

## PLUG and ABANDONMENT PROCEDURE

### WADDLE 24-6L

#### Step Description of Work

1. Provide 48 hour notice to COGCC prior to rig up per request on approved Form 6 (e.g. call field coordinator, submit Form 42, etc.). Notify Automation Removal Group at least 24 hours prior to rig move. Request they catch and remove plunger, isolate production equipment, and remove any automation prior to rig MIRU.
2. MIRU slickline services. Pull bumper spring and tag bottom. Record tag depth in Open Wells. Well has a gyro from 8/26/2014. RD slickline.
3. Prepare location for base beam equipped rig. Install perimeter fence as needed.
4. Check and record bradenhead pressure. If bradenhead valve is not accessible, re-plumb so that valve is above GL. Blow down bradenhead and re-check pressure the next day. Repeat until pressure stays at 0 psi.
5. MIRU WO rig. Spot a min of 25 jts of 2.06" 3.25# J-55 tbg. Kill well as necessary using clean fresh water with biocide. ND WH. NU BOP. Unland tbg using unlanding joint and LD.
6. TOOH and SB 6970' 2.06" tbg. LD Remainder.
7. PU and RIH with (3.5", 7.7#) Bit and Scraper on 2.06" tbg to 6970'.TOOH.
8. RU WL. PU and RIH with (3.5", 7.7#) CIBP and set at +/- 6960' to abandon the Nio/Codell perms. TOOH. WL standby.
9. TIH with 2.06" tbg down to 2500' and circulate all gas out of the hole with biocide treated fresh water. Pressure test CIBP to 1000 psi for 15 minutes. TOOH and SB all 2.06" tbg.
10. Well does not have CBL. PU and RIH w/ CCL-GR-CBL-VDL. Run log from 6960' to surface and send results to engineering to discuss. TOOH. RDMO WL.
11. RIH with 2.06" tbg to 6960'.
12. RU cementers. Pump Niobrara Balance Plug: Pump 15 sxs (24 cf) 15.8 ppg & 1.55 cf/sk. Volume based on 400' inside 3.5" production casing. Cement will be from 6960' – 6560'. RD cementers.
13. Slowly pull out of the cement and PUH 6 jts. Reverse circulate tubing clean to ensure no cement is left in the tubing. TOOH and SB 4030' of 2.06" tubing. LD Remaining.
14. RU WL. PU and RIH with one 2-7/8" perf guns with 3 spf, min 0.5" EHD, 120° phasing. Shoot 2' of squeeze holes at 4430'. RD WL.
15. PU and RIH with (3.5", 7.7#) packer on 2.06" tbg down to 4030'. Set packer and establish injection with biocide treated fresh water into squeeze perms. Do not exceed 1000 psi while trying to establish injection. Attempt to circulate to surface with 100 bbls biocide treated fresh water.
16. TOOH. SB 1084" 2.06" tbg. LD packer and remaining tbg.
17. RU cementers. Pump Shannon/Sussex Squeeze: 10 bbls sodium silicate and 5 bbls fresh water followed by 195 sxs (230 cf) w/ Polyflake, 15.8 ppg & 1.18 cf/sk. Follow cement with a 3-1/2" wiper plug. Displace wiper plug down to 4000' with 37 bbls of biocide treated fresh water. Catch final displacement pressure and SI well overnight. NOTE: Do not exceed a pump pressure greater than 1000psi. Volume based on 430' inside 3-1/2" production casing, 430' in the 3-1/2" production casing annulus assuming 8" OH from the caliper log with 20% excess. RD cementers.
18. WOC per cement company recommendations. Relieve pressure.

Engineer: Sterling Metzger  
Cell: 330-605-2231

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19. RU WL. PU and RIH with 3.5" csg cutter, tag wiper plug with tbg (~4000). Note tag depth in OpenWells report. PUH to 984" cut csg.
20. Circulate with fresh water containing biocide to remove any gas.
21. Un-land casing using a casing spear, not a lifting sub. Max pull shall be 100,000#. If unable to unland, contact Engineering.
22. ND BOP. ND TH. Install BOP on casing head with 3.5" pipe rams.
23. TOOH and LD all 3.5" casing. Remove 3.5" pipe rams and install 2.06" pipe rams.
24. RIH with 2.06" tubing to 1084'.
25. Establish circulation with biocide treated fresh water and pump one hole volume (100 bbls). Pump 10 bbls (min) SAPP, followed by 5 bbls fresh water spacer.
26. RU Cementers. **Pump Stub Plug:** 240 sxs (279 cf) with 0.25 lb/sk Polyflake, 15.8 ppg & 1.16 cf/sk (100' in 3.5" production casing with no excess, 470' in 8" OH w/ 60% excess factor, and 200' in 8-5/8" surface casing with no excess). The plug will cover 1084' – 314' RD cementers.
27. Slowly pull out of the cement and PUH 6 jts. Reverse Circulate using biocide treated fresh water, to ensure the tubing is clean.
28. WOC per cement company recommendation. TIH and tag cement. Cement top needs to be at or above 464' (50' above the surface casing shoe at 514'). Call Engineering if tag is lower than 464'. PU and TOOH.
29. RU WL. RIH 8-5/8" CIBP to 80'. RDMO WL and WO rig.
30. Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries to [rscDJVendors@anadarko.com](mailto:rscDJVendors@anadarko.com) within 24 hours of completion of the job.
31. Supervisor submit paper copies of all invoices, logs, and reports to Evans Engineering Specialist.
32. Excavation crew to notify One Call to clear excavation area around wellhead and for flow lines.
33. Capping crew will set and secure night cap on 8 5/8" casing head, restrain the casing head, pressure test CIBP to 500 psi with hydrotest pump, then remove night cap and casing head restraints.
34. Excavate hole around surface casing enough to allow welder to cut casing a minimum 5' below ground level.
35. Welder cut casing minimum 5' below ground level.
36. Fill casing to surface using 4500 psi compressive strength cement (NO gravel).
37. Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
38. Obtain GPS location data as per COGCC Rule 215 and send to [rscDJVendors@anadarko.com](mailto:rscDJVendors@anadarko.com).
39. Properly abandon flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.
40. Back fill hole with fill. Clean location, and level.
41. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.