Bison Oil Well Cementing
Two Cement Surface Pipe

Customer	Noble Energy Inc.
Well Name	Guttersen State DD30-725

Date	11/22/2019
INVOICE #	200544
LOCATION	Weld
FOREMAN	Kirk Kallhoff

Treatment Report Page 2

Amount Pumped		Time	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	116.8	1230 pm	ARRIVE ON LOCATION	ASSESS LOCATION			
Lead % Excess	10%	130 pm	JSA	Bison/SPOT EQUIPMENT IN			
Lead Sacks	551	200 pm	JSA	Bison and Rig Crew			
		239 pm	PRESSURE TEST	PRESSURE TEST TO 1000 PSI			1000
		240 pm	SPACER AHEAD	WATER S.	5	30	200
Tail mixed bbls	13.81	245 pm	LEAD CEMENT	CEMENT MIXED AT 13.5 PPG PG. 551 sks	5	165	220
Tail % Excess	0%	323 pm	TAIL CEMENT	CEMENT MIXED AT 15.2 PPG PG. 100 sks	5	22.6	300
Tail Sacks	100	328 pm	SHUT DOWN				
		332 pm	DROP PLUG				
Total Sacks	651	332 pm	DISPLACEMENT	bison to DISPLACE	5	143.4	350
Water Temp	60	400 pm	Bump Plug	(600 PSI)	3	143.4	790
bbl Returns	38	401 pm	Casing TEST	1000 psi 15 min			1010
		416 pm	Check Floats	FLOATS I held .5 BBL Back			
Notes:		430 pm	RIG DOWN	PRE RIG DOWN MEETING			
Montered well for		500 pm	Leave Location				
30 Min. No top out							
Needed							

X _(signature)_ Gary Houghton
Work Preformed

X WSS
Title

X 11-22-19
Date

Bison Oil Well Cementing
Tail & Lead

Date:	11/22/2019
Invoice #	200544
API#	05-123-48665

Customer: Noble Energy Inc.
Well Name: Guttersen State DD30-725
Foreman: Kirk Kallhoff

		Consultant:	gary
County:	Weld	**Rig Name & Number:**	H&P 321
State:	Colorado	**Distance To Location:**	26
		Units On Location:	4047/4020
Sec:	36	**Time Requested:**	200 pm
Twp:	3N	**Time Arrived On Location:**	1230 pm
Range:	63W	**Time Left Location:**	5:00pm

WELL DATA

Casing Size (in) :	9.625
Casing Weight (lb) :	36
Casing Depth (ft.) :	1,893
Total Depth (ft) :	1935
Open Hole Diameter (in) :	13.50
Conductor Length (ft) :	110
Conductor ID :	15.15
Shoe Joint Length (ft) :	41
Landing Joint (ft) :	4
Sacks of Tail Requested	100
HOC Tail (ft):	0

One or the other, cannot have quantity in both

Max Rate:	8
Max Pressure:	2500

Cement Data

Lead

Cement Name:	BFN III
Cement Density (lb/gal) :	13.5
Cement Yield (cuft) :	1.68
Gallons Per Sack :	8.90
% Excess	10%

Tail   Type III

Cement Name:	
Cement Density (lb/gal) :	15.2
Cement Yield (cuft) :	1.27
Gallons Per Sack:	5.80
% Excess:	0%
Fluid Ahead (bbls)	30.0
H20 Wash Up (bbls)	20.0

Spacer Ahead Makeup

30 BBL ahed with Die in 2nd 10

Casing ID	8.921	Casing Grade	J-55 only used

Lead Calculated Results

HOC of Lead	1555.56 ft
Casing Depth - HOC Tail	
Volume of Lead Cement	760.25 cuft
HOC of Lead X Open Hole Ann	
Volume of Conductor	82.12 cuft
(Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	
Total Volume of Lead Cement	842.37 cuft
(cuft of Lead Cement) + (Cuft of Conductor)	
bbls of Lead Cement	165.03 bbls
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	
Sacks of Lead Cement	551.55 sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	
bbls of Lead Mix Water	116.88 bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42	
Displacement	143.47 bbls
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	
Total Water Needed:	324.15 bbls

Tail Calculated Results

Tail Cement Volume In Ann	127.00 cuft
(HOC Tail) X (OH Ann)	
Total Volume of Tail Cement	109.20 Cuft
(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)	
bbls of Tail Cement	22.62 bbls
(HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)	
HOC Tail	223.44 ft
(Tail Cement Volume) ÷ (OH Ann)	
Sacks of Tail Cement	100.00 sk
(Total Volume of Tail Cement) ÷ (Cement Yield)	
bbls of Tail Mix Water	13.81 bbls
(Sacks of Tail Cement X Gallons Per Sack) ÷ 42	
Pressure of cement in annulus	
Hydrostatic Pressure	585.23 PSI
Collapse PSI:	2020.00 psi
Burst PSI:	3520.00 psi

X _Gary Stapleton_
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

Pressure & Total Volume

PSI — Barrels / Minute — Barrels — Lbs / Gallon — Stage Volume

Density & Rate