

**Bison Oil Well Cementing  
Tail & Lead**

Date: 2/5/2021  
 Invoice # 200671  
 AFE # \_\_\_\_\_  
 Foreman: Terry Richey

Customer: Noble Energy Inc.  
 Well Name: REVEILLE A33-720

County: Weld  
 State: Colorado

Sec: 34  
 Twp: 6N  
 Range: 64W

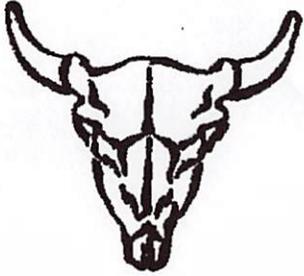
Consultant: Charles  
 Rig Name & Number: H&P 517  
 Distance To Location: 10  
 Units On Location: 4028/3103-4020/3203 4025/3214  
 Time Requested: 600 pm  
 Time Arrived On Location: 430 pm  
 Time Left Location: \_\_\_\_\_

WELL DATA	Cement Data
Casing Size (in) : <u>9.625</u> Casing Weight (lb) : <u>36</u> Casing Depth (ft.) : <u>1,893</u> Total Depth (ft) : <u>1938</u> Open Hole Diameter (in) : <u>13.50</u> Conductor Length (ft) : <u>110</u> Conductor ID : <u>15.5</u> Shoe Joint Length (ft) : <u>41</u> Landing Joint (ft) : <u>2</u>  Sacks of Tail Requested : <u>100</u> HOC Tail (ft): <u>0</u> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">             One or the other, cannot have quantity in both           </div> Max Rate: <u>8</u> Max Pressure: <u>700</u>	<b>Lead</b> Cement Name: 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</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:  <b>Fluid Ahead (bbls)</b> : <u>30.0</u> <b>H2O Wash Up (bbls)</b> : <u>20.0</u>  <b>Spacer Ahead Makeup</b> <u>30BBL WATER DYE IN 2ND 10</u>

Lead Calculated Results	Tail Calculated Results
<b>HOC of Lead</b> : <u>1556.73 ft</u>	<b>Tail Cement Volume In Ann</b> : <u>127.00 cuft</u>
Casing Depth - HOC Tail	(HOC Tail) X (OH Ann)
<b>Volume of Lead Cement</b> : <u>760.82 cuft</u>	<b>Total Volume of Tail Cement</b> : <u>109.41 Cuft</u>
HOC of Lead X Open Hole Ann	(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
<b>Volume of Conductor</b> : <u>88.56 cuft</u>	<b>bbls of Tail Cement</b> : <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)
<b>Total Volume of Lead Cement</b> : <u>849.38 cuft</u>	<b>HOC Tail</b> : <u>223.87 ft</u>
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
<b>bbls of Lead Cement</b> : <u>166.40 bbls</u>	<b>Sacks of Tail Cement</b> : <u>100.00 sk</u>
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	(Total Volume of Tail Cement) ÷ (Cement Yield)
<b>Sacks of Lead Cement</b> : <u>556.14 sk</u>	<b>bbls of Tail Mix Water</b> : <u>14.02 bbls</u>
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	(Sacks of Tail Cement X Gallons Per Sack) ÷ 42
<b>bbls of Lead Mix Water</b> : <u>117.85 bbls</u>	<b>Pressure of cement in annulus</b>
(Sacks Needed) X (Gallons Per Sack) ÷ 42	<b>Hydrostatic Pressure</b> : <u>585.23 PSI</u>
<b>Displacement</b> : <u>143.17 bbls</u>	<b>Collapse PSI:</b> : <u>2020.00 psi</u>
(Casing ID Squared) X (.0009714) X (Casing Depth) - (Shoe Length)	<b>Burst PSI:</b> : <u>3520.00 psi</u>
<b>Total Water Needed:</b> : <u>325.04 bbls</u>	

Centralizers: 18

X [Signature]  
 Authorization To Proceed



Bison Oil Well Cementing  
Two Cement Surface Pipe

Customer Well Name: Noble Energy Inc.  
REVEILLE A33-720

Date: 2/5/2021  
INVOICE #: 200671  
LOCATION: Weld  
FOREMAN: Terry Richey

Treatment Report Page 2

DESCRIPTION OF JOB EVENTS

	Time/Date	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	118	430 pm	ARRIVE ON LOCATION			
Lead % Excess	10%	550 pm	MIRU			
Lead Sacks	557	650 pm	PRE JOB SAFETY MEETING			
		655 pm	Test Lines			1200
		657 pm	bbls ahead			100
Tail mixed bbls	14	700 pm	LEAD CEMENT	6	30	110
Tail % Excess	0%	735 pm	TAIL CEMENT	6	167	70
Tail Sacks	100	740 pm	SHUT DOWN	4	22.6	
		745 pm	DROP PLUG			
Total Sacks	657	747 pm	DISPLACEMENT	7	144.36	340
Water Temp	68	813 pm	BUMP PLUG	3	143	1100
bbl Returns		828 pm	CHECK FLOATS			
		830 pm	RIG DOWN			
Notes:		900 pm	LEAVE LOCATION			
			monitered well no top off			

Work Performed

Title

Date 2-5-21

# SERIES 2000

PSI      Barrels / Minute   Barrels      Lbs / Gallon      Stage Volume

