



## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N. Water STE 300  
Wichita, KS 67202

ATTN: Tom Funk

### **Vanava #4-5**

### **5-13S-32W Logan,KS**

Start Date: 2019.06.26 @ 05:10:00

End Date: 2019.06.26 @ 13:53:19

Job Ticket #: 64354                      DST #: 1

Trilobite Testing, Inc  
1515 Commerce Parkway Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2019.07.03 @ 14:39:03



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling Co Inc  
 250 N. Water STE 300  
 Wichita, KS 67202  
 ATTN: Tom Funk

**5-13S-32W Logan,KS**

**Vanava #4-5**

Job Ticket: 64354

**DST#: 1**

Test Start: 2019.06.26 @ 05:10:00

## GENERAL INFORMATION:

Formation: **LKC "B - D"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 07:11:50

Time Test Ended: 13:53:19

Test Type: Conventional Bottom Hole (Initial)

Tester: Martine Salinas

Unit No: 82

Interval: **4027.00 ft (KB) To 4070.00 ft (KB) (TVD)**

Total Depth: 4070.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Good

Reference Elevations: 3018.00 ft (KB)

3007.00 ft (CF)

KB to GR/CF: 11.00 ft

**Serial #: 8734 Outside**

Press@RunDepth: 417.10 psig @ 4028.00 ft (KB)

Start Date: 2019.06.26

End Date: 2019.06.26

Start Time: 05:10:01

End Time: 13:53:19

Capacity: 8000.00 psig

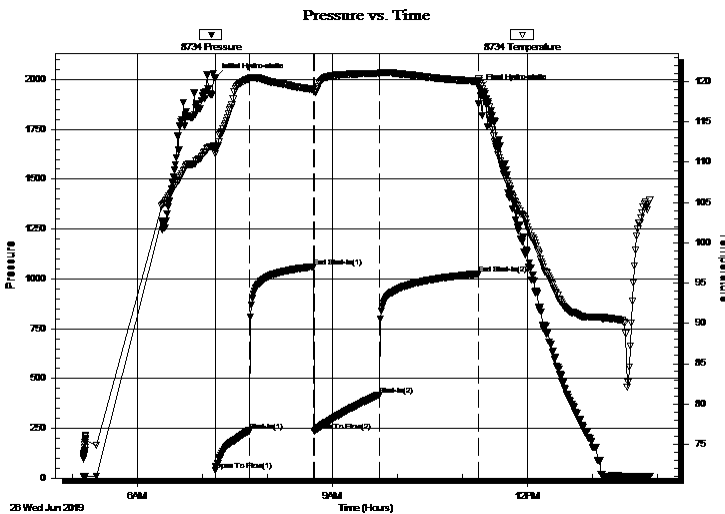
Last Calib.: 2019.06.26

Time On Btm: 2019.06.26 @ 07:11:40

Time Off Btm: 2019.06.26 @ 11:15:30

**TEST COMMENT:** 30-IF-BOB (11 inches) @ 10 1/2 mins blow increased to 28 3/4"  
 60-ISI-No blow back  
 60-FF-BOB(11 inches) @ 15 mins (blow increased to 36")  
 90-FSI-No blow back

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2007.34	111.98	Initial Hydro-static
1	38.77	111.06	Open To Flow (1)
32	237.04	120.31	Shut-In(1)
91	1060.59	119.05	End Shut-In(1)
92	236.03	118.75	Open To Flow (2)
152	417.10	120.99	Shut-In(2)
243	1025.21	120.05	End Shut-In(2)
244	1955.61	120.13	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
615.00	MSW 5%M, 95%W	6.13
250.00	MCW/ Oil specks <1%O, 25%M, 75%W	3.51

## Gas Rates

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



# TRILOBITE TESTING, INC.

## DRILL STEM TEST REPORT

Murfin Drilling Co Inc  
 250 N. Water STE 300  
 Wichita, KS 67202  
 ATTN: Tom Funk

5-13S-32W Logan, KS

Vanava #4-5

Job Ticket: 64354

DST#: 1

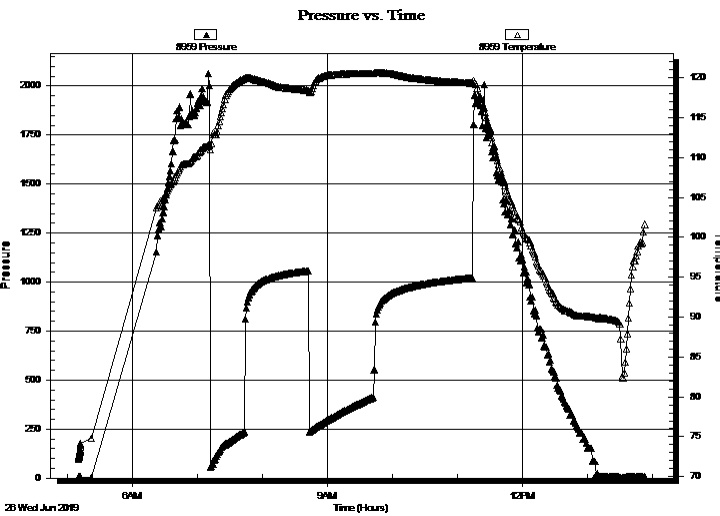
Test Start: 2019.06.26 @ 05:10:00

### GENERAL INFORMATION:

Formation: LKC "B - D"  
 Deviated: No Whipstock: ft (KB)  
 Test Type: Conventional Bottom Hole (Initial)  
 Time Tool Opened: 07:11:50 Tester: Martine Salinas  
 Time Test Ended: 13:53:19 Unit No: 82  
 Interval: 4027.00 ft (KB) To 4070.00 ft (KB) (TVD) Reference Elevations: 3018.00 ft (KB)  
 Total Depth: 4070.00 ft (KB) (TVD) 3007.00 ft (CF)  
 Hole Diameter: 7.88 inches Hole Condition: Good KB to GR/CF: 11.00 ft

Serial #: 8959 Inside  
 Press@RunDepth: psig @ 4028.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2019.06.26 End Date: 2019.06.26 Last Calib.: 2019.06.26  
 Start Time: 05:10:01 End Time: 13:53:10 Time On Btm:  
 Time Off Btm:

TEST COMMENT: 30-IF-BOB (11 inches) @ 10 1/2 mins blow increased to 28 3/4"  
 60-ISI-No blow back  
 60-FF-BOB(11 inches) @ 15 mins (blow increased to 36")  
 90-FSI-No blow back



### PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation

### Recovery

Length (ft)	Description	Volume (bbl)
615.00	MSW 5%M, 95%W	6.13
250.00	MCW/ Oil specks <1%O, 25%M, 75%W	3.51

### Gas Rates

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



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co Inc

**5-13S-32W Logan,KS**

250 N. Water STE 300  
Wichita, KS 67202

**Vanava #4-5**

Job Ticket: 64354

**DST#: 1**

ATTN: Tom Funk

Test Start: 2019.06.26 @ 05:10:00

## Tool Information

Drill Pipe:	Length: 3732.00 ft	Diameter: 3.80 inches	Volume: 52.35 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 274.00 ft	Diameter: 2.25 inches	Volume: 1.35 bbl	Weight to Pull Loose: 86000.00 lb
			Total Volume: 53.70 bbl	Tool Chased 0.00 ft
Drill Pipe Above KB:	7.00 ft			String Weight: Initial 72000.00 lb
Depth to Top Packer:	4027.00 ft			Final 72000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	43.00 ft			
Tool Length:	71.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

## Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			4000.00	
Shut In Tool	5.00			4005.00	
Hydraulic tool	5.00	1113		4010.00	
Jars	5.00	01-07		4015.00	
Safety Joint	3.00	-001		4018.00	
Packer	5.00			4023.00	28.00 Bottom Of Top Packer
Packer	4.00			4027.00	
Stubb	1.00			4028.00	
Recorder	0.00	8959	Inside	4028.00	
Recorder	0.00	8734	Outside	4028.00	
Perforations	37.00			4065.00	
Bullnose	5.00			4070.00	43.00 Bottom Packers & Anchor

**Total Tool Length: 71.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co Inc

**5-13S-32W Logan,KS**

250 N. Water STE 300  
Wichita, KS 67202

**Vanava #4-5**

Job Ticket: 64354

**DST#: 1**

ATTN: Tom Funk

Test Start: 2019.06.26 @ 05:10:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

55000 ppm

Viscosity: 53.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.38 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 3000.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
615.00	MSW 5%M, 95%W	6.131
250.00	MCW/ Oil specks <1%O, 25%M, 75%W	3.507

Total Length: 865.00 ft      Total Volume: 9.638 bbl

Num Fluid Samples: 0

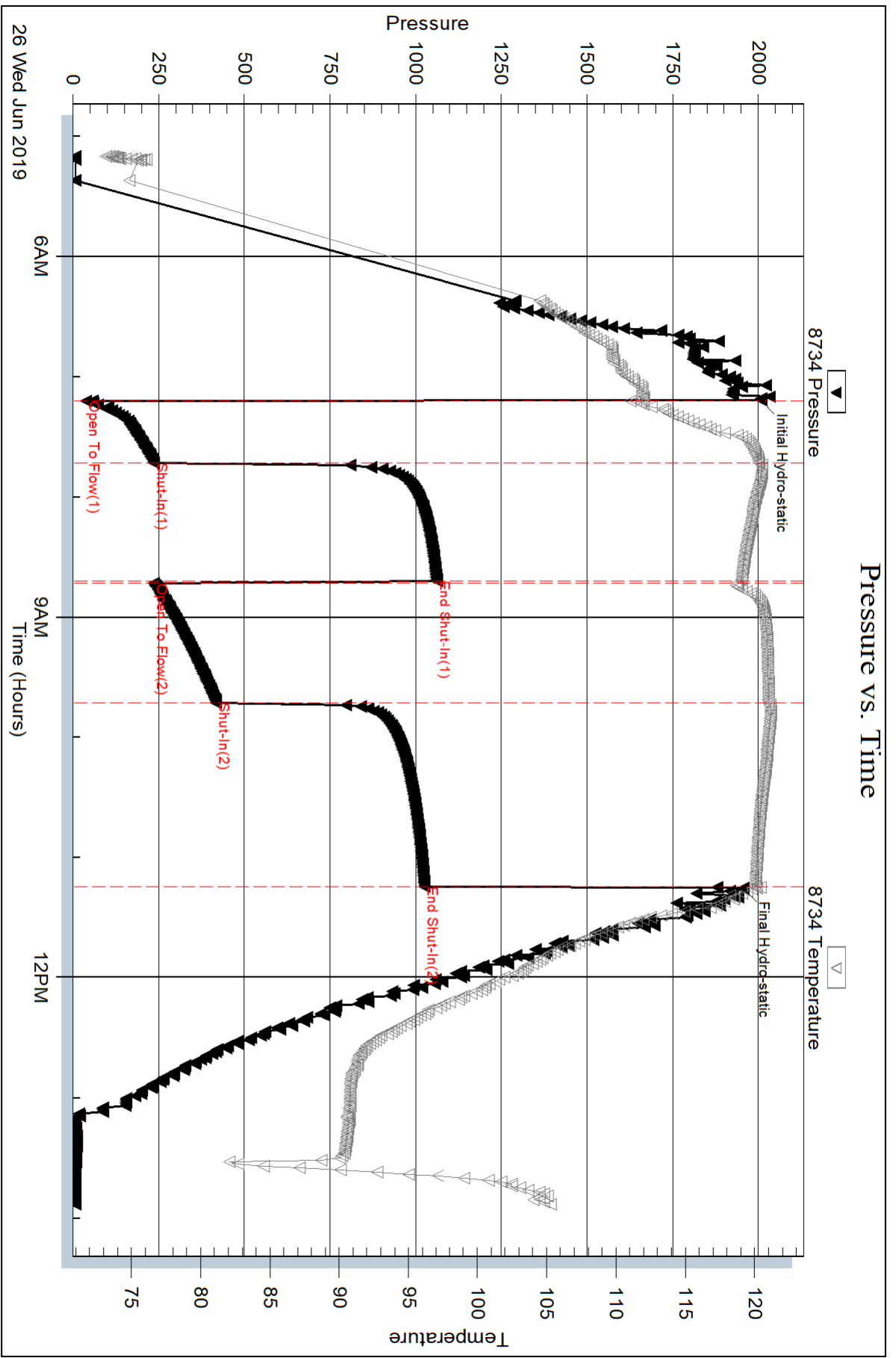
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW= .120 @ 90.5 degs = 55,000PPM



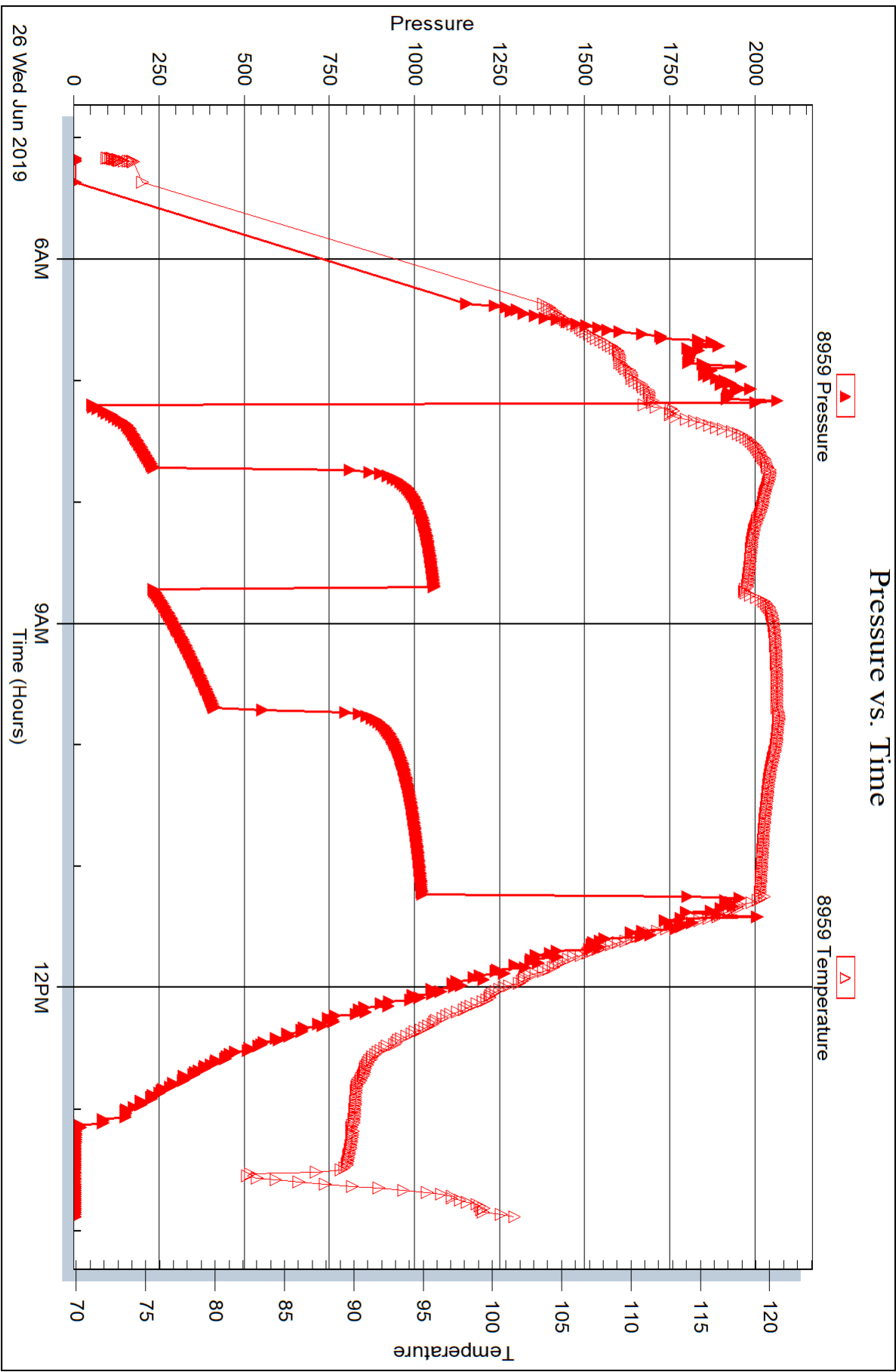
Serial #: 8959

Inside

Murfin Drilling Co Inc

Vanava #4-5

DST Test Number: 1





## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N. Water STE 300  
Wichita, KS 67202

ATTN: Tom Funk

### **Vanava #4-5**

### **5-13S-32W Logan,KS**

Start Date: 2019.06.26 @ 22:40:00

End Date: 2019.06.27 @ 07:10:39

Job Ticket #: 64355                      DST #: 2

Trilobite Testing, Inc  
1515 Commerce Parkway Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2019.07.03 @ 14:31:16

Murfin Drilling Co Inc  
5-13S-32W Logan,KS  
Vanava #4-5  
DST # 2  
LKC " E - F "  
2019.06.26





**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling Co Inc  
 250 N. Water STE 300  
 Wichita, KS 67202  
 ATTN: Tom Funk

**5-13S-32W Logan,KS**

**Vanava #4-5**

Job Ticket: 64355

**DST#: 2**

Test Start: 2019.06.26 @ 22:40:00

## GENERAL INFORMATION:

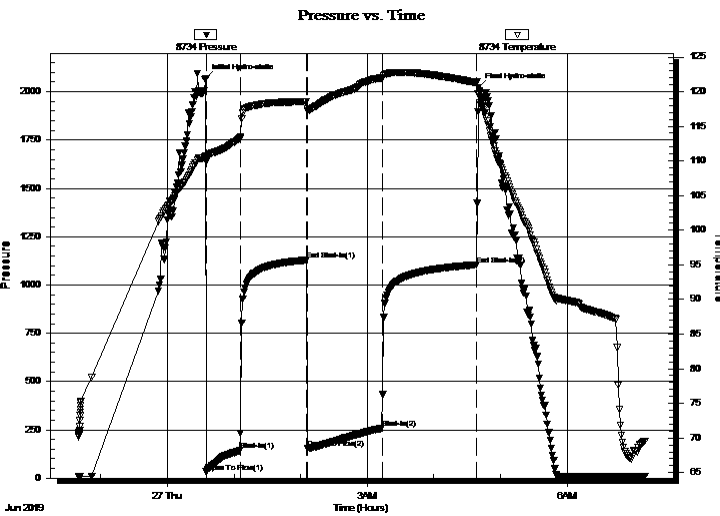
Formation: **LKC "E - F"**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 00:34:50  
 Time Test Ended: 07:10:39  
 Interval: **4076.00 ft (KB) To 4111.00 ft (KB) (TVD)**  
 Total Depth: 4111.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Good  
 Test Type: Conventional Bottom Hole (Reset)  
 Tester: Martine Salinas  
 Unit No: 82  
 Reference Elevations: 3018.00 ft (KB)  
 3007.00 ft (CF)  
 KB to GR/CF: 11.00 ft

## Serial #: 8734

**Outside**

Press@RunDepth: 256.96 psig @ 4077.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2019.06.26 End Date: 2019.06.27 Last Calib.: 2019.06.27  
 Start Time: 22:40:01 End Time: 07:10:40 Time On Btm: 2019.06.27 @ 00:34:40  
 Time Off Btm: 2019.06.27 @ 04:40:09

**TEST COMMENT:** 30-IF-BOB (11 inches) @ 10 1/2 mins (blow increased to 29")  
 60-ISI-Surface blow back built to 3" @ 30 mins & decreased to 2"  
 60-FF-BOB (11 inches) @ 15 mins (blow increased to 49 1/2")  
 90-FSI-Surface blow back built to 2 1/4" @ 9 mins & decreased to 1/2"



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2069.32	110.69	Initial Hydro-static
1	32.71	109.92	Open To Flow (1)
31	141.93	113.30	Shut-In(1)
91	1128.48	118.58	End Shut-In(1)
92	154.27	117.30	Open To Flow (2)
159	256.96	121.98	Shut-In(2)
244	1104.23	121.30	End Shut-In(2)
246	2022.58	119.48	Final Hydro-static

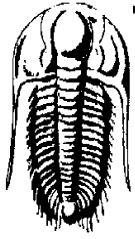
## Recovery

Length (ft)	Description	Volume (bbl)
306.00	GMCO 30%G, 20%M, 50%O	1.80
335.00	CGO 4%G, 96%O	4.70
0.00	160' GIP	0.00

\* Recovery from multiple tests

## Gas Rates

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



**TRILOBITE  
TESTING, INC.**

**DRILL STEM TEST REPORT**

Murfin Drilling Co Inc  
250 N. Water STE 300  
Wichita, KS 67202  
ATTN: Tom Funk

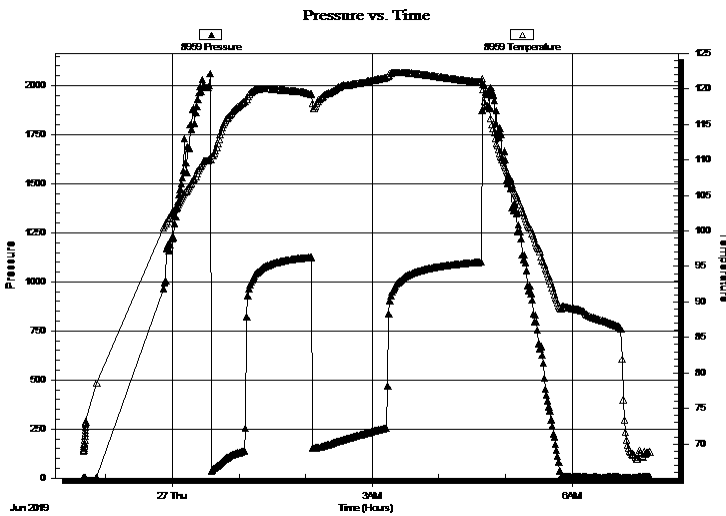
**5-13S-32W Logan,KS**  
**Vanava #4-5**  
Job Ticket: 64355 **DST#: 2**  
Test Start: 2019.06.26 @ 22:40:00

**GENERAL INFORMATION:**

Formation: **LKC "E-F"**  
Deviated: No Whipstock: ft (KB)  
Time Tool Opened: 00:34:50  
Time Test Ended: 07:10:39  
Interval: **4076.00 ft (KB) To 4111.00 ft (KB) (TVD)**  
Total Depth: 4111.00 ft (KB) (TVD)  
Hole Diameter: 7.88 inches Hole Condition: Good  
Test Type: Conventional Bottom Hole (Reset)  
Tester: Martine Salinas  
Unit No: 82  
Reference Elevations: 3018.00 ft (KB)  
3007.00 ft (CF)  
KB to GR/CF: 11.00 ft

**Serial #: 8959 Inside**  
Press@RunDepth: psig @ 4077.00 ft (KB) Capacity: 8000.00 psig  
Start Date: 2019.06.26 End Date: 2019.06.27 Last Calib.: 2019.06.27  
Start Time: 22:40:01 End Time: 07:10:30 Time On Btm:  
Time Off Btm:

**TEST COMMENT:** 30-IF-BOB (11 inches) @ 10 1/2 mins (blow increased to 29")  
60-ISI-Surface blow back built to 3" @ 30 mins & decreased to 2"  
60-FF-BOB (11 inches) @ 15 mins (blow increased to 49 1/2")  
90-FSI-Surface blow back built to 2 1/4" @ 9 mins & decreased to 1/2"



**PRESSURE SUMMARY**

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation

**Recovery**

Length (ft)	Description	Volume (bbl)
306.00	GMCO 30%G, 20%M, 50%O	1.80
335.00	CGO 4%G, 96%O	4.70
0.00	160' GIP	0.00

\* Recovery from multiple tests

**Gas Rates**

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



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co Inc

**5-13S-32W Logan,KS**

250 N. Water STE 300  
Wichita, KS 67202

**Vanava #4-5**

Job Ticket: 64355

**DST#: 2**

ATTN: Tom Funk

Test Start: 2019.06.26 @ 22:40:00

## Tool Information

Drill Pipe:	Length: 3795.00 ft	Diameter: 3.80 inches	Volume: 53.23 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 274.00 ft	Diameter: 2.25 inches	Volume: 1.35 bbl	Weight to Pull Loose: 78000.00 lb
			<u>Total Volume: 54.58 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	21.00 ft			String Weight: Initial 72000.00 lb
Depth to Top Packer:	4076.00 ft			Final 72000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	35.00 ft			
Tool Length:	63.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

## Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			4049.00	
Shut In Tool	5.00			4054.00	
Hydraulic tool	5.00	1113		4059.00	
Jars	5.00	01-07		4064.00	
Safety Joint	3.00	-001		4067.00	
Packer	5.00			4072.00	28.00 Bottom Of Top Packer
Packer	4.00			4076.00	
Stubb	1.00			4077.00	
Recorder	0.00	8959	Inside	4077.00	
Recorder	0.00	8734	Outside	4077.00	
Perforations	29.00			4106.00	
Bullnose	5.00			4111.00	35.00 Bottom Packers & Anchor

**Total Tool Length: 63.00**



**TRILOBITE  
TESTING, INC.**

**DRILL STEM TEST REPORT**

**FLUID SUMMARY**

Murfin Drilling Co Inc

**5-13S-32W Logan,KS**

250 N. Water STE 300  
Wichita, KS 67202

**Vanava #4-5**

Job Ticket: 64355

**DST#: 2**

ATTN: Tom Funk

Test Start: 2019.06.26 @ 22:40:00

**Mud and Cushion Information**

Mud Type: Gel Chem

Cushion Type:

Oil API:

34.6 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 60.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.98 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 3300.00 ppm

Filter Cake: 2.00 inches

**Recovery Information**

Recovery Table

Length ft	Description	Volume bbl
306.00	GMCO 30%G, 20%M, 50%O	1.796
335.00	CGO 4%G, 96%O	4.699
0.00	160' GIP	0.000

Total Length: 641.00 ft      Total Volume: 6.495 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

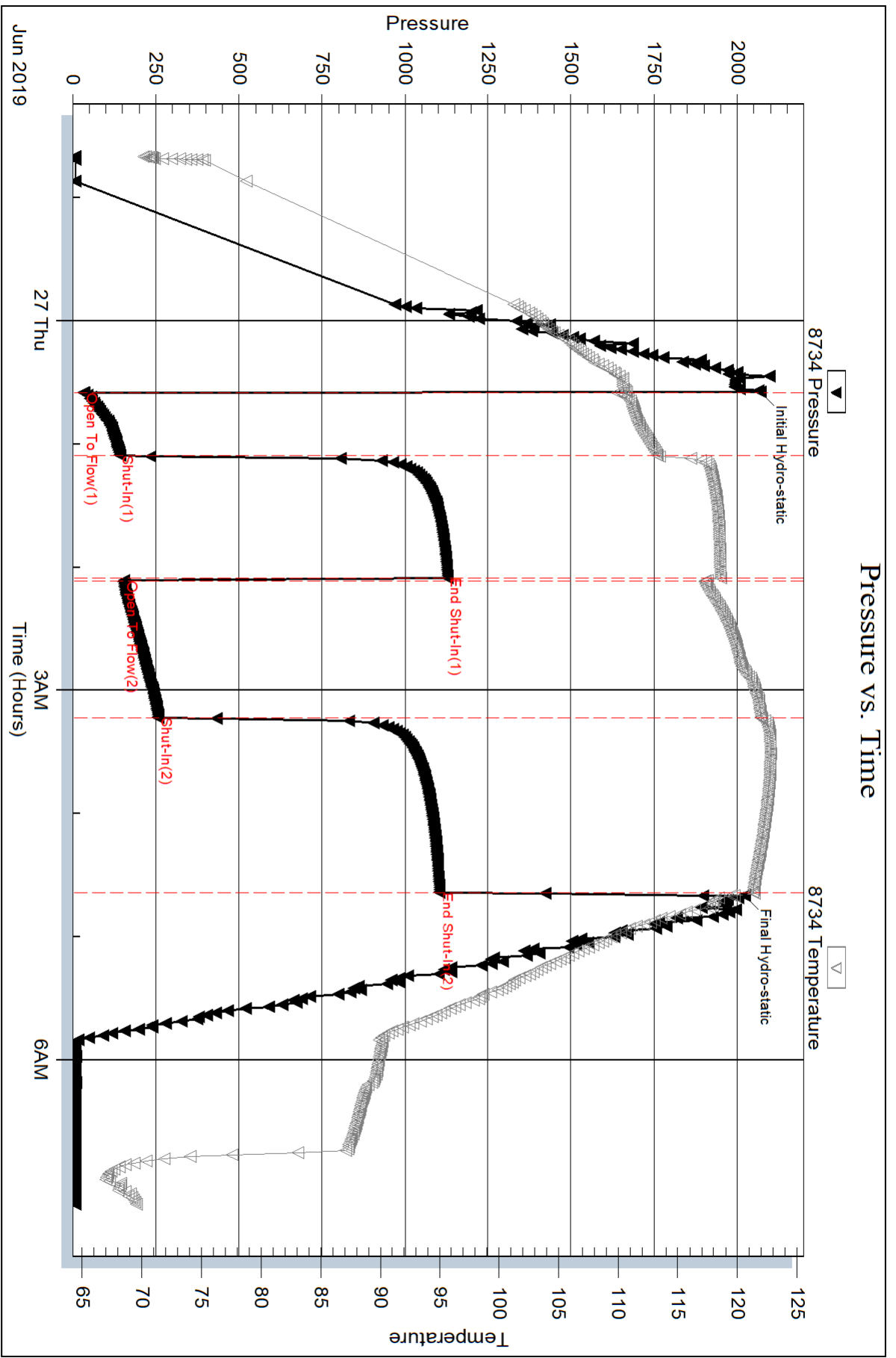
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: Gravity of oil = 35.4 @ 68 degs

Gravity corrected to 34.6 @ 60 degs



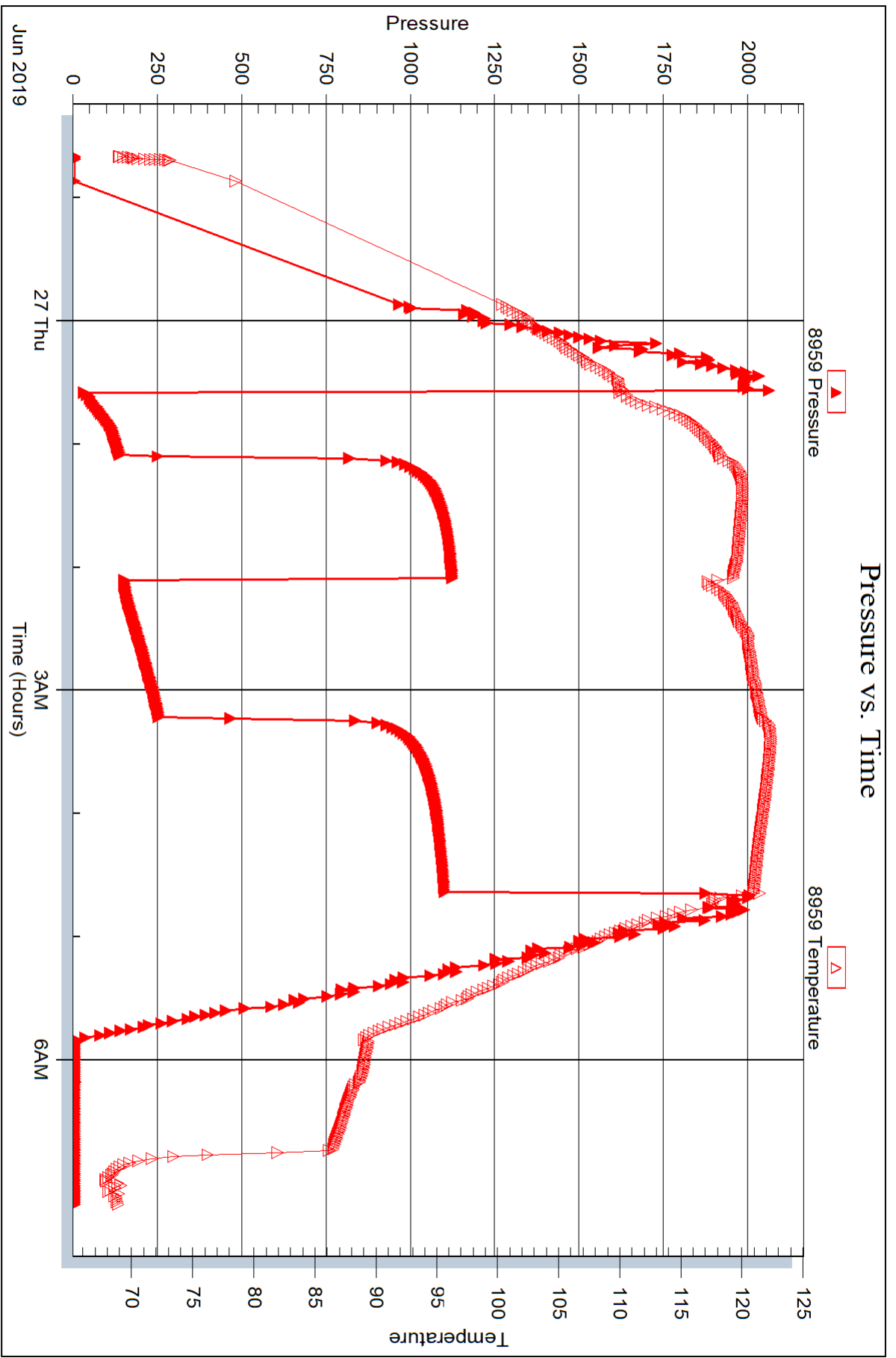
Serial #: 8959

Inside

Murfin Drilling Co Inc

Vanava #4-5

DST Test Number: 2



Trilobite Testing, Inc

Ref. No: 64355

Printed: 2019.07.03 @ 14:31:17



## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N. Water STE 300  
Wichita, KS 67202

ATTN: Tom Funk

### **Vanava #4-5**

### **5-13S-32W Logan,KS**

Start Date: 2019.06.27 @ 16:38:00

End Date: 2019.06.28 @ 01:09:20

Job Ticket #: 64356                      DST #: 3

Trilobite Testing, Inc  
1515 Commerce Parkway Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2019.07.03 @ 14:07:02



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling Co Inc  
250 N. Water STE 300  
Wichita, KS 67202  
ATTN: Tom Funk

**5-13S-32W Logan,KS**

**Vanava #4-5**

Job Ticket: 64356

**DST#: 3**

Test Start: 2019.06.27 @ 16:38:00

## GENERAL INFORMATION:

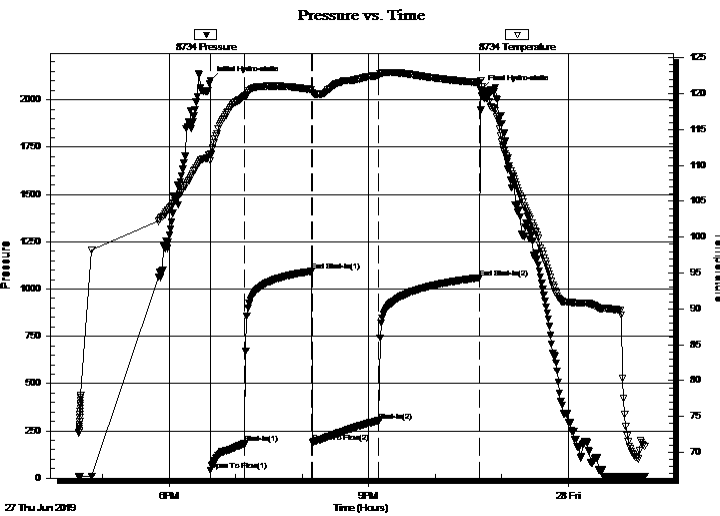
Formation: **LKC " H "**  
 Deviated: No Whipstock: ft (KB)  
 Test Type: Conventional Bottom Hole (Reset)  
 Time Tool Opened: 18:37:10  
 Tester: Martine Salinas  
 Time Test Ended: 01:09:20  
 Unit No: 82  
 Interval: **4146.00 ft (KB) To 4180.00 ft (KB) (TVD)**  
 Reference Elevations: 3018.00 ft (KB)  
 Total Depth: 4180.00 ft (KB) (TVD)  
 3007.00 ft (CF)  
 Hole Diameter: 7.88 inches  
 Hole Condition: Good  
 KB to GR/CF: 11.00 ft

**Serial #: 8734**

**Outside**

Press@RunDepth: 302.42 psig @ 4147.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2019.06.27 End Date: 2019.06.28 Last Calib.: 2019.06.28  
 Start Time: 16:38:01 End Time: 01:09:20 Time On Btm: 2019.06.27 @ 18:37:00  
 Time Off Btm: 2019.06.27 @ 22:41:09

**TEST COMMENT:** 30-IF-BOB (11 inches) @ 6 mins (blow increased to 50")  
 60-ISI-Surface blow back built to 10" @ 26 mins & decreased to 8"  
 60-FF-BOB (11 inches) @ 8 mins (blow increased to 79 1/4")  
 90-FSI-Surface blow back built to 4 3/4" @ 26 mins & decreased to 1 1/2"



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2102.26	111.56	Initial Hydro-static
1	39.49	110.62	Open To Flow (1)
31	181.79	119.64	Shut-In(1)
92	1093.66	120.56	End Shut-In(1)
92	191.09	120.17	Open To Flow (2)
152	302.42	122.51	Shut-In(2)
244	1059.81	121.54	End Shut-In(2)
245	2055.35	121.79	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
499.00	GMCO 28%G, 10%M, 62%O	4.50
280.00	CGO 16%G, 84%O	3.93
0.00	980' GIP	0.00

\* Recovery from multiple tests

## Gas Rates

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







**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co Inc

**5-13S-32W Logan,KS**

250 N. Water STE 300  
Wichita, KS 67202

**Vanava #4-5**

Job Ticket: 64356

**DST#: 3**

ATTN: Tom Funk

Test Start: 2019.06.27 @ 16:38:00

## Tool Information

Drill Pipe:	Length: 3857.00 ft	Diameter: 3.80 inches	Volume: 54.10 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 274.00 ft	Diameter: 2.25 inches	Volume: 1.35 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 55.45 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	13.00 ft			String Weight: Initial 70000.00 lb
Depth to Top Packer:	4146.00 ft			Final 72000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	34.00 ft			
Tool Length:	62.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

## Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			4119.00	
Shut In Tool	5.00			4124.00	
Hydraulic tool	5.00	1113		4129.00	
Jars	5.00	01-07		4134.00	
Safety Joint	3.00	-001		4137.00	
Packer	5.00			4142.00	28.00 Bottom Of Top Packer
Packer	4.00			4146.00	
Stubb	1.00			4147.00	
Recorder	0.00	8959	Inside	4147.00	
Recorder	0.00	8734	Outside	4147.00	
Perforations	28.00			4175.00	
Bullnose	5.00			4180.00	34.00 Bottom Packers & Anchor

**Total Tool Length: 62.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co Inc

**5-13S-32W Logan,KS**

250 N. Water STE 300  
Wichita, KS 67202

**Vanava #4-5**

Job Ticket: 64356

**DST#: 3**

ATTN: Tom Funk

Test Start: 2019.06.27 @ 16:38:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

36.8 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 58.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.98 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 4200.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
499.00	GMCO 28%G, 10%M, 62%O	4.504
280.00	CGO 16%G, 84%O	3.928
0.00	980' GIP	0.000

Total Length: 779.00 ft      Total Volume: 8.432 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

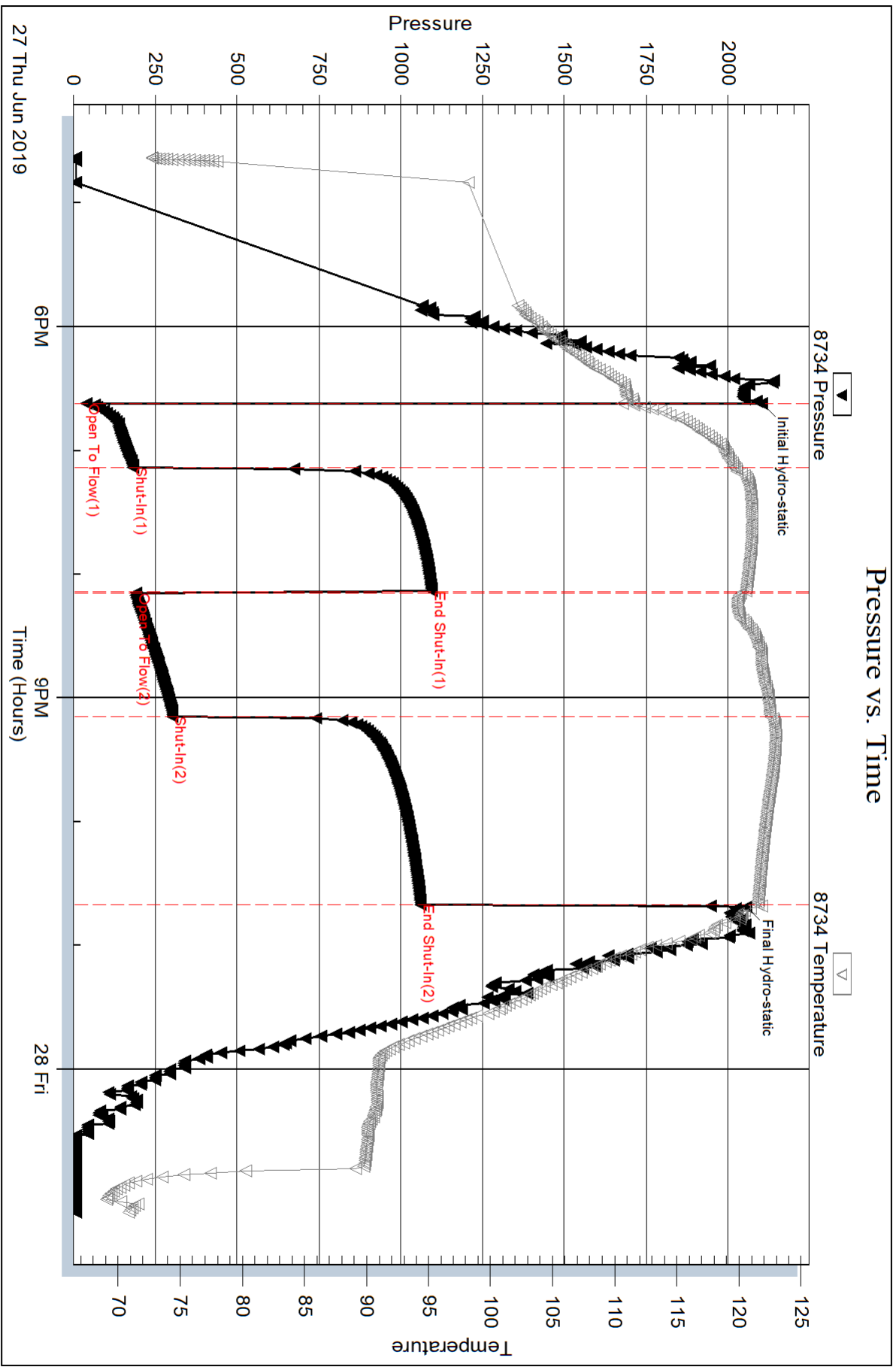
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: Gravity of oil = 38 @ 72 degs

Gravity corrected to 36.8 @ 60 degs



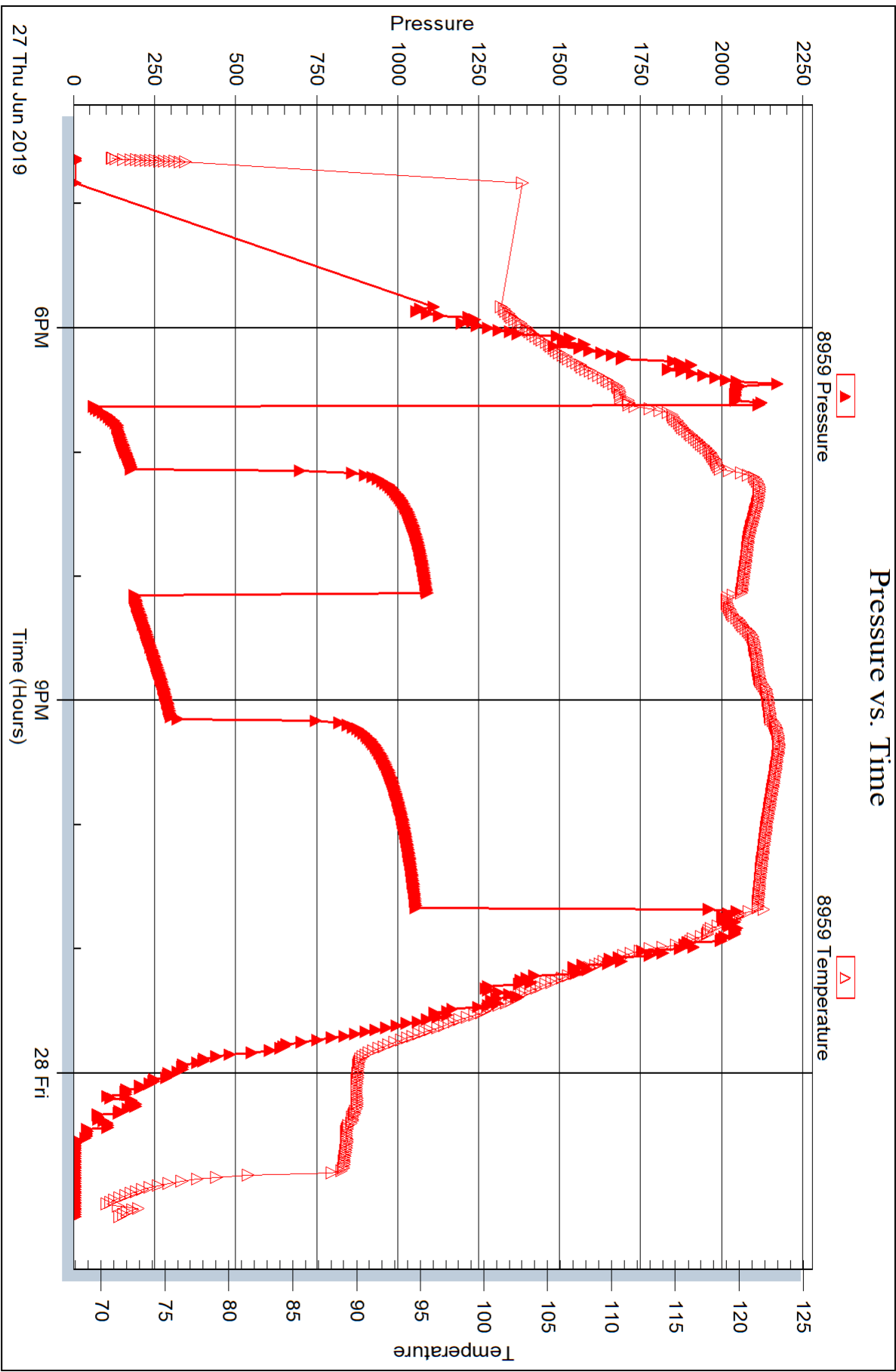
Serial #: 8959

Inside

Murfin Drilling Co Inc

Vanava #4-5

DST Test Number: 3





## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N. Water STE 300  
Wichita, KS 67202

ATTN: Tom Funk

### **Vanava #4-5**

### **5-13S-32W Logan,KS**

Start Date: 2019.06.28 @ 11:05:00

End Date: 2019.06.28 @ 19:27:39

Job Ticket #: 64358                      DST #: 4

Trilobite Testing, Inc  
1515 Commerce Parkway Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2019.07.03 @ 13:59:26



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling Co Inc  
 250 N. Water STE 300  
 Wichita, KS 67202  
 ATTN: Tom Funk

**5-13S-32W Logan,KS**

**Vanava #4-5**

Job Ticket: 64358

**DST#: 4**

Test Start: 2019.06.28 @ 11:05:00

## GENERAL INFORMATION:

Formation: **LKC "I - J"**  
 Deviated: No Whipstock: ft (KB)  
 Test Type: Conventional Bottom Hole (Reset)  
 Time Tool Opened: 12:41:20 Tester: Martine Salinas  
 Time Test Ended: 19:27:39 Unit No: 82  
 Interval: **4174.00 ft (KB) To 4235.00 ft (KB) (TVD)** Reference Elevations: 3018.00 ft (KB)  
 Total Depth: 4235.00 ft (KB) (TVD) 3007.00 ft (CF)  
 Hole Diameter: 7.88 inches Hole Condition: Good KB to GR/CF: 11.00 ft

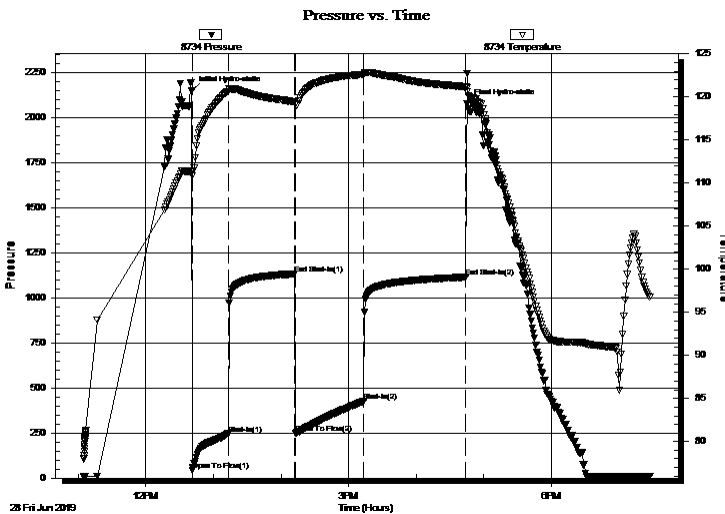
## Serial #: 8734

**Outside**

Press@RunDepth: 425.90 psig @ 4175.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2019.06.28 End Date: 2019.06.28 Last Calib.: 2019.06.28  
 Start Time: 11:05:01 End Time: 19:27:40 Time On Btm: 2019.06.28 @ 12:41:00  
 Time Off Btm: 2019.06.28 @ 16:45:09

**TEST COMMENT:** 30-IF-BOB (11 inches) @ 8 mins (blow increased to 30 3/4")  
 60-ISI-No blow back  
 60-FF-BOB (11 inches) @ 12 mins (blow increased to 44 1/2")  
 90-FSI-Surface blow back @ 5 mins built to 2"

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2151.47	111.42	Initial Hydro-static
1	43.92	110.84	Open To Flow (1)
32	245.90	120.61	Shut-In(1)
92	1134.01	119.41	End Shut-In(1)
92	247.55	119.10	Open To Flow (2)
153	425.90	122.62	Shut-In(2)
243	1115.98	121.23	End Shut-In(2)
245	2078.07	120.64	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
275.00	SMOCW 5%M, 8%O, 87%W	1.36
600.00	GSOMCW 18%G, 10%O, 19%M, 53%W	8.42
65.00	GSMWO 7%G, 8%M, 17%W, 68%O	0.91
10.00	CO 100%O	0.14
0.00	180' GIP	0.00

\* Recovery from multiple tests

## Gas Rates

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







**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co Inc

**5-13S-32W Logan,KS**

250 N. Water STE 300  
Wichita, KS 67202

**Vanava #4-5**

Job Ticket: 64358

**DST#: 4**

ATTN: Tom Funk

Test Start: 2019.06.28 @ 11:05:00

## Tool Information

Drill Pipe:	Length: 3890.00 ft	Diameter: 3.80 inches	Volume: 54.57 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 274.00 ft	Diameter: 2.25 inches	Volume: 1.35 bbl	Weight to Pull Loose: 88000.00 lb
			<u>Total Volume: 55.92 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	18.00 ft			String Weight: Initial 73000.00 lb
Depth to Top Packer:	4174.00 ft			Final 77000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	61.00 ft			
Tool Length:	89.00 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			4151.00	
Hydraulic tool	5.00	1113		4156.00	
Jars	5.00	01-07		4161.00	
Safety Joint	3.00	-001		4164.00	
Packer	5.00			4169.00	28.00 Bottom Of Top Packer
Packer	5.00			4174.00	
Stubb	1.00			4175.00	
Recorder	0.00	8959	Inside	4175.00	
Recorder	0.00	8734	Outside	4175.00	
Perforations	21.00			4196.00	
Change Over Sub	1.00			4197.00	
Drill Pipe	32.00			4229.00	
Change Over Sub	1.00			4230.00	
Bullnose	5.00			4235.00	61.00 Bottom Packers & Anchor

**Total Tool Length: 89.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co Inc

**5-13S-32W Logan,KS**

250 N. Water STE 300  
Wichita, KS 67202

**Vanava #4-5**

Job Ticket: 64358

**DST#: 4**

ATTN: Tom Funk

Test Start: 2019.06.28 @ 11:05:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

32.4 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

63000 ppm

Viscosity: 54.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.29 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 5000.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
275.00	SMOCW 5%M, 8%O, 87%W	1.362
600.00	GSOMCW 18%G, 10%O, 19%M, 53%W	8.416
65.00	GSMWO 7%G, 8%M, 17%W, 68%O	0.912
10.00	CO 100%O	0.140
0.00	180' GIP	0.000

Total Length: 950.00 ft      Total Volume: 10.830 bbl

Num Fluid Samples: 0

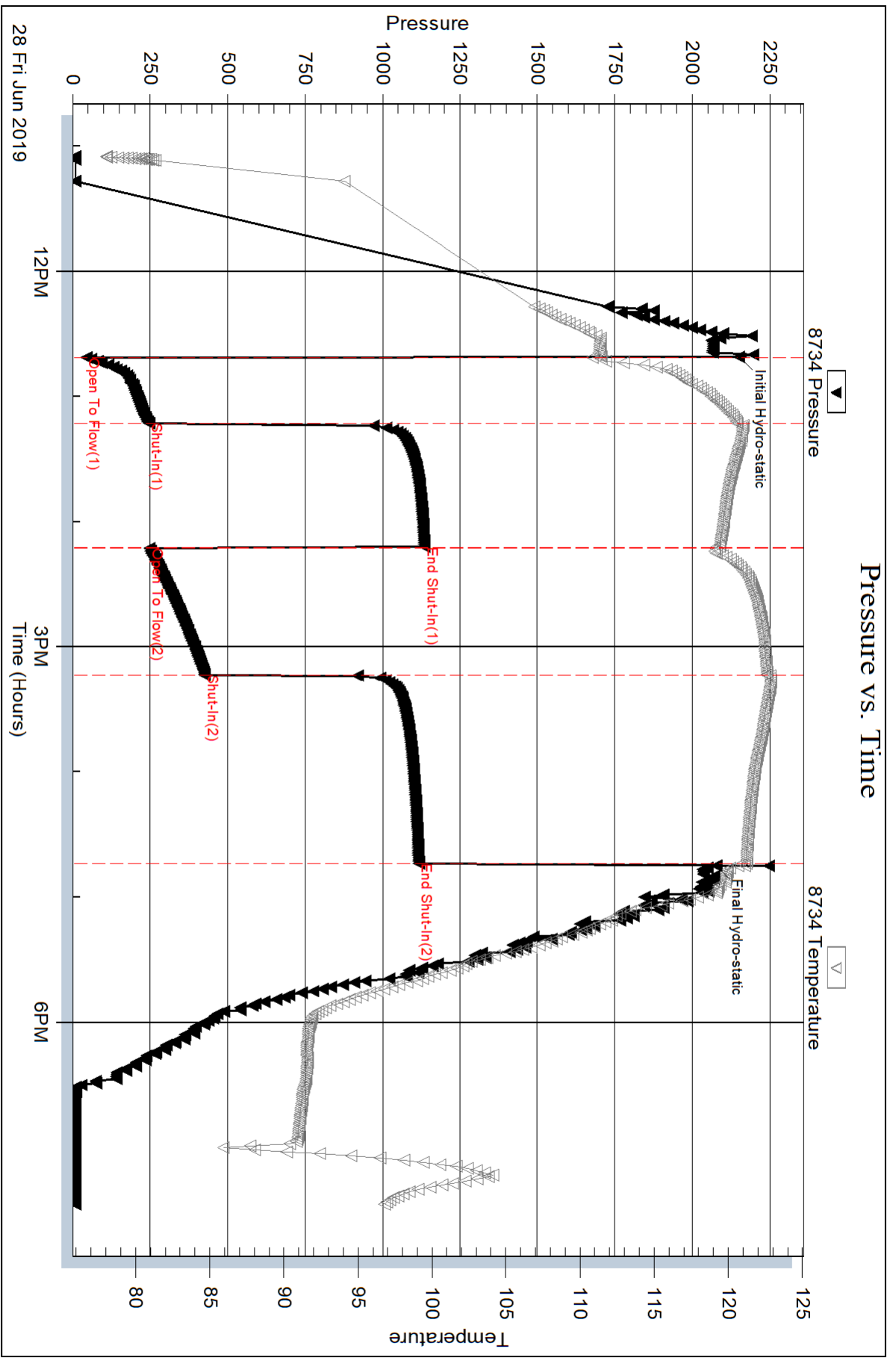
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: Gravity of oil = 36.6 @ 102 degs corrected to 32.4 @ 60 degs  
RW = .090 @ 96 degs = 63,000 PPM



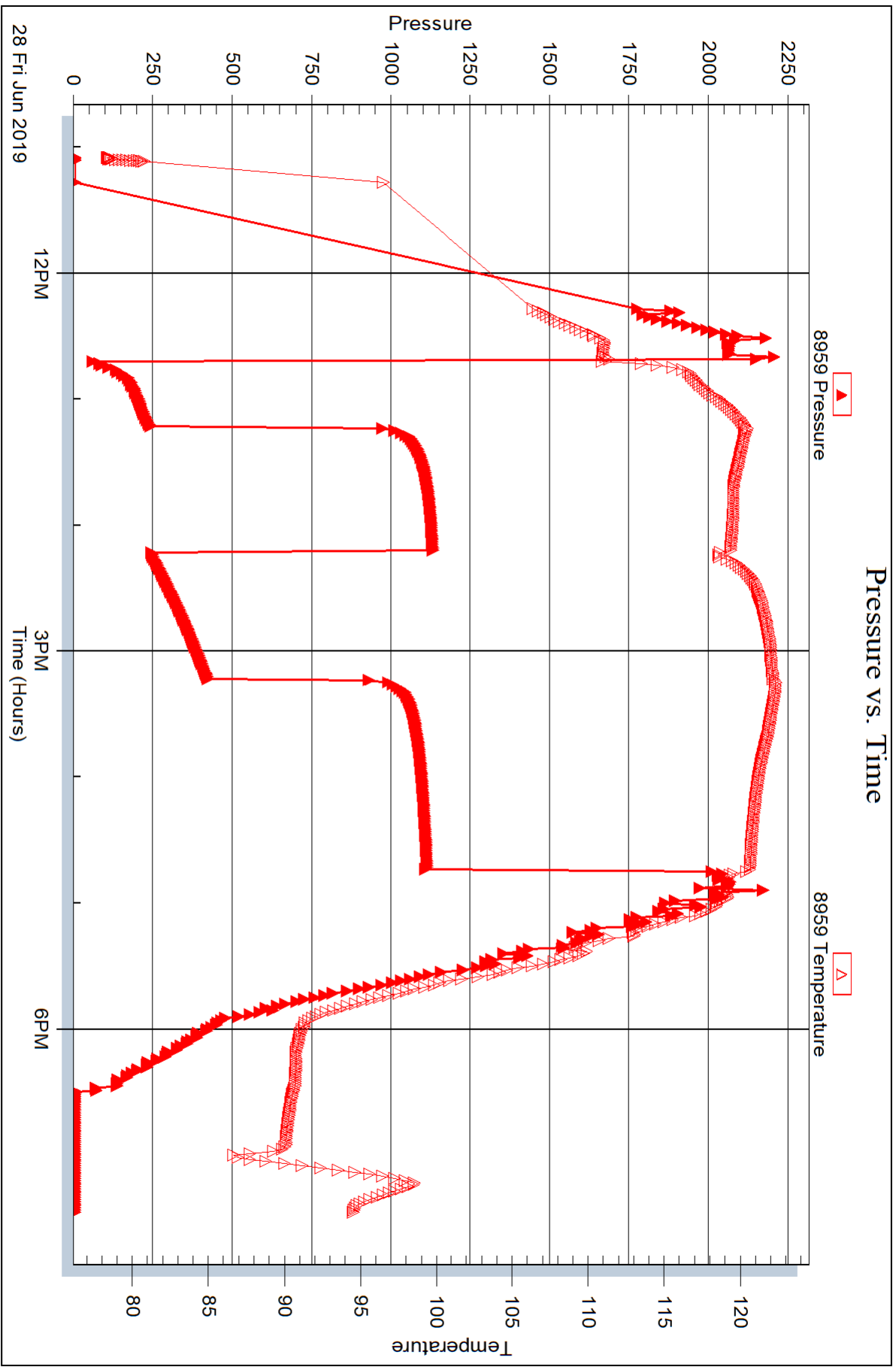
Serial #: 8959

Inside

Murfin Drilling Co Inc

Vanava #4-5

DST Test Number: 4



Triobite Testing, Inc

Ref. No: 64358

Printed: 2019.07.03 @ 13:59:27



## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N. Water STE 300  
Wichita, KS 67202

ATTN: Tom Funk

### **Vanava #4-5**

### **5-13S-32W Logan,KS**

Start Date: 2019.06.29 @ 15:47:00

End Date: 2019.06.30 @ 00:21:40

Job Ticket #: 64359                      DST #: 5

Trilobite Testing, Inc  
1515 Commerce Parkway Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2019.07.03 @ 13:59:01



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling Co Inc  
250 N. Water STE 300  
Wichita, KS 67202  
ATTN: Tom Funk

**5-13S-32W Logan,KS**

**Vanava #4-5**

Job Ticket: 64359

**DST#: 5**

Test Start: 2019.06.29 @ 15:47:00

## GENERAL INFORMATION:

Formation: **Altamont**  
 Deviated: No Whipstock: ft (KB)  
 Test Type: Conventional Bottom Hole (Reset)  
 Time Tool Opened: 17:58:50  
 Tester: Martine Salinas  
 Time Test Ended: 00:21:40  
 Unit No: 82  
 Interval: **4337.00 ft (KB) To 4420.00 ft (KB) (TVD)**  
 Reference Elevations: 3018.00 ft (KB)  
 Total Depth: 4420.00 ft (KB) (TVD)  
 3007.00 ft (CF)  
 Hole Diameter: 7.88 inches  
 Hole Condition: Good  
 KB to GR/CF: 11.00 ft

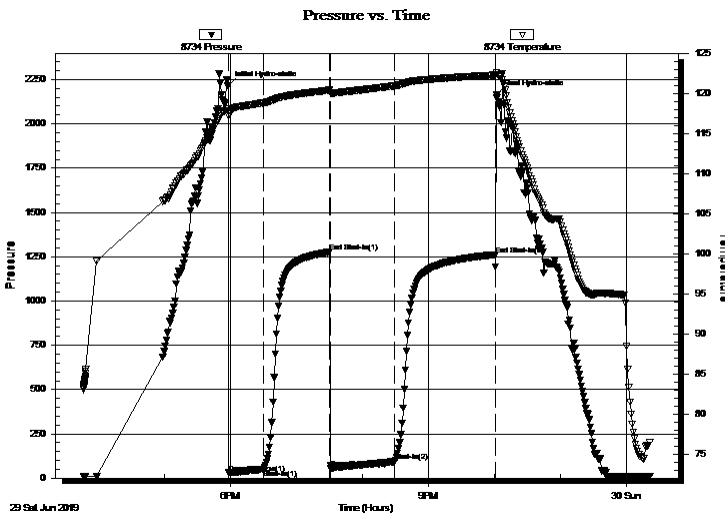
## Serial #: 8734

**Outside**

Press@RunDepth: 93.30 psig @ 4338.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2019.06.29 End Date: 2019.06.30 Last Calib.: 2019.06.30  
 Start Time: 15:47:01 End Time: 00:21:40 Time On Btm: 2019.06.29 @ 17:58:40  
 Time Off Btm: 2019.06.29 @ 22:02:09

**TEST COMMENT:** 30-IF-Surface blow built to 9 1/4"  
 60-ISI-Surface blow back dead @ 5 mins  
 60-FF-BOB (11 inches) @ 37 mins (blow increased to 15")  
 90-FSI-Surface blow back built to 3/4" @ 30 mins & decreased to surface blow

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2215.57	118.05	Initial Hydro-static
1	29.50	117.22	Open To Flow (1)
32	50.17	118.81	Shut-In(1)
92	1276.05	120.38	End Shut-In(1)
93	56.84	119.99	Open To Flow (2)
151	93.30	120.94	Shut-In(2)
243	1261.20	122.26	End Shut-In(2)
244	2166.15	122.58	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
40.00	GHOCM 30%G, 30%O, 40%M	0.20
100.00	CGO 40%G, 60%O	0.49
0.00	210' GIP	0.00

\* Recovery from multiple tests

## Gas Rates

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



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling Co Inc

**5-13S-32W Logan,KS**

250 N. Water STE 300  
Wichita, KS 67202

**Vanava #4-5**

Job Ticket: 64359

**DST#: 5**

ATTN: Tom Funk

Test Start: 2019.06.29 @ 15:47:00

## GENERAL INFORMATION:

Formation: **Altamont**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 17:58:50

Time Test Ended: 00:21:40

Test Type: Conventional Bottom Hole (Reset)

Tester: Martine Salinas

Unit No: 82

**Interval: 4337.00 ft (KB) To 4420.00 ft (KB) (TVD)**

Reference Elevations: 3018.00 ft (KB)

Total Depth: 4420.00 ft (KB) (TVD)

3007.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 11.00 ft

**Serial #: 8959**

**Inside**

Press@RunDepth: psig @ 4338.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.06.29

End Date:

2019.06.30

Last Calib.:

2019.06.30

Start Time:

15:47:01

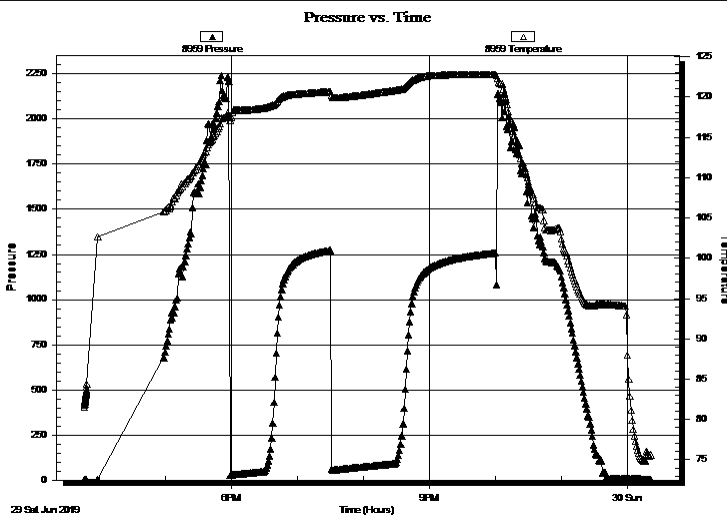
End Time:

00:21:30

Time On Btm:

Time Off Btm:

**TEST COMMENT:** 30-IF-Surface blow built to 9 1/4"  
60-ISI-Surface blow back dead @ 5 mins  
60-FF-BOB (11 inches) @ 37 mins (blow increased to 15")  
90-FSI-Surface blow back built to 3/4" @ 30 mins & decreased to surface blow



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation

## Recovery

Length (ft)	Description	Volume (bbl)
40.00	GHOCM 30%G, 30%O, 40%M	0.20
100.00	CGO 40%G, 60%O	0.49
0.00	210' GIP	0.00

## Gas Rates

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

\* Recovery from multiple tests



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co Inc

**5-13S-32W Logan,KS**

250 N. Water STE 300  
Wichita, KS 67202

**Vanava #4-5**

Job Ticket: 64359

**DST#: 5**

ATTN: Tom Funk

Test Start: 2019.06.29 @ 15:47:00

## Tool Information

Drill Pipe:	Length: 4048.00 ft	Diameter: 3.80 inches	Volume: 56.78 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 274.00 ft	Diameter: 2.25 inches	Volume: 1.35 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 58.13 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	13.00 ft			String Weight: Initial 73000.00 lb
Depth to Top Packer:	4337.00 ft			Final 73000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	83.00 ft			
Tool Length:	111.00 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			4314.00	
Hydraulic tool	5.00	1113		4319.00	
Jars	5.00	01-07		4324.00	
Safety Joint	3.00	-001		4327.00	
Packer	5.00			4332.00	28.00 Bottom Of Top Packer
Packer	5.00			4337.00	
Stubb	1.00			4338.00	
Recorder	0.00	8959	Inside	4338.00	
Recorder	0.00	8734	Outside	4338.00	
Perforations	11.00			4349.00	
Change Over Sub	1.00			4350.00	
Drill Pipe	64.00			4414.00	
Change Over Sub	1.00			4415.00	
Bullnose	5.00			4420.00	83.00 Bottom Packers & Anchor

**Total Tool Length: 111.00**





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co Inc

**5-13S-32W Logan,KS**

250 N. Water STE 300  
Wichita, KS 67202

**Vanava #4-5**

Job Ticket: 64359

**DST#: 5**

ATTN: Tom Funk

Test Start: 2019.06.29 @ 15:47:00

## Mud and Cushion Information

Mud Type: Gel Chem  
Mud Weight: 9.00 lb/gal  
Viscosity: 56.00 sec/qt  
Water Loss: 5.99 in<sup>3</sup>  
Resistivity: ohm.m  
Salinity: 4500.00 ppm  
Filter Cake: 2.00 inches

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

Oil API: 25 deg API  
Water Salinity: ppm

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
40.00	GHOCM 30%G, 30%O, 40%M	0.197
100.00	CGO 40%G, 60%O	0.492
0.00	210' GIP	0.000

Total Length: 140.00 ft      Total Volume: 0.689 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

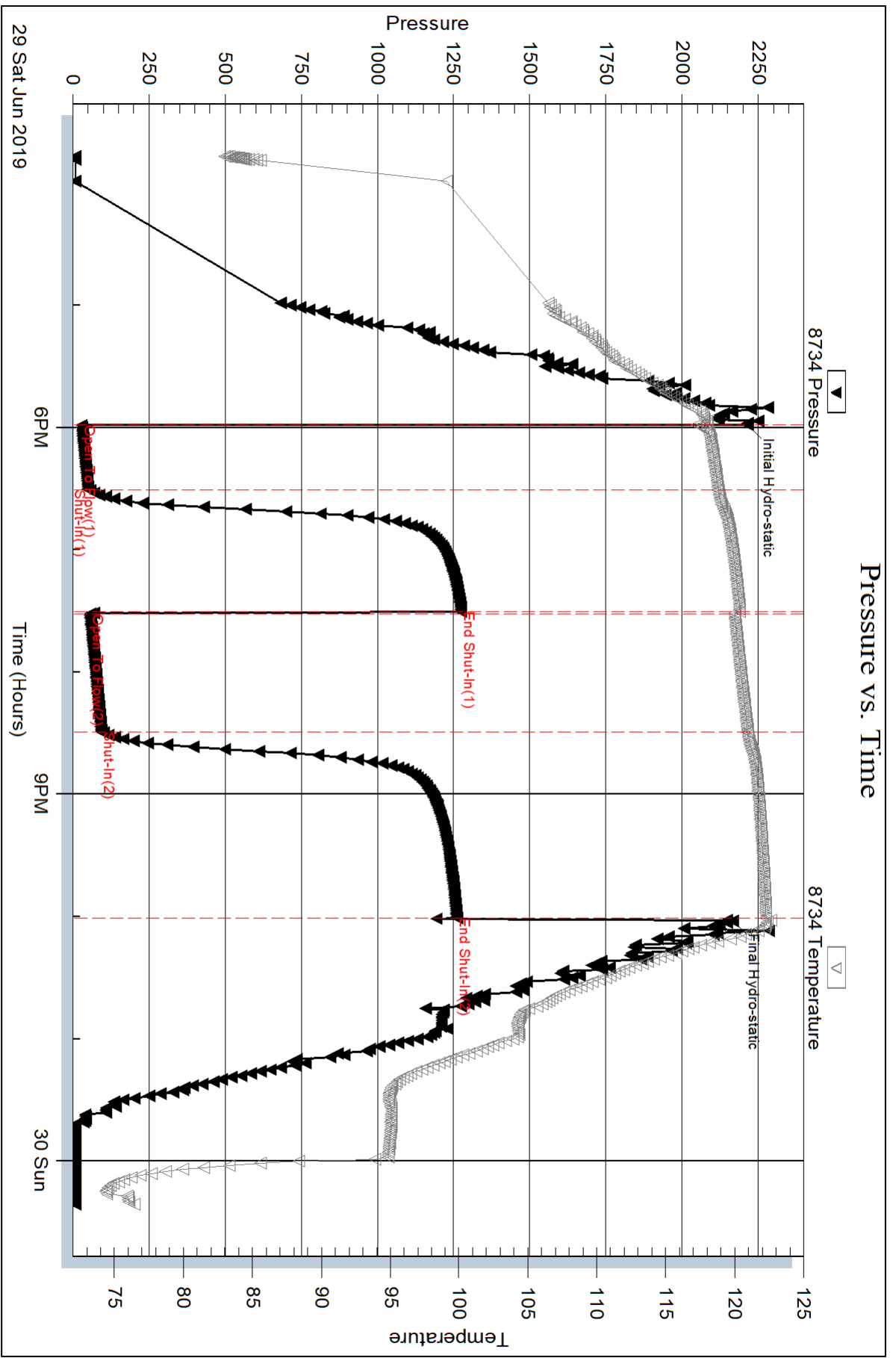
Recovery Comments: Gravity of oil = 27 @ 80 degs  
Gravity of oil corrected to 25 @ 60 degs

Serial #: 8734

Outside Murfin Drilling Co Inc

Vanava #4-5

DST Test Number: 5



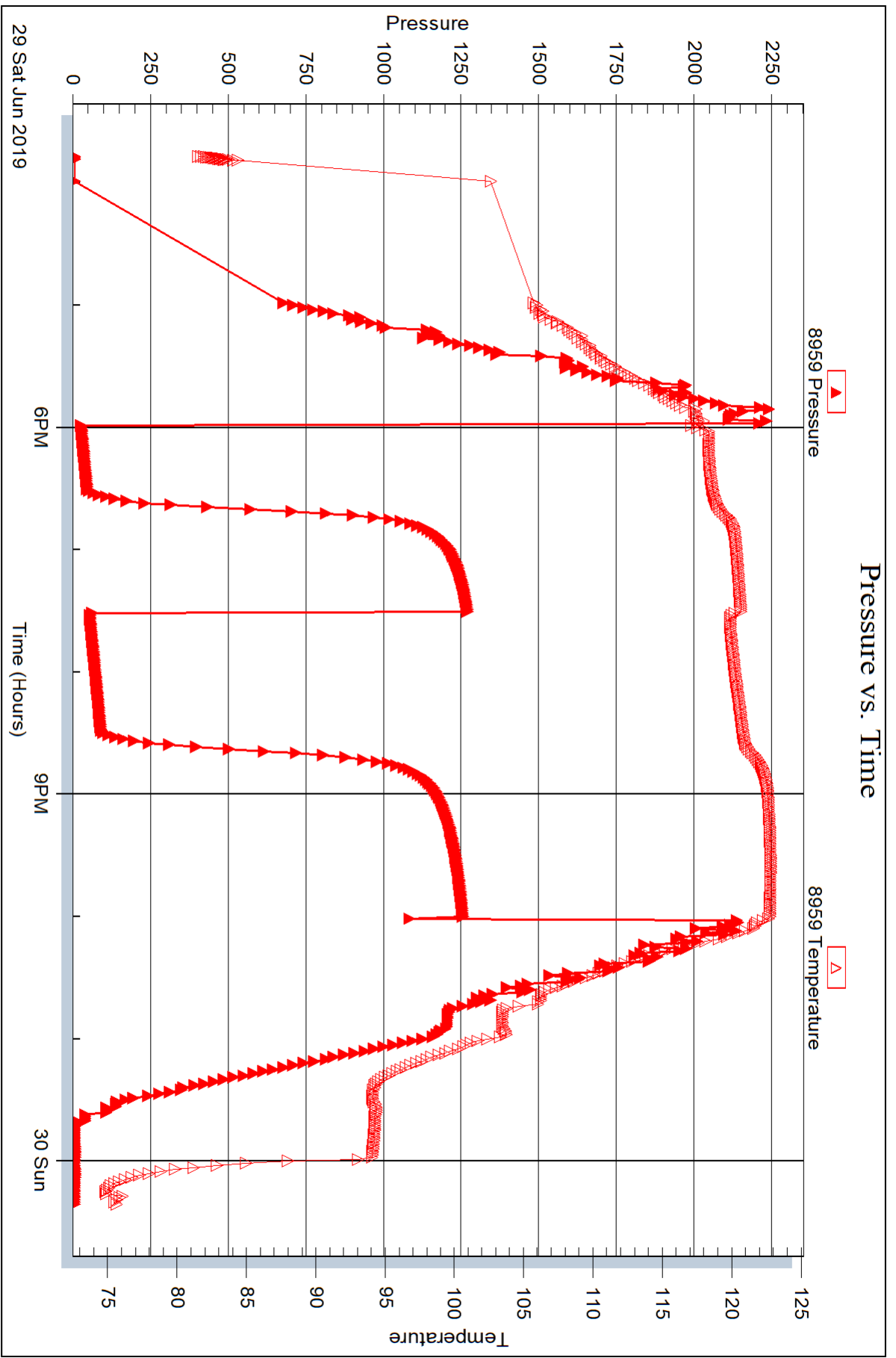
Serial #: 8959

Inside

Murfin Drilling Co Inc

Vanava #4-5

DST Test Number: 5



Trilobite Testing, Inc

Ref. No: 64359

Printed: 2019.07.03 @ 13:59:02



## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N. Water STE 300  
Wichita, KS 67202

ATTN: Tom Funk

### **Vanava #4-5**

### **5-13S-32W Logan,KS**

Start Date: 2019.06.30 @ 12:23:00

End Date: 2019.06.30 @ 20:25:30

Job Ticket #: 64360                      DST #: 6

Trilobite Testing, Inc  
1515 Commerce Parkway Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2019.07.03 @ 13:55:56



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling Co Inc  
 250 N. Water STE 300  
 Wichita, KS 67202  
 ATTN: Tom Funk

**5-13S-32W Logan,KS**

**Vanava #4-5**

Job Ticket: 64360

**DST#: 6**

Test Start: 2019.06.30 @ 12:23:00

## GENERAL INFORMATION:

Formation: **" Pawnee - Ft. Scott**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 14:02:50

Time Test Ended: 20:25:30

Test Type: Conventional Bottom Hole (Reset)

Tester: Martine Salinas

Unit No: 82

**Interval: 4428.00 ft (KB) To 4510.00 ft (KB) (TVD)**

Total Depth: 4510.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Good

Reference Elevations: 3018.00 ft (KB)

3007.00 ft (CF)

KB to GR/CF: 11.00 ft

**Serial #: 8734 Outside**

Press@RunDepth: 579.31 psig @ 4429.00 ft (KB)

Start Date: 2019.06.30

End Date: 2019.06.30

Start Time: 12:23:01

End Time: 20:25:30

Capacity: 8000.00 psig

Last Calib.: 2019.06.30

Time On Btm: 2019.06.30 @ 14:02:40

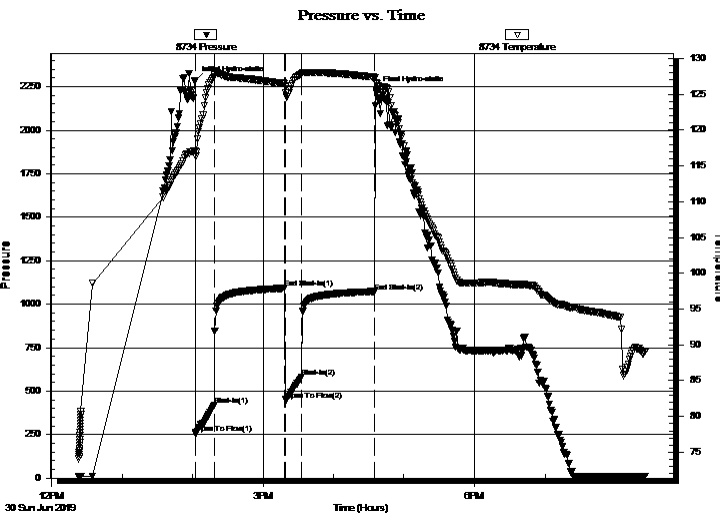
Time Off Btm: 2019.06.30 @ 16:36:40

**TEST COMMENT:** 15-IF-BOB (11 inches) @ 1 mins 45 secs (blow increased to 136 1/2")

60-ISI-BOB (11 inches) @ 4 mins (blow increased to 144")

15-FF-BOB (11 inches) @ 1 1/2 mins (blow increased to 82 1/2")

60-FSI-BOB (11 inches) @ 5 mins (blow increased to 119 1/2")



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2285.97	117.11	Initial Hydro-static
1	255.74	116.34	Open To Flow (1)
16	420.02	127.49	Shut-In(1)
76	1090.96	126.49	End Shut-In(1)
77	449.97	125.14	Open To Flow (2)
91	579.31	127.80	Shut-In(2)
153	1072.78	127.36	End Shut-In(2)
154	2226.75	126.63	Final Hydro-static

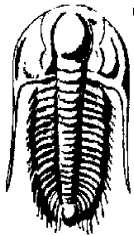
## Recovery

Length (ft)	Description	Volume (bbl)
123.00	GMCO 43%G, 22%M, 35%O	0.60
1289.00	10-30 MINS GMCO 49%G,9%M,42%O	16.71
0.00	0-10 MINS CGO 31%G, 69%O REVERSE	0.00
0.00	2690' GIP	0.00

\* Recovery from multiple tests

## Gas Rates

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



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling Co Inc  
 250 N. Water STE 300  
 Wichita, KS 67202  
 ATTN: Tom Funk

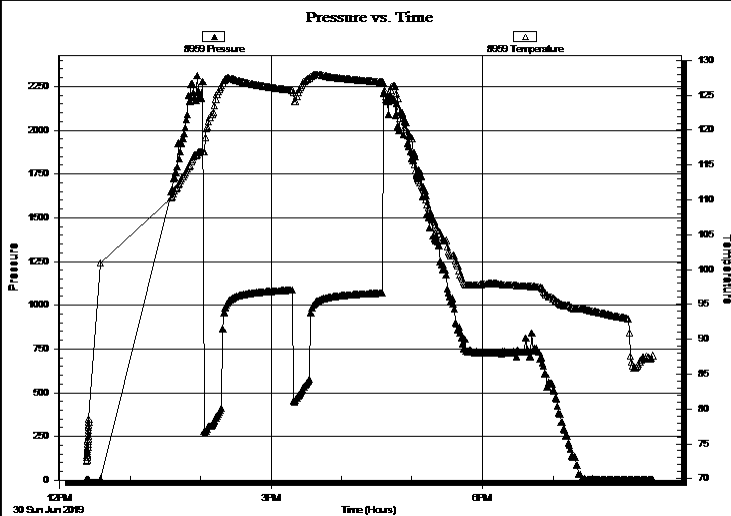
**5-13S-32W Logan,KS**  
**Vanava #4-5**  
 Job Ticket: 64360      **DST#: 6**  
 Test Start: 2019.06.30 @ 12:23:00

## GENERAL INFORMATION:

Formation: **" Pawnee - Ft. Scott**  
 Deviated: No Whipstock: ft (KB) Test Type: Conventional Bottom Hole (Reset)  
 Time Tool Opened: 14:02:50 Tester: Martine Salinas  
 Time Test Ended: 20:25:30 Unit No: 82  
**Interval: 4428.00 ft (KB) To 4510.00 ft (KB) (TVD)** Reference Elevations: 3018.00 ft (KB)  
 Total Depth: 4510.00 ft (KB) (TVD) 3007.00 ft (CF)  
 Hole Diameter: 7.88 inches Hole Condition: Good KB to GR/CF: 11.00 ft

**Serial #: 8959 Inside**  
 Press@RunDepth: psig @ 4429.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2019.06.30 End Date: 2019.06.30 Last Calib.: 2019.06.30  
 Start Time: 12:23:01 End Time: 20:25:20 Time On Btm:  
 Time Off Btm:

**TEST COMMENT:** 15-IF-BOB (11 inches) @ 1 mins 45 secs (blow increased to 136 1/2")  
 60-ISI-BOB (11 inches) @ 4 mins (blow increased to 144")  
 15-FF-BOB (11 inches) @ 1 1/2 mins (blow increased to 82 1/2")  
 60-FSI-BOB (11 inches) @ 5 mins (blow increased to 119 1/2")



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation

## Recovery

Length (ft)	Description	Volume (bbl)
123.00	GMCO 43%G, 22%M, 35%O	0.60
1289.00	10-30 MINS GMCO 49%G,9%M,42%O	16.71
0.00	0-10 MINS CGO 31%G, 69%O REVERSE	0.00
0.00	2690' GIP	0.00

## Gas Rates

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

\* Recovery from multiple tests



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co Inc

**5-13S-32W Logan,KS**

250 N. Water STE 300  
Wichita, KS 67202

**Vanava #4-5**

Job Ticket: 64360

**DST#: 6**

ATTN: Tom Funk

Test Start: 2019.06.30 @ 12:23:00

## Tool Information

Drill Pipe:	Length: 4144.00 ft	Diameter: 3.80 inches	Volume: 58.13 bbl	Tool Weight:	2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length: 274.00 ft	Diameter: 2.25 inches	Volume: 1.35 bbl	Weight to Pull Loose:	80000.00 lb
			<u>Total Volume: 59.48 bbl</u>	Tool Chased	0.00 ft
Drill Pipe Above KB:	18.00 ft			String Weight: Initial	75000.00 lb
Depth to Top Packer:	4428.00 ft			Final	80000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	82.00 ft				
Tool Length:	110.00 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			4405.00	
Hydraulic tool	5.00	1113		4410.00	
Jars	5.00	01-07		4415.00	
Safety Joint	3.00	-001		4418.00	
Packer	5.00			4423.00	28.00 Bottom Of Top Packer
Packer	5.00			4428.00	
Stubb	1.00			4429.00	
Recorder	0.00	8959	Inside	4429.00	
Recorder	0.00	8734	Outside	4429.00	
Perforations	10.00			4439.00	
Change Over Sub	1.00			4440.00	
Drill Pipe	64.00			4504.00	
Change Over Sub	1.00			4505.00	
Bullnose	5.00			4510.00	82.00 Bottom Packers & Anchor

**Total Tool Length: 110.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co Inc

**5-13S-32W Logan,KS**

250 N. Water STE 300  
Wichita, KS 67202

**Vanava #4-5**

Job Ticket: 64360

**DST#: 6**

ATTN: Tom Funk

Test Start: 2019.06.30 @ 12:23:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

29 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 53.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.79 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 4400.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
123.00	GMCO 43%G, 22%M, 35%O	0.605
1289.00	10-30 MINS GMCO 49%G,9%M,42%O	16.706
0.00	0-10 MINS CGO 31%G, 69%O REVERSED	0.000
0.00	2690' GIP	0.000

Total Length: 1412.00 ft      Total Volume: 17.311 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: G.T.S. on the end of the FSI

Gravity of oil = 33 @ 100 degs corrected to 29.0 @ 60 degs

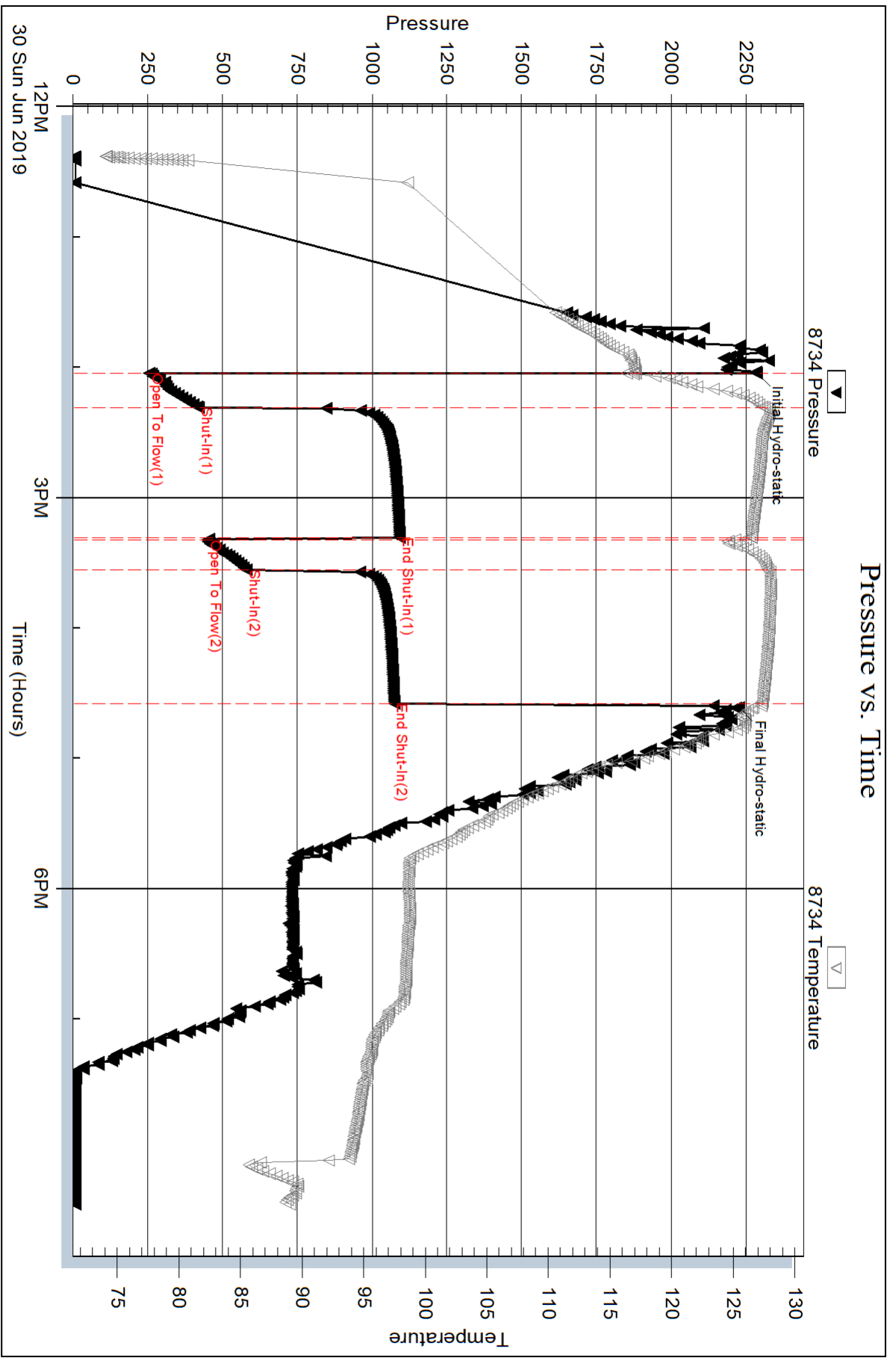


Serial #: 8734

Outside Murfin Drilling Co Inc

Vanava #4-5

DST Test Number: 6



Trilobite Testing, Inc

Ref. No: 64360

Printed: 2019.07.03 @ 13:55:57

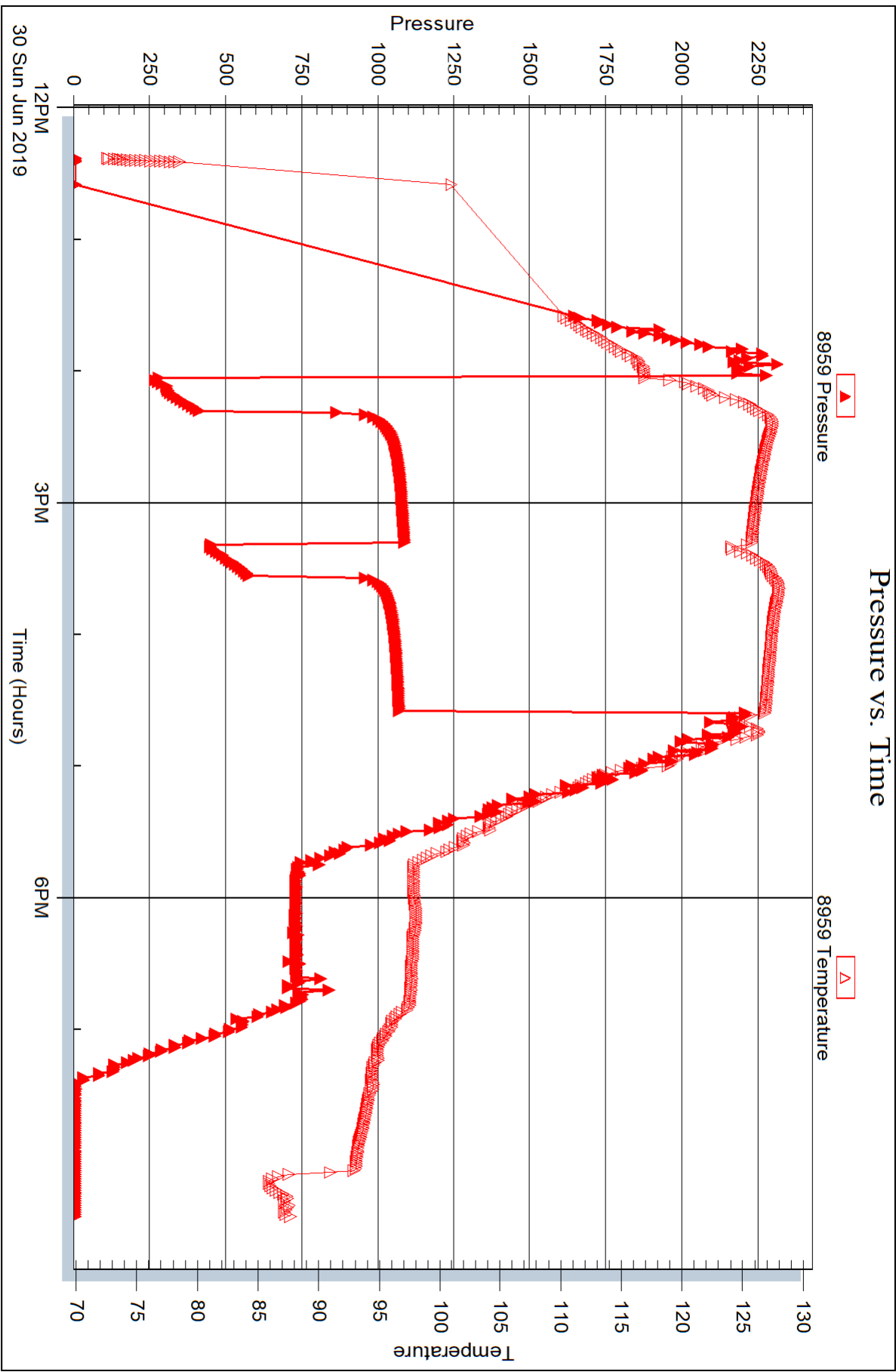
Serial #: 8959

Inside

Murfin Drilling Co Inc

Vanava #4-5

DST Test Number: 6





## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co INC**

250 N. Water STE 300  
Wichita, KS 67202

ATTN: Tom Funk

### **Vanava #4-5**

### **5-13S-32W Logan,KS**

Start Date: 2019.07.01 @ 18:20:00

End Date: 2019.07.02 @ 01:43:50

Job Ticket #: 64361                      DST #: 7

Trilobite Testing, Inc  
1515 Commerce Parkway Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2019.07.03 @ 13:55:09



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling Co INC  
 250 N. Water STE 300  
 Wichita, KS 67202  
 ATTN: Tom Funk

**5-13S-32W Logan,KS**

**Vanava #4-5**

Job Ticket: 64361

**DST#: 7**

Test Start: 2019.07.01 @ 18:20:00

## GENERAL INFORMATION:

Formation: **Johnson**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 20:25:40  
 Time Test Ended: 01:43:50  
 Interval: **4514.00 ft (KB) To 4585.00 ft (KB) (TVD)**  
 Total Depth: 4585.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Good  
 Test Type: Conventional Bottom Hole (Reset)  
 Tester: Martine Salinas  
 Unit No: 82  
 Reference Elevations: 3018.00 ft (KB)  
 3007.00 ft (CF)  
 KB to GR/CF: 11.00 ft

**Serial #: 8734**

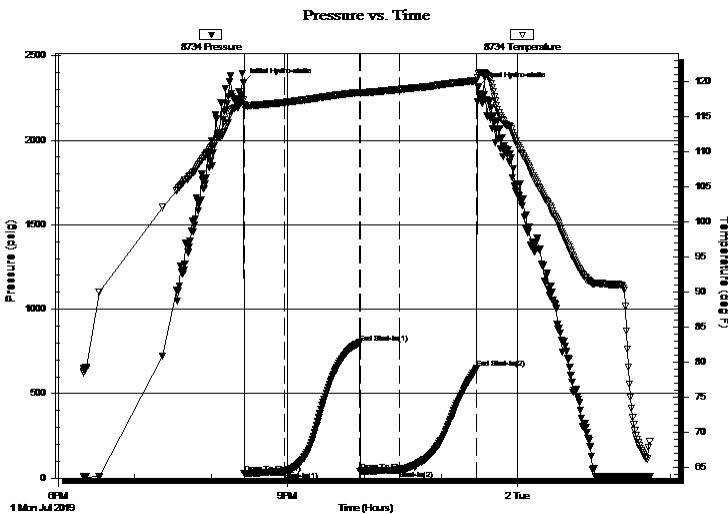
**Outside**

Press@RunDepth: 47.75 psig @ 4515.00 ft (KB)  
 Start Date: 2019.07.01 End Date: 2019.07.02  
 Start Time: 18:20:01 End Time: 01:43:50

Capacity: 8000.00 psig  
 Last Calib.: 2019.07.02  
 Time On Btm: 2019.07.01 @ 20:25:30  
 Time Off Btm: 2019.07.01 @ 23:29:09

**TEST COMMENT:** 30-IF- Weak surface blow built to 1/8"  
 60-ISI-No blow back  
 30-FF-No blow  
 60-FSI-No blow back

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2337.73	117.34	Initial Hydro-static
1	28.09	116.35	Open To Flow (1)
32	37.60	117.02	Shut-In(1)
91	802.36	118.45	End Shut-In(1)
91	42.17	118.35	Open To Flow (2)
123	47.75	118.88	Shut-In(2)
183	650.43	120.15	End Shut-In(2)
184	2318.95	121.08	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
15.00	GOCM 12%G, 13%O, 75%M	0.07
0.00	Hevy oil in tool	0.00

\* Recovery from multiple tests

## Gas Rates

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





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co INC

**5-13S-32W Logan,KS**

250 N. Water STE 300  
Wichita, KS 67202

**Vanava #4-5**

Job Ticket: 64361

**DST#: 7**

ATTN: Tom Funk

Test Start: 2019.07.01 @ 18:20:00

## Tool Information

Drill Pipe:	Length: 4239.00 ft	Diameter: 3.80 inches	Volume: 59.46 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 274.00 ft	Diameter: 2.25 inches	Volume: 1.35 bbl	Weight to Pull Loose: 90000.00 lb
			<u>Total Volume: 60.81 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	27.00 ft			String Weight: Initial 78000.00 lb
Depth to Top Packer:	4514.00 ft			Final 78000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	71.00 ft			
Tool Length:	99.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
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Shut In Tool	5.00			4491.00	
Hydraulic tool	5.00	1113		4496.00	
Jars	5.00	01-07		4501.00	
Safety Joint	3.00	-001		4504.00	
Packer	5.00			4509.00	28.00 Bottom Of Top Packer
Packer	5.00			4514.00	
Stubb	1.00			4515.00	
Recorder	0.00	8959	Inside	4515.00	
Recorder	0.00	8734	Outside	4515.00	
Perforations	31.00			4546.00	
Change Over Sub	1.00			4547.00	
Drill Pipe	32.00			4579.00	
Change Over Sub	1.00			4580.00	
Bullnose	5.00			4585.00	71.00 Bottom Packers & Anchor

**Total Tool Length: 99.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co INC

**5-13S-32W Logan,KS**

250 N. Water STE 300  
Wichita, KS 67202

**Vanava #4-5**

Job Ticket: 64361

**DST#: 7**

ATTN: Tom Funk

Test Start: 2019.07.01 @ 18:20:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 50.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.59 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 3900.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
15.00	GOCM 12%G, 13%O, 75%M	0.074
0.00	Hevy oil in tool	0.000

Total Length: 15.00 ft      Total Volume: 0.074 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

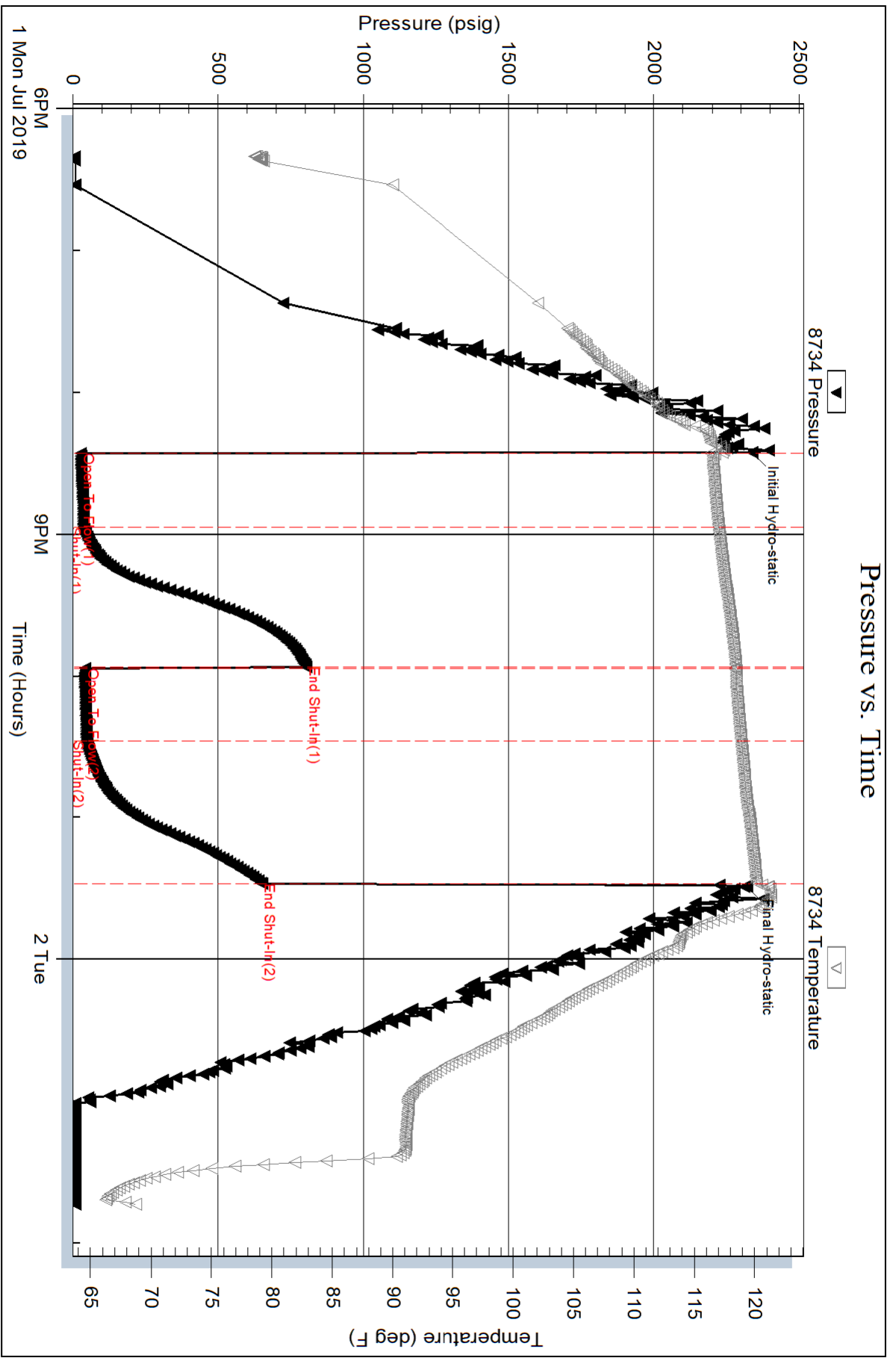
Recovery Comments:

Serial #: 8734

Outside Murfin Drilling Co INC

Vanava #4-5

DST Test Number: 7





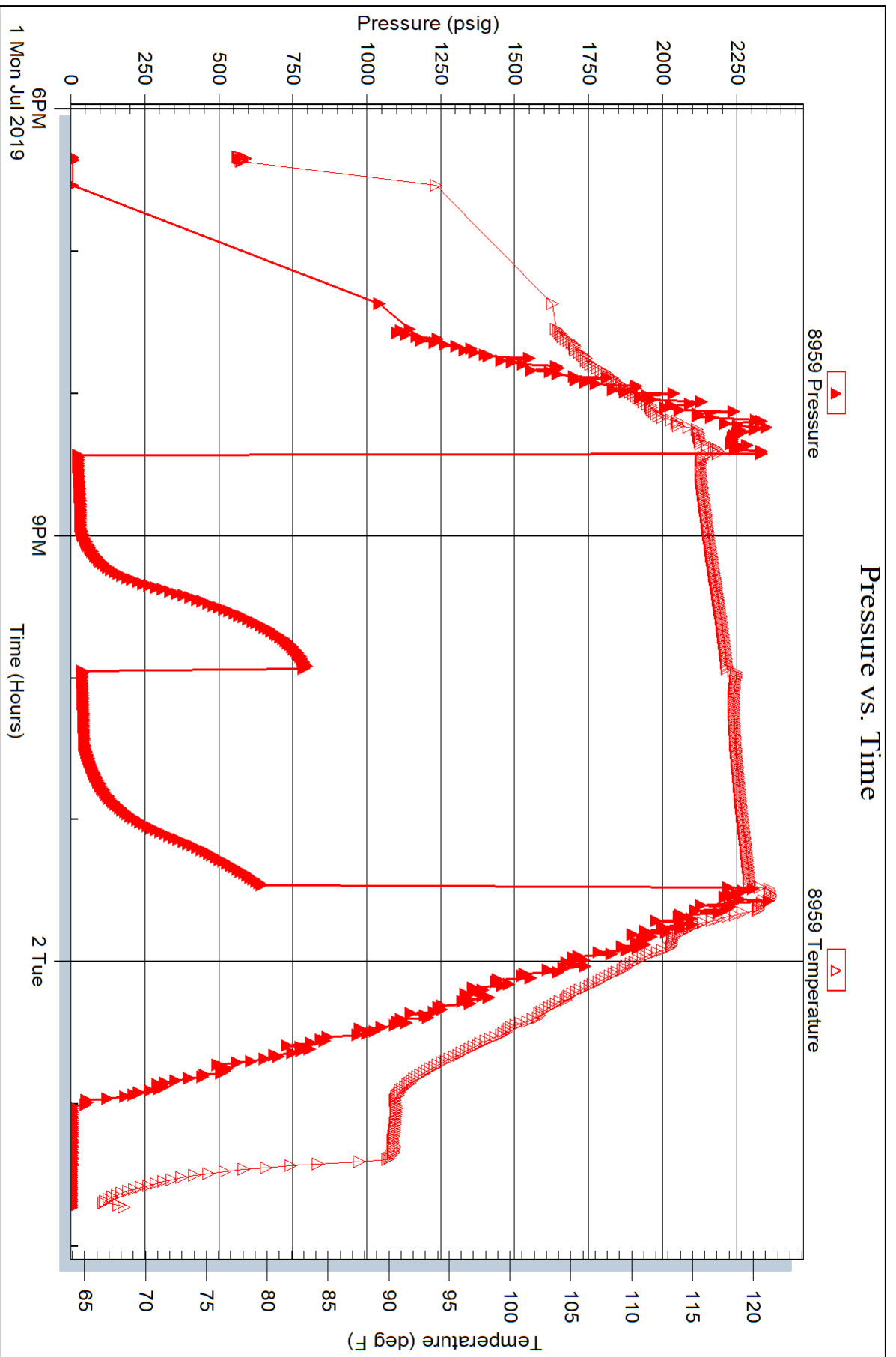
Serial #: 8959

Inside

Murfin Drilling Co INC

Vanava #4-5

DST Test Number: 7





# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 64354

Well Name & No. Vanava #4-5 Test No. 1 Date 6-26-19  
 Company Murfin Drilling Co INC Elevation 3018 KB 3007 GL  
 Address 250 N Water, STE 300, Wichita, KS 67202  
 Co. Rep / Geo. Tom Funk Rig Murfin #21  
 Location: Sec. 5 Twp 13S. Rge. 32W. Co. Logan State KS.

Interval Tested 4027-4070 Zone Tested Lansing "B-D"  
 Anchor Length 43' Drill Pipe Run 3732 Mud Wt. 9.0  
 Top Packer Depth 4022 Drill Collars Run 274 Vis 53  
 Bottom Packer Depth 4027 Wt. Pipe Run — WL 6.4  
 Total Depth 4070 Chlorides 3000 ppm System LCM 4#

Blow Description IF - 1/4" blow built to B.O.B (11 inches) @ 10 1/2 mins (blow increased to 25 3/4")  
ISI - No blowback  
FF - S. blow built to B.O.B (11 inches) @ 15 mins (blow increased to 36")  
FSI - No blowback

Rec	Feet of	%gas	%oil	%water	%mud
<u>615</u>	<u>MSW</u>		<u>95</u>	<u>5</u>	
<u>250</u>	<u>MCW / oil specks</u>	<u>41</u>	<u>75</u>	<u>25</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 865 BHT 120 Gravity — API RW 120 @ 90.5 °F Chlorides 55,000 ppm

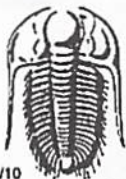
(A) Initial Hydrostatic 2007  Test 1300 T-On Location 03:00  
 (B) First Initial Flow 39  Jars 250 T-Started 05:10  
 (C) First Final Flow 237  Safety Joint 75 T-Open 07:12  
 (D) Initial Shut-In 1061  Circ Sub — T-Pulled 11:12  
 (E) Second Initial Flow 236  Hourly Standby — T-Out 13:53  
 (F) Second Final Flow 417  Mileage 84 RT. 84  
 (G) Final Shut-In 1025  Sampler —  
 (H) Final Hydrostatic 1956  Straddle —  
 Shale Packer —  
 Extra Packer —  
 Extra Recorder —  
 Day Standby —  
 Accessibility —

Initial Open 30  
 Initial Shut-In 60  
 Final Flow 60  
 Final Shut-In 90

Sub Total 1709  
 Total 1709  
 MP/DST Disc't —

Approved By Tom Funk Our Representative Montana Adams

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 64355

Well Name & No. Vanava #4-5 Test No. 2 Date 6-26-19  
 Company Murfin Drilling Co INC Elevation 3018 KB 3007 GL  
 Address 250 N. Water, STE 300, Wichita, KS 67202  
 Co. Rep / Geo. Tom Funk Rig Murfin #21  
 Location: Sec. 5 Twp 13 S. Rge. 32 W. Co. Logan State KS.

Interval Tested 4076-4111 Zone Tested Lansing "E-F"  
 Anchor Length 35 Drill Pipe Run 3795- Mud Wt. 9.0  
 Top Packer Depth 4071 Drill Collars Run 274 Vis 60  
 Bottom Packer Depth 4076 Wt. Pipe Run --- WL 6.0  
 Total Depth 4111 Chlorides 3300 ppm System LCM 4#

Blow Description IF: 1/4" blow built to B.O.B (11 inches) @ 10 1/2 mins (blow increased to 29")  
ISI: Surface blowback built to 3" @ 30 mins + decreased to 2"  
FF: S. blow built to B.O.B (11 inches) @ 15 mins (blow increased to 49 1/2")  
FSI: Surface blowback built to 2 1/4" @ 9 mins + decreased to 1/2"

Rec	Feet of	%gas	%oil	%water	%mud
<u>306</u>	<u>GMCO</u>	<u>30</u>	<u>50</u>	<u>20</u>	
<u>335</u>	<u>CGO</u>	<u>4</u>	<u>96</u>		
<u>0</u>	<u>160' GIP</u>				

Rec Total 641 BHT 120 Gravity 34.6 API RW --- @ --- °F Chlorides --- ppm

(A) Initial Hydrostatic 2069  Test 1300 T-On Location 22:00  
 (B) First Initial Flow 33  Jars 250 T-Started 22:40  
 (C) First Final Flow 142  Safety Joint 75 T-Open 00:35  
 (D) Initial Shut-In 1128  Circ Sub \_\_\_\_\_ T-Pulled 04:35  
 (E) Second Initial Flow 154  Hourly Standby \_\_\_\_\_ T-Out 07:11  
 (F) Second Final Flow 257  Mileage 84 RT 84 Comments ISI-Bled off manifold 3 mins  
 (G) Final Shut-In 1104  Sampler \_\_\_\_\_ FSI-Bled off manifold 3 mins  
 (H) Final Hydrostatic 2023  Straddle \_\_\_\_\_

Initial Open 30  Ruined Shale Packer \_\_\_\_\_  
 Initial Shut-In 60  Ruined Packer \_\_\_\_\_  
 Final Flow 60  Extra Packer \_\_\_\_\_  
 Final Shut-In 90  Extra Recorder \_\_\_\_\_  
 Sub Total 0  
 Total 1709  
 MP/DST Disc't \_\_\_\_\_  
 Sub Total 1709

Approved By [Signature] Our Representative [Signature]

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. **64356**

Well Name & No. Vanava #4-5 Test No. 3 Date 6-27-19  
 Company Murfin Drilling Co INC Elevation 3018 KB 3007 GL  
 Address 250 N. Water, STE 300, Wichita, KS 67202  
 Co. Rep / Geo. Tom Funk Rig Murfin #21  
 Location: Sec. 5 Twp 13S. Rge. 32W. Co. Logan State KS

Interval Tested 4146-4180 Zone Tested Lansing "H"  
 Anchor Length 34 Drill Pipe Run 3857 Mud Wt. 9.1  
 Top Packer Depth 4141 Drill Collars Run 274 Vis 58  
 Bottom Packer Depth 4146 Wt. Pipe Run — WL 6.0  
 Total Depth 4180 Chlorides 4200 ppm System LCM 4#

Blow Description IF: 1/2" blow built to B.O.B (11 inches) @ 6 mins (blow increased to 50")  
ISI: S. blowback built to 10' @ 26 mins & decreased to 8' (blow)  
FF: S. blow built to B.O.B (11 inches) @ 8 mins (blow increased to 79' 1/4")  
FSI: S. blowback built to 4 3/4' @ 26 mins & decreased to 1 1/2"

Rec	Feet of	%gas	%oil	%water	%mud
<u>499</u>	<u>Feet of G M C O</u>	<u>28</u>	<u>62</u>	<u>10</u>	<u>—</u>
<u>280'</u>	<u>Feet of C G O</u>	<u>16</u>	<u>84</u>	<u>—</u>	<u>—</u>
<u>0</u>	<u>Feet of <del>980</del> 980' GTP</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
<u>—</u>	<u>Feet of</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
<u>—</u>	<u>Feet of</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>

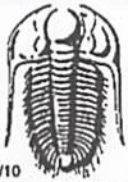
Rec Total 779 BHT 122 Gravity 36.8 API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic 2102  Test 1300 T-On Location 16:30  
 (B) First Initial Flow 39  Jars 250 T-Started 16:38  
 (C) First Final Flow 182  Safety Joint 75 T-Open 18:38  
 (D) Initial Shut-In 1094  Circ Sub — T-Pulled 22:38  
 (E) Second Initial Flow 191  Hourly Standby — T-Out 01:10  
 (F) Second Final Flow 302  Mileage 84 RT <sup>84</sup> Comments —  
 (G) Final Shut-In 1060  Sampler —  
 (H) Final Hydrostatic 2055  Straddle —  Ruined Shale Packer —  
 Shale Packer —  Ruined Packer —  
 Extra Packer —  Extra Copies —  
 Extra Recorder — Sub Total 0  
 Day Standby — Total 1709  
 Accessibility — MP/DST Disc't —  
 Sub Total 1709

Initial Open 30  
 Initial Shut-In 60  
 Final Flow 60  
 Final Shut-In 90

Approved By [Signature] Our Representative Martin Salinas

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 64358

4/10

Well Name & No. Vanava #4-5 Test No. 4 Date 6-28-19  
 Company Murfin Drilling Co Inc. Elevation 3018 KB 3007 GL  
 Address 250 N. Water, STE 300, Wichita, KS 67202  
 Co. Rep / Geo. Tom Funk Rig Murfin #21  
 Location: Sec. 5 Twp 13.S. Rge. 32W. Co. Logan State KS

Interval Tested 4174-4235 Zone Tested Lancing "I-J"  
 Anchor Length 61' Drill Pipe Run 3890 Mud Wt. 9.2  
 Top Packer Depth 4169 Drill Collars Run 274 Vis 54  
 Bottom Packer Depth 4174 Wt. Pipe Run — WL 6.4  
 Total Depth 4235 Chlorides 5000 ppm System LCM 4#  
 Blow Description IF: 1/2" Blow built to B.O.B (11 inches) @ 8 mins (blow increased to 30 3/4")  
TSI: No blowback  
FF: S. blow built to B.O.B (11 inches) @ 12 mins (blow increased to 44 1/8")  
FSI: S. blowback @ 5 mins built to 2"

Rec	Feet of	%gas	%oil	%water	%mud
275	SMOCW	8	87	5	
600	G.SOMCW	18	10	53	19
665	G.SMWO	7	68	17	8
10	CO	100			
0	180' GIP				
950	BHT 121	Gravity 32.4	API RW .090 @ 96.	F Chlorides 63,000	ppm

(A) Initial Hydrostatic 2151  Test 1300 T-On Location 10:45  
 (B) First Initial Flow 44  Jars 250 T-Started 11:05  
 (C) First Final Flow 246  Safety Joint 75 T-Open 12:42  
 (D) Initial Shut-In 1134  Circ Sub \_\_\_\_\_ T-Pulled 16:42  
 (E) Second Initial Flow 248  Hourly Standby \_\_\_\_\_ T-Out 19:28  
 (F) Second Final Flow 426  Mileage 84 RT 84  
 (G) Final Shut-In 1116  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 2078  Straddle \_\_\_\_\_  
 Initial Open 30  Shale Packer \_\_\_\_\_  
 Initial Shut-In 60  Extra Packer \_\_\_\_\_  
 Final Flow 60  Extra Recorder \_\_\_\_\_  
 Final Shut-In 90  Day Standby \_\_\_\_\_  
 Accessibility \_\_\_\_\_  
 Sub Total 1709

Comments \_\_\_\_\_  
 Ruined Shale Packer \_\_\_\_\_  
 Ruined Packer \_\_\_\_\_  
 Extra Copies \_\_\_\_\_  
 Sub Total 0  
 Total 1709  
 MP/DST Disc't \_\_\_\_\_

Approved By [Signature]

Our Representative [Signature]

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 64359

Well Name & No. Vanava. #4-5 Test No. 5 Date 6-29-19  
 Company Murfin Drilling Co Inc Elevation 3018 KB 3007 GL  
 Address 250 N. Water STE 300, Wichita, KS 67202  
 Co. Rep / Geo. Tom Funk Rig Murfin #21  
 Location: Sec. 5 Twp 13S. Rge. 32W. Co. Logan State KS.

Interval Tested 4337-4420 Zone Tested Altamont  
 Anchor Length 83' Drill Pipe Run 4648 Mud Wt. 9.2  
 Top Packer Depth 4332 Drill Collars Run 274 Vls 56  
 Bottom Packer Depth 4337 Wt. Pipe Run — WL 6.0  
 Total Depth 4420 Chlorides 4500 ppm System LCM 4#

Blow Description IF - S. blow built to 9 1/4"  
ISI - S. blowback dead @ 5 mins.  
FF - S. blow built to B.O.B (11 inches) @ 37 mins (blow increased to 15")  
FSI - S. blow back built to 3/4" @ 30 mins + decreased to surface blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>40</u>	<u>210' GHO CM</u>	<u>30</u>	<u>30</u>	<u>40</u>	<u>—</u>
<u>100</u>	<u>CGO</u>	<u>40</u>	<u>60</u>	<u>—</u>	<u>—</u>
<u>0</u>	<u>210' GEP</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>

Rec Total 140 BHT 123 Gravity 25 API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic 2216  Test 1300 T-On Location 15:30  
 (B) First Initial Flow 30  Jars 250 T-Started 15:47  
 (C) First Final Flow 50  Safety Joint 75 T-Open 18:00  
 (D) Initial Shut-In 1276  Circ Sub — T-Pulled 22:00  
 (E) Second Initial Flow 57  Hourly Standby — T-Out 00:23  
 (F) Second Final Flow 93  Mileage 84 RT 84 Comments —  
 (G) Final Shut-In 1261  Sampler —  
 (H) Final Hydrostatic 2166  Straddle —  Ruined Shale Packer —  
 Shale Packer —  Ruined Packer —  
 Extra Packer —  Extra Copies —  
 Extra Recorder — Sub Total 0  
 Day Standby — Total 1709  
 Accessibility — MP/DST Disc't —  
 Sub Total 1709

Approved By [Signature] Our Representative [Signature]  
 Trilobite Testing Inc. shall not be liable for damaged of any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.



# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 64360

Well Name & No. Vanava #4-5 Test No. 6 Date 6-30-19  
 Company Murfin Drilling Co Inc. Elevation 3018 KB 3007 GL  
 Address 250 N. Water, STE 300, Wichita, KS 67202  
 Co. Rep / Geo. Tom Funk Rig Murfin #21  
 Location: Sec. 5 Twp 13S. Rge. 32W. Co. Logan State KS

Interval Tested 4428-4510 Zone Tested Pawnee-Ft. Scott.  
 Anchor Length 82' Drill Pipe Run 4144 Mud Wt. 9.2  
 Top Packer Depth 4423 Drill Collars Run 274 Vis 53  
 Bottom Packer Depth 4428 Wt. Pipe Run ← WL 6.8  
 Total Depth 4510 Chlorides 4400 ppm System LCM 4#

Blow Description IF - 2" blow built to B.O.B (11 inches) @ 1 min 45 secs (blow increased to 136 1/2")  
TSI - 3/4" blowback built to B.O.B (11 inches) @ 4 min (blow increased to 144")  
FF - 3" blow built to B.O.B (11 inches) @ 1 1/2 mins (blow increased to 82 1/2")  
FSI - 1" blowback built to B.O.B (11 inches) @ 5 mins (blow increased to 119 1/2")

Rec	Feet of		%gas	%oil	%water	%mud
Rec <u>123</u>	Feet of <u>GMC0</u>	<u>43</u>	<u>35</u>		<u>22</u>	
Rec <u>1289 Rev</u>	Feet of <u>10-30 mins GMC0</u>	<u>49</u>	<u>42</u>		<u>9</u>	
Rec <u>0 Rev</u>	Feet of <u>0-10 mins CGO</u>	<u>31</u>	<u>69</u>			
Rec <u>0</u>	Feet of <u>2690' GTP</u>					
Rec	Feet of		%gas	%oil	%water	%mud

Rec Total 1412. BHT 127 Gravity 29.0 API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic 2286  Test 1300 T-On Location 12:00  
 (B) First Initial Flow 256  Jars 250 T-Started 12:23  
 (C) First Final Flow 420  Safety Joint 75 T-Open 14:03  
 (D) Initial Shut-In 1091  Circ Sub Drop Bar 50 T-Pulled 16:33  
 (E) Second Initial Flow 450  Hourly Standby \_\_\_\_\_ T-Out 20:25  
 (F) Second Final Flow 579  Mileage 84 RT. 84 Comments G.T.S on ~~the~~ end of FSI.  
 (G) Final Shut-In 1073  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 2227  Straddle \_\_\_\_\_  Ruined Shale Packer \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  Ruined Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  Extra Copies \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_ Sub Total 0  
 Day Standby \_\_\_\_\_ Total 1759  
 Accessibility \_\_\_\_\_ MP/DST Disc't \_\_\_\_\_  
 Sub Total 1759

Initial Open 15  
 Initial Shut-In 60  
 Final Flow 15  
 Final Shut-In 60

Approved By Tom Funk Our Representative Marko Polina  
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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. **64361**

Well Name & No. Vanava #4-5 Test No. 7 Date 7-1-19  
 Company Murfin Drilling Co Inc Elevation 3018 KB 3007 GL  
 Address 250 N. Water, STE 300, Wichita, KS 67202  
 Co. Rep / Geo. Tom Funk Rig Murfin #21  
 Location: Sec. S Twp 13S. Rge. 32W. Co. Logan State KS.

Interval Tested 4514-4585 Zone Tested Johnson  
 Anchor Length 71 Drill Pipe Run 4239 Mud Wt. 9.3  
 Top Packer Depth 4509 Drill Collars Run 274 Vis 50  
 Bottom Packer Depth 4514 Wt. Pipe Run — WL 7.6  
 Total Depth 4585 Chlorides 3900 ppm System LCM 4#  
 Blow Description IF - Weak surface blow built to 1/8"  
ISI - No blowback  
FF - No blow  
FST - No blowback

Rec	Feet of	%gas	%oil	%water	%mud
<u>15</u>	<u>Feet of GOCM.</u>	<u>12</u>	<u>13</u>	<u>75</u>	
<u>0</u>	<u>Feet of Heavy oil in tool</u>				

Rec Total 15 BHT 121 Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic 2338  Test 1300 T-On Location 18:00  
 (B) First Initial Flow 28  Jars 250 T-Started 18:20  
 (C) First Final Flow 33  Safety Joint 75 T-Open 20:26  
 (D) Initial Shut-In 802  Circ Sub — T-Pulled 23:26  
 (E) Second Initial Flow 42  Hourly Standby — T-Out 01:44  
 (F) Second Final Flow 48  Mileage 84RT. 84 Comments Tools loaded @  
 (G) Final Shut-In 650  Sampler — 02:30  
 (H) Final Hydrostatic 2319  Straddle —  Ruined Shale Packer —  
 Shale Packer —  Ruined Packer —  
 Extra Packer —  Extra Copies —  
 Extra Recorder — Sub Total 0  
 Day Standby — Total 1709  
 Accessibility — MP/DST Disc't —  
 Sub Total 1709

Approved By [Signature] Our Representative [Signature]

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