

RECOMMENDED PROCEDURE

Notify BLM, COGCC and any other relevant regulatory representative at least 48 hrs. prior to plugging operations. Confirm all permits and approvals have been obtained and are on location prior to beginning well work.

1. MIRU WO unit
2. Kill well, ND tree, and NU Class III BOPs (1000 psi < MASIP < 3000 psi) and test per ExxonMobil requirements.
 - i. Kill fluid is produced water
 - ii. 3,000psi WP, Class III BOPs
 - a. Pipe rams for 2-3/8" tubing
 - b. Spool
 - c. Blind rams
 - iii. Low pressure test: 200-300 psi for 5 minutes
 - iv. High pressure test: 3,000 psi for 10 minutes
3. POOH with 2 3/8" tubing.
4. MIRU Slickline Unit and associated equipment (5K lubricator, 5K wireline BOP's, and stuffing box). NU lubricator and Class II BOP's and test per XOM requirements:
 - 200-300 psi for 5 minutes
 - 3,000 psi for 10 minutes
5. PU 1.75" gauge ring and junk basket and RIH to PBTD (~3,111'). POOH with tools.
6. PU 1.75" Vaughn gyro tool, RIH, tag bottom and record depth. Log from PBTD to surface making stops every 200 ft. Ensure that data was captured properly by tool when brought to surface. RDMO Slickline Unit.
 - Email Gyro data to Slade.Downing@ExxonMobil.com
7. PU bit and scraper for 5 1/2" 14# casing on WS and RIH to 2,300'. POOH with bit and scraper.
8. PU cement retainer for 5 1/2" 14# casing on 2 3/8" WS, RIH, and set @ 2,250'. While stung into retainer, pressure test tubing to 500 psi. If tubing fails pressure test, contact SSE.
9. MIRU Halliburton Cement Unit and pressure test lines.

10. Sting out of retainer. Pump 10 bbls of fresh water; then, pump 250' balanced plug (~6 bbls, 30sks) using 15.8 ppg Class G, neat cement. PU WS to 1,500', and reverse circulate clear. SD and WOC overnight.
11. RIH and tag plug. Record depth for official record. Circulate inhibited 10 lb brine from top of plug to 1,200' (~20 bbls of brine).
12. POOH with WS. PU retrievable packer, RIH, and set @ 960'. Pressure test tubing by casing annulus to 500 psi to verify that the top of the leaks is still at this depth. If casing fails pressure test, move packer up hole until the top of leaks is established. Contact SSE if this occurs. POOH with packer and WS.
13. Spot cement plug across casing leaks. Contact SSE for final plug placement. Assuming leak interval has not changed, RIH with WS to 1,280'. Spot balanced cement plug up to 910' (~9 bbls, 44 sks) using 15.8 ppg class G, neat cement. PU WS to 500' and reverse circulate clear. SD and WOC overnight.
 - Take care to ensure that cement volumes are pumped in accordance with this procedure to prevent cement top above perforation depth (890').
14. RIH and tag plug. Record depth for official record. Pressure test casing to 500 psi for 15 minutes. Chart and record test for official record. Contact SSE if casing fails pressure test. POOH with WS.
15. MIRU E-line Unit and associated equipment (5K lubricator, 5K wireline BOP's, and greasehead). NU lubricator and Class II BOP's and test per XOM requirements:
 - 200-300 psi for 5 minutes
 - 3,000 psi for 10 minutes
16. PU 1 ft of 3 1/8" casing guns loaded with big hole charges @ 4 spf and 90 degree phasing. RIH and perforate casing @ 890'. POOH with spent guns.
17. Open 8 5/8" casing valve and check to see if surface casing will stand full of fluid. Attempt to establish circulation down production casing and up production by surface casing annulus. Contact SSE with results of both tests.
 - Do not exceed a surface pumping pressure of 1,000 psi.
 - If perforations cannot be pumped into, contact SSE before continuing with procedure.
18. RDMO E-line.

19. PU Cement retainer for 5 ½" 14# casing (on WS), RIH, and set @ 840'. Pressure test retainer to 500 psi. Chart and record test for official record. Sting out of retainer and pump 5 bbls of fresh water on top of retainer.

20. Sting into retainer and squeeze surface casing shoe:

- If circulation up production by surface casing annulus was possible:
 - i. Pump 10 bbl fresh water spacer ahead, pump 15.8 ppg class G cement until cement returns are seen at surface or returns are lost at surface. Cement volume to surface is ~28 bbls. Ensure that at least 5 bbls are displaced through retainer before returns are lost. If returns are lost before 5 bbls, SD for 10 minutes and begin cement squeeze as described in the next step (2 hesitations). Contact SSE if this happens.
 - ii. Sting out of retainer and spot 12 bbl (~60 sks) balanced plug on top of retainer (~500' plug).
 - iii. PU WS and reverse circulate clear. SD and WOC overnight.
- If circulation was not possible up production by surface casing annulus:
 - i. Mix 10 bbls (50 sks) of 15.8 ppg class G cement with 1% CaCl₂ (see Halliburton cement design for pumping time and slurry design). Pump 5 bbl of fresh water spacer, pump 8 bbls of cement. Shut down and wait 10 minutes.
 - ii. Begin first 2 bbl squeeze @ .5 bbl/min in an attempt to attain 200-300 psi squeeze pressure. This squeeze should be pumped with the remaining 2 bbls of cement in the mix tub. If no pressure is seen, SD again for 5-10 minutes. Attempt to squeeze with remaining cement (~3 bbls) in the string @ .5 bpm by pumping fresh water displacement.
 - iii. Once squeeze pressure is achieved, sting out of retainer and spot 12 bbl (~60 sks) balanced plug on top of retainer (~500' plug). PU WS, reverse circulate clear. SD and WOC overnight.
 - iv. If squeeze pressure is not achieved after second hesitation, overdisplace all cement through perforations by pumping 15 bbls of fresh water. Sting out of retainer and reverse circulate clear. SD and WOC. Contact SSE for new squeeze design.

21. RIH and tag plug. Record depth for official record. Circulate inhibited 10 lb brine to surface (~8 bbls). POOH and lay down WS.
22. Ensure there is no pressure on any casing string and backside is standing full of fluid. ND BOPs. Prepare well for removal of all casing at the base of the cellar. Cut-off casing and tubing head 4' below ground level.
23. RIH to 150' with 1" pipe into production by surface annulus. Pump cement to surface. POOH with 1" pipe. Repeat previous step in production casing. SD and wait on cement levels to settle. Top off both strings and ensure cement levels remain at surface. Cement should be 15.8 ppg class G, neat cement.
24. Remove any excess cement necessary to attach marker. Attach regulation marker plate with weep hole. Marker must have the following information permanently placed on marker head:
 - i. Operator Name
 - ii. Federal Lease Serial number
 - iii. Well number
 - iv. Location by $\frac{1}{4}$ $\frac{1}{4}$, Section, Township and range, or other acceptable surveyed description
25. The cellar shall be filled and surface restored in accordance with the COGCC, BLM, and any other relevant regulatory agency.
26. RDMO workover rig. Clean and clear location, hand site off to operations for reclamation.

For Questions, Please Contact SSE
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713-431-1250

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