




Bison Oil Well Cementing Single Cement Surface Pipe

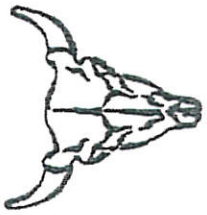
Date: 12/17/2014
Invoice # 4092
API# 05-123-40166
Foreman: JASON KELEHER

Customer: Noble Energy Inc.
Well Name: CROW CREEK AA01-789

County: Weld
State: Colorado
Sec: 1
Twp: 6N
Range: 63W
Consultant: JOHN
Rig Name & Number: H&P 315
Distance To Location: 31
Units On Location: 4032-3107/ 4018-3204
Time Requested: 1900
Time Arrived On Location: 1830
Time Left Location: 200

WELL DATA	Cement Data
Casing Size OD (in) : 9.625	Cement Name: BFN III
Casing Weight (lb) : 36.00	Cement Density (lb/gal) : 14.2
Casing Depth (ft) : 668	Cement Yield (cuft) : 1.49
Total Depth (ft) : 697	Gallons Per Sack: 7.48
Open Hole Diameter (in.) : 13.50	% Excess: 35%
Conductor Length (ft) : 100	Displacement Fluid lb/gal: 8.3
Conductor ID : 15.25	BBL to Pit: 15.0
Shoe Joint Length (ft) : 45	Fluid Ahead (bbls): 40.0
Landing Joint (ft) : 30	H2O Wash Up (bbls): 20.0
Max Rate: 6	Spacer Ahead Makeup
Max Pressure: 1000	40 BBL WATER W/ DYE IN 2ND 10

Casing ID	8.921	Casing Grade	J-55 only used
Calculated Results		Displacement: 50.48 bbls (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)	
cuft of Shoe 19.60 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	Pressure of cement in annulus		
cuft of Conductor 76.31 cuft (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Hydrostatic Pressure: 492.78 PSI		
cuft of Casing 374.76 cuft (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Pressure of the fluids inside casing		
Total Slurry Volume 470.67 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Displacement: 268.56 psi		
bbls of Slurry 83.83 bbls (Total Slurry Volume) X (.1781)	Shoe Joint: 33.31 psi		
Sacks Needed 316 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Total 301.87 psi		
Mix Water 56.26 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Differential Pressure: 190.91 psi		
	Collapse PSI: 2020.00 psi		
	Burst PSI: 3520.00 psi		
	Total Water Needed: 166.74 bbls		
 x <u>John M. Taylor</u> Authorization To Proceed			
Customers hereby acknowledge 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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Single Cement Surface Pipe

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LOCATION Weld
FOREMAN JASON KELEHER
Date 12/17/2014

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DESCRIPTION OF JOB EVENTS

	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
Safety Meeting	2245														
MIRU	2140														
CIRCULATE	2350														
Drop Plug															
1229															
M & P															
Time	Sacks														
0004-0024	316														
% Excess	35%														
Mixed bbls	56.2														
Total Sacks	316														
bbl Returns	15														
Water Temp	40														

Notes:

PERFORMED PRESSURE TEST TO 1500 PSI AT 2346, PUMPED 40 BBL WATER W/ DYE IN 2ND 10 AT 2350, MIXED AND PUMPED 316 SKS AT 14.2, 83.8
BBLE AT 0004, SHUT DOWN AT 0024, STARTED DISPLACEMENT AT 0029, PLUG LANDED AT 190 PSI AT 0048 AND PRESSURED UP TO 910 PSI, HELD FOR
1 MINUTES AND PRESSURED UP TO 1000 PSI TO PERFORM CASING TEST, HELD FOR 15 MINUTES AND THEN RELEASED AND GOT .5 BBL BACK AND

FLOATS HELD

X Jason M. Taylor
Work Performed

X Co. Man
Title

X 12-17-14
Date