



Musgrove

PETROLEUM CORPORATION
Clayton, Kansas

NOTES

Company: Palmer Oil, Inc.

Lease: Willis #23-8

Field: Willis

Location: NE-SW-SW-SE (335' FSL & 2300' FEL)

Sec: 23 Twsp: 32S Rge: 37W

County: Stevens State: Kansas

KB: 3123' GL: 3110'

API #: 15-189-22833-00-00

Contractor: Duke Drilling Inc. (Rig #9)

Spud: 2/14/2014 Comp: 2/23/2014

RTD: 6500' LTD: 6499'

Mud Up: 4500' Type Mud: Chemical

Samples Saved From: 4600' to RTD

Drilling Time Kept From: 4100' to RTD

Samples Examined From: 4600' to RTD

Geological Supervision from: 4600' to RTD

Geologist on Well: Wyatt Urban

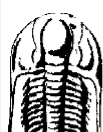
Surface Casing: 8 5/8@1743'

Electronic Surveys: Logged by Pioneer Energy Services, DIL, CNL/CDL, MEL

Palmer Oil, Inc.

well comparison sheet

Formation	DRILLING WELL				COMPARISON WELL				COMPARISON WELL			
	Sample	Sub-Sea	Log	Sub-Sea	Log	Sub-Sea	Sample	Log	Log	Sub-Sea	Sample	Log
	Palmer Oil-Willis 23-8 NE SW SE 23-32-37W 3123 KB				Palmer Oil, Inc- Willis 23-7 SE NW NW SE 23-32S-37W 3117 KB				EOG Resources- Willis 23-3 SE SE SE 23-32S-37W 3109 KB			
					Structural Relationship				Structural Relationship			
B. Heebner	4150	-1027			4133	-1016	11		4133	-1016	-11	
Lansing	4255	-1132			4251	-1134	-2		4251	-1142	10	
Marmaton	4932	-1809	4912	-1789	4916	-1799	-10	10	4916	-1799	-10	10
Cherokee	5129	-2006	5111	-1988	5117	-2000	-6	12	5117	-2000	-6	12
Atoka	5525	-2402	5529	-2406	5523	-2406	4	0	5523	-2406	4	0
Morrow	5629	-2506	5628	-2505	5622	-2505	-1	0	5622	-2505	-1	0
St. Gen.	6174	-3051	6169	-3046	6172	-3055	4	9				
St. Louis	6292	-3169	6294	-3171	6297	-3180	11	9				
St. Louis B	6368	-3245	6365	-3242	6347	-3230	-15	-12				
RTD	6500	-3377	6500	-3377	6500	-3383	6	6				
LTD	6499	-3376	6499	-3376	6506	-3389	13	13				



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Palmer Oil Inc

23-32-37 Stevens, Ks

3118 N Cummings Rd
Garden City, Ks

Willis #23-8



Garden City, KS
67846
ATTN: Wyatt Urban

Job Ticket: 56284
DST#: 1
Test Start: 2014.02.22 @ 12:25:05

GENERAL INFORMATION:

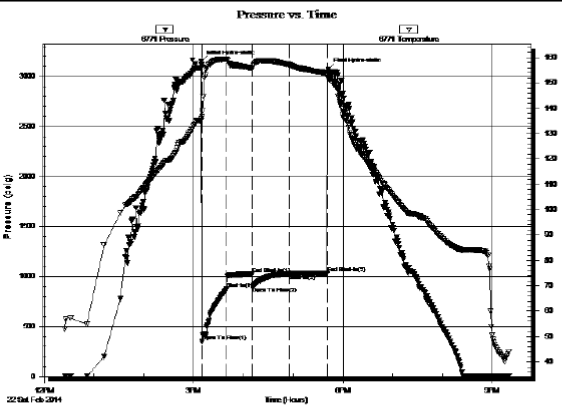
Formation: **St Louis**
 Deviated: No Whipstock: 0.00 ft (KB)
 Time Tool Opened: 15:10:05
 Time Test Ended: 21:50:35
 Interval: **6325.00 ft (KB) To 6385.00 ft (KB) (TVD)**
 Total Depth: 6385.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches-Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Initial)
 Tester: Shane McBride
 Unit No: 55
 Reference Elevations: 3122.00 ft (KB)
 3110.00 ft (CF)
 KB to GR/CF: 12.00 ft

Serial #: 6771

Inside

Press@RunDepth: 1027.79 psig @ 6326.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2014.02.22 End Date: 2014.02.22 Last Calib.: 2014.02.22
 Start Time: 12:25:05 End Time: 21:19:35 Time On Btm: 2014.02.22 @ 15:09:20
 Time Off Btm: 2014.02.22 @ 17:42:05

TEST COMMENT: 12' of fill on bottom . B.O.B. in 2 min.
 No return
 B.O.B. in 6 1/2 min.
 No return



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	3149.75	135.79	Initial Hydro-static
1	350.62	136.81	Open To Flow (1)
31	872.33	159.33	Shut-In(1)
62	1026.59	155.79	End Shut-In(1)
62	898.82	155.76	Open To Flow (2)
106	1027.79	157.21	Shut-In(2)
152	1032.57	153.91	End Shut-In(2)
153	3069.18	152.16	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
1449.00	water 100%w	18.61
378.00	s m c w 15%m 85%w	5.30
315.00	m c w 40%m 60%w	4.42

Gas Rates

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

ROCK TYPES

sdymst Lmst fw> Carbon Sh
 Lmst fw<7 shale, gry

ACCESSORIES

FOSSIL

⊕ Oolite

OTHER SYMBOLS

Oil Show

- Good Show
- Fair Show
- Poor Show
- Spotted or Trace
- Questionable Strn
- D Dead Oil Strn
- Fluorescence
- * Gas

DST

- DST Int
- DST alt
- Core
- || tail pipe

Curve Track #1	Intervals	log	HOW	TG, C1 - C5
ROP (min/ft)				Total Gas (units)
Gamma (API)				C1 (units)
Cal (in)				C2 (units)
				C3 (units)

Depth
Cored Interval
DST Interval

DST

Lithol

O/S

Geological Descriptions

C4 (units)

—

1:240 Imperial

ROP (min/ft)
Gamma (API)
Cal (in)

1:240 Imperial

ROP (min/ft)
Gamma (API)
Cal (in)

1:240 Imperial

ROP (min/ft)
Gamma (API)
Cal (in)

1:240 Imperial

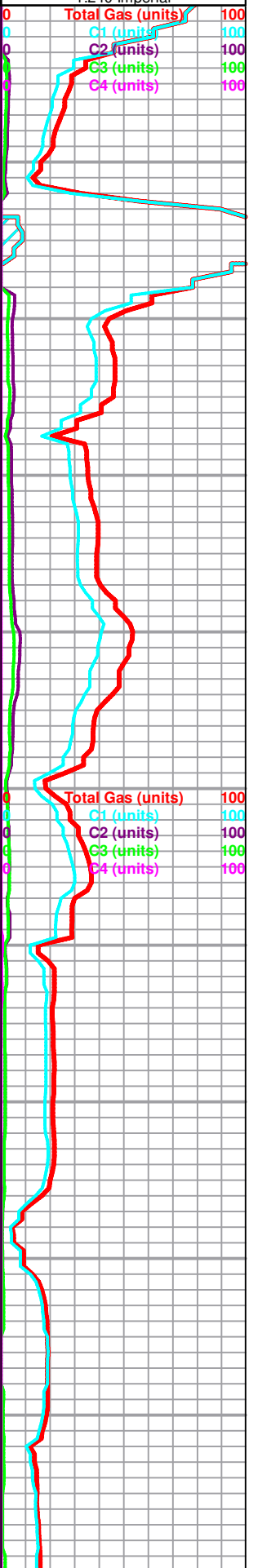
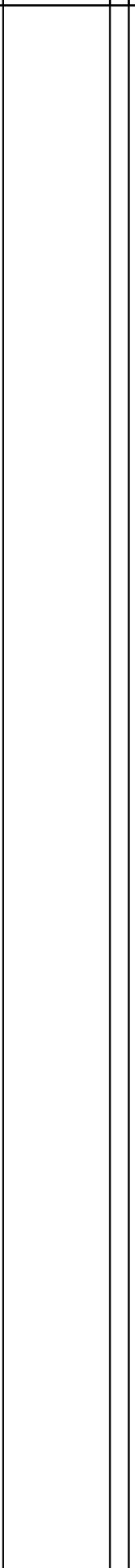
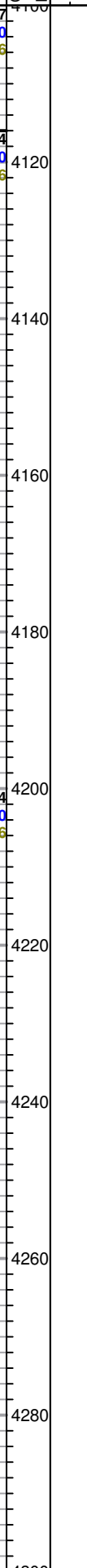
Total Gas (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)

1:240 Imperial

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

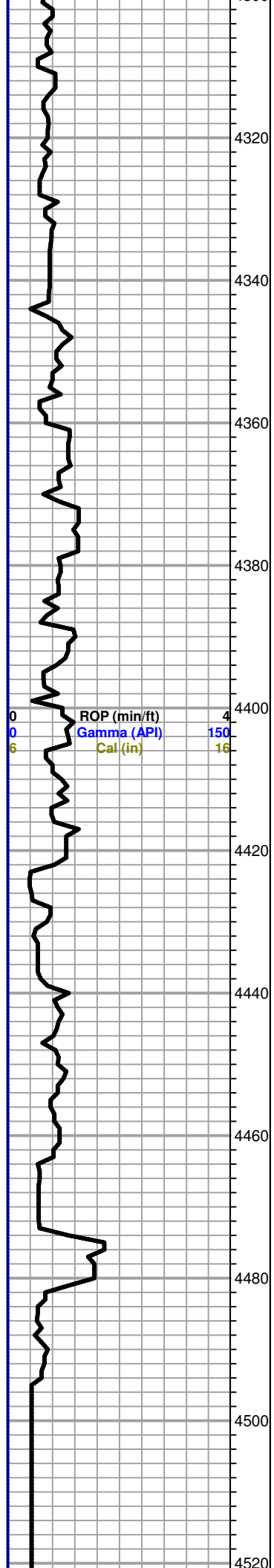
B. Heebner 4150 (-1027)

Lansing 4255 (-1132)

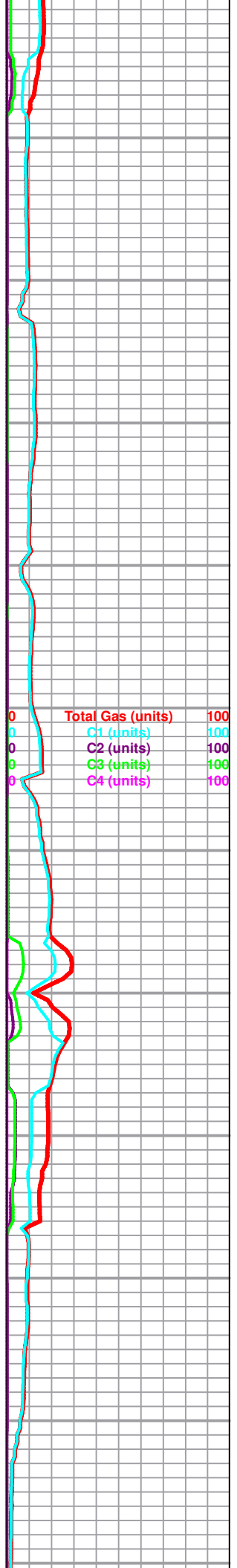


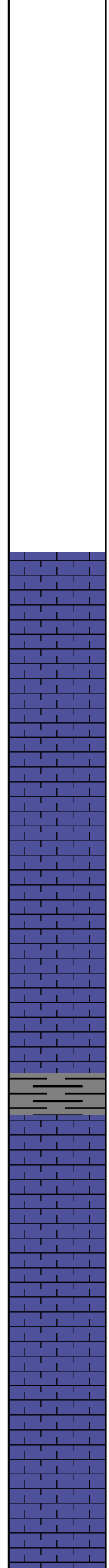
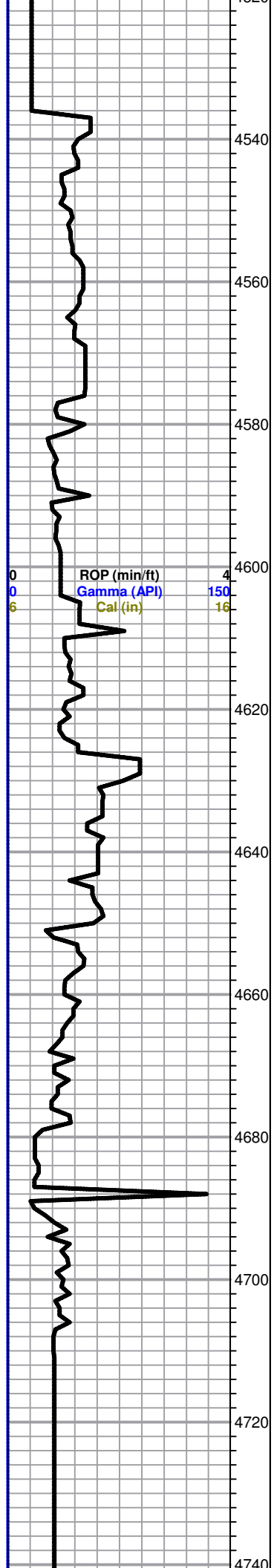
4320
4340
4360
4380
4400
4420
4440
4460
4480
4500
4520

ROP (min/ft) 4
Gamma (API) 150
Cal (in) 16



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





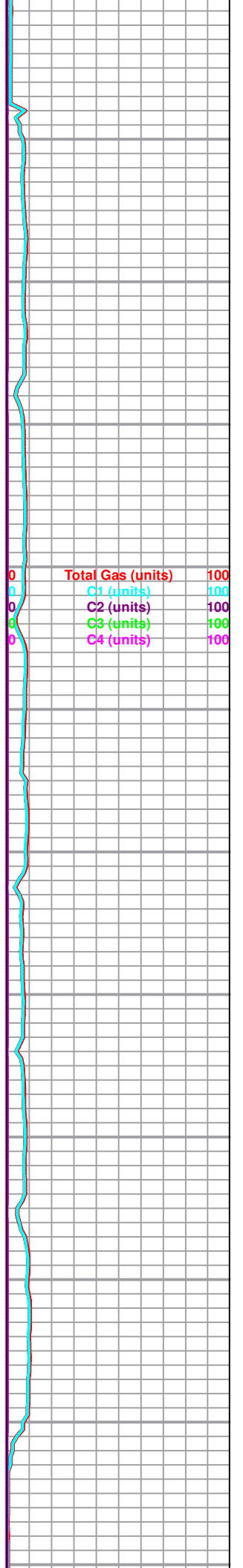
LS, tan to cream, mottled, FXL, chalky in parts, trace Sh. black, gray, silty

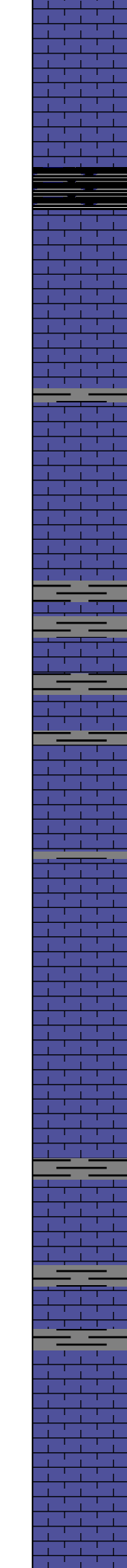
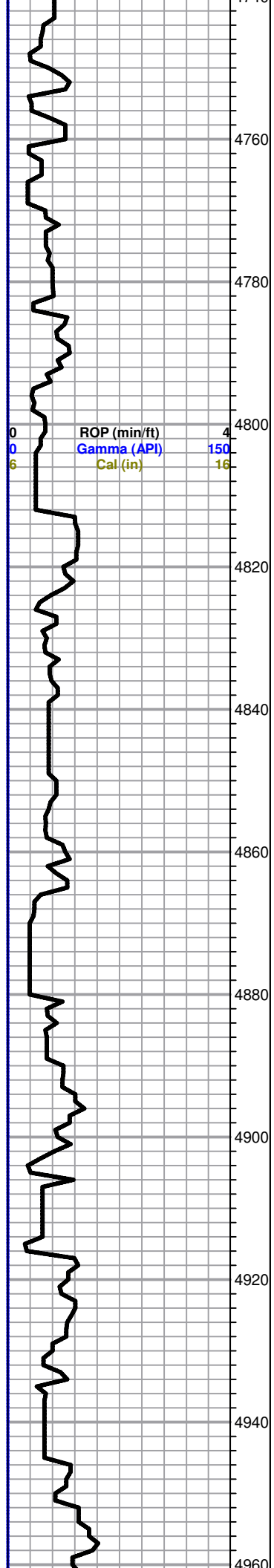
LS, tan to brown, FXL, poor visible porosity, dense, few foss, no shows

Sh. gray, black

LS, cream, FXL, chalky, poor visible porosity, few foss in parts, no shows

LS, cream to tan, mottled, FXL, dense, cherty in parts, few foss, poor visible porosity, no shows





Black carb shale

LS, cream to tan, FXL, dense, poor scattered porosity, trace Sh, black carb, maroon, gray, silty

Sh. gray, greenish, maroon, trace LS, cream to tan, mottled, FXI, dense, poor scattered porosity, no shows

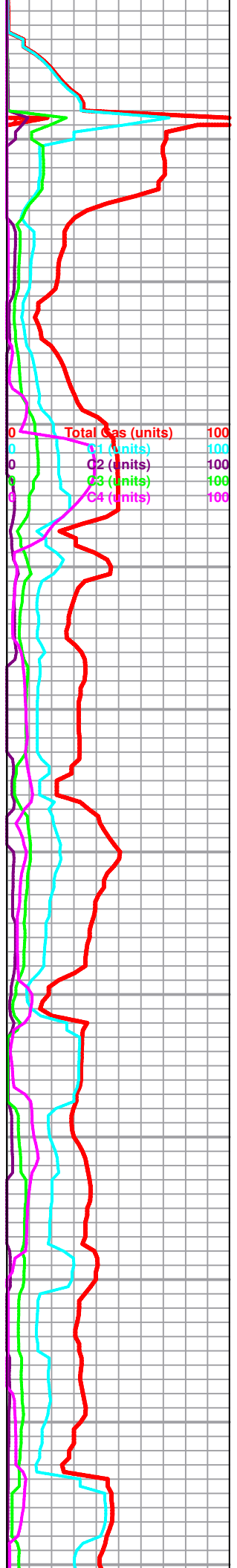
LS, cream chalky, few foss, poor scattered porosity, dense, cherty in parts, no shows

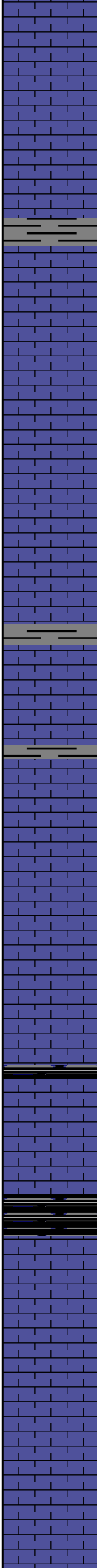
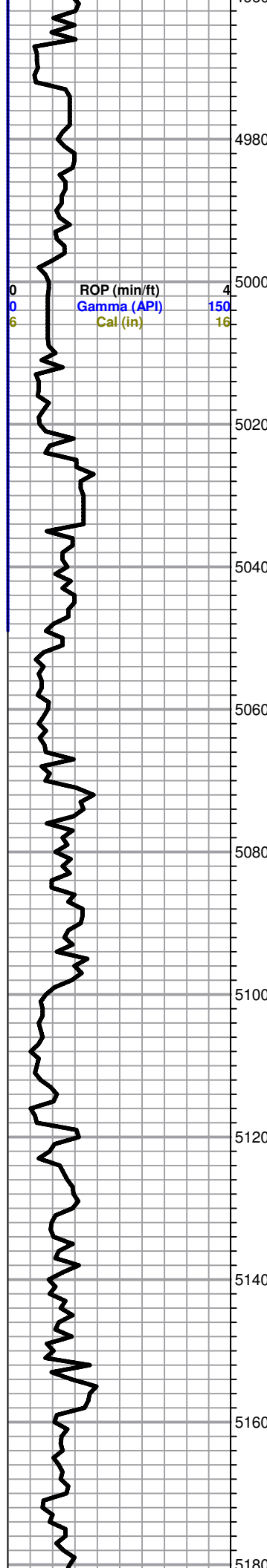
LS, cream to tan, FXL, dense, no visible porosity, cherty, no shows

LS, brown, FXL, dense, cherty, no shows,

Marmaton 4932 (-1809)

LS, cream to tan, FXL, dense, chalky in parts, trace gray shale





LS, brown, FXL, dense, cherty, poor scattered porosity, trace maroon shale, trace pyrite

LS, cream to white, ool poorly developed, poor scattered porosity, chalky

LS, brown to tan, FXL, cherty, dense, no visible porosity, no shows, Trc Sh. gray, silty

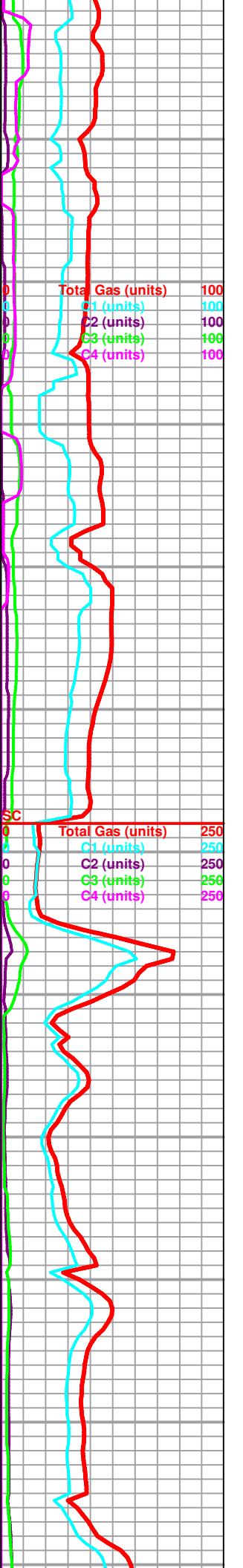
LS, brown to tan, FXL, cherty, poor scattered porosity, no shows

LS, brown, FXL, dense, poor visible porosity, no shows

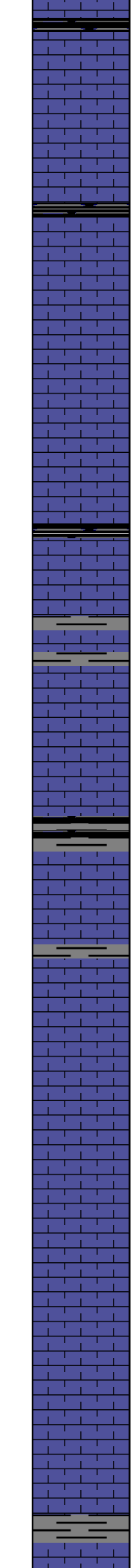
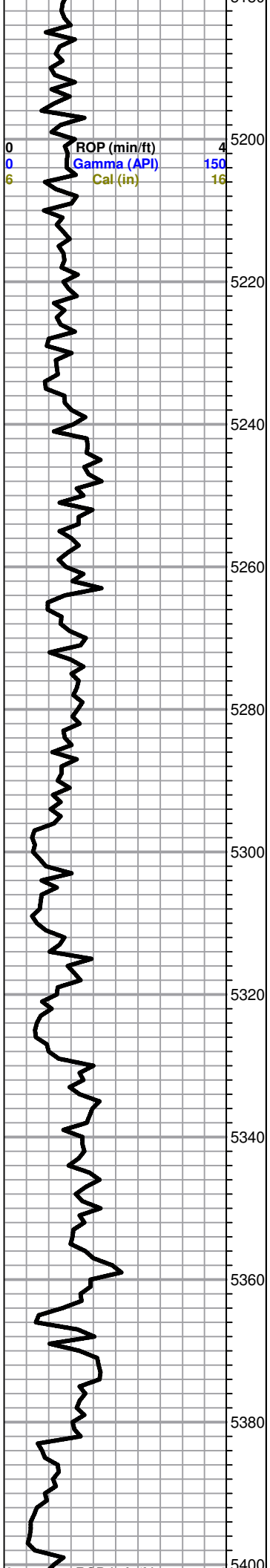
Cherokee 5129 (-2006)

Black carb Sh.

LS, tan to brown, FXL, dense, poor visible porosity, few foss, no shows



SC



LS, brown, FXL, dense, poor visible porosity, cherty in parts, no shows

LS, brown to gray, FXL, dense, no shows, trace ool, chert, opaque, no shows

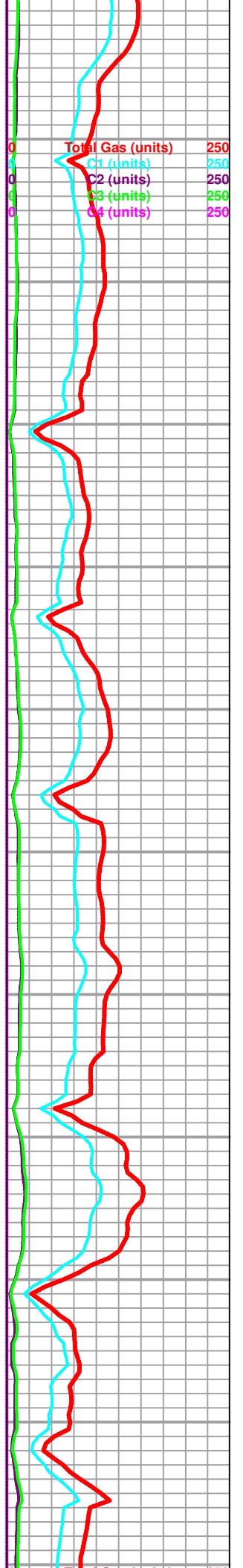
LS, gray, FXL, cherty, poor visible porosity, no shows

Sh. gray, maroon, silty

Sh. black to gray, slity

LS, tan to brown, mottled, FXL, poor visible porosity, dense, no shows

LS, gray, FXL, dense, cherty, no visible porosity, no shows



C1 (units) 250

C2 (units) 250

C3 (units) 250

C4 (units) 250

5200

5220

5240

5260

5280

5300

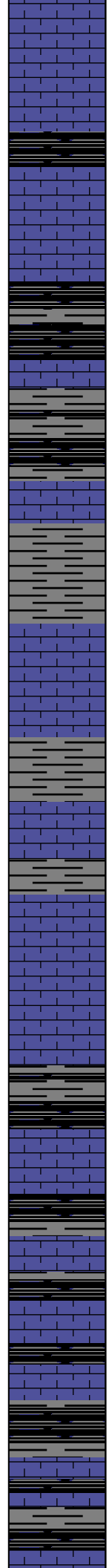
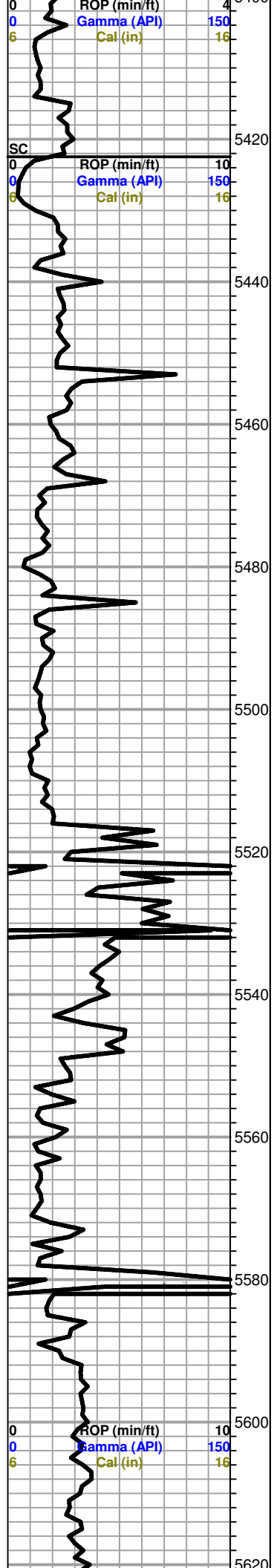
5320

5340

5360

5380

5400



LS, gray, FXL, cherty, no shows, trace gray sh.

Black carb Sh.

Black carb Sh.

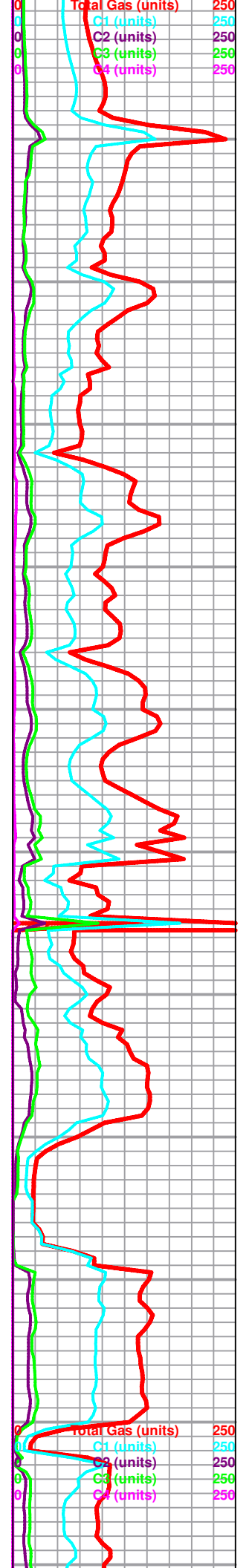
Sh. gray, silty

Sh. A/A, trace LS, brown, FXL, cherty, no visible porosity, dense, no shows

Atoka 5525 (-2402)

Sh. gray, silty, trace black carb

Black carb Sh.



Morrow 5629 (-2506)

Black carb Sh.

Sh. gray, silty, trace black carb sh.

Sh. black carb

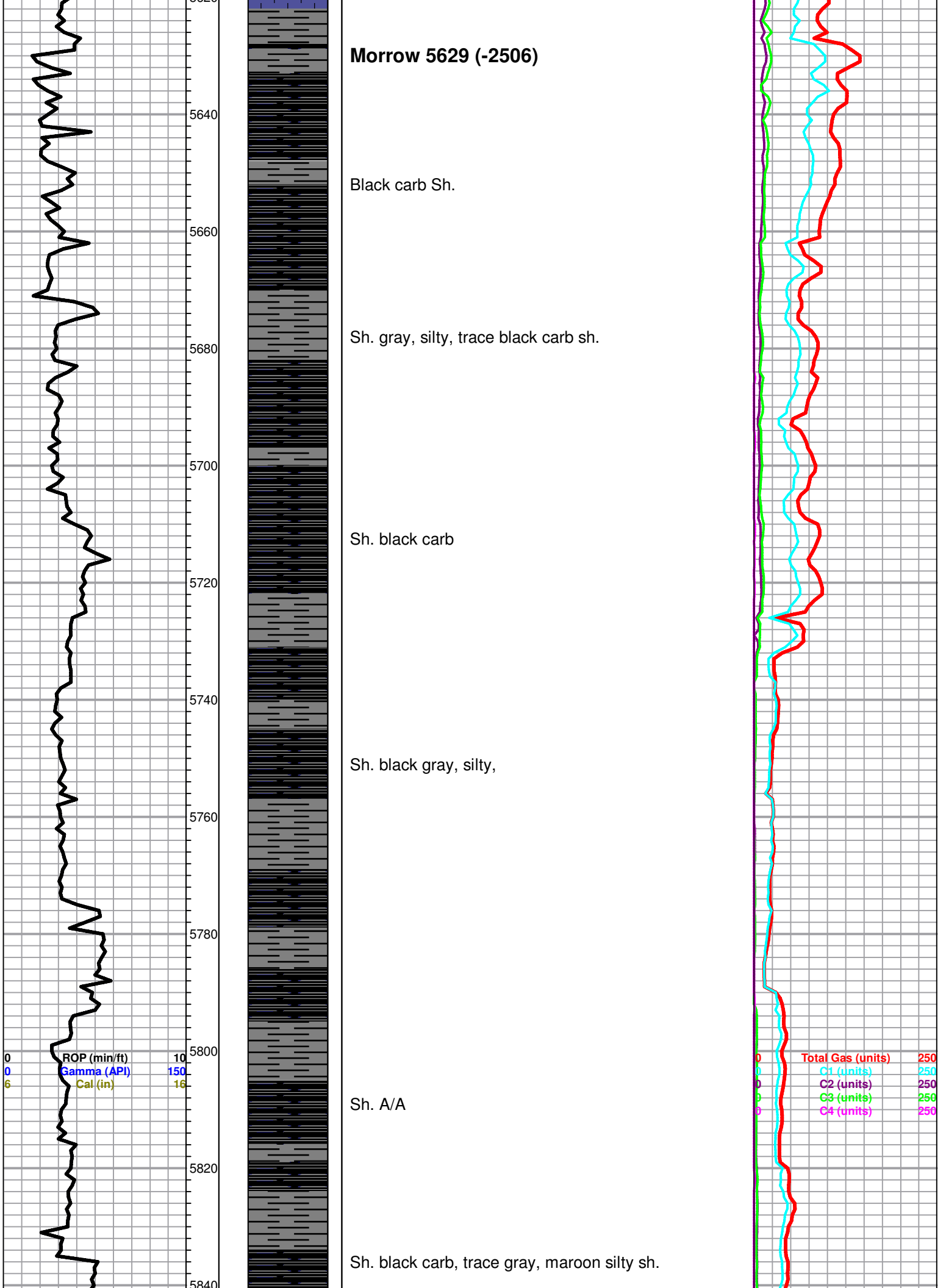
Sh. black gray, silty,

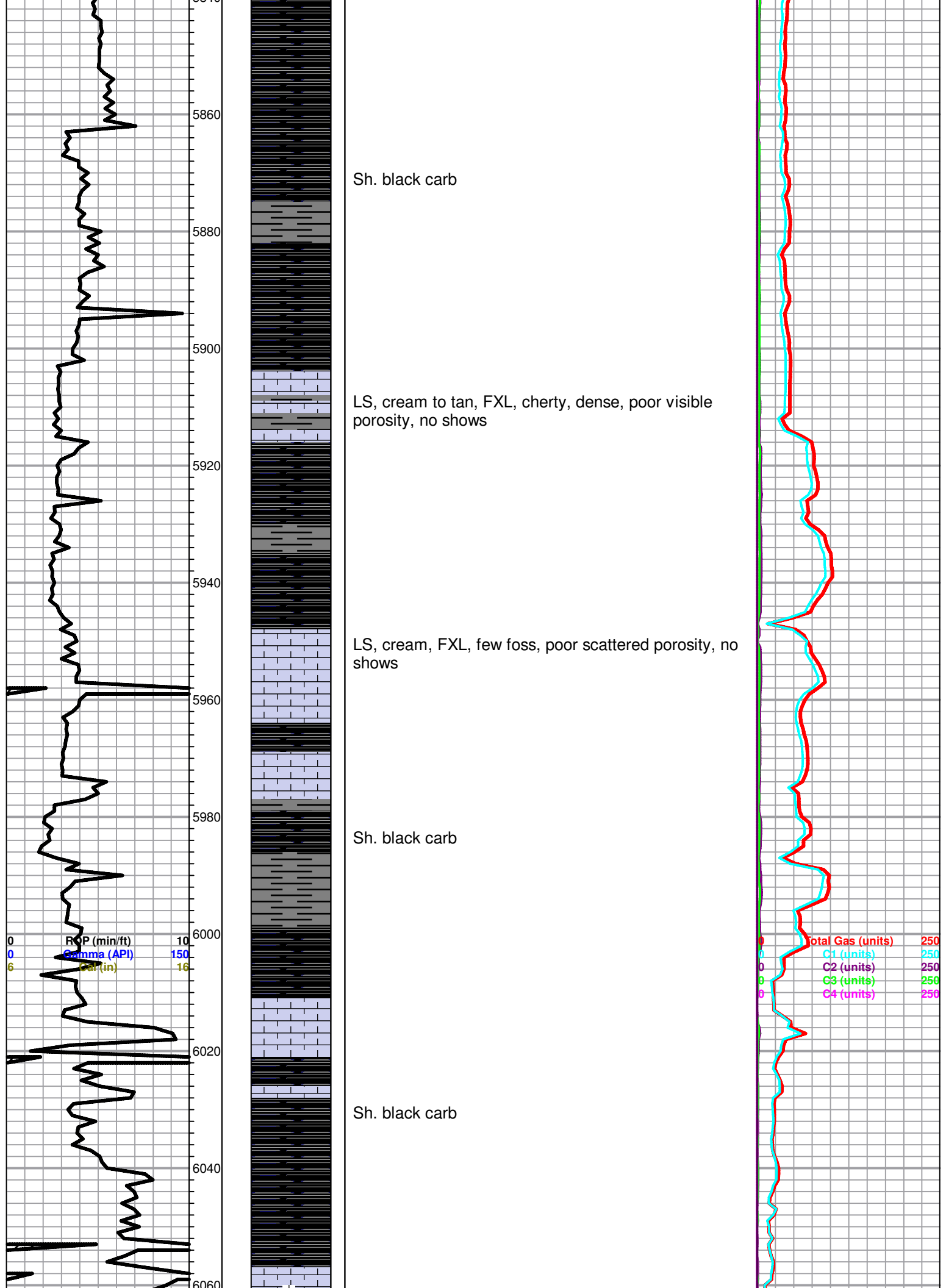
Sh. A/A

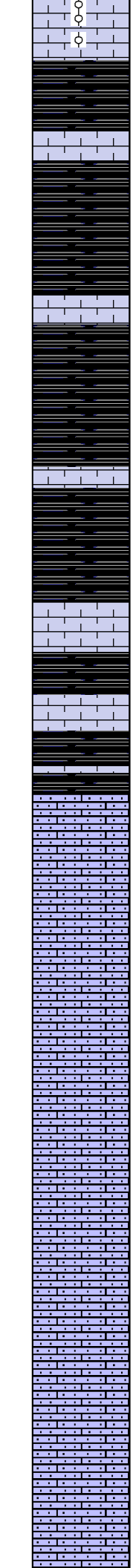
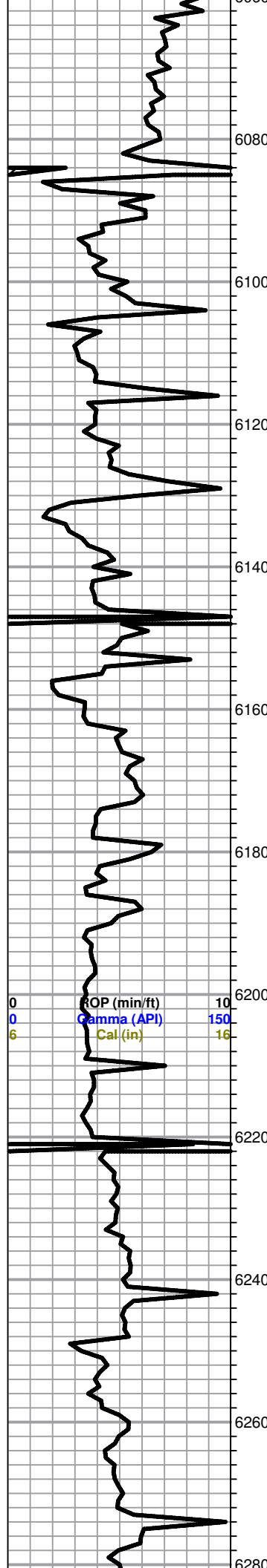
Sh. black carb, trace gray, maroon silty sh.

ROP (min/ft) 10
Gamma (API) 150
Cal (in) 16

Total Gas (units) 250
C1 (units) 250
C2 (units) 250
C3 (units) 250
C4 (units) 250







LS, cream, few ool, poorly developed, poor scattered porosity, no shows

LS, tan, gray, FXL, dense, poor visible porosity, trace black carb sh.

LS, tan, gray, cream, FXL, dense, poor scattered porosity, no shows

LS, cream to tan, FXL, cherty, poor visible porosity, no shows

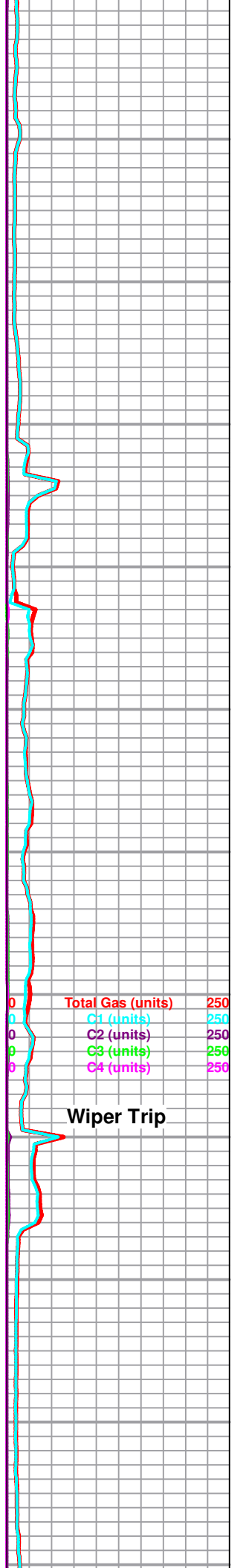
Ste. Gen 6174 (-3051)

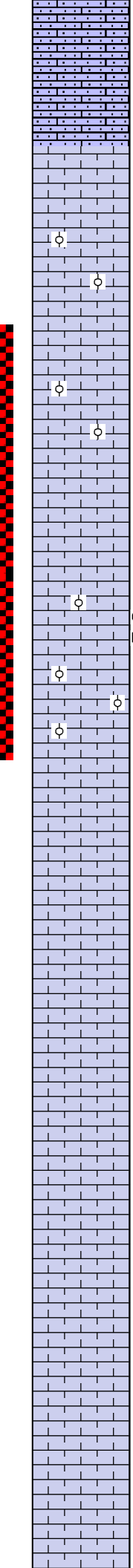
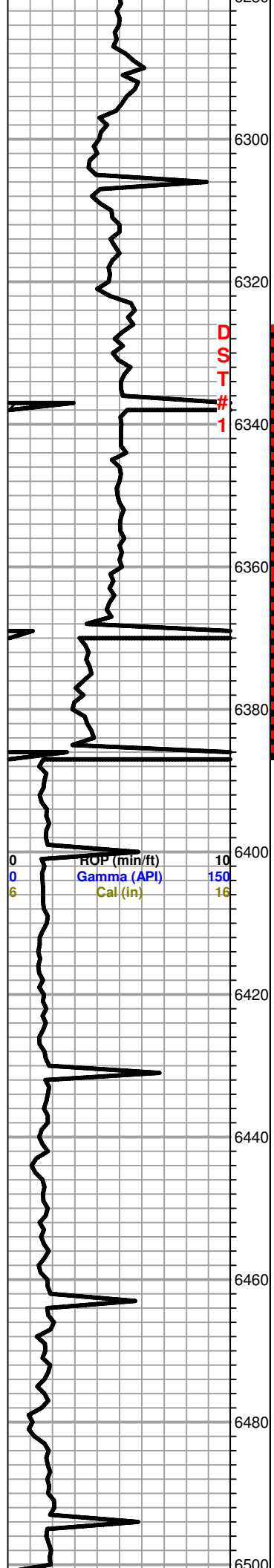
LS, tan to rose, micro ool, friable, fair visible porosity, no shows

LS, tan, rose, brown, micro ool, no shows

LS, A/A

LS, tan, brown, rose, mirco ool, friable, no shows





St. Louis 6292 (-3169)

LS, cream to tan, chalky, poor scattered porosity, few poorly dev. ool, no shows

LS, cream to tan, ool, poorly developed, poor scattered porosity, no shows, no flor. cut,

St. Louis B 6368 (-3245)

LS, cream to tan, ool, well developed, good scattered porosity, poor to fair flor. cut, faint odor, trace light brown stain.

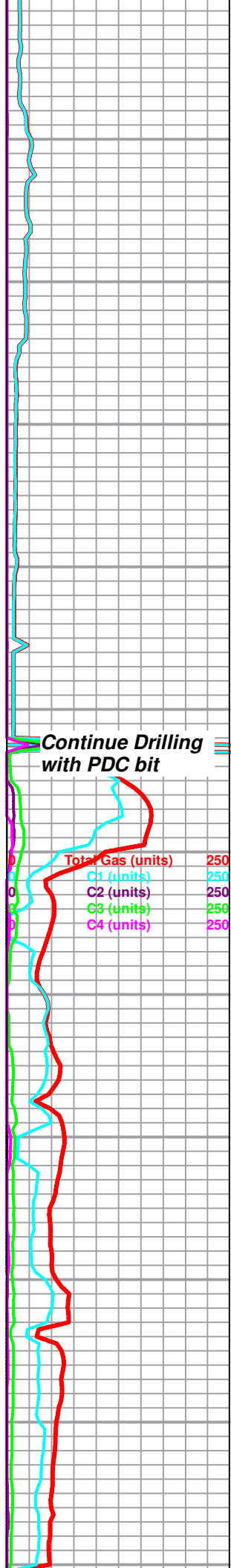
Poor sample quality, due to DST trip

LS, white to cream, chalky, poor scattered porosity, no shows

LS, cream, ool, poorly developed, chalky, no shows

LS, cream to brown, FXL, chalky, few ool, poor scattered porosity, no shows

LS, tan to brown FXL, dense, poor visible porosity, trace white chert, no shows



**RTD
6500'**

6500

6520

6540

