



## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co.**

250 N Water STE 300  
Wichita, KS 67202

ATTN: Larry Nicholson

### **Abell Ranch B #3-31**

### **31 12s 30w Gove,KS**

Start Date: 2015.01.05 @ 03:14:00

End Date: 2015.01.05 @ 12:59:45

Job Ticket #: 59558                      DST #: 1

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

Printed: 2015.01.12 @ 09:33:19



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co.

**31 12s 30w Gove, KS**

250 N Water STE 300  
Wichita, KS 67202

**Abell Ranch B #3-31**

Job Ticket: 59558

**DST#: 1**

ATTN: Larry Nicholson

Test Start: 2015.01.05 @ 03:14:00

## GENERAL INFORMATION:

Formation: **Toronto - LKC D**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 06:18:00

Time Test Ended: 12:59:45

Test Type: Conventional Bottom Hole (Initial)

Tester: Bradley Walter

Unit No: 69

**Interval: 3911.00 ft (KB) To 4027.00 ft (KB) (TVD)**

Reference Elevations: 2893.00 ft (KB)

Total Depth: 4027.00 ft (KB) (TVD)

2882.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 11.00 ft

**Serial #: 8365**

**Inside**

Press@RunDepth: 134.96 psig @ 3912.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2015.01.05

End Date: 2015.01.05

Last Calib.: 2015.01.05

Start Time: 03:14:05

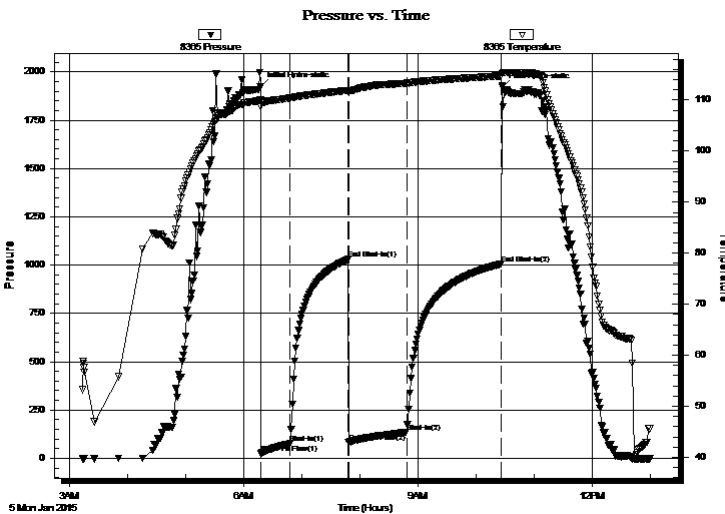
End Time: 12:59:45

Time On Btm: 2015.01.05 @ 06:17:30

Time Off Btm: 2015.01.05 @ 10:27:15

**TEST COMMENT:** IF: 1" blow.  
IS: No return.  
FF: 1 1/2" blow.  
FS: No return.

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1923.57	110.01	Initial Hydro-static
1	23.57	108.72	Open To Flow (1)
31	75.36	110.39	Shut-In(1)
91	1029.57	111.88	End Shut-In(1)
91	81.08	111.53	Open To Flow (2)
151	134.96	113.29	Shut-In(2)
249	1006.29	114.74	End Shut-In(2)
250	1921.33	115.17	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
240.00	socm 2o 98m	1.18

## Gas Rates

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





**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co.

**31 12s 30w Gove, KS**

250 N Water STE 300  
Wichita, KS 67202

**Abell Ranch B #3-31**

Job Ticket: 59558

**DST#: 1**

ATTN: Larry Nicholson

Test Start: 2015.01.05 @ 03:14:00

## Tool Information

Drill Pipe:	Length: 3644.00 ft	Diameter: 3.80 inches	Volume: 51.12 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: 278.00 ft	Diameter: 2.25 inches	Volume: 1.37 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 52.49 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	38.00 ft			String Weight: Initial 68000.00 lb
Depth to Top Packer:	3911.00 ft			Final 68000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	116.00 ft			
Tool Length:	143.00 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			3885.00	
Shut In Tool	5.00			3890.00	
Hydraulic tool	5.00			3895.00	
Jars	5.00			3900.00	
Safety Joint	2.00			3902.00	
Packer	5.00			3907.00	27.00 Bottom Of Top Packer
Packer	4.00			3911.00	
Stubb	1.00			3912.00	
Recorder	0.00	8365	Inside	3912.00	
Recorder	0.00	8522	Outside	3912.00	
Perforations	15.00			3927.00	
Change Over Sub	1.00			3928.00	
Drill Pipe	95.00			4023.00	
Change Over Sub	1.00			4024.00	
Bullnose	3.00			4027.00	116.00 Bottom Packers & Anchor

**Total Tool Length: 143.00**



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

## FLUID SUMMARY

Murfin Drilling Co.

**31 12s 30w Gove,KS**

250 N Water STE 300  
Wichita, KS 67202

**Abell Ranch B #3-31**

Job Ticket: 59558

**DST#: 1**

ATTN: Larry Nicholson

Test Start: 2015.01.05 @ 03:14:00

### 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: 54.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.18 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2700.00 ppm

Filter Cake: 2.00 inches

### Recovery Information

Recovery Table

Length ft	Description	Volume bbl
240.00	socm 2o 98m	1.180

Total Length: 240.00 ft      Total Volume: 1.180 bbl

Num Fluid Samples: 0

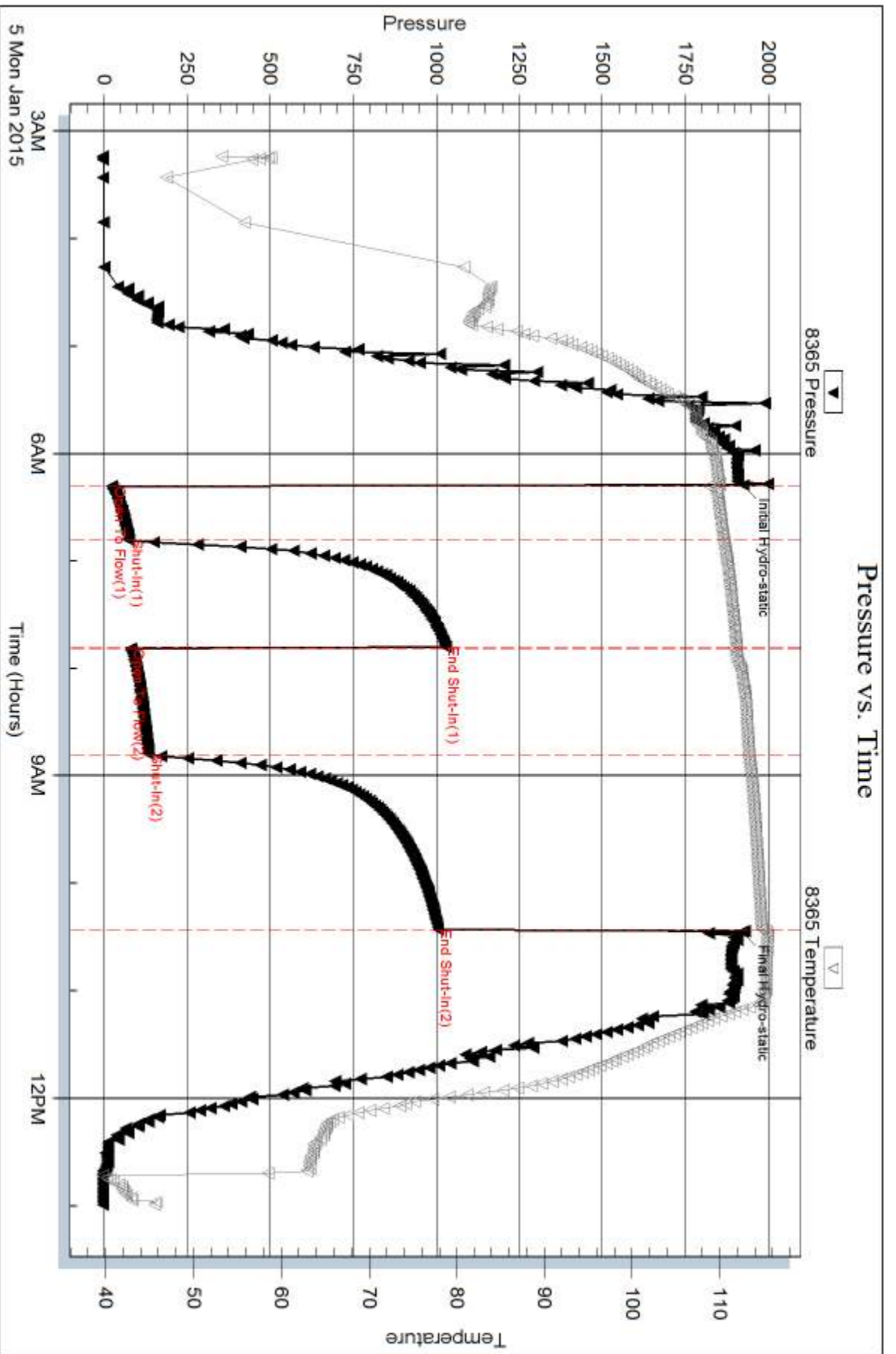
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

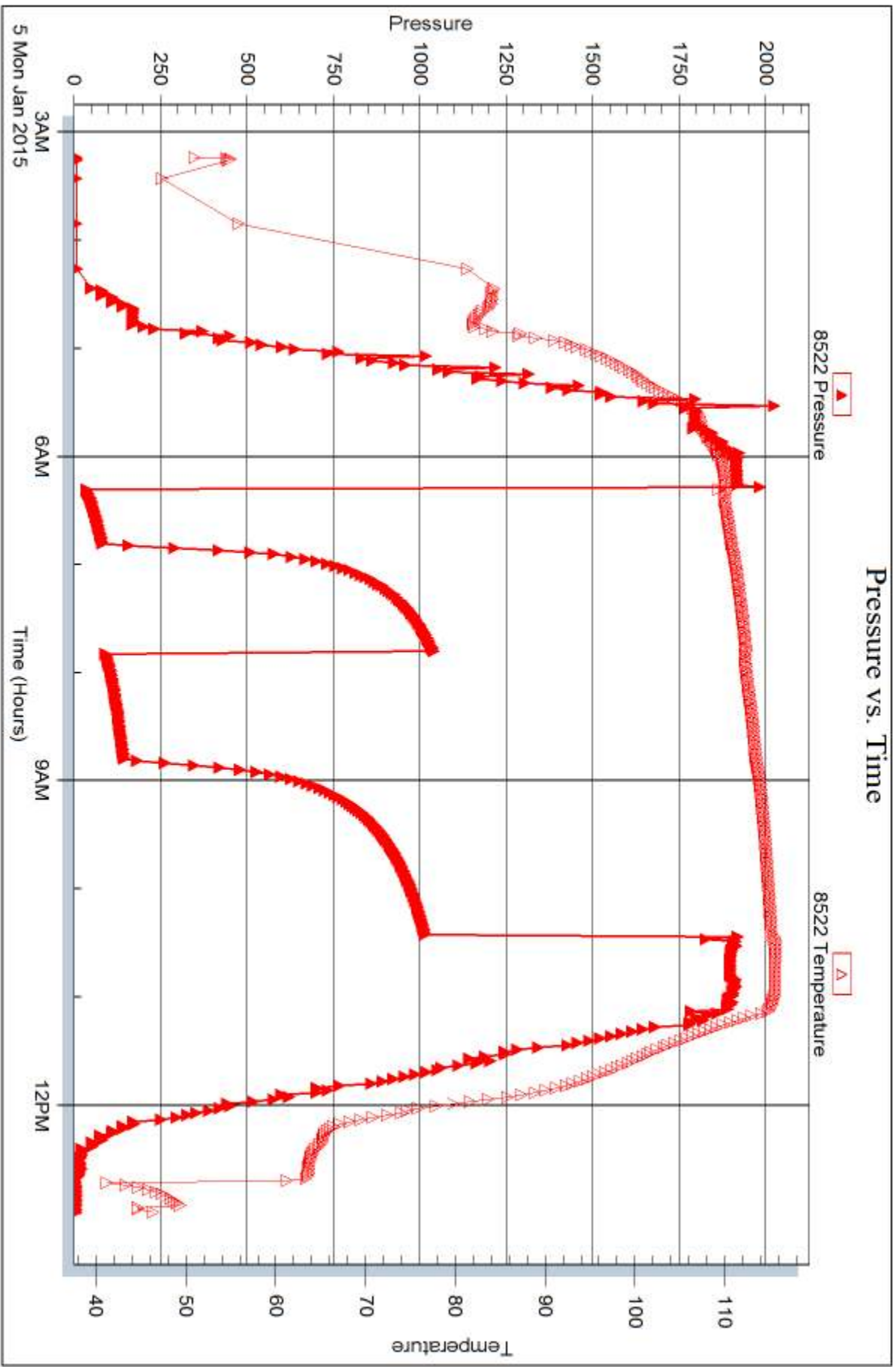


Serial #: 8522

Outside Murfin Drilling Co.

Abell Ranch B #3-31

DST Test Number: 1





## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co.**

250 N Water STE 300  
Wichita, KS 67202

ATTN: Larry Nicholson

### **Abell Ranch B #3-31**

### **31 12s 30w Gove,KS**

Start Date: 2015.01.05 @ 19:56:00

End Date: 2015.01.06 @ 06:50:00

Job Ticket #: 59559                      DST #: 2

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

Printed: 2015.01.12 @ 09:32:58

Murfin Drilling Co.  
31 12s 30w Gove,KS  
Abell Ranch B #3-31  
DST # 2  
LKC - E & F  
2015.01.05





**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co.

**31 12s 30w Gove, KS**

250 N Water STE 300  
Wichita, KS 67202

**Abell Ranch B #3-31**

ATTN: Larry Nicholson

Job Ticket: 59559

**DST#: 2**

Test Start: 2015.01.05 @ 19:56:00

## GENERAL INFORMATION:

Formation: **LKC - E & F**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 00:39:15

Time Test Ended: 06:50:00

Test Type: Conventional Bottom Hole (Reset)

Tester: Bradley Walter

Unit No: 69

**Interval: 4025.00 ft (KB) To 4052.00 ft (KB) (TVD)**

Reference Elevations: 2893.00 ft (KB)

Total Depth: 4052.00 ft (KB) (TVD)

2882.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 11.00 ft

**Serial #: 8365**

**Inside**

Press@RunDepth: 73.36 psig @ 4026.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2015.01.05

End Date:

2015.01.06

Last Calib.:

2015.01.06

Start Time: 19:56:05

End Time:

06:50:00

Time On Btm:

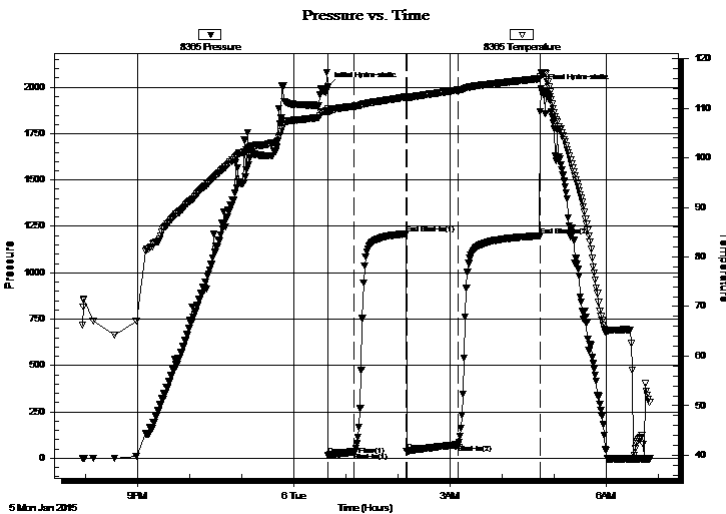
2015.01.06 @ 00:39:00

Time Off Btm:

2015.01.06 @ 04:45:00

**TEST COMMENT:** IF: 8" blow.  
IS: No return.  
FF: 6" blow.  
FS: No return.

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2002.48	109.87	Initial Hydro-static
1	15.37	109.03	Open To Flow (1)
30	33.04	110.37	Shut-In(1)
91	1210.02	112.26	End Shut-In(1)
91	37.53	112.04	Open To Flow (2)
151	73.36	113.65	Shut-In(2)
245	1198.82	115.96	End Shut-In(2)
246	1992.00	117.11	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
60.00	gmco 25g 25m 50o	0.30
90.00	gmco 10g 5m 85o	0.44
0.00	340' 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.

**31 12s 30w Gove, KS**

250 N Water STE 300  
Wichita, KS 67202

**Abell Ranch B #3-31**

Job Ticket: 59559

**DST#: 2**

ATTN: Larry Nicholson

Test Start: 2015.01.05 @ 19:56:00

## Tool Information

Drill Pipe:	Length: 3750.00 ft	Diameter: 3.80 inches	Volume: 52.60 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: 278.00 ft	Diameter: 2.25 inches	Volume: 1.37 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 53.97 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	30.00 ft			String Weight: Initial 70000.00 lb
Depth to Top Packer:	4025.00 ft			Final 70000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	27.00 ft			
Tool Length:	54.00 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			3999.00	
Shut In Tool	5.00			4004.00	
Hydraulic tool	5.00			4009.00	
Jars	5.00			4014.00	
Safety Joint	2.00			4016.00	
Packer	5.00			4021.00	27.00 Bottom Of Top Packer
Packer	4.00			4025.00	
Stubb	1.00			4026.00	
Recorder	0.00	8365	Inside	4026.00	
Recorder	0.00	8522	Outside	4026.00	
Perforations	23.00			4049.00	
Bullnose	3.00			4052.00	27.00 Bottom Packers & Anchor

**Total Tool Length: 54.00**



**TRILOBITE  
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# DRILL STEM TEST REPORT

## FLUID SUMMARY

Murfin Drilling Co.

**31 12s 30w Gove,KS**

250 N Water STE 300  
Wichita, KS 67202

**Abell Ranch B #3-31**

Job Ticket: 59559

**DST#: 2**

ATTN: Larry Nicholson

Test Start: 2015.01.05 @ 19:56:00

### Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

40 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

0 ppm

Viscosity: 54.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.18 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2700.00 ppm

Filter Cake: 2.00 inches

### Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
60.00	gmco 25g 25m 50o	0.295
90.00	gmco 10g 5m 85o	0.443
0.00	340' GIP	0.000

Total Length: 150.00 ft      Total Volume: 0.738 bbl

Num Fluid Samples: 0

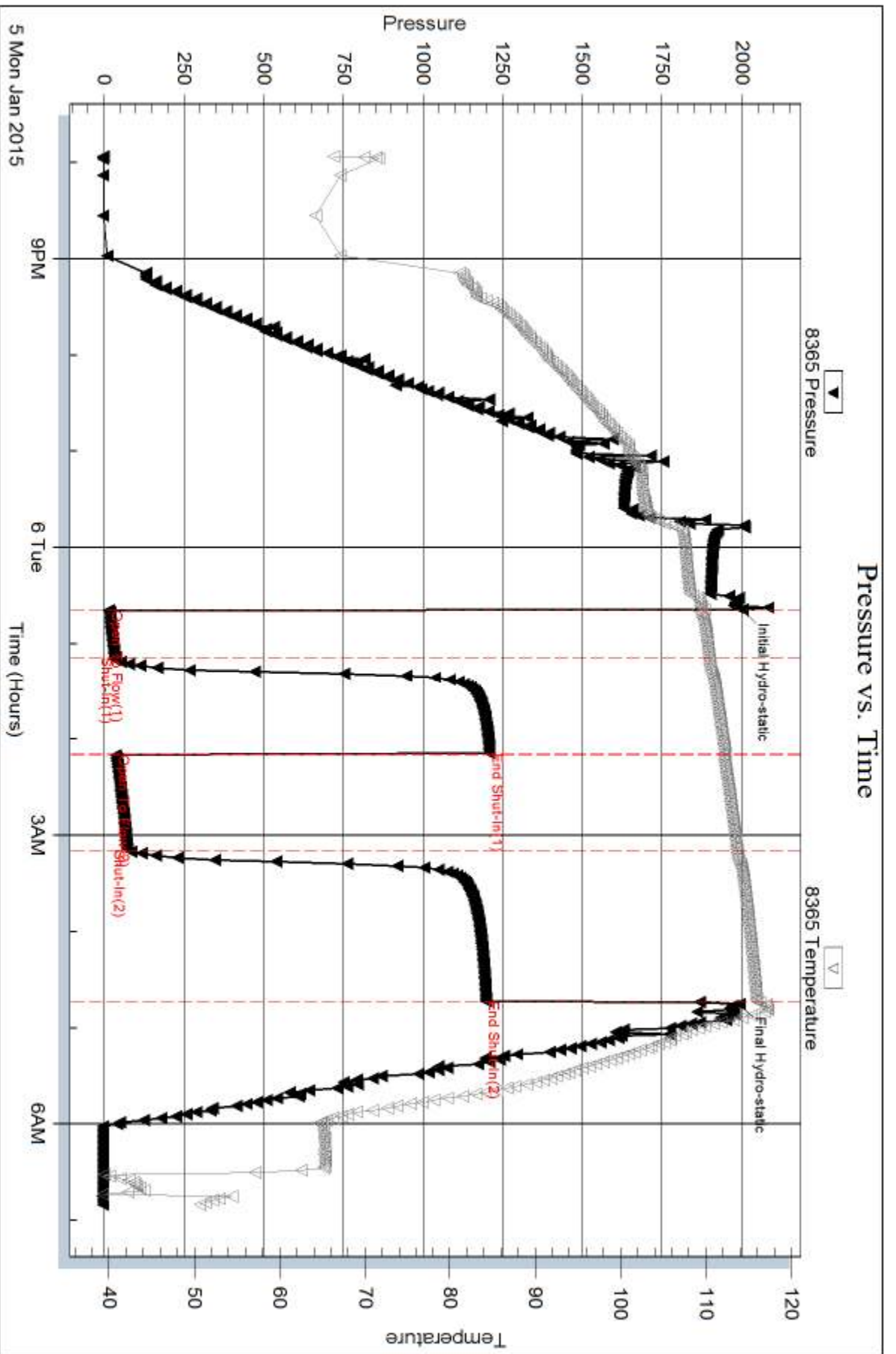
Num Gas Bombs: 0

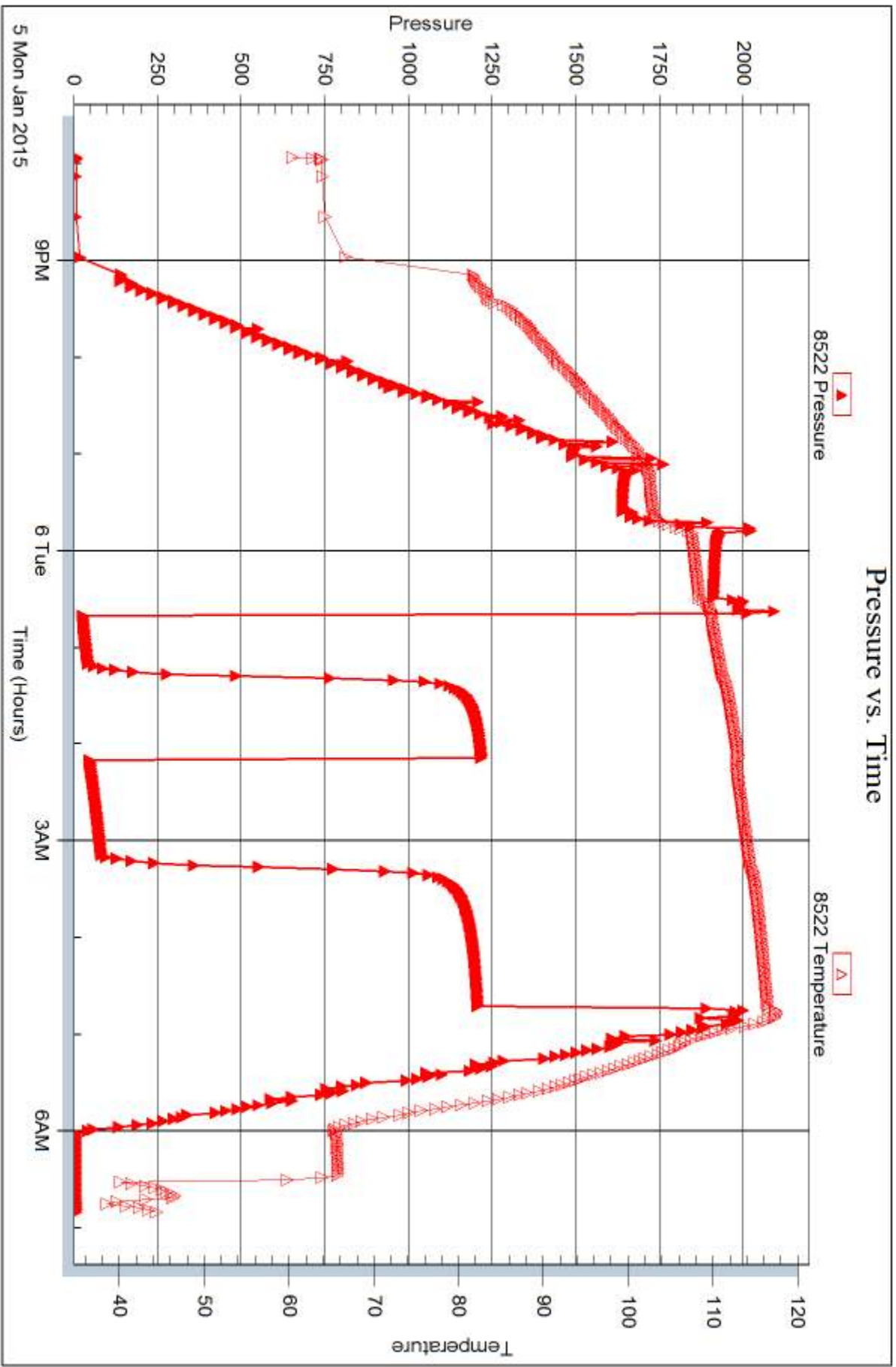
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:







## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co.**

250 N Water STE 300  
Wichita, KS 67202

ATTN: Larry Nicholson

### **Abell Ranch B #3-31**

### **31 12s 30w Gove,KS**

Start Date: 2015.01.07 @ 01:03:00

End Date: 2015.01.07 @ 10:20:15

Job Ticket #: 59560                      DST #: 3

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

Printed: 2015.01.12 @ 09:32:34



**TRILOBITE TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co.

**31 12s 30w Gove, KS**

250 N Water STE 300  
Wichita, KS 67202

**Abell Ranch B #3-31**

Job Ticket: 59560

**DST#: 3**

ATTN: Larry Nicholson

Test Start: 2015.01.07 @ 01:03:00

## GENERAL INFORMATION:

Formation: **LKC H - K**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 03:53:30

Time Test Ended: 10:20:15

Test Type: Conventional Bottom Hole (Reset)

Tester: Bradley Walter

Unit No: 69

**Interval: 4091.00 ft (KB) To 4218.00 ft (KB) (TVD)**

Reference Elevations: 2893.00 ft (KB)

Total Depth: 4218.00 ft (KB) (TVD)

2882.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 11.00 ft

**Serial #: 8365**

**Inside**

Press@RunDepth: 57.92 psig @ 4092.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2015.01.07

End Date:

2015.01.07

Last Calib.: 2015.01.07

Start Time: 01:03:05

End Time:

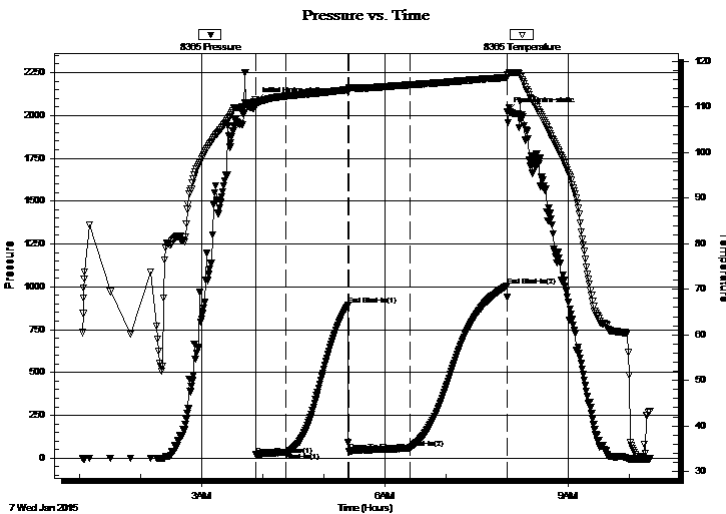
10:20:15

Time On Btm: 2015.01.07 @ 03:53:00

Time Off Btm: 2015.01.07 @ 08:00:15

TEST COMMENT: IF: 2" blow.  
IS: No return.  
FF: 3" blow.  
FS: No return.

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2081.51	111.71	Initial Hydro-static
1	19.56	110.42	Open To Flow (1)
30	36.79	112.37	Shut-In(1)
91	891.49	113.76	End Shut-In(1)
92	40.34	114.02	Open To Flow (2)
151	57.92	114.82	Shut-In(2)
247	1005.64	116.45	End Shut-In(2)
248	2021.79	117.01	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
80.00	socm 1o 99m	0.39
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.

**31 12s 30w Gove, KS**

250 N Water STE 300  
Wichita, KS 67202

**Abell Ranch B #3-31**

Job Ticket: 59560

**DST#: 3**

ATTN: Larry Nicholson

Test Start: 2015.01.07 @ 01:03:00

## Tool Information

Drill Pipe:	Length: 3803.00 ft	Diameter: 3.80 inches	Volume: 53.35 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: 278.00 ft	Diameter: 2.25 inches	Volume: 1.37 bbl	Weight to Pull Loose: 85000.00 lb
			<u>Total Volume: 54.72 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	17.00 ft			String Weight: Initial 70000.00 lb
Depth to Top Packer:	4091.00 ft			Final 71000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	127.00 ft			
Tool Length:	154.00 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			4065.00	
Shut In Tool	5.00			4070.00	
Hydraulic tool	5.00			4075.00	
Jars	5.00			4080.00	
Safety Joint	2.00			4082.00	
Packer	5.00			4087.00	27.00 Bottom Of Top Packer
Packer	4.00			4091.00	
Stubb	1.00			4092.00	
Recorder	0.00	8365	Inside	4092.00	
Recorder	0.00	8522	Outside	4092.00	
Perforations	26.00			4118.00	
Change Over Sub	1.00			4119.00	
Drill Pipe	95.00			4214.00	
Change Over Sub	1.00			4215.00	
Bullnose	3.00			4218.00	127.00 Bottom Packers & Anchor

**Total Tool Length: 154.00**



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

## FLUID SUMMARY

Murfin Drilling Co.

**31 12s 30w Gove, KS**

250 N Water STE 300  
Wichita, KS 67202

**Abell Ranch B #3-31**

Job Ticket: 59560

**DST#: 3**

ATTN: Larry Nicholson

Test Start: 2015.01.07 @ 01:03:00

### 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: 56.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.58 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2500.00 ppm

Filter Cake: 2.00 inches

### Recovery Information

Recovery Table

Length ft	Description	Volume bbl
80.00	socm 1o 99m	0.393
0.00	160' GIP	0.000

Total Length: 80.00 ft      Total Volume: 0.393 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

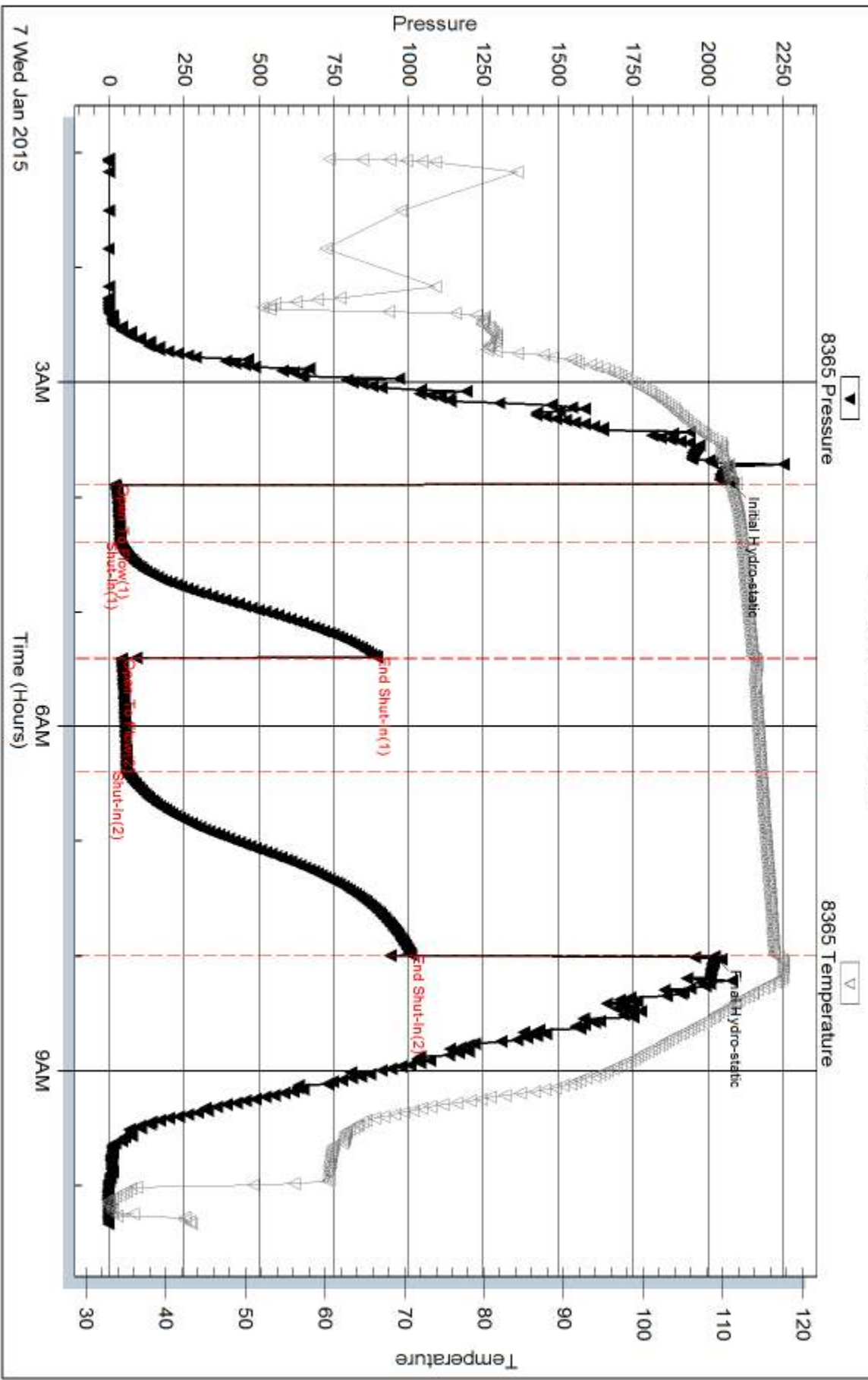
Serial #:

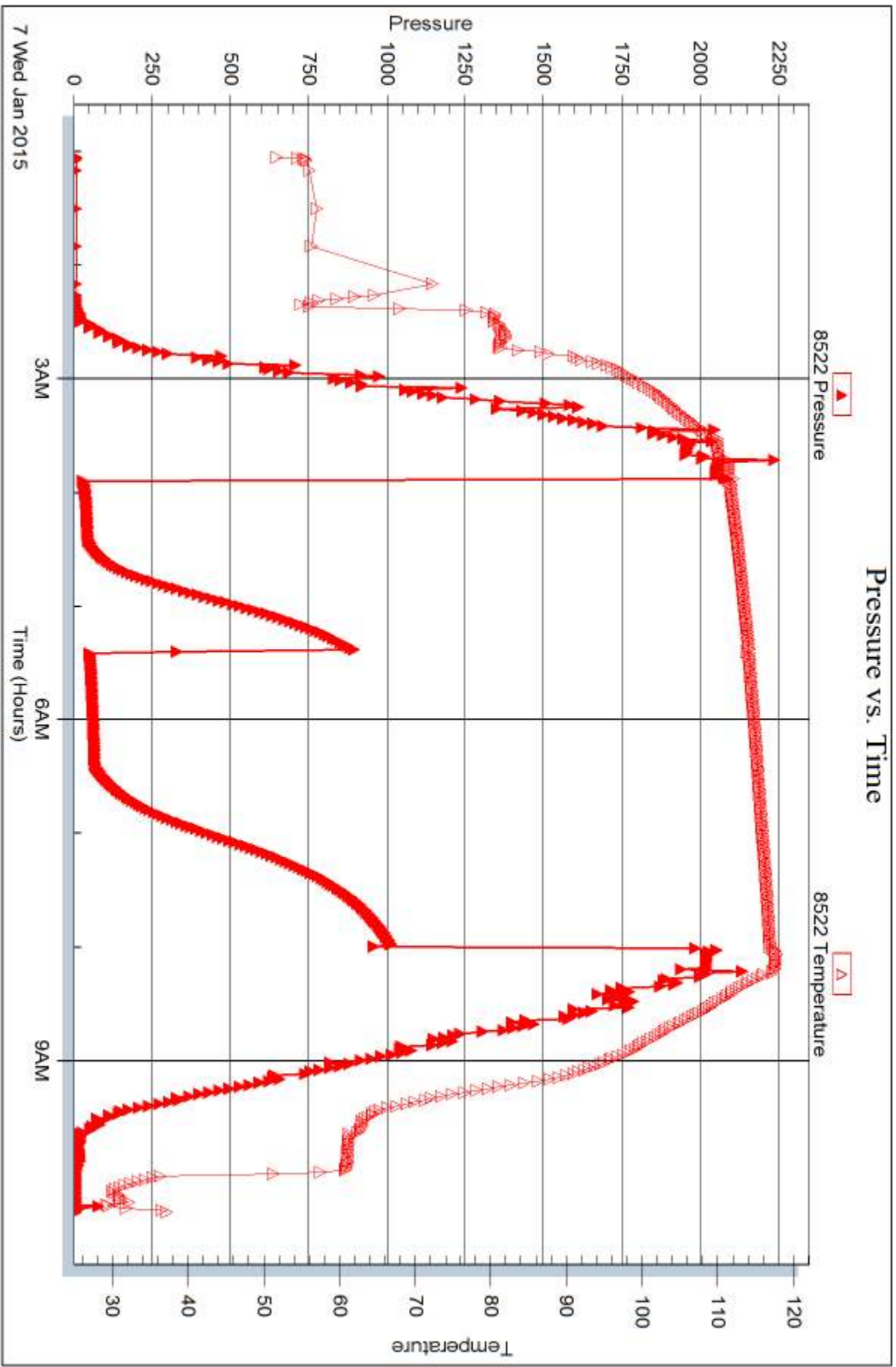
Laboratory Name:

Laboratory Location:

Recovery Comments:

### Pressure vs. Time







## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co.**

250 N Water STE 300  
Wichita, KS 67202

ATTN: Larry Nicholson

### **Abell Ranch B #3-31**

### **31 12s 30w Gove,KS**

Start Date: 2015.01.08 @ 10:37:00

End Date: 2015.01.08 @ 19:28:00

Job Ticket #: 59561                      DST #: 4

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

Printed: 2015.01.12 @ 09:32:10



**TRILOBITE TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co.

**31 12s 30w Gove, KS**

250 N Water STE 300  
Wichita, KS 67202

**Abell Ranch B #3-31**

Job Ticket: 59561

**DST#: 4**

ATTN: Larry Nicholson

Test Start: 2015.01.08 @ 10:37:00

## GENERAL INFORMATION:

Formation: **Pawnee - Ft. Scott**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 13:08:00

Time Test Ended: 19:28:00

Test Type: Conventional Bottom Hole (Reset)

Tester: Bradley Walter

Unit No: 69

**Interval: 4360.00 ft (KB) To 4458.00 ft (KB) (TVD)**

Reference Elevations: 2893.00 ft (KB)

Total Depth: 4458.00 ft (KB) (TVD)

2882.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 11.00 ft

**Serial #: 8365**

**Inside**

Press@RunDepth: 144.27 psig @ 4361.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2015.01.08

End Date:

2015.01.08

Last Calib.: 2015.01.08

Start Time: 10:37:05

End Time:

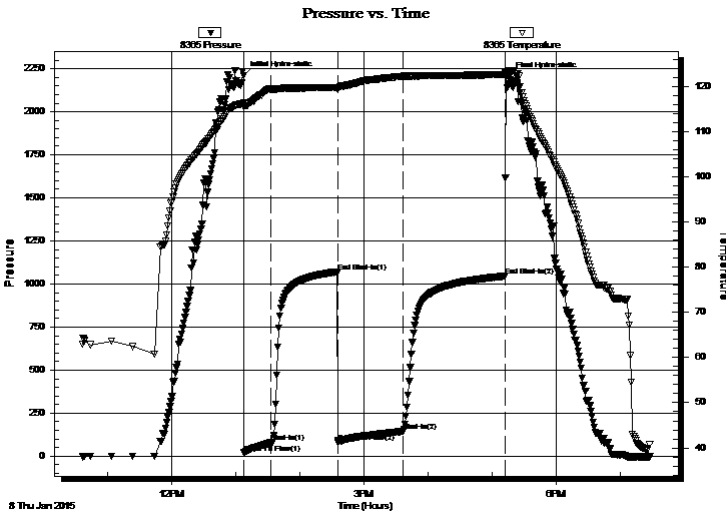
19:28:00

Time On Btm: 2015.01.08 @ 13:07:45

Time Off Btm: 2015.01.08 @ 17:16:00

TEST COMMENT: IF: 2 1/2" blow .  
IS: No return.  
FF: 3" blow .  
FS: No return.

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2208.88	116.40	Initial Hydro-static
1	19.90	115.38	Open To Flow (1)
26	82.86	119.42	Shut-In(1)
88	1070.86	119.77	End Shut-In(1)
89	81.26	119.58	Open To Flow (2)
149	144.27	122.22	Shut-In(2)
245	1045.80	122.61	End Shut-In(2)
249	2202.14	123.29	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
90.00	socm 1o 99m	0.44
180.00	socm 3o 97m	0.89

\* 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.

**31 12s 30w Gove, KS**

250 N Water STE 300  
Wichita, KS 67202

**Abell Ranch B #3-31**

Job Ticket: 59561

**DST#: 4**

ATTN: Larry Nicholson

Test Start: 2015.01.08 @ 10:37:00

## Tool Information

Drill Pipe:	Length: 4080.00 ft	Diameter: 3.80 inches	Volume: 57.23 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: 278.00 ft	Diameter: 2.25 inches	Volume: 1.37 bbl	Weight to Pull Loose: 90000.00 lb
			<u>Total Volume: 58.60 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	25.00 ft			String Weight: Initial 68000.00 lb
Depth to Top Packer:	4360.00 ft			Final 70000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	98.00 ft			
Tool Length:	125.00 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			4334.00	
Shut In Tool	5.00			4339.00	
Hydraulic tool	5.00			4344.00	
Jars	5.00			4349.00	
Safety Joint	2.00			4351.00	
Packer	5.00			4356.00	27.00 Bottom Of Top Packer
Packer	4.00			4360.00	
Stubb	1.00			4361.00	
Recorder	0.00	8365	Inside	4361.00	
Recorder	0.00	8522	Outside	4361.00	
Perforations	28.00			4389.00	
Change Over Sub	1.00			4390.00	
Drill Pipe	64.00			4454.00	
Change Over Sub	1.00			4455.00	
Bullnose	3.00			4458.00	98.00 Bottom Packers & Anchor

**Total Tool Length: 125.00**



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co.

**31 12s 30w Gove, KS**

250 N Water STE 300  
Wichita, KS 67202

**Abell Ranch B #3-31**

Job Ticket: 59561

**DST#: 4**

ATTN: Larry Nicholson

Test Start: 2015.01.08 @ 10:37:00

## 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:

bbbl

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

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2200.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
90.00	socm 1o 99m	0.443
180.00	socm 3o 97m	0.885

Total Length: 270.00 ft      Total Volume: 1.328 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

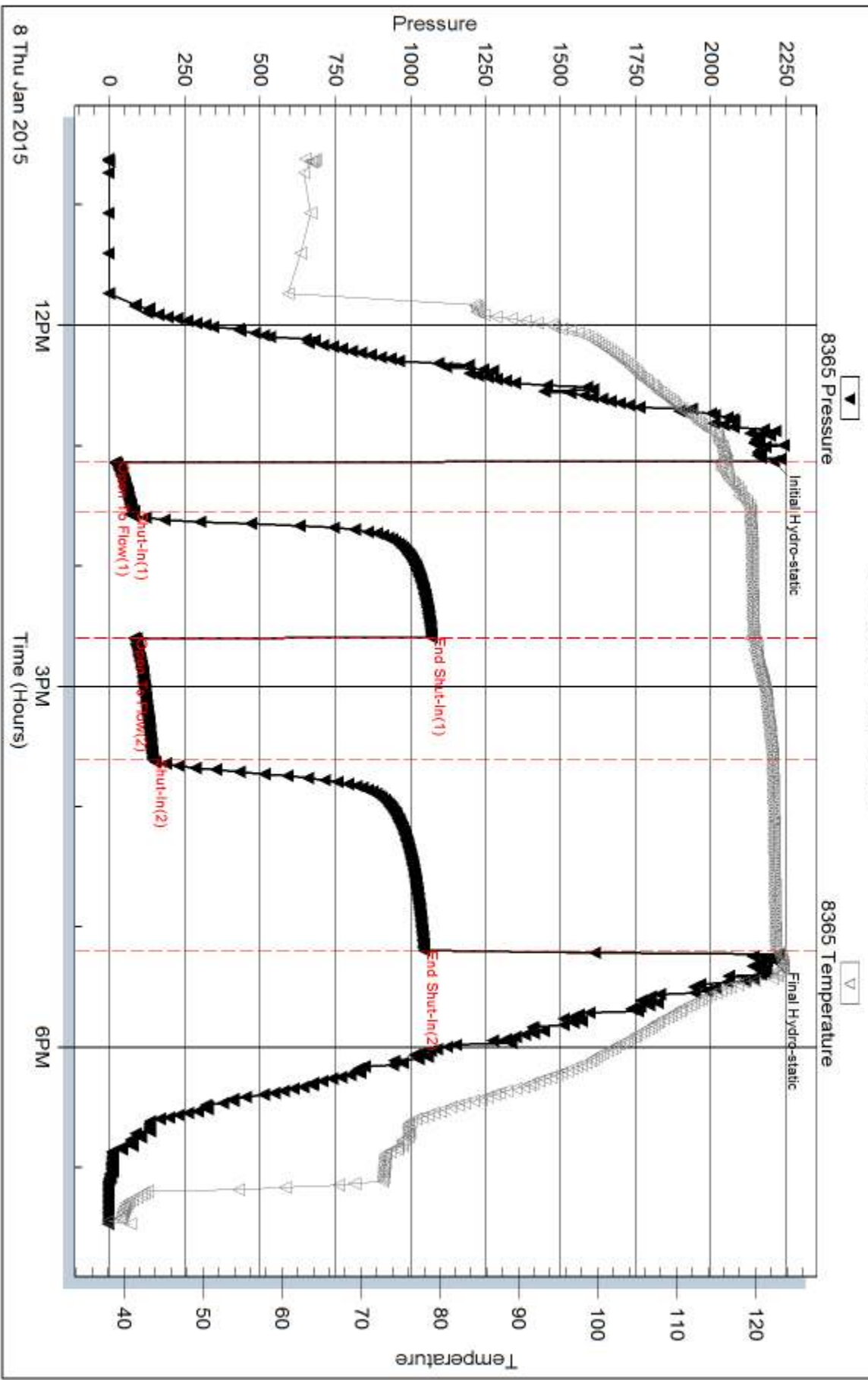
Serial #:

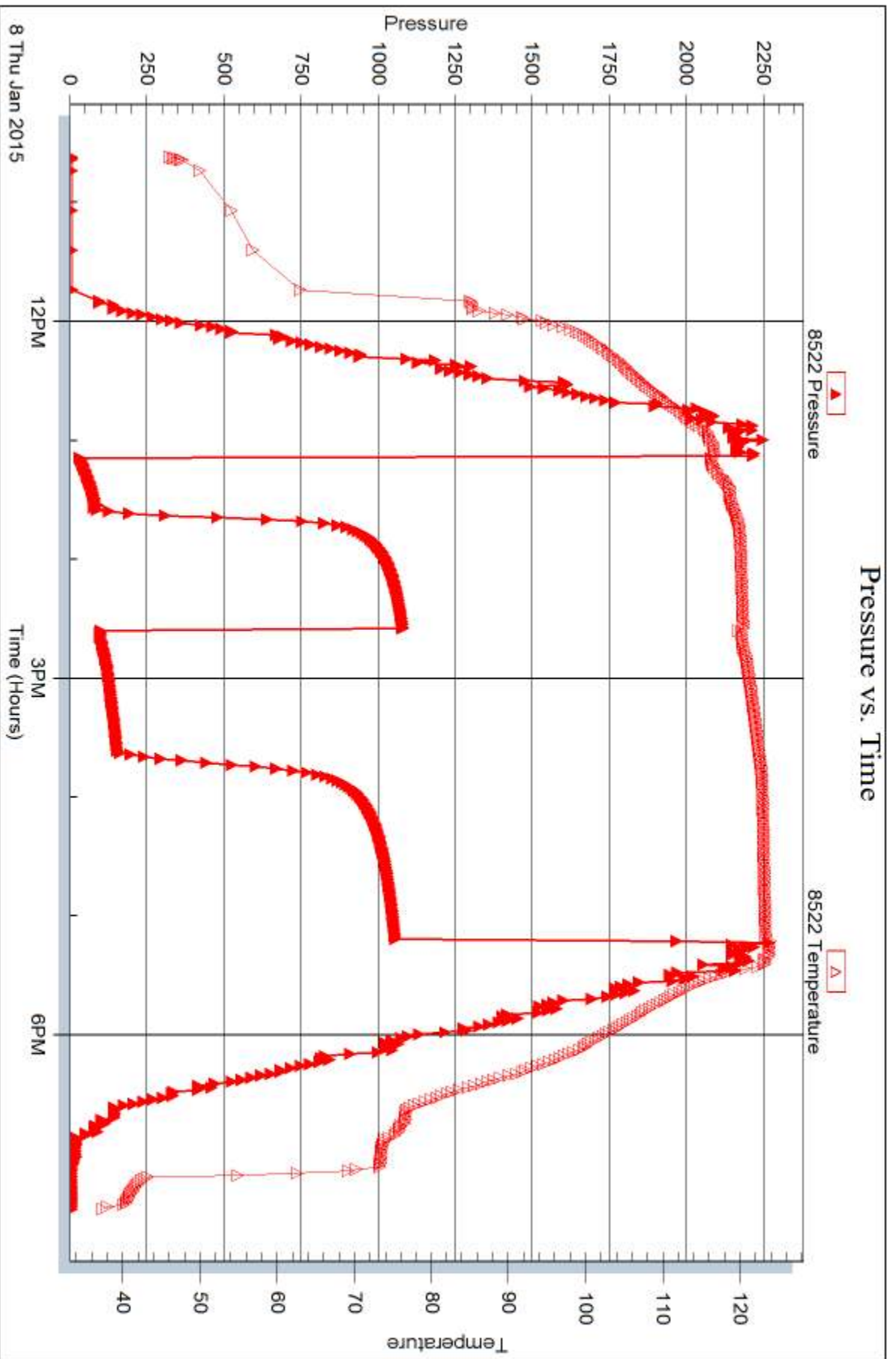
Laboratory Name:

Laboratory Location:

Recovery Comments:

### Pressure vs. Time







## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co.**

250 N Water STE 300  
Wichita, KS 67202

ATTN: Larry Nicholson

### **Abell Ranch B #3-31**

### **31 12s 30w Gove,KS**

Start Date: 2015.01.09 @ 07:41:15

End Date: 2015.01.09 @ 15:40:00

Job Ticket #: 58565                      DST #: 5

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

Printed: 2015.01.12 @ 09:31:39



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co.

**31 12s 30w Gove, KS**

250 N Water STE 300  
Wichita, KS 67202

**Abell Ranch B #3-31**

ATTN: Larry Nicholson

Job Ticket: 58565

**DST#: 5**

Test Start: 2015.01.09 @ 07:41:15

## GENERAL INFORMATION:

Formation: **Johnson-Miss**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 09:26:00

Time Test Ended: 15:40:00

Test Type: Conventional Bottom Hole (Reset)

Tester: Mike Roberts

Unit No: 65

**Interval: 4498.00 ft (KB) To 4538.00 ft (KB) (TVD)**

Reference Elevations: 2893.00 ft (KB)

Total Depth: 4027.00 ft (KB) (TVD)

2882.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 11.00 ft

**Serial #: 8846**

**Inside**

Press@RunDepth: 131.33 psig @ 4500.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2015.01.09

End Date: 2015.01.09

Last Calib.: 2015.01.09

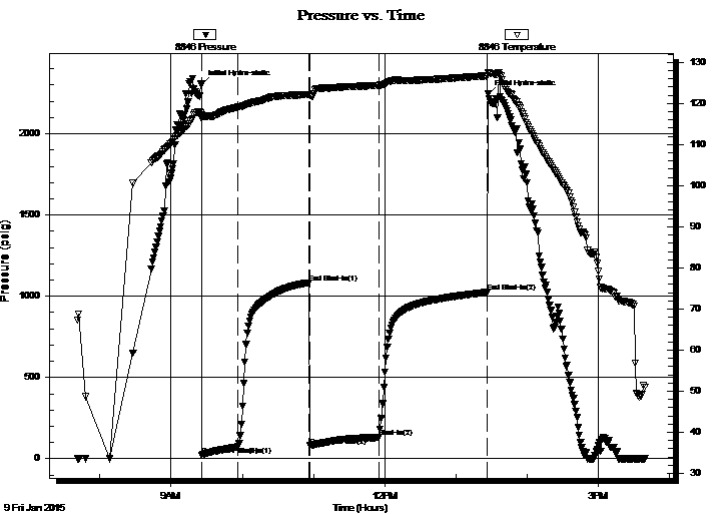
Start Time: 07:41:15

End Time: 15:40:00

Time On Btm: 2015.01.09 @ 09:25:45

Time Off Btm: 2015.01.09 @ 13:27:15

TEST COMMENT: IF: Built to 7" blow  
IS: No return blow  
FF: BOB in 40 min.  
FS: No return blow



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2304.36	117.35	Initial Hydro-static
1	21.03	116.25	Open To Flow (1)
31	73.98	119.13	Shut-In(1)
91	1083.35	122.17	End Shut-In(1)
92	79.44	121.84	Open To Flow (2)
150	131.33	124.39	Shut-In(2)
241	1023.59	126.69	End Shut-In(2)
242	2242.93	127.55	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
70.00	gcmo 20%g 40%o 40%m	0.34
140.00	gcmo 20%g 30%m 50%o	0.69
70.00	gcmo 5%g 15%m 80%o	0.36
70.00	mco 10%m 90%o	0.98
0.00	GIP= 372 feet	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.

**31 12s 30w Gove, KS**

250 N Water STE 300  
Wichita, KS 67202

**Abell Ranch B #3-31**

Job Ticket: 58565

**DST#: 5**

ATTN: Larry Nicholson

Test Start: 2015.01.09 @ 07:41:15

## Tool Information

Drill Pipe:	Length: 4210.00 ft	Diameter: 3.80 inches	Volume: 59.06 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: 278.00 ft	Diameter: 2.25 inches	Volume: 1.37 bbl	Weight to Pull Loose: 90000.00 lb
			<u>Total Volume: 60.43 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	18.00 ft			String Weight: Initial 76000.00 lb
Depth to Top Packer:	4498.00 ft			Final 76000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	40.00 ft			
Tool Length:	68.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

## Tool Description

**Length (ft) Serial No. Position Depth (ft) Accum. Lengths**

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			4471.00	
Shut In Tool	5.00			4476.00	
Hydraulic tool	5.00			4481.00	
Jars	5.00			4486.00	
Safety Joint	3.00			4489.00	
Packer	5.00			4494.00	28.00 Bottom Of Top Packer
Packer	4.00			4498.00	
Stubb	1.00			4499.00	
Perforations	1.00			4500.00	
Recorder	0.00	8846	Inside	4500.00	
Recorder	0.00	8737	Outside	4500.00	
Change Over Sub	1.00			4501.00	
Drill Pipe	31.00			4532.00	
Change Over Sub	1.00			4533.00	
Bullnose	5.00			4538.00	40.00 Bottom Packers & Anchor

**Total Tool Length: 68.00**





**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

## FLUID SUMMARY

Murfin Drilling Co.

**31 12s 30w Gove,KS**

250 N Water STE 300  
Wichita, KS 67202

**Abell Ranch B #3-31**

Job Ticket: 58565

**DST#: 5**

ATTN: Larry Nicholson

Test Start: 2015.01.09 @ 07:41:15

### 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:

0 ppm

Viscosity: 54.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.17 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2700.00 ppm

Filter Cake: 2.00 inches

### Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
70.00	gcmo 20%g 40%o 40%m	0.344
140.00	gcmo 20%g 30%m 50%o	0.688
70.00	gcmo 5%g 15%m 80%o	0.362
70.00	mco 10%m 90%o	0.982
0.00	GIP= 372 feet	0.000

Total Length: 350.00 ft

Total Volume: 2.376 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

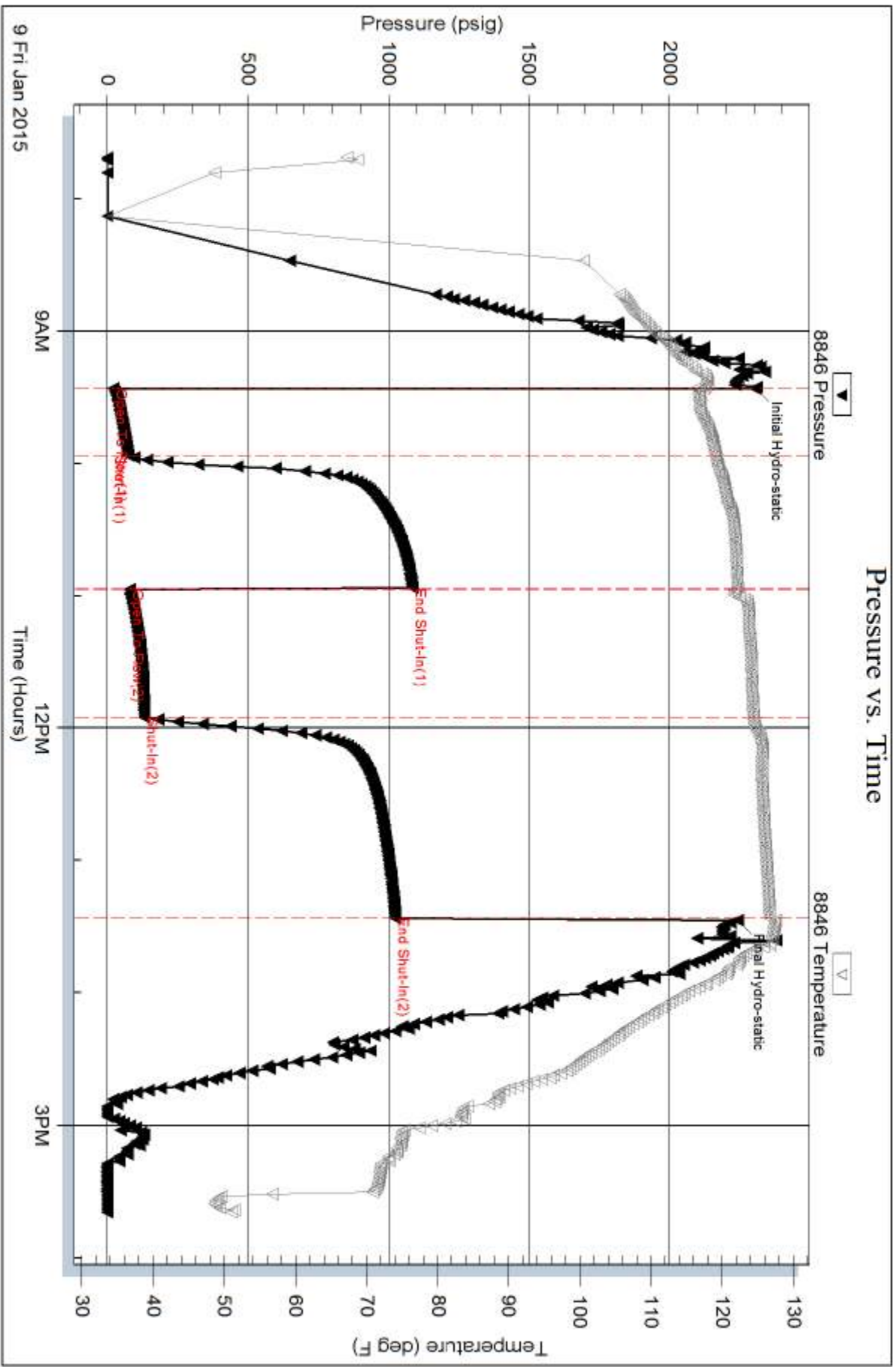
Serial #: 8846

Inside

Murfin Drilling Co.

Abell Ranch B #3-31

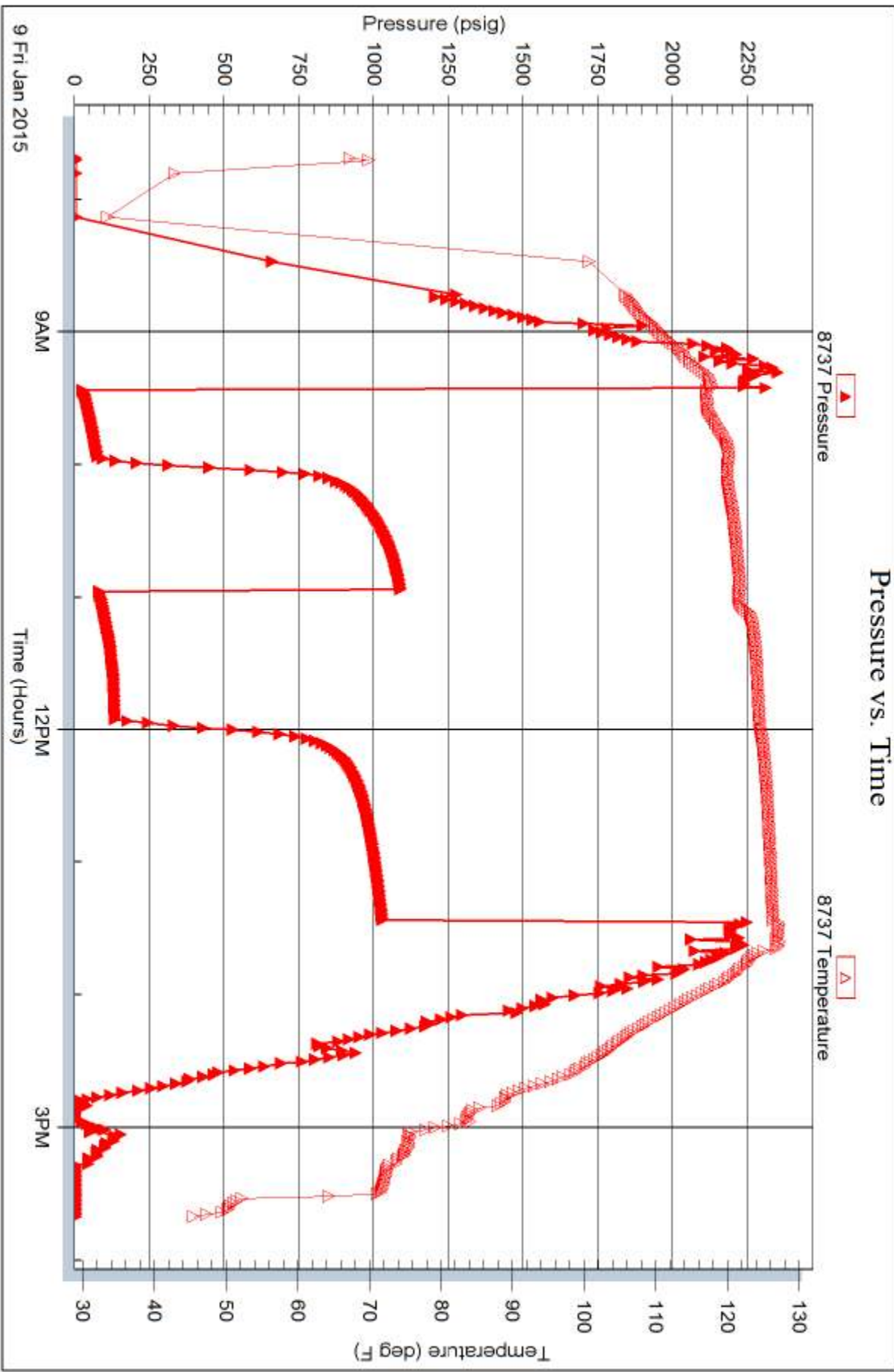
DST Test Number: 5

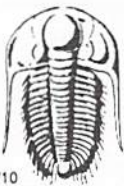


Trilobite Testing, Inc

Ref. No: 58565

Printed: 2015.01.12 @ 09:31:41





# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. **59558**

4/10

Well Name & No. Abell Ranch B #3-31 Test No. 1 Date 1/5/2015  
 Company Martin Drilling Co, Inc Elevation 2893 KB 2882 GL  
 Address 250 N Water STE 300 Wichita, ks 67202  
 Co. Rep / Geo. Larry Nicholson Rig Martin 21  
 Location: Sec. 31 Twp. 12s Rge. 30w Co. Gore State Ks

Interval Tested 3911 - 2882 4027 Zone Tested Toronto - LKC "D"  
 Anchor Length 116 Drill Pipe Run 3644 Mud Wt. 9.1  
 Top Packer Depth 3906 Drill Collars Run 247 Vis 54  
 Bottom Packer Depth 3911 Wt. Pipe Run 0 WL 5.2  
 Total Depth 4027 Chlorides 2700 ppm System LCM 2#

Blow Description IF: 1" blow.  
TSI: No return  
FF: 1 1/2" blow  
FSI: No return.

Rec	Feet of	%gas	%oil	%water	%mud
<u>248</u>	<u>SOCM</u>	<u>2</u>		<u>98</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 240 BHT 115 Gravity — API RW — @ — ° F Chlorides — ppm

(A) Initial Hydrostatic <u>1924</u>	<input checked="" type="checkbox"/> Test <u>1150</u>	T-On Location <u>0200</u>
(B) First Initial Flow <u>24</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>0314</u>
(C) First Final Flow <u>75</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>0618</u>
(D) Initial Shut-In <u>1030</u>	<input checked="" type="checkbox"/> Circ Sub <u>N/C</u>	T-Pulled <u>1018</u>
(E) Second Initial Flow <u>81</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>1300</u>
(F) Second Final Flow <u>135</u>	<input checked="" type="checkbox"/> Mileage <u>91 RT</u> <u>91</u>	Comments
(G) Final Shut-In <u>1006</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>1921</u>	<input type="checkbox"/> Straddle	

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

Shale Packer 250  
 Extra Packer  
 Extra Recorder  
 Day Standby  
 Accessibility

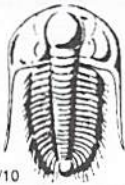
Ruined Shale Packer  
 Ruined Packer  
 Extra Copies

Sub Total 0  
 Total 1816  
 MP/DST Disc't

Sub Total 1816

Approved By \_\_\_\_\_ Our Representative [Signature]

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. **59559**

4/10

Well Name & No. Abell Ranch B #3-31 Test No. 2 Date 1/6/2015  
 Company Martin Drilling Co, Inc Elevation 2893 KB 2882 GL  
 Address 250 N Walker STE 300 Wichita, Ks 67202  
 Co. Rep / Geo. Larry Nicholson Rig Martin 21  
 Location: Sec. 31 Twp. 12s Rge. 30w Co. Gove State Ks

Interval Tested 4025 - 4052 Zone Tested LKC E&F  
 Anchor Length 27' Drill Pipe Run 3770 Mud Wt. 9.1  
 Top Packer Depth 4020 Drill Collars Run 247 Vis 56  
 Bottom Packer Depth 4025 Wt. Pipe Run 0 WL 206.0  
 Total Depth 4052 Chlorides 2,000 ppm System LCM 2,000  
 Blow Description IF: 8" blow.  
ISI: No return.  
FF: 6" blow.  
FSI: No return.

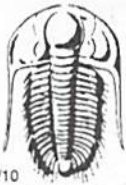
Rec	Feet of	%gas	%oil	%water	%mud
<u>90</u>	<u>60cm</u>	<u>10</u>	<u>85</u>	<u>5</u>	
<u>60</u>	<u>60cm</u>	<u>25</u>	<u>50</u>	<u>25</u>	
	<u>340' GIP</u>				

Rec Total 150 BHT 116 Gravity 40 API RW - @ - °F Chlorides - ppm

(A) Initial Hydrostatic 2002  Test 1150 T-On Location 1915  
 (B) First Initial Flow 15  Jars 250 T-Started 1956  
 (C) First Final Flow 33  Safety Joint 75 T-Open 0039  
 (D) Initial Shut-In 1210  Circ Sub NC T-Pulled 0439  
 (E) Second Initial Flow 38  Hourly Standby \_\_\_\_\_ T-Out 0650  
 (F) Second Final Flow 73  Mileage 91 RT 91 Comments \_\_\_\_\_  
 (G) Final Shut-In 1199  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 1992  Straddle \_\_\_\_\_  Ruined Shale Packer \_\_\_\_\_  
 Shale Packer 250  Ruined Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  Extra Copies \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_ Sub Total 0  
 Day Standby \_\_\_\_\_ Total 1816  
 Accessibility \_\_\_\_\_ MP/DST Disc't \_\_\_\_\_  
 Sub Total 1/816

Approved By \_\_\_\_\_ Our Representative [Signature]

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 59560

Well Name & No. Abell Ranch B #3-31 Test No. 3 Date 1/7/2014  
 Company Murkin Drilling Co, Inc Elevation 2593 KB 2582 GL  
 Address 250N Water Ste 300 Wichita, ks 67202  
 Co. Rep / Geo. Larry Nicholson Rig Murkin 21  
 Location: Sec. 31 Twp. 12s Rge. 30w Co. Gove State Ks

Interval Tested 4091 - 4218 Zone Tested LKC H-K  
 Anchor Length 127 Drill Pipe Run 3803 Mud Wt. 9.5  
 Top Packer Depth 4086 Drill Collars Run 278 Vis 56  
 Bottom Packer Depth 4091 Wt. Pipe Run 8 WL 5.6'  
 Total Depth 4218 Chlorides 2500 ppm System LCM 2#

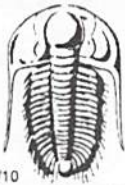
Blow Description IF: 2" blow.  
ISI: No return.  
FF: 3" blow.  
FBI: No Return.

Rec	Feet of	%gas	%oil	%water	%mud
<u>80</u>	<u>AD 50cm</u>		<u>1</u>		<u>99</u>
	<u>160' Gassy Odor</u>				

Rec Total 80 BHT 117 Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic <u>2082</u>	<input checked="" type="checkbox"/> Test <u>1150</u>	T-On Location <u>0045</u>
(B) First Initial Flow <u>20</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>0103</u>
(C) First Final Flow <u>37</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>0354</u>
(D) Initial Shut-In <u>891</u>	<input checked="" type="checkbox"/> Circ Sub <u>N/C</u>	T-Pulled <u>0754</u>
(E) Second Initial Flow <u>40</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>1020</u>
(F) Second Final Flow <u>58</u>	<input checked="" type="checkbox"/> Mileage <u>91RT</u> <u>91</u>	Comments
(G) Final Shut-In <u>1006</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>2022</u>	<input type="checkbox"/> Straddle	<input type="checkbox"/> Ruined Shale Packer
Initial Open <u>30</u>	<input checked="" type="checkbox"/> Shale Packer <u>250</u>	<input type="checkbox"/> Ruined Packer
Initial Shut-In <u>60</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Extra Copies
Final Flow <u>60</u>	<input type="checkbox"/> Extra Recorder	Sub Total <u>0</u>
Final Shut-In <u>90</u>	<input type="checkbox"/> Day Standby	Total <u>1816</u>
	<input type="checkbox"/> Accessibility	MP/DST Disc't
	Sub Total <u>1816</u>	

Approved By \_\_\_\_\_ Our Representative [Signature]  
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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 59561

4/10

Well Name & No. Abell Ranch B # 3-31 Test No. 4 Date 1/8/2015  
 Company Murkin Drilling Co, Inc Elevation 2893 KB 2882 GL  
 Address 250 N Water Ste 300 Wichita, ks 67202  
 Co. Rep / Geo. Larry Nicholson Rig Murkin 21  
 Location: Sec. 31 Twp. 12s Rge. 30w Co. Gove State KS

Interval Tested 4360 4458 Zone Tested Pawnee - Ft Scott  
 Anchor Length 98 Drill Pipe Run 4080 Mud Wt. 9.3  
 Top Packer Depth 4355 ~~436~~ Drill Collars Run 278 Vis 55  
 Bottom Packer Depth 4360 Wt. Pipe Run 0 WL 6.0  
 Total Depth 4458 Chlorides 2200 ppm System LCM 2#  
 Blow Description IF! 2 1/2" blow  
TSI! No return  
FF! 3" blow.  
FSI! No return.

Rec	Feet of	%gas	%oil	%water	%mud
<u>180</u>	<u>50cm</u>	<u>3</u>		<u>97</u>	
<u>90</u>	<u>50cm</u>	<u>1</u>		<u>99</u>	

Rec Total 270 BHT 126 Gravity - API RW - @ - °F Chlorides - ppm

(A) Initial Hydrostatic 2209  Test 1150 T-On Location 1015  
 (B) First Initial Flow 20  Jars 250 T-Started 1037  
 (C) First Final Flow ~~1074~~ 83  Safety Joint 75 T-Open 1305  
 (D) Initial Shut-In ~~85~~ 1071  Circ Sub 1/4 T-Pulled 1705  
 (E) Second Initial Flow ~~144~~ 81  Hourly Standby \_\_\_\_\_ T-Out 1928  
 (F) Second Final Flow ~~1046~~ 144  Mileage 91 RT 91 Comments \_\_\_\_\_  
 (G) Final Shut-In 1046  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 2202  Straddle \_\_\_\_\_  Ruined Shale Packer 350  
 Shale Packer 250  Ruined Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  Extra Copies \_\_\_\_\_  
 Initial Open 30  Extra Recorder \_\_\_\_\_ Sub Total 0  
 Initial Shut-In 60  Day Standby \_\_\_\_\_ Total 2166  
 Final Flow 60  Accessibility \_\_\_\_\_ MP/DST Disc't \_\_\_\_\_  
 Final Shut-In 90 Sub Total 1816

Approved By \_\_\_\_\_ Our Representative [Signature]

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 58565

Well Name & No. Abell Ranch B #3-31 Test No. 5 Date 1-9-15  
 Company Murfin Drilling Co. Elevation 2893 KB 2882 GL  
 Address 250 N Water STE 300 Wichita KS 67202  
 Co. Rep / Geo. Larry Nicholson Rig Murfin 21  
 Location: Sec. 31 Twp. 12S Rge. 30W Co. Gove State KS

Interval Tested 4498-4538 Zone Tested Johnson - Miss  
 Anchor Length 40 Drill Pipe Run 4210 Mud Wt. 9.3  
 Top Packer Depth 4493 Drill Collars Run 278 Vis 55  
 Bottom Packer Depth 4498 Wt. Pipe Run φ WL 6.0  
 Total Depth 4538 Chlorides 2200 ppm System LCM 3

Blow Description IF: Built to 7" Blow  
IS: No Return Blow  
FF: BOB in 40 Min  
FS: No Return Blow

Rec	Feet of	%gas	%oil	%water	%mud
372	GIP	100			
70	MCO DP		90	10	
70	gcmo Collars	5	80	15	
140	gcmo	20	50	30	
70	gcmo	20	40	40	

Rec Total BHT 128 Gravity 34 API RW - @ - ° F Chlorides - ppm  
 (A) Initial Hydrostatic 2304  Test 1150 T-On Location 07:05  
 (B) First Initial Flow 21  Jars 250 T-Started 07:41  
 (C) First Final Flow 73  Safety Joint 75 T-Open 09:26  
 (D) Initial Shut-In 1083  Circ Sub NC T-Pulled 13:26  
 (E) Second Initial Flow 79  Hourly Standby T-Out 15:40  
 (F) Second Final Flow 131  Mileage 91 RT 91 Comments \_\_\_\_\_  
 (G) Final Shut-In 1023  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 2242  Straddle \_\_\_\_\_  
 Shale Packer 250  Ruined Shale Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  Ruined Packer \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_  Extra Copies \_\_\_\_\_

Initial Open 30  
 Initial Shut-In 60  
 Final Flow 60  
 Final Shut-In 90  
 Sub Total 1816  
 Total 1816  
 MP/DST Disc't \_\_\_\_\_

Approved By [Signature] Our Representative Mike Roberts

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