



# Bison Oil Well Cementing Single Cement Surface Pipe

Date: 10/18/2017  
 Invoice # 666217  
 API# 05-123-45229  
 Foreman: Nick Vigil

**Customer:** Anadarko Petroleum Corporation  
**Well Name:** Borough 28N-17HZ

County: Weld  
 State: Colorado  
 Sec: 17  
 Twp: 1N  
 Range: 66W

Consultant: Levi  
 Rig Name & Number: Cartel 88  
 Distance To Location: 32 Miles  
 Units On Location: 4023/4040/4039  
 Time Requested: 3:30  
 Time Arrived On Location: 2:45  
 Time Left Location: \_\_\_\_\_

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>1,867</u>	Cement Yield (cuft) : <u>1.49</u>
Total Depth (ft) : <u>1877</u>	Gallons Per Sack: <u>7.48</u>
Open Hole Diameter (in.) : <u>13.50</u>	% Excess: <u>15%</u>
Conductor Length (ft) : <u>80</u>	Displacement Fluid lb/gal: <u>8.3</u>
Conductor ID : <u>15.25</u>	BBL to Pit:
Shoe Joint Length (ft) : <u>47</u>	Fluid Ahead (bbls): <u>30.0</u>
Landing Joint (ft) : <u>10</u>	H2O Wash Up (bbls): <u>20.0</u>
Max Rate: <u>8</u>	Spacer Ahead Makeup
Max Pressure: <u>2000</u>	Dye in second 10 bbl

Casing ID 8.921 Casing Grade J-55 only used

Calculated Results	Displacement: <u>141.47 bbls</u>
<b>cuft of Shoe</b> <u>20.40</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>61.05</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>1004.36</u> <b>cuft</b> (Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	<b>Hydrostatic Pressure:</b> <u>1377.29 PSI</u>
<b>Total Slurry Volume</b> <u>1085.81</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>193.38</u> <b>bbls</b> (Total Slurry Volume) X (.1781)	<b>Displacement:</b> <u>784.75 psi</u>
<b>Sacks Needed</b> <u>729</u> <b>sk</b> (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	<b>Shoe Joint:</b> <u>34.67 psi</u>
<b>Mix Water</b> <u>129.78</u> <b>bbls</b> (Sacks Needed) X (Gallons Per Sack) ÷ 42	<b>Total</b> <u>819.42 psi</u>
	<b>Differential Pressure:</b> <u>557.86 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>321.26 bbls</u>

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.

