Perstorp
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TurboKlear™ effectively solves multiple drilling challenges in the powder river basin

Customized fluid design allowed drilling curve and lateral sections through bentonitic strata, numerous faults, diastrophic geomechanical intervals while maintaining wellbore stability and ultra-low Equivalent Circulating Density (ECD).

USA - Land

Challenge

- Ensure wellbore stability due to multiple mechanisms
- Provide optimal hole cleaning
- Significantly lower ECD avoided ballooning problems and losses
- High rotary torque in aggressive 3D curve and lateral intervals.
- Facilitate a thoroughly scoured wellbore immediately prior to cementing casing

Solution

- Perstorp/Reeve Energy Solutions engineered solution, TurboKlear™ brine providing:
- Optimal hole cleaning regardless of annular velocity
- Customized bridging/plugging blends to address seepage losses
- Virtually solids-free design while providing in-solution density to counteract wellbore pressures and geomechanically stressed intervals

Results

- Stable wellbore throughout operations
- Large reduction of ECD, in turn minimizing losses associated with previous high ECDs
- Elimination of potential OBM/SBM EHS issues to rig crew and environment
- Reduced drill pipe tube body wear and DBR rates
- Significant reduction in rig fuel consumption, shaker screen replacement, pump fluid end expendables

Overview

A prominent operator with ongoing drilling operations in the Powder River Basin in SE Wyoming needed to drill a 7 7/8" (200 mm) curve and lateral interval within the target reservoir, which had, on preceding wells, proven to be prone to wellbore instability, ballooning, and presented directional drilling challenges due to high rotary torque when drilled with oil-based mud.

Challenge

Both the curve and lateral sections featured potential for significant massive and interbedded highly reactive bentonitic intervals, numerous faults with significant throw, abnormal in-situ geomechanical forces, water-sensitive shales, ballooning and potential well control issues associated with excessive ECDs while drilling. Both multiple fault crossings and aggressive 3D curve wellbore placement added tortuosity to the designed well path, contributing to high rotary drilling torque.

Solution

Perstorp/Reeve Energy Solutions' engineered TurboKlear™ drilling brine provided the necessary array of fluid properties to successfully address all the wellbore stability mechanisms, ECD issues, and lubricity concerns.

Results

The TurboKlear™ fluid provided the excellent lubricity needed to drill the aggressive wellbore placement path with no wellbore stability issues, and to run production casing with no problems. Downhole losses were minimal throughout the drilling operation. Rig fuel consumption and standpipe pressure were lowered significantly, the solids control equipment performed very well in the ultra-low viscosity rheological environment, and shaker screen longevity was vastly improved.

Economic Value

Overall, the TurboKlear™ drilling brine wellbore environment minimized operational risk by reducing ECD and the associated ballooning difficulties seen with the earlier oil-based mud. This, in turn, eliminated the need for a standby kill fluid volume for tripping for drilling assembly changes or to run production casing. The operator also noted elimination of the rig crews' exposure to toxic elements in the previous oil-based mud formulations, lower rig housekeeping costs and labor expenditure, minimized spill impact, reduced waste volumes and haul-off expense.

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