



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 9/10/2014
 Invoice # 65004
 API# 05 123 37614
 Foreman: LEE SHARP

Customer: EnCana Oil & Gas (USA) Inc.
Well Name: DRIETH 4B-6H-I368

County: Weld Consultant: KEVIN
 State: Colorado Rig Name & Number: H&P 522
 Distance To Location: 27
 Sec: 6 Units On Location: 4031-3106;3105-3210
 Twp: 3N Time Requested: 8:00
 Range: 68W Time Arrived On Location: 8:00
 Time Left Location: 11:25

WELL DATA	Cement Data
Casing Size OD (in) : <u>9.625</u>	Cement Name: <u>BFN III</u>
Casing Weight (lb) : <u>40.00</u>	Cement Density (lb/gal) : <u>15.2</u>
Casing Depth (ft.) : <u>828</u>	Cement Yield (cuft) : <u>1.27</u>
Total Depth (ft) : <u>880</u>	Gallons Per Sack: <u>5.89</u>
Open Hole Diameter (in.) : <u>12.25</u>	% Excess: <u>20%</u>
Conductor Length (ft) : <u>110</u>	Displacement Fluid lb/gal: <u>8.3</u>
Conductor ID : <u>15.25</u>	BBL to Pit: <u>9.0</u>
Shoe Joint Length (ft) : <u>40</u>	Fluid Ahead (bbls): <u>15.0</u>
Landing Joint (ft) : <u>45</u>	H2O Wash Up (bbls): <u>20.0</u>
Max Rate:	Spacer Ahead Makeup
Max Pressure:	<u>10F+10D+10=30</u>

Calculated Results	Pressure of cement in annulus
cuft of Shoe <u>17.03</u> cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Displacement: <u>63.16</u> bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
cuft of Conductor <u>83.94</u> cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Hydrostatic Pressure: <u>653.67</u> PSI
cuft of Casing <u>269.78</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>370.75</u> cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: <u>339.71</u> psi
bbls of Slurry <u>66.03</u> bbls (Total Slurry Volume) X (.1781)	Shoe Joint: <u>31.58</u> psi
Sacks Needed <u>292</u> sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Total <u>371.29</u> psi
Mix Water <u>40.94</u> bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Differential Pressure: <u>282.38</u> psi
	Collapse PSI: <u>2570.00</u> psi
	Burst PSI: <u>3950.00</u> psi
	Total Water Needed: <u>139.10</u> bbls

X Kevin Boyer
 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.