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Star-Telegram

Water recycling is big business for oil, gas support firms

Posted Saturday, Apr. 27, 2013

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Just a few years ago, Fort Worth-based Bosque Systems mostly operated wastewater disposal wells for oil and gas operators. And another Fort Worth-based oil field company, FTS International, was busy becoming one of the nation's biggest providers of hydraulic fracturing services.

Now, both are rolling out water recycling operations, as is Austin-based Omni Water Solutions. All are motivated by the same driver -- producers' high costs of acquiring and disposing of water at oil and natural gas drilling sites in regions that are either arid or lack an inexpensive water disposal infrastructure.

In those areas, such as Pennsylvania's Marcellus Shale and the dry plains of West Texas, water and disposal costs can approach and even exceed \$1 million per well. Drilling and fracturing a horizontal well can use 5 million gallons of water or more.

At the same time, the continuing drought in West Texas has raised attendant concerns about drilling's competition with municipal and agricultural uses of quality groundwater. Water use in the state is enough of a priority that the Texas Senate last week approved a bill would draw \$2 billion from the state's Rainy Day Fund to create a water infrastructure bank to fund new reservoirs and water reuse projects.

"What's critical about this is, you can tell a customer he can reuse a lot of that water," said Greg Lanham, CEO at FTS. One of the company's Aquacor units can clean as much as 15,000 barrels of water a day, or 630,000 gallons, of the fracturing fluid that flows back out of the well after the job is completed

It doesn't have to be drinkable. It just needs enough of the salts, metals and other contaminants removed so it won't interfere with the chemistry of the chemical fluids used in the next fracturing job.

And it has to be done at a price producers are willing to pay.

More water service companies are betting they can do that and are gearing up to meet demand.

For example, Bosque Systems expects to double its payroll, from 250 to about 500, by year's end, CEO Clane Lacrosse says. The 7-year-old company moved its headquarters last year to Fort Worth from Johnson County.

Bosque only operates disposal wells in the Barnett Shale, but the walls of a conference room in its downtown offices are covered with maps of its operations in the other plays. The company started to expand its offerings in 2008 and can manage water from acquisition to treatment to disposal.

"We see that trend becoming bigger," said Marc Bellanger, the company's marketing manager.

FTS, formerly Frac Tech, has tested its Aquacor service in the Barnett Shale and expects to have three of the systems by year's end. Each unit includes three truck-mounted components.

Roanoke-based Fountain Quail Water Management, the busiest water recycler in the Barnett Shale, in February said it contracted to install two of its water treatment units in the Permian Basin. It said it expected the job to produce more than \$5 million a year initially.

That would represent a big boost for the company, which was hit hard by the collapse in natural gas prices after 2008, said Brent Halldorson, chief operating officer of Fountain Quail, which has about 40 employees. The company operates nine freshwater distilling units, like the ones it sent to West Texas, and one filtering unit, which produces clean saltwater.

Starting to flow

When the Barnett Shale served as the opening stage of the U.S. shale boom, water reuse was something of a novelty. Producers could acquire plenty of water at relatively low prices, and disposal wells provided a ready means of getting rid of the contaminated flowback.

Even now, as the field has matured, water reuse and recycling is the exception rather than the rule in the Barnett. According to a 2012 study by the Bureau of Economic Geology at the University of Texas at Austin, only about 5 percent of the total water used for hydraulic fracturing was recycled or reused in the field.

Halldorson said that sounds about right. While between 75 and 80 percent of the water that flows back out of a well can be recycled, he said, only about a third of fluid returns from Barnett wells. So new water will still be needed even when recycling.

"We expected it to become more prolific earlier, especially in Texas," Halldorson said. When his company got into the business nearly a decade ago, he said, "it was almost more like a pilot project" rather than a mainstream activity.

Cost remains a hurdle.

Jay Ewing, Devon Energy's longtime water use expert in the Barnett, told a Texas House committee hearing in February that the company's cost of recycling, while it varies by location, "is 50 to 75 percent more expensive than the alternatives."

The Barnett Shale isn't an outlier in the state. Recycled water as a percentage of total water use in oil and gas is low around the state, according to the 2012 Bureau of Economic Geology study. Recycled water's share ranges from zero in the Eagle Ford Shale in South Texas and the far western Permian Basin, to 2 percent around Midland and tops out at 20 percent in the Anadarko Basin, part of which is in the Texas Panhandle.

That's going to change, says Ross Craft, CEO of Fort Worth-based Approach Resources.

"The cost of water is huge" at the company's operations in Crockett County, south of Midland, Craft said. The company amassed 168,000 acres in the Wolfcamp formation and has sunk \$45 million just to handle its water needs as it develops the acreage.

That system includes its own wells and millions of gallons of storage capacity, all connected by miles of buried pipeline, eliminating the expense of trucking water.

Not using freshwater

Craft expects the money he has invested in new wells, storage and water treatment to pay off financially, as well as environmentally.

"Our drilling cost without the system is about \$6.3 million" per well, Craft said. When it's in place, it's about \$5.4 million."

"That's a lot of savings," he said. With Approach's plans to drill about 40 wells in the Wolfcamp in the next year, the payback time will be roughly a year. And Approach has an estimated 2,000 potential drilling locations on its acreage.

Part of the savings comes from using brackish water, rather than freshwater.

Brackish water has more salt in it than freshwater, but not as much as seawater.

Approach sank its own water wells into a brackish aquifer called the Santa Rosa. It treats that water to remove harmful compounds, like sulfates, injects chlorine to kill bacteria and uses that water for hydraulic fracturing. It then takes the flowback water, filters out most contaminants -- including oil, which can be collected and sold -- and mixes it with new brackish water for the next frac job.

"The main thing is, we're not using any freshwater," which in an environment like West Texas needs to be reserved for agriculture and municipal use, he said.

The water service companies are the ones that will be providing all that treatment, Craft said. He calls it "a good business to be in."

Some, like FTS and Omni, are just providing mobile treatment units. Others, like Bosque and Fountain Quail in partnership with another company, market "global" water management, from acquisition to treatment to disposal.

The Texas Railroad Commission in March made it easier for producers to contract with water service companies by eliminating the need for additional permits. It's an important measure, said John Tintera, former director of the Texas Railroad Commission and president of the Texas Water Recycling Association, a group that went into operation at the start of the year.

"It expedites recycling to move ahead," Tintera said. Otherwise, it could take weeks or months to get the necessary permits, he said.

Recycling "is growing, but nothing like an explosion," Tintera acknowledges. "It is not inexpensive. You can't do it out of your garage. But as demand picks up, we'll see more" new entrants into the business as recycling becomes an established part of oil field operations.

"Ten years from now, we'll be saying it saved the day," he said.

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