

PLUG AND ABANDONMENT PROCEDURE

Apollo 1

Step	Description of Work
1	Provide notice to COGCC prior to rig up per request on approved Form 6 (e.g. call field coordinator, submit Form 42, etc.). Install perimeter fence as needed.
2	Locate and expose casing stub. (4 1/2" casing was cut off 4 feet below GL and may be cemented in 8 5/8" at surface.) Extend casing to GL and install 3M well head with 3000 psi ball valves in both outlets.
3	MIRU workover rig. NU 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 (5 sk) using fresh water with biocide.
5	Once surface cement plug is drilled, displace hole with drilling mud and continue washing down to 5 sk cement cap on CIBP @ 7000' (calculated top ~6940').
6	Drill out cement and CIBP. (push CIBP to at least 7850'. Notify cementers to be on call. Volumes listed below may be adjusted per CBL.
7	TOOH standing back WS. LD bit and DCs.
8	MIRU WL. PU CIBP for 4 1/2" 11.6# csg. Run and set at 7800'. Dump bail 2 sx cement on CIBP. Fill csg with water. Run gyro survey from PBTB to surface. Run CBL from PBTB to surface. NOTE: It is important to check for cement in the 8 5/8" X 4 1/2" annulus at surface. If cement is not present it may be possible to recover some 4 1/2" casing. Forward results to Evans Engineering.
9	PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120° phasing. Shoot 1' of squeeze holes at 6930' and 6530'. Adjust perf heights according to cement location on CBL. Desired bottom perf is 20' above TOC. Top perf should be adjusted to leave 400' of cement in the annulus above the Niobrara Top (7036').
10	PU CICR. RIH and set at 6560'+/-20' pending collar locator on CBL. RD WL.
11	RIH w/ WS and stinger for CICR while hydrotesting to 3,000 psi.
12	RU Cementers. Pump Niobrara Suicide: 190 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 (11"+ hole 20% Caliper Log in file) to place suicide squeeze between perfs. Underdisplace and sting out of CICR to leave 3 bbls on top of retainer.
13	PUH 6 stands. Circulate with water containing biocide to clear tubing. TOH standing back ~ 4300' of WS.
14	RUWL & PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120° phasing. Shoot 1' of squeeze holes at 4920' and 4310'.
15	PU CICR. RIH and set at 4340'+/-20' pending collar locator on CBL. RD WL.
16	RIH w/ WS and stinger.
17	RU Cementers. Pump 5 bbl water w/ biocide, 20 bbl Sodium Metasilicate solution, and another 5 bbl spacer immediately preceding cement.
18	Pump SX Suicide: 630 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/sx (165.4bbls) (13.5"+20% Caliper Log in file) to place suicide squeeze between perfs. Underdisplace and sting out of CICR to leave 3 bbls on top of retainer.
19	PUH 6 stands. Circulate water containing biocide to clear WS. TOOH and WOC 4 hours.
20	RUWL & PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120° phasing. Shoot 1' of squeeze holes at 710' and 120' pending CBL.
21	PU CICR. RIH and set at 150'+/-20' pending collar locator on CBL. RD WL.
22	RIH w/ WS and stinger.
23	RU Cementers. Pump Surface Suicide: 320 sx Type III CaCl ₂ cement mixed at 14.0 ppg and 1.53 cf/sk (140' inside 8 5/8" Casing and 450' in 13" OH + 20% excess, and 1 bbl on top of CICR) to place suicide squeeze between perfs. Pump all but ~1 bbl. Sting out of CICR and spot ~1 bbl on top of retainer.
24	TOOH circulating WS and 4 1/2" csg clean to 100' from surface.
25	MIRU WL. RIH 4 1/2" CIBP to 100'. Set, PT to 1000 psi for 15 min. If tests, RDMO WL and WO rig.
26	Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries to rsdJVendor@anadarko.com within 24 hrs of completion of the job.
27	Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
28	Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
29	Excavate hole around surface casing enough to allow welder to cut 8 5/8" casing minimum 5' below ground level.
30	Welder cut casing minimum 5' below ground level.
31	MIRU ready cement mixer. Use 4500 psi compressive strength cement, (NO gravel) fill stubout.

