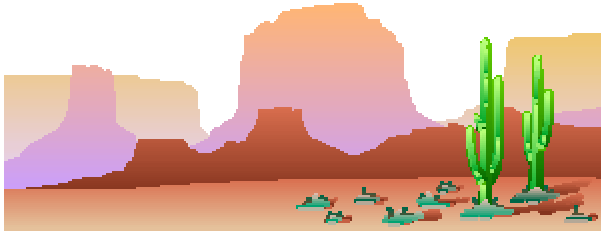


# TECHNICAL SERVICES NEWS LETTER

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## WHAT IS A DRILL-IN FLUID?

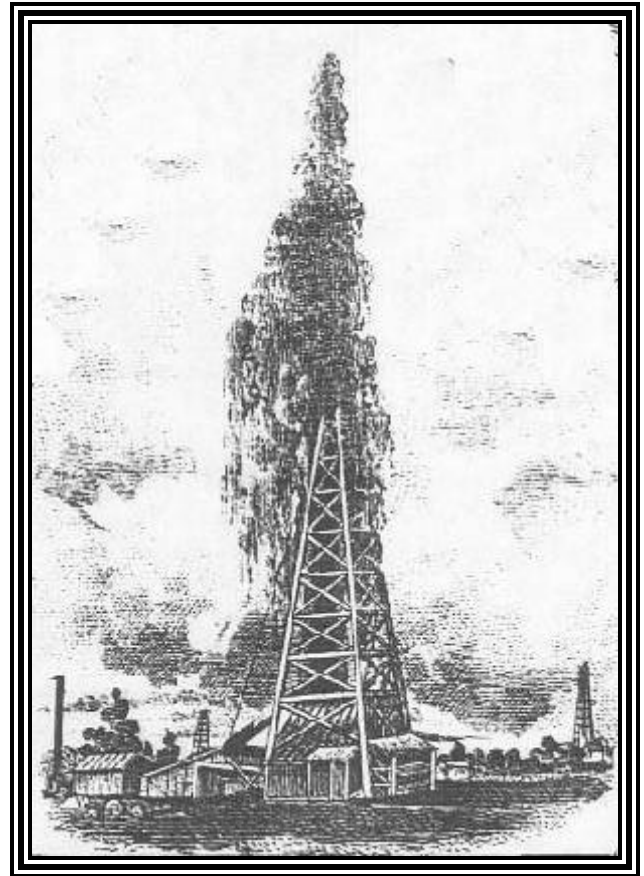
“A Drill-in fluid is a combination drilling fluid and completion fluid, specially formulated to maximize the productivity index of a producing well.”<sup>1</sup> The term “Drill-In Fluid” actually applies to any fluid that is used to drill a producing formation.

In the past, it was not unusual to do an open hole change over to an oil base mud just before drilling into the zone. This has been replaced with pilot holes, casing to the top of the zone, and change over to a clear drilling fluid for opening hole.

In horizontal wells, the zone is exposed to drilling fluid for a long period of time. In addition, completion options are limited because of the horizontal nature of the hole. For this reason most horizontal wells are drilled with specially formulated Drill-In fluids to minimize formation damage.

The most common Drill-In fluids used in California are Potash (KCl) based. The Potassium ion provides excellent inhibition at a reasonable cost and low density. Viscosity in vertical wells is usually derived from HEC due to the fact that it is naturally biodegradable.

Horizontal wells are usually drilled with



Xanthan Gum (Xanvis) fluid to provide high viscosity at low shear rates. This helps clean the horizontal section of the hole where the flow rate beside the pipe is lower than the average flow rate for the hole.

When loss of fluid to the hole becomes excessive, there are a number of options available. It is the very nature of plugging materials that they will be hard to remove from the formation. For this reason they should be avoided if at all possible.

Four types of plugging materials are available:

- C Water soluble such as sized salt in a saturated brine.
- C Acid soluble such as calcium carbonate products.
- C Oil soluble specialty products.

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<sup>1</sup>Toups, John et al, Drill-In Fluids, The American Oil & Gas Reporter, August 1997.

C Breakable polymers such as HEC and Xanvis.

Removing these materials involves first getting the breaking fluid to interact with the bridging material and second back flushing whatever residual material is present.

Washing a formation that has been plugged is difficult. The more powerful acids will eat their way in but also disturb the formation matrix and can cause problems greater than those caused by the bridging agents. The best alternative is the H-Break 100 type material where the breaker travels with the polymer and waits for the proper conditions to go to work.

Many of the solutions discussed in various papers depend on the formation pressures to force the bridging materials out. This is based largely on high pressure fractured chalk formations and may be totally irrelevant when talking about heavy oil in a dirty sand.