

## PLUG and ABANDONMENT PROCEDURE

Engineer: MICHAEL LEE

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### DODERO LOUIS A UNIT 1

#### 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. Arrange for 130 bbls of 9.0 mud to be used prior to the stub plug.
3. MIRU slickline services. Pull bumper spring and tag bottom. Record tag depth in Open Wells. RD slickline.
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. The last Form 17 test on 1/29/2014 recorded a Bradenhead pressure of 209 psi, blown down to 1 psi and no fluid was produced. Blow down bradenhead and re-check pressure the next day. Repeat until pressure stays at 0 psi. Contact Evans Engineering if pressure does not blow down to 0 and stay at 0.
6. MIRU WO rig. Spot a min of 25 jts of 2-3/8" 4.7# J-55 tbg. Kill well as necessary using clean fresh water with biocide. ND WH. NU BOP. Unseat landing joint, and LD.
7. Release PKR (6495') and TOO, SB all 2-3/8" tubing. LD PKR.
8. PU scraper and RIH to 7450' for 4-1/2" 11.6 lb/ft casing. TOO, SB 7275' tubing, and LD scraper.
9. MIRU Wireline. RIH to 7450' and dump 2sx cement on CIBP (7450'). TOO. RIH with 4-1/2" CIBP and set at +/- 7275' to abandon the Codell perms. TOO. RD wireline.
10. Fill hole with biocide treated water, circulate gas out of the hole, and pressure test CIBP to 1000 psi for 15 minutes. ***Monitor bradenhead pressure during test. Contact Evans Engineering if the bradenhead pressure is affected by the casing test.***
11. TIH with 2-3/8" tbg while hydrotesting tubing to 3000 psi to 7275'.
12. RU cementers. **Pump Niobrara plug:** 35 sxs (68 cf) Thermal 35 +0.5% CFR-2+0.25% FMC, mixed at 15.6 ppg & 1.51 cf/sk. The plug will cover 7275' to 6660'. Volume is based on 615' inside 4-1/2" production casing with no excess. RD cementers.
13. Slowly pull out of the cement and PUH to 6460'. Reverse circulate tubing clean to ensure no cement is left in the tubing. TOO and SB 4050' of 2-3/8" tubing.
14. RU WL. PU and RIH with two 3-1/8" perf guns with 3 spf, min 0.5" EHD, 120° phasing. Shoot 1' of squeeze holes at 4830' and 2' of squeeze holes at 4020'. RD WL.
15. PU CIRC (4-1/2" 10.5# K-55) and 2-3/8" tbg and RIH. Set CIRC at 4050' (Refer to Wireline's perforation run for collar locations). PT CIRC to 1000 psi for 15 minutes.
16. Establish circulation to surface with biocide treated fresh water.
17. RU Cementers. **Pump Sussex Squeeze:** Pump 5 bbls fresh water, 20 bbls sodium metasilicate and 5 bbls fresh water followed 670 sxs (862 cf) 1.1 'Poz:G' + 0.6% CFL-2 + 0.5% CFR + 0.6% SMS + 0.2% SPC-2 + 0.1% LTR mixed at 14.6 ppg & 1.12 cf/sk. Volume is based on 780' below the CIRC inside 4-1/2" production casing with no excess, 810' in the 4-1/2" annulus assuming 12" OH from the log with 20% excess and 42' on top of the CIRC to cover top perms. Underdisplace by 3 bbls. RD cementers.

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18. Slowly pull out of the cement and PUH to 3650'. Reverse circulate to ensure no cement is left in the tbg.
19. TOOH and SB 1050' 2-3/8" tbg, LD CICR stinger and the rest of tbg.
20. RU WL. RIH and cut 4-1/2" casing at 950'. RD WL.
21. Circulate with fresh water containing biocide to remove any gas.
22. Un-land casing. ND BOP. ND TH. Install BOP on casing head with 4-1/2" pipe rams.
23. TOOH and LD 950' of 4-1/2" casing. Remove 4-1/2" pipe rams and install 2-3/8" pipe rams.
24. RIH with 2-3/8" tubing to 1050'.
25. Establish circulation with biocide treated fresh water. Precede new mud with 10 bbl (min) SAPP followed by a 20 bbl fresh water spacer. Pump 9.0 ppg minimum mud and get bottoms up (circulation volume is ~130bbl). NOTE: Due to history of bradenhead pressure, it is very important to get all gas out of the hole prior to cementing.
26. **RU Cementers.** **Pump Stub Plug:** 480 sxs (645 cf) Type III + 0.3% CFL-3 + 0.3% CFR-2 + 0.25 lb/sk Polyflake, mixed at 14.8 ppg & 1.33 cf/sk (100' in 4-1/2" production casing with no excess, 505' in 12" OH from caliper with 40% excess, and 200' in 8-5/8" surface casing with no excess). The plug will cover 1050' - 245'. RD cementers.
27. Slowly pull out of the cement and PUH to 150'. Circulate using biocide treated fresh water, to ensure the tubing is clean and that TOC is no higher than 150' (a CIBP will be set at 80'). PUH to 60' and WOC.
28. WOC per cement company recommendation. Tag cement. Cement top needs to be at or above 345' (100' above the surface casing shoe at 445'). TOOH.
29. RU WL. RIH 8-5/8" CIBP to 80'. Set and pressure test to 1000 psi for 15 minutes. 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. Excavate hole around surface casing enough to allow welder to cut casing a minimum 5' below ground level.
34. Welder cut casing minimum 5' below ground level.
35. Fill casing to surface using 4500 psi compressive strength cement (NO gravel).
36. Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
37. Obtain GPS location data as per COGCC Rule 215 and send to [rscDJVendors@anadarko.com](mailto:rscDJVendors@anadarko.com).
38. Properly abandon flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.
39. Back fill hole with fill. Clean location, and level.
40. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.