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PLUG and ABANDONMENT PROCEDURE

LUDWIG 17-5

API: 05-123-24066

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. Directional Survey was run on 08/01/06. 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. Refer to BOP testing guidelines, fluid barrier management, and tripping best practices as applicable. All wireline operations will need a flanged changeover, WL BOP, Lubricator with an ID to fit the largest OD of the toolstring, and a packoff. Please contact foreman to discuss arrangement of stack, or alternate plan. Contact your foremen with any questions regarding standard operating procedures or any potential deviations.
7. 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.
8. Once well has been killed, pump an additional 200bbls of water to ensure wellbore is clear of gas. Must maintain full column of fluid or constant pump rate to keep gas out until top perforations are covered with a cast iron bridge plug.
9. TOOH and SB 810' of 2-3/8" tbg. LD remaining 2-3/8" tbg.
10. MIRU WL. PU and RIH with (4-1/2", 11.6#) gauge ring to 6920'. POOH.
11. PU and RIH with (4-1/2", 11.6#) CIBP and set at +/- 6910' (collars at 6895' & 6937'). POOH.
12. Top fill hole with biocide treated Water. PT CIBP to 500 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. RIH and dump 2 sx cement on CIBP. POOH.
14. PU and RIH with (4-1/2", 11.6#) CIBP and set at +/- 4052' (collars at 4035' & 4078'). POOH. RIH and dump 2 sx cement on CIBP. POOH.
15. COA: Confirm and document static conditions in the well before placing the next plug. If there is evidence of pressure or fluid migration at any time after placing the Sussex plug, contact Engineering.
16. PU and RIH with one 4' 3-1/8" perf gun with 4 spf, 120° phasing, and 0.5 EHD. Shoot 4' of squeeze holes at 1250'. POOH. RDMO WL.

17. Establish circulation down production casing out the surface casing with fresh water and several sweeps of mud thinner with the rig pump. Pump at least two hole volumes (142 bbl) or until returns are clean. If unable to gain circulation, contact Foreman to discuss reverse circulation. Note: start with rig pump FIRST.
18. Start at 1.5 bpm and slowly STEP up to maintain a minimum of 6 bpm with fresh water and surfactant during the remainder of circulation to promote hole cleaning and residual gas removal.
19. PU and RIH with one 4' 3-1/8" perf gun with 4 spf, 120° phasing, and 0.5 EHD. Shoot 4' of squeeze holes at 750'. POOH. RDMO WL.
20. PU and TIH with (4.5") CICR on 2.375" tbg. Set CICR at 810'. Close bradenhead. Pump cement down tubing and out the production casing x tubing annulus.
21. Note: ensure rig crew is ready to pull tubing as soon as cement is done pumping to prevent stuck tubing.
22. MIRU Cementers. Pump 10 bbl pre flush then a 5 bbl water spacer. Pump Bradenhead Circulation Plug: 190 sx (42 bbls or 234 cuft) Class G, assuming 15.8 ppg & 1.23 yld with 0.40% Latex, 2% Calcium Chloride, and 4% Gypsum. Mix water must be 70°F (may have to bring out cold water to dilute heated water). Volume is based on 50' in 4.5" production casing on top of the CICR, 440' in 4.5" production casing under the CICR, and 500' in 4.5" production casing x 7.875" open hole with 60% excess. This plug is designed to cover 1250' - 760'. Collect wet and dry samples of cement to be left on rig. RDMO Cementers. Notify engineering if circulation is ever lost during the job.
23. Pull out of cement at a rate of 1 jt/min. Displace cement with 1 bbl of fresh water. TOO H to 760'. Forward circulate down tubing, up production casing with 12 ppg mud to ensure no cement is left in the tbg and to clean up top perforation holes. TOO H all 2.375" tbg while continuing to fill hole with mud. Note: you will need at least 12 bbl 12 ppg mud to fill hole from estimated TOC to surface while TOO H.
24. Close tubing. Establish circulation down casing and up bradenhead with 12 ppg mud to ensure top perforations are able to circulate before SDFN.
25. 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.
26. Open bradenhead - circulate through both bradenhead valves if applicable to the wellhead for water/mud circulation and cement. Establish circulation down the 4-1/2" casing, up the annulus with fresh water and several sweeps of mud thinner. Pump at least two hole volumes (99 bbl) or until returns are clean. Start at 1.5 bpm and slowly STEP up to maintain a minimum of 6 bpm with fresh water and surfactant during the remainder of circulation to promote hole cleaning and residual gas removal. Note: if rig pump cannot pump 6 bpm, use cement truck pump.
27. ND BOP. Connect B1 swedge to 4.5" casing.
28. MIRU Cementers. Pump 10 bbl pre flush then a 5 bbl water spacer. Pump surface circulation plug: 280 sx (62 bbls or 345 cuft) Class G, assuming 15.8 ppg & 1.23 yld with 0.40% Latex, 2% Calcium Chloride, and 4% Gypsum. Mix water must be 70°F (may have to bring out cold water to dilute heated water). Volume is based on 750' in 4.5" production casing with no excess, 118' in 4.5" production casing x 7.875 open hole annulus with 100% excess, and 632' in 4.5" production casing x 8-5/8" surface casing annulus with no excess plus an additional 50 sx. This plug is designed to cover 750' - 0'. Excess is calculated into the job - pump cement until you receive 15.8 ppg cement on the backside. Collect wet and dry samples of cement to be left on rig. RDMO Cementers. Notify engineering if circulation is ever lost during the job.
29. Monitor well 4 hours to ensure cement does not fall back. RDMO WO rig.

30. 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.
31. Supervisor submit paper copies of all invoices, logs, and reports to VWP 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. Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
36. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
37. Properly abandon flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.
38. Back fill hole with fill. Clean location, and level.
39. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.