Egypt Operator Stops Severe Losses, Saving USD 100K

ENGINEERED BARALOCK®-666 LCM PILL HELPS REDUCE LOSS RATE BY 90 PERCENT IN HIGHLY FRACTURED LIMESTONE

ONSHORE EGYPT

OVERVIEW
An operator in Egypt planned to drill through the Eocene limestone formation in a Sudr field well; however, offset data indicated that severe downhole losses would be encountered while drilling the cavernous, fractured limestone formation.

OPERATOR EXPECTS SEVERE TO TOTAL LOSSES IN HIGHLY FRACTURED LIMESTONE
The impact of severe to total lost circulation was considered to be the highest risk for drilling operations in the Sudr field. Downhole losses typically ranged between 10,000 bbl and 20,000 bbl per well. About 4–5 days of non-productive time (NPT) was spent attempting to control losses. The resulting hydrostatic head reduction caused instability in the shale formation, along with well control issues. Attempts to cure losses with conventional lost circulation material (LCM) and cement plugs proved ineffective in the offset wells.

CUSTOMIZED PILL WITH BARALOCK-666 LCM RAPIDLY REDUCES LOSS RATE
Based on analysis of the limestone lithology and on previous remediation attempts, the Halliburton Baroid technical team engaged with the operator to develop a detailed lost circulation decision tree that would address specific well conditions.

The proposed treatment included a blend of specialized LCM supported by BaraLock®-666 engineered, supplemental material (in medium and coarse sizes). The BaraLock-666 supplement would help seal fractures up to 25,000 microns. As the actual size of the loss zone was unknown, the combination of BaraLock-666 medium and coarse grades helped ensure the highest probability of success. The pill formulation contained < 1.0 ppb of BaraLock-666 LCM supplement, and ≥ 20 ppb of multiple types of LCM with varying particle sizes. These included BAROFIBRE® cellulose LCM, BARACARB® ground marble, WALL-NUT® LCM and mica.

Using a bypass sub, Baroid field personnel spotted a 50-bbl LCM pill loaded with BaraLock-666 LCM on bottom. Partial returns were noted as the pill was being spotted across the thief zone. After a two-hour soak period, static losses dropped from 100 bbl/hr to 10 bbl/hr, and the dynamic loss rate dropped from 160 bbl/hr to 18 bbl/hr at a 250-gpm flow rate. The hole remained in good condition while running casing to bottom, and the cement job was performed successfully.

OPERATOR AVOIDS NPT AND CEMENT PLUGS, SAVING TIME AND MONEY
When severe losses were encountered, the engineered LCM pill quickly reduced the dynamic loss rate by approximately 90 percent. The operator saved about USD 100,000 by reducing remediation time by at least four days compared to offsets, preserving whole mud valued at USD 30,000 and eliminating cement plugs valued at USD 20,000, maximizing asset value.

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