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PLUG AND ABANDONMENT PROCEDURE

OPATRIL 12-9L, API 05-123-16250

Steps

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.). Call IOC (970-506-5980) 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 from surface to 7150' making gradient stops every 1000'. Forward pressure bomb results to Evans Engineering. RDMO pressure bomb services. MIRU VES and run gyro stopping every 100' from tagged depth to surface. Forward survey results to 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.
5. MIRU, kill as necessary using clean fresh water with biocide. NDWH. NUBOP. Unseat landing jt, LD.
6. Notify cementers to be on call. Provide volumes listed below:
 - 6.1 Niobrara plug: **25 sx** (35 cu-ft) "G" w/silica flour, 0.4% CD-32, 0.4 ASA-301 and R-3 to achieve 2:30 pump time. Mix at 15.8 ppg and 1.38 cu-ft/sk. Cement volume based on 365' in 4 ½" casing.
 - 6.2 Sussex suicide: **320 sx** (368 cu-ft) "G" w/0.25 pps cello flake, 0.4% CD-32, 0.4% ASA-301, mixed at 15.8 ppg and 1.15 cu-ft/sk. Cement volume based on 410' in 4 ½" casing and 410' in an 11" OH with 20% excess. Caliper on file.
 - 6.3 Foxhills plug: **350 sx** (466 cu-ft) Type III w/cello flake and CaCl₂ as necessary, mixed at 14.8 ppg and 1.33 cu-ft/sk. Cement volume based on 100' in 4 ½" casing, 480' in an 11" OH with 20% excess, and 200' in 8 5/8" casing. Caliper on file.
7. TOOH 229 joints of 2 3/8" tubing landed at 7294'. Stand back.
8. MIRU WL. RIH gauge ring for 4 ½" 11.6# casing to 6990'. POOH.
9. PU 4 ½" 11.6# CIBP and RIH w/WL. Set at +/-6940' to abandon Niobrara and Codell perms. PT to 1000 psi.
10. RIH with 2 3/8" tubing to +/- 6940', tag CIBP and PUH 5'. Hydrotest tubing to 3000 psi while RIH.
11. RU cementers. Pump Niobrara plug: **25 sx** (35 cu-ft) "G" w/silica flour, 0.4% CD-32, 0.4 ASA-301 and R-3 to achieve 2:30 pump time. Mix at 15.8 ppg and 1.38 cu-ft/sk. Plug to cover 6940'-6575'.
12. PUH to ~6300'. Circulate with water containing biocide to displace cement and clear tubing.
13. POOH. Stand back 4060' of tubing.

14. RU WL. PU 3 1/8" perf guns with 3 spf, 120 degree phasing, 0.42" EHD and RIH w/WL. Shoot 1' of squeeze holes at 4500' and 4030. RD WL.
15. PU and RIH w/CICR on 2 3/8" tubing, set CICR at ~4060'. Establish circulation w/rig pump using freshwater containing biocide.
16. RU cementers. Precede cement with 5 bbl water containing biocide, 20 bbl sodium metasilicate and another 5 bbl water spacer.
17. Pump Sussex suicide: 320sx (368 cu-ft) "G" w/0.25 pps cello flake, 0.4% CD-32, 0.4% ASA-301, mixed at 15.8 ppg and 1.15 cu-ft/sk to place cement between perfs from 4500' to 4030'. Under displace and sting out of CICR to leave 3 bbls (~200') on top of retainer. Cement volume based on 11" OH with 20% excess. Caliper on file. RD cementers.
18. PUH to ~3500'. Circulate with water containing biocide to displace cement and clear tubing.
19. P&SB 1090', LD remainder.
20. RU WL. Shoot off 4 1/2" casing at or below 990'. RD WL. Circulate casing with water containing biocide to remove any gas.
21. NDBOP, NDTH.
22. Install BOP on casing head with 4 1/2" pipe rams.
23. TOOH 4 1/2" casing, LD.
24. RIH with 2 3/8" tubing to 1090' inside 4 1/2" casing.
25. RU cementers. Precede cement with 10 bbl SAPP and a minimum 20 bbl fresh water spacer. Pump Foxhills plug: 350 sx (466 cu-ft) Type III w/ cello flake and CaCl₂ as necessary, mixed at 14.8 ppg and 1.33 cu-ft/sk. Plug to cover 1090'-990' in 4 1/2" casing, 990'-510' in 11" OH with 20% excess, and 510'-310' in 8 5/8" casing. Caliper on file. RD cementers.
26. PUH to 100' and circulate with water and biocide to displace cement and clear tubing.
27. WOC per cement company recommendation. Tag cement at or above 310'. If not, consult with Evans Engineering.
28. RU WL. RIH 8 5/8" 23# CIBP to 80'. Set and pressure test to 1000 psi for 15 minutes. If tests, RDMO WL and WO rig.
29. Instruct cementing and wireline contractors to email copies of all job logs/jobs summaries to rscDJVendors@anadarko.com within 24 hours of completion of the job.
30. Supervisor is to submit paper copies of all invoices, logs, and reports to Joleen Kramer.
31. Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
32. Excavate hole around surface casing enough to allow welder to cut casing minimum 5' below ground level.
33. Welder cut casing minimum 5' below ground level.
34. Fill casing to surface using 4500 psi compressive strength cement, (NO gravel).
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 flowlines per Rule 1103. File electronic Form 42 once abandonment complete.
38. Back fill hole with fill. Clean location, level.