

xWATER

Integrated water-flexible fracturing fluid delivery service

APPLICATIONS

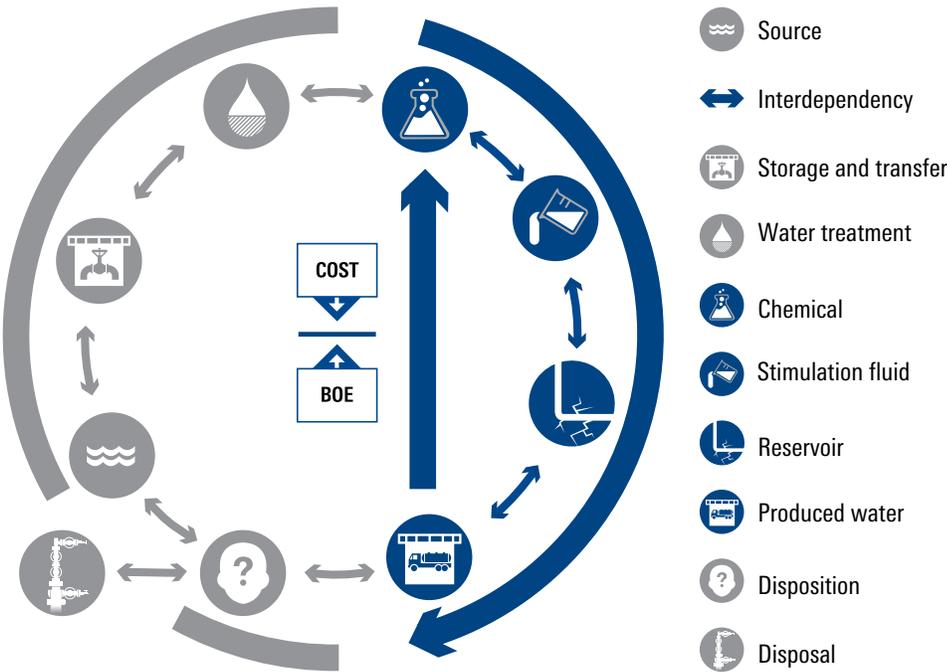
- Locations where
 - produced water, brackish water, seawater, brinewater, or wastewater are readily available
 - freshwater is scarce
 - disposal or surface discharge is uneconomical
 - environmental initiatives or regulations require water reuse
 - transportation or conveyance costs are high

BENEFITS

- Reduces or eliminates water acquisition and disposal costs
- Minimizes water transportation or conveyance costs
- Maximizes use of alternative water sources, such as produced water, brackish water, seawater, and wastewater
- Optimizes the fracturing fluid system for the specific reservoir conditions
- Minimizes or eliminates the need for water treatment

FEATURES

- Characterization and identification of water quality, volumes, and total water management cycle costs to optimize economics and efficiencies
- Evaluation of reservoir effects to ensure positive impact to production
- Rapid economic feasibility assessment developed to compare current economics with optimized water management and operational scheme
- Tailored fracturing fluid engineered for operator's specific water and fluid conditions
- No operational upgrades
- Use of nonderivatized guar in most applications with no need for expensive fluid upgrades



xWATER service (shown in blue) enables 100% reuse of produced water, while reducing or eliminating costs associated with source water storage, transportation, and treatment, and eliminating produced water transportation and disposal.

xWATER* integrated water-flexible fracturing fluid delivery service enables operators to use an engineered fracturing fluid customized for the available water, well conditions, and reservoir properties. The service eliminates and reduces sourcing, treatment, and disposal costs.

The xWATER service

- Quantifies current total water cycle management costs
- Enables operators to use all available water
- Requires little or no treatment
- Provides tailored fracturing fluids to work with the available water quality
- Demonstrates positive impact to production
- Ensures value is captured at key decision points in the water management cycle, which provide the greatest savings.

Integrated water management process

The xWATER service implementation and integration process begins with

- Characterization of current water management costs and water quality parameters
- Modeling of reservoir damage mechanisms and water reuse infrastructure costs
- Creation of a fracturing fluid tailored to work with produced water or alternative water sources
- Implementation of fracturing treatment using same equipment without costly fluid upgrades, while integrating with the customer's existing water management infrastructure
- Evaluation of reservoir effects to ensure positive impact to production.



xWATER service was used to create a high-performance crosslinked gel using 100% produced water (fluid on right) with concentrations of 280,000 mg/L total dissolved solids, 25,000 mg/L hardness, and 60 mg/L boron. With the same waters, the failure of a traditional fluid system (fluid on left) is evident, showing an unstable fluid with visible scale.

Design of a tailored fracturing fluid

After completing the feasibility assessment, a customized fracturing fluid solution is engineered specifically to work with produced water or the most economic water source available. The use of produced water and other higher salinity waters for tailored fluids maintains reservoir integrity and maximizes production when compared to freshwater.

Reduced cost of water transportation

By reusing produced water, as well as other alternative water sources, xWATER service drastically reduces overall water transportation and conveyance costs. Eliminating the need for freshwater also minimizes water acquisition costs and conserves natural resources in water-scarce areas.

No need for disposal

As the well enters the production phase, the produced water is collected in centralized, on-site storage facilities, transported to new fracturing sites, then returned to storage after job completion — reducing transportation costs and eliminating the need for disposal.

slb.com/xWATER

Schlumberger