



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 2/9/2016
 Invoice # 90067
 API# 05-123-41988
 Foreman: Matthew

Customer: Noble Energy Inc.
Well Name: Wells Ranch BB01-615

County: Weld
 State: Colorado
 Sec: 5
 Twp: 5N
 Range: 62W

Consultant: _____
 Rig Name & Number: H&P 343
 Distance To Location: 24
 Units On Location: 4027/3106, 4032/3203, 4019/3205
 Time Requested: 1630
 Time Arrived On Location: 1530
 Time Left Location: 2/09/15 0400

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>1,945</u>	Cement Yield (cuft) : <u>1.49</u>
Total Depth (ft) : <u>1945</u>	Gallons Per Sack: <u>7.48</u>
Open Hole Diameter (in.) : <u>13.50</u>	% Excess: <u>20%</u>
Conductor Length (ft) : <u>104</u>	Displacement Fluid lb/gal: <u>8.7</u>
Conductor ID : <u>15.25</u>	BBL to Pit: <u>0.0</u>
Shoe Joint Length (ft) : <u>43</u>	Fluid Ahead (bbls): <u>50.0</u>
Landing Joint (ft) : <u>29</u>	H2O Wash Up (bbls): <u>20.0</u>
Max Rate: <u>7</u>	Spacer Ahead Makeup
Max Pressure: <u>1500</u>	<u>40Water , 10 Dye</u>

Calculated Results	Pressure Calculations
Displacement: <u>149.00 bbls</u> (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)	Pressure of cement in annulus
cuft of Shoe <u>18.53 cuft</u> (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Hydrostatic Pressure: <u>1422.20 PSI</u>
cuft of Conductor <u>98.00 cuft</u> (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Pressure of the fluids inside casing
cuft of Casing <u>1079.00 cuft</u> (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Displacement: <u>871.30 psi</u>
Total Slurry Volume <u>1199.00 cuft</u> (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Shoe Joint: <u>31.50 psi</u>
bbls of Slurry <u>210.00 bbls</u> (Total Slurry Volume) X (.1781)	Total <u>902.80 psi</u>
Sacks Needed <u>790 sk</u> (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Differential Pressure: <u>575.00 psi</u>
Mix Water <u>140.70 bbls</u> (Sacks Needed) X (Gallons Per Sack) ÷ 42	Collapse PSI: <u>2020.00 psi</u>
	Burst PSI: <u>3520.00 psi</u>
	Total Water Needed: <u>211.00 bbls</u>

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
Single Cement Surface Pipe**

Customer
Well Name

Noble Energy Inc.
Wells Ranch BB01-615

INVOICE #
LOCATION
FOREMAN
Date

90067
Weld
Matthew
2/9/2016

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DESCRIPTION OF JOB EVENTS

Amount Pumped	Time/Date	Event	Description	Rate	BBLs	Pressure
% Excess 20%	1530/2-8-16	Arrive on location				
Mixed bbls 210	10:00pm	Rig Up				
Total Sacks 790	1230/2-9-16	JSA				
bbl Returns 41	12:58am	Pressure Test	3 bbls fresh h2o to fill lines	2	3	1350
Water Temp 65	1:03am	Spacer Ahead	40bbls Fresh h2O 10bbls dye h2o	7.4	50	270
	1:10am	Pump Cement	Neat Type III 14.2#/gal, 1.49yield, 7.48gal/sk	7.4	210	280
Notes:	1:44am	Shutdown				
	1:47am	Drop Plug				
	1:52am	Pump Displacement	Displaced with OBM 8.7#/gal	7.4	149	480
	2:18am	Bump Plug	Bumped Plug 100psi over final lift	2		600
	2:20am	Casing Test	Increased pressure to 1000psi	1		1000
	2:37am	Check Floats	Floats Held			
	2:40	End Job	41bbl CMT to surface			
	3:00	Rig Down				
	4:00	Leave Location				
			**10gal Oil Based Mud Spilled in Containment			
			due to discharge line on pump cap coming off***			

X
Work Performed

X W.S.S.
Title

X 2/9/16
Date