Bison Oil Well Cementing
Tail & Lead

Date: 1/2/2021
Invoice # 200650
API# 05-123-50795
Foreman: Kirk Kallhoff

Customer: Noble Energy Inc.
Well Name: reveille a34-735

County: Weld
State: Colorado

Sec: 35
Twp: 6N
Range: 64W

Consultant: jim
Rig Name & Number: H&P 517
Distance To Location: 10
Units On Location: 4028/4033
Time Requested: 1130 pm
Time Arrived On Location: 830 pm
Time Left Location: 3:30pm

WELL DATA

Casing Size (in) :	9.625
Casing Weight (lb) :	36
Casing Depth (ft.) :	1,900
Total Depth (ft) :	1944
Open Hole Diameter (in) :	13.50
Conductor Length (ft) :	110
Conductor ID :	15.5
Shoe Joint Length (ft) :	42
Landing Joint (ft) :	35
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:	5.89
% 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	1532.44 ft
Casing Depth - HOC Tail	
Volume of Lead Cement	748.95 cuft
HOC of Lead X Open Hole Ann	
Volume of Conductor	88.56 cuft
(Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	
Total Volume of Lead Cement	837.51 cuft
(cuft of Lead Cement) + (Cuft of Conductor)	
bbls of Lead Cement	164.08 bbls
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	
Sacks of Lead Cement	548.37 sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	
bbls of Lead Mix Water	116.20 bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42	
Displacement	146.33 bbls
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	
Total Water Needed:	326.55 bbls

Tail Calculated Results

Tail Cement Volume In Ann	127.00 cuft
(HOC Tail) X (OH Ann)	
Total Volume of Tail Cement	108.77 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	222.56 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	14.02 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

17 Centralizers

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.

Bison Oil Well Cementing
Two Cement Surface Pipe

Customer	Noble Energy Inc.
Well Name	reveille a34-735

Date	1/2/2021
INVOICE #	200650
LOCATION	Weld
FOREMAN	Kirk Kallhoff

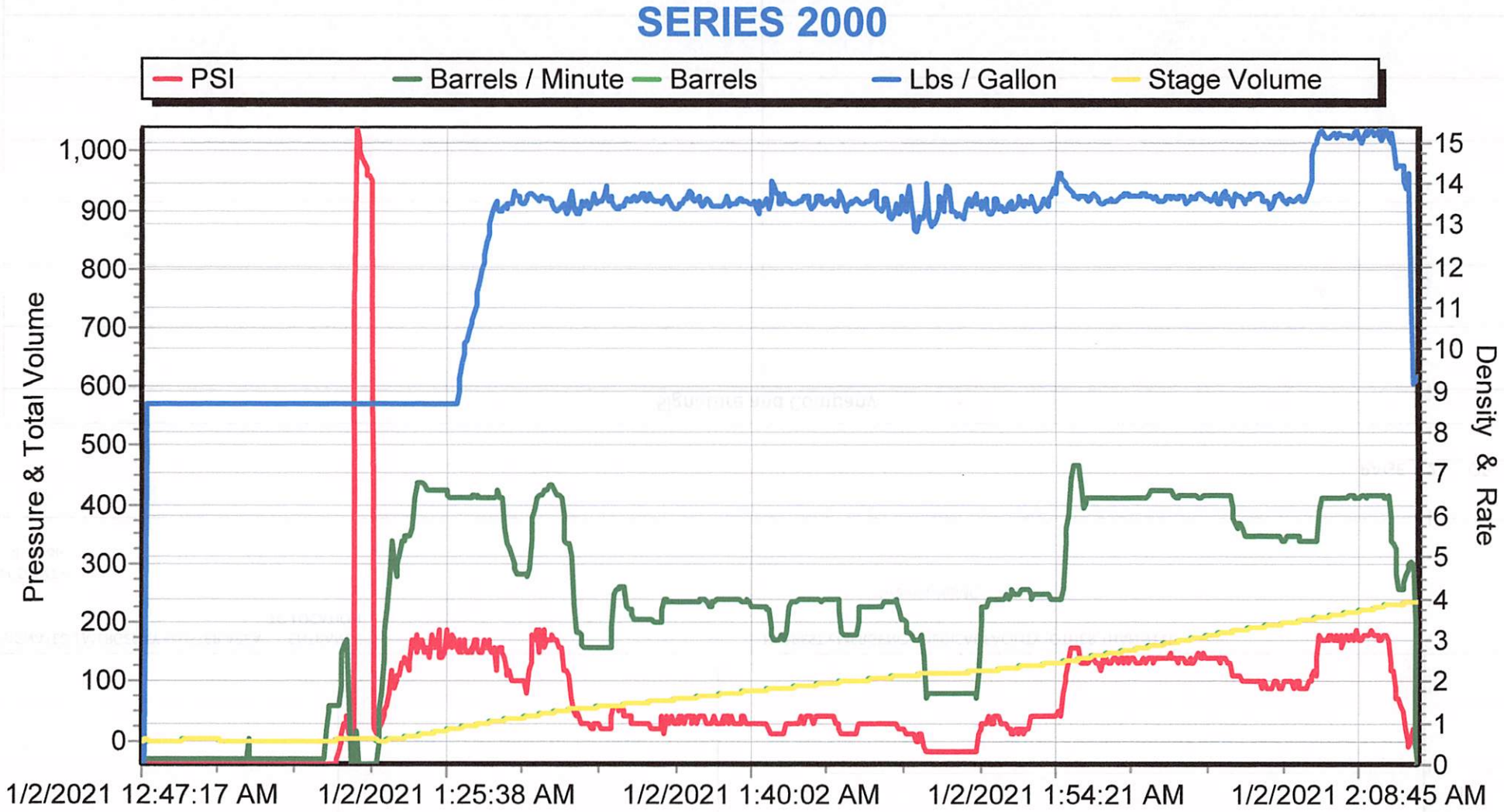
Treatment Report Page 2

Amount Pumped		Time	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	118.4	830 pm	ARRIVE ON LOCATION	ASSESS LOCATION			
Lead % Excess	10%	1220 am	JSA	Bison/SPOT EQUIPMENT IN			
Lead Sacks	559	101 am	JSA	Bison and Rig Crew			
		121 am	PRESSURE TEST	PRESSURE TEST TO 700 PSI			750
		122 am	SPACER AHEAD	WATER S. .	6	30	180
Tail mixed bbls	14	128 am	LEAD CEMENT	CEMENT MIXED AT 13.5 PPG 548 SKS	5	164	290
Tail % Excess	0%	206 am	TAIL CEMENT	CEMENT MIXED AT 15.2 PPG PG. 100sks	6	22.6	200
Tail Sacks	100	211 am	SHUT DOWN				
		215 am	DROP PLUG				
Total Sacks	659	215 am	DISPLACEMENT	rig to DISPLACE	8	146.3	300
Water Temp	60	243 am	Bump Plug	450 lift psi	2	146.3	450
bbl Returns	34	244 am	Casing TEST	Held for 15 Min.			1010
		300 am	Check Floats	FLOATS Iheld .5 BBL Back			0
Notes:		315 am	RIG DOWN				
Montered well for		330 am	Leave Location				
20 Min. No top out							
Needed							

X _____
Work Preformed

X WSS
Title

X 1-2-21
Date


SERIES 2000
PSI
Barrels / Minute
Barrels
Lbs / Gallon
Stage Volume
Pressure & Total Volume
Density & Rate
1,000
900
800
700
600
500
400
300
200
100
0
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1/2/2021 12:47:17 AM
1/2/2021 1:25:38 AM
1/2/2021 1:40:02 AM
1/2/2021 1:54:21 AM
1/2/2021 2:08:45 AM