

Haynesville Operator Eliminates One String of Intermediate Casing, Saving \$500,000 Per Well Using STAR SHIELD® Technology

Location: Panola County, Texas

CHALLENGE:

- ▶ Saltwater Influx due to nearby injector wells
- ▶ Mechanically weak formations
- ▶ Narrow mud window limiting mud weights to 9.4 – 9.6 lb/gal
- ▶ Mud weights as high as 11.5 lb/gal needed to prevent saltwater influx

SOLUTION:

- ▶ 4 – 6 lb/bbl STAR SHIELD 100 and STAR SHIELD Wellbore Shielding technology added to the water-based drilling fluid and maintained in the circulating fluid system
- ▶ Larger fractures were remediated with STAR SHIELD 500 and STAR SHIELD 3000 mixed with conventional LCM to run in a sweep

RESULT:

- ▶ Saved an average of \$500,000 per well by eliminated the need to run an intermediate casing string
- ▶ Increased fracture initiation limits of Travis Peak and Cotton Valley formations by 1.0 – 1.5 lb/gal
- ▶ Permitted an increase in mud weight to 11.5 lb/gal without encountering significant losses in the Travis Peak and Cotton Valley formations
- ▶ Prevented saltwater influx while drilling through the Rodessa Formation
- ▶ Mitigated previously encountered wellbore instability events



PROBLEM

During the last decade, operators in the Haynesville Formation of East Texas and Northeast Louisiana have experienced a substantial increase in water flows while drilling. This increase in saltwater flow is due to nearby saltwater disposal wells injecting into the mechanically weak formations above the Haynesville Formation. This flow is known to occur in the intermediate hole section and through the challenging Rodessa Formation. The extended mud weights needed to prevent this water influx exceed the fracture gradient of the mechanically weak Travis Peak and Cotton Valley formations below. Frequently, the common solution has been to run two intermediate casing strings.

SOLUTION

The operator sought to reduce total well cost and eliminate one intermediate casing string. Working with Impact Fluid Solutions, the operator used the latest Wellbore Shielding® Technology, STAR SHIELD® 100, together with STAR SHIELD®, to extend the mud weight window 1.5 lb/gal beyond the anticipated fracture gradient. Using this new fluid technology to drill through these weak formations enabled the operator to drill with the higher mud weight needed to prevent saltwater influx without incurring problems in the lower pressured formations below. STAR SHIELD 100 and STAR SHIELD were used at low concentrations (4 – 6 lb/bbl) beginning at 5,500-ft depth and maintained in the fluid system while drilling through the Travis Peak and Cotton Valley formations to the intermediate casing point, thus eliminating the need to run the extra string of intermediate casing.

RESULT

The STAR SHIELD Wellbore Shielding technology has been used successfully on multiple wells in this area to prevent significant lost circulation and wellbore stability events while drilling with mud weights as high as 11.5 lb/gal through the Travis Peak and Cotton Valley formations. When a fracture larger than the sealing capabilities of STAR SHIELD 100 and STAR SHIELD was encountered, STAR SHIELD® 500 and STAR SHIELD® 3000 were pumped in conjunction with conventional lost circulation materials (LCM) in a sweep and returns were regained immediately. The Wellbore Shielding technology allowed the operator to eliminate the need to run the extra intermediate casing string on these wells therefore changing their drilling program from 4-string to 3-string well designs. To date, the operator saved three casing strings and over \$1.5 million in total well costs with the adoption of this technology.

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