



# BISON

## Invoice

Bison Oil Well Cementing Inc.  
 1547 Gaylord Street  
 Denver, CO 80206  
 303-296-3010

Date	Invoice #
11/10/2013	12762

Bill To
Noble Energy Inc. Attn: Accounting 1625 Broadway Ste 2000 Denver, CO 80202

Location	Well Name & No.	Terms	Job Type		
Weld CO	Wells Ranch AE20-694N	Net 30	Surface Pipe		
Item	Description	Qty	U/M	Rate	Amount
Pump surface	PUMP Charge-surface pipe	1			
Discount 15%	Discount 15%				
MILEAGE	Mileage charge	360			
Discount 15%	Discount 15%				
Data Acquisition ...	Data Acquisition Charge	1			
Discount 15%	Discount 15%				
HOURS	Wait Time	1.5			
	Subtotal of Services				
BFN III Summer ...	BFN III Blend	492	Sack		
Discount 15%	Discount 15%				
KCL Mud Flush	(BHS 117)	7	qt		
Discount 15%	Discount 15%				
Dye - 4880	Dye (Hot Pink 4880)	10	oz		
Discount 15%	Discount 15%				
Sugar	Sugar	50	lb		
	Subtotal of Materials				

Please Remit Payment To:

Bison Oil Well Cementing, Inc.  
 P.O. Box 29671  
 Thornton, CO 80229

<b>Subtotal</b>
<b>Sales Tax</b>
<b>Total</b>
<b>Balance Due</b>



# Bison Oil Well Cementing Single Cement Surface Pipe

Invoice # 12762  
 API# \_\_\_\_\_  
 Foreman: Kirk Kallhoff

Customer: noble  
 Well Name: wells ranch ae 20-69hn

County: Weld County  
 State: Colorado  
 Sec: 20  
 Twp: 6n  
 Range: 62w

Consultant: stetson  
 Rig Name & Number: h&p 321  
 Distance To Location: \_\_\_\_\_  
 Units On Location: 3103-3210  
 Time Requested: 830 am  
 Time Arrived On Location: 820 am  
 Time Left Location: 2:00 pm

WELL DATA	Cement Data
Casing Size OD (in) : <u>9.6250</u>	Cement Name: <u>BFN III</u>
Casing Weight (lb) : <u>36</u>	Cement Density (lb/gal) : <u>15.2</u>
Casing Depth (ft.) : <u>950</u>	Cement Yield (cuft) : <u>1.27</u>
Total Depth (ft) : <u>990</u>	Gallons Per Sack: <u>5.89</u>
Open Hole Diameter (in.) : <u>13.75</u>	% Excess: <u>30%</u>
Conductor Length (ft) : <u>100</u>	Displacement Fluid lb/gal: <u>8.3</u>
Conductor ID : <u>15.5</u>	BBL to Pit: _____
Shoe Joint Length (ft) : <u>43</u>	Fluid Ahead (bbls): _____
Landing Joint (ft) : <u>30</u>	H2O Wash Up (bbls): <u>20.0</u>
Max Rate: _____	Spacer Ahead Makeup
Max Pressure: _____	

Calculated Results	Pressure of cement in annulus
<b>cuft of Shoe</b> <u>18.56</u> <b>cuft</b> (Casing ID Squared) X (.005454) X (Shoe Joint ft)	<b>Displacement:</b> <u>72.46</u> <b>bbls</b> (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
<b>cuft of Conductor</b> <u>80.51</u> <b>cuft</b> (Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)	<b>Hydrostatic Pressure:</b> <u>750.12</u> <b>PSI</b>
<b>cuft of Casing</b> <u>447.00</u> <b>cuft</b> (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> <u>546.07</u> <b>cuft</b> (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	<b>Displacement:</b> <u>391.18</u> <b>psi</b> <b>Shoe Joint:</b> <u>33.76</u> <b>psi</b> <b>Total</b> <u>424.95</u> <b>psi</b>
<b>bbls of Slurry</b> <u>126.43</u> <b>bbls</b> (Total Slurry Volume) X (.1781) X (% Excess Cement)	<b>Differential Pressure:</b> <u>325.17</u> <b>psi</b>
<b>Sacks Needed</b> <u>559</u> <b>sk</b> (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	<b>Collapse PSI:</b> <u>2020.00</u> <b>psi</b> <b>Burst PSI:</b> <u>3520.00</u> <b>psi</b>
<b>Mix Water</b> <u>78.39</u> <b>bbls</b> (Sacks Needed) X (Gallons Per Sack) ÷ 42	<b>Total Water Needed:</b> <u>98.39</u> <b>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.