

OPERATOR

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

Contact Geologist: MIKE HERTEL
 Contact Phone Nbr: 785-628-2445
 Well Name: JACOBS # 1
 Location: SW NW SE NW SEC.4-T15S-R18W
 API: 15-051-26,772-00-00
 Pool: INFIELD
 State: KANSAS
 Field: RUDER NORTH
 Country: USA

Scale 1:240 Imperial

Well Name: JACOBS # 1
 Surface Location: SW NW SE NW SEC.4-T15S-R18W
 Bottom Location:
 API: 15-051-26,772-00-00
 License Number: 33625
 Spud Date: 2/19/2015 Time: 12:17 PM
 Region: ELLIS COUNTY
 Drilling Completed: 2/24/2015 Time: 12:19 PM
 Surface Coordinates: 1977' FNL & 1634' FWL
 Bottom Hole Coordinates:
 Ground Elevation: 2016.00ft
 K.B. Elevation: 2024.00ft
 Logged Interval: 2900.00ft To: 3700.00ft
 Total Depth: 3700.00ft
 Formation: LANSING-KANSAS CITY
 Drilling Fluid Type: CHEMICAL/FRESH WATER GEL

SURFACE CO-ORDINATES

Well Type: Vertical
 Longitude: -99.3313517
 Latitude: 38.7785646
 N/S Co-ord: 1977' FNL
 E/W Co-ord: 1634' 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 #: 2
 Rig Type: MUD ROTARY
 Spud Date: 2/19/2015 Time: 12:17 PM
 TD Date: 2/24/2015 Time: 12:19 PM
 Rig Release: 2/25/2015 Time: 10:00 AM

ELEVATIONS

K.B. Elevation: 2024.00ft Ground Elevation: 2016.00ft
 K.B. to Ground: 8.00ft

NOTES

RECOMMENDATION TO PLUG AND ABANDON BASED ON LOG ANALYSIS AND NEGATIVE RESULTS OF TWO

DSTS

OPEN HOLE LOGGING BY GEMINI WIRELINE LLC: DUAL INDUCTION LOG, COMPENSATED DENSITY NEUTRON LOG, MICRORESISTIVITY LOG

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

FORMATION TOPS COMPARISON

	JACOBS # 1 SW NW SE NW SEC.4-15S-18W 2016'GL 2024'KB	RUDER # A-1 NW SE NW SEC.4-15-18W KB 2021'	JACOBS-WERTH #1 SE NE SE NW SEC.4-15-18W KB 2027'
<u>FORMATION</u>	<u>LOG TOPS</u>	<u>LOG TOPS</u>	<u>LOG TOPS</u>
Anhydrite-top	1202+ 822	+ 824	+ 819
Anhydrite-base	1239+ 785	+ 787	+ 781
Topeka	3009- 985	- 982	- 991
Heebner Sh.	3269-1245	-1247	-1250
Toronto	3289-1265	-1269	-1269
LKC	3323-1299	-1302	-1304
BKC	3550-1526	-1529	-1530
Marmaton	3591-1567	-1571	-1571
Conglomerate Sd	3622-1598	-1597	None
Arbuckle	3654-1630	-1643	-1600
RTD	3700-1676	-1659	-1723

SUMMARY OF DAILY ACTIVITY

2-19-15	RU, spud 12:15 PM, set 8 5/8" surface casing to 224' w/150 sxs Common 2%Gel 3%CC, slope 1 degree
2-20-15	557', drill plug at 3:30AM
2-21-15	2065', drilling
2-22-15	2825', drilling
2-23-15	3440', CFS 3622', CFS 3630', CFS 3635,ST 25 stands, CCH, TOWB, DST # 1 3601' to 3635' Conglomerate Sand, slope 1 ¼ degree
2-24-15	3635', finish DST # 1, TIWB, RTD 3700' @ 12:19PM, TOWB, logs, Straddle DST #2 3331' to 3402' "C", "D", "F", top of "G", TOWT
2-25-15	3700', TIWB, LDDP, P&A

DST # 1 TEST SUMMARY

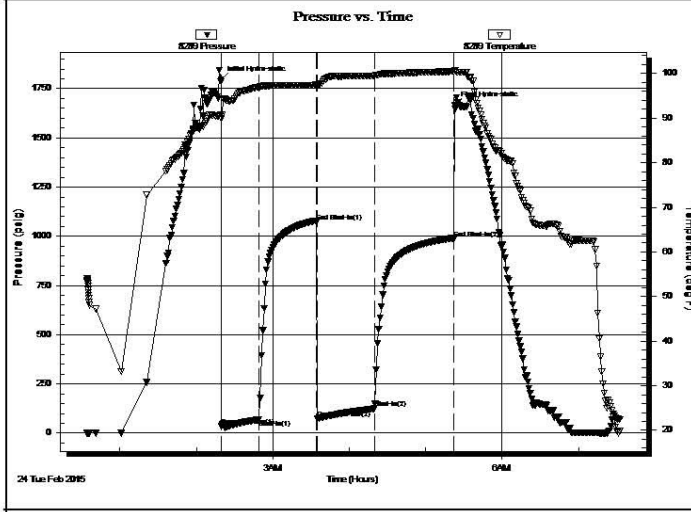
 TRILOBITE TESTING, INC.	DRILL STEM TEST REPORT	
	Hertel Oil Company LLC 704 E 12th St Hays KS 67601-3440 ATTN: Herb Deines	4 15s 18w Ellis Jacobs # 1 Job Ticket: 61397 DST#: 1 Test Start: 2015.02.24 @ 00:34:00

GENERAL INFORMATION:

Formation: Cong. Sand	Test Type: Conventional Bottom Hole (Initial)
Deviated: No Whipstock: ft (KB)	Tester: Jim Svaty
Time Tool Opened: 02:19:45	Unit No: 76
Time Test Ended: 07:33:00	
Interval: 3601.00 ft (KB) To 3635.00 ft (KB) (TVD)	Reference Elevations: 2025.00 ft (KB)
Total Depth: 3635.00 ft (KB) (TVD)	2017.00 ft (CF)
Hole Diameter: 7.88 inches Hole Condition: Fair	KB to GR/CF: 8.00 ft

Serial #: 8289 Inside	Capacity: 8000.00 psig
Press@RunDepth: 125.35 psig @ 3607.00 ft (KB)	Last Calib.: 2015.02.24
Start Date: 2015.02.24 End Date: 2015.02.24	Time On Btm: 2015.02.24 @ 02:19:30
Start Time: 00:34:02 End Time: 07:33:00	Time Off Btm: 2015.02.24 @ 05:23:00

TEST COMMENT: 30-IFP- BOB in 21min.
 45-ISIP- Surface Blow in 3min.
 45-FFP- BOB in 31min.
 60-FSIP- Surface Blow in 1min.



PRESSURE SUMMARY			
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1796.68	90.84	Initial Hydro-static
1	33.50	89.88	Open To Flow (1)
30	69.38	96.97	Shut-In(1)
75	1075.30	97.43	End Shut-In(1)
76	75.17	96.99	Open To Flow (2)
121	125.35	99.51	Shut-In(2)
183	989.82	100.45	End Shut-In(2)
184	1666.04	100.69	Final Hydro-static

Recovery		
Length (ft)	Description	Volume (bbl)
62.00	OCM 10%o 90% m	0.46
84.00	WMCO 15%w 30% m 55% o	0.62
122.00	CO 100%	0.90
0.00	180 GIP	0.00

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

DST # 2 TEST SUMMARY

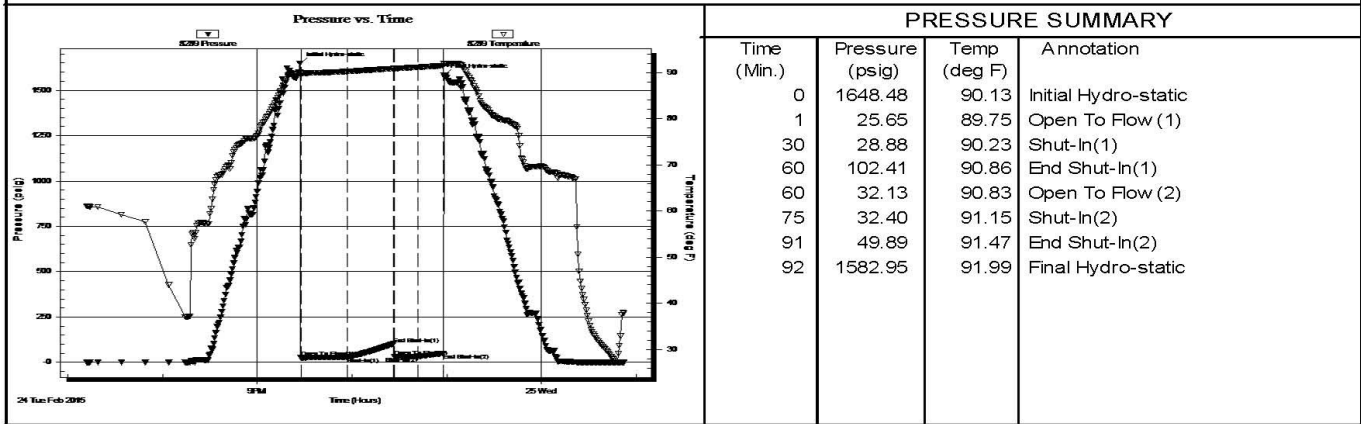
 TRILOBITE TESTING, INC.	DRILL STEM TEST REPORT	
	Hertel Oil Company LLC 704 E 12th St Hays KS 67601-3440 ATTN: Herb Deines	4 15s 18w Ellis Jacobs # 1 Job Ticket: 61398 DST#: 2 Test Start: 2015.02.24 @ 19:12:00

GENERAL INFORMATION:

Formation: LKC " C - G "	Test Type: Conventional Straddle (Reset)
Deviated: No Whipstock: ft (KB)	Tester: Jim Svaty
Time Tool Opened: 21:27:30	Unit No: 76
Time Test Ended: 00:53:00	Reference Elevations: 2025.00 ft (KB)
Interval: 3331.00 ft (KB) To 3402.00 ft (KB) (TVD)	2017.00 ft (CF)
Total Depth: 3700.00 ft (KB) (TVD)	KB to GR/CF: 8.00 ft
Hole Diameter: 7.88 inches Hole Condition: Fair	

Serial #: 8289 Outside	Capacity: 8000.00 psig
Press@RunDepth: 32.40 psig @ 3351.00 ft (KB)	Last Calib.: 2015.02.25
Start Date: 2015.02.24 End Date: 2015.02.25	Time On Btm: 2015.02.24 @ 21:27:00
Start Time: 19:12:02 End Time: 00:53:00	Time Off Btm: 2015.02.24 @ 22:58:15

TEST COMMENT: 30-IFP- Surface Blow Building to 2 1/4in.
 30-ISIP- No Blow
 15-FFP- 1/4in. Blow
 15-FSIP- No Blow



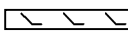






<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3" style="text-align: center;">Recovery</th> </tr> <tr> <th>Length (ft)</th> <th>Description</th> <th>Volume (bbl)</th> </tr> </thead> <tbody> <tr> <td>15.00</td> <td>Mud 100% Show of Oil in Tool</td> <td>0.11</td> </tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table> <p style="font-size: x-small;">* Recovery from multiple tests</p>	Recovery			Length (ft)	Description	Volume (bbl)	15.00	Mud 100% Show of Oil in Tool	0.11													<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3" style="text-align: center;">Gas Rates</th> </tr> <tr> <th>Choke (inches)</th> <th>Pressure (psig)</th> <th>Gas Rate (Mcf/d)</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	Gas Rates			Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)									
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Trilobite Testing, Inc

Ref. No: 61398

Printed: 2015.02.25 @ 07:38:42

ROCK TYPES

 Clystgy	 Dol Lime	 shale, grn	 shale, red
 Chtcong	 Lmst fw<7	 shale, gry	 Ss
 Delorim	 Lmst fw>7	 Carbon Sh	 CalSandy

ACCESSORIES

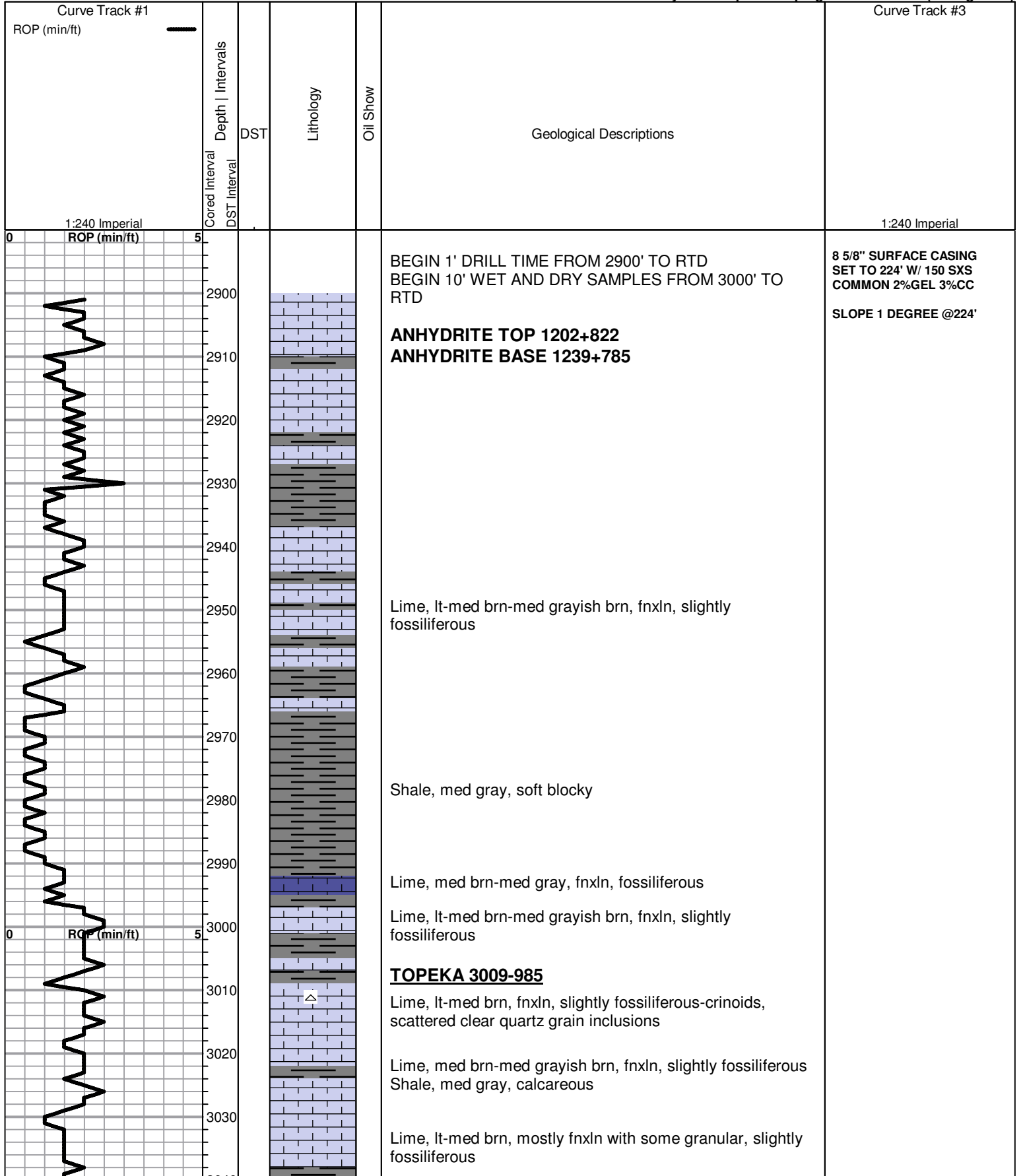
MINERAL

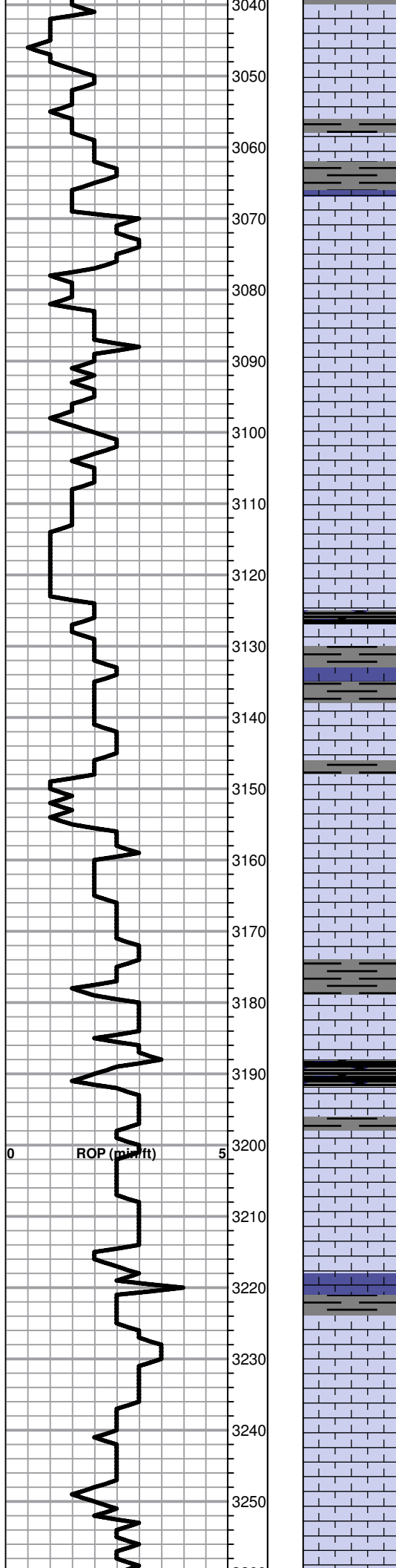
- ▲ Chert, dark
- ▨ Nodules
- △ Chert White

FOSSIL

- Oolite
- ⊕ Oomoldic

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

Shale, med-dark gray, blocky, calcareous

Lime, med brn-gray shaley, fnxln

Lime, offwhitelgt brn, granular with lt chalky matrix, NS

Lime, offwhite-lt brn-lt gray, granular with slight mottling in part

Lime, lt brn-lt gray, fnxln

Lime, lt brn-lt gray, fnxln, sticky chalk clumps in part

Shale, black carbonaceous, blocky
Lime, med grayish brn, fn-vfxln

Lime, lt-med brn, fnxln

Lime, lt brn-lt grayish brn, fnxln with some granular in part, NS

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

Lime, lt-med brn, fnxln

Lime, lt brn-crm, fnxln-granular in part

Shale, black carbonaceous

Lime, crm-lt brn, fnxln-granular

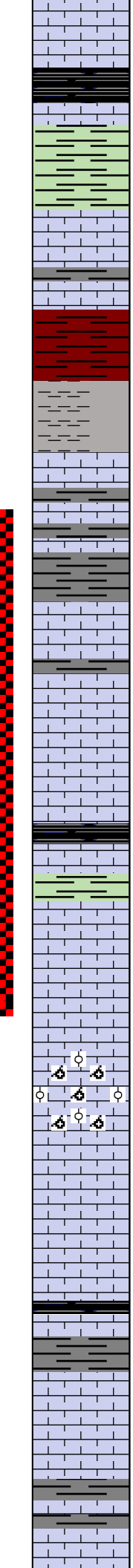
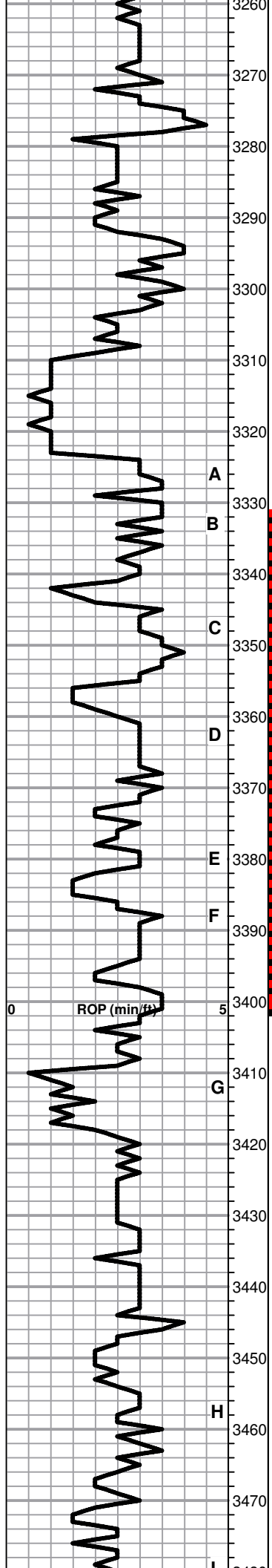
Lime, crm-lt brn, fnxln, slightly fossiliferous

Lime, lt brn, fnxln-granular in part

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

Lime, lt brn, fnxln

Lime, lt-med brn, fn-vfxln



Lime, lt brn-lt grayish brn, fnxln

HEEBNER SHALE 3269-1245
 Shale, black carbonaceous, blocky
 Lime, lt-med brn, vfxln

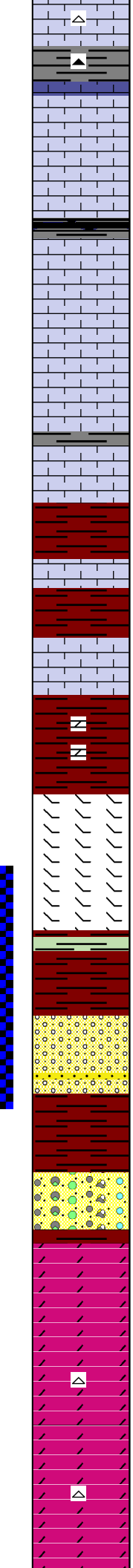
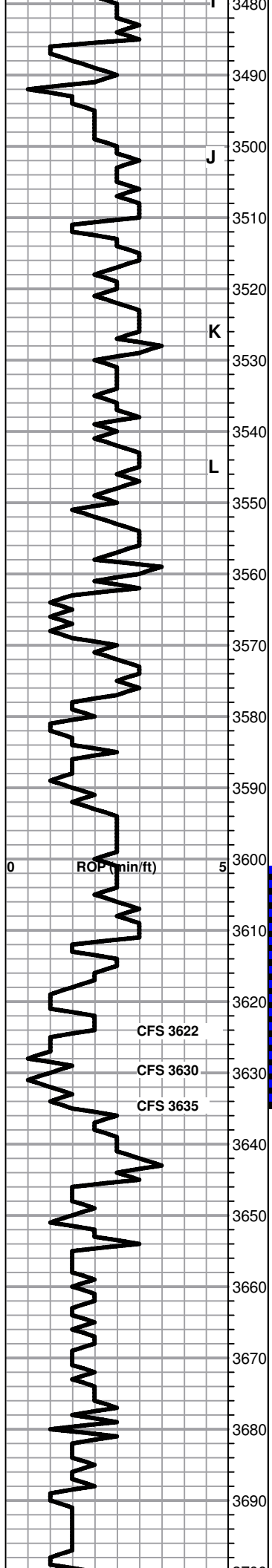
Shale, lt gray, soft-firm blocky

TORONTO 3289-1265
 Lime, crm-lt brn, fnxln, slight bedded chalk, NS
 Lime, lt-med brn-med gray near shale boundary, fn-vfxln

Shale, lt red wash, soft mud

LKC 3323-1299
 Lime, crm-lt brn, fnxln, slight bedded chalk, NS
 Lime, lt-med brn-grayish brn, fn-vfxln, slightly fossiliferous
 Shale, lt-med gray, soft mud-soft blocky
 Lime, lt-med brn, fn-vfxln, NS, no visible porosity
 Lime, crm-lt brn, fnxln with thin oolitic, fossiliferous bed, spotty staining, lt odor, NFO, appears poorly developed
 Lime, crm-lt brn, fn-vfxln, slight bedded chalk
 Shale, black carbonaceous, blocky
 Lime, lt gray, fn-vfxln
 Lime, crm-lt brn, thin cemented fossiliferous bed, spotty staining, NFO, no odor
 Lime, crm-lt brn, fnxln, spotty staining, NFO, no odor
 Lime, crm-lt brn, oomoldic/oolitic, NS, no staining
 Lime, crm-lt brn, fn-vfxln, slight bedded chalk
 Lime, crm-lt brn-lt grayish brn, fnxln, slightly fossiliferous, lt white wash
 Shale, gray-black carbonaceous, blocky
 Lime, lt grayish brn, fn-vfxln
 Lime, white-crm, fnxln, few cemented oolitic chips, NS
 Lime, white-crm-lt brn, fn-vfxln, slight bedded chalk
 Lime, lt brn, fn-vfxln, few oolitic chips, slight spotty oil staining, NFO, No Odor

**DST # 2 STRADDLE TEST
 3331' TO 3402' SEE HEADER
 FOR TEST SUMMARY**



Lime, crm-lt brn, fnxln, slight bedded chalk, white chert, fresh, sharp

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

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

Shale, gray-black, blocky

Lime, offwhite-white, fnxln

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

Lime, crm-lt brn, fn-micro xln

Lime, crm-lt brn, fnxln

BKC 3550-1526

Shale, red-redish brn, soft blocky

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

Shale, red with lt red wash, soft mud

Lime, crm, fn-vfxln, no visible porosity

Shale, reddish brn, soft blocky, few red chert nodules

MARMATON MARKER 3591-1567

Lime, crm, fnxln, chert, bright orange, fresh

Lime, crm, fnxln, slightly dolomitic

Shale, red mud with sticky lime green shale clumps

CONGLOMERATE SAND 3622-1598

Sandy cemented conglomeritic sand and rubble mix with thin quartz sand len, show of lt gassy oil on crush, very lt odor, spotty lt staining, white clay cementing, lt dolomitic cement in part

Shale, reddish brn-dark brn, soft to moderately firm

Shale, red-med gray, with vari colored cherts

ARBUCKLE 3654-1630

Dolomite, ivory-crm, granular, NS, No Staining

Dolomite, ivory, granular

Dolomite, ivory, granular-fnxln in part, few chips of fresh, sharp chert

Dolomite, ivory, fnxln-granular

Dolomite, ivory, fnxln-granular, few chips with coarse rhombic dolomite xls.

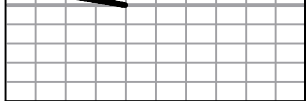
RTD 3700-1676 LTD 3700-1676

DST #1 3601' TO 3635' SEE HEADER FOR TEST SUMMARY

SLOPE 1 1/4 DEGREE @3635'

1ST PLUG @3635 W/ 50 SXS
 2ND PLUG @1215' W/50 SXS
 3RD PLUG @520' W/100 SXS
 4TH PLUG @275' W/50 SXS
 5TH PLUG @ 40' W/ 10 SXS
 RATHOLE W/ 30 SXS
 MOUSEHOLE W/ 15 SXS

ORDERED 305 SXS 60/40
 POS 4% GEL, 1/4# FLOCELE
 PER SX



3/00

