

PROJECT OF INTEREST

August 2016

WASTE NOT, WANT NOT: WATER REUSE AND RECYCLING IN TEXAS

CHALLENGES

It is said that necessity is the mother of invention, a notion which rings true in Texas where a challenging climate has demanded a pioneering spirit and innovations in water management in order to survive. Water reuse is not new in Texas. In fact, one might consider reclaimed and reuse projects as best management practices in a state where strained water supplies and drought are a part of life. The State has weathered several droughts, including the most recent and severe 4-year event which began in 2011 and has finally begun to ease.

Communities are still struggling with the multitude of impacts that the drought has brought that include aquifer and reservoir storage depletion, diminished soil moisture and erosion, wildfires, and low streamflows. These impacts are felt not only in the municipal sectors and the challenge of continuing to provide adequate potable water supplies to the public, but throughout the private economic, agricultural and industrial sectors as well. Luckily reservoir storage in Texas is recovering and presently holding strong at 85.4% full as compared to 68% just four years ago.

These years have punctuated the importance of water reuse and recycling, as well as the development of alternative water supply sources, and Texas communities have pursued these types of projects vigorously with the help of the Texas Water Development Board (TWDB) who provides financial assistance in the form of grants and loans. TWDB's Clean Water State Revolving Fund Program (CWSRF) funded its first reuse project in 1989 and has since provided more than \$300 million to over 28 reuse projects of varying types.

SOLUTIONS AND OPPORTUNITIES

Texas has developed a diversified portfolio of water reclamation, reuse and supply development solutions which has helped augment community resiliency in the face of severe drought events and the case studies from the following three communities help to illustrate these laudable efforts.

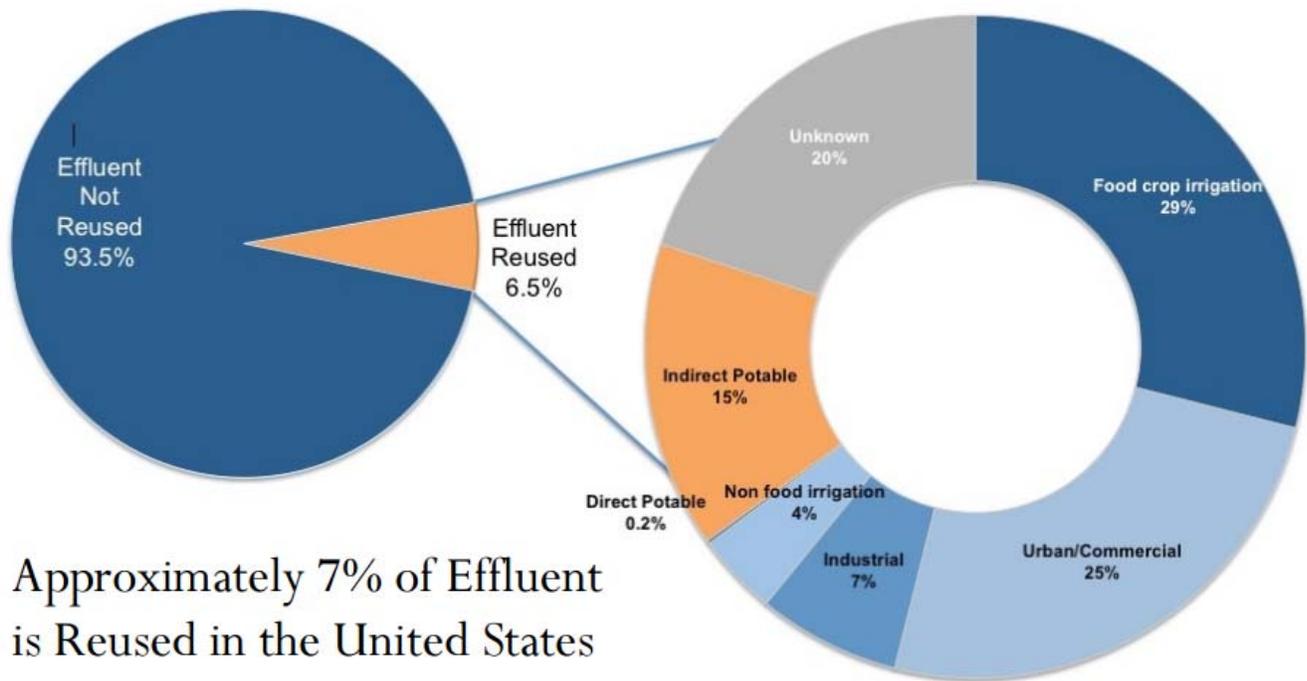
San Antonio Water System's Water Recycling Centers (WRCs)

In 1996, the San Antonio Water System (SAWS) unveiled a plan to construct the nation's largest water recycling delivery system. This ambition has been realized with nearly 130 miles of pipeline delivering high quality treated effluent to parks, golf courses, and numerous commercial and industrial customers in the SAWS service area. Today, this trend continues with the support of more than \$27 million in CWSRF funding for the development and expansion of the San Antonio Water System's (SAWS) water recycling program, comprised of three major WRCs: Medio Creek, Leon Creek and Dos Rios (pictured right). Together, these facilities produce 130,000 acre feet (AF) of treated wastewater annually. The 35,000 AF alone that is conserved is equivalent to 20% of the potable demand that would otherwise be placed on the Edwards Aquifer.



Wichita Falls Indirect Potable Reuse (IPR)

Indirect potable reuse is the use of reclaimed water to augment drinking water supplies by discharging to a water body, either surface or ground, and subsequently treating it for potable consumption. Thus, IPR is limited in its application to locations with access to a suitable natural water body. Geographically, the City of Wichita Falls is ideally situated and now in the process of constructing a 17-mile pipeline between the River Road Wastewater Treatment Plant and the point of outfall at Lake Arrowhead with the capability to produce 8-10 million gallons of treated effluent daily. This \$30 million dollar project funded by the TWDB is considered a permanent IPR system that will supplement the primary potable water supply source for the community.



Source: <http://texaslivingwaters.org/wp-content/uploads/2016/02/Bob-Johnson1.pdf>

The project consists of new chemical facilities, phosphorous removal treatment units, pumping facilities, and other infrastructure improvements. According to Russell Schreiber, Wichita Falls Director of Public Works, this project will be tremendous boost to the City's overall water supply, and will allow them to be better prepared for the next major drought event. Though the four-year drought has ended, water challenges for Texas communities remain. Over 84 million acre feet of groundwater stores were lost during the drought, and as of January 2015 there has been only a 10% recovery. IPR is an alternative water supply development option that increases community preparedness in times of uncertainty.

Mastering Innovation with Direct Potable Reuse (DPR) in Big Spring

Direct Potable Reuse is the use of reclaimed water that is piped directly from a wastewater treatment facility to a drinking water treatment and distribution facility. Texas built the first DPR facilities in the United States and, although not funded by the CWSRF program, the TWDB did provide \$11.9 million in loan assistance to the state's first large-scale DPR project through a State financing program called the Water Infrastructure Fund. This groundbreaking project was spearheaded by the Colorado River Municipal Water District, which was created by the Texas State Legislature for the specific purpose of developing and financing water resources to the communities of Odessa, Big Spring, and Snyder. Using 20-year projection models, the District knew that traditional surface water sources like lakes and reservoirs

would not be viable for adequate supply, so they turned their attention to alternative technologies involving advanced treatment and capitalizing on an often wasted resource.

Operating since 2013, the Big Spring plant treats 2 MGD of wastewater effluent using microfiltration, reverse osmosis, and ultraviolet disinfection. The “reclaimed” water derived from the wastewater effluent is then added to a raw water pipeline that is transmitting water from a source water lake. This mixture of treated (reclaimed) water and raw surface water from the lake is distributed to five drinking water facilities in the region that serve 250,000 people where it is treated again using conventional drinking water treatment techniques. The blend of raw water from the lake and treated reclaimed water provides drinking water to customers in Big Spring, Snyder, Midland, Odessa and Stanton.



A key factor in making DPR technology truly successful is securing the support of the local community and helping customers to understand the processes and to overcome some of the stereotypes and misinformation often associated with pursuing this type of water reuse. The District held a series of public meetings, shared detailed information in the media, and reached out to numerous organizations and stakeholder groups and, for the most part, public reaction has been very positive.

This project represents a significant turning point in the way that water managers in areas beleaguered by extreme drought and water scarcity can cultivate a sustainable water supply in times of uncertainty. Since Texas pioneered DPR technology, more states have begun to pursue this approach including California where the State Legislature has mandated a determination of feasibility by December 31, 2016 to ensure it can be implemented safely and reliably.



The CWSRF program supports projects that promote water conservation, efficiency, and reduced consumption and provides funding for a broad array of projects that achieve these ends, including DPR technology.

FOR MORE INFORMATION, PLEASE VISIT:

<https://www.epa.gov/cwsrf>
www.twdb.texas.gov/

