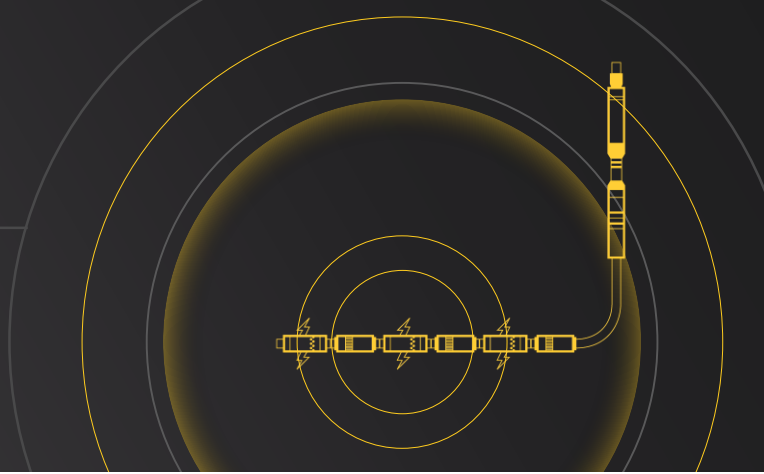


CASE STUDY

RECEDO™ DISSOLVABLE FRAC PLUG

Appropriate chemical interaction and unique slip design



Recedo™ Dissolvable Frac Plug improves operational efficiency by eliminating plug slippage, reducing cleanout time and cost, as well as the risk of plug presets in the Wolfcamp formation. An appropriate chemical interaction and unique slip design ensured flawless execution and brought production quickly and efficiently to the market.

OVERVIEW

Frontier Oil Tools collaborated with a major operator in the Permian Basin to develop a unique dissolvable plug solution for improving the efficiency in their operations utilizing high salinity frac fluid (produced water) and reducing plug preset, slippage, and lack of degradation.

The Recedo™ Dissolvable Plug was developed to meet the operator's requirements utilizing a proprietary degradable metallic alloy, minimal buttons, and no element; thereby significantly reducing the amount of non-dissolvable material left in your wellbore.

APPLICATION SPECIFICS

- Frontier's Recedo™ Dissolvable Frac Plug, Xcel Material
- 5-1/2" 20# P110 Casing
- 50 Stages
- All Plugs were Ball in Place
- Diamondback disposable setting tools were utilized on every stage
- Frac Fluid – Produced and Fresh Water
- BHT – 150 degrees

In Q1 of 2021, a fifty stage well utilizing the Recedo™ dissolvable frac plug was successfully deployed and stimulated for the operator in New Mexico, Wolfcamp formation. After the stimulation operation, the operator experienced a successful cleanout operation with no plugs tagged, thereby reducing cleanout time, minimal debris in well, and ultimately saving cost.

To ensure maximum success, Frontier Oil Tools partnered with this specific operator pre-frac to test the specific fluids that would be utilized and ensure that the Recedo™ plug material would be formulated to chemically interact appropriately. Slip design was also unique to help reduce the debris in the well and hold required frac pressure during stimulation. Operationally, Frontier engineers ensured that wireline personnel were trained to deploy the Recedo™ and were able to take over operations without a hand after the first couple of stages. The successful results allowed this operator to bring production quickly and efficiently to the market.



» CHALLENGE

- Zipper Frac with possible delays between stages due to transportation and frac equipment
- Recycled fluid was utilized, however the operator had to switch over to fresh fluid in the latter stages
- Client requires zero plug slippage
- Plugs must be compatible with Disposable Setting Tool

» SOLUTION

- Frontier Oil Tools performs a pre-frac material selection for every application utilizing the Recedo™ Dissolvable plug. This enables the plug to perform in different formation environments, withstand delays during frac due to zipper operations, and still hold pressure and degrade in a possible hybrid fluid condition.
- The Recedo™ plug incorporates a unique slip design and orientation which creates an anchor supporting the 10ksi pressure rating and thus eliminating slippage during the frac and reducing the amount of non-degradable material left in wellbore.
- The Recedo™ plug is versatile and compatible with industry widely utilized setting tools. Recedo™ plugs have been run with the Diamondback Disposable Setting Tool, Hunting T-Set One, and the standard Baker E-40. Available for both ball drop and ball-in-place applications.

» RESULTS

- Appropriate chemical interaction was ensured by pre-frac tests
- A unique slip design helped to reduce the debris and hold required frac pressure
- Wireline personnel was trained to deploy the Recedo™ without a hand
- Production brought on line quickly and efficiently

