

OPERATOR

Company: TDI, INC
 Address: 1310 BISON ROAD
 HAYS, KANSAS 67601

Contact Geologist: TOM DENNING
 Contact Phone Nbr: 785-628-2593
 Well Name: LAWRENCE # 1
 Location: N2 NE SW NE Sec.15-15s-19w
 Pool: API: 15-051-26,633-00-00
 State: KANSAS Country: MARTINA NORTH
 USA



Scale 1:240 Imperial

Well Name: LAWRENCE # 1
 Surface Location: N2 NE SW NE Sec.15-15s-19w
 Bottom Location:
 API: 15-051-26,633-00-00
 License Number: 4787
 Spud Date: 11/13/2013 Time: 3:15 PM
 Region: ELLIS COUNTY
 Drilling Completed: 11/20/2013 Time: 12:55 AM
 Surface Coordinates: 1575' FNL & 1650' FEL
 Bottom Hole Coordinates:
 Ground Elevation: 2012.00ft
 K.B. Elevation: 2022.00ft
 Logged Interval: 2900.00ft To: 3735.00ft
 Total Depth: 3735.00ft
 Formation: LANSING-KANSAS CITY
 Drilling Fluid Type: CHEMICAL/FRESH WATER GEL

SURFACE CO-ORDINATES

Well Type: Vertical
 Longitude: -99.4174494 Latitude: 38.7504643
 N/S Co-ord: 1575' FNL
 E/W Co-ord: 1650' FEL

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: SOUTHWIND DRILLING, INC.
 Rig #: 1
 Rig Type: MUD ROTARY
 Spud Date: 11/13/2013 Time: 3:15 PM
 TD Date: 11/20/2013 Time: 12:55 AM
 Rig Release: 11/21/2013 Time: 2:00 AM

ELEVATIONS

K.B. Elevation: 2022.00ft Ground Elevation: 2012.00ft
 K.B. to Ground: 10.00ft

NOTES

RECOMMENDATION TO RUN PRODUCTION CASING BASED ON POSITIVE RESULTS OF CONGLOMERATE SAND DRILL STEM TEST.

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

DRILL STEM TESTING BY TRILOBITE TESTING INC: TWO (2) CONVENTIONAL TESTS AND ONE (1) STRADDLE TEST

FORMATION TOPS SUMMARY AND CHRONOLOGY OF DAILY ACTIVITY

LAWRENCE # 1
N2 NE SW NE
SEC.15-15S-19W
2012'GL 2022'KB

LARRY # 1
N2 NE SE NE
SEC.15-15S-19W


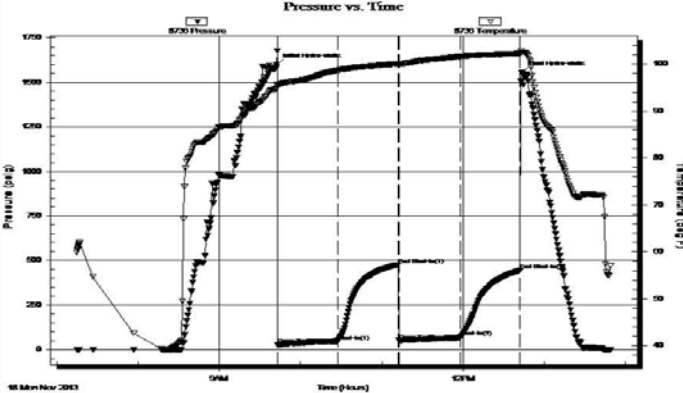
<u>FORMATION</u>	<u>SAMPLE TOPS</u>	<u>LOG TOPS</u>	<u>COMPARISON</u>
Anhydrite	1225 +797	1228 +794	+ 801
B-Anhydrite	1266 +756	1266 +756	+ 765

Topeka	2999- 977	3000- 978	- 972
Heebner Shale	3270-1248	3269-1247	-1241
Toronto	3287-1265	3289-1267	-1260
LKC	3312-1290	3316-1294	-1284
BKC	3558-1536	3558-1536	-1532
Marmaton	3607-1585	3610-1588	-1591
Congl. Sand	3620-1598	3620-1598	-1603
Arbuckle	3639-1617	3638-1616	-1624
RTD	3735-1713	3736-1714	-1689

SUMMARY OF DAILY ACTIVITY

- 11-13-13 RU, Spud 3:15PM
- 11-14-13 1005', drilling surface hole, CCH, run 8 5/8" surface casing to 1226'
- 11-15-13 1227', cement 8 5/8"w/ 375 sxs SMD, slope ¾ degree, plug down 12:30AM, WOC 12 hrs, drill plug @ 12:30 PM
- 11-16-13 2060', drilling
- 11-17-13 2804', drilling, displaced 2899'-2914'
- 11-18-13 3344', drilling, short trip @3296', CFS 3344', DST #1 3296'-3344' "C" strap 3370.46 board 3370.52, slope 1 ¼ degree
- 11-19-13 3640', CFS 3510', CFS 3640', mini short trip, TOWB, DST #2 3616'-3640' conglomerate sand, TIWB, drilling
- 11-20-13 3735', RTD 3735'@12:45 AM, CCH, TOWB, logs, straddle test 3460'-3508' "I" and "J" LKC, TIWB, CCH, LDDP, run production casing
- 11-21-13 3735', cement production casing, RD

DST # 1 TEST SUMMARY "C" ZONE OF LKC

 TRILOBITE TESTING, INC.	DRILL STEM TEST REPORT																																														
	TDI Inc. 1310 Bison Rd Hays KS 67601 ATTN: Herb Deines	15-15-19, Ellis, KS Lawrence #1 Job Ticket: 55323 DST#: 1 Test Start: 2013.11.18 @ 07:15:00																																													
GENERAL INFORMATION: Formation: KC "C" Deviated: No Whipstock: ft (KB) Time Tool Opened: 09:43:00 Time Test Ended: 13:49:15 Test Type: Conventional Bottom Hole (Initial) Tester: Brett Dickinson Unit No: 59 Interval: 3296.00 ft (KB) To 3344.00 ft (KB) (TVD) Total Depth: 3344.00 ft (KB) (TVD) Hole Diameter: 7.88 inches Hole Condition: KB to GR/CF: 9.00 ft Reference Elevations: 2022.00 ft (KB) 2013.00 ft (CF)																																															
Serial #: 8736 Outside Press@RunDepth: 68.92 psig @ 3307.00 ft (KB) Capacity: 8000.00 psig Start Date: 2013.11.18 End Date: 2013.11.18 Last Calib.: 2013.11.18 Start Time: 07:15:05 End Time: 13:49:14 Time On Btm: 2013.11.18 @ 09:42:15 Time Off Btm: 2013.11.18 @ 12:43:30																																															
TEST COMMENT: IF-4 1/4in blow ISI-No blow FF-6in blow FSI-Weak surface blow																																															
	PRESSURE SUMMARY																																														
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Trilobite Testing, Inc Ref. No: 55323 Printed: 2013.11.18 @ 14:53:55																																															

DST # 2 TEST SUMMARY CONGLOMERATE SAND



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

TDI Inc.

15-15-19, Ellis, KS

1310 Bison Rd
Hays KS 67601

Lawrence #1

Job Ticket: 55324

DST#: 2

ATTN: Herb Deines

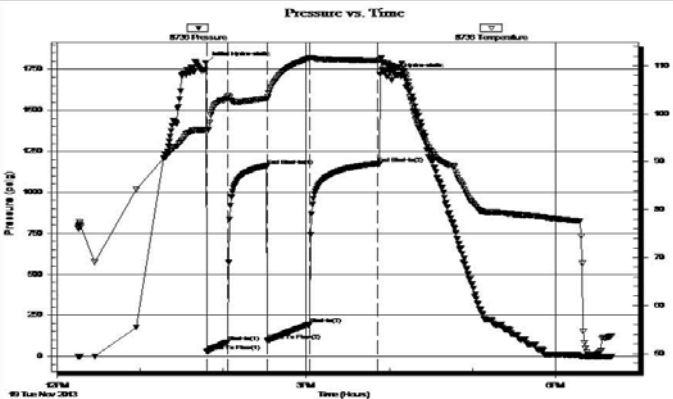
Test Start: 2013.11.19 @ 12:15:00

GENERAL INFORMATION:

Formation: **Cong. Sd.**
 Deviated: No Whipstock: ft (KB)
 Test Type: Conventional Bottom Hole (Reset)
 Time Tool Opened: 13:48:00
 Tester: Brett Dickinson
 Time Test Ended: 18:41:00
 Unit No: 59
 Interval: **3616.00 ft (KB) To 3640.00 ft (KB) (TVD)**
 Reference Elevations: 2022.00 ft (KB)
 Total Depth: 3640.00 ft (KB) (TVD)
 2013.00 ft (CF)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 KB to GR/CF: 9.00 ft

Serial #: 8736 Outside
 Press@RunDepth: 195.67 psig @ 3637.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2013.11.19 End Date: 2013.11.19 Last Calib.: 2013.11.19
 Start Time: 12:15:05 End Time: 18:40:59 Time On Btm: 2013.11.19 @ 13:47:15
 Time Off Btm: 2013.11.19 @ 15:53:15

TEST COMMENT: IF-BOB in 5 1/2min
 ISI-1 1/2in blow
 FF-BOB in 5 1/2min
 FSI-1 3/4in blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1789.84	96.60	Initial Hydro-static
1	28.16	96.32	Open To Flow (1)
16	86.32	103.44	Shut-In(1)
45	1162.75	103.23	End Shut-In(1)
45	93.87	103.01	Open To Flow (2)
75	195.67	111.61	Shut-In(2)
125	1174.40	111.12	End Shut-In(2)
126	1718.34	111.28	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
90.00	V SOMCW 2%O 78%W 20%M	1.26
90.00	SWOCM 35%O 10%W 55%M	1.26
260.00	GO 25%G 75%O	3.65
0.00	120ft GIP	0.00

Gas Rates

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

* Recovery from multiple tests

Trilobite Testing, Inc

Ref. No: 55324

Printed: 2013.11.19 @ 21:21:16

DST # 3 STRADDLE TEST SUMMARY "I" AND "J" LKC BOTTOM PACKER HELD



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

TDI Inc.

15-15-19, Ellis, KS

1310 Bison Rd
Hays KS 67601

Lawrence #1

Job Ticket: 55325

DST#: 3

ATTN: Herb Deines

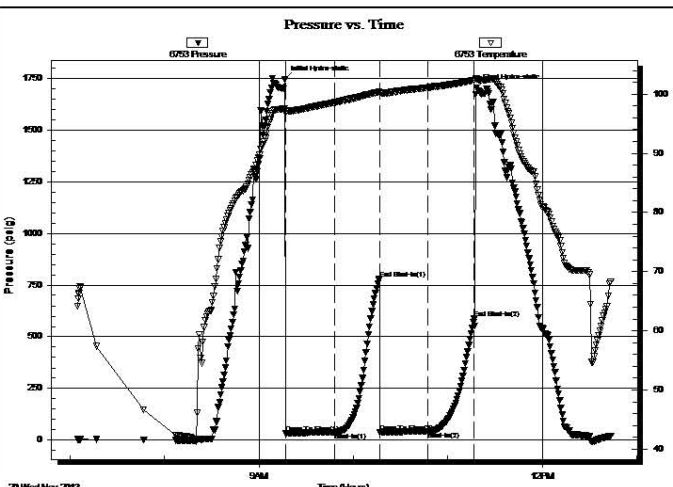
Test Start: 2013.11.20 @ 07:05:00

GENERAL INFORMATION:

Formation: **KC "I-J"**
 Deviated: No Whipstock: ft (KB)
 Test Type: Conventional Straddle (Reset)
 Time Tool Opened: 09:17:00
 Tester: Brett Dickinson
 Time Test Ended: 12:43:30
 Unit No: 59
 Interval: **3460.00 ft (KB) To 3508.00 ft (KB) (TVD)**
 Reference Elevations: 2022.00 ft (KB)
 Total Depth: 3508.00 ft (KB) (TVD)
 2013.00 ft (CF)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 KB to GR/CF: 9.00 ft

Serial #: 6753 Outside
 Press@RunDepth: 41.77 psig @ 3504.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2013.11.20 End Date: 2013.11.20 Last Calib.: 2013.11.20
 Start Time: 07:05:05 End Time: 12:43:29 Time On Btm: 2013.11.20 @ 09:16:15
 Time Off Btm: 2013.11.20 @ 11:18:15

TEST COMMENT: IF-3in blow
 ISI-No blow
 FF-4 1/2in blow
 FSI-No blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1742.80	97.54	Initial Hydro-static
1	35.02	96.79	Open To Flow (1)
32	38.42	98.56	Shut-In(1)
61	781.38	100.43	End Shut-In(1)
61	38.57	100.19	Open To Flow (2)
91	41.77	101.09	Shut-In(2)
121	586.83	102.34	End Shut-In(2)
122	1703.58	102.55	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
90.00	V SOMCW 2%O 78%W 20%M	1.26
90.00	SWOCM 35%O 10%W 55%M	1.26
260.00	GO 25%G 75%O	3.65
0.00	120ft GIP	0.00

Gas Rates

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

30.00	SWDCM 30%O 15%W 55%M	0.42
0.00	60ft GIP	0.00

* Recovery from multiple tests

Trilobite Testing, Inc

Ref. No: 55325

Printed: 2013.11.20 @ 13:31:25

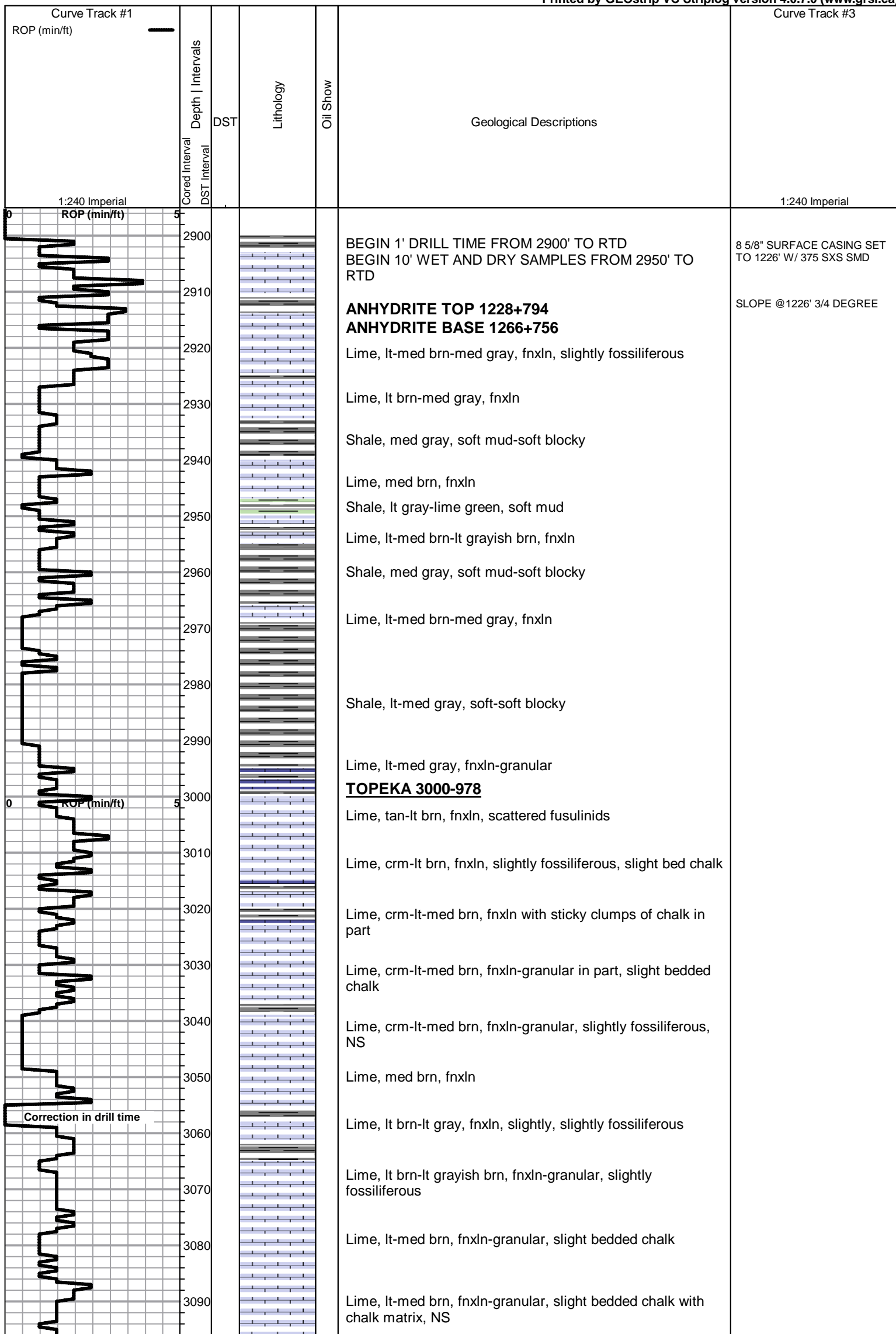
ROCK TYPES

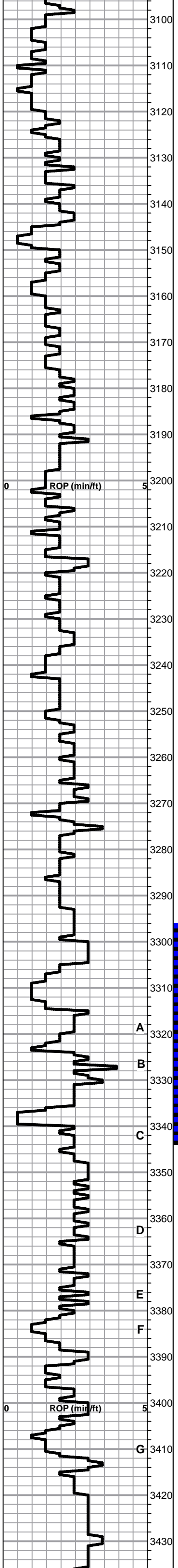
Cht vari	Dol Lime	Lscongl	Carbon Sh	Ss
Clystgy	Lmst fw<7	shale, grn	shale, red	CglSandy
Dolprim	Lmst fw>7	shale, gry	Shcol	

ACCESSORIES

MINERAL	FOSSIL
Glauconite	Oomoldic
Pyrite	
Sandy	
Varicolored chert	
Chert White	

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





Lime, lt-med brn, fnxln-granular, slight bedded chalk

Lime, lt brn, granular, chalk with sticky clumps in part

Shale, gray-black carbonaceous
Lime, med brn, fn-vfxln

Shale, lt-med gray, soft blocky, calcareous in part

Lime, lt brn, fnxln, bedded chalk

Lime, crm-lt brn, fnxln-granular, bedded chalk with scattered clumps of sticky chalk, NS

Lime, lt brn-lt gray, fn-vfxln, slight bedded chalk

Lime, lt brn-lt gray, fnxln, slight bedded chalk

Lime, lt brn-lt gray, fn-vfxln, slight bedded chalk

Shale, gray-black carbonaceous

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

Lime, tan-lt brn, fnxln-granular, bedded chalk, NS

Lime, lt brn, fnxln-granular, bedded chalk

Lime, lt brn, fnxln, bedded chalk in part

Lime, crm-lt brn, fnxln, soft on crush, lt chalk matrix, slightly fossiliferous

Lime, lt brn, fnxln

Lime, lt brn, fnxln, slight bedded chalk

HEEBNER SHALE 3269-1247
Shale, black carbonaceous, fissile, blocky
Lime, med brn, vfxln-micro xln

Shale, lime green, soft mud-soft blocky

TORONTO 3289-1267
Lime, white, fn-vf xln, hard bedded chalk, 1 chip fossiliferous with trace of stain, NFO, No Odor

Lime, crm, fnxln, bedded chalk, NS

Shale, reddish brn, soft blocky

LKC 3316-1294
Lime, med brn, fnxln

Lime, lt-med brn, fn-micro xln
Shale, lt gray, soft blocky

Lime, lt brn, oolmoldic, lt spotted staining, MSFO, very lt odor

Lime, crm-tan, fnxln, bedded chalk

Lime, crm-tan, fnxln, bedded chalk, NS

Lime, crm, mostly fnxln, bedded chalk, few chips with spotty staining, NFO, No Odor

Shale, gray-black carbonaceous, firm blocky
Lime, lt gray, fnxln

Lime, crm-tan, fnxln, bedded chalk, slight fossiliferous, NS

Lime, crm-tan, fnxln, bedded chalk with white chert, fresh, sharp

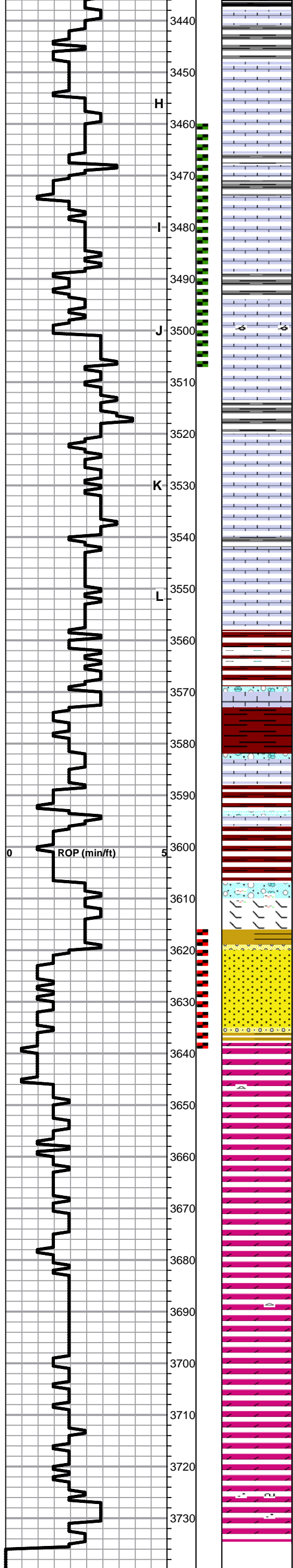
Lime, crm-tan, fnxln, bedded chalk, NS

Lime, crm-tan, fn-micro xln, bedded chalk

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

Lime, med brn-med gray, fn-vfxln

DST # 1 3296' TO 3344' SEE
HEADER FOR TEST
SUMMARY



Lime, med brn-med gray, fnxln, slightly fossiliferous

Lime, lt-med brn, fnxln-granular, slight bedded chalk, NS

Lime, crm-tan, fn-vfxln, slight bedded chalk

Shale, med grayish green, soft blocky

Lime, crm, fnxln with spotty staining in slightly oomoldic, fossiliferous lime with scattered vuggy porosity, floating specks of oil in tray

Lime, crm-tan, fnxln

Lime, crm, fnxln with scattered oomoldic chips, barren of staining, NFO, No Odor

Lime, crm, fnxln, bedded chalk

Lime, crm-tan, fn-vfxln, bedded chalk

Shale, grayish green, soft blocky

Lime, crm-lt brn, fnxln, bedded chalk, NS

Lime, crm-tan, fn-vfxln, bedded chalk

Lime, crm-tan-lt brn, fn-micro xln

Lime, crm-lt brn-tan, fn-vfxln, slight bedded chalk, NS

Lime, tan, fn-micro xln

BKC 3558-1536

Shale, reddish brn, firm blocky with red chert nodules

Lime, crm-tan, vfxln

Shale, reddish brn-maroon, soft blocky

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

Shale, reds, brns, maroon, soft blocky

Shale, reds, brn, maroon, lt red wash, soft mud-soft blocky

MARMATON 3610-1588

Lime, crm-lt brn, fn-vfxln, dolomitic, orange-tan chert

CONGLOMERATE SAND 3620-1598

Shale vari colored grading into cemented sandstone cleaning up with depth. Sandstone-poor to fair sorting, subangular, lt dolomitic cementing, saturated stain, very lite odor, friable sand clusters

ARBUCKLE 3638-1616

Dolomite, crm, granular, sucrosic with dead oil flakes in interxln porosity

Dolomite, ivory-crm, fnxln-hard granular

Dolomite, crm, fnxln-granular

Dolomite, crm, fnxln-granular with some cxln in part

Dolomite, crm, fnxln-granular, few chips of pale gray-pale green, soft blocky shale

Dolomite, crm, fnxln-granular

Dolomite, ivory-crm, fnxln-granular

Dolomite, ivory-crm, fnxln-granular

Dolomite, crm, fnxln-granular with specks of glauconite and quartz grain inclusions

RTD 3735-1713 LTD 3736-1714

DST STRADDLE TEST 3460' TO 3508' SEE HEADER FOR TEST SUMMARY

DST # 2 3616' TO 3640' SEE HEADER FOR TEST SUMMARY

5 1/2" 14# PRODUCTION CASING SET TO 3733' W/ 135 SXS EA2, RATHOLE W/ 30 SXS MOUSEHOLE W/ 15 SXS SWIFT TICKET #25191 PLUG DOWN 1:45AM 11-21-2013