



Bison Oil Well Cementing Single Cement Surface Pipe

Date: 8/5/2014
Invoice #: 45013
API#: 05-123-38855
Foreman: JASON

Customer: Noble Energy Inc.
Well Name: CUTTHROAT LC28-79HNB

County: Weld
State: Colorado
Sec: 28
Twp: 9N
Range: 59W
Consultant: CHRIS
Rig Name & Number: H&P 326
Distance To Location: 68
Units On Location: 4031-3106/ 4019-3204
Time Requested: 1930
Time Arrived On Location: 1900
Time Left Location: 2330

WELL DATA	Cement Data
Casing Size OD (in) : 9.625	Cement Name: BFN III
Casing Weight (lb) : 36.00	Cement Density (lb/gal) : 15.2
Casing Depth (ft.) : 605	Cement Yield (cuft) : 1.27
Total Depth (ft) : 644	Gallons Per Sack: 5.89
Open Hole Diameter (in.) : 13.75	% Excess: 35%
Conductor Length (ft) : 100	Displacement Fluid lb/gal: 8.3
Conductor ID : 15.25	BBL to Pit: 19.0
Shoe Joint Length (ft) : 44	Fluid Ahead (bbls): 45.0
Landing Joint (ft) : 34	H2O Wash Up (bbls): 20.0
Max Rate: 7	Spacer Ahead Makeup
Max Pressure: 2500	H2O WITH KCL, 2ND 10 WITH DYE

Casing ID: 8.921	Casing Grade: J-55 only used
Calculated Results cuft of Shoe 19.23 cuft $(\text{Casing ID Squared}) \times (.005454) \times (\text{Shoe Joint ft})$ cuft of Conductor 76.31 cuft $(\text{Conductor Width Squared}) - (\text{Casing Size OD Squared}) \times (.005454) \times (\text{Conductor Length ft})$ cuft of Casing 358.17 cuft $(\text{Open Hole Squared}) - (\text{Casing Size Squared}) \times (.005454) \times (\text{Casing Depth - Conductor Length})$ Total Slurry Volume 453.72 cuft $(\text{cuft of Shoe}) + (\text{cuft of Conductor}) + (\text{cuft of Casing})$ bbls of Slurry 80.81 bbls $(\text{Total Slurry Volume}) \times (.1781)$ Sacks Needed 357 sk $(\text{Total Slurry Volume}) \div (\text{Cement Yield}) \times (\% \text{ Excess Cement})$ Mix Water 50.10 bbls $(\text{Sacks Needed}) \times (\text{Gallons Per Sack}) \div 42$	Displacement: 45.91 bbls $(\text{Casing ID Squared}) \times (.0009714) \times (\text{Casing Depth} + \text{Landing Joint} - \text{Shoe Joint})$ Pressure of cement in annulus Hydrostatic Pressure: 477.32 PSI Pressure of the fluids inside casing Displacement: 241.55 psi Shoe Joint: 34.99 psi Total: 276.53 psi Differential Pressure: 200.79 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.



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DESCRIPTION OF JOB EVENTS

Safety Meeting MIRU CIRCULATE Drop Plug 2218 M & P Time 2156-2214 % Excess Mixed bbls Total Sacks bbl Returns Water Temp	2100 2015 2145 2218 2221 2227 2231 2238 Sacks 357 35% 50 357 19 82	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	2218	0	0			0			0			0		
		10	2221	130	10			10			10			10		
		20	2223	180	20			20			20			20		
		30	2227	250	30			30			30			30		
		40	2231	250	40			40			40			40		
		50	2238	260	50			50			50			50		
		60	BUMP	550	60			60			60			60		
		70			70			70			70			70		
		80			80			80			80			80		
		90			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:

The day

PRESSURE TESTED TO 1000 PSI @ 2143, PUMPED 45 BBL WATER WITH DYE IN 2ND 10 @ 2145, MIX AND PUMPED 357 SKS AT 15.2, 80.7 BBLs AT 2156,
STARTED DISPLACEMENT AT 2218, PLUG LANDED AT 2238 PSI AT 260 AND PRESSURED UP TO 550 PSI AND HELD FOR 2 MINUTES, RELEASED PRESSURE
AND GOT .25 BBL BACK

X WSS
Work Performed

X WSS
Title

X Aug 5, 2014
Date