



Bison Oil Well Cementing Single Cement Surface Pipe

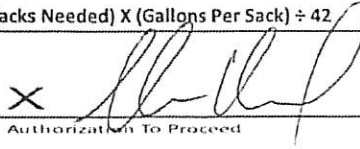
Date: 8/25/2015
Invoice #: 80436
API#: 05-123-41566
Foreman: Calvin Reimers

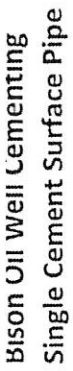
Customer: Noble Energy Inc.

Well Name: Brecken LD 28-747

County: Weld
State: Colorado
Sec: 28
Twp: 9N
Range: 58W
Consultant: Shane
Rig Name & Number: H&P 273
Distance To Location: 64 Miles
Units On Location: 4023-3104/4033-3212
Time Requested: 200am
Time Arrived On Location: 100am
Time Left Location: 5:45 pm

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.) : 1,102	Cement Yield (cuft) : 1.49
Total Depth (ft) : 1132	Gallons Per Sack: 7.48
Open Hole Diameter (in.) : 13.50	% Excess: 20%
Conductor Length (ft) : 100	Displacement Fluid lb/gal: 8.3
Conductor ID : 16	BBL to Pit: 2.0
Shoe Joint Length (ft) : 43	Fluid Ahead (bbls): 50.0
Landing Joint (ft) : 29	H2O Wash Up (bbls): 10.0
Max Rate: 7	Spacer Ahead Makeup
Max Pressure: 2500	50bbls H2O+Dye in 2nd 10bbls

Casing ID 8.921	Casing Grade J-55 only used
Calculated Results	Displacement: 84.10 bbls
cuft of Shoe 18.79 cuft (Casing ID Squared) X (.005454) X (Shoe Joint ft)	(Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)
cuft of Conductor 89.10 cuft (Conductor Width Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)	Pressure of cement in annulus
cuft of Casing 587.65 cuft (Open Hole Squared) - (Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length)	Hydrostatic Pressure: 812.95 PSI
Total Slurry Volume 695.54 cuft (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	Pressure of the fluids inside casing
bbls of Slurry 123.88 bbls (Total Slurry Volume) X (.1781)	Displacement: 456.49 psi
Sacks Needed 467 sk (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	Shoe Joint: 31.94 psi
Mix Water 83.14 bbls (Sacks Needed) X (Gallons Per Sack) ÷ 42	Total 488.43 psi
	Differential Pressure: 324.51 psi
	Collapse PSI: 2020.00 psi
	Burst PSI: 3520.00 psi
	Total Water Needed: 227.24 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.	



80436
Weld
Calvin Reimers
8/25/2015

Noble Energy Inc.
Brecken LD 28-747

Treatment Report Page 2

DESCRIPTION OF JOB EVENTS

[illegible]