



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 8/17/2018
 Invoice # 200309
 API# _____
 Foreman: KirkKallhoff

Customer: Anadarko Petroleum Corporation

Well Name: cowboy 21-3hz

County: Weld
 State: Colorado
 Sec: 24
 Twp: 2N
 Range: 66W

Consultant: bryan
 Rig Name & Number: Cartel 88
 Distance To Location: 30
 Units On Location: 4028/4039/4035
 Time Requested: 430 pm
 Time Arrived On Location: 200 pm
 Time Left Location: 8:00pm

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>1,869</u>	Cement Yield (cuft) : <u>1.48</u>
Total Depth (ft) : <u>1879</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>40</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	Displacement: <u>142.02 bbls</u>
cuft of Shoe <u>17.36</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>61.05</u> cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Pressure of cement in annulus
cuft of Casing <u>961.77</u> cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Hydrostatic Pressure: <u>1378.76 PSI</u>
Total Slurry Volume <u>1040.18</u> cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Pressure of the fluids inside casing
bbls of Slurry <u>185.26</u> bbls (Total Slurry Volume) X (.1781)	Displacement: <u>788.63 psi</u>
Sacks Needed <u>703</u> sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Shoe Joint: <u>29.51 PSI</u>
Mix Water <u>123.83</u> bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Total <u>818.14 psi</u>
	Differential Pressure: <u>560.62 psi</u>
	Collapse PSI: <u>2020.00 psi</u>
	Burst PSI: <u>3520.00 psi</u>
	Total Water Needed: <u>305.85 bbls</u>

X Kirk Kallhoff
 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

— PSI — Barrels / Minute — Barrels — Lbs / Gallon

