



Musgrove

PETROLEUM CORPORATION
Clafin, Kansas

NOTES

Company: Palmer Oil, Inc.

Lease: Willis #23-9

Field: Willis

Location: NE-NW-SW-SE (1200' FSL & 2300' FEL)

Sec: 23 Twsp: 32S Rge: 37W

County: Stevens State: Kansas

KB: 3123' GL: 3110'

API #: 15-189-22834-00-00

Contractor: Duke Drilling Inc. (Rig #9)

Spud: 2/24/2014 Comp: 3/06/2014

RTD: 6452' LTD: 6449'

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@1746'

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

Palmer Oil Well Comparison Willis 23-9

| | DRILLING WELL | | | | COMPARISON WELL | | | | COMPARISON WELL | | | | |
|-------------|---------------------------|---------|------|---------|---------------------------|---------|--------|-------------------------|------------------------------|---------|--------|-------------------------|--|
| | Palmer Oil- Willis 23-9 | | | | Palmer Oil-Willis 23-8 | | | | Palmer Oil, Inc- Willis 23-7 | | | | |
| | NE NW SW SE 23-32S-37W | | | | NE SW SW SE 23-32S-37W | | | | SE NW NW SE 23-32S-37W | | | | |
| 3123 KB | | | | 3123 KB | | | | Structural Relationship | | 3117 KB | | Structural Relationship | |
| Formation | Sample | Sub-Sea | Log | Sub-sea | Sample | Sub-Sea | Sample | Log | Log | Sub-Sea | Sample | Log | |
| B. Heebner | 4149 | -1026 | | | 4150 | -1027 | 1 | | 4133 | -1016 | -10 | | |
| Lansing | 4259 | -1136 | | | 4255 | -1132 | -4 | | 4251 | -1134 | -2 | | |
| Marmaton | 4934 | -1811 | 4941 | -1818 | 4932 | -1809 | -2 | -9 | 4916 | -1799 | -12 | -19 | |
| Cherokee | 5122 | -1999 | 5115 | -1992 | 5129 | -2006 | 7 | 14 | 5117 | -2000 | 1 | 8 | |
| Atoka | 5512 | -2389 | 5530 | -2407 | 5525 | -2402 | 13 | -5 | 5523 | -2406 | 17 | -1 | |
| Morrow | 5627 | -2504 | 5628 | -2505 | 5629 | -2506 | 2 | 1 | 5622 | -2505 | 1 | 0 | |
| St. Gen. | 6168 | -3045 | 6173 | -3050 | 6174 | -3051 | 6 | 1 | 6172 | -3055 | 10 | 5 | |
| St. Louis | 6292 | -3169 | 6301 | -3178 | 6285 | -3162 | -7 | -16 | 6297 | -3180 | 11 | 2 | |
| St. Louis B | 6368 | -3245 | 6362 | -3239 | 6372 | -3249 | 4 | 10 | 6347 | -3230 | -15 | -9 | |
| RTD | 6452 | -3329 | 6450 | -3327 | 6500 | -3377 | 48 | 50 | 6500 | -3383 | 54 | 56 | |
| LTD | 6449 | -3326 | 6450 | -3327 | 6499 | -3376 | 50 | 49 | 6506 | -3389 | 63 | 62 | |



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Palmer Oil, Inc.

23 32s 37w Stevens, KS

3118 Cummings Rd.
Garden City KS 67846

Willis 23-9



ATTN: Wyatt Urban

Job Ticket: 56383

DST#: 1

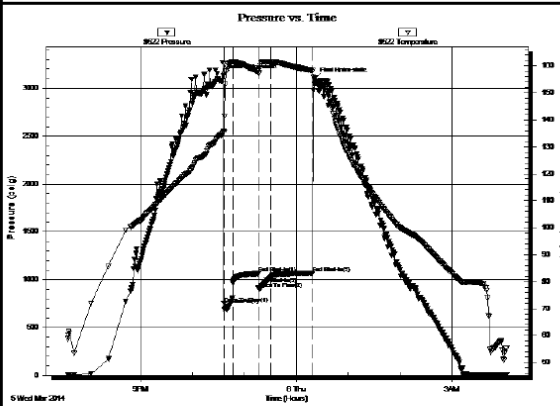
Test Start: 2014.03.05 @ 19:36:00

GENERAL INFORMATION:

Formation: **St. Louis**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 22:36:15
 Time Test Ended: 04:02:45
 Interval: **6340.00 ft (KB) To 6392.00 ft (KB) (TVD)**
 Total Depth: 6392.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Good
 Test Type: Conventional Bottom Hole (Initial)
 Tester: Bradley Walter
 Unit No: 69
 Reference Elevations: 3123.00 ft (KB)
 3110.00 ft (CF)
 KB to GR/CF: 13.00 ft

Serial #: 8522 Outside
 Press@RunDepth: 1022.78 psig @ 6341.00 ft (KB)
 Start Date: 2014.03.05 End Date: 2014.03.06 Capacity: 8000.00 psig
 Start Time: 19:36:05 End Time: 04:02:44 Last Calib.: 2014.03.06
 Time On Btm: 2014.03.05 @ 22:36:00
 Time Off Btm: 2014.03.06 @ 00:21:15

TEST COMMENT: IF: BOB @ 30 sec.
 IS: No return.
 FF: BOB @ 70 sec.
 FS: No return.



PRESSURE SUMMARY

| Time (Min.) | Pressure (psig) | Temp (deg F) | Annotation |
|-------------|-----------------|--------------|----------------------|
| 0 | 3130.55 | 135.71 | Initial Hydro-static |
| 1 | 752.45 | 135.42 | Open To Flow (1) |
| 11 | 805.26 | 161.48 | Shut-h(1) |
| 40 | 1063.94 | 157.98 | End Shut-h(1) |
| 41 | 908.40 | 157.15 | Open To Flow (2) |
| 55 | 1022.78 | 161.34 | Shut-h(2) |
| 103 | 1068.28 | 158.21 | End Shut-h(2) |
| 106 | 3102.16 | 154.41 | Final Hydro-static |

Recovery

| Length (ft) | Description | Volume (bbl) |
|-------------|------------------------------|--------------|
| 2040.00 | smcw 2m 98w (trace oil scum) | 25.98 |
| | | |
| | | |
| | | |
| | | |

Gas Rates

| Choke (inches) | Pressure (psig) | Gas Rate (Mscf/c) |
|----------------|-----------------|-------------------|
| | | |

ROCK TYPES

sdy lmst
 Lmst fw>7
 Carbon Sh
 Shcol
 Lmst fw<7
 shale, gry
 shale, red

ACCESSORIES

FOSSIL
 ◊ Oolite

TEXTURE
 FX Finexln

OTHER SYMBOLS

Oil Show
 ● Good Show
 ● Fair Show
 ● Poor Show
 ○ Spotted or Trace
 ○ Questionable Stn
 D Dead Oil Stn
 ■ Fluorescence
 * Gas

DST
 DST Int
 DST alt
 Core
 tail pipe

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

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

De
Cored Interval
DST Interval

Lit

Oil

Geological Descriptions

C4 (units)

1:240 Imperial

0 ROP (min/ft) 7
0 Gamma (API) 150
6 Cal (in) 16

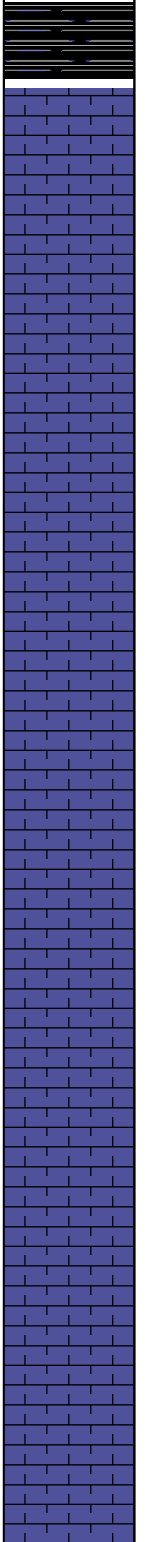
0 ROP (min/ft) 4
0 Gamma (API) 150
6 Cal (in) 16

0 ROP (min/ft) 4
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

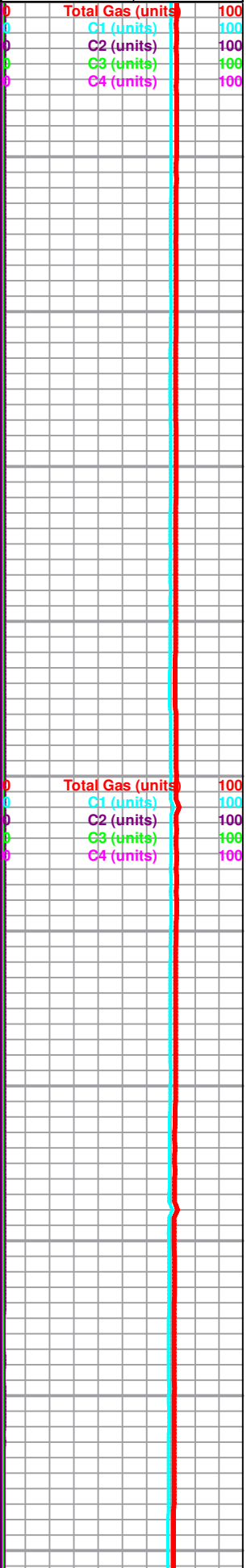
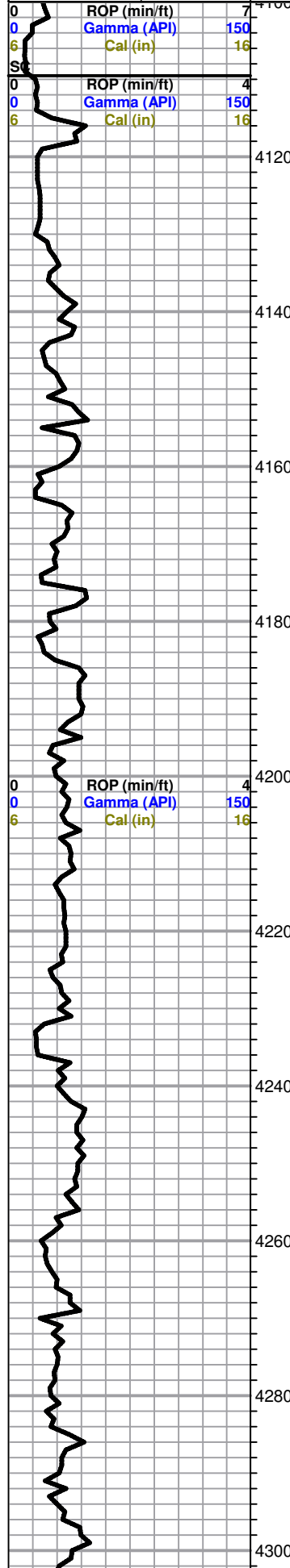
0 Total Gas (units) 100
0 C1 (units) 100
0 C2 (units) 100
0 C3 (units) 100
0 C4 (units) 100

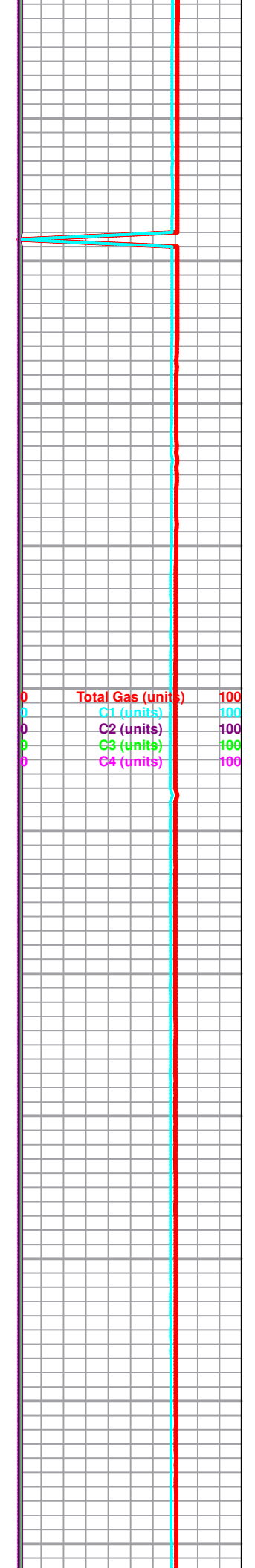
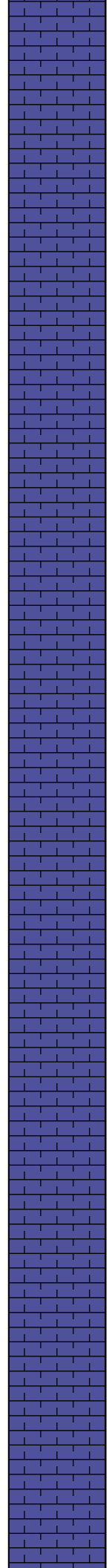
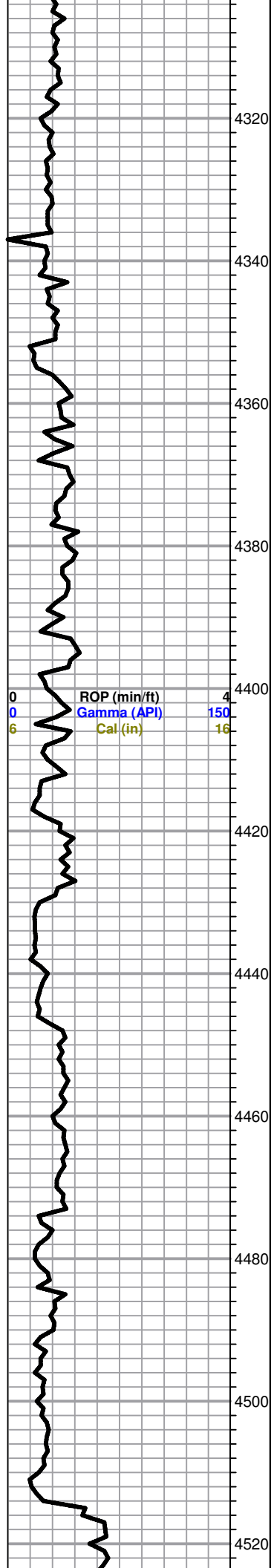
4100
4120
4140
4160
4180
4200
4220
4240
4260
4280
4300

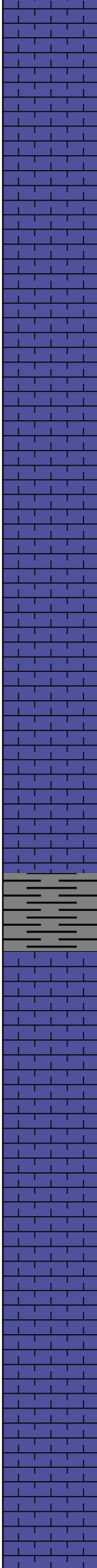
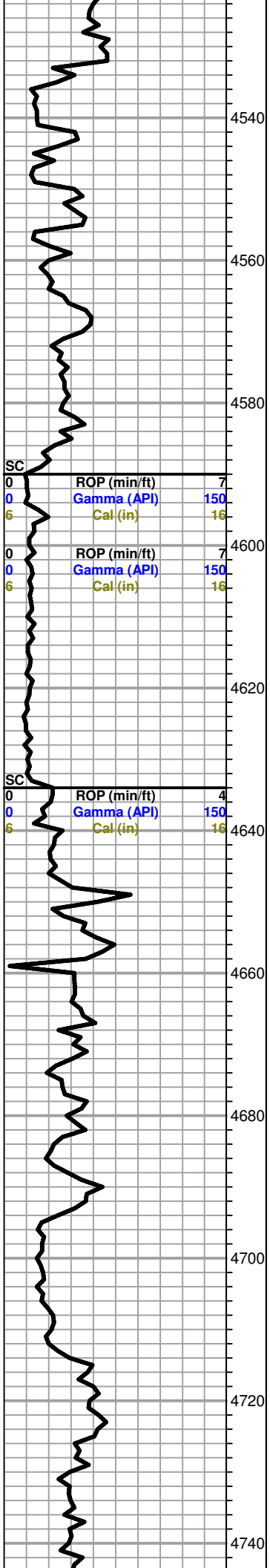


B. Heebner 4149 (-1026)

Lansing 4259 (-1136)





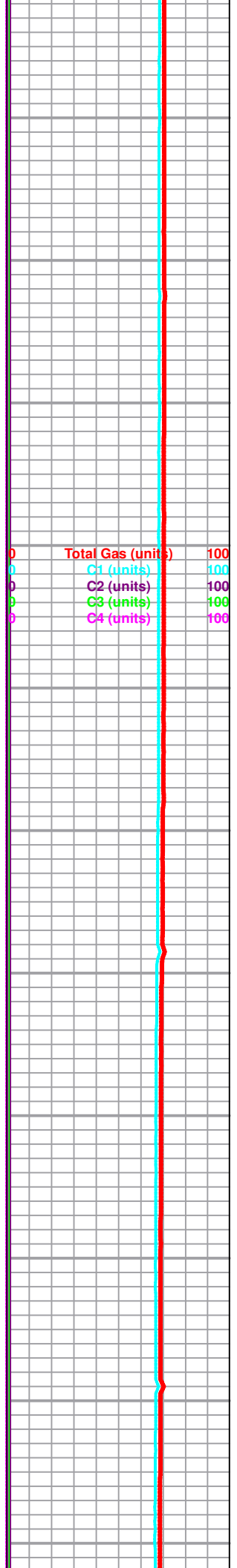


LS, tan to cream mottled, FXL dense, chalky in parts, Sh. gray, black, silty

Sh. gray, black carb

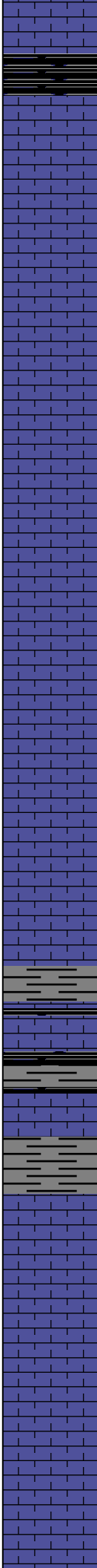
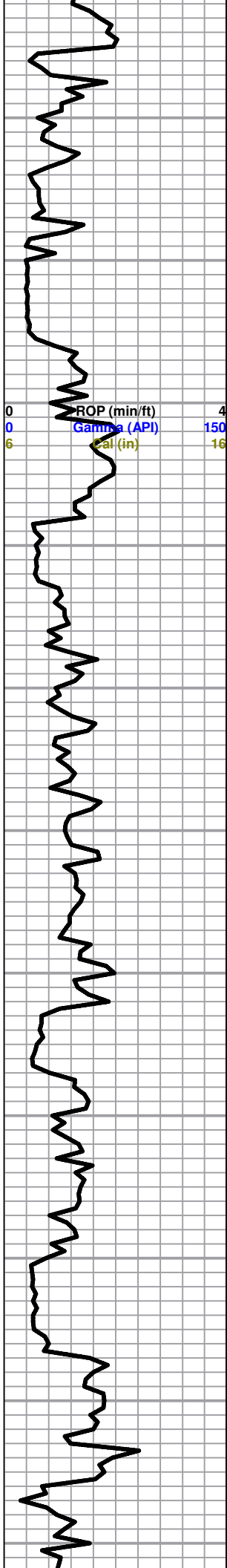
LS, cream to white, FXL, chalky, poor visible porosity, few foss

LS, gray, FXL, dense, no visible porosity, few foss, no shows



4760
4780
4800
4820
4840
4860
4880
4900
4920
4940
4960

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



Black carb Sh.

LS, cream to tan, FXL, sandy in parts, poor-fair visible porosity, no shows

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

Sh. gray, maroon, greenish,
LS, tan, mottled, dense, poor visible porosity, few foss

LS, tan to brown FXL, dense, cherty, no visible porosity

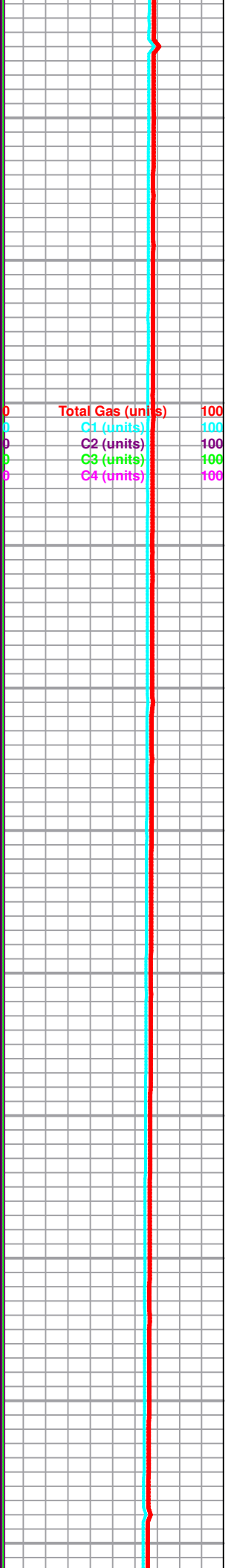
Sh. gray to black silty

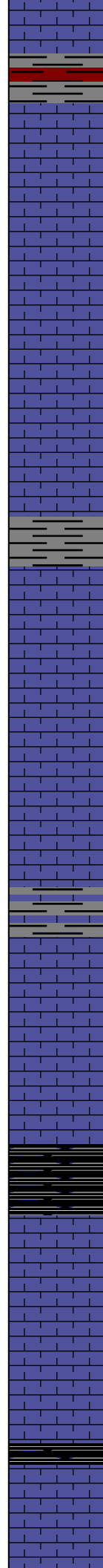
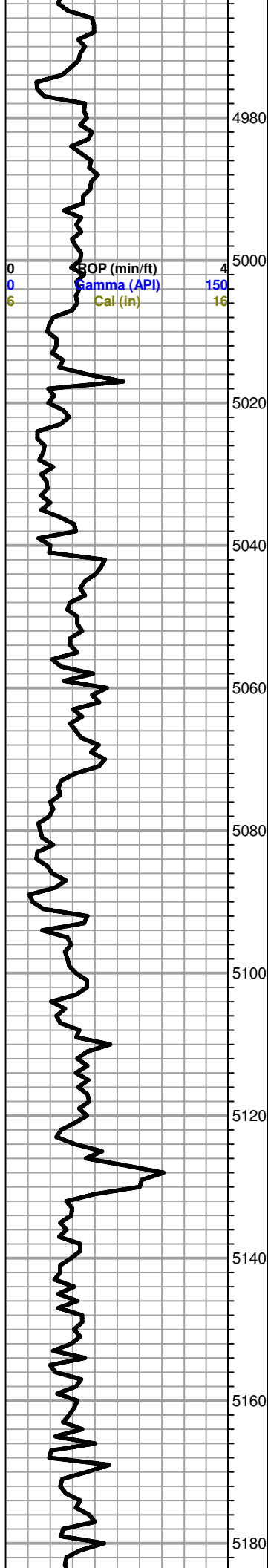
LS, brown, FXL, cherty, no visible porosity,
Trc. gray sh. slty, soft

Marmaton 4934 (-1811)

LS, tan, FXL, dense, cherty, poor visible porosity, no shows,

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





LS, brown, FXL, cherty, poor scattered porosity, dense, no shows

LS, gray to tan, FXL, mottled, cherty in parts, poor scattered porosity, no shows

LS, gray to tan, A/A, trace LS, cream to white, chalky in parts no shows, trace gray shale, soft, silty

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

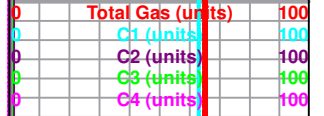
LS, tan, ool, chalky, fair vuggy porosity, no shows, trace gray silty sh.

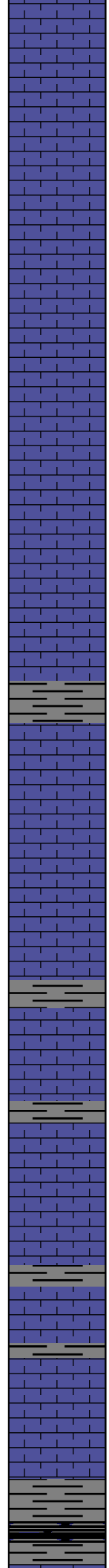
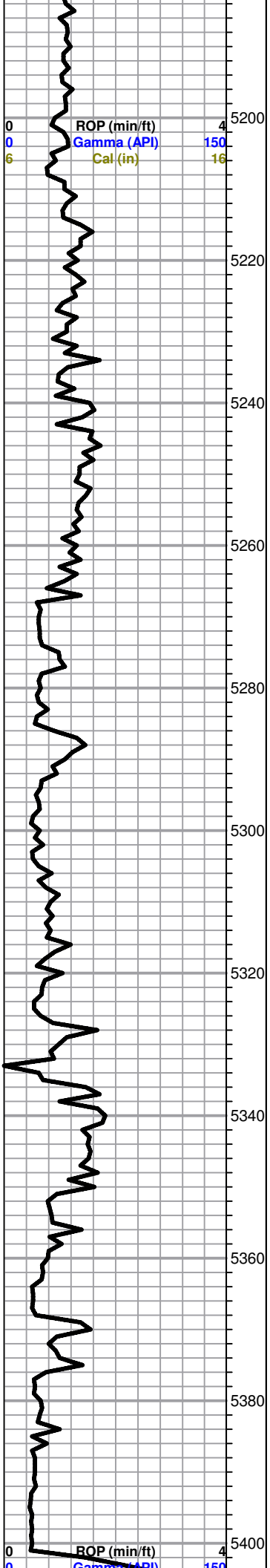
Cherokee 5122 (-1999)

Black carb shale

LS, tan, brown, FXL, poor visible porosity, foss, no shows

LS, brown, FXL, poor scattered porosity, no shows,





LS, gray, dense, poor scattered porosity, trace Black carb sh. no shows.

LS, tan to gray, chalky, poor visible porosity, few foss, no shows

LS, gray, FXL, cherty no visible porosity,

Sh. gray to black silty,
LS, gray, mottled, FXL, dense, cherty no shows

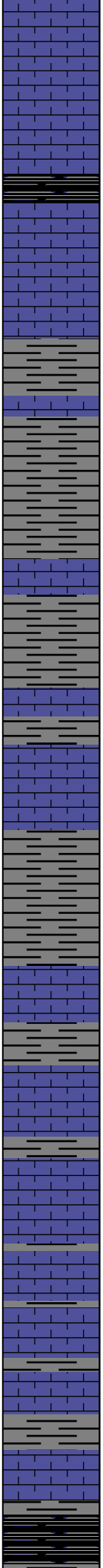
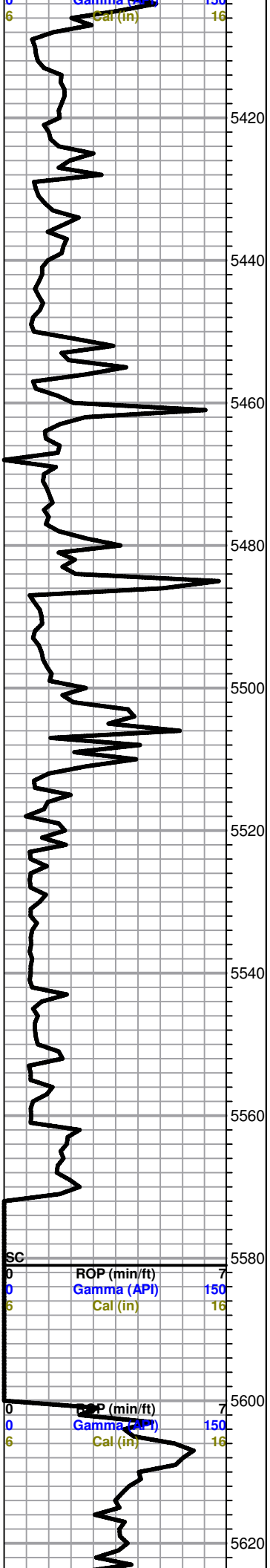
LS, tan to gray, mottled, FXL, dense, cherty in parts, no shows

LS, gray, FXL, dense, cherty poor scattered porosity, no shows

Sh. black gray,

| Total Gas (Units) | 100 |
|-------------------|-----|
| C1 (units) | 100 |
| C2 (units) | 100 |
| C3 (units) | 100 |
| C4 (units) | 100 |

| Total Gas (Units) | 100 |
|-------------------|-----|
| C1 (units) | 100 |



LS, cream to tan, FXL, cherty, few foss, poor scattered porosity, no shows

Black carb sh.

Sh. gray, black maroon

Sh. gray, silty

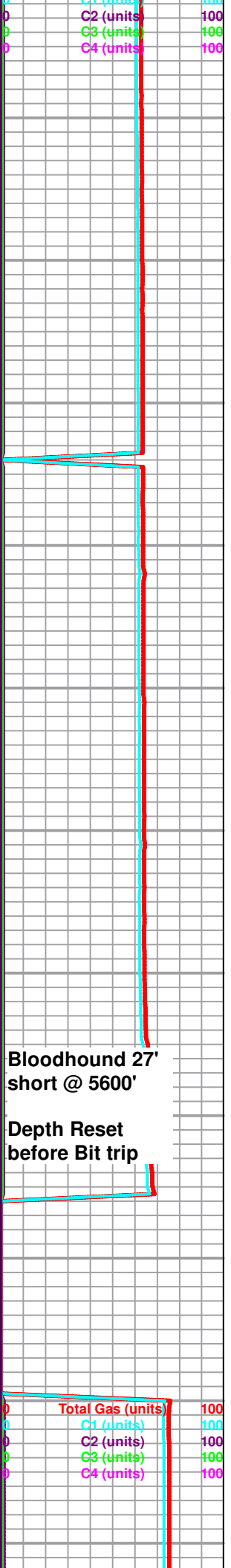
Atoka 5512 (-2389)

LS, tan to cream FXL, dense poor visible porosity, chalky in parts, few foss,

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

LS, tan to white, chalky in parts, dense, poor visible porosity, no shows

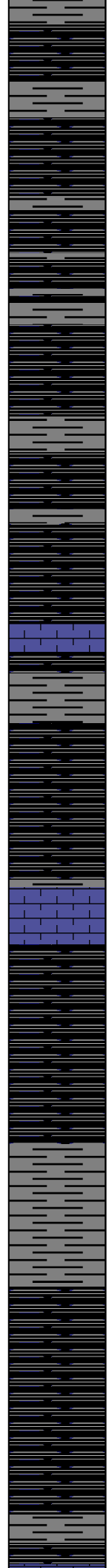
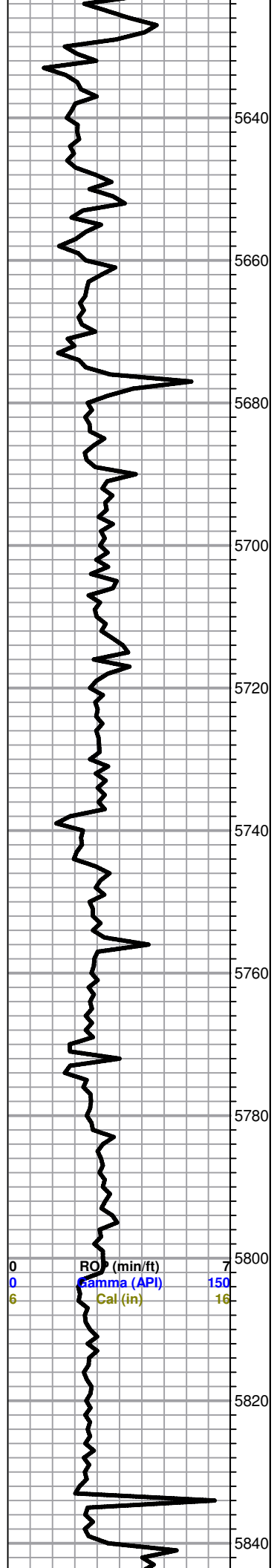
Sh. gray, black carb



Bloodhound 27' short @ 5600'

Depth Reset before Bit trip

Morrow 5627 (-2504)



Sh. black maroon gray, soft in parts

Sh. A/A, trace cream LS, chalky, poor visible porosity, no shows

Sh. black carb, maroon, gray silty

Sh. black to gray, A/A, trace, maroon, greenish,

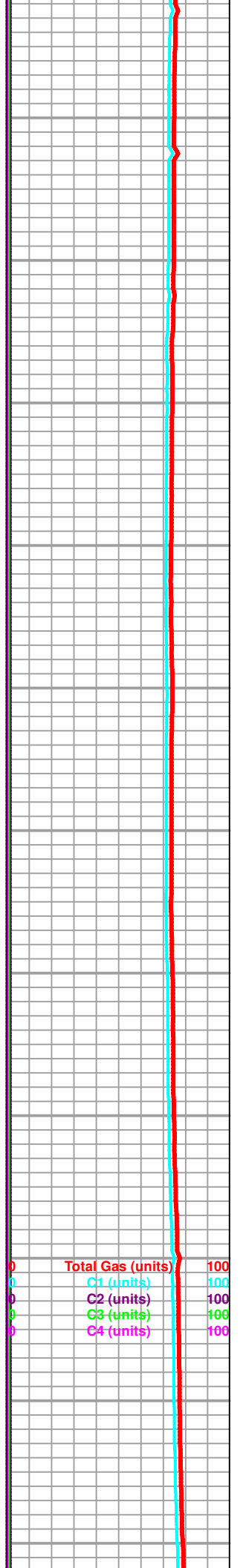
Sh. black soft, gray

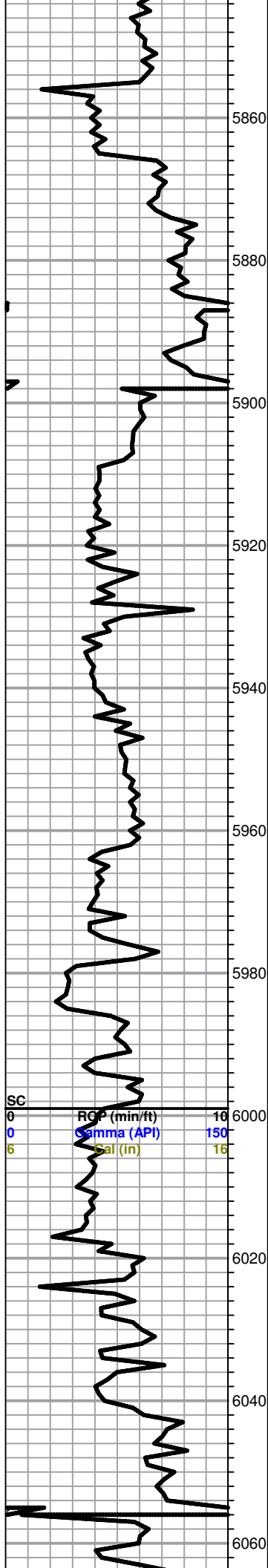
Sh. black carb, trc. LS, brown FXL dense no shows

Sh. Black carb, soft trace LS, cream to tan, FXL, chalky, few foss, scattered porosity no shows

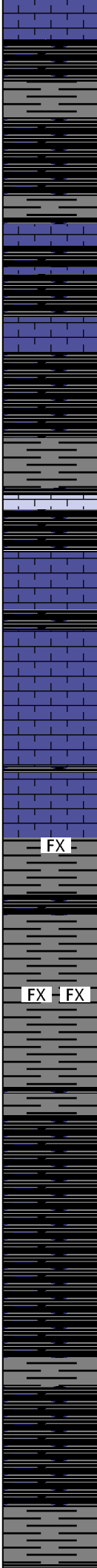
Sh. gray, soft, silty, black

Sh. black carb





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



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

Sh. black carb, maroon, gray

Sh. black carb

Sh. gray silty soft,

LS, cream to tan, FXL, cherty dense, poor scattered porosity no shwos

LS, cream to white, FXL, dense, cherty poor visible porosity, no shows

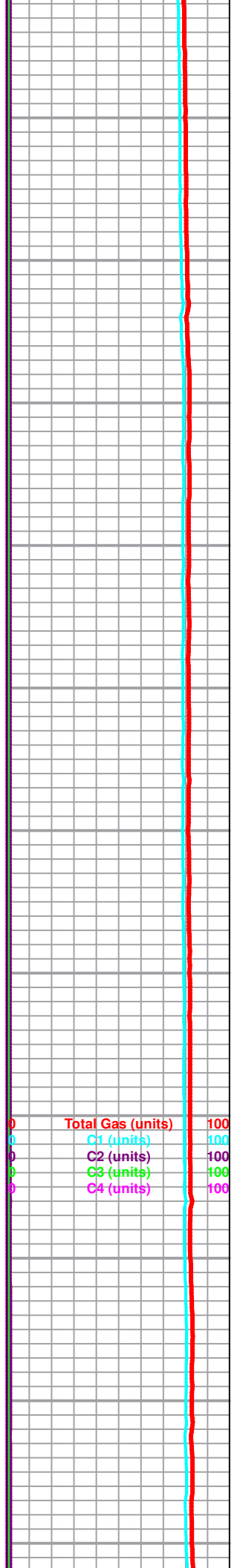
FX

FX FX

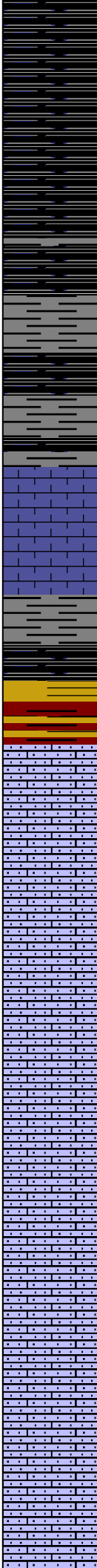
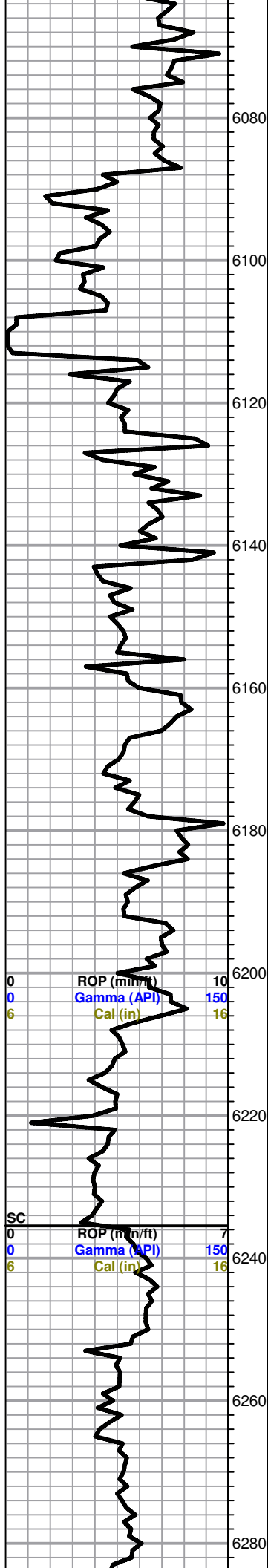
Sh. black carb, trc. green, maroon, sh.

Sh. black carb

Sh. black carb, gray, maroon, silty



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



Sh. black carb

6080

Sh. gray, black carb,

6100

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

6120

Sh. gray, black, soft in parts, trace LS, gray, cherty FXL dense, no shows

6140

Trc. red, orange, silty,

6160

Ste Gen. 6168 (-3045)

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

6180

LS, tan, rose, micro ool, sndy, dense, poor visible porosity, no shows

6200

LS, cream tan rose, A/A, trc. greenish chert

6220

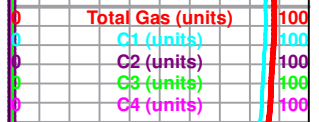
LS, cream to white, dense, micro ool, poor scattered porosity, no shows

6240

LS, tan, cream, micro ool, friable, fair scattered

6260

6280



porosity, no shows

St. Louis 6292 (-3175)

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

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

LS, tan, FXL, dense, cherty, few ool, poorly developed, poor visible porosity, no shows,

LS, cream, chalky, FXL, poor scattered porosity, ool, poorly developed, no shows

LS, tan, well developed ool, fair scattered porosity, chalky, Lt. flor. cut, odor???

LS, white, cream, ool, well developed, good scattered porosity, Lt. brown stain, Trc. SFO, faint odor in freshly broken samples. Lt.- Fair Flor. cut

LS, tan, ool, chalky, poor visible porosity, no shows, no flor. cut

LS, tan, FXL, poor visible porosity, few ool, poor scattered porosity, poor inxln porosity, no shows

LS tan to cream, FXL, dense, few ool, poorly developed, poor visible porosity, no shows

6300
6320
6340
6360
6380
6400
6420
6440
6460
6480

FX

FX

○

○

○

○

○

○

○

○

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○

○

○

○

○

ROP (min/ft) 7
Gamma (API) 150
Cal (in) 16

0
0
6

CFS 20-40-60

CFS 20-40-60

Continue drilling with PDC bit

C2 (units) 100
C3 (units) 100
C4 (units) 100

0
0
0

100
100
100

RTD 6452'