

PLUG AND ABANDONMENT PROCEDURE

Graham E C #1

1. Note: Production Casing = 4 1/2" OD, 10.5-11.6#/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 and VES. Pull bumper spring and tag bottom. Run pressure bomb and obtain pressure gradient survey from surface to 8250' making gradient stops every 1000'. Run gyro survey from 8225' to surface with stops every 100'. Forward gyro survey and pressure gradient survey data to Sabrina Frantz and invoices to Sabrina Frantz. RDMO SL and VES.
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 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 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 Suicide: 725 cu ft/ 630 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 (910' in 11.25" OH + 20% excess. 910' inside 4 1/2" casing, no excess).
 - 7.3 Stub Plug: 558 cu ft/ 420 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, 488' inside 11.25" OH + 40% excess, and 202' inside 8-5/8" surface casing).
8. TOO H 2-3/8" production tubing. Stand back.
9. PU casing scraper and RIH with 2-3/8" tubing to 8200'. Then TOO H.
10. MIRU WL. RIH CIBP and set at +/- 8150. Pressure test CIBP to 1000 psi. Dump bail 2 sx class G cmt.
11. Run CBL from 8000' to surface to verify cement coverage. Note: It is important to get a good quality CBL. It may be necessary to circulate from just above CIBP to surface in order to get gas out of the hole. RD WL.
12. RIH to 7470' w/ 2-3/8" tubing while hydro testing to 3000 psi.
13. RU Cementers. Pump Niobrara 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) to place cement in production casing from 7470' to 7070'.
14. PUH to 6800'. Circulate 110 bbls water containing biocide to clear tubing. Then, TOO H and SB ~4500' of tbg.
15. RU WL. PU 3-1/8" perf guns with 3 spf, 0.5" dia 120deg phasing. Shoot 1' of squeeze holes at 5420' and 4510'. RD WL.
16. PU and RIH w/ CICR and 2-3/8" tubing and set CICR at approximately 4540'.
17. RU Cementers. Pump 5 bbl water w/biocide, 20 bbl Sodium Metasilicate, and another 5 bbl water spacer immediately preceding cement. Pump SX Suicide: 725 cu ft/ 630 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 to place suicide squeeze between perfs from 5420' to 4510'. Under displace and sting out of CICR to leave 3 bbls on top of retainer.
18. PUH to 4200'. Circulate 70 bbls water containing biocide to clear tubing. Then, TOO H.
19. RU WL. Shoot off casing at or below 1330'. RDMO WL. Circulate water containing biocide down casing and up annulus to remove any gas.
20. NDBOP, NDTH.

21. Install BOP on casing head with 4-1/2" pipe rams.
22. TOOH with 4-1/2" casing, LD.
23. RIH with 2-3/8 " tubing to 1430'.
24. RU Cementers. Pump 10 bbl SAPP with a minimum of 20 bbl fresh water spacer. Pump Stub Plug: 558 cu ft/ 420 sx
Type III CaCl₂ cement w/0.25 pps cello flake mixed at 14.8 ppg and 1.33 cf/sx from 1430' to 640'.
25. PUH to 300'. Circulate 20 bbls water containing biocide to clear cement.
26. TOOH. WOC 4 hrs. Tag Cement. Cement top needs to be at or above 640'; Proceed assuming TOC is at or above 640'. Otherwise, call production engineer.
27. MIRU WL. RIH 8-5/8" CIBP to 80'. Set, PT to 1000 psi for 15 min. If tests, RDMO WL and WO rig.
28. 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.
29. Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
30. Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
31. Excavate hole around surface casing enough to allow welder to cut 8 5/8" casing minimum 5' below ground level.
32. Welder cut 8 5/8" casing minimum 5' below ground level.
33. MIRU ready cement mixer. Use 4500 psi compressive strength cement, (NO gravel) fill stubout.
34. Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
35. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
36. Properly abandon flowlines per Rule 1103.
37. Back fill hole with fill. Clean location, level.
38. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed. File electronic Form 42 once abandonment complete.