

Short Procedure: SKR-698-28-02 - Squeeze casing, perf & frac the Wasatch formation in 1 stage, cleanout, run tubing, & RTP as dual completion.

Background: Perf and squeeze to raise cement above top of Wasatch. And recompleat into the Fort Union/Wasatch. This will be a commingle with the Williams Fork.

It is up to the WSM, Workover Engineer and Production Engineer to make the decisions necessary to safely do what is best for the well.

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WellSafe Procedure Required: No, well requires less than 10 ppg to kill.

Short Procedure: Refer to the MMWW standard procedure for requirements and general procedure for job. Also, utilize the field's specific Well Planning Tool (WPT) for field best practices.

Workover operations in Skinner Ridge are conducted underbalanced a majority of the time. The use of a rotating rubber and flow back system allow us to work on the well while flowing up the backside in a controlled state. The only time the well will not be allowed to flow is during N/D and N/U operations when we are unable to set a BPV or during pipe light conditions while tripping. Be sure to calculate when pipe light conditions are before each trip based on current conditions of the well. Confirm calculations with the WOE.

1. MIRU Slickline. **N/U lubricator and test to 500 psi for 5 minutes (WSEA 10A)**. RIH and pull plunger lift equipment and tag for fill. RDMO with slickline.
2. MIRU workover rig and equipment. Uncover casing valves. Check pressure on all casing strings (including bradenhead). **Record tubing and casing pressures every day on the WellView report.**
3. Kill tubing. **Set BPV in hanger (WSEA 10B)**, if possible. N/D tree. **N/U 7-1/16" 5K BOP with 3K Washington head, 3K annular and 2-3/8" pipe rams on top of blind rams (WSEA 8A)**. Pull BPV. Test BOPE to 250 psi low/1400 psi high.

NOTE: If BPV cannot be set, the well must be monitored for flow for 15 minutes or longer before installing BOP.

4. MIRU flowback equipment (manifold, flarestack, seperator and lines). Ensure line restraints are inspected and installed correctly. Test lines to 4500 psi for 5 minutes.

NOTE: The QuadO A spreadsheet will need to be filled out during all times gas is being flowed through the system. Pictures will also need to be taken of the system rigged up on the well. Communicate with WOE on any questions regarding QuadO A.

5. Caliper elevators and document in WellView. TOOH with production tubing laying down. See WBD-current tab for details.
6. P/U 3-7/8" bit and 4-1/2" scrapper and make bit and scraper run to 2,200'. TOOH L/D bit and scraper. P/U 4-1/2" RBP and TIH to 2200' and set. Spot 20' of sand on top of RBP and TOOH.

7. MIRU E-line and lubricator. Test lubricator to 500 psi for 5 minutes per trip. P/U 3-1/8" guns loaded 4 SPF 90 degree phasing. Perforate squeeze holes in 4-1/2" casing @ 1,965'. Correlate to GR-CCL-RBT-RMT log dated 4/25/2009. RDMO with e-line and auxillary equipment.

NOTE: Current TOC @ 2,240'.

8. Attempt to establish injection rate from down the casing while monitoring surface casing valve. Once injection rate established, a cement slurry design/volumes will be determined to bring TOC behind the 4-1/2" to 1,300'. **Consult with WOE and superintendent on forward plan for pumping cement.**
9. P/U 3-7/8" bit and cleanout BHA and TIH to TOC. Drill out cmt to squeeze holes. Test casing to 500 psi for 15 minutes. If leaks do not hold consult with WOE. If leaks hold continue cleaning out to sand on RBP. **DO NOT CIRCULATE SAND OFF OF RBP. TOOH.**
10. MIRU E-line and lubricator. Test lubricator to 500 psi for 5 minutes per trip. P/U CBL and RIH to ~1,975'. Log well to surface. Send results to WOE and PE. If TOC is higher than 1,300' continue on with the procedure. If TOC did not achieve 1,300' consult with WOE and Superintendent on forward plan.
11. P/U RBP retrieval tool. TIH to top of sand on RBP. Circulate off sand and latch RBP. Release and TOOH L/D.
12. P/U 1.791" XN profile nipple, 1 jt of 2-3/8" tubing, 1.875" X profile nipple, ~81 jts of 2-3/8" yellow band tubing, and 4-1/2" full opening packer with on/of tool. TIH and set packer @ ~1,865' with EOT at ~4,415'.
13. MIRU Slickline. N/U lubricator and test to 500 psi for 5 minutes. RIH and set plug 1.875" plug in X-profile. RDMO with slickline. Release from on/off and TOOH.
14. P/U 4-1/2" 10K RBP and TIH to ~1,845' and set. Spot 20' of sand on top of RBP. TOOH L/D tubing.
15. **Set BPV (WSEA 10C).** N/D BOP. N/U dual 7-1/16" 5K frac valves with goat head. Pull BPV and set TWC. **Test valves and goat head to 4500 psi for 15 minutes (WSEA 10D).** Pull TWC.
16. MIRU E-line and lubricator. Test lubricator to 1000 psi for 5 minutes per trip. P/U 3-1/8" guns loaded 3 SPF 120 degree phasing with large diameter deep penetrating shots. Perforate 1st proposed stage (Wasatch). See proposed perforations below. Correlate to GR-CCL-RBT-RMT log dated 3/6/2009. RDMO with e-line and auxillary equipment.

Proposed Perfs 1: @ 1535', 1552', 1558', 1564', 1570', 1575', 1633', 1638', 1643', 1648', 1661', 1666', 1687', 1693', 1714', 1720', 1749', 1759', & 1765'
17. MIRU frac equipment. Frac 1st proposed stage (Fort Union) per proposed frac design. **Utilize section 16.2.4 of the MMWW standard procedure for specific hydraulic fracturing requirements.**

NOTE: Max surface treating pressure will be 4500 psi. Ensure that line restraints are certified and installed. All equipment will need to be tested to 5000 psi including the suction manifold on the CO2 pump. Ensure that required surrounding wells are monitored during the frac job and pop-offs are set accordingly.

18. Flow back well until CO2 levels have reached to turn the well to sales. **Ensure that Quad OA spreadsheet is being filled out correctly.**

NOTE: In the event the rig cannot return immediately a forward plan will have to be developed based on timing of the rigs return. Communicate with WOE and Superintendent on best plan forward.

19. MIRU workover rig and equipment. Uncover casing valves. Check pressure on all casing strings (including bradenhead). **Record tubing and casing pressures every day on the WellView report.**
20. **Set BPV in hanger (WSEA 10E)**, if possible. N/D frac tree. **N/U 7-1/16" 5K BOP with 3K Washington head, 3K annular and 2-3/8" pipe rams on top of blind rams (WSEA 8B).** Pull BPV. Test BOPE to 250 psi low/1400 psi high.

NOTE: If BPV cannot be set, the well must be monitored for flow for 15 minutes or longer before installing BOP.

21. R/U tubing handling equipment. Caliper elevators and document in WellView. P/U 3-7/8" bit and cleanout BHA on 2-3/8", L-80 workstring. Cleanout to RBP @ 1,845'. Circulate clean. L/D workstring and cleanout BHA.

NOTE: Depending on CO2 levels of flow back will determine if the gas re-circulation unit or N2 will be used for the cleanout.

22. P/U RBP retrieval tool and TIH to 1,845'. Ensure wellbore is clean of any debris prior to releasing RBP. Latch RBP and TOOH.
23. P/U on/off skirt 2-3/8" L-80 yellow band production tubing and TIH to 4-1/2" packer @ ~1,865'. Engage 4-1/2" packer. MIRU Slickline. N/U lubricator and test to 500 psi for 5 minutes. RIH and pull 1.875" X-profile plug. RDMO with slickline.

NOTE: Prior to returning well to sales ensure gas is of saleable quality. May have to flow through flowback system to flare prior to returning to operations.

24. **Set BPV (WSEA 10F).** N/U tubing adaptor and test void to 5000 psi for 15 minutes **(WSEA 10G).** Pull BPV.

NOTE: If BPV cannot be set, the well must be monitored for flow for 15 minutes or longer before installing production tree.

25. Notify production personal in field office and contact pumper that well is ready for pumping. Complete Ownership Transfer Document from D&C to Operations. RDMO workover rig and equipment. **ENSURE LOCATION IS CLEAN.**