Bison Oil Well Cementing
Tail & Lead

Date: 11/17/2014
Invoice # 25093
API# 05-123-39672
Foreman: Calvin Reimers

Customer: Noble Energy Inc.
Well Name: McCaffrey State LD 12-74-1AHN

County: Weld
State: Colorado

Sec: 1
Twp: 9N
Range: 58W

Consultant: Seth
Rig Name & Number: H&P 343
Distance To Location: 81 Miles
Units On Location: 4023-3104/4024-3203
Time Requested: 900am
Time Arrived On Location: 900am
Time Left Location: 430pm

WELL DATA

Casing Size (in)	9.625
Casing Weight (lb)	36
Casing Depth (ft)	1,193
Total Depth (ft) :	1227
Open Hole Diameter (in) :	13.50
Conductor Length (ft)	100
Conductor ID	16
Shoe Joint Length (ft)	45
Landing Joint (ft)	29
Sacks of Tail Requested	100
HOC Tail (ft):	0

One or the other, cannot have quantity in both

Max Rate:	7
Max Pressure:	2500

Cement Data

Lead

Cement Name:	BFN III
Cement Density (lb/gal) :	13.1
Cement Yield (cuft) :	1.84
Gallons Per Sack	10.06
% Excess	25%

Tail

Cement Name:	BFN III
Cement Density (lb/gal) :	15.2
Cement Yield (cuft) :	1.27
Gallons Per Sack:	5.89
% Excess:	0%
Fluid Ahead (bbls)	90.9
H20 Wash Up (bbls)	20.0

Spacer Ahead Makeup

50bbls H2O+Dye in 2nd 10bbls

Casing ID 8.921 Casing Grade J-55 only used

Lead Calculated Results

HOC of Lead Casing Depth - HOC Tail	844.62 ft
Volume of Lead Cement HOC of Lead X Open Hole Ann	412.79 cuft
Volume of Conductor (Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	89.10 cuft
Total Volume of Lead Cement (cuft of Lead Cement) + (Cuft of Conductor)	501.89 cuft
bbls of Lead Cement (Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	111.75 bbls
Sacks of Lead Cement (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	341.00 sk
bbls of Lead Mix Water (Sacks Needed) X (Gallons Per Sack) ÷ 42	81.68 bbls
Displacement (Casing ID Squared) X (.0009714) X (Casing Depth) ÷ (Landing Joint) - (Shoe Length)	90.92 bbls
Total Water Needed	297.54 bbls

Tail Calculated Results

Tail Cement Volume In Ann (HOC Tail) X (OH Ann)	127.00 cuft
Total Volume of Tail Cement (HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)	107.39 Cuft
bbls of Tail Cement (HOC of Tail) X (OH Ann) ÷ (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)	22.62 bbls
HOC Tail (Tail Cement Volume) ÷ (OH Ann)	219.73 ft
Sacks of Tail Cement (Total Volume of Tail Cement) ÷ (Cement Yield)	100.00 sk
bbls of Tail Mix Water (Sacks of Tail Cement X Gallons Per Sack) ÷ 42	14.02 bbls
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	McCaffrey State LD 12-74-1AHN

Date	11/17/2014
INVOICE #	25093
LOCATION	Weld
FOREMAN	Calvin Reimers

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DESCRIPTION OF JOB EVENTS

Safety Meeting	209pm
MIRU	140pm
CIRCULATE	252pm
Drop Plug	
320pm	
M & P	

Time	Sacks
259pm	441
216pm	

Lead mixed bbls	81.68
Lead % Excess	25%
Lead Sacks	341
Tail mixed bbls	14.02
Tail % Excess	0%
Tail Sacks	100
Total Sacks	441
Water Temp	41.9
bbl Returns	32

Displace 1			Displace 2			Displace 3			Displace 4			Displace 5		
BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI
0	321pm	60	0			0			0			0		
10	324pm	30	10			10			10			10		
20	326pm	60	20			20			20			20		
30	328pm	120	30			30			30			30		
40	330pm	190	40			40			40			40		
50	331pm	230	50			50			50			50		
60	333pm	260	60			60			60			60		
70	335pm	350	70			70			70			70		
80	337pm	400	80			80			80			80		
90	340pm	300	90			90			90			90		
100	Bump	460	100			100			100			100		
110			110			110			110			110		
120			120			120			120			120		
130			130			130			130			130		
140			140			140			140			140		
150			150			150			150			150		

Notes:
1/2 bbl Back on Bleed Off

X _____
Work Preformed

X WSS
Title

X 11/30/14
Date