

SHALEDRIL® F Water-Based Fluid Proves Successful on Troublesome Fayetteville Shale

FAYETTEVILLE, ARKANSAS, USA

CHALLENGE

Replace oil-based fluids with a more effective water-based fluid to drill highly reactive Marrowian shale, which is prone to fracturing and delamination

SOLUTION

SHALEDRIL® F water-based system to provide inhibition against Marrowian shale

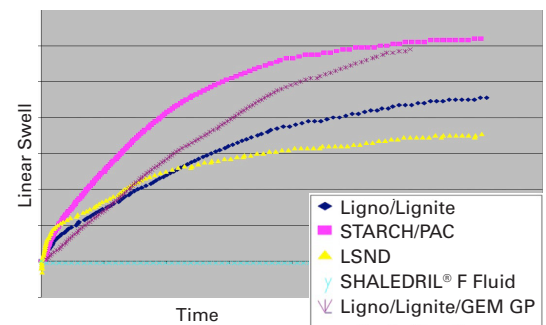
RESULTS

- » Minimized site remediation costs and other ancillary costs
- » Reduced per-barrel costs, along with costs related to cuttings processing
- » Avoided fees related to oil-based mud disposal
- » Decreased environmental concern from using a water-based fluid
- » Provided great lubricity values for horizontal drilling
- » Achieved average sliding ROP of 30–50 feet/hour (9–15 meters/hour) and rotating at 100–250 feet/hour (30–76 meters/hour), allowing well to be drilled more economically

OVERVIEW

The Marrowian shale that lies above the Fayetteville shale play in Arkansas is highly reactive and prone to fracturing and delamination. It is typically drilled with an oil-based fluid, which reduces the chance of swelling in this formation. The operator wanted to use a water-based fluid that would allow it to inhibit the clays in the shale and also to drill horizontally with a lubricity similar to that of an oil-based fluid while keeping costs down. One offset was drilled with a competitor's water-based fluid, but assistance was needed to run casing. The casing had to be pumped to the bottom, delaying the operation. Typically, a dispersed water-based system is used to drill wells on the Fayetteville shale formation, but this has shown inconsistent results in the region.

Linear Swell Meter (LSM) Findings on Upper Fayetteville Cuttings (3,800 Feet)



SOLUTION

In 2010, having customized a system specifically to address the unique drilling needs of the Fayetteville shale, the Halliburton team offered the SHALEDRIL® F water-based system as a solution. This fluid met the operator's criteria and was extremely successful in inhibiting the Marrowian shale. The fluid was tested on the operator's core samples and cutting samples, and proved to stand up well against the water-sensitive shale. The fluid has been used successfully on multiple wells in the field, having no issues while drilling and running casing.

RESULTS

The SHALEDRIL F system performed exceptionally well in all aspects of the drilling operations compared with the competition's similar product, permitting minimal site remediation and other ancillary costs. In addition to the decreased environmental concern from using a water-based fluid, the system provided great lubricity values for horizontal drilling. The average sliding rate of penetration (ROP) was 30–50 feet/hour (9–15 meters/hour) and rotating at 100–250 feet/hour (30–76 meters/hour), some points having even higher averages, allowing the well to be drilled more economically. Per-barrel costs were reduced, along with costs related to cuttings processing, and there were no fees from oil-based mud disposal.

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