



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 6/15/2015
 Invoice #: 80147
 API#: 05-123-41212
 Foreman: JASON KELEHER

Customer: Noble Energy Inc.
Well Name: WELLS RANCH AA11-676

County: Weld
 State: Colorado
 Sec: 11
 Twp: 6N
 Range: 63W

Consultant: JIM
 Rig Name & Number: H&P 321
 Distance To Location: 38
 Units On Location: 4031-3106/ 4020-3212
 Time Requested: 1000
 Time Arrived On Location: 900
 Time Left Location: 1530

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) : 598	Cement Yield (cuft) : 1.49
Total Depth (ft) : 638	Gallons Per Sack: 7.48
Open Hole Diameter (in.) : 13.50	% Excess: 45%
Conductor Length (ft) : 100	Displacement Fluid lb/gal: 8.3
Conductor ID : 15.25	BBL to Pit: 18.0
Shoe Joint Length (ft) : 43	Fluid Ahead (bbls): 40.0
Landing Joint (ft) : 34	H2O Wash Up (bbls): 20.0
Max Rate: 6	Spacer Ahead Makeup
Max Pressure: 1000	40 BBL WATER/ DYE IN 2ND 10

Calculated Results	Pressure of cement in annulus
cuft of Shoe 18.86 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Displacement: 45.52 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
cuft of Conductor 76.31 cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Hydrostatic Pressure: 441.14 PSI
cuft of Casing 352.91 cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Pressure of the fluids inside casing
Total Slurry Volume 448.08 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: 239.11 psi Shoe Joint: 32.05 psi Total: 271.16 psi
bbls of Slurry 79.80 bbls (Total Slurry Volume) X (.1781)	Differential Pressure: 169.98 psi
Sacks Needed 301 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Collapse PSI: 2020.00 psi Burst PSI: 3520.00 psi
Mix Water 53.56 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Total Water Needed: 159.08 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.

