

## **BW Musser 21**

### **API 05-081-06229**

#### **Plugging Procedure**

1. Test deadman anchors and replace as needed.
2. MIRU a contract workover rig w/ pipe racks, mud pump, rig tank, and a 400 bbl upright tank. Fill the upright with fresh water. Move in and set one flow back tank and 200 bbl cement returns tank.
3. Lay return lines from flow back and rig tank to the wellhead. Blow well down if needed.
4. ND wellhead and NU 7-1/16", 5M hydraulically operated double gate BOP equipped w/ 2-3/8" pipe rams in the top gate and blind rams in the bottom gate. Function-test both the blind and pipe rams. Hook up pump line to the BOP.
5. Take receipt of 6200' 2-3/8" 4.7# L-80 work string tubing.
6. PU retrievable packer dressed for 4-1/2" 11.6# casing. PU single in hole with work-string tubing to 2500'.
7. Set the packer +/- 2500' and pressure test casing below to the CICR set @ 6,110' to 500# (CICR was set @ 6,110' WLM on 11-26-13). Attempt test above packer.
8. POOH SB tubing resetting the packer as needed to identify and isolate casing leak.
  - Note: Suspect casing leak ~ 2,385' – shiny wash spot found in 2013 when tubing was pulled from well.
9. POOH SB remaining tubing and LD packer.
10. PU Casper Oil Tools slick stinger for CICR. TIH w/ tubing from derrick. PU single in with remaining tubing to locate CICR set @ 6,110' WLM.
11. Establish circulation. Circulate hole volume with fresh water ~120 bbls. Wash and sting into CICR w/ stinger.
12. Establish injection rate thru CICR.
13. RU cementing services.

#### **Cement squeeze#1**

14. Mix and pump 75 sks (15.8 ppg slurry assume 1.15 yeild ) and squeeze 70 sks below CICR. Sting out and leave 5 sks above. POOH LD 3 joints to +/- 6015'.
15. HU and reverse out w/ 30 bbls fresh water.

#### **9.0# POZ SPACER #1 (6,015'-3,015').**

16. Mix and pump 9.0# balanced Poz-Gel spacer to place same from 6,015' up to 3,015' in 4-1/2" casing after tubing pull out. ~47 bbls ( Assume 9.94 yield)
17. POOH LD tubing to ~ 3015'. RU cementers.

### Balanced cement plug #1 (3,015- 2,685')

18. Mix and pump and lay in a 25 sk balanced cement plug (15.8 ppg - 330') leaving plug from 3,015'- up to 2,685' after tubing pull out.
19. POOH LD to ~ 2,685'. HU and reverse out w/ 15 bbls of fresh water.

### 9.0 # POZ SPACER #2 (2,685'- 2,385')

20. Assuming that casing leak was located near 2,385' (wash mark on tubing found on tubing in 2013) Mix and pump and lay in balanced 9.0 ppg Poz spacer from 2,685' up to 2,385' (~ 4 bbls)
21. POOH LD tubing to 2,330'. SB the remaining in derrick. LD stinger. MU MS CICR
22. TIH and set the CICR @ ~2,330' or 50' above located leak.
23. RU cementers and establish injection rate.

### Cement squeeze #2

24. Mix and pump 60 sks cement ( 15.8 ppg) Squeeze 50 sks below CICR, sting out and leave 10 sks above CICR (132') monitor 9-5/8" x 4-1/2" annulus for any sign of returns during squeeze. POOH LD to +/- 2,200'.
25. HU and reverse out w/15 bbls of fresh water.

### 9.0 # POZ SPACER #3 (2,200 – 365')

26. Mix, pump and lay in 9.0 ppg balanced Poz-spacer from 2,200' up to 365' after tubing pull out. ~29 bbls.
27. POOH LD all of the tubing.
28. RU WL contractor. RIH w/ 3-1/8" perf gun dressed 4 spf 90 deg. phased and perforate the casing 50' below 9-5/8" casing shoe @ ~365'. POOH RD WL.
29. Close the blind rams. With fresh water establish circulation by pumping down 4-1/2" casing and returning up 9-5/8" x 4-1/2" annulus. ~27 bbls hole volume.

### Surface cement plug.

30. With circulation established mix and pump 135 sks of 15.8 ppg cement surface to surface down 4-1/2" 11.6 # production casing and returning up the 9-5/8" x 4-1/2 annulus.
31. RDMO WOR and associated equipment.
32. Excavate from out around WH (cement at surface on outside of surface casing). Cut off and remove the WH 3' below GL. Top out cement in casing and annulus if needed.
33. Install regulation abandonment marker and obtain GPS coordinates for sub surface location. Cut off guy line anchors below GL.