

**OPERATOR**

Company: HERTEL OIL COMPANY, LLC  
 Address: 704 E 12TH STREET  
 HAYS, KANSAS 67601

Contact Geologist: DAVE HERTEL  
 Contact Phone Nbr: 785-628-2445  
 Well Name: SOPHIE # 1  
 Location: S2 SW NW SW Sec. 27-14s-18w      API: 15-051-26,475-00-00  
 Pool: INFIELD      Field: ENGEL  
 State: KANSAS      Country: USA



Scale 1:240 Imperial

Well Name: SOPHIE # 1  
 Surface Location: S2 SW NW SW Sec. 27-14s-18w  
 Bottom Location:  
 API: 15-051-26,475-00-00  
 License Number: 33625  
 Spud Date: 2/18/2013      Time: 1:50 PM  
 Region: ELLIS COUNTY  
 Drilling Completed: 2/26/2013      Time: 6:45 AM  
 Surface Coordinates: 1325' FSL & 330' FWL  
 Bottom Hole Coordinates:  
 Ground Elevation: 2065.00ft  
 K.B. Elevation: 2073.00ft  
 Logged Interval: 2900.00ft      To: 3780.00ft  
 Total Depth: 3780.00ft  
 Formation: ARBUCKLE  
 Drilling Fluid Type: CHEMICAL/FRESH WATER GEL

**SURFACE CO-ORDINATES**

Well Type: Vertical  
 Longitude:      Latitude:  
 N/S Co-ord: 1325' FSL  
 E/W Co-ord: 330' FWL

**LOGGED BY**

Company: SOLUTIONS CONSULTING, INC.  
 Address: 108 W 35TH  
 HAYS, KS 67601  
 Phone Nbr: (785) 639-1337  
 Logged By: Geologist      Name: HERB DEINES

**CONTRACTOR**

Contractor: DISCOVERY DRILLING, INC.  
 Rig #: 1  
 Rig Type: MUD ROTARY  
 Spud Date: 2/18/2013      Time: 1:50 PM  
 TD Date: 2/26/2013      Time: 6:45 AM  
 Rig Release: 2/27/2013      Time: 10:00 PM

**ELEVATIONS**

**NOTES**

RECOMMENDATION TO RUN PRODUCTION CASING BASED ON FAVORABLE RESULTS OF DST # 1 IN THE ARBUCKLE, POSITIVE STRUCTURE AND LOG ANALYSIS OF LANSING-KANSAS CITY "I" ZONE WHICH LOOKED GOOD IN THE SAMPLES.

OPEN HOLE LOGGING: PIONEER ENERGY SERVICES DUAL INDUCTION LOG, DUAL COMPENSATED POROSITY LOG, MICRORESISTIVITY LOG.

DRILL STEM TESTING: TRILOBITE TESTING INC: ONE (1) CONVENTIONAL STRADDLE TEST

**FORMATION TOPS SUMMARY AND CHRONOLOGY OF DAILY ACTIVITY**

**SOPHIE # 1**

**1325' FSL & 330' FWL, SW/4**

**Sec. 27-14s-18w**

**2065' GL 2073' KB**

**M. ENGEL # 1-V**

**SW SE SW**

**Sec. 27-14s-18w**

**Reference Well**

<u>FORMATION</u>	<u>SAMPLE TOP</u>	<u>LOG TOP</u>	<u>LOG TOP</u>
Anhydrite	1261+ 812	<b>1257+ 816</b>	+ 815
B-Anhydrite	1297+ 776	<b>1293+ 780</b>	+ 781
Topeka	3031- 958	<b>3040- 967</b>	- 954
Heebner Shale	3299-1226	<b>3297-1224</b>	-1223
Toronto	3318-1245	<b>3318-1245</b>	-1246
LKC	3345-1272	<b>3343-1270</b>	-1273
BKC	3577-1504	<b>3582-1509</b>	-1503
Marmaton	3611-1538	<b>3614-1541</b>	-1535
Reworked Arbuckle		<b>3659-1586</b>	
Arbuckle	3666-1593	<b>3668-1595</b>	-1587
RTD	3780-1707		
LTD		<b>3779-1706</b>	-1590

**SUMMARY OF DAILY ACTIVITY**

- 2-18-13** RU, spud 1:50 pm, set 8 5/8" surface casing to 219.93' w/ 150 sxs common, 2%gel, 3%CC, plug down 6:30pm, slope ¼ degree,
- 2-19-13** 536', drilling
- 2-20-13** 2261', drilling, shut down at noon– weather delay
- 2-21-13** 2363', shut down – weather delay
- 2-22-13** 2363', weather delay, started drilling at 8:45 pm
- 2-23-13** 2663', drilling, displace at 2804'



# DST # 1 STRADDLE TEST - EXPANDED CHART OF TEST

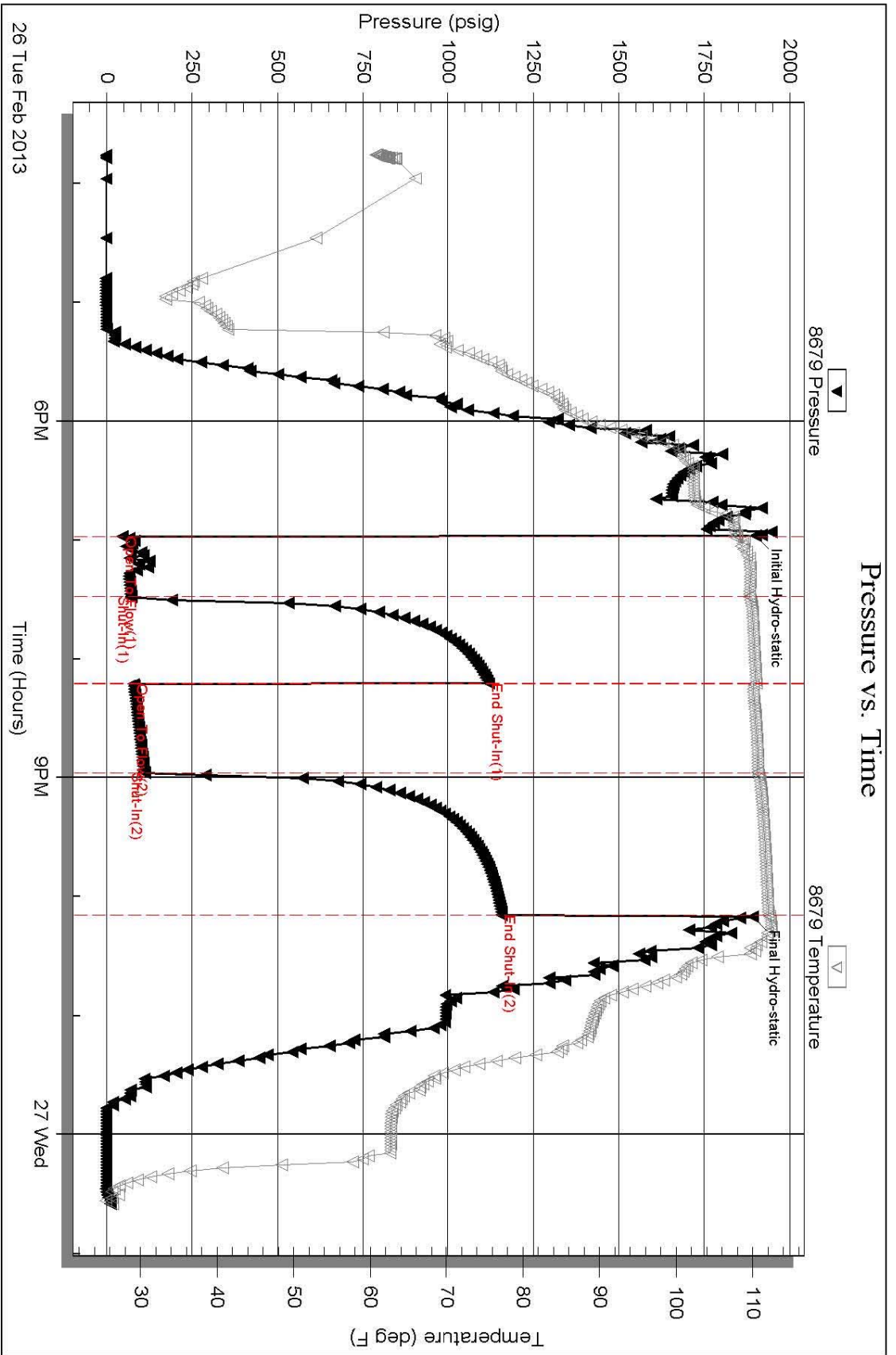
Serial #: 8679

Inside

Hertel Oil Company LLC

Sophie #1

DST Test Number: 1



Trilobite Testing, Inc

Ref. No: 50396

Printed: 2013.02.27 @ 07:48:51

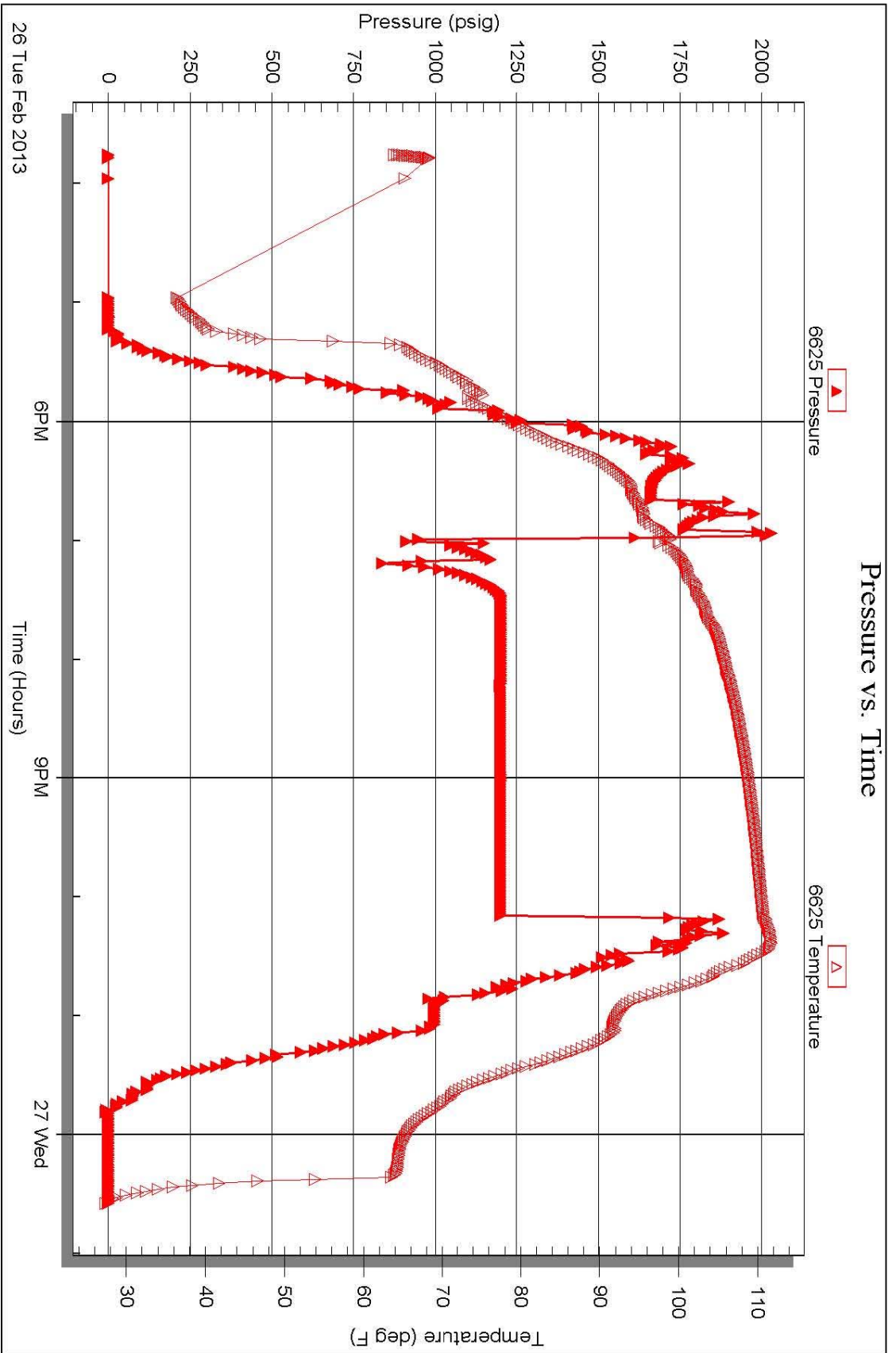
# DST # 1 STRADDLE TEST - ARBUCKLE CHART FOR BOTTOM PACKER

Serial #: 6625

Below (Straddle) Oil Company LLC

Sophie #1

DST Test Number: 1

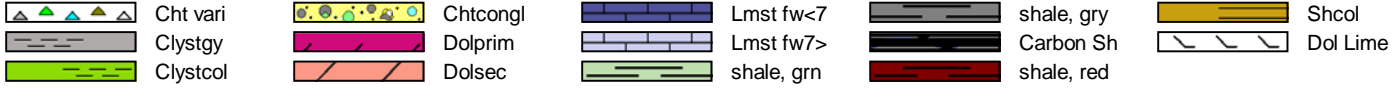


Tribble Testing, Inc

Ref. No: 50396

Printed: 2013.02.27 @ 07:48:51

### ROCK TYPES



### ACCESSORIES

#### MINERAL

- Glauconite
- Pyrite
- Sandy
- Varicolored chert
- Chert White

#### FOSSIL

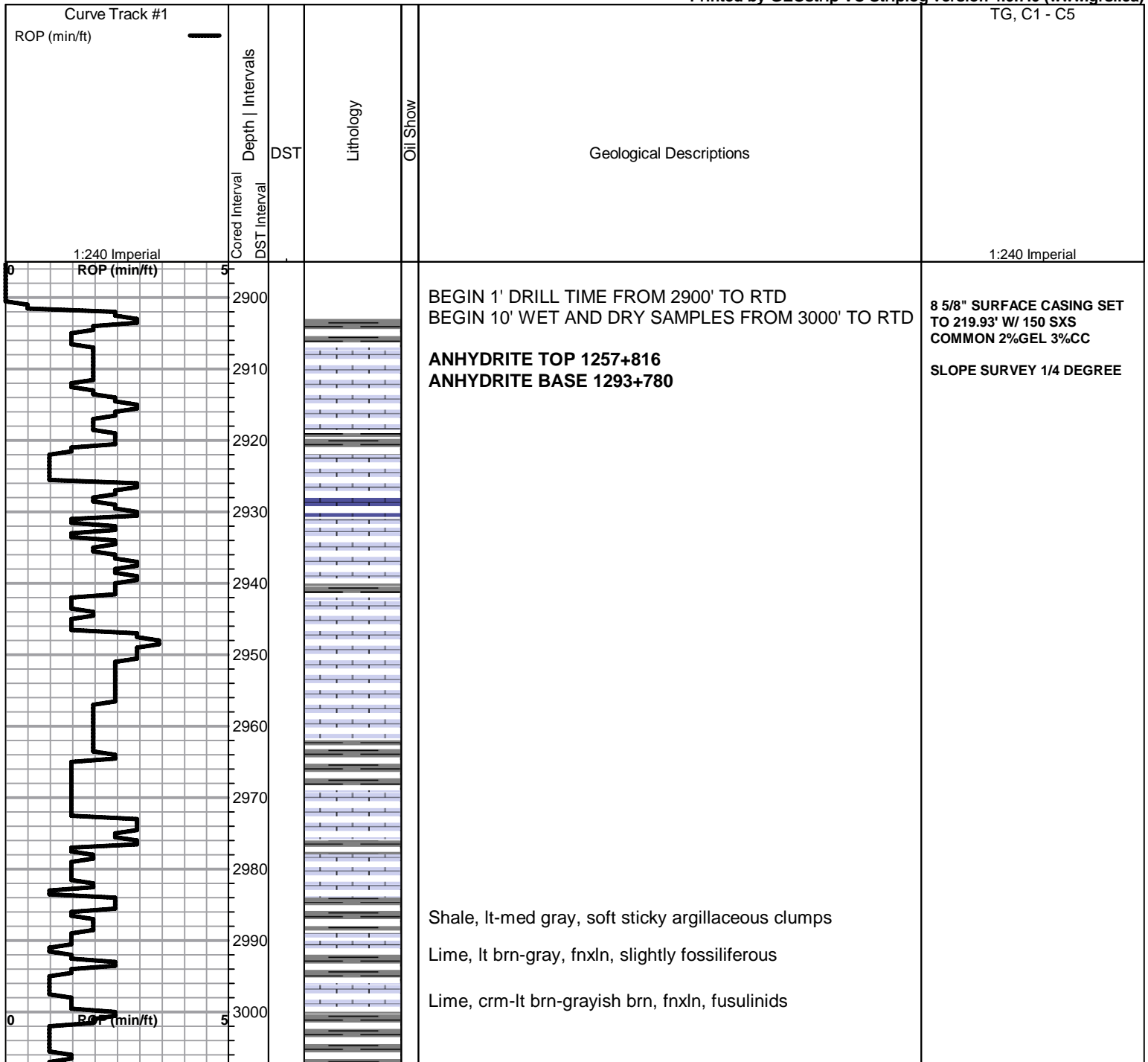
- Fossils < 20%
- Oolite
- Oomoldic

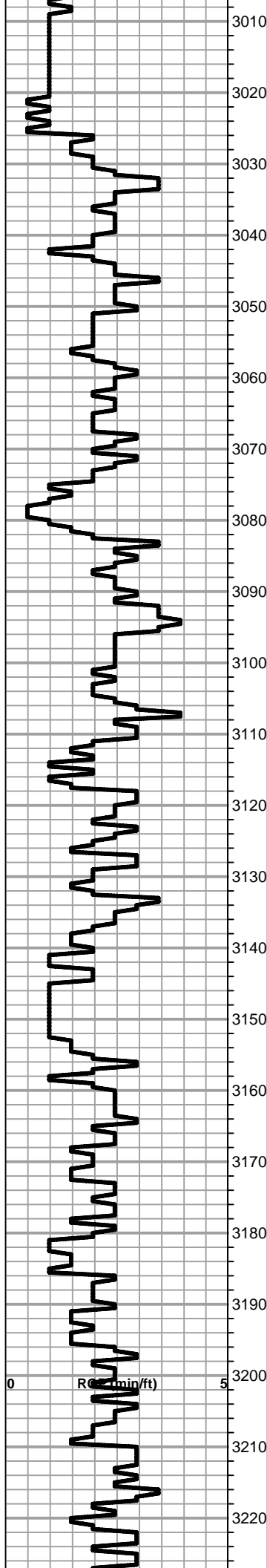
### OTHER SYMBOLS

#### DST

- DST Int
- DST alt
- Core

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





Shale, lt-med gray, soft sticky argillaceous to soft blocky

Lime, med brn, fnxln, fossiliferous

Lime, crm, fnxln-granular, slightly fossiliferous, sparry calcite backfill in part

**TOPEKA 3040-967**

Lime, lt-med brn, fnxln with fine granular chalky matrix in part

Lime, lt-med brn-grayish brn, fnxln, slightly fossiliferous

Lime, lt-med brn, fnxln, slight chalk in part, slightly fossiliferous

Lime, lt-med brn, mostly fnxln

Shale, med gray, calcareous, w/ fossil fragments

Lime, crm-lt brn, granular with spotty show of free oil on break, no odor

VERY THIN ZONE WHICH IS NONCOMMERCIAL IN AREA

Lime, lt-med brn-grayish brn, fnxln, slightly fossiliferous  
Shale, dark gray, firm blocky, w/ pyrite clusters

Lime, lt-med brn-grayish brn, fnxln, fossiliferous in part

Lime, lt-med brn, fnxln grading into granular lime w/ chalk in part, slightly fossiliferous

Lime, lt-med brn-grayish brn, fn-vfxln, micritic in part, slight chalk

Lime, crm-med brn, fnxln-granular, slight chalk

Lime, lt-med brn, fnxln-granular, scattered fine oolitic lime

Lime, lt-med brn, mostly granular, slightly chalky

Shale, black carbonaceous, fissile, blocky

Lime, lt brn, fnxln, slightly fossiliferous

Lime, crm, fn-vfxln, slight chalk, NS

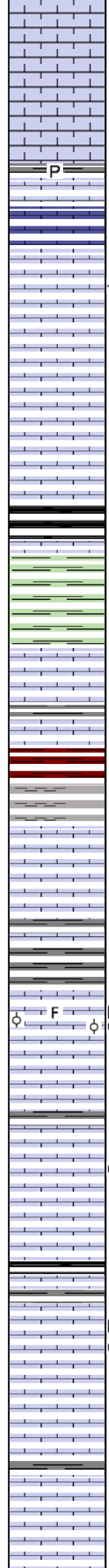
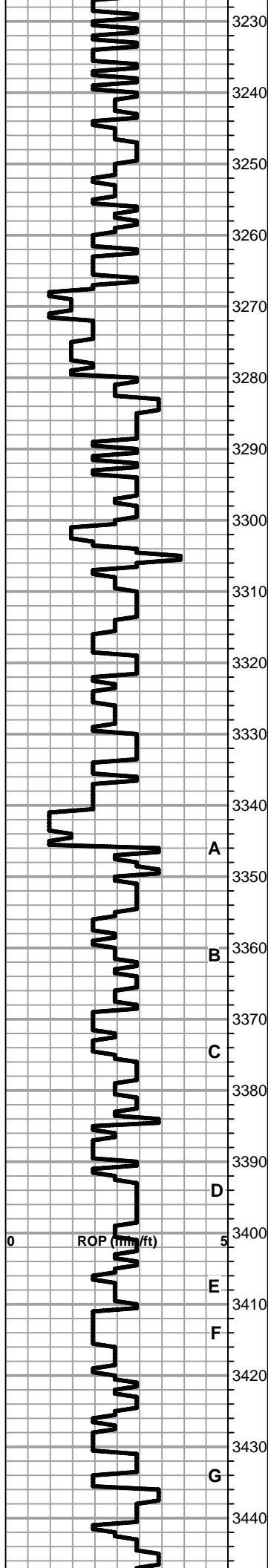
Lime, crm-lt brn, fn-vfxln

Lime, crm-lt brn, fnxln-granular, slight chalk in part, NS

Lime, crm-lt brn, fn-vfxln, slight bedded chalk in part

Lime, crm-lt brn, fnxln, slight chalk in part

Shale, gray-black carbonaceous  
Lime, med brn-gray, fnxln  
Shale, gray, calcareous w/ thin fossil beds



Lime, crm-med brn, fnxln, bedded chalk in part

Lime, lt-med brn-grayish brn, fnxln

Lime, lt-med brn-grayish brn, fnxln  
 Shale, med gray, firm, blocky, calcareous w/ fossil fragments

Lime, lt-med brn-grayish brn, fnxln w/ bedded chalk in part

\* Lime, crm-lt brn, fnxln-granular, slightly fossiliferous  
 lt gassy odor with no staining, NFO

Lime, lt-med brn, fnxln

Lime, crm-lt brn, fnxln

**HEEBNER SHALE 3297-1224**  
 Shale, black carbonaceous, fissile, blocky  
 Lime, med brn, fnxln, hard on crush  
 Shale, lime green, soft sticky clumps - soft blocky

**TORONTO 3318-1245**  
 Lime, white-crm, fnxln-granular, slight chalk, NS, no wet cut

Lime, crm-lt brn, fnxln, chalk in part, NS

Shale, lt red wash, soft grading into lt gray, soft blocky

**LKC 3343-1270**  
 Lime, med brn, vfxln, hard on crush

Lime, brn-grayish brn, fnxln, slightly fossiliferous, NS

Shale, dove gray, soft, sticky argillaceous clumps  
 Lime, lt-med brn, fnxln, hard on crush  
 Shale, lt-med gray, soft, sticky argillaceous clumps

○ F ○ D  
 Lime, crm-lt brn, fnxln grading into oolitic-fossil fragment w/  
 gilsonite and trace of lt fresh oil staining in interoolitic  
 porosity

Lime, lt-dark brn, fn-vfxln  
 Shale, gray, soft blocky

○  
 Lime, crm-lt gray, fn-vfxln, hard on crush, few chips,  
 fossiliferous w. pinpt porosity, trace fresh oil stain, v lt odor

Lime, lt-med brn, mostly fnxln

Shale, gray-black carbonaceous, soft blocky  
 Lime, pale gray, fnxln, hard on crush

D  
 Lime, white-crm, oolitic in part, dead oil stain w trace of  
 fresh oil staining, NFO, No Odor

Lime, crm-lt brn, mostly fnxln, scattered cementic oolitic  
 material w. bedded chalk in part, NS

Lime, crm-lt brn, fn-vfxln, scattered bedded chalk

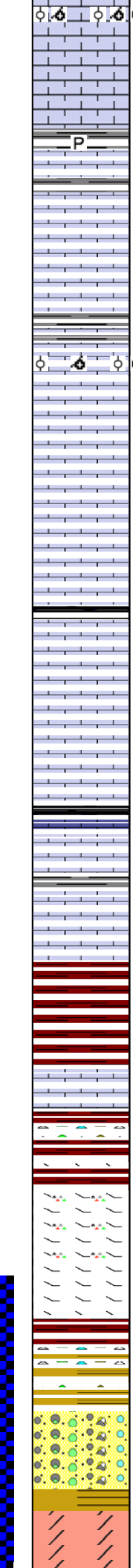
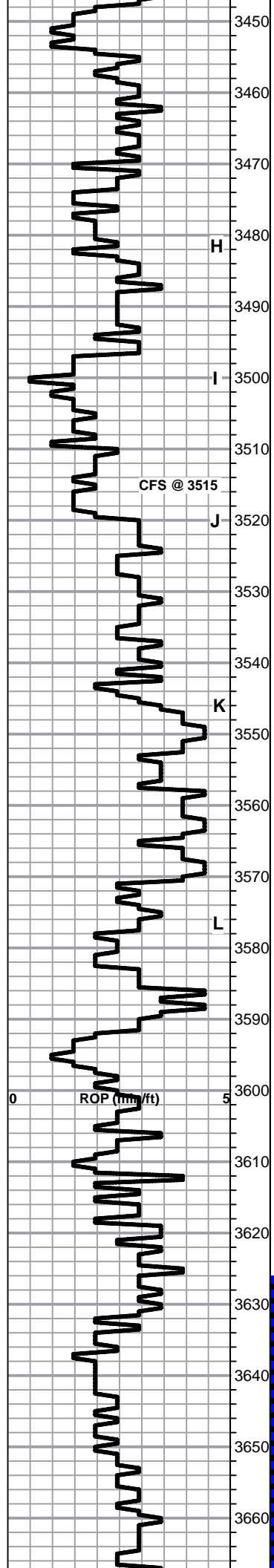
LOG INTERVAL FROM 3370-73  
 SHOULD BE PERFORATED  
 AND TESTED PRIOR TO  
 ABANDONMENT OF WELL

LOG INTERVAL 3386-90  
 SHOWS VERY THIN  
 DEVELOPMENT. MAY  
 CONSIDER TESTING DUE TO  
 FAVORABLE STRUCTURE

LOG INTERVAL 3415-18  
 APPEARS TO HAVE GOOD  
 PERMEABILITY ON LOG WITH  
 SLIGHT EVIDENCE OF  
 HYDROCARBON PRESENCE.  
 MAY CONSIDER TESTING DUE  
 TO FAVORABLE STRUCTURE

LOG INTERVAL 3445-52  
 MOSTLY LIME WITH





Lime, tan-lt brn-offwhite, fnxln w/ increasing bedded chalk, 1-2 chips oolitic/oolmoldic with trace of lt stain, NFO, No Odor.

Lime, lt brn, fn-vfxln, slight chalk in part

Shale, gray-black

Lime, crm, fnxln, chalk, NS

Lime, lt brn, fn-micro xln

Lime, offwhite-lt brn, fn-vfxln

Lime, lt brn, oolitic/oolmoldic, interoolitic w/ pinpt porosity, V Lt Odor, MSFO from vugs as sample warmed, lt to sat stain

Lime, crm, fn-vfxln

Lime, crm-lt brn-lt gray, fn-vfxln, slightly chalk

Lime, crm-lt brn, fn-micro xln, slight bedded chalk

Lime, crm-lt brn, fn-vfxln

Lime, crm-lt brn, fn-vfxln, slight chalk

Lime, crm-lt brn, fn-vfxln, slight chalk

Shale, gray-black carbonaceous, soft blocky  
Lime, crm-lt brn, fn-micro xln

Lime, crm-lt brn, fnxln, slight chalk

**BKC 3582-1509**

Shale, reddish brn-brn, soft blocky

Shale, reddish brn with clastic lime rubble in part

Lime, crm-lt brn, fnxln, bedded chalk, crumbly in part

Shale, brn, firm blocky-soft reddish brn, vari colored cherts

**MARMATION 3614-1541**

Lime, crm-lt brn, fnxln-granular, orange chert, fresh, sharp

Lime, crm-tan-lt gray, dolomitic, fn-vfxln, hard on crush, NS

Shale, lt red wash grading into vari colored shales and cherts

Shale, reds, brns, soft-firm, cherts vari colored, scattered cemented sandstone clusters, NS

**REWORKED ARBUCKLE 3659-1586**

Mix of dolomite, cherts, sand, lt brn, fnxln, V lt odor

MOSTLY CHALKY WITH TRACE OF STAIN. MAY CONSIDER PERFORATING AND TESTING PRIOR TO ABANDONMENT OF WELL BASED ON STRUCTURE OF WELL

LOG INTERVAL 3497-3500 SHOULD BE PERFORATED AND TESTED. MAY WANT TO PERFORATE 3510-16 PRIOR TO ABANDONMENT OF WELL

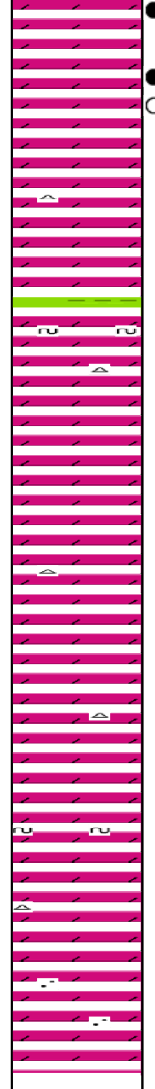
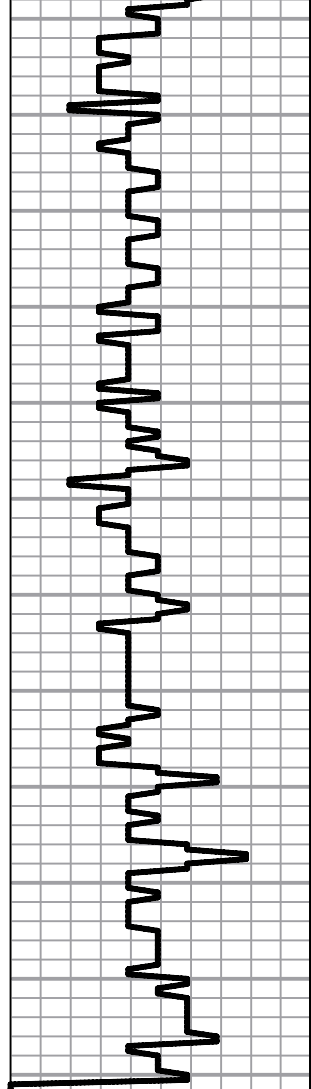
SHUT DOWN @ 3515' AND BANKED DRILL PIPE FOR BLIZZARD

DST # 1 STRADDLE TEST FROM 3626'-78. SEE HEADER FOR TEST SUMMARY

**ARBUCKLE 3668-1595**

**LOG INTERVAL 3668-78  
APPEARS TO BE  
PRODUCTIVE INTERVAL IN  
ARBUCKLE**

3670  
3680  
3690  
3700  
3710  
3720  
3730  
3740  
3750  
3760  
3770  
3780



Dolomite, ivory, fn-cxln, rhombic, gd visible interxln porosity, Lt Odor, saturated staining, gilsonitic.

Dolomite, ivory, fn-cxln, rhombic, gilsonitic, with SFO, lt odor, saturated staining

Dolomite, ivory, fn-cxln, decreasing odor and staining  
Chert, beige, fresh, sharp

Dolomite, ivory-crm, fn-cxln, interxln porosity, mostly barren  
Chert, crm-tan, fresh, sharp  
Shale, lt green, soft blocky, waxy

Dolomite, ivory-crm, fn-cxln, scattered specks of glauconite

Dolomite, white-ivory-crm, fn-cxln, few chips white sucrosic dolomite

Dolomite, ivory-crm, fnxln, interxln porosity, hard on crush

Dolomite, ivory-crm, fn-cxln

Dolomite, ivory-crm, mostly fnxln, hard on crush

Dolomite, ivory-crm, fnxln, w/ scattered specks of glauconite

Dolomite, ivory-crm, fnxln w/ scattered quartz grain inclusions and fused quartz.

Dolomite, ivory-salmon, fnxln, increasing quartz content

**RTD 3780-1707 LTD 3779-1706**

**OIL/WATER CONTACT  
APPEARS TO BE BELOW 3678'**

**SLOPE SURVEY 1 DEGREE**

# 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. 6417

Date	2-17-13	Sec.	27	Twp.	14	Range	18	County	ELLIS	State	KANSAS	On Location		Finish	6:30 pm
------	---------	------	----	------	----	-------	----	--------	-------	-------	--------	-------------	--	--------	---------

Location HAYS - 4S - E / INTO

Lease	SOPHIE		Well No.	#1	Owner	HERTEL OIL.	
Contractor	D.D #1				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				Charge To	HERTEL OIL.	
Hole Size	12 1/4"		T.D.	220'	Street	704 E. 12TH ST.	
Csg.	8 7/8" - 23LB - NEW		Depth	220'	City	HAYS State KS, 67601	
Tbg. Size			Depth		The above was done to satisfaction and supervision of owner agent or contractor.		
Tool			Depth		Cement Amount Ordered	150com - 3 <sup>38</sup> cc - 2 <sup>28</sup> gel	
Cement Left in Csg.			Shoe Joint	15			
Meas Line			Displace	13 BBLs			

**EQUIPMENT**

Pumptrk #15	No.	Cementer		Common	150
		Helper	NICK W.	Poz. Mix	
Bulktrk #14	No.	Driver		Gel.	3
		Driver	DAVID L.	Calcium	5
Bulktrk P/W	No.	Driver			
		Driver	CISCO A.		

**JOB SERVICES & REMARKS**

Remarks:	Hulls
Rat Hole	Salt
Mouse Hole	Flowseal
Centralizers	Kol-Seal
Baskets	Mud CLR 48
D/V or Port Collar	CFL-117 or CD110 CAF 38
	Sand
	Handling 158
	Mileage

CEMENT DID CIRCULATE

**FLOAT EQUIPMENT**

	Guide Shoe
	Centralizer
	Baskets
	AFU Inserts
	Float Shoe
	Latch Down

THANK YOU!

Pumptrk Charge Surface

Mileage 4

X Signature *Cuff Mayfield*

Tax	
Discount	
Total Charge	

**JOB LOG**

**SWIFT Services, Inc.**

DATE 2-27-13 PAGE NO.

CUSTOMER Herbel Oil WELL NO. 1 LEASE Sophie JOB TYPE 5 1/2 Two-Stage TICKET NO. 23931

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS		PRESSURE (PSI)		DESCRIPTION OF OPERATION AND MATERIALS
				T	C	TUBING	CASING	
	0700							On location TO 3780 SS 21 TP 3779 Insert 3758 OV 1236 rpb3 5 1/2 x 14# Centralizers 1,3,5,7,9,11,13,62 Basket 6,12,63
	0930							Start Pipe
	1058							Drop Ball Break Circulation
	1140	5	12		✓		300	Start Mud Flush
		5	20		✓		300	Start KCL Flush
		5	36		✓		200	Start Cement EA-2
	1200							Drop Plug wash out Pump + Lines
	1202	6			✓			Displace
		6	61		✓			Start mud
		6	73		✓			Start KCL flush
	1215		91.7				1500	Land Plug Release Dry Drop opening Plug
	1220		7/4					Plug BH Zostys, MH 15 SKS
	1245				✓		500	Open OV
			86		✓			Start Cement SMO
	1315							Drop Closing Plug Displace
	1330		30.2		✓			Land Plug
	1330						1500	Close OV Release Dry Circulate <u>30</u> SKS to pit
	1400							wash up Back up Job Complete Thank You Josh, Brian, Rob