



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 9/15/2015
 Invoice # 80446
 API# 05-123-42072
 Foreman: Calvin Reimers

Customer: Anadarko Petroleum Corporation
Well Name: Sunflower 25G-17HZ

County: Weld Consultant: Hayden / Bryan
 State: Colorado Rig Name & Number: Noble 2
 Distance To Location: 28 Miles
 Sec: 8 Units On Location: 4023-3104/4033-3203
 Twp: 2N Time Requested: 500am
 Range: 65W Time Arrived On Location: 325am
 Time Left Location: 9:15am

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>1,835</u>	Cement Yield (cuft) : <u>1.49</u>
Total Depth (ft) : <u>1852</u>	Gallons Per Sack: <u>7.48</u>
Open Hole Diameter (in.) : <u>13.50</u>	% Excess: <u>20%</u>
Conductor Length (ft) : <u>60</u>	Displacement Fluid lb/gal: <u>8.3</u>
Conductor ID : <u>15.25</u>	BBL to Pit: <u>22</u>
Shoe Joint Length (ft) : <u>41</u>	Fluid Ahead (bbls): <u>30.0</u>
Landing Joint (ft) : <u>10</u>	H2O Wash Up (bbls): <u>15.0</u>
Max Rate: <u>8</u>	Spacer Ahead Makeup
Max Pressure: <u>1250</u>	<u>30 bbls H2O+Dye in 2nd 10 bbls</u>

Calculated Results	Pressure of cement in annulus
cuft of Shoe <u>17.83</u> cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Displacement: <u>139.44</u> bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
cuft of Conductor <u>45.79</u> cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Hydrostatic Pressure: <u>1353.51</u> PSI
cuft of Casing <u>1040.86</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>1104.47</u> cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: <u>773.41</u> psi
bbls of Slurry <u>196.71</u> bbls (Total Slurry Volume) X (.1781)	Shoe Joint: <u>30.30</u> psi
Sacks Needed <u>741</u> sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Total <u>803.71</u> psi
Mix Water <u>132.01</u> bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Differential Pressure: <u>549.80</u> psi
	Collapse PSI: <u>2020.00</u> psi
	Burst PSI: <u>3520.00</u> psi
	Total Water Needed: <u>316.46</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.

SERIES 2000

