

		
MicroPlug™ Case History		Pipe Recovery
Document Number	Approver Position	TENAX Energy Solutions BDM
McPPR000004	Approver Name	Lauren Mendenhall

Days stuck in well: 1 was 32,000lbs over the last known pulling weight.
Location: Dimmit / TX Both HydraShock and MicroPlug products were
Stuck Depth: 10,399' employed to remove the coiled tubing from the
TVD @ Stuck Depth: 7,102' wellbore.

Scope of Work:

Free coiled tubing stuck during a millout.

Treatment:

The TENAX technician began with 102 HydraShock ΔnBalls moving the CT to 10,356ft before integrating the MicroPlug PR system. This choice was made to utilize MicroPlugs based on the formational propensity to communicate and crossflow, which necessitated mechanical zonal isolation. A baseline rate of 7bbls/min was maintained at 3,400psi and the initial 15 MicroPlugs were dropped. With the tubing at neutral weight, operations were continued with 15 MicroPlugs per 25bbls fluid pumped. After 750 MicroPlugs, a pressure change allowed for HydraShock operations to be resumed. During this time 13 ΔnBalls were pumped. Next, N₂ with foamer was pumped down the annulus and the backside was surged. Then, 28 more ΔnBalls were deployed with at 90,000lbs (load cell reading) with the annulus open to flowback. Next, 400,000scf of N₂ was pumped down the annulus followed by a 2hr shutdown. Then, 7 "Yellow" ΔnBalls were dropped resulting in 72ft of uphole movement. Next, 500,000scf of N₂ was pumped down the annulus and the well shut in for 8 hours. The pipe started moving freely on ΔnBall 151, with four more "Yellows" gaining 80ft total uphole. The next 6 "White" ΔnBalls gave 846ft of downhole movement. After 6 more "White" ΔnBalls were extruded, the pipe was pulled out of the wellbore, only hanging up one more time during the trip. Isolating crossflow and/or thief zones with the MicroPlug PR, while using the HydraShock down the tubing represents the strongest available means of pipe recovery for extended reach wellbores.

Background:

Workstring: 2.625" / 0.224" - 0.175" wall / HT125
TENAX tools: 500 Series HydraShock / MicroPlug PR
Max Rate: 7bbls/min @ 3400psi

Perforation Information

Gun Info: 3.375" OD guns w/120° phasing
Shots: 6spf / 21g RDX charge
0.38" EHD / 40" Penetration
Perforations to BHA: 1520
Regimen: 15 MicroPlugs every 25bbls fluid
Completion Specifics:
➤ 5.5" 20lb P110
➤ 90° @ 7,260'
➤ PBTD @ 19,433'
➤ BHT - 220°
➤ BHP - 4,283psi

SITP: 2900psi

SICP: 2908psi

Immediate Concerns: Simultaneous frac ops dynamically changing wellbore conditions | 4% CT fatigue | 2nd time rescue operations performed for string

Initially, the operating company was milling out plugs after completing fracturing operations. After milling out plug 37/63, the coiled tubing became stuck at 10,419ft during a short trip. The max tension applied to the coiled tubing before calling out a TENAX tech