



**Bison Oil Well Cementing  
Tail & Lead**

Date: 5/3/2019

Invoice #: 900335

API#: 05-123-48188

Foreman: Corey Barras

Customer: Noble Energy Inc.

Well Name: Wells Ranch State AA36-622

County: Weld

State: Colorado

Sec: 16

Twp: 2n

Range: 64w

Consultant: CHARLES

Rig Name & Number: H&P 321

Distance To Location: 25

Units On Location: 4033/3201-4032/3203

Time Requested: 630 am

Time Arrived On Location: 600 am

Time Left Location:

**WELL DATA**

Casing Size (in) : 9.625  
 Casing Weight (lb) : 36  
 Casing Depth (ft.) : 1,922  
 Total Depth (ft) : 1932  
 Open Hole Diameter (in) : 13.50  
 Conductor Length (ft) : 80  
 Conductor ID : 15.25  
 Shoe Joint Length (ft) : 44  
 Landing Joint (ft) : 0

Sacks of Tail Requested 100  
 HOC Tail (ft): 0

One or the other, cannot have quantity in both

Max Rate: 8  
 Max Pressure: 1500

**Cement Data**

**Lead**

Cement Name:  
 Cement Density (lb/gal) : 13.5  
 Cement Yield (cuft) : 1.7  
 Gallons Per Sack 9.00  
 % Excess 15%

**Tail**

Cement Name:  
 Cement Density (lb/gal) : 15.2  
 Cement Yield (cuft) : 1.27  
 Gallons Per Sack: 5.89  
 % Excess: 0%

Fluid Ahead (bbls) 30.0  
 H2O Wash Up (bbls) 20.0

Spacer Ahead Makeup  
 30BBL WATER DYE IN 2ND 10

Casing ID

8.921

Casing Grade

J-55 only used

**Lead Calculated Results**

**HOC of Lead 1621.22 ft**  
 Casing Depth - HOC Tail  
**Volume of Lead Cement 792.34 cuft**  
 HOC of Lead X Open Hole Ann  
**Volume of Conductor 61.05 cuft**  
 (Conductor ID Squared) - (Casing Size OD Squared) X (.005454) X  
 (Conductor Length ft)  
**Total Volume of Lead Cement 853.39 cuft**  
 (cuft of Lead Cement) + (Cuft of Conductor)  
**bbls of Lead Cement 174.79 bbls**  
 (Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)  
**Sacks of Lead Cement 577.29 sk**  
 (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)  
**bbls of Lead Mix Water 123.71 bbls**  
 (Sacks Needed) X (Gallons Per Sack) ÷ 42  
**Displacement 145.17 bbls**  
 (Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe  
 Length)  
**Total Water Needed: 332.90 bbls**

**Tail Calculated Results**

**Tail Cement Volume In Ann 127.00 cuft**  
 (HOC Tail) X (OH Ann)  
**Total Volume of Tail Cement 107.90 Cuft**  
 (HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)  
**bbls of Tail Cement 22.62 bbls**  
 (HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (%  
 Excess)  
**HOC Tail 220.78 ft**  
 (Tail Cement Volume) ÷ (OH Ann)  
**Sacks of Tail Cement 100.00 sk**  
 (Total Volume of Tail Cement) ÷ (Cement Yield)  
**bbls of Tail Mix Water 14.02 bbls**  
 (Sacks of Tail Cement X Gallons Per Sack) ÷ 42  
**Pressure of cement in annulus**  
**Hydrostatic Pressure 585.23 PSI**  
**Collapse PSI: 2020.00 psi**  
**Burst PSI: 3520.00 psi**

X

Authorization To Proceed

# Wells Ranch State AA36-622

