



**Bison Oil Well Cementing
Tail & Lead**

Date: 11/27/2020
 Invoice #: 200642
 API#: 05-123-48949
 Foreman: Matthew Rosales

Customer: Noble Energy Inc.
 Well Name: Guttersen D09-785

County: Weld
 State: Colorado
 Sec: 33
 Twp: 4N
 Range: 64W

Consultant: Dave
 Rig Name & Number: H&P 517
 Distance To Location: 19
 Units On Location: 402,840,334,044
 Time Requested: 4:30pm
 Time Arrived On Location: 3:00pm
 Time Left Location:

WELL DATA	Cement Data
Casing Size (in) : 9.625 Casing Weight (lb) : 36 Casing Depth (ft.) : 1,929 Total Depth (ft) : 1937 Open Hole Diameter (in) : 13.50 Conductor Length (ft) : 80 Conductor ID : 15.25 Shoe Joint Length (ft) : 43 Landing Joint (ft) : 2 Sacks of Tail Requested : 100 HOC Tail (ft): 0 <small>One or the other, cannot have quantity in both</small> Max Rate: 8 Max Pressure: 750	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 H2O Wash Up (bbls) : 20.0 Spacer Ahead Makeup 30 BBL ahead with Die in 2nd 10

Casing ID: 8.921 Casing Grade: J-55 only used

Lead Calculated Results	Tail Calculated Results
HOC of Lead : 1625.33 ft	Tail Cement Volume In Ann (HOC Tail) X (OH Ann) : 127.00 cuft
Casing Depth - HOC Tail	Total Volume of Tail Cement : 108.34 Cuft
Volume of Lead Cement : 794.35 cuft	(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
HOC of Lead X Open Hole Ann	bbls of Tail Cement : 22.62 bbls
Volume of Conductor : 61.05 cuft	(HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)
(Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	HOC Tail : 221.67 ft
Total Volume of Lead Cement : 855.40 cuft	(Tail Cement Volume) ÷ (OH Ann)
(cuft of Lead Cement) + (Cuft of Conductor)	Sacks of Tail Cement : 100.00 sk
bbls of Lead Cement : 167.58 bbls	(Total Volume of Tail Cement) ÷ (Cement Yield)
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	bbls of Tail Mix Water : 14.02 bbls
Sacks of Lead Cement : 560.08 sk	(Sacks of Tail Cement X Gallons Per Sack) ÷ 42
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Pressure of cement in annulus
bbls of Lead Mix Water : 118.68 bbls	Hydrostatic Pressure : 585.23 PSI
(Sacks Needed) X (Gallons Per Sack) ÷ 42	Collapse PSI: 2020.00 psi
Displacement : 145.94 bbls	Burst PSI: 3520.00 psi
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	
Total Water Needed: 328.65 bbls	

Centralizers: 18

Authorization To Proceed

Guttersen D09-785

