting by welcoming the attendees and asking audience/observers to introduce themselves. Mr. John Rehring, meeting facilitator, noted that Council members had been sent a draft set of recommendations which were compiled based on input from previous meetings. The goal of today's meeting is to receive additional input from the Council and to refine/expand those recommendations so that a draft report can be prepared that is reflective of the Council's desires and intent.

## **Review of Public Water Supply Measures: Water Savings and Costs**

Mr. Rehring turned the Council's attention to the PowerPoint presentation (copy attached), which was sent out in advance of the meeting in PDF format. He noted that in response to requests by several Council members, Carollo Engineers had conducted an analysis of savings/costs of public water supply conservation measures and programs (refer to pages 2-5 of the attached). The analysis was primarily based on conservation scenarios and information provided as part of the *2012 OCWP Update* process. There was some discussion on what scenarios—or mix of scenarios—could best achieve the goal of using no more water in 2060 than is used in 2012. The group also discussed that it might be informative to

include a summary of the potential water savings from various water conservation measures and the respective costs of implementation in the Council's 2015 report to the Governor and Legislature.

### **Review and Discuss Preliminary Draft Recommendations**

The discussion then turned to further consideration and refinement of the recommendations that were drafted for public water supply, crop irrigation, and other water use sectors.

**Public Water Supply (PWS) (refer to pages 6-7 of the attached)** – based on discussions from the May 20, 2014 workshop, the priorities for “Desired Results” were split into 2 primary categories: 1) reduce distribution system losses, and 2) best practices/information sharing. Several Council members recommended putting regionalization (interconnecting neighboring public water supply systems and/or sharing resources) back on the table as part of the group's recommendations. While interconnections may not help provide new/additional sources of water, regionalization may conserve water through economies of scale and more efficient systems. Highlights of discussion concerning the redrafted recommendations include:

#### Reduce Distribution System Losses

- Encourage systems to meter 100% of their customer accounts
  - Some smaller systems cannot afford to purchase and/or read meters
  - Number of non-metered systems are declining, but meters may not be accurate
- Need clearinghouse of information on meters/technology/etc.
- Can we redirect some Community Development Block Grant (CDBG) or other existing funds toward non-revenue water reduction? Coordinate through the state/federal Funding Agencies Coordinating Team
- Best practices for PWS could include rewards for fixing leaks

#### Best Practices & Information Sharing

- Public outreach—do not need to develop entirely new materials, but could pull together existing “best of the best” and present that information in a central place
- PWS Best Practices 2(a) should reflect that systems need an overall coordinator for public education and outreach; do not need to form a new state office—establish Portal to get all information together, maybe at an existing agency
- “Best Practices Manual” and other tools would need to be periodically updated
- Need to provide people to conduct conservation education at schools--not just training guides or brochures; many schools may not have the resources/expertise/manpower to incorporate independently
- Vo-techs and cooperative extension services could assist with public outreach and/or distribution of information on a regional scale
- PWS Best Practices 3(c)--strike out legislative requirement for high-efficiency WaterSense products, but use participation as WaterSense partner or adoption of local high-efficiency ordinances as criteria for financing and/or recognition
- Identify other/additional mechanisms to encourage PWS to implement conservation rates
- Need to consider impacts of long-term asset management/replacement (meters, etc.)
- Best practice manual should include methodology to show the “true cost of water”
- Support regionalization/interconnections
  - Could drive economies of scale
  - Establish and share existing efficiency practices

- Distinguish between mutual aid (sharing supplies intermittently between separate water providers and/or providing central water supply sources or treatment facilities for water providers) vs. consolidation (merging water providers)

**Crop Irrigation (refer to pages 7-8 of attached)** – input from the May 20, 2014 workshop supported several priorities for “Desired Results” in this water use sector. Recommendations for conservation initiatives were drafted based on that discussion. Additional input by Council members included:

- Identify water use “bench marks” for crop irrigation
- Identify ways to better leverage Mesonet data (similar to lawn irrigation Simple Irrigation Plan “SIP” program-- <http://sip.mesonet.org/>) via portal; develop stronger links to on-farm irrigation technology?
- Add recognition for hitting a threshold that reduces water use while maintaining crop yield and profit, e.g., Texas demonstration project that gained recognition for implementing water conservation technologies and practices with the goal to grow 200 bushels of corn on 12 inches of irrigation per crop acres (“200-12 Project”-- <http://www.northplainsgcd.org/education/200-12-project.html>); could recognize successful projects at venues such as the Governor’s Water Conference
- State financing programs could include support for meter implementation programs to enhance water efficiency
  - Linked Deposit Program could be mechanism, as individuals do not qualify for state funding programs
- Consider combining PWS and Agriculture Portals

**Industrial/Power/Oil and Gas (refer to pages 8-9 of the attached)** – based on input received from the August 19, 2014 Council meeting, draft recommendations were developed and distributed for review and consideration. Council member suggestions included:

- Establish benchmarks and share data on the amount of water used for power generation, e.g., gallons per megawatt of power produced and/or percent of water consumptively used
- Establish a Portal to disseminate output from the Oklahoma Secretary of Energy and Environment ‘s collaborative meetings and other industry information – possibly via trade groups (OIPA, OERB, etc.)
- Establish recognition based on shifts from percent of fresh water use to percent of marginal quality water use
- Marginal quality water use items 2(a) and 2(c) (developing alternatives to water for fracking and technologies for treatment of flowback) are already underway via industry; instead use Oklahoma Secretary of Energy and Environment collaboration efforts and Portal development to share information on progress
- Streamlining the site specific stream standards approval process; move to “parking lot”
- Add recommendation to “remove regulatory impediments to reuse”
- Broaden Best Practices 3(a) and (d) to include other industries; not just aggregate

### **Next Steps and Group Resources**

Mr. Rehring noted that a draft report should be ready for consideration by the Advisory Council in the 1<sup>st</sup> Quarter of 2015. The next quarterly meeting was tentatively scheduled for February 17, 2015, at 1:00 pm. at the OWRB’s offices. The Advisory Council’s report will be developed as follows:

- OWRB and the consultant team will develop draft text for each of the recommendations discussed at today's workshop by mid- to late January
- Advisory Council members will be assigned one of three subgroups to review the draft text (one subgroup will review, comment, and build on draft text for PWS recommendations, a second subgroup for Crop Irrigation, and the third subgroup for Industry/Other)
- Subgroups may be convened via teleconference to discuss the preliminary draft text
- OWRB and the consultant team will revise the text based on the subgroups' input and submit a full draft report to the full Advisory Council prior to the February 2015 Advisory Council meeting
- Steps for finalizing the report will be discussed at the February 2015 Advisory Council meeting





# Water for 2060 Advisory Council

**DRAFT**

Conservation Savings Analyses

Draft Recommendations for the  
Governor and Legislature

November 2014



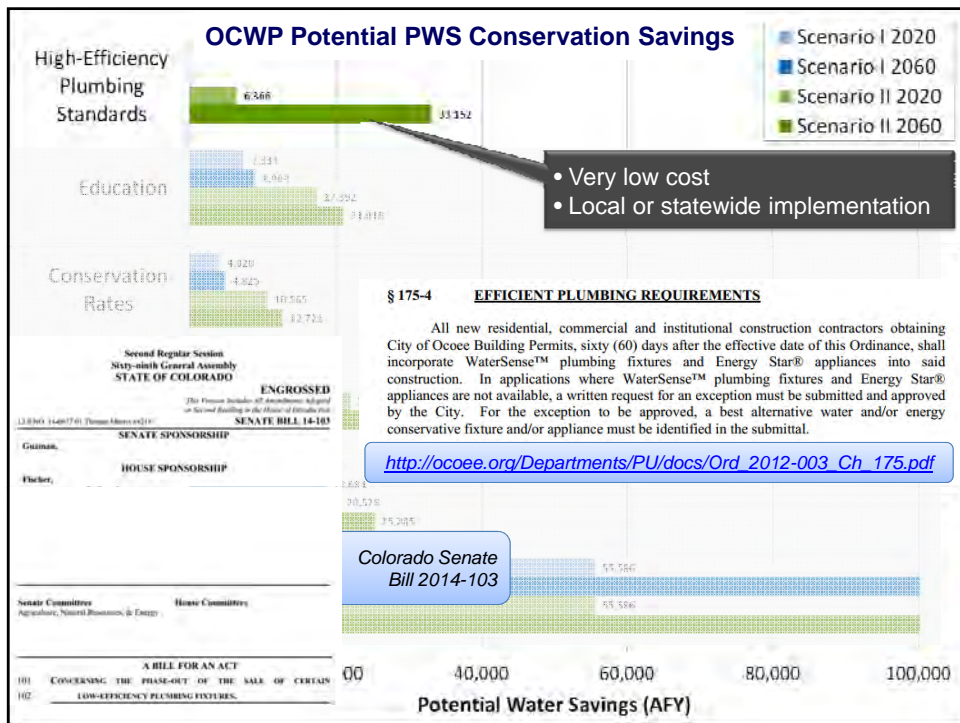
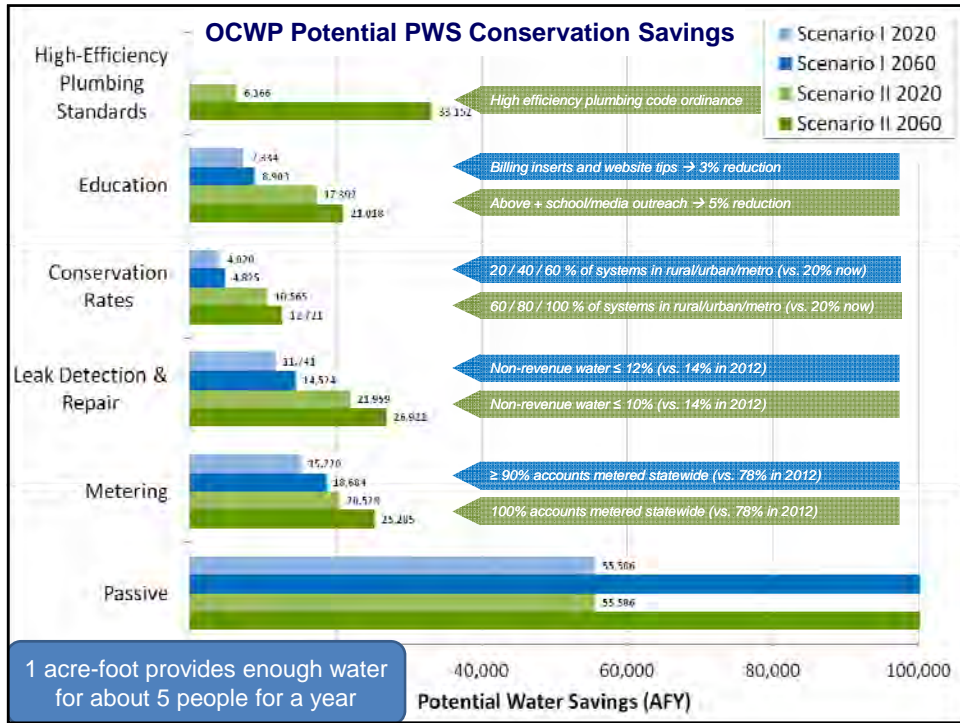
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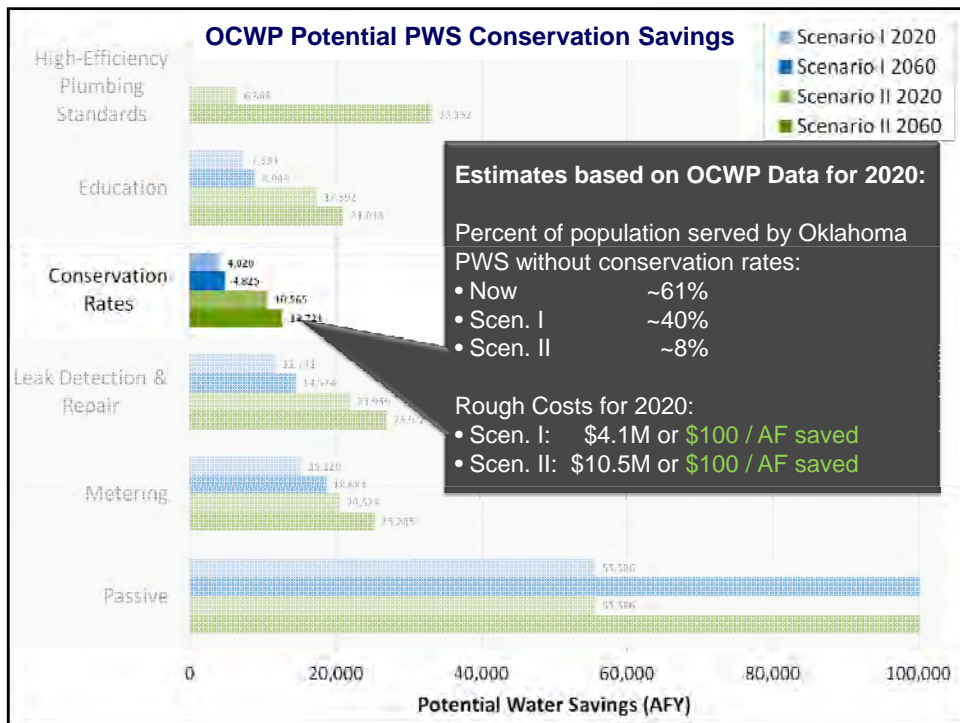
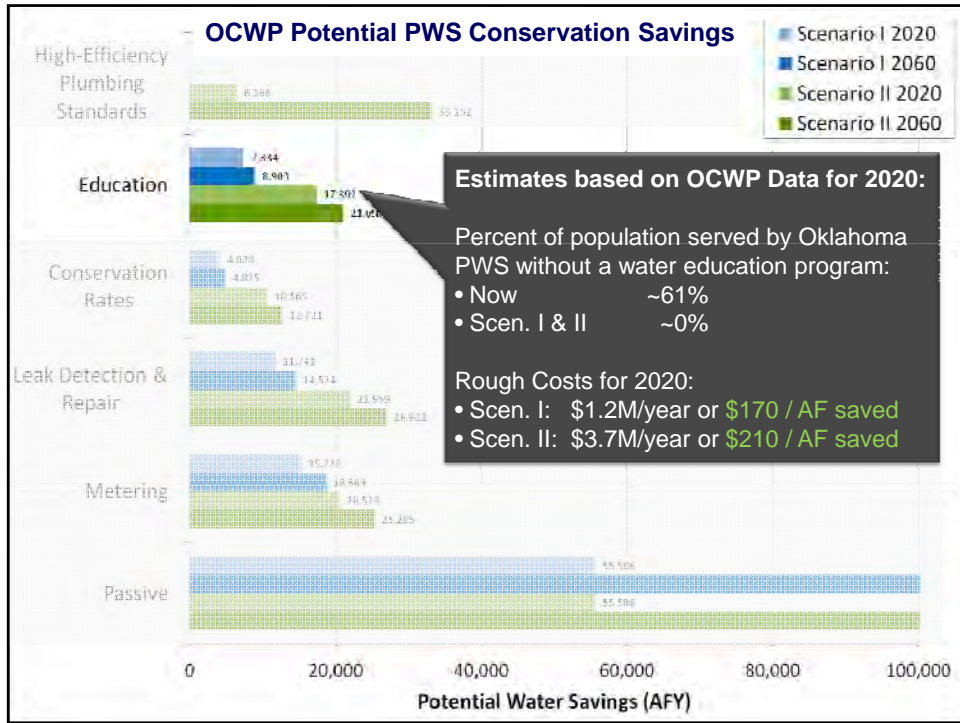
## Topics

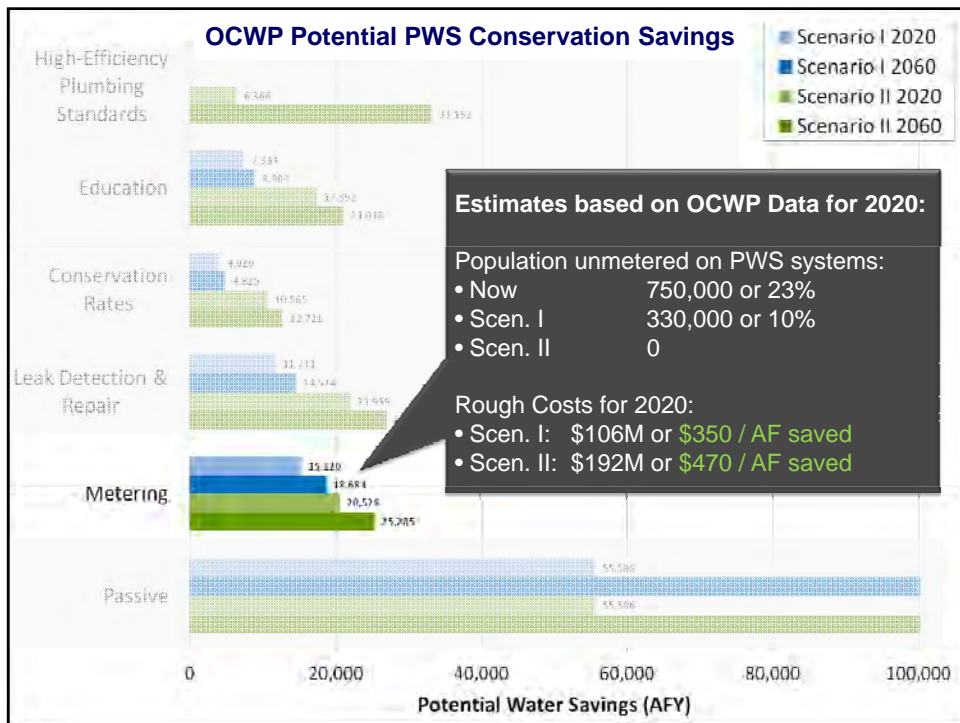
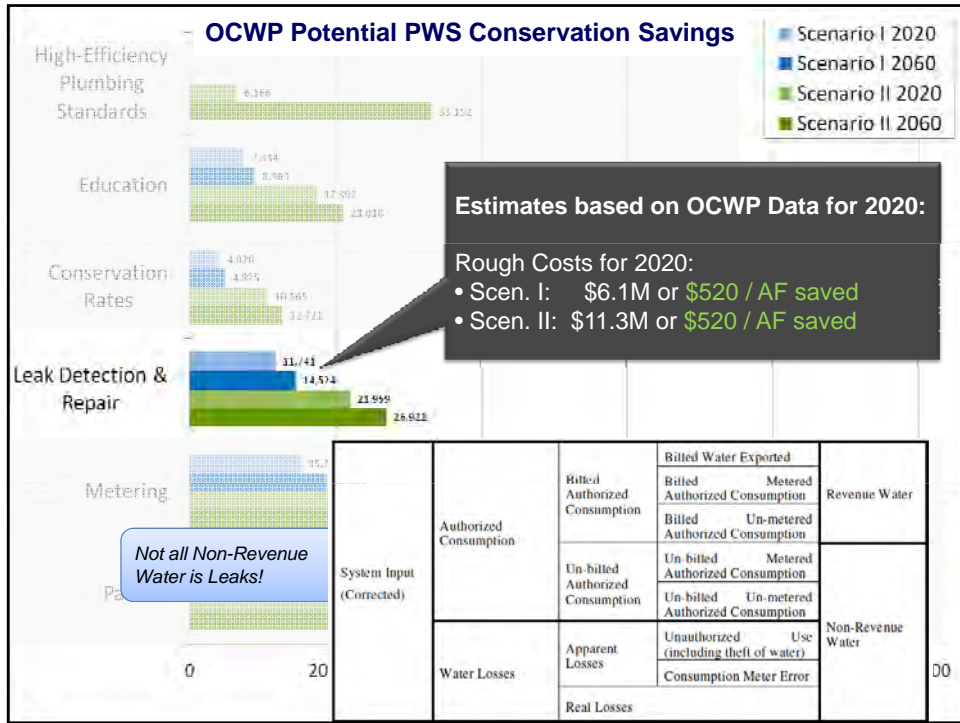
- **Analysis of Public Water Supply Conservation Measures and Programs**
  - Potential water savings
  - Order-of-magnitude costs to implement
- **Working Draft of Advisory Council Recommendations**
  - Public Water Supply
  - Crop Irrigation
  - Industrial, Power, Oil and Gas and Other Use Sectors

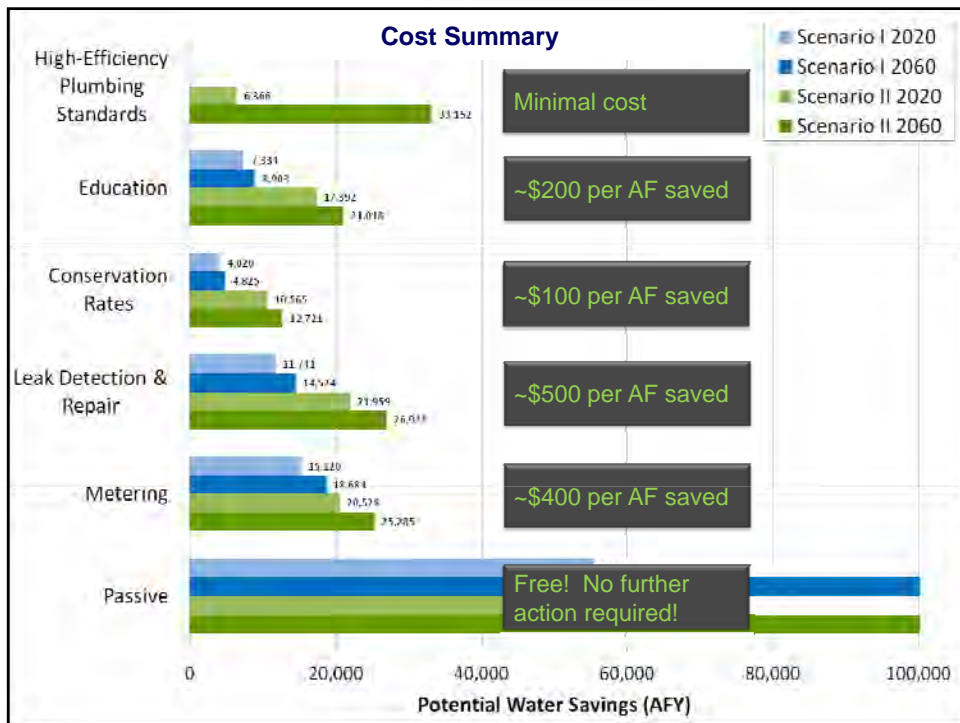
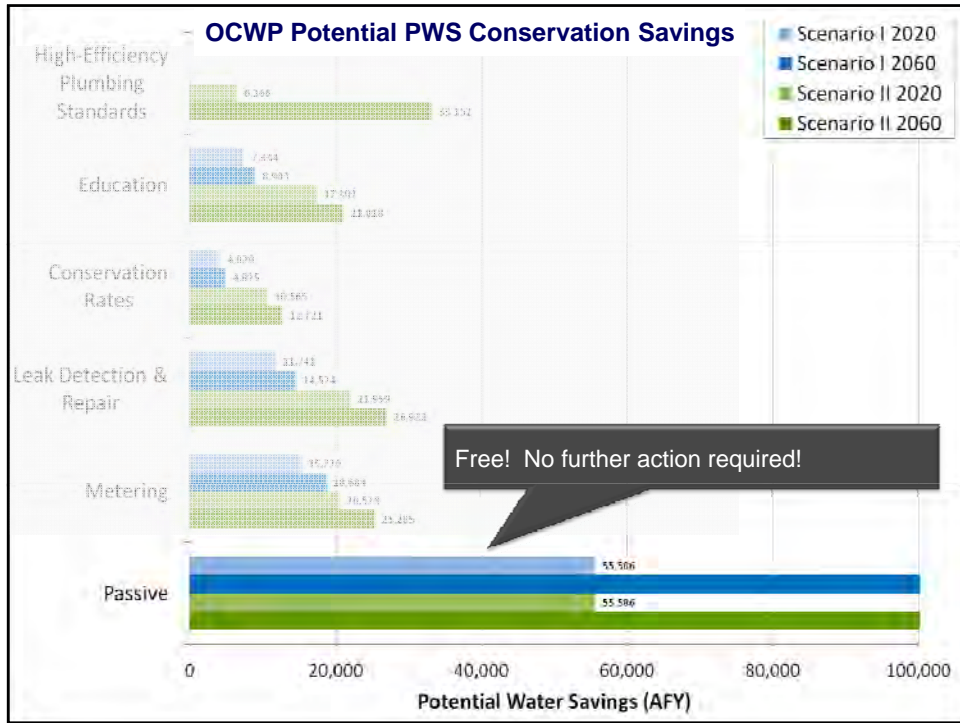


Caroline Blain Tempelton/WaterLogo.com









## Public Water Supply

Priorities for “Desired Results” (5/20/2014 Workshop)



- Reduce distribution system losses (system leaks, metering, etc.)
- Public awareness and action (conservation, value of water)
- Conservation pricing
- Regionalization/ interconnecting systems
- Local water conservation plans
- High-efficiency fixtures
- Increased nonpotable reuse
- Increased potable reuse
- Increased gray water use (household level)

“Best Practices”

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## Public Water Supply Recommendations

Reduce Distribution System Losses



1. Develop & distribute the Oklahoma Water System Loss Reduction Best Practices Manual
  - a. Reference available water system audit tools
  - b. Include system inspection and repair methods
  - c. Include case studies of return on investment
  - d. Coordinate with ODEQ and Bureau of Reclamation efforts
2. Provide state funding and financing for Water System Loss Reduction
  - a. Commit legislative funds for new System Loss Reduction matching-fund grant program
  - b. Add new OWRB/ODEQ water project financing criteria to encourage System Loss Reduction projects
  - c. Add new OWRB/ODEQ water project financing criteria to reward utilities with low Non-Revenue Water or designated Oklahoma Water-Wise Communities

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## Public Water Supply Recommendations

### Best Practices & Information Sharing



1. Develop & distribute the Oklahoma Public Water Supply System Water Efficiency Best Practices Manual
  - a. Group by system size
  - b. Revenue-neutral conservation rate structures
  - c. Sample high-efficiency plumbing ordinance
  - d. Water reuse opportunities and planning guidance
  - e. Reference System Loss Best Practices Manual
  - f. Other best practices for consideration (e.g., metering, penalties for wasting water, awards for identifying leaks)
2. Develop Public Education and Outreach Materials
  - a. Establish the Oklahoma Water Efficiency Office as a resource to PWS systems
  - b. Downloadable public education and outreach materials (school program materials, brochures, public service announcements, etc.)
  - c. Reference available materials from national organizations (AWWA)
  - d. Develop model website for conservation tips, supply data, etc.
3. Develop a State reward/recognition program
  - a. Set criteria for designation as an Oklahoma Water-Wise Community (low Non-Revenue Water, implementation of reuse, state-approved water conservation plan, etc.)
  - b. Design signage for posting in community
  - c. Statewide legislation requiring high-efficiency WaterSense products?

Source: Billan Tempelton/WTML Logo 2014

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## Crop Irrigation

### Priorities for "Desired Results" (5/20/14 workshop)



- Supported:
  - Adoption of efficient irrigation technologies
  - Reduction in fresh water use
  - Low water-use and drought-tolerant crops
  - Avoid wasting water to prove out crop insurance
  - Increased unit water efficiency (e.g., gallons used per bushel of crop)
  - Manage supplies for long-term viability
- Not supported, not necessary, or not effective
  - Recognition programs
  - Best practices for operations (soil management, etc.)
  - Funding/grants for equipment upgrades
  - Drought-tolerant crop research

Source: Billan Tempelton/WTML Logo 2014

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## Crop Irrigation Recommendations



1. Actively support federal crop insurance reform
2. Develop and distribute Oklahoma Crop Irrigation Best Practices Guide and Information-Sharing Portal
  - a. Best practices guide for irrigation technologies and practices
  - b. Demonstrate return on investment potential
  - c. Encourage focus on profit, not just yield;  
Also assess efficiency in terms of gallons of water per bushel of yield
  - d. Reporting for recent acre-feet/bushel data to demonstrate potential for high yields with low water use
  - e. Information sharing on water levels in aquifers and OCWP demand/shortage projections
  - f. Targeted outreach to areas of state with lower-efficiency equipment and practices
  - g. Information sharing on local/state/federal programs and opportunities that support best irrigation practices
3. Apply State financing programs for water-efficient crop irrigation equipment conversion and practices

Source: Billan Tempelton/VRML Logo, 2016

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## Industrial, Power, Oil and Gas and Other Use Sectors: Key Takeaways



- No “one size fits all” approach to different industrial water use categories; site-specific requirements require flexible and adaptable approaches
- More opportunity to reduce consumptive uses vs. “divert & discharge” pass-through users
- Technologies, economics, and non-water-related regs already drive significant reductions over historical use
  - Gas-fired vs. coal-fired power plants → 1/3 the kgal/mw
  - Reuse of flowback and produced water for oil and gas drilling/fracking

Source: Billan Tempelton/VRML Logo, 2016

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## Draft Recommendations for Industrial, Power, and Oil & Gas Users (1 of 2)



1. Facilitate Increased Sharing of Information and Supplies Between Users
  - a. Inventory and map sources of municipal effluent in relation to large industry demand
  - b. Actively promote/facilitate shared use of water resources between O&G operators per recent rule change avoiding classification as "commercial" operation; regulatory reform to address disincentives for O&G water sharing
  - c. Continue facilitating collaboration between water users via Oklahoma Secretary of Energy and Environment
  - d. Use public/private partnerships to improve municipal effluent water quality and treatment reliability to increase value of municipal effluent, and/or use OWRB Financial Assistance Programs to facilitate improvements
  - e. Create intra-state and inter-state forums for water efficiency best practices info-sharing

Creative: Billan Tempelton/istockphoto.com

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## Draft Recommendations for Industrial, Power, and Oil & Gas Users (2 of 2)



2. Promote Marginal Quality Water Use
  - a. Support initiatives to develop alternatives to water for fracking or lower-water fluids
  - b. Support additional brackish water mapping and research on its use
  - c. Support development of evolving treatment technology for flowback
  - d. Model the economics of alternative water sources for power generation; would also apply to large industrial users
  - e. Streamline the process for approving site-specific stream standards
  - f. Identify true water quality requirements for concrete (not just "potable") and get engineering industry to change specifications
3. Develop Best Practices Guidance and Recognition
  - a. Identify and document best practices for onsite water management at concrete and aggregate facilities to employ elsewhere
  - b. Award LEED-type points for sustainable site development
  - c. Develop recognition programs for water-efficient industries
  - d. Identify opportunities for aggregate sites to be used for recharge purposes as plants are in place long-term

Creative: Billan Tempelton/istockphoto.com

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## Next Steps

- Individually: Review and mark up prior to November 18 Advisory Council Meeting
  - What's missing?
  - What's on the list that shouldn't be?
  - How can we make the recommendations more specific and actionable?
  - Did we cover all the types of recommendations specified in the legislation? What wasn't addressed and how can we address it?
- As a Group: Discuss draft recommendations and provide feedback at November 18 Advisory Council Meeting
  - Edits, Deletions, Additions, and Clarifications
  - Verify vs. Legislative requirements: Are we covering all the bases?
  - Define process for detailing and finalizing recommendations
- Draft Report and Advisory Council Meeting in 1Q2015

Caroline Blain Tempelton/WTML Logo 2014

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## Water for 2060 Advisory Council

**DRAFT**

Conservation Savings Analyses

Draft Recommendations for the  
Governor and Legislature

November 2014



Caroline Blain Tempelton/WTML Logo 2014

# Water for 2060 Advisory Council

Meeting Minutes – 1:00 P.M., April 21, 2015

OWRB Board Room, 3800 N. Classen Blvd., Oklahoma City, Oklahoma

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## ATTENDEES:

### ***Advisory Council Members and Representation:***

Bob Drake, Agriculture (Davis)  
Russ Doughty for Charlette Hearne,  
Oklahomans for Responsible Water Policy  
(Broken Bow)  
Trent Smith, Small Business (Choctaw)  
Kevin Smith, Ward Petroleum (Enid)  
J. D. Strong, Chair, Oklahoma Water Resources  
Board (Oklahoma City)

Joe Taron, Pottawatomie County Development  
Authority (Shawnee)  
Jerry Wiebe, Oklahoma Panhandle Agriculture  
& Irrigation (OPAI) (Hooker)  
Nathan Kuhnert, Devon Energy (Oklahoma City)  
Roger Griffin, Weyerhaeuser (Broken Bow)  
Dan Galloway, City of Stillwater

### ***OWRB and USACE Staff and Consultants:***

Cole Perryman, OWRB  
Jennifer Wasinger, OWRB  
Owen Mills, OWRB  
Julie Cunningham, OWRB  
Darla Whitley, OWRB  
Scott Roberson, OWRB  
Derek Smithee, OWRB  
Sara Gibson, OWRB

Kasie Strambaugh, OWRB  
Robert Singletary, OWRB  
Rudy Herrmann, Board Member, OWRB  
Terri Sparks, Sparks Write  
John Rehring, Carollo Engineers  
Anna Childers, CH2M Hill  
Bryan Mitchell, CH2M Hill  
Bryan Taylor, USACE

### ***Other Attendees:***

Brandon Bowman, ODEQ  
Preston Hartman, OU

Morgan Hopkins, OSU Extension  
Mike Mathis, Continental Resources

## **Introductions and Goals for Today**

Mr. J.D. Strong, OWRB Executive Director and Advisory Council Chairman, opened the meeting by welcoming the attendees and asking audience/observers to introduce themselves. He noted that the primary goal of today's meeting was to go over the draft recommendations report and discuss anything else that might be needed to advance the goals of the Water for 2060 Act. Mr. John Rehring, meeting facilitator, reiterated that we needed to get feedback on the draft recommendations so the report could be submitted to the Governor and Legislature. He noted that OWRB and the consultant team developed draft text for each of the recommendations discussed at the November 18 Council meeting. He went over the process of setting up subgroups and holding teleconferences to receive feedback. Advisory Council members were assigned to one of three subgroups (Public Water Supply, Crop Irrigation and Industry/Other) to review the draft text. Feedback from the subgroups both during the teleconferences and offline input was incorporated into the report and re-sent to all members for review prior to this meeting.

## **Report Overview and Overarching Comments**

Mr. Rehring noted that it was the consensus of each of the subgroups that recommendations would be prioritized within groups/user categories, but not between categories. He suggested that the full Council proceed by first looking at overall comments of each subgroup, then look at individual recommendations. Comments and discussion regarding the recommendations in the draft report included:

- Public awareness and education is not category specific and needs to apply to all categories
- Move PWS-5, Develop Public Education and Outreach Materials, to general category encompassing all water use sectors
- Consider vibrant conservation campaign similar to tourism and recreation, but effectiveness may depend on area of state; unique characteristics
- Consider partnering water conservation with opportunities to conserve oil and energy (energy/water nexus)—resource efficiency
- Identify voluntary/cooperative mechanisms for local cost-sharing in costs of implementing the Water for 2060 recommendations; look at ability of beneficiaries to help pay
- Concern over adding regulation or constraints that might inadvertently cause problems; do not want to save water in one area/sector at a cost to other areas/sectors
- Can use Clean Water State Revolving Fund (CWSRF) loan program for public education loans
- Common theme between the sectors' recommendations is web-based information-sharing portals. Modify recommendation for public outreach (formerly PWS-5) to also include development of a statewide information-sharing portal, with separate "branches" for specific water use sector information. Details of information to be posted to portals are discussed under individual water use sector recommendations.

## **Feedback on Energy and Industry Recommendations**

- Need to find way to drive people toward portal(s)
- Guidance through various regulatory requirements for marginal quality water (MQW, e.g., reuse) would be helpful for users and agencies alike
- Need to plan for continual updates on portal information
- Move portal to its own general recommendation and cross-reference within category—specific recommendations
- Recommendations EI-1/EI-2: use case studies to demonstrate "success stories"
- Recognition programs should acknowledge dollar savings associated with them
- Recommendation EI-3: Add guidance on navigating the regulatory process

## **Feedback on Crop Irrigation Recommendations**

- Express 2060 goals as a percent reduction goal relative to OCWP baseline demand projection (offset fresh water use); add to front of report
- Tie recognition to a "challenge"?
- Link Water for 2060 goals to projected demand growth in a sector, so that those sectors with the most growth would be expected to show a proportionately larger reduction? May not be productive

## **Feedback on Public Water Supply Recommendations**

- Add guidance on navigating MQW regulatory/permitting process to PWS-1

- Revise title to Recommendation PWS-2 to consider all PWS systems for meeting the defined goal; score all systems, not just the highly-efficient ones
- All recommendations/all sectors need to have periodic evaluation of effectiveness
- Recommendation PWS-3: encourage regular calibration of meters for water produced and sold
- PWS-4: also explore opportunities for private investment in water loss with return on investment (via public/private partnerships)
- PWS-4: show water savings that might be expected to be associated with a \$1M investment by the Legislature
- PWS-5 (now moved to general recommendations): consider increasing funding from \$200,000-300,000 per year to as much as \$1 million; compare to other programs' expenditures (eg OKC's conservation program); provide a range of costs
- PWS-6: add reference to Drinking Water SRF principal forgiveness program

### **Next Steps and Group Resources**

- Add brief executive summary to front of report
- Where does aquifer recharge fit in? Is it linked to marginal quality water?
- Confirm no additional Advisory Council meeting will be required after revised draft report is distributed. Advisory Council will be asked to perform a final review of the revised draft report, reflecting modifications made in response to input received at today's workshop.
- OWRB and its consultants will prepare letter transmitting recommendations report to Governor and Legislature

# WATER FOR 2060 ADVISORY COUNCIL

J.D. STRONG, CHAIR

JIM BACHMANN (TULSA)

LAUREN BROOKEY (TULSA)

TOM BUCHANAN (ALTUS)

BOB DRAKE (DAVIS)

DAN GALLOWAY (STILLWATER)

ROGER GRIFFIN (BROKEN BOW)

CHARLETTE HEARNE (BROKEN BOW)

MARK HELM (OKLAHOMA CITY)

NATHAN KUHNERT (OKLAHOMA CITY)

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KEVIN SMITH (ENID)

TRENT SMITH (CHOCTAW)

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