



**Bison Oil Well Cementing
Tail & Lead**

Date: 5/31/2018

Invoice # 666325

API# 05-123-

Supervisor: Nick Vigil

Customer: Crestone Peak Resources

Well Name: Sam 3K-25H M166

County: Weld

State: Colorado

Sec: 4

Twp: 1N

Range: 65W

Consultant: Clarence

Rig Name & Number: Ensign 122

Distance To Location: 40 Miles

Units On Location: 3

Time Requested: 3:00

Time Arrived On Location: 2:45

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>2,415</u> Total Depth (ft) : <u>2430</u> Open Hole Diameter (in) : <u>13.50</u> Conductor Length (ft) : <u>111</u> Conductor ID : <u>15.25</u> Shoe Joint Length (ft) : <u>83</u> Landing Joint (ft) : _____</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: <u>8</u> Max Pressure: <u>2500</u></p>	<p>Lead</p> <p>Cement Name: _____ Cement Density (lb/gal) : <u>13.5</u> Cement Yield (cuft) : <u>1.7</u> Gallons Per Sack <u>9.00</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 Dye in 2nd 10 bbl.</p>

Lead Calculated Results	Tail Calculated Results
HOC of Lead <u>1882.57 ft</u>	Tail Cement Volume In Ann <u>241.30 cuft</u>
Casing Depth - HOC Tail	(HOC Tail) X (OH Ann)
Volume of Lead Cement <u>920.07 cuft</u>	Total Volume of Tail Cement <u>205.96 Cuft</u>
HOC of Lead X Open Hole Ann	(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
Volume of Conductor <u>84.71 cuft</u>	bbls of Tail Cement <u>42.98 bbls</u>
(Conductor ID Squared) - (Casing Size OD Squared) X (.005454) X (Conductor Length ft)	(HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)
Total Volume of Lead Cement <u>1004.78 cuft</u>	HOC Tail <u>421.43 ft</u>
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
bbls of Lead Cement <u>223.69 bbls</u>	Sacks of Tail Cement <u>190.00 sk</u>
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	(Total Volume of Tail Cement) ÷ (Cement Yield)
Sacks of Lead Cement <u>738.81 sk</u>	bbls of Tail Mix Water <u>26.65 bbls</u>
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	(Sacks of Tail Cement X Gallons Per Sack) ÷ 42
bbls of Lead Mix Water <u>158.32 bbls</u>	Pressure of cement in annulus
(Sacks Needed) X (Gallons Per Sack) ÷ 42	Hydrostatic Pressure <u>585.23 PSI</u>
Displacement <u>176.77 bbls</u>	
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	Collapse PSI: <u>2570.00 psi</u>
Total Water Needed: <u>441.73 bbls</u>	Burst PSI: <u>3950.00 psi</u>

X Satch Bowe

 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.

