

## Robert M Burch 1 Remedial Cement.docx

- 1 PLEASE NOTE THAT CEMENT/TOOL DEPTHS WILL LIKELY CHANGE BASED ON CBL. PLEASE VERIFY ALL DEPTH WITH EVANS ENGINEERING BEFORE PROCEEDING ON PERFORATING/PUMPING CEMENT.
- 2 NOTE: NO GYRO RAN AS OF 1/24/14.
- 3 Level location for base beam rig.
- 4 Call Foreman or Field Coordinator before rig up to catch plunger, isolate production equipment, and ask if replacement parts/equipment are requested. Operations need to hook up the Bradenhead pressure and bleed off the pressure before the rig gets on location.
- 5 Check and report surface casing pressure. If surface casing is not accessible at ground level, re-plumb so valve is at ground level.
- 6 Spot a minimum of 5 jts 2-3/8", 4.7#, J-55 EUE TBG for replacement and 40 jts 1-1/4" (1.66" OD), 2.33#, J-55, IJ TBG for annular cement job.
- 7 MIRU slickline. Fish production equipment as necessary and tag fill. Note tagged depth in OpenWells. RDMO Slickline.
- 8 MIRU WO rig, flat tanks and rig pumps. Kill well, as necessary, with biocide treated fresh water. ND WH. NU BOP.
- 9 Unseat landing joint and lay down.
- 10 MIRU EMI services. TOOH with 2-3/8" TBG. EMI on TOOH. LD joints with wall loss or penetrations > 35%. Replace joints as necessary. \*\*Keep yellow & blue band tubing. Note joint number and depth of tubing leak(s) on PRODUCTION EQUIPMENT FAILURE REPORT IN OPEN WELLS.
- 11 PU casing scraper for 4-1/2", 10.5/11.6# casing and TIH to 7310' KB. Circulate all debris from wellbore with clean water. POOH and stand back tubing and LD scraper.
- 12 MIRU WL. RIH with CCL and CIBP. Set CIBP at 7250'. POOH.
- 13 Pressure test casing/CIBP to 1000 psi for 15 mins. If pressure test passes, proceed.
- 14 RIH with CCL and CBL/VDL/GR tool. Correlate depth to Schlumberger Density log dated 3/14/75. Run CBL from just above CIBP to surface. Immediately send CBL to Matt Agee for review to verify cement/perforation plans.
- 15 ND BOPs, ND existing tubing head. NU new 5000 psi rated wellhead but do not install adapter flange. NU BOPs.
- 16 RIH with CCL and perf guns. Correlate depth to CBL. PUH and shoot squeeze holes as per the following: 7150'-7151', 3 spf, 0.38" EHD, 23 gm charge. POOH and LD guns.
- 17 PU and TIH retrievable packer for 4-1/2", 10.5/11.6# casing. Set packer at 7050'. Establish injection/circulation before setting CICR. Note rate, pressure, volume pumped. Release packer and TOOH while standing back tubing and laying down packer.
- 18 RIH and set CICR at 7050'. RDMO WL.
- 19 PU stinger and RIH on 2-3/8" tbg. Sting into retainer at 7050'.
- 20 RU cementer. Prepare & pump 135 sks 50/50 Poz 'G' + 20% silica flour + 3% gel + 0.1% SMS + 0.4% fluid-loss additive, mixed at 13.5 ppg and 1.71 cu ft/sk, into squeeze holes at 7150'. Displace cement ½ bbl short of CICR. Sting out of CICR, place remaining cement on top of CICR. PUH 1 jt and reverse out. Design is for coverage from 7150 to 6600 in 9" hole (caliper log), including 20% excess.
- 21 TOOH and stand back tbg. LD stinger. WOC overnight at minimum.
- 22 ND WH. Unland 4-1/2" casing. NU double entry flange.
- 23 PU 1-1/4", 2.3#/ft J-55 10rd IJ tubing and TIH outside 4-1/2" casing and open hole to 1200'. Circulate with biocide treated fresh water on TIH.
- 24 MIRU cement services. Mix and pump cement job as follows: Freshwater spacer, 20 bbls Sodium Metasilicate, 400 sx 14.0 ppg Type III cement with ¼#/sk cello-flake mixed at 1.53 cuft/sk. The cement is

to be retarded for 125 degF for a six hour pump time. (Attempt to cement from 1200' to 275'). Design is for 11" hole, 4.5" casing, 925' w/ 20% excess (caliper).

- 25 PUH to trip out of the hole with 1-1/4" tubing and shut in well.
- 26 Rig down cementing services.
- 27 Reland 4-1/2" CSG. ND double entry flange. NU WH. SDFN to WOC.
- 28 MIRU wireline services.
- 29 MIRU WL. PU and RIH with CCL/CBL/GR. Correlate to depth to CBL. Run CBL from 7000' to 200' above TOC over Niobrara AND from 1300' to surface. Deliver logs to Evans for review. Once cleared by Engineering, proceed with next step.
- 30 TIH with 3-7/8" bit on 2-3/8" TBG. Drill through cement and CICR down to CIBP at 7250'. Pressure test squeeze perforations to 1000 psi for 15 mins. If pressure test passes, proceed.
- 31 Continue to drill out to PBTD of 7843'.
- 32 TOOH while standing back tubing and LD bit.
- 33 MIRU hydrotester.
- 34 PU & RIH with 2-3/8" NC, 2-3/8" XN profile nipple, 33 joints 2-3/8" TBG, Arrowset AS-1X packer (10k psi rated), and 2-3/8" TBG. Hydrotest tubing to 6000 psi while RIH. Set packer at 6700'.
- 35 Load backside with biocide treated water and pressure test packer to 1000 psi for 15 min.
- 36 ND BOP. NU WH. Ensure all valves on TBG head are rated to 5000 psi and ensure TBG head has a new R-46 ring gasket installed.
- 37 Hydrotest TBG head and master valve to 5000 psi. If pressure test fails, call Evans office for alternate procedures.
- 38 RDMO hydrotester. RDMO WO rig.
- 39 Return well to production team.
- 40 END OF SAFETY PREP STEPS. BELOW ARE STEPS FOR UN-PREPPING THE WELL.
- 41 When notification is sent to un-prep well, MIRU WO rig.
- 42 Control well with biocide treated water.
- 43 ND WH. NU BOP.
- 44 Release Arrowset AS-1X packer and POOH with 2-3/8" TBG, Arrowset packer, XN profile nipple, and NC while standing back TBG and laying down packer.
- 45 Return packer to shop were purchased and have redressed.
- 46 PU & RIH with 2-3/8" NC, 2-3/8" XN profile nipple (ensure nipple is input into OpenWells), and 2-3/8" TBG.
- 47 Clean out to PBTD at 7843' using biocide treated water. Use a bailer if necessary.
- 48 PUH and land TBG at 7733', which is approximately 1 joint above the top JS perf.
- 49 RU rig lubricator. Broach TBG to SN. RD rig lubricator.
- 50 ND BOP, NU WH.
- 51 Hydrotest TBG head and master valve to 5000 psi. If pressure test fails, call Evans office for alternate procedures. RDMO hydrotesters.
- 52 RDMO WO rig. Swab well back if needed. Return well to production team.