

## PLUG AND ABANDONMENT PROCEDURE

UPRR 22 PAN AM H 1

Step	Description of Work
1	Note: Production Casing = 4 1/2" OD, 10.5#/ft, K-55; Production Hole Drilled @ 7 7/8"; Cement Stage Tool: 665'.
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. Pull bumper spring and tag bottom. Run pressure bomb and obtain pressure gradient survey from surface to 7936' making gradient stops every 1000'. Forward pressure bomb results to Evans Engineering. RDMO slickline services.
4	Notify IOC when rig mobilizes to location to generate workorder for flowline removal & one call for line locates.
5	Prepare location for base beam equipped rig. MI ~15 additional 2 3/8" prod tbg jts.
6	MIRU, kill as necessary using clean fresh water with biocide and circulate. ND WH. NU BOP. Unseat landing jt, LD.
7	Notify cementers to be on call. Provide volumes listed below:
7.1	Niobrara Suicide: 310 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 (88.9 bbls) (11 1/2 " + 20%)
7.2	SX Suicide: 830 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 (165.7 bbls) (15 1/2 "+20% excess)
7.3	Surface Suicide: 560 sx Type III CaCl <sub>2</sub> cement w/0.25 pps cello flake mixed at 14.0 ppg and 1.53 cf/sx (139.9 bbls) (640' inside 4 1/2" Prod Casing and 670' in 12 3/4" OH + 40% excess, and 10 bbls on top of CICR)
8	TOOH 2 3/8" production tubing. Stand Back.
9	MIRU WL. RIH gauge ring for 4 1/2" 10.5#/ft casing to 7909'.
10	RIH CIBP w/ WL. Set at 7830'. PU dump bailer, dump bail 2 sx class 'G' cement on CIBP. PT Casing to 1000 psi.
11	PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120° phasing. Shoot 1' of squeeze holes at 7360' and 6750'.
12	PU CICR. RIH and set at 6780'. RD WL.
13	RIH w/ stinger on 2 3/8" tubing while hydrotesting to 3,000 psi.

- 14 RU Cementers. Pump Niobrara Suicide: 310 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 (88.9 bbls) (11 1/2 " + 20%) to place suicide squeeze between perfs. Underdisplace and sting out of CICR to leave 3 bbls on top of retainer.
- 15 PUH 6 stands. Circulate 95 bbls water containing biocide to clear tubing. P&LD tbg to 4970'.
- 16 RUWL & PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120° phasing. Shoot 1' of squeeze holes at 4970' and 4360'.
- 17 PU CICR. RIH and set at 4390'. RD WL.
- 18 RIH w/ stinger on 2 3/8" tubing.
- 19 RU Cementers. Pump 5 bbl water w/ biocide, 20 bbl Sodium Metasilicate, and another 5 bbl spacer immediately preceding cement.
- 20 Pump SX Suicide: 830 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 (165.7 bbls) (15 1/2 "+20% excess) to place suicide squeeze between perfs. Underdisplace and sting out of CICR to leave 3 bbls on top of retainer.
- 21 PUH 5 stands. Circulate 60 bbls water containing biocide to clear tubing. P&LD tbg to 1420'. SB remainder.
- 22 RUWL & PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120° phasing. Shoot 1' of squeeze holes at 1420' and 750'.
- 23 PU CICR. RIH and set at 780'. RD WL.
- 24 RIH w/ stinger on 2 3/8" tubing.
- 25 RU Cementers. Pump Surface Suicide: 560 sx Type III CaCl<sub>2</sub> cement w/0.25 pps cello flake mixed at 14.0 ppg and 1.53 cf/sx (139.9 bbls) (640' inside 4 1/2" Prod Casing and 670' in 12 3/4" OH + 40% excess, and 10 bbls on top of CICR) to place suicide squeeze between perfs. Pump all but 10 bbls. Sting out of CICR and spot 10 bbls on top of retainer.
- 26 TOOH circulating as necessary to clear tubing. WOC 4 hrs. Tag Cement. Cement top needs to be above 540'; Proceed assuming TOC is above 540'. Otherwise, call production engineer.
- 27 MIRU WL. RIH 4 1/2" CIBP to 150'. Set, PT to 1000 psi for 15 min. If tests, RDMO WL and WO rig.
- 28 Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries and invoices to [rscDJVendors@anadarko.com](mailto:rscDJVendors@anadarko.com) within 24 hrs of the completion of the job.
- 29 Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
- 30 Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
- 31 Excavate hole around surface casing enough to allow welder to cut 8 5/8" casing minimum 5' below ground level.

- 32 Welder cut 8 5/8" casing minimum 5' below ground level.
- 33 MIRU ready cement mixer. Use 4500 psi compressive strength cement, (NO gravel) fill stubout.
- 34 Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
- 35 Properly abandon flowlines per Rule 1103.
- 36 Back fill hole with fill. Clean location, level.
- 37 Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed. File electronic Form 42 once abandonment complete.

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