MACRO STRENGTH† High Fluid Loss Squeeze Eliminates Losses, Strengthens Well in West Texas

CHALLENGES

Allow drilling operations to proceed by strengthening a weak intermediate casing shoe

Reduce or eliminate oil-based mud losses of >90 barrels per hour

Failed cement squeeze, ineffective LCM treatments

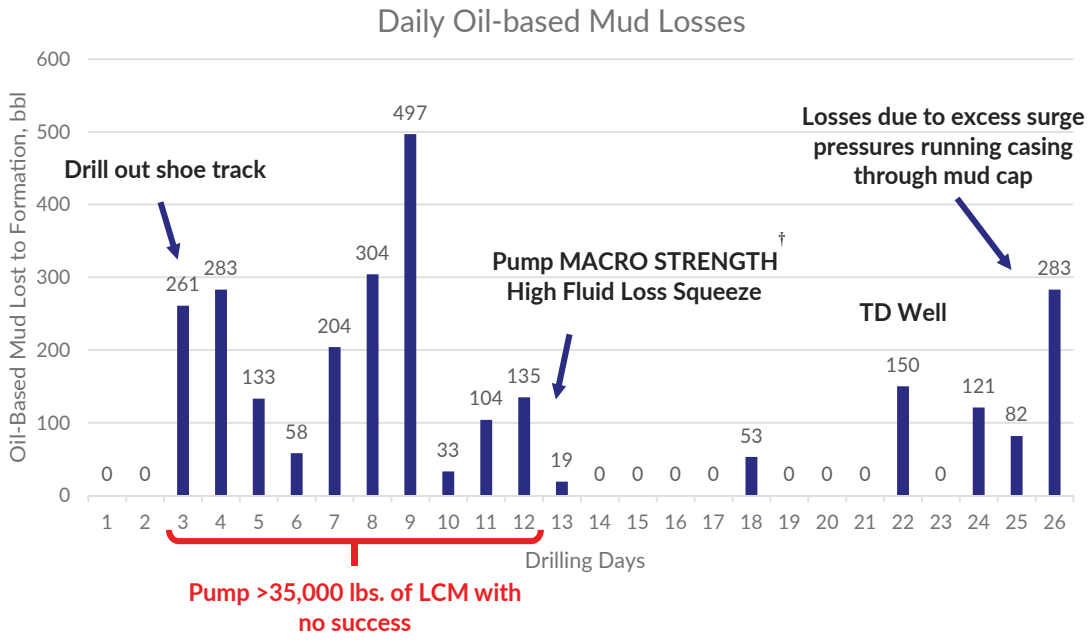
SOLUTION

Perform hesitation squeeze using MACRO STRENGTH at approximately 100 lb/bbl

Increase squeeze density to 13.0 lb/gal and pump as a balanced pill

RESULTS

- Established casing shoe integrity, allowing well to be drilled to TD
- Eliminated excessive OBM losses
- Successfully ran and cemented production casing
- Prevented sidetrack/well abandonment scenarios



OVERVIEW

After drilling out the shoe track, an operator in West Texas encountered a weak intermediate casing shoe ahead of drilling the lateral section with oil-based mud. Multiple pills containing as much as 100 lb/bbl of lost circulation material were unsuccessful in achieving the required formation integrity test pressure. A cement squeeze alleviated the issue, allowing drilling of the lateral section to commence. However, downhole losses as high as 90 barrels per hour persisted despite further aggressive LCM treatments.

As a last resort, a decision was made to pull the drilling BHA and pump a high fluid loss squeeze (HFLS) with a bullnose assembly. AES recommended MACRO STRENGTH, a HFLS pill to seal the loss zone. MACRO STRENGTH is an engineered, composite blend designed to strengthen the wellbore, sealing up to 5000 microns or greater.

2 x 100 bbl HFLS with MACRO STRENGTH were pumped, covering the loss zone at the shoe. Once on bottom with the drilling assembly, no further losses were observed, indicating a successful squeeze was performed. The improved casing shoe integrity allowed the well be drilled to TD, saving rig time, lowering operational costs, reducing costly oil-based mud losses, and ultimately avoiding sidetracking or well abandonment.

DETAILS

After more than 35,000 pounds of LCM was pumped and a cement squeeze proved ineffective, sidetracking or well abandonment scenarios were discussed. The decision to pump a HFLS as a last resort was made, and product was sent to location. A 100 barrel pill consisting of 90 lb/bbl MACRO STRENGTH and 30 lb/bbl Nut Plug M was blended in diesel base oil. The density of the HFLS was increased to 13.0 lb/gal with barite to improve likelihood of placement across the loss zone.

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DETAILS (continued)

Ten hesitation squeezes with MACRO STRENGTH resulted in the ability to hold 1026 psi. After tripping to bottom, no losses were observed with a 13.9 lb/gal equivalent mud weight (EMW) at the shoe. Downhole loss rates increased to 20 barrels per hour once full circulating rates were achieved (14.2 lb/gal EMW at shoe). A second HFLS with 100 lb/bbl of MACRO STRENGTH was pumped, eliminating losses and allowing the casing shoe to withstand pressures required to reach TD. While drilling ahead, sloughing shale dictated an increase in mud weight and extra pressure was applied with MPD to stabilize the wellbore. Hydraulic modeling indicated pressure at the shoe was approximately 13.7 lbm/gal while drilling to TD. Mud caps were placed in the vertical section while tripping out for wellbore stability.

The casing run saw surge pressures as high as 14.3 lb/gal at the shoe with only partial losses. No further losses were observed while circulating casing on bottom and cementing the well.

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