

HARRY LEONARD "A" #23

Ran 158 joints 6385.77' of 7" OD 23# N-80 & J-55 R-3 SS Casing. Set and cemented at 6398.77' w/2800 sacks cement, 2224 sacks 8% Gel & 476 sacks 4% Gel & 100 sacks neat on bottom. Lost circulation when approximately 1450 sacks 8% Gel cement outside 7" casing at bottom w/1000# pressure Plug stop at 6312'. Ran HOWCO temperature survey in 16 hrs found top of cement outside 7" casing at 2510'. Perforated 7" casing w/2, $\frac{1}{2}$ " bullet holes by HOWCO at 1200'. Ran HOWCO 7" DM cement retainer on tubing set at 1146'. Recemented w/total of 560 sacks cement, pump in 360 sacks 4% Gel & 71 sacks neat slow set thru perforations in 7" casing at 1200' & cement started circulating w/450 # pressure. Closed casinghead & started stage cementing. Squeezed 100 sacks neat cement thru perforations w/900# pressure, shut down 5 mins, & pump $2\frac{1}{2}$ bbls w/900#. Shut down bleed back to 100# pressure. Wait 5 min & pump $1\frac{1}{2}$ bbls at 1000#, bleed back to 300# wait 5 min & pump $1\frac{1}{2}$ bbls w/1000#, set 10 mins pressure holding 1000#, left 10' cement on top retainer reversed out 4 sacks cement. WOC 40 hrs. Drilled cement & HOWCO retainer from 1136-1200', CO to 1250', tested perforations in 7" casing at 1200'. Pump in formation thru perforations w/1200#, broke down to 550#. Ran tubing w/HOWCO DM cement retainer, set at 1146' & squeeze cement w/250 sacks regular neat cement. Stage cement 6 times waiting 10 mins each stage, except last 2 stages 15 mins each. Pump 150 sacks first stage, 3 times 30 sacks each & 8 sacks 800# and 15 mins & 2 sacks last stage. Pump in last stage 1200#. Clear tool and perforations w/ $2\frac{1}{2}$ bbls water. WOC 8 hrs. Re-squeeze cement thru perforations in 7" casing at 1200' w/131 sacks regular neat cement, stage cemented 8 times. WOC 12 hrs. Re-squeeze cement thru perforations at 1200' w/85 sacks cement, stage cemented 11 times, after last stage wait 10 mins & pressure to 2200#, holding OK, take no fluid, left 11 sacks cement in casing from 1200-1146' and 10' cement above retainer. Pulled out of hole, WOC 24 hrs. Drilled cement and retainer from 1139-1200' & CO to 1280'. Tested perforations in 7" casing at 1200' w/water & 2000# pressure for 30 minutes. There was no drop in pressure. Drilled cement and shoe from 6312' to 6398', tested below shoe w/800# pressure for 30 minutes. There was no drop in pressure.

After approval of Mr. Yarbrough, State Oil & Gas Inspector, preparations were made to complete well.