Bison Oil Well Cementing
Tail & Lead

Date: 5/17/2018
Invoice # 900297
API# 05-123-46557
Foreman: Corey Barras

Customer: Crestone Peak Resources
Well Name: Ruegge 3P-4H-N165

Consultant: Jerry Thorstad
County: Weld
Rig Name & Number: Ensign 122
State: Colorado
Distance To Location: 36 Miles
Units On Location: 4027-3103/4041-3205/4039-3214
Sec: 4
Time Requested: 1200
Twp: 1N
Time Arrived On Location: 2245
Range: 65W
Time Left Location: 445

WELL DATA

Casing Size (in) :	_9.625
Casing Weight (lb) :	40
Casing Depth (ft.) :	2,523
Total Depth (ft) :	2540
Open Hole Diameter (in) :	13.50
Conductor Length (ft) :	98
Conductor ID :	15.6
Shoe Joint Length (ft) :	72
Landing Joint (ft) :	10
Sacks of Tail Requested	190
HOC Tail (ft):	0

One or the other, cannot have quantity in both

Max Rate:
Max Pressure:

Cement Data

Lead

Cement Name:	
Cement Density (lb/gal) :	13.5
Cement Yield (cuft) :	1.68
Gallons Per Sack	8.90
% Excess	25%

Tail

Cement Name:	
Cement Density (lb/gal) :	15.2
Cement Yield (cuft) :	1.27
Gallons Per Sack:	5.89
% Excess:	0%
Fluid Ahead (bbls)	60.0
H20 Wash Up (bbls)	20.0

Spacer Ahead Makeup
60 BBL with Die in 2nd 10

Casing ID 8.835 Casing Grade J-55 only used

Lead Calculated Results

HOC of Lead 1983.99 ft
Casing Depth - HOC Tail

Volume of Lead Cement 969.63 cuft
HOC of Lead X Open Hole Ann

Volume of Conductor 80.56 cuft
(Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)

Total Volume of Lead Cement 1050.19 cuft
(cuft of Lead Cement) + (Cuft of Conductor)

bbls of Lead Cement 233.80 bbls
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)

Sacks of Lead Cement 781.39 sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)

bbls of Lead Mix Water 165.58 bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42

Displacement 186.54 bbls
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)

Total Water Needed: 458.77 bbls

Tail Calculated Results

Tail Cement Volume In Ann 241.30 cuft
(HOC Tail) X (OH Ann)

Total Volume of Tail Cement 210.65 Cuft
(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)

bbls of Tail Cement 42.98 bbls
(HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)

HOC Tail 431.01 ft
(Tail Cement Volume) ÷ (OH Ann)

Sacks of Tail Cement 190.00 sk
(Total Volume of Tail Cement) ÷ (Cement Yield)

bbls of Tail Mix Water 26.65 bbls
(Sacks of Tail Cement X Gallons Per Sack) ÷ 42

Pressure of cement in annulus

Hydrostatic Pressure 585.23 PSI

Collapse PSI: 2570.00 psi
Burst PSI: 3950.00 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.

Bison Oil Well Cementing
Two Cement Surface Pipe

Customer	Crestone Peak Resources
Well Name	Ruegge 3P-4H-N165

Date	5/17/2018
INVOICE #	900297
LOCATION	Weld
FOREMAN	Corey Barras

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DESCRIPTION OF JOB EVENTS

Amount Pumped		Time/Date	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	165.58	2145	Arrive on Location				
Lead % Excess	25%	100	Rig Up				
Lead Sacks	781	145	Safety Meeting	Bison and Rig Crew			
		220	Start Job				
Tail mixed bbls	26.6	222	Test Lines	1500 lPSI	1.5	2	1500
Tail % Excess	0%	224	Pump Spacer	Water	7	60	150
Tail Sacks	190						
		235	Lead Cement	13.5 PPG	7	233	70
Total Sacks	971	315	Tail Cement	15.2 PPG	5	43	90
Water Temp	52						
bbl Returns	30	325	Shut Down				
		357	Drop Plug	Preloaded in Plug Container			
Notes:							
		330	Pump Dispacement	Water	7	90	230
		356	Bump Plug	500 PSI over Final Lift (1320 PSI)	2	186	680
				With 1 bbl Back to surface			
		405	Rig Dowm				
		445	Leave Location				

X _____ X _____ X _____

Work Preformed | Title | Date