



# Bison Oil Well Cementing Single Cement Surface Pipe

Date: 11/30/2014  
 Invoice # 45082  
 API# 05-123-40548  
 Foreman: JASON KELEHER

Customer: Anadarko Petroleum Corporation  
 Well Name: THOMSEN 5N-31HZ

County: Weld  
 State: Colorado  
 Sec: 7  
 Twp: 2N  
 Range: 65W

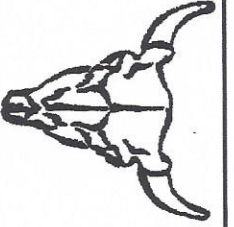
Consultant: RANDY  
 Rig Name & Number: MAJORS 29  
 Distance To Location: 18  
 Units On Location: 4031-3106/ 4022-3213  
 Time Requested: 430  
 Time Arrived: 300  
 Time Left Location: 1100

| WELL DATA                               | Cement Data                           |
|---|---------------------------------------|
| Casing Size OD (in) : <u>9.625</u>      | Cement Name: <u>BFN III</u>           |
| Casing Weight (lb) : <u>36.00</u>       | Cement Density (lb/gal) : <u>14.2</u> |
| Casing Depth (ft.) : <u>1,344</u>       | Cement Yield (cuft) : <u>1.49</u>     |
| Total Depth (ft) : <u>1360</u>          | Gallons Per Sack: <u>7.48</u>         |
| Open Hole Diameter (in.) : <u>13.50</u> | % Excess: <u>16%</u>                  |
| Conductor Length (ft) : _____           | Displacement Fluid lb/gal: <u>8.3</u> |
| Conductor ID : _____                    | BBL to Pit: <u>21.0</u>               |
| Shoe Joint Length (ft) : <u>39</u>      | Fluid Ahead (bbls): <u>30.0</u>       |
| Landing Joint (ft) : <u>8</u>           | H2O Wash Up (bbls): <u>20.0</u>       |
| Max Rate: <u>7</u>                      | Spacer Ahead Makeup                   |
| Max Pressure: <u>2500</u>               | <u>30 BBL WATER, DYE IN 2ND 10</u>    |

| Calculated Results  | Pressure of cement in annulus               |
|---|---|
| Casing ID <u>8.921</u>  | Casing Grade <u>J-55 only used</u>          |
| <b>Displacement: 101.49 bbls</b><br>(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)              | <b>Pressure of cement in annulus</b>        |
| <b>cuft of Shoe 16.93 cuft</b><br>(Casing ID Squared) X (.005454) X (Shoe Joint ft)   | <b>Hydrostatic Pressure: 991.28 PSI</b>     |
| <b>cuft of Conductor 0.00 cuft</b><br>(Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)   | <b>Pressure of the fluids inside casing</b> |
| <b>cuft of Casing 759.84 cuft</b><br>(Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length ) | <b>Displacement: 562.58 psi</b>             |
| <b>Total Slurry Volume 776.77 cuft</b><br>(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)                               | <b>Shoe Joint: 28.77 psi</b>                |
| <b>bbls of Slurry 138.34 bbls</b><br>(Total Slurry Volume) X (.1781)  | <b>Total 591.35 psi</b>                     |
| <b>Sacks Needed 521 sk</b><br>(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)  | <b>Differential Pressure: 399.93 psi</b>    |
| <b>Mix Water 92.84 bbls</b><br>(Sacks Needed) X (Gallons Per Sack) ÷ 42   | <b>Collapse PSI: 2020.00 psi</b>            |
|   | <b>Burst PSI: 3520.00 psi</b>               |
|   | <b>Total Water Needed: 244.33 bbls</b>      |

*[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

Anadarko Petroleum Corporation  
 THOMSEN 5N-31HZ

INVOICE #  
 LOCATION  
 FOREMAN  
 Date

45082  
 Weld  
 JASON KELEHER  
 11/30/2014

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**DESCRIPTION OF JOB EVENTS**

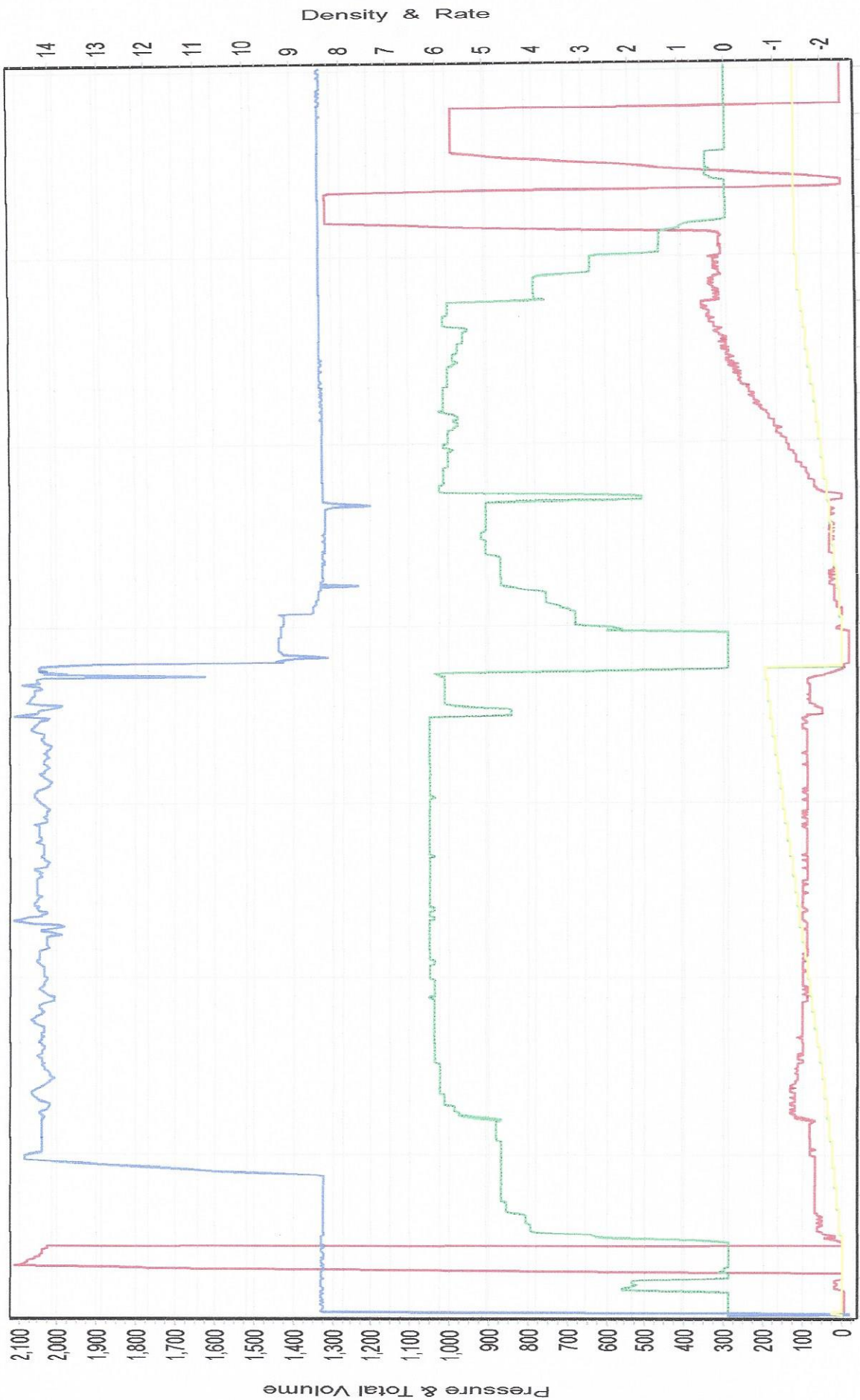
| Safety Meeting<br>MIRU<br>CIRCULATE<br>Drop Plug<br>954 | Displace 1 |      |      | Displace 2 |      |     | Displace 3 |      |     | Displace 4 |      |     | Displace 5 |      |     |
|---|------------|------|------|------------|------|-----|------------|------|-----|------------|------|-----|------------|------|-----|
|   | BBLs       | Time | PSI  | BBLs       | Time | PSI | BBLs       | Time | PSI | BBLs       | Time | PSI | BBLs       | Time | PSI |
| 830   |            |      |      |            |      |     |            |      |     |            |      |     |            |      |     |
| 730   | 0          | 954  | 0    | 0          |      |     | 0          |      |     | 0          |      |     | 0          |      |     |
| 918   | 10         | 956  | 20   | 10         |      |     | 10         |      |     | 10         |      |     | 10         |      |     |
|   | 20         | 959  | 30   | 20         |      |     | 20         |      |     | 20         |      |     | 20         |      |     |
|   | 30         | 1002 | 30   | 30         |      |     | 30         |      |     | 30         |      |     | 30         |      |     |
|   | 40         | 1004 | 100  | 40         |      |     | 40         |      |     | 40         |      |     | 40         |      |     |
|   | 50         | 1006 | 160  | 50         |      |     | 50         |      |     | 50         |      |     | 50         |      |     |
| M & P   | 60         | 1008 | 220  | 60         |      |     | 60         |      |     | 60         |      |     | 60         |      |     |
| Time  | 70         | 1010 | 280  | 70         |      |     | 70         |      |     | 70         |      |     | 70         |      |     |
| 0925-0952   | 80         | 1011 | 320  | 80         |      |     | 80         |      |     | 80         |      |     | 80         |      |     |
|   | 90         | 1013 | 340  | 90         |      |     | 90         |      |     | 90         |      |     | 90         |      |     |
|   | 100        | 1016 | 310  | 100        |      |     | 100        |      |     | 100        |      |     | 100        |      |     |
|   | 110        | 1018 | 320  | 110        |      |     | 110        |      |     | 110        |      |     | 110        |      |     |
| % Excess  | 120        | BUMP | 1310 | 120        |      |     | 120        |      |     | 120        |      |     | 120        |      |     |
| Mixed bbbs  | 130        |      |      | 130        |      |     | 130        |      |     | 130        |      |     | 130        |      |     |
| Total Sacks   | 140        |      |      | 140        |      |     | 140        |      |     | 140        |      |     | 140        |      |     |
| bbl Returns   | 21         |      |      | 150        |      |     | 150        |      |     | 150        |      |     | 150        |      |     |
| Water Temp  | 55         |      |      |            |      |     |            |      |     |            |      |     |            |      |     |

Notes:

PERFORMED PRESSURE TEST TO 2000 PSI AT 0916, PUMPED 30 BBL WATER WITH DYE IN 2ND 10 AT 0918, MIXED AND PUMPED 521 SKS AT 14.2  
 138.3 BBL AT 0925, SHUT DOWN AT 0952, STARTED DISPLACEMENT AT 0954, BUMPED PLUG AT 320 PSI AT 1018 AND PRESSURED UP TO 1310 PSI,  
 HELD FOR 2 MINUTES, RELEASED PRESSURE, FLOATS HELD, GOT .5 BBL BACK, REPRESSURE TO 1000 PSI FOR 2 MINUTES AND RELEASED

X *Mark Cole*  
 Work Performed  
 X *APC Consultant*  
 Title  
 X *11/30/2014*  
 Date

# THOMSEN 5N-31HZ SURFACE





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X *Randy Case*  
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