Optimized ENVIROMUL™ Fluid and WellSET® Treatments Help Save Costs on Horizontal Monobore Well

EDSON FIELD, ALBERTA, CANADA

**CHALLENGES**

» Avoid lost circulation in the Belly River and Mannville Coal formations
» Provide effective hole cleaning in large-diameter wellbore
» Prepare for abnormal pressures in multiple zones

**SOLUTIONS**

» Apply WellSET® treatments to strengthen wellbore in potential loss zones
» Optimize ENVIROMUL™ NAF to ensure reliable hole cleaning without excessive downhole circulating pressures
» Perform DFG™ hydraulics modeling to adjust drilling parameters on the fly, per wellbore conditions

**RESULTS**

» Successfully drilled monobore and completed well within the operator’s budget and schedule
» Eliminated the intermediate casing string
» Saved three days of rig time on casing and cementing operations
» Reduced well construction costs by 34 percent compared to conventional offset wells

**ENVIROMUL FLUID AND WELLBORE STRENGTHENING DELIVER STABILITY**

The Baroid team proposed the ENVIROMUL™ non-aqueous fluid (NAF) system to help mitigate risks associated with wellbore stability and to provide good hole cleaning without exceeding downhole fracture gradients.

Drilling parameters and wellbore conditions were modeled daily, using Baroid’s Drilling Fluids Graphics (DFG™) hydraulics modeling software. This ensured that the drilling fluid properties were optimized for cuttings carrying capacity, and that downhole circulating pressures were maintained within pore pressure and fracture gradient margins. DFG modeling was also applied to optimize tripping and casing runs, allowing the driller to minimize surge and swab pressures.

To mitigate the risk of losses, a WellSET® lost circulation treatment strategy was prepared specifically for the well. The WellSET module identified the most effective lost circulation material (LCM) for strengthening the wellbore, and it also determined the optimal particle size distribution (PSD) for the LCM added to the system.
The ENVIROMUL™ NAF delivered on wellbore stability and effective hole cleaning.

SOLUTION ELIMINATES INTERMEDIATE CASING STRING, SAVING DAYS OF RIG TIME

The ENVIROMUL NAF delivered on wellbore stability and effective hole cleaning.

The WellSET treatments performed well in the Belly River and Mannville Coal sections, where losses were 40 percent lower than anticipated.

On offset wells, issues running casing had required that the casing string be pumped or forced to bottom. The Baroid team improved wellbore lubricity by treating the system with BAROFIBRE® natural cellulose LCM. The BAROFIBRE treatment minimized torque and drag, and helped prevent induced losses. The casing was run to bottom successfully on the first attempt, and the well was cemented with full returns to surface.

The well was drilled and completed within the operator’s planned days. Using the monobore design eliminated the need for an intermediate casing string, saving costs on tubulars and cement, and decreasing rig time by three days.

Average well construction cost on over 30 previous wells in the area was USD 2.8 million. The monobore well costs came in at USD 1.85 million, saving the operator USD 950,000.

The customized ENVIROMUL NAF formulation optimized WellSET treatments, and accurate modeling with DFG software provided Perpetual Oil Company with sound drilling practices for subsequent monobore wells.

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