

PLUG AND ABANDONMENT PROCEDURE

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AMEN 1

Step	Description of Work
1	"Note: Production Casing = 4 1/2" OD, 11.6#/ft, J-55; Production Hole Drilled @ 7 7/8"; Sqz Holes: 2238'. 7126' of 2 3/8 " tbg in hole."
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, VES, and pressure bomb services. Pull bumper spring and tag bottom. Run pressure bomb and obtain pressure gradient survey from surface to 7158' making gradient stops every 1000'. Forward pressure bomb results to Evans Engineering. RDMO pressure bomb services. MIRU VES and run gyro survey from 7090' to surface with stops every 100'. Forward gyro survey data and invoices to tech (currently Sabrina Frantz). RDMO slickline services and VES.
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 Plug: 25 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 (5.3 bbls) (Inside 4 1/2" Casing, no excess)
7.2	"SX Suicide: 310 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 (58.8 bbls) (9 1/2 "+20% excess)"
7.3	Stub Plug: 350 sx Type III CaCl ₂ cement w/0.25 pps cello flake mixed at 14.8 ppg and 1.33 cf/sx (94.9 bbls) (100' in 4 1/2" prod casing, 479' in 12 1/4" OH + 20% excess, and 150' in 8 5/8" surface casing)
8	TOOH 2 3/8 " production tubing. Stand Back.
9	MIRU WL. RIH gauge ring for 4 1/2" 11.6#/ft casing to 6825'.

- 10 RIH CIBP w/ WL. Set at 6760'. Do Not PT (note squeeze holes).
- 11 Run CBL from CIBP to Surface. Send results to Mark.Hinaman@anadarko.com immediately. RDWL.
- 12 RIH to 6760' w/ 2 3/8 " tubing while hydrotesting to 3,000 psi.
- 13 "RU Cementers. Pump Niobrara Plug: 25 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 (5.3 bbls) (Inside 4 1/2" Casing, no excess) to place balanced plug between 6760' - 6420'."
- 14 PUH 9 stands. Circulate at least 90 bbls (one full circulation) water containing biocide to ensure tubing is clear of any cement. P&LD tbg to 4380'.
- 15 RUWL & PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120° phasing. Shoot 3 squeeze holes at 4380' and 3 at 3770'.
- 16 PU CICR. RIH on wireline and set at approximately 3800' (30' below the top perf pending collar locator on CBL). RD WL.
- 17 RIH w/ stinger on 2 3/8 " tubing.
- 18 RU Cementers. Pump 5 bbl water w/ biocide, 20 bbl Sodium Metasilicate, and another 5 bbl spacer immediately preceding cement.
- 19 Pump SX Suicide: 310 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 (58.8 bbls) (9 1/2 " +20% excess) to place suicide squeeze between perfs. Underdisplace and sting out of CICR to leave 3 bbls on top of retainer.
- 20 PUH 5 stands. Circulate at least 50 bbls (one full circulation) water containing biocide to ensure tubing is clear of any cement. P&LD tbg to 920'. SB remainder.
- 21 RU WL. Shoot off casing at or below 820' based on CBL. RDMO WL. Circulate a full circulation or 5 bbls (whichever is more) with water containing biocide to remove any gas.
- 22 NDBOP, NDTH.
- 23 Install BOP on casing head with 4 1/2" pipe rams.
- 24 TOOH with 4 1/2" casing, LD.
- 25 RIH with 2 3/8 " tubing to 920'.
- 26 RU Cementers. Spot Stub Plug: 350 sx Type III CaCl₂ cement w/0.25 pps cello flake mixed at 14.8 ppg and 1.33 cf/sx (94.9 bbls) (100' in 4 1/2" prod casing, 479' in 12 1/4" OH + 20% excess, and 150' in 8 5/8" surface casing).
- 27 POH to approximately 80' - 100' and circulate 5 bbls water containing biocide to clear tubing.

- 28 TOOH. WOC 4 hrs. Tag Cement. Cement top needs to be above 241'; Proceed if TOC is above 241'. Otherwise, call production engineer.
- 29 MIRU WL. RIH 8 5/8" CIBP to 80'. Set CIBP, and PT to 1000 psi for 15 min. If tests, RDMO WL and WO rig.
- 30 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.
- 31 Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
- 32 Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
- 33 Excavate hole around surface casing enough to allow welder to cut 8 5/8" casing minimum 5' below ground level.
- 34 Welder cut 8 5/8" casing minimum 5' below ground level.
- 35 MIRU ready cement mixer. Use 4500 psi compressive strength cement, (NO gravel) fill stubout.
- 36 "Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number."
- 37 Properly abandon flowlines per Rule 1103.
- 38 Back fill hole with fill. Clean location, level.
- 39 Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed. File electronic Form 42 once abandonment complete.