



# Bison Oil Well Cementing Single Cement Surface Pipe

Date: 10/12/2014  
 Invoice #: 65016  
 API#: 05-123-3698#3  
 Foreman: Lee Sharp

Customer: EnCana Oil & Gas (USA) Inc.  
 Well Name: Billings 3A-18H

County: Weld  
 State: Colorado  
 Sec: 18  
 Twp: 3N  
 Range: 68W

Consultant: Ira  
 Rig Name & Number: Patterson 326  
 Distance To Location: 22  
 Units On Location: 4018-3204;4031-3106  
 Time Requested: 9:30  
 Time Arrived On Location: 9:20  
 Time Left Location:

| WELL DATA                        | Cement Data                    |
|----------------------------------|--------------------------------|
| Casing Size OD (in) : 9.625      | Cement Name: BFN III           |
| Casing Weight (lb) : 40.00       | Cement Density (lb/gal) : 15.2 |
| Casing Depth (ft.) : 866         | Cement Yield (cuft) : 1.27     |
| Total Depth (ft) : 880           | Gallons Per Sack: 5.89         |
| Open Hole Diameter (in.) : 12.25 | % Excess: 50%                  |
| Conductor Length (ft) : 155      | Displacement Fluid lb/gal: 8.3 |
| Conductor ID : 15.25             | BBL to Pit:                    |
| Shoe Joint Length (ft) : 47      | Fluid Ahead (bbls): 30.0       |
| Landing Joint (ft) : 0           | H2O Wash Up (bbls): 20.0       |
| Max Rate:                        | Spacer Ahead Makeup            |
| Max Pressure:                    | 10F+10D+10F= 30bbl             |

| Calculated Results   | Pressure of cement in annulus   |
|--|---|
| <b>cuft of Shoe</b> 19.92 cuft<br>(Casing ID Squared) X (.005454) X (Shoe Joint ft)  | <b>Displacement:</b> 62.14 bbls<br>(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint) |
| <b>cuft of Conductor</b> 118.29 cuft<br>(Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft) | <b>Hydrostatic Pressure:</b> 684.09 PSI   |
| <b>cuft of Casing</b> 334.18 cuft<br>(Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length) | <b>Pressure of the fluids inside casing</b>   |
| <b>Total Slurry Volume</b> 472.39 cuft<br>(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)                                | <b>Displacement:</b> 353.39 psi<br><b>Shoe Joint:</b> 36.95 psi<br><b>Total:</b> 390.34 psi                       |
| <b>bbls of Slurry</b> 84.13 bbls<br>(Total Slurry Volume) X (.1781)  | <b>Differential Pressure:</b> 293.75 psi  |
| <b>Sacks Needed</b> 372 sk<br>(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)   | <b>Collapse PSI:</b> 2570.00 psi<br><b>Burst PSI:</b> 3950.00 psi   |
| <b>Mix Water</b> 52.16 bbls<br>(Sacks Needed) X (Gallons Per Sack) ÷ 42  | <b>Total Water Needed:</b> 164.31 bbls  |

X *[Signature]*  
 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  
Single Cement Surface Pipe**

Customer  
Well Name

EnCana Oil & Gas (USA) Inc.  
Billings 3A-18H

INVOICE #  
LOCATION  
FOREMAN  
Date

65016  
Weld  
Lee Sharp  
10/12/2014

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**DESCRIPTION OF JOB EVENTS**

|                | Time  | 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 | 10:30 |            |       |     |            |      |     |            |      |     |            |      |     |            |      |     |
| MIRU           | 10:00 |            |       |     |            |      |     |            |      |     |            |      |     |            |      |     |
| CIRCULATE      | 11:38 | 0          | 12:06 |     | 0          |      |     | 0          |      |     | 0          |      |     | 0          |      |     |
| Drop Plug      |       | 10         | 12:08 | 60  | 10         |      |     | 10         |      |     | 10         |      |     | 10         |      |     |
| 12:06          |       | 20         | 12:11 | 150 | 20         |      |     | 20         |      |     | 20         |      |     | 20         |      |     |
|                |       | 30         | 12:14 | 260 | 30         |      |     | 30         |      |     | 30         |      |     | 30         |      |     |
|                |       | 40         | 12:17 | 310 | 40         |      |     | 40         |      |     | 40         |      |     | 40         |      |     |
|                |       | 50         | 12:20 | 360 | 50         |      |     | 50         |      |     | 50         |      |     | 50         |      |     |
| M & P          |       | 60         | 12:24 | 390 | 60         |      |     | 60         |      |     | 60         |      |     | 60         |      |     |
| Time           | Sacks | 70         |       |     | 70         |      |     | 70         |      |     | 70         |      |     | 70         |      |     |
| 11:45-12:01    | 372   | 80         |       |     | 80         |      |     | 80         |      |     | 80         |      |     | 80         |      |     |
|                |       | 90         |       |     | 90         |      |     | 90         |      |     | 90         |      |     | 90         |      |     |
|                |       | 100        |       |     | 100        |      |     | 100        |      |     | 100        |      |     | 100        |      |     |
|                |       | 110        |       |     | 110        |      |     | 110        |      |     | 110        |      |     | 110        |      |     |
|                |       | 120        |       |     | 120        |      |     | 120        |      |     | 120        |      |     | 120        |      |     |
| % Excess       | 51%   | 130        |       |     | 130        |      |     | 130        |      |     | 130        |      |     | 130        |      |     |
| Mixed bbls     | 52.37 | 140        |       |     | 140        |      |     | 140        |      |     | 140        |      |     | 140        |      |     |
| Total Sacks    | 373   | 150        |       |     | 150        |      |     | 150        |      |     | 150        |      |     | 150        |      |     |
| bbl Returns    |       |            |       |     |            |      |     |            |      |     |            |      |     |            |      |     |
| Water Temp     | 55    |            |       |     |            |      |     |            |      |     |            |      |     |            |      |     |

Notes:

Onset of job went well. Pumped 30 bbl head 10f 10D 10F went into cement mixed 85 bbl slurry. Dropped Plug @ 12:06pm displace displaced 64 bbl  
 Calculated displacement was 62.14 bbl at count of 62 did not bump into float collar pumped an additional 2 bbl in an attempt to land plug. At 2 bbl  
 mark still had not bumped, @ 12:40 I made call to stop pumping to avoid wet shoe, talked with Ira (EnCana Rep) we agreed to shut in and allow time to  
 set up. 1:02 pm shut in.  
 3:30 rig removed cement head got returns of about 10 gallons of water. Company man is happy with out come of job

X *Lee Sharp*  
 Work Performed

X *Encana Rep*  
 Title

X *10-12-14*  
 Date