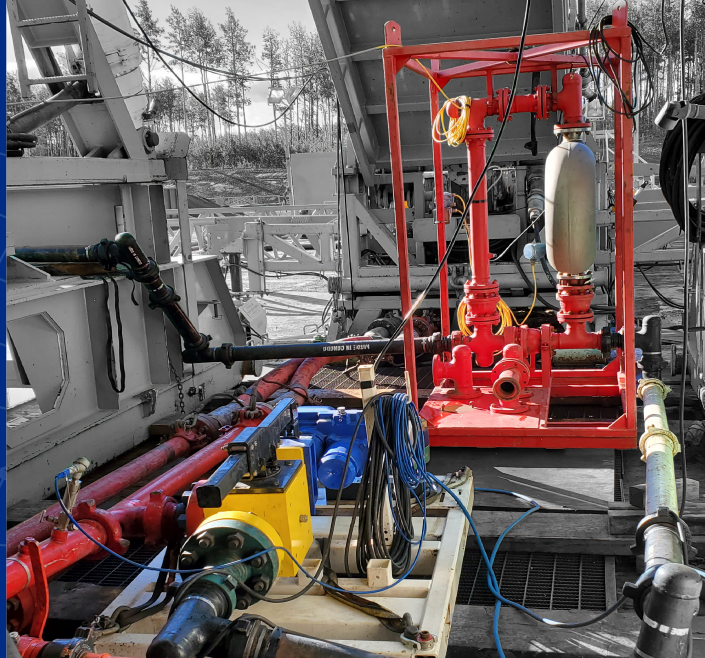




Case Study

Mud Weight On Demand™ (MWOD™) for Density and Cost Reduction



As a leading North American company proud of spearheading the design and manufacturing of our own equipment, we specialize in providing advanced Managed Pressure Drilling (MPD) and Underbalanced Drilling (UBD) services throughout Canada and the USA.

Challenge

- The Montney formation is an unconventional gas target, requiring multistage fracturing to expose full production pressure.
- Small, localized pressure fractures can lead to higher density requirements than may be required to drill the formation.

Solution

- Alpine Energy Services provided the Mud Weight On Demand™ (MWOD™) system to allow the operator to drill with lower densities while maintaining the ability to instantly increase downhole pressure.
- The MWOD™ system is scalable to match the MPD needs of the operator. It can be as simple as RCD, single choke, and control panel. The offering can be further enhanced to a fully automated system with flow meters, SMGS, carbon tracker and flare stake.

Results

- There was a reduction of 36% in drilling fluid cost for the lateral portion of the wells.
- Drilling fluid density was reduced from 1360 kg/m³ to 1290 kg/m³ over four wells. Further reductions in density are possible.

Advantages to MWOD™ / MPD on Location

There are many advantages to operators having a MPD offering on location such as:

1. The ability to instantly increase downhole pressure
2. Reduction of total solids content in drilling fluid
3. Kick detection by utilizing a closed loop system and Coriolis meter
4. Elimination of weight up mud system for drilled gas
5. Accurate determination of Pore Pressure at which point the formation will flow (Optimize drilling fluid selection)

Proven Results in the Montney with MWOD™

The MWOD offering was utilized initially on one pad. As the benefits were recognized a second and third pad were added.

1. Two Rigs in Montney Formation drilling in the Sunrise and Parkland fields.
2. 19 Wells drilled with MWOD on three pads.
3. Reduced MPD personnel to one supervisor on location and assisted by rig personnel.



More Results with MWOD™

1. User friendly and customizable HMI interface with a one connection mode set up in doghouse.
2. MWOD™ was used in with both OBM and CaCl₂ brine systems.
3. Lower solids in a drilling fluid will result in lower pump pressures and opportunity to increase flow rate.
4. Drilling Fluid Cost optimized by 36%

Comparing Conventional Well to MWOD Wells

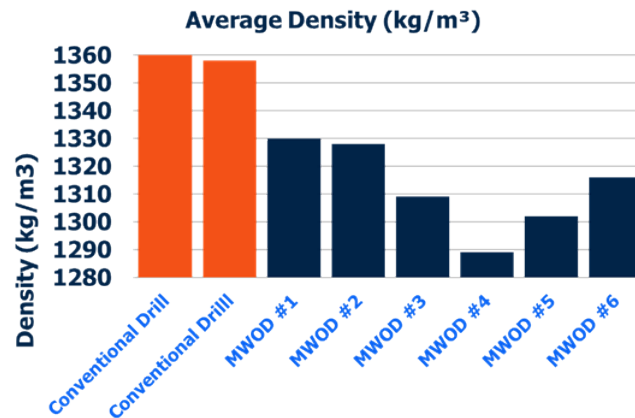


Figure 1: Comparing Density in Conventional Drilling to MWOD Drilling Fluid Densities

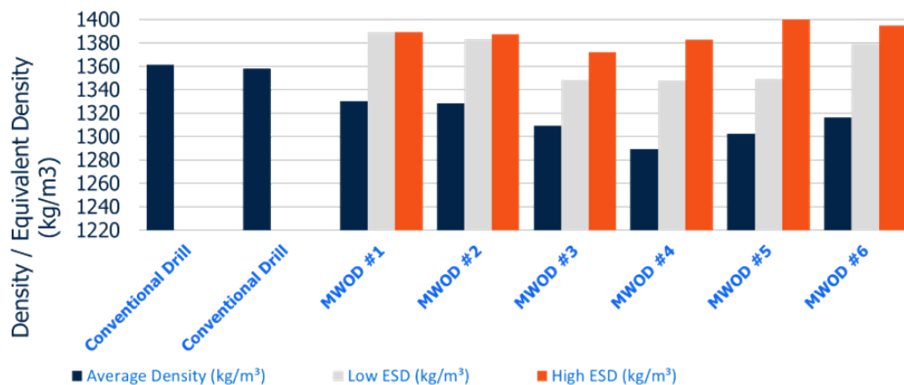


Figure 2: The downhole pressure on connections was the same or higher compared to wells drilled with higher densities and solids.

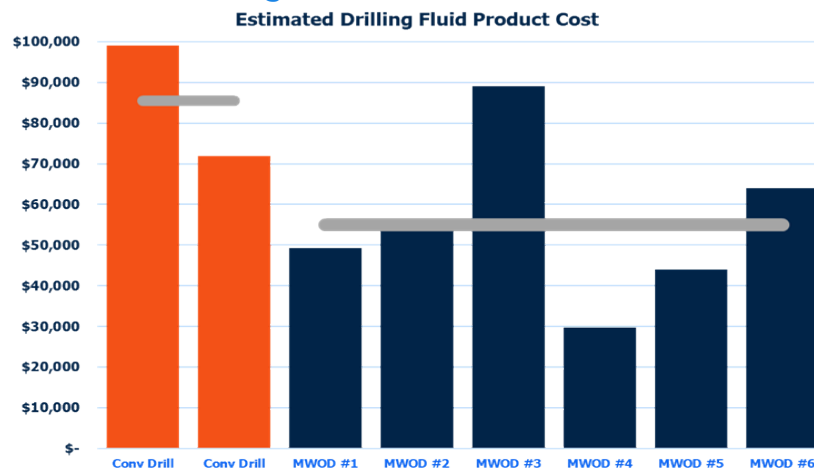


Figure 3: Average drilling fluid cost with conventional wells were estimated at \$85.5 K. Average drilling fluid cost with MWOD was estimated at \$55 K. MWOD wells had a reduction of 36% drilling fluid cost.