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Date: 4/28/2015

## **PLUG AND ABANDONMENT PROCEDURE**

### **FERME FARMS 13-4L, API 05-123-17715**

#### **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 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. Pull bumper spring and tag bottom. RDMO slickline services.
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 biocide treated water. NDWH. NUBOP. Unseat landing jt, LD.
6. Notify cementers to be on call. Provide volumes listed below:
  - 6.1 Niobrara plug: 25 sx (38 cu-ft) Thermal 35 w/ 0.5% CFR-2 and 0.25% FMC, mixed at 15.6 ppg and 1.51 cu-ft/sk yield. Cement volume based on 610' in 3 1/2" casing.
  - 6.2 Sussex squeeze: 280 sx (322 cu-ft) 0:1:0 'G' w/ 0.25 pps cello flake, 0.5% CFR-2, 0.2% FMC, 0.5% LWA, mixed at 15.8 ppg and 1.15 cu-ft/sk yield. Cement volume based on 500' in 3 1/2" casing and 500' in a 10" OH with 20% excess. Caliper on file.
  - 6.3 Foxhills plug: 240 sx (319 cu-ft) Type III w/ 0.25 pps cello flake, 0.3% CFL-3, 0.3% CFR-2, and CaCl<sub>2</sub> as necessary, mixed at 14.8 ppg and 1.33 cu-ft/sk yield. Cement volume based on 100' in 3 1/2" casing, 455' in a 9" OH with 20% excess, and 200' in 8 5/8" casing. Caliper on file.
7. TOOH 2 1/16" tubing landed at 7257'. Stand back 2 1/16" tubing.
8. MIRU WL. RIH gauge ring for 3 1/2" 7.7# casing to 7250'. POOH.
9. PU 3 1/2" 7.7# CIBP and RIH with WL. Set at +/- 7200' to abandon Codell perfs. PT to 2500 psi for 15 minutes. RDMO WL.
10. RIH with 2 1/16" tubing to +/- 7200', tag CIBP and PUH 5'. Hydrotest tubing to 3000 psi while RIH.
11. RU cementers. Pump Niobrara plug: 25 sx (38 cu-ft) Thermal 35 w/ 0.5% CFR-2 and 0.25% FMC, mixed at 15.6 ppg and 1.51 cu-ft/sk yield. Plug to cover 7200' – 6590'.
12. PUH to +/- 6300'. Reverse circulate with biocide treated water to displace cement and clear tubing.
13. POOH. Stand back 1060' of tubing.
14. MIRU WL. PU 1' 2 1/2" perf gun with 6 spf, 60 degree phasing, 0.49" EHD and RIH with WL. Shoot 1' of squeeze holes at 4460'. RDMO WL.
15. Establish circulation down 3 1/2" casing up the 8 5/8" X 3 1/2" annulus with biocide treated water. If circulation cannot be established, consult with Evans Engineering.

TOC – 6374'

NB Top – 6996', SX Top – 4169', FHM – 854'

Offset to Viper Pyro 4-15HZ and Jester 5-15HZ Pads in Top Gun Campaign

Crops

Gyro Completed 12/22/2014

No Known Casing Issues

Noble Trade Well

16. MIRU cementers. Establish circulation with biocide treated water down 3 ½" casing and precede cement with 5 bbl biocide treated water, 20 bbl sodium metasilicate, and another 5 bbl water spacer.
17. Pump Sussex squeeze down 3 ½" casing: 280 sx (322 cu-ft) 0:1:0 'G' w/ 0.25 pps cello flake, 0.5% CFR-2, 0.2% FMC, 0.5% LWA, mixed at 15.8 ppg and 1.15 cu-ft/sk yield. Drop wiper plug and displace to 3960' with ~36 bbls of biocide treated water. Planned cement is from 4460' – 3960' in 10"OH x 3 ½" casing annulus with 20% excess and from 4460' – 3960' in 3 ½" casing. Caliper readings across entire interval. RDMO cementers. WOC per cement company recommendation.
18. MIRU WL. RIH with jet cutter, tag cement at or above 3960'. If not, consult with Evans Engineering.
19. Shoot off 3 ½" casing at or below 960'. RDMO WL. Circulate casing with biocide treated water to remove any gas.
20. NDBOP, NDTH.
21. Install BOP on casing head with 3 ½" pipe rams.
22. TOOH 3 ½" casing, LD.
23. RIH with 2 1/16" tubing to 1060' inside 3 ½" casing.
24. MIRU cementers. Establish circulation with biocide treated water and precede cement with 10 bbl SAPP and a minimum 20 bbl fresh water spacer. Pump Foxhills plug: 240 sx (319 cu-ft) Type III w/ 0.25 pps cello flake, 0.3% CFL-3, 0.3% CFR-2, and CaCl<sub>2</sub> as necessary, mixed at 14.8 ppg and 1.33 cu-ft/sk yield. Plug to cover 1060' – 960' in 3 ½" casing, 960' – 505' in 9" OH with 20% excess, and 505' – 305' in 8 5/8" casing. Caliper readings across entire interval. RDMO cementers.
25. PUH to 100' and circulate with biocide treated water to displace cement and clear tubing.
26. WOC per cement company recommendation. Tag cement at or above 405'. If not, consult with Evans Engineering.
27. MIRU 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.
28. Instruct cementing and wireline contractors to email copies of all job logs/jobs summaries to [rscDJVendors@anadarko.com](mailto:rscDJVendors@anadarko.com) within 24 hours of completion of the job.
29. Supervisor is to submit paper copies of all invoices, logs, and reports to Evans Engineering Specialist.
30. Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
31. Excavate hole around surface casing enough to allow welder to cut casing minimum 5' below ground level.
32. Welder cut casing minimum 5' below ground level.
33. Fill casing to surface using 4500 psi compressive strength cement, (NO gravel).
34. Spot weld on steel marker plate. Marker should contain well name, well number, legal location (1/4 1/4 descriptor) and API number.
35. Obtain GPS location data as per COGCC Rule 215 and send to [rscDJVendors@anadarko.com](mailto:rscDJVendors@anadarko.com).
36. Properly abandon flowlines per Rule 1103. File electronic Form 42 once abandonment complete.
37. Back fill hole with fill. Clean location, level.

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