

## HSR-Deborrah 7-5 Bradenhead Procedure

- 1 Well needs GYRO.
- 2 Call IOC (970-506-5980) at least 24 hr prior to rig move. If not already completed, request that they catch and remove plunger, isolate production equipment and remove any automation equipment prior to the rig showing up. Install perimeter fence as needed.
- 3 MIRU slickline. Fish plunger from lubricator. RIH and pull the bumper spring and standing valve if necessary. RBIH with sinker bars and tag bottom. Report findings. PBSD should be at 7376'. RIH with GYRO, and run from SN (7258') to surface making stops every 100'. RDMO slickline.
- 4 Prepare location for base beam rig.
- 5 Spot a minimum of 25 jts of 2-3/8", 4.7#, J-55, EUE tbg for replacement and 165 jts 1-1/4", 2-33#/ft, J-55, 10rd IJ for annular cement job.
- 6 MIRU WO rig and auxiliary equipment. Check pressures. Rig up 2" line from the casing head annulus to work tank. Kill well with fresh water. ND tree and adapter flange, NU BOP's.
- 7 PU 8-10' landing joint. TIW valve on top and screw into the tbg hanger. Back out the lock down pins and pull up on tbg string to break any possible sand bridges, unseat landing joint and lay down. Do not exceed 80% of tubing tensile strength, or **57,380-lb**. Clean out as necessary to 7376'.
- 8 MIRU EMI equipment. TOOH with 2-3/8" tbg. EMI tbg while TOOH. Lay down joints with wall loss or penetrations >35%. Replace joints as necessary. Note joint number and depth of tubing leak(s) on production equipment failure report in Open Wells. Clearly mark all junk (red band) tubing sent to yard.
- 9 TIH with 2-3/8" tbg and 4.5" RBP. Set RBP @ +/-6890', (collars are at 6864' and 6908'). Pressure test RBP to 1000 psi. Spot 2sx of sand on top of RBP and TOOH.
- 10 Bleed off pressure. ND BOP's, ND wellhead, Un-land 4-1/2" casing, NU dual entry flange, NU BOP.
- 11 PU 1-1/4" 2.3#/ft J-55 10rd IJ tubing, and TIH outside 4-1/2" casing in open hole to ~5200'. Circulate with freshwater treated with biocide to clean up annulus while TIH, circulate with rig pump until clean returns are seen.
- 12 Contact Imperial mud (min of 24hrs. in advance) to bring out 40bbls of 10.0ppg mud, circulate the well with continuous sweeps of mud until well is completely dead and all gas is removed from annulus (shut in well for 1 hr to ensure no gas is present).
- 13 If gas is detected, contact engineering to discuss plan moving forward.
- 14 PUH to +/- 5012' to displace cement.
- 15 MIRU cement services. Prepare to cement. Circulate 330 bbls (~1 annular volume) of water at 2-3bpm, followed by a 30bbl (5bbls water, 20bbls SMS, 5bbls water) spacer.
- 16 Mix and pump **415sx (~85bbls)** of 14.6 ppg (1.12 cuft/sk) neat Class G cement and ¼ lb/sk Cello Flake. The cement is to be retarded for 120 °F and 6 hour pump time.
- 17 TOOH ~42 joints to ~3700' and reverse circulate 2 times the tubing volume of water or until clean returns are seen.
- 18 PUH to 1450'. Mix and pump **380sx (~90bbls)** of 14.8 ppg (1.33 cuft/sk) Type III and ¼ lb/sk Cello Flake. The cement is to be retarded for 80 °F and 3 hour pump time.
- 19 TOOH ~43 joints to ~100' and reverse circulate 2 times the tubing volume of water or until clean returns are seen. TOOH with 1-1/4" tubing.
- 20 RDMO cementing company.
- 21 ND BOP. ND dual entry flange and crossover. Pick up and land 4-1/2" casing in slips. NU 4-1/2" 5000 psi tubing head with 2-5000 psi valves (use new style flanged well head equipment if available). NU BOP's to

Remediate Shannon/Sussex and Fox Hills with Dual Stage Annular  
Run GYRO  
Design is for coverage from ~5012' to 4009' and from ~1450' to 308'

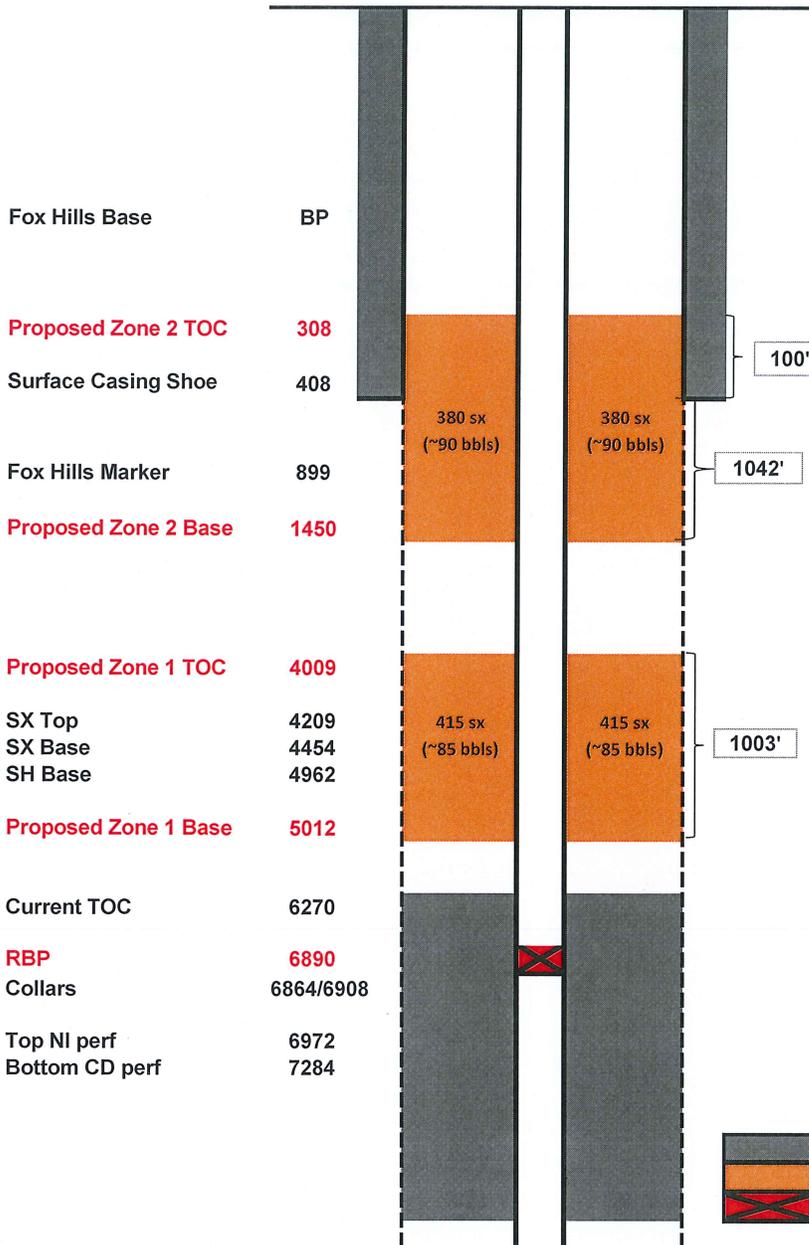


- tubing head. Make sure all valves and nipples are rated to 5000 psi.
- 22 Leave well shut in for ~36hrs.
  - 23 MIRU wireline and run CCL-GR-CBL-VDL from 6500' to surface. Verify with Evans Engineering that new TOC is at 308' or higher. In addition to normal handling of logs/job summaries, email copies of all cement job logs/job summaries and invoices to rscDJVendors@anadarko.com within 24 hours of the completion of the job.
  - 24 RDMO wireline.
  - 25 PU and TIH with 2-3/8" tbg and retrieving head. Circulate sand off RBP at @ +/-6890'. TOOH with RBP and SB tbg.
  - 26 TIH with 2-3/8" NC, 2-3/8" XN SN and 2-3/8" 4.7# J55 EUE tbg, circulate out fill or bail if necessary to 7376'. Land tbg @ +/- 7244' (1 joint above top Codell perf).
  - 27 Broach tubing to seating nipple. ND BOP's, NU master valve and tubing head adaptor. Hydrotest tubing head to 5000 psi for 15 minutes.
  - 28 RDMO WO rig.
  - 29 Clean location and swab well back to production. Notify IOC of finished work and turn well back over to production team.

HSR-Deborah 7-5 05-123-16755 Proposed WBD (Bradenhead)

12-1/4" Surface Hole

7-7/8" Prod Hole



Between 8-5/8" Casing 24# and 4.5" casing	0.24715	ft <sup>3</sup> /ft
Between 8-5/8" Casing 24# and 4.5" casing	0.04402	bbbl/ft
7 7/8" Open hole and 4.5" casing	0.2278	ft <sup>3</sup> /ft
7 7/8" Open hole and 4.5" casing	0.0406	bbbl/ft
8" Open hole and 4.5" casing	0.2386	ft <sup>3</sup> /ft
8" Open hole and 4.5" casing	0.0425	bbbl/ft
8.5" Open hole and 4.5" casing	0.2836	ft <sup>3</sup> /ft
8.5" Open hole and 4.5" casing	0.05051	bbbl/ft
9" Open hole and 4.5" casing	0.3313	ft <sup>3</sup> /ft
9" Open hole and 4.5" casing	0.0590	bbbl/ft
9.5" Open hole and 4.5" casing	0.3818	ft <sup>3</sup> /ft
9.5" Open hole and 4.5" casing	0.0680	bbbl/ft
10.5" Open hole and 4.5" casing	0.4909	ft <sup>3</sup> /ft
10.5" Open hole and 4.5" casing	0.0874	bbbl/ft
11" Open hole and 4.5" casing	0.5495	ft <sup>3</sup> /ft
11" Open hole and 4.5" casing	0.0979	bbbl/ft
11.5" Open hole and 4.5" casing	0.6108	ft <sup>3</sup> /ft
11.5" Open hole and 4.5" casing	0.1088	bbbl/ft
12.0" Open hole and 4.5" casing	0.6749	ft <sup>3</sup> /ft
12.0" Open hole and 4.5" casing	0.1202	bbbl/ft
Class Cement yield (zone 1, SX/SH) 14.6ppg	1.12	ft <sup>3</sup> /sk
Class Cement yield (zone 2, Fox Hills) 14.8ppg	1.33	ft <sup>3</sup> /sk

0.2 excess

**Zone 2 (Fox Hills)**

$$(0.3818 * (1450 - 408)) / 1.33 * 1.2 = 358.9 \text{ sx}$$

$$(0.24715 * (408 - 308)) / 1.33 = 18.6 \text{ sx}$$

$$\text{Total } 377.5 \text{ sx} \sim 380 \text{ sx}$$

$$(0.0680 * (1450 - 408)) * 1.2 = 85.0 \text{ bbl}$$

$$(0.04402 * (408 - 308)) = 4.4 \text{ bbl}$$

$$\text{Total } 89.4 \text{ bbls} \sim 90.0 \text{ bbls}$$

**Zone 1 (SX/SH)**

$$(0.3818 * (5012 - 4009)) / 1.12 * 1.2 = 410.3 \text{ sx} \sim 415 \text{ sx}$$

$$(0.0680 * (5012 - 4009)) * 1.2 = 81.8 \text{ bbls} \sim 85 \text{ bbls}$$

	Existing Cement
	Proposed Cement
	RBP