

Engineer: Kaylie Milam  
Cell Phone Number: 816-536-9591

## PLUG and ABANDONMENT PROCEDURE

### HSR-BEALL 16-17

#### 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 11/22/11. RDMO Slickline.
3. Prepare location for base beam equipped rig. Install perimeter fence as needed.
4. COA: Verify Form 17 (State Bradenhead Test) has been run within 60 days of RU. If Form 17 required sampling, contact Engineering to verify plugging orders before beginning P&A operations.
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 BOP testing guidelines. ND WH. NU BOP. Unland tbg using unlanding joint and LD. Release packer set at 6815'.
7. TOOH and SB 7470' of 2-3/8" tbg. LD remaining 2-3/8" tbg and packer.
8. PU and TIH with (4-1/2", 11.6#) Bit and Scraper on 2-3/8" tbg to 7470'. TOOH and SB 7160' of 2-3/8" tbg. LD remaining tbg and Bit and Scraper.
9. MIRU WL. PU and RIH with (4-1/2", 11.6#) CIBP and set at +/- 7460' (collars at 7435' & 7490'). POOH. RIH and dump 2 sx cement on CIBP. POOH.
10. PU and RIH with (4-1/2", 11.6#) CIBP and set at +/- 7160' (collars at 7141' & 7182'). POOH. RDMO WL.
11. TIH with 2-3/8" tbg to 7160'
12. Load hole with biocide treated fresh water and circulate all gas out of well. PT CIBP to 1000 psi for 15 minutes. A good PT has less than 10% loss in pressure and stabilization at the end of the test. Test can be extended longer in time if need be. Contact Foreman or Engineer to confirm proceeding after pressure test.
13. 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 7160'-6760'. Collect wet and dry samples of cement to be left on rig. RDMO Cementers.
14. COA: Confirm and document static conditions in the well before placing the Sussex plug. If there is evidence of pressure or fluid migration at any time after placing the Niobrara plug, contact Engineering.
15. Pull out of cement at a rate of 1 jt/min. TOOH, SB 4238' 2-3/8" tbg. LD remaining tbg.
16. MIRU WL. PU and RIH with two 3-1/8" perf guns with 3 spf, min 0.5" EHD, 120° phasing. Shoot 2' of squeeze holes at 4578' and 4' of squeeze holes at 4178'. RDMO WL.
17. MIRU Hydrotesters. Hydrotest tubing on the way in to 6100 psi (80% of burst for 4.7#, J-55, EUE). PU and TIH with (4-1/2", 11.6#) packer on 2-3/8" tbg. Set packer at 4238'.

18. Establish circulation to surface with biocide treated fresh water, and pump 100 bbls to clean up hole. Max pump pressure is 972 psi with fresh water at 2 bpm. If unable to circulate at that pressure, contact engineer.
19. Release packer. TOOH, SB 2-3/8" tbg. LD packer.
20. PU and TIH with (4-1/2", 11.6#) CICR on 2-3/8" tbg. Set CICR at 4238'.
21. MIRU cements. Pump 10 bbls (min) of pre-flush, followed by 5 bbls fresh water spacer. Pump Sussex Squeeze: 110 sx (35.1 bbl or 197 cf), assuming 12 ppg & 1.79 cf/sk. Max pump pressure is to be 806 psi at 2 bpm with a full column of cement. Underdisplace by 3 bbls. Volume is based on 340' below the CICR inside 4-1/2", 11.6# production casing with no excess, 400' in the 4-1/2", 11.6# annulus assuming 7.875" bit size with 60% excess and 193' on top of the CICR to cover top perfs. Collect wet and dry samples of cement to be left on rig. RDMO Cements.
22. Pull out of cement at a rate of 1 jt/min. TOOH to 3545'. Reverse circulate to ensure no cement is left in the tbg.
23. TOOH and SB 750' of 2-3/8" tbg. LD stinger, and remaining tbg.
24. PU and TIH with mechanical cutter on 2-3/8" tbg. Cut 4-1/2", 11.6# casing at 700'. TOOH and LD cutter.
25. Attempt to establish circulation and circulate (53 bbl) with fresh water containing biocide to remove any gas.
26. 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.
27. Install BOP on casing head with 4-1/2", 11.6# pipe rams.
28. 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.
29. TIH with mule shoe on 2-3/8" tubing to 750'. Establish circulation to surface with biocide treated fresh water and pump at least two hole-volumes (108 bbl) to clean up wellbore.
30. COA: Verify and document that all pressure and fluid migration has been eliminated prior to placing the SC shoe plug at 750'. If there is evidence of pressure or fluid migration, contact Engineering.
31. MIRU cements. Pump 10 bbls (min) of pre-flush, followed by 5 bbls fresh water spacer. Pump Stub Plug: Pump 120 sx (33.2 bbl or 186 cf), assuming 14 ppg & 1.55 cf/sk. Volume is based on 50' in 4-1/2", 11.6# production casing with no excess. 154' in 7.875" bit size open hole with 100% excess factor. 201' in the 8-5/8", 24# surface casing with no excess. The plug is designed to cover 750'-345'. Collect wet and dry samples of cement to be left on rig. RDMO Cements. Notify engineering if circulation is ever lost during job.
32. COA: If cement was not circulated to surface, then WOC 4 hours. Tag TOC. TOC must be 496' or shallower. If tag is too deep or there is evidence of pressure or fluid migration, contact Engineering.
33. Pull out of cement at a rate of 1 jt/min. TOOH to 150'. Reverse circulate using biocide treated fresh water to ensure the tubing is clean. TOOH, SB 450' of 2-3/8" tbg, LD remaining. WOC.
34. TIH with mule shoe on 2-3/8" tbg and tag cement to verify appropriate coverage above the surface casing shoe. Pressure test casing to 500 psi and hold for 15 minutes. TOOH to 150', LD 2-3/8" tbg.
35. MIRU Cements. Pump Surface Plug: Pump 50 sx (10.3 bbl or 58 cf) Class G cement, assuming 15.8 ppg & 1.15 cf/sk. Volume based on 150' inside 8-5/8", 24# surface casing with no excess. Cement will be from 150' to surface. Verify and document cement to surface. Collect wet and dry samples of cement to be left on rig.
36. Pull out of cement at a rate of 1 jt/min. TOOH, LD all 2-3/8" tbg. PU and TIH with 16' of tbg subs. Top off cement to surface. Circulate clean. RDMO cements. TOOH and LD tbg subs. RDMO WO rig.

37. 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.
38. Supervisor submit paper copies of all invoices, logs, and reports to VWP Engineering Specialist.
39. Excavation crew to notify One Call to clear excavation area around wellhead and for flow lines.
40. Excavate hole around surface casing enough to allow welder to cut casing a minimum 5' below ground level.
41. Welder cut casing minimum 5' below ground level.
42. Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
43. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
44. Properly abandon flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.
45. Back fill hole with fill. Clean location, and level.
46. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.