

# Enhanced BaraShale™ Lite Fluid System Enables Operator to Avoid Lost Circulation and Drill Faster

## DIRECT EMULSION FLUID SYSTEM TOLERATES HIGH LEVELS OF HARDNESS, AND PREVENTS HIGH VISCOSITY AND FOAMING

PERMIAN BASIN, NEW MEXICO

### CHALLENGES

- » Achieve faster, more efficient drilling through a thick salt layer and underlying formations that are prone to lost circulation
- » Manage waterflow conditions caused by offset injector wells
- » Optimize fluid flow by mitigating mud-related problems (hardness, viscosity, foaming)

### SOLUTION

Leverage the accumulated knowledge of Baroid drilling experts, and pilot test the latest advancement in innovative fluid technology:

- » Updated version of the Halliburton BaraShale™ Lite water-based fluid system to improve drilling efficiency in high-salt, hard-water environments

### RESULTS

- » Maximized fluid performance by reducing downhole fluid losses and salt washout
- » Rolled through known waterflow zones without creating thick mud
- » Minimized downtime due to more efficient hole cleaning
- » Produced less waste volumes, thus lowering disposal/haul-off costs and handling hazards
- » Saved operator USD 100,00 in TCO per well, making this solution its new preferred method for drilling future wells

### OVERVIEW

An operator in New Mexico's Delaware Basin (part of the larger Permian Basin) sought a solution to drill faster, while keeping a low enough mud weight to avoid lost circulation without washing out the salt. This was an ideal opportunity to apply the newly updated BaraShale™ Lite direct emulsion fluid system, which is designed to keep full salt saturation with reduced density to help increase drilling efficiency.

**SAVED**  
**USD 100,000**  
IN TOTAL  
OPERATING COSTS  
**PER WELL**

### CHALLENGES

The operator required a more efficient way to drill through a thick salt layer embedded with anhydrite, which was quickly followed by a couple of weak formations prone to lost circulation. Another prevalent challenge while drilling this interval was water flow from offset injection wells, which often resulted in fluctuations in rheological properties and foaming.

### SOLUTION

The operator agreed to implement the enhanced formulation of the BaraShale Lite direct emulsion fluid system. This high-performance system contains a new proprietary emulsifier additive that tolerates hardness levels of 6,000–8,000 mg/liter, and it tightly combines the base fluid, which consists of brine to prevent salt washout, and oil to lighten the mud weight. The result is a fluid system that prevents lost circulation and washout, while minimizing dilution and waste volumes. It has also proved to be a more stable emulsion, showing no hydrocarbon separation even after several weeks. In fact, unlike other water-based fluids, this formulation can be reused across multiple wells. Finally, it helps support the stability of the wellbore itself to allow for extended casing depths in some areas.



*The BaraShale™ Lite direct emulsion fluid system is designed to prevent lost circulation and washout while minimizing dilution and waste volumes.*

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## **RESULTS**

Using the updated BaraShale Lite direct emulsion fluid system, the operator achieved better drilling with less time and expense needed to maintain optimal fluid properties. After bit trips to surface, the fluid properties remained completely stable. Due to continual water flows, system hardness levels exceeded the operational envelope for the original system/emulsifier. This improvement in efficiency, both operationally and economically, has influenced the operator's decision to continue using the new BaraShale Lite chemical formulation for its similar wells going forward.

Previous offset wells were drilled with conventional invert emulsion fluids. These systems provided excellent downhole performance, but also added costs due to downhole losses and ancillary waste costs on surface. The operator compared these programs to the direct emulsion fluid system and, in total cost of ownership (TCO), recognized savings of approximately USD 100,000 per well.

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