



INNOVERT® Solution Enables Operator to Complete Long Lateral Section in Combo Well

OFFSHORE, UAE

CHALLENGE

Extend the horizontal reservoir section from 17,751 ft (5,411 meters) to 27,751 ft (8,459 meters), with a lateral section of 18,674 ft (5,692 meters):

- » Successfully drill and complete ambitiously long well trajectory
- » Complete operation in minimum amount of time
- » Maintain maximum reservoir productivity

SOLUTION

Baroid proposed the organophilic clay-free INNOVERT® non-aqueous reservoir drill-in fluid system, delivering several benefits:

- » Non-damaging, reservoir drill-in fluid
- » Low friction factor

RESULTS

- » INNOVERT fluid demonstrated a remarkably high stability when circulated again after 24 days of static conditions
- » Key rheological indicators remained stable throughout
- » Friction factors as low as 0.1–0.2 FF with a minimum of 0.05 FF
- » Fifty days of drilling operation were avoided, equating to approximately USD 12.5 million in savings for the operator

OVERVIEW

During well planning the customer decided to extend the well's horizontal reservoir section from 17,751 ft (5,411 meters) to 27,751 ft (8,459 meters), with a lateral section of 18,674 ft (5,692 meters). This operation was the first time the customer had combined two reservoir intervals, and it involved running and installing the longest liner section in the UAE at the time: 18,824 ft (5,738 meters) of a 6-5/8-inch slotted liner.

The operator challenged Baroid for a cost-effective solution that would enable the successful drilling and completion of such an ambitious well trajectory in a minimum amount of time while maintaining maximum reservoir productivity.

ORGANOPHILIC CLAY-FREE, OIL-BASED FLUID HELPS CUSTOMER REALIZE SIGNIFICANT OPERATIONAL EFFICIENCIES AND COST SAVINGS

Baroid implemented its Solution Creation process with extensive testing to customize a fluid solution that matched, and, in some properties, surpassed the customer-specified design targets. As a solution, Baroid proposed to use a high-performance, organophilic clay-free INNOVERT® non-aqueous reservoir drill-in fluid (RDF) to mitigate high torque and drag values due to the long lateral section. For nearly a decade, water-based fluids had been used to drill the reservoir section, using lubricants engineered to minimize friction; non-aqueous fluids had not been considered because of their low initial density and issues associated with stimulating the reservoir. For Baroid's INNOVERT RDF solution, calcium bromide (CaBr_2) was used as the internal phase to achieve the required density while retaining the fluids' low viscosity and fragile gel structure, thus minimizing the equivalent circulating density (ECD) during drilling.

Excessive friction factor for the well at depths higher than 25,000 ft (7,620 meters) was expected during the execution of the well. Simulations suggested friction would be lower using the INNOVERT solution and, in practice, this was confirmed: field observations indicated friction factors (FFs) as low as 0.1–0.2 FF with a minimum of 0.05 FF. Furthermore, no fluid treatment was necessary to maintain that lubricity beyond the physical properties of the system itself. The INNOVERT solution was the key to the successful running and installation of the liner without any torque or drag effects.

Operator Saves approximately 50 DAYS Drilling Time

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ECONOMIC VALUE CREATED

The customer estimated that 50 days of drilling operation were saved, which led to approximately USD 12.5 million in savings, without considering additional services. The actual cost for the INNOVERT RDF solution was also lower than estimated due to low fluid losses and minimal requirements for dilution and fluid treatment while drilling; these are very typical characteristics of INNOVERT systems. This RDF system was unique in that its only solids content consisted of the BARACARB® bridging agent. N-FLOW™ 325, a state-of-the-art delayed filter cake acid breaker, and a cleanup package were also used to maximize the return on investment.

Following this operation, the fluid was recovered and stored for re-use in the next well requiring minimal reconditioning and product treatment. This practice has allowed the customer further savings in subsequent well applications.

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