

Engineer: Tod Haanes
Cell: 303-929-2339

PLUG and ABANDONMENT PROCEDURE

CHIKUMA 1-13A

Step Description of Work

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. Arrange for 102 bbls of 9.0 mud to be used prior to the stub plug.
3. MIRU slickline. Pull bumper spring and tag bottom. Record tag depth in Open Wells. A CIBP with 2 sxs cement are reported at 7800'. Please call Evans Engineering if the CIBP is not tagged. Run pressure bomb and obtain pressure gradient survey from surface to 7470' (halfway between Codell perfs) making gradient stops every 1000'. Forward pressure bomb results to Evans Engineering. Note: Do not run the BHP Survey after blowing down or killing the well with fluid. RD slickline.
4. Prepare location for base beam equipped rig. Install perimeter fence as needed.
5. 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 12/18/2014 recorded a Bradenhead pressure of 52 to 1 psi, 20 gallons of water was produced, and after 15 minutes of surface casing shut-in, pressure increased to 9 psi.
6. **Blow-down bradenhead and re-check pressure the next day.** Repeat until pressure stays at 0 psi. Contact Evans Engineering if pressure does not report at 0 psi the next day.
7. MIRU WO rig. Kill well as necessary using clean fresh water with biocide. ND WH. NU BOP. Unseat landing joint, and LD.
8. TOOH and SB all 2-3/8" tubing.
9. RU WL. PU gauge ring and RIH to 7090' for 4-1/2" 11.6 lb/ft casing (spud date = 8/4/2003). POOH and LD gauge ring.
10. PU 4-1/2" 11.6 lb/ft CIBP and set at 7060' (collars at 7035' and 7077') to abandon the Niobrara/Codell perfs. RD WL.
11. RU hydrotesters. TIH with 2-3/8" tubing to 7060' while hydrotesting to 3000 psi. PU 5', circulate gas out of the hole, and pressure test CIBP to 1000 psi for 15 minutes. RD hydrotesters. **Monitor bradenhead pressure during test. Contact Evans Engineering if the bradenhead pressure is affected by the casing test.**
12. RU cementers. **Pump Niobrara plug:** 25 sxs (38 cf) Thermal 35 +0.5% CFR-2+0.25% FMC, mixed at 15.6 ppg & 1.51 cf/sk. The plug will cover 7060' to 6620'. Volume is based on 440' inside 4-1/2" production casing with no excess. RD cementers.
13. Slowly pull out of the cement and PUH to 6400'. Reverse circulate to ensure no cement is left in the tubing. PUH to 5170'.
14. RU Cementers. **Pump Sussex balanced plug:** 70 sxs (80 cf) 0:1:0 'G'+0.5% CFR-2+0.2% FMC+0.5% LWA, mixed at 15.8 ppg & 1.15 cf/sk. The plug will cover 5170' - 4250'. Volume is based on 920' in 4-1/2" production casing with no excess. RD cementers. *A DV Tool is located at 5070'.*
15. Slowly pull out of the cement and PUH to 4000'. Reverse circulate to ensure no cement is left in the tubing. PUH to 3900' and WOC.

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16. WOC per cement company recommendation. Tag cement. Cement top needs to be at or above 4259' (200' above the Sussex TOP of 4459').
17. TOOH and SB 1150' 2-3/8" tubing.
18. RU WL. RIH and cut 4-1/2" casing at 1050'. RD WL.
19. Circulate with fresh water containing biocide to remove any gas.
20. Un-land casing. ND BOP. ND TH. Install BOP on casing head with 4-1/2" pipe rams.
21. TOOH and LD 1050' of 4-1/2" casing. Remove 4-1/2" pipe rams and install 2-3/8" pipe rams.
22. RIH with 2-3/8" tubing to 1150'.
23. Establish circulation with 9.0 ppg minimum mud and get bottoms up. NOTE: Due to history of bradenhead pressure, it is very important to get all gas out of the hole prior to cementing.
24. RU Cementers. Precede cement with 10 bbl (min) SAPP followed by a 20 bbl fresh water spacer.
Pump Stub Plug: 250 sxs (332 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, 200' in 8.5" OH from caliper with 40% excess, 596' in 8-5/8" surface casing with no excess). The plug will cover 1150' - 254'. RD cementers.
25. Slowly PUH to 254'. Reverse circulate to ensure no cement is left in the tubing, and that TOC is no higher than 254' (a CIBP will be set at 80'). PUH to 100' and WOC.
26. WOC per cement company recommendation. Tag cement. Cement top needs to be at or above 451' (50' above the Fox Hills sand TOP located at 501'). TOOH.
27. RU WL. RIH 8-5/8" CIBP to 80'. Set and pressure test to 1000 psi for 15 minutes. RD MO WL and WO rig.
28. 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.
29. Supervisor 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 flow lines.
31. Excavate hole around surface casing enough to allow welder to cut casing a 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.
36. Properly abandon flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.
37. Back fill hole with fill. Clean location, and level.
38. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.