



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 5/29/2015

Invoice # 80139

API# 05-123-41249

Foreman: JASON KELEHER

Customer: Noble Energy Inc.

Well Name: WELLS RANCH AA11-615

County: Weld

State: Colorado

Sec: 11

Twp: 6N

Range: 63W

Consultant: JW

Rig Name & Number: H&P 343

Distance To Location: 32

Units On Location: 4031-3107/ 4019-3205

Time Requested: 1300

Time Arrived On Location: 1200

Time Left Location: 1700

WELL DATA

Casing Size OD (in) : 9.625
Casing Weight (lb) : 36.00
Casing Depth (ft.) : 565
Total Depth (ft) : 599
Open Hole Diameter (in.) : 13.50
Conductor Length (ft) : 100
Conductor ID : 15.25
Shoe Joint Length (ft) : 45
Landing Joint (ft) : 24

Max Rate: 6
Max Pressure: 1000

Cement Data

Cement Name: BFN III
Cement Density (lb/gal) : 14.2
Cement Yield (cuft) : 1.49
Gallons Per Sack: 7.48
% Excess: 35%
Displacement Fluid lb/gal: 8.3
BBL to Pit: 14.0
Fluid Ahead (bbls): 40.0
H2O Wash Up (bbls): 20.0

Spacer Ahead Makeup

40 BBL WATER/ DYE IN 2ND 10

Casing ID

8.921

Casing Grade

J-55 only used

Calculated Results

cuft of Shoe 19.66 cuft

(Casing ID Squared) X (.005454) X (Shoe Joint ft)

cuft of Conductor 76.31 cuft

(Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)

cuft of Casing 306.93 cuft

(Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)

Total Slurry Volume 402.90 cuft

(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)

bbls of Slurry 71.76 bbls

(Total Slurry Volume) X (.1781)

Sacks Needed 270 sk

(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)

Mix Water 48.16 bbls

(Sacks Needed) X (Gallons Per Sack) ÷ 42

Displacement: 42.05 bbls

(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)

Pressure of cement in annulus

Hydrostatic Pressure: 416.95 PSI

Pressure of the fluids inside casing

Displacement: 224.18 psi

Shoe Joint: 33.41 psi

Total 257.59 psi

Differential Pressure: 159.36 psi

Collapse PSI: 2020.00 psi

Burst PSI: 3520.00 psi

Total Water Needed: 150.21 bbls

X Jw Irwin
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.

X 5/29/15
Date