



DRILL STEM TEST REPORT

Prepared For: **Larson Engineering Inc**

562 W State Rd
Olmitz KS 67564

ATTN: Vern Schrag

Hineman Ranch #1-31

31-18s-28w Lane,KS

Start Date: 2014.05.25 @ 16:54:00

End Date: 2014.05.25 @ 22:53:39

Job Ticket #: 57213 DST #: 1

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

Printed: 2014.05.30 @ 11:28:01



TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

Larson Engineering Inc

31-18s-28w Lane, KS

562 W State Rd
Olmitz KS 67564

Hineman Ranch #1-31

ATTN: Vern Schrag

Job Ticket: 57213

DST#: 1

Test Start: 2014.05.25 @ 16:54:00

GENERAL INFORMATION:

Formation: **LKC " K "**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 18:59:55

Time Test Ended: 22:53:39

Test Type: Conventional Bottom Hole (Initial)

Tester: Will MacLean

Unit No: 72

Interval: 4264.00 ft (KB) To 4284.00 ft (KB) (TVD)

Reference Elevations: 2764.00 ft (KB)

Total Depth: 4284.00 ft (KB) (TVD)

2757.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 7.00 ft

Serial #: 8674

Inside

Press@RunDepth: 126.12 psig @ 4265.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.05.25

End Date:

2014.05.25

Last Calib.:

2014.05.25

Start Time: 16:54:00

End Time:

22:53:39

Time On Btm:

2014.05.25 @ 18:59:40

Time Off Btm:

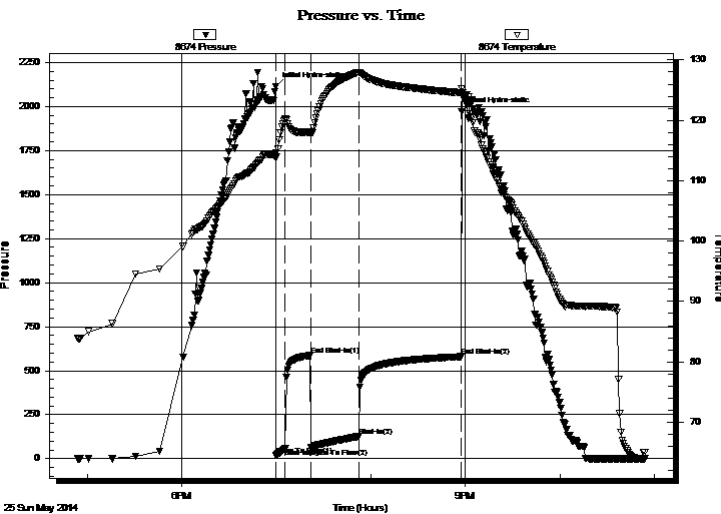
2014.05.25 @ 20:57:40

TEST COMMENT: IF- Weak Surface Blow Built to 2 1/2"

IS- No Blow

FF- Weak Surface Blow Built to 8 1/2"

FS- No Blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2113.31	114.55	Initial Hydro-static
1	20.23	113.77	Open To Flow (1)
6	58.65	120.17	Shut-In(1)
22	586.25	118.04	End Shut-In(1)
23	60.91	117.78	Open To Flow (2)
53	126.12	127.93	Shut-In(2)
118	579.74	124.54	End Shut-In(2)
118	1969.77	125.23	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
124.00	MCW 7%m 93%w	0.61
62.00	MCW 12%m 88%w	0.87
57.00	MCW 44%m 56%w	0.80

Gas Rates

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



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Larson Engineering Inc

31-18s-28w Lane, KS

562 W State Rd
Olmitz KS 67564

Hineman Ranch #1-31

Job Ticket: 57213

DST#: 1

ATTN: Vern Schrag

Test Start: 2014.05.25 @ 16:54:00

Tool Information

Drill Pipe:	Length: 4139.00 ft	Diameter: 3.80 inches	Volume: 58.06 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:	30000.00 lb
Drill Collar:	Length: 124.00 ft	Diameter: 2.25 inches	Volume: 0.61 bbl	Weight to Pull Loose:	8000.00 lb
			<u>Total Volume: 58.67 bbl</u>	Tool Chased	ft
Drill Pipe Above KB:	26.00 ft			String Weight: Initial	58000.00 lb
Depth to Top Packer:	4264.00 ft			Final	58000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	20.00 ft				
Tool Length:	47.00 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			4238.00	
Shut In Tool	5.00			4243.00	
Hydraulic tool	5.00			4248.00	
Jars	5.00			4253.00	
Safety Joint	2.00			4255.00	
Packer	5.00			4260.00	27.00 Bottom Of Top Packer
Packer	4.00			4264.00	
Stubb	1.00			4265.00	
Recorder	0.00	8355	Outside	4265.00	
Recorder	0.00	8674	Inside	4265.00	
Perforations	14.00			4279.00	
Bullnose	5.00			4284.00	20.00 Bottom Packers & Anchor

Total Tool Length: 47.00



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering Inc

31-18s-28w Lane,KS

562 W State Rd
Olmitz KS 67564

Hineman Ranch #1-31

Job Ticket: 57213

DST#: 1

ATTN: Vern Schrag

Test Start: 2014.05.25 @ 16:54:00

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:

42000 ppm

Viscosity: 61.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.55 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2400.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
124.00	MCW 7%m 93%w	0.610
62.00	MCW 12%m 88%w	0.870
57.00	MCW 44%m 56%w	0.800

Total Length: 243.00 ft Total Volume: 2.280 bbl

Num Fluid Samples: 0

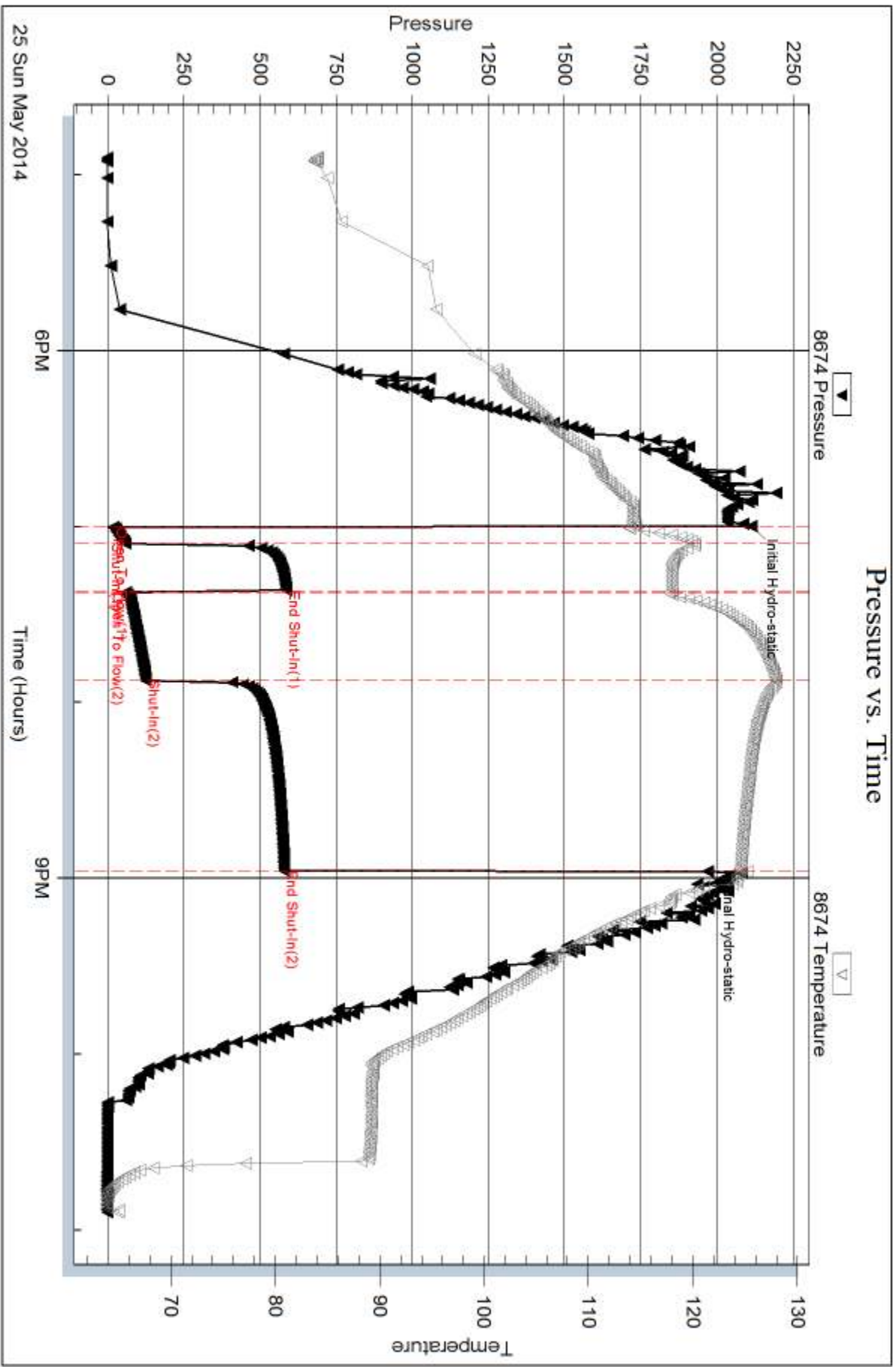
Num Gas Bombs: 0

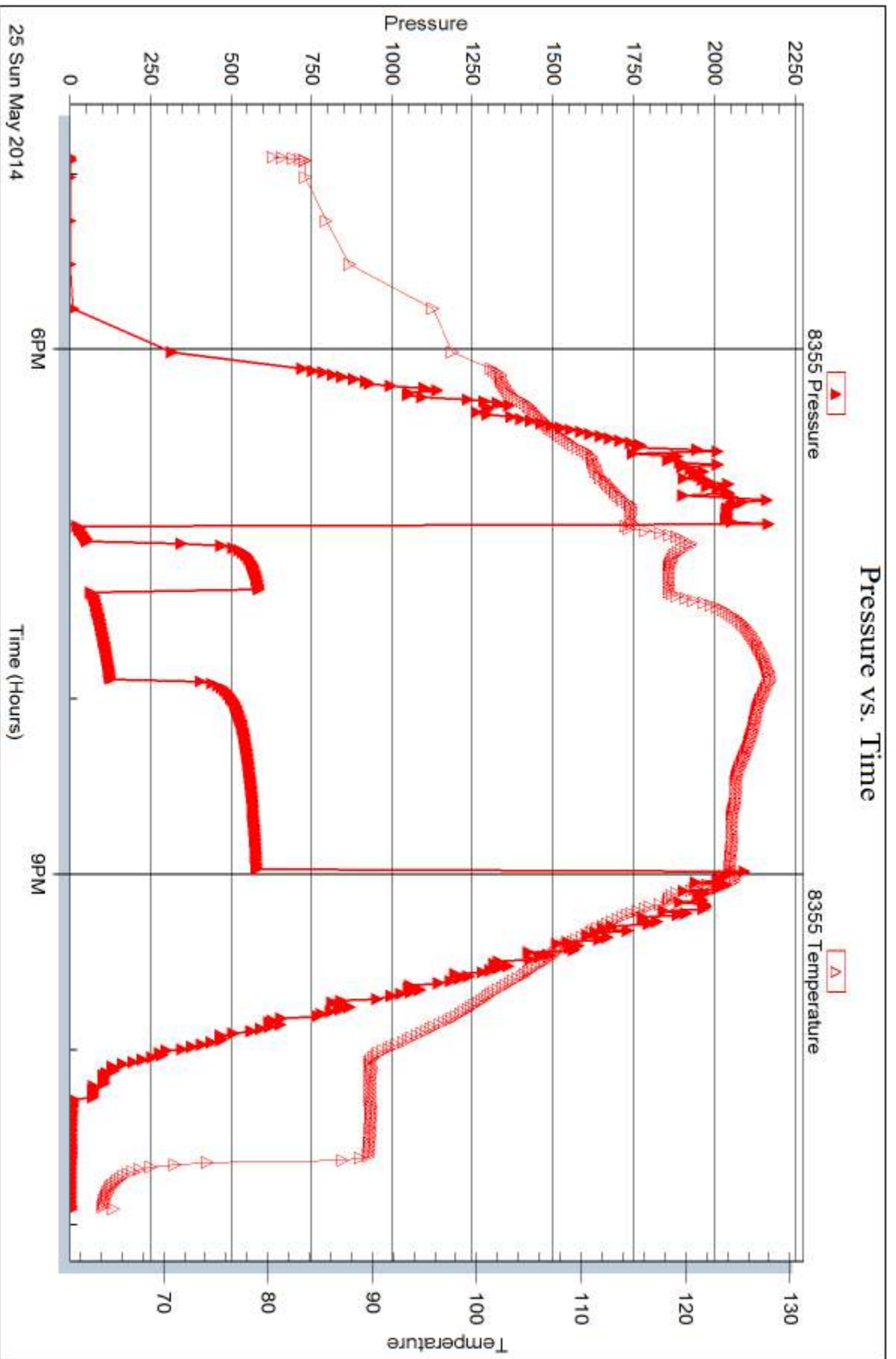
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW is .175 @ 68f = 42000







DRILL STEM TEST REPORT

Prepared For: **Larson Engineering Inc**

562 W State Rd
Olmitz KS 67564

ATTN: Vern Schrag

Hineman Ranch #1-31

31-18s-28w Lane,KS

Start Date: 2014.05.26 @ 10:00:00

End Date: 2014.05.26 @ 16:05:39

Job Ticket #: 57214 DST #: 2

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

Printed: 2014.05.30 @ 11:27:34



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

Larson Engineering Inc

31-18s-28w Lane, KS

562 W State Rd
Olmitz KS 67564

Hineman Ranch #1-31

ATTN: Vern Schrag

Job Ticket: 57214

DST#: 2

Test Start: 2014.05.26 @ 10:00:00

GENERAL INFORMATION:

Formation: **LKC " L "**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 12:31:25

Time Test Ended: 16:05:39

Test Type: Conventional Bottom Hole (Reset)

Tester: Will MacLean

Unit No: 72

Interval: 4296.00 ft (KB) To 4315.00 ft (KB) (TVD)

Reference Elevations: 2764.00 ft (KB)

Total Depth: 4315.00 ft (KB) (TVD)

2757.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 7.00 ft

Serial #: 8674

Inside

Press@RunDepth: 89.55 psig @ 4297.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.05.26

End Date:

2014.05.26

Last Calib.:

2014.05.26

Start Time: 10:00:00

End Time:

16:05:39

Time On Btm:

2014.05.26 @ 12:31:10

Time Off Btm:

2014.05.26 @ 14:24:24

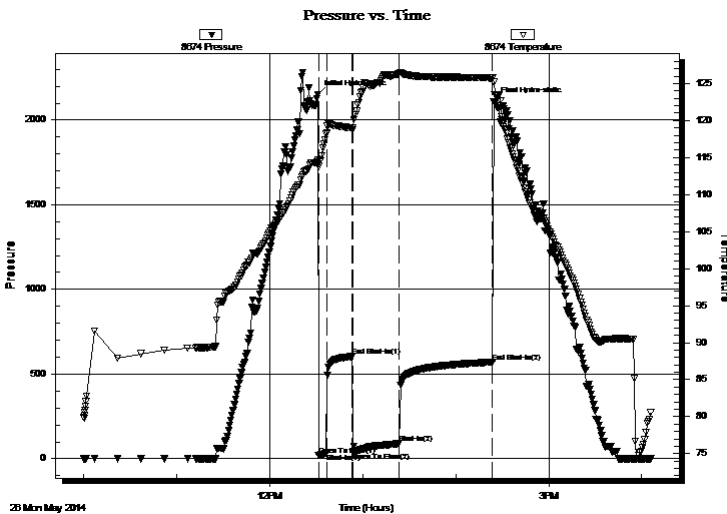
TEST COMMENT: IF- Weak Surface Blow Built to 3/4"

IS- No Blow

FF- Weak Surface Blow Built to 1 1/2"

FS- No Blow

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2149.25	114.68	Initial Hydro-static
1	18.17	113.81	Open To Flow (1)
6	33.20	118.32	Shut-In(1)
22	603.41	118.99	End Shut-In(1)
23	38.97	118.72	Open To Flow (2)
53	89.55	126.39	Shut-In(2)
113	570.82	125.74	End Shut-In(2)
114	2108.85	125.19	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
124.00	MCW 14%m 86%w	0.61
20.00	MCW 44%m 56%w	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

Larson Engineering Inc

31-18s-28w Lane, KS

562 W State Rd
Olmitz KS 67564

Hineman Ranch #1-31

Job Ticket: 57214

DST#: 2

ATTN: Vern Schrag

Test Start: 2014.05.26 @ 10:00:00

Tool Information

Drill Pipe:	Length: 4169.00 ft	Diameter: 3.80 inches	Volume: 58.48 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: 28000.00 lb
Drill Collar:	Length: 124.00 ft	Diameter: 2.25 inches	Volume: 0.61 bbl	Weight to Pull Loose: 6000.00 lb
			<u>Total Volume: 59.09 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	24.00 ft			String Weight: Initial 58000.00 lb
Depth to Top Packer:	4296.00 ft			Final 58000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	19.00 ft			
Tool Length:	46.00 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			4270.00	
Shut In Tool	5.00			4275.00	
Hydraulic tool	5.00			4280.00	
Jars	5.00			4285.00	
Safety Joint	2.00			4287.00	
Packer	5.00			4292.00	27.00 Bottom Of Top Packer
Packer	4.00			4296.00	
Stubb	1.00			4297.00	
Recorder	0.00	8355	Outside	4297.00	
Recorder	0.00	8674	Inside	4297.00	
Perforations	13.00			4310.00	
Bullnose	5.00			4315.00	19.00 Bottom Packers & Anchor

Total Tool Length: 46.00



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering Inc

31-18s-28w Lane, KS

562 W State Rd
Olmitz KS 67564

Hineman Ranch #1-31

Job Ticket: 57214

DST#: 2

ATTN: Vern Schrag

Test Start: 2014.05.26 @ 10:00:00

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:

32000 ppm

Viscosity: 55.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.16 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2600.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
124.00	MCW 14%m 86%w	0.610
20.00	MCW 44%m 56%w	0.281

Total Length: 144.00 ft Total Volume: 0.891 bbl

Num Fluid Samples: 0

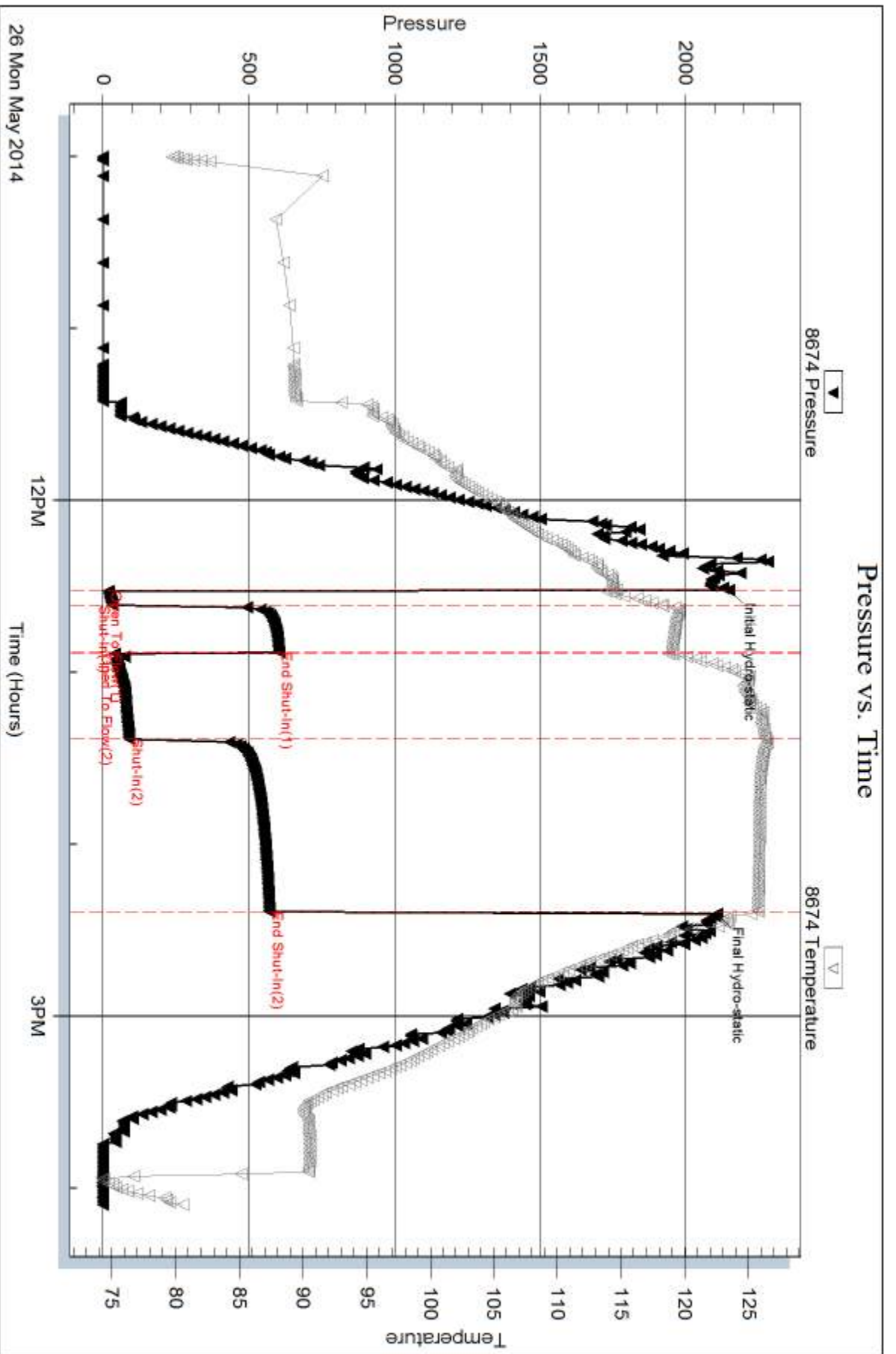
Num Gas Bombs: 0

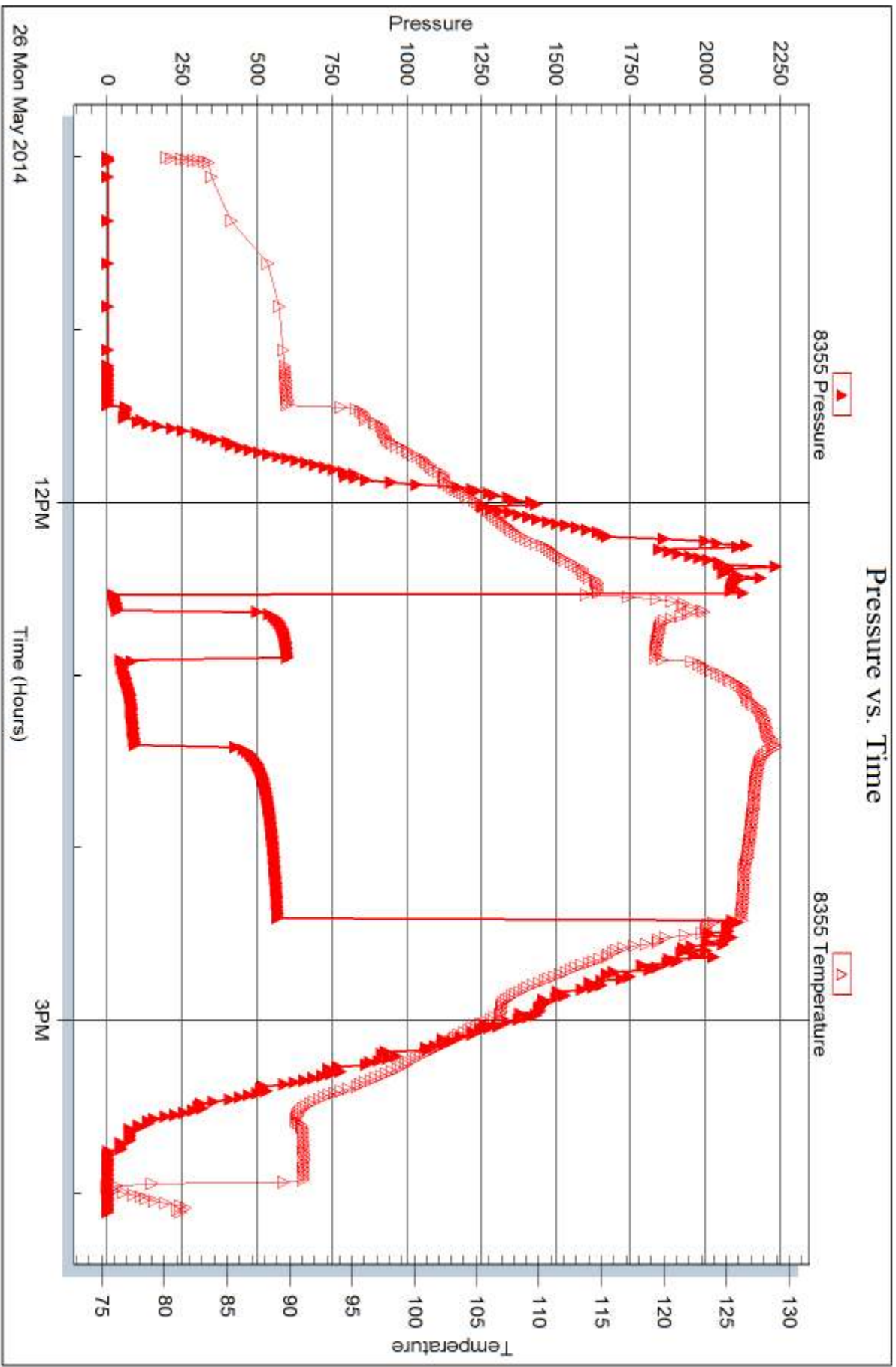
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW is .198 @ 74f = 32000







DRILL STEM TEST REPORT

Prepared For: **Larson Engineering Inc**

562 W State Rd
Olmitz KS 67564

ATTN: Vern Schrag

Hineman Ranch #1-31

31-18s-28w Lane,KS

Start Date: 2014.05.27 @ 02:34:00

End Date: 2014.05.27 @ 08:59:24

Job Ticket #: 57215 DST #: 3

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

Printed: 2014.05.30 @ 11:26:32



TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

Larson Engineering Inc

31-18s-28w Lane, KS

562 W State Rd
Olmitz KS 67564

Hineman Ranch #1-31

ATTN: Vern Schrag

Job Ticket: 57215

DST#: 3

Test Start: 2014.05.27 @ 02:34:00

GENERAL INFORMATION:

Formation: **Pleasanton**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 04:45:25

Time Test Ended: 08:59:24

Test Type: Conventional Bottom Hole (Reset)

Tester: Will MacLean

Unit No: 72

Interval: 4339.00 ft (KB) To 4385.00 ft (KB) (TVD)

Reference Elevations: 2764.00 ft (KB)

Total Depth: 4385.00 ft (KB) (TVD)

2757.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 7.00 ft

Serial #: 8674

Inside

Press@RunDepth: 109.79 psig @ 4352.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.05.27

End Date:

2014.05.27

Last Calib.:

2014.05.27

Start Time:

02:34:00

End Time:

08:59:24

Time On Btm:

2014.05.27 @ 04:45:10

Time Off Btm:

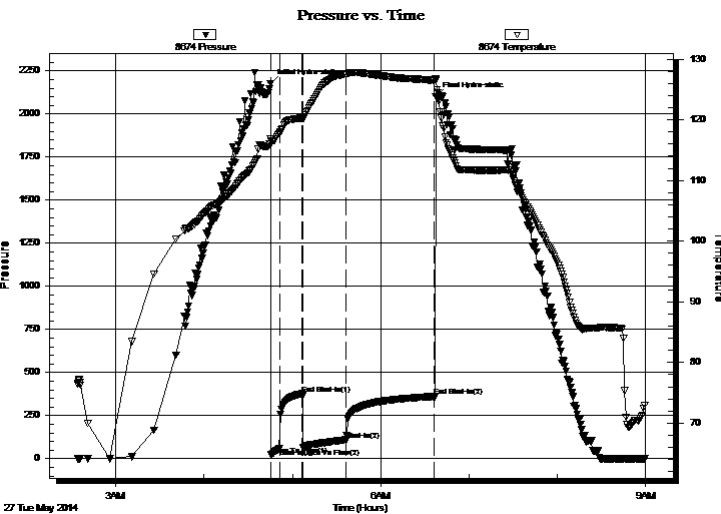
2014.05.27 @ 06:37:10

TEST COMMENT: IF- Weak Surface Blow Built to 2 1/2"

IS- No Blow

FF- Weak Surface Blow Built to 6"

FS- No Blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2178.70	116.88	Initial Hydro-static
1	22.09	116.08	Open To Flow (1)
6	58.70	117.82	Shut-In(1)
22	377.02	120.28	End Shut-In(1)
22	63.12	120.13	Open To Flow (2)
52	109.79	127.52	Shut-In(2)
112	361.35	126.50	End Shut-In(2)
112	2103.35	126.83	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
124.00	MCW 18%w 82%w	0.61
62.00	WCM 39%w 61%w with Oil Spots	0.87
25.00	WCM 16%w 84%w with Oil Spots	0.35

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Larson Engineering Inc

31-18s-28w Lane, KS

562 W State Rd
Olmitz KS 67564

Hineman Ranch #1-31

Job Ticket: 57215

DST#: 3

ATTN: Vern Schrag

Test Start: 2014.05.27 @ 02:34:00

Tool Information

Drill Pipe:	Length: 4204.00 ft	Diameter: 3.80 inches	Volume: 58.97 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: 32000.00 lb
Drill Collar:	Length: 124.00 ft	Diameter: 2.25 inches	Volume: 0.61 bbl	Weight to Pull Loose: 8000.00 lb
			<u>Total Volume: 59.58 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	6.00 ft			String Weight: Initial 56000.00 lb
Depth to Top Packer:	4349.00 ft			Final 56000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	36.00 ft			
Tool Length:	63.00 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			4323.00	
Shut In Tool	5.00			4328.00	
Hydraulic tool	5.00			4333.00	
Jars	5.00			4338.00	
Safety Joint	2.00			4340.00	
Packer	5.00			4345.00	27.00 Bottom Of Top Packer
Packer	4.00			4349.00	
Stubb	1.00			4350.00	
Perforations	2.00			4352.00	
Recorder	0.00	8355	Outside	4352.00	
Recorder	0.00	8674	Inside	4352.00	
Perforations	28.00			4380.00	
Bullnose	5.00			4385.00	36.00 Bottom Packers & Anchor

Total Tool Length: 63.00



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering Inc

31-18s-28w Lane,KS

562 W State Rd
Olmitz KS 67564

Hineman Ranch #1-31

Job Ticket: 57215

DST#: 3

ATTN: Vern Schrag

Test Start: 2014.05.27 @ 02:34:00

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:

26100 ppm

Viscosity: 55.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.16 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2600.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
124.00	MCW 18%m 82%w	0.610
62.00	WCM 39%w 61%m with Oil Spots	0.870
25.00	WCM 16%w 84%m with Oil Spots	0.351

Total Length: 211.00 ft Total Volume: 1.831 bbl

Num Fluid Samples: 0

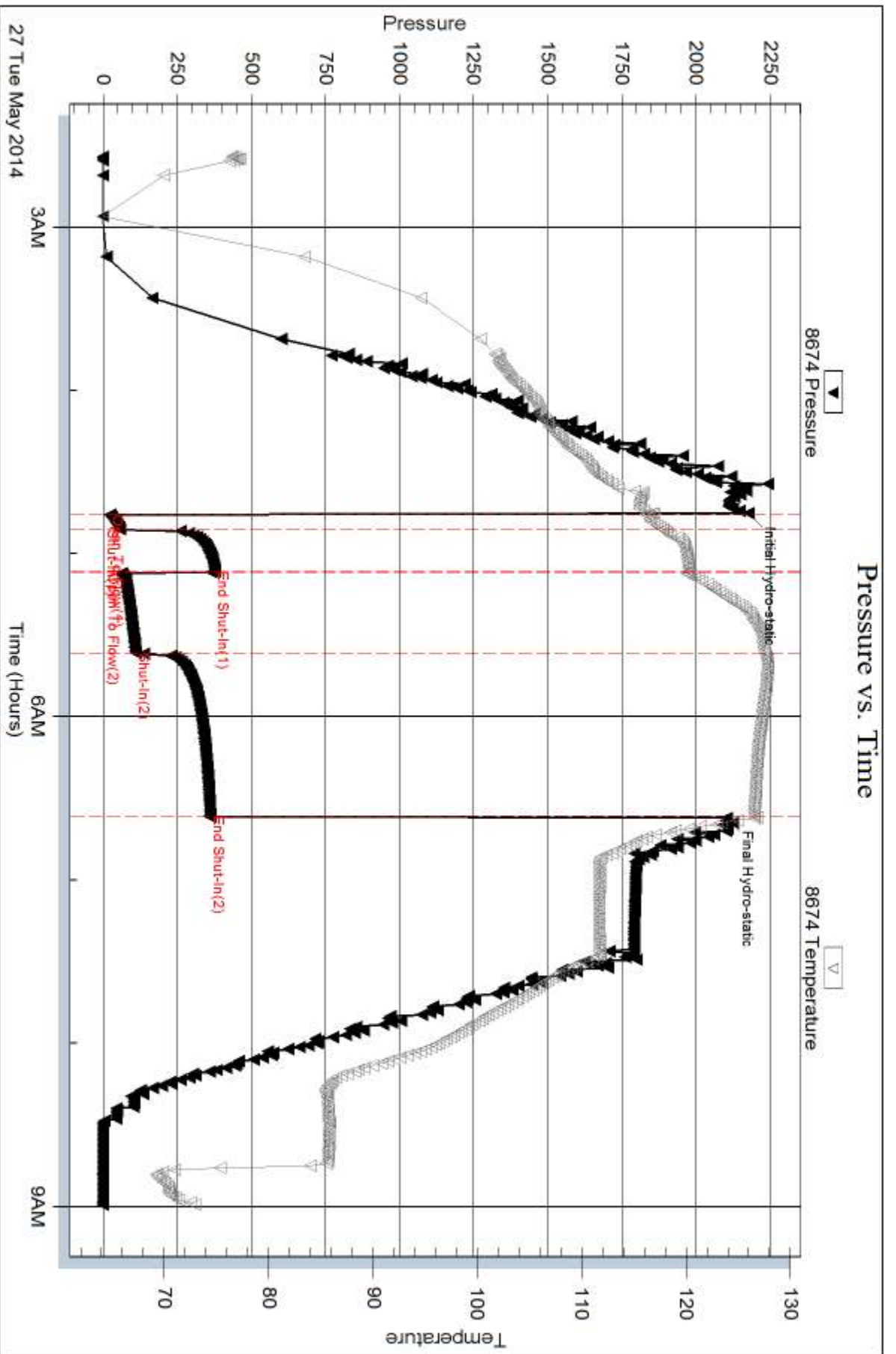
Num Gas Bombs: 0

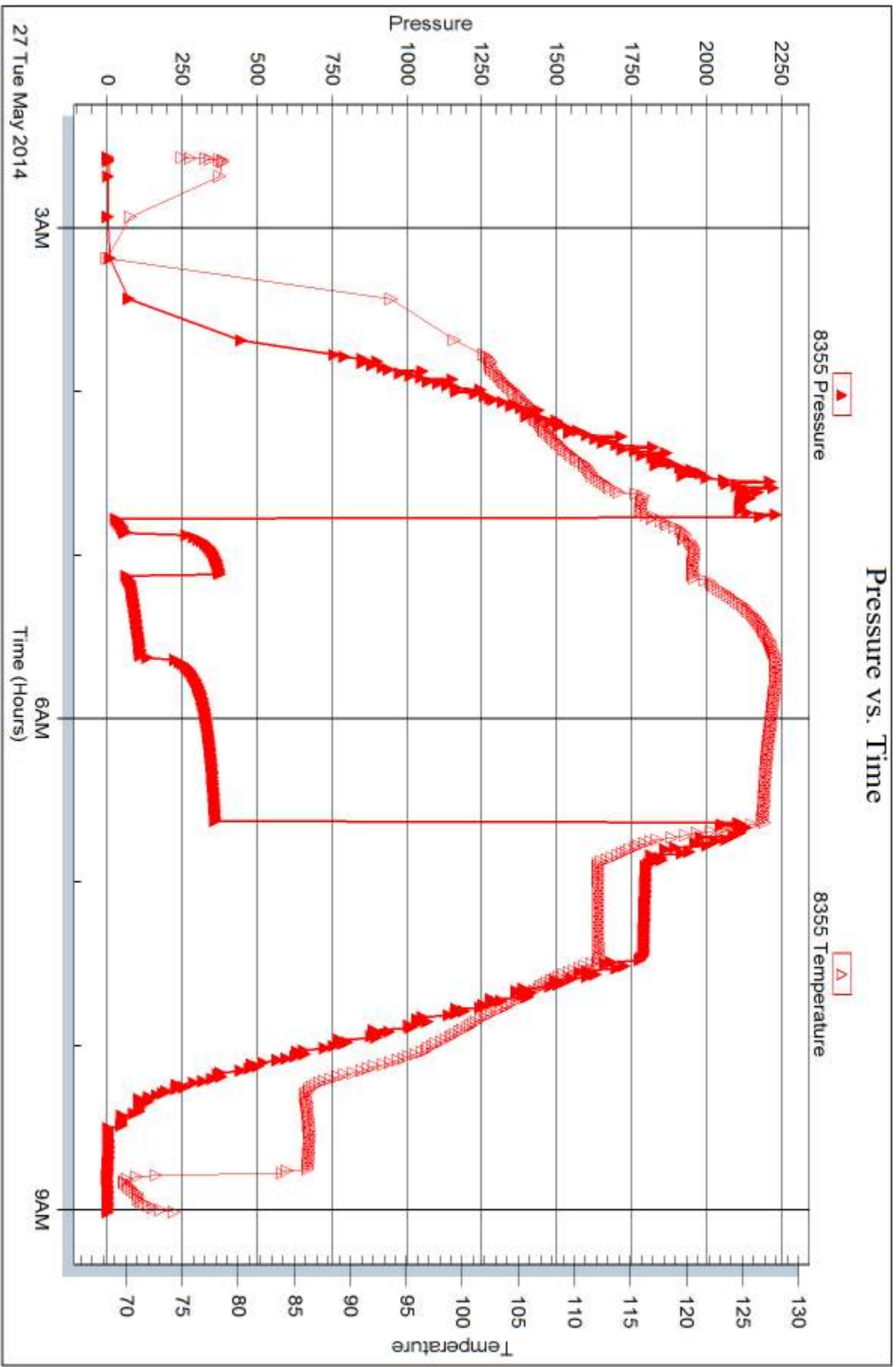
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW is .271 @ 65f = 26100







DRILL STEM TEST REPORT

Prepared For: **Larson Engineering Inc**

562 W State Rd
Olmitz KS 67564

ATTN: Vern Schrag

Hineman Ranch #1-31

31-18s-28w Lane,KS

Start Date: 2014.05.28 @ 05:28:00

End Date: 2014.05.28 @ 10:49:54

Job Ticket #: 57216 DST #: 4

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

Printed: 2014.05.30 @ 11:26:06



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

Larson Engineering Inc

31-18s-28w Lane, KS

562 W State Rd
Olmitz KS 67564

Hineman Ranch #1-31

ATTN: Vern Schrag

Job Ticket: 57216

DST#: 4

Test Start: 2014.05.28 @ 05:28:00

GENERAL INFORMATION:

Formation: **Marmanton**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 07:41:40

Time Test Ended: 10:49:54

Test Type: Conventional Bottom Hole (Reset)

Tester: Will MacLean

Unit No: 72

Interval: 4383.00 ft (KB) To 4544.00 ft (KB) (TVD)

Reference Elevations: 2764.00 ft (KB)

Total Depth: 4544.00 ft (KB) (TVD)

2757.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 7.00 ft

Serial #: 8674 Inside

Press@RunDepth: 63.38 psig @ 4384.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.05.28 End Date: 2014.05.28

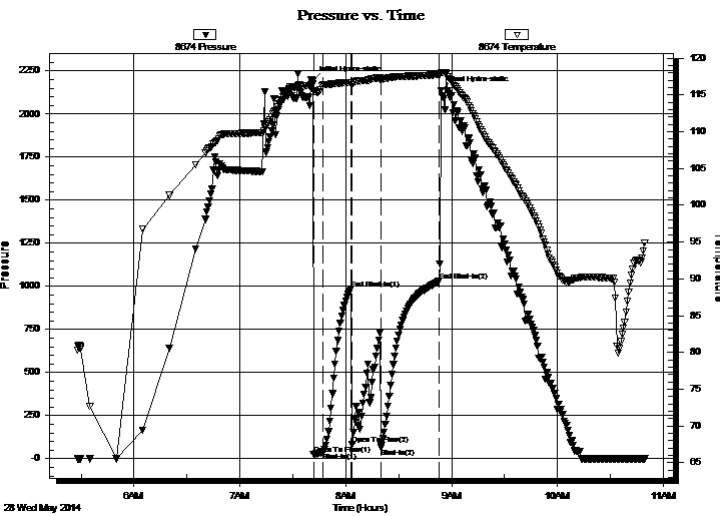
Last Calib.: 2014.05.28

Start Time: 05:28:00 End Time: 10:49:54

Time On Btm: 2014.05.28 @ 07:41:25

Time Off Btm: 2014.05.28 @ 08:53:55

TEST COMMENT: IF- Weak Surface Blow Built to 1 1/4"
IS- No Blow
FF- Weak Surface Blow Built to 1/4"
FS- No Blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2194.66	116.47	Initial Hydro-static
1	24.07	115.51	Open To Flow (1)
6	37.31	116.34	Shut-In(1)
22	986.53	116.71	End Shut-In(1)
23	85.10	116.46	Open To Flow (2)
39	63.38	116.98	Shut-In(2)
72	1032.89	117.78	End Shut-In(2)
73	2137.53	118.08	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
62.00	WCM 2%w 98%m with a Skim of Oil on	0.30
5.00	100%m with a Few Oil Spots	0.02

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Larson Engineering Inc

31-18s-28w Lane,KS

562 W State Rd
Olmitz KS 67564

Hineman Ranch #1-31

Job Ticket: 57216

DST#: 4

ATTN: Vern Schrag

Test Start: 2014.05.28 @ 05:28:00

Tool Information

Drill Pipe:	Length: 4238.00 ft	Diameter: 3.80 inches	Volume: 59.45 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: 28000.00 lb
Drill Collar:	Length: 124.00 ft	Diameter: 2.25 inches	Volume: 0.61 bbl	Weight to Pull Loose: 4000.00 lb
			<u>Total Volume: 60.06 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	6.00 ft			String Weight: Initial 62000.00 lb
Depth to Top Packer:	4383.00 ft			Final 62000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	161.00 ft			
Tool Length:	188.00 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			4357.00	
Shut In Tool	5.00			4362.00	
Hydraulic tool	5.00			4367.00	
Jars	5.00			4372.00	
Safety Joint	2.00			4374.00	
Packer	5.00			4379.00	27.00 Bottom Of Top Packer
Packer	4.00			4383.00	
Stubb	1.00			4384.00	
Recorder	0.00	8355	Outside	4384.00	
Recorder	0.00	8674	Inside	4384.00	
Perforations	28.00			4412.00	
Change Over Sub	1.00			4413.00	
Drill Pipe	125.00			4538.00	
Change Over Sub	1.00			4539.00	
Bullnose	5.00			4544.00	161.00 Bottom Packers & Anchor

Total Tool Length: 188.00



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering Inc

31-18s-28w Lane, KS

562 W State Rd
Olmitz KS 67564

Hineman Ranch #1-31

Job Ticket: 57216

DST#: 4

ATTN: Vern Schrag

Test Start: 2014.05.28 @ 05:28:00

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: 52.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.58 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 3100.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
62.00	WCM 2%w 98%m with a Skim of Oil on Top	0.305
5.00	100%m with a Few Oil Spots	0.025

Total Length: 67.00 ft Total Volume: 0.330 bbl

Num Fluid Samples: 0

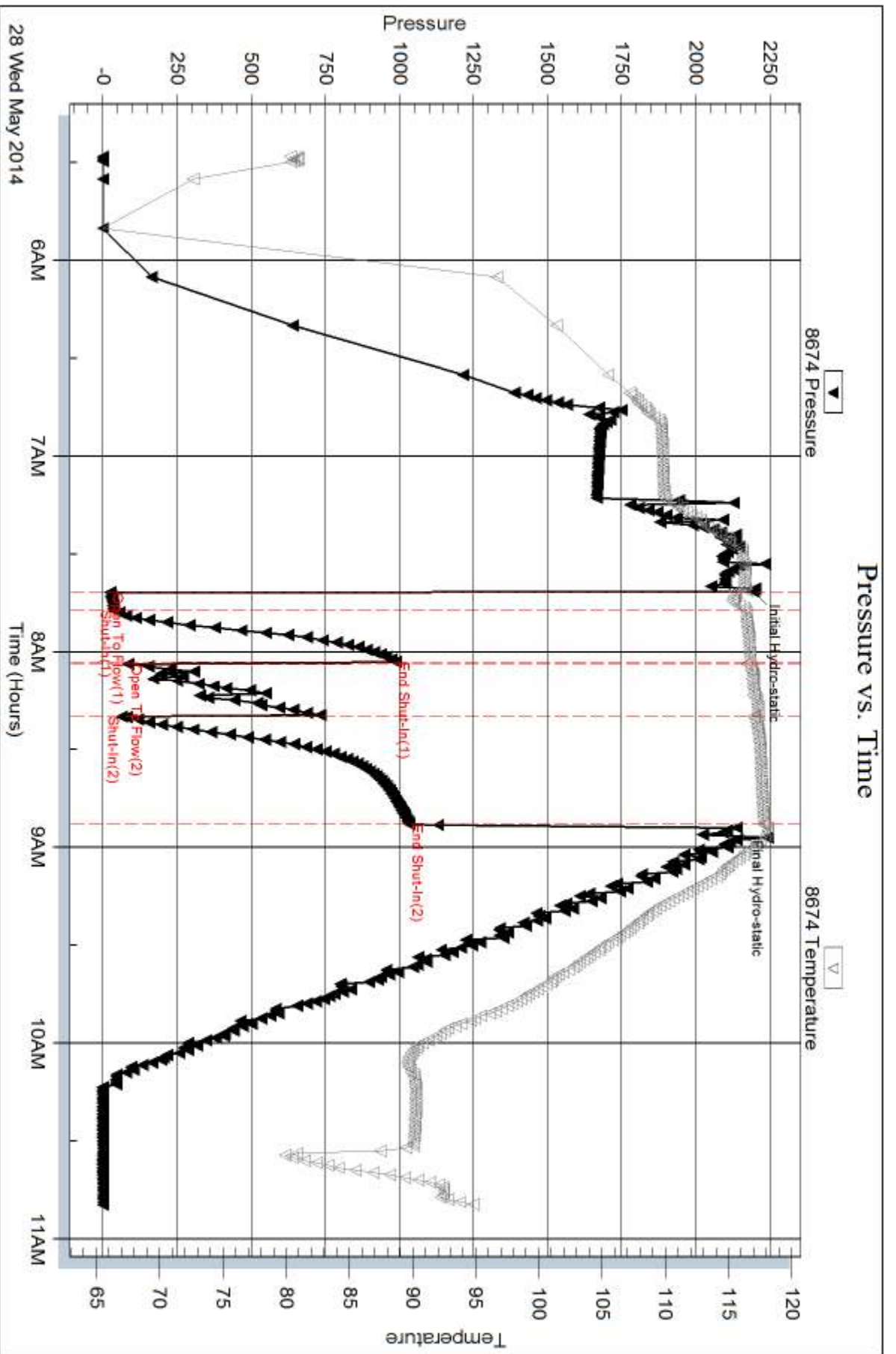
Num Gas Bombs: 0

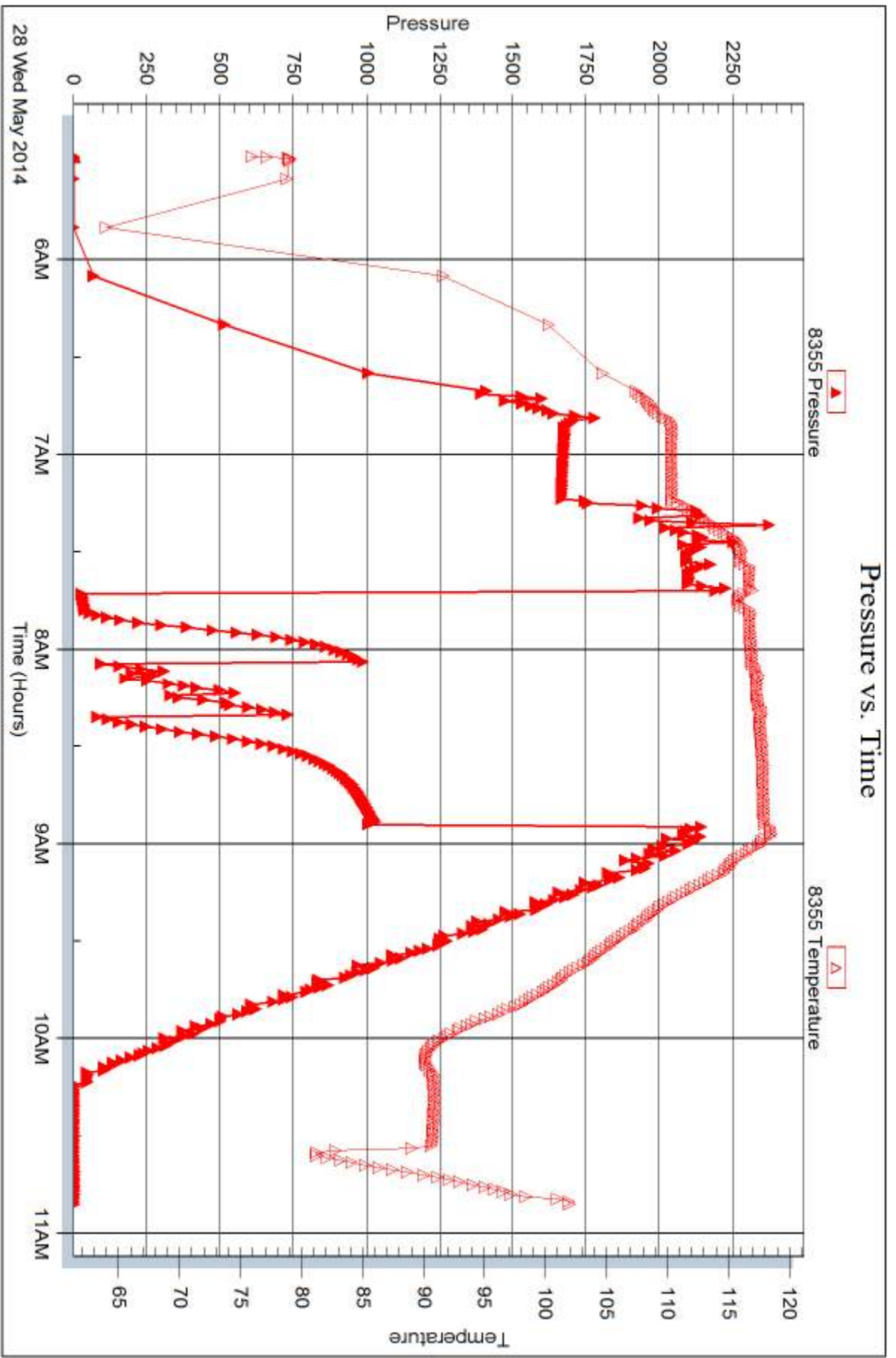
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:







DRILL STEM TEST REPORT

Prepared For: **Larson Engineering Inc**

562 W State Rd
Olmitz KS 67564

ATTN: Vern Schrag

Hineman Ranch #1-31

31-18s-28w Lane,KS

Start Date: 2014.05.28 @ 21:54:00

End Date: 2014.05.29 @ 03:14:54

Job Ticket #: 57217 DST #: 5

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

Printed: 2014.05.30 @ 11:25:15



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

Larson Engineering Inc

31-18s-28w Lane, KS

562 W State Rd
Olmitz KS 67564

Hineman Ranch #1-31

ATTN: Vern Schrag

Job Ticket: 57217

DST#: 5

Test Start: 2014.05.28 @ 21:54:00

GENERAL INFORMATION:

Formation: **Cherokee**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 23:58:10

Time Test Ended: 03:14:54

Test Type: Conventional Bottom Hole (Reset)

Tester: Will MacLean

Unit No: 72

Interval: 4542.00 ft (KB) To 4602.00 ft (KB) (TVD)

Reference Elevations: 2764.00 ft (KB)

Total Depth: 4602.00 ft (KB) (TVD)

2757.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 7.00 ft

Serial #: 8674 Inside

Press@RunDepth: 24.02 psig @ 4543.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.05.28

End Date:

2014.05.29

Last Calib.:

2014.05.29

Start Time: 21:54:00

End Time:

03:14:54

Time On Btm:

2014.05.28 @ 23:57:55

Time Off Btm:

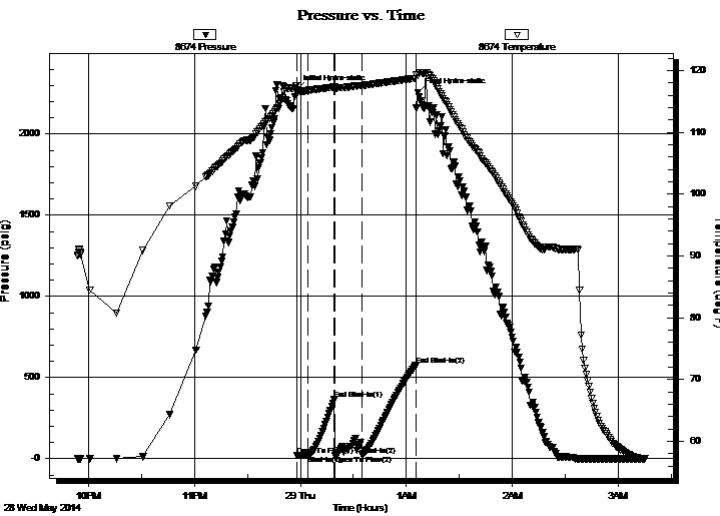
2014.05.29 @ 01:06:25

TEST COMMENT: IF- Weak Surface Blow 1/4"

IS- No Blow

FF- No Blow

FS- No Blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2273.20	117.57	Initial Hydro-static
1	19.33	116.35	Open To Flow (1)
6	20.85	116.75	Shut-In(1)
22	366.07	117.33	End Shut-In(1)
22	21.72	117.08	Open To Flow (2)
37	24.02	117.56	Shut-In(2)
68	573.99	118.73	End Shut-In(2)
69	2255.23	119.25	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
5.00	100% Few Oil Spots in Tool	0.02

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Larson Engineering Inc

31-18s-28w Lane,KS

562 W State Rd
Olmitz KS 67564

Hineman Ranch #1-31

Job Ticket: 57217

DST#: 5

ATTN: Vern Schrag

Test Start: 2014.05.28 @ 21:54:00

Tool Information

Drill Pipe:	Length: 4395.00 ft	Diameter: 3.80 inches	Volume: 61.65 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: 28000.00 lb
Drill Collar:	Length: 124.00 ft	Diameter: 2.25 inches	Volume: 0.61 bbl	Weight to Pull Loose: 22000.00 lb
			<u>Total Volume: 62.26 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	4.00 ft			String Weight: Initial 60000.00 lb
Depth to Top Packer:	4542.00 ft			Final 60000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	60.00 ft			
Tool Length:	87.00 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			4516.00	
Shut In Tool	5.00			4521.00	
Hydraulic tool	5.00			4526.00	
Jars	5.00			4531.00	
Safety Joint	2.00			4533.00	
Packer	5.00			4538.00	27.00 Bottom Of Top Packer
Packer	4.00			4542.00	
Stubb	1.00			4543.00	
Recorder	0.00	8355	Outside	4543.00	
Recorder	0.00	8674	Inside	4543.00	
Perforations	21.00			4564.00	
Change Over Sub	1.00			4565.00	
Drill Pipe	31.00			4596.00	
Change Over Sub	1.00			4597.00	
Bullnose	5.00			4602.00	60.00 Bottom Packers & Anchor

Total Tool Length: 87.00



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering Inc

31-18s-28w Lane, KS

562 W State Rd
Olmitz KS 67564

Hineman Ranch #1-31

Job Ticket: 57217

DST#: 5

ATTN: Vern Schrag

Test Start: 2014.05.28 @ 21:54:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 10.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 51.00 sec/qt

Cushion Volume:

bbf

Water Loss: 7.19 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2400.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbf
5.00	100% m Few Oil Spots in Tool	0.025

Total Length: 5.00 ft Total Volume: 0.025 bbf

Num Fluid Samples: 0

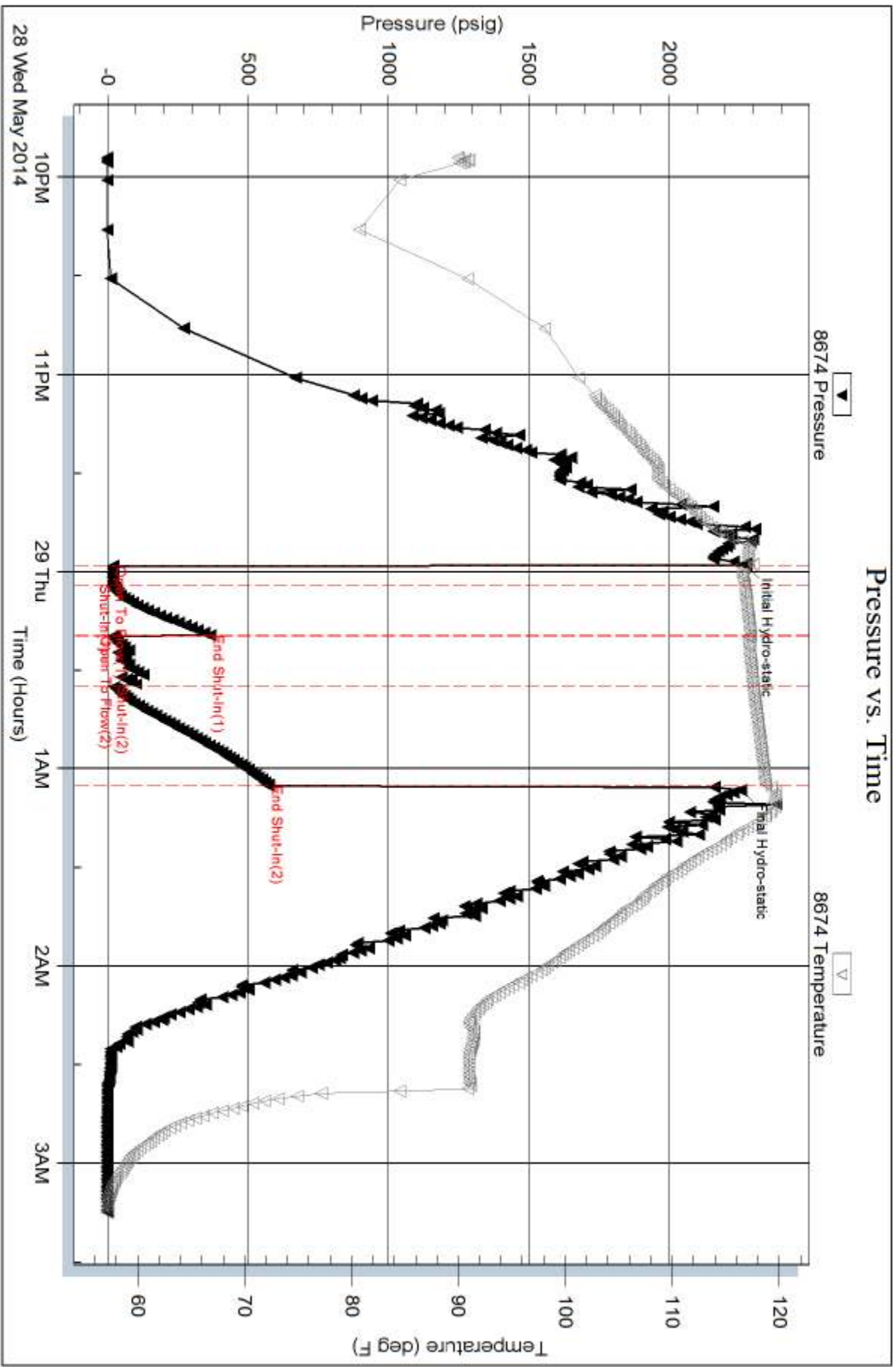
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

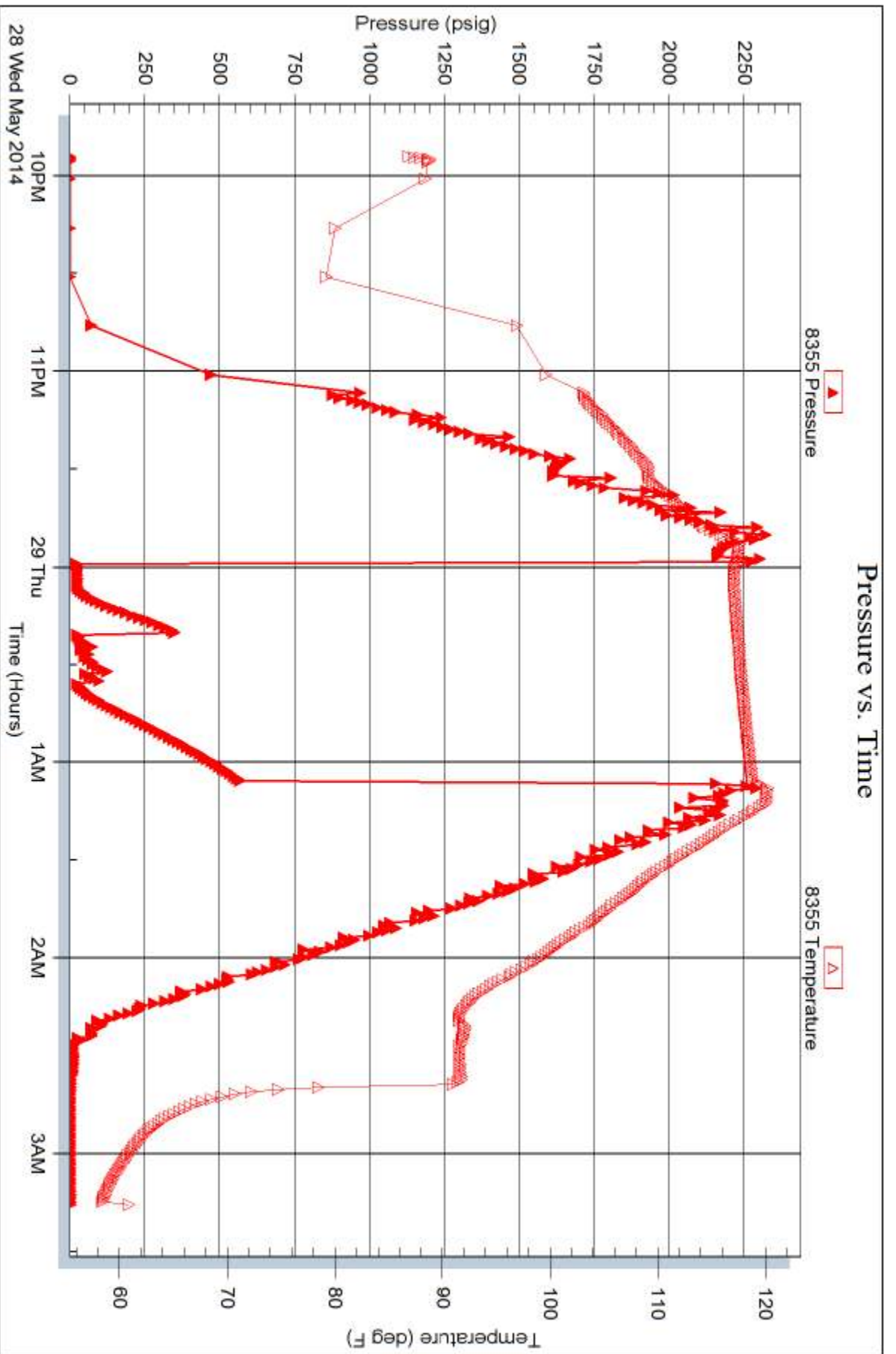


Serial #: 8355

Outside Larson Engineering Inc

Hineman Ranch #1-31

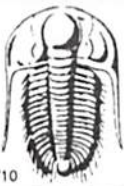
DST Test Number: 5



Trilobite Testing, Inc

Ref. No: 57217

Printed: 2014.05.30 @ 11:25:16



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 57213

Well Name & No. Hineman Ranch #1-31 Test No. DST#1 Date 5-25-14
 Company Larson Engineering Inc Elevation 2764 KB 2757 GL
 Address 562 W. State Rd Olmitz KS 67564
 Co. Rep / Geo. Vern Schrag Rig H-D R's #3
 Location: Sec. 31 Twp. 18S Rge. 28W Co. Lane State KS

Interval Tested 4264 - 4284 Zone Tested LRC "K"
 Anchor Length 20 Drill Pipe Run 4139 Mud Wt. 9.0
 Top Packer Depth 4260 Drill Collars Run 124 Vis 61
 Bottom Packer Depth 4264 Wt. Pipe Run 0 WL 7.6
 Total Depth 4284 Chlorides 2400 ppm System LCM 216
 Blow Description IF- Weak Surface Blow Built to 2 1/2"
ISI- No Blow
FF- Weak Surface Blow Built to 8 1/2"
FST- No Blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>57</u>	<u>MCW</u>			<u>44</u>	
<u>62</u>	<u>MCW</u>		<u>88</u>	<u>88</u>	<u>12</u>
<u>124</u>	<u>MCW</u>		<u>93</u>	<u>93</u>	<u>7</u>

Rec Total 243 BHT 125 Gravity _____ API RW 175 @ 68 ° F Chlorides 42000 ppm

(A) Initial Hydrostatic 2113 Test 1250 T-On Location 15:50
 (B) First Initial Flow 20 Jars 250 T-Started 16:54
 (C) First Final Flow 58 Safety Joint 75 T-Open 18:59
 (D) Initial Shut-In 586 Circ Sub NIC T-Pulled 20:57
 (E) Second Initial Flow 60 Hourly Standby _____ T-Out 22:53
 (F) Second Final Flow 126 Mileage 58 RTT 89.90 Comments _____
 (G) Final Shut-In 579 Sampler _____
 (H) Final Hydrostatic 1969 Straddle _____ Ruined Shale Packer _____
 Shale Packer _____ Ruined Packer _____
 Extra Packer _____ Extra Copies _____
 Extra Recorder _____ Sub Total 0
 Day Standby _____ Total 1664.90
 Accessibility _____ MP/DST Disc't _____
 Sub Total 1664.90

Initial Open 5
 Initial Shut-In 15
 Final Flow 30
 Final Shut-In 60

Approved By [Signature] Our Representative [Signature]

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 57214

Well Name & No. Hineman Ranch #1-31 Test No. DST #2 Date 5-26-14
 Company Larson Engineering Inc Elevation 2764 KB 2757 GL
 Address 562 W State Rd Olmitz KS 67564
 Co. Rep / Geo. Vera Schrag Rig H-D Rig #3
 Location: Sec. 31 Twp. 18s Rge. 28W Co. Lane State KS

Interval Tested 4296-4315 Zone Tested LKC "L"
 Anchor Length 19 Drill Pipe Run 4169 Mud Wt. 9.0
 Top Packer Depth 4292 Drill Collars Run 124 Vis 55
 Bottom Packer Depth 4296 Wt. Pipe Run 0 WL 7.2
 Total Depth 4315 Chlorides 2600 ppm System LCM 216

Blow Description IF- Weak Surface Blow Built to 3/4"
ISJ- No Blow
FF- Weak Surface Blow Built to 1 1/2"
FST- No Blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>20</u>	<u>MCW</u>		<u>56</u>	<u>44</u>	
<u>124</u>	<u>MCW</u>		<u>86</u>	<u>14</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

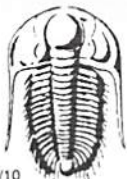
Rec Total 144 BHT 125 Gravity API RW, 198 @ 174 °F Chlorides 32000 ppm

(A) Initial Hydrostatic 2149 Test 1250 T-On Location 9:38
 (B) First Initial Flow 18 Jars 250 T-Started 10:00
 (C) First Final Flow 33 Safety Joint 75 T-Open 12:31
 (D) Initial Shut-In 603 Circ Sub N/C T-Pulled _____
 (E) Second Initial Flow 38 Hourly Standby _____ T-Out 16:05
 (F) Second Final Flow 89 Mileage 58 RIT 89.90 Comments _____
 (G) Final Shut-In 570 Sampler _____ Work on Shut in Tool 1/2 hr
 (H) Final Hydrostatic 2108 Straddle _____ Ruined Shale Packer _____
 Shale Packer _____ Ruined Packer _____

Initial Open 5 Extra Packer _____ Extra Copies _____
 Initial Shut-In 15 Extra Recorder _____ Sub Total 0
 Final Flow 30 Day Standby _____ Total 1664.90
 Final Shut-In 60 Accessibility _____ MP/DST Disc't _____
 Sub Total 1664.90

Approved By [Signature] Our Representative [Signature]

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 57215

4/10

Well Name & No. Higeman Ranch #1-31 Test No. DST #3 Date 5-27-14
 Company Larson Engineering Inc Elevation 2764 KB 2757 GL
 Address 562 W. State Rd Olmitz KS 67564
 Co. Rep / Geo. Vern Schrag Rig H-D Rig #3
 Location: Sec. 31 Twp. 18s Rge. 28W Co. Lane State KS

Interval Tested 4349-4385 Zone Tested Pleasanton
 Anchor Length 36 Drill Pipe Run 4204 Mud Wt. 9.0
 Top Packer Depth 4345 Drill Collars Run 124 Vis 55
 Bottom Packer Depth 4349 Wt. Pipe Run 0 WL 7.2
 Total Depth 4385 Chlorides 2600 ppm System LCM 216
 Blow Description IF - Weak Surface Blow Built to 2 1/2"
ISI - No Blow
FF - Weak Surface Blow Built to 6"
FST -

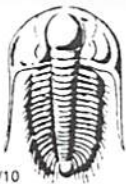
Rec	Feet of	%gas	%oil	%water	%mud
<u>25</u>	<u>WCM with Oil Spots</u>		<u>16</u>	<u>84</u>	
<u>62</u>	<u>WCM with Oil Spots</u>		<u>39</u>	<u>61</u>	
<u>124</u>	<u>MCW</u>		<u>82</u>	<u>18</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 211 BHT 126 Gravity _____ API RW 271 @ 65 °F Chlorides 26100 ppm

(A) Initial Hydrostatic <u>2178</u>	<input checked="" type="checkbox"/> Test <u>1250</u>	T-On Location <u>1:50</u>
(B) First Initial Flow <u>22</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>2:34</u>
(C) First Final Flow <u>58</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>4:45</u>
(D) Initial Shut-In <u>377</u>	<input checked="" type="checkbox"/> Circ Sub <u>N/C</u>	T-Pulled <u>6:37</u>
(E) Second Initial Flow <u>63</u>	<input type="checkbox"/> Hourly Standby _____	T-Out <u>8:59</u>
(F) Second Final Flow <u>109</u>	<input checked="" type="checkbox"/> Mileage <u>58 RIT</u> 89.90	Comments _____
(G) Final Shut-In <u>361</u>	<input type="checkbox"/> Sampler _____	
(H) Final Hydrostatic <u>2103</u>	<input type="checkbox"/> Straddle _____	<input type="checkbox"/> Ruined Shale Packer _____
Initial Open <u>5</u>	<input checked="" type="checkbox"/> Shale Packer <u>250</u>	<input type="checkbox"/> Ruined Packer _____
Initial Shut-In <u>15</u>	<input type="checkbox"/> Extra Packer _____	<input type="checkbox"/> Extra Copies _____
Final Flow <u>30</u>	<input type="checkbox"/> Extra Recorder _____	Sub Total <u>0</u>
Final Shut-In <u>60</u>	<input type="checkbox"/> Day Standby _____	Total <u>1914.90</u>
	<input type="checkbox"/> Accessibility _____	MP/DST Disc't _____
	Sub Total <u>1914.90</u>	

Approved By [Signature] Our Representative _____

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 57216

4/10

Well Name & No. Hineman Ranch #1-31 Test No. DST #4 Date 5-28-14
 Company Larson Engineering Inc Elevation 2764 KB 2757 GL
 Address 562 W. State Rd Olin, KS 67564
 Co. Rep / Geo. Vern Schrag Rig H-D Rig #3
 Location: Sec. 31 Twp. 18S Rge. 28W Co. Lane State KS

Interval Tested 4383 - 4544 Zone Tested Marmanton
 Anchor Length 161 Drill Pipe Run 4238 Mud Wt. 9.4
 Top Packer Depth 4379 Drill Collars Run 124 Vis 52
 Bottom Packer Depth 4383 Wt. Pipe Run 0 WL 7.6
 Total Depth 4544 Chlorides 3100 ppm System LCM 110

Blow Description IF- Weak Surface Blow Built to 1 1/4"
ISI- No Blow
FF- Weak Surface Blow Built to 1/4"
FSI- No Blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>5</u>	<u>Mud with a few Oil spots</u>			<u>100</u>	
<u>62</u>	<u>UCM with a skin of Oil on Top</u>		<u>2</u>	<u>98</u>	

Rec Total 67 BHT 118 Gravity _____ API RW _____ @ _____ °F Chlorides _____ ppm

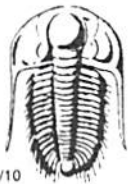
(A) Initial Hydrostatic <u>2194</u>	<input checked="" type="checkbox"/> Test <u>1250</u>	T-On Location <u>4:58</u>
(B) First Initial Flow <u>24</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>5:28</u>
(C) First Final Flow <u>37</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>7:41</u>
(D) Initial Shut-In <u>986</u>	<input checked="" type="checkbox"/> Circ Sub <u>N/C</u>	T-Pulled <u>8:53</u>
(E) Second Initial Flow <u>85</u>	<input type="checkbox"/> Hourly Standby _____	T-Out <u>10:49</u>
(F) Second Final Flow <u>63</u>	<input checked="" type="checkbox"/> Mileage <u>58 RIT</u> 89.90	Comments _____
(G) Final Shut-In <u>1032</u>	<input type="checkbox"/> Sampler _____	
(H) Final Hydrostatic <u>2137</u>	<input type="checkbox"/> Straddle _____	<input type="checkbox"/> Ruined Shale Packer _____
	<input checked="" type="checkbox"/> Shale Packer <u>250</u>	<input type="checkbox"/> Ruined Packer _____
	<input type="checkbox"/> Extra Packer _____	<input type="checkbox"/> Extra Copies _____

Initial Open 5
 Initial Shut-In 15
 Final Flow 15
 Final Shut-In 30

Sub Total 1914.90

Approved By [Signature] Our Representative [Signature]

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 57217

4/10

Well Name & No. Hineman Ranch #1-31 Test No. DST #5 Date 5-28-14
 Company Larson Engineering Inc Elevation 2764 KB 2757 GL
 Address 562 W. State Rd Olmitz KS 67564
 Co. Rep / Geo. Vern Schrag Rig H-D Rig #3
 Location: Sec. 31 Twp. 18S Rge. 28W Co. Lane State KS

Interval Tested 4542-4602 Zone Tested Cherokee
 Anchor Length 60 Drill Pipe Run 4395 Mud Wt. 9.5
 Top Packer Depth 4538 Drill Collars Run 124 Vis 51
 Bottom Packer Depth 4542 Wt. Pipe Run 0 WL 7.2
 Total Depth 4602 Chlorides 2400 ppm System LCM 116

Blow Description IF- Weak Surface Blow 1/4"
ISI- No Blow
FF- No Blow
FSI- No Blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>5</u>	<u>Mud Few Oil Spots in Tool</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 116 Gravity _____ API RW _____ @ _____ °F Chlorides _____ ppm

(A) Initial Hydrostatic 2273 Test 1250 T-On Location 21:18
 (B) First Initial Flow 19 Jars 250 T-Started 21:54
 (C) First Final Flow 20 Safety Joint 75 T-Open 23:58
 (D) Initial Shut-In 366 Circ Sub NIC T-Pulled 1:06
 (E) Second Initial Flow 21 Hourly Standby _____ T-Out 3:14
 (F) Second Final Flow 24 Mileage 58 R/T 89.90 Comments _____
 (G) Final Shut-In 573 Sampler _____
 (H) Final Hydrostatic 2255 Straddle _____ Ruined Shale Packer _____
 Shale Packer _____ Ruined Packer _____

Initial Open 5 Extra Packer _____ Extra Copies _____
 Initial Shut-In 15 Extra Recorder _____ Sub Total 0
 Final Flow 15 Day Standby _____ Total 1664.90
 Final Shut-In 30 Accessibility _____ MP/DST Disc't _____
 Sub Total 1664.90

Approved By Vern Schrag Our Representative Hineman

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