

PLUG AND ABANDONMENT PROCEDURE

Paul Jacobucci GU #1

1. Note: Production Casing = 4 1/2" OD, 10.5#/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 services.
4. Prepare location for base beam equipped rig. Install perimeter fence as needed.
5. Check and record Bradenhead pressure. If Bradenhead valve is not accessible, re-plumb so that valve is above GL.
6. MIRU, kill well 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 Suicide: 256 cu ft/ 150 sx 50/50 Poz "G" w/20% silica flour, 3% gel, 0.1% sodium metasilicate and 0.4% FL-52 Mixed at 13.5 ppg and 1.71 cuft/sk yield (250' inside 10" OH + 20% excess and 300' inside 4-1/2" casing).
 - 7.2 SX Balanced Plug: 34 cu ft/ 30 sx class "G" w/0.25 pps cello flake, 0.4% CD-32, 0.4% ASA-301 mixed at 15.8 ppg and 1.15 cf/sx (400' inside 4-1/2" csg).
 - 7.3 FH Suicide: 824 cu ft/ 620 sx Type III CaCl₂ cement w/0.25 pps cello flake mixed at 14.8 ppg and 1.33 cf/sx (720' inside 12" OH + 40% excess and 1520' inside 4-1/2" csg).
8. TOOH 2-3/8" production tubing. Stand back.
9. PU scraper and RIH to 8300'. TOOH and LD scraper.
10. RU WL. PU 4-1/2" CIBP and RIH w/WL. Set at +/- 8390'. Dump bail 2 sx class G cement. POOH.
11. PU 4-1/2" CIBP and RIH w/WL. Set at +/- 8250'. Dump bail 2 sx class G cement. POOH.
12. PU 4-1/2" CIBP and RIH w/WL. Set at +/- 7800'. Pressure test to 1000psi. Note: squeeze perfs at 5130' and 4500'. Dump bail 2 sx class G cmt. POOH
13. Run CBL from CIBP at 7800' to surface to verify cement. If CBL results differ from wellbore diagram, contact engineering. Squeeze intervals may be changed based on CBL. Note: it is important to get a good quality CBL. It may be necessary to circulate to surface in order to get gas out of the hole. If surface cement looks spotty, consider running CBL again under pressure.
14. PU 3-1/8" perf guns with 3 spf, 0.5" dia 120deg phasing. Shoot 1' of squeeze holes at 7290' and 6990'. RD WL.
15. PU and RIH w/CICR on 2-3/8" tubing while hydrotesting to 3000 psi and set CICR at approximately 7070'.
16. RU Cementers. Pump Niobrara Plug: 256 cu ft/ 150 sx of 50/50 Poz "G" w/20% silica flour, 3% gel, 0.1% sodium metasilicate and 0.4% FL-52 mixed at 13.5 ppg and 1.71 cuft/sk yield to place cement in production casing and annulus from 7290' to 7040'. Under displace and sting out of CICR to leave 3 bbls on top of retainer.
17. PUH to 6700'. Circulate 110 bbls water containing biocide to clear tubing. Then, PUH to 5070'.
18. RU Cementers. Pump SX Balanced Plug: 34 cu ft/ 30 sx class "G" w/ 0.4% CD-32, 0.4% ASA-301 mixed at 15.8 ppg and 1.15 cf/sk to place cement inside casing from 5070' to 4670'.
19. PUH to 4400'. Circulate 70 bbls water containing biocide to clear tubing. Then, TOOH.
20. RU WL. PU 3-1/8" perf guns with 3 spf, 0.5" dia 120deg phasing. Shoot 1' of squeeze holes at 1620' and 900'. RD WL.
21. PU tension set CICR on 2-3/8" tubing and set CICR at approximately 930'.

22. RU Cementers. Pump 10 bbl SAPP with a minimum of 20 bbl fresh water spacer. Pump FH Suicide: 824 cu ft/ 620 sx Type III CaCl₂ cement w/0.25 pps cello flake mixed at 14.8 ppg and 1.33 cf/sx from 1620' to 900'. Sting out of CICR and pump remaining 12 bbls on top of CICR (up to 100').
23. PUH to 100' and circulate 5 bbls water containing biocide to clear tubing and cement. Then TOO. H.
24. WOC 4 hrs. Tag Cement. Cement top needs to be at 100'; Proceed assuming TOC is at 100'. Otherwise, call production engineer.
25. MIRU WL. RIH 4-1/2" CIBP to 100'. Set, PT to 1000 psi for 15 min. If tests, RDMO WL and WO rig.
26. 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.
27. Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
28. Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
29. Excavate hole around surface casing enough to allow welder to cut 8 5/8" casing minimum 5' below ground level.
30. Welder cut 8 5/8" casing minimum 5' below ground level.
31. MIRU ready cement mixer. Use 4500 psi compressive strength cement, (NO gravel) fill stubout.
32. Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
33. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
34. Properly abandon flowlines per Rule 1103.
35. Back fill hole with fill. Clean location, level.
36. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed. File electronic Form 42 once abandonment complete.