



# BISON

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

## Invoice

Date	Invoice #
11/17/2013	12584

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

Location	Well Name & No.	Terms	Job Type		
Weld CO	Crow Creek St. AC36-72-1H	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	2			
	Subtotal of Services				
BFN III Summer ...	BFN III Blend	337	Sack		
Discount 15%	Discount 15%				
KCL Mud Flush	(BHS 117)	4	qt		
Discount 15%	Discount 15%				
Dye - 4880	Dye (Hot Pink 4880)	16	oz		
Discount 15%	Discount 15%				
	Subtotal of Materials				

Please Remit Payment To:

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

Subtotal	
Sales Tax	2.5%
Total	
Balance Due	



# Bison Oil Well Cementing Single Cement Surface Pipe

Date: 11/17/2013  
Invoice #: 12584  
API#: 05-123-37424  
Foreman: Calvin Reimers

Customer: Noble  
Well Name: Crow Creek ST AC 36-72-1HN

County: Weld  
State: Colorado  
Sec: 36  
Twp: 7N  
Range: 63W  
Consultant: Martin / Cliff  
Rig Name & Number: H&P 277  
Distance To Location: 32 Miles  
Units On Location: 3106/3212  
Time Requested: 430am  
Time Arrived On Location: 345am  
Time Left Location: 1000am

WELL DATA		Cement Data	
Casing Size OD (in) :	9.6250	Cement Name:	BFN III
Casing Weight (lb) :	36	Cement Density (lb/gal) :	15.2
Casing Depth (ft) :	574	Cement Yield (cuft) :	1.27
Total Depth (ft) :	608	Gallons Per Sack:	5.89
Open Hole Diameter (in.) :	13.75	% Excess:	20%
Conductor Length (ft) :	100	Displacement Fluid lb/gal:	8.3
Conductor ID :	16	BBL to Pit:	14.0
Shoe Joint Length (ft) :	42	Fluid Ahead (bbls):	
Landing Joint (ft) :	28	H2O Wash Up (bbls):	20.0
Max Rate:	7	Spacer Ahead Makeup	
Max Pressure:	2500	Is H2O with KCL+Dye in 2nd 10bbls	

Casing ID	8.921	Casing Grade	1.55 only used
<b>Calculated Results</b>		<b>Displacement:</b> 43.23 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)	
cuft of Shoe	18.42 cuft	<b>Pressure of cement in annulus</b>	
(Casing ID Squared) X (.005454) X (Shoe Joint ft)		Hydrostatic Pressure:	452.94 PSI
cuft of Conductor	89.10 cuft	<b>Pressure of the fluids inside casing</b>	
(Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)		Displacement:	229.04 psi
cuft of Casing	249.07 cuft	Shoe Joint:	33.50 psi
(Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)		Total	262.55 psi
Total Slurry Volume	356.59 cuft	Differential Pressure:	190.39 psi
(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)		Collapse PSI:	2020.00 psi
bbls of Slurry	76.21 bbls	Burst PSI:	3520.00 psi
(Total Slurry Volume) X (.1781) X (% Excess Cement)		Total Water Needed:	67.25 bbls
Sacks Needed	337 sk		
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)			
Mix Water	47.25 bbls		
(Sacks Needed) X (Gallons Per Sack) ÷ 42			

X *Martin Hand*  
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

Noble  
Crow Creek ST AC 36-72-1HN

INVOICE #  
LOCATION  
FOREMAN  
Date

12584  
Weld  
Calvin Reimers  
11/17/2013

Treatment Report Page 2

**DESCRIPTION OF JOB EVENTS**

Safety Meeting	645am	Displace 1			Displace 2			Displace 3			Displace 4			Displace 5		
	610am 810am	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI
MIRU		0	848am	60	0			0			0			0		
CIRCULATE		10	851am	140	10			10			10			10		
		20	853am	210	20			20			20			20		
		30	855am	280	30			30			30			30		
		40	857am	270	40			40			40			40		
Drop Plug		50	859am	240	50			50			50			50		
		60	859am	240	60			60			60			60		
M & P		70	Bump	790	70			70			70			70		
		80			80			80			80			80		
823am		90			90			90			90			90		
845am		100			100			100			100			100		
		110			110			110			110			110		
		120			120			120			120			120		
% Excess	20%	130			130			130			130			130		
Mixed bbls	47.25	140			140			140			140			140		
Total Sacks	337	150			150			150			150			150		
bbl Returns	34															

Notes:

The day

Float Held Used 337 sks 76.21 bbls Slurry Casing PSI Test 1020 PSI at 900am to 1050 PSI at 915am 14 bbls Slurry Back to Surface

X *W. O. O'Leary*

X *C. W. Sulthart*

X *11-17-13*

Work Performed