



## DRILL STEM TEST REPORT

Prepared For: **Arrowhead Exploration LLC.**

2919 Hall Street  
Hayas Kansas, 67601

ATTN: herb Deines

### **Sander Witt Unit #1**

### **9-14s-15w Russell**

Start Date: 2017.08.12 @ 10:12:00

End Date: 2017.08.12 @ 00:00:00

Job Ticket #: 01182                      DST #: 1

Eagle Testers  
1309 Patton Road    Great Bend, Kansas 67530  
620-791-7394

Printed: 2017.08.12 @ 15:13:41



# DRILL STEM TEST REPORT

Arrow head Exploration LLC.

**9-14s-15w Russell**

2919 Hall Street  
Hayas Kansas, 67601

**Sander Witt Unit #1**

Job Ticket: 01182

**DST#: 1**

ATTN: herb Deines

Test Start: 2017.08.12 @ 10:12:00

## GENERAL INFORMATION:

Formation: **Oread & Topeka**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 11:27:00

Time Test Ended: 00:00:00

Test Type: Conventional Bottom Hole (Initial)

Tester: Gene Budig

Unit No: 1-90

**Interval: 2922.00 ft (KB) To 2940.00 ft (KB) (TVD)**

Reference Elevations: 1877.00 ft (KB)

Total Depth: 2940.00 ft (KB) (TVD)

1869.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 8.00 ft

**Serial #: 91716 Outside**

Press@RunDepth: 120.84 psig @ 2935.00 ft (KB)

Capacity: 5000.00 psig

Start Date: 2017.08.12

End Date: 2017.08.12

Last Calib.: 1899.12.30

Start Time: 10:12:00

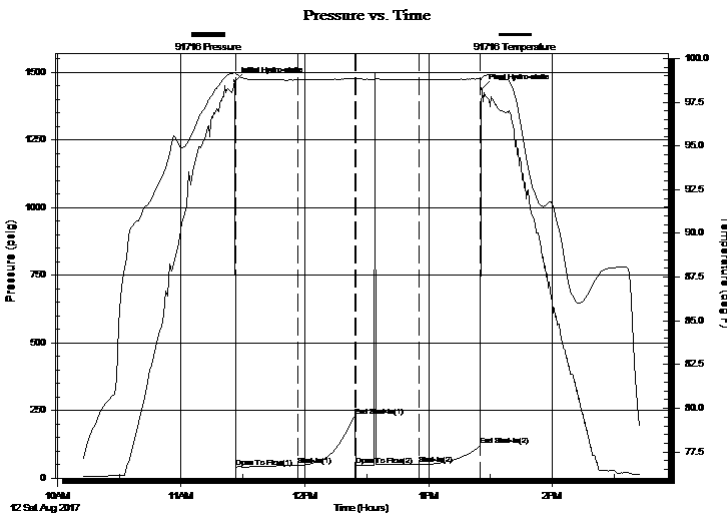
End Time: 14:43:00

Time On Btm: 2017.08.12 @ 11:26:00

Time Off Btm: 2017.08.12 @ 13:26:00

**TEST COMMENT:** 1st Opening 30 Minutes very weak surface blow  
1st Shut-In 30 Minutes no blow back  
2nd opening 30 Minutes no blow flushed tool no help  
2nd shut-in 30 Minutes no blow back

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1466.40	99.20	Initial Hydro-static
1	39.23	99.17	Open To Flow (1)
31	46.70	98.79	Shut-In(1)
59	230.65	98.86	End Shut-In(1)
59	47.66	98.85	Open To Flow (2)
90	49.92	98.81	Shut-In(2)
119	120.84	98.83	End Shut-In(2)
120	1439.41	98.88	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
25.00	Drilling Mud	0.35

## Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



# DRILL STEM TEST REPORT

Arrow head Exploration LLC.

**9-14s-15w Russell**

2919 Hall Street  
Hayas Kansas, 67601

**Sander Witt Unit #1**

ATTN: herb Deines

Job Ticket: 01182

**DST#: 1**

Test Start: 2017.08.12 @ 10:12:00

## GENERAL INFORMATION:

Formation: **Oread & Topeka**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 11:27:00

Time Test Ended: 00:00:00

Test Type: Conventional Bottom Hole (Initial)

Tester: Gene Budig

Unit No: 1-90

**Interval: 2922.00 ft (KB) To 2940.00 ft (KB) (TVD)**

Reference Elevations: 1877.00 ft (KB)

Total Depth: 2940.00 ft (KB) (TVD)

1869.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 8.00 ft

**Serial #: 9119**

**Inside**

Press@RunDepth: 125.11 psig @ 2935.00 ft (KB)

Capacity: 5000.00 psig

Start Date: 2017.08.12 End Date: 2017.08.12

Last Calib.: 2017.08.12

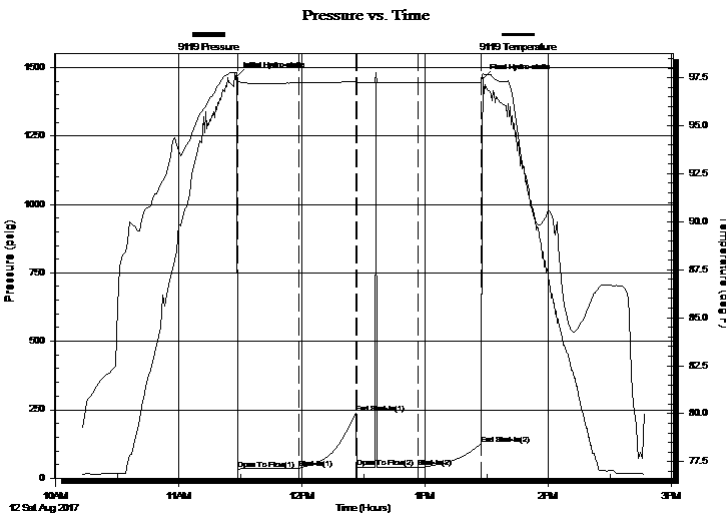
Start Time: 10:12:00 End Time: 14:47:00

Time On Btm: 2017.08.12 @ 11:28:00

Time Off Btm: 2017.08.12 @ 13:28:00

**TEST COMMENT:** 1st Opening 30 Minutes very weak surface blow  
1st Shut-In 30 Minutes no blow back  
2nd opening 30 Minutes no blow flushed tool no help  
2nd shut-in 30 Minutes no blow back

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1464.97	97.76	Initial Hydro-static
1	32.21	97.33	Open To Flow (1)
31	36.70	97.23	Shut-In(1)
59	238.16	97.30	End Shut-In(1)
59	38.25	97.25	Open To Flow (2)
89	41.04	97.23	Shut-In(2)
119	125.11	97.25	End Shut-In(2)
120	1460.32	97.70	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
25.00	Drilling Mud	0.35

## Gas Rates

Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Arrow head Exploration LLC.

**9-14s-15w Russell**

2919 Hall Street  
Hayas Kansas, 67601

**Sander Witt Unit #1**

Job Ticket: 01182

**DST#: 1**

ATTN: herb Deines

Test Start: 2017.08.12 @ 10:12:00

## Tool Information

Drill Pipe:	Length: 2919.00 ft	Diameter: 3.80 inches	Volume: 40.95 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight to Pull Loose: 44000.00 lb
			<u>Total Volume: 40.95 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	17.00 ft			String Weight: Initial 30000.00 lb
Depth to Top Packer:	2922.00 ft			Final 30000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	18.00 ft			
Tool Length:	38.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
------------------	-------------	------------	----------	------------	----------------

Shut In Tool	5.00			2907.00	
Hydraulic tool	5.00			2912.00	
Top Packer	5.00			2917.00	
Packer	5.00			2922.00	20.00 Bottom Of Top Packer
Anchor	13.00			2935.00	
Recorder	0.00	9119	Inside	2935.00	
Recorder	0.00	91716	Outside	2935.00	
Bullnose	5.00			2940.00	18.00 Anchor Tool

**Total Tool Length: 38.00**



# DRILL STEM TEST REPORT

## FLUID SUMMARY

Arrow head Exploration LLC.

**9-14s-15w Russell**

2919 Hall Street  
Hayas Kansas, 67601

**Sander Witt Unit #1**

Job Ticket: 01182

**DST#: 1**

ATTN: herb Deines

Test Start: 2017.08.12 @ 10:12:00

### Mud and Cushion Information

Mud Type: Gel Chem  
Mud Weight: 9.00 lb/gal  
Viscosity: 47.00 sec/qt  
Water Loss: 8.00 in<sup>3</sup>  
Resistivity: ohm.m  
Salinity: 4000.00 ppm  
Filter Cake: 1.00 inches

Cushion Type:  
Cushion Length: ft  
Cushion Volume: bbl  
Gas Cushion Type:  
Gas Cushion Pressure: psig

Oil API: deg API  
Water Salinity: ppm

### Recovery Information

Recovery Table

Length ft	Description	Volume bbl
25.00	Drilling Mud	0.351

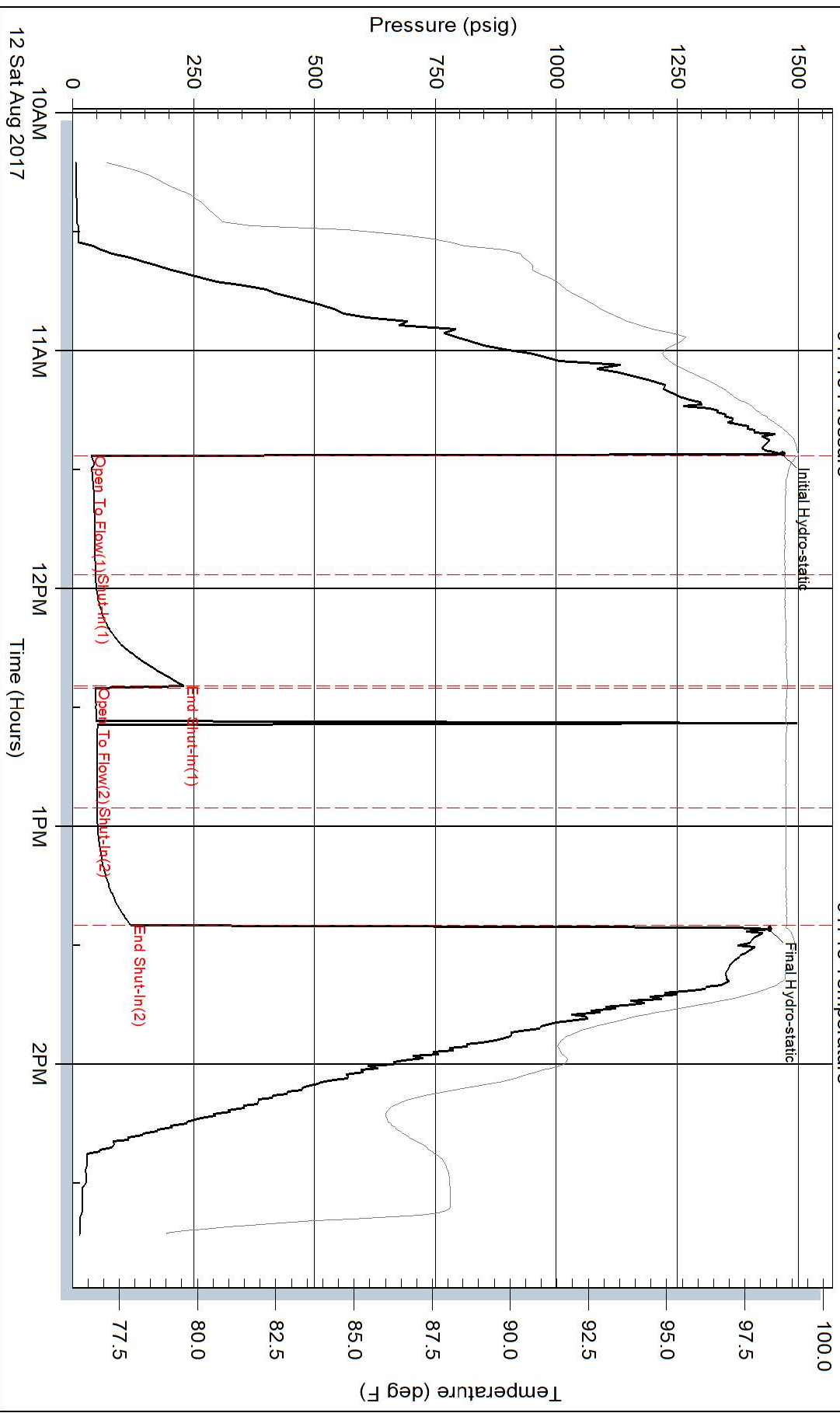
Total Length: 25.00 ft      Total Volume: 0.351 bbl

Num Fluid Samples: 0      Num Gas Bombs: 0      Serial #:

Laboratory Name:      Laboratory Location:

Recovery Comments:

### Pressure vs. Time



### Pressure vs. Time

