



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 12/11/2019
 Invoice # 200551
 API# _____
 Foreman: Terry Richey

Customer: Anadarko Petroleum Corporation

Well Name: Windsock 21-8HZ

County: Weld Consultant: Dave
 State: Colorado Rig Name & Number: Cartel 88
 Distance To Location: 84
 Sec: 12 Units On Location: 4047/4027
 Twp: 1n Time Requested: 1.30pm
 Range: 68w Time Arrived On Location: 12:20 PM
 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>1,889</u>	Cement Yield (cuft) : <u>1.48</u>
Total Depth (ft) : <u>1899</u>	Gallons Per Sack: <u>7.40</u>
Open Hole Diameter (in.) : <u>13.50</u>	% Excess: <u>10%</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>41</u>	Fluid Ahead (bbls): <u>30.0</u>
Landing Joint (ft) : <u>8</u>	H2O Wash Up (bbls): <u>10.0</u>
Max Rate: <u>8</u>	Spacer Ahead Makeup
Max Pressure: <u>2000</u>	<u>30 bbl with Die in 2nd 10</u>

Calculated Results	Pressure of cement in annulus
Casing ID <u>8.921</u> Casing Grade <u>J-55 only used</u>	Displacement: <u>143.48 bbls</u> (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
cuft of Shoe <u>17.80 cuft</u> (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Pressure of cement in annulus
cuft of Conductor <u>61.05 cuft</u> (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Hydrostatic Pressure: <u>1393.52 PSI</u>
cuft of Casing <u>972.52 cuft</u> (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Pressure of the fluids inside casing
Total Slurry Volume <u>1051.37 cuft</u> (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: <u>796.82 psi</u>
bbls of Slurry <u>187.25 bbls</u> (Total Slurry Volume) X (.1781)	Shoe Joint: <u>30.25 PSI</u>
Sacks Needed <u>710 sk</u> (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Total <u>827.07 psi</u>
Mix Water <u>125.16 bbls</u> (Sacks Needed) X (Gallons Per Sack) ÷ 42	Differential Pressure: <u>566.45 psi</u>
	Collapse PSI: <u>2020.00 psi</u>
	Burst PSI: <u>3520.00 psi</u>
	Total Water Needed: <u>308.65 bbls</u>

[Signature]
 Authorization To Proceed

Windsock 21-8HZ

— PSI — Barrels / Minute — Lbs / Gallon

