



Bison Oil Well Cementing

Tail & Lead

Date: 11/16/2018

Invoice # 200365

API#

Foreman: Kirk Kallhoff

Customer: Noble Energy Inc.

Well Name: INDEPENDENCE D30-743

County: Weld

State: Colorado

Sec: 8

Twp: 5N

Range: 62W

Consultant: gary

Rig Name & Number: H&P 517

Distance To Location: 22

Units On Location: 4028/4030/4023

Time Requested: 200 pm

Time Arrived On Location: 1130 am

Time Left Location: 6:30 pm

WELL DATA	Cement Data
<p>Casing Size (in) : 9.625</p> <p>Casing Weight (lb) : 36</p> <p>Casing Depth (ft.) : 1,894</p> <p>Total Depth (ft) : 1939</p> <p>Open Hole Diameter (in) : 13.50</p> <p>Conductor Length (ft) : 110</p> <p>Conductor ID : 15.6</p> <p>Shoe Joint Length (ft) : 41</p> <p>Landing Joint (ft) : 35</p> <p>Sacks of Tail Requested : 100</p> <p>HOC Tail (ft) : 0</p> <p>One or the other, cannot have quantity in both</p> <p>Max Rate: 8</p> <p>Max Pressure: 2500</p>	<p>Lead</p> <p>Cement Name: BFN III</p> <p>Cement Density (lb/gal) : 13.5</p> <p>Cement Yield (cuft) : 1.68</p> <p>Gallons Per Sack : 8.90</p> <p>% Excess : 15%</p> <p>Tail Type III</p> <p>Cement Name:</p> <p>Cement Density (lb/gal) : 15.2</p> <p>Cement Yield (cuft) : 1.27</p> <p>Gallons Per Sack: 5.80</p> <p>% Excess: 0%</p> <p>Fluid Ahead (bbls) : 30.0</p> <p>H2O Wash Up (bbls) : 20.0</p> <p>Spacer Ahead Makeup</p> <p>30 BBL ahead with Die in 2nd 10</p>

Lead Calculated Results	Tail Calculated Results
HOC of Lead : 1525.56 ft	Tail Cement Volume In Ann (HOC Tail) X (OH Ann) : 127.00 cuft
Casing Depth - HOC Tail	Total Volume of Tail Cement (HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann) : 109.20 Cuft
Volume of Lead Cement : 745.58 cuft	bbls of Tail Cement (HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess) : 22.62 bbls
HOC of Lead X Open Hole Ann	HOC Tail (Tail Cement Volume) ÷ (OH Ann) : 223.44 ft
Volume of Conductor : 90.42 cuft (Conductor ID Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Sacks of Tail Cement (Total Volume of Tail Cement) ÷ (Cement Yield) : 100.00 sk
Total Volume of Lead Cement (cuft of Lead Cement) + (Cuft of Conductor) : 836.01 cuft	bbls of Tail Mix Water (Sacks of Tail Cement X Gallons Per Sack) ÷ 42 : 13.81 bbls
bbls of Lead Cement (Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess) : 171.23 bbls	Pressure of cement in annulus
Sacks of Lead Cement (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement) : 572.27 sk	Hydrostatic Pressure : 585.23 PSI
bbls of Lead Mix Water (Sacks Needed) X (Gallons Per Sack) ÷ 42 : 121.27 bbls	Collapse PSI: 2020.00 psi
Displacement (Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length) : 145.94 bbls	Burst PSI: 3520.00 psi
Total Water Needed: 331.02 bbls	

X Gary Stapleton
 Authorization To Proceed

