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PW Government 2
API 05-081-06224

Plugging Procedure

1. Test dead man anchors if needed.
2. Move in workover rig, pipe racks, catwalk, rig pump, rig tank and flowback tank. Move in and spot a 400 bbl tank and fill with fresh water. Set in 200 bbl G&J tank for cement returns and wash up.
3. Blow down tubing and casing to rig tank.
4. Remove upper wellhead. Install a 7-1/16" 5000 psi hydraulically operated double gate BOP equipped with 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 a flow line from the BOP port to the rig tank.
5. Pick up and un-land tubing.
6. POOH, SLM & SB tubing.
7. Pick up and TIH w/ retrieving head to pull Casper Oil Tools "WLTC" RBP set @ 6705' on 8/4/15
8. Latch onto RBP while circulating conventionally. Release RBP.
9. POOH stand back tubing and LD plug.
10. PU a MSCICR dressed for 4-1/2" 11.6# N-80 casing.
11. TIH and set the CICR +/- 6,683'. Test tubing and valve in CICR. Shear out of CICR.
12. Circulate a hole volume w/ heated fresh water to remove any oil / paraffin from well bore and tubing. Sting back into CICR.
13. Rig up cementing services, establish injection rate.

Cement squeeze 1 (Ft. Union perforations 6,733'- 7,197') Assume 1.15 yield for all cement plugs.

14. Mix and pump 75 sks. Squeeze perforations w/ 70 sks (14bbls) below retainer. Sting out leaving 5 sks above (1 bbl).
15. POOH LD 3 joints to +/- 6,590'. HU and reverse out cement w/ water +/- 35 bbls.

Poz spacer #1 (6,583'). Assume 9.94 yield for 9.0 ppg Poz

16. Mix and pump balanced 9.0# Poz Gel spacer from 6,583' up to 5,925' ~ 10 bbls.

17. POOH LD tubing to 5,925'.

Cement plug #2 (Balanced plug across Ft. Union top)

18. Mix and lay in a 25 sk (5.12 bbls) balanced cement plug from 5,925' up to 5,595' (330' plug).
19. POOH LD tubing to +/- 5560'
20. HU and reverse out with fresh water +/- 30 bbls.

Poz spacer #2 (5,560')

21. Mix and pump balanced 9.0# Poz Gel spacer f/ 5,560' to 2,566' ~ 47 bbls.
22. POOH LD tubing to +/- 2,566'

Cement plug #3 (Balanced plug)

23. Mix and lay in a 25 sk (5.12 bbls) balanced cement plug from 2,566' up to 2,236' (330' plug).
24. POOH LD tubing to +/- 2,200'.
25. HU and reverse circulate w/ fresh water +/- 15 bbls.

Poz spacer #3 (2,200')

26. Mix and pump balanced 9.0# Poz Gel spacer f/ 2,200' to 1,300' ~ 14 bbls.
27. POOH LD tubing to +/-1,250'.
28. POOH SB remaining tubing in derrick.
29. RU wireline contractor and perforate the casing w/ 4 spf @ 90 degree phasing @ 1,350'.
30. MU a MSCICR dressed for 4-1/2", 11.6# casing. RIH and set CICR 100' above squeeze perfs @ 1,250'
31. RU cementers and establish an injection rate. Monitor 9-5/8" x 4-1/2" annulus for indication of circulation.

Cement plug #4 (Squeeze shallow water zone)

32. Mix and pump 50 sks (10.24 bbls). Squeeze 45 sks (9-1/4 bbls) below retainer and sting out and leave 5 sks (1 bbl) above.
33. POOH LD 3 joints to +/- 1,155'. HU and reverse out with +/- 10 bbls.

Poz Spacer #4 (1,155')

34. Mix and pump balanced 9.0# Poz Gel spacer 1,155' to 410' ~12 bbls
35. POOH LD remainder of tubing.

36. Close blind rams and attempt to circulate down 4-1/2" production casing taking returns up the 9-5/8"x 4-1/2" annulus. Hole capacity to 410' is 30 bbls. With circulation established proceed to Step 7.
    - Note: If unable to circulate surface to surface an additional cement retainer will need to be set @ +/- 280' and casing leak squeezed w/ 45 sks below retainer and (5 sks) 65' cement above retainer. Pump 9.0# Poz gel spacer 215' to surface. Pump 50' surface cement plugs inside 4-1/2" and in 9-5/8" x 4-1/2" annulus using 1" tubing after WH cut off.

Cement plug #5 (surface to surface)

37. With circulation established mix and pump 150 sks (30 bbls) cement pumping surface to surface down 4-1/2" casing and returns up 9-5/8" x 4-1/2" casing annulus.
38. ND BOPE, RDMO WOR. Excavate from out around casing head and cut off same 3' below GL, top off annular and annulus if needed and install sub-surface regulation abandonment marker plate and note location of well by GPS for future reference. Cover / backfill over the marker plate and cut off dead-man anchors 3' below GL.
39. Release surface rentals and transfer WH equipment to Westgate pipe yard and tubing to inspection or junk as decided by management. Check tubing and wellhead for NORM before transferring.