

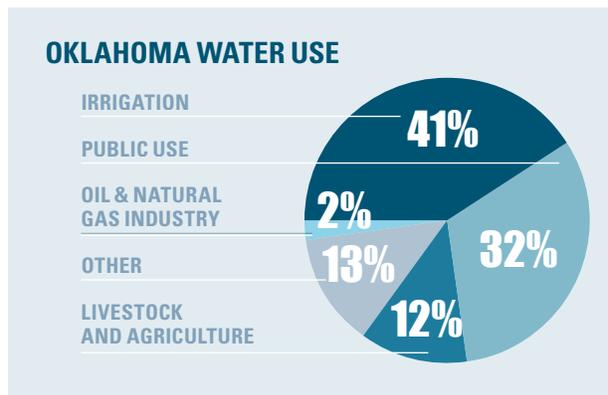


Water and energy; these two critical resources are inextricably and reciprocally linked. The production of energy requires water while the treatment of water is equally dependent upon readily available energy. Without water, U.S. oil and natural gas production would be impossible. In fact, we wouldn't be able to cultivate any of the resources, from coal and nuclear to wind and biofuels, used to provide electricity.

Thanks to new technologies being deployed to conserve, recycle and reuse water, the impact on water usage will decline as oil and natural gas development continues to grow over the next several decades.

WATER USE REALITIES

Irrigation is the number one use of Oklahoma's water supply, accounting for 41 percent of the state's usage; public consumption is second at 32 percent, followed distantly by livestock and agriculture at 12 percent. Contrast those levels with oil and natural gas development which only accounts for approximately 2 percent of water use in the state.¹ And while significant growth is anticipated in the state's oil and natural gas industry, it is only projected to account for 5 percent of Oklahoma's total water demand in 2060.¹



In some areas of the state, the industry's water usage may account for a higher percentage of use. Although temporary, producers remain cognizant of this fact and are consistently exploring new technologies to reduce and reuse water.

Producers typically use several sources of water within Oklahoma for drilling and completion processes, including surface, groundwater and marginal quality water sources such as wastewater effluent. Whenever producers acquire water for these operations, they get all the required permits from the Oklahoma Water Resources Board and applicable authorizations from landowners, rural water districts and municipalities.

EMERGING TECHNOLOGIES

Oklahoma's oil and natural gas producers continue to explore opportunities for reusing and recycling produced water for hydraulic fracturing. Where technically, operationally and economically viable, the reuse of produced water provides Oklahoma's oil and natural gas producers an opportunity to reduce its use of fresh water sources. In this regard, the industry works closely with the Oklahoma Corporation Commission on recycling and reuse regulations.

Processes that can be utilized for water treatment include, but aren't limited to: filtration, aeration, sedimentation, biological treatment, reverse osmosis, natural evaporation and condensation.

Many producers have also established water sustainability principles that guide their ongoing efforts to conserve this resource. Producers work closely with federal, state and local governments to develop practical water use guidelines for the industry and feasible alternatives are constantly being considered and evaluated to help Oklahoma oil and natural gas producers preserve this valuable resource.



¹ Oklahoma Water Resources Board, Water and Power Issues, Impact to Well Operations, J.D. Strong, January 2013

² Oklahoma Comprehensive Water Plan, 2012 Update, Water Demand Forecast Report, CDM, 3/2011, pg 4 14

LEARN MORE

To learn more about the use and preservation of water in oil and natural gas activities, please visit the following sources:

The Oklahoma Water Resources Board; Oklahoma Water Facts

<http://www.owrb.ok.gov/util/waterfact.php>

American Petroleum Institute; Water Management Associated with Hydraulic Fracturing

http://www.shalegas.energy.gov/resources/HF2_e1.pdf

U.S. Department of Interior; Oil and Gas Produced Water Management and Beneficial Use in the Western United States

<http://www.usbr.gov/research/AWT/reportpdfs/report157.pdf>

University of Pittsburg; Shale Gas Roundtable- Water and Unconventional Gas

<http://www.iop.pitt.edu/shalegas/PDF/water-unconvent-oil-gas.pdf>