

Hanks Pooling Unit 2 Remedial Cement -NI- Wellhead & Packer.docx

- 1 Level location for base beam rig.
 - 2 Call Foreman or Field Coordinator before rig up to catch plunger, isolate production equipment, and ask if replacement parts/equipment are requested. Check and report surface casing pressure. If surface casing is not accessible at ground level, re-plumb so valve is at ground level.
 - 3 Spot a minimum of 4 jts 2-3/8", 4.7#, J-55 EUE TBG for replacement.
 - 4 MIRU slickline. Fish production equipment as necessary and tag fill. Note tagged depth in OpenWells. RDMO Slickline.
 - 5 MIRU WO rig, flat tanks and rig pumps. Kill well, as necessary, with biocide treated fresh water. ND WH. NU BOP.
 - 6 Unseat landing joint and lay down.
 - 7 Drop down and clean out to 8129' using biocide treated water to ensure adequate rathole for post-cement work cleanout. Use bailer if necessary.
 - 8 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.
 - 9 MIRU WL. RIH with gauge ring (appropriate for CIBP to be run) down to 7300'. POOH. PU and RIH with CCL and CIBP. Set CIBP at 7220'. POOH.
 - 10 PU and RIH with CCL/GR/CBL tool. Correlate depth to Schlumberger CBL dated 3/24/95. Run CBL from 4950' to surface to ensure DV tool depth/cement coverage across FH formation. Immediately send CBL to Evans engineering for review. POOH and LD tools.
 - 11 Pressure test CIBP to 1000 psi for 15 mins. If pressure test passes, proceed.
 - 12 PU and RIH with CCL and perf guns. Correlate depth to CBL. Shoot squeeze holes at 7118'-7119', 0.38" EHD, 1 SPF. PUH and shoot circulation holes at 6718'-6719', 0.6" EHD, 1 SPF. POOH and LD guns.
 - 13 PU and RIH with CICR. Set CICR at 7020'. POOH. RDMO WL.
 - 14 PU stinger and RIH on 2-3/8" tbg. Sting into retainer at 7020'.
 - 15 Establish circulation/injection down tubing before pumping cement. Note rate, pressure, volume pumped, and returns.
 - 16 RU cementer. Prepare & pump 100 sks 50/50 Poz G + 20% silica flour + 3% gel + 0.4% FL additive + 0.1% SMS mixed at 13.5 ppg and 1.71 cu ft/sk, into squeeze holes at 7118'. Displace cement 1.5 bbl short of CICR. Sting out of CICR and place ½ bbl cement on CICR. PUH to circulation holes at 6718' and place remaining cement across holes. PUH 3 stands and reverse out. Design is for coverage from 7118' to 6718' in 9.25" hole, including 10% excess (partial caliper log).
 - 17 TOOH and stand back tbg. LD stinger. WOC 24 hrs at minimum.
 - 18 ND existing tubing head. NU new 5000 psi rated wellhead but do not install adapter flange.
 - 19 SEE ATTACHED APPENDIX/ALTERNATE PROCEDURE BEFORE PROCEEDING. REQUIRED FOX HILLS REMEDIAL CEMENT IF CEMENT/DV TOOL CONFIRMED AT ANY DEPTH SHALLOWER THAN 750'.
 - 20 NU BOPs. TIH with 3-7/8" bit on 2-3/8" TBG.
 - 21 Drill through cement down to at least 6950' to ensure CBL tools can be run down to adequate depth.
 - 22 MIRU WL. PU and RIH with CCL/CBL/GR. Correlate to depth to CBL/GR. Run CBL from 6980' to 6520' and from 1300' to surface. Deliver logs to Evans for review.
 - 23 Pressure test squeeze perforations to 1000 psi for 15 mins. If pressure test passes, proceed. Once cleared by Engineering, proceed with next step.
 - 24 TIH with 3-7/8" bit on 2-3/8" TBG. Drill through cement and CICR down to CIBP at 7220'. Pressure test squeeze perforations to 1000 psi for 15 mins. If pressure test passes, proceed.
- APC Spurling, Black Tiger, & JZM HZ pads; estimated frac start date during 2014 CROP SEASON.
Nio top: 7297'; TOC: 7144'
2k psi rated wellhead, Closest SCHEDULED frac is 310'
NPV: \$225; Last casing test: unknown
MULTIPLE SQUEEZES near SX/SH interval

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- 25 Continue to drill/clean out to PBTD of 8129'. TOO H while standing back TBG and LD bit.
- 26 MIRU hydrotester.
- 27 PU & RIH with 2-3/8" NC, 2-3/8" XN profile nipple, 123 joint 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 4200'. EOT should be at +/- 8015'.
- 28 Load backside with biocide treated water and pressure test packer to 500 psi for 15 min.
- 29 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.
- 30 Hydrotest TBG head and master valve to 5000 psi. If pressure test fails, call Evans office for alternate procedures.
- 31 RDMO hydrotester. RDMO WO rig.
- 32 Return well to production team.
- 33 END OF SAFETY PREP STEPS. BELOW ARE STEPS FOR UN-PREPPING THE WELL.
- 34 When notification is sent to un-prep well, MIRU WO rig.
- 35 Control well with biocide treated water.
- 36 ND WH. NU BOP.
- 37 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.
- 38 Return packer to shop were purchased and have redressed.
- 39 PU & RIH with 2-3/8" NC, 2-3/8" XN profile nipple, and 2-3/8" TBG. Land TBG at 8015', which is approximately 1 joint above the top JS perf.
- 40 RU rig lubricator. Broach TBG to SN. RD rig lubricator.
- 41 ND BOP, NU WH.
- 42 Hydrotest TBG head and master valve to 5000 psi. If pressure test fails, call Evans office for alternate procedures. RDMO hydrotesters.
- 43 RDMO WO rig. Swab well back if needed. Return well to production team.

APPENDIX (AS REQUESTED BY COGCC)

- 1 Alternate procedure for steps proceeding Step 19. Should cement/DV tool be confirmed any depth shallower than +/- 750', please follow the below steps to remediate the Fox Hills/aquifer cement coverage.
- 2 VERIFY CEMENT VOLUMES AND PERF DEPTHS WITH EVANS ENGINEERING ONCE CBL IS ANALYZED.
- 3 MIRU WL. PU and RIH with CCL and perf guns. Correlate depth to CBL. Shoot squeeze holes at 1100'-1101', 0.38" EHD, 3 SPF. PUH and shoot circulation holes at 656'-657', 0.6" EHD, 3 SPF. POOH and LD guns.
- 4 PU and RIH with CICR. Set CICR at 1000'. POOH. RDMO WL.
- 5 PU stinger and RIH on 2-3/8" tbg. Sting into retainer at 1000'.
- 6 Establish circulation/injection down tubing before pumping cement. Note rate, pressure, volume pumped, and returns.
- 7 RU cementer. Prepare & pump freshwater spacer, 20 bbls Sodium Metasilicate, 185 sks Type III cement + 1/4 #/sk cello flake, mixed at 14.0 ppg and 1.53 cu ft/sk. Displace cement 1½ bbl short of CICR. Sting out of CICR and place ½ bbl cement on CICR. PUH to circulation holes at 656' and place remaining cement across holes. PUH 3 stands and reverse out. Design is for coverage from 1100' to 656' in 11" hole, including 10% excess.

APC Spurling, Black Tiger, & JZM HZ pads; estimated frac start date during 2014 CROP SEASON.

Nio top: 7297'; TOC: 7144'

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- 8 TOOH and stand back tbg. LD stinger. **WOC 48 HOURS.**
- 9 TIH with 3-7/8" bit on 2-3/8" TBG. Drill through cement down to at least 750'.
- 10 Pressure test circulation holes to 1000 psi for 15 minutes. If pressure test passes, proceed.
- 11 TIH with 3-7/8" bit on 2-3/8" TBG. Drill through cement and CICR down to 1200'.
- 12 Pressure test squeeze perforations to 1000 psi for 15 mins. If pressure test passes, proceed.
- 44 FOR REMAINING STEPS, REFER TO ORIGINAL PROCEDURE BEGINNING WITH Step 21: "Drill through cement down to at least 6950' to ensure CBL tools can be run down to adequate depth."
- 13 CONTINUE FOLLOWING ORIGINAL PROCEDURE FOR PROCEEDING STEPS.

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