

PLUG AND ABANDONMENT PROCEDURE

LEMONS X 6-4

- | 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 IOC (970-506-5980) 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 | MIRU slickline services. Pull bumper spring and tag bottom. 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, kill as necessary using clean fresh water with biocide. ND WH. NU BOP. Unseat landing jt, LD. |
| 6 | Notify cementers to be on call. Provide volumes listed below: |
| 7 | "Niobrara Plug: 70 sx (97 cu-ft) "G" w/silica flour, 0.4% CD-32, 0.4% ASA-301 and R-3 to achieve 2:30 pump time. Mix at 15.8 ppg and 1.38 cuft/sk. Cement volume based on 1000' in 4 1/2" casing, no excess. |
| 8 | "Sussex Balance Plug: 50 sx (58 cu-ft) "G" w/ 0.4% CD-32, 0.4% ASA-301, mixed at 15.8 ppg and 1.15 cuft/sk. Cement volume based on 650' in 4 1/2" casing, no excess. |
| 9 | Stub Plug: 480 sx (638 cu-ft) Type III w/cello flake and CaCl ₂ as necessary, mixed at 14.8 ppg and 1.33 cu-ft/sk. Cement volume based on 100' in 4 1/2" casing, 573' in 12" OH with 20% excess, and 227' in 8 5/8" casing. |
| 10 | TOOH 2 3/8" production tubing. Stand back. |
| 11 | MIRU WL. RIH gauge ring for 4 1/2" 11.6# casing to 7840'. POOH. |
| 12 | PU 4 1/2" 11.6# CIBP and RIH w/ WL. Set at +/- 7750' per CBL. Pressure test to 1000 psi. |
| 13 | RIH with 2 3/8" production tubing to +/- 7750'. Hydrotest tubing to 3000 psi while RIH. |
| 14 | RU Cementers. Pump Niobrara Plug: 70 sx (97 cu-ft) "G" w/silica flour, 0.4% CD-32, 0.4% ASA-301 and R-3 to achieve 2:30 pump time. Mix at 15.8 ppg and 1.38 cuft/sk. Plug to cover 7750'-6750'. |
| 15 | POH 21 stands to ~6450'. Circulate with water and biocide to clear tubing. |
| 16 | P&SB ~4950', LD remainder. |
| 17 | Pump Sussex Balance Plug: 50 sx (58 cu-ft) "G" w/ 0.4% CD-32, 0.4% ASA-301, mixed at 15.8 ppg and 1.15 cuft/sk. Plug to cover 4850'-4200. RD cementer. |
| 18 | POH 16 stands to ~3900'. Circulate with water and biocide to clear tubing . WOC per cement company recommendations. |
| 19 | RIH with 2 3/8" tubing. Tag top of plug at 4200' or shallower. If not, consult Evans Engineering. |
| 20 | P&SB 27 stands (~1650'). LD remainder. |
| 21 | RU WL. Shoot off 4 1/2" casing at 1550'. RD WL. |
| 22 | Circulate with water and biocide to remove any gas. |
| 23 | NDBOP, NDTH. |

- 24 NUBOP on casing head with 4 1/2" pipe rams.
- 25 TOOH with 4 1/2" casing, LD.
- 26 RIH with 2 3/8" tubing into casing stub to +/- 1650' inside 4 1/2"
- 27 RU Cementers. Precede cement with 10 bbl SAPP and a 20 bbl (min) freshwater spacer.
- 28 Pump Stub Plug: 480 sx (638 cu-ft) Type III w/ cello flake and CaCl₂, mixed at 14.8 ppg and 1.33 cuft/sk. Plug to cover 1650'-1550' in 4 1/2" casing, 1550'-977' in 12" OH with 20% excess, and 977'-750' in 8 5/8" casing.
- 29 POH to 450' and circulate with water and biocide to displace cement and clear tubing.
- 30 WOC per company recommendation. Tag cement at 780' or shallower. If not, consult with Evans Engineering.
- 31 MIRU WL. RIH 8 5/8" 24# CIBP to 80'. Set and PT to 1000 psi for 15 minutes. If tests, RDMO WL and WO 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 Joleen Kramer.
- 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 Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
- 40 Properly abandon flowlines per Rule 1103. File electronic Form 42 once abandonment complete.
- 41 Back fill hole with fill. Clean location, level.

Engineer: Jade Patterson

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