

Location: New Mexico and Texas

# Wellbore sealant improves drilling conditions and wellbore stability

BaraSeal™-957 helps enhance integrity by stabilizing microfractures, lowering fluid loss and minimizing wellbore invasion of filtrate

## CHALLENGE(S)

- Deliver performance and cost effective solutions for problematic curve sections in the Delaware Basin's Wolfcamp Shale when using cut-brine fluids in lieu of traditional oil-based fluids.

## SOLUTION(S)

- Implemented BaraSeal™-957 wellbore sealant program. This solution stabilizes microfractures, lowers fluid loss, and minimizes wellbore invasion of filtrate at low concentrations.

## RESULTS

- Reduced time spent drilling curve section from over 44 hours to 19 hours.
- Improved wellbore conditions, which resulted in better tool face consistency and lower time drilling curve.
- Eliminated need for jarring during drilling and trips.



For years, operators have observed the consistency of the fluid properties, low fluid-loss penetration into the wellbore, and performance while drilling.

## Background

Oil-based drilling fluids are widely used in the Delaware Basin. For years, operators have observed the consistency of the fluid properties, low fluid-loss penetration into the wellbore, and performance while drilling. Saltwater flows are common, and the mud weight window doesn't allow for an increase in fluid density due to existing fracture gradients. These conditions present new challenges related to cost and performance with existing solutions. Halliburton Baroid developed and successfully implemented a new solution for this application.

## Challenge

The operator required the use of a modified, water-based fluid (cut-brine). This fluid strategy needed a low fluid-loss value. It also required wellbore stability



## CASE STUDY

for improved performance while drilling the curve sections of wells in the Wolfcamp Shale. The cost of a fully built, high-performance, and water-based fluid could not be justified for only the curve section. The presence of saltwater flows dampened the use of traditional oil-based fluids, and current mud weight windows did not allow for a higher density fluid. Drilling the section with a modified cut-brine fluid had its own challenges, such as low rate of penetration, high torque, and the possibility of stuck pipe. production casing. It was deemed critical to find a more efficient solution that would be simple to implement, and reliable in execution. Multiple vendors approached the operator with high-cost lubricant solutions that did not consider the “big-picture” well construction scenario.

### Solution

Baroid technical personnel combined offset data and product knowledge to design a solution that included the use of the wellbore sealant, BaraSeal™-957. The product consists of a proprietary, sub-micron polymer technology that rapidly stabilizes microfractures in shale formations. Using the wellbore sealant on a cut-brine fluid that was treated for fluid loss allowed for an ultra-low fluid loss system (API fluid loss test of <5 mL/30 min., with a thin/

pliable filter cake). The redesigned fluid strategy enabled the operator to drill the curve section of the test well with improved performance (reduced hang ups and torque, better tool face angle, and fewer hours to drill curve to landing point). The strategy also included additional benefits, such as the absence of jarring while drilling or tripping, and a smooth trip-out on elevators after reaching total depth.

BaraSeal™-957 saved the customer costs associated with product usage and valuable rig time.

The curve of the test well was drilled to the landing point in 19 hours with a final inclination of 81 degrees. The curve of the previous well, which had a near identical total vertical depth and directional profile, drilled to a final inclination of 60 degrees before limiting out because of well instability issues.

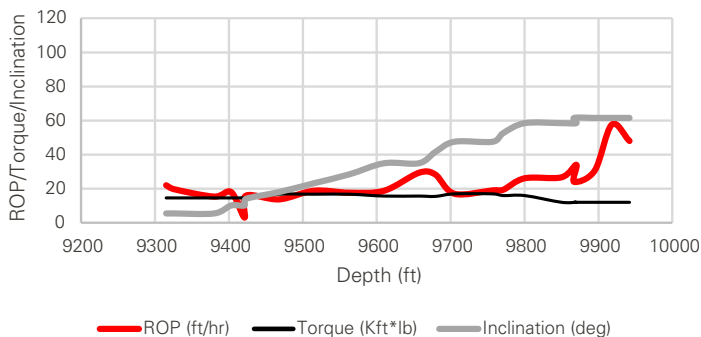
### Results

Operators added the wellbore sealant, BaraSeal™-957, into a pre-existing, cut-brine system, treated for water loss. This allowed the operator to drill the curve section of a Wolfcamp well 43% faster than the previous near identical hole section, with a 50% total cost reduction.

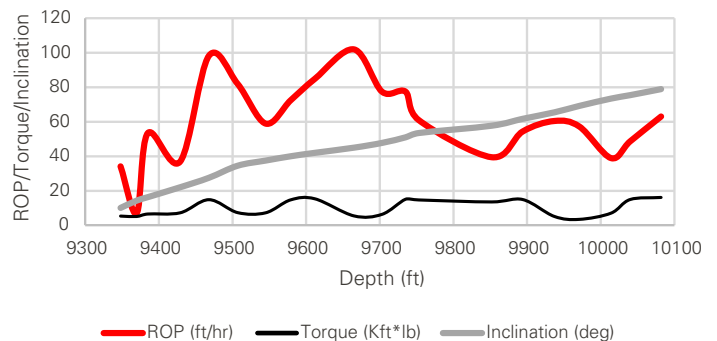
**Additional performance metrics along with viable cost savings are shown below.**

Metrics	Well A: No BaraSeal-957	Well B: Yes BaraSeal-957
Drill Time (hrs.)	44.25 hours	19 hours
Final Inclination (degrees)	60 degrees	81 degrees
Average Torque (Kft*lb.)	14.67 Kft*lb.	9.98 Kft*lb.
Average ROP (ft/hr.)	23.80 ft/hr.	60.50 ft/hr.

Offset Well Cut Brine WBM



Well Treated with BaraSeal™-957



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