

BaraShield®-664 & BaraLock®-666 LCMs Help Cure Total Losses and Improve Cement Job in Known Thief Zone

FOX HILLS FORMATION, U.S. ROCKY MOUNTAINS

CHALLENGES

An operator needed to avoid lost circulation in its wells in the Fox Hills formation, which had a log history of total lost returns. The operator's issues included:

- » Difficulties in reaching planned casing point and in cementing casing string
- » Drilling delays and NPT
- » High fluid replacement costs

SOLUTION

Engineered BaraShield®-664 and BaraLock®-666 sweeps and LCM squeeze pills were used throughout the interval to seal and heal the wellbore.

RESULTS

The Baroid sweep and squeeze strategy saved the operator significant time and money by:

- » Cutting mud losses by 47 percent
- » Saving 1–2 days of rig time
- » Securing good primary cement job
- » Reducing NPT

TOTAL LOST RETURNS DELAY DRILLING, RUN UP MUD COSTS

The Fox Hills formation is well known for severe to total lost circulation. It is typically encountered in the intermediate interval and can hinder reaching the planned casing point, as well as compromise cementation of the casing string. Historically, losses range from 10,000–25,000 bbl of mud in this section. Attempts to stop the losses with third-party materials had failed.

On previous wells, the operator had drilled with no returns, suspending drilling activity at intervals to build enough fluid volume prior to resuming drilling. This accounted for up to two days of nonproductive time (NPT).

SWEEP AND SQUEEZE STRATEGY HELPS CONTROL LOSSES, IMPROVE CEMENTING

On the subject well, the Baroid field personnel worked closely with the operator to develop a strategy for reducing the severity of losses and NPT incurred while fighting those losses. They reviewed offset well data and collaborated with Baroid's global technology group to determine the best practices and LCM options for this specific set of conditions. This treatment protocol has been applied to subsequent wells with good success, reducing losses by 47 percent on average, as shown on the comparison graphs.

Sweeps formulated with BaraShield®-664 and BaraLock®-666.M and BaraLock-666.C LCMs were pumped at various intervals with pill concentrations ranging from 30 ppb to 120 ppb, depending on the severity of downhole losses. Hesitation squeezes were applied to ensure proper pill placement.

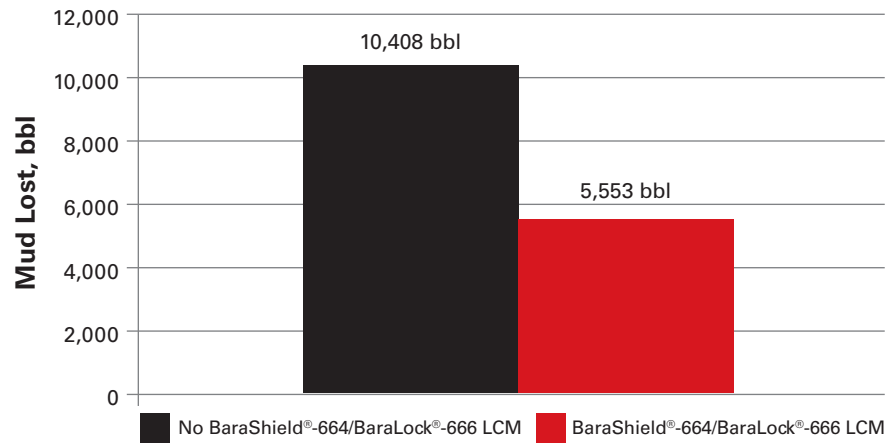
LCM SWEEPS REDUCE MUD COSTS BY HALF, SAVING OPERATOR SIGNIFICANT TIME AND MONEY

The sweep and squeeze protocol helped save 1–2 days of rig time, valued at USD 100,000–200,000. The operator also saved more than USD 400,000 on drilling fluid costs and significantly reduced downtime for LCM treatments. Cement reached higher in the annulus than on any previous well, helping to ensure good casing integrity and fewer workover interventions in the future.

BaraShield®-664 and BaraLock®-666 LCM sweeps reduce losses by 47% on average

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Comparison of Average Mud Volume Lost Per Well



Avg. Loss Volume Per Well: Competitor vs. Baroid

Competitor wells (black) lost 31,225 bbl total (10,408 bbl average). Baroid wells (red) lost 11,106 bbl total (5,553 bbl average).