



DRILL STEM TEST REPORT

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

8100 E 22ND St N St. #700
Wichita, KS 67278

ATTN: Kent Matson

MJW 10C #1

10-16S-38W Wichita,KS

Start Date: 2019.07.05 @ 05:10:00

End Date: 2019.07.05 @ 11:50:15

Job Ticket #: 47655 DST #: 1

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

Printed: 2019.07.11 @ 08:55:33



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.
8100 E 22ND St N St. #700
Wichita, KS 67278
ATTN: Kent Matson

10-16S-38W Wichita, KS
MJW 10C #1
Job Ticket: 47655 **DST#: 1**
Test Start: 2019.07.05 @ 05:10:00

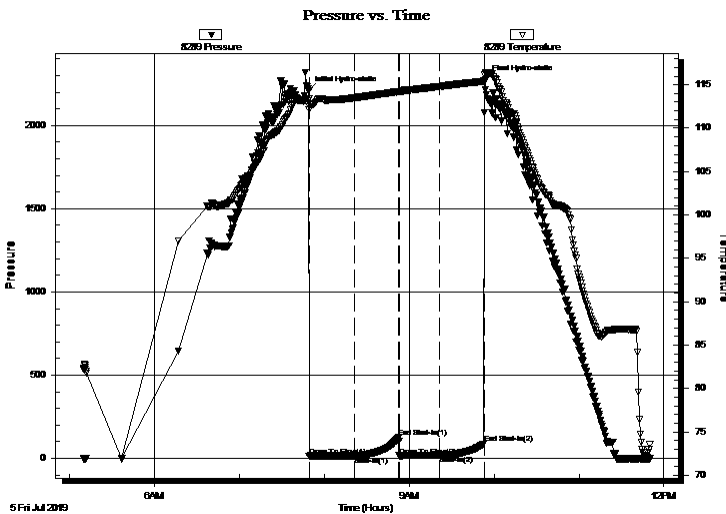
GENERAL INFORMATION:

Formation: **Altamont A**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 07:49:25
Time Test Ended: 11:50:15
Interval: **4536.00 ft (KB) To 4570.00 ft (KB) (TVD)**
Total Depth: 4570.00 ft (KB) (TVD)
Hole Diameter: 7.80 inches Hole Condition: Good
Test Type: Conventional Bottom Hole (Initial)
Tester: Chris Hagman
Unit No: 75
Reference Elevations: 3457.00 ft (KB)
3449.00 ft (CF)
KB to GR/CF: 8.00 ft

Serial #: 8289 Inside
Press@RunDepth: 17.39 psig @ 4538.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2019.07.05 End Date: 2019.07.05 Last Calib.: 2019.07.05
Start Time: 05:10:02 End Time: 11:50:15 Time On Btm: 2019.07.05 @ 07:49:05
Time Off Btm: 2019.07.05 @ 09:53:45

TEST COMMENT: IF: Weak surface blow , died 9 min.
IS: No bow back
FF: No blow , Flushed, no change
FS: No blow back

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2208.09	113.35	Initial Hydro-static
1	13.37	112.46	Open To Flow (1)
33	14.80	113.50	Shut-In(1)
64	123.83	114.22	End Shut-In(1)
64	14.74	114.19	Open To Flow (2)
93	17.39	114.82	Shut-In(2)
124	88.03	115.43	End Shut-In(2)
125	2273.43	116.43	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
5.00	Mud w / oil spots	0.02

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 St. #700
 Wichita, KS 67278
 ATTN: Kent Matson

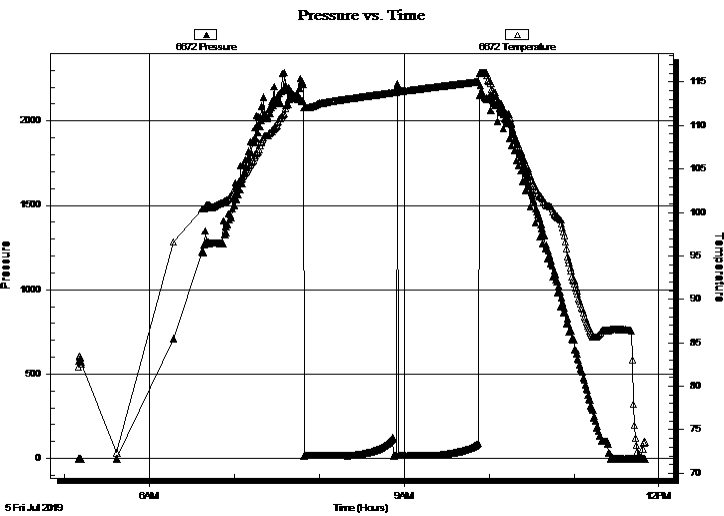
10-16S-38W Wichita, KS
MJW 10C #1
 Job Ticket: 47655 **DST#: 1**
 Test Start: 2019.07.05 @ 05:10:00

GENERAL INFORMATION:

Formation: **Altamont A**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 07:49:25
 Time Test Ended: 11:50:15
 Interval: **4536.00 ft (KB) To 4570.00 ft (KB) (TVD)**
 Total Depth: 4570.00 ft (KB) (TVD)
 Hole Diameter: 7.80 inches Hole Condition: Good
 Test Type: Conventional Bottom Hole (Initial)
 Tester: Chris Hagman
 Unit No: 75
 Reference Elevations: 3457.00 ft (KB)
 3449.00 ft (CF)
 KB to GR/CF: 8.00 ft

Serial #: 6672 Outside
 Press@RunDepth: psig @ 4538.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2019.07.05 End Date: 2019.07.05 Last Calib.: 1899.12.30
 Start Time: 05:10:02 End Time: 11:50:00 Time On Btm:
 Time Off Btm:

TEST COMMENT: IF: Weak surface blow , died 9 min.
 IS: No bow back
 FF: No blow , Flushed, no change
 FS: No blow back



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
5.00	Mud w / oil spots	0.02

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Ritchie Exploration, Inc.

10-16S-38W Wichita, KS

8100 E 22ND St N St. #700
Wichita, KS 67278

MJW 10C #1

Job Ticket: 47655

DST#: 1

ATTN: Kent Matson

Test Start: 2019.07.05 @ 05:10:00

Tool Information

Drill Pipe:	Length: 4329.00 ft	Diameter: 3.80 inches	Volume: 60.72 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 187.00 ft	Diameter: 2.25 inches	Volume: 0.92 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 61.64 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	7.00 ft			String Weight: Initial 60000.00 lb
Depth to Top Packer:	4536.00 ft			Final 60000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	34.00 ft			
Tool Length:	61.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
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Shut In Tool	5.00			4514.00	
Hydraulic tool	5.00			4519.00	
Jars	5.00			4524.00	
Safety Joint	3.00			4527.00	
Packer	5.00			4532.00	27.00 Bottom Of Top Packer
Packer	4.00			4536.00	
Stubb	1.00			4537.00	
Perforations	1.00			4538.00	
Recorder	0.00	8289	Inside	4538.00	
Recorder	0.00	6672	Outside	4538.00	
Perforations	29.00			4567.00	
Bullnose	3.00			4570.00	34.00 Bottom Packers & Anchor

Total Tool Length: 61.00



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DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc.

10-16S-38W Wichita,KS

8100 E 22ND St N St. #700
Wichita, KS 67278

MJW 10C #1

Job Ticket: 47655

DST#: 1

ATTN: Kent Matson

Test Start: 2019.07.05 @ 05:10:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 50.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.99 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 5400.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
5.00	Mud w / oil spots	0.025

Total Length: 5.00 ft Total Volume: 0.025 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

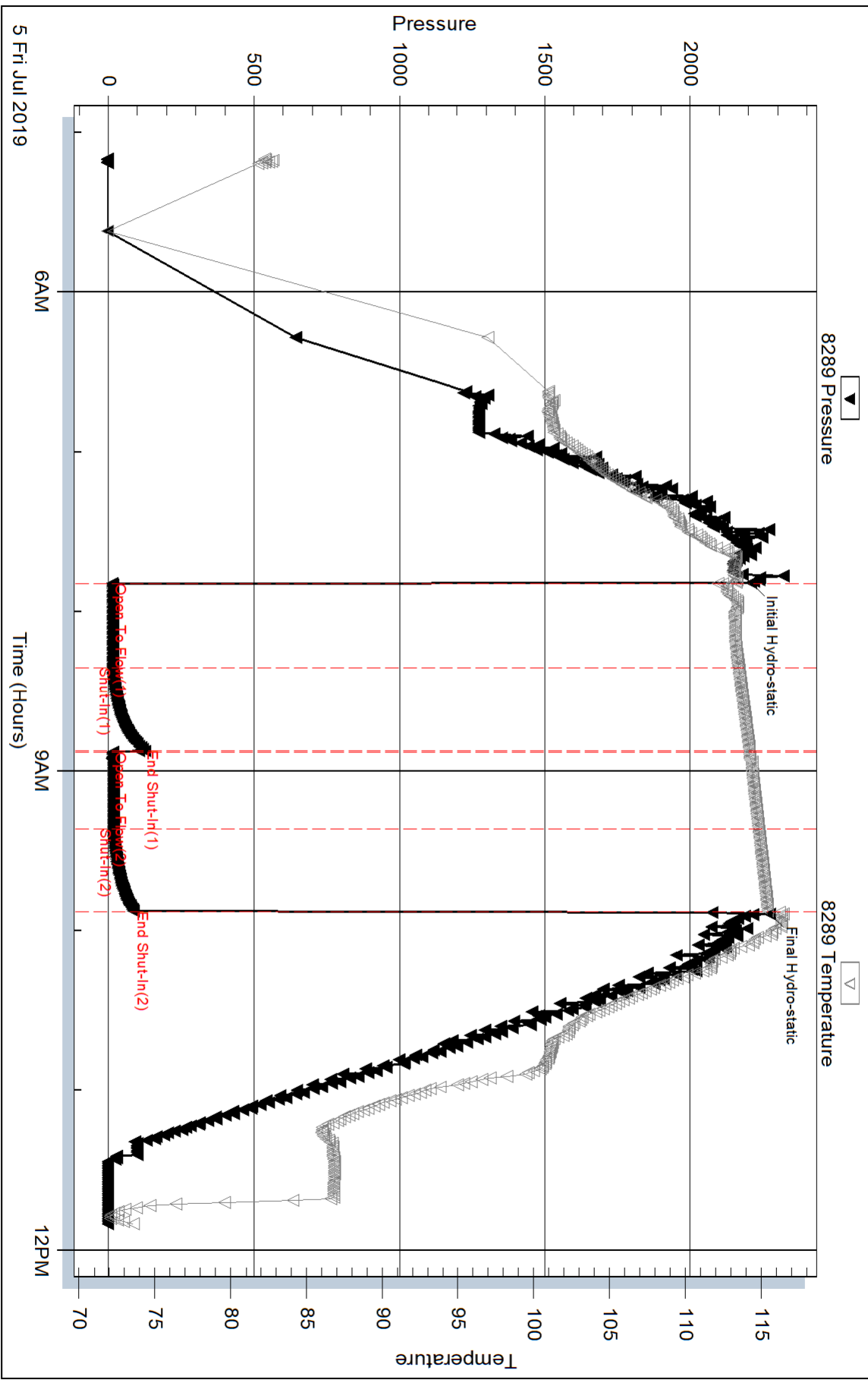
Serial #:

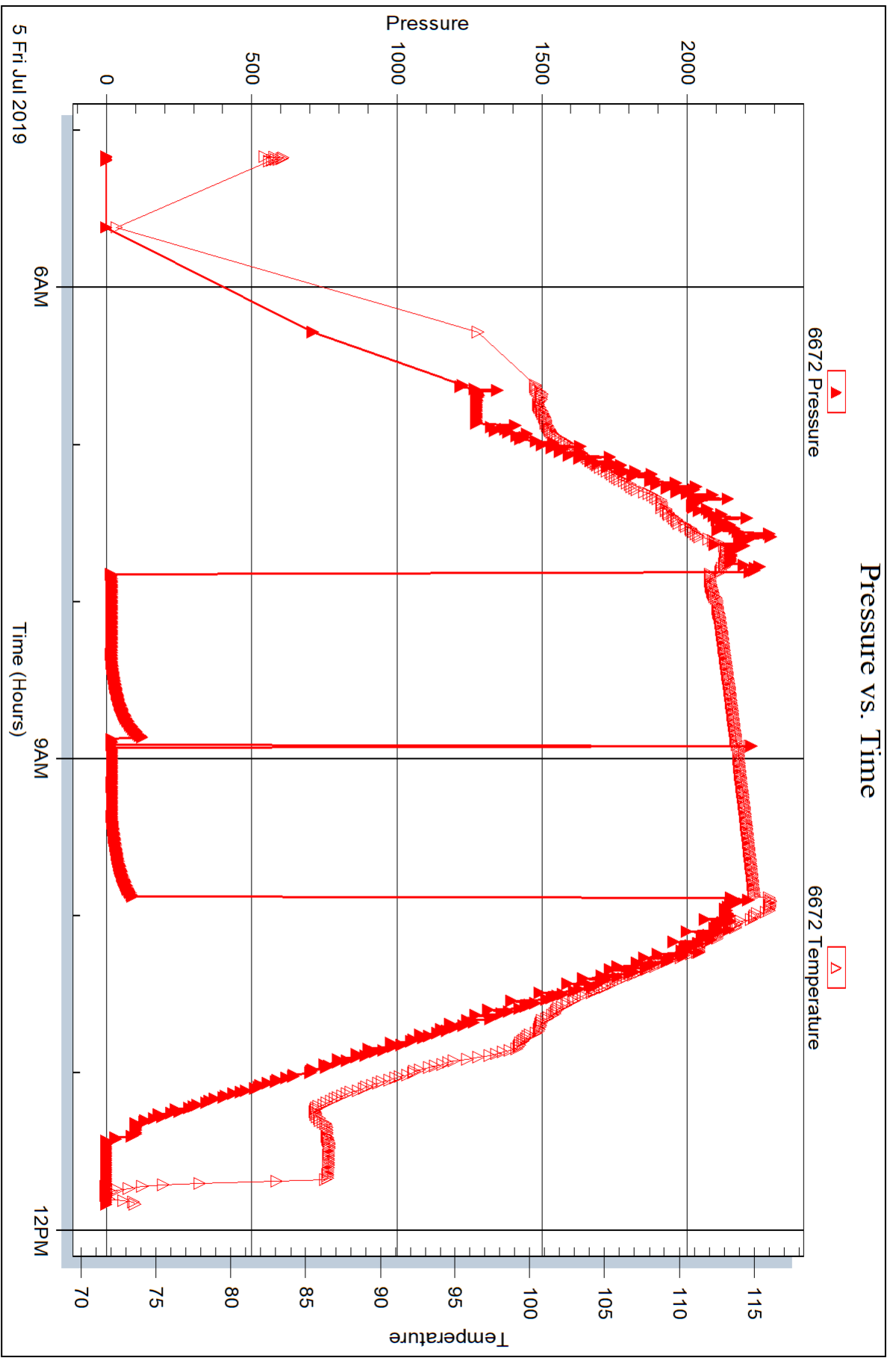
Laboratory Name:

Laboratory Location:

Recovery Comments:

Pressure vs. Time







DRILL STEM TEST REPORT

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

8100 E 22ND St N St. #700
Wichita, KS 67278

ATTN: Kent Matson

MJW 10C #1

10-16S-38W Wichita,KS

Start Date: 2019.07.06 @ 00:17:00

End Date: 2019.07.06 @ 08:02:30

Job Ticket #: 47656 DST #: 2

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

Printed: 2019.07.11 @ 08:55:07



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.
8100 E 22ND St N St. #700
Wichita, KS 67278
ATTN: Kent Matson

10-16S-38W Wichita, KS
MJW 10C #1
Job Ticket: 47656 **DST#: 2**
Test Start: 2019.07.06 @ 00:17:00

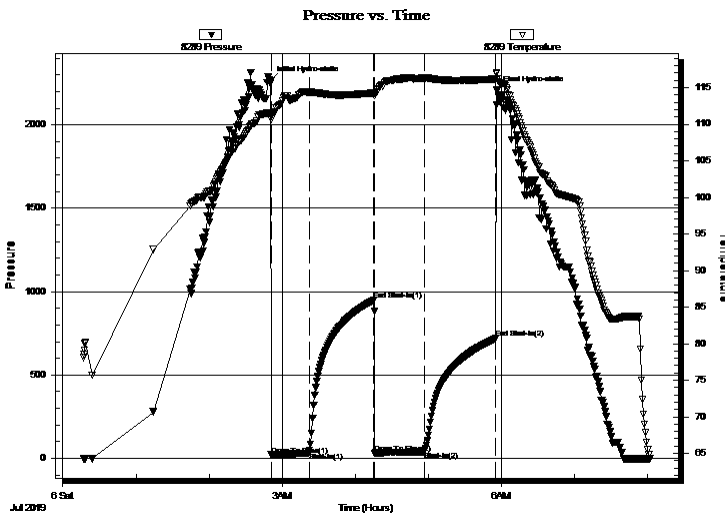
GENERAL INFORMATION:

Formation: **Altamont B - C**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 02:50:55
Time Test Ended: 08:02:30
Interval: **4566.00 ft (KB) To 4600.00 ft (KB) (TVD)**
Total Depth: 4600.00 ft (KB) (TVD)
Hole Diameter: 7.80 inches Hole Condition: Good
Test Type: Conventional Bottom Hole (Initial)
Tester: Chris Hagman
Unit No: 75
Reference Elevations: 3457.00 ft (KB)
3449.00 ft (CF)
KB to GR/CF: 8.00 ft

Serial #: 8289 **Inside**
Press@RunDepth: 44.75 psig @ 4568.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2019.07.06 End Date: 2019.07.06 Last Calib.: 2019.07.06
Start Time: 00:17:02 End Time: 08:02:30 Time On Btm: 2019.07.06 @ 02:50:40
Time Off Btm: 2019.07.06 @ 05:56:05

TEST COMMENT: IF: Weak surface blow , 1.2"
IS: No blow back
FF: Weak surface blow , 0.75"
FS: No blow back

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2263.71	111.60	Initial Hydro-static
1	21.03	110.69	Open To Flow (1)
32	35.99	114.40	Shut-In(1)
85	948.42	114.27	End Shut-In(1)
86	31.97	113.91	Open To Flow (2)
126	44.75	116.22	Shut-In(2)
185	719.03	116.18	End Shut-In(2)
186	2207.71	116.92	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
10.00	Mud w / oil spots	0.05

Gas Rates

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

10-16S-38W Wichita, KS

8100 E 22ND St N St. #700
Wichita, KS 67278

MJW 10C #1

Job Ticket: 47656

DST#: 2

ATTN: Kent Matson

Test Start: 2019.07.06 @ 00:17:00

GENERAL INFORMATION:

Formation: **Altamont B - C**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 02:50:55

Time Test Ended: 08:02:30

Test Type: Conventional Bottom Hole (Initial)

Tester: Chris Hagman

Unit No: 75

Interval: **4566.00 ft (KB) To 4600.00 ft (KB) (TVD)**

Reference Elevations: 3457.00 ft (KB)

Total Depth: 4600.00 ft (KB) (TVD)

3449.00 ft (CF)

Hole Diameter: 7.80 inches Hole Condition: Good

KB to GR/CF: 8.00 ft

Serial #: 6672 Outside

Press@RunDepth: psig @ 4568.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.07.06

End Date:

2019.07.06

Last Calib.:

1899.12.30

Start Time: 00:17:02

End Time:

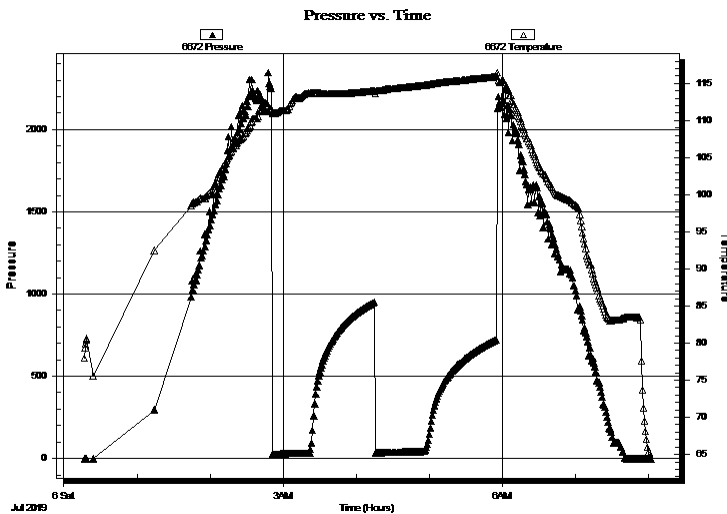
08:02:19

Time On Btm:

Time Off Btm:

TEST COMMENT: IF: Weak surface blow , 1.2"
IS: No blow back
FF: Weak surface blow , 0.75"
FS: No blow back

PRESSURE SUMMARY



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

Recovery

Gas Rates

Length (ft)	Description	Volume (bbl)
10.00	Mud w / oil spots	0.05

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



**TRILOBITE
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DRILL STEM TEST REPORT

TOOL DIAGRAM

Ritchie Exploration, Inc.

10-16S-38W Wichita, KS

8100 E 22ND St N St. #700
Wichita, KS 67278

MJW 10C #1

Job Ticket: 47656

DST#: 2

ATTN: Kent Matson

Test Start: 2019.07.06 @ 00:17:00

Tool Information

Drill Pipe:	Length: 4360.00 ft	Diameter: 3.80 inches	Volume: 61.16 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 187.00 ft	Diameter: 2.25 inches	Volume: 0.92 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 62.08 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	8.00 ft			String Weight: Initial 60000.00 lb
Depth to Top Packer:	4566.00 ft			Final 60000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	34.00 ft			
Tool Length:	61.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
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Shut In Tool	5.00			4544.00	
Hydraulic tool	5.00			4549.00	
Jars	5.00			4554.00	
Safety Joint	3.00			4557.00	
Packer	5.00			4562.00	27.00 Bottom Of Top Packer
Packer	4.00			4566.00	
Stubb	1.00			4567.00	
Perforations	1.00			4568.00	
Recorder	0.00	8289	Inside	4568.00	
Recorder	0.00	6672	Outside	4568.00	
Perforations	29.00			4597.00	
Bullnose	3.00			4600.00	34.00 Bottom Packers & Anchor

Total Tool Length: 61.00



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DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc.

10-16S-38W Wichita,KS

8100 E 22ND St N St. #700
Wichita, KS 67278

MJW 10C #1

Job Ticket: 47656

DST#: 2

ATTN: Kent Matson

Test Start: 2019.07.06 @ 00:17:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 48.00 sec/qt

Cushion Volume:

bbf

Water Loss: 7.99 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 5600.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbf
10.00	Mud w / oil spots	0.049

Total Length: 10.00 ft Total Volume: 0.049 bbf

Num Fluid Samples: 0

Num Gas Bombs: 0

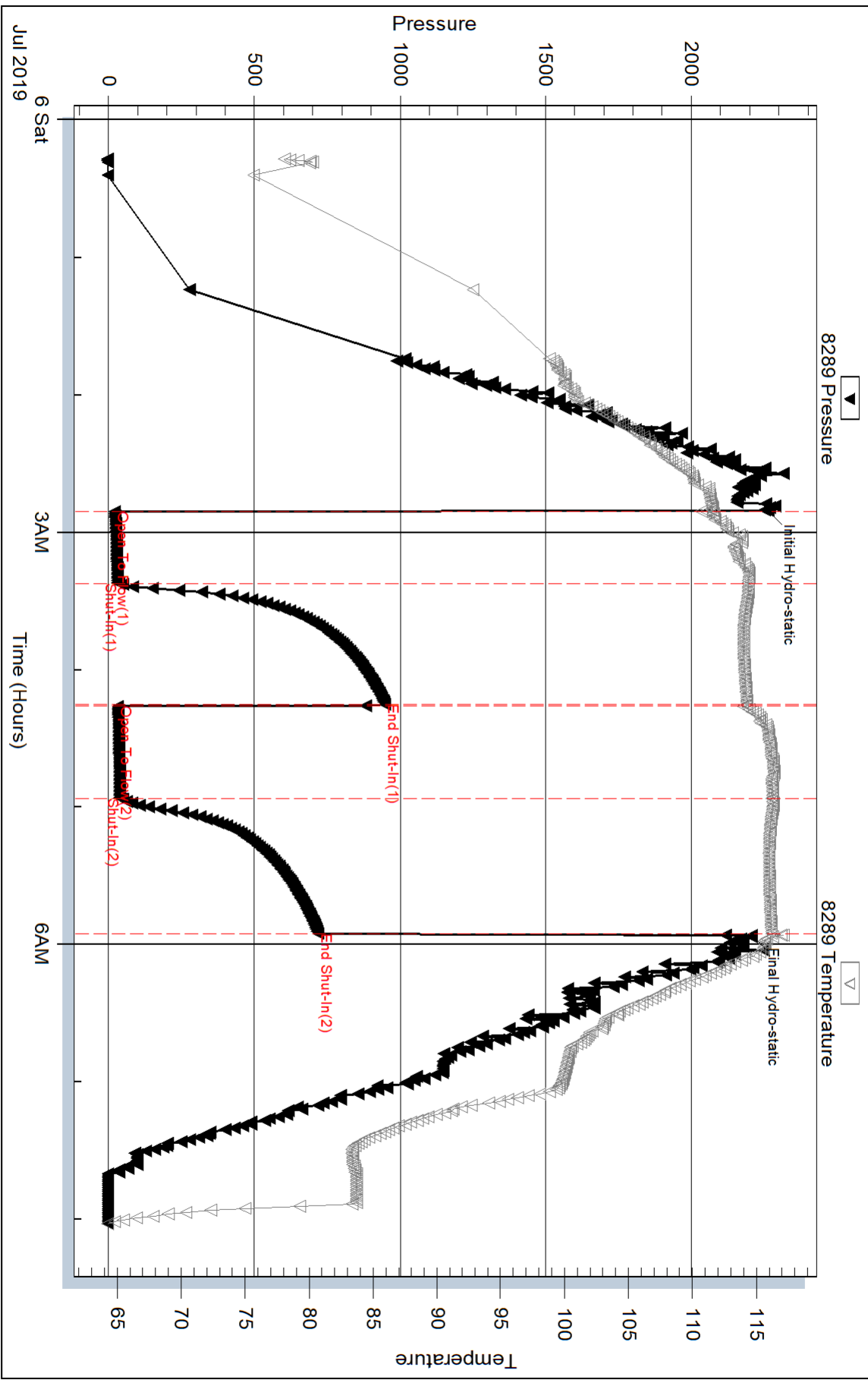
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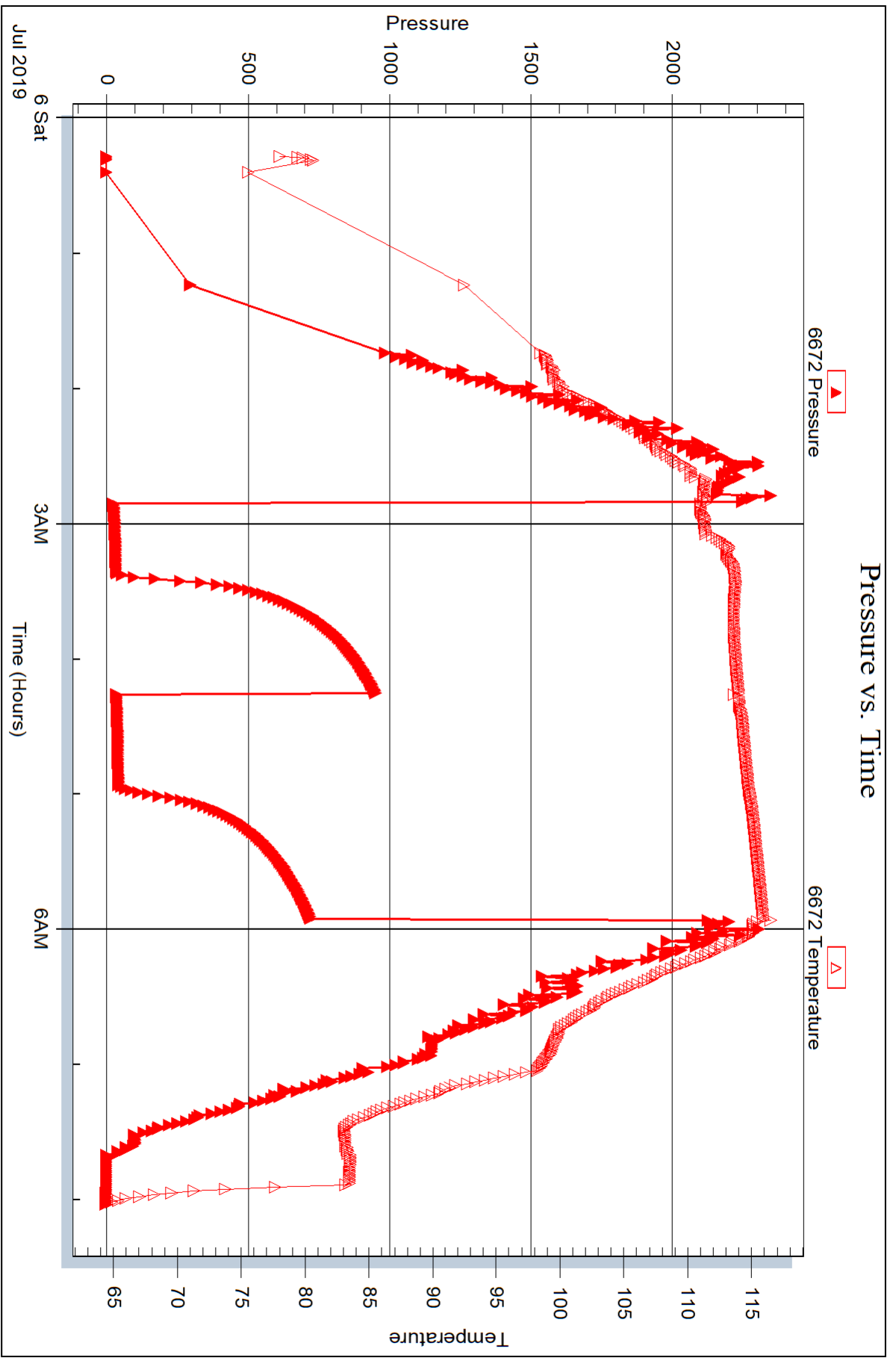
Laboratory Name:

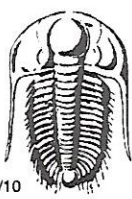
Laboratory Location:

Recovery Comments:

Pressure vs. Time







TRILOBITE TESTING INC.

P.O. Box 1733 • Hays, Kansas 67601

Test Ticket

NO. 47655

Well Name & No. M5W 10C-1 Test No. 1 Date 7-5-19
 Company Ritchie Exploration, Inc. Elevation 3457 KB 3449 GL
 Address 8100 E 22ND ST N #1700 Wichita, KS 67278
 Co. Rep / Geo. Ken Matson Rig WW12
 Location: Sec. 10 Twp. 16S Rge. 38W Co. Wichita State KS

Interval Tested 4536-4570 Zone Tested Atamont A
 Anchor Length 34' Drill Pipe Run 4329 Mud Wt. 9.2
 Top Packer Depth 4531 Drill Collars Run 187 Vis 50
 Bottom Packer Depth 4536 Wt. Pipe Run N.A. WL 8.0
 Total Depth 4570 Chlorides 5400 ppm System LCM 1"

Blow Description IF: Weak surface blow, died 9 min.
IST: No blow back
FF: No blow, flushed, no change
FST: No blow back

Rec	Feet of	%gas	%oil	%water	%mud
<u>5</u>	<u>oil spotted mud</u>	<u>Spot</u>			<u>100</u>
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

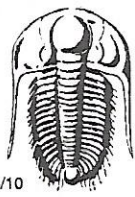
Rec Total 5 BHT 115 Gravity _____ API RW _____ @ _____ °F Chlorides _____ ppm

(A) Initial Hydrostatic 2208 Test CONV. 1300 T-On Location 0400
 (B) First Initial Flow 13 Jars 250 T-Started 0515
 (C) First Final Flow 15 Safety Joint 75 T-Open 0750
 (D) Initial Shut-In 124 Circ Sub _____ T-Pulled 0950
 (E) Second Initial Flow 15 Hourly Standby _____ T-Out 1200
 (F) Second Final Flow 17 Mileage 90 90 Comments bats on @
 (G) Final Shut-In 88 Sampler _____ 0510
 (H) Final Hydrostatic 2273 Straddle _____ Ruined Shale Packer _____
 Shale Packer _____ Ruined Packer _____

Initial Open 30 Extra Packer _____ Extra Copies _____
 Initial Shut-In 30 Extra Recorder _____ Sub Total 0
 Final Flow 30 Day Standby _____ Total 1715
 Final Shut-In 30 Accessibility _____ MP/DST Disc't _____
 Sub Total 1715

Approved By [Signature] Our Representative [Signature] Chris Hugman

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.

P.O. Box 1733 • Hays, Kansas 67601

Test Ticket

NO. 47656

Well Name & No. MJW 10C -1 Test No. 2 Date 7-6-19
 Company Ritchie Exploration, Inc. Elevation 3457 KB 3449 GL
 Address 8100 E 22ND ST W #700 Wichita, KS 67278
 Co. Rep / Geo. Kent Matson Rig WW 12
 Location: Sec. 10 Twp. 16S Rge. 38W Co. Wichita State KS

Interval Tested 4566-4600 Zone Tested Altamont B,C
 Anchor Length 34' Drill Pipe Run 4360 Mud Wt. 9.1
 Top Packer Depth 4561 Drill Collars Run 187 Vis 48
 Bottom Packer Depth 4566 Wt. Pipe Run N.A. WL 8.0
 Total Depth 4600 Chlorides 5600 ppm System LCM 3[#]

Blow Description IF: Weak surface blow, 1.2 inches
ISB: No blow back
FP: ~~Weak~~ weak surface blow, .75 inches
FSB: No blow back

Rec	Feet of	%gas	Spot %oil	%water	%mud
10	oil spotted mud				100%

Rec Total 10 BHT 116 Gravity _____ API RW _____ @ _____ °F Chlorides _____ ppm

(A) Initial Hydrostatic 2264 Test com. 1300 T-On Location 1200 AM
 (B) First Initial Flow 21 Jars 250 T-Started 1230 A.M.
 (C) First Final Flow 36 Safety Joint 75 T-Open 0250
 (D) Initial Shut-In 948 Circ Sub _____ T-Pulled 0550
 (E) Second Initial Flow 32 Hourly Standby _____ T-Out 0800
 (F) Second Final Flow 45 Mileage 90 90 +90 Comments bats on @ 1217
 (G) Final Shut-In 719 Sampler _____
 (H) Final Hydrostatic 2208 Straddle _____ Ruined Shale Packer _____
 Shale Packer _____ Ruined Packer _____
 Extra Packer _____ Extra Copies _____
 Initial Open 30 Extra Recorder 2.5d 4.5h Sub Total 1600
 Initial Shut-In 45 Day Standby Released 7-9-19 Total 3405
 Final Flow 45 Accessibility 12:30 A.M. MP/DST Disc't _____
 Final Shut-In 60 Sub Total 1805

Approved By [Signature] Our Representative [Signature] Chris Hegman

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.