



AES DRILLING FLUIDS

CHALLENGES

- Slow rates of penetration
- Short bit life
- Long days on well
- Cost of using invert emulsion system

SOLUTION

- EnerCLEAR brine drilling fluid system to increase rate of penetration while mitigating corrosion
- Maximize fluid life through de-watering and optimized solids control setup

RESULTS

- Increased average rate of penetration by 63% versus invert emulsion system
- Extended bit life over 25%
- Reduced days to rig release by 38%

EnerCLEAR[†] brine drilling fluid system conquers the Montney shale

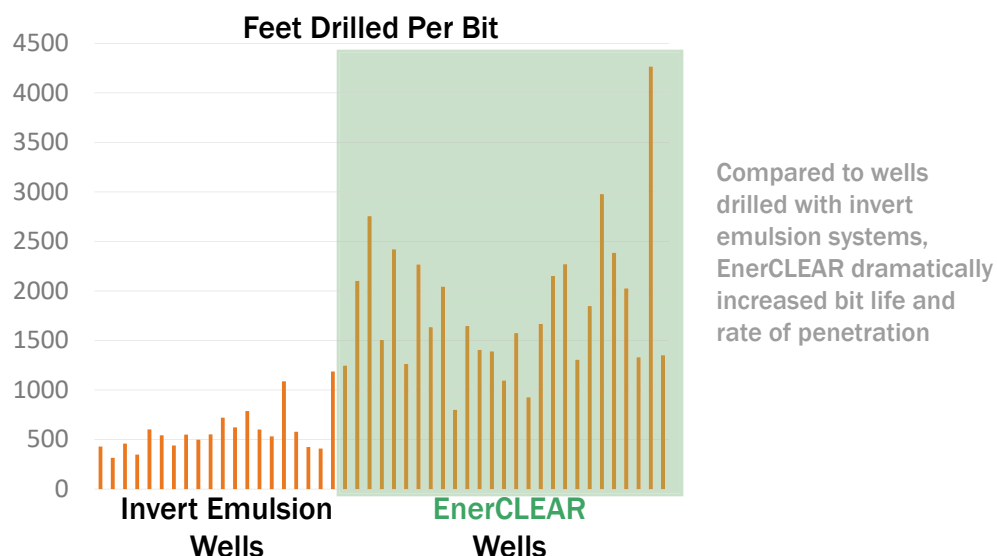
Overview

In the Montney shale, operators struggled with poor drilling rates and high costs. Shortened bit life and slow drilling resulted in wells requiring 40 to 65 days. Invert emulsion systems failed to provide the benefits to justify their cost.

Brine systems have the potential to improve drilling rates through osmotic inhibition of low activity shales, such as the Montney shale. A shortcoming of brine systems is their limited compatibility with critical corrosion control chemicals designed to prevent tool failures and preserve equipment life.

The EnerCLEAR system was designed for compatibility with common brines used for drilling, including calcium chloride and calcium ammonium nitrate. Patented corrosion control chemicals are designed to work with a number of cost-effective brines to control corrosion within acceptable levels.

The introduction of the EnerCLEAR brine drilling fluid transformed the economics of the Montney formation by increasing rate of penetration over 60%, with drilling days reduced nearly 40%.

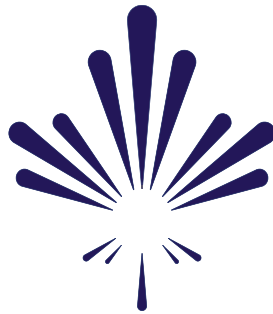


Details

EnerCLEAR systems were used for both vertical and horizontal sections in the drilling program. Densities ranged from ~9.2 lbm/gal to ~11.2 lbm/gal using predominantly calcium chloride brine. Horizontal length averaged 5,900' drilling 6 1/8" wellbores.

A comprehensive solids control program includes the use of EnerCLEAR flocculant additives for de-watering. Fine shaker screens and a dual centrifuge setup minimize chemical usage and dilution requirements.

Corrosion monitoring continues to confirm product performance and typical drilling days are now under 25 days from over 40.



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