

**NPR 22A-3 596**

API: 5045239950000

Garfield County, CO

Location: Sec 3 T5S-96W

AFE #: 01-2018-766

Surface Csg Details: 9.625", 36.0#, J-55, Set at 2,990'

Prod Csg Details: 4.5", 11.60#, P-110, LTC

Orig KB Elev (ft): 8,361'

Gr Elev (ft): 8,331'

TD: 11,508'

PBTD: 11,428'

Top Of Marker Joint: 4,508'

**OBJECTIVE - Perform remedial cement squeeze and set patch prior to frac.**

**Procedure**

- 1 MIRU wireline unit (RMWS). Check production and surface casing pressures and record them.
- 2 RU 5k lubricator. PU and RIH with a one foot, 3-1/8" casing gun loaded with 4 SPF (4 shots total), 90 degree phased, 0.4" or larger hole. Correlate to top of the short joint at 4,508' using SLB cased hole logs dated 4-18-2019. Perforate four holes from 7,935'-36'. Monitor production and surface casing for influx or pressure changes after perforating. POH.  
  
RU flowlines to surface casing valve. Open surface casing to flowback tank. RU pump to 4-1/2" production casing valve, establish injection down the production casing and through the squeeze holes using clean produced water.
- 3 Closely monitor all volumes, pressures, and rate builds/drops and any fluctuations along with any/all signs of returns up Bradenhead. Document all pressures, rates, and note any circulation. Continue injecting fluid until a stabilized rate and pressure are obtained.
- 4 RIH with CICR on wireline and set at 7,835'. TOH. RDMO WLU.
- 5 MIRU WOU. Unload and tally 2-3/8", 4.7 ppf, L-80, EUE work string. ND frac valve. NU 5k BOP and pressure test. TIH with cement retainer stinger and 2-3/8" tubing. RU Power Swivel and Sting into CR, then sting out. Close annulus and test to 1,000 psig. Sting in and test tubing/casing annulus to 1,000 psig. Establish injection down tbg, into squeeze perms and record rates, pressure, and note circulation up surface casing.
- 6 MIRU BJ cementers. Establish circulation and pump as per the following schedule:
  - 40 bbls of spacer (Mud Flush)
  - 34.9 bbls of 13.5 ppg Class G Cement (1.5012 ft3/sk, 7.26 gals/sk, 130.4 sx)**\* See attached BJ Cementing Services proposal**
- 7 Displace tubing with 29.8 bbls of water, leaving 0.5 bbls in the tbg. Sting out of cement retainer, PU 30' and reverse circulate tbg clean. RDMO cementers. SDFN.  
  
TOH with 2-3/8" tubing. Make up 3-7/8" SB Tricone bit. RIH and tag cement retainer. RU Power Swivel, break circulation, and drill out CR and cement. Continue to RIH to 8,935'. Circulate well clean. TOH laying down with tbg. LD BHA. RDMO WOU.
- 9 RU WLU. RIH with CBL/CCL. Correlate to SLB cased hole logs dated 4-18-2019. Run CBL from 8,450 to 2,500'. Review CBL with Denver office. ( Est TOC ~ 7,435', Top of Ohio Creek ~ 7,896' )

***\*Casing Patch Procedure to follow to patch perf holes***