

PLUG AND ABANDONMENT PROCEDURE

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HOLTON TP GAS UNIT 1

- | Step | Description of Work |
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| 1 | Provide 48 hr 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 hr prior to rig move. Request they catch and remove plunger, isolate production equipment and remove any automation prior to rig MIRU. |
| 2 | Prepare location for base beam equipped rig. Install perimeter fence as needed. |
| 3 | MIRU slickline services. Pull bumper spring and tag bottom. Run pressure bomb and obtain pressure gradient survey from surface to 7952' making gradient stops every 1000'. Forward pressure bomb results to Evans Engineering. RDMO slickline services. NOTE: Pressure survey must be completed before well is blown down or killed. |
| 4 | Check and record Bradenhead pressure. If Bradenhead valve is not accessible, re-plumb so that valve is above GL. |
| 5 | MIRU, kill as necessary using clean fresh water with biocide. ND WH. NU BOP. Unseat landing jt, LD. |
| 6 | POOH and stand back 2-3/8" tbg. (258 jnts landed at 7970'). |
| 7 | PU scraper for 4-1/2", 11.6# casing and RIH to 7900'. POOH and LD scraper. (Conflicting reports show both 10.5# and 11.6# casing). |
| 8 | PU 4-1/2" CIBP on 2-3/8" tbg and RIH and set at +/- 7870'. Circulate gas out of the hole from just above the CIBP and PT CIBP and casing to 1000 psi for 15 minutes. Assuming passing PT, POOH. Circulate at +/- 2500' to ensure casing is full with no trapped gas for CBL. |
| 9 | RU WL. Run CBL from ~7870' to surface. Find the TOC above the J Sand and the Bottom and Top of Cement at the DV Tool at 764' and identify any other anomalies. Forward results to Evans Engineering. Contact Evans Engineering for changes to cementing procedures as required per CBL. |
| 10 | PU dumpbailer and set 2 sacks neat "G" on top of the CIBP at 7870'. POOH and LD dumpbailer. |
| 11 | PU 2- 3-1/8" perf guns w/ 0.59" diam charges, 3 per foot, 120 phasing and shoot 1' of squeeze holes at 7150' and 2' of holes at 6850'. Adjust bottom sqz holes based on results from CBL to be ~20' from TOC. RDMO WL. |
| 12 | Notify Cementers to be on call. |
| 13 | PU 4-1/2" CICR on 2-3/8" tbg and RIH while hydrotesting to 4000 psi. Set CICR at 6890' +/- 10' pending CCL. Establish circulation through sqz holes with fresh water and biocide. |
| 14 | "RU Cementers. Pump Niobrara Suicide squeeze consisting of 110 sx 50/50 Poz ""G"" w/ 20% silica flour, 3% gel, 0.1% sodium metasilicate and 0.4% FL-52. Mixed at 13.5 ppg and 1.71 cuft/sk |

- (188 cuft of slurry). Underdisplace by 3 bbls and unsting from CICR. Spot final 3 bbls on top of the CICR to leave ~150' on top of the CICR and sqz holes. Volume based on 9" x 4-1/2" annulus with 40% excess from 6850' to 7150', and 4-1/2" casing from 6700' to 7150'. RD Cementers.
- 15 PUH 10 stands and circulate hole clean with fresh water and biocide. POOH standing back +- 4340' tbg.
 - 16 MIRU WL. PU 2 3-1/8" perf guns w/ 0.59" diam charges, 3 per foot, 120 phasing and shoot 1' of squeeze holes at 4770' and 2' of holes at 4300'. RDMO WL.
 - 17 PU 4-1/2" CICR on 2-3/8" tbg. RIH and Set CICR at 4340' +/- 10' pending CCL. Establish circulation through sqz holes.
 - 18 RU Cementers. Pump Sussex Suicide squeeze: Pump 5 bbls fresh water followed by 20 bbls sodium metasilicate followed by 5 bbls fresh water ahead of cement: 330 sks "G" w/ 0.25 pps cello flake, 0.4% CD-32, 0.4% ASA-301 with CaCl₂ as necessary, Mixed at 15.8 ppg, 1.15 cuft/sack (380 cuft of slurry). Underdisplace by 3 bbls and unsting from CICR. Spot final 3 bbls on top of CICR to leave 150' on top of CICR and sqz holes. Volume based on 11" x 4-1/2" annulus with 20% excess from 4300' to 4770', and 4-1/2" casing from 4150' to 4770'. RD Cementers.
 - 19 PUH 10 stands and circulate hole clean with fresh water and biocide. POOH standing back +-820' tbg.
 - 20 MIRU WL. PU 2- 3-1/8" perf guns w/ 0.59" diam charges, 3 per foot, 120 phasing and shoot 1' of squeeze holes at 1500' and 2' of holes at 780'. Adjust top perf to be ~ 20' below BOC at the DV Tool based on the CBL.
 - 21 PU 4-1/2" Thunderbird tension-set CICR and RIH and set at 820' +/- 10' based on CCL. RDMO WL.
 - 22 PU stinger on 2-3/8" tbg and RIH to CICR at 820'. Sting in, chain down tbg, and establish circulation through sqz holes with fresh water and biocide.
 - 23 MIRU Cementers. Pump Fox Hills Suicide squeeze: Pump 420 sx Type III w/cello flake and CaCl₂ as deemed necessary, mixed at 1.33 cf per sack, 14.8 ppg (559 cuft of slurry). Underdisplace by 3 bbls and unsting from CICR. Spot final 3 bbls on top of CICR. Volumes based on 11" x 4-1/2" annulus with 20% excess from 780' to 1500' and 4-1/2" casing from 630' to 1500'.
 - 24 PUH to 520' and circulate hole clean to ensure TOC inside 4 1/2" csg is below the TOC behind pipe based on the CBL. POOH and stand back 500' tbg.
 - 25 MIRU WL. Cut 4-1/2" csg at 400'. Adjust depth to be above TOC by ~20'. RDMO WL. Circulate approximately 120 bbls of fresh water and biocide to remove any gas from wellbore.
 - 26 ND BOP and tubing head. Install a BOP on surface casing head with 4-1/2" pipe rams. Install 3000 psi ball valves on both casing head outlets. Install a choke or choke manifold on one outlet.
 - 27 POOH and LD 4-1/2" csg. Remove the 4-1/2" pipe rams and Install 2-3/8" pipe rams.
 - 28 RIH w/ 2-3/8" tbg open ended to 500' (100' past the 4-1/2" csg stub). Establish circulation with water containing biocide and get bottoms up.
 - 29 MIRU Cementers. Pump Fox Hills Balanced plug: Pump mud flush of 10 bbls SAPP followed by 20 bbls water ahead of 150 sx Type III w/cello flake and CaCl₂ as deemed necessary, mixed at

1.33 cf per sack, 14.8 ppg (200 cuft of slurry). Plug size is based on 4-1/2" casing from 400' to 500' and 11" hole with 20% excess covering 400' to shoe of surface casing at 218' plus capacity of surface casing to 100'. PUH to 100' and Circulate out any excess cmt. TOH and WOC per cement company recommendation.

- 30 RIH and tag top of plug. TOC needs to be at 118' or shallower. POOH and LD 2-3/8" tbg.
- 31 RU wireline. Run and set CIBP in the 8 5/8", 24# surface casing at 80'. PT CIBP and surface casing to 1000 psi for 15 minutes. Assuming successful test, RD wireline. RDMO workover rig.
- 32 Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries to rscDJVendors@anadarko.com within 24 hrs 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 flowlines.
- 35 Excavate hole around surface casing enough to allow welder to cut casing minimum 5' below ground level.
- 36 Welder cut casing minimum 5' below ground level.
- 37 Fill casing to surface using 4500 psi compressive strength cement, (NO gravel).
- 38 Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
- 39 Properly abandon flowlines per Rule 1103. File electronic Form 42 once abandonment complete.
- 40 Back fill hole with fill. Clean location, level.
- 41 Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.