



DRILL STEM TEST REPORT

Prepared For: **Larson Engineering Incorporated**

562 West State Road 4
Olmitz, KS 67564+8561

ATTN: Vern Schrag

7-26s-20w Edwards,KS

Miller-Williams #1-17

Start Date: 2015.10.24 @ 10:57:00

End Date: 2015.10.24 @ 16:43:16

Job Ticket #: 61957 DST #: 1

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

Printed: 2015.10.26 @ 16:02:44



TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

Larson Engineering Incorporated

Miller-Williams #1-17

562 West State Road 4
Olmitz, KS 67564+8561

7-26s-20w Edwards,KS

ATTN: Vern Schrag

Job Ticket: 61957

DST#: 1

Test Start: 2015.10.24 @ 10:57:00

GENERAL INFORMATION:

Formation: **Cherokee**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 13:07:31

Time Test Ended: 16:43:16

Test Type: Conventional Bottom Hole (Initial)

Tester: Ken Swinney

Unit No: 58

Interval: 4590.00 ft (KB) To 4704.00 ft (KB) (TVD)

Reference Elevations: 2255.00 ft (KB)

Total Depth: 4704.00 ft (KB) (TVD)

2246.00 ft (CF)

Hole Diameter: 7.80 inches Hole Condition: Fair

KB to GR/CF: 9.00 ft

Serial #: 6838 Inside

Press@RunDepth: 32.84 psig @ 4699.79 ft (KB)

Capacity: 8000.00 psig

Start Date: 2015.10.24

End Date:

2015.10.24

Last Calib.: 2015.10.24

Start Time: 10:57:01

End Time:

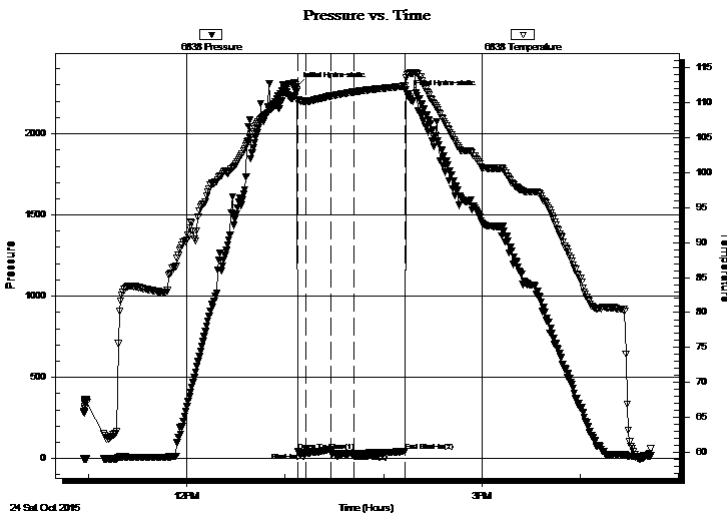
16:43:16

Time On Btm: 2015.10.24 @ 13:07:01

Time Off Btm: 2015.10.24 @ 14:14:31

TEST COMMENT: IFP 5 Minutes Weak surface blow did not build
ISI 15 Minutes No blow back
FFP 15 Minutes Weak surface blow for 2 minutes then dead
FSI 30 Minutes No blow back

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2288.98	111.57	Initial Hydro-static
1	44.21	110.15	Open To Flow (1)
6	36.20	110.13	Shut-In(1)
21	59.29	110.93	End Shut-In(1)
21	37.27	110.92	Open To Flow (2)
35	32.84	111.51	Shut-In(2)
66	44.33	112.33	End Shut-In(2)
68	2239.17	114.07	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
5.00	Mud with skim of oil/Mud 100%	0.02

Gas Rates

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



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Larson Engineering Incorporated

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ATTN: Vern Schrag

Job Ticket: 61957

DST#: 1

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Tester: Ken Swinney

Unit No: 58

Interval: 4590.00 ft (KB) To 4704.00 ft (KB) (TVD)

Reference Elevations: 2255.00 ft (KB)

Total Depth: 4704.00 ft (KB) (TVD)

2246.00 ft (CF)

Hole Diameter: 7.80 inches Hole Condition: Fair

KB to GR/CF: 9.00 ft

Serial #: 6663 Outside

Press@RunDepth: 54.26 psig @ 4700.79 ft (KB)

Capacity: 8000.00 psig

Start Date: 2015.10.24

End Date: 2015.10.24

Last Calib.: 2015.10.24

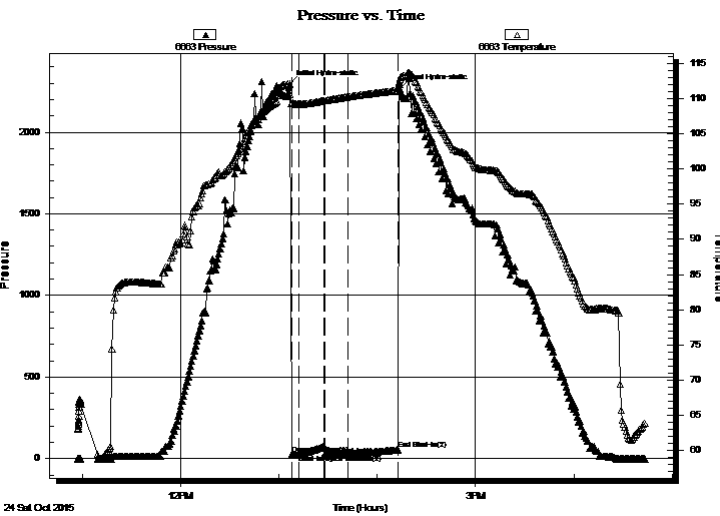
Start Time: 10:57:01

End Time: 16:43:31

Time On Btm: 2015.10.24 @ 13:06:46

Time Off Btm: 2015.10.24 @ 14:13:46

TEST COMMENT: IFP 5 Minutes Weak surface blow did not build
 ISI 15 Minutes No blow back
 FFP 15 Minutes Weak surface blow for 2 minutes then dead
 FSI 30 Minutes No blow back



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2294.91	110.65	Initial Hydro-static
1	24.04	109.33	Open To Flow (1)
6	25.66	109.20	Shut-In(1)
21	74.05	109.71	End Shut-In(1)
21	27.02	109.69	Open To Flow (2)
36	28.13	110.25	Shut-In(2)
66	54.26	111.14	End Shut-In(2)
67	2268.64	112.76	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
5.00	Mud with skim of oil/Mud 100%	0.02

Gas Rates

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



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Larson Engineering Incorporated

Miller-Williams #1-17

562 West State Road 4
Olmitz, KS 67564+8561

7-26s-20w Edwards,KS

Job Ticket: 61957

DST#: 1

ATTN: Vern Schrag

Test Start: 2015.10.24 @ 10:57:00

Tool Information

Drill Pipe:	Length: 4456.00 ft	Diameter: 3.80 inches	Volume: 62.51 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: 120.00 ft	Diameter: 2.25 inches	Volume: 0.59 bbl	Weight to Pull Loose: 67000.00 lb
			<u>Total Volume: 63.10 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	14.00 ft			String Weight: Initial 62000.00 lb
Depth to Top Packer:	4590.00 ft			Final 62000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	113.79 ft			
Tool Length:	141.79 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Shut-In Tool	5.00			4567.00	
Hydraulic tool	5.00			4572.00	
Jars	6.00			4578.00	
Safety Joint	2.00			4580.00	
Top Packer	5.00			4585.00	
Packer	5.00			4590.00	28.00 Bottom Of Top Packer
Anchor	5.00			4595.00	
Change Over Sub	0.75			4595.75	
Drill Pipe	94.29			4690.04	
Change Over Sub	0.75			4690.79	
Anchor	8.00			4698.79	
Recorder	1.00	6838	Inside	4699.79	
Recorder	1.00	6663	Outside	4700.79	
Bullnose	3.00			4703.79	113.79 Anchor Tool

Total Tool Length: 141.79



**TRILOBITE
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DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering Incorporated

Miller-Williams #1-17

562 West State Road 4
Olmitz, KS 67564+8561

7-26s-20w Edwards,KS

Job Ticket: 61957

DST#: 1

ATTN: Vern Schrag

Test Start: 2015.10.24 @ 10:57:00

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: 59.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.79 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 4400.00 ppm

Filter Cake: 1.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
5.00	Mud w ith skim of oil/Mud 100%	0.025

Total Length: 5.00 ft Total Volume: 0.025 bbl

Num Fluid Samples: 0

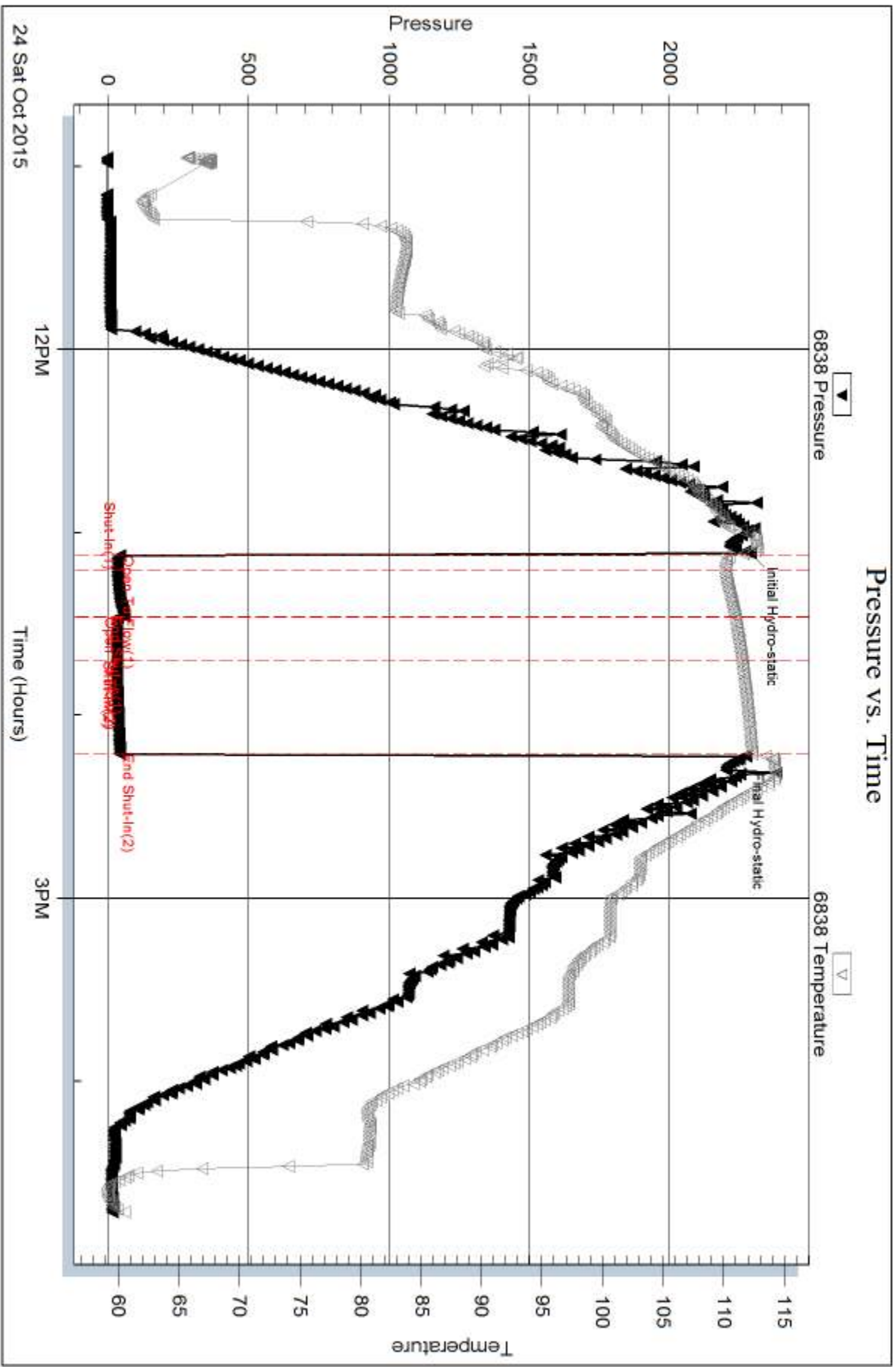
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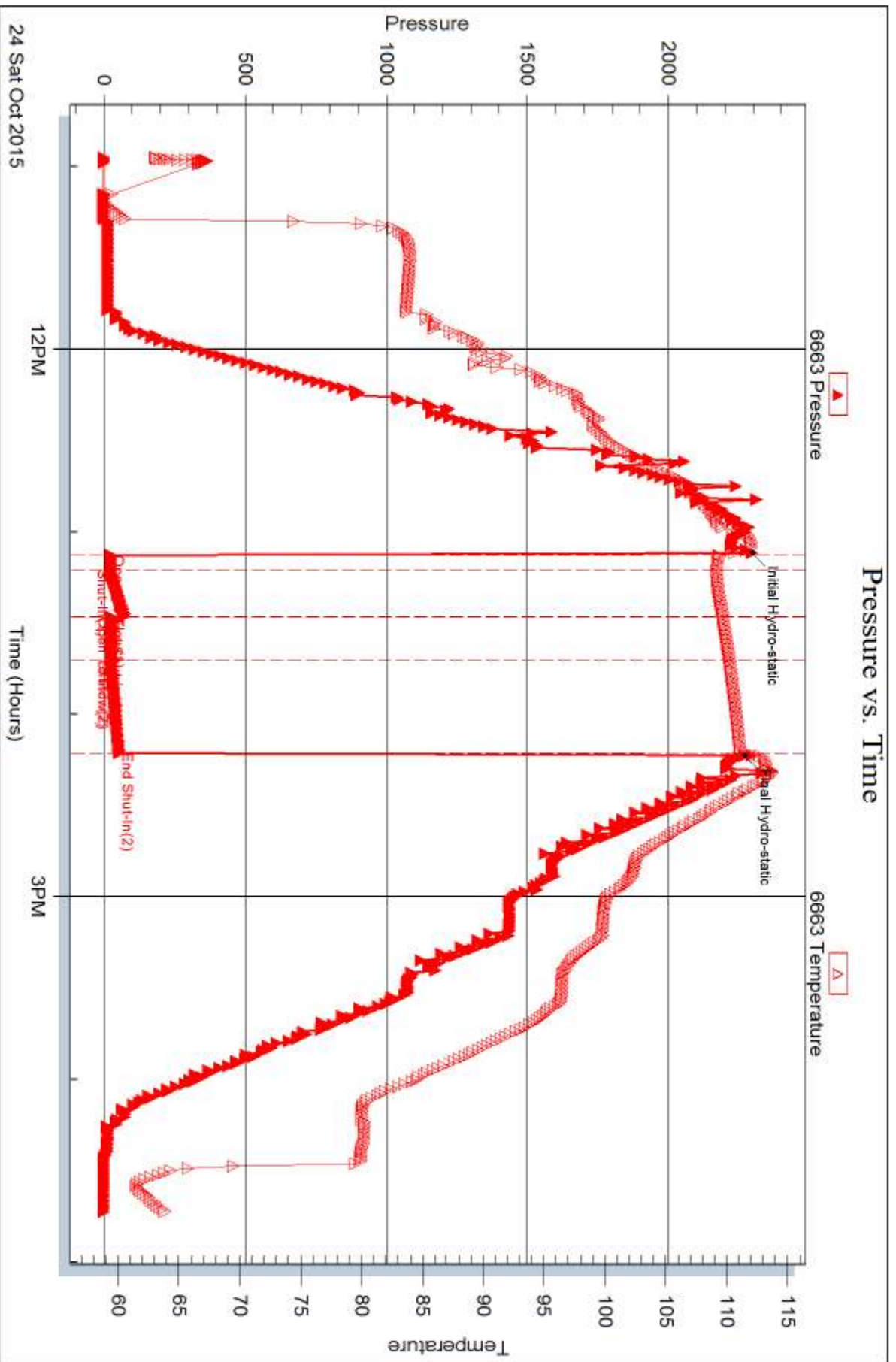
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:







DRILL STEM TEST REPORT

Prepared For: **Larson Engineering Incorporated**

562 West State Road 4
Olmitz, KS 67564+8561

ATTN: Vern Schrag

7-26s-20w Edwards,KS

Miller-Williams #1-17

Start Date: 2015.10.25 @ 03:35:00

End Date: 2015.10.25 @ 09:47:01

Job Ticket #: 61958 DST #: 2

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

Printed: 2015.10.26 @ 15:31:35



TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

Larson Engineering Incorporated

Miller-Williams #1-17

562 West State Road 4
Olmitz, KS 67564+8561

7-26s-20w Edwards,KS

ATTN: Vern Schrag

Job Ticket: 61958

DST#: 2

Test Start: 2015.10.25 @ 03:35:00

GENERAL INFORMATION:

Formation: **Mississippi**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 05:49:31

Time Test Ended: 09:47:01

Test Type: Conventional Bottom Hole (Initial)

Tester: Ken Swinney

Unit No: 58

Interval: 4701.00 ft (KB) To 4765.00 ft (KB) (TVD)

Reference Elevations: 2255.00 ft (KB)

Total Depth: 4765.00 ft (KB) (TVD)

2246.00 ft (CF)

Hole Diameter: 7.80 inches Hole Condition: Fair

KB to GR/CF: 9.00 ft

Serial #: 6838

Inside

Press@RunDepth: 431.35 psig @ 4760.80 ft (KB)

Capacity: 8000.00 psig

Start Date: 2015.10.25

End Date:

2015.10.25

Last Calib.:

2015.10.25

Start Time: 03:35:01

End Time:

09:47:01

Time On Btm:

2015.10.25 @ 05:49:16

Time Off Btm:

2015.10.25 @ 06:56:16

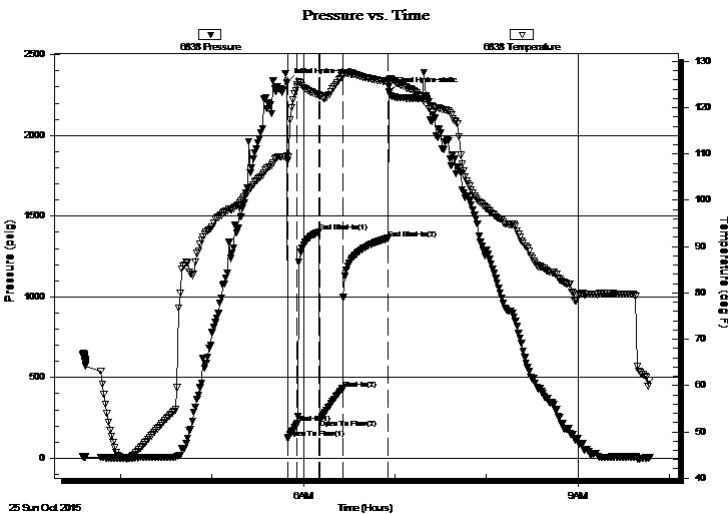
TEST COMMENT: IFP 5 Minutes BOB in 2 minutes 45 seconds

ISI 15 Minutes No blow back

FFP 15 Minutes BOB in 3 minutes

FSI 30 Minutes No blow back

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2325.29	109.52	Initial Hydro-static
1	124.32	108.52	Open To Flow (1)
7	215.04	124.58	Shut-In(1)
21	1401.19	122.76	End Shut-In(1)
22	240.07	122.39	Open To Flow (2)
37	431.35	126.73	Shut-In(2)
66	1361.78	125.61	End Shut-In(2)
67	2270.90	126.04	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
887.00	GOMCW Gas 5% Oil 5% Mud 20% Water	11.35

Gas Rates

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



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ATTN: Vern Schrag

Job Ticket: 61958

DST#: 2

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GENERAL INFORMATION:

Formation: **Mississippi**

Deviated: No Whipstock: ft (KB)

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Time Test Ended: 09:47:01

Test Type: Conventional Bottom Hole (Initial)

Tester: Ken Swinney

Unit No: 58

Interval: 4701.00 ft (KB) To 4765.00 ft (KB) (TVD)

Reference Elevations: 2255.00 ft (KB)

Total Depth: 4765.00 ft (KB) (TVD)

2246.00 ft (CF)

Hole Diameter: 7.80 inches Hole Condition: Fair

KB to GR/CF: 9.00 ft

Serial #: 6663 Outside

Press@RunDepth: 1369.22 psig @ 4761.80 ft (KB)

Capacity: 8000.00 psig

Start Date: 2015.10.25

End Date:

2015.10.25

Last Calib.:

2015.10.25

Start Time: 03:35:01

End Time:

09:47:01

Time On Btm:

2015.10.25 @ 05:49:16

Time Off Btm:

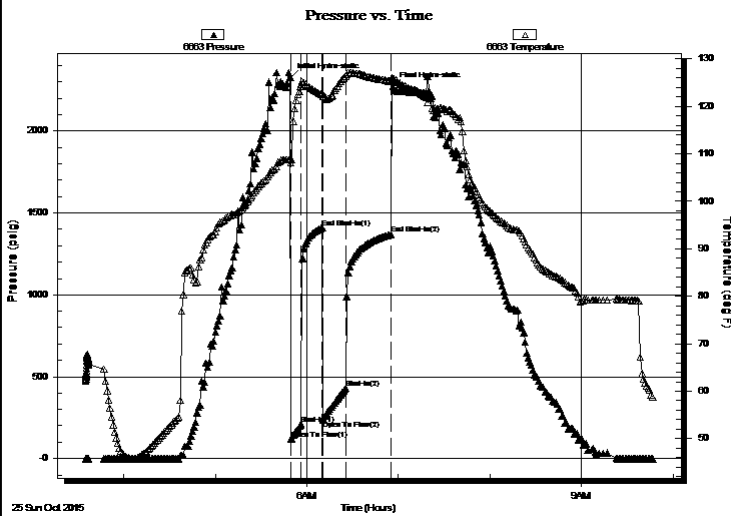
2015.10.25 @ 06:56:16

TEST COMMENT: IFP 5 Minutes BOB in 2 minutes 45 seconds

ISI 15 Minutes No blow back

FFP 15 Minutes BOB in 3 minutes

FSI 30 Minutes No blow back



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2324.17	108.86	Initial Hydro-static
1	117.37	108.10	Open To Flow (1)
7	206.81	124.17	Shut-In(1)
21	1410.81	122.44	End Shut-In(1)
22	235.70	122.04	Open To Flow (2)
37	430.97	126.40	Shut-In(2)
66	1369.22	125.24	End Shut-In(2)
67	2271.61	125.60	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
887.00	GOMCW Gas 5% Oil 5% Mud 20% Water	11.35

Gas Rates

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



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Larson Engineering Incorporated

Miller-Williams #1-17

562 West State Road 4
Olmitz, KS 67564+8561

7-26s-20w Edwards,KS

Job Ticket: 61958

DST#: 2

ATTN: Vern Schrag

Test Start: 2015.10.25 @ 03:35:00

Tool Information

Drill Pipe:	Length: 4583.00 ft	Diameter: 3.80 inches	Volume: 64.29 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: 120.00 ft	Diameter: 2.25 inches	Volume: 0.59 bbl	Weight to Pull Loose: 70000.00 lb
			<u>Total Volume: 64.88 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	30.00 ft			String Weight: Initial 64000.00 lb
Depth to Top Packer:	4701.00 ft			Final 66000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	63.80 ft			
Tool Length:	91.80 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description

Length (ft) Serial No. Position Depth (ft) Accum. Lengths

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Shut-In Tool	5.00			4678.00	
Hydraulic tool	5.00			4683.00	
Jars	6.00			4689.00	
Safety Joint	2.00			4691.00	
Top Packer	5.00			4696.00	
Packer	5.00			4701.00	28.00 Bottom Of Top Packer
Anchor	5.00			4706.00	
Change Over Sub	0.75			4706.75	
Drill Pipe	31.30			4738.05	
Change Over Sub	0.75			4738.80	
Anchor	21.00			4759.80	
Recorder	1.00	6838	Inside	4760.80	
Recorder	1.00	6663	Outside	4761.80	
Bullnose	3.00			4764.80	63.80 Anchor Tool

Total Tool Length: 91.80



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DRILL STEM TEST REPORT

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Miller-Williams #1-17

562 West State Road 4
Olmitz, KS 67564+8561

7-26s-20w Edwards,KS

Job Ticket: 61958

DST#: 2

ATTN: Vern Schrag

Test Start: 2015.10.25 @ 03:35:00

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:

22000 ppm

Viscosity: 59.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.80 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 4400.00 ppm

Filter Cake: 1.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
887.00	GOMCW Gas 5% Oil 5% Mud 20% Water 70%	11.349

Total Length: 887.00 ft

Total Volume: 11.349 bbl

Num Fluid Samples: 0

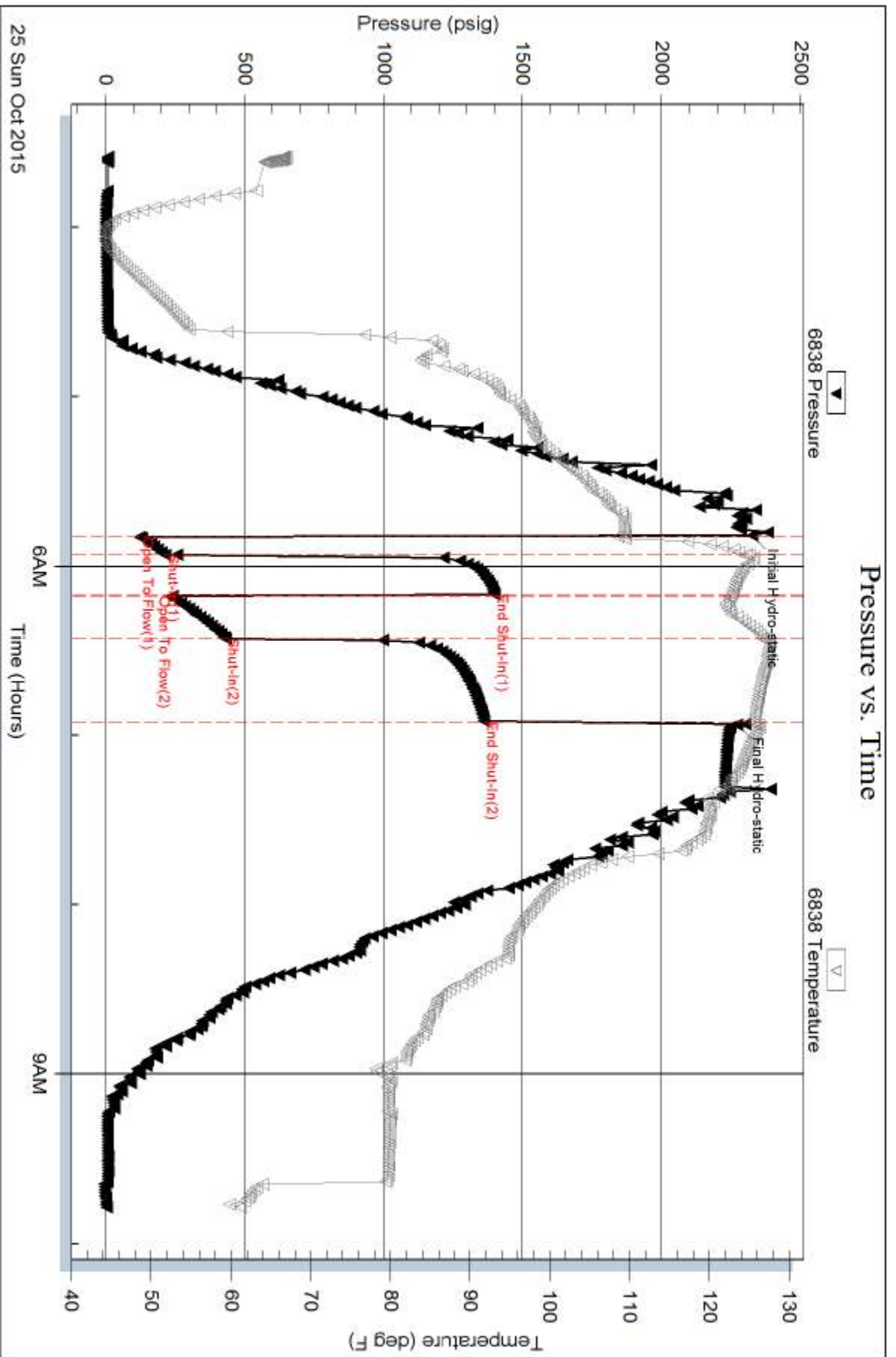
Num Gas Bombs: 0

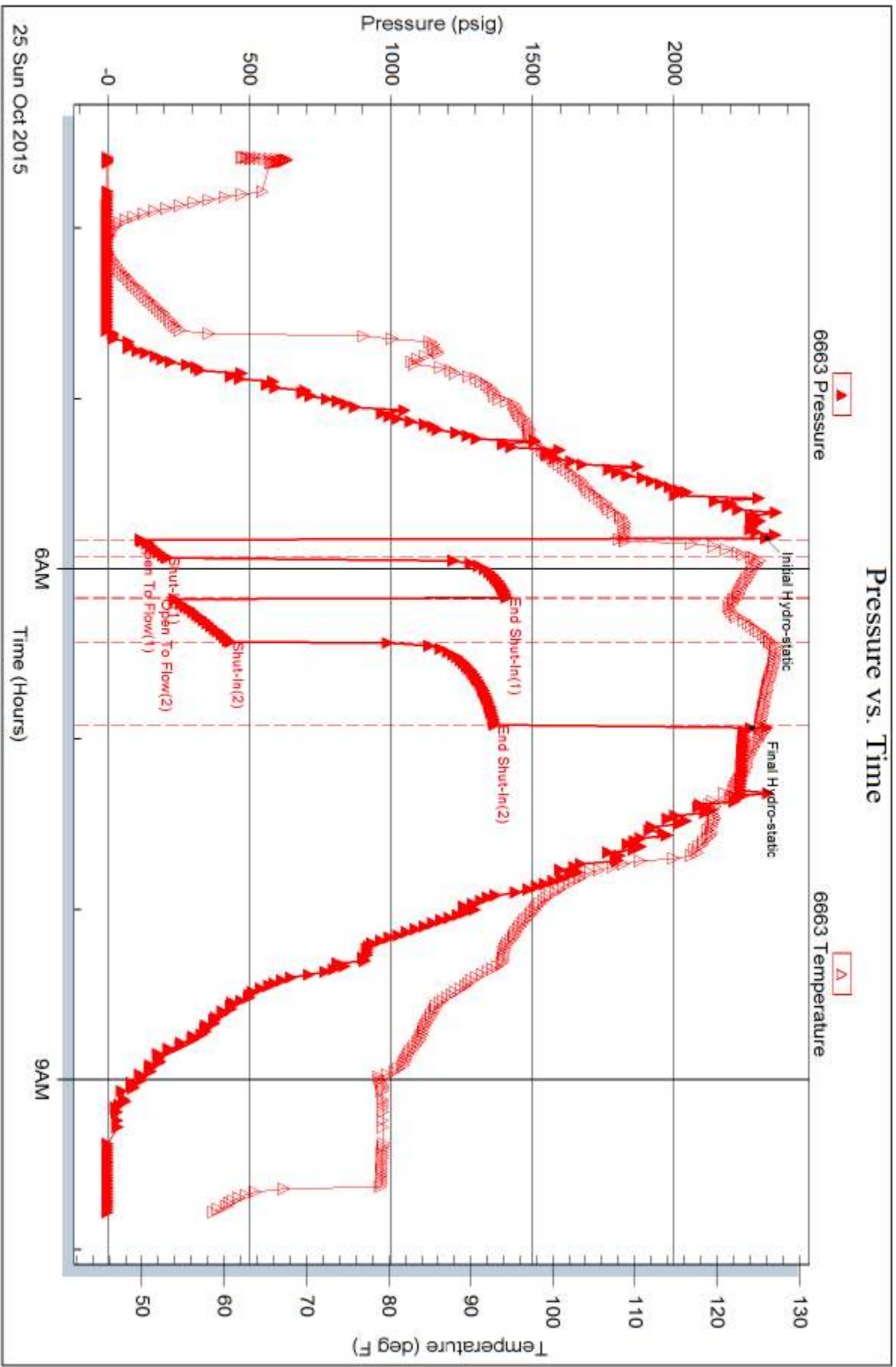
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:







TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 61957

Well Name & No. Miller-Williams #1-17 Test No. 1 Date 24 Oct 15
 Company Larson Engineering Incorporated Elevation 2255' KB 2246 GL
 Address 562 West State Highway 4 Olmitz, Kansas 67564-8561
 Co. Rep / Geo. Vern Schrag Rig HD Rig #3
 Location: Sec. 7 Twp. 26S Rge. 20W Co. Ford State KS

Interval Tested 4590-4704 Zone Tested Cherokee
 Anchor Length 114 Drill Pipe Run 4456 Mud Wt. 9.35
 Top Packer Depth 4585 Drill Collars Run 120 Vis 59
 Bottom Packer Depth 4590 Wt. Pipe Run — WL 6.8
 Total Depth 4704 Chlorides 4400 ppm System LCM 1#

Blow Description Weak blow at surface, no build
No blow back
Weak blow at surface for 2 minutes then dead
No blow back

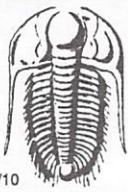
Rec	Feet of	%gas	%oil	%water	%mud
<u>5</u>	<u>Mud with skim of oil</u>				<u>100%</u>
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 5 BHT 114 Gravity 1150 API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic 2288 Test 1150 T-On Location 9:30 am
 (B) First Initial Flow 44 Jars 250 T-Started 10:57 am
 (C) First Final Flow 36 Safety Joint 75 T-Open 1:08 pm
 (D) Initial Shut-In 59 Circ Sub — T-Pulled 2:13 pm
 (E) Second Initial Flow 37 Hourly Standby — T-Out 4:42 pm
 (F) Second Final Flow 32 Mileage 124 Comments —
 (G) Final Shut-In 44 Sampler —
 (H) Final Hydrostatic 2239 Straddle — Ruined Shale Packer —
 Shale Packer — Ruined Packer —
 Extra Packer — Extra Copies —
 Extra Recorder — Sub Total 0
 Day Standby — Total 1599
 Accessibility — MP/DST Disc't —
 Sub Total 1599

Approved By Vern C. Schrag Our Representative [Signature]

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



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 61958

Well Name & No. Miller Williams #1-17 Test No. 2 Date 25 OCT 15
 Company Larson Engineering Incorporated Elevation 2255 KB 2246 GL
 Address 562 West State Road 4 Olmitz, Kansas 67564+8561
 Co. Rep / Geo. Vern Schrag Rig HD Rig #3
 Location: Sec. 7 Twp. 26S Rge. 20W Co. Ford State KS

Interval Tested 4701-4765 Zone Tested Mississippi
 Anchor Length 64 Drill Pipe Run 4583 Mud Wt. 9.35
 Top Packer Depth 4696 Drill Collars Run 120 Vis 59
 Bottom Packer Depth 4701 Wt. Pipe Run — WL 6.8
 Total Depth 4765 Chlorides 4400 ppm System LCM 1#
 Blow Description Strong blow/ Blow built to bottom of bucket in 2 minutes 45 seconds
No blow back
Strong blow/ Blow built to bottom of bucket in 3 minutes
No blow back

Rec	Feet of	%gas	%oil	%water	%mud
<u>987</u>	<u>Gas 40.1 Cut Muddy Water</u>	<u>5</u>	<u>5</u>	<u>70</u>	<u>20</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 987 BHT 126 Gravity — API RW .38 @ 55 °F Chlorides 22,000 ppm
 (A) Initial Hydrostatic 2325 Test 1150 T-On Location 2:37 am
 (B) First Initial Flow 124 Jars 250 T-Started 3:35 am
 (C) First Final Flow 215 Safety Joint 75 T-Open 5:40 am
 (D) Initial Shut-In 1401 Circ Sub _____ T-Pulled 6:45 am
 (E) Second Initial Flow 240 Hourly Standby _____ T-Out _____
 (F) Second Final Flow 431 Mileage 124 Comments _____
 (G) Final Shut-In 1361 Sampler _____
 (H) Final Hydrostatic 2270 Straddle _____
 Shale Packer _____
 Shale Packer _____
 Extra Packer _____
 Extra Recorder _____
 Day Standby _____
 Accessibility _____
 Sub Total 1599
 Ruined Shale Packer _____
 Ruined Packer _____
 Extra Copies _____
 Sub Total 0
 Total 1599
 MP/DST Disc't _____

Initial Open 35
 Initial Shut-In 15
 Final Flow 15
 Final Shut-In 30
 Approved By Vernon C Schrag Our Representative [Signature]

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