



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 3/12/2018
 Invoice #: 666292
 API#: 05-123-46260
 Foreman: Nick Vigil

Customer: Anadarko Petroleum Corporation
 Well Name: Quarter Circle 24-8HZ

County: Weld
 State: Colorado
 Sec: 24
 Twp: 1N
 Range: 67W

Consultant: Bryan
 Rig Name & Number: Cartel 88
 Distance To Location: 33 Miles
 Units On Location: 4023/4032/4040
 Time Requested: 2:30
 Time Arrived On Location: 1:30
 Time Left Location:

| 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.) : 1,830 | Cement Yield (cuft) : 1.49 |
| Total Depth (ft) : 1840 | Gallons Per Sack: 7.48 |
| Open Hole Diameter (in.) : 13.50 | % Excess: 10% |
| Conductor Length (ft) : 80 | Displacement Fluid lb/gal: 8.3 |
| Conductor ID : 15.25 | BBL to Pit: |
| Shoe Joint Length (ft) : 43 | Fluid Ahead (bbls): 30.0 |
| Landing Joint (ft) : 10 | H2O Wash Up (bbls): 20.0 |
| Max Rate: 8 | Spacer Ahead Makeup |
| Max Pressure: 2000 | Dye in second 10 bbl |

| Calculated Results | Pressure of cement in annulus |
|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| cuft of Shoe 18.66 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft) | Displacement: 138.92 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint) |
| cuft of Conductor 61.05 cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft) | Pressure of cement in annulus |
| cuft of Casing 940.80 cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length) | Hydrostatic Pressure: 1349.99 PSI |
| Total Slurry Volume 1020.52 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing) | Pressure of the fluids inside casing |
| bbls of Slurry 181.75 bbls (Total Slurry Volume) X (.1781) | Displacement: 770.52 psi |
| Sacks Needed 685 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement) | Shoe Joint: 31.72 psi |
| Mix Water 121.98 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42 | Total 802.24 psi |
| | Differential Pressure: 547.75 psi |
| | Collapse PSI: 2020.00 psi |
| | Burst PSI: 3520.00 psi |
| | Total Water Needed: 310.90 bbls |

X 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.

Quarter Circle 24-8HZ

