



DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co.**

250 N Water Ste 300
Wichita, KS 67202

ATTN: Tom Funk

Frahm A #2-20

20-10s-34w Thomas,KS

Start Date: 2014.12.02 @ 20:03:00

End Date: 2014.12.03 @ 05:46:00

Job Ticket #: 58599 DST #: 1

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

Printed: 2014.12.10 @ 13:53:57



TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

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

20-10s-34w Thomas,KS

Frahm A #2-20

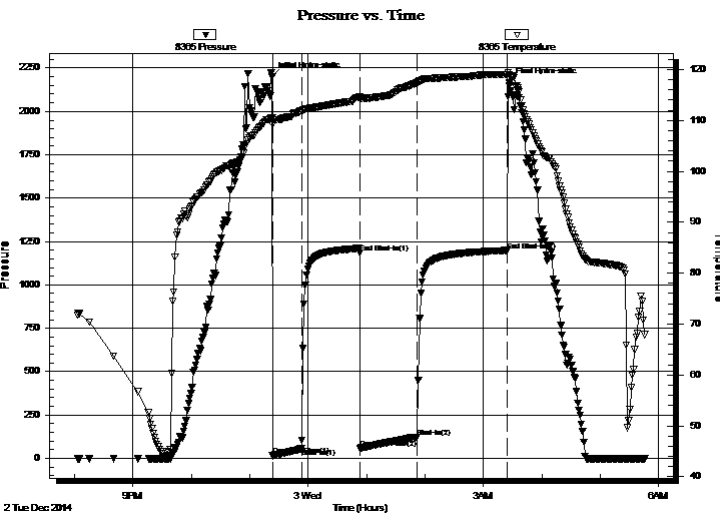
Job Ticket: 58599 **DST#: 1**
Test Start: 2014.12.02 @ 20:03:00

GENERAL INFORMATION:

Formation: **LKC H-J**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 23:23:15
Time Test Ended: 05:46:00
Interval: **4284.00 ft (KB) To 4370.00 ft (KB) (TVD)**
Total Depth: 4370.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good
Test Type: Conventional Bottom Hole (Initial)
Tester: Bradley Walter
Unit No: 69
Reference Elevations: 3231.00 ft (KB)
3219.00 ft (CF)
KB to GR/CF: 12.00 ft

Serial #: 8365 Inside
Press@RunDepth: 122.46 psig @ 4285.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2014.12.02 End Date: 2014.12.03 Last Calib.: 2014.12.03
Start Time: 20:03:05 End Time: 05:46:00 Time On Btm: 2014.12.02 @ 23:23:00
Time Off Btm: 2014.12.03 @ 03:26:45

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	2202.15	110.53	Initial Hydro-static
1	15.27	109.18	Open To Flow (1)
30	56.12	111.82	Shut-In(1)
90	1184.20	114.56	End Shut-In(1)
91	59.19	114.25	Open To Flow (2)
150	122.46	117.39	Shut-In(2)
242	1198.77	119.02	End Shut-In(2)
244	2164.57	118.87	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
239.00	socm 2o 98m	1.22
1.00	oil 100o	0.01

Gas Rates

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



DRILL STEM TEST REPORT

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

20-10s-34w Thomas,KS

Frahm A #2-20

Job Ticket: 58599 DST#: 1
Test Start: 2014.12.02 @ 20:03:00

GENERAL INFORMATION:

Formation: **LKC H-J**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 23:23:15

Time Test Ended: 05:46:00

Test Type: Conventional Bottom Hole (Initial)

Tester: Bradley Walter

Unit No: 69

Interval: **4284.00 ft (KB) To 4370.00 ft (KB) (TVD)**

Total Depth: 4370.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Good

Reference Elevations: 3231.00 ft (KB)

3219.00 ft (CF)

KB to GR/CF: 12.00 ft

Serial #: **8522** Outside

Press@RunDepth: psig @ 4285.00 ft (KB)

Start Date: 2014.12.02

End Date:

2014.12.03

Start Time: 20:03:05

End Time:

05:46:00

Capacity: 8000.00 psig

Last Calib.:

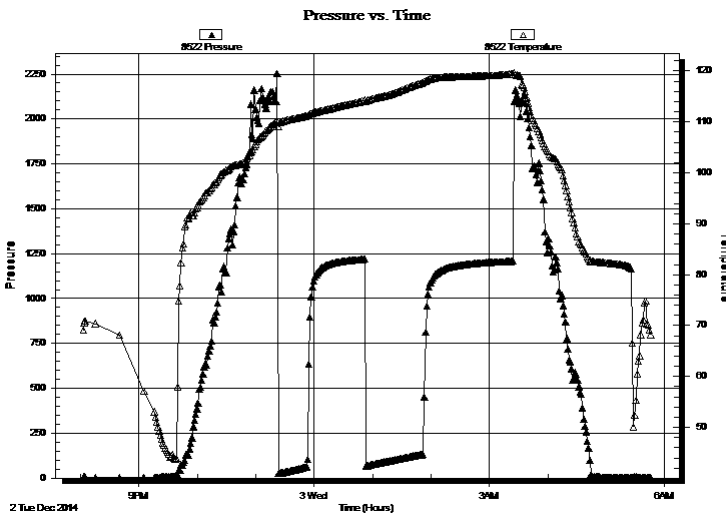
2014.12.03

Time On Btm:

Time Off Btm:

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

Recovery

Length (ft)	Description	Volume (bbl)
239.00	socm 2o 98m	1.22
1.00	oil 100o	0.01

Gas Rates

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



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co.

20-10s-34w Thomas,KS

250 N Water Ste 300
Wichita, KS 67202

Frahm A #2-20

Job Ticket: 58599

DST#: 1

ATTN: Tom Funk

Test Start: 2014.12.02 @ 20:03:00

Tool Information

Drill Pipe:	Length: 4041.00 ft	Diameter: 3.80 inches	Volume: 56.68 bbl	Tool Weight:	2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length: 234.00 ft	Diameter: 2.25 inches	Volume: 1.15 bbl	Weight to Pull Loose:	80000.00 lb
			<u>Total Volume: 57.83 bbl</u>	Tool Chased	0.00 ft
Drill Pipe Above KB:	11.00 ft			String Weight: Initial	67000.00 lb
Depth to Top Packer:	4284.00 ft			Final	67000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	86.00 ft				
Tool Length:	106.00 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			4265.00	
Shut In Tool	5.00			4270.00	
Hydraulic tool	5.00			4275.00	
Packer	5.00			4280.00	20.00 Bottom Of Top Packer
Packer	4.00			4284.00	
Stubb	1.00			4285.00	
Recorder	0.00	8365	Inside	4285.00	
Recorder	0.00	8522	Outside	4285.00	
Perforations	18.00			4303.00	
Change Over Sub	1.00			4304.00	
Drill Pipe	62.00			4366.00	
Change Over Sub	1.00			4367.00	
Bullnose	3.00			4370.00	86.00 Bottom Packers & Anchor

Total Tool Length: 106.00



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co.

20-10s-34w Thomas,KS

250 N Water Ste 300
Wichita, KS 67202

Frahm A #2-20

Job Ticket: 58599

DST#: 1

ATTN: Tom Funk

Test Start: 2014.12.02 @ 20:03:00

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: 54.00 sec/qt

Cushion Volume:

bbf

Water Loss: 7.19 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 12000.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbf
239.00	socm 2o 98m	1.221
1.00	oil 100o	0.014

Total Length: 240.00 ft Total Volume: 1.235 bbl

Num Fluid Samples: 0

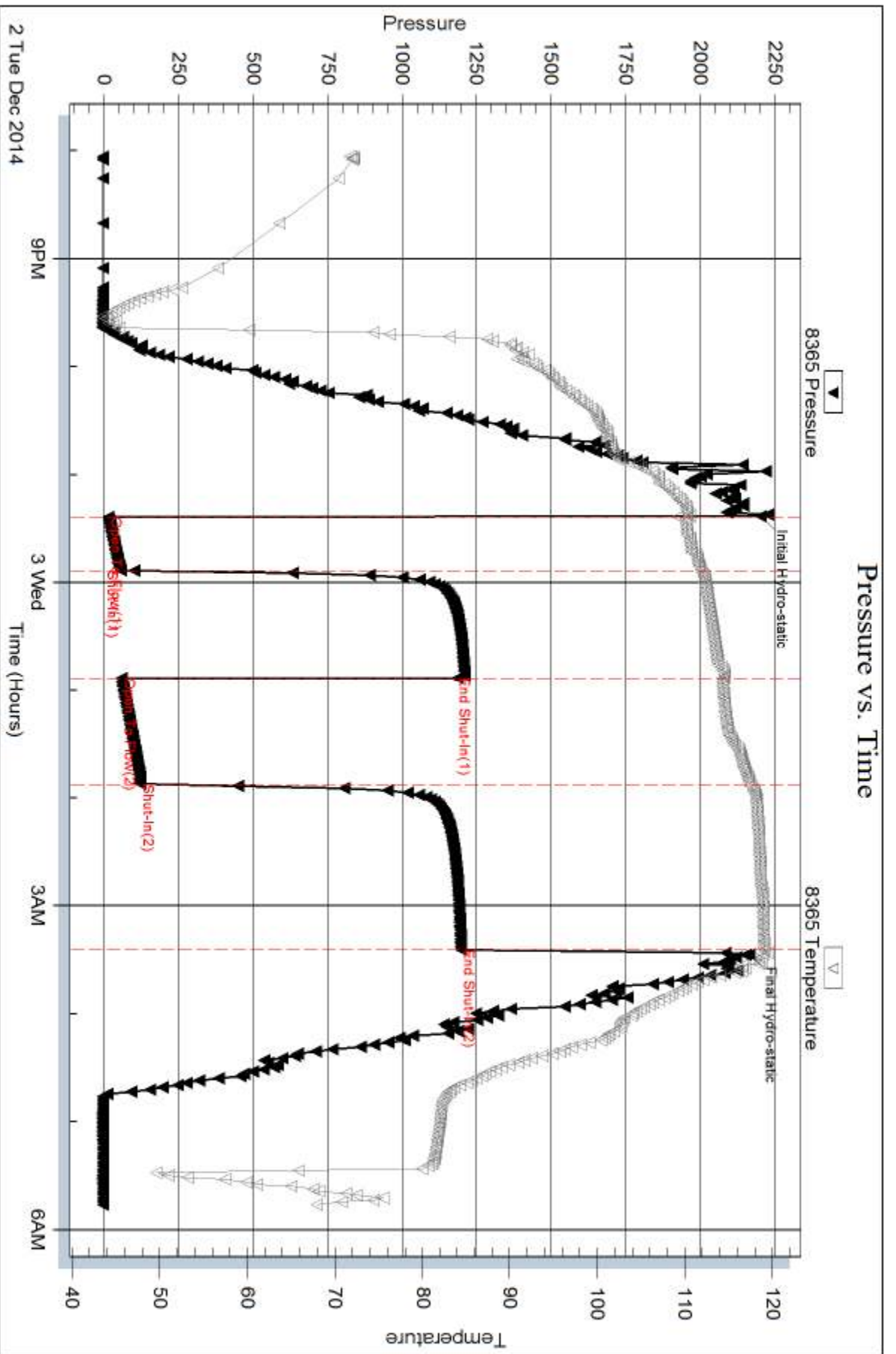
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

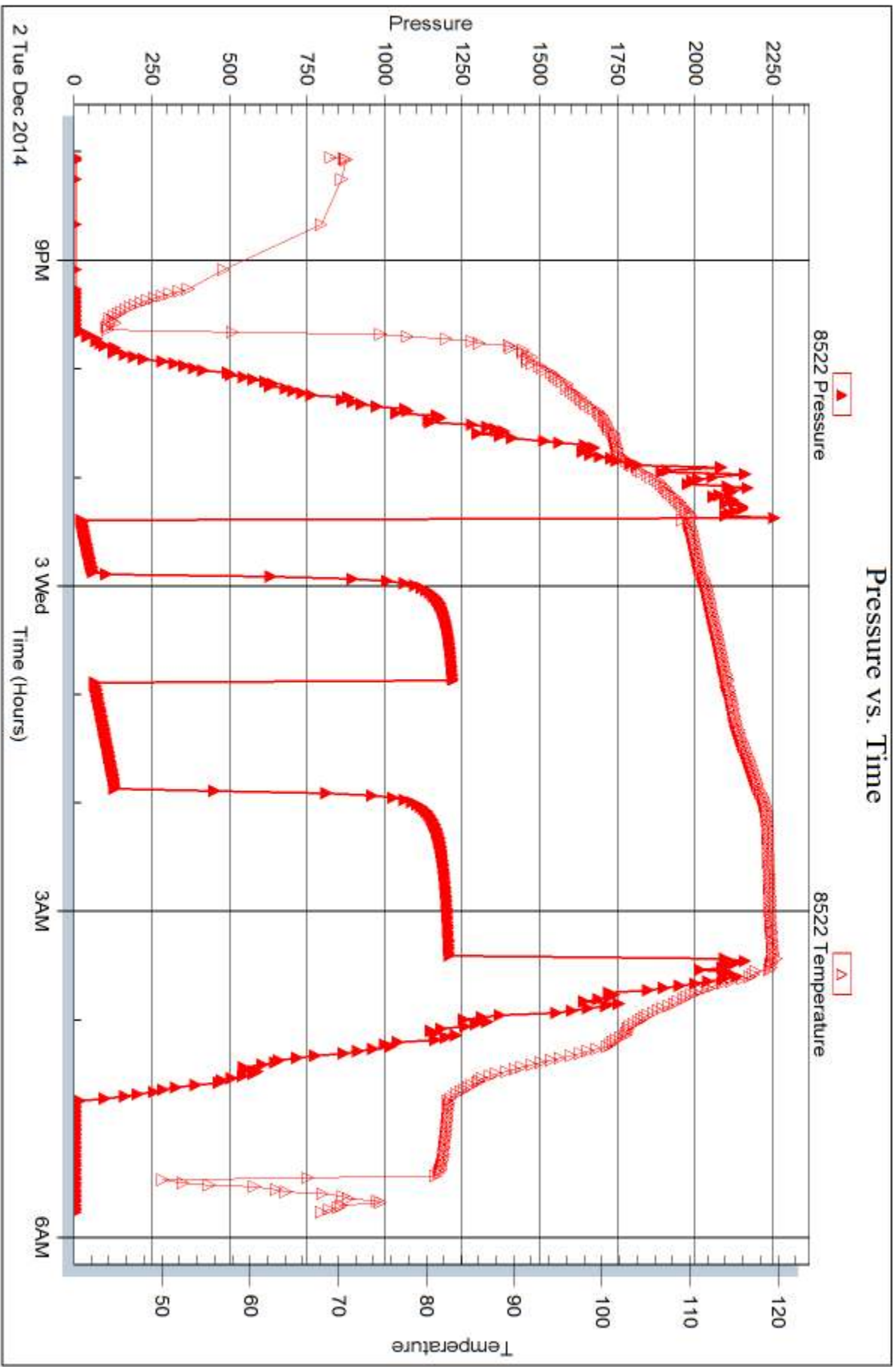


Serial #: 8522

Outside Murfin Drilling Co.

Frahm A #2-20

DST Test Number: 1



Trilobite Testing, Inc

Ref. No: 58599

Printed: 2014.12.10 @ 13:53:58



DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co.**

250 N Water Ste 300
Wichita, KS 67202

ATTN: Tom Funk

Frahm A #2-20

20-10s-34w Thomas,KS

Start Date: 2014.12.03 @ 14:33:00

End Date: 2014.12.03 @ 22:59:30

Job Ticket #: 58600 DST #: 2

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

Printed: 2014.12.10 @ 13:53:35



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

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

20-10s-34w Thomas,KS

Frahm A #2-20

Job Ticket: 58600 **DST#: 2**
Test Start: 2014.12.03 @ 14:33:00

GENERAL INFORMATION:

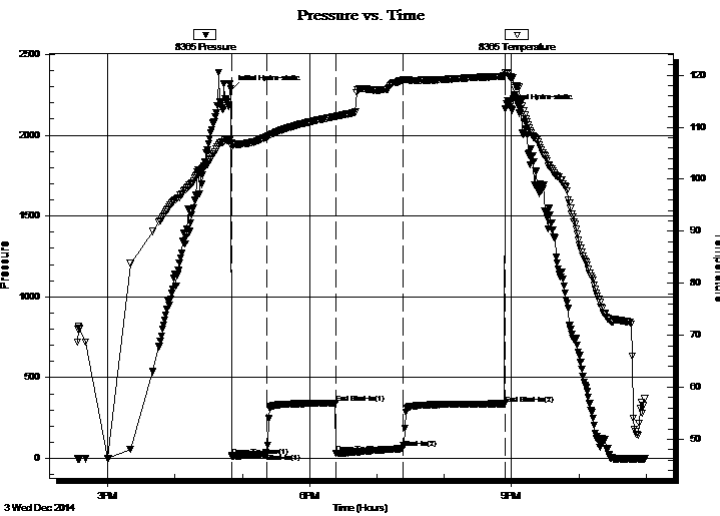
Formation: **LKC K**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 16:50:30
Time Test Ended: 22:59:30
Interval: **4374.00 ft (KB) To 4400.00 ft (KB) (TVD)**
Total Depth: 4400.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good
Test Type: Conventional Bottom Hole (Reset)
Tester: Bradley Walter
Unit No: 69
Reference Elevations: 3231.00 ft (KB)
3219.00 ft (CF)
KB to GR/CF: 12.00 ft

Serial #: 8365

Inside

Press@RunDepth: 61.18 psig @ 4375.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2014.12.03 End Date: 2014.12.03 Last Calib.: 2014.12.03
Start Time: 14:33:05 End Time: 22:59:29 Time On Btm: 2014.12.03 @ 16:50:15
Time Off Btm: 2014.12.03 @ 20:54:30

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



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2284.98	107.87	Initial Hydro-static
1	15.89	106.14	Open To Flow (1)
32	28.16	108.17	Shut-In(1)
93	341.50	112.09	End Shut-In(1)
94	30.15	112.09	Open To Flow (2)
153	61.18	119.05	Shut-In(2)
244	338.15	119.81	End Shut-In(2)
245	2166.50	120.48	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
90.00	mud 100m (oil spots)	0.44

* Recovery from multiple tests

Gas Rates

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

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

20-10s-34w Thomas,KS

Frahm A #2-20

Job Ticket: 58600

DST#: 2

Test Start: 2014.12.03 @ 14:33:00

GENERAL INFORMATION:

Formation: LKC K

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 16:50:30

Time Test Ended: 22:59:30

Test Type: Conventional Bottom Hole (Reset)

Tester: Bradley Walter

Unit No: 69

Interval: 4374.00 ft (KB) To 4400.00 ft (KB) (TVD)

Total Depth: 4400.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Good

Reference Elevations: 3231.00 ft (KB)

3219.00 ft (CF)

KB to GR/CF: 12.00 ft

Serial #: 8522 Outside

Press@RunDepth: psig @ 4375.00 ft (KB)

Start Date: 2014.12.03

End Date:

2014.12.03

Start Time: 14:34:05

End Time:

23:00:29

Capacity: 8000.00 psig

Last Calib.:

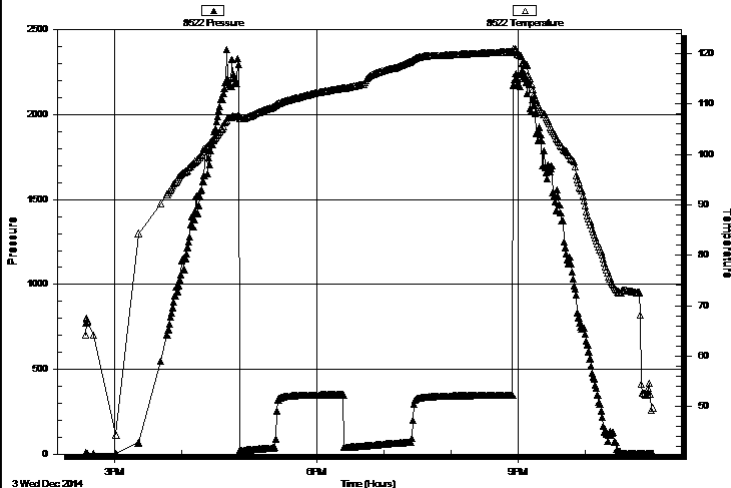
2014.12.03

Time On Btm:

Time Off Btm:

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

Pressure vs. Time



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
90.00	mud 100m (oil spots)	0.44

* 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.

20-10s-34w Thomas,KS

250 N Water Ste 300
Wichita, KS 67202

Frahm A #2-20

Job Ticket: 58600

DST#: 2

ATTN: Tom Funk

Test Start: 2014.12.03 @ 14:33:00

Tool Information

Drill Pipe:	Length: 4136.00 ft	Diameter: 3.80 inches	Volume: 58.02 bbl	Tool Weight:	2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length: 234.00 ft	Diameter: 2.25 inches	Volume: 1.15 bbl	Weight to Pull Loose:	80000.00 lb
			<u>Total Volume: 59.17 bbl</u>	Tool Chased	0.00 ft
Drill Pipe Above KB:	16.00 ft			String Weight: Initial	67000.00 lb
Depth to Top Packer:	4374.00 ft			Final	67000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	26.00 ft				
Tool Length:	46.00 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			4355.00	
Shut In Tool	5.00			4360.00	
Hydraulic tool	5.00			4365.00	
Packer	5.00			4370.00	20.00 Bottom Of Top Packer
Packer	4.00			4374.00	
Stubb	1.00			4375.00	
Recorder	0.00	8365	Inside	4375.00	
Recorder	0.00	8522	Outside	4375.00	
Perforations	22.00			4397.00	
Bullnose	3.00			4400.00	26.00 Bottom Packers & Anchor
Total Tool Length:	46.00				



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co.

20-10s-34w Thomas,KS

250 N Water Ste 300
Wichita, KS 67202

Frahm A #2-20

Job Ticket: 58600

DST#: 2

ATTN: Tom Funk

Test Start: 2014.12.03 @ 14:33:00

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: 66.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.98 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 12000.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
90.00	mud 100m (oil spots)	0.443

Total Length: 90.00 ft Total Volume: 0.443 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

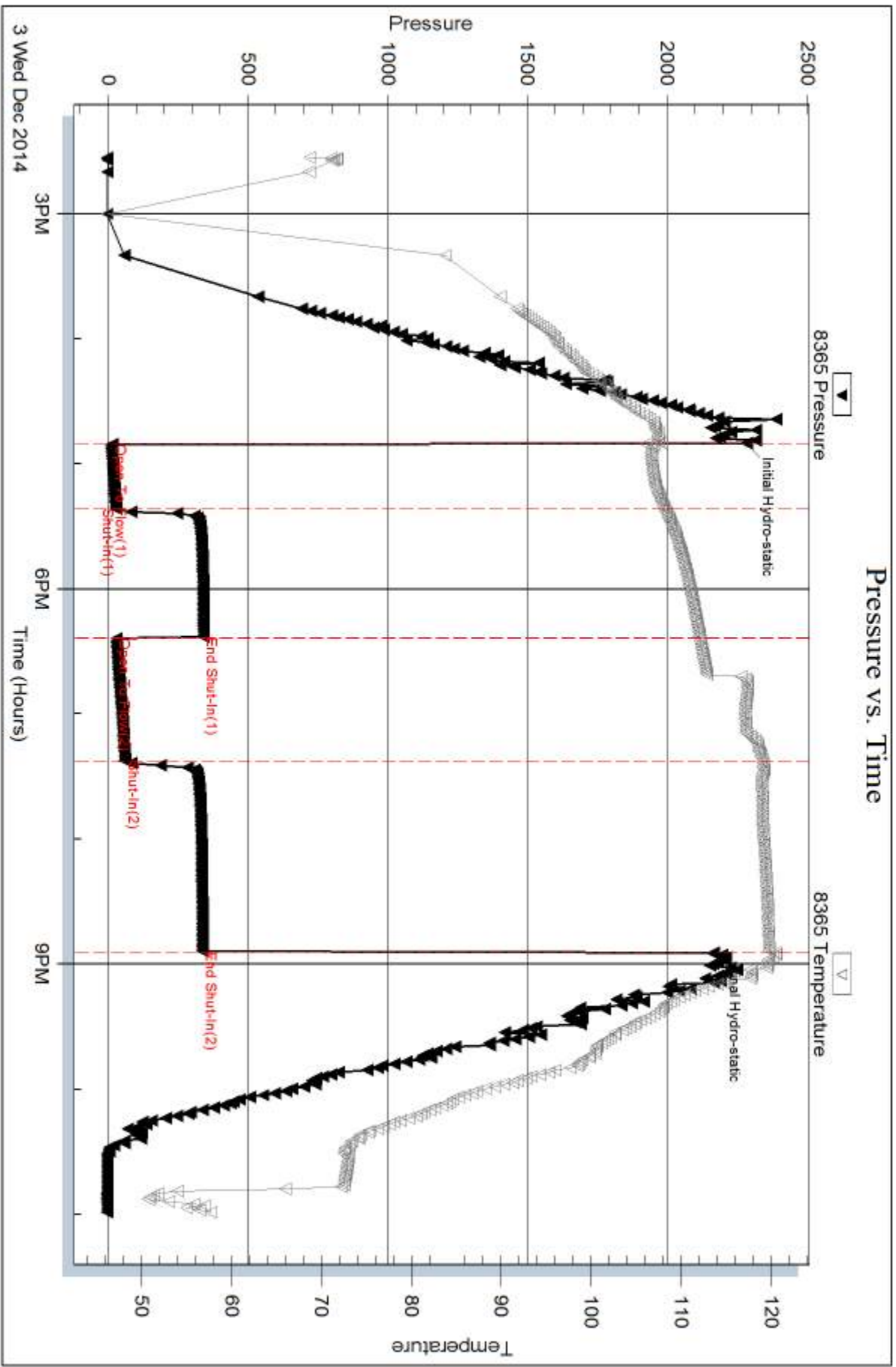
Serial #: 8365

Inside

Murfin Drilling Co.

Frahm A #2-20

DST Test Number: 2



Triobite Testing, Inc

Ref. No: 59600

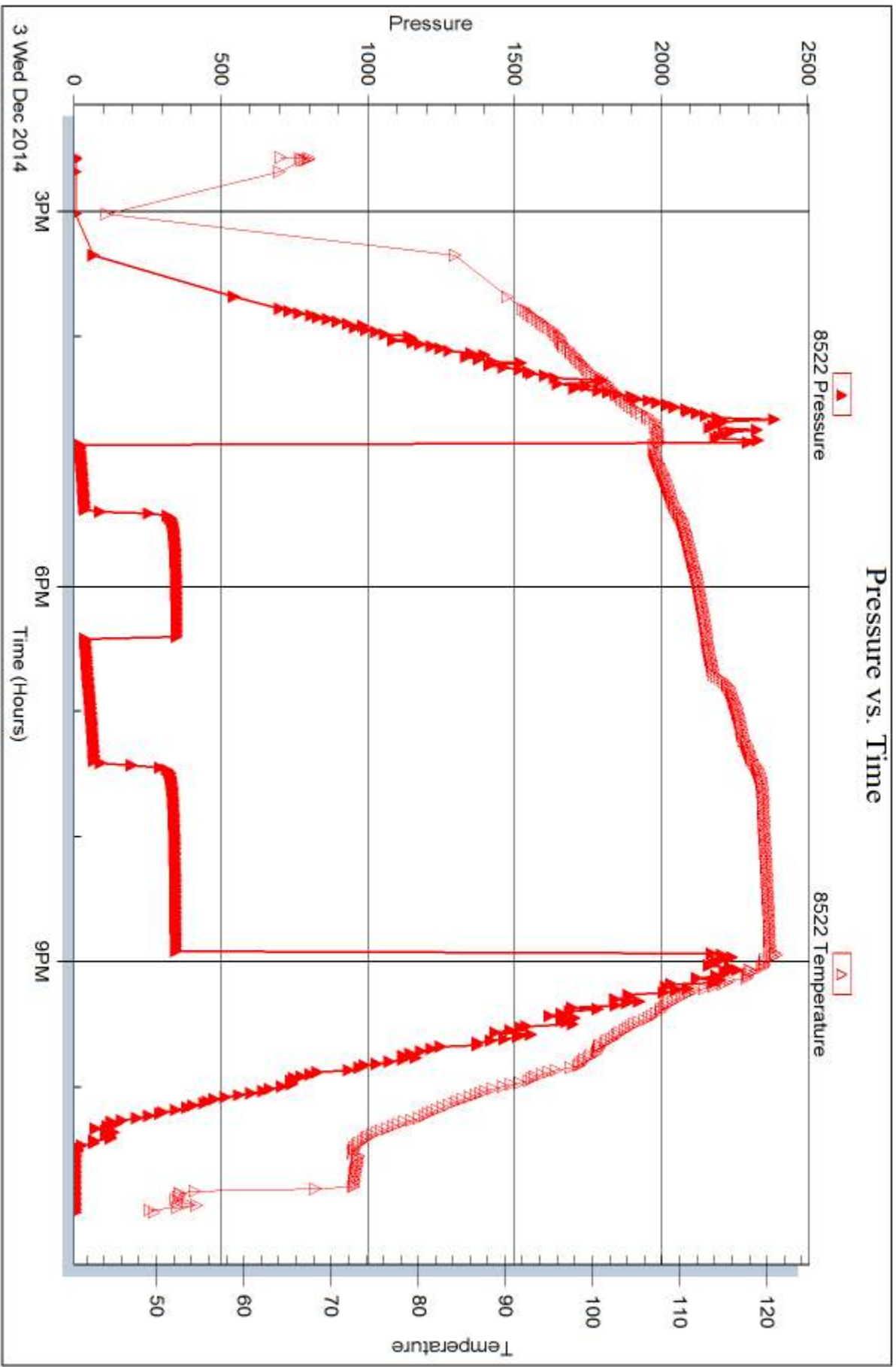
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Serial #: 8522

Outside Murfin Drilling Co.

Frahm A #2-20

DST Test Number: 2



Trilobite Testing, Inc

Ref. No: 59600

Printed: 2014.12.10 @ 13:53:36



DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co.**

250 N Water Ste 300
Wichita, KS 67202

ATTN: Tom Funk

Frahm A #2-20

20-10s-34w Thomas,KS

Start Date: 2014.12.04 @ 23:00:00

End Date: 2014.12.05 @ 09:13:30

Job Ticket #: 58638 DST #: 3

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

Printed: 2014.12.10 @ 13:53:09



TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

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

20-10s-34w Thomas,KS

Frahm A #2-20

Job Ticket: 58638

DST#: 3

Test Start: 2014.12.04 @ 23:00:00

GENERAL INFORMATION:

Formation: **Pawnee - Ft Scott**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 03:08:00
 Time Test Ended: 09:13:30
 Interval: **4555.00 ft (KB) To 4650.00 ft (KB) (TVD)**
 Total Depth: 4650.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Poor
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Justin Harris
 Unit No: 58
 Reference Elevations: 3231.00 ft (KB)
 3219.00 ft (CF)
 KB to GR/CF: 12.00 ft

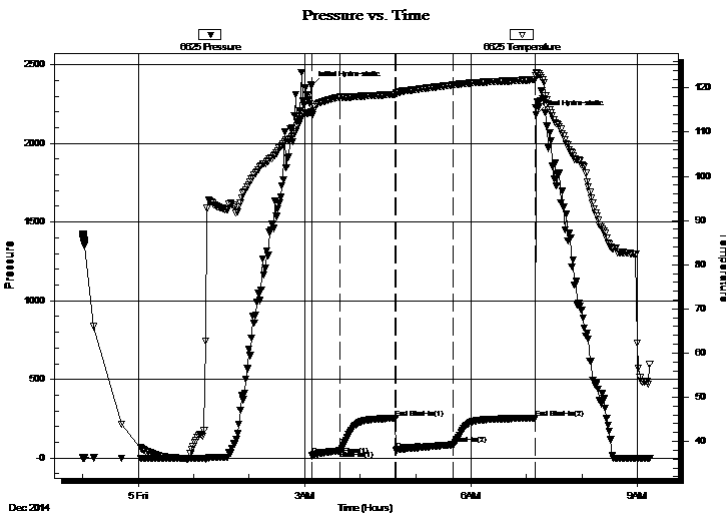
Serial #: 6625

Inside

Press@RunDepth: 85.27 psig @ 4556.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2014.12.04 End Date: 2014.12.05 Last Calib.: 2014.12.05
 Start Time: 23:00:01 End Time: 09:13:30 Time On Btm: 2014.12.05 @ 03:07:30
 Time Off Btm: 2014.12.05 @ 07:10:30

TEST COMMENT: 30: B.O.B in 23 mins.
 60: No Return.
 60: B.O.B in 25 mins.
 90: No Return.

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2369.64	114.47	Initial Hydro-static
1	15.26	114.07	Open To Flow (1)
31	46.85	117.88	Shut-In(1)
91	253.43	118.55	End Shut-In(1)
91	47.99	118.84	Open To Flow (2)
154	85.27	120.65	Shut-In(2)
242	254.84	121.83	End Shut-In(2)
243	2181.76	123.50	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
146.00	ocm 2%o 98%m	0.72

* Recovery from multiple tests

Gas Rates

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



TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

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

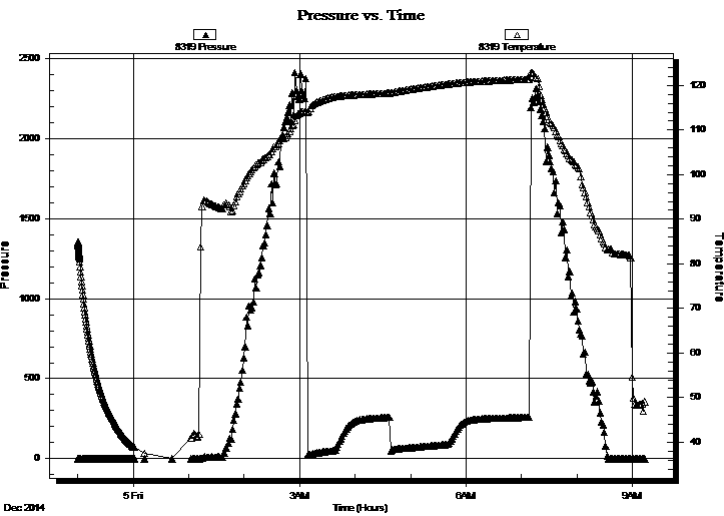
20-10s-34w Thomas,KS
Frahm A #2-20
Job Ticket: 58638 **DST#: 3**
Test Start: 2014.12.04 @ 23:00:00

GENERAL INFORMATION:

Formation: **Pawnee - Ft Scott**
Deviated: No Whipstock: ft (KB) Test Type: Conventional Bottom Hole (Reset)
Time Tool Opened: 03:08:00 Tester: Justin Harris
Time Test Ended: 09:13:30 Unit No: 58
Interval: 4555.00 ft (KB) To 4650.00 ft (KB) (TVD) Reference Elevations: 3231.00 ft (KB)
Total Depth: 4650.00 ft (KB) (TVD) 3219.00 ft (CF)
Hole Diameter: 7.88 inches Hole Condition: Poor KB to GR/CF: 12.00 ft

Serial #: 8319 Outside
Press@RunDepth: psig @ 4556.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2014.12.04 End Date: 2014.12.05 Last Calib.: 2014.12.05
Start Time: 23:00:01 End Time: 09:13:00 Time On Btm:
Time Off Btm:

TEST COMMENT: 30: B.O.B in 23 mins.
60: No Return.
60: B.O.B in 25 mins.
90: No Return.



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
146.00	ocm 2%o 98%m	0.72

* 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.

20-10s-34w Thomas,KS

250 N Water Ste 300
Wichita, KS 67202

Frahm A #2-20

Job Ticket: 58638

DST#: 3

ATTN: Tom Funk

Test Start: 2014.12.04 @ 23:00:00

Tool Information

Drill Pipe:	Length: 4320.00 ft	Diameter: 3.80 inches	Volume: 60.60 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 30000.00 lb
Drill Collar:	Length: 234.00 ft	Diameter: 2.25 inches	Volume: 1.15 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 61.75 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	19.00 ft			String Weight: Initial 70000.00 lb
Depth to Top Packer:	4555.00 ft			Final 71000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	95.00 ft			
Tool Length:	115.00 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			4536.00	
Shut In Tool	5.00			4541.00	
Hydraulic tool	5.00			4546.00	
Packer	5.00			4551.00	20.00 Bottom Of Top Packer
Packer	4.00			4555.00	
Stubb	1.00			4556.00	
Recorder	0.00	6625	Inside	4556.00	
Recorder	0.00	8319	Outside	4556.00	
Perforations	25.00			4581.00	
Change Over Sub	1.00			4582.00	
Drill Pipe	63.00			4645.00	
Change Over Sub	1.00			4646.00	
Bullnose	4.00			4650.00	95.00 Bottom Packers & Anchor

Total Tool Length: 115.00



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co.

20-10s-34w Thomas,KS

250 N Water Ste 300
Wichita, KS 67202

Frahm A #2-20

Job Ticket: 58638

DST#: 3

ATTN: Tom Funk

Test Start: 2014.12.04 @ 23:00:00

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: 47.00 sec/qt

Cushion Volume:

bbf

Water Loss: 9.19 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 12900.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbf
146.00	ocm 2%o 98%m	0.718

Total Length: 146.00 ft Total Volume: 0.718 bbf

Num Fluid Samples: 0

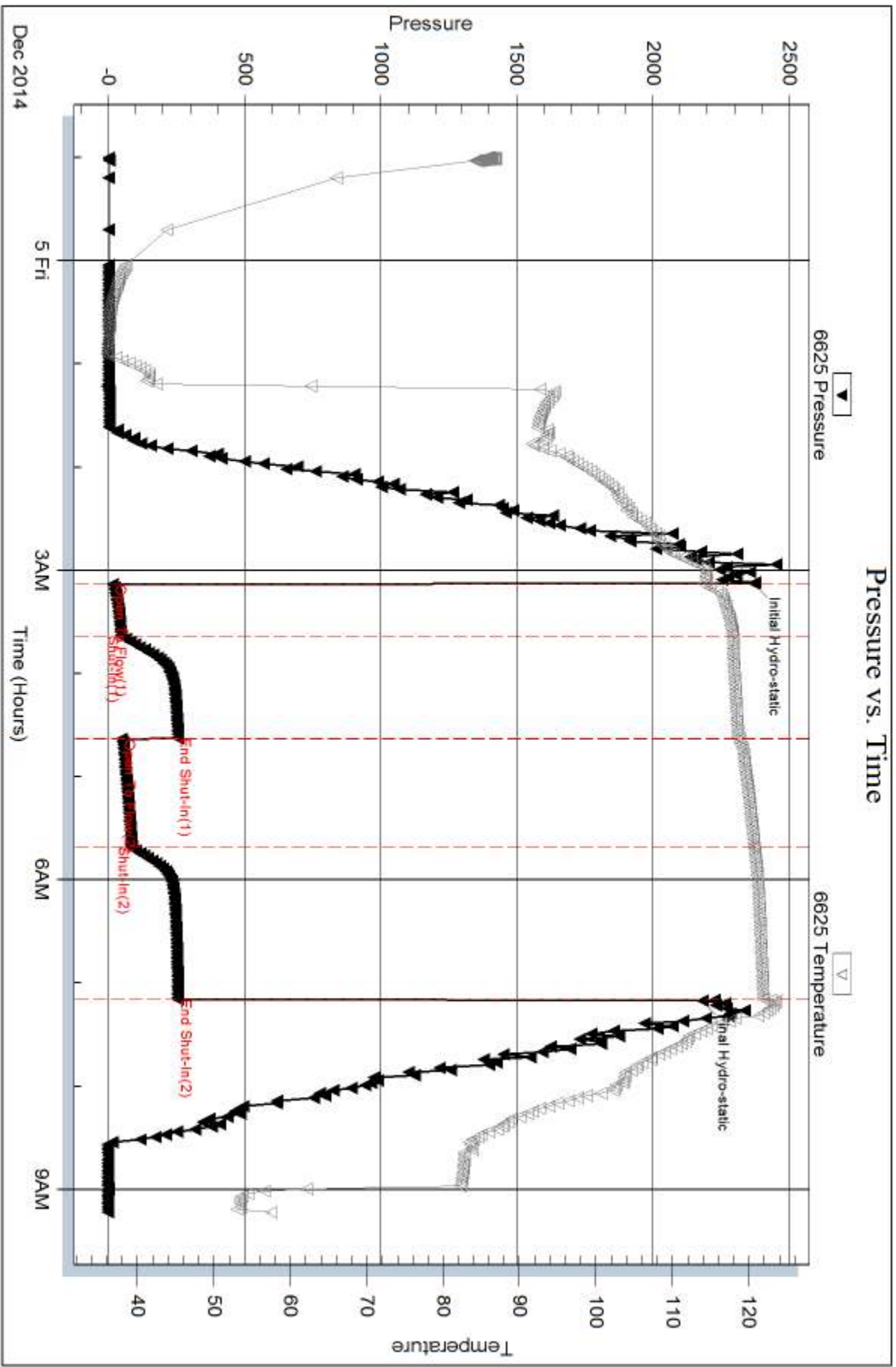
Num Gas Bombs: 0

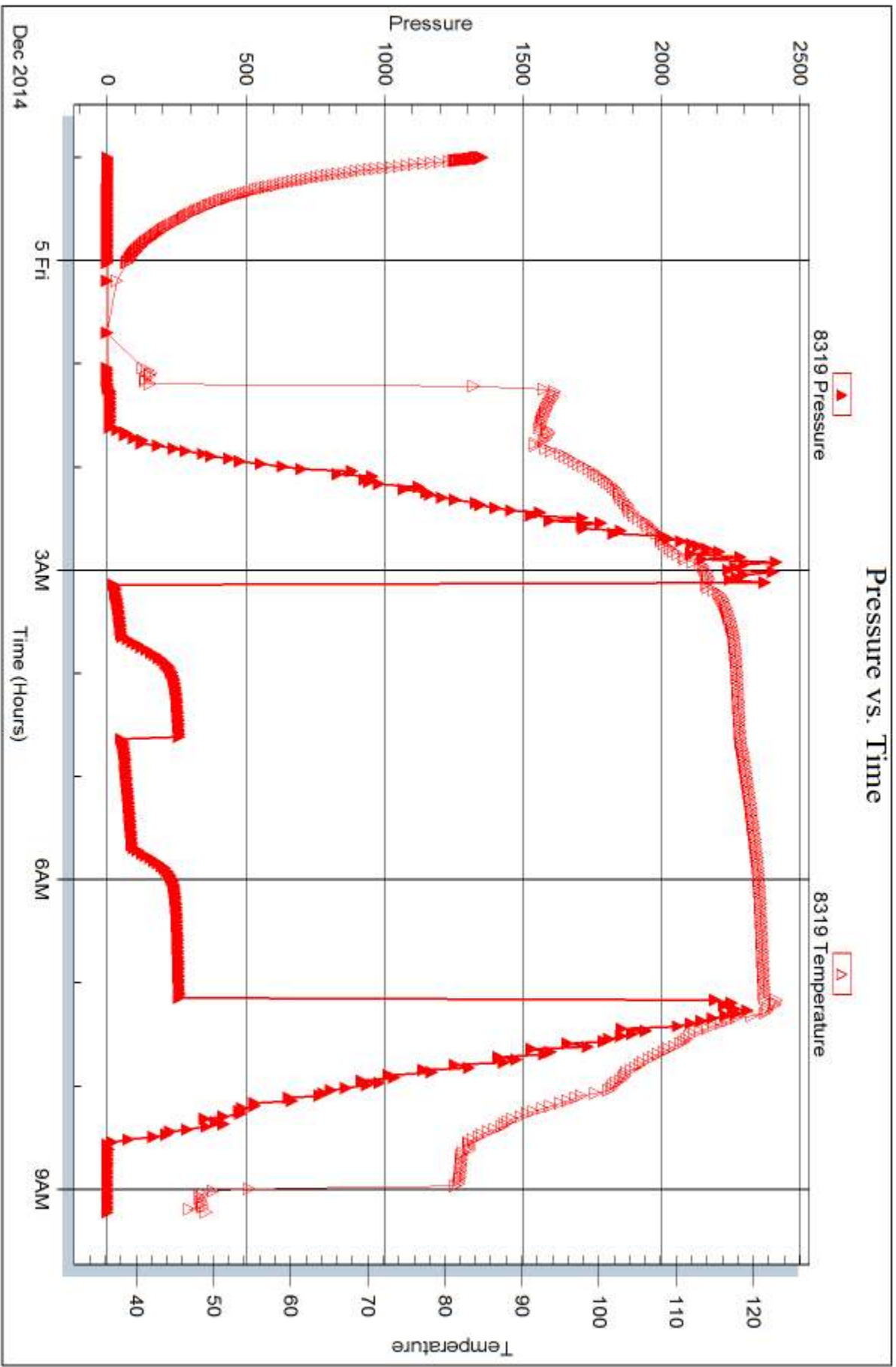
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:







DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co.**

250 N Water Ste 300
Wichita, KS 67202

ATTN: Tom Funk

Frahm A #2-20

20-10s-34w Thomas,KS

Start Date: 2014.12.05 @ 19:12:00

End Date: 2014.12.06 @ 03:40:30

Job Ticket #: 58639 DST #: 4

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

Printed: 2014.12.10 @ 13:52:02



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

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

20-10s-34w Thomas,KS

Frahm A #2-20

Job Ticket: 58639

DST#: 4

Test Start: 2014.12.05 @ 19:12:00

GENERAL INFORMATION:

Formation: **Johnson**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 21:31:30
 Time Test Ended: 03:40:30
 Interval: **4674.00 ft (KB) To 4715.00 ft (KB) (TVD)**
 Total Depth: 4715.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Poor
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Justin Harris
 Unit No: 58
 Reference Elevations: 3231.00 ft (KB)
 3219.00 ft (CF)
 KB to GR/CF: 12.00 ft

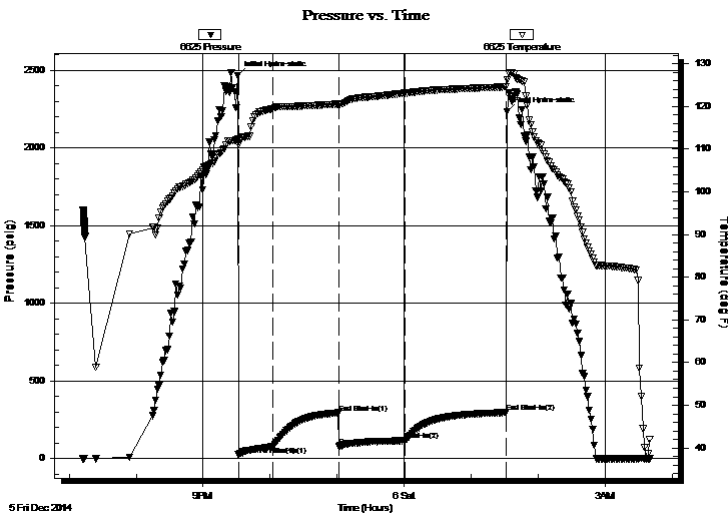
Serial #: 6625

Inside

Press@RunDepth: 116.22 psig @ 4675.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2014.12.05 End Date: 2014.12.06 Last Calib.: 2014.12.06
 Start Time: 19:12:01 End Time: 03:40:30 Time On Btm: 2014.12.05 @ 21:31:00
 Time Off Btm: 2014.12.06 @ 01:32:30

TEST COMMENT: 30: B.O.B in 19 mins.
 60: No Return.
 60: B.O.B. in 8 mins.
 90: Weak surface blow.

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2466.28	112.40	Initial Hydro-static
1	24.08	111.05	Open To Flow (1)
31	75.53	119.44	Shut-In(1)
91	294.68	120.60	End Shut-In(1)
91	79.45	120.56	Open To Flow (2)
150	116.22	123.11	Shut-In(2)
241	296.46	124.63	End Shut-In(2)
242	2237.05	126.20	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
126.00	gocm 20g 20o 60m	0.62
136.00	gmco 20g 30m 50o	0.92

* Recovery from multiple tests

Gas Rates

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



TRILOBITE
TESTING, INC

DRILL STEM TEST REPORT

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

20-10s-34w Thomas,KS

Frahm A #2-20

Job Ticket: 58639

DST#: 4

Test Start: 2014.12.05 @ 19:12:00

GENERAL INFORMATION:

Formation: **Johnson**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 21:31:30

Time Test Ended: 03:40:30

Test Type: Conventional Bottom Hole (Reset)

Tester: Justin Harris

Unit No: 58

Interval: 4674.00 ft (KB) To 4715.00 ft (KB) (TVD)

Reference Elevations: 3231.00 ft (KB)

Total Depth: 4715.00 ft (KB) (TVD)

3219.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Poor

KB to GR/CF: 12.00 ft

Serial #: 8319 Outside

Press@RunDepth: psig @ 4675.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.12.05

End Date:

2014.12.06

Last Calib.:

2014.12.06

Start Time: 19:12:01

End Time:

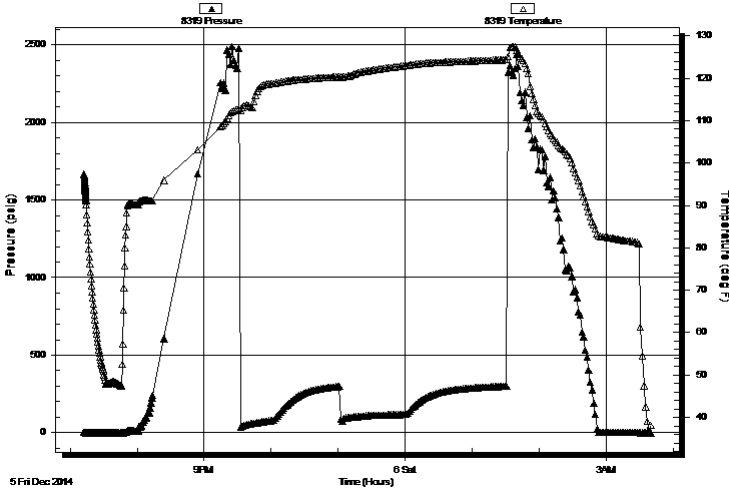
03:41:00

Time On Btm:

Time Off Btm:

TEST COMMENT: 30: B.O.B in 19 mins.
60: No Return.
60: B.O.B. in 8 mins.
90: Weak surface blow.

Pressure vs. Time



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
126.00	gocm 20g 20o 60m	0.62
136.00	gmco 20g 30m 50o	0.92

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.

20-10s-34w Thomas,KS

250 N Water Ste 300
Wichita, KS 67202

Frahm A #2-20

Job Ticket: 58639

DST#: 4

ATTN: Tom Funk

Test Start: 2014.12.05 @ 19:12:00

Tool Information

Drill Pipe:	Length: 4445.00 ft	Diameter: 3.80 inches	Volume: 62.35 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 30000.00 lb
Drill Collar:	Length: 234.00 ft	Diameter: 2.25 inches	Volume: 1.15 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 63.50 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	25.00 ft			String Weight: Initial 69000.00 lb
Depth to Top Packer:	4674.00 ft			Final 70000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	41.00 ft			
Tool Length:	61.00 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			4655.00	
Shut In Tool	5.00			4660.00	
Hydraulic tool	5.00			4665.00	
Packer	5.00			4670.00	20.00 Bottom Of Top Packer
Packer	4.00			4674.00	
Stubb	1.00			4675.00	
Recorder	0.00	6625	Inside	4675.00	
Recorder	0.00	8319	Outside	4675.00	
Perforations	3.00			4678.00	
Change Over Sub	1.00			4679.00	
Drill Pipe	31.00			4710.00	
Change Over Sub	1.00			4711.00	
Bullnose	4.00			4715.00	41.00 Bottom Packers & Anchor

Total Tool Length: 61.00



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co.

20-10s-34w Thomas,KS

250 N Water Ste 300
Wichita, KS 67202

Frahm A #2-20

Job Ticket: 58639

DST#: 4

ATTN: Tom Funk

Test Start: 2014.12.05 @ 19:12:00

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:

bbf

Water Loss: 7.18 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 12000.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbf
126.00	gocm 20g 20o 60m	0.620
136.00	gmco 20g 30m 50o	0.924

Total Length: 262.00 ft

Total Volume: 1.544 bbf

Num Fluid Samples: 0

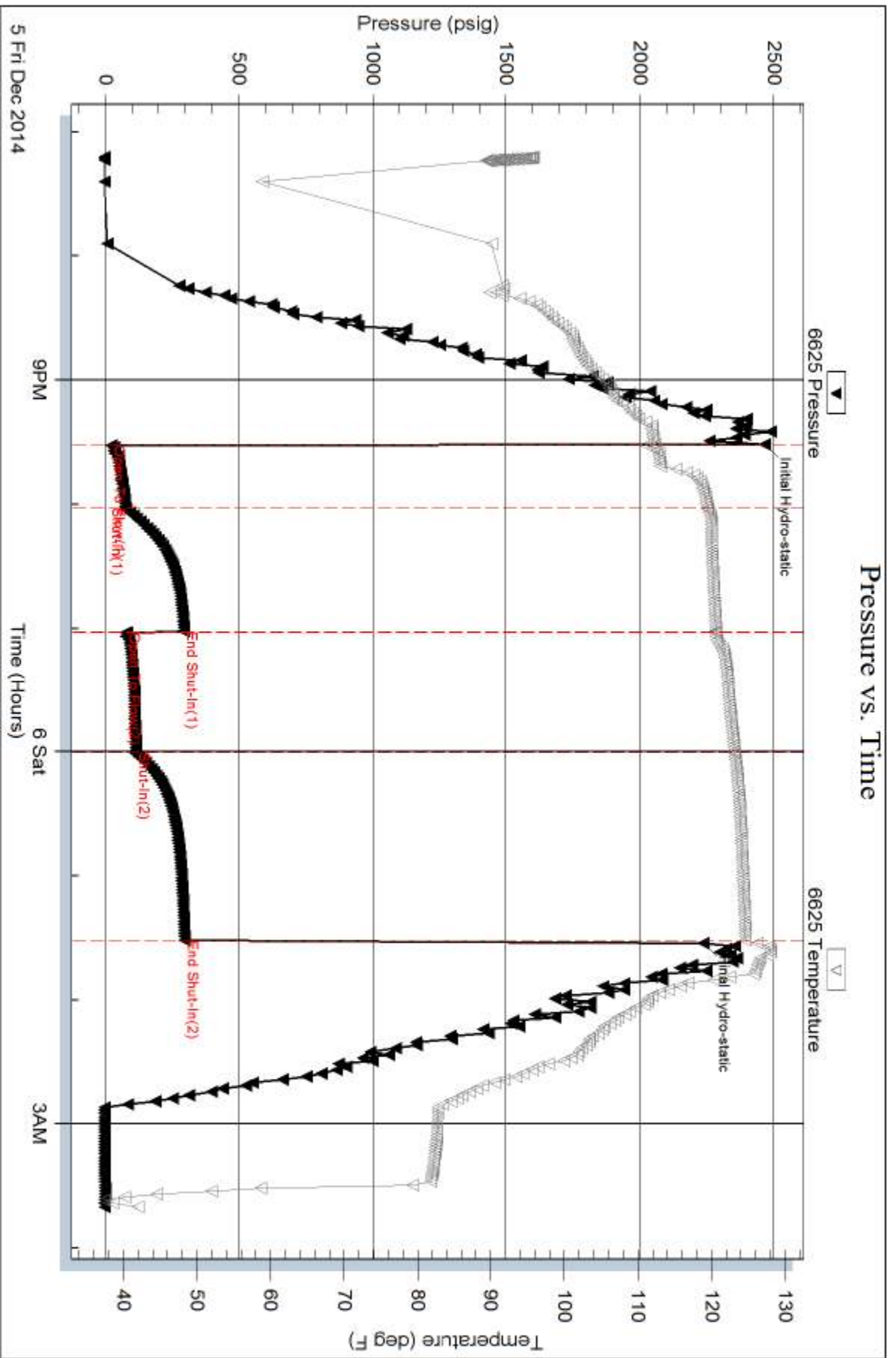
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

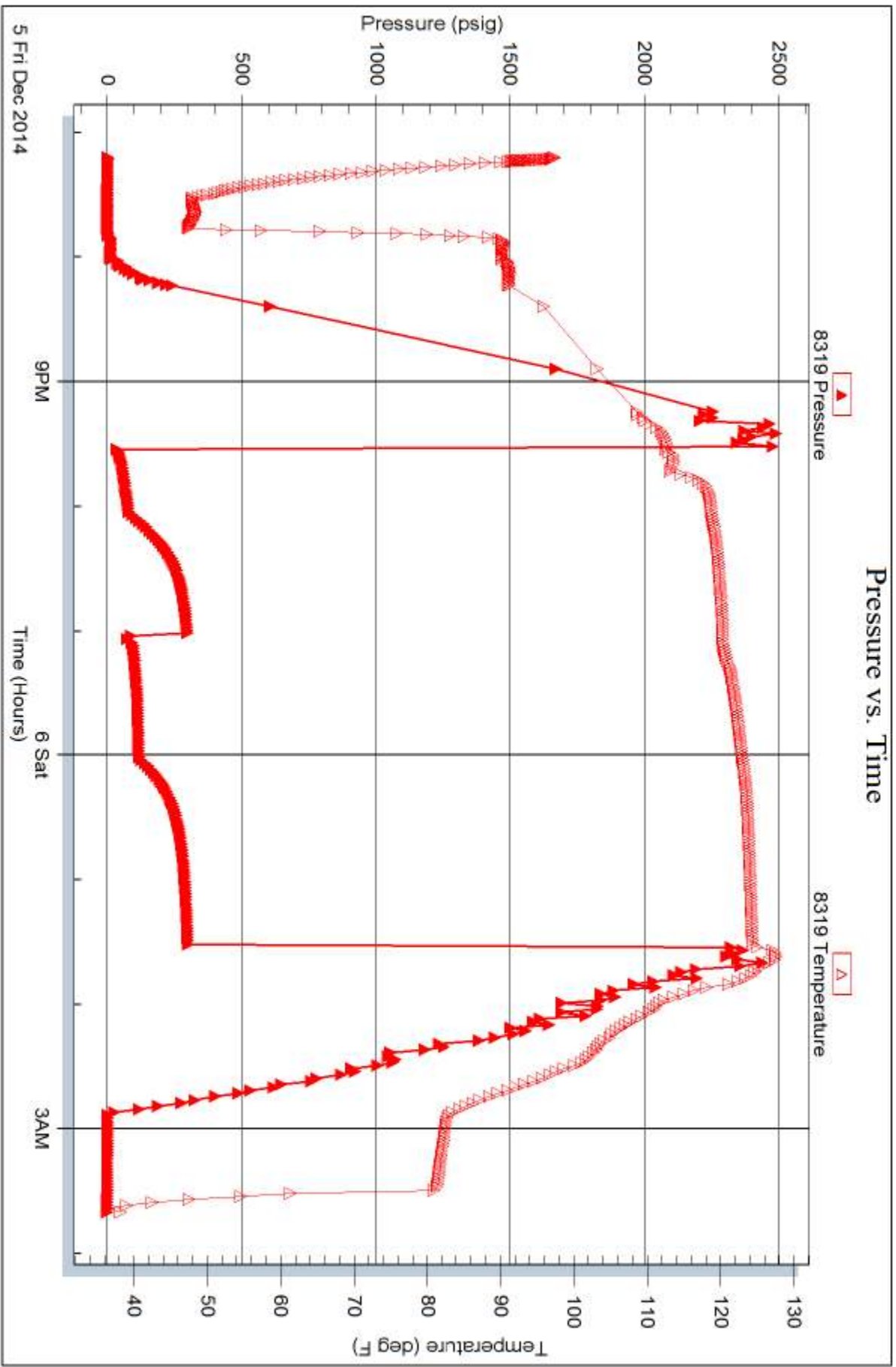


Serial #: 8319

Outside Murfin Drilling Co.

Frahm A #2-20

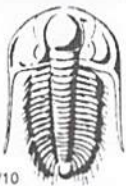
DST Test Number: 4



Trilobite Testing, Inc

Ref. No: 58639

Printed: 2014.12.10 @ 13:52:03



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 58599

4/10

Well Name & No. Frahan A #2-20 Test No. 1 Date 12/03/2014
 Company Martin Drilling Co Elevation 3231 KB 3214 GL
 Address 250 N Water Ste 300 Wichita, ks 67202
 Co. Rep / Geo. Tom Funk Rig Martin 22
 Location: Sec. 20 Twp. 10s Rge. 34w Co. Thomas State Ks

Interval Tested 4284 - 4370 Zone Tested LKC H, I & J
 Anchor Length 4286 Drill Pipe Run 4041 Mud Wt. 9.3
 Top Packer Depth 4279 Drill Collars Run 234 Vis 54
 Bottom Packer Depth 4284 Wt. Pipe Run 0 WL 7.2
 Total Depth 4370 Chlorides 12000 ppm System LCM 4#
 Blow Description IF 1" blow
ISI No return.
FF 1 1/2" blow
FSI No return.

Rec	Feet of	%gas	%oil	%water	%mud
<u>1</u>	<u>0 IL</u>	<u>100</u>			
<u>239</u>	<u>50cm</u>	<u>2</u>		<u>98</u>	

Rec Total 240 BHT 119 Gravity — API RW — @ — °F Chlorides — ppm
 (A) Initial Hydrostatic 2202 Test 1250 T-On Location 2000
 (B) First Initial Flow 15 Jars T-Started 2003
 (C) First Final Flow 56 Safety Joint T-Open 2523
 (D) Initial Shut-In 1184 Circ Sub N/C T-Pulled 0323 12/03
 (E) Second Initial Flow 59 Hourly Standby T-Out 0546
 (F) Second Final Flow 122 Mileage 137.24 212.35 Comments _____
 (G) Final Shut-In 1199 Sampler _____
 (H) Final Hydrostatic 2165 Straddle _____
 Initial Open 30 Shale Packer _____
 Initial Shut-In 60 Shale Packer _____
 Final Flow 60 Extra Packer _____
 Final Shut-In 90 Extra Recorder _____
 Day Standby _____ Sub Total 0
 Accessibility _____ Total 1462.35
 Sub Total 1462.35 MP/DST Disc't _____

Approved By _____ Our Representative [Signature]
 Trilobite Testing Inc. shall not be liable for damaged or 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. 58600

4/10

Well Name & No. Frahm A #2-20 Test No. 2 Date 12/03/2014
 Company Martin Drilling Co Elevation 3231 KB 3214 GL
 Address 250 N Water Ste 300 Wichita, KS 67202
 Co. Rep / Geo. Tom Funk Rig Martin 22
 Location: Sec. 20 Twp. 10g Rge. 34w Co. Thomas State Ks

Interval Tested 4374 4400 Zone Tested LKC - K
 Anchor Length 26' Drill Pipe Run 4136 Mud Wt. 9.3
 Top Packer Depth 4369 Drill Collars Run 234 Vis 66
 Bottom Packer Depth 4374 Wt. Pipe Run 0 WL 8.0
 Total Depth 4400 Chlorides 1200 ppm System LCM 4#

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

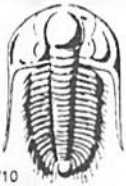
Rec	Feet of	%gas	%oil	%water	%mud
<u>90</u>	<u>MUD (OIR spots)</u>			<u>100</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 90 BHT 120 Gravity — API RW — @ — °F Chlorides — ppm
 (A) Initial Hydrostatic 2285 Test 1250 T-On Location 1400
 (B) First Initial Flow 16 Collars — T-Started 1435
 (C) First Final Flow 29 Safety Joint — T-Open 1642
 (D) Initial Shut-In 342 Circ Sub NC T-Pulled 2042
 (E) Second Initial Flow 30 Hourly Standby — T-Out 2300
 (F) Second Final Flow 61 Mileage 137 RT 212.35 Comments —
 (G) Final Shut-In 338 Sampler —
 (H) Final Hydrostatic 2167 Straddle — Ruined Shale Packer —
 Shale Packer — Ruined Packer —
 Extra Packer — Extra Copies —
 Extra Recorder — Sub Total 0
 Day Standby — Total 1462.35
 Accessibility — MP/DST Disc't —

Initial Open 30
 Initial Shut-In 60
 Final Flow 60
 Final Shut-In 90
 Sub Total 1462.35

Approved By _____ Our Representative 

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 58638

4/10

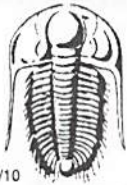
Well Name & No. Fahm A 2-20 Test No. 3 Date 12/4 12/5
 Company Murfin Drilling Co. Elevation 3231 KB 3219 GL
 Address 250 N Water Ste 300 Wichita, KS 67202
 Co. Rep / Geo. Tom Funk Rig Murfin 22
 Location: Sec. 20 Twp. 10s Rge. 34w Co. Thomas State KS

Interval Tested 4555 4650 Zone Tested Pawn, lower Pawn, FS
 Anchor Length 95 Drill Pipe Run 4320 Mud Wt. 9.4
 Top Packer Depth 4555 Drill Collars Run 234 Vis 47
 Bottom Packer Depth 4555 Wt. Pipe Run Ø WL 9.2
 Total Depth 4650 Chlorides 12,900 ppm System LCM 4
 Blow Description 30 No Return
60 B.O.B. in 23 min
60 No Return
60 B.O.B. in 25 min
90 No Return

Rec	Feet of	%gas	%oil	%water	%mud
<u>146</u>	<u>0cm</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 146 BHT 122 Gravity - API RW - @ - ° F Chlorides - ppm
 (A) Initial Hydrostatic 2370 Test 1250 T-On Location 2245
 (B) First Initial Flow 15 Jars _____ T-Started 2300
 (C) First Final Flow 47 Safety Joint _____ T-Open 0307
 (D) Initial Shut-In 253 Circ Sub N/C T-Pulled 0707
 (E) Second Initial Flow 48 Hourly Standby _____ T-Out 09:13
 (F) Second Final Flow 85 Mileage 134 RT 212.35 Comments _____
 (G) Final Shut-In 255 Sampler _____
 (H) Final Hydrostatic 2182 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 1462.35
 Final Flow 60 Accessibility _____ MP/DST Disc't _____
 Final Shut-In 90 Sub Total 1462.35

Approved By [Signature] Our Representative [Signature]
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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 58639

4/10

Well Name & No. Freshman A 2-20 Test No. 4 Date 12/5 12/6
 Company Murfin Drilling Co Elevation 3231 KB 3219 GL
 Address 250 N Water STE 300 Wichita KS 67202
 Co. Rep / Geo. Tom Funk Rig Murfin 22
 Location: Sec. 20 Twp. 10S Rge. 34W Co. Thomas State Ks

Interval Tested 4674 4715 Zone Tested Johnson
 Anchor Length 41 Drill Pipe Run 4475 Mud Wt. 9.3
 Top Packer Depth 4670 Drill Collars Run 234 Vis 60
 Bottom Packer Depth 4674 Wt. Pipe Run 0 WL 8.0
 Total Depth 4715 Chlorides 12,900 ppm System LCM 4
 Blow Description 30 B.O.B in 19 min
60 No Return
60 B.O.B in 8 min
90 Weak surface blow

Rec	Feet of	%gas	%oil	%water	%mud
126	gocm	20	20	40	
136	@gmc0	20	50	30	

Rec Total 262 BHT 125 Gravity - API RW - @ - ° F Chlorides - ppm

(A) Initial Hydrostatic 2464 Test 1250 T-On Location 19:00
 (B) First Initial Flow 24 Jars _____ T-Started 19:12
 (C) First Final Flow 76 Safety Joint _____ T-Open 21:32
 (D) Initial Shut-In 295 Circ Sub N/C T-Pulled 1:32
 (E) Second Initial Flow 79 Hourly Standby _____ T-Out 3:41
 (F) Second Final Flow 116 Mileage 134 RT 212.35 Comments _____
 (G) Final Shut-In 296 Sampler _____
 (H) Final Hydrostatic 2237 Straddle _____ Ruined Shale Packer _____
 Shale Packer _____ Ruined Packer _____
 Extra Packer _____ Extra Copies _____
 Extra Recorder _____ Sub Total 0
 Day Standby _____ Total 1462.35
 Accessibility _____ MP/DST Disc't _____
 Sub Total 1462.35

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

Approved By [Signature] Our Representative [Signature]

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