



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 5/11/2015
 Invoice # 80038
 API# 05-123-40676
 Foreman: Calvin Reimers

Customer: Noble Energy Inc.
 Well Name: Todd LC 25-750

County: Weld
 State: Colorado
 Sec: 25
 Twp: 9N
 Range: 59W

Consultant: Seith
 Rig Name & Number: H&P 326
 Distance To Location: 68 Miles
 Units On Location: 4023-3104/4034-3203
 Time Requested: 1100am
 Time Arrived On Location: 1000am
 Time Left Location: 4:15 pm

WELL DATA	Cement Data
Casing Size OD (in) : <u>9.625</u>	Cement Name: <u>BFN III</u>
Casing Weight (lb) : <u>36.00</u>	Cement Density (lb/gal) : <u>14.2</u>
Casing Depth (ft.) : <u>1,370</u>	Cement Yield (cuft) : <u>1.49</u>
Total Depth (ft) : <u>1410</u>	Gallons Per Sack: <u>7.48</u>
Open Hole Diameter (in.) : <u>13.50</u>	% Excess: <u>30%</u>
Conductor Length (ft) : <u>100</u>	Displacement Fluid lb/gal: <u>8.3</u>
Conductor ID : <u>16</u>	BBL to Pit: <u>3.5</u>
Shoe Joint Length (ft) : <u>43</u>	Fluid Ahead (bbls): <u>50.0</u>
Landing Joint (ft) : <u>34</u>	H2O Wash Up (bbls): <u>20.0</u>
Max Rate: <u>7</u>	Spacer Ahead Makeup
Max Pressure: <u>2500</u>	<u>50bbls With Dye in Last 10bbls</u>

Calculated Results	Pressure of cement in annulus
Displacement: <u>105.16 bbls</u> (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)	Hydrostatic Pressure: <u>1010.63 PSI</u>
cuft of Shoe <u>18.88 cuft</u> (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Pressure of the fluids inside casing
cuft of Conductor <u>89.10 cuft</u> (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Displacement: <u>571.95 psi</u>
cuft of Casing <u>806.87 cuft</u> (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Shoe Joint: <u>32.08 psi</u>
Total Slurry Volume <u>914.85 cuft</u> (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Total <u>604.04 psi</u>
bbls of Slurry <u>162.93 bbls</u> (Total Slurry Volume) X (.1781)	Differential Pressure: <u>406.59 psi</u>
Sacks Needed <u>614 sk</u> (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Collapse PSI: <u>2020.00 psi</u>
Mix Water <u>109.35 bbls</u> (Sacks Needed) X (Gallons Per Sack) ÷ 42	Burst PSI: <u>3520.00 psi</u>
	Total Water Needed: <u>284.50 bbls</u>

X [Signature]
 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.

