CASE STUDY – DRILLING FLUIDS

Open your Drilling Window with BEST FG+

CHALLENGE

Many areas in the Western Canada Sedimentary Basin experience challenges brought on due to lower than ideal fracture gradients. This can be solved with additional casing strings or setting casing suboptimally. An example is in Deep Basin where many operators set intermediate casing vertically in the Cadotte/Harmon formations to isolate the upper hole formations from the higher pressures seen deeper. Unfortunately, this limits the lateral to oil-based drilling fluids as coals are left exposed in the build. By giving the operator flexibility to remove a casing string, or modify the formation in which it is set, real step changes in cost reduction and performance are seen.

SOLUTION

Beyond Energy worked in the lab to develop custom wellbore strengthening blends optimized for 250 µm and 3000 µm fractures. By optimizing ratios of fibrous and granular materials we achieved excellent results in slot plugging tests.

By working to block and seal fractures before they have the opportunity to propagate, lost circulation events are stopped before they can even begin. This effectively creates local areas of extremely low permeability over potential thief zones which provides the additional benefit of reducing the risk of differential sticking.

The package is designed such that 70% of the material passes through API 70 screens. This significantly reduces maintenance additions further reducing the cost to the operator. Additionally, it provides a stabilized background concentration which minimizes the required oversight to ensure performance.

Figure 1: BEST FG+ on the left, and BEST Blocker II on the right.

RESULTS

BEST FG+ has shown time and time again the ability to build an additional 300 kg/m³ on the fracture gradient. This has allowed Jupiter Resources to drop their intermediate casing down to the target formation isolating troublesome formations in the upper hole section.

It is seen in table 1 how significant downhole losses were avoided despite using fluids 200 – 300 kg/m³ denser than ever before. It was this success that reduced over 3 days from the total AF by enabling flocculated brine to be utilized in the lateral.

Table 1: Resthaven and Smoky wells drilled for Jupiter Resources

	Fluid Density [kg/m³]	BEST FG+ Applied?	Downhole Losses?
Well 1	1100 - 1140	No	Yes
Well 2	1060 - 1100	No	Yes
Well 3	1100 - 1205	No	Yes
Well 4	1190	Yes	No
Well 5	1290	Yes	No
Well 6	1270 - 1550	Yes	Yes
Well 7	1100 - 1540	Yes	No
Well 8	1100 - 1450	Yes	No
Well 9	1085 - 1450	Yes	No
Well 10	1080 - 1550	Yes	No
Well 11	1080 - 1490	Yes	No