



**Bison Oil Well Cementing
Tail & Lead**

Date: 4/28/2018

Invoice #: 900286

API#: 05-123-46556

Foreman: Corey Barras

Customer: Crestone Peak Resources

Well Name: Ruegge 3D-4H-N165

Consultant: Matt Rosales

County: Weld

Rig Name & Number: Ensign 122

State: Colorado

Distance To Location: 36 Miles

Sec: 4

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

Twp: 1N

Time Requested: 1030

Range: 65W

Time Arrived On Location: 930

Time Left Location: 215 04-29-18

WELL DATA	Cement Data
<p>Casing Size (in) : 9.625 Casing Weight (lb) : 40 Casing Depth (ft.) : 2,492 Total Depth (ft) : 2508 Open Hole Diameter (in) : 13.50 Conductor Length (ft) : 98 Conductor ID : 15.6 Shoe Joint Length (ft) : 76 Landing Joint (ft) : 10</p> <p>Sacks of Tail Requested 190 HOC Tail (ft): 0</p> <p>One or the other, cannot have quantity in both</p> <p>Max Rate: Max Pressure:</p>	<p>Lead Cement Name: Cement Density (lb/gal) : 13.5 Cement Yield (cuft) : 1.68 Gallons Per Sack 8.90 % Excess 10%</p> <p>Tail Cement Name: Cement Density (lb/gal) : 15.2 Cement Yield (cuft) : 1.27 Gallons Per Sack: 5.89 % Excess: 0%</p> <p>Fluid Ahead (bbls) 60.0 H2O Wash Up (bbls) 20.0</p> <p>Spacer Ahead Makeup 60 BBL with Die in 2nd 10</p>

Lead Calculated Results	Tail Calculated Results
HOC of Lead 1956.47 ft	Tail Cement Volume In Ann 241.30 cuft
Casing Depth - HOC Tail	(HOC Tail) X (OH Ann)
Volume of Lead Cement 956.19 cuft	Total Volume of Tail Cement 208.94 Cuft
HOC of Lead X Open Hole Ann	(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
Volume of Conductor 80.56 cuft	bbls of Tail Cement 42.98 bbls
(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 1036.74 cuft	HOC Tail 427.53 ft
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
bbls of Lead Cement 203.11 bbls	Sacks of Tail Cement 190.00 sk
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	(Total Volume of Tail Cement) ÷ (Cement Yield)
Sacks of Lead Cement 678.82 sk	bbls of Tail Mix Water 26.65 bbls
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	(Sacks of Tail Cement X Gallons Per Sack) ÷ 42
bbls of Lead Mix Water 143.85 bbls	Pressure of cement in annulus
(Sacks Needed) X (Gallons Per Sack) ÷ 42	Hydrostatic Pressure 585.23 PSI
Displacement 183.89 bbls	Collapse PSI: 2570.00 psi
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	Burst PSI: 3950.00 psi
Total Water Needed: 434.38 bbls	



Authorization To Proceed

