

**TRILOBITE  
TESTING, INC.**

## DRILL STEM TEST REPORT

Prepared For: **Herman L Loeb, LLC**

PO Box 838  
Lawrenceville, IL 62439

ATTN: Jon Christensen

**23-28s-18w Kiowa,KS**

**Hardy # 3**

Start Date: 2011.07.24 @ 10:46:26

End Date: 2011.07.24 @ 20:06:11

Job Ticket #: 43933      DST #: 1

Trilobite Testing, Inc

PO Box 1733 Hays, KS 67601

ph: 785-625-4778 fax: 785-625-5620

Herman L Loeb, LLC

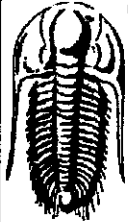
Hardy # 3

23-28s-18w Kiowa,KS

DST # 1

Lansing "A"

2011.07.24



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Lawrenceville, IL 62439  
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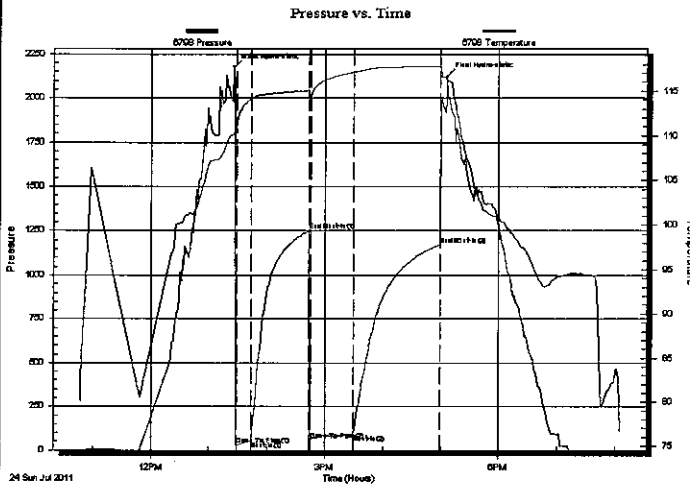
**Hardy # 3**  
**23-28s-18w Kiowa, KS**  
Job Ticket: 43933 **DST#: 1**  
Test Start: 2011.07.24 @ 10:46:26

### GENERAL INFORMATION:

Formation: **Lansing "A"**  
Deviated: **No Whipstock** ft (KB) Test Type: **Conventional Bottom Hole**  
Time Tool Opened: **13:27:41** Tester: **Leal Cason**  
Time Test Ended: **20:06:11** Unit No: **45**  
Interval: **4244.00 ft (KB) To 4262.00 ft (KB) (TVD)** Reference Elevations: **2231.00 ft (KB)**  
Total Depth: **4262.00 ft (KB) (TVD)** **2220.00 ft (CF)**  
Hole Diameter: **7.88 inches** Hole Condition: **Good** KB to GR/CF: **11.00 ft**

**Serial #: 6798** Inside  
Press@RunDepth: **89.20 psig @ 4245.00 ft (KB)** Capacity: **8000.00 psig**  
Start Date: **2011.07.24** End Date: **2011.07.24** Last Calib.: **2011.07.24**  
Start Time: **10:46:27** End Time: **20:06:11** Time On Btm: **2011.07.24 @ 13:25:11**  
Time Off Btm: **2011.07.24 @ 17:06:41**

TEST COMMENT: IF: Strong Blow, BOB in 15 seconds  
IS: Bled Off, No Blow back  
FF: Strong Blow, BOB in 1 minute  
FS: Bled Off, No Blow back



### PRESSURE SUMMARY

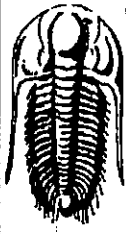
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2174.19	110.17	Initial Hydro-static
3	29.72	111.30	Open To Flow (1)
18	52.11	114.07	Shut-In(1)
78	1251.06	115.05	End Shut-In(1)
81	57.03	114.38	Open To Flow (2)
124	89.20	117.10	Shut-In(2)
214	1172.76	117.78	End Shut-In(2)
222	2123.13	116.37	Final Hydro-static

### Recovery

Length (ft)	Description	Volume (bbl)
0.00	2500 GIP	0.00
60.00	MCW 10%M 90%W	0.30
125.00	SOGWCM 1%O 4%G 43%W 52%M	0.61

### Gas Rates

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



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

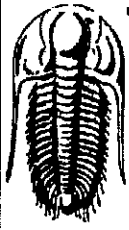
Herman L Loeb, LLC  
 PO Box 838  
 Lawrenceville, IL 62439  
 ATTN: Jon Christensen

**Hardy # 3**  
**23-28s-18w Kiowa,KS**  
 Job Ticket: 43933      **DST#: 1**  
 Test Start: 2011.07.24 @ 10:46:26

**Tool Information**

Drill Pipe:	Length: 4026.00 ft	Diameter: 3.80 inches	Volume: 56.47 bbl	Tool Weight:	2100.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length: 213.00 ft	Diameter: 2.25 inches	Volume: 1.05 bbl	Weight to Pull Loose:	80000.00 lb
			<b>Total Volume: 57.52 bbl</b>	Tool Chased	ft
Drill Pipe Above KB:	17.00 ft			String Weight: Initial	70000.00 lb
Depth to Top Packer:	4244.00 ft			Final	71000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	18.00 ft				
Tool Length:	40.00 ft				
Number of Packers:	2	Diameter: 6.75 inches			
Tool Comments:					

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Shut In Tool	5.00			4227.00	
Hydraulic tool	5.00			4232.00	
Safety Joint	2.00			4234.00	
Packer	5.00			4239.00	22.00      Bottom Of Top Packer
Packer	5.00			4244.00	
Stubb	1.00			4245.00	
Recorder	0.00	6798	Inside	4245.00	
Recorder	0.00	8367	Outside	4245.00	
Perforations	14.00			4259.00	
Bullnose	3.00			4262.00	18.00      Bottom Packers & Anchor
<b>Total Tool Length:</b>	<b>40.00</b>				



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**DRILL STEM TEST REPORT**

**FLUID SUMMARY**

Herman L Loeb, LLC  
 PO Box 838  
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 ATTN: Jon Christensen

**Hardy # 3**  
**23-28s-18w Kiowa, KS**  
 Job Ticket: 43933      **DST#: 1**  
 Test Start: 2011.07.24 @ 10:46:26

**Mud and Cushion Information**

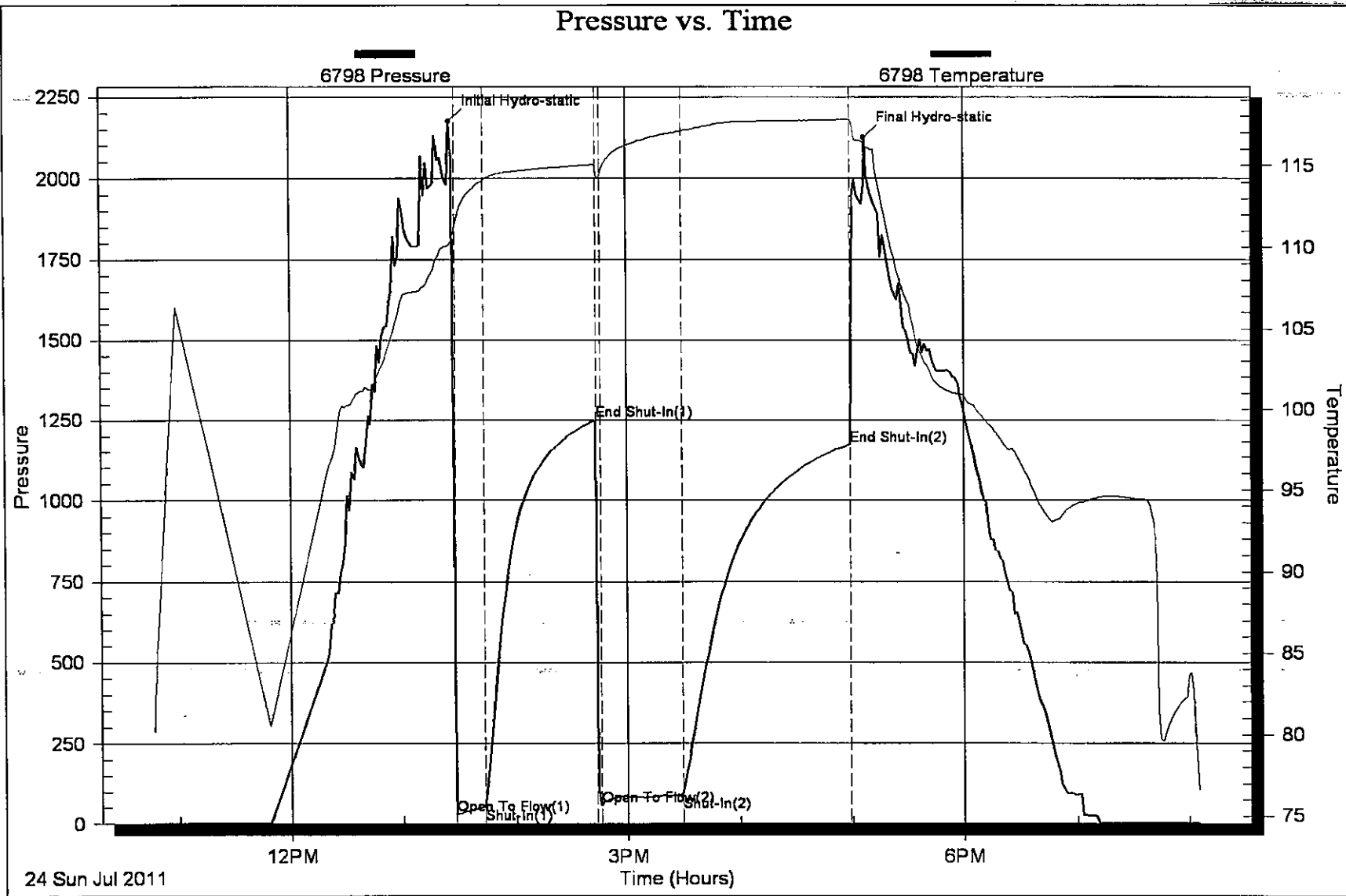
Mud Type: Gel Chem	Cushion Type:	Oil API:	deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity:	125000 ppm
Viscosity: 59.00 sec/qt	Cushion Volume: bbl		
Water Loss: 13.97 in <sup>3</sup>	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 5800.00 ppm			
Filter Cake: 0.20 inches			

**Recovery Information**

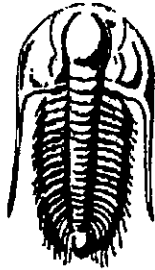
Recovery Table

Length ft	Description	Volume bbl
0.00	2500 GIP	0.000
60.00	MCW 10%M 90%W	0.295
125.00	SOGWCM 1%O 4%G 43%W 52%M	0.615

Total Length: 185.00 ft      Total Volume: 0.910 bbl  
 Num Fluid Samples: 0      Num Gas Bombs: 0      Serial #:  
 Laboratory Name:      Laboratory Location:  
 Recovery Comments: RW was .065 @ 85 degrees







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## DRILL STEM TEST REPORT

Prepared For: **Herman L Loeb, LLC**

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ATTN: Jon Christensen

**23-28s-18w Kiowa,KS**

**Hardy # 3**

Start Date: 2011.07.26 @ 14:55:29

End Date: 2011.07.27 @ 00:25:29

Job Ticket #: 43934      DST #: 2

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ph: 785-625-4778 fax: 785-625-5620

Herman L Loeb, LLC

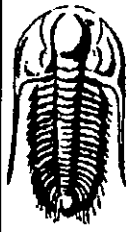
Hardy # 3

23-28s-18w Kiowa,KS

DST # 2

Mississippi

2011.07.26



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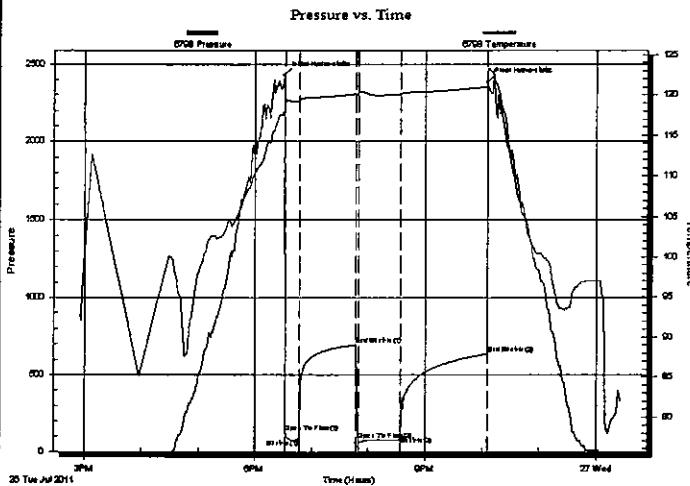
**Hardy # 3**  
**23-28s-18w Kiowa,KS**  
 Job Ticket: 43934      **DST#: 2**  
 Test Start: 2011.07.26 @ 14:55:29

**GENERAL INFORMATION:**

Formation: **Mississippi**  
 Deviated: **No Whipstock**      ft (KB)  
 Time Tool Opened: 18:31:59  
 Time Test Ended: 00:25:29  
 Interval: **4786.00 ft (KB) To 4844.00 ft (KB) (TVD)**  
 Total Depth: **4844.00 ft (KB) (TVD)**  
 Hole Diameter: **7.88 inches** Hole Condition: **Good**  
 Test Type: **Conventional Bottom Hole**  
 Tester: **Leal Cason**  
 Unit No: **45**  
 Reference Elevations: **2231.00 ft (KB)**  
**2220.00 ft (CF)**  
 KB to GR/CF: **11.00 ft**

**Serial #: 6798**      **Inside**  
 Press@RunDepth: **104.73 psig @ 4787.00 ft (KB)**      Capacity: **8000.00 psig**  
 Start Date: **2011.07.26**      End Date: **2011.07.27**      Last Calib.: **2011.07.27**  
 Start Time: **14:55:30**      End Time: **00:25:29**      Time On Btm: **2011.07.26 @ 18:30:29**  
 Time Off Btm: **2011.07.26 @ 22:05:14**

**TEST COMMENT:** IF: Strong Blow, BOB in 30 seconds, GTS in 12 minutes, Gauged Gas  
 IS: Bled Off, 4 inch Blow back  
 FF: Strong Blow, BOB & GTS Immediate, Gauged Gas & Caught Sample  
 FSI: Bled Off, 2 inch Blow back



**PRESSURE SUMMARY**

Time (Mn.)	Pressure (psig)	Temp (deg F)	Annotation
0	2427.79	118.13	Initial Hydro-static
2	129.62	118.78	Open To Flow (1)
16	84.19	119.20	Shut-In(1)
77	693.53	120.15	End Shut-In(1)
79	77.77	120.51	Open To Flow (2)
123	104.73	120.09	Shut-In(2)
215	636.48	121.01	End Shut-In(2)
215	2384.97	121.68	Final Hydro-static

**Recovery**

Length (ft)	Description	Volume (bbl)
0.00	4654 GIP	0.00
125.00	SGOM 2%G 98%M	0.61

**Gas Rates**

	Choke (Inches)	Pressure (psig)	Gas Rate (Mcf/d)
First Gas Rate	0.25	28.00	67.26
Last Gas Rate	0.25	19.00	52.99
Max. Gas Rate	0.25	28.00	67.26





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**TOOL DIAGRAM**

Herman L Loeb, LLC

**Hardy # 3**

PO Box 838  
Lawrenceville, IL 62439

**23-28s-18w Kiowa, KS**

Job Ticket: 43934

**DST#: 2**

ATTN: Jon Christensen

Test Start: 2011.07.26 @ 14:55:29

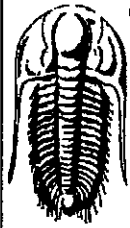
### Tool Information

Drill Pipe:	Length: 4566.00 ft	Diameter: 3.80 inches	Volume: 64.05 bbl	Tool Weight: 2100.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 213.00 ft	Diameter: 2.25 inches	Volume: 1.05 bbl	Weight to Pull Loose: 85000.00 lb
			<u>Total Volume: 65.10 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	15.00 ft			String Weight: Initial 79000.00 lb
Depth to Top Packer:	4786.00 ft			Final 80000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	58.00 ft			
Tool Length:	80.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		
Tool Comments:				

### Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Shut In Tool	5.00			4769.00	
Hydraulic tool	5.00			4774.00	
Safety Joint	2.00			4776.00	
Packer	5.00			4781.00	22.00 Bottom Of Top Packer
Packer	5.00			4786.00	
Stubb	1.00			4787.00	
Recorder	0.00	6798	Inside	4787.00	
Recorder	0.00	8367	Outside	4787.00	
Perforations	6.00			4793.00	
Change Over Sub	1.00			4794.00	
Drill Pipe	32.00			4826.00	
Change Over Sub	1.00			4827.00	
Perforations	14.00			4841.00	
Bullnose	3.00			4844.00	58.00 Bottom Packers & Anchor

**Total Tool Length: 80.00**



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**23-28s-18w Kiowa, KS**

Job Ticket: 43934

**DST#: 2**

ATTN: Jon Christensen

Test Start: 2011.07.26 @ 14:55:29

**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: 61.00 sec/qt

Cushion Volume:

bbl

Water Loss: 9.98 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 5800.00 ppm

Filter Cake: 0.20 inches

**Recovery Information**

Recovery Table

Length ft	Description	Volume bbl
0.00	4654 GIP	0.000
125.00	SGCM 2%G 98%M	0.615

Total Length: 125.00 ft      Total Volume: 0.615 bbl

Num Fluid Samples: 0

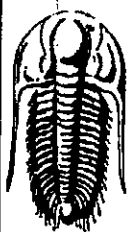
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:



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**GAS RATES**

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**Hardy # 3**

**23-28s-18w Kiowa, KS**

Job Ticket: 43934

**DST#: 2**

ATTN: Jon Christensen

Test Start: 2011.07.26 @ 14:55:29

### Gas Rates Information

Temperature: 59 deg C  
Relative Density: 0.65  
Z Factor: 0.8

Gas Rates Table

Flow Period	Elapsed Time	Choke (mm)	Pressure (kPaa)	Gas Rate (m <sup>3</sup> /d)
1	15	0.25	28.00	67.26
1	15	0.25	28.00	67.26
2	10	0.25	20.00	54.57
2	20	0.25	22.00	57.75
2	30	0.25	22.00	57.75
2	40	0.25	19.00	52.99

