

## **PLUG AND ABANDONMENT PROCEDURE**

Engineer: Taj Brar (970-339-1088)

1. Call foreman or Lead Operator before rig up to isolate and remove automation and production equipment. Install fence if needed.
2. MIRU slickline services & VES. Pull bumper spring, tag bottom (Gyro ordered 1/15/2014). RDMO SL.
3. Provide notice to COGCC prior to MIRU per Form 6 COA.
4. Notify IOC when rig moves on location to generate work order for flowline removal and one call for line locates.
5. Prepare location for base beam rig.
6. MIRU WO rig. Kill well; circulate as necessary, with water containing biocide. ND wellhead. NU BOP's. Unseat landing joint and lay down.
7. Place cement services on will call when rig moves on location, providing expected volumes of cement needed. (~340sx for top plug; ~250 sx for SX/SH plug and 70 sx for NB/CD plug). See attached WBD for cement blends.
8. TOOH and stand back 2-3/8" TBG.
9. MIRU wireline services. RIH gauge ring for 4-1/2" casing to 8200'.
10. PU 4-1/2" CIBP and RIH on W/L to +/-8130'. Set CIBP.
11. Dump bail 2 sacks of cement on top of it.
12. PU 4-1/2" CIBP and RIH on wireline to 7680'. Set CIBP at 7680'. RDMO W/L.
13. RIH 2-3/8" TBG to 7680'. Hydrotest TBG to 3000 psi while RIH.
14. Initiate circulation using water containing biocide. Note rate and pressure.

15. MIRU cementing services. Pump 70 sx of G" w/ 20% silica flour, 0.4% CD-32, 0.4% ASA-301 and R-3 to achieve pump time (CD-32 is dispersant, ASA-301 is anti-settling agent and R-3 is retarder) mixed at 15.8 ppg and 1.38 cuft/sk.
16. PUH 24 stands. Circulate (TBG Vol + Excess) to CLR TBG. RD cementing services
17. Load hole and circulate with 9.0 ppg mud containing biocide.
18. P&SB 4560' of TBG (74 Stands). LD remainder.
19. RU wireline services. PU two 1' 3-1/8" perf guns loaded with 3 spf, 0.5" EHD, 120 phasing. Shoot 1' of squeeze holes at 4990' and 4500'. RD wireline.
20. PU 4-1/2" CICR and RIH on 2-3/8" TBG to 4560'. Set CICR
21. Initiate circulation through CICR using water containing biocide. Note rate and pressure.
22. MIRU cementing services. Preflush with 5 bbl of H2O; 20 bbl of sodium metasilicate; 5 bbl of H2O.
23. Pump 250 sacks of "G" w/ 0.25 pps cello flake , 0.4% CD-32, 0.4% ASA - 301, mixed at 15.8 ppg and 1.15 cuft/sk. Cement from 4990' to 4500'.
24. PUH 9 stands. Circulate (TBG Vol + Excess) to CLR TBG. RD cementing services.
25. Load hole and circulate with 9.0 ppg mud containing biocide.
26. P & SB 960' (16 stands) of TBG. LD remainder.
27. RU wireline services. PU two 1' 3-1/8" perf guns loaded with 3 spf, 0.5" EHD, 120 phasing. Shoot 1' of squeeze holes at 1650' and 900'. RD wireline.
28. PU 4-1/2" CICR and RIH on 2-3/8" TBG to 960'. Set CICR
29. Initiate circulation through CICR using water containing biocide. Note rate and pressure.
30. MIRU cementing services. Preflush with 20 bbl of sodium metasilicate.

31. Pump 340 sacks of Type III w/ cello flake and CaCl<sub>2</sub>, mixed at 14.0 ppg and 1.53 cuft/sk. Cement from 1650' to 100'.
32. PUH & circulate 9.0 PPG mud w/ biocide to clear TBG. TOOH. WOC 4 hrs
33. TIH and tag cement plug. If plug top is below 100', top as necessary.
34. MIRU wireline services. PU 4-1/2" CIBP and RIH to 100'. Set CIBP. Pressure test CIBP to 1000 psi for 15 minutes. If plug tests, RDMO wireline and WO rig
35. Wellsite supervisor turn all paper copies of cementing reports/invoices and logs in to Joleen Kramer. NOTE: During the job, wellsite supervisor should instruct the logging and cementing contractors to e-mail all logs, job reports/invoices to Joleen Kramer.
36. Have excavation contractor notify One-Call to clear for excavating around wellhead and flowline removal.
37. Excavate hole around surface casing of sufficient size and depth to allow welder to cut off 8-5/8" surface casing and at least 5' below ground level.
38. Have welder cut off 8-5/8" surface casing at least 5' below ground level.
39. MIRU ready cement mixer. Use 4,500 psi compressive strength redi-mix cement (sand and cement only, no gravel) Fill STUB. RDMO cement services.
40. Have welder spot weld steel marker plate on top of surface casing. (Note: marker shall be labeled with well name and number, legal location (¼ ¼ description) and API number.
41. Properly abandon flowlines as per Rule 1103.
42. Have excavation contractor back fill hole with native material. Clean up location and have leveled.
43. Submit Form 6 to COGCC. Provide "As Plugged" wellbore diagram identifying the specific plugging completed.