



# Bison Oil Well Cementing Single Cement Surface Pipe

Date: 8/27/2015  
 Invoice #: 80631  
 API#: 05-123-41590  
 Foreman: JASON KELEHER

Customer: Noble Energy Inc.  
 Well Name: KIDD LD22-770

County: Weld  
 State: Colorado  
 Sec: 22  
 Twp: 9N  
 Range: 58W

Consultant: JOHN  
 Rig Name & Number: H&P 326  
 Distance To Location: 66  
 Units On Location: 4031-3103/ 4034-3213  
 Time Requested: 800  
 Time Arrived On Location: 630  
 Time Left Location: 1230

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) : 758	Cement Yield (cuft) : 1.49
Total Depth (ft) : 768	Gallons Per Sack: 7.48
Open Hole Diameter (in.) : 13.50	% Excess: 20%
Conductor Length (ft) : 80	Displacement Fluid lb/gal: 8.3
Conductor ID : 15.25	BBL to Pit: 23.0
Shoe Joint Length (ft) : 42	Fluid Ahead (bbls): 50.0
Landing Joint (ft) : 35	H2O Wash Up (bbls): 20.0
Max Rate: 6	Spacer Ahead Makeup
Max Pressure: 1000	50 BBL WATER DYE IN 2ND 10

Calculated Results	Pressure of cement in annulus
<b>cuft of Shoe</b> 18.34 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	<b>Displacement:</b> 58.04 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
<b>cuft of Conductor</b> 61.05 cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	<b>Hydrostatic Pressure:</b> 559.18 PSI
<b>cuft of Casing</b> 397.63 cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	<b>Pressure of the fluids inside casing</b>
<b>Total Slurry Volume</b> 477.02 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	<b>Displacement:</b> 308.61 psi
<b>bbls of Slurry</b> 84.96 bbls (Total Slurry Volume) X (.1781)	<b>Shoe Joint:</b> 31.18 psi
<b>Sacks Needed</b> 320 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	<b>Total</b> 339.79 psi
<b>Mix Water</b> 57.02 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	<b>Differential Pressure:</b> 219.39 psi
	<b>Collapse PSI:</b> 2020.00 psi
	<b>Burst PSI:</b> 3520.00 psi
	<b>Total Water Needed:</b> 185.06 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.

