



UNDERGROUND AND ON THE HORIZON: Produced Water in Texas

Texas generates approximately 1 billion gallons per day of water known as *produced water* as industry extracts oil and gas from underground. At the same time, Texas faces long-term water supply challenges as population and economic growth increase demand on constrained freshwater supplies. Historically managed as a waste stream, treated or “polished” produced water’s potential use beyond the oilfields has been evaluated in recent years. This potential has been of particular interest in West Texas where groundwater resources are under strain. The Texas Legislature and courts have made projects to treat produced water eligible for state funding, and have clarified produced water ownership and liability expectations. The speed and scale of treated produced water as a supply within Texas will depend on cost, the pace of regulatory approval, and public acceptance.

KEY TAKEAWAYS

- **Disposal constraints** for produced water are a growing challenge in oil-producing parts of Texas, particularly in the Permian Basin, where rising costs, infrastructure limitations, and seismicity concerns are impeding the viability of injecting this wastewater back underground.
- Produced water represents a **potential water supply for certain areas**. Oil and gas operations in Texas generate significant volumes of produced water and state-supported research suggests a portion could be treated for beneficial use, depending on cost, technology, and regulatory feasibility.
- **State policy has been laying the framework and standards** for future use outside the oil and gas sector. Recent state actions have increased funding options, clarified ownership and liability, and consolidated regulatory oversight.
- **Permits and economics** will shape future use. Surface discharge and land application permitting processes underway at the Texas Commission on Environmental Quality (TCEQ) will determine how treated produced water can be used outside the oilfield. Economics will determine its competitiveness compared to other supply options.

PRODUCED WATER EXPLAINED

Produced water is fluid that comes to the surface during oil and gas extraction. It includes naturally occurring formation water and chemicals injected during drilling, completion, and production.¹ Historically, produced water has been managed as a waste stream with about one-third injected into the formation to increase production and the other two-thirds injected for disposal.² Produced water differs from conventional water sources due to:

- **Highly variable chemistry** over geological formations and time, which adds to treatment complexity
- **High levels of salinity and total dissolved solids**, often greater than seawater
- **Presence of known and proprietary chemical components and minerals**, including naturally occurring radioactive materials that affect treatment, monitoring, and regulatory standards³

These characteristics significantly influence how produced water is managed, evaluated, and treated for potential beneficial use.⁴ Treatment requirements vary by intended end use and involve multiple steps, including filtration, desalination, and removal of organic compounds, as shown in the graphic on the following page.⁵



Figure 1. The produced water treatment process. Derived from Walker, Shane. "Texas Produced Water Consortium." Presentation to the Texas Desalination Association 2025 Annual Conference, slide 11, and Texas Produced Water Consortium, "Produced Water Treatment Pilot Testing: Water Quality Report," i.

WHY PRODUCED WATER MATTERS NOW

Disposal Pressures: Most produced water is managed either through underground injection wells with suitable geologic formations, or recycling within oil and gas production. In areas without nearby disposal capacity, produced water must be transported for injection, increasing costs and operational complexity. Rising volumes—particularly in regions with concentrated oil and gas activity—are placing pressure on existing disposal capacity. Increased seismic activity and long-term capacity in the geologic formations are driving interest in alternative approaches, such as treatment and non-injection reuse.⁶

Potential Water Supply: Texas oil and gas production generates more produced water than any other state, with current volumes approximating 1 billion gallons per day. The Texas Produced Water Consortium (TPWC) estimates that treated produced water could offset approximately **17-30% of projected irrigation demand shortage in 2050**. This accounts for water recycled within oil and gas production and the efficiency of current technology to convert about 50% of raw volumes as final, treated water.⁷

Water Infrastructure Funding: The 2023 Texas Legislature established a specific fund for certain projects that add to the state's water supply, including produced water. Voter approval of Proposition 6 in 2023 dedicated at least \$250 million to this fund.⁸ The 2025 Legislature passed SB 7, which required at least half of constitutionally dedicated funds from Proposition 4 to go to either this new water supply fund or the fund that supports strategies in the State Water Plan.⁹ Together, these actions elevate produced water's access to funds for treatment and transport.

Produced Water Governance: Recent developments by the entities below have elevated produced water in statewide discussions, accelerated scientific progress, and shifted regulation to address its potential beneficial use.

- TCEQ:** Since 2021, TCEQ has exercised authority to permit produced water discharges into surface waters and has several produced water discharge permit applications under review.¹⁰ TCEQ is currently finalizing rules for land application of produced water discharges following the passage of SB 1145 in 2025.¹¹ Adhering to these permits is an important factor for liability limitations that the Legislature enacted in 2025.¹²
- TPWC:** The Legislature established this consortium in 2021 to evaluate the technical, environmental, and economic feasibility of produced water treatment and beneficial use. The Consortium supports research and pilot projects that help inform agency actions and legislative discussions.¹³ It evaluated five pilot projects in the Permian Basin in 2024-2025. Recent results reported that the pilot treatments removed over 99% of saline, organic, and radioactive materials when all three treatment steps were applied.¹⁴ The Consortium continues to study produced water quality and economics while industry is preparing treatment systems for pending permit actions.¹⁵ Other states, such as New Mexico and Colorado, have also established multidisciplinary research groups for produced water.
- Environmental Protection Agency (EPA):** EPA currently limits produced water discharges in navigable waters to agriculture and wildlife purposes if it is of "good enough quality" and "put to those uses."¹⁶ EPA recently included produced water applications and regulatory flexibility as part of its updated Water Reuse Action Plan 2.0, and is slated to propose rule changes in September 2026 that could add new uses, including industrial cooling and mineral recovery.¹⁷
- Railroad Commission of Texas (RRC):** RRC continues to regulate produced water management within oil and gas operations, including conventional recycling and disposal through injection wells.



POLICY CONSIDERATIONS

Policymakers responsible for treated produced water face a multilayered challenge. Key questions include the capacity of the existing regulatory system to protect against potential hazards, economic viability as compared to other water management approaches, and how it may fit within broader water supply needs and plans.

Water Quality and Human Health: Produced water contains a complex and variable mixture of constituents that pose risks to environmental and human health without adequate desalination and treatment. Texas' surface water quality standards apply to discharges into rivers or streams to protect for uses like aquatic life, recreation, and downstream human consumption. Although 40-90 produced water constituents can be addressed in existing water quality standards, a greater number lack surface water quality standards or approved analytical methods.¹⁸ According to TCEQ, produced water is a novel waste stream and handled differently from other industrial discharge permits. Using its process for surface water quality standards, TCEQ is developing limits for chemicals that lack a current surface water quality standard.¹⁹ Other states are also in the process of adjusting their regulatory frameworks. New Mexico, for example, accepted a petition in May 2026 to revisit its 2025 five-year ban on produced water discharges outside the oilfield.²⁰

Cost and Feasibility: According to the TPWC, "economic viability continues to be the most significant hurdle to beneficial use of treated produced water."²¹ Produced water testing and treatment costs vary depending on the chemical makeup and the requirements for discharge onto land or into surface water. Produced water composition varies by location and over time, which

makes designing and building treatment more difficult. Disposal underground remains the most cost-effective management method for the oil and gas industry. Current estimates suggest that disposal via underground injection can cost approximately .60-.75¢ per barrel, may require additional pipeline costs, and continue to increase.²² While treatment technology and related energy costs for beneficial use outside the oil and gas sector are currently more expensive than disposal costs, efforts are underway to narrow this gap.²³

Potential solutions to address this gap include treatment technology improvements or financial assistance for infrastructure development. These cost differences shape discussions around economic viability, public and private infrastructure investment, and how produced water compares to other water supply and demand management strategies for water-stressed regions.

Supply Suitability: Produced water availability is tied to oil and gas production, which fluctuates with market conditions. This variability raises questions about its suitability as a long-term water supply compared to other water supply options. In addition, adoption of treated produced water will depend on regulatory frameworks and infrastructure development.

Additionally, where treated produced water can be used will shape its adoption. For example, EPA's pending rule proposal on expanding use could open the door for produced water to be used for industrial facilities. While agriculture is often discussed as a potential user due to high water demand, they may be less likely to use treated produced water over cheaper sources without financial support.²⁴

FRAMING THE PATH AHEAD

Texas generates significantly more produced water than any other state. Its future role as a resource outside the oilfields will depend on cost, safety, public confidence, ongoing research, rulemaking, and funding. The Legislature is evaluating produced water activities during 2026 interim hearings.

For additional information, please consult our references list or contact us.

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