



Bison Oil Well Cementing Tail & Lead

Date: 2/15/2020
 Invoice # 900475
 AFE # 206786
 Foreman: Corey Barras

Customer: Noble Energy Inc.
 Well Name: Vogler State D33-769

County: Weld Consultant: Tim
 State: Colorado Rig Name & Number: H&P 321
 Distance To Location: 21
 Units On Location: 4028/3103-4020/3203
 Sec: 21 Time Requested: 1200
 Twp: 3N Time Arrived On Location: 2330
 Range: 64W Time Left Location: _____

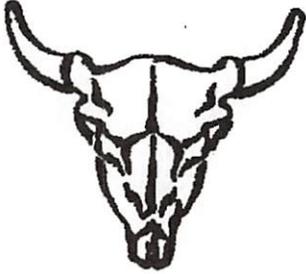
WELL DATA	Cement Data
Casing Size (in) : <u>9.625</u> Casing Weight (lb) : <u>36</u> Casing Depth (ft.) : <u>1,886</u> Total Depth (ft) : <u>1927</u> Open Hole Diameter (in) : <u>13.50</u> Conductor Length (ft) : <u>80</u> Conductor ID : <u>15.25</u> Shoe Joint Length (ft) : <u>42</u> Landing Joint (ft) : <u>0</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>1500</u>	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> 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> Fluid Ahead (bbls) : <u>30.0</u> H2O Wash Up (bbls) : <u>20.0</u> Spacer Ahead Makeup <u>30BBL WATER DYE IN 2ND 10</u>

Lead Calculated Results	Tail Calculated Results
HOC of Lead <u>1583.44 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>773.88 cuft</u>	Total Volume of Tail Cement <u>108.77 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>834.93 cuft</u>	HOC Tail <u>222.56 ft</u>
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
bbls of Lead Cement <u>163.57 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>540.25 sk</u>	bbls of Tail Mix Water <u>14.02 bbls</u>
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	(Sacks of Tail Cement X Gallons Per Sack) ÷ 42
bbls of Lead Mix Water <u>115.77 bbls</u>	Pressure of cement in annulus
(Sacks Needed) X (Gallons Per Sack) ÷ 42	Hydrostatic Pressure <u>585.23 PSI</u>
Displacement <u>142.54 bbls</u>	Collapse PSI: <u>2020.00 psi</u>
(Casing ID Squared) X (.0009714) X (Casing Depth) - (Shoe Length)	Burst PSI: <u>3520.00 psi</u>
Total Water Needed: <u>322.33 bbls</u>	



 Authorization To Proceed

Customers hereby acknowledges and specifically agrees to the terms and condition on this work order, including, without limitation, the provisions on this work order.



**Bison Oil Well Cementing
Two Cement Surface Pipe**

Customer: **Noble Energy Inc.**
Well Name: **Vogler State D33-769**

Date: **2/15/2020**
INVOICE #: **900475**
LOCATION: **Weld**
FOREMAN: **Corey Barras**

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DESCRIPTION OF JOB EVENTS

	Time/Date	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	115.7	2330	ARRIVE ON LOCATION			
Lead % Excess	10%	1245	MIRU			
Lead Sacks	540	115	PRE JOB SAFETY MEETING			
		152	PRESSURE TEST LINES			1200
		153	bbls ahead	6	30	140
Tail mixed bbls	14	200	LEAD CEMENT	6	163.5	160
Tail % Excess	0%	236	TAIL CEMENT	4	22.6	120
Tail Sacks	100	243	SHUT DOWN			
		245	DROP PLUG			
Total Sacks	640	246	DISPLACEMENT	7	70	380
Water Temp	78	315	BUMP PLUG	2	142.5	1040
bbl Returns	23	330	CHECK FLOATS			
		345	RIG DOWN			
Notes:		415	LEAVE LOCATION			
			monitered well no top off			

x

x WSS

x 2/15/20

Work Performed

Title

Date

Volger State D33-769

