



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 8/28/2015

Invoice # 90031

API# 05-123-42021

Supervisor Nick

Customer: Anadarko Petroleum Corporation

Well Name: Powers 2N-34HZ

County: Weld

State: Colorado

Sec: 27

Twp: 2N

Range: 65W

Consultant: Sean

Rig Name & Number: Noble 2

Distance To Location: 35

Units On Location: 024/3210/4007/3106/3105/320

Time Requested: 7:00

Time Arrived On Location: 5:45

Time Left Location: 11:00

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.) : 1,845	Cement Yield (cuft) : 1.49
Total Depth (ft) : 1856	Gallons Per Sack: 7.48
Open Hole Diameter (in.) : 13.50	% Excess: 20%
Conductor Length (ft) : 40	Displacement Fluid lb/gal: 8.3
Conductor ID : 15.25	BBL to Pit: 38.0
Shoe Joint Length (ft) : 43	Fluid Ahead (bbls): 30.0
Landing Joint (ft) : 10	H2O Wash Up (bbls): 20.0
Max Rate: 7	Spacer Ahead Makeup
Max Pressure: 1750	30 bbl dye in second 10

Calculated Results	Displacement: 140.12 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
cuft of Shoe 18.45 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Pressure of cement in annulus
cuft of Conductor 30.53 cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Hydrostatic Pressure: 1361.06 PSI
cuft of Casing 1058.59 cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Pressure of the fluids inside casing
Total Slurry Volume 1107.56 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: 777.20 psi
bbls of Slurry 197.26 bbls (Total Slurry Volume) X (.1781)	Shoe Joint: 31.35 psi
Sacks Needed 743 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Total 808.56 psi
Mix Water 132.38 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Differential Pressure: 552.50 psi
	Collapse PSI: 2020.00 psi
	Burst PSI: 3520.00 psi
	Total Water Needed: 322.50 bbls

[Signature]
Authorization To Proceed

Powers 2N-34HZ

— PSI — Barrels / Minute — Barrels — Lbs / Gallon — Stage Volume

