



# Bison Oil Well Cementing Single Cement Surface Pipe

Date: 1/10/2016  
 Invoice # 90064  
 API# 05-123-40592  
 Supervisor Nick

**Customer:** Noble Energy Inc.  
**Well Name:** Remora LC 34-715

County: Weld  
 State: Colorado  
 Sec: 34  
 Twp: 9N  
 Range: 59W

Consultant: Dave Nielsen  
 Rig Name & Number: H&P 273  
 Distance To Location: 55  
 Units On Location: 3102/4016/4022/3215  
 Time Requested: 7:00  
 Time Arrived On Location: 4:00  
 Time Left Location: 13:45

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>633</u>	Cement Yield (cuft) : <u>1.49</u>
Total Depth (ft) : <u>643</u>	Gallons Per Sack: <u>7.48</u>
Open Hole Diameter (in.) : <u>13.50</u>	% Excess: <u>20%</u>
Conductor Length (ft) : <u>80</u>	Displacement Fluid lb/gal: <u>8.3</u>
Conductor ID : <u>15.25</u>	BBL to Pit: <u>20.0</u>
Shoe Joint Length (ft) : <u>44</u>	Fluid Ahead (bbls): <u>40.0</u>
Landing Joint (ft) : <u>5</u>	H2O Wash Up (bbls): <u>20.0</u>
Max Rate: <u>7</u>	Spacer Ahead Makeup
Max Pressure: <u>1500</u>	<b>DYE IN SECOND 10 BBL</b>

Calculated Results	Pressure of cement in annulus
<b>cuft of Shoe</b> <u>19.10</u> <b>cuft</b> (Casing ID Squared) X (.005454) X (Shoe Joint ft)	<b>Displacement:</b> <u>45.40</u> <b>bbls</b> (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
<b>cuft of Conductor</b> <u>61.05</u> <b>cuft</b> (Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)	<b>Hydrostatic Pressure:</b> <u>466.96</u> <b>PSI</b>
<b>cuft of Casing</b> <u>270.00</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>420.18</u> <b>cuft</b> (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	<b>Displacement:</b> <u>253.97</u> <b>psi</b> <b>Shoe Joint:</b> <u>32.46</u> <b>psi</b> <b>Total</b> <u>286.42</u> <b>psi</b>
<b>bbls of Slurry</b> <u>74.80</u> <b>bbls</b> (Total Slurry Volume) X (.1781)	<b>Differential Pressure:</b> <u>180.54</u> <b>psi</b>
<b>Sacks Needed</b> <u>282</u> <b>sk</b>	<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>50.22</u> <b>bbls</b> (Sacks Needed) X (Gallons Per Sack) ÷ 42	<b>Total Water Needed:</b> <u>155.62</u> <b>bbls</b>

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.



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INVOICE # 90064  
LOCATION Weld  
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**DESCRIPTION OF JOB EVENTS**

Amount Pumped	Time/Date	Event	Description	Rate	BBLs	Pressure
% Excess 20%	4:00 AM	Arrive on location	Well site assesment, Hazard hunt			
Mixed bbls 69.2	10:45 AM	Rig up equipment	Rig up safety meeting.			
Total Sacks 282	11:45 AM	Pre job JSA	Held safety meeting with all personnel involved.			
bbl Returns 20	12:10 PM	Pressure Test	Pressure tested lines to 1500 psi.			
Water Temp 51	12:13 PM	Spacer Ahead	Dye in second 10 bbl	6.6	40	140
	12:19 PM	Lead Cement	14.2 ppg Cement	6.6	74.8	210
Notes:	12:35 PM	Shutdown				
	12:37 PM	Drop Plug	Plug was pre loaded.			
	12:38 PM	Pump Displacement	Displaced with fresh water	5.5	20	230
	12:47 PM	Bump Plug	Bumped 200 psi over final lift pressure	1.4	45.4	230
	12:48 PM	Casing Test	Tested casing to 1000 psi for 15 min.			1000
	1:03 PM	Check Floats	Floats held (.5 bbl back to truck)			
	1:04 PM	End Job	Rig down safety meeting.			
	1:10 PM	Rig down equipment				
	1:45 PM	Crew left location				

X DAVE NIGUSEN  
Work Performed

X COMAN  
Title

X 1-10-16  
Date