



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 12/20/2015
 Invoice # 80563
 API# _____
 Foreman: Kirk Kallhoff

Customer: Noble Energy Inc.
Well Name: ann lc 34-765

County: Weld Consultant: charles
 State: Colorado Rig Name & Number: H&P 273
 Distance To Location: _____
 Sec: 25 Units On Location: 4031-3106/4032-3215
 Twp: 6n Time Requested: 900 am
 Range: 68w Time Arrived On Location: 730 am
 Time Left Location: 12:30 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>600</u>	Cement Yield (cuft) : <u>1.49</u>
Total Depth (ft) : <u>645</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: _____
Shoe Joint Length (ft) : <u>43</u>	Fluid Ahead (bbls): <u>40.0</u>
Landing Joint (ft) : <u>35</u>	H2O Wash Up (bbls): <u>10.0</u>
Max Rate: _____	Spacer Ahead Makeup _____
Max Pressure: _____	

Calculated Results	Pressure of cement in annulus
cuft of Shoe <u>18.66</u> cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Displacement: <u>45.77</u> bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
cuft of Conductor <u>89.10</u> cuft (Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Pressure of cement in annulus Hydrostatic Pressure: <u>442.62</u> PSI
cuft of Casing <u>317.67</u> cuft (Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Pressure of the fluids inside casing Displacement: <u>240.17</u> psi
Total Slurry Volume <u>425.43</u> cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Shoe Joint: <u>31.72</u> psi
bbls of Slurry <u>75.77</u> bbls (Total Slurry Volume) X (.1781)	Total <u>271.89</u> psi
Sacks Needed <u>286</u> sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Differential Pressure: <u>170.73</u> psi
Mix Water <u>50.85</u> bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Collapse PSI: <u>2020.00</u> psi
	Burst PSI: <u>3520.00</u> psi
	Total Water Needed: <u>146.62</u> bbls

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.

