

Engineer: Carson Muscat  
Cell Phone Number: 832-216-1491

### SAFETY PREP PROCEDURE - Aquifer Coverage and Packer Install

#### HSR-CANNON 9-18A

#### Description

1. Well needs annular fill from 1300'-1500' for aquifer coverage and a packer install.
2. Contact field foreman or field coordinator before rig up to isolate production equipment if possible. 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.
3. MIRU Slickline. Pull production equipment. Record tag depth in OpenWells. RD slickline. Well has Gyro from 10/13/2011.
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. Blow down bradenhead and re-check pressure the next day. Repeat until pressure stays at 0 psi.
6. MIRU WO rig. Kill well as necessary with biocide + freshwater. ND wellhead, NU BOP. Unland tbg using unlanding joint and LD.
7. MIRU EMI services. EMI 2-3/8" tbg while TOO H and tally while standing back. Lay down joints that have greater than 35% penetration or wall loss. Replace all joints that fail EMI testing. Document joint numbers and depth of bad tubing and create a Production Equipment Failure Report in OpenWells. RDMO EMI services.
8. MIRU WL. PU and RIH gauge ring for (4-1/2" 11.6#) casing and run to 7780'. POOH. RDMO WL.
9. PU and TIH with 10,000 psi rated above and below RBP(4.5", 11.6#) and 2-3/8" tbg. Set RBP at +/-7780', ~60' above the top perf (collars at 7766' and 7808').
10. Load hole with biocide + fresh water and circulate out any gas out of the hole. Pressure test the casing to 500 psi for 15 minutes. TOO H with 1 stand of tbg. Dump 2 sx sand down tbg on top of RBP. Kick on pumps at low rate to chase sand down tubing. Do not pump at high rate causing the sand to circulate.
11. TOO H and SB all 2-3/8" tubing.
12. ND BOP. ND WH. Un-land casing using a casing spear, not a lifting sub. Max pull shall be 100,000#. If unable to unland, contact Engineering. NU double entry flange and BOP. Install 1.66" pipe rams.
13. PU 1.66" 2.33# J-55 10 RD tubing and TIH between the 4-1/2" production casing and 8-5/8" surface casing/open hole to 1500' while continuously circulating. Make polymer sweeps as needed while TIH. If unable to make it to 1500' call Engineering.
14. Circulate with the rig pump to clean the hole. Circulate a minimum of 1.5 annular volumes and ensure well is dead. If not able to clean well, contact engineering.
15. MIRU Cementing. Establish circulation and pump a spacer, followed by 50 sx Fox Hills Annular cement (78 cf, 14 bbls) 14.0 ppg, 1.55 yld. Calculations based on 200' in the annulus between 7.88" hole and 4.5" casing with 60% excess. Attempt to cement from 1500'-1300'.
16. TOO H with 1.66" 2.3# J-55 tubing until EOT is at 1100' and LD remaining tbg. Circulate with freshwater 1.5 times the hole volume or until returns are clean. RDMO Cementers.
17. TOO H and LD all 1.66" 2.3# tbg. ND BOP and double entry flange. Use 4-1/2" casing spear to re-land 4-1/2" casing. NU 5K tubing head, NU BOP. Install 2-3/8" pipe rams. Shut well in and WOC.

18. MIRU WL and run CCL-GR-CBL-VDL from +/- 2000' to surface to confirm coverage. Contact engineer. Need coverage from 1300'-1500' to continue. RD WL. In addition to normal handling of logs/job summaries, email copies of all cement job logs/job summaries and invoices to DJVendors@anadarko.com within 24 hours of completion of the job.
19. Once aquifer coverage has been confirmed, PU and TIH with RBP retrieving head and 2-3/8" tbg. Circulate fresh water + biocide to remove sand. Un-set RBP at +/-7780'. TOOH. LD RBP and retrieving head.
20. RU Hydrotesters. Hydrotest production string on the way in to 6,000 psi (80% of burst for 2 3/8" J55 tubing) below the slips. PU and TIH with 2-3/8" NC, 2-3/8" XN nipple, ~17 jts of 2-3/8 tbg to get the EOT +/-1 joint above the J Sand perf with a 10,000 psi rated Packer above and below (4-1/2" 11.6") on 2-3/8"tbg. Set Packer at +/-7080' (collars at 7058' and 7100'), with EOT at 7814'.
21. Reverse circulate casing volume at least once to load backside with biocide + fresh water and circulate any gas out of the hole. Have SDS on location. Set packer. Pressure test to 500 psi for 15 minutes. No leakoff is acceptable. If any leakoff, contact engineer.
22. RU rig lubricator. Broach tubing to XN seating nipple. RD rig lubricator.
23. Install 2 - 5,000 psi rated casing valves on the offside and 1 - 5,000 psi rated casing valve on the flowline side for a total of 3 casing valves and XXH nipples.
24. ND BOP, NU 7-1/16", 5,000 psi flanged tubing head adaptor w/ two 2-1/16", 5,000 psi flanged master valves. Put new R46 gasket on tubing head. Install new tubing hanger ring gaskets. Install new lockdown screw packing. Ensure WH, valves, and fittings are rated to 5,000 psi. Torque and test WH.
25. If Seabord/Weir - RU hydrotester. Install 2-3/8" pup joint above master valve. Hydrotest wellhead first to 250 psi for a low pressure test for 15 minutes. Then, hydrotest wellhead to 5,000 psi for 15 minutes. Document results. No leakoff is acceptable. RD hydrotester. If GE - pressure test void first to 250 psi for a low pressure test for 15 minutes. Then, pressure wellhead to 5,000 psi for 15 minutes. Document results. No leakoff is acceptable. Bleed off all pressure from the void when you are done.
26. Secure wellhead, clean up location. RDMO WO rig. Return well to production team.