Musgrove Petroleum Geology
212 Main Street, Claflin KS

NOTES

Company: Lynn Packard

Lease: Packard 2-27

Location: NW-NE-NW (330' FNL & 1650' FWL)
Sec: 27 Twsp: 31S Rge: 13W
County: Barber State: Kansas
Field: Nurse

KB: 1585' GL: 1575'

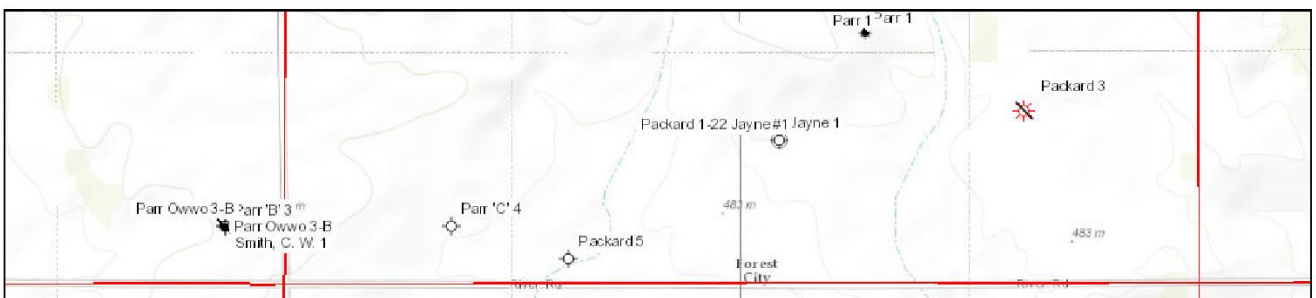
Contractor: Landmark Drilling, Inc. (Rig #3)
Spud: 03/03/2017 Comp: 03/11/2017
RTD: 4350' LTD: 4344'
Mud Up: 2400' Type Mud: Chemical
API #: 15-007-24312-00-00

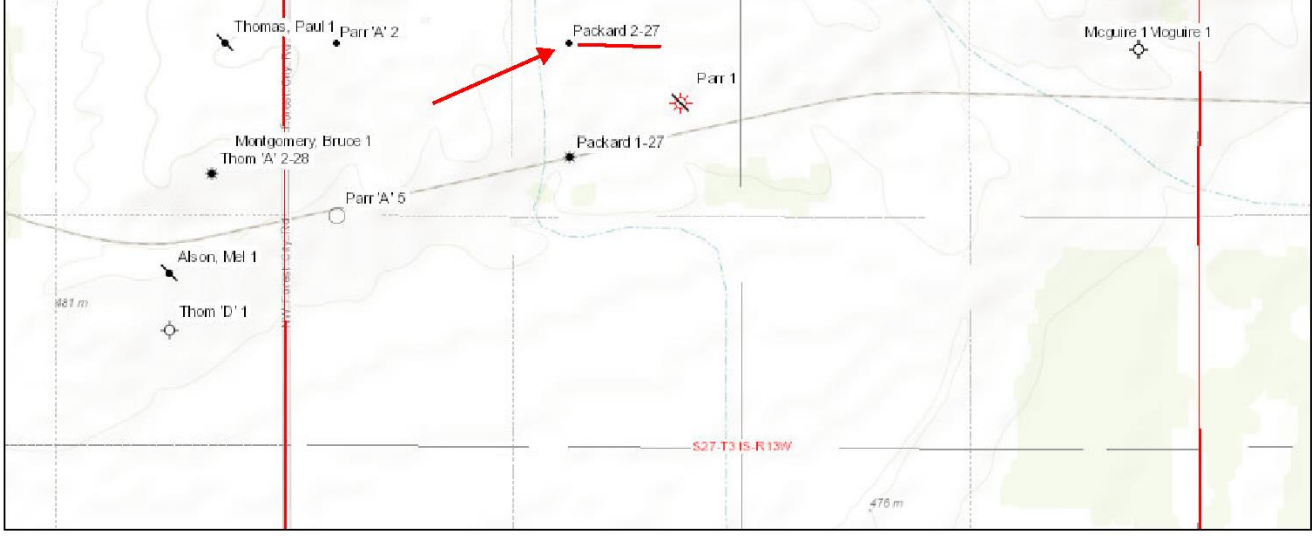
Samples Saved From: 2500' to RTD
Drilling Time Kept From: 2500' to RTD
Samples Examined From: 2500' to RTD
Geological Supervision from: 2500' to RTD
Geologist on Well: Wyatt Urban

Surface Casing: 8 5/8"@ 210'
Production Casing: 5 1/2" @ 4340'

Electronic Surveys: Logged by ELI: DIL,MEL, CDL/CNL

LYNN PACKARD- PACKARD #2-27





LYNN PACKARD
WELL COMPARISON SHEET

	DRILLING WELL Lynn Packard-Packard 2-27 NW-NE-NW 27-31S-13W				COMPARISON WELL Lynn Packard- Packard 1-27 SW-NE-NW 27-31S-13W				COMPARISON WELL Packard O&G - #5 Packard SE NE SE 23-16S-15W			
	1585 KB				1574 KB		Structural Relationship		1578 KB		Structural Relationship	
Formation	Sample	Sub-Sea	Log	Sub-Sea	Log	Sub-Sea	Sample	Log	Log	Sub-Sea	Sample	Log
Onaga Shale	2607	-1022	2604	-1019	2598	-1024	2	5				
Wabunsee	2666	-1081	2655	-1070	2646	-1072	-9	2				
Stotler	2805	-1220	2796	-1211	2792	-1218	-2	7				
Tarkio Lime	2843	-1258	2829	-1244	2825	-1251	-7	7				
Howard	3043	-1458	3030	-1445	3025	-1451	-7	6				
Topeka	3322	-1737	3307	-1722	3303	-1729	-8	7				
Elgin	3356	-1771	3355	-1770	3344	-1770	-1	0				
Heebner	3533	-1948	3529	-1944	3523	-1949	1	5	3525	-1947	-1	3
Douglas	3574	-1989	3563	-1978	3558	-1984	-5	6				
Upper Dg. Sd.	3595	-2010	3594	-2009	3586	-2012	2	3				
Lower Dg. Sd	3665	-2080	3651	-2066	3662	-2088	8	22				
Brown Lime	3724	-2139	3714	-2129	3711	-2137	-2	8				
Lansing	3734	-2149	3724	-2139	3720	-2146	-3	7				
Stark Sh.	4050	-2465	4040	-2455	4036	-2462	-3	7				
BKC	4171	-2586	4160	-2575	4162	-2588	2	13				
Mississippian	4222	-2637	4217	-2632	4211	-2637	0	5	4217	-2639	2	7
RTD	4350	-2765	4350	-2765	4365	-2791	26	26	4510	-2932	167	167
LTD	4344	-2759	4344	-2759	4369	-2795	36	36				

DIAMOND TESTING
P.O. Box 157
HOISINGTON, KANSAS 67544
(800) 542-7313

DRILL-STEM TEST TICKET
FILE: Packard 2-27 Dst 1

TIME ON: 12:50
TIME OFF: 23:17

Company Lynn Packard — Lease & Well No. Packard 2-27
Contractor Landmark Drilling — Charge to Lynn Packard
Elevation 1575 Est Formation Miss Effective Pay Ft. Ticket No. RR267
Date Mar-10-2017 Sec. 27 Twp. 31 S Range 13 W County Barton State KANSAS
Test Approved By Wyatt Urban — Diamond Representative Ricky Ray

Formation Test No. 1 Interval Tested from 4207 ft. to 4239 ft. Total Depth 4239 ft.
Packer Depth 4202 ft. Size 6 3/4 in. — Packer depth ft. Size 6 3/4 in.
Packer Depth 4207 ft. Size 6 3/4 in. — Packer depth ft. Size 6 3/4 in.
Depth of Selective Zone Set

Top Recorder Depth (Inside)	4195 ft.	Recorder Number	0062	Cap.	5000 P.S.I.
Bottom Recorder Depth (Outside)	4211 ft.	Recorder Number	8471	Cap.	5000 P.S.I.
Below Straddle Recorder Depth	ft.	Recorder Number		Cap.	P.S.I.

Mud Type	Chem	Viscosity	47	Drill Collar Length	232 ft.	I.D.	2 1/4 in.
Weight	9.5 +	Water Loss	9.6 cc.	Weight Pipe Length	-- ft.	I.D.	2 7/8 in
Chlorides	4500 P.P.M.			Drill Pipe Length	3943 ft.	I.D.	3 1/2 in
Jars: Make	STERLING	Serial Number	na	Test Tool Length	32 ft.	Tool Size	3 1/2-IF in
Did Well Flow?	na	Reversed Out	na	Anchor Length	32 ft.	Size	4 1/2-FH in
Main Hole Size	7 7/8	Tool Joint Size	4 1/2 xh in.	Surface Choke Size	1 in.	Bottom Choke Size	5/8 in

Blow: 1st Open: 1" Blow (BOB in 35 secs) 6" BB

2nd Open: 1" Blow (BOB in 45 secs) "Gas At Surface in 13 mins" BBBB

Recovered	3557 ft. of	GIP			
Recovered	92 ft. of	OSM	100% M With Few Oil Specs		
Recovered	62 ft. of	SLOGWM	5%G 3% O 5% W 87% M		
Recovered	232 ft. of	OGWM	15% G 5% O 55% W 25% M		
Recovered	386 ft. of	Total Fluid	PH: 7	Price Job	
Recovered	ft. of		Chlorides: 65,000 PPM	Other Charges	
Remarks:	Tool Sample:	Blown Out	RW: .15 @ 45 Deg	Insurance	
				Total	

Time Set Packer(s) 4:07 PM A.M. P.M. Time Started Off Bottom 7:07 PM A.M. P.M. Maximum Temperature 124

Initial Hydrostatic Pressure			(A)	2082 P.S.I.		
Initial Flow Period	Minutes 30		(B)	49 P.S.I. to (C)	97 P.S.I.	
Initial Closed In Period	Minutes 45		(D)	1485 P.S.I.		
Final Flow Period	Minutes 45		(E)	102 P.S.I. to (F)	155 P.S.I.	
Final Closed In Period	Minutes 60		(G)	1460 P.S.I.		
Final Hydrostatic Pressure			(H)	2046 P.S.I.		

ROCK TYPES

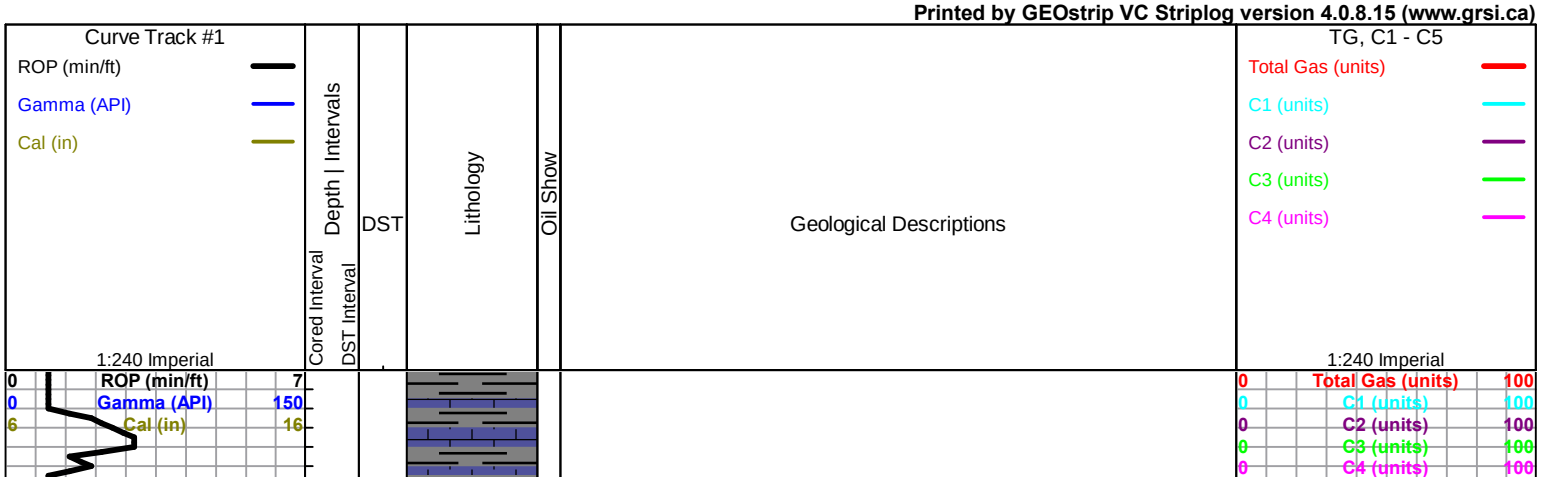
Cht, Lmst fw<7, Lmst fw7>, shale, grn, shale, gry, Carbon Sh, shale, red, Ss

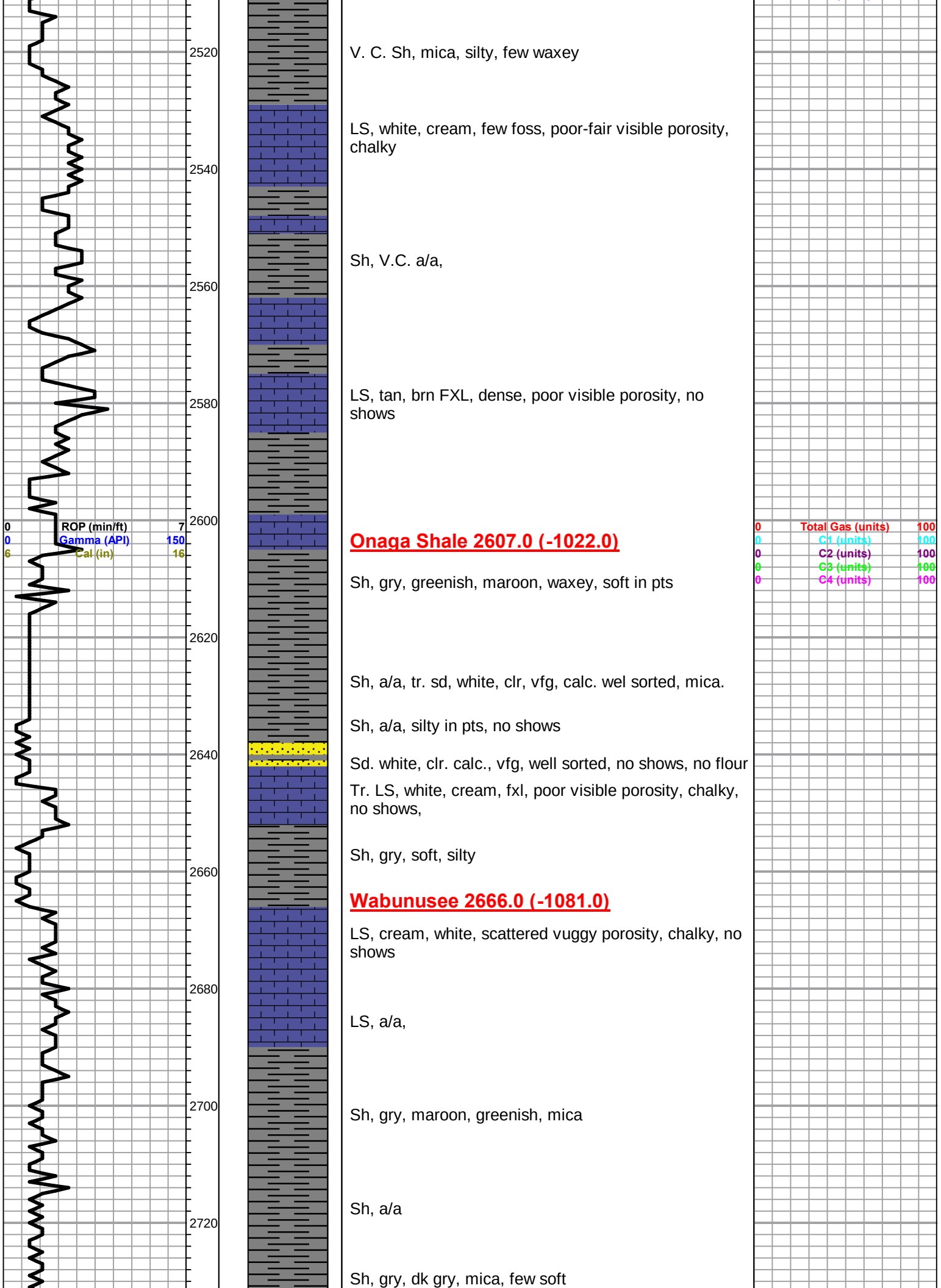
OTHER SYMBOLS

Oil Show
- Good Show
- Fair Show
- Poor Show
- Spotted or Trace
- Questionable Stn
- Dead Oil Stn
- Fluorescence
- Gas

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

Printed by GEOstrip VC Striplog version 4.0.8.15 (www.grsi.ca)

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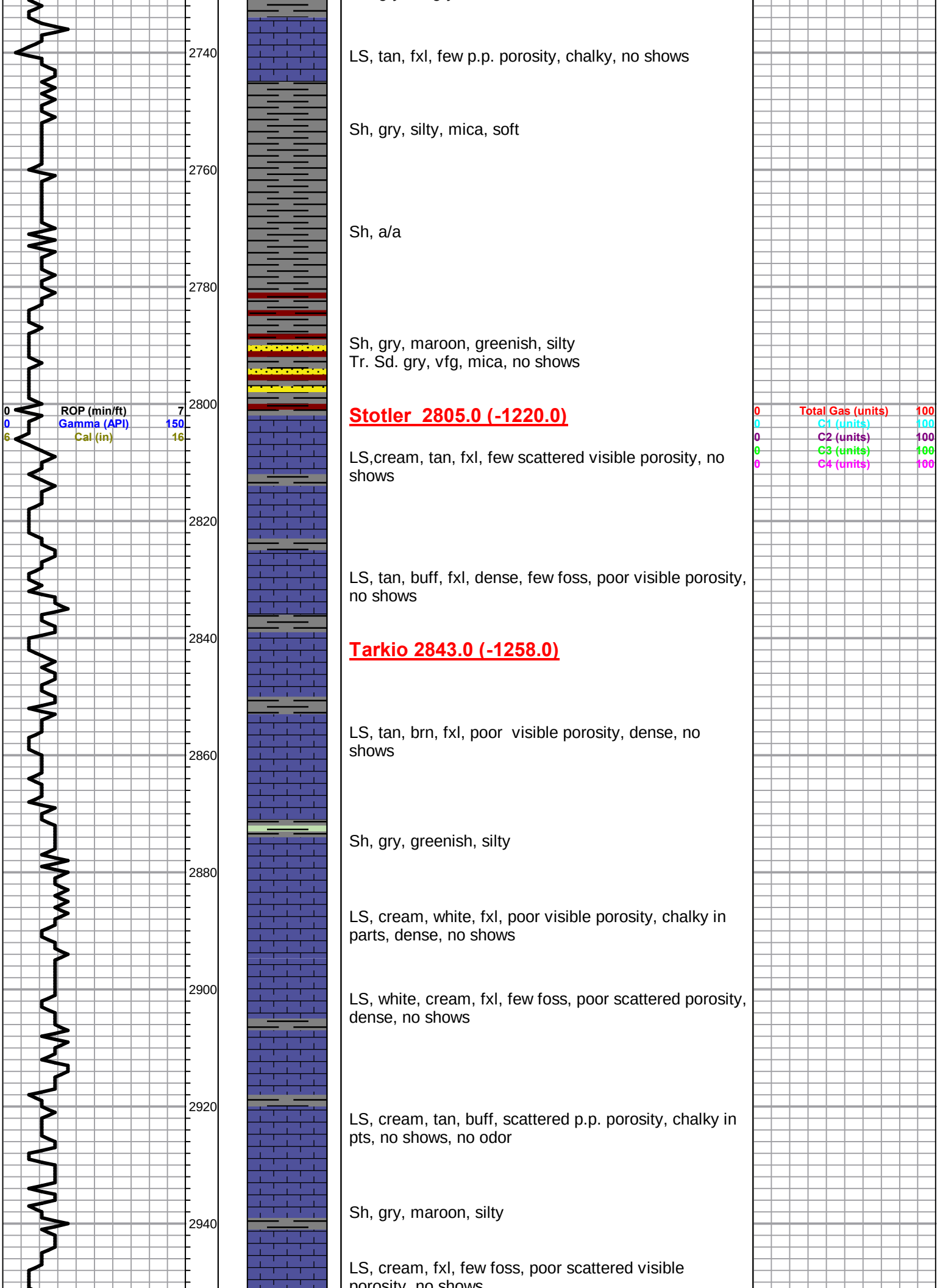
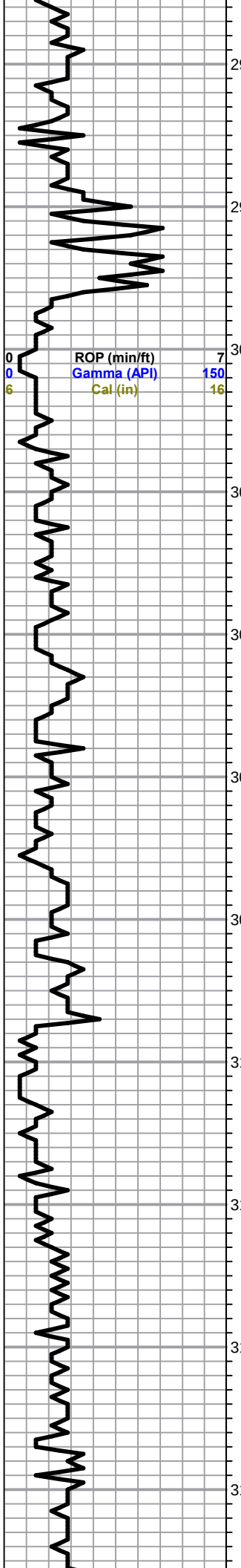
0 Gamma (API) 150
6 Cal (in) 16
0 Total Gas (units) 100
0 C1 (units) 100
0 C2 (units) 100
0 C3 (units) 100
0 C4 (units) 100
2520
2540
2560
2580
2600
2620
2640
2660
2680
2700
2720
V. C. Sh, mica, silty, few waxey
LS, white, cream, few foss, poor-fair visible porosity, chalky
Sh, V.C. a/a,
LS, tan, brn FXL, dense, poor visible porosity, no shows
Onaga Shale 2607.0 (-1022.0)
Sh, gry, greenish, maroon, waxey, soft in pts
Sh, a/a, tr. sd, white, clr, vfg, calc. wel sorted, mica.
Sh, a/a, silty in pts, no shows
Sd. white, clr. calc., vfg, well sorted, no shows, no flour
Tr. LS, white, cream, fxl, poor visible porosity, chalky, no shows,
Sh, gry, soft, silty
Wabunusee 2666.0 (-1081.0)
LS, cream, white, scattered vuggy porosity, chalky, no shows
LS, a/a,
Sh, gry, maroon, greenish, mica
Sh, a/a
Sh, gry, dk gry, mica, few soft


0 ROP (min/ft) 7
0 Gamma (API) 150
6 Cal (in) 16
0 Total Gas (units) 100
0 C1 (units) 100
0 C2 (units) 100
0 C3 (units) 100
0 C4 (units) 100
2740
2760
2780
2800
2820
2840
2860
2880
2900
2920
2940
LS, tan, fxl, few p.p. porosity, chalky, no shows
Sh, gry, silty, mica, soft
Sh, a/a
Sh, gry, maroon, greenish, silty
Tr. Sd. gry, vfg, mica, no shows
Stotler 2805.0 (-1220.0)
LS,cream, tan, fxl, few scattered visible porosity, no shows
LS, tan, buff, fxl, dense, few foss, poor visible porosity, no shows
Tarkio 2843.0 (-1258.0)
LS, tan, brn, fxl, poor visible porosity, dense, no shows
Sh, gry, greenish, silty
LS, cream, white, fxl, poor visible porosity, chalky in parts, dense, no shows
LS, white, cream, fxl, few foss, poor scattered porosity, dense, no shows
LS, cream, tan, buff, scattered p.p. porosity, chalky in pts, no shows, no odor
Sh, gry, maroon, silty
LS, cream, fxl, few foss, poor scattered visible



2960

LS, a/a

Poor Samples
(sd grains)

2980

LS, tan, buff, poor-fair scattered visible porosity, no shows

3000

-Poor Samples -

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

3020

Sh, gry, silty, mica

3040

Howard 3043.0 (-1458.0)

LS, tan, buff, fxl, dense, poor visible porosity, no shows

Sh, gry, maroon, greenish,

3060

LS. tan, cream, fxl, dense, poor visible porosity, no shows

3080

LS, a/a

3100

LS, cream, tan, white, fxl, poor visible porosity, dense, no shows

3120

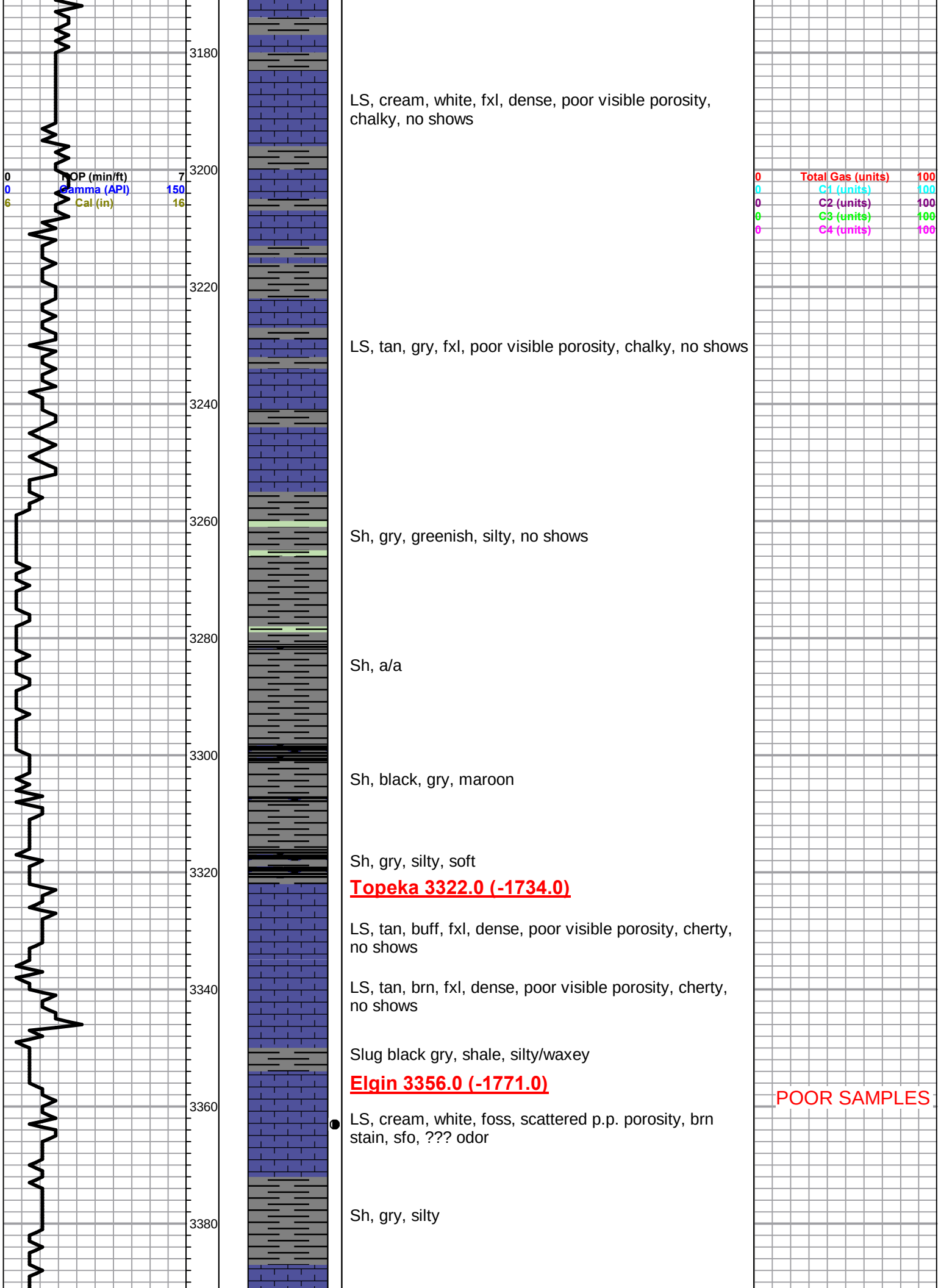
LS, a/a

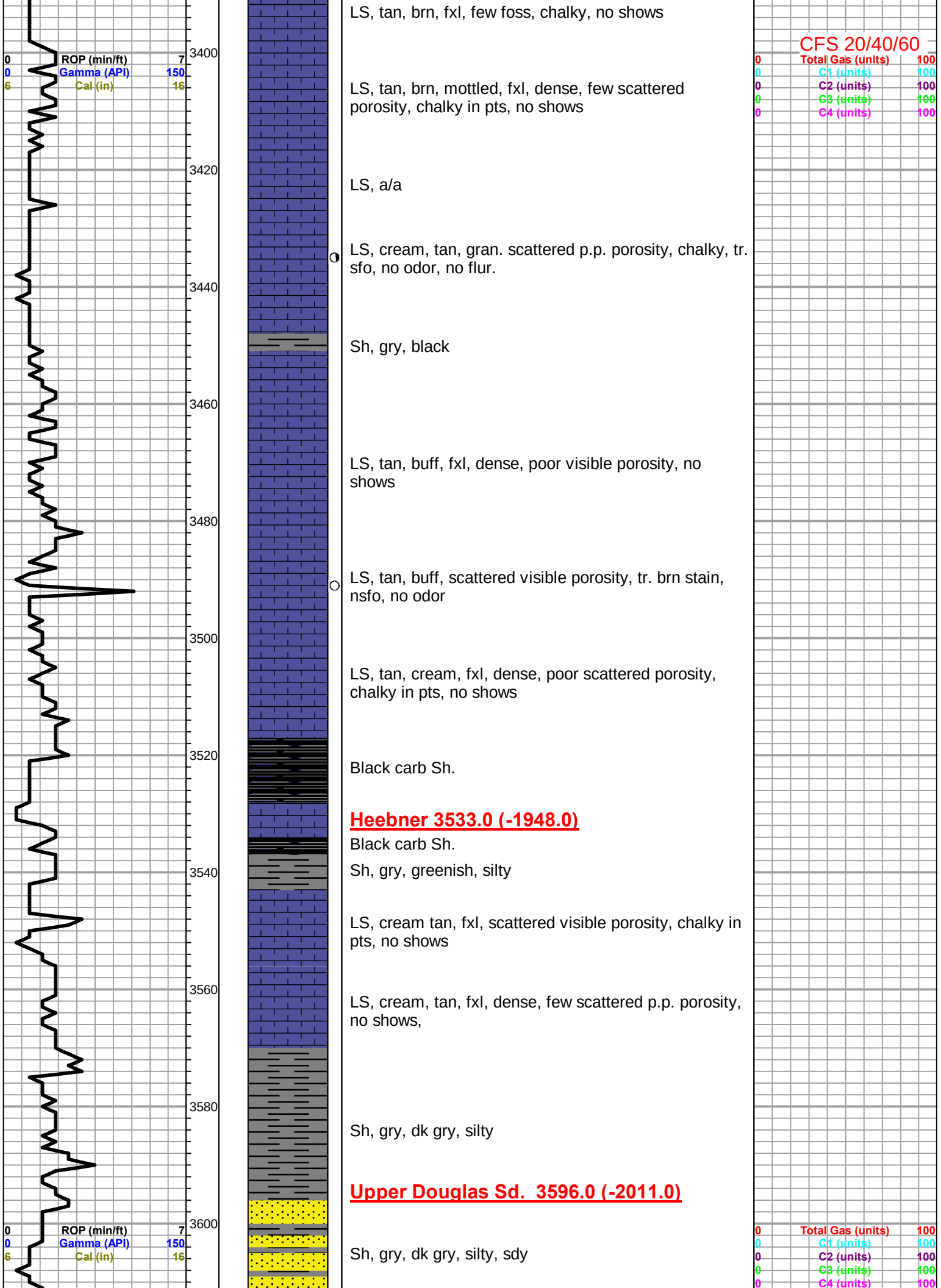
3140

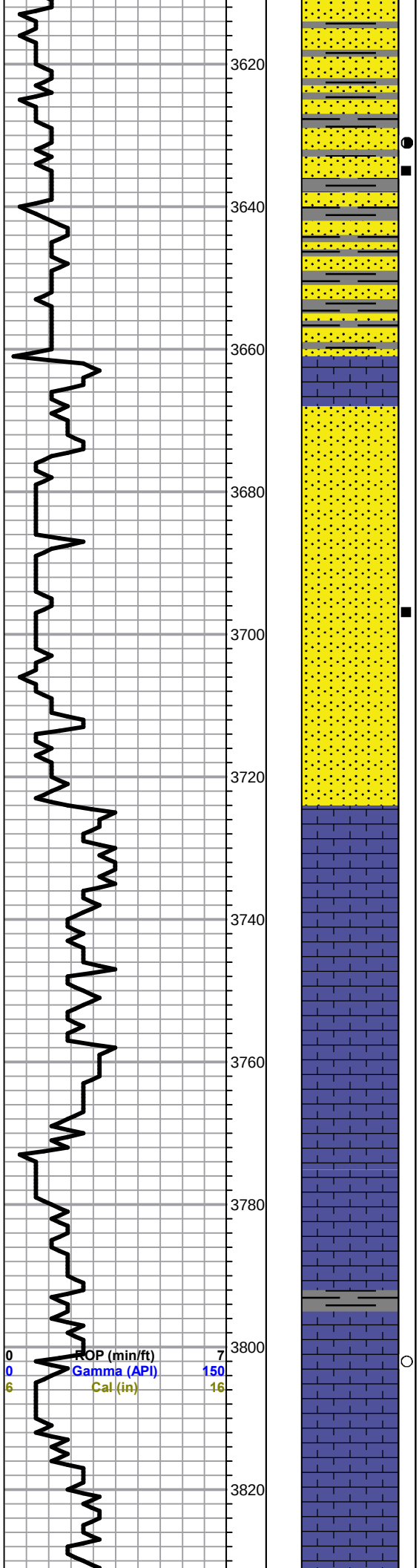
LS, cream, white, fxl, few foss, poor visible porosity, no shows

3160

Sh, gry, maroon, mica, silty


0 ROP (min/ft) 7
0 Gamma (API) 150
6 Cal (in) 16
0 Total Gas (units) 100
0 C1 (units) 100
0 C2 (units) 100
0 C3 (units) 100
0 C4 (units) 100
3180
3200
3220
3240
3260
3280
3300
3320
3340
3360
3380
LS, cream, white, fxl, dense, poor visible porosity, chalky, no shows
LS, tan, gry, fxl, poor visible porosity, chalky, no shows
Sh, gry, greenish, silty, no shows
Sh, a/a
Sh, black, gry, maroon
Sh, gry, silty, soft
Topeka 3322.0 (-1734.0)
LS, tan, buff, fxl, dense, poor visible porosity, cherty, no shows
LS, tan, brn, fxl, dense, poor visible porosity, cherty, no shows
Slug black gry, shale, silty/waxey
Elgin 3356.0 (-1771.0)
LS, cream, white, foss, scattered p.p. porosity, brn stain, sfo, ??? odor
Sh, gry, silty
POOR SAMPLES


0 ROP (min/ft) 7
0 Gamma (API) 150
6 Cal (in) 16
3400
3420
3440
3460
3480
3500
3520
3540
3560
3580
3600
LS, tan, brn, fxl, few foss, chalky, no shows
LS, tan, brn, mottled, fxl, dense, few scattered porosity, chalky in pts, no shows
LS, a/a
LS, cream, tan, gran. scattered p.p. porosity, chalky, tr. sfo, no odor, no flur.
Sh, gry, black
LS, tan, buff, fxl, dense, poor visible porosity, no shows
LS, tan, buff, scattered visible porosity, tr. brn stain, nsfo, no odor
LS, tan, cream, fxl, dense, poor scattered porosity, chalky in pts, no shows
Black carb Sh.
Heebner 3533.0 (-1948.0)
Black carb Sh.
Sh, gry, greenish, silty
LS, cream tan, fxl, scattered visible porosity, chalky in pts, no shows
LS, cream, tan, fxl, dense, few scattered p.p. porosity, no shows,
Sh, gry, dk gry, silty
Upper Douglas Sd. 3596.0 (-2011.0)
Sh, gry, dk gry, silty, sdy
CFS 20/40/60
0 Total Gas (units) 100
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



Sh, a/a, plus Sd. clear, white, vfg, well sorted, poorly developed, nsfo, tr. flur cut, no visible gas

CFS 20/40/60

Sd. a/a, white, well sorted, friable, SFO, odor, flur cut.

Sh, gry, dk gry, greenish, sdy,
Sd. clear, white, calc. well sorted, friable, sfo, odor

LS, cream, tan, foss, poor visible porosity, chalky, no shows

Lower Douglas Sd. 3674.0 (-2089.0)

Sd. clear, sub ang. f-med grainwell sorted, tr. sfo, odor???

Sd, a/a, tr. sfo, lt. flur cut,
Sh, blk, gry, silty

Sd. clear, whIte, f-grain, well sorted, no shows, no odor

Brown Lime 3724.0 (-2139.0)

LS, brn, fxl, dense, poor visible porosity, cherty, nsfo

Lansing 3734.0 (-2149.0)

POOR SAMPLES

LS, cream, tan, fxl, foss, poor visible porosity, chalky, no shows

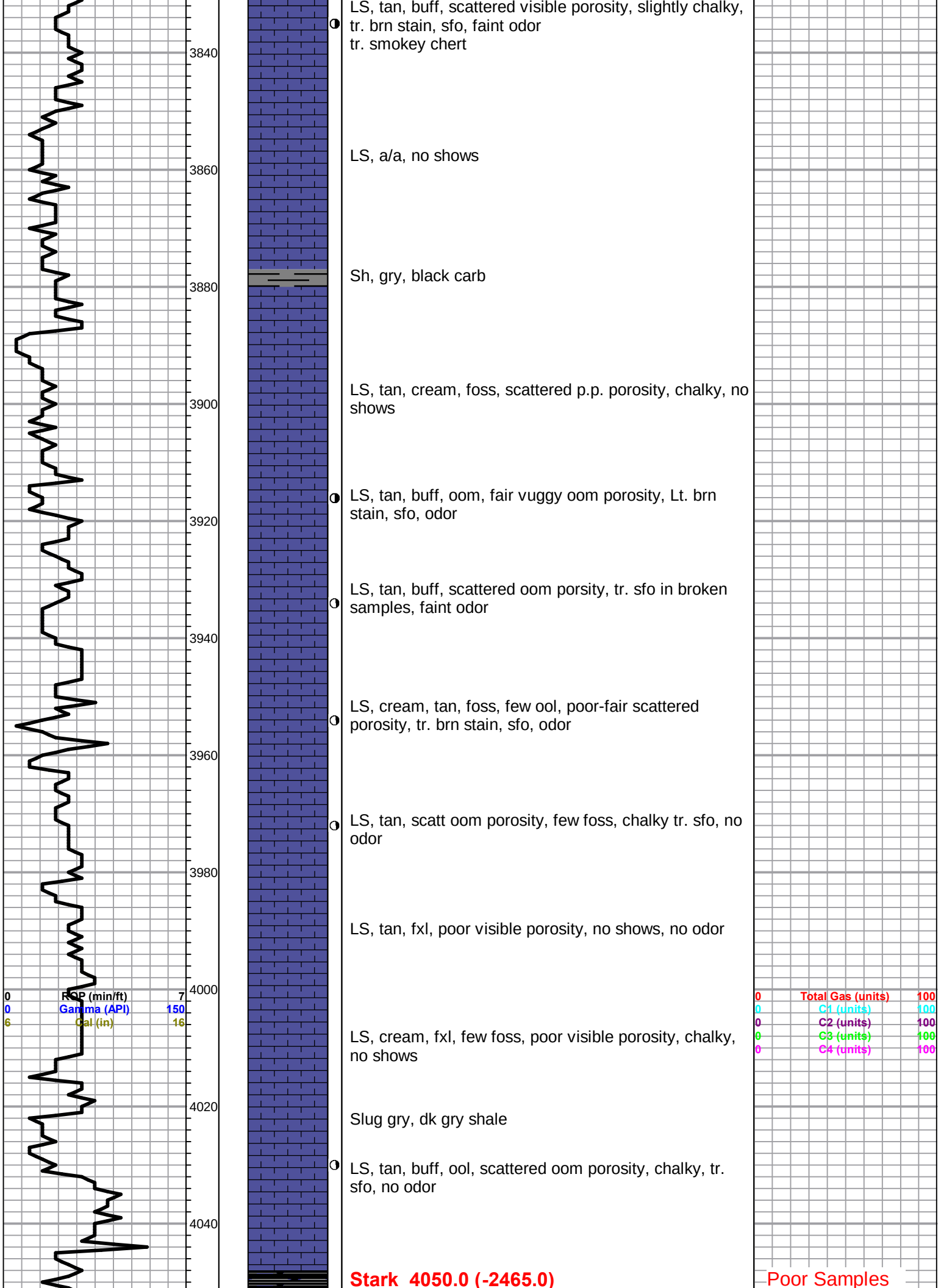
LS, cream, f-med xln, poor visible porosity, chalky, no shows

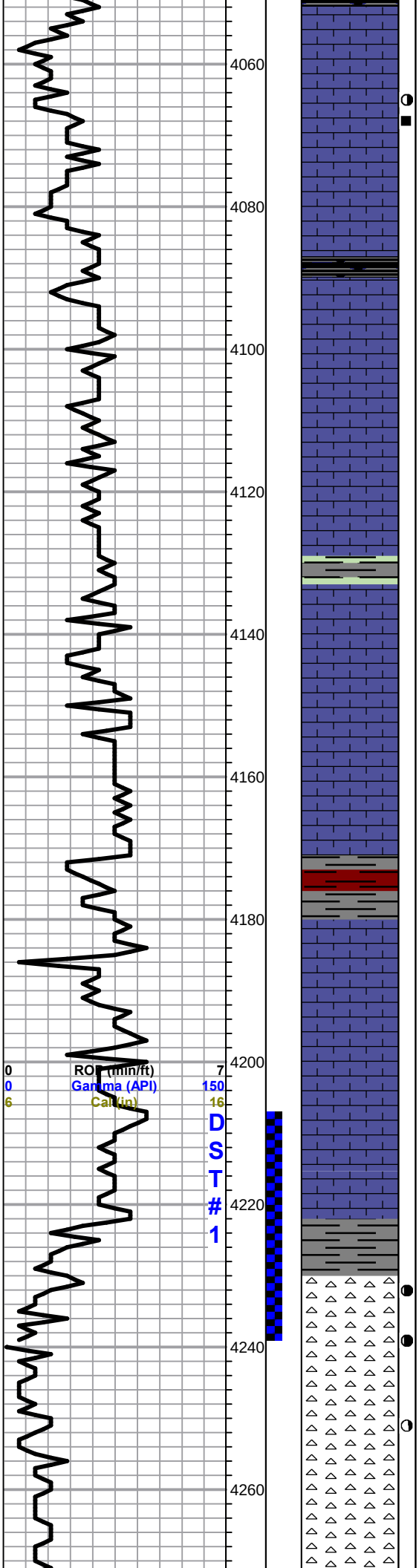
LS, a/a, scattered porosity, chalky in pts, no shows
Slug gry, black shale, tr. pyrite

LS, cream, tan, scattered p.p. porosity, tr. black stain, nsfo, no odor

LS, cream, tan, fxl, few foss, poor visible porosity, chalky, no shows

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


3840
3860
3880
3900
3920
3940
3960
3980
4000
4020
4040
0 ROP (min/ft) 7
0 Gamma (API) 150
6 Cal (in) 16
0 Total Gas (units) 100
0 C1 (units) 100
0 C2 (units) 100
0 C3 (units) 100
0 C4 (units) 100
LS, tan, buff, scattered visible porosity, slightly chalky, tr. brn stain, sfo, faint odor
tr. smokey chert
LS, a/a, no shows
Sh, gry, black carb
LS, tan, cream, foss, scattered p.p. porosity, chalky, no shows
LS, tan, buff, oom, fair vuggy oom porosity, Lt. brn stain, sfo, odor
LS, tan, buff, scattered oom porsity, tr. sfo in broken samples, faint odor
LS, cream, tan, foss, few ool, poor-fair scattered porosity, tr. brn stain, sfo, odor
LS, tan, scatt oom porosity, few foss, chalky tr. sfo, no odor
LS, tan, fxl, poor visible porosity, no shows, no odor
LS, cream, fxl, few foss, poor visible porosity, chalky, no shows
Slug gry, dk gry shale
LS, tan, buff, ool, scattered oom porosity, chalky, tr. sfo, no odor
Stark 4050.0 (-2465.0)
Poor Samples



Black carb

Swope 4060.0 (-2475.0)

LS, cream, tan, scattered p.p porosity, v. chalky, tr. brn stain, sfo, lt. flur cut

LS, cream, tan, fxl, chalky, no shows

Hushpuckney 4085.0 (-2500.0)

LS, cream, tan, fxl, poor visible porosity, chalky in pts no shows, no odor

LS, cream, tan, fxl, poor visible porosity, cherty, no shows, no odor

Sh, maroon, greenish, black carb

Poor Samples

LS, cream, tan, buff, fxl, poor visible porosity, with white, opaque, cherts

LS, tan, brn, scattered oom vuggy porosity, dense, no shows, no odor

BKC 4171.0 (-2586.0)

Sh, black, maroon, gry

Marmaton 4180.0 (-2595.0)

LS, cream, fxl, poor visible porosity, dense, cherty in pts, no shows

0 Total Gas (units) 100

LS, cream, tan, fxl, few cherty, poor visible porosity, chalky in pts, tr. brn stain, nsfo

DST#1 4207-4239

30-45-45-60

1st Open:
BOB 35 sec.

2nd Open:
BOB 45 sec.
GTS in 13 mins

Recovery:
92' OSM

62' SLOGWM
(5%G, 3%O, 5%W, 87%M)

232' OGWM

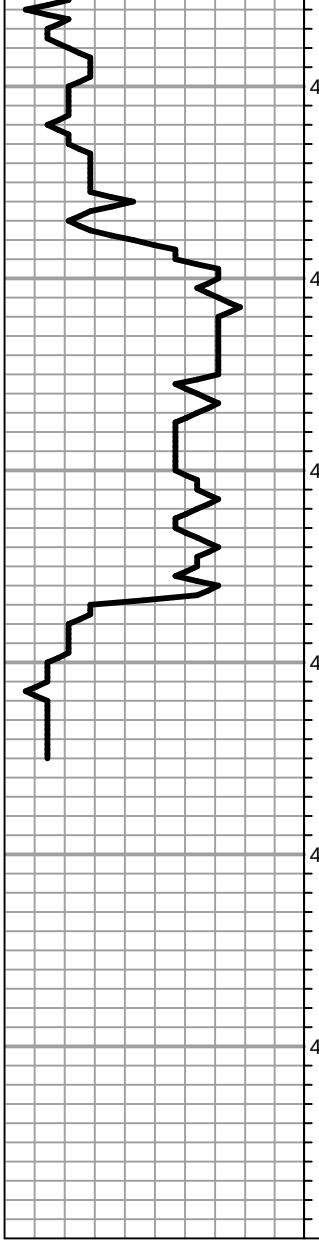
Sh, black gry, dk gry, greenish

Mississippi 4231.0 (-2641.0)

Chert, white, opaque, scattered visible p.p. porosity, brn, golden brn stain, sfo, strong odor

Chert, white, opaque, poor scattered p.p. porosity, (show decreasing), tr. golden brn stain, sfo

Chert, boney white, few ool, poor visible porosity, tr. golden brown stain, nsfo, ??? odor



Chert white, opaque, boney, clean, nsfo, no odor

Chert, a/a

Chert, a/a,
Tr.LS, tan, gry, fxl, scattered visible porosity, no shows,

Lower Miss 4333.0 (-2748.0)

Chert, white opaque, clear, tr. stain on few(2 pieces), very weak flur.

LTD 4344.0 (-2759.0)

RTD 4350.0 (-2765.0)

(15%G, 5%O, 55% W, 25%M)

Pressures:

ISIP 1485 psi
FSIP 1460 psi
IFP 49-97 psi
FFP 102-155 psi
HSH 2082-2046 psi