

## PLUG AND ABANDONMENT PROCEDURE

### BELL L 12-20

- | 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    | TOOH and SB 1.66" production tubing (224 jts landed @ 7393').  |
| 7    | MIRU WL. RIH junk basket w/ gauge ring for 2 7/8" 6.5 #/ft casing to 7300'. POOH.  |
| 8    | Set CIBP at 7265' to abandon Codell perms. RDMO WL.  |
| 9    | MIRU hydrotester. Hydrotest 1.66" tubing to 3000 psi while TIH open ended. Tag CIBP set at 7265'. Pumping water with biocide, pressure test the CIBP and production casing to 2500 psi for 15 minutes. If pressure test passes, dump bail 1 sx; but if it fails, contact engineering for revised procedure steps to hydrotest 2 7/8" casing back in hole to spot stub plug prior to step 21.                                 |
| 10   | RU Cementers. Pump Niobrara/Codell plug w/ 1.66" tubing: 20 sx (27.6 cuft) class "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/sx (849' inside 2 7/8" csg, no excess). The plug will cover 7265' - 6415'. RD cementers.   |
| 11   | PUH to 6300' and circulate tubing clean to ensure no cement is left in the tubing.   |
| 12   | TOOH 1.66" tubing, LD.   |
| 13   | MIRU WL. PU and RIH with 1 11/16" perf gun and shoot squeeze holes at 4650' with 6 spf, 0.5" diam. RDMO WL.  |
| 14   | MIRU Cementers on the 2 7/8" casing. Establish circulation down the production casing and up surface casing/production casing annulus. If circulation is not established, call Evans Engineering.  |
| 15   | Pump 20 bbl sodium metasilicate and a 5 bbl water spacer followed by Sussex Squeeze: 430 sx (495 cuft) Class "G" cement with 0.25 pps cello flake, 0.4% CD-32, 0.4% ASA-301 mixed at 15.8 ppg and 1.15 cuft/sx (550' in 12" OH from caliper with 40% excess, 550' in 2 7/8" production casing with no excess). The plug will cover 4650' - 4100'. Drop wiper plug and displace to 4100' using 24 bbls water. RDMO cementers. |
| 16   | WOC per cement company recommendation.   |

- 17 MIRU WL. RIH and tag cement at 4100' or shallower. If the tag is deeper than 4100', contact Evans Engineering.
- 18 RIH and jet cut casing at 1320'. RDMO WL.
- 19 Circulate with fresh water containing biocide to remove any gas.
- 20 NDBOP, NDTH. Install BOP on casing head with 2 7/8" pipe rams. If PT failed from step 9, hydrotest the 2 7/8" casing back in the hole.
- 21 MIRU Cementers. Establish circulation and pump 10 bbl (min) SAPP followed by a 20 bbl fresh water spacer. Pump Stub Plug: 690 sx (918 cuft) Type III w/ cello flake and CaCl<sub>2</sub> as deemed necessary, mixed at 14.8 ppg and 1.33 cuft/sx (762' in 12" OH from caliper with 40% excess, 208' in 8 5/8" surface csg with no excess). The plug will cover 1320' - 350'. RD cementers.
- 22 Pull up to 100' and circulate tubing clean using fresh water treated with biocide. TOOH.
- 23 WOC per cement company recommendation. Tag cement. Cement top needs to be above 358'.
- 24 MIRU WL. RIH 8 5/8" CIBP to 80'. Set and pressure test to 1000 psi for 15 minutes. RDMO WL and WO rig.
- 25 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.
- 26 Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
- 27 Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
- 28 Excavate hole around surface casing enough to allow welder to cut casing minimum 5' below ground level.
- 29 Welder cut casing minimum 5' below ground level.
- 30 Fill casing to surface using 4500 psi compressive strength cement, (NO gravel).
- 31 Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
- 32 Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
- 33 Properly abandon flowlines per Rule 1103. File electronic Form 42 once abandonment complete.
- 34 Back fill hole with fill. Clean location, level.
- 35 Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.

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