



# Bison Oil Well Cementing Single Cement Surface Pipe

Date: 8/19/2015  
 Invoice # 80434  
 API# 05-123-41905  
 Foreman: Calvin Reimers

**Customer:** Anadarko Petroleum Corporation  
**Well Name:** Powers 14C-22HZ

County: Weld Consultant: Bryan / Hayden  
 State: Colorado Rig Name & Number: Noble 2  
 Distance To Location: 40 Miles  
 Sec: 22 Units On Location: 4023-3104/4024-3203  
 Twp: 2N Time Requested: 200pm  
 Range: 65W Time Arrived On Location: 1215pm  
 Time Left Location: 6:00pm

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>1,865</u>	Cement Yield (cuft) : <u>1.49</u>
Total Depth (ft) : <u>1872</u>	Gallons Per Sack: <u>7.48</u>
Open Hole Diameter (in.) : <u>13.50</u>	% Excess: <u>15%</u>
Conductor Length (ft) : <u>60</u>	Displacement Fluid lb/gal: <u>8.3</u>
Conductor ID : <u>15.5</u>	BBL to Pit: <u>23</u>
Shoe Joint Length (ft) : <u>43</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>6</u>	Spacer Ahead Makeup
Max Pressure: <u>1750</u>	<u>30 bbls With Dye in 2nd 10 bbls</u>

Calculated Results	Displacement: <u>141.68 bbls</u>
<b>cuft of Shoe</b> <u>18.47</u> <b>cuft</b> (Casing ID Squared) X (.005454) X (Shoe Joint ft)	(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
<b>cuft of Conductor</b> <u>48.30</u> <b>cuft</b> (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	<b>Pressure of cement in annulus</b>
<b>cuft of Casing</b> <u>1014.62</u> <b>cuft</b> (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length )	<b>Hydrostatic Pressure:</b> <u>1375.99 PSI</u>
<b>Total Slurry Volume</b> <u>1081.39</u> <b>cuft</b> (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	<b>Pressure of the fluids inside casing</b>
<b>bbls of Slurry</b> <u>192.60</u> <b>bbls</b> (Total Slurry Volume) X (.1781)	<b>Displacement:</b> <u>785.91 psi</u>
<b>Sacks Needed</b> <u>726</u> <b>sk</b> (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	<b>Shoe Joint:</b> <u>31.39 psi</u>
<b>Mix Water</b> <u>129.26</u> <b>bbls</b> (Sacks Needed) X (Gallons Per Sack) ÷ 42	<b>Total</b> <u>817.30 psi</u>
	<b>Differential Pressure:</b> <u>558.69 psi</u>
	<b>Collapse PSI:</b> <u>2020.00 psi</u>
	<b>Burst PSI:</b> <u>3520.00 psi</u>
	<b>Total Water Needed:</b> <u>315.94 bbls</u>

X Hayden  
 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

