KOLAR Document ID: 1418546

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 # 3842
Name: Larson Engineering, Inc. dba Larson Operating Company
Address 1: 562 W STATE RD 4
Address 2:
City: OLMITZ State: KS Zip: 67564 + 8561
Contact Person: Thomas Larson
Phone: (620) 653-7368
CONTRACTOR: License # 33350
Name: Southwind Drilling, Inc.
Wellsite Geologist: Vernon Schrag
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.)*: D & A

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 #:

04/20/2018	04/29/2018	04/29/2018
Spud Date or Recompletion Date	Date Reached TD	Completion Date or Recompletion Date

API No.: 15-101-22606-00-00
Spot Description:
SE - SW - NE - NW Sec. 29 Twp. 18 S. R. 30 ☐ East ☑ West
1140 Feet from ☑ North / ☐ South Line of Section
1800 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: Lane
Lease Name: MILLER O Well #: 2
Field Name:
Producing Formation: N/A
Elevation: Ground: 2891 Kelly Bushing: 2901
Total Vertical Depth: 4448 Plug Back Total Depth:
Amount of Surface Pipe Set and Cemented at: 265 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: 17400 ppm Fluid volume: 800 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: 08/15/2018
☐ **Confidential Release Date:** 08/14/2020
☑ **Wireline Log Received** ☑ **Drill Stem Tests Received**
☑ **Geologist Report / Mud Logs Received**
☐ **UIC Distribution**
ALT ☐ I ☑ II ☐ III **Approved by:** Karen Ritter **Date:** 08/16/2018

Operator Name: Larson Engineering, Inc. dba Larson Operating Company Lease Name: MILLER O Well #: 2

Sec. 29 Twp. 18 S. R. 30 ☐ East ☑ West County: Lane

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 Induction
Dual Comp Porosity
Microresistivity

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

Name	Top	Datum
Anhydrite	2194	+707
B Anhydrite	2256	+645
Heebner	3896	-995
Lansing	3945	-1044
Stark Sh	4228	-1327
Pawnee	4434	-1533

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	8.625	20	265	Class A	165	2% gel, 3% CC

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

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	Larson Engineering, Inc. dba Larson Operating Company
Well Name	MILLER O 2
Doc ID	1418546

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	8.625	20	265	Class A	165	2% gel, 3% CC

SWIFT Services, Inc.

CHARGE TO: Carson Engineering
ADDRESS
CITY, STATE, ZIP CODE

TICKET 30894

PAGE 1 OF

SERVICE LOCATIONS	WELL/PROJECT NO.	LEASE	COUNTY/PARISH	STATE	CITY	DATE	OWNER
1. Hays Ks	#2	Miller 'O'	Lane	Ks		4-20-18	
2. Ness City Ks	TICKET TYPE ☐ SERVICE ☐ SALES	CONTRACTOR Southwind Drilling	RIG NAME/NO.	SHIPPED VIA CT	DELIVERED TO location	ORDER NO.	
3.	WELL TYPE Oil	WELL CATEGORY development	JOB PURPOSE Shallow Surface		WELL PERMIT NO.	WELL LOCATION	
4. REFERRAL LOCATION	INVOICE INSTRUCTIONS						

PRICE REFERENCE	SECONDARY REFERENCE/ PART NUMBER	ACCOUNTING LOC	ACCT	DF	DESCRIPTION	QTY.	U/M	QTY.	U/M	UNIT PRICE	AMOUNT
575		1			MILEAGE Trk # 111	40	mi			5 00	200 00
576S		1			Pump Charge - Shallow Surface	1	PA			875 00	875 00
290		1			D- Air	2	Gal			42 00	84 00
325		2			Standard Cement	165	SKS			13 00	2145 00
279		2			Bentonite Gel	3	SKS			30 00	90 00
278		2			Calcium Chloride	8	SKS			40 00	320 00
276		2			Flocele	42	lbs			2 50	105 00
581		2			Service Charge Cement	165	SKS			1 75	288 75
583		2			Drayage	386	TM			85	277 10

LEGAL TERMS: Customer hereby acknowledges and agrees to the terms and conditions on the reverse side hereof which include, but are not limited to, **PAYMENT, RELEASE, INDEMNITY,** and **LIMITED WARRANTY** provisions.

MUST BE SIGNED BY CUSTOMER OR CUSTOMER'S AGENT PRIOR TO START OF WORK OR DELIVERY OF GOODS

X

DATE SIGNED | TIME SIGNED ☐ A.M. ☐ P.M.

REMIT PAYMENT TO:

SWIFT SERVICES, INC.
P.O. BOX 466
NESS CITY, KS 67560
785-798-2300

SURVEY	AGREE	UN-DECIDED	DIS-AGREE
OUR EQUIPMENT PERFORMED WITHOUT BREAKDOWN?			
WE UNDERSTOOD AND MET YOUR NEEDS?			
OUR SERVICE WAS PERFORMED WITHOUT DELAY?			
WE OPERATED THE EQUIPMENT AND PERFORMED JOB CALCULATIONS SATISFACTORILY?			

ARE YOU SATISFIED WITH OUR SERVICE? ☐ YES ☐ NO

☐ CUSTOMER DID NOT WISH TO RESPOND

PAGE TOTAL	4384 85
	−438 49
10% Disc $$27.4	3946 36
Lane Co. TAX 7.5%	185 22
TOTAL	4131 58

CUSTOMER ACCEPTANCE OF MATERIALS AND SERVICES The customer hereby acknowledges receipt of the materials and services listed on this ticket.

SWIFT OPERATOR David Edgerton | APPROVAL

Thank You!

JOB LOG

SWIFT Services, Inc.

DATE 4-20-18 | PAGE NO.

CUSTOMER	WELL NO.	LEASE	JOB TYPE	TICKET NO.
Carlson Engineering	#2	Miller 'D'	Shallow Surf.	30894

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS T	PUMPS C	PRESSURE (PSI) TUBING	PRESSURE (PSI) CASING	DESCRIPTION OF OPERATION AND MATERIALS
	2130							On location
								8 5/8 csg
								RTD - 266
	2200							Start running Csg
	2330							break circ on Bottom
	2345	5	40			200		pump cmt - 165 sks @ 14.7 ppg
	2355	5	15.75			300		Disp
	0500	5						End Disp 144 psi - 300 psi
								Circulated 40 sks cmt to pit
								Used 165 sks standard w/ 2% gel 3% CC & 1/4 # Flocele
								@
								Job Complete
								Thanks
								David, Zach & Kirby

SWIFT Services, Inc.

CHARGE TO: Larson Engineering Inc
ADDRESS
CITY, STATE, ZIP CODE

TICKET 27255

PAGE 1 OF 1

SERVICE LOCATIONS	WELL/PROJECT NO.	LEASE	COUNTY/PARISH	STATE	CITY	DATE	OWNER
1. Hays, KS	#2	Miller 'D'	Lane	KS		04/24/18	
2. Ness City, KS	TICKET TYPE ☑ SERVICE ☐ SALES	CONTRACTOR	RIG NAME/NO.	SHIPPED VIA	DELIVERED TO	ORDER NO.	
3.		South Wind Drilling		CT	Location		
4.	WELL TYPE	WELL CATEGORY	JOB PURPOSE		WELL PERMIT NO.	WELL LOCATION	
REFERRAL LOCATION	Oil	Development	Plug to Abandon				
	INVOICE INSTRUCTIONS						

PRICE REFERENCE	SECONDARY REFERENCE/ PART NUMBER	ACCOUNTING LOC	ACCT	DF	DESCRIPTION	QTY.	U/M	QTY.	U/M	UNIT PRICE	AMOUNT
575		1			MILEAGE #113	40	mi			5 00	200 00
576P		1			Pump Charge - PTA	1	EA			875 00	825 00
290		1			D-Air	5	gal			42 00	210 00
410		1			Top Plug 8 5/8"	1	EA			130 00	130 00
3284		2			60/40 Pozmix (4% Gel)	300	SKS			10 60	3180 00
279		2			Bentonite Gel	9	SKS			30 00	270 00
581		2			Service Charge Cement	300	SKS	25110	lbs	1 25	525 00
583		2			Drayage	40	mi	502.2	TM	0 95	426 90

LEGAL TERMS: Customer hereby acknowledges and agrees to the terms and conditions on the reverse side hereof which include, but are not limited to, **PAYMENT, RELEASE, INDEMNITY,** and **LIMITED WARRANTY** provisions.

MUST BE SIGNED BY CUSTOMER OR CUSTOMER'S AGENT PRIOR TO START OF WORK OR DELIVERY OF GOODS

X

DATE SIGNED | TIME SIGNED ☐ A.M. ☐ P.M.

REMIT PAYMENT TO:

SWIFT SERVICES, INC.
P.O. BOX 466
NESS CITY, KS 67560
785-798-2300

SURVEY	AGREE	UN-DECIDED	DIS-AGREE
OUR EQUIPMENT PERFORMED WITHOUT BREAKDOWN?			
WE UNDERSTOOD AND MET YOUR NEEDS?			
OUR SERVICE WAS PERFORMED WITHOUT DELAY?			
WE OPERATED THE EQUIPMENT AND PERFORMED JOB CALCULATIONS SATISFACTORILY?			

ARE YOU SATISFIED WITH OUR SERVICE? ☐ YES ☐ NO

☐ CUSTOMER DID NOT WISH TO RESPOND

PAGE TOTAL	~~5806 97~~ 5816 87
10% Disc	-581 69
	5235 18
Lange TAX 7.5%	284 25
TOTAL	5519 43

CUSTOMER ACCEPTANCE OF MATERIALS AND SERVICES The customer hereby acknowledges receipt of the materials and services listed on this ticket.

SWIFT OPERATOR Tom Stumpf | APPROVAL

Thank You!

JOB LOG

SWIFT Services, Inc.

DATE 04/29/18 | PAGE NO. 1

CUSTOMER: Lerson Engineering | WELL NO.: #2 | LEASE: Miller 'D' | JOB TYPE: P.T.A. | TICKET NO.: 27255

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS T	PUMPS C	PRESSURE (PSI) TUBING	PRESSURE (PSI) CASING	DESCRIPTION OF OPERATION AND MATERIALS
	0145							On location, set up trucks,
								RTD - 4450'
								Plugs #1 - 50sks @ 2280'
								#2 - 80sks @ 1500'
								#3 - 50sks @ 750'
								#4 - 50sks @ 300'
								#5 - 20sks @ 60'
								Rathole - 30sks
								Mousehole - 20sks
	0235	4	10					Start water ahead
		4	13					Pump Cement
		4	3½					Pump Water behind
	0255							Rig pump for 2min 15sec no/mud
	0320	4	7					Start water ahead
		4	21					Pump Cement
		4	2½					Pump Water behind
	0335							Have Rig pump for 1min 15sec no/mud.
	0410	4	3					Start water ahead
		4	13					Pump Cement
		4	1					Pump Water behind
	0435	3	2					Pump Water ahead
		3	13					Pump Cement
		3	1					Pump Water behind
	0500	2½	1					Pump Water ahead
		2½	5					Pump Cement
		2½	1					Pump Water behind
	0520	2	8					Plug Rathole
	0525	2	5					Plug Mousehole
								Wash up truck, Rack up
	0530							Job Complete
								Thanks
								Jon, Austin, Isaac

DRILL STEM TEST REPORT

Prepared For: **Larson Engineering, Inc.**

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

Miller O #2

29-18s-30w Lane,KS

Start Date: 2018.04.25 @ 06:57:00
End Date: 2018.04.25 @ 12:58:30
Job Ticket #: 63660 DST #: 1

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

Printed: 2018.05.01 @ 09:10:11

DRILL STEM TEST REPORT

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63660 **DST#: 1**

Test Start: 2018.04.25 @ 06:57:00

GENERAL INFORMATION:

Formation: **LKC H**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 09:56:45
Time Test Ended: 12:58:30

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

Interval: 4125.00 ft (KB) To 4150.00 ft (KB) (TVD)
Total Depth: 4150.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

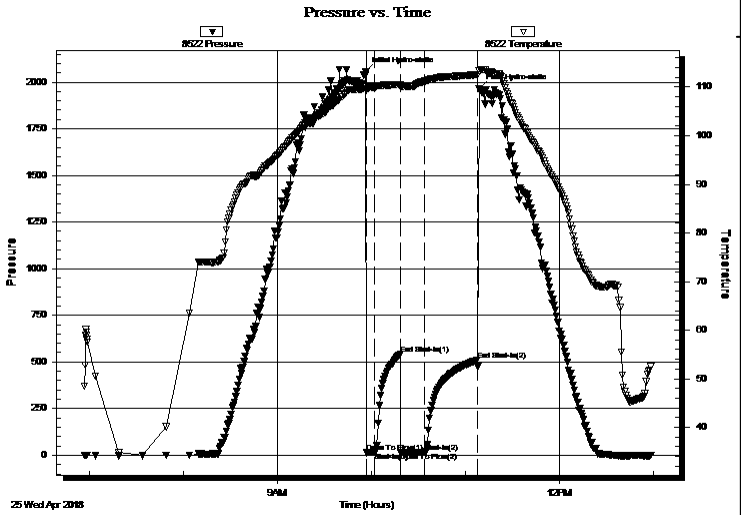
Reference Elevations: 2901.00 ft (KB)
2891.00 ft (CF)
KB to GR/CF: 10.00 ft

Serial #: 8522 **Inside**

Press@RunDepth: 16.18 psig @ 4126.00 ft (KB)
Start Date: 2018.04.25 End Date: 2018.04.25
Start Time: 06:57:05 End Time: 12:58:29

Capacity: 8000.00 psig
Last Calib.: 2018.04.25
Time On Btm: 2018.04.25 @ 09:56:30
Time Off Btm: 2018.04.25 @ 11:08:45

TEST COMMENT: IF: 1/4" Blow .
ISI: No return.
FF: No blow .
FSI: No return.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2056.15	109.73	Initial Hydro-static
1	13.22	109.25	Open To Flow (1)
6	14.76	110.01	Shut-In(1)
22	543.08	110.50	End Shut-In(1)
23	15.34	110.04	Open To Flow (2)
38	16.18	111.21	Shut-In(2)
71	507.99	112.54	End Shut-In(2)
73	1963.53	113.26	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
10.00	Mud 100m (oil spots in tool)	0.14

Gas Rates

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

DRILL STEM TEST REPORT

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63660 **DST#: 1**

Test Start: 2018.04.25 @ 06:57:00

GENERAL INFORMATION:

Formation: **LKC H**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 09:56:45
Time Test Ended: 12:58:30

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

Interval: 4125.00 ft (KB) To 4150.00 ft (KB) (TVD)
Total Depth: 4150.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

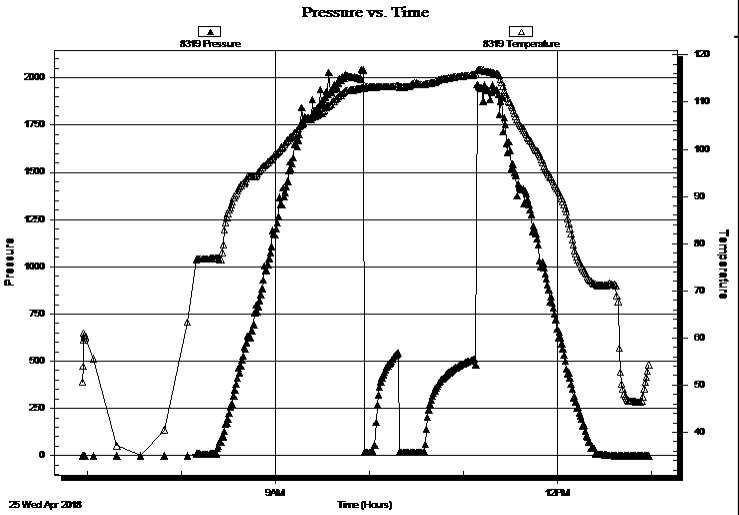
Reference Elevations: 2901.00 ft (KB)
2891.00 ft (CF)
KB to GR/CF: 10.00 ft

Serial #: 8319 **Outside**

Press@RunDepth: psig @ 4126.00 ft (KB)
Start Date: 2018.04.25 End Date: 2018.04.25
Start Time: 06:57:05 End Time: 12:58:29

Capacity: 8000.00 psig
Last Calib.: 2018.04.25
Time On Btm:
Time Off Btm:

TEST COMMENT: IF: 1/4" Blow .
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)
10.00	Mud 100m (oil spots in tool)	0.14

Gas Rates

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

DRILL STEM TEST REPORT

TOOL DIAGRAM

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63660 **DST#: 1**

Test Start: 2018.04.25 @ 06:57:00

Tool Information

Drill Pipe:	Length:	4131.00 ft	Diameter:	3.80	inches	Volume:	57.95	bbl	
Heavy Wt. Pipe:	Length:	0.00 ft	Diameter:	2.75	inches	Volume:	0.00	bbl	
Drill Collar:	Length:	0.00 ft	Diameter:	2.25	inches	Volume:	0.00	bbl	
						Total Volume:	57.95	bbl	

Drill Pipe Above KB:	28.00 ft
Depth to Top Packer:	4125.00 ft
Depth to Bottom Packer:	ft
Interval betw een Packers:	25.00 ft
Tool Length:	47.00 ft
Number of Packers:	2 Diameter: 6.75 inches

Tool Weight:		2000.00 lb
Weight set on Packer:		25000.00 lb
Weight to Pull Loose:		70000.00 lb
Tool Chased		0.00 ft
String Weight:	Initial	51000.00 lb
	Final	51000.00 lb

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths	
Change Over Sub	1.00			4104.00		
Shut In Tool	5.00			4109.00		
Hydraulic tool	5.00			4114.00		
Safety Joint	2.00			4116.00		
Packer	5.00			4121.00	22.00	Bottom Of Top Packer
Packer	4.00			4125.00		
Stubb	1.00			4126.00		
Recorder	0.00	8522	Inside	4126.00		
Recorder	0.00	8319	Outside	4126.00		
Perforations	21.00			4147.00		
Bullnose	3.00			4150.00	25.00	Bottom Packers & Anchor
Total Tool Length:	**47.00**					

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63660 **DST#: 1**

Test Start: 2018.04.25 @ 06:57:00

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:	57.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	6.78 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	2800.00 ppm				
Filter Cake:	1.00 inches				

Recovery Information

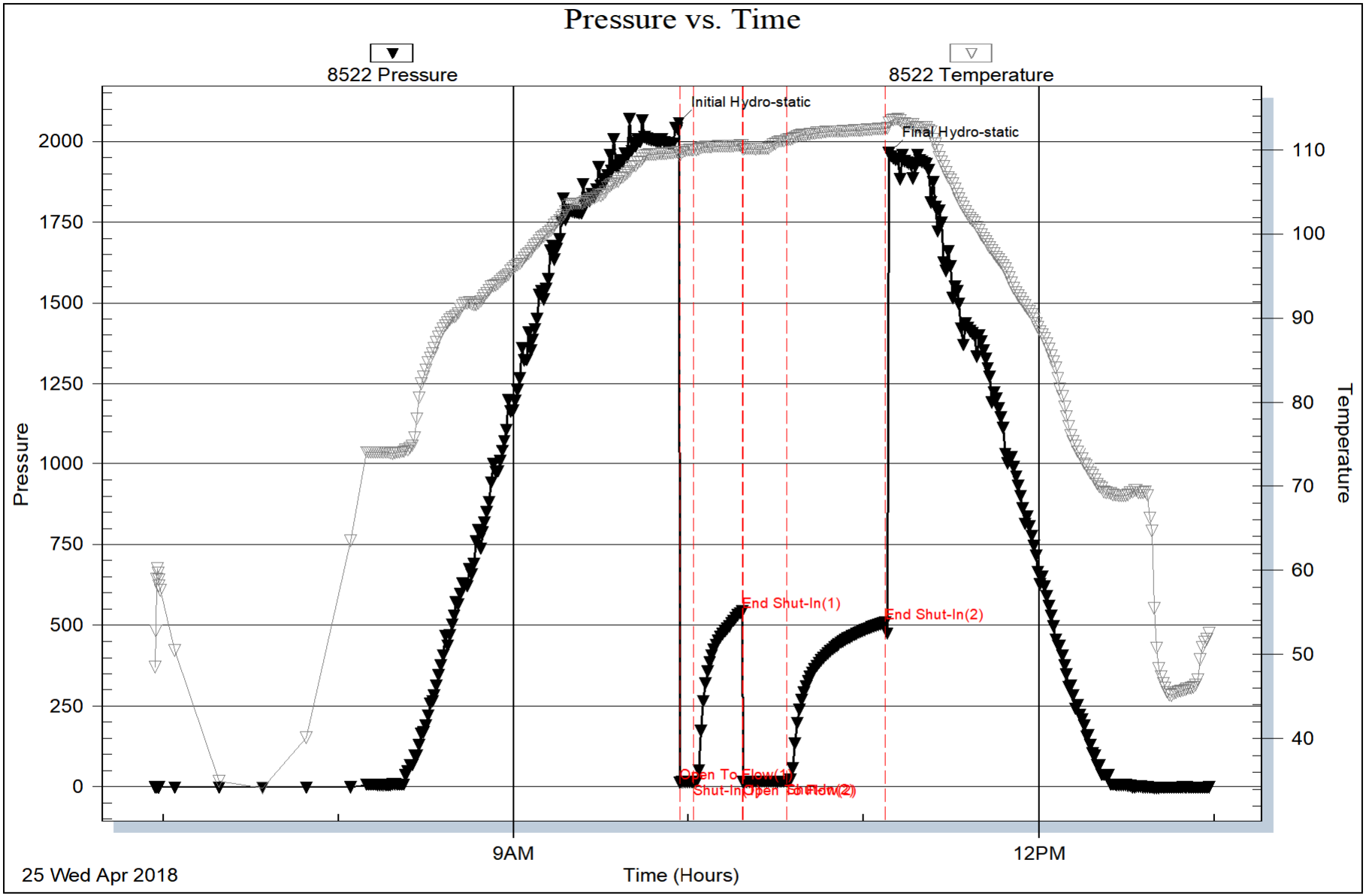
Recovery Table

Length ft	Description	Volume bbl
10.00	Mud 100m (oil spots in tool)	0.140

Total Length: 10.00 ft Total Volume: 0.140 bbl

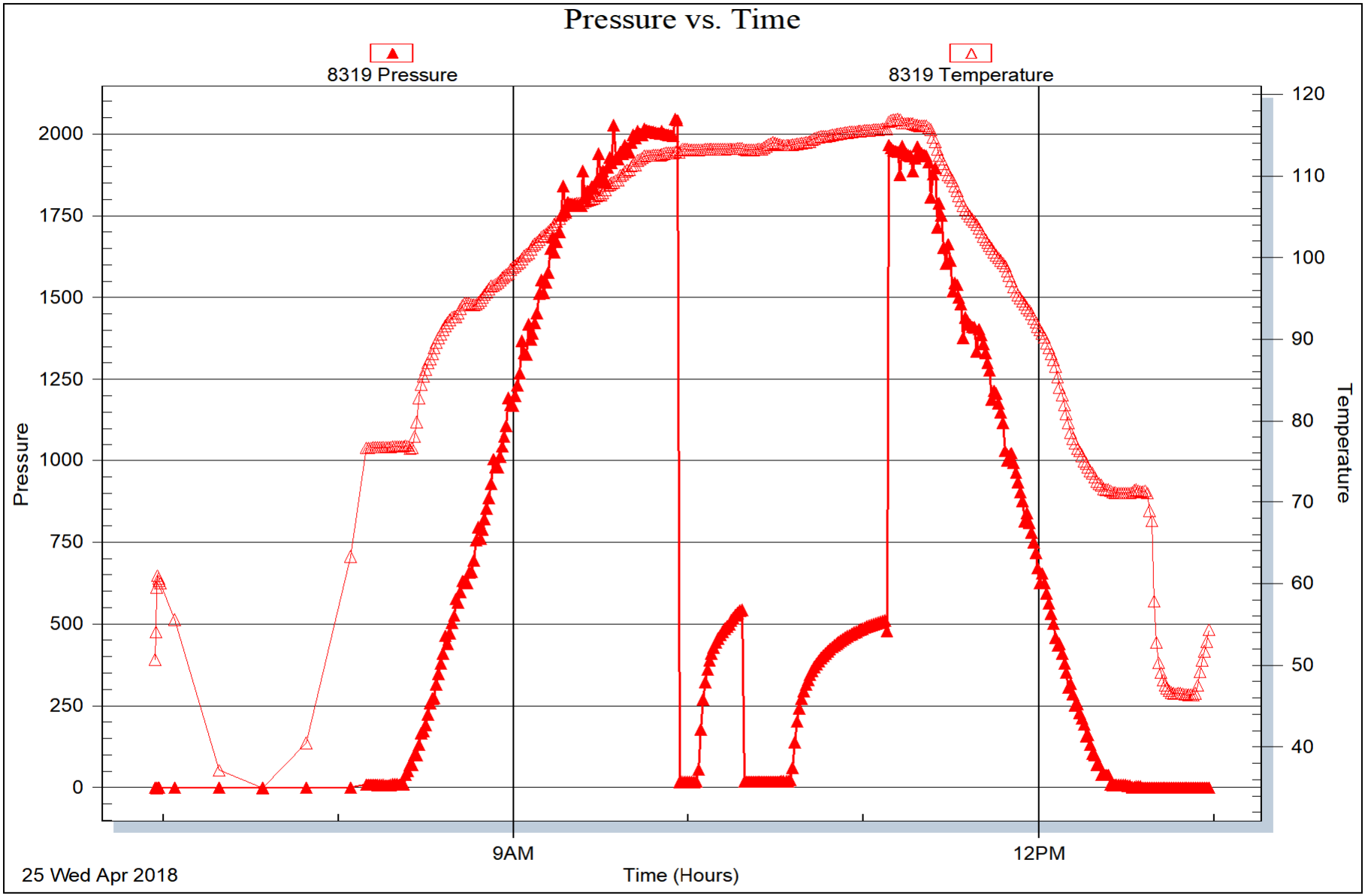
Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
Laboratory Name: Laboratory Location:
Recovery Comments:

Serial #: 8522 **Inside** Larson Engineering, Inc. Miller O #2 DST Test Number: 1



Trilobite Testing, Inc Ref. No: 63660 Printed: 2018.05.01 @ 09:10:12

Serial #: 8319 **Outside** Larson Engineering, Inc. Miller O #2 DST Test Number: 1



Trilobite Testing, Inc Ref. No: 63660 Printed: 2018.05.01 @ 09:10:12

DRILL STEM TEST REPORT

Prepared For: **Larson Engineering, Inc.**

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

Miller O #2

29-18s-30w Lane,KS

Start Date: 2018.04.26 @ 02:24:00
End Date: 2018.04.26 @ 08:33:00
Job Ticket #: 63661 DST #: 2

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

Printed: 2018.05.01 @ 09:09:01

DRILL STEM TEST REPORT

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63661 **DST#: 2**

Test Start: 2018.04.26 @ 02:24:00

GENERAL INFORMATION:

Formation: **LKC K**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 04:46:15
Time Test Ended: 08:33:00

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

Interval: 4226.00 ft (KB) To 4241.00 ft (KB) (TVD)
Total Depth: 4226.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

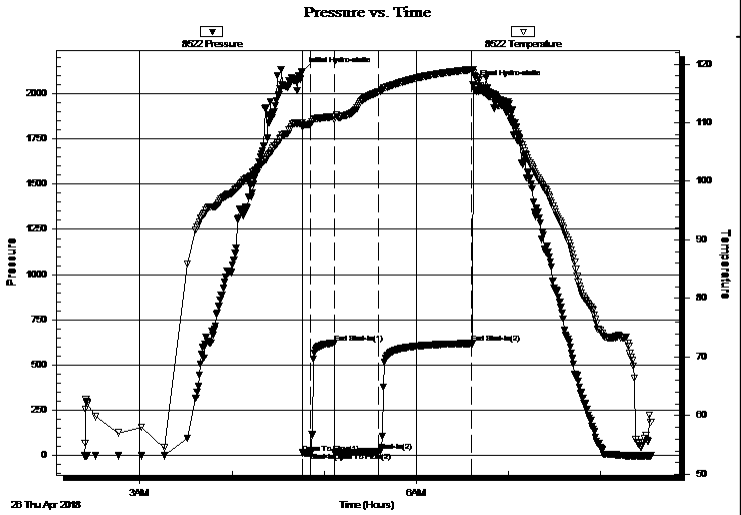
Reference Elevations: 2901.00 ft (KB)
2891.00 ft (CF)
KB to GR/CF: 10.00 ft

Serial #: 8522 **Inside**

Press@RunDepth: 21.16 psig @ 4227.00 ft (KB)
Start Date: 2018.04.26 End Date: 2018.04.26
Start Time: 02:24:05 End Time: 08:32:59

Capacity: 8000.00 psig
Last Calib.: 2018.04.26
Time On Btm: 2018.04.26 @ 04:46:00
Time Off Btm: 2018.04.26 @ 06:37:00

TEST COMMENT: IF: 1/2" blow .
ISI: No return.
FF: 1 1/2" blow .
FSI: No return.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2124.03	109.97	Initial Hydro-static
1	13.10	109.34	Open To Flow (1)
5	14.38	109.73	Shut-In(1)
21	621.67	111.04	End Shut-In(1)
21	15.50	110.56	Open To Flow (2)
50	21.16	115.28	Shut-In(2)
110	619.03	119.06	End Shut-In(2)
111	2048.67	119.10	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
20.00	w cm 20w 80m (oil puddle on top)	0.28

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63661 **DST#: 2**

Test Start: 2018.04.26 @ 02:24:00

GENERAL INFORMATION:

Formation: **LKC K**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 04:46:15
Time Test Ended: 08:33:00

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

Interval: 4226.00 ft (KB) To 4241.00 ft (KB) (TVD)
Total Depth: 4226.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

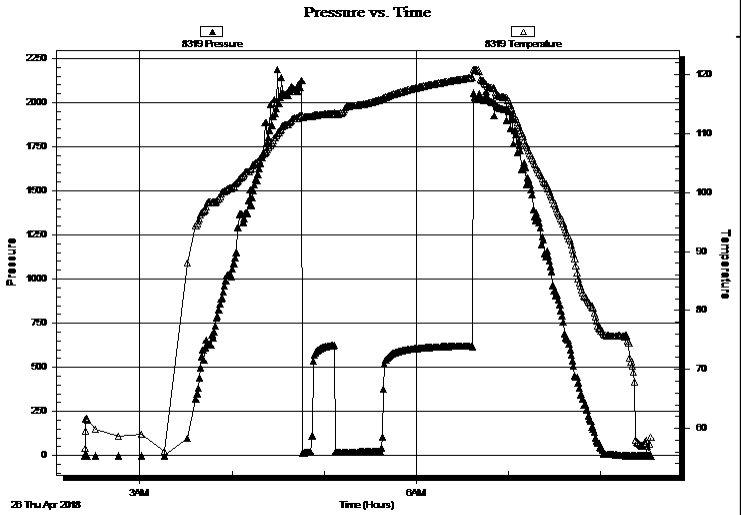
Reference Elevations: 2901.00 ft (KB)
2891.00 ft (CF)
KB to GR/CF: 10.00 ft

Serial #: 8319 **Outside**

Press@RunDepth: psig @ 4227.00 ft (KB)
Start Date: 2018.04.26 End Date: 2018.04.26
Start Time: 02:24:05 End Time: 08:32:59

Capacity: 8000.00 psig
Last Calib.: 2018.04.26
Time On Btm:
Time Off Btm:

TEST COMMENT: IF: 1/2" blow .
ISI: No return.
FF: 1 1/2" blow .
FSI: No return.



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
20.00	w cm 20w 80m (oil puddle on top)	0.28

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

TOOL DIAGRAM

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63661 **DST#: 2**

Test Start: 2018.04.26 @ 02:24:00

Tool Information

Drill Pipe:	Length:	4226.00 ft	Diameter:	3.80 inches	Volume:	59.28 bbl	
Heavy Wt. Pipe:	Length:	0.00 ft	Diameter:	2.75 inches	Volume:	0.00 bbl	
Drill Collar:	Length:	0.00 ft	Diameter:	2.25 inches	Volume:	0.00 bbl	
					Total Volume:	59.28 bbl	

Drill Pipe Above KB:	22.00 ft
Depth to Top Packer:	4226.00 ft
Depth to Bottom Packer:	ft
Interval betw een Packers:	15.00 ft
Tool Length:	37.00 ft
Number of Packers:	2 Diameter: 6.75 inches

Tool Weight:	2000.00 lb
Weight set on Packer:	25000.00 lb
Weight to Pull Loose:	70000.00 lb
Tool Chased	0.00 ft
String Weight: Initial	50000.00 lb
Final	50000.00 lb

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths	
Change Over Sub	1.00			4205.00		
Shut In Tool	5.00			4210.00		
Hydraulic tool	5.00			4215.00		
Safety Joint	2.00			4217.00		
Packer	5.00			4222.00	22.00	Bottom Of Top Packer
Packer	4.00			4226.00		
Stubb	1.00			4227.00		
Recorder	0.00	8522	Inside	4227.00		
Recorder	0.00	8319	Outside	4227.00		
Perforations	11.00			4238.00		
Bullnose	3.00			4241.00	15.00	Bottom Packers & Anchor
Total Tool Length:	**37.00**					

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63661 **DST#: 2**

Test Start: 2018.04.26 @ 02:24:00

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:	53.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	6.78 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	2800.00 ppm				
Filter Cake:	1.00 inches				

Recovery Information

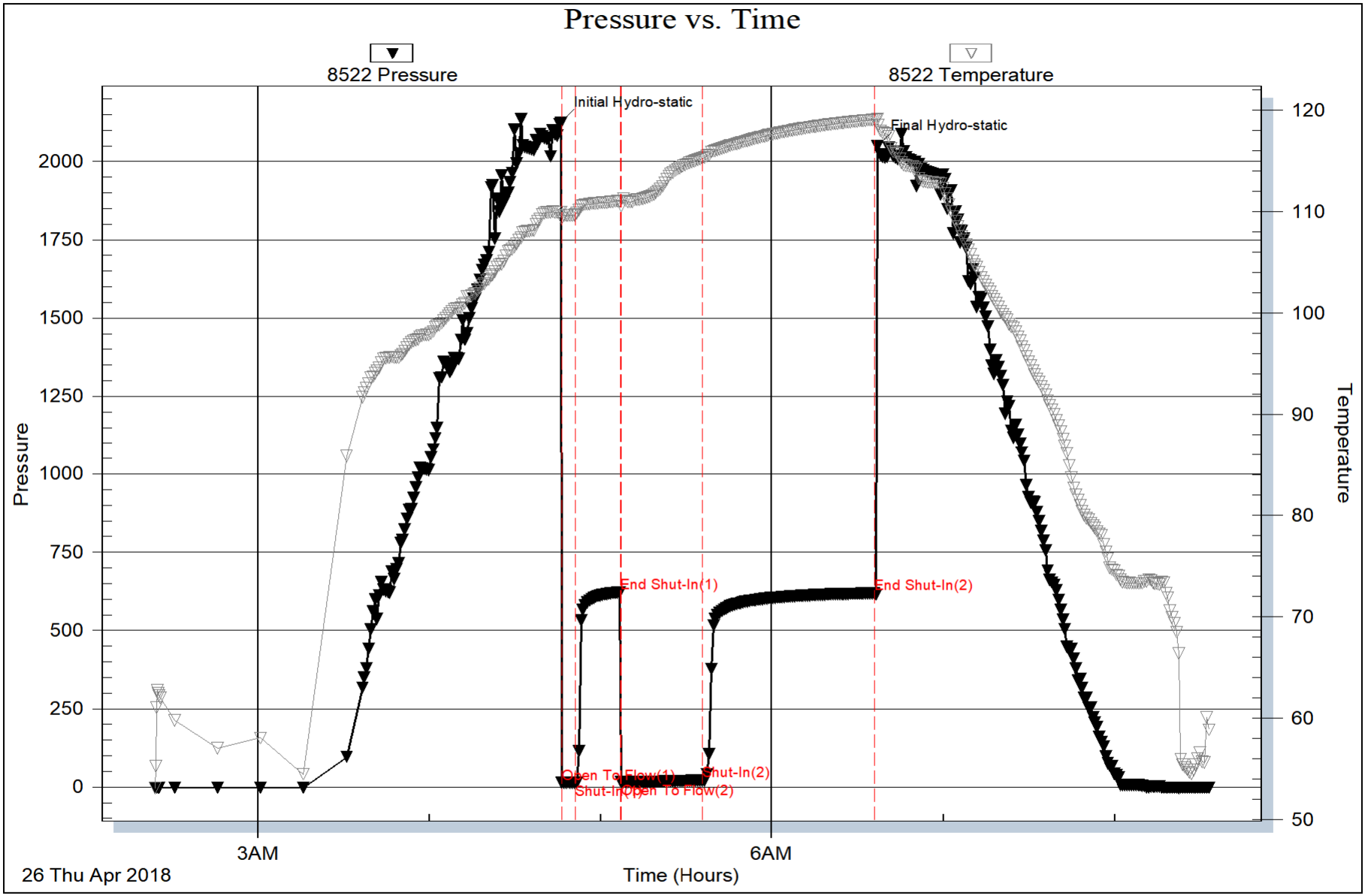
Recovery Table

Length ft	Description	Volume bbl
20.00	w cm 20w 80m (oil puddle on top)	0.281

Total Length: 20.00 ft Total Volume: 0.281 bbl

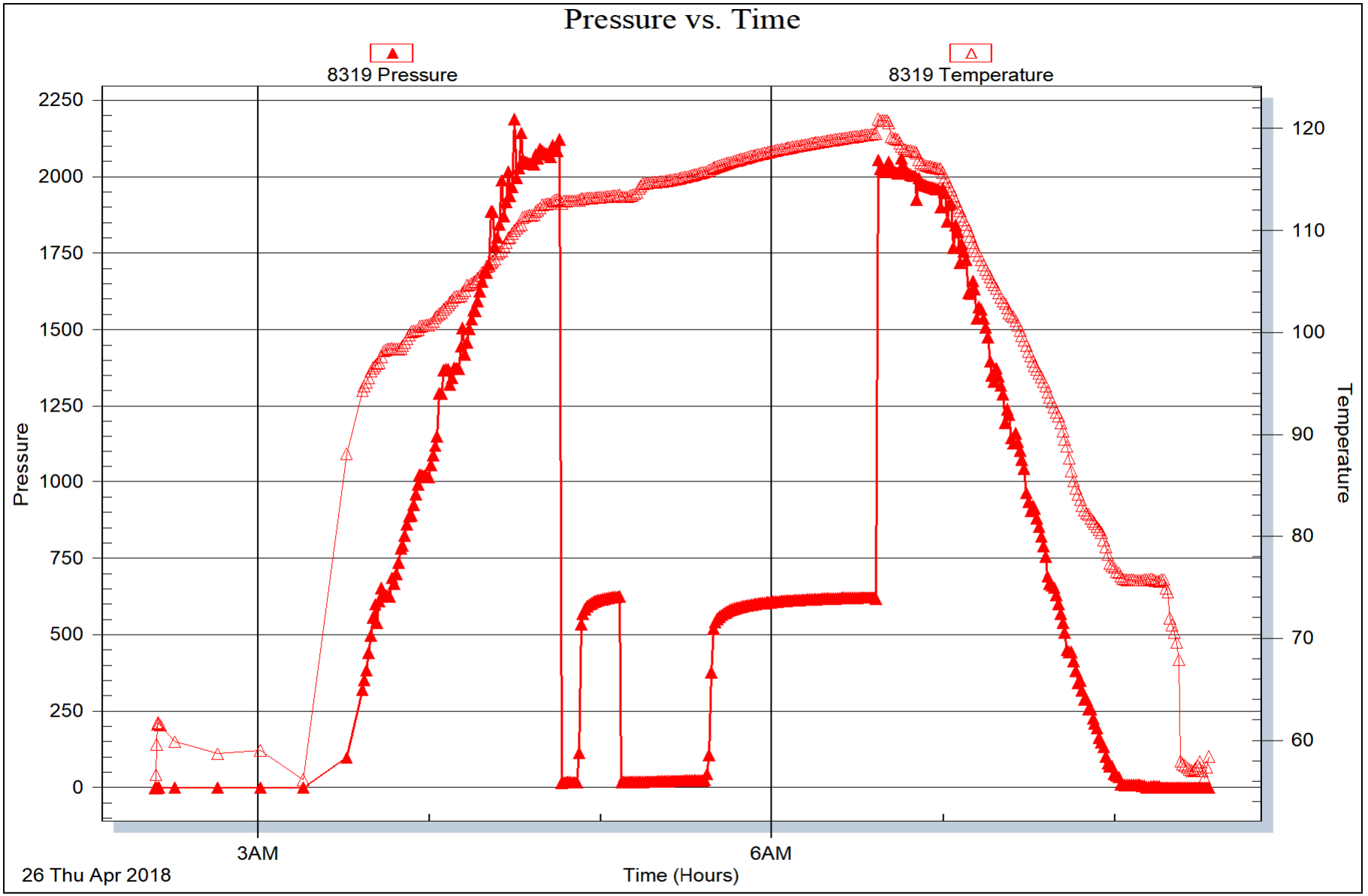
Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
Laboratory Name: Laboratory Location:
Recovery Comments:

Serial #: 8522 **Inside** Larson Engineering, Inc. Miller O #2 DST Test Number: 2



Trilobite Testing, Inc Ref. No: 63661 Printed: 2018.05.01 @ 09:09:02

Serial #: 8319 **Outside** Larson Engineering, Inc. Miller O #2 DST Test Number: 2



Trilobite Testing, Inc Ref. No: 63661 Printed: 2018.05.01 @ 09:09:02

TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Prepared For: **Larson Engineering, Inc.**

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

Miller O #2

29-18s-30w Lane,KS

Start Date: 2018.04.26 @ 19:31:00
End Date: 2018.04.27 @ 00:26:00
Job Ticket #: 63662 DST #: 3

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

Printed: 2018.05.01 @ 09:05:45

DRILL STEM TEST REPORT

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63662 **DST#: 3**

Test Start: 2018.04.26 @ 19:31:00

GENERAL INFORMATION:

Formation: **LKC L**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 21:32:15
Time Test Ended: 00:26:00

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

Interval: 4264.00 ft (KB) To 4285.00 ft (KB) (TVD)
Total Depth: 4285.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

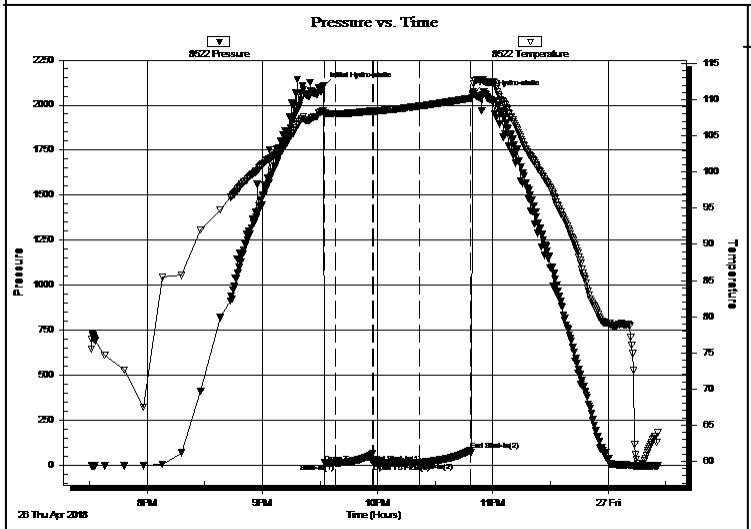
Reference Elevations: 2901.00 ft (KB)
2891.00 ft (CF)
KB to GR/CF: 10.00 ft

Serial #: 8522 **Inside**

Press@RunDepth: 16.09 psig @ 4265.00 ft (KB)
Start Date: 2018.04.26 End Date: 2018.04.27
Start Time: 19:31:05 End Time: 00:25:59

Capacity: 8000.00 psig
Last Calib.: 2018.04.27
Time On Btm: 2018.04.26 @ 21:31:45
Time Off Btm: 2018.04.26 @ 22:49:15

TEST COMMENT: IF: 1/4" blow .
ISI: No return.
FF: No blow .
FSI: No return.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2104.85	108.50	Initial Hydro-static
1	13.61	107.97	Open To Flow (1)
6	14.03	108.04	Shut-In(1)
26	63.19	108.44	End Shut-In(1)
26	12.96	108.36	Open To Flow (2)
50	16.09	109.10	Shut-In(2)
77	82.79	110.19	End Shut-In(2)
78	2057.39	110.87	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
3.00	Mud 100m (oil spots in tool)	0.04

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63662 **DST#: 3**

Test Start: 2018.04.26 @ 19:31:00

GENERAL INFORMATION:

Formation: **LKC L**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 21:32:15
Time Test Ended: 00:26:00

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

Interval: 4264.00 ft (KB) To 4285.00 ft (KB) (TVD)
Total Depth: 4285.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

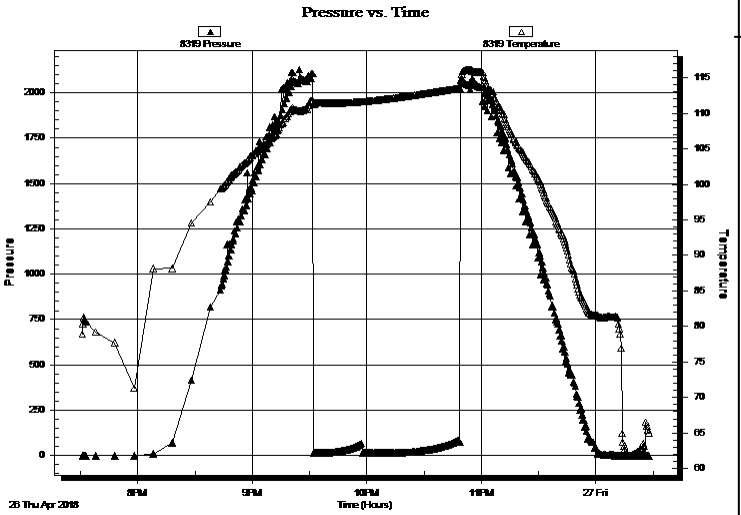
Reference Elevations: 2901.00 ft (KB)
2891.00 ft (CF)
KB to GR/CF: 10.00 ft

Serial #: 8319 **Outside**

Press@RunDepth: psig @ 4265.00 ft (KB)
Start Date: 2018.04.26 End Date: 2018.04.27
Start Time: 19:31:05 End Time: 00:27:44

Capacity: 8000.00 psig
Last Calib.: 2018.04.27
Time On Btm:
Time Off Btm:

TEST COMMENT: IF: 1/4" blow .
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 (oil spots in tool)	0.04

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

TOOL DIAGRAM

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63662 **DST#: 3**

Test Start: 2018.04.26 @ 19:31:00

Tool Information

Drill Pipe:	Length:	4257.00 ft	Diameter:	3.80 inches	Volume:	59.71 bbl	
Heavy Wt. Pipe:	Length:	0.00 ft	Diameter:	2.75 inches	Volume:	0.00 bbl	
Drill Collar:	Length:	0.00 ft	Diameter:	2.25 inches	Volume:	0.00 bbl	
					Total Volume:	59.71 bbl	

Drill Pipe Above KB:	15.00 ft
Depth to Top Packer:	4264.00 ft
Depth to Bottom Packer:	ft
Interval betw een Packers:	21.00 ft
Tool Length:	43.00 ft
Number of Packers:	2 Diameter: 6.75 inches

Tool Weight:		2000.00 lb
Weight set on Packer:		25000.00 lb
Weight to Pull Loose:		70000.00 lb
Tool Chased		0.00 ft
String Weight:	Initial	51000.00 lb
	Final	51000.00 lb

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths	
Change Over Sub	1.00			4243.00		
Shut In Tool	5.00			4248.00		
Hydraulic tool	5.00			4253.00		
Safety Joint	2.00			4255.00		
Packer	5.00			4260.00	22.00	Bottom Of Top Packer
Packer	4.00			4264.00		
Stubb	1.00			4265.00		
Recorder	0.00	8522	Inside	4265.00		
Recorder	0.00	8319	Outside	4265.00		
Perforations	17.00			4282.00		
Bullnose	3.00			4285.00	21.00	Bottom Packers & Anchor
Total Tool Length:	**43.00**					

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63662 **DST#: 3**

Test Start: 2018.04.26 @ 19:31:00

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:	49.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	6.78 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	2800.00 ppm				
Filter Cake:	1.00 inches				

Recovery Information

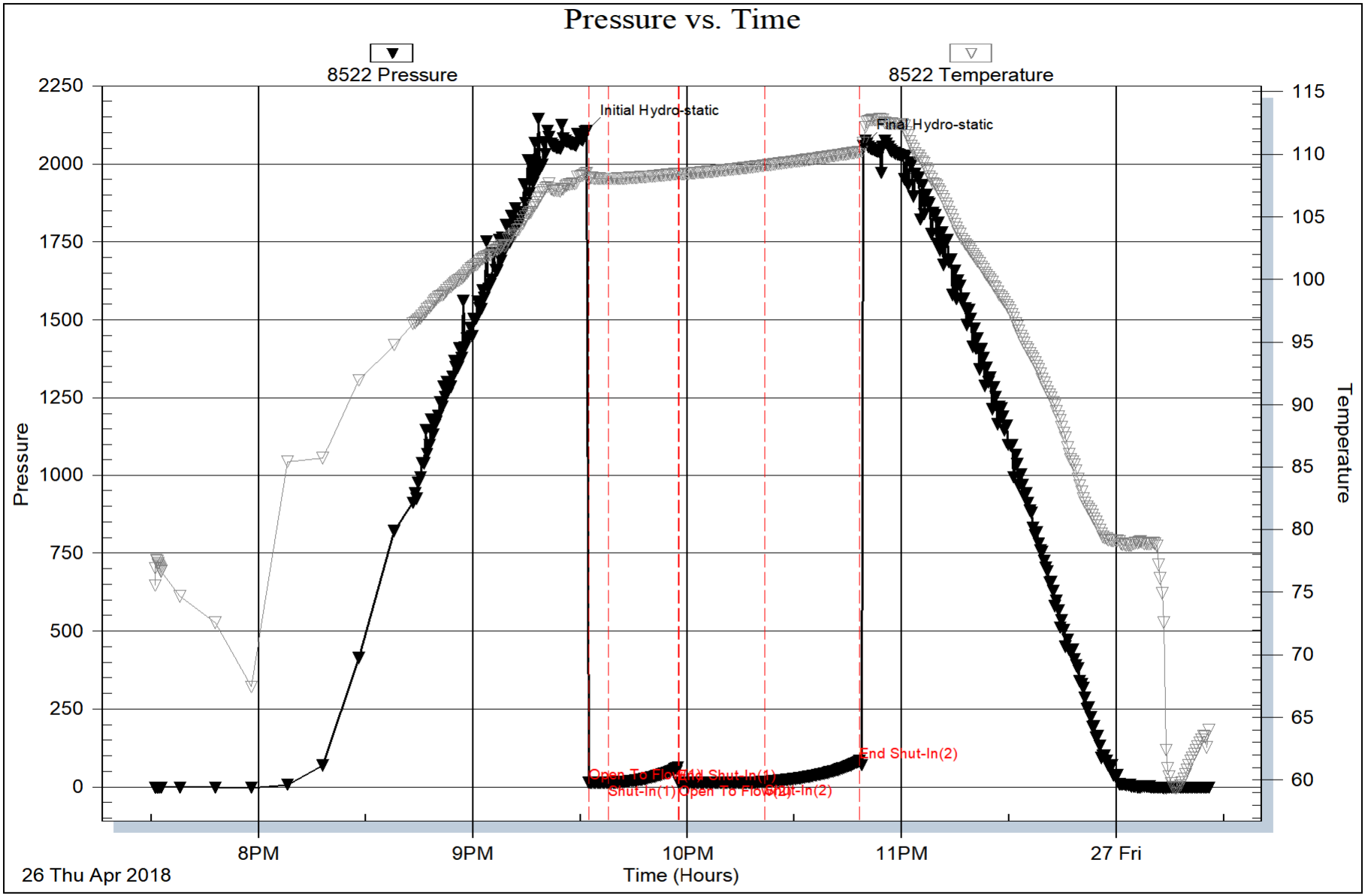
Recovery Table

Length ft	Description	Volume bbl
3.00	Mud 100m (oil spots in tool)	0.042

Total Length: 3.00 ft Total Volume: 0.042 bbl

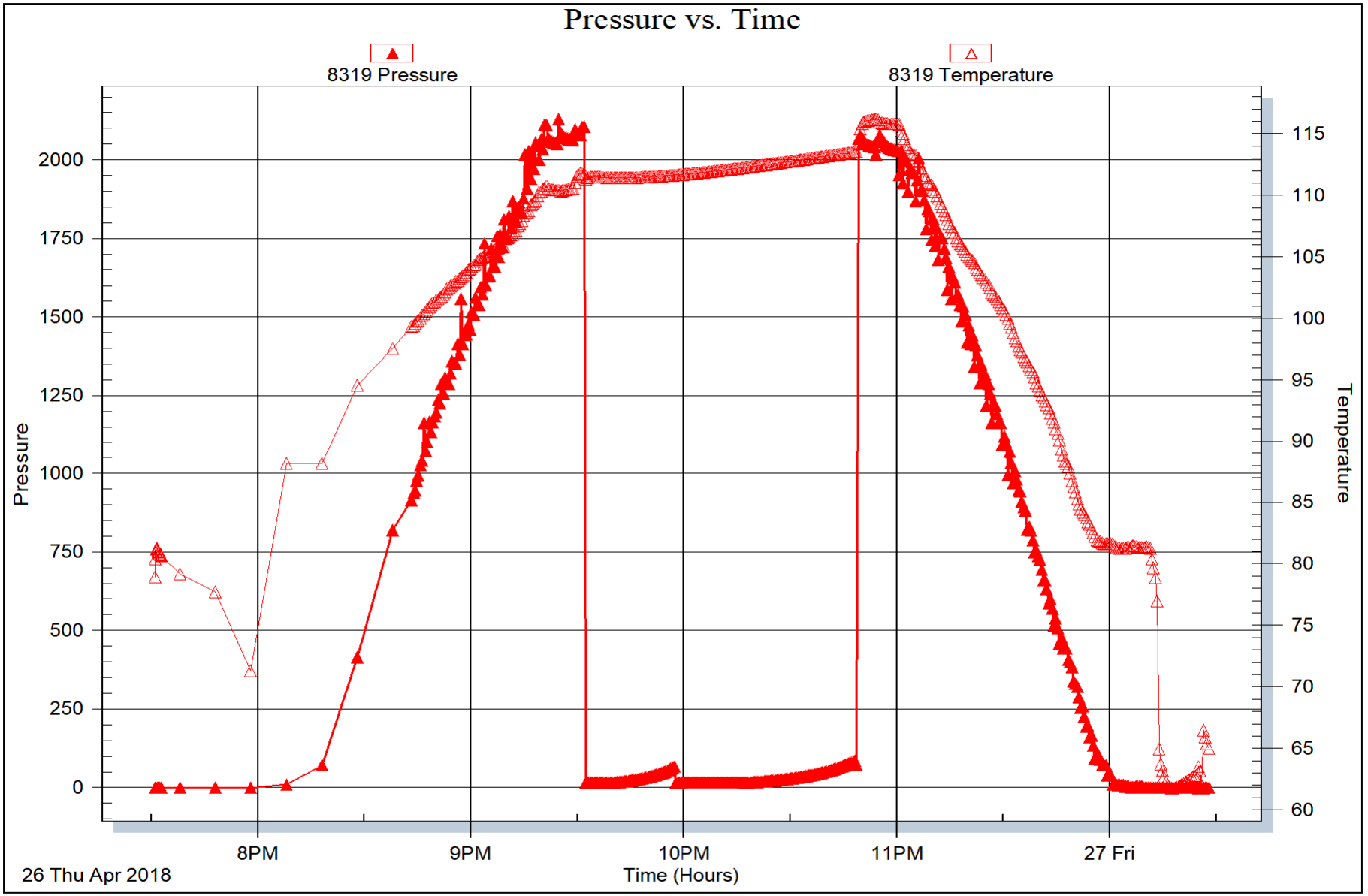
Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
Laboratory Name: Laboratory Location:
Recovery Comments:

Serial #: 8522 **Inside** Larson Engineering, Inc. Miller O #2 DST Test Number: 3



Trilobite Testing, Inc Ref. No: 63662 Printed: 2018.05.01 @ 09:05:46

Serial #: 8319 **Outside** Larson Engineering, Inc. Miller O #2 DST Test Number: 3



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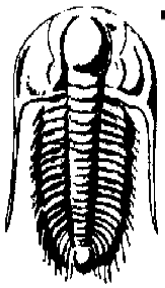


TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Prepared For: **Larson Engineering, Inc.**

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

Miller O #2

29-18s-30w Lane,KS

Start Date: 2018.04.27 @ 11:03:00
End Date: 2018.04.27 @ 16:55:00
Job Ticket #: 63663 DST #: 4

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

Printed: 2018.05.01 @ 09:05:10

DRILL STEM TEST REPORT

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63663 **DST#: 4**

Test Start: 2018.04.27 @ 11:03:00

GENERAL INFORMATION:

Formation: **Pleasanton**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 13:07:00
Time Test Ended: 16:55:00

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

Interval: 4301.00 ft (KB) To 4350.00 ft (KB) (TVD)
Total Depth: 4350.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

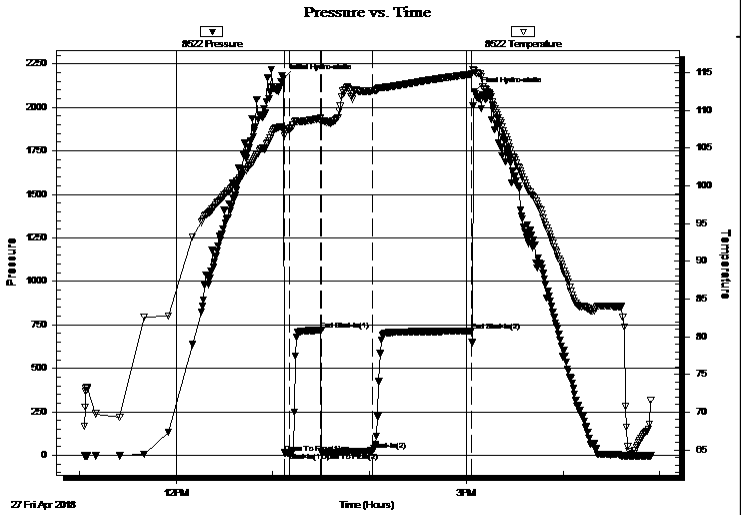
Reference Elevations: 2901.00 ft (KB)
2891.00 ft (CF)
KB to GR/CF: 10.00 ft

Serial #: 8522 **Inside**

Press@RunDepth: 26.58 psig @ 4302.00 ft (KB)
Start Date: 2018.04.27 End Date: 2018.04.27
Start Time: 11:03:05 End Time: 16:54:59

Capacity: 8000.00 psig
Last Calib.: 2018.04.27
Time On Btm: 2018.04.27 @ 13:06:45
Time Off Btm: 2018.04.27 @ 15:05:00

TEST COMMENT: IF: 3/4" blow .
ISI: No return.
FF: 2" blow .
FSI: No return.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2166.38	107.60	Initial Hydro-static
1	14.64	106.62	Open To Flow (1)
4	15.44	107.56	Shut-In(1)
23	719.30	108.96	End Shut-In(1)
24	16.77	108.37	Open To Flow (2)
55	26.58	112.59	Shut-In(2)
117	713.24	114.81	End Shut-In(2)
119	2089.63	115.32	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
30.00	w cm 10w 90m(oil spots)	0.42

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63663 **DST#: 4**

Test Start: 2018.04.27 @ 11:03:00

GENERAL INFORMATION:

Formation: **Pleasanton**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 13:07:00
Time Test Ended: 16:55:00

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

Interval: 4301.00 ft (KB) To 4350.00 ft (KB) (TVD)
Total Depth: 4350.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

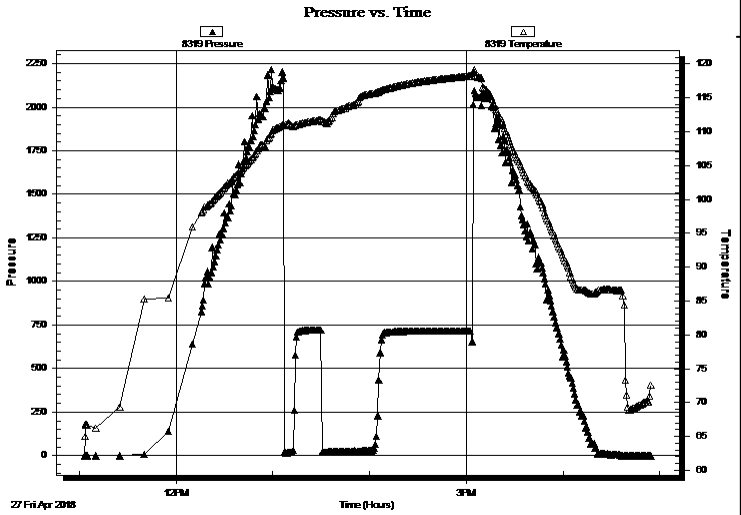
Reference Elevations: 2901.00 ft (KB)
2891.00 ft (CF)
KB to GR/CF: 10.00 ft

Serial #: 8319 **Outside**

Press@RunDepth: psig @ 4302.00 ft (KB)
Start Date: 2018.04.27 End Date: 2018.04.27
Start Time: 11:03:05 End Time: 16:54:59

Capacity: 8000.00 psig
Last Calib.: 2018.04.27
Time On Btm:
Time Off Btm:

TEST COMMENT: IF: 3/4" blow .
ISI: No return.
FF: 2" blow .
FSI: No return.



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
30.00	w cm 10w 90m(oil spots)	0.42

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

TOOL DIAGRAM

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63663 **DST#: 4**

Test Start: 2018.04.27 @ 11:03:00

Tool Information

Drill Pipe:	Length:	4289.00 ft	Diameter:	3.80 inches	Volume:	60.16 bbl	
Heavy Wt. Pipe:	Length:	0.00 ft	Diameter:	2.75 inches	Volume:	0.00 bbl	
Drill Collar:	Length:	0.00 ft	Diameter:	2.25 inches	Volume:	0.00 bbl	
					Total Volume:	60.16 bbl	

Drill Pipe Above KB:	10.00 ft
Depth to Top Packer:	4301.00 ft
Depth to Bottom Packer:	ft
Interval betw een Packers:	49.00 ft
Tool Length:	71.00 ft
Number of Packers:	2 Diameter: 6.75 inches

Tool Weight:		2000.00 lb
Weight set on Packer:		25000.00 lb
Weight to Pull Loose:		70000.00 lb
Tool Chased		0.00 ft
String Weight:	Initial	52000.00 lb
	Final	52000.00 lb

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths	
Change Over Sub	1.00			4280.00		
Shut In Tool	5.00			4285.00		
Hydraulic tool	5.00			4290.00		
Safety Joint	2.00			4292.00		
Packer	5.00			4297.00	22.00	Bottom Of Top Packer
Packer	4.00			4301.00		
Stubb	1.00			4302.00		
Recorder	0.00	8522	Inside	4302.00		
Recorder	0.00	8319	Outside	4302.00		
Perforations	12.00			4314.00		
Change Over Sub	1.00			4315.00		
Drill Pipe	31.00			4346.00		
Change Over Sub	1.00			4347.00		
Bullnose	3.00			4350.00	49.00	Bottom Packers & Anchor
Total Tool Length:	**71.00**					

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63663 **DST#: 4**

Test Start: 2018.04.27 @ 11:03:00

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:	6.79 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	2700.00 ppm				
Filter Cake:	1.00 inches				

Recovery Information

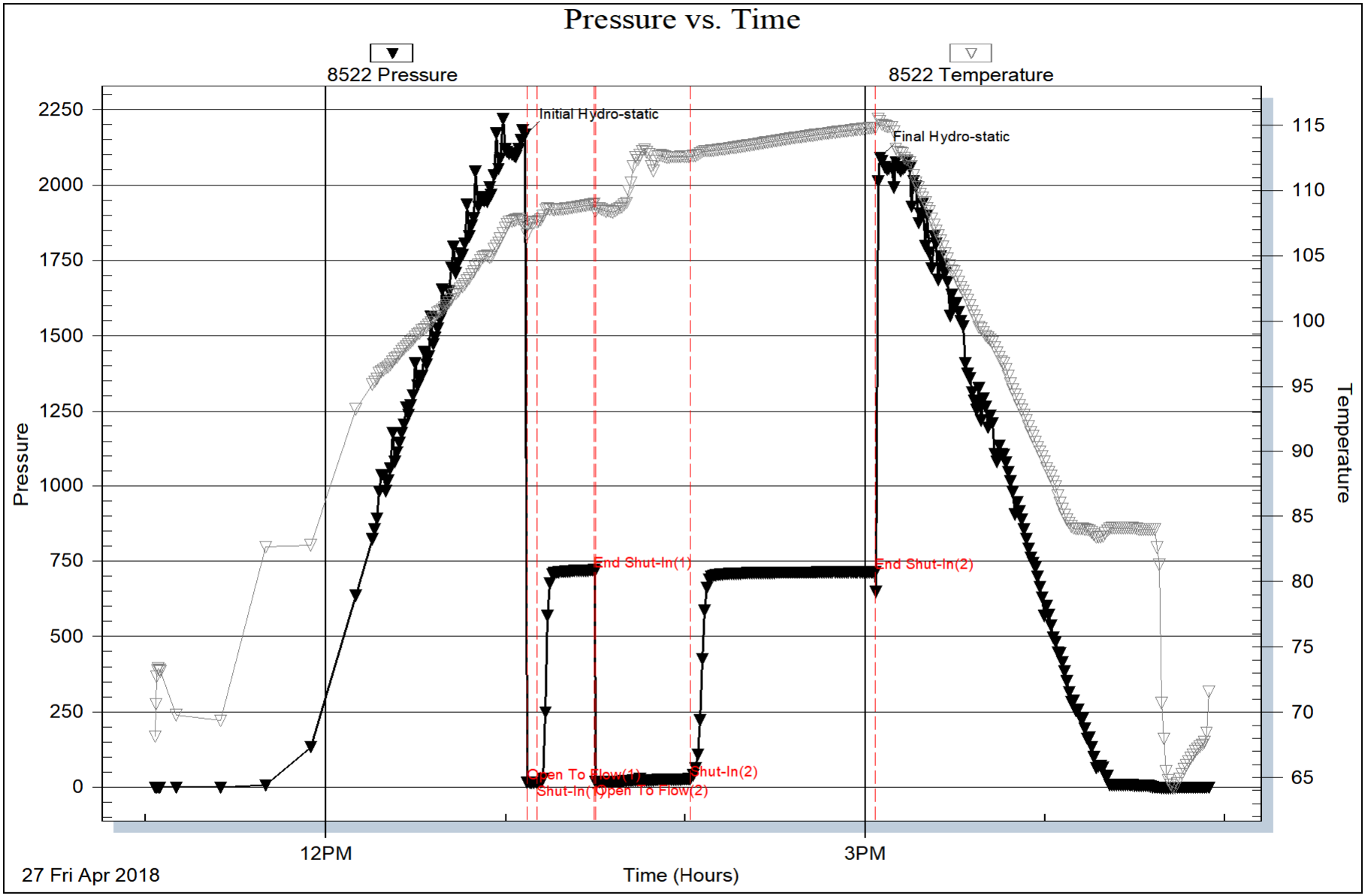
Recovery Table

Length ft	Description	Volume bbl
30.00	w cm 10w 90m(oil spots)	0.421

Total Length: 30.00 ft Total Volume: 0.421 bbl

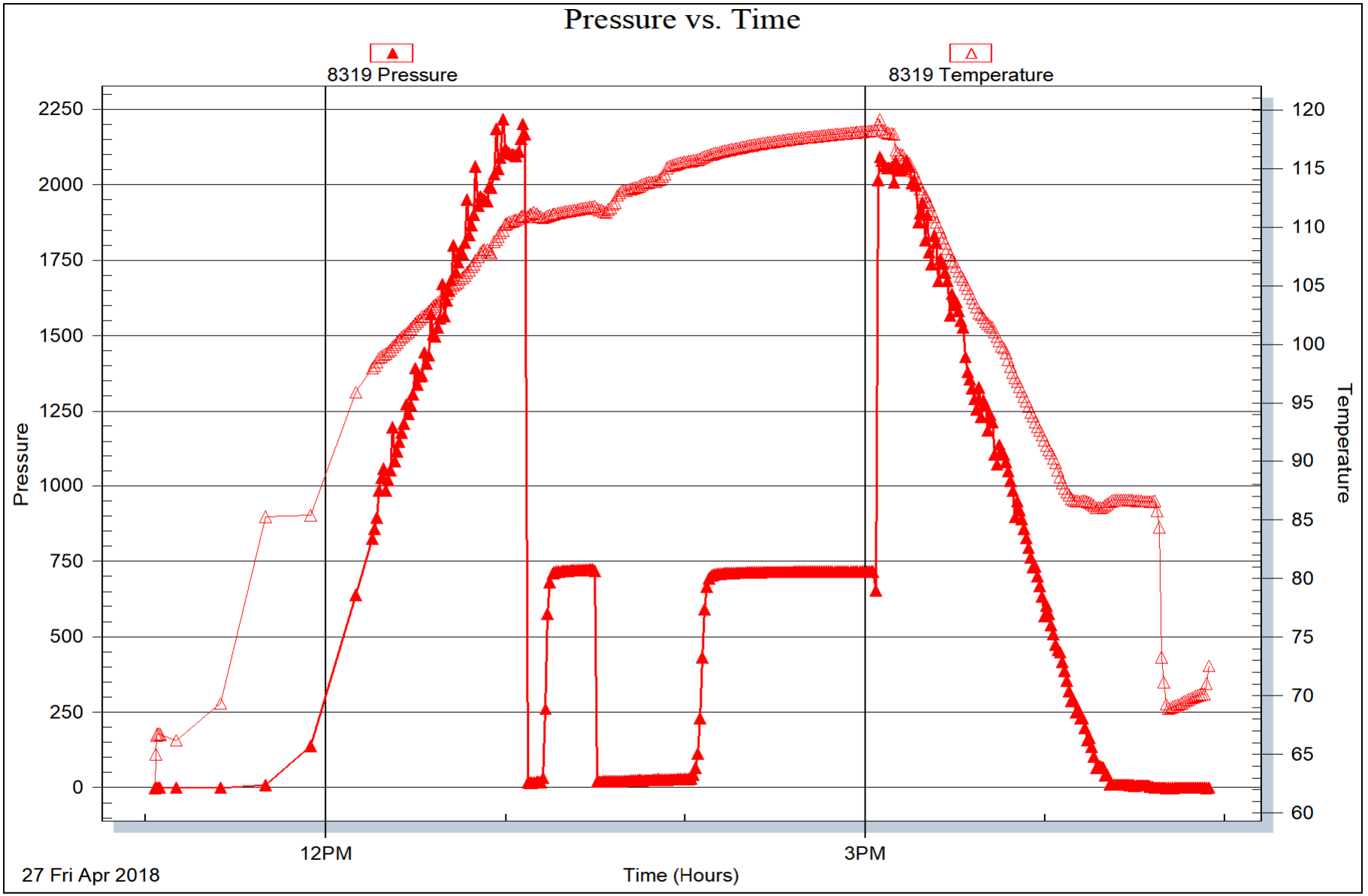
Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
Laboratory Name: Laboratory Location:
Recovery Comments:

Serial #: 8522 **Inside** Larson Engineering, Inc. Miller O #2 DST Test Number: 4



Trilobite Testing, Inc Ref. No: 63663 Printed: 2018.05.01 @ 09:05:11

Serial #: 8319 **Outside** Larson Engineering, Inc. Miller O #2 DST Test Number: 4



Trilobite Testing, Inc Ref. No: 63663 Printed: 2018.05.01 @ 09:05:11

DRILL STEM TEST REPORT

Prepared For: **Larson Engineering, Inc.**

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

Miller O #2

29-18s-30w Lane,KS

Start Date: 2018.04.28 @ 02:15:00
End Date: 2018.04.28 @ 08:24:00
Job Ticket #: 63664 DST #: 5

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

Printed: 2018.05.01 @ 09:04:41

DRILL STEM TEST REPORT

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63664 **DST#: 5**

Test Start: 2018.04.28 @ 02:15:00

GENERAL INFORMATION:

Formation: **Altamont.**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 04:44:45
Time Test Ended: 08:24:00

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

Interval: 4348.00 ft (KB) To 4392.00 ft (KB) (TVD)
Total Depth: 4392.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

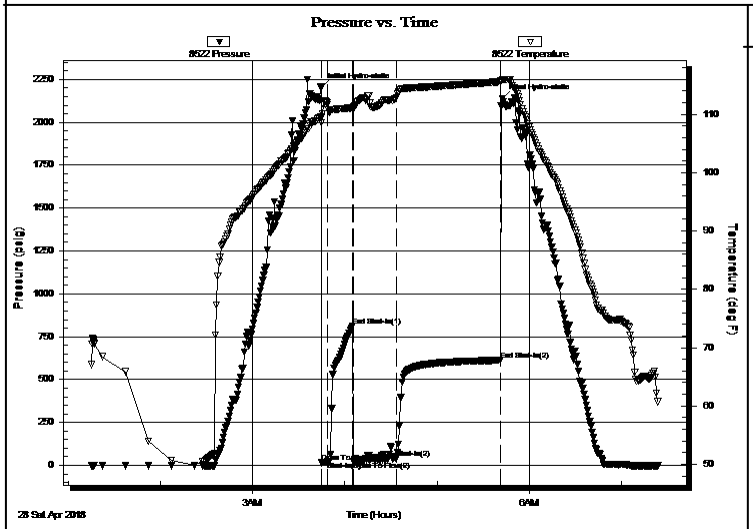
Reference Elevations: 2901.00 ft (KB)
2891.00 ft (CF)
KB to GR/CF: 10.00 ft

Serial #: 8522 **Inside**

Press@RunDepth: 40.88 psig @ 4349.00 ft (KB)
Start Date: 2018.04.28 End Date: 2018.04.28
Start Time: 01:15:05 End Time: 07:23:59

Capacity: 8000.00 psig
Last Calib.: 2018.04.28
Time On Btm: 2018.04.28 @ 03:44:30
Time Off Btm: 2018.04.28 @ 05:42:30

TEST COMMENT: IF: 1" blow .
ISI: No return.
FF: 3" blow .
FSI: No return.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2204.46	109.50	Initial Hydro-static
1	15.22	108.59	Open To Flow (1)
5	21.22	111.66	Shut-In(1)
21	812.88	111.12	End Shut-In(1)
21	20.76	110.90	Open To Flow (2)
49	40.88	112.91	Shut-In(2)
117	612.57	115.59	End Shut-In(2)
118	2138.86	115.99	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
45.00	Mud 100m (oil spots)	0.63

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63664 **DST#: 5**

Test Start: 2018.04.28 @ 02:15:00

GENERAL INFORMATION:

Formation: **Altamont.**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 04:44:45
Time Test Ended: 08:24:00

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

Interval: 4348.00 ft (KB) To 4392.00 ft (KB) (TVD)
Total Depth: 4392.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Good

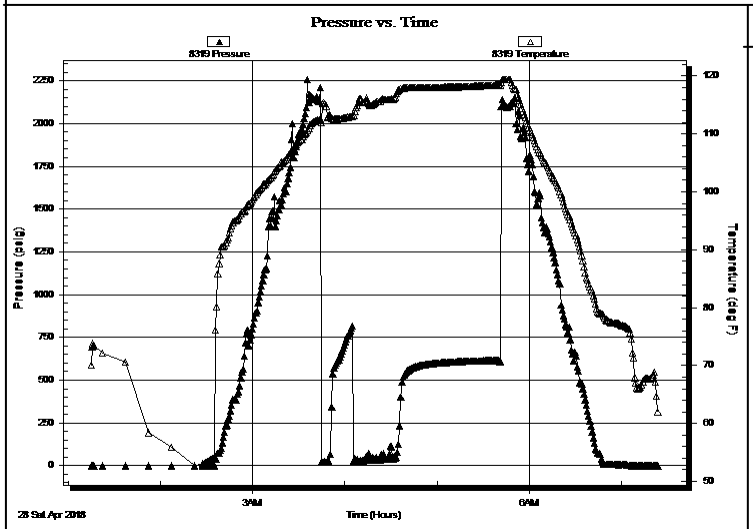
Reference Elevations: 2901.00 ft (KB)
2891.00 ft (CF)
KB to GR/CF: 10.00 ft

Serial #: 8319 **Outside**

Press@RunDepth: psig @ 4349.00 ft (KB)
Start Date: 2018.04.28 End Date: 2018.04.28
Start Time: 01:15:05 End Time: 07:23:59

Capacity: 8000.00 psig
Last Calib.: 2018.04.28
Time On Btm:
Time Off Btm:

TEST COMMENT: IF: 1" blow .
ISI: No return.
FF: 3" blow .
FSI: No return.



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
45.00	Mud 100m (oil spots)	0.63

* Recovery from multiple tests

Gas Rates

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

DRILL STEM TEST REPORT

TOOL DIAGRAM

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63664 **DST#: 5**

Test Start: 2018.04.28 @ 02:15:00

Tool Information

Drill Pipe:	Length:	4353.00 ft	Diameter:	3.80 inches	Volume:	61.06 bbl	
Heavy Wt. Pipe:	Length:	0.00 ft	Diameter:	2.75 inches	Volume:	0.00 bbl	
Drill Collar:	Length:	0.00 ft	Diameter:	2.25 inches	Volume:	0.00 bbl	
					Total Volume:	61.06 bbl	

Drill Pipe Above KB:	27.00 ft
Depth to Top Packer:	4348.00 ft
Depth to Bottom Packer:	ft
Interval betw een Packers:	44.00 ft
Tool Length:	66.00 ft
Number of Packers:	2 Diameter: 6.75 inches

Tool Weight:		2000.00 lb
Weight set on Packer:		25000.00 lb
Weight to Pull Loose:		70000.00 lb
Tool Chased		0.00 ft
String Weight:	Initial	51000.00 lb
	Final	51000.00 lb

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths	
Change Over Sub	1.00			4327.00		
Shut In Tool	5.00			4332.00		
Hydraulic tool	5.00			4337.00		
Safety Joint	2.00			4339.00		
Packer	5.00			4344.00	22.00	Bottom Of Top Packer
Packer	4.00			4348.00		
Stubb	1.00			4349.00		
Recorder	0.00	8522	Inside	4349.00		
Recorder	0.00	8319	Outside	4349.00		
Perforations	7.00			4356.00		
Change Over Sub	1.00			4357.00		
Drill Pipe	31.00			4388.00		
Change Over Sub	1.00			4389.00		
Bullnose	3.00			4392.00	44.00	Bottom Packers & Anchor
Total Tool Length:	**66.00**					

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering, Inc.

562 W State Rd 4
Olmitz, KS 67564

ATTN: Vern Schrag

29-18s-30w Lane,KS

Miller O #2

Job Ticket: 63664 **DST#: 5**

Test Start: 2018.04.28 @ 02:15:00

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:	57.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	6.79 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	2700.00 ppm				
Filter Cake:	1.00 inches				

Recovery Information

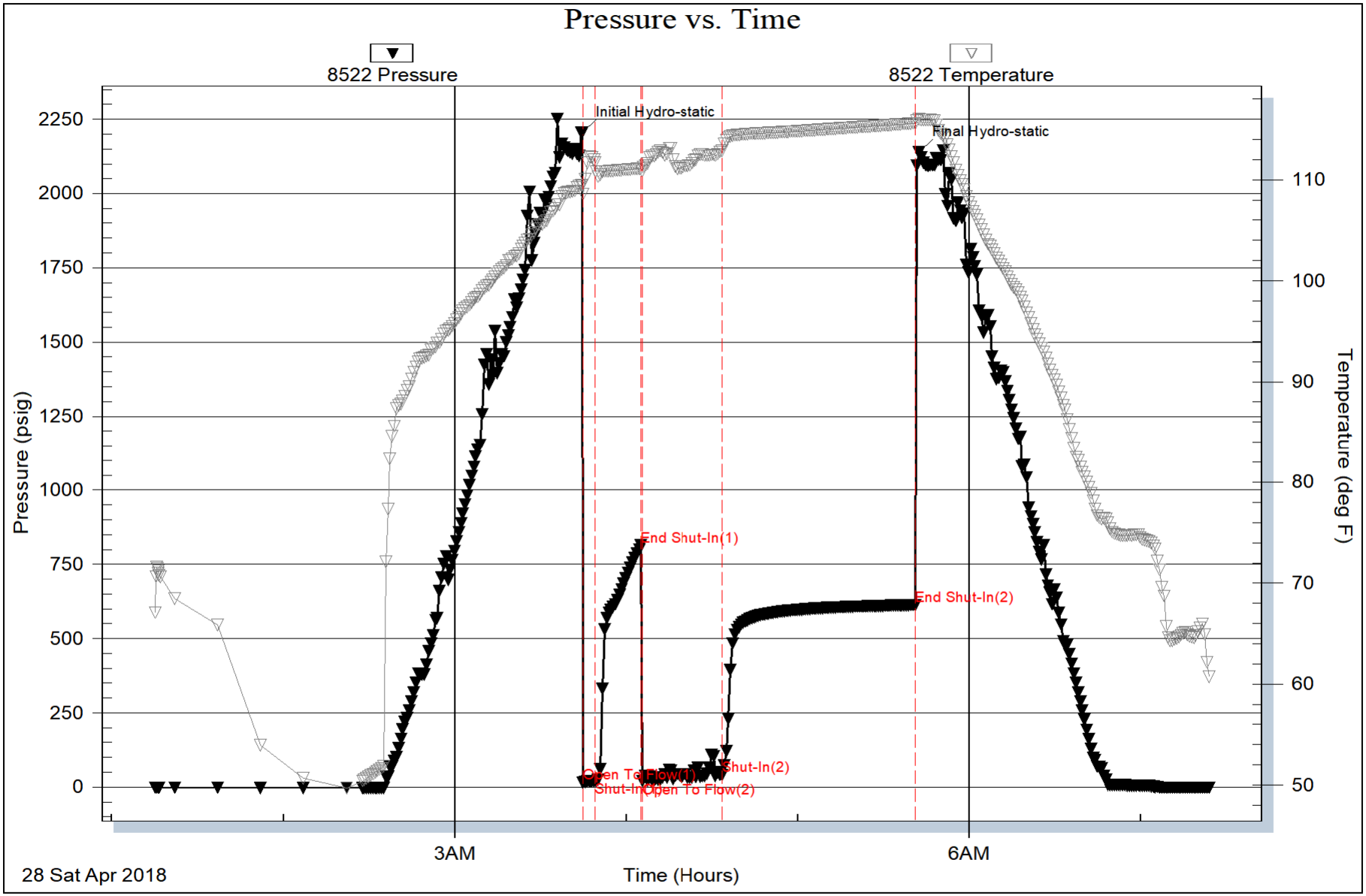
Recovery Table

Length ft	Description	Volume bbl
45.00	Mud 100m (oil spots)	0.631

Total Length: 45.00 ft Total Volume: 0.631 bbl

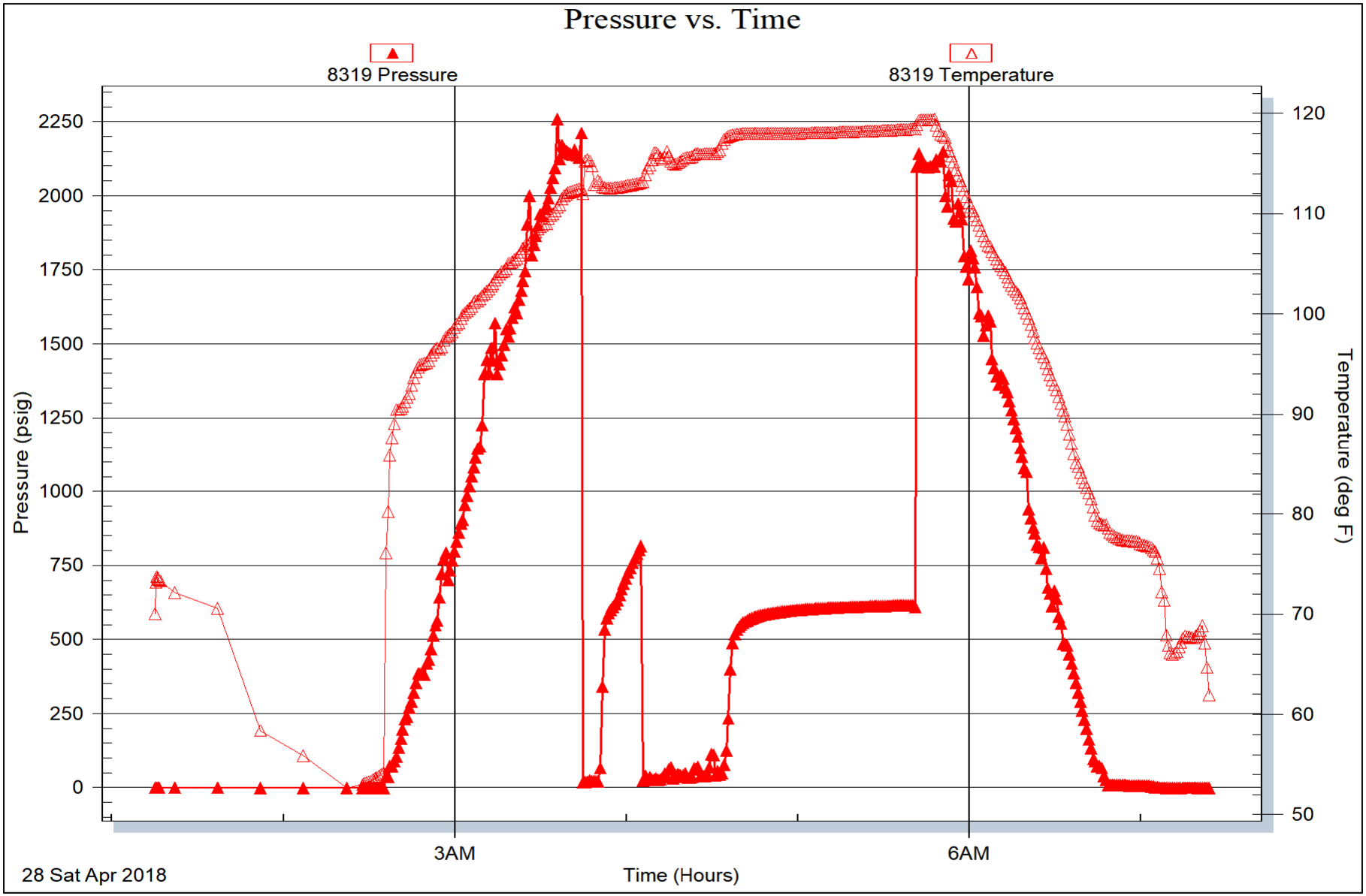
Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
Laboratory Name: Laboratory Location:
Recovery Comments:

Serial #: 8522 **Inside** Larson Engineering, Inc. Miller O #2 DST Test Number: 5



Trilobite Testing, Inc Ref. No: 63664 Printed: 2018.05.01 @ 09:04:41

Serial #: 8319 **Outside** Larson Engineering, Inc. Miller O #2 DST Test Number: 5



Trilobite Testing, Inc Ref. No: 63664 Printed: 2018.05.01 @ 09:04:42

TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

4/10

Test Ticket

NO. 63660

Well Name & No. Miller O #2 Test No. 1 Date 4-25-2018

Company Larson Engineering, Inc Elevation 2901 KB 2891 GL

Address 562 W State Rd 4 Olmitz, Ks 67564

Co. Rep / Geo. Vern Schrag Rig Southwind #8

Location: Sec. 29 Twp 18s Rge. 30w Co. Lane State Ks

Interval Tested 4125-4150 Zone Tested LKC H

Anchor Length 25' Drill Pipe Run 4131 Mud Wt. 9.1

Top Packer Depth 4120 Drill Collars Run Ø Vis 57

Bottom Packer Depth 4125 Wt. Pipe Run Ø WL 6.8

Total Depth 4150 Chlorides 2800 ppm System LCM 3#

Blow Description IF: ¼" blow.

ISI: No return.

FF: No blow.

FSI: No return.

Rec 10	Feet of mud	oil spots in tool	%gas	%oil	%water 100	%mud
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 113 Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic 2056	☒ Test 1150	T-On Location 0545
(B) First Initial Flow 13	☐ Jars	T-Started 0657
(C) First Final Flow 15	☒ Safety Joint 75	T-Open 0949
(D) Initial Shut-In 543	☒ Circ Sub N/C	T-Pulled 1057
(E) Second Initial Flow 15	☐ Hourly Standby	T-Out 1259
(F) Second Final Flow 16	☒ Mileage 31 RT 31	Comments
(G) Final Shut-In 508	☐ Sampler	
(H) Final Hydrostatic 1964	☐ Straddle	☐ Ruined Shale Packer
	☐ Shale Packer	☐ Ruined Packer
Initial Open 5	☐ Extra Packer	☐ Extra Copies
Initial Shut-In 15	☐ Extra Recorder	Sub Total 0
Final Flow 15	☐ Day Standby	Total 1256
Final Shut-In 30	☐ Accessibility	MP/DST Disc't
	Sub Total 1256	

Approved By Our Representative

TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

4/10

Test Ticket

NO. 63661

Well Name & No. Miller O #2 Test No. 2 Date 4/26/2018

Company Larson Engineering, Inc Elevation 2901 KB 2891 GL

Address 562 W State Rd 4 Olmitz, KS 67564

Co. Rep / Geo. Vern Schrag Rig Southwind #8

Location: Sec. 29 Twp 18s Rge. 30w Co. Lane State KS

Interval Tested 4226-4241 Zone Tested Lkc K

Anchor Length 15' Drill Pipe Run 4226 Mud Wt. 9.2

Top Packer Depth 4221 Drill Collars Run 0 Vis 53

Bottom Packer Depth 4226 Wt. Pipe Run 0 WL 6.8

Total Depth 4241 Chlorides 2800 ppm System LCM 3#

Blow Description IF ½" blow.

ISI No return.

FF 1½" blow

FSI No return.

Rec	20	Feet of	WCM	%gas	%oil	20	%water	80 %mud
Rec		Feet of	oil puddle on top	%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 20 BHT 119 Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic	2124	☒ Test	1150	T-On Location	0215
(B) First Initial Flow	13	☐ Jars		T-Started	0224
(C) First Final Flow	14	☒ Safety Joint	75	T-Open	0446
(D) Initial Shut-In	622	☒ Circ Sub	N/C	T-Pulled	0636
(E) Second Initial Flow	16	☐ Hourly Standby		T-Out	0833
(F) Second Final Flow	21	☒ Mileage	62 RT 31	Comments	
(G) Final Shut-In	619	☐ Sampler			
(H) Final Hydrostatic	2049	☐ Straddle			
		☐ Shale Packer		☐ Ruined Shale Packer	
Initial Open	5	☐ Extra Packer		☐ Ruined Packer	
Initial Shut-In	15	☐ Extra Recorder		☐ Extra Copies	
Final Flow	30	☐ Day Standby		Sub Total	0
Final Shut-In	60	☐ Accessibility		Total	1256
		Sub Total	1256	MP/DST Disc't	

Approved By _____ Our Representative _____

TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

4/10

Test Ticket

NO. 63662

Well Name & No. Miller O #2 Test No. 3 Date 4/26/2017

Company Larson Engineering Inc Elevation 2901 KB 2891 GL

Address 562 W State Rd 4 Olmitz Ks 67564

Co. Rep / Geo. Vern Schrag Rig Southwind 8

Location: Sec. 29 Twp 18s Rge. 30 w Co. Lane State KS

Interval Tested 4264-4285 Zone Tested LKC L

Anchor Length 21 Drill Pipe Run 4257 Mud Wt. 9.2

Top Packer Depth 4259 Drill Collars Run 0 Vis 49

Bottom Packer Depth 4264 Wt. Pipe Run 0 WL 6.8

Total Depth 4285 Chlorides 2600 ppm System LCM 4#

Blow Description IF: 1/4" blow
ISI: No return.
FF: No blow.
FSI: No return.

Rec 3	Feet of mud	%gas	%oil	%water 100	%mud	
Rec	Feet of oil spots	%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 3 BHT 110 Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic 2105	☒ Test 1150	T-On Location 1900	
(B) First Initial Flow 14	☐ Jars	T-Started 1931	
(C) First Final Flow 14	☒ Safety Joint 75	T-Open 2155	
(D) Initial Shut-In 63	☒ Circ Sub NC	T-Pulled 2250	
(E) Second Initial Flow 13	☐ Hourly Standby	T-Out 0026	
(F) Second Final Flow 16	☒ Mileage 31 rt 31	Comments	
(G) Final Shut-In 83	☐ Sampler		
(H) Final Hydrostatic 2057	☐ Straddle		
	☐ Shale Packer	☐ Ruined Shale Packer	
Initial Open 5	☐ Extra Packer	☐ Ruined Packer	
Initial Shut-In 15	☐ Extra Recorder	☐ Extra Copies	
Final Flow 15	☐ Day Standby	Sub Total 0	
Final Shut-In 30	☐ Accessibility	Total 1256	
	Sub Total 1256	MP/DST Disc't	

Approved By _____ Our Representative _____

TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

4/10

Test Ticket

NO. 63663

Well Name & No. Miller O #2 Test No. 4 Date 4/27/2015

Company Larson Engineering Inc Elevation 2901 KB 2891 GL

Address 562 W State Rd 4 Olmitz, Ks 67564

Co. Rep / Geo. Vern Schrag Rig Southwind 8

Location: Sec. 29 Twp 18s Rge. 30w Co. Lane State Ks

Interval Tested 4301 - 4350 Zone Tested ~~LKC~~ Pleasanton

Anchor Length 49 Drill Pipe Run 4289 Mud Wt. 9.1

Top Packer Depth 4296 Drill Collars Run Ø Vis 56

Bottom Packer Depth 4301 Wt. Pipe Run Ø WL 6.8

Total Depth 4350 Chlorides 2700 ppm System LCM 3#

Blow Description IF ~~3/4~~" blow

ISI No return.

FF 2" blow

FSI No return.

Rec 30	Feet of wcm	%gas	%oil	10	%water 90	%mud	
Rec	Feet of	%gas	%oil		%water	%mud	
Rec	Feet of Oil spots	%gas	%oil		%water	%mud	
Rec	Feet of	%gas	%oil		%water	%mud	
Rec	Feet of	%gas	%oil		%water	%mud	

Rec Total 30 BHT 115 Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic	2166	☒ Test	1150	T-On Location	1030
(B) First Initial Flow	15	☐ Jars		T-Started	1103
(C) First Final Flow	15	☒ Safety Joint	75	T-Open	1308
(D) Initial Shut-In	719	☒ Circ Sub		T-Pulled	1502
(E) Second Initial Flow	17	☐ Hourly Standby		T-Out	1655
(F) Second Final Flow	27	☒ Mileage 31 A	31	Comments	
(G) Final Shut-In	713	☐ Sampler			
(H) Final Hydrostatic	2090	☐ Straddle			
		☐ Shale Packer		☐ Ruined Shale Packer	
Initial Open	5	☐ Extra Packer		☐ Ruined Packer	
Initial Shut-In	15	☐ Extra Recorder		☐ Extra Copies	
Final Flow	30	☐ Day Standby		Sub Total	0
Final Shut-In	60	☐ Accessibility		Total	12256
		Sub Total	1256	MP/DST Disc't	

Approved By _____ Our Representative Brad Kaufman

TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

4/10

Test Ticket

NO. 63664

Well Name & No. Miller O #2 Test No. 5 Date 4/28/2018

Company Larson Engineering, Inc Elevation 2901 KB 2891 GL

Address 562 W State Rd 4 Olmitz, Ks 67546

Co. Rep / Geo. Vern Schrag Rig Southwind 8

Location: Sec. 29 Twp 18s Rge. 30 w Co. Lane State Ks

Interval Tested 4348 4392 Zone Tested Altamont

Anchor Length 44 Drill Pipe Run 4353 Mud Wt. 9.3

Top Packer Depth 4343 Drill Collars Run 0 Vis 57

Bottom Packer Depth 4348 Wt. Pipe Run 0 WL 6.8

Total Depth 4392 Chlorides 2700 ppm System LCM 3#

Blow Description IF 1" blow

ISI No return.

FF 3" blow

FSI No return.

Rec 45	Feet of mud	%gas	%oil	%water	100	%mud
Rec	Feet of oil spots	%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 45 BHT 115 Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic 2204	☒ Test 1150	T-On Location 0045
(B) First Initial Flow 15	☒ ~~Tool~~ Jars No	T-Started 0115
(C) First Final Flow 21	☒ Safety Joint 75	T-Open 0338
(D) Initial Shut-In 813	☒ Circ Sub N/C	T-Pulled 0530
(E) Second Initial Flow 21	☐ Hourly Standby	T-Out 0724
(F) Second Final Flow 41	☒ Mileage 3 1/2 RT 31	Comments
(G) Final Shut-In 613	☐ Sampler	
(H) Final Hydrostatic 2139	☐ Straddle	☐ Ruined Shale Packer
	☐ Shale Packer	☒ Ruined Packer 320
Initial Open 5	☐ Extra Packer	☐ Extra Copies
Initial Shut-In 15	☐ Extra Recorder	Sub Total 320
Final Flow 30	☐ Day Standby	Total 1576
Final Shut-In 60	☐ Accessibility	MP/DST Disc't
	Sub Total 1256	

Approved By Our Representative

WELLSITE GEOLOGIST'S REPORT

VERNON C. SCHRAG
CONSULTANT GEOLOGIST

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

Well Name:	**MILLER 'O' #2**		
Location:	**SE SW NE NW SEC. 29-18S-30W**		
Licence Number:	**API: 15-101-22606**	**Region:**	**Lane Co., KS**
Spud Date:	**April 20, 2018**	**Drilling Completed:**	**April 28, 2018**
Surface Coordinates:	**1140' FNL & 1800' FWL**		
Bottom Hole Coordinates:			
Ground Elevation (ft):	**2891'**	**K.B. Elevation (ft):**	**2901'**
Logged Interval (ft):	**3800'** **To: RTD**	**Total Depth (ft):**	**4850'**
Formation:	**Pawnee**		
Type of Drilling Fluid:	**Chemical Premix (Displaced)**		

OPERATOR:

Company: **Larson Engineering Inc.**
Address: **562 West State Road 4**
Olmitz, KS 67564-8561

DRILLING CONTRACTOR:

Southwind Drilling Co., Rig #8

DP 4.5" XH (16.6#); DC 6-1/4" x 2-3/8" x 489.27', Kelly 40.00', Tool Joint 5.5" ; Bit: Varel HE29H, 7-7/8", standard jets 14-14-14; rpm 60-70, WOB 35k; Kelly Bushing 10' above ground level; Bill Sanders (tool pusher).

CASING:

Ran 6 jts new 8-5/8" 20# R3 STC 8rd csg. Tallied 252', set @ 265' KB.

CIRCULATION SYSTEM:

Continental EMSCO D-300, duplex, 6 x 14, 56 spm, Chemical, premix, earth pits, MudCo/Service Mud, Inc., Jason Whiting

GAS DETECTION SYSTEM:

USB-1208LS-41, portable hot-wire, Delphian 3.0 volt catalytic bead conbustible gas detector.

OPEN HOLE LOGS:

DN, DI (SP), ML; No Sonic; 5" detail LTD-3600; 2" DI to suface casing; LogTech-Pioneer Wireline, Hays, KS, Log total depth (4448') was two feet short to rotary total depth (4450').