



**Bison Oil Well Cementing
Tail & Lead**

Date: 5/22/2018

Invoice # 900300

API# 05-123-46128

Foreman: Corey Barras

Customer: Crestone Peak Resources

Well Name: Sam 3B-25H-M166

County: Weld

State: Colorado

Sec: 4

Twp: 1N

Range: 65W

Consultant: Jerry Thorstad

Rig Name & Number: Ensign 122

Distance To Location: 40 Miles

Units On Location: 4027-3103/4041-3205/4039-3214

Time Requested: 500

Time Arrived On Location: 445

Time Left Location: _____

WELL DATA	Cement Data
<p>Casing Size (in) : <u>9.625</u> Casing Weight (lb) : <u>40</u> Casing Depth (ft.) : <u>2,404</u> Total Depth (ft) : <u>2418</u> Open Hole Diameter (in) : <u>13.50</u> Conductor Length (ft) : <u>98</u> Conductor ID : <u>15.25</u> Shoe Joint Length (ft) : <u>70</u> Landing Joint (ft) : <u>10</u></p> <p>Sacks of Tail Requested <u>190</u> HOC Tail (ft): <u>0</u></p> <p>One or the other, cannot have quantity in both</p> <p>Max Rate: Max Pressure:</p>	<p>Lead</p> <p>Cement Name: Cement Density (lb/gal) : <u>13.5</u> Cement Yield (cuft) : <u>1.68</u> Gallons Per Sack <u>8.90</u> % Excess <u>25%</u></p> <p>Tail</p> <p>Cement Name: Cement Density (lb/gal) : <u>15.2</u> Cement Yield (cuft) : <u>1.27</u> Gallons Per Sack: <u>5.89</u> % Excess: <u>0%</u></p> <p>Fluid Ahead (bbls) <u>60.0</u> H2O Wash Up (bbls) <u>20.0</u></p> <p>Spacer Ahead Makeup <u>60 BBL with Die in 2nd 10</u></p>

Lead Calculated Results	Tail Calculated Results
HOC of Lead <u>1863.25 ft</u> Casing Depth - HOC Tail	Tail Cement Volume In Ann <u>241.30 cuft</u> (HOC Tail) X (OH Ann)
Volume of Lead Cement <u>910.62 cuft</u> HOC of Lead X Open Hole Ann	Total Volume of Tail Cement <u>211.50 Cuft</u> (HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
Volume of Conductor <u>74.79 cuft</u> (Conductor ID Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)	bbls of Tail Cement <u>42.98 bbls</u> (HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)
Total Volume of Lead Cement <u>985.41 cuft</u> (cuft of Lead Cement) + (Cuft of Conductor)	HOC Tail <u>432.75 ft</u> (Tail Cement Volume) ÷ (OH Ann)
bbls of Lead Cement <u>219.38 bbls</u> (Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	Sacks of Tail Cement <u>190.00 sk</u> (Total Volume of Tail Cement) ÷ (Cement Yield)
Sacks of Lead Cement <u>733.19 sk</u> (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	bbls of Tail Mix Water <u>26.65 bbls</u> (Sacks of Tail Cement X Gallons Per Sack) ÷ 42
bbls of Lead Mix Water <u>155.37 bbls</u> (Sacks Needed) X (Gallons Per Sack) ÷ 42	Pressure of cement in annulus
Displacement <u>177.68 bbls</u> (Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	Hydrostatic Pressure <u>585.23 PSI</u>
Total Water Needed: <u>439.69 bbls</u>	Collapse PSI: <u>2570.00 psi</u> Burst PSI: <u>3950.00 psi</u>

X Francis Bowe
 Authorization To Proceed



**Bison Oil Well Cementing
Two Cement Surface Pipe**

Customer Crestone Peak Resources
Well Name Sam 3B-25H-M166

Date 5/22/2018
INVOICE # 900300
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	155.37	445	Arrive on Location			
Lead % Excess	25%	700	Rig Up			
Lead Sacks	733	815	Safety Meeting			
			Bison and Rig Crew			
		847	Start Job			
Tail mixed bbls	26.6	848	Test Lines	1500 IPSI	2	1500
Tail % Excess	0%	850	Pump Spacer	Water	60	150
Tail Sacks	190					
		905	Lead Cement	13.5 PPG	219	110
Total Sacks	923	943	Tail Cement	15.2 PPG	43	130
Water Temp	55					
bbl Returns	3	950	Shut Down			
		952	Drop Plug			
Notes:			Preloaded in Plug Container			
		954	Pump Displacement	Water	90	230
		1025	Bump Plug	500 PSI over Final Lift (1250 PSI)	177	650
			With 1 bbl Back to surface			
		1040	Rig Down			
		1115	Leave Location			

x Francis Bowe
Work Performed

X _____
Title

X _____
Date