CalVisc™ Fracturing Fluid System vs. Slickwater Hybrid
*Montney Formation, Western Canadian Sedimentary Basin*

**OVERVIEW**

The CalVisc™ fluid system was introduced to the Montney in late 2015 as an alternative to the traditional slickwater/hybrid fluid systems. Being a high concentration friction reduced system, CalVisc provides many advantages over a dual fracturing system design including the elimination of the hybrid portion of a conventional Montney fracturing treatment. In the past, max proppant concentrations using slickwater treatments in the Montney have plateaued around 400 kg/m³. To achieve higher concentrations, a transition into a cross-linked borate system was used, effectively creating a hybrid style treatment. This transition allowed for 600-700 kg/m³ of proppant placement, but severely reduced treatment rates and added operational and logistical complexity. With the development of the CalVisc fracturing fluid system, a myriad of issues have been minimized or eliminated completely.

**CHALLENGE**

- Necessary use of a crosslinked system to achieve targeted proppant concentration; drastic reduction in rate results in only 3-5 tonnes/minute of proppant placement
- Extremely low shear limited proppant transportation using conventional slickwater systems; necessary use of a crosslink system to achieve effective fracturing length
- Operational complexity resulting from the need to transport and quality control a crosslinked system
- Dual fracturing systems result in additional heavy equipment on the road and more moving pieces and personnel on location
- Limited control on fracture geometry and reduced tonnage rates increase treatment time and water usage
- Water management complexity and cost resulting from using two fluid systems

**SOLUTION**

- CalVisc provides exceptional proppant carrying capacity at treatment rates and performs even better when near wellbore velocity has diminished in the fracture network
- CalVisc is a single system that can increase or decrease viscosity with a touch of a button; on-site quality control required for crosslinked systems is virtually eliminated
- A reduction in chemical additive complexity allows the fracturing operators to focus on the treatment at hand, reducing the risk of operational mistakes
- Ability to alter viscosity and fracture geometry on the fly coupled with extremely high proppant placement

**RESULTS**

- As a single system, CalVisc limited the equipment required on site
- CalVisc improved both the economics and environmental profile of the well by completing more quickly and using less water
- Additional heating of tanks was not required when pumping CalVisc
- CalVisc maintained slickwater rates and crosslink equivalent concentrations were placed, resulting in proppant placement of up to 10 tonnes/minute
- CalVisc requires less human intervention, reducing the risk of human error or injury
ILLUSTRATION OF RESULTS

Figure 1: Before CalVisc: Conventional Slickwater and Crosslink Hybrid Results

1. CalVisc maintains a high rate throughout the treatment which saves up to 20% in pumping time.

2. CalVisc provides superior safety and operational profile when the switch to the hybrid system is made.

3. CalVisc does not require a drop in sand concentration when the switch to the hybrid system is made.

4. CalVisc allows for the placement of high tonnage per minute (10T/minute vs. 4.5T/minute).

Figure 2: With CalVisc