Bison Oil Well Cementing
Tail & Lead

Date: 9/22/2018
Invoice # 200337
API#
Foreman: Kirk Kallhoff

Customer: Noble Energy Inc.
Well Name: Emmy h25-731

County: Weld
State: Colorado
Sec: 8
Twp: 5N
Range: 62W

Consultant: chris
Rig Name & Number: H&P 517
Distance To Location: 23
Units On Location: 4028/4033/4024
Time Requested: 300 am
Time Arrived On Location: 130 am
Time Left Location:

WELL DATA

Casing Size (in) :	9.625
Casing Weight (lb) :	36
Casing Depth (ft.) :	1,902
Total Depth (ft) :	1947
Open Hole Diameter (in) :	13.50
Conductor Length (ft) :	110
Conductor ID :	15.6
Shoe Joint Length (ft) :	43
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	15%

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	1535.33 ft
Casing Depth - HOC Tail	
Volume of Lead Cement	750.36 cuft
HOC of Lead X Open Hole Ann	
Volume of Conductor	90.42 cuft
(Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	
Total Volume of Lead Cement	840.78 cuft
(cuft of Lead Cement) + (Cuft of Conductor)	
bbls of Lead Cement	172.21 bbls
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	
Sacks of Lead Cement	575.54 sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	
bbls of Lead Mix Water	121.96 bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42	
Displacement	146.41 bbls
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	
Total Water Needed:	332.17 bbls

Tail Calculated Results

Tail Cement Volume In Ann	127.00 cuft
(HOC Tail) X (OH Ann)	
Total Volume of Tail Cement	108.34 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	221.67 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 _____
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	Emmy h25-731

Date	9/22/2018
INVOICE #	200337
LOCATION	Weld
FOREMAN	Kirk Kallhoff

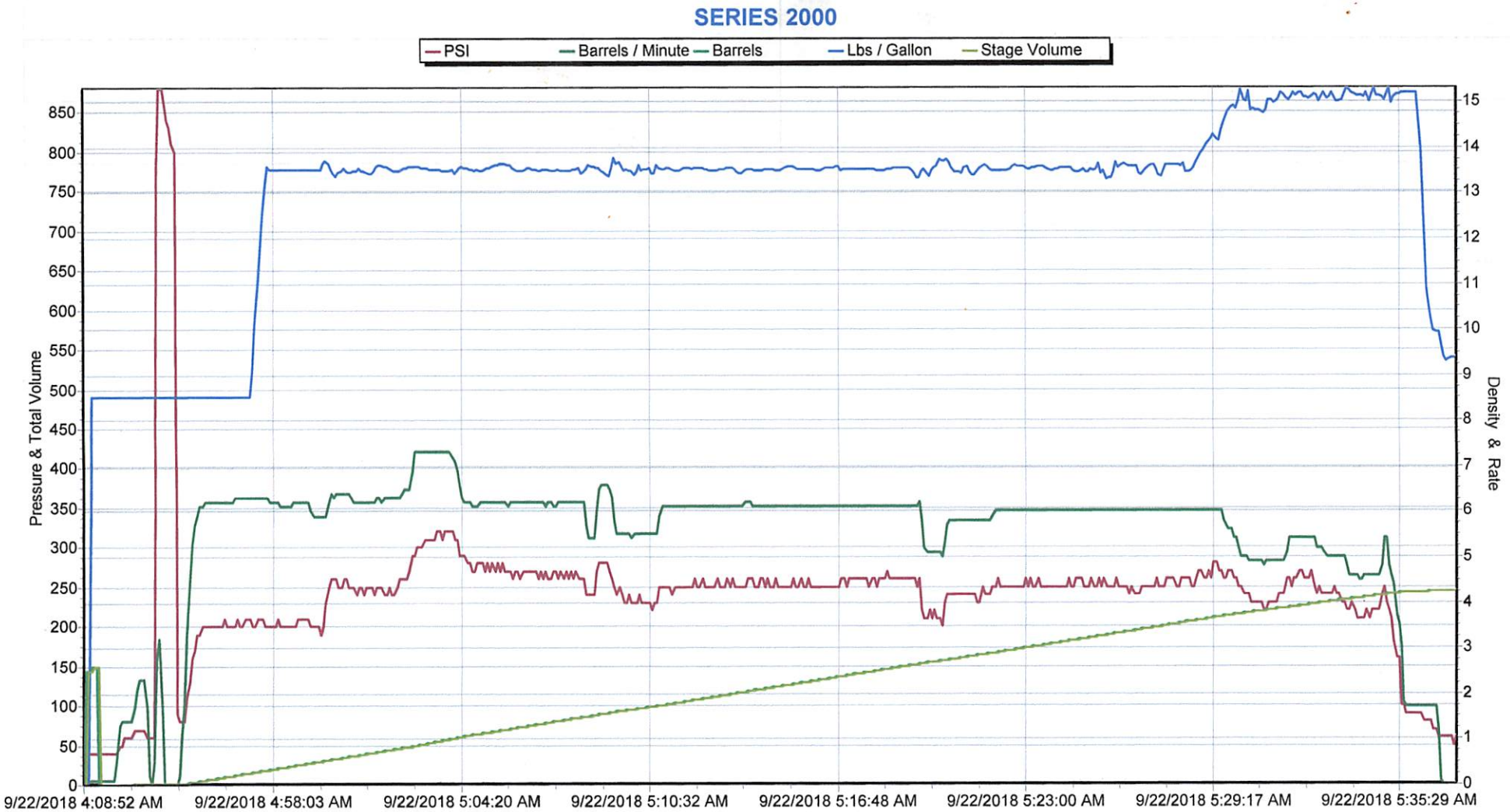
Treatment Report Page 2

Amount Pumped		Time	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	121.9	130 am	ARRIVE ON LOCATION	ASSESS LOCATION			
Lead % Excess	15%	400 am	JSA	Bison/SPOT EQUIPMENT IN			
Lead Sacks	575	430 am	JSA	Bison and Rig Crew			
		453 am	PRESSURE TEST	PRESSURE TEST TO 1100 PSI			1500
		455 am	SPACER AHEAD	WATER S. .	6	30	180
Tail mixed bbls	13.81	459 am	LEAD CEMENT	CEMENT MIXED AT 13.5 PPG 575 sks	6	172.2	190
Tail % Excess	0%	530 am	TAIL CEMENT	CEMENT MIXED AT 15.2 PPG PG. 100 sks	6	22.6	210
Tail Sacks	100	537 am	SHUT DOWN				
		540 am	DROP PLUG	PLUG PRELOADED			
Total Sacks	675	540 am	DISPLACEMENT	RIG DISPLACE	7	146.6	540
Water Temp	58	601 am	Bump Plug	480 lift psi		146.6	1110
bbl Returns	32	602 am	Casing TEST	Held for 15 Min.			
		617 am	Check Floats	FLOATS I held 2.5 BBL Back			
Notes:		715 am	RIG DOWN				
Montered well for		730 am	Leave Location				
20 Min. No top out							
Needed							

X Tony Stapleton
Work Preformed

X WSS
Title

X 9-22-18
Date


SERIES 2000
PSI
Barrels / Minute
Barrels
Lbs / Gallon
Stage Volume
Pressure & Total Volume
Density & Rate
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
0
1
2
3
4
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8
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11
12
13
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15
9/22/2018 4:08:52 AM
9/22/2018 4:58:03 AM
9/22/2018 5:04:20 AM
9/22/2018 5:10:32 AM
9/22/2018 5:16:48 AM
9/22/2018 5:23:00 AM
9/22/2018 5:29:17 AM
9/22/2018 5:35:29 AM