

Engineer: MICHAEL LEE

Cell: 970-302-4601

## PLUG and ABANDONMENT PROCEDURE

### POWERS 3-23A

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.). 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. Pull bumper spring and tag bottom. Record tag depth in OpenWells. Well has a gyro survey from 09/29/2011. RDMO slickline.
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. Repeat until pressure stays at 0 psi. Contact Evans Engineering if pressure does not blow down to 0 and stay at 0.
5.	MIRU WO rig. Load hole using clean fresh water with biocide to control well. ND WH. NU BOP. Unland tbg using unlanding joint and LD.
6.	TOOH and SB 6850' of 2-3/8" tbg. LD remainder.
7.	MIRU WL. RIH with gauge rig (4-1/2", 11.6#, I-70) down to 7570'. TOOH.
8.	RIH with CIBP (4-1/2", 11.6#, I-70) and set at +/- 7560' to abandon the J-Sand perfs. TOOH. RIH to dump 2 sx on CIBP. TOOH.
9.	RIH with CIBP (4-1/2", 11.6#, I-70) and set at +/- 6850' to abandon the Codell perfs. TOOH. Load hole with biocide treated fresh water and PT CIBP to 1000 psi for 15 minutes. RD WL.
10.	TIH with 2-3/8" tbg to 6850' while hydrotesting to 3000 psi. When on bottom, get bottoms up to circulate all the gas out of the well.
11.	<u>RU cementers.</u> <b>Pump Niobrara Balance Plug:</b> Pump 25 sxs (38 cf) assuming a density of 15.6 ppg & a yield of 1.51 cf/sk. Volume based on 430' inside 4-1/2" production casing. Cement will be from 6850' – 6420'. RD cementers.
12.	Slowly pull out of the cement and PUH to 6220'. Reverse circulate to ensure no cement is left in the tbg.
13.	TOOH and SB 4100' of 2-3/8" tbg. LD remainder.
14.	RU WL. PU and RIH with two 3-1/8" perf guns with 3 spf, min 0.5" EHD, 120° phasing. Shoot 2' of holes at 4630' and 4' of holes at 4070'. TOOH. RD WL.
15.	PU CICR (4-1/2", 11.6#, I-70) and 2-3/8" tbg and RIH. Set CICR at 4100'.
16.	Establish circulation to surface with biocide treated fresh water.
17.	Pump 200 bbls of biocide treated fresh water, 20 bbls sodium metasilicate and 5 bbls fresh water.
18.	<u>RU Cementers.</u> <b>Pump Sussex Balance Plug:</b> 240 sxs (266 cf) assuming a density of 15.8 ppg & a yield of 1.15 cf/sk. Underdisplace by 3 bbls. Volume is based on 530' below the CICR inside 4-1/2" production casing, 560' in the annulus assuming 8.5" OH from the log with 20% excess, and 190' on top of the CICR to cover the top perfs at 4070'. RD cementers.
19.	Slowly pull out of the cement and PUH to 3710'. Reverse circulate to ensure no cement is left in the tbg.
20.	TOOH and SB 1530' of 2-3/8" tbg. LD remainder.
21.	RU WL. RIH and cut 4-1/2" casing at 1430'. RD WL.
22.	Circulate with fresh water containing biocide to remove any gas.

Engineer: MICHAEL LEE  
Cell: 970-302-4601

## PLUG and ABANDONMENT PROCEDURE

### **POWERS 3-23A**

23. Un-land casing. ND BOP. ND TH. Install BOP on casing head with 4-1/2" pipe rams.
24. TOOH and LD 1430' of 4-1/2" casing. Remove 4-1/2" pipe rams and install 2-3/8" pipe rams.
25. RIH with 2-3/8" tbg to 1530'.
26. Establish circulation with biocide treated fresh water.
27. Pump 100 bbls of biocide treated fresh water, 10 bbls (min) SAPP, followed by 20 bbls fresh water spacer.
28. **RU Cementers. Pump Stub Plug:** 240 sxs (316 cf) with polyflake assuming a density of 14.8 ppg & a yield of 1.33 cf/sk. Volume is based on 100' in 4-1/2" production casing with no excess, 496' of 8.5" OH from log with 20% excess, and 204' in 8-5/8" surface casing with no excess. The plug will cover 1530' - 730'. RD cementers.
29. Slowly pull out of the cement and PUH to 530'. Circulate using biocide treated fresh water to ensure no cement is left in the tbg. WOC per cement company recommendation.
30. TIH to tag cement and record tag depth in OpenWells. Cement needs to be at or above 884' (50' into the SC shoe). If tag is below 884', call Evans Engineering.
31. RU WL. RIH with 8-5/8" CIBP and set at 80'. RDMO WL and WO rig.
32. Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries to [rscDJVendors@anadarko.com](mailto:rscDJVendors@anadarko.com) within 24 hours of completion of the job.
33. Supervisor submit paper copies of all invoices, logs, and reports to Evans Engineering Specialist.
34. Excavation crew to notify One Call to clear excavation area around wellhead and for flow lines.
35. 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.
36. Excavate hole around surface casing enough to allow welder to cut casing a minimum 5' below ground level.
37. Welder cut casing minimum 5' below ground level.
38. Fill casing to surface using 4500 psi compressive strength cement (NO gravel) if necessary.
39. Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
40. Obtain GPS location data as per COGCC Rule 215 and send to [rscDJVendors@anadarko.com](mailto:rscDJVendors@anadarko.com).
41. Properly abandon flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.
42. Back fill hole with fill. Clean location, and level.
43. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.