

Confidentiality Requested:

Yes  No

**KANSAS CORPORATION COMMISSION  
OIL & GAS CONSERVATION DIVISION**

Form ACO-1

January 2018

**Form must be Typed**

**Form must be Signed**

**All blanks must be Filled**

**WELL COMPLETION FORM  
WELL HISTORY - DESCRIPTION OF WELL & LEASE**

OPERATOR: License # \_\_\_\_\_

Name: \_\_\_\_\_

Address 1: \_\_\_\_\_

Address 2: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ + \_\_\_\_\_

Contact Person: \_\_\_\_\_

Phone: ( \_\_\_\_\_ ) \_\_\_\_\_

CONTRACTOR: License # \_\_\_\_\_

Name: \_\_\_\_\_

Wellsite Geologist: \_\_\_\_\_

Purchaser: \_\_\_\_\_

Designate Type of Completion:

New Well  Re-Entry  Workover

Oil  WSW  SWD

Gas  DH  EOR

OG  GSW

CM (Coal Bed Methane)

Cathodic  Other (Core, Expl., etc.): \_\_\_\_\_

If Workover/Re-entry: Old Well Info as follows:

Operator: \_\_\_\_\_

Well Name: \_\_\_\_\_

Original Comp. Date: \_\_\_\_\_ Original Total Depth: \_\_\_\_\_

Deepening  Re-perf.  Conv. to EOR  Conv. to SWD

Plug Back  Liner  Conv. to GSW  Conv. to Producer

Commingled Permit #: \_\_\_\_\_

Dual Completion Permit #: \_\_\_\_\_

SWD Permit #: \_\_\_\_\_

EOR Permit #: \_\_\_\_\_

GSW Permit #: \_\_\_\_\_

Spud Date or Date Reached TD Completion Date or Recompletion Date

API No.: \_\_\_\_\_

Spot Description: \_\_\_\_\_

\_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ Sec. \_\_\_\_\_ Twp. \_\_\_\_\_ S. R. \_\_\_\_\_  East  West

\_\_\_\_\_ Feet from  North /  South Line of Section

\_\_\_\_\_ Feet from  East /  West Line of Section

Footages Calculated from Nearest Outside Section Corner:

NE  NW  SE  SW

GPS Location: Lat: \_\_\_\_\_, Long: \_\_\_\_\_  
(e.g. xx.xxxxx) (e.g. -xxx.xxxxx)

Datum:  NAD27  NAD83  WGS84

County: \_\_\_\_\_

Lease Name: \_\_\_\_\_ Well #: \_\_\_\_\_

Field Name: \_\_\_\_\_

Producing Formation: \_\_\_\_\_

Elevation: Ground: \_\_\_\_\_ Kelly Bushing: \_\_\_\_\_

Total Vertical Depth: \_\_\_\_\_ Plug Back Total Depth: \_\_\_\_\_

Amount of Surface Pipe Set and Cemented at: \_\_\_\_\_ Feet

Multiple Stage Cementing Collar Used?  Yes  No

If yes, show depth set: \_\_\_\_\_ Feet

If Alternate II completion, cement circulated from: \_\_\_\_\_

feet depth to: \_\_\_\_\_ w/ \_\_\_\_\_ sx cmt.

**Drilling Fluid Management Plan**

(Data must be collected from the Reserve Pit)

Chloride content: \_\_\_\_\_ ppm Fluid volume: \_\_\_\_\_ bbls

Dewatering method used: \_\_\_\_\_

Location of fluid disposal if hauled offsite:

Operator Name: \_\_\_\_\_

Lease Name: \_\_\_\_\_ License #: \_\_\_\_\_

Quarter \_\_\_\_\_ Sec. \_\_\_\_\_ Twp. \_\_\_\_\_ S. R. \_\_\_\_\_  East  West

County: \_\_\_\_\_ Permit #: \_\_\_\_\_

**AFFIDAVIT**

I am the affiant and I hereby certify that all requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Submitted Electronically

**KCC Office Use ONLY**

Confidentiality Requested

Date: \_\_\_\_\_

Confidential Release Date: \_\_\_\_\_

Wireline Log Received  Drill Stem Tests Received

Geologist Report / Mud Logs Received

UIC Distribution

ALT  I  II  III Approved by: \_\_\_\_\_ Date: \_\_\_\_\_

Operator Name: \_\_\_\_\_ Lease Name: \_\_\_\_\_ Well #: \_\_\_\_\_

Sec. \_\_\_\_\_ Twp. \_\_\_\_\_ S. R. \_\_\_\_\_  East  West County: \_\_\_\_\_

**INSTRUCTIONS:** Show important tops of formations penetrated. Detail all cores. Report all final copies of drill stems tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface test, along with final chart(s). Attach extra sheet if more space is needed.

Final Radioactivity Log, Final Logs run to obtain Geophysical Data and Final Electric Logs must be emailed to kcc-well-logs@kcc.ks.gov. Digital electronic log files must be submitted in LAS version 2.0 or newer AND an image file (TIFF or PDF).

Drill Stem Tests Taken <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Attach Additional Sheets)</i>  Samples Sent to Geological Survey <input type="checkbox"/> Yes <input type="checkbox"/> No  Cores Taken <input type="checkbox"/> Yes <input type="checkbox"/> No Electric Log Run <input type="checkbox"/> Yes <input type="checkbox"/> No Geologist Report / Mud Logs <input type="checkbox"/> Yes <input type="checkbox"/> No  List All E. Logs Run:	<input type="checkbox"/> Log Formation (Top), Depth and Datum <input type="checkbox"/> Sample  Name Top Datum
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CASING RECORD <input type="checkbox"/> New <input type="checkbox"/> Used							
Report all strings set-conductor, surface, intermediate, production, etc.							
Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs. / Ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives

ADDITIONAL CEMENTING / SQUEEZE RECORD				
Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
<input type="checkbox"/> Perforate <input type="checkbox"/> Protect Casing <input type="checkbox"/> Plug Back TD <input type="checkbox"/> Plug Off Zone				

1. Did you perform a hydraulic fracturing treatment on this well?  Yes  No *(If No, skip questions 2 and 3)*
2. Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons?  Yes  No *(If No, skip question 3)*
3. Was the hydraulic fracturing treatment information submitted to the chemical disclosure registry?  Yes  No *(If No, fill out Page Three of the ACO-1)*

Date of first Production/Injection or Resumed Production/Injection:	Producing Method: <input type="checkbox"/> Flowing <input type="checkbox"/> Pumping <input type="checkbox"/> Gas Lift <input type="checkbox"/> Other <i>(Explain)</i> _____			
Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio Gravity

DISPOSITION OF GAS: <input type="checkbox"/> Vented <input type="checkbox"/> Sold <input type="checkbox"/> Used on Lease <i>(If vented, Submit ACO-18.)</i>	METHOD OF COMPLETION: <input type="checkbox"/> Open Hole <input type="checkbox"/> Perf. <input type="checkbox"/> Dually Comp. <input type="checkbox"/> Commingled <i>(Submit ACO-5)</i> <i>(Submit ACO-4)</i>	PRODUCTION INTERVAL: Top Bottom
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Shots Per Foot	Perforation Top	Perforation Bottom	Bridge Plug Type	Bridge Plug Set At	Acid, Fracture, Shot, Cementing Squeeze Record <i>(Amount and Kind of Material Used)</i>

TUBING RECORD:	Size:	Set At:	Packer At:	
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Form	ACO1 - Well Completion
Operator	Norstar Petroleum, Inc.
Well Name	THE SISTERS 1-15
Doc ID	1368659

Tops

Name	Top	Datum
Anhydrite	1990	+669
Heebner	3928	-1269
Lansing	3968	-1309
Stark Shale	4236	-1577
Marmaton	4351	-1692
Ft. Scott	4492	-1833
Cherokee Sh	4515	-1856
Cherokee Sand	4570	-1911
Mississippi	4606	-1947



JOB LOG

SWIFT Services, Inc.

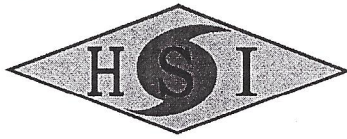
DATE 9-5-17 PAGE NO. 1

CUSTOMER NORSTAR PETROLEUM WELL NO. 1-15 LEASE SYSTERS JOB TYPE 8 5/8" SURFACE TICKET NO. 30626

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL/GAL)	PUMPS		PRESSURE (PSI)		DESCRIPTION OF OPERATION AND MATERIALS
				T	C	TUBING	CASING	
	1500							ON LOCATION - CIRCULATING T.D. w/ BIT
								TD - 307' SET - 302'
								TP - 307' 8 5/8" # 23
								15' CEMENT LEFT IN CASING
	1830							CASING ON BOTTOM
	1840							BREAK CIRCULATION - MUD PUMP
	1850	4 1/2	45		✓		150	MIX CEMENT - 185 SWS STANDARD 2% GEL, 3% CC
	1902	6	0		✓		200	DISPLACE CEMENT
	1905		18 3/4					CEMENT DISPLACED - SHUT IN
								CIRCULATED 20 SWS CEMENT TO PAD
								WASH TRUCK
	2000							JOB COMPLETE

THANK YOU  
WAYNE, DAVE K., KIRBY

**TREATMENT REPORT**



**HURRICANE SERVICES INC**

<b>Customer:</b> Northstar Petroleum	<b>Date:</b> 9/16/2017	<b>Ticket No.:</b> 100804
<b>Field Rep:</b> Mike Kern		
<b>Address:</b>		
<b>City, State:</b>		
<b>County, Zip:</b>		

<b>Field Order No.:</b> 100804	<b>Open Hole:</b>	<b>Perf Depths (ft)</b>	<b>Perfs</b>
<b>Well Name:</b> The Sisters 1-15	<b>Casing Depth:</b>		
<b>Location:</b> Alamota	<b>Casing Size:</b>		
<b>Formation:</b>	<b>Tubing Depth:</b> 2030'		
<b>Type of Service:</b> PTA	<b>Tubing Size:</b> 4 1/2 16.6 Lb		
<b>Well Type:</b> Oil	<b>Liner Depth:</b>		
<b>Age of Well:</b> New	<b>Liner Size:</b>		
<b>Packer Type:</b>	<b>Liner Top:</b>		
<b>Packer Depth:</b>	<b>Liner Bottom:</b>		
<b>Treatment Via:</b> 4 1/2 Drill Pipe	<b>Total Depth:</b>		
		<b>Total Perfs</b>	<b>0</b>

TIME	INJECTION RATE FLUID	N2/CO2	PRESSURE STP	ANNULUS	REMARKS	PROP (lbs)	HCL (gls)	FLUID (bbls)
12:00 AM					Called Out			
1:30 AM					On Location With Trucks Hold Safety Meeting			
					Spot & Set Up Trucks			
					1 St Plug @ 2030' 50 Sacks 60/40 4% Gel			
5:25 AM	4.3		80.0		Start Pumping H2O			15.00
	4.0		280.0		Start Mix & Pump 50 Sk 60/40 4% Gel			12.65
	4.0		280.0		Start Displacement H2O			5.00
	7.0		350.0		Start Displace wRig Mud			20.00
5:50 AM					Shut Down PDPOOH			
					2 nd Plug @ 1170' 80 Sacks 60/40 4% Gel			
6:30 AM	4.0		140.0		Start Pumping H2O			10.00
	4.0		230.0		Start Mix & Pump 80 Sk 60/40 4% Gel			20.23
	4.0		350.0		Start Displacement H2O			3.00
	7.0		200.0		Start Displace wRig Mud			8.00
6:50 AM					Shut Down PDPOOH			
					3 rd Plug @ 600' 40 Sacks 60/40 4% Gel			
7:05 AM	3.5		150.0		Start Pumping H2O			5.00
	3.5		150.0		Start Mix & Pump 40 Sk 60/40 4% Gel			10.12
<b>TOTAL:</b>						-	-	144.31

**SUMMARY**

Max Fl. Rate	Avg Fl. Rate	Max PSI	Avg PSI
7.0	4.2	350.0	184.1

**PRODUCTS USED**

270 Sacks 60/40 4% Gel

Treater: Brad Starks

Customer: Mike Kern







## DRILL STEM TEST REPORT

Prepared For: **Norstar Petroleum Inc.**

88 Inverness Cir.E Unit F104  
Englewood CO. 80112

ATTN: Aaron Young

### **The Sisters #1-15**

### **15-19s-27w Lane,KS**

Start Date: 2017.09.12 @ 14:26:15

End Date: 2017.09.12 @ 20:34:30

Job Ticket #: 63847                      DST #: 1

Trilobite Testing, Inc

PO Box 362 Hays, KS 67601

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

Printed: 2017.09.18 @ 11:43:11





**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Norstar Petroleum Inc.  
 88 Inverness Cir.E Unit F104  
 Englewood CO. 80112  
 ATTN: Aaron Young

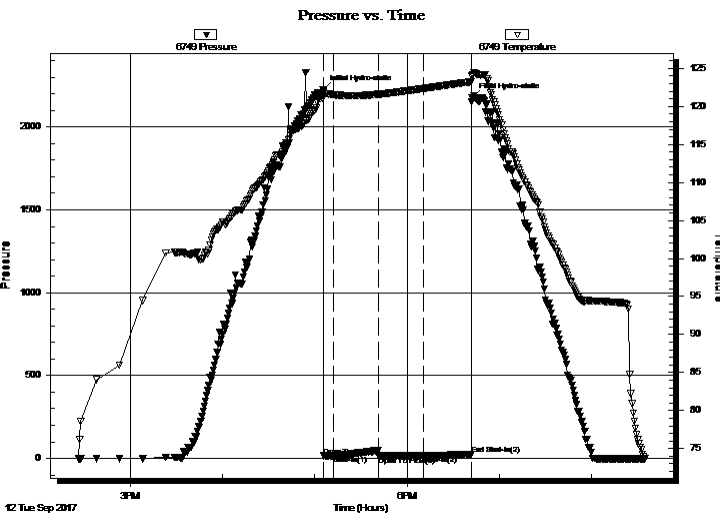
**15-19s-27w Lane,KS**  
**The Sisters #1-15**  
 Job Ticket: 63847 **DST#: 1**  
 Test Start: 2017.09.12 @ 14:26:15

## GENERAL INFORMATION:

Formation: **Ft. Scott**  
 Deviated: No Whipstock: ft (KB)  
 Test Type: Conventional Bottom Hole (Initial)  
 Time Tool Opened: 17:05:45 Tester: Mike Roberts  
 Time Test Ended: 20:34:30 Unit No: 81  
 Interval: **4480.00 ft (KB) To 4510.00 ft (KB) (TVD)** Reference Elevations: 2659.00 ft (KB)  
 Total Depth: 4510.00 ft (KB) (TVD) 2654.00 ft (CF)  
 Hole Diameter: 7.88 inches Hole Condition: Fair KB to GR/CF: 5.00 ft

**Serial #: 6749 Outside**  
 Press@RunDepth: 15.84 psig @ 4481.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2017.09.12 End Date: 2017.09.12 Last Calib.: 2017.09.12  
 Start Time: 14:26:15 End Time: 20:34:30 Time On Btm: 2017.09.12 @ 17:05:30  
 Time Off Btm: 2017.09.12 @ 18:42:15

**TEST COMMENT:** IF: Built to weak surface blow and died in 3 min.  
 IS: No return blow  
 FF: No blow  
 FS: No return blow



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2226.35	121.95	Initial Hydro-static
1	15.16	121.28	Open To Flow (1)
7	15.96	121.54	Shut-In(1)
36	49.53	121.60	End Shut-In(1)
36	15.71	121.59	Open To Flow (2)
66	15.84	122.35	Shut-In(2)
97	25.01	123.25	End Shut-In(2)
97	2175.49	123.96	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
2.00	mud 100% m	0.01

## Gas Rates

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



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Norstar Petroleum Inc.

**15-19s-27w Lane, KS**

88 Inverness Cir.E Unit F104  
Englewood CO. 80112

**The Sisters #1-15**

Job Ticket: 63847

**DST#: 1**

ATTN: Aaron Young

Test Start: 2017.09.12 @ 14:26:15

## GENERAL INFORMATION:

Formation: **Ft. Scott**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 17:05:45

Time Test Ended: 20:34:30

Test Type: Conventional Bottom Hole (Initial)

Tester: Mike Roberts

Unit No: 81

**Interval: 4480.00 ft (KB) To 4510.00 ft (KB) (TVD)**

Total Depth: 4510.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 2659.00 ft (KB)

2654.00 ft (CF)

KB to GR/CF: 5.00 ft

**Serial #: 8672 Inside**

Press@RunDepth: psig @ 4481.00 ft (KB)

Start Date: 2017.09.12

End Date: 2017.09.12

Start Time: 14:26:15

End Time: 20:34:45

Capacity: 8000.00 psig

Last Calib.: 2017.09.12

Time On Btm:

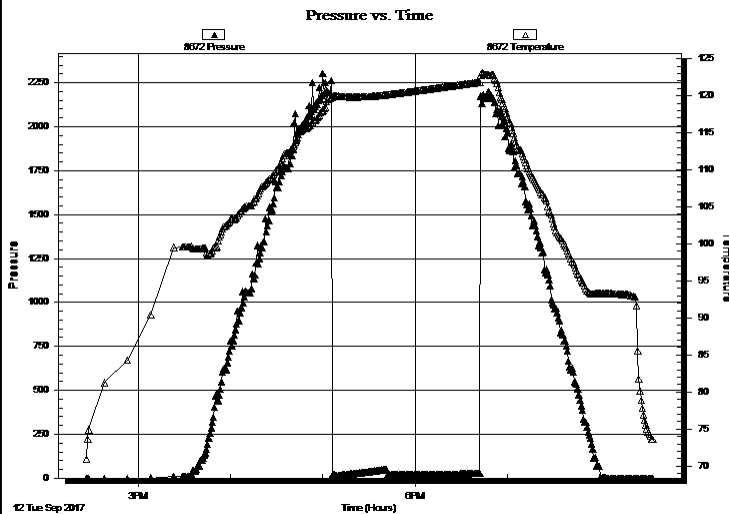
Time Off Btm:

TEST COMMENT: IF: Built to weak surface blow and died in 3 min.

IS: No return blow

FF: No blow

FS: No return blow



## PRESSURE SUMMARY

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

## Recovery

Length (ft)	Description	Volume (bbl)
2.00	mud 100%m	0.01

## Gas Rates

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



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Norstar Petroleum Inc.

**15-19s-27w Lane, KS**

88 Inverness Cir. E Unit F104  
Englewood CO. 80112

**The Sisters #1-15**

Job Ticket: 63847

**DST#: 1**

ATTN: Aaron Young

Test Start: 2017.09.12 @ 14:26:15

## Tool Information

Drill Pipe:	Length: 4343.00 ft	Diameter: 3.80 inches	Volume: 60.92 bbl	Tool Weight: 1500.00 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: 121.00 ft	Diameter: 2.25 inches	Volume: 0.60 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 61.52 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	12.00 ft			String Weight: Initial 64000.00 lb
Depth to Top Packer:	4480.00 ft			Final 64000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	30.00 ft			
Tool Length:	58.00 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			4453.00	
Shut In Tool	5.00			4458.00	
Hydraulic tool	5.00			4463.00	
Jars	5.00			4468.00	
Safety Joint	3.00			4471.00	
Packer	5.00			4476.00	28.00 Bottom Of Top Packer
Packer	4.00			4480.00	
Stubb	1.00			4481.00	
Recorder	0.00	8672	Inside	4481.00	
Recorder	0.00	6749	Outside	4481.00	
Perforations	24.00			4505.00	
Bullnose	5.00			4510.00	30.00 Bottom Packers & Anchor

**Total Tool Length: 58.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

## FLUID SUMMARY

Norstar Petroleum Inc.

15-19s-27w Lane, KS

88 Inverness Cir. E Unit F104  
Englewood CO. 80112

**The Sisters #1-15**

Job Ticket: 63847

**DST#: 1**

ATTN: Aaron Young

Test Start: 2017.09.12 @ 14:26:15

### Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

0 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

0 ppm

Viscosity: 55.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 8.74 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 3800.00 ppm

Filter Cake: 1.00 inches

### Recovery Information

Recovery Table

Length ft	Description	Volume bbl
2.00	mud 100% m	0.010

Total Length: 2.00 ft      Total Volume: 0.010 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

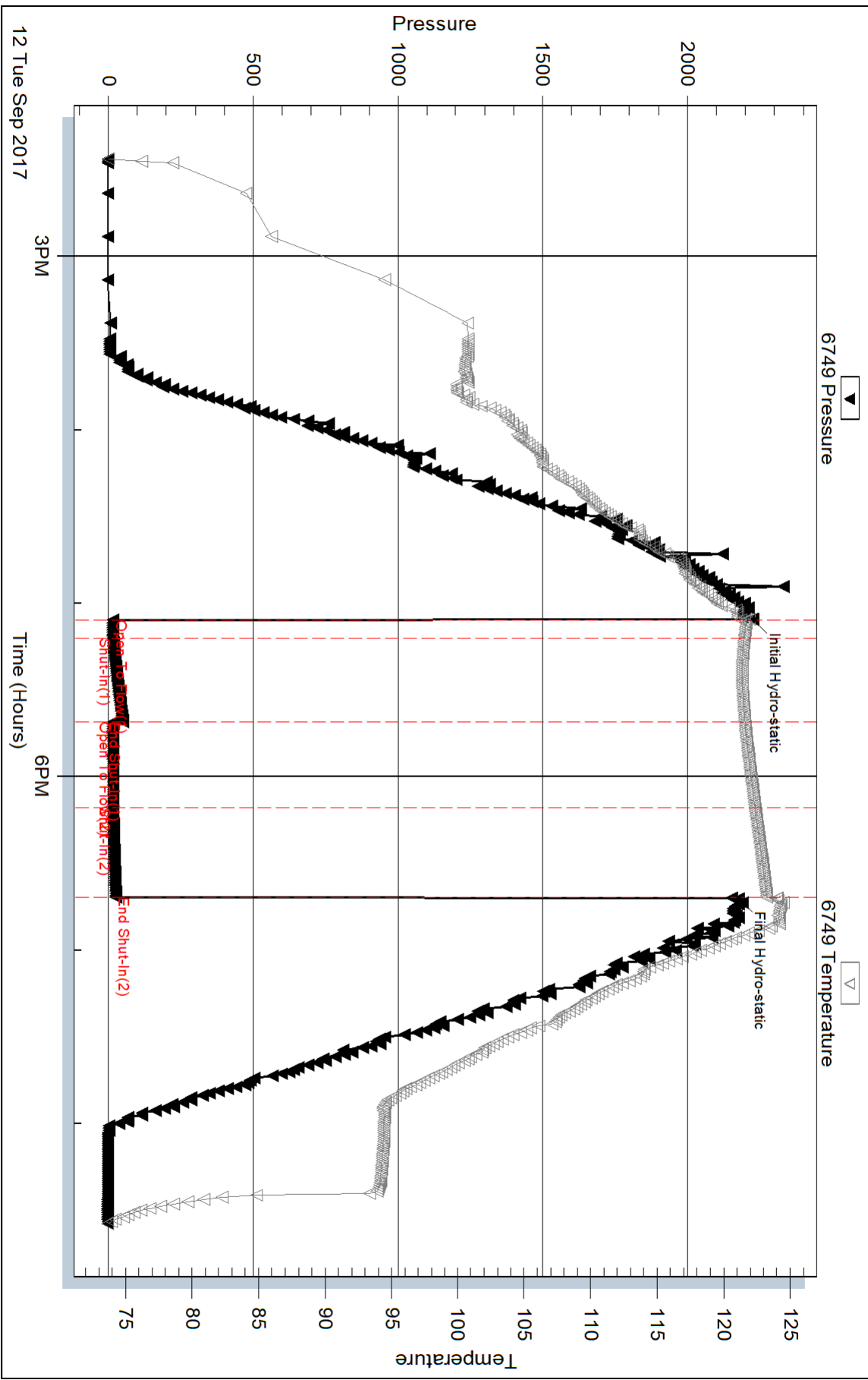
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

### Pressure vs. Time



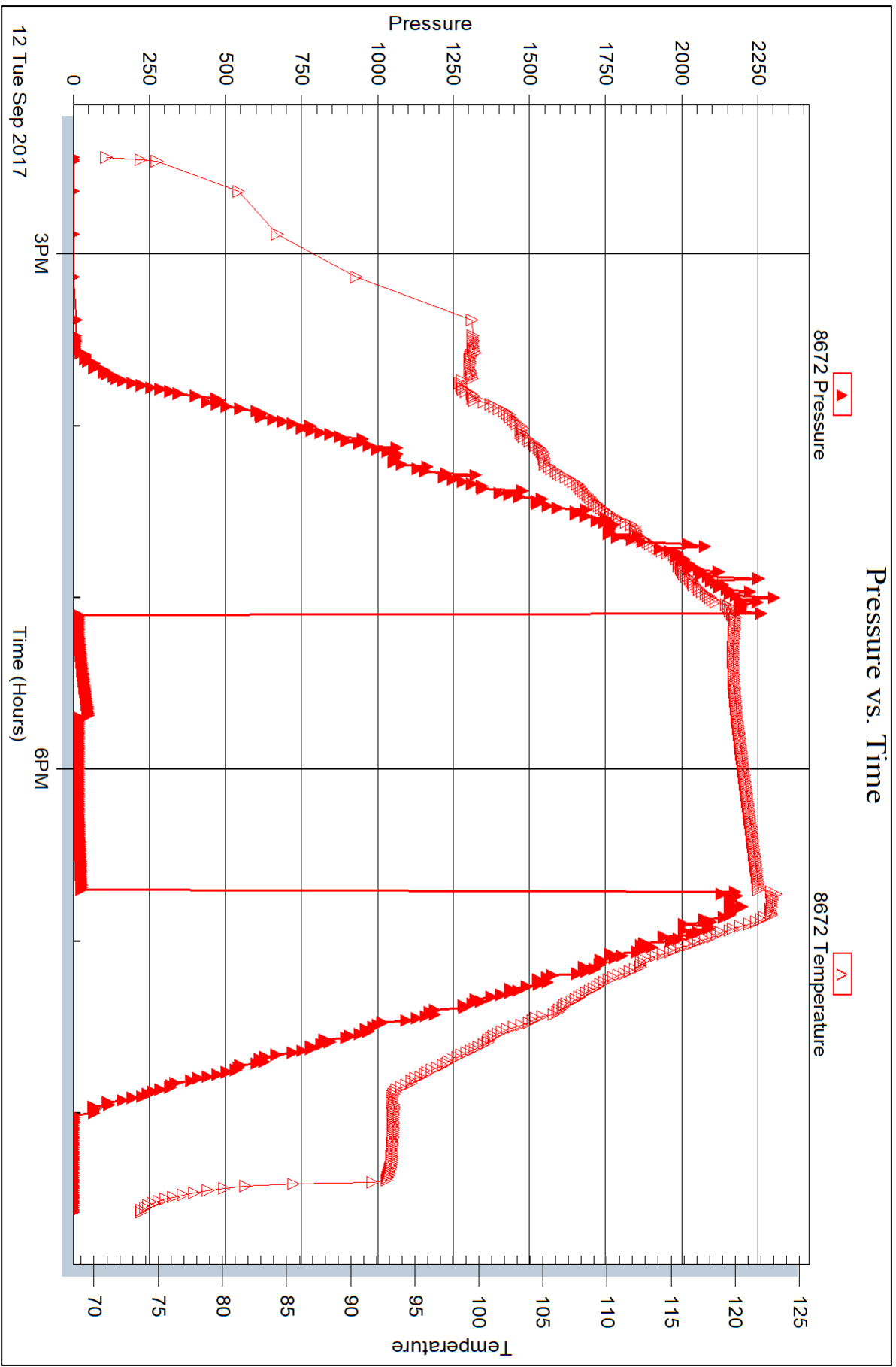
Serial #: 8672

Inside

Norstar Petroleum Inc.

The Sisters #1-15

DST Test Number: 1







## DRILL STEM TEST REPORT

Prepared For: **Norstar Petroleum Inc.**

88 Inverness Cir.E Unit F104  
Englewood CO. 80112

ATTN: Aaron Young

### **The Sisters #1-15**

#### **15-19s-27w Lane,KS**

Start Date: 2017.09.13 @ 20:23:15

End Date: 2017.09.14 @ 02:23:15

Job Ticket #: 63848                      DST #: 2

Trilobite Testing, Inc

PO Box 362 Hays, KS 67601

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

Printed: 2017.09.18 @ 11:41:13



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Norstar Petroleum Inc.  
 88 Inverness Cir.E Unit F104  
 Englewood CO. 80112  
 ATTN: Aaron Young

**15-19s-27w Lane,KS**  
**The Sisters #1-15**  
 Job Ticket: 63848 **DST#: 2**  
 Test Start: 2017.09.13 @ 20:23:15

## GENERAL INFORMATION:

Formation: **Cherokee**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 22:33:30  
 Time Test Ended: 02:23:15  
 Interval: **4534.00 ft (KB) To 4584.00 ft (KB) (TVD)**  
 Total Depth: 4584.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Fair  
 Test Type: Conventional Bottom Hole (Reset)  
 Tester: Mike Roberts  
 Unit No: 81  
 Reference Elevations: 2659.00 ft (KB)  
 2654.00 ft (CF)  
 KB to GR/CF: 5.00 ft

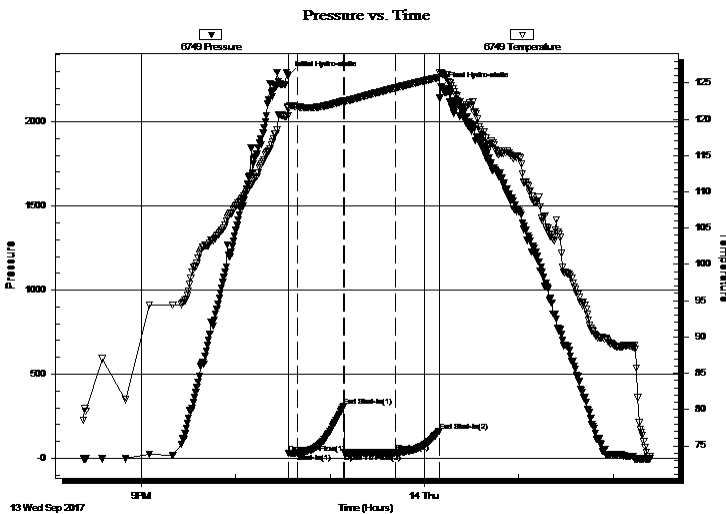
## Serial #: 6749

Outside

Press@RunDepth: 33.35 psig @ 4579.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2017.09.13 End Date: 2017.09.14 Last Calib.: 2017.09.14  
 Start Time: 20:23:15 End Time: 02:23:15 Time On Btm: 2017.09.13 @ 22:33:15  
 Time Off Btm: 2017.09.14 @ 00:10:30

TEST COMMENT: IF:Weak surface blow  
 IS:No return blow  
 FF:No blow  
 FS:No return blow

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2273.73	121.77	Initial Hydro-static
1	31.17	120.52	Open To Flow (1)
6	32.09	121.75	Shut-In(1)
36	307.83	122.51	End Shut-In(1)
36	32.08	122.45	Open To Flow (2)
69	33.35	124.33	Shut-In(2)
96	162.34	125.78	End Shut-In(2)
98	2205.56	126.38	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
5.00	mud 100%m	0.02

\* Recovery from multiple tests

## Gas Rates

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



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

Norstar Petroleum Inc.  
88 Inverness Cir.E Unit F104  
Englewood CO. 80112  
ATTN: Aaron Young

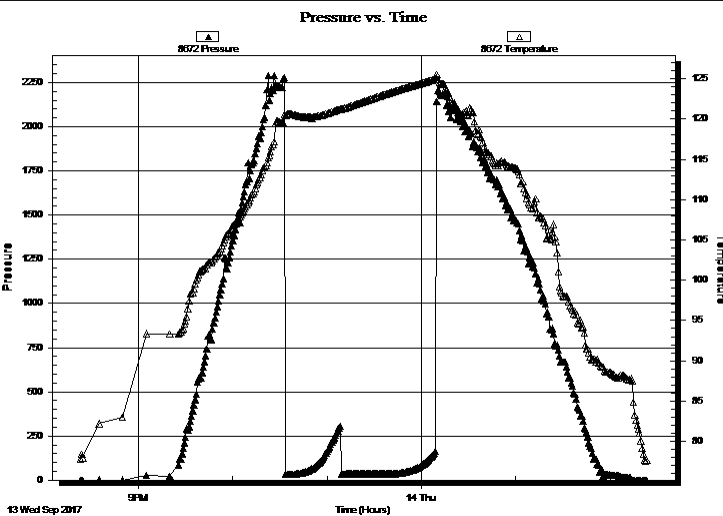
**15-19s-27w Lane,KS**  
**The Sisters #1-15**  
Job Ticket: 63848 **DST#: 2**  
Test Start: 2017.09.13 @ 20:23:15

## GENERAL INFORMATION:

Formation: **Cherokee**  
Deviated: No Whipstock: ft (KB) Test Type: Conventional Bottom Hole (Reset)  
Time Tool Opened: 22:33:30 Tester: Mike Roberts  
Time Test Ended: 02:23:15 Unit No: 81  
Interval: **4534.00 ft (KB) To 4584.00 ft (KB) (TVD)** Reference Elevations: 2659.00 ft (KB)  
Total Depth: 4584.00 ft (KB) (TVD) 2654.00 ft (CF)  
Hole Diameter: 7.88 inches Hole Condition: Fair KB to GR/CF: 5.00 ft

**Serial #: 8672** Inside  
Press@RunDepth: psig @ 4579.00 ft (KB) Capacity: 8000.00 psig  
Start Date: 2017.09.13 End Date: 2017.09.14 Last Calib.: 2017.09.14  
Start Time: 20:23:15 End Time: 02:23:15 Time On Btm:  
Time Off Btm:

TEST COMMENT: IF:Weak surface blow  
IS:No return blow  
FF:No blow  
FS:No return blow



## PRESSURE SUMMARY

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

## Recovery

Length (ft)	Description	Volume (bbl)
5.00	mud 100%m	0.02

## Gas Rates

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

\* Recovery from multiple tests



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Norstar Petroleum Inc.

**15-19s-27w Lane, KS**

88 Inverness Cir. E Unit F104  
Englewood CO. 80112

**The Sisters #1-15**

Job Ticket: 63848

**DST#: 2**

ATTN: Aaron Young

Test Start: 2017.09.13 @ 20:23:15

## Tool Information

Drill Pipe:	Length: 4407.00 ft	Diameter: 3.80 inches	Volume: 61.82 bbl	Tool Weight: 1500.00 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: 121.00 ft	Diameter: 2.25 inches	Volume: 0.60 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 62.42 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	22.00 ft			String Weight: Initial 64000.00 lb
Depth to Top Packer:	4534.00 ft			Final 64000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	50.00 ft			
Tool Length:	78.00 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			4507.00	
Shut In Tool	5.00			4512.00	
Hydraulic tool	5.00			4517.00	
Jars	5.00			4522.00	
Safety Joint	3.00			4525.00	
Packer	5.00			4530.00	28.00 Bottom Of Top Packer
Packer	4.00			4534.00	
Stubb	1.00			4535.00	
Perforations	1.00			4536.00	
Change Over Sub	1.00			4537.00	
Drill Pipe	31.00			4568.00	
Change Over Sub	1.00			4569.00	
Perforations	10.00			4579.00	
Recorder	0.00	8672	Inside	4579.00	
Recorder	0.00	6749	Outside	4579.00	
Bullnose	5.00			4584.00	50.00 Bottom Packers & Anchor
<b>Total Tool Length:</b>	<b>78.00</b>				



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Norstar Petroleum Inc.

**15-19s-27w Lane, KS**

88 Inverness Cir. E Unit F104  
Englewood CO. 80112

**The Sisters #1-15**

Job Ticket: 63848

**DST#: 2**

ATTN: Aaron Young

Test Start: 2017.09.13 @ 20:23:15

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

0 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

0 ppm

Viscosity: 55.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 9.55 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 4000.00 ppm

Filter Cake: 1.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
5.00	mud 100% m	0.025

Total Length: 5.00 ft      Total Volume: 0.025 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

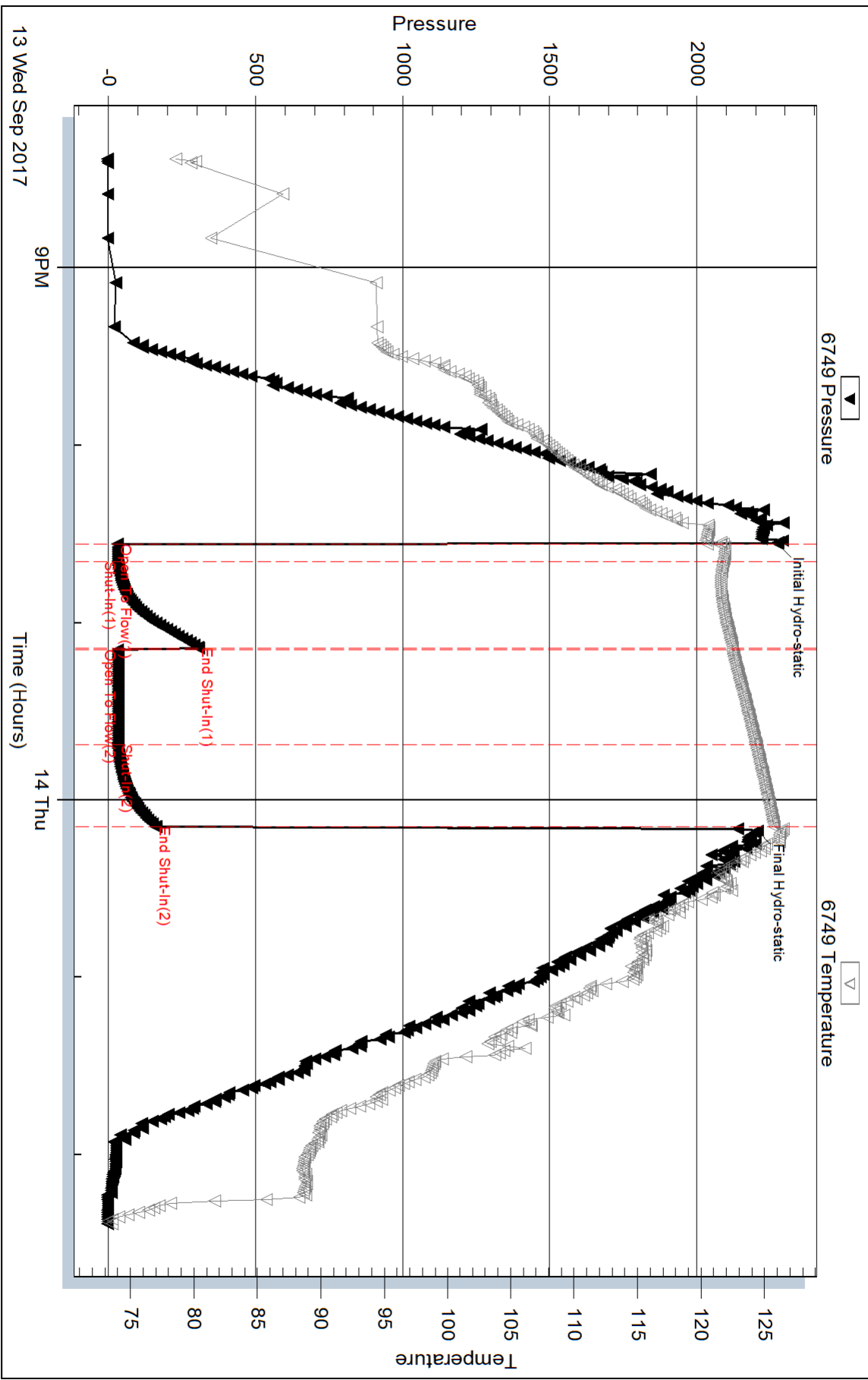
Serial #: 6749

Outside Norstar Petroleum Inc.

The Sisters #1-15

DST Test Number: 2

### Pressure vs. Time



Triobite Testing, Inc

Ref. No: 63848

Printed: 2017.09.18 @ 11:41:14



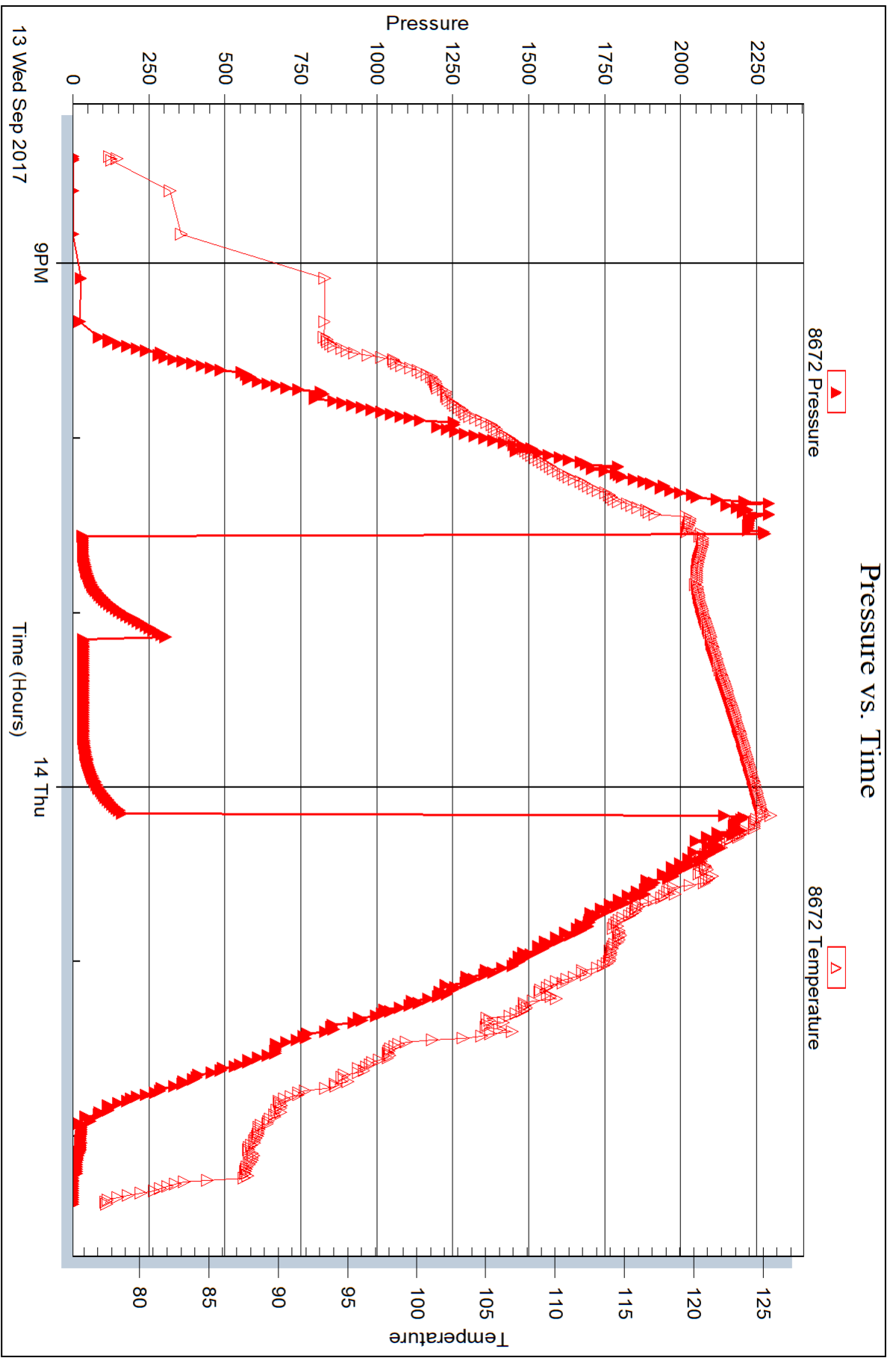
Serial #: 8672

Inside

Norstar Petroleum Inc.

The Sisters #1-15

DST Test Number: 2



Trilobite Testing, Inc

Ref. No: 63848

Printed: 2017.09.18 @ 11:41:14



## DRILL STEM TEST REPORT

Prepared For: **Norstar Petroleum Inc.**

88 Inverness Cir.E Unit F104  
Englewood CO. 80112

ATTN: Aaron Young

### **The Sisters #1-15**

### **15-19s-27w Lane,KS**

Start Date: 2017.09.15 @ 11:05:15

End Date: 2017.09.15 @ 16:56:30

Job Ticket #: 63849                      DST #: 3

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

Printed: 2017.09.18 @ 11:40:07



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Norstar Petroleum Inc.  
 88 Inverness Cir.E Unit F104  
 Englewood CO. 80112  
 ATTN: Aaron Young

**15-19s-27w Lane,KS**  
**The Sisters #1-15**  
 Job Ticket: 63849 **DST#: 3**  
 Test Start: 2017.09.15 @ 11:05:15

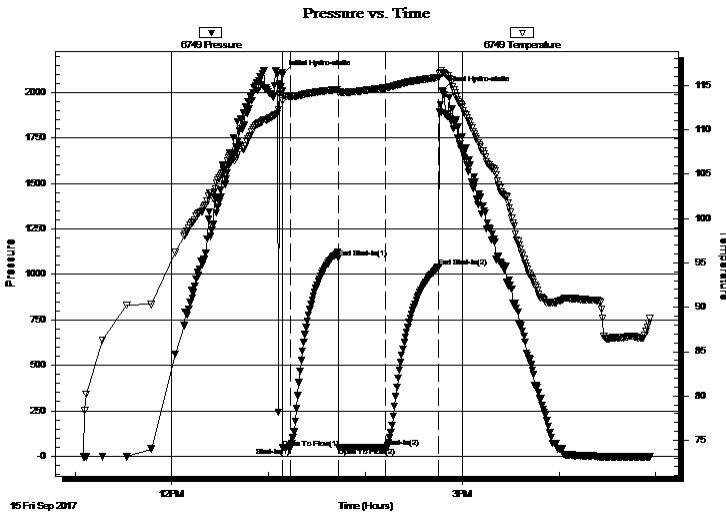
## GENERAL INFORMATION:

Formation: **LKC J**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 13:08:45  
 Time Test Ended: 16:56:30  
 Interval: **4147.00 ft (KB) To 4169.00 ft (KB) (TVD)**  
 Total Depth: 4630.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Fair  
 Test Type: Conventional Straddle (Reset)  
 Tester: Mike Roberts  
 Unit No: 81  
 Reference Elevations: 2659.00 ft (KB)  
 2654.00 ft (CF)  
 KB to GR/CF: 5.00 ft

**Serial #: 6749 Outside**  
 Press@RunDepth: 48.52 psig @ 4150.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2017.09.15 End Date: 2017.09.15 Last Calib.: 2017.09.15  
 Start Time: 11:05:15 End Time: 16:56:30 Time On Btm: 2017.09.15 @ 13:08:30  
 Time Off Btm: 2017.09.15 @ 14:47:45

**TEST COMMENT:** IF: Built to weak surface blow  
 IS: No return blow  
 FF: No blow  
 FS: No return blow

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2095.92	114.38	Initial Hydro-static
1	47.05	113.34	Open To Flow (1)
5	46.65	113.72	Shut-In(1)
35	1089.68	114.54	End Shut-In(1)
35	48.32	114.22	Open To Flow (2)
64	48.52	114.74	Shut-In(2)
97	1042.12	115.91	End Shut-In(2)
100	2011.20	116.50	Final Hydro-static

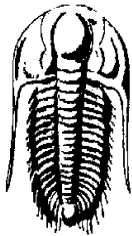
## Recovery

Length (ft)	Description	Volume (bbl)
70.00	mud 100% m	0.34

\* Recovery from multiple tests

## Gas Rates

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



**TRILOBITE  
TESTING, INC.**

**DRILL STEM TEST REPORT**

Norstar Petroleum Inc.  
88 Inverness Cir.E Unit F104  
Englewood CO. 80112  
ATTN: Aaron Young

**15-19s-27w Lane,KS**  
**The Sisters #1-15**  
Job Ticket: 63849      **DST#: 3**  
Test Start: 2017.09.15 @ 11:05:15

**GENERAL INFORMATION:**

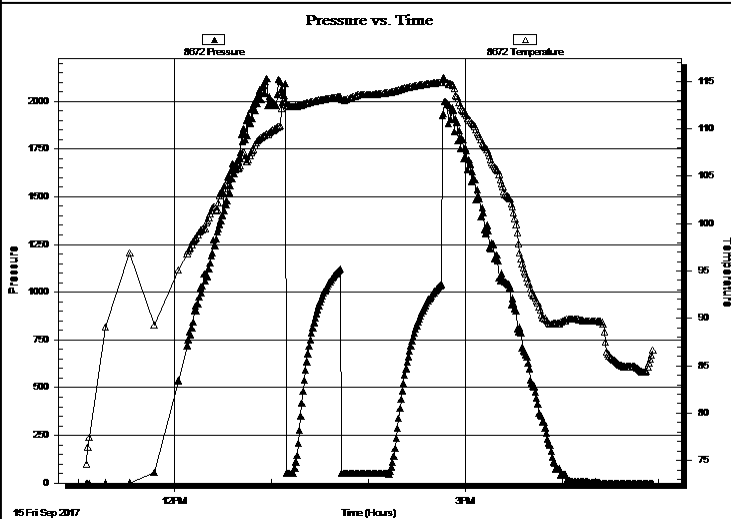
Formation: **LKC J**  
Deviated: No Whipstock: ft (KB)      Test Type: Conventional Straddle (Reset)  
Time Tool Opened: 13:08:45      Tester: Mike Roberts  
Time Test Ended: 16:56:30      Unit No: 81

Interval: **4147.00 ft (KB) To 4169.00 ft (KB) (TVD)**      Reference Elevations: 2659.00 ft (KB)  
Total Depth: 4630.00 ft (KB) (TVD)      2654.00 ft (CF)  
Hole Diameter: 7.88 inches Hole Condition: Fair      KB to GR/CF: 5.00 ft

**Serial #: 8672      Inside**

Press@RunDepth:      psig @      4150.00 ft (KB)      Capacity: 8000.00 psig  
Start Date: 2017.09.15      End Date: 2017.09.15      Last Calib.: 2017.09.15  
Start Time: 11:05:15      End Time: 16:56:15      Time On Btm:  
Time Off Btm:

TEST COMMENT: IF: Built to weak surface blow  
IS: No return blow  
FF: No blow  
FS: No return blow



**PRESSURE SUMMARY**

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

**Recovery**

Length (ft)	Description	Volume (bbl)
70.00	mud 100% m	0.34

**Gas Rates**

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

\* Recovery from multiple tests



# TRILOBITE TESTING, INC.

## DRILL STEM TEST REPORT

Norstar Petroluem Inc.

15-19s-27w Lane,KS

88 Inverness Cir.E Unit F104  
Englewood CO. 80112

The Sisters #1-15

Job Ticket: 63849

DST#: 3

ATTN: Aaron Young

Test Start: 2017.09.15 @ 11:05:15

### GENERAL INFORMATION:

Formation: **LKC J**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 13:08:45

Time Test Ended: 16:56:30

Interval: **4147.00 ft (KB) To 4169.00 ft (KB) (TVD)**

Total Depth: 4630.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Test Type: Conventional Straddle (Reset)

Tester: Mike Roberts

Unit No: 81

Reference Elevations: 2659.00 ft (KB)

2654.00 ft (CF)

KB to GR/CF: 5.00 ft

Serial #: **8647**

Below (Straddle)

Press@RunDepth: psig @ 4626.00 ft (KB)

Start Date: 2017.09.15 End Date: 2017.09.15

Start Time: 11:05:15 End Time: 16:55:45

Capacity: 8000.00 psig

Last Calib.: 2017.09.15

Time On Btm:

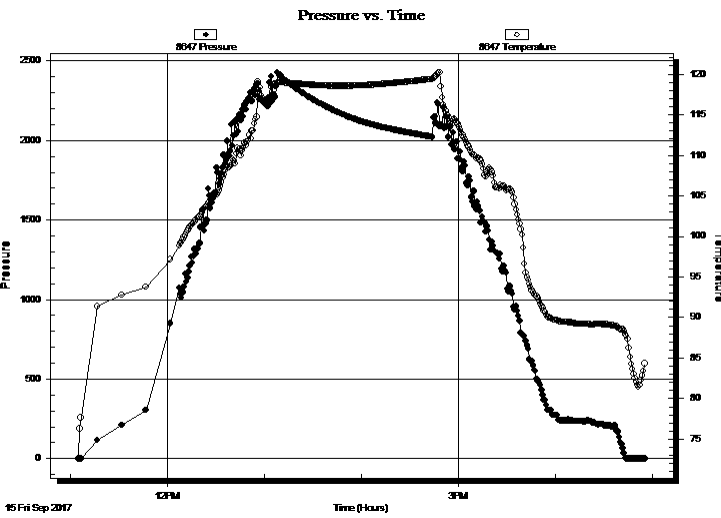
Time Off Btm:

TEST COMMENT: IF: Built to weak surface blow

IS: No return blow

FF: No blow

FS: No return blow



### PRESSURE SUMMARY

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

### Recovery

Length (ft)	Description	Volume (bbl)
70.00	mud 100% m	0.34

\* Recovery from multiple tests

### Gas Rates

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



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Norstar Petroleum Inc.

**15-19s-27w Lane, KS**

88 Inverness Cir. E Unit F104  
Englewood CO. 80112

**The Sisters #1-15**

Job Ticket: 63849

**DST#: 3**

ATTN: Aaron Young

Test Start: 2017.09.15 @ 11:05:15

## Tool Information

Drill Pipe:	Length: 4081.00 ft	Diameter: 3.80 inches	Volume: 57.25 bbl	Tool Weight: 1500.00 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: 121.00 ft	Diameter: 2.25 inches	Volume: 0.60 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 57.85 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	83.00 ft			String Weight: Initial 64000.00 lb
Depth to Top Packer:	4147.00 ft			Final 64000.00 lb
Depth to Bottom Packer:	4166.00 ft			
Interval between Packers:	19.00 ft			
Tool Length:	513.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments: Rig ran 7 stands of pipe in tailpipe instead of 6 Tested the incorrect interval.

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			4120.00	
Shut In Tool	5.00			4125.00	
Hydraulic tool	5.00			4130.00	
Jars	5.00			4135.00	
Safety Joint	3.00			4138.00	
Packer	5.00			4143.00	28.00 Bottom Of Top Packer
Packer	4.00			4147.00	
Stubb	1.00			4148.00	
Perforations	2.00			4150.00	
Recorder	0.00	8672	Inside	4150.00	
Recorder	0.00	6749	Outside	4150.00	
Perforations	10.00			4160.00	
Blank Off Sub	1.00			4161.00	
Packer - Shale	5.00			4166.00	19.00 Tool Interval
Packer	5.00			4171.00	
Stubb	1.00			4172.00	
Perforations	15.00			4187.00	
Change Over Sub	1.00			4188.00	
Drill Pipe	438.00			4626.00	
Recorder	0.00	8647	Below	4626.00	
Change Over Sub	1.00			4627.00	
Bullnose	5.00			4632.00	466.00 Bottom Packers & Anchor
<b>Total Tool Length:</b>	<b>513.00</b>				





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Norstar Petroleum Inc.

**15-19s-27w Lane, KS**

88 Inverness Cir. E Unit F104  
Englewood CO. 80112

**The Sisters #1-15**

Job Ticket: 63849

**DST#: 3**

ATTN: Aaron Young

Test Start: 2017.09.15 @ 11:05:15

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

0 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

0 ppm

Viscosity: 58.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 8.76 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 4200.00 ppm

Filter Cake: 1.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
70.00	mud 100% m	0.344

Total Length: 70.00 ft      Total Volume: 0.344 bbl

Num Fluid Samples: 0

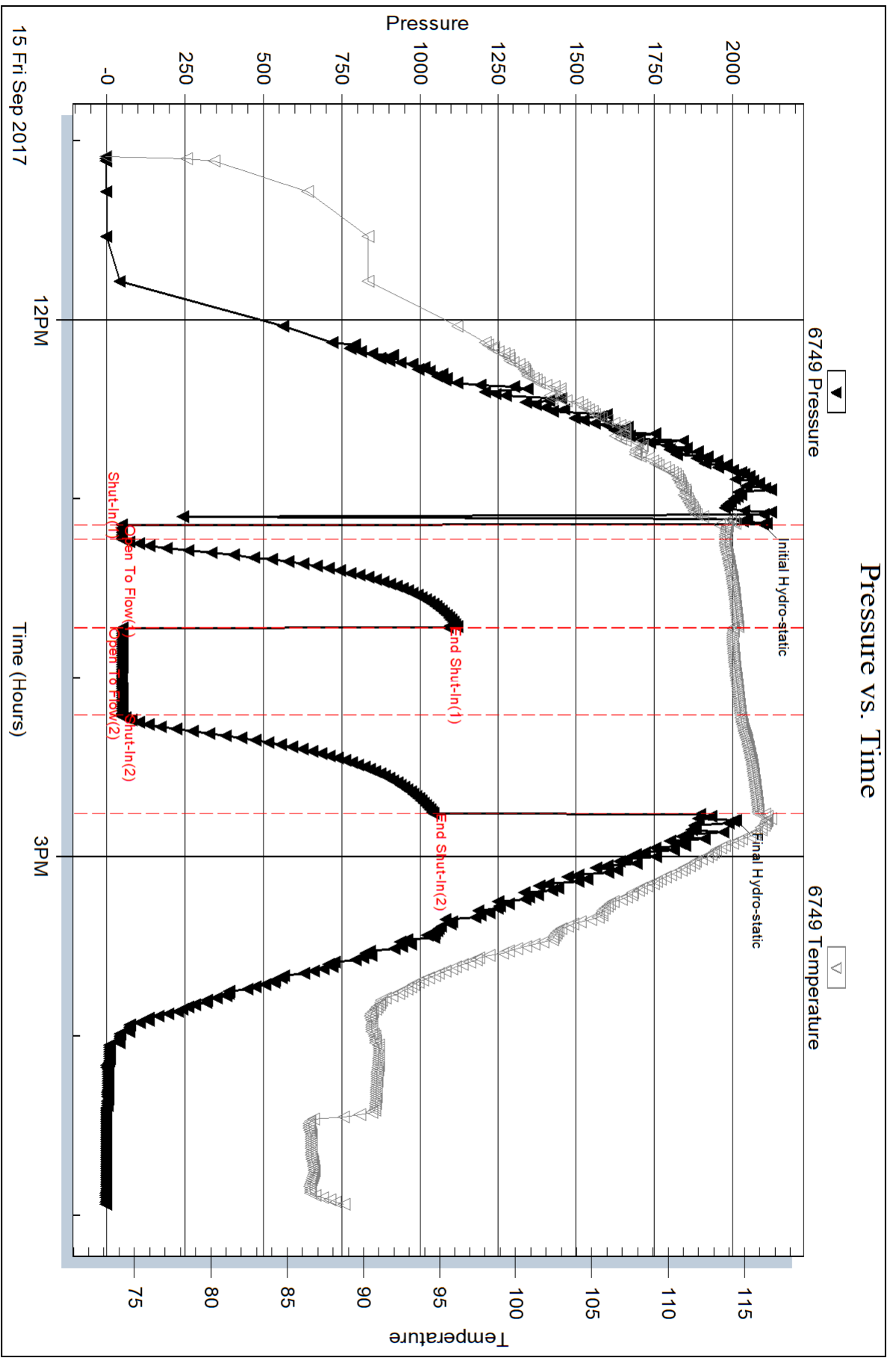
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:



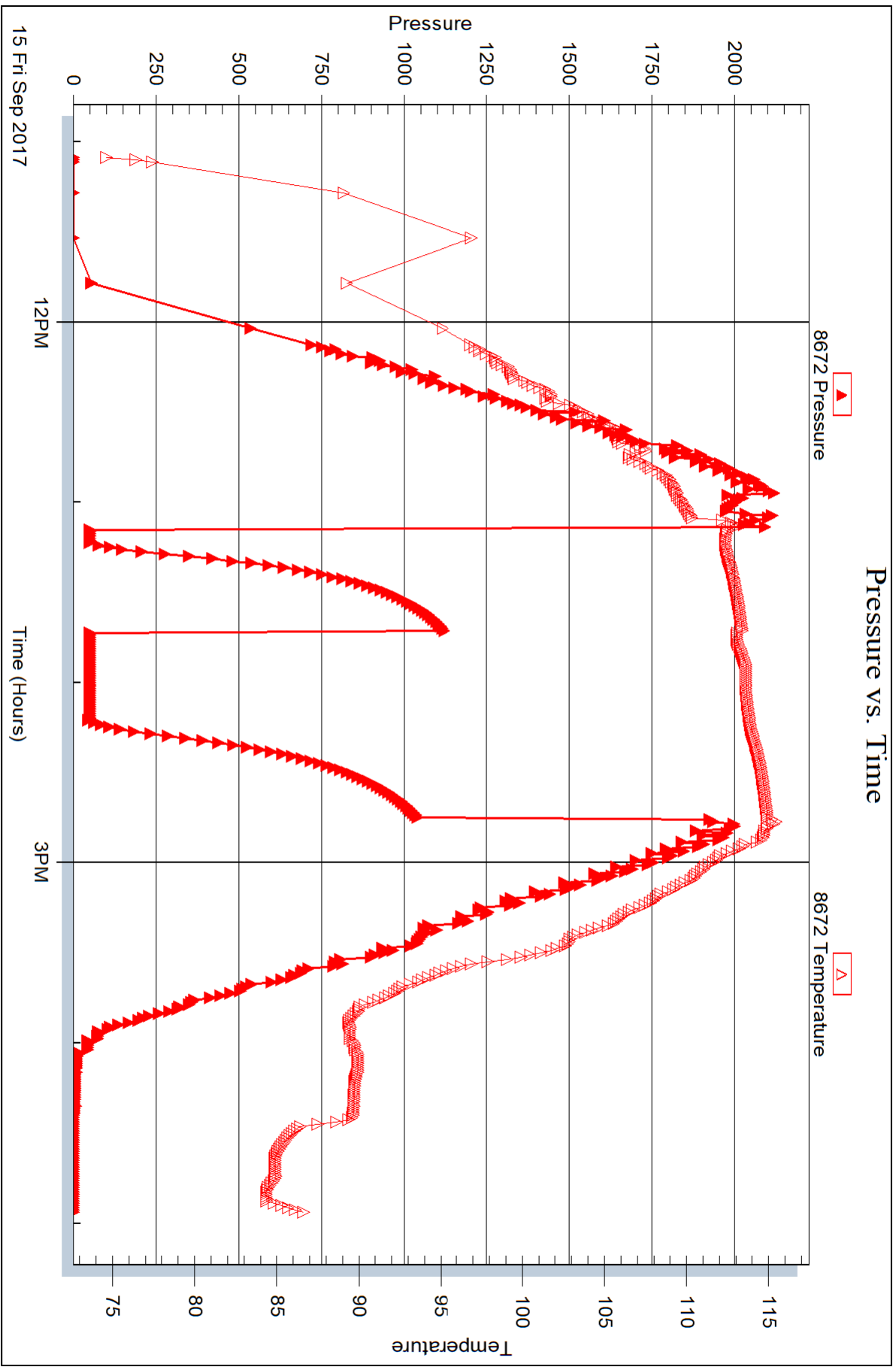
Serial #: 8672

Inside

Norstar Petroleum Inc.

The Sisters #1-15

DST Test Number: 3



Triobite Testing, Inc

Ref. No: 63849

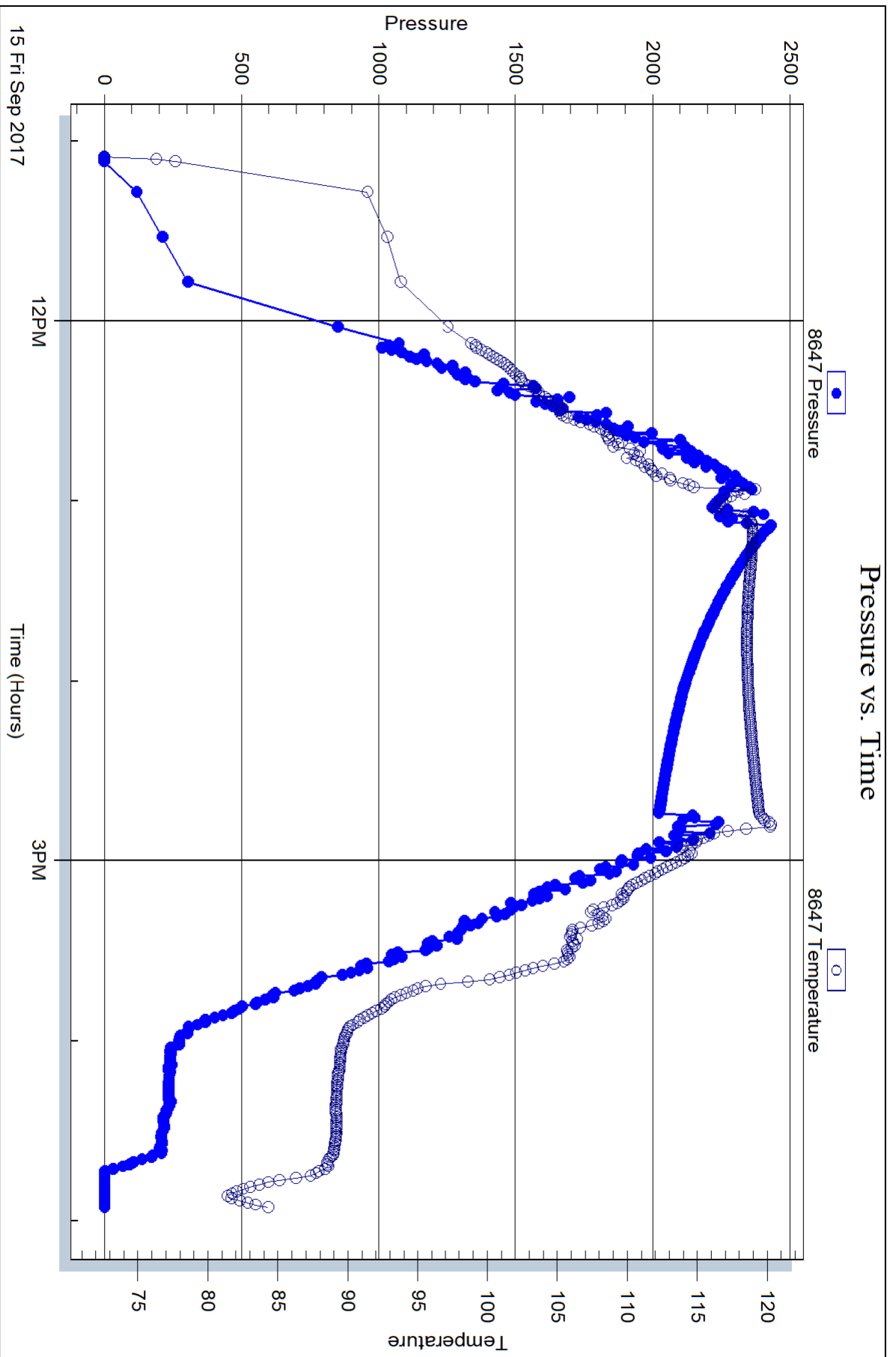
Printed: 2017.09.18 @ 11:40:09

Serial #: 8647

Below (Strat) Petrfluem Inc.

The Sisters #1-15

DST Test Number: 3





## DRILL STEM TEST REPORT

Prepared For: **Norstar Petroleum Inc.**

88 Inverness Cir.E Unit F104  
Englewood CO. 80112

ATTN: Aaron Young

### **The Sisters #1-15**

### **15-19s-27w Lane,KS**

Start Date: 2017.09.15 @ 17:20:15

End Date: 2017.09.16 @ 00:27:45

Job Ticket #: 63850                      DST #: 4

Trilobite Testing, Inc

PO Box 362 Hays, KS 67601

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

Printed: 2017.09.18 @ 11:40:39



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Norstar Petroleum Inc.  
 88 Inverness Cir.E Unit F104  
 Englewood CO. 80112  
 ATTN: Aaron Young

**15-19s-27w Lane, KS**  
**The Sisters #1-15**  
 Job Ticket: 63850 **DST#: 4**  
 Test Start: 2017.09.15 @ 17:20:15

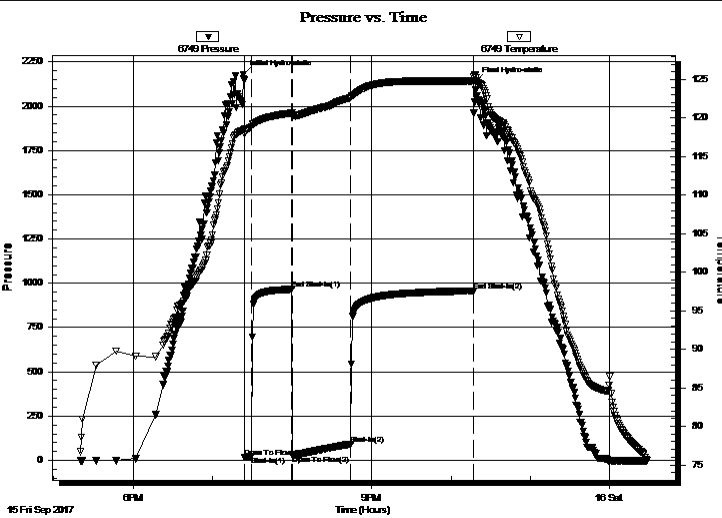
## GENERAL INFORMATION:

Formation: **LKC J**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 19:24:15  
 Time Test Ended: 00:27:45  
 Interval: **4210.00 ft (KB) To 4232.00 ft (KB) (TVD)**  
 Total Depth: 4630.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Fair  
 Test Type: Conventional Straddle (Reset)  
 Tester: Mike Roberts  
 Unit No: 81  
 Reference Elevations: 2659.00 ft (KB)  
 2654.00 ft (CF)  
 KB to GR/CF: 5.00 ft

## Serial #: 6749 Outside

Press@RunDepth: 91.76 psig @ 4213.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2017.09.15 End Date: 2017.09.16 Last Calib.: 2017.09.16  
 Start Time: 17:20:15 End Time: 00:27:45 Time On Btm: 2017.09.15 @ 19:23:00  
 Time Off Btm: 2017.09.15 @ 22:18:15

TEST COMMENT: IF: Built to 2" blow  
 IS: No return blow  
 FF: Built to 4" blow  
 FS: No return blow



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2179.84	118.50	Initial Hydro-static
2	18.32	118.00	Open To Flow (1)
7	24.37	118.87	Shut-In(1)
37	966.14	120.66	End Shut-In(1)
37	27.75	120.28	Open To Flow (2)
82	91.76	122.65	Shut-In(2)
174	957.26	124.79	End Shut-In(2)
176	2140.89	125.51	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
124.00	mcw 10% m 90% w	0.64
62.00	w cm 30% w 70% m	0.87

## Gas Rates

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

\* Recovery from multiple tests



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Norstar Petroleum Inc.  
 88 Inverness Cir.E Unit F104  
 Englewood CO. 80112  
 ATTN: Aaron Young

**15-19s-27w Lane,KS**  
**The Sisters #1-15**  
 Job Ticket: 63850      **DST#: 4**  
 Test Start: 2017.09.15 @ 17:20:15

## GENERAL INFORMATION:

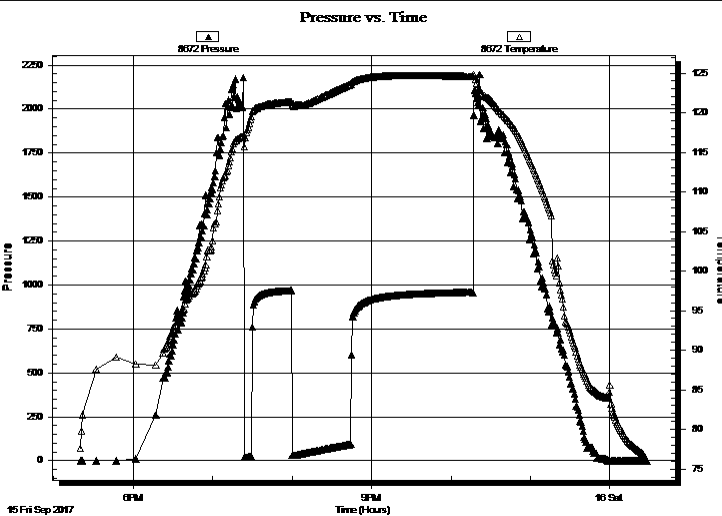
Formation: <b>LKC J</b>		Test Type: Conventional Straddle (Reset)
Deviated: No Whipstock: ft (KB)		Tester: Mike Roberts
Time Tool Opened: 19:24:15		Unit No: 81
Time Test Ended: 00:27:45		
<b>Interval: 4210.00 ft (KB) To 4232.00 ft (KB) (TVD)</b>		Reference Elevations: 2659.00 ft (KB)
Total Depth: 4630.00 ft (KB) (TVD)		2654.00 ft (CF)
Hole Diameter: 7.88 inchesHole Condition: Fair		KB to GR/CF: 5.00 ft

## Serial #: 8672

Inside

Press@RunDepth: psig @ 4213.00 ft (KB)	Capacity: 8000.00 psig
Start Date: 2017.09.15	End Date: 2017.09.16
Start Time: 17:20:15	End Time: 00:27:45
	Last Calib.: 2017.09.16
	Time On Btm:
	Time Off Btm:

TEST COMMENT: IF:Built to 2" blow  
 IS:No return blow  
 FF:Built to 4" blow  
 FS:No return blow



## PRESSURE SUMMARY

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

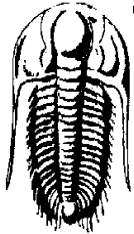
## Recovery

Length (ft)	Description	Volume (bbl)
124.00	mcw 10% m 90% w	0.64
62.00	w cm 30% w 70% m	0.87

## Gas Rates

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

\* Recovery from multiple tests



# TRILOBITE TESTING, INC.

## DRILL STEM TEST REPORT

Norstar Petroleum Inc.  
 88 Inverness Cir.E Unit F104  
 Englewood CO. 80112  
 ATTN: Aaron Young

**15-19s-27w Lane,KS**  
**The Sisters #1-15**  
 Job Ticket: 63850 **DST#: 4**  
 Test Start: 2017.09.15 @ 17:20:15

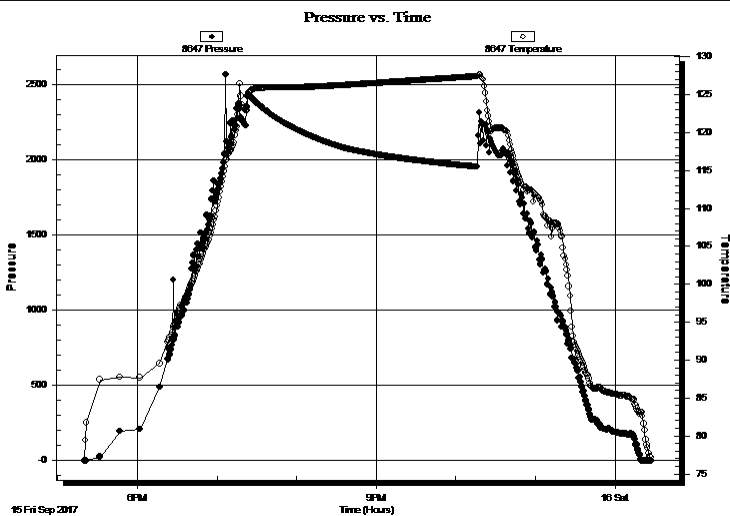
### GENERAL INFORMATION:

Formation: <b>LKC J</b>		Test Type: Conventional Straddle (Reset)
Deviated: No Whipstock:	ft (KB)	Tester: Mike Roberts
Time Tool Opened: 19:24:15		Unit No: 81
Time Test Ended: 00:27:45		
<b>Interval: 4210.00 ft (KB) To 4232.00 ft (KB) (TVD)</b>		Reference Elevations: 2659.00 ft (KB)
Total Depth: 4630.00 ft (KB) (TVD)		2654.00 ft (CF)
Hole Diameter: 7.88 inches	Hole Condition: Fair	KB to GR/CF: 5.00 ft

### Serial #: 8647 Below (Straddle)

Press@RunDepth: psig @ 4626.00 ft (KB)	Capacity: 8000.00 psig
Start Date: 2017.09.15	End Date: 2017.09.16
Start Time: 17:20:15	End Time: 00:27:30
	Last Calib.: 2017.09.16
	Time On Btm:
	Time Off Btm:

TEST COMMENT: IF: Built to 2" blow  
 IS: No return blow  
 FF: Built to 4" blow  
 FS: No return blow



### PRESSURE SUMMARY

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

### Recovery

Length (ft)	Description	Volume (bbl)
124.00	mcw 10% m 90% w	0.64
62.00	w cm 30% w 70% m	0.87

### Gas Rates

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

\* Recovery from multiple tests





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Norstar Petroleum Inc.

**15-19s-27w Lane, KS**

88 Inverness Cir. E Unit F104  
Englewood CO. 80112

**The Sisters #1-15**

Job Ticket: 63850

**DST#: 4**

ATTN: Aaron Young

Test Start: 2017.09.15 @ 17:20:15

## Tool Information

Drill Pipe:	Length: 4090.00 ft	Diameter: 3.80 inches	Volume: 57.37 bbl	Tool Weight: 1500.00 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: 121.00 ft	Diameter: 2.25 inches	Volume: 0.60 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 57.97 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	29.00 ft			String Weight: Initial 64000.00 lb
Depth to Top Packer:	4210.00 ft			Final 64000.00 lb
Depth to Bottom Packer:	4229.00 ft			
Interval between Packers:	19.00 ft			
Tool Length:	450.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

## Tool Description

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

Change Over Sub	1.00			4183.00	
Shut In Tool	5.00			4188.00	
Hydraulic tool	5.00			4193.00	
Jars	5.00			4198.00	
Safety Joint	3.00			4201.00	
Packer	5.00			4206.00	28.00 Bottom Of Top Packer
Packer	4.00			4210.00	
Stubb	1.00			4211.00	
Perforations	2.00			4213.00	
Recorder	0.00	8672	Inside	4213.00	
Recorder	0.00	6749	Outside	4213.00	
Perforations	10.00			4223.00	
Blank Off Sub	1.00			4224.00	
Packer - Shale	5.00			4229.00	19.00 Tool Interval
Packer	5.00			4234.00	
Stubb	1.00			4235.00	
Perforations	15.00			4250.00	
Change Over Sub	1.00			4251.00	
Drill Pipe	375.00			4626.00	
Recorder	0.00	8647	Below	4626.00	
Change Over Sub	1.00			4627.00	
Bullnose	5.00			4632.00	403.00 Bottom Packers & Anchor

**Total Tool Length: 450.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Norstar Petroleum Inc.

**15-19s-27w Lane, KS**

88 Inverness Cir. E Unit F104  
Englewood CO. 80112

**The Sisters #1-15**

Job Ticket: 63850

**DST#: 4**

ATTN: Aaron Young

Test Start: 2017.09.15 @ 17:20:15

## 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:

17000 ppm

Viscosity: 58.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 8.77 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 4200.00 ppm

Filter Cake: 1.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
124.00	mcw 10%m 90%w	0.637
62.00	wcm 30%w 70%m	0.870

Total Length: 186.00 ft      Total Volume: 1.507 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

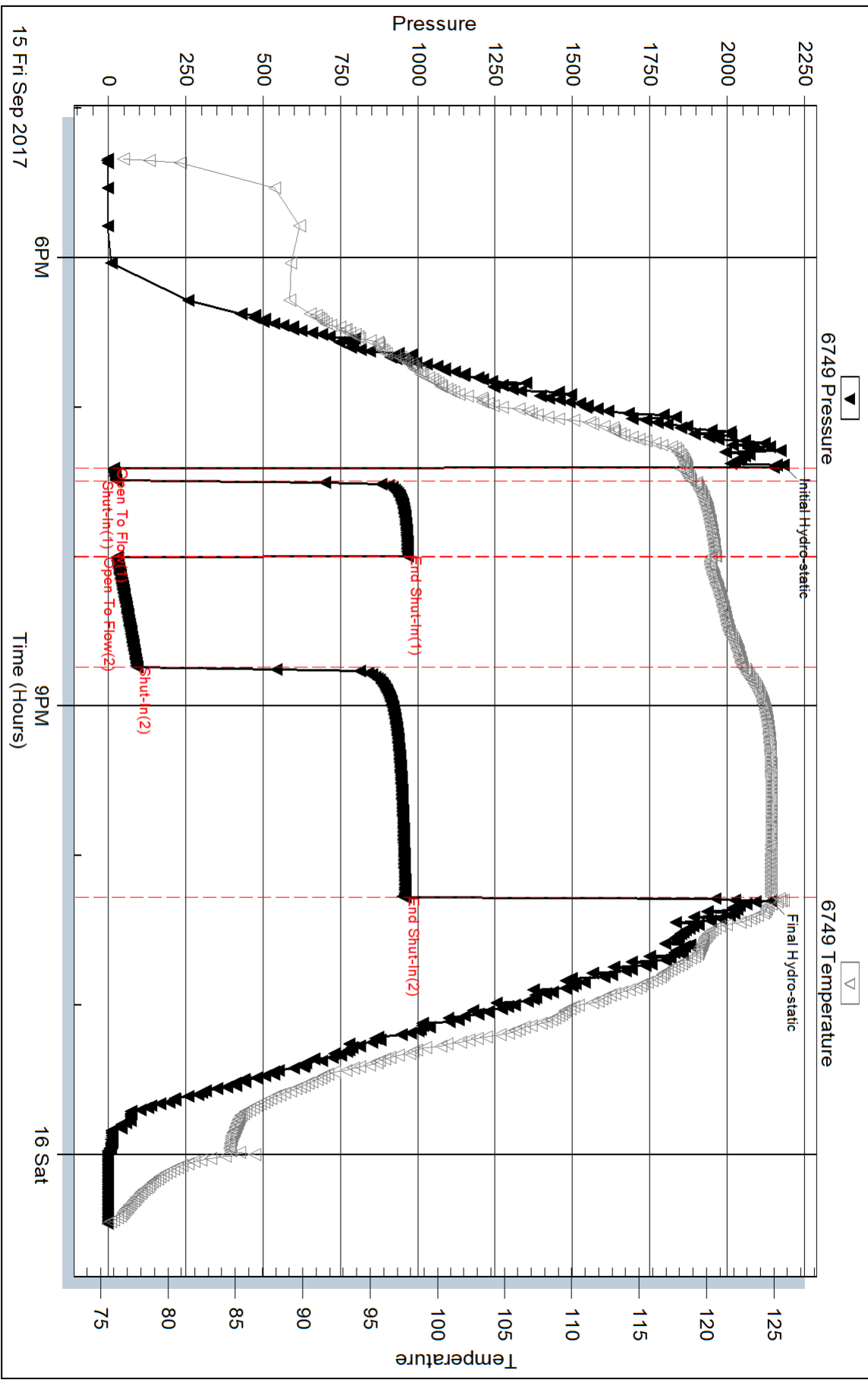
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW= .445@72.5= 17,000 ppm

# Pressure vs. Time



Serial #: 8672

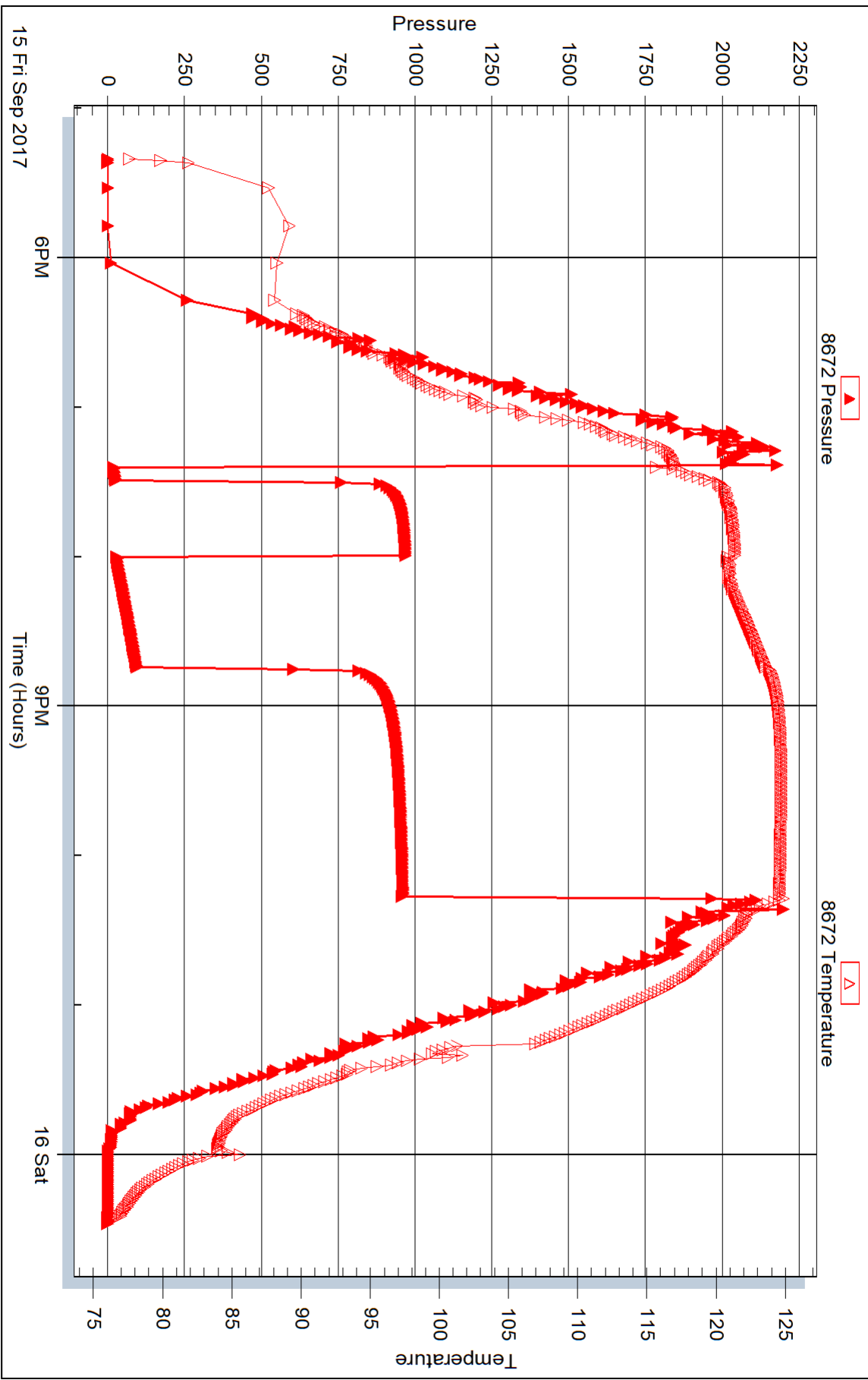
Inside

Norstar Petroleum Inc.

The Sisters #1-15

DST Test Number: 4

### Pressure vs. Time

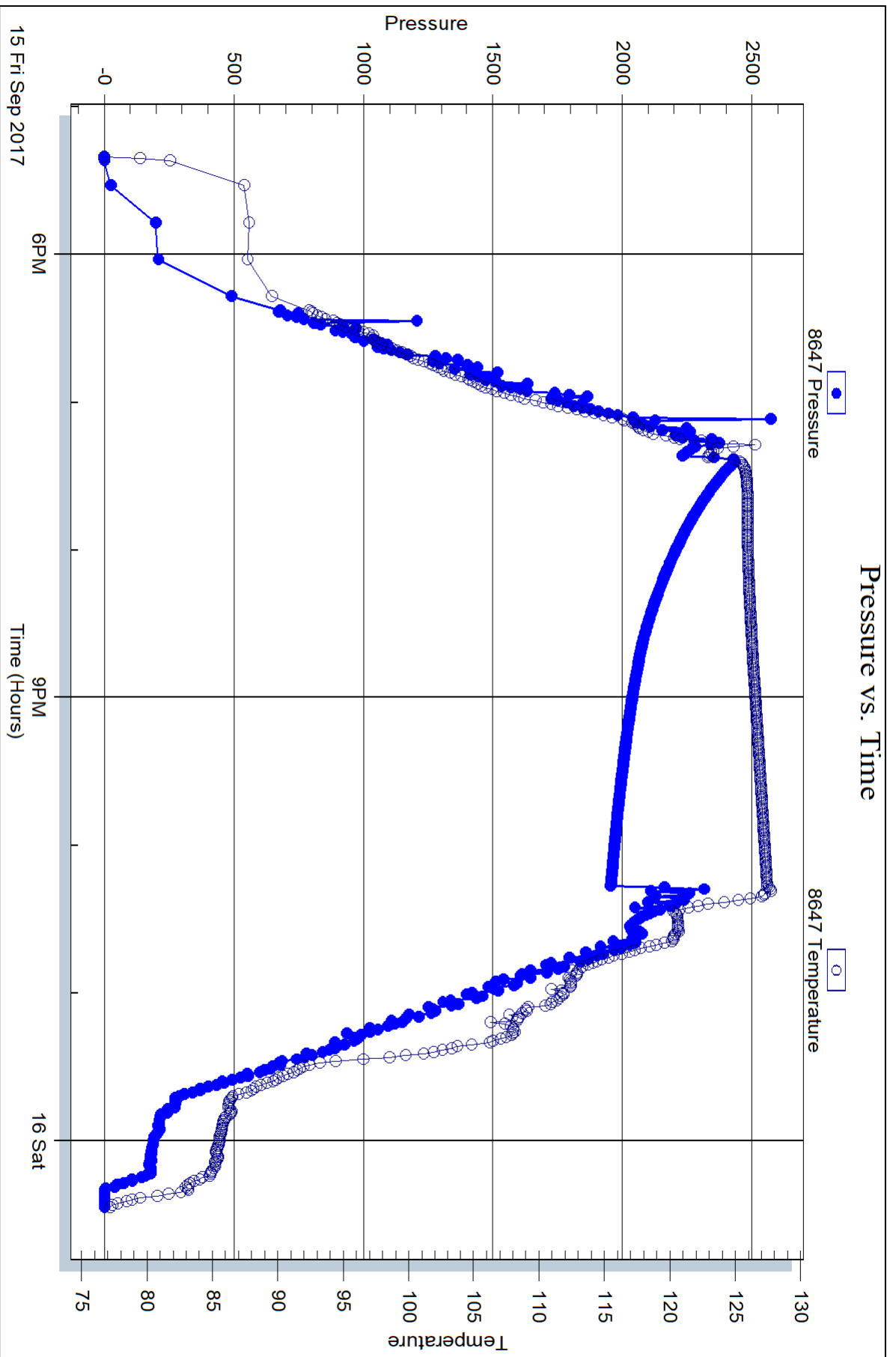


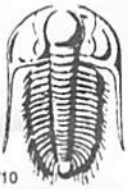
Serial #: 8647

Below (Str ~~Ad~~ Petrfluem Inc.

The Sisters #1-15

DST Test Number: 4





# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. **63847** 23953

Well Name & No. Sisters 1-15 Test No. 1 Date 9-12-17  
 Company Norstar Petroleum Inc Elevation 2659 KB 2654 GL  
 Address 88 Taverness Circ. E Unit K104 Englewood Co 80112  
 Co. Rep / Geo. Aaron Young Rig Pickrell 10  
 Location: Sec. 15 Twp. 19 Rge. 27 Co. Lane State KS

Interval Tested 4480-4510 Zone Tested FT. SCOTT  
 Anchor Length 30 Drill Pipe Run 4343 Mud Wt. 9.3  
 Top Packer Depth 4475 Drill Collars Run 121 Vis 0.55  
 Bottom Packer Depth 4480 Wt. Pipe Run 6 WL 8.8  
 Total Depth 4510 Chlorides 3800 ppm System LCM 2  
 Blow Description IF: Built to weak surface + Died in 3 Min.  
IS: No Return Blow  
FF: No Blow  
FS: No Return Blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>2</u>	<u>MUD</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 Total 2 BHT 124 Gravity — API RW — @ — ° F Chlorides — ppm

(A) Initial Hydrostatic <u>2226</u>	<input checked="" type="checkbox"/> Test <u>\$1150.00/-</u>	T-On Location <u>12:40</u>
(B) First Initial Flow <u>15</u>	<input checked="" type="checkbox"/> Jars <u>\$250.00/-</u>	T-Started <u>14:26</u>
(C) First Final Flow <u>15</u>	<input checked="" type="checkbox"/> Safety Joint <u>\$75.00/-</u>	T-Open <u>17:07</u>
(D) Initial Shut-In <u>49</u>	<input checked="" type="checkbox"/> Circ Sub <u>NC</u>	T-Pulled <u>18:42</u>
(E) Second Initial Flow <u>15</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>20:39</u>
(F) Second Final Flow <u>15</u>	<input checked="" type="checkbox"/> Mileage <u>90RT \$67.50/-</u>	Comments _____
(G) Final Shut-In <u>25</u>	<input type="checkbox"/> Sampler	_____
(H) Final Hydrostatic <u>2175</u>	<input type="checkbox"/> Straddle	<input type="checkbox"/> Ruined Shale Packer _____
Initial Open <u>5</u>	<input type="checkbox"/> Shale Packer	<input type="checkbox"/> Ruined Packer _____
Initial Shut-In <u>30</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>30</u>	<input type="checkbox"/> Day Standby	Total <u>1542.50</u>
	<input type="checkbox"/> Accessibility	MP/DST Disc't _____
	Sub Total <u>\$1542.50/-</u>	

Approved By [Signature] 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. **63848**

Well Name & No. Sisters 1-15 Test No. 2 Date 9-13-17  
 Company Norstar Petroleum Inc Elevation 2659 KB 2654 GL  
 Address 88 Inverness Cir. E Unit FLOY Englewood Co 80112  
 Co. Rep / Geo. Aaron Young Rig Pickrell  
 Location: Sec. 15 Twp. 19 Rge. 27 Co. Lane State KS

Interval Tested 4534-4584 Zone Tested Cherokee  
 Anchor Length 50 Drill Pipe Run 4407 Mud Wt. 9.2  
 Top Packer Depth 4529 Drill Collars Run 121 Vis 55  
 Bottom Packer Depth 4534 Wt. Pipe Run Ø WL 9.6  
 Total Depth 4584 Chlorides 4000 ppm System LCM 2  
 Blow Description IF: Weak Surface Blow  
IS: No Return Blow  
FF: No Blow  
FS: No Return Blow

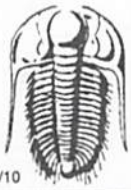
Rec	Feet of	%gas	%oil	%water	%mud
5	MUD			100	

Rec Total 5 BHT 126  
 (A) Initial Hydrostatic 2273  
 (B) First Initial Flow 31  
 (C) First Final Flow 32  
 (D) Initial Shut-In 307  
 (E) Second Initial Flow 32  
 (F) Second Final Flow 33  
 (G) Final Shut-In 162  
 (H) Final Hydrostatic 2205  
 Initial Open 5  
 Initial Shut-In 30  
 Final Flow 30  
 Final Shut-In 30

Gravity — API RW — @ — ° F Chlorides — ppm  
 Test \$1150.00/- T-On Location 19:00  
 Jars \$250.00/- T-Started 20:23  
 Safety Joint \$75.00/- T-Open 22:35  
 Circ Sub NC T-Pulled 00:10  
 Hourly Standby — T-Out 02:23  
 Mileage 90RT = \$67.50/- Comments loaded tools after test  
 Sampler —  
 Straddle —  
 Shale Packer —  
 Extra Packer —  
 Extra Recorder —  
 Day Standby —  
 Accessibility —  
 Sub Total \$1542.50/-

Approved By Aaron Young Our Representative Mike Polats

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. **63849**

Well Name & No. Sisters 1-15 Test No. 3 Date 9-15-17  
 Company Norstar Petroleum Inc. Elevation 2659 KB 2654 GL  
 Address 88 Inverness Cir E Unit F104 Englewood Co 80112  
 Co. Rep / Geo. Aaron Young Rig Pickrell 10  
 Location: Sec. 15 Twp. 19 Rge. 27 Co. Lane State KS

Interval Tested 4210-4232 4630 Zone Tested Lansing J  
 Anchor Length 22 Drill Pipe Run 4081 Mud Wt. 9.2  
 Top Packer Depth 4205 Drill Collars Run 0 Vis 58  
 Bottom Packer Depth 4210 Wt. Pipe Run 0 WL 8.8  
 Total Depth 4630 Chlorides 4200 ppm System LCM 2  
 Blow Description TF: Weak Surface Blow  
IS: NO Return Blow  
FF: NO Blow  
FS: NO Return Blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>70</u>	<u>MUD</u>			<u>100</u>	

Rec Total 70 BHT 116 Gravity   API RW   @   °F Chlorides   ppm

(A) Initial Hydrostatic <u>2095</u>	<input checked="" type="checkbox"/> Test <u>\$1150.00/-</u>	T-On Location <u>08:20</u>
(B) First Initial Flow <u>47</u>	<input checked="" type="checkbox"/> Jars <u>\$250.00/-</u>	T-Started <u>11:05</u>
(C) First Final Flow <u>46</u>	<input checked="" type="checkbox"/> Safety Joint <u>\$75.00/-</u>	T-Open <u>13:08</u>
(D) Initial Shut-In <u>1089</u>	<input checked="" type="checkbox"/> Circ Sub <u>NC</u>	T-Pulled <u>14:43</u>
(E) Second Initial Flow <u>48</u>	<input type="checkbox"/> Hourly Standby <u> </u>	T-Out <u>16:56</u>
(F) Second Final Flow <u>48</u>	<input checked="" type="checkbox"/> Mileage <u>90RT = \$67.50/-</u>	Comments <u>wrong Tail pipe</u>
(G) Final Shut-In <u>1042</u>	<input type="checkbox"/> Sampler <u> </u>	<input type="checkbox"/> Ruined Shale Packer <u> </u>
(H) Final Hydrostatic <u>2011</u>	<input checked="" type="checkbox"/> Straddle <u>\$600.00/-</u>	<input type="checkbox"/> Ruined Packer <u> </u>
Initial Open <u>5</u>	<input checked="" type="checkbox"/> Shale Packer <u>\$250.00/-</u>	<input type="checkbox"/> Extra Copies <u> </u>
Initial Shut-In <u>30</u>	<input checked="" type="checkbox"/> Extra Packer <u>\$200.00/-</u>	Sub Total <u>0</u>
Final Flow <u>30</u>	<input type="checkbox"/> Extra Recorder <u> </u>	Total <u>0</u>
Final Shut-In <u>30</u>	<input type="checkbox"/> Day Standby <u> </u>	MP/DST Disc't <u> </u>
	<input type="checkbox"/> Accessibility <u> </u>	
	Sub Total <u>\$2592.50/-</u>	

Approved By   Our Representative Mike Roberts

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. **63850**

Well Name & No. Sisters 1-15 Test No. 4 Date 9-15-17  
 Company Norstar Petroleum Inc Elevation 2659 KB 2654 GL  
 Address 88 Inverness Cir E Unit F104 Englewood Co 80112  
 Co. Rep / Geo. Aaron Young Rig Pickrell 10  
 Location: Sec. 15 Twp. 19 Rge. 27 Co. Lane State KS

Interval Tested ~~4210-4232~~ 4210-4232 <sup>4630</sup> Zone Tested Lansing J  
 Anchor Length 22 Drill Pipe Run ~~4091~~ 4091 Mud Wt. 9.2  
 Top Packer Depth 4205 Drill Collars Run 0 Vis 58  
 Bottom Packer Depth 4210 Wt. Pipe Run 0 WL 8.8  
 Total Depth 4630 Chlorides 4200 ppm System LCM 2  
 Blow Description IF: Built to 2" Blow  
IS: No Return Blow  
FF: Built to 4" Blow  
FS: No Return Blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>124</u>	<u>MCW</u>		<u>90</u>	<u>10</u>	
<u>102</u>	<u>WCM</u>		<u>30</u>	<u>70</u>	

Rec Total 186 BHT 125 Gravity — API RW .445 @ 72.5° F Chlorides 17,000 ppm  
 (A) Initial Hydrostatic 2179  Test 1150 T-On Location Stayed  
 (B) First Initial Flow 18  Jars 250 T-Started ~~19:25~~ 17:20  
 (C) First Final Flow 24  Safety Joint 75 T-Open 19:25  
 (D) Initial Shut-In 966  Circ Sub NC T-Pulled 20:15  
 (E) Second Initial Flow 27  Hourly Standby \_\_\_\_\_ T-Out 00:27  
 (F) Second Final Flow 91  Mileage \_\_\_\_\_ 67.50 Comments \_\_\_\_\_  
 (G) Final Shut-In 957  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 2140  Straddle 600  Ruined Shale Packer \_\_\_\_\_  
 Shale Packer 250  Ruined Packer \_\_\_\_\_  
 Extra Packer 200  Extra Copies \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_ Sub Total 0  
 Day Standby \_\_\_\_\_ Total 2592.50  
 Accessibility \_\_\_\_\_ MP/DST Disc't \_\_\_\_\_  
 Sub Total 2592.50

Approved By [Signature] Our Representative Mike Roberts

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Geologic Report  
**Aaron L. Young**

Drilling Time and Sample Log

Scale 1:240 (5"=100') Imperial  
Measured Depth Log

Well Name: The Sisters #1-15  
API: 15-101-22597  
Location: Section 15 - T19S - R27W  
License Number: 31652  
Spud Date: 9 / 5 / 2017  
Surface Coordinates: 1725' FNL and 1095' FWL  
Approx. SE - NE - SW - NW  
Region: Lane Co., KS  
Drilling Completed: 9 / 15 / 2017  
Bottom Hole Coordinates:  
Ground Elevation (ft): 2652' K.B. Elevation (ft): 2659'  
Logged Interval (ft): 3800' To: 4631' Total Depth (ft): 4631'  
Formation: Mississippi  
Type of Drilling Fluid: Chemical - MudCo

Printed by MUD.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

**OPERATOR**

Company: Norstar Petroleum, Inc.  
Address: 88 Inverness Cir E. Unit F104  
Englewood, CO 80112 + 5514

**GEOLOGIST**

Name: Aaron L. Young, M. S.  
Company: Young Consulting LLC  
Address: 100 S Main Ste 505  
Wichita, KS 67202

**General Info**

**CONTRACTOR:** Pickrell Drilling, Rig #10

**BIT RECORD:**

No.	Size	Make	Jets	Out	Feet	Hours
1	12-1/4	JZ RR	16-16-16	307'	300'	3.5
2	7-7/8	JZ HA20	15-15-15	4650'	4331'	123.0

**SURVEYS:** 307'-.5, 919'-.75, 1388'-.75, 1919'-.5, 2419'-.75, 2919'-.75, 4510'-1, 4584'-.5

**GENERAL DRILLING AND PUMP INFORMATION:**

Drilling with 38,000 -40,000 lbs. on bit and approx 60-70 RPM.  
Running 10 stands of collars; 598.49'  
Pumping approx 800 psi at standpipe.

## Daily Status

9/1/17 - MIRU, shut down until 9/5/17

9/5/17 - Spud @ 9:15am, Drilled to 307', ran 7 jts of new 8 5/8" 23# surface casing set @ 302', cemented w/ 185 sx. Standard, w/ 2% gel & 3% CC, cem circ. WOC

9/6/17 - Drilling, @ 470'

9/7/17 - Drilling, @ 1919'

9/8/17 - Drilling, @ 2650'

9/9/17 - Drilling, @ 3252'

9/10/17 - Drilling, @ 3805'

9/11/17 - CFS @ 4253'

9/12/17 - Drilling, @ 4492', DST #1

9/13/17 - TOOH, @ 4510', DST #2

9/14/17 - Drilling, @ 4584'

9/15/17 - RTD, @ 4631' DST #3 Straddle Test, DST #4 Straddle Test

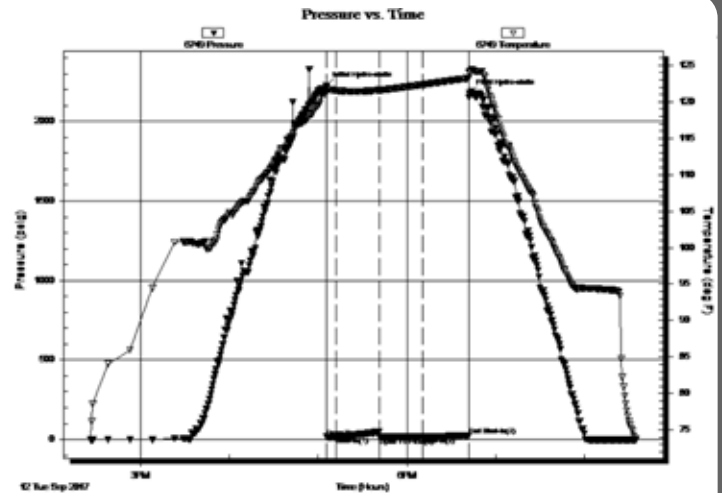
9/16/17 - Plugged w/ 50 sx at 2030', 80 sx at 1170', 40 sx at 600', 50 sx at 330', 20 sx at 60', 30 sx in rathole. All cement 60/40 POZ w/ 4% gel, 1/4# floseal. Plug down at 8:45am on 8/16/17. Released rig.

**DST #1 FT. SCOTT 4480' - 4510'**  
5" - 30" - 30" - 30"

IF: Weak surface blow, died in 3 min  
ISI: No Blow  
FF: No Blow  
FSI: No Blow

Rec'd: 2' Mud

SIP: 50-25# FP: 15-46#, 16-16# HP: 2226-2175#

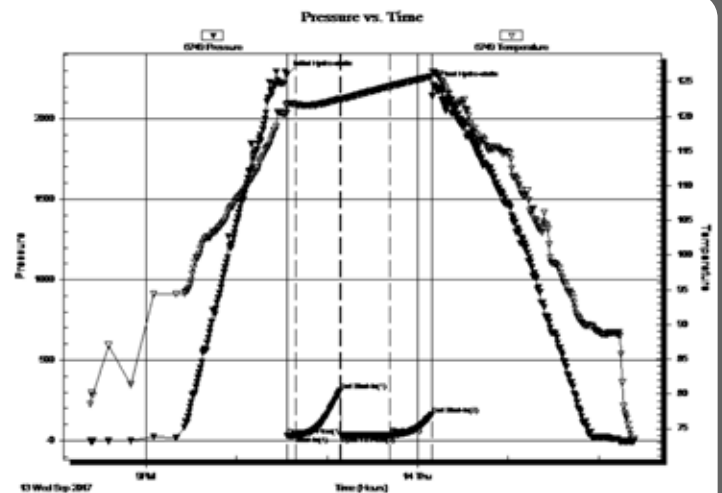


**DST #2 CHEROKEE SAND 4534' - 4584'**  
5" - 30" - 30" - 30"

IF: Weak surface blow  
ISI: No Blow  
FF: No Blow  
FSI: No Blow

Rec'd: 5' Mud

SIP: 308-162# FP: 31-32#, 32-33# HP: 2273-2205#



**DST #3**  
**WRONG INTERVAL TESTED**

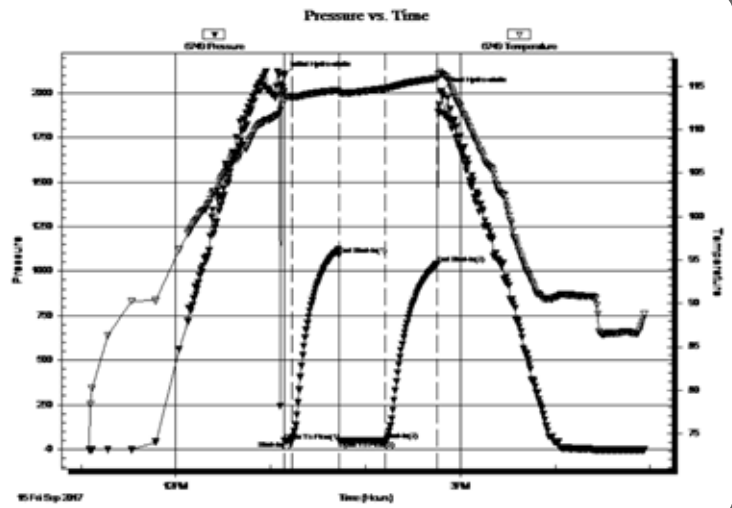
TEST INTENDED TO BE LKC 'J' ZONE STRADDLE TEST AFTER LOGS, AN EXTRA STAND WAS PUT IN THE TAIL, MOVING TEST INTERVAL UP APPROX 63'

4147' - 4169'  
 5" - 30" - 30" - 30"

IF: Built to weak surface blow  
 ISI: No Blow  
 FF: No Blow  
 FSI: No Blow

Rec'd: 70' Mud

SIP: 1090-1042# FP: 47-47#, 48-49# HP: 2096-2011#



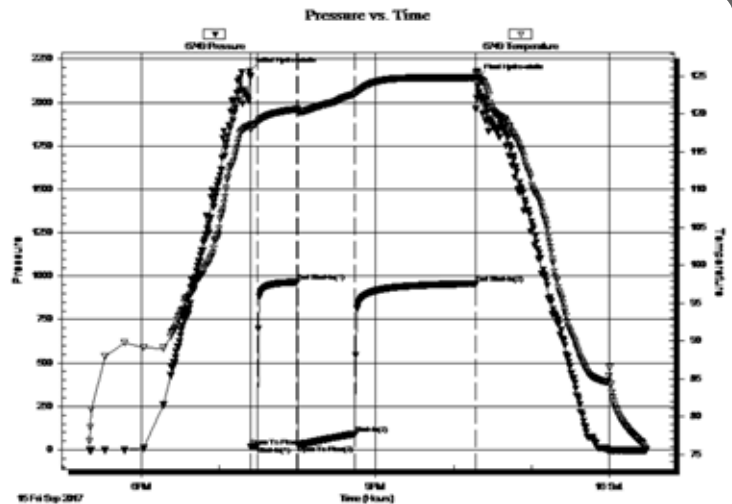
**DST #4 LKC 'J' STRADDLE TEST AFTER LOGS**

4210' - 4232'  
 5" - 30" - 45" - 90"

IF: Built to 2"  
 ISI: No Blow  
 FF: Built to 4"  
 FSI: No Blow

Rec'd: 124' MCW (10% M, 90% W), 62' WCM (30% W, 70% M)

SIP: 966-957# FP: 18-24#, 28-92# HP: 2180-2141#



**ROCK TYPES**

- Anhy
- Bent
- Brec
- Cht
- Clyst
- Coal
- Congl
- Dol

- Gyp
- Igne
- Lmst
- Meta
- Mrlst
- Salt
- Shale
- Shcol

- Shgy
- Sltst
- Ss
- Till
- Carb sh
- Dol
- Dtd
- Gry sh

- Sandylms
- Shale
- Sltstn
- Shlyslts
- Sltyslts
- Lms

### ACCESSORIES

#### MINERAL

- Anhy
- Arggrn
- Arg
- Bent
- Bit
- Brecfrag
- Calc
- Carb
- Chtdk
- Chtlt
- Dol
- Feldspar
- Ferrpel
- Ferr
- Glau
- Gyp
- Hvymin
- Kaol
- Marl
- Minxl
- Nodule
- Phos
- Pyr

- Salt
- Sandy
- Silt
- Sil
- Sulphur
- Tuff
- Chlorite
- Dol
- Sand
- Sltly

#### FOSSIL

- Algae
- Amph
- Belm
- Bioclst
- Brach
- Bryozoa
- Cephal
- Coral
- Crin
- Echin
- Fish
- Foram

- Fossil
- Gastro
- Oolite
- Ostra
- Pelec
- Pellet
- Pisolite
- Plant
- Strom
- Fuss
- Oomold

#### STRINGER

- Anhy
- Arg
- Bent
- Coal
- Dol
- Gyp
- Ls
- Mrst
- Sltstrg
- Ssstrg
- Carbsh

- Clystn
- Dol
- Grysh
- Gryslt
- Lms
- Sandylms
- Sh
- Sltstn

#### TEXTURE

- Boundst
- Chalky
- Cryxln
- Earthy
- Finexln
- Grainst
- Lithogr
- Microxln
- Mudst
- Packst
- Wackest

### OTHER SYMBOLS

#### POROSITY TYPE

- Earthy
- Fenest
- Fracture
- Inter
- Moldic
- Organic
- Pinpoint
- Vuggy

#### SORTING

- Well
- Moderate
- Poor

#### ROUNDING

- Rounded
- Subrnd
- Subang
- Angular

#### OIL SHOWS

- Even
- Spotted
- Ques
- Dead
- Gas show

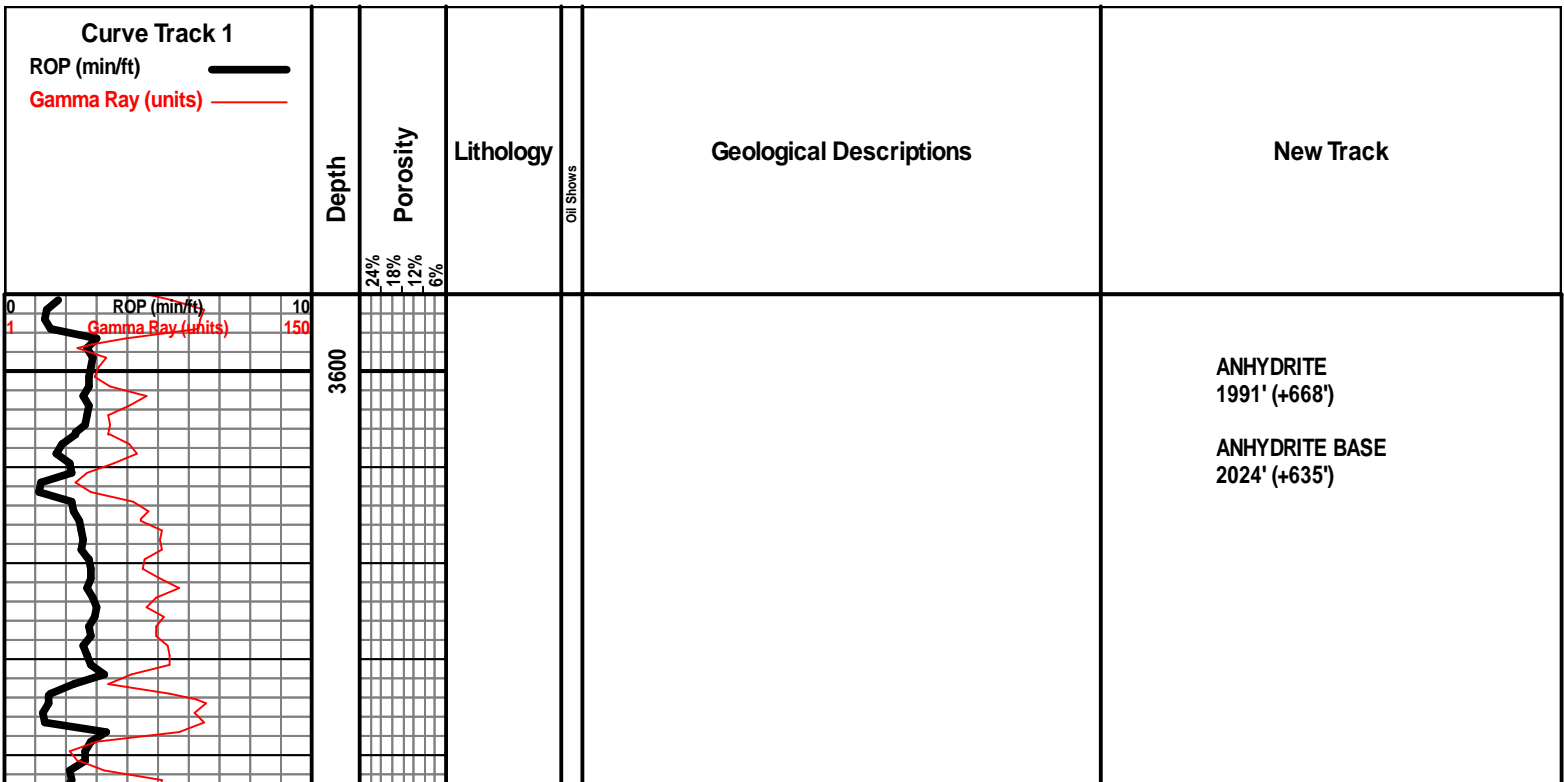
#### INTERVALS

- Core
- Dst

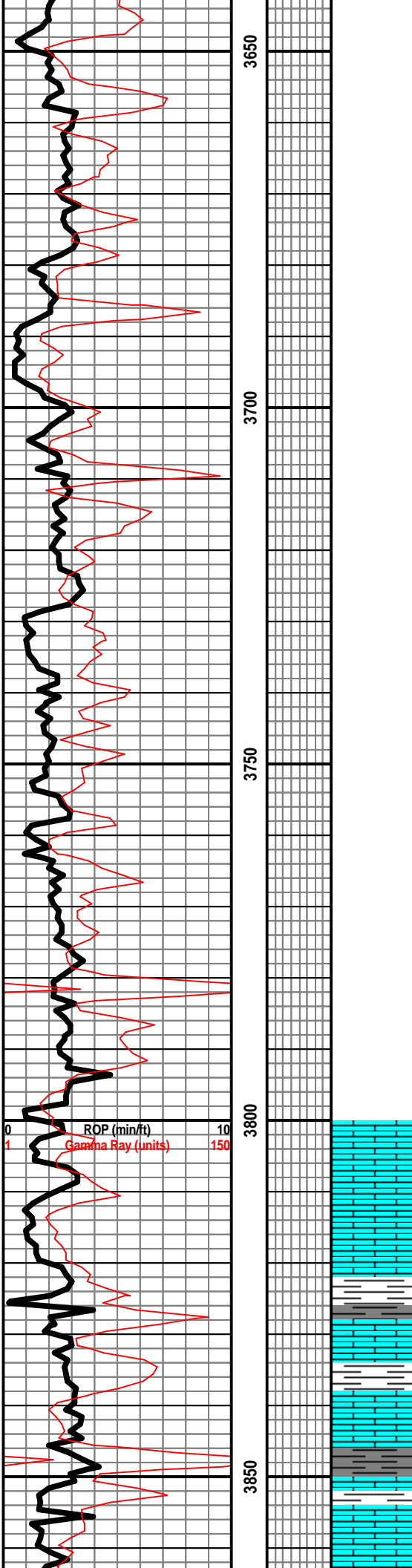
- Dst

#### EVENTS

- Rft
- Sidewall
- Conn



ELECTRONIC DRILL  
TIME TAKEN



LS - TAN / BRN, F XLN, MOD DNS / DNS, ABUND  
FOSS, PYRITIC IN PT

LS - TAN, F / M XLN, DNS, FOSS IN PT

LS - CRM / TAN, F XLN, MOD DNS / DNS, ABUD FOSS,  
LRG FUSIL, W/ CHT - WHT / TAN / CLR IN PT, FRSH,  
PRED OPAQ, TRANSLUCNT IN PT, W/ CHT - LT GY /  
DK GY

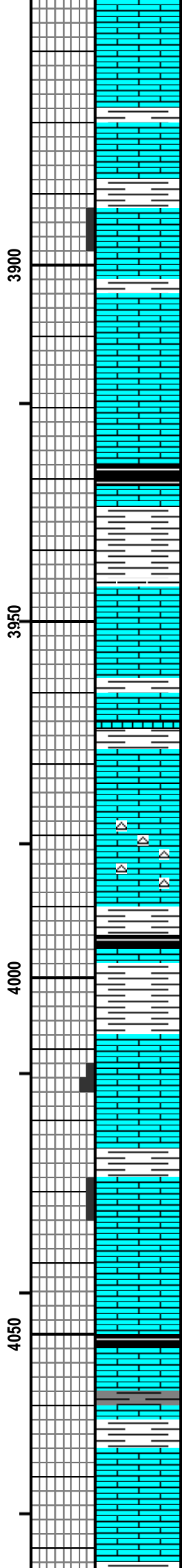
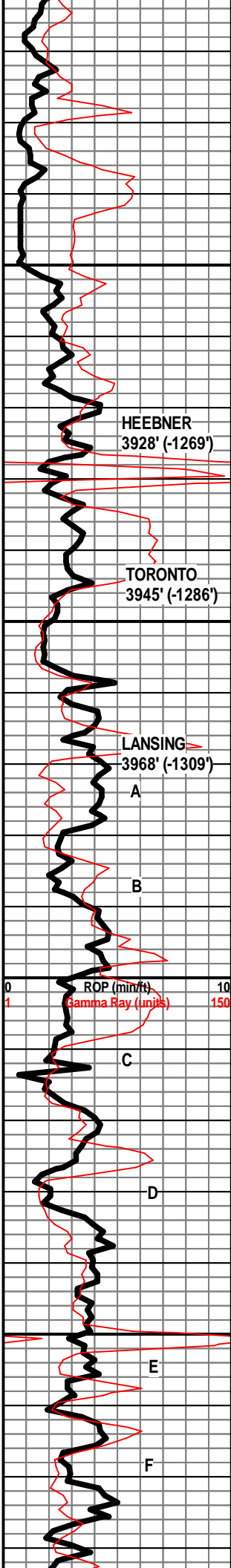
LS - TAN / CRM / WHT, VF XLN, SUBCHKY, CHKY IN  
PT, W/ SH - LT GRN / GY

SH - DK GY, W/ LS - TAN / GY, VF / F XLN, MOD DNS /  
DNS, FOSS

LS - TAN / LT BRN, F XLN, DNS, FOSS, W/ SH - LT  
GRN / GY

LS - DK TAN / GY, F XLN, DNS, PYRITIC IN PT





LS - DK TAN / GY, F XLN, DNS, PYRITIC IN PT

LS - CRM / TAN / LT BRN, F XLN, MOD DNS / DNS, FOSS, STYLOLITIZED IN PT

LS - CRM / TAN, F XLN, MOD DNS, ABUND FOSS

LS - CRM / TAN, F XLN, MOD DNS, P INTRAMOLDIC POR IN PT, ABUND FOSS

SH - GY, W/ LS - CRM / TAN, VF / F XLN, MOD DNS, FOSS

LS - GY / BRN, F XLN, MOD DNS / DNS, FOSS, W/ LS - WHT - VF XLN, CHKY

LS - TAN / BRN, F XLN, MOD DNS / DNS, FOSS

SH - BLK, CARB

LS - TAN / GY, F XLN, W/ SH - LT GY / GRN

LS - CRM / TAN, F XLN, MOD DNS / DNS, FOSS, W/ SH - GY / GRN

LS - CRM / TAN, F XLN, MOD DNS / SUBCHKY, FOSS

LS - WHT / CRM, VF / F XLN, SUBCHKY / CHKY, MOD DNS IN PT, FOSS IN PT, W/ SH - GRN / RD

LS - CRM / TAN, F XLN, DNS, OOLITIC, ABUND FOSS, VOIDS FILLED W/ CALCTE

LS - CRM / TAN, F XLN, DNS, OOLITIC, FOSS, W/ CHT - CRM / TAN / GY, FRSH, SLI TRANSLUCNT

SH - RD / GRN / GY, W/ SH - BLK, V SLI CARB

SH - GRN / GY / RD

LS - TAN, F XLN, MOD DNS / DNS, FEW PIECES W/ P VUG + INTXLN POR, NS, NO ODOR, W/ CHT - WHT / GY / BRN, FRSH, PRED OPAQ, SLI TRANSLUCNT IN PT

SH - LT GY / DK GY, W/ LS - WHT / CRM, VF / F XLN, SUBCHKY / CHKY, V CHKY IN PT

LS - CRM, VF / F XLN, MOD DNS / DNS, FEW PIECES W/ P INTXLN POR, NS, NS ODOR, ABUND FOSS

LS - CRM / TAN, F XLN, MOD DNS / DNS, FOSS IN PT

SH - DK GY / BLK, CARB, W/ LS - TAN / LT GY, F XLN, DNS, FOSS IN PT

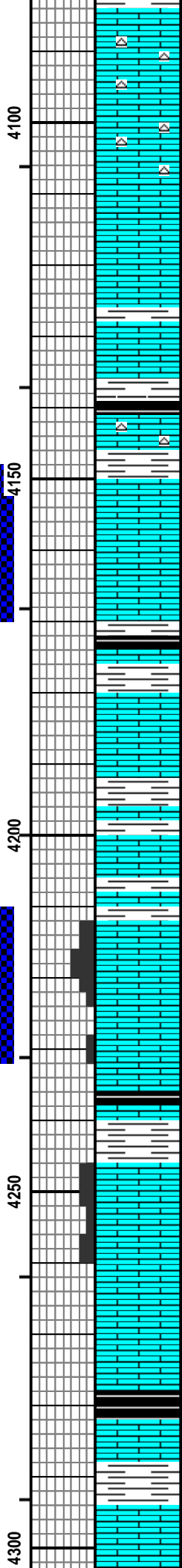
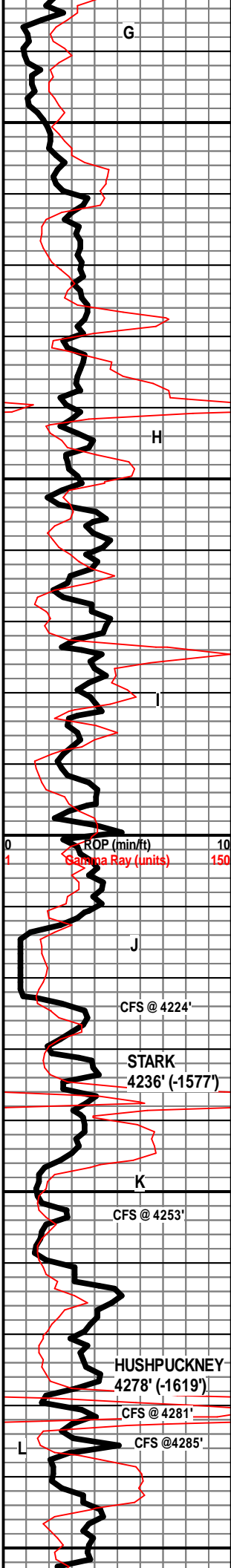
SH - DK GY, CARB, W/ SH - RD / GRN, W/ LS - TAN / LT BRN, F XLN, MOD DNS, ABUND OF CALCTE FILLED CRACKS + FOSS MOLDS

LS - WHT / CRM, VF XLN, SUBCHKY / CHKY

LS - TAN, F XLN, MOD DNS / DNS, ABUND STYLOLITES, FOSS IN PT

WT 8.9  
VIS 59  
LCM 2#

WT 8.9  
VIS 66  
LCM 2#



LS - CRM / WHT, VF / F XLN, MOD DNS / SUBCHKY, CHKY IN PT, W/ SH - GRN  
 LS - CRM / TAN, VF XLN, MOD DNS, SUBCHKY IN PT, FOSS IN PT, W/ CHT - WHT / TAN, FRSH, PRED OPAQ, TRANSLUCNT IN PT  
 LS - TAN, VF / F XLN, MOD DNS / SUBCHKY IN PT, FOSS, W/ CHT - WHT / CLR, FRSH, TRANSLUCNT & OPAQ  
 LS - TAN / GY, F XLN, MOD DNS / DNS, FOSS, W/ SH - GRN / RD  
 LS - GY, VF / F XLN, SUBCHKY  
 SH - BLK, CARB, W/ SH - GY, W/ LS - TAN / GY, F XLN DNS, W/ CHT - WHT, PRED OPAQ, TRANSLUCNT IN PT  
 SH - RD, W/ LS - CRM / WHT, VF / F XLN, SUBCHKY / CHKY  
 LS - CRM / WHT, VF XLN, SUBCHKY / CHKY  
 SH - RD / GRN, W/ SH - BLK, SLI CARB, W/ LS - TAN / GY, F XLN, DNS, FOSS  
 LS - CRM / TAN, VF / F XLN, MOD DNS / SUBCHKY  
 LS - TAN / LT BRN, F XLN, DNS, FOSS, W/ SH - GRN / GY  
 LS - WHT / CRM, F XLN, MOD DNS / SUBCHKY, W/ SH - GY  
 LS - CRM / WHT, F XLN, SUBCHKY / MOD DNS, W/ SH - GY  
 LS - CRM / TAN, F XLN, F / G INTXLN + OOLMOLDIC POR, PRED OOLMOLDIC, VUG POR IN PT, FOSS, NS, NO ODOR, V SLI YEL-GRN FLUOR  
 LS - CRM / TAN, VF / F XLN, DNS IN PT, PRED MOD DNS / SUBCHKY  
 SH - DK GY / BLK, SLI CARB  
 LS - CRM / TAN, F XLN, DNS, ABUND FOSS, OOLITIC, P OOLMOLDIC POR IN PT, NS, NO ODOR, W/ SH - GY / GRN  
 LS - CRM / TAN, F XLN, PRED OOL, FOSS, G OOLMOLDIC POR, P / F INTXLN POR, NS, NO ODOR  
 LS - TAN / BRN, F XLN, DNS, FOSS IN PT  
 SH - BLK, CARB, W/ LS - CRM / TAN, VF / F XLN, MOD DNS / SUBCHKY  
 LS - GY / BRN, F XLN, DNS, ABUND FOSS, NS, NO ODOR, NO FLUOR  
 LS - CRM / TAN, VF / F XLN, MOD DNS / SUBCHKY IN PT, FOSS IN PT, NS, NO ODOR, W/ SH - GRN / GY  
 LS - TAN / GY, VF / F XLN, MOD DNS / SUBCHKY, FOSS IN PT, NO VIS POR, NS, NO ODOR, SLI

DST #3  
 WRONG INTERVAL TESTED  
 TEST INTENDED TO BE LKC 'J' ZONE STRADDLE TEST AFTER LOGS, AN EXTRA STAND WAS PUT IN THE TAIL, MOVING TEST INTERVAL UP APPROX 63'

4147' - 4169'  
 5" - 30" - 30" - 30"

IF: Built to weak surface blow  
 ISI: No Blow  
 FF: No Blow  
 FSI: No Blow

Rec'd: 70' Mud

IH: 2096#  
 IF: 47-47#  
 ISI: 1090#  
 FF: 48-49#  
 FSI: 1042#  
 FH: 2011#

DST #4 LKC 'J' STRADDLE TEST AFTER LOGS

4210' - 4232'  
 5" - 30" - 45" - 90"

IF: Built to 2"  
 ISI: No Blow  
 FF: Built to 4"  
 FSI: No Blow

Rec'd: 124' MCW (10% M, 90% W), 62' WCM (30% W, 70% M)

IH: 2180#  
 IF: 18-24#  
 ISI: 966#  
 FF: 28-92#  
 FSI: 957#  
 FH: 2141#

WT 9.2  
 VIS 57  
 LCM 1#

WT 9.2  
 VIS 63  
 LCM 2#

WT 9.2  
 VIS 50  
 LCM 2#

G

H

I

J

K

L

CFS @ 4224'

STARK  
 4236' (-1577')

CFS @ 4253'

HUSHPUCKNEY  
 4278' (-1619')

CFS @ 4281'

CFS @ 4285'

4100

4150

4200

4250

4300

0 10  
 1 150



CFS @ 4307'

MARMATON  
4351' (-1692')

ROP (min/ft) 10  
Gamma Ray (units) 150

PAWNEE  
4459' (-1800')

FT. SCOTT  
4492' (-1833')

CFS @ 4500'

CFS @ 4510'  
CHEROKEE  
SH

4350

4400

4450

4500

MINERAL FLUOR

SH - GRN / GY

LS - CRM / TAN, VF / F XLN, MOD DNS / SUBCHKY,  
DNS IN PT

SH - DK GY / BLK

LS - CRM / TAN, VF / F XLN, MOD DNS / SUBCHKY

SH - GY / GRN / RD

LS - CRM / TAN IN PT, F XLN, MOD DNS / DNS, FOSS,  
STYLITOLIZED IN PT

SH - BLK, SLI CARB, W/ SH - GRN / GY / RD

SH - GRN / MAR / RD ORNG, W/ LS - GY / BRN, F XLN,  
DNS, FOSS

LS - WHT / CRM, VF / F XLN, SUBCHKY / CHKY, W/ SH  
- GY

SH - RD / GRN / GY, W/ LS - CRM / TAN, VF / F XLN,  
MOD DNS / SUBCHKY, FOSS IN PT

LS - CRM / TAN, F XLN, MOD DNS / DNS, FOSS IN PT

LS - CRM, VF / F XLN, MOD DNS / SUBCHKY, W/ SH -  
RD / GRN / GY

SH - BLK, SLI CARB, W/ LS - CRM / TAN / LT GY IN PT,  
F XLN, DNS, ABUND FOSS

LS - WHT / CRM, VF XLN, SUBCHKY / CHKY

SH - BLK, CARB, W/ SH - RD / GRN / GY, W/ LS - TAN /  
BRN, F XLN, DNS, FOSS

LS - TAN, F XLN, DNS, FOSS

LS - TAN / LT BRN, GY IN PT, DNS, PYRITIC

LS - TAN / LT BRN, F XLN, DNS, ABUND FOSS, OOL IN PT, VOIDS  
FILLED W/ CALCTE, P INTERPART + INTXLN POR, NSFO, SHO OF  
GAS BUBB, ABUND OIL SHEEN, F ODOR, GYEL-GRN FLUOR

LS - LT BRN / DK BRN, F / M XLN, V DNS, FOSS, NS

LS - CRM / TAN / LT BRN, F XLN, P / F INTXLN + INTERPART POR,  
ABUND FOSS, FSFO, LT BRN OIL, G SHO GAS BUBB, G ODOR, G  
YEL-GRN FLUOR

SH - BLK, SLI CARB, IRON STN, W/ LS - CRM / TAN /  
GY, F XLN, DNS, FOSS IN PT

WT 9.3  
VIS 47  
LCM 1#

WT 9.4  
VIS 54  
LCM 1#

JET AND RAN  
TANK

WT 9.3  
VIS 51  
LCM 1#

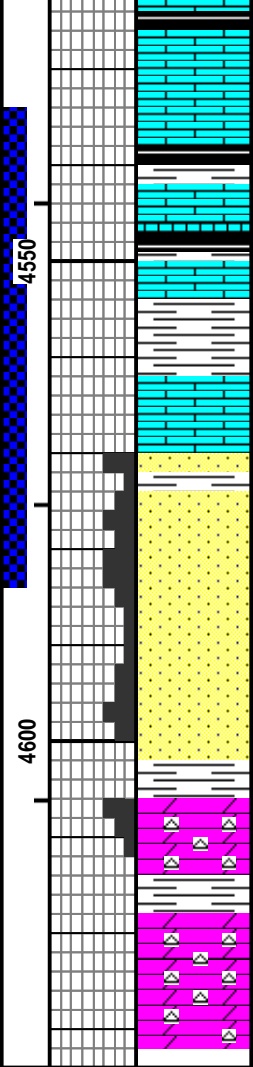
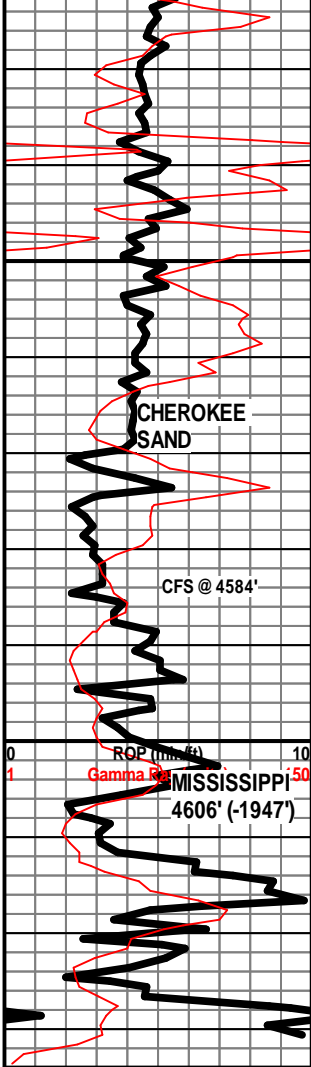
DST #1 FT. SCOTT  
4480' - 4510'  
5" - 30" - 30" - 30"

IF: Weak surface blow, died in 3 min  
ISI: No Blow  
FF: No Blow  
FSI: No Blow

Rec'd: 2' Mud

IH: 2226#  
IF: 15-46#  
ISI: 50#  
FF: 16-16#  
FSI: 25#  
FH: 2175#

STRAP 1.57' LONG  
TO BOARD



SH - BLK, CARB, W/ LS - BRN, F XLN, MOD DNS / DSN, ABUND OF FOSS, OOL IN PT

LS - LT BRN / TAN, F XLN, DNS, FOSS, W/ SH - BLK, SLI CARB, W/ SH - GRN / GY

LS - TAN / GY, F XLN, MOD DNS / DNS, W/ SH - BLK, CARB, W/ SH - RD / GRN / LT GRN / GY

SH - RD / GRN / RD-ORNG, W / LS - TAN, F / M XLN, DNS, FOSS IN PT

LS - CRM / WHT, VF / F XLN, MOD DNS / SUBCHKY, W/ SH - GRN / RD

SS - WHT / CLR, VF / F GR / M IN PT, SUB RND, MOD SRTD, W CEM, 30% DNS, 70% F / G INTGR POR, FRI IN PT, GSFO, LT BRN OIL, SLI YEL-GRN FLUOR

SS - PRED WHT / CLR IN PT, VF / F GRN, SUB RND, MOD SRTD, MOD / W CEM, G INTGR POR, PRED FRI, SPOTTY SFO, POR MOSTLY BARREN, SLI ODOR, SLI YEL-GRN FLUOR IN PT

SS - CLR / WHT / GY, F GRN, SUB ANG, W SRTD, W CEM, V DNS, NO VIS POR, NS, NO ODOR, NO FLUOR, W/ SH IN PT - GRN / GY

SS - WHT / CLR, VF / F GR, F / G INTGR POR, NS, NO ODOR, NO FLUOR

SH - RD / GRN / GY / RD-ORNG

DOLO - CRM / TAN, F XLN, PRED DNS & CHTLT, P INTXLNAND VUG POR IN PT, NS, NO ODOR, NO FLUOR, FOSS IN PT, FEW PIECES OF CHT - WHT / GY / CLR, F

SH - RD / GRN / GY, W/ DOLO - WHT / CRM / TAN, VF / F XLN PRED DNS, SUBCHKY IN PT, NS, NO ODOR

DOLO - GY / TAN / LT BRN, F XLN, DNS, CHTLT IN PT, FOSS IN PT, NS, NO ODOR, G YEL-GRN FLUOR, W/ SH - GY

**RTD 4631'**

**DST #2 CHEROKEE SAND**  
4534' - 4584'  
5" - 30" - 30" - 30"

IF: Weak surface blow  
ISI: No Blow  
FF: No Blow  
FSI: No Blow

Rec'd: 5' Mud

IH: 2273#  
IF: 31-32#  
ISI: 308#  
FF: 32-33#  
FSI: 162#  
FH: 2205#

WT 9.3  
VIS 54  
LCM 1#

WT 9.2  
VIS 55