



# Bison Oil Well Cementing Tail & Lead

Customer: Noble Energy Inc.  
Well Name: Wells Ranch State AA33-725

Date: 4/1/2017  
Invoice #: 666104  
API#: 05-123-43917  
Foreman: Nick Vigil

County: Weld  
State: Colorado  
Sec: 21  
Twp: 6N  
Range: 63W  
Consultant: Woodie  
Rig Name & Number: H&P 517  
Distance To Location: 18 Miles  
Units On Location: 4023/4032  
Time Requested: 1:00  
Time Arrived On Location: 12:30  
Time Left Location: 5:45

WELL DATA	Cement Data
<p>Casing Size (in) : 9.625 Casing Weight (lb) : 36 Casing Depth (ft.) : 1,913 Total Depth (ft) : 1923 Open Hole Diameter (in) : 13.50 Conductor Length (ft) : 80 Conductor ID : 15.25 Shoe Joint Length (ft) : 44 Landing Joint (ft) :</p> <p>Sacks of Tail Requested 100 HOC Tail (ft): 0</p> <p>One or the other, cannot have quantity in both</p> <p>Max Rate: 8 Max Pressure: 2000</p>	<p><b>Lead</b> Cement Name: Cement Density (lb/gal) : 13.5 Cement Yield (cuft) : 1.7 Gallons Per Sack 9.00 % Excess 15%</p> <p><b>Tail</b> Cement Name: Cement Density (lb/gal) : 15.2 Cement Yield (cuft) : 1.27 Gallons Per Sack: 5.89 % Excess: 0%</p> <p>Fluid Ahead (bbls) 50.0 H2O Wash Up (bbls) 20.0</p> <p>Spacer Ahead Makeup Dye in 2nd 10 bbl</p>

Casing ID 8.921	Casing Grade J-55 only used
<b>Lead Calculated Results</b> HOC of Lead 1607.22 ft Casing Depth - HOC Tail Volume of Lead Cement 785.50 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 846.55 cuft (cuft of Lead Cement) + (Cuft of Conductor) bbls of Lead Cement 173.39 bbls (Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess) Sacks of Lead Cement 572.66 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement) bbls of Lead Mix Water 122.71 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42 Displacement 144.86 bbls (Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length) Total Water Needed: 351.60 bbls	<b>Tail Calculated Results</b> 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

Date \_\_\_\_\_