



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 6/5/2015
Invoice # 90003
API# 05-123-41248
Foreman: Nick

Customer: Noble Energy Inc.
Well Name: Wells Ranch AA11-623

County: Weld
State: Colorado
Sec: 11
Twp: 6N
Range: 63W
Consultant: J.W.
Rig Name & Number: H&P 343
Distance To Location: 60
Units On Location: 3102/4020/3212
Time Requested: 12:30
Time Arrived On Location: 11:15
Time Left Location: 5:15

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) : 606	Cement Yield (cuft) : 1.49
Total Depth (ft) : 616	Gallons Per Sack: 7.48
Open Hole Diameter (in.) : 13.50	% Excess: 30%
Conductor Length (ft) : 100	Displacement Fluid lb/gal: 8.3
Conductor ID : 15.376	BBL to Pit: 0.0
Shoe Joint Length (ft) : 43	Fluid Ahead (bbls): 40.0
Landing Joint (ft) : 29	H2O Wash Up (bbls): 20.0
Max Rate: 6	Spacer Ahead Makeup
Max Pressure: 1500	DYE IN SECOND 10 BBL

Casing ID	8.921	Casing Grade	J-55 only used
Calculated Results		Displacement:	43.91 bbls
cuft of Shoe 18.78 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 78.42 cuft (Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)		Pressure of cement in annulus	
cuft of Casing 321.49 cuft (Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)		Hydrostatic Pressure: 447.05 PSI	
Total Slurry Volume 418.69 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)		Pressure of the fluids inside casing	
bbls of Slurry 78.00 bbls (Total Slurry Volume) X (.1781)		Displacement: 242.64 psi	
Sacks Needed 294 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)		Shoe Joint: 31.92 psi	
Mix Water 52.36 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42		Total 274.56 psi	
		Differential Pressure: 172.49 psi	
		Collapse PSI: 2020.00 psi	
		Burst PSI: 3520.00 psi	
		Total Water Needed: 156.27 bbls	

X Jim J. Irwin
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.

