

## Wardell 11-20 – Bradenhead Procedure

- 1 Call Foreman or Lead Operator 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.
- 2 MIRU Slick line. Fish plunger if necessary and tag for PBTD (should be at 7524')
- 3 Prepare location for base beam rig.
- 4 Spot 12 jts of 2-3/8" 4.7# J-55 8RD EUE tbg.
- 5 Spot 5 jts of 4 1/2" 11.6# I-80 LTC csg.
- 6 Spot 6 2 7/8" 16# drill collars
- 7 MIRU WO rig. Kill well with fresh water with biocide. ND wellhead, NU BOPs.
- 8 Run two 2" or one 3" line(s) from starting head to return tanks. (Need to be able to circulate at 10 bbl/min).
- 9 PU 8-10' landing joint with TIW safety valve on top and screw into the tbg hanger. Back out the lock down pins and pull up on the tbg string to break any possible sand bridges. Do not exceed 80% of tubing tensile strength, or 57,384-lb.
- 10 Unseat tbg hanger and LD tbg hanger and landing joint. Install rubber wiper in stripping head.
- 11 MIRU EMI equipment. TOO H with 2-3/8" tbg. EMI tbg while TOO H. Lay down joints with wall loss or penetrations >35%. Replace joints as necessary. Keep yellow and blue band tubing. Note joint number and depth of tubing leak(s) on production equipment failure report in OpenWells. Clearly mark all junk (red band) tubing sent to yard.
- 12 MIRU wire line.
- 13 RIH with CCL/Gage Ring to 7524'. POOH with wire line.
- 14 RIH with wire line and 4.5" RBP (4.5" 11.6# I-80). Set RBP at +/- 7000' (Collars at 6978' and 7022' (flag joint)). Dump bail 2 sx sand on top of RBP. RDMO wire line.
- 15 Pressure test RBP to 1,000 psi for 15 minutes. (Pressure test to make sure plug is set correctly)
- 16 PU and RIH with CCL and 3-1/8" perforating gun, 0.60" EHD charge, 3 spf. Perforate 4 1/2" csg @ +/- 1600' avoiding any collars identified by CCL. POOH with wire line. RDMO wire line company.
- 17 MIRU cement company. Establish circulation with 9.0 ppg drilling mud at 10 bbl/min or maximum rate achievable.
- 18 Commence pumping cement job consisting 5 bbl fresh water, 20 bbl sodium meta silicate and 5 bbl fresh water; 35 bbl (130 sx) of Type III + with CaCl<sub>2</sub> and 2 lb/sk PS Flake mixed at 14.0 ppg and 1.53 cuft/sk (Cement from 1600' to 875'). Drop wiper plug and under displace by 1.5 bbl (23.3 bbl total, leave 100' of cement in csg. Do not over displace).
- 19 Break lines and clean up with fresh water. RDMO cement company.
- 20 NU tbg head and BOP.
- 21 Leave well shut in overnight with 100 psi on it.
- 22 Circulate gas out of hole with fresh water with biocide.
- 23 PU 6 2 7/8" 16# drill collars with 3-7/8" bit/mill and TIH with 2-3/8" tbg and crossover. Rig up power swivel and mill cement to +/- 1600'.
- 24 TOO H with bit and SB tbg. LD collars.
- 25 MIRU wire line and run CCL-GR-CBL-VDL from 1700' to 100'. If cement is not above 875', contact engineering for further instructions. RDMO wire line.

- 26 Pressure test csg to 1,000 psig.
- 27 TIH with 2-3/8" tbg and retrieving head. Circulate sand off RBP, latch onto RBP and TOOH. SB tbg.
- 28 TIH with 2-3/8" XN SN and 2-3/8" 4.7# J55 EUE csg. Land tbg @ +/- 7362' (1 jt above top Codell perf). Broach tbg to XN nipple.
- 29 ND BOP, NU master valve and tubing head adaptor. Hydrotest tubing head to 5000 psi for 15 minutes.
- 30 RMDO WO rig.
- 31 Clean location and swab well back to production. Notify field foreman/field coordinator of finished work and turn well back over to production team.