

PLUG AND ABANDONMENT PROCEDURE

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UPRR 41 PAN AM E 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 Team at least 24 hr prior to rig move. Request they isolate production equipment and remove any automation prior to rig MIRU. |
| 2 | MIRU slickline services. Pull bumper spring and tag bottom. Run pressure bomb and obtain pressure gradient survey from surface to *halfway between top and bottom perms of producing formation (7,097')* making gradient stops every 1000'. Forward pressure bomb results to Evans Engineering. RDMO slickline services. |
| 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. |
| 5 | MIRU workover rig, kill as necessary using clean fresh water with biocide. ND WH. NU BOP. Unseat landing jt, LD. |
| 6 | TOOH and SB 2-3/8" tbg. |
| 7 | MIRU Wireline. PU gauge ring for 5-1/2" 15.5# and RIH to 6900'. |
| 8 | RIH with 5-1/2" CIBP and set at 6855'. PT csg to 1000 psi for 15 minutes. RDMO wireline. |
| 9 | Notify Cementers to be on call. |
| 10 | RIH 2-3/8" tbg while hydrotesting to 3000 psi to CIBP at 6855'. Tag plug and pick up 5'. |
| 11 | RU Cementers. Pump Niobrara plug consisting of 41.4 cu-ft (30 sx)"G" w/ 20% silica flour , 0.4% CD -32, 0.4% ASA -301 and R-3 to achieve 2:30 pump time mixed at 15.8 ppg and 1.38 cuft/sk. Calculated top in the 5-1/2" csg is 6550'. |
| 12 | PUH ~68 joints 2-3/8" tbg to leave EOT at 4750'. |
| 13 | RU Cementers. Pump Sussex Balanced plug: 110 sks "G" w/ 0.4% CD-32, 0.4% ASA-301 with CaCl ₂ as necessary. Mixed at 15.8 ppg, 1.15 cuft/sack. Calculated TOC is 3820' in the 5-1/2" casing. |
| 14 | PUH to 3600' and circulate hole clean with fresh water w/biocide. |
| 15 | RIH and tag top of plug. Plug must be tagged at 3920' or shallower, contact Evans Engineering if tag depth is insufficient. POOH standing back 32 jnts and laying down the rest. |

- 16 RU WL. Cut off 5-1/2" csg at 800'. RDMO WL. Circulate using water and biocide to remove all gas from wellbore.
- 17 ND BOP and wellhead. Install a BOP on surface casing head with 5-1/2" pipe rams. Install 3000 psi ball valves on both casing head outlets. Install a choke or choke manifold on one outlet.
- 18 POOH and LD 5-1/2" csg. Remove the 5-1/2" pipe rams and Install 2-3/8" pipe rams.
- 19 RIH w/ 2-3/8" WS open ended 100' past the 5-1/2" csg stub to 900'.
- 20 MIRU Cementers. Pump Fox Hills Balanced plug: Establish circulation with water containing biocide. Pump mud flush of 10 bbls SAPP followed by 20 bbls water ahead of 200 sx (~47.4 bbls) Type III w/cello flake and CaCl₂ as deemed necessary, mixed at 1.33 cf per sack, 14.8 ppg. Plug size is based on 12" hole with 20% excess covering 900' to shoe of surface casing at 619' plus capacity of surface casing to 410'. PUH to 150' and circulate out any excess cmt. TOH and WOC per cement company recommendation.
- 21 RIH and tag top of plug. Plug needs to be tagged at 510' or shallower. POOH and LD 2-3/8" tbg.
- 22 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.
- 23 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.
- 24 Supervisor submit paper copies of all invoices, logs, and reports to engineering specialist.
- 25 Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
- 26 Excavate hole around surface casing enough to allow welder to cut casing minimum 9' below ground level.
- 27 Welder cut casing minimum 9' below ground level.
- 28 Fill casing to surface using 4500 psi compressive strength cement, (NO gravel).
- 29 Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
- 30 Properly abandon flowlines per Rule 1103. File electronic Form 42 once abandonment complete.
- 31 Back fill hole with fill. Clean location, level.
- 32 Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.