



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 9/17/2015
 Invoice # 80449
 API# 05-123-42073
 Foreman: Calvin Reimers

Customer: Anadarko Petroleum Corporation
Well Name: Sunflower 24N-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: 400am
 Range: 65W Time Arrived On Location: 230am
 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>1,832</u>	Cement Yield (cuft) :	<u>1.49</u>
Total Depth (ft) :	<u>1849</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>29</u>
Shoe Joint Length (ft) :	<u>42</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>	30 bbls H2O+Dye in 2nd 10 bbls	

Casing ID 8.921 Casing Grade J-55 only used

Calculated Results	Displacement: 139.18 bbls
cuft of Shoe <u>18.20</u> cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	(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)	Pressure of cement in annulus
cuft of Casing <u>1039.36</u> cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Hydrostatic Pressure: 1351.62 PSI
Total Slurry Volume <u>1103.35</u> cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Pressure of the fluids inside casing
bbls of Slurry <u>196.51</u> bbls (Total Slurry Volume) X (.1781)	Displacement: 771.93 psi
Sacks Needed <u>741</u> sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Shoe Joint: 30.93 psi
Mix Water <u>131.88</u> bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Total 802.87 psi
	Differential Pressure: 548.75 psi
	Collapse PSI: 2020.00 psi
	Burst PSI: 3520.00 psi
	Total Water Needed: 316.06 bbls

X Bryan Brown
 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

