AES DRILLING FLUIDS

EnerSEAL Case History

Five fewer drilling days per well: EnerSEAL† mixed metal hydroxide system accelerates client drilling program with fewer casing strings

CHALLENGES

- Drill the salt section and intermediate section together to lower drilling cost
- Limit washout of the salt
- Minimize losses above the production interval

SOLUTION

- EnerSEAL MMH system to control washout through a laminar flow regime
- Prevent losses to the formation using EnerSEAL properties to minimize fluid invasion

RESULTS

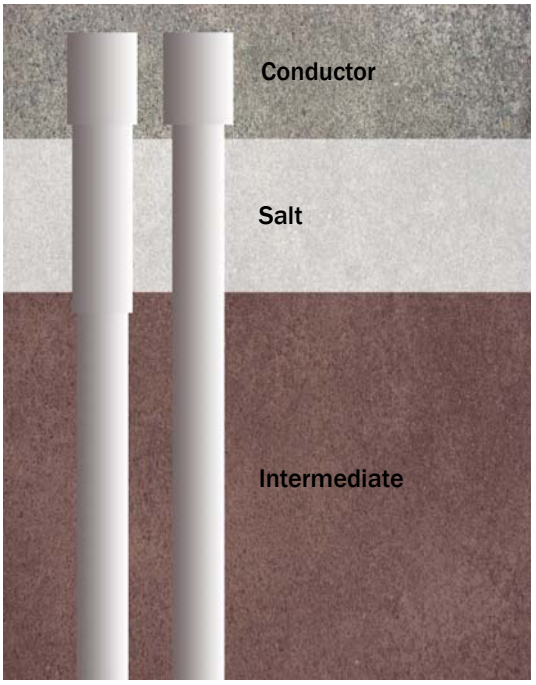
- 5 days saved by eliminating a separate casing interval
- Increased fracture gradient by 0.3 lbm/gal

Overview

As part of a campaign to lower drilling cost, a client sought to optimize every component of its drill program. A particularly costly and time-consuming step was drilling and casing an evaporite formation directly below the surface casing. Previous attempts to drill this section with the intermediate section resulted in substantial washout as the salt in the formation went into solution of the drilling fluid. The excess washout created issues cementing the section. A saturated brine inhibits washout, but its density exceeds the fracture gradient of the lower intermediate section.

AES recommended EnerSEAL to address both washout and the risk of losses. As a highly thixotropic fluid, EnerSEAL thickens at low shear, minimizing turbulence against the formation while circulating to reduce dissolution of salt. This same property minimizes losses. As EnerSEAL enters a fracture, it thickens, slowing movement of fluid away from the wellbore. In some applications this property resulted in an increased fracture gradient more than 0.3 lb/gal.

EnerSEAL enabled drilling both sections in a single run by minimizing losses at lower depths. The thixotropic nature of the EnerSEAL minimized turbulent flow at the wellbore wall, reducing washout through the salt.



EnerSEAL enabled drilling the salt layer and intermediate sections in a single casing run. The original design (above, left) required five extra days to drill as compared to the new casing design (above, right) after the introduction of EnerSEAL.

Details

For the new drilling strategy, the surface casing shoe was drilled out with field brine. The saturated field brine was used to drill through the salt section. The well was then displaced to EnerSEAL using a standard procedure to minimize interface.

Drilling continued with the EnerSEAL system, which allowed for mud weights as high as 10.3 lbm/gal without encountering losses. Typically losses initiate at 9.8 lbm/gal and higher.

Total depth was ~10,000' for the intermediate sections. Caliper logs demonstrated reduced washout in the salt zone. Casing was cemented using a two-stage program.

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