



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 10/18/2015
 Invoice #: 80455
 API#: 05-123-41733
 Foreman: Calvin Reimers

Customer: Noble Energy Inc.

Well Name: Wells Ranch AE 32-690

County: Weld
 State: Colorado
 Sec: 32
 Twp: 6N
 Range: 62W

Consultant: Cliff
 Rig Name & Number: H&P 343
 Distance To Location: 23 Miles
 Units On Location: 4023-3104/4033-3212
 Time Requested: 400pm
 Time Arrived On Location: 240pm
 Time Left Location: 700pm

| WELL DATA | | Cement Data | |
|----------------------------|-------|-------------------------------|---------|
| Casing Size OD (in) : | 9.625 | Cement Name: | BFN III |
| Casing Weight (lb) : | 36.00 | Cement Density (lb/gal) : | 14.2 |
| Casing Depth (ft.) : | 610 | Cement Yield (cuft) : | 1.49 |
| Total Depth (ft) : | 639 | Gallons Per Sack: | 7.48 |
| Open Hole Diameter (in.) : | 13.50 | % Excess: | 50% |
| Conductor Length (ft) : | 100 | Displacement Fluid lb/gal: | 8.3 |
| Conductor ID : | 16 | BBL to Pit: | 18.0 |
| Shoe Joint Length (ft) : | 45 | Fluid Ahead (bbls): | 40.0 |
| Landing Joint (ft) : | 29 | H2O Wash Up (bbls): | 10.0 |
| Max Rate: | 7 | Spacer Ahead Makeup | |
| Max Pressure: | 2500 | 40 bbls H2o+Dye in 2nd 10bbls | |

| Calculated Results | Displacement: 45.87 bbls |
|---|--|
| cuft of Shoe 19.69 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft) | (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint) |
| cuft of Conductor 89.10 cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft) | Pressure of cement in annulus |
| cuft of Casing 374.06 cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length) | Hydrostatic Pressure: 450.18 PSI |
| Total Slurry Volume 482.85 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing) | Pressure of the fluids inside casing |
| bbls of Slurry 85.99 bbls (Total Slurry Volume) X (.1781) | Displacement: 243.57 psi |
| Sacks Needed 324 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement) | Shoe Joint: 33.46 psi |
| Mix Water 57.71 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42 | Total 277.03 psi |
| | Differential Pressure: 173.15 psi |
| | Collapse PSI: 2020.00 psi |
| | Burst PSI: 3520.00 psi |
| | Total Water Needed: 153.59 bbls |

Xo Derch o Dupes
 Authorization To Proceed

Customers hereby acknowledges and specifically agrees to the terms and condition on this work order, including, without limitation, the provisions on this work order.

