Bison Oil Well Cementing
Single Cement Surface Pipe

Date: 12/10/2014
Invoice # 45088
API# 05-123-39633
Foreman: JASON KELEHER

Customer: Noble Energy Inc.

Well Name: Wells Ranch AE 19-626

County: Weld
State: Colorado

Sec: 20
Twp: 6N
Range: 62W

Consultant: LANE
Rig Name & Number: H&P 330
Distance To Location: 33
Units On Location: 4023-3104/ 4022-3213
Time Requested: 1630
Time Arrived 1600
Time Left Location: 2100

WELL DATA

Casing Size OD (in) :	9.625
Casing Weight (lb) :	36.00
Casing Depth (ft.) :	717
Total Depth (ft) :	733
Open Hole Diameter (in.) :	13.50
Conductor Length (ft) :	100
Conductor ID :	15.25
Shoe Joint Length (ft) :	45
Landing Joint (ft) :	35
Max Rate:	7
Max Pressure:	2500

Cement Data

Cement Name:	BFN III
Cement Density (lb/gal) :	15.2
Cement Yield (cuft) :	1.27
Gallons Per Sack:	5.89
% Excess:	39%
Displacement Fluid lb/gal:	8.3
BBL to Pit:	24.0
Fluid Ahead (bbls):	30.0
H20 Wash Up (bbls):	20.0

Spacer Ahead Makeup
30 BBL WATER, DYE IN 2ND 10

Casing ID 8.921 Casing Grade J-55 only used

Calculated Results

cuft of Shoe 19.59 cuft
(Casing ID Squared) X (.005454) X (Shoe Joint ft)

cuft of Conductor 76.31 cuft
(Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)

cuft of Casing 420.05 cuft
(Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)

Total Slurry Volume 515.96 cuft
(cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)

bbls of Slurry 91.89 bbls
(Total Slurry Volume) X (.1781)

Sacks Needed 406 sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)

Mix Water 56.97 bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42

Displacement: 54.65 bbls
(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)

Pressure of cement in annulus
Hydrostatic Pressure: 566.14 PSI

Pressure of the fluids inside casing
Displacement: 289.69 psi
Shoe Joint: 35.64 psi
Total 325.34 psi

Differential Pressure: 240.81 psi

Collapse PSI: 2020.00 psi
Burst PSI: 3520.00 psi

Total Water Needed: 161.62 bbls

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.

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LOCATION	Weld
FOREMAN	JASON KELEHER
Date	12/10/2014

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DESCRIPTION OF JOB EVENTS

		Displace 1			Displace 2			Displace 3			Displace 4			Displace 5		
Safety Meeting	1815	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI	BBLS	Time	PSI
MIRU	1615	0	1911	0	0			0			0			0		
CIRCULATE	1837	10	1914	50	10			10			10			10		
Drop Plug		20	1917	130	20			20			20			20		
1911		30	1920	290	30			30			30			30		
		40	1922	320	40			40			40			40		
M & P		50	1924	330	50			50			50			50		
Time	Sacks	60	1926	320	60			60			60			60		
1847-1908	406	70	BUMP	980	70			70			70			70		
		80			80			80			80			80		
		90			90			90			90			90		
		100			100			100			100			100		
		110			110			110			110			110		
% Excess	39%	120			120			120			120			120		
Mixed bbls	57	130			130			130			130			130		
Total Sacks	406	140			140			140			140			140		
bbl Returns	24	150			150			150			150			150		
Water Temp	50															

Notes:

PERFORMED PRESSURE TEST TO 1500 PSI AT 1834, PUMPED 40 BBL WATER WITH DYE IN 2ND 10 AT 1837, MIXED AND PUMPED 406 SKS AT 15.2, 91.9 BBL AT 1847, SHUT DOWN AT 1908, STARTED DISPLACEMENT AT 1911, LANDED PLUG AT 320 PSI AT 1926 AND PRESSURED UP TO 980 PSI, HELD FOR 1 MINUTES, PRESSURED UP TO 1000 PSI FOR 15 MINUTES AND RELEASED, FLOATS HELD, GOT .75 BBL BACK

X _____ Work Preformed

X WSS Title

X 12.10.14 Date