



**Bison Oil Well Cementing
Tail & Lead**

Date: 6/3/2018
 Invoice # 300147
 API# 05-123-46510
 Foreman: JASON KELEHER

Customer: Crestone Peak Resources
 Well Name: SAM 3N-25H-M166

County: Weld Consultant: SITCH
 State: Colorado Rig Name & Number: Ensign 122
 Distance To Location: 40
 Units On Location: 3
 Time Requested: 430
 Time Arrived On Location: 400
 Time Left Location: 1600

WELL DATA		Cement Data	
Casing Size (in) :	<u>9.625</u>	Lead	N-Gel-12
Casing Weight (lb) :	<u>40</u>	Cement Name:	
Casing Depth (ft.) :	<u>2,412</u>	Cement Density (lb/gal) :	<u>13.5</u>
Total Depth (ft) :	<u>2428</u>	Cement Yield (cuft) :	<u>1.7</u>
Open Hole Diameter (in) :	<u>13.50</u>	Gallons Per Sack	<u>9.00</u>
Conductor Length (ft) :	<u>98</u>	% Excess	<u>25%</u>
Conductor ID :	<u>15.25</u>		
Shoe Joint Length (ft) :	<u>82</u>	Tail	Type III
Landing Joint (ft) :	<u>5</u>	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:	
Sacks of Tail Requested	<u>190</u>	Fluid Ahead (bbls)	<u>60.0</u>
HOC Tail (ft):		H2O Wash Up (bbls)	<u>10.0</u>
One or the other, cannot have quantity in both			
Max Rate:	<u>8</u>	Spacer Ahead Makeup	
Max Pressure:	<u>2000</u>	<u>60 BBL WATER DYE IN 2ND 10</u>	

Casing ID 8.835 Casing Grade J-55 only used

Lead Calculated Results	Tail Calculated Results
HOC of Lead <u>1990.16 ft</u>	Tail Cement Volume In Ann <u>206.06 cuft</u>
Casing Depth - HOC Tail	(HOC Tail) X (OH Ann)
Volume of Lead Cement <u>1186.62 cuft</u>	Total Volume of Tail Cement <u>241.30 Cuft</u>
HOC of Lead X Open Hole Ann	(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
Volume of Conductor <u>74.78 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>1261.40 cuft</u>	HOC Tail <u>421.84 ft</u>
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
bbls of Lead Cement <u>224.60 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>742.00 sk</u>	bbls of Tail Mix Water <u>26.64 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>159.00 bbls</u>	Pressure of cement in annulus
(Sacks Needed) X (Gallons Per Sack) ÷ 42	Hydrostatic Pressure <u>655.00 PSI</u>
Displacement <u>176.90 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>430.00 bbls</u>	Burst PSI: <u>3950.00 psi</u>

X Francis Bowl

Authorization To Proceed



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

Customer: Crestone Peak Resources
Well Name: SAM 3N-25H-M166

Date: 6/3/2018
INVOICE #: 300147
LOCATION: Weld
FOREMAN: JASON KELEHER

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DESCRIPTION OF JOB EVENTS

Amount Pumped	Time/Date	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	159	400	ARRIVE ON LOCATION			
Lead % Excess	25%	1300	MIRU			
Lead Sacks	742	1330	PRE JOB SAFETY MEETING			
		1345	PRESSURE TEST			
		1346	FRESH WATER SPACER			
Tail mixed bbls	26.6	1355	LEAD CEMENT	7	60	220
Tail % Excess	0%	1436	TAIL CEMENT	7	224.6	180
Tail Sacks	190	1444	SHUT DOWN	3.5	42.9	120
		1447	DROP PLUG			
Total Sacks	932	1447	DISPLACEMENT	3	176.9	875
Water Temp	60	1518	BUMP PLUG			1590
bbl Returns	80	1523	CHECK FLOATS			
		1530	RIG DOWN			
Notes:	1600	LEAVE LOCATION				
AT BEGINNING OF TAIL						
HYDRAULIC MOTOR						
SHUT DOWN AND						
WOULD NOT RESTART.						
HAD TO PUMP CEMENT						
OUT OF HOLE AND						
HAVE ANOTHER PUMP						
BROUGHT OUT.						

X _____
CUSTOMER SIGNATURE

x Francis Bowe
Title

x 6-3-18
Date