



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

Customer: **Noble Energy Inc.**
Well Name: **Emmy State H25-771**

Date: **8/16/2018**
INVOICE #: **200308**
LOCATION: **Weld**
FOREMAN: **Kirk Kallhoff**

Amount Pumped	Time	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	123.3	1100 am	ARRIVE ON LOCATION			
Lead % Excess	15%	150 pm	JSA			
Lead Sacks	581	220 pm	JSA			
		245 pm	PRESSURE TEST			1500
		247 pm	SPACER AHEAD	6	30	180
Tail mixed bbls	13.81	251 pm	LEAD CEMENT	6	174	190
Tail % Excess	0%	323 pm	TAIL CEMENT	6	22.6	210
Tail Sacks	100	328 pm	SHUT DOWN			
		332 pm	DROP PLUG			
Total Sacks	681	332 pm	DISPLACEMENT	7	148.2	580
Water Temp	58	353 pm	Bump Plug			1115
bbl Returns	35	353 pm	Casing TEST			
		407 pm	Check Floats			
		440 pm	RIG DOWN			
Notes:		500 pm	Leave Location			
Montered well for						
20 Min. No top out						
Needed						

X *[Signature]*
Work Performed

X *Co-Man*
Title

X *8-16-18*
Date



Bison Oil Well Cementing Tail & Lead

Date: 8/16/2018
 Invoice # 200308
 API# _____
 Foreman: Kirk Kallhoff

Customer: Noble Energy Inc.
 Well Name: Emmy State H25-771

County: Weld Consultant: john
 State: Colorado Rig Name & Number: H&P 517
 Distance To Location: 23
 Units On Location: 4028/4030/4040
 Sec: 8 Time Requested: 1230 pm
 Twp: 5N Time Arrived On Location: 1100 am
 Range: 62W Time Left Location: 5:00pm

WELL DATA	Cement Data
Casing Size (in) : <u>9.625</u> Casing Weight (lb) : <u>36</u> Casing Depth (ft.) : <u>1,923</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>41</u> Landing Joint (ft) : <u>35</u> Sacks of Tail Requested : <u>100</u> HOC Tail (ft): <u>0</u>	Lead 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>15%</u> Tail Type III Cement Name: Cement Density (lb/gal) : <u>15.2</u> Cement Yield (cuft) : <u>1.27</u> Gallons Per Sack: <u>5.80</u> % Excess: <u>0%</u> Fluid Ahead (bbls) : 30.0 H2O Wash Up (bbls) : 20.0 Spacer Ahead Makeup 30 BBL ahead with Die in 2nd 10
One or the other, cannot have quantity in both Max Rate: 8 Max Pressure: 2500	

Casing ID 8.921 Casing Grade J-55 only used

Lead Calculated Results	Tail Calculated Results
HOC of Lead : 1554.56 ft	Tail Cement Volume In Ann : 127.00 cuft
Casing Depth - HOC Tail	(HOC Tail) X (OH Ann)
Volume of Lead Cement : 759.76 cuft	Total Volume of Tail Cement : 109.20 Cuft
HOC of Lead X Open Hole Ann	(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
Volume of Conductor : 90.42 cuft	bbls of Tail Cement : 22.62 bbls
(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 : 850.18 cuft	HOC Tail : 223.44 ft
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
bbls of Lead Cement : 174.13 bbls	Sacks of Tail Cement : 100.00 sk
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	(Total Volume of Tail Cement) ÷ (Cement Yield)
Sacks of Lead Cement : 581.97 sk	bbls of Tail Mix Water : 13.81 bbls
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	(Sacks of Tail Cement X Gallons Per Sack) ÷ 42
bbls of Lead Mix Water : 123.32 bbls	Pressure of cement in annulus
(Sacks Needed) X (Gallons Per Sack) ÷ 42	Hydrostatic Pressure : 585.23 PSI
Displacement : 148.18 bbls	Collapse PSI: 2020.00 psi
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	Burst PSI: 3520.00 psi
Total Water Needed: 335.32 bbls	

X _____
 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.

SERIES 2000

