



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 10/11/2017
 Invoice #: 666213
 API#: 05-123-45251
 Foreman: Nick Vigil

Customer: Anadarko Petroleum Corporation
 Well Name: Robin 9-13HZ

County: Weld
 State: Colorado
 Sec: 9
 Twp: 1N
 Range: 65W

Consultant: Levi
 Rig Name & Number: Cartel 88
 Distance To Location: 39 Miles
 Units On Location: 4040/4030/4039
 Time Requested: 3:30
 Time Arrived On Location: 3:00
 Time Left Location:

WELL DATA	Cement Data
Casing Size OD (in) : 9.625	Cement Name: BFN III
Casing Weight (lb) : 36.00	Cement Density (lb/gal) : 14.2
Casing Depth (ft.) : 1,873	Cement Yield (cuft) : 1.49
Total Depth (ft) : 1884	Gallons Per Sack: 7.48
Open Hole Diameter (in.) : 13.50	% Excess: 15%
Conductor Length (ft) : 80	Displacement Fluid lb/gal: 8.3
Conductor ID : 15.25	BBL to Pit:
Shoe Joint Length (ft) : 45	Fluid Ahead (bbls): 30.0
Landing Joint (ft) : 10	H2O Wash Up (bbls): 20.0
Max Rate: 8	Spacer Ahead Makeup
Max Pressure: 2000	Dye in second 10 bbl

Calculated Results	Pressure of cement in annulus
Casing ID: 8.921 Casing Grade: J-55 only used	Displacement: 142.09 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
cuft of Shoe: 19.53 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Pressure of cement in annulus
cuft of Conductor: 61.05 cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Hydrostatic Pressure: 1381.71 PSI
cuft of Casing: 1007.74 cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Pressure of the fluids inside casing
Total Slurry Volume: 1088.32 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: 788.20 psi
bbls of Slurry: 193.83 bbls (Total Slurry Volume) X (.1781)	Shoe Joint: 33.20 psi
Sacks Needed: 730 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Total: 821.40 psi
Mix Water: 130.08 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Differential Pressure: 560.32 psi
	Collapse PSI: 2020.00 psi
	Burst PSI: 3520.00 psi
	Total Water Needed: 322.18 bbls

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.

Robin 9-13HZ

— PSI
— Barrels / Minute
— Lbs / Gallon

