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## PLUG and ABANDONMENT PROCEDURE

### SANDAU 24-34

#### Description

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. Pull production equipment and tag bottom. Record tag depth in Open Wells. Gyro was run on 01/05/15. RDMO Slickline.
3. Prepare location for base beam equipped rig. Install perimeter fence as needed.
4. Verify COAs before RU.
5. Upon RU, 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.
6. MIRU WO rig. Kill well as necessary using biocide treated fresh water. Verify BOP and wellhead rating, inspect for appropriate API standards, pressure test BOP according to VWP BOP testing guidelines. ND WH. NU BOP. Unland tbg using unlanding joint and LD.
7. TOOH and SB 6920' 2-3/8" tbg. LD any remainder.
8. PU and TIH with (4-1/2", 11.6#) Bit and Scraper on 2-3/8" tbg to 6920'. TOOH and SB 6910' of 2-3/8" tbg. LD Bit and Scraper and remaining tbg.
9. MIRU WL. PU and RIH with (4-1/2", 11.6#) CIBP and set at +/- 6910' (collars at 6884' & 6926'). POOH. RDMO WL.
10. TIH with 2-3/8" tbg to 6910'
11. Load hole with biocide treated fresh water and circulate all gas out of well. PT CIBP to 1000 psi for 15 minutes.
12. MIRU Cementers. Pump Niobrara Balance Plug: Pump 25 sx (6.9 bbl or 39 cf) Class G Cement, assuming 15.8 ppg & 1.53 cf/sk. Volume based on 400' inside 4-1/2", 11.6# production casing with no excess. Cement will be from 6910'-6510'. Collect wet and dry samples of cement to be left on rig. RDMO Cementers.
13. Pull out of cement at a rate of 1 jt/min. TOOH, SB 4050' 2-3/8" tbg. LD remaining tbg.
14. MIRU WL. RIH and jet cut 4-1/2", 11.6# casing at 2500'. RDMO WL.
15. Attempt to establish circulation and circulate (50 bbl) with fresh water containing biocide to remove any gas.
16. ND BOP. ND TH. Un-land casing using a casing spear, not a lifting sub. Rig max pull shall be 100,000#. Max pull over string weight shall be 50,000#. If unable to unland, contact Engineering.
17. Install BOP on casing head with 4-1/2", 11.6# pipe rams.
18. TOOH and LD all 4-1/2", 11.6# casing. Remove 4-1/2", 11.6# pipe rams and install 2-3/8" pipe rams.
19. TIH with mule shoe and 2-3/8" tubing to 4050'.
20. Establish circulation to surface with biocide treated fresh water and pump at least two hole-volumes (101 bbl) to circulate all gas out of the well. Contact engineering if evidence of gas migration persists.

21. MIRU Cementers. Pump Sussex Plug: Pump 10 sx (2.8 bbl or 16 cf), assuming 14 ppg & 1.55 cf/sk. Volume based on 178' inside 4-1/2", 11.6# production casing with no excess. Cement will be from 4050'-3872'.
22. Pull out of cement at a rate of 1 jt/min. TOOH to 2550', LD 2-3/8" tubing.
23. Pump Upper Peirre Plug: Pump 25 sx (7 bbl or 39 cf), assuming 14 ppg & 1.55 cf/sk. Volume based on 50' inside 4-1/2", 11.6# production casing with no excess. 50' in 7.875" bit size open hole with 100% excess factor. Cement will be from 2550'-2450'.
24. Pull out of cement at a rate of 1 jt/min. TOOH to 600', LD 2-3/8" tubing.
25. Pump Stub Plug: Pump 190 sx (52.5 bbl or 295 cf) Class G cement, assuming 14 ppg & 1.55 cf/sk. Volume is based on 213' in 7.875" bit size open hole with 100% excess factor. 387' in the 8-5/8", 24# surface casing with no excess. The plug is designed to cover 600'-0'. Verify and document cement to surface. Collect wet and dry samples of cement to be left on rig. RDMO Cementers. Notify engineering if circulation is ever lost during job.
26. Pull out of cement at a rate of 1 jt/min. TOOH, LD all 2-3/8" tbg. Tag cement as needed to verify cement to surface. RDMO WO rig.
27. Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries to rscDJVendors@anadarko.com within 24 hours of completion of the job.
28. Supervisor submit paper copies of all invoices, logs, and reports to VWP Engineering Specialist.
29. Excavation crew to notify One Call to clear excavation area around wellhead and for flow lines.
30. Excavate hole around surface casing enough to allow welder to cut casing a minimum 5' below ground level.
31. Welder cut casing minimum 5' below ground level.
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 flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.
35. Back fill hole with fill. Clean location, and level.
36. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.