

## PLUG AND ABANDONMENT PROCEDURE (RE-ENTER)

### REHDER 1

Step	Description of Work
1	Locate and expose casing stub. Extend 4 1/2" casing to GL and install 3M well head with 3000 psi ball valves in both outlets. Prepare location for workover rig. Install perimeter fence as needed.
2	Provide notice to COGCC prior to rig up per request on approved Form 6 (e.g. call field coordinator, submit Form 42, etc.).
3	MIRU workover rig. NU 7 1/16" 3000 psi BOP stack on casing head. PT BOP and csg head per approved Form 2. Function test BOPE . NU rotating head on BOP. Hook up return line to shale shaker on flat tank
4	PU 3 7/8" mill tooth bit, necessary drill collars and drill pipe/work string (WS). Drill through existing cement plug at surface (Reported to be 10' - 300') using water with biocide.
5	Once surface plug is drilled, RIH to 2 sk cement cap on CIBP @ 7800' (calculated top is 7774').
6	TOOH standing back WS. LD bit and DCs.
7	MIRU WL. Run gyro survey from PBTD to surface. Run CBL to find TOC @ the Niobrara and check cement coverage from 800' to surface. If the production casing is free below the surface casing shoe @ 215', it may be possible to pull some of the 4 1/2". Forward results to Evans Engineering.
8	PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120° phasing. Shoot 1' of squeeze holes at 7350' and 6685'. Adjust perf depths according to cement top per CBL. Desired bottom perf is 20' above TOC.
9	PU CICR. RIH and set at 6715'+/-20' pending collar locator on CBL. RD WL.
10	RIH w/ WS and stinger for CICR while hydrotesting to 3,000 psi.
11	RU Cementers. Pump Niobrara Suicide squeeze: 230 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 cf/sk. Underdisplace and sting out of CICR to leave 3 bbls on top of retainer. Cement volume based on 9 1/2" hole with 20% excess.
12	PUH 10 stands. Circulate with water containing biocide to clear tubing. TOH standing back ~ 4100' of WS.
13	RUWL & PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120° phasing. Shoot 1' of squeeze holes at 4653' and 4250'. Adjust perf depths as necessary per CBL.
14	PU CICR. RIH and set at 4280'+/-20' pending collar locator on CBL. RD WL.
15	RIH w/ WS and stinger.
16	RU cementers. Pump 5 bbls water with biocide, 20 bbls Sodium Metasilicate solution, and another 5 bbl spacer immediately preceding cement.
17	Pump Sussex squeeze consisting of 360 sx class "G" w/0.25 pps cello flake, 0.4% CD-32, 0.4% ASA-301 mixed at 15.8 ppg and 1.15 cf/sk. Underdisplace and sting out of CICR to leave 3 bbls of cement on top of retainer. (Cement volume based on 12 1/2" hole with 20% excess).
18	PUH 10 stands. Circulate with water containing biocide to clear tubing. TOH standing back ~ 810' of WS.
19	RUWL & PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120° phasing. Shoot 1' of squeeze holes at 1340' and 780'. Adjust perf depths as necessary per CBL.
20	PU CICR. RIH and set at 810'+/-20' pending collar locator on CBL. RD WL.

- 21 RIH w/ WS and stinger.
- 22 RU Cementers. Pump Surface Suicide: 430 sx Type III cement w/ 0.25 pps cello flake and CaCl<sub>2</sub> as deemed necessary mixed at 14.0 ppg and 1.53 cf/sk (1225' inside 4 1/2" Casing and 560' in 13" OH + 20% excess ). Pump all but ~3 bbls. Sting out of CICR and spot ~3 bbls cmt on top of retainer.
- 23 TOOH circulating WS and 4 1/2" csg clean to 115' from surface.
- 24 MIRU WL. RIH 4 1/2" CIBP to 100'. Set, PT to 1000 psi for 15 min. If tests, 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 8 5/8" casing minimum 5' below ground level.
- 29 Welder cut casing minimum 5' below ground level.
- 30 MIRU ready cement mixer. Use 4500 psi compressive strength cement, (NO gravel) fill stubout.
- 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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