

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](mailto: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	CWA E 1-17
Doc ID	1372462

All Electric Logs Run

DIL
DUCP
MEL
BHCS



MDCI  
 CWA 'E' #1-17  
 1100' FNL 330'FEL  
 Sec. 17-3S-35W  
 3258' KB

Formation	Sample top	Datum	Ref	Log tops	Datum	Ref
Anhydrite	3042	+216	+8	3040	+218	+10
B/Anhydrite	3084	+174	+9	3082	+176	+11
Topeka	3964	-706	+7	3955	-697	+16
Oread	4082	-824	+7	4077	-819	+12
Lansing	4164	-906	+10	4160	-902	+14
Stark	4373	-1115	+10	4371	-1113	+12
Mound City				4419	-1161	+12
Ft Scott	4548	-1290	+14	4549	-1291	+13
Oakley	4618	-1360	+9	4622	-1364	+5
Mississippi	4820	-1562	-3	4813	-1555	+4
RTD	4900					
LTD				4902		

**TREATMENT REPORT**



**HURRICANE SERVICES INC**

<b>Customer:</b>	Murfin Drilling Company Inc.	<b>Date:</b>	9/12/2017	<b>Ticket No.:</b>	100802
<b>Field Rep:</b>	Arturo				
<b>Address:</b>					
<b>City, State:</b>					
<b>County, Zip:</b>					

<b>Field Order No.:</b>	100802	<b>Open Hole:</b>		<b>Perf Depths (ft)</b>	<b>Perfs</b>
<b>Well Name:</b>	CWA E 1-17	<b>Casing Depth:</b>	344'		
<b>Location:</b>	McDonald	<b>Casing Size:</b>	8.625 23 Lb		
<b>Formation:</b>		<b>Tubing Depth:</b>			
<b>Type of Service:</b>	8 5/8 Surface	<b>Tubing Size:</b>			
<b>Well Type:</b>	Oil	<b>Liner Depth:</b>			
<b>Age of Well:</b>	New	<b>Liner Size:</b>			
<b>Packer Type:</b>		<b>Liner Top:</b>			
<b>Packer Depth:</b>		<b>Liner Bottom:</b>			
<b>Treatment Via:</b>	Casing	<b>Total Depth:</b>	345'	<b>Total Perfs</b>	0

TIME	INJECTION RATE		PRESSURE		REMARKS	PROP (lbs)	HCL (gls)	FLUID (bbls)
	FLUID	N2/CO2	STP	ANNULUS				
2:00 PM					Called Out			
5:30 PM					On location with Trucks Hold Safety Meeting			
					Spot & Set Up Trucks			
					TD= 346' TP= 344.81 SJ=20'			
					Run 8 Jt's 23 Lb Csg Set @ 344' Centralizers Jt 1/2 1 Jt 4			
6:00 PM					Start Casing			
6:30 PM					Casing On Bottom			
6:45 PM					Hook Up To Casing & Break Circulation W/Rig			
7:10 PM	4.0		190.0		Start Pumping H2O			15.00
	4.0		300.0		Start Mix 285 Sacks Common 2%Gel 3% C.C. @ 15 Lb/Gal			69.03
	4.0		145.0		Start Displacement H2O			20.77
7:30 PM			200.0		Shut Down			
					Good Circulation Thru Job			
					Circulate 6 Bbl's Cement To Pit			
					Off Location			
					Thank You			
					Please Call Again			
					Todd Cody Brad Brandon			
<b>TOTAL:</b>								104.80

**SUMMARY**

Max Fl. Rate	Avg Fl. Rate	Max PSI	Avg PSI
4.0	4.0	300.0	208.8

**PRODUCTS USED**

285 Sacks Common 2%Gel 3% Calcium Chloride

Treater: Tony P

Customer: Arturo Cabezas

TREATMENT REPORT



HURRICANE SERVICES INC

TIME	INJECTION RATE		PRESSURE		REMARKS	PROP (lbs)	HCL (gls)	FLUID (bbls)
FLUID	N2/CO2	STP	ANNULUS					
					Plug 4 15 Sacks @ 40'			
7:00 AM	3.5		60.0		Start Mixing Cement			3.79
					Plug 5 15 Sacks Rat Hole			
7:15 AM	3.5		90.0		Start Mixing Cement			3.79
					Plug 6 15 Sacks Mouse Hole			
7:20 AM	3.5		80.0		Start Mixing Cement			3.79
					Clean Pump And Lines			
8:00 AM					Off Location			
					Thank You			
					Please Call Again			
					Tony Cody Brad Brandon			

Activity provided on this page is calculated in the summary and totals on page 1

### CEMENTING LOG

Company	Murfin Drilling	Lease	0	Well Name/No.	CWA E1-17
Type Job	Longstring	Type & Amt Material	300 sx h-con 200 sx h-long		
Field	0	Ticket Number	50152		
<b>CASING DATA</b>					
Size	5.5"	Type	j-55	Weight	17#
Casing Depths:	Top	0	Bottom	4898	Collar
Drill Pipe:	Size	Weight	Collars		
Open Hole:	Size 7.825"	T.O. (ft)	4900'	P.B. to (ft)	
<b>CAPACITY FACTORS</b>					
Casing	Bbbs/Lin. ft.	0.0238		Lin. ft./Bbl	
Open Holes	Bbbs/Lin. ft.	0.0602		Lin. ft./Bbl	
Drill Pipes	Bbbs/Lin. ft.			Lin. ft./Bbl	
Annulus	Bbbs/Lin. ft.	0.0309		Lin. ft./Bbl	
	Bbbs/Lin. ft.			Lin. ft./Bbl	
Perforations	From (ft)	To	Amount		
<b>CEMENT DATA</b>					
Spacer Type	Mudflush				
Amt.	500 gal	Sks Yield	ft <sup>3</sup> /sk		Density (PPG)
<b>LEAD</b>					
Pump Time (hrs)	Type		h-con		Excess
Amt.	300	Sks Yield	2.6	ft <sup>3</sup> /sk	Density (PPG) 12#
<b>TAIL</b>					
Pump Time (hrs)	Type		h-long		Excess
Amt.	200	Sks Yield	1.5	ft <sup>3</sup> /sk	Density (PPG) 14.8#
<b>WATER</b>					
Lead	15.69	gals/sk	Tail	6.61	gals/sk Total (Bbbs.) 143.54
Pump Trucks Used					230
Bulk Equipment					
240 and 242					
Float Equipment: Manufacturer	Industrial Rubber				
Shoe: Type	AFU				Depth 4898
Float: Type					
Centralizers: Quantity	15		Plugs: Top	LDP	
Stage Collars					
Special Equipment	Baskets				
Disp. Fluid Type	2% KCL water		Amt. (Bbbs.)		Weight (PPG)
Mud Type	WBM				Weight (PPG) 9.3-9.5

COMPANY REPRESENTATIVE Ben CEMENTER Jake Heard

TIME	PRESSURES PSI		FLUID PUMPED DATA			REMARKS
	DRILL PIPE CASING	ANNULUS	TOTAL FLUID	PUMPED/TIME PERIOD	RATE (BBLS MIN.)	
1:30 AM						On location safety meeting
						Spot in and rig up
						Run float equipment
						On bottom Circulating
						Hook up to casing
7:40 AM	320		5		5	Pump water
	320		12		5	Pump Mudflush
	320		5		5	Pump water
7:50 AM	200		13		2	Plug rat and mouse holes
7:58	300		141		5	Mix and pump lead cement
8:40	400		53		6	Mix and pump tail cement
						Stop
						Wash pump and lines
						Release plug
9:03 AM	0		1		6	Displace
	1400		108		3	Slow rate
9:31 AM	2200		116		3	Bump plug
						Check Floats
9:45 AM						Rig down and leave location





**GEOLOGIST'S REPORT**

OPERATOR: MURFIN DRILLING COMPANY, INC.  
LEASE: CWA 'E' # 1-17

ELEVATIONS  
K8 3255 FT.  
K9 3256 FT.

LOCATION: 1100 FNL & 330 FWL  
SEC. 17 TWSP 3S RGE 35W  
COUNTY: RAWLINS STATE: KANSAS  
FIELD: WILDCAT

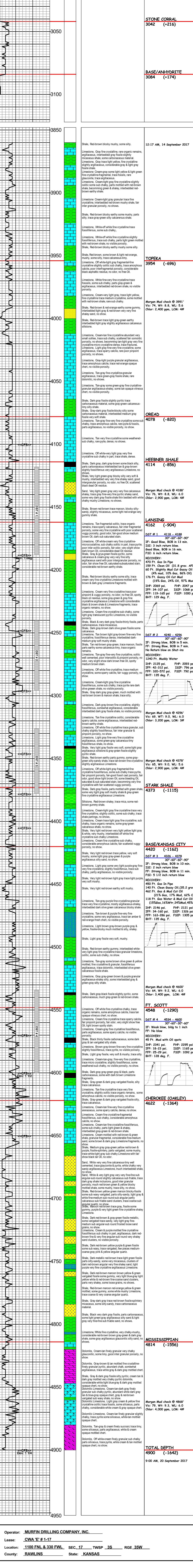
CONTRACTOR: Murfin Drilling Co. RIG NO. 24  
COMMENCED: 12 Sept. 2017 COMPLETED: 22 Sept. 2017  
MUD DISPLACED: 3505 MUD TYPE: Chem/B  
DRAINING TIME: KEPT FROM 3600 TO 4900  
SAMPLES SAVED FROM: 3600 TO 4900  
SAMPLES EXAMINED FROM: 3600 TO 4900

GEOLOGICAL SUPERVISION FROM: 3753 TO 4900  
GEOLOGIST ON WELL: Paul Guizelmann

FORMATION NAME LOG TOP DATUM TOP DATUM SAMPLE DATE

REMARKS  
API 15-153-21200-00-00  
Drilling Fluids: Morgan Mud, Inc. (David Lines, engineer)  
Drill Stem Testing: Triobite Testing, Inc. (James Winder, tester)  
Gas Trailer: No Gas Trailer  
Reserve Pit Chlorides: 7.900 PPM

DRILL TIME (MIN/FT) DEPTH LITHOLOGY SHOWS SAMPLE DESCRIPTIONS REMARKS



STONE CORRAL  
3042 (+216)

BASE/ANHYDRITE  
3084 (+174)

12:17 AM, 14 September 2017

TOPEKA  
3954 (-696)

Morgan Mud check @ 3991'  
Vis: 74, Wt: 8.8, WL: 5.6  
Chlor: 2,400 ppm, LCM: 4#

OREAD  
4078 (-820)

HIEBNER SHALE  
4114 (-856)

Morgan Mud check @ 4188'  
Vis: 76, Wt: 8.8, WL: 6.0  
Chlor: 2,900 ppm, LCM: 4#

LANSING  
4162 (-904)

DST # 1 4118 - 4188  
30"-60"-60"-90"  
IF: Good Blow, BOB in 13 min.  
ISI: 3 inch return blow  
Good Blow, BOB in 16 min.  
FSI: 6 inch return blow.  
RECOVERY:  
470 Ft. Gas In Pipe  
159 Ft. Clean Oil (31.8 grav. API)  
60 Ft. Slightly Mud Cut Gassy Oil  
(4% mud, 10% Gas, 86% Oil)  
176 Ft. Gassy Oil Cut Mud  
(19% Gas, 24% Oil, 57% Mud)  
IHP: 2069 psi. FHP: 2047 psi.  
IFP: 34-107 psi. ISIP: 1068 psi.  
FFP: 119-165 psi. FSDP: 1000 psi.  
BHT: 129 deg. F.

DST # 2 4240 - 4296  
30"-60"-60"-90"  
IF: Strong blow, BOB in 5 min.  
FF: Strong Blow, BOB in 7 min.  
No Return Blow on Shut-ins  
RECOVERY:  
1240 Ft. Muddy Water  
IHP: 2125 psi. FHP: 2093 psi.  
IFP: 42-312 psi. ISIP: 796 psi.  
FFP: 320-572 psi. FSDP: 792 psi.  
BHT: 135 deg. F.

Morgan Mud check @ 4378'  
Vis: 65, Wt: 9.0, WL: 6.0  
Chlor: 3,200 ppm, LCM: 4#

STARK SHALE  
4373 (-1115)

BASE/KANSAS CITY  
4420 (-1162)

DST # 3 4326 - 4378  
30"-60"-60"-90"  
IF: Strong blow, BOB in 10 min.  
FF: Strong blow, BOB in 11 min.  
FSI: 5 1/2 inch return blow  
RECOVERY:  
450 Ft. Gas In Pipe  
140 Ft. Clean Gassy Oil (35.2 grav.)  
462 Ft. Gas & Mud Cut Oil  
(21% Gas, 17% Mud, 62% Oil)  
118 Ft. Gas Water & Mud Cut Oil  
(15%Gas, 16%Wtr, 24%Mud, 45%Oil)  
IHP: 2146 psi. FHP: 2121 psi.  
IFP: 34-160 psi. ISIP: 1326 psi.  
FFP: 163-286 psi. FSDP: 1305 psi.  
BHT: 135 deg. F.

Morgan Mud check @ 4600'  
Vis: 64, Wt: 9.2, WL: 6.0  
Chlor: 3,400 ppm, LCM: 4#

FT. SCOTT  
4548 (-1290)

DST # 4 4534 - 4600  
30"-60"-30"-60"  
IF: Weak blow, bldg to 1 inch  
FF: No blow  
RECOVERY:  
45 Ft. Mud with Oil spots  
IHP: 2341 psi. FHP: 2295 psi.  
IFP: 18-23 psi. ISIP: 1165 psi.  
FFP: 25-29 psi. FSDP: 1092 psi.  
BHT: 128 deg. F.

CHEROKEE (OAKLEY)  
4622 (-1364)

MISSISSIPPIAN  
4814 (-1556)

Morgan Mud check @ 4868'  
Vis: 79, Wt: 9.3, WL: 6.0  
Chlor: 4,000 ppm, LCM: 4#

TOTAL DEPTH  
4900 (-1642)

9:00 AM, 20 September 2017

Operator: MURFIN DRILLING COMPANY, INC.  
Lease: CWA 'E' # 1-17  
Location: 1100 FNL & 330 FWL SEC. 17 TWSP 3S RGE 35W  
County: RAWLINS State: KANSAS





## DRILL STEM TEST REPORT

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

250 N. Water STE 300  
Wichita, KS 67202

ATTN: Paul Gunzelman

**CWA 'E' #1-17**

**17-3s-35w Rawlins,KS**

Start Date: 2017.09.16 @ 01:00:00

End Date: 2017.09.16 @ 09:25:15

Job Ticket #: 63306                      DST #: 1

Trilobite Testing, Inc

PO Box 362 Hays, KS 67601

ph: 785-625-4778 fax: 785-625-5620

Printed: 2017.09.21 @ 08:50:38

Murfin Drilling Co., Inc  
17-3s-35w Rawlins,KS  
CWA 'E' #1-17  
DST # 1  
LKC "A"  
2017.09.16



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling Co., Inc

**17-3s-35w Rawlins,KS**

250 N. Water STE 300  
Wichita, KS 67202

**CWA 'E' #1-17**

Job Ticket: 63306

**DST#: 1**

ATTN: Paul Gunzelman

Test Start: 2017.09.16 @ 01:00:00

## GENERAL INFORMATION:

Formation: **LKC "A"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 03:05:00

Time Test Ended: 09:25:15

Test Type: Conventional Bottom Hole (Initial)

Tester: James Winder

Unit No: 83

**Interval: 4118.00 ft (KB) To 4188.00 ft (KB) (TVD)**

Reference Elevations: 3258.00 ft (KB)

Total Depth: 4188.00 ft (KB) (TVD)

3253.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 5.00 ft

**Serial #: 8017 Outside**

Press@RunDepth: 164.61 psig @ 4119.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2017.09.16

End Date:

2017.09.16

Last Calib.:

2017.09.16

Start Time: 01:00:05

End Time:

09:25:14

Time On Btm:

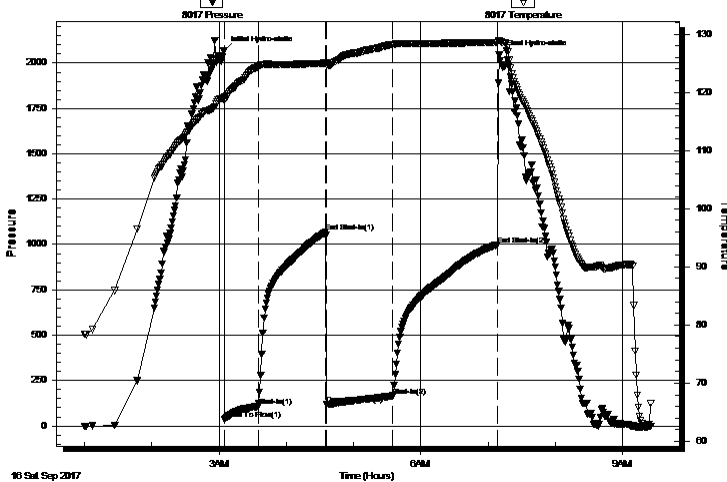
2017.09.16 @ 03:04:45

Time Off Btm:

2017.09.16 @ 07:10:00

**TEST COMMENT:** 30 - IF: Blow built to BOB (11") at 13 3/4 min.  
60 - IS: Blow back built to 3"  
60 - FF: Blow built to BOB at 16 1/4 min.  
90 - FS: Blow back built to 6 1/2"

Pressure vs. Time



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2068.57	119.25	Initial Hydro-static
1	34.11	118.55	Open To Flow (1)
31	107.17	124.40	Shut-In(1)
91	1067.67	125.00	End Shut-In(1)
91	119.03	124.66	Open To Flow (2)
151	164.61	128.20	Shut-In(2)
244	999.97	128.61	End Shut-In(2)
246	2046.83	128.85	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
176.00	GOCM 57%o, 24%g, 19%g	0.87
60.00	SMCGO 86%o, 10%g, 4%m	0.58
159.00	CGO 71%o, 28%g, 1%m	2.23
0.00	GIP = 470'	0.00

## Gas Rates

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



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

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

**17-3s-35w Rawlins, KS**

**CWA 'E' #1-17**

Job Ticket: 63306

**DST#: 1**

Test Start: 2017.09.16 @ 01:00:00

## GENERAL INFORMATION:

Formation: **LKC "A"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 03:05:00

Time Test Ended: 09:25:15

Test Type: Conventional Bottom Hole (Initial)

Tester: James Winder

Unit No: 83

**Interval: 4118.00 ft (KB) To 4188.00 ft (KB) (TVD)**

Total Depth: 4188.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 3258.00 ft (KB)

3253.00 ft (CF)

KB to GR/CF: 5.00 ft

**Serial #: 6625**

**Inside**

Press@RunDepth: psig @ 4119.00 ft (KB)

Start Date: 2017.09.16

End Date:

2017.09.16

Start Time: 01:00:05

End Time:

09:25:44

Capacity: 8000.00 psig

Last Calib.:

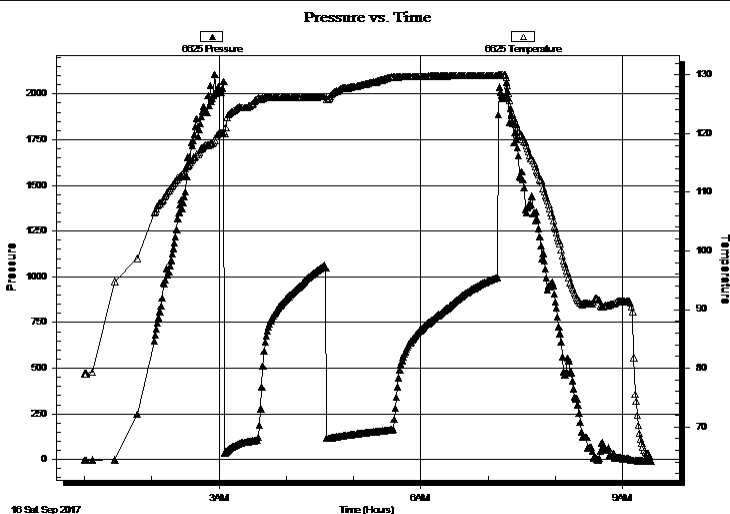
2017.09.16

Time On Btm:

Time Off Btm:

**TEST COMMENT:** 30 - IF: Blow built to BOB (11") at 13 3/4 min.  
60 - IS: Blow back built to 3"  
60 - FF: Blow built to BOB at 16 1/4 min.  
90 - FS: Blow back built to 6 1/2"

## PRESSURE SUMMARY



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

## Recovery

Length (ft)	Description	Volume (bbl)
176.00	GOCM 57% <i>m</i> , 24% <i>o</i> , 19% <i>g</i>	0.87
60.00	SMCGO 86% <i>o</i> , 10% <i>g</i> , 4% <i>m</i>	0.58
159.00	CGO 71% <i>o</i> , 28% <i>g</i> , 1% <i>m</i>	2.23
0.00	GIP = 470'	0.00

## Gas Rates

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



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co., Inc

**17-3s-35w Rawlins,KS**

250 N. Water STE 300  
Wichita, KS 67202

**CWA 'E' #1-17**

Job Ticket: 63306

**DST#: 1**

ATTN: Paul Gunzelman

Test Start: 2017.09.16 @ 01:00:00

## Tool Information

Drill Pipe:	Length: 3899.00 ft	Diameter: 3.80 inches	Volume: 54.69 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: 20000.00 lb
Drill Collar:	Length: 205.00 ft	Diameter: 2.25 inches	Volume: 1.01 bbl	Weight to Pull Loose: 60000.00 lb
			<u>Total Volume: 55.70 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	15.00 ft			String Weight: Initial 56000.00 lb
Depth to Top Packer:	4118.00 ft			Final 58000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	70.00 ft			
Tool Length:	99.00 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			4090.00	
Shut In Tool	5.00			4095.00	
Hydraulic tool	5.00			4100.00	
Jars	5.00			4105.00	
Safety Joint	3.00			4108.00	
Packer	5.00			4113.00	29.00 Bottom Of Top Packer
Packer	5.00			4118.00	
Stubb	1.00			4119.00	
Recorder	0.00	6625	Inside	4119.00	
Recorder	0.00	8017	Outside	4119.00	
Perforations	29.00			4148.00	
Blank Spacing	33.00			4181.00	
Perforations	4.00			4185.00	
Bullnose	3.00			4188.00	70.00 Bottom Packers & Anchor

**Total Tool Length: 99.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co., Inc

**17-3s-35w Rawlins,KS**

250 N. Water STE 300  
Wichita, KS 67202

**CWA 'E' #1-17**

Job Ticket: 63306

**DST#: 1**

ATTN: Paul Gunzelman

Test Start: 2017.09.16 @ 01:00:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

31.8 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 75.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.57 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2400.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
176.00	GOCM 57% <sub>m</sub> , 24% <sub>o</sub> , 19% <sub>g</sub>	0.866
60.00	SMCGO 86% <sub>o</sub> , 10% <sub>g</sub> , 4% <sub>m</sub>	0.577
159.00	CGO 71% <sub>o</sub> , 28% <sub>g</sub> , 1% <sub>m</sub>	2.230
0.00	GIP = 470'	0.000

Total Length: 395.00 ft      Total Volume: 3.673 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

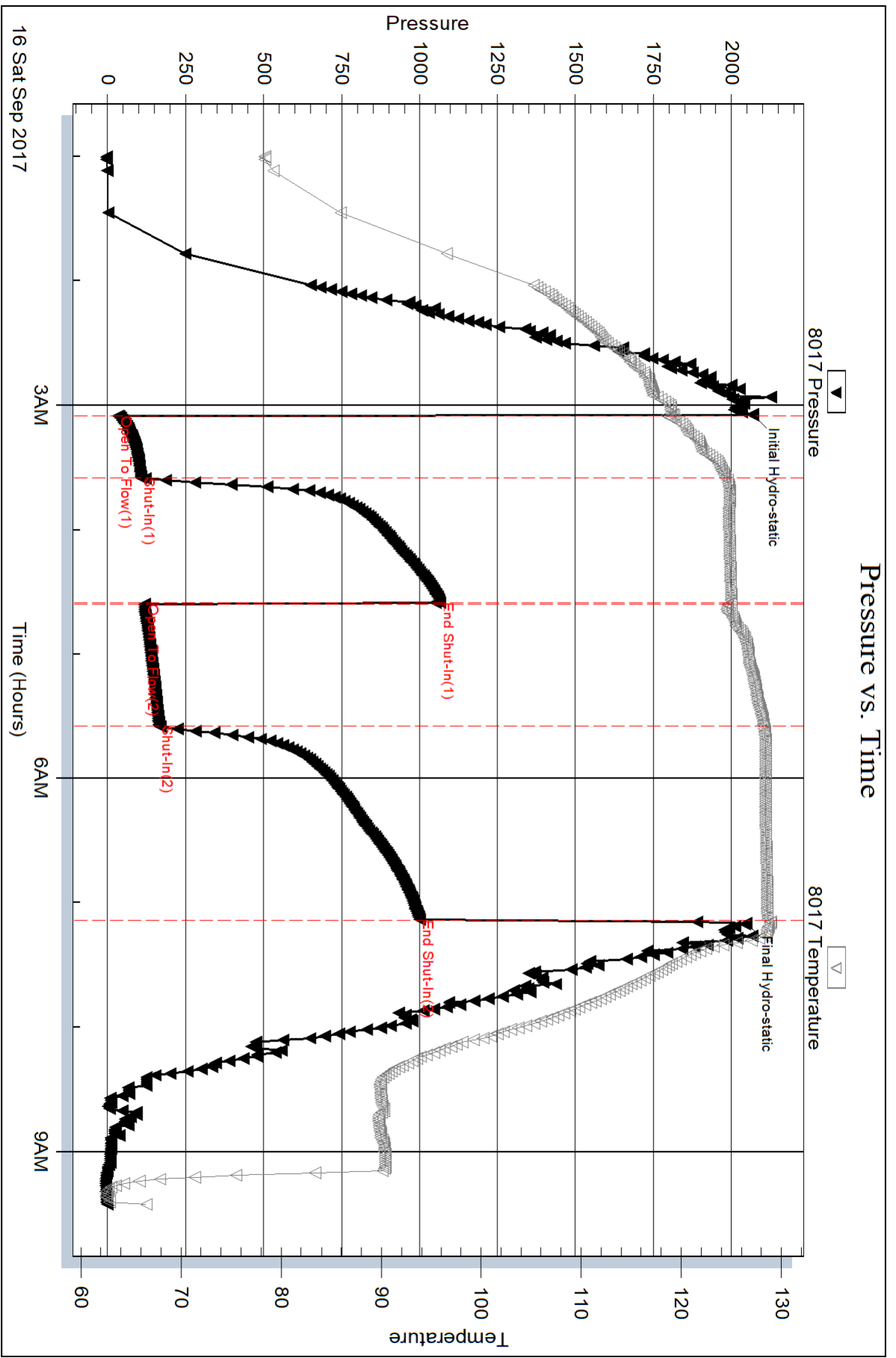
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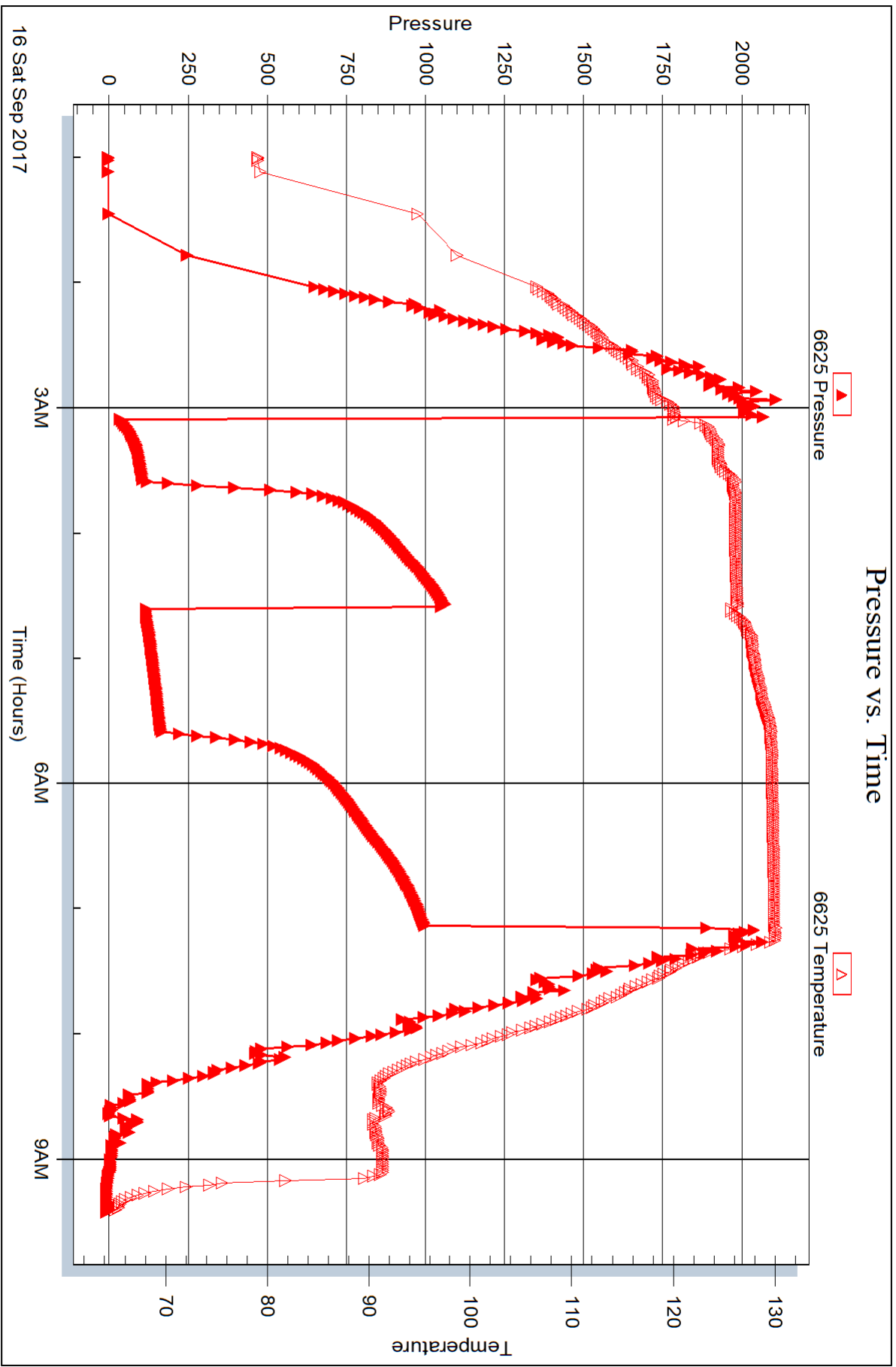
Laboratory Name:

Laboratory Location:

Recovery Comments: Gravity = 32 api @ 62 deg F

Corrected Gravity = 31.8 api









## DRILL STEM TEST REPORT

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

250 N. Water STE 300  
Wichita, KS 67202

ATTN: Paul Gunzelman

**CWA 'E' #1-17**

**17-3s-35w Rawlins,KS**

Start Date: 2017.09.17 @ 00:10:00

End Date: 2017.09.17 @ 08:49:00

Job Ticket #: 63307                      DST #: 2

Trilobite Testing, Inc

PO Box 362 Hays, KS 67601

ph: 785-625-4778 fax: 785-625-5620

Printed: 2017.09.21 @ 08:50:11



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

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

**17-3s-35w Rawlins,KS**  
**CWA 'E' #1-17**  
Job Ticket: 63307      **DST#: 2**  
Test Start: 2017.09.17 @ 00:10:00

## GENERAL INFORMATION:

Formation: **LKC "G"**  
Deviated: No Whipstock:      ft (KB)  
Time Tool Opened: 02:15:00  
Time Test Ended: 08:49:00  
**Interval: 4240.00 ft (KB) To 4296.00 ft (KB) (TVD)**  
Total Depth: 4296.00 ft (KB) (TVD)  
Hole Diameter: 7.88 inches Hole Condition: Fair  
Test Type: Conventional Bottom Hole (Reset)  
Tester: James Winder  
Unit No: 83  
Reference Elevations: 3258.00 ft (KB)  
3253.00 ft (CF)  
KB to GR/CF: 5.00 ft

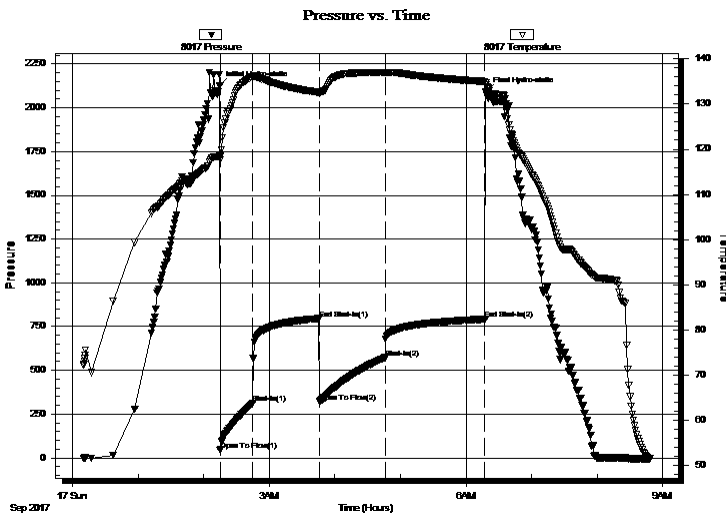
## Serial #: 8017

## Outside

Press@RunDepth: 572.47 psig @ 4241.00 ft (KB)      Capacity: 8000.00 psig  
Start Date: 2017.09.17      End Date: 2017.09.17      Last Calib.: 2017.09.17  
Start Time: 00:10:05      End Time: 08:49:00      Time On Btm: 2017.09.17 @ 02:14:45  
Time Off Btm: 2017.09.17 @ 06:18:30

**TEST COMMENT:** 30 - IF: Blow built to BOB (11") at 5 1/4 min.  
60 - IS: No blow back  
60 - FF: Blow built to BOB at 7 1/2 min.  
90 - FS: No blow back

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2125.07	118.66	Initial Hydro-static
1	41.82	117.67	Open To Flow (1)
31	311.98	135.93	Shut-In(1)
91	795.65	132.55	End Shut-In(1)
92	319.88	132.39	Open To Flow (2)
152	572.47	136.90	Shut-In(2)
243	791.81	134.98	End Shut-In(2)
244	2093.05	134.25	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
860.00	SMCW 95%w, 5%m	10.20
380.00	MW 54%w, 46%m	5.33

\* Recovery from multiple tests

## Gas Rates

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



**TRILOBITE  
TESTING, INC.**

## DRILL STEM TEST REPORT

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

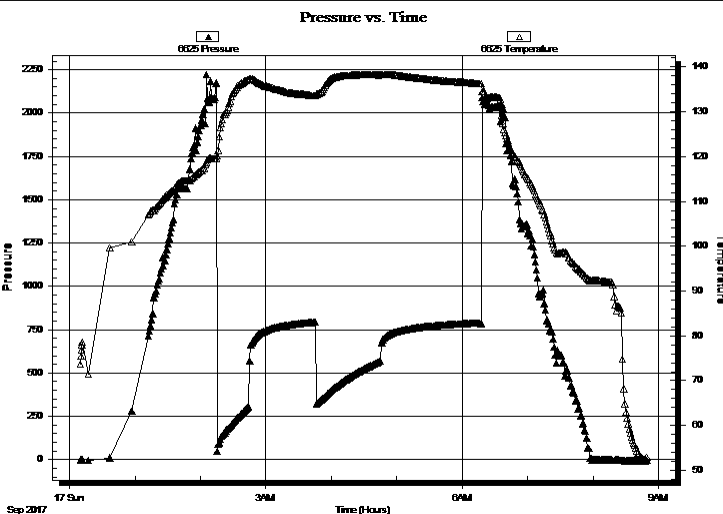
**17-3s-35w Rawlins,KS**  
**CWA 'E' #1-17**  
Job Ticket: 63307 **DST#: 2**  
Test Start: 2017.09.17 @ 00:10:00

### GENERAL INFORMATION:

Formation: **LKC "G"**  
Deviated: No Whipstock: ft (KB)  
Time Tool Opened: 02:15:00  
Time Test Ended: 08:49:00  
Interval: **4240.00 ft (KB) To 4296.00 ft (KB) (TVD)**  
Total Depth: 4296.00 ft (KB) (TVD)  
Hole Diameter: 7.88 inches Hole Condition: Fair  
Test Type: Conventional Bottom Hole (Reset)  
Tester: James Winder  
Unit No: 83  
Reference Elevations: 3258.00 ft (KB)  
3253.00 ft (CF)  
KB to GR/CF: 5.00 ft

**Serial #: 6625 Inside**  
Press@RunDepth: psig @ 4241.00 ft (KB) Capacity: 8000.00 psig  
Start Date: 2017.09.17 End Date: 2017.09.17 Last Calib.: 2017.09.17  
Start Time: 00:10:05 End Time: 08:49:15 Time On Btm:  
Time Off Btm:

TEST COMMENT: 30 - IF: Blow built to BOB (11") at 5 1/4 min.  
60 - IS: No blow back  
60 - FF: Blow built to BOB at 7 1/2 min.  
90 - FS: No blow back



### PRESSURE SUMMARY

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

### Recovery

Length (ft)	Description	Volume (bbl)
860.00	SMCW 95%w, 5%m	10.20
380.00	MW 54%w, 46%m	5.33

### 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

**17-3s-35w Rawlins,KS**

250 N. Water STE 300  
Wichita, KS 67202

**CWA 'E' #1-17**

Job Ticket: 63307

**DST#: 2**

ATTN: Paul Gunzelman

Test Start: 2017.09.17 @ 00:10:00

## Tool Information

Drill Pipe:	Length: 4025.00 ft	Diameter: 3.80 inches	Volume: 56.46 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: 205.00 ft	Diameter: 2.25 inches	Volume: 1.01 bbl	Weight to Pull Loose:	70000.00 lb
			<u>Total Volume: 57.47 bbl</u>	Tool Chased	0.00 ft
Drill Pipe Above KB:	19.00 ft			String Weight: Initial	58000.00 lb
Depth to Top Packer:	4240.00 ft			Final	62000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	56.00 ft				
Tool Length:	85.00 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			4212.00	
Shut In Tool	5.00			4217.00	
Hydraulic tool	5.00			4222.00	
Jars	5.00			4227.00	
Safety Joint	3.00			4230.00	
Packer	5.00			4235.00	29.00 Bottom Of Top Packer
Packer	5.00			4240.00	
Stubb	1.00			4241.00	
Recorder	0.00	6625	Inside	4241.00	
Recorder	0.00	8017	Outside	4241.00	
Perforations	15.00			4256.00	
Blank Spacing	33.00			4289.00	
Perforations	4.00			4293.00	
Bullnose	3.00			4296.00	56.00 Bottom Packers & Anchor

**Total Tool Length: 85.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co., Inc

**17-3s-35w Rawlins,KS**

250 N. Water STE 300  
Wichita, KS 67202

**CWA 'E' #1-17**

Job Ticket: 63307

**DST#: 2**

ATTN: Paul Gunzelman

Test Start: 2017.09.17 @ 00:10:00

## 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:

13000 ppm

Viscosity: 770.00 sec/qt

Cushion Volume:

bbbl

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

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2900.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
860.00	SMCW 95%w , 5%m	10.196
380.00	MW 54%w , 46%m	5.330

Total Length: 1240.00 ft      Total Volume: 15.526 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

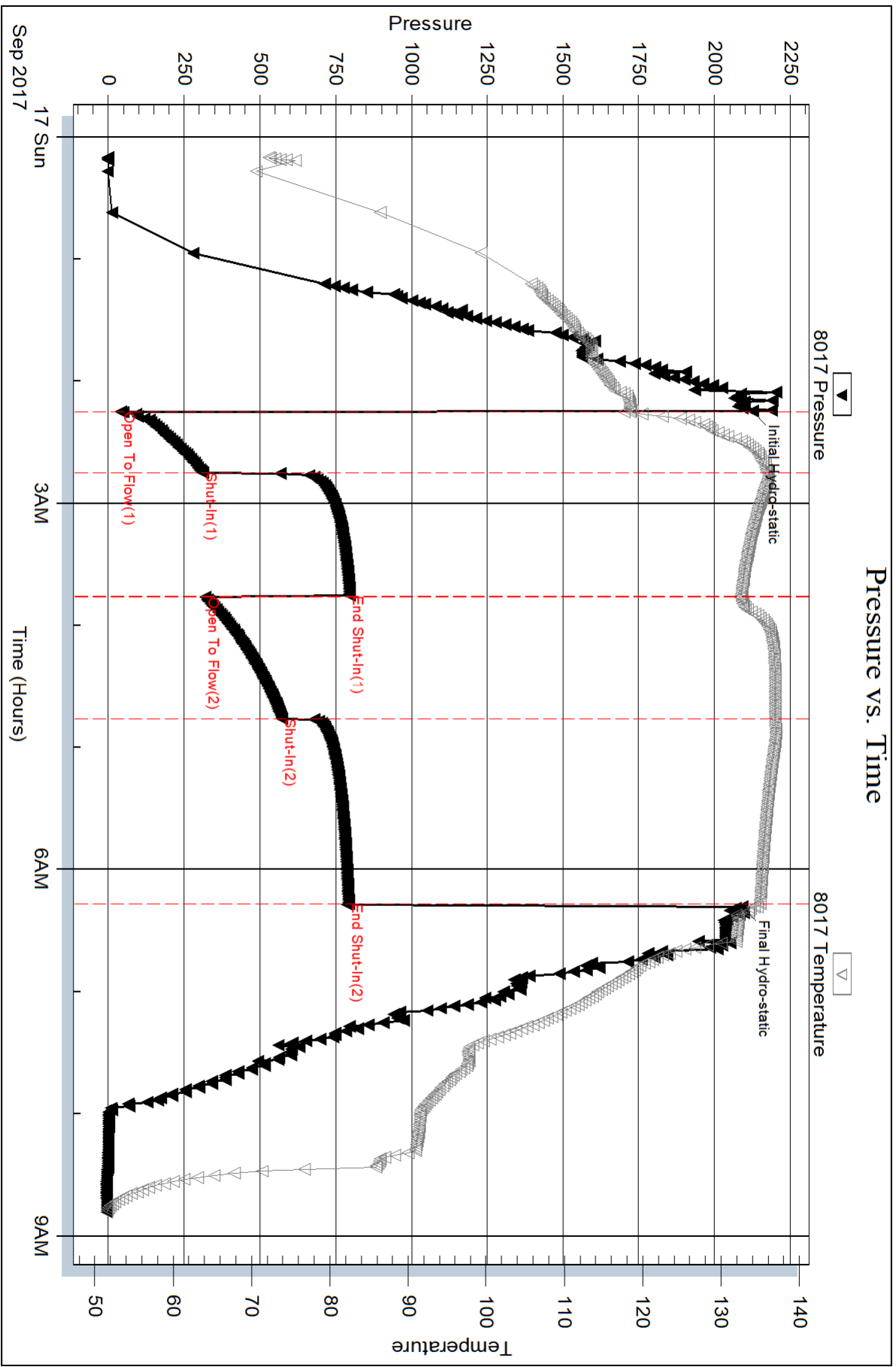
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW = .704 ohms @ 50.2 deg F

Chlorides = 13,000 ppm



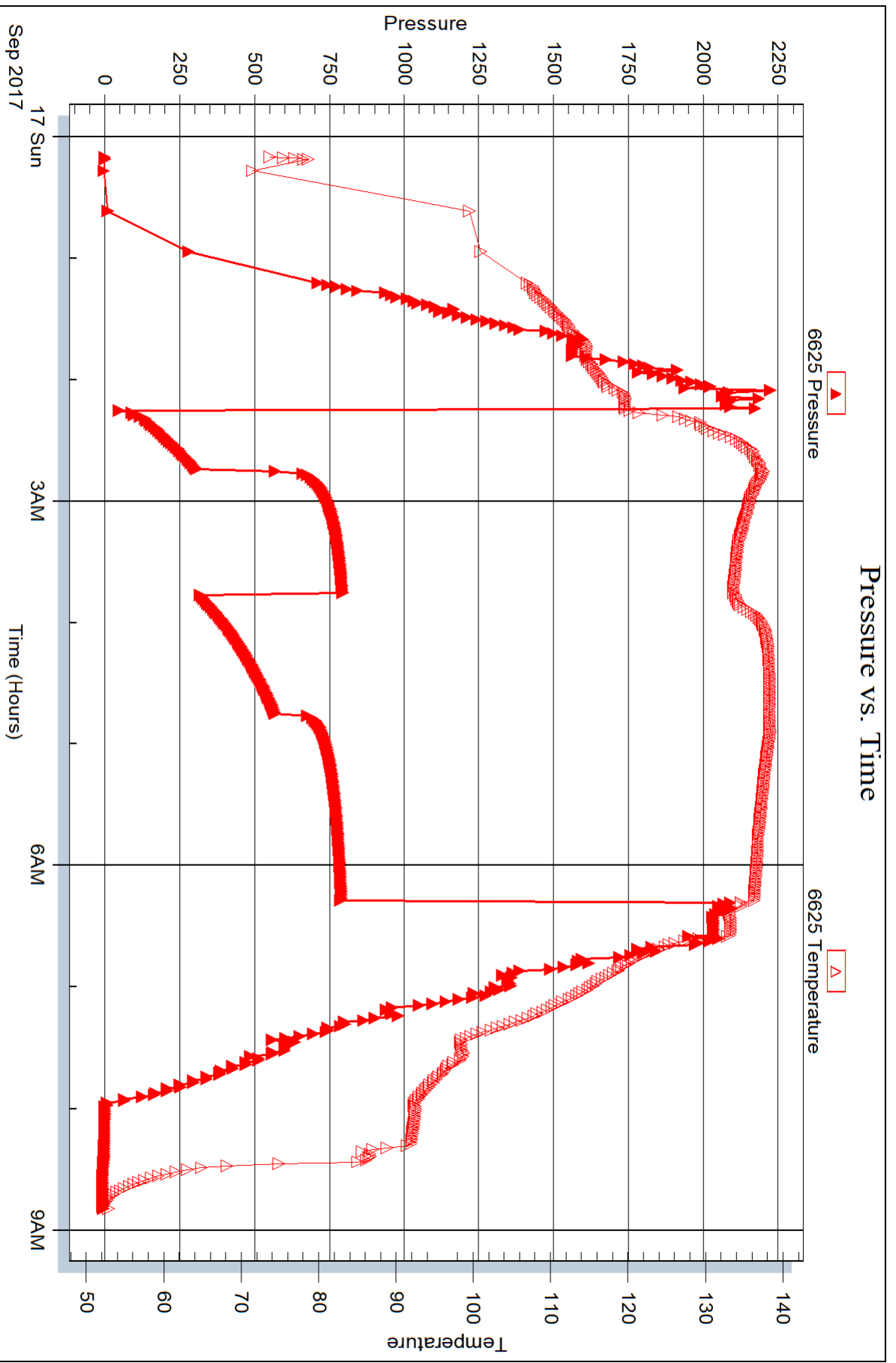
Serial #: 6625

Inside

Murfin Drilling Co., Inc

CWA E#1-17

DST Test Number: 2





## DRILL STEM TEST REPORT

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

250 N. Water STE 300  
Wichita, KS 67202

ATTN: Paul Gunzelman

**CWA 'E' #1-17**

**17-3s-35w Rawlins,KS**

Start Date: 2017.09.17 @ 20:48:00

End Date: 2017.09.18 @ 05:39:30

Job Ticket #: 63308                      DST #: 3

Trilobite Testing, Inc

PO Box 362 Hays, KS 67601

ph: 785-625-4778 fax: 785-625-5620

Printed: 2017.09.21 @ 08:49:48





**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

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

**17-3s-35w Rawlins, KS**  
**CWA 'E' #1-17**  
 Job Ticket: 63308      **DST#: 3**  
 Test Start: 2017.09.17 @ 20:48:00

## GENERAL INFORMATION:

Formation: **LKC "J"**  
 Deviated: No Whipstock:      ft (KB)  
 Time Tool Opened: 22:54:00  
 Time Test Ended: 05:39:30  
 Interval: **4326.00 ft (KB) To 4378.00 ft (KB) (TVD)**  
 Total Depth: 4378.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Fair  
 Test Type: Conventional Bottom Hole (Reset)  
 Tester: James Winder  
 Unit No: 83  
 Reference Elevations: 3258.00 ft (KB)  
 3253.00 ft (CF)  
 KB to GR/CF: 5.00 ft

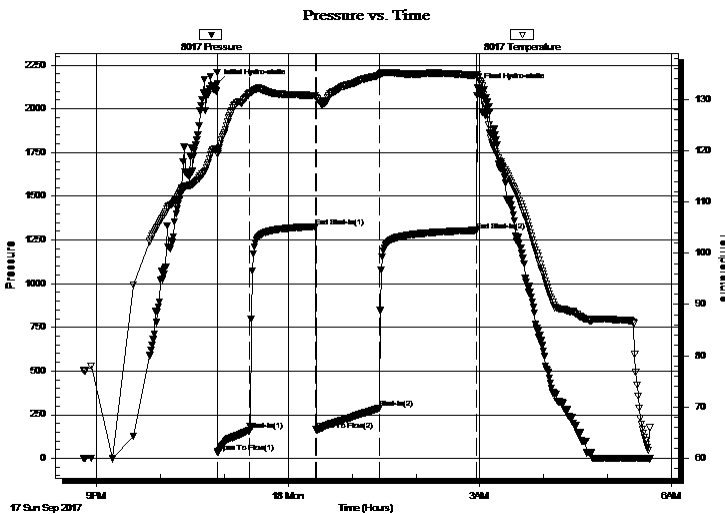
## Serial #: 8017

## Outside

Press@RunDepth: 286.29 psig @ 4327.00 ft (KB)      Capacity: 8000.00 psig  
 Start Date: 2017.09.17      End Date: 2017.09.18      Last Calib.: 2017.09.18  
 Start Time: 20:48:05      End Time: 05:39:30      Time On Btm: 2017.09.17 @ 22:53:45  
 Time Off Btm: 2017.09.18 @ 02:58:00

TEST COMMENT: 30 - IF: Blow built to BOB at 10 min.  
 60 - IS: Blow back built to 2"  
 60 - FF: Blow built to BOB at 11 1/2 min.  
 90 - FS: Blow back built to 5 1/2"

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2145.51	120.30	Initial Hydro-static
1	33.83	119.33	Open To Flow (1)
31	160.13	131.18	Shut-In(1)
92	1326.02	130.69	End Shut-In(1)
93	163.23	130.32	Open To Flow (2)
152	286.29	134.64	Shut-In(2)
243	1304.67	134.63	End Shut-In(2)
245	2120.85	134.43	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
118.00	GWMCO 45%o, 24%m, 16%w, 15%g	0.58
462.00	GMCO 62%o, 21%g, 17%m	5.69
140.00	CGO 88%o, 11%g, 1%m	1.96
0.00	GIP = 450'	0.00

\* Recovery from multiple tests

## Gas Rates

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



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

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

**17-3s-35w Rawlins, KS**  
**CWA 'E' #1-17**  
Job Ticket: 63308      **DST#: 3**  
Test Start: 2017.09.17 @ 20:48:00

## GENERAL INFORMATION:

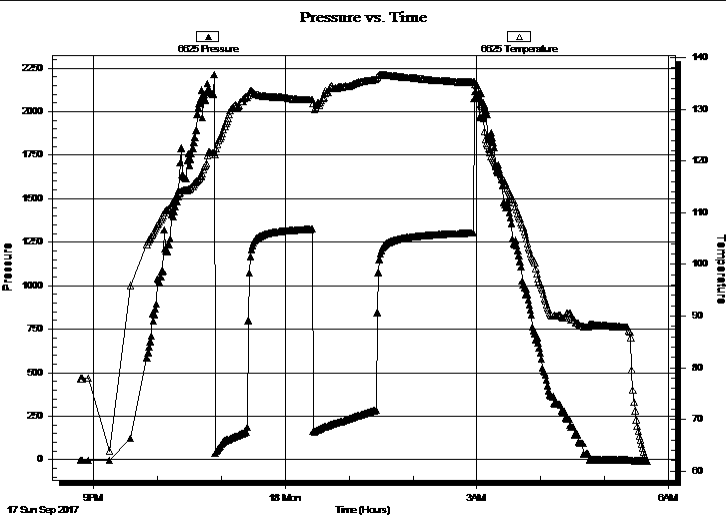
Formation: **LKC "J"**  
Deviated: No Whipstock: ft (KB)  
Time Tool Opened: 22:54:00  
Time Test Ended: 05:39:30  
Interval: **4326.00 ft (KB) To 4378.00 ft (KB) (TVD)**  
Total Depth: 4378.00 ft (KB) (TVD)  
Hole Diameter: 7.88 inches Hole Condition: Fair  
Test Type: Conventional Bottom Hole (Reset)  
Tester: James Winder  
Unit No: 83  
Reference Elevations: 3258.00 ft (KB)  
3253.00 ft (CF)  
KB to GR/CF: 5.00 ft

## Serial #: 6625

Inside

Press@RunDepth:                    psig @ 4327.00 ft (KB)      Capacity: 8000.00 psig  
Start Date: 2017.09.17      End Date: 2017.09.18      Last Calib.: 1899.12.30  
Start Time: 20:48:05      End Time: 05:40:00      Time On Btm:  
Time Off Btm:

TEST COMMENT: 30 - IF: Blow built to BOB at 10 min.  
60 - IS: Blow back built to 2"  
60 - FF: Blow built to BOB at 11 1/2 min.  
90 - FS: Blow back built to 5 1/2"



## PRESSURE SUMMARY

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

## Recovery

Length (ft)	Description	Volume (bbl)
118.00	GWMCO 45%o, 24%m, 16%w, 15%g	0.58
462.00	GMCO 62%o, 21%g, 17%m	5.69
140.00	CGO 88%o, 11%g, 1%m	1.96
0.00	GIP = 450'	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

**17-3s-35w Rawlins,KS**

250 N. Water STE 300  
Wichita, KS 67202

**CWA 'E' #1-17**

Job Ticket: 63308

**DST#: 3**

ATTN: Paul Gunzelman

Test Start: 2017.09.17 @ 20:48:00

## Tool Information

Drill Pipe:	Length: 4118.00 ft	Diameter: 3.80 inches	Volume: 57.76 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: 205.00 ft	Diameter: 2.25 inches	Volume: 1.01 bbl	Weight to Pull Loose: 62000.00 lb
			<u>Total Volume: 58.77 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	26.00 ft			String Weight: Initial 58000.00 lb
Depth to Top Packer:	4326.00 ft			Final 60000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	52.00 ft			
Tool Length:	81.00 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			4298.00	
Shut In Tool	5.00			4303.00	
Hydraulic tool	5.00			4308.00	
Jars	5.00			4313.00	
Safety Joint	3.00			4316.00	
Packer	5.00			4321.00	29.00 Bottom Of Top Packer
Packer	5.00			4326.00	
Stubb	1.00			4327.00	
Recorder	0.00	6625	Inside	4327.00	
Recorder	0.00	8017	Outside	4327.00	
Perforations	15.00			4342.00	
Blank Spacing	33.00			4375.00	
Bullnose	3.00			4378.00	52.00 Bottom Packers & Anchor

**Total Tool Length: 81.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co., Inc

**17-3s-35w Rawlins,KS**

250 N. Water STE 300  
Wichita, KS 67202

**CWA 'E' #1-17**

Job Ticket: 63308

**DST#: 3**

ATTN: Paul Gunzelman

Test Start: 2017.09.17 @ 20:48:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

35.2 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 75.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.99 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 3200.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
118.00	GWMCO 45%o, 24%m, 16%w, 15%g	0.580
462.00	GMCO 62%o, 21%g, 17%m	5.688
140.00	CGO 88%o, 11%g, 1%m	1.964
0.00	GIP = 450'	0.000

Total Length: 720.00 ft      Total Volume: 8.232 bbl

Num Fluid Samples: 0

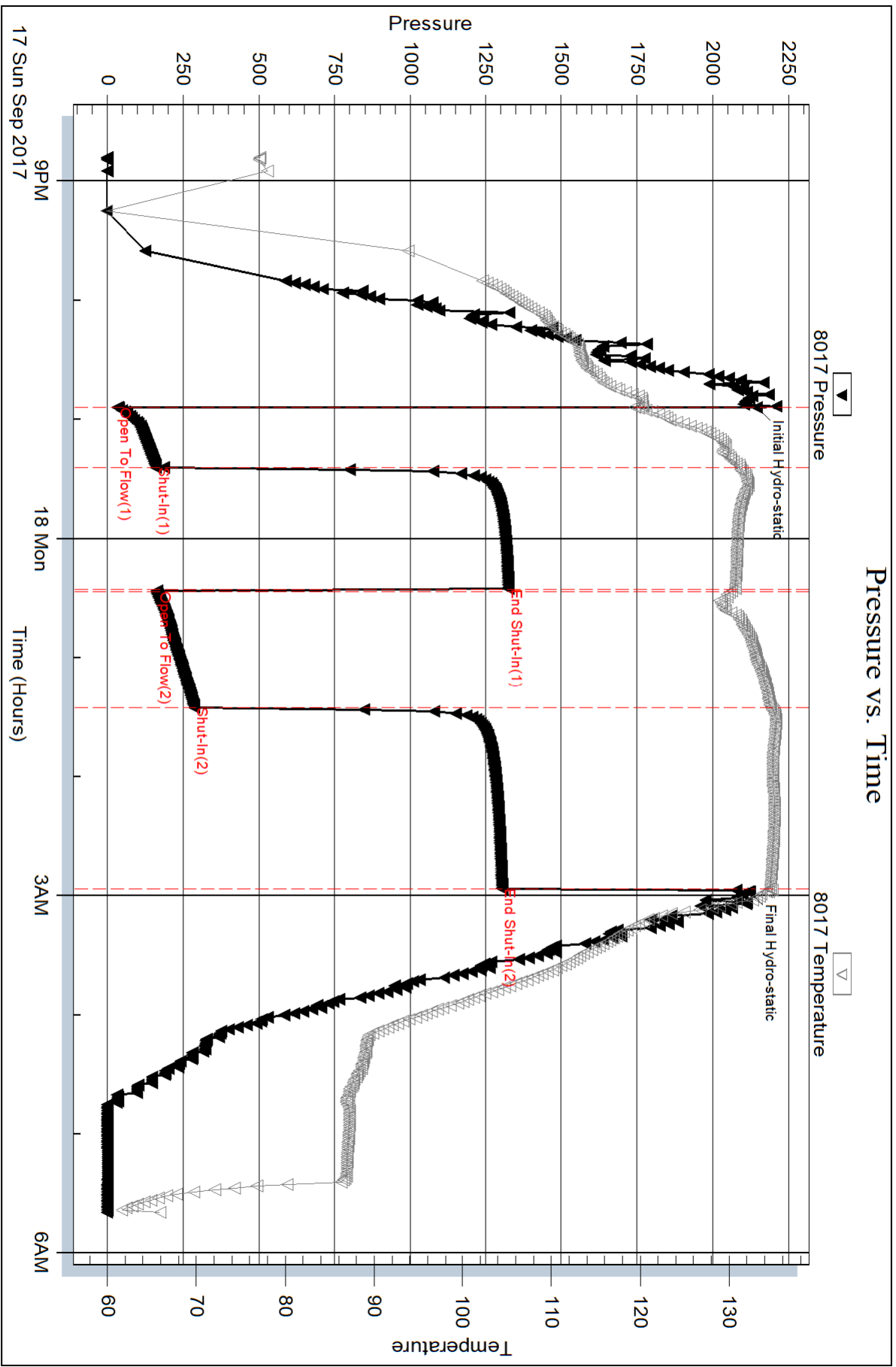
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: Gravity = 35.4 api @ 62 Deg F  
Corrected Gravity = 35.2 api



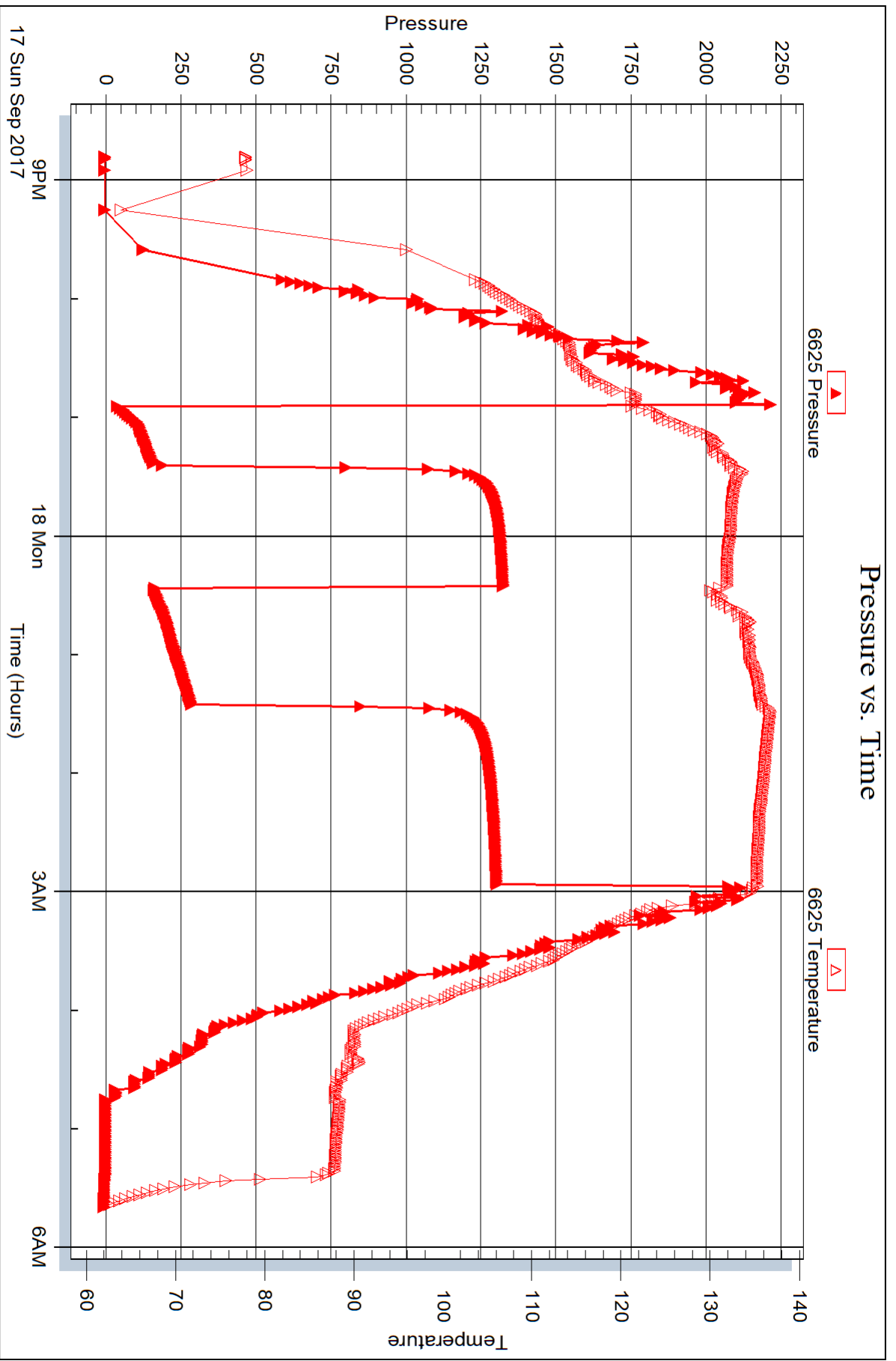
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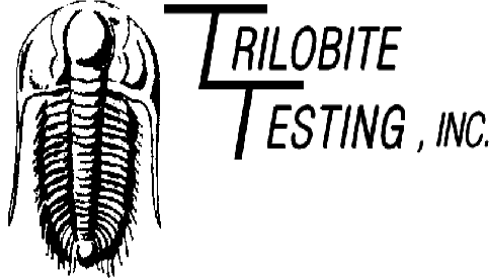
Inside

Murfin Drilling Co., Inc

CWA E#1-17

DST Test Number: 3





## DRILL STEM TEST REPORT

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

250 N. Water STE 300  
Wichita, KS 67202

ATTN: Paul Gunzelman

**CWA 'E' #1-17**

**17-3s-35w Rawlins,KS**

Start Date: 2017.09.19 @ 06:40:00

End Date: 2017.09.19 @ 13:53:00

Job Ticket #: 63309                      DST #: 4

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

Printed: 2017.09.21 @ 08:49:08



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

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

**17-3s-35w Rawlins, KS**  
**CWA 'E' #1-17**  
 Job Ticket: 63309 **DST#: 4**  
 Test Start: 2017.09.19 @ 06:40:00

## GENERAL INFORMATION:

Formation: **Ft. Scott - Lower Ft**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 08:18:30  
 Time Test Ended: 13:53:00  
 Interval: **4534.00 ft (KB) To 4600.00 ft (KB) (TVD)**  
 Total Depth: 4600.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Fair  
 Test Type: Conventional Bottom Hole (Reset)  
 Tester: James Winder  
 Unit No: 83  
 Reference Elevations: 3258.00 ft (KB)  
 3253.00 ft (CF)  
 KB to GR/CF: 5.00 ft

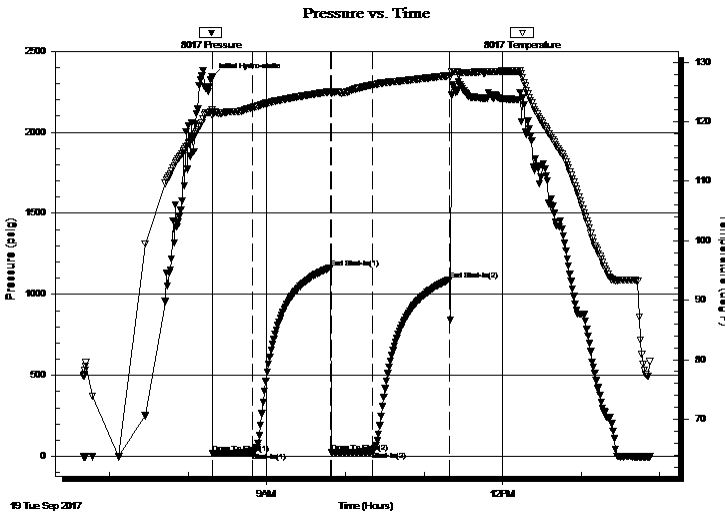
## Serial #: 8017

## Outside

Press@RunDepth: 29.19 psig @ 4535.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2017.09.19 End Date: 2017.09.19 Last Calib.: 2017.09.19  
 Start Time: 06:40:05 End Time: 13:52:59 Time On Btm: 2017.09.19 @ 08:18:15  
 Time Off Btm: 2017.09.19 @ 11:21:30

TEST COMMENT: 30 - IF: Blow built to 1"  
 60 - IS: No blow back  
 30 - FF: No blow  
 60 - FS: No blow

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2341.09	122.06	Initial Hydro-static
1	17.68	121.03	Open To Flow (1)
31	22.61	122.40	Shut-In(1)
91	1165.45	125.08	End Shut-In(1)
91	25.43	124.73	Open To Flow (2)
122	29.19	126.14	Shut-In(2)
182	1091.66	127.75	End Shut-In(2)
184	2294.56	128.39	Final Hydro-static

## Recovery

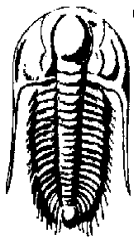
Length (ft)	Description	Volume (bbl)
45.00	Mud w /Oil spots 98%m, 2%o	0.22

\* Recovery from multiple tests

## Gas Rates

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





**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling Co., Inc

250 N. Water STE 300  
Wichita, KS 67202

ATTN: Paul Gunzelman

**17-3s-35w Rawlins, KS**

**CWA 'E' #1-17**

Job Ticket: 63309

**DST#: 4**

Test Start: 2017.09.19 @ 06:40:00

## GENERAL INFORMATION:

Formation: **Ft. Scott - Lower Ft**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 08:18:30

Time Test Ended: 13:53:00

Test Type: Conventional Bottom Hole (Reset)

Tester: James Winder

Unit No: 83

**Interval: 4534.00 ft (KB) To 4600.00 ft (KB) (TVD)**

Total Depth: 4600.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 3258.00 ft (KB)

3253.00 ft (CF)

KB to GR/CF: 5.00 ft

**Serial #: 6625**

Inside

Press@RunDepth: psig @ 4535.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2017.09.19

End Date:

2017.09.19

Last Calib.:

2017.09.19

Start Time: 06:40:05

End Time:

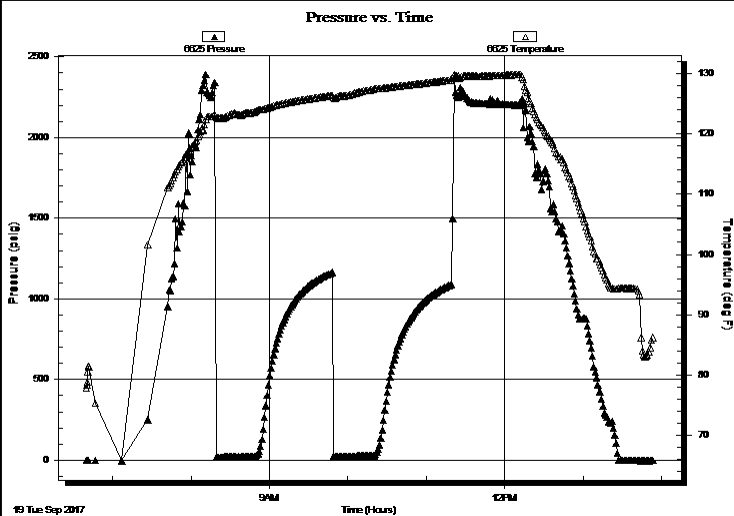
13:53:14

Time On Btm:

Time Off Btm:

TEST COMMENT: 30 - IF: Blow built to 1"  
60 - IS: No blow back  
30 - FF: No blow  
60 - FS: No blow

## PRESSURE SUMMARY



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

Length (ft)	Description	Volume (bbl)
45.00	Mud w /Oil spots 98%m, 2%o	0.22

\* Recovery from multiple tests

## Gas Rates

Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)
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**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co., Inc

**17-3s-35w Rawlins,KS**

250 N. Water STE 300  
Wichita, KS 67202

**CWA 'E' #1-17**

Job Ticket: 63309

**DST#: 4**

ATTN: Paul Gunzelman

Test Start: 2017.09.19 @ 06:40:00

## Tool Information

Drill Pipe:	Length: 4305.00 ft	Diameter: 3.80 inches	Volume: 60.39 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: 205.00 ft	Diameter: 2.25 inches	Volume: 1.01 bbl	Weight to Pull Loose: 65000.00 lb
			<u>Total Volume: 61.40 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	5.00 ft			String Weight: Initial 62000.00 lb
Depth to Top Packer:	4534.00 ft			Final 62000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	66.00 ft			
Tool Length:	95.00 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			4506.00	
Shut In Tool	5.00			4511.00	
Hydraulic tool	5.00			4516.00	
Jars	5.00			4521.00	
Safety Joint	3.00			4524.00	
Packer	5.00			4529.00	29.00 Bottom Of Top Packer
Packer	5.00			4534.00	
Stubb	1.00			4535.00	
Recorder	0.00	6625	Inside	4535.00	
Recorder	0.00	8017	Outside	4535.00	
Perforations	25.00			4560.00	
Blank Spacing	33.00			4593.00	
Perforations	4.00			4597.00	
Bullnose	3.00			4600.00	66.00 Bottom Packers & Anchor

**Total Tool Length: 95.00**



**TRILOBITE  
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# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co., Inc

**17-3s-35w Rawlins,KS**

250 N. Water STE 300  
Wichita, KS 67202

**CWA 'E' #1-17**

Job Ticket: 63309

**DST#: 4**

ATTN: Paul Gunzelman

Test Start: 2017.09.19 @ 06:40:00

## 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: 64.00 sec/qt

Cushion Volume:

bbf

Water Loss: 5.99 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 3400.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbf
45.00	Mud w /Oil spots 98% <sub>m</sub> , 2% <sub>o</sub>	0.221

Total Length: 45.00 ft      Total Volume: 0.221 bbf

Num Fluid Samples: 0

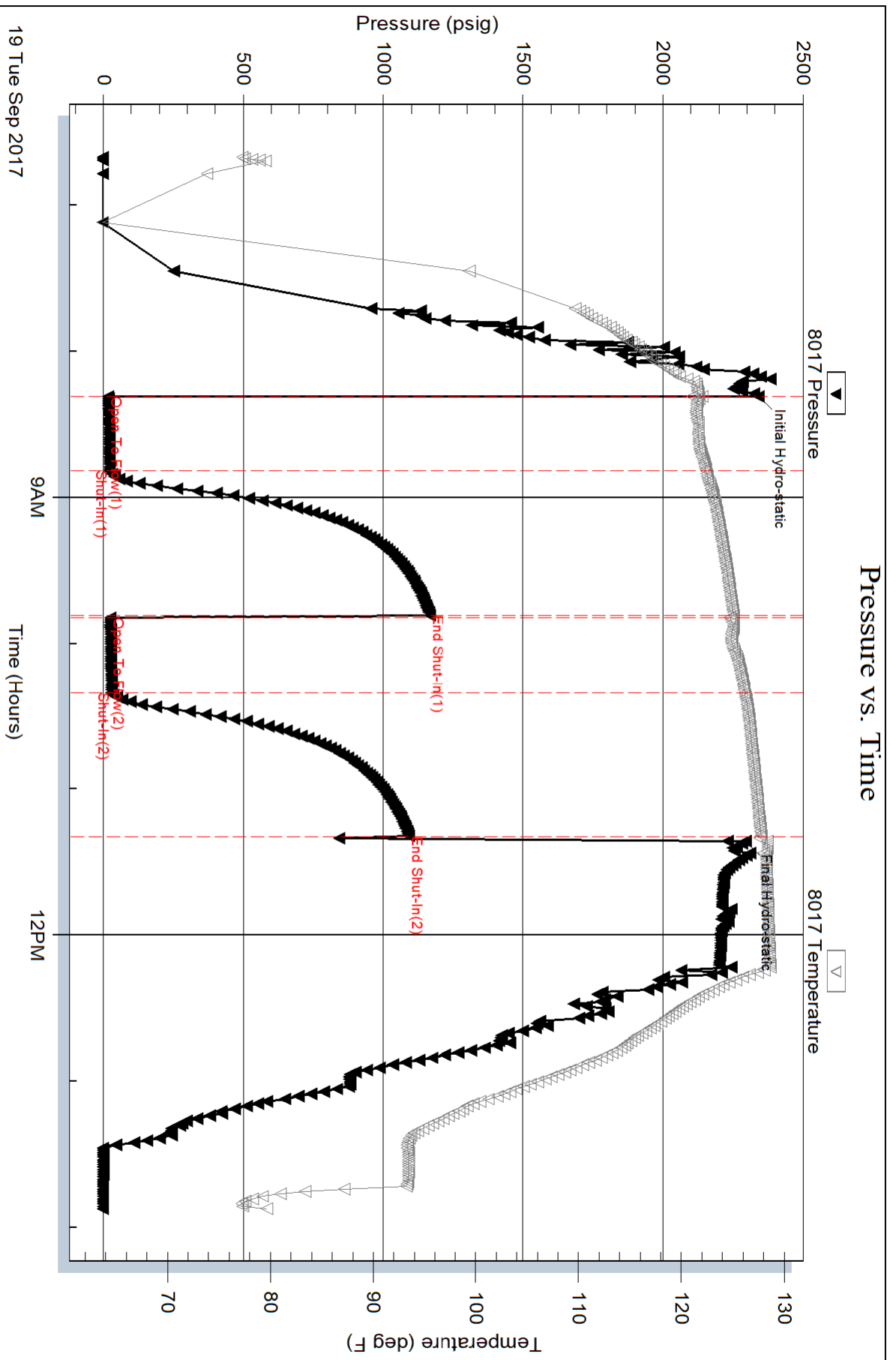
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:



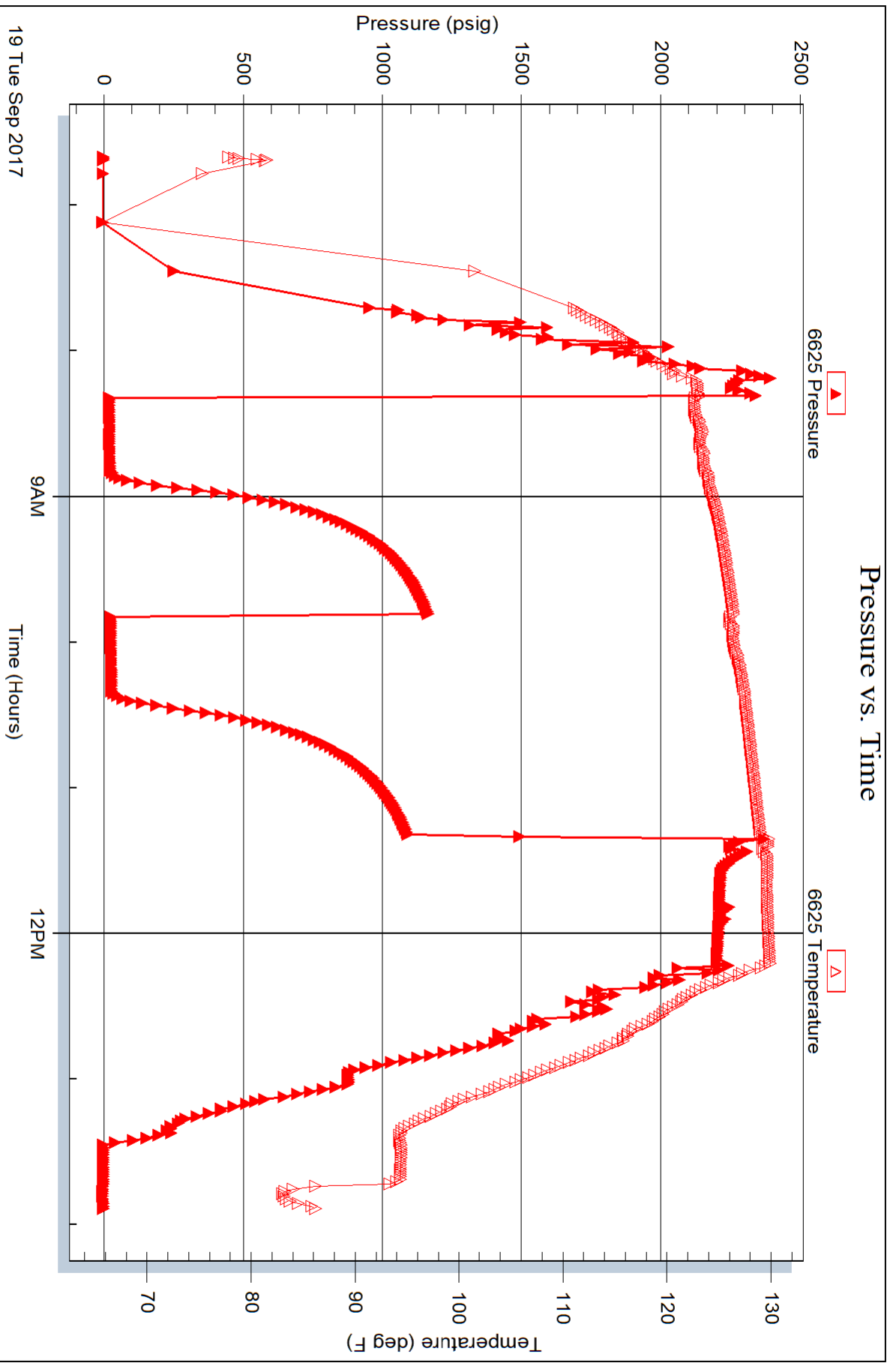
Serial #: 6625

Inside

Murfin Drilling Co., Inc

CWA 'E#1-17

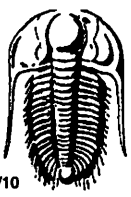
DST Test Number: 4



Trilobite Testing, Inc

Ref. No: 63309

Printed: 2017.09.21 @ 08:49:09



# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 63306

Well Name & No. CWA 'E' #1-17 Test No. 1 Date 9-16-17  
 Company Murfin Drilling Co Inc Elevation 3258 KB 3253 GL  
 Address 250 N. Water STE 300 Wichita, KS 67202  
 Co. Rep / Geo. Paul Gunzelman Rig Murfin #24  
 Location: Sec. 17 Twp. 3s Rge. 35w Co. Rawlins State KS

Interval Tested 4118 - 4188 Zone Tested Lans. "A"  
 Anchor Length 70 Drill Pipe Run ~~3899~~ 3899 Mud Wt. 8.9  
 Top Packer Depth 4113 Drill Collars Run ~~205~~ 205 Vis 75  
 Bottom Packer Depth 4118 Wt. Pipe Run - WL 5.6  
 Total Depth 4188 Chlorides 2400 ppm System LCM 4

Blow Description IF: Blow built to BOB (11") at 13 3/4 min.  
ISI: Blowback built to 3"  
FF: Blow built to BOB at 16 1/4 min.  
FSI: Blowback built to 6 1/2"

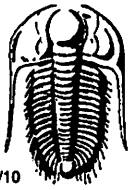
Rec	Feet of	%gas	%oil	%water	%mud
<u>159</u>	<u>CGO</u>	<u>28</u>	<u>71</u>	<u>-</u>	<u>1</u>
<u>60</u>	<u>SMCSO</u>	<u>10</u>	<u>86</u>	<u>-</u>	<u>4</u>
<u>176</u>	<u>60cm</u>	<u>19</u>	<u>24</u>	<u>-</u>	<u>57</u>
<u>    </u>	<u>GIP = 470'</u>	<u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>
<u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>

Rec Total 395 BHT 129 Gravity 31.8 API RW @ °F Chlorides      ppm  
 (A) Initial Hydrostatic 2069  Test 1150 T-On Location 23:25 9/15  
 (B) First Initial Flow 34  Jars 250 T-Started 1:00  
 (C) First Final Flow 107  Safety Joint 75 T-Open 3:05  
 (D) Initial Shut-In 1068  Circ Sub      T-Pulled 7:08  
 (E) Second Initial Flow 119  Hourly Standby      T-Out 9:25 9/16  
 (F) Second Final Flow 165  Mileage 84RT 63 Comments       
 (G) Final Shut-In 1000  Sampler       
 (H) Final Hydrostatic 2047  Straddle       Ruined Shale Packer       
 Shale Packer       Ruined Packer       
 Extra Packer       Extra Copies       
 Extra Recorder      Sub Total 0  
 Day Standby      Total 1538  
 Accessibility      MP/DST Disc't       
 Sub Total 1538

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

Approved By \_\_\_\_\_ Our Representative James Winder

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. 63307

Well Name & No. CWA 'E' #1-17 Test No. 2 Date 9-17-17  
 Company Murfin Drilling Co Inc Elevation 3258 KB 3253 GL  
 Address 250 N. Water STE 300 Wichita, KS 67202  
 Co. Rep / Geo. Paul Gunzelman Rig Murfin #24  
 Location: Sec. 17 Twp. 3s Rge. 35w Co. Rawlins State KS

Interval Tested 4240 - 4296 Zone Tested LKC "6"  
 Anchor Length 56 Drill Pipe Run 4025 Mud Wt. 8.9  
 Top Packer Depth 4235 Drill Collars Run 205 Vis 70  
 Bottom Packer Depth 4240 Wt. Pipe Run - WL 6.0  
 Total Depth 4296 Chlorides 2900 ppm System LCM 4

Blow Description IF: Blow built to BOB (11") at 5 1/4 min.  
ISI: No blowback  
FF: Blow built to BOB at 7 1/2 min.  
FSI: No blowback

Rec	Feet of	%gas	%oil	%water	%mud
<u>380</u>	<u>MW</u>		<u>54</u>	<u>46</u>	
<u>860</u>	<u>SMCW</u>		<u>95</u>	<u>5</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 1240 BHT 135 Gravity \_\_\_\_\_ API RW .704 @ 50.2 °F Chlorides 13,000 ppm

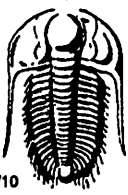
(A) Initial Hydrostatic 2125  Test 1150 T-On Location 23:25 9/16  
 (B) First Initial Flow 42  Jars 250 T-Started 00:10  
 (C) First Final Flow 312  Safety Joint 75 T-Open 2:15  
 (D) Initial Shut-In 796  Circ Sub \_\_\_\_\_ T-Pulled 6:17  
 (E) Second Initial Flow 320  Hourly Standby \_\_\_\_\_ T-Out 8:35 9/17  
 (F) Second Final Flow 572  Mileage 84RT 63 Comments \_\_\_\_\_  
 (G) Final Shut-In 792  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 2093  Straddle \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_  
 Day Standby \_\_\_\_\_  
 Accessibility \_\_\_\_\_  
 Sub Total 1538

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

Sub Total 1538  
 Total 1538  
 MP/DST Disc't \_\_\_\_\_

Approved By \_\_\_\_\_ Our Representative James Wanda

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 63308

Well Name & No. CWA 'E' #1-17 Test No. 3 Date 9-17-17  
 Company Murfin Drilling Co. Inc Elevation 3258 KB 3253 GL  
 Address 250 N. Water STE 300 Wichita, KS 67202  
 Co. Rep / Geo. Paul Gunzelman Rig Murfin #24  
 Location: Sec. 17 Twp. 3S Rge. 35W Co. Rawlins State KS

Interval Tested 4326-4378 Zone Tested Lans. "J"  
 Anchor Length 52 Drill Pipe Run 4118 Mud Wt. 8.9  
 Top Packer Depth 4321 Drill Collars Run 205 Vis 75  
 Bottom Packer Depth 4326 Wt. Pipe Run - WL 6.0  
 Total Depth 4378 Chlorides 3200 ppm System LCM 3\*

Blow Description IF: Blow built to BOB (11") at 10 min.  
ISI: Blowback built to 2"  
FF: Blow built to BOB at 11 1/2 min.  
FSI: Blowback built to 5 1/2"

Rec	Feet of	%gas	%oil	%water	%mud
<u>140</u>	<u>C60</u>	<u>11</u>	<u>88</u>	<u>-</u>	<u>1</u>
<u>462</u>	<u>GMCO</u>	<u>21</u>	<u>62</u>	<u>-</u>	<u>17</u>
<u>118</u>	<u>6Wmco</u>	<u>15</u>	<u>45</u>	<u>16</u>	<u>24</u>
<u>Rec</u>	<u>Feet of</u>	<u>%gas</u>	<u>%oil</u>	<u>%water</u>	<u>%mud</u>
<u>Rec</u>	<u>Feet of</u>	<u>%gas</u>	<u>%oil</u>	<u>%water</u>	<u>%mud</u>

Rec Total 720 BHT 135 Gravity 35.2 API RW @ °F Chlorides ppm

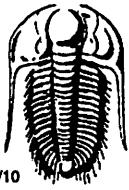
(A) Initial Hydrostatic 2146  Test 1150 T-On Location 19:45 9/17  
 (B) First Initial Flow 34  Jars 250 T-Started 20:48  
 (C) First Final Flow 160  Safety Joint 75 T-Open 22:54  
 (D) Initial Shut-In 1326  Circ Sub \_\_\_\_\_ T-Pulled 2:56  
 (E) Second Initial Flow 163  Hourly Standby \_\_\_\_\_ T-Out 5:30 9/18  
 (F) Second Final Flow 286  Mileage 84RT 63 Comments \_\_\_\_\_  
 (G) Final Shut-In 1305  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 2121  Straddle \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_  
 Day Standby \_\_\_\_\_  
 Accessibility \_\_\_\_\_  
 Sub Total 1538

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

Sub Total 1538 Total 1538 MP/DST Disc't \_\_\_\_\_

Approved By \_\_\_\_\_ Our Representative James Winkler  
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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 63309

Well Name & No. CWA 'E' #1-17 Test No. 4 Date 9-19-17  
 Company Murfin Drilling Co Inc Elevation 3258 KB 3253 GL  
 Address 250 N Water STE 300 Wichita, KS 67202  
 Co. Rep / Geo. Paul Gunzelman Rig Murfin #24  
 Location: Sec. 17 Twp. 3s Rge. 35w Co. Rawlins State KS

Interval Tested 4534-4600 Zone Tested Ft Scott - Lower Ft Scott  
 Anchor Length 66 Drill Pipe Run 4305 Mud Wt. 9.2  
 Top Packer Depth 4529 Drill Collars Run 205 Vis 64  
 Bottom Packer Depth 4534 Wt. Pipe Run - WL 6.0  
 Total Depth 4600 Chlorides 3400 ppm System LCM 4

Blow Description IF: Blow built to 1"  
ISI: No blowback  
FF: No blow  
FSI: No blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>45</u>	<u>Mud w/oil spots</u>	<u>-</u>	<u>2</u>	<u>-</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 45 BHT 128 Gravity \_\_\_\_\_ API RW \_\_\_\_\_ @ \_\_\_\_\_ °F Chlorides \_\_\_\_\_ ppm

(A) Initial Hydrostatic 2341  Test 1150 T-On Location 5:45  
 (B) First Initial Flow 18  Jars 250 T-Started 6:40  
 (C) First Final Flow 23  Safety Joint 75 T-Open 8:18  
 (D) Initial Shut-In 1165  Circ Sub \_\_\_\_\_ T-Pulled 11:19  
 (E) Second Initial Flow 25  Hourly Standby \_\_\_\_\_ T-Out 13:50  
 (F) Second Final Flow 29  Mileage 84RT 63 Comments \_\_\_\_\_  
 (G) Final Shut-In 1092  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 2295  Straddle \_\_\_\_\_  
 Ruined Shale Packer \_\_\_\_\_  
 Ruined Packer \_\_\_\_\_  
 Extra Copies \_\_\_\_\_  
 Initial Open 30  Shale Packer \_\_\_\_\_  
 Initial Shut-In 60  Extra Packer \_\_\_\_\_  
 Final Flow 30  Extra Recorder \_\_\_\_\_  
 Final Shut-In 60  Day Standby \_\_\_\_\_  
 Accessibility \_\_\_\_\_  
 Sub Total 1538 Sub Total \_\_\_\_\_  
 Total 1538 MP/DST Disc't \_\_\_\_\_

Approved By \_\_\_\_\_ Our Representative James Winder

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