



DRILL STEM TEST REPORT

Prepared For: **TDI, Inc.**

1310 Bison Rd.
Hays, KS 67601

ATTN: Herb Deines

Wittman #1

3-15S-16W Ellis, KS

Start Date: 2017.03.12 @ 18:30:48

End Date: 2017.03.13 @ 02:59:34

Job Ticket #: 58119 DST #: 1

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

Printed: 2017.03.15 @ 11:34:22

TDI, Inc.
3-15S-16W Ellis, KS
Wittman #1
DST # 1
LKC "C - D"
2017.03.12



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

TDI, Inc.
1310 Bison Rd.
Hays, KS 67601
ATTN: Herb Deines

3-15S-16W Ellis, KS
Wittman #1
Job Ticket: 58119 **DST#: 1**
Test Start: 2017.03.12 @ 18:30:48

Tool Information

Drill Pipe:	Length: 3178.00 ft	Diameter: 3.82 inches	Volume: 45.05 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 2.25 inches	Volume: 0.00 bbl	Weight to Pull Loose: 47000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	12.00 ft			String Weight: Initial 36000.00 lb
Depth to Top Packer:	3186.00 ft			Final 36000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	54.00 ft			
Tool Length:	74.00 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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Change Over Sub	1.00			3167.00	
Shut In Tool	5.00			3172.00	
Hydraulic tool	5.00			3177.00	
Packer	5.00			3182.00	20.00 Bottom Of Top Packer
Packer	4.00			3186.00	
Stubb	1.00			3187.00	
Recorder	0.00	6838	Inside	3187.00	
Recorder	0.00	8524	Outside	3187.00	
Perforations	16.00			3203.00	
Change Over Sub	1.00			3204.00	
Drill Pipe	32.00			3236.00	
Change Over Sub	1.00			3237.00	
Bullnose	3.00			3240.00	54.00 Bottom Packers & Anchor

Total Tool Length: 74.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

TDI, Inc.
1310 Bison Rd.
Hays, KS 67601
ATTN: Herb Deines

3-15S-16W Ellis, KS
Wittman #1
Job Ticket: 58119 **DST#: 1**
Test Start: 2017.03.12 @ 18:30:48

Mud and Cushion Information

Mud Type: Gel Chem	Cushion Type:	Oil API: 26 deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity: ppm
Viscosity: 49.00 sec/qt	Cushion Volume: bbl	
Water Loss: 6.39 in ³	Gas Cushion Type:	
Resistivity: ohm.m	Gas Cushion Pressure: psig	
Salinity: 4200.00 ppm		
Filter Cake: inches		

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
40.00	SOCM, 5%O 95%M	0.567

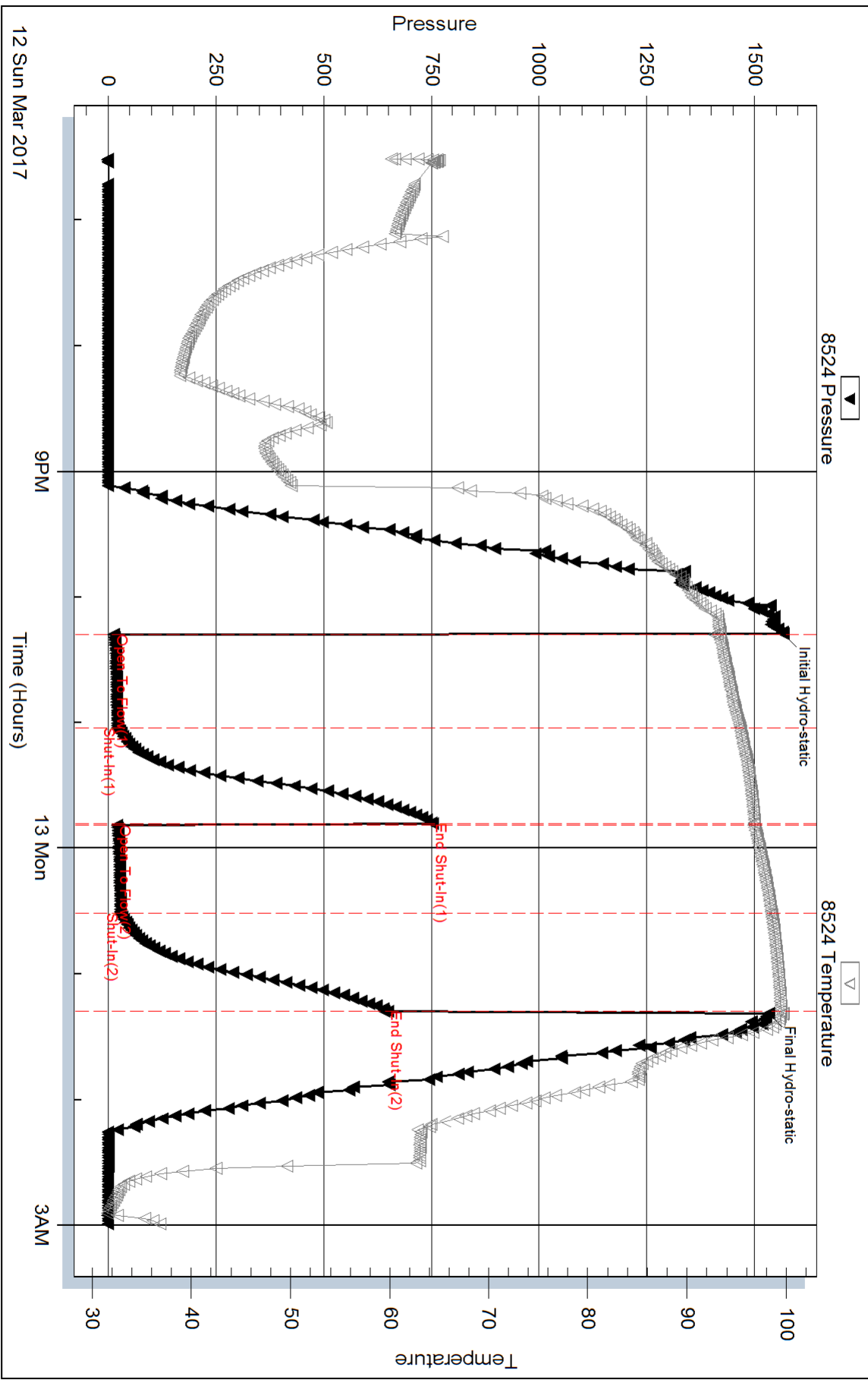
Total Length: 40.00 ft Total Volume: 0.567 bbl

Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:

Laboratory Name: Laboratory Location:

Recovery Comments:

Pressure vs. Time



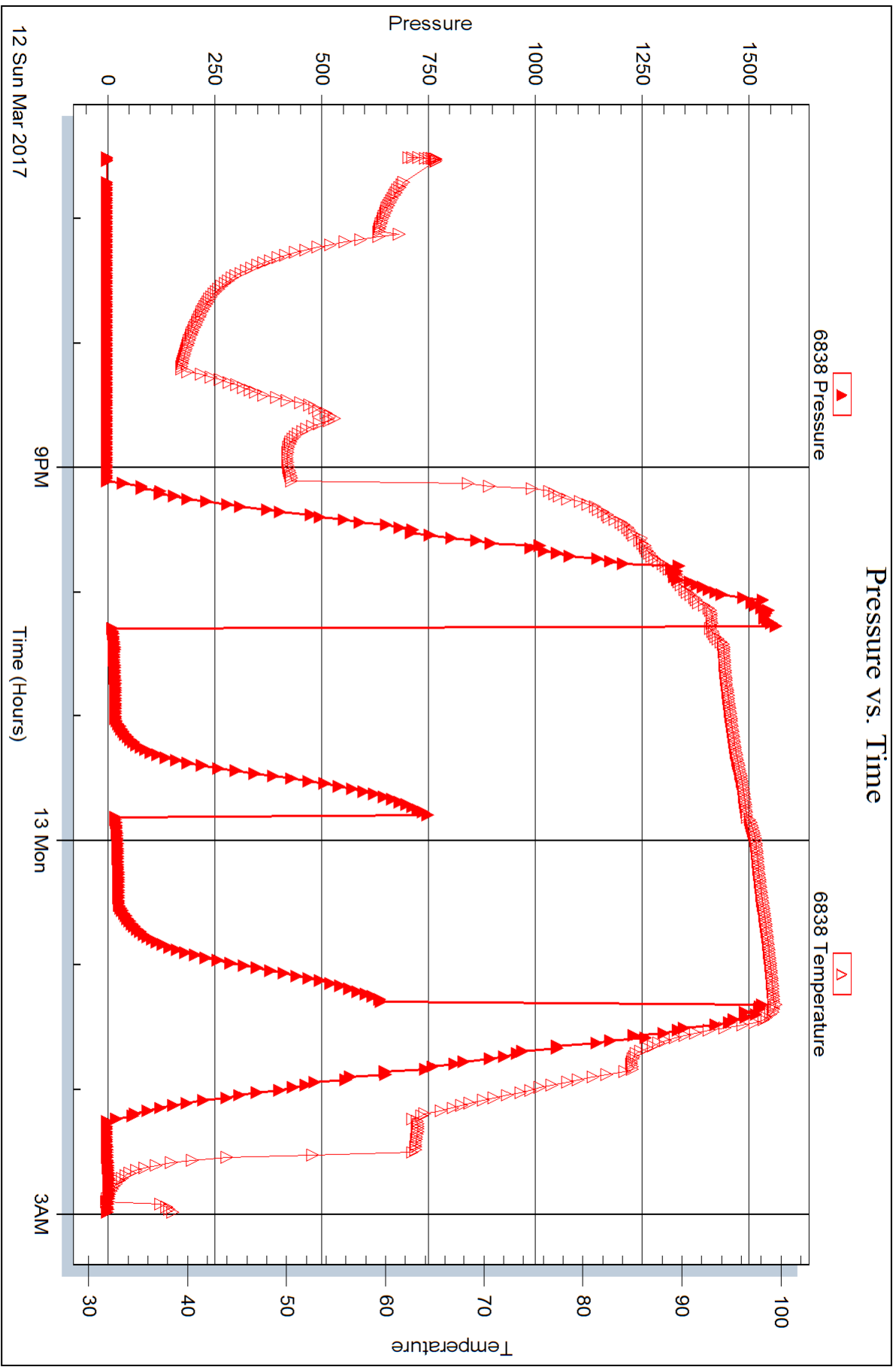
Serial #: 6838

Inside

TDI, Inc.

Wellman #1

DST Test Number: 1



Triobite Testing, Inc

Ref. No: 58119

Printed: 2017.03.15 @ 11:34:23



DRILL STEM TEST REPORT

Prepared For: **TDI, Inc.**

1310 Bison Rd.
Hays, KS 67601

ATTN: Herb Deines

Wittman #1

3-15S-16W Ellis, KS

Start Date: 2017.03.13 @ 16:34:58

End Date: 2017.03.13 @ 22:34:14

Job Ticket #: 58120 DST #: 2

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

Printed: 2017.03.15 @ 11:15:45

TDI, Inc.
3-15S-16W Ellis, KS
Wittman #1
DST # 2
LKC "H - K"
2017.03.13



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

TDI, Inc.
1310 Bison Rd.
Hays, KS 67601
ATTN: Herb Deines

3-15S-16W Ellis, KS
Wittman #1
Job Ticket: 58120 **DST#: 2**
Test Start: 2017.03.13 @ 16:34:58

GENERAL INFORMATION:

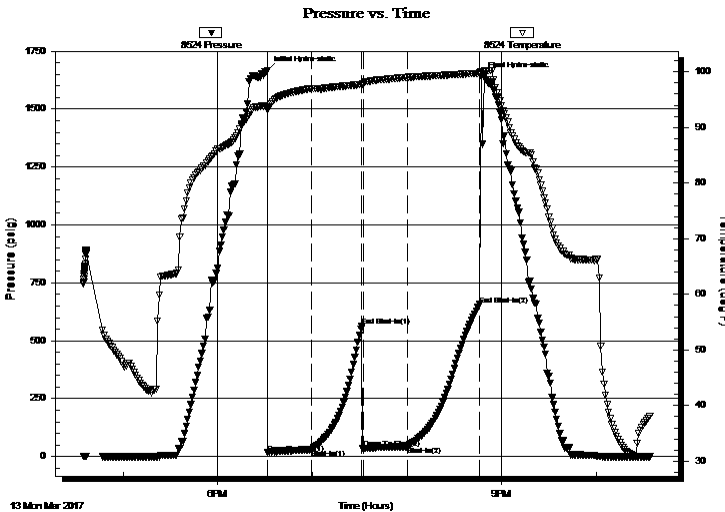
Formation: **LKC "H - K"**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 18:31:44
Time Test Ended: 22:34:14
Interval: 3302.00 ft (KB) To 3395.00 ft (KB) (TVD)
Total Depth: 3395.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Fair
Test Type: Conventional Bottom Hole (Reset)
Tester: Brannan Lonsdale
Unit No: 73
Reference Elevations: 1912.00 ft (KB)
1902.00 ft (CF)
KB to GR/CF: 10.00 ft

Serial #: 8524 Outside

Press@RunDepth: 43.04 psig @ 3303.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2017.03.13 End Date: 2017.03.13 Last Calib.: 2017.03.13
Start Time: 16:34:59 End Time: 22:34:14 Time On Btm: 2017.03.13 @ 18:31:29
Time Off Btm: 2017.03.13 @ 20:46:59

TEST COMMENT: 30- IF- BOB 15 mins
30- IS- Surface blow died in 2 mins
30- FF- 6" initial surge BOB 2 mins
45- FS- Surface blow died in 3 mins

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1666.67	93.68	Initial Hydro-static
1	16.43	93.24	Open To Flow (1)
29	30.44	97.02	Shut-In(1)
60	562.38	97.74	End Shut-In(1)
61	34.40	97.85	Open To Flow (2)
89	43.04	99.03	Shut-In(2)
135	656.02	99.75	End Shut-In(2)
136	1640.50	100.01	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
78.00	GOCM, 10%G 15%O 75%M	1.11
0.00	361' 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

TDI, Inc.
1310 Bison Rd.
Hays, KS 67601
ATTN: Herb Deines

3-15S-16W Ellis, KS
Wittman #1
Job Ticket: 58120 **DST#: 2**
Test Start: 2017.03.13 @ 16:34:58

Tool Information

Drill Pipe:	Length: 3305.00 ft	Diameter: 3.82 inches	Volume: 46.85 bbl	Tool Weight:	2000.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 2.25 inches	Volume: 0.00 bbl	Weight to Pull Loose:	56000.00 lb
			<u>Total Volume:</u> - bbl	Tool Chased	0.00 ft
Drill Pipe Above KB:	23.00 ft			String Weight: Initial	37000.00 lb
Depth to Top Packer:	3302.00 ft			Final	37000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	93.00 ft				
Tool Length:	113.00 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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Change Over Sub	1.00			3283.00	
Shut In Tool	5.00			3288.00	
Hydraulic tool	5.00			3293.00	
Packer	5.00			3298.00	20.00 Bottom Of Top Packer
Packer	4.00			3302.00	
Stubb	1.00			3303.00	
Recorder	0.00	6838	Inside	3303.00	
Recorder	0.00	8524	Outside	3303.00	
Perforations	25.00			3328.00	
Change Over Sub	1.00			3329.00	
Drill Pipe	62.00			3391.00	
Change Over Sub	1.00			3392.00	
Bullnose	3.00			3395.00	93.00 Bottom Packers & Anchor

Total Tool Length: 113.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

TDI, Inc.

3-15S-16W Ellis, KS

1310 Bison Rd.
Hays, KS 67601

Wittman #1

Job Ticket: 58120

DST#: 2

ATTN: Herb Deines

Test Start: 2017.03.13 @ 16:34:58

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

32 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 55.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.79 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 4300.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
78.00	GOCM, 10%G 15%O 75%M	1.106
0.00	361' GIP	0.000

Total Length: 78.00 ft Total Volume: 1.106 bbl

Num Fluid Samples: 0

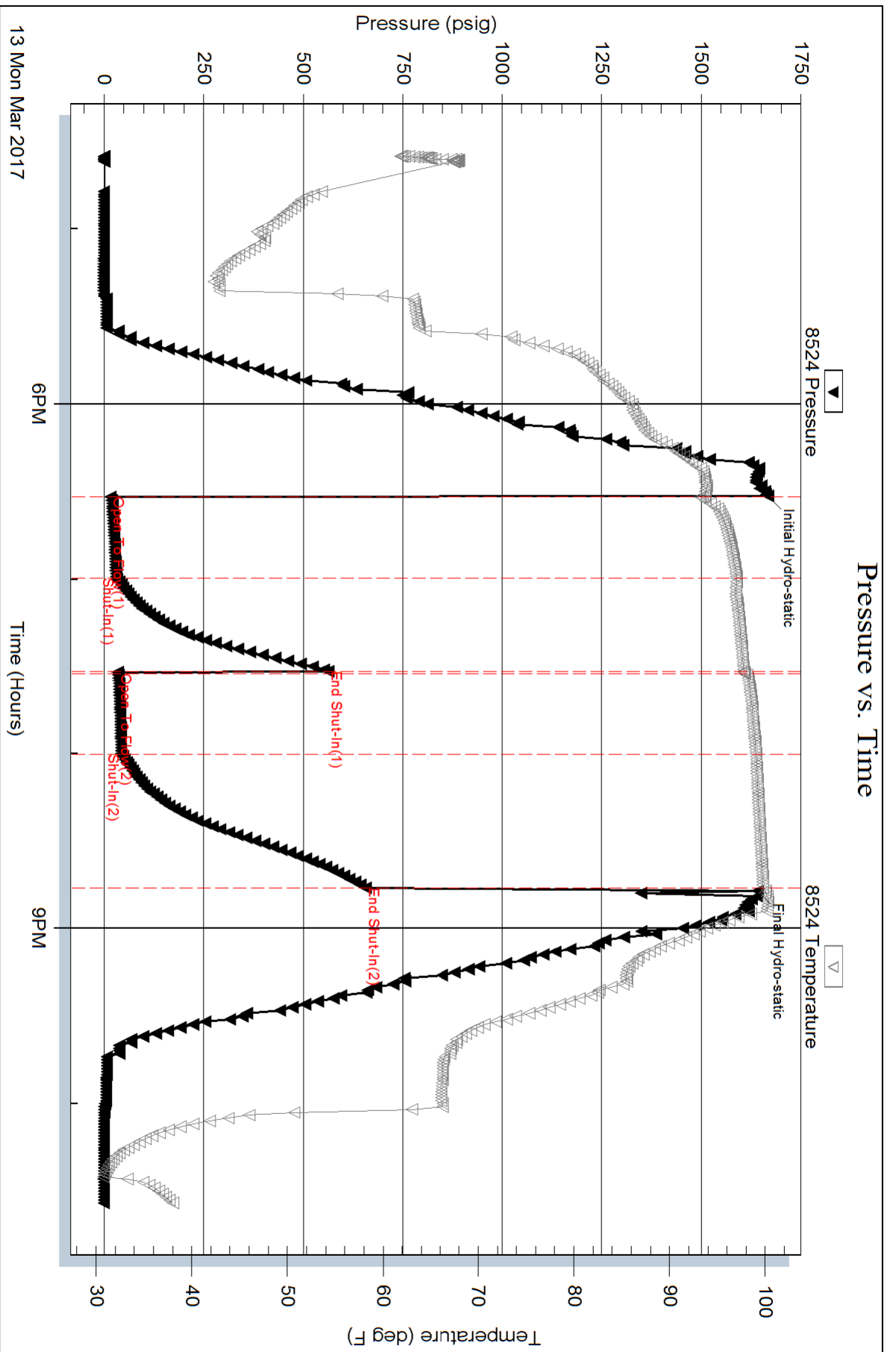
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:



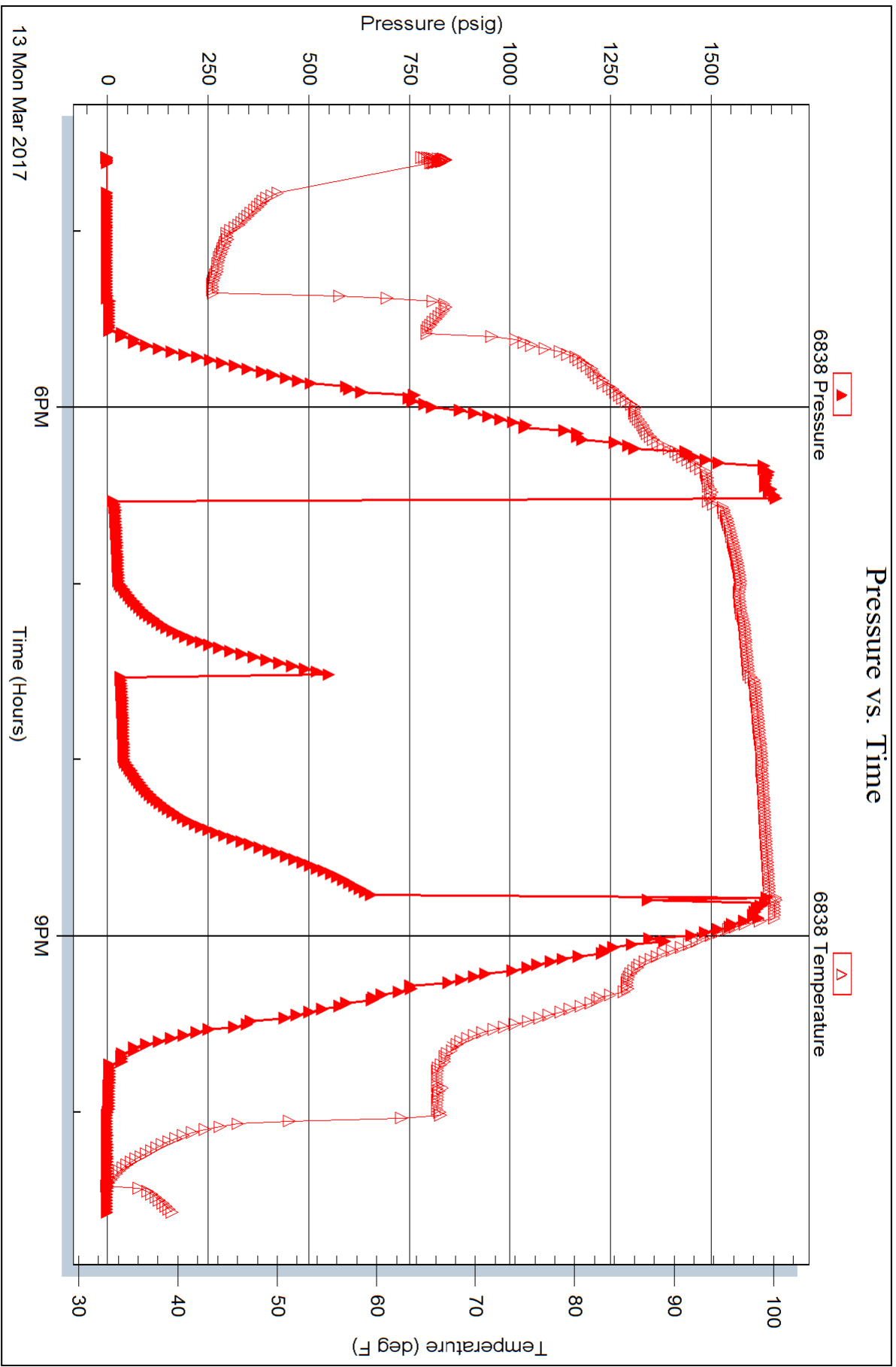
Serial #: 6838

Inside

TDI, Inc.

Withman #1

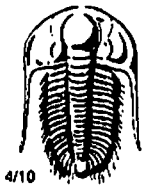
DST Test Number: 2



Trilobite Testing, Inc

Ref. No: 58120

Printed: 2017.03.15 @ 11:16:04



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 58119

Well Name & No. Wottman #1 Test No. 1 Date 3/12/17
 Company IDI, Inc. Elevation 1912 KB 1902 GL
 Address 1310 Bison Rd. Hays, KS 67601
 Co. Rep / Geo. Herb Dennes Rig Southwind #1
 Location: Sec. 3 Twp. 15 S Rge. 16 W Co. Ellis State KS

Interval Tested 3186-3240 Zone Tested LKC "C+D"
 Anchor Length 54' Drill Pipe Run 3178 Mud Wt. 9.0
 Top Packer Depth 3181 Drill Collars Run — Vis 49
 Bottom Packer Depth 3186 Wt. Pipe Run — WL 6.4
 Total Depth 3240 Chlorides 4200 ppm System LCM 2#

Blow Description IF - Slowly built to 3"
ISI - No blow
PF - Slowly built to 1"
RSI - No blow

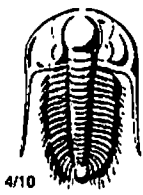
Rec	Feet of	%gas	%oil	%water	%mud
<u>40</u>	<u>SOCM</u>		<u>5</u>		<u>9.5</u>
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 40' BHT 100° Gravity 26 API RW — @ — °F Chlorides — ppm
 (A) Initial Hydrostatic 1566 Test 1050 T-On Location 1815
 (B) First Initial Flow 13 Jars — T-Started 1830
 (C) First Final Flow 21 Safety Joint — T-Open 2217
 (D) Initial Shut-In 753 Circ Sub — T-Pulled 0117
 (E) Second Initial Flow 21 Hourly Standby — T-Out 3/13 0259
 (F) Second Final Flow 28 Mileage 38 RT 28.50 Comments —
 (G) Final Shut-In 649 Sampler —
 (H) Final Hydrostatic 1533 Straddle — Ruined Shale Packer —
 Shale Packer — Ruined Packer —
 Extra Packer — Extra Copies —
 Extra Recorder — Sub Total 0
 Day Standby — Total 1078.50
 Accessibility — MP/DST Disc't —
 Sub Total 1078.50

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

Approved By _____ Our Representative Brannan Loasdale

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. 58120

Well Name & No. Wittman #1 Test No. 2 Date 3/13/17
 Company TDF, Inc. Elevation 1912 KB 1962 GL
 Address 1310 Bison Rd Hays, KS 67601
 Co. Rep / Geo. Herb Dames Rig Southwind #1
 Location: Sec. 3 Twp. 15 S Rge. 16 Wco. Ellis State KS

Interval Tested 3302 - 3395 Zone Tested LKC "H-K"
 Anchor Length 93' Drill Pipe Run 3305 Mud Wt. 9.1
 Top Packer Depth 3297 Drill Collars Run --- Vis 55
 Bottom Packer Depth 3302 Wt. Pipe Run --- WL 6.8
 Total Depth 3395 Chlorides 4300 ppm System LCM 2^F

Blow Description IF-BOB 15 mins
ISI - Surface blow died in 2 mins
FF - 6" Initial surge BOB 2 mins
FST - Surface blow died in 3 mins

Rec	Feet of	%gas	%oil	%water	%mud
<u>78</u>	<u>40CM</u>	<u>10</u>	<u>15</u>	<u>25</u>	
	<u>361' LIP</u>				

Rec Total 78' BHT 100° Gravity 32 API RW ---@ --- °F Chlorides --- ppm

(A) Initial Hydrostatic	<u>1667</u>	<input checked="" type="checkbox"/> Test	<u>1050</u>	T-On Location	<u>1620</u>
(B) First Initial Flow	<u>16</u>	<input type="checkbox"/> Jars		T-Started	<u>1634</u>
(C) First Final Flow	<u>30</u>	<input type="checkbox"/> Safety Joint		T-Open	<u>1830</u>
(D) Initial Shut-In	<u>562</u>	<input type="checkbox"/> Circ Sub		T-Pulled	<u>2045</u>
(E) Second Initial Flow	<u>34</u>	<input type="checkbox"/> Hourly Standby		T-Out	<u>2233</u>
(F) Second Final Flow	<u>43</u>	<input checked="" type="checkbox"/> Mileage	<u>38 RT 57</u>	Comments	<u>Tools Loaded</u>
(G) Final Shut-In	<u>656</u>	<input type="checkbox"/> Sampler			<u>3/14 @ 1830</u>
(H) Final Hydrostatic	<u>1641</u>	<input type="checkbox"/> Straddle		<input type="checkbox"/> Ruined Shale Packer	

Initial Open	<u>30</u>	<input type="checkbox"/> Shale Packer		<input type="checkbox"/> Extra Copies	
Initial Shut-In	<u>30</u>	<input type="checkbox"/> Extra Packer		Sub Total	<u>0</u>
Final Flow	<u>30</u>	<input type="checkbox"/> Extra Recorder		Total	<u>1107</u>
Final Shut-In	<u>45</u>	<input type="checkbox"/> Day Standby		MP/DST Disc't	
		<input type="checkbox"/> Accessibility		Sub Total	<u>1107</u>

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.