



# Bison Oil Well Cementing Single Cement Surface Pipe

Date: 6/11/2015  
 Invoice # 90005  
 API# 05-123-41247  
 Foreman: Nick

Customer: Noble Energy Inc.  
 Well Name: Wells Ranch AA11-628

County: Weld Consultant: Johnny Sanchez  
 State: Colorado Rig Name & Number: H&P 343  
 Distance To Location: 60  
 Sec: 11 Units On Location: 4029/3101/4022/3213  
 Twp: 6N Time Requested: 5:30  
 Range: 63W Time Arrived On Location: 5:00  
 Time Left Location: 11:30

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>592</u>	Cement Yield (cuft) : <u>1.49</u>
Total Depth (ft) : <u>600</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>15.25</u>	BBL to Pit: <u>8.0</u>
Shoe Joint Length (ft) : <u>43</u>	Fluid Ahead (bbls): <u>40.0</u>
Landing Joint (ft) : <u>29</u>	H2O Wash Up (bbls): <u>20.0</u>
Max Rate: <u>6</u>	Spacer Ahead Makeup
Max Pressure: <u>1500</u>	DYE IN SECOND 10 BBL

Calculated Results	Pressure of cement in annulus
<b>cuft of Shoe</b> <u>18.66</u> <b>cuft</b> (Casing ID Squared) X (.005454) X (Shoe Joint ft)	<b>Displacement:</b> <u>42.60</u> <b>bbls</b> (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
<b>cuft of Conductor</b> <u>76.31</u> <b>cuft</b> (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	<b>Hydrostatic Pressure:</b> <u>436.72</u> <b>PSI</b>
<b>cuft of Casing</b> <u>228.60</u> <b>cuft</b> (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> <u>421.11</u> <b>cuft</b> (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	<b>Displacement:</b> <u>236.72</u> <b>psi</b> <b>Shoe Joint:</b> <u>31.72</u> <b>psi</b> <b>Total</b> <u>268.44</u> <b>psi</b>
<b>bbls of Slurry</b> <u>75.00</u> <b>bbls</b> (Total Slurry Volume) X (.1781)	<b>Differential Pressure:</b> <u>168.28</u> <b>psi</b>
<b>Sacks Needed</b> <u>283</u> <b>sk</b> (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	<b>Collapse PSI:</b> <u>2020.00</u> <b>psi</b> <b>Burst PSI:</b> <u>3520.00</u> <b>psi</b>
<b>Mix Water</b> <u>50.40</u> <b>bbls</b> (Sacks Needed) X (Gallons Per Sack) ÷ 42	<b>Total Water Needed:</b> <u>153.00</u> <b>bbls</b>

X Johnny Sanchez  
 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.

