



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 9/17/2015
 Invoice # 80529
 API# _____
 Foreman: Kirk Kallhoff

Customer: Noble Energy Inc.
 Well Name: wells ranch ae 32-620

County: Weld
 State: Colorado
 Sec: 17
 Twp: 5n
 Range: 63w

Consultant: J.W
 Rig Name & Number: H&P 273
 Distance To Location: _____
 Units On Location: 4029-3106/4020-3205
 Time Requested: 430 am
 Time Arrived On Location: 445 am
 Time Left Location: 8:00am

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>627</u>	Cement Yield (cuft) : <u>1.49</u>
Total Depth (ft) : <u>637</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>18.0</u>
Shoe Joint Length (ft) : <u>43</u>	Fluid Ahead (bbls): <u>60.0</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>47.85</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)	Hydrostatic Pressure: <u>462.54</u> PSI
cuft of Casing <u>334.83</u> cuft (Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Pressure of the fluids inside casing
Total Slurry Volume <u>442.59</u> cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: <u>251.81</u> psi Shoe Joint: <u>31.72</u> psi Total <u>283.53</u> psi
bbls of Slurry <u>78.83</u> bbls (Total Slurry Volume) X (.1781)	Differential Pressure: <u>179.01</u> psi
Sacks Needed <u>297</u> sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Collapse PSI: <u>2020.00</u> psi Burst PSI: <u>3520.00</u> psi
Mix Water <u>52.90</u> bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Total Water Needed: <u>170.76</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.