



## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling**

250 N Water STE 300  
Wichita KS 67202

ATTN: Tom Funk

### **Heier- Racette #1-34**

### **34 12s 33 Logan KS**

Start Date: 2014.03.09 @ 23:15:00

End Date: 2014.03.10 @ 07:58:15

Job Ticket #: 56767                      DST #: 1

Trilobite Testing, Inc  
PO Box 362 Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2014.03.19 @ 18:03:28

Murfin Drilling  
34 12s 33 Logan KS  
Heier- Racette #1-34  
DST # 1  
LKC "H & I"  
2014.03.09



**TRILOBITE TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling  
 250 N Water STE 300  
 Wichita KS 67202  
 ATTN: Tom Funk

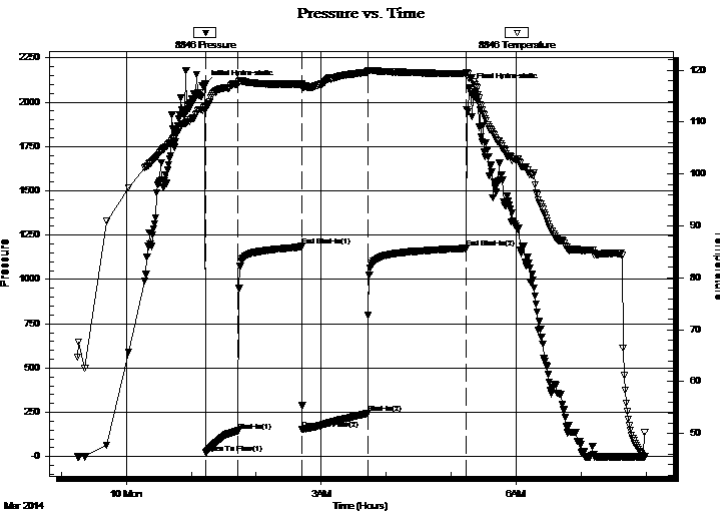
**34 12s 33 Logan KS**  
**Heier- Racette #1-34**  
 Job Ticket: 56767 **DST#: 1**  
 Test Start: 2014.03.09 @ 23:15:00

## GENERAL INFORMATION:

Formation: **LKC "H & I"**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 01:13:15  
 Time Test Ended: 07:58:15  
 Interval: **4198.00 ft (KB) To 4260.00 ft (KB) (TVD)**  
 Total Depth: 4260.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Fair  
 Test Type: Conventional Bottom Hole (Initial)  
 Tester: Robert Zodrow  
 Unit No: 65  
 Reference Elevations: 3104.00 ft (KB)  
 3094.00 ft (CF)  
 KB to GR/CF: 10.00 ft

**Serial #: 8846** **Inside**  
 Press@RunDepth: 244.07 psig @ 4199.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2014.03.09 End Date: 2014.03.10 Last Calib.: 2014.03.10  
 Start Time: 23:15:15 End Time: 07:58:15 Time On Btm: 2014.03.10 @ 01:12:45  
 Time Off Btm: 2014.03.10 @ 05:17:00

**TEST COMMENT:** 30-IF-BOB In 22 min  
 60-ISI-Blow back Built To 1/2" Died Back To Surface Blow  
 60-FF-BOB In 30 min  
 90-FSI-Blow back Built To 1/4" Died Back To Surface Blow



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2096.39	112.88	Initial Hydro-static
1	20.79	112.38	Open To Flow (1)
31	145.09	117.45	Shut-In(1)
90	1186.43	117.28	End Shut-In(1)
90	152.40	116.94	Open To Flow (2)
150	244.07	119.63	Shut-In(2)
241	1175.34	119.28	End Shut-In(2)
245	2084.15	118.56	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
240.00	gow cm 3%g 2%o 40%w 55%m	1.20
216.00	ocm 30%o 67%m 3%g	3.16
45.00	clean oil 95%o 5%g	0.66

## Gas Rates

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



**TRILOBITE TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling  
 250 N Water STE 300  
 Wichita KS 67202  
 ATTN: Tom Funk

**34 12s 33 Logan KS**  
**Heier- Racette #1-34**  
 Job Ticket: 56767 **DST#: 1**  
 Test Start: 2014.03.09 @ 23:15:00

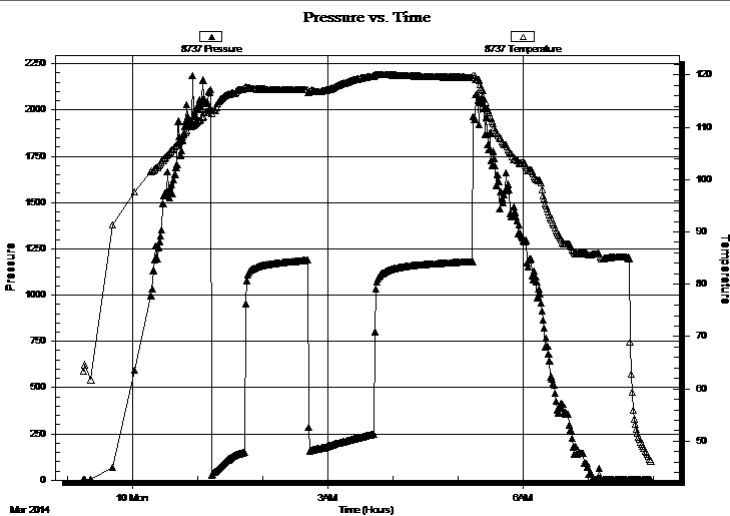
## GENERAL INFORMATION:

Formation: <b>LKC "H &amp; I"</b>		Test Type: Conventional Bottom Hole (Initial)
Deviated: No Whipstock: ft (KB)		Tester: Robert Zodrow
Time Tool Opened: 01:13:15		Unit No: 65
Time Test Ended: 07:58:15		Reference Elevations: 3104.00 ft (KB)
<b>Interval: 4198.00 ft (KB) To 4260.00 ft (KB) (TVD)</b>		3094.00 ft (CF)
Total Depth: 4260.00 ft (KB) (TVD)		KB to GR/CF: 10.00 ft
Hole Diameter: 7.88 inches	Hole Condition: Fair	

## Serial #: 8737

Press@RunDepth: psig @ ft (KB)	Capacity: 8000.00 psig
Start Date: 2014.03.09	End Date: 2014.03.10
Start Time: 23:15:15	End Time: 07:58:00
Last Calib.: 2014.03.10	Time On Btm:
	Time Off Btm:

TEST COMMENT: 30-IF-BOB In 22 min  
 60-ISI-Blow back Built To 1/2" Died Back To Surface Blow  
 60-FF-BOB In 30 min  
 90-FSI-Blow back Built To 1/4" Died Back To Surface Blow



## PRESSURE SUMMARY

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

## Recovery

Length (ft)	Description	Volume (bbl)
240.00	gow cm 3%g 2%o 40%w 55%m	1.20
216.00	ocm 30%o 67%m 3%g	3.16
45.00	clean oil 95%o 5%g	0.66

## Gas Rates

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



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling

**34 12s 33 Logan KS**

250 N Water STE 300  
Wichita KS 67202

**Heier- Racette #1-34**

Job Ticket: 56767

**DST#: 1**

ATTN: Tom Funk

Test Start: 2014.03.09 @ 23:15:00

## Tool Information

Drill Pipe:	Length: 3944.00 ft	Diameter: 3.88 inches	Volume: 57.68 bbl	Tool Weight:	2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length: 238.00 ft	Diameter: 2.25 inches	Volume: 1.17 bbl	Weight to Pull Loose:	72000.00 lb
			<u>Total Volume: 58.85 bbl</u>	Tool Chased	ft
Drill Pipe Above KB:	5.00 ft			String Weight: Initial	68000.00 lb
Depth to Top Packer:	4198.00 ft			Final	70000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	62.00 ft				
Tool Length:	83.00 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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Change Over Sub	1.00			4178.00	
Shut In Tool	5.00			4183.00	
Hydraulic tool	5.00			4188.00	
Packer	5.00			4193.00	21.00 Bottom Of Top Packer
Packer	5.00			4198.00	
Stubb	1.00			4199.00	
Recorder	0.00	8846	Inside	4199.00	
Recorder	0.00			4199.00	
Perforations	23.00			4222.00	
Change Over Sub	1.00			4223.00	
Drill Pipe	31.00			4254.00	
Change Over Sub	1.00			4255.00	
Bullnose	5.00			4260.00	62.00 Bottom Packers & Anchor

**Total Tool Length: 83.00**



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling

**34 12s 33 Logan KS**

250 N Water STE 300  
Wichita KS 67202

**Heier- Racette #1-34**

Job Ticket: 56767

**DST#: 1**

ATTN: Tom Funk

Test Start: 2014.03.09 @ 23:15:00

## 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: 57.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.97 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 5500.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
240.00	gow cm 3%g 2%o 40%w 55%m	1.200
216.00	ocm 30%o 67%m 3%g	3.159
45.00	clean oil 95%o 5%g	0.658

Total Length: 501.00 ft

Total Volume: 5.017 bbl

Num Fluid Samples: 0

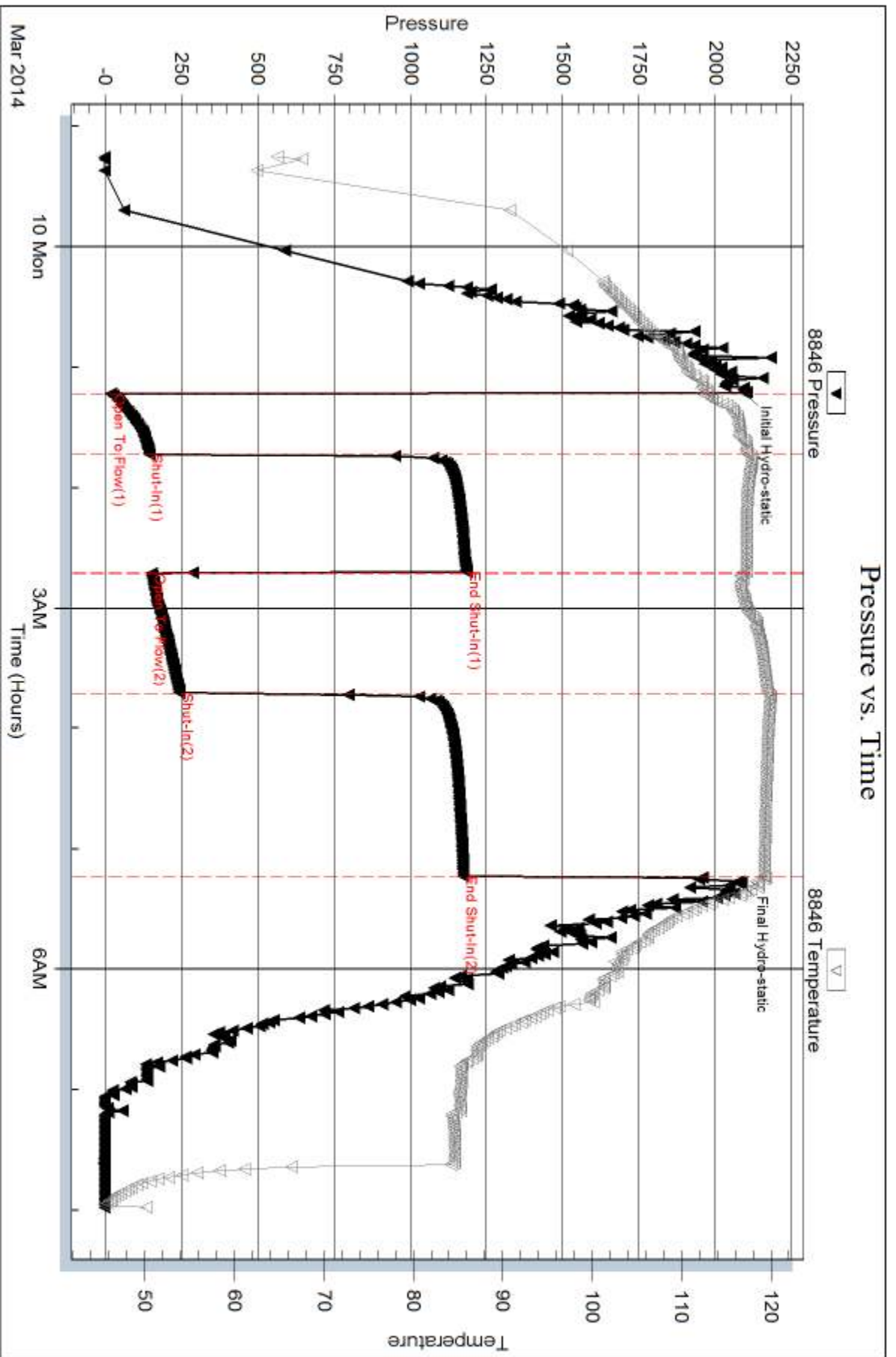
Num Gas Bombs: 0

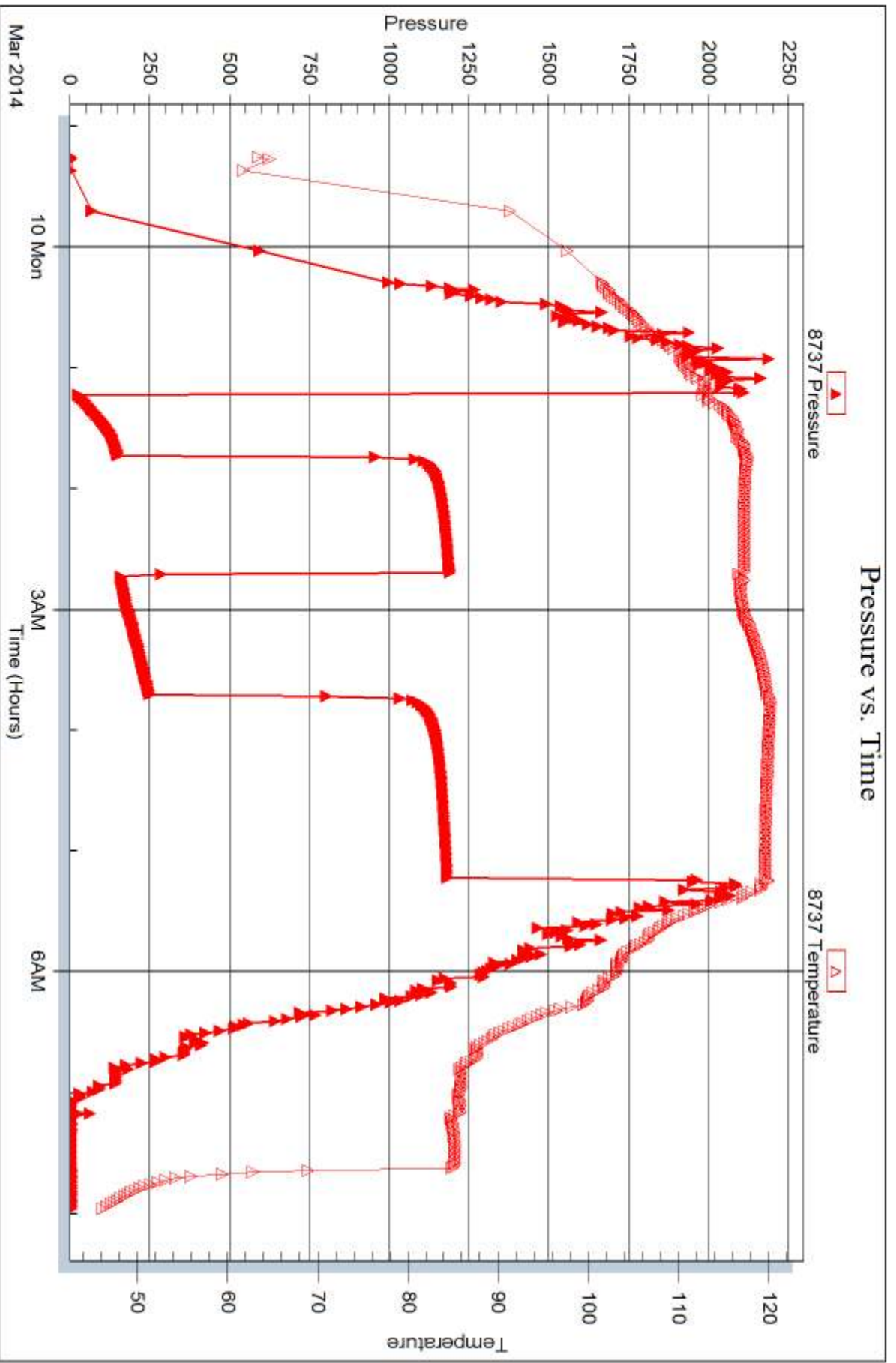
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:







## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling**

250 N Water STE 300  
Wichita KS 67202

ATTN: Tom Funk

### **Heier- Racette #1-34**

### **34 12s 33 Logan KS**

Start Date: 2014.03.10 @ 14:52:00

End Date: 2014.03.11 @ 00:12:45

Job Ticket #: 56768                      DST #: 2

Trilobite Testing, Inc  
PO Box 362 Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2014.03.19 @ 18:03:04

Murfin Drilling  
34 12s 33 Logan KS  
Heier- Racette #1-34  
DST # 2  
LKC "J"  
2014.03.10





**TRILOBITE TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling  
 250 N Water STE 300  
 Wichita KS 67202  
 ATTN: Tom Funk

**34 12s 33 Logan KS**  
**Heier- Racette #1-34**  
 Job Ticket: 56768 **DST#: 2**  
 Test Start: 2014.03.10 @ 14:52:00

## GENERAL INFORMATION:

Formation: **LKC "J"**  
 Deviated: No Whipstock: ft (KB)  
 Test Type: Conventional Bottom Hole (Reset)  
 Time Tool Opened: 17:07:45 Tester: Robert Zodrow  
 Time Test Ended: 00:12:45 Unit No: 65  
 Interval: **4260.00 ft (KB) To 4283.00 ft (KB) (TVD)** Reference Elevations: 3104.00 ft (KB)  
 Total Depth: 4260.00 ft (KB) (TVD) 3094.00 ft (CF)  
 Hole Diameter: 7.88 inches Hole Condition: Fair KB to GR/CF: 10.00 ft

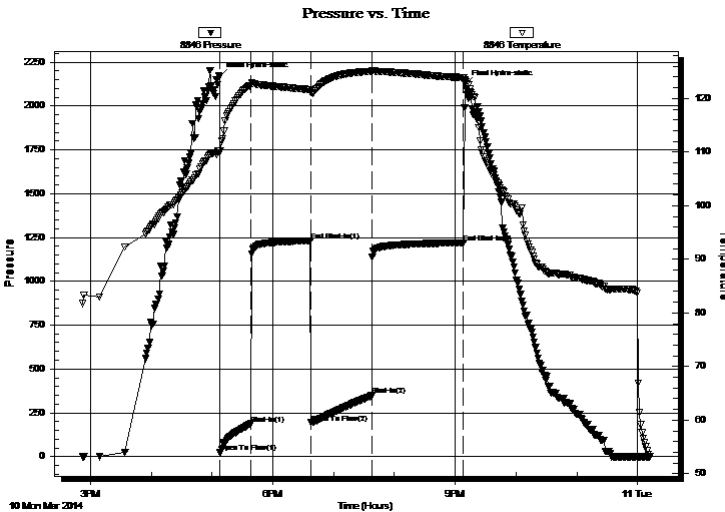
## Serial #: 8846

Inside

Press@RunDepth: 347.50 psig @ 4261.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2014.03.10 End Date: 2014.03.11 Last Calib.: 2014.03.11  
 Start Time: 14:52:15 End Time: 00:12:45 Time On Btm: 2014.03.10 @ 17:07:30  
 Time Off Btm: 2014.03.10 @ 21:09:45

TEST COMMENT: 30-IF- BoB In 10 min  
 60-ISI-Return Built To 2 3/4"  
 60-FF-BOB In 15 min  
 90-FSI-Return Built To 3 3/4"

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2167.21	110.28	Initial Hydro-static
1	22.50	109.85	Open To Flow (1)
31	187.42	122.45	Shut-In(1)
90	1231.42	121.62	End Shut-In(1)
90	192.47	121.10	Open To Flow (2)
150	347.50	125.04	Shut-In(2)
241	1219.48	123.84	End Shut-In(2)
243	2124.69	123.27	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
548.00	MW 8%g 92%w	5.70
60.00	gw mco 5%g 15%w 20%m 50%o	0.88
196.00	clean oil 5%g 95%o	2.87

\* Recovery from multiple tests

## Gas Rates

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



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling  
250 N Water STE 300  
Wichita KS 67202  
ATTN: Tom Funk

**34 12s 33 Logan KS**  
**Heier- Racette #1-34**  
Job Ticket: 56768 **DST#: 2**  
Test Start: 2014.03.10 @ 14:52:00

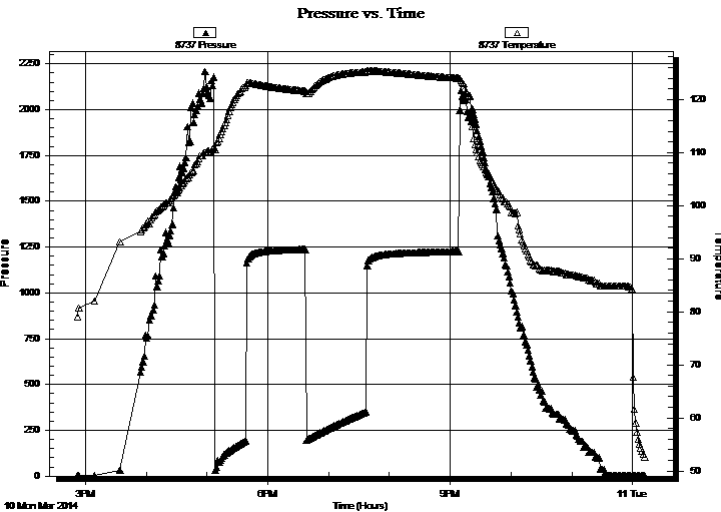
## GENERAL INFORMATION:

Formation: **LKC "J"**  
Deviated: No Whipstock: ft (KB)  
Time Tool Opened: 17:07:45  
Time Test Ended: 00:12:45  
Interval: **4260.00 ft (KB) To 4283.00 ft (KB) (TVD)**  
Total Depth: 4260.00 ft (KB) (TVD)  
Hole Diameter: 7.88 inches Hole Condition: Fair  
Reference Elevations: 3104.00 ft (KB)  
3094.00 ft (CF)  
KB to GR/CF: 10.00 ft  
Test Type: Conventional Bottom Hole (Reset)  
Tester: Robert Zodrow  
Unit No: 65

## Serial #: 8737

Press@RunDepth: psig @ ft (KB) Capacity: 8000.00 psig  
Start Date: 2014.03.10 End Date: 2014.03.11 Last Calib.: 2014.03.11  
Start Time: 14:52:15 End Time: 00:12:45 Time On Btm:  
Time Off Btm:

TEST COMMENT: 30-IF- BoB In 10 min  
60-ISI-Return Built To 2 3/4"  
60-FF-BOB In 15 min  
90-FSI-Return Built To 3 3/4"



## PRESSURE SUMMARY

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

## Recovery

Length (ft)	Description	Volume (bbl)
548.00	MW 8% <i>m</i> 92% <i>w</i>	5.70
60.00	gw <i>mco</i> 5% <i>g</i> 15% <i>w</i> 20% <i>m</i> 50% <i>o</i>	0.88
196.00	clean oil 5% <i>g</i> 95% <i>o</i>	2.87

\* Recovery from multiple tests

## Gas Rates

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



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling

**34 12s 33 Logan KS**

250 N Water STE 300  
Wichita KS 67202

**Heier- Racette #1-34**

Job Ticket: 56768

**DST#: 2**

ATTN: Tom Funk

Test Start: 2014.03.10 @ 14:52:00

## Tool Information

Drill Pipe:	Length: 4006.00 ft	Diameter: 3.88 inches	Volume: 58.58 bbl	Tool Weight:	2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length: 238.00 ft	Diameter: 2.25 inches	Volume: 1.17 bbl	Weight to Pull Loose:	88000.00 lb
			<u>Total Volume: 59.75 bbl</u>	Tool Chased	ft
Drill Pipe Above KB:	5.00 ft			String Weight: Initial	76000.00 lb
Depth to Top Packer:	4260.00 ft			Final	80000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	23.00 ft				
Tool Length:	44.00 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			4240.00	
Shut In Tool	5.00			4245.00	
Hydraulic tool	5.00			4250.00	
Packer	5.00			4255.00	21.00 Bottom Of Top Packer
Packer	5.00			4260.00	
Stubb	1.00			4261.00	
Recorder	0.00	8846	Inside	4261.00	
Recorder	0.00			4261.00	
Perforations	17.00			4278.00	
Bullnose	5.00			4283.00	23.00 Bottom Packers & Anchor
<b>Total Tool Length:</b>	<b>44.00</b>				



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

## FLUID SUMMARY

Murfin Drilling

**34 12s 33 Logan KS**

250 N Water STE 300  
Wichita KS 67202

**Heier- Racette #1-34**

Job Ticket: 56768

**DST#: 2**

ATTN: Tom Funk

Test Start: 2014.03.10 @ 14:52:00

### Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

34 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

26000 ppm

Viscosity: 64.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.77 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 7300.00 ppm

Filter Cake: 2.00 inches

### Recovery Information

Recovery Table

Length ft	Description	Volume bbl
548.00	MW 8%m 92%w	5.704
60.00	gw mco 5%g 15%w 20%m 50%o	0.877
196.00	clean oil 5%g 95%o	2.866

Total Length: 804.00 ft      Total Volume: 9.447 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW .36@54deg f = 26000

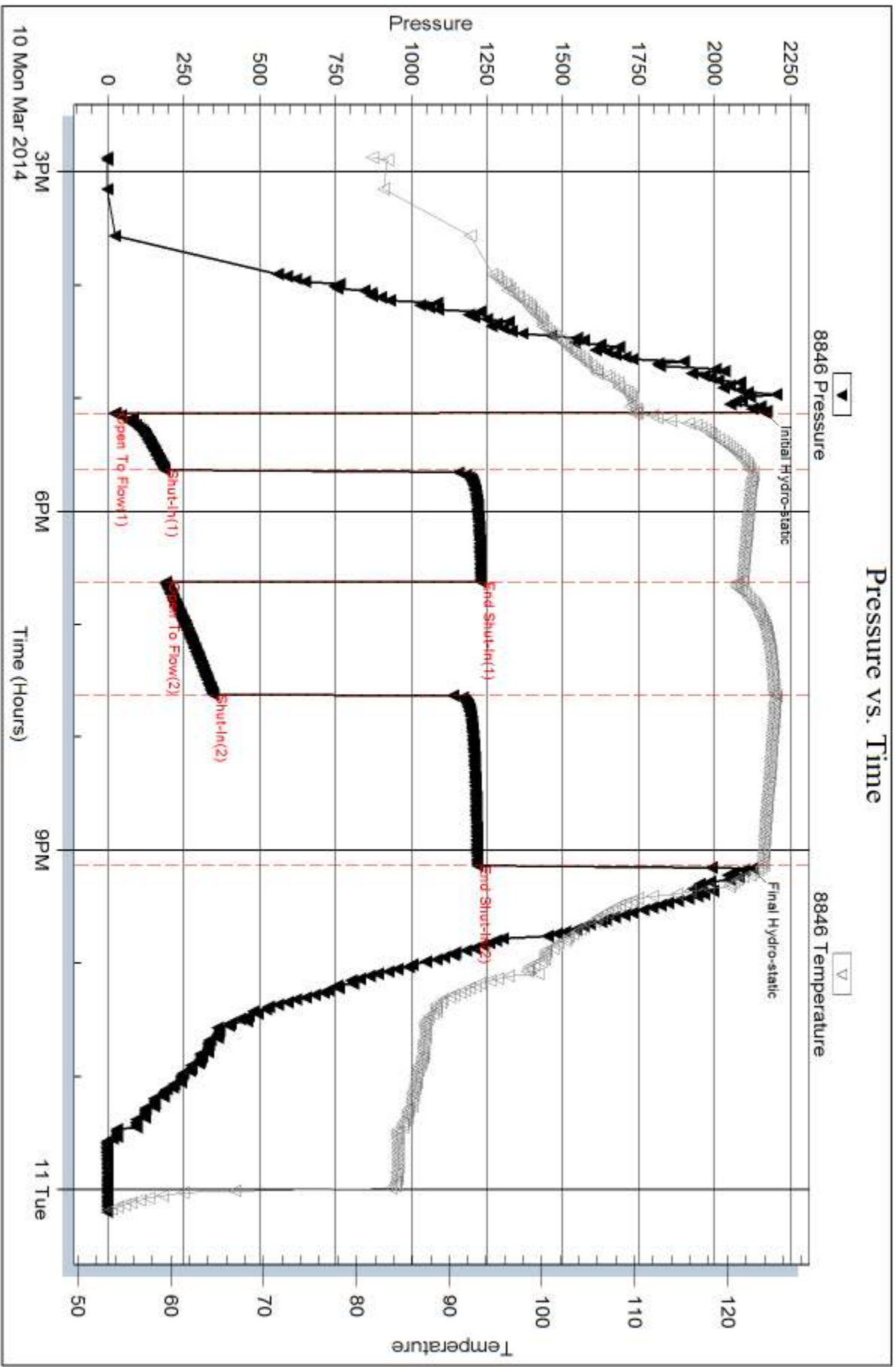
Serial #: 8846

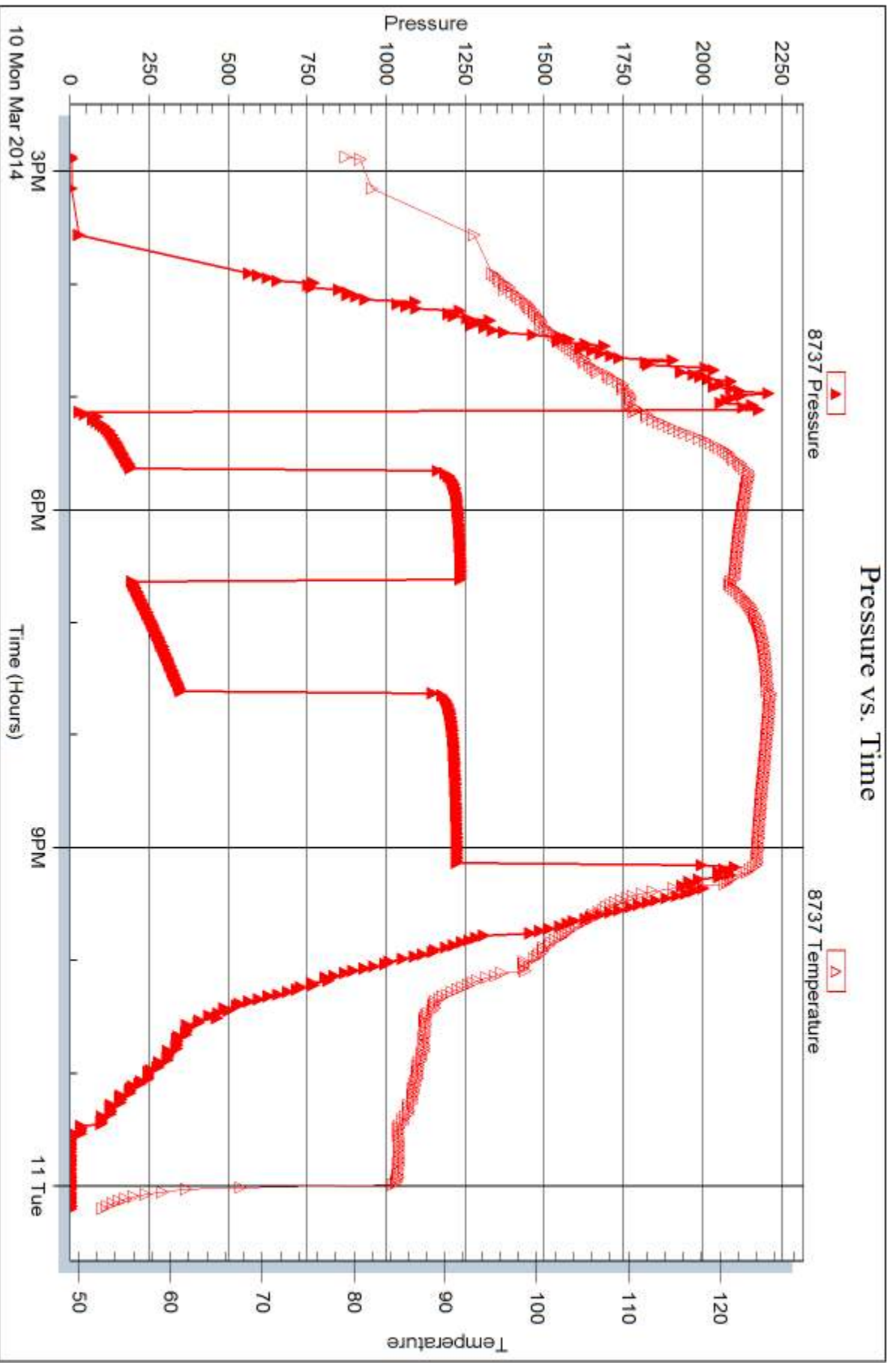
Inside

Murfin Drilling

Heier - Racette #1-34

DST Test Number: 2







## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling**

250 N Water STE 300  
Wichita KS 67202

ATTN: Tom Funk

### **Heier- Racette #1-34**

### **34 12s 33 Logan KS**

Start Date: 2014.03.11 @ 08:50:15

End Date: 2014.03.11 @ 17:32:00

Job Ticket #: 56769                      DST #: 3

Trilobite Testing, Inc  
PO Box 362 Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2014.03.19 @ 18:02:35

Murfin Drilling  
34 12s 33 Logan KS  
Heier- Racette #1-34  
DST # 3  
LKC  
"K"  
2014.03.11



**TRILOBITE TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling  
 250 N Water STE 300  
 Wichita KS 67202  
 ATTN: Tom Funk

**34 12s 33 Logan KS**  
**Heier- Racette #1-34**  
 Job Ticket: 56769 **DST#: 3**  
 Test Start: 2014.03.11 @ 08:50:15

## GENERAL INFORMATION:

Formation: **LKC "K"**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 10:56:15  
 Time Test Ended: 17:32:00  
 Interval: **4287.00 ft (KB) To 4310.00 ft (KB) (TVD)**  
 Total Depth: 4260.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Fair  
 Test Type: Conventional Bottom Hole (Reset)  
 Tester: Robert Zodrow  
 Unit No: 65  
 Reference Elevations: 3104.00 ft (KB)  
 3094.00 ft (CF)  
 KB to GR/CF: 10.00 ft

## Serial #: 8846

Inside

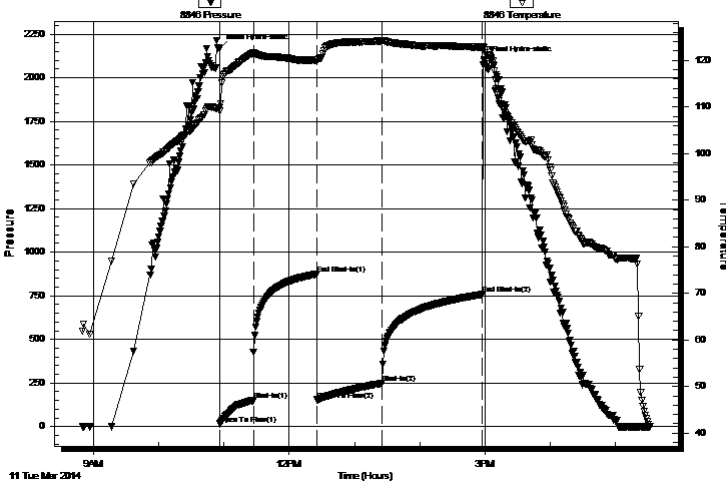
Press@RunDepth: 247.81 psig @ 4287.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2014.03.11 End Date: 2014.03.11 Last Calib.: 2014.03.11  
 Start Time: 08:50:15 End Time: 17:32:00 Time On Btm: 2014.03.11 @ 10:56:00  
 Time Off Btm: 2014.03.11 @ 14:59:30

TEST COMMENT: 30-IF- BOB In 20 min  
 60-ISI-No Return  
 60-FF-BOB In 32 min  
 90-FSI-No Return

## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2168.61	109.91	Initial Hydro-static
1	16.12	109.12	Open To Flow (1)
31	151.16	121.56	Shut-In(1)
90	874.54	120.04	End Shut-In(1)
90	153.78	119.74	Open To Flow (2)
150	247.81	124.22	Shut-In(2)
242	757.97	122.79	End Shut-In(2)
244	2100.10	122.37	Final Hydro-static

Pressure vs. Time



## Recovery

Length (ft)	Description	Volume (bbl)
516.00	msw 23% m 77% w	5.24

\* Recovery from multiple tests

## Gas Rates

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





**TRILOBITE TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling  
 250 N Water STE 300  
 Wichita KS 67202  
 ATTN: Tom Funk

**34 12s 33 Logan KS**  
**Heier- Racette #1-34**  
 Job Ticket: 56769 **DST#: 3**  
 Test Start: 2014.03.11 @ 08:50:15

## GENERAL INFORMATION:

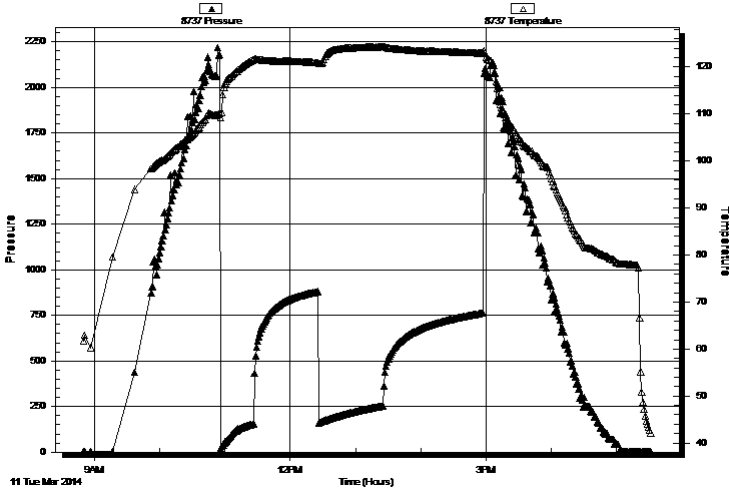
Formation: **LKC "K"**  
 Deviated: No Whipstock: ft (KB)  
 Test Type: Conventional Bottom Hole (Reset)  
 Time Tool Opened: 10:56:15  
 Tester: Robert Zodrow  
 Time Test Ended: 17:32:00  
 Unit No: 65  
 Interval: **4287.00 ft (KB) To 4310.00 ft (KB) (TVD)**  
 Reference Elevations: 3104.00 ft (KB)  
 Total Depth: 4260.00 ft (KB) (TVD)  
 3094.00 ft (CF)  
 Hole Diameter: 7.88 inches  
 Hole Condition: Fair  
 KB to GR/CF: 10.00 ft

## Serial #: 8737

Press@RunDepth: psig @ ft (KB) Capacity: 8000.00 psig  
 Start Date: 2014.03.11 End Date: 2014.03.11 Last Calib.: 2014.03.11  
 Start Time: 08:50:15 End Time: 17:32:00 Time On Btm:  
 Time Off Btm:

**TEST COMMENT:** 30-IF- BOB In 20 min  
 60-ISI-No Return  
 60-FF-BOB In 32 min  
 90-FSI-No Return

Pressure vs. Time



## PRESSURE SUMMARY

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

## Recovery

Length (ft)	Description	Volume (bbl)
516.00	msw 23%m 77%w	5.24

\* Recovery from multiple tests

## Gas Rates

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



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling

**34 12s 33 Logan KS**

250 N Water STE 300  
Wichita KS 67202

**Heier- Racette #1-34**

Job Ticket: 56769

**DST#: 3**

ATTN: Tom Funk

Test Start: 2014.03.11 @ 08:50:15

## Tool Information

Drill Pipe:	Length: 4037.00 ft	Diameter: 3.88 inches	Volume: 59.04 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 238.00 ft	Diameter: 2.25 inches	Volume: 1.17 bbl	Weight to Pull Loose: 86000.00 lb
			<u>Total Volume: 60.21 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	9.00 ft			String Weight: Initial 72000.00 lb
Depth to Top Packer:	4287.00 ft			Final 74000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	23.00 ft			
Tool Length:	44.00 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			4267.00	
Shut In Tool	5.00			4272.00	
Hydraulic tool	5.00			4277.00	
Packer	5.00			4282.00	21.00 Bottom Of Top Packer
Packer	5.00			4287.00	
Recorder	0.00	8846	Inside	4287.00	
Recorder	0.00			4287.00	
Perforations	17.00			4304.00	
Change Over Sub	1.00			4305.00	
Bullnose	5.00			4310.00	23.00 Bottom Packers & Anchor
<b>Total Tool Length:</b>	<b>44.00</b>				



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling

**34 12s 33 Logan KS**

250 N Water STE 300  
Wichita KS 67202

**Heier- Racette #1-34**

Job Ticket: 56769

**DST#: 3**

ATTN: Tom Funk

Test Start: 2014.03.11 @ 08:50:15

## 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:

28000 ppm

Viscosity: 57.00 sec/qt

Cushion Volume:

bbf

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

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 5500.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbf
516.00	msh 23% m 77% w	5.236

Total Length: 516.00 ft      Total Volume: 5.236 bbf

Num Fluid Samples: 0

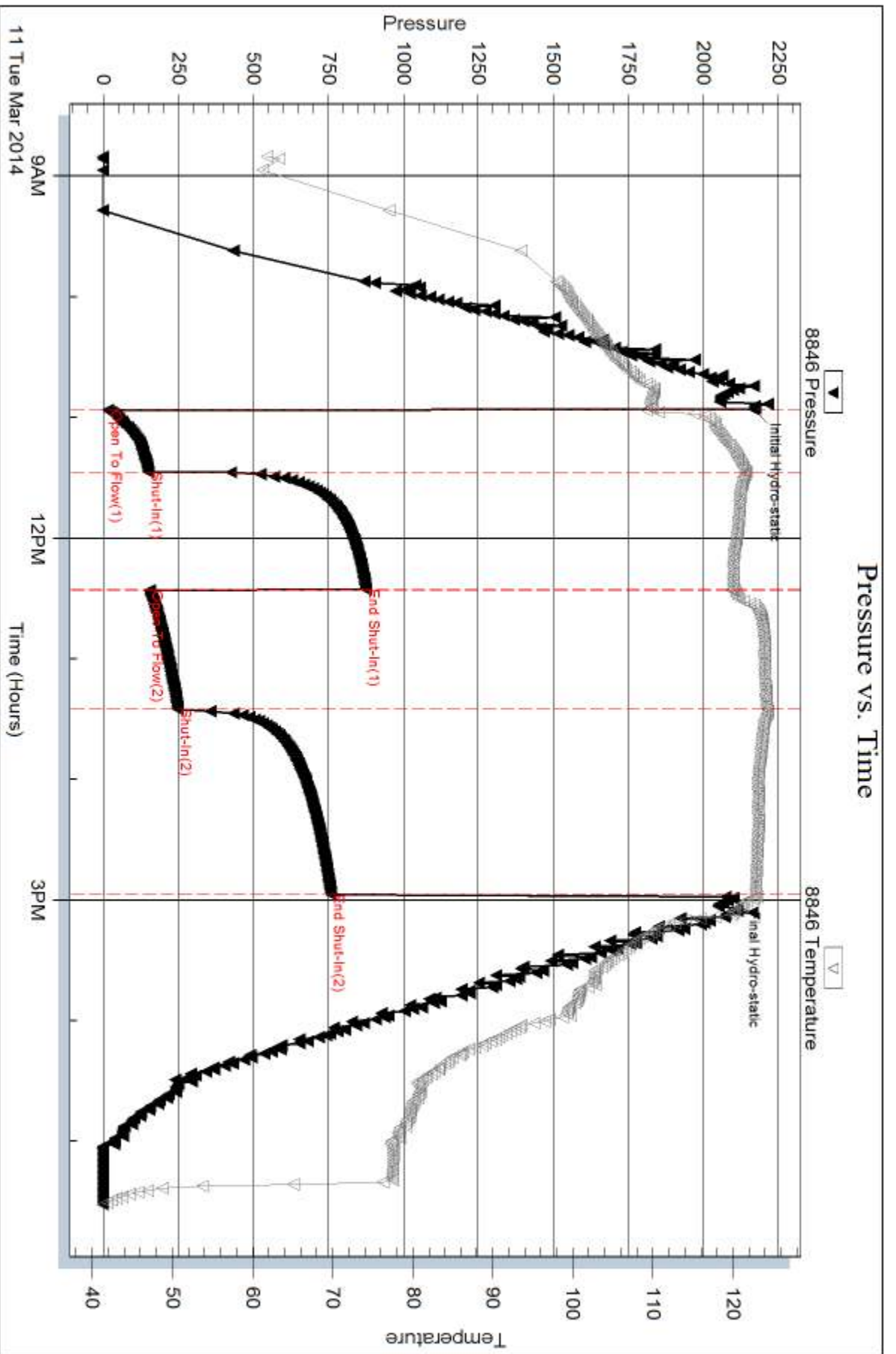
Num Gas Bombs: 0

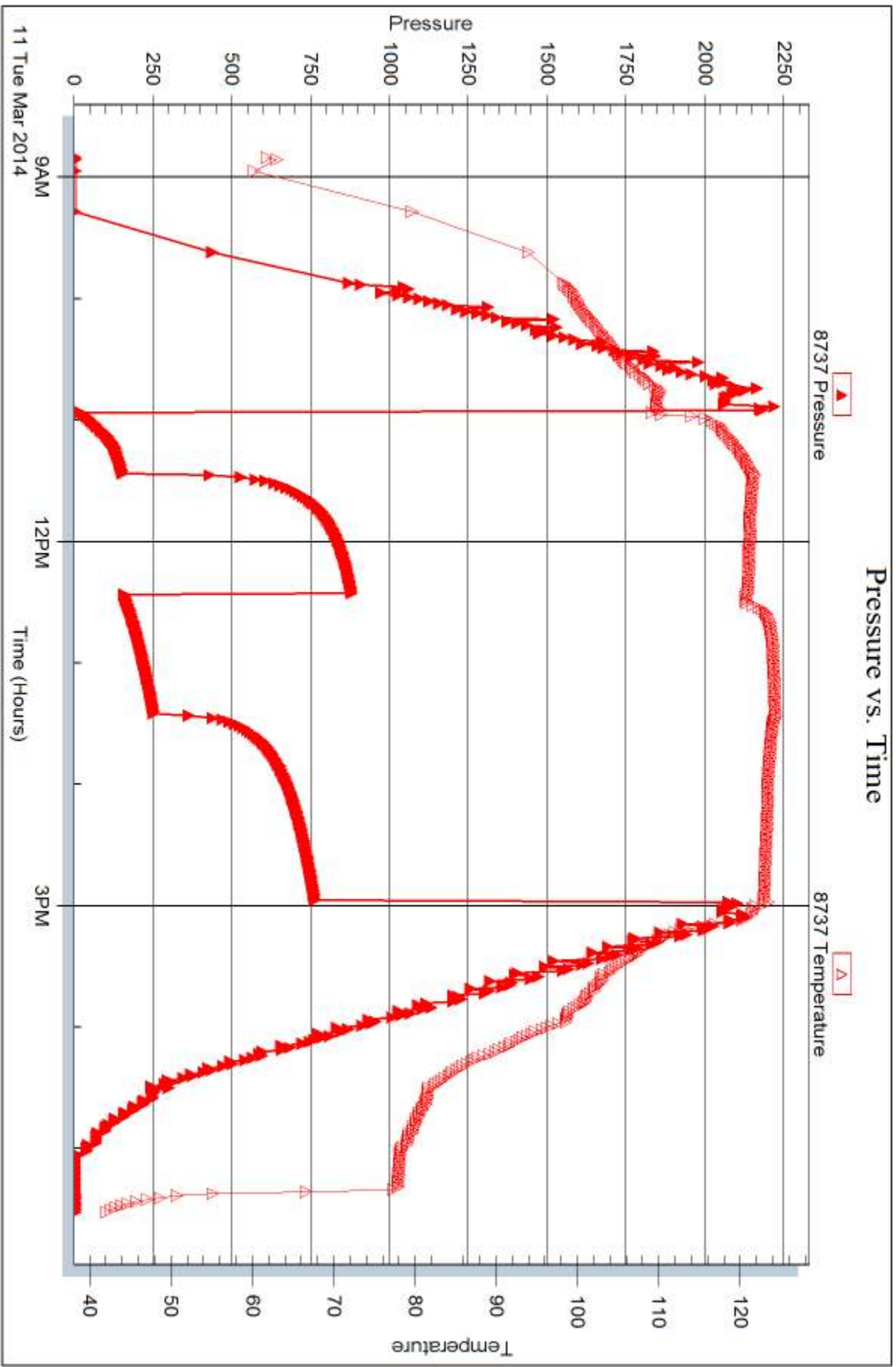
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW .41 @ 56deg F = 28000







## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling**

250 N Water STE 300  
Wichita KS 67202

ATTN: Tom Funk

### **Heier- Racette #1-34**

### **34 12s 33 Logan KS**

Start Date: 2014.03.13 @ 15:00:15

End Date: 2014.03.13 @ 22:59:30

Job Ticket #: 56412                      DST #: 4

Trilobite Testing, Inc  
PO Box 362 Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2014.03.19 @ 18:02:01



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling  
250 N Water STE 300  
Wichita KS 67202  
ATTN: Tom Funk

**34 12s 33 Logan KS**  
**Heier- Racette #1-34**  
Job Ticket: 56412      **DST#: 4**  
Test Start: 2014.03.13 @ 15:00:15

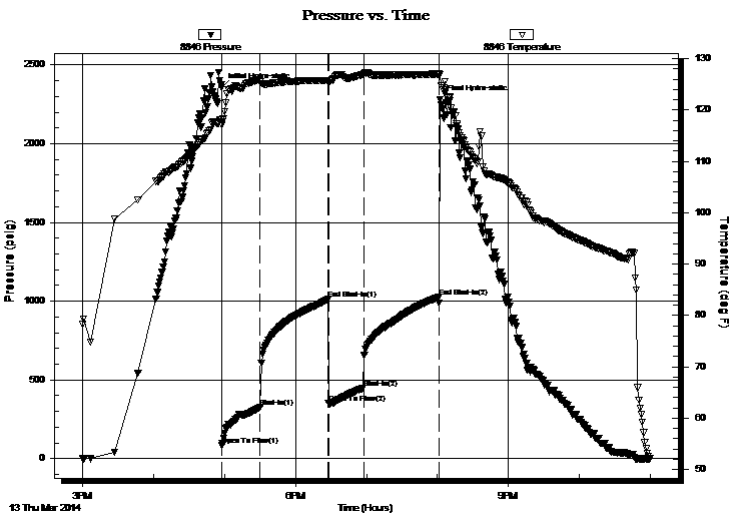
## GENERAL INFORMATION:

Formation: **Ft. Scott-Johnson**  
Deviated: No Whipstock: ft (KB)      Test Type: Conventional Bottom Hole (Reset)  
Time Tool Opened: 16:58:00      Tester: Mike Roberts  
Time Test Ended: 22:59:30      Unit No: 65  
**Interval: 4541.00 ft (KB) To 4640.00 ft (KB) (TVD)**      Reference Elevations: 3104.00 ft (KB)  
Total Depth: 4541.00 ft (KB) (TVD)      3094.00 ft (CF)  
Hole Diameter: 7.88 inches Hole Condition: Fair      KB to GR/CF: 10.00 ft

**Serial #: 8846      Inside**  
Press@RunDepth: 448.58 psig @ 4543.00 ft (KB)      Capacity: 8000.00 psig  
Start Date: 2014.03.13      End Date: 2014.03.13      Last Calib.: 2014.03.13  
Start Time: 15:00:15      End Time: 22:59:30      Time On Btm: 2014.03.13 @ 16:57:45  
Time Off Btm: 2014.03.13 @ 20:02:15

TEST COMMENT: IF:BOB in 4 min.  
IS:BOB in 11 min.  
FF:BOB in 4 min.  
FS:BOB in 13 min.

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2358.01	118.08	Initial Hydro-static
1	85.71	117.06	Open To Flow (1)
33	326.33	125.56	Shut-In(1)
90	1011.23	125.76	End Shut-In(1)
91	350.99	125.64	Open To Flow (2)
120	448.58	126.93	Shut-In(2)
184	1024.34	126.97	End Shut-In(2)
185	2280.93	126.85	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
0.00	GIP= 744 feet	0.00
238.00	mcgo 5%m 40%g 55%o	1.17
620.00	mcgo 10%m 30%g 60%o	9.07
154.00	gcmo 10%g 10%m 80%o	2.25

\* Recovery from multiple tests

## Gas Rates

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



**TRILOBITE TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling  
250 N Water STE 300  
Wichita KS 67202  
ATTN: Tom Funk

**34 12s 33 Logan KS**  
**Heier- Racette #1-34**  
Job Ticket: 56412      **DST#: 4**  
Test Start: 2014.03.13 @ 15:00:15

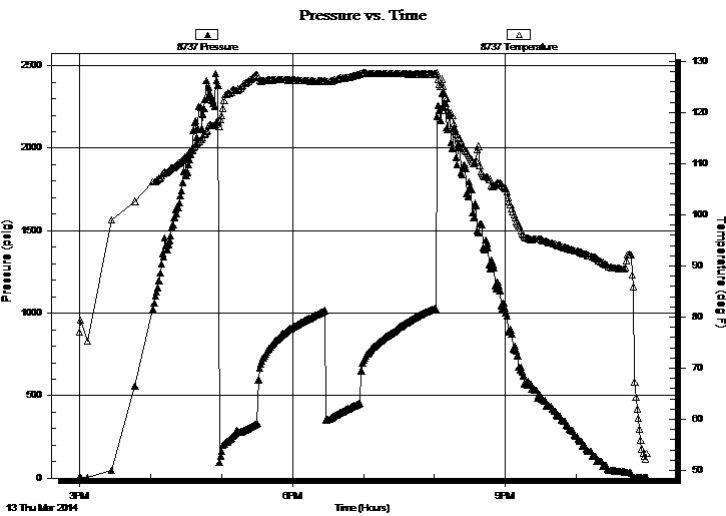
## GENERAL INFORMATION:

Formation: **Ft. Scott-Johnson**  
 Deviated: No Whipstock:      ft (KB)      Test Type: Conventional Bottom Hole (Reset)  
 Time Tool Opened: 16:58:00      Tester: Mike Roberts  
 Time Test Ended: 22:59:30      Unit No: 65  
**Interval: 4541.00 ft (KB) To 4640.00 ft (KB) (TVD)**      Reference Elevations: 3104.00 ft (KB)  
 Total Depth: 4541.00 ft (KB) (TVD)      3094.00 ft (CF)  
 Hole Diameter: 7.88 inches Hole Condition: Fair      KB to GR/CF: 10.00 ft

## Serial #: 8737      Outside

Press@RunDepth:      psig @      4543.00 ft (KB)      Capacity: 8000.00 psig  
 Start Date: 2014.03.13      End Date: 2014.03.13      Last Calib.: 2014.03.13  
 Start Time: 15:00:15      End Time: 22:59:45      Time On Btm:  
    Time Off Btm:

TEST COMMENT: IF:BOB in 4 min.  
IS:BOB in 11 min.  
FF:BOB in 4 min.  
FS:BOB in 13 min.



## PRESSURE SUMMARY

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

## Recovery

Length (ft)	Description	Volume (bbl)
0.00	GIP= 744 feet	0.00
238.00	mcgo 5%m 40%g 55%o	1.17
620.00	mcgo 10%m 30%g 60%o	9.07
154.00	gcmo 10%g 10%m 80%o	2.25

## Gas Rates

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

\* Recovery from multiple tests





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling  
250 N Water STE 300  
Wichita KS 67202  
ATTN: Tom Funk

**34 12s 33 Logan KS**  
**Heier- Racette #1-34**  
Job Ticket: 56412      **DST#: 4**  
Test Start: 2014.03.13 @ 15:00:15

## Tool Information

Drill Pipe:	Length: 4288.00 ft	Diameter: 3.88 inches	Volume: 62.71 bbl	Tool Weight:	2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length: 238.00 ft	Diameter: 2.25 inches	Volume: 1.17 bbl	Weight to Pull Loose:	90000.00 lb
			<u>Total Volume: 63.88 bbl</u>	Tool Chased	9.00 ft
Drill Pipe Above KB:	5.00 ft			String Weight: Initial	80000.00 lb
Depth to Top Packer:	4541.00 ft			Final	82000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	99.00 ft				
Tool Length:	119.00 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			4522.00	
Shut In Tool	5.00			4527.00	
Hydraulic tool	5.00			4532.00	
Packer	5.00			4537.00	20.00      Bottom Of Top Packer
Packer	4.00			4541.00	
Stubb	1.00			4542.00	
Perforations	1.00			4543.00	
Recorder	0.00	8846	Inside	4543.00	
Recorder	0.00	8737	Outside	4543.00	
Change Over Sub	1.00			4544.00	
Blank Spacing	63.00			4607.00	
Change Over Sub	1.00			4608.00	
Perforations	27.00			4635.00	
Bullnose	5.00			4640.00	99.00      Bottom Packers & Anchor

**Total Tool Length: 119.00**



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling

**34 12s 33 Logan KS**

250 N Water STE 300  
Wichita KS 67202

**Heier- Racette #1-34**

Job Ticket: 56412

**DST#: 4**

ATTN: Tom Funk

Test Start: 2014.03.13 @ 15:00:15

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

0 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

0 ppm

Viscosity: 55.00 sec/qt

Cushion Volume:

bbf

Water Loss: 8.38 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 8500.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbf
0.00	GIP= 744 feet	0.000
238.00	mcgo 5%m 40%g 55%o	1.170
620.00	mcgo 10%m 30%g 60%o	9.067
154.00	gcmo 10%g 10%m 80%o	2.252

Total Length: 1012.00 ft

Total Volume: 12.489 bbf

Num Fluid Samples: 0

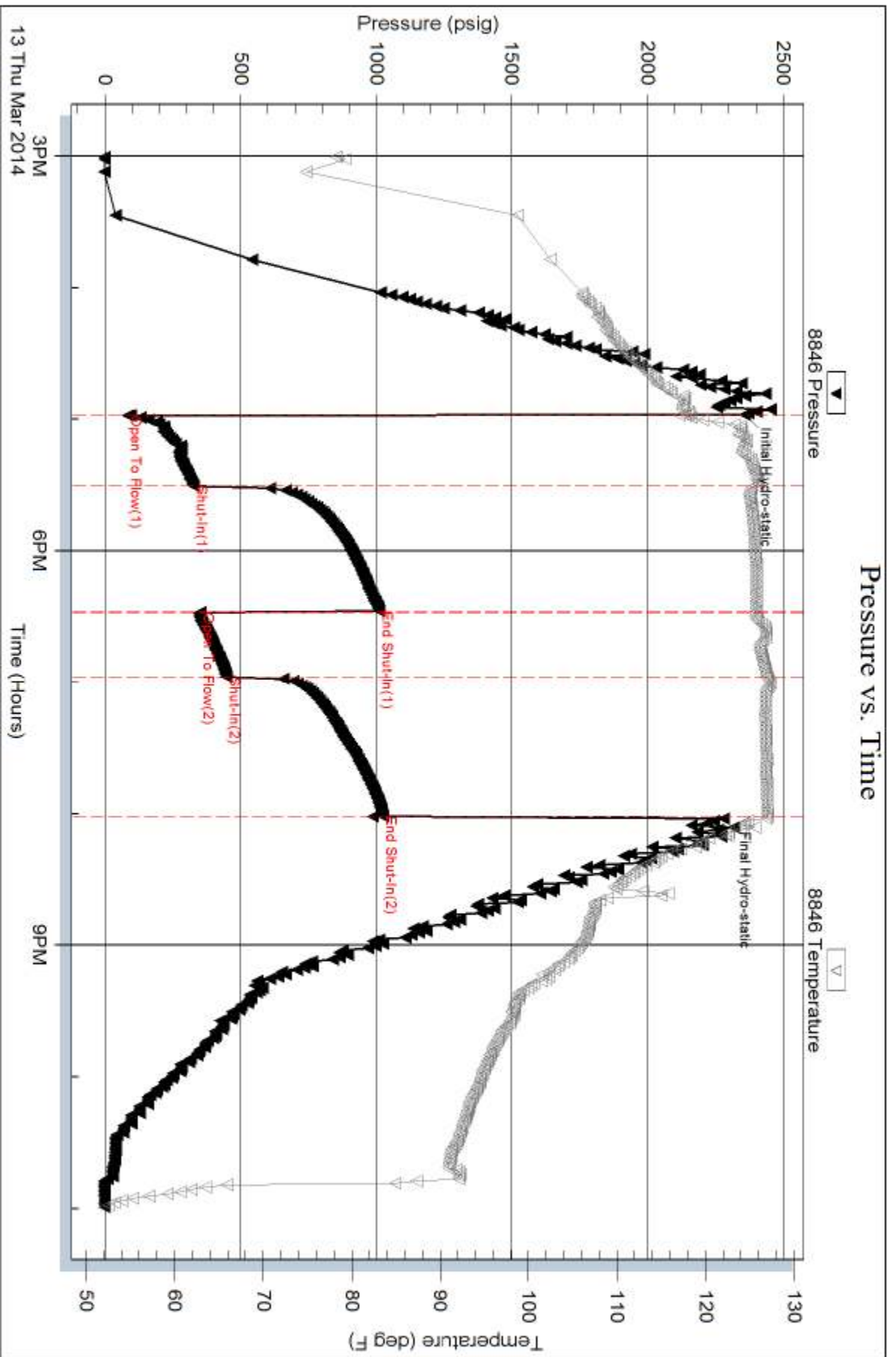
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

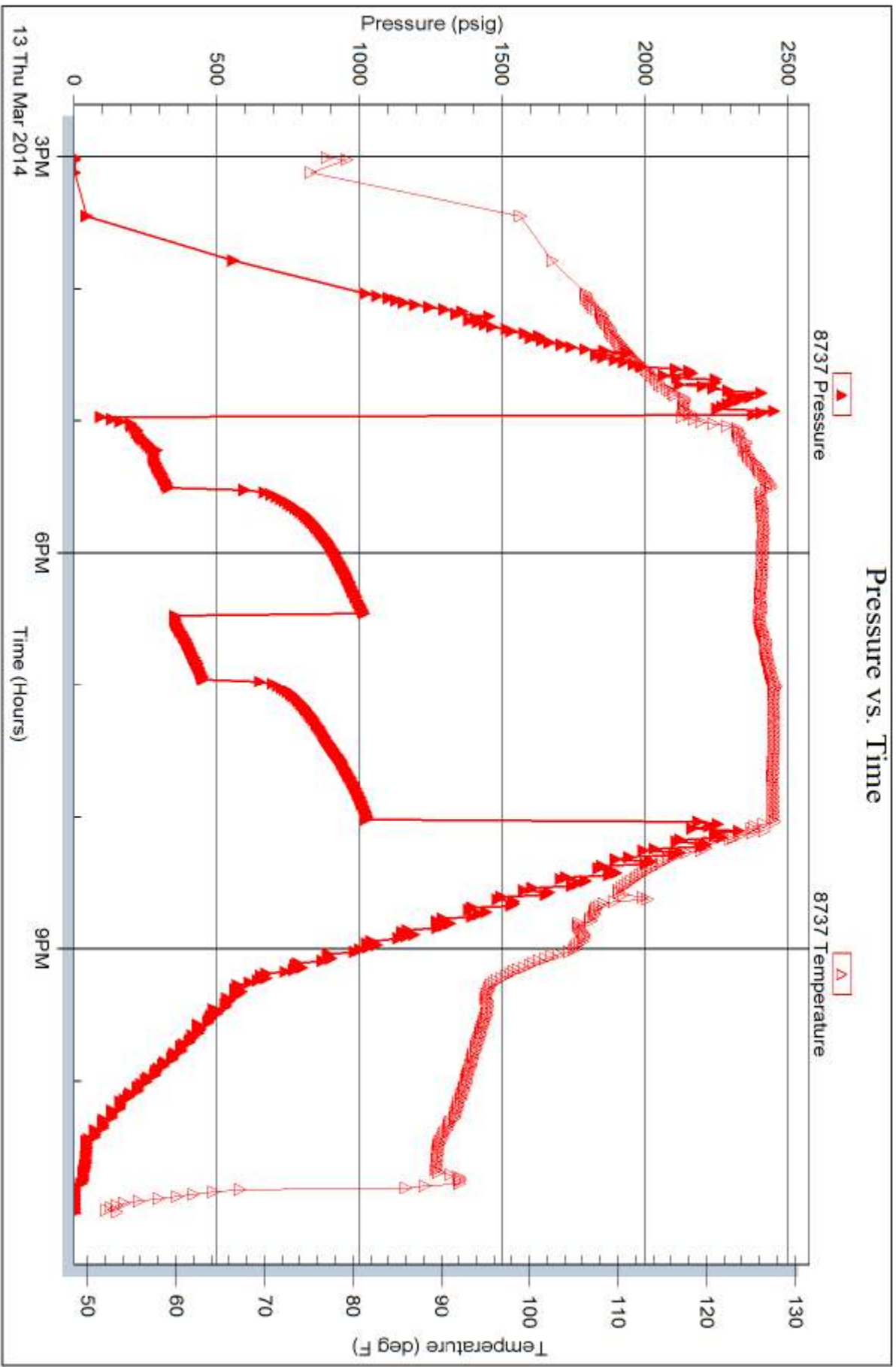


Serial #: 8737

Outside Murfin Drilling

Heier - Racette #1-34

DST Test Number: 4





# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 56767

Well Name & No. Heier-Racette # 1-34 Test No. 1 Date \_\_\_\_\_  
 Company Murfin Drilling Elevation 3104 KB 3094 GL \_\_\_\_\_  
 Address 250 N water STE 300 Wichita KS, 67202  
 Co. Rep / Geo. Tom Funk Rig \_\_\_\_\_  
 Location: Sec. 34 Twp. 12 S Rge. 33 Co. Logan State KS.

Interval Tested 4198 - 4260 Zone Tested LKC "H + I"  
 Anchor Length 62 Drill Pipe Run 3944 Mud Wt. 9.1  
 Top Packer Depth 4194 Drill Collars Run 238 Vis 57  
 Bottom Packer Depth 4198 Wt. Pipe Run 0 WL 6.0  
 Total Depth 4260 Chlorides 5,500 ppm System LCM 8.0

Blow Description IF - Bob in 22 min  
ISE - Blowback built to 1/2" died back to surface blow  
FF - Bob in 30 min  
FSE - Blowback built to 1/4" died back to surface blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>45</u>	<u>clean oil</u>	<u>5</u>	<u>95</u>		
<u>216</u>	<u>OCM</u>	<u>3</u>	<u>30</u>	<u>67</u>	
<u>240</u>	<u>90 wcm</u>	<u>3</u>	<u>2</u>	<u>40</u>	<u>55</u>
Rec _____	Feet of _____	%gas _____	%oil _____	%water _____	%mud _____
Rec _____	Feet of _____	%gas _____	%oil _____	%water _____	%mud _____

Rec Total 501 BHT 119 Gravity 31 API RW \_\_\_\_\_ @ \_\_\_\_\_ °F Chlorides \_\_\_\_\_ ppm

(A) Initial Hydrostatic 2096  Test 1250 T-On Location 10:15 pm 3-9  
 (B) First Initial Flow 21  Jars \_\_\_\_\_ T-Started 11:15 pm 3-9  
 (C) First Final Flow 145  Safety Joint \_\_\_\_\_ T-Open 1:15 Am 3-10  
 (D) Initial Shut-In 1186  Circ Sub \_\_\_\_\_ T-Pulled 5:15 Am 3-10  
 (E) Second Initial Flow 152  Hourly Standby \_\_\_\_\_ T-Out 7:45 Am 3-10  
 (F) Second Final Flow 244  Mileage 82 RT 127.10 Comments \_\_\_\_\_  
 (G) Final Shut-In 1175  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 2084  Straddle \_\_\_\_\_  Ruined Shale Packer \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  Ruined Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  Extra Copies \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_ Sub Total 0  
 Day Standby \_\_\_\_\_ Total 1377.10  
 Accessibility \_\_\_\_\_ MP/DST Disc't \_\_\_\_\_

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

Approved By [Signature] Our Representative Robert Zoolow

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 56768

Well Name & No. Heier - Racette # 1-34 Test No. 2 Date 3-10-2014  
 Company Murfin Drilling Elevation 3104 KB 3094 GL  
 Address 250 N. water st E 300 Wichita KS, 67202  
 Co. Rep / Geo. Tom Funk Rig Murfin #22  
 Location: Sec. 34 Twp. 12 S Rge. 33 Co. Logan State KS

Interval Tested 4260-4283 Zone Tested LKC "J"  
 Anchor Length 23 Drill Pipe Run 4006 Mud Wt. 9.1  
 Top Packer Depth 4256 Drill Collars Run 238 Vis 64  
 Bottom Packer Depth 4260 Wt. Pipe Run 0 WL 6.8  
 Total Depth 4283 Chlorides 7,300 ppm System LCM 7.0

Blow Description IF - Bob In 10 min  
ISI - Return built to 2 3/4"  
FF - Bob In 15 min  
FSI - Return built to 3 3/4"

Rec	Feet of	%gas	%oil	%water	%mud
<del>196</del>	<u>4IP 248'</u>				
<u>196</u>	<u>Clean Oil</u>	<u>5</u>	<u>95</u>		
<u>60</u>	<u>gumco</u>	<u>5</u>	<u>50</u>	<u>15</u>	<u>20</u>
<u>548</u>	<u>MW</u>			<u>92</u>	<u>8</u>

Rec Total 804 BHT 124 Gravity 34 API RW .36 @ 54 °F Chlorides 26,000 ppm

(A) Initial Hydrostatic 2167  Test 1250 T-On Location 2:06 pm 3-10  
 (B) First Initial Flow 23  Jars T-Started 2:52 pm 3-10  
 (C) First Final Flow 187  Safety Joint T-Open 5:07 pm 3-10  
 (D) Initial Shut-In 1231  Circ Sub T-Pulled 9:07 pm 3-10  
 (E) Second Initial Flow 192  Hourly Standby T-Out 11:00 AM 3-11  
 (F) Second Final Flow 348  Mileage 82 Rt 127.10 Comments \_\_\_\_\_  
 (G) Final Shut-In 1219  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 2125  Straddle \_\_\_\_\_  Ruined Shale Packer \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  Ruined Packer \_\_\_\_\_

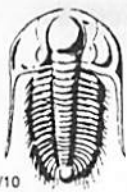
Initial Open 30  Extra Packer \_\_\_\_\_  Extra Copies \_\_\_\_\_  
 Initial Shut-In 60  Extra Recorder \_\_\_\_\_ Sub Total 0  
 Final Flow 60  Day Standby \_\_\_\_\_ Total 1377.10  
 Final Shut-In 90  Accessibility \_\_\_\_\_ MP/DST Disc't \_\_\_\_\_

Sub Total 1377.10

Approved By \_\_\_\_\_

Our Representative Robert Zedner

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. 56769

Well Name & No. Heier - Racette #1-34 Test No. 3 Date 3-11-2014  
 Company Murfin Drilling Elevation 3104 KB 3094 GL  
 Address 250 N Water St E 300 Wichita KS, 67202  
 Co. Rep / Geo. Tom Funk Rig Murfin 22  
 Location: Sec. 34 Twp. 12 S Rge. 33 Co. Logan State KS

Interval Tested 4287 - 4310 Zone Tested LKC "K"  
 Anchor Length 23 Drill Pipe Run 4037 Mud Wt. 9.1  
 Top Packer Depth 4283 Drill Collars Run 238 Vis 57  
 Bottom Packer Depth 4287 Wt. Pipe Run 0 WL 6.0  
 Total Depth 4310 Chlorides 7,300 ppm System LCM 7  
 Blow Description IF - Bob In 20 min  
ISI - NO Return  
FF - Bob In 32 min  
FSI - NO Return

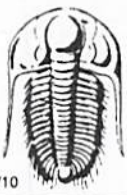
Rec	Feet of	%gas	%oil	%water	%mud
<u>516</u>	<u>MSW</u>			<u>77</u>	<u>23</u>
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total \_\_\_\_\_ BHT 123 Gravity \_\_\_\_\_ API RW 41 @ 56 °F Chlorides 28,008 ppm

(A) Initial Hydrostatic 2169  Test 1250 T-On Location 8:30 Am 3-11  
 (B) First Initial Flow 16  Jars \_\_\_\_\_ T-Started 8:50 Am 3-11  
 (C) First Final Flow 151  Safety Joint \_\_\_\_\_ T-Open 10:56 Am 3-11  
 (D) Initial Shut-In 874  Circ Sub \_\_\_\_\_ T-Pulled 12:56 pm 3-11  
 (E) Second Initial Flow 154  Hourly Standby \_\_\_\_\_ T-Out 5:20 pm 3-11  
 (F) Second Final Flow 248  Mileage 82 Rt 127.10 Comments \_\_\_\_\_  
 (G) Final Shut-In 758  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 2100  Straddle \_\_\_\_\_  Ruined Shale Packer \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  Ruined Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  Extra Copies \_\_\_\_\_  
 Initial Open 30  Extra Recorder \_\_\_\_\_ Sub Total 0  
 Initial Shut-In 60  Day Standby \_\_\_\_\_ Total 1377.10  
 Final Flow 60  Accessibility \_\_\_\_\_ MP/DST Disc't \_\_\_\_\_  
 Final Shut-In 90 Sub Total 1377.10

Approved By [Signature] Our Representative Robert Zedlow

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# TRIOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. **56412**

4/10

Well Name & No. Heier Racette 1-34 Test No. 4 Date 3-13-14  
 Company Martin Drilling Elevation 3104 KB 3094 GL  
 Address 250 N. Water STE 300 Wichita KS 67202  
 Co. Rep / Geo. Tom Funk Rig Martin 22  
 Location: Sec. 34 Twp. 12S Rge. 3E Co. Logan State KS

Interval Tested 4541-4640 Zone Tested Fort Scott - Johnson  
 Anchor Length 99 Drill Pipe Run 4288 Mud Wt. 9.2  
 Top Packer Depth 4536 Drill Collars Run 238 Vis 55  
 Bottom Packer Depth 4541 Wt. Pipe Run Ø WL 8.4  
 Total Depth 4640 Chlorides 800 ppm System LCM 7  
 Blow Description IF: BOB in 4 Min  
IS: BOB in 11 Min  
FF: BOB in 4 Min  
FS: BOB in 13 Min

Rec	Feet of	%gas	%oil	%water	%mud
<u>154</u>	<u>gcmo</u>	<u>10</u>	<u>80</u>	<u>10</u>	<u>10</u>
<u>20</u>	<u>mcgo</u>	<u>30</u>	<u>60</u>	<u>10</u>	<u>10</u>
<u>238</u>	<u>mcgo</u>	<u>40</u>	<u>55</u>	<u>5</u>	<u>10</u>
<u>Ø</u>	<u>GIP = 744'</u>	<u>100</u>			
		%gas	%oil	%water	%mud

Rec Total 1012 BHT 126 Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic 2358  Test 1250 T-On Location 14:43  
 (B) First Initial Flow 85  Jars — T-Started 15:00  
 (C) First Final Flow 326  Safety Joint — T-Open 16:57  
 (D) Initial Shut-In 1011  Circ Sub NC T-Pulled 19:57  
 (E) Second Initial Flow 350  Hourly Standby — T-Out —  
 (F) Second Final Flow 448  Mileage 100 RT 127.10 Comments Day Standby  
 (G) Final Shut-In 1024  Sampler — Between Robert +  
 (H) Final Hydrostatic 2280  Straddle — Mike?  
 Ruined Shale Packer —  
 Shale Packer —  
 Extra Packer —  
 Extra Recorder —  
 Day Standby 1d 21.25h  
 Accessibility —

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

Sub Total 1377.10 Sub Total 708.33  
 Total 2085.43 MP/DST Disc't —

Approved By [Signature] Our Representative [Signature]

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