

Engineer: STERLING METZGER

Cell: 330-605-2231

PLUG and ABANDONMENT PROCEDURE

HSR-EPPINGER 1-1

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 isolate production equipment, and remove any automation prior to rig MIRU. |
| 2. | MIRU Slickline. Gyro ran 2/4/2014. RIH tag bottom and record tag depth in OpenWells. |
| 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 2-3/8" 4.7# J-55 tbg. Load hole using clean fresh water with biocide to control well. ND WH. NU BOP. Unland tbg using unlanding joint and LD. |
| 6. | TOOH. SB 7890' of 2-3/8" tbg. LD remaining tbg. |
| 7. | PU and RIH with (4.5", 11.6#) Bit and Scraper on 2-3/8" tbg to 7890'.TOOH. |
| 8. | RU WL. PU and RIH with (4.5", 11.6#) CIBP and set at +/- 7875' to abandon the J Sand perfs. TOOH. RD WL. |
| 9. | TIH with 2-3/8" tbg while hydrotesting to 3000 psi to 7875'. Circulate all gas from well. PT CIBP to 1000 psi for 15 minutes. |
| 10. | <u>RU cementers</u> . Pump Niobrara Balance Plug: Pump 70 sxs (109 cf) 15.8 ppg & 1.55 cf/sk. Volume based on 1175' inside 4.5" production casing w/ no excess. Cement will be from 7875' – 6700'. RD cementers. |
| 11. | Slowly pull out of the cement and PUH to 6500'. Reverse circulate tubing clean to ensure no cement is left in the tubing. |
| 12. | PUH to 4900'. LD remaining 2-3/8" tubing. |
| 13. | <u>RU Cementers</u> . Pump Sussex Balance Plug: 35 sxs (42 cf) 15.8 ppg & 1.18 cf/sk. Volume is based on 410' inside 4-1/2" production casing. The plug will cover from 4900'-4490'. RD cementers. |
| 14. | Slowly pull out of the cement and PUH to 4200'. Reverse circulate to ensure no cement is left in the tbg. TOOH and SB 1730' tbg. |
| 15. | RU 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 2000' and 4' of squeeze holes at 1700'. RD WL. |
| 16. | PU and RIH with (4.5" 11.6#) CIGR on 2-3/8" tbg. Set CIGR at 1730'. |
| 17. | Establish circulation to surface with biocide treated fresh water, and pump 100 bbls to clean up hole. |
| 18. | <u>RU Cementers</u> . Pump Fox Hills Squeeze: Pump 10 bbls sodium silicate and 5 bbls fresh water followed 215 sx (250 cf) with 0.25 lb/sk polyflake 15.8 ppg & 1.16 cf/sk. Putting 145 sx under the retainer and then Sting out of retainer and pump remaining 70 sx. Volume is based on 270' below the CIGR inside 4-1/2" production casing with no excess, 300' in the 4-1/2" annulus assuming 7.88" OH with 60% excess and 930' on top of the CIGR to cover top perfs. RD cementers. |
| 19. | Slowly pull out of the cement and PUH to 600'. Reverse circulate to ensure no cement is left in the tbg. TOOH and SB 800' tbg. |

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20. RU WL. RIH and cut 4-1/2" casing at 150'. RD WL.
21. Circulate with fresh water containing biocide to remove any gas.
22. Un-land casing using a casing spear, not a lifting sub. Max pull shall be 100,000#. If unable to unland, contact Engineering.
23. ND BOP. ND TH. Install BOP on casing head with 4-1/2" pipe rams.
24. TOOH and LD all 4-1/2" casing. Remove 4-1/2" pipe rams and install 2-3/8" pipe rams.
25. RIH with 2-3/8" tubing to 800' and establish circulation.
26. RU Cementers. Pump Stub Plug (Part 2): 65 sxs (76 cf) 15.8 ppg and 1.16 cf/sk. Volume is based on 650' inside the 4.5" csg, and 50' in 8 5/8" surface casing. Cement will be from 800' – 100'. RD cementers. Notify Engineering if circulation is ever lost during job.
27. Slowly pull out of the cement and PUH to 100' left in hole. Circulate using biocide treated fresh water to ensure no cement is left in the tubing. TOOH. LD all tbgs.
28. RU WL. RIH 8-5/8" 24# CIBP to 80'. RDMO WL and WO rig.
29. 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.
30. Supervisor submit paper copies of all invoices, logs, and reports to Evans Engineering Specialist.
31. Excavation crew to notify One Call to clear excavation area around wellhead and for flow lines.
32. 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.
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.
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.