



Bison Oil Well Cementing Tail & Lead

Date: 2/28/2019
Invoice # 300269
API# 05-123-48577
Foreman: JASON KELEHER

Customer: Noble Energy Inc.
Well Name: VOGLER STATE D21-770

County: Weld
State: Colorado

Sec: 21
Twp: 3N
Range: 64W

Consultant: JOHN
Rig Name & Number: H&P 517
Distance To Location: 22
Units On Location: 4045-3103,4032-3203
Time Requested: 2200
Time Arrived On Location: 2000
Time Left Location: 300

WELL DATA	Cement Data
<p>Casing Size (in) : 9.625 Casing Weight (lb) : 36 Casing Depth (ft.) : 1,917 Total Depth (ft) : 1957 Open Hole Diameter (in) : 13.50 Conductor Length (ft) : 80 Conductor ID : 15.5 Shoe Joint Length (ft) : 48 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: 1500</p>	<p>Lead Cement Name: Cement Density (lb/gal) : 13.5 Cement Yield (cuft) : 1.7 Gallons Per Sack 9.00 % Excess 15%</p> <p>Tail 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) 30.0 H2O Wash Up (bbls) 20.0</p> <p>Spacer Ahead Makeup 30 BBL WATER DYE IN 2ND 10</p>

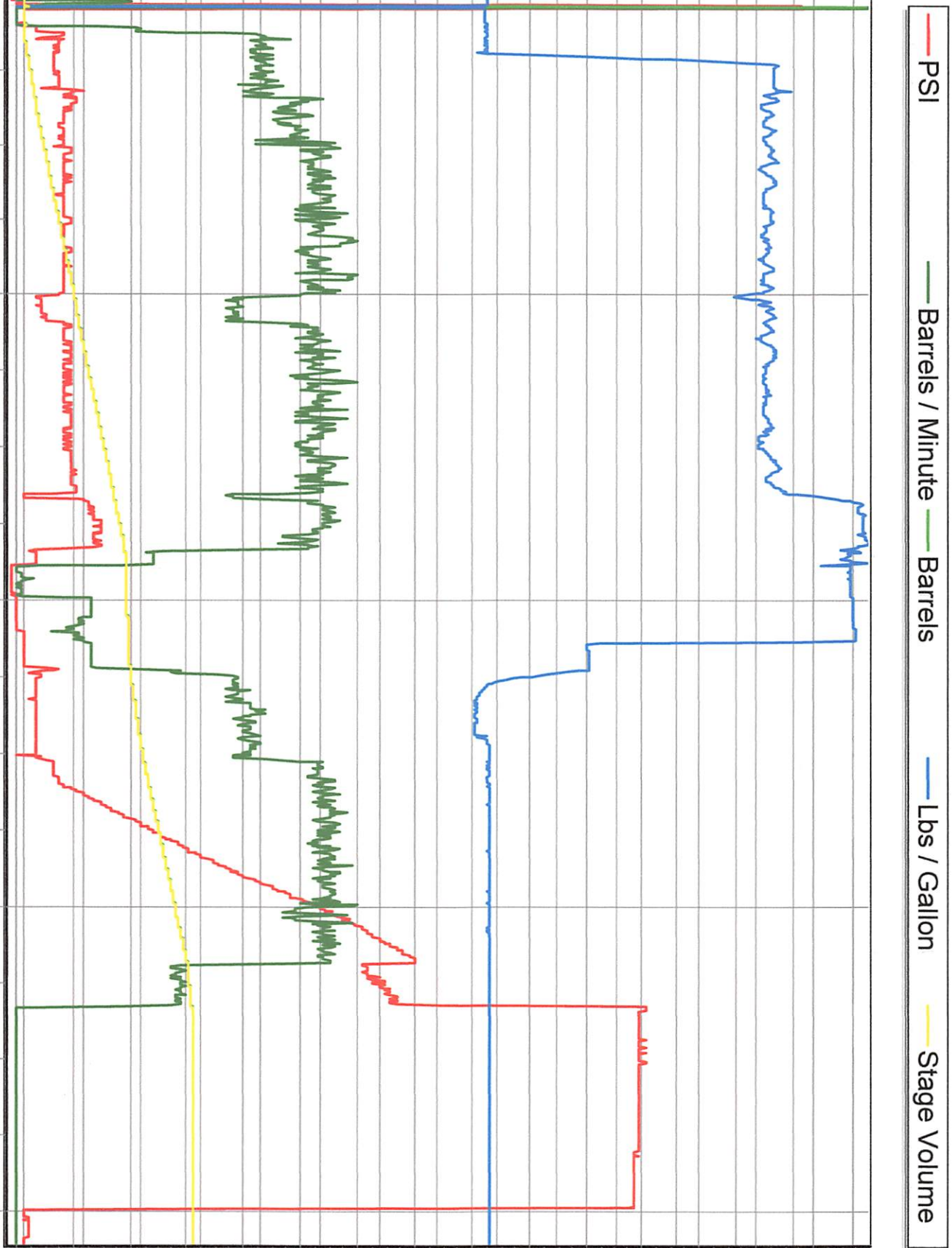
Lead Calculated Results	Tail Calculated Results
<p>HOC of Lead 1700.53 ft Casing Depth - HOC Tail</p> <p>Volume of Lead Cement 910.74 cuft HOC of Lead X Open Hole Ann</p> <p>Volume of Conductor 64.40 cuft (Conductor ID Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)</p> <p>Total Volume of Lead Cement 975.09 cuft (cuft of Lead Cement) + (Cuft of Conductor)</p> <p>bbls of Lead Cement 173.70 bbls (Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)</p> <p>Sacks of Lead Cement 574.00 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)</p> <p>bbls of Lead Mix Water 123.00 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42</p> <p>Displacement 144.40 bbls (Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)</p> <p>Total Water Needed: 315.00 bbls</p>	<p>Tail Cement Volume In Ann 105.56 cuft (HOC Tail) X (OH Ann)</p> <p>Total Volume of Tail Cement 127.00 Cuft (HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)</p> <p>bbls of Tail Cement 22.62 bbls (HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)</p> <p>HOC Tail 216.09 ft (Tail Cement Volume) ÷ (OH Ann)</p> <p>Sacks of Tail Cement 100.00 sk (Total Volume of Tail Cement) ÷ (Cement Yield)</p> <p>bbls of Tail Mix Water 14.02 bbls (Sacks of Tail Cement X Gallons Per Sack) ÷ 42</p> <p>Pressure of cement in annulus</p> <p>Hydrostatic Pressure 520.00 PSI</p> <p>Collapse PSI: 2020.00 psi Burst PSI: 3520.00 psi</p>

X

Authorization To Proceed

X 3-1-19
Date

VOLGER STATE D21-770



2/28/2019 10:51:56 PM 3/1/2019 1:05:51 AM 3/1/2019 1:29:29 AM 3/1/2019 1:53:05 AM 3/1/2019 2:16:43 AM