

BAROLIFT® Sweeping Agent and DFG™ Modeling Software Help Save 10 Days, \$800K on Horizontal Well

WEST QURNA FIELD, SOUTHERN IRAQ

CHALLENGE

Provide effective hole cleaning to overcome backreaming and sidetracks encountered on offset wells.

SOLUTION

Engineered sweep program including BAROLIFT® sweeping agent and DFG™ modeling software to provide effective hole cleaning throughout the build and horizontal well sections

RESULTS

Engineered sweep program enables lower hole intervals to be drilled trouble-free:

- » Reached TD 10 days ahead of plan
- » Executed valuable logging operation in the reservoir
- » Set and cemented casing in both intervals with no issues
- » Overall, operator saved approximately USD 800,000

OFFSET WELLS SHOW HIGH RISK OF STUCK PIPE AND SIDETRACKING

An operator in Iraq's West Qurna field faced hole cleaning challenges in the 8-1/2-inch and 6-1/8-inch intervals, as the wellbore transitioned through the build section (40–60° angle) into the 1,250-meter (4,101-foot) horizontal step-out. This was the first horizontal well drilled by the operator in this area.

Drilling on offset wells had been delayed by frequent backreaming and sidetracking in the 8-1/2-inch section. There was a high risk of stuck pipe and loss of the well.

ENGINEERED SWEEP PROGRAM PROVIDES EFFECTIVE HOLE CLEANING

The maximum allowable mud density was closely restricted, so that pumping weighted sweeps was not an option. After applying the Baroid Technical Process to analyze potential challenges and solutions, the Baroid team recommended pumping pills built with BAROLIFT® sweeping agent to achieve effective hole cleaning. BAROLIFT sweeping agent, a synthetic fiber, increases the carrying capacity of fluids without significantly altering rheological properties. This would improve suspension while minimizing impact on equivalent circulating density (ECD).

Each 2-m³ pill was formulated with 0.15 ppb of BAROLIFT material. The sweep program was tailored to meet changing wellbore conditions, as shown below:

Normal ROP	One sweep pumped per stand (90 feet/27 meters)
High ROP (20–25 m/hr) Low ROP	One sweep pumped every 1/2 stand (45 and 90 feet/14 and 27 meters)

In addition to executing the sweep program, Baroid personnel monitored drilling parameters using Drilling Fluids Graphics (DFG™) hydraulics modeling software. Fluid properties and drilling parameters were optimized in real time to maintain effective cuttings removal efficiency. DFG modeling outputs were discussed with the operator, then used to adjust sweep frequency and to manage ECD.

This program was applied throughout the tangent and lateral hole sections. The mud exhibited good carrying capacity, and there were no backreaming delays during trips. The wellbore remained in good condition at all times, in contrast to the significant issues that had been experienced on offset wells.

DRILLING COMPLETED 10 DAYS AHEAD OF PLAN, SMOOTH LOGGING OPERATION

Using BAROLIFT sweeping agent and DFG modeling software, the operator was able to reach total depth (TD) 10 days ahead of plan, saving approximately USD 800,000. The logging operation was completed successfully, allowing the retrieval of essential information about this reservoir. The intermediate and production intervals (7-inch and 4-1/2-inch strings, respectively) were cased and cemented with no delays or problems.

**PROGRAM
SAVES**
10 DAYS
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= AND =
USD 800,000

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