KOLAR Document ID: 1417514

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 # 4767
Name: Ritchie Exploration, Inc.
Address 1: 8100 E 22ND ST N # 700
Address 2: BOX 783188
City: WICHITA State: KS Zip: 67278 + 3188
Contact Person: Peter Fiorini
Phone: (316) 691-9500
CONTRACTOR: License # 30606
Name: Murfin Drilling Co., Inc.
Wellsite Geologist: Bob Peterson
Purchaser: N/A

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 #:

04/28/2018 Spud Date or Recompletion Date
05/10/2018 Date Reached TD
05/10/2018 Completion Date or Recompletion Date

API No.: 15-109-21545-00-00
Spot Description: 1' N & 95' W
_ - W2 - W2 - SW Sec. 24 Twp. 15 S. R. 37 ☐ East ☑ West
1321 Feet from ☐ North / ☑ South Line of Section
235 Feet from ☐ East / ☑ West Line of Section
Footages Calculated from Nearest Outside Section Corner:
☐ NE ☐ NW ☐ SE ☑ SW
GPS Location: Lat: *(e.g. xx.xxxxx)* , Long: *(e.g. -xxx.xxxxx)*
Datum: ☐ NAD27 ☐ NAD83 ☐ WGS84
County: Logan
Lease Name: GERSTBERGER-WATT Well #: 1
Field Name:
Producing Formation: N/A
Elevation: Ground: 3377 Kelly Bushing: 3388
Total Vertical Depth: 5040 Plug Back Total Depth:
Amount of Surface Pipe Set and Cemented at: 225 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: 25800 ppm Fluid volume: 880 bbls
Dewatering method used: Evaporated
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: 08/06/2018
☐ **Confidential Release Date:** 08/05/2020
☑ **Wireline Log Received** ☑ **Drill Stem Tests Received**
☑ **Geologist Report / Mud Logs Received**
☐ **UIC Distribution**
ALT ☐ I ☑ II ☐ III **Approved by:** Karen Ritter **Date:** 08/07/2018

Operator Name: Ritchie Exploration, Inc. Lease Name: GERSTBERGER-WATT Well #: 1

Sec. 24 Twp. 15 S. R. 37 ☐ East ☑ West County: Logan

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 *(Attach Additional Sheets)*	☑ Yes	☐ No
Samples Sent to Geological Survey	☑ Yes	☐ No
Cores Taken	☐ Yes	☑ No
Electric Log Run	☑ Yes	☐ No
Geologist Report / Mud Logs	☑ Yes	☐ No

List All E. Logs Run:

Dual Comp Porosity Micro & Dual Ind Log

☐ Log Formation (Top), Depth and Datum ☑ Sample

Name	Top	Datum
See Attached		

CASING RECORD ☐ New ☑ 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
Surface	12.25	8.63	23	225	Common	175	3% cc, 2% gel

ADDITIONAL CEMENTING / SQUEEZE RECORD

Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
☐ Perforate ☐ Protect Casing ☐ Plug Back TD ☐ 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: ☐ Flowing ☐ Pumping ☐ Gas Lift ☐ Other *(Explain)*

Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity

DISPOSITION OF GAS:	METHOD OF COMPLETION:	PRODUCTION INTERVAL: Top / Bottom
☐ Vented ☐ Sold ☐ Used on Lease *(If vented, Submit ACO-18.)*	☐ Open Hole ☐ Perf. ☐ Dually Comp. *(Submit ACO-5)* ☐ Commingled *(Submit ACO-4)*	

Shots Per Foot	Perforation Top	Perforation Bottom	Bridge Plug Type	Bridge Plug Set At	Acid, Fracture, Shot, Cementing Squeeze Record *(Amount and Kind of Material Used)*

TUBING RECORD: Size: Set At: Packer At:

Mail to: KCC - Conservation Division, 266 N. Main, Suite 220, Wichita, Kansas 67202

Form	ACO1 - Well Completion
Operator	Ritchie Exploration, Inc.
Well Name	GERSTBERGER-WATT 1
Doc ID	1417514

Casing

Purpose Of String	Size Hole Drilled	Size Casing Set	Weight	Setting Depth	Type Of Cement	Number of Sacks Used	Type and Percent Additives
Surface	12.25	8.63	23	225	Common	175	3% cc, 2% gel

DRILL STEM TEST REPORT

Ritchie Exploration, Inc

Box 783188
Wichita, Ks 67278

ATTN: Bob Peterson

24 15s 37w Logan, Ks

Gerstberger-Watt #1

Job Ticket: 63668 **DST#: 1**

Test Start: 2018.05.06 @ 12:35:00

GENERAL INFORMATION:

Formation: **Altamont A-B**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 15:18:45
Time Test Ended: 19:15:00

Test Type: Conventional Bottom Hole (Initial)
Tester: Bradley Walter
Unit No: 78

Interval: 4503.00 ft (KB) To 4564.00 ft (KB) (TVD)
Total Depth: 4564.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

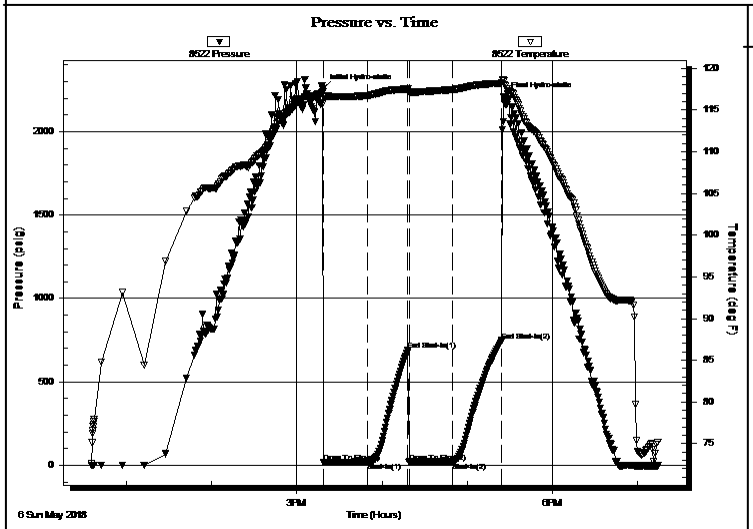
Reference Elevations: 3388.00 ft (KB)
3377.00 ft (CF)
KB to GR/CF: 11.00 ft

Serial #: 8522 **Inside**

Press@RunDepth: 20.85 psig @ 4504.00 ft (KB)
Start Date: 2018.05.06 End Date: 2018.05.06
Start Time: 12:35:05 End Time: 19:14:59

Capacity: 8000.00 psig
Last Calib.: 2018.05.06
Time On Btm: 2018.05.06 @ 15:18:15
Time Off Btm: 2018.05.06 @ 17:26:00

TEST COMMENT: IF: Surface blow , Died @ 8 min.
ISI: No return.
FF: No blow .
FSI: No return.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2256.92	117.14	Initial Hydro-static
1	16.86	115.86	Open To Flow (1)
32	20.50	116.72	Shut-In(1)
60	688.71	117.53	End Shut-In(1)
61	20.30	117.11	Open To Flow (2)
92	20.85	117.46	Shut-In(2)
127	747.24	118.23	End Shut-In(2)
128	2211.55	118.51	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
15.00	mud 100m (oil spots)	0.07

Gas Rates

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

DRILL STEM TEST REPORT

Ritchie Exploration, Inc

Box 783188
Wichita, Ks 67278

ATTN: Bob Peterson

24 15s 37w Logan, Ks

Gerstberger-Watt #1

Job Ticket: 63668 **DST#: 1**

Test Start: 2018.05.06 @ 12:35:00

GENERAL INFORMATION:

Formation: **Altamont A-B**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 15:18:45
Time Test Ended: 19:15:00

Test Type: Conventional Bottom Hole (Initial)
Tester: Bradley Walter
Unit No: 78

Interval: 4503.00 ft (KB) To 4564.00 ft (KB) (TVD)
Total Depth: 4564.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

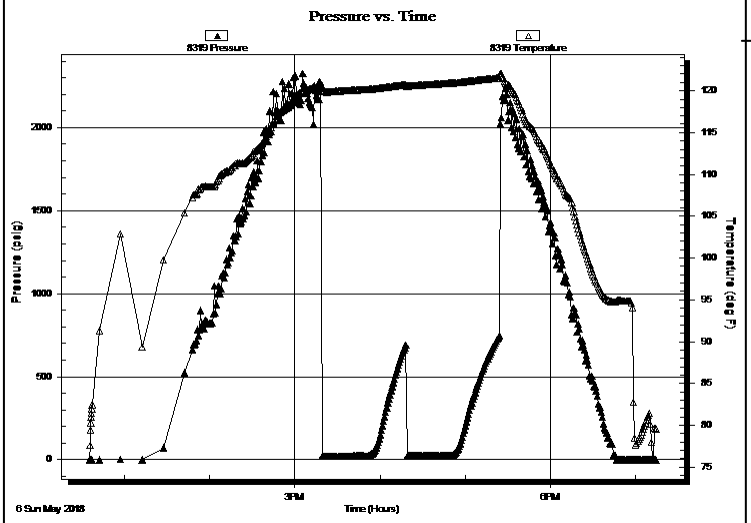
Reference Elevations: 3388.00 ft (KB)
3377.00 ft (CF)
KB to GR/CF: 11.00 ft

Serial #: 8319 **Outside**

Press@RunDepth: psig @ 4504.00 ft (KB)
Start Date: 2018.05.06 End Date: 2018.05.06
Start Time: 12:35:05 End Time: 19:14:59

Capacity: 8000.00 psig
Last Calib.: 2018.05.06
Time On Btm:
Time Off Btm:

TEST COMMENT: IF: Surface blow , Died @ 8 min.
ISI: No return.
FF: No blow .
FSI: No return.



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
15.00	mud 100m (oil spots)	0.07

Gas Rates

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

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc

Box 783188
Wichita, Ks 67278

ATTN: Bob Peterson

24 15s 37w Logan, Ks

Gerstberger-Watt #1

Job Ticket: 63668 **DST#: 1**

Test Start: 2018.05.06 @ 12:35:00

Mud and Cushion Information

Mud Type:	Gel Chem	Cushion Type:		Oil API:	0 deg API
Mud Weight:	9.00 lb/gal	Cushion Length:	ft	Water Salinity:	0 ppm
Viscosity:	64.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	7.99 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	2000.00 ppm				
Filter Cake:	1.00 inches				

Recovery Information

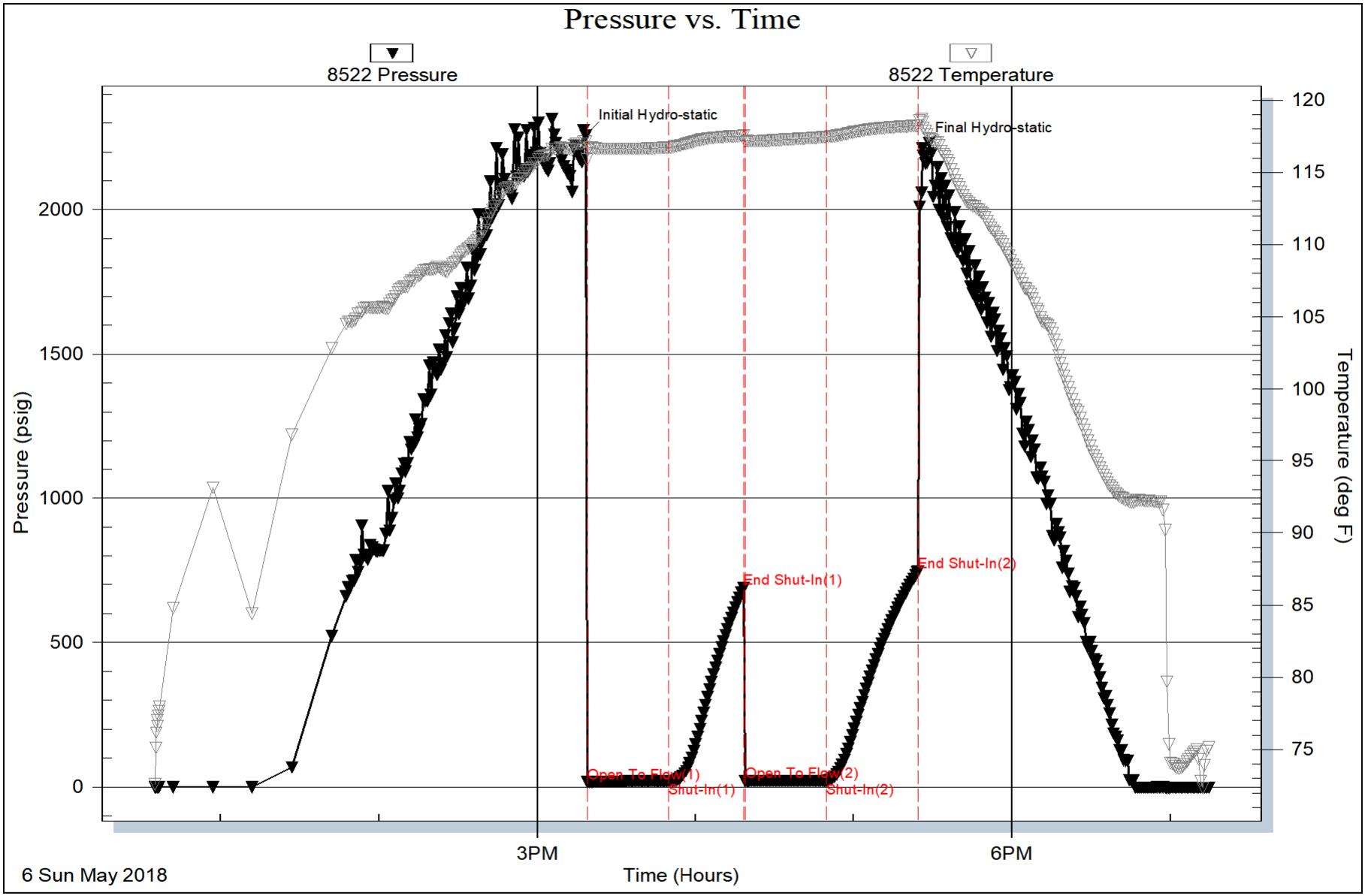
Recovery Table

Length ft	Description	Volume bbl
15.00	mud 100m (oil spots)	0.074

Total Length: 15.00 ft Total Volume: 0.074 bbl

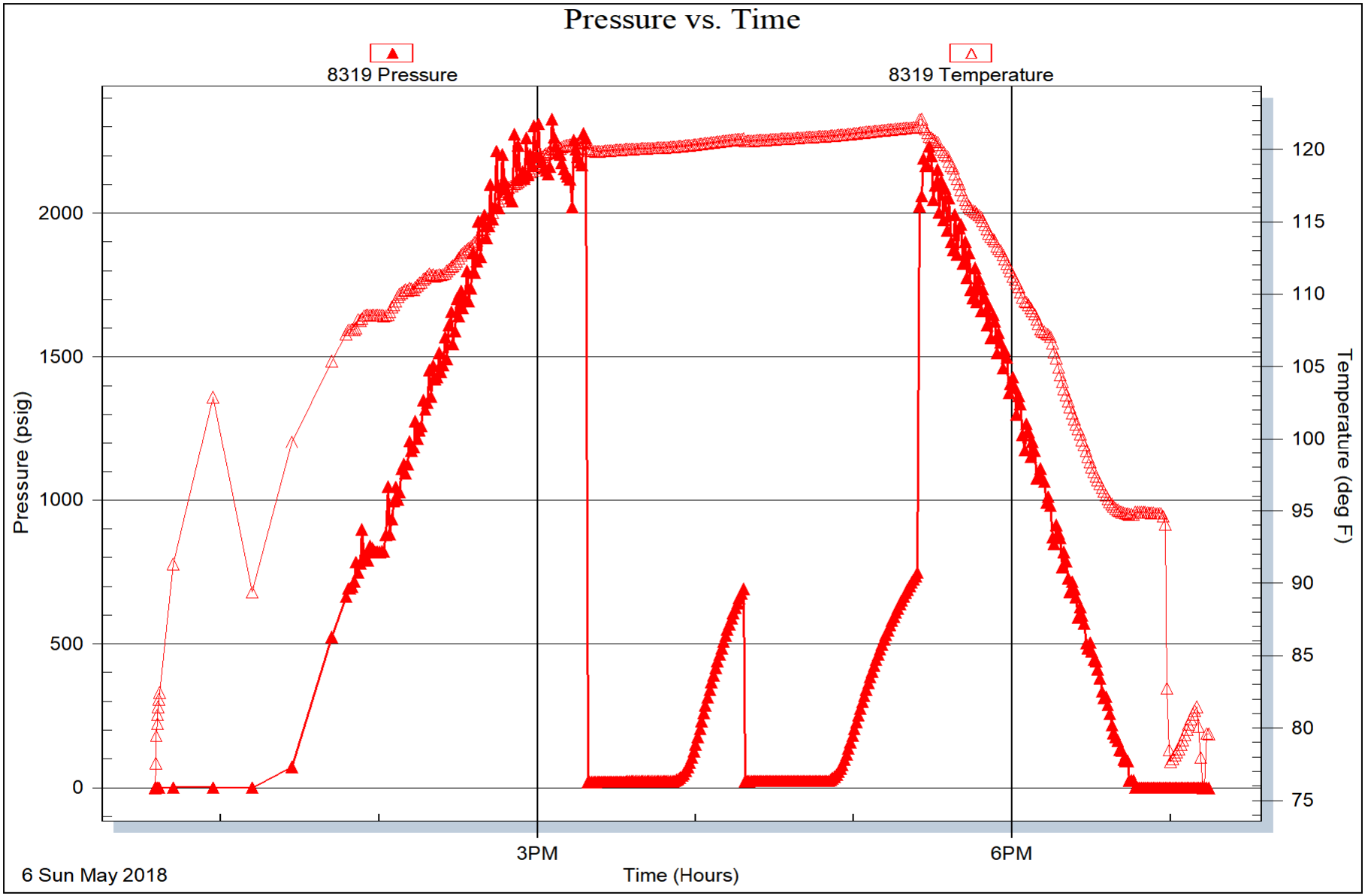
Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
Laboratory Name: Laboratory Location:
Recovery Comments:

Serial #: 8522 **Inside** Ritchie Exploration, Inc Gerstberger-Watt #1 DST Test Number: 1



Trilobite Testing, Inc Ref. No: 63668 Printed: 2018.05.06 @ 21:45:35

Serial #: 8319 **Outside** Ritchie Exploration, Inc Gerstberger-Watt #1 DST Test Number: 1



Trilobite Testing, Inc Ref. No: 63668 Printed: 2018.05.06 @ 21:45:35

DRILL STEM TEST REPORT

TRILOBITE TESTING, INC.

Ritchie Exploration, Inc

Box 783188
Wichita, Ks 67278

ATTN: Bob Peterson

24 15s 37w Logan, Ks

Gerstberger-Watt #1

Job Ticket: 63669 **DST#: 2**

Test Start: 2018.05.07 @ 07:32:00

GENERAL INFORMATION:

Formation: **Altamont C - Pawnee**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 09:51:15
Time Test Ended: 13:50:45

Test Type: Conventional Bottom Hole (Reset)
Tester: Bradley Walter
Unit No: 78

Interval: 4558.00 ft (KB) To 4630.00 ft (KB) (TVD)
Total Depth: 4564.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

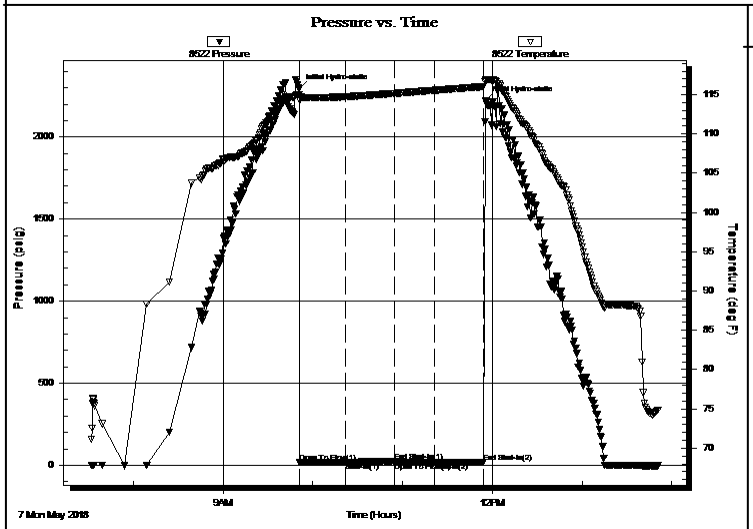
Reference Elevations: 3388.00 ft (KB)
3377.00 ft (CF)
KB to GR/CF: 11.00 ft

Serial #: 8522 **Inside**

Press@RunDepth: 18.74 psig @ 4559.00 ft (KB)
Start Date: 2018.05.07 End Date: 2018.05.07
Start Time: 07:32:05 End Time: 13:50:44

Capacity: 8000.00 psig
Last Calib.: 2018.05.07
Time On Btm: 2018.05.07 @ 09:51:00
Time Off Btm: 2018.05.07 @ 11:55:30

TEST COMMENT: IF: Surface blow , Died @ 17 min.
ISI: No return.
FF: No blow .
FSI: No return.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2294.90	115.05	Initial Hydro-static
1	19.03	114.29	Open To Flow (1)
31	20.09	114.74	Shut-In(1)
64	23.57	115.17	End Shut-In(1)
64	18.38	115.16	Open To Flow (2)
91	18.74	115.56	Shut-In(2)
123	19.84	116.03	End Shut-In(2)
125	2223.82	116.94	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
3.00	mud 100m	0.01

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

TRILOBITE TESTING, INC.

Ritchie Exploration, Inc

Box 783188
Wichita, Ks 67278

ATTN: Bob Peterson

24 15s 37w Logan, Ks

Gerstberger-Watt #1

Job Ticket: 63669 **DST#: 2**

Test Start: 2018.05.07 @ 07:32:00

GENERAL INFORMATION:

Formation: **Altamont C - Pawnee**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 09:51:15
Time Test Ended: 13:50:45

Test Type: Conventional Bottom Hole (Reset)
Tester: Bradley Walter
Unit No: 78

Interval: 4558.00 ft (KB) To 4630.00 ft (KB) (TVD)
Total Depth: 4564.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

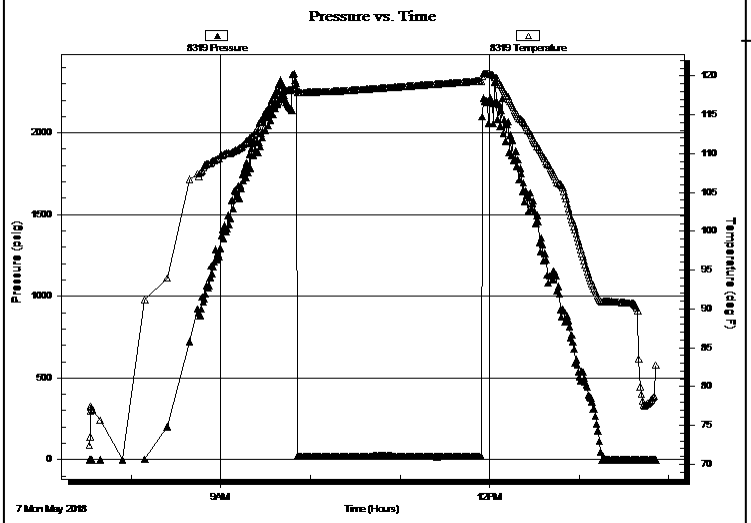
Reference Elevations: 3388.00 ft (KB)
3377.00 ft (CF)
KB to GR/CF: 11.00 ft

Serial #: 8319 **Outside**

Press@RunDepth: psig @ 4559.00 ft (KB)
Start Date: 2018.05.07 End Date: 2018.05.07
Start Time: 07:32:05 End Time: 13:51:14

Capacity: 8000.00 psig
Last Calib.: 2018.05.07
Time On Btm:
Time Off Btm:

TEST COMMENT: IF: Surface blow , Died @ 17 min.
ISI: No return.
FF: No blow .
FSI: No return.



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
3.00	mud 100m	0.01

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

FLUID SUMMARY

Ritchie Exploration, Inc

Box 783188
Wichita, Ks 67278

ATTN: Bob Peterson

24 15s 37w Logan, Ks

Gerstberger-Watt #1

Job Ticket: 63669 **DST#: 2**

Test Start: 2018.05.07 @ 07:32:00

Mud and Cushion Information

Mud Type:	Gel Chem	Cushion Type:		Oil API:	0 deg API
Mud Weight:	9.00 lb/gal	Cushion Length:	ft	Water Salinity:	0 ppm
Viscosity:	56.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	7.98 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	5000.00 ppm				
Filter Cake:	1.00 inches				

Recovery Information

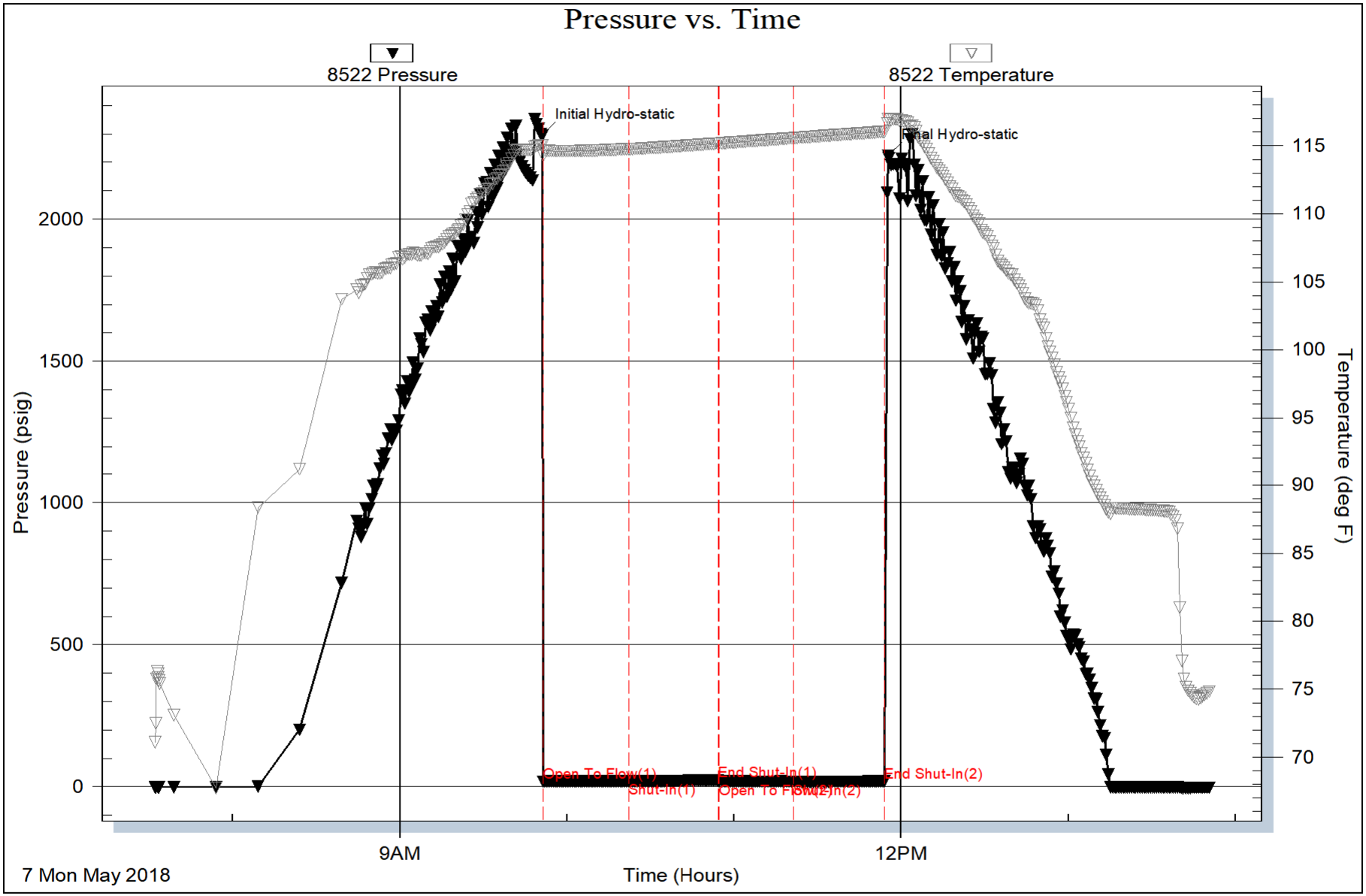
Recovery Table

Length ft	Description	Volume bbl
3.00	mud 100m	0.015

Total Length: 3.00 ft Total Volume: 0.015 bbl

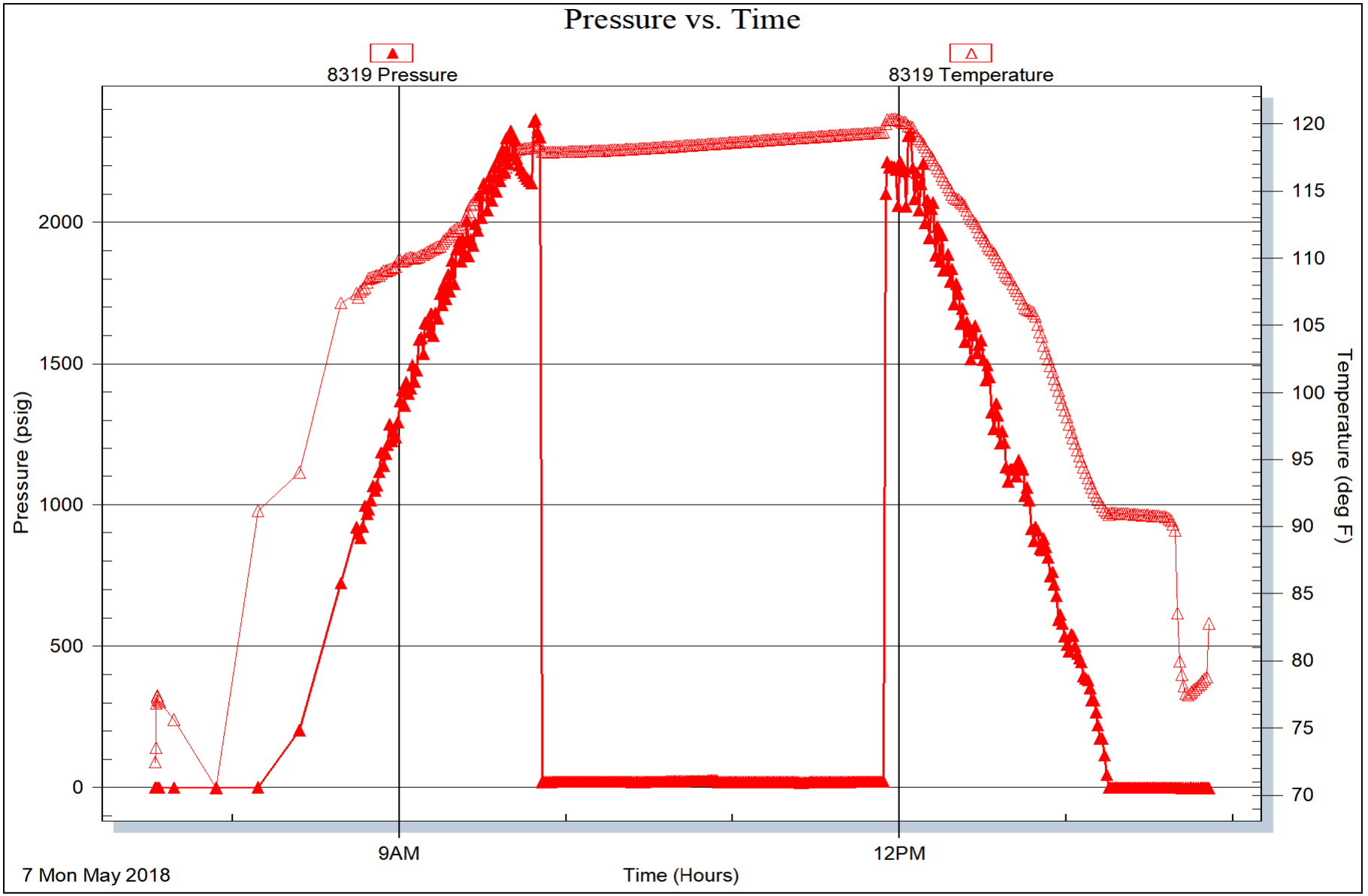
Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
Laboratory Name: Laboratory Location:
Recovery Comments:

Serial #: 8522 **Inside** Ritchie Exploration, Inc Gerstberger-Watt #1 DST Test Number: 2



Trilobite Testing, Inc Ref. No: 63669 Printed: 2018.05.07 @ 15:42:56

Serial #: 8319 **Outside** Ritchie Exploration, Inc Gerstberger-Watt #1 DST Test Number: 2



Trilobite Testing, Inc Ref. No: 63669 Printed: 2018.05.07 @ 15:42:56

DRILL STEM TEST REPORT

Ritchie Exploration, Inc

Box 783188
Wichita, Ks 67278

ATTN: Bob Peterson

24 15s 37w Logan, Ks

Gerstberger-Watt #1

Job Ticket: 63670 **DST#: 3**

Test Start: 2018.05.08 @ 16:12:00

GENERAL INFORMATION:

Formation: **Morrow**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 18:47:15
Time Test Ended: 22:54:15

Test Type: Conventional Bottom Hole (Reset)
Tester: Bradley Walter
Unit No: 78

Interval: 4810.00 ft (KB) To 4860.00 ft (KB) (TVD)
Total Depth: 4860.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

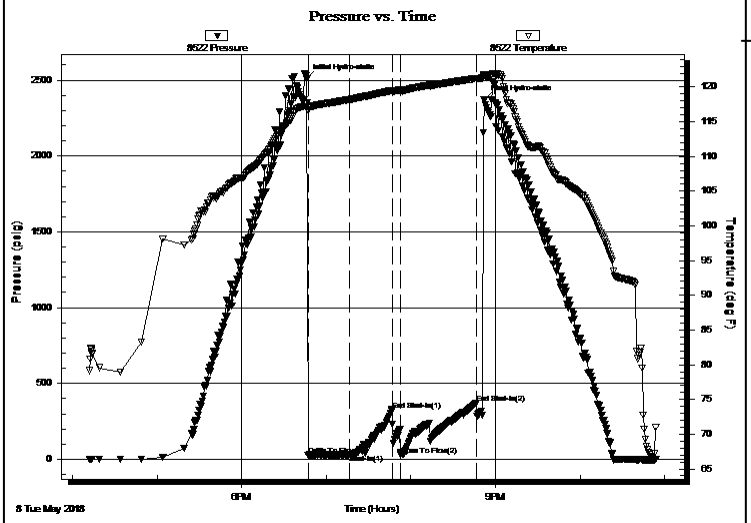
Reference Elevations: 3388.00 ft (KB)
3377.00 ft (CF)
KB to GR/CF: 11.00 ft

Serial #: 8522 **Inside**

Press@RunDepth: 31.35 psig @ 4811.00 ft (KB)
Start Date: 2018.05.08 End Date: 2018.05.08
Start Time: 16:12:05 End Time: 22:54:14

Capacity: 8000.00 psig
Last Calib.: 2018.05.08
Time On Btm: 2018.05.08 @ 18:46:15
Time Off Btm: 2018.05.08 @ 20:52:00

TEST COMMENT: IF: Surface blow , Died @ 12 minutes.
ISI: No return.
FF: No blow .
FSI: No return.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2512.15	117.69	Initial Hydro-static
1	26.29	117.06	Open To Flow (1)
30	31.35	118.20	Shut-In(1)
61	326.83	119.53	End Shut-In(1)
67	28.86	119.36	Open To Flow (2)
120	367.88	121.23	End Shut-In(2)
126	2371.21	121.75	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
7.00	mud 100m	0.03

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

Ritchie Exploration, Inc

Box 783188
Wichita, Ks 67278

ATTN: Bob Peterson

24 15s 37w Logan, Ks

Gerstberger-Watt #1

Job Ticket: 63670 **DST#: 3**

Test Start: 2018.05.08 @ 16:12:00

GENERAL INFORMATION:

Formation: **Morrow**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 18:47:15
Time Test Ended: 22:54:15

Test Type: Conventional Bottom Hole (Reset)
Tester: Bradley Walter
Unit No: 78

Interval: 4810.00 ft (KB) To 4860.00 ft (KB) (TVD)
Total Depth: 4860.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

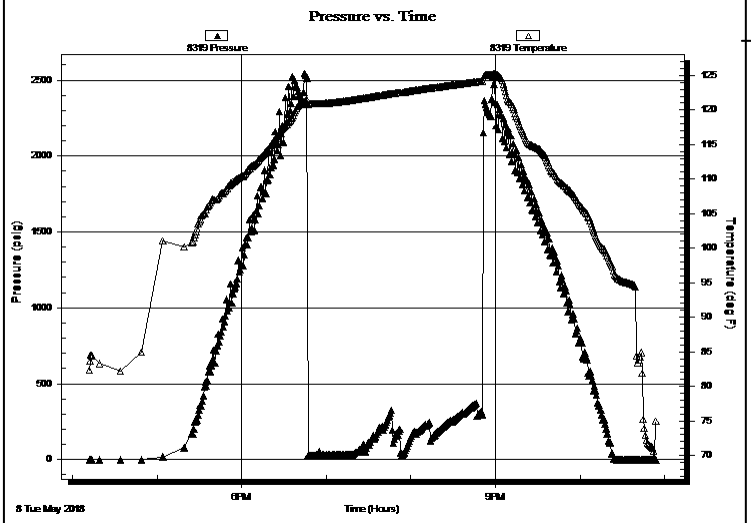
Reference Elevations: 3388.00 ft (KB)
3377.00 ft (CF)
KB to GR/CF: 11.00 ft

Serial #: 8319 **Outside**

Press@RunDepth: psig @ 4811.00 ft (KB)
Start Date: 2018.05.08 End Date: 2018.05.08
Start Time: 16:12:05 End Time: 22:54:14

Capacity: 8000.00 psig
Last Calib.: 2018.05.08
Time On Btm:
Time Off Btm:

TEST COMMENT: IF: Surface blow , Died @ 12 minutes.
ISI: No return.
FF: No blow .
FSI: No return.



PRESSURE SUMMARY

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

Recovery

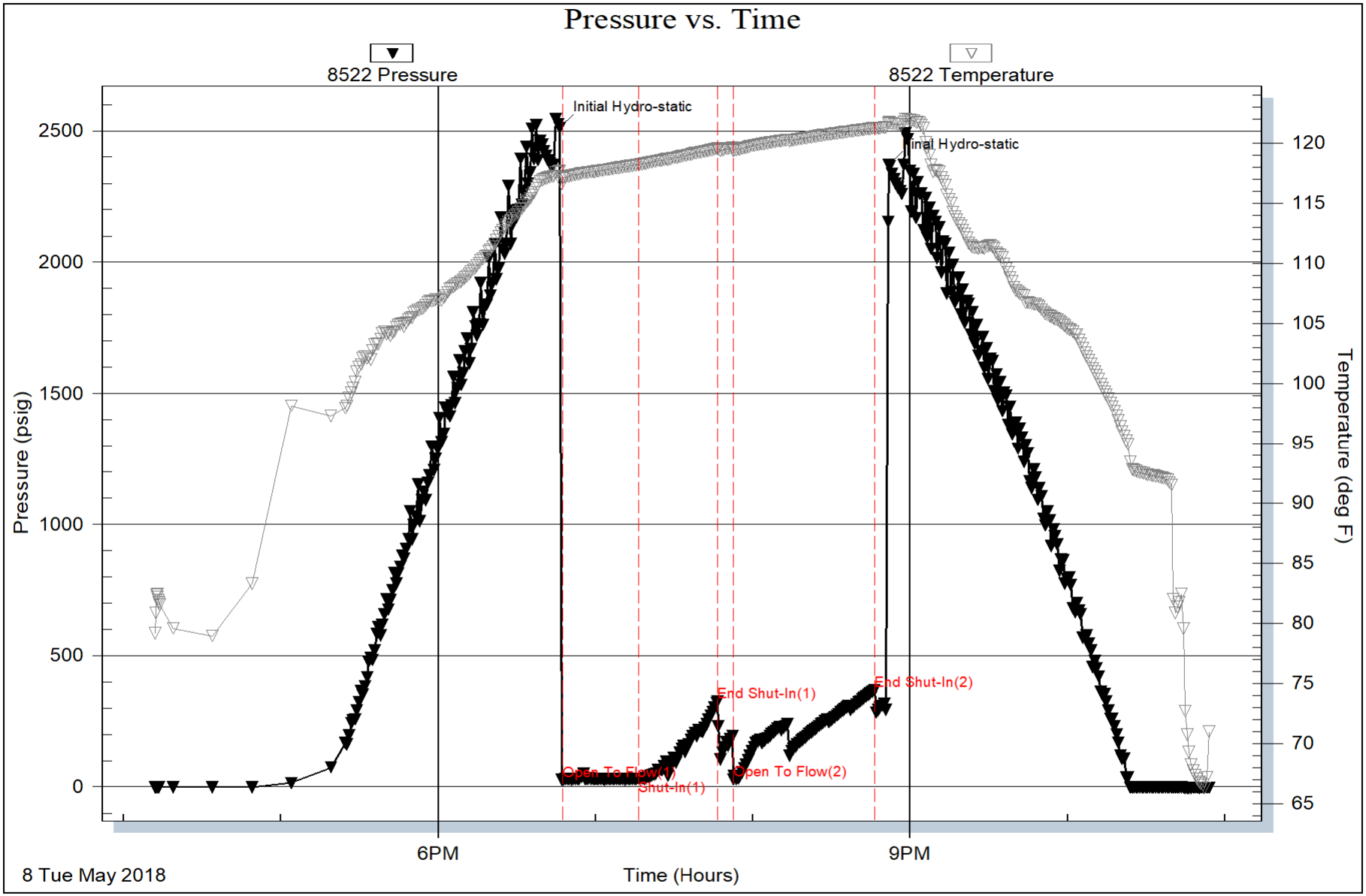
Length (ft)	Description	Volume (bbl)
7.00	mud 100m	0.03

* Recovery from multiple tests

Gas Rates

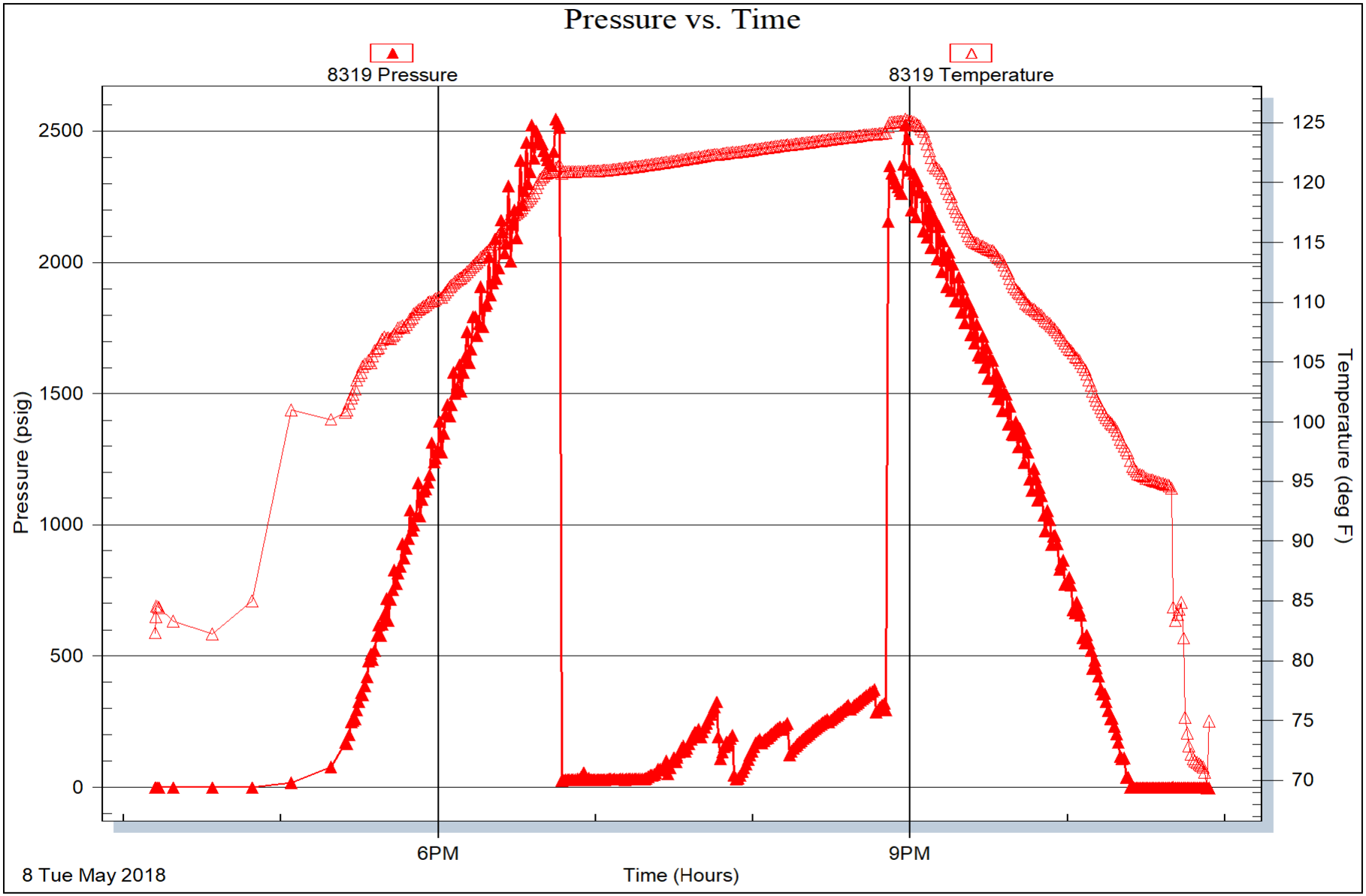
	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)

Serial #: 8522 **Inside** Ritchie Exploration, Inc Gerstberger-Watt #1 DST Test Number: 3



Trilobite Testing, Inc Ref. No: 63670 Printed: 2018.05.08 @ 23:13:58

Serial #: 8319 **Outside** Ritchie Exploration, Inc Gerstberger-Watt #1 DST Test Number: 3



Trilobite Testing, Inc Ref. No: 63670 Printed: 2018.05.08 @ 23:13:58

RITCHIE
EXPLORATION, INC.
Wichita, Kansas

#1 Gerstberger-Watt

1,321' FSL & 235' FWL
1' N & 95' W of W/2 W/2 SW Section 24-15S-37W
Logan County, Kansas
API# 15-109-21545-0000
Elevation: GL: 3377', KB: 3388'

Sample Tops			Ref. Well
Anhydrite	2640'	+748	+2
B/Anhydrite	2660'	+728	+2
Stotler	3686'	-298	+8
Heebner	4055'	-667	+10
Toronto	4075'	-687	+10
Lansing	4107'	-719	+10
Muncie	4281'	-893	+17
Stark	4369'	-981	+15
Hush	4423'	-1035	+14
BKC	4457'	-1069	+20
Marmaton	4498'	-1110	+23
Altamont	4513'	-1125	+21
Pawnee	4591'	-1203	+19
Myrick	4638'	-1250	+20
Ft Scott	4651'	-1263	+20
Cherokee	4679'	-1291	+21
Johnson	4767'	-1379	+22
Morrow	4820'	-1432	+23
Miss	4920'	-1532	+1
RTD	5040'	-1652	

P.O. Box 783188
Wichita, Kansas 67278-3188

(316) 691-9500
Fax (316) 691-9550
rei@ritchie-exp.com

8100 E. 22nd St. N., Bldg. 700
Wichita, Kansas 67226-2328

QES

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

1055 / 1044

TICKET NUMBER 55143
LOCATION Oakley Ks
FOREMAN Miles Shaw

FIELD TICKET & TREATMENT REPORT
CEMENT

Invoice #813013

DATE	CUSTOMER #	WELL NAME & NUMBER	SECTION	TOWNSHIP	RANGE	COUNTY
4-28-18	7173	Gerstberger #1	24	15 S	37 W	Logan

CUSTOMER: Ritchie Explorations
MAILING ADDRESS: P.O. Box 783188
CITY: Wichita | STATE: KS | ZIP CODE: 67278-3188

Russell Springs + Hwy 25 South to County Rd [illegible] East 1/2 N+2

TRUCK #	DRIVER	TRUCK #	DRIVER
528-T118	Travis Williams		
70	Walt Dinkel		

JOB TYPE Surface | HOLE SIZE 12 1/4" | HOLE DEPTH 225' | CASING SIZE & WEIGHT 8 5/8 23#
CASING DEPTH 225' | DRILL PIPE | TUBING | OTHER
SLURRY WEIGHT 15.2 | SLURRY VOL | WATER gal/sk | CEMENT LEFT in CASING 15-20'
DISPLACEMENT 13.0 | DISPLACEMENT PSI | MIX PSI | RATE

REMARKS: Safety Meeting, rig up equipment, Circ Casing on Bottom mixed 175 SKs Cement, Displaced 13 BBL H_2O, Shut in

Thank You
Walt & Crew

ACCOUNT CODE	QUANITY or UNITS	DESCRIPTION of SERVICES or PRODUCT	UNIT PRICE	TOTAL
Ceo 471	1	PUMP CHARGE	1,150.00	1,150.00
Ceo002	45	MILEAGE	7.15	321.75
Ceo711	8.23	Ton Mileage Delivery	1.25	660.00
CC5871 16915	175 SKs	Surface Blend II	24.00	4,200.00
				6,331.75
		30% Disc		-1,899.53
				4,432.23
			SALES TAX	235.20
			ESTIMATED TOTAL	4661.43

Ravin 3737

AUTHORIZTION Jason Davis 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.

QES

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

10705/10596

TICKET NUMBER 55156
LOCATION Oakley
FOREMAN Miles Shaw

FIELD TICKET & TREATMENT REPORT
CEMENT

Invoice #813194

DATE	CUSTOMER #	WELL NAME & NUMBER	SECTION	TOWNSHIP	RANGE	COUNTY
5-10-18	7173	Gerstberger-Watt #1	24	15 S	37 W	Logan

CUSTOMER: Ritchie Exploration
MAILING ADDRESS: P.O. Box 783188
CITY: Wichita | STATE: KS | ZIP CODE: 67278-3188

TRUCK #	DRIVER	TRUCK #	DRIVER
731	Keith C		
530/T-139	Paul W		

JOB TYPE PTA | HOLE SIZE 7 7/8" | HOLE DEPTH 5073 | CASING SIZE & WEIGHT
CASING DEPTH | DRILL PIPE 4 1/2" | TUBING | OTHER
SLURRY WEIGHT 13.8 | SLURRY VOL 1.4 | WATER gal/sk | CEMENT LEFT in CASING
DISPLACEMENT | DISPLACEMENT PSI | MIX PSI | RATE

REMARKS: Safety meeting and Rig up on Murfin Drilling Rig #21 Plugs ordered
1st plug 50 sx @ 2650'
2nd plug 100 sx @ 1130'
3rd plug 60 sx @ 275'
4th plug 40 sx @ 40' w/ plug 255 sx 60/40 4% gel 1/4# flo
RH 30 sx
MH 15 sx

ACCOUNT CODE	QUANITY or UNITS	DESCRIPTION of SERVICES or PRODUCT	UNIT PRICE	TOTAL
CE0451	1	PUMP CHARGE	1900.00	1900.00
CE0002	45	MILEAGE	7.15	321.75
CE0710	10.97 ton	ton mileage delivery	80.88	863.88
CC5829	255 sx	~~Cement~~ Lite Weight blend	16.00	4080.00
CC6075	64 lb	Cello flake	3.00	192.00
CC8228	1	8 5/8" Wooden plug	165.00	165.00
			Subtotal	7522.63
		less 30% discount		2256.79
			Subtotal	5265.84
		8%	SALES TAX	248.47
			ESTIMATED TOTAL	5514.32

Ravin 3737

AUTHORIZTION Jean Dawes 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.

GEOLOGIST'S REPORT
DRILLING TIME AND SAMPLE LOG

RITCHIE EXPLORATION, INC.

GERSTBERGER-WATT #1
SEC. 24 TWP 15S RGE 37W
W2 W2 SW
1321' FSL & 235' FWL
LOGAN COUNTY, KANSAS
API: 15-109-21545-00-00

DRILLING CONTR.: MURFIN RIG #21
SPUD: 04-28-2018 COMP:5-9-2018
MUD UP: 3600' TYPE MUD: CHEM.
DRILL TIME: 3600' to RTD
RTD:5040' LTD:5045'
SAMPLES SAVED: 3750 to RTD
GEOLOGIST: ROBERT J. PETERSEN

ELEVATION
KB: 3388'
GL: 3377'
LOG MEASURED
FROM: KB

SURFACE CASING
8 5/8" Set@224' w/175 SX

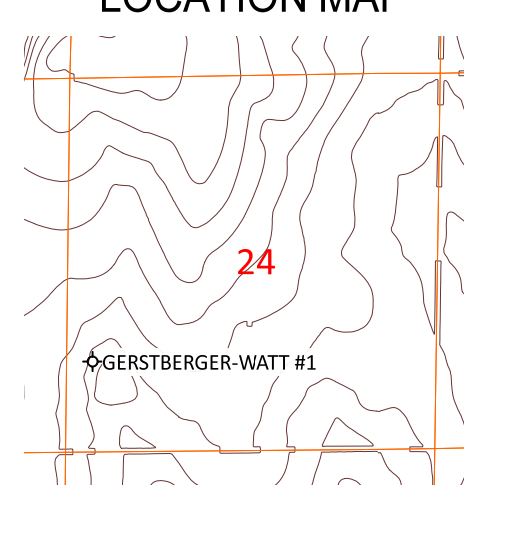
PRODUCTION CASING
D&A

WELL LOG SURVEYS
DIL/CDL/MICRO/SONIC

ELECTRIC LOG TOPS

Formation	Depth	Datum	Position
Anhydrite	2640	+748	+2
Base Anhydrite	2659	+729	+3
Stotler	3686	-298	+8
Heebner	4056	-668	+9
Toronto	4079	-691	+6
Lansing	4110	-722	+7
Lansing C	4151	-763	+9
Muncie Creek	4284	-896	+14
Stark	4373	-985	+11
Hush	4425	-1037	+12
BKC	4456	-1068	+21
Marmaton	4503	-1115	+18
Alamont	4515	-1127	+19
Pawnee	4594	-1206	+16
Ft Scott	4654	-1266	+17
Cherokee	4680	-1292	+20
Morrow	4834	-1446	+9
Mississippian	4934	-1546	-13

LOCATION MAP



REFERENCE WELL
15-109-21450-00-00
Russell Oil, Inc.
McElree Orr 'A' No. 30-1
1895' FNL & 1470' FEL
Sec. 30-T15S-R36W
Logan County, KS

REMARKS
This well was plugged and abandoned by the operator

DAILY REPORT @7:00 A.M.
04-28-18 MIRU/SPUD
04-29-18 224' WOC
04-30-18 1628' Drilling
05-01-18 2476' Drilling
05-02-18 3179' Drilling
05-03-18 3657' Drilling
05-04-18 4033' Drilling
05-05-18 4258' Drilling
05-06-18 4538' Drilling
05-07-18 4630' TOH DST
05-08-18 4788' Drilling
05-09-18 4948' Drilling

Mudco Mud Check @3719'
Vis 53/Wt 8.8/WL 6.4/LCM 3#
Chlorides 2,200

SAMPLE DESCRIPTION

SH; Dark gray + LS; Tan/lt gray, dense (3750)

LS; Tan/cream, very fine crystalline, foss, subchalky + SH; Red/gray (3760)

SH; Red/gray, silty (3770)

SH; Red/green-gray, sandy + LS; Tan, very fine crystalline to dense, foss; sl cherty, chalky (3780)

SH; Black/brown + SH; Red, silty + LS; Cream/gray, dense, subchalky (3790)

LS; Cream/lt gray, very fine crystalline to dense, foss, sl cherty + SH; Red (3800)

LS; Cream/gray, fine crystalline, foss, chalky (3810)

LS; Cream/white, fine crystalline, foss, chalky, cherty (blocky) + SH; Red/gray (3820)

LS; Tan, fine crystalline, ool-gran in part, sl mottled + SH; Red/gray (3830)

LS; Cream/white, very fine crystalline, foss, cherty + LS; Tan/gray, dense + SH; Red/gray (3840)

LS; Cream/lt gtray, very fine crystalline to denes, sl foss + red bed slough(3850)

LS; Cream/lt gray, very fine crystalline to dene, chalky +red bed slough (3860)

LS; Cream/tan, very fine crystalline to dense, foss, cherty (angular to blocky) + slough(3870)

LS: Gray, mottled, fine crystalline, foss, chalky-mealy, sl cherty (3880-por sample)

Added Premix @3874'

SH; Red/green-gray, silty (3890)

SH; Maroon/gray, blocky + tr LS: Gray, dense (3900)

LS: Cream/tan, fine crystalline, ool-gran in part, sl cherty + SH; Red (3910)

LS: Cream, fine crystalline, foss, gran, very chalky-soft (3920)

LS; Cream/tan, fine crystalline, foss, very chalky, cherty (3930)

LS; Cream/gray, very fine crystalline, foss, chalky, cherty inclusions (3940)

LS; Cream/tan/gray; fine crystalline, chalky (3950)
SH; Black (tr 3950)
LS; Tan/gray, dense, foss, very chalky, mealy, tr sd (3960)

LS; Tan/gray, very fine crystalline, chalky + SD; Gray, ang, calc, friable + SH;Red (3970)

SH; Red, sandy (3980)

LS; Cream, fine crystalline, ool/foss, subgran, chalky (3990)

SH; Maroon/gray, silty-sandy (3990)

LS; Cream, fine crystalline, ool/foss, subgran, chalky(soft), sl cherty (sharp) (4000)

SH; Black (tr 4010)
LS: Cream, fine crystalline, foss, very chalky (soft) (4010)

LS: Lt gray, very fine crystalline to dense (4020)
SH; Red/gray, sandy (4020)

LS; Cream/tan/gray, very fine crystalline ,foss, chalky (4030)

Mudco Mud Check 4050'
Vis 63/Wt 9.2/WL 6.8/LCM 4#
Chlorides 2,800

LS; Cream/tan, very fine crystalline , w/ some coarse crystalline regrowth, foss w/micro-ool, gran in part, chalky, cherty (blocky), trace mealy chalky w/dead stain(4040)

LS; Cream/tan, fine crystalline, foss, very chalky (soft) + LS; Gray, very fine crystalline to dense, foss, chalky + Chert; Lt gray, angular to sharp, foss (4050)

LS; Gray, very fine crystalline, foss, sl mottled, chalky increase in sharp chert (4050/15")
LS; Tan/gray, fine crystalline, ool, very chalky, sl gummy w/tr gray, shalke (4050/30")

LS; Tan/brown/gray, dense, foss, chalky (4060)

Wiper Trip 30 stands @4050'

SH; Black (4070)
LS; Tan, fine crystalline to dense, foss, hard (4070)

SH; Red/gray, silty-sandy + SD; Blue-gray, f-m, subrounded, silty-chalky, friable (4080)

LS; Cream/tan, very fine crystalline, ool-chalky, soft, no vis por (4080/30")
LS; Lt gray, very fine crystalline to dense, ool/foss, subgranular, chalky (4080/45-60")
LS; Cream/white, fine crystalline, foss, very chalky(soft)(4090)

LS; Cream/tan, fine crystalline, ool, very chalky, tr poor moldic por, nso + LS: Gray, very fine crystalline to dense, foss + Chert; Gray (4100)

LS; Cream/lt gray, very fine crystalline, foss, chalky (4100/20")

LS; Cream/tan, very fine crystalline to dense, foss, very chalky trace dead edsge stain on chalk (4100/40") + LS; Gray, fine cystalline, chalky, fraible (4100/60')

SH; Dark gray + SH; Gray, silty, sandy (4110)

LS; Cream/tan/lt gray, fine crystalline to dense, foss, sl dolo w/tr poor moldic por (barren), chalky, chert inclusions, tr dead oil flake from crushed mealy chalk (4120)
LS; Cream/tan, fine crystalline to dense. Foss/ool in part, granular with partial chert matrix, chalky (4120/20")

LS; Lt gray, dense, foss, chalky (soft white) cherty w/trace red shale (4120/40-60")

LS; Tan, fine crystalline to dense, foss, poor moldic por (barren), cherty (4130-4140)

SH; Black (4140/4150)

LS; Cream/lt gray, dense, sl foss, chalky, cherty (4150)

SH; Red/gray, silty-sandy (4150-4160)

LS; Cream/tan, dense, ool-gran, chalky, trace poor moldic por, nso (4160)
LS; Cream, fine crystalline to dense, ool, dolomitic in part w/sl mineral stain on dry w/no fl, scat dull fl (calcite) w/ nso in tray, chalky, cherty (white-angular)(4160/20")increase dolomitic, increase chert (4160/40")+ LS; Tan/brown, dense, hard, chalky, cherty (4160/60")
LS; Cream, fine crystalline, dolo, very chalky (4170)

LS; Cream/tan,dense, hard , chalky, cherty + SH; Gray (4178)

LS; Cream/tan, fine crystalline to dense w/scatt coarse crystal regrowth, chalky, w/tr poor dead oil edge stain (4178/20")
LS: Cream/lt gray, dense, foss, foss, very chalky, cherty, tr poor moldic por (barren) (4178/40")
LS; Tan/brown, fine crystalline to dense, very chalky (4178/60")
LS; Cream/lt gray, dense, chalku, tr poor moldc ipr (barren) (4190)

LS:Cream, very fine crystalline to dense, brittle, foss, chalky (4200)

SH; Black (4210)
LS; Cream/lt gray, fine crystalline to dense, ool, chalky (4210/4210-20')

SH; Red (4220)

LS; Cream, fine crystalline, foss, subgran, chalky-cherty, tr dead stain on frac por (4220)

LS; Tan/cream, very fine crystalline to dense, foss/ool, subgranular, brittle, chalky (4220/20"-4230)

SH; Red, sandy (4230)

LS: Cream, very fine crystalline to denes, foss, chalky, cherty (chert sharp white) (4240/4240/20")

LS; Cream, fine crystalline to dense, sl foss, sl dolo, chalky (4240/40-60")

LS; Cream, very fine crystalline to dense, sl dolo, chalky (4250)

LS Cream,/lt gray, very fine crystalline to dense, sl dol, chalky (4260-4270)

LS; Cream/lt gray, fine crystalline w/coarse crystal regrowth, sl dolo, chalky (white-soft) (4280)

LS; Gray, dense, chalky (4280)

LS; Gray/cream, motttle,very fine crystalline to dense foss, chalky (4290)

SH; Black (4290)

LS; Cream/gray/brown mottle, fine crystalline fosss, chalky, cherty (tan/brown-sharp/black-blocky) (4300)

SH; Dark gray (4310)

LS; Cream/tan, very fine crystalline to dense, foss, sl dolo, chalky, cherty (gray/white/tan-angular) (4310)

Mudco Mud Check 4308'
Vis 78/Wt 9.3/WL 8.0/LCM 3#
Chlorides 4,500

LS; Cream/tan, fine crystalline, foss-subgran in part, very chalky (soft/white) (4320) trace dead edage stain on chalk, nsfo (4320/20")

LS; Cream/gray, fine crystalline to dense, foss, chalky, cherty (angular-gray) (4320/40")
SH; Black (4330)
LS; Cream/tan, fine crystalline, foss, chalky (white-soft)(4330)

SH; Red/gray, sandy + SD; Bluish-gray, very fine grained, friable (4340)

LS; Cream/gray/lit gray, mottled in part, dense, foss, chalky (4340)
LS; Cream/tan/brown, fine crystalline to dense, some coarse cryst regrowth on fracture, foss-subgran in part w/some cherty atrix, chalkt, poor moldic por (barren) (4350)
LS; Cream/tan/gray, dense, foss w/some calc og, chalky, tr shale inclusions, tr black shale (4350/20")
LS; Cream/gray/brown, dense-hard, ool-gran, chalky, cherty (gray blocky)(4350/40") + SH; Dark gray (4350/60")
LS; Tan, very fine crystalline to dense-hard, foss/ool, granulat in part, chalky (4360)
LS; Tan/cream/brown, very fine crystalline to dense (hard) foss/ool, granular in part, chalky w/sharp chert in chalk (4370)

SH; Black + SH; Green-gray, sandy (4370)

LS; Cream/tan/gray, dense, foss, cherty(white/angular (4374 20-40")

SH; Black (4374/40")
LS; Gray, dense, foss, chalky (4380) LS: Cream/gray, fine crystalline, foss, chalky, tr poor moldic por (barren) + SH; Green-gray, sandy(4390)

LS; Cream/gray, fine crystalline, foss, chalky, cherty (chert milky/translucent)(4400)

LS; Cream/tan/gray, fine crystalline, foss, very chalky-soft (4410)

LS; Cream/gray, dense, ool-gran, no vis por, chalky (4415)

LS: Tan, dense, foss, chalky (white-soft), trace black stain on chalky, nsfo (4415/20), LS; Brown, dense, hadr, pelletal/ool, chalky (4415/40")

LS:Gray, very fine crystalline to dense, foss, blocky (4415/60")
LS; Cream/gray, dense, hard, ool-granular tr SH; Black (4420)

LS; Lt brown, dense (4430)

SH; Black, carb (4440)

LS; Cream/tan, very fine crystalline to dense, foss + LS; Gray, dense, foss + Chalk; White, soft + Chert; White, sharp (4440)

LS; Tan/brown mottled, fine crystalline, foss, chalky + LS: Cream/lt gray, fine crystalline to dense, ool + LS; Lt gray,dense, sandy, hard, trace black chert/black shalke (4450)

LS; Cream/lt gray, very fine crystalline, ool/foss, subgran, poor moldic por (barren), chalky (white-soft)(4460)

LS; Cream/lt gray, fine crystalline, foss, granular, chalky, brittle (4470) + SH; Maroon/green/gray (4470)

LS; Cream, fine crystalline, ool-granular, partial chert matrix + sharp chert (4480)

SH; Red/gray/green-gray, sofy (4480-4480/20") + LS; Lt gray, dense, foss (abund) (4492)

LS; Gray, fine crystalline, chalky + SH; Reed/gray, soft (4492 20-40")

SH; Red/gray. Sandy + SD; Gray, fine grained, silty, mic, friable (4510)

LS: Cream/lt gray, dense, foss, subchalky (4510)
LS: Cream/tan, dense w/coaise crystal regrowth, foss/ool in part, chalky, trace spot edge stain (weak fl) no sfo, no odor, no vis por + SH; Red, sandy/
SH; Dark gray, blocky(4520)
LS; Gray, dense-hard, ool, shaley (red) brec w/abund shale stain + SH; Red, sandy/SH; Gray + Chert; Orange (4530)
LS; Cream, dense-hard, ool-gran, foss in part no vis por, chalky w/orange sharp LS nod + SH; gray (4538)

DST #1
4503-4564'
30-30-30-30 min
IF: Surface blow died in 8 min
FF: None
No return blows
Recovered: 15' Mud w/oil spots
SIP: 689-747#
FP: 17-21/20-21#
HP: 2257-2212#
BHT: 118F

LS; Gray/cream, dense-hard, foss, trace dead oil flake from crushed sample + SH; Gray (4538/20") + Shaley red (4538/40")

SH; Dark gray/red, hard (4538/40-60")

LS; Cream/lt gray/tan, very fine crystalline to dense, foss (4550)

Mudco Mud Check 4554'
Vis 64/Wt 9.2/Wl 7.2/LCM 3#
Chlorides 4,000

SH; Black (flood) (4554/20")
LS; Brown/tan, dense, ool/foss, granular, chalky matrix in part, chalky , tr brown stain w/few flaakes crushed sample+ LS; Cream/gray, dense, (4554-4564) + LS; Gray, very fine crystalline, hard, , chalky (4464/20")
SH; Gray, soft, silty (4564/40")(sample box thin at 60 min)

LS; Cream/lt gray, very fine crystalline to dense, ool, sub chalky, tr lt brown pinpoint spot stain, nsfo, no odor, no vis por (4580)

LS; Lt gray, very fine crystalline to dense,foss , cherty (white/ang/lt-tan) tr brown spot/edge stain, nsfo, no odor + SH; Gray (4590-4595)

DST #2
4558-4630'
30-30-30-30 min
IF: Surface blow, died in 17 min
FF: None
No return blows
Recvoered:
3' Mud
SIP: 24-20#
FP: 19-20/18-19#
HP: 2295-2224#
BHT: 116F

SH; Black/dark green-gray (4595/20")
LS: Gray/tan, very fine crystalline to dense, chalky (4595/40-60")
LS; Brown/tan, dense, ool-granular, subchalky matrix, tr brown tarry stain, no vis por (4600)
LS; Cream/gray, very fine crystalline to dense, sl foss, cherty , trace very light stain, dull flor nsfo, no odor+ LS; Gray, arg + SH; Gray, sandy (4610)

LS; Cream/gray, dense, cherty, arg in part + LS: Cream/tan, fine crystalline ool, tr w/weak edge stain w/dull fl, no sfo, no odor, no vis por + SH; Dark gray/green-gray (4620)

LS; Tan/gray, dense, hard, cherty (tan/black-angular), tr weak edge stain, dull fl, nsfo, no odor no vis por (4630) + SH; Black (4630/20")

LS; Cream/gray/brown, very fine crystalline to dense, foss, cherty(dark gray-ang) , chalky +SH; Gray (4630 40-60")
SH; Black (4640)

Mudco Mud Check
Vis 56/Wt 9.3/WL 7.2/LCM 3#
Chlorides 5,000

LS; Cream/gray/tan, dense, ool-gran, chalky, cherty (tan/black-ang) (4645) oolitic-granular w/chalky-chery matrix, brittle, chert (white/ang/foss) (4645/20')

LS; Gray, dense, sl foss, chalky, cherty (46545/40") + chert gray/black (4650)
SH; Black (4660)
LS; Cream/tan mottled, ool, chalky + LS; Gray, dense, foss, cherty (gray) (4660)

LS; Gray/cream, very fine crystalline to dense, foss, subchalky, cherty + SH; Gray (4670)

LS; Cream/gray mottle, dense, ool, granular, cherty matix, block chert, chalky-soft + LS; Gray, very fine crystalline, chalky(4680)
LS; Cream/gray, very fine crystalline to dense, foss, chalky, very cherty + SH; Gray/dark gray (4680/20")
LS; Cream/tan, very fine crystalline to dense, ool, chalky, cherty(4690)
SH: Black (4690)

LS; Cream/gray, very fine crystalline to dense, ool, chalky, cherty + SH; Black, hard (4700)

LS; Cream/tan/gray, very fine crystalline to dense, foss + SH; Black/gray (4710)

LS; Crean/tan/gray mottle, vey fine crystalline to dense, foss, sl cherty (4720)

LS: Cream/brown/gray, very fine crystalline to dense, foss, brittle, chalky, sl cherty + SH; Gray (4730)

LS: Cream, fine crystalline ,foss, chalky, cherty + LS ;Gray, dense, blocky + Chert; Black + SH; Black/gray (4740)

LS; Cream/gray, very fine crystalline, foss, chalky + LS; Gray, dense, foss ++ SH ;Gray (4750)

LS ;Cream, very fine crystalline to dense, chalky, cherty (angular to sharp) +SH; Black (4760)

LS; Cream/gray, denes, foss, chalku +SH; Brown/green, sandy (4770) (odor reported in sample box-no odor in sample cup)

LS; Cream/tan, dense, hard, foss, subchalky, +Chert; Gray/brown, tabular-angular + SH; Gray/green (4780)

LS; Cream/gray/tan, dense-hard, w/some coarse crystalline regrowth, oolititic, cherty (brown-gray translucent/orange/tan/angular)(4790)

LS; Gray, dense hard, sl foss, subchalky (4800)

LS; Cream/gray, very fine crystalline to dense, foss, cherty (sharp translucent) + SH; Black/dark gray/green (4810)

LS; Tan/brown, very fine crystalline to dense, hard, oolitic in part + SH; Gray/green (4820)

SH; Black, hard + SH; Green, silty + LS; Gray, dense, blocky (4830)
SH; Gray-green, silty-sandy + SD; Gray, very fine grained, angular , silty + LS; Gray, dense (4840)

SD; Gray, very fine grained, friable, few loose sd grains (poor sample)(4850/4850-20-40")

SH; Green/gray/black +SD; Tan, very fine grained calc grading to LS; Gray, sandy (4850/60")

DST #3
4810-4860'
30-30-30-30 min.
IF: Surface blow, died in 12min
FF: None
No return blow
Recovered:
7' Mud
SIP: 327-368#
FP: 26-31/29-NA
HP: 2512-2371#
BHP: 121F

SD; Gray, very fine grained, subangular-subrounded, friable, show light oil from crushed sample, no odor + SH; Black/dark gray/green/ light tan, waxy (4860-4860-20")

SH; Lt cream/black/green + LS; Tan, dense, tr SD; Lt gray, very fine grained, friable w/show very light oil crushed sample (4860/40") increase LS; Tan, dense + SH; Maroon, blocky (4860/60")
SH; Black/green/red/olive + SH; Lt gray-tan, soft + LS; Cream/tan, dense (4870)

LS; Cream/tan, dense, foss in part, hard + SH; Dark gray/light green, tr SD: White, very fine grained, friable (4880-4890)

SH; Black-bluish green, waxy, tr mustard yellow shale, SH; Lt gray/calc+ LS; Cream/tan, dense, hard trace SD; Clear, med-coarse, subangular, SD; Lt gray-soft (4900-4900/20")+ trace SD; Clear, med-coarse, subangular, poorly sorted, calc/glauc, well-cem-hard, LS; Lt gray, sandy (4900/40-60")

+LS; Cream/tan, dense, hardm foss, SD; Clear, med-coarse, subangular to subrounded, calc, glauc, well-cem + LS; Gray, dense, sandy (4900/40")
SD; Clearm coarse, subang, glauc + SH; Black/dark green + LS; Cream/tan, dense, sl foss (4910)
SH;Dark gray/olive/maroon + SD; White/clear, med to coarse, subangular, poorly sorted, calc/glauc, hard +tr SD; Brown, med, pyritic(4920)
SD; Brown, med, well rounded,calc + SD; White, fine grained, angular, hard, glauc + SH;Black/green (abund) (4930)

+ SD; Tan, coarse, subangular to subrounded, well-cemented w/chert fragments + SD; White, fine grained, hard, glauc + LS; Tan, dense/tr LS; Gream, dense, chalky (4940)

LS;Cream, dense, chalky, sandy + LS; Tan, dense + Chert, Tan, angular (4950)

LS; Tan, dense, sl foss + LS: Cream/white,dense, sandy, tr SD; Gray, very fine grained, silty (4960)

LS: Cream/tan, fine crystalline, chalky + LS; Cream/white, dense, sandy, tr SD; White, very fine grained, (4970)

Mudco Mud Check 4939'
Vis 58/Wt 9.4/WL 8.0/LCM 3#
Chlorides 5,400

LS; Cream/tan, fine crystalline, sl foss + LS: Tan, dense, hard, trace shale impurity + SH; Green/black (4980)

LS; Cream/lt gray, fine crystalline, ool, chalky, sandy in part (4990)

LS: Cream/lt gray, very fine crystalline, foss, chalky + LS; Cream, dense, chalky, sandy + SH; Black (5000)

LS ;Cream/tan, very fine crystalline to dense, chalky + SH; Pale greeen, calc, blocky (5010)

LS; Cream, very fine crystalline, foss + LS; Lt gray, dense, hard,chalky, cherty, sl sdy, glauc (5020)

LS; Cream/tan, very fine crystalline to dense, foss, chalky, cherty (5030)

LS; Cream/tan, fine crystalline to dense, chalky + LS; Tan, dense (5040)

LS; Cream/tan, fine crystalline, ool, chalky, trace shale impurity + LS; Tan, dense, hard, cherty, sl pyritic + SH; Red/gray (5040/30-45")

RTD 5040'
DRIFT SURVEY
0.2 ° @225'
0.1° @618'
0.2° @1091'
0.4° @1628'
0.3° @2102'
0.8° @2610'
0.3° @3117'
0.6° @3622'
0.4° @3905'
1.2° @4564'
0.7° @4860'
0.1° @5040'