



**Bison Oil Well Cementing  
Tail & Lead**

Date: 5/8/2018

Invoice # 200276

API# \_\_\_\_\_

Foreman: Kirk Kallhoff

Customer: Crestone Peak Resources

Well Name: rugge 3j-4h

Consultant: nate

County: Weld

Rig Name & Number: ENSIGN 122

State: Colorado

Distance To Location: 36

Units On Location: 4028/4039/4041

Sec: 4

Time Requested: 1200 am

Twp: 1n

Time Arrived On Location: 1030 pm

Range: 65w

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>2,431</u>            Total Depth (ft) : <u>2466</u>            Open Hole Diameter (in) : <u>13.50</u>            Conductor Length (ft) : <u>110</u>            Conductor ID : <u>15.6</u>            Shoe Joint Length (ft) : <u>75</u>            Landing Joint (ft) : <u>17</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: <u>8</u>            Max Pressure: <u>2000</u></p>	<p><b>Lead</b>            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>20%</u></p> <p><b>Tail</b>            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: _____</p> <p><b>Fluid Ahead (bbls)</b> <u>60.0</u>  <b>H2O Wash Up (bbls)</b> <u>10.0</u></p> <p><b>Spacer Ahead Makeup</b>  <u>60 BBL WATER DYE IN 2ND 10</u></p>

Lead Calculated Results	Tail Calculated Results
<b>HOC of Lead</b> <u>1875.60 ft</u>	<b>Tail Cement Volume In Ann</b> <u>241.30 cuft</u>
Casing Depth - HOC Tail	(HOC Tail) X (OH Ann)
<b>Volume of Lead Cement</b> <u>916.66 cuft</u>	<b>Total Volume of Tail Cement</b> <u>209.37 Cuft</u>
HOC of Lead X Open Hole Ann	(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
<b>Volume of Conductor</b> <u>90.42 cuft</u>	<b>bbls of Tail Cement</b> <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)
<b>Total Volume of Lead Cement</b> <u>1007.08 cuft</u>	<b>HOC Tail</b> <u>428.40 ft</u>
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
<b>bbls of Lead Cement</b> <u>215.23 bbls</u>	<b>Sacks of Tail Cement</b> <u>190.00 sk</u>
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	(Total Volume of Tail Cement) ÷ (Cement Yield)
<b>Sacks of Lead Cement</b> <u>710.88 sk</u>	<b>bbls of Tail Mix Water</b> <u>26.65 bbls</u>
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	(Sacks of Tail Cement X Gallons Per Sack) ÷ 42
<b>bbls of Lead Mix Water</b> <u>152.33 bbls</u>	<b>Pressure of cement in annulus</b>
(Sacks Needed) X (Gallons Per Sack) ÷ 42	<b>Hydrostatic Pressure</b> <u>585.23 PSI</u>
<b>Displacement</b> <u>179.87 bbls</u>	<b>Collapse PSI:</b> <u>2570.00 psi</u>
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	<b>Burst PSI:</b> <u>3950.00 psi</u>
<b>Total Water Needed:</b> <u>428.85 bbls</u>	



Authorization To Proceed

