

PLUG AND ABANDONMENT PROCEDURE

POWERS USX X 27-2

Step	Description of Work
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| 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 and pressure bomb services. Pull bumper spring, tag bottom, and run pressure bomb survey and obtain pressure gradient survey from surface to 7200' making gradient stops every 1000'. Forward pressure bomb results to Evans Engineering. RDMO pressure bomb services. MIRU VES and run gyro survey from 7200' to surface with stops every 100'. Forward gyro survey data and invoices to tech (currently Sabrina Frantz). RDMO slickline services and VES. |
| 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. The last Form 17 test on 11/04/2014 recorded a Bradenhead pressure of 1 psi, blown down 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. |
| 5. | MIRU WO rig. Kill well as necessary using clean fresh water with biocide. ND WH. NU BOP. Unseat landing joint, and LD. |
| 6. | TOOH, SB 6930' of 2-3/8" tubing. |
| 7. | MIRU Wireline. RIH with CIBP and set at 6930'. TOOH. RD wireline. |
| 8. | TIH with 2-3/8" tbg while hydrotesting tubing to 3000 psi to 6930'. |
| 9. | 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. |
| 10. | <u>RU cementers. Pump Niobrara plug:</u> 25 sxs (37.5 cf) Thermal 35 + 0.3% CFR-2 + 0.3% ASM-3, mixed at 15.6 ppg & 1.51 cf/sk. The plug will cover 6930' to 6500'. Volume is based on 430' inside 4-1/2" production casing with no excess. RD cementers. |
| 11. | Slowly pull out of the cement and PUH to 6300'. Reverse circulate tubing clean to ensure no cement is left in the tubing. TOOH to 5220'. |
| 12. | <u>RU Cementers. Pump Sussex Balance Plug:</u> 70 sxs (40 cf) 0:1:0 'G' + 0.5% CFR-2 + 0.2% FMC + 0.5% LWA mixed at 15.8 ppg & 1.15 cf/sk. Volume is based on 900' inside 4-1/2" production casing with no excess from 5220' - 4320'. RD cementers. |
| 13. | Slowly pull out of the cement and PUH to 4100'. Reverse circulate to ensure no cement is left in the tbg. WOC for a minimum of 4hrs or per cement company recommendations. |
| 14. | TIH and tag TOC with tbg. TOC must be 4320' or higher. If not, call Evans Engineering. Note tag depth in report. TOOH, SB 1480' of tbg and LD the remainder. |
| 15. | RU WL. RIH and cut 4-1/2" casing at 1380'. RD WL. |
| 16. | Circulate with fresh water containing biocide to remove any gas. |
| 17. | Un-land casing. ND BOP. ND TH. Install BOP on casing head with 4-1/2" pipe rams. |
| 18. | TOOH and LD 1480' of 4-1/2" casing. Remove 4-1/2" pipe rams and install 2-3/8" pipe rams. |
| 19. | RIH with 2-3/8" tubing to 1480'. |

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20. RU Cementers. Establish circulation with biocide treated fresh water, 10 bbl (min) SAPP, followed by a 20 bbl fresh water spacer. **Pump Stub Plug:** 260 sxs (290 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, 401' in 8" OH from caliper with 20% excess, and 463' in 8-5/8" surface casing with no excess). The plug will cover 1480' - 513'. RD cementers.
21. Slowly pull out of the cement and PUH to 400'. 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.
22. WOC per cement company recommendation. Tag cement. Cement top needs to be at or above 513' (50' above the Laramie-Fox Hills top at 563'). TOOH.
23. RU WL. RIH 8-5/8" CIBP to 80'. Set and pressure test to 1000 psi for 15 minutes. RDMO WL and WO rig.
24. 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.
25. Supervisor submit paper copies of all invoices, logs, and reports to Evans Engineering Specialist.
26. Excavation crew to notify One Call to clear excavation area around wellhead and for flow lines.
27. Excavate hole around surface casing enough to allow welder to cut casing a minimum 5' below ground level.
28. Welder cut casing minimum 5' below ground level.
29. Fill casing to surface using 4500 psi compressive strength cement (NO gravel).
30. Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
31. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
32. Properly abandon flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.
33. Back fill hole with fill. Clean location, and level.
34. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.