

**OPERATOR**

Company: Murfin Drilling Company  
 Address: 250 N. Water  
 Suite 300  
 Wichita, KS 67202  
 Contact Geologist: Shauna Gunzelman  
 Contact Phone Nbr: 316-267-3241  
 Well Name: Schmidt - Vap #2-26  
 Location: Sec. 26 - T4S - R31W  
 API: 15-153-21119-0000  
 Pool: State: Kansas  
 Field: un-named  
 Country: USA



Scale 1:240 Imperial

Well Name: Schmidt - Vap #2-26  
 Surface Location: Sec. 26 - T4S - R31W  
 Bottom Location:  
 API: 15-153-21119-0000  
 License Number: 30606  
 Spud Date: 3/3/2015 Time: 1:00 PM  
 Region: Rawlins  
 Drilling Completed: 3/9/2015 Time: 7:15 AM  
 Surface Coordinates: 2310' FSL & 380' FWL  
 Bottom Hole Coordinates:  
 Ground Elevation: 2877.00ft  
 K.B. Elevation: 2882.00ft  
 Logged Interval: 3600.00ft To: 4450.00ft  
 Total Depth: 4450.00ft  
 Formation: Cherokee  
 Drilling Fluid Type: Chemical/Fresh Water Gel

**SURFACE CO-ORDINATES**

Well Type: Vertical  
 Longitude:  
 Latitude:  
 N/S Co-ord: 2310' FSL  
 E/W Co-ord: 380' FWL

**LOGGED BY**

***Keith Reavis***  
*Consulting Geologist*

Company: Keith Reavis, Inc.  
 Address: 3420 22nd Street  
 Great Bend, KS 67530

Phone Nbr: 620-617-4091  
 Logged By: KLG #136

Name: Keith Reavis

**CONTRACTOR**

Contractor: Murfin Drilling Company  
 Rig #: 7  
 Rig Type: mud rotary  
 Spud Date: 3/3/2015 Time: 1:00 PM  
 TD Date: 3/9/2015 Time: 7:15 AM  
 Rig Release: Time:

### ELEVATIONS

K.B. Elevation: 2882.00ft  
K.B. to Ground: 5.00ft

Ground Elevation: 2877.00ft

### NOTES

Due to positive drill stem tests and electrical log analysis, the operator elected to set and cement 5 1/2" production casing and further test several Lansing/KC zones through perforations and stimulation.

The samples were saved and will be available for review at the Kansas Geological Survey Well Sample Library located in Wichita, KS.

Respectfully submitted,  
Keith Reavis

## Murfin Drilling Company

### daily drilling report

DATE	7:00 AM DEPTH	REMARKS
03/05/2015		Geologists Keith Reavis on location @ 1315 hrs, 3545 ft., running bit trip, lost circ. At 1800 ft going in hole with button bit, get returns, finish trip in hole, resume drilling
03/06/2015	3908	drilling, Topeka, Oread, Heebner, Toronto, Lansing, show in Toronto, A & B warrants test, short trip, TOH w/bit, conduct and complete DST #1, successful test, TIH w/bit
03/07/2015	4010	resume drilling, show in F and G warrant test, TOH w/bit, conducting DST #2, complete DST #2, successful test, TIH w/bit, resume drilling
03/08/2015	4076	shows in H & J warrant test, TOH w/bit, in w/tools, conducting DST #3, complete DST #3, successful test, TIH w/bit, resume drilling, BKC, Marmaton
03/09/2015	4450	drilling ahead Pawnee, Cherokee, TD @ 0715 hrs, short trip, ctch, TOH for logs, conduct and complete logging operations, geologist off loc.1720 hrs

## Murfin Drilling Company

### well comparison sheet

DRILLING WELL					COMPARISON WELL				
MDC - Schmidt-Vap #2-26 2310' FSL' & 380' FWL Sec 26-T4S-R31W					MDC - Schmidt-Vap #1-26 1545' FSL & 880' FSL Sec 26-T4S-R31W				
2882 KB					2911 KB			Structural Relationship	
Formation	Sample	Sub-Sea	Log	Sub-Sea	Log	Sub-Sea	Sample	Log	
Topeka	3694	-812	3696	-814	3721	-810	-2	-4	
Heebner	3856	-974	3852	-970	3884	-973	-1	3	
Lansing	3908	-1026	3903	-1021	3937	-1026	0	5	
Stark	4076	-1194	4068	-1186	4103	-1192	-2	6	
BKC	4127	-1245	4124	-1242	4159	-1248	3	6	
Pawnee	4233	-1351	4230	-1348	4267	-1356	5	8	
Cherokee	4314	-1432	4311	-1429	4351	-1440	8	11	
Mississippian	4424	-1542	4424	-1542	4474	-1563	21	21	
Total Depth	4450	-1568	4452	-1570	4542	-1631	63	61	

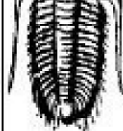
### Drill Stem Test #1



### DRILL STEM TEST REPORT

Murfin Drilling CO INC

26 4S 31W Rawlins KS



ESTING, INC

250 N Water STE 300  
Wichita KS 67202

ATTN: Keith Reavis

Schmidt Vap 2-26

Job Ticket: 60818

DST#: 1

Test Start: 2015.03.06 @ 13:55:00

GENERAL INFORMATION:

Formation: Toronto---LKC "B"

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 16:03:30

Time Test Ended: 22:40:00

Test Type: Conventional Bottom Hole (Initial)

Tester: Robert Zodrow

Unit No: 66

Interval: 3856.00 ft (KB) To 3942.00 ft (KB) (TVD)

Total Depth: 3942.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches -hole Condition: Fair

Reference Elevations: 2882.00 ft (KB)

2877.00 ft (CF)

KB to GR/CF: 5.00 ft

Serial #: 8959

Inside

Press@RunDepth: 864.53 psig @ 3857.00 ft (KB)

Start Date: 2015.03.06

End Date: 2015.03.06

Start Time: 13:55:05

End Time: 22:40:00

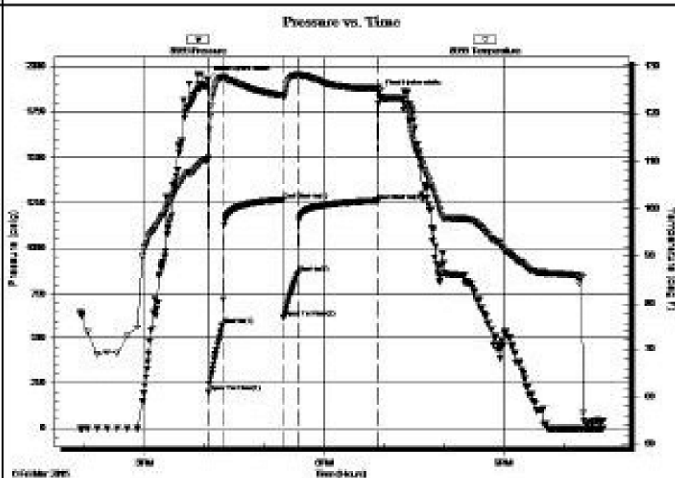
Capacity: 8000.00 psig

Last Calib.: 2015.03.06

Time On Btm: 2015.03.06 @ 16:03:00

Time Off Btm: 2015.03.06 @ 18:55:00

TEST COMMENT: 15-F- Bob in 1 min  
60-IS- Return built to weak surface blow  
15-FF- Bob in 2 mins  
60-FSI- Return built to 1/2'



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1927.92	110.33	Initial Hydro-static
1	199.60	110.81	Open To Flow (1)
15	581.69	127.70	Shut-In (1)
76	1266.30	123.88	End Shut-In (1)
76	620.10	123.45	Open To Flow (2)
91	864.53	126.13	Shut-In (2)
171	1262.70	125.20	End Shut-In (2)
172	1855.76	124.97	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
1115.00	GOCW 15%G 15%O 70%W	14.50
500.00	GOCWM 7%G 10%O 35%W 48%M	7.31
30.00	WMCO 5%W 10%M 85%O	0.44

Gas Rates

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

Drill Stem Test #2



TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

Murfin Drilling CO INC

26 4S 31W Rawlins KS

250 N Water STE 300  
Wichita KS 67202

Schmidt Vap 2-26

Job Ticket: 60819

DST#: 2

ATTN: Keith Reavis

Test Start: 2015.03.07 @ 08:50:00

GENERAL INFORMATION:

Formation: LKC "F-G"

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 10:52:00

Time Test Ended: 17:17:30

Test Type: Conventional Bottom Hole (Reset)

Tester: Robert Zodrow

Unit No: 66

Interval: 3962.00 ft (KB) To 4010.00 ft (KB) (TVD)  
 Total Depth: 4010.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches -hole Condition: Fair

Reference Elevations: 2862.00 ft (KB)  
 2877.00 ft (CF)  
 KB to GR/CF: 5.00 ft

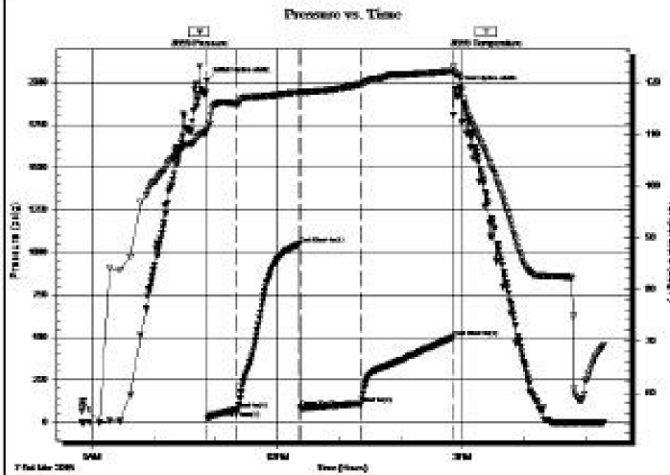
Serial #: 8959

Inside

Press@RunDepth: 110.86 psig @ 3963.00 ft (KB)  
 Start Date: 2015.03.07 End Date: 2015.03.07  
 Start Time: 08:50:05 End Time: 17:17:29

Capacity: 8000.00 psig  
 Last Calib.: 2015.03.07  
 Time On Btm: 2015.03.07 @ 10:51:30  
 Time Off Btm: 2015.03.07 @ 14:52:30

TEST COMMENT: 30-F- Bob in 15 mins  
 60-IS- Return built to 1/2"  
 60-FF- Bob in 16 mins  
 90-FS- Return built to 2"



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2009.97	110.63	Initial Hydro-static
1	25.07	111.09	Open To Flow(1)
30	77.65	115.82	Shut-In(1)
90	1046.98	117.99	End Shut-In(1)
91	67.35	117.86	Open To Flow(2)
150	110.86	119.57	Shut-In(2)
240	500.20	122.13	End Shut-In(2)
241	1957.18	121.92	Final Hydro-static

Recovery


Length (ft)	Description	Volume (bbl)
220.00	GMCO 15%G 25%M 60%O	1.41
30.00	GO 10%G 90%O	0.44
0.00	GIP 300'	0.00

Gas Rates

	Choke (Inches)	Pressure (psig)	Gas Rate (M dfl)

\* Recovery from multiple tests

Drill Stem Test #3



**TRILOBITE TESTING, INC.**

Murfin Drilling CO INC  
 250 N Water STE 300  
 Wichita KS 67202  
 ATTN: Keith Reavis

**DRILL STEM TEST REPORT**

26 4S 31W Rawlins KS  
 Schmidt Vap 2-26  
 Job Ticket: 60620 DST#:3  
 Test Start: 2015.03.08 @ 04:15:00

GENERAL INFORMATION:

Formation: LKC "H-J"  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 06:41:00  
 Time Test Ended: 11:53:00

Test Type: Conventional Bottom Hole (Reset)  
 Tester: Robert Zodrow  
 Unit No: 66

Interval: 4004.00 ft (KB) To 4076.00 ft (KB) (TVD)  
 Total Depth: 4076.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches -hole Condition: Fair

Reference Elevations: 2862.00 ft (KB)  
 2877.00 ft (CF)  
 KB to GR/CF: 5.00 ft

Serial #: 8959

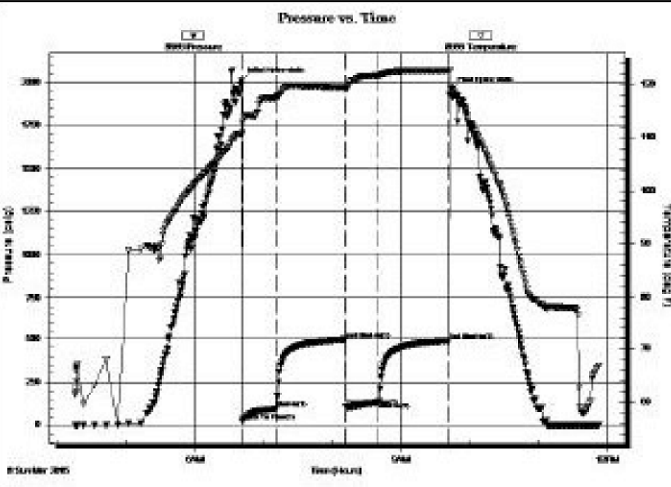
Inside

Press@RunDepth: 135.35 psig @ 4005.00 ft (KB)  
 Start Date: 2015.03.08 End Date: 2015.03.08  
 Start Time: 04:15:05 End Time: 11:52:59

Capacity: 8000.00 psig  
 Last Calib.: 2015.03.08  
 Time On Btm: 2015.03.08 @ 06:40:30  
 Time Off Btm: 2015.03.08 @ 09:43:30

TEST COMMENT: 30-F- Blow built to 3"

TEST COMMENT: 60-FSI- No return  
 30-FF-Blow built to 1/4"  
 60-FSI- No return



**PRESSURE SUMMARY**

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2007.69	110.47	Initial Hydro-static
1	24.54	110.85	Open To Flow(1)
30	95.64	117.45	Shut-In(1)
91	497.66	119.35	End Shut-In(1)
91	109.04	118.90	Open To Flow(2)
120	135.35	121.64	Shut-In(2)
181	491.44	122.55	End Shut-In(2)
183	1957.50	119.58	Final Hydro-static

**Recovery**

Length (ft)	Description	Volume (bbl)
250.00	GMCO 20%G 30%M 50%O	1.85
70.00	GO 10%G 90%O	1.02
0.00	GIP 200'	0.00

\* Recovery from multiple tests

**Gas Rates**

	Choke (Inches)	Pressure (psig)	Gas Rate (Mcf/D)

**ROCK TYPES**

Cht	Lmst fw<7	Carbon Sh	Ss
Cht vari	shale, grn	shale, red	Siltst
sdy lmst	shale, gry	Shcol	

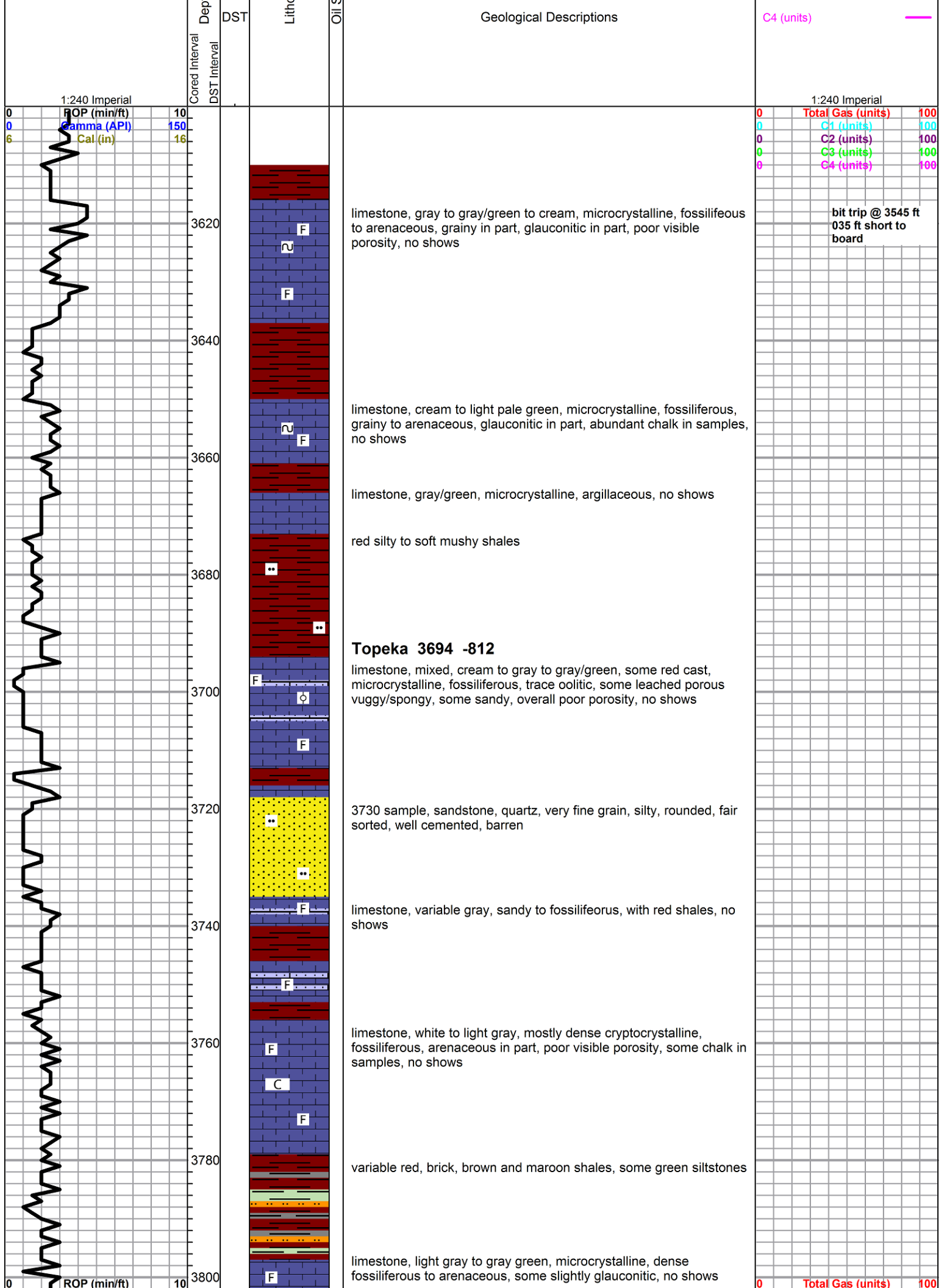
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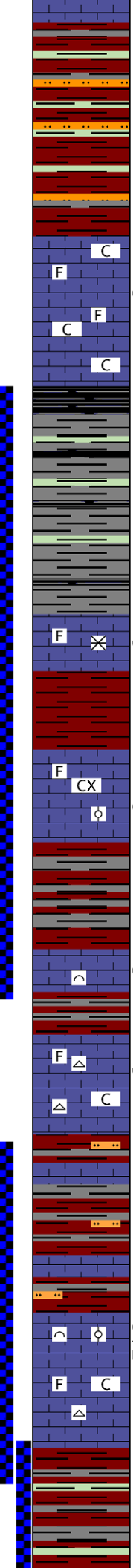
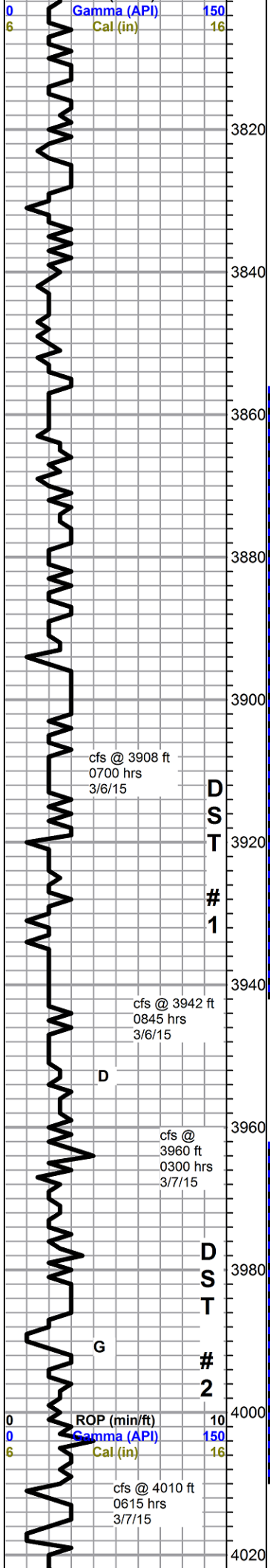
<p><b>MINERAL</b></p> <ul style="list-style-type: none"> <li>▲ Chert, dark</li> <li>∩ Glauconite</li> <li>× Mineral Crystals</li> <li>• Silty</li> <li>△ Chert White</li> </ul>	<p><b>FOSSIL</b></p> <ul style="list-style-type: none"> <li>∩ Bioclastic or Fragments</li> <li>F Fossils &lt; 20%</li> <li>∅ Oolite</li> <li>∅ Pellets</li> </ul>	<p><b>STRINGER</b></p> <ul style="list-style-type: none"> <li>••• Sandstone</li> <li>••• Siltstone</li> </ul>	<p><b>TEXTURE</b></p> <ul style="list-style-type: none"> <li>C Chalky</li> <li>CX Cryptocrystalline</li> <li>L Lithogr</li> </ul>
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**OTHER SYMBOLS**

<p><b>MISC</b></p> <ul style="list-style-type: none"> <li> Daily Report</li> <li> Digital Photo</li> <li> Document</li> <li> Folder</li> <li> Link</li> <li> Vertical Log File</li> <li> Horizontal Log File</li> <li> Core Log File</li> <li> Drill Cuttings Rpt</li> </ul>	<p><b>Oil Show</b></p> <ul style="list-style-type: none"> <li>● Good Show</li> <li>● Fair Show</li> <li>● Poor Show</li> <li>○ Spotted or Trace</li> <li>○ Questionable Stn</li> <li>D Dead Oil Stn</li> <li>■ Fluorescence</li> <li>* Gas</li> </ul>	<p><b>DST</b></p> <ul style="list-style-type: none"> <li> DST Int</li> <li> DST alt</li> <li> Core</li> <li> tail pipe</li> </ul>
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Curve Track #1								
ROP (min/ft)		th   Intervals	ology	Show	TG, C1 - C5			
Gamma (API)					Total Gas (units)			
Cal (in)					C1 (units)			
					C2 (units)			
					C3 (units)			





**Oread**

limestone, cream to light gray, microcrystalline, fossiliferous, some vuggy, trace pyritic, scattered spotty to slight saturated stain, streaming sheen in tray, slight show free oil as warms in tray, no odor, fair fluorescence, fair slow streaming cut, flood chalk in lower portion

**Heebner 3856 -974**

abundant black carbonaceous shale with gray and green

**Toronto**

limestone, white to gray, microcrystalline, slightly fossiliferous, fair surface etching, to pinpoint porosity and small solution vugs, some secondary calcite xtals, fair black to brown staining, good streaming sheen, slight show bleeding free oil, faint to fair odor, fair fluorescence, good slow streaming cut

flood red sticky shale in 3908 sample

**Lansing 3908 -1026**

limestone, light gray, cryptocrystalline, slightly fossiliferous, trace oolitic, large wormy stained solution vug, crystal lined, some slight oil bleeding, some white weathered chalky limestone, small solution vugs, fair stain, good streaming sheen in tray, slight show free oil, faint odor in cup, good odor under lamp, fair fluorescence, good white milky cut

Murfin Schmidt Vap 2-26 dst 1.pdf

limestone, light gray to gray, grainy bioclastic, some good pinpoint interclast porosity, dark brown to black mostly saturated stain, sheen in tray, slight bleeding, faint odor, faint fluorescence, milky slow cut

limestone, light gray, cryptocrystalline, slight re-crystallized fossiliferous, cherty, some scattered stained solution vugs, light gray chalky fossiliferous limestone, light gray cherts with black speckles, sheen in tray, no free oil, no odor, poor fluorescence, very slight cut

mostly red soft shales, with limestone a.a. some scattered siltstones and glauconitic dirty greenish sandstones, abundant chert a.a., few scattered pieces of white to gray chalky limestone with slight staining, some sheen in tray, (sluff from above?), no free oil or odor

Murfin Schmidt Vap 2-26 dst 2.pdf

limestone, light gray, bioclastic to sub-oolitic, good interclast porosity with some fair framework, light brown stain, gassy, bleeding some oil, good show oil on break, no odor, poor fluorescence, good cut, grades to white to light gray limestone, mostly cryptocrystalline, slightly fossiliferous, dense to chalky, trace white chert, abundant chalk

0	C1 (units)	100
0	C2 (units)	100
0	C3 (units)	100
0	C4 (units)	100

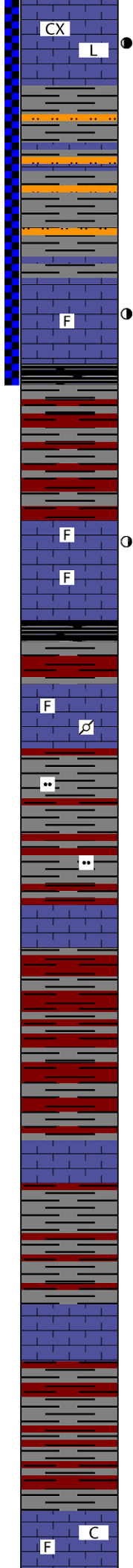
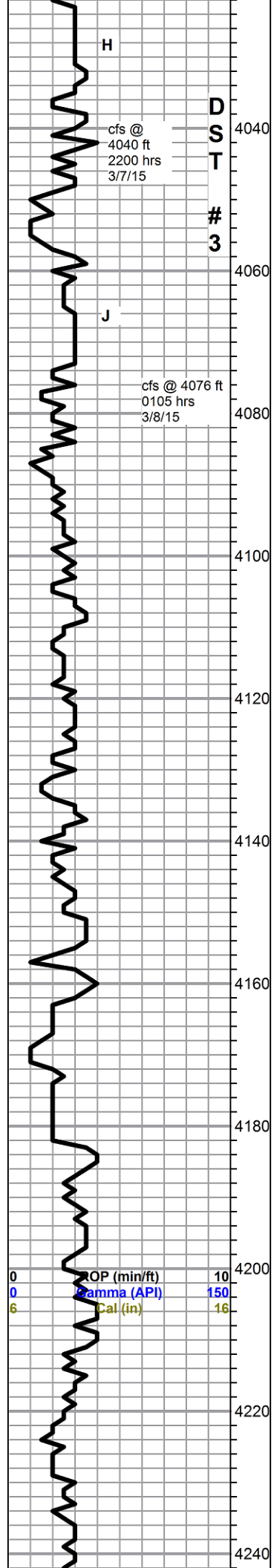
0	Total Gas (units)	100
0	C1 (units)	100
0	C2 (units)	100
0	C3 (units)	100
0	C4 (units)	100

Morgan Mud chk @ 3942 ft.		
1110 hrs.	3/6/15	
Vis.	71 Wt. 9.0	
PV	28 YP 25	
WL	5.2	
Cake	2/32,	
pH	10.0	
CHL	1600 ppm	
Ca	10 ppm	
Sol	5.0 LCM 8#	
DMC	\$2772.00	
CMC	\$18893.00	

Morgan Mud chk @ 4010 ft.		
0805 hrs.	3/7/15	
Vis.	65 Wt. 9.1	



limestone, white, cryptocrystalline, mostly smooth compact lithographic, some recrystallized fossiliferous, with some stained surface etching and small wormy stained solution vugs, bleeding some gassy free oil, good sheen in tray, fair odor in wet cup, no fluorescence, good but slow streaming cut - grades to light gray microcrystalline fossiliferous, slightly grainy, no show

mostly gray shale and silty shale and siltstone, with upper stringer of brown microcrystalline limestone, fossiliferous, then lower stringer of light and dark gray mottled fossiliferous, chalky, large clasts, no shows

Murfin Schmidt Vap 2-26 dst 3.pdf

limestone, light gray to tan, microcrystalline, fossiliferous, some recrystallized, some fair interclast porosity, fair light staining, good streaming sheen in tray, slight show oil on break, no odor, fair even fluorescence, poor cut

**Stark Shale 4076 -1194**

limestone, white to light gray and pale green, microcrystalline, fossiliferous, chalky in part, found couple specimens with slight etching and light stain, scaley sheen of oil on break, no odor, poor cut, otherwise barren, some chalk

limestones a.a., with some gray grainy sub-pelletal, pyritic, no shows

**Base KC 4127 -1245**

soft gray silty shales, some red and olive

limestone, gray to gray green, grainy to arenaceous, some lithographic, dense, no shows

shales, mixed, mostly soft red

limestone, white to gray, micorcrystalline, grainy fossiliferous, poor visible porosity, some chalky, no shows

limestone a.a. with some soft very chalky amorphous limestone

shale, red, gray, brown and lavender

**Pawnee 4233 -1351**

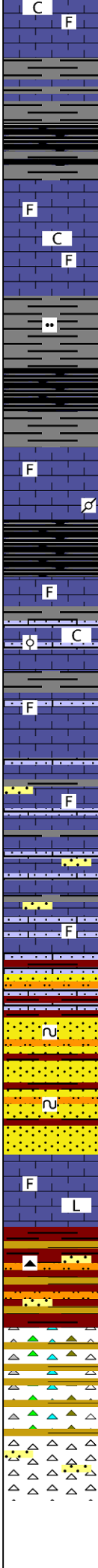
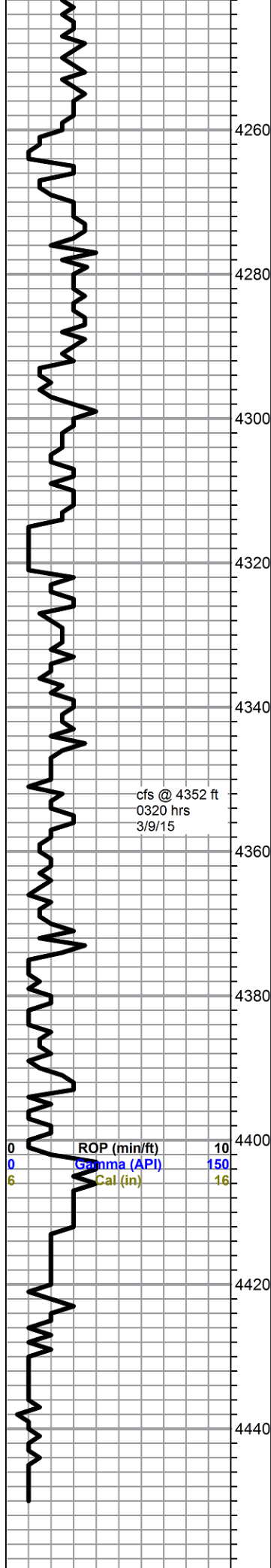
limestone, white to cream, microcrystalline, fossiliferous, poor visible porosity, fairly dense, no shows, abundant chalk

PV 21 YP 24  
 WL 6.0  
 Cake 2/32,  
 pH 9.5  
 CHL 2100 ppm  
 Ca 10 ppm  
 Sol 5.7 LCM 7#  
 DMC \$0.00  
 CMC \$18893.00

Morgan Mud chk  
 @ 4076 ft.  
 1155 hrs. 3/8/15  
 Vis. 52 Wt. 9.1  
 PV 17 YP 18  
 WL 6.0  
 Cake 2/32,  
 pH 9.5  
 CHL 2400 ppm  
 Ca 10 ppm  
 Sol 5.7 LCM 9#  
 DMC \$1614.00  
 CMC \$20507.00

0	Total Gas (units)	100
0	C1 (units)	100
0	C2 (units)	100
0	C3 (units)	100
0	C4 (units)	100





4270 sample, limestone a.a. with abundant soft gray silty shale

4280 sample, flood black shales

limestone, white to cream and light gray, micro-cryptocrystalline, fossiliferous, some grainy and chalky, poor visible porosity, no shows, very faint fluorescence

shale, black carbonaceous with abundant light gray silty shale

limestone, cream to gray, mostly cryptocrystalline, fossiliferous, some pelletal, trace white grainy bioclastic, no shows

**Cherokee 4314 -1432**  
black/brown carbonaceous shale

limestone, mixed, cream to gray, micor-cryptocrystalline, fossiliferous, oolitic, dense to chalky, poor visible porosity, no shows

4350 sample, a.a., influx gray to cream argillaceous limestones, no shows

cfs sample - a.a. with influx limestone, red cast, sandy with quartz/arkose., found 1 piece limestone from above with slight black dead stain, no other shows noted

4360-80 sample, mixed limestones a.a., predominantly white to cream dense fossiliferous limestone, scattered variable sandstones, very little shale in samples

4390 sample, a.a. with slight influx red shale and increase in red-cast sandy/arkosic limestone a.a.

4400 red arkosic and quartz sandstones, fine grain, round to sub-round, poorly sorted, glauconitic, well cemented, abundant red clays and siltstones, some yellow chert and ochre

some large qtz grains

limestone, white to cream and gray, cryptocrystalline, fossiliferous, some lithographic, dense, no shows

shaley conglomerate, red and yellow, some yellow chert, trashy red sandstones, red siltstone, heavy red wash in samples

**Mississippian 4424 -1542**  
grades to chert, yellow, shale and ochre, yellow, with white fossiliferous cherts

30 min cfs sample, cherts white to yellow cast and tan, fossiliferous to white sub-tripolitic, some scattered sandstone, white, quartz, very fine grain, well rounded, well sorted, friable, no shows - 60 min, a.a. w/flood reddish fine grain sandstone

rotary TD @ 4450 ft - 0715 hrs 3/9/15  
Pioneer Log TD 4452 ft

0	Total Gas (units)	100
0	C1 (units)	100
0	C2 (units)	100
0	C3 (units)	100
0	C4 (units)	100

Morgan Mud chk  
@ 4455 ft.  
3/9/15  
DMC \$2616.00  
CMC \$23123.00

deviation survey 1 deg