



# Bison Oil Well Cementing Single Cement Surface Pipe

Date: 8/31/2014  
Invoice #: 25044  
API#: 05-123-39478  
Foreman: Calvin Reimers

Customer: Noble Energy Inc.  
Well Name: Five Rivers K07-65-1HN

County: Weld  
State: Colorado  
Sec: 8  
Twp: 4N  
Range: 66W  
Consultant: Martin/John  
Rig Name & Number: H&P 315  
Distance To Location: 6 Miles  
Units On Location: 4034-3104/4020-3212  
Time Requested: 100am  
Time Arrived On Location: 1125pm  
Time Left Location: 415am

## WELL DATA

Casing Size OD (in) : 9.625  
Casing Weight (lb) : 36.00  
Casing Depth (ft) : 595  
Total Depth (ft) : 627  
Open Hole Diameter (in.) : 13.75  
Conductor Length (ft) : 100  
Conductor ID : 16  
Shoe Joint Length (ft) : 44  
Landing Joint (ft) : 30

Max Rate: 7  
Max Pressure: 2500

## Cement Data

Cement Name: BEN III  
Cement Density (lb/gal) : 15.2  
Cement Yield (cuft) : 1.27  
Gallons Per Sack: 5.89  
% Excess: 12%  
Displacement Fluid lb/gal: 8.3  
BBL to Pit: 13.0  
Fluid Ahead (bbls): 40.0  
H2O Wash Up (bbls): 20.0

Spacer Ahead Makeup  
40 bbls H2O+Dye in 2nd 10bbls

Casing ID

8.921

Casing Grade

J-55 only used

## Calculated Results

cuft of Shoe 19.22 cuft

(Casing ID Squared) X (.005454) X (Shoe Joint ft)

cuft of Conductor 89.10 cuft  
(Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)

cuft of Casing 291.53 cuft  
(Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)

Total Slurry Volume 399.84 cuft  
(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)

bbls of Slurry 71.21 bbls  
(Total Slurry Volume) X (.1781)

Sacks Needed 315 sk  
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)

Mix Water 44.15 bbls  
(Sacks Needed) X (Gallons Per Sack) ÷ 42

Displacement: 44.90 bbls

(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)

## Pressure of cement in annulus

Hydrostatic Pressure: 469.79 PSI

## Pressure of the fluids inside casing

Displacement: 237.45 psi

Shoe Joint: 34.96 psi

Total 272.41 psi

Differential Pressure: 197.38 psi

Collapse PSI: 2020.00 psi

Burst PSI: 3520.00 psi

Total Water Needed: 149.05 bbls

Authorization To Proceed

Customers hereby acknowledge 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  
Single Cement Surface Pipe

Customer  
Well Name

Noble Energy Inc.  
Five Rivers K07-65-1HN

INVOICE #  
LOCATION  
FOREMAN  
Date

25044  
Weld  
Calvin Reimers  
8/31/2014

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### DESCRIPTION OF JOB EVENTS

|                |       | 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 |
| Safety Meeting | 217am |            |       |     |            |      |     |            |      |     |            |      |     |            |      |     |
| MIRU           | 115am |            |       |     |            |      |     |            |      |     |            |      |     |            |      |     |
| CIRCULATE      | 234am | 0          | 300am | 50  | 0          |      |     | 0          |      |     | 0          |      |     | 0          |      |     |
| Drop Plug      |       | 10         | 303am | 80  | 10         |      |     | 10         |      |     | 10         |      |     | 10         |      |     |
| 259am          |       | 20         | 305am | 140 | 20         |      |     | 20         |      |     | 20         |      |     | 20         |      |     |
|                |       | 30         | 307am | 210 | 30         |      |     | 30         |      |     | 30         |      |     | 30         |      |     |
|                |       | 40         | 309am | 240 | 40         |      |     | 40         |      |     | 40         |      |     | 40         |      |     |
| M & P          |       | 50         | 313am | 210 | 50         |      |     | 50         |      |     | 50         |      |     | 50         |      |     |
| Time           | Sacks | 60         | Bump  | 420 | 60         |      |     | 60         |      |     | 60         |      |     | 60         |      |     |
| 243am          | 315   | 70         |       |     | 70         |      |     | 70         |      |     | 70         |      |     | 70         |      |     |
| 256am          |       | 80         |       |     | 80         |      |     | 80         |      |     | 80         |      |     | 80         |      |     |
|                |       | 90         |       |     | 90         |      |     | 90         |      |     | 90         |      |     | 90         |      |     |
|                |       | 100        |       |     | 100        |      |     | 100        |      |     | 100        |      |     | 100        |      |     |
|                |       | 110        |       |     | 110        |      |     | 110        |      |     | 110        |      |     | 110        |      |     |
| % Excess       | 12%   | 120        |       |     | 120        |      |     | 120        |      |     | 120        |      |     | 120        |      |     |
| Mixed bbls     | 44.15 | 130        |       |     | 130        |      |     | 130        |      |     | 130        |      |     | 130        |      |     |
| Total Sacks    | 315   | 140        |       |     | 140        |      |     | 140        |      |     | 140        |      |     | 140        |      |     |
| bbl Returns    | 13    | 150        |       |     | 150        |      |     | 150        |      |     | 150        |      |     | 150        |      |     |
| Water Temp     | 69.1  |            |       |     |            |      |     |            |      |     |            |      |     |            |      |     |

Notes:

The day

1/2 BBL Back on Bleed Off

PSI Test 314am 1040psi to 329am 1070psi

X John M Taylor  
Work Performed

X Coman  
Title

X 8-31-2014  
Date