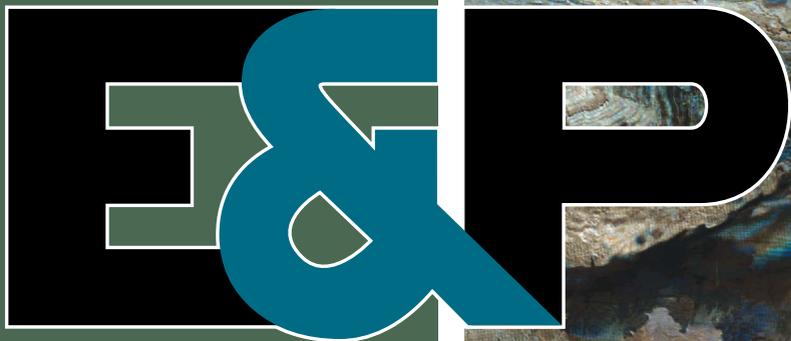


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The Great **UNKNOWN**

Technology continues to improve and impress. But the subsurface remains as inscrutable as ever.

Testing the waters

Water chemistry analysis helps companies better tailor their fracture fluids.

Operators and service companies need to have a strong grasp on the chemistry of the water they are using to fracture a well. Chemicals such as boron, barium, iron II and iron III can have a detrimental effect on the fracture fluids. In addition to understanding the water's chemistry, companies are under pressure to reduce their use of freshwater and leverage more recycled water in their fracturing operations.

Houston-based Water Lens has developed a water-testing system it said solves the challenges of fully characterizing water chemistry and frees companies from relying on often unreliable field kits or outside laboratories. Its system works with a 96-well plate preloaded with all of the necessary chemistries to perform each analysis. The kit is configured to test for the most critical parameters that shale producers might require when preparing produced and flowback water for fracture jobs.

"The principles of the operation are based on colorimetric detection," said Keith Cole, CEO and founder of Water Lens.

"What differentiates Water Lens from other colorimetric systems is our ability to account for interferences," said Adam Garland, chief science officer for WaterLens. "All of these chemicals are interfering with the other tests. Since we measure them all at the same time, we can account for their impact on the final results using our proprietary correction algorithms."

The results of the test are formulated in about 10 minutes, Garland said, and can be conducted either in the field or in a laboratory.

"You load the water into the tray, and then you put the tray in the reader and press 'Go,'" Cole said. "From there, everything is automatic, and [the system] just generates the report. The machine scans the plate, looks at the color changes and runs it through the algorithms to account for interferences, and then the software generates a report that lets the user know what's in the water."



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Garland said the Water Lens system has been used around the world, including the Permian Basin, Eagle Ford, Bakken, the Middle East, Canada, Oklahoma and Utah. Cole said the system is easily adaptable for offshore use as well, where weight and space limitations exist and large-scale testing units may not be feasible.

In an example of the system's effectiveness, Cole said a mid-size service company experienced cost savings by monitoring its fracture stages with the Water Lens system.

"They used our system to monitor every stage of the frack that they were pumping," he said. "They were noticing that the fluid was starting to change—it was a gel frack. The fluid started to weaken, and because they were monitoring with our system, they caught it before it became a big problem."

Cole explained the company was able to stop the fracture job for about 30 minutes and adjust the chemistry of its fluids before going back online—a measure that the company said saved

about \$100,000 to \$200,000.

Water Lens currently tests for 26 parameters in a single analysis. According to Water Lens, more parameters are under development and will be available shortly, including tests for sulfate-reducing bacteria, manganese, phosphate, silicate, chlorine and zinc.

"People get excited about what we have, but they get even more excited about what's coming around the corner," Cole said. **ESP**



The Water Lens system helps service companies and operators better understand the chemistry of fracture fluids and water within a reservoir. (Source: Water Lens)