

## PLUG AND ABANDONMENT PROCEDURE

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### HOUSTON B 5-16

- | 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 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    | Check and record Bradenhead pressure. If Bradenhead valve is not accessible, re-plumb so that valve is above GL. Last FM 17 test on 2/14/2013 recorded an instantaneous BH pressure of <1 psig.  |
| 4    | MIRU, kill as necessary using clean fresh water with biocide. ND WH. NU BOP.   |
| 5    | Unland 2 1/16" tbg (220 jts) landed at 7129'. TOOH, SB all tubing.   |
| 6    | MIRU WL. RIH with 3 1/2" 7.7 #/ft junk basket and gauge ring to 7155'. POOH.   |
| 7    | Set CIBP at 7150' to abandon J-sand perfs (collars at 7118' and liner top @ 7162'). Dump bail 1 sx cmt on CIBP.  |
| 8    | Set CIBP at 6830' (collars @ 6814' & 6858'). RD WL.  |
| 9    | RU hydrotester. RIH with 2 1/16" tubing to 6830' while hydrotesting to 3000 psi. Tag CIBP and pick up 5'. Circulate gas out of the hole and pressure test the CIBP and production casing to 3000 psi for 15 minutes. If pressure test passes, proceed to the next step; but if it fails, contact engineering for revised procedure steps to hydrotest 3 1/2" casing back in hole to spot stub plug prior to step 18. |
| 10   | RU Cementers. Pump Niobrara Balanced Plug: 15 sx (22.7 cuft) Thermal 35 + 0.5% CHR-2 + 0.25% FMC blend mixed at 15.6 ppg and 1.51 cuft/sx (440' inside 3 1/2" casing, no excess). The plug will cover 6830' - 6390'. RD cementers.   |
| 11   | PUH to 6200', circulate tubing clean to ensure no cement is in tubing.   |
| 12   | P & SB 4730' of tubing, LD remainder.  |
| 13   | RU Cementers. Pump Sussex Balanced Plug: 45 sx (51.8 cuft) Class "G" cement with 0.5% CFR-2 + 0.2% FMC + 0.5% LWA, mixed at 15.8 ppg and 1.15 cuft/sx (1000' in 3 1/2" production casing with no excess). The plug will cover 4630' - 3630'. RD cementers.   |
| 14   | PUH to 3400' and circulate tubing clean to ensure no cement is in tubing.  |
| 15   | WOC per cement company recommendation. Tag cement. Cement top needs to be above 3760'. POOH and LD 2 1/16" tubing.   |
| 16   | RU WL. Cut casing at 850'. RDMO WL.  |

- 17 Circulate with fresh water containing biocide to remove any gas.
- 18 NDBOP, NDTH. Install BOP on casing head with 3 1/2" pipe rams. If casing PT to 3000 psi passed in step 9, proceed; otherwise, TOO and hydrotest back in the hole.
- 19 MIRU Cementers. Establish circulation and get bottoms up. Pump 10 bbl (min) SAPP followed by a 20 bbl fresh water spacer. Pump Stub Plug: 110 sx (146.3 cuft) Type III w/ cello flake and CaCl<sub>2</sub> as deemed necessary w/ 0.3% CFL-3 + 0.3% CFR-2, mixed at 14.8 ppg and 1.33 cuft/sx (122' in 9" OH from caliper with 40% excess, 208' in 8 5/8" surface csg with no excess). The plug will cover 850' - 620'. RD cementers.
- 20 Pull up to 100' and circulate tubing clean using fresh water treated with biocide. TOO.
- 21 WOC per cement company recommendation. Tag cement. Cement top needs to be above 628'.
- 22 MIRU WL. RIH 8 5/8" CIBP to 80'. Set and pressure test to 1000 psi for 15 minutes. RDMO WL and WO 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 Evans 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 5' below ground level.
- 27 Welder cut casing minimum 5' 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 Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
- 31 Properly abandon flowlines per Rule 1103. File electronic Form 42 once abandonment complete.
- 32 Back fill hole with fill. Clean location, level.
- 33 Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.