

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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DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc.**

PO Box 783188
Wichita, KS 67278

ATTN: John Goldsmith

Saline Valley 7D #1

7-12S-36W Logan,KS

Start Date: 2019.12.09 @ 00:04:27

End Date: 2019.12.09 @ 09:43:02

Job Ticket #: 59447 DST #: 1

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

Printed: 2019.12.16 @ 13:33:59



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

7-12S-36W Logan, KS

PO Box 783188
Wichita, KS 67278

Saline Valley 7D #1

ATTN: John Goldsmith

Job Ticket: 59447

DST#: 1

Test Start: 2019.12.09 @ 00:04:27

GENERAL INFORMATION:

Formation: **LKC "A"**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 04:06:48
 Time Test Ended: 09:43:02
 Interval: **3851.00 ft (KB) To 3876.00 ft (KB) (TVD)**
 Total Depth: 3876.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Initial)
 Tester: Brannan Lonsdale
 Unit No: 73
 Reference Elevations: 3100.00 ft (KB)
 3091.00 ft (CF)
 KB to GR/CF: 9.00 ft

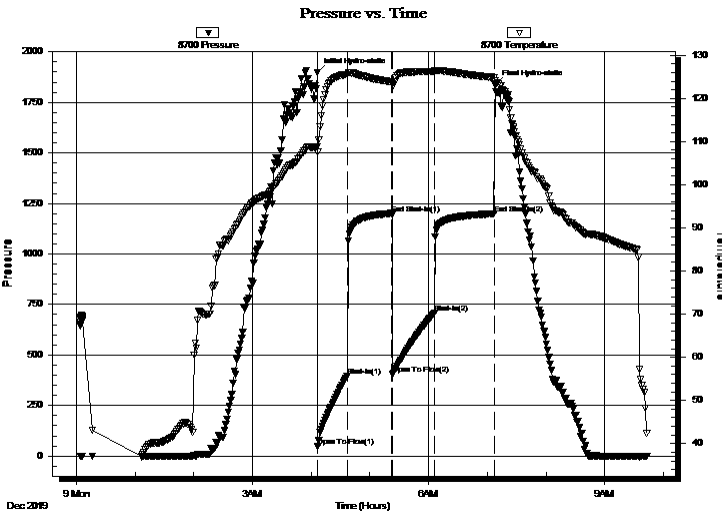
Serial #: 8700

Outside

Press@RunDepth: 706.78 psig @ 3852.00 ft (KB)
 Start Date: 2019.12.09 End Date: 2019.12.09
 Start Time: 00:04:28 End Time: 09:43:02
 Capacity: 8000.00 psig
 Last Calib.: 2019.12.09
 Time On Btm: 2019.12.09 @ 04:06:33
 Time Off Btm: 2019.12.09 @ 07:07:48

TEST COMMENT: 30- IF- BOB 3mins. Built to 81.43"
 45- IS- No blow
 45- FF- BOB 4mins. Built to 81.84"
 60- FS- No blow

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1896.48	108.79	Initial Hydro-static
1	49.00	107.60	Open To Flow (1)
30	395.71	125.59	Shut-In(1)
76	1200.47	123.79	End Shut-In(1)
77	405.14	123.26	Open To Flow (2)
120	706.78	126.13	Shut-In(2)
181	1198.16	124.83	End Shut-In(2)
182	1835.88	124.12	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
1545.00	MW, 20%M 80%W	20.18

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Ritchie Exploration, Inc.

7-12S-36W Logan,KS

PO Box 783188
Wichita, KS 67278

Saline Valley 7D #1

Job Ticket: 59447

DST#: 1

ATTN: John Goldsmith

Test Start: 2019.12.09 @ 00:04:27

Tool Information

Drill Pipe:	Length: 3665.00 ft	Diameter: 3.82 inches	Volume: 51.95 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 186.00 ft	Diameter: 2.25 inches	Volume: 0.91 bbl	Weight to Pull Loose: 50000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	28.00 ft			String Weight: Initial 47000.00 lb
Depth to Top Packer:	3851.00 ft			Final 47000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	25.00 ft			
Tool Length:	53.00 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			3824.00	
Shut In Tool	5.00			3829.00	
Hydraulic tool	5.00			3834.00	
Jars	5.00			3839.00	
Safety Joint	3.00			3842.00	
Packer	5.00			3847.00	28.00 Bottom Of Top Packer
Packer	4.00			3851.00	
Stubb	1.00			3852.00	
Recorder	0.00	6771	Inside	3852.00	
Recorder	0.00	8700	Outside	3852.00	
Perforations	21.00			3873.00	
Bullnose	3.00			3876.00	25.00 Bottom Packers & Anchor

Total Tool Length: 53.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc.

7-12S-36W Logan,KS

PO Box 783188
Wichita, KS 67278

Saline Valley 7D #1

Job Ticket: 59447

DST#: 1

ATTN: John Goldsmith

Test Start: 2019.12.09 @ 00:04:27

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

125000 ppm

Viscosity: 56.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.38 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2500.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
1545.00	MW, 20%M 80%W	20.179

Total Length: 1545.00 ft Total Volume: 20.179 bbl

Num Fluid Samples: 0

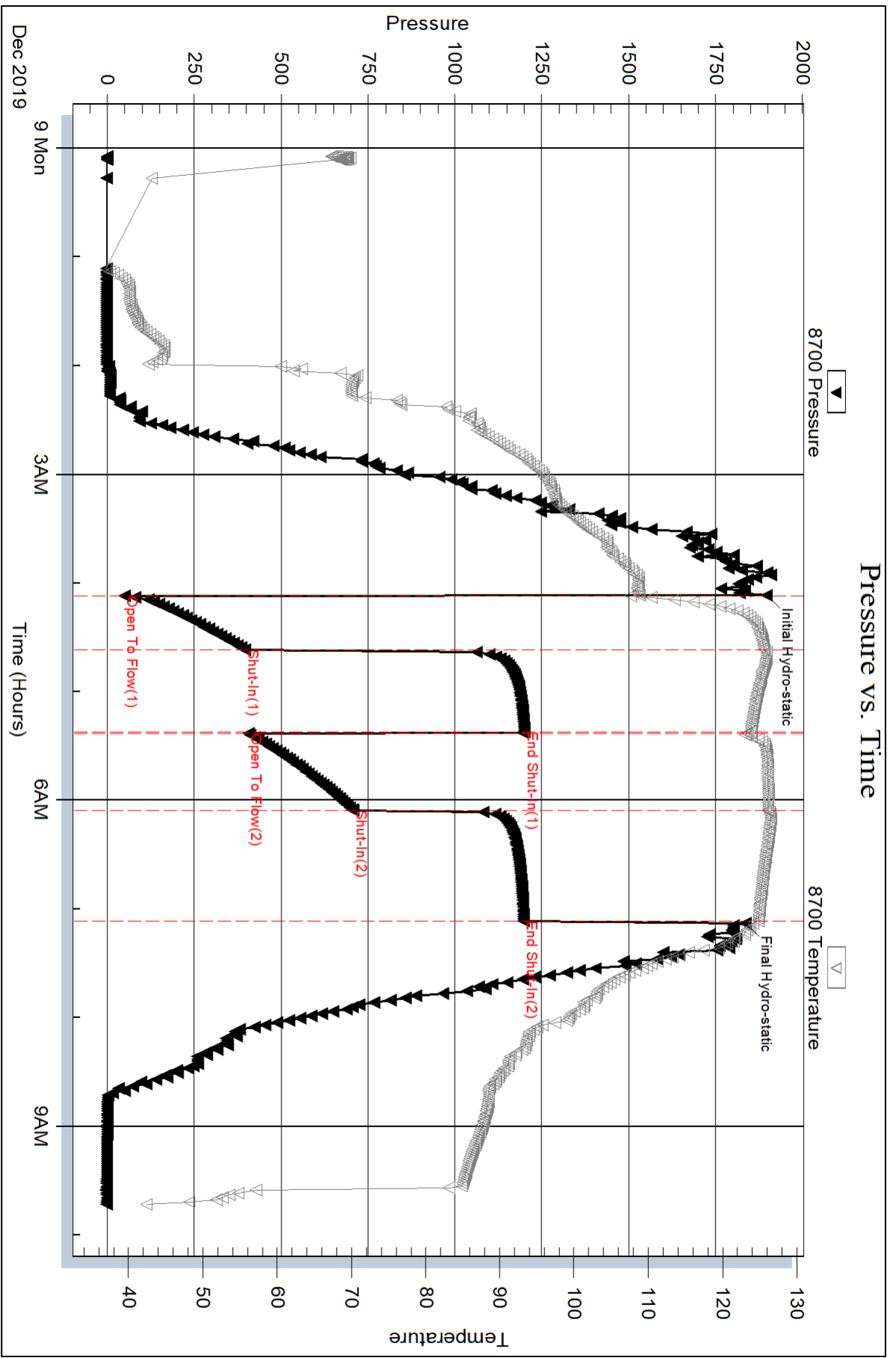
Num Gas Bombs: 0

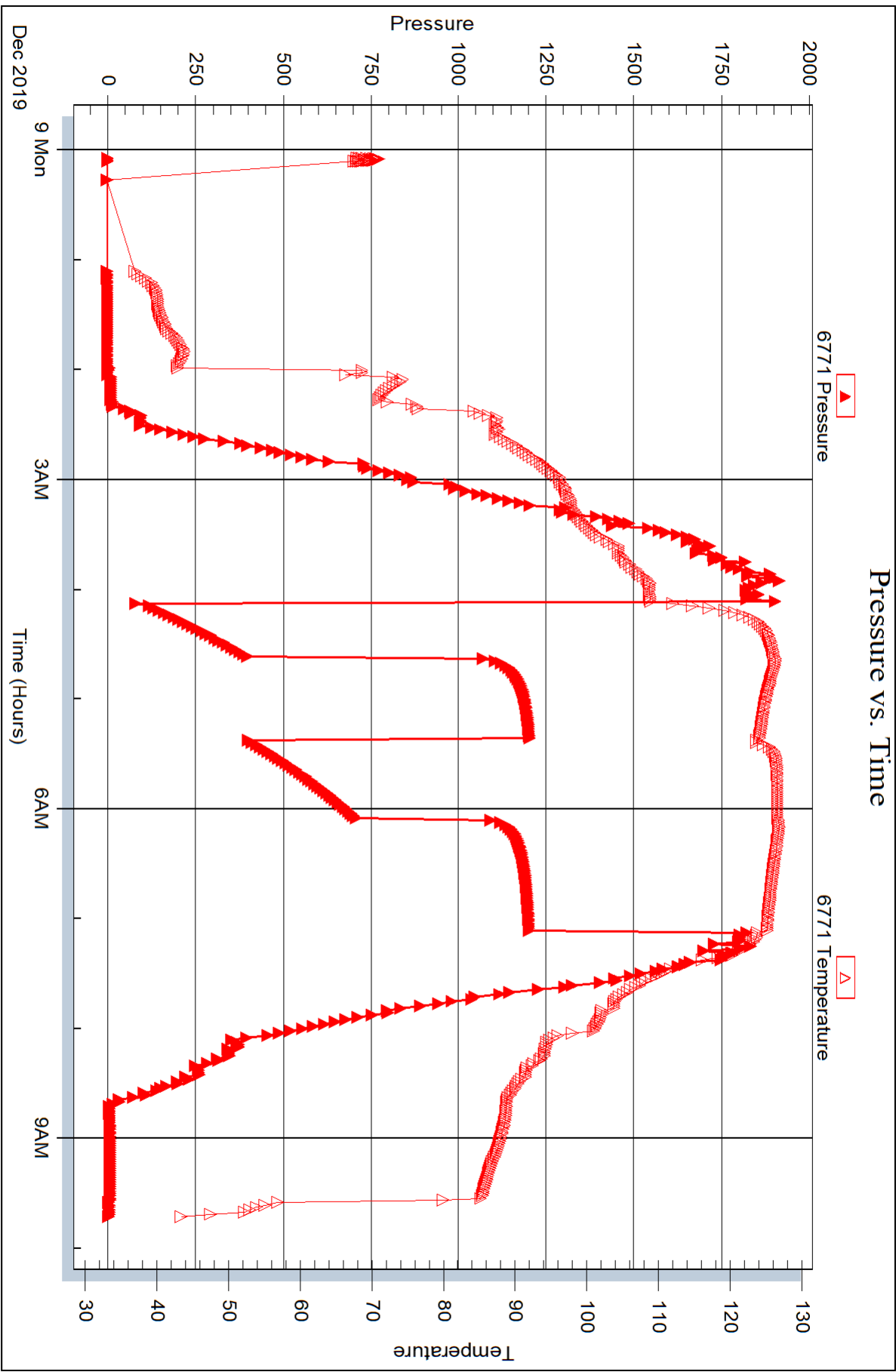
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW: .11@36deg







DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc.**

PO Box 783188
Wichita, KS 67278

ATTN: John Goldsmith

Saline Valley 7D #1

7-12S-36W Logan,KS

Start Date: 2019.12.11 @ 02:10:55

End Date: 2019.12.11 @ 11:52:00

Job Ticket #: 59449 DST #: 2

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

Printed: 2019.12.16 @ 13:28:03



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

7-12S-36W Logan,KS

PO Box 783188
Wichita, KS 67278

Saline Valley 7D #1

ATTN: John Goldsmith

Job Ticket: 59449

DST#: 2

Test Start: 2019.12.11 @ 02:10:55

GENERAL INFORMATION:

Formation: **Altamont**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 06:24:46

Time Test Ended: 11:52:00

Test Type: Conventional Bottom Hole (Reset)

Tester: Brannan Lonsdale

Unit No: 73

Interval: 4226.00 ft (KB) To 4260.00 ft (KB) (TVD)

Reference Elevations: 3100.00 ft (KB)

Total Depth: 4260.00 ft (KB) (TVD)

3091.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 9.00 ft

Serial #: 8700 Outside

Press@RunDepth: 455.52 psig @ 4227.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.12.11

End Date:

2019.12.11

Last Calib.:

2019.12.11

Start Time: 02:10:56

End Time:

11:52:00

Time On Btm:

2019.12.11 @ 06:24:31

Time Off Btm:

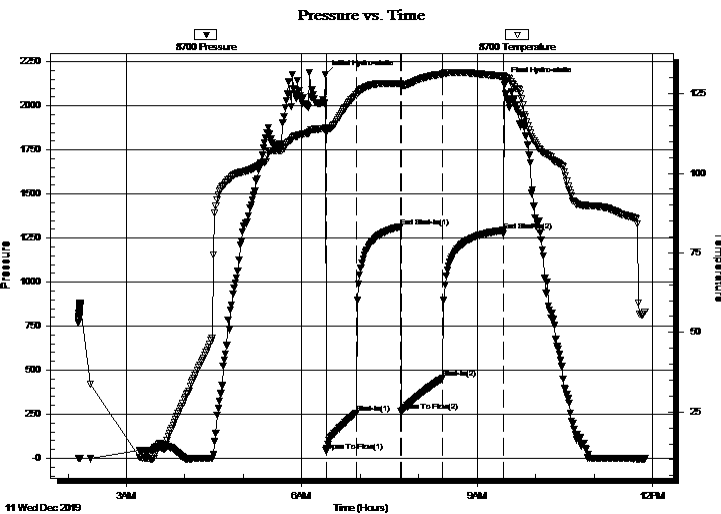
2019.12.11 @ 09:27:46

TEST COMMENT: 30- IF- BOB 8mins. Built to 34.55"

45- IS- No blow

45- FF- BOB 10mins. Built to 41.04"

60- FS- No blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2176.21	114.16	Initial Hydro-static
1	42.40	112.79	Open To Flow (1)
31	257.89	124.59	Shut-In(1)
77	1315.24	128.19	End Shut-In(1)
78	265.46	127.61	Open To Flow (2)
120	455.52	131.17	Shut-In(2)
182	1293.60	130.52	End Shut-In(2)
184	2137.28	130.20	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
960.00	MW, 10%M 90%W	11.89

* 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.

7-12S-36W Logan,KS

PO Box 783188
Wichita, KS 67278

Saline Valley 7D #1

Job Ticket: 59449

DST#: 2

ATTN: John Goldsmith

Test Start: 2019.12.11 @ 02:10:55

Tool Information

Drill Pipe:	Length: 4037.00 ft	Diameter: 3.82 inches	Volume: 57.23 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 186.00 ft	Diameter: 2.25 inches	Volume: 0.91 bbl	Weight to Pull Loose: 58000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	25.00 ft			String Weight: Initial 28000.00 lb
Depth to Top Packer:	4226.00 ft			Final 53000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	34.00 ft			
Tool Length:	62.00 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			4199.00	
Shut In Tool	5.00			4204.00	
Hydraulic tool	5.00			4209.00	
Jars	5.00			4214.00	
Safety Joint	3.00			4217.00	
Packer	5.00			4222.00	28.00 Bottom Of Top Packer
Packer	4.00			4226.00	
Stubb	1.00			4227.00	
Recorder	0.00	6771	Inside	4227.00	
Recorder	0.00	8700	Outside	4227.00	
Perforations	30.00			4257.00	
Bullnose	3.00			4260.00	34.00 Bottom Packers & Anchor

Total Tool Length: 62.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc.

7-12S-36W Logan,KS

PO Box 783188
Wichita, KS 67278

Saline Valley 7D #1

Job Ticket: 59449

DST#: 2

ATTN: John Goldsmith

Test Start: 2019.12.11 @ 02:10:55

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:

48000 ppm

Viscosity: 56.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.19 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 4700.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
960.00	MW, 10%M 90%W	11.886

Total Length: 960.00 ft Total Volume: 11.886 bbl

Num Fluid Samples: 0

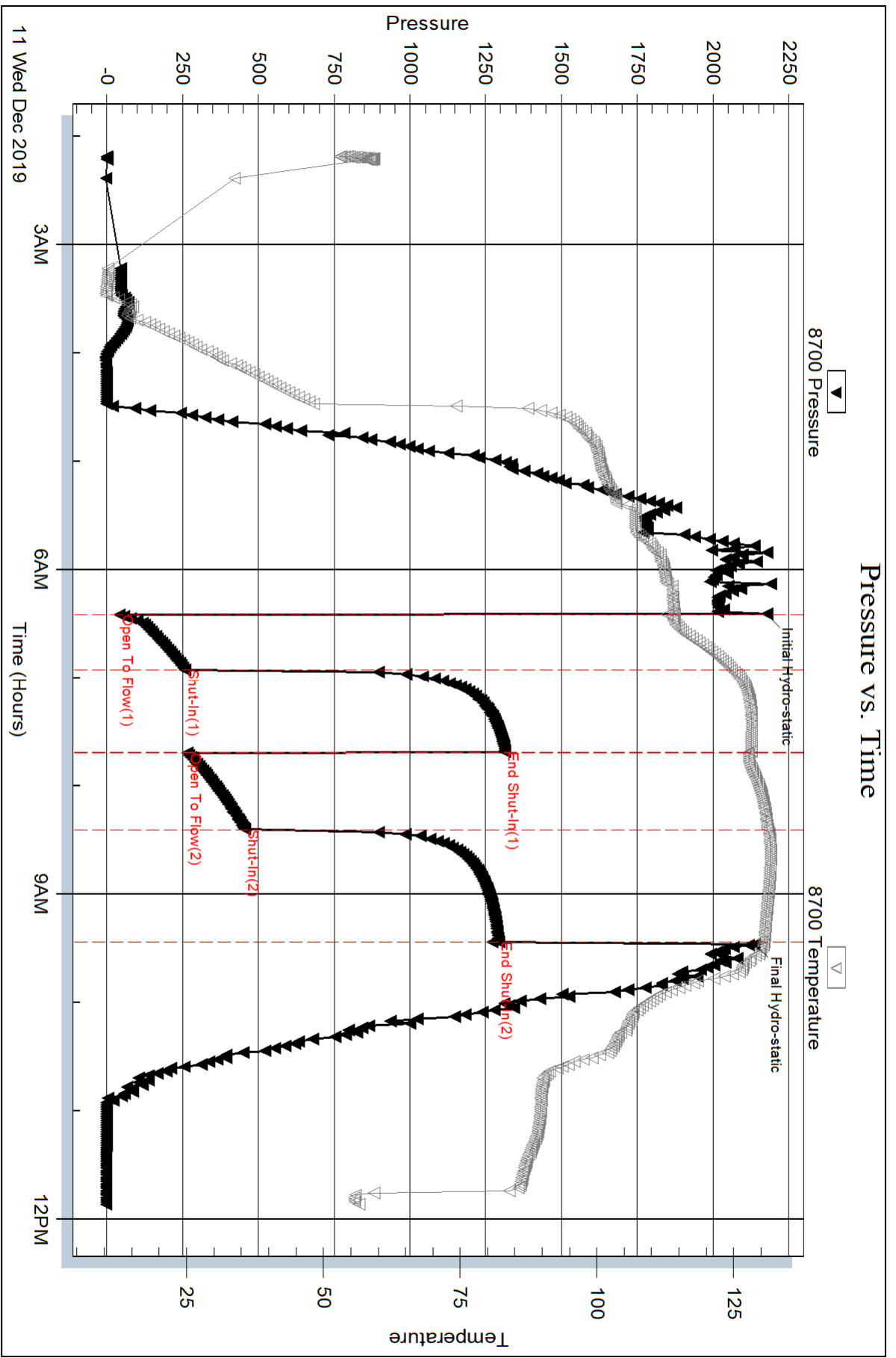
Num Gas Bombs: 0

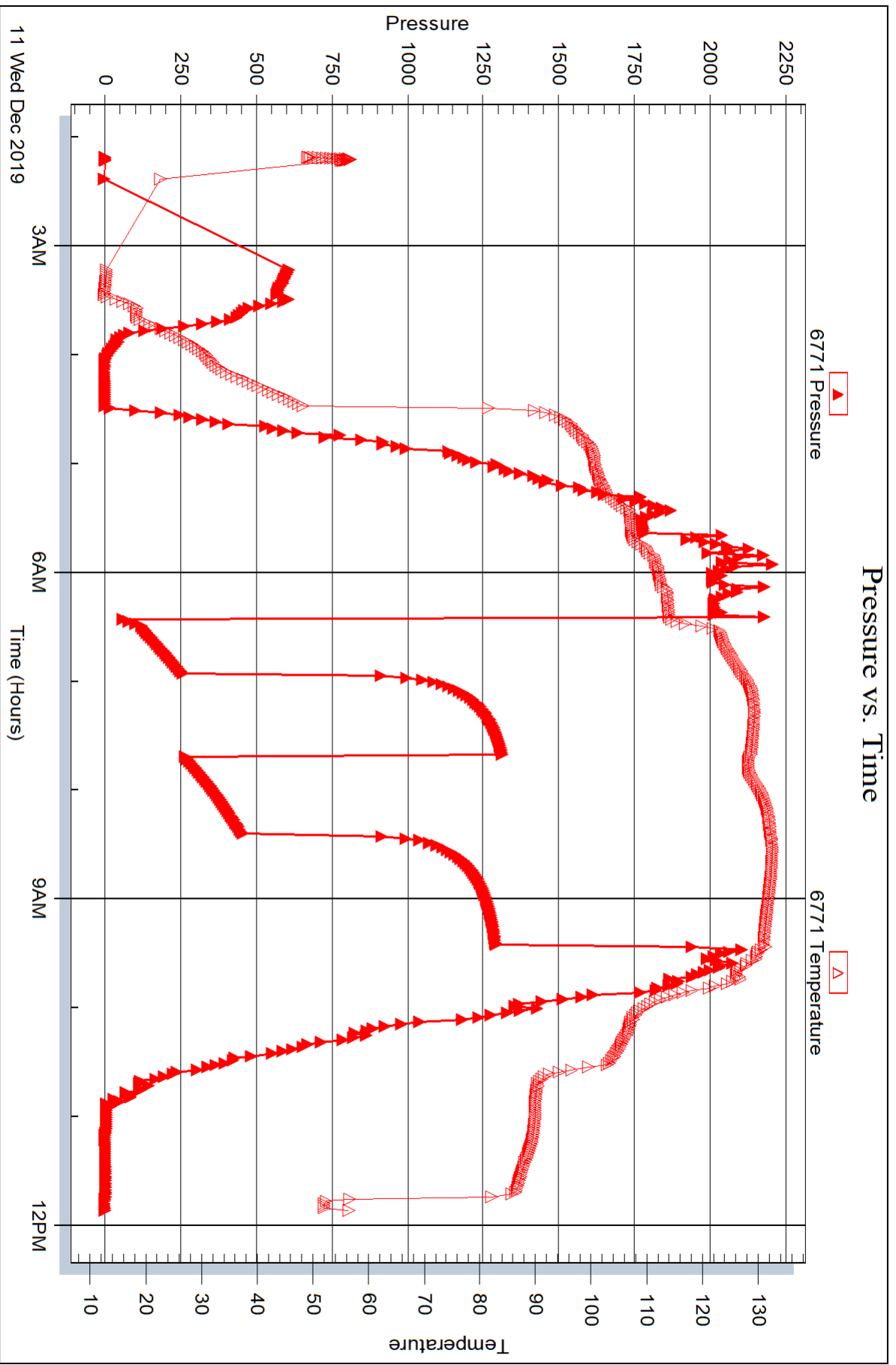
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW: .21@47deg







DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc.**

PO Box 783188
Wichita, KS 67278

ATTN: John Goldsmith

Saline Valley 7D #1

7-12S-36W Logan,KS

Start Date: 2019.12.12 @ 11:50:23

End Date: 2019.12.12 @ 18:16:44

Job Ticket #: 59450 DST #: 3

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

Printed: 2019.12.16 @ 13:25:55



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

7-12S-36W Logan,KS

PO Box 783188
Wichita, KS 67278

Saline Valley 7D #1

ATTN: John Goldsmith

Job Ticket: 59450

DST#: 3

Test Start: 2019.12.12 @ 11:50:23

GENERAL INFORMATION:

Formation: **Myrick & Ft. Scott**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 14:20:14
 Time Test Ended: 18:16:44
 Interval: **4318.00 ft (KB) To 4393.00 ft (KB) (TVD)**
 Total Depth: 4393.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Brannan Lonsdale
 Unit No: 73
 Reference Elevations: 3100.00 ft (KB)
 3091.00 ft (CF)
 KB to GR/CF: 9.00 ft

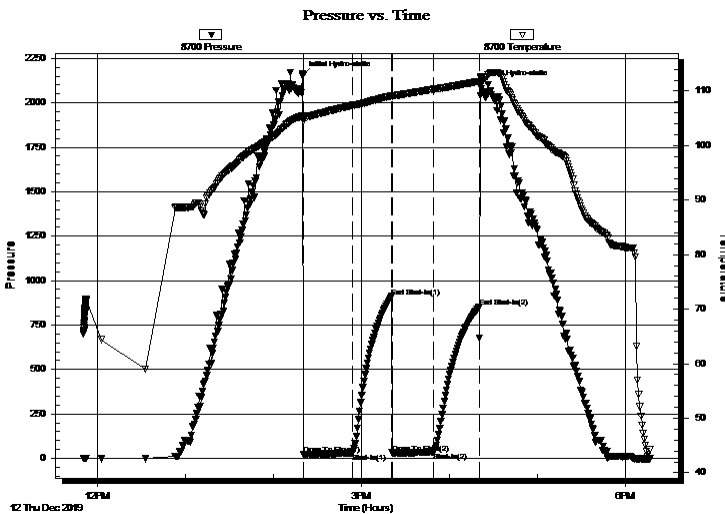
Serial #: 8700

Outside

Press@RunDepth: 33.04 psig @ 4319.00 ft (KB)
 Start Date: 2019.12.12 End Date: 2019.12.12
 Start Time: 11:50:24 End Time: 18:16:44
 Capacity: 8000.00 psig
 Last Calib.: 2019.12.12
 Time On Btm: 2019.12.12 @ 14:19:59
 Time Off Btm: 2019.12.12 @ 16:21:29

TEST COMMENT: 30- IF- 3/4" blow
 30- IS- No blow
 30- FF- No blow
 30- FSI- No blow

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2154.73	105.47	Initial Hydro-static
1	22.28	104.51	Open To Flow (1)
34	28.98	107.36	Shut-In(1)
61	910.17	109.15	End Shut-In(1)
61	30.63	109.02	Open To Flow (2)
90	33.04	110.34	Shut-In(2)
121	850.84	111.81	End Shut-In(2)
122	2101.40	112.41	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
10.00	M	0.05

* 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.

7-12S-36W Logan,KS

PO Box 783188
Wichita, KS 67278

Saline Valley 7D #1

Job Ticket: 59450

DST#: 3

ATTN: John Goldsmith

Test Start: 2019.12.12 @ 11:50:23

Tool Information

Drill Pipe:	Length: 4136.00 ft	Diameter: 3.82 inches	Volume: 58.63 bbl	Tool Weight:	2500.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length: 186.00 ft	Diameter: 2.25 inches	Volume: 0.91 bbl	Weight to Pull Loose:	70000.00 lb
			<u>Total Volume:</u>	Tool Chased	0.00 ft
Drill Pipe Above KB:	32.00 ft			String Weight: Initial	54000.00 lb
Depth to Top Packer:	4318.00 ft			Final	54000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	75.00 ft				
Tool Length:	103.00 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			4291.00	
Shut In Tool	5.00			4296.00	
Hydraulic tool	5.00			4301.00	
Jars	5.00			4306.00	
Safety Joint	3.00			4309.00	
Packer	5.00			4314.00	28.00 Bottom Of Top Packer
Packer	4.00			4318.00	
Stubb	1.00			4319.00	
Recorder	0.00	6771	Inside	4319.00	
Recorder	0.00	8700	Outside	4319.00	
Perforations	6.00			4325.00	
Change Over Sub	1.00			4326.00	
Drill Pipe	63.00			4389.00	
Change Over Sub	1.00			4390.00	
Bullnose	3.00			4393.00	75.00 Bottom Packers & Anchor

Total Tool Length: 103.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc.

7-12S-36W Logan,KS

PO Box 783188
Wichita, KS 67278

Saline Valley 7D #1

Job Ticket: 59450

DST#: 3

ATTN: John Goldsmith

Test Start: 2019.12.12 @ 11:50:23

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 52.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.19 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 4500.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
10.00	M	0.049

Total Length: 10.00 ft Total Volume: 0.049 bbl

Num Fluid Samples: 0

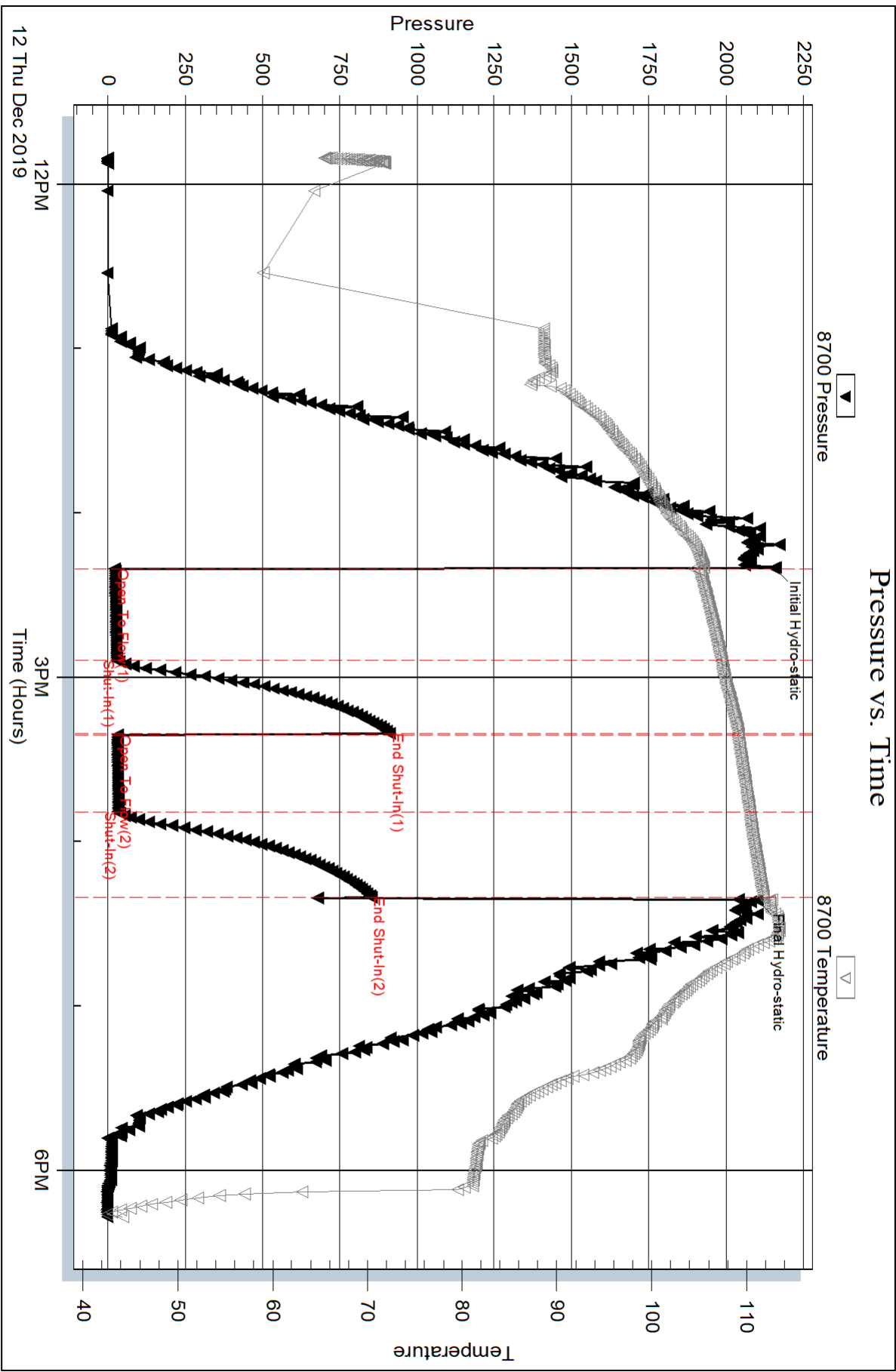
Num Gas Bombs: 0

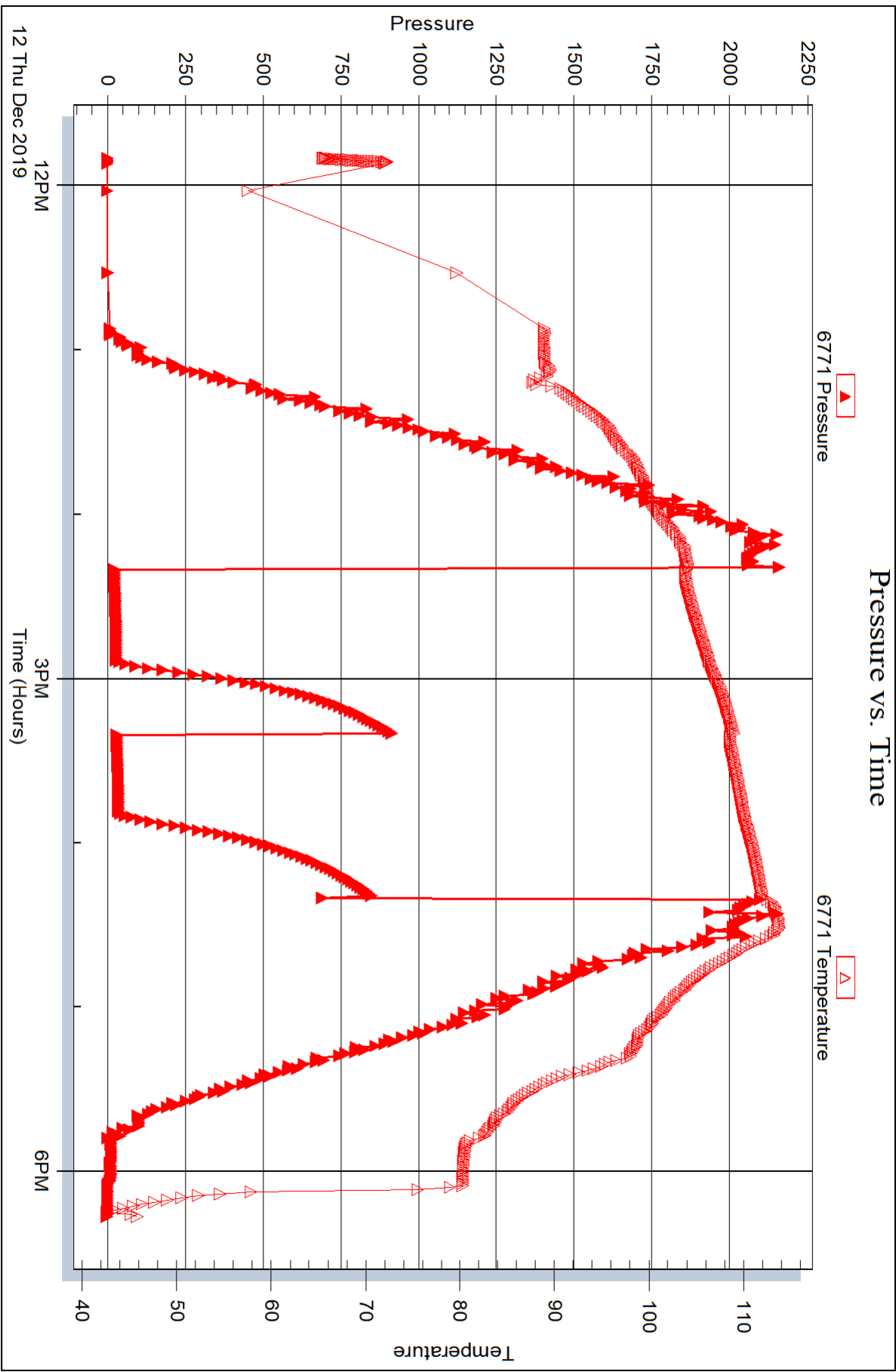
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:







DRILL STEM TEST REPORT

Prepared For: **Ritchie Exploration, Inc.**

PO Box 783188
Wichita, KS 67278

ATTN: John Goldsmith

Saline Valley 7D #1

7-12S-36W Logan,KS

Start Date: 2019.12.13 @ 05:26:04

End Date: 2019.12.13 @ 12:57:55

Job Ticket #: 66203 DST #: 4

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

Printed: 2019.12.16 @ 13:22:22



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

7-12S-36W Logan,KS

PO Box 783188
Wichita, KS 67278

Saline Valley 7D #1

ATTN: John Goldsmith

Job Ticket: 66203

DST#: 4

Test Start: 2019.12.13 @ 05:26:04

GENERAL INFORMATION:

Formation: **Cherokee**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 08:53:55

Time Test Ended: 12:57:55

Test Type: Conventional Bottom Hole (Reset)

Tester: Brannan Lonsdale

Unit No: 73

Interval: 4398.00 ft (KB) To 4460.00 ft (KB) (TVD)

Reference Elevations: 3100.00 ft (KB)

Total Depth: 4460.00 ft (KB) (TVD)

3091.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 9.00 ft

Serial #: 8700 Outside

Press@RunDepth: 22.26 psig @ 4399.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.12.13

End Date:

2019.12.13

Last Calib.: 2019.12.13

Start Time: 05:26:05

End Time:

12:57:55

Time On Btm: 2019.12.13 @ 08:53:40

Time Off Btm: 2019.12.13 @ 10:55:55

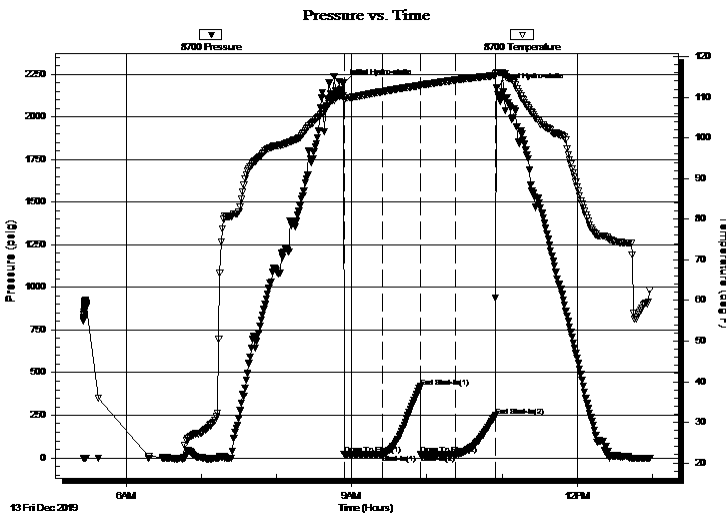
TEST COMMENT: 30- IF- Slowly built to 3/4"

30- IS- No blow

30- FF- No blow

30- FSI- No blow

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2192.57	110.33	Initial Hydro-static
1	20.67	109.38	Open To Flow (1)
31	21.52	111.39	Shut-In(1)
61	417.09	112.91	End Shut-In(1)
62	22.69	112.92	Open To Flow (2)
90	22.26	114.24	Shut-In(2)
121	247.30	115.36	End Shut-In(2)
123	2171.65	116.01	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
5.00	M	0.02

* Recovery from multiple tests

Gas Rates

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Ritchie Exploration, Inc.

7-12S-36W Logan,KS

PO Box 783188
Wichita, KS 67278

Saline Valley 7D #1

ATTN: John Goldsmith

Job Ticket: 66203

DST#: 4

Test Start: 2019.12.13 @ 05:26:04

GENERAL INFORMATION:

Formation: **Cherokee**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 08:53:55

Time Test Ended: 12:57:55

Test Type: Conventional Bottom Hole (Reset)

Tester: Brannan Lonsdale

Unit No: 73

Interval: 4398.00 ft (KB) To 4460.00 ft (KB) (TVD)

Reference Elevations: 3100.00 ft (KB)

Total Depth: 4460.00 ft (KB) (TVD)

3091.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 9.00 ft

Serial #: 6771 Inside

Press@RunDepth: psig @ 4399.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.12.13

End Date: 2019.12.13

Last Calib.: 2019.12.13

Start Time: 05:26:20

End Time: 12:57:55

Time On Btm:

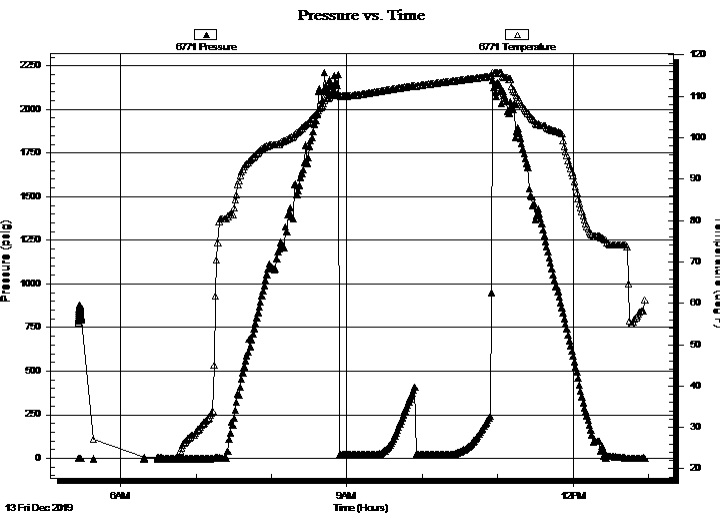
Time Off Btm:

TEST COMMENT: 30- IF- Slowly built to 3/4"

30- IS- No blow

30- FF- No blow

30- FSI- No blow



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
5.00	M	0.02

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Ritchie Exploration, Inc.

7-12S-36W Logan,KS

PO Box 783188
Wichita, KS 67278

Saline Valley 7D #1

ATTN: John Goldsmith

Job Ticket: 66203

DST#: 4

Test Start: 2019.12.13 @ 05:26:04

Tool Information

Drill Pipe:	Length: 4200.00 ft	Diameter: 3.82 inches	Volume: 59.54 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 186.00 ft	Diameter: 2.25 inches	Volume: 0.91 bbl	Weight to Pull Loose: 58000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	16.00 ft			String Weight: Initial 30000.00 lb
Depth to Top Packer:	4398.00 ft			Final 56000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	62.00 ft			
Tool Length:	90.00 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			4371.00	
Shut In Tool	5.00			4376.00	
Hydraulic tool	5.00			4381.00	
Jars	5.00			4386.00	
Safety Joint	3.00			4389.00	
Packer	5.00			4394.00	28.00 Bottom Of Top Packer
Packer	4.00			4398.00	
Stubb	1.00			4399.00	
Recorder	0.00	6771	Inside	4399.00	
Recorder	0.00	8700	Outside	4399.00	
Perforations	24.00			4423.00	
Change Over Sub	1.00			4424.00	
Drill Pipe	32.00			4456.00	
Change Over Sub	1.00			4457.00	
Bullnose	3.00			4460.00	62.00 Bottom Packers & Anchor

Total Tool Length: 90.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc.

7-12S-36W Logan,KS

PO Box 783188
Wichita, KS 67278

Saline Valley 7D #1

Job Ticket: 66203

DST#: 4

ATTN: John Goldsmith

Test Start: 2019.12.13 @ 05:26:04

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 52.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.19 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 4500.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
5.00	M	0.025

Total Length: 5.00 ft Total Volume: 0.025 bbl

Num Fluid Samples: 0

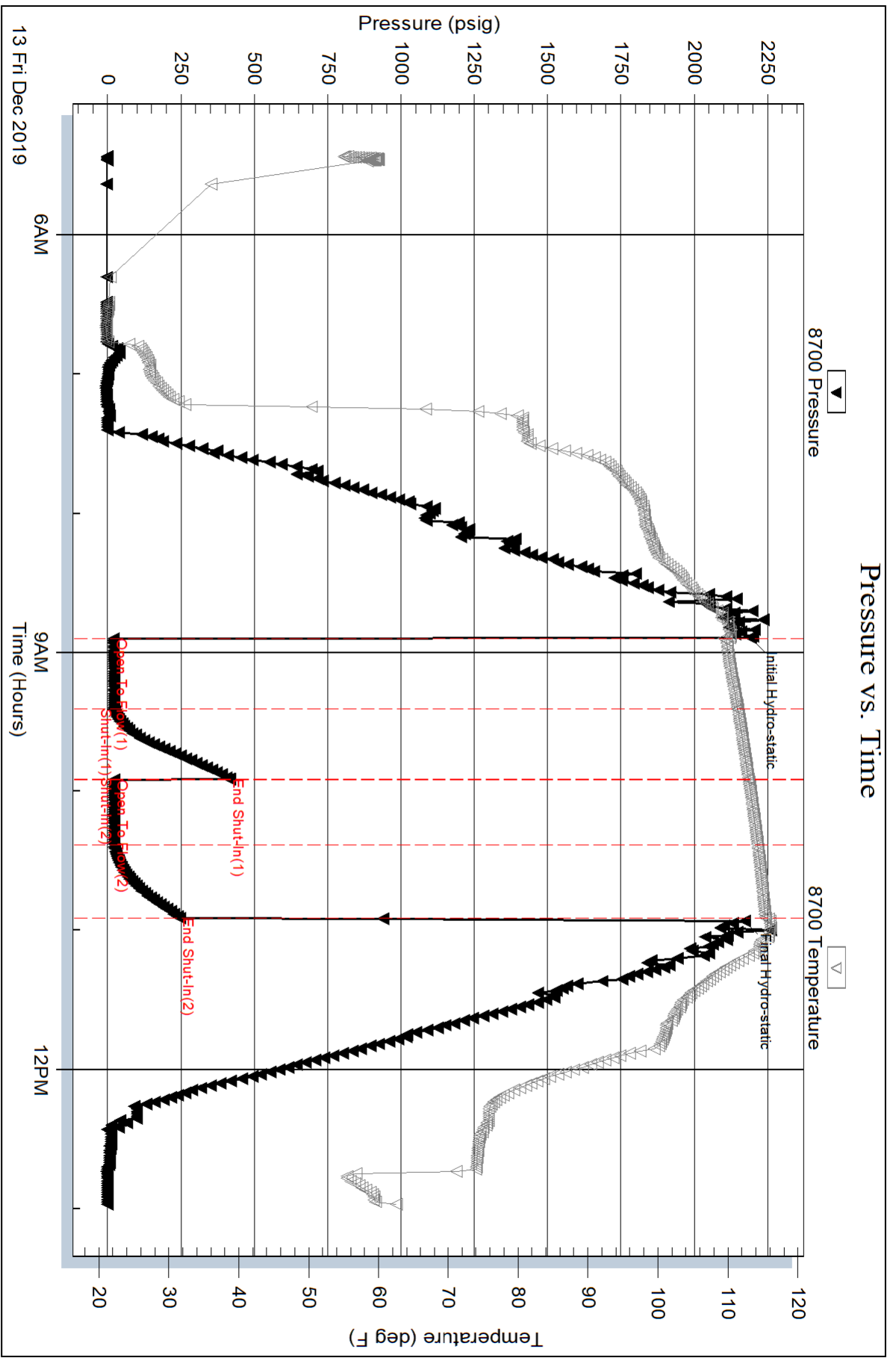
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:



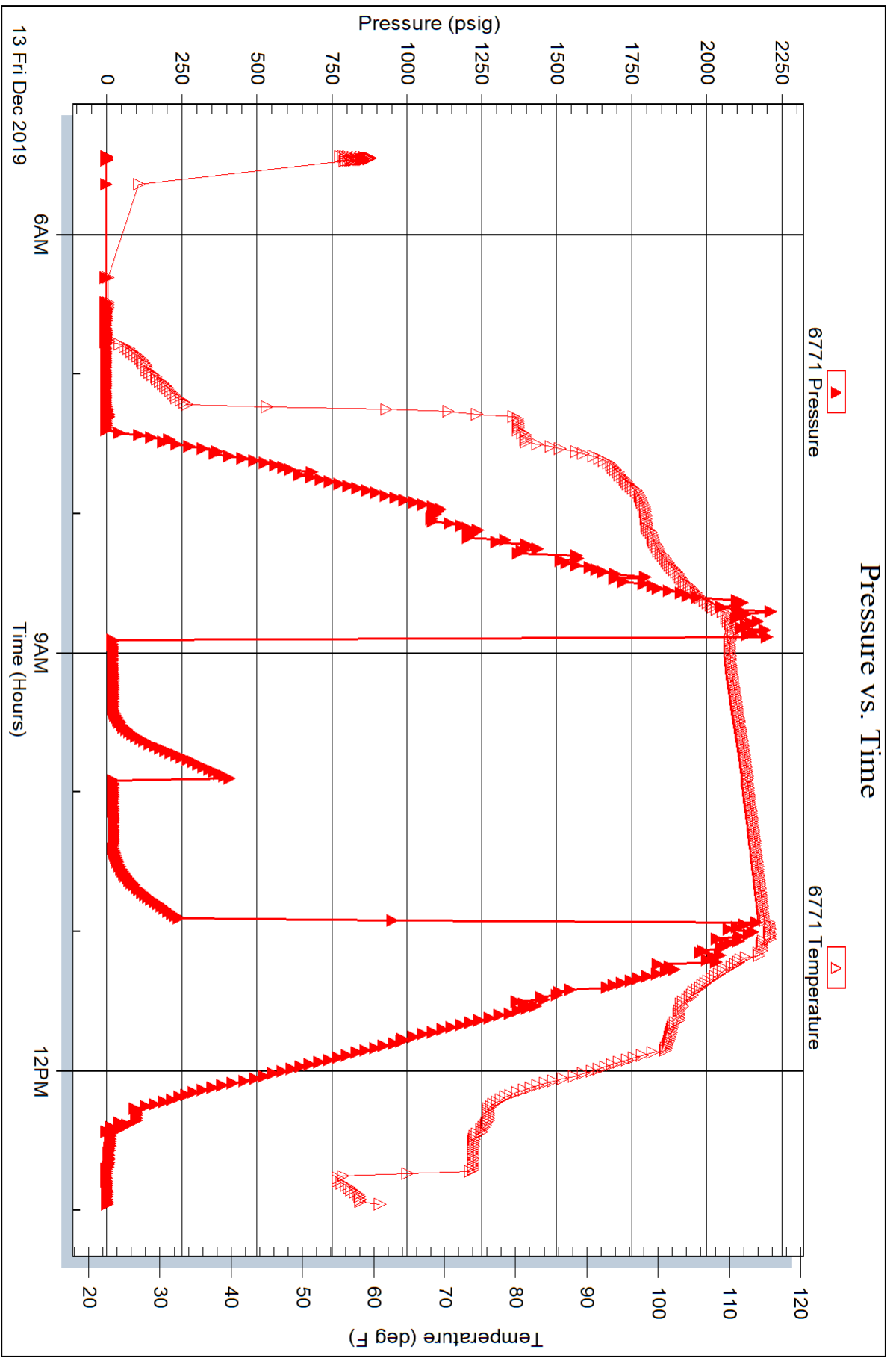
Serial #: 6771

Inside

Ritchie Exploration, Inc.

Saline Valley 7D#1

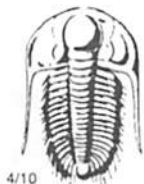
DST Test Number: 4



Trilobite Testing, Inc

Ref. No: 66203

Printed: 2019.12.16 @ 13:22:23



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 59447

Well Name & No. Saline Valley 7D #1 Test No. 1 Date 12/9/19
 Company Ritchie Exploration, Inc. Elevation 3100 KB 3091 GL
 Address 8100 E. 22nd St. N #700, PO Box 283188 Wichita, KS 67278
 Co. Rep / Geo. Goldy Rig WW 12'
 Location: Sec. 7 Twp. 12 S Rge. 36 W Co. Logan State KS

Interval Tested 3851-3876 Zone Tested LKC "A"
 Anchor Length 25' Drill Pipe Run 3665 Mud Wt. 8.7
 Top Packer Depth 3846 Drill Collars Run 186 Vis 56
 Bottom Packer Depth 3851 Wt. Pipe Run WL 6.4
 Total Depth 3876 Chlorides 3,500 ppm System LCM 2[#]

Blow Description PF- BOB 3mins. Built to 81.43"
FST- No blow
FF- BOB 4mins. Built to 81.84"
FST- No blow

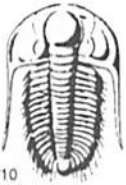
Rec	Feet of	%gas	%oil	%water	%mud
<u>1545</u>	<u>MW</u>			<u>80</u>	<u>20</u>
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 1545' BHT 125° Gravity API RW .11 @ 36° F Chlorides 125,000 ppm
 (A) Initial Hydrostatic 1896 Test 1200 T-On Location 2334
 (B) First Initial Flow 49 Jars 250 T-Started 0004
 (C) First Final Flow 396 Safety Joint 75 T-Open 0406
 (D) Initial Shut-In 1200 Circ Sub T-Pulled 0706
 (E) Second Initial Flow 405 Hourly Standby 1.25hr 125 T-Out 0943
 (F) Second Final Flow 207 Mileage 150 RT (Scott) Comments
 (G) Final Shut-In 1198 Sampler
 (H) Final Hydrostatic 1836 Straddle Ruined Shale Packer
 Shale Packer Ruined Packer
 Extra Packer Extra Copies
 Extra Recorder Sub Total 0
 Day Standby Total 1800
 Accessibility MP/DST Disc't

Initial Open 30
 Initial Shut-In 45
 Final Flow 45
 Final Shut-In 60
 Sub Total 1800

Approved By _____ Our Representative Brannon Lonsdale

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. 59449

4/10

Well Name & No. Saline Valley 7P #1 Test No. 2 Date 12/11/19
 Company Ritchie Exploration, Inc. Elevation 3100 KB 3091 GL
 Address 8100 E. 22nd St. N #700, PO Box 783108 Wichita, KS 67278
 Co. Rep / Geo. Goldy Rig ww R
 Location: Sec. 7 Twp. 12 S Rge. 36 W Co. Logan State KS

Interval Tested 4226-4260 Zone Tested Altamont
 Anchor Length 34' Drill Pipe Run 4037 Mud Wt. 9.2
 Top Packer Depth 4221 Drill Collars Run 186 Vis 56
 Bottom Packer Depth 4226 Wt. Pipe Run _____ WL 7.2
 Total Depth 4260 Chlorides 4,700 ppm System LCM 2#

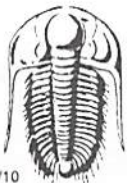
Blow Description IF-BOB 8mins. Built to 34.55"
FST- No blow
FF- BOB 10mins. Built to 41.04"
FST- No blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>960</u>	<u>MW</u>			<u>90%</u>	<u>10%</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 960' BHT 131° Gravity _____ API RW .21 @ 47° F Chlorides 48,000 ppm
 (A) Initial Hydrostatic 2176 Test 1300 T-On Location 0150
 (B) First Initial Flow 42 Jars 250 T-Started 0210
 (C) First Final Flow 258 Safety Joint 75 T-Open 0624
 (D) Initial Shut-In 1315 Circ Sub _____ T-Pulled 0924
 (E) Second Initial Flow 265 Hourly Standby _____ T-Out 1152
 (F) Second Final Flow 456 Mileage 150 RT (Scott) Comments _____
 (G) Final Shut-In 1294 Sampler _____
 (H) Final Hydrostatic 2137 Straddle _____ Ruined Shale Packer _____
 Shale Packer _____ Ruined Packer _____
 Extra Packer _____ Extra Copies _____
 Initial Open 30 Extra Recorder _____ Sub Total 66.67
 Initial Shut-In 45 Day Standby 1.5d 2h Total 1841.67
 Final Flow 45 Accessibility _____ MP/DST Disc't _____
 Final Shut-In 60 Sub Total 1775

Approved By _____ Our Representative Brannan Lonsdale

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 59450

Well Name & No. Saline Valley 2D #1 Test No. 3 Date 12/12/19
 Company Ritchie Exploration, Inc. Elevation 3100 KB 3091 GL
 Address 3100 E 22nd St. N # 700, PO Box 783188 Wichita, KS 67278
 Co. Rep / Geo. Luddy Rig WW R
 Location: Sec. 7 Twp. 12 S Rge. 36 W Co. Logan State KS

Interval Tested 4318-4393 Zone Tested Myrick + Ft. Scott
 Anchor Length 75' Drill Pipe Run 4136 Mud Wt. 9.2
 Top Packer Depth 4313 Drill Collars Run 186 Vis 52
 Bottom Packer Depth 4318 Wt. Pipe Run _____ WL 7.2
 Total Depth 4393 Chlorides 4500 ppm System LCM 1#

Blow Description IF - 3/4" blow
ISI - No blow
FF - No blow
FST - No blow

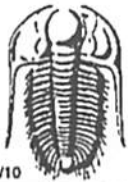
Rec	Feet of	%gas	%oil	%water	%mud
<u>10</u>	<u>M</u>				
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 10' BHT 112° Gravity _____ API RW _____ @ _____ °F Chlorides _____ ppm

(A) Initial Hydrostatic <u>2155</u>	<input checked="" type="checkbox"/> Test <u>1300</u>	T-On Location <u>1124</u>
(B) First Initial Flow <u>22</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>1150</u>
(C) First Final Flow <u>29</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>1420</u>
(D) Initial Shut-In <u>910</u>	<input type="checkbox"/> Circ Sub _____	T-Pulled <u>1620</u>
(E) Second Initial Flow <u>31</u>	<input type="checkbox"/> Hourly Standby _____	T-Out <u>1817</u>
(F) Second Final Flow <u>33</u>	<input checked="" type="checkbox"/> Mileage <u>150 RT (Scott)</u>	Comments _____
(G) Final Shut-In <u>851</u>	<input type="checkbox"/> Sampler _____	
(H) Final Hydrostatic <u>2101</u>	<input type="checkbox"/> Straddle _____	<input type="checkbox"/> Ruined Shale Packer _____
Initial Open <u>30</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>1775</u>
	<input type="checkbox"/> Accessibility _____	MP/DST Disc't _____
	Sub Total <u>1775</u>	

Approved By _____ Our Representative Brannan Lonsdale

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket 66203

NO.

Well Name & No. Saline Valley 7D #1 Test No. 4 Date 12/13/19
 Company Ritchie Exploration Elevation 3100 KB 3691 GL
 Address 8100 E. 22nd St. N #700, PO Box 23188 Wichita, KS 67278
 Co. Rep / Geo. John Coldsmitth Rig WW 12
 Location: Sec. 7 Twp 12 S Rge. 36 W Co. Logan State KS

Interval Tested 4398-4460 Zone Tested Cherokee
 Anchor Length 62' Drill Pipe Run 4200 Mud Wt. 9.7
 Top Packer Depth 4393 Drill Collars Run 186 Vis 52
 Bottom Packer Depth 4398 Wt. Pipe Run _____ WL 7.2
 Total Depth 4460 Chlorides 4,500 ppm System LCM 1#

Blow Description IF - Only built to 3 1/4"
ISF - No blow
FF - No blow
FSF - No blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>5</u>	<u>M</u>				
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 5' BHT 115° Gravity _____ API RW _____ @ _____ °F Chlorides _____ ppm

(A) Initial Hydrostatic <u>2193</u>	<input checked="" type="checkbox"/> Test <u>1300</u>	T-On Location <u>0458</u>
(B) First Initial Flow <u>21</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>0526</u>
(C) First Final Flow <u>22</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>0854</u>
(D) Initial Shut-In <u>417</u>	<input type="checkbox"/> Circ Sub _____	T-Pulled <u>1054</u>
(E) Second Initial Flow <u>23</u>	<input type="checkbox"/> Hourly Standby _____	T-Out <u>1258</u>
(F) Second Final Flow <u>23</u>	<input checked="" type="checkbox"/> Mileage <u>150 RT (Scott) x 2</u>	Comments <u>Stayed 6 nights @ Rodeway Inn in Colley</u>
(G) Final Shut-In <u>247</u>	<input type="checkbox"/> Sampler <u>150+150</u>	<u>Tools loaded 12/15 @ 0830</u>
(H) Final Hydrostatic <u>2172</u>	<input type="checkbox"/> Straddle _____	<input type="checkbox"/> EM Tool _____
Initial Open <u>30</u>	<input type="checkbox"/> Shale Packer _____	<input type="checkbox"/> Ruined Shale Packer _____
Initial Shut-In <u>30</u>	<input type="checkbox"/> Extra Packer _____	<input type="checkbox"/> Ruined Packer _____
Final Flow <u>30</u>	<input type="checkbox"/> Extra Recorder _____	<input type="checkbox"/> Extra Copies _____
Final Shut-In <u>30</u>	<input checked="" type="checkbox"/> Day Standby <u>1.5d 7h</u>	Sub Total <u>800</u>
	<input type="checkbox"/> Accessibility _____	Total <u>2725</u>
	Sub Total <u>1925</u>	MP/DST Disc't _____

Approved By _____

Our Representative Brennan Lousdak

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RITCHIE

EXPLORATION, INC.
Wichita, Kansas

#1 Saline Valley 7D

335' FSL & 1552' FEL

25' N & 98' E of SE/4 SW/4 SE/4 Section 7-12S-36W

Logan County, Kansas

Collins Prospect

2019 Drilling Program

Sample Tops			Ref. Well
Anhydrite	2463'	+637	-7
B/Anhydrite	2488'	+612	-5
Stotler	3455'	-355	+4
Heebner	3816'	-716	+8
Toronto	3840'	-740	+9
Lansing	3860'	-760	+8
Muncie	4021'	-921	+8
Stark	4110'	-1010	+2
Hush	4143'	-1043	-1
BKC	4177'	-1077	+5
Marmaton	4212'	-1112	+4
Altamont	4233'	-1133	+3
Pawnee	4306'	-1206	+3
Myrick	4356'	-1256	+4
Fort Scott	4370'	-1270	+5
Cherokee	4403'	-1303	+4
Johnson	4464'	-1364	+5
Morrow	4537'	-1437	+6
Mississippian	4617'	-1517	+10
RTD	4725'	-1625	

FOOTING
Cover
LAP

GLOBAL OIL FIELD SERVICES, LLC

13927

REMIT TO 24 S. Lincoln
Russell, KS 67665

SERVICE POINT: Russell

DATE <u>12.4.19</u>	SEC. <u>7</u>	TWP. <u>12</u>	RANGE <u>36</u>	CALLED OUT	ON LOCATION <u>5:00 PM</u>	JOB START	JOB FINISH <u>9:30 AM</u>
LEASE <u>Refine 70 valley</u>	WELL #. <u>1</u>	LOCATION <u>Wagonwheel L.W.</u>			COUNTY <u>Logan</u>	STATE <u>Ks</u>	
OLD OR NEW (CIRCLE ONE)							

CONTRACTOR <u>W. G. W.</u>	OWNER
TYPE OF JOB <u>SURFACE</u>	
HOLE SIZE <u>12 1/8</u>	T.D. <u>221</u>
CASING SIZE	DEPTH
TUBING SIZE	DEPTH
DRILL PIPE	DEPTH
TOOL	DEPTH
PRES. MAX	MINIMUM
MEAS. LINE	SHOE JOINT
CEMENT LEFT IN CSG. <u>15</u>	
PERFS	
DISPLACEMENT <u>13 bbls</u>	EQUIPMENT
PUMP TRUCK # <u>117</u>	CEMENTER <u>Bill</u>
	HELPER <u>Chad</u>
BULK TRUCK #	DRIVER <u>Eddie</u>
BULK TRUCK #	DRIVER

CEMENT AMOUNT ORDERED	
<u>13 bbls 40 lb / bbl 3700</u>	
COMMON	@
POZMIX	@
GEL	@
CHLORIDE	@
ASC	@
	@
	@
	@
	@
	@
	@
	@
	@
	@
HANDLING MILEAGE	@
TOTAL	

REMARKS:

Russell site at 25' out of 221'
Count up 17 bbls cement
pouring 13 bbls with
same old pipe
that

CHARGE TO: Russell Expt. Inc
STREET _____
CITY _____ STATE _____ ZIP _____

SERVICE

DEPTH OF JOB	
PUMP TRUCK CHARGE	
EXTRA FOOTAGE	@
MILEAGE	@
MANIFOLD	@
	@
	@
TOTAL	

PLUG & FLOAT EQUIPMENT

	@
	@
	@
	@
	@
TOTAL	

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 Robert H. Haggard
SIGNATURE [Signature]

SALES TAX (If Any) _____
TOTAL CHARGES _____
DISCOUNT _____ IF PAID IN 30 DAYS

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: #1 Saline Valley 7D
API: 15-109-21602
Location: 335' FSL & 1552' FEL, Sec 7-12S-36W, Se SW SE
License Number: REI #4767
Spud Date: 12/4/2019
Surface Coordinates: LAT: 39.021372
LONG: -101.355303
Bottom Hole Vertical Hole
Coordinates: 3/4 Degree Deviation
Ground Elevation (ft): 3092' K.B. Elevation (ft): 3100'
Logged Interval (ft): 3550' To: RTD Total Depth (ft): 4725'
Formation: Mississippian at RTD
Type of Drilling Fluid: Chemical

Region: Logan County

Drilling Completed: 12/15/2019

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: WW Drilling Rig #112
Pusher: Calvin Pfannenstiel

Collar Tally: 479'
6 1/4" x 2.5"

Pump: DB 550
Liner & Stroke: 6 x 14

BIT RECORDS

Size:	Type:	Footage:	Condition:	Hours:	Serial #:
12 1/4"	Stc-Tooth	0-224'	RR	3	RH-7319
7 7/8"	Stc-F27i	224'-4725'	New	133.25	RL-2092

COMMENTS

Surface Casing: 5 joints of 8 5/8" set @ 224'
Production Casing: No production casing was set.
Mud by: MudCo
DST's by: Trilobite Testing
Logs by: Pioneer Energy Services (DIL, CN-CD, ML, CS)
RTD=4725' LTD=4724'

FORMATION TOPS

FORMATION	SAMPLE TOPS		LOG TOPS	
	Depth	Datum	Depth	Datum
B/Anhydrite	2488'	+612	2484'	+616
Stotler	3455'	-355	3455'	-355
Heebner Shale	3816'	-716	3815'	-715
Toronto	3840'	-740	3843'	-743
Lansing	3860'	-760	3861'	-761
Muncie Creek Shale	4021'	-921	4016'	-916
Stark Shale	4110'	-1010	4107'	-1007
Base of the KC	4177'	-1077	4180'	-1080
Marmaton	4212'	-1112	4218'	-1118
Altamont	4233'	-1133	4240'	-1140
Pawnee	4306'	-1206	4304'	-1204
Myrick Station	4356'	-1256	4353'	-1253
Ft Scott	4370'	-1270	4368'	-1268
Cherokee Shale	4403'	-1303	4401'	-1301
Johnson Zone	4464'	-1364	4460'	-1360
Morrow	4530'	-1430	4528'	-1428
Mississippian	4600'	-1500	4598'	-1498
RTD	4725'	-1625		
LTD			4724'	-1624

DST's

DST #1 "LKC A" 3851'-3876' 12/9/19 30-45-45-60

1st Blw: Blw blt to BOB in 3min (No BB)

2nd Blw: Blw blt to BOB in 4min (No BB)

IFP: 49-396# ISIP: 1200# FFP: 405-707# FSIP: 1198#

Hyd: 1896-1836#

Rec: 1545'MW (80%Wtr).

DST #2 "Altamont" 4226'-4260' 12/11/19 30-45-45-60

1st Blw: Blw blt to BOB in 8min (No BB)

2nd Blw: Blw blt to BOB in 10min (No BB)

IFP: 42-258# ISIP: 1315# FFP: 265-456# FSIP: 1294#

Hyd: 2176-2137#

Rec: 960'MW (90%Wtr).

DST #3 "Myrick & Ft Scott" 4318'-4393'

12/12/19 30-30-30-30

1st Blw: Blw blt to 3/4" (No BB)

2nd Blw: No Blw (No BB)

IFP: 22-29# ISIP: 910# FFP: 31-33# FSIP: 851#

Hyd: 2155-2101#

Rec: 10'M.

DST #4 "Cherokee" 4398'-4460' 12/13/19 30-30-30-30

1st Blw: Blw blt to 3/4" (No BB)

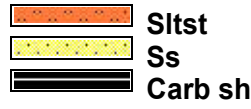
2nd Blw: No Blw (No BB)

IFP: 21-22# ISIP: 417# FFP: 23-22# FSIP: 247#

Hyd: 2193-2172#

Rec: 5'M.

ROCK TYPES



ACCESSORIES

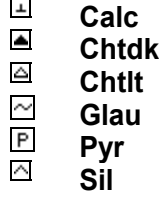
EVENTS



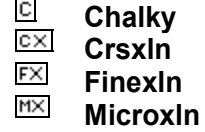
FOSSIL



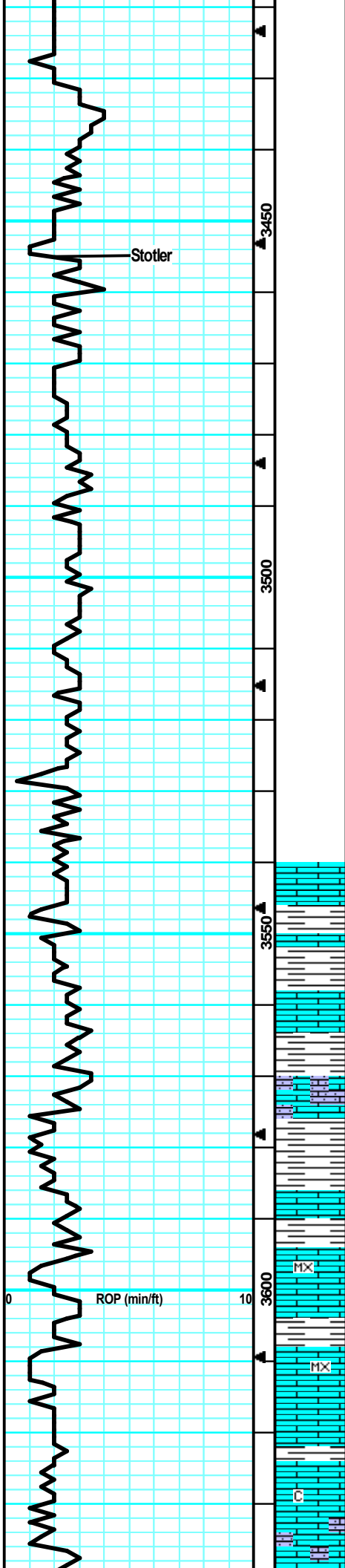
MINERAL



TEXTURE



Drilling Time ROP (min/ft)	Depth	Lithology	CFS Point	Oil Shows	Geological Descriptions	Remarks
0	10					Survey @ 224' = 1/2 Degree
2450					Morning Activity Report @ 7:00am	
		Anhydrite			Dec. 4, 2019: Spud @ 4:15pm 321'	12/5/19: Drg @ 2325'
					12/7/19: Drg @ 3140'	
					12/8/19: CFS @ 3700'	12/9/19: Running DST #1 (LKC "A")
					12/11/19: Running DST #2 (Alt "A")	12/10/19: CFS @ 4102'
					12/12/19: Drg @ 4393', DST #3 (Myrick-Ft Sc)	12/13/19: Running DST #4 (Cher)
					RTD @ 4725'	12/14/19: Drg @ 4583', 12/15/19: Running E-Log
		B/Anhydrite				B/Anhydrite @ 2488' (+612)
						MudCo Check #2 2490' on 12/6/19 Wt Vis pH 9.7 31 7.5 Filt Chlr LCM n/c 49K 1#
						MudCo Check #3 3242' on 12/7/19 Wt Vis pH 9.6 32 7.0 Filt Chlr LCM n/c 57K 1#
3400					Drilling Time @ 3400' on 12/7/19	



Stotler

3450

3500

3550

3600

3650

ROP (min/ft)

0

10

MX

MX

C

Samples @ 3550' on 12/7/19

LS: tan/lt gry, fn xln, dense, sub-chlky, tr-nvp, fw SH: br/gry, silty, soft, no odr, ns.

Much of the same, incrs in SH, no odr, ns.

LS: lt tan, micro-fn xln, dense, dense, brittle, tr-nvp, intbd SHL: gry, drk bm, silty, no odr, ns.

LS: cm/lt tan, micro-fn xln, fw gritty/sandy, tr-pr intxln por in fw, no odr, ns.

LS: tan/lt gry, fn xln, dense, fw firm, tr-nvp, fw SH: bm, silty, soft, no odr, ns.

LS: lt tan/tan, micro-fn xln, dense, tr-nvp, o odr, ns.

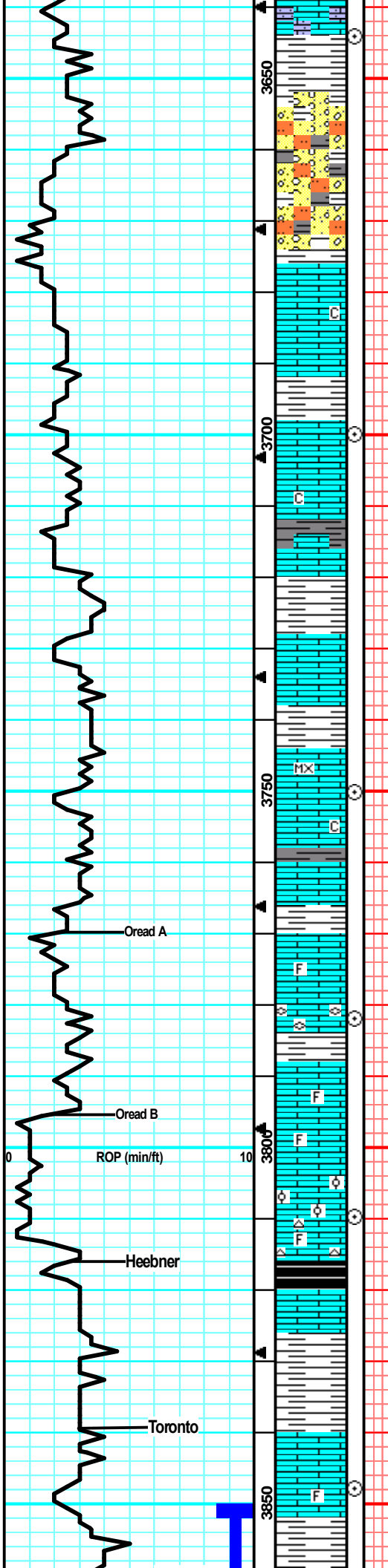
LS: tan/lt tan, micro-fn xln, sm dense, sm brittle, sub-chlky, int prt, tr-nvp, fw SH: bm, silty, soft, no odr, ns.

LS: lt gry/lt tan, slight mott in prt, fn xln, fw brittle, tr-nvp, no odr, ns.

LS: gry/lt tan, mott in prt, fw flakey/mealy, tr-nvp, no odr, ns.

in flux of sandv/arainv chl. am/blu. vr soft. aritty. no odr. ns.

Stotler @ 3455' (-355)



SH: drk gry, soft, fw SS: gry, fn gm, will srt, arg, v firm, sm hard, tr-pr intgm, fw drk min stns, no fluor/cut, no cup odr, ns.

SltStn: bm, gritty, v soft, sm muddy like, abund SH: silty, soft, many SS: gry, arg, hard, tr-pr intgm por, no odr, ns.

LS: gry/tan, slight mott, fn xln, dense, firm, tr-nvp, no odr, ns.

Mostly lt tan LS as above, lrg infx chlky, no odr, ns.

LS: tan/gry, mott, fn xln, sm brittle, fw flakey, abund of drk spptd min stns?, no flour/cut, pos drk dead oil, no cup odr, ns.

Much more, gry, dense, firm rx, tr-nvp, fw stn pcs ? fluor, no cut, nsfo, no odr.

LS: gry, fn xln, sm sandy/gritty, fw brittle, tr-v pr intxln por, no cup odr, ns.

LS: tan, fn xln, pr int xln por, 3 pcs w/ fr spptd stns, wk-? flour, no engy, no cup odr, nsfo.

LS: lt tan/lt gry, sing, micro-fn xln, dense, sm brittle, tr-nvp, no odr, ns.

LS: lt tan/lt gry, fn xln, fw brittle, sub-chlky in prt, tr-nvp, fw SH: drk gry, no odr, ns.

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

LS: lt tan, sing, fn xln, dense, 2 pcs w/ pos drk tar like stns, no fluor/cut, pos drk dead oil, nsfo, no cup odr.

LS: tan/lt tan, fn xln, foss in prt w/ fuss, dense, no cup odr, ns.

LS: tan/lt gry, fn xln, fw foss frags, motly dense, sm brittle, fw w/ pr intxln por, no cup odr, ns.

LS: tan, fn xln, fw foss frags, sm gritty/gmy, pr intxln por, sm brittle, tr-nvp, svrl SH: gry, silty, no odr, ns.

LS: tan/lt tan, fn xln, sm slight ool, fr intxln/intool por, no cup odr, ns.

LS: tan/gry, slight mott, fn xln, fw foss frags, tr-nvp, fw Chert: wht/opaq, foss, fw SH: blk, carb, no odr, ns.

LS: tan/gry, slight mott, fn xln, tr-nvp, svrl SH: gry, silty, no odr, ns.

LS: tan/gry, slight mott, fn xln, 3 pcs w/ drk bm tary stn, no fluor/cut, no cup odr, pos drk dead oil.

LS: gry/tan, mostly dense, fn xln, sm firm, tr-nvp, svrl SH: gry/bm, silty, no odr, ns.

LS: lt tan/lt gry, slight mott, fn xln, fw foss, sm brittle, tr-nvp, no odr, ns, fw SH: bm/gry.

CFS @ 3644' (20"/40")

MudCo Check #4
 3700' on 12/8/19
 Wt Vis pH
 8.7 56 11.5 Filtr Chr
 LCM
 CFS @ 3700' (20"/40") 6.4 2.5K 2#

CFS @ 3750' (20"/45")

CFS @ 3782' (25"/45")

CFS @ 3810' (25"/45")

Heebner @ 3816' (-716)

Toronto @ 3840' (-740)

CFS @ 3848' (25"/45")

Lansing @ 3860' (-760)

Survey @ 3876' = 1 Degree

CFS @ 3876' (30"/60")

DST #1 "LKCA" 3851'-3876' 12/9/19 30-45-45-60
 1st Blw: Blw bit to BOB in 3min (No BB)
 2nd Blw: Blw bit to BOB in 4min (No BB)
 IFP: 49-396# ISIP: 1200# FFP: 405-707# FSIP: 1198#
 Hyd: 1896-1836#
 Rec: 1545' MW (80% Wtr).

MudCo Check #5
 3876' on 12/9/19
 Wt Vis pH
 9.2 55 11.0 Filt Chr
 LCM
 6.4 3.3K 2#

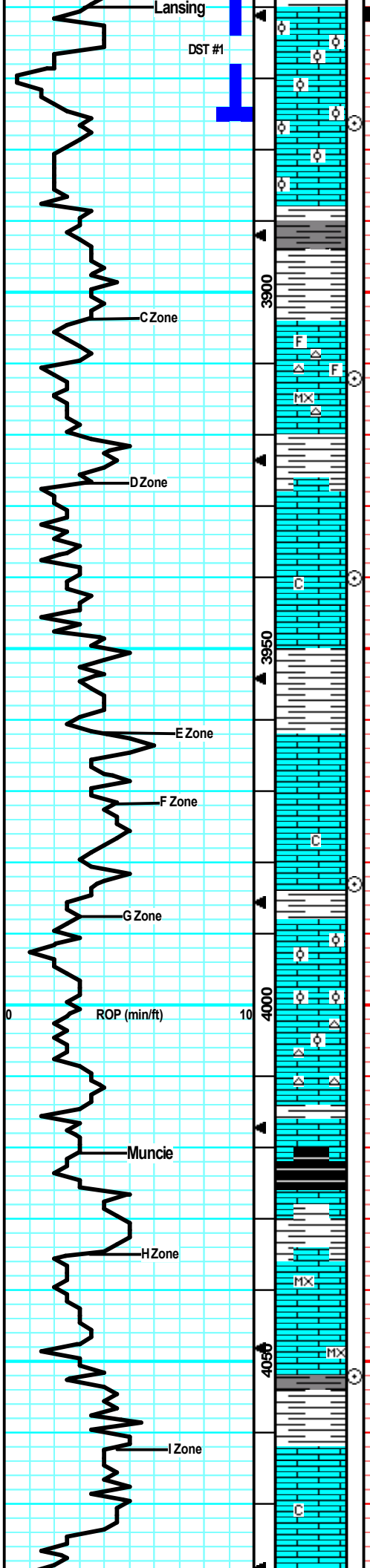
CFS @ 3912' (30"/60")

CFS @ 3940' (30"/60")

CFS @ 3983' (30"/60")

Muncie Creek @ 4021' (-921)

CFS @ 4052' (30"/60")



LS: tan/lt gry, fn xln, sm ool in prt, sm gd oolcast/vuggy por, 2 pcs w/ drk hvy stns in vuggy por, no cup odr, vssfo.

LS: lt tan, fn xln, svrl ool, gd intool por, brittle, lrg infx chlk, no cup odr.

LS: lt tan, sing, fn xln, smool, sm fr intool/vuggy por, chlky in prt, fw Chert: wht/opaq, sharp, ns, no odr.

SH: bm/gry/blu-gm, silty, soft, sm waxy, ns.

LS: tan/lt tan, sing, fn xln, fw foss, sm dense, sub-chlky, tr-nvp, fw Chert: wht/lt gry, foss, no cup odr, ns.

LS: lt tan, micro-fn xln, dense, sub-chlky, tr-nvp, fw Chert: wht/opaq, sharp, no odr, ns.

SH: drk gry/bm, silty, soft.

LS: tan/lt gry, fn xln, sm 2nd xln, fr intxn w/ sm scat vuggy por, brittle, abund pur chlk, no cup odr, ns.

LS: lt tan, fn xln, sm fr intxn por, fw scat vugs, sm brittle, no cup odr, ns.

LS: tan/lt gry, fn xln, fw flakey, tr-nvp, sm SH: gry, silty, no cup odr, nsfo.

LS: tan/lt gry, fn xln, sm flakey, fw firm, tr-nvp, svrl SH: gry/drk bm, silty, no cup odr, ns.

LS: tan, fn xln, mostly dense, fw flakey, 1 pcs w/ pos drk bm stn, no fluor/cut, nsfo, no cup odr.

LS: tan, slight mott, fn xln, many v ool, mostly dense, firm, fw w/ fr intool/vuggy por, no cup odr, ns.

Much of the same, infx of fw LS: tan/lt tan, micro-fn xln, dense, tr-nvp, svrl Chert: cm/lt gry, sharp, abund pur chlk, ns, no cup odr.

LS: gry/lt tan, slight mott, fn xln, fw foss, sub-chlky in prt, tr-nvp, fw SH: gry, silty, no odr, ns.

SH: blk, carb, fw fissile, no cup odr, ns.

LS: tan/lt tan, mott in prt, fn xln, fw pcs w/ pr intxn por, no fluor/cut, no cup odr, nsfo.

LS: lt tan, sing, micro-fn xln, sm firm, v fw w/ pr ppt intxn por, 2 pcs drk bm v sml spttd stns, nsfo, no cut/flour, no cup odr, most likely min stns.

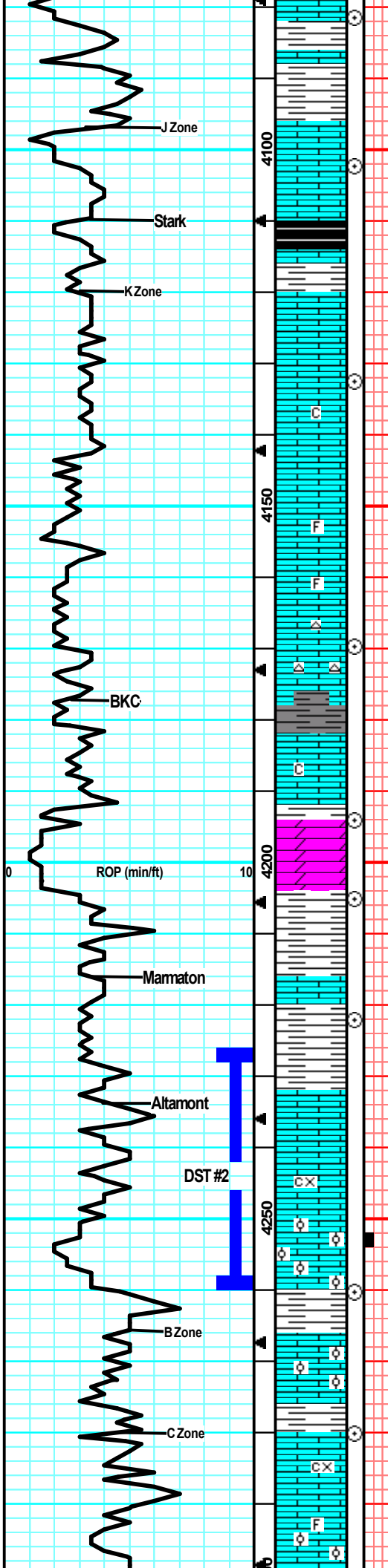
Much more, dense, micro xln, tr-nvp, rx in 60" Smpl.

SH: drk gry/gry, silty, soft, fw LS: tan/gry, slight mott, fn xln, tr-nvp, fw Chert: gry/wht, foss, no cup odr, ns.

LS: tan/gry, slight mott in prt, fn xln, sub-chlky in prt, mostly dense, sm firm, tr-nvp, no cup odr, ns.

Lrg influx pur chlk, no cup odr, ns.

MudCo Check #5 3876' on 12/9/19					
Wt	Vis	pH	Filt	Chr	
9.2	55	11.0			
LCM					
6.4	3.3K	2#			



SH: drk gry/gry, silty.

LS: tan/lt gry, sing, fn xln, many flakey/mealy, sub-chlky in prt, tr-ppt intxn por in sm, abund pur chl, no cup odr, ns.

LS: gry/tan, fn xln, dense, many firm, fw sub-chlky, tr-nvp, fw pcs SH: blk carb, no cup odr, ns.

LS: gry/lt bm, mott in prt, fn xln, flakey, many firm, sm hard, tr-nvp, abund SH: blk/drk gry, many carb, no cup odr, ns.

LS: tan/gry, fn xln, dense, many firm, 2-3 pcs w/ pr intxn por on frac edge, drk bm/blk, stn, no fluor/cut, no odr, nsfo.

LS: gry/tan, fn xln, flakey/mealy in prt, many firm, tr-nvp, fw SH: blk, carb, no cup odr, ns.

LS: gry/lt bm/lt tan, mott, fn xln, sm 2nd rxln, sm flakey, hard, tr-nvp, svrl SH: gry/bm, silty, no odr, ns.

LS: gry/tan, mott, fn xln, foss, dense, hard, tr-nvp, abund SH: drk gry/dr k bm, silty, no odr, ns.

LS: tan/lt gry, fn xln, flakey, dense, tr-nvp, no cup odr, ns.

LS: d gry/tan, fn xln, dense, many firm, tr-nvp, fw Chert: wht/opaq, sharp, no odr, ns.

SH: gry/dr k gry, silty, soft.

LS: tan/lt gry, fn xln, dense, sm firm, fw pcs w/ pr ppt intxn por, svrl pcs pur chl, no cup odr, ns.

DOL: gry/tan, fn xln, suc in prt, pr ppt intxn por, many firm, chlky in prt, no cup odr, ns.

LS: tan/lt gry, fn xln, dense, firm, tr-nvp, fw SH: gry, silty, no odr, ns.

SS: gry, fn gm, arg, firm, tr-pr intgm por in v fw, sm SltStn: gry/fw bm, v soft, gritty, sm SH: gry/dr k gry.

LS: gry/lt tan, fn xln, dense, firm, sub chlky in prt, tr-pr ppt intxn por, no cup odr, ns.

SH: gry/blu/bm, silty, soft, fw fissile, fw LS: lt tan/lt gry, fn xln, sub-chlky, tr-nvp, no cup odr, ns.

LS: gry/tan, mott, fn-crs xln, dense, sm flakey/mealy, tr-nvp, no cup odr, ns.

LS: gry/lt tan, slight mott, fn xln, sm v ool, brittle, sm fr intool por, fw pcs w/ drk spttd stns, no fluor, vssfo, no cup odr.

SH: gry/dr k gry/dr k bm, silty, soft, fw waxy, no cup odr.

LS: lt tan, fn xln, sm ool, pr intxn/sm intool por, no cup odr, ns.

LS: cm/lt tan, mott, fn-crs xln, flakey, sub-chlky, brittle, sm pr intxn por, 2 pcs w/ spttd tar like stns, no odr, no fluor.

LS: lt tan, mott, fn xln, many foss, sm ool, brittle, tr-v pr intxn/intool por, no cup odr, ns.

CFS @ 4081' (30"/60")

CFS @ 4102' (30"/60")

Stark @ 4110' (-1010)

MudCo Check #6
4132' on 12/10/19
Wt Vis pH
9.2 56 11.0 Filt Chlr
LCM
7.2 4.7K 2#

CFS @ 4132' (30"/60")

CFS @ 4170' (30"/60")

BKC @ 4177' (-1077)

CFS @ 4194' (30"/60")

CFS @ 4205' (30"/60")

Marmaton @ 4212' (-1112)

CFS @ 4222' (30"/60")

Altamont @ 4233' (-1133)

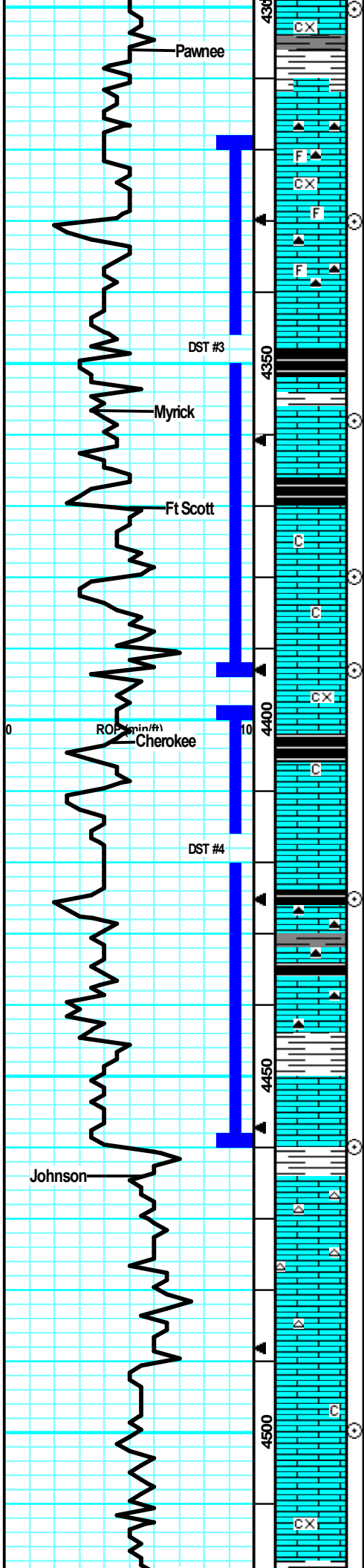
DST #2 "Altamont" 4226'-4260' 12/11/19 30-45-45-60
1st Blw: Blw blt to BOB in 8min (No BB)
2nd Blw: Blw blt to BOB in 10min (No BB)
IFP: 42-258# ISIP: 1315# FFP: 265-456# FSIP: 1294#
Hyd: 2176-2137#
Rec: 960' MW (90% Wtr).

CFS @ 4260' (30"/60")

MudCo Check #7
4260' on 12/11/19
Wt Vis pH
9.3 57 11.0 Filt Chlr
LCM
7.2 4.0K 1#

CFS @ 4280' (30"/60")

CFS @ 4300' (30"/60")



Pawnee

Myrick

Ft Scott

Cherokee

Johnson

DST #3

DST #4

ROP (min/ft)

LS: lt tan, slight mott, fn-crs xln, many flakey, sub-chlky, tr-nvp, abund SH; gry/bm, silty, no cup odr, ns.

LS: gry/lt bm, sing, fn xln, dense, hard, tr-nvp, fw Chert: gry/smoke, sharp, fw SH: blk, carb, no odr, ns.

LS: gry, mott, fn-crs xln, firm, foss, flakey, tr-nvp, sm Chert: gry, foss, sharp, no cup odr, ns.

LS: gry/lt bm, slight mott, fn xln, many dense, tr-nvp, fw Chert: gry, foss, svrl pcs SH: blk, carb?

LS: tan, sing, fn xln, mostly dense, sm pr intxn/frac por, drk bm stns in por, vssfo on break in 3 pcs, faint cup odr?

SH: blk, carb, no cup odr, ns.

LS: tan/lt gry, slight mott, fn xln, fw dense, sm brittle, 2 pcs w/ pr intxn opr, lght bm spptd stns, no fluor, no cup odr vvsfo on crush, abund SH: blk carb.

LS: tan/lt tan, fn xln, many brittle, mostly dense, sm v ool, tr-nvp, no cup odr, ns.

LS: gry/lt bm, fn xln, mostly dense, many firm, tr-nvp,

LS: gry, mott, fn-crs xln, sm 2nd rxln, many hard, mostly flakey, tr-nvp, abund, no cup odr, ns.

SH: drk gry/blk, silty, sm carb.

LS: tan/lt gry, fn xln, mostly dense, sub-chlky in prt, tr-nvp, no cup odr, ns.

SH: drk gry/blk, fw carb.

LS: gry/tan, mostly sing, fn xln, firm, tr-nvp, fw sandy/grainy, tr-nvp, fw Chert: bm, trans, shrp, no cup odr, ns.

LS: lt tan/lt gry, sing, fn xln, sub-chlky, dense, tr-nvp, sm SH: gry, soft, fw Chert: gry/smk, trans, shrp, no cup odr, ns.

LS: crm/lt tan, sing, fn xln, sub-chlky/brit, sm pr-fr intxn por, patchy bm stns stns in por, gd dul yel fluor, strn cut, fr odr, fr sfo in 7 pcs.

60" Smpl: 4 more sho pcs, 2 w/ gd intxn/vuggy por, wk cup odr.

LS: tan/gry, fn xln, dense, many firm, tr-nvp, sm Chert: wht/gry, foss, 2 pcs of sho rx most likely from above, no cup odr.

LS: gry/lt bm, fn xln, hard, mostly flakey/mealy, tr-nvp, no cup odr, ns.

LS: tan/gry, fn xln, dense, hard, tr-nvp, svrl SH: gry, silty, no odr, ns.

LS: tan/lt gry, fn xln, mostly dense, sm flakey, tr-nvp, 3 pcs w/ pos drk dead oil stns, no fluor, no cut, no energy, no cup odr.

LS: gry/tan, fn-crs xln, flakey/mealy, hard, tr-nvp, abund SH: drk bm/gry/blk, no cup odr, ns.

Pawnee @ 4306' (-1206)

CFS @ 4330' (30"/60")

DST #3 "Myrick & Ft Scott" 4318'-4393'
12/12/19 30-30-30-30
1st Blw: Blw blt to 3/4" (No BB)
2nd Blw: No Blw (No BB)
IFP: 22-29# ISIP: 910# FFP: 31-33# FSIP: 851#
Hyd: 2155-2101#
Rec: 10'M.

Myrick @ 4356' (-1256)

CFS @ 4358' (30"/60")

Ft Scott @ 4370' (-1270)

CFS @ 4393' (30"/60")

MudCo Check #8
4393' on 12/12/19

Wt	Vis	pH
9.2	52	11.0
Flit Chr		
LCM		
7.2	4.5K	1#

Cherokee @ 4403' @ (-1303)

CFS @ 4425' (30"/60")

DST #4 "Cherokee" 4398'-4460' 12/13/19
30-30-30-30
1st Blw: Blw blt to 3/4" (No BB)
2nd Blw: No Blw (No BB)
IFP: 21-22# ISIP: 417# FFP: 23-22# FSIP: 247#
Hyd: 2193-2172#
Rec: 5'M.

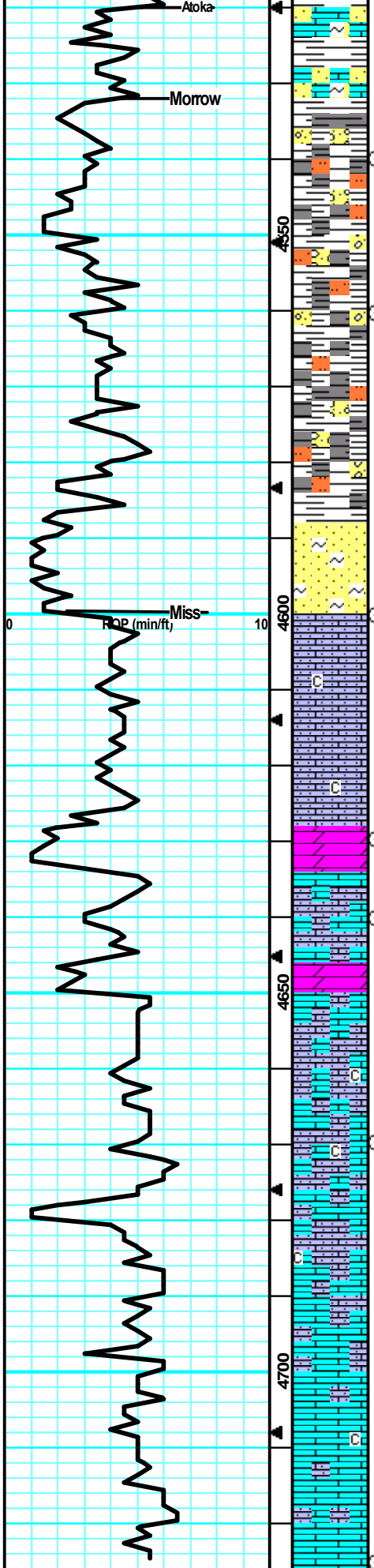
CFS @ 4460' (30"/60")

Johnson @ 4464' (-1364)

CFS @ 4500' (30"/60")

MudCo Check #9
4460' on 12/13/19

Wt	Vis	pH
9.2	60	11.5
Flit Chr		
LCM		
8.0	4.9K	1#



blu-gry/blu-gm, no cup odr, ns.

Influx of SS: blu-gm, fn gm, arg, glauc, sil cem, well srtd, well cem, frible but firm, tr-nvp, abund SH: gry/bm, blu-gm, no cup odr, ns.

Mostly likely Cong: abund SH: blu-gm/gry/bm, waxy in prt, fw LS: gry/lt brn, fw foss, sm hard, tr-nvp, sm Chert: wht, foss, sharp, no cup odr, ns.

SH: drk gry/bm/blk/yel, sm wthrd, mostly drk silty and soft, no odr, ns.

SH: dgry/blu-gm, silty, soft, fw SS: mostly the same, blue-gm, arg, fn gm, hard, tr-nvp, no cup odr, ns.

Much of the same, much more fresh, clean Shale, no odr, ns.

SS: cm/wht/blu-gm, fn gm, arg, chlky in prt, sil cem, brittle, friable, tr-nvp, no cup odr, ns.

60" Smp: lrg infx of Chert: tan/org/wht, tripl, sharp, no odr, ns.

LS: gry, fn xln, sm sandy/gritty, sm flakey, mostly dense, nvp, v fw pcs w/ fr intxn por on frac edge, pos drk min stns, no fluor/no cut resid, nsfo, no cup odr.

Mostly same gry, firm, dense, LS, infx of wthrd, yel'd LS, v dense, tr-nvp, no cup odr, ns.

60 Smp: much of the same dense, hard, LS, no odr, ns.

DOL: gry, fn gm, sandy, arg, hard, tr-pt intxn por, no sfo no cup odr, LS: gry, hard, pr intxn por on frac edge, slw bleed cut, nsfo, drk dead oil.

LS: tan, fn xln, dense, firm, flakey, tr-nvp, sm DOL: drk gry/bm, fn xln, hard, gritty, tr-ppt intxn por in fw, no cup odr, ns.

LS: cm/lt tan, sandy/grainy, sub-chlky, firm yet brittle, tr-nvp, no cup odr, ns.

Much of the same cm sandy LS, no odr, ns.

LS: cm/lt tan, fn xln, sandy/gritty, sub-chlky, brittle, tr-nvp, fw SS: cm/lt gm, fn gm, arg, brght gm glauc specs, tr-ppt intgm por, no cup odr, ns.

Much of the same.

LS: cm/lt tan, fn xln, sandy/gritty, sub-chlky in prt, fw flakey/mealy, tr-nvp, no cup odr, ns.

Much of the same, more LS: lt tan, fn xln, flakey/mealy, tr-nvp, no cup odr, ns.

Morrow @ 4530' (-1430)

CFS @ 4540' (30"/60")

CFS @ 4560' (30"/60")

Mississippi @ 4600' (-1500)

CFS @ 4600' (30"/60")

MudCo Check #10
4614' on 12/14/19

Wt	Vis	pH	Filt	Chr
9.1	54	11.0		
LCM				
8.8	4.5K	1#		

CFS @ 4630' (30"/60")

CFS @ 4640' (30"/60")

CFS @ 4670' (30"/60")

CFS @ 4725' (30"/60")

Survey @ 4725' = 3/4 Degree

					
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