

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) (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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DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc.**

8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278

ATTN: Max Lovely

Zachman AP #4

5-12S-19W Ellis,KS

Start Date: 2017.12.08 @ 17:25:46

End Date: 2017.12.09 @ 01:08:22

Job Ticket #: 63327 DST #: 1

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

Printed: 2017.12.15 @ 09:55:39



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63327

DST#: 1

Test Start: 2017.12.08 @ 17:25:46

GENERAL INFORMATION:

Formation: **Oread 'B'**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 20:11:07

Time Test Ended: 01:08:22

Test Type: Conventional Bottom Hole (Initial)

Tester: Brannan Lonsdale

Unit No: 73

Interval: 3345.00 ft (KB) To 3379.00 ft (KB) (TVD)

Reference Elevations: 2163.00 ft (KB)

Total Depth: 3379.00 ft (KB) (TVD)

2153.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 10.00 ft

Serial #: 8524 Outside

Press@RunDepth: 48.31 psig @ 3376.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2017.12.08

End Date:

2017.12.09

Last Calib.: 2017.12.09

Start Time: 17:25:47

End Time:

01:08:22

Time On Btm: 2017.12.08 @ 20:10:52

Time Off Btm: 2017.12.08 @ 23:12:37

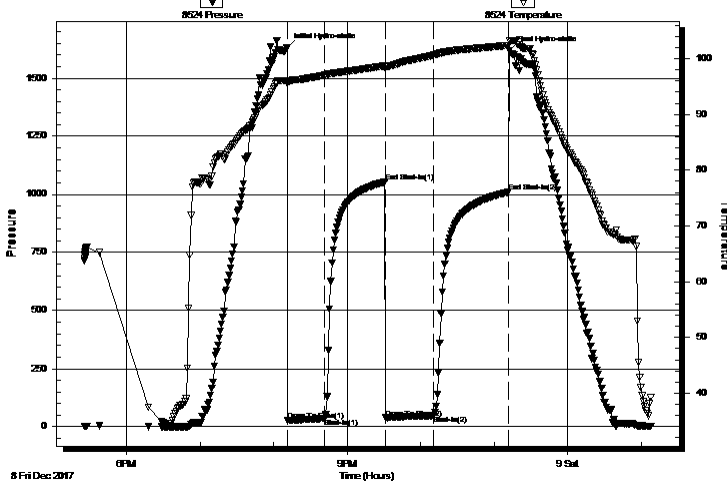
TEST COMMENT: 30- IF- Slowly built to 1 1/4"

45- IS- No blow

45- FF- Very weak surface blow

60- FSI- No blow

Pressure vs. Time



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1631.32	96.05	Initial Hydro-static
1	25.75	95.50	Open To Flow (1)
31	36.17	97.03	Shut-In(1)
80	1053.24	98.70	End Shut-In(1)
81	38.63	98.26	Open To Flow (2)
120	48.31	100.62	Shut-In(2)
181	1010.11	102.36	End Shut-In(2)
182	1617.26	103.19	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
30.00	Mud	0.15

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N#700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63327

DST#: 1

Test Start: 2017.12.08 @ 17:25:46

Tool Information

Drill Pipe:	Length: 3230.00 ft	Diameter: 3.82 inches	Volume: 45.79 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 119.00 ft	Diameter: 2.25 inches	Volume: 0.59 bbl	Weight to Pull Loose: 55000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	32.00 ft			String Weight: Initial 46000.00 lb
Depth to Top Packer:	3345.00 ft			Final 46000.00 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

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			3318.00	
Shut In Tool	5.00			3323.00	
Hydraulic tool	5.00			3328.00	
Jars	5.00			3333.00	
Safety Joint	3.00			3336.00	
Packer	5.00			3341.00	28.00 Bottom Of Top Packer
Packer	4.00			3345.00	
Stubb	1.00			3346.00	
Perforations	30.00			3376.00	
Recorder	0.00	6771	Inside	3376.00	
Recorder	0.00	8524	Outside	3376.00	
Bullnose	3.00			3379.00	34.00 Bottom Packers & Anchor

Total Tool Length: 62.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63327

DST#: 1

Test Start: 2017.12.08 @ 17:25:46

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: 62.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.77 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1700.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
30.00	Mud	0.148

Total Length: 30.00 ft Total Volume: 0.148 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

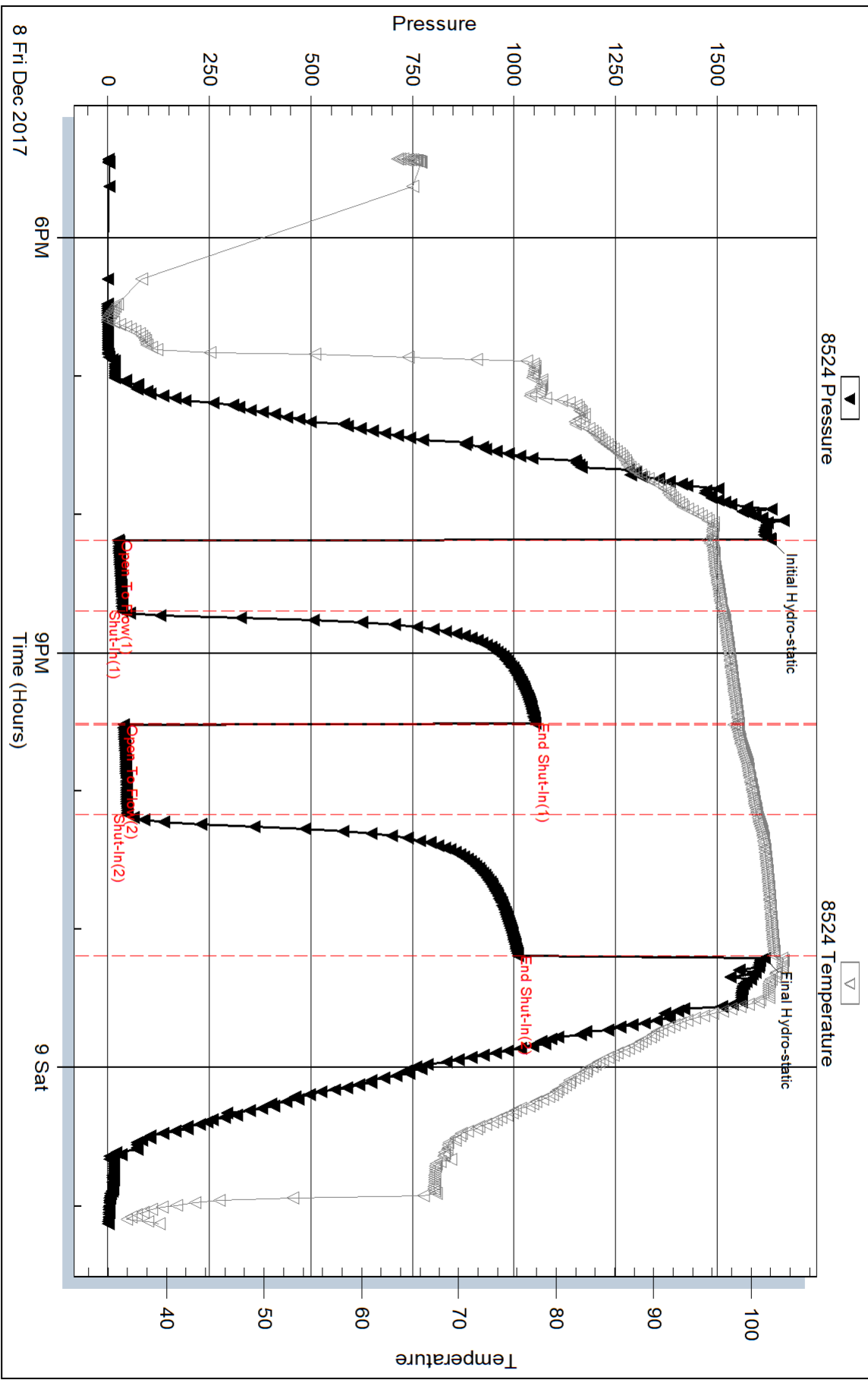
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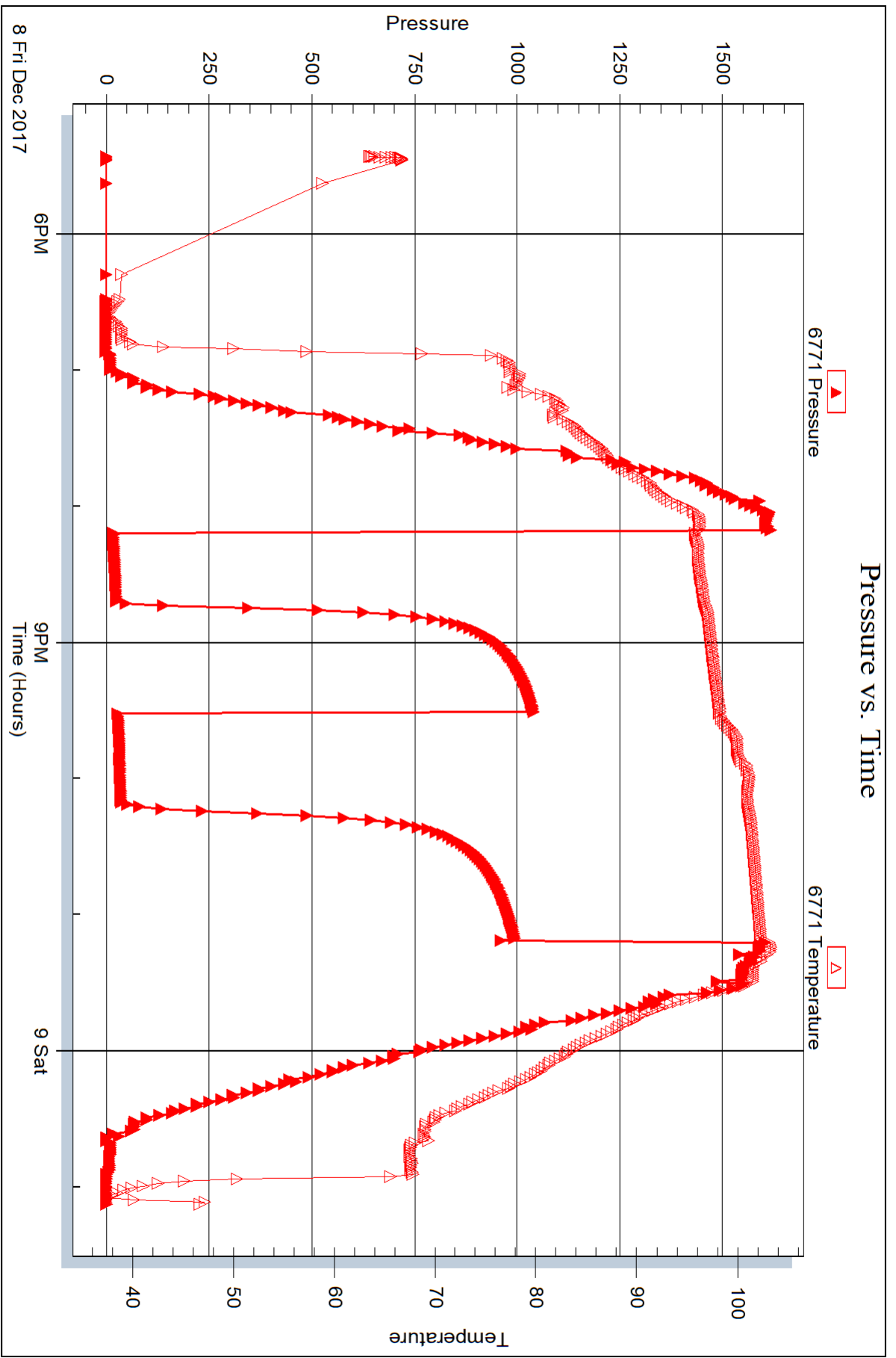
Laboratory Name:

Laboratory Location:

Recovery Comments:

Pressure vs. Time







DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc.**

8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278

ATTN: Max Lovely

Zachman AP #4

5-12S-19W Ellis,KS

Start Date: 2017.12.09 @ 12:05:23

End Date: 2017.12.09 @ 18:23:44

Job Ticket #: 63328 DST #: 2

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

Printed: 2017.12.15 @ 09:36:37



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N #700
 PO Box 783188
 Wichita, KS 67278
 ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63328

DST#: 2

Test Start: 2017.12.09 @ 12:05:23

GENERAL INFORMATION:

Formation: **LKC "A-C"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 14:37:29

Time Test Ended: 18:23:44

Test Type: Conventional Bottom Hole (Reset)

Tester: Brannan Lonsdale

Unit No: 73

Interval: 3409.00 ft (KB) To 3474.00 ft (KB) (TVD)

Reference Elevations: 2163.00 ft (KB)

Total Depth: 3474.00 ft (KB) (TVD)

2153.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 10.00 ft

Serial #: 8524 Outside

Press@RunDepth: 37.30 psig @ 3438.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2017.12.09

End Date:

2017.12.09

Last Calib.: 2017.12.09

Start Time: 12:05:24

End Time:

18:23:44

Time On Btm: 2017.12.09 @ 14:36:59

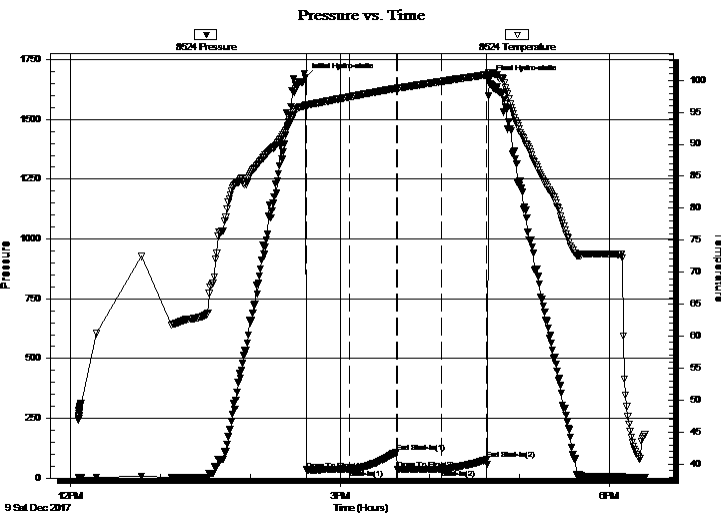
Time Off Btm: 2017.12.09 @ 16:39:29

TEST COMMENT: 30- IF- 1" blow slow ly died in 28 mins

30- IS- No blow

30- FF- No blow

30- FSI- No blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1675.06	96.15	Initial Hydro-static
1	34.57	95.93	Open To Flow (1)
30	35.48	97.41	Shut-In(1)
61	108.50	98.74	End Shut-In(1)
62	36.66	98.76	Open To Flow (2)
91	37.30	99.80	Shut-In(2)
121	77.39	100.85	End Shut-In(2)
123	1667.74	101.23	Final Hydro-static

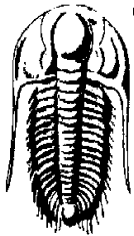
Recovery

Length (ft)	Description	Volume (bbl)
10.00	Mud	0.05

* Recovery from multiple tests

Gas Rates

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.
 8100 E. 22nd St. N #700
 PO Box 783188
 Wichita, KS 67278
 ATTN: Max Lovely

5-12S-19W Ellis,KS

Zachman AP #4

Job Ticket: 63328

DST#: 2

Test Start: 2017.12.09 @ 12:05:23

GENERAL INFORMATION:

Formation: **LKC "A-C"**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 14:37:29
 Time Test Ended: 18:23:44
Interval: 3409.00 ft (KB) To 3474.00 ft (KB) (TVD)
 Total Depth: 3474.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Brannan Lonsdale
 Unit No: 73
 Reference Elevations: 2163.00 ft (KB)
 2153.00 ft (CF)
 KB to GR/CF: 10.00 ft

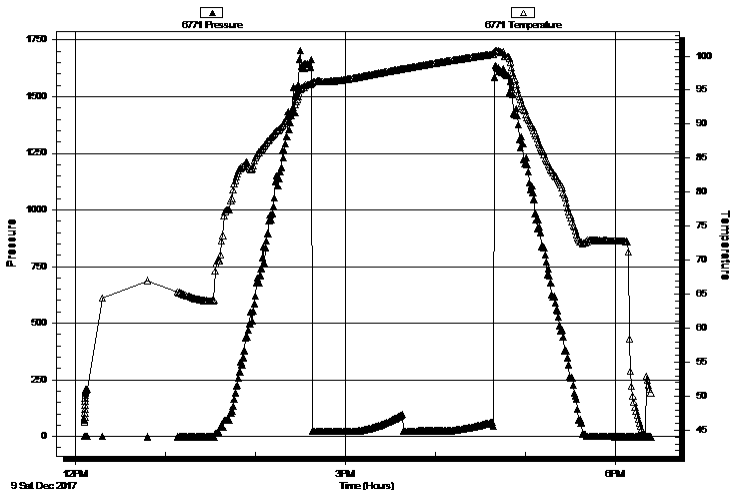
Serial #: 6771

Inside

Press@RunDepth: psig @ 3438.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2017.12.09 End Date: 2017.12.09 Last Calib.: 2017.12.09
 Start Time: 12:05:46 End Time: 18:24:06 Time On Btm:
 Time Off Btm:

TEST COMMENT: 30- IF- 1" blow slow ly died in 28 mins
 30- ISI- No blow
 30- FF- No blow
 30- FSI- No blow

Pressure vs. Time



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
10.00	Mud	0.05

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N#700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63328

DST#: 2

Test Start: 2017.12.09 @ 12:05:23

Tool Information

Drill Pipe:	Length: 3261.00 ft	Diameter: 3.82 inches	Volume: 46.23 bbl	Tool Weight:	2500.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length: 119.00 ft	Diameter: 2.25 inches	Volume: 0.59 bbl	Weight to Pull Loose:	57000.00 lb
			<u>Total Volume:</u>	Tool Chased	0.00 ft
Drill Pipe Above KB:	4.00 ft			String Weight: Initial	49000.00 lb
Depth to Top Packer:	3409.00 ft			Final	49000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	65.00 ft				
Tool Length:	98.00 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			3377.00	
Shut In Tool	5.00			3382.00	
Hydraulic tool	5.00			3387.00	
Jars	5.00			3392.00	
EM Tool	5.00			3397.00	
Safety Joint	3.00			3400.00	
Packer	5.00			3405.00	33.00 Bottom Of Top Packer
Packer	4.00			3409.00	
Stubb	1.00			3410.00	
Perforations	28.00			3438.00	
Recorder	0.00	6771	Inside	3438.00	
Recorder	0.00	8524	Outside	3438.00	
Change Over Sub	1.00			3439.00	
Drill Pipe	31.00			3470.00	
Change Over Sub	1.00			3471.00	
Bullnose	3.00			3474.00	65.00 Bottom Packers & Anchor
Total Tool Length:	98.00				



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63328

DST#: 2

Test Start: 2017.12.09 @ 12:05:23

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: 55.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.17 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2400.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
10.00	Mud	0.049

Total Length: 10.00 ft Total Volume: 0.049 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

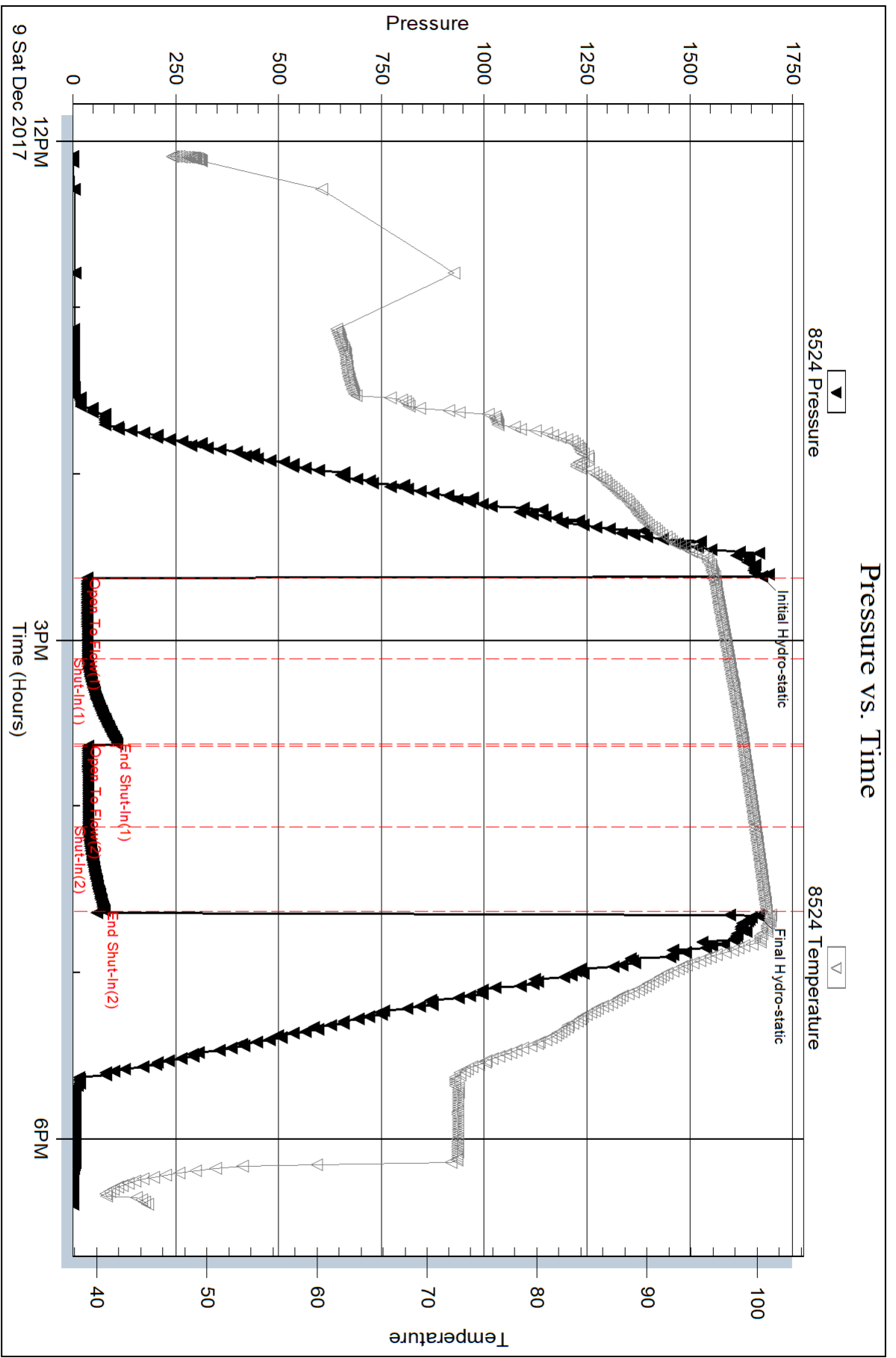
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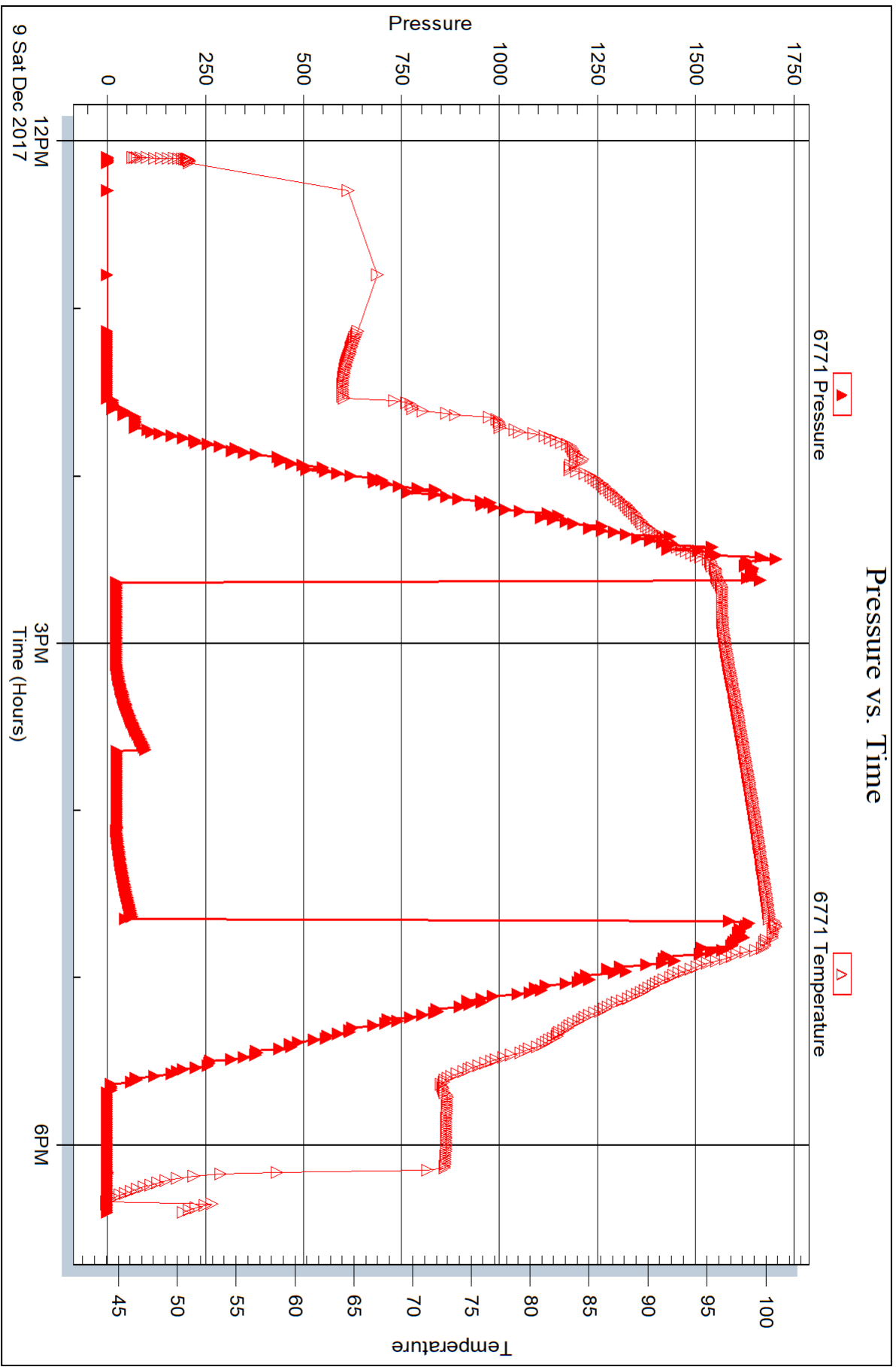
Serial #: 8524

Outside Ritchie Exploration, Inc.

Zachman AP#4

DST Test Number: 2







DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc.**

8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278

ATTN: Max Lovely

Zachman AP #4

5-12S-19W Ellis,KS

Start Date: 2017.12.10 @ 02:58:40

End Date: 2017.12.10 @ 10:33:46

Job Ticket #: 63329 DST #: 3

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

Printed: 2017.12.15 @ 09:36:11



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N#700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63329

DST#: 3

Test Start: 2017.12.10 @ 02:58:40

GENERAL INFORMATION:

Formation: **LKC "E-F"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 05:33:16

Time Test Ended: 10:33:46

Test Type: Conventional Bottom Hole (Reset)

Tester: Brannan Lonsdale

Unit No: 73

Interval: 3490.00 ft (KB) To 3515.00 ft (KB) (TVD)

Reference Elevations: 2163.00 ft (KB)

Total Depth: 3515.00 ft (KB) (TVD)

2153.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 10.00 ft

Serial #: 8524 Outside

Press@RunDepth: 90.79 psig @ 3512.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2017.12.10 End Date: 2017.12.10

Last Calib.: 2017.12.10

Start Time: 02:58:41 End Time: 10:33:46

Time On Btm: 2017.12.10 @ 05:33:01

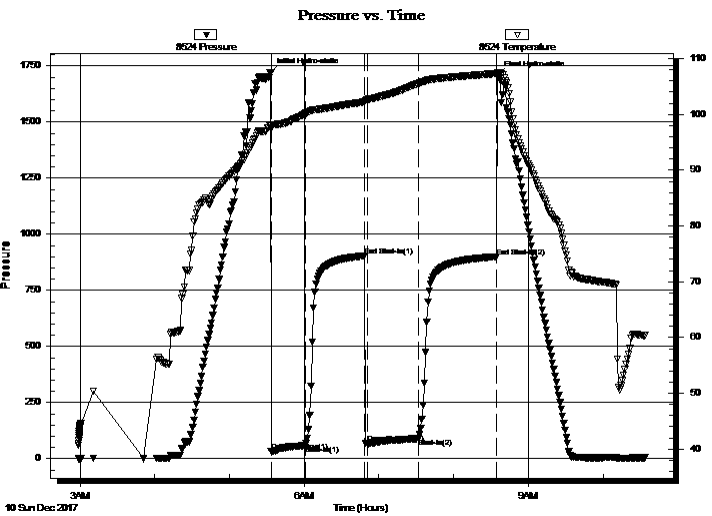
Time Off Btm: 2017.12.10 @ 08:35:31

TEST COMMENT: 30- IF- Built slow ly to 4 1/2"

45- IS- No blow

45- FF- Slow ly built to 9"

60- FSI- No blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1720.93	97.97	Initial Hydro-static
1	31.75	97.44	Open To Flow (1)
28	60.15	100.11	Shut-In(1)
76	903.95	102.28	End Shut-In(1)
78	68.11	102.68	Open To Flow (2)
119	90.79	105.54	Shut-In(2)
182	900.43	107.32	End Shut-In(2)
183	1708.27	107.54	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
60.00	SOCWM, 10%O 30%W 60%M	0.30
60.00	SOCM, 5%O 95%M	0.30
20.00	SWMC0, 5%W 5%M 90%O	0.28

* Recovery from multiple tests

Gas Rates

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.
 8100 E. 22nd St. N #700
 PO Box 783188
 Wichita, KS 67278
 ATTN: Max Lovely

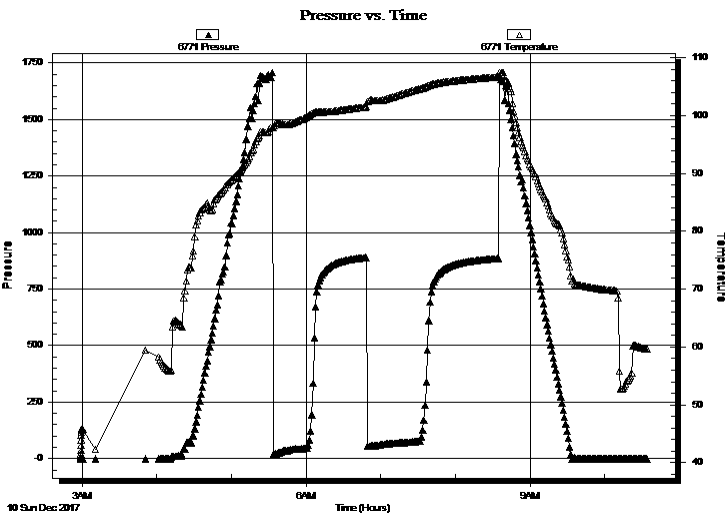
5-12S-19W Ellis, KS
Zachman AP #4
 Job Ticket: 63329 **DST#: 3**
 Test Start: 2017.12.10 @ 02:58:40

GENERAL INFORMATION:

Formation: LKC "E-F"		Test Type: Conventional Bottom Hole (Reset)
Deviated: No Whipstock:	ft (KB)	Tester: Brannan Lonsdale
Time Tool Opened: 05:33:16		Unit No: 73
Time Test Ended: 10:33:46		Reference Elevations: 2163.00 ft (KB)
Interval: 3490.00 ft (KB) To 3515.00 ft (KB) (TVD)		2153.00 ft (CF)
Total Depth: 3515.00 ft (KB) (TVD)		KB to GR/CF: 10.00 ft
Hole Diameter: 7.88 inches	Hole Condition: Fair	

Serial #: 6771	Inside				
Press@RunDepth:	psig @	3512.00 ft (KB)	Capacity:	8000.00 psig	
Start Date:	2017.12.10	End Date:	2017.12.10	Last Calib.:	2017.12.10
Start Time:	02:58:54	End Time:	10:33:44	Time On Btm:	
				Time Off Btm:	

TEST COMMENT: 30- IF- Built slow ly to 4 1/2"
 45- IS- No blow
 45- FF- Slow ly built to 9"
 60- FS- No blow



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

Recovery		
Length (ft)	Description	Volume (bbl)
60.00	SOCWM, 10%O 30%W 60%M	0.30
60.00	SOCM, 5%O 95%M	0.30
20.00	SWMC0, 5%W 5%M 90%O	0.28

* Recovery from multiple tests

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N#700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63329

DST#: 3

Test Start: 2017.12.10 @ 02:58:40

Tool Information

Drill Pipe:	Length: 3355.00 ft	Diameter: 3.82 inches	Volume: 47.56 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 119.00 ft	Diameter: 2.25 inches	Volume: 0.59 bbl	Weight to Pull Loose: 53000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	17.00 ft			String Weight: Initial 49000.00 lb
Depth to Top Packer:	3490.00 ft			Final 50000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	25.00 ft			
Tool Length:	58.00 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			3458.00	
Shut In Tool	5.00			3463.00	
Hydraulic tool	5.00			3468.00	
Jars	5.00			3473.00	
EM Tool	5.00			3478.00	
Safety Joint	3.00			3481.00	
Packer	5.00			3486.00	33.00 Bottom Of Top Packer
Packer	4.00			3490.00	
Stubb	1.00			3491.00	
Perforations	21.00			3512.00	
Recorder	0.00	6771	Inside	3512.00	
Recorder	0.00	8524	Outside	3512.00	
Bullnose	3.00			3515.00	25.00 Bottom Packers & Anchor

Total Tool Length: 58.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63329

DST#: 3

Test Start: 2017.12.10 @ 02:58:40

Mud and Cushion Information

Mud Type: Gel Chem
Mud Weight: 9.00 lb/gal
Viscosity: 55.00 sec/qt
Water Loss: 7.17 in³
Resistivity: ohm.m
Salinity: 2400.00 ppm
Filter Cake: inches

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

Oil API: 35 deg API
Water Salinity: 40000 ppm

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
60.00	SOCWM, 10%O 30%W 60%M	0.295
60.00	SOCM, 5%O 95%M	0.304
20.00	SWMCO, 5%W 5%M 90%O	0.284

Total Length: 140.00 ft Total Volume: 0.883 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

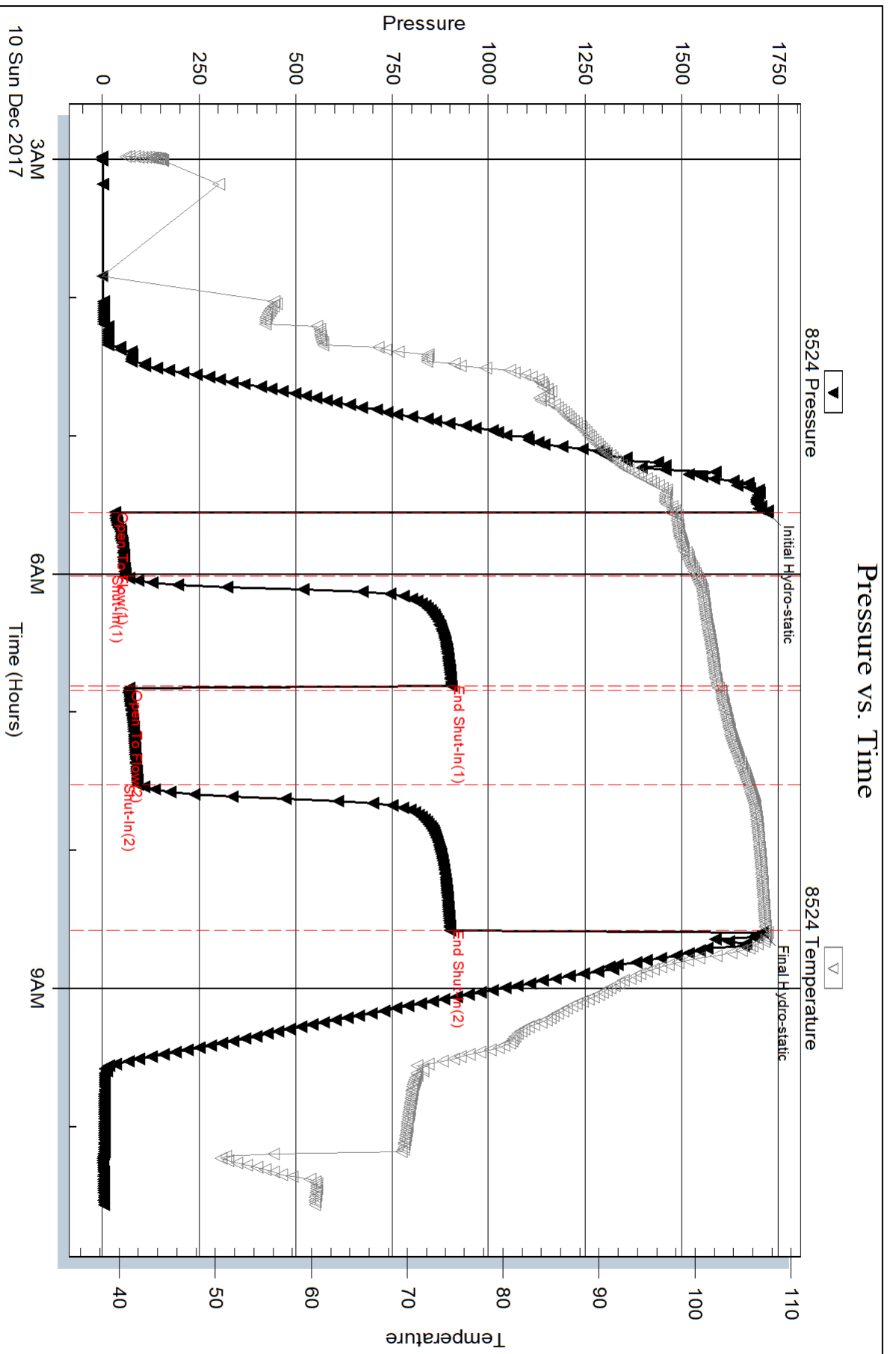
Recovery Comments: RW: .20@55deg

Serial #: 8524

Outside Ritchie Exploration, Inc.

Zachman AP#4

DST Test Number: 3



Trilobite Testing, Inc

Ref. No: 63329

Printed: 2017.12.15 @ 09:36:11

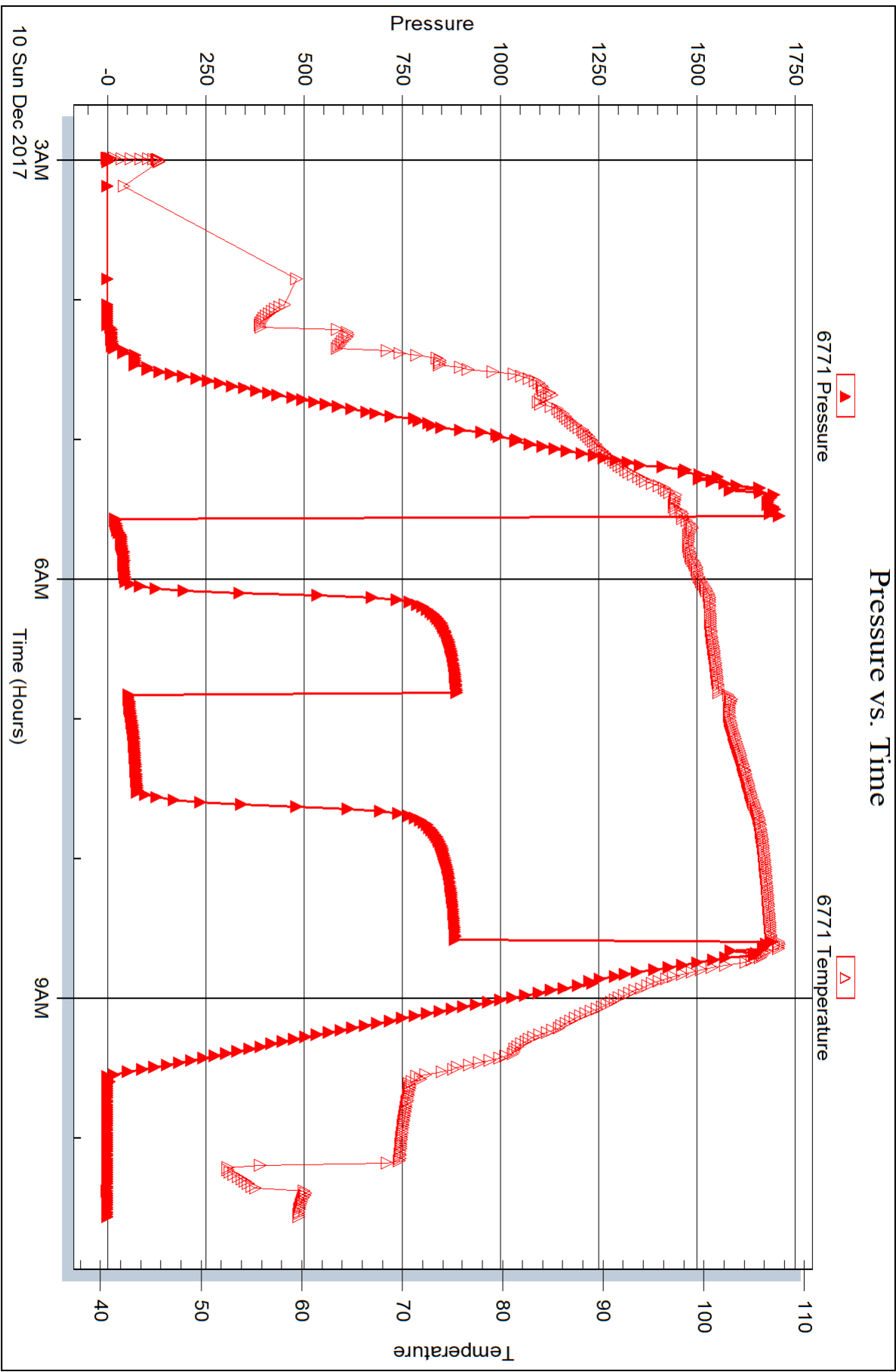
Serial #: 6771

Inside

Ritchie Exploration, Inc.

Zachman AP#4

DST Test Number: 3



Trilobite Testing, Inc

Ref. No: 63329

Printed: 2017.12.15 @ 09:36:12



DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc.**

8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278

ATTN: Max Lovely

Zachman AP #4

5-12S-19W Ellis,KS

Start Date: 2017.12.10 @ 15:56:55

End Date: 2017.12.10 @ 23:00:46

Job Ticket #: 63330 DST #: 4

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

Printed: 2017.12.15 @ 09:35:13



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N #700
 PO Box 783188
 Wichita, KS 67278
 ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63330

DST#: 4

Test Start: 2017.12.10 @ 15:56:55

GENERAL INFORMATION:

Formation: **LKC "G"**
 Deviated: No Whipstock: ft (KB)
 Test Type: Conventional Bottom Hole (Reset)
 Time Tool Opened: 17:41:01
 Tester: Brannan Lonsdale
 Time Test Ended: 23:00:46
 Unit No: 73
 Interval: **3514.00 ft (KB) To 3531.00 ft (KB) (TVD)**
 Reference Elevations: 2163.00 ft (KB)
 Total Depth: 3531.00 ft (KB) (TVD)
 2153.00 ft (CF)
 Hole Diameter: 7.88 inches
 Hole Condition: Fair
 KB to GR/CF: 10.00 ft

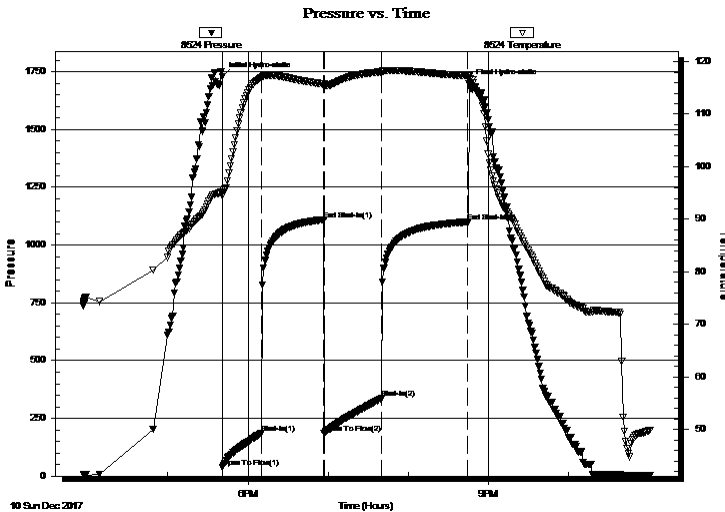
Serial #: 8524

Outside

Press@RunDepth: 336.16 psig @ 3528.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2017.12.10 End Date: 2017.12.10 Last Calib.: 2017.12.10
 Start Time: 15:56:56 End Time: 23:00:46 Time On Btm: 2017.12.10 @ 17:40:46
 Time Off Btm: 2017.12.10 @ 20:45:31

TEST COMMENT: 30- IF- BOB 5 mins
 45- IS- Slow ly built to 1"
 45- FF- BOB 7 mins
 60- FSI- Slow ly built to .5"

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1728.42	95.26	Initial Hydro-static
1	38.07	94.49	Open To Flow (1)
30	185.47	116.90	Shut-In(1)
76	1109.78	115.72	End Shut-In(1)
77	186.25	115.24	Open To Flow (2)
120	336.16	118.05	Shut-In(2)
184	1099.95	117.27	End Shut-In(2)
185	1697.64	117.34	Final Hydro-static

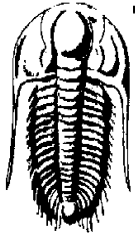
Recovery

Length (ft)	Description	Volume (bbl)
557.00	MW, 10%M 90%W	6.79
63.00	OCMW, 10%O 30%M 60%W	0.89
47.00	WOCM, 30%W 10%O 60%M	0.67
0.00	15' GIP	0.00

* Recovery from multiple tests

Gas Rates

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.
 8100 E. 22nd St. N #700
 PO Box 783188
 Wichita, KS 67278
 ATTN: Max Lovely

5-12S-19W Ellis,KS

Zachman AP #4

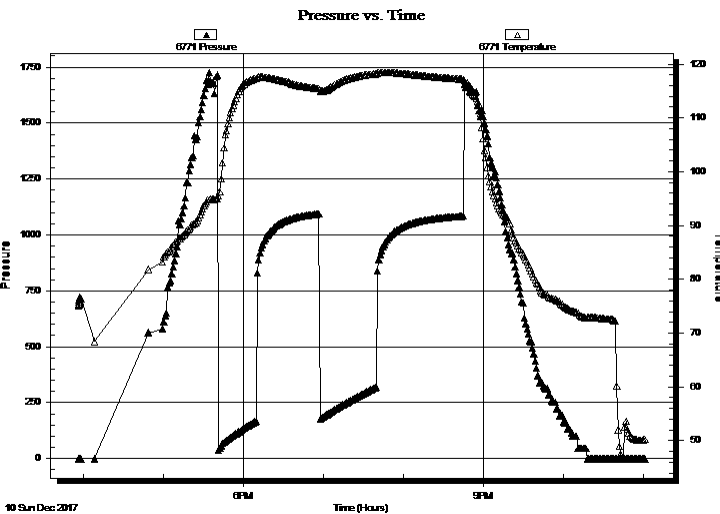
Job Ticket: 63330 **DST#: 4**
 Test Start: 2017.12.10 @ 15:56:55

GENERAL INFORMATION:

Formation: **LKC "G"**
 Deviated: No Whipstock: ft (KB) Test Type: Conventional Bottom Hole (Reset)
 Time Tool Opened: 17:41:01 Tester: Brannan Lonsdale
 Time Test Ended: 23:00:46 Unit No: 73
Interval: 3514.00 ft (KB) To 3531.00 ft (KB) (TVD) Reference Elevations: 2163.00 ft (KB)
 Total Depth: 3531.00 ft (KB) (TVD) 2153.00 ft (CF)
 Hole Diameter: 7.88 inches Hole Condition: Fair KB to GR/CF: 10.00 ft

Serial #: 6771 Inside
 Press@RunDepth: psig @ 3528.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2017.12.10 End Date: 2017.12.10 Last Calib.: 2017.12.10
 Start Time: 15:56:46 End Time: 23:00:36 Time On Btm:
 Time Off Btm:

TEST COMMENT: 30- IF- BOB 5 mins
 45- IS- Slow ly built to 1"
 45- FF- BOB 7 mins
 60- FS- Slow ly built to .5"



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

Recovery		
Length (ft)	Description	Volume (bbl)
557.00	MW, 10%M 90%W	6.79
63.00	OCMW, 10%O 30%M 60%W	0.89
47.00	WOCM, 30%W 10%O 60%M	0.67
0.00	15' 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

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N#700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63330

DST#: 4

Test Start: 2017.12.10 @ 15:56:55

Tool Information

Drill Pipe:	Length: 3386.00 ft	Diameter: 3.82 inches	Volume: 48.00 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 119.00 ft	Diameter: 2.25 inches	Volume: 0.59 bbl	Weight to Pull Loose: 55000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	19.00 ft			String Weight: Initial 46000.00 lb
Depth to Top Packer:	3514.00 ft			Final 51000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	17.00 ft			
Tool Length:	45.00 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			3487.00	
Shut In Tool	5.00			3492.00	
Hydraulic tool	5.00			3497.00	
Jars	5.00			3502.00	
Safety Joint	3.00			3505.00	
Packer	5.00			3510.00	28.00 Bottom Of Top Packer
Packer	4.00			3514.00	
Stubb	1.00			3515.00	
Perforations	13.00			3528.00	
Recorder	0.00	6771	Inside	3528.00	
Recorder	0.00	8524	Outside	3528.00	
Bullnose	3.00			3531.00	17.00 Bottom Packers & Anchor

Total Tool Length: 45.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N#700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63330

DST#: 4

Test Start: 2017.12.10 @ 15:56:55

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

34 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

80000 ppm

Viscosity: 53.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.17 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2100.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
557.00	MW, 10%M 90%W	6.794
63.00	OCMW, 10%O 30%M 60%W	0.893
47.00	WOCM, 30%W 10%O 60%M	0.666
0.00	15' GIP	0.000

Total Length: 667.00 ft Total Volume: 8.353 bbl

Num Fluid Samples: 0

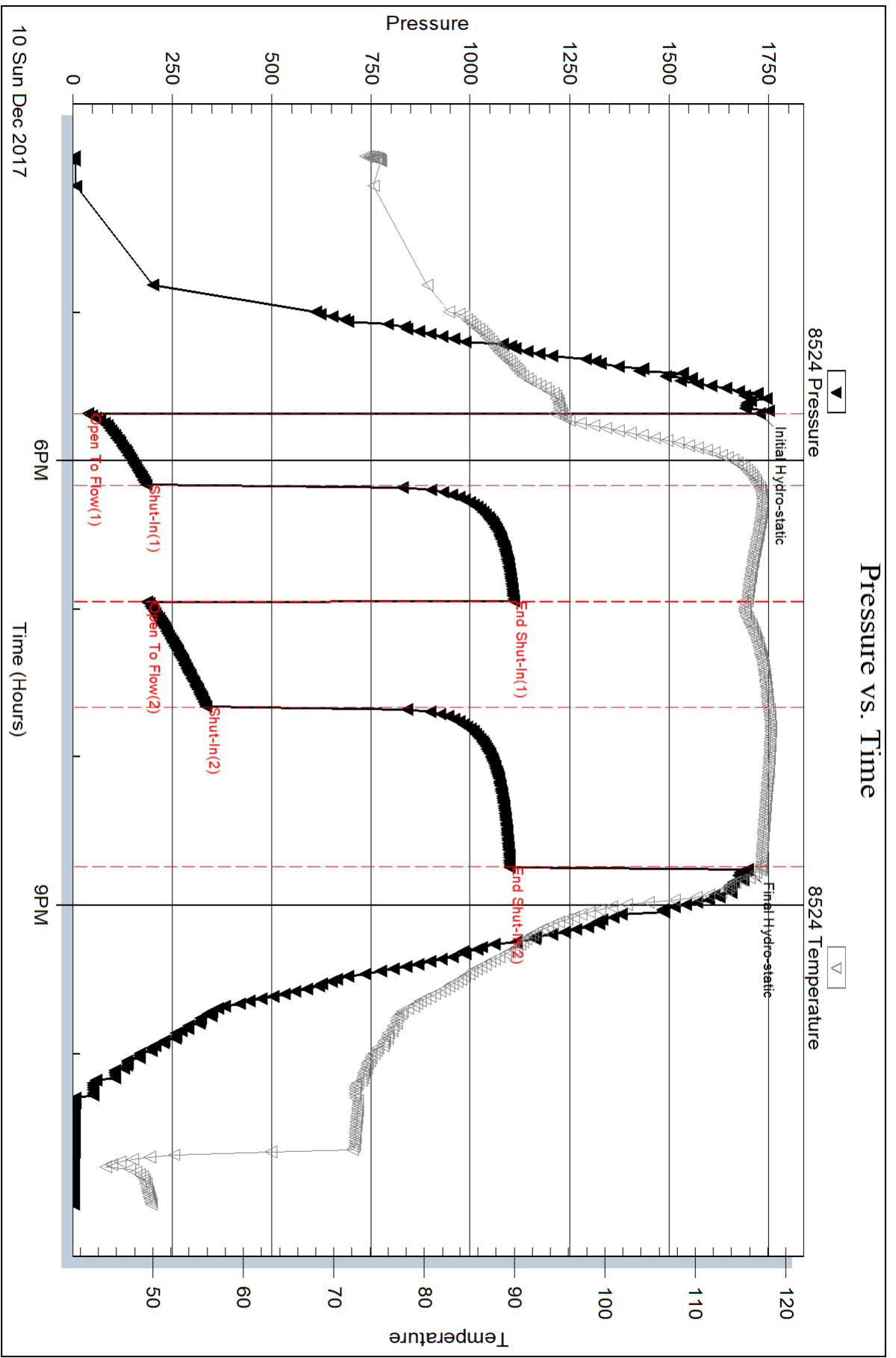
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW: .11@53deg



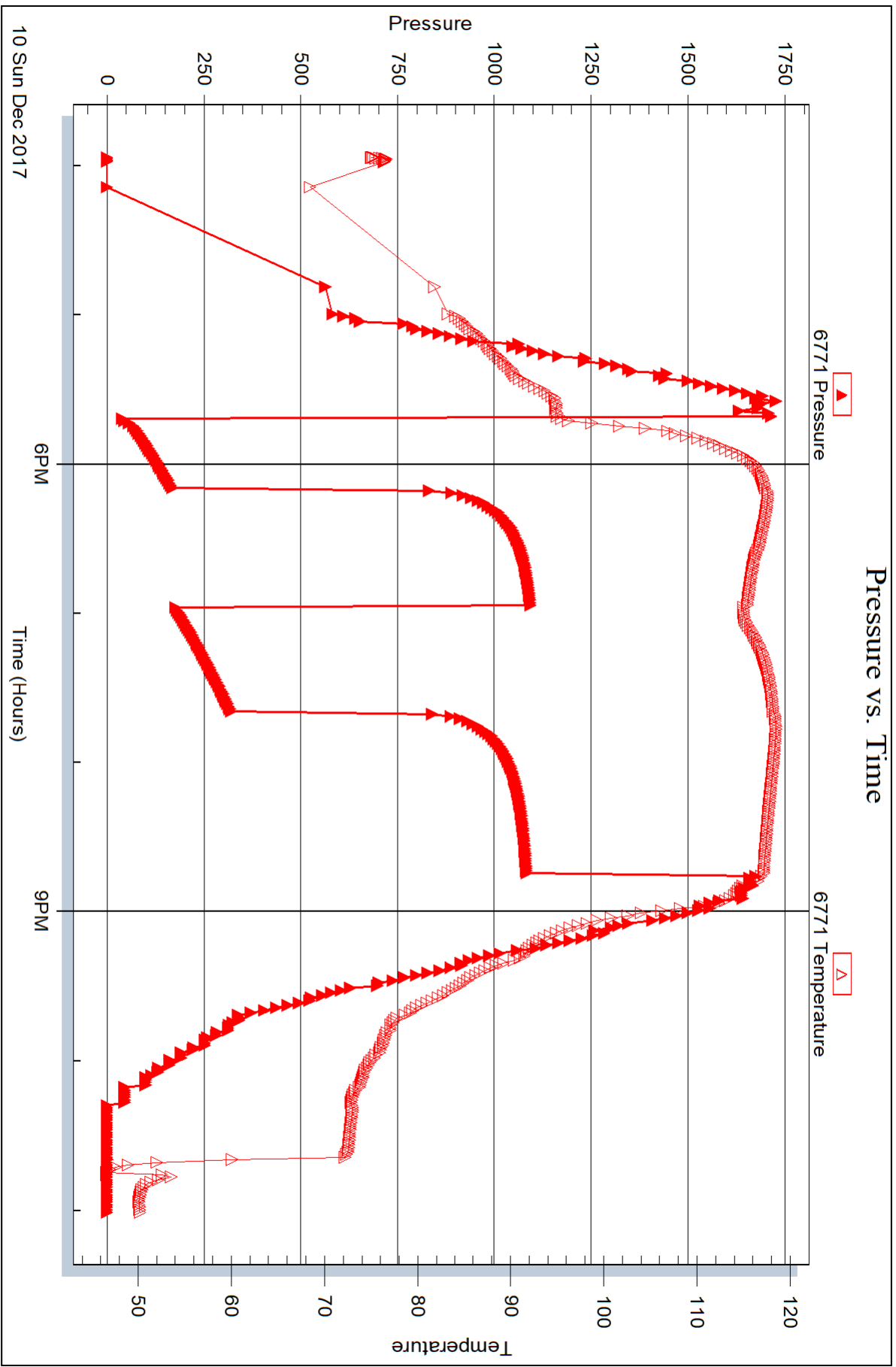
Serial #: 6771

Inside

Ritchie Exploration, Inc.

Zachman AP#4

DST Test Number: 4



Trilobite Testing, Inc

Ref. No: 63330

Printed: 2017.12.15 @ 09:35:14



DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc.**

8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278

ATTN: Max Lovely

Zachman AP #4

5-12S-19W Ellis,KS

Start Date: 2017.12.11 @ 08:55:55

End Date: 2017.12.11 @ 16:47:31

Job Ticket #: 63331 DST #: 5

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

Printed: 2017.12.15 @ 09:34:43



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N#700
 PO Box 783188
 Wichita, KS 67278
 ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63331

DST#: 5

Test Start: 2017.12.11 @ 08:55:55

GENERAL INFORMATION:

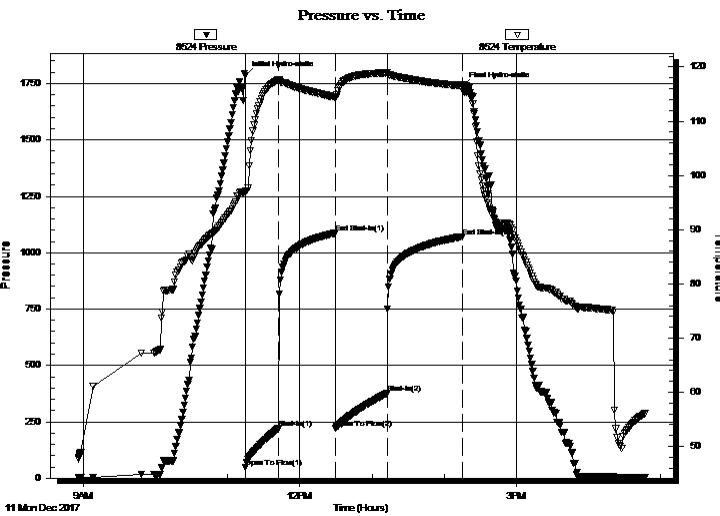
Formation: **LKC "H - I"**
 Deviated: No Whipstock: ft (KB)
 Test Type: Conventional Bottom Hole (Reset)
 Time Tool Opened: 11:14:46
 Tester: Brannan Lonsdale
 Time Test Ended: 16:47:31
 Unit No: 73
 Interval: **3567.00 ft (KB) To 3595.00 ft (KB) (TVD)**
 Reference Elevations: 2163.00 ft (KB)
 Total Depth: 3595.00 ft (KB) (TVD)
 2153.00 ft (CF)
 Hole Diameter: 7.88 inches
 Hole Condition: Fair
 KB to GR/CF: 10.00 ft

Serial #: 8524

Outside

Press@RunDepth: 377.66 psig @ 3592.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2017.12.11 End Date: 2017.12.11 Last Calib.: 2017.12.11
 Start Time: 08:55:56 End Time: 16:47:31 Time On Btm: 2017.12.11 @ 11:14:31
 Time Off Btm: 2017.12.11 @ 14:15:01

TEST COMMENT: 30- IF- BOB 4 mins
 45- IS- Slow ly built to 1 1/2"
 45- FF- BOB 6mins
 60- FSI- Slow ly built to 1 1/2"



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1786.03	97.09	Initial Hydro-static
1	48.89	96.77	Open To Flow (1)
28	219.02	117.61	Shut-In(1)
75	1086.90	114.49	End Shut-In(1)
75	222.07	114.19	Open To Flow (2)
118	377.66	118.93	Shut-In(2)
181	1071.01	116.54	End Shut-In(2)
181	1735.27	116.77	Final Hydro-static

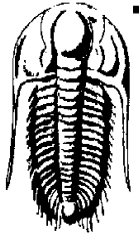
Recovery

Length (ft)	Description	Volume (bbl)
307.00	MW, 10%M 90%W	3.25
406.00	OCMW, 15%O 40%M 45%W	5.76
47.00	CO	0.67
0.00	50' GIP	0.00

* Recovery from multiple tests

Gas Rates

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely**Zachman AP #4**

Job Ticket: 63331

DST#: 5

Test Start: 2017.12.11 @ 08:55:55

GENERAL INFORMATION:

Formation: **LKC "H - I"**

Deviated: No Whipstock: ft (KB)

Test Type: Conventional Bottom Hole (Reset)

Time Tool Opened: 11:14:46

Tester: Brannan Lonsdale

Time Test Ended: 16:47:31

Unit No: 73

Interval: 3567.00 ft (KB) To 3595.00 ft (KB) (TVD)

Reference Elevations: 2163.00 ft (KB)

Total Depth: 3595.00 ft (KB) (TVD)

2153.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 10.00 ft

Serial #: 6771 **Inside**

Press@RunDepth: psig @ 3592.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2017.12.11

End Date:

2017.12.11

Last Calib.:

2017.12.11

Start Time: 08:55:58

End Time:

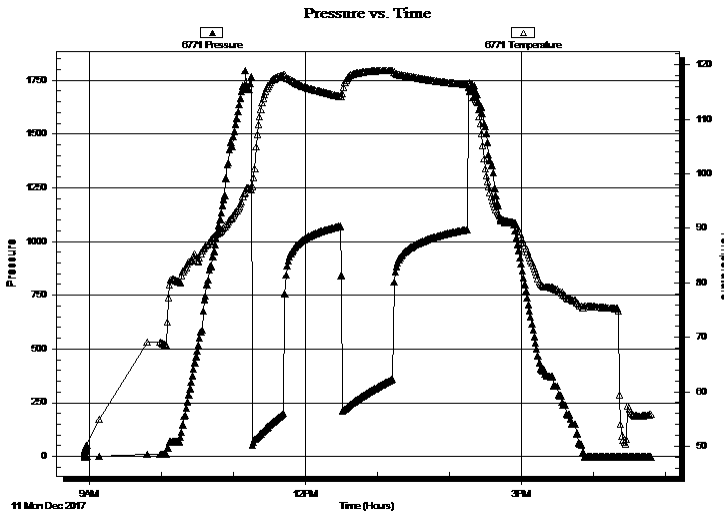
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Time On Btm:

Time Off Btm:

TEST COMMENT: 30- IF- BOB 4 mins
 45- IS- Slow ly built to 1 1/2"
 45- FF- BOB 6mins
 60- FSI- Slow ly built to 1 1/2"

PRESSURE SUMMARY



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

Recovery

Length (ft)	Description	Volume (bbl)
307.00	MW, 10%M 90%W	3.25
406.00	OCMW, 15%O 40%M 45%W	5.76
47.00	CO	0.67
0.00	50' 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

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N#700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63331

DST#: 5

Test Start: 2017.12.11 @ 08:55:55

Tool Information

Drill Pipe:	Length: 3450.00 ft	Diameter: 3.82 inches	Volume: 48.91 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 119.00 ft	Diameter: 2.25 inches	Volume: 0.59 bbl	Weight to Pull Loose: 58000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	30.00 ft			String Weight: Initial 48000.00 lb
Depth to Top Packer:	3567.00 ft			Final 54000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	28.00 ft			
Tool Length:	56.00 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			3540.00	
Shut In Tool	5.00			3545.00	
Hydraulic tool	5.00			3550.00	
Jars	5.00			3555.00	
Safety Joint	3.00			3558.00	
Packer	5.00			3563.00	28.00 Bottom Of Top Packer
Packer	4.00			3567.00	
Stubb	1.00			3568.00	
Perforations	24.00			3592.00	
Recorder	0.00	6771	Inside	3592.00	
Recorder	0.00	8524	Outside	3592.00	
Bullnose	3.00			3595.00	28.00 Bottom Packers & Anchor

Total Tool Length: 56.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N#700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63331

DST#: 5

Test Start: 2017.12.11 @ 08:55:55

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

33 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

67000 ppm

Viscosity: 50.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.38 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 3000.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
307.00	MW, 10%M 90%W	3.250
406.00	OCMW, 15%O 40%M 45%W	5.755
47.00	CO	0.666
0.00	50' GIP	0.000

Total Length: 760.00 ft Total Volume: 9.671 bbl

Num Fluid Samples: 0

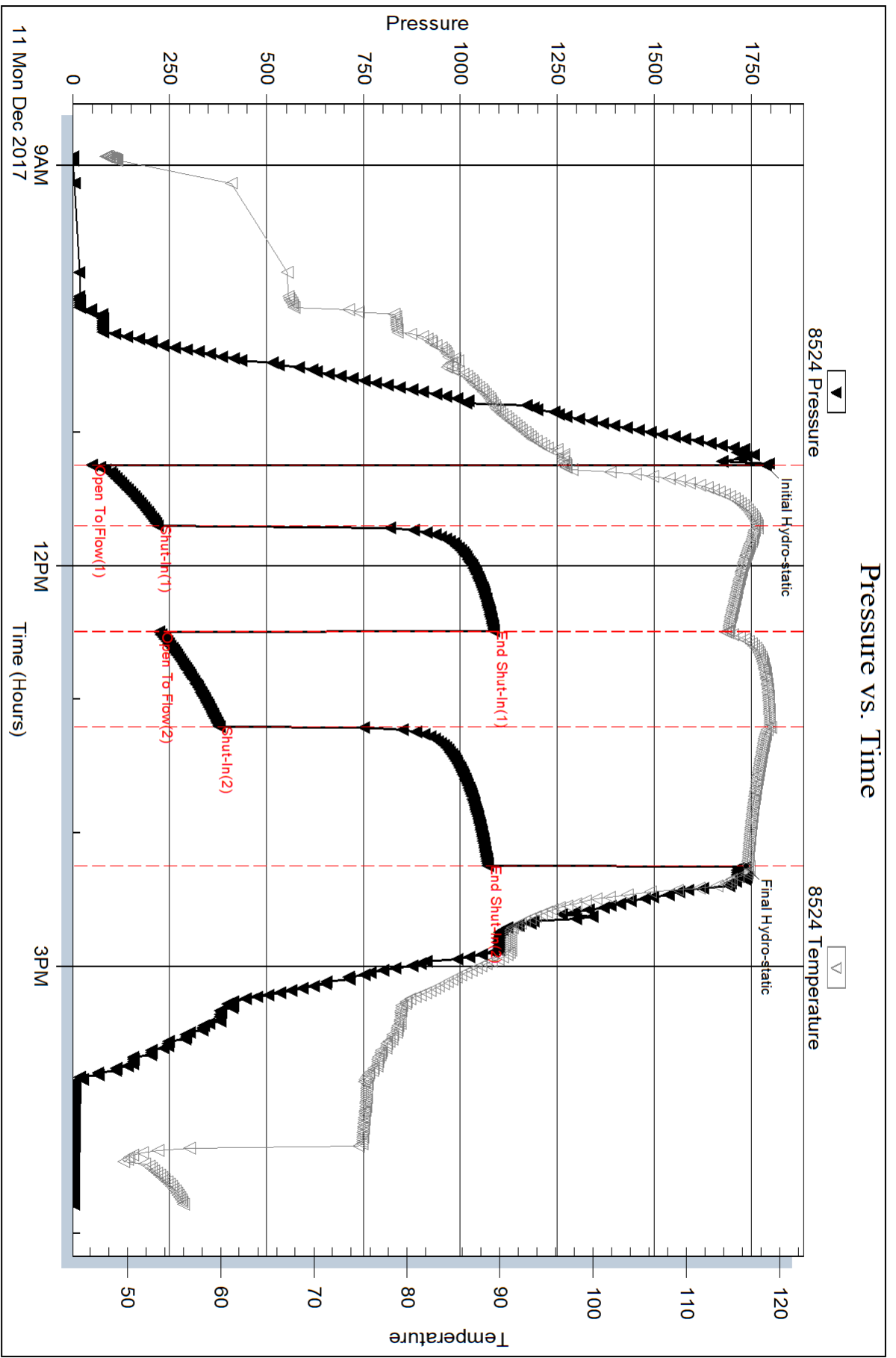
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW: .12@57deg



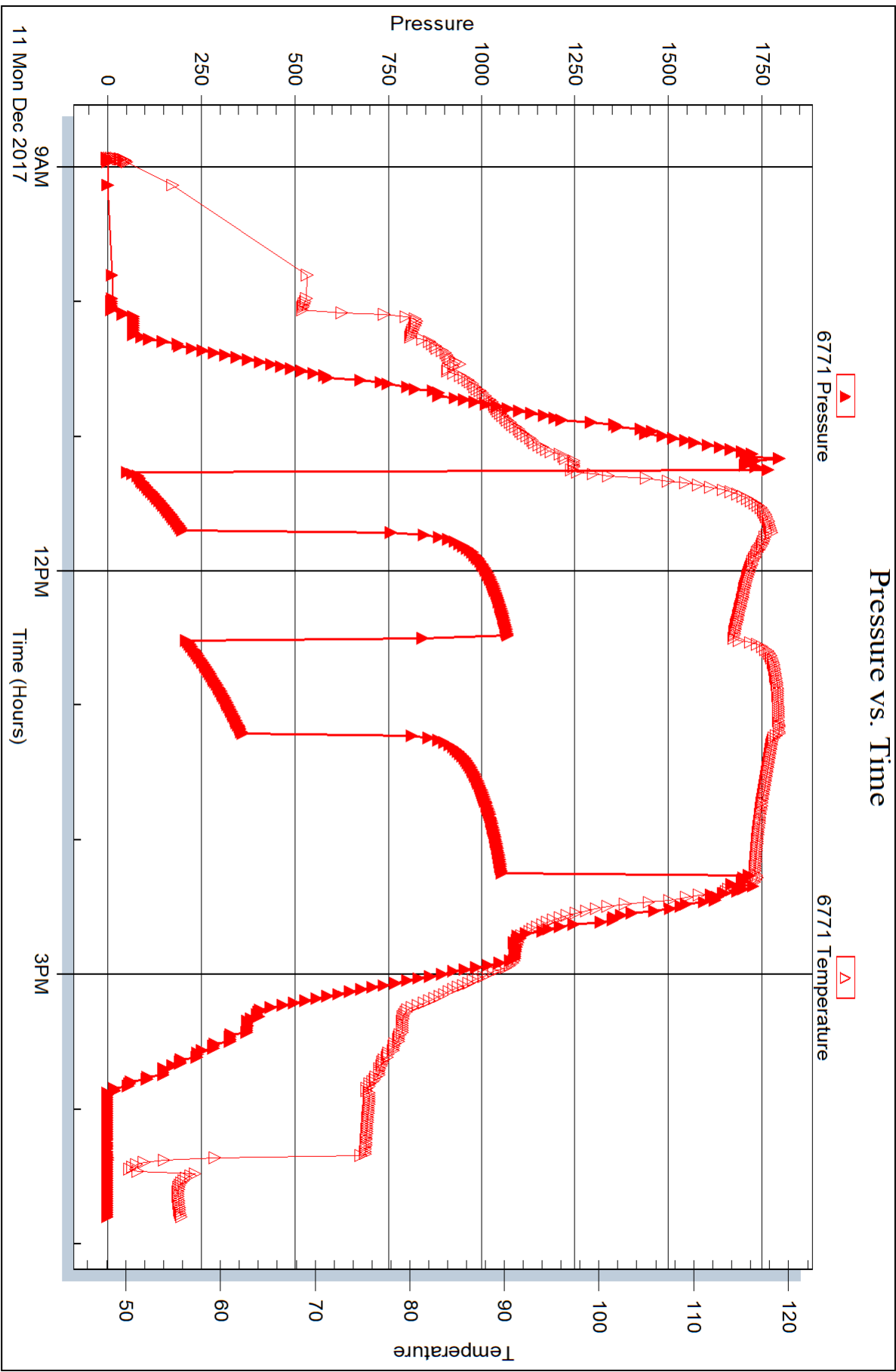
Serial #: 6771

Inside

Ritchie Exploration, Inc.

Zachman AP#4

DST Test Number: 5





DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc.**

8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278

ATTN: Max Lovely

Zachman AP #4

5-12S-19W Ellis,KS

Start Date: 2017.12.11 @ 22:33:43

End Date: 2017.12.12 @ 05:06:34

Job Ticket #: 63332 DST #: 6

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

Printed: 2017.12.15 @ 09:34:08



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N#700
 PO Box 783188
 Wichita, KS 67278
 ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63332

DST#: 6

Test Start: 2017.12.11 @ 22:33:43

GENERAL INFORMATION:

Formation: **LKC "J"**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 00:45:34
 Time Test Ended: 05:06:34
 Interval: **3596.00 ft (KB) To 3614.00 ft (KB) (TVD)**
 Total Depth: 3614.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Brannan Lonsdale
 Unit No: 73
 Reference Elevations: 2163.00 ft (KB)
 2153.00 ft (CF)
 KB to GR/CF: 10.00 ft

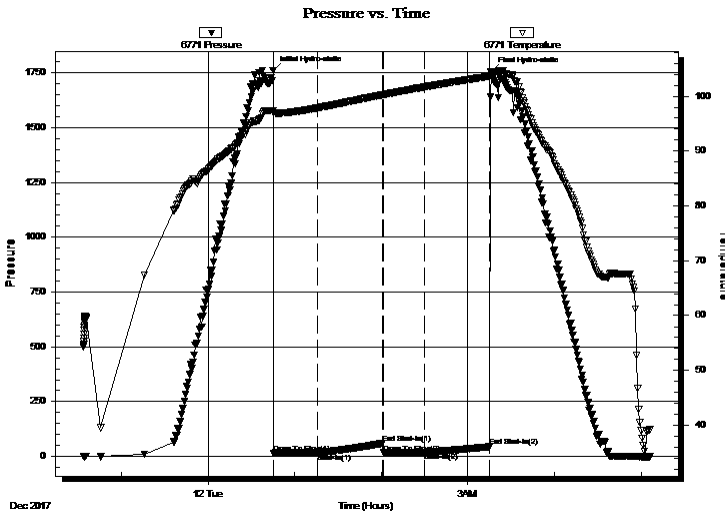
Serial #: 6771

Inside

Press@RunDepth: 17.42 psig @ 3611.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2017.12.11 End Date: 2017.12.12 Last Calib.: 2017.12.12
 Start Time: 22:33:44 End Time: 05:06:34 Time On Btm: 2017.12.12 @ 00:45:04
 Time Off Btm: 2017.12.12 @ 03:16:19

TEST COMMENT: 30- IF- Built very slow ly to 3/4"
 45- IS- No blow
 30- FF- No blow
 45- FSI- No blow

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1760.76	97.35	Initial Hydro-static
1	15.44	97.01	Open To Flow (1)
31	15.72	97.85	Shut-In(1)
76	59.98	100.25	End Shut-In(1)
77	16.89	100.29	Open To Flow (2)
105	17.42	101.69	Shut-In(2)
150	44.41	103.63	End Shut-In(2)
152	1757.00	104.21	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
2.00	Mw / few oil spots	0.01

* Recovery from multiple tests

Gas Rates

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.
 8100 E. 22nd St. N #700
 PO Box 783188
 Wichita, KS 67278
 ATTN: Max Lovely

5-12S-19W Ellis,KS

Zachman AP #4

Job Ticket: 63332

DST#: 6

Test Start: 2017.12.11 @ 22:33:43

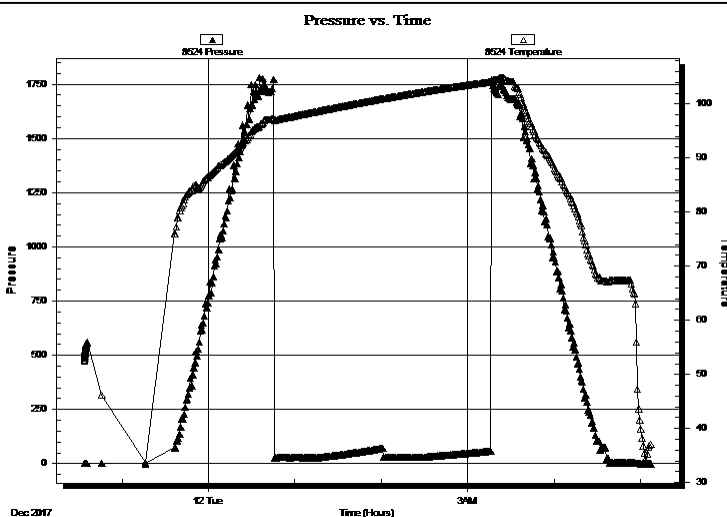
GENERAL INFORMATION:

Formation: LKC "J"	Test Type: Conventional Bottom Hole (Reset)
Deviated: No Whipstock: ft (KB)	Tester: Brannan Lonsdale
Time Tool Opened: 00:45:34	Unit No: 73
Time Test Ended: 05:06:34	Reference Elevations: 2163.00 ft (KB)
Interval: 3596.00 ft (KB) To 3614.00 ft (KB) (TVD)	2153.00 ft (CF)
Total Depth: 3614.00 ft (KB) (TVD)	KB to GR/CF: 10.00 ft
Hole Diameter: 7.88 inches	Hole Condition: Fair

Serial #: 8524 Outside

Press@RunDepth: psig @ 3611.00 ft (KB)	Capacity: 8000.00 psig
Start Date: 2017.12.11	End Date: 2017.12.12
Start Time: 22:34:01	End Time: 05:07:06
	Last Calib.: 2017.12.12
	Time On Btm:
	Time Off Btm:

TEST COMMENT: 30- IF- Built very slow ly to 3/4"
 45- IS- No blow
 30- FF- No blow
 45- FS- No blow



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
2.00	Mw / few oil spots	0.01

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N#700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63332

DST#: 6

Test Start: 2017.12.11 @ 22:33:43

Tool Information

Drill Pipe:	Length: 3481.00 ft	Diameter: 3.82 inches	Volume: 49.34 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 119.00 ft	Diameter: 2.25 inches	Volume: 0.59 bbl	Weight to Pull Loose: 57000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	32.00 ft			String Weight: Initial 47000.00 lb
Depth to Top Packer:	3596.00 ft			Final 47000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	18.00 ft			
Tool Length:	46.00 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			3569.00	
Shut In Tool	5.00			3574.00	
Hydraulic tool	5.00			3579.00	
Jars	5.00			3584.00	
Safety Joint	3.00			3587.00	
Packer	5.00			3592.00	28.00 Bottom Of Top Packer
Packer	4.00			3596.00	
Stubb	1.00			3597.00	
Perforations	14.00			3611.00	
Recorder	0.00	6771	Inside	3611.00	
Recorder	0.00	8524	Outside	3611.00	
Bullnose	3.00			3614.00	18.00 Bottom Packers & Anchor

Total Tool Length: 46.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63332

DST#: 6

Test Start: 2017.12.11 @ 22:33:43

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: 7.38 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 3000.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
2.00	Mw / few oil spots	0.010

Total Length: 2.00 ft Total Volume: 0.010 bbl

Num Fluid Samples: 0

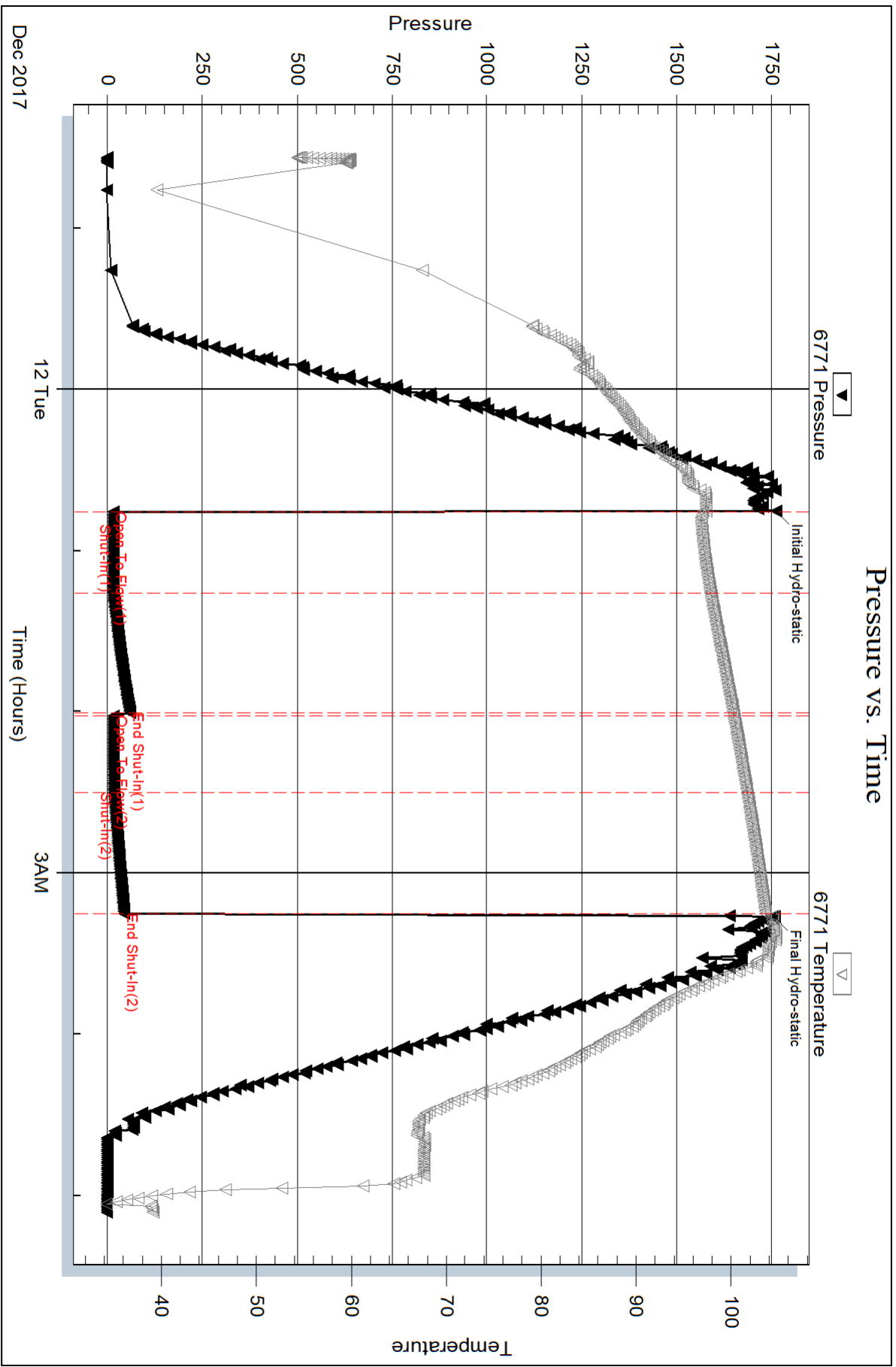
Num Gas Bombs: 0

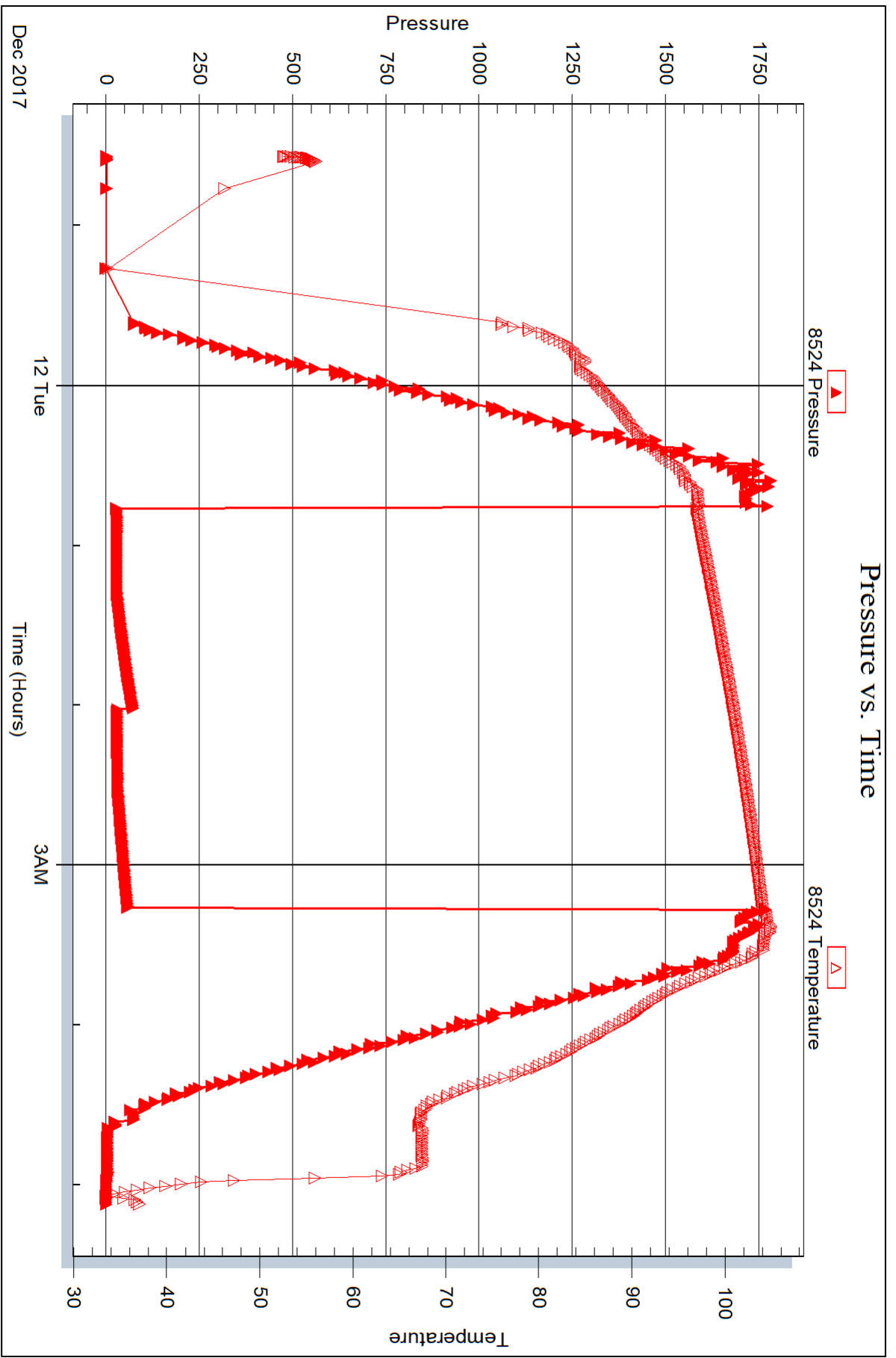
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:







DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc.**

8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278

ATTN: Max Lovely

Zachman AP #4

5-12S-19W Ellis,KS

Start Date: 2017.12.12 @ 11:32:57

End Date: 2017.12.12 @ 18:04:48

Job Ticket #: 63333 DST #: 7

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

Printed: 2017.12.15 @ 09:33:28



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N #700
 PO Box 783188
 Wichita, KS 67278
 ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63333

DST#: 7

Test Start: 2017.12.12 @ 11:32:57

GENERAL INFORMATION:

Formation: **LKC "K"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 13:35:33

Time Test Ended: 18:04:48

Test Type: Conventional Bottom Hole (Reset)

Tester: Brannan Lonsdale

Unit No: 73

Interval: 3615.00 ft (KB) To 3637.00 ft (KB) (TVD)

Reference Elevations: 2163.00 ft (KB)

Total Depth: 3637.00 ft (KB) (TVD)

2153.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 10.00 ft

Serial #: 6771

Inside

Press@RunDepth: 17.88 psig @ 3634.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2017.12.12

End Date:

2017.12.12

Last Calib.:

2017.12.12

Start Time: 11:32:58

End Time:

18:04:48

Time On Btm:

2017.12.12 @ 13:35:03

Time Off Btm:

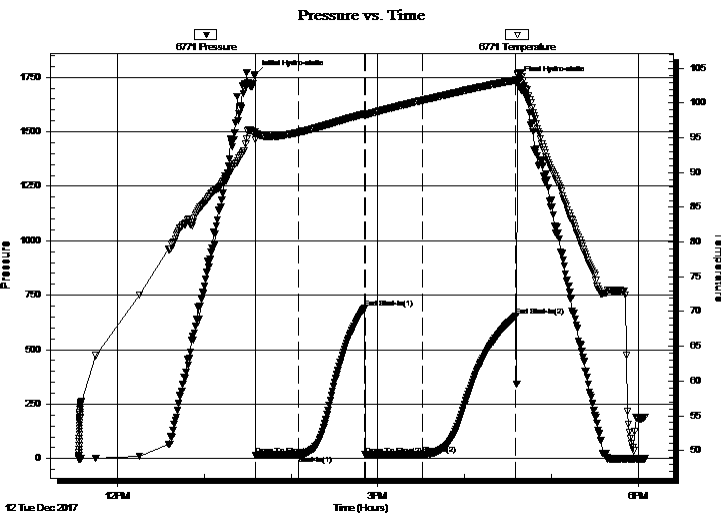
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TEST COMMENT: 30- IF- Slow ly built to 1"

45- IS- No blow

45- FF- Very weak surface blow

60- FSI- No blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1760.73	95.87	Initial Hydro-static
1	16.15	95.58	Open To Flow (1)
30	16.68	95.75	Shut-In(1)
76	689.43	98.43	End Shut-In(1)
76	16.95	98.30	Open To Flow (2)
116	17.88	100.36	Shut-In(2)
181	653.19	103.29	End Shut-In(2)
182	1732.53	104.08	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
3.00	Mud	0.01

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

5-12S-19W Ellis, KS

8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63333

DST#: 7

Test Start: 2017.12.12 @ 11:32:57

GENERAL INFORMATION:

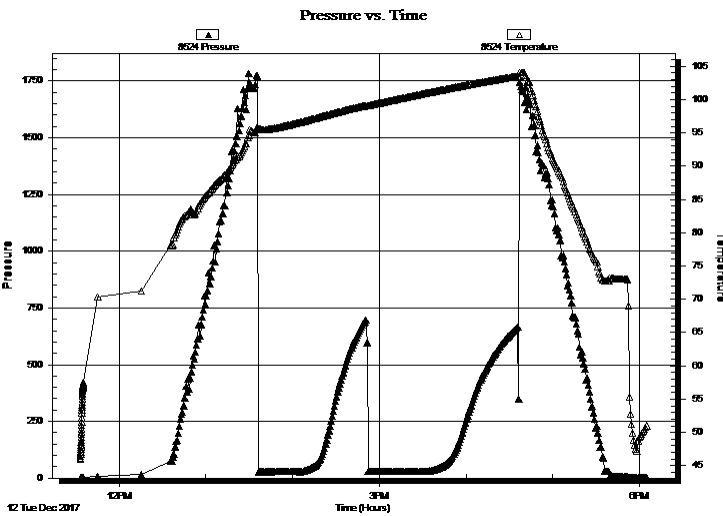
Formation: LKC "K"		Test Type: Conventional Bottom Hole (Reset)
Deviated: No Whipstock: ft (KB)		Tester: Brannan Lonsdale
Time Tool Opened: 13:35:33		Unit No: 73
Time Test Ended: 18:04:48		Reference Elevations: 2163.00 ft (KB)
Interval: 3615.00 ft (KB) To 3637.00 ft (KB) (TVD)		2153.00 ft (CF)
Total Depth: 3637.00 ft (KB) (TVD)		KB to GR/CF: 10.00 ft
Hole Diameter: 7.88 inches Hole Condition: Fair		

Serial #: 8524

Outside

Press@RunDepth: psig @ 3634.00 ft (KB)	Capacity: 8000.00 psig
Start Date: 2017.12.12 End Date: 2017.12.12	Last Calib.: 2017.12.12
Start Time: 11:33:24 End Time: 18:05:29	Time On Btm:
	Time Off Btm:

TEST COMMENT: 30- IF- Slowly built to 1"
45- IS- No blow
45- FF- Very weak surface blow
60- FSI- No blow



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
3.00	Mud	0.01

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N#700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63333

DST#: 7

Test Start: 2017.12.12 @ 11:32:57

Tool Information

Drill Pipe:	Length: 3481.00 ft	Diameter: 3.82 inches	Volume: 49.34 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 119.00 ft	Diameter: 2.25 inches	Volume: 0.59 bbl	Weight to Pull Loose: 65000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	13.00 ft			String Weight: Initial 51000.00 lb
Depth to Top Packer:	3615.00 ft			Final 51000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	22.00 ft			
Tool Length:	50.00 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			3588.00	
Shut In Tool	5.00			3593.00	
Hydraulic tool	5.00			3598.00	
Jars	5.00			3603.00	
Safety Joint	3.00			3606.00	
Packer	5.00			3611.00	28.00 Bottom Of Top Packer
Packer	4.00			3615.00	
Stubb	1.00			3616.00	
Perforations	18.00			3634.00	
Recorder	0.00	6771	Inside	3634.00	
Recorder	0.00	8524	Outside	3634.00	
Bullnose	3.00			3637.00	22.00 Bottom Packers & Anchor

Total Tool Length: 50.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63333

DST#: 7

Test Start: 2017.12.12 @ 11:32:57

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: 55.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.18 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2200.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
3.00	Mud	0.015

Total Length: 3.00 ft Total Volume: 0.015 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

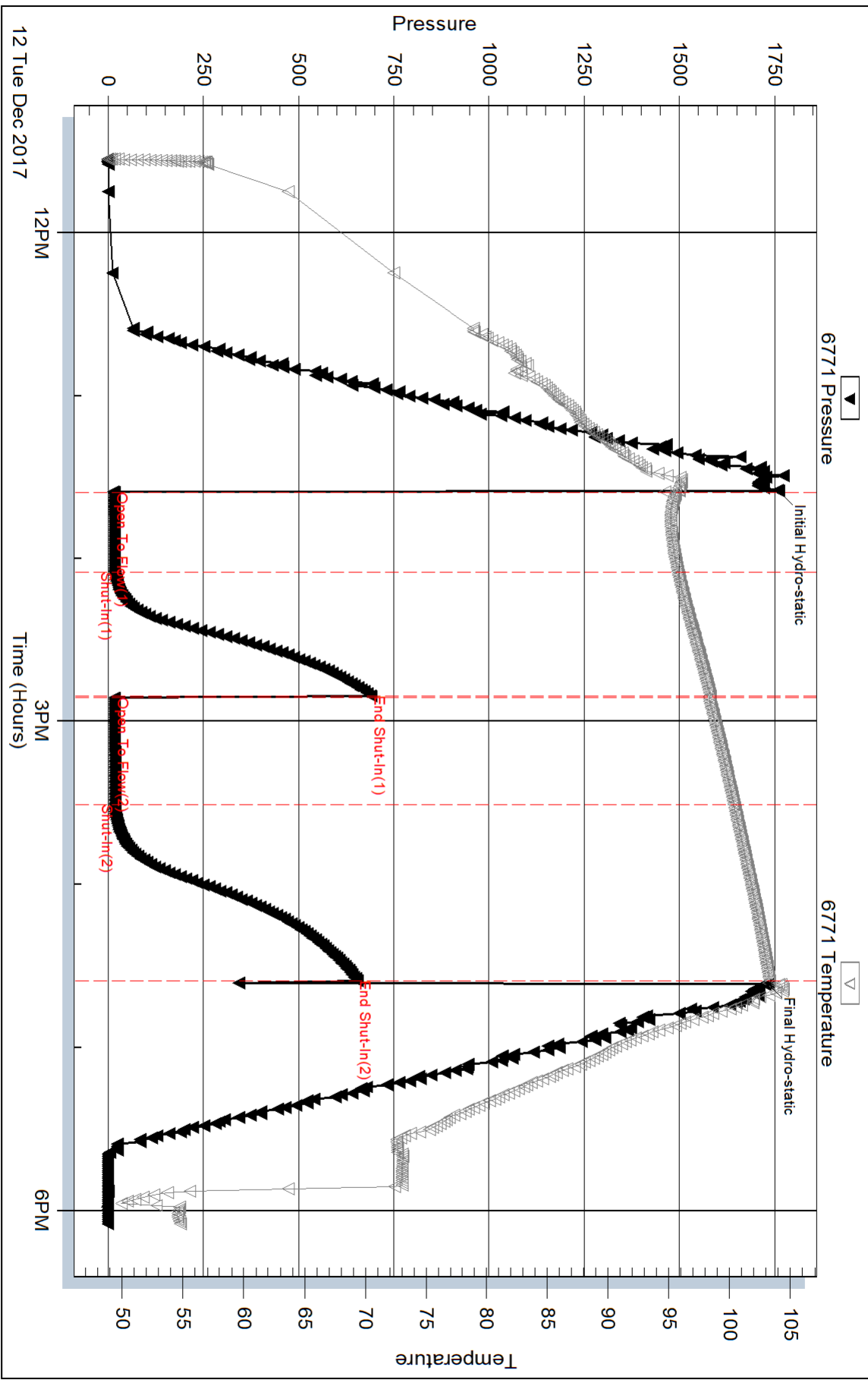
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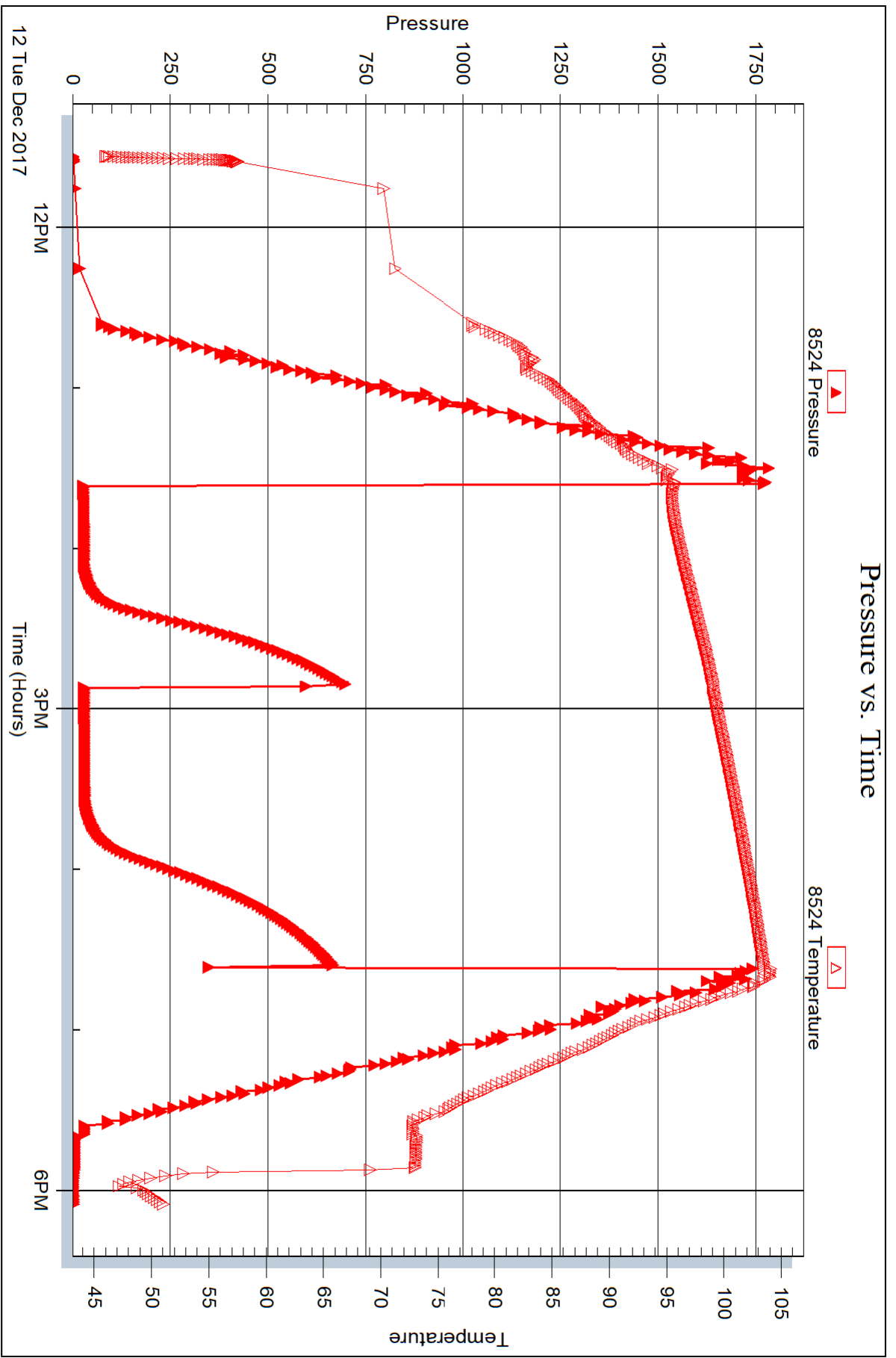
Laboratory Name:

Laboratory Location:

Recovery Comments:

Pressure vs. Time







DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc.**

8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278

ATTN: Max Lovely

Zachman AP #4

5-12S-19W Ellis,KS

Start Date: 2017.12.13 @ 10:08:40

End Date: 2017.12.13 @ 15:55:31

Job Ticket #: 63334 DST #: 8

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

Printed: 2017.12.15 @ 09:30:16



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N #700
 PO Box 783188
 Wichita, KS 67278
 ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63334

DST#: 8

Test Start: 2017.12.13 @ 10:08:40

GENERAL INFORMATION:

Formation: **Arbuckle**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 11:51:46

Time Test Ended: 15:55:31

Test Type: Conventional Bottom Hole (Reset)

Tester: Brannan Lonsdale

Unit No: 73

Interval: 3713.00 ft (KB) To 3734.00 ft (KB) (TVD)

Reference Elevations: 2163.00 ft (KB)

Total Depth: 3734.00 ft (KB) (TVD)

2153.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 10.00 ft

Serial #: 6771

Inside

Press@RunDepth: 53.69 psig @ 3731.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2017.12.13

End Date: 2017.12.13

Last Calib.: 2017.12.13

Start Time: 10:08:41

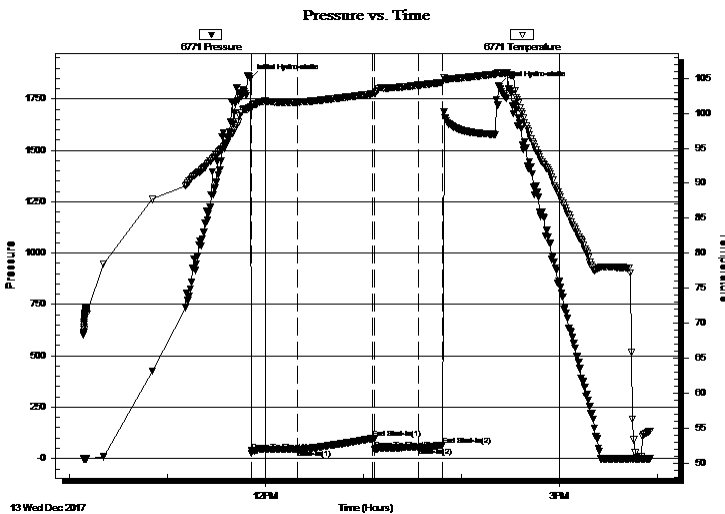
End Time: 15:55:31

Time On Btm: 2017.12.13 @ 11:50:46

Time Off Btm: 2017.12.13 @ 14:22:31

TEST COMMENT: 30- IF- Built to 3" in 15 mins and maintained 3" blow throughout
 45- IS- No blow
 30- FF- Weak surface blow died in 4 mins
 45- FSI- No blow

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1847.89	100.89	Initial Hydro-static
1	37.07	100.87	Open To Flow (1)
29	46.37	101.59	Shut-In(1)
75	97.76	102.77	End Shut-In(1)
76	46.08	102.79	Open To Flow (2)
103	53.69	104.00	Shut-In(2)
118	65.31	104.41	End Shut-In(2)
152	1815.08	105.72	Final Hydro-static

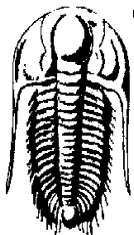
Recovery

Length (ft)	Description	Volume (bbl)
60.00	Mud	0.30

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N#700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63334

DST#: 8

Test Start: 2017.12.13 @ 10:08:40

GENERAL INFORMATION:

Formation: **Arbuckle**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 11:51:46

Time Test Ended: 15:55:31

Test Type: Conventional Bottom Hole (Reset)

Tester: Brannan Lonsdale

Unit No: 73

Interval: 3713.00 ft (KB) To 3734.00 ft (KB) (TVD)

Total Depth: 3734.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 2163.00 ft (KB)

2153.00 ft (CF)

KB to GR/CF: 10.00 ft

Serial #: 8524 Outside

Press@RunDepth: psig @ 3731.00 ft (KB)

Start Date: 2017.12.13

End Date: 2017.12.13

Start Time: 10:08:25

End Time: 15:55:15

Capacity: 8000.00 psig

Last Calib.: 2017.12.13

Time On Btm:

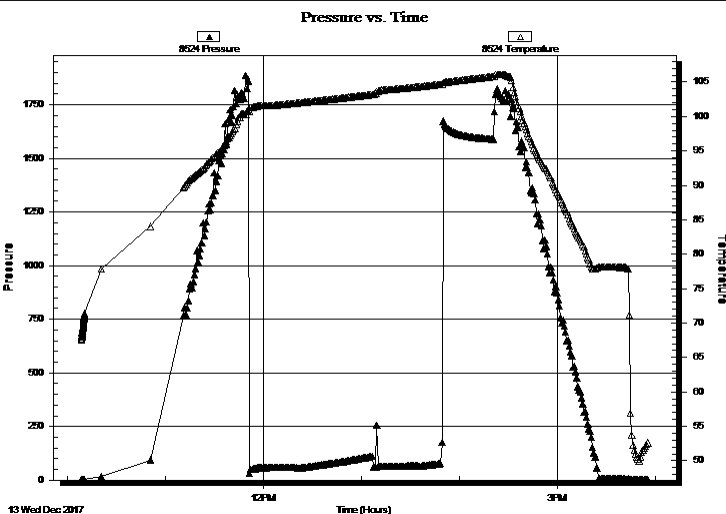
Time Off Btm:

TEST COMMENT: 30- IF- Built to 3" in 15 mins and maintained 3" blow throughout

45- IS- No blow

30- FF- Weak surface blow died in 4 mins

45- FSI- No blow



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
60.00	Mud	0.30

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N#700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63334

DST#: 8

Test Start: 2017.12.13 @ 10:08:40

Tool Information

Drill Pipe:	Length: 3574.00 ft	Diameter: 3.82 inches	Volume: 50.66 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 119.00 ft	Diameter: 2.25 inches	Volume: 0.59 bbl	Weight to Pull Loose: 59000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	8.00 ft			String Weight: Initial 51000.00 lb
Depth to Top Packer:	3713.00 ft			Final 51000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	21.00 ft			
Tool Length:	49.00 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			3686.00	
Shut In Tool	5.00			3691.00	
Hydraulic tool	5.00			3696.00	
Jars	5.00			3701.00	
Safety Joint	3.00			3704.00	
Packer	5.00			3709.00	28.00 Bottom Of Top Packer
Packer	4.00			3713.00	
Stubb	1.00			3714.00	
Perforations	17.00			3731.00	
Recorder	0.00	6771	Inside	3731.00	
Recorder	0.00	8524	Outside	3731.00	
Bullnose	3.00			3734.00	21.00 Bottom Packers & Anchor

Total Tool Length: 49.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N#700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63334

DST#: 8

Test Start: 2017.12.13 @ 10:08:40

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: 7.19 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2100.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
60.00	Mud	0.295

Total Length: 60.00 ft Total Volume: 0.295 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

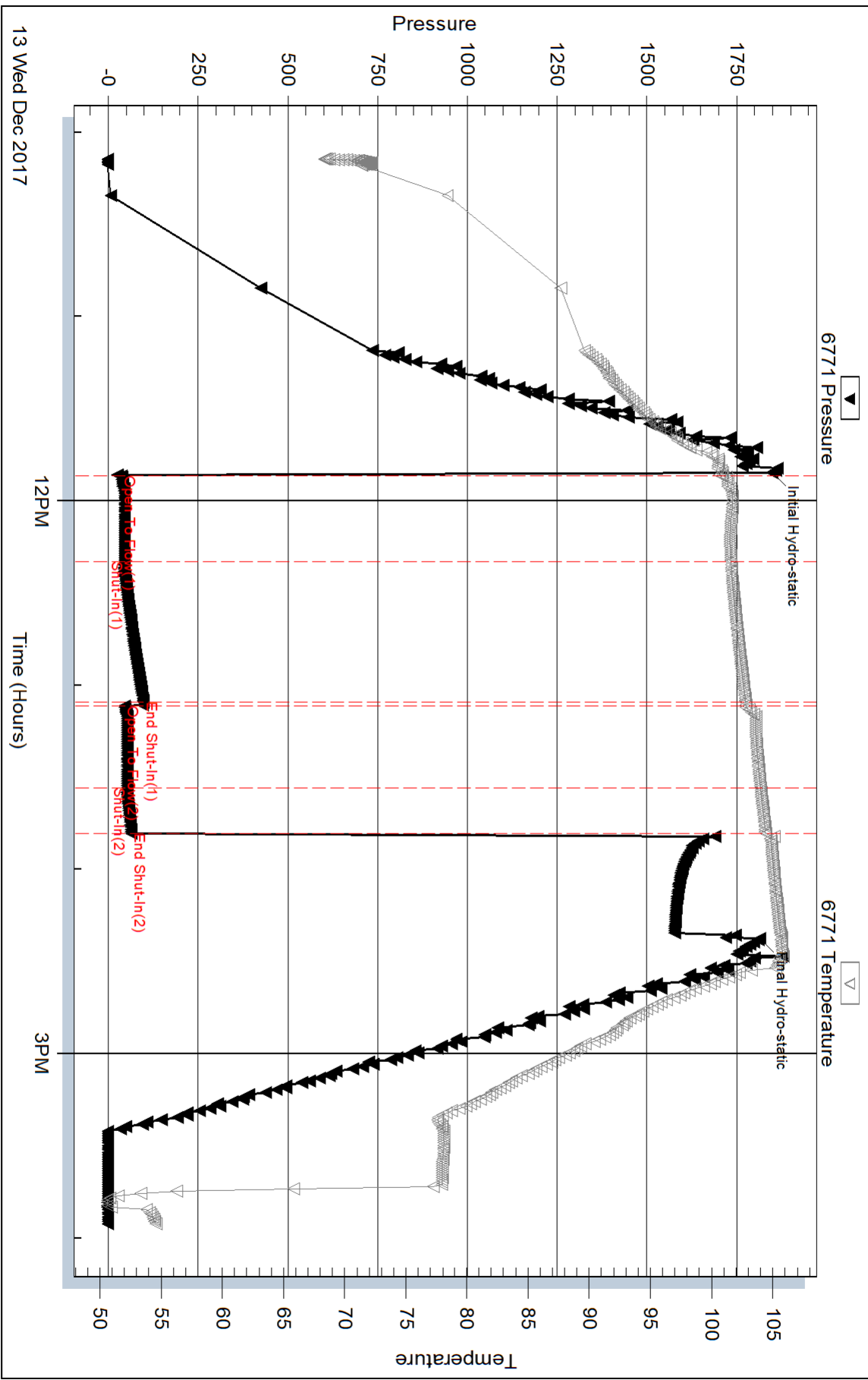
Serial #:

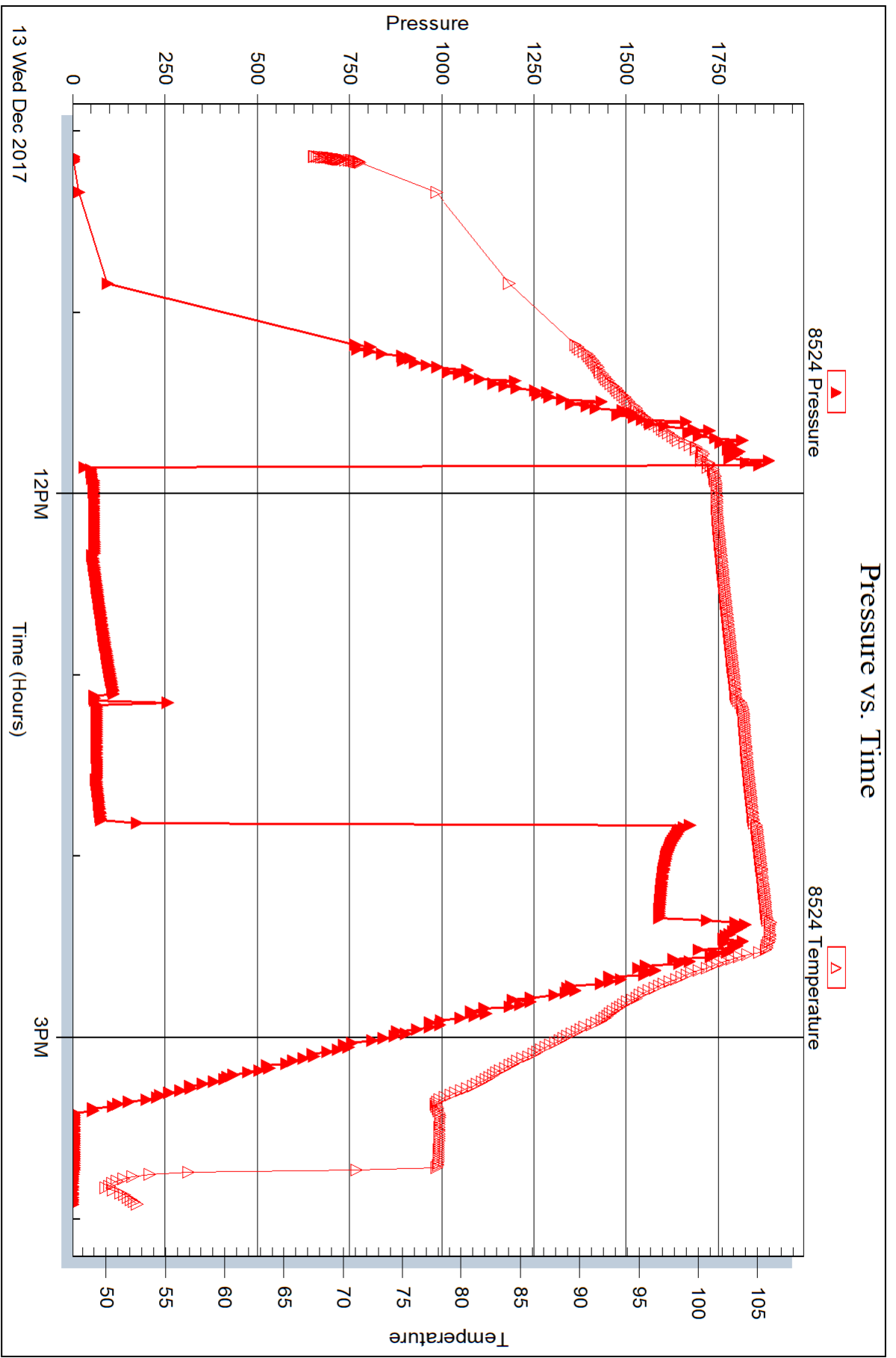
Laboratory Name:

Laboratory Location:

Recovery Comments:

Pressure vs. Time







DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc.**

8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278

ATTN: Max Lovely

Zachman AP #4

5-12S-19W Ellis,KS

Start Date: 2017.12.13 @ 22:19:31

End Date: 2017.12.14 @ 04:39:37

Job Ticket #: 63335 DST #: 9

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

Printed: 2017.12.15 @ 09:29:30



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N #700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63335

DST#: 9

Test Start: 2017.12.13 @ 22:19:31

GENERAL INFORMATION:

Formation: **Arbuckle**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 00:13:37

Time Test Ended: 04:39:37

Test Type: Conventional Bottom Hole (Reset)

Tester: Brannan Lonsdale

Unit No: 73

Interval: 3714.00 ft (KB) To 3744.00 ft (KB) (TVD)

Reference Elevations: 2163.00 ft (KB)

Total Depth: 3744.00 ft (KB) (TVD)

2153.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 10.00 ft

Serial #: 8524 Outside

Press@RunDepth: 66.50 psig @ 3741.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2017.12.13

End Date:

2017.12.14

Last Calib.: 2017.12.14

Start Time: 22:19:32

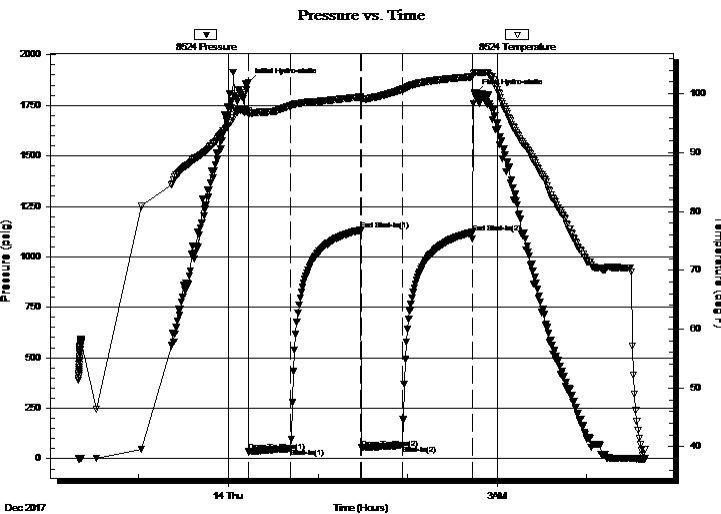
End Time:

04:39:37

Time On Btm: 2017.12.14 @ 00:13:22

Time Off Btm: 2017.12.14 @ 02:45:22

TEST COMMENT: 30- IF- Slowly built to 3"
45- IS- No blow
30- FF- Very weak surface blow died in 7 mins
45- FSI- No blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1861.73	97.07	Initial Hydro-static
1	34.80	96.53	Open To Flow (1)
29	50.74	97.91	Shut-In(1)
75	1131.90	99.45	End Shut-In(1)
76	54.42	99.16	Open To Flow (2)
103	66.50	100.68	Shut-In(2)
150	1121.02	102.88	End Shut-In(2)
152	1809.79	103.56	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
65.00	Mud	0.32

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N#700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63335

DST#: 9

Test Start: 2017.12.13 @ 22:19:31

Tool Information

Drill Pipe:	Length: 3574.00 ft	Diameter: 3.82 inches	Volume: 50.66 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 119.00 ft	Diameter: 2.25 inches	Volume: 0.59 bbl	Weight to Pull Loose: 65000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	7.00 ft			String Weight: Initial 49000.00 lb
Depth to Top Packer:	3714.00 ft			Final 49000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	30.00 ft			
Tool Length:	58.00 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			3687.00	
Shut In Tool	5.00			3692.00	
Hydraulic tool	5.00			3697.00	
Jars	5.00			3702.00	
Safety Joint	3.00			3705.00	
Packer	5.00			3710.00	28.00 Bottom Of Top Packer
Packer	4.00			3714.00	
Stubb	1.00			3715.00	
Perforations	26.00			3741.00	
Recorder	0.00	6771	Inside	3741.00	
Recorder	0.00	8524	Outside	3741.00	
Bullnose	3.00			3744.00	30.00 Bottom Packers & Anchor

Total Tool Length: 58.00



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TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc.

5-12S-19W Ellis,KS

8100 E. 22nd St. N#700
PO Box 783188
Wichita, KS 67278
ATTN: Max Lovely

Zachman AP #4

Job Ticket: 63335

DST#: 9

Test Start: 2017.12.13 @ 22:19:31

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: 7.19 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2100.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
65.00	Mud	0.320

Total Length: 65.00 ft Total Volume: 0.320 bbl

Num Fluid Samples: 0

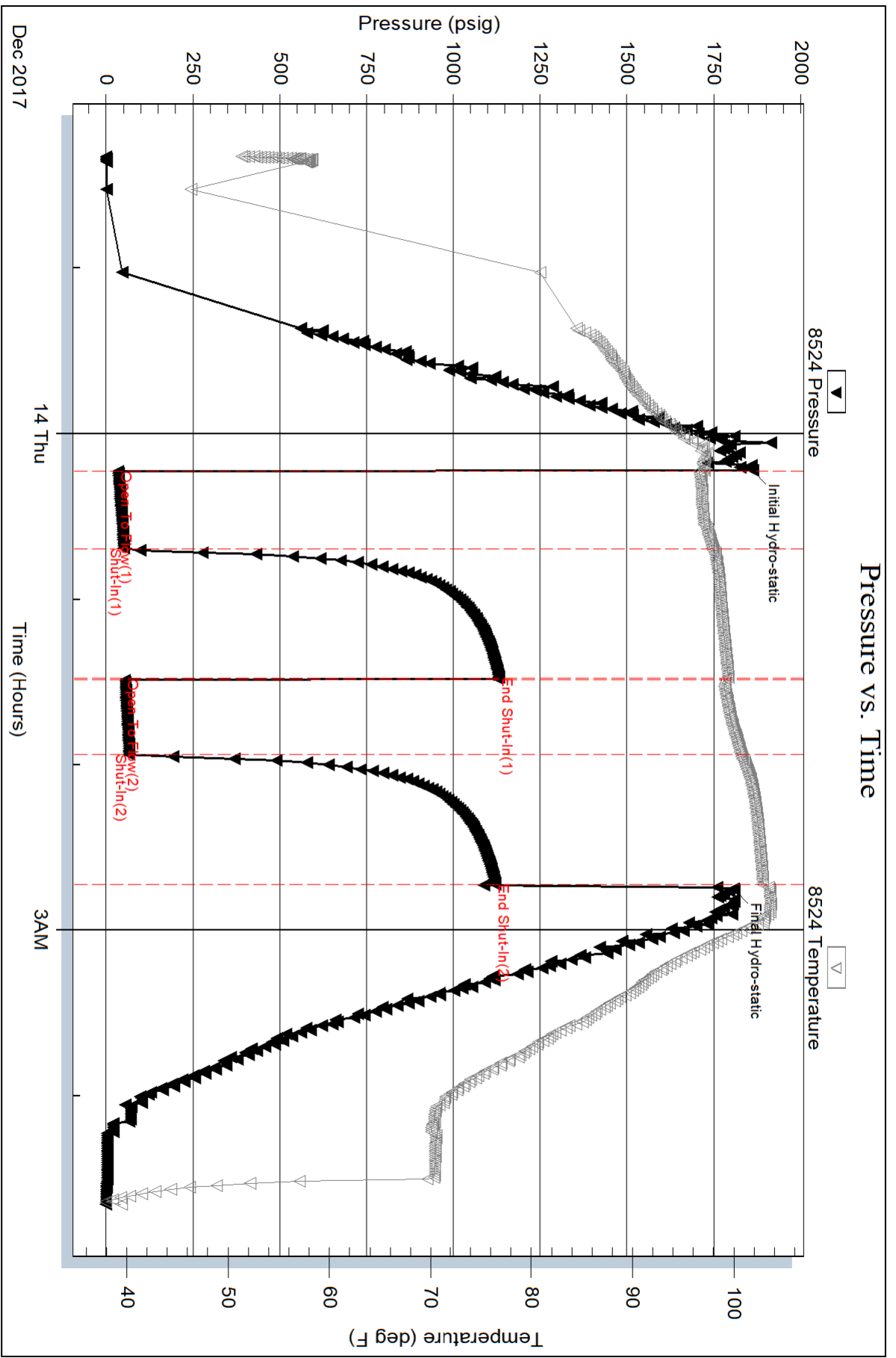
Num Gas Bombs: 0

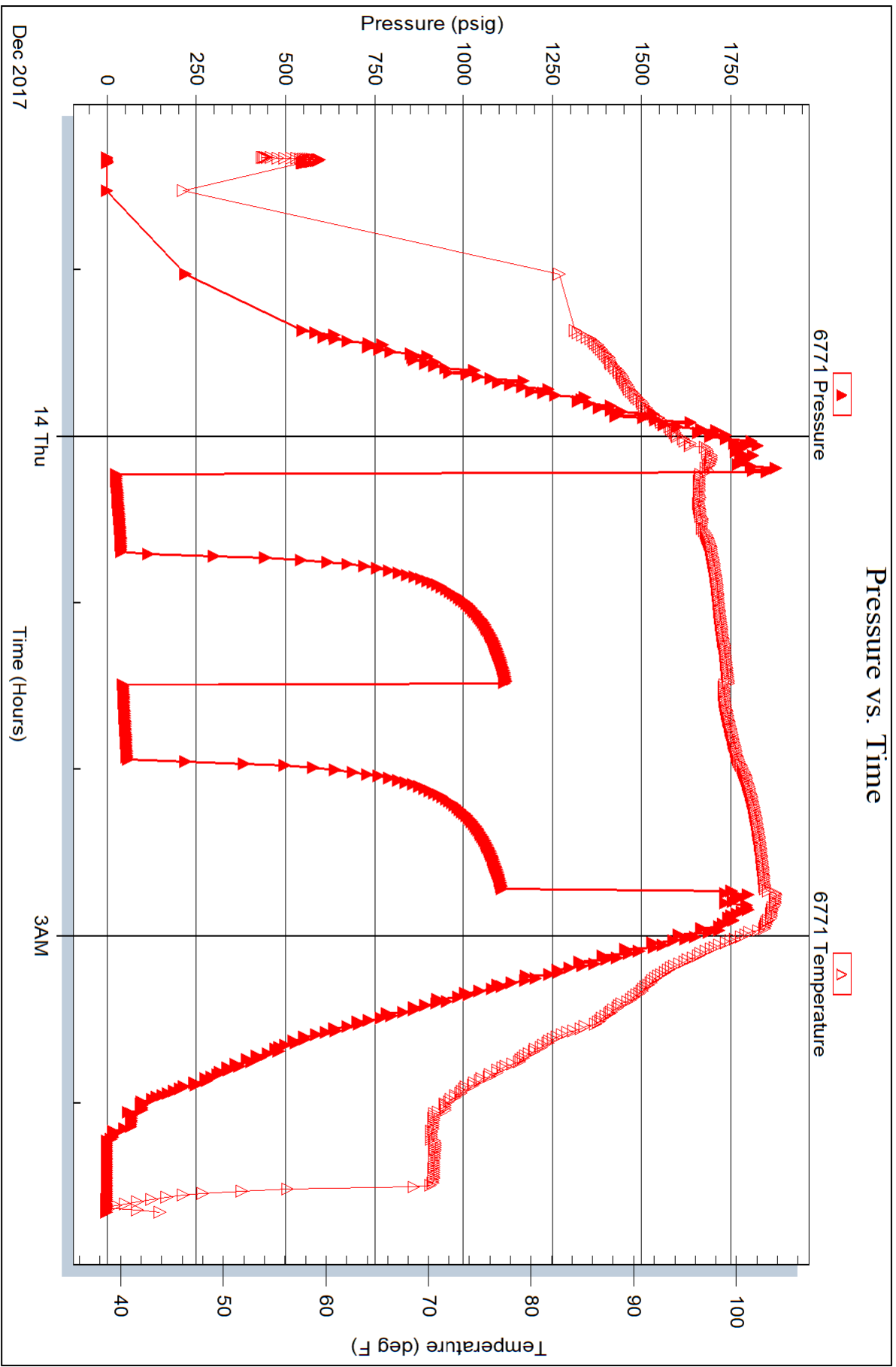
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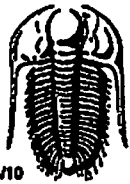
Laboratory Name:

Laboratory Location:

Recovery Comments:







TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 63327

Well Name & No. Zachman AP #4 Test No. 1 Date 12/8/17
 Company Ritchie Exploration, Inc. Elevation 2163 KB 2153 GL
 Address 8100 E. 22nd St N #700 PO Box 783108 Wichita, KS 67228
 Co. Rep / Geo. Max Lovely Flg WW #12
 Location: Sec. 5 Twp R S Rge. 19 W Co. Ellis State KS

Interval Tested 3345-3379 Zone Tested Oread "B"
 Anchor Length 34' Drill Pipe Run 3230 Mud Wt. 8.9
 Top Packer Depth 3340 Drill Collars Run 119 Vis 62
 Bottom Packer Depth 3345 Wt. Pipe Run — WL 6.8
 Total Depth 3379 Chlorides 1,700 ppm System LCM 2nd

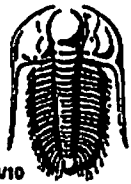
Blow Description IF - slowly built to 1 1/4"
ISI - No flow
FF - Very weak surface flow
FSI - No flow

Rec	Feet of	%gas	%oil	%water	%mud
<u>30</u>	<u>NA</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 30 BHT 102° Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic <u>1631</u>	<input checked="" type="checkbox"/> Test	T-On Location <u>1722</u>
(B) First Initial Flow <u>26</u>	<input checked="" type="checkbox"/> Jars	T-Started <u>1725</u>
(C) First Final Flow <u>36</u>	<input checked="" type="checkbox"/> Safety Joint	T-Open <u>2011</u>
(D) Initial Shut-In <u>1653</u>	<input type="checkbox"/> Circ Sub	T-Pulled <u>2311</u>
(E) Second Initial Flow <u>39</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>12/9 0108</u>
(F) Second Final Flow <u>48</u>	<input checked="" type="checkbox"/> Mileage <u>46 RT</u>	Comments
(G) Final Shut-In <u>1010</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>1617</u>	<input type="checkbox"/> Straddle	
Initial Open <u>30</u>	<input type="checkbox"/> Shale Packer	<input type="checkbox"/> Ruined Shale Packer
Initial Shut-In <u>45</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Ruined Packer
Final Flow <u>45</u>	<input type="checkbox"/> Extra Recorder	<input type="checkbox"/> Extra Copies
Final Shut-In <u>60</u>	<input type="checkbox"/> Day Standby	Sub Total
	<input type="checkbox"/> Accessibility	Total
	Sub Total	MP/DST Disc't

Approved By _____ Our Representative Brannan Lonsdale
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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 63328

Well Name & No. Zachman AP #4 Test No. 2 Date 12/9/17
 Company Britch Exploration, Inc. Elevation 2163 KB 2153 GL
 Address 8100 E 22nd St. N #700 PO Box 703188 Wichita, KS 67278
 Co. Rep / Geo. Max Lovely Rig WW #12
 Location: Sec. 5 Twp 12 Rge. 19 Wco. Ellis State KS

Interval Tested 3409-3474 Zone Tested Lansing "A-C"
 Anchor Length 65' Drill Pipe Run 3261 Mud Wt. 9.0
 Top Packer Depth 3424 Drill Collars Run 119 Vis 5.5
 Bottom Packer Depth 3409 Wt. Pipe Run --- WL 7.2
 Total Depth 3474 Chlorides 2400 ppm System LCM 2nd
 Blow Description IF-1" blow slowly died in 28 mins
ISI - No blow
FF - No blow
FSD - No blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>10</u>	<u>M</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 10' BHT 101° Gravity --- API RW --- @ --- °F Chlorides --- ppm

(A) Initial Hydrostatic <u>1675</u>	<input checked="" type="checkbox"/> Test	T-On Location <u>1203</u>
(B) First Initial Flow <u>35</u>	<input checked="" type="checkbox"/> Jars	T-Started <u>1205</u>
(C) First Final Flow <u>35</u>	<input checked="" type="checkbox"/> Safety Joint	T-Open <u>1437</u>
(D) Initial Shut-In <u>109</u>	<input type="checkbox"/> Circ Sub	T-Pulled <u>1637</u>
(E) Second Initial Flow <u>37</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>1824</u>
(F) Second Final Flow <u>37</u>	<input checked="" type="checkbox"/> Mileage <u>46 RT</u>	Comments <u>FM Tool</u>
(G) Final Shut-In <u>77</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>1668</u>	<input type="checkbox"/> Straddle	<input type="checkbox"/> Ruined Shale Packer
	<input type="checkbox"/> Shale Packer	<input type="checkbox"/> Ruined Packer
Initial Open <u>30</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Extra Copies
Initial Shut-In <u>30</u>	<input type="checkbox"/> Extra Recorder	Sub Total
Final Flow <u>30</u>	<input type="checkbox"/> Day Standby	Total
Final Shut-In <u>30</u>	<input type="checkbox"/> Accessibility	MP/DST Disc't
	Sub Total	

Approved By _____ Our Representative Brennan Lonsdale

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 63329

Well Name & No. Zachman AP #4 Test No. 3 Date 12/10/17
 Company Ritchie Exploration, Inc. Elevation 2163 KB 2153 GL
 Address 8100 E. 22nd St. N #700 PO Box 783188 Wichita, KS 67278
 Co. Rep / Geo. Max Larely Flg WW #12
 Location: Sec. 5 Twp 13 S Rge. 19 W Co. Ellis State KS

Interval Tested 3490-3515 Zone Tested Lansing "F & F"
 Anchor Length 25' Drill Pipe Run 3355 Mud Wt. 9.0
 Top Packer Depth 3485 Drill Collars Run 119 Vis 55
 Bottom Packer Depth 3490 Wt. Pipe Run — WL 7.2
 Total Depth 3515 Chlorides 2,400 ppm System LCM 2#

Blow Description IF - Built slowly to 4 1/2"
ISF - No blow
FF - Built slowly to 9"
FSI - No blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>60</u>	<u>SDCWM</u>	<u>10</u>	<u>30</u>	<u>60</u>	<u>—</u>
<u>60</u>	<u>SOCMA</u>	<u>5</u>	<u>—</u>	<u>95</u>	<u>—</u>
<u>20</u>	<u>SWMCO</u>	<u>90</u>	<u>5</u>	<u>5</u>	<u>—</u>
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

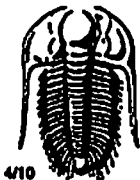
Rec Total 140' BHT 107' Gravity 35 API RW 20 @ 55° F Chlorides 40,000 ppm

(A) Initial Hydrostatic 1721 Test _____ T-On Location 0256
 (B) First Initial Flow 32 Jars _____ T-Started 0259
 (C) First Final Flow 60 Safety Joint _____ T-Open 0533
 (D) Initial Shut-In 9.04 Circ Sub _____ T-Pulled 0833
 (E) Second Initial Flow 68 Hourly Standby _____ T-Out 1034
 (F) Second Final Flow 91 Mileage 46 RT Comments EM Tool
 (G) Final Shut-In 9.00 Sampler _____
 (H) Final Hydrostatic 1708 Straddle _____ Ruined Shale Packer _____
 Shale Packer _____ Ruined Packer _____
 Extra Packer _____ Extra Copies _____
 Extra Recorder _____
 Day Standby _____
 Accessibility _____

Initial Open 30
 Initial Shut-In 45
 Final Flow 45
 Final Shut-In 60
 Sub Total _____
 Total _____
 MP/DST Disc't _____

Approved By _____ Our Representative Braman Lonsdale

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 63330

Well Name & No. Zachman AP #4 Test No. 4 Date 12/10/17
 Company Ritchie Exploration, Inc. Elevation 2163 KB 2153 GL
 Address 8100 E. 22nd St. N #700 PO Box 783188 Wichita, KS 67278
 Co. Rep / Gen. Max Lovely Rig WW #17
 Location: Sec. 5 Twp 12 S Rge. 19 W Co. Ellis State KS

Interval Tested 3514 - 3531 Zone Tested Lansing "A"
 Anchor Length 17' Drill Pipe Run 3386 Mud Wt. 9.0
 Top Packer Depth 3509 Drill Collars Run 119 Vis 53
 Bottom Packer Depth 3514 Wt. Pipe Run _____ WL 7.2
 Total Depth 3531 Chlorides 2,100 ppm System LCM 2[#]

Blow Description IF-BOB 5 mins
ISF - slowly built to 1"
FF-BOB 7 mins
FSF - slowly built to 1/2"

Rec	Feet of	%gas	%oil	%water	%mud
<u>438557</u>	<u>Feet of MW</u>			<u>90</u>	<u>10</u>
<u>63</u>	<u>Feet of OCMW</u>		<u>10</u>	<u>60</u>	<u>30</u>
<u>47</u>	<u>Feet of WOCM</u>		<u>10</u>	<u>30</u>	<u>60</u>
	<u>Feet of 15' GIP</u>				
	<u>Feet of</u>				

Rec Total 667' BHT 117° Gravity 34 API RW .11 @ 53 °F Chlorides 80,000 ppm

(A) Initial Hydrostatic <u>1728</u>	<input checked="" type="checkbox"/> Test _____	T-On Location <u>155.5</u>
(B) First Initial Flow <u>38</u>	<input checked="" type="checkbox"/> Jars _____	T-Started <u>1557</u>
(C) First Final Flow <u>185</u>	<input checked="" type="checkbox"/> Safety Joint _____	T-Open <u>1741</u>
(D) Initial Shut-In <u>1110</u>	<input type="checkbox"/> Circ Sub _____	T-Pulled <u>2041</u>
(E) Second Initial Flow <u>186</u>	<input type="checkbox"/> Hourly Standby _____	T-Out <u>2301</u>
(F) Second Final Flow <u>336</u>	<input checked="" type="checkbox"/> Mileage <u>46 RT</u>	Comments _____
(G) Final Shut-In <u>1100</u>	<input type="checkbox"/> Sampler _____	
(H) Final Hydrostatic <u>1698</u>	<input type="checkbox"/> Straddle _____	

Initial Open <u>30</u>	<input type="checkbox"/> Shale Packer _____	<input type="checkbox"/> Ruined Shale Packer _____
Initial Shut-In <u>45</u>	<input type="checkbox"/> Extra Packer _____	<input type="checkbox"/> Ruined Packer _____
Final Flow <u>45</u>	<input type="checkbox"/> Extra Recorder _____	Extra Copies _____
Final Shut-In <u>60</u>	<input type="checkbox"/> Day Standby _____	Sub Total _____
	<input type="checkbox"/> Accessibility _____	Total _____
	Sub Total _____	MP/DST Disc't _____

Approved By _____ Our Representative Brannan Lonsdale

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 63331

Well Name & No. Zachman AP #4 Test No. 5 Date 12/11/17
 Company Ritchie Exploration Inc. Elevation 2163 KB 2153 GL
 Address 8100 E. 22nd St. N #700 PO Box 703188 Wichita KS 67278
 Co. Rep / Geo. Max Lovely Rig WW #12
 Location: Sec. 5 Twp 12 S Rge. 19 Wco. Ellis State KS

Interval Tested 3567-3595 Zone Tested Lansing "H4I"
 Anchor Length 28' Drill Pipe Run 3450 Mud Wt. 9.2
 Top Packer Depth 3562 Drill Collars Run 169 Vis 50
 Bottom Packer Depth 3567 Wt. Pipe Run — WL 7.4
 Total Depth 3595 Chlorides 3,600 ppm System LCM 2⁺

Blow Description IF-BOB 4 mins
ISI - slowly built to 1 1/2"
FF-BOB 6 mins
FSI - slowly built to 1 1/2"

Rec	Feet of	%gas	%oil	%water	%mud
<u>307</u>	<u>M.W</u>			<u>90%</u>	<u>10%</u>
<u>406</u>	<u>OC.M.W</u>		<u>15%</u>	<u>45%</u>	<u>40%</u>
<u>47</u>	<u>CO</u>				
	<u>50' GIP</u>				

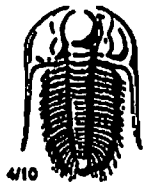
Rec Total 760' BHT 117° Gravity 33 API RW 12 @ 57° F Chlorides 67,000 ppm

(A) Initial Hydrostatic <u>1786</u>	<input checked="" type="checkbox"/> Test	T-On Location <u>0842</u>
(B) First Initial Flow <u>49</u>	<input checked="" type="checkbox"/> Jars	T-Started <u>0856</u>
(C) First Final Flow <u>219</u>	<input checked="" type="checkbox"/> Safety Joint	T-Open <u>1115</u>
(D) Initial Shut-In <u>1087</u>	<input type="checkbox"/> Circ Sub	T-Pulled <u>1415</u>
(E) Second Initial Flow <u>222</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>1648</u>
(F) Second Final Flow <u>378</u>	<input checked="" type="checkbox"/> Mileage <u>46 RT</u>	Comments _____
(G) Final Shut-In <u>1071</u>	<input type="checkbox"/> Sampler	_____
(H) Final Hydrostatic <u>1735</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>45</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Extra Copies
Final Flow <u>45</u>	<input type="checkbox"/> Extra Recorder	Sub Total _____
Final Shut-In <u>60</u>	<input type="checkbox"/> Day Standby	Total _____
	<input type="checkbox"/> Accessibility	MP/DST Disc't _____
	Sub Total _____	

Approved By _____ Our Representative Brian Lonsdale

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 63332

Well Name & No. Zachman AP #4 Test No. 6 Date 12/11/17
 Company Ritchie Exploration, Inc Elevation 2163 KB 2155 GL
 Address 8100 E 22nd St. N # 700 PO Box 283188 Wichita, KS 67278
 Co. Rep / Geo. Max Lovely Rig WW #12
 Location: Sec. 5 Twp 12 S Rge. 19 W Co. Ellis State KS

Interval Tested 3596-3614 Zone Tested Lansing "J"
 Anchor Length 18' Drill Pipe Run 3481 Mud Wt. 9.2
 Top Packer Depth 3591 Drill Collars Run 119 Vis 50
 Bottom Packer Depth 3596 Wt. Pipe Run --- WL 2.4
 Total Depth 3614 Chlorides 3000 ppm System LCM 2#
 Blow Description IF - Built very slowly to 3/4"
ISF - No blow
FF - No blow
FSD - No blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>2</u>	<u>M w/ oil spots</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

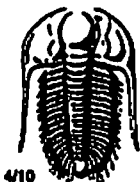
Rec Total 2' BHT 104° Gravity _____ API RW _____ @ _____ ° F Chlorides _____ ppm

(A) Initial Hydrostatic 1761 Test _____ T-On Location 2223
 (B) First Initial Flow 15 Jars _____ T-Started 2234
 (C) First Final Flow 16 Safety Joint _____ T-Open 12/12 0046
 (D) Initial Shut-In 60 Circ Sub _____ T-Pulled 0316
 (E) Second Initial Flow 17 Hourly Standby _____ T-Out 0507
 (F) Second Final Flow 17 Mileage 46 RT Comments _____
 (G) Final Shut-In 44 Sampler _____
 (H) Final Hydrostatic 1757 Straddle _____ Ruined Shale Packer _____
 Shale Packer _____ Ruined Packer _____
 Extra Packer _____ Extra Copies _____
 Extra Recorder _____ Sub Total _____
 Day Standby _____ Total _____
 Accessibility _____ MP/DST Disc't _____
 Sub Total _____

Approved By _____

Our Representative Braman Lonsdale

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 63333

Well Name & No. Zachman AP #4 Test No. 7 Date 12/12/17
 Company Ritchie Exploration, Inc. Elevation 2163 KB 2155 GL
 Address 8100 E. 22nd St. N #700 PO Box 783188 Wichita, KS 67278
 Co. Rep / Geo. Max Lovely Rig WW #12
 Location: Sec. 5 Twp 12 S Rge. 19 WCo. Ellis State KS

Interval Tested 3615-3637 Zone Tested Lansing "K" 92
 Anchor Length 22' Drill Pipe Run 3481 Mud Wt. 92
 Top Packer Depth 3610 Drill Collars Run 119 Vis 5.8
 Bottom Packer Depth 3615 Wt. Pipe Run _____ WL 7.2
 Total Depth 3637 Chlorides 2,200 ppm System LCM 2th

Blow Description IF - Sludgy built to 1"
ISI - No blow
PF - Very weak surface blow
FST - No blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>3</u>	<u>M</u>				
_____	_____				
_____	_____				
_____	_____				
_____	_____				

Rec Total 3' BHT 103° Gravity _____ API RW _____ @ _____ °F Chlorides _____ ppm

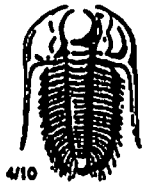
(A) Initial Hydrostatic <u>1761</u>	<input checked="" type="checkbox"/> Test _____	T-On Location <u>1124</u>
(B) First Initial Flow <u>16</u>	<input checked="" type="checkbox"/> Jars _____	T-Started <u>1133</u>
(C) First Final Flow <u>17</u>	<input checked="" type="checkbox"/> Safety Joint _____	T-Open <u>1335</u>
(D) Initial Shut-In <u>689</u>	<input type="checkbox"/> Circ Sub _____	T-Pulled <u>1835</u>
(E) Second Initial Flow <u>17</u>	<input type="checkbox"/> Hourly Standby _____	T-Out <u>1805</u>
(F) Second Final Flow <u>18</u>	<input checked="" type="checkbox"/> Mileage <u>46 RT</u>	Comments _____
(G) Final Shut-In <u>653</u>	<input type="checkbox"/> Sampler _____	_____
(H) Final Hydrostatic <u>1733</u>	<input type="checkbox"/> Straddle _____	<input type="checkbox"/> Ruined Shale Packer _____
	<input type="checkbox"/> Shale Packer _____	<input type="checkbox"/> Ruined Packer _____
	<input type="checkbox"/> Extra Packer _____	<input type="checkbox"/> Extra Copies _____

Initial Open 30
 Initial Shut-In 45
 Final Flow 45
 Final Shut-In 60

Sub Total _____ Total _____ MP/DST Disc't _____

Approved By _____ Our Representative Brannan Lonsdale

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. 63334

Well Name & No. Zachman AP #4 Test No. 8 Date 12/13/17
 Company Ritchie Exploration, Inc. Elevation 2163 KB 2155 GL
 Address 8100 E 22nd St. N^W 700 PO Box 703188 Wichita, KS 67278
 Co. Rep / Geo. Max Lovely Rig WW #12
 Location: Sec. 5 Twp 12 S Rge. 19 W Co. Ellis State KS

Interval Tested 3713-3734 Zone Tested Arbuckle
 Anchor Length 21' Drill Pipe Run 3574 Mud Wt. 9.2
 Top Packer Depth 3708 Drill Collars Run 119 Vis 30
 Bottom Packer Depth 3713 Wt. Pipe Run — WL 22
 Total Depth 3734 Chlorides 2,100 ppm System LCM 2#
 Blow Description IF - Built to 3" in 15 mins then maintained 3" throughout
ISI - No blow
EF - Weak surface blow died in 4 mins
FST - No blow

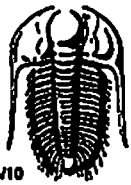
Rec	Feet of	%gas	%oil	%water	%mud
<u>60</u>	<u>M</u>				
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 60 BHT 104' Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic <u>1848</u>	<input checked="" type="checkbox"/> Test	T-On Location <u>1106</u>
(B) First Initial Flow <u>37</u>	<input checked="" type="checkbox"/> Jars	T-Started <u>1109</u>
(C) First Final Flow <u>46</u>	<input checked="" type="checkbox"/> Safety Joint	T-Open <u>1252</u>
(D) Initial Shut-In <u>98</u>	<input type="checkbox"/> Circ Sub	T-Pulled <u>1522</u>
(E) Second Initial Flow <u>46</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>1656</u>
(F) Second Final Flow <u>54</u>	<input checked="" type="checkbox"/> Mileage <u>46 RT</u>	Comments _____
(G) Final Shut-In <u>65</u>	<input type="checkbox"/> Sampler	_____
(H) Final Hydrostatic <u>1815</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>45</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Extra Copies
Final Flow <u>30</u>	<input type="checkbox"/> Extra Recorder	Sub Total _____
Final Shut-In <u>45</u>	<input type="checkbox"/> Day Standby	Total _____
	<input type="checkbox"/> Accessibility	MP/DST Disc't _____
	Sub Total _____	

Approved By _____ Our Representative Brannan Lonsdale

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. 63335

Well Name & No. Zachman AP #4 Test No. 9 Date 12/13/17
 Company Rutchie Exploration, Inc. Elevation 2163 KB 2155 GL
 Address 2100 E. 22nd St. N #700 PO Box 783188 Wichita, KS 67278
 Co. Rep / Geo. Max Lovely Rig WW #12
 Location: Sec. 5 Twp R 5 Rge. 19 W. Co. Ellis State KS

Interval Tested 3714-3744 Zone Tested Arbuckle
 Anchor Length 30' Drill Pipe Run 3574 Mud Wt. 9.2
 Top Packer Depth 3209 Drill Collars Run 119 Vis 50
 Bottom Packer Depth 3714 Wt. Pipe Run --- WL 7.2
 Total Depth 3744 Chlorides 2,100 ppm System LCM 2#

Blow Description IF - slowly built to 3"
FSI - No blow
FF - Very weak surface blow died in 7mins
FSI - No blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>65</u>	<u>M</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 65' BHT 103° Gravity --- API RW --- @ --- °F Chlorides --- ppm

(A) Initial Hydrostatic 1862 Test --- T-On Location 2216
 (B) First Initial Flow 35 Jars --- T-Started 2219
 (C) First Final Flow 51 Safety Joint --- T-Open 12/14 0012
 (D) Initial Shut-In 1132 Circ Sub --- T-Pulled 0242
 (E) Second Initial Flow 54 Hourly Standby --- T-Out 0439
 (F) Second Final Flow 67 Mileage 46 RT Comments Tools loaded
 (G) Final Shut-In 1121 Sampler --- 12/14 @ 1900
 (H) Final Hydrostatic 1810 Straddle ---
 Ruined Shale Packer ---
 Ruined Packer ---

Initial Open 30 Extra Packer --- Extra Copies ---
 Initial Shut-In 45 Extra Recorder --- Sub Total ---
 Final Flow 30 Day Standby --- Total ---
 Final Shut-In 45 Accessibility --- MP/DST Disc't ---
 Sub Total ---

Approved By _____ Our Representative Brannan Lonsdale

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#4 Zachman A/P

800' FSL & 1735' FEL

140' N & 85' W of E/2 SW SE Section 5-12S-19W

Ellis County, Kansas

API# 15-051-26900-0000

Elevation: GL: 2155', KB: 2163'

Sample Tops			Ref. Well
Anhydrite	1514'	+649	-4
B/Anhydrite	1555'	+608	-5
Topeka	3165'	-1002	-2
Heebner	3385'	-1222	+3
Lansing	3426'	-1263	+5
Muncie Shale	3553'	-1390	+3
Stark	3619'	-1456	-1
Hush	3648'	-1485	-4
BKC	3662'	-1499	-3
Marmaton	3679'	-1516	+5
Arbuckle	3723'	-1560	Flat
RTD	3800'	-1637	

GLOBAL OIL FIELD SERVICES, LLC

3208

REMIT TO 24 S. Lincoln
Russell, KS 67665

SERVICE POINT:

Russell

DATE <u>12-4-17</u>	SEC. <u>S</u>	TWP. <u>12</u>	RANGE <u>19</u>	CALLED OUT	ON LOCATION <u>5:00 PM</u>	JOB START	JOB FINISH <u>7:00 PM</u>
LEASE <u>Zachman</u>	WELL #. <u>4</u>	LOCATION <u>Ellis 6N3W</u>			COUNTY <u>Ellis</u>	STATE <u>Ks</u>	
OLD OR NEW (CIRCLE ONE)							

CONTRACTOR W & W Drilling

TYPE OF JOB SURFACE

HOLE SIZE 12 1/4 T.D. 220

CASING SIZE 8 1/2 DEPTH 219

TUBING SIZE DEPTH

DRILL PIPE DEPTH

TOOL DEPTH

PRES. MAX MINIMUM

MEAS. LINE SHOE JOINT

CEMENT LEFT IN CSG. 15

PERFS

DISPLACEMENT 12 3/4 bbls

EQUIPMENT

PUMP TRUCK CEMENTER Bill

417 HELPER JASON

BULK TRUCK DRIVER Bullet

328

BULK TRUCK DRIVER

OWNER

CEMENT AMOUNT ORDERED 150 at 60/40 3% CC 2% Gel

COMMON @

POZMIX @

GEL @

CHLORIDE @

ASC @

HANDLING @

MILEAGE @

TOTAL

REMARKS:

RAN 5 hrs at 8 1/2" x 220
cont w/ 1500 lbs
pump plug w/ bbls of water
cont did cure.

CHARGE TO: Ritchie Exp. FAC

STREET

CITY STATE ZIP

SERVICE

DEPTH OF JOB

PUMP TRUCK CHARGE

EXTRA FOOTAGE @

MILEAGE @

MANIFOLD @

TOTAL

PLUG & FLOAT EQUIPMENT

@

@

@

@

@

TOTAL

Global Oil Field Services, LLC

You are hereby requested to rent cementing equipment and furnish cementer and helper(s) to assist owner or contractor to do work as is listed. The above work was done to satisfaction and supervision of owner agent or contractor. I have read and understand the "GENERAL TERMS AND CONDITIONS" listed on the reverse side.

PRINTED NAME Calvin Pannowick

SIGNATURE Calvin Pannowick

SALES TAX (if Any)

TOTAL CHARGES 2502.00

DISCOUNT

IF PAID IN 30 DAYS



PRESSURE PUMPING LLC

PO Box 884, Chanute, KS 66720
620-431-9210 or 800-467-8676

FIELD TICKET & TREATMENT REPORT CEMENT

9739
9630

TICKET NUMBER 54956

LOCATION Orkley KS

FOREMAN Jerry Y

W. H. D
812000 KS

DATE	CUSTOMER #	WELL NAME & NUMBER	SECTION	TOWNSHIP	RANGE	COUNTY
12-14-17	7173	Zachman AP #4	5	12 ^S	19 ^W	Ellis
CUSTOMER <u>Ritchie Exp</u>			Yocemento 7W2W Ninto			
MAILING ADDRESS			TRUCK #	DRIVER	TRUCK #	DRIVER
CITY			STATE	ZIP CODE		
			753	Troy (S)		
			066	Seth O		

JOB TYPE long string HOLE SIZE 7 7/8 HOLE DEPTH 3800 CASING SIZE & WEIGHT 4 1/2 10.5
 CASING DEPTH 037908 DRILL PIPE _____ TUBING _____ OTHER Port Collar @ 1477
 SLURRY WEIGHT 14.5 SLURRY VOL 1.36 WATER gal/sk _____ CEMENT LEFT in CASING 20'
 DISPLACEMENT 60 bbl DISPLACEMENT PSI _____ MIX PSI _____ RATE _____

REMARKS: Safety meeting early upon arrival run float gauges turbos on shoe, 2, 5, 7, 10, 53, 55, Baskets and 54069, 81 Port Collar top @ 5' set @ 1477 run casing to bottom circ vis w pump 5bbl H₂O, mud flush, 5bbl H₂O mix 150 sks 60/40 2 bagal 10% salt + 5# Kol seal / 1/4" CDI-26 1/8" CAF-38 shut down release plug clean pump & lines displace with 60 bbl freshwater 800# final 1/4" plug lance @ 1600# release back float held press back up to 500# set in turbos

Thank you
Jerry & crew

30 sks out hole

ACCOUNT CODE	QUANTITY or UNITS	DESCRIPTION of SERVICES or PRODUCT	UNIT PRICE	TOTAL
CE0453	1	PUMP CHARGE	2800.00	2800.00
CE0002	20	MILEAGE	7.15	143.00
CE0711	7.74	van mileage delivery	66.00	66.00
CC5842	180 sks	Poz blend 2 "A"	14.75	2655.00
CC5326	976 #	salt	1.00	976.00
CC5965	310 #	gal	.30	93.00
CC6077	900 #	Kol seal	1.50	450.00
CC6000	45 #	CDI-26	7.85	353.25
CC6155	25 #	CAF-38	10.20	255.00
CC6125	300 gal	mud flush	.65	325.00
CP8484	1	4 1/2 AF4 float shoe	470.00	470.00
CP8253	1	4 1/2 latch down assy	340.00	340.00
CP8575	7	4 1/2 turbolizers	95.00	665.00
CP8628	3	4 1/2 baskets	350.00	1050.00
CP8775	1	4 1/2 Port Collar	2750.00	2750.00
			Subtotal	13,985.25
			-30% discount	4,195.58
			Subtotal	9,789.67
			SALES TAX	472.39
			ESTIMATED TOTAL	10,262.07

Ravin 3737

AUTHORIZATION [Signature]

TITLE _____

DATE _____

I acknowledge that the payment terms, unless specifically amended in writing on the front of the form or in the customer's account records, at our office, and conditions of service on the back of this form are in effect for services identified on this form.



Dec. 21. 2017 10:08AM
 PRESSURE PUMPING LLC
 PO Box 884, Chanute, KS 66720
 620-431-9210 or 800-467-8676

No. 0491 P. 2
 TICKET NUMBER 54977

9751/9642

LOCATION Oddley MS
 FOREMAN Miles Shaw

FIELD TICKET & TREATMENT REPORT
 CEMENT

Invoice #812018

DATE	CUSTOMER #	WELL NAME & NUMBER	SECTION	TOWNSHIP	RANGE	COUNTY	
12-20-17	2173	Zachman #4				Ellis	
CUSTOMER		MATERIALS		TRUCK #	DRIVER	TRUCK #	DRIVER
B. Ichio Exploration		Kernentold		753	T Paulson		
MAILING ADDRESS		N to St. John		772/T-127	Paul W		
P.O. Box 783188		St Andrew					
CITY		STATE	ZIP CODE				
Wichita		KS	67218-3188				

JOB TYPE <u>Part color</u>	HOLE SIZE	HOLE DEPTH	CASING SIZE & WEIGHT <u>4 1/2"</u>
CASING DEPTH	DRILL PIPE	TUBING <u>2 3/8'</u>	OTHER <u>P.C. @ 1470'</u>
SLURRY WEIGHT <u>12.8</u>	SLURRY VOL <u>1.9</u>	WATER gal/sk	CEMENT LEFT in CASING
DISPLACEMENT <u>4.5 bbls</u>	DISPLACEMENT PSI	MIX PSI	RATE

REMARKS: Safety meeting and Run up on well ~~at~~ tested 11000 psi open tail
 Establish blow mix 200 500 light weight blend with 60/40 P&G 1/4" P&G with 500
 Cotton Seed hulls displace 4 1/2 bbls shut tool joint to 1000 psi held 5 min released Run
 in 500 psi Reversed out clean with 200 bbls water Pull tubing and Press up casing
 to 500 psi Shut in Cement and circulate

Thanks Miles & Crew

ACCOUNT CODE	QUANTITY or UNITS	DESCRIPTION of SERVICES or PRODUCT	UNIT PRICE	TOTAL
CE0450	1	PUMP CHARGE	1500.00	1500.00
CE0002	20	MILEAGE	7.15	143.00
CE0711	9.14 Tons	Ton mileage delivery	1060.00	6160.00
C5831	210 sk	Light weight blend P&G	17.50	3675.00
CC6080	500 #	Cotton Seed hulls	1.00	500.00
C5326	100 #	Salt Bedden L&L	N/C	N/C
			Subtotal	6478.00
			less 30% discount	1993.40
			Subtotal	4484.60
			SALES TAX	204.57
			ESTIMATED TOTAL	4739.17

Ravin 8737

AUTHORIZATION [Signature] TITLE _____

DATE _____

I am authorized that the information on this form was accurately amended in writing on the front of the form or in the customer's account records, at our office, and conditions of service on the back of this form are in effect for services identified on this form.
 Received Time: Dec. 21. 2017 10:09AM No. 1829