Bison Oil Well Cementing
Tail & Lead

Date: 7/17/2017
Invoice # 200124
API#
Foreman: Kirk Kallhoff

Customer: Noble Energy Inc.
Well Name: wells ranch af 07-659

County: Weld
State: Colorado
Sec: 20
Twp: 9n
Range: 58w

Consultant: gary
Rig Name & Number: H&P 517
Distance To Location: 25
Units On Location: 4028/4034
Time Requested: 100 am
Time Arrived On Location: 1100 pm
Time Left Location:

WELL DATA

Casing Size (in) :	9.625
Casing Weight (lb) :	36
Casing Depth (ft.) :	1,894
Total Depth (ft) :	1940
Open Hole Diameter (in) :	13.50
Conductor Length (ft) :	80
Conductor ID :	15.6
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:
Max Pressure:

Cement Data

Lead

Cement Name:	fn3 gel calcium
Cement Density (lb/gal) :	13.5
Cement Yield (cuft) :	1.7
Gallons Per Sack	9.00
% Excess	15%

Tail

Cement Name:	bfn 3
Cement Density (lb/gal) :	15.2
Cement Yield (cuft) :	1.27
Gallons Per Sack:	5.89
% Excess:	0%
Fluid Ahead (bbls)	145.9
H20 Wash Up (bbls)	20.0

Spacer Ahead Makeup

Casing ID 8.921 Casing Grade J-55 only used

Lead Calculated Results

HOC of Lead Casing Depth - HOC Tail	1556.44 ft
Volume of Lead Cement HOC of Lead X Open Hole Ann	760.68 cuft
Volume of Conductor (Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	65.76 cuft
Total Volume of Lead Cement (cuft of Lead Cement) + (Cuft of Conductor)	826.44 cuft
bbls of Lead Cement (Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	169.27 bbls
Sacks of Lead Cement (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	559.06 sk
bbls of Lead Mix Water (Sacks Needed) X (Gallons Per Sack) ÷ 42	119.80 bbls
Displacement (Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	145.87 bbls
Total Water Needed:	445.55 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)	108.77 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)	222.56 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 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.

Bison Oil Well Cementing
Two Cement Surface Pipe

Customer	Noble Energy Inc.
Well Name	wells ranch af 07-659

Date	7/17/2017
INVOICE #	200124
LOCATION	Weld
FOREMAN	Kirk Kallhoff

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DESCRIPTION OF JOB EVENTS

Amount Pumped		Time/Date	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	119.8	1100 pm	arived on location				
Lead % Excess	15%	145 am	rig up				
Lead Sacks	559	215 am	jsa				
		234 am	test lines	test lines to 1300 psi	1	2	1300
		236 am	bbls ahead	50 bbls h2o dye in 2nd 10	5	30	120
Tail mixed bbls	14	245 am	m&p lead cement	559 sks 169.2 bbls slury	6	170.9	200
Tail % Excess	0%	322 am	m&p tail cement	100 sks 22.6 bbls slury	6	22.6	200
Tail Sacks	100	327 am	shutdown				
		331 am	drop plug				
Total Sacks	659	331 am	displace	rig to displace 145.9 bbls OBM		145.9	
Water Temp	60	355 am	bump plug	lift psi 560	1.5	145.9	1030
bbl Returns	18	355 am	casing test	rig to test			1030
		410 am	release psi				0
Notes:		500 am	rig down				
		530 am	leave location				
				monitered well no top off			

x Gary Stapleton
Work Preformed

x WSS
Title

x 7-17-17
Date