

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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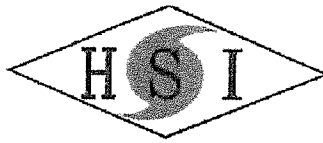
Shots Per Foot	Perforation Top	Perforation Bottom	Bridge Plug Type	Bridge Plug Set At	Acid, Fracture, Shot, Cementing Squeeze Record <i>(Amount and Kind of Material Used)</i>

TUBING RECORD:	Size:	Set At:	Packer At:	
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Form	ACO1 - Well Completion
Operator	Murfin Drilling Co., Inc.
Well Name	VANAVA 4-5
Doc ID	1474463

All Electric Logs Run

DIL
DUCP
MEL
BHCS



CEMENT TREATMENT REPORT

Customer: Murfin Drilling Co	Well: Vanava Venava #4-5	Ticket: ICT2078
City, State:	County: Logan	Date: 6/21/2019
Field Rep: Juan	S-T-R: Sec 5 - T13S - R32W	Service: Cement

Downhole Information	
Hole Size:	12.25 in
Hole Depth:	310 ft
Casing Size:	8.625 in
Casing Depth:	305 ft
Tubing / Liner:	in
Depth:	ft
Tool / Packer:	
Depth:	ft
Displacement:	18.5 bbls

Slurry	
Weight:	14.7 # / sx
Water / Sx:	6.70 gal / sx
Yield:	1.41 ft ³ / sx
Bbls / Ft.:	0.0735
Depth:	310 ft
Volume:	22.8 bbls
Excess:	120% %
Total Slurry:	50.2 bbls
Total Sacks:	200 sx

Cement Blend		
Product	%	#
Class A	100.0	18800
Gel	2.0	376
CaCl	3.0	564
Metso		
KolSeal		
PhenoSeal		
Salt		
Total		19,740

TIME	RATE	PSI	BBLs	REMARKS	TIME	RATE	PSI	BBLs	REMARKS
4:30 PM				Called for job					
6:30 PM				Depart Oakley yard					
7:00 PM				Arrive on locn. Rig performing wiper trip.					
7:05 PM				JSA, discuss moving, spotting & rig-up					
7:15 PM				Move on, spot & rig-up					
7:45 PM				Rig-up complete					
7:50 PM				Rig TOH w/ DP					
8:21 PM				Start to RIH w/ casing					
9:00 PM				Casing @ setting depth					
9:15 PM		300.0		Circulate & condition hole					
9:22 PM	2.0	100.0	2.0	Pump H2O ahead					
9:25 PM	4.0	100.0	50.0	Mix & pump 200sx cement @ 14.7#					
				Y - 1.41cuft/sk, MW - 6.7g/sk					
9:37 PM	3.0	200.0		Cement to surface, 42hbl cement away					
9:39 PM	3.0	140.0	18.5	Displ. w H2O					
9:45 PM				Shutdown. End Job					
				Note: Circulated approx 25bbl good cement to surface					
				Thanks for calling HIS					

CREW		UNIT
Cementer:	Scott Green	74
Pump Operator:	Michael Rebarček	231
Bulk #1:	Alan Ryan	182 / 256
Bulk #2:		

SUMMARY		
Average Rate	Average Pressure	Total Fluid
3 bpm	168.00 psi	70.50 bbls

MDCI
 Vanava #4-5
 330' FSL 500' FEL
 Sec. 5-T13S-R32W
 3018' KB

Formation	SampleTops	Datum	Ref	Log Tops	Datum	Ref
Anhydrite	2505	+513	-9	2500	+518	-4
B/Anhydrite	2525	+493	-5	2525	+493	-5
Topeka	3743	-725	-8	3740	-722	-5
Heebner	3967	-949	-6	3964	-946	-3
Lansing	4011	-993	-9	4007	-889	-5
Stark	4235	-1217	-5	4231	-1213	-1
Ft Scott	4434	-1416	-4	4432	-1414	-2
Oakley	4519	-1501	-4	4514	-1496	+1
Johnson	4562	-1544	-1	4557	-1539	+4
Morrow	4598	-1580	-3	4586	-1568	+9
Mississippi	4636	-1618	-18	4632	-1614	-14
RTD	4715					
LTD				4712		

Thomas J. Funk
Petroleum Geologist

**Geologists Report
Drilling Time and Sample Log**

OPERATOR **Murfin Drilling Co., Inc**

LEASE **Vanava** WELL NO #4-5
FIELD **High Hat West** API **15-109-21596**
LOCATION **330' FSL & 500' FEL**
SEC. **5** TWP **13S** RGE **32W**
COUNTY **Logan** STATE **Kansas**

CONTRACTOR **Murfin Dng Co** Rig #21
COMM **6/21/2019** COMP **7/2/2019**
RTD **4/7/15** LOG TD **4/7/15**

SAMPLES SAVED FROM **3630** TO **4715**
DRILLING TIME KEPT FROM **3630** TO **4715**
SAMPLES EXAMINED FROM **3630** TO **4715**
GEOLOGICAL SUPERVISION FROM **3600** TO **4715**
MUD UP **3250** TYPE MUD **Chemical**

FORMATION	LOG	SAMPLE	ELECTRICAL SURVEYS
	TOP DATUM	TOP DATUM	Log-Tech
Anhydrite	2502 (+516)	2505 (+513)	DIL
Baryhydrite	2525 (+493)	2525 (+493)	MEL
Toppekka	3740 (-722)	3743 (-725)	DUQP
Heebner Sh	3964 (-946)	3967 (-949)	BHCS
Lansing	4007 (-989)	4011 (-993)	
Muncie Creek	4150 (-1132)	4154 (-1136)	
Start Sh	4231 (-1213)	4235 (-1217)	
Marmaton	4331 (-1313)	4332 (-1314)	
Pawnee	4430 (-1412)	4433 (-1415)	
Cherokee Sh	4514 (-1496)	4516 (-1498)	
Johnson Zone	4557 (-1539)	4562 (-1544)	
Mississippian	4632 (-1614)	4636 (-1618)	

Date	Daily Progress	NO	Stret	Make	Type	Begin	Out	Feet	Hours
	Depth				RR				
6/21/19	370'	1	12	1/4	GMS	310	310		2.25
6/22/19	370'	2	7	8'	HTC	DF506F	3554	3244	47.25
6/23/19	1940'	3	7	7/8'	HTC	GX22s	4715	1161	75.5
6/24/19	3345'								
6/25/19	3782'								
6/26/19	4070'								
6/27/19	4111'								
6/28/19	4215'								
6/29/19	4338'								
6/30/19	4471'								
7/1/19	4585'								
7/2/19	4652'								
7/3/19	4715' Ring Csg								

ELEVATION
KB 3018'
DF
GL 3007'
Measurements Are All From KB

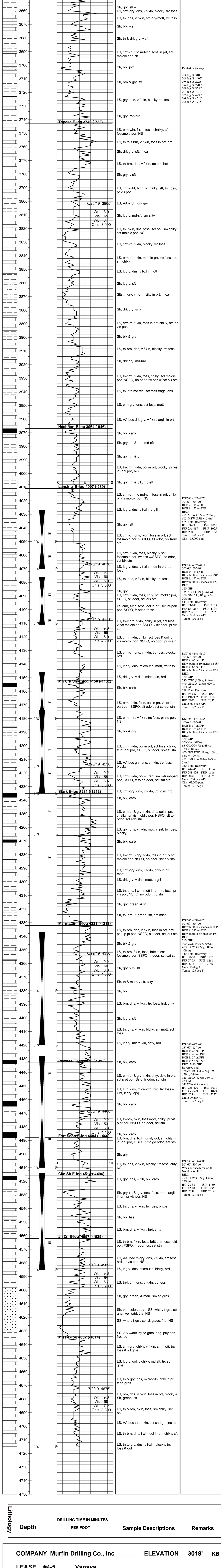
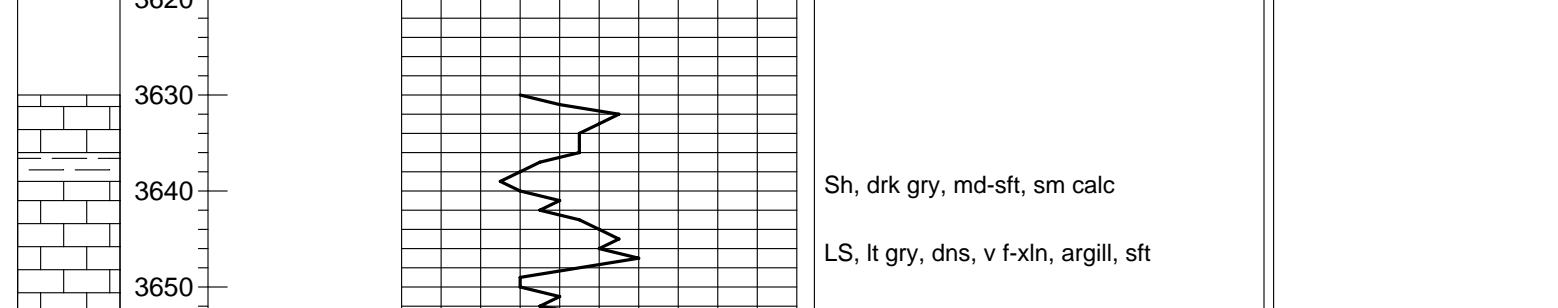
CASING RECORD
SURFACE
8 5/8" at 310'KB w/2008x
TO 4715'
TO 4715'
TO 4715'

PRODUCTION
5 1/2" at 4710'KB w/175sx
TO 4715'

ELECTRICAL SURVEYS
Log-Tech
DIL
MEL
DUQP
BHCS

REMARKS AND RECOMMENDATIONS:
Based on sample examination, DST results, and log analysis it was recommended to run casing to further test the #4-5 Vanava.
Thomas Funk
Petroleum Geologist

LEGEND



COMPANY	Murfin Drilling Co., Inc	ELEVATION	3018'	KB
LEASE	#4-5 Vanava			
LOCATION	330' FSL & 500' FEL	Sec 5	TWP 13S	RGE 32W
COUNTY	Logan	STATE	Kansas	



DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N. Water STE 300
Wichita, KS 67202

ATTN: Tom Funk

Vanava #4-5

5-13S-32W Logan,KS

Start Date: 2019.06.26 @ 05:10:00

End Date: 2019.06.26 @ 13:53:19

Job Ticket #: 64354 DST #: 1

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

Printed: 2019.07.03 @ 14:39:03



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

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

5-13S-32W Logan,KS

Vanava #4-5

Job Ticket: 64354

DST#: 1

Test Start: 2019.06.26 @ 05:10:00

GENERAL INFORMATION:

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

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 07:11:50

Time Test Ended: 13:53:19

Test Type: Conventional Bottom Hole (Initial)

Tester: Martine Salinas

Unit No: 82

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

Total Depth: 4070.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Good

Reference Elevations: 3018.00 ft (KB)

3007.00 ft (CF)

KB to GR/CF: 11.00 ft

Serial #: 8734

Outside

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

Start Date: 2019.06.26

End Date: 2019.06.26

Start Time: 05:10:01

End Time: 13:53:19

Capacity: 8000.00 psig

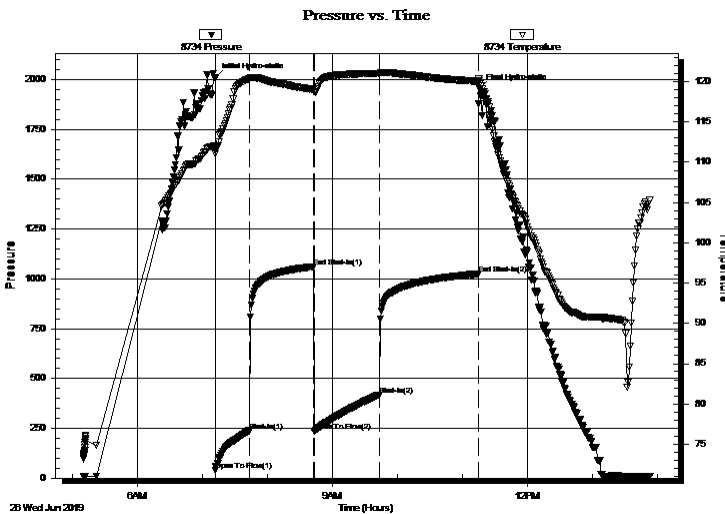
Last Calib.: 2019.06.26

Time On Btm: 2019.06.26 @ 07:11:40

Time Off Btm: 2019.06.26 @ 11:15:30

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

PRESSURE SUMMARY



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

Recovery

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

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co Inc

5-13S-32W Logan,KS

250 N. Water STE 300
Wichita, KS 67202

Vanava #4-5

Job Ticket: 64354

DST#: 1

ATTN: Tom Funk

Test Start: 2019.06.26 @ 05:10:00

Tool Information

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

Tool Comments:

Tool Description

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

Total Tool Length: 71.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co Inc

5-13S-32W Logan,KS

250 N. Water STE 300
Wichita, KS 67202

Vanava #4-5

Job Ticket: 64354

DST#: 1

ATTN: Tom Funk

Test Start: 2019.06.26 @ 05:10:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

55000 ppm

Viscosity: 53.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.38 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 3000.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

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

Total Length: 865.00 ft Total Volume: 9.638 bbl

Num Fluid Samples: 0

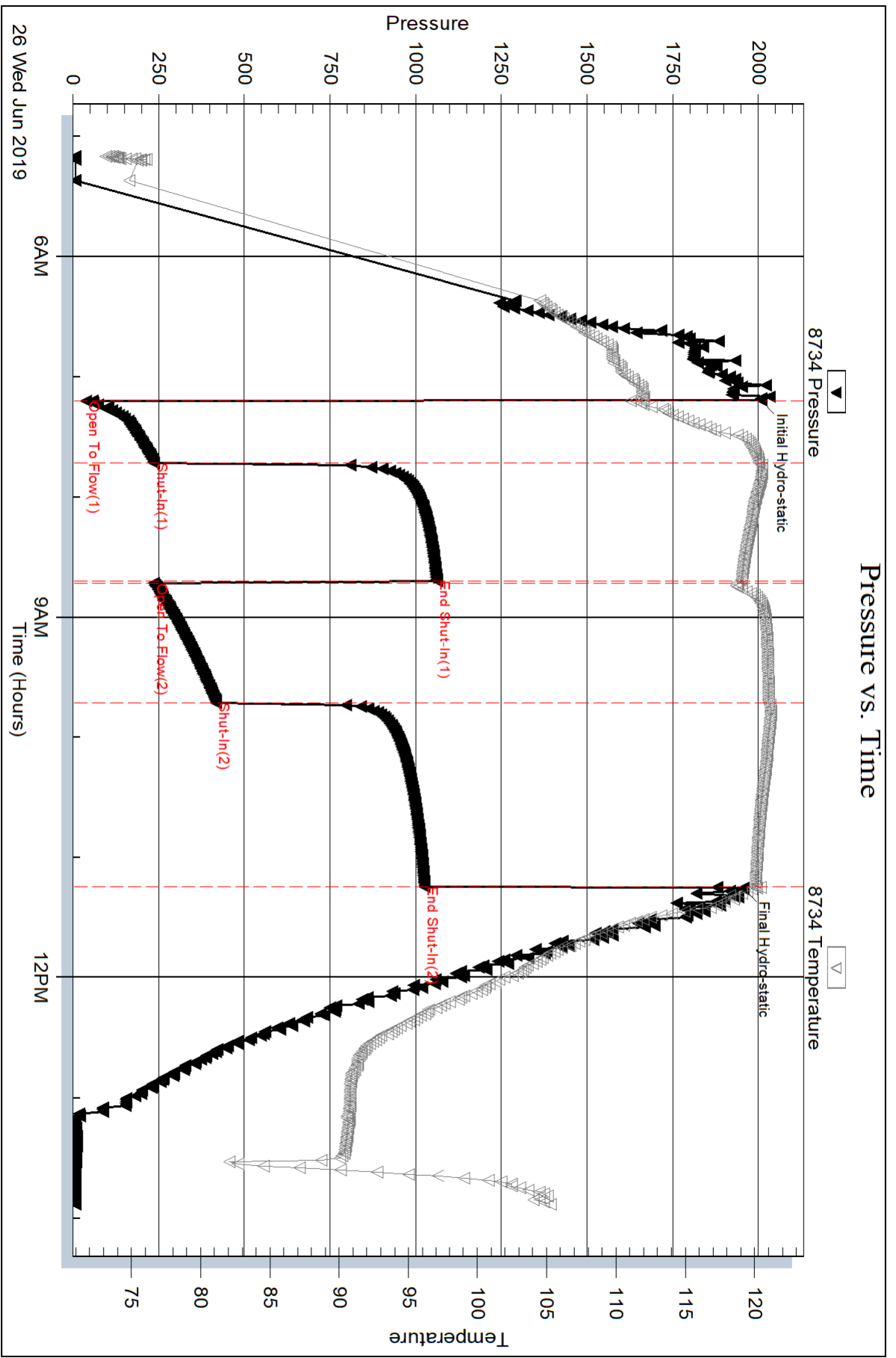
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

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



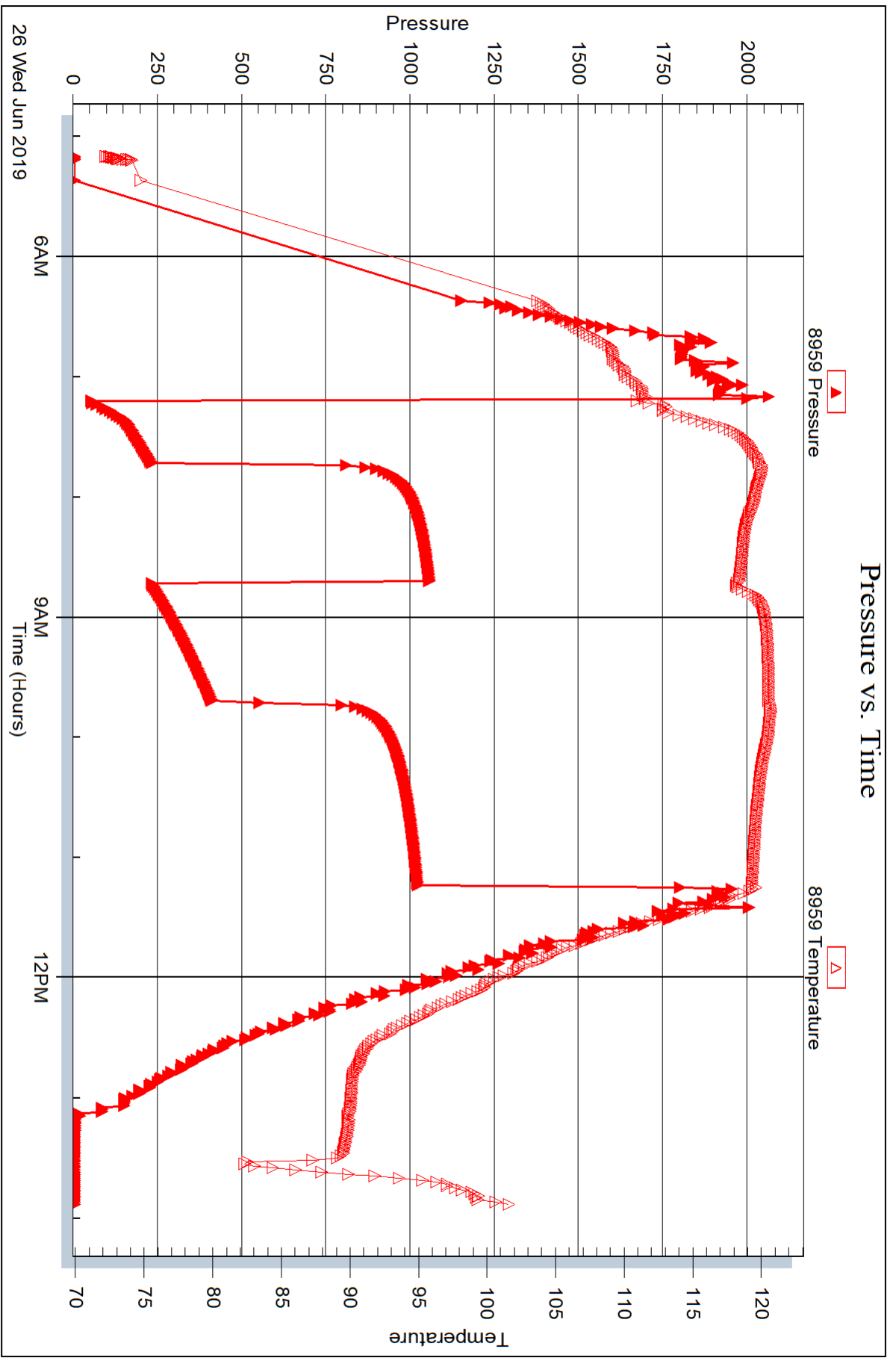
Serial #: 8959

Inside

Murfin Drilling Co Inc

Vanava #4-5

DST Test Number: 1



Triobite Testing, Inc

Ref. No: 64354

Printed: 2019.07.03 @ 14:39:04



DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N. Water STE 300
Wichita, KS 67202

ATTN: Tom Funk

Vanava #4-5

5-13S-32W Logan,KS

Start Date: 2019.06.26 @ 22:40:00

End Date: 2019.06.27 @ 07:10:39

Job Ticket #: 64355 DST #: 2

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

Printed: 2019.07.03 @ 14:31:16

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

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

5-13S-32W Logan,KS

Vanava #4-5

Job Ticket: 64355

DST#: 2

Test Start: 2019.06.26 @ 22:40:00

GENERAL INFORMATION:

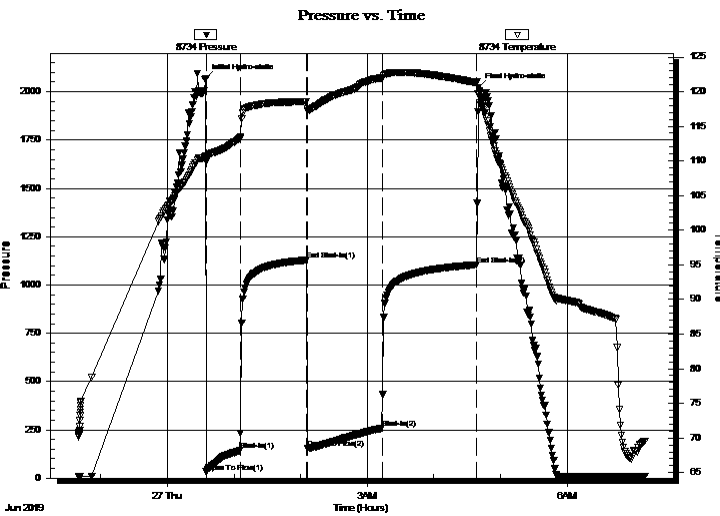
Formation: **LKC "E - F"**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 00:34:50
 Time Test Ended: 07:10:39
 Interval: **4076.00 ft (KB) To 4111.00 ft (KB) (TVD)**
 Total Depth: 4111.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Good
 Test Type: Conventional Bottom Hole (Reset)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

Serial #: 8734

Outside

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

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



PRESSURE SUMMARY

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

Recovery

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

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co Inc

5-13S-32W Logan,KS

250 N. Water STE 300
Wichita, KS 67202

Vanava #4-5

Job Ticket: 64355

DST#: 2

ATTN: Tom Funk

Test Start: 2019.06.26 @ 22:40:00

Tool Information

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

Tool Comments:

Tool Description

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

Total Tool Length: 63.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co Inc

5-13S-32W Logan,KS

250 N. Water STE 300
Wichita, KS 67202

Vanava #4-5

Job Ticket: 64355

DST#: 2

ATTN: Tom Funk

Test Start: 2019.06.26 @ 22:40:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

34.6 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 60.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.98 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 3300.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

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

Total Length: 641.00 ft Total Volume: 6.495 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

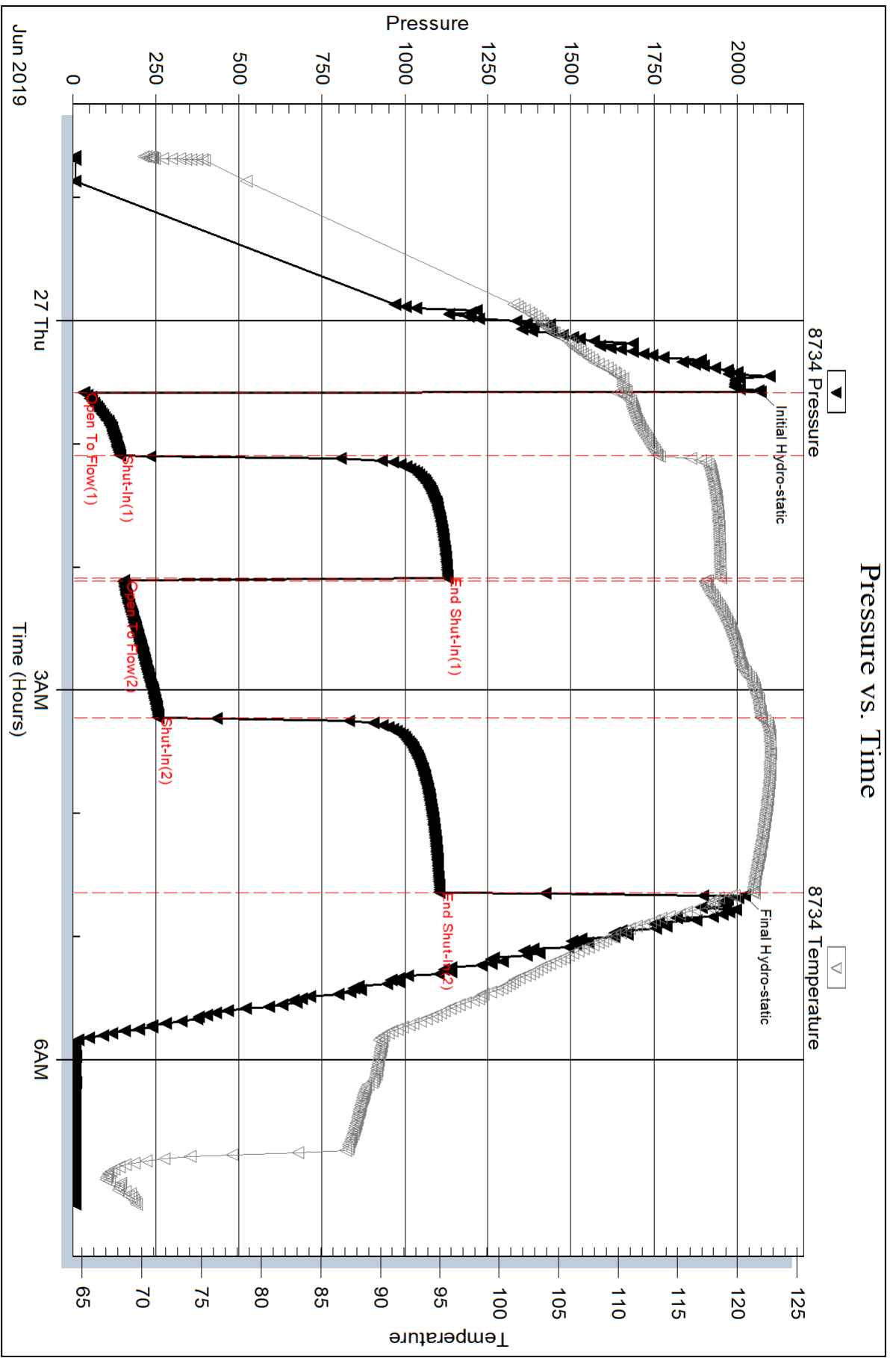
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: Gravity of oil = 35.4 @ 68 degs

Gravity corrected to 34.6 @ 60 degs



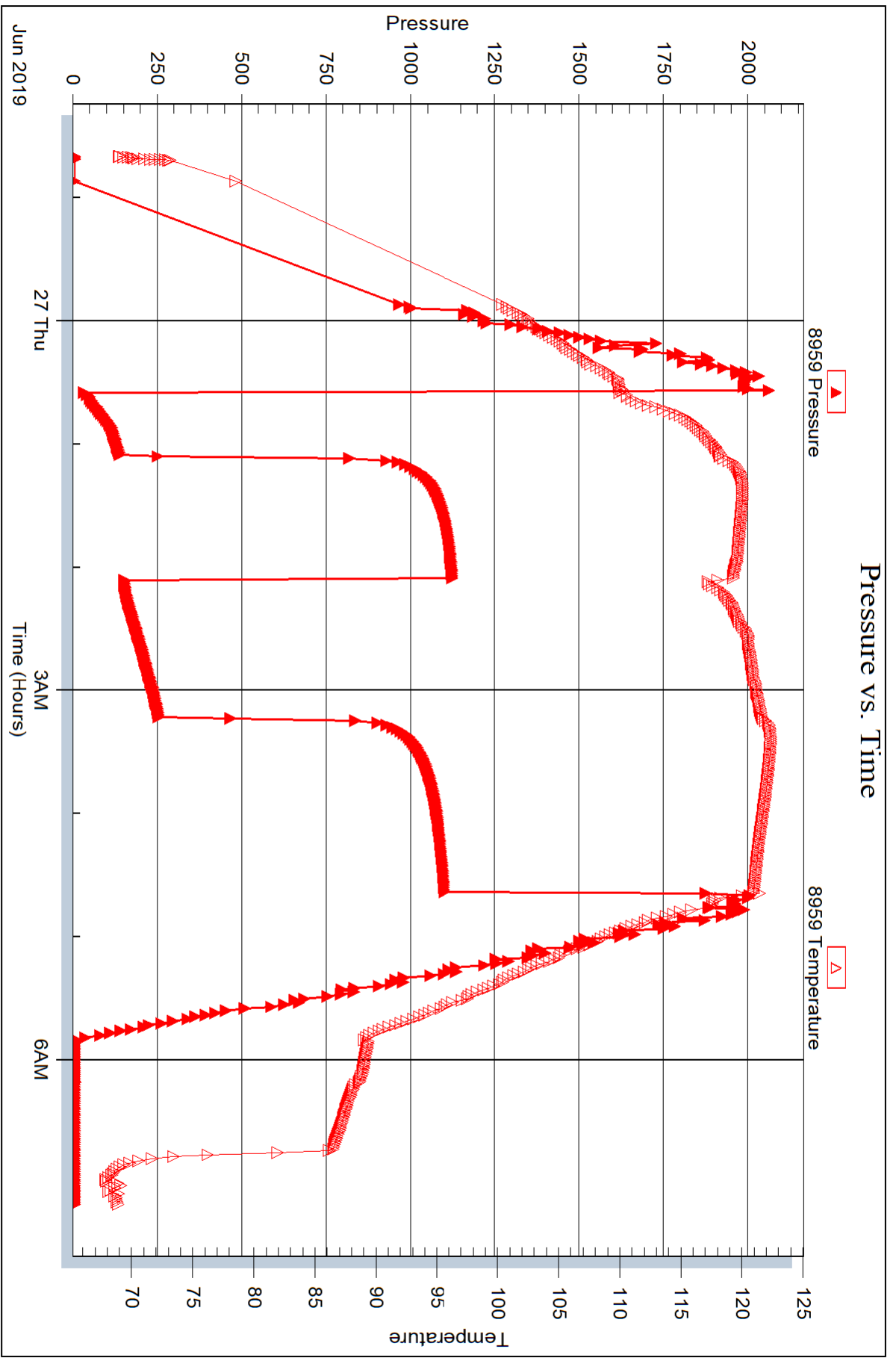
Serial #: 8959

Inside

Murfin Drilling Co Inc

Vanava #4-5

DST Test Number: 2



Trilobite Testing, Inc

Ref. No: 64355

Printed: 2019.07.03 @ 14:31:17



DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N. Water STE 300
Wichita, KS 67202

ATTN: Tom Funk

Vanava #4-5

5-13S-32W Logan,KS

Start Date: 2019.06.27 @ 16:38:00

End Date: 2019.06.28 @ 01:09:20

Job Ticket #: 64356 DST #: 3

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

Printed: 2019.07.03 @ 14:07:02



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

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

5-13S-32W Logan,KS

Vanava #4-5

Job Ticket: 64356

DST#: 3

Test Start: 2019.06.27 @ 16:38:00

GENERAL INFORMATION:

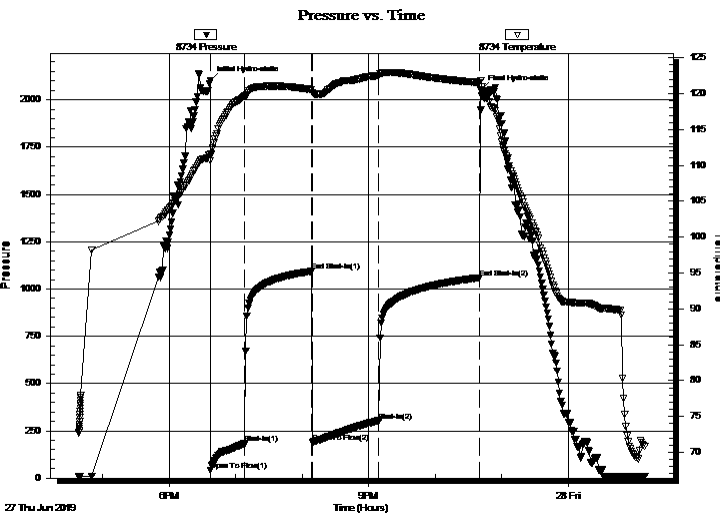
Formation: **LKC "H"**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 18:37:10
 Time Test Ended: 01:09:20
 Interval: **4146.00 ft (KB) To 4180.00 ft (KB) (TVD)**
 Total Depth: 4180.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Good
 Test Type: Conventional Bottom Hole (Reset)
 Tester: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

Serial #: 8734

Outside

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

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



PRESSURE SUMMARY

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

Recovery

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

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co Inc

5-13S-32W Logan,KS

250 N. Water STE 300
Wichita, KS 67202

Vanava #4-5

Job Ticket: 64356

DST#: 3

ATTN: Tom Funk

Test Start: 2019.06.27 @ 16:38:00

Tool Information

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

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
------------------	-------------	------------	----------	------------	----------------

Change Over Sub	1.00			4119.00	
Shut In Tool	5.00			4124.00	
Hydraulic tool	5.00	1113		4129.00	
Jars	5.00	01-07		4134.00	
Safety Joint	3.00	-001		4137.00	
Packer	5.00			4142.00	28.00 Bottom Of Top Packer
Packer	4.00			4146.00	
Stubb	1.00			4147.00	
Recorder	0.00	8959	Inside	4147.00	
Recorder	0.00	8734	Outside	4147.00	
Perforations	28.00			4175.00	
Bullnose	5.00			4180.00	34.00 Bottom Packers & Anchor

Total Tool Length: 62.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co Inc

5-13S-32W Logan,KS

250 N. Water STE 300
Wichita, KS 67202

Vanava #4-5

Job Ticket: 64356

DST#: 3

ATTN: Tom Funk

Test Start: 2019.06.27 @ 16:38:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

36.8 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 58.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.98 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 4200.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

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

Total Length: 779.00 ft Total Volume: 8.432 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: Gravity of oil = 38 @ 72 degs

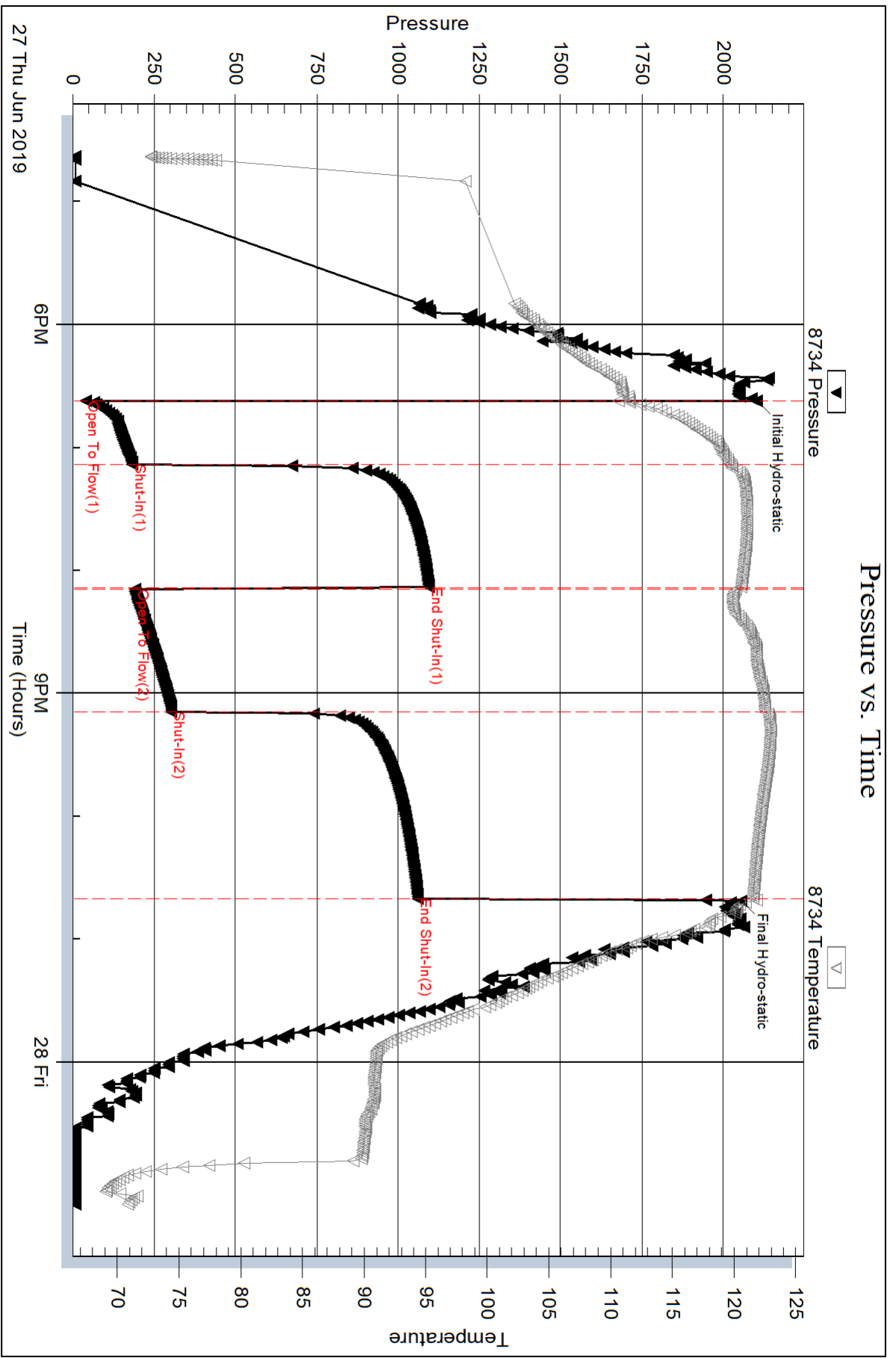
Gravity corrected to 36.8 @ 60 degs

Serial #: 8734

Outside Murfin Drilling Co Inc

Vanava #4-5

DST Test Number: 3



Trilobite Testing, Inc

Ref. No: 64356

Printed: 2019.07.03 @ 14:07:03

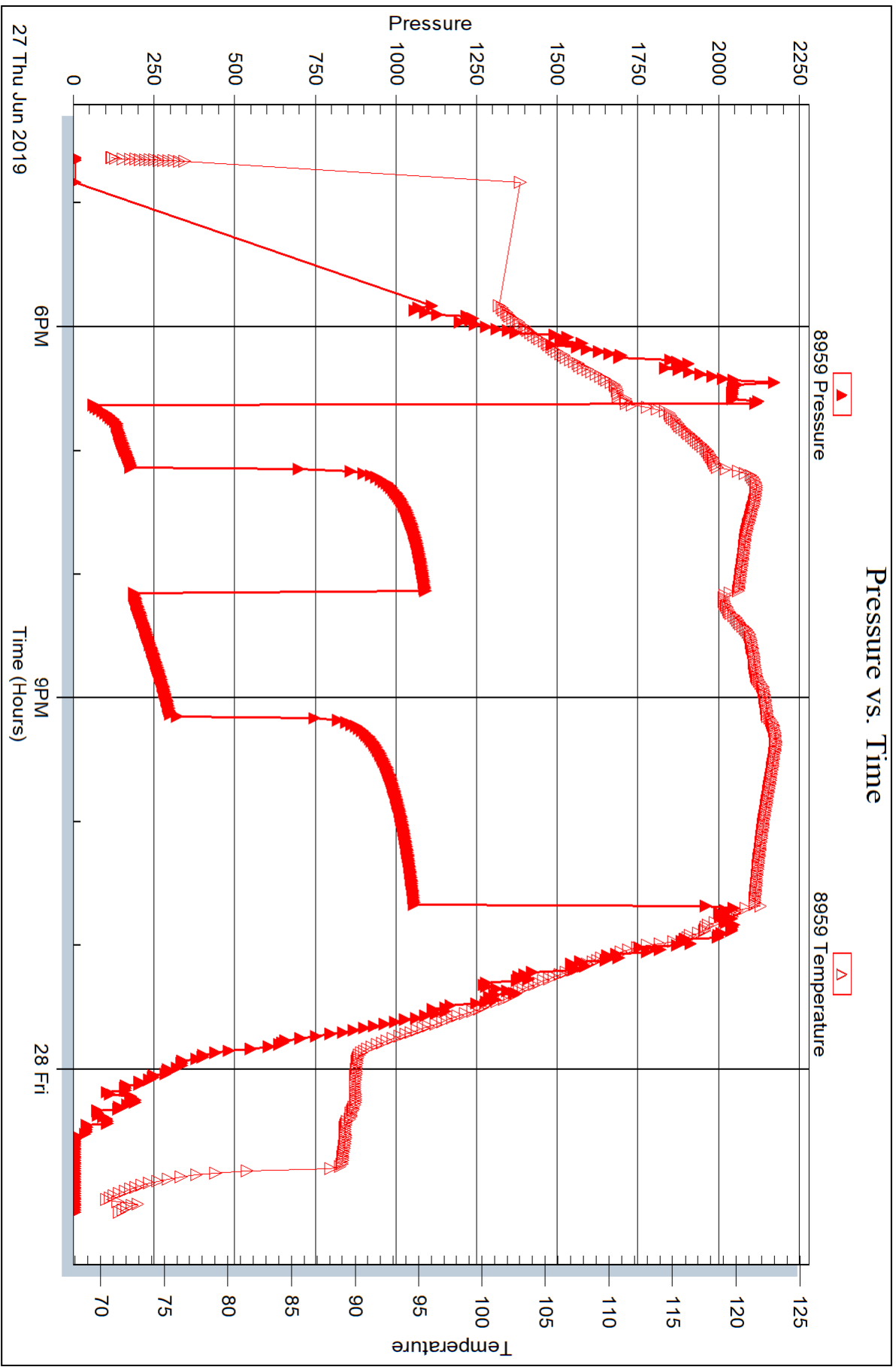
Serial #: 8959

Inside

Murfin Drilling Co Inc

Vanava #4-5

DST Test Number: 3



Trilobite Testing, Inc

Ref. No: 64356

Printed: 2019.07.03 @ 14:07:03



DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N. Water STE 300
Wichita, KS 67202

ATTN: Tom Funk

Vanava #4-5

5-13S-32W Logan,KS

Start Date: 2019.06.28 @ 11:05:00

End Date: 2019.06.28 @ 19:27:39

Job Ticket #: 64358 DST #: 4

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

Printed: 2019.07.03 @ 13:59:26



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

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

5-13S-32W Logan,KS

Vanava #4-5

Job Ticket: 64358

DST#: 4

Test Start: 2019.06.28 @ 11:05:00

GENERAL INFORMATION:

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

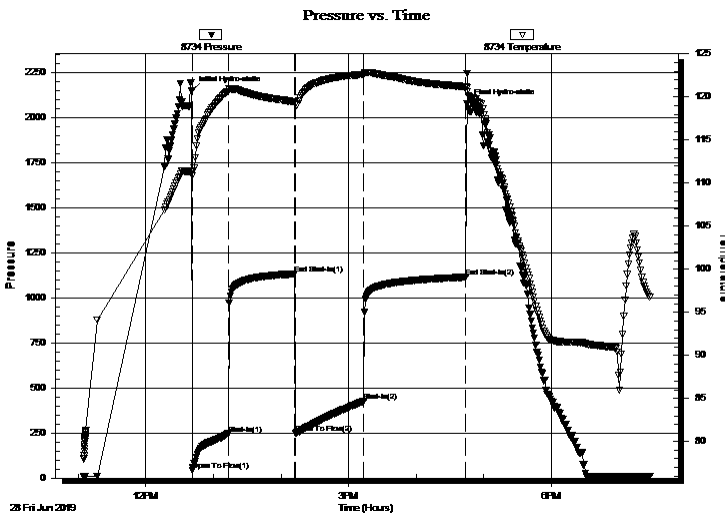
Serial #: 8734

Outside

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

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

PRESSURE SUMMARY



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

Recovery

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

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co Inc

5-13S-32W Logan,KS

250 N. Water STE 300
Wichita, KS 67202

Vanava #4-5

Job Ticket: 64358

DST#: 4

ATTN: Tom Funk

Test Start: 2019.06.28 @ 11:05:00

Tool Information

Drill Pipe:	Length: 3890.00 ft	Diameter: 3.80 inches	Volume: 54.57 bbl	Tool Weight:	2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length: 274.00 ft	Diameter: 2.25 inches	Volume: 1.35 bbl	Weight to Pull Loose:	88000.00 lb
			<u>Total Volume: 55.92 bbl</u>	Tool Chased	0.00 ft
Drill Pipe Above KB:	18.00 ft			String Weight: Initial	73000.00 lb
Depth to Top Packer:	4174.00 ft			Final	77000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	61.00 ft				
Tool Length:	89.00 ft				
Number of Packers:	2	Diameter: 6.75 inches			

Tool Comments:

Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Shut In Tool	5.00			4151.00	
Hydraulic tool	5.00	1113		4156.00	
Jars	5.00	01-07		4161.00	
Safety Joint	3.00	-001		4164.00	
Packer	5.00			4169.00	28.00 Bottom Of Top Packer
Packer	5.00			4174.00	
Stubb	1.00			4175.00	
Recorder	0.00	8959	Inside	4175.00	
Recorder	0.00	8734	Outside	4175.00	
Perforations	21.00			4196.00	
Change Over Sub	1.00			4197.00	
Drill Pipe	32.00			4229.00	
Change Over Sub	1.00			4230.00	
Bullnose	5.00			4235.00	61.00 Bottom Packers & Anchor

Total Tool Length: 89.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co Inc

5-13S-32W Logan,KS

250 N. Water STE 300
Wichita, KS 67202

Vanava #4-5

Job Ticket: 64358

DST#: 4

ATTN: Tom Funk

Test Start: 2019.06.28 @ 11:05:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

32.4 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

63000 ppm

Viscosity: 54.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.29 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 5000.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

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

Total Length: 950.00 ft Total Volume: 10.830 bbl

Num Fluid Samples: 0

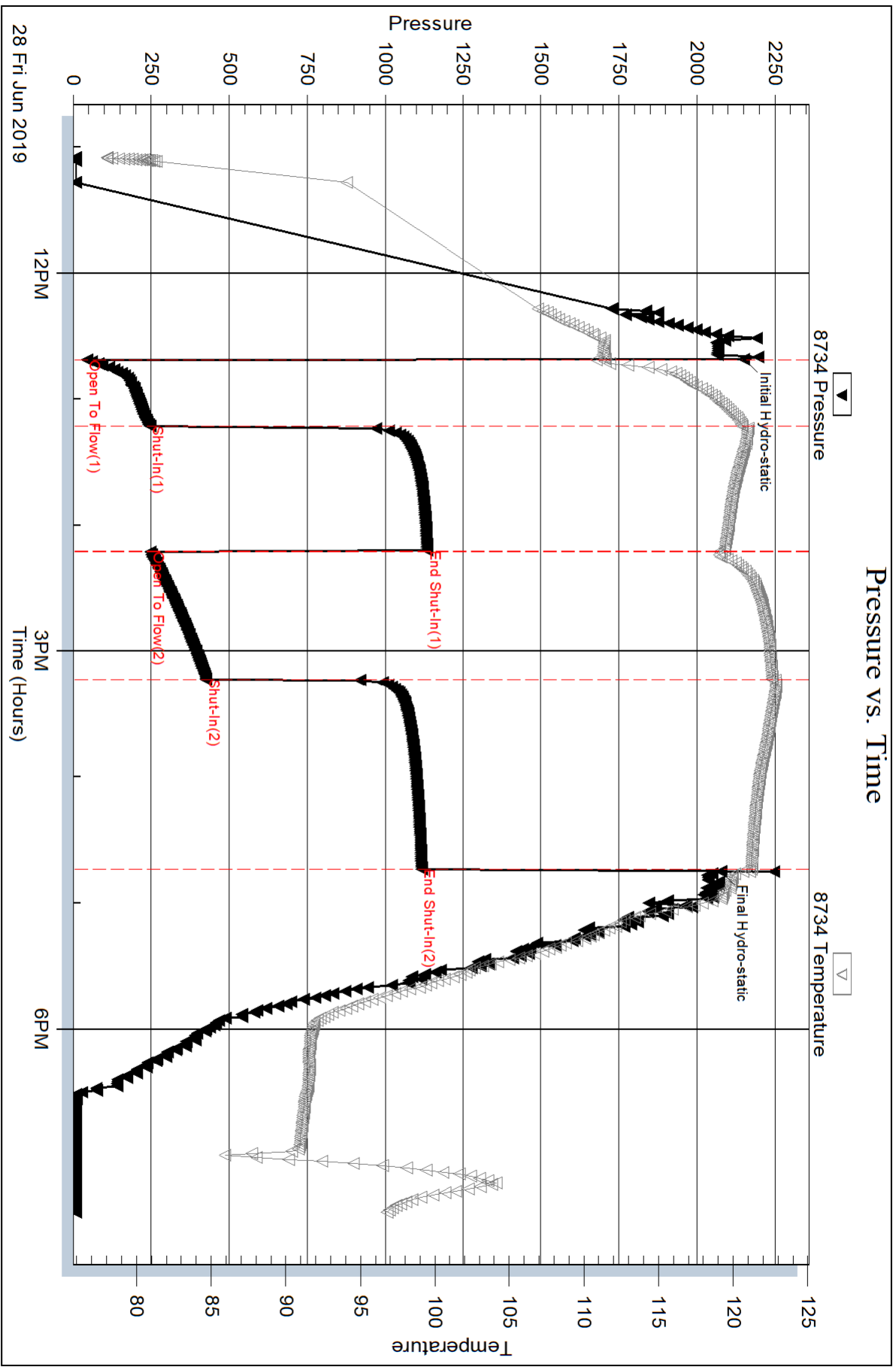
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

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



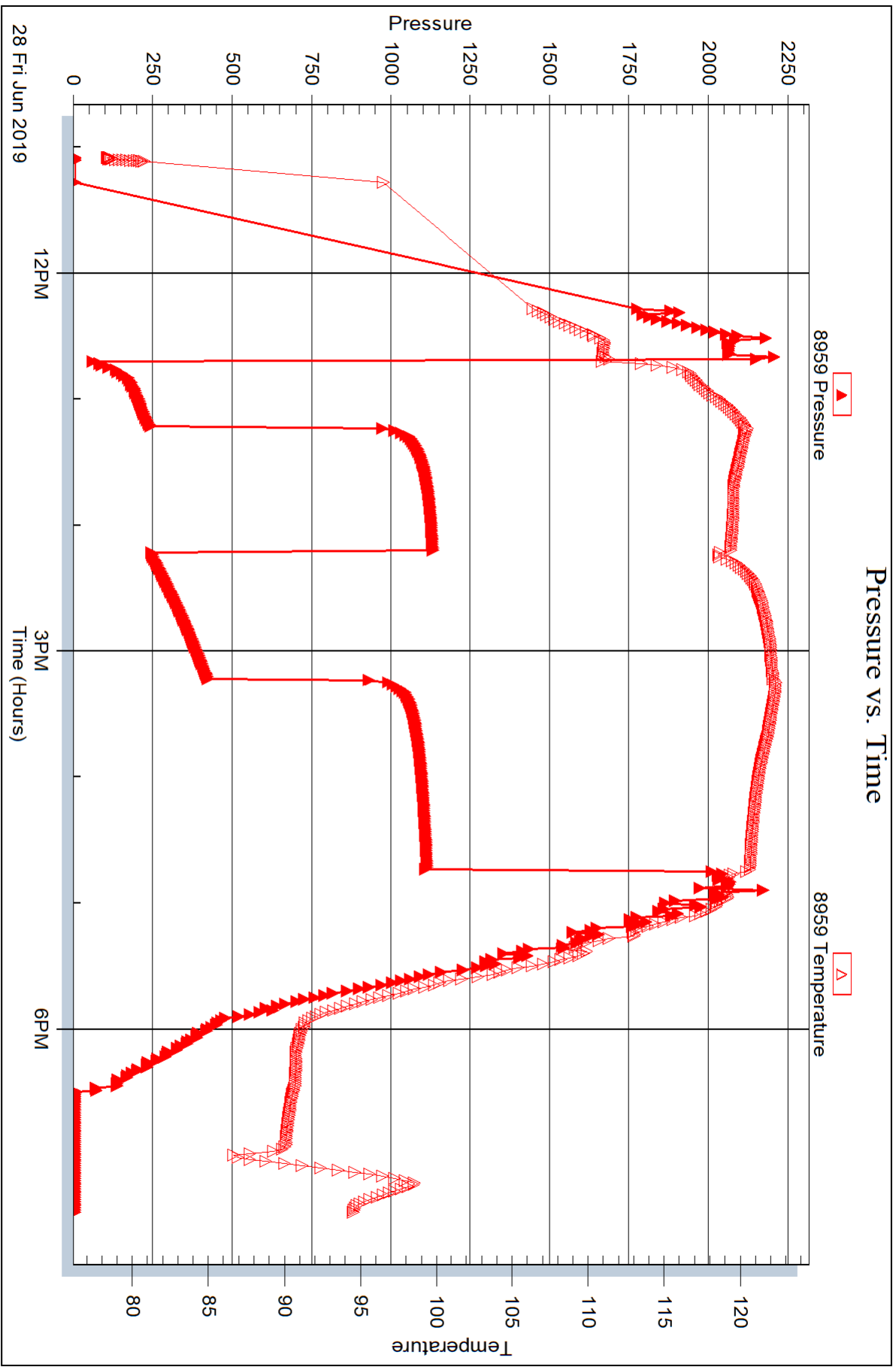
Serial #: 8959

Inside

Murfin Drilling Co Inc

Vanava #4-5

DST Test Number: 4





DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N. Water STE 300
Wichita, KS 67202

ATTN: Tom Funk

Vanava #4-5

5-13S-32W Logan,KS

Start Date: 2019.06.29 @ 15:47:00

End Date: 2019.06.30 @ 00:21:40

Job Ticket #: 64359 DST #: 5

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

Printed: 2019.07.03 @ 13:59:01



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

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

5-13S-32W Logan,KS

Vanava #4-5

Job Ticket: 64359

DST#: 5

Test Start: 2019.06.29 @ 15:47:00

GENERAL INFORMATION:

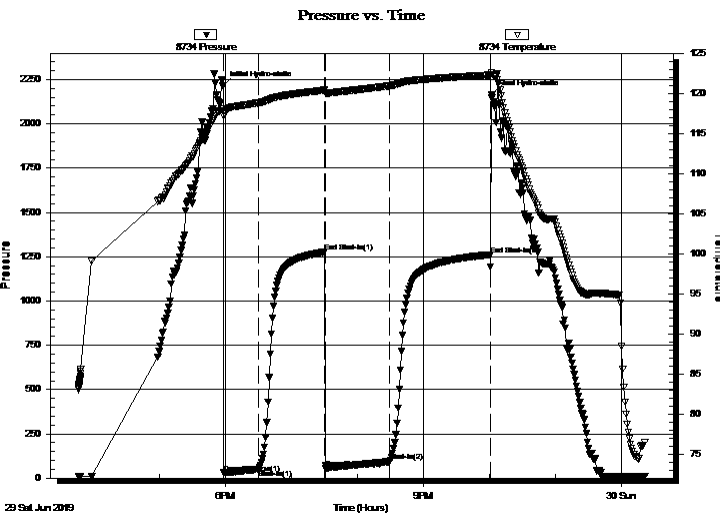
Formation: **Altamont**
 Deviated: No Whipstock: ft (KB)
 Test Type: Conventional Bottom Hole (Reset)
 Time Tool Opened: 17:58:50
 Tester: Martine Salinas
 Time Test Ended: 00:21:40
 Unit No: 82
 Interval: **4337.00 ft (KB) To 4420.00 ft (KB) (TVD)**
 Reference Elevations: 3018.00 ft (KB)
 Total Depth: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

Serial #: 8734

Outside

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

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



PRESSURE SUMMARY

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

Recovery

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

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co Inc

5-13S-32W Logan,KS

250 N. Water STE 300
Wichita, KS 67202

Vanava #4-5

Job Ticket: 64359

DST#: 5

ATTN: Tom Funk

Test Start: 2019.06.29 @ 15:47:00

Tool Information

Drill Pipe:	Length: 4048.00 ft	Diameter: 3.80 inches	Volume: 56.78 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 274.00 ft	Diameter: 2.25 inches	Volume: 1.35 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 58.13 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	13.00 ft			String Weight: Initial 73000.00 lb
Depth to Top Packer:	4337.00 ft			Final 73000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	83.00 ft			
Tool Length:	111.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
------------------	-------------	------------	----------	------------	----------------

Shut In Tool	5.00			4314.00	
Hydraulic tool	5.00	1113		4319.00	
Jars	5.00	01-07		4324.00	
Safety Joint	3.00	-001		4327.00	
Packer	5.00			4332.00	28.00 Bottom Of Top Packer
Packer	5.00			4337.00	
Stubb	1.00			4338.00	
Recorder	0.00	8959	Inside	4338.00	
Recorder	0.00	8734	Outside	4338.00	
Perforations	11.00			4349.00	
Change Over Sub	1.00			4350.00	
Drill Pipe	64.00			4414.00	
Change Over Sub	1.00			4415.00	
Bullnose	5.00			4420.00	83.00 Bottom Packers & Anchor

Total Tool Length: 111.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co Inc

5-13S-32W Logan,KS

250 N. Water STE 300
Wichita, KS 67202

Vanava #4-5

Job Ticket: 64359

DST#: 5

ATTN: Tom Funk

Test Start: 2019.06.29 @ 15:47:00

Mud and Cushion Information

Mud Type: Gel Chem
Mud Weight: 9.00 lb/gal
Viscosity: 56.00 sec/qt
Water Loss: 5.99 in³
Resistivity: ohm.m
Salinity: 4500.00 ppm
Filter Cake: 2.00 inches

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

Oil API: 25 deg API
Water Salinity: ppm

Recovery Information

Recovery Table

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

Total Length: 140.00 ft Total Volume: 0.689 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: Gravity of oil = 27 @ 80 degs

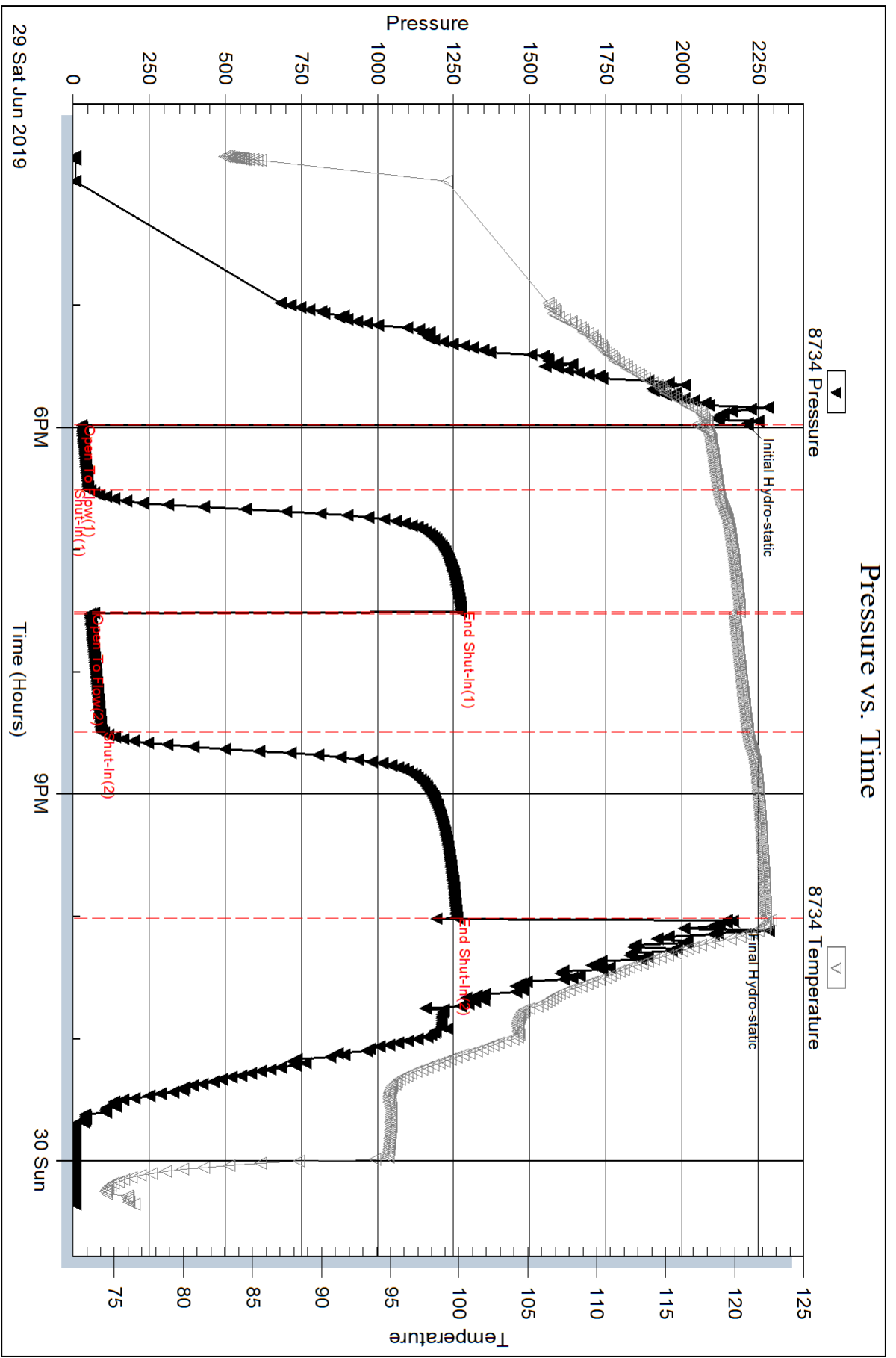
Gravity of oil corrected to 25 @ 60 degs

Serial #: 8734

Outside Murfin Drilling Co Inc

Vanava #4-5

DST Test Number: 5



Triobite Testing, Inc

Ref. No: 64359

Printed: 2019.07.03 @ 13:59:02

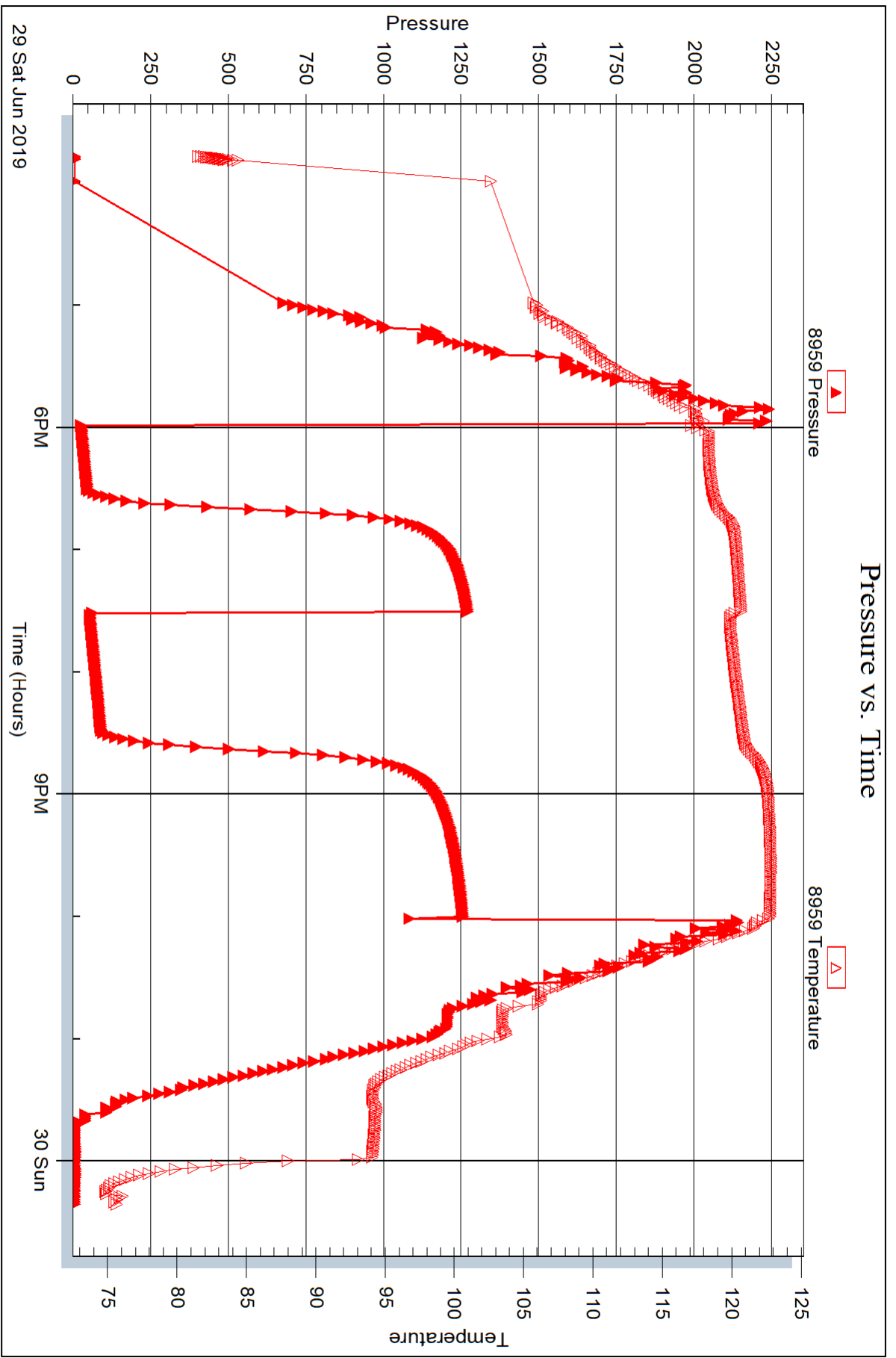
Serial #: 8959

Inside

Murfin Drilling Co Inc

Vanava #4-5

DST Test Number: 5



Trilobite Testing, Inc

Ref. No: 64359

Printed: 2019.07.03 @ 13:59:02



DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N. Water STE 300
Wichita, KS 67202

ATTN: Tom Funk

Vanava #4-5

5-13S-32W Logan,KS

Start Date: 2019.06.30 @ 12:23:00

End Date: 2019.06.30 @ 20:25:30

Job Ticket #: 64360 DST #: 6

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

Printed: 2019.07.03 @ 13:55:56



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

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

5-13S-32W Logan,KS

Vanava #4-5

Job Ticket: 64360

DST#: 6

Test Start: 2019.06.30 @ 12:23:00

GENERAL INFORMATION:

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

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 14:02:50

Time Test Ended: 20:25:30

Test Type: Conventional Bottom Hole (Reset)

Tester: Martine Salinas

Unit No: 82

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

Reference Elevations: 3018.00 ft (KB)

Total Depth: 4510.00 ft (KB) (TVD)

3007.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 11.00 ft

Serial #: 8734 Outside

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

Capacity: 8000.00 psig

Start Date: 2019.06.30

End Date: 2019.06.30

Last Calib.: 2019.06.30

Start Time: 12:23:01

End Time: 20:25:30

Time On Btm: 2019.06.30 @ 14:02:40

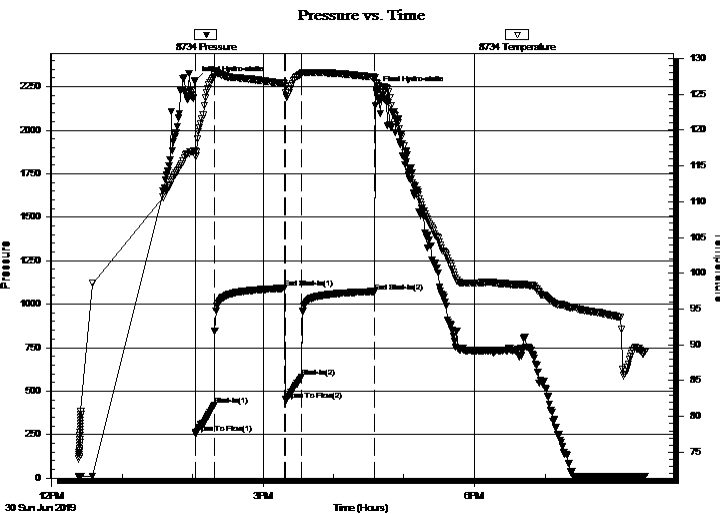
Time Off Btm: 2019.06.30 @ 16:36:40

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

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

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

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



PRESSURE SUMMARY

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

Recovery

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

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co Inc

5-13S-32W Logan,KS

250 N. Water STE 300
Wichita, KS 67202

Vanava #4-5

Job Ticket: 64360

DST#: 6

ATTN: Tom Funk

Test Start: 2019.06.30 @ 12:23:00

Tool Information

Drill Pipe:	Length: 4144.00 ft	Diameter: 3.80 inches	Volume: 58.13 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 274.00 ft	Diameter: 2.25 inches	Volume: 1.35 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 59.48 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	18.00 ft			String Weight: Initial 75000.00 lb
Depth to Top Packer:	4428.00 ft			Final 80000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	82.00 ft			
Tool Length:	110.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
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Shut In Tool	5.00			4405.00	
Hydraulic tool	5.00	1113		4410.00	
Jars	5.00	01-07		4415.00	
Safety Joint	3.00	-001		4418.00	
Packer	5.00			4423.00	28.00 Bottom Of Top Packer
Packer	5.00			4428.00	
Stubb	1.00			4429.00	
Recorder	0.00	8959	Inside	4429.00	
Recorder	0.00	8734	Outside	4429.00	
Perforations	10.00			4439.00	
Change Over Sub	1.00			4440.00	
Drill Pipe	64.00			4504.00	
Change Over Sub	1.00			4505.00	
Bullnose	5.00			4510.00	82.00 Bottom Packers & Anchor

Total Tool Length: 110.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co Inc

5-13S-32W Logan,KS

250 N. Water STE 300
Wichita, KS 67202

Vanava #4-5

Job Ticket: 64360

DST#: 6

ATTN: Tom Funk

Test Start: 2019.06.30 @ 12:23:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

29 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 53.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.79 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 4400.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

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

Total Length: 1412.00 ft Total Volume: 17.311 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

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

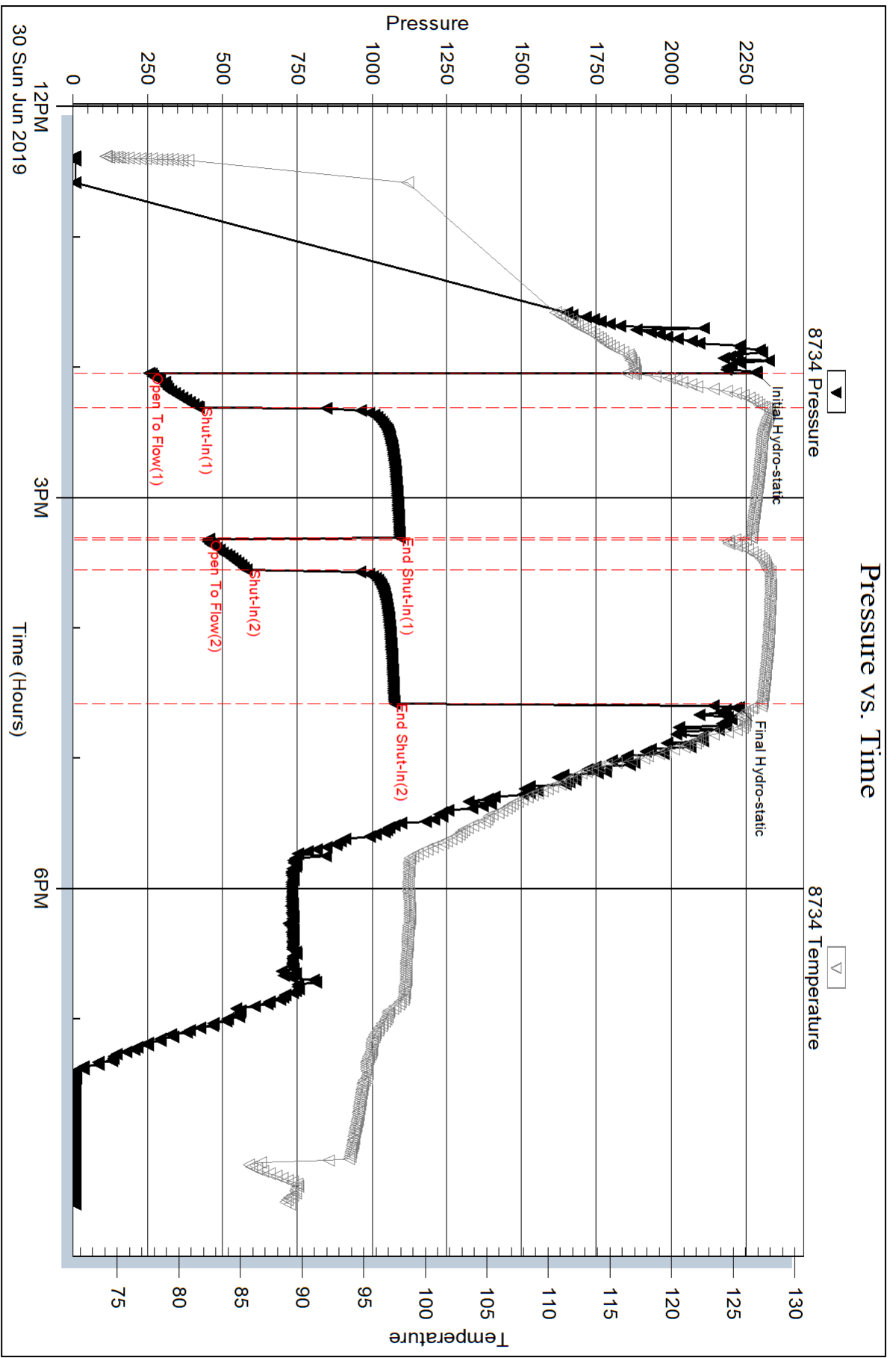
Gravity of oil = 33 @ 100 degs corrected to 29.0 @ 60 degs

Serial #: 8734

Outside Murfin Drilling Co Inc

Vanava #4-5

DST Test Number: 6



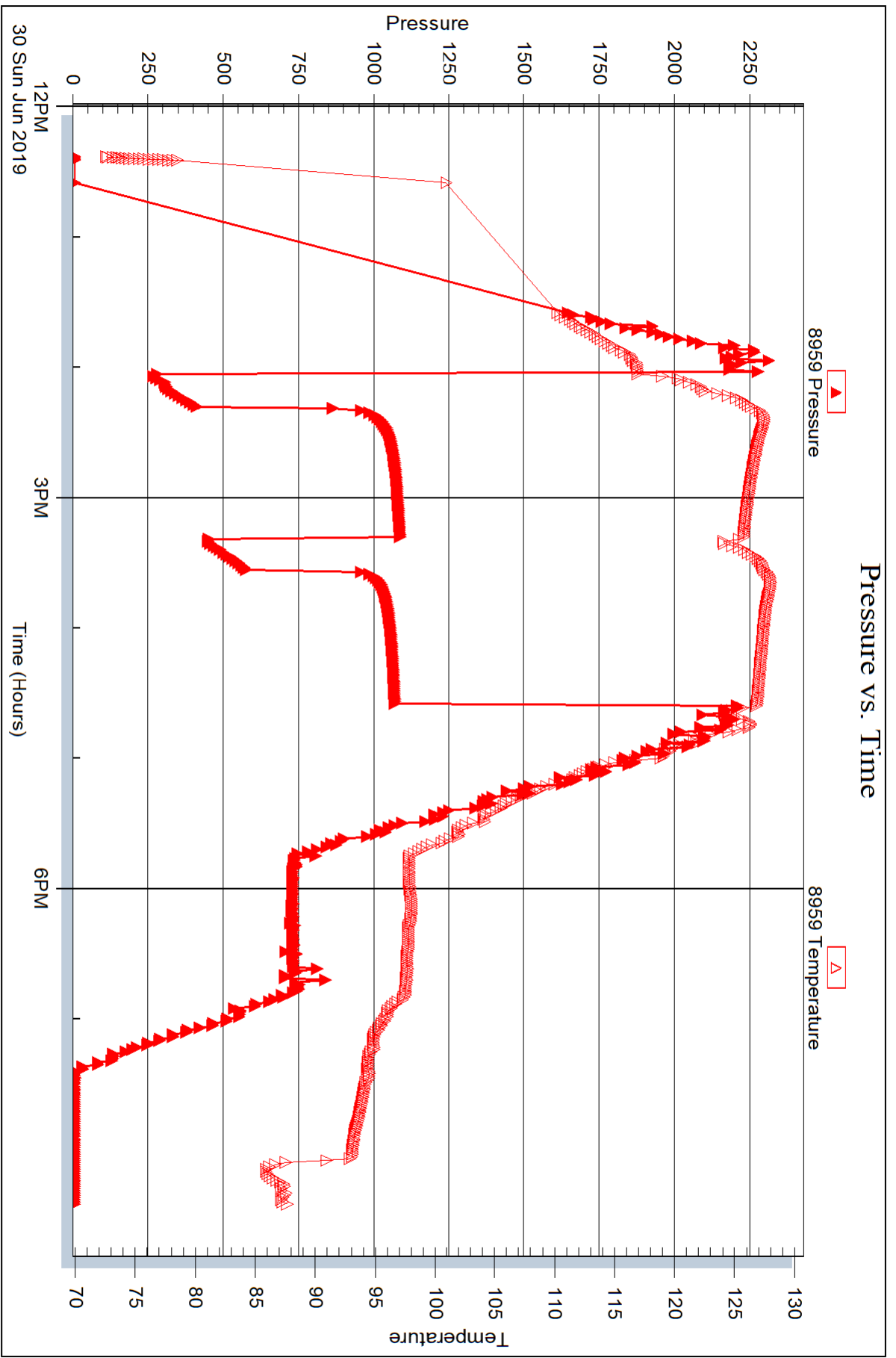
Serial #: 8959

Inside

Murfin Drilling Co Inc

Vanava #4-5

DST Test Number: 6



Trilobite Testing, Inc

Ref. No: 64360

Printed: 2019.07.03 @ 13:55:57



DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co INC**

250 N. Water STE 300
Wichita, KS 67202

ATTN: Tom Funk

Vanava #4-5

5-13S-32W Logan,KS

Start Date: 2019.07.01 @ 18:20:00

End Date: 2019.07.02 @ 01:43:50

Job Ticket #: 64361 DST #: 7

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

Printed: 2019.07.03 @ 13:55:09



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

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

5-13S-32W Logan,KS

Vanava #4-5

Job Ticket: 64361

DST#: 7

Test Start: 2019.07.01 @ 18:20:00

GENERAL INFORMATION:

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

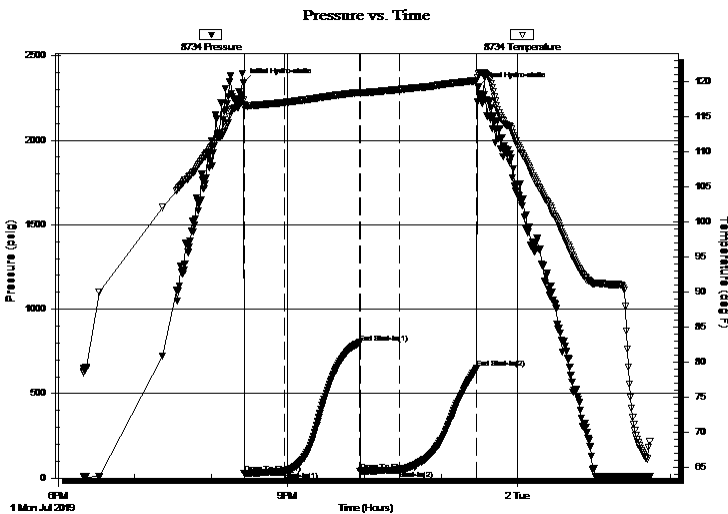
Serial #: 8734

Outside

Press@RunDepth: 47.75 psig @ 4515.00 ft (KB)
 Start Date: 2019.07.01 End Date: 2019.07.02
 Start Time: 18:20:01 End Time: 01:43:50
 Capacity: 8000.00 psig
 Last Calib.: 2019.07.02
 Time On Btm: 2019.07.01 @ 20:25:30
 Time Off Btm: 2019.07.01 @ 23:29:09

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

PRESSURE SUMMARY



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

Recovery

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

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co INC

5-13S-32W Logan,KS

250 N. Water STE 300
Wichita, KS 67202

Vanava #4-5

Job Ticket: 64361

DST#: 7

ATTN: Tom Funk

Test Start: 2019.07.01 @ 18:20:00

Tool Information

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

Tool Comments:

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

Total Tool Length: 99.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co INC

5-13S-32W Logan,KS

250 N. Water STE 300
Wichita, KS 67202

Vanava #4-5

Job Ticket: 64361

DST#: 7

ATTN: Tom Funk

Test Start: 2019.07.01 @ 18:20:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 50.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.59 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 3900.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

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

Total Length: 15.00 ft Total Volume: 0.074 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

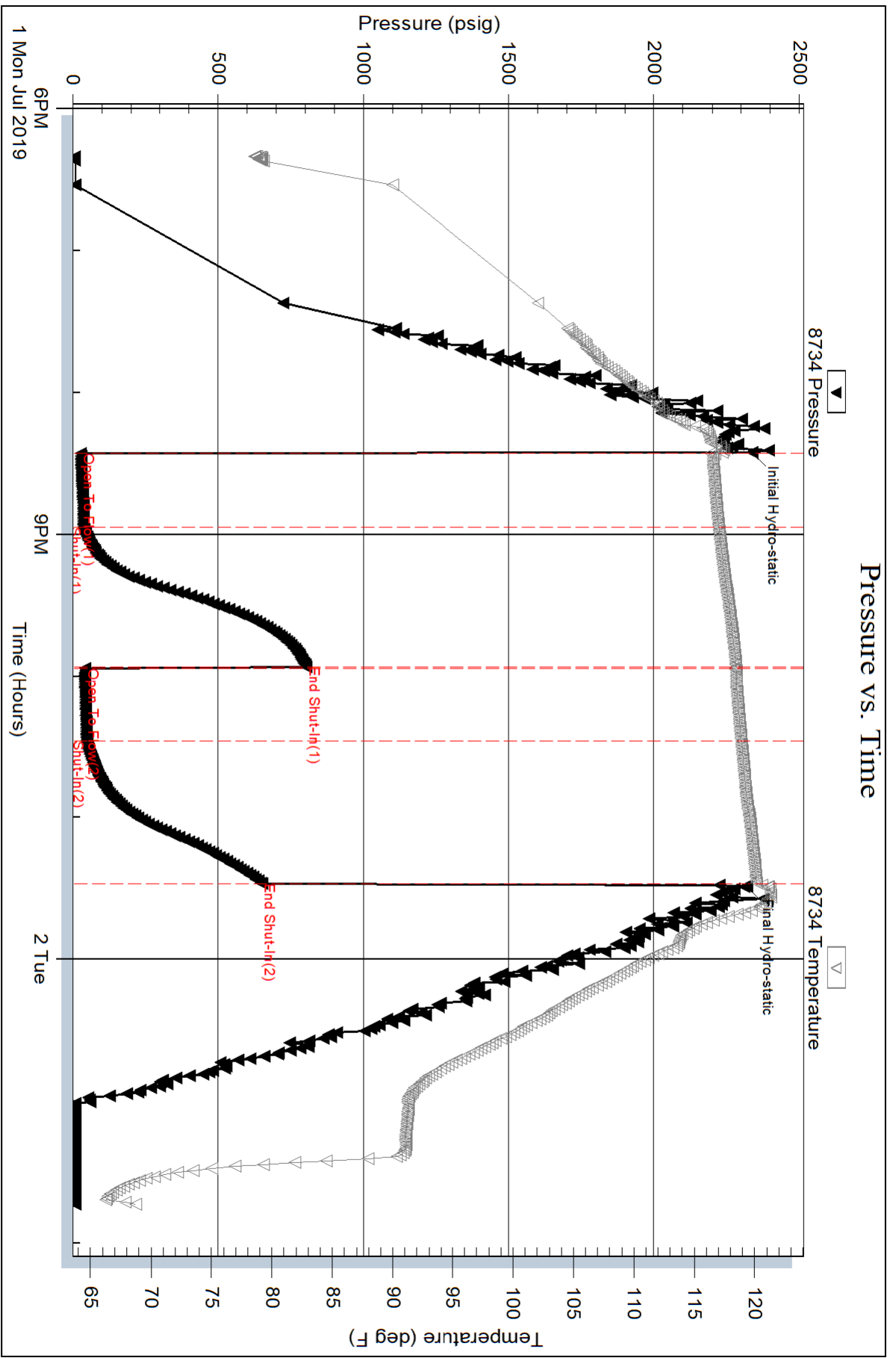
Recovery Comments:

Serial #: 8734

Outside Murfin Drilling Co INC

Vanava #4-5

DST Test Number: 7



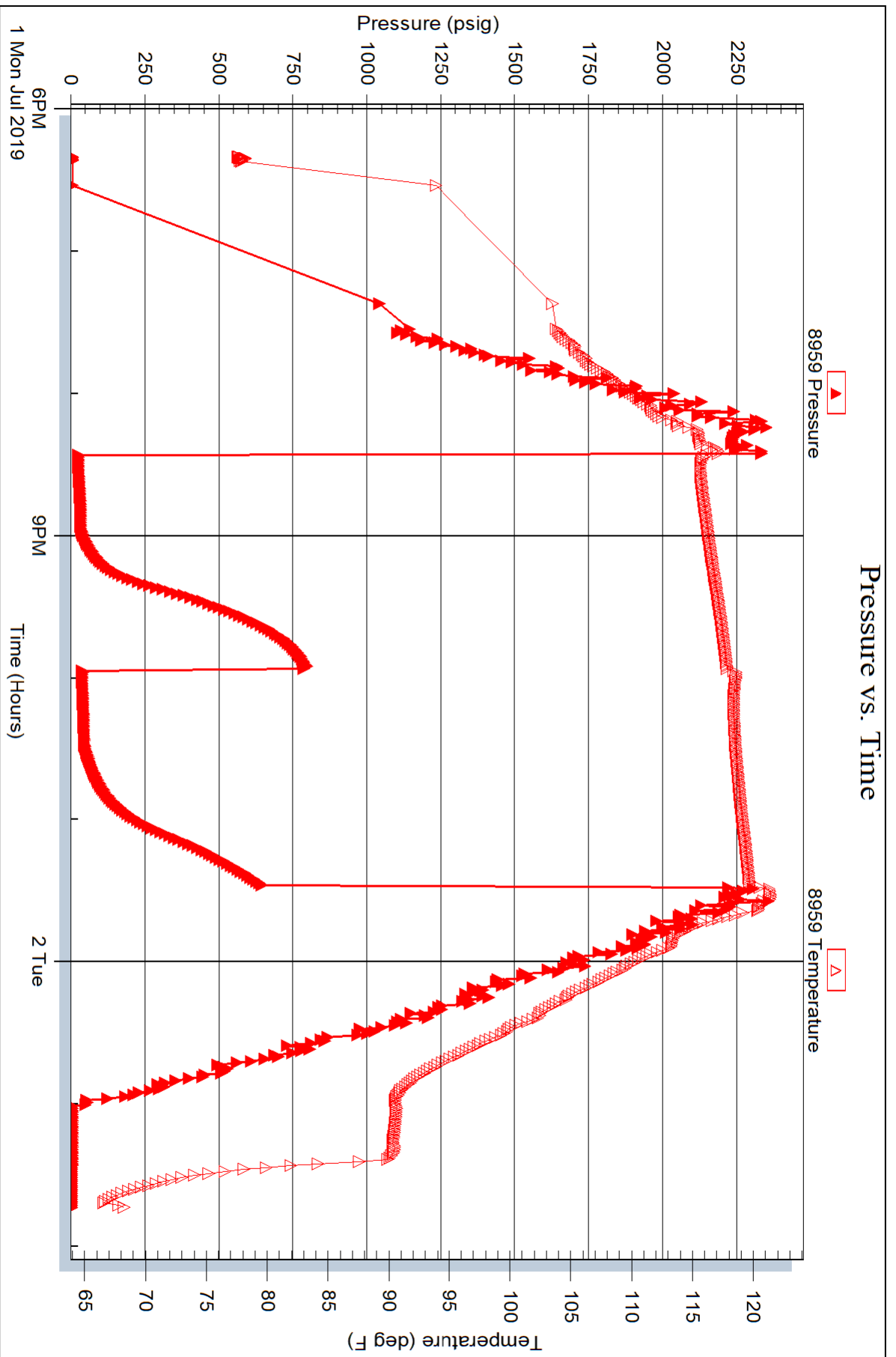
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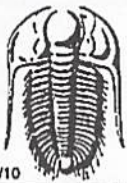
Inside

Murfin Drilling Co INC

Vanava #4-5

DST Test Number: 7





TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. **64354**

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

Interval Tested 4027-4070 Zone Tested Lansing "B-D"
 Anchor Length 43' Drill Pipe Run 3732 Mud Wt. 9.0
 Top Packer Depth 4022 Drill Collars Run 274 Vis 53
 Bottom Packer Depth 4027 Wt. Pipe Run — WL 6.4
 Total Depth 4070 Chlorides 3000 ppm System LCM 4#
 Blow Description IF - 1/4" blow built to B.O.B (11 inches) @ 10 1/2 mins (blow increased to 25 3/4")
ISI - No blowback
FF - S. blow built to B.O.B (11 inches) @ 15 mins (blow increased to 36")
FSI - No blowback

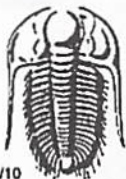
Rec	Feet of	%gas	%oil	%water	%mud
<u>615</u>	<u>M5W</u>		<u>95</u>	<u>5</u>	
<u>250</u>	<u>MCW / oil specks</u>	<u>41</u>	<u>75</u>	<u>25</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

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

(A) Initial Hydrostatic <u>2007</u>	<input checked="" type="checkbox"/> Test <u>1300</u>	T-On Location <u>03:00</u>
(B) First Initial Flow <u>39</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>05:10</u>
(C) First Final Flow <u>237</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>07:12</u>
(D) Initial Shut-In <u>1061</u>	<input type="checkbox"/> Circ Sub	T-Pulled <u>11:12</u>
(E) Second Initial Flow <u>236</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>13:53</u>
(F) Second Final Flow <u>417</u>	<input checked="" type="checkbox"/> Mileage <u>84 RT.</u> <u>84</u>	Comments
(G) Final Shut-In <u>1025</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>1956</u>	<input type="checkbox"/> Straddle	<input type="checkbox"/> Ruined Shale Packer
Initial Open <u>30</u>	<input type="checkbox"/> Shale Packer	<input type="checkbox"/> Ruined Packer
Initial Shut-In <u>60</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Extra Copies
Final Flow <u>60</u>	<input type="checkbox"/> Extra Recorder	Sub Total <u>0</u>
Final Shut-In <u>90</u>	<input type="checkbox"/> Day Standby	Total <u>1709</u>
	<input type="checkbox"/> Accessibility	MP/DST Disc't
	Sub Total <u>1709</u>	

Approved By Tom Funk Our Representative Montana Palmer

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



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 64355

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

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

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

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

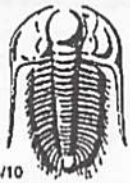
Rec Total 641 BHT 120 Gravity 34.6 API RW --- @ --- °F Chlorides --- ppm

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

Initial Open <u>30</u>	<input type="checkbox"/> Shale Packer	
Initial Shut-In <u>60</u>	<input type="checkbox"/> Shale Packer	
Final Flow <u>60</u>	<input type="checkbox"/> Extra Packer	
Final Shut-In <u>90</u>	<input type="checkbox"/> Extra Recorder	
	<input type="checkbox"/> Day Standby	Sub Total <u>0</u>
	<input type="checkbox"/> Accessibility	Total <u>1709</u>
	Sub Total <u>1709</u>	MP/DST Disc't <u>---</u>

Approved By [Signature] Our Representative [Signature]

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



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. **64356**

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

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

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

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

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

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

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

Approved By [Signature] Our Representative Martin Salinas

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



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 64358

4/10

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

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

Rec	Feet of	%gas	%oil	%water	%mud
275	SMOCW	8	87	5	
600	G.SOMCW	18	53	19	
665	G.SMWO	7	68	8	
10	CO	100			
0	180' GIP				
Rec Total	950	BHT	121	Gravity	32.4

API RW .090 @ 96. °F Chlorides 63,000 ppm

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

Sub Total 1709

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

Approved By [Signature]

Our Representative [Signature]

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 64359

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

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

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

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

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

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

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

Approved By [Signature] Our Representative [Signature]

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 64360

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

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

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

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

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

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

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

Approved By Tom Funk Our Representative Marko Polina

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 64361

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

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

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

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

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

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

Approved By [Signature] Our Representative [Signature]

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