Bison Oil Well Cementing
Tail & Lead

Date: 9/10/2018
Invoice # 300184
API# 05-123-46968
Foreman: JASON KELEHER

Customer: Noble Energy Inc.
Well Name: EMMY H25-711

County: Weld
State: Colorado

Sec: 25
Twp: 3N
Range: 65W

Consultant: TOMMY
Rig Name & Number: H&P 517
Distance To Location: 23
Units On Location: 4044-3103,4032-3203
Time Requested: 1730
Time Arrived On Location: 1630
Time Left Location: 2200

WELL DATA

Casing Size (in) :	9.625
Casing Weight (lb) :	36
Casing Depth (ft.) :	1,935
Total Depth (ft) :	1946
Open Hole Diameter (in) :	13.50
Conductor Length (ft) :	80
Conductor ID :	15.25
Shoe Joint Length (ft) :	48
Landing Joint (ft) :	5
Sacks of Tail Requested	100
HOC Tail (ft):	0

One or the other, cannot have quantity in both

Max Rate:	8
Max Pressure:	1500

Cement Data

Lead

Cement Name:	
Cement Density (lb/gal) :	13.5
Cement Yield (cuft) :	1.7
Gallons Per Sack	9.00
% Excess	15%

Tail

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 WATER DYE IN 2ND 10

Casing ID 8.921 Casing Grade J-55 only used

Lead Calculated Results

HOC of Lead	1717.76 ft
Casing Depth - HOC Tail	
Volume of Lead Cement	920.43 cuft
HOC of Lead X Open Hole Ann	
Volume of Conductor	60.64 cuft
(Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	
Total Volume of Lead Cement	981.31 cuft
(cuft of Lead Cement) + (Cuft of Conductor)	
bbls of Lead Cement	175.00 bbls
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	
Sacks of Lead Cement	578.00 sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	
bbls of Lead Mix Water	123.80 bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42	
Displacement	146.20 bbls
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	
Total Water Needed:	189.00 bbls

Tail Calculated Results

Tail Cement Volume In Ann	106.12 cuft
(HOC Tail) X (OH Ann)	
Total Volume of Tail Cement	127.00 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	217.24 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	460.00 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 H25-711

Date	9/10/2018
INVOICE #	300184
LOCATION	Weld
FOREMAN	JASON KELEHER

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DESCRIPTION OF JOB EVENTS

Amount Pumped		Time/Date	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	123.8	1630	ARRIVE ON LOCATION	ASSESS LOCATION AND HAZARDS			
Lead % Excess	15%	1800	MIRU	SPOT EQUIPMENT, PRE RIG UP MEETING			
Lead Sacks	578	1920	PRE JOB SAFETY MEETING	RIG CREW AND BISON			
		1947	PRESSURE TEST LINES				1500
		1949	SPACER AHEAD	WATER SUPPLIED RIG W/DYE IN 2ND 10	5.5	30	220
Tail mixed bbls	14	1954	LEAD CEMENT	CEMENT MIXED AT 13.5 PPG 578 SKS	6	175	180
Tail % Excess	0%	2025	TAIL CEMENT	CEMENT MIXED AT 15.2 PPG 100 SKS	5.5	22.6	180
Tail Sacks	100	2029	SHUT DOWN				
		2035	DROP PLUG				
Total Sacks	675	2035	DISPLACEMENT	RIG DISPLACES	1	146.2	549
Water Temp	60	2101	BUMP PLUG				1134
bbl Returns	32	2117	CHECK FLOATS	FLOATS HELD, 2 BBL BACK, WATCH FALL BACK			1030
		2125	RIG DOWN				
Notes:		2200	LEAVE LOCATION				
				monitered well no top off			

X Signature

X - Company Man Title

X 9/10/18 Date

EMMY H25-711 SURFACE