

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) (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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DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc**

PO Box 783188
Wichita, KS 67278-3188

ATTN: John Goldsmith

Voss #5

7-6s-21w Graham KS

Start Date: 2018.10.23 @ 16:04:00

End Date: 2018.10.23 @ 22:53:15

Job Ticket #: 64628 DST #: 1

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

Printed: 2018.10.30 @ 09:11:40



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc
 PO Box 783188
 Wichita, KS 67278-3188
 ATTN: John Goldsmith

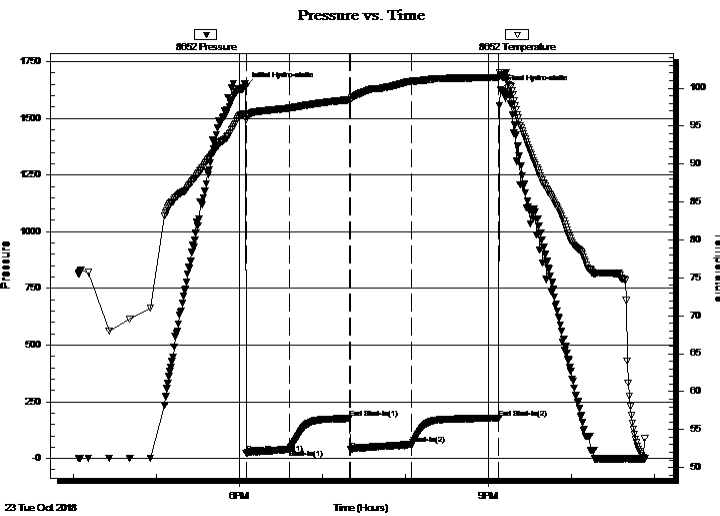
7-6s-21w Graham KS
Voss #5
 Job Ticket: 64628 **DST#: 1**
 Test Start: 2018.10.23 @ 16:04:00

GENERAL INFORMATION:

Formation: **Oread B**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 18:05:00
 Time Test Ended: 22:53:15
 Interval: **3342.00 ft (KB) To 3380.00 ft (KB) (TVD)**
 Total Depth: 3380.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Good
 Test Type: Conventional Bottom Hole (Initial)
 Tester: James Winder
 Unit No: 83
 Reference Elevations: 2204.00 ft (KB)
 2199.00 ft (CF)
 KB to GR/CF: 5.00 ft

Serial #: 8652 Outside
 Press@RunDepth: 62.02 psig @ 3343.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2018.10.23 End Date: 2018.10.23 Last Calib.: 2018.10.23
 Start Time: 16:04:05 End Time: 22:53:14 Time On Btm: 2018.10.23 @ 18:04:45
 Time Off Btm: 2018.10.23 @ 21:08:45

TEST COMMENT: 30 - IF: 1/4" Blow at open, built to 5"
 45 - IS: No blow back
 45 - FF: Blow built to BOB (11") at 42 min., built to 11 1/2"
 60 - FS: No blow back



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1640.13	96.62	Initial Hydro-static
1	22.64	95.92	Open To Flow (1)
32	39.65	97.36	Shut-In(1)
75	176.03	98.46	End Shut-In(1)
76	38.26	98.50	Open To Flow (2)
120	62.02	100.90	Shut-In(2)
183	176.82	101.40	End Shut-In(2)
184	1625.79	101.66	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
60.00	OWCM 56% _m , 23% _w , 21% _o	0.30
45.00	OCM 78% _m , 22% _o	0.22
0.00	GIP = 140'	0.00

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration, Inc
 PO Box 783188
 Wichita, KS 67278-3188
 ATTN: John Goldsmith

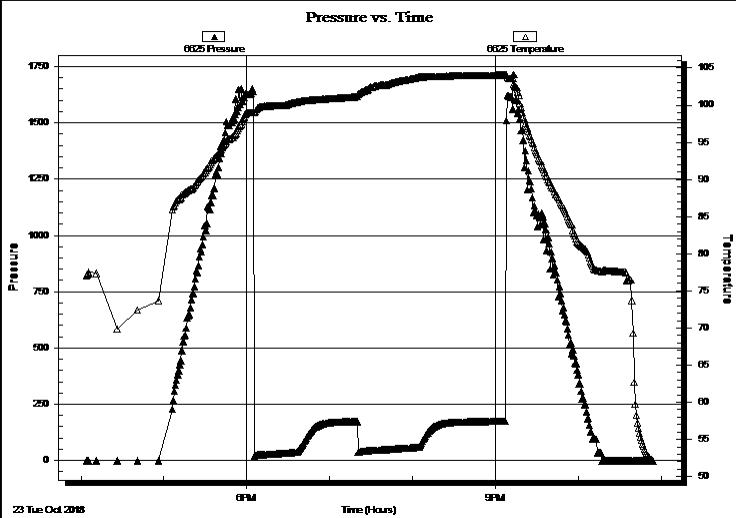
7-6s-21w Graham KS
Voss #5
 Job Ticket: 64628 **DST#: 1**
 Test Start: 2018.10.23 @ 16:04:00

GENERAL INFORMATION:

Formation: Oread B				
Deviated: No Whipstock:	ft (KB)		Test Type: Conventional Bottom Hole (Initial)	
Time Tool Opened: 18:05:00			Tester: James Winder	
Time Test Ended: 22:53:15			Unit No: 83	
Interval: 3342.00 ft (KB) To 3380.00 ft (KB) (TVD)			Reference Elevations:	2204.00 ft (KB)
Total Depth: 3380.00 ft (KB) (TVD)				2199.00 ft (CF)
Hole Diameter: 7.88 inches	Hole Condition: Good		KB to GR/CF:	5.00 ft

Serial #: 6625	Inside			
Press@RunDepth: psig @ 3343.00 ft (KB)			Capacity: 8000.00 psig	
Start Date: 2018.10.23	End Date: 2018.10.23		Last Calib.: 2018.10.23	
Start Time: 16:04:05	End Time: 22:53:59		Time On Btm:	
			Time Off Btm:	

TEST COMMENT: 30 - IF: 1/4" Blow at open, built to 5"
 45 - IS: No blow back
 45 - FF: Blow built to BOB (11") at 42 min., built to 11 1/2"
 60 - FS: No blow back



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

Recovery		
Length (ft)	Description	Volume (bbl)
60.00	OWCM 56% _m , 23% _w , 21% _o	0.30
45.00	OCM 78% _m , 22% _o	0.22
0.00	GIP = 140'	0.00

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Ritchie Exploration, Inc
 PO Box 783188
 Wichita, KS 67278-3188
 ATTN: John Goldsmith

7-6s-21w Graham KS
Voss #5
 Job Ticket: 64628 **DST#: 1**
 Test Start: 2018.10.23 @ 16:04:00

Tool Information

Drill Pipe:	Length: 3161.00 ft	Diameter: 3.80 inches	Volume: 44.34 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 178.00 ft	Diameter: 2.25 inches	Volume: 0.88 bbl	Weight to Pull Loose: 56000.00 lb
			<u>Total Volume: 45.22 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	26.00 ft			String Weight: Initial 48000.00 lb
Depth to Top Packer:	3342.00 ft			Final 50000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	38.00 ft			
Tool Length:	67.00 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			3314.00	
Shut In Tool	5.00			3319.00	
Hydraulic tool	5.00			3324.00	
Jars	5.00			3329.00	
Safety Joint	3.00			3332.00	
Packer	5.00			3337.00	29.00 Bottom Of Top Packer
Packer	5.00			3342.00	
Stubb	1.00			3343.00	
Recorder	0.00	6625	Inside	3343.00	
Recorder	0.00	8652	Outside	3343.00	
Perforations	34.00			3377.00	
Bullnose	3.00			3380.00	38.00 Bottom Packers & Anchor

Total Tool Length: 67.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc
 PO Box 783188
 Wichita, KS 67278-3188
 ATTN: John Goldsmith

7-6s-21w Graham KS
Voss #5
 Job Ticket: 64628 **DST#: 1**
 Test Start: 2018.10.23 @ 16:04:00

Mud and Cushion Information

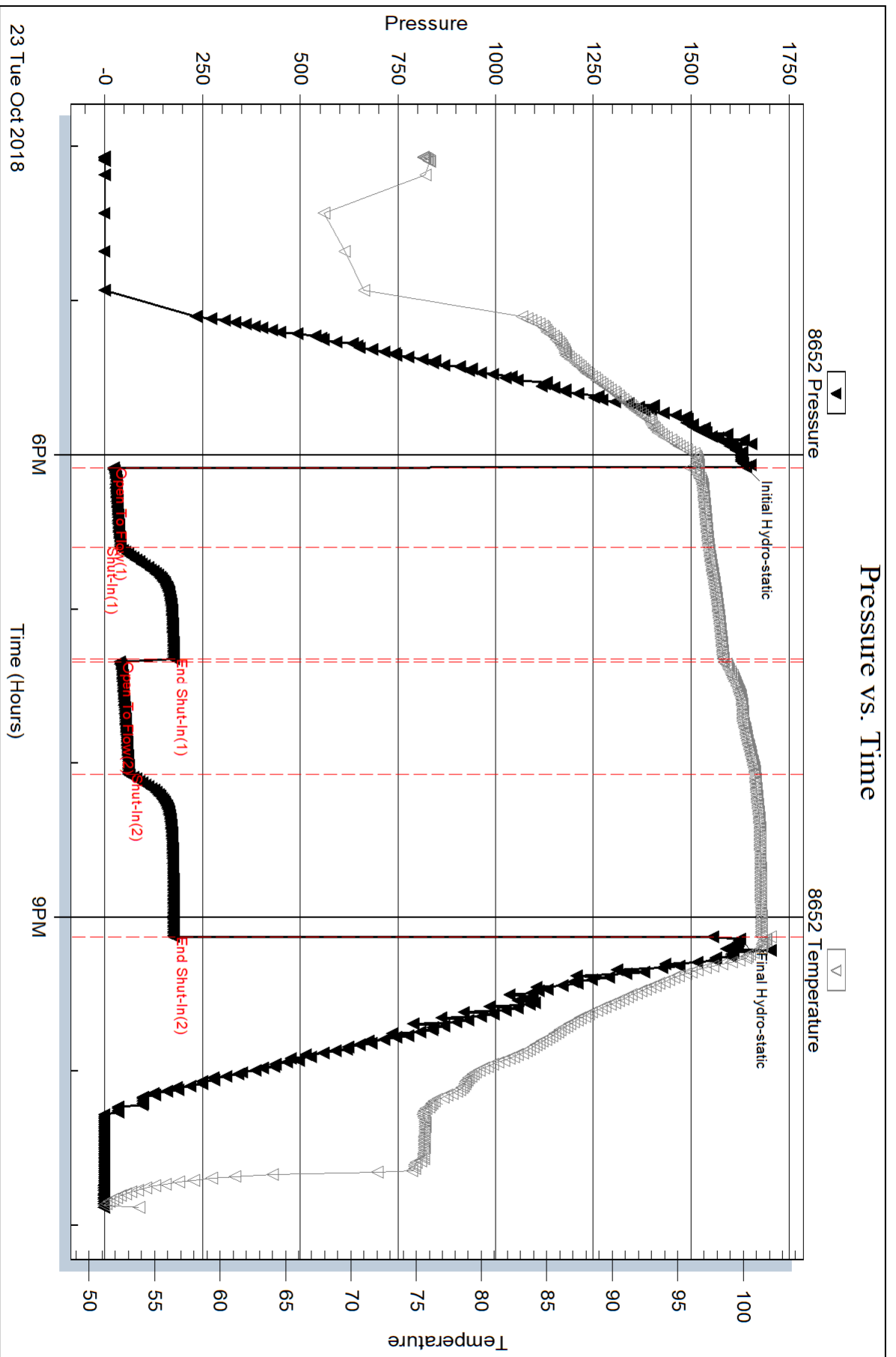
Mud Type: Gel Chem	Cushion Type:	Oil API:	deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity:	ppm
Viscosity: 55.00 sec/qt	Cushion Volume: bbl		
Water Loss: 6.37 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 1200.00 ppm			
Filter Cake: 1.00 inches			

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
60.00	OWCM 56% <i>m</i> , 23% <i>w</i> , 21% <i>o</i>	0.295
45.00	OCM 78% <i>m</i> , 22% <i>o</i>	0.221
0.00	GIP = 140'	0.000

Total Length: 105.00 ft Total Volume: 0.516 bbl
 Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
 Laboratory Name: Laboratory Location:
 Recovery Comments:



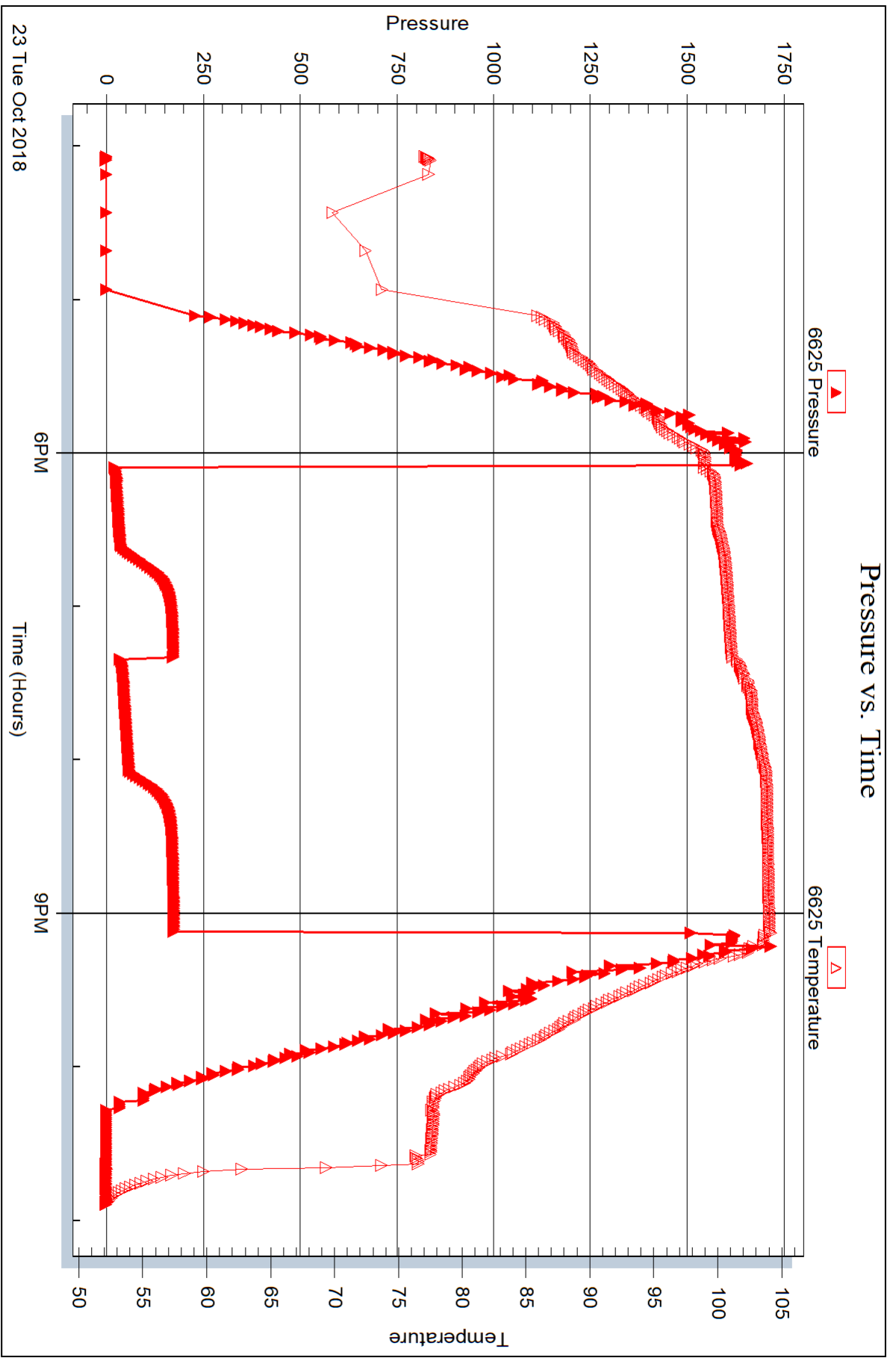
Serial #: 6625

Inside

Ritchie Exploration, Inc

Voss #5

DST Test Number: 1



Trilobite Testing, Inc

Ref. No: 64628

Printed: 2018.10.30 @ 09:11:41



DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc**

PO Box 783188
Wichita, KS 67278-3188

ATTN: John Goldsmith

Voss #5

7-6s-21w Graham KS

Start Date: 2018.10.24 @ 10:42:00

End Date: 2018.10.24 @ 16:18:45

Job Ticket #: 64629 DST #: 2

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

Printed: 2018.10.30 @ 09:11:15



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc
 PO Box 783188
 Wichita, KS 67278-3188
 ATTN: John Goldsmith

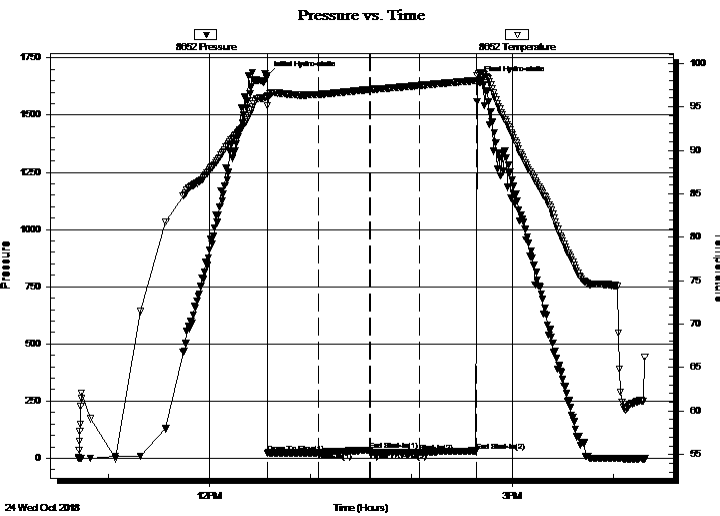
7-6s-21w Graham KS
Voss #5
 Job Ticket: 64629 **DST#: 2**
 Test Start: 2018.10.24 @ 10:42:00

GENERAL INFORMATION:

Formation: **Toronto - LKC "A"**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 12:34:30
 Time Test Ended: 16:18:45
 Interval: **3394.00 ft (KB) To 3450.00 ft (KB) (TVD)**
 Total Depth: 3450.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Good
 Test Type: Conventional Bottom Hole (Reset)
 Tester: James Winder
 Unit No: 83
 Reference Elevations: 2204.00 ft (KB)
 2199.00 ft (CF)
 KB to GR/CF: 5.00 ft

Serial #: 8652 Outside
 Press@RunDepth: 25.64 psig @ 3395.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2018.10.24 End Date: 2018.10.24 Last Calib.: 2018.10.24
 Start Time: 10:42:05 End Time: 16:18:44 Time On Btm: 2018.10.24 @ 12:34:15
 Time Off Btm: 2018.10.24 @ 14:39:15

TEST COMMENT: 30 - IF: Blow built to 1/2"
 30 - IS: No blow back
 30 - FF: No blow
 30 - FS: No blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1674.05	96.24	Initial Hydro-static
1	22.79	95.14	Open To Flow (1)
31	24.55	96.41	Shut-In(1)
61	33.68	96.98	End Shut-In(1)
62	25.03	96.99	Open To Flow (2)
91	25.64	97.44	Shut-In(2)
125	32.01	98.02	End Shut-In(2)
125	1649.61	98.62	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
20.00	Mud w /trace oil 100%m	0.10

* Recovery from multiple tests

Gas Rates

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc
PO Box 783188
Wichita, KS 67278-3188
ATTN: John Goldsmith

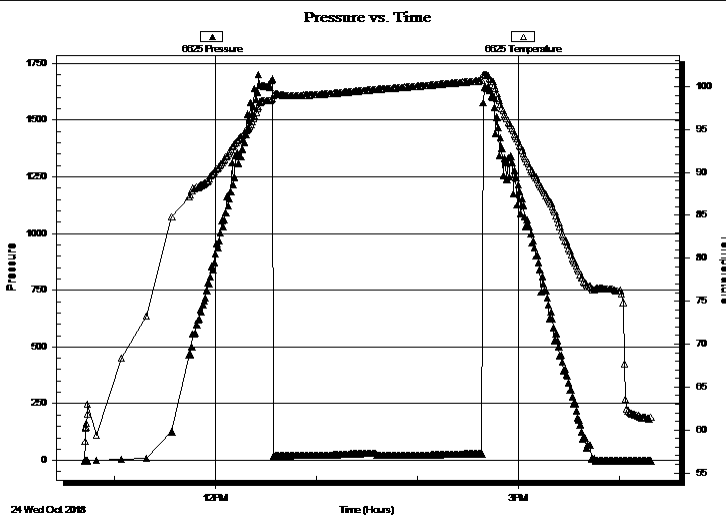
7-6s-21w Graham KS
Voss #5
Job Ticket: 64629 DST#: 2
Test Start: 2018.10.24 @ 10:42:00

GENERAL INFORMATION:

Formation: Toronto - LKC "A"
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 12:34:30
Time Test Ended: 16:18:45
Interval: 3394.00 ft (KB) To 3450.00 ft (KB) (TVD)
Total Depth: 3450.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good
Reference Elevations: 2204.00 ft (KB)
2199.00 ft (CF)
KB to GR/CF: 5.00 ft

Serial #: 6625 Inside
Press@RunDepth: psig @ 3395.00 ft (KB)
Start Date: 2018.10.24 End Date: 2018.10.24
Start Time: 10:42:05 End Time: 16:19:14
Capacity: 8000.00 psig
Last Calib.: 2018.10.24
Time On Btm:
Time Off Btm:

TEST COMMENT: 30 - IF: Blow built to 1/2"
30 - IS: No blow back
30 - FF: No blow
30 - FS: No blow



PRESSURE SUMMARY

Table with 4 columns: Time (Min.), Pressure (psig), Temp (deg F), and Annotation. All cells are currently empty.

Recovery

Table with 3 columns: Length (ft), Description, and Volume (bbl). Row 1: 20.00, Mud w /trace oil 100%m, 0.10.

Gas Rates

Table with 4 columns: Choke (inches), Pressure (psig), and Gas Rate (Mcf/d). All cells are currently empty.

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Ritchie Exploration, Inc
 PO Box 783188
 Wichita, KS 67278-3188
 ATTN: John Goldsmith

7-6s-21w Graham KS
Voss #5
 Job Ticket: 64629 **DST#: 2**
 Test Start: 2018.10.24 @ 10:42:00

Tool Information

Drill Pipe:	Length: 3193.00 ft	Diameter: 3.80 inches	Volume: 44.79 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 178.00 ft	Diameter: 2.25 inches	Volume: 0.88 bbl	Weight to Pull Loose: 52000.00 lb
			<u>Total Volume: 45.67 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	6.00 ft			String Weight: Initial 48000.00 lb
Depth to Top Packer:	3394.00 ft			Final 48000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	56.00 ft			
Tool Length:	85.00 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			3366.00	
Shut In Tool	5.00			3371.00	
Hydraulic tool	5.00			3376.00	
Jars	5.00			3381.00	
Safety Joint	3.00			3384.00	
Packer	5.00			3389.00	29.00 Bottom Of Top Packer
Packer	5.00			3394.00	
Stubb	1.00			3395.00	
Recorder	0.00	6625	Inside	3395.00	
Recorder	0.00	8652	Outside	3395.00	
Perforations	15.00			3410.00	
Blank Spacing	33.00			3443.00	
Perforations	4.00			3447.00	
Bullnose	3.00			3450.00	56.00 Bottom Packers & Anchor

Total Tool Length: 85.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc
 PO Box 783188
 Wichita, KS 67278-3188
 ATTN: John Goldsmith

7-6s-21w Graham KS
Voss #5
 Job Ticket: 64629 **DST#: 2**
 Test Start: 2018.10.24 @ 10:42:00

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: bbl		
Water Loss: 5.98 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 900.00 ppm			
Filter Cake: 1.00 inches			

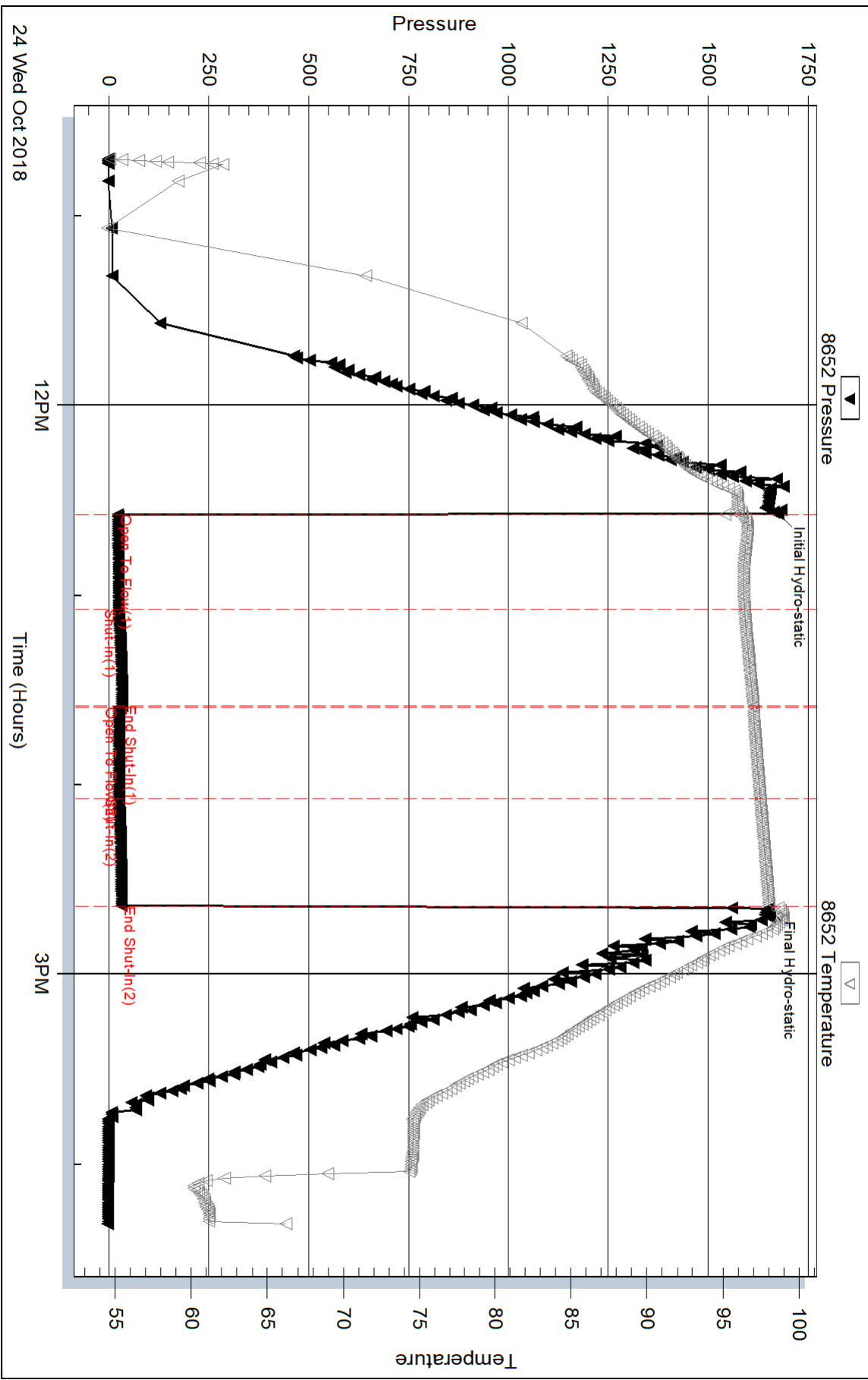
Recovery Information

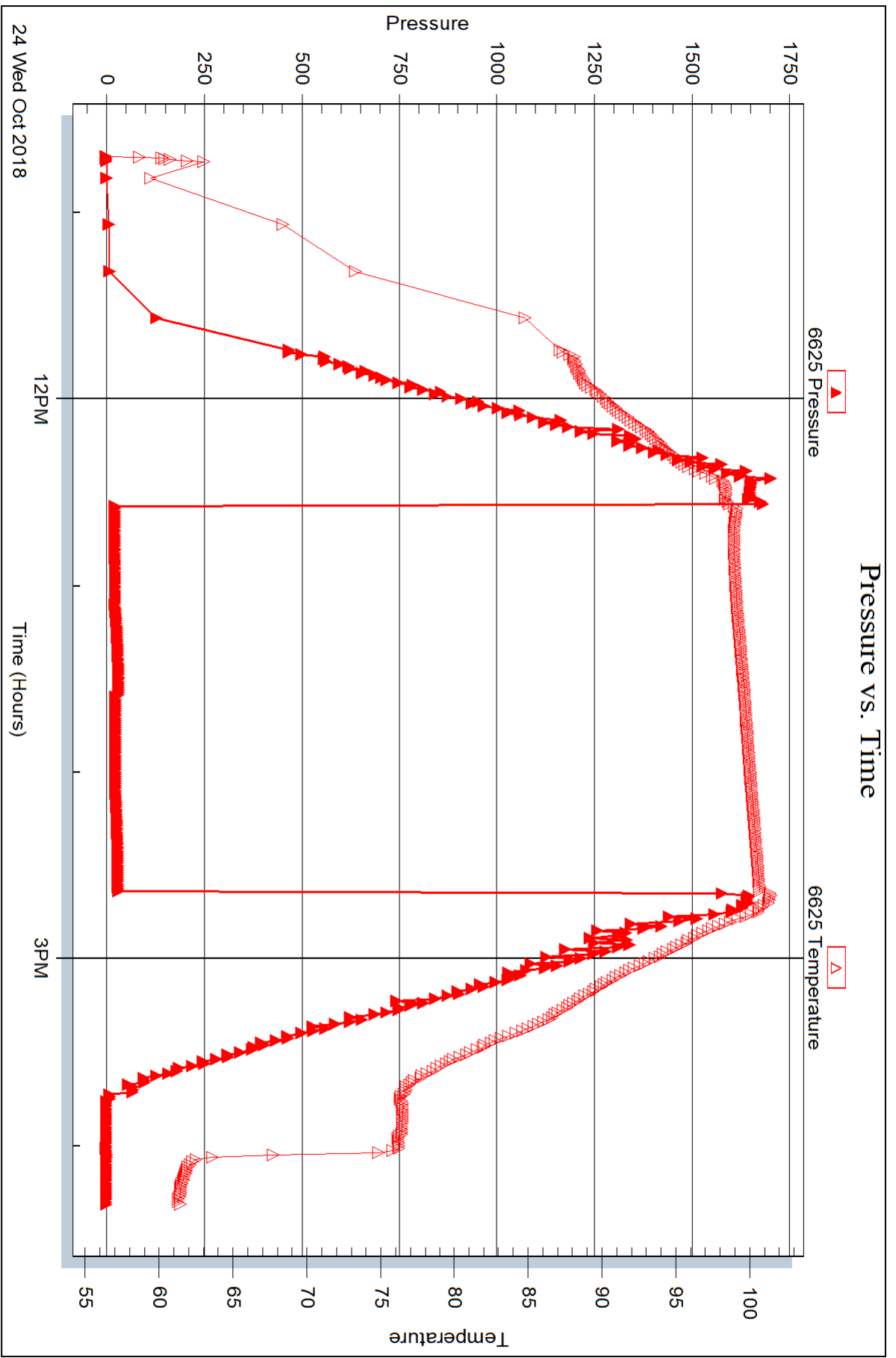
Recovery Table

Length ft	Description	Volume bbl
20.00	Mud w /trace oil 100%m	0.098

Total Length: 20.00 ft Total Volume: 0.098 bbl
 Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
 Laboratory Name: Laboratory Location:
 Recovery Comments:

Pressure vs. Time







DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc**

PO Box 783188
Wichita, KS 67278-3188

ATTN: John Goldsmith

Voss #5

7-6s-21w Graham KS

Start Date: 2018.10.25 @ 00:06:00

End Date: 2018.10.25 @ 05:50:00

Job Ticket #: 64630 DST #: 3

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

Printed: 2018.10.30 @ 09:10:50



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration, Inc
PO Box 783188
Wichita, KS 67278-3188
ATTN: John Goldsmith

7-6s-21w Graham KS
Voss #5
Job Ticket: 64630 **DST#: 3**
Test Start: 2018.10.25 @ 00:06:00

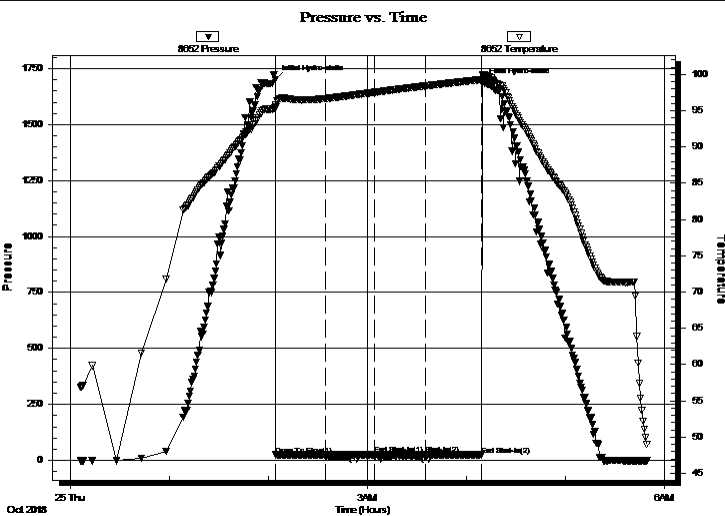
GENERAL INFORMATION:

Formation: **LKC "C"**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 02:04:30
Time Test Ended: 05:50:00
Interval: **3456.00 ft (KB) To 3478.00 ft (KB) (TVD)**
Total Depth: 3478.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good
Reference Elevations: 2204.00 ft (KB)
2199.00 ft (CF)
KB to GR/CF: 5.00 ft
Test Type: Conventional Bottom Hole (Reset)
Tester: James Winder
Unit No: 83

Serial #: 8652 Outside

Press@RunDepth: 25.75 psig @ 3457.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2018.10.25 End Date: 2018.10.25 Last Calib.: 2018.10.25
Start Time: 00:06:05 End Time: 05:49:59 Time On Btm: 2018.10.25 @ 02:04:15
Time Off Btm: 2018.10.25 @ 04:10:00

TEST COMMENT: 30 - IF: Blow built to 3/4"
30 - IS: No blow back
30 - FF: No blow
30 - FS: No blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1702.36	95.83	Initial Hydro-static
1	24.69	95.48	Open To Flow (1)
31	25.63	96.67	Shut-In(1)
60	25.09	97.53	End Shut-In(1)
61	25.11	97.54	Open To Flow (2)
91	25.75	98.41	Shut-In(2)
125	24.54	99.27	End Shut-In(2)
126	1688.41	99.95	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
15.00	Mud w /trace oil 100% m	0.07

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Ritchie Exploration, Inc
 PO Box 783188
 Wichita, KS 67278-3188
 ATTN: John Goldsmith

7-6s-21w Graham KS
Voss #5
 Job Ticket: 64630 **DST#: 3**
 Test Start: 2018.10.25 @ 00:06:00

Tool Information

Drill Pipe:	Length: 3257.00 ft	Diameter: 3.80 inches	Volume: 45.69 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 178.00 ft	Diameter: 2.25 inches	Volume: 0.88 bbl	Weight to Pull Loose: 48000.00 lb
			<u>Total Volume: 46.57 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	8.00 ft			String Weight: Initial 48000.00 lb
Depth to Top Packer:	3456.00 ft			Final 48000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	22.00 ft			
Tool Length:	51.00 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			3428.00	
Shut In Tool	5.00			3433.00	
Hydraulic tool	5.00			3438.00	
Jars	5.00			3443.00	
Safety Joint	3.00			3446.00	
Packer	5.00			3451.00	29.00 Bottom Of Top Packer
Packer	5.00			3456.00	
Stubb	1.00			3457.00	
Recorder	0.00	6625	Inside	3457.00	
Recorder	0.00	8652	Outside	3457.00	
Perforations	18.00			3475.00	
Bullnose	3.00			3478.00	22.00 Bottom Packers & Anchor

Total Tool Length: 51.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc
PO Box 783188
Wichita, KS 67278-3188
ATTN: John Goldsmith

7-6s-21w Graham KS
Voss #5
Job Ticket: 64630 **DST#: 3**
Test Start: 2018.10.25 @ 00:06:00

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: 55.00 sec/qt	Cushion Volume: bbl		
Water Loss: 6.37 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 1200.00 ppm			
Filter Cake: 1.00 inches			

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
15.00	Mud w /trace oil 100%m	0.074

Total Length: 15.00 ft Total Volume: 0.074 bbl

Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:

Laboratory Name: Laboratory Location:

Recovery Comments:

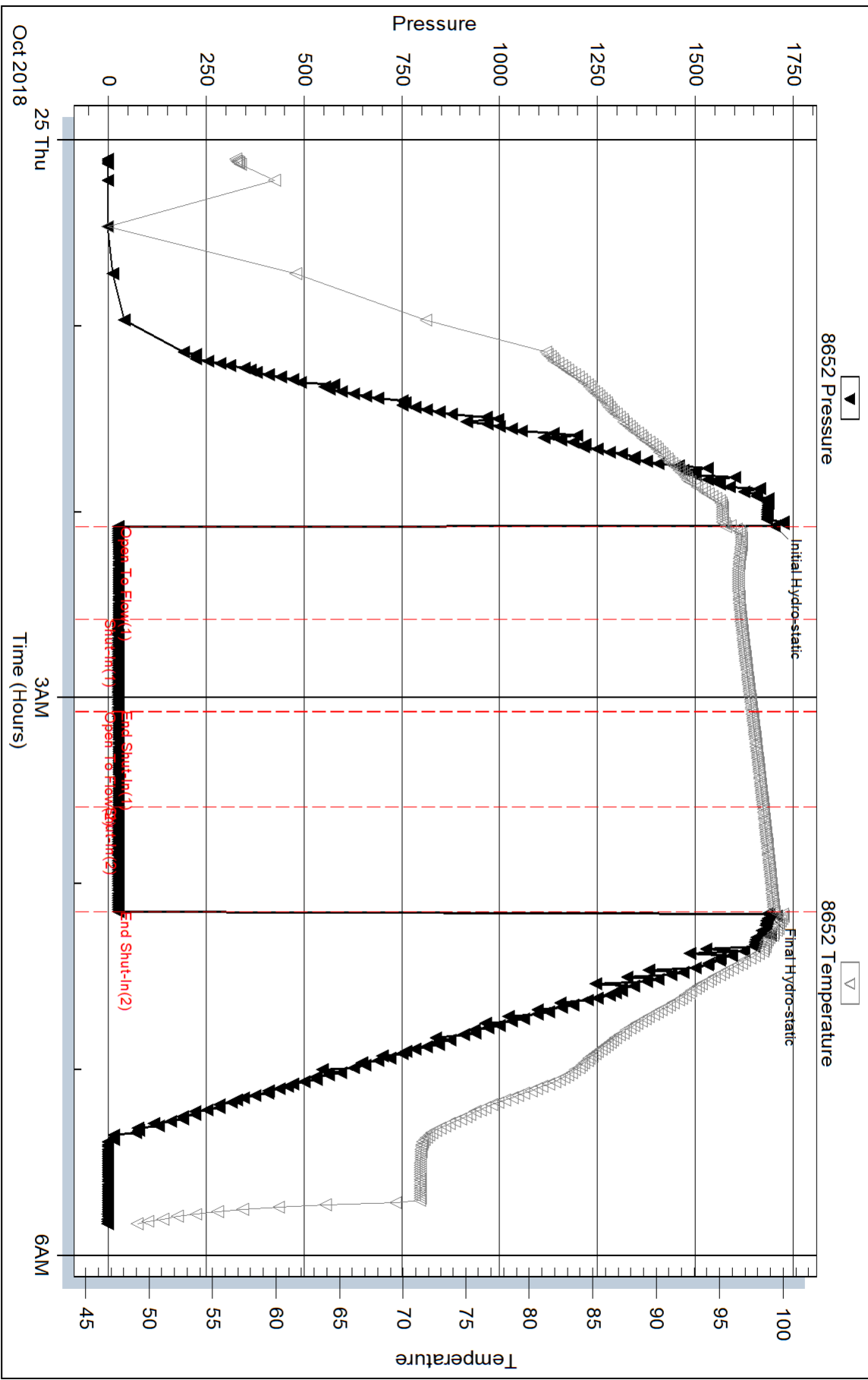
Serial #: 8652

Outside Ritchie Exploration, Inc

Voss #5

DST Test Number: 3

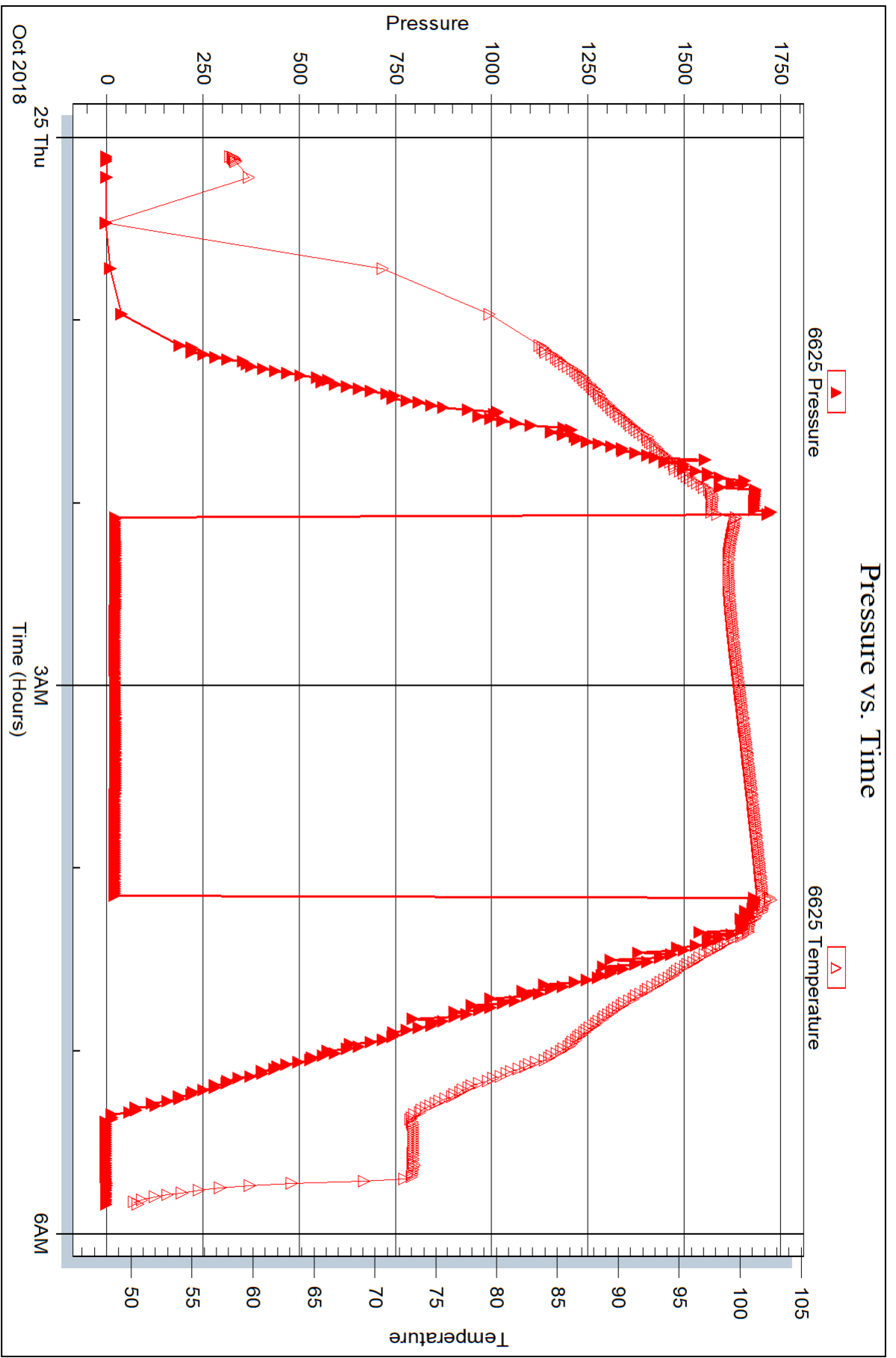
Pressure vs. Time



Trilobite Testing, Inc

Ref. No: 64630

Printed: 2018.10.30 @ 09:10:51





DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc**

PO Box 783188
Wichita, KS 67278-3188

ATTN: John Goldsmith

Voss #5

7-6s-21w Graham KS

Start Date: 2018.10.25 @ 16:23:00

End Date: 2018.10.25 @ 23:05:30

Job Ticket #: 64631 DST #: 4

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

Printed: 2018.10.30 @ 09:09:44



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration, Inc
PO Box 783188
Wichita, KS 67278-3188
ATTN: John Goldsmith

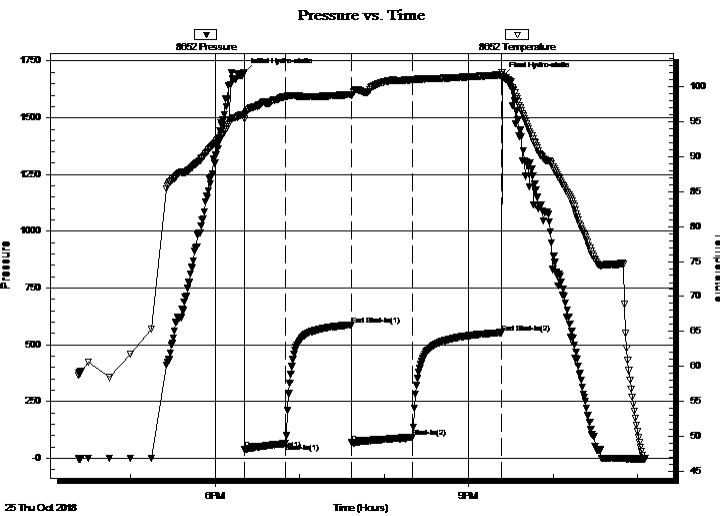
7-6s-21w Graham KS
Voss #5
Job Ticket: 64631 **DST#: 4**
Test Start: 2018.10.25 @ 16:23:00

GENERAL INFORMATION:

Formation: **LKC "D - F"**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 18:20:45
Time Test Ended: 23:05:30
Test Type: Conventional Bottom Hole (Reset)
Tester: James Winder
Unit No: 83
Interval: **3476.00 ft (KB) To 3522.00 ft (KB) (TVD)**
Reference Elevations: 2204.00 ft (KB)
Total Depth: 3522.00 ft (KB) (TVD) 2199.00 ft (CF)
Hole Diameter: 7.88 inches Hole Condition: Good KB to GR/CF: 5.00 ft

Serial #: 8652 Outside
Press@RunDepth: 93.42 psig @ 3477.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2018.10.25 End Date: 2018.10.25 Last Calib.: 2018.10.25
Start Time: 16:23:05 End Time: 23:05:29 Time On Btm: 2018.10.25 @ 18:20:30
Time Off Btm: 2018.10.25 @ 21:23:45

TEST COMMENT: 30 - IF: 1 1/2" Surge blow at open, bled off, Blow built to 2 1/2"
45 - IS: No blow back
45 - FF: Blow built to 2 1/4"
60 - FS: No blow back



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1699.95	96.07	Initial Hydro-static
1	38.01	95.37	Open To Flow (1)
30	65.65	98.63	Shut-In(1)
76	587.74	98.93	End Shut-In(1)
77	67.86	98.79	Open To Flow (2)
120	93.42	101.05	Shut-In(2)
183	553.72	101.71	End Shut-In(2)
184	1682.41	102.08	Final Hydro-static

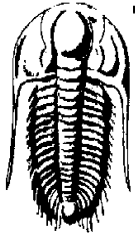
Recovery

Length (ft)	Description	Volume (bbl)
60.00	WCM 80% _m , 20% _w	0.30
105.00	Mud w /trace of oil 100% _m	0.52

* Recovery from multiple tests

Gas Rates

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc

PO Box 783188
Wichita, KS 67278-3188

ATTN: John Goldsmith

7-6s-21w Graham KS

Voss #5

Job Ticket: 64631

DST#: 4

Test Start: 2018.10.25 @ 16:23:00

GENERAL INFORMATION:

Formation: **LKC "D - F"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 18:20:45

Time Test Ended: 23:05:30

Test Type: Conventional Bottom Hole (Reset)

Tester: James Winder

Unit No: 83

Interval: 3476.00 ft (KB) To 3522.00 ft (KB) (TVD)

Total Depth: 3522.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Good

Reference Elevations: 2204.00 ft (KB)

2199.00 ft (CF)

KB to GR/CF: 5.00 ft

Serial #: 6625

Inside

Press@RunDepth: psig @ 3477.00 ft (KB)

Start Date: 2018.10.25 End Date: 2018.10.25

Start Time: 16:23:05 End Time: 23:05:59

Capacity: 8000.00 psig

Last Calib.: 2018.10.25

Time On Btm:

Time Off Btm:

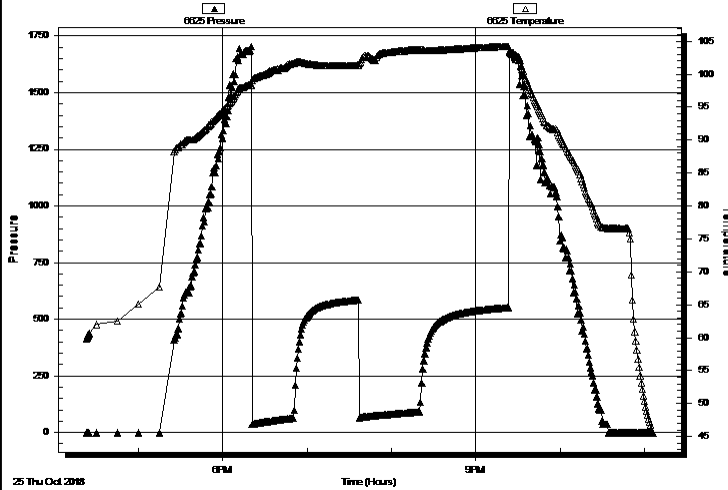
TEST COMMENT: 30 - IF: 1 1/2" Surge blow at open, bled off, Blow built to 2 1/2"

45 - IS: No blow back

45 - FF: Blow built to 2 1/4"

60 - FS: No blow back

Pressure vs. Time



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
60.00	WCM 80% _m , 20% _w	0.30
105.00	Mud w /trace of oil 100% _m	0.52

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Ritchie Exploration, Inc
 PO Box 783188
 Wichita, KS 67278-3188
 ATTN: John Goldsmith

7-6s-21w Graham KS
Voss #5
 Job Ticket: 64631 **DST#: 4**
 Test Start: 2018.10.25 @ 16:23:00

Tool Information

Drill Pipe:	Length: 3288.00 ft	Diameter: 3.80 inches	Volume: 46.12 bbl	Tool Weight:	2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer:	20000.00 lb
Drill Collar:	Length: 178.00 ft	Diameter: 2.25 inches	Volume: 0.88 bbl	Weight to Pull Loose:	52000.00 lb
			<u>Total Volume: 47.00 bbl</u>	Tool Chased	2.00 ft
Drill Pipe Above KB:	19.00 ft			String Weight: Initial	48000.00 lb
Depth to Top Packer:	3476.00 ft			Final	50000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	46.00 ft				
Tool Length:	75.00 ft				
Number of Packers:	2	Diameter: 6.75 inches			

Tool Comments: Tool chased 2' to bottom at open, lost a few ft of mud, 1 1/2" surge blow at open

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

Change Over Sub	1.00			3448.00	
Shut In Tool	5.00			3453.00	
Hydraulic tool	5.00			3458.00	
Jars	5.00			3463.00	
Safety Joint	3.00			3466.00	
Packer	5.00			3471.00	29.00 Bottom Of Top Packer
Packer	5.00			3476.00	
Stubb	1.00			3477.00	
Recorder	0.00	6625	Inside	3477.00	
Recorder	0.00	8652	Outside	3477.00	
Perforations	8.00			3485.00	
Blank Spacing	33.00			3518.00	
Perforations	1.00			3519.00	
Bullnose	3.00			3522.00	46.00 Bottom Packers & Anchor

Total Tool Length: 75.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc
 PO Box 783188
 Wichita, KS 67278-3188
 ATTN: John Goldsmith

7-6s-21w Graham KS
Voss #5
 Job Ticket: 64631 **DST#: 4**
 Test Start: 2018.10.25 @ 16:23:00

Mud and Cushion Information

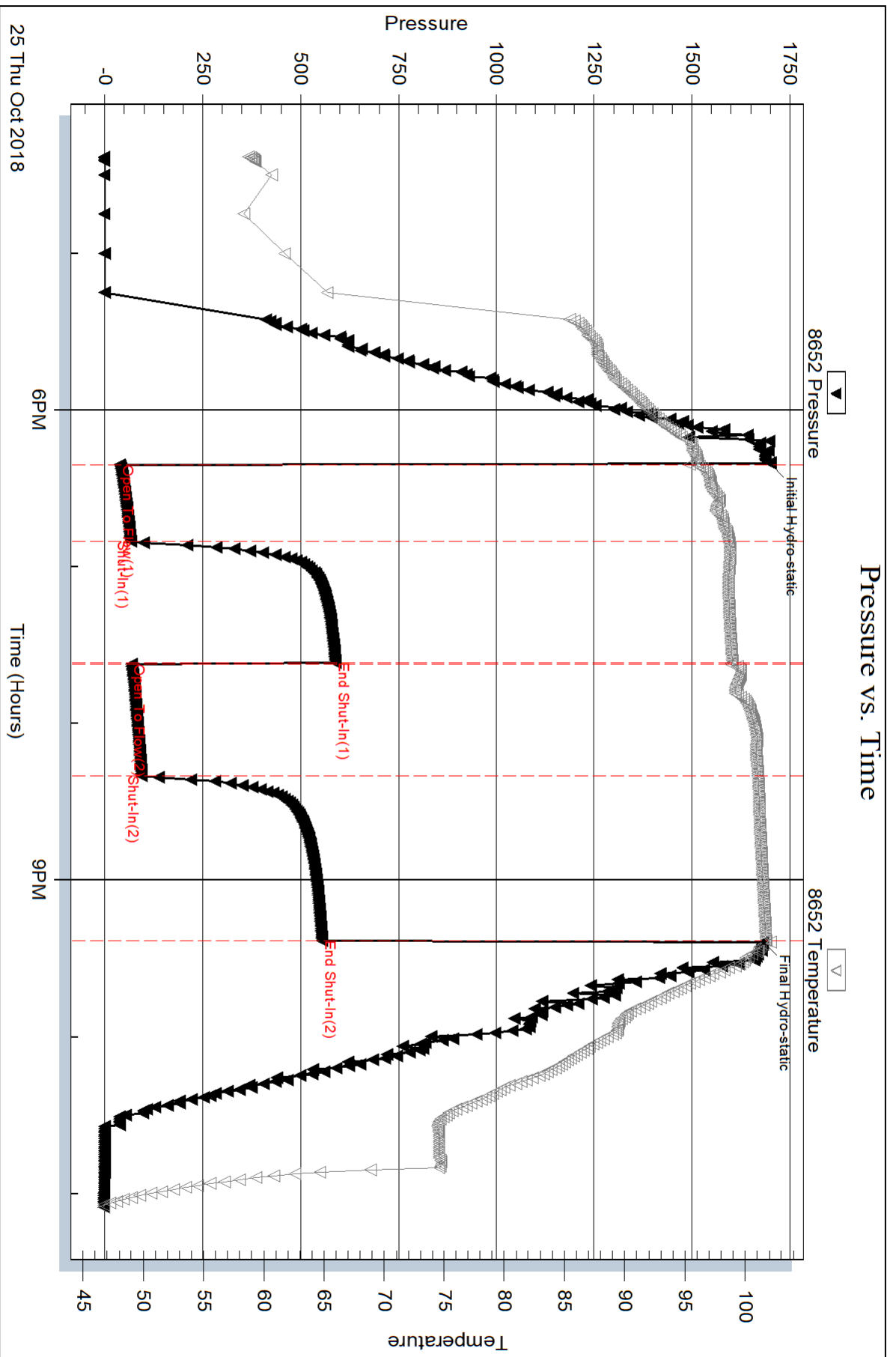
Mud Type: Gel Chem	Cushion Type:	Oil API:	deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity:	19000 ppm
Viscosity: 51.00 sec/qt	Cushion Volume: bbl		
Water Loss: 6.36 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 1000.00 ppm			
Filter Cake: 1.00 inches			

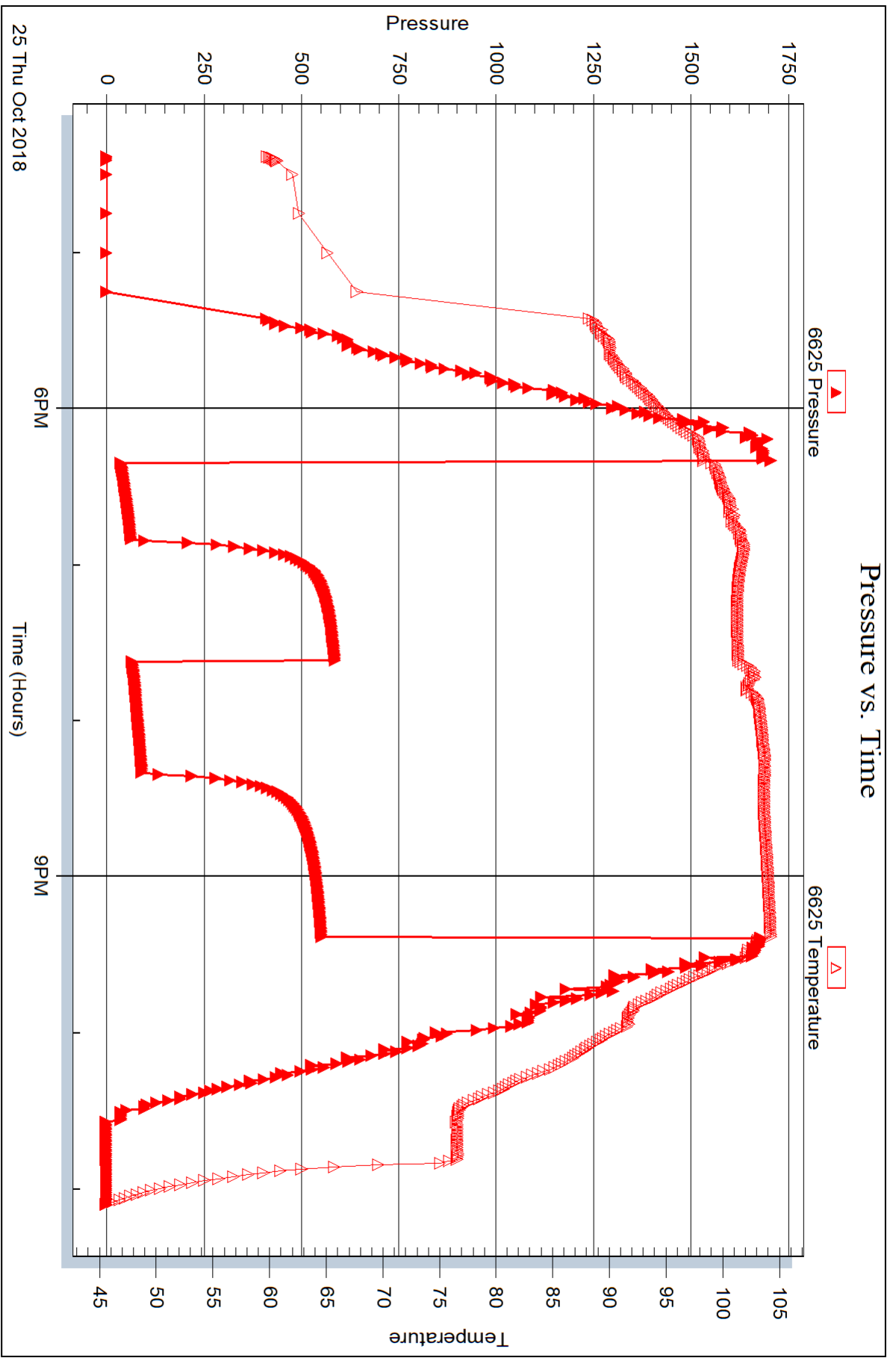
Recovery Information

Recovery Table

Length ft	Description	Volume bbl
60.00	WCM 80%m, 20%w	0.295
105.00	Mud w /trace of oil 100%m	0.516

Total Length: 165.00 ft Total Volume: 0.811 bbl
 Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
 Laboratory Name: Laboratory Location:
 Recovery Comments: RW = .554 ohms @ 44.1 deg F Chlorides = 19,000 ppm







DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc**

PO Box 783188
Wichita, KS 67278-3188

ATTN: John Goldsmith

Voss #5

7-6s-21w Graham KS

Start Date: 2018.10.26 @ 12:29:00

End Date: 2018.10.26 @ 18:02:15

Job Ticket #: 64632 DST #: 5

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

Printed: 2018.10.30 @ 09:08:37



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration, Inc
 PO Box 783188
 Wichita, KS 67278-3188
 ATTN: John Goldsmith

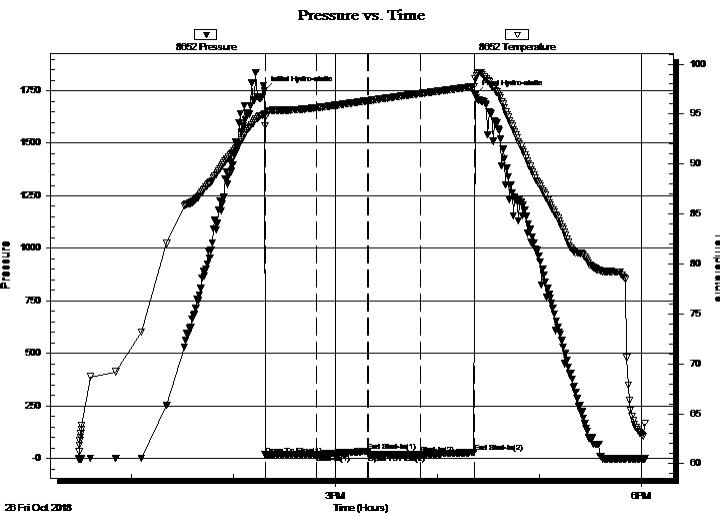
7-6s-21w Graham KS
Voss #5
 Job Ticket: 64632 **DST#: 5**
 Test Start: 2018.10.26 @ 12:29:00

GENERAL INFORMATION:

Formation: **LKC "H - J"**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 14:18:45
 Time Test Ended: 18:02:15
 Interval: **3546.00 ft (KB) To 3602.00 ft (KB) (TVD)**
 Total Depth: 3602.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Good
 Test Type: Conventional Bottom Hole (Reset)
 Tester: James Winder
 Unit No: 83
 Reference Elevations: 2204.00 ft (KB)
 2199.00 ft (CF)
 KB to GR/CF: 5.00 ft

Serial #: 8652 Outside
 Press@RunDepth: 19.73 psig @ 3547.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2018.10.26 End Date: 2018.10.26 Last Calib.: 2018.10.26
 Start Time: 12:29:05 End Time: 18:02:14 Time On Btm: 2018.10.26 @ 14:18:30
 Time Off Btm: 2018.10.26 @ 16:22:15

TEST COMMENT: 30 - IF: Blow built to almost 1/4"
 30 - IS: No blow back
 30 - FF: No blow
 30 - FS: No blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1751.68	94.98	Initial Hydro-static
1	16.67	93.81	Open To Flow (1)
31	18.95	95.63	Shut-In(1)
61	33.64	96.34	End Shut-In(1)
61	19.31	96.34	Open To Flow (2)
92	19.73	97.05	Shut-In(2)
124	28.48	97.75	End Shut-In(2)
124	1729.10	98.49	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
2.00	Mud 100%	0.01

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration, Inc
PO Box 783188
Wichita, KS 67278-3188
ATTN: John Goldsmith

7-6s-21w Graham KS
Voss #5
Job Ticket: 64632 **DST#: 5**
Test Start: 2018.10.26 @ 12:29:00

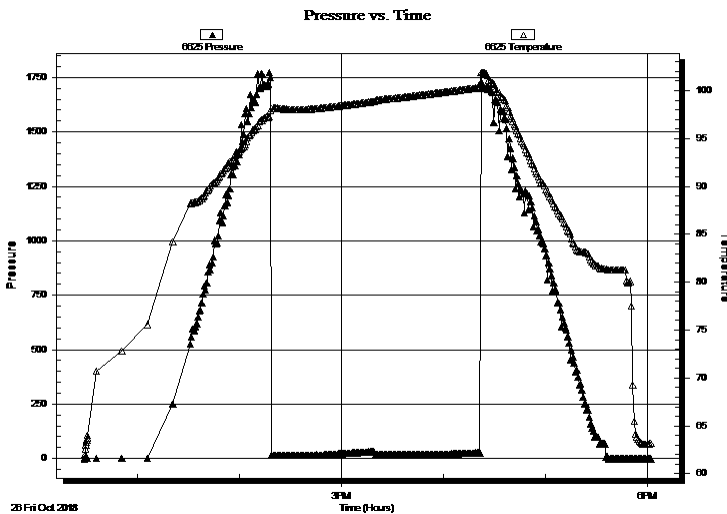
GENERAL INFORMATION:

Formation: **LKC "H - J"**
Deviated: No Whipstock: ft (KB) Test Type: Conventional Bottom Hole (Reset)
Time Tool Opened: 14:18:45 Tester: James Winder
Time Test Ended: 18:02:15 Unit No: 83

Interval: **3546.00 ft (KB) To 3602.00 ft (KB) (TVD)** Reference Elevations: 2204.00 ft (KB)
Total Depth: 3602.00 ft (KB) (TVD) 2199.00 ft (CF)
Hole Diameter: 7.88 inches Hole Condition: Good KB to GR/CF: 5.00 ft

Serial #: 6625 Inside
Press@RunDepth: psig @ 3547.00 ft (KB) Capacity: 8000.00 psig
Start Date: 2018.10.26 End Date: 2018.10.26 Last Calib.: 2018.10.26
Start Time: 12:29:05 End Time: 18:02:29 Time On Btm:
Time Off Btm:

TEST COMMENT: 30 - IF: Blow built to almost 1/4"
30 - IS: No blow back
30 - FF: No blow
30 - FS: No blow



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
2.00	Mud 100%	0.01

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Ritchie Exploration, Inc
 PO Box 783188
 Wichita, KS 67278-3188
 ATTN: John Goldsmith

7-6s-21w Graham KS
Voss #5
 Job Ticket: 64632 **DST#: 5**
 Test Start: 2018.10.26 @ 12:29:00

Tool Information

Drill Pipe:	Length: 3358.00 ft	Diameter: 3.80 inches	Volume: 47.10 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 178.00 ft	Diameter: 2.25 inches	Volume: 0.88 bbl	Weight to Pull Loose: 60000.00 lb
			<u>Total Volume: 47.98 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	19.00 ft			String Weight: Initial 48000.00 lb
Depth to Top Packer:	3546.00 ft			Final 48000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	56.00 ft			
Tool Length:	85.00 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			3518.00	
Shut In Tool	5.00			3523.00	
Hydraulic tool	5.00			3528.00	
Jars	5.00			3533.00	
Safety Joint	3.00			3536.00	
Packer	5.00			3541.00	29.00 Bottom Of Top Packer
Packer	5.00			3546.00	
Stubb	1.00			3547.00	
Recorder	0.00	6625	Inside	3547.00	
Recorder	0.00	8652	Outside	3547.00	
Perforations	18.00			3565.00	
Blank Spacing	34.00			3599.00	
Bullnose	3.00			3602.00	56.00 Bottom Packers & Anchor

Total Tool Length: 85.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc
PO Box 783188
Wichita, KS 67278-3188
ATTN: John Goldsmith

7-6s-21w Graham KS
Voss #5
Job Ticket: 64632 **DST#: 5**
Test Start: 2018.10.26 @ 12:29:00

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: 58.00 sec/qt	Cushion Volume: bbl		
Water Loss: 5.99 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 1000.00 ppm			
Filter Cake: 1.00 inches			

Recovery Information

Recovery Table

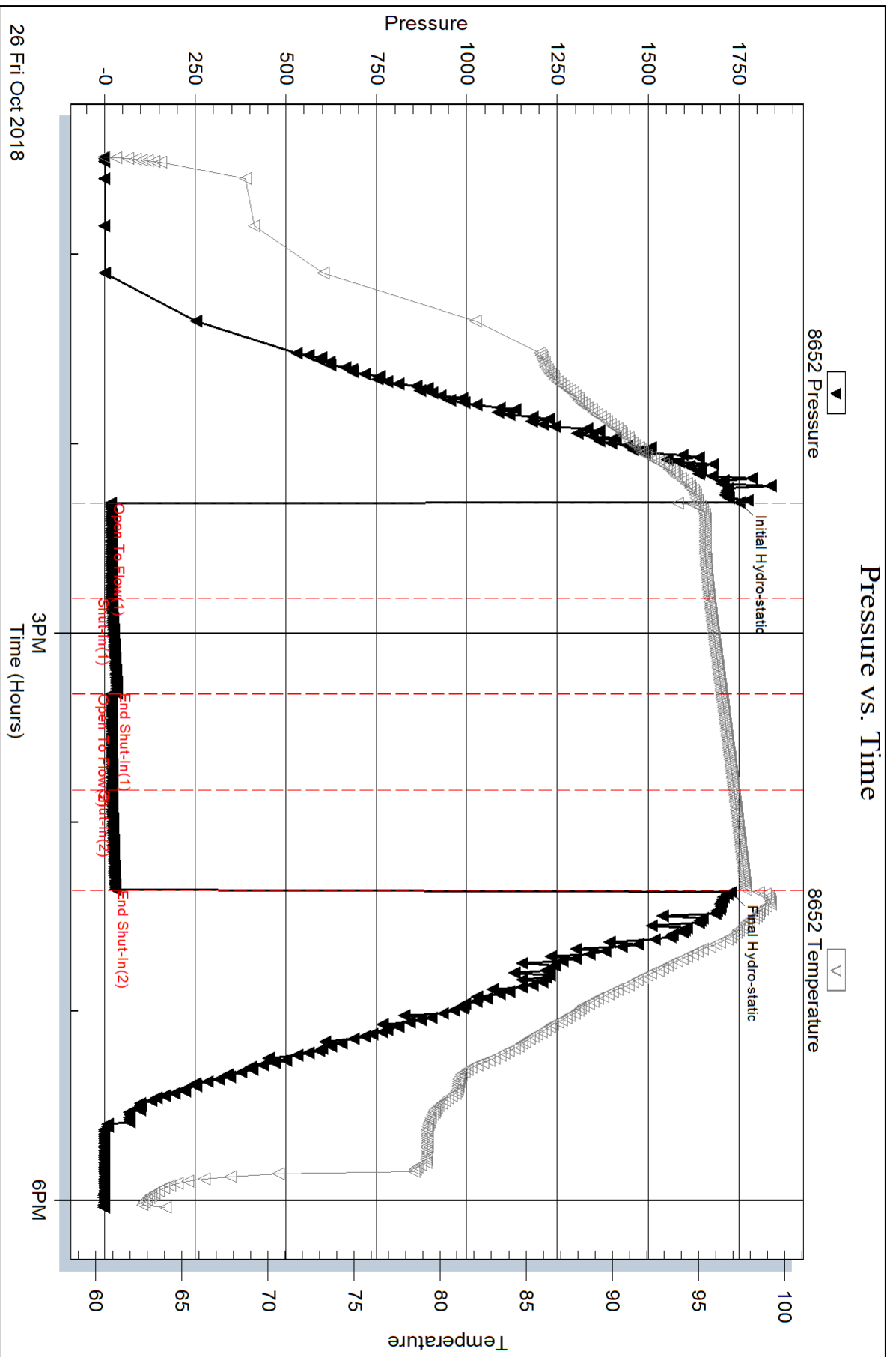
Length ft	Description	Volume bbl
2.00	Mud 100%	0.010

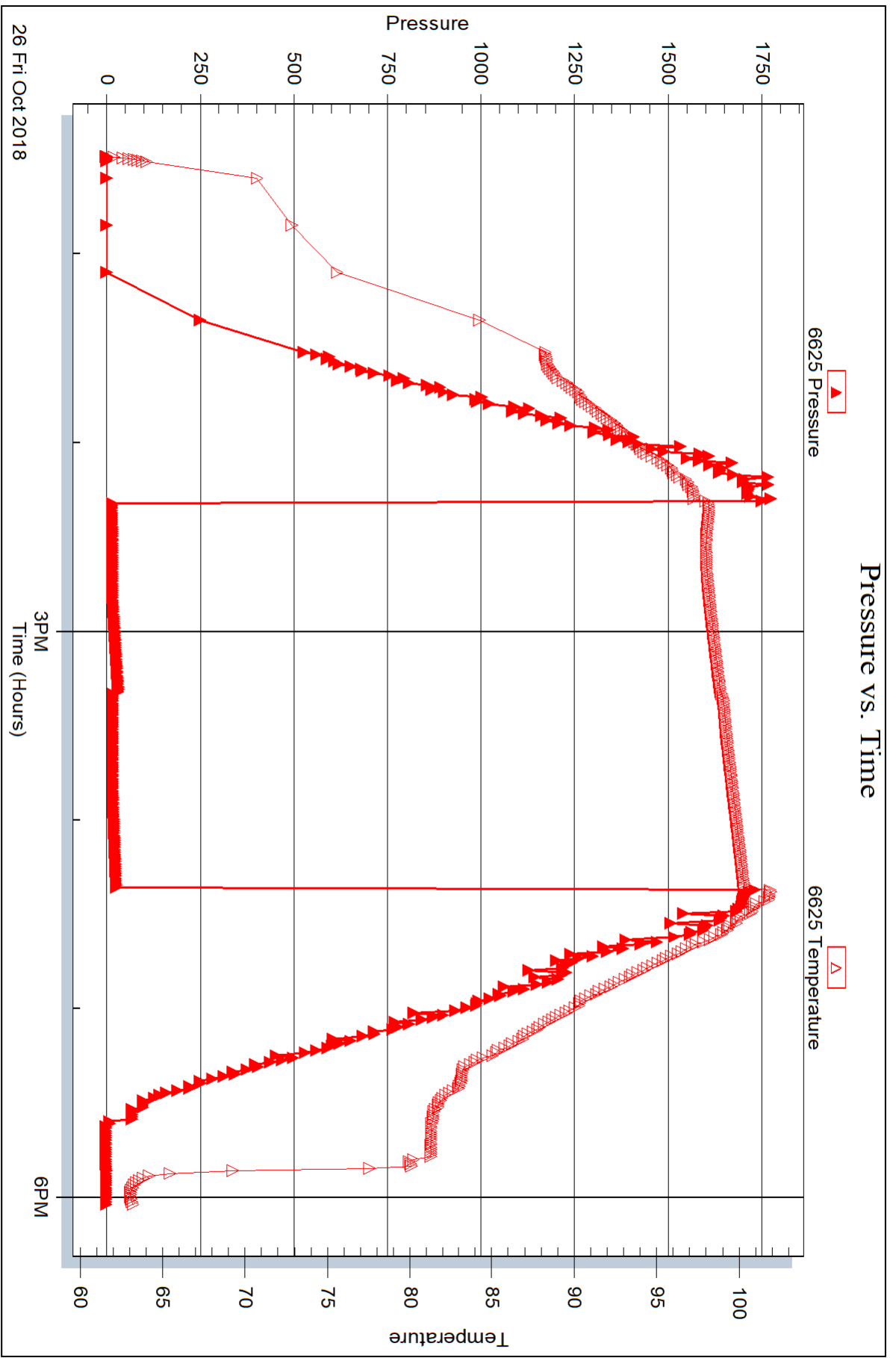
Total Length: 2.00 ft Total Volume: 0.010 bbl

Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:

Laboratory Name: Laboratory Location:

Recovery Comments:







DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc**

PO Box 783188
Wichita, KS 67278-3188

ATTN: John Goldsmith

Voss #5

7-6s-21w Graham KS

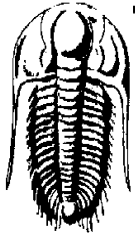
Start Date: 2018.10.27 @ 00:54:00

End Date: 2018.10.27 @ 06:33:45

Job Ticket #: 64633 DST #: 6

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

Printed: 2018.10.30 @ 09:08:11



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc
PO Box 783188
Wichita, KS 67278-3188
ATTN: John Goldsmith

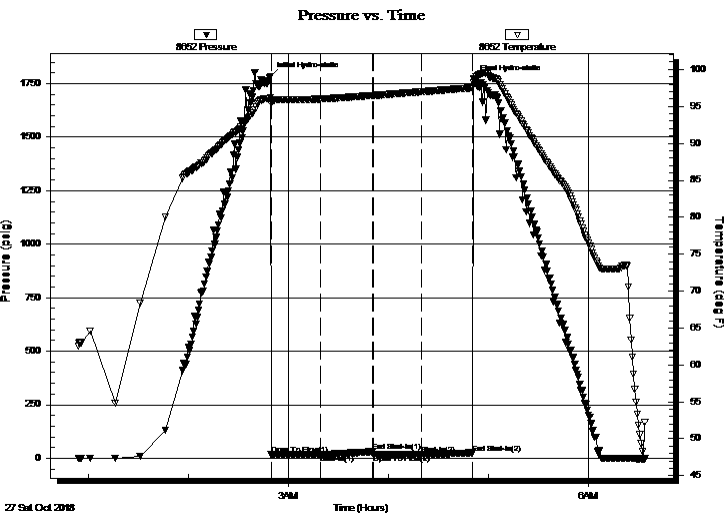
7-6s-21w Graham KS
Voss #5
Job Ticket: 64633 **DST#: 6**
Test Start: 2018.10.27 @ 00:54:00

GENERAL INFORMATION:

Formation:	LKC "K - L"			Test Type:	Conventional Bottom Hole (Reset)
Deviated:	No Whipstock:	ft (KB)		Tester:	James Winder
Time Tool Opened:	02:49:30			Unit No:	83
Time Test Ended:	06:33:45			Reference Elevations:	2204.00 ft (KB) 2199.00 ft (CF)
Interval:	3597.00 ft (KB) To 3628.00 ft (KB) (TVD)			KB to GR/CF:	5.00 ft
Total Depth:	3628.00 ft (KB) (TVD)				
Hole Diameter:	7.88 inches	Hole Condition: Good			

Serial #: 8652	Outside			Capacity:	8000.00 psig
Press@RunDepth:	17.76 psig @	3598.00 ft (KB)		Last Calib.:	2018.10.27
Start Date:	2018.10.27	End Date:	2018.10.27	Time On Btm:	2018.10.27 @ 02:49:15
Start Time:	00:54:05	End Time:	06:33:44	Time Off Btm:	2018.10.27 @ 04:51:00

TEST COMMENT: 30 - IF: Blow built to 1/4"
 30 - IS: No blow back
 30 - FF: No blow
 30 - FS: No blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1782.45	96.19	Initial Hydro-static
1	16.37	95.35	Open To Flow (1)
30	17.33	96.00	Shut-In(1)
62	30.48	96.49	End Shut-In(1)
62	17.71	96.49	Open To Flow (2)
91	17.76	96.99	Shut-In(2)
122	25.04	97.52	End Shut-In(2)
122	1771.23	98.25	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
1.00	Mud 100%	0.00
0.00	Oil spots in tool	0.00

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Ritchie Exploration, Inc
 PO Box 783188
 Wichita, KS 67278-3188
 ATTN: John Goldsmith

7-6s-21w Graham KS
Voss #5
 Job Ticket: 64633 **DST#: 6**
 Test Start: 2018.10.27 @ 00:54:00

Tool Information

Drill Pipe:	Length: 3417.00 ft	Diameter: 3.80 inches	Volume: 47.93 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 178.00 ft	Diameter: 2.25 inches	Volume: 0.88 bbl	Weight to Pull Loose: 60000.00 lb
			<u>Total Volume: 48.81 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	27.00 ft			String Weight: Initial 59000.00 lb
Depth to Top Packer:	3597.00 ft			Final 59000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	31.00 ft			
Tool Length:	60.00 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			3569.00	
Shut In Tool	5.00			3574.00	
Hydraulic tool	5.00			3579.00	
Jars	5.00			3584.00	
Safety Joint	3.00			3587.00	
Packer	5.00			3592.00	29.00 Bottom Of Top Packer
Packer	5.00			3597.00	
Stubb	1.00			3598.00	
Recorder	0.00	6625	Inside	3598.00	
Recorder	0.00	8652	Outside	3598.00	
Perforations	27.00			3625.00	
Bullnose	3.00			3628.00	31.00 Bottom Packers & Anchor

Total Tool Length: 60.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc
PO Box 783188
Wichita, KS 67278-3188
ATTN: John Goldsmith

7-6s-21w Graham KS
Voss #5
Job Ticket: 64633 **DST#: 6**
Test Start: 2018.10.27 @ 00:54:00

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:	ppm
Viscosity: 58.00 sec/qt	Cushion Volume: bbl		
Water Loss: 5.99 in ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 1000.00 ppm			
Filter Cake: 1.00 inches			

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
1.00	Mud 100%	0.005
0.00	Oil spots in tool	0.000

Total Length: 1.00 ft Total Volume: 0.005 bbl

Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:

Laboratory Name: Laboratory Location:

Recovery Comments:

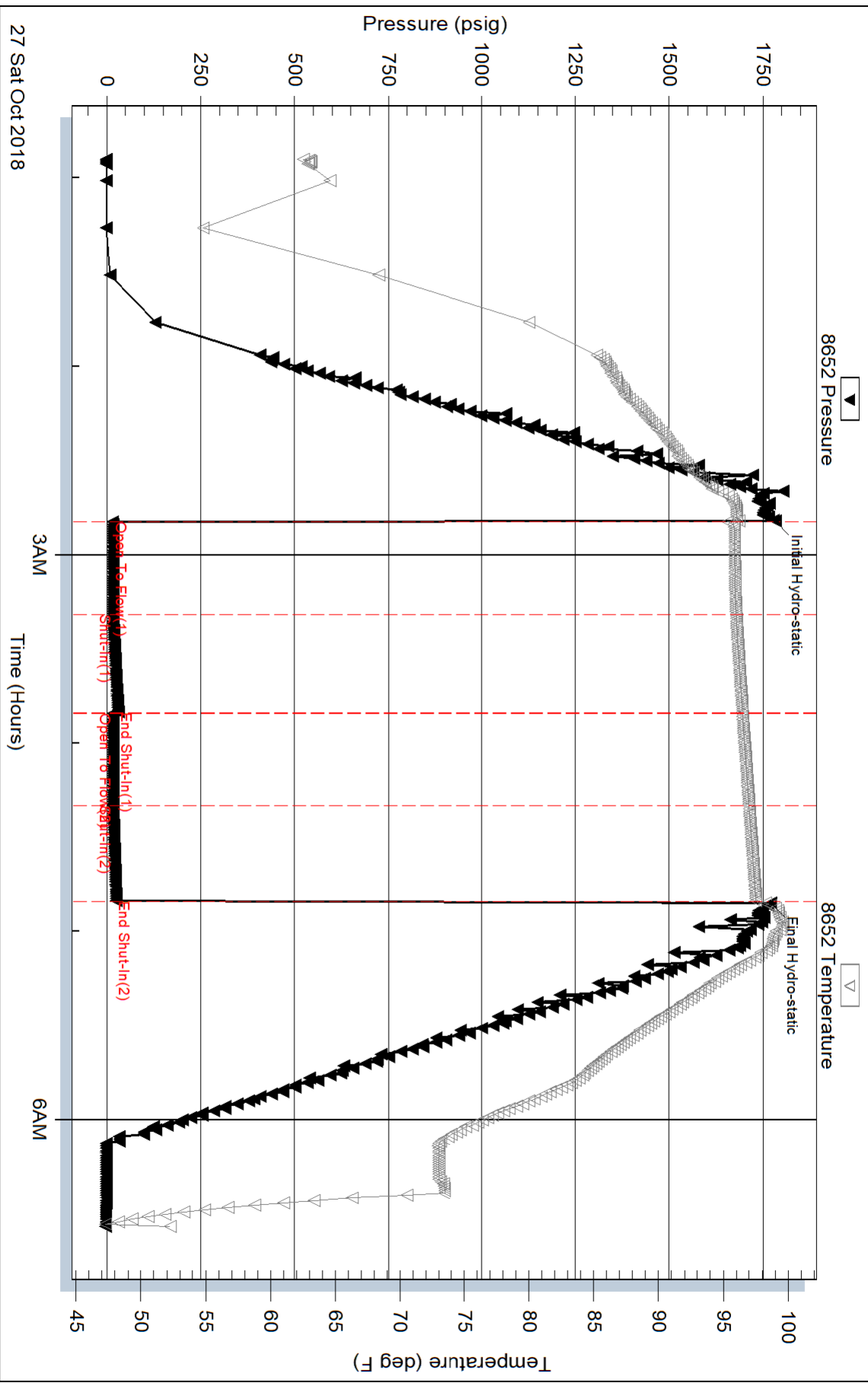
Serial #: 8652

Outside Ritchie Exploration, Inc

Voss #5

DST Test Number: 6

Pressure vs. Time



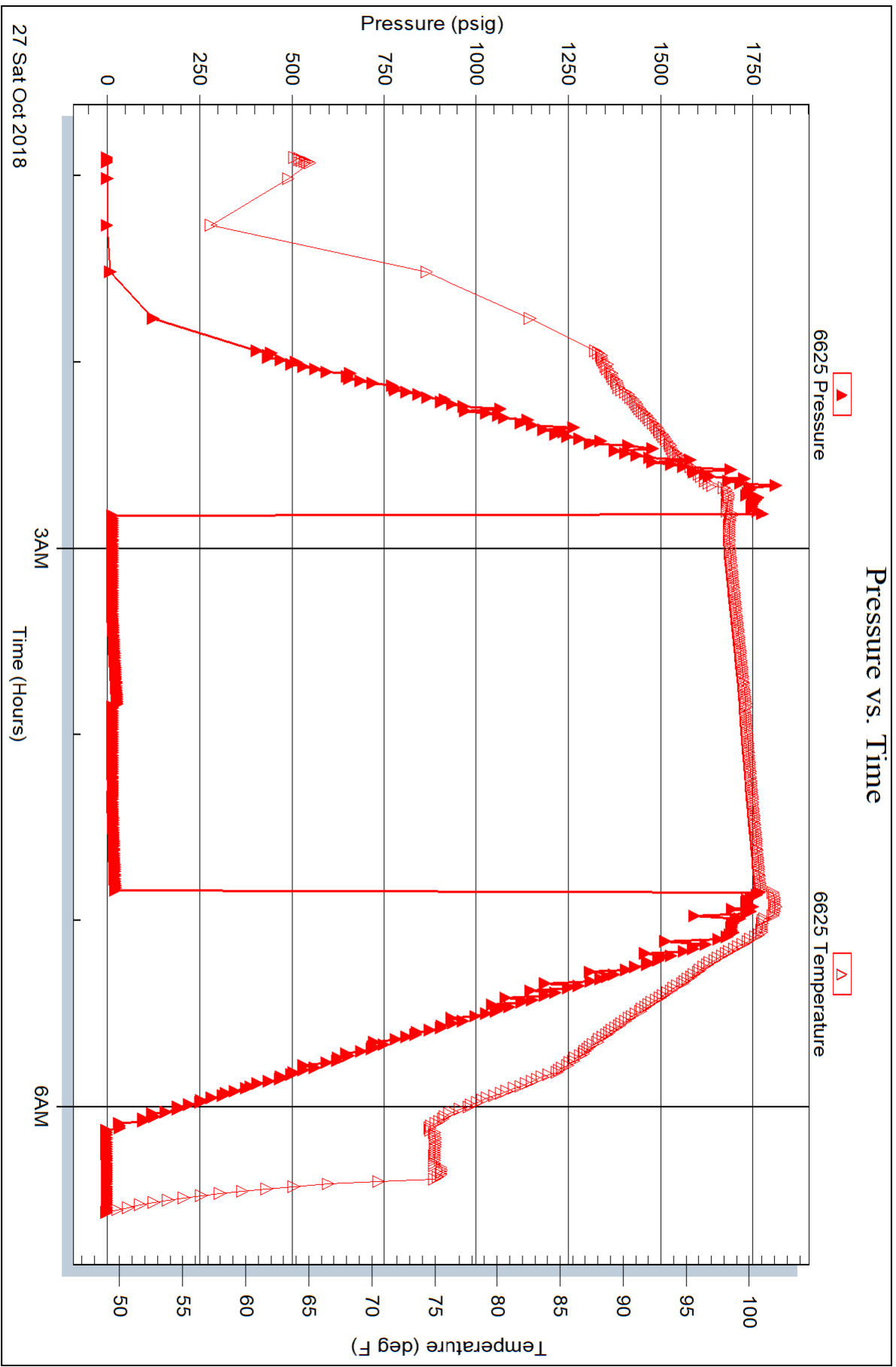
Serial #: 6625

Inside

Ritchie Exploration, Inc

Voss #5

DST Test Number: 6





TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 64628

Well Name & No. Voss # 105 Test No. 1 Date 10-23-18
 Company Ritchie Exploration Inc Elevation 2204 KB 2199 GL
 Address 8100 E 22nd STN #700 Box 783188 Wichita, KS 67278-3188
 Co. Rep / Geo. John Goldsmith RIG Murfin #8
 Location: Sec. 7 Twp 6S Rge. 21W Co. Graham State KS

Interval Tested 3342-3380 Zone Tested Dread B
 Anchor Length 38 Drill Pipe Run 3161 Mud Wt. 9.0
 Top Packer Depth 3337 Drill Collars Run 178 Vis 55
 Bottom Packer Depth 3342 Wt. Pipe Run - WL 6.4
 Total Depth 3380 Chlorides 1200 ppm System LCM 2
 Blow Description IF: 1/4" Blow at open, built to 5"
ISI: No blowback
FF: Blow built to BOB (11") at 42 min., built to 11 1/2"
FSI: No blowback

Rec	Feet of	%gas	%oil	%water	%mud
<u>45</u>	<u>OCM</u>	<u>-</u>	<u>22</u>	<u>-</u>	<u>78</u>
<u>60</u>	<u>OWCM</u>	<u>-</u>	<u>21</u>	<u>23</u>	<u>56</u>
<u>Rec</u>	<u>Feet of GIP=140'</u>	<u>%gas</u>	<u>%oil</u>	<u>%water</u>	<u>%mud</u>
<u>Rec</u>	<u>Feet of</u>	<u>%gas</u>	<u>%oil</u>	<u>%water</u>	<u>%mud</u>
<u>Rec</u>	<u>Feet of</u>	<u>%gas</u>	<u>%oil</u>	<u>%water</u>	<u>%mud</u>

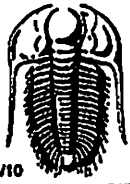
Rec Total 105 BHT 101 Gravity _____ API RW _____ @ _____ °F Chlorides _____ ppm

(A) Initial Hydrostatic 1640 Test 1050 T-On Location 15:30
 (B) First Initial Flow 23 Jars 250 T-Started 16:04
 (C) First Final Flow 40 Safety Joint 75 T-Open 18:05
 (D) Initial Shut-In 176 Circ Sub _____ T-Pulled 21:07
 (E) Second Initial Flow 38 Hourly Standby _____ T-Out 22:50
 (F) Second Final Flow 62 Mileage 134RT 134 Comments _____
 (G) Final Shut-In 177 Sampler _____
 (H) Final Hydrostatic 1626 Straddle _____
 Ruined Shale Packer _____
 Ruined Packer _____
 Extra Copies _____
 Sub Total 0
 Total 1509
 MP/DST Disc't _____

Initial Open 30
 Initial Shut-In 45
 Final Flow 45
 Final Shut-In 60

Sub Total 1509

Approved By [Signature] Our Representative James Winder
 Triobite 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. 64629

Well Name & No. Voss #5 Test No. 2 Date 10-24-18
 Company Ritchie Exploration Inc Elevation 2204 KB 2199 GL
 Address 8100 E 22nd St N #700 Box 783188 Wichita, KS 67278-3188
 Co. Rep / Geo. John Goldsmith Rig Murfin #8
 Location: Sec. 7 Twp 6S Rge. 21W Co. Graham State KS

Interval Tested 3394-3450 Zone Tested Toronto - LKC 'H'
 Anchor Length 56 Drill Pipe Run 3193 Mud Wt. 9.0
 Top Packer Depth 3389 Drill Collars Run 178 Vis 52
 Bottom Packer Depth 3394 Wt. Pipe Run - WL 6.0
 Total Depth 3450 Chlorides 900 ppm System LCM 2
 Blow Description IF: Blow built to 1/2"
ISI: No blowback
FF: No blow
FST: No blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>20</u>	<u>Mud w/trace oil</u>	<u>trace</u>		<u>NO</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

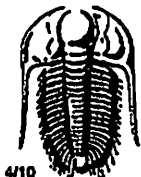
Rec Total 20 BHT 98 Gravity _____ API RW _____ @ _____ °F Chlorides _____ ppm

(A) Initial Hydrostatic 1674 Test 1050 T-On Location 10:25
 (B) First Initial Flow 23 Jars 250 T-Started 10:42
 (C) First Final Flow 25 Safety Joint 75 T-Open 12:34
 (D) Initial Shut-In 34 Circ Sub _____ T-Pulled 14:38
 (E) Second Initial Flow 25 Hourly Standby _____ T-Out 16:15
 (F) Second Final Flow 26 Mileage 134RT 134 Comments _____
 (G) Final Shut-In 32 Sampler _____
 (H) Final Hydrostatic 1650 Straddle _____
 Shale Packer _____
 Extra Packer _____
 Extra Recorder _____
 Day Standby _____
 Accessibility _____
 Sub Total 1509

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

Ruined Shale Packer _____
 Ruined Packer _____
 Extra Copies _____
 Sub Total 0
 Total 1509
 MP/DST Disc't _____

Approved By [Signature] Our Representative James Winder
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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 64630

Well Name & No. Voss #5 Test No. 3 Date 10-25-18
 Company Ritchie Exploration Inc Elevation 2204 KB 2199 GL
 Address 8100 E 22nd St N #700 PO Box 783188 Wichita, KS 67278-3188
 Co. Rep / Geo. John Goldsmith Rig Murfin #8
 Location: Sec. 7 Twp 6S Rge. 21W Co. Graham State KS

Interval Tested 3456 - 3478 Zone Tested LKC "C"
 Anchor Length 22 Drill Pipe Run 3257 Mud Wt. 9.3
 Top Packer Depth 3451 Drill Collars Run 178 Vis 55
 Bottom Packer Depth 3456 Wt. Pipe Run - WL 6.0
 Total Depth 3478 Chlorides 900 ppm System LCM 2

Blow Description IF: Blow built to 3/4"
ISI: No blowback
FF: No blow
FST: No blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>15</u>	<u>Mud w/trace oil</u>	<u>trace</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 15 BHT 99 Gravity _____ API RW _____ @ _____ °F Chlorides _____ ppm

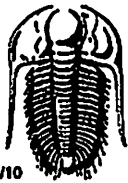
(A) Initial Hydrostatic 1702 Test 1050 T-On Location 23:25 ^{10/24}
 (B) First Initial Flow 25 Jars 250 T-Started 00:06
 (C) First Final Flow 26 Safety Joint 75 T-Open 2:04
 (D) Initial Shut-In 25 Circ Sub _____ T-Pulled 4:09
 (E) Second Initial Flow 25 Hourly Standby _____ T-Out 5:45
 (F) Second Final Flow 26 Mileage 134RT 134
 (G) Final Shut-In 25 Sampler _____
 (H) Final Hydrostatic 1688 Straddle _____

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

Ruined Shale Packer _____
 Ruined Packer _____
 Extra Copies _____
 Sub Total 0
 Total 1509
 MP/DST Disc't _____

Approved By [Signature] Our Representative James Wanda

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 64631

Well Name & No. Voss #5 Test No. 4 Date 10-25-18
 Company Ritchie Exploration Inc Elevation 2204 KB 2199 GL
 Address 8100 E 22nd St N #700 PO Box 783188 Wichita, KS 67278-3188
 Co. Rep / Geo. John Goldsmith Rig Murfin #8
 Location: Sec. 7 Twp 6S Rge. 21W Co. Graham State KS

Interval Tested 3476 - 3522 Zone Tested LKC "D-F"
 Anchor Length 46 Drill Pipe Run 3288 Mud Wt. 9.3
 Top Packer Depth 3471 Drill Collars Run 178 Vis 51
 Bottom Packer Depth 3476 Wt. Pipe Run - WL 6.4
 Total Depth 3522 Chlorides 1000 ppm System LCM 1
 Blow Description IF: 1/2" surge blow at open, bled off, Blow built to 2 1/2"
ISI: No blowback
FF: Blow built to 2 1/4"
FSI: No blowback

Rec	Feet of	%gas	%oil	%water	%mud
<u>185</u>	<u>Mud w/trace oil</u>	<u>trace</u>		<u>100</u>	
<u>60</u>	<u>10cm</u>		<u>20</u>	<u>80</u>	

Rec Total 165 BHT 102 Gravity _____ API RW 554 @ 44.1 °F Chlorides 19,000 ppm

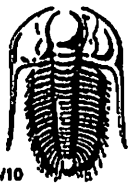
(A) Initial Hydrostatic 1700 Test 1050 T-On Location 16:00
 (B) First Initial Flow 38 Jars 250 T-Started 16:23
 (C) First Final Flow 66 Safety Joint 75 T-Open 18:20
 (D) Initial Shut-In 588 Circ Sub _____ T-Pulled 21:23
 (E) Second Initial Flow 68 Hourly Standby _____ T-Out 23:00
 (F) Second Final Flow 93 Mileage 134 RT 134 Comments tool chased about 2'
 (G) Final Shut-In 554 Sampler _____ to bottom at open - lost a
 (H) Final Hydrostatic 1682 Straddle _____ few ft of mud - 1/2" surge blow
 Ruined Shale Packer _____
 Ruined Packer _____
 Extra Copies _____
 Initial Open 30 Shale Packer _____
 Initial Shut-In 45 Extra Packer _____
 Final Flow 45 Extra Recorder _____
 Final Shut-In 60 Day Standby _____
 Accessibility _____
 Sub Total 1509 Sub Total _____
 Total 1509 MP/DST Disc't _____

Approved By

Our Representative

James Winder

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 64632

Well Name & No. Voss #5 Test No. 5 Date 10-26-18
 Company Ritchie Exploration Inc Elevation 2204 KB 2199 GL
 Address 8100 E 22N St N #700 PO Box 783188 Wichita, KS 67278-3188
 Co. Rep / Geo. John Goldsmith Rig Murfin #8
 Location: Sec. 7 Twp 6s Rge. 21w Co. Graham State KS

Interval Tested 3546-3602 Zone Tested LKC "H-J"
 Anchor Length 56 Drill Pipe Run 3358 Mud Wt. 9.3
 Top Packer Depth 3541 Drill Collars Run 178 Vls 58
 Bottom Packer Depth 3546 Wt. Pipe Run - WL 6.0
 Total Depth 3602 Chlorides 1000 ppm System LCM 1

Blow Description IF: Blow built to almost 1/4"
ISI: No blowback
FF: No blow
FSI: No 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 98 Gravity _____ API RW _____ @ _____ °F Chlorides _____ ppm

(A) Initial Hydrostatic 1752 Test 1050 T-On Location 12:00
 (B) First Initial Flow 17 Jars 250 T-Started 12:29
 (C) First Final Flow 19 Safety Joint 75 T-Open 14:18
 (D) Initial Shut-In 34 Circ Sub _____ T-Pulled 16:21
 (E) Second Initial Flow 19 Hourly Standby _____ T-Out 18:00
 (F) Second Final Flow 20 Mileage 134RT 134 Comments _____
 (G) Final Shut-In 28 Sampler _____
 (H) Final Hydrostatic 1729 Straddle _____
 Shale Packer _____
 Shale Packer _____
 Extra Packer _____
 Extra Recorder _____
 Day Standby _____
 Accessibility _____
 Sub Total 1509 Ruined Shale Packer _____
 Ruined Packer _____
 Extra Copies _____
 Sub Total 0
 Total 1509
 MP/DST Disc't _____

Approved By _____ Our Representative James Winder

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 64633

Well Name & No. Voss #5 Test No. 6 Date 10-27-18
 Company Ritchie Exploration Inc Elevation 2204 KB 2199 GL
 Address 8100 E 22nd St N #700 Po Box 783188 Wichita, KS 67278-3188
 Co. Rep / Geo. John Goldsmith Rig Murfin #8
 Location: Sec. 7 Twp 6s Rge. 21w Co. Graham State KS

Interval Tested 3597 - 3628 Zone Tested LKC "K-L"
 Anchor Length 31 Drill Pipe Run 3417 Mud Wt. 9.3
 Top Packer Depth 3592 Drill Collars Run 178 Vis 58
 Bottom Packer Depth 3597 Wt. Pipe Run - WL 6.0
 Total Depth 3628 Chlorides 1000 ppm System LCM 1

Blow Description IF: Blow built to 1/4"
IST: No blowback
FF: No blow
FSI: No blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>1</u>	<u>Mud</u>			<u>100</u>	
	<u>Oil spots in tool</u>				

Rec Total 1 BHT 98 Gravity _____ API RW _____ @ _____ °F Chlorides _____ ppm

(A) Initial Hydrostatic 1782 Test 1050 T-On Location 00:00
 (B) First Initial Flow 16 Jars 250 T-Started 00:54
 (C) First Final Flow 17 Safety Joint 75 T-Open 2:49
 (D) Initial Shut-In 30 Circ Sub _____ T-Pulled 4:50
 (E) Second Initial Flow 18 Hourly Standby _____ T-Out 6:30
 (F) Second Final Flow 18 Mileage 134 RTX2 268
 (G) Final Shut-In 25 Sampler _____
 (H) Final Hydrostatic 1771 Straddle _____

Initial Open 30 Ruined Shale Packer _____
 Initial Shut-In 30 Ruined Packer _____
 Final Flow 30 Extra Copies _____
 Final Shut-In 30 Extra Recorder _____ Sub Total 0
 Day Standby _____ Total 1643
 Accessibility _____ MP/DST Disc't _____
 Sub Total 1643

Approved By _____ Our Representative James Winder

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Wellsite Services, LLC

John Goldsmith
(316) 640-0236

427 Roosevelt St.
Cheney, KS 67025

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

Well Name: #5 Voss
API: 15-065-24156
Location: 1280' FSL & 548' FEL, Sec 7-6S-21W, E/2 SE
License Number: REI #4767
Spud Date: 10/20/2018
Surface Coordinates: LAT: 39.5423876
LONG: -99.6970838
Bottom Hole Vertical Hole
Coordinates: 1.25 Degree Deviation
Ground Elevation (ft): 2199' K.B. Elevation (ft): 2204'
Logged Interval (ft): 3100' To: RTD Total Depth (ft): 3695'
Formation: Granite Basement at RTD
Type of Drilling Fluid: Chemical

Region: Graham County

Drilling Completed: 10/28/2018

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

OPERATOR

Company: Ritchie Exploration Inc.
Address: 8100 E. 22nd St. N. #700
Wichita, KS 67226
(316) 691-9500

GEOLOGIST

Name: John Goldsmith
Company: Wellsite Services LLC
Address: 427 Roosevelt St.
Cheney, KS 67025
(316) 640-0236

RIG RECORDS

Contractor: Murfin Rig #8
Pusher: Jason Galli

Pump: National K-380
Liner & Stroke: 6 x 14

BIT RECORDS

Size:	Type:	Footage:	Condition:	Hours:	Serial #:
12 1/4"	CH20	0-262'	RR	3	194506
7 7/8"	D4506	262'-3081'	New	29	7162497
7 7/8"	GX-20C	3081'-3695'	New	41.25	No Rec

COMMENTS

Surface Casing: 6 joints of 8 5/8" set @ 262'
Production Casing: 5.5" production casing was set.
Mud by: MudCo
DST's by: Trilobite Testing
Logs by: ELI (DIL, CN-CD, ML)
RTD=3695' LTD=3684'

FORMATION TOPS

FORMATION	SAMPLE TOPS		LOG TOPS	
	Depth	Datum	Depth	Datum
B/Anhydrite	1886'	+318	1885'	+319
Stotler	3158'	-954	3157'	-953
Topeka	3208'	-1004	3201'	-997
Heebner Shale	3396'	-1192	3393'	-1189
Toronto	3421'	-1217	3419'	-1215
Lansing	3438'	-1234	3436'	-1232
Muncie Creek Shale	3548'	-1344	3546'	-1342
Stark Shale	3599'	-1395	3598'	-1394
Hushpuckney Shale	3618'	-1414	3616'	-1412
Base of LKC	3628'	-1424	3624'	-1420
Marmaton	3650'	-1446	3651'	-1447
Conglomerate	3658'	-1454	3655'	-1451
Arbuckle	3683'	-1479	NDE	
Granite Basement	3691'	-1487	NDE	
RTD	3695'	-1491		
LTD			3684'	-1480

DST's

DST #1: 3,342' - 3,380' (Oread "B")

Rec: 140' gas in pipe, 45' oil cut mud (22% oil, 78% mud), and 60' oil and water cut mud (21% oil, 23% water, 56% mud).

IFP: 23-40#/30" ISIP: 176#/45"

FFP: 38-62#/45" FSIP: 177#/60"

DST #2: 3,394' - 3,450' (Toronto - LKC "A")

Rec: 20' mud with trace of oil.

IFP: 23-25#/30" ISIP: 34#/30"

FFP: 25-26#/30" FSIP: 32#/30"

DST #3: 3,456' - 3,478' (LKC "C")

Rec: 15' mud with trace of oil.

IFP: 25-26#/30" ISIP: 25#/30"

FFP: 25-26#/30" FSIP: 25#/30"

DST #4: 3,476' - 3,522' (LKC "D" - "F")

Rec: 60' water cut mud (20% water, 80% mud) and 105' mud with trace of oil.

IFP: 38-66#/30" ISIP: 588#/45"

FFP: 68-93#/45" FSIP: 554#/60"

DST #5: 3,546' - 3,602' (LKC "H" - "J")

Rec: 2' mud.

IFP: 17-19#/30" ISIP: 34#/30"

FFP: 19-20#/30" FSIP: 28#/30"

DST #6: 3,597' - 3,628' (LKC "K" - "L")

Rec: 1' mud with oil spots.

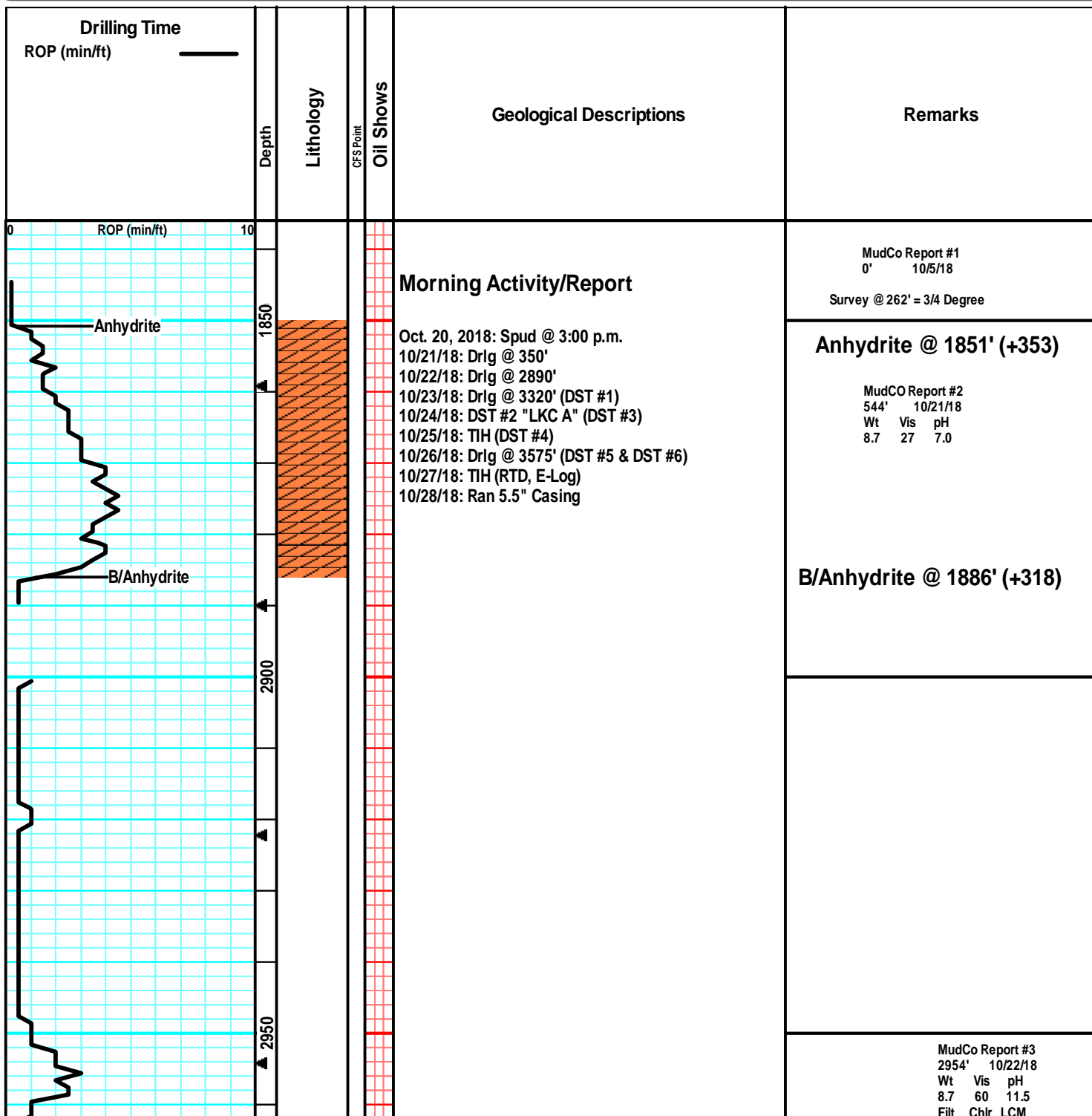
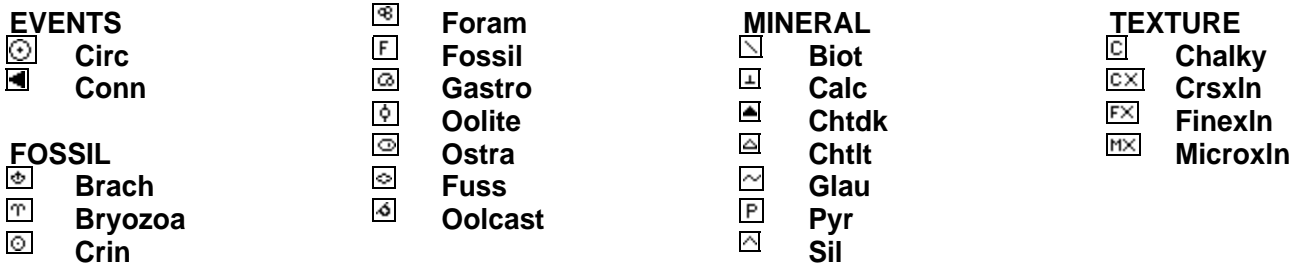
IFP: 16-17#/30" ISIP: 30#/30"

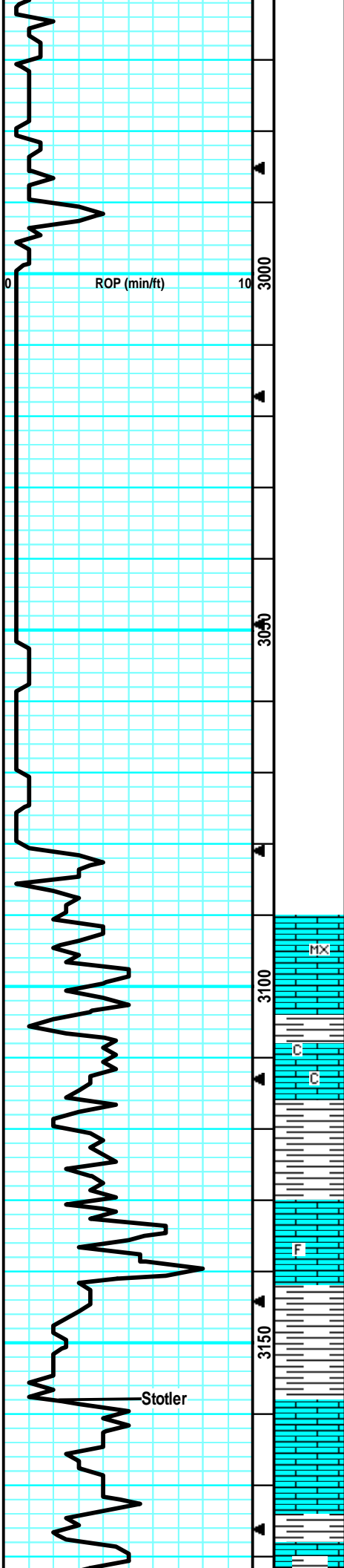
FFP: 18-18#/30" FSIP: 25#/30"

ROCK TYPES



ACCESSORIES





Samples Caught @ 3100' 10/22/2018

LS: gry/lt tan, micro-fn xln, dense, sm brit, sub-chlky in prt, tr-nvp, fw SH: gry, silty, no odr, ns.

LS: tan/lt tan, sing, fn xln, fw foss, mostly brit, sub-chlky in prt, tr-nvp, no odr, ns.

Much of the same, lrg inflx of pur chlk, no odr, ns.

LS: gry/lt gry, sing, fn xln, fw foss frags, sm sandy/gritty, tr-nvp, no cup odr, ns.

LS: gry, slight mott, fn xln, fw foss, sm flakey, tr-nvp, no cup odr, ns.

LS: gry, slight mott, fn xln, sm dense, fw firm, sandy/gritty, tr-nvp, no cup odr, ns.

LS: gry, fn xln, dense, flakey/mealy, fw sandy/gritty, tr-nvp, no cup odr, ns.

Much of the same, no cup odr, ns.

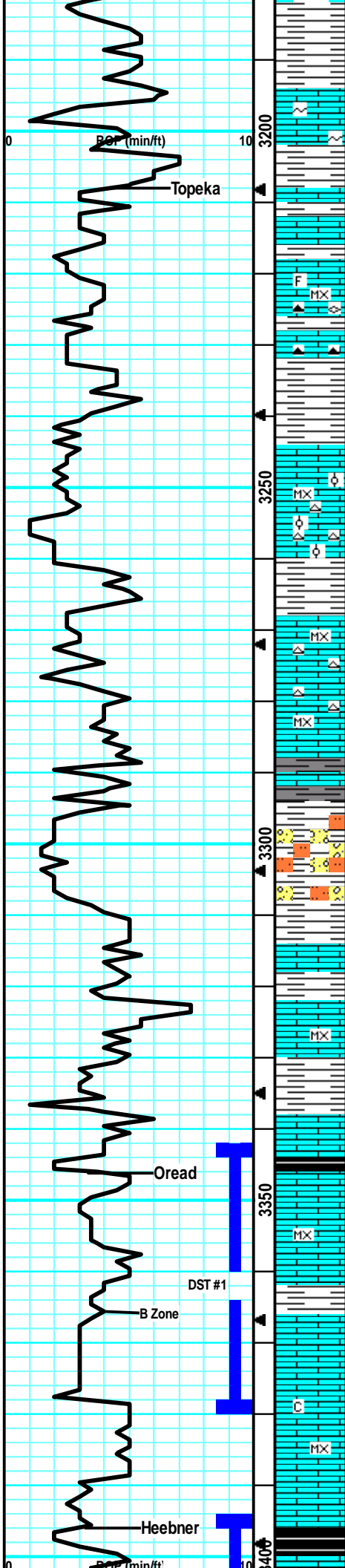
LS: gry, fn xln, sandy/gritty, tr-nvp, fw SH: gry, silty, no cup odr, ns.

Bit Trip to Tri-Cone @ 3081'

Strap = 0.57' to Board

Survey @ 3081' = 3/4 Degree

Stotler @ 3158' (-954)



Much of the same gry mott LS, lrg influx of gry/drk gry, SH: silty, no cup odr, ns.

LS: lt gry/lt tan, slght mott, fn xln, moslty sub0chlky, brit, tr-nvp, fw sandy/gritty, friab, glauc, tr-pr intgrn por, no cup odr, ns.

LS: gry w/ blu/grn tint, mott, fn xln, fw foss frags/crin, fw flakey, sm sandy/gritty, glauc in prt, tr-nvp, svrl SH, no cup odr, ns.

LS: gry/drk gry, mott, fn xln, sm flakey/mealy, dense, many, firm, tr-nvp, fw pcs w/ pos drk min stns, no fluor/cut, no bled, influx drk gry/blk SH, no cup odr, ns.

LS: lt tan, sing, micro-fn xln, foss in prt w/ fuss and frags, brit & sub-chlky, tr-nvp, fw Chert: tan/gry, sharp, no cup odr, ns.

Much of the same LS, lrg flod of SH, drk gry/brn/grn, silty, soft, no cup odr, ns.

SH: gry/brn/grn/blk, silty, soft, v fw carb, no cup odr, ns.

LS: crm/lt tan, sing, micro-fn xln, fw foss/ool, mostly brit, chlky in prt, tr-nvp, fw Chert: lt gry/crm, foss, sharp, no odr, ns.

Much of the same LS, less chl contnt, more firm, tr-nvp, Chert: crm/tan, opaq, foss, sharp, no odr, ns.

LS: crm/lt tan, sing, micro xln, dense, fw brit, sub-chlky in prt, tr-nvp, fw Chert: crm/wht, opaq, sharp, no odr, ns.

LS: lt gry/lt tan, micro-fn xln, sm brit, sub-chlky, fw flakey, tr-nvp, no cup odr, ns.

SH: blk/drk gry, silty, soft, no cup odr, ns.

LS: tan/lt gry, mott, fn xln, fw gritty like, abun chl, most brit, tr-nvp, fw pcs w/ drk tarry spitted stns on surf, no fluor/cut, pos min, no odr, ns.

SH/Slt: brn/gry/grn, silty, soft, smpl v muddy, no cup odr, ns.

LS: lt tan/lt gry, sing, micro xln, dense, fw brit, tr-nvp, no cup odr, ns.

LS: lt gry, slght mott, micro-fn xln, sub-chlky in prt, fw brit, tr-nvp, fw SH: brn, silty, no odr, ns.

LS: tan/gry, mott, fn xln, sub-chlky in prt, tr-nvp, sm SH: blk/brn, silty, fw carb, no cup odr, ns.

LS: lt tan/lt gry, fn xln, many dense, brit, fw pcs w/ scat pr intxln por, drk brn stns in por, yel/gld fluor, gd cut, fr odr, ssfo in 10-12 pcs.

LS: lt gry/lt tan, micro-fn xln, mostly dense, sub-chlky in prt, tr-nvp, faint to wk cup odr, 1-2 pcs w/ vssfo.

LS: tan, slght mott, fn xln, sm ool, sm brit, fr intool por, sm slght vuggy, gd sat stns in por, gd gassy oil on brk, gd cup odr, fr sfo in 6-8 pcs.

LS: tan, fn xln, gd intxln/vuggy por in many pcs, lght brn sat stns in por, fr med sho oil on brk, strng cup odr, gd fluor/cut, fr sfo in 20+ pcs.

LS: lt gry/crm, micro-fn xln, sub-chlky, brit, tr-nvp, ns, fnt odor of hydro-carb in system.

LS: lt gry/lt tan, slght mott, fn xln, fw sub-chlky, fw brit, sm flakey, tr-nvp, influx of SH: blk/drk gry, silty, carb, no cup odr, ns.

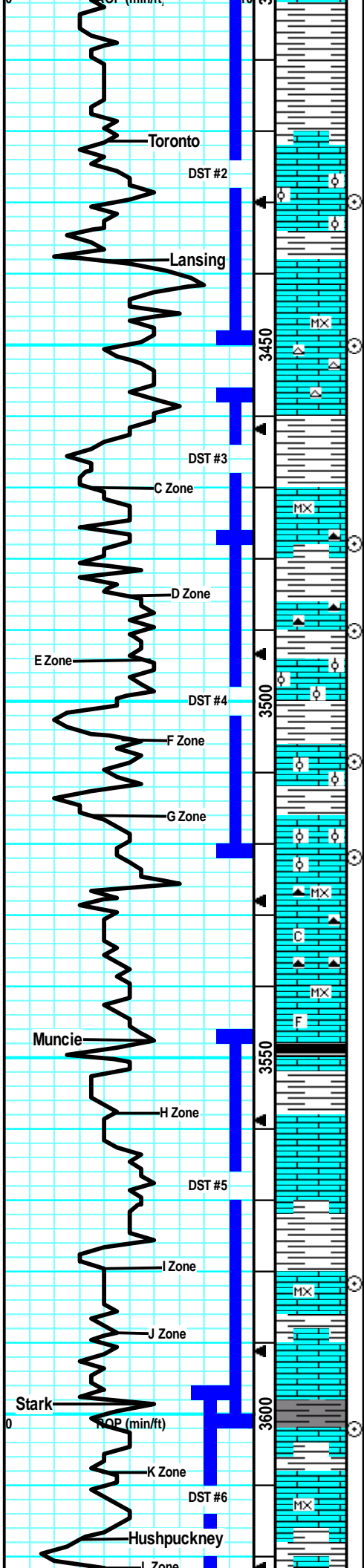
Topeka @ 3208' (-1004)

DST #1: 3,342'-3,380' (Oread "B")
 Rec: 140' gas in pipe, 45' oil cut mud (22% oil, 78% mud), and 60' oil and water cut mud (21% oil, 23% water, 56% mud).
 IFP: 23-40#/30" ISIP: 176#/45"
 FFP: 38-62#/45" FSIP: 177#/60"

MudCo Report #4		
3352'	10/23/18	
Wt	Vis	pH
9.0	55	11.0
Filt	Chlr	LCM
6.4	1.2K	2#

CFS @ 3380'
 (20"/45") Survey @ 3380' = 3/4 Degree

Heebner @ 3396' (-1192)



SH: gry/brn/grn, silty, soft, fw waxy, no odr, ns.

Same as above, no odr, ns.

LS: lt tan, sing, fn xln, brit chlky, 12-15 pcs w patchy spttd lght brn stns, gr fluor/cut, sml bled oil on brk, fw Chert: tan/org, foss, sharp, vssfo in apprx 15 pcs, wk cup odr.

45" smpl: mostly LS: lt gry/dense, tr-nvp, no cup odr, ns.

SH: gry/brn, silty, soft, fw LS: tan/yel, fn xln, ool, dense, firm, tr-nvp, no cup odr, ns.

LS: tan/lt tan, fn xln, sm pr intxln por, fw pcs w/rx in por, lght brn patchy stns, dul yel flour/gd cut, fnt-wk cup odr, vssfo on brk in 8-10 pcs.

LS: tan/lt gry, sing, micro-fn xln, dense, fw sub-chlky, flakey in prt, tr-nvp, no odr, ns.

LS: tan/lt gry, fn xln, dense, sm flakey/mealy, tr-nvp, fw Chert: tan/wht, opa, fw SH: brn/gry, silty, no cup odr, ns.

SH: brn/grn/gry, silty, gritty, fw LS: lt tan/lt gry, fn xln, sub-chlky, sm brit, tr-pr ppt intxln por in fw, fw Chert: tan/gry, sharp, ? cup odr, nsfo.

LS: crm/lt tan, micro-fn xln, many brit, 6-8 pcs w/fr-gd intxln por, mostly tight ppt intxln por, gd lght brn stns in por, fr cup odr, gd fluor/cut, sso in only 5-6 pcs.

SH: brn/gry/blu-grn, silty, soft, fw LS: lt tan, micro xln, brit, sub-chlky, fw Chert: tan/lt brn, sharp, no odr, ns.

LS: lt tan, sing, micro-fn xln, many dense, sm brit, fw pcs w/fr intxln por, scat vugs, med brn stns in por, gd fluor/cut, sso on brk in 8-10 pcs, faint cup odr.

LS: tan, slght mott, fn xln, ool, dense, firm, tr-no intool por, lght brn stns in tight intool por, no fluor/cut, nsfo, no cup odr.

Sm of the same tight ool LS, inflix LS: tan, fn xln, tr ppt intxln por in v fw pcs, mostly brit, tr-nvp, 4-5 pcs w/ patchy lght brn stns, no fluor/cut, nsfo, no cup odr.

LS: tan/lt gry, slght mott, fn xln, slght ool in prt, many firm, tr-nvp, abund SH: brn, silty, soft, no cup odr, ns.

LS: crm/lt tan, micro-fn xln, slght ool, mostly dense, brit, fw pcs w/pr ppt intxln por, lght brn patchy stns, wk-? fluor, vssfo 2-3 pcs, no cup odr.

LS: lt tan, slght mott, fn xln, sm ool, many brit, sm firm, v fw pcs w/ scat oolcast por, lght brn stns in por, 2 pcs w/ vssfo on brk, faint-? cup odr.

LS: tan/lt tan, micro-fn xln, dense, sub-chlky, fw bit, tr-nvp, fw Chrt: tan/lt brn, foss, sharp, 1-2 pcs w/ slght intxln por, wk fluor/cut, nsfo, no odr.

LS: lt gry, sing, micro-fn xln, dense, sub-chlky in prt, fw firm, tr-nvp, fw pcs pur chlky, no odr, ns.

LS: gry/tan, slght mott in prt, fn xln, sm foss, many chlky/brit, tr-nvp, inflix SH: drk gry/blk, silty, carb, no odr, ns.

LS: tan/lt tan, micro-fn xln, sm v brit, chlky, tr-pr ppt intxln por, patchy brn stns, fr fluor/slw cut on brk, vssfo only on brk, faint cup odr.

LS: gry/tan, mott, fn xln, mostly dense, sub-chlky, tr-nvp, 2 pcs w/ lght brn patchy stns, wk/fluor, no cup odr,

LS: tan, micro-fn xln, sm dense, many firm, tr-pt ppt intxln por in sm, drk blk/tarry like stns, wk-? fluor, no cut, pos drk dead oil, no odr, lrg inflix SH: brn, silty.

Much of the same LS: much more drk tarry oil pcs, 15-20 pcs, wk fluor, gd cut resid, sso on brk, no cup odr, abund SH: brn/gry,

LS: tan, slght mott, micro-fn xln, dense, tr ppt intxln por in 1/2 try, drk hvy tarry like patchy stns, wk fluor/slw cut, vssfo on brk in 15+ pcs, no cup odr.

LS: tan, fn xln, many brit, sm friab, fr-gd fn intxln por w/ rare scat vugs, lght brns evn stns, sso on brk w/ gas bub in 15+ pcs, fr cup odr.

45" Smpl: had svrl more pcs of fr intxln/scat vuggy por pcs w/ sho, gd odr and svrl pcs w/ sso on brk, slght influx of chlky brit pcs.

Mostly SH: brn/gry/drk brn, silty, soft, sm muddy, fw LS: lt tan/lt brn, mott, fn xln, 4 pcs w/ gd intxln por, gd evn brn stns in por, gd fluor/cut, sso on brk, no cup odr.

LS: 3 pcs w/ sho like above, mostly LS: crm/lt tan, sing, micro-fn xln, mostly brittle, tr-nvp, fw SH: brn/fw gry, silty, no cup odr.

LS: crm/lt tan, sing, micro-fn xln, many dense, mostly brit, 7 pcs w/ pr intxln slght scat vuggy por drk hvy tar stns, vssfo on brk, wk

DST #2: 3,394'-3,450' (TORONTO - LKC "A")
 Rec: 20' mud with trace of oil.
 IFP: 23-25#/30" ISIP: 34#/30"
 FFP: 25-26#/30" FSIP: 32#/30"

Toronto @ 3421' (-1217)

CFS @ 3430'
(20"/45")

Lansing @ 3438' (-1234)

CFS @ 3450'
(20"/45")

MudCo Report #5			
3450' 10/24/18			
Wt	Vis	pH	
9.0	52	11.0	
Filt	Chlr	LCM	
6.0	900	2#	

DST #3: 3,456'-3,478' (LKC "C")
 Rec: 15' mud with trace of oil.
 IFP: 25-26#/30" ISIP: 25#/30"
 FFP: 25-26#/30" FSIP: 25#/30"

CFS @ 3478'
(20"/45")

MudCo Report #6			
3480' 10/25/18			
Wt	Vis	pH	
9.3	51	10.5	
Filt	Chlr	LCM	
6.4	1.0K	1#	

CFS @ 3490'
(20"/45")

CFS @ 3508'
(20"/45")

DST #4: 3,476'-3,522' (LKC "D" - "F")
 Rec: 60' water cut mud (20% water, 80% mud) and 105' mud with trace of oil.
 IFP: 38-66#/30" ISIP: 588#/45"
 FFP: 68-93#/45" FSIP: 554#/60"

CFS @ 3522'
(20"/45")

Muncie @ 3548' (-1344)

DST #5: 3,546'-3,602' (LKC "H" - "J")
 Rec: 2' mud.
 IFP: 17-19#/30" ISIP: 34#/30"
 FFP: 19-20#/30" FSIP: 28#/30"

CFS @ 3582'
(20"/45")

MudCo Report #7			
3602' 10/26/18			
Wt	Vis	pH	
9.3	58	10.5	
Filt	Chlr	LCM	
6.0	1.0K	1#	

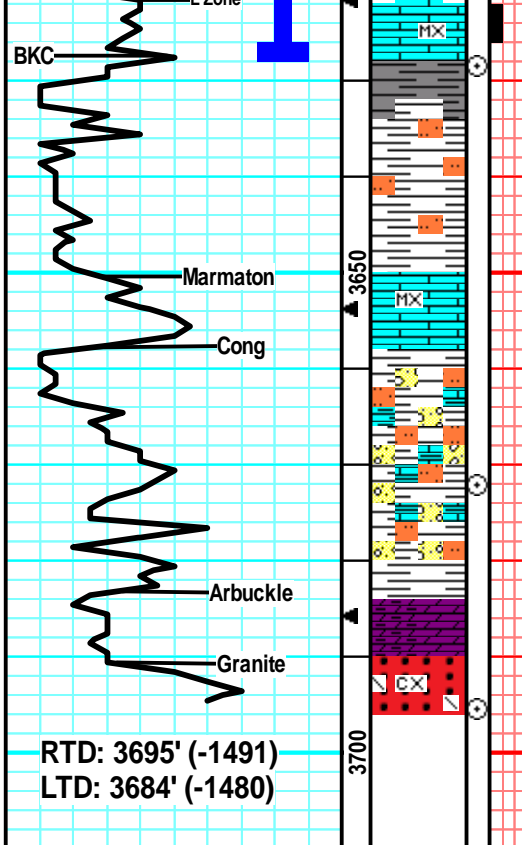
Stark @ 3599' (-1395)

CFS @ 3602'
(20"/45")

MudCo Report #7			
3628' 10/27/18			
Wt	Vis	pH	
9.1	60	10.5	
Filt	Chlr	LCM	
6.0	900	2#	

Hushpuckney @ 3618' (-1414)

CFS @ 3628'



pr mix in slight seal vuggy por, drk nvy tan stns, vssro on brk, wk fluor/slw cut, no cup odr.

40" & 60" smpl: LS: crm/lt tan, sing, micro-fn xln, mostly dense, many brit, 3 pcs w/ sho like above, no cup odr.

SH: brn/gry/drk gry, silty, soft, gritty, fw LS: crm/lt gry, v sandy/gritty, friable, tr-nvp, no odr, ns.

SH: brn/gry/grn, silty, fw SltStn: brn, gritty, friable, gritty, no odr, ns.

LS: lt tan/lt gry, slight mott, micro-fn xln, v fw foss frags, most dense, sm brit, tr-nvp, no cup odr, ns.

SH: brn/gry, silty, soft, fw SltStn: lt brn, gritty, friable, fw LS: tan/lt tan, slight mott, fn xln, mostly dense, tr-nvp, no odr, ns.

SH: brn/gry/grn, muddy, silty, sm soft, fw SltStn: lght brn, gritty, no odr, ns.

Abund SH: brn/gry, silty, soft, mostly muddy, fw LS: lt tan/lt gry, micro-fn xln, dense, sm DOL: lt brn/gry, fn xln, dense, mostly firm, tr-nvp, no odr, ns.

Mostly SH: brn/gry, silty, soft, fw DOL: lt brn/gry, fn xln, mostly firm, tr-nvp, no odr, ns.

GRAN: pink/org, mott, lrg crs xln, v hard, biot mica inclus, abund SH: slough, fw DOL as disc above, no odr, ns.

CFS @ 3628
(20"/40"/60")

BKC @ 3628' (-1424)

DST #: 3,597'-3,628' (LKC "K" - "L")
Rec: 1' mud with oil spots.
IFP: 16-17#/30" ISIP: 30#/30"
FFP: 18-18#/30" FSIP: 25#/30"

Marmaton @ 3650' (-1446)

Conglomerate @ 3658' (-1454)

CFS @ 3672'
(20"/45")

Arbuckle @ 3683' (-1479)

Granite @ 3691' (-1487)

CFS @ 3695'
(20"/45")

Survey @ 3695' = 1 1/4 Degrees



#5 Voss

1,280' FSL & 548' FEL

40' S & 112' E of E/2 SE Section 7-6S-21W

Graham County, Kansas

API# 15-065-24156-0000

Elevation: GL: 2,199', KB: 2,204'

Sample Tops			Ref. Well
Anhydrite	1852	+352	-7
B/Anhydrite	1886	+318	-8
Stotler	3158	-954	+1
Topeka	3208	-1004	-5
Heebner	3396	-1192	-3
Toronto	3418	-1214	Flat
Lansing	3438	-1234	-3
Muncie	3548	-1344	-1
Stark	3599	-1395	-1
Hush	3618	-1414	-4
BKC	3628	-1424	-5
Marmaton	3650	-1446	-3
Conglomerate	3658	-1454	NDE
Arbuckle	3683	-1479	NDE
RTD	3695	-1491	

GLOBAL OIL FIELD SERVICES, LLC 0013248

REMIT TO 24 S. Lincoln
Russell, KS 67665

SERVICE POINT: RUSSELL, KS

DATE <u>10-20-18</u>	SEC. <u>7</u>	TWP. <u>6</u>	RANGE <u>21W</u>	CALLED OUT <u>3PM</u>	ON LOCATION <u>6PM</u>	JOB START <u>8PM</u>	JOB FINISH <u>8:30PM</u>
LEASE <u>Wags</u>	WELL #. <u>3</u>		LOCATION <u>Bogue, KS - 11 N on 360th</u>			COUNTY <u>GRAHAM</u>	STATE <u>KS</u>
OLD OR <input checked="" type="radio"/> NEW (CIRCLE ONE)			<u>CC RD W TO RIC</u>				

CONTRACTOR MURFIN DRILLING RIG # 8

TYPE OF JOB SURFACE

HOLE SIZE 12 1/4 T.D. 262'

CASING SIZE 8 5/8 DEPTH 254.02 + 8' LT

TUBING SIZE _____ DEPTH _____

DRILL PIPE _____ DEPTH _____

TOOL _____ DEPTH _____

PRES. MAX 200 PSI MINIMUM 0

MEAS. LINE _____ SHOE JOINT 42.38'

CEMENT LEFT IN CSG. 20'

PERFS _____

DISPLACEMENT 15 1/2 BBL.

OWNER _____

CEMENT AMOUNT ORDERED 190 SX 3% CC 2% GGL

COMMON _____ @ _____

POZMIX _____ @ _____

GEL _____ @ _____

CHLORIDE _____ @ _____

ASC _____ @ _____

_____ @ _____

_____ @ _____

_____ @ _____

_____ @ _____

_____ @ _____

_____ @ _____

_____ @ _____

HANDLING _____ @ _____

MILEAGE _____ @ _____

TOTAL _____

EQUIPMENT

PUMP TRUCK CEMENTER BRAD

109 HELPER JASON

BULK TRUCK

379 DRIVER TOM

BULK TRUCK

_____ DRIVER _____

REMARKS:
RUN IN 6 STS. BRAND NEW 8 5/8 CASING WITH 9' LANDING JOINT, CIRCULATE MUD, HOOK UP CEMENT, MIX 100SX, WASH UP + DISPLACE W/ 15 1/2 BBL H2O, SHOT IN @ 200 PSI, CEMENT DID CIRCULATE

CHARGE TO: RITCHIE EXPLORATION

STREET _____

CITY _____ STATE _____ ZIP _____

Global Oil Field Services, LLC
You are hereby requested to rent cementing equipment and furnish cementer and helper(s) to assist owner or contractor to do work as is listed. The above work was done to satisfaction and supervision of owner agent or contractor. I have read and understand the "GENERAL TERMS AND CONDITIONS" listed on the reverse side.

PRINTED NAME JASON GALL

SIGNATURE [Signature]

SERVICE

DEPTH OF JOB _____

PUMP TRUCK CHARGE _____

EXTRA FOOTAGE _____ @ _____

MILEAGE _____ @ _____

MANIFOLD _____ @ _____

_____ @ _____

_____ @ _____

TOTAL _____

PLUG & FLOAT EQUIPMENT

_____ @ _____

_____ @ _____

_____ @ _____

_____ @ _____

_____ @ _____

TOTAL _____

SALES TAX (If Any) _____

TOTAL CHARGES _____

DISCOUNT _____ IF PAID IN 30 DAYS



PRESSURE PUMPING LLC

P.O. Box 884, Chanute, KS 66720
620-431-9210 or 800-467-8676

11902

11789

FIELD TICKET & TREATMENT REPORT
CEMENT

TICKET NUMBER 55910

LOCATION Oakley Ks

FOREMAN Jerry Miles

Invoice #814440 Ks

DATE	CUSTOMER #	WELL NAME & NUMBER	SECTION	TOWNSHIP	RANGE	COUNTY
10-27-19	7173	Voss #5	7	65	21W	Graham
CUSTOMER		Bogue 12N 1 1/2 W 140				
MAILING ADDRESS		Ritchie Exp.				
P.O. Box 783188						
CITY	STATE	ZIP CODE	TRUCK #	DRIVER	TRUCK #	DRIVER
Wichita	KS	67278-3188	753	Cory W		
			70	Miles S		
			535	Jerry Y		

JOB TYPE long string HOLE SIZE 7 7/8 HOLE DEPTH 3695 CASING SIZE & WEIGHT 5 1/2 15.50
 CASING DEPTH 3688 DRILL PIPE _____ TUBING _____ OTHER P.C. @ 1835
 SLURRY WEIGHT _____ SLURRY VOL _____ WATER gal/sk _____ CEMENT LEFT IN CASING 21'
 DISPLACEMENT 87 1/4 bbl DISPLACEMENT PSI _____ MIX PSI _____ RATE _____

REMARKS: Safety meeting -> rig upon Murfin & run 1st equip. turbos on 1, 4, 5, 6, 7, 8, 43, 45 baskets on 44, 57, 72 Port + Collar on top 44 set @ 1835 run casing 1 1/4 circ 1 hour pump 500 gal mud flush with 5 bbl H₂O spacers mix 125 sks com 100 salt 28 gr/s 4 Kalseal release plug clean pump lines & sp log with 87 1/4 bbl water plug lands @ 1700 ft final LFP 800#

30 sks RH 20 sks MH

Thank you Jerry & crew

ACCOUNT CODE	QUANTITY or UNITS	DESCRIPTION of SERVICES or PRODUCT	UNIT PRICE	TOTAL
CE0453	1	PUMP CHARGE	2800.00	2800.00
CE0002	65	MILEAGE	7.15	464.75
CE0710	8.23	ten mileage delivery	97.75	936.16
CC5800A	175 sks	Class A	20.00	3500.00
CC5326	905 #	salt	1.00	905.00
CC5965	329 #	gel	.30	98.70
CC6077	875 #	Kalseal	.50	437.50
CC6125	500 gal	mud flush	.65	325.00
CP8485	1	5 1/2 A fu float shoe	585.00	585.00
CP8254	1	3 1/2 latchdown assy	400.00	400.00
CP8576	8	5 1/2 turbolizers	110.00	880.00
CP8629	3	5 1/2 baskets	385.00	1155.00
CP8776	1	5 1/2 Port Collar SA 1802132	2850.00	2850.00
		Subtotal		15337.11
		-20% discount		3067.42
		Subtotal		12269.69
		SALES TAX		1008.17
		ESTIMATED TOTAL		12937.86

Ravin 3737

AUTHORIZATION

TITLE _____

DATE 11-28

I acknowledge that the payment terms, unless specifically amended in writing on the front of the form or in the customer's account records, at our office, and conditions of service on the back of this form are in effect for services identified on this form.



PRESSURE PUMPING LLC
PO Box 884, Chanute, KS 66720
620-431-9210 or 800-467-8676

11978

11860

TICKET NUMBER 55939
LOCATION Oakley KS
FOREMAN Jerry

FIELD TICKET & TREATMENT REPORT
CEMENT

INVOICE # 814529 KS

DATE	CUSTOMER #	WELL NAME & NUMBER	SECTION	TOWNSHIP	RANGE	COUNTY
11-3-18	7173	Voss # 5	7	6S	21W	Graham
CUSTOMER			TRUCK #	DRIVER	TRUCK #	DRIVER
Ritchie Exp			731	Cony D	679	Walt D
MAILING ADDRESS			530 T-129	Neil W		
P.O. Box 783188			assist	Keith		
CITY	STATE	ZIP CODE	535	Jerry Y		
Wichita	KS	67278-3188				

JOB TYPE Port & Color HOLE SIZE _____ HOLE DEPTH _____ CASING SIZE & WEIGHT 5 1/2
CASING DEPTH _____ DRILL PIPE _____ TUBING 2 3/8 OTHER Port & Color @ 836
SLURRY WEIGHT 12.5 SLURRY VOL 1.89 WATER gal/sk _____ CEMENT LEFT In CASING _____
DISPLACEMENT 6 1/2 DISPLACEMENT PSI _____ MIX PSI _____ RATE _____

REMARKS: Safety meeting & rig up on X Port well serv. test tool to 1200 ft hold
5 min open tool taking rate 0.5 bbl/pm @ 400# mix 225 sks 60/40 80 1/4 flo seal
with 500 # hulls bringing cement to surface close tool press to 1200 ft hold
5 min run 5 ft raise clean with 20 bbl pull tubing & press casing to 5000
& shut in

Thank you
Jerry & crew

ACCOUNT CODE	QUANTITY or UNITS	DESCRIPTION of SERVICES or PRODUCT	UNIT PRICE	TOTAL
CE0451	1	PUMP CHARGE	1900.00	1900.00
CE0002	50	MILEAGE	7.15	357.50
CE0710	9.68	ton mileage delivery	1.75	847.00
CC5831	225 sks	lite blend III	17.50	3937.50
CC6080	500 #	hulls	1.00	500.00
CC6075	57 #	flo seal	3.00	171.00
			subtotal	7713.00
			-20% disc	1542.60
			subtotal	6170.40
			SALES TAX	276.51
			ESTIMATED TOTAL	6446.91

Ravin 3737

AUTHORIZATION [Signature] TITLE _____ DATE _____

I acknowledge that the payment terms, unless specifically amended in writing on the front of the form or in the customer's account records, at our office, and conditions of service on the back of this form are in effect for services identified on this form.