



DRILL STEM TEST REPORT

Prepared For: **Samuel Gary Jr. and Associates, Inc**

1515 Wynkoop St. Ste 700
Denver, CO
80202

ATTN: Claton Camozzi

1-16-16/Rush

Wagner Trust 4-1

Start Date: 2011.04.27 @ 00:11:57

End Date: 2011.04.27 @ 08:01:57

Job Ticket #: 42557 DST #: 2

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



TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

Samuel Gary Jr. and Associates, Inc

Wagner Trust 4-1

1515 Wynkoop St. Ste 700
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80202
ATTN: Claton Camozzi

1-16-16/Rush

Job Ticket: 42557

DST#: 2

Test Start: 2011.04.27 @ 00:11:57

GENERAL INFORMATION:

Formation: **LKC "F-G"**

Deviated: **No Whipstock:** ft (KB)

Time Tool Opened: 01:50:27

Time Test Ended: 08:01:57

Test Type: **Conventional Bottom Hole**

Tester: **Brian Fairbank**

Unit No: **41**

Interval: 3242.00 ft (KB) To 3290.00 ft (KB) (TVD)

Reference Elevations: **1917.00 ft (KB)**

Total Depth: **3290.00 ft (KB) (TVD)**

1909.00 ft (CF)

Hole Diameter: **7.88 inches** Hole Condition:

KB to GR/CF: 8.00 ft

Serial #: 8734 Outside

Press @ Run Depth: **404.38 psig @ 3250.00 ft (KB)**

Capacity: **8000.00 psig**

Start Date: **2011.04.27** End Date: **2011.04.27**

Last Calib.: **2011.04.27**

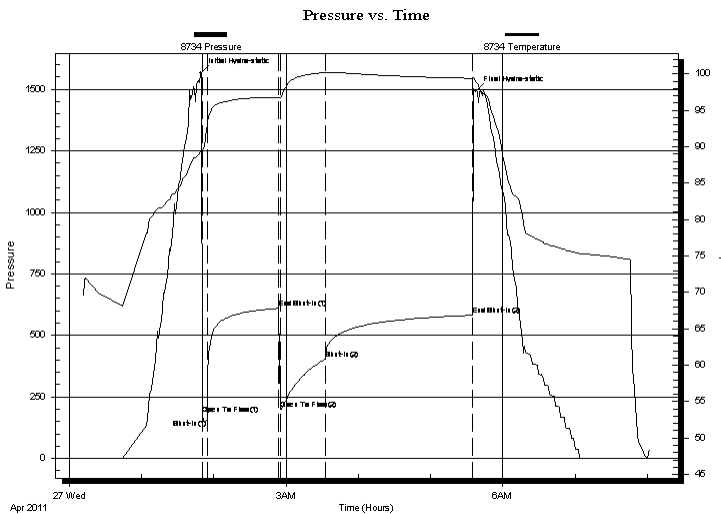
Start Time: **00:11:58** End Time: **08:01:57**

Time On Btm: **2011.04.27 @ 01:49:27**

Time Off Btm: **2011.04.27 @ 05:37:57**

TEST COMMENT: 5 - IFP - BOB 45 sec
60 - ISI - no blow back
40 - FFP - BOB 1 min
120 - FSI - BOB 15 min

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1567.34	89.56	Initial Hydro-static
1	179.56	89.37	Open To Flow (1)
5	160.34	92.92	Shut-In(1)
65	610.30	96.80	End Shut-In(1)
66	198.61	96.71	Open To Flow (2)
104	404.38	100.17	Shut-In(2)
226	582.37	99.39	End Shut-In(2)
229	1494.20	98.80	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
5.00	mud 100%	0.02
465.00	MW 95%W, 5%M	6.29
340.00	GM & WCO 20%G, 50%O, 25%W, 5%M	4.77
75.00	GM & OCW 40%G, 15%O, 35%W, 10%M	1.05
0.00	480' GIP	0.00
0.00	2000 G, 1000 O, 200 M, 800 W, 360 LBS	0.00

Gas Rates

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



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1-16-16/Rush

Job Ticket: 42557

DST#: 2

Test Start: 2011.04.27 @ 00:11:57

GENERAL INFORMATION:

Formation: **LKC "F-G"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 01:50:27

Time Test Ended: 08:01:57

Test Type: Conventional Bottom Hole

Tester: Brian Fairbank

Unit No: 41

Interval: 3242.00 ft (KB) To 3290.00 ft (KB) (TVD)

Reference Elevations: 1917.00 ft (KB)

Total Depth: 3290.00 ft (KB) (TVD)

1909.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition:

KB to GR/CF: 8.00 ft

Serial #: 8365 Fluid

Press @ RunDepth: psig @ 3207.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2011.04.27 End Date: 2011.04.27

Last Calib.: 2011.04.27

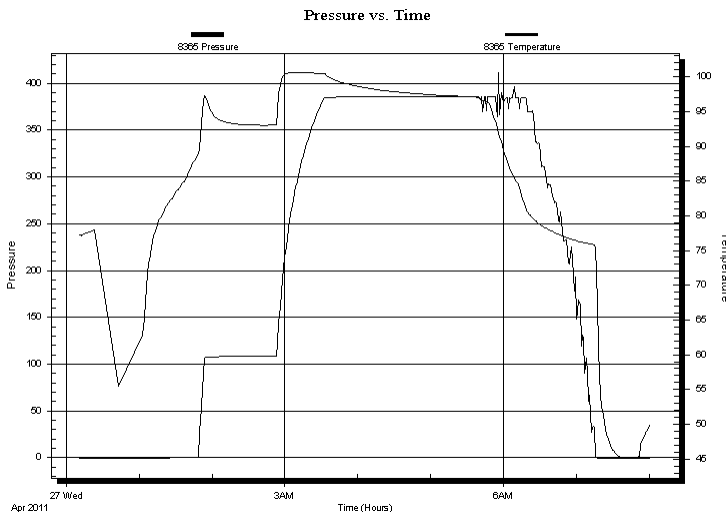
Start Time: 00:11:04 End Time: 08:01:03

Time On Btm:

Time Off Btm:

TEST COMMENT: 5 - IFP - BOB 45 sec
60 - ISI - no blow back
40 - FFP - BOB 1 min
120 - FSI - BOB 15 min

PRESSURE SUMMARY



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

Recovery

Length (ft)	Description	Volume (bbl)
5.00	mud 100%	0.02
465.00	MW 95%W, 5%M	6.29
340.00	GM & WCO 20%G, 50%O, 25%W, 5%M	4.77
75.00	GM & OCW 40%G, 15%O, 35%W, 10%M	1.05
0.00	480' GIP	0.00
0.00	2000 G, 1000 O, 200 M, 800 W, 360 LBS	0.00

Gas Rates

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



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Wagner Trust 4-1

1-16-16/Rush

Job Ticket: 42557

DST#: 2

Test Start: 2011.04.27 @ 00:11:57

GENERAL INFORMATION:

Formation: **LKC "F-G"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 01:50:27

Time Test Ended: 08:01:57

Interval: 3242.00 ft (KB) To 3290.00 ft (KB) (TVD)

Total Depth: 3290.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition:

Test Type: Conventional Bottom Hole

Tester: Brian Fairbank

Unit No: 41

Reference Elevations: 1917.00 ft (KB)

1909.00 ft (CF)

KB to GR/CF: 8.00 ft

Serial #: 8372 Inside

Press @ Run Depth: psig @ 3250.00 ft (KB)

Start Date: 2011.04.27

End Date:

2011.04.27

Capacity: 8000.00 psig

Last Calib.:

2011.04.27

Start Time: 00:11:30

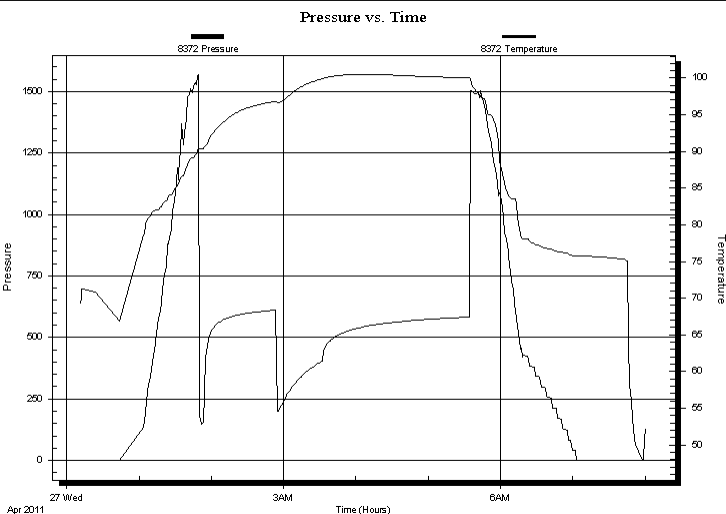
End Time:

08:01:29

Time On Btm:

Time Off Btm:

TEST COMMENT: 5 - IFP - BOB 45 sec
60 - ISI - no blow back
40 - FFP - BOB 1 min
120 - FSI - BOB 15 min



PRESSURE SUMMARY

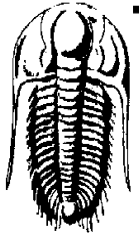
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation

Recovery

Length (ft)	Description	Volume (bbl)
5.00	mud 100%	0.02
465.00	MW 95%W, 5%M	6.29
340.00	GM & WCO 20%G, 50%O, 25%W, 5%M	4.77
75.00	GM & OCW 40%G, 15%O, 35%W, 10%M	1.05
0.00	480' GIP	0.00
0.00	2000 G, 1000 O, 200 M, 800 W, 360 LBS	0.00

Gas Rates

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



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DRILL STEM TEST REPORT

TOOL DIAGRAM

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1-16-16/Rush

Job Ticket: 42557

DST#: 2

Test Start: 2011.04.27 @ 00:11:57

Tool Information

Drill Pipe:	Length: 3197.00 ft	Diameter: 3.80 inches	Volume: 44.85 bbl	Tool Weight: 2500.00 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: 30.00 ft	Diameter: 2.25 inches	Volume: 0.15 bbl	Weight to Pull Loose: 52000.00 lb
			<u>Total Volume: 45.00 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	20.00 ft			String Weight: Initial 45000.00 lb
Depth to Top Packer:	3242.00 ft			Final 50000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	48.00 ft			
Tool Length:	83.00 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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Recorder	0.00	8365	Fluid	3207.00	
Blank Spacing	5.00			3212.00	
Shut In Tool	5.00			3217.00	
Sampler	3.00			3220.00	
Hydraulic tool	5.00			3225.00	
Jars	5.00			3230.00	
Safety Joint	2.00			3232.00	
Packer	5.00			3237.00	35.00 Bottom Of Top Packer
Packer	5.00			3242.00	
Stubb	1.00			3243.00	
Perforations	6.00			3249.00	
Change Over Sub	1.00			3250.00	
Recorder	0.00	8372	Inside	3250.00	
Recorder	0.00	8734	Outside	3250.00	
Blank Spacing	31.00			3281.00	
Change Over Sub	1.00			3282.00	
Perforations	5.00			3287.00	
Bullnose	3.00			3290.00	48.00 Bottom Packers & Anchor

Total Tool Length: 83.00



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FLUID SUMMARY

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Job Ticket: 42557

DST#: 2

Test Start: 2011.04.27 @ 00:11:57

Mud and Cushion Information

Mud Type: Gel Chem
Mud Weight: 9.00 lb/gal
Viscosity: 53.00 sec/qt
Water Loss: 7.98 in³
Resistivity: ohm.m
Salinity: 6100.00 ppm
Filter Cake: inches

Cushion Type:
Cushion Length: ft
Cushion Volume: bbl
Gas Cushion Type:
Gas Cushion Pressure: psig

Oil API: deg API
Water Salinity: 105000 ppm

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
5.00	mud 100%	0.025
465.00	MW 95%W, 5%M	6.295
340.00	GM & WCO 20%G, 50%O, 25%W, 5%M	4.769
75.00	GM & OCW 40%G, 15%O, 35%W, 10%M	1.052
0.00	480' GIP	0.000
0.00	2000 G, 1000 O, 200 M, 800 W, 360 LBS	0.000

Total Length: 885.00 ft Total Volume: 12.141 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

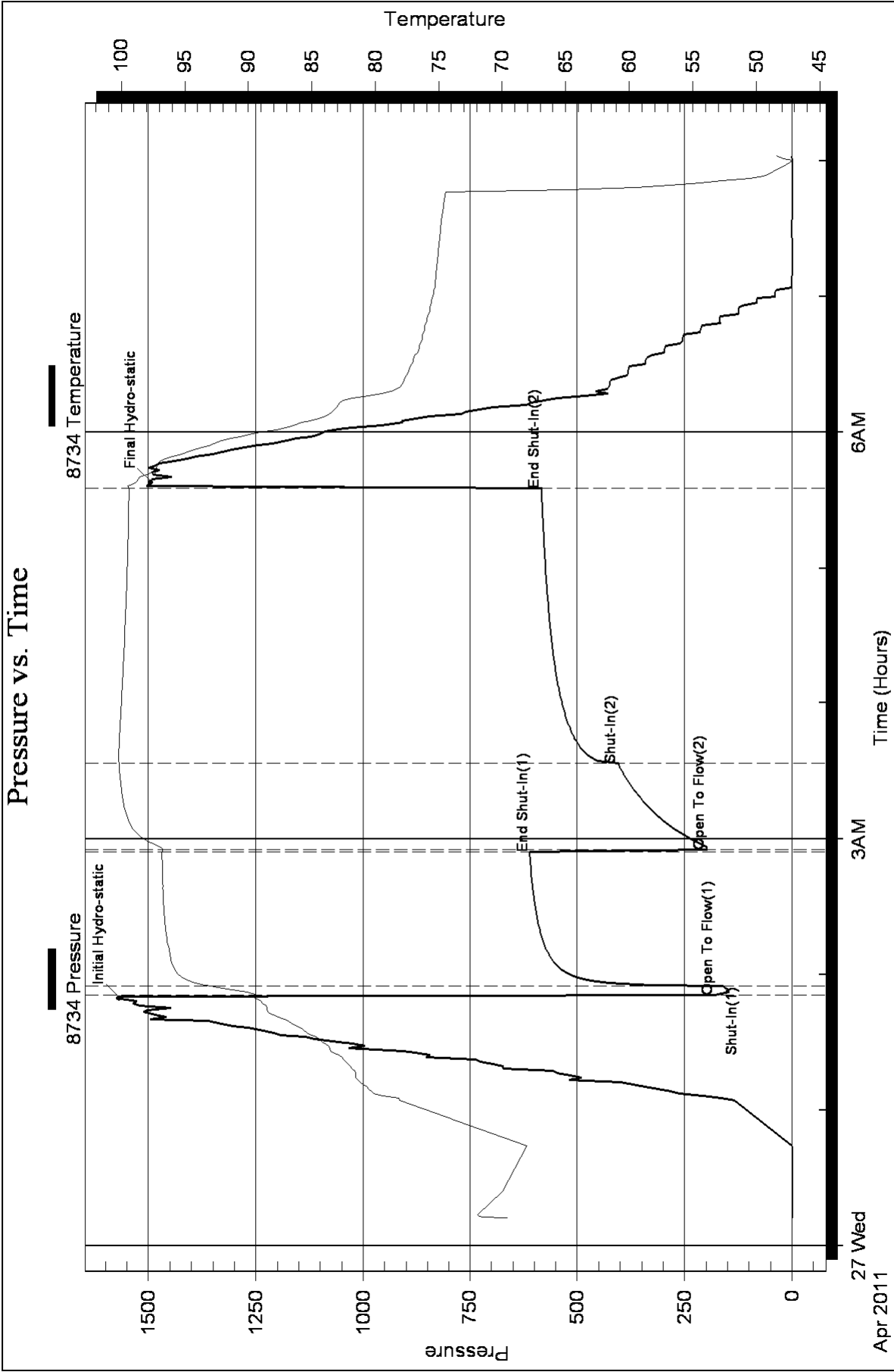
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

Pressure vs. Time



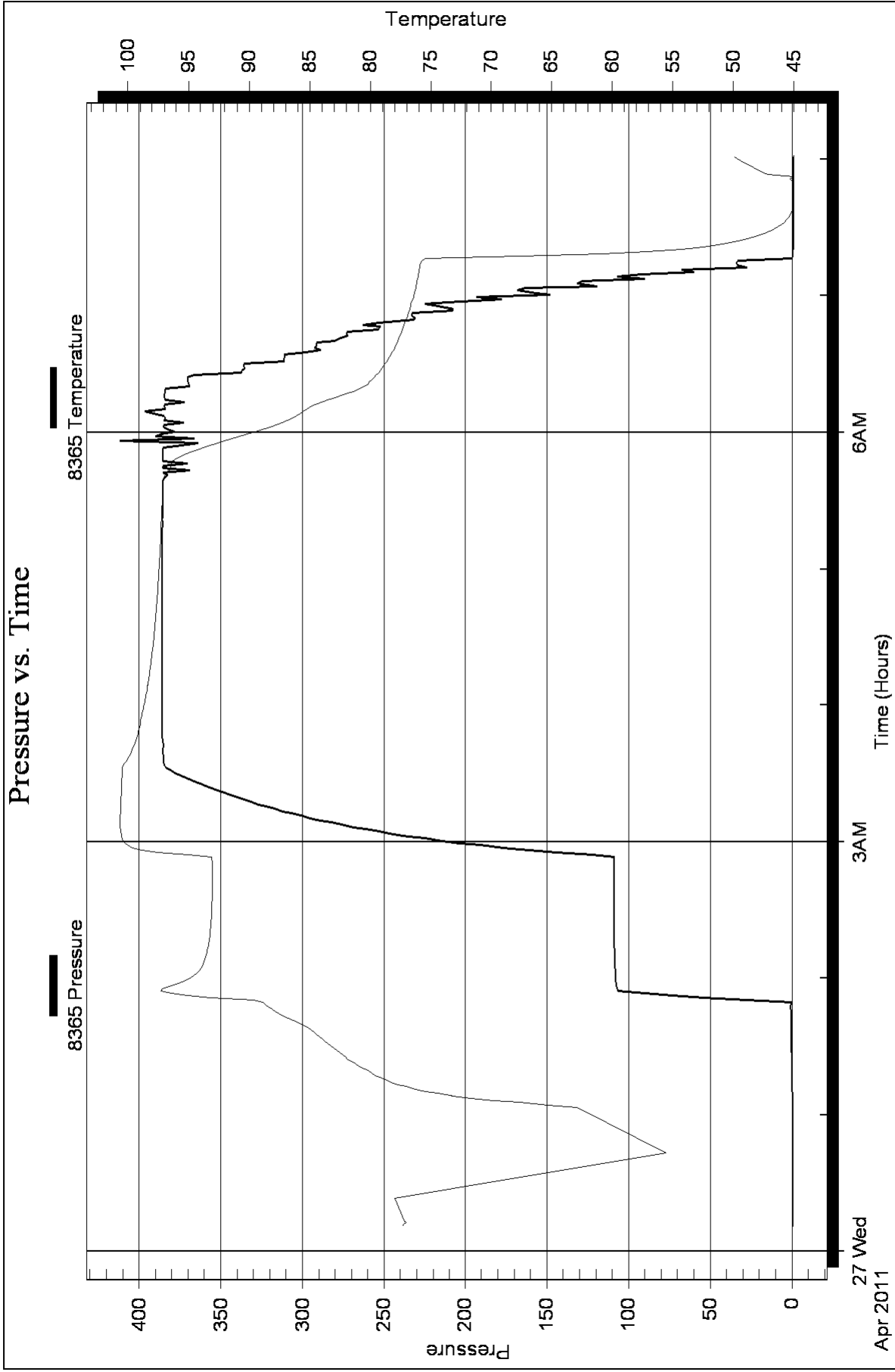
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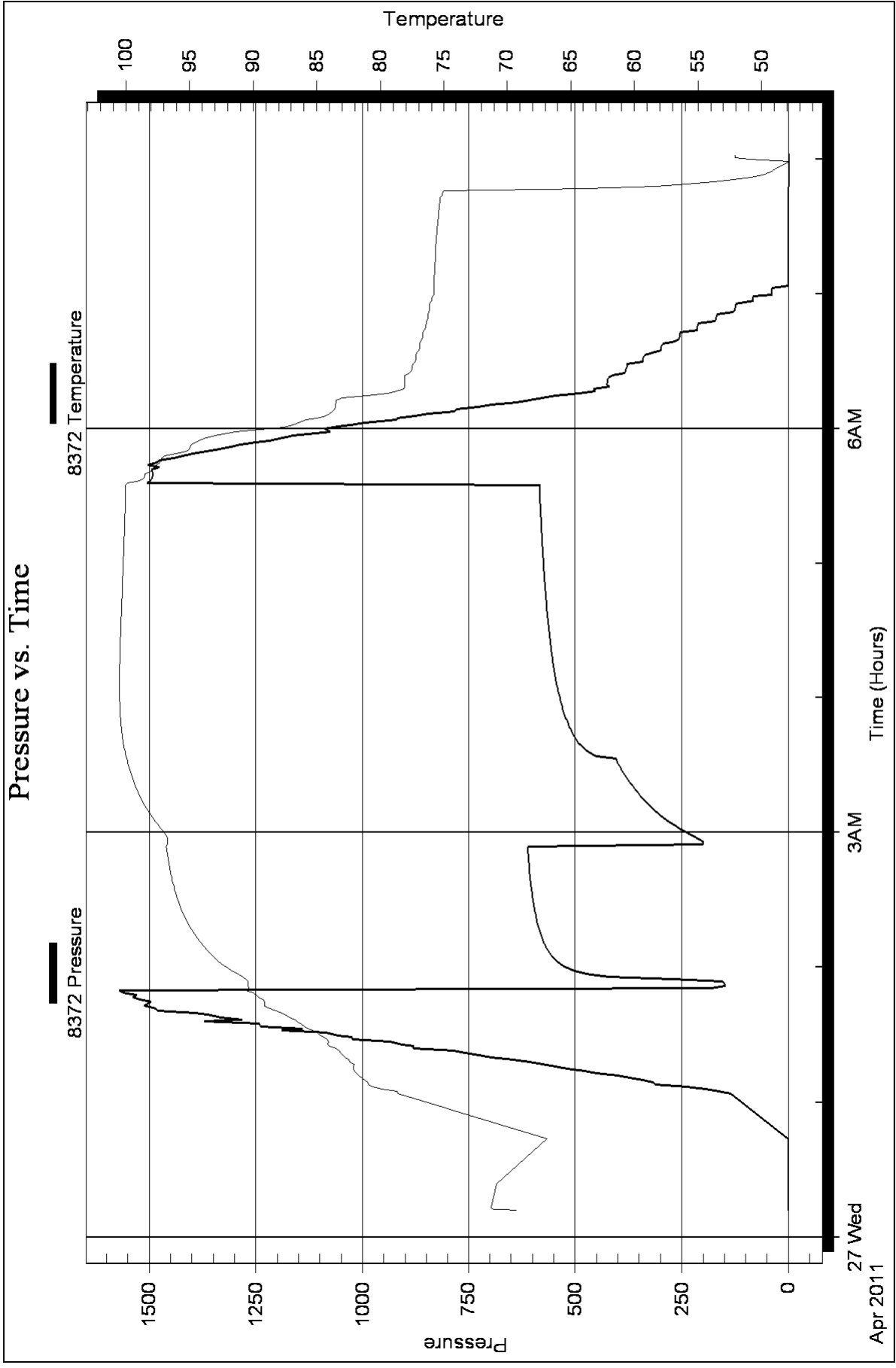
Fluid

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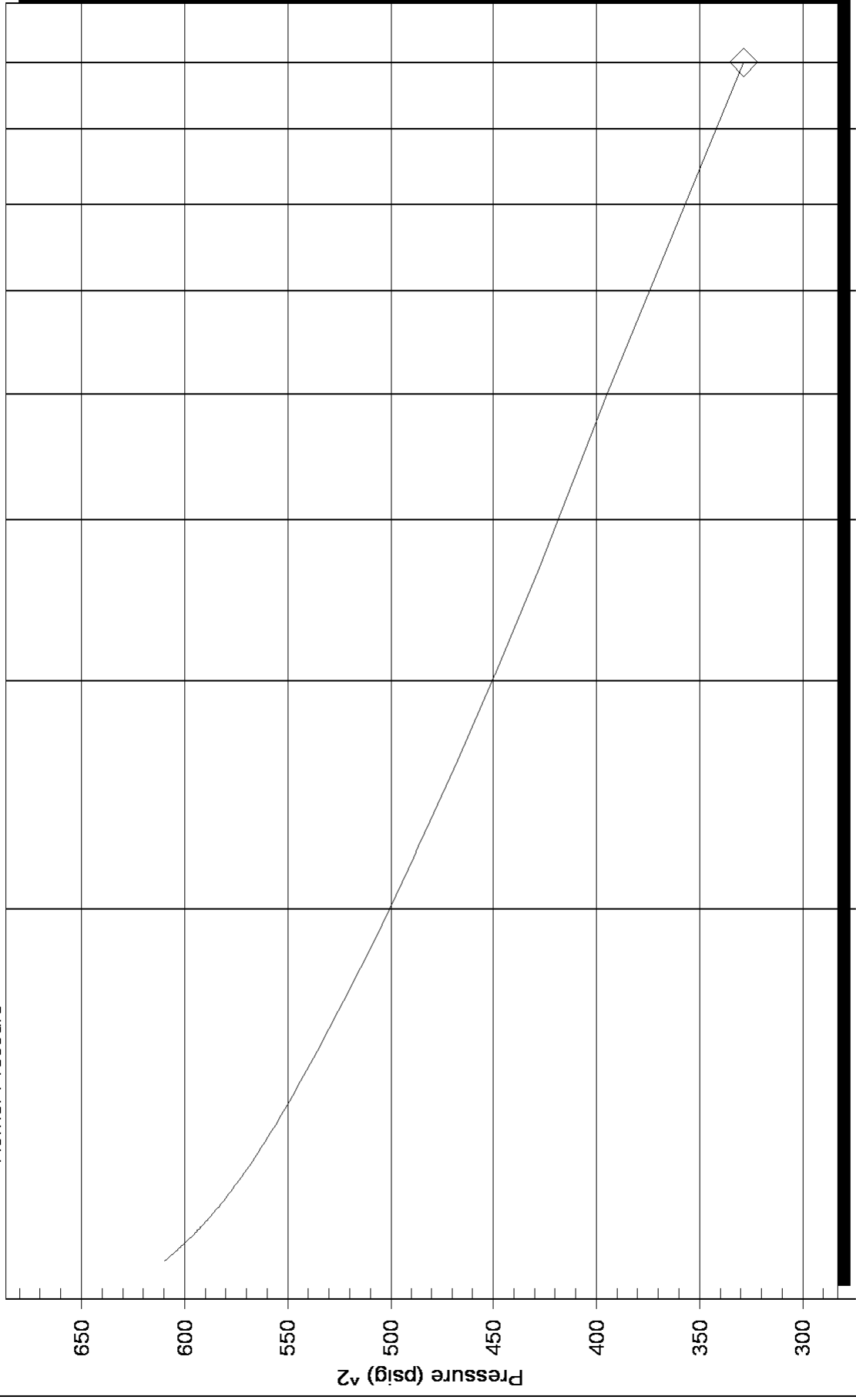
DST Test Number: 2





Homer Plot

Horner Pressure



10⁰

2*10⁰

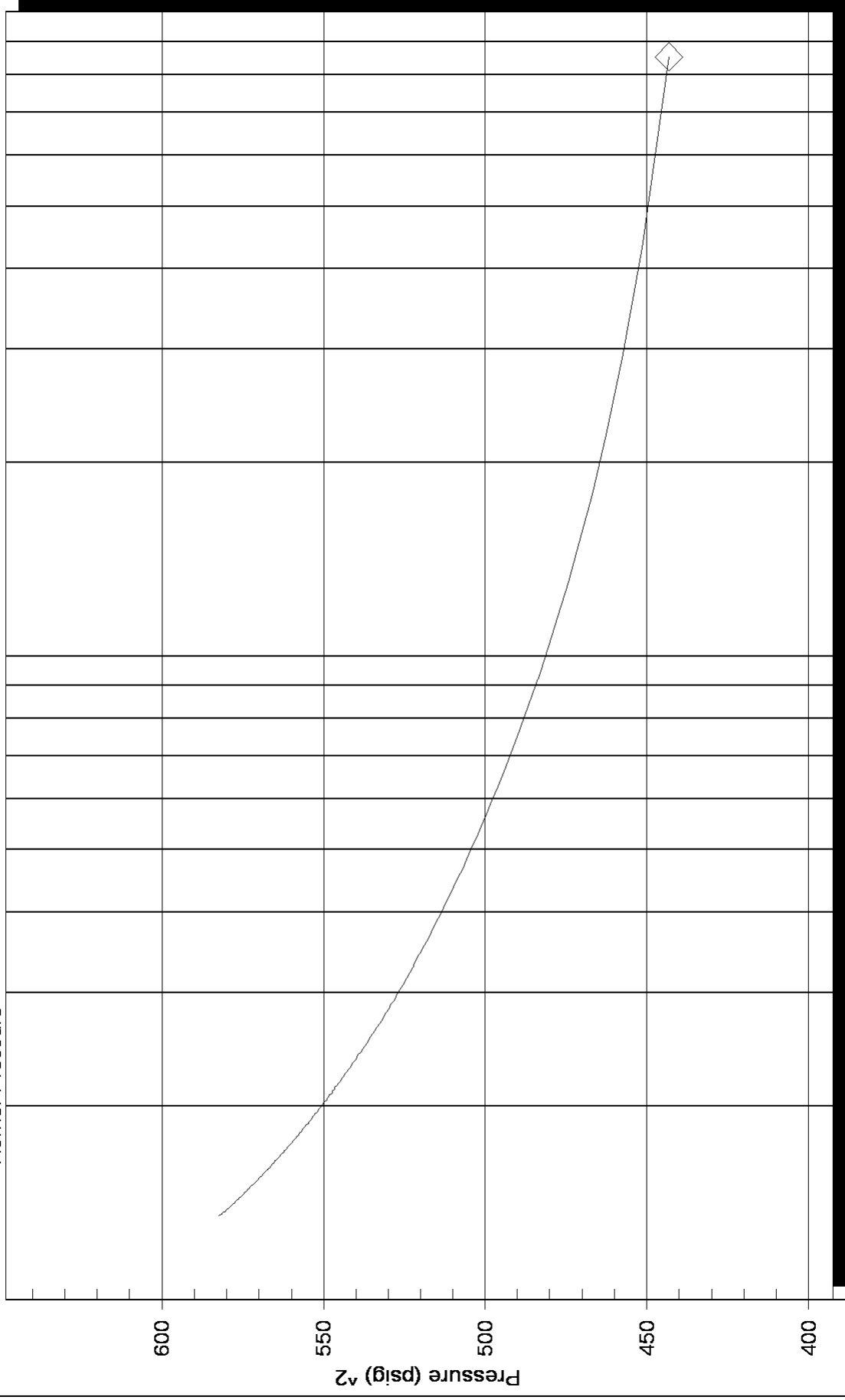
4*10⁰

6*10⁰

8*10⁰

Homer Plot

Horner Pressure



Horner Time: $(T_{wf} + dt) / dt$

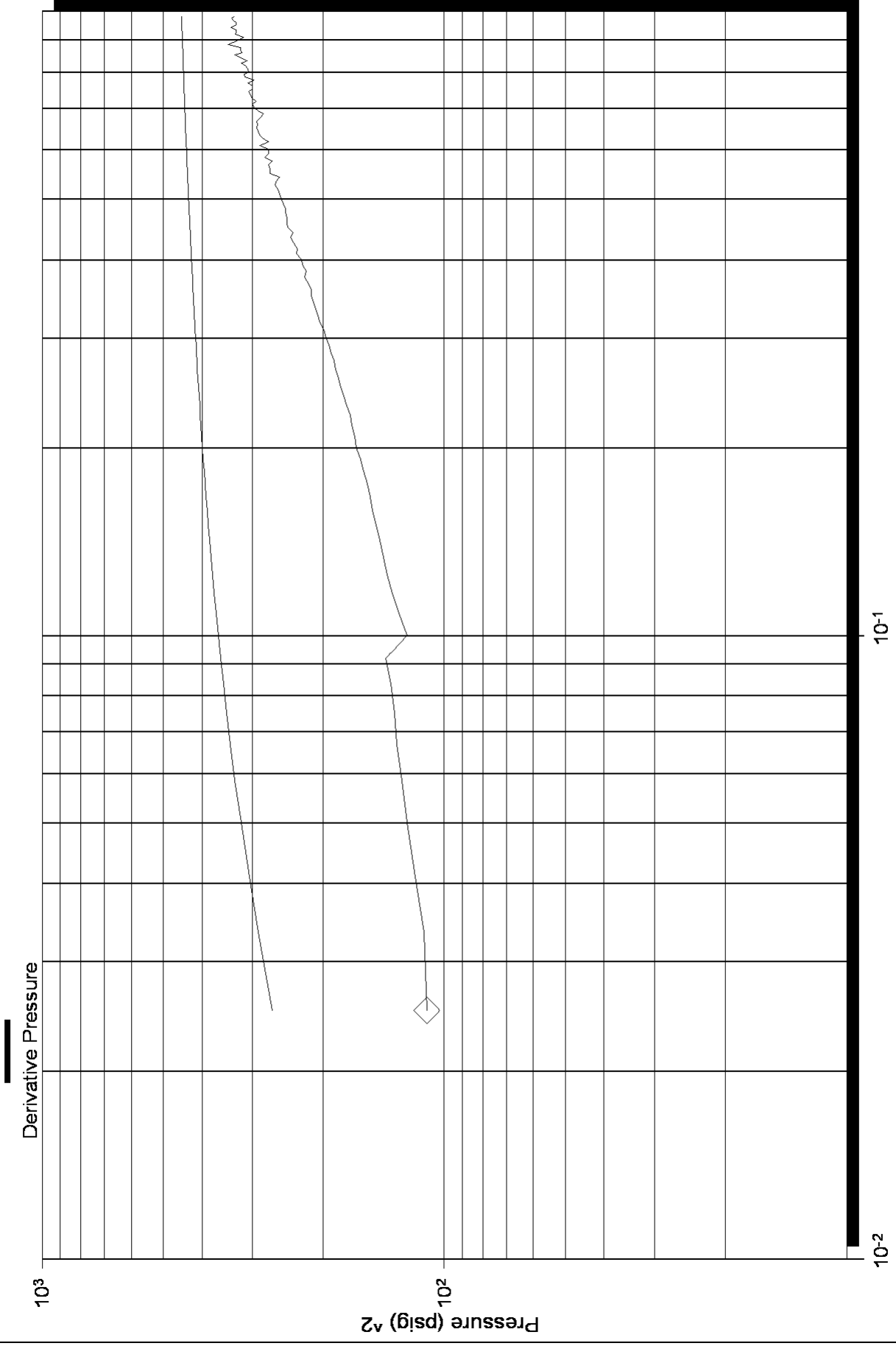
Slope (m) : kpa/log cycle

P* :

Serial Number: 8734 (Outside)

Flow Cycle: 2

Log-Log and Pseudo-Log-Derivative



Log-Log and Pseudo-Derivative

