



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 11/3/2015
 Invoice #: 80461
 API#: 05-123-40733
 Foreman: Calvin Reimers

Customer: Noble Energy Inc.

Well Name: Moser H22-776

County: Weld
 State: Colorado
 Sec: 22
 Twp: 3N
 Range: 65W

Consultant: Dave / Mike
 Rig Name & Number: H&P 273
 Distance To Location: 24 Miles
 Units On Location: 4023-3104/4019-3210
 Time Requested: 800pm
 Time Arrived On Location: 620pm
 Time Left Location: 1215am

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.) : 816	Cement Yield (cuft) : 1.49
Total Depth (ft) : 845	Gallons Per Sack: 7.48
Open Hole Diameter (in.) : 13.50	% Excess: 10%
Conductor Length (ft) : 100	Displacement Fluid lb/gal: 8.3
Conductor ID : 16	BBL to Pit: 21.0
Shoe Joint Length (ft) : 45	Fluid Ahead (bbls): 60.0
Landing Joint (ft) : 29	H2O Wash Up (bbls): 10.0
Max Rate: 7	Spacer Ahead Makeup
Max Pressure: 1750	60 bbls H2O+Dye in 2nd 10 bbls

Calculated Results	Pressure of cement in annulus
cuft of Shoe 19.53 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Displacement: 61.83 bbls (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: 601.62 PSI
cuft of Casing 384.68 cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Pressure of the fluids inside casing
Total Slurry Volume 493.30 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: 332.24 psi
bbls of Slurry 87.86 bbls (Total Slurry Volume) X (.1781)	Shoe Joint: 33.20 psi
Sacks Needed 331 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Total 365.44 psi
Mix Water 58.96 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Differential Pressure: 236.19 psi
	Collapse PSI: 2020.00 psi
	Burst PSI: 3520.00 psi
	Total Water Needed: 190.79 bbls

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.

