

Establishing Wellbore Integrity While Achieving Cement to Surface in the Marcellus Shale Play

North America

CHALLENGE:

- ▶ Poor cement jobs
- ▶ Mechanically weak formation
- ▶ Maintaining wellbore stability and eliminating NPT
- ▶ Severe lost circulation events while drilling through the Marcellus Shale

SOLUTION:

- ▶ Incorporating 6 lb/bbl Star Shield® Wellbore Shielding® Technology to prevent OBM losses in the 8 ¾-in. lateral section.
- ▶ Impact Field Service Rep working with the field team to ensure proper product use
- ▶ Maintained mud weights of 11.5-11.7 ppg with no wellbore instability.

RESULT:

- ▶ Zero recorded NPT, complete wellbore stability
- ▶ Eliminated drilling fluid losses for the interval
- ▶ Successfully run the production casing
- ▶ Achieve full cement returns to surface



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OVERVIEW

This case study highlights a significant challenge faced by an operator drilling in the Marcellus Shale Play. The operator encountered severe oil-based mud (OBM) losses (~2,000 bbls) while drilling the 8 ¾-inch lateral section through the Marcellus formation on the previous two wells on this pad. The goal of this project was to minimize non-productive time (NPT), ensure optimal wellbore integrity, and prevent drilling fluid losses.

SOLUTION

Impact Fluid Solutions proposed the use of Star Shield® Wellbore Shielding Technology in the oil-based drilling fluid to address the challenges encountered while drilling through the mechanically fragile Marcellus Formation. The treatment plan involved introducing a modest concentration of Star Shield® at 6 pounds per barrel (lb/bbl) in the active system prior to drilling into the Marcellus Formation. This concentration was maintained as a background material in the active circulating system while drilling the curve and lateral sections to total depth. To ensure the treatment's effectiveness, an Impact Field Representative was on-site to oversee the treatment and provide ongoing hourly maintenance. This involved monitoring factors such as dilution, rate of penetration (ROP), solids control equipment (SCE), sand bed fluid invasion (SBT) results. Based on these assessments, the treatment plan was adjusted to optimize the drilling process.

RESULT

Impact Fluids' Wellbore Shielding Technology is used to increase the fracture initiation limits of mechanically weak formations by creating a low permeability barrier to limit fluid and pressure invasion at the fluid-rock interface. After facing severe OBM losses and costly hole instability events on the first two wells, the remaining two wells were drilled using Star Shield. This approach on these two wells resulted in reaching total depth (TD) while eliminating massive OBM losses experienced by the first two wells, and recording zero hours of NPT due to hole instability events. The 5 ½-inch production casing was successfully run to bottom and cemented. The operator was highly satisfied as full cement returns were observed at the surface, enhancing operational efficiency and eliminating the need for costly remedial cement jobs.