

# Bison Oil Well Cementing Tail & Lead

Date: 6/17/2019  
 Invoice # 200463  
 API# \_\_\_\_\_  
 Foreman: Kirk Kallhoff

Customer: Noble Energy Inc.  
 Well Name: guttersen state d23- 741

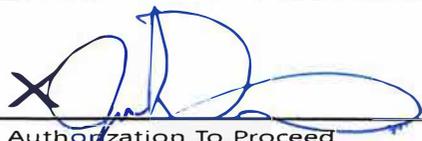
County: Weld Consultant: John  
 State: Colorado Rig Name & Number: H&P 517  
 Distance To Location: 25  
 Units On Location: 4047/4034/4041  
 Time Requested: 730 am  
 Time Arrived On Location: 600 am  
 Time Left Location: 3:00pm

Sec: 23  
 Twp: 3N  
 Range: 64W

WELL DATA	Cement Data
Casing Size (in) : <u>9.625</u> Casing Weight (lb) : <u>36</u> Casing Depth (ft.) : <u>1,922</u> Total Depth (ft) : <u>1968</u> Open Hole Diameter (in) : <u>13.50</u> Conductor Length (ft) : <u>110</u> Conductor ID : <u>15.6</u> Shoe Joint Length (ft) : <u>47</u> Landing Joint (ft) : <u>35</u>  Sacks of Tail Requested : <u>100</u> HOC Tail (ft): <u>0</u> <small>One or the other, cannot have quantity in both</small>  Max Rate: <u>8</u> Max Pressure: <u>2500</u>	<b>Lead</b> Cement Name: <u>BFN III</u> Cement Density (lb/gal) : <u>13.5</u> Cement Yield (cuft) : <u>1.68</u> Gallons Per Sack <u>8.90</u> % Excess <u>10%</u>  <b>Tail Type III</b> Cement Name: Cement Density (lb/gal) : <u>15.2</u> Cement Yield (cuft) : <u>1.27</u> Gallons Per Sack: <u>5.89</u> % Excess: <u>0%</u>  <b>Fluid Ahead (bbls) <u>30.0</u></b> <b>H2O Wash Up (bbls) <u>20.0</u></b>  <b>Spacer Ahead Makeup</b> <u>30 BBL ahead with Die in 2nd 10</u>

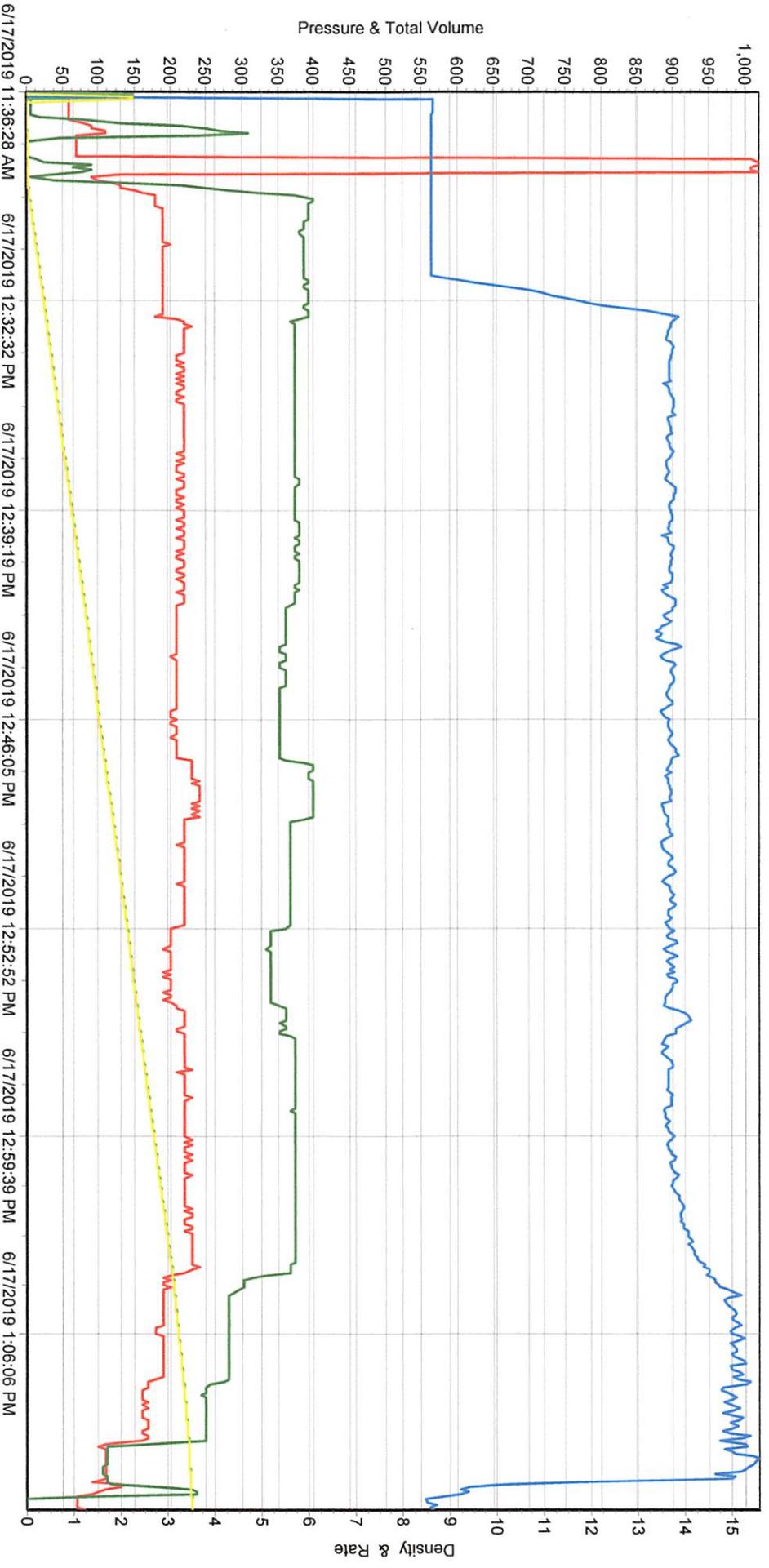
Casing ID 8.921 Casing Grade J-55 only used

Lead Calculated Results	Tail Calculated Results
<b>HOC of Lead <u>1558.88 ft</u></b>	<b>Tail Cement Volume In Ann <u>127.00 cuft</u></b> (HOC Tail) X (OH Ann)
<b>Volume of Lead Cement <u>761.87 cuft</u></b> HOC of Lead X Open Hole Ann	<b>Total Volume of Tail Cement <u>106.60 Cuft</u></b> (HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
<b>Volume of Conductor <u>90.42 cuft</u></b> (Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	<b>bbls of Tail Cement <u>22.62 bbls</u></b> (HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)
<b>Total Volume of Lead Cement <u>852.30 cuft</u></b> (cuft of Lead Cement) + (Cuft of Conductor)	<b>HOC Tail <u>218.12 ft</u></b> (Tail Cement Volume) ÷ (OH Ann)
<b>bbls of Lead Cement <u>166.97 bbls</u></b> (Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	<b>Sacks of Tail Cement <u>100.00 sk</u></b> (Total Volume of Tail Cement) ÷ (Cement Yield)
<b>Sacks of Lead Cement <u>558.05 sk</u></b> (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	<b>bbls of Tail Mix Water <u>14.02 bbls</u></b> (Sacks of Tail Cement X Gallons Per Sack) ÷ 42
<b>bbls of Lead Mix Water <u>118.25 bbls</u></b> (Sacks Needed) X (Gallons Per Sack) ÷ 42	<b>Pressure of cement in annulus</b>
<b>Displacement <u>147.64 bbls</u></b> (Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	<b>Hydrostatic Pressure <u>585.23 PSI</u></b>
<b>Total Water Needed: <u>329.92 bbls</u></b>	<b>Collapse PSI: <u>2020.00 psi</u></b> <b>Burst PSI: <u>3520.00 psi</u></b>

  
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 Authorization To Proceed



# SERIES 2000



Pressure & Total Volume

6/17/2019 11:36:28 AM 6/17/2019 12:32:32 PM 6/17/2019 12:39:19 PM 6/17/2019 12:46:05 PM 6/17/2019 12:52:52 PM 6/17/2019 12:59:39 PM 6/17/2019 1:06:06 PM

Density & Rate

PSI Barrels / Minute Barrels Lbs / Gallon Stage Volume