

Confidentiality Requested:

Yes No

KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

Form ACO-1

January 2018

Form must be Typed

Form must be Signed

All blanks must be Filled

WELL COMPLETION FORM
WELL HISTORY - DESCRIPTION OF WELL & LEASE

OPERATOR: License # _____

Name: _____

Address 1: _____

Address 2: _____

City: _____ State: _____ Zip: _____ + _____

Contact Person: _____

Phone: (_____) _____

CONTRACTOR: License # _____

Name: _____

Wellsite Geologist: _____

Purchaser: _____

Designate Type of Completion:

New Well Re-Entry Workover

Oil WSW SWD

Gas DH EOR

OG GSW

CM (Coal Bed Methane)

Cathodic Other (Core, Expl., etc.): _____

If Workover/Re-entry: Old Well Info as follows:

Operator: _____

Well Name: _____

Original Comp. Date: _____ Original Total Depth: _____

Deepening Re-perf. Conv. to EOR Conv. to SWD

Plug Back Liner Conv. to GSW Conv. to Producer

Commingled Permit #: _____

Dual Completion Permit #: _____

SWD Permit #: _____

EOR Permit #: _____

GSW Permit #: _____

Spud Date or Date Reached TD Completion Date or Recompletion Date

API No.: _____

Spot Description: _____

_____ - _____ - _____ Sec. _____ Twp. _____ S. R. _____ East West

_____ Feet from North / South Line of Section

_____ Feet from East / West Line of Section

Footages Calculated from Nearest Outside Section Corner:

NE NW SE SW

GPS Location: Lat: _____, Long: _____
(e.g. xx.xxxxx) (e.g. -xxx.xxxxx)

Datum: NAD27 NAD83 WGS84

County: _____

Lease Name: _____ Well #: _____

Field Name: _____

Producing Formation: _____

Elevation: Ground: _____ Kelly Bushing: _____

Total Vertical Depth: _____ Plug Back Total Depth: _____

Amount of Surface Pipe Set and Cemented at: _____ Feet

Multiple Stage Cementing Collar Used? Yes No

If yes, show depth set: _____ Feet

If Alternate II completion, cement circulated from: _____

feet depth to: _____ w/ _____ sx cmt.

Drilling Fluid Management Plan

(Data must be collected from the Reserve Pit)

Chloride content: _____ ppm Fluid volume: _____ bbls

Dewatering method used: _____

Location of fluid disposal if hauled offsite:

Operator Name: _____

Lease Name: _____ License #: _____

Quarter _____ Sec. _____ Twp. _____ S. R. _____ East West

County: _____ Permit #: _____

AFFIDAVIT

I am the affiant and I hereby certify that all requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Submitted Electronically

KCC Office Use ONLY

Confidentiality Requested

Date: _____

Confidential Release Date: _____

Wireline Log Received Drill Stem Tests Received

Geologist Report / Mud Logs Received

UIC Distribution

ALT I II III Approved by: _____ Date: _____

Operator Name: _____ Lease Name: _____ Well #: _____

Sec. _____ Twp. _____ S. R. _____ East West County: _____

INSTRUCTIONS: Show important tops of formations penetrated. Detail all cores. Report all final copies of drill stems tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface test, along with final chart(s). Attach extra sheet if more space is needed.

Final Radioactivity Log, Final Logs run to obtain Geophysical Data and Final Electric Logs must be emailed to kcc-well-logs@kcc.ks.gov. Digital electronic log files must be submitted in LAS version 2.0 or newer AND an image file (TIFF or PDF).

Drill Stem Tests Taken <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Attach Additional Sheets)</i> Samples Sent to Geological Survey <input type="checkbox"/> Yes <input type="checkbox"/> No Cores Taken <input type="checkbox"/> Yes <input type="checkbox"/> No Electric Log Run <input type="checkbox"/> Yes <input type="checkbox"/> No Geologist Report / Mud Logs <input type="checkbox"/> Yes <input type="checkbox"/> No List All E. Logs Run:	<input type="checkbox"/> Log Formation (Top), Depth and Datum <input type="checkbox"/> Sample Name Top Datum
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CASING RECORD <input type="checkbox"/> New <input type="checkbox"/> Used							
Report all strings set-conductor, surface, intermediate, production, etc.							
Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs. / Ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives

ADDITIONAL CEMENTING / SQUEEZE RECORD				
Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
<input type="checkbox"/> Perforate <input type="checkbox"/> Protect Casing <input type="checkbox"/> Plug Back TD <input type="checkbox"/> Plug Off Zone				

1. Did you perform a hydraulic fracturing treatment on this well? Yes No *(If No, skip questions 2 and 3)*
2. Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons? Yes No *(If No, skip question 3)*
3. Was the hydraulic fracturing treatment information submitted to the chemical disclosure registry? Yes No *(If No, fill out Page Three of the ACO-1)*

Date of first Production/Injection or Resumed Production/Injection:	Producing Method: <input type="checkbox"/> Flowing <input type="checkbox"/> Pumping <input type="checkbox"/> Gas Lift <input type="checkbox"/> Other <i>(Explain)</i> _____			
Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio Gravity

DISPOSITION OF GAS: <input type="checkbox"/> Vented <input type="checkbox"/> Sold <input type="checkbox"/> Used on Lease <i>(If vented, Submit ACO-18.)</i>	METHOD OF COMPLETION: <input type="checkbox"/> Open Hole <input type="checkbox"/> Perf. <input type="checkbox"/> Dually Comp. <input type="checkbox"/> Commingled <i>(Submit ACO-5)</i> <i>(Submit ACO-4)</i>	PRODUCTION INTERVAL: Top Bottom
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Shots Per Foot	Perforation Top	Perforation Bottom	Bridge Plug Type	Bridge Plug Set At	Acid, Fracture, Shot, Cementing Squeeze Record <i>(Amount and Kind of Material Used)</i>

TUBING RECORD:	Size:	Set At:	Packer At:	
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Form	ACO1 - Well Completion
Operator	Murfin Drilling Co., Inc.
Well Name	KOPRIVA 1-14
Doc ID	1364218

All Electric Logs Run

DIL
DUCP
MEL
BHCS

TREATMENT REPORT



HURRICANE SERVICES INC

Customer: Murfin Drilling Company Inc.	Date: 6/9/2017	Ticket No.: 100752
Field Rep: Arturo		
Address:		
City, State:		
County, Zip:		

Field Order No.: 100752	Open Hole:	Perf Depths (ft)	Perfs
Well Name: Kopriva @ 1-14	Casing Depth: 254'		
Location: Atwood	Casing Size: 8.625 23 Lb		
Formation:	Tubing Depth:		
Type of Service: 8 5/8 Surface	Tubing Size:		
Well Type: Oil	Liner Depth:		
Age of Well: New	Liner Size:		
Packer Type:	Liner Top:		
Packer Depth:	Liner Bottom:		
Treatment Via: Casing	Total Depth: 255'	Total Perfs	0

TIME	INJECTION RATE		PRESSURE		REMARKS	PROP (lbs)	HCL (gfs)	FLUID (bbls)
	FLUID	N2/C02	STP	ANNULUS				
12:45 PM					Called Out			
5:30 PM					On location with Trucks Hold Safety Meeting			
					Spot & Set Up Trucks			
					TD= 255' TP= 260.21' SJ=20'			
					Run 6 Jt's 23 Lb Csg Set @ 254' Centralizers Jt 1/2 1 Jt 4			
5:15 PM					Start Casing			
6:00 PM					Casing On Bottom			
6:15 PM					Hook Up To Casing & Break Circulation W/Rig			
6:50 PM	4.0		140.0		Start Pumping H2O			5.00
	4.0		175.0		Start Mix 210 Sacks Common 2% Gel 3% C.C. @ 15 Lb/Gal			50.87
	4.0		175.0		Start Displacement H2O			15.37
8:05 PM			200.0		Shut Down			
					Good Circulation Thru Job			
					Circulate 5 Bbl's Cement To Pit			
					Off Location			
					Thank You			
					Please Call Again			
					Tony Cody Sheldon			
TOTAL:						-	-	71.24

SUMMARY

Max Fl. Rate	Avg Fl. Rate	Max PSI	Avg PSI
4.0	4.0	200.0	172.5

PRODUCTS USED

225 Sacks Common 2%Gel 3% Calcium Chloride

Treater: Todd Seba Tony P

Customer: Kelly Wilson

TREATMENT REPORT



HURRICANE SERVICES INC

Customer: MURFIN	Date: 6/19/2017	Ticket No.: 100754
Field Rep: GLEN		
Address:		
City, State:		
County, Zip:		

Field Order No.: 100754	Open Hole:		Perf Depths (ft)	Perfs
Well Name: Kopriva #1-14	Casing Depth: 4847'			
Location: Beardsley	Casing Size: 5.5" 15.5 Lb/Ft			
Formation:	Tubing Depth:			
Type of Service: LONGSTRING	Tubing Size:			
Well Type: OIL	Liner Depth:			
Age of Well: NEW	Liner Size:			
Packer Type:	Liner Top:			
Packer Depth:	Liner Bottom:			
Treatment Via: CASING	Total Depth: 4855'			
			Total Perfs	0

TIME	INJECTION RATE		PRESSURE		REMARKS	PROP (lbs)	HCL (gls)	FLUID (bbls)
	FLUID	N2/CO2	STP	ANNULUS				
4:30 AM					Called Out			
10:30 AM					On location With Float Equipment			
					Run 115 Jt's 5 1/2 15.5 lb casing			
					TD=4855' TP=4847' Sj=23.05			
					AFU Float Shoe & LD Plug & Baffle 1 St Jt 23.05			
					Turbolizers on Jt's 1-2-3-4-5-6-7-8-11-13-15-17-19-43-66			
					Cement Baskets on Jt's 20-44-67			
12:15 PM					Start Casing			
12:00 PM					Trucks On Location			
1:30 AM					1/2 Way Break Circulation With Rig Jt # 56 30 Min			
					Hold Safety Meeting Spot & Set Up Trucks			
2:45 PM					Casing On Bottom Drop Ball			
					Hook Up To Casing			
3:00 PM	7.0		450.0		Break Circulation With Rig			
					Rotate Casing Circulate 1 Hour			
4:00 PM			200.0		Start Pumping Preflushes			
	3.0		200.0		5 Bbl's H2O			5.00
	3.0		200.0		12 Bbl's Mud Flush			12.00
TOTAL:								

SUMMARY

Max Fl. Rate	Avg Fl. Rate	Max PSI	Avg PSI
7.0	4.5	2,000.0	652.1

PRODUCTS USED

300 SACKS H-CON AND 200 SACKS H-LONG

Treater: Todd Seba

Customer: GLEN

MDCI
 Kopriva #1-14
 1320' FNL 1980'FWL
 Sec. 14-2S-35W
 3201' KB

Formation	Sample top	Datum	Ref	Log tops	Datum	Ref
Anhydrite	3052	+149	-36	3043	+158	-27
B/Anhydrite	3096	+105	-41	3078	+123	-23
Topeka	3929	-728	-22	3922	-721	-15
Oread	4032	-831	-24	4032	-831	-24
Lansing	4125	-924	-21	4122	-921	-18
Stark	4338	-1137	-20	4338	-1137	-20
Mound City	4386	-1185	-20	4385	-1184	-19
Ft Scott	4508	-1307	-22	4506	-1305	-20
Oakley	4588	-1387	-22	4584	-1383	-18
Mississippi	4774	-1573	+11	4766	-1565	+19
RTD	4855	-1654				
LTD				4856	-1655	



DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co, Inc.**

250 N Water Ste 300
Wichita, KS 67202

ATTN: Rocky Milford

Kopriva #1-4

14-2s-35w Rawlins,KS

Start Date: 2017.06.13 @ 00:10:00

End Date: 2017.06.13 @ 07:58:15

Job Ticket #: 61370 DST #: 1

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

Printed: 2017.06.20 @ 10:37:45

Murfin Drilling Co, Inc. 14-2s-35w Rawlins,KS Kopriva #1-4 DST # 1 Oread 2017.06.13



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Murfin Drilling Co, Inc.
250 N Water Ste 300
Wichita, KS 67202
ATTN: Rocky Milford

14-2s-35w Rawlins,KS

Kopriva #1-4

Job Ticket: 61370

DST#: 1

Test Start: 2017.06.13 @ 00:10:00

GENERAL INFORMATION:

Formation: **Oread**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 02:57:30

Time Test Ended: 07:58:15

Test Type: Conventional Bottom Hole (Initial)

Tester: Bradley Walter

Unit No: 78

Interval: 3993.00 ft (KB) To 4057.00 ft (KB) (TVD)

Reference Elevations: 3201.00 ft (KB)

Total Depth: 4057.00 ft (KB) (TVD)

3196.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

Serial #: 8845 Outside

Press@RunDepth: 18.33 psig @ 3994.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2017.06.13

End Date:

2017.06.13

Last Calib.: 2017.06.13

Start Time: 00:10:05

End Time:

07:58:14

Time On Btm: 2017.06.13 @ 02:57:15

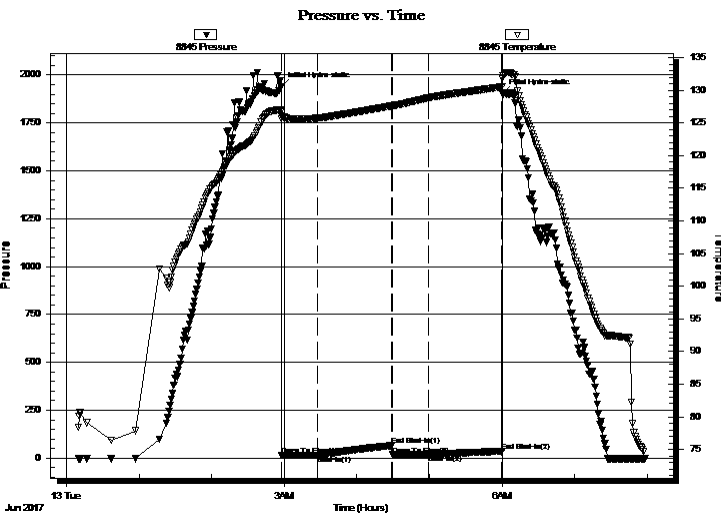
Time Off Btm: 2017.06.13 @ 06:00:15

TEST COMMENT: IF: Surface blow , died @ 15 min.

IS: No return.

FF: No blow .

FS: No return.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1937.59	126.85	Initial Hydro-static
1	15.25	125.70	Open To Flow (1)
30	16.58	125.75	Shut-In(1)
92	65.01	127.62	End Shut-In(1)
92	17.10	127.61	Open To Flow (2)
122	18.33	128.83	Shut-In(2)
183	35.36	130.53	End Shut-In(2)
183	1900.47	131.75	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
5.00	Mud 100m	0.02

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co, Inc.

14-2s-35w Rawlins,KS

250 N Water Ste 300
Wichita, KS 67202

Kopriva #1-4

Job Ticket: 61370

DST#: 1

ATTN: Rocky Milford

Test Start: 2017.06.13 @ 00:10:00

Tool Information

Drill Pipe:	Length: 3777.00 ft	Diameter: 3.80 inches	Volume: 52.98 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: 205.00 ft	Diameter: 2.25 inches	Volume: 1.01 bbl	Weight to Pull Loose: 70000.00 lb
			<u>Total Volume: 53.99 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	16.00 ft			String Weight: Initial 58000.00 lb
Depth to Top Packer:	3993.00 ft			Final 58000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	64.00 ft			
Tool Length:	91.00 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			3967.00	
Shut In Tool	5.00			3972.00	
Hydraulic tool	5.00			3977.00	
Jars	5.00			3982.00	
Safety Joint	2.00			3984.00	
Packer	5.00			3989.00	27.00 Bottom Of Top Packer
Packer	4.00			3993.00	
Stubb	1.00			3994.00	
Recorder	0.00	8365	Inside	3994.00	
Recorder	0.00	8845	Outside	3994.00	
Perforations	27.00			4021.00	
Change Over Sub	1.00			4022.00	
Drill Pipe	31.00			4053.00	
Change Over Sub	1.00			4054.00	
Bullnose	3.00			4057.00	64.00 Bottom Packers & Anchor

Total Tool Length: 91.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co, Inc.

14-2s-35w Rawlins,KS

250 N Water Ste 300
Wichita, KS 67202

Kopriva #1-4

Job Ticket: 61370

DST#: 1

ATTN: Rocky Milford

Test Start: 2017.06.13 @ 00:10:00

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: 62.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.78 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 800.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
5.00	Mud 100m	0.025

Total Length: 5.00 ft Total Volume: 0.025 bbl

Num Fluid Samples: 0

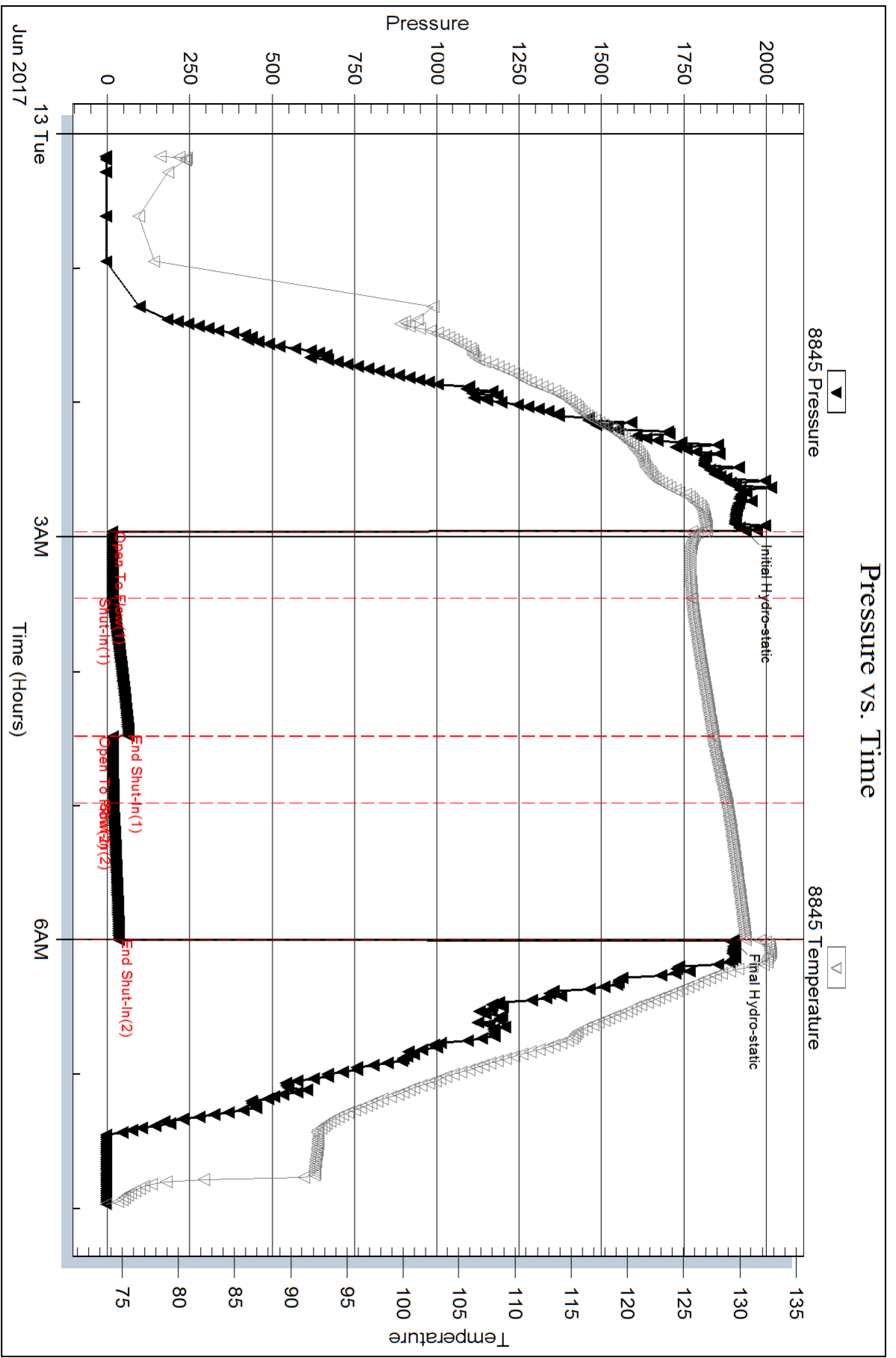
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:



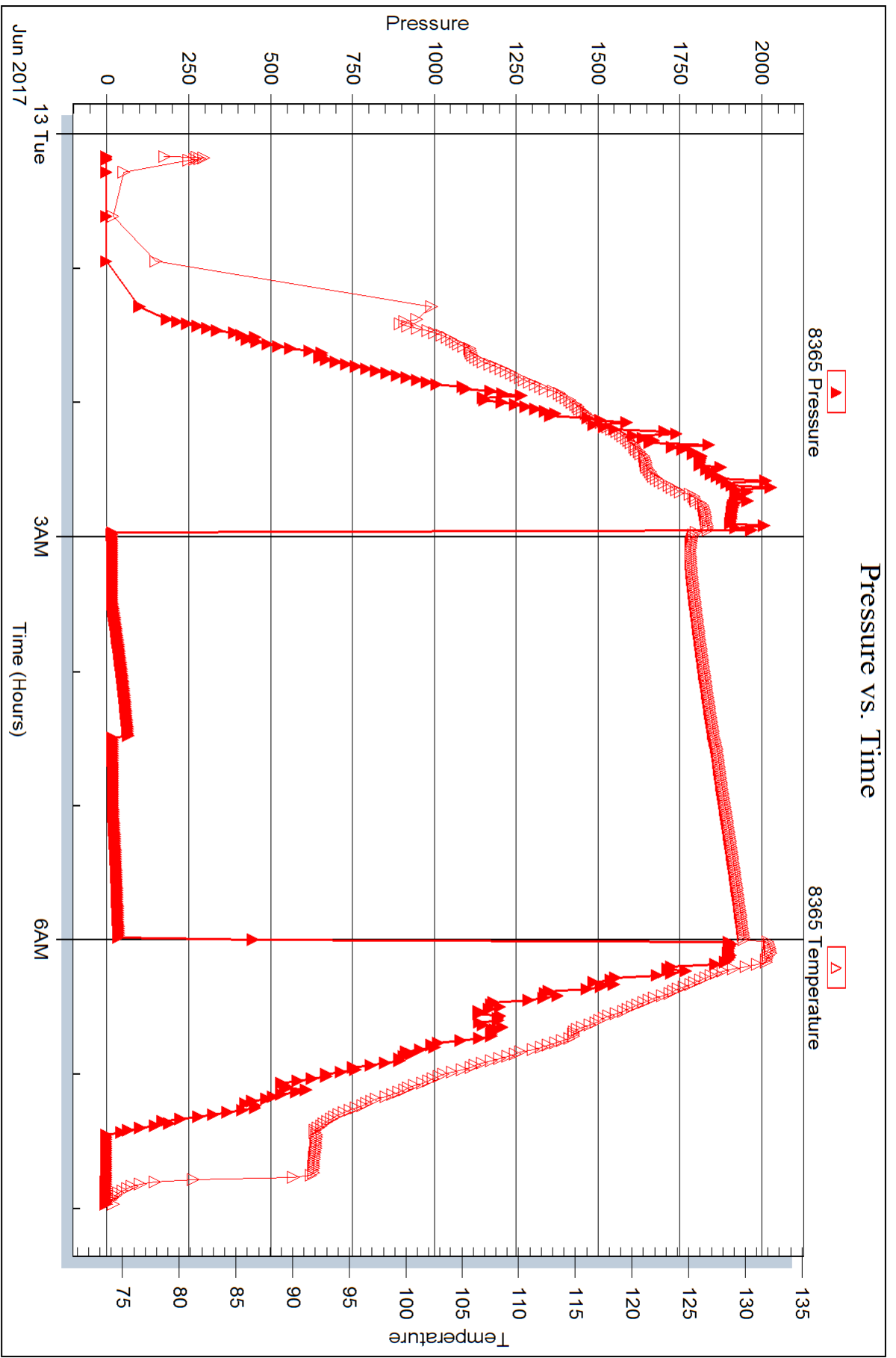
Serial #: 8365

Inside

Murfin Drilling Co, Inc.

Kopriva #1-4

DST Test Number: 1





DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co, Inc.**

250 N Water Ste 300
Wichita, KS 67202

ATTN: Rocky Milford

Kopriva #1-4

14-2s-35w Rawlins,KS

Start Date: 2017.06.13 @ 19:46:00

End Date: 2017.06.14 @ 04:46:30

Job Ticket #: 61371 DST #: 2

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

Printed: 2017.06.20 @ 10:37:16



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Murfin Drilling Co, Inc.

14-2s-35w Rawlins,KS

250 N Water Ste 300
Wichita, KS 67202

Kopriva #1-4

Job Ticket: 61371

DST#: 2

ATTN: Rocky Milford

Test Start: 2017.06.13 @ 19:46:00

GENERAL INFORMATION:

Formation: **LKC A**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 22:05:45

Time Test Ended: 04:46:30

Test Type: Conventional Bottom Hole (Reset)

Tester: Bradley Walter

Unit No: 78

Interval: 4074.00 ft (KB) To 4148.00 ft (KB) (TVD)

Reference Elevations: 3201.00 ft (KB)

Total Depth: 4148.00 ft (KB) (TVD)

3196.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

Serial #: 8845 Outside

Press@RunDepth: 143.99 psig @ 4075.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2017.06.13

End Date:

2017.06.14

Last Calib.:

2017.06.14

Start Time:

19:46:05

End Time:

04:46:30

Time On Btm:

2017.06.13 @ 22:05:30

Time Off Btm:

2017.06.14 @ 02:08:00

TEST COMMENT: IF: 3 1/2" blow after bleed off. tool slid 10' picked up some mud.

IS: No return.

FF: 9 1/2" blow.

FS: 1/2" return, died @ 60 min.

PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1994.48	123.11	Initial Hydro-static
1	72.92	122.20	Open To Flow (1)
31	111.45	124.89	Shut-In(1)
91	1156.80	128.14	End Shut-In(1)
91	118.94	127.81	Open To Flow (2)
149	143.99	130.10	Shut-In(2)
241	1128.96	133.58	End Shut-In(2)
243	1949.21	133.88	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
120.00	gocm 10g 30o 60m	0.59
100.00	gocm 10g 40o 50m	0.63
60.00	oil 100o	0.84
0.00	140' GIP	0.00

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co, Inc.

14-2s-35w Rawlins,KS

250 N Water Ste 300
Wichita, KS 67202

Kopriva #1-4

Job Ticket: 61371

DST#: 2

ATTN: Rocky Milford

Test Start: 2017.06.13 @ 19:46:00

Tool Information

Drill Pipe:	Length: 3870.00 ft	Diameter: 3.80 inches	Volume: 54.29 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:	30000.00 lb
Drill Collar:	Length: 205.00 ft	Diameter: 2.25 inches	Volume: 1.01 bbl	Weight to Pull Loose:	74000.00 lb
			<u>Total Volume: 55.30 bbl</u>	Tool Chased	10.00 ft
Drill Pipe Above KB:	28.00 ft			String Weight: Initial	58000.00 lb
Depth to Top Packer:	4074.00 ft			Final	60000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	74.00 ft				
Tool Length:	101.00 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			4048.00	
Shut In Tool	5.00			4053.00	
Hydraulic tool	5.00			4058.00	
Jars	5.00			4063.00	
Safety Joint	2.00			4065.00	
Packer	5.00			4070.00	27.00 Bottom Of Top Packer
Packer	4.00			4074.00	
Stubb	1.00			4075.00	
Recorder	0.00	8365	Inside	4075.00	
Recorder	0.00	8845	Outside	4075.00	
Perforations	5.00			4080.00	
Change Over Sub	1.00			4081.00	
Drill Pipe	63.00			4144.00	
Change Over Sub	1.00			4145.00	
Bullnose	3.00			4148.00	74.00 Bottom Packers & Anchor

Total Tool Length: 101.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co, Inc.

14-2s-35w Rawlins,KS

250 N Water Ste 300
Wichita, KS 67202

Kopriva #1-4

Job Ticket: 61371

DST#: 2

ATTN: Rocky Milford

Test Start: 2017.06.13 @ 19:46:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

21 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: 6.38 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 900.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
120.00	gocm 10g 30o 60m	0.590
100.00	gocm 10g 40o 50m	0.628
60.00	oil 100o	0.842
0.00	140' GIP	0.000

Total Length: 280.00 ft Total Volume: 2.060 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

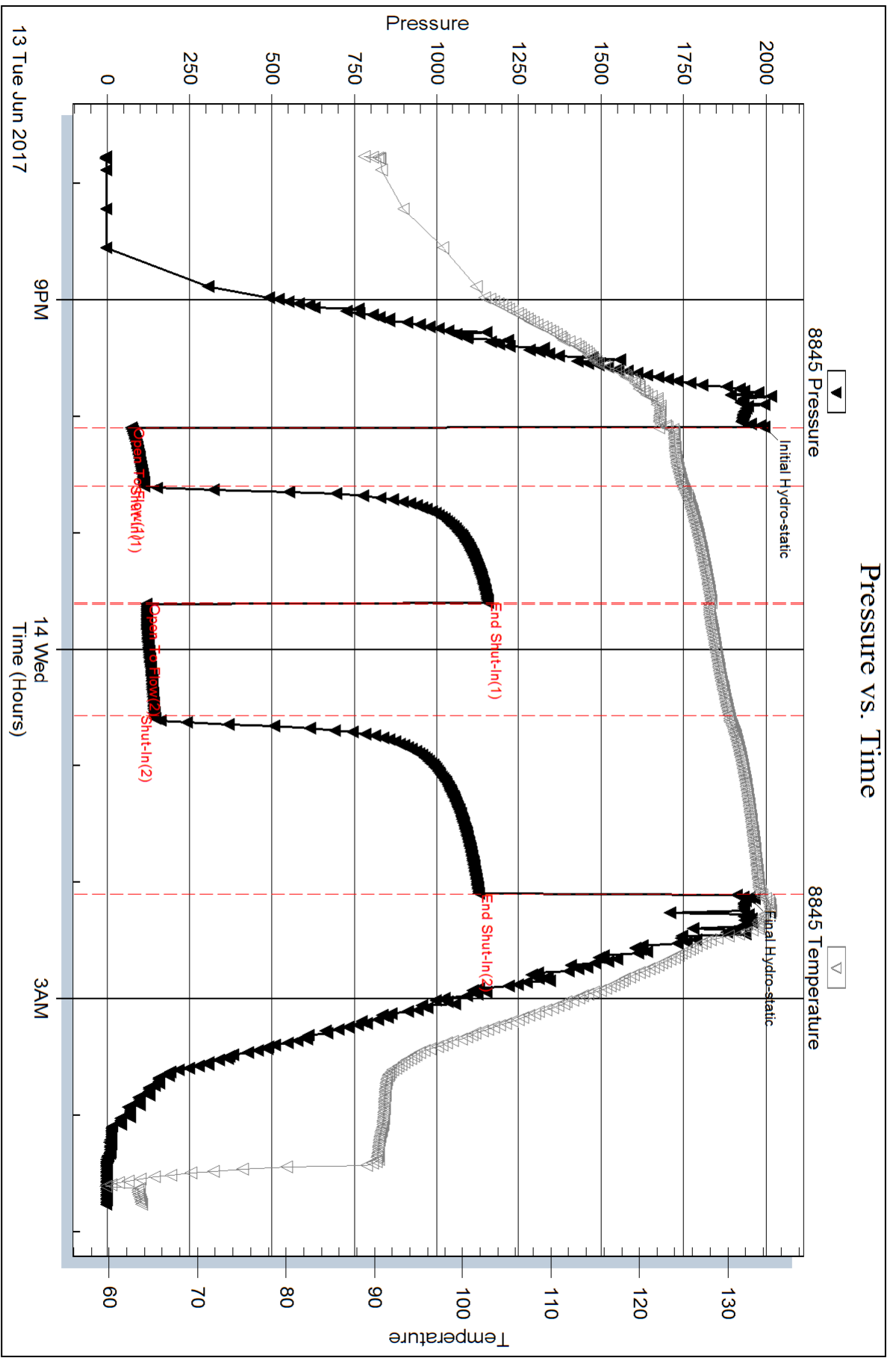
Recovery Comments: tool slid, mud dropped down anulis below 6' out of site

Serial #: 8845

Outside Murfin Drilling Co, Inc.

Kopriva #1-4

DST Test Number: 2



Trilobite Testing, Inc

Ref. No: 61371

Printed: 2017.06.20 @ 10:37:19

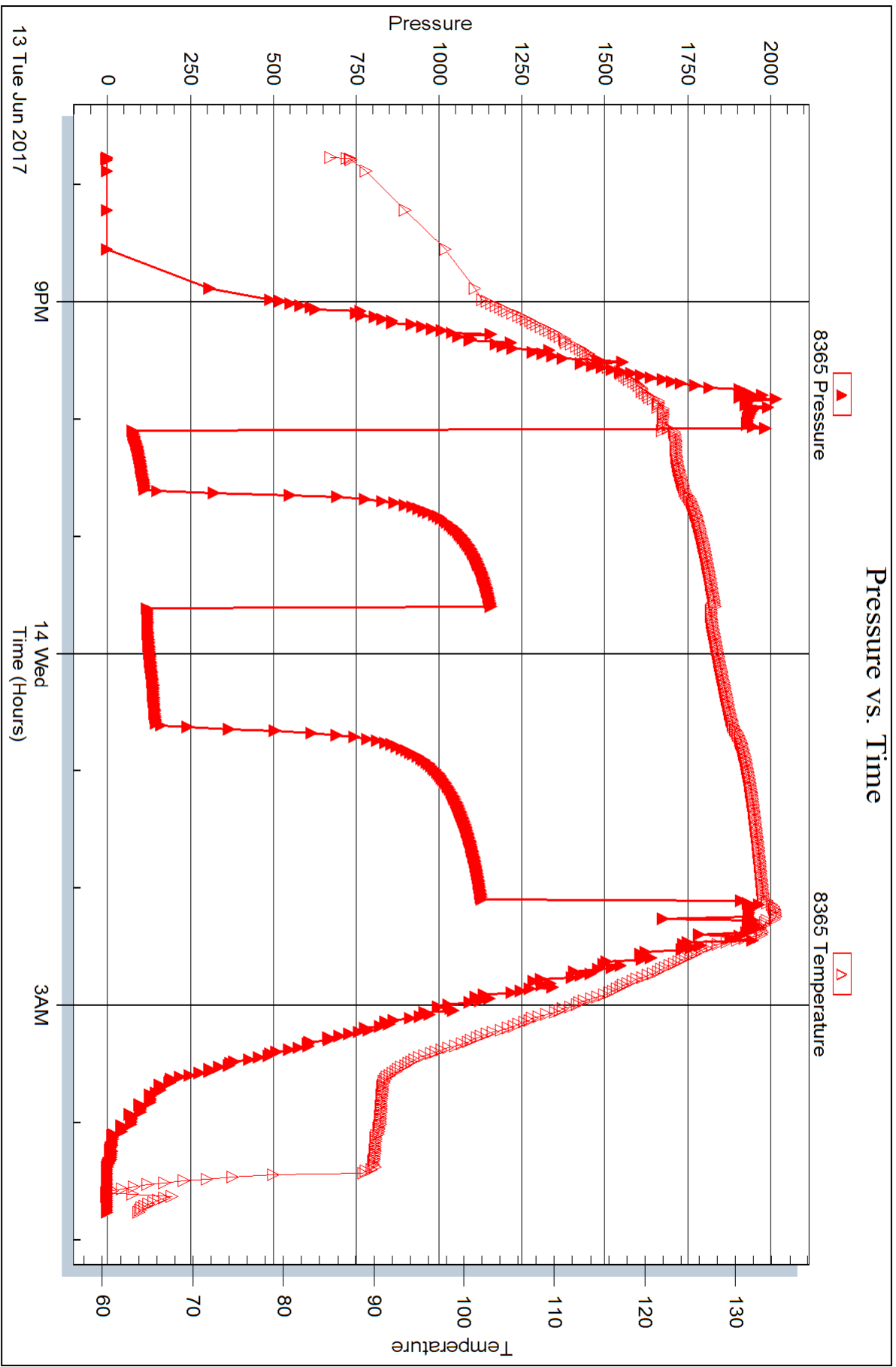
Serial #: 8365

Inside

Murfin Drilling Co, Inc.

Kopriva#1-4

DST Test Number: 2





DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co, Inc.**

250 N Water Ste 300
Wichita, KS 67202

ATTN: Rocky Milford

Kopriva #1-4

14-2s-35w Rawlins,KS

Start Date: 2017.06.14 @ 14:26:00

End Date: 2017.06.14 @ 22:29:45

Job Ticket #: 61372 DST #: 3

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

Printed: 2017.06.20 @ 10:36:55



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co, Inc.
 250 N Water Ste 300
 Wichita, KS 67202
 ATTN: Rocky Milford

14-2s-35w Rawlins,KS

Kopriva #1-4

Job Ticket: 61372

DST#: 3

Test Start: 2017.06.14 @ 14:26:00

GENERAL INFORMATION:

Formation: **LKC A snd - D**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 16:09:45
 Time Test Ended: 22:29:45
 Interval: **4144.00 ft (KB) To 4200.00 ft (KB) (TVD)**
 Total Depth: 4200.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Good
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Bradley Walter
 Unit No: 78
 Reference Elevations: 3201.00 ft (KB)
 3196.00 ft (CF)
 KB to GR/CF: 5.00 ft

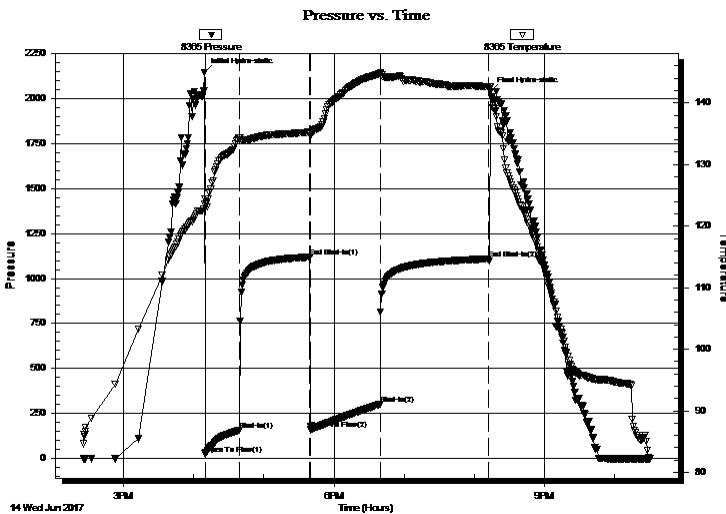
Serial #: 8365

Inside

Press@RunDepth: 301.96 psig @ 4145.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2017.06.14 End Date: 2017.06.14 Last Calib.: 2017.06.14
 Start Time: 14:26:05 End Time: 22:29:44 Time On Btm: 2017.06.14 @ 16:09:15
 Time Off Btm: 2017.06.14 @ 20:13:45

TEST COMMENT: IF: BOB @ 16 min. Slid 8 ft mud dropped 1'.
 IS: No return.
 FF: BOB @ 31 min.
 FS: No return.

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2146.08	123.52	Initial Hydro-static
1	25.22	124.33	Open To Flow (1)
30	156.54	134.33	Shut-In(1)
91	1119.01	135.26	End Shut-In(1)
91	160.00	134.96	Open To Flow (2)
150	301.96	144.77	Shut-In(2)
243	1109.23	142.60	End Shut-In(2)
245	2041.36	142.57	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
590.00	mcw 15m 85w (oil spots)	6.41

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co, Inc.

14-2s-35w Rawlins,KS

250 N Water Ste 300
Wichita, KS 67202

Kopriva #1-4

Job Ticket: 61372

DST#: 3

ATTN: Rocky Milford

Test Start: 2017.06.14 @ 14:26:00

Tool Information

Drill Pipe:	Length: 3933.00 ft	Diameter: 3.80 inches	Volume: 55.17 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: 205.00 ft	Diameter: 2.25 inches	Volume: 1.01 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 56.18 bbl</u>	Tool Chased 8.00 ft
Drill Pipe Above KB:	21.00 ft			String Weight: Initial 62000.00 lb
Depth to Top Packer:	4144.00 ft			Final 64000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	56.00 ft			
Tool Length:	83.00 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			4118.00	
Shut In Tool	5.00			4123.00	
Hydraulic tool	5.00			4128.00	
Jars	5.00			4133.00	
Safety Joint	2.00			4135.00	
Packer	5.00			4140.00	27.00 Bottom Of Top Packer
Packer	4.00			4144.00	
Stubb	1.00			4145.00	
Recorder	0.00	8365	Inside	4145.00	
Recorder	0.00	8845	Outside	4145.00	
Perforations	19.00			4164.00	
Change Over Sub	1.00			4165.00	
Drill Pipe	31.00			4196.00	
Change Over Sub	1.00			4197.00	
Bullnose	3.00			4200.00	56.00 Bottom Packers & Anchor

Total Tool Length: 83.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co, Inc.
250 N Water Ste 300
Wichita, KS 67202
ATTN: Rocky Milford

14-2s-35w Rawlins,KS
Kopriva #1-4
Job Ticket: 61372 **DST#: 3**
Test Start: 2017.06.14 @ 14:26:00

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: 28000 ppm
Viscosity: 62.00 sec/qt	Cushion Volume: bbl	
Water Loss: 6.78 in ³	Gas Cushion Type:	
Resistivity: ohm.m	Gas Cushion Pressure: psig	
Salinity: 800.00 ppm		
Filter Cake: 2.00 inches		

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
590.00	mcw 15m 85w (oil spots)	6.409

Total Length: 590.00 ft Total Volume: 6.409 bbl
 Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
 Laboratory Name: Laboratory Location:
 Recovery Comments: rw is .210 @ 80f = 28,000ppm

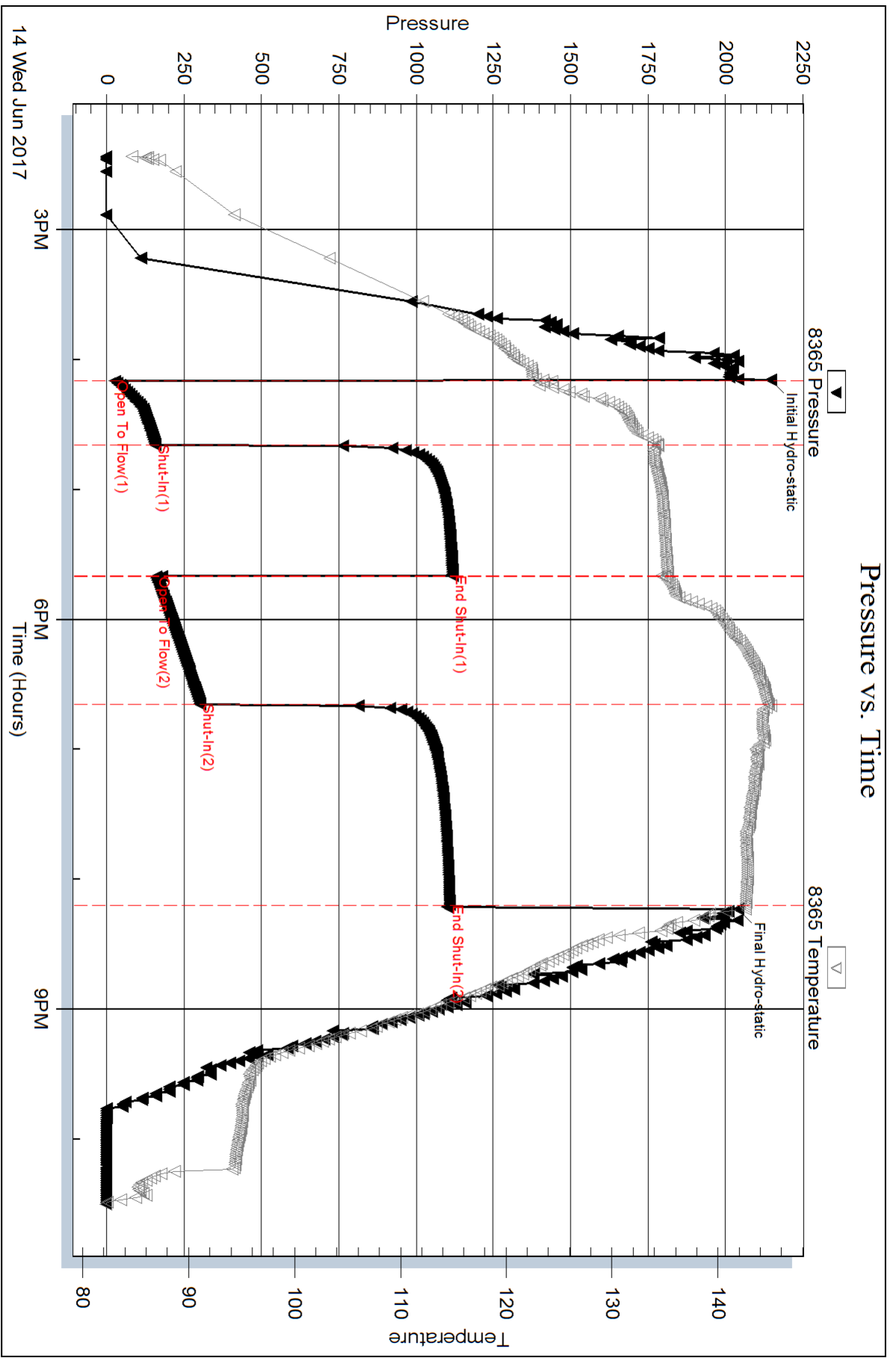
Serial #: 8365

Inside

Murfin Drilling Co, Inc.

Kopriva #1-4

DST Test Number: 3



Triobite Testing, Inc

Ref. No: 61372

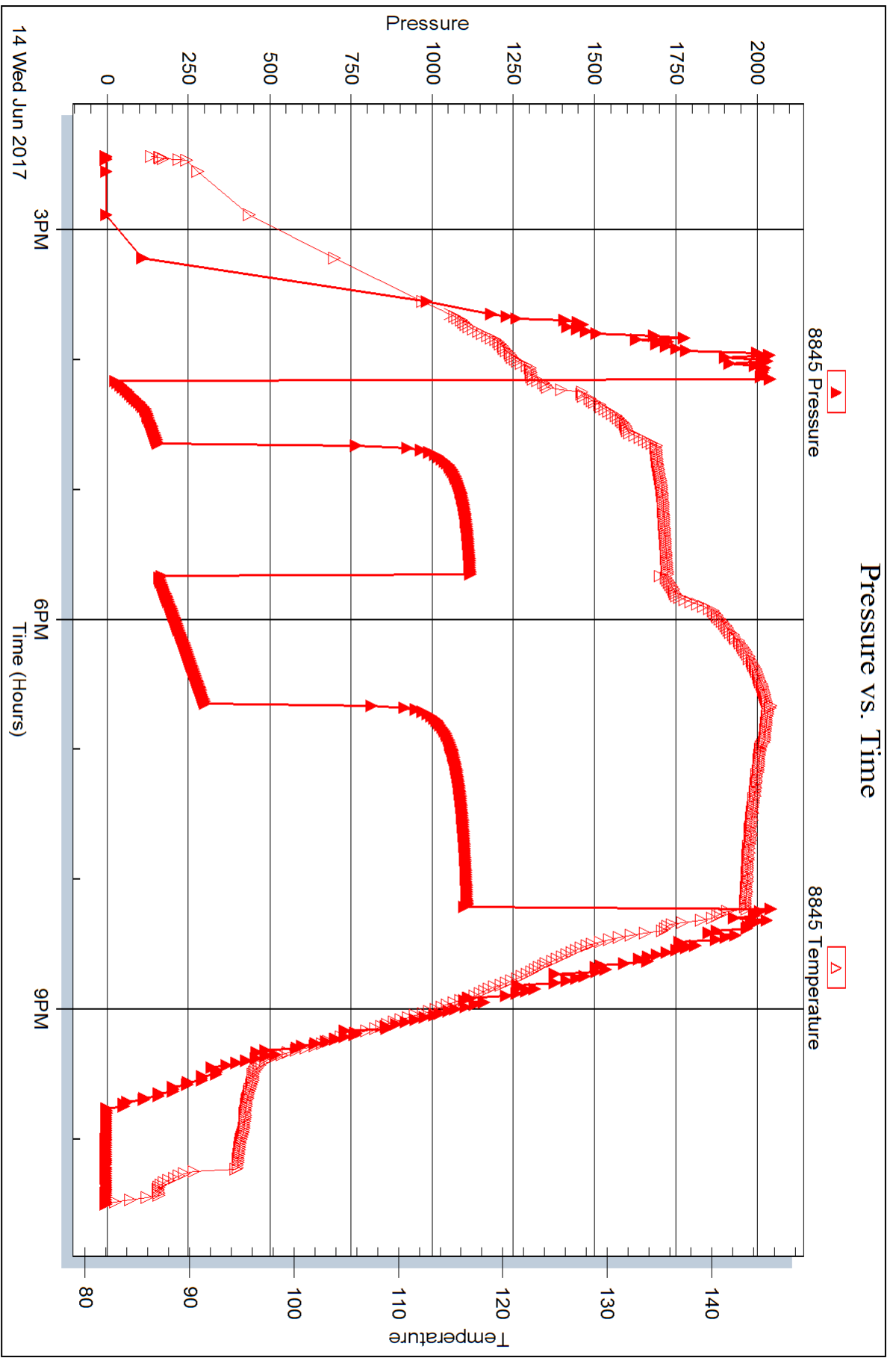
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Serial #: 8845

Outside Murfin Drilling Co, Inc.

Kopriva#1-4

DST Test Number: 3





DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co, Inc.**

250 N Water Ste 300
Wichita, KS 67202

ATTN: Rocky Milford

Kopriva #1-4

14-2s-35w Rawlins,KS

Start Date: 2017.06.15 @ 08:30:00

End Date: 2017.06.15 @ 15:41:15

Job Ticket #: 61373 DST #: 4

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

Printed: 2017.06.20 @ 10:34:31

Murfin Drilling Co, Inc.

14-2s-35w Rawlins,KS

Kopriva #1-4

DST # 4

LKC D prime - upper

2017.06.15



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Murfin Drilling Co, Inc.
250 N Water Ste 300
Wichita, KS 67202
ATTN: Rocky Milford

14-2s-35w Rawlins,KS

Kopriva #1-4

Job Ticket: 61373

DST#: 4

Test Start: 2017.06.15 @ 08:30:00

GENERAL INFORMATION:

Formation: **LKC D prime - upper**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 10:39:30

Time Test Ended: 15:41:15

Test Type: Conventional Bottom Hole (Reset)

Tester: Bradley Walter

Unit No: 78

Interval: **4197.00 ft (KB) To 4244.00 ft (KB) (TVD)**

Reference Elevations: 3201.00 ft (KB)

Total Depth: 4244.00 ft (KB) (TVD)

3196.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

Serial #: 8845 Outside

Press@RunDepth: 17.69 psig @ 4198.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2017.06.15

End Date:

2017.06.15

Last Calib.: 2017.06.15

Start Time: 08:30:05

End Time:

15:41:14

Time On Btm: 2017.06.15 @ 10:39:15

Time Off Btm: 2017.06.15 @ 13:41:15

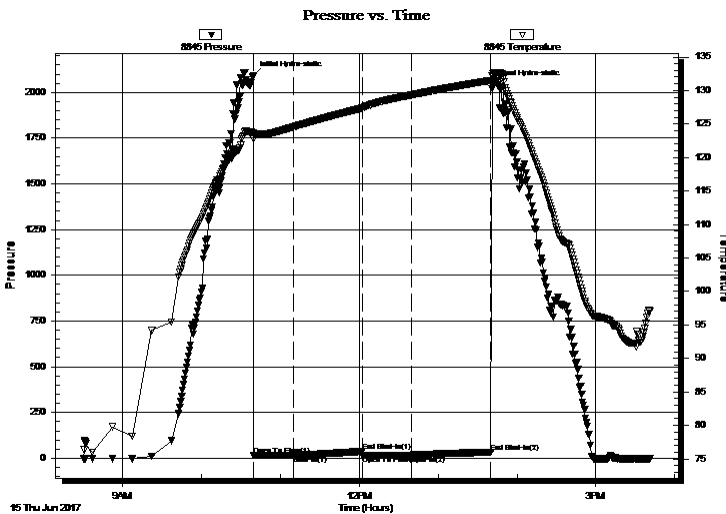
TEST COMMENT: IF: 1/4 inch blow , receded to Surface.

IS: No return.

FF: No blow .

FS: No return.

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2089.73	123.65	Initial Hydro-static
1	15.34	122.73	Open To Flow (1)
31	16.23	124.57	Shut-In(1)
83	37.41	127.36	End Shut-In(1)
84	16.98	127.36	Open To Flow (2)
121	17.69	129.33	Shut-In(2)
181	33.85	131.52	End Shut-In(2)
182	2040.89	132.04	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
5.00	Mud 100m (oil spots)	0.02

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co, Inc.

14-2s-35w Rawlins,KS

250 N Water Ste 300
Wichita, KS 67202

Kopriva #1-4

Job Ticket: 61373

DST#: 4

ATTN: Rocky Milford

Test Start: 2017.06.15 @ 08:30:00

Tool Information

Drill Pipe:	Length: 3990.00 ft	Diameter: 3.80 inches	Volume: 55.97 bbl	Tool Weight:	2500.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length: 205.00 ft	Diameter: 2.25 inches	Volume: 1.01 bbl	Weight to Pull Loose:	80000.00 lb
			<u>Total Volume: 56.98 bbl</u>	Tool Chased	0.00 ft
Drill Pipe Above KB:	25.00 ft			String Weight: Initial	64000.00 lb
Depth to Top Packer:	4197.00 ft			Final	64000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	47.00 ft				
Tool Length:	74.00 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			4171.00	
Shut In Tool	5.00			4176.00	
Hydraulic tool	5.00			4181.00	
Jars	5.00			4186.00	
Safety Joint	2.00			4188.00	
Packer	5.00			4193.00	27.00 Bottom Of Top Packer
Packer	4.00			4197.00	
Stubb	1.00			4198.00	
Recorder	0.00	8365	Inside	4198.00	
Recorder	0.00	8845	Outside	4198.00	
Perforations	10.00			4208.00	
Change Over Sub	1.00			4209.00	
Drill Pipe	31.00			4240.00	
Change Over Sub	1.00			4241.00	
Bullnose	3.00			4244.00	47.00 Bottom Packers & Anchor

Total Tool Length: 74.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co, Inc.

14-2s-35w Rawlins,KS

250 N Water Ste 300
Wichita, KS 67202

Kopriva #1-4

Job Ticket: 61373

DST#: 4

ATTN: Rocky Milford

Test Start: 2017.06.15 @ 08:30:00

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: 60.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.39 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1400.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
5.00	Mud 100m (oil spots)	0.025

Total Length: 5.00 ft Total Volume: 0.025 bbl

Num Fluid Samples: 0

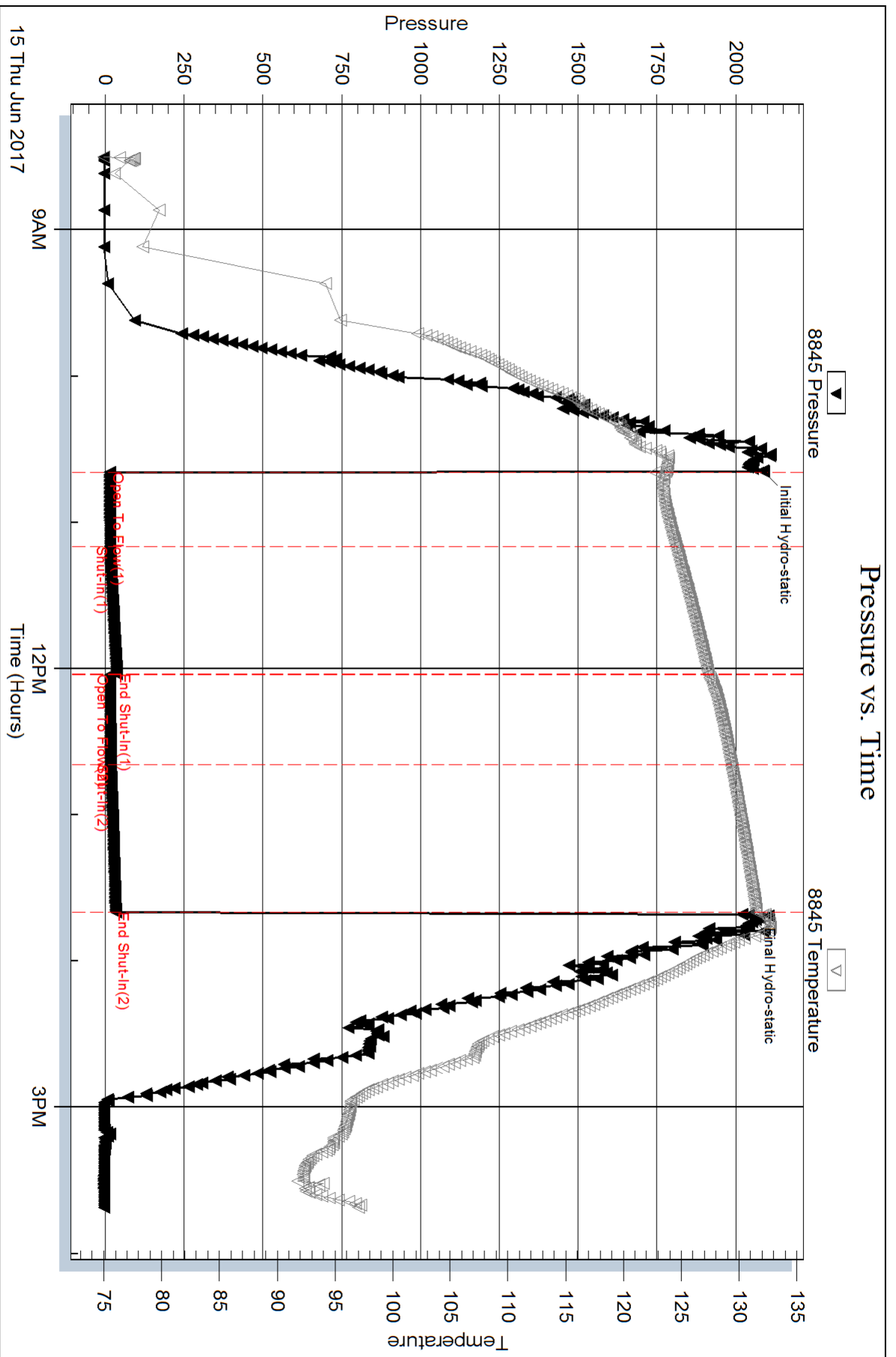
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:



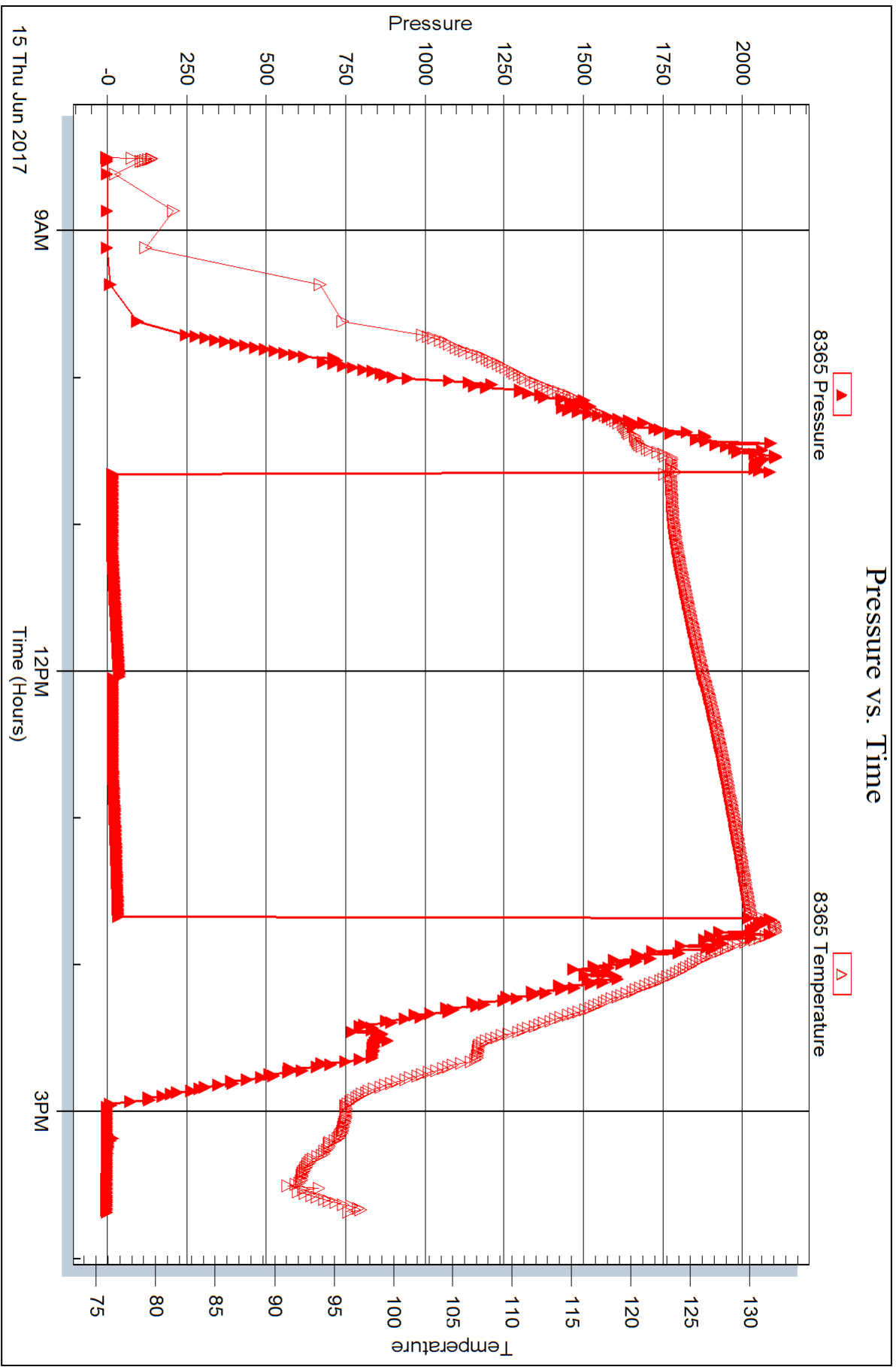
Serial #: 8365

Inside

Murfin Drilling Co, Inc.

Kopriva#1-4

DST Test Number: 4



Triobite Testing, Inc

Ref. No: 61373

Printed: 2017.06.20 @ 10:34:32



DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co, Inc.**

250 N Water Ste 300
Wichita, KS 67202

ATTN: Rocky Milford

Kopriva #1-4

14-2s-35w Rawlins,KS

Start Date: 2017.06.16 @ 01:36:00

End Date: 2017.06.16 @ 10:30:15

Job Ticket #: 61374 DST #: 5

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

Printed: 2017.06.20 @ 10:34:03



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co, Inc.
 250 N Water Ste 300
 Wichita, KS 67202
 ATTN: Rocky Milford

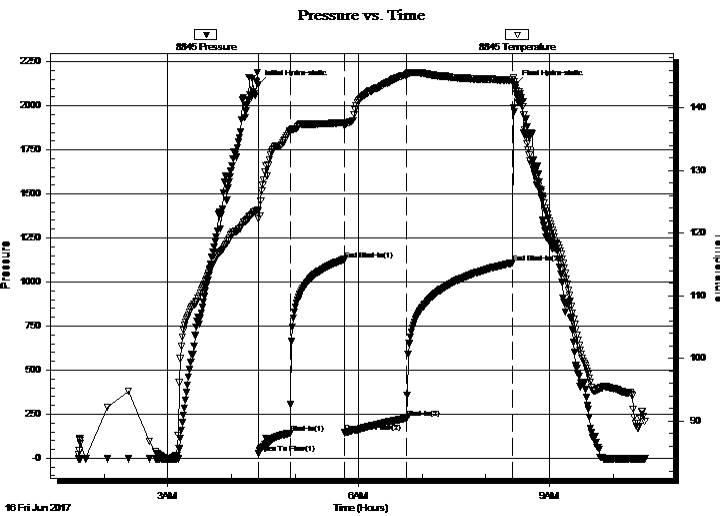
14-2s-35w Rawlins,KS
Kopriva #1-4
 Job Ticket: 61374 **DST#: 5**
 Test Start: 2017.06.16 @ 01:36:00

GENERAL INFORMATION:

Formation: **LKC Lwr G - H**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 04:25:45
 Time Test Ended: 10:30:15
 Interval: **4243.00 ft (KB) To 4292.00 ft (KB) (TVD)**
 Total Depth: 4292.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Good
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Bradley Walter
 Unit No: 78
 Reference Elevations: 3201.00 ft (KB)
 3196.00 ft (CF)
 KB to GR/CF: 5.00 ft

Serial #: 8845 Outside
 Press@RunDepth: 227.40 psig @ 4244.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2017.06.16 End Date: 2017.06.16 Last Calib.: 2017.06.16
 Start Time: 01:36:05 End Time: 10:30:15 Time On Btm: 2017.06.16 @ 04:25:30
 Time Off Btm: 2017.06.16 @ 08:27:30

TEST COMMENT: IF: BOB @ 21 min.
 IS: No return.
 FF: BOB @ 33 min.
 FS: No return.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2120.09	123.58	Initial Hydro-static
1	25.11	122.26	Open To Flow (1)
30	142.12	136.29	Shut-In(1)
81	1128.10	137.65	End Shut-In(1)
82	145.07	137.14	Open To Flow (2)
140	227.40	145.22	Shut-In(2)
240	1108.54	144.42	End Shut-In(2)
242	2119.40	143.76	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
20.00	sow cm 1o 20w 79m (oil puddle top)	0.10
620.00	mcw 20m 80w (oil spots)	7.01

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co, Inc.

14-2s-35w Rawlins,KS

250 N Water Ste 300
Wichita, KS 67202

Kopriva #1-4

Job Ticket: 61374

DST#: 5

ATTN: Rocky Milford

Test Start: 2017.06.16 @ 01:36:00

Tool Information

Drill Pipe:	Length: 4023.00 ft	Diameter: 3.80 inches	Volume: 56.43 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: 205.00 ft	Diameter: 2.25 inches	Volume: 1.01 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 57.44 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	12.00 ft			String Weight: Initial 64000.00 lb
Depth to Top Packer:	4243.00 ft			Final 66000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	49.00 ft			
Tool Length:	76.00 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			4217.00	
Shut In Tool	5.00			4222.00	
Hydraulic tool	5.00			4227.00	
Jars	5.00			4232.00	
Safety Joint	2.00			4234.00	
Packer	5.00			4239.00	27.00 Bottom Of Top Packer
Packer	4.00			4243.00	
Stubb	1.00			4244.00	
Recorder	0.00	8365	Inside	4244.00	
Recorder	0.00	8845	Outside	4244.00	
Perforations	12.00			4256.00	
Change Over Sub	1.00			4257.00	
Drill Pipe	31.00			4288.00	
Change Over Sub	1.00			4289.00	
Bullnose	3.00			4292.00	49.00 Bottom Packers & Anchor

Total Tool Length: 76.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co, Inc.

14-2s-35w Rawlins,KS

250 N Water Ste 300
Wichita, KS 67202

Kopriva #1-4

Job Ticket: 61374

DST#: 5

ATTN: Rocky Milford

Test Start: 2017.06.16 @ 01:36:00

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:

24000 ppm

Viscosity: 75.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.39 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1400.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
20.00	sow cm 1o 20w 79m (oil puddle top)	0.098
620.00	mcw 20m 80w (oil spots)	7.012

Total Length: 640.00 ft Total Volume: 7.110 bbl

Num Fluid Samples: 0

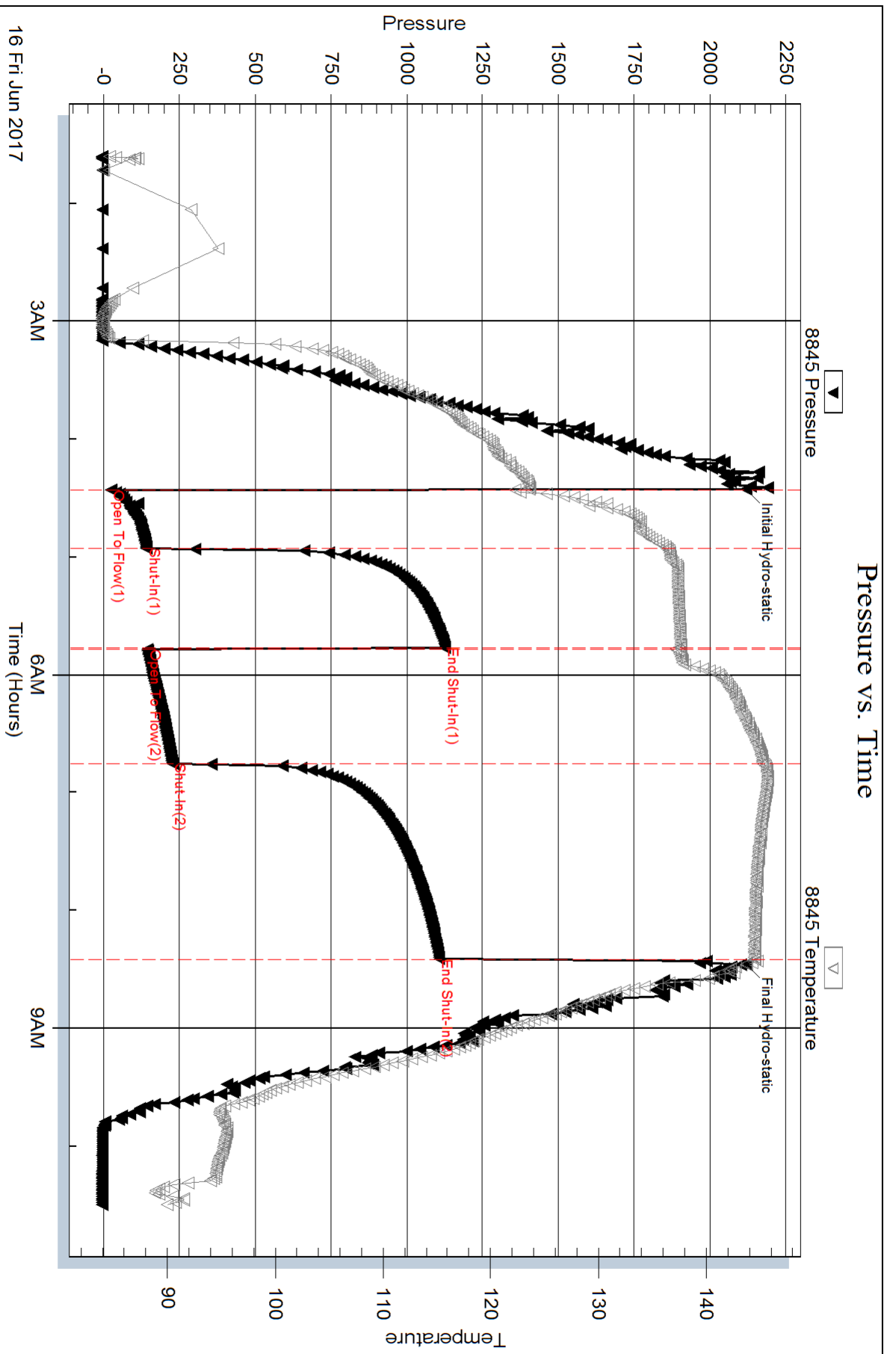
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: rw is .255 @ 77F = 24000ppm



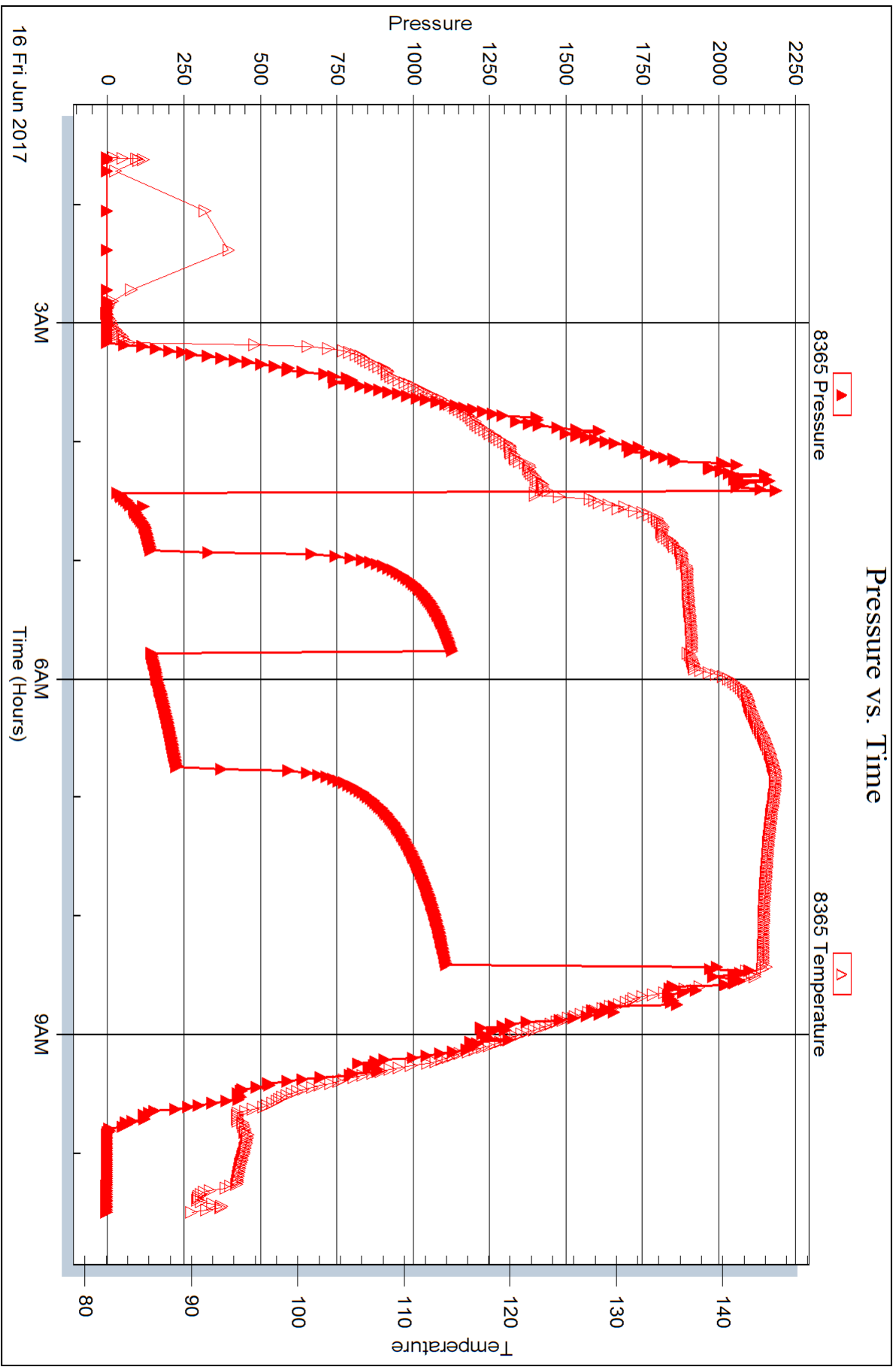
Serial #: 8365

Inside

Murfin Drilling Co, Inc.

Kopriva#1-4

DST Test Number: 5





DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co, Inc.**

250 N Water Ste 300
Wichita, KS 67202

ATTN: Rocky Milford

Kopriva #1-4

14-2s-35w Rawlins,KS

Start Date: 2017.06.16 @ 19:50:00

End Date: 2017.06.17 @ 03:41:30

Job Ticket #: 61375 DST #: 6

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

Printed: 2017.06.20 @ 10:31:27



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Murfin Drilling Co, Inc.

14-2s-35w Rawlins,KS

250 N Water Ste 300
Wichita, KS 67202

Kopriva #1-4

Job Ticket: 61375

DST#: 6

ATTN: Rocky Milford

Test Start: 2017.06.16 @ 19:50:00

GENERAL INFORMATION:

Formation: **LKC J**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 22:23:30
 Time Test Ended: 03:41:30
 Interval: **4291.00 ft (KB) To 4340.00 ft (KB) (TVD)**
 Total Depth: 4340.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Good
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Bradley Walter
 Unit No: 78
 Reference Elevations: 3201.00 ft (KB)
 3196.00 ft (CF)
 KB to GR/CF: 5.00 ft

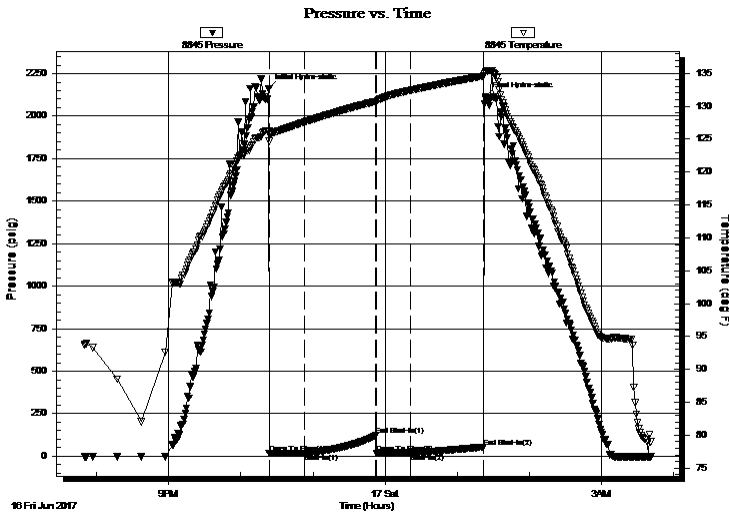
Serial #: 8845

Outside

Press@RunDepth: 19.51 psig @ 4292.00 ft (KB)
 Start Date: 2017.06.16 End Date: 2017.06.17
 Start Time: 19:50:05 End Time: 03:41:29
 Capacity: 8000.00 psig
 Last Calib.: 2017.06.17
 Time On Btm: 2017.06.16 @ 22:23:15
 Time Off Btm: 2017.06.17 @ 01:23:15

TEST COMMENT: IF: 1/4" blow , receded to surface.
 IS: No return.
 FF: No blow .
 FS: No return.

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2161.30	126.26	Initial Hydro-static
1	16.19	124.71	Open To Flow (1)
30	17.93	127.59	Shut-In(1)
89	120.80	130.74	End Shut-In(1)
90	19.03	130.75	Open To Flow (2)
118	19.51	132.42	Shut-In(2)
179	54.39	134.57	End Shut-In(2)
180	2112.98	135.12	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
5.00	ocm 2o 98m	0.02

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co, Inc.

14-2s-35w Rawlins,KS

250 N Water Ste 300
Wichita, KS 67202

Kopriva #1-4

Job Ticket: 61375

DST#: 6

ATTN: Rocky Milford

Test Start: 2017.06.16 @ 19:50:00

Tool Information

Drill Pipe:	Length: 4086.00 ft	Diameter: 3.80 inches	Volume: 57.32 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: 205.00 ft	Diameter: 2.25 inches	Volume: 1.01 bbl	Weight to Pull Loose:	80000.00 lb
			<u>Total Volume: 58.33 bbl</u>	Tool Chased	1.00 ft
Drill Pipe Above KB:	27.00 ft			String Weight: Initial	66000.00 lb
Depth to Top Packer:	4291.00 ft			Final	66000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	49.00 ft				
Tool Length:	76.00 ft				
Number of Packers:	2	Diameter: 6.75 inches			
Tool Comments:					

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	
Jars	5.00			4280.00	
Safety Joint	2.00			4282.00	
Packer	5.00			4287.00	27.00 Bottom Of Top Packer
Packer	4.00			4291.00	
Stubb	1.00			4292.00	
Recorder	0.00	8365	Inside	4292.00	
Recorder	0.00	8845	Outside	4292.00	
Perforations	12.00			4304.00	
Change Over Sub	1.00			4305.00	
Drill Pipe	31.00			4336.00	
Change Over Sub	1.00			4337.00	
Bullnose	3.00			4340.00	49.00 Bottom Packers & Anchor

Total Tool Length: 76.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co, Inc.

14-2s-35w Rawlins,KS

250 N Water Ste 300
Wichita, KS 67202

Kopriva #1-4

Job Ticket: 61375

DST#: 6

ATTN: Rocky Milford

Test Start: 2017.06.16 @ 19:50:00

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: 75.00 sec/qt

Cushion Volume:

bbf

Water Loss: 5.59 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1800.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbf
5.00	ocm 2o 98m	0.025

Total Length: 5.00 ft Total Volume: 0.025 bbf

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

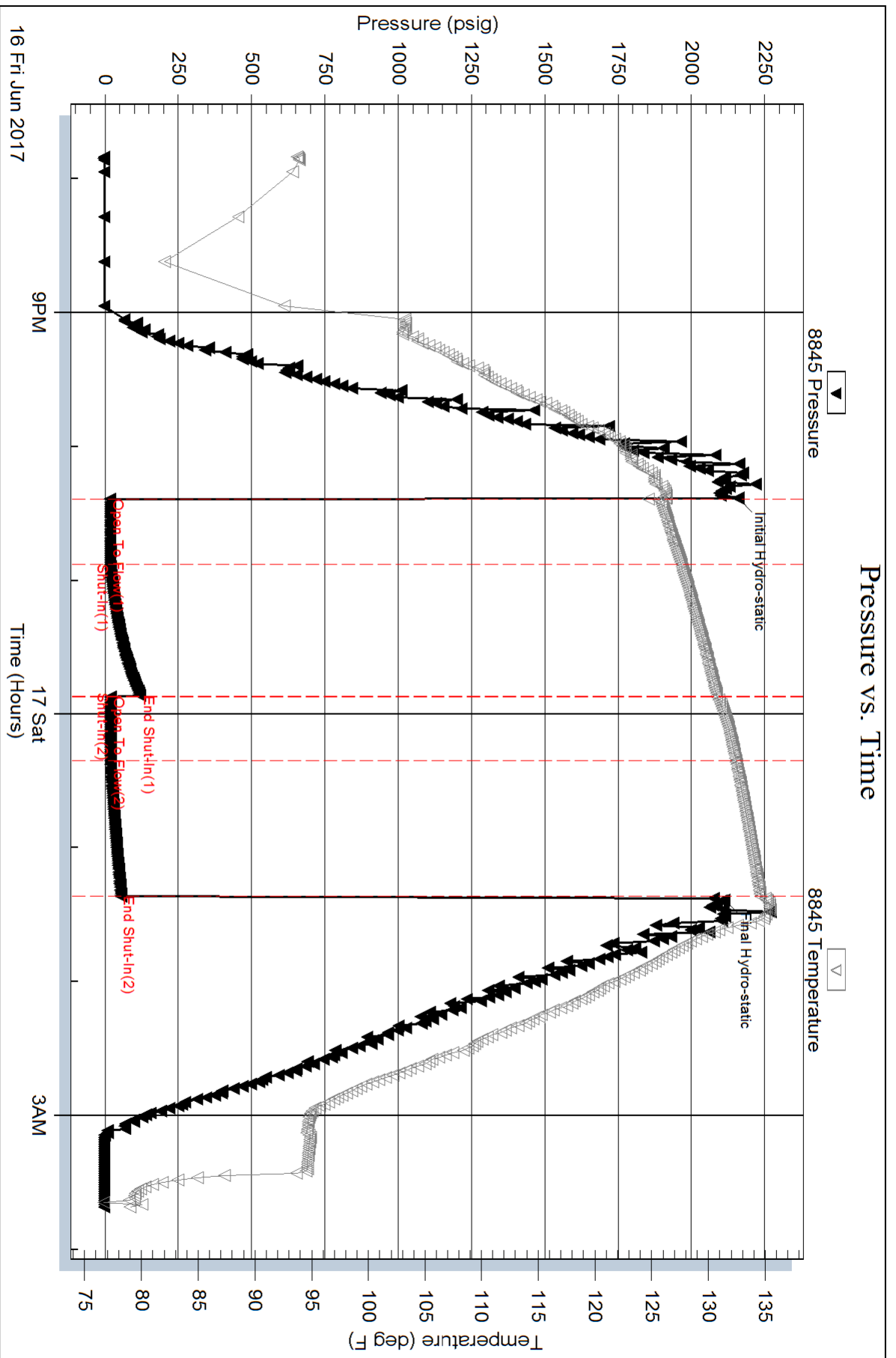
Recovery Comments:

Serial #: 8845

Outside Murfin Drilling Co, Inc.

Kopriva#1-4

DST Test Number: 6



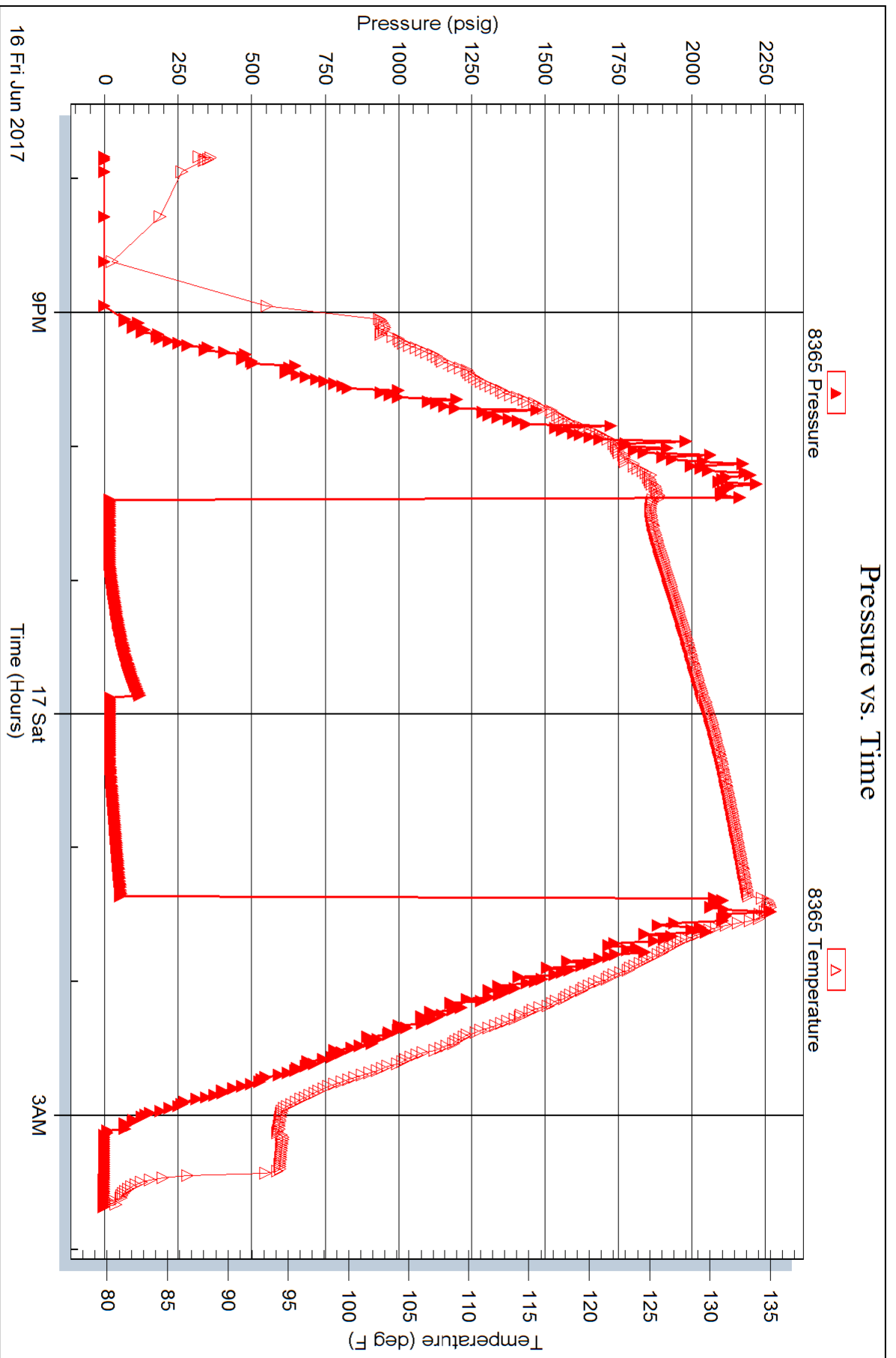
Serial #: 8365

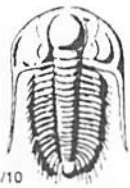
Inside

Murfin Drilling Co, Inc.

Kopriva#1-4

DST Test Number: 6





TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 61370

Well Name & No. Kopriva F1-14 Test No. 1 Date 6/13/2017
 Company Morton Drilling Co, Inc Elevation 3703 / KB 6/13/2017
 Address 250 N Water Ste 300 Wichita, KS 67202 4057 3196
 Co. Rep / Geo. Rocky McFord Rig Morton 24
 Location: Sec. 14 Twp. 2 S Rge. 35 W Co. Rawlins State Ks

Interval Tested 3993 Zone Tested Oread
 Anchor Length 4057 Drill Pipe Run 3777 Mud Wt. 8.8
 Top Packer Depth 3988 Drill Collars Run 205 Vis 62
 Bottom Packer Depth 3993 Wt. Pipe Run 0 WL 6.8
 Total Depth 4057 Chlorides 800 ppm System LCM 4 #

Blow Description IF Surface blow.
ISI No return.
FF No blow
PSI No return.

Rec	Feet of	%gas	%oil	%water	%mud
<u>5</u>	<u>MOO</u>			<u>400</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 5 BHT 128 Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic <u>1938</u>	<input checked="" type="checkbox"/> Test <u>1150</u>	T-On Location <u>2315 6/12</u>
(B) First Initial Flow <u>15</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>0010</u>
(C) First Final Flow <u>17</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>0259</u>
(D) Initial Shut-In <u>65</u>	<input checked="" type="checkbox"/> Circ Sub <u>NC</u>	T-Pulled <u>0557</u>
(E) Second Initial Flow <u>17</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>0758</u>
(F) Second Final Flow <u>18</u>	<input checked="" type="checkbox"/> Mileage <u>134rt 100.50</u>	Comments
(G) Final Shut-In <u>35</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>1900</u>	<input type="checkbox"/> Straddle	

Initial Open <u>30</u>	<input checked="" type="checkbox"/> Shale Packer <u>250</u>	<input type="checkbox"/> Ruined Shale Packer
Initial Shut-In <u>60</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Ruined Packer
Final Flow <u>30</u>	<input type="checkbox"/> Extra Recorder	<input type="checkbox"/> Extra Copies
Final Shut-In <u>60</u>	<input type="checkbox"/> Day Standby	Sub Total <u>0</u>
	<input type="checkbox"/> Accessibility	Total <u>1825.50</u>
	Sub Total <u>1825.50</u>	MP/DST Disc't

Approved By _____ Our Representative [Signature]

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 61371

Well Name & No. Kopriva # 1-14 Test No. 2 Date 6/14/2017
 Company Martin Drilling Co, Inc Elevation 3201 KB 3196 GL
 Address 250 N Water Ste 300 Wichita, KS 67202
 Co. Rep / Geo. Rocky Milford Rig Martin 24
 Location: Sec. 14 Twp. 2S Rge. 35W Co. Rawlins State Ks

Interval Tested 4074 - 4148 Zone Tested LKC A
 Anchor Length 74 Drill Pipe Run 4370 Mud Wt. 8.9
 Top Packer Depth 4069 Drill Collars Run 205 Vis 56
 Bottom Packer Depth 4074 Wt. Pipe Run 0 WL 6.4
 Total Depth 4148 Chlorides 800 ppm System LCM 5#

Blow Description IF: 3 1/2" blow after bleedoff, tool slid 10' took on some mud
ISF: No return.
FF: 9 1/2" blow
FST: 1/2" return. dial @ 60 min.

Rec	Feet of	%gas	%oil	%water	%mud
<u>60</u>	<u>OIL</u>		<u>100</u>		
<u>100</u>	<u>60cm</u>	<u>10</u>	<u>40</u>		<u>50</u>
<u>120</u>	<u>60cm</u>	<u>10</u>	<u>30</u>		<u>60</u>
	<u>140' GIP</u>				

Rec Total 280 BHT 134 Gravity 82.1 API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic <u>1994</u>	<input checked="" type="checkbox"/> Test <u>1150</u>	T-On Location <u>1408</u>
(B) First Initial Flow <u>73</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>1946</u>
(C) First Final Flow <u>111</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>2203</u>
(D) Initial Shut-In <u>1157</u>	<input checked="" type="checkbox"/> Circ Sub <u>NC</u>	T-Pulled <u>0203 6/14</u>
(E) Second Initial Flow <u>119</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>0447</u>
(F) Second Final Flow <u>144</u>	<input checked="" type="checkbox"/> Mileage <u>100.50</u>	Comments
(G) Final Shut-In <u>1129</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>1949</u>	<input type="checkbox"/> Straddle	

Initial Open <u>30</u>	<input type="checkbox"/> Shale Packer <u>NO</u>	<input type="checkbox"/> Ruined Shale Packer
Initial Shut-In <u>60</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Ruined Packer
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>1575.50</u>
	<input type="checkbox"/> Accessibility	MP/DST Disc't
	Sub Total <u>1575.50</u>	

Approved By _____ Our Representative [Signature]

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. **61372**

4/10

Well Name & No. Kopriva #1-14 Test No. 3 Date 6/14/2017
 Company Martin Drilling Co, Inc Elevation 3201 KB 3196 GL
 Address 250 N Water Ste 300 Wichita, Ks 67202
 Co. Rep / Geo. Rocky Milford Rig MuAer 24
 Location: Sec. 14 Twp. 2S Rge. 35W Co. Rawlins State Ks

Interval Tested 4144 - 4200 Zone Tested LKs Asd - D
 Anchor Length 56 Drill Pipe Run 3933 Mud Wt. 9.0
 Top Packer Depth 4139 Drill Collars Run 205 Vis 58
 Bottom Packer Depth 4144 Wt. Pipe Run 8 WL 5# 6.0
 Total Depth 4200 Chlorides 900 ppm System LCM 5#
 Blow Description IF BOB @ 16 min Slid 8' mud fell 1'
ISS No return.
FF BOB @ 31 min.
FSI No return.

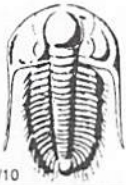
Rec	Feet of	%gas	%oil	%water	%mud
<u>590</u>	<u>mcw</u>			<u>85</u>	<u>15</u>
	<u>Oil spots</u>				

Rec Total 590 BHT 143 Gravity — API RW 1211 @ 80 °F Chlorides 28,000 ppm

(A) Initial Hydrostatic <u>2146</u>	<input checked="" type="checkbox"/> Test <u>1150</u>	T-On Location <u>1338</u>
(B) First Initial Flow <u>25</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>1426</u>
(C) First Final Flow <u>157</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>1608</u>
(D) Initial Shut-In <u>1119</u>	<input checked="" type="checkbox"/> Circ Sub <u>MC</u>	T-Pulled <u>2008</u>
(E) Second Initial Flow <u>160</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>2230</u>
(F) Second Final Flow <u>302</u>	<input checked="" type="checkbox"/> Mileage <u>100.50</u>	Comments
(G) Final Shut-In <u>1109</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>2041</u>	<input type="checkbox"/> Straddle	
	<input type="checkbox"/> Shale Packer	
Initial Open <u>30</u>	<input type="checkbox"/> Extra Packer	
Initial Shut-In <u>60</u>	<input type="checkbox"/> Extra Recorder	
Final Flow <u>60</u>	<input type="checkbox"/> Day Standby	Sub Total <u>0</u>
Final Shut-In <u>90</u>	<input type="checkbox"/> Accessibility	Total <u>1575.50</u>
	Sub Total <u>1575.50</u>	MP/DST Disc't

Approved By _____ Our Representative [Signature]

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. **61373**

Well Name & No. Kopriva #1-14 Test No. 4 Date 6/15/2016
 Company Martin Drilling Co, Inc Elevation 3201 KB 316 GL
 Address 250 N Water Ste 300 Wichita, ks 67202
 Co. Rep / Geo. Roddy Milford Rig Martin 24
 Location: Sec. 14 Twp. 2S Rge. 35W Co. Rawlins State KS

Interval Tested 4197 - 4244 Zone Tested LKC Dpme - upper G
 Anchor Length 47 Drill Pipe Run 3990 Mud Wt. 9.0
 Top Packer Depth 4192 Drill Collars Run 205 Vis 60
 Bottom Packer Depth 4197 Wt. Pipe Run 0 WL 6.4
 Total Depth 4244 Chlorides 1400 ppm System LCM 4#
 Blow Description IF 1/4" blow needed to surface,
ISI No return,
FF No blow,
FEI No return.

Rec	Feet of	%gas	%oil	%water	%mud
<u>5</u>	<u>MUD</u>			<u>100</u>	
	<u>OIL SPOTS</u>				

Rec Total 5 BHT 132 Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic <u>2090</u>	<input checked="" type="checkbox"/> Test <u>1150</u>	T-On Location <u>0735</u>
(B) First Initial Flow <u>15</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>0830</u>
(C) First Final Flow <u>16</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>1041</u>
(D) Initial Shut-In <u>37</u>	<input checked="" type="checkbox"/> Circ Sub <u>etc</u>	T-Pulled <u>1247</u>
(E) Second Initial Flow <u>17</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>1541</u>
(F) Second Final Flow <u>18</u>	<input checked="" type="checkbox"/> Mileage <u>100.50</u>	Comments
(G) Final Shut-In <u>34</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>2041</u>	<input checked="" type="checkbox"/> Straddle <u>used</u>	
	<input type="checkbox"/> Shale Packer <u>250</u>	<input type="checkbox"/> Ruined Shale Packer
Initial Open <u>20</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Ruined Packer
Initial Shut-In <u>00</u>	<input type="checkbox"/> Extra Recorder	<input type="checkbox"/> Extra Copies
Final Flow <u>30</u>	<input type="checkbox"/> Day Standby	Sub Total <u>0</u>
Final Shut-In <u>60</u>	<input type="checkbox"/> Accessibility	Total <u>1825.50</u>
	Sub Total <u>1825.50</u>	MP/DST Disc't

Approved By _____ Our Representative 

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 61374

Well Name & No. Kopnva # 1-14 Test No. 5 Date 6/16/2017
 Company Martin Drilling Co, Inc Elevation 3201 KB 3196 GL
 Address 250 N water Ste 300 Wichita, KS 67202
 Co. Rep / Geo. Rodney Milford Rig Martin 24
 Location: Sec. 14 Twp. 2S Rge. 35W Co. Rawlins State KS

Interval Tested 4243-4292 Zone Tested LRC LUG-H
 Anchor Length 49 Drill Pipe Run 4025 Mud Wt. 8.9
 Top Packer Depth 4238 Drill Collars Run 205 Vis 7.5
 Bottom Packer Depth 4243 Wt. Pipe Run 0 WL 6.4
 Total Depth 4292 Chlorides 1400 ppm System LCM 5#

Blow Description IF 303 @ 21 min
ISI No return.
FF 303 @ 33 min
FSI No return.

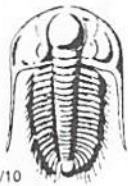
Rec	Feet of	%gas	%oil	%water	%mud
<u>20</u>	<u>50WCM</u>		<u>1</u>	<u>20</u>	<u>79</u>
<u>620</u>	<u>MCM OIL SPOTS</u>			<u>80</u>	<u>20</u>

Rec Total 640 BHT 144 Gravity — API RW 1255 @ 77 °F Chlorides 24,000 ppm

(A) Initial Hydrostatic <u>2120</u>	<input checked="" type="checkbox"/> Test <u>1150</u>	T-On Location <u>0045</u>
(B) First Initial Flow <u>25</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>0137</u>
(C) First Final Flow <u>142</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>0424</u>
(D) Initial Shut-In <u>1128</u>	<input checked="" type="checkbox"/> Circ Sub <u>NC</u>	T-Pulled <u>0824</u>
(E) Second Initial Flow <u>145</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>1030</u>
(F) Second Final Flow <u>227</u>	<input checked="" type="checkbox"/> Mileage <u>100.50</u>	Comments
(G) Final Shut-In <u>1109</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>2119</u>	<input type="checkbox"/> Straddle	
	<input checked="" type="checkbox"/> Shale Packer <u>250</u>	<input type="checkbox"/> Ruined Shale Packer
Initial Open <u>30</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Ruined Packer
Initial Shut-In <u>60</u>	<input type="checkbox"/> Extra Recorder	<input type="checkbox"/> Extra Copies
Final Flow <u>60</u>	<input type="checkbox"/> Day Standby	Sub Total <u>0</u>
Final Shut-In <u>90</u>	<input type="checkbox"/> Accessibility	Total <u>1825.50</u>
	Sub Total <u>1825.50</u>	MP/DST Disc't

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 61375

Well Name & No. Kopriva # 1-14 Test No. 6 Date 6/16/2017
 Company Murfin Drilling Co, Inc Elevation 3201 KB 3196 GL
 Address 250 N Water Ste 300 Wichita, ks 67202
 Co. Rep / Geo. Rocky Milford Rig Murfin 24
 Location: Sec. 14 Twp. 2s Rge. 35 w Co. Rawlins State KS

Interval Tested 4291 - 4340 Zone Tested LKC J
 Anchor Length 49' Drill Pipe Run 4086 Mud Wt. 9.0
 Top Packer Depth 4286 Drill Collars Run 205 Vis 75
 Bottom Packer Depth 4340 Wt. Pipe Run Ø WL 5.6
 Total Depth 4340 Chlorides 1800 ppm System LCM 5#

Blow Description IF: ~~Su~~ 1/4" blow receded to surface.
ISF: No return.
FF: No blow
FSI: No return.

Rec	Feet of	%gas	%oil	%water	%mud
<u>5</u>	<u>OCM</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 5 BHT 135 Gravity — API RW — @ —° F Chlorides — ppm

(A) Initial Hydrostatic 2161 Test 1150 T-On Location 1900
 (B) First Initial Flow 16 Jars 250 T-Started 1950
 (C) First Final Flow 18 Safety Joint 75 T-Open 2224
 (D) Initial Shut-In 121 Circ Sub 4/4 T-Pulled 0124
 (E) Second Initial Flow 19 Hourly Standby — T-Out 0342
 (F) Second Final Flow 20 35 Mileage 201 Comments Loaded tools
 (G) Final Shut-In 54 Sampler — 1230 6/16
 (H) Final Hydrostatic 2113 Straddle — Ruined Shale Packer —

Initial Open 36 Shale Packer 250 Ruined Packer —
 Initial Shut-In 60 Extra Packer — Extra Copies —
 Final Flow 30 Extra Recorder — Sub Total 0
 Final Shut-In 60 Day Standby — Total 1926
 Accessibility — MP/DST Disc't —
 Sub Total 1926

Approved By _____ Our Representative [Signature]

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Robert L. Milford

PETROLEUM GEOLOGIST

Wichita, Kansas

GEOLOGISTS' REPORT

DRILLING TIME AND SAMPLE LOG

OPERATOR **Murfin Drilling Company, Inc.**

LEASE **Kopriva #1-14**

LOC SPOT **C E2 NW**

LOC FOOTAGE **1,320' FNL 1,980' FWL**

SEC. **14** TWP **25** RANG **35W**

COUNTY **Rawlins** STATE **Kansas**

API **15-153-21191-00-00**

CONTRACTOR **Murfin Drilling Co., Inc.** REG NO. **24**

DRILLING STARTED **6/2/07** COMPLETED **6/18/2007**

MUD/FLUID **3/595** MUD TYPE **Chemical**

DRILLING TIME KEPT FROM **3/51** TO **RTD**

SAMPLES SAVED FROM **3,800'** TO **RTD**

SAMPLES EXAMINED FROM **3,800'** TO **RTD**

GEOLOGICAL SUPERVISION FROM **3,800'** TO **RTD**

CONDUCTOR **8.5/8" @ 253'**

Production **5.1/21" @ 4847'**

Production **4/50 sec/cement**

ELECTRICAL SURVES:

Power Wires: **to RTD**

Diagn Induction Log **to RTD**

Diagn Compensated **to RTD**

MEASUREMENTS FROM **to RTD**

CASINO RECORD

ELEVATIONS

KB **3,201'**

GL **3,196'**

FORMATIONS

NAME TOP DATUM TOP DATE TIME

Stone Corral 3,043' +158' no pick on D.T.

Topoka 4,032' -720' 3,923' -722'

Oread 4,032' -831' 4,034' -833'

Loring 4,122' -921' 4,124' -923'

Stark 4,338' -1137' 4,339' -1138'

Mound City 4,385' -1184' 4,386' -1185'

Fort Scott 4,506' -1305' 4,507' -1306'

Oakley 4,584' -1383' 4,585' -1384'

Mississippian 4,766' -1565' 4,767' -1566'

Total Depth 4,855' -1654'

FORMATION TOPS

Parosity Log

Microresistivity Log

Borehole Compensated

Some Log

14

DATE 7:00 AM DEPTH REMARKS

6-9-17 0' Spud @ 1:30 pm. Plug down @ 8:00 pm. Drilled out plug @ 4:00 am on 6-10-17 w/ PDC bit

6-10-17 536' Cut 536' in last 24 hrs.

6-11-17 2,805' Cut 2,269' in last 24 hrs; 21.25 hrs drlg. Bit trip @ 3751' (ran button bit)

6-12-17 3,795' Cut 990' in last 24 hrs; 13.5 hrs drlg. DST #1 @ 4057'

6-13-17 4,057' Cut 262' in last 24 hrs; 11.25 hrs drlg. DST #2 @ 4148'

6-14-17 4,148' Cut 91' in last 24 hrs; 5.75 hrs drlg. DST #3 @ 4200'

6-15-17 4,244' Cut 96' in last 24 hrs; 7.5 hrs drlg. DST #4 @ 4244' DST #5 @ 4292'

6-16-17 4,292' Cut 48' in last 24 hrs; 3.75 hrs drlg. DST #6 @ 4340'

6-17-17 4,340' Cut 48' in last 24 hrs; 4 hrs drlg.

6-18-17 4,658' Cut 318' in last 24 hrs; 21 hrs drlg. RTD 4855' @ 6:13 pm

6-19-17 4,855' Cut 197' in last 24 hrs; 10.75 hrs drlg. Ran production casing.

Remarks

The electric log measurements correlate from 1' to 2' higher to the drilling measurements.

Formation tops and lithology on this report have been corrected to the electric log.

The drilling samples were deposited at the Kansas Geological Survey office in Wichita.

Respectfully submitted,

Robert L. Milford

Drill Stem Test Charts

Drill Stem Test by **Trilobite Testing, Inc.**

DST #1

DST #2

DST #3

DST #4

DST #5

DST #6

LITH. 0 DRILL TIME (MIN/FT) 10 DEPTH 3000 SAMPLE DESCRIPTIONS REMARKS

Stone Corral 3043' (+158) EL

B/Stone Corral 3078' (+123) EL

3750

3800

3850

3900

3950

4000

4050

4100

4150

4200

4250

4300

4350

4400

4450

4500

4550

4600

4650

4700

4750

4800

4850

Call depth 3500' @ 2:39 pm on 6-11-17

Bit trip at 3751'. Replaced PDC bit with button bit.

Pipe Strap @ 3751': Strap long 1.96'

Straight Hole Survey @ 3751': 0.25' Dev.

Note: 1' drill time was started with samples at 3800' but I had the driller go back and record the 1' drill time from the bit trip at 3751'

LS: crm-gr, fos in prt, sub chky-prtly dns, pr por, NS

Sh: red-brn (some soft & gummy), some gry & grn

Samples start 3800' @ 7:05 am on 6-12-17

LS: crm-gr w/ some wh, fos-ool in prt, sub chky-prtly dns, pr por, tr blk tarry-asp sptd stn, NSF0, no odor

Sh: red-brn (some soft & gummy) w/ some gry (some soft & gummy)

Sh: red-brn (some soft & gummy), some gry

LS: crm-gr, some shly (red-brn, mottled), sub chky-prtly dns, pr por, NS

Sh: chky-prtly dns, pr por, NS

Stotler 3845' (-644) EL

LS: crm-gr, fos-ool in prt, sub chky-prtly dns, pr w/ tr fr intrprtial por, vry scat blk thick-tarry sptd-sub sat stn, few pcs w/ VSSFO (thick-hvy oil), no odor

LS: crm-gr, fos-ool in prt, sub chky-prtly dns, pr por, tr blk tarry sptd stn, NSF0, no odor

LS: A.A. w/ tr blk thick-tarry sptd-sub sat stn, 1 pc w/ VSSFO, no odor

LS: crm-gr, fos in prt, sub chky-prtly dns w/ some chky, pr por, vry scat blk thick-tarry sptd-sub sat stn, NSF0, no odor

Sh: red-brn

Morgan Mud check @ 3870': 76 Vis, 8.6 Wt, 6.8 WL, 800 ppm Chl, 4# LCM

LS: crm-lt gry, fos in prt, sub chky-prtly dns w/ some chky, pr por, tr blk tarry-asp sptd stn, NSF0, no odor

Sh: red-brn (some silty), some gry-grn

Topeka 3921' (-720) EL

LS: wh-lt gry, fos-ool in prt, some shly (red-brn, mottled), sub chky-prtly dns w/ some chky, pr por, vry scat blk tarry-asp sptd-sub sat stn, NSF0, no odor

LS: wh-crm, fos in prt, sub chky-prtly dns w/ some chky-vry chky, pr por, tr blk tarry-asp sptd stn, NSF0, no odor

Sh: red-brn (some sdy), some gry & grn

Sd: crm-lt gry, fr-vry fr grain, calc, semi fri, pr vis por, vry scat blk asphalt speckled stn, NSF0, no odor, w/ small amt of Sdy Sh: lt grn

Sh: red-brn (some sdy), some gry & grn

LS: crm-tan, sli fos, sub chky-prtly dns w/ some chky, pr por, tr blk tarry-asp sptd stn, NSF0, no odor

LS: gry-tan, sli shly & Calc Sh: lt gry-lt maroon

A.A. w/ some Calc Sh

Sh: gry w/ some red-brn

DST #1

LS: crm, fos-ool in prt, sub chky-prtly dns, pr w/ tr fr intrprtial por, gd amt blk w/ some brn patchy-sub sat w/ tr sat stn, VSSFO, no odor

LS: crm, sli fos, sli chty (tan), sub chky-prtly dns w/ some chky, pr por, NS

Morgan Mud check @ 3870': 76 Vis, 8.6 Wt, 6.8 WL, 800 ppm Chl, 4# LCM

LS: brn, some sli shly, prtly dns-sli gritty, pr por, NS

Sh: Blk Carb w/ drk gry

Heebner 4076' (-875) EL

LS: tan-brn, sli fos, mstly prtly dns, pr por, NS

LS: crm-lt gry, fr-vry fr grain, calc, sli pyr, semi fri-brittle, pr vis por, NSF0, some yell flour, sli-fr cut, no odor

Sh: red-brn, gry & brn, intermixed w/ some Shly Sd-Sdy Sh: lt gry, pyritic, pr por, NS

Sh: red-brn & gry, small amt grn

DST #2

LS: crm-tan, ool-fos in prt, sub chky-prtly dns w/ some dns, pr-fr w/ some gd intrprtial & moldic-vug por, fr amt drk w/ some med brn patchy-sub sat stn, NSF0 (some thk-hvy), no odor

LS: crm-tan, sli fos, sub chky-prtly dns w/ some chky, pr fos por, vry scat blk tarry-asp sptd-sub sat stn, NSF0, no odor

Sh: gry & grn, w/ cpl pcs Sdy Sh: lt grn

Sd: crm-lt gry, fr-vry fr grain, calc, some shly, soft-brITTLE, pr vis por, gd amt lt-vry lt w/ tr med brn sub sat stn, FSFO (mstly pin point-small beads, some lrg thk-hvy), no odor

Sh: red-brn, some gry-grn

Morgan Mud check @ 4062': 56 Vis, 8.9 Wt, 6.4 WL, 900 ppm Chl, 5# LCM

LS: crm-tan, sli fos, sli chty (tan), sub chky-prtly dns w/ some chky, pr por, NS

LS: A.A. w/ incrs tan, tr fos, pr por, NS

Heebner 4076' (-875) EL

LS: brn, some sli shly, prtly dns-sli gritty, pr por, NS

Sh: Blk Carb & drk gry

DST #2

LS: tan-brn, sli fos, mstly prtly dns, pr por, NS

LS: crm-lt gry, fr-vry fr grain, calc, sli pyr, semi fri-brittle, pr vis por, NSF0, some yell flour, sli-fr cut, no odor

Sh: red-brn, gry & brn, intermixed w/ some Shly Sd-Sdy Sh: lt gry, pyritic, pr por, NS

Sh: red-brn & gry, small amt grn

DST #2

LS: crm-tan, ool-fos in prt, sub chky-prtly dns w/ some dns, pr-fr w/ some gd intrprtial & moldic-vug por, fr amt drk w/ some med brn patchy-sub sat stn, NSF0 (some thk-hvy), no odor

LS: crm-tan, sli fos, sub chky-prtly dns w/ some chky, pr fos por, vry scat blk tarry-asp sptd-sub sat stn, NSF0, no odor

Sh: gry & grn, w/ cpl pcs Sdy Sh: lt grn

Sd: crm-lt gry, fr-vry fr grain, calc, some shly, soft-brITTLE, pr vis por, gd amt lt-vry lt w/ tr med brn sub sat stn, FSFO (mstly pin point-small beads, some lrg thk-hvy), no odor

Sh: red-brn, some gry-grn

Morgan Mud check @ 4062': 56 Vis, 8.9 Wt, 6.4 WL, 900 ppm Chl, 5# LCM

LS: crm-lt gry, fos in prt, sli pyr, sub chky-prtly dns, pr-fr w/ some gd fos-vug por, scat lt-drk brn patchy-sub sat w/ tr sat stn, S-FSFO, no odor (some thk-hvy), no odor

Sh: lt gry-grn (some soft & gummy)

DST #3

LS: crm, fos in prt, sub chky-prtly dns, pr fos por, scat lt-drk brn patchy-sub sat stn, SSFO, no odor

Sh: red-brn (some soft & gummy), some gry-grn

Morgan Mud check @ 4292': 60 Vis, 9.0 Wt, 5.6 WL, 1,800 ppm Chl, 5# LCM (11:25 am, TIH after DST #5)

LS: crm-lt gry, fos in prt, sub chky-prtly dns, pr w/ some fr fos por, scat lt-drk brn patchy-sub sat stn, S-FSFO, no odor

Sh: red-brn, some gry-grn

DST #4

LS: crm-lt gry, fos in prt, sub chky-prtly dns, pr w/ some fr fos por, scat lt-drk brn patchy-sub sat w/ some sub chky, pr por, NS

Sh: med-drk w/ some lt gry

LS: tan-brn & red, prtly dns, pr por, NS

Sh: gry-grn & gry, some grn

Morgan Mud check @ 4292': 60 Vis, 9.0 Wt, 5.6 WL, 1,800 ppm Chl, 5# LCM (11:25 am, TIH after DST #5)

LS: crm, fos in prt, sub chky-prtly dns w/ some chky, pr fr fos por, scat lt-drk brn patchy-sub sat w/ some sub chky, pr por, NS

Sh: red-brn (some calc) & gry (some calc)

DST #4

LS: crm, fos in prt, sub chky-prtly dns, pr por, NS

Sh: red-brn (some soft & gummy), some gry, tr grn

Morgan Mud check @ 4244': 60 Vis, 9.0 Wt, 6.0 WL, 1,400 ppm Chl, 4# LCM (10:50 am, during IFP on DST #4)

LS: crm-lt gry, fos in prt, some shly (red-brn, mottled), sub chky-prtly dns, pr por, NS

LS: A.A. w/ some tan, fos, prtly dns, NS

Sh: red-brn, some gry-grn

LS: crm-tan, fos in prt, sub chky-prtly dns, pr por, NS

Sh: red-brn (some soft & gummy), some gry, tr grn

Morgan Mud check @ 4244': 1" Dev.

LS: crm-lt gry, fxln, fos in prt, sub chky-prtly dns w/ some chky, pr por, NS

LS: gry-tan, fos, prtly dns, pr por, NS

Sh: red-brn, some grn & gry

Stark 4338' (-1137) EL

LS: crm-tan, fos in prt, some shly (red-brn, mottled), sub chky-prtly dns, pr por, NS

LS: A.A. w/ some tan, fos, prtly dns, NS

Sh: red-brn (some soft & gummy), some gry, tr grn

Morgan Mud check @ 4244': 1" Dev.

LS: crm-lt gry, fos in prt, some shly (red-brn, mottled), sub chky-prtly dns, pr por, NS

LS: gry (some calc), small amt red-brn

Sh: A.A. w/ sli incrs amt red-brn

Sh: mstly red-brn (some calc) w/ some gry (some calc), & intermixed w/ some LS: crm-gr, fos, some shly, sub chky-prtly dns, pr por, NS

Sh: mstly red-brn (some sdy, some calc), w/ some gry (some calc)

Morgan Mud check @ 4292': 60 Vis, 9.0 Wt, 5.6 WL, 1,800 ppm Chl, 5# LCM (11:25 am, TIH after DST #5)

LS: crm-gr, fos in prt, some shly (red-brn, mottled), sub chky-prtly dns, pr por, NS

Sh: red-brn (some calc) & gry (some calc)

Sh: A.A. w/ some Calc Sh: purple-gry

Sh: mstly gry (some soft & gummy, some calc), w/ small amt red-brn

Sh: A.A. w/ some drk gry

LS: wh-crm, fos in prt, sub chky-prtly dns w/ some chky, pr w/ tr-fr-gd fos por, NS

LS: wh-lt gry, fos in prt, sub chky-prtly dns w/ some chky, pr fos por, NS

LS: med gry, sli shly, prtly dns, pr por, NS

Sh: A.A. w/ some calc & Shly LS: gry, pr por, NS

LS: crm-tan, sli fos, mstly prtly dns w/ some sub chky, pr por, NS

LS: crm-tan, sli chty (tan), sub chky-prtly dns w/ some chky, pr por, NS

Sh: brn, sli fos, prtly dns, pr por, NS

Sh: Blk Carb w/ lt-drk gry (some calc)