BISON

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

Invoice

Date	Invoice #
1/7/2014	12548

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

Location	Well Name & No.	Terms	Job Type
Weld CO	Castor Federal LD15-75-1H	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	642.4			
Discount 15%	Discount 15%				
Data Acquisition ...	Data Acquisition Charge	1			
Discount 15%	Discount 15%				
HOURS	Wait Time	3			
Service Charge	Casing PSI Test	1			
	Subtotal of Services				
BFN III Winter ...	BFN III Blend	522	Sack		
Discount 15%	Discount 15%				
KCL Mud Flush	(BHS 117)	5	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	
Total	
Balance	

Bison Oil Well Cementing
Tail & Lead

Date: 1/7/2014
Invoice # 12548
API# 445564
Foreman: monte

Customer: noble
Well Name: castor federal ld15-75-1hn

Consultant: john
Rig Name & Number: h & p 326
Distance To Location: 80.3
Units On Location: 3
Time Requested: 8:30pm
Time Arrived On Location: 7:30
Time Left Location:

County: Weld
State: Colorado
Sec: 15
Twp: 9n
Range: 58w

WELL DATA

Casing Size (in)	9.625
Casing Weight (lb)	36
Casing Depth (ft.)	1,212
Total Depth (ft)	1222
Open Hole Diameter (in)	13.75
Conductor Length (ft)	130
Conductor ID	15.5
Shoe Joint Length (ft)	44
Landing Joint (ft)	33
Sacks of Tail Requested	100
HOC Tail (ft)	0

One or the other, cannot have quantity in both

Max Rate:
Max Pressure:

Cement Data

Lead

Cement Name:	
Cement Density (lb/gal)	13.1
Cement Yield (cuft)	1.69
Gallons Per Sack	8.64
% Excess	30%

Tail

Cement Name:	
Cement Density (lb/gal)	15.2
Cement Yield (cuft)	1.27
Gallons Per Sack:	5.89
% Excess:	0%

Fluid Ahead (bbls)	50.0
H20 Wash Up (bbls)	20.0

Spacer Ahead Makeup: 40 fresh 10 dye

Casing ID 8.921 Casing Grade J-55 only used

Lead Calculated Results

HOC of Lead Casing Depth - HOC Tail	844.16 ft
Volume of Lead Cement HOC of Lead X Open Hole Ann	443.93 cuft
Volume of Conductor (Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	104.66 cuft
Total Volume of Lead Cement (cuft of Lead Cement) + (Cuft of Conductor)	548.59 cuft
bbls of Lead Cement (Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	127.01 bbls
Sacks of Lead Cement (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	421.99 sk
bbls of Lead Mix Water (Sacks Needed) X (Gallons Per Sack) ÷ 42	86.81 bbls
Displacement (Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	92.81 bbls
Total Water Needed:	156.81 bbls

Tail Calculated Results

Tail Cement Volume In Ann (HOC Tail) X (OH Ann)	127.00 cuft
Total Volume of Tail Cement (HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)	107.72 Cuft
bbls of Tail Cement (HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)	22.62 bbls
HOC Tail (Tail Cement Volume) ÷ (OH Ann)	204.84 ft
Sacks of Tail Cement (Total Volume of Tail Cement) ÷ (Cement Yield)	100.00 sk
bbls of Tail Mix Water (Sacks of Tail Cement X Gallons Per Sack) ÷ 42	14.02 bbls
Pressure of cement in annulus	
Hydrostatic Pressure	824.77 PSI
Collapse PSI	2020.00 psi
Burst PSI:	3520.00 psi

X _____
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
Two Cement Surface Pipe

Customer	noble
Well Name	castor federal ld15-75-1hn

Date	41646
INVOICE #	12548
LOCATION	Weld
FOREMAN	monte

Treatment Report Page 2

DESCRIPTION OF JOB EVENTS

Safety Meeting	11:40pm
MIRU	11:00pm
CIRCULATE	11:58
Drop Plug	
1:38	
M & P	
Time	**Sacks**
11:58-134	522
Lead mixed bbls	86.81
Lead % Excess	30%
Lead Sacks	422
Tail mixed bbls	14.02
Tail % Excess	0%
Tail Sacks	100
Total Sacks	522
bbl Returns	27

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
0	1:38	10	0			0			0			0		
10	1:40	110	10			10			10			10		
20	1:42	110	20			20			20			20		
30	1:44	130	30			30			30			30		
40	1:46	190	40			40			40			40		
50	1:48	240	50			50			50			50		
60	1:50	240	60			60			60			60		
70	1:52	340	70			70			70			70		
80	1:54	350	80			80			80			80		
90	2:00	550	90			90			90			90		
100			100			100			100			100		
110			110			110			110			110		
120			120			120			120			120		
130			130			130			130			130		
140			140			140			140			140		
150			150			150			150			150		

Notes:

circulate 50 bbls ahead with dye in last 10, mix and pump 421.99 sks lead cement, 13,1 , 1.69 yield, 8.64 h20
mix and pump 100 sks tail cement at 15.2, 1.27 yield, 5.89 h2o
displace 91.7 bbls h2o, bump plug at2:00am at 550 psi, hold 5 min, release pressure wash up rig down
27 bbls back to pit
#VALUE!

X _____
Work Preformed

X WSS
Title

X June, 2014
Date