

PLUG AND ABANDONMENT PROCEDURE

Erickson Birkle P 25-6

Engineer: Tyler Davis

Step	Description of Work
1	Note: Production Casing = 4 1/2" OD, 12.6#/ft, N-80; Production Hole Drilled @ 7-7/8"
2	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 foreman or lead operator at least 24 hr prior to rig move. Request they catch and remove the plunger, isolate production equipment and remove any automation prior to rig showing up. Install perimeter fence as needed.
3	MIRU slickline services and VES. Pull bumper spring and tag bottom. Run pressure bomb and obtain pressure gradient survey from surface to 7766' making gradient stops every 1000'. Forward pressure bomb results to Evans Engineering.
4	Run gyro survey from 7874' to surface with stops every 100'. Forward gyro survey data to Sabrina Frantz and invoices to Sabrina Frantz. RDMO slickline services and VES.
5	Notify IOC when rig mobilizes to location to generate workorder for flowline removal & one call for line locates.
6	Prepare location for base beam equipped rig.
7	MIRU, kill as necessary using clean fresh water with biocide and circulate. ND WH. NU BOP. Unseat landing jt, LD.
8	Notify cementers to be on call. Provide volumes listed below:
8.1	Niobrara Suicide Plug: 110 sx class G w/ 20% silica flour, 0.4% CD-32, 0.4% ASA-301 and R-3 mixed at 15.8 ppg and 1.38 cuft/sk (400' inside 7-7/8" casing +20% excess and 400' in 4 1/2" Casing, no excess)
8.2	SX Suicide Plug: 160 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 (125 sx for 8-1/2" + 20% excess and 35 sx 4 1/2" casing, no excess).
8.3	Stub Plug: 160 sx Type III CaCl ₂ cement w/0.25 pps cello flake mixed at 14.0 ppg and 1.53 cf/sx (100' in 4 1/2" prod casing, 487' in 8-1/2" OH + 20% excess, and 200' in 8 5/8" surface casing)
9	TOOH 2 3/8 " production tubing. Stand Back.
10	MIRU WL. RIH gauge ring for 4 1/2" 12.6#/ft casing to 7730'. POOH.

- 11 RIH CIBP w/ WL. Set at +/- 7660' (collars located at 7772' and 7742'). Dump bail 2 sx class "G" cement on CIBP.
- 12 Pressure test CIBP to 1000 psi.
- 13 PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120deg phasing. Shoot 1' of squeeze holes at 6720' and 6320'.
- 14 PU CICR. RIH and set a CICR approximately 30' below the top perf pending collar locator on CBL. RDWL
- 15 RIH w/stinger on 2-3/8" tubing while hydrotesting to 3000 psi.
- 16 RU Cementers. Pump Niobrara Plug: 110 sx class G w/ 20% silica flour, 0.4% CD-32, 0.4% ASA-301 and R-3 mixed at 15.8 ppg and 1.38 cuft/sk to place cement between perfs and in casing. Underdisplace and sting out of CICR to leave 3 bbls on top of retainer.
- 17 PUH 9 stands. Circulate 95 bbls water containing biocide to clear tubing. Then, TOO H.
- 18 PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120deg phasing. Shoot 1' of squeeze holes at 4610' and 4000'.
- 19 PU CICR. RIH and set a approximately 30' below the top perf pending collar locator on CBL. RDWL
- 20 RIH w/stinger on 2-3/8" tubing.
- 21 RU Cementers. Pump 5 bbl water w/biocide, 20 bbl Sodium Metasilicate, and another 5 bbl spacer immediately preceding cement.
- 22 Pump Suicide SX: 160 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 to place cement between perfs and in casing. Underdisplace and sting out of CICR to leave 3 bbls on top of retainer.
- 23 PUH 5 stands. Circulate 55 bbls water containing biocide to clear tubing. Then, TOO H and SB remainder of tbg.
- 24 RU WL. Shoot off casing at or below 1100'. RDMO WL. Circulate a full circulation with water containing biocide to remove any gas.
- 25 NDBOP, NDTH.
- 26 Install BOP on casing head with 4 1/2" pipe rams.
- 27 TOO H with 4 1/2" casing, LD.
- 28 RIH with 2 3/8 " tubing to 1200'.

- 29 RU Cementers. Spot Stub Plug: 160 sx Type III CaCl₂ cement w/0.25 pps cello flake mixed at 14.0 ppg and 1.53 cf/sx (100' in 4 1/2" prod casing, 487' in 8-1/2" OH + 20% excess, and 200' in 8 5/8" surface casing).
- 30 Circulate 5 bbls water containing biocide to clear tubing.
- 31 TOOH. WOC 4 hrs. Tag Cement. Cement top needs to be above 413'; Proceed assuming TOC is above 413'. Otherwise, call production engineer.
- 32 MIRU WL. RIH 8 5/8" CIBP to 80'. Set, PT to 1000 psi for 15 min. If tests, RDMO WL and WO rig.
- 33 Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries and invoices to rscDJVendors@anadarko.com within 24 hrs of the completion of the job.
- 34 Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
- 35 Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
- 36 Excavate hole around surface casing enough to allow welder to cut 8 5/8" casing minimum 5' below ground level.
- 37 Welder cut 8 5/8" casing minimum 5' below ground level.
- 38 MIRU ready cement mixer. Use 4500 psi compressive strength cement, (NO gravel) fill stubout.
- 39 Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
- 40 Properly abandon flowlines per Rule 1103.
- 41 Back fill hole with fill. Clean location, level.
- 42 Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed. File electronic Form 42 once abandonment complete.