



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 10/3/2015
 Invoice #: 80451
 API#: 05-123-41732
 Foreman: Calvin Reimers

Customer: Noble Energy Inc.
Well Name: Wells Ranch AE 32-675

County: Weld Consultant: Josh
 State: Colorado Rig Name & Number: H&P 343
 Distance To Location: 23 Miles
 Sec: 32 Units On Location: 4023-3104/4033-3212
 Twp: 6N Time Requested: 430am
 Range: 62W Time Arrived On Location: 250am
 Time Left Location: 845am

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.) : 604	Cement Yield (cuft) : 1.49
Total Depth (ft) : 638	Gallons Per Sack: 7.48
Open Hole Diameter (in.) : 13.50	% Excess: 40%
Conductor Length (ft) : 100	Displacement Fluid lb/gal: 8.3
Conductor ID : 16	BBL to Pit: 12.0
Shoe Joint Length (ft) : 45	Fluid Ahead (bbbls): 40.0
Landing Joint (ft) : 29	H2O Wash Up (bbbls): 10.0
Max Rate: 7	Spacer Ahead Makeup
Max Pressure: 2500	40 bbbls H2o+Dye in 2nd 10bbbls

Casing ID: 8.921 Casing Grade: J-55 only used

Calculated Results	Pressure of cement in annulus
cuft of Shoe 19.66 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Displacement: 45.41 bbbls (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)	Hydrostatic Pressure: 445.76 PSI
cuft of Casing 345.02 cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Pressure of the fluids inside casing
Total Slurry Volume 453.78 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: 241.01 psi
bbbls of Slurry 80.82 bbbls (Total Slurry Volume) X (.1781)	Shoe Joint: 33.42 psi
Sacks Needed 305 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Total 274.43 psi
Mix Water 54.24 bbbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Differential Pressure: 171.33 psi
	Collapse PSI: 2020.00 psi
	Burst PSI: 3520.00 psi
	Total Water Needed: 149.65 bbbls

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.

