Bison Oil Well Cementing
Tail & Lead

Date:	5/9/2018
Invoice #	200277
API#	

Customer: Crestone Peak Resources
Well Name: rugge 3k-4h

	Consultant:	brent
County: Weld	**Rig Name & Number:**	ENSIGN 122
State: Colorado	**Distance To Location:**	36
	Units On Location:	4028/4039/4041
Sec: 4	**Time Requested:**	830 am
Twp: 1n	**Time Arrived On Location:**	630 am
Range: 65w	**Time Left Location:**	

WELL DATA

Casing Size (in) :	_9.625
Casing Weight (lb) :	40
Casing Depth (ft.) :	2,440
Total Depth (ft) :	2515
Open Hole Diameter (in) :	13.50
Conductor Length (ft) :	110
Conductor ID :	15.6
Shoe Joint Length (ft) :	77
Landing Joint (ft) :	17
Sacks of Tail Requested	190
HOC Tail (ft):	0

One or the other, cannot have quantity in both

Max Rate:	8
Max Pressure:	2000

Cement Data

Lead

Cement Name:	
Cement Density (lb/gal) :	13.5
Cement Yield (cuft) :	1.7
Gallons Per Sack :	9.00
% Excess	20%

Tail

Cement Name:	
Cement Density (lb/gal) :	15.2
Cement Yield (cuft) :	1.27
Gallons Per Sack:	5.89
% Excess:	

Fluid Ahead (bbls)	60.0
H20 Wash Up (bbls)	10.0

Spacer Ahead Makeup

60 BBL WATER DYE IN 2ND 10

Casing ID	8.835	Casing Grade	J-55 only used

Lead Calculated Results

HOC of Lead — 1886.34 ft
Casing Depth - HOC Tail

Volume of Lead Cement — 921.91 cuft
HOC of Lead X Open Hole Ann

Volume of Conductor — 90.42 cuft
(Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)

Total Volume of Lead Cement — 1012.33 cuft
(cuft of Lead Cement) + (Cuft of Conductor)

bbls of Lead Cement — 216.36 bbls
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)

Sacks of Lead Cement — 714.59 sk
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)

bbls of Lead Mix Water — 153.13 bbls
(Sacks Needed) X (Gallons Per Sack) ÷ 42

Displacement — 180.40 bbls
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)

Total Water Needed: — 430.18 bbls

Tail Calculated Results

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

Total Volume of Tail Cement — 208.52 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 — 426.66 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

Bison Oil Well Cementing
Two Cement Surface Pipe

Date	5/9/2018
INVOICE #	200277
LOCATION	Weld
FOREMAN	Kirk Kallhoff

Customer: Crestone Peak Resources
Well Name: rugge 3k-4h

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DESCRIPTION OF JOB EVENTS

Amount Pumped		Time/Date	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	153.1	630 am	ARRIVE ON LOCATION	ASSESS LOCATION			
Lead % Excess	20%	930 am	MIRU	SPOT EQUIPMENT AND RIG UP			
Lead Sacks	714	1005 am	PRE JOB SAFETY MEETING				
		1028 am	PRESSURE TEST	PRESSURE TEST TO 1500 PSI			
		1030 am	cicrulate	60 BBL WATER DYE IN 2ND 10	6	60	110
Tail mixed bbls	26.6	1039 am	LEAD CEMENT	714 SKS MIXED 13.5 PPG 216.3 bbls slurry	6	2163	200
Tail % Excess	0%	1116 am	TAIL CEMENT	190 SKS MIXED AT 15.2 PPG 43 bbls slurry	6	43	230
Tail Sacks	190	1125 am	SHUT DOWN				
		1127 am	DROP PLUG				
Total Sacks	904	1127 am	DISPLACEMENT	disp 180.4 bbls h2o	6	180.4	670
Water Temp	60	1202 pm	BUMP PLUG	lift pressure 710 psi		180.4	1250
bbl Returns	5	1207 pm	CHECK FLOATS	1 BBL BACK			
		100 pm	RIG DOWN				
Notes:		130 pm	LEAVE LOCATION				

X
CUSTOMER SIGNATURE

X
Title

X
Date