



Confidentiality Requested:

Yes  No

KANSAS CORPORATION COMMISSION 1206613  
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: \_\_\_\_\_

1206613

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 <i>(Attach Additional Sheets)</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Log	Formation (Top), Depth and Datum	<input type="checkbox"/> Sample
Samples Sent to Geological Survey	<input type="checkbox"/> Yes <input type="checkbox"/> No	Name	Top	Datum
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:				

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:  Yes  No

Date of First, Resumed Production, SWD or ENHR: \_\_\_\_\_ Producing Method:  Flowing  Pumping  Gas Lift  Other *(Explain)* \_\_\_\_\_

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> _____ <i>(Submit ACO-4)</i>	<b>PRODUCTION INTERVAL:</b> _____ _____
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Form	ACO1 - Well Completion
Operator	Murfin Drilling Co., Inc.
Well Name	Hagen 2-12
Doc ID	1206613

All Electric Logs Run

Dual Induction
Dual Compensated
Microresistivity
Borehole Compensated



Hagen #2-12  
 Daily Drilling Report  
 Page Two

4/5/14 RTD: 3945'. CT: 14hrs. Pioneer logged 8:00AM – 12:00PM 4/4. LTD: 3944'. Globe plugged from 2:00PM - 5:00PM 4/4, using 60/40Poz, 4%Gel, ¼#Flo seal, 50sxs @ 3792, 25sxs @ 1547', 100sxs @ 806', 40sxs @ 267', 10sxs @ 40', 30sxs RH. Orders by Pat Staab, KCC Hays. RR @ 9:00PM 4/5. FINAL REPORT

MDCI Hagen #2-12 1550' FSL 1980' FWL Sec. 12-T12S-R20W 2161' KB							MDCI Hagen #1-12 1550' FSL 1240' FWL Sec. 12-T12S-R20W 2143' KB	
Formation	Sample top	Datum	Ref	Log tops	Datum	Ref	Log tops	Datum
Anhydrite	1525	+636	-2	1522	+639	-1	1505	+638
B/Anhydrite	1570	+591	+1	1568	+593	+3	1553	+590
Topeka	3207	-1046	+2	3205	-1044	+4	3191	-1048
Heebner	3432	-1271	+2	3430	-1269	+4	3416	-1273
Lansing	3474	-1313	+2	3474	-1313	+2	3458	-1315
BKC	3722	-1561	-3	3708	-1547	+11	3701	-1558
Marmaton	3732	-1571	-5	3718	-1557	+9	3709	-1566
Pawnee	3758	-1597	+6	3757	-1596	+7	3746	-1603
Arbuckle	3845	-1684	+2	3814	-1653	+33	3829	-1686
RTD	3945						3880	-1737
LTD				3944			3880	-1737



**QUALITY OILWELL CEMENTING, INC.**

PO Box 32 - 740 West Wichita Ave, Russell KS 67665  
 Phone: 785-324-1041 fax: 785-483-1087  
 Email: cementing@ruraltel.net

Date: 3/29/2014  
 Invoice # 7192

*Prod-MG*

P.O.#:

Due Date: 4/28/2014

Division: Russell

# Invoice

OPERATOR PAY MDC

LEASE: Hagen 2-12

**Contact:**  
 Murfin Drilling Company  
**Address/Job Location:**  
 Murfin Drilling Company  
 P.O. Box 288  
 Russell Ks 67665

USED FOR \_\_\_\_\_  
 APPROVED \_\_\_\_\_

**Reference:**  
 HAGEN 2-12

**Description of Work:**  
 SURFACE JOB

Services / Items Included:	Quantity	Price	Taxable	Item	Quantity	Price	Taxable
Labor		\$ 1,020.55	No				
Common-Class A	150	\$ 2,514.71	Yes				
Bulk Truck Matl-Material Service Charge	158	\$ 353.18	No				
Calcium Chloride	5	\$ 311.04	Yes				
Pump Truck Mileage-Job to Nearest Camp	26	\$ 290.01	No				
Bulk Truck Mileage-Job to Nearest Bulk Plant	26	\$ 169.70	No				
Premium Gel (Bentonite)	3	\$ 54.59	Yes				

**Invoice Terms:**

Net 30

SubTotal: \$ 4,713.77  
 Discount Available ONLY if Invoice is Paid & Received within listed terms of invoice: \$ (707.06)

SubTotal for Taxable Items:	\$ 2,448.28
SubTotal for Non-Taxable Items:	\$ 1,558.42
Total:	\$ 4,006.71
Tax:	\$ 150.57

6.15% Ellis County Sales Tax

**Thank You For Your Business!**

**Amount Due: \$ 4,157.28**  
**Applied Payments:**  
**Balance Due: \$ 4,157.28**

Past Due Invoices are subject to a service charge (annual rate of 24%)  
 This does not include any applicable taxes unless it is listed.  
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*W*

# QUALITY OILWELL CEMENTING, INC.

Federal Tax I.D.# 20-2886107

Phone 785-483-2025  
Cell 785-324-1041

Home Office P.O. Box 32 Russell, KS 67665

No. 7192

Date	3-29-14	Sec.	12	Twp.	12	Range	20	County	Ellis	State	Ks	On Location		Finish	9:30 PM		
Lease								Location		Ellis, Ks N to Buckeye Rd, 2E							
Hagen		Well No.			2-12		Owner 1/4 N, E into										
Contractor		Murfin			#16		To Quality Oilwell Cementing, Inc. You are hereby requested to rent cementing equipment and furnish cementer and helper to assist owner or contractor to do work as listed.										
Type Job		Surface															
Hole Size		12 1/4"		T.D.		218'		Charge To								Murfin Drilling	
Csg.		8 5/8"		Depth		218'		Street									
Tbg. Size				Depth				City				State					
Tool				Depth				The above was done to satisfaction and supervision of owner agent or contractor.									
Cement Left in Csg.		15'		Shoe Joint		15'		Cement Amount Ordered								150 Com 3% CC 2% Gel	
Meas Line				Displace		12 1/2 BLS											
<b>EQUIPMENT</b>								Common								150	
Pumptrk		17	No.	Cementer	Billy	Helper		Poz. Mix									
Bulktrk		9	No.	Driver	Heath	Driver		Gel.								3	
Bulktrk		p.u.	No.	Driver	Rick	Driver		Calcium								5	
<b>JOB SERVICES &amp; REMARKS</b>								Hulls									
Remarks:		Cement did Circulate															
Rat Hole		Flowseal															
Mouse Hole		Kol-Seal															
Centralizers		Mud CLR 48															
Baskets		CFL-117 or CD110 CAF 38															
D/V or Port Collar		Sand															
		Handling														158	
		Mileage															
<b>FLOAT EQUIPMENT</b>								Guide Shoe									
<b>FLOAT EQUIPMENT</b>								Centralizer									
<b>FLOAT EQUIPMENT</b>								Baskets									
<b>FLOAT EQUIPMENT</b>								AFU Inserts									
<b>FLOAT EQUIPMENT</b>								Float Shoe									
<b>FLOAT EQUIPMENT</b>								Latch Down									
		Pumptrk Charge														Surface	
		Mileage														26	
Signature		Ag [Signature]															
												Tax					
												Discount					
												Total Charge					

Global Cementing LLC

18048 I-70 Road  
Russell, KS 67665

*Prod - MG*  
**Invoice**

Date	Invoice #
4/4/2014	1289

<b>Bill To</b>
MURFIN DRILLING 250 N WATER STREET SUITE 300 WICHITA, KS 67202

P.O. No.	Terms	Project
HAGEN#2-12	Net 30	

Quantity	Description	Rate	Amount
153	COMMON	15.50	2,371.50
102	POZ	8.50	867.00
9	GEL	23.50	211.50
70	FLO-SEAL	2.00	140.00
264	HANDLING	2.10	554.40
	BULK MILEAGE	506.88	506.88
1	TRI-PLEX PUMP CHARGE FOR ROTARY PLUG	1,200.00	1,200.00
48	PUMP TRUCK MILEAGE	6.50	312.00
48	PICKUP	2.50	120.00
1	8 5/8 WOOD PLUG	57.50	57.50
	DEDUCT 15% FROM TOTAL IF PAID WITHIN 30 DAYS OF INVOICE ELLIS CO	6.65%	0.00

*OK*

Thank you for your business.

Phone #	Fax #	E-mail
785-324-2658	785-445-3526	

<b>Total</b>	\$6,340.78
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# GLOBAL CEMENTING, L.L.C.

1289

REMIT TO 18048 170RD  
RUSSELL, KS 67665

SERVICE POINT: Russell, KS

DATE <u>4-4-14</u>	SEC. <u>12</u>	TWP. <u>12</u>	RANGE <u>20</u>	CALLED OUT	ON LOCATION <u>2:00pm</u>	JOB START <u>4:00pm</u>	JOB FINISH <u>5:00pm</u>
LEASE <u>Hagen</u>	WELL# <u>2-12</u>	LOCATION			COUNTY <u>Ellis</u>	STATE <u>KS</u>	
OLD OR <u>NEW</u> (CIRCLE ONE)							

CONTRACTOR Murfin

TYPE OF JOB Rotary Plug

HOLE SIZE 7 7/8 T.D. 3715

CASING SIZE \_\_\_\_\_ DEPTH \_\_\_\_\_

TUBING SIZE \_\_\_\_\_ DEPTH \_\_\_\_\_

DRILL PIPE \_\_\_\_\_ DEPTH \_\_\_\_\_

TOOL \_\_\_\_\_ DEPTH \_\_\_\_\_

PRES. MAX \_\_\_\_\_ MINIMUM \_\_\_\_\_

MEAS. LINE \_\_\_\_\_ SHOE JOINT \_\_\_\_\_

CEMENT LEFT IN CSG. \_\_\_\_\_

PERFS \_\_\_\_\_

DISPLACEMENT \_\_\_\_\_

EQUIPMENT \_\_\_\_\_

PUMP TRUCK CEMENTER Heath

# P1 HELPER Coily

BULK TRUCK \_\_\_\_\_

# B4 DRIVER Fric

BULK TRUCK \_\_\_\_\_

# \_\_\_\_\_ DRIVER \_\_\_\_\_

OWNER \_\_\_\_\_

CEMENT AMOUNT ORDERED 255SY 60/40 4%gel

1 1/4" F10

COMMON \_\_\_\_\_ @ \_\_\_\_\_

POZMIX \_\_\_\_\_ @ \_\_\_\_\_

GEL \_\_\_\_\_ @ \_\_\_\_\_

CHLORIDE \_\_\_\_\_ @ \_\_\_\_\_

ASC \_\_\_\_\_ @ \_\_\_\_\_

\_\_\_\_\_ @ \_\_\_\_\_

\_\_\_\_\_ @ \_\_\_\_\_

\_\_\_\_\_ @ \_\_\_\_\_

\_\_\_\_\_ @ \_\_\_\_\_

\_\_\_\_\_ @ \_\_\_\_\_

\_\_\_\_\_ @ \_\_\_\_\_

HANDLING \_\_\_\_\_ @ \_\_\_\_\_

MILEAGE \_\_\_\_\_ @ \_\_\_\_\_

TOTAL \_\_\_\_\_

REMARKS:

1st Plug @ 3792 = 50SY

2nd Plug @ 1547 = 125SY

3rd Plug @ 806 = 100SY

4th Plug @ 267 = 40SY come out at

Note find push wiper plug = 10SY RH = 50SY

CHARGE TO: Murfin

STREET \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

Global Cementing, L.L.C.,  
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 AFD

SIGNATURE Ang [Signature]

SERVICE

DEPTH OF JOB \_\_\_\_\_

PUMP TRUCK CHARGE \_\_\_\_\_

EXTRA FOOTAGE \_\_\_\_\_ @ \_\_\_\_\_

MILEAGE 2482 @ \_\_\_\_\_

MANIFOLD \_\_\_\_\_ @ \_\_\_\_\_

\_\_\_\_\_ @ \_\_\_\_\_

\_\_\_\_\_ @ \_\_\_\_\_

TOTAL \_\_\_\_\_

PLUG & FLOAT EQUIPMENT

\_\_\_\_\_ @ \_\_\_\_\_

8 5/8 Plug @ \_\_\_\_\_

\_\_\_\_\_ @ \_\_\_\_\_

\_\_\_\_\_ @ \_\_\_\_\_

\_\_\_\_\_ @ \_\_\_\_\_

TOTAL \_\_\_\_\_

SALES TAX (If Any) \_\_\_\_\_

TOTAL CHARGES \_\_\_\_\_

DISCOUNT \_\_\_\_\_ IF PAID IN 30 DAYS \_\_\_\_\_



## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N. Water STE 300  
Wichita KS 67202

ATTN: Andy White

### **Hagen #2-12**

#### **12-12s-20w Ellis KS**

Start Date: 2014.04.02 @ 02:56:00

End Date: 2014.04.02 @ 10:08:30

Job Ticket #: 56097                      DST #: 1

Trilobite Testing, Inc  
PO Box 362 Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2014.04.04 @ 10:36:55



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co Inc

**12-12s-20w Ellis KS**

250 N. Water STE 300  
Wichita KS 67202

**Hagen #2-12**

Job Ticket: 56097

**DST#: 1**

ATTN: Andy White

Test Start: 2014.04.02 @ 02:56:00

## GENERAL INFORMATION:

Formation: **Oread**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 05:25:00

Time Test Ended: 10:08:30

Test Type: Conventional Bottom Hole (Initial)

Tester: Cody Bloedorn

Unit No: 73

**Interval: 3374.00 ft (KB) To 3496.00 ft (KB) (TVD)**

Reference Elevations: 2156.00 ft (KB)

Total Depth: 3496.00 ft (KB) (TVD)

2151.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 5.00 ft

**Serial #: 8648**

**Inside**

Press@RunDepth: 88.73 psig @ 3473.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.04.02

End Date:

2014.04.02

Last Calib.:

2014.04.02

Start Time: 02:56:05

End Time:

10:08:29

Time On Btm:

2014.04.02 @ 05:24:45

Time Off Btm:

2014.04.02 @ 08:26:30

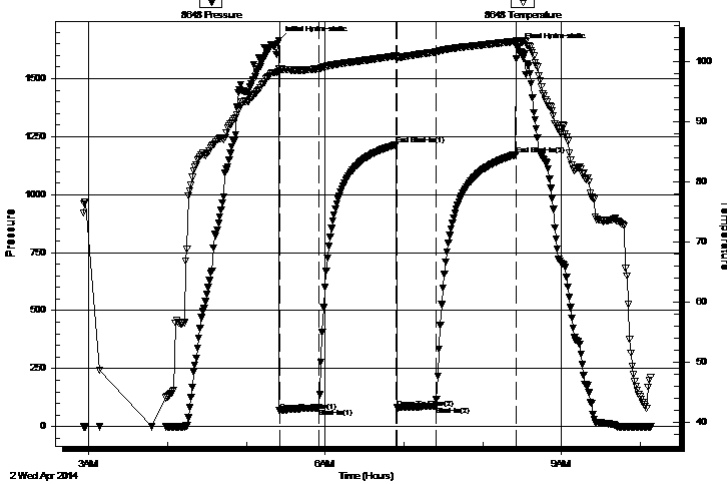
TEST COMMENT: 30 - IF- 1 1/2" blow

60 - IS- No return

30 - FF- 1/2" blow

60 - FS- No reutr

Pressure vs. Time



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1664.95	98.73	Initial Hydro-static
1	67.71	98.17	Open To Flow (1)
31	80.54	98.76	Shut-In(1)
90	1214.71	100.87	End Shut-In(1)
90	80.88	100.35	Open To Flow (2)
120	88.73	101.53	Shut-In(2)
181	1172.75	103.30	End Shut-In(2)
182	1634.37	102.76	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
50.00	Mud - w ith oil spots, 100%M	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

**12-12s-20w Ellis KS**

250 N. Water STE 300  
Wichita KS 67202

**Hagen #2-12**

Job Ticket: 56097

**DST#: 1**

ATTN: Andy White

Test Start: 2014.04.02 @ 02:56:00

## Tool Information

Drill Pipe:	Length: 3325.00 ft	Diameter: 3.80 inches	Volume: 46.64 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: 30000.00 lb
Drill Collar:	Length: 30.00 ft	Diameter: 2.25 inches	Volume: 0.15 bbl	Weight to Pull Loose: 54000.00 lb
			<u>Total Volume: 46.79 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	10.00 ft			String Weight: Initial 50000.00 lb
Depth to Top Packer:	3374.00 ft			Final 50000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	122.00 ft			
Tool Length:	151.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

## Tool Description

**Length (ft) Serial No. Position Depth (ft) Accum. Lengths**

Change Over Sub	1.00			3346.00	
Shut In Tool	5.00			3351.00	
Hydraulic tool	5.00			3356.00	
Jars	5.00			3361.00	
Safety Joint	3.00			3364.00	
Packer	5.00			3369.00	29.00 Bottom Of Top Packer
Packer	5.00			3374.00	
Stubb	1.00			3375.00	
Perforations	3.00			3378.00	
Change Over Sub	1.00			3379.00	
Drill Pipe	93.00			3472.00	
Change Over Sub	1.00			3473.00	
Recorder	0.00	8648	Inside	3473.00	
Recorder	0.00	8940	Outside	3473.00	
Perforations	20.00			3493.00	
Bullnose	3.00			3496.00	122.00 Bottom Packers & Anchor
<b>Total Tool Length:</b>	<b>151.00</b>				



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co Inc

**12-12s-20w Ellis KS**

250 N. Water STE 300  
Wichita KS 67202

**Hagen #2-12**

Job Ticket: 56097

**DST#: 1**

ATTN: Andy White

Test Start: 2014.04.02 @ 02:56:00

## 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: 60.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.79 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1100.00 ppm

Filter Cake: inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
50.00	Mud - with oil spots, 100%M	0.428

Total Length: 50.00 ft      Total Volume: 0.428 bbl

Num Fluid Samples: 0

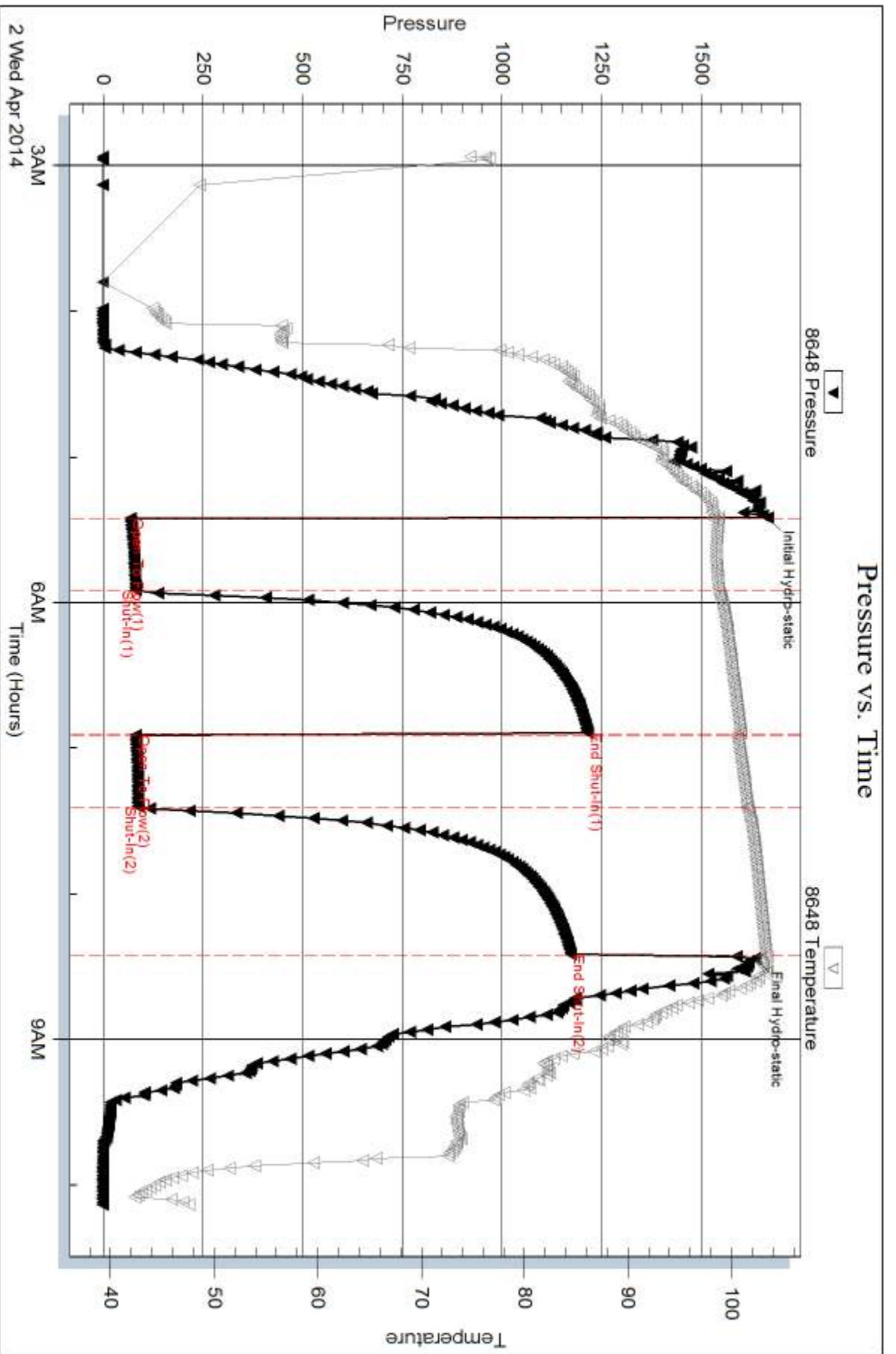
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

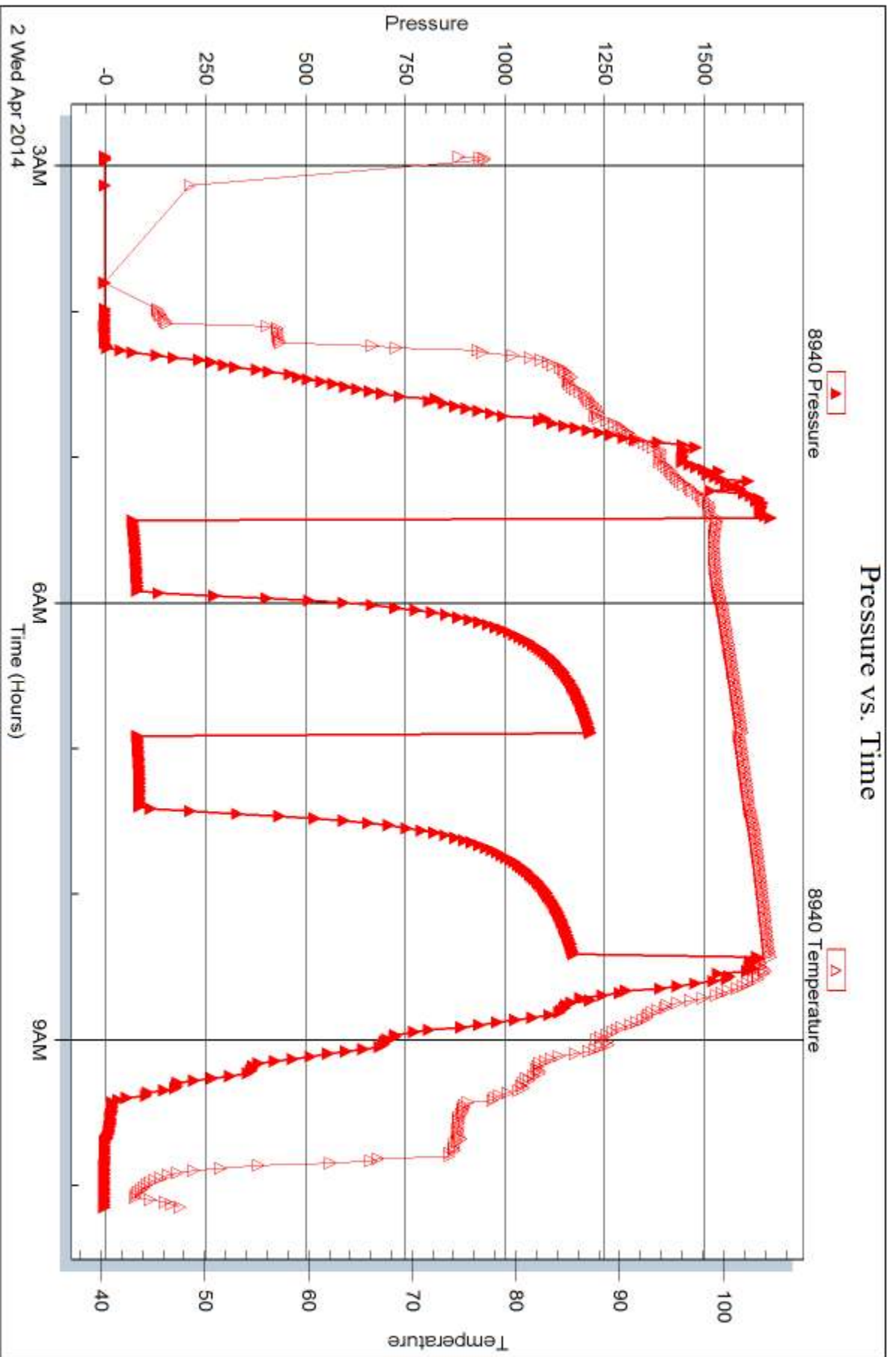


Serial #: 8940

Outside Murfin Drilling Co Inc

Hagen #2-12

DST Test Number: 1



Triobite Testing, Inc

Ref. No: 56097

Printed: 2014.04.04 @ 10:36:57





## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co Inc**

250 N. Water STE 300  
Wichita KS 67202

ATTN: Andy White

### **Hagen #2-12**

#### **12-12s-20w Ellis KS**

Start Date: 2014.04.02 @ 19:31:00

End Date: 2014.04.03 @ 02:00:15

Job Ticket #: 56098                      DST #: 2

Trilobite Testing, Inc

PO Box 362 Hays, KS 67601

ph: 785-625-4778 fax: 785-625-5620

Printed: 2014.04.04 @ 10:36:16



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

Murfin Drilling Co Inc  
250 N. Water STE 300  
Wichita KS 67202  
ATTN: Andy White

**12-12s-20w Ellis KS**  
**Hagen #2-12**  
Job Ticket: 56098 **DST#: 2**  
Test Start: 2014.04.02 @ 19:31:00

## GENERAL INFORMATION:

Formation: **LKC "B-F"**  
Deviated: No Whipstock: ft (KB)  
Time Tool Opened: 21:15:15  
Time Test Ended: 02:00:15  
Interval: **3494.00 ft (KB) To 3565.00 ft (KB) (TVD)**  
Total Depth: 3565.00 ft (KB) (TVD)  
Hole Diameter: 7.88 inches Hole Condition: Fair  
Test Type: Conventional Bottom Hole (Reset)  
Tester: Cody Bloedorn  
Unit No: 73  
Reference Elevations: 2156.00 ft (KB)  
2151.00 ft (CF)  
KB to GR/CF: 5.00 ft

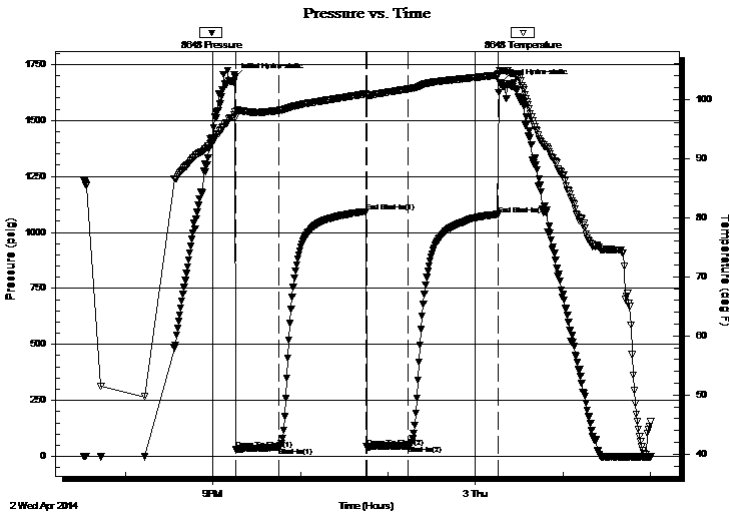
## Serial #: 8648

Inside

Press@RunDepth: 47.75 psig @ 3533.00 ft (KB) Capacity: 8000.00 psig  
Start Date: 2014.04.02 End Date: 2014.04.03 Last Calib.: 2014.04.03  
Start Time: 19:31:05 End Time: 02:00:14 Time On Btm: 2014.04.02 @ 21:15:00  
Time Off Btm: 2014.04.03 @ 00:16:45

TEST COMMENT: 30 - IF- 1" blow  
60 - IS- No return  
30 - FF- Surface blow  
60 - FS- No return

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1692.65	97.91	Initial Hydro-static
1	30.83	96.96	Open To Flow (1)
31	40.84	98.10	Shut-In(1)
90	1093.50	100.88	End Shut-In(1)
91	42.93	100.53	Open To Flow (2)
119	47.75	101.71	Shut-In(2)
181	1080.42	104.05	End Shut-In(2)
182	1665.85	104.84	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
33.00	Mud, 100%M	0.19

\* Recovery from multiple tests

## Gas Rates

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





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co Inc

**12-12s-20w Ellis KS**

250 N. Water STE 300  
Wichita KS 67202

**Hagen #2-12**

Job Ticket: 56098

**DST#: 2**

ATTN: Andy White

Test Start: 2014.04.02 @ 19:31:00

## Tool Information

Drill Pipe:	Length: 3450.00 ft	Diameter: 3.80 inches	Volume: 48.39 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: 30000.00 lb
Drill Collar:	Length: 30.00 ft	Diameter: 2.25 inches	Volume: 0.15 bbl	Weight to Pull Loose: 54000.00 lb
			<u>Total Volume: 48.54 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	13.00 ft			String Weight: Initial 50000.00 lb
Depth to Top Packer:	3496.00 ft			Final 50000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	69.00 ft			
Tool Length:	98.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

## Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			3468.00	
Shut In Tool	5.00			3473.00	
Hydraulic tool	5.00			3478.00	
Jars	5.00			3483.00	
Safety Joint	3.00			3486.00	
Packer	5.00			3491.00	29.00 Bottom Of Top Packer
Packer	5.00			3496.00	
Stubb	1.00			3497.00	
Perforations	3.00			3500.00	
Change Over Sub	1.00			3501.00	
Drill Pipe	31.00			3532.00	
Change Over Sub	1.00			3533.00	
Recorder	0.00	8648	Inside	3533.00	
Recorder	0.00	8940	Outside	3533.00	
Perforations	29.00			3562.00	
Bullnose	3.00			3565.00	69.00 Bottom Packers & Anchor
<b>Total Tool Length:</b>	<b>98.00</b>				



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co Inc

**12-12s-20w Ellis KS**

250 N. Water STE 300  
Wichita KS 67202

**Hagen #2-12**

Job Ticket: 56098

**DST#: 2**

ATTN: Andy White

Test Start: 2014.04.02 @ 19:31:00

## 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: 60.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.79 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1100.00 ppm

Filter Cake: inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
33.00	Mud, 100%M	0.190

Total Length: 33.00 ft      Total Volume: 0.190 bbl

Num Fluid Samples: 0

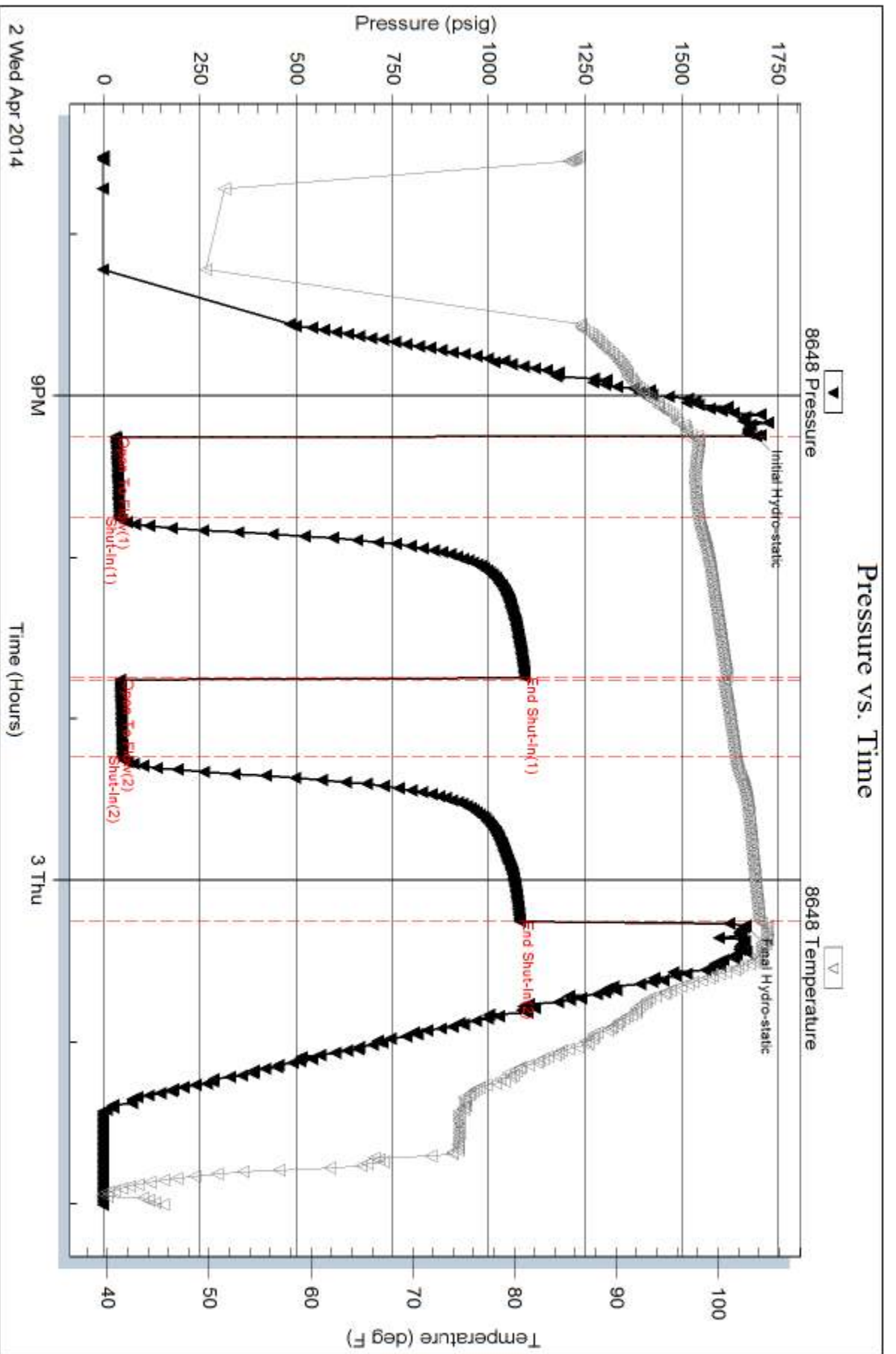
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

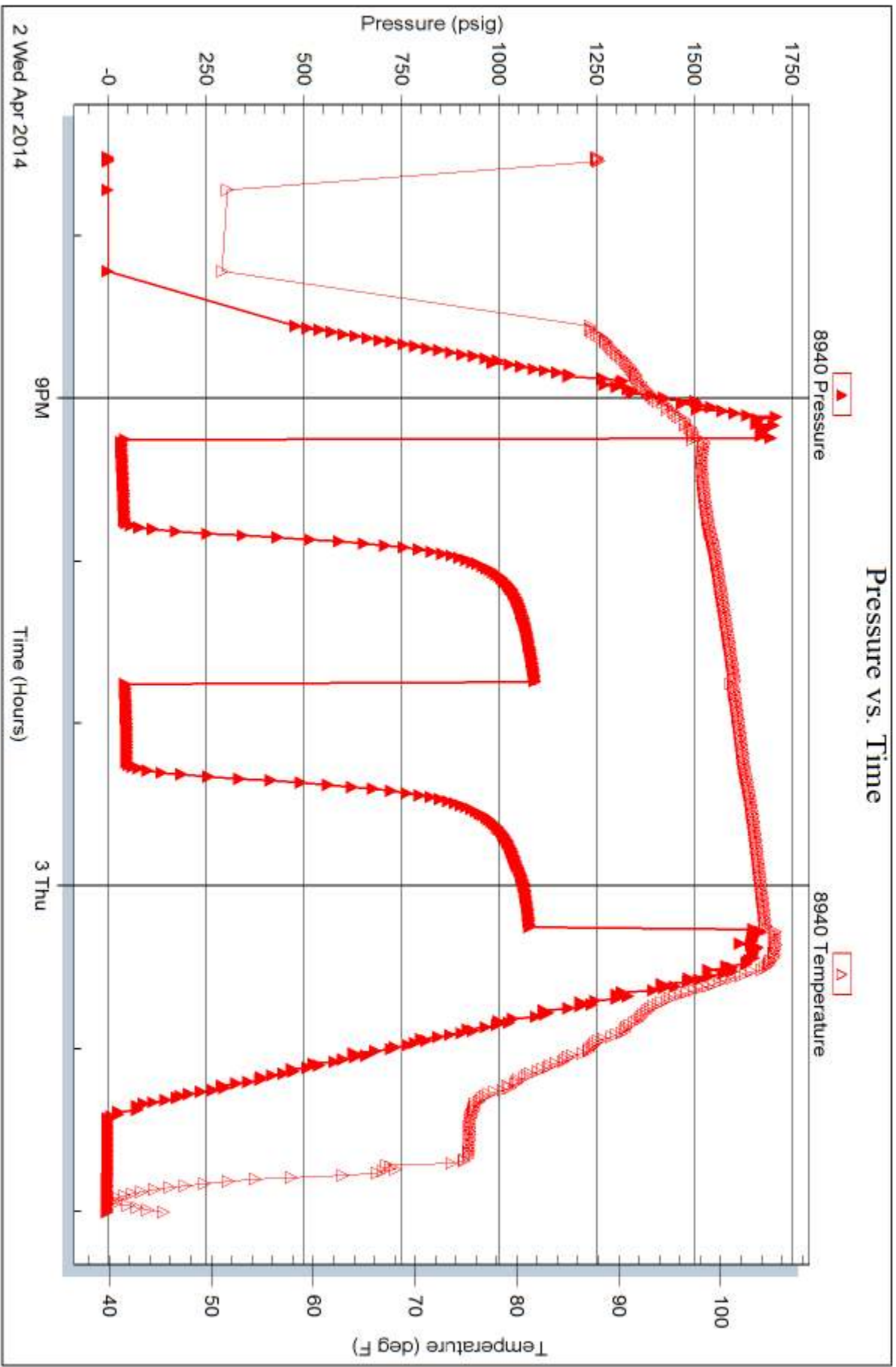


Serial #: 8940

Outside Murfin Drilling Co Inc

Hagen #2-12

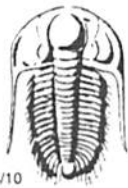
DST Test Number: 2



Triobite Testing, Inc

Ref. No: 56098

Printed: 2014.04.04 @ 10:36:18



# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 56097

Well Name & No. Hagen 2-12 Test No. 1 Date 4-2-14  
 Company Murfin Drilling Co Inc Elevation 2156 KB 2151 GL  
 Address 250 N Water STE 300, Wichita KS, 67202  
 Co. Rep / Geo. Andy White Rig Murfin 16  
 Location: Sec. 12 Twp. 12s Rge. 20w Co. Ellis State KS

Interval Tested 3374 - 3496 Zone Tested Oread  
 Anchor Length 122' Drill Pipe Run 3325 Mud Wt. 8.6  
 Top Packer Depth 3369 Drill Collars Run 30' Vis EO+  
 Bottom Packer Depth 3374 Wt. Pipe Run — WL 5.8  
 Total Depth ~~3369~~ 3496 Chlorides 1,100 ppm System LCM —  
 Blow Description IF- 1 1/2" blow  
FSI- No return  
FF- 1/2" blow  
FSI- No return

Rec	Feet of	%gas	%oil	%water	%mud
<u>50'</u>	<u>Mud - with oil spots</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

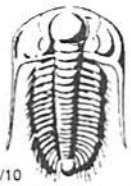
Rec Total 50 BHT 103° Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic <u>1664</u>	<input checked="" type="checkbox"/> Test <u>1150</u>	T-On Location <u>0234</u>
(B) First Initial Flow <u>67</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>0256</u>
(C) First Final Flow <u>80</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>0526</u>
(D) Initial Shut-In <u>1214</u>	<input type="checkbox"/> Circ Sub	T-Pulled <u>0826</u>
(E) Second Initial Flow <u>80</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>1009</u>
(F) Second Final Flow <u>88</u>	<input checked="" type="checkbox"/> Mileage <u>52RT</u> 80.60	Comments
(G) Final Shut-In <u>1172</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>1634</u>	<input type="checkbox"/> Straddle	<input type="checkbox"/> Ruined Shale Packer
	<input type="checkbox"/> Shale Packer	<input type="checkbox"/> Ruined Packer
Initial Open <u>30</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Extra Copies
Initial Shut-In <u>60</u>	<input type="checkbox"/> Extra Recorder	Sub Total <u>0</u>
Final Flow <u>30</u>	<input type="checkbox"/> Day Standby	Total <u>1555.60</u>
Final Shut-In <u>60</u>	<input type="checkbox"/> Accessibility	MP/DST Disc't
	Sub Total <u>1555.60</u>	

Approved By \_\_\_\_\_ Our Representative Cody Bluff

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. 56098

Well Name & No. Hagen #2-12 Test No. 2 Date 4-2-14  
 Company Murfin Drilling Co Inc Elevation 2156 KB 2151 GL  
 Address 250 N. Water STE 300, Wichita KS, 67202  
 Co. Rep / Geo. Andy White Rig Murfin #16  
 Location: Sec. 12 Twp. 12s Rge. 20w Co. Ellis State KS

Interval Tested 3496 - 3565 Zone Tested "B-F"  
 Anchor Length 69' Drill Pipe Run 3450' Mud Wt. 8.6  
 Top Packer Depth 3491 Drill Collars Run 30' Vis 60  
 Bottom Packer Depth 3496 Wt. Pipe Run — WL 5.8  
 Total Depth 3565 Chlorides 1100 ppm System LCM —

Blow Description IF-1" blow  
ISI - No return  
FF - Surface blow  
FST - No return

Rec	Feet of	%gas	%oil	%water	%mud
<u>33</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 33 BHT 104° Gravity — API RW — @ —°F Chlorides — ppm

(A) Initial Hydrostatic <u>1692</u>	<input checked="" type="checkbox"/> Test <u>1150</u>	T-On Location <u>1918</u>
(B) First Initial Flow <u>30</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>1931</u>
(C) First Final Flow <u>40</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>2117</u>
(D) Initial Shut-In <u>1093</u>	<input type="checkbox"/> Circ Sub	T-Pulled <u>1217</u>
(E) Second Initial Flow <u>42</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>0201</u>
(F) Second Final Flow <u>47</u>	<input checked="" type="checkbox"/> Mileage <u>52 RT</u> <u>161.20</u>	Comments <u>loaded tools 4/3 15:00</u>
(G) Final Shut-In <u>1080</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>1665</u>	<input type="checkbox"/> Straddle	<input type="checkbox"/> Ruined Shale Packer

Initial Open 30  
 Initial Shut-In 60  
 Final Flow \_\_\_\_\_  
 Final Shut-In \_\_\_\_\_

Shale Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_  
 Day Standby \_\_\_\_\_  
 Accessibility \_\_\_\_\_

Sub Total 1636.20

Approved By \_\_\_\_\_ Our Representative Cody Bledorn

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# Andrew White

Petroleum Geologist

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

Well Name: Hagen 2-12  
Location: 12-12S-20W  
License Number: API: 15-051-26680  
Spud Date: 03/29/2014  
Surface Coordinates: 1550' FSL, 1980' FWL

Region: Ellis Co, KS  
Drilling Completed: 04/03/2014

Bottom Hole  
Coordinates:  
Ground Elevation (ft): 2156                      K.B. Elevation (ft): 2161  
Logged Interval (ft): 3100                      To: 3945                      Total Depth (ft): 3945  
Formation: Arbuckle  
Type of Drilling Fluid: Chemical

Printed by MUD.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

## OPERATOR

Company: Murfin Drilling Co., Inc.  
Address: 250 N. Water, Suite 300  
Wichita, KS 67202

## GEOLOGIST

Name: Andrew White  
Company: White Exploration, Inc.  
Address: 1635 N. Waterfront Pkwy, Suite 100  
Wichita, KS 67206

## Remarks

Due to the negative Drill Stem Test results, the decision was made to P&A the well.

## General Info

Drilling Contractor: Murfin Drilling Rig 16

Logs: Pioneer  
Compensated Density/Neutron, Dual Induction, Micro, Sonic

Drilling Mud: Mudco/Service Mud, Inc.

Surveys: 218'-.25; 3496'-.75; 3945'-.75

## Daily Status

3/29/14: MIRT, set 8 5/8" Csg at 217', 150 sxs of Comm 3%CC, 2% gel

3/30/14: Drill ahead at 300'

3/31/14: Drilling ahead at 2260'

4/1/14: Drilling ahead at 3090'

4/2/14: Running DST #1

4/3/14: Drilling ahead at 3610'

4/4/14: RTD starting to log

Plug well using 60/40 Poz, 4% gel, 1/4# Floseal, 50sxs@3792', 25 sxs @1547', 100sxs @ 806', 40 sxs @ 267', 10 sxs @ 40', 30 sxs @ RH

Murfin Hagen #2-12				Murfin Hagen #1-12	
12-12S-20W				12-12S-20W	
1550' FSL, 1980' FWL				1550' FSL, 1240' FWL	
KB: 2161				KB: 2143	
Sample	Log	Datum		Relationship	
Anhydrite	1525	1522	639	+1	
Base Anhy	1570	1568	593	+3	
Topeka	3207	3205	-1044	+4	
Heebner	3432	3430	-1269	+4	
Lansing	3474	3474	-1313	+2	
BKC	3722	3708	-1547	+11	
Marm	3732	3718	-1557	+9	
Pawnee	3758	3757	-1596	+7	
Arbuckle	3845	3814	-1653	+33	

### ROCK TYPES

#### LITHOLOGY

	Anhy
	Bent
	Brec
	Cht
	Clyst
	Black shale
	Congl

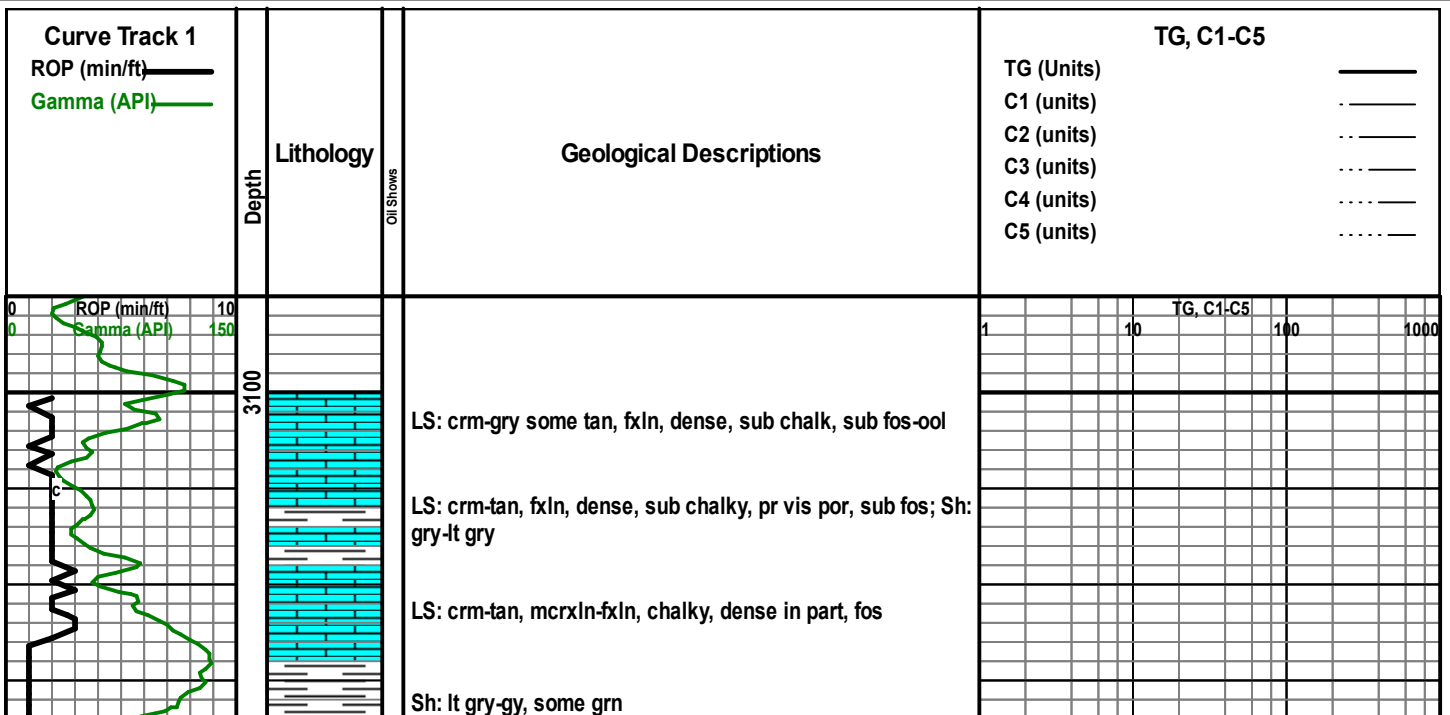
	Dol
	Gyp
	Igne
	Lmst
	Meta
	Mrlst
	Salt
	Shale

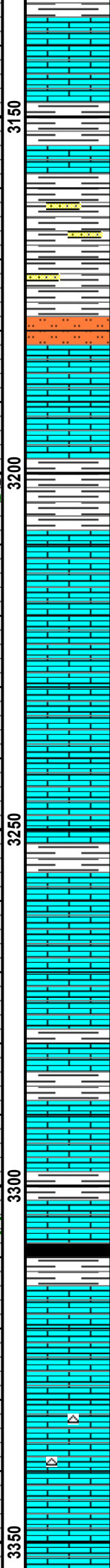
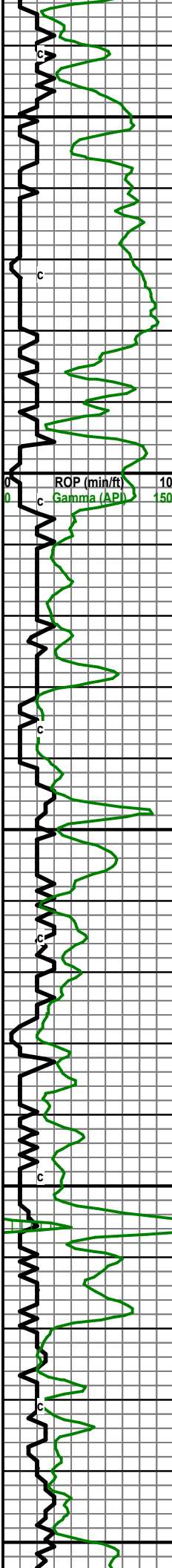
	Shcol
	Shgy
	Slstst
	Ss
	Till

	STRINGER
	Anhy

	Arg
	Bent
	Coal
	Dol
	Gyp
	Ls
	Mrst
	Slststrg

	Ssstrg
<b>OIL SHOW</b>	
	Even
	Spotted
	Ques
	Dead





Sh: gry-drk gry, LS: crm-gry, mcr-fxln, sli chalky, dense, no vis por

Sh: gry-grn, some SS: opaque-gry, vfgrn-fgrn, sli friable

Sh: A.A. with some SS: gry-white, vfgrn-fgrn, sli dense

Sh: lt gry-gry, slight Siltstone in part

LS: crm-tan, fxln, sli friable, sub chalky, fos

LS: A.A. with Sh: gry-lt gry, some grn

Sh: gry-lt gry

LS: crm-tan-brwn, fxln, dense, fos, some chalk

LS: A.A. with some gry and a little more chalk

LS: crm-tan-gry, mrcxln-fxln, dense, no vis por

LS: gry-crm, mrcxln-fxln, dense, no vis por, sli chalky,

LS: A.A. some Sh: gry-lt gry

LS: crm-lt gry, fxln, dense, sli fos, sli chalky, no vis por

LS: A.A.

LS: crm-white, fxln some mrcxln, fos, dense, some chalk, no vis por, some Sh: lt gry

LS: crm-tan, fxln, dense, some chalk some Sh: lt gry-gry

LS: A.A. with some Sh: lt gry

LS: crm, fxln, chalk, fos, dense, some Sh: gry few blk

LS: crm-gry, fxln, some granular, dense, sli ool, sub chalky,

LS: crm-tan, some gry, fxln, fos, few pieces ool, chalky in part, dense, some Chert: tan-opaque,

LS: crm-lt gry, mrcxln-fxln, sli ool, sli chalky, dense few pieces of Chert: A.A.

LS: crm-tan, mrcxln-fxln, part ool, dense some friable

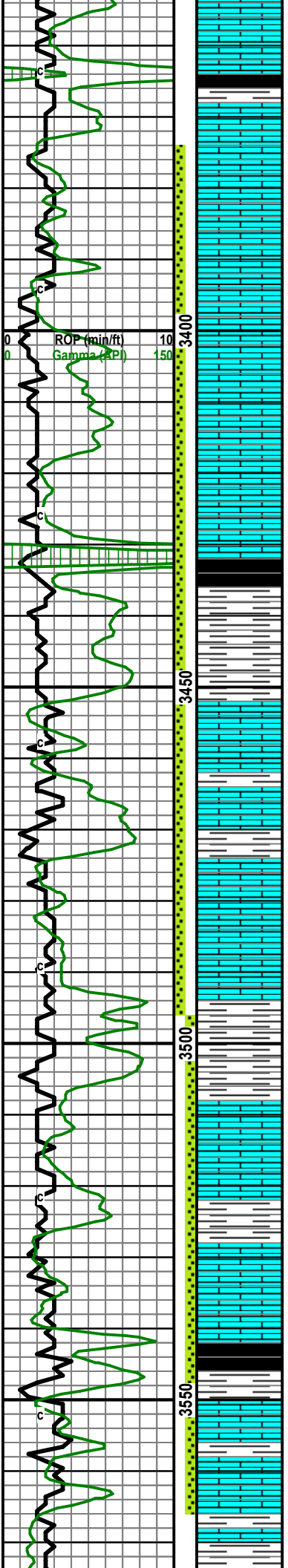
Mudco Mck  
 Wt: 8.6 Vis:60+  
 pH: 11.5 Fil:5.8  
 LCM: 2

TG, C1-C5  
 1 10 100 1000

**Topeka 3207 (-1046)**

Wt: 8.7, Vis: 60

Wt: 8.8, Vis: 57



LS: crm-gry, mcrxln, dense

LS: A.A. with some Sh: gry, trace blk

LS: crm-tan, fxln, dense, some friable, part fos and ool, sli cherty, sli drk staining, pr vis por, verr SFO, verr show gas, sli gold fluor, no odor

LS: crm-tan, fxln, dense, part fos, some chert, NSO, sli drk stain

LS: crm-tan, dense, fos, cherty, sli inter por, dead oil stain

LS: crm, fxln, dense, some chert, pr vis por, sli oil stain, some chalk

LS: crm-tan-brwn, some gry, fxln, dense some friable, fos, sli vis por, some stain, verr SFO, verr gas, faint gold fluor, sli cherty

Sh: blk carb

Sh: gry some grn

Sh: A.A.

LS: crm-tan, fxln, dense sub friable, sli drk stain, pr-fr por, sli cherty

Sh: gry-grn

LS: white-crm-tan, mcr-fxln, dense, sli chalky, sli fos, some drk stain, verr SFO only a few pieces

Sh: gry-grn, some red

LS: crm-gry, fxln, sub friable, part cherty, sli stain, sub fos

LS: crm-tan, fxln, dense, some friable, sli cherty, some lt brwn-drk stain, rsfo, rsgas, sli vis por, dull fluor

LS: crm-gry, fxln, dense, cherty

Sh: gry-grn, some red

LS: crm-tan, fxln, sli ool, dense, some friable, pr inter por, very sli odor, sli show gas, sli light stain, NSFO, some chert

Sh: gry-grn

LS: crm-tan, fxln, ool, dense, pr vis por, few pieces with o and g, no odor, sli gold fluor

LS: crm-tan, fxln, dense some friable, pr-fr inter por, few pieces with good saturation of oil, sli show gas

Sh: drk gry-blck, some grn

LS: cream-white, mcr-fxln, sli ool, sli inter por, some stain, no odor, NSFO

Sh: gry-drk gry, some grn

LS: white-crm-tan, mcr-fxln, sli ool, no vis por, sli stain, sli show gas,

LS: crm-tan, mcrxln, dense, no show, some Sh: gry-grn

DST #1: 3374-3496

30-60-30-60

IF: 1 1/2" blow

FF: 1/2" blow

Recovery: 50' M w/ Oil spots

IFP: 67-80 ISIP: 1214

FFP: 80-88 FSIP: 1172

BHT: 103

TG, C1-C5  
1 10 100 1000

Heebner: 3432 (-1271)

Toronto: 3452 (-1291)

CFS: 60 min

Lansing: 3474 (-1313)

CFS: 60 min

Strap .59 long

Mudco mdck,  
Wt: 9.0 Vis: 60  
pH: 11 Fil: 5.8  
LCM: 2

CFS: 60 min

DST #2: 3496-3565

30-60-30-60

IF: 1" blow

FF: Surface blow

Recovery: 33' M

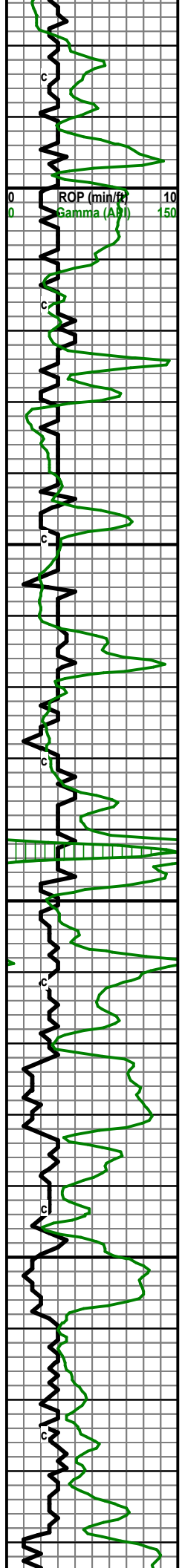
CFS: 60 min IFP: 30-40 ISIP: 1094

FFP: 42-47 FSIP: 1080

BHT: 104

CFS: 60 min

Mudco mdchk  
Wt: 9.0 Vis: 52  
pH: 10.5 Fil: 6.0  
LCM: 2



LS: crm, mcrxln, dense, sli ool, no vis por, NSFO

LS: crm-tan, mcr-fxln, dense, sli ool, sli fos, no vis por, NSFO, good amount of Sh: gry-drk gry-grn in sample

Sh: drk gry-gry-grn, some blk carb

SH: gry-grn some drk gry

LS: crm-lt gry, fxln, dense sub friable, sli ool, vrrsfo, no odor, no vis-sli inter por, very dull gold fluor, light brwn stain

LS: crm-lt gry, mcrxln, dense, sli cherty, nsfo

Sh: gry-grn

LS: crm-lt gry, mcrxln, dense, sli cherty, nsfo

LS: crm-gry, mcrxln-fxln, dense sli cherty, sli brwn stain

Sh: gry-drk gry-grn, some red

LS: crm-lt gry, mcrxln, dense sub friable, sli cherty, sli ool, drk tar stain

LS: crm-lt gry, mcrxln some fxln, dense sub friable, sli ool, sli chalky, drk stain

Sh: gry-drk gry, some grn and red

LS: crm-tan, mcrxln-fxln, sli ool, dense, sub chalk, sli drk stain, pr vis por

LS: crm-tan, mcrxln-fxln, sli ool, sli fos, dense sub friable, sli chalk, sli stain, nsfo

Sh: gry-grn some red and blk carb

LS: crm-tan, mcrxln, dense sli ool, sli chalk, nsfo

LS: crm-tan, dense, ool, sli chalky, nsfo

Sh: gry-drk gry, some blk and green good amount of red

LS: crm-tan, dense, sli ool, sli fos, sli chalky with abundant Sh: A.A.

Sh: gry-drk gry-grn, still a lot of red

LS: crm-tan, some sli purple, dense, sli ool, nsfo some Chert: opaque-orange-red

LS: A.A. with Chert: red-orange-opaque, fresh blocky, some weathered, nsfo, no cut

LS and Chert: A.A. with Sh: red-gry, some grn

Sh: red-arv. some arn

TG, C1-C5  
1 10 100 1000

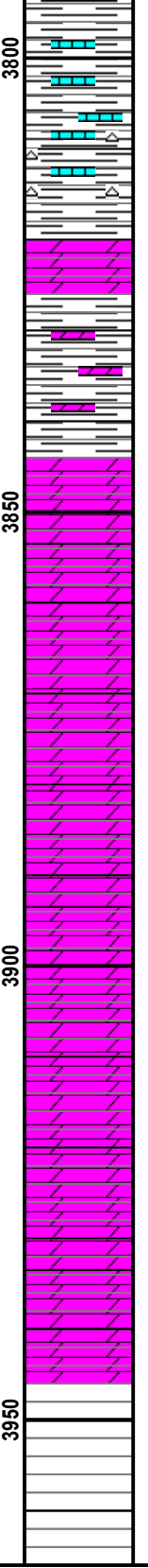
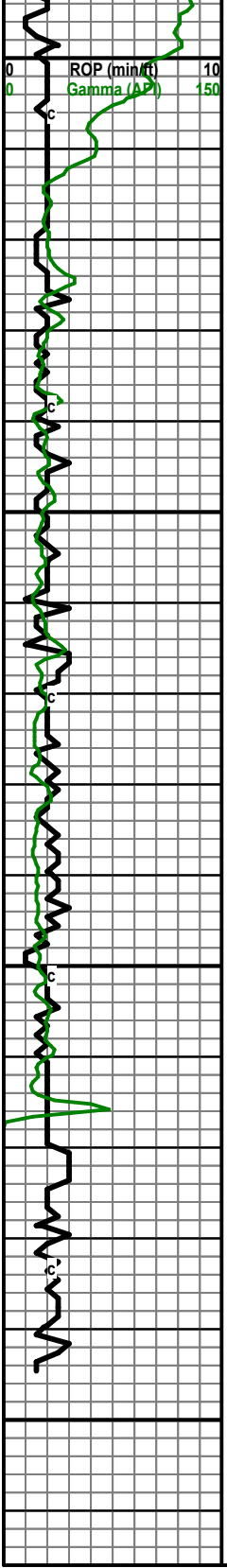
CFS: 60 min

CFS: 60 min

**BKC: 3722 (-1561)**

**Marm: 3732 (-1571)**

**Pawnee: 3758 (-1597)**



Sh: A.A. some LS: crm-white, mcrxln, sub friable, sli chalky

Sh and LS: A.A. with some Chert: opaque fresh

Dolo: crm-tan some gry, fxln, dense, pr vis por,

Dolo: A.A. with Sh: red-grn-gry

Dolo: crm-tan, fn-mxln, sli suc, pr por, dense, no show

Dolo: A.A.

Dolo: crm-lt gry, fxln-mxln, pr por some with fr pinpoint por, no show

Dolo: crm-white, fxln-mxln, sli ool, dense, fr inter por, no show

Dolo: tan-crm, fxln-mxln, ool, dense, pr-fr por, no show

Dolo: A.A.

Dolo: tan-crm some gry, fxln, sli ool, pr-fr por, no show

Dolo: tan-crm-gry, mcrxln-fxln, sli ool, pr por, no show

Dolo: A.A.

RTD: 3945  
LTD: 3944

