



We recommend adding **MF-55** to the system in this particular area to minimize potential sloughing shale. **MF-55** is a non-ionic emulsion polymer that will chemically tie up water. This "taking on of water" effect has proven to significantly minimize fluid invasion. **MF-55** also has the ability to inhibit through encapsulation, or coating of the wellbore.

It is possible to encounter abnormal pressure in the **Atoka** formation. Drilling slightly under-balanced has proven successful at maximizing penetration rates; however, it may be necessary to increase the mud weight to **10.0-10.8 ppg** to control formation pressure. It may be possible to avoid increasing the weight of the entire system by spotting heavy pills on bottom for trips.

The Oxy- Moo Cow #1 located in Section 6, T-21-S, R-27-E took a kick at 10,100' while drilling with a 9.7 ppg fluid. This formation required 10.3 ppg to control while heavy seepage losses would be encountered at 10.6 ppg. At total depth, a heavy pill was spotted on bottom to control pressure while successfully logging the well. A detailed recap is included in this program.

REDUCED FORMATION DAMAGE WITH XC POLYMER

At 10,500', we recommend increasing the concentration of **XC Polymer** to 1 3/4 to 2 ppb to achieve low shear-rate viscosity (**LSRV**). This concentration of **XC Polymer** is necessary to accomplish the networking effect of the polymers. It is this networking effect of the **Zanthan Gum** polymer that gives it its unique ability to increase the **LSRV**.

By achieving elevated viscosities in the low shear region of the flow profile, lateral penetration of fluid into the formation is reduced. This will minimize damage to the **Morrow** formation caused by the migration of clays once the kaolinite booklets have been broken. Also, an additional benefit of reaching this flow profile is that hole cleaning is maximized.

LSRV is monitored by measuring the gel strength and the relaxation time of the fluid. Minimum gel strength values of 30 – 50 (.2 spring) and a relaxation measurement of 1 ½ to 3 minutes are essential to provide the proper flow profile. The "relaxation measurement" directly measures the **LSRV** of the fluid. The **Brookfield Reometer** is also used in the field to correlate with the relaxation measurement.

This fluid, adjusted as shown in the "**RECOMMENDED MUD PROPERTIES**" section, or as hole conditions dictate, should provide good hole conditions for any testing, logging and casing operations.