

PLUG AND ABANDONMENT PROCEDURE

Henrickson Amoco 41-19 A

1. Note: Production Casing = 4-1/2" OD, 11.6#/ft, WC-70; 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 IOC (970-506-5980) at least 24 hr prior to rig move. Request they isolate production equipment and remove any automation prior to rig MIRU.
3. MIRU slickline services. Pull bumper spring and tag bottom. Forward results to Evans Engineering. RD slick line services.
4. Prepare location for base beam equipped rig.
5. Check and record Bradenhead pressure. If Bradenhead valve is not accessible, re-plumb so that valve is above GL.
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: 41 cu ft/30 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 4-1/2" casing, no excess)
 - 7.2 SX Suicide: 287 cu ft/ 250 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 (400' in 10.75" OH + 20% excess and 400' inside 4-1/2" casing, no excess).
 - 7.3 Stub Plug: 652 cu ft/490 sx Type III CaCl₂ cement w/0.25 pps cello flake mixed at 14.8 ppg and 1.33 cf/sx (100' in 4-1/2" prod casing, 634' in 10.75" OH + 40% excess, and 206' in 8 5/8" surface casing).
8. TOOH 2-3/8" and 1.66" tubing. LD 1.66" tubing.
9. RU WL. RIH gauge ring for 4-1/2" 11.6# casing to 7450'. POOH.
10. RIH CIBP and set at +/- 7400'. Dump bail 2 sx neat "G" cmt. POOH.
11. RIH CIBP and set at +/- 7040'. Pressure test CIBP to 1000 psi. POOH.
12. Run CBL from 7040' to surface to verify cement coverage of Amoco well. Note: It is important to get a good quality CBL. It may be necessary to circulate from just above CIBP to surface in order to get gas out of the hole. RD WL.
13. RU Cementers. Pump Niobrara Plug: 41 cu ft/30 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 in 4-1/2" production casing from 7040' to 6640'.
14. PUH to 6400'. Circulate 100 bbls water containing biocide to clear tubing. Then, TOOH.
15. RU WL. PU 3-1/8" perf guns with 3 spf, 0.5" dia 120deg phasing. Shoot 1' of squeeze holes at 4520' and 4120'. RD WL.
16. RIH w/CICR on 2-3/8" to 4150' while hydrotesting to 3000 psi.
17. RU Cementers. Pump SX suicide: 287 cu ft/250 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 in squeeze holes and casing from 4520' to

4120' (400' in 10.75" OH + 20% excess and 400' inside 4-1/2" casing, no excess). Under displace and sting out of CICR to leave 3 bbls on top of retainer.

18. PUH to 3800' and circulate 60 bbls water containing biocide to clear cement and tubing. Then TOO H and LD all but ~1200' of tbg.
19. RU WL. Shoot off casing at or below 1100'. RD WL. Circulate water containing biocide to remove any gas.
20. NDBOP, NDTH.
21. Install BOP on casing head with 4-1/2" pipe rams.
22. TOO H with 4-1/2" casing, LD. Remove 4-1/2" rams, install 2-3/8" rams.
23. RIH with 2-3/8 " tubing to 1200'.
24. RU Cementers. Pump 10 bbl SAPP with a minimum of 20 bbl fresh water spacer. Spot Stub Plug: 652 cu ft 490 sx Type III CaCl₂ cement w/0.25 pps cello flake mixed at 14.8 ppg and 1.33 cf/sx from 1200' to 260' (100' in 4-1/2" prod casing, 634' in 10.75" OH + 40% excess, and 206' in 8 5/8" surface casing).
25. PUH to 100' and circulate 10 bbls water containing biocide to clear tubing.
26. TOO H. WOC 4 hrs. Tag Cement. Cement top needs to be above 260'; Proceed assuming TOC is above 260'. Otherwise, call production engineer.
27. MIRU WL. RIH 8 5/8" CIBP to 80'. 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 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. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
37. Back fill hole with fill. Clean location, level.
38. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed. File electronic Form 42 once abandonment complete.