

PLUG AND ABANDONMENT PROCEDURE

Reynolds 2-23

1. Note: Production Casing = 4 1/2" OD, 11.6#/ft; Production Hole Drilled @ 7 7/8."
2. Provide 48 hr notice to COGCC prior to rig up per request on approved Form 6 (e.g. call field coordinator, submit Form 42, etc.). Call IOC (970-506-5980) at least 24 hr prior to rig move. Request they catch and remove plunger, isolate production equipment and remove any automation prior to rig MIRU.
3. MIRU slickline services. Pull bumper spring and tag bottom. RD slickline.
4. Prepare location for base beam equipped rig.
5. Check and record Bradenhead pressure. If Bradenhead valve is not accessible, re-plumb so that valve is above GL.
6. MIRU, kill as necessary using clean fresh water with biocide and circulate. ND WH. NU BOP. Unseat landing jt, LD.
7. Notify cementers to be on call. Provide volumes listed below:
 - 7.1 Niobrara Balanced Plug: 41 cu ft/ 30 sx "G" w/20% silica flour, 0.4% CD-32, 0.4% ASA-301 and R-3 to achieve 2:30 pump time, mixed at 15.8 ppg and 1.38 cuft/sk yield (400' inside 4-1/2" casing).
 - 7.2 SX Balanced Plug: 57 cu ft/ 50 sx class "G" w/ 0.4% CD-32, 0.4% ASA-301 mixed at 15.8 ppg and 1.15 cf/sx (600' inside 4-1/2" casing, no excess).
 - 7.3 Stub Plug: 146 cu ft/ 110 sx Type III CaCl₂ cement w/0.25 pps cello flake mixed at 14.8 ppg and 1.33 cf/sx (100' inside 4-1/2" csg, 105' in 9" OH + 40% excess, and 205' in 8-5/8" surface casing).
8. TOO H 2-3/8" OD production tubing. Stand back.
9. MIRU WL. RIH gauge ring for 4-1/2", 11.6#/ft casing to 7130'. POOH.
10. RIH CIBP w/ WL. Set at +/- 7070'. POOH. PT CIBP to 1000 psi for 15 minutes. Dump bail 2 sx class "G" cement on CIBP. POOH.
11. Run CBL from 3700' to Surface. Send results to Tyler.Davis@anadarko.com and Brent.Marchant@anadarko.com to verify that there is no cement above 1000'. RD WL. Note: it is important to get a good quality CBL. It may be necessary to TIH and circulate from 3800' to get gas out of the hole.
12. RIH 2-3/8" tbg while hydrotesting tbg to 3000 psi to 7070'.
13. RU Cementers. Pump Niobrara Balanced Plug: 41 cu ft/ 30 sx "G" w/20% silica flour, 0.4% CD-32, 0.4% ASA-301 and R-3 15.8 ppg and 1.38 cuft/sk yield (400' inside 4-1/2" Casing, no excess) to place cement from 7070' to 6670'.
14. PUH to ~6450'. Circulate 100 bbls water containing biocide to clear tubing. PUH and LD all but 4550' of tbg.
15. RU Cementers. Pump SX Balanced Plug: 57 cu ft/ 50 sx class "G" w/ 0.4% CD-32, 0.4% ASA-301 mixed at 15.8 ppg and 1.15 cf/sx (600' inside 4-1/2" casing) to place cement from 4550' to 3950'.
16. PUH to ~3750'. Circulate 60 bbls water containing biocide to clear tubing. WOC 4 hours.
17. Tag TOC at or above 3950' w/ 2-3/8" OD tubing. If plug is tagged deeper than 3950' contact engineering. Then, TOO H and LD all but 930' of tbg.
18. RU WL. Shoot off casing at or below 830'. RDMO WL. Circulate water containing biocide to remove any gas.
19. NDBOP, NDTH.
20. Install BOP on casing head with 4-1/2" pipe rams.
21. TOO H with 4-1/2" casing, LD.
22. RIH with 2-3/8" OD tubing to 930'.
23. RU Cementers. Pump 10 bbl SAPP with a minimum of 20 bbl fresh water spacer. Spot Stub Plug: 146 cu ft/ 110 sx Type III CaCl₂ cement w/0.25 pps cello flake mixed at 14.8 ppg and 1.33 cf/sx (100' in 4-1/2" prod casing, 105' in 9" OH + 40% excess, and 205' in 8-5/8" surface casing) from 930' to 520'.
24. PUH to ~300'. Circulate 5 bbls water containing biocide to clear tubing.

25. TOOH. WOC 4 hrs. Tag Cement. Cement top needs to be above 520'; Proceed assuming TOC is above 520'. Otherwise, call production engineer.
26. MIRU WL. RIH 8-5/8" CIBP to 80'. Set, PT to 1000 psi for 15 min. If tests, RDMO WL and WO rig.
27. Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries and invoices to rscDJVendors@anadarko.com within 24 hrs of the completion of the job.
28. Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
29. Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
30. Excavate hole around surface casing enough to allow welder to cut 8 5/8" casing minimum 5' below ground level.
31. Welder cut 8 5/8" casing minimum 5' below ground level.
32. MIRU ready cement mixer. Use 4500 psi compressive strength cement, (NO gravel) fill stubout.
33. Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
34. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
35. Properly abandon flowlines per Rule 1103.
36. Back fill hole with fill. Clean location, level.
37. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed. File electronic Form 42 once abandonment complete.