

## PLUG AND ABANDONMENT PROCEDURE

### Strong P 21-7

1. Note: Production Casing = 2-7/8" OD, 8.7#/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 slick line services. Pull bumper spring and tag bottom. RDMO slick line 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 Balanced Plug: 34 cu ft/ 25 sx class G w/ 20% silica flour, 0.4% CD-32, 0.4% ASA-301 and R-3 mixed at 15.8 ppg and 1.38 cuft/sk (1050' inside 2-7/8" Casing, no excess)
  - 7.2 SX Wiper Plug: 701 cu ft/ 610 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 (1000' in 10-1/4" + 20% excess and 1000' in 2-7/8" casing, no excess).
  - 7.3 Stub Plug: 532 cu ft/ 400 sx Type III CaCl<sub>2</sub> cement w/0.25 pps cello flake mixed at 14.8 ppg and 1.33 cf/sx (438' in 10-1/4" OH + 40% excess, and 202' in 8 5/8" surface casing).
8. TOOH 1.66" OD production tubing. Stand Back.
9. MIRU Warrior WL. RIH gauge ring for 2-7/8" 6.5#/ft casing to 7050'. POOH.
10. RIH CIBP w/ WL. Set at +/- 6900'. Pressure test CIBP to 2500 psi. If PT passes, use 2-7/8" as WS for stub plug. RD WL.
11. Run gyro survey from 7060' to surface with stops every 100'. Forward gyro survey data and invoices to Sabrina Frantz.
12. Run CBL from CIBP at 6900' to surface to verify Sussex and surface 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.
13. RIH to 6900' with 1.66" OD tbg hydrotesting to 3000 psi. PUH ~5 ft off of CIBP.
14. RU Cementers. Pump Niobrara Balanced Plug: 34 cu ft/ 25 sx class G w/ 20% silica flour, 0.4% CD-32, 0.4% ASA-301 and R-3 mixed at 15.8 ppg and 1.38 cuft/sk to place cement in 2-7/8" production casing from 6900' to 6400'.
15. PUH to 6000'. Circulate 35 bbls water containing biocide. Then, TOOH laying down tbg.
16. MIRU WL. PU 2-1/8" 6 spf 0.42, 60deg phasing. Shoot 1' of squeeze holes at 4800'. RDMO WL.
17. RU Cementers. Pump 5 bbl water w/biocide, 20 bbl Sodium Metasilicate, and another 5 bbl spacer immediately preceding cement. Pump: 701 cu ft/ 610 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 squeeze cement into annulus and place in casing from 4800' to 3800'. Follow w/wiper plug and displace to 3800'. Shut well in to prevent flowback.
18. WOC 4 hours. RU WL. RIH w/sinker bars and tag TOC. Notify engineering if tag depth is deeper than 3800'.
  19. Shoot off casing at or below 930'. RDMO WL. PUH 5' and circulate water containing biocide to remove any gas.
  20. NDBOP, NDTH.
  21. Install BOP on casing head with 2-7/8" pipe rams.
  22. If PT to 2500 psi passed, proceed. If PT failed, TOO and hydrotest 2-7/8" to 3000 psi back in hole.
  23. RU Cementers. Pump Stub Plug: 532 cu ft/ 400 sx Type III CaCl<sub>2</sub> cement w/0.25 pps cello flake mixed at 14.8 ppg and 1.33 cf/sx from 930' to 180' (10-1/4" OH + 40% excess).
  24. PUH to 150'. Circulate 10 bbls water containing biocide to clear tubing.
  25. TOO. WOC 4 hrs. MIRU WL. Tag Cement. Cement top needs to be above 180'; Proceed assuming TOC is above 180'. Otherwise, call production engineer.
  26. 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. Properly abandon flowlines per Rule 1103.
  35. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
  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.