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## State of Colorado 1

### API 05-081-05705

#### Plugging Procedure

1. Dig and fence off an 8' x 8' x 6' (L x W x D) pit to accommodate cement cleanup.
2. Move in and rig up a contract workover rig with pipe racks, catwalk, rig pump and rig tank.
3. Move in and spot one 400 bbl tank and fill with fresh water.
4. Lay flow lines from the wellhead to the rig tank.
5. Check and record tubing pressure and casing pressure. Bleed-off any pressures to rig tank.
6. Pump 30 bbl fresh water down the tubing for well control.
7. Remove upper wellhead. Install a 7-1/16" 5000 psi hydraulically operated double gate BOP equipped with 2-3/8" pipe rams in the top gate and blind rams in the bottom gate. Function test both the blind and pipe rams. Hook up a flow line from the BOP to the rig tank.
8. Prep to pull tubing. Pick up and un-land tubing, release retrievable packer and remove hanger. Note: Arrow Model R packer is set at 6344' in 12,000# compression.
9. POOH standing back.
10. RU wireline and run gauge ring to 6370'. CBL to confirm cement top which is believed to be 5750' and confirm top and bottom of 75 sk cement squeeze at 399'.

**Plug 1 (Squeeze Fort Union perforations from 6389'-6405')** Cement yield assumed for all plugs is 1.15 ft<sup>3</sup>/sk.

11. Pick up a cast iron cement retainer (CICR) dressed for 5-1/2", 15.5# casing and trip in hole on tubing. Set retainer @ 6340' or ~50' above the top perforation.
12. Rig up cementers and establish an injection rate and pressure through the CICR. Sting out of the CICR. Mix 75 sacks (~15 bbl) of cement and displace to end of tubing. Note tubing volume @ 6330' is ~36.7 bbl.
13. Sting into the retainer and squeeze the perforations with 60 sacks (~12 bbl.) of cement below the CICR.
14. Sting out and POOH slowly to 6240'. Reverse out cement leaving 100' of cement on top of the retainer.

**Spacer 1 (6240' – ~75' below TOC (believed to be 5750'))**

15. Mix and spot 9 ppg Poz Gel from 6240' to 5825' or 75' below TOC ~ 10 bbl. POOH to ~75 below TOC'.

**Plug 2 (balanced plug across TOC)**

16. Lay a 150' balanced cement plug from 5675' to 5825' with 25 sacks (~5 bbl.) which includes +25% excess. POOH laying down to 75' above TOC and reverse out cement.

**Spacer 2 (5675' – 3050')**

17. Mix and spot 9 ppg Poz Gel from 5675' to 3050' (63 bbl). POOH laying down to 3050'.

### **Plug 3 (balanced plug)**

18. Lay a 130' balanced cement plug from 3050' to 2920' with 20 sacks (~4 bbl.) which includes +25% excess. POOH laying down to 2920' and reverse out cement.

- Assuming CBL indicates cement from squeeze work done in 1985 is inside 8-5/8" surface casing proceed as follows: (If no cement is present the procedure will need to be changed to perforate 50' below 8-5/8" shoe and pump a 100' cement plug behind and inside the 5-1/2" casing.)

### **Spacer 3 (2920' – 450')**

19. Mix and spot 9 ppg Poz Gel from 2920' to 450' (~ 60 bbl). POOH laying down to 450', standing back remainder.

### **Plug 4 (balanced plug 450' (50' below confirmed casing leak) - 300' (50' above casing shoe))**

20. Lay a 150' balanced cement plug from 450' to 300' with 22 sacks (~4.5 bbl.) which includes +25% excess. POOH laying down to 300' and reverse out cement.

### **Spacer 4 (300' – 50')**

21. Mix and spot 9 ppg Poz Gel from 300' to 50' (~ 6 bbl). POOH laying down.

22. Nipple down the BOP and remove the tubing spool. Cut off casing head 3' below ground level.

### **Plug 5 (surface plug in the 5-1/2" casing and the 5-1/2"x 8-5/8" ann.)**

23. Using 1" line pipe, spot a surface cement plug from 50' to surface in the 5-1/2" casing with ~7 sks and 5-1/2" x 8-5/8" annulus with ~15 sacks.

24. Install a regulation dry hole marker on casing stub. Note the GPS coordinates of the wellbore location for future reference.

25. Backfill around the dry hole marker and the cement pit.

26. Rig down and move off all rig and rental equipment.

27. Reclaim location per COGCC requirements.