KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

1062026

Form ACO-1
June 2009
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 # 33935
Name: H. D. Drilling, LLC
Wellsite Geologist: Robert Lewellyn
Purchaser: NCRA

Designate Type of Completion:

- [x] New Well [ ] Re-Entry [ ] Workover
- [x] Oil [ ] WSW [ ] SWD [ ] SIOW
- [ ] Gas [ ] D&A [ ] ENHR [ ] SIGW
- [ ] OG [ ] GSW [ ] Temp. Abd.
- [ ] 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 ENHR [ ] Conv. to SWD
- [ ] Conv. to GSW
- [ ] Plug Back: Plug Back Total Depth
- [ ] Commingled Permit #:
- [ ] Dual Completion Permit #:
- [ ] SWD Permit #:
- [ ] ENHR Permit #:
- [ ] GSW Permit #:

5/17/2011	6/1/2011	7/6/2011
Spud Date or Recompletion Date	Date Reached TD	Completion Date or Recompletion Date

API No. 15 - 15-101-22292-00-00
Spot Description:
NW - SW - NW - SE Sec. 32 Twp. 17 S. R. 28 [ ] East [x] West
1800 Feet from [ ] North / [x] South Line of Section
2475 Feet from [x] East / [ ] West Line of Section
Footages Calculated from Nearest Outside Section Corner:
[ ] NE [ ] NW [x] SE [ ] SW
County: Lane
Lease Name: Joann Unit Well #: 1-32
Field Name: Wildcat
Producing Formation: Cherokee, Marmaton
Elevation: Ground: 2762 Kelly Bushing: 2769
Total Depth: 4653 Plug Back Total Depth: 4607
Amount of Surface Pipe Set and Cemented at: 261 Feet
Multiple Stage Cementing Collar Used? [x] Yes [ ] No
If yes, show depth set: 2159 Feet
If Alternate II completion, cement circulated from: 2159
feet depth to: 0 w/ 170 sx cmt.

Drilling Fluid Management Plan
(Data must be collected from the Reserve Pit)

Chloride content: 12000 ppm Fluid volume: 900 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

- [x] **Letter of Confidentiality Received**
  Date: 09/14/2011
- [x] **Confidential Release Date:** 09/13/2013
- [x] **Wireline Log Received**
- [x] **Geologist Report Received**
- [ ] **UIC Distribution**

ALT [ ] I [x] II [ ] III **Approved by:** NAOMI JAMES **Date:** 09/14/2011

Side Two

[redacted]

1062026

Operator Name: Larson Engineering, Inc. dba Larson Operating Company Lease Name: Joann Unit Well #: 1-32

Sec. 32 Twp. 17 S. R. 28 ☐ East ☑ West County: Lane

INSTRUCTIONS: Show important tops and base 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. Attach complete copy of all Electric Wire-line Logs surveyed. Attach final geological well site report.

Drill Stem Tests Taken ☑ Yes ☐ No
(Attach Additional Sheets)

Samples Sent to Geological Survey ☐ Yes ☑ No

Cores Taken ☐ Yes ☑ No

Electric Log Run ☑ Yes ☐ No

Electric Log Submitted Electronically ☑ Yes ☐ No
(If no, Submit Copy)

List All E. Logs Run:

Dual Induction
Dual Comp Porosity
Microresistivity

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

Name	Top	Datum
Attached	Attached	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	8.625	20	261	Class A	175	2% gel, 3% CC
Production	7.875	5.5	15.5	4652	EA-2	125	7#/sk gilsonite, 1/4#/sk flocele, halad

ADDITIONAL CEMENTING / SQUEEZE RECORD

Purpose:
☐ Perforate
☐ Protect Casing
☐ Plug Back TD
☐ Plug Off Zone

Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
0-2159	SMD	170	1/4#/sk flocele
-			

Shots Per Foot	PERFORATION RECORD - Bridge Plugs Set/Type Specify Footage of Each Interval Perforated	Acid, Fracture, Shot, Cement Squeeze Record *(Amount and Kind of Material Used)*	Depth
Attached	Attached	Attached	Attached

TUBING RECORD: Size: 2.375 Set At: 4604 Packer At:

Liner Run: ☐ Yes ☑ No

Date of First, Resumed Production, SWD or ENHR. 7/6/2011

Producing Method: ☐ Flowing ☑ Pumping ☐ Gas Lift ☐ Other *(Explain)*

Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity
	20		0		38

DISPOSITION OF GAS:
☐ Vented ☐ Sold ☐ Used on Lease
(If vented, Submit ACO-18.)

METHOD OF COMPLETION:
☐ Open Hole ☑ Perf. ☐ Dually Comp. *(Submit ACO-5)* ☐ Commingled *(Submit ACO-4)*
☐ Other *(Specify)*

PRODUCTION INTERVAL:
4350 - 4572

Mail to: KCC - Conservation Division, 130 S. Market - Room 2078, Wichita, Kansas 67202

Form	ACO1 - Well Completion
Operator	Larson Engineering, Inc. dba Larson Operating Company
Well Name	Joann Unit 1-32
Doc ID	1062026

Tops

Name	Top	Datum
Anhydrite	281	+588
Base Anhydrite	2211	+558
Heebner Sh	3958	-1189
L-KC	3997	-1228
Stark Sh	4250	-1481
Base KC	4328	-1599
Marmaton	4344	-1575
Pawnee	4445	-1676
Fort Scott	4496	-1727
Cherokee	4522	-1753
Cherokee Sand	4572	-1803
Mississippian	4608	-1839

Form	ACO1 - Well Completion
Operator	Larson Engineering, Inc. dba Larson Operating Company
Well Name	Joann Unit 1-32
Doc ID	1062026

Perforations

Shots Per Foot	Perforation Record	Material Record	Depth
4	4568-72	150 Gal 7-1/2% HCl	4568-72
		300 Gal 7-1/2% HCl / 3%HF	4568-72
4	4502-04, 4447-52	250 Gal 15% NEFe	4502-04
		250 GAL 15% NE	4447-52
4	4350-54	250 Gal 15% MCA	4350-54
		400 Gal 15% NE	4350-54
		400 Gal 15% NE	4502-04

SWIFT Services, Inc.

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

TICKET 20750

PAGE 1 OF 1

SERVICE LOCATIONS	WELL/PROJECT NO.	LEASE	COUNTY/PARISH	STATE	CITY	DATE	OWNER
1. Ness City KS	1-32	Joara Unit	Lane	KS	Dighton	6 Jun 11	
2.	TICKET TYPE ☐ SERVICE ☐ SALES	CONTRACTOR	RIG NAME/NO.	SHIPPED VIA CT	DELIVERED TO location	ORDER NO.	
3.	WELL TYPE oil	WELL CATEGORY Development	JOB PURPOSE cement port collar	WELL PERMIT NO.		WELL LOCATION 4-1n 1½-2e 1-5s	
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 114	40	mi			5 00	200 00
576D		1			Port Collar	1	ea			1100 00	1100 00
330		1			SMD cmt			180	sk	15 00	2700 00
276		1			Flocele			50	lb	1 50	75 00
290		1			D-AIR	2	gal			35 00	70 00
581		1			Service charge	235	sk			1 50	352 50
583		1			Drayage			467.70	TM	1 00	467 70
288		1			Sand	5	sk			22 00	110 00

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	5075 20
Lane TAX 6.3%	186 17
TOTAL	5261 37

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

SWIFT OPERATOR | APPROVAL

Thank You!

JOB LOG

SWIFT Services, Inc.

DATE 6 Jun 11 | PAGE NO. 1

CUSTOMER	WELL NO.	LEASE	JOB TYPE	TICKET NO.
Olson Engineering	1-32	Joann Unit	cement port collar	20750

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS T	PUMPS C	PRESSURE (PSI) TUBING	PRESSURE (PSI) CASING	DESCRIPTION OF OPERATION AND MATERIALS
								235 sks SMDair 1/4# floacle
								2 7/8 x 5 1/2 Portcollar - 2159'
	1050							on loc TRK 114
	1118					1000	1000	test to 1000 psi - held
	1130	3 1/2	3			450		brk rate
	1135							mix SMD @ 11.2 ppg
	1200	3 1/2	88			600		170 sks mixed - cement to surface, close tool
								test to 1200 psi - held
								Rem 5 joints
	1215		20					reverse hole clean
								wash truck
								Rack up
	1345							job complete
								170 sks - 20 to pit
								Thank
								Blan Rob & Dave

JOB LOG

SWIFT Services, Inc.

DATE 6 Jan 11 | PAGE NO. 1

CUSTOMER Leon Engineering | WELL NO. | LEASE Dorris | JOB TYPE Cement water well | TICKET NO. 20250

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS T	PUMPS C	PRESSURE (PSI) TUBING	PRESSURE (PSI) CASING	DESCRIPTION OF OPERATION AND MATERIALS
								10 sks SMD
	1320							on loc TRK 1/4
								Drop 5 sks sand (20/40 Brady) w/ water
								mix SMD @ 14 ppg
			3					8 sks mixed
								Rack up
	1345							job complete
								Blair Dan & Rob

SWIFT Services, Inc.

CHARGE TO: LARSON ENGINEERING
ADDRESS
CITY, STATE, ZIP CODE

TICKET 20521

PAGE 1 OF 2

SERVICE LOCATIONS	WELL/PROJECT NO.	LEASE	COUNTY/PARISH	STATE	CITY	DATE	OWNER
1. NESS CITY, KS	1-32	JOANN UNIT	LANE	KS		6-1-11	SAME
2.	TICKET TYPE: ☒ SERVICE ☐ SALES — CONTRACTOR: H-D DRILLING #3	RIG NAME/NO.	SHIPPED VIA: CT	DELIVERED TO: LOCATION		ORDER NO.	
3.	WELL TYPE: OIL	WELL CATEGORY: DEVELOPMENT	JOB PURPOSE: 5½" LONGSTRING	WELL PERMIT NO.		WELL LOCATION: DIGHTON, KS - 4N, 1½E	
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 # 110	40	MI			5 00	200 00
578		1			PUMP CHARGE	1	JOB	4652	FT	1400 00	1400 00
221		1			LIQUID KCL	2	GAL			25 00	50 00
280		1			FLOCHECK 21	500	GAL			2 50	1250 00
419		1			ROTATING HEAD RENTAL	1	JOB			150 00	150 00

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: 6-1-11 TIME SIGNED: 1830 ☐ 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 #1	3050 00
#2	4231 50 ~~1154 50~~
subtotal	7281 50
TAX Lane 6.3%	321 62
TOTAL	7603 12

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

SWIFT OPERATOR: WAYNE WILSON APPROVAL

Thank You!

SWIFT Services, Inc.

PO Box 466.
Ness City, KS 67560
Off: 785-798-2300

TICKET CONTINUATION

TICKET No. 20521

CUSTOMER: LARSON ENGINEERING | WELL: JOANN UNIT 1-32 | DATE: 6-1-11 | PAGE 2 OF 2

PRICE REFERENCE	SECONDARY REFERENCE/ PART NUMBER	ACCOUNTING LOC	ACCT	DF	TIME	DESCRIPTION	QTY.	U/M	QTY.	U/M	UNIT PRICE	AMOUNT
325		1				STANDARD CEMENT EA-2	~~155~~	SKS	155	SKS	12 00	1860 00
276		1				FLOCELE	25	LBS			1 50	37 50
277		1				GILSONITE	1050	00			60	630 00
283		1				SALT	750	LBS			15	112 50
284		1				CALSEAL	7	SKS	700	LBS	30 00	210 00
286		1				HALAD-1	105	LBS			7 00	735 00
290		1				D-AIR	2	GAL			35 00	70 00
												232 50
581		1				SERVICE CHARGE	CUBIC FEET		~~155~~		1 50	~~225 00~~
583		1				MILEAGE CHARGE / TOTAL WEIGHT ~~17230~~ / LOADED MILES 40	TON MILES		~~344.6~~		1 00	~~344 00~~
						17200					CONTINUATION TOTAL	~~4154.50~~ 4231.50

JOB LOG

SWIFT Services, Inc.

DATE 6-1-11 | PAGE NO. 1

CUSTOMER	WELL NO.	LEASE	JOB TYPE	TICKET NO.
LARSON ENGINEERING	1-32	JOANN UNIT	5½" LONGSTRING	20521

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS T	PUMPS C	PRESSURE (PSI) TUBING	PRESSURE (PSI) CASING	DESCRIPTION OF OPERATION AND MATERIALS
	1830							ON LOCATION
								TD - 4653 SET @ 4652'
								TP - 4656.35 PORT COLLAR @ 2159
								SJ - 42.61 5½ # 15.5
	2000							DROP BALL - CIRCULATE ROTATE
	2105	6	15		✓		450	PUMP 15 BBLS KCL SPACER "
	2108	6	12		✓		450	PUMP 500 GAL FLOCHECK-21 "
	2110	6	5		✓		450	PUMP 5 BBLS KCL SPACER "
	2112		7					PLUG RH (30SKS)
	2115	4½	30		✓		300	MIX CEMNT - 125 SKS EA-2 @ 15.4 PPG "
	2125							WASH OUT PUMP & LINES
	2127							RELEASE LATCH DOWN PLUG
	2130	6½	0		✓			DISPLACE PLUG
		6½	100				700	SHUT OFF ROTATING
	2147	6	109.8				1500	PLUG DOWN - PSI UP LATCH IN PLUG
	2150						OK	RELEASE PSI - HELD
								WASH TRUCK
	2230							JOB COMPLETE
								THANK YOU
								WAYNE, JEFF, DAVE

ALLIED CEMENTING CO., LLC. 038749

Federal Tax I.D.# 20-5975804

REMIT TO P.O. BOX 31
RUSSELL, KANSAS 67665

SERVICE POINT:
Great Bend KS

DATE 5-17-11	SEC. 32	TWP. 17S	RANGE 28W	CALLED OUT	ON LOCATION	JOB START 6:45pm	JOB FINISH 7:15pm
LEASE Soannhurst	WELL # 1-32		LOCATION Brighton KS 4 north to AORD			COUNTY Lane	STATE KS
OLD OR NEW (Circle one)			1½ East Southinto				

CONTRACTOR HD Drilling Rig #3
TYPE OF JOB Surface
HOLE SIZE 12 ¼ T.D. 264
CASING SIZE 8 5/8 DEPTH 261
TUBING SIZE DEPTH
DRILL PIPE 4½ DEPTH 264
TOOL DEPTH
PRES. MAX MINIMUM
MEAS. LINE SHOE JOINT
CEMENT LEFT IN CSG. 15Ft
PERFS.
DISPLACEMENT 15.67 bbls freshwater

OWNER Larson Engineering Inc

CEMENT

AMOUNT ORDERED 175sx Class A 3%cc 2%gel

EQUIPMENT

PUMP TRUCK CEMENTER Bobby Roller
224 HELPER Bobby Roller
BULK TRUCK
482-186 DRIVER Dewayne/Logan S
BULK TRUCK
DRIVER

COMMON	175sx	@ 16.25	2843.75
POZMIX		@	
GEL	3	@ 21.25	63.75
CHLORIDE	6	@ 58.20	349.20
ASC		@	
HANDLING	184	@ 2.25	414.00
MILEAGE	184x90x.11		1821.60
		TOTAL	5.492.30

REMARKS:

Break circulation with rig mud
Hook up to cement pump and
mix 175sx com 3%cc 2%gel
Cement out - start displacement with
15.67 bbls freshwater & top pump
shut in cement did circulate

SERVICE

DEPTH OF JOB 261
PUMP TRUCK CHARGE 1125.00
EXTRA FOOTAGE @
MILEAGE 180 @ 7.00 1260.00
MANIFOLD @
Light Truck 180 @ 4.00 720.00
@
TOTAL 3105.00

CHARGE TO: Larson Engineering
STREET
CITY STATE ZIP

PLUG & FLOAT EQUIPMENT

@
@
@
@
@
TOTAL

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

SALES TAX (If Any)
TOTAL CHARGES [redacted]
DISCOUNT [redacted] IF PAID IN 30 DAYS

PRINTED NAME Dewayne Tresner

SIGNATURE [signature]

Thank You

DRILL STEM TEST REPORT

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43187 **DST#: 1**

Test Start: 2011.05.23 @ 22:42:00

GENERAL INFORMATION:

Formation: **Lansing H**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 01:50:15
Time Test Ended: 05:57:00

Test Type: Conventional Bottom Hole
Tester: Bradley Walter
Unit No: 40

Interval: 4148.00 ft (KB) To 4177.00 ft (KB) (TVD)
Total Depth: 4177.00 ft (KB) (TVD)
Hole Diameter: 7.85 inches Hole Condition: Poor

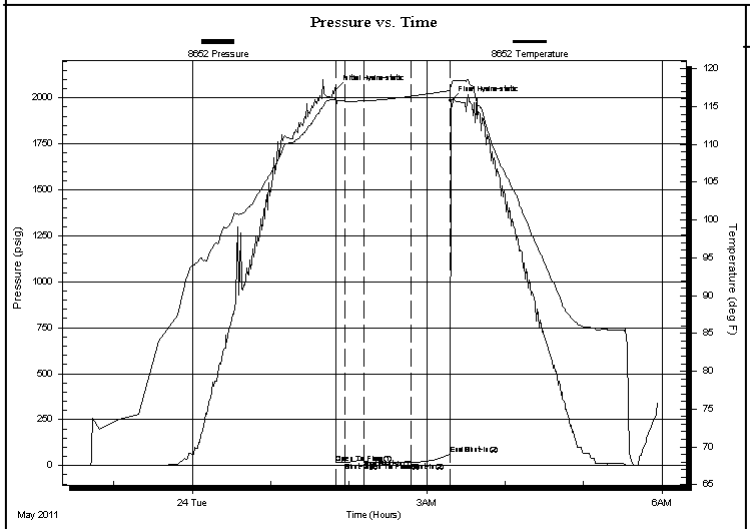
Reference Elevations: 2769.00 ft (KB)
2762.00 ft (CF)
KB to GR/CF: 7.00 ft

Serial #: 8652 **Inside**

Press@RunDepth: 17.75 psig @ 4149.00 ft (KB)
Start Date: 2011.05.23 End Date: 2011.05.24
Start Time: 22:42:05 End Time: 05:56:59

Capacity: 8000.00 psig
Last Calib.: 2011.05.24
Time On Btm: 2011.05.24 @ 01:50:00
Time Off Btm: 2011.05.24 @ 03:18:15

TEST COMMENT: IF: Surface blow.
ISI: No return blow.
FF: No blow.
FSI No return blow.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2045.55	116.13	Initial Hydro-static
1	15.47	114.82	Open To Flow (1)
8	17.59	115.72	Shut-In(1)
22	36.89	115.75	End Shut-In(1)
22	17.12	115.74	Open To Flow (2)
58	17.75	116.37	Shut-In(2)
88	63.92	117.14	End Shut-In(2)
89	1985.35	117.95	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
3.00	mud (oil spots)	0.01

Gas Rates

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

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43187 **DST#: 1**

Test Start: 2011.05.23 @ 22:42:00

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:	52.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	7.60 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	2000.00 ppm				
Filter Cake:	2.00 inches				

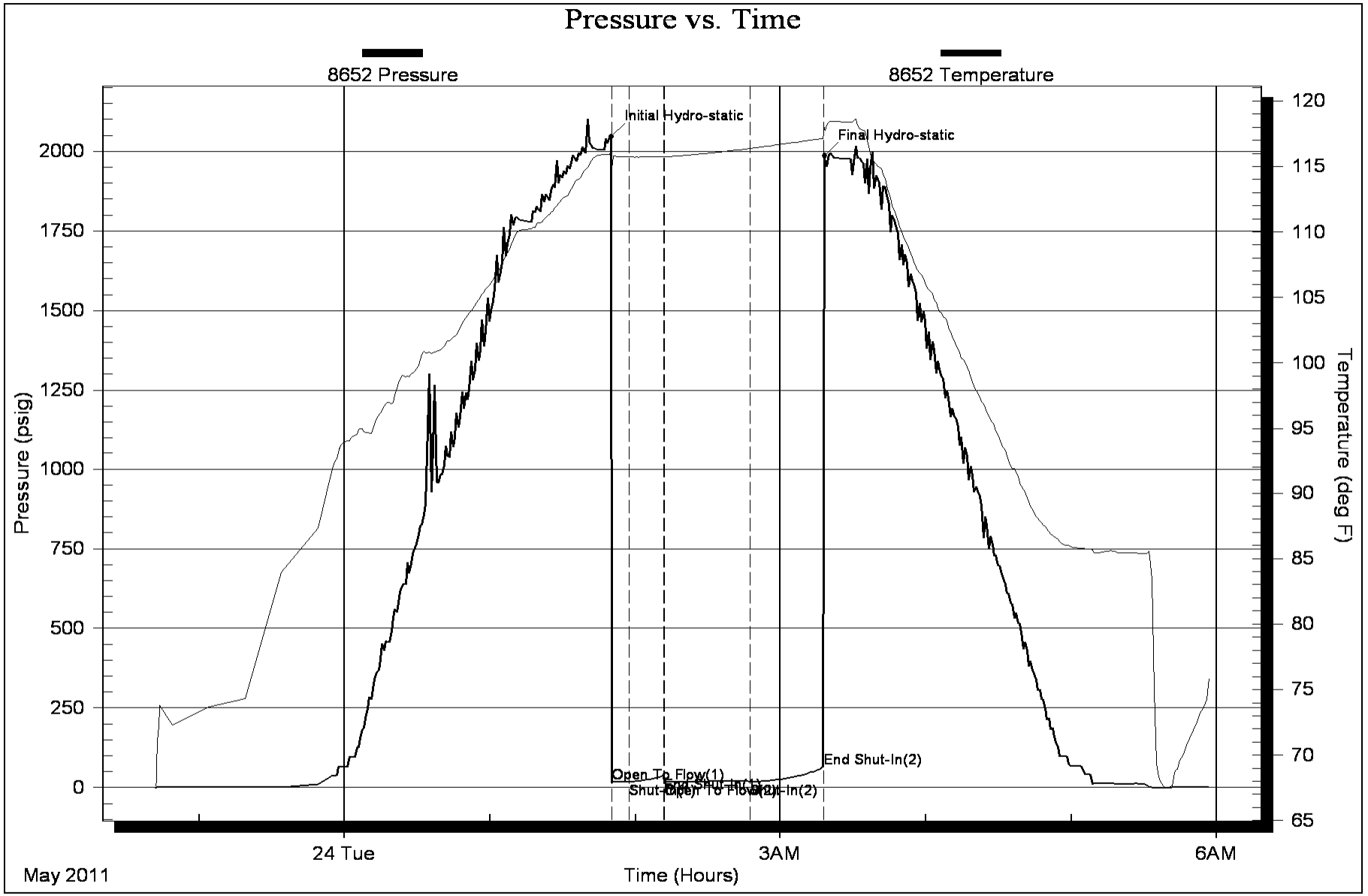
Recovery Information

Recovery Table

Length ft	Description	Volume bbl
3.00	mud (oil spots)	0.014

Total Length: 3.00 ft Total Volume: 0.014 bbl

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


Pressure vs. Time
8652 Pressure
8652 Temperature
Initial Hydro-static
Final Hydro-static
End Shut-In(2)
Open To Flow(1)
Shut-In(1)
Pressure (psig)
Temperature (deg F)
2000
1750
1500
1250
1000
750
500
250
0
120
115
110
105
100
95
90
85
80
75
70
65
24 Tue
3AM
6AM
May 2011
Time (Hours)

DRILL STEM TEST REPORT

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43188 **DST#: 2**

Test Start: 2011.05.24 @ 15:08:00

GENERAL INFORMATION:

Formation: **Lansing I**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 17:28:45
Time Test Ended: 20:33:45

Test Type: Conventional Bottom Hole
Tester: Bradley Walter
Unit No: 40

Interval: 4180.00 ft (KB) To 4210.00 ft (KB) (TVD)
Total Depth: 4210.00 ft (KB) (TVD)
Hole Diameter: 7.85 inches Hole Condition: Poor

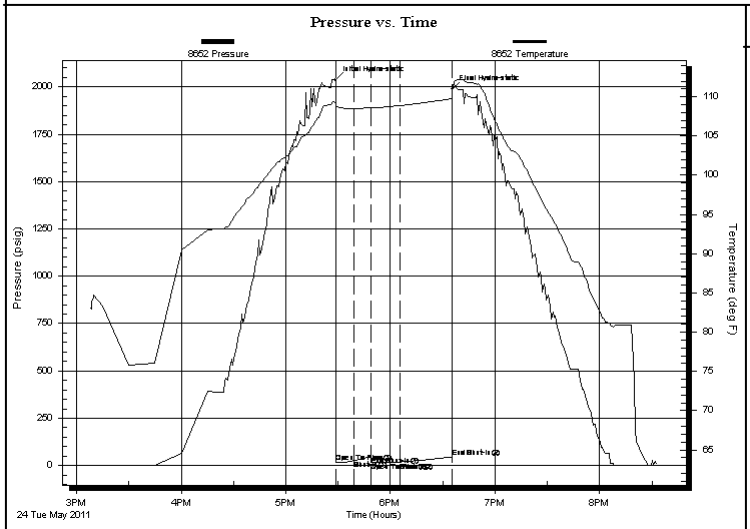
Reference Elevations: 2769.00 ft (KB)
2762.00 ft (CF)
KB to GR/CF: 7.00 ft

Serial #: 8652 **Inside**

Press@RunDepth: 19.11 psig @ 4181.00 ft (KB)
Start Date: 2011.05.24 End Date: 2011.05.24
Start Time: 15:08:05 End Time: 20:33:44

Capacity: 8000.00 psig
Last Calib.: 2011.05.24
Time On Btm: 2011.05.24 @ 17:28:30
Time Off Btm: 2011.05.24 @ 18:35:30

TEST COMMENT: IF: Surface blow.
ISI: No return blow.
FF: No blow.
FSI: No return blow.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2035.91	109.29	Initial Hydro-static
1	17.18	108.43	Open To Flow (1)
11	25.96	108.51	Shut-In(1)
21	47.42	108.59	End Shut-In(1)
21	17.76	108.57	Open To Flow (2)
37	19.11	108.86	Shut-In(2)
67	45.88	109.76	End Shut-In(2)
67	1987.67	110.75	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
5.00	mud (oil spots)	0.02

Gas Rates

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

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43188 **DST#: 2**

Test Start: 2011.05.24 @ 15:08:00

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:	7.20 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	1700.00 ppm				
Filter Cake:	2.00 inches				

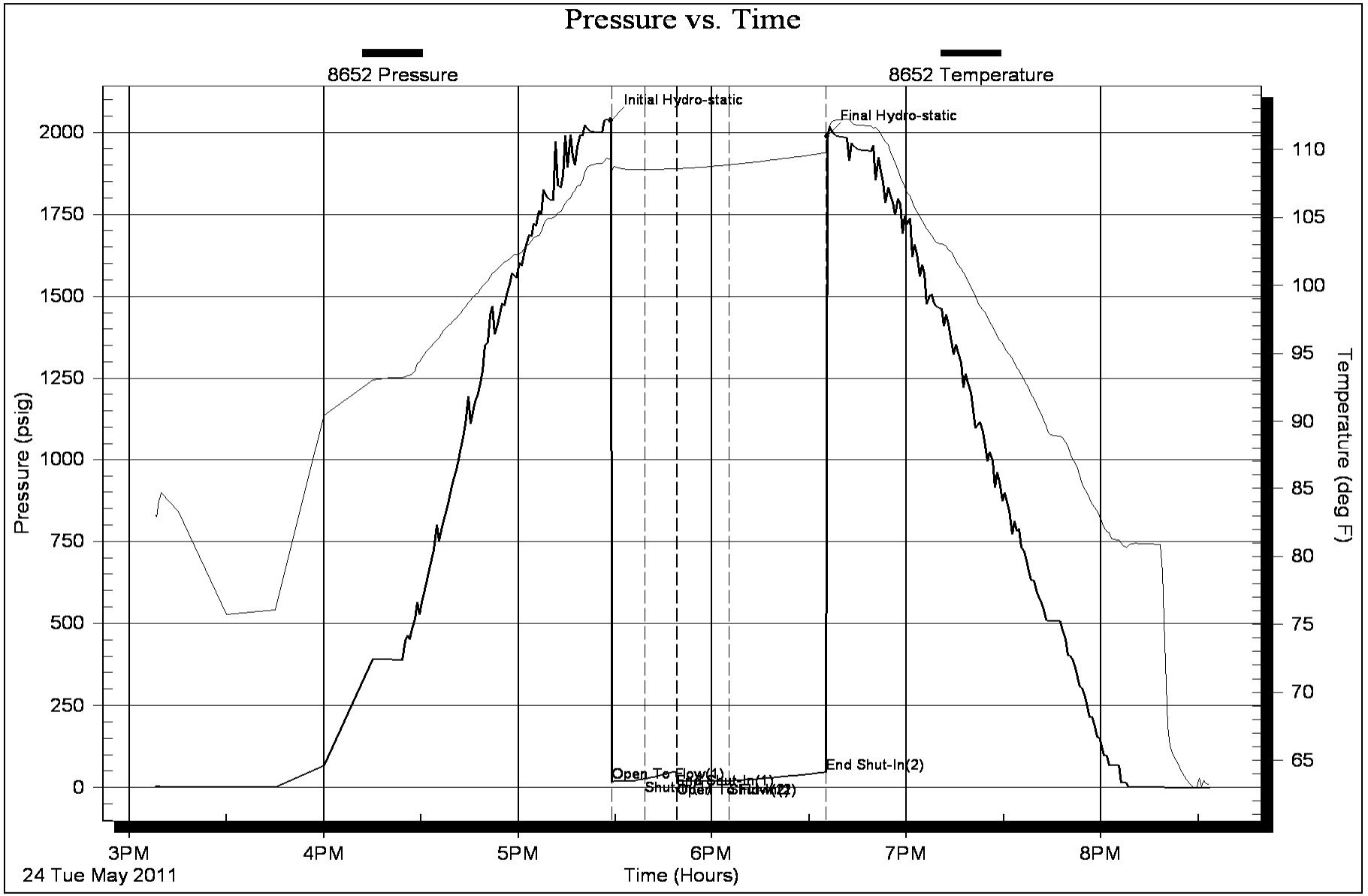
Recovery Information

Recovery Table

Length ft	Description	Volume bbl
5.00	mud (oil spots)	0.024

Total Length: 5.00 ft Total Volume: 0.024 bbl

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


Pressure vs. Time
8652 Pressure
8652 Temperature
Initial Hydro-static
Final Hydro-static
End Shut-In(2)
Pressure (psig)
Temperature (deg F)
2000
1750
1500
1250
1000
750
500
250
0
110
105
100
95
90
85
80
75
70
65
3PM
4PM
5PM
6PM
7PM
8PM
24 Tue May 2011
Time (Hours)

DRILL STEM TEST REPORT

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43189 **DST#: 3**

Test Start: 2011.05.25 @ 05:14:00

GENERAL INFORMATION:

Formation: **Lansing J**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 07:40:45
Time Test Ended: 11:46:45

Test Type: Conventional Bottom Hole
Tester: Bradley Walter
Unit No: 40

Interval: 4210.00 ft (KB) To 4242.00 ft (KB) (TVD)
Total Depth: 4242.00 ft (KB) (TVD)
Hole Diameter: 7.85 inches Hole Condition: Poor

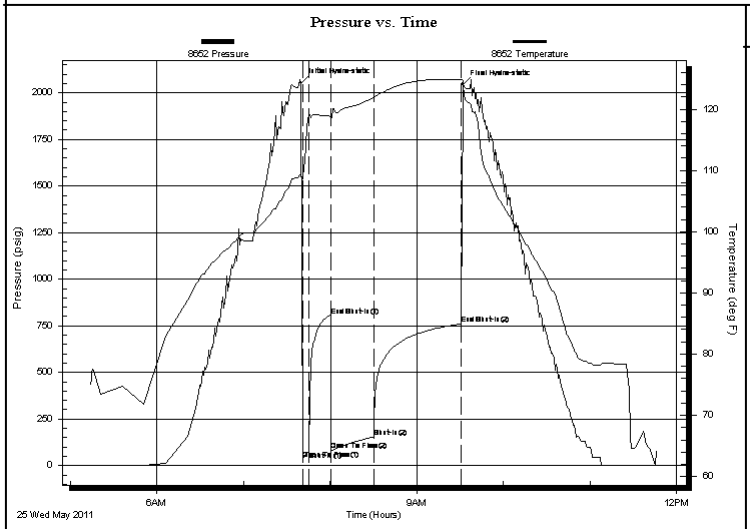
Reference Elevations: 2769.00 ft (KB)
2762.00 ft (CF)
KB to GR/CF: 7.00 ft

Serial #: 8652 **Inside**

Press@RunDepth: 154.01 psig @ 4211.00 ft (KB)
Start Date: 2011.05.25 End Date: 2011.05.25
Start Time: 05:14:05 End Time: 11:46:44

Capacity: 8000.00 psig
Last Calib.: 2011.05.25
Time On Btm: 2011.05.25 @ 07:40:15
Time Off Btm: 2011.05.25 @ 09:32:00

TEST COMMENT: IF: 5 inches blow.
ISI: No return blow.
FF: BOB @ 15minutes.
FSI: No return blow.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2054.36	109.23	Initial Hydro-static
1	33.93	108.66	Open To Flow (1)
6	74.40	119.10	Shut-In(1)
20	800.82	118.83	End Shut-In(1)
21	82.55	118.38	Open To Flow (2)
50	154.01	121.89	Shut-In(2)
111	759.29	124.80	End Shut-In(2)
112	2045.85	123.79	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
295.00	mcw 10m 90w	3.07
5.00	oil 100o	0.07

Gas Rates

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

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43189 **DST#: 3**

Test Start: 2011.05.25 @ 05:14:00

Mud and Cushion Information

Mud Type:	Gel Chem	Cushion Type:		Oil API:	38 deg API
Mud Weight:	9.00 lb/gal	Cushion Length:	ft	Water Salinity:	71000 ppm
Viscosity:	53.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	7.19 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	1700.00 ppm				
Filter Cake:	2.00 inches				

Recovery Information

Recovery Table

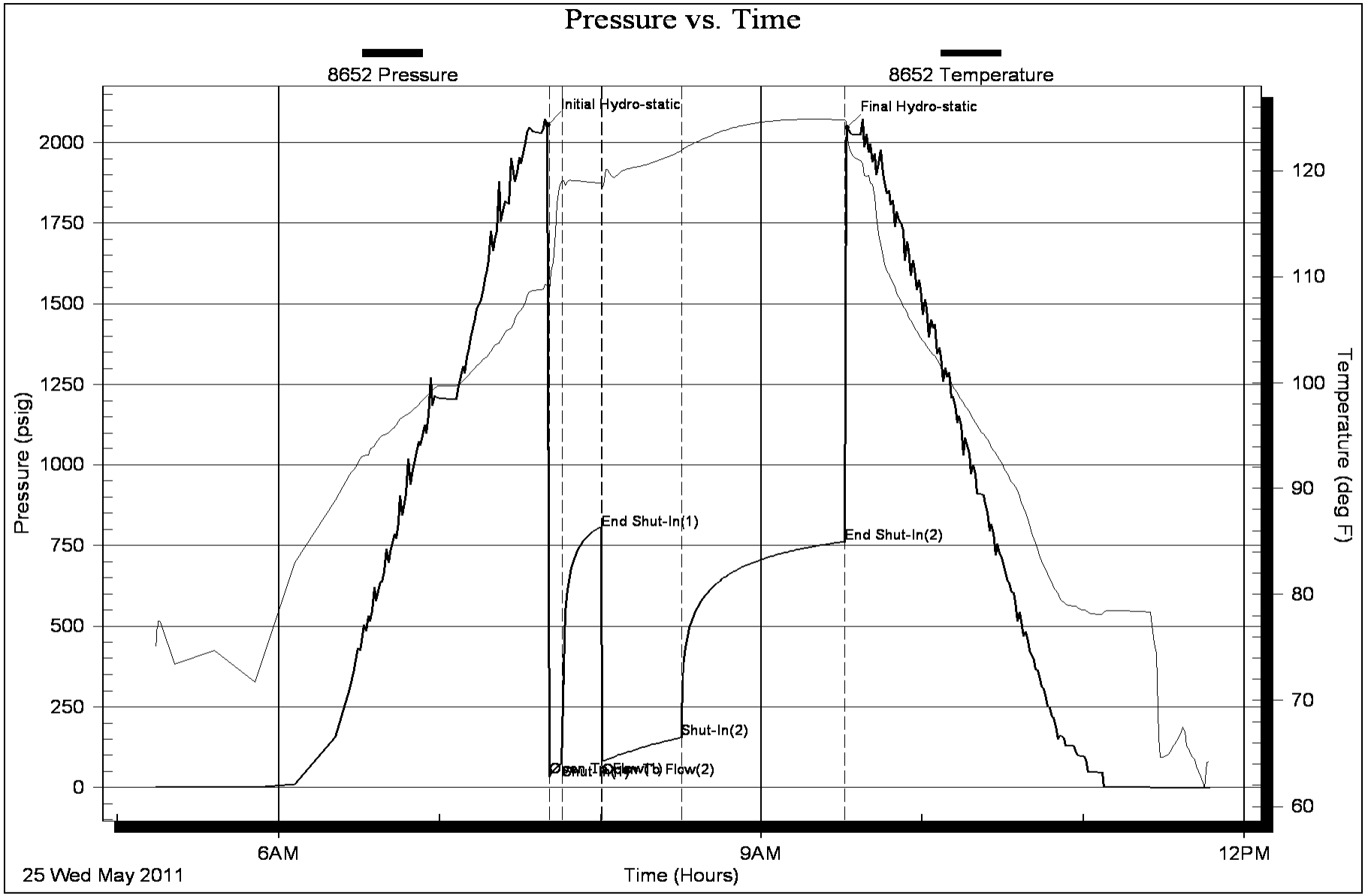
Length ft	Description	Volume bbl
295.00	mcw 10m 90w	3.066
5.00	oil 100o	0.070

Total Length: 300.00 ft Total Volume: 3.136 bbl

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

Laboratory Name: Laboratory Location:

Recovery Comments: rw is .117 @ 65f = 71000ppm


Pressure vs. Time
8652 Pressure
8652 Temperature
Initial Hydro-static
Final Hydro-static
End Shut-In(1)
End Shut-In(2)
Shut-In(2)
Pressure (psig)
Temperature (deg F)
2000
1750
1500
1250
1000
750
500
250
0
120
110
100
90
80
70
60
6AM
9AM
12PM
25 Wed May 2011
Time (Hours)

DRILL STEM TEST REPORT

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43190 **DST#: 4**

Test Start: 2011.05.25 @ 23:07:00

GENERAL INFORMATION:

Formation: **Lansing K**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 01:27:15
Time Test Ended: 04:44:15

Test Type: Conventional Bottom Hole
Tester: Bradley Walter
Unit No: 40

Interval: 4242.00 ft (KB) To 4289.00 ft (KB) (TVD)
Total Depth: 4269.00 ft (KB) (TVD)
Hole Diameter: 7.85 inches Hole Condition: Fair

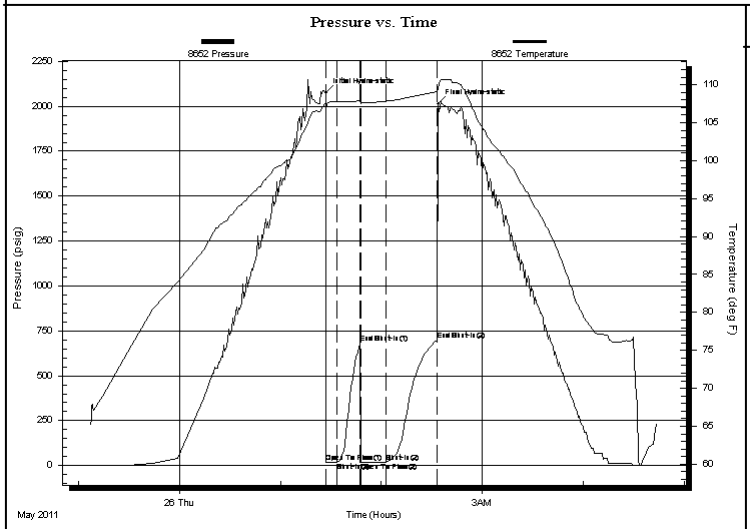
Reference Elevations: 2769.00 ft (KB)
2762.00 ft (CF)
KB to GR/CF: 7.00 ft

Serial #: 8652 **Inside**

Press@RunDepth: 21.35 psig @ 4243.00 ft (KB)
Start Date: 2011.05.25 End Date: 2011.05.26
Start Time: 23:07:05 End Time: 04:44:14

Capacity: 8000.00 psig
Last Calib.: 2011.05.26
Time On Btm: 2011.05.26 @ 01:27:00
Time Off Btm: 2011.05.26 @ 02:33:45

TEST COMMENT: IF: Surface blow.
ISI: No return blow.
FF: Surface blow, died @ 5 minutes.
FSI: No return blow.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2074.84	107.64	Initial Hydro-static
1	18.20	106.47	Open To Flow (1)
7	20.83	107.77	Shut-In(1)
21	683.01	107.85	End Shut-In(1)
21	19.73	107.50	Open To Flow (2)
36	21.35	107.83	Shut-In(2)
66	698.44	109.08	End Shut-In(2)
67	2012.12	109.45	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
3.00	mud (oil spots in tool)	0.01

Gas Rates

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

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43190 **DST#: 4**

Test Start: 2011.05.25 @ 23:07:00

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:	59.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	7.60 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	8600.00 ppm				
Filter Cake:	2.00 inches				

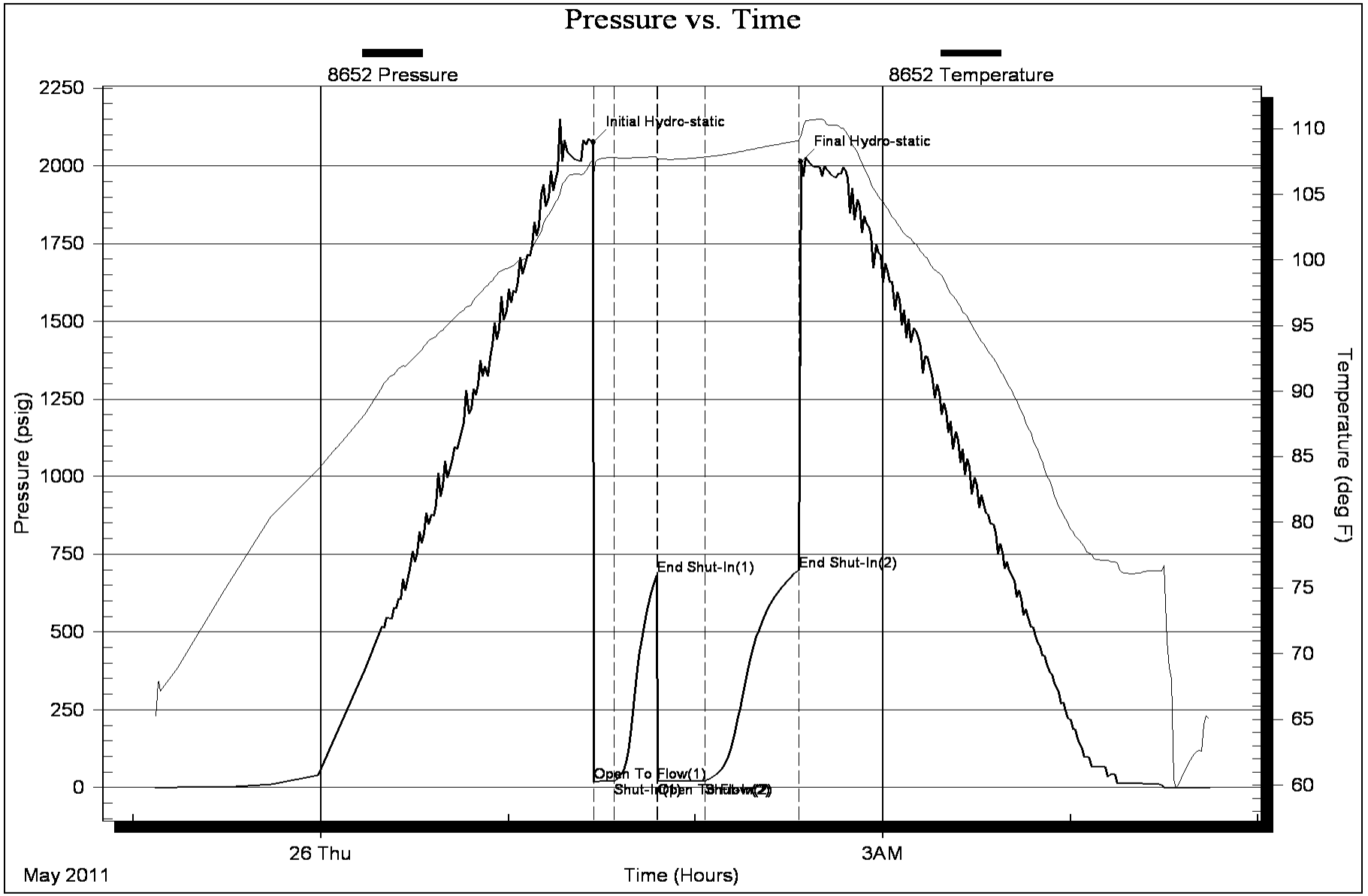
Recovery Information

Recovery Table

Length ft	Description	Volume bbl
3.00	mud (oil spots in tool)	0.014

Total Length: 3.00 ft Total Volume: 0.014 bbl

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


Pressure vs. Time
8652 Pressure
8652 Temperature
Initial Hydro-static
Final Hydro-static
End Shut-In(1)
End Shut-In(2)
Open To Flow(1)
Pressure (psig)
Temperature (deg F)
2250
2000
1750
1500
1250
1000
750
500
250
0
110
105
100
95
90
85
80
75
70
65
60
26 Thu
3AM
May 2011
Time (Hours)

DRILL STEM TEST REPORT

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43191 **DST#: 5**

Test Start: 2011.05.26 @ 15:09:00

GENERAL INFORMATION:

Formation: **Lansing L**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 17:01:00
Time Test Ended: 20:01:15

Test Type: Conventional Bottom Hole
Tester: Bradley Walter
Unit No: 40

Interval: 4276.00 ft (KB) To 4301.00 ft (KB) (TVD)
Total Depth: 4301.00 ft (KB) (TVD)
Hole Diameter: 7.85 inches Hole Condition: Poor

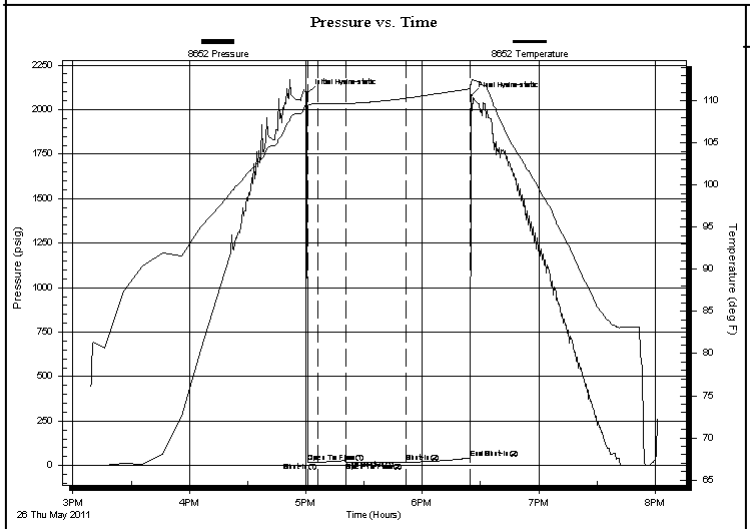
Reference Elevations: 2769.00 ft (KB)
2762.00 ft (CF)
KB to GR/CF: 7.00 ft

Serial #: 8652 **Inside**

Press@RunDepth: 18.47 psig @ 4277.00 ft (KB)
Start Date: 2011.05.26 End Date: 2011.05.26
Start Time: 15:09:05 End Time: 20:01:14

Capacity: 8000.00 psig
Last Calib.: 2011.05.26
Time On Btm: 2011.05.26 @ 17:00:45
Time Off Btm: 2011.05.26 @ 18:25:15

TEST COMMENT: IF: Surface blow.
ISI: No return blow.
FF: No blow.
FSI: No return blow.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2092.67	109.68	Initial Hydro-static
1	17.82	108.96	Open To Flow (1)
6	18.04	109.67	Shut-In(1)
20	28.59	109.69	End Shut-In(1)
20	17.08	109.69	Open To Flow (2)
51	18.47	110.32	Shut-In(2)
84	43.51	111.44	End Shut-In(2)
85	2076.20	112.15	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
1.00	mud (oil spots)	0.00

Gas Rates

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

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43191 **DST#: 5**

Test Start: 2011.05.26 @ 15:09:00

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:	52.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	6.40 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	3000.00 ppm				
Filter Cake:	2.00 inches				

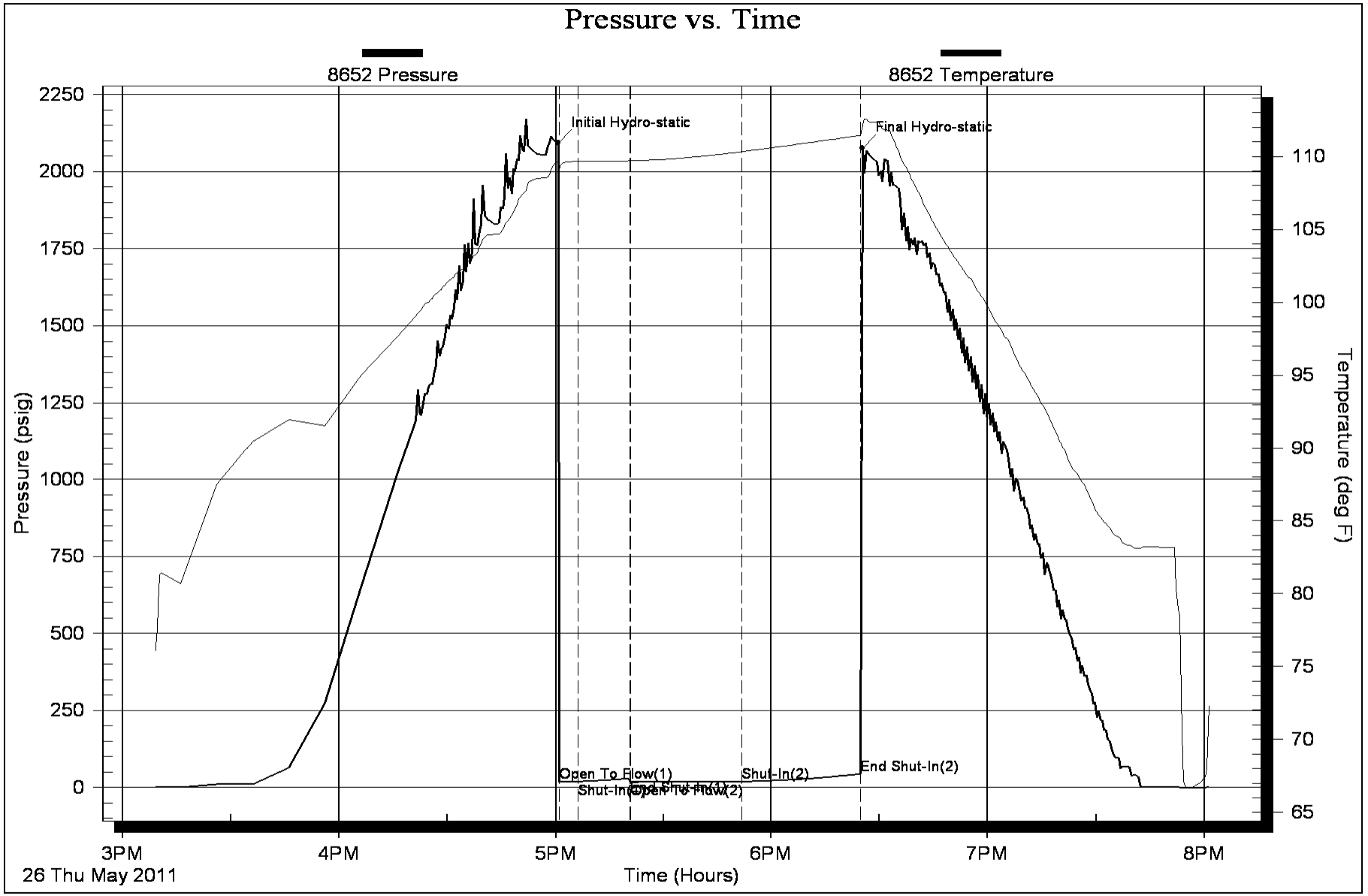
Recovery Information

Recovery Table

Length ft	Description	Volume bbl
1.00	mud (oil spots)	0.005

Total Length: 1.00 ft Total Volume: 0.005 bbl

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


Pressure vs. Time
8652 Pressure
8652 Temperature
Initial Hydro-static
Final Hydro-static
Open To Flow(1)
Shut-In(1)
Shut-In(2)
End Shut-In(2)
Pressure (psig)
Temperature (deg F)
2250
2000
1750
1500
1250
1000
750
500
250
0
110
105
100
95
90
85
80
75
70
65
3PM
4PM
5PM
6PM
7PM
8PM
26 Thu May 2011
Time (Hours)

DRILL STEM TEST REPORT

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43192 **DST#: 6**

Test Start: 2011.05.27 @ 02:49:00

GENERAL INFORMATION:

Formation: **Lansing L**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 05:10:00
Time Test Ended: 08:47:00

Test Type: Conventional Bottom Hole
Tester: Bradley Walter
Unit No: 40

Interval: 4278.00 ft (KB) To 4311.00 ft (KB) (TVD)
Total Depth: 4311.00 ft (KB) (TVD)
Hole Diameter: 7.85 inches Hole Condition: Poor

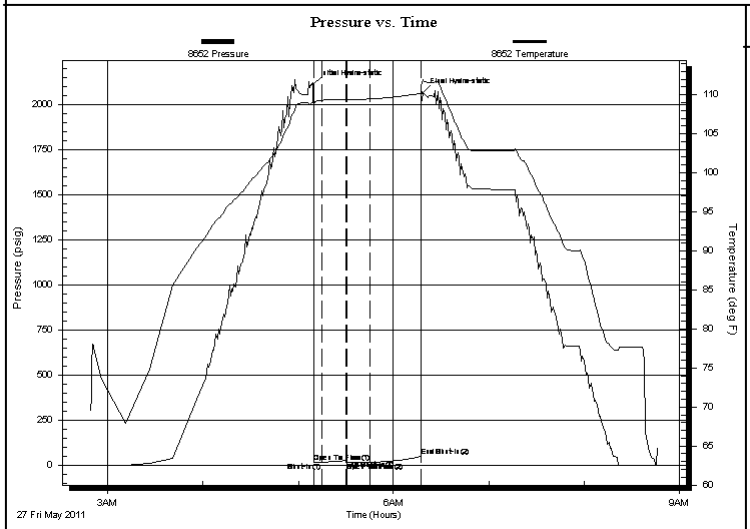
Reference Elevations: 2769.00 ft (KB)
2762.00 ft (CF)
KB to GR/CF: 7.00 ft

Serial #: 8652 **Inside**

Press@RunDepth: 18.78 psig @ 4279.00 ft (KB)
Start Date: 2011.05.27 End Date: 2011.05.27
Start Time: 02:49:05 End Time: 08:46:59

Capacity: 8000.00 psig
Last Calib.: 2011.05.27
Time On Btm: 2011.05.27 @ 05:09:30
Time Off Btm: 2011.05.27 @ 06:18:30

TEST COMMENT: IF: Surface blow.
ISI; No return blow.
FF: No blow.
FSI: No return blow.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2109.34	109.21	Initial Hydro-static
1	18.36	108.63	Open To Flow (1)
6	18.67	109.29	Shut-In(1)
21	27.72	109.37	End Shut-In(1)
22	17.28	109.37	Open To Flow (2)
36	18.78	109.47	Shut-In(2)
68	49.72	110.15	End Shut-In(2)
69	2062.57	111.97	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
2.00	mud (oil spots)	0.01

Gas Rates

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

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43192 **DST#: 6**

Test Start: 2011.05.27 @ 02:49:00

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:	52.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	6.70 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	3000.00 ppm				
Filter Cake:	2.00 inches				

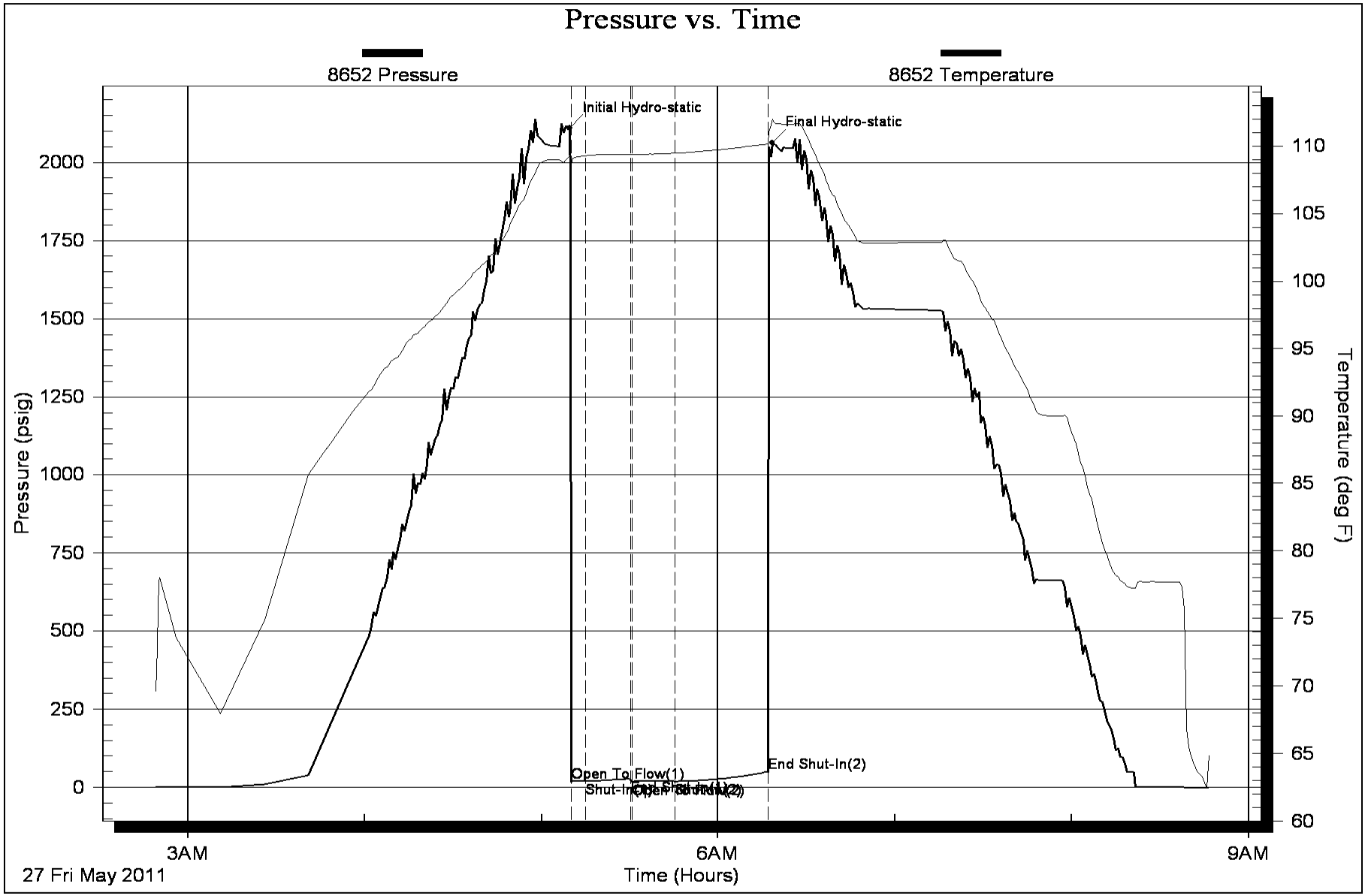
Recovery Information

Recovery Table

Length ft	Description	Volume bbl
2.00	mud (oil spots)	0.009

Total Length: 2.00 ft Total Volume: 0.009 bbl

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


Pressure vs. Time
8652 Pressure
8652 Temperature
Initial Hydro-static
Final Hydro-static
Open To Flow(1)
End Shut-In(2)
Pressure (psig)
Temperature (deg F)
2000
1750
1500
1250
1000
750
500
250
0
110
105
100
95
90
85
80
75
70
65
60
3AM
6AM
9AM
27 Fri May 2011
Time (Hours)

DRILL STEM TEST REPORT

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43193 **DST#: 7**

Test Start: 2011.05.28 @ 02:13:00

GENERAL INFORMATION:

Formation: **Marmaton - Altamont**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 04:19:45
Time Test Ended: 09:08:00

Test Type: Conventional Bottom Hole
Tester: Bradley Walter
Unit No: 40

Interval: 4316.00 ft (KB) To 4410.00 ft (KB) (TVD)
Total Depth: 4410.00 ft (KB) (TVD)
Hole Diameter: 7.85 inches Hole Condition: Poor

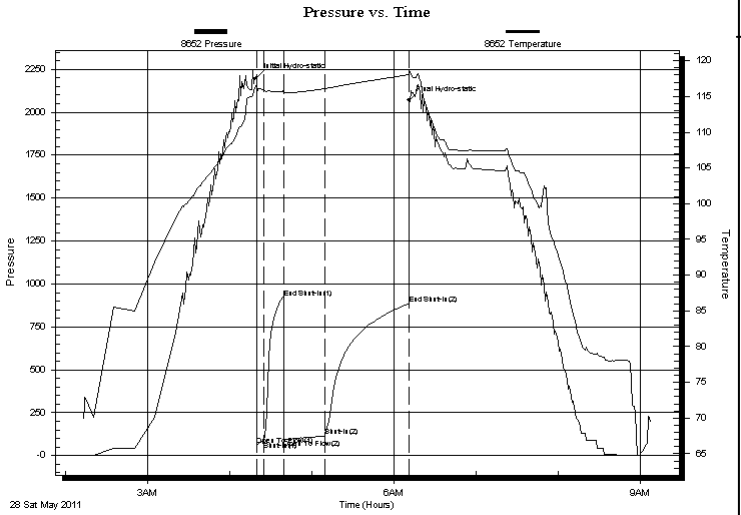
Reference Elevations: 2769.00 ft (KB)
2762.00 ft (CF)
KB to GR/CF: 7.00 ft

Serial #: 8652 **Inside**

Press@RunDepth: 112.82 psig @ 4317.00 ft (KB)
Start Date: 2011.05.28 End Date: 2011.05.28
Start Time: 02:13:05 End Time: 09:07:59

Capacity: 8000.00 psig
Last Calib.: 2011.05.28
Time On Btm: 2011.05.28 @ 04:19:30
Time Off Btm: 2011.05.28 @ 06:10:45

TEST COMMENT: IF: 4 inches blow.
ISI: No return blow.
FF: BOB@ 11 minutes.
FSI: Surfacw blow, died @ 15 minutes.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2201.20	116.64	Initial Hydro-static
1	62.34	115.44	Open To Flow (1)
6	85.63	115.95	Shut-In(1)
20	916.64	115.74	End Shut-In(1)
20	95.36	115.41	Open To Flow (2)
50	112.82	116.08	Shut-In(2)
111	883.07	118.04	End Shut-In(2)
112	2068.47	118.78	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
150.00	ocm 50o 50m	1.03
20.00	oil 100o	0.28
0.00	70 ft GIP	0.00

Gas Rates

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

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43193 **DST#: 7**

Test Start: 2011.05.28 @ 02:13:00

Mud and Cushion Information

Mud Type:	Gel Chem	Cushion Type:		Oil API:	33 deg API
Mud Weight:	9.00 lb/gal	Cushion Length:	ft	Water Salinity:	ppm
Viscosity:	53.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	7.98 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	2000.00 ppm				
Filter Cake:	2.00 inches				

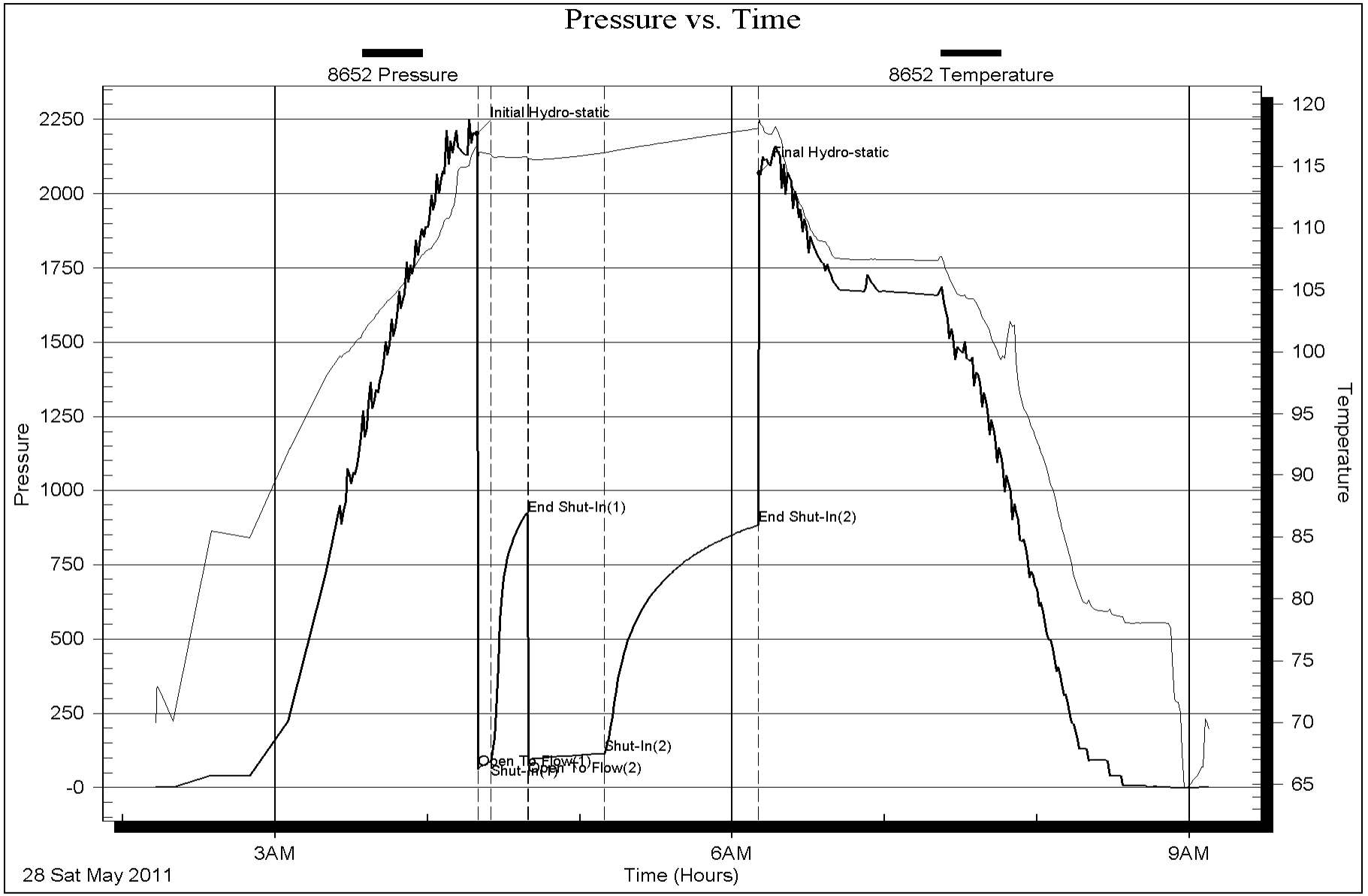
Recovery Information

Recovery Table

Length ft	Description	Volume bbl
150.00	ocm 50o 50m	1.032
20.00	oil 100o	0.281
0.00	70 ft GIP	0.000

Total Length: 170.00 ft Total Volume: 1.313 bbl

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


Pressure vs. Time
8652 Pressure
8652 Temperature
Initial Hydro-static
Final Hydro-static
End Shut-In(1)
End Shut-In(2)
Open To Flow(1)
Shut-In(1)
Open To Flow(2)
Shut-In(2)
2250
2000
1750
1500
1250
1000
750
500
250
-0
Pressure
120
115
110
105
100
95
90
85
80
75
70
65
Temperature
3AM
6AM
9AM
28 Sat May 2011
Time (Hours)

DRILL STEM TEST REPORT

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43194 **DST#: 8**

Test Start: 2011.05.29 @ 04:17:00

GENERAL INFORMATION:

Formation: **Pawnee - Ft Scott**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 06:39:45
Time Test Ended: 10:57:15

Test Type: Conventional Bottom Hole
Tester: Bradley Walter
Unit No: 40

Interval: 4413.00 ft (KB) To 4520.00 ft (KB) (TVD)
Total Depth: 4520.00 ft (KB) (TVD)
Hole Diameter: 7.85 inches Hole Condition: Poor

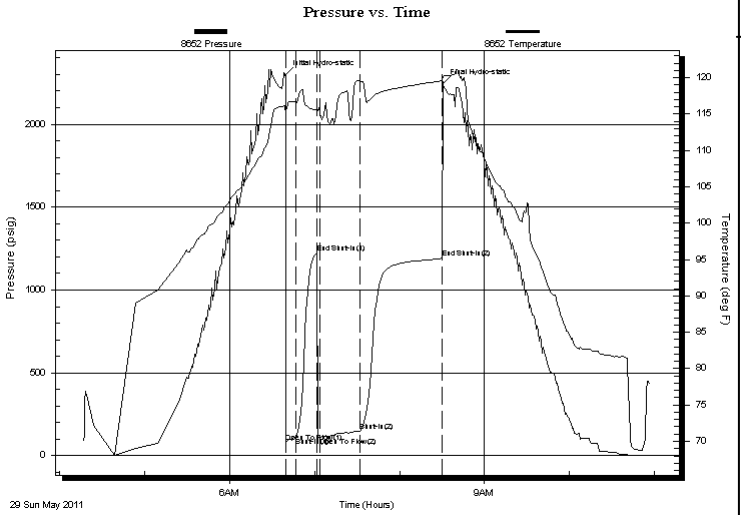
Reference Elevations: 2769.00 ft (KB)
2762.00 ft (CF)
KB to GR/CF: 7.00 ft

Serial #: 8652 **Inside**

Press@RunDepth: 148.08 psig @ 4521.00 ft (KB)
Start Date: 2011.05.29 End Date: 2011.05.29
Start Time: 04:17:05 End Time: 10:57:14

Capacity: 8000.00 psig
Last Calib.: 2011.05.29
Time On Btm: 2011.05.29 @ 06:39:30
Time Off Btm: 2011.05.29 @ 08:31:00

TEST COMMENT: IF: 4 inches blow.
ISI: No return blow.
FF: BOB @ 7 minutes.
FSI: 1/2 inch return blow, died @ 40 minutes.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2298.04	116.23	Initial Hydro-static
1	80.35	114.85	Open To Flow (1)
8	112.15	116.65	Shut-In(1)
22	1224.81	115.65	End Shut-In(1)
24	110.22	115.31	Open To Flow (2)
53	148.08	119.53	Shut-In(2)
111	1190.83	119.60	End Shut-In(2)
112	2246.36	120.13	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
60.00	ocm 10o 90m	0.28
165.00	gocm 45g 20o 35m	1.80
0.00	495 ft GIP	0.00

Gas Rates

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

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43194 **DST#: 8**

Test Start: 2011.05.29 @ 04:17:00

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:	6.80 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	2000.00 ppm				
Filter Cake:	2.00 inches				

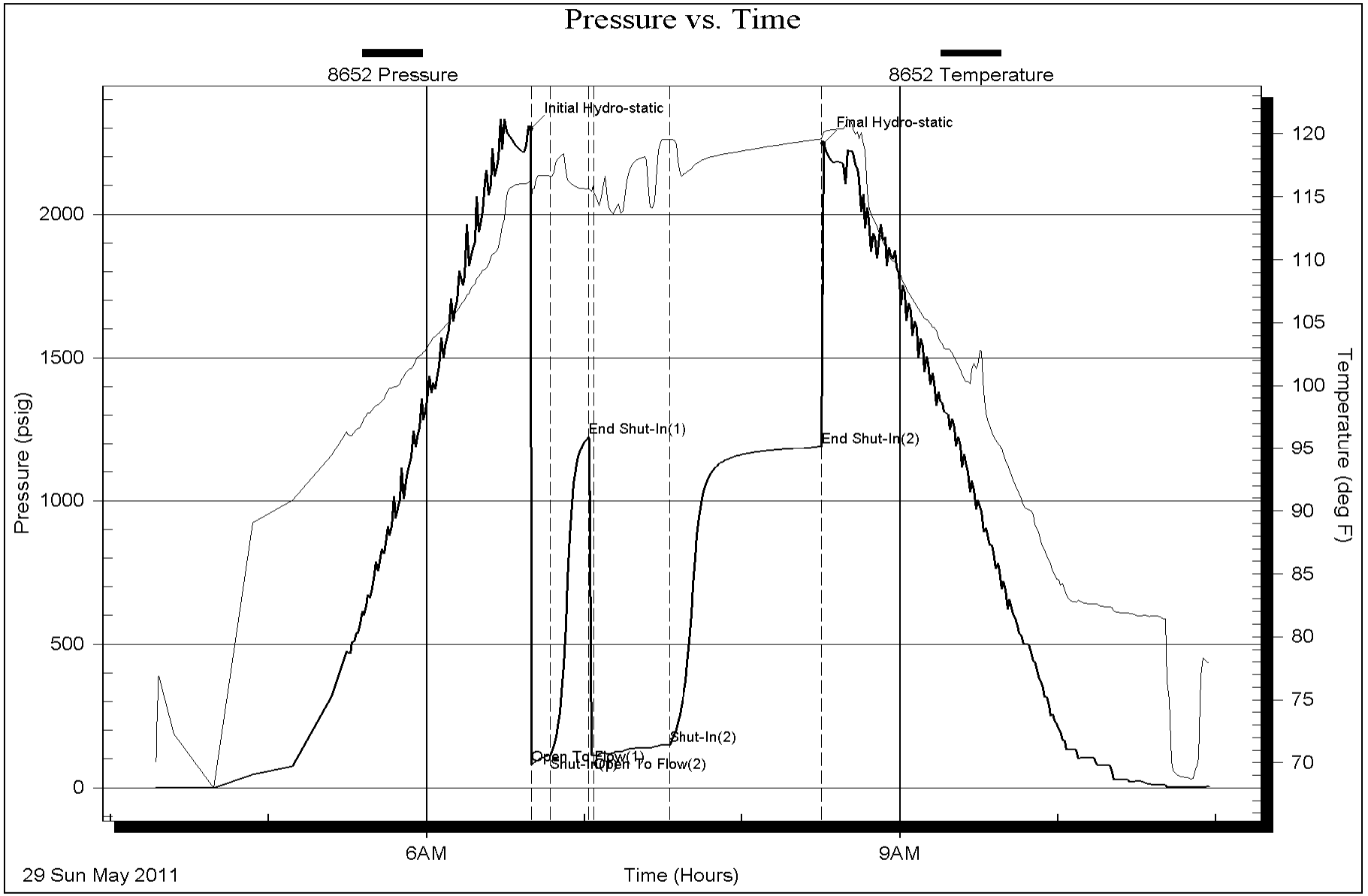
Recovery Information

Recovery Table

Length ft	Description	Volume bbl
60.00	ocm 10o 90m	0.282
165.00	gocm 45g 20o 35m	1.802
0.00	495 ft GIP	0.000

Total Length: 225.00 ft Total Volume: 2.084 bbl

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


Pressure vs. Time
8652 Pressure
8652 Temperature
Initial Hydro-static
Final Hydro-static
End Shut-In(1)
End Shut-In(2)
Shut-In(2)
Open To Flow(1)
Shut-In(1)
Open To Flow(2)
2000
1500
1000
500
0
120
115
110
105
100
95
90
85
80
75
70
Pressure (psig)
Temperature (deg F)
6AM
9AM
29 Sun May 2011
Time (Hours)

DRILL STEM TEST REPORT

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43195 **DST#: 9**

Test Start: 2011.05.30 @ 05:37:00

GENERAL INFORMATION:

Formation: **Johnson**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 09:03:45
Time Test Ended: 12:20:00

Test Type: Conventional Bottom Hole
Tester: Bradley Walter
Unit No: 40

Interval: 4525.00 ft (KB) To 4560.00 ft (KB) (TVD)
Total Depth: 4560.00 ft (KB) (TVD)
Hole Diameter: 7.85 inches Hole Condition: Fair

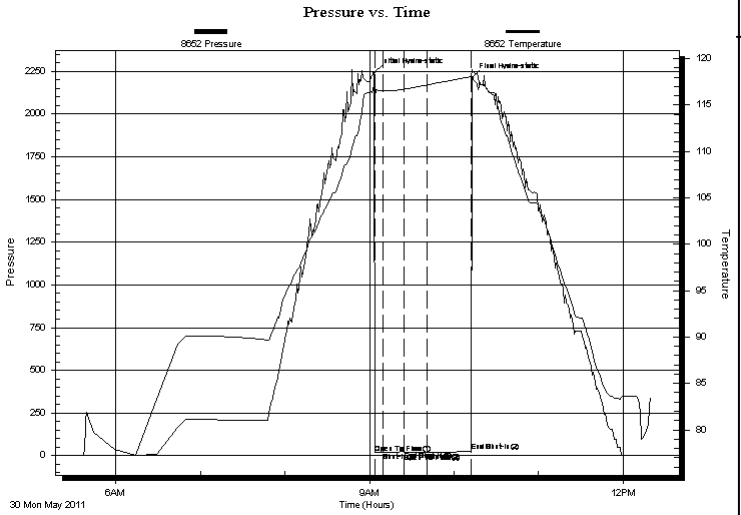
Reference Elevations: 2769.00 ft (KB)
2762.00 ft (CF)
KB to GR/CF: 7.00 ft

Serial #: 8652 **Inside**

Press@RunDepth: 18.05 psig @ 4526.00 ft (KB)
Start Date: 2011.05.30 End Date: 2011.05.30
Start Time: 05:37:05 End Time: 12:19:59

Capacity: 8000.00 psig
Last Calib.: 2011.05.30
Time On Btm: 2011.05.30 @ 09:03:30
Time Off Btm: 2011.05.30 @ 10:13:00

TEST COMMENT: IF: Surface blow .
ISI: No return blow .
FF: No blow ..
FSI: No return blow .



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2242.31	117.29	Initial Hydro-static
1	16.85	115.84	Open To Flow (1)
7	18.16	116.54	Shut-In(1)
21	23.65	116.71	End Shut-In(1)
21	16.94	116.71	Open To Flow (2)
37	18.05	117.16	Shut-In(2)
69	25.60	118.06	End Shut-In(2)
70	2212.56	118.84	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
1.00	mud (oil spots)	0.00

Gas Rates

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

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43195 **DST#: 9**

Test Start: 2011.05.30 @ 05:37:00

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:	8.77 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	2500.00 ppm				
Filter Cake:	2.00 inches				

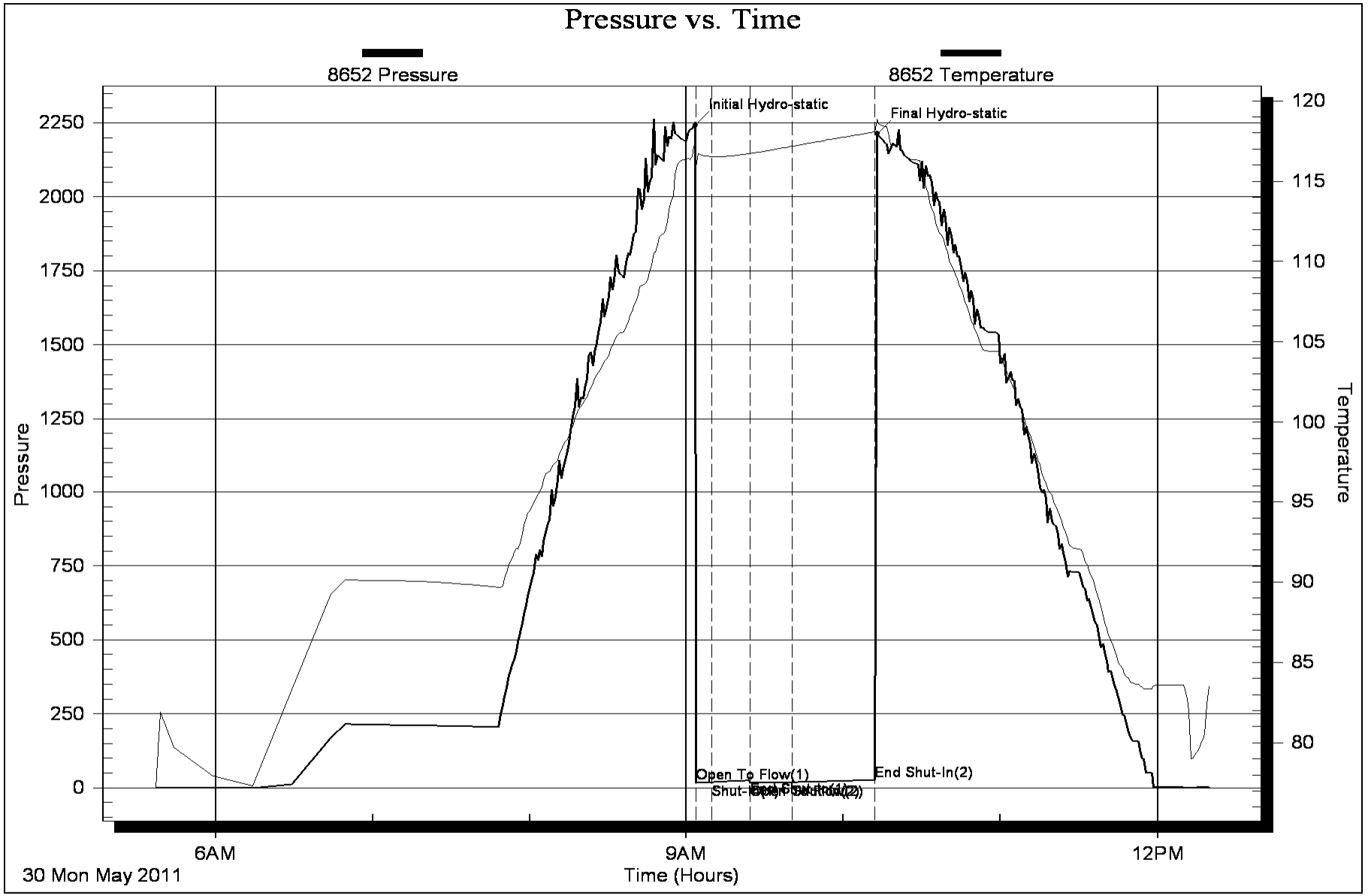
Recovery Information

Recovery Table

Length ft	Description	Volume bbl
1.00	mud (oil spots)	0.005

Total Length: 1.00 ft Total Volume: 0.005 bbl

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


Pressure vs. Time
8652 Pressure
8652 Temperature
Initial Hydro-static
Final Hydro-static
Open To Flow(1)
End Shut-In(2)
Pressure
Temperature
2250
2000
1750
1500
1250
1000
750
500
250
0
120
115
110
105
100
95
90
85
80
6AM
9AM
12PM
30 Mon May 2011
Time (Hours)

DRILL STEM TEST REPORT

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43196 **DST#: 10**

Test Start: 2011.05.31 @ 01:18:00

GENERAL INFORMATION:

Formation: **Cherokee Sand**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 04:01:45
Time Test Ended: 06:58:15

Test Type: Conventional Bottom Hole
Tester: Bradley Walter
Unit No: 40

Interval: 4557.00 ft (KB) To 4580.00 ft (KB) (TVD)
Total Depth: 4580.00 ft (KB) (TVD)
Hole Diameter: 7.85 inches Hole Condition: Poor

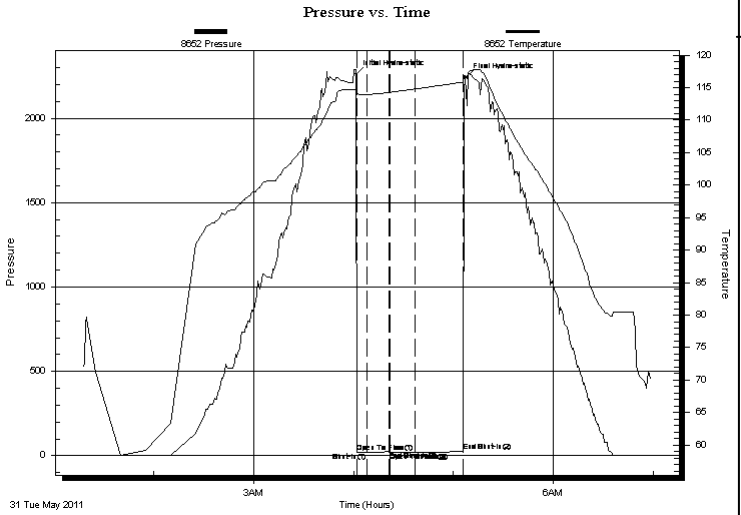
Reference Elevations: 2769.00 ft (KB)
2762.00 ft (CF)
KB to GR/CF: 7.00 ft

Serial #: 8652 **Inside**

Press@RunDepth: 17.99 psig @ 4558.00 ft (KB)
Start Date: 2011.05.31 End Date: 2011.05.31
Start Time: 01:18:05 End Time: 06:58:14

Capacity: 8000.00 psig
Last Calib.: 2011.05.31
Time On Btm: 2011.05.31 @ 04:01:30
Time Off Btm: 2011.05.31 @ 05:07:15

TEST COMMENT: IF: Surface blow.
ISI: No return blow.
FF: No blow.
FSI: No return blow.



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2260.05	114.61	Initial Hydro-static
1	18.79	113.86	Open To Flow (1)
7	19.14	113.95	Shut-In(1)
20	23.02	114.27	End Shut-In(1)
21	17.76	114.28	Open To Flow (2)
36	17.99	114.79	Shut-In(2)
65	25.68	115.85	End Shut-In(2)
66	2243.74	116.49	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
2.00	mud 100m (oil spots in tool)	0.01

Gas Rates

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

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering, Inc

562 West State Road 4
Olmitz, Ks 67564

ATTN: Bob Lewellyn

JoAnn Unit #1-32

32 17s 28w Lane Ks

Job Ticket: 43196 **DST#: 10**

Test Start: 2011.05.31 @ 01:18:00

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:	50.00 sec/qt	Cushion Volume:	bbl		
Water Loss:	8.38 in³	Gas Cushion Type:			
Resistivity:	ohm.m	Gas Cushion Pressure:	psig		
Salinity:	2300.00 ppm				
Filter Cake:	2.00 inches				

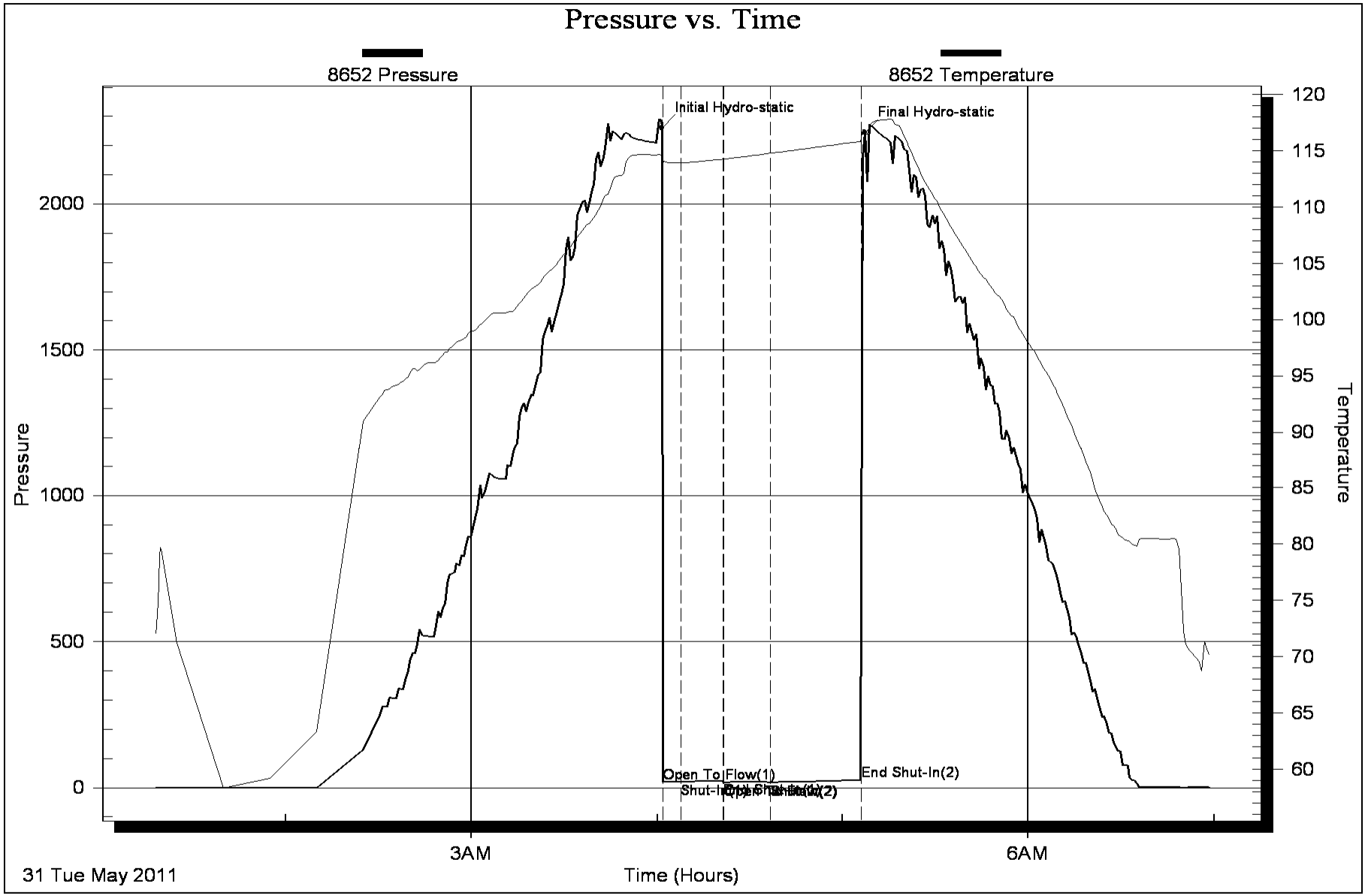
Recovery Information

Recovery Table

Length ft	Description	Volume bbl
2.00	mud 100m (oil spots in tool)	0.009

Total Length: 2.00 ft Total Volume: 0.009 bbl

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


Pressure vs. Time
8652 Pressure
8652 Temperature
Initial Hydro-static
Final Hydro-static
Open To Flow(1)
End Shut-In(2)
Pressure
Temperature
2000
1500
1000
500
0
120
115
110
105
100
95
90
85
80
75
70
65
60
3AM
6AM
31 Tue May 2011
Time (Hours)

Robert C. Lewellyn

Consulting Petroleum Geologist

P. O. Box 375
Kechi, Kansas 67067
316-518-0495
boblewellyn@yahoo.com

GEOLOGICAL REPORT

Larson Engineering, Inc.
No. 1-32 Joann Unit
1800' FSL & 2475' FEL Sec. 32-17S-28W
Lane County, Kansas

CONTRACTOR:	H D Drilling, LLC, rig 3
SPUDDED:	May 17, 2011
DRILLING COMPLETED:	June 01, 2011
SURFACE CASING:	8 5/8" @ 261 KBM/175 sx.
ELECTRIC LOGS:	DIL CNL/CDL MEL
ELEVATIONS:	2769 KB 2762 GL

FORMATION TOPS: (Electric Log)

Anhydrite	2181 (+ 588)
Base Anhydrite	2211 (+ 558)
Heebner Shale	3958 (-1189)
Lansing-Kansas City Group	3997 (-1228)
Muncie Creek Shale	4158 (-1389)
Stark Shale	4250 (-1481)
Hushpuckney Shale	4282 (-1513)
Base Kansas City	4328 (-1599)
Marmaton (Lenapah)	4344 (-1575)
Altamont	4368 (-1599)
Pawnee	4445 (-1676)
Myrick Station	4470 (-1701)
Fort Scott	4496 (-1727)
Cherokee	4522 (-1753)
Cherokee Sand	4572 (-1803)
Detrital Zone	4589 (-1820)
Mississippian	4608 (-1839)
Electric Log Total Depth	4653 (-1884)
Rotary Total Depth	4650 (-1881)

Samples were examined microscopically from 3800 to Rotary Total Depth. Samples were examined wet and dry and samples from potentially productive zones were viewed under a fluoroscope and checked for oil cut. Depths on drill stem tests were corrected downhole three feet to correlate with electric log depths. Following is a description of zones of interest, Drill Stem Tests, etc. For a complete lithologic description of all formations refer to the sample log in the back pages of this report.

Lansing-Kansas City Zones:

3997-4018 (A Zone)

Limestone, cream to buff, dense to finely crystalline with much chalky, rare trace of very poor intercrystalline porosity, no show of oil.

4027-4031 (B Zone)

Limestone, cream to buff, dense to finely crystalline, partly chalky, partly fossiliferous, scattered poor intercrystalline porosity, no show of oil.

4047-4070 (C/D Zone)

Limestone, cream to buff, trace of tan, dense, some finely crystalline and considerable chalky, zone is mostly tight with no shows of oil.

4073-4084 (E Zone)

Limestone, cream to buff, some tan, dense to finely crystalline and fossiliferous, some fair intercrystalline and interfossil porosity, trace of scattered dead stain, no show of live oil.

4086-4099 (F Zone)

Limestone, cream to buff to tan, dense to finely crystalline, trace of light gray fresh chert, zone is mostly tight with rare trace of dead oil stain, no show of live oil.

4101-4158 (G Zone)

The top of this interval contained a foot or two of finely crystallline limestone, slightlly oolitic, with poor intercrystalline and scattered interoolitic porosity. The remainder of the section was dense, chalky, and tight. No shows of oil were present in this section.

4169-4174 (H Zone)

Limestone, buff to tan, finely crystalline and fossiliferous, poor to fair intercrystalline and interfossil porosity, trace of fossil-cast porosity, poor to fair spotted stain, slight to fair show of free oil, faint odor, poor fluorescence, poor to fair cut, trace of finely oolitic with poor ooliticastic porosity and show of oil as above.

Drill Stem Test No. 1 4151-4180
5-15-35-30; surface blow on first flow period, no blowback; blow did not return on second flow period.

Recovered three feet of mud with oil spots. ISIP 37# FSIP 64# IFP 15-18# FFP 17-18# IHP 2046# FHP 1985# BHT 117 degrees F.

4199-4204 (I Zone)

Limestone, buff to tan, some light gray, dense to finely crystalline and partly fossiliferous, fair intercrystalline porosity, some scattered vugular porosity, scattered poor interfossil porosity, fair spotted stain, fair show of free oil, good odor, poor to fair fluorescence, fair to good cut.

Drill Stem Test No. 2 4183-4213
5-15-15-30; surface blow through first flow period, no blowback; blow did not return on second flow period. Recovered five feet of mud with oil spots. ISIP 47# FSIP 46# IFP 17-26# FFP 18-19# IHP 2036# FHP 1988# BHT 110 degrees F.

4226-4233 (J Zone)

Limestone, white to cream, some buff, finely crystalline and finely oolitic, fair intercrystalline, interoolitic, and ooliticastic porosity, fair spotted stain, fair show of free oil, fair odor, poor to fair fluorescence, fair to good cut.

Drill Stem Test No. 3 4213-4247
5-15-30-60; five inch blow on first flow period, no blowback; built to bottom of bucket in 15 minutes on second flow, no blowback. Recovered five feet of clean oil and 295 feet of mud cut water (90% water, 10% mud). ISIP 801# FSIP 759# IFP 34-74# FFP 83-154# IHP 2054# FHP 2046# BHT 125 degrees F.

4264-4270 (K Zone)

Limestone, buff to tan, dense to finely crystalline and oolitic, scattered poor to fair intercrystalline and interoolitic porosity, poor to fair spotted stain, very slight show of free oil, faint odor, poor fluorescence, poor cut. Some buff, tight oolitic limestone with dark gray to black oolites.

Drill Stem Test No. 4 4245-4271
5-15-15-30; surface blow on first flow period, no blowback; blow did not return on second flow. Recovered three feet of mud with oil spots in the tool. ISIP 683# FSIP 698# IFP 18-21# FFP 20-21# IHP 2075# FHP 2012# BHT N/A.

4284-4295 (Middle Creek Zone)

Limestone, buff, finely crystalline, some dense, slightly fossiliferous, poor to fair intercrystalline porosity, trace of poor spotted stain, trace of dead stain, trace of free oil, poor to fair odor, no fluorescence, poor cut.

4298-4304 (L Zone)

Limestone, buff, dense to finely crystalline, trace of medium crystalline, slightly fossiliferous, poor to fair intercrystalline porosity, poor to fair spotted stain, slight show of free oil, faint to fair odor, poor fluorescence, poor to fair cut, trace of scattered calcite crystal overgrowth.

Drill Stem Test No. 5 4279-4304
5-15-30-30; surface blow on first flow period, no blowback; blow did not return on second flow. Recovered one foot of mud with oil spots. ISIP 29# FSIP 44# IFP 18-18# FFP 17-18# IHP 2093# FHP 2076# BHT 111 degrees F.

4304-4314

Limestone, buff, some tan, dense to finely crystalline and slightly fossiliferous, poor to fair intercrystalline and interfossil porosity, very slight show of free oil, faint odor, poor fluorescence, poor to fair cut.

Drill Stem Test No. 6 4281-4314
5-15-15-30; surface blow on first flow period, no blowback; blow did not return on second flow period. Recovered two feet of mud with oil spots. ISIP 28# FSIP 50# IFP 18-19# FFP 17-19# IHP 2109# FHP 2063 BHT 110 degrees F.

4314-4328 (Lower L Zone)

The remaining L Zone section consisted of limestone, buff to tan, dense to finely crystalline, mostly tight with traces of very poor spotted stain, no free oil, no odor, no fluorescence, no cut.

4330-4344 (Pleasanton Zone)

Limestone, cream to buff, some tan, dense to finely crystalline with considerable chalk, zone is mostly tight with no shows of oil.

4344-4358 (Marmaton Lenapah Zone)

Limestone, buff to tan, dense to finely crystalline and fossiliferous, fair intercrystalline porosity with scattered fair vugular porosity, fair spotted stain, fair show of free oil, faint to fair odor, fair fluorescence, fair cut.

4410-4412 (Altamont "A" Zone)

Limestone, cream to buff, some tan, dense to finely crystalline and fossiliferous, fair vugular, intercrystalline and interfossil porosity, fair spotted stain, fair show of free oil, fair odor, fair fluorescence, fair cut.

Drill Stem Test No. 7 4319-4413
5-15-30-60; built to four inch blow on first flow period, no blowback; built to bottom of bucket in 11 minutes of second flow, surface blowback died in 5 minutes. Recovered 70 feet of gas in drill pipe, 20 feet of oil, 150 feet of oil cut mud (50% oil, 50% mud). ISIP 917# FSIP 883# IFP 62-86# FFP 95-113# IHP 2201# FHP 2068# BHT 118 degrees F.

4421-4441 (Lower Altamont Zone)

Limestone, cream to buff to tan, some brown, dense to finely crystalline, partly fossiliferous, partly chalky, scattered poor to fair intercrystalline and vugular porosity, poor to fair spotted stain, slight show of free oil, faint odor, poor flluorescence, poor to fair cut.

4445-4450 (Pawnee Zone)

Limestone, buff to tan, some brown, some cream, dense to finely crystalline, poor to fair intercrystalline porosity, trace of poor vugular porosity, scattered poor to fair spotted stain, show of free oil, fair odor, fair fluorescence, fair cut.

4470-4492 (Myrick Station Zone)

Limestone, buff to tan to brown, dense to finely crystalline, slightly fossilliferous, zone is mostly tight with just a trace of poor spotted stain on dense pieces, no free oil, no odor, no fluorescnece, no cut.

4496-4504 (Upper Fort Scott Zone)

Limestone, buff to tan, some brown, some mottled, dense to finely crystalline, oolitic in part, fair scattered intercrystalline porosity, scattered poor spotted stain, very slight show of free oil, faint odor, poor fluorescence, poor cut.

4517-4521 (Lower Fort Scott Zone)

Limestone, buff to tan, dense to finely crystalline, slightly oolitic, trace of poor scattered intercrystalline porosity with traces of poor spotted stain, no free oil, no odor, no fluorescence, no cut.

Drill Stem Test No. 8 4416-4523
5-15-30-60; built to four-inch blow on first flow period, no blowback; blow off bottom of bucket in seven minutes of second flow period, blowback built to ½ inch and died in 40 minutes. Recovered 165 feet of gassy oil cut mud (45% gas, 20% oil, 35% mud), and 60 feet of oil cut mud (10% oil, 90% mud). ISIP 1225# FSIP 1191# IFP 80-112# FFP 110-148# IHP 2298# FHP 2246# BHT 120 degrees F.

4525-4555 (Cherokee Zones)

This interval consisted of limestone, tan to brown, mostly dense, some scattered finely crystalline, very poor vugular porosity, rare trace of spotted stain, no free oil, no odor, no fluorescence, no cut.

4555-4570 (Johnson Zone)

Limestone, buff to brown, some gray, dense to finely crystalline and partly oolitic, scattered poor to fair intercrystalline porosity with scattered poor interoolitic porosity, poor to fair spotted stain, slight show of free oil, faint odor, poor fluorescence, poor to fair cut, some stain of fracture faces on dense lime.

Drill Stem Test No. 9 4528-4563
5-15-15-30; surface blow through first flow period, no blowback; blow did not return on second flow period. Recovered one foot of mud with a few oil spots. ISIP 24# FSIP 26# IFP 17-18# FFP 17-18# IHP 2242# FHP 2213# BHT 118 degrees F

4572-4582 (Cherokee Sand Zone)

Sand, buff, medium grained, subround to partly subangular, fairly well-cemented to friable, fair intergranular porosity, fair to good spotted stain, some saturated stain, good show of free oil, good odor, fair to good fluorescence, good cut, some scattered tight sand present in section.

Drill Stem Test No. 10 4560-4583
Surface blow though first flow, no blowback; blow did not return on second flow. Recovered two feet of mud with a few oil spots in tool. ISIP 23# FSIP 26# IFP 19-19# FFP 18-18# IHP 2260# FHP 2243# BHT 116 degrees F.

4584-4589 (Lower Cherokee Sand Zone)

Sand, white, very fine-grained, well-cemented and tight, subround, hard, no visible porosity and no shows of oil.

4589-4608 (Detrital Zone)

This section consisted of sand as above with white to varicolored, fresh to weathered cherts and various and varicollered shales. No reservoir quality and no shows of oil were present in the section.

4608-4625 (Mississippian Zone)

Limestone, dolomitic, tan to brown, medium crystalline, slightly oolitic, slightly fossiliferous, fair to good intercrystalline porosity, some light gray fresh chert, no shows of oil.

4625-4653 (Lower Mississippian)

Dolomite, tan, some brown, medium crystalline, fair to good intercrystalline porosity, no show of oil.

4653 Electric Log Total Delpth

Conclusions and recommendations:

Production casing was cemented in the No. 1-32 Joann Unit. The well should be completed with treatment as necessary to facilitate production as per Tom Larson and Kyle Carter.

Respectfully submitted,

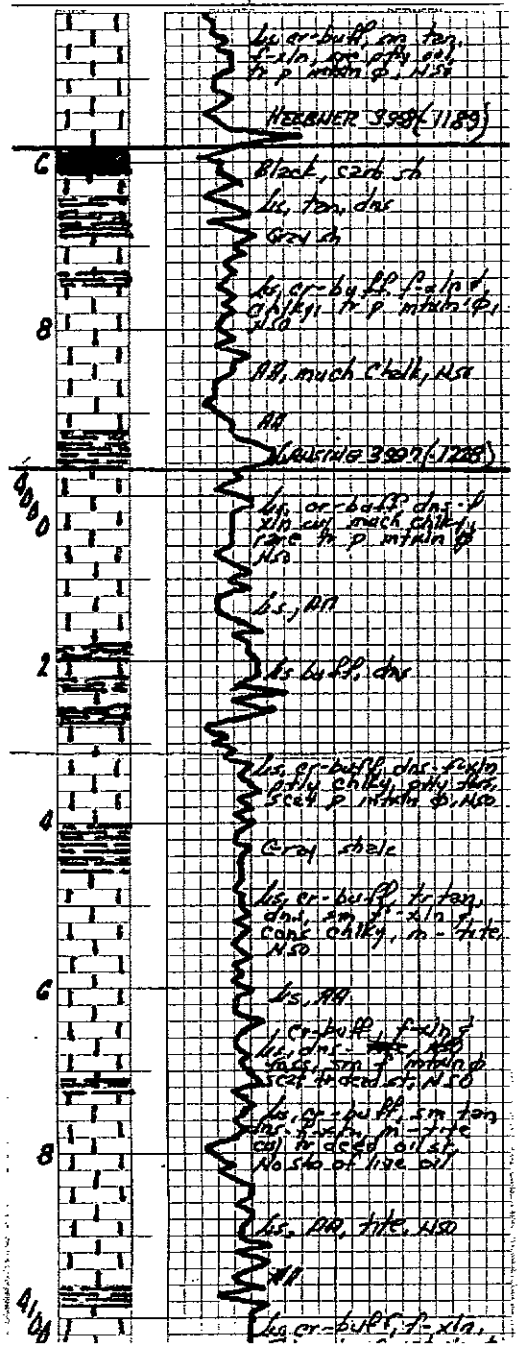
Robert C. Lewellyn
Petroleum Geologist

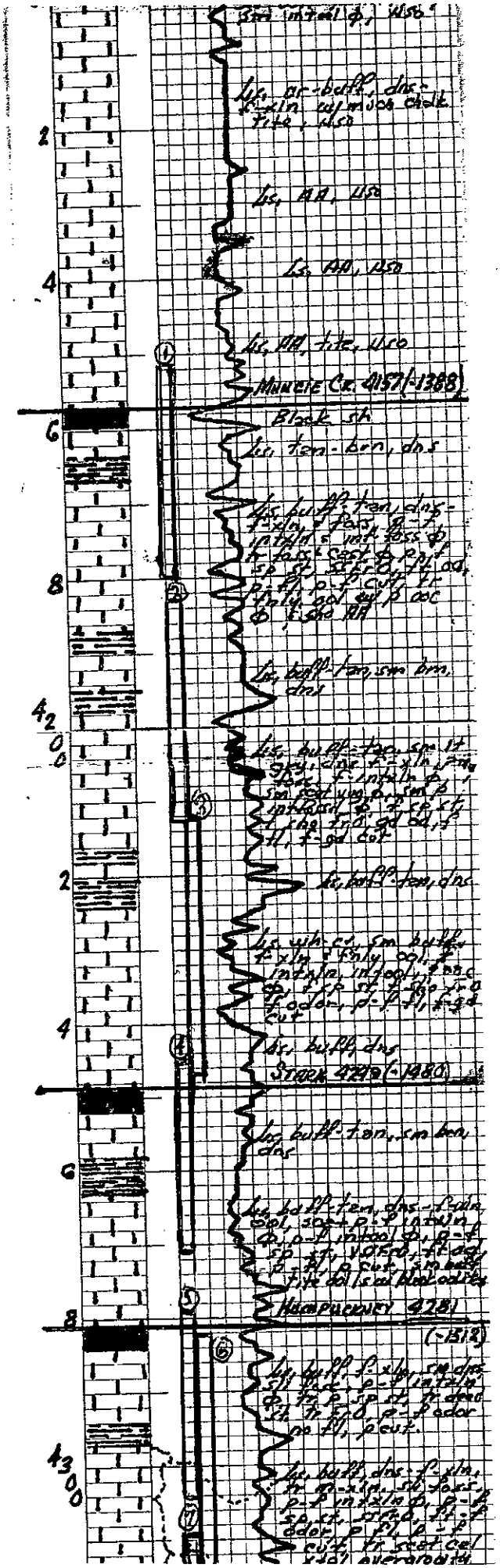
RCL:me

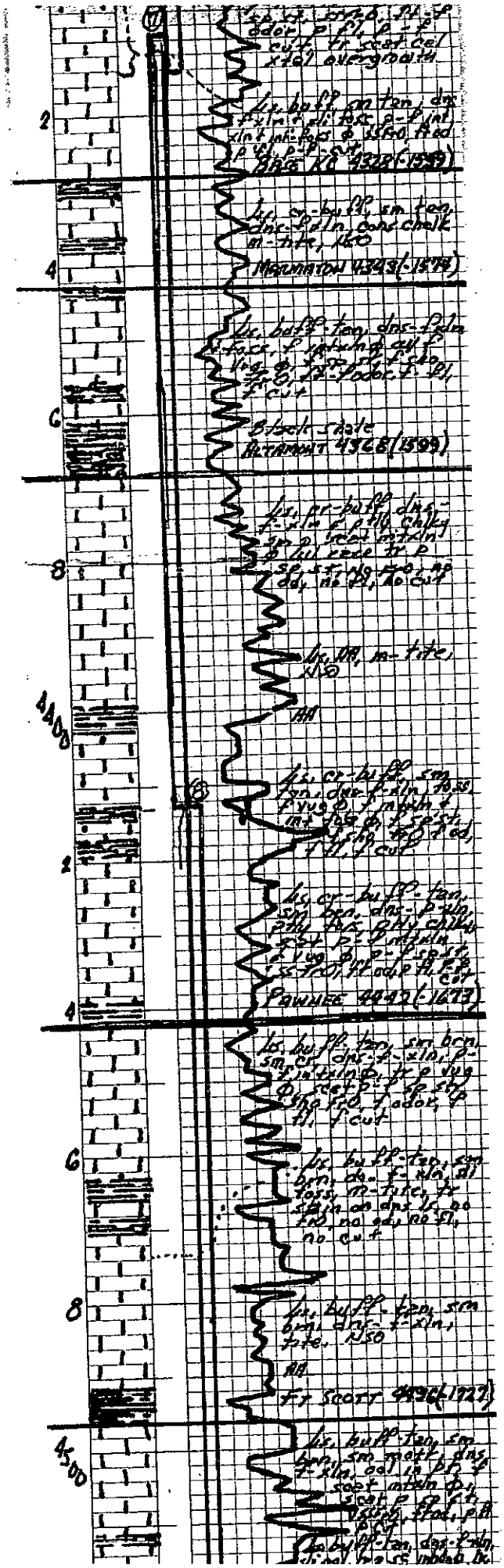
STATE: KANSAS
COUNTY: LANE
BLOCK:
SEC.: 32
T.: 17S
R.: 28W
ALTITUDE: 2769 KB
PRODUCTION: OIL

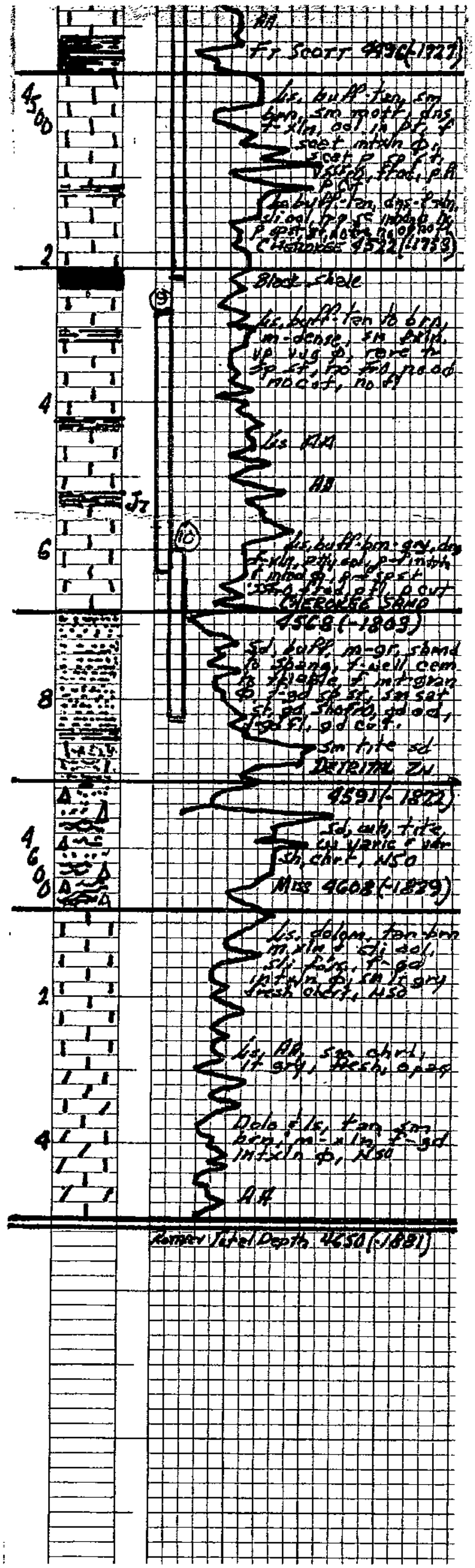
COMPANY: LARSON ENGINEERING, INC
FARM: JOZAN UNIT
WELL NO.: No. 1-32
SURVEY: 1800' FSL & 2475' FEL
TOTAL DEPTH: 4650
CONTRACTOR: H.D Drilling, LLC
COMMENCED: 5-17-11
COMPLETED: 6-01-11
REMARKS: Robert C. Lewellyn-Geologist

CASING RECORD
8⅝" @ 261 KBM/175sx




MUNCIE Cr. 4157 (-1388)
Black sh.
STOCK 4279 (-1480)
HAMPSHIRE 4281 (-1512)


2
4
6
8
4400
2
4
6
8
4500



Ft Scott
4500
2
Black shale
4
J7
6
CHEROKEE SAND
4568 (-1809)
8
Sm tite sd
DETRITAL ZN
4591 (-1822)
4600
Miss 4608 (-1839)
2
4
AA
Total Depth 4650 (-1881)

Conservation Division
Finney State Office Building
130 S. Market, Rm. 2078
Wichita, KS 67202-3802

Kansas
Corporation Commission

Phone: 316-337-6200
Fax: 316-337-6211
http://kcc.ks.gov/

September 14, 2011

Thomas Larson
Larson Engineering, Inc. dba Larson Operating Company
562 W STATE RD 4
OLMITZ, KS 67564-8561

Re: ACO1
API 15-101-22292-00-00
Joann Unit 1-32
SE/4 Sec.32-17S-28W
Lane County, Kansas

Dear Production Department:

We are herewith requesting that the Well Completion Form ACO-1 and attached information for the subject well be held confidential for a period of two years.

Should you have any questions or need additional information regarding subject well, please contact our office.

Respectfully,
Thomas Larson