



Confidentiality Requested:

Yes  No

KANSAS CORPORATION COMMISSION 1231981  
OIL & GAS CONSERVATION DIVISION

Form ACO-1

August 2013

Form must be Typed  
Form must be Signed  
All blanks must be Filled

WELL COMPLETION FORM  
WELL HISTORY - DESCRIPTION OF WELL & LEASE

OPERATOR: License # \_\_\_\_\_

Name: \_\_\_\_\_

Address 1: \_\_\_\_\_

Address 2: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ + \_\_\_\_\_

Contact Person: \_\_\_\_\_

Phone: ( \_\_\_\_\_ ) \_\_\_\_\_

CONTRACTOR: License # \_\_\_\_\_

Name: \_\_\_\_\_

Wellsite Geologist: \_\_\_\_\_

Purchaser: \_\_\_\_\_

Designate Type of Completion:

- New Well       Re-Entry       Workover
- Oil       WSW       SWD       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
- Plug Back       Conv. to GSW       Conv. to Producer
- Commingled      Permit #: \_\_\_\_\_
- Dual Completion      Permit #: \_\_\_\_\_
- SWD      Permit #: \_\_\_\_\_
- ENHR      Permit #: \_\_\_\_\_
- GSW      Permit #: \_\_\_\_\_

Spud Date or Recompletion Date	Date Reached TD	Completion Date or Recompletion Date
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API No. 15 - \_\_\_\_\_

Spot Description: \_\_\_\_\_

\_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ Sec. \_\_\_\_\_ Twp. \_\_\_\_\_ S. R. \_\_\_\_\_  East  West

\_\_\_\_\_ Feet from  North /  South Line of Section

\_\_\_\_\_ Feet from  East /  West Line of Section

Footages Calculated from Nearest Outside Section Corner:

- NE       NW       SE       SW

GPS Location: Lat: \_\_\_\_\_, Long: \_\_\_\_\_  
(e.g. xx.xxxxx)      (e.g. -xxx.xxxxx)

Datum:  NAD27       NAD83       WGS84

County: \_\_\_\_\_

Lease Name: \_\_\_\_\_ Well #: \_\_\_\_\_

Field Name: \_\_\_\_\_

Producing Formation: \_\_\_\_\_

Elevation: Ground: \_\_\_\_\_ Kelly Bushing: \_\_\_\_\_

Total Vertical Depth: \_\_\_\_\_ Plug Back Total Depth: \_\_\_\_\_

Amount of Surface Pipe Set and Cemented at: \_\_\_\_\_ Feet

Multiple Stage Cementing Collar Used?  Yes  No

If yes, show depth set: \_\_\_\_\_ Feet

If Alternate II completion, cement circulated from: \_\_\_\_\_

feet depth to: \_\_\_\_\_ w/ \_\_\_\_\_ sx cmt.

Drilling Fluid Management Plan

(Data must be collected from the Reserve Pit)

Chloride content: \_\_\_\_\_ ppm Fluid volume: \_\_\_\_\_ bbls

Dewatering method used: \_\_\_\_\_

Location of fluid disposal if hauled offsite:

Operator Name: \_\_\_\_\_

Lease Name: \_\_\_\_\_ License #: \_\_\_\_\_

Quarter \_\_\_\_\_ Sec. \_\_\_\_\_ Twp. \_\_\_\_\_ S. R. \_\_\_\_\_  East  West

County: \_\_\_\_\_ Permit #: \_\_\_\_\_

AFFIDAVIT

I am the affiant and I hereby certify that all requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Submitted Electronically

KCC Office Use ONLY

- Confidentiality Requested  
Date: \_\_\_\_\_
- Confidential Release Date: \_\_\_\_\_
- Wireline Log Received
- Geologist Report Received
- UIC Distribution
- ALT  I  II  III Approved by: \_\_\_\_\_ Date: \_\_\_\_\_

1231981

Operator Name: \_\_\_\_\_ Lease Name: \_\_\_\_\_ Well #: \_\_\_\_\_

Sec. \_\_\_\_\_ Twp. \_\_\_\_\_ S. R. \_\_\_\_\_  East  West County: \_\_\_\_\_

**INSTRUCTIONS:** Show important tops of formations penetrated. Detail all cores. Report all final copies of drill stems tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface test, along with final chart(s). Attach extra sheet if more space is needed.

Final Radioactivity Log, Final Logs run to obtain Geophysical Data and Final Electric Logs must be emailed to kcc-well-logs@kcc.ks.gov. Digital electronic log files must be submitted in LAS version 2.0 or newer AND an image file (TIFF or PDF).

Drill Stem Tests Taken <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Attach Additional Sheets)</i>  Samples Sent to Geological Survey <input type="checkbox"/> Yes <input type="checkbox"/> No  Cores Taken <input type="checkbox"/> Yes <input type="checkbox"/> No Electric Log Run <input type="checkbox"/> Yes <input type="checkbox"/> No  List All E. Logs Run: _____	<input type="checkbox"/> Log Formation (Top), Depth and Datum <input type="checkbox"/> Sample  Name Top Datum
--	---

CASING RECORD <input type="checkbox"/> New <input type="checkbox"/> Used							
Report all strings set-conductor, surface, intermediate, production, etc.							
Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs. / Ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives

ADDITIONAL CEMENTING / SQUEEZE RECORD				
Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
<input type="checkbox"/> Perforate <input type="checkbox"/> Protect Casing <input type="checkbox"/> Plug Back TD <input type="checkbox"/> Plug Off Zone				

Did you perform a hydraulic fracturing treatment on this well?  Yes  No *(If No, skip questions 2 and 3)*

Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons?  Yes  No *(If No, skip question 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)*

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

TUBING RECORD:	Size: _____ Set At: _____ Packer At: _____	Liner Run: <input type="checkbox"/> Yes <input type="checkbox"/> No
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Date of First, Resumed Production, SWD or ENHR. _____	Producing Method: <input type="checkbox"/> Flowing <input type="checkbox"/> Pumping <input type="checkbox"/> Gas Lift <input type="checkbox"/> Other <i>(Explain)</i> _____
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Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity

<b>DISPOSITION OF GAS:</b> <input type="checkbox"/> Vented <input type="checkbox"/> Sold <input type="checkbox"/> Used on Lease <i>(If vented, Submit ACO-18.)</i>	<b>METHOD OF COMPLETION:</b> <input type="checkbox"/> Open Hole <input type="checkbox"/> Perf. <input type="checkbox"/> Dually Comp. <input type="checkbox"/> Commingled <i>(Submit ACO-5)</i> <input type="checkbox"/> Other <i>(Specify)</i> _____	<b>PRODUCTION INTERVAL:</b> _____ _____
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Form	ACO1 - Well Completion
Operator	Murfin Drilling Co., Inc.
Well Name	Berdie 2-21
Doc ID	1231981

All Electric Logs Run

DIL
DUCP
MEL
BHCS





PO Box 93999  
Southlake, TX 76092

Voice: (817) 546-7282  
Fax: (817) 246-3361

*uact.  
Prod-MG*

# INVOICE

Invoice Number: 144607  
Invoice Date: Jul 22, 2014  
Page: 1

**Bill To:**  
Murfin Drlg. Co., Inc.  
250 N. Water  
STE #300  
Wichita, KS 67202

Customer ID	Field Ticket #	Payment Terms	
Murfin	63264	Net 30 Days	
Job Location	Camp Location	Service Date	Due Date
KS1-01	Oakley	Jul 22, 2014	8/21/14

Quantity	Item	Description	Unit Price	Amount
1.00	WELL NAME	Berdie #3-21 2-21		
275.00	CEMENT MATERIALS	Class A Common	17.90	4,922.50
517.00	CEMENT MATERIALS	Gel	1.05	542.85
775.00	CEMENT MATERIALS	Chloride	1.10	852.50
297.35	CEMENT SERVICE	Cubic Feet Charge	2.48	737.43
1,034.00	CEMENT SERVICE	Ton Mileage Charge	2.75	2,843.50
1.00	CEMENT SERVICE	Surface	1,512.25	1,512.25
80.00	CEMENT SERVICE	Pump Truck Mileage	7.70	616.00
80.00	CEMENT SERVICE	Light Vehicle Mileage	4.40	352.00
1.00	CEMENT SUPERVISOR	Kelly Gabel		
1.00	EQUIPMENT OPERATOR	Wayne McGhghy		

ALL PRICES ARE NET, PAYABLE  
30 DAYS FOLLOWING DATE OF  
INVOICE. 1 1/2% CHARGED  
THEREAFTER. IF ACCOUNT IS  
CURRENT, TAKE DISCOUNT OF

\$ 4,332.65 *JKM 8/10*

ONLY IF PAID ON OR BEFORE  
Aug 21, 2014

Subtotal	12,379.03
Sales Tax	499.11
Total Invoice Amount	12,878.14
Payment/Credit Applied	
<b>TOTAL</b>	<b>12,878.14</b>

*OK JL - 4332.65  
8545.49*

# ALLIED OIL & GAS SERVICES, LLC 043254

Federal Tax I.D. # 20-8651475

REMIT TO P.O. BOX 93999  
SOUTHLAKE, TEXAS 76092

SERVICE POINT:  
Oakley, KS

DATE <u>7-22-14</u>	SEC. <u>21</u>	TWP. <u>15</u>	RANGE <u>35W</u>	CALLED OUT	ON LOCATION <u>8:30 AM</u>	JOB START <u>10:00 AM</u>	JOB FINISH <u>11:00 AM</u>
LEASE <u>Radio</u>		WELL# <u>2-21</u>		LOCATION <u>Beardsley N to R 04A</u>		COUNTY <u>Rawlins</u>	STATE <u>KS</u>
OLD OR (NEW) (Circle one)				<u>NEW</u>			
LOCATION <u>1 N W 45 into</u>							

CONTRACTOR Mudfin #7 OWNER SGM

TYPE OF JOB Surface

HOLE SIZE 12 1/4 T.D. 285 CEMENT AMOUNT ORDERED 275 SKS com

CASING SIZE 8 7/8 DEPTH 285 390cc 290gal

TUBING SIZE DEPTH

DRILL PIPE DEPTH

TOOL DEPTH

PRES. MAX MINIMUM

MEAS. LINE SHOE JOINT

CEMENT LEFT IN CSG. 15'

PERFS.

DISPLACEMENT 17 bbl

EQUIPMENT

PUMP TRUCK CEMENTER Kelly Gabel

# 422 HELPER Wayne McElbby

BULK TRUCK

# 2184287 DRIVER John P. (TWO)

BULK TRUCK

# DRIVER

REMARKS:

rigged up

mixed cement

displaced with water

shut in

Cement did circulate

15 SKS to 21' Thank You Kellyscrew

CHARGE TO: Mudfin

STREET

CITY STATE ZIP

To: Allied Oil & Gas Services, LLC.

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

PRINTED NAME FRED Williams

SIGNATURE [Signature]

COMMON	<u>275 SKS @ 17.90</u>	<u>4922.50</u>
POZMIX	@	
GEL	<u>517# @ 1.05</u>	<u>542.85</u>
CHLORIDE	<u>725# @ 1.10</u>	<u>852.50</u>
ASC	@	
MATERIAL TOTAL	@	<u>6317.85</u>
	@	
	@	
	@	
	@	
	@	
HANDLING	<u>297.35 cu ft @ 2.45</u>	<u>737.73</u>
MILEAGE	<u>12.92 x 80 x 2.15</u>	<u>2843.20</u>
TOTAL		

SERVICE		
DEPTH OF JOB		<u>285'</u>
PUMP TRUCK CHARGE		<u>1512.35</u>
EXTRA FOOTAGE	@	
MILEAGE	<u>M. HV 80 @ 7.20</u>	<u>616.00</u>
MANIFOLD	@	
	<u>M. LV 80 @ 4.40</u>	<u>352.00</u>
	@	
	@	
	@	
	@	
TOTAL		<u>6,061.16</u>

PLUG & FLOAT EQUIPMENT		
	@	
	@	
	@	
	@	
	@	
TOTAL		

SALES TAX (If Any)		
TOTAL CHARGES	<u>12,379.01</u>	
DISCOUNT	<u>4,380.65 (35%)</u>	
IF PAID IN 30 DAYS	<u>8,516.35 Net.</u>	



**CONSOLIDATED**  
Oil Well Services, LLC

**REMIT TO**  
Consolidated Oil Well Services, LLC  
Dept. 970  
P.O. Box 4346  
Houston, TX 77210-4346

**MAIN OFFICE**  
P.O. Box 884  
Chanute, KS 66720  
620/431-9210 • 1-800/467-8676  
Fax 620/431-0012

INVOICE

Invoice # 270028

Invoice Date: 07/31/2014 Terms: 10/10/10,n/30

Page 1

MURFIN DRILLING  
P.O. BOX 288  
RUSSELL KS 67665  
( ) -

BERDIE #2-21 Rawlins  
46640  
21-25-35W  
07/30/2014 USED FOR 10103  
KS

APPROVED JT/FH

Part Number	Description	Qty	Unit Price	Total
1104D	CLASS "A" CEMENT CMD	300.00	27.9200	8376.00
1107	FLO-SEAL (25#)	150.00	2.9700	445.50
1110A	KOL SEAL (50# BAG)	1000.00	.5600	560.00
1126	OIL WELL CEMENT	200.00	23.7000	4740.00
1142A	KCL SUB MB6875 CC3107 (1	2.00	41.1000	82.20
4104	CEMENT BASKET 5 1/2"	3.00	275.0000	825.00
4136	TURBOLIZER 5 1/2"	15.00	75.7500	1136.25
4159	FLOAT SHOE AFU 5 1/2"	1.00	433.7500	433.75
4310	ROTATING HEAD	1.00	200.0000	200.00
4315	ROTATING SCRATCHERS	20.00	94.5000	1890.00
4454	5 1/2" LATCH DOWN PLUG	1.00	318.2500	318.25

Sublet Performed	Description	Total
9996-130	CEMENT MATERIAL DISCOUNT	-1900.70
9995-130	CEMENT EQUIPMENT DISCOUNT	-711.73

Description	Hours	Unit Price	Total
399 SINGLE PUMP	1.00	3175.00	3175.00
399 EQUIPMENT MILEAGE (ONE WAY)	85.00	5.25	446.25
529 TON MILEAGE DELIVERY	1.00	3496.05	3496.05

Amount Due 27625.79 if paid after 08/10/2014

Parts:	19006.95	Freight:	.00	Tax:	1351.38	AR	24863.20
Labor:	.00	Misc:	.00	Total:	24863.20		
Sublt:	-2612.43	Supplies:	.00	Change:	.00		

Signed \_\_\_\_\_

Date \_\_\_\_\_



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

270028

TICKET NUMBER 46640  
LOCATION Dahler 45  
FOREMAN Miles Star

FIELD TICKET & TREATMENT REPORT  
CEMENT

DATE	CUSTOMER #	WELL NAME & NUMBER	SECTION	TOWNSHIP	RANGE	COUNTY
7-30-14	5406	Berdie #2-21	21	25	35W	Rawlins
CUSTOMER <u>Martin Drilling</u>			Bardsley 15 12AN W.S			
MAILING ADDRESS			TRUCK #	DRIVER	TRUCK #	DRIVER
CITY			599	Jordan		
STATE			529727	Lancaster		
ZIP CODE						

JOB TYPE long string HOLE SIZE 7 1/2" HOLE DEPTH 4470 CASING SIZE & WEIGHT 5 1/2" 15.5#  
 CASING DEPTH 4464.95 DRILL PIPE \_\_\_\_\_ TUBING \_\_\_\_\_ OTHER \_\_\_\_\_  
 SLURRY WEIGHT 10.7/138 SLURRY VOL 8.1/1.42 WATER gal/sk \_\_\_\_\_ CEMENT LEFT in CASING 23.26'  
 DISPLACEMENT 106 bbls DISPLACEMENT PSI 1300 MIX PSI 1800 RATE \_\_\_\_\_

REMARKS: Safety and rig upon Martin Big #7 float equipment Turboizers on  
Sats # 1, 2, 3, 4, 5, 7, 8, 9, 11, 12, 13, 15, 17, 20, 33. Baskets on Sats # 14, 34, 53  
Run 106 Sats to bottom circulate casing pump 45 min Pump read flush  
mix 300 Sks CMD with 1/2" Floseal tated in with 200 Sks OWC 5' Kals seal shut  
down cleared pump & lines, released plug. Displace 106 bbls with 1300 PSI till  
plug did land & hold with 1800 PSI. Cement did not circulate  
lost have return after releasing plug dis eated from thier

Mix 300 Sks RH 200 Sks MH Thanks Miles & crew

ACCOUNT CODE	QUANTITY or UNITS	DESCRIPTION of SERVICES or PRODUCT	UNIT PRICE	TOTAL
5401C	1	PUMP CHARGE	3175. <sup>00</sup>	3175. <sup>00</sup>
5406	85	MILEAGE	5.25	446.25
5407A	23.5 tons	Ton mileage delivery	1.75	348.75
1104D	300 Sks	CMD	27.92	8376. <sup>00</sup>
1107	150 #	Floseal	2.97	445.50
1110A	1000 #	Kals seal	1.56	560. <sup>00</sup>
1126	200 Sks	OWC	23.70	4740. <sup>00</sup>
1142A	2 gal	HCL	41.10	82.20
4104	3	5 1/2" Baskets	275. <sup>00</sup>	825. <sup>00</sup>
4130	15	5 1/2" Turboizers	75.75	1136.25
4159	1	5 1/2" Float Shoe APH	433.75	433.75
4310	1	Rotating head	200. <sup>00</sup>	200. <sup>00</sup>
4315	20	5' Rotating Scratchers	94.50	1890. <sup>00</sup>
4454	1	5 1/2" Latchdown Plug	318.25	318.25
		Subtotal		26124.25
		1055/10 discount		2612.93
		Subtotal		23511.82
		SALES TAX		1351.38
		ESTIMATED TOTAL		24,863.20

Ravin 3737  
 AUTHORIZATION [Signature] TITLE \_\_\_\_\_ DATE \_\_\_\_\_

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



Berdie #2-21  
 Daily Drilling Report  
 Page Two

7/29/14 Depth 4331'. Cut 90'. DT: None. CT: 17hrs. Dev.: None. **DST #3 4184-4240 (LKC G):** 30-60-60-90. IF: surf blw built to 3". FF: Surf blw built to 6 3/4". Rec.: 126'TF, 63'MCO (90%O, 10%M), 63'MCO (50%O, 50%M). HP: 2077-2024. FP: 101/121, 101/121. SIP: 1250-1235. BHT: 129°. **LKC H:** Lm-crm-off wht, fxln, loosely cemented, fsl w/dense xln por, drk DO & lt stn, tr FO, wk-fr odr, dull-ylw fluor, some sft wht chalk carrying DO stn A/A, some sctrd recrystallization. **LKC J:** Lm-wht off wht, FXLN, mod. Well dev. Oolitic w/sctrd to mostly consistent fn ppt inter oolite por, sctrd lt stn, hvy oily sheen, SFO, gd odr, much free floating oil on top of wet cup. **DST #4 4238-4338 (LKC H-J):** 30-60-60-90. IF: Surf blw built to 2 1/2". FF: surf blw built to 2 1/2". Rec.: 65' OCM (55%M, 45%O). HP: 2146-2104. FP: 25/37, 40/50. SIP: 1349-1330. BHT: 131°.

7/30/14 RTD: 4470'. Cut 139'. DT: 1/4 hr pump. CT: 16hrs. Dev.: 1° @ 4470'. HC @ 9:00PM 7/29. Pioneer started logging @ 3:00AM 7/30. LTD: 4471'. Ran 106 jts of 15.5# 5 1/2 prod csg set @ 4464'.

7/31/14 RTD: 4470'. CT: 20 1/2 hrs. C.O.W.S. cmt w/450sxs (250sxs CMD 200sxs OWC). PD @ 11:30PM 7/30. 30sxs RH, 20sxs MH. RR 3:30AM 7/31/14. FINAL REPORT

		MDCI Berdie #2-21 660 FNL 1650 FEL Sec. 21-1S-35W 3185' KB					MDCI Berdie #1-21 729 FNL 1664 FWL Sec. 21-1S-35W 3161' KB		
Formation	Sample top	Datum	Ref	Log tops	Datum	Ref	Log tops	Datum	
Anhydrite	3040	+145	+30	3064	+121	-6	3046	+115	
B/Anhydrite	3070	+115	+35	3098	+87	+7	3081	+80	
Foraker				3684	-499	+5	3665	-504	
Topeka	3888	-703	+21	3897	-712	+12	3885	-724	
Oread	4000	+815	+6	3998	-813	+8	3982	-821	
Heebner	4067	-882	+1				4044	-883	
Lansing	4107	-922	+17	4119	-934	+5	4100	-939	
BKC	4370	-1185	+16	4377	-1192	+9	4362	-1201	
Pawnee				DNR			4483	-1322	
RTD	4470	-1285							
LTD				4471	-1286		4814		



## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co., Inc**

250 N. Water STE 300  
Wichita KS 67202

ATTN: Jeff Lawler

### **Berdie #2-21**

#### **21-1s-35w Rawlins,KS**

Start Date: 2014.07.25 @ 17:38:00

End Date: 2014.07.26 @ 01:05:30

Job Ticket #: 58460                      DST #: 1

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

Printed: 2014.07.31 @ 16:27:58



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co., Inc

**21-1s-35w Rawlins, KS**

250 N. Water STE 300  
Wichita KS 67202

**Berdie #2-21**

Job Ticket: 58460

**DST#: 1**

ATTN: Jeff Lawler

Test Start: 2014.07.25 @ 17:38:00

## GENERAL INFORMATION:

Formation: **Stotler**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 19:49:30

Time Test Ended: 01:05:30

Test Type: Conventional Bottom Hole (Initial)

Tester: Royal Fisher

Unit No: 54

**Interval: 3743.00 ft (KB) To 3840.00 ft (KB) (TVD)**

Reference Elevations: 3185.00 ft (KB)

Total Depth: 3840.00 ft (KB) (TVD)

3180.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

**Serial #: 6753 Outside**

Press@RunDepth: 24.15 psig @ 3744.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.07.25

End Date:

2014.07.26

Last Calib.:

2014.07.26

Start Time:

17:38:05

End Time:

01:05:29

Time On Btm:

2014.07.25 @ 19:49:15

Time Off Btm:

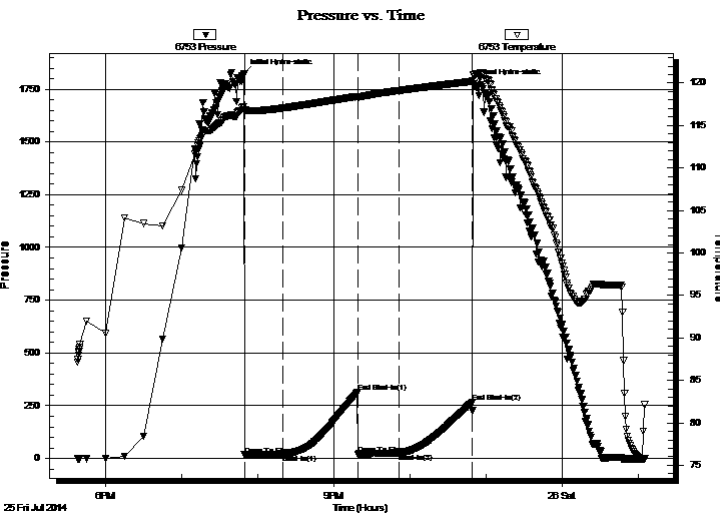
2014.07.25 @ 22:50:00

TEST COMMENT: 30 - IF - Weak surface blow dead in 12 min.

60 - ISI - No return

30 - FF - No surface blow

60 - FSI - No return



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1823.41	117.21	Initial Hydro-static
1	17.17	116.64	Open To Flow (1)
31	20.56	117.06	Shut-In(1)
90	313.43	118.43	End Shut-In(1)
90	20.08	118.26	Open To Flow (2)
123	24.15	119.13	Shut-In(2)
180	265.09	120.21	End Shut-In(2)
181	1774.55	120.94	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
10.00	Mud - 100M	0.05

## Gas Rates

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





**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co., Inc

**21-1s-35w Rawlins, KS**

250 N. Water STE 300  
Wichita KS 67202

**Berdie #2-21**

Job Ticket: 58460

**DST#: 1**

ATTN: Jeff Lawler

Test Start: 2014.07.25 @ 17:38:00

## Tool Information

Drill Pipe:	Length: 3612.68 ft	Diameter: 3.80 inches	Volume: 50.68 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 124.41 ft	Diameter: 2.25 inches	Volume: 0.61 bbl	Weight to Pull Loose: 65000.00 lb
			<u>Total Volume: 51.29 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	21.09 ft			String Weight: Initial 62000.00 lb
Depth to Top Packer:	3743.00 ft			Final 62000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	97.00 ft			
Tool Length:	124.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

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

Shut In Tool	5.00			3721.00	
Hydraulic tool	5.00			3726.00	
Jars	5.00			3731.00	
Safety Joint	3.00			3734.00	
Packer	4.00			3738.00	27.00 Bottom Of Top Packer
Packer	5.00			3743.00	
Stubb	1.00			3744.00	
Recorder	0.00	8368	Inside	3744.00	
Recorder	0.00	6753	Outside	3744.00	
Perforations	27.00			3771.00	
Change Over Sub	1.00			3772.00	
Drill Pipe	63.00			3835.00	
Change Over Sub	1.00			3836.00	
Bullnose	4.00			3840.00	97.00 Bottom Packers & Anchor

**Total Tool Length: 124.00**



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co., Inc

**21-1s-35w Rawlins, KS**

250 N. Water STE 300  
Wichita KS 67202

**Berdie #2-21**

Job Ticket: 58460

**DST#: 1**

ATTN: Jeff Lawler

Test Start: 2014.07.25 @ 17:38:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 55.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.99 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 500.00 ppm

Filter Cake: 3.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
10.00	Mud - 100M	0.049

Total Length: 10.00 ft      Total Volume: 0.049 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

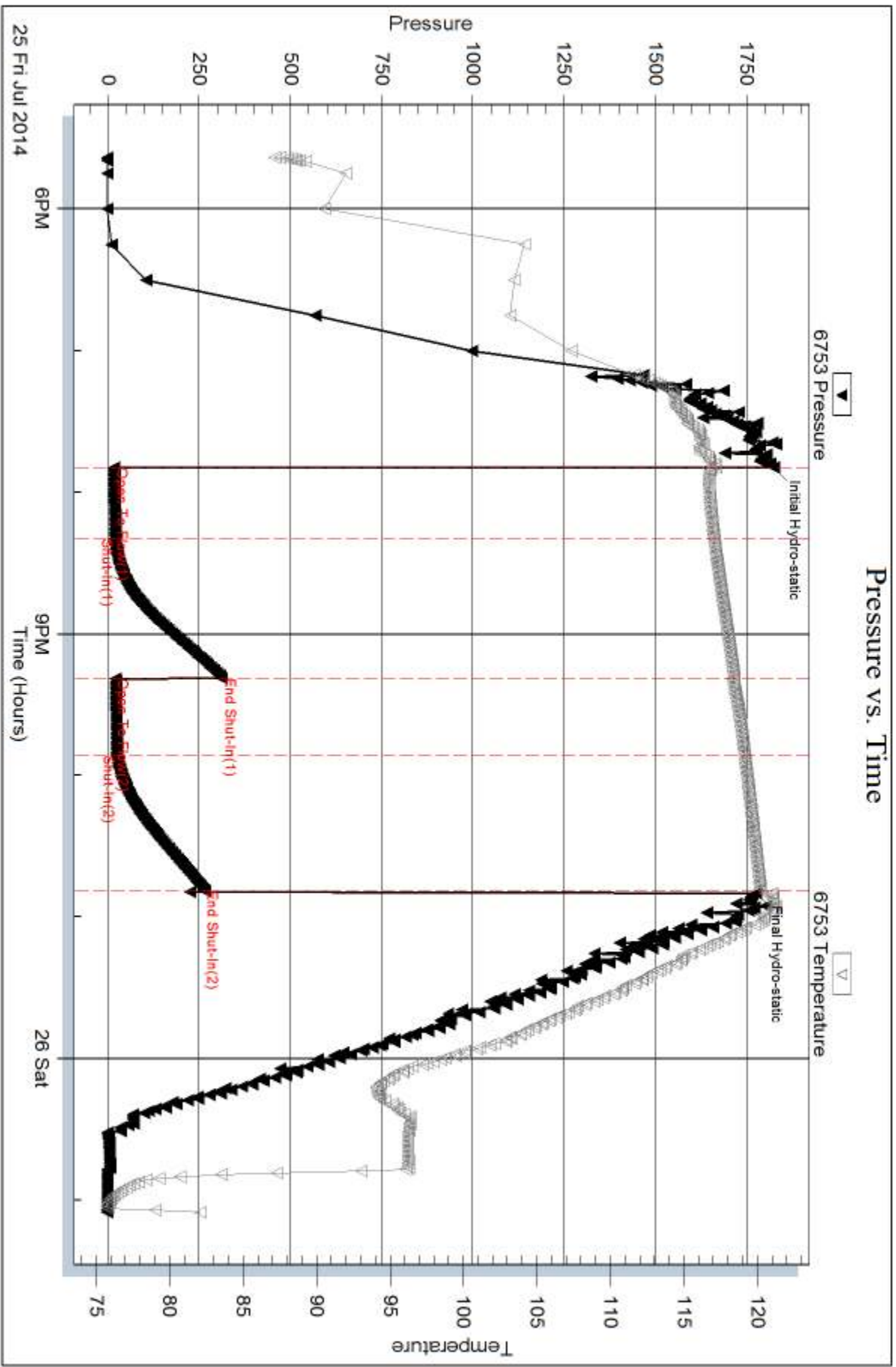
Recovery Comments:

Serial #: 6753

Outside Murfin Drilling Co., Inc

Berdie #2-21

DST Test Number: 1



Triobite Testing, Inc

Ref. No: 58460

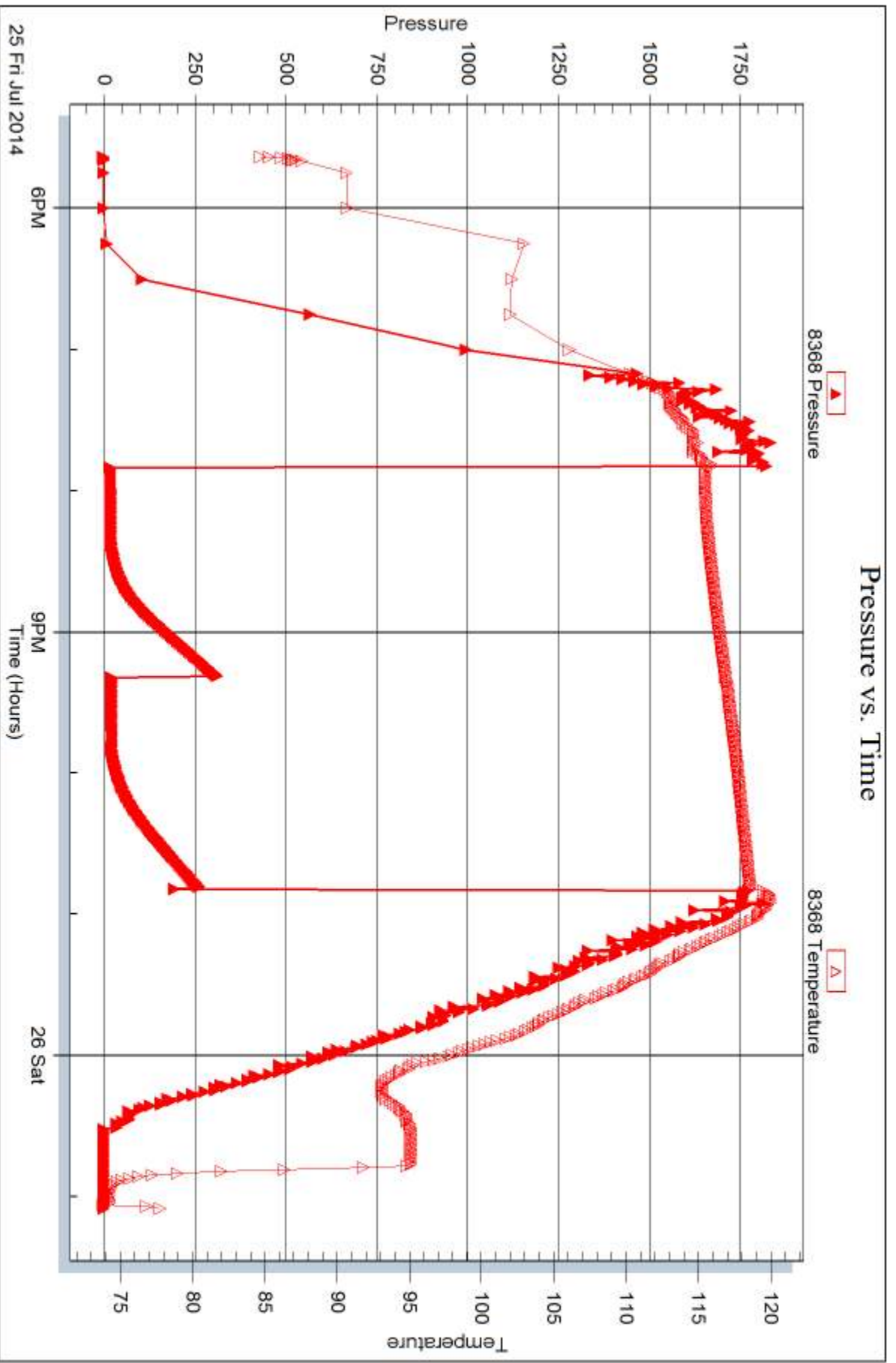
Printed: 2014.07.31 @ 16:27:59

Serial #: 8368

Murfin Drilling Co., Inc

Berdie #2-21

DST Test Number: 1



Triobite Testing, Inc

Ref. No: 58460

Printed: 2014.07.31 @ 16:28:00





## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co., Inc**

250 N. Water STE 300  
Wichita KS 67202

ATTN: Jeff Lawler

### **Berdie #2-21**

#### **21-1s-35w Rawlins,KS**

Start Date: 2014.07.27 @ 08:26:00

End Date: 2014.07.27 @ 16:52:30

Job Ticket #: 58461                      DST #: 2

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

Printed: 2014.07.31 @ 16:27:31



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co., Inc

**21-1s-35w Rawlins, KS**

250 N. Water STE 300  
Wichita KS 67202

**Berdie #2-21**

Job Ticket: 58461

**DST#: 2**

ATTN: Jeff Lawler

Test Start: 2014.07.27 @ 08:26:00

## GENERAL INFORMATION:

Formation: **LKC - A - D**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 10:19:45

Time Test Ended: 16:52:30

Test Type: Conventional Bottom Hole (Initial)

Tester: Royal Fisher

Unit No: 54

**Interval: 4055.00 ft (KB) To 4190.00 ft (KB) (TVD)**

Reference Elevations: 3185.00 ft (KB)

Total Depth: 4190.00 ft (KB) (TVD)

3180.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

**Serial #: 6753 Outside**

Press@RunDepth: 116.34 psig @ 4056.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.07.27

End Date:

2014.07.27

Last Calib.:

2014.07.27

Start Time:

08:26:05

End Time:

16:52:29

Time On Btm:

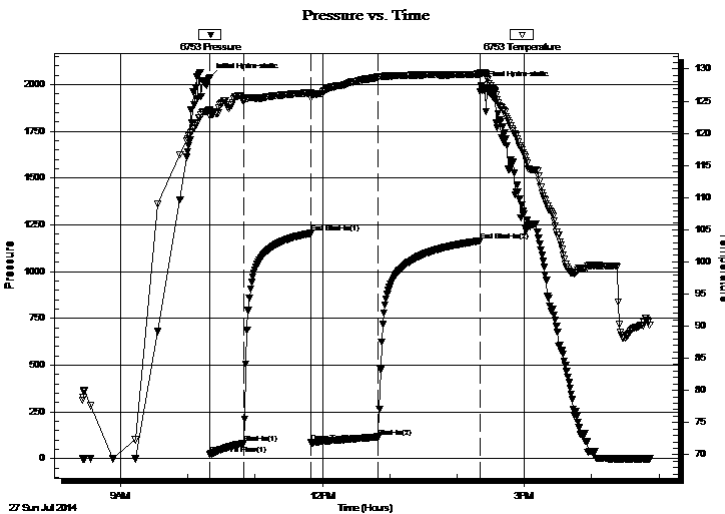
2014.07.27 @ 10:19:30

Time Off Btm:

2014.07.27 @ 14:21:45

**TEST COMMENT:** IF - Surface blow built to 4 1/2"  
ISI - No return  
FF - Surface blow built to 4 3/4"  
FSI - No return

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2036.80	123.62	Initial Hydro-static
1	22.06	122.74	Open To Flow (1)
31	81.94	125.11	Shut-In(1)
91	1205.58	126.28	End Shut-In(1)
91	85.80	125.57	Open To Flow (2)
151	116.34	128.76	Shut-In(2)
241	1164.78	129.20	End Shut-In(2)
243	1992.93	129.31	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
63.00	OSWM - 65M - 35W - Oil Spots	0.31
63.00	OSWM - 55M - 45W - Oil Spots	0.32
63.00	OCWM - 80M - 15W - 5o	0.88
31.00	OCM - 95M - 5o	0.43

## Gas Rates

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





**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co., Inc

**21-1s-35w Rawlins, KS**

250 N. Water STE 300  
Wichita KS 67202

**Berdie #2-21**

Job Ticket: 58461

**DST#: 2**

ATTN: Jeff Lawler

Test Start: 2014.07.27 @ 08:26:00

## Tool Information

Drill Pipe:	Length: 3929.14 ft	Diameter: 3.80 inches	Volume: 55.12 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 124.41 ft	Diameter: 2.25 inches	Volume: 0.61 bbl	Weight to Pull Loose: 78000.00 lb
			<u>Total Volume: 55.73 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	25.55 ft			String Weight: Initial 64000.00 lb
Depth to Top Packer:	4055.00 ft			Final 64000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	135.00 ft			
Tool Length:	162.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

## Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Shut In Tool	5.00			4033.00	
Hydraulic tool	5.00			4038.00	
Jars	5.00			4043.00	
Safety Joint	3.00			4046.00	
Packer	4.00			4050.00	27.00 Bottom Of Top Packer
Packer	5.00			4055.00	
Stubb	1.00			4056.00	
Recorder	0.00	8368	Inside	4056.00	
Recorder	0.00	6753	Outside	4056.00	
Perforations	34.00			4090.00	
Change Over Sub	1.00			4091.00	
Drill Pipe	94.00			4185.00	
Change Over Sub	1.00			4186.00	
Bullnose	4.00			4190.00	135.00 Bottom Packers & Anchor

**Total Tool Length: 162.00**



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co., Inc

**21-1s-35w Rawlins, KS**

250 N. Water STE 300  
Wichita KS 67202

**Berdie #2-21**

Job Ticket: 58461

**DST#: 2**

ATTN: Jeff Lawler

Test Start: 2014.07.27 @ 08:26:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 58.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.19 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 500.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
63.00	OSWM - 65M - 35W - Oil Spots	0.310
63.00	OSWM - 55M - 45W - Oil Spots	0.324
63.00	OCWM - 80M - 15W - 5o	0.884
31.00	OCM - 95M - 5o	0.435

Total Length: 220.00 ft

Total Volume: 1.953 bbl

Num Fluid Samples: 0

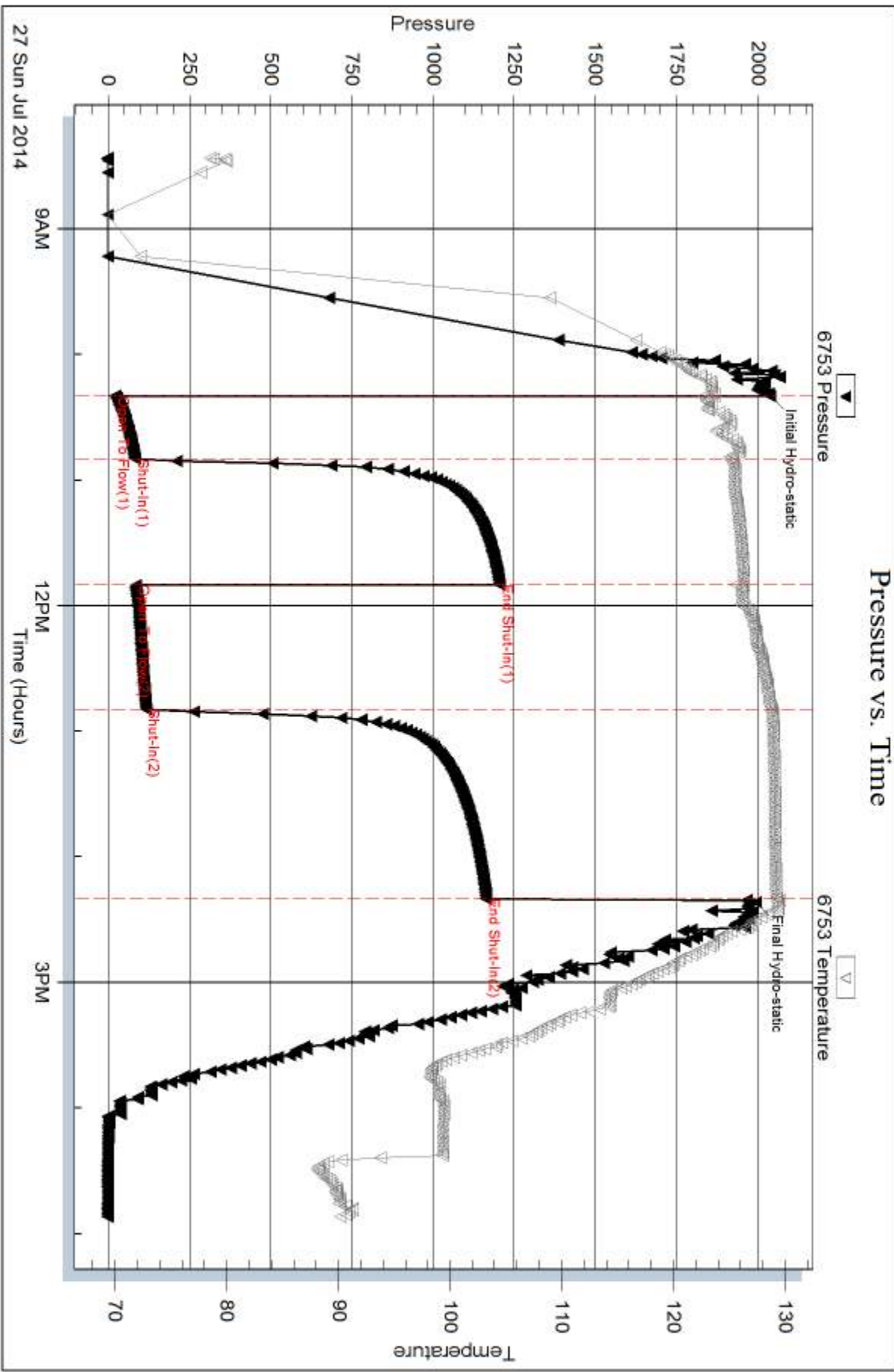
Num Gas Bombs: 0

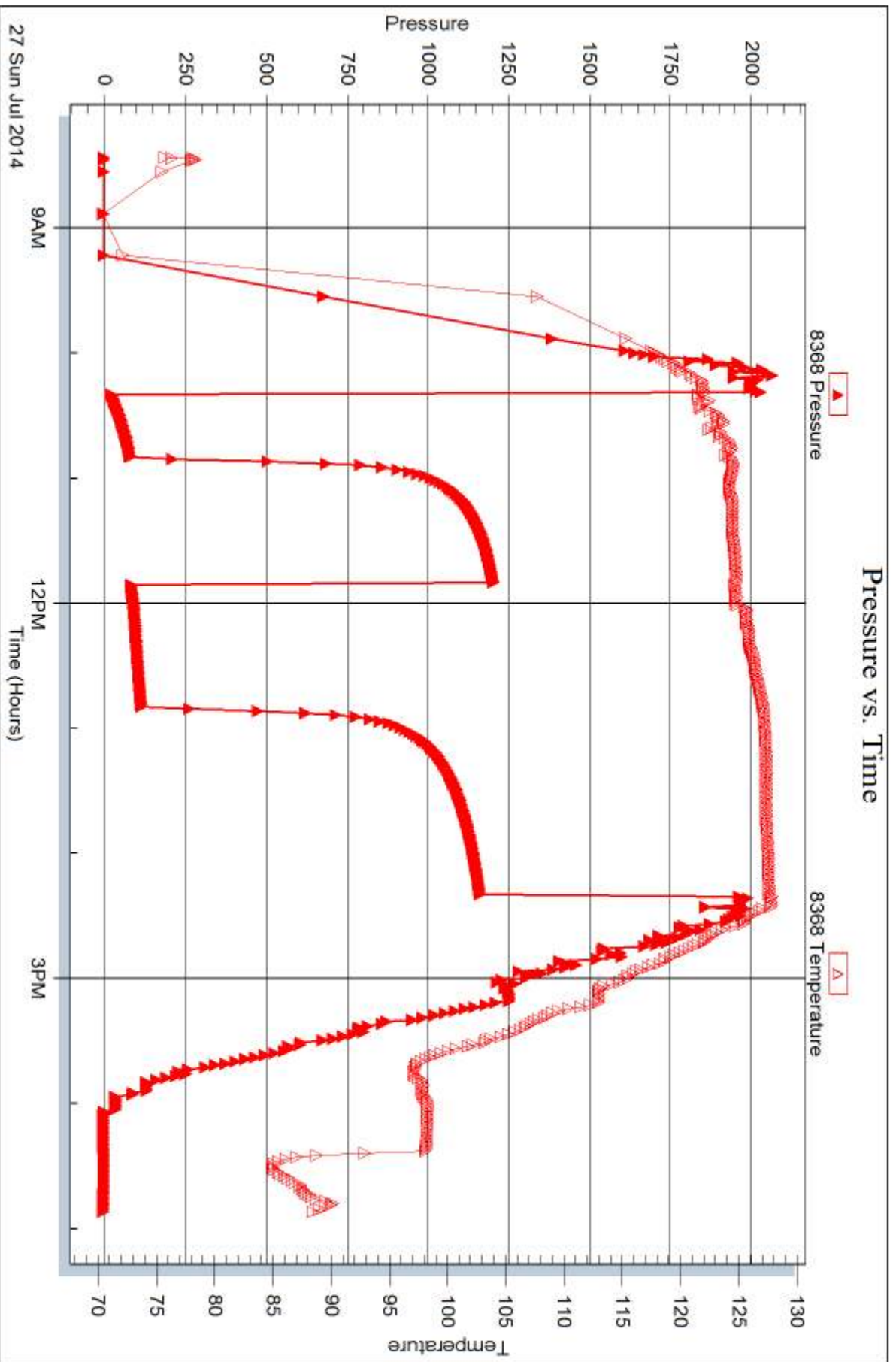
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:







## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co., Inc**

250 N. Water STE 300  
Wichita KS 67202

ATTN: Jeff Lawler

### **Berdie #2-21**

#### **21-1s-35w Rawlins,KS**

Start Date: 2014.07.28 @ 02:43:00

End Date: 2014.07.28 @ 11:43:45

Job Ticket #: 58462                      DST #: 3

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

Printed: 2014.07.31 @ 16:27:09





**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co., Inc

**21-1s-35w Rawlins, KS**

250 N. Water STE 300  
Wichita KS 67202

**Berdie #2-21**

Job Ticket: 58462

**DST#: 3**

ATTN: Jeff Lawler

Test Start: 2014.07.28 @ 02:43:00

## GENERAL INFORMATION:

Formation: **LKC - G**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 05:33:45

Time Test Ended: 11:43:45

Test Type: Conventional Bottom Hole (Initial)

Tester: Royal Fisher

Unit No: 54

**Interval: 4184.00 ft (KB) To 4241.00 ft (KB) (TVD)**

Reference Elevations: 3185.00 ft (KB)

Total Depth: 4241.00 ft (KB) (TVD)

3180.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

**Serial #: 6753**

**Outside**

Press@RunDepth: 120.85 psig @ 4185.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.07.28

End Date:

2014.07.28

Last Calib.:

2014.07.28

Start Time: 02:43:05

End Time:

11:43:45

Time On Btm:

2014.07.28 @ 05:33:30

Time Off Btm:

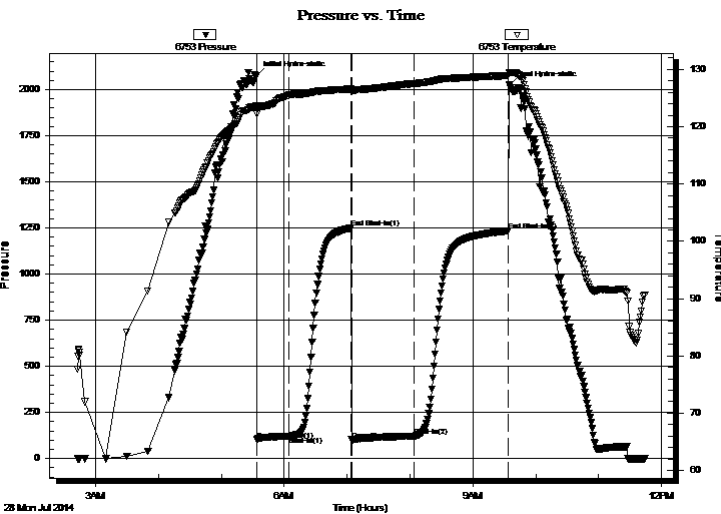
2014.07.28 @ 09:34:45

TEST COMMENT: 30 - IF - Surface blow built to 3"

60 - ISI - No return

60 - FF - Surface blow built to 6 3/4"

90 - FSI - No return



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2076.95	123.56	Initial Hydro-static
1	101.17	122.20	Open To Flow (1)
31	121.05	125.51	Shut-In(1)
91	1250.24	126.60	End Shut-In(1)
91	101.10	126.19	Open To Flow (2)
151	120.85	127.53	Shut-In(2)
241	1234.57	128.93	End Shut-In(2)
242	2024.06	129.42	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
63.00	MCO - 50M - 50o	0.31
63.00	MCO - 10M - 90o	0.32

## Gas Rates

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





**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co., Inc

**21-1s-35w Rawlins, KS**

250 N. Water STE 300  
Wichita KS 67202

**Berdie #2-21**

Job Ticket: 58462

**DST#: 3**

ATTN: Jeff Lawler

Test Start: 2014.07.28 @ 02:43:00

## Tool Information

Drill Pipe:	Length: 4055.15 ft	Diameter: 3.80 inches	Volume: 56.88 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 124.41 ft	Diameter: 2.25 inches	Volume: 0.61 bbl	Weight to Pull Loose: 78000.00 lb
			<u>Total Volume: 57.49 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	22.56 ft			String Weight: Initial 60000.00 lb
Depth to Top Packer:	4184.00 ft			Final 62000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	57.00 ft			
Tool Length:	84.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

## Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Shut In Tool	5.00			4162.00	
Hydraulic tool	5.00			4167.00	
Jars	5.00			4172.00	
Safety Joint	3.00			4175.00	
Packer	4.00			4179.00	27.00 Bottom Of Top Packer
Packer	5.00			4184.00	
Stubb	1.00			4185.00	
Recorder	0.00	8368	Inside	4185.00	
Recorder	0.00	6753	Outside	4185.00	
Perforations	19.00			4204.00	
Change Over Sub	1.00			4205.00	
Drill Pipe	31.00			4236.00	
Change Over Sub	1.00			4237.00	
Bullnose	4.00			4241.00	57.00 Bottom Packers & Anchor

**Total Tool Length: 84.00**



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

## FLUID SUMMARY

Murfin Drilling Co., Inc

**21-1s-35w Rawlins, KS**

250 N. Water STE 300  
Wichita KS 67202

**Berdie #2-21**

Job Ticket: 58462

**DST#: 3**

ATTN: Jeff Lawler

Test Start: 2014.07.28 @ 02:43:00

### Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 67.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.19 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 900.00 ppm

Filter Cake: 2.00 inches

### Recovery Information

Recovery Table

Length ft	Description	Volume bbl
63.00	MCO - 50M - 50o	0.310
63.00	MCO - 10M - 90o	0.324

Total Length: 126.00 ft      Total Volume: 0.634 bbl

Num Fluid Samples: 0

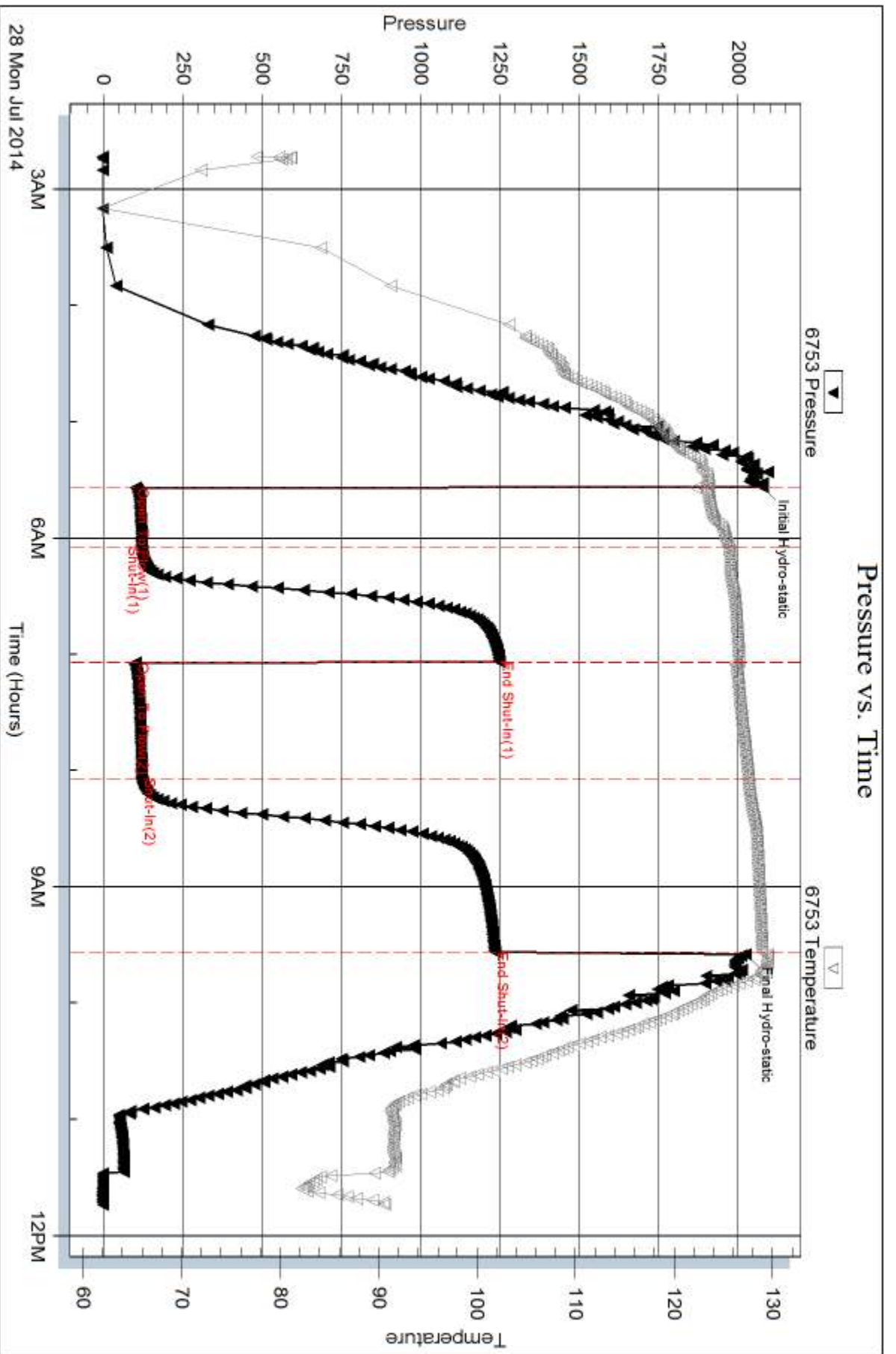
Num Gas Bombs: 0

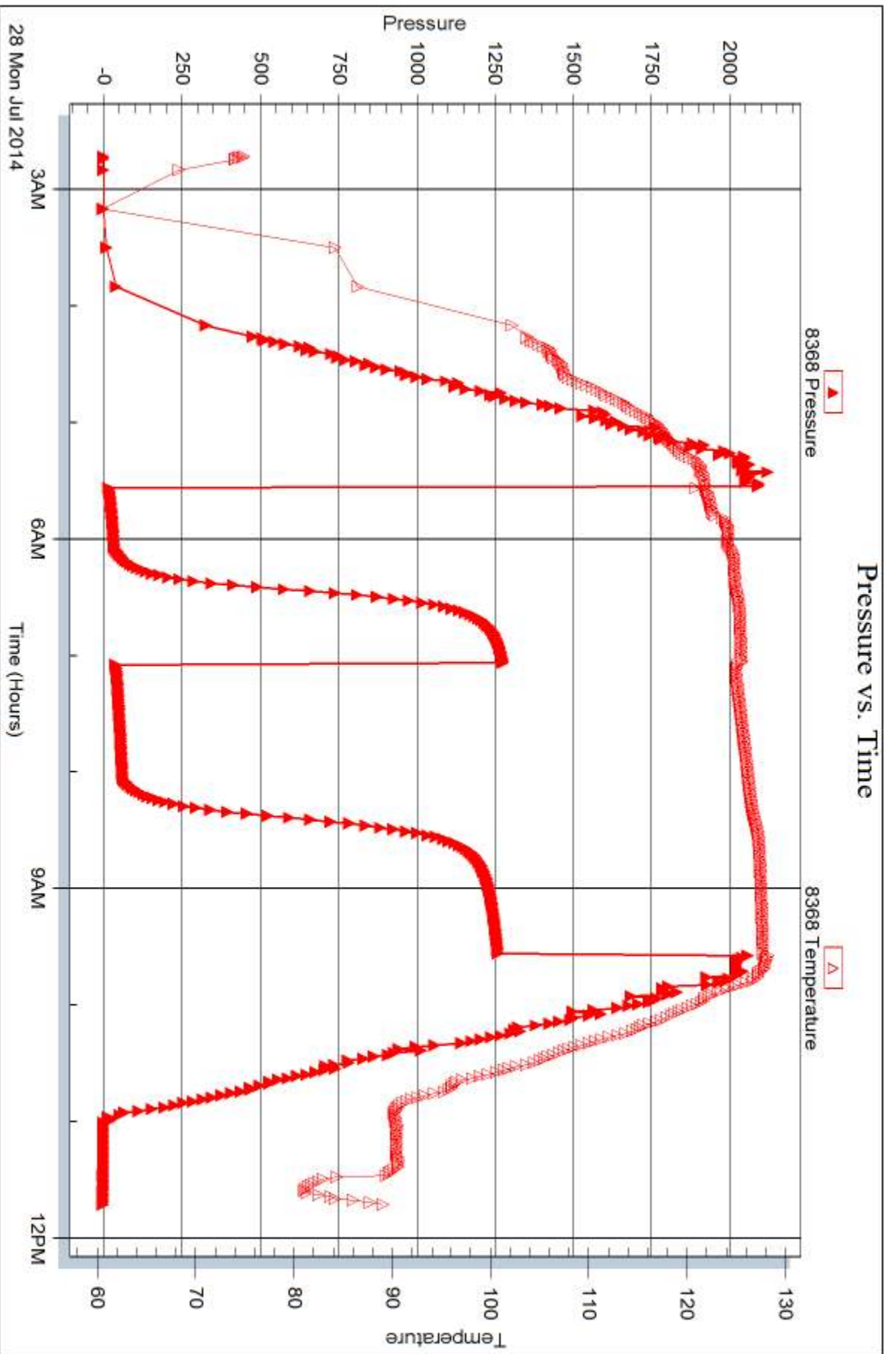
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:







## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co., Inc**

250 N. Water STE 300  
Wichita KS 67202

ATTN: Jeff Lawler

### **Berdie #2-21**

#### **21-1s-35w Rawlins,KS**

Start Date: 2014.07.28 @ 23:57:00

End Date: 2014.07.29 @ 09:09:45

Job Ticket #: 58463                      DST #: 4

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

Printed: 2014.07.31 @ 16:26:05



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co., Inc

**21-1s-35w Rawlins, KS**

250 N. Water STE 300  
Wichita KS 67202

**Berdie #2-21**

Job Ticket: 58463

**DST#: 4**

ATTN: Jeff Lawler

Test Start: 2014.07.28 @ 23:57:00

## GENERAL INFORMATION:

Formation: **LKC - H & J**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 02:47:30

Time Test Ended: 09:09:45

Test Type: Conventional Bottom Hole (Initial)

Tester: Royal Fisher

Unit No: 54

**Interval: 4239.00 ft (KB) To 4331.00 ft (KB) (TVD)**

Reference Elevations: 3185.00 ft (KB)

Total Depth: 4331.00 ft (KB) (TVD)

3180.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

**Serial #: 6753 Outside**

Press@RunDepth: 49.62 psig @ 4240.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.07.28

End Date:

2014.07.29

Last Calib.:

2014.07.29

Start Time: 23:57:05

End Time:

09:09:45

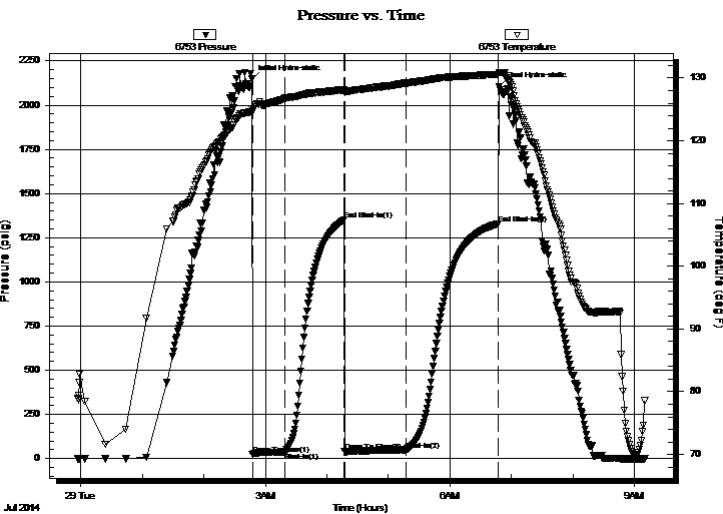
Time On Btm:

2014.07.29 @ 02:47:00

Time Off Btm:

2014.07.29 @ 06:47:45

**TEST COMMENT:** 30 - IF - Surface blow built to 2 1/2"  
60 - ISI - No return  
60 - FF - Surface blow built to 2 1/2"  
90 - FSI - No return



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2146.15	125.15	Initial Hydro-static
1	24.94	124.65	Open To Flow (1)
32	37.40	126.77	Shut-In(1)
90	1349.48	128.09	End Shut-In(1)
91	39.56	127.72	Open To Flow (2)
151	49.62	129.15	Shut-In(2)
240	1329.84	130.60	End Shut-In(2)
241	2104.27	130.85	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
65.00	OCM - 55M - 45o	0.32

## Gas Rates

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







**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co., Inc

**21-1s-35w Rawlins, KS**

250 N. Water STE 300  
Wichita KS 67202

**Berdie #2-21**

Job Ticket: 58463

**DST#: 4**

ATTN: Jeff Lawler

Test Start: 2014.07.28 @ 23:57:00

## Tool Information

Drill Pipe:	Length: 4119.31 ft	Diameter: 3.80 inches	Volume: 57.78 bbl	Tool Weight: 2500.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 124.41 ft	Diameter: 2.25 inches	Volume: 0.61 bbl	Weight to Pull Loose: 70000.00 lb
			<u>Total Volume: 58.39 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	31.72 ft			String Weight: Initial 62000.00 lb
Depth to Top Packer:	4239.00 ft			Final 62000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	92.00 ft			
Tool Length:	119.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

## Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Shut In Tool	5.00			4217.00	
Hydraulic tool	5.00			4222.00	
Jars	5.00			4227.00	
Safety Joint	3.00			4230.00	
Packer	4.00			4234.00	27.00 Bottom Of Top Packer
Packer	5.00			4239.00	
Stubb	1.00			4240.00	
Recorder	0.00	8368	Inside	4240.00	
Recorder	0.00	6753	Outside	4240.00	
Perforations	22.00			4262.00	
Change Over Sub	1.00			4263.00	
Drill Pipe	63.00			4326.00	
Change Over Sub	1.00			4327.00	
Bullnose	4.00			4331.00	92.00 Bottom Packers & Anchor

**Total Tool Length: 119.00**



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co., Inc

**21-1s-35w Rawlins, KS**

250 N. Water STE 300  
Wichita KS 67202

**Berdie #2-21**

Job Ticket: 58463

**DST#: 4**

ATTN: Jeff Lawler

Test Start: 2014.07.28 @ 23:57:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 67.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.19 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 900.00 ppm

Filter Cake: 2.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
65.00	OCM - 55M - 45o	0.320

Total Length: 65.00 ft      Total Volume: 0.320 bbl

Num Fluid Samples: 0

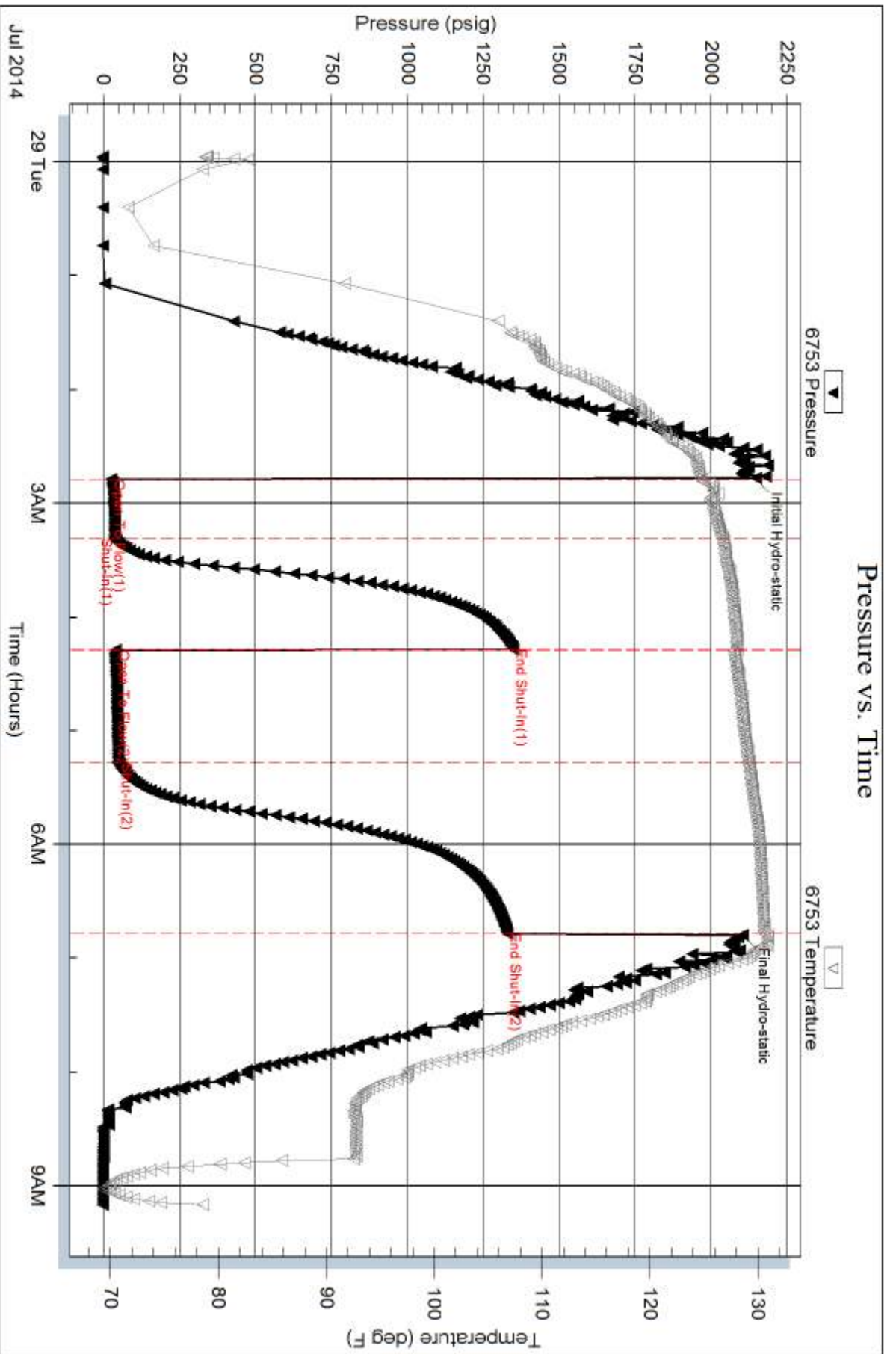
Num Gas Bombs: 0

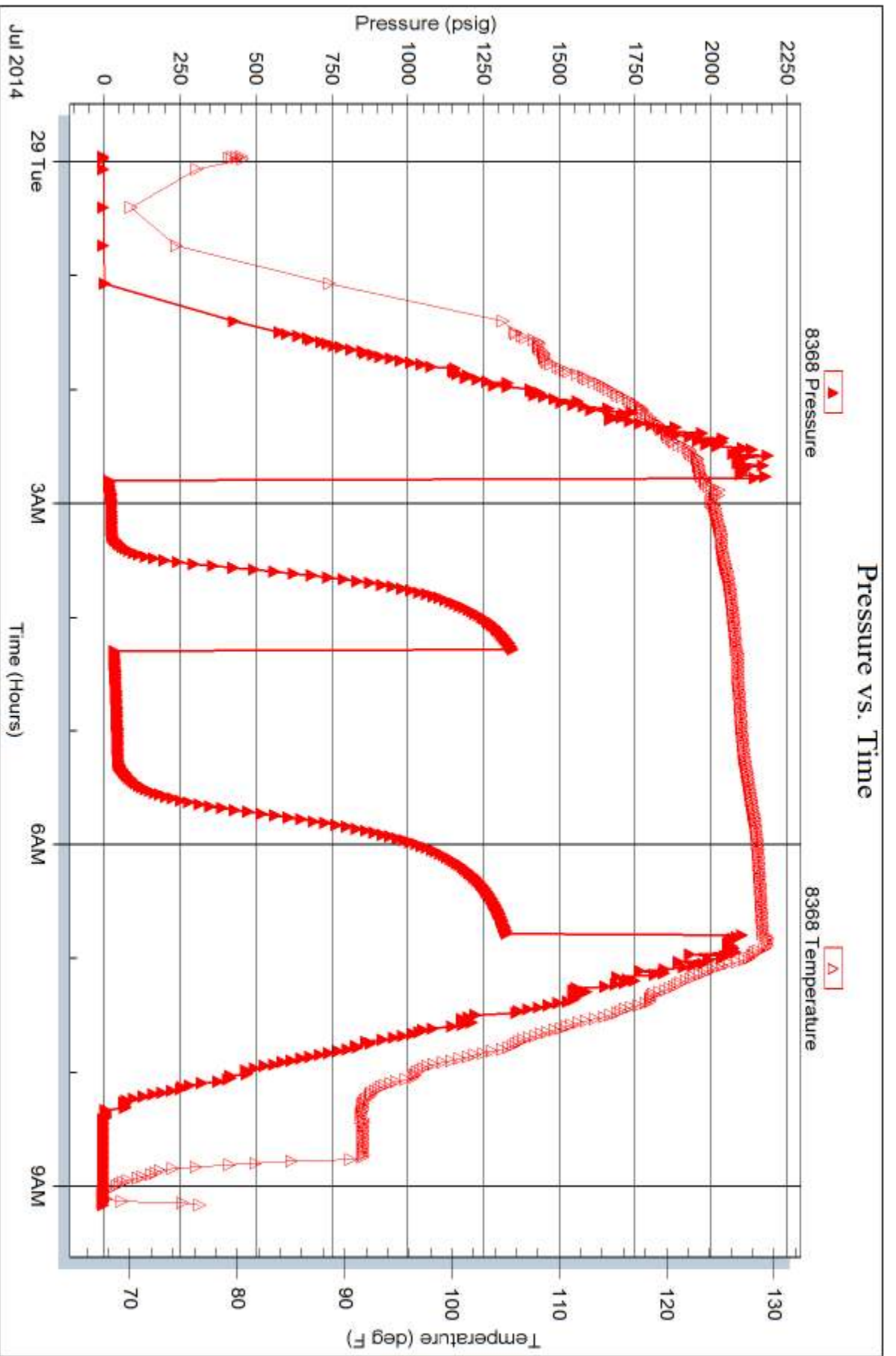
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:







# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 58460

Well Name & No. Berdie #2-21 Test No. 1 Date 7-25-14  
 Company Murfin Drilling Co., Inc. Elevation ~~3180~~ 3185 KB ~~3185~~ 3180 GL  
 Address 250 N. Water, Ste. 300 Wichita Ks 67202  
 Co. Rep / Geo. Jeff Lawler Rig Murfin #7  
 Location: Sec. 21 Twp. 1 S Rge. 35 W Co. Rawlins State Ks

Interval Tested 3743 - 3840 Zone Tested Stotler  
 Anchor Length 97' Drill Pipe Run 3612.68' Mud Wt. 8.8  
 Top Packer Depth 3738 Drill Collars Run ~~124.41'~~ Vis 55  
 Bottom Packer Depth 3743 Wt. Pipe Run 0 WL 6  
 Total Depth 3840 Chlorides 500 ppm System LCM 3#

Blow Description IF - Surface blow built to a weak blow died off in 12 mins.  
ISI - No return  
FF - No Surface blow  
FSL - No return

Rec	Feet of	%gas	%oil	%water	%mud
<u>10</u>	<u>mud</u>			<u>100</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 10 BHT 120.2°F Gravity \_\_\_\_\_ API RW \_\_\_\_\_ @ \_\_\_\_\_ °F Chlorides \_\_\_\_\_ ppm

(A) Initial Hydrostatic 1823.41  Test 1150 T-On Location 3:40 pm  
 (B) First Initial Flow 17.17  Jars 250 T-Started 5:38 pm  
 (C) First Final Flow 20.56  Safety Joint 75 T-Open 7:48 pm  
 (D) Initial Shut-In 313.43  Circ Sub N/C T-Pulled 10:49 pm  
 (E) Second Initial Flow 20.08  Hourly Standby \_\_\_\_\_ T-Out 1:06 a.m.  
 (F) Second Final Flow 24.15  Mileage 100 R/T 155 Comments \_\_\_\_\_  
 (G) Final Shut-In 245.09  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 1774.55  Straddle \_\_\_\_\_

Shale Packer 250  Ruined Shale Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  Ruined Packer \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_  Extra Copies \_\_\_\_\_  
 Day Standby \_\_\_\_\_ Sub Total 0  
 Accessibility \_\_\_\_\_ Total 1880  
 Sub Total 1880 MP/DST Disc't \_\_\_\_\_

Approved By \_\_\_\_\_ Our Representative Dan Baumann / Jeff Lawler

Trilobite Testing Inc. shall not be liable for damaged of any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.





# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 58461

4/10

Well Name & No. Berdie #2-21 Test No. 2 Date 7-27-14  
 Company Murfin Drilling Co., Inc. Elevation ~~3185~~ 3185 KB ~~3185~~ 3180 GL  
 Address 250 N. Water, Ste 300 Wichita Ks 67202  
 Co. Rep / Geo. Jeff Lawler Rig Murfin #7  
 Location: Sec. 21 Twp. 1S Rge. 35W Co. Rawlins State Ks

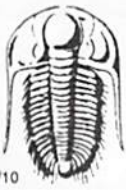
Interval Tested 4055-4190 Zone Tested LKC - 'A-D'  
 Anchor Length 135' Drill Pipe Run 3929.14' Mud Wt. ~~8.8~~ 9.1  
 Top Packer Depth 4050 Drill Collars Run 124.41' Vis ~~57~~ 58  
 Bottom Packer Depth 4055 Wt. Pipe Run 0 WL ~~5.6~~ 5.2  
 Total Depth 4190 Chlorides 500 ppm System LCM ~~5#~~ 6#  
 Blow Description IF - Surface blow built to 4 1/2"  
ISI - No Return  
FF - Surface blow built to 4 3/4"  
FSI - No Return

Rec	Feet of	%gas	%oil	%water	%mud
<u>31'</u>	<u>OCM</u>	<u>5</u>		<u>95</u>	
<u>63'</u>	<u>OCWM</u>	<u>5</u>	<u>15</u>	<u>80</u>	
<u>63'</u>	<u>OSWM</u>	<u>Spots</u>	<u>45</u>	<u>55</u>	
<u>63'</u>	<u>OSWM</u>	<u>Spots</u>	<u>35</u>	<u>65</u>	
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 220' BHT 129.2°F Gravity \_\_\_\_\_ API RW \_\_\_\_\_ @ \_\_\_\_\_ °F Chlorides \_\_\_\_\_ ppm

(A) Initial Hydrostatic 2036.80  Test 1250 T-On Location 7:10am  
 (B) First Initial Flow 22.06  Jars 250 T-Started 8:26am  
 (C) First Final Flow 81.94  Safety Joint 75 T-Open 10:20 a.m.  
 (D) Initial Shut-In 1205.58  Circ Sub N/C T-Pulled 2:20 pm  
 (E) Second Initial Flow 85.80  Hourly Standby \_\_\_\_\_ T-Out 4:53pm  
 (F) Second Final Flow 116.34  Mileage 100 R/T 155 Comments \_\_\_\_\_  
 (G) Final Shut-In 1164.78  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 1992.93  Straddle \_\_\_\_\_  
 Shale Packer 250  Ruined Shale Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  Ruined Packer \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_  Extra Copies \_\_\_\_\_  
 Day Standby \_\_\_\_\_ Sub Total 0  
 Accessibility \_\_\_\_\_ Total 1980  
 Sub Total 1980 MP/DST Disc't \_\_\_\_\_

Approved By \_\_\_\_\_ Our Representative *Donovan Peterson*  
 Trilobite Testing Inc. shall not be liable for damaged of any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.



# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 58462

Well Name & No. Berdie #2-21 Test No. 3 Date 1-28-14  
 Company Murfin Drilling Co, Inc Elevation ~~3180~~ 3185 KB ~~3185~~ 3180 GL  
 Address 250 N. Water, Ste 300 Wichita KS 67202  
 Co. Rep / Geo. Jeff Lawler Rig Murfin #7  
 Location: Sec. 21 Twp. 1S Rge. 35W Co. Rawlin S State KS

Interval Tested 4184-4241 Zone Tested LKC-"G"  
 Anchor Length 57' Drill Pipe Run 4055.15' Mud Wt. 9.1  
 Top Packer Depth 4179 Drill Collars Run 124.41 Vis 58 67  
 Bottom Packer Depth 4184 Wt. Pipe Run 0 WL 52 7.2  
 Total Depth 4241 Chlorides 500 900 ppm System LCM 6# 4#  
 Blow Description IF- Surface blow built to 3"  
ISI- NO return  
FF- Surface blow built to 6 3/4"  
FSI- NO return

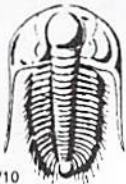
Rec	Feet of	%gas	%oil	%water	%mud
63'	<del>63'</del> mco		90	10	
63'	mco		50	50	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 126' BHT 128.9 Gravity \_\_\_\_\_ API RW \_\_\_\_\_ @ \_\_\_\_\_ °F Chlorides \_\_\_\_\_ ppm

(A) Initial Hydrostatic 2076.95  Test 1250 T-On Location 11:32 a.m.  
 (B) First Initial Flow 101.17  Jars 250 T-Started 2:43 a.m.  
 (C) First Final Flow 121.05  Safety Joint 75 T-Open 5:34 a.m.  
 (D) Initial Shut-In 1250.24  Circ Sub n/c T-Pulled 9:34 a.m.  
 (E) Second Initial Flow 101.10  Hourly Standby \_\_\_\_\_ T-Out 11:44 a.m.  
 (F) Second Final Flow 120.85  Mileage 100 R/T 155 Comments \_\_\_\_\_  
 (G) Final Shut-In 1234.57  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 2024.06  Straddle \_\_\_\_\_  
 Shale Packer 250  Ruined Shale Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  Ruined Packer \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_  Extra Copies \_\_\_\_\_  
 Day Standby \_\_\_\_\_ Sub Total 0  
 Accessibility \_\_\_\_\_ Total 1980  
 Sub Total 1980 MP/DST Disc't \_\_\_\_\_

Approved By \_\_\_\_\_ Our Representative Donovan Paurorena  
 Trilobite Testing Inc. shall not be liable for damaged of any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.





# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 58463

Well Name & No. Berdie #2-21 Test No. 4 Date 7-28-14  
 Company Murfin Drilling Co., Inc. Elevation 3185 KB 3180 GL  
 Address 250 N. Water, Ste 300 Wichita Ks 67202  
 Co. Rep / Geo. Jeff Lawler Rig Murfin #7  
 Location: Sec. 21 Twp. 1S Rge. 35W Co. Rawlins State Ks

Interval Tested 4239 - 4331 Zone Tested LKC - H+J  
 Anchor Length 92' Drill Pipe Run 4119.31' Mud Wt. 9.1  
 Top Packer Depth 4234 Drill Collars Run 124.41' Vis 67  
 Bottom Packer Depth 4239 Wt. Pipe Run 0 WL 7.2  
 Total Depth 4331 Chlorides 900 ppm System LCM 4#

Blow Description IF - Surface blow built to 2 1/2"  
ISI - NO return  
FF - Surface blow built to 2 1/2"  
FSI - No Return

Rec	Feet of	%gas	%oil	%water	%mud
<u>65'</u>	<u>OCM</u>	<u>45</u>		<u>55</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 65' BHT 130.6 Gravity \_\_\_\_\_ API RW \_\_\_\_\_ @ \_\_\_\_\_ °F Chlorides \_\_\_\_\_ ppm

(A) Initial Hydrostatic 2146.15  Test 1250 T-On Location 11:10 p.m.  
 (B) First Initial Flow 24.94  Jars 250 T-Started 11:57 pm  
 (C) First Final Flow 37.40  Safety Joint 75 T-Open 2:47 a.m.  
 (D) Initial Shut-In 1319.48  Circ Sub N/C T-Pulled 6:47 am  
 (E) Second Initial Flow 39.56  Hourly Standby \_\_\_\_\_ T-Out 9:10 am  
 (F) Second Final Flow 49.62  Mileage 100 R/T 310 Comments \_\_\_\_\_  
 (G) Final Shut-In 1329.84  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 2104.27  Straddle \_\_\_\_\_  
 Shale Packer 250  Ruined Shale Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  Ruined Packer \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_  Extra Copies \_\_\_\_\_

Initial Open 30  
 Initial Shut-In 60  
 Final Flow 60  
 Final Shut-In 90  
 Sub Total 2135  
 Total 2135  
 MP/DST Disc't \_\_\_\_\_

Approved By \_\_\_\_\_ Our Representative Donovan Baumann / Paul Foster

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**OPERATOR**

Company: MURFIN DRILLING CO., INC.  
 Address: 250 N WATER  
 SUITE 300  
 WICHITA, KS 67202  
 Contact Geologist: SHAUNA GUNZLEMAN  
 Contact Phone Nbr: (316) 267-3241  
 Well Name: BERDIE #2-21  
 Location: E2 NW NE Sec. 21 - 1S - 35W  
 Pool:  
 State: KANSAS

API: 15-153-21029-00-00  
 Field: WILDCAT  
 Country: USA

**Scale 1:240 Imperial**

Well Name: BERDIE #2-21  
 Surface Location: E2 NW NE Sec. 21 - 1S - 35W  
 Bottom Location:  
 API: 15-153-21029-00-00  
 License Number: 30606  
 Spud Date: 7/22/2014  
 Region: RAWLINS COUNTY KANSAS  
 Drilling Completed: 7/29/2014  
 Surface Coordinates: 660' FNL & 1650' FEL  
 Bottom Hole Coordinates:  
 Ground Elevation: 3180.00ft  
 K.B. Elevation: 3185.00ft  
 Logged Interval: 3500.00ft  
 Total Depth: 4470.00ft  
 Formation: LANSING - KANSAS CITY  
 Drilling Fluid Type: FRESH WATER / CHEMICAL GEL

Time: 5:15 PM  
 Time: 7:03 PM  
 To: 4471.00ft

**SURFACE CO-ORDINATES**

Well Type: Vertical  
 Longitude: -101.2485085  
 N/S Co-ord: 660' FNL  
 E/W Co-ord: 1650' FEL

Latitude: 39.9568147

**LOGGED BY**

Company: BIG CREEK CONSULTING, INC.  
 Address: 1909 MAPLE  
 ELLIS, KS 67637

Phone Nbr: (785) 259-3737  
 Logged By: Geologist

Name: JEFF LAWLER

**CONTRACTOR**

Contractor: MURFIN DRILLING CO., INC.  
 Rig #: 7  
 Rig Type: MUD ROTARY  
 Spud Date: 7/22/2014  
 TD Date: 7/29/2014  
 Rig Release: 7/30/2014

Time: 5:15 PM  
 Time: 7:03 PM  
 Time: 5:00 PM

**ELEVATIONS**

K.B. Elevation: 3185.00ft  
 K.B. to Ground: 5.00ft

Ground Elevation: 3180.00ft

**NOTES**


THE BERDIE #2-21 WAS DRILLED OFF A SEISMIC PROSPECT & RAN STRUCTURALLY HIGH TO REGIONAL WELLS. DUE TO LOG ANALYSIS AND ECONOMICAL RECOVERY ON MULTIPLE DST'S DECISION WAS MADE TO RUN 5 1/2" PRODUCTION CASING AND FURTHER EVALUATE ZONES WITH PERFORATION.

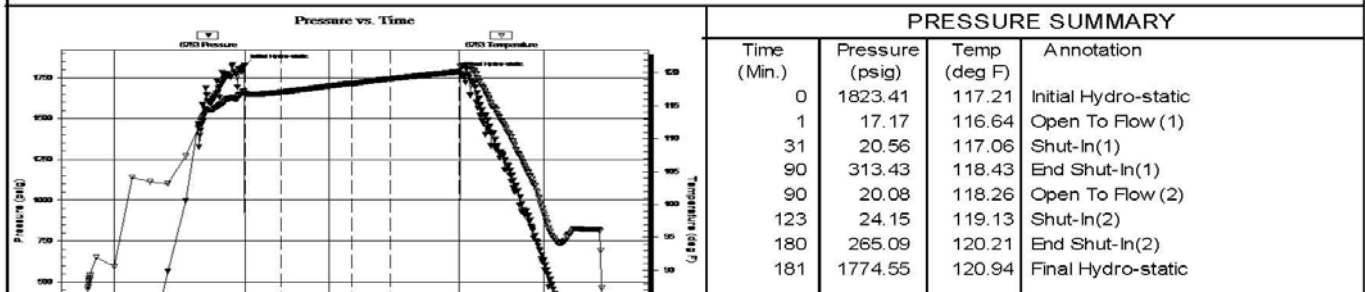
RESPECTFULLY SUBMITTED,  
 JEFF LAWLER

**WELL COMPARISON SHEET**

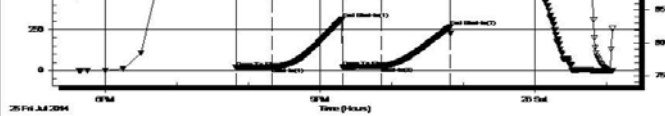
FORMATION	BERDIE #2-21				NE SW NE NW 21-1-35				NW SW NE SW 16-1-35				NE NE 21-1-35			
	MURFING DRILLING CO., INC.		MURFING DRILLING CO., INC.		MURFING DRILLING CO., INC.		MURFING DRILLING CO., INC.		LEONARD #1-16		LEONARD #1-16		AMERADA PETROLEUM		AMERADA PETROLEUM	
	BERDIE #1-21		BERDIE #1-21		BERDIE #1-21		BERDIE #1-21		CHRISTONSON #1		CHRISTONSON #1		CHRISTONSON #1		CHRISTONSON #1	
	KB	3185	GL	3180	KB	3161	KB	3112	KB	3229						
LOG TOPS	SAMPLE TOPS			COMP. CARD	LOG	SMPL.	COMP. CARD	LOG	SMPL.	COMP. CARD	LOG	SMPL.	COMP. CARD	LOG	SMPL.	
DEPTH	DATUM	DEPTH	DATUM	DEPTH	DATUM	CORR.	CORR.	DEPTH	DATUM	CORR.	CORR.	DEPTH	DATUM	CORR.	CORR.	
ANHYDRITE TOP	3063	122	3040	145	3046	115	+ 7	+ 30	3003	109	+ 13	+ 36	3108	121	+ 1	+ 24
BASE	3098	87	3068	117	3081	80	+ 7	+ 37	3036	76	+ 11	+ 41	3146	83	+ 4	+ 34
NEVA	3568	-383			3549	-388	+ 5		3507	-395	+ 12					
RED EAGLE	3633	-448			3615	-454	+ 6		3571	-459	+ 11					
FORAKER	3684	-499			3665	-504	+ 5		3622	-510	+ 11					
STOTLER	3834	-649	3813	-628	3815	-654	+ 5	+ 26	3770	-658	+ 9	+ 30				
TOPEKA	3897	-712	3888	-703	3884	-723	+ 11	+ 20	3831	-719	+ 7	+ 16				
DEER CREEK	3906	-721	3896	-711	3895	-734	+ 13	+ 23	3846	-734	+ 13	+ 23				
OREAD	3998	-813	4000	-815	3982	-821	+ 8	+ 6	3934	-822	+ 9	+ 7	4048	-819	+ 6	+ 4
HEEBNER	4059	-874	4067	-882	4044	-883	+ 9	+ 1	3991	-879	+ 5	- 3				
LANSING A	4119	-934	4117	-932	4100	-939	+ 5	+ 7	4048	-936	+ 2	+ 4	4166	-937	+ 3	+ 5
LANSING B	4159	-974			4143	-982	+ 8		4090	-978	+ 4					
LANSING D	4170	-985	4170	-985	4154	-993	+ 8	+ 8	4101	-989	+ 4	+ 4				
LANSING G	4220	-1035	4218	-1033	4204	-1043	+ 8	+ 10	4153	-1041	+ 6	+ 8				
LANSING H	4270	-1085			4254	-1093	+ 8		4204	-1092	+ 7					
LANSING J	4310	-1125	4307	-1122	4298	-1137	+ 12	+ 15	4248	-1136	+ 11	+ 14				
STARK SHALE	4327	-1142	4324	-1139	4313	-1152	+ 10	+ 13	4261	-1149	+ 7	+ 10				
LANSING K	4350	-1165	4339	-1154	4337	-1176	+ 11	+ 22	4284	-1172	+ 7	+ 18				
BKC	4376	-1191	4371	-1186	4362	-1201	+ 10	+ 15	4310	-1198	+ 7	+ 12	4432	-1203	+ 12	+ 17
LENAPAH	4389	-1204	4388	-1203	4375	-1214	+ 10	+ 11	4324	-1212	+ 8	+ 9				
MARMATON / ALTAMONT	4413	-1228	4412	-1227	4398	-1237	+ 9	+ 10	4348	-1236	+ 8	+ 9				
PAWNEE					4483	-1322			4429	-1317						
LOWER PAWNEE					4506	-1345			4450	-1338						
FT SCOTT					4553	-1392			4497	-1385						
CHEROKEE					4567	-1406			4510	-1398			4651	-1422		
REAGAN					4673	-1512			4600	-1488						
MISSISSIPPIAN					4761	-1600			4702	-1590			4826	-1597		
TOTAL DEPTH	4471	-1286	4470	-1285	4814	-1653	+ 367	+ 368	4755	-1643	+ 357	+ 358	4880	-1651	+ 365	+ 366

**DST #1 STOTLER 4743' - 4840'**

	<b>DRILL STEM TEST REPORT</b>	
	Murfin Drilling Co., Inc 250 N. Water STE 300 Wichita KS 67202 ATTN: Jeff Lawler	<b>21-1S-35W</b>  <b>Berdie #2-21</b> Job Ticket: 58460 <b>DST#: 1</b> Test Start: 2014.07.25 @ 17:38:00
<b>GENERAL INFORMATION:</b>		
Formation: <b>Stotler</b> Deviated: No Whipstock      ft (KB) Time Tool Opened: 19:49:30 Time Test Ended: 01:05:30	Test Type: Conventional Bottom Hole (Initial) Tester: Royal Fisher Unit No: 54	
Interval: <b>3743.00 ft (KB) To 3840.00 ft (KB) (TVD)</b> Total Depth: 3840.00 ft (KB) (TVD) Hole Diameter: 7.88 inches Hole Condition: Good	Reference Elevations: 3185.00 ft (KB) 3180.00 ft (CF) KB to GR/CF: 5.00 ft	
<b>Serial #: 6753      Outside</b> Press@RunDepth: 24.15 psig @ 3744.00 ft (KB) Start Date: 2014.07.25      End Date: 2014.07.26 Start Time: 17:38:05      End Time: 01:05:29	Capacity: 8000.00 psig Last Calib.: 2014.07.26 Time On Btm: 2014.07.25 @ 19:49:15 Time Off Btm: 2014.07.25 @ 22:50:00	
<b>TEST COMMENT:</b> 30 - IF - Weak surface blow dead in 12 min. 60 - ISI - No return 30 - FF - No surface blow 60 - FSI - No return		







**Recovery**

Length (ft)	Description	Volume (bbl)
10.00	Mud - 100M	0.05

**Gas Rates**

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

Trilobite Testing, Inc

Ref. No: 58460

Printed: 2014.07.26 @ 06:36:43

**DST #2 LANSING A - D 4055' - 4190'**



**TRILOBITE TESTING, INC.**

**DRILL STEM TEST REPORT**

Murfin Drilling Co., Inc  
 250 N. Water STE 300  
 Wichita KS 67202  
 ATTN: Jeff Lawler

**21-1S-35W**

**Berdie #2-21**

Job Ticket: 58461

**DST#: 2**

Test Start: 2014.07.27 @ 08:26:00

**GENERAL INFORMATION:**

Formation: **LKC - A - D**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 10:19:45  
 Time Test Ended: 16:52:30

Test Type: Conventional Bottom Hole (Initial)  
 Tester: Royal Fisher  
 Unit No: 54

Interval: **4055.00 ft (KB) To 4190.00 ft (KB) (TVD)**  
 Total Depth: 4190.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Good

Reference Elevations: 3185.00 ft (KB)  
 3180.00 ft (CF)  
 KB to GR/CF: 5.00 ft

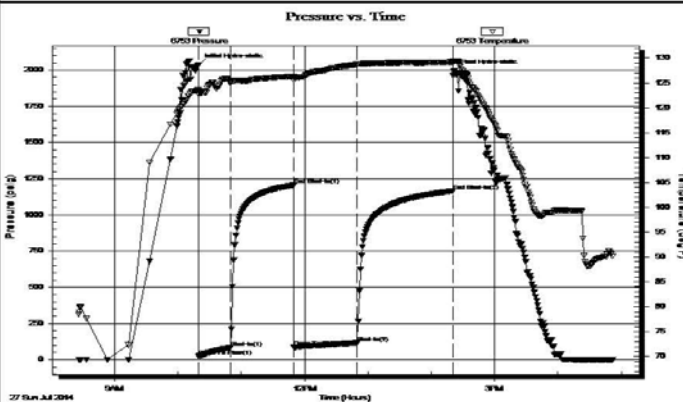
**Serial #: 6753**

**Outside**

Press@RunDepth: 116.34 psig @ 4056.00 ft (KB)  
 Start Date: 2014.07.27 End Date: 2014.07.27  
 Start Time: 08:26:05 End Time: 16:52:29

Capacity: 8000.00 psig  
 Last Calib.: 2014.07.27  
 Time On Btm: 2014.07.27 @ 10:19:30  
 Time Off Btm: 2014.07.27 @ 14:21:45

TEST COMMENT: IF - Surface blow built to 4 1/2  
 ISI - No return  
 FF - Surface blow built to 4 3/4  
 FSI - No return



**PRESSURE SUMMARY**

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2036.80	123.62	Initial Hydro-static
1	22.06	122.74	Open To Flow (1)
31	81.94	125.11	Shut-In(1)
91	1205.58	126.28	End Shut-In(1)
91	85.80	125.57	Open To Flow (2)
151	116.34	128.76	Shut-In(2)
241	1164.78	129.20	End Shut-In(2)
243	1992.93	129.31	Final Hydro-static


**Recovery**

Length (ft)	Description	Volume (bbl)
63.00	OSVM - 65M - 35W - Oil Spots	0.31
63.00	OSVM - 55M - 45W - Oil Spots	0.32
63.00	OCVM - 80M - 15W - 5o	0.88
31.00	OCM - 95M - 5o	0.43

**Gas Rates**

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

**DST #3 LKC G 4184' - 4240'**

 <p><b>TRILOBITE TESTING, INC</b></p>	<b>DRILL STEM TEST REPORT</b>	
	Murfin Drilling Co., Inc 250 N. Water STE 300 Wichita KS 67202 ATTN: Jeff Lawler	<b>21-1S-35W</b>  <b>Berdie #2-21</b> Job Ticket: 58462 <b>DST#: 3</b> Test Start: 2014.07.28 @ 02:43:00

**GENERAL INFORMATION:**

Formation: **LKC - G**  
 Deviated: No Whipstock:                      ft (KB)  
 Time Tool Opened: 05:33:45  
 Time Test Ended: 11:43:45

Interval: **4184.00 ft (KB) To 4241.00 ft (KB) (TVD)**  
 Total Depth: 4241.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Good

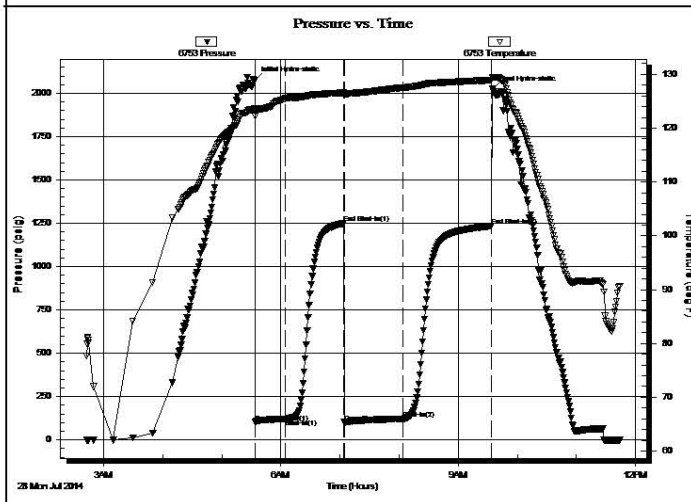
Test Type: Conventional Bottom Hole (Initial)  
 Tester: Royal Fisher  
 Unit No: 54

Reference Elevations: 3185.00 ft (KB)  
 3180.00 ft (CF)  
 KB to GR/CF: 5.00 ft

**Serial #: 6753      Outside**

Press@RunDepth: 120.85 psig @ 4185.00 ft (KB)	Capacity: 8000.00 psig
Start Date: 2014.07.28      End Date: 2014.07.28	Last Calib.: 2014.07.28
Start Time: 02:43:05      End Time: 11:43:45	Time On Btm: 2014.07.28 @ 05:33:30
	Time Off Btm: 2014.07.28 @ 09:34:45

**TEST COMMENT:** 30 - IF - Surface blow built to 3"  
 60 - ISI - No return  
 60 - FF - Surface blow built to 6 3/4"  
 90 - FSI - No return



PRESSURE SUMMARY			
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2076.95	123.56	Initial Hydro-static
1	101.17	122.20	Open To Flow (1)
31	121.05	125.51	Shut-In(1)
91	1250.24	126.60	End Shut-In(1)
91	101.10	126.19	Open To Flow (2)
151	120.85	127.53	Shut-In(2)
241	1234.57	128.93	End Shut-In(2)
242	2024.06	129.42	Final Hydro-static

Recovery		
Length (ft)	Description	Volume (bbl)
63.00	MCO - 50M - 50o	0.31
63.00	MCO - 10M - 90o	0.32

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

**DST #4 LKC H - J 4238' - 4331'**



**TRILOBITE  
TESTING, INC.**

**DRILL STEM TEST REPORT**

Murfin Drilling Co., Inc  
250 N. Water STE 300  
Wichita KS 67202  
ATTN: Jeff Lawler

**21-1S-35W**

**Berdie #2-21**

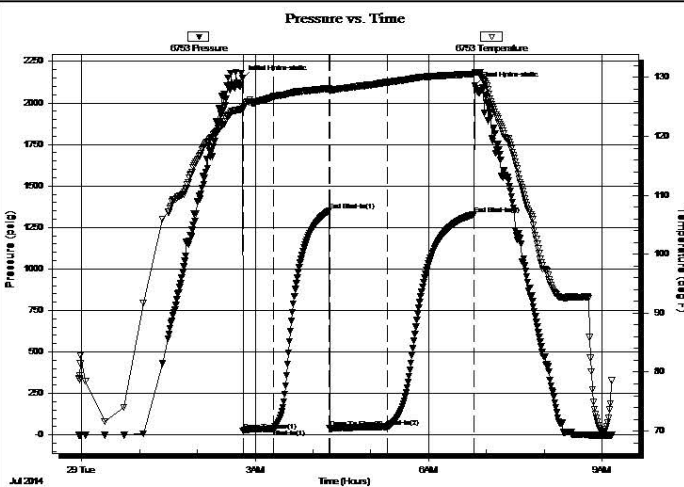
Job Ticket: 58463      **DST#: 4**  
Test Start: 2014.07.28 @ 23:57:00

**GENERAL INFORMATION:**

Formation: **LKC - H & J**  
Deviated: No Whipstock: ft (KB)  
Time Tool Opened: 02:47:30  
Time Test Ended: 09:09:45  
Interval: **4239.00 ft (KB) To 4331.00 ft (KB) (TVD)**  
Total Depth: 4331.00 ft (KB) (TVD)  
Hole Diameter: 7.88 inches Hole Condition: Good  
Test Type: Conventional Bottom Hole (Initial)  
Tester: Royal Fisher  
Unit No: 54  
Reference Elevations: 3185.00 ft (KB)  
3180.00 ft (CF)  
KB to GR/CF: 5.00 ft

**Serial #: 6753      Outside**  
Press@RunDepth: 49.62 psig @ 4240.00 ft (KB)      Capacity: 8000.00 psig  
Start Date: 2014.07.28      End Date: 2014.07.29      Last Calib.: 2014.07.29  
Start Time: 23:57:05      End Time: 09:09:45      Time On Btm: 2014.07.29 @ 02:47:00  
Time Off Btm: 2014.07.29 @ 06:47:45

TEST COMMENT: 30 - IF - Surface blow built to 2 1/2"  
60 - ISI - No return  
60 - FF - Surface blow built to 2 1/2"  
90 - FSI - No return



**PRESSURE SUMMARY**

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2146.15	125.15	Initial Hydro-static
1	24.94	124.65	Open To Flow (1)
32	37.40	126.77	Shut-In(1)
90	1349.48	128.09	End Shut-In(1)
91	39.56	127.72	Open To Flow (2)
151	49.62	129.15	Shut-In(2)
240	1329.84	130.60	End Shut-In(2)
241	2104.27	130.85	Final Hydro-static

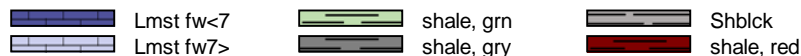
**Recovery**

Length (ft)	Description	Volume (bbl)
65.00	OCM - 55M - 45o	0.32

**Gas Rates**

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

### ROCK TYPES



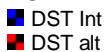
### ACCESSORIES

#### STRINGER

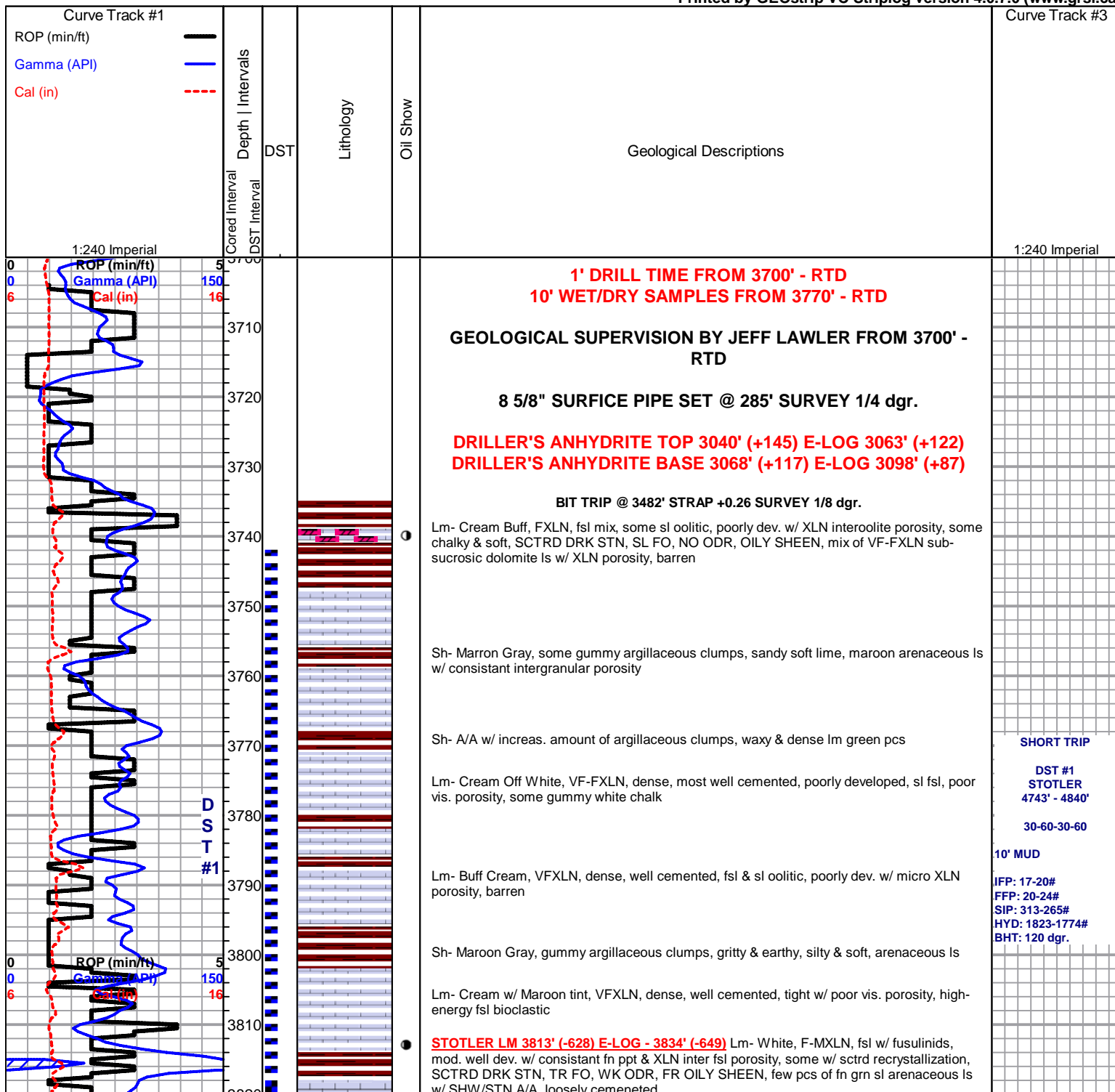


### OTHER SYMBOLS

#### DST



Printed by GEOstrip VC Striplog version 4.0.7.0 (www.grsi.ca)



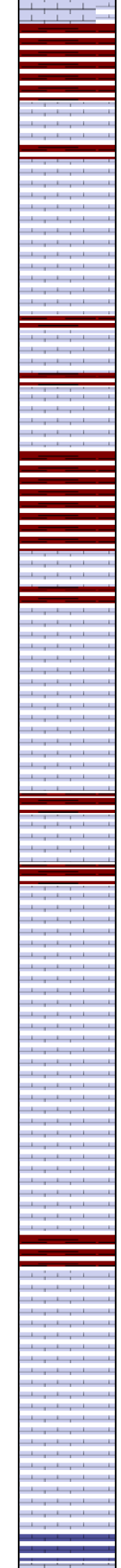
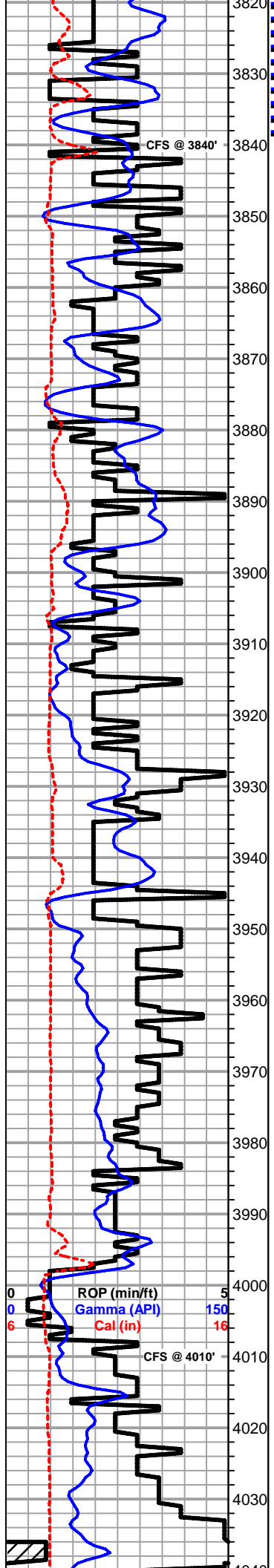
SHORT TRIP

DST #1  
STOTLER  
4743' - 4840'

30-60-30-60

10' MUD

IFP: 17-20#  
FFP: 20-24#  
SIP: 313-265#  
HYD: 1823-1774#  
BHT: 120 dgr.



Sh- Maroon, gummy argillaceous clumps, some gritty & earthy

\*\*LOST ~60-80 BBL VOL.\*\*

Lm- White Off White, F-MXLN, fsl, mod. well dev. w/ GD inter fsl porosity, SCTRD DRK STN, TR FO, NO ODR, OILY SHEEN, some gummy white chalk

Lm- White Off White, FXLN, sl fsl, loosely cemented, some sl chalky in part, some sctrd recrystallization, SCTRD DRK STN, NSFO, SCTRD DO, NO ODR

Lm- Cream Off White, VF-FXLN, dense, well cemented, mostly tight & poorly dev. w/ poor vis. porosity, barren

Sh- Maroon Grey White, gritty & earthy, argillaceous wash, silty & soft, gummy white chalk

Sh- A/A w/ incr. gray shale & silty lm green shale

**TOPEKA 3888' (-703) E-LOG 3897' (-712)** Lm- Cream w/ Maroon tint, VF-FXLN, detrital ls, most well cemented, some loosely cemented, fsl w/ fusulinids, poorly dev. w/ micro XLN porosity

**DEER CREEK 3896' (-711) E-LOG 3906' (-721)** Lm- Cream Off White, FXLN, well cemented arenaceous ls mixed w/ few pcs of fsl, sctrd XLN porosity, SCTRD DRK STN, NSFO, NO ODR

Lm- Cream Off White, VFXLN, dense, well cemented, tight w/ minimal vis. porosity, vry clean

**D** Lm- White, VFXLN, dense, most vry well cemented & tight w/ sctrd porosity, BLK GILSONITE STN, NSFO, NO ODR

Sh/Ss- Maroon Lm Green, mix of gritty & earthy shale & loosely cemented shaley Ss

Lm- Maroon Lt Purple, Fn Grn arenaceous ls w/ consistant intergranular porosity, barren, some gummy white chalk

Lm- A/A w/ cream & buff fn grn arenaceous ls, gritty & earthy maroon shale

Lm- Lt Purple, incr. amount of fn grn arenaceous ls, silty gray & lm grn shale

**D** Lm- White, Fn Grn, friable arenaceous ls w/ consistant intergranular porosity, well sorted & consolidated, DRK SAT TO SUB-SAT STN, NSFO, NO ODR, DEAD OIL??

**OREAD 4000' (-815) E-LOG 3998' (-813)** Lm- Cream Off White, VF-FXLN, dense, most well cemented, oolitic, poorly dev. w/ XLN porosity mixed w/ tight VFXLN w/o vis. porosity, barren

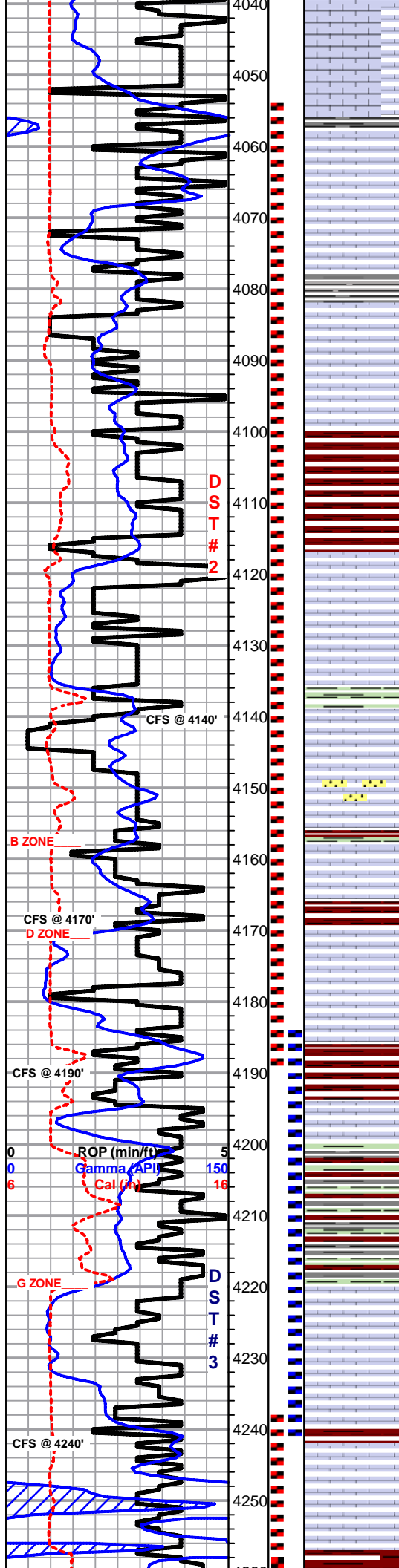
**O** Lm- A/A, few oolitic pcs w/ rare small oomoldic ppt porosity, no inter connectivity, 2-3 PCS W/ BLK GILSONITE EDGE STN, NSFO, NO ODR

Lm- Cream, VFXLN, dense, well cemented, tight w/ minimal vis. porosity, vry clean

Lm- Cream Buff, A/A w/ few pcs of crypto XLN w/o vis. porosity

Lm- Buff, VFXLN, vry well cemented, tight w/o vis. porosity, few pcs of vf grn, sl silty & loosely cemented mud supported matrix, all vry clean





Lm- Drk Gray, Vf Grn, dense, well cemented, silty, no vis. porosity

Lm- A/A w/ incr. amount, w/ soft & silty & loosely cemented

Lm- Cream Buff, Vf-fn Grn, mix of unconsolidated mud supported matrix, loosely-well cemented w/ poor vis. porosity, some sctrd XLN porosity, & semi-translucent oomoldic, loosely cemented, semi-friable, sctrd inter vugular connectivity, LT OILY STN, SFO, LT ODR UPON CRUSH, INSTANT HALO FLOR.

**HEEBNER 4067' (-882) E-LOG 4059' (-874)** Sh- Maroon Gray, gritty & earthy, silty & calcareous, few ps of unconsolidated & spkld w/ drk organics

Lm- Cream Buff Lt Gray, Fn Grn, consolidated arenaceous ls, loosely cemented, sl chalky, w/ constant intergranular porosity, barren

Lm- Brown Maroon, Fn Grn, arenaceous ls, consolidated & loosely cemented, FEW PCS W/ WK STN, NSFO, DULL FLOR., NO ODR

Sh- Maroon Gray, gritty & earthy, dense & blocky

**LKC 4117' (-932) E-LOG 4119' (-934)** Lm- Cream Off White, VF-FXLN, mix of sl fsl & oolitic, poorly dev. w/ sctrd XLN & fn ppt inter fsl porosity, SCTRD LT DRK SPOTTY STN, NSFO, NO ODR, & VFXLN, dense, vry well cemented, tight w/ minimal vis. porosity, vry clean & barren

Lm- White Cream, VFXLN Fn Grn, mix of lithographic w/o vis. porosity, & fn grn loosely cemented, sl arenaceous ls, consolidated w/ intergranular porosity, DRK STN, TR FO, NO ODR

Lm- White Off White, FXLN, mix of sl chalky & loosely cemented w/ sctrd ppt porosity & well cemented poorly dev w/ sctrd recrystallization & XLN porosity, all w/ SCTRD DRK STN, SL TR FO, NO ODR

Lm- Cream Maroon, VFXLN Fn Grn, lithographic w/o vis. porosity, barren & arenaceous ls

Lm- Cream Off White, FXLN, fsl & oolitic, mod. well dev. w/ sctrd-consistant fn ppt interoolite porosity, few loose fusulinids, SCTRD LT STN, TR FO, OILY SHEEN, FNT ODR, LT FLOR.

Sh- Maroon Lm Green, gritty & earthy, silty & soft, maroon arenaceous ls

Lm- White, VF-FXLN, mod. well dev. w/ sctrd-dense fn ppt & XLN porosity, sctrd recrystallization & secondary porosity, SCTRD LT STN, SL SFO, WK ODR, BRIGHT YLW FLOR.

Lm- Cream Buff, VF-FXLN, dense, well cemented, mostly tight w/ no to poor vis. porosity, barren

Sh- Maroon Gray, gritty & earthy, silty & soft, some white chalk

Lm- Cream Buff, FXLN, fsl, poorly dev. w/ XLN porosity, barren

Sh- Gray Lm Green Maroon, silty & calcareous, soft & silty, gritty & earthy

Sh- Maroon Brown Lm Green, gritty & earthy, dense & blocky, unconsolidated & pebbly lm green clumps

Lm- Cream Off White, FXLN, fsl & oolitic, mix of unconsolidated & spkld w/ sediment, sctrd XLN & fn ppt porosity & mod. well dev. oomoldic w/ sctrd fn ppt porosity, few w/ dense ppt porosity, ALL W/ LT STN, FR-GD SFO, SWEET LT ODR, FREE FLOATING OIL ON TOP OF WET CUP

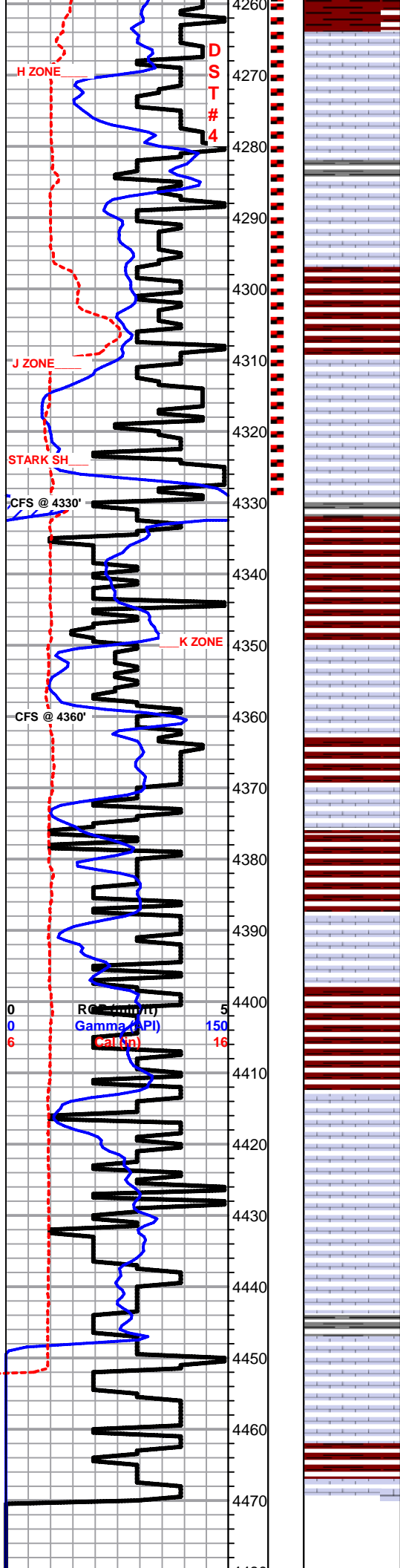
Lm- Cream, VFXLN, dense, well cemented, tight w/ minimal vis. to sctrd XLN porosity, vry clean, barren, few pcs w/ sctrd ppt porosity & secondary recrystallization, SCTRD LT STN, SFO, SOME W/ GSY BUBBLES UPON CRUSH, FR ODR

Lm- Lt Gray, VFXLN, dense, tight, loosely-well cemented, tight w/ minimal vis. porosity, barren

Lm- Cream Tan, VF-FXLN, dense, well cemented, sctrd dev. & XLN porosity, some rare ppt porosity w/ coarse recrystallization w/in porosity, DRK SCTRD STN, COPPER COLORED STN ALONG EDGE PLANES & ALONG RECRYSTALLIZATION, WK-FR SFO, FR ODR

**DST #2**  
LKC A - D  
4055' - 4190'  
**220' TOTAL FLUID**  
31' OCM (5%O, 95%M)  
63' OCWM (5%O, 15%M, 80%M)  
63' OSPWM (45%M, 55%M)  
63' OSPWM (35%M, 65%M)  
IFP: 22-81#  
FFP: 85-116#  
SIP: 1205-1164#  
HYD: 2036-1992#  
BHT: 129 dgr.

**DST #3**  
LKC G  
4184' - 4240'  
**30-60-60-90**  
**126' TOTAL FLUID**  
63' MCO (90%O, 10%M)  
63' MCO (50%O, 50%M)  
IFP: 101-121#  
FFP: 101-120#  
SIP: 1250-1235#  
HYD: 2076-2024#  
BHT: 129 dgr.



Sh- Maroon Gray Lm Green, gritty & earthy, silty & calcareous

● Lm- Cream Off White Tan, VF-FXLN, majority of mix w/ sctrd XLN & sctrd fn ppt to sub-vugular porosity, few mod. dev. oolitic w/ consistant fn ppt inter oolite porosity, ALL W/ SCTRD DRK STN, WK-FR SFO, OILY SHEEN, FR ODR  
 ○ Lm- Lt Gray Buff, FXLN, poorly dev. & mostly tight w/ sctrd XLN porosity, FEW PCS W/ SCTRD BLK DO STN, NSFO, TR ODR, some gray wash  
 ● Lm- Cream Off White, FXLN, loosely cemented, fsl w/ dense XLN porosity, DRK DO & LT STN, TR FO, WK-FR ODR, DULL TO YLW FLOR, some soft white chalk carrying DO STN A/A, some sctrd recrystallization

Sh- Maroon Brown Gray, dense & blocky, gritty & earthy, silty & calcareous, few black w/ hvy organics

● Lm- White Off White, FXLN, mod. well dev. oolitic w/ sctrd to mostly consistant fn ppt inter oolite porosity, SCTRD LT STN, HVY OILY SHEEN, SFO, GD ODR, MUCH FREE FLOATING OIL ON TOP OF WET CUP  
 ● Lm- White Off White, VF-FXLN, fsl, sl oolitic w/ fusulinds, poorly dev. w/ sctrd XLN porosity, some soft white chalk, vry clean & barren  
 ● Lm- Cream Off White, FXLN, sctrd XLN porosity, most well cemented, sctrd recrystallization, SCTRD DRK STN, TR FO, WK ODR

Sh- Maroon Gray, gritty & earthy, silty & soft, some sandy lime

Sh- Maroon Brown, A/A w/ dense & blocky

● Lm- White Off White, FXLN, oolitic, poorly dev. w/ sctrd micro XLN & XLN porosity, sctrd secondary recrystallization porosity, well cemented, vry clean & barren  
 ● Lm- Cream Off White, VFXLN, dense, well cemented, few pcs of oolitic biomicrite w/ in situ fusulinds, mostly tight w/ minimal vis. porosity, some chalky mud supported matrix, all clean & barren

**BKC 4371' (-1186) E-LOG 4376' (-1191)** Sh- Maroon Lm Green Gray, gritty & earthy, silty & calcareous, soft & silty, some gray wash

**LENAPAH 4388' (-1203) E-LOG 4389' (-1204)** Lm- White Off White, FXLN, dense, well cemented, poorly dev. w/ sctrd XLN porosity, clean & barren

Sh- Maroon Lt Purple Lm Green Gray, gritty & earthy, dense & blocky, sl waxy

Sh- A/A w/ incr. amount of silty & calcareous gray shale

**MARMATON 4412' (-1227) E-LOG 4413' (-1228)** Lm- Cream Off White, VF-FXLN, dense, well cemented, poorly dev. mostly tight w/ sctrd XLN porosity, barren

Lm- Lt Gray, Fn Gray, sl arenaceous ls, loosely-well cemented, consistant intergranular porosity, barren

Lm- Maroon Lt Gray Mustard Yellow, dense & blocky, some sl silty & calcareous, few pcs of gummy wash

Lm- Lt Gray, Fn Grn, loosely-well cemented, poor vis. porosity, barren

Sh- Maroon Gray, gritty & earthy, soft, some silty, some sandy shale

Lm- Cream Tan, VFXLN, dense, well cemented, sl fsl, high-energy bioclastic w/ poor vis. porosity, barren

Sh- Maroon Gray, dense & blocky

Lm- Cream Off White, VFXLN, dense, well cemented, poorly dev. & mostly tight w minimal vis. porosity

**DST #4**  
**LKC H - J**  
**4238' - 4331'**  
**30-60-60-90**  
**65' OCM**  
**(45% O, 55% M)**  
**IFP: 24-37#**  
**FFP: 39-49#**  
**SIP: 1349-1329#**  
**HYD: 2146-2104#**  
**BHT: 130 dgr.**

**RTD 4470' (-1285) LTD 4471' (-1286) @ 17:03 7/29/2014**

**SHORT TRIP**  
**SURVEY 1 dgr.**  
**CTCH**  
**TOH FOR LOG**

4480

4490

