



**Bison Oil Well Cementing
Tail & Lead**

Date: 6/16/2019

Invoice # 900355

API# 05-123-48623

Foreman: Corey Barras

Customer: Noble Energy Inc.

Well Name: Guttersen State D23-731

County: Weld
State: Colorado

Sec: 23
Twp: 3n
Range: 64w

Consultant: Chris
Rig Name & Number: H&P 517
Distance To Location: 25
Units On Location: 4033/3201-4024/3201- 4035/3205
Time Requested: 1930
Time Arrived On Location: 1850
Time Left Location: _____

WELL DATA	Cement Data
<p>Casing Size (in) : <u>9.625</u> Casing Weight (lb) : <u>36</u> Casing Depth (ft.) : <u>1,906</u> Total Depth (ft) : <u>1947</u> Open Hole Diameter (in) : <u>13.50</u> Conductor Length (ft) : <u>80</u> Conductor ID : <u>15.25</u> Shoe Joint Length (ft) : <u>44</u> Landing Joint (ft) : <u>0</u></p> <p>Sacks of Tail Requested <u>100</u> HOC Tail (ft): <u>0</u></p> <p>One or the other, cannot have quantity in both</p> <p>Max Rate: <u>8</u> Max Pressure: <u>1500</u></p>	<p>Lead Cement Name: Cement Density (lb/gal) : <u>13.5</u> Cement Yield (cuft) : <u>1.7</u> Gallons Per Sack <u>9.00</u> % Excess <u>10%</u></p> <p>Tail 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></p> <p>Fluid Ahead (bbls) <u>30.0</u> H2O Wash Up (bbls) <u>20.0</u></p> <p>Spacer Ahead Makeup 30BBL WATER DYE IN 2ND 10</p>

Lead Calculated Results	Tail Calculated Results
HOC of Lead <u>1605.22 ft</u>	Tail Cement Volume In Ann <u>127.00 cuft</u>
Casing Depth - HOC Tail	(HOC Tail) X (OH Ann)
Volume of Lead Cement <u>784.52 cuft</u>	Total Volume of Tail Cement <u>107.90 Cuft</u>
HOC of Lead X Open Hole Ann	(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
Volume of Conductor <u>61.05 cuft</u>	bbls of Tail Cement <u>22.62 bbls</u>
(Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	(HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)
Total Volume of Lead Cement <u>845.57 cuft</u>	HOC Tail <u>220.78 ft</u>
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
bbls of Lead Cement <u>165.66 bbls</u>	Sacks of Tail Cement <u>100.00 sk</u>
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	(Total Volume of Tail Cement) ÷ (Cement Yield)
Sacks of Lead Cement <u>547.13 sk</u>	bbls of Tail Mix Water <u>14.02 bbls</u>
(Total Slurry Volume) ÷ (CementYield) X (% Excess Cement)	(Sacks of Tail Cement X Gallons Per Sack) ÷ 42
bbls of Lead Mix Water <u>117.24 bbls</u>	Pressure of cement in annulus
(Sacks Needed) X (Gallons Per Sack) ÷ 42	Hydrostatic Pressure <u>585.23 PSI</u>
Displacement <u>143.93 bbls</u>	
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	
Total Water Needed: <u>325.20 bbls</u>	Collapse PSI: <u>2020.00 psi</u>
	Burst PSI: <u>3520.00 psi</u>

X
Authorization To Proceed



Bison Oil Well Cementing
Two Cement Surface Pipe

Customer Well Name Noble Energy Inc.
Guttersen State D23-731

Date 6/16/2019
 INVOICE # 900355
 LOCATION Weld
 FOREMAN Corey Barras

Treatment Report Page 2

DESCRIPTION OF JOB EVENTS

		Time/Date	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	117.24	1850	ARRIVE ON LOCATION	ASSESS LOCATION AND HAZARDS			
Lead % Excess	10%	2010	MIRU	SPOT EQUIPMENT, PRE RIG UP MEETING			
Lead Sacks	547	2055	PRE JOB SAFETY MEETING	RIG CREW AND BISON			
		2112	PRESSURE TEST LINES				1500
		2114	bbls ahead	WATER SUPPLIED RIG W/DYE IN 2ND 10	8	30	180
Tail mixed bbls	14	2120	LEAD CEMENT	CEMENT MIXED AT 13.5 PPG	6	165.6	130
Tail % Excess	0%	2155	TAIL CEMENT	CEMENT MIXED AT 15.2 PPG	3	22.6	90
Tail Sacks	100	2205	SHUT DOWN				
		2207	DROP PLUG				
Total Sacks	647	2208	DISPLACEMENT	DISPLACE W/ H2O	8	70	360
Water Temp	62	2234	BUMP PLUG	Casing Test for 15 Min @ 1020 Psi (Lift 610)	3	144	1020
bbl Returns	19	2250	CHECK FLOATS	FLOATS HELD/ WATCH FOR FALL BACK			0
		2310	RIG DOWN				
Notes:		2330	LEAVE LOCATION				
				monitered well no top off			

WSS X
Work Performed

WSS X
Title

6-16-19 X
Date

Guttersen State D23-731

