# Bison Oil Well Cementing
## Tail & Lead

Date: 6/15/2019
Invoice # 900354
API# 05-123-48845
Foreman: Corey Barras

**Customer:** Noble Energy Inc.
**Well Name:** Guttersen D23-711

**County:** Weld
**State:** Colorado

**Sec:** 23
**Twp:** 3n
**Range:** 64w

Consultant: John
Rig Name & Number: H&P 517
Distance To Location: 25
Units On Location: 4033/3201-4024/3201-
Time Requested: 1700
Time Arrived On Location: 1630
Time Left Location:

## WELL DATA

| | |
|---|---|
| Casing Size (in) : | _9.625 |
| Casing Weight (lb) : | 36 |
| Casing Depth (ft.) : | 1,903 |
| Total Depth (ft) : | 1943 |
| Open Hole Diameter (in) : | 13.50 |
| Conductor Length (ft) : | 80 |
| Conductor ID : | 15.25 |
| Shoe Joint Length (ft) : | 44 |
| Landing Joint (ft) : | 0 |

| | |
|---|---|
| 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 | 10% |

**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**

30BBL WATER DYE IN 2ND 10

Casing ID 8.921 Casing Grade J-55 only used

## Lead Calculated Results

**HOC of Lead** 1602.22 ft
Casing Depth - HOC Tail

**Volume of Lead Cement** 783.05 cuft
HOC of Lead X Open Hole Ann

**Volume of Conductor** 61.05 cuft
(Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)

**Total Volume of Lead Cement** 844.10 cuft
(cuft of Lead Cement) + (Cuft of Conductor)

**bbls of Lead Cement** 165.37 bbls
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)

**Sacks of Lead Cement** 546.18 sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)

**bbls of Lead Mix Water** 117.04 bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42

**Displacement** 143.70 bbls
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)

**Total Water Needed:** 324.76 bbls

## Tail Calculated Results

**Tail Cement Volume In Ann** 127.00 cuft
(HOC Tail) X (OH Ann)

**Total Volume of Tail Cement** 107.90 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** 220.78 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** 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 | Guttersen D23-711 |

| | |
|---|---|
| Date | 6/15/2019 |
| INVOICE # | 900354 |
| LOCATION | Weld |
| FOREMAN | Corey Barras |

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| | |
|---|---|
| Lead mixed bbls | 117.04 |
| Lead % Excess | 10% |
| Lead Sacks | 546 |
| Tail mixed bbls | 14 |
| Tail % Excess | 0% |
| Tail Sacks | 100 |
| Total Sacks | 646 |
| Water Temp | 62 |
| bbl Returns | 19 |

Notes:

**DESCRIPTION OF JOB EVENTS**

| Time/Date | Event | Description | Rate | BBLs | Pressure |
|---|---|---|---|---|---|
| 1630 | ARRIVE ON LOCATION | ASSESS LOCATION AND HAZARDS | | | |
| 1830 | MIRU | SPOT EQUIPMENT, PRE RIG UP MEETING | | | |
| 1915 | PRE JOB SAFETY MEETING | RIG CREW AND BISON | | | |
| 1928 | PRESSURE TEST LINES | | | | 1500 |
| 1930 | bbls ahead | WATER SUPPLIED RIG W/DYE IN 2ND 10 | 7 | 30 | 160 |
| 1937 | LEAD CEMENT | CEMENT MIXED AT 13.5 PPG | 6 | 165.3 | 110 |
| 2015 | TAIL CEMENT | CEMENT MIXED AT 15.2 PPG | 3 | 22.6 | 90 |
| 2015 | SHUT DOWN | | | | |
| 2025 | DROP PLUG | | | | |
| 2026 | DISPLACEMENT | DISPLACE W/ H2O | 8 | 70 | 700 |
| 2058 | BUMP PLUG | Casing Test for 15 Min @ 1020 Psi ( Lift 590) | 3 | 143.7 | 1020 |
| 2114 | CHECK FLOATS | FLOATS HELD/ WATCH FOR FALL BACK | | | 0 |
| 2140 | RIG DOWN | | | | |
| 2200 | LEAVE LOCATION | | | | |
| | | | | | |
| | | monitered well no top off | | | |

x _____ Work Performed

x WSS Title

6-15-19 Date x

# Guttersen D23-711