

## **F Wilson 18**

**API 05-081-05541**

### **Plugging Procedure**

1. Test dead man anchors and replace as needed.
2. Dig and fence off an 8' x 8' x 6' (L x W x D) pit to accommodate cement cleanup.
3. Move in and rig up a contract workover rig with pipe racks, catwalk, rig pump and rig tank.
4. Move in and spot a 400 bbl tank and fill with fresh water.
5. Check and record tubing pressure and casing pressure. Bleed-off pressures to rig tank.
6. Top kill well by pumping tubing volume of 9.0 bbl of water down the tubing.
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 port to the rig tank.
8. Prep to pull tubing. Pick up and un-land tubing. Proceed to remove hanger.
9. POOH standing back.
10. Pick up a bit & scraper dressed for 5-1/2" 15.5# casing and TIH through the perfs to approximately 2350'. Circulate the wellbore until returns are clean. POOH standing back and break off bit & scraper.

#### Cement 1 (squeeze)

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 @ 2222' (50' above perfs).
12. Rig up cementers and establish an injection rate and pressure through the CICR. Sting out of the CICR. Mix 50 sacks (10.2 bbl) of cement and displace to end of tubing. Note tubing volume @ 2222' is 8.7 bbl.
13. Sting into the retainer and squeeze the perforations with 38 sacks (7.9 bbl) of cement below the CICR.
14. Sting out and POOH 100'. Reverse out cement leaving 50' of cement on top of retainer plus 50' excess.
15. Mix and spot 9 ppg Poz Gel from 2172' to 1425' (approx. 17.8 bbl).

#### Cement 2 (TOC)

16. Lay a 100' balanced cement plug across the top of cement behind the 5-1/2" casing. Mix and spot cement from 1425' to 1325' with 17 sacks (3.6 bbl) including 50' excess. POOH 50' to 1275' and reverse out cement.
17. Mix and spot 9 ppg Poz Gel from 1325' to 100' (approx. 29.2 bbl).
18. POOH and lay down tubing.

### Cement 3 (annulus surface plug)

19. Tie into the 5-1/2" x 8-5/8" annulus with the cementer. Assuming a bullheaded injection rate can be established, mix and pump 28 sacks (5.7 bbl) of cement for a 116' annulus surface plug including 50' excess.
  - a. If a bullheaded injection cannot be established, then perforate 50' below surface casing shoe, set CIRC at shoe depth and squeeze leaving a 100' cement plug across shoe.

### Cement 4 (tubing surface plug)

20. Nipple down the BOP and remove the tubing spool. Cut off casing head 3' below ground level.
21. Using 1" tubing, spot a surface cement plug from 100' to surface in the 5-1/2" casing with 12 sacks (2.4 bbl).
22. Top off cement in casing and in annulus as needed.
23. Install a regulation dry hole marker on casing stub. Note the GPS coordinates of the wellbore location for future reference.
24. Backfill around the dry hole marker and the cement pit.
25. Rig down and move off all rig and rental equipment.
26. Reclaim location per BLM requirements.

## Calculations

F Wilson 18			input	
			output	
Description	Variable Name	Capacity		
2-3/8" 4.7# Tubing	Tbg Cap	0.0039 bbl/ft		5.614 cu ft / bbl
2-3/8" 4.7# x 5-1/2" 15.5# Annulus	Tbg/Csg Ann Cap	0.0183 bbl/ft		1.150 cu ft / sk
5-1/2" 15.5# Casing	Csg Cap	0.0238 bbl/ft		4.882 sk / bbl
5-1/2" 15.5# x 8-5/8" 25.55# Annulus	Csg/SurfCsg Ann Cap	0.0343 bbl/ft		
<b>Cement 1 (squeeze)</b>				
Bottom Perf Depth		2,344 ft		
CICR Depth		2,222 ft		
Desired volume of cement mix		10.2 bbl	50	sks
Required volume = V_cement1 = V_below + V_above =		6.7 bbl	33	sks
Is desired volume enough?		Yes		
V_above = (Csg Cap)*(50' + 50' Excess) =		2.4 bbl	12	sks
V_below = (Csg Cap)*(Bottom Perf Depth - CICR Depth)+(50% Excess) =		4.4 bbl	21	sks
Actual V_below = (Volume Desired - V_above) =		7.9 bbl	38	sks
<b>Poz 1</b>				
Depth Initial		2,172 ft		
Depth Final		1,425 ft		
V_poz1 = (Csg Cap)*(Depth Initial - Depth Final) =		17.8 bbl		
<b>Cement 2 (balanced plug)</b>				
Depth Initial		1,425 ft		
Depth Final		1,325 ft		
V_cement2 = (Csg Cap)*(Depth Initial - Depth Final + 50' Excess) =		3.6 bbl	17	sks
<b>Poz 2</b>				
Depth Initial		1,325 ft		
Depth Final		100 ft		
V_poz2 = (Csg Cap)*(Depth Initial - Depth Final) =		29.2 bbl		
<b>Cement 3 (annulus surface plug)</b>				
Depth SurfCsg Shoe		116 ft		
V_cement3 = (Csg/SurfCsg Ann Cap)*(Depth SurfCsg Shoe + 50' Excess) =		5.7 bbl	28	sks
<b>Cement 4 (tubing surface plug)</b>				
Depth Initial		100 ft		
Depth Final		- ft		
V_cement4 = (Csg Cap)*(Depth Initial - Depth Final) =		2.4 bbl	12	sks
<b>Volume Totals</b>				
V_cement_total = V_cement1 + V_cement2 + V_cement3 + V_cement4 =		21.9 bbl	107	sks
V_poz_total = V_poz1 + V_poz2 =		47 bbl		