



Scale: 5" / 100'
Measured Depth Log

Well Name Kodak North FD 28-002HN

Location SENW SEC 26 T6N R67W

State COLORADO

County WELD

Country USA

Rig Number PRECISION 460

API Number 05-123-38908

AFE # 16DCC0083

Geographic Region DJ BASIN

Field WATTENBERG

Spud Date 11/19/2016

Drilling Completed 1/17/2017

Surface Coordinates 2253' FNL x 2030' FEL

Bottom Hole Coordinates 343' FNL x 310' FEL

Ground Elevation 4761.0'

K.B. Elevation 4781.6'

Logged Interval 6000' To 15200'

Total Depth 15200'

Formation NIOBRARA B CHALK BENCH

Type of Drilling Fluid OBM

Operator

Company Great Western Oil and Gas

Address 1801 Broadway, Ste 500
Denver, CO 80202

Geologist

Name Kevin Donahue and Beth Storey

Company Terra Guidance

Address 1298 O Road
Loma CO 81524
(970) 260-5408

Zone Color Coding

Oil
Note
Error

Condensate
Core
Water

Gas
Prest
Seal

Rock Types

	LIMESTONE		SANDSTONE		DOLOMITE
	Chalk		BENTONITE		CHERT
	Marl		CEMENT		COAL
	SHALE		UNKNOWN		MARLSTONE
	Silty Shale		ANHYDRITE		SHALE GRAY
	Shaly Siltstone		GYPSUM		SHALE COLOR
	SILTSTONE		SALT		CONGLOMERATE
	Shaly Sandstone		SIDERITE or LIMONITE		

Accessories

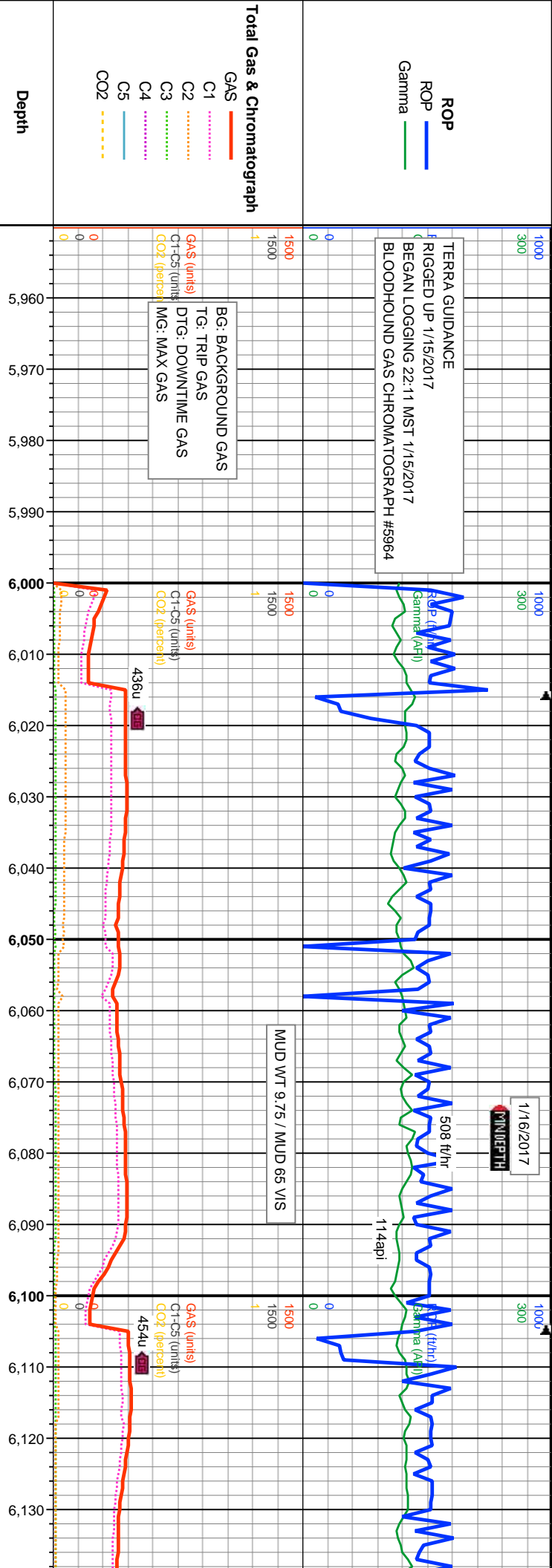
Fossils	F FOSSIL	- ARGILLACEOUS	∨ GLAUCONITE	Stringer	
ALGAE	GASTROPOD	/ ARGILLITE GRAIN	∕ GYPSIFEROUS	ANHYDRITE STRINGER	
AMPHIPORA	φ OOLITE	B BENTONITE	∕ HEAVY MINERAL	BENTONITE STRINGER	
BELEMNITE	OSTRACOD	BITUMENOUS SUBSTANCE	K KAOLIN	COAL STRINGER	
BIOCLASTIC	PELECYPOD	BRECCIA FRAGMENTS	T MARLSTONE	DOLOMITE STRINGER	
BRACHIOPOD	∩ PELLET	CALCAREOUS	MINERAL CRYSTALS	GYPSUM STRINGER	
BRACHIOPOD	⊖ PISOLITE	CARBONACEOUS FLAKES	NODULES	LIMESTONE STRINGER	
CEPHALOPOD	PLANT REMAINS	▲ CHTDK	PHOSPHATE PELLETS	MARLSTONE (CALC) STRG	
CORAL	PLANT SPORES	△ CHTLT	P PYRITE	MARLSTONE (DOU) STRG	
CRINOID	SCAPHOPOD	- COAL - THIN BEDS	⊞ SALT CAST	SANDSTONE STRINGER	
ECHINOID	STROMATOPOROID	∠ DOLOMITIC	: SANDY	SHALE STRINGER	
FORAMINIFERA		+ FELDSPAR	∨ SILICEOUS	SILTSTONE STRINGER	
FISH		● FERRUGINOUS PELLETS	∗ SILTY		
ANHYDRITIC		∠ FERRUGINOUS	∨ TUFACEOUS		

Other Symbols

Oil Show	□ ORGANIC	↔ FORMATION TOP	Rounding	L LITHOGRAPHIC
D DEAD	P PINPOINT	* GAS SHOW	ANGULAR	MX MICROXLN
● EVEN	∨ VUGGY	MINDEPTH MNDEPTH	R ROUNDED	MS MUDSTONE
○ QUESTIONABLE		∕ NORMAL FAULT	B SUBANG	PS PACKSTONE
● SPOTTED STAINING		∩ OIL SHOW	P SUBRND	WS WACKESTONE
		∩ OVERTURNED STRATA		
Porosity	BIT	↔ REVERSE FAULT	Textures	Sorting
	CASING	↔ SIDEWALL CORE (LEFT)	M MODERATE	
E EARTHY	↔ CONNECTION (LEFT)	↔ SIDEWALL CORE (RIGHT)	P POOR	
F FRACTURE	↔ CONNECTION (RIGHT)	↔ CONNECTION GAS	C CHALKY	
X INTERCRYSTALLINE	↔ CORE - LOST	SURVEY	CX CRYPTOXLN	
φ INTEROOLITIC	∩ CORE - RECOVERED	TRIP GAS	E EARTHY	
M MOLDIC	∩ DST INTERVAL	∩ WIRELINE TESTED - LEFT	FX FINELYXLN	
	∩ FAULT	∩ WIRELINE TESTED - RT	GS GRAINSTONE	

- BRECCIA
- TUFF
- IGNEOUS METAMORPHIC

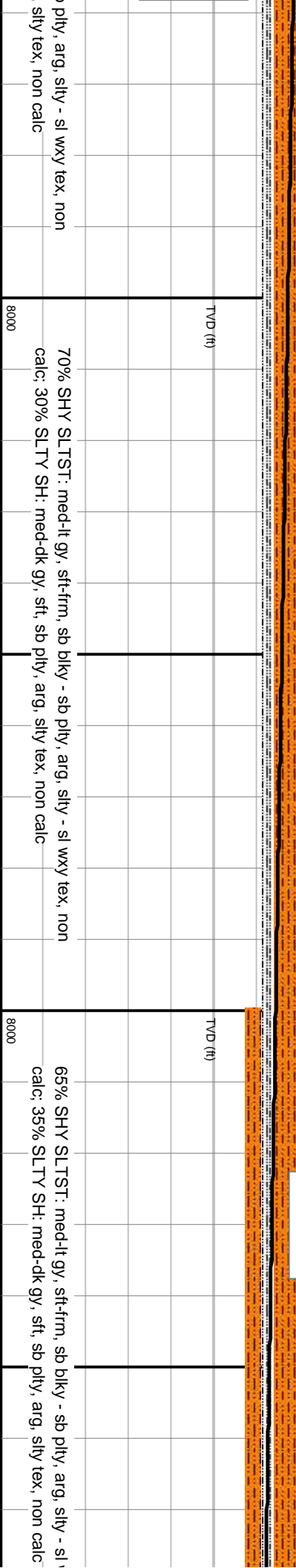
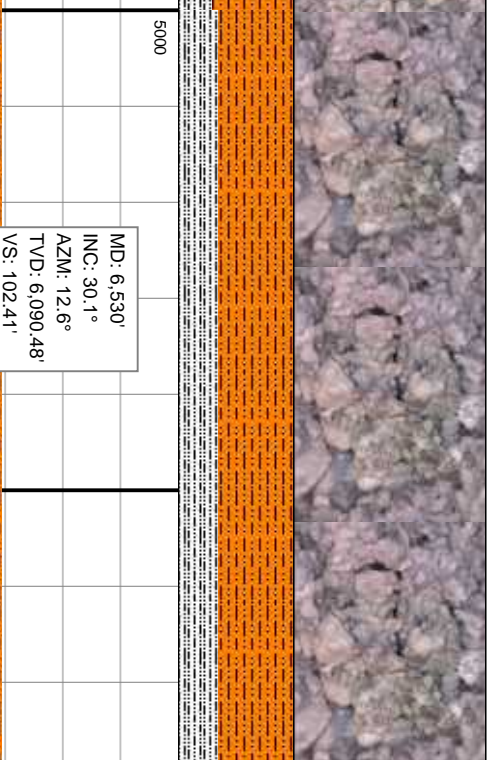
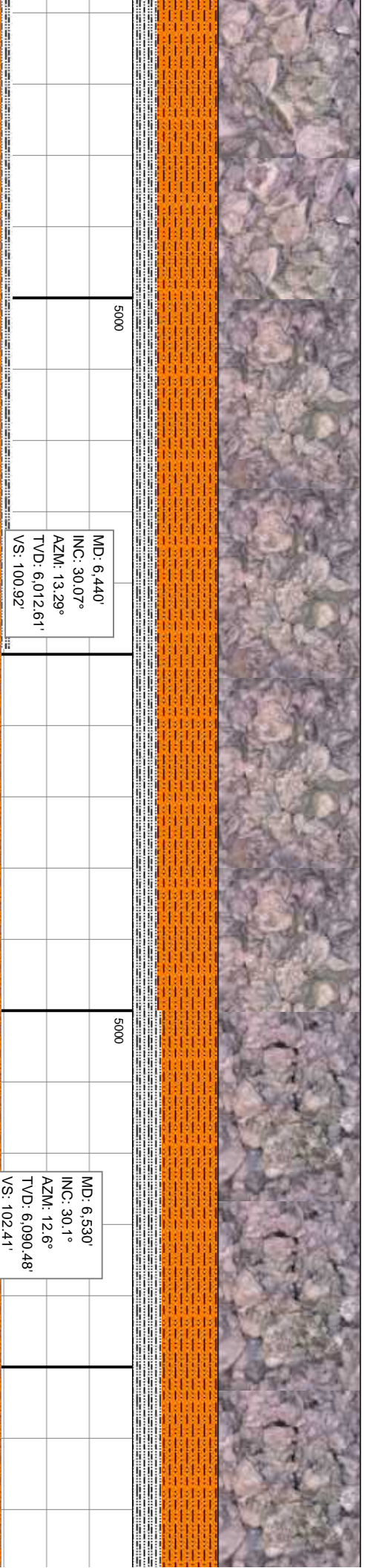
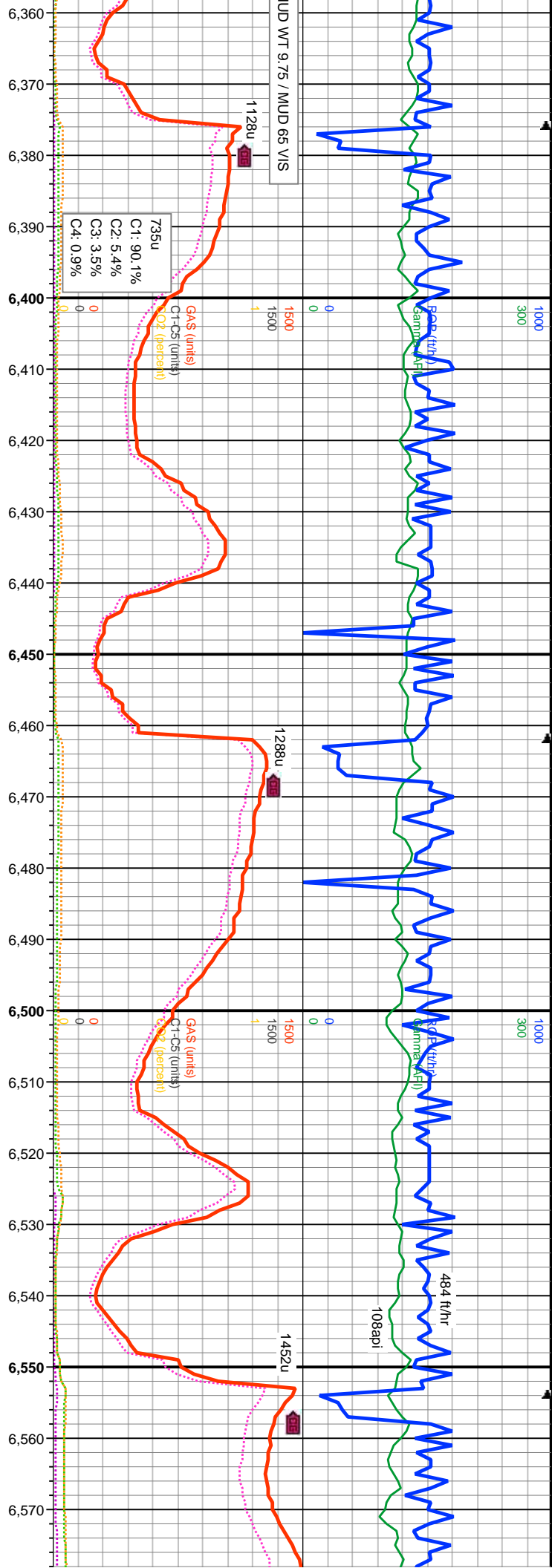
RED
DATE

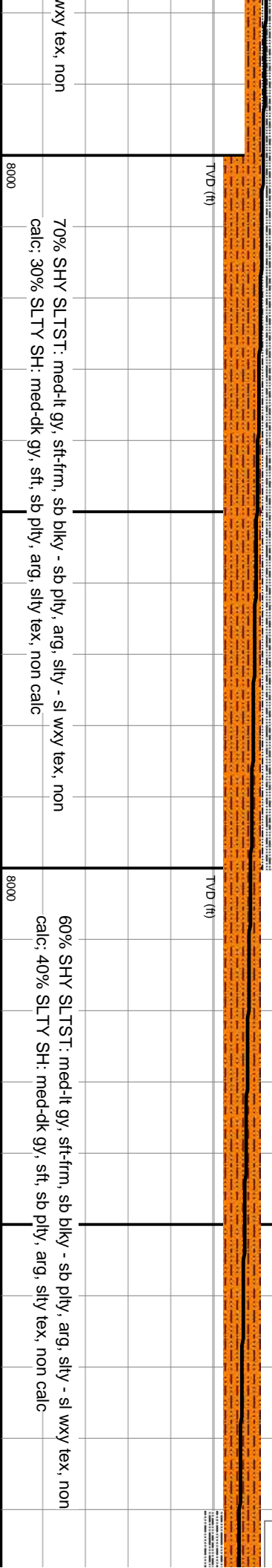
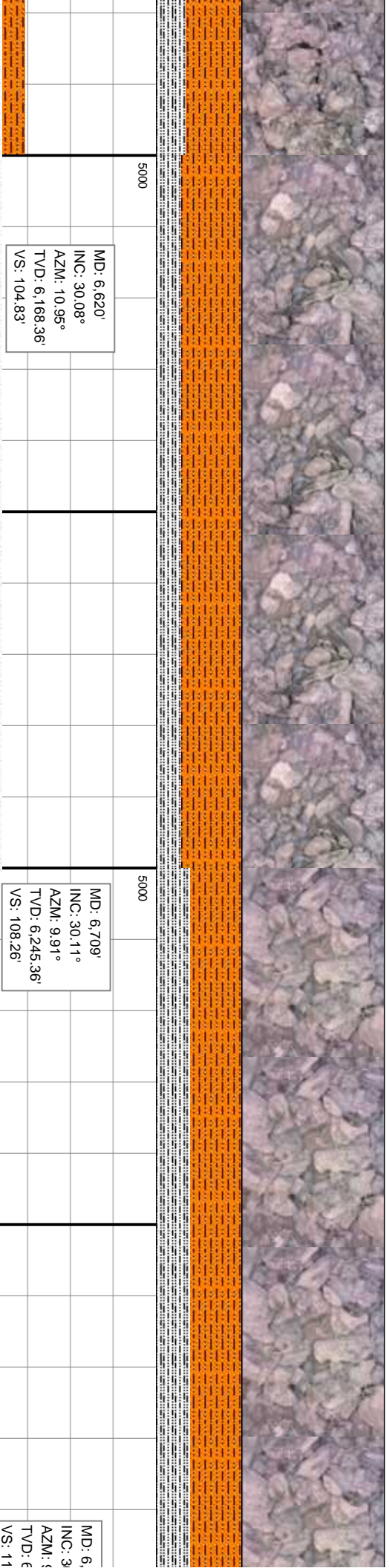
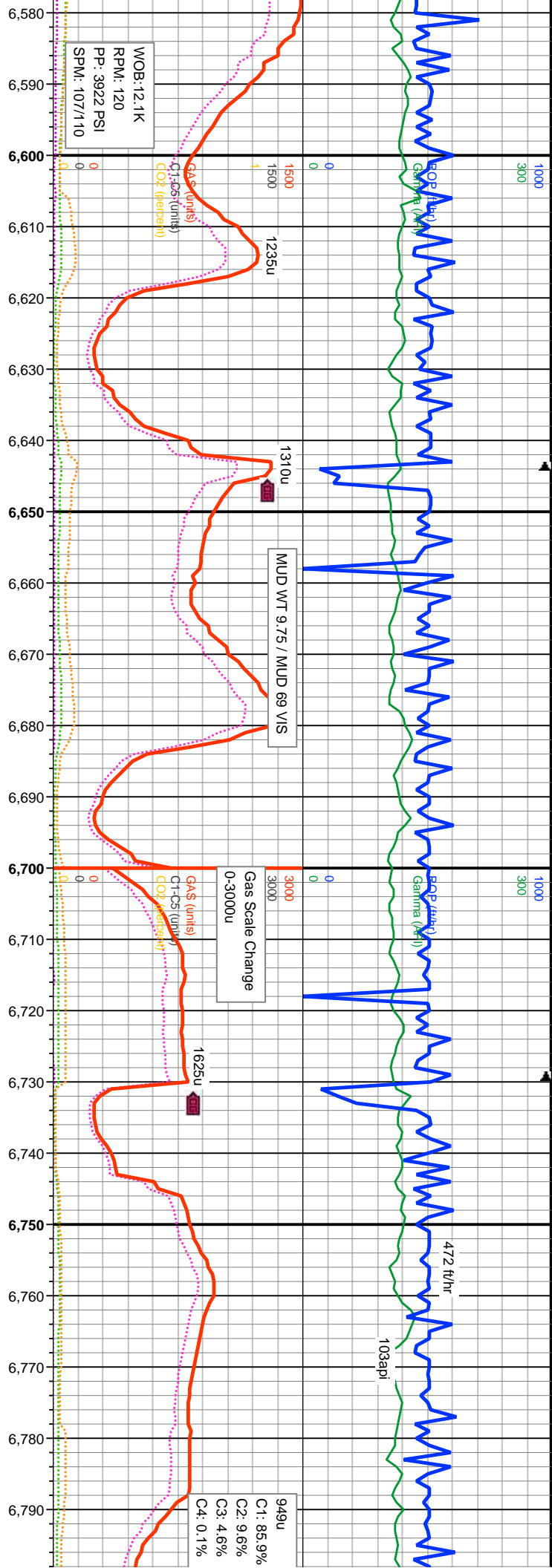


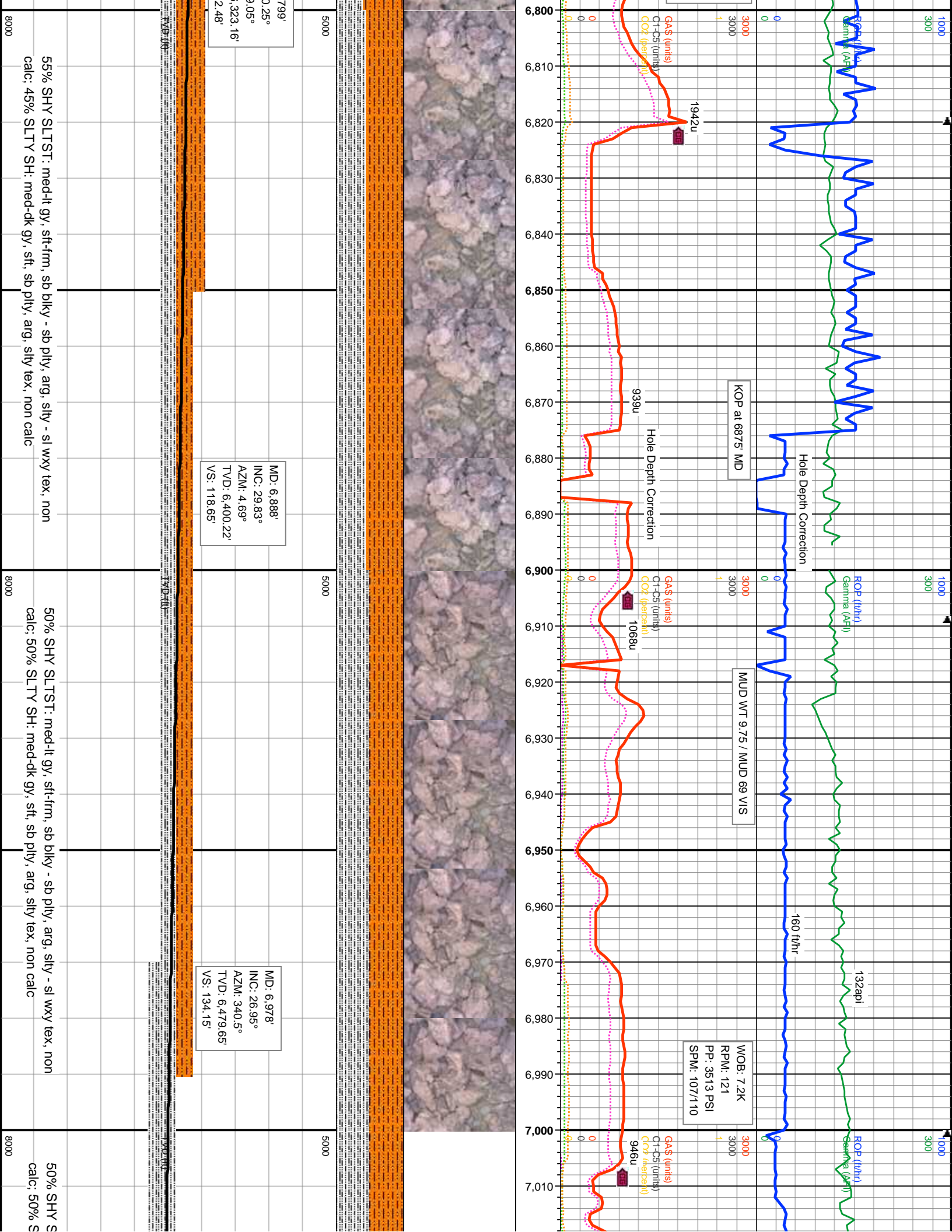
Depth	% Lithology	Well Bore
5000		MD: 5.993' INC: 30.25° AZM: 16.91° TVD: 5.626.14' VS: 102.24'
5000		MD: 6.083' INC: 30.21° AZM: 16.31° TVD: 5.703.9' VS: 100.84'
8000		MD: 5.993' INC: 30.25° AZM: 16.91° TVD: 5.626.14' VS: 102.24'
8000		MD: 6.083' INC: 30.21° AZM: 16.31° TVD: 5.703.9' VS: 100.84'

80% SHY SLTST: med-lt gy, sft-frm, sb blk - sb ply, arg, stly - sl wxy tex, non calc;
 20% SLTY SH: med-dk gy, sft, sb ply, arg, stly tex, non calc

80% SHY SLTST: med-lt gy, calc;
 20% SLTY SH: med-dk







7991'
 0.25°
 0.05°
 .323.16'
 2.48'

MD: 6.888'
 INC: 29.83°
 AZM: 4.69°
 TVD: 6.400.22'
 VS: 118.65'

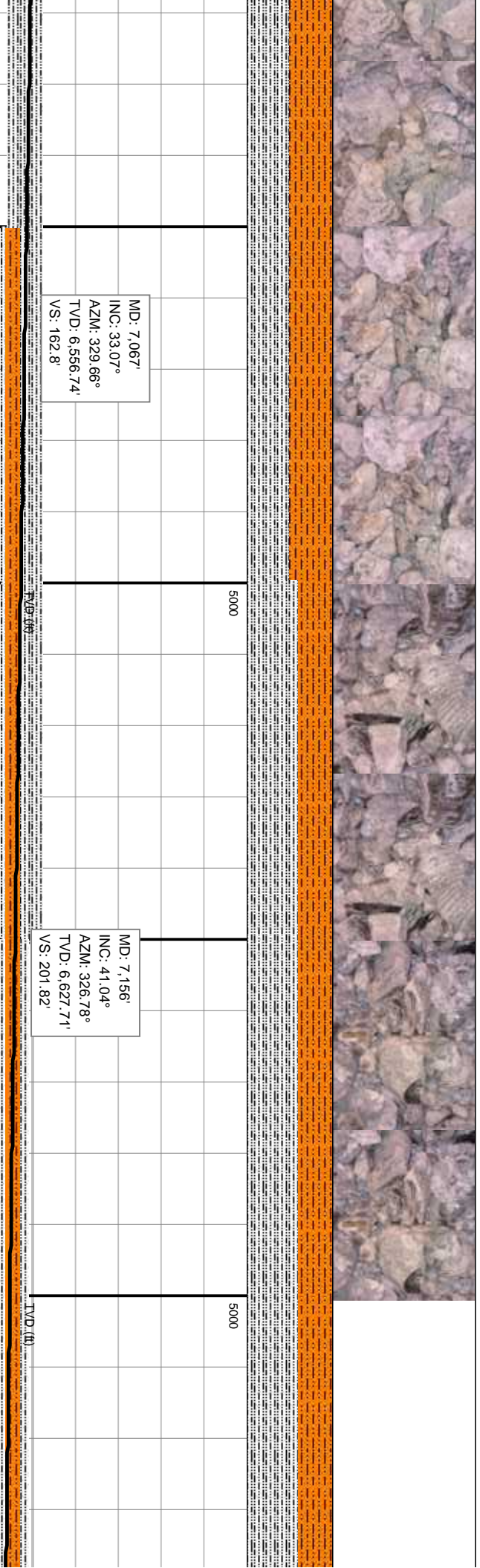
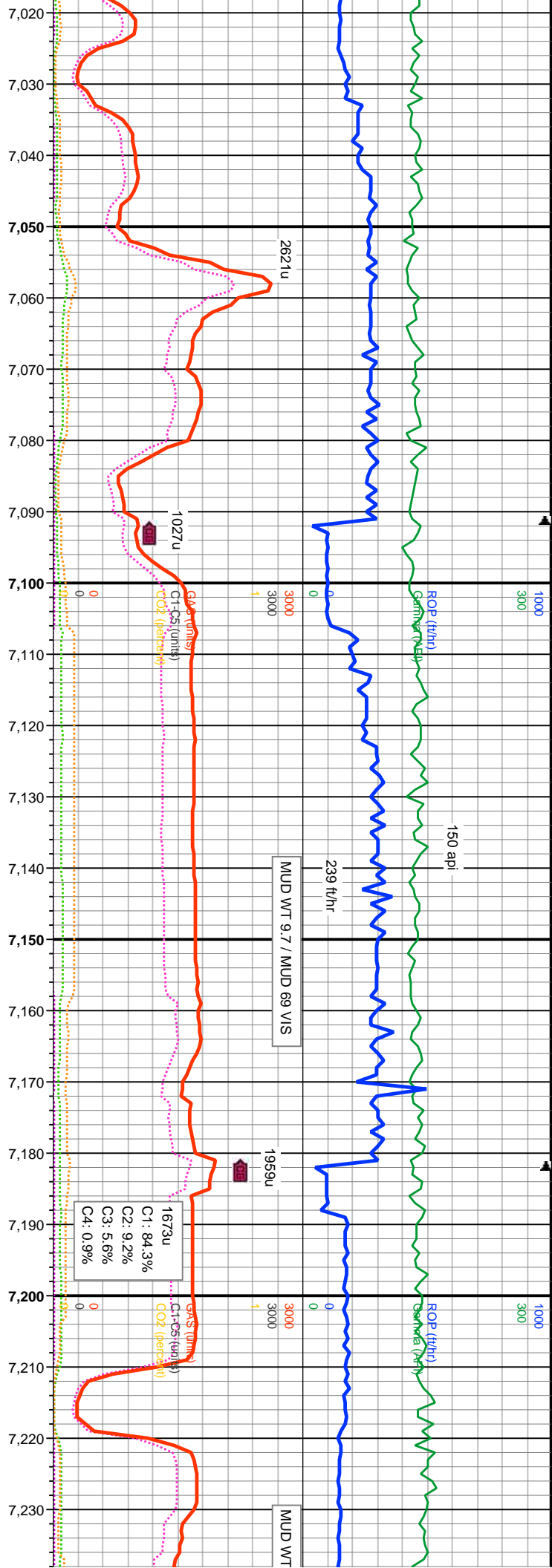
MD: 6.978'
 INC: 26.95°
 AZM: 340.5°
 TVD: 6.479.65'
 VS: 134.15'

WOB: 7.2K
 RPM: 121
 PP: 3513 PSI
 SPM: 107/110

55% SHY SLTST: med-ht gy, sft-firm, sb blk-y - sb plty, arg, silty - sl wxy tex, non calc; 45% SLTY SH: med-dk gy, sft, sb plty, arg, silty tex, non calc

50% SHY SLTST: med-ht gy, sft-firm, sb blk-y - sb plty, arg, silty - sl wxy tex, non calc; 50% SLTY SH: med-dk gy, sft, sb plty, arg, silty tex, non calc

50% SHY S
 calc; 50% S



MD: 7.067'
 INC: 33.07°
 AZM: 329.66°
 TVD: 6.556.74'
 VS: 162.8'

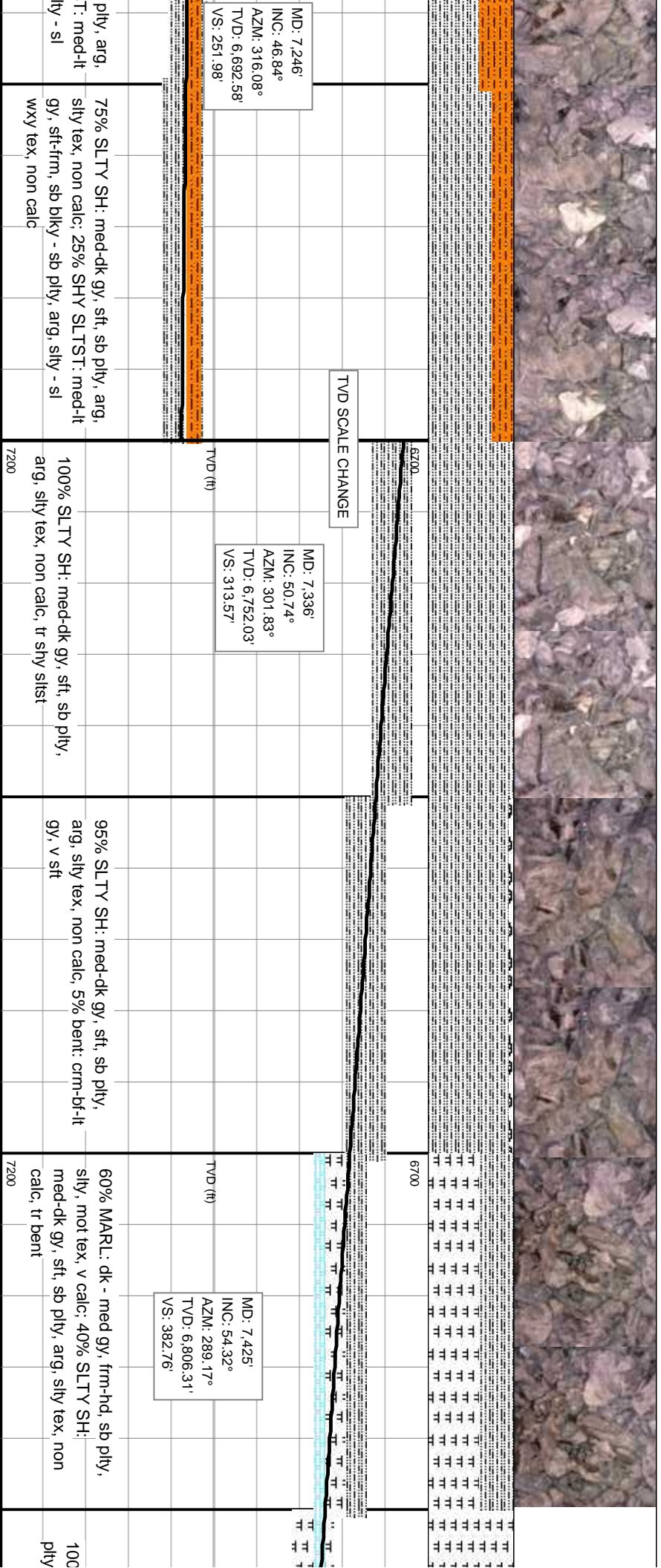
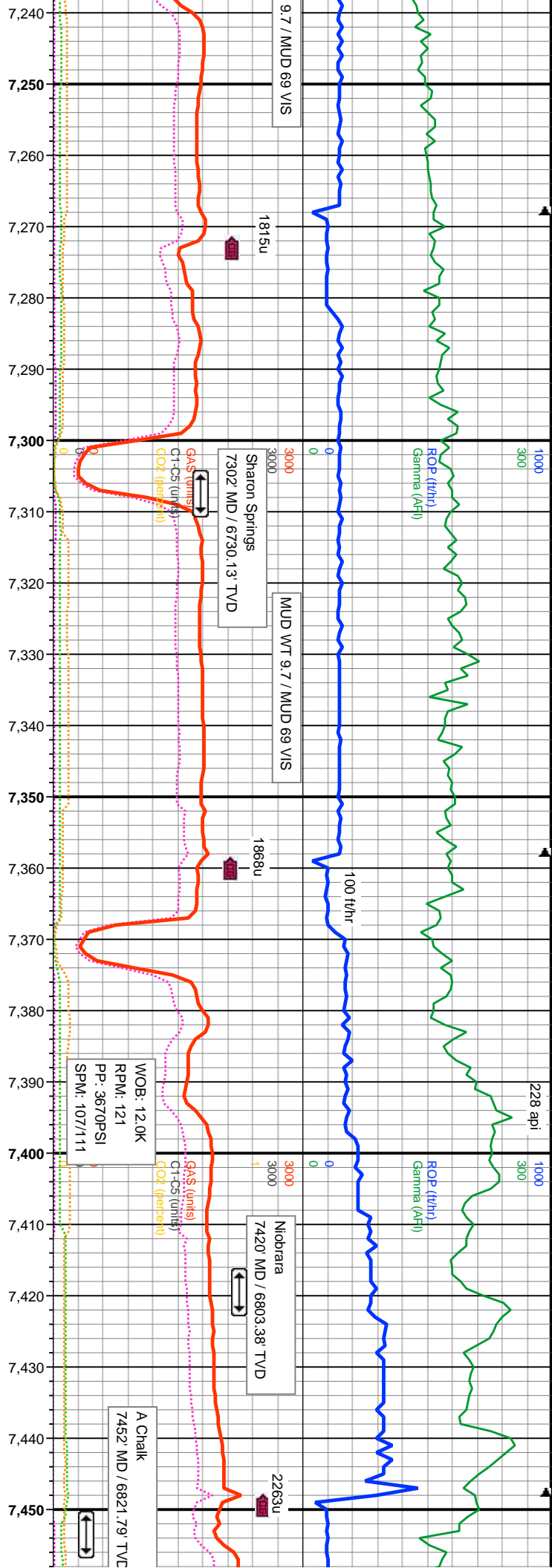
MD: 7.156'
 INC: 41.04°
 AZM: 326.78°
 TVD: 6.627.71'
 VS: 201.82'

SLTY SH: med-lt gy, sft-frm, sb blkly - sb plty, arg, silty - sl wxy tex, non calc

SLTY SH: med-dk gy, sft, sb plty, arg, silty tex, non calc; 40% SHY SLTST: med-lt gy, sft-frm, sb blkly - sb plty, arg, silty - sl wxy tex, non calc

SLTY SH: med-dk gy, sft, sb plty, arg, silty tex, non calc; 40% SHY SLTST: med-lt gy, sft-frm, sb blkly - sb plty, arg, silty - sl wxy tex, non calc

SLTY SH: med-dk gy, sft, sb plty, arg, silty tex, non calc; 40% SHY SLTST: med-lt gy, sft-frm, sb blkly - sb plty, arg, silty - sl wxy tex, non calc



MD: 7.246'
INC: 46.84°
AZM: 316.08°
TVD: 6.692.58'
VS: 251.98'

MD: 7.336'
INC: 50.74°
AZM: 301.83°
TVD: 6.752.03'
VS: 313.57'

MD: 7.425'
INC: 54.32°
AZM: 289.17°
TVD: 6.806.31'
VS: 382.76'

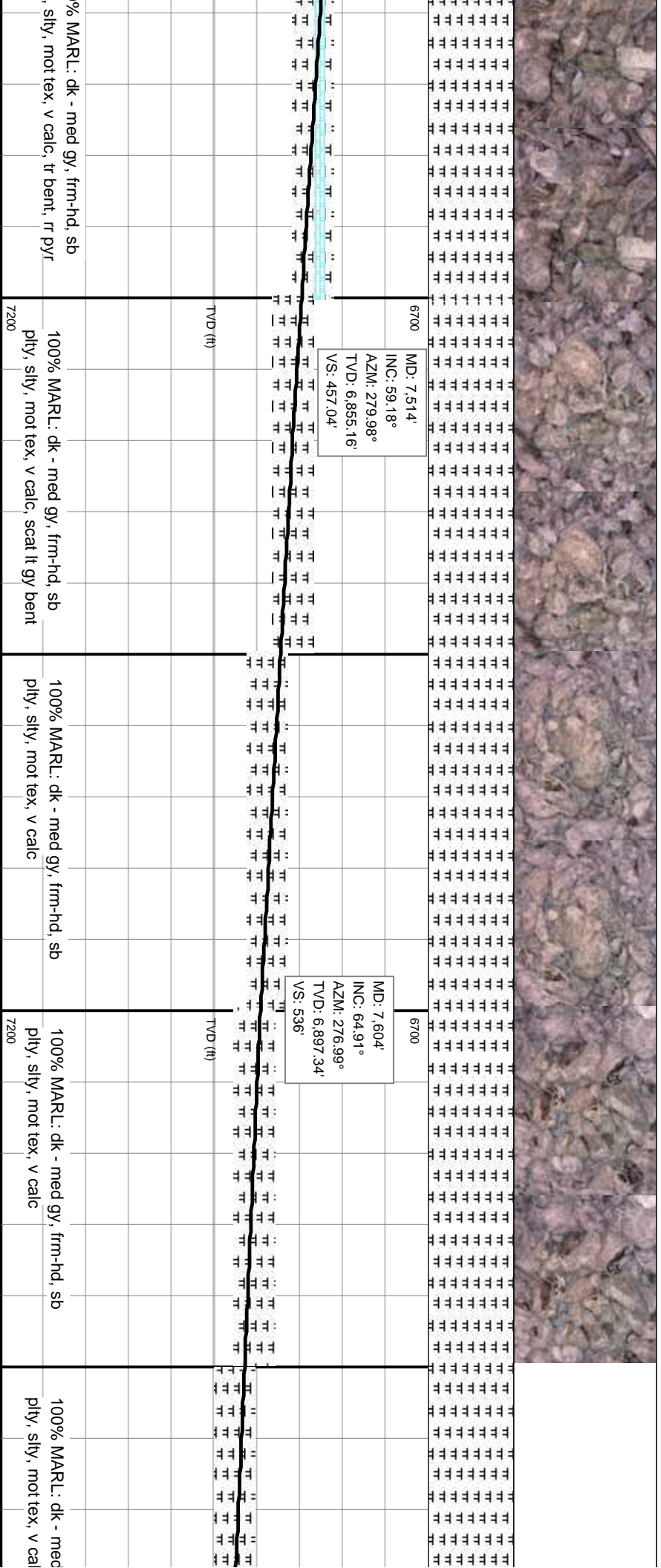
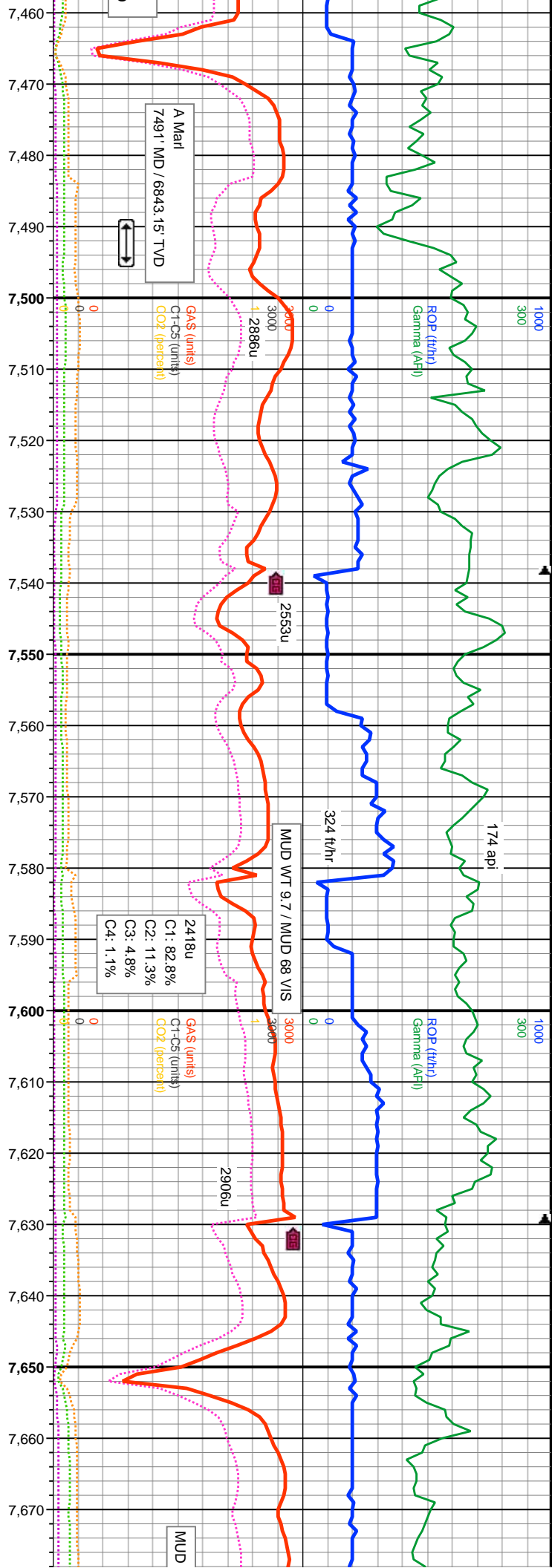
pily, arg,
T: med-lt
sily - sl
75% SLTY SH: med-dk gy, sft, sb pily, arg,
sily tex, non calc, 25% SHY SLTST: med-lt
gy, sft-frm, sb bily - sb pily, arg, sily - sl
wxy tex, non calc

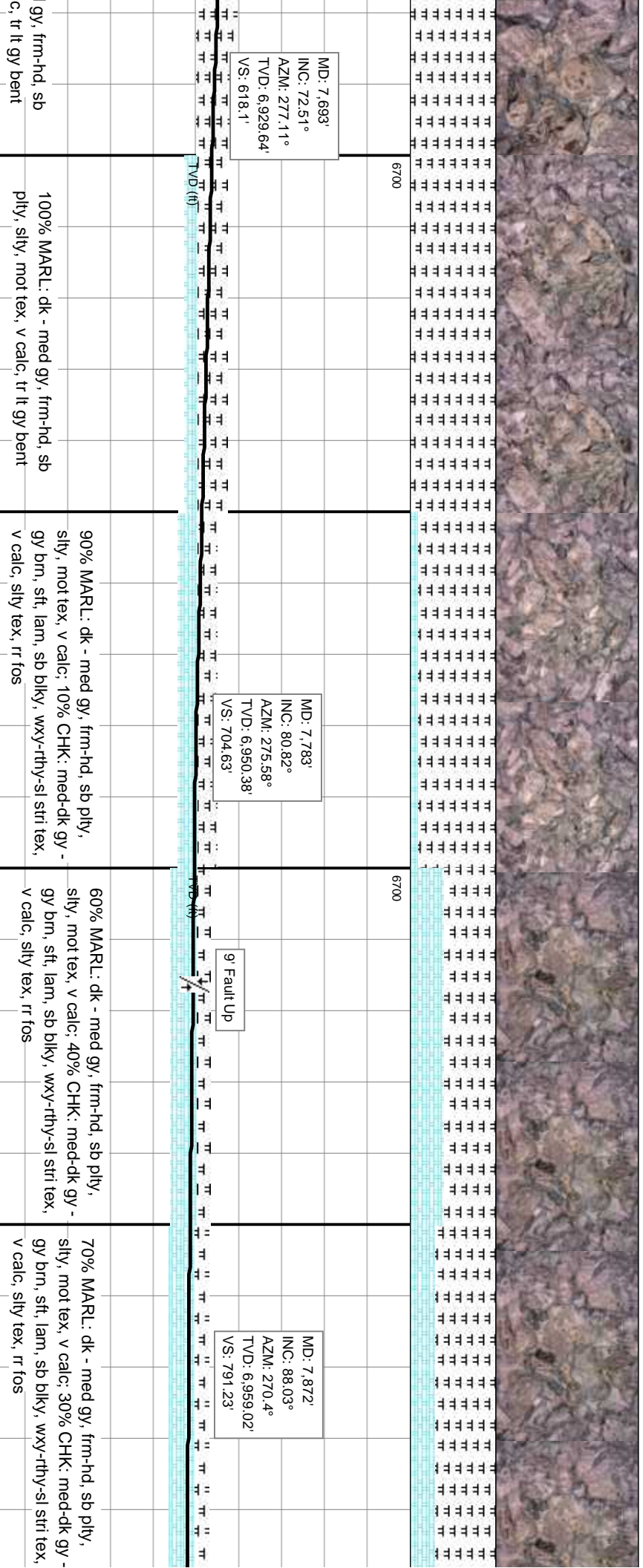
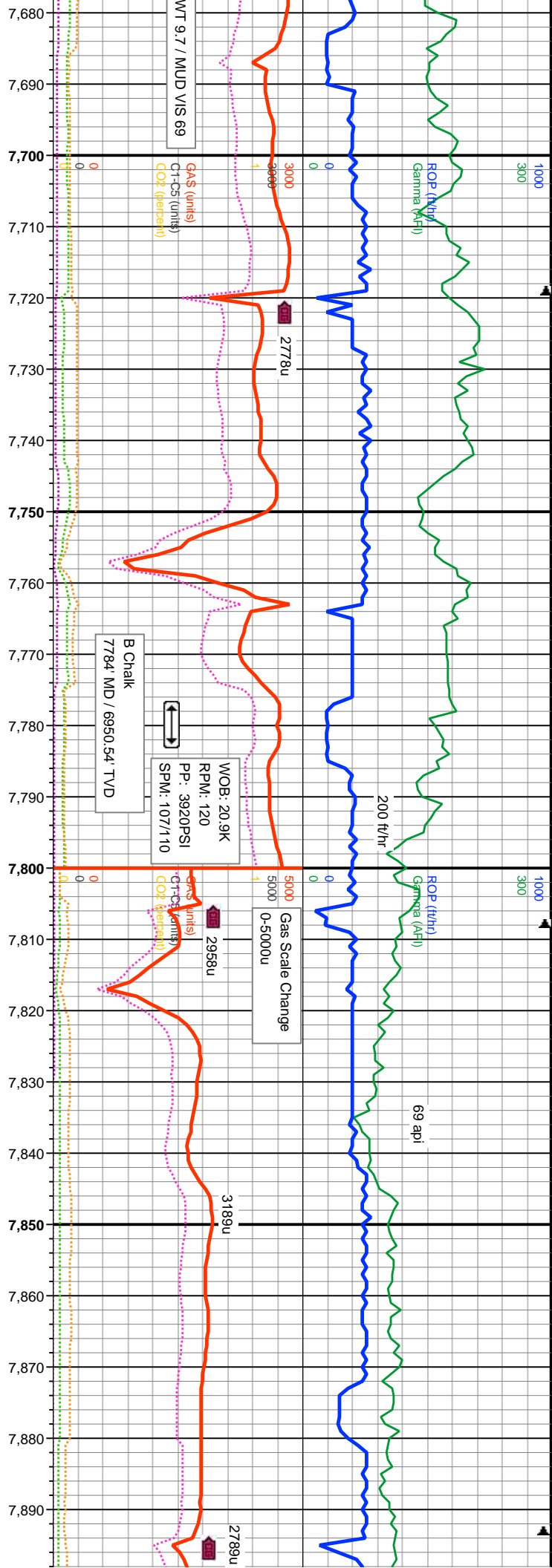
100% SLTY SH: med-dk gy, sft, sb pily,
arg, sily tex, non calc, tr sily slst

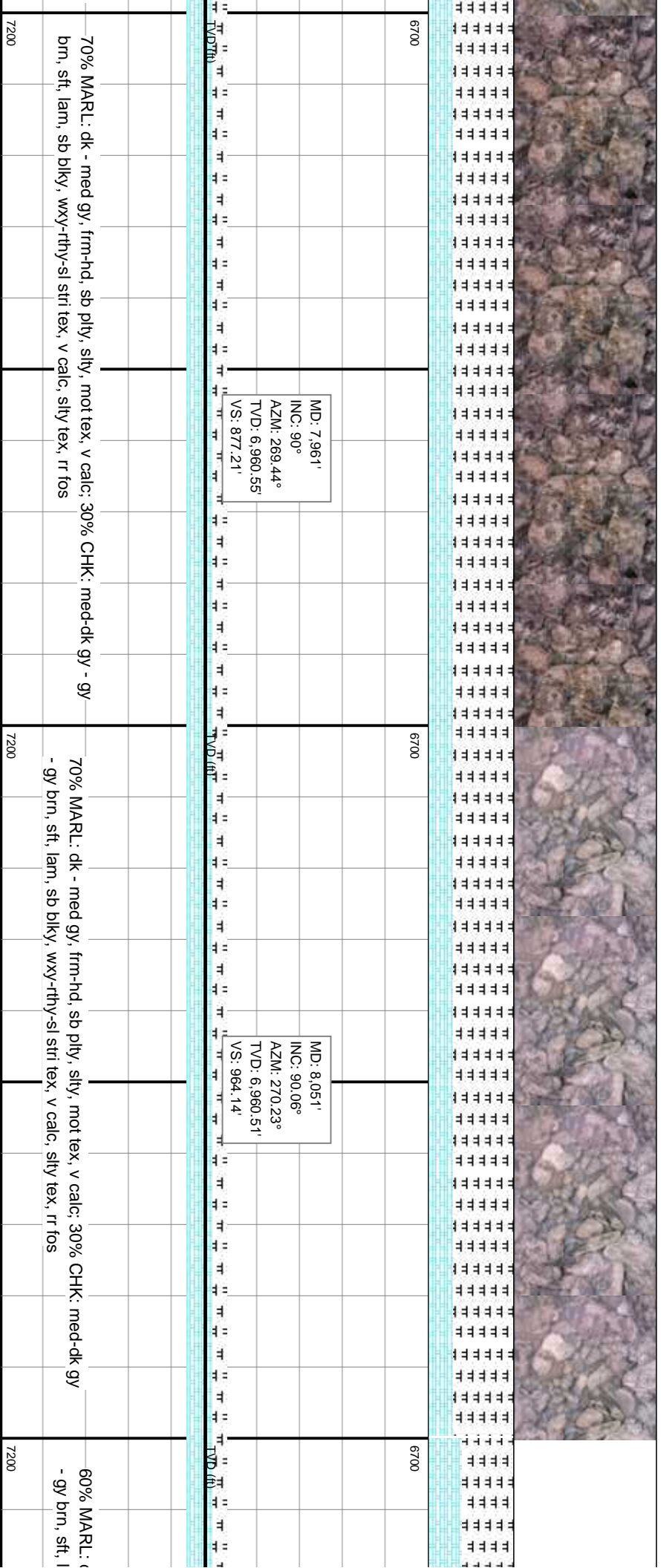
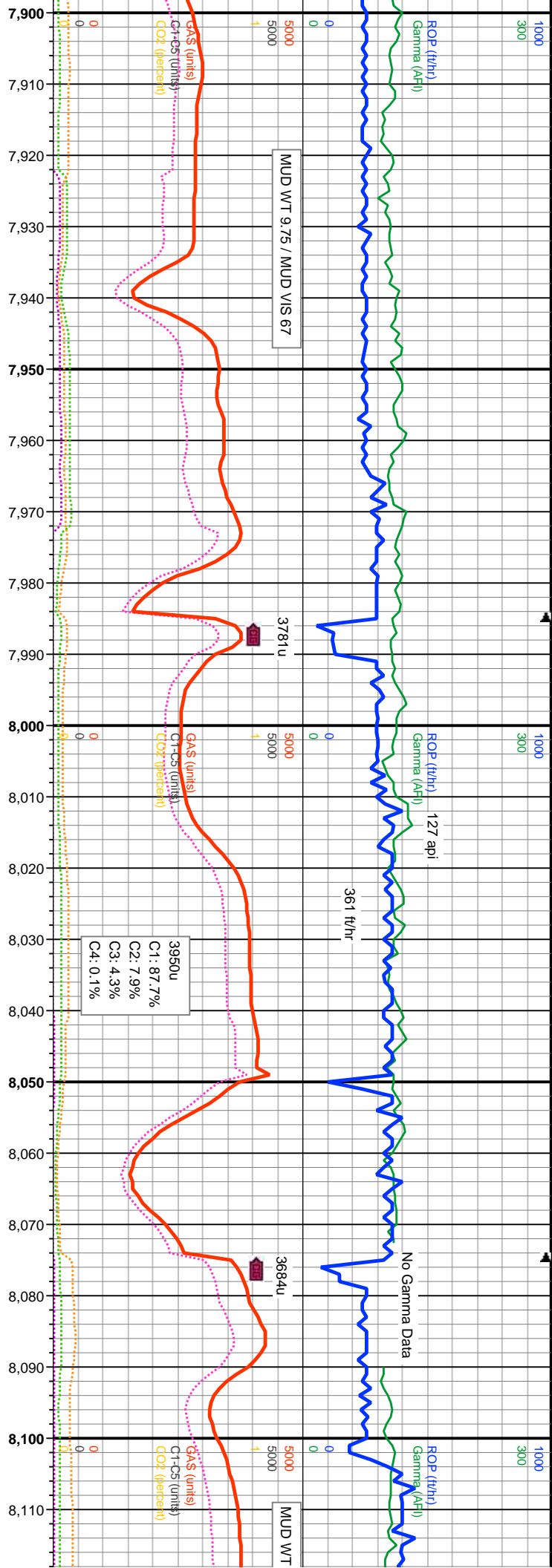
95% SLTY SH: med-dk gy, sft, sb pily,
arg, sily tex, non calc, 5% bent: crm-bf-lt
gy, v sft

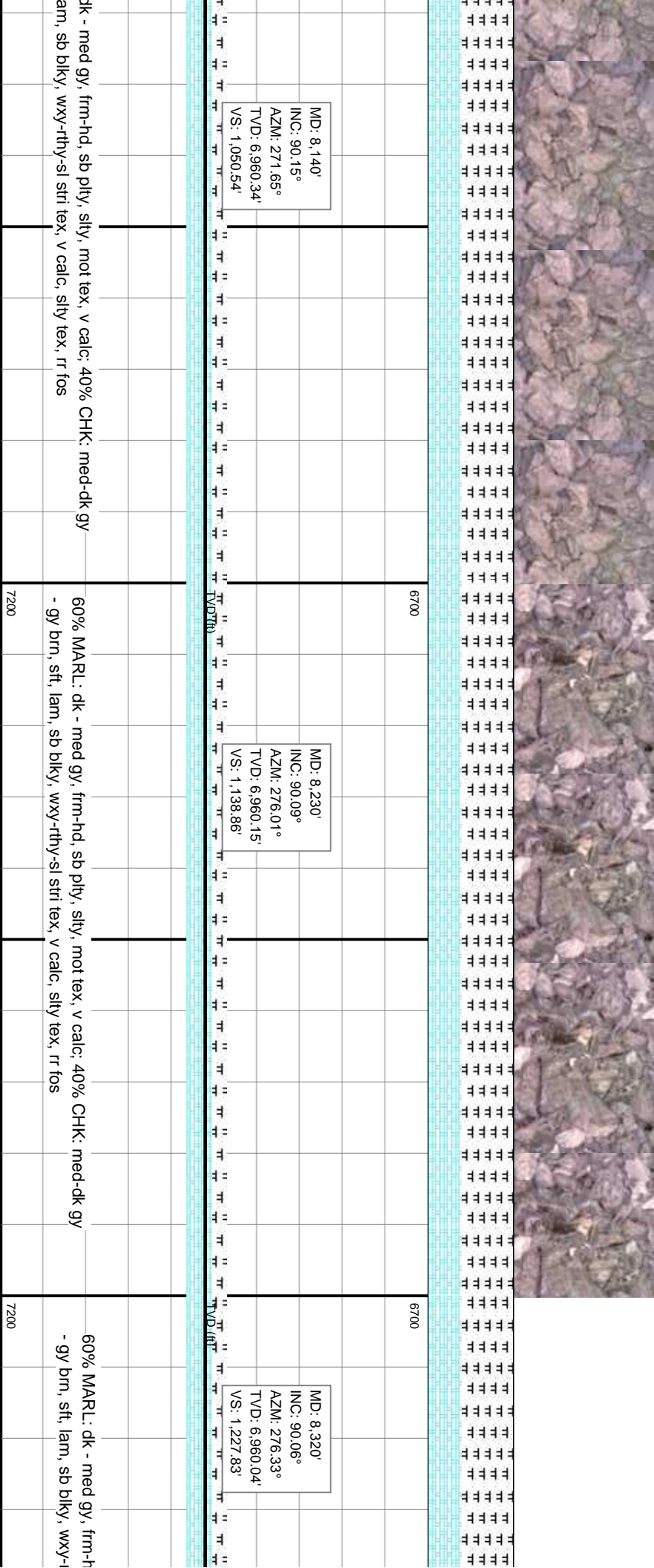
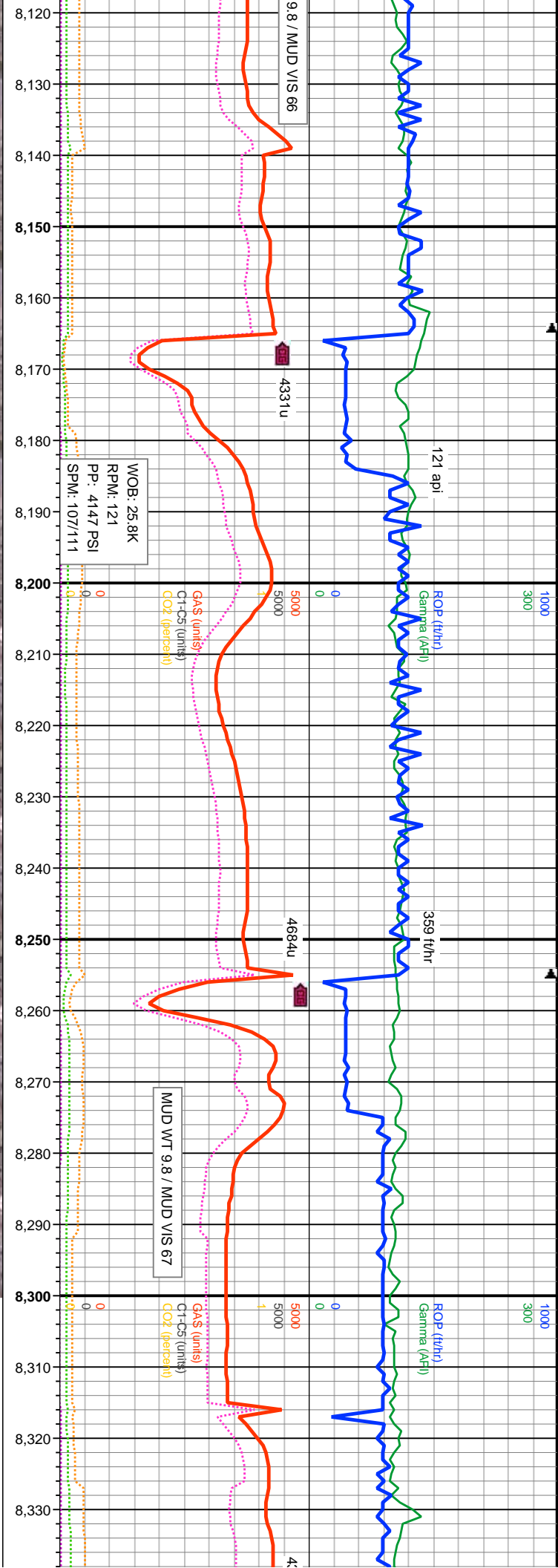
60% MARL: dk - med gy, frm-hd, sb pily,
sily, mot tex, v calc; 40% SLTY SH:
med-dk gy, sft, sb pily, arg, sily tex, non
calc, tr bent

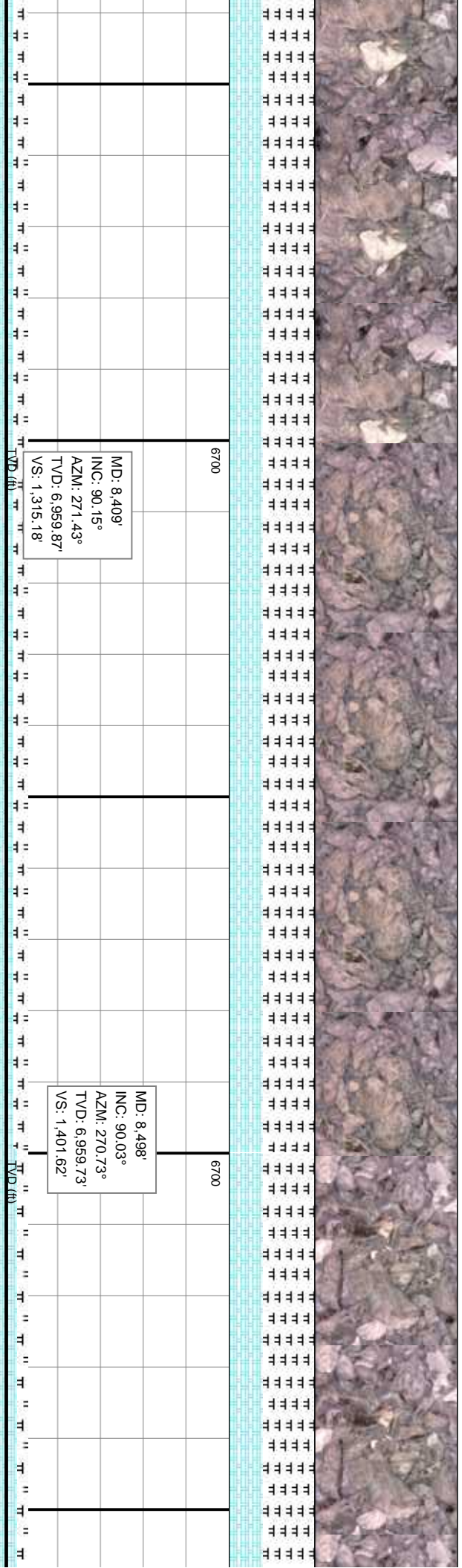
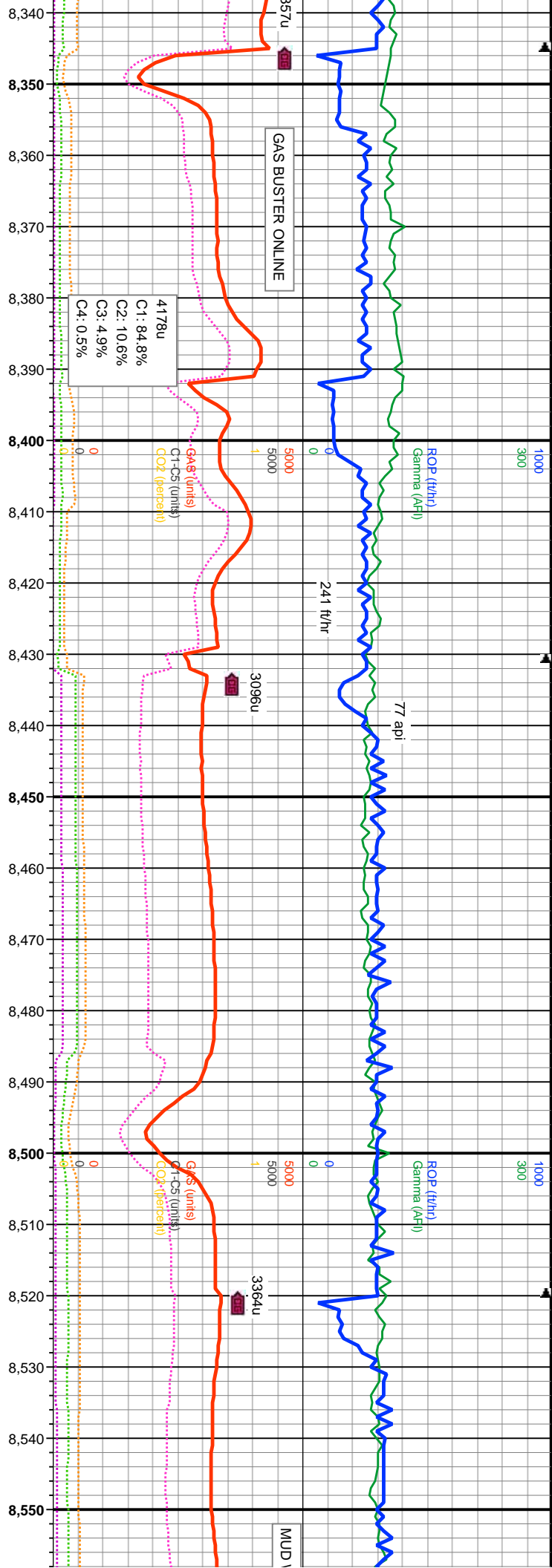
100
pily











MD: 8.409'
INC: 90.15°
AZM: 271.43°
TVD: 6.959.87'
VS: 1.315.18'

MD: 8.498'
INC: 90.03°
AZM: 270.73°
TVD: 6.959.73'
VS: 1.401.62'

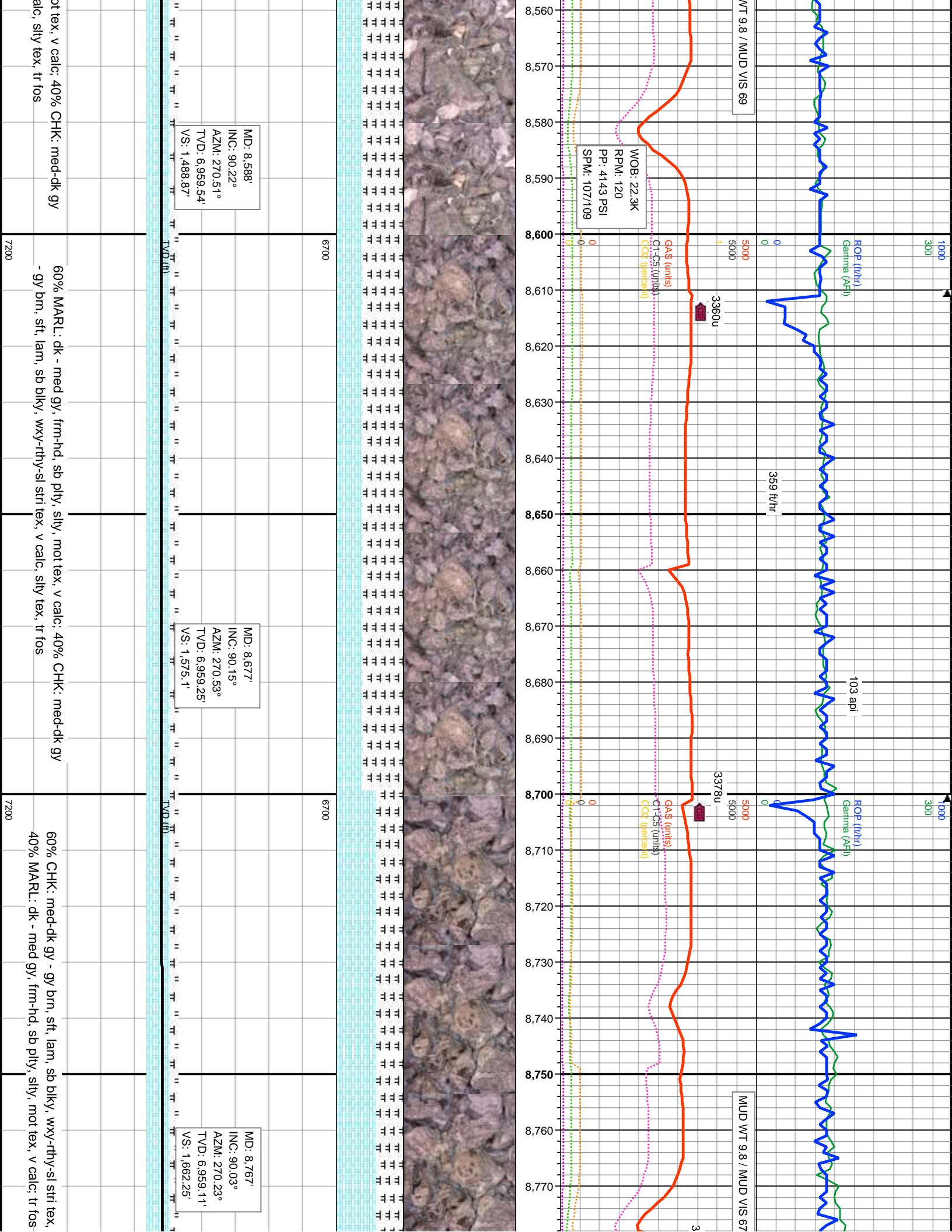
d, sb ply, sly, mot tex, v calc: 40% CHK: med-dk gy

60% MARL: dk - med gy, frm-hd, sb ply, sly, mot tex, v calc: 40% CHK: med-dk gy

60% MARL: dk - med gy, frm-hd, sb ply, sly, m

thy-sl stri tex, v calc, sly tex, tr fos

- gy brn, sft, lam, sb blk, wxy-rthy-sl stri tex, v c

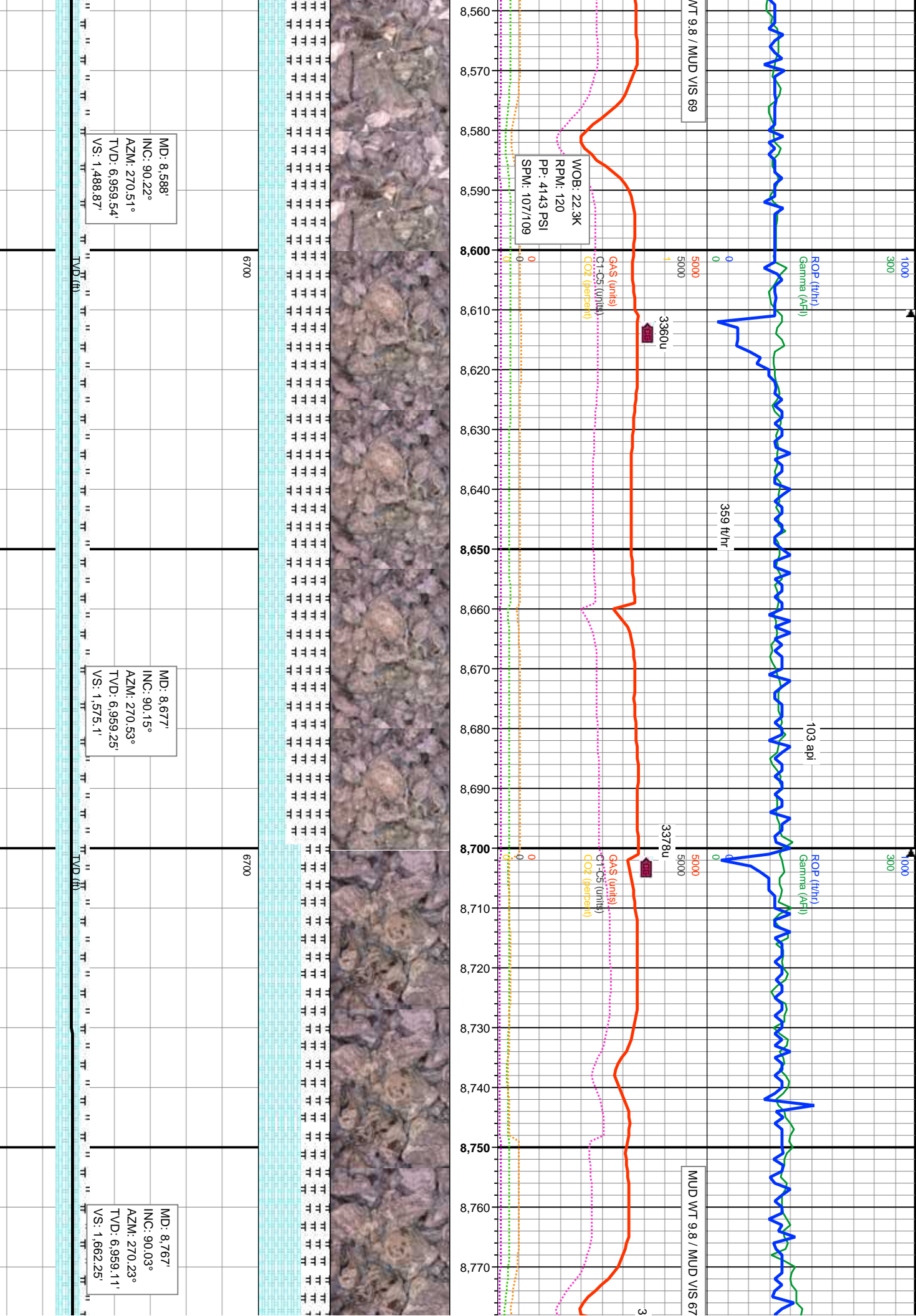


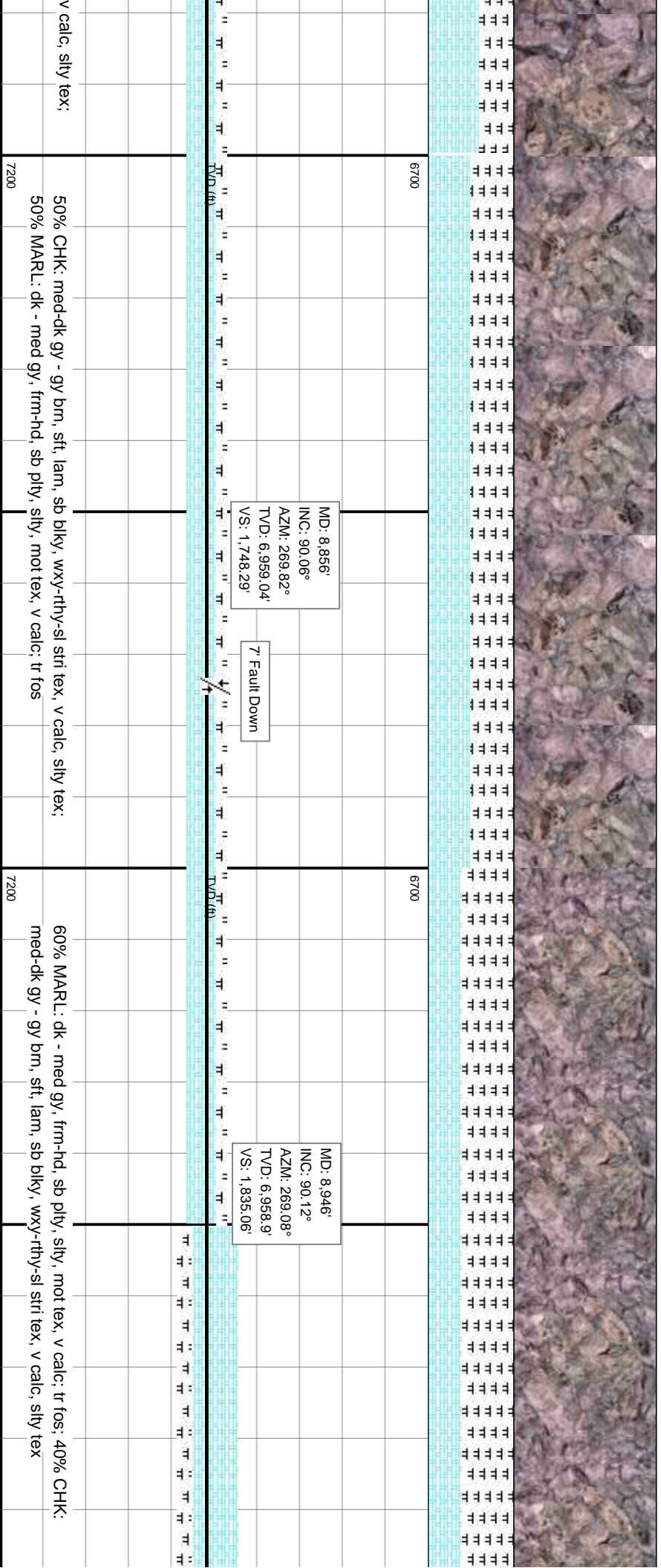
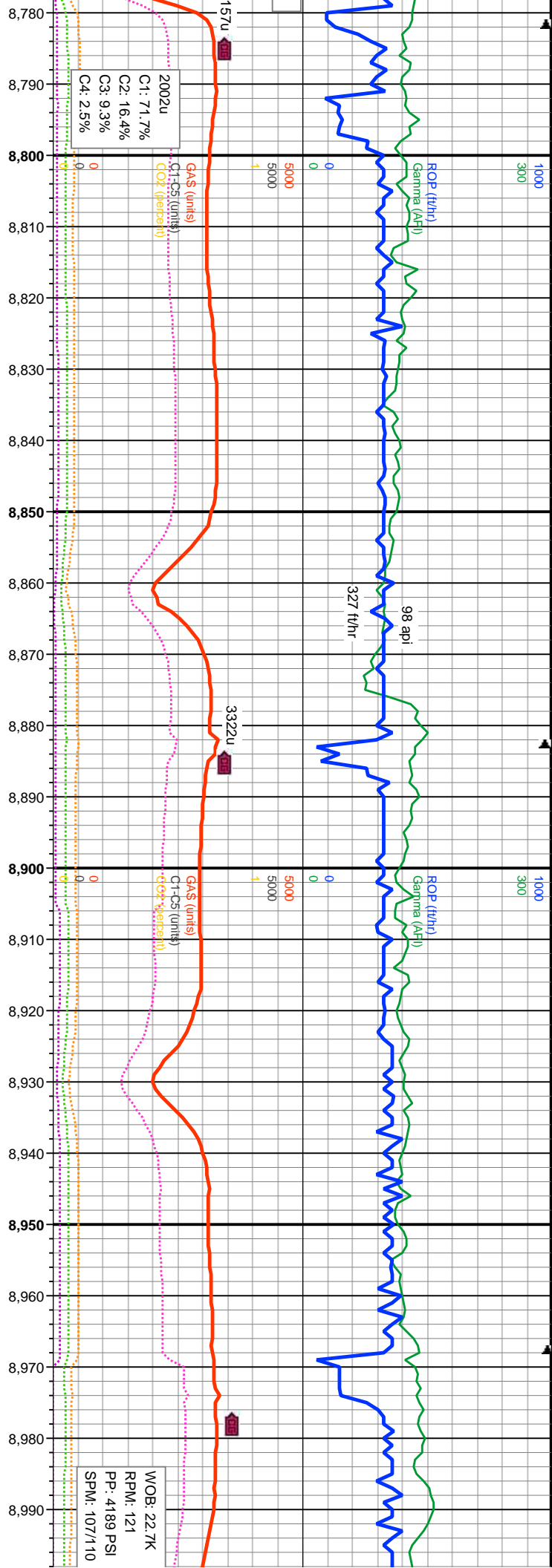
text, v calc: 40% CHK: med-dk gy
 calc; sily tex, tr fos

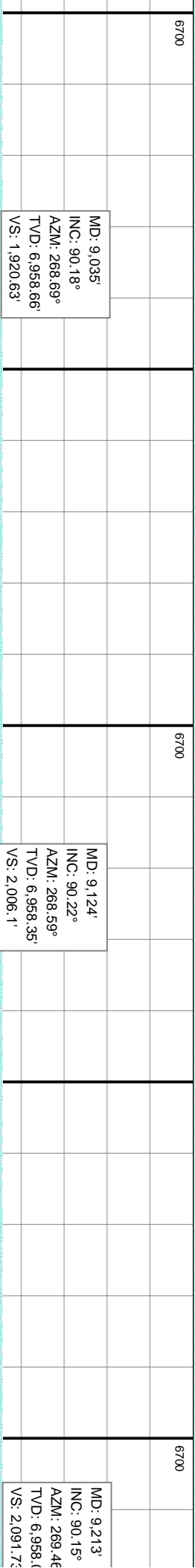
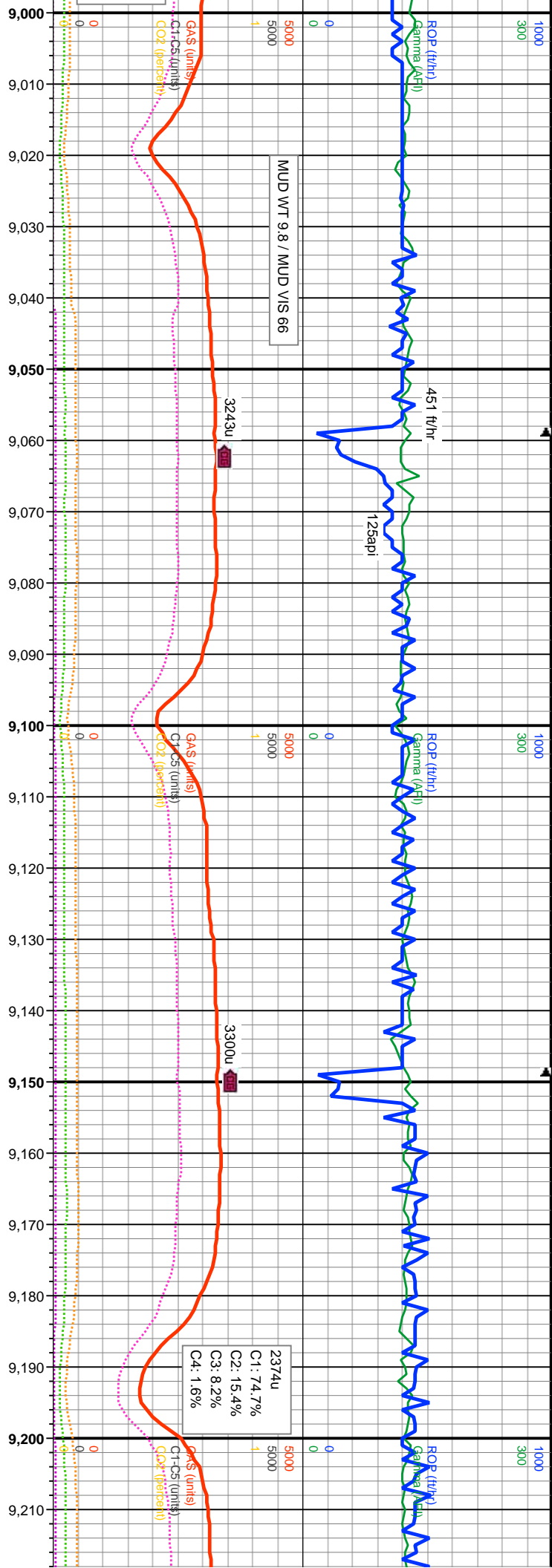
60% MARL: dk - med gy, frm-hd, sb plty, sily, mot tex, v calc, 40% CHK: med-dk gy
 - gy brn, sft, lam, sb blk, wxy-rthy-sl stri tex, v calc, sily tex, tr fos

60% MARL: dk - med gy, frm-hd, sb plty, sily, mot tex, v calc, 40% CHK: med-dk gy
 - gy brn, sft, lam, sb blk, wxy-rthy-sl stri tex, v calc, sily tex, tr fos

60% MARL: dk - med gy, frm-hd, sb plty, sily, mot tex, v calc, 40% CHK: med-dk gy
 - gy brn, sft, lam, sb blk, wxy-rthy-sl stri tex, v calc, sily tex, tr fos



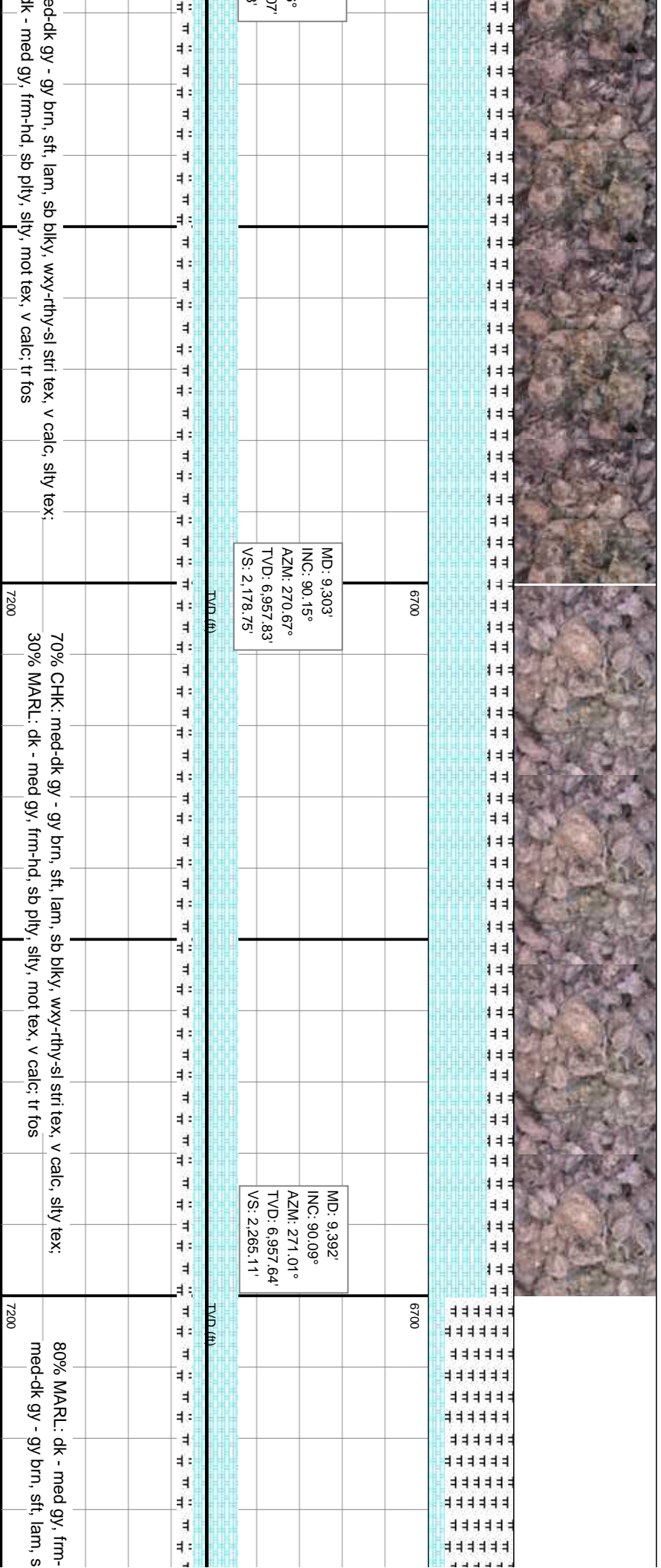
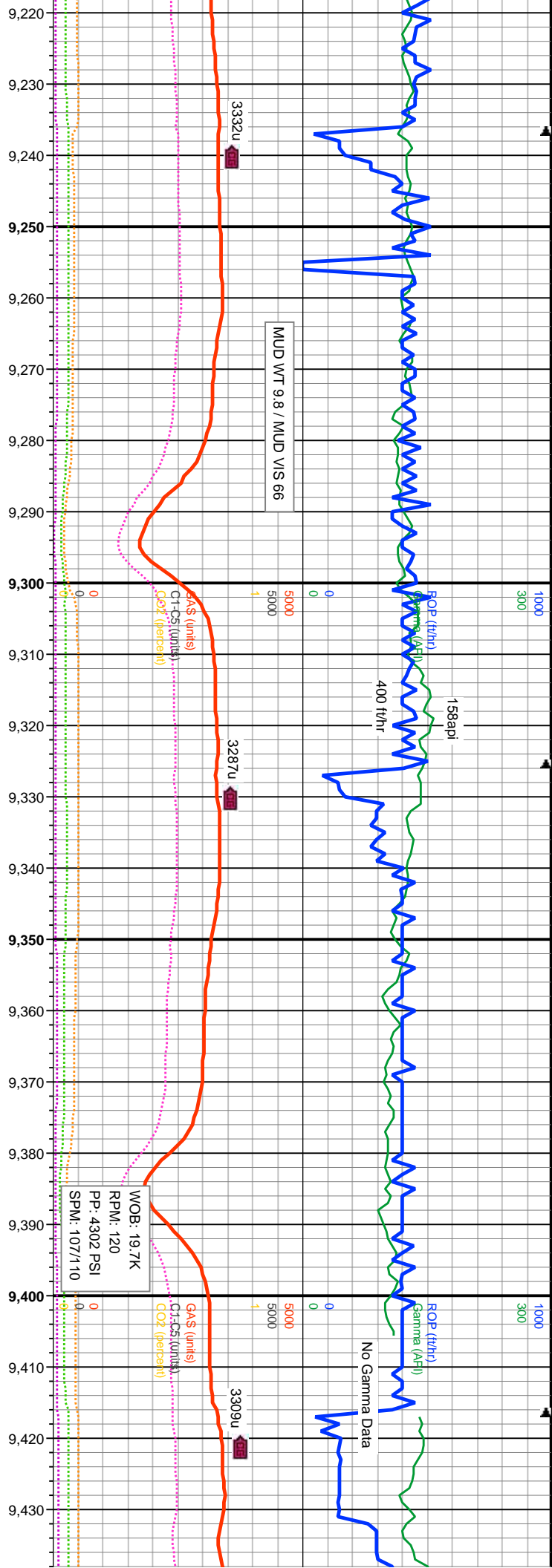


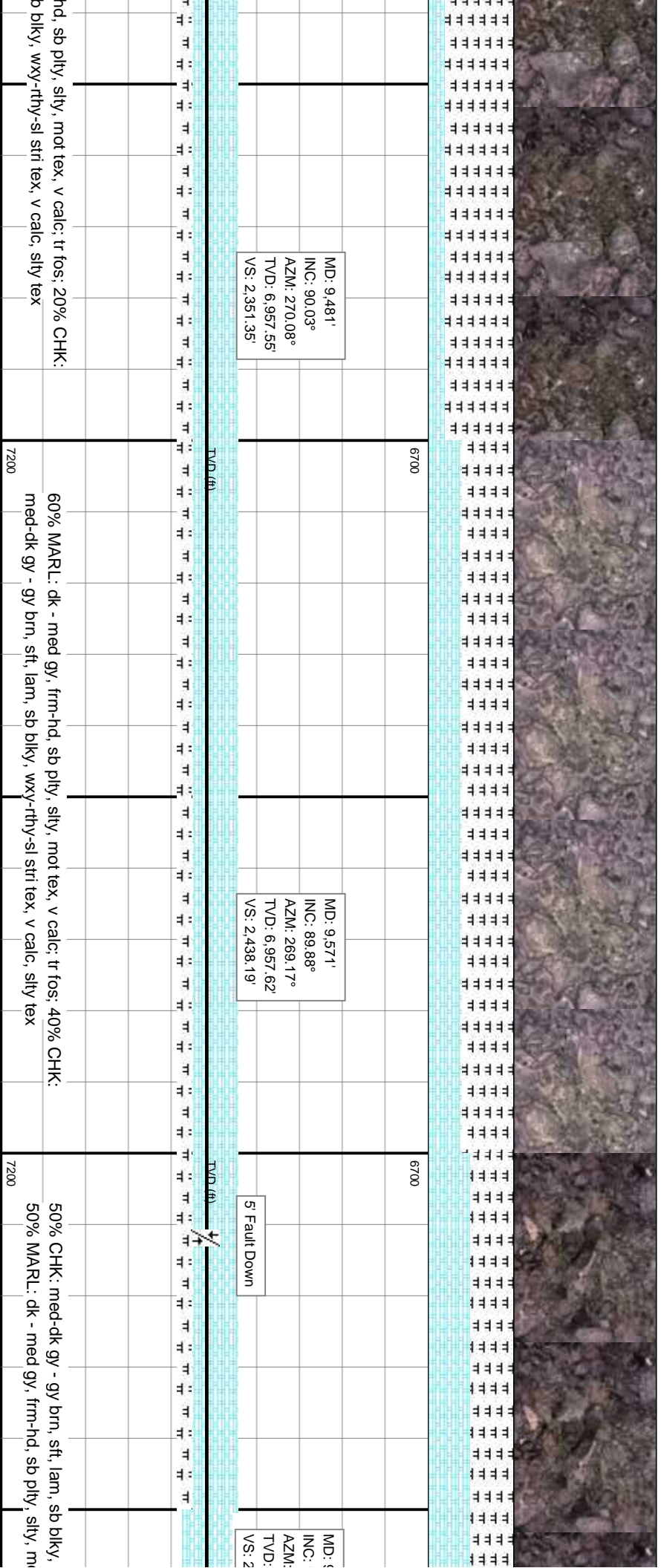
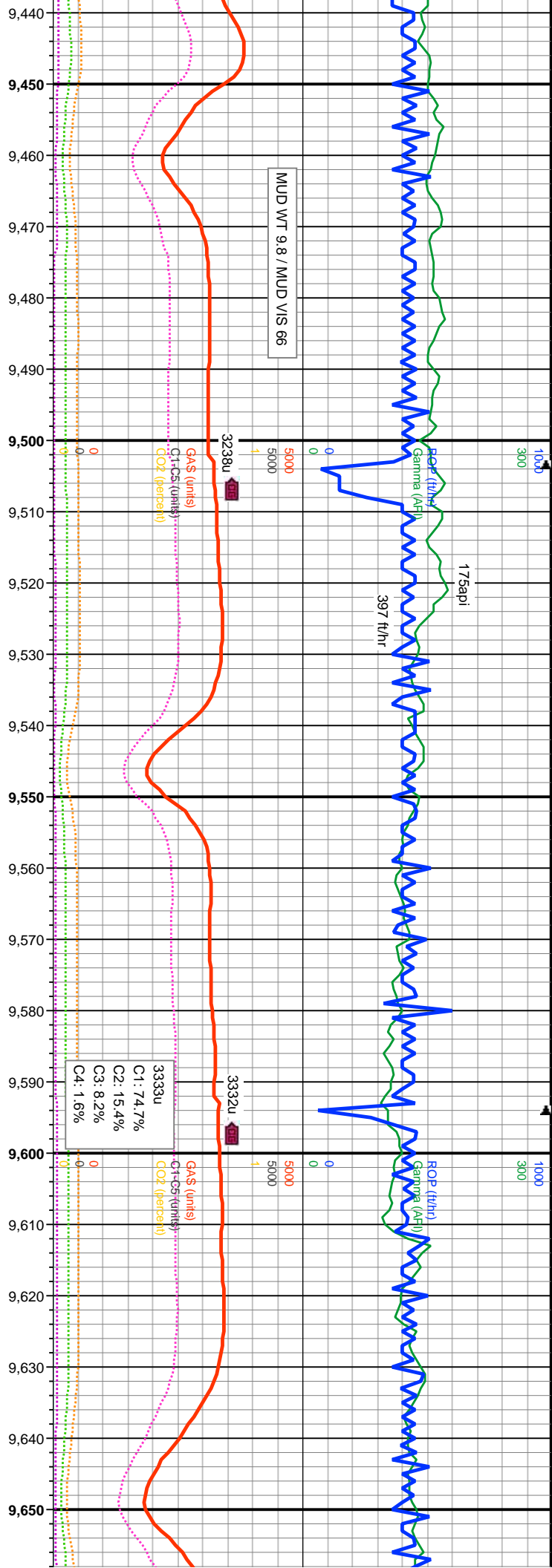


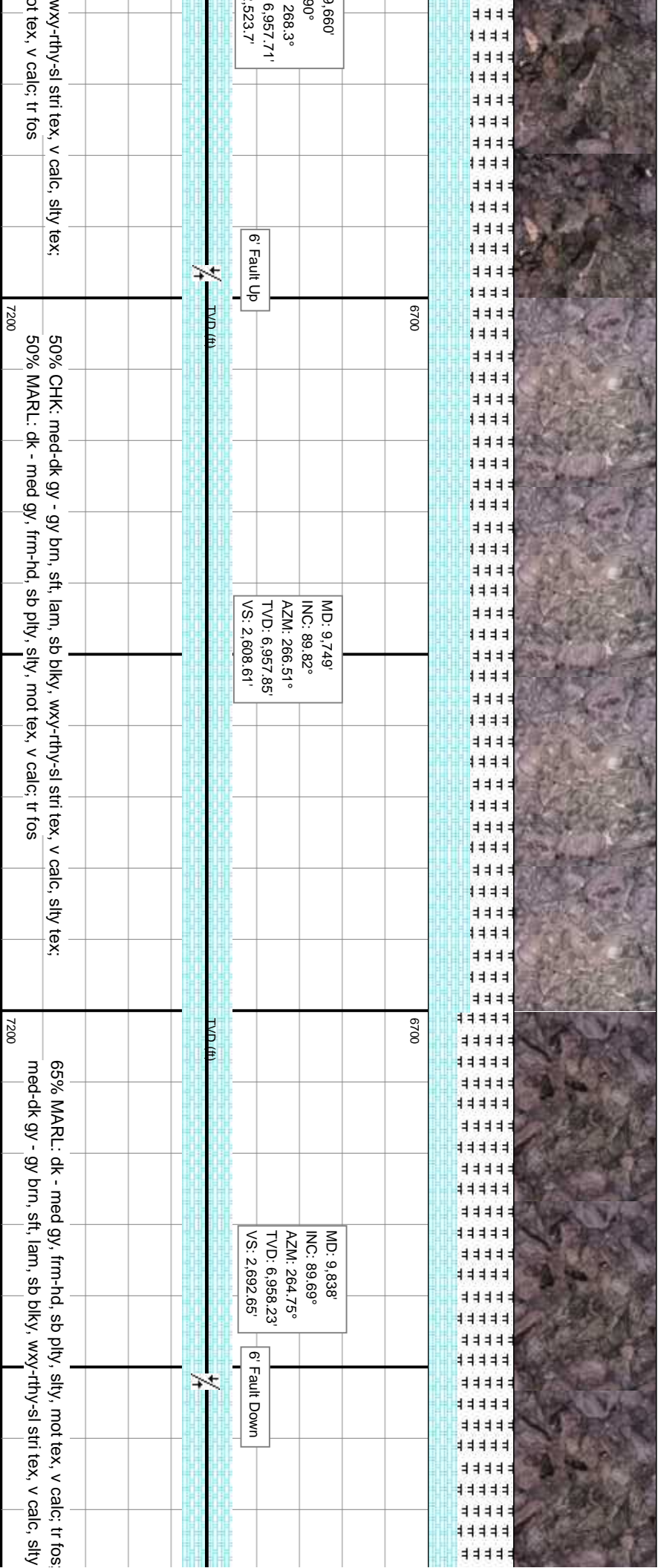
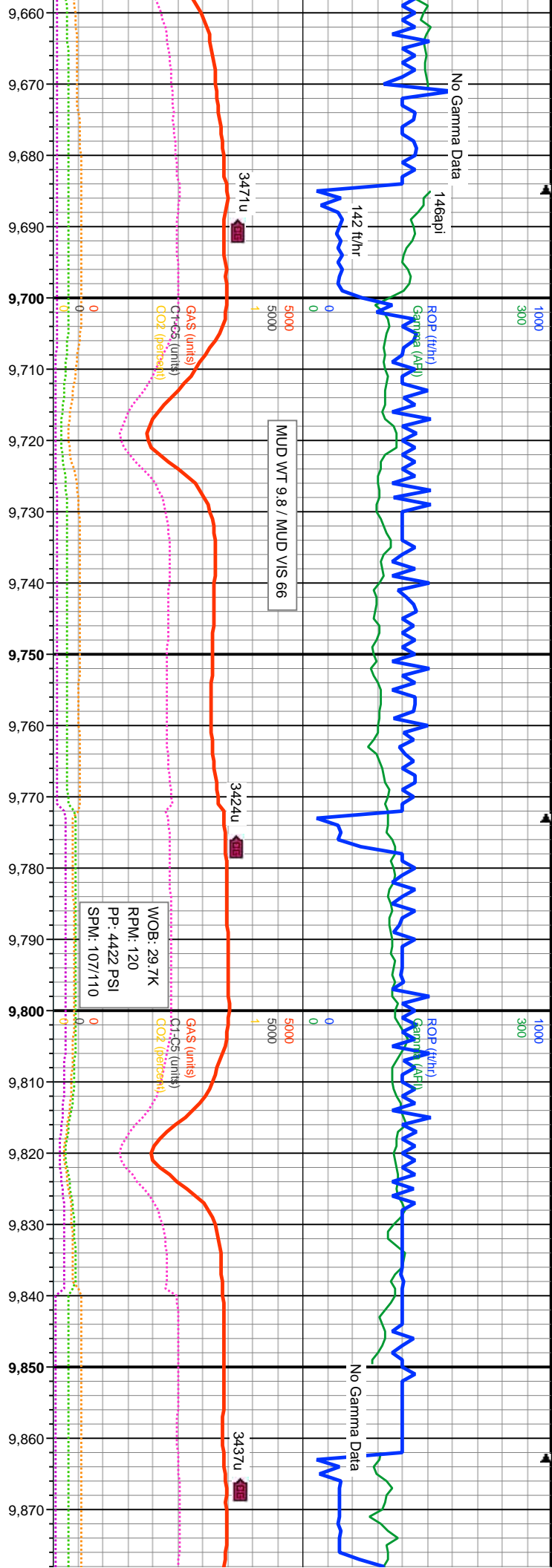
60% MARL: dk - med gy, frm-hd, sb plty, slty, mot tex, v calc; tr fos: 40% CHK:
med-dk gy - gy brn, sft, lam, sb blkly, wxy-rthy-sl strf tex, v calc, slty tex

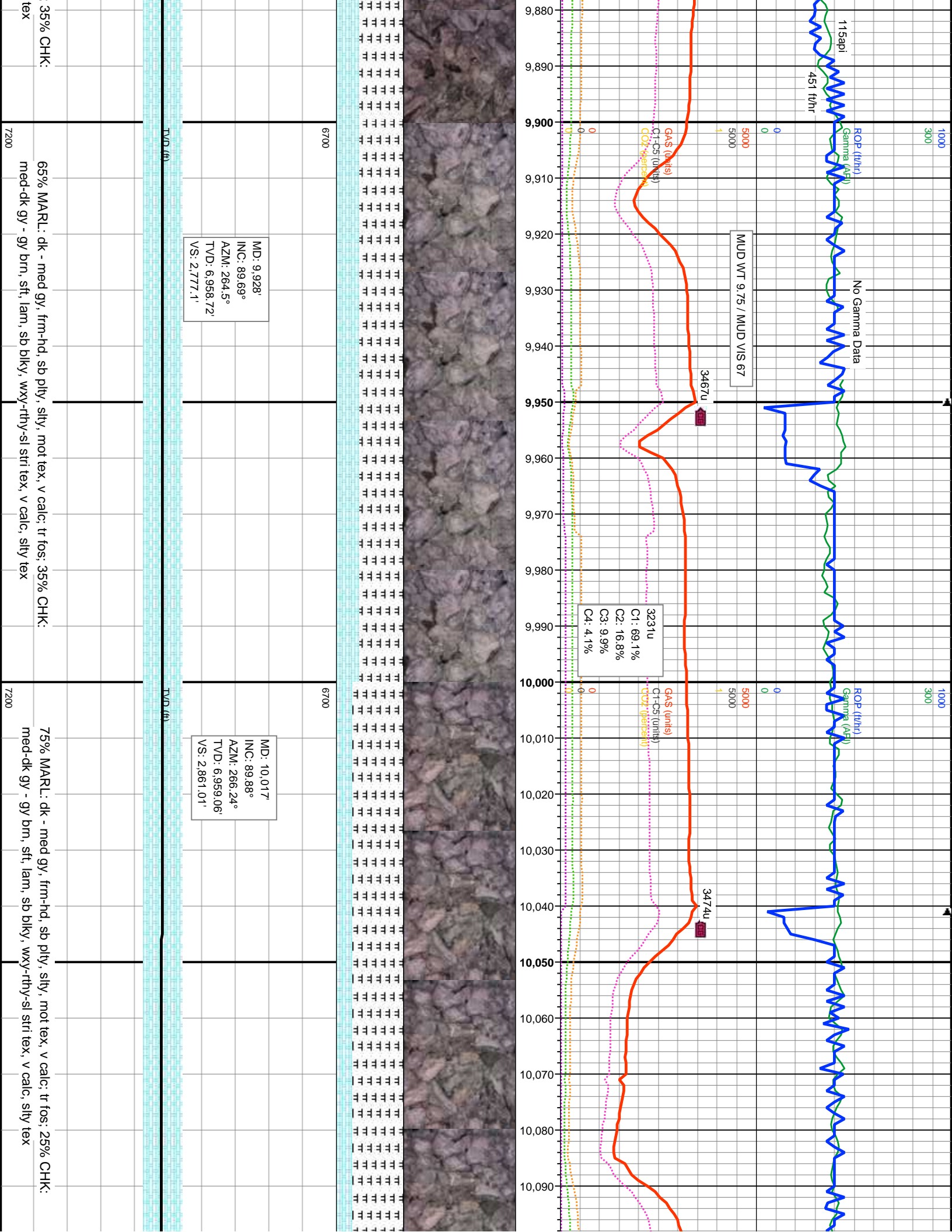
50% CHK: med-dk gy - gy brn, sft, lam, sb blkly, wxy-rthy-sl strf tex, v calc, slty tex:
50% MARL: dk - med gy, frm-hd, sb plty, slty, mot tex, v calc; tr fos

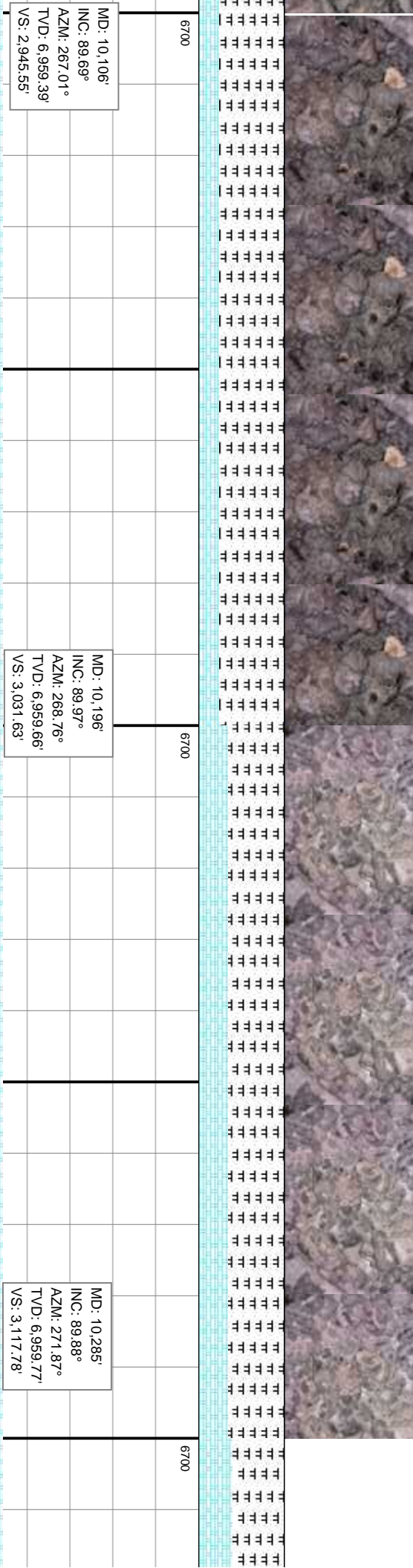
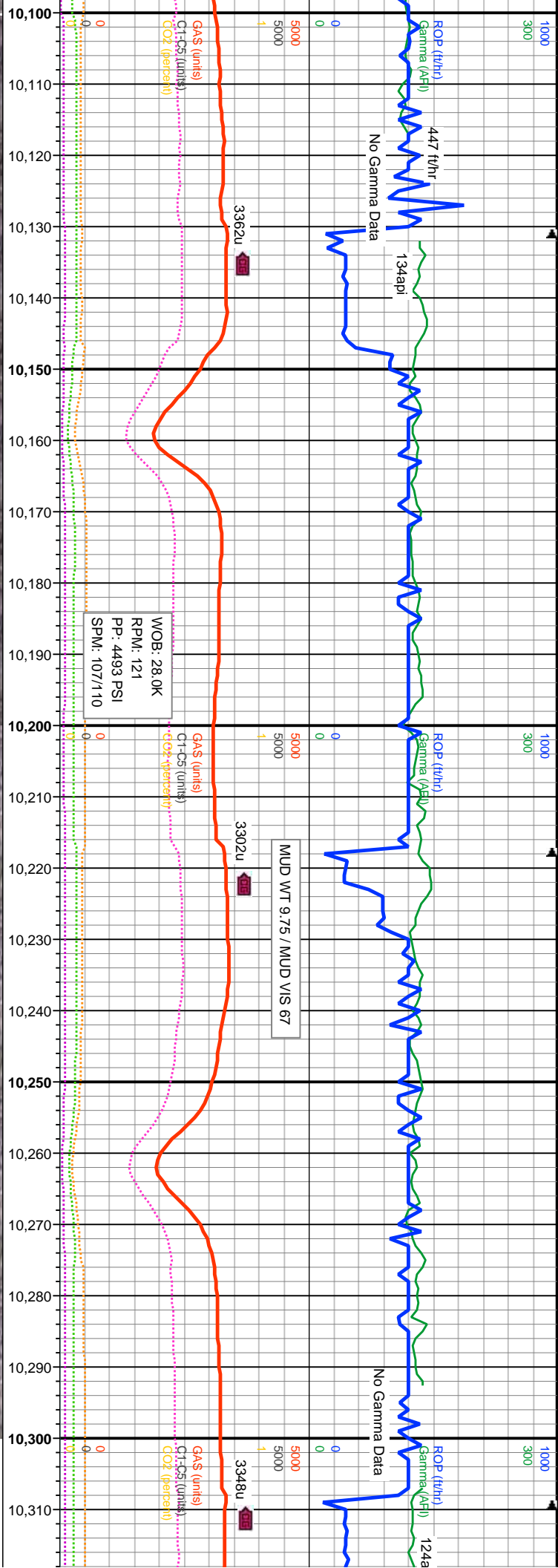
70% CHK: m
30% MARL: c



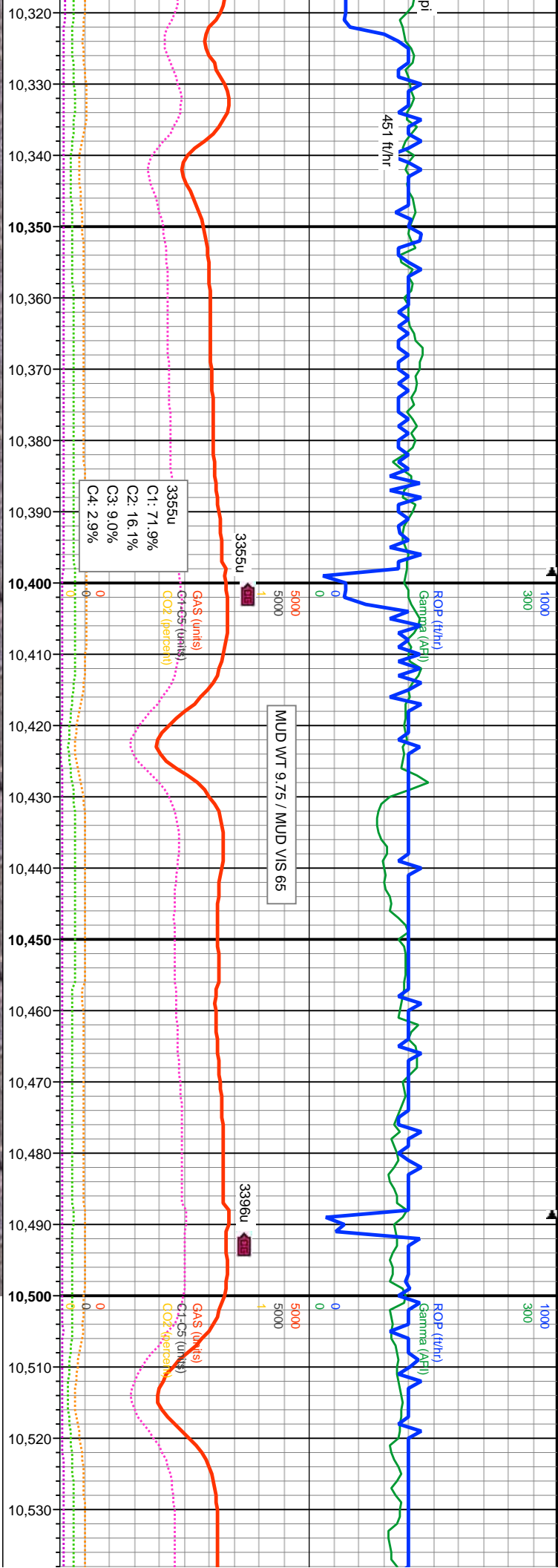








MD: 10.106'	INC: 89.69°	AZM: 267.01°	TVD: 6.959.39'	VS: 2.945.55'
75% MARL: dk - med gy, frm-hd, sb pily, silty, mot tex, v calc, tr fos, 25% CHK: med-dk gy - gy brn, sft, lam, sb blk, wxy-rthy-sl strit tex, v calc, silty tex				
MD: 10.196'	INC: 89.97°	AZM: 268.76°	TVD: 6.959.66'	VS: 3.031.63'
65% MARL: dk - med gy, frm-hd, sb pily, silty, mot tex, v calc, 35% CHK: med-dk gy - gy brn, sft, lam, sb blk, wxy-rthy-sl strit tex, v calc, silty tex, tr inoc fos, v sl tr pyr				
MD: 10.285'	INC: 89.88°	AZM: 271.87°	TVD: 6.959.77'	VS: 3.117.78'
60% MARL: med-dk gy -				



M/D: 10.374'
INC: 89.88°
AZM: 271.79°
TVD: 6.959.96'
VS: 3.204.49'

M/D: 10.464'
INC: 90.03°
AZM: 271.74°
TVD: 6.960.03'
VS: 3.292.16'

TVD (ft)

TVD (ft)

dk - med gy, frm-hd, sb plty, slty, mot tex, v calc; tr fos: 40% CHK;
gy brn, sft, lam, sb blkly, wxy-rthy-sl strl tex, v calc, slty tex

50% MARL: dk - med gy, frm-hd, sb plty, slty, mot tex, v calc; 50% CHK: med-dk gy
- gy brn, sft, lam, sb blkly, wxy-rthy-sl strl tex, v calc; slty tex; tr bent, v sl tr inoc fos

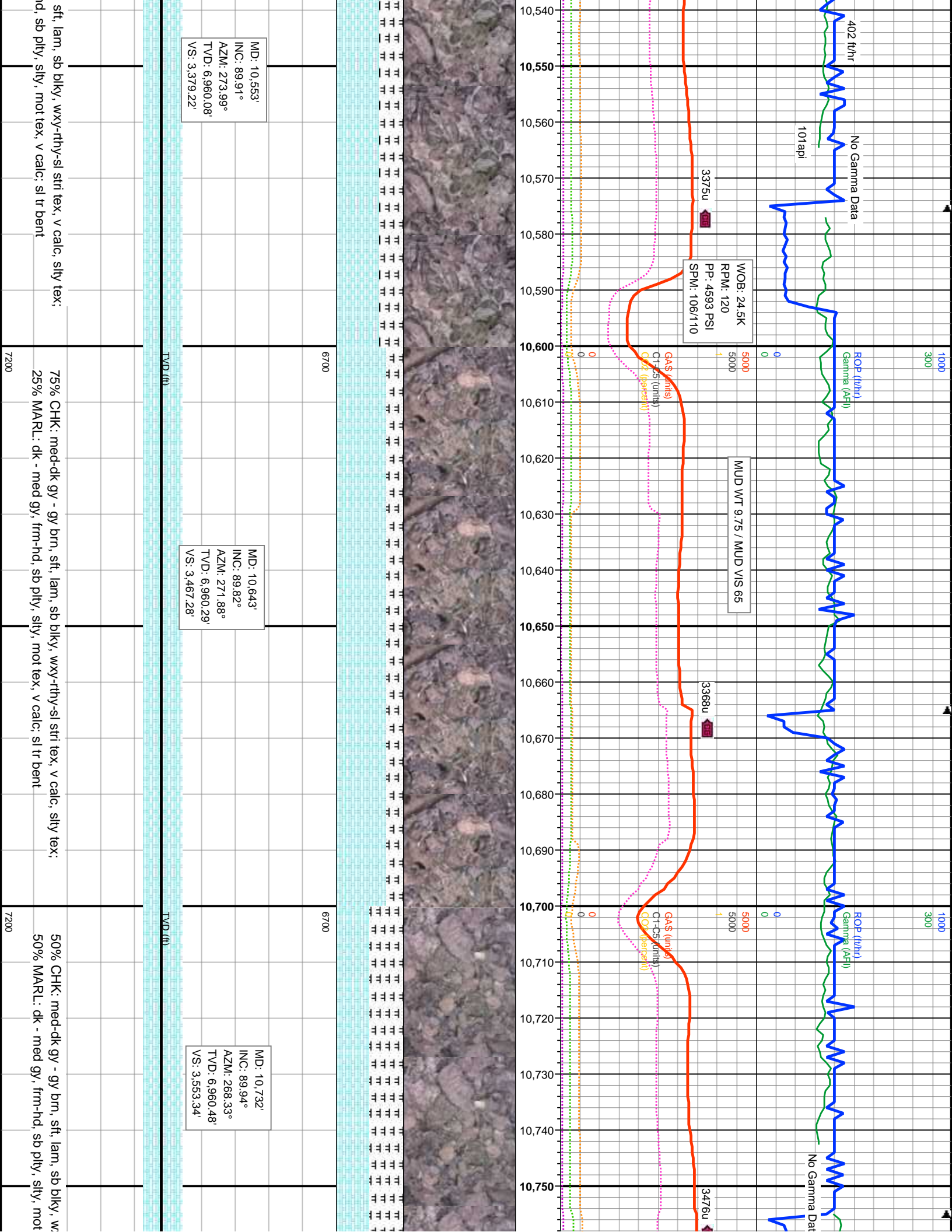
65% CHK: med-dk gy - gy brn,
35% MARL: dk - med gy, frm-hd

6700

6700

7200

7200



MD: 10,553'
 INC: 89.91°
 AZM: 273.99°
 TVD: 6,960.08'
 VS: 3,379.22'

MD: 10,643'
 INC: 89.82°
 AZM: 271.88°
 TVD: 6,960.29'
 VS: 3,467.28'

MD: 10,732'
 INC: 89.94°
 AZM: 268.33°
 TVD: 6,960.48'
 VS: 3,553.34'

WOB: 24.5K
 RPM: 120
 PP: 4593 PSI
 SPM: 106/110

MUD WT 9.75 / MUD VIS 65

fti, lam, sb blk, wxy-rthy-sl stri tex, v calc, silty tex;
 sb ply, silty, mot tex, v calc; sl tr bent

75% CHK: med-dk gy - gy brn, sti, lam, sb blk, wxy-rthy-sl stri tex, v calc, silty tex;
 25% MARL: dk - med gy, frm-hd, sb ply, silty, mot tex, v calc; sl tr bent

50% CHK: med-dk gy - gy brn, sti, lam, sb blk, wxy-rthy-sl stri tex, v calc, silty tex;
 50% MARL: dk - med gy, frm-hd, sb ply, silty, mot

TVD (ft)

TVD (ft)

6700

6700

7200

7200

10,540
10,550
10,560
10,570
10,580
10,590
10,600
10,610
10,620
10,630
10,640
10,650
10,660
10,670
10,680
10,690
10,700
10,710
10,720
10,730
10,740
10,750

1000
300

1000
300

402 ft/hr
 No Gamma Data
 101api

ROP (ft/hr)
 Gamma (API)
 No Gamma Data

3375u

3368u

3476u

GAS (units)
 G1-C5 (units)
 G1-C2 (percent)
 G1-C3 (percent)

GAS (units)
 G1-C5 (units)
 G1-C2 (percent)
 G1-C3 (percent)

5000

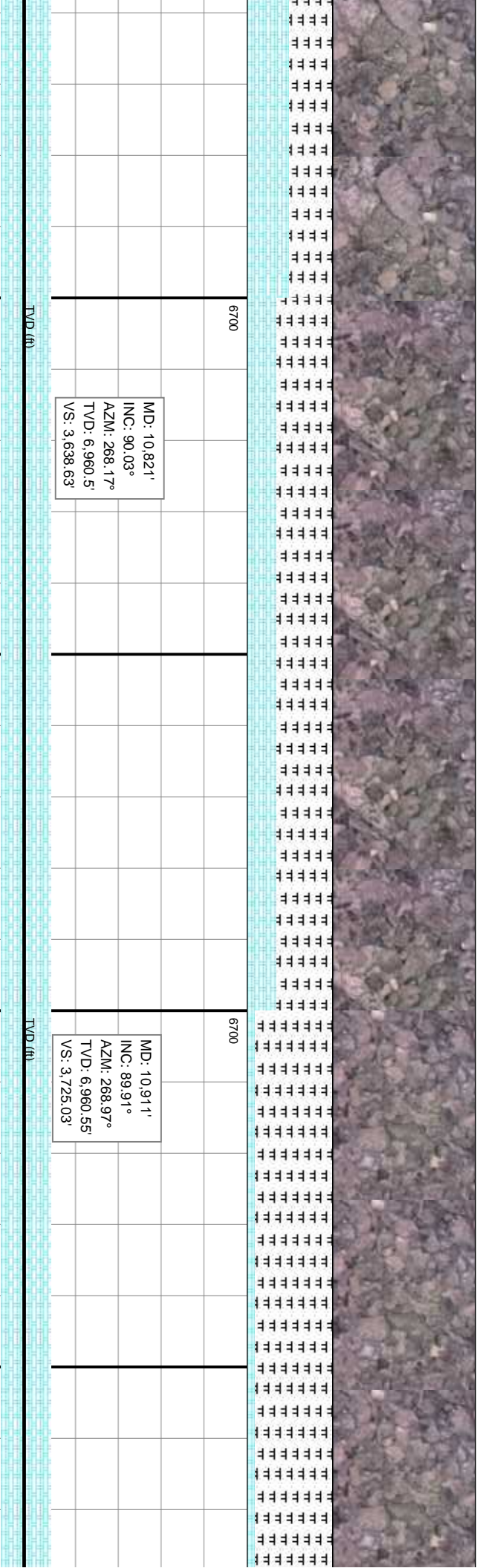
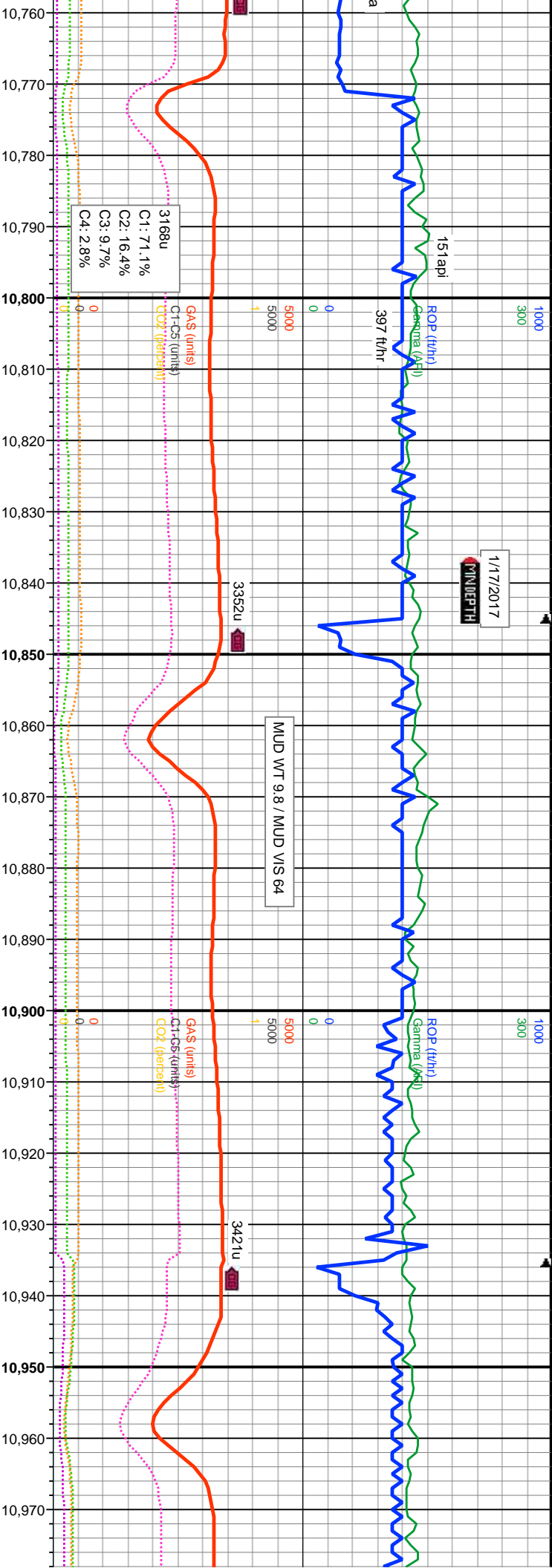
5000

1

1

0

0



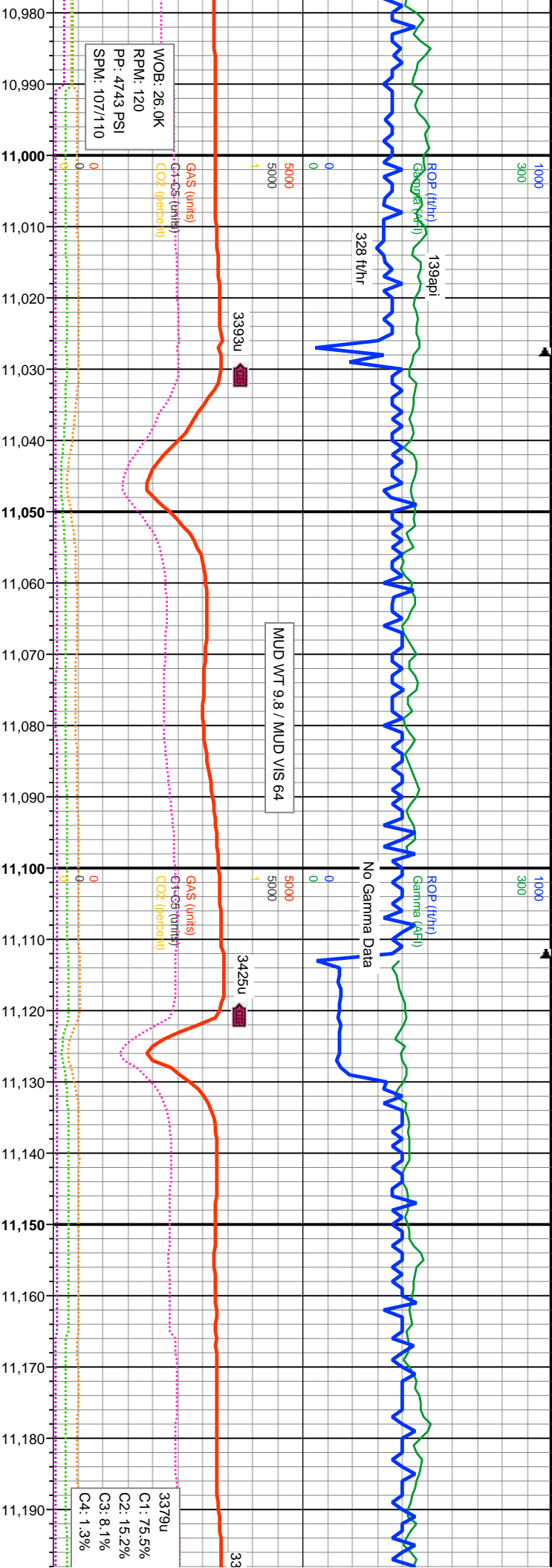
MD: 10,821'
INC: 90.03°
AZMI: 268.17°
TVD: 6,960.5'
VS: 3,638.63

MD: 10,911'
INC: 89.91°
AZMI: 268.97°
TVD: 6,960.55'
VS: 3,725.03'

65% MARL: dk - med gy, frm-hd, sb pty, sly, mot tex, v calc; 35% CHK: med-dk gy - gy brn, sft, lam, sb blkly, wxy-rthy-sl str tex, v calc, sly tex; tr bent, v sl tr inoc fos

90% MARL: dk - med gy, frm-hd, sb pty, sly, mot tex, v calc; 10% - gy brn, sft, lam, sb blkly, wxy-rthy-sl str tex, v calc, sly tex; abnt in

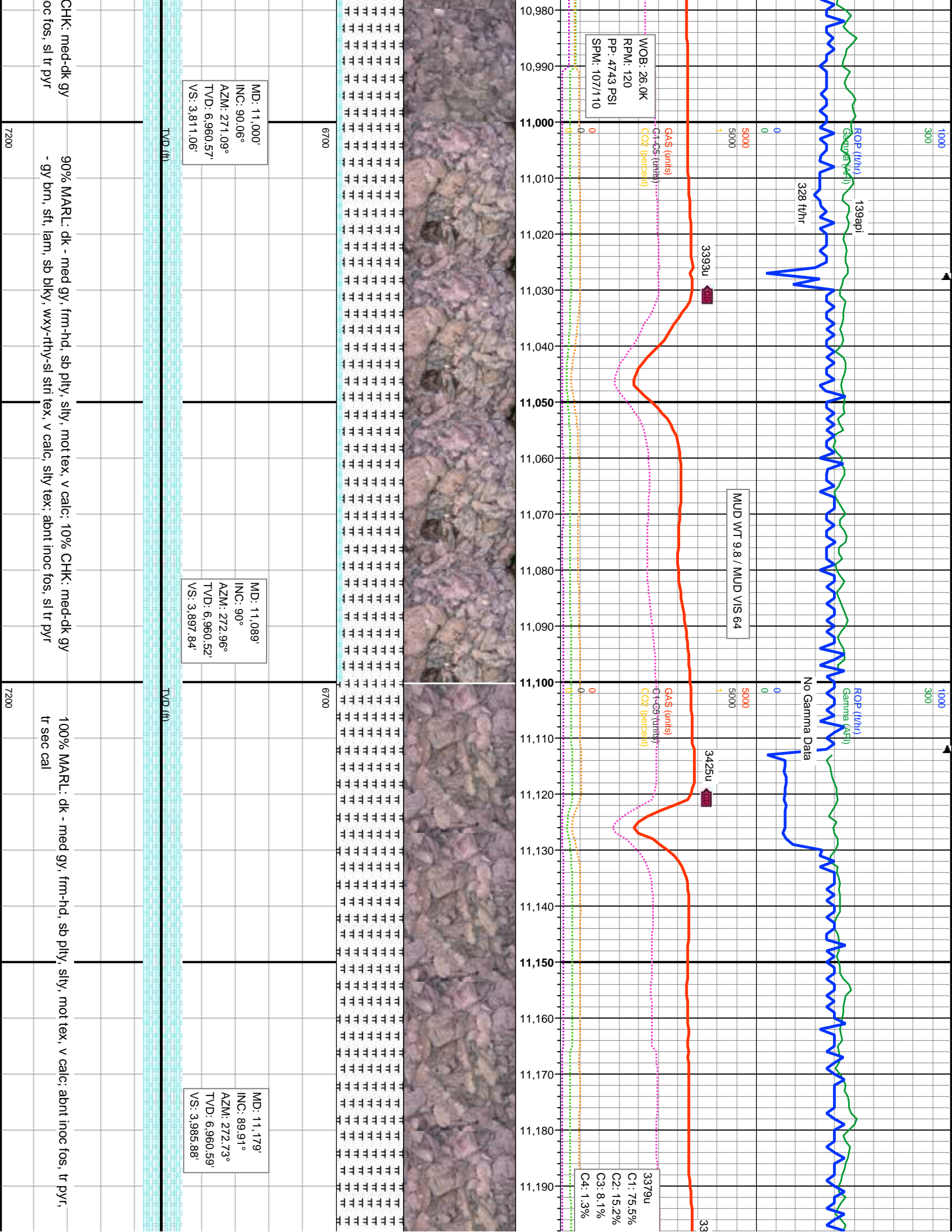
yrthy-sl str tex, v calc, sly tex; tex, v calc, sl tr bent, tr inoc fos



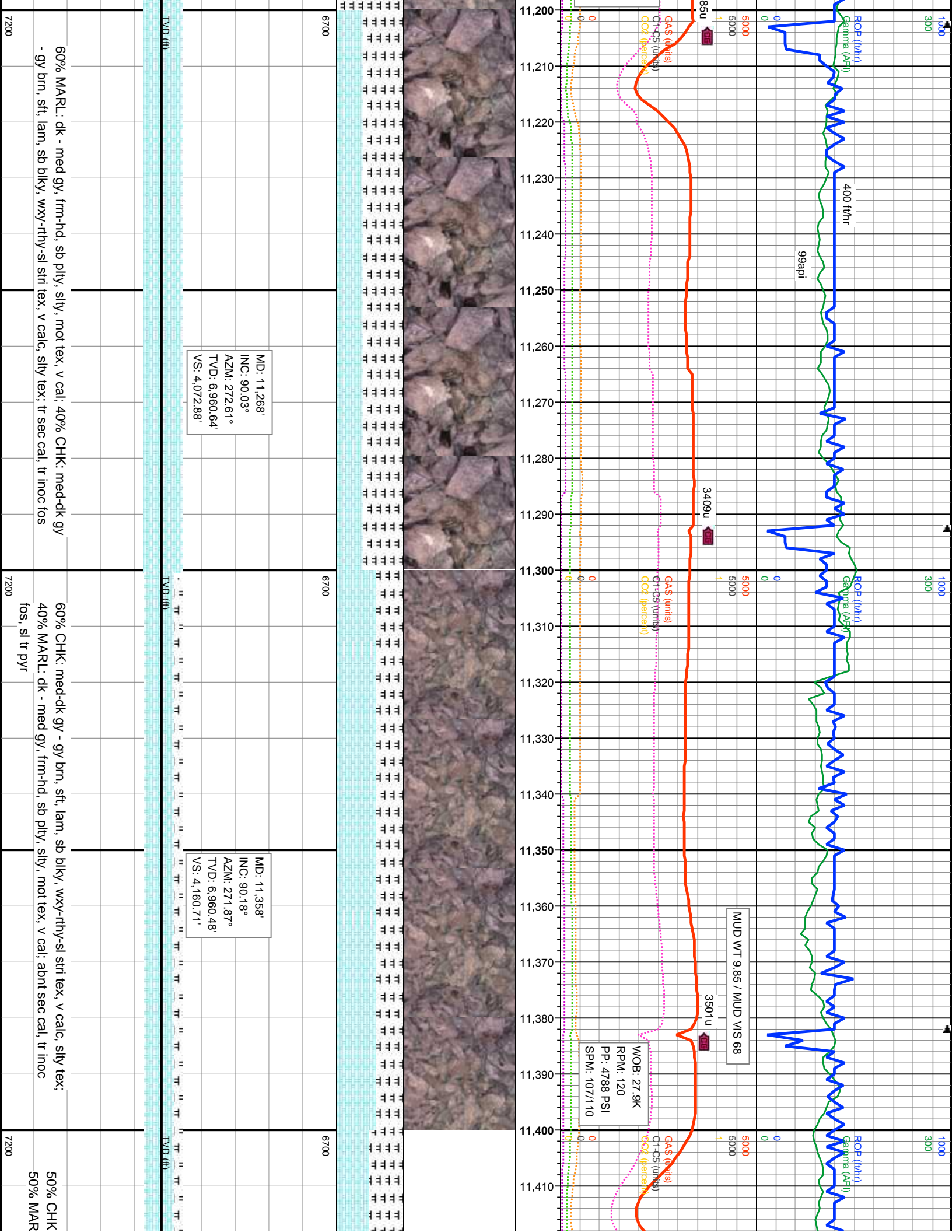
MD: 11,000'
INC: 90.06°
AZM: 271.09°
TVD: 6,960.57'
VS: 3,811.06'

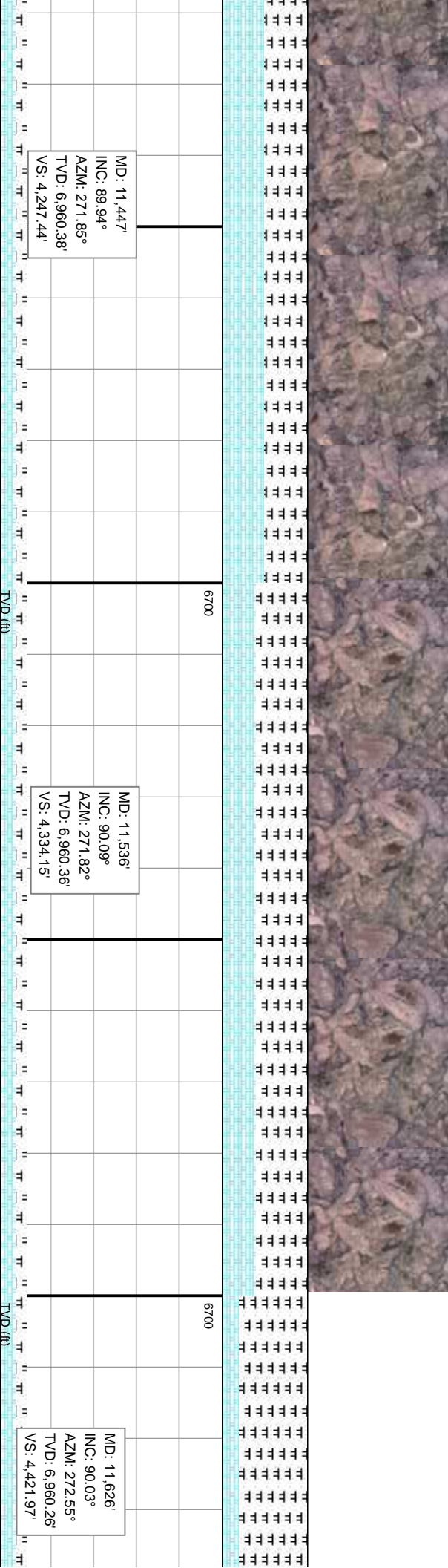
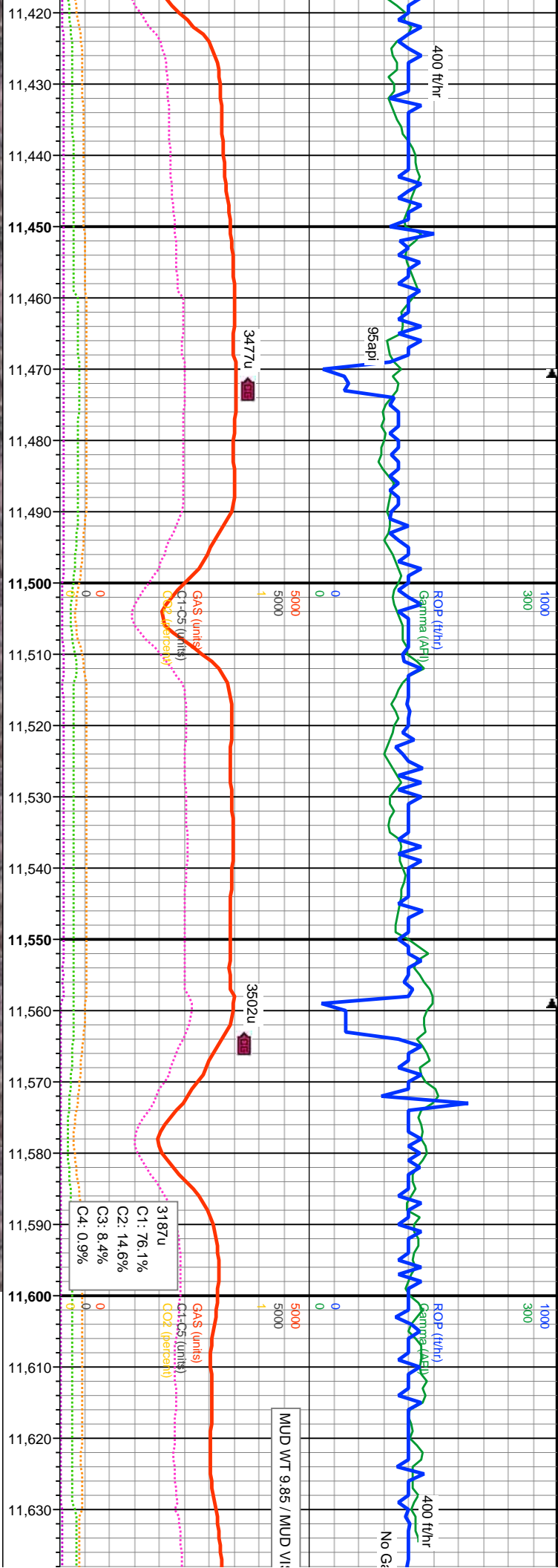
MD: 11,089'
INC: 90°
AZM: 272.96°
TVD: 6,960.52'
VS: 3,897.84'

MD: 11,179'
INC: 89.91°
AZM: 272.73°
TVD: 6,960.59'
VS: 3,985.88'



Depth (ft)	Description
6700	90% MARL: dk - med gy, frm-hd, sb pfty, silty, mot tex, v calc; 10% CHK: med-dk gy - gy brn, sft, lam, sb blk, wxy-rthy-sil str tex, v calc, silty tex; abnt inoc fos, sil tr pyr
7200	100% MARL: dk - med gy, frm-hd, sb pfty, silty, mot tex, v calc; abnt inoc fos, tr pyr, tr sec cal





med-dk gy - gy brn, sft, lam, sb blk, wxy-rthy-si stri tex, v calc, silty tex;

L - dk - med gy, frm-hd, sb ply, silty, mot tex, v calc; scat sec cal, com inoc

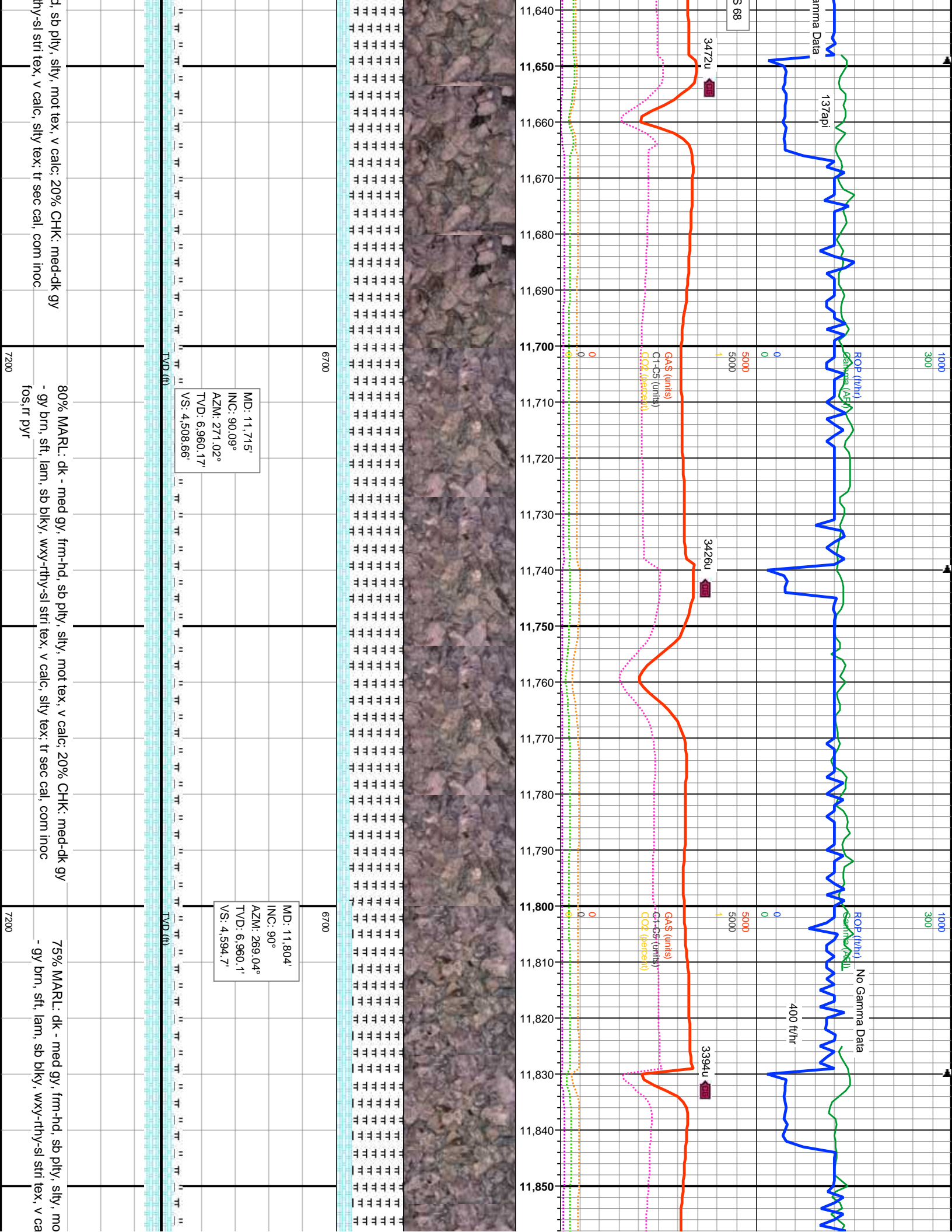
60% MARL: dk - med gy, frm-hd, sb ply, silty, mot tex, v calc, 40% CHK, med-dk gy

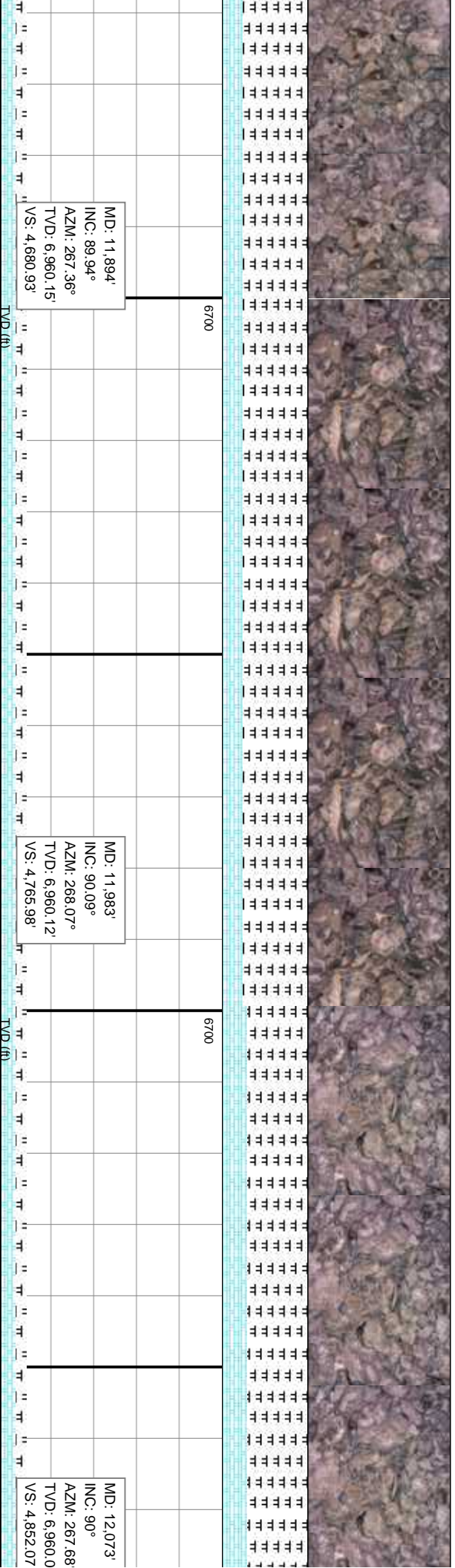
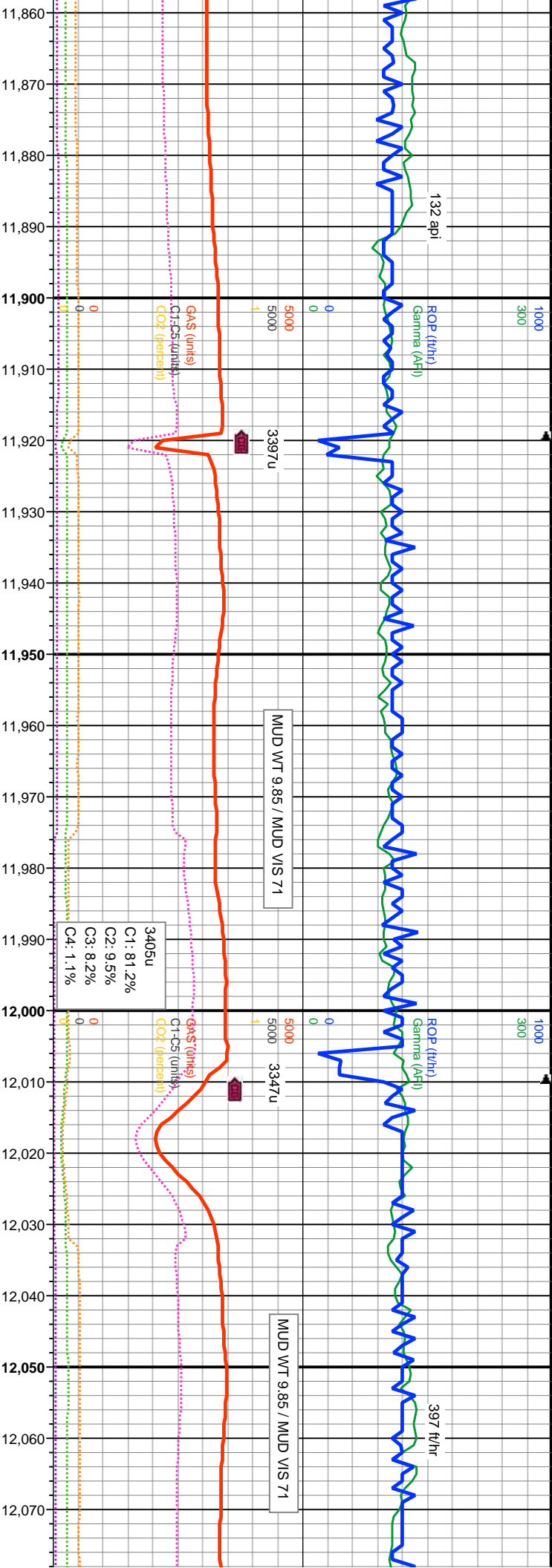
- gy brn, sft, lam, sb blk, wxy-rthy-si stri tex, v calc, silty tex; tr sec cal, tr bent

80% MARL: dk - med gy, frm-hd, sb ply, silty, mot tex, v calc, 40% CHK, med-dk gy

- gy brn, sft, lam, sb blk, wxy-rthy-si stri tex, v calc, silty tex; tr sec cal, tr bent

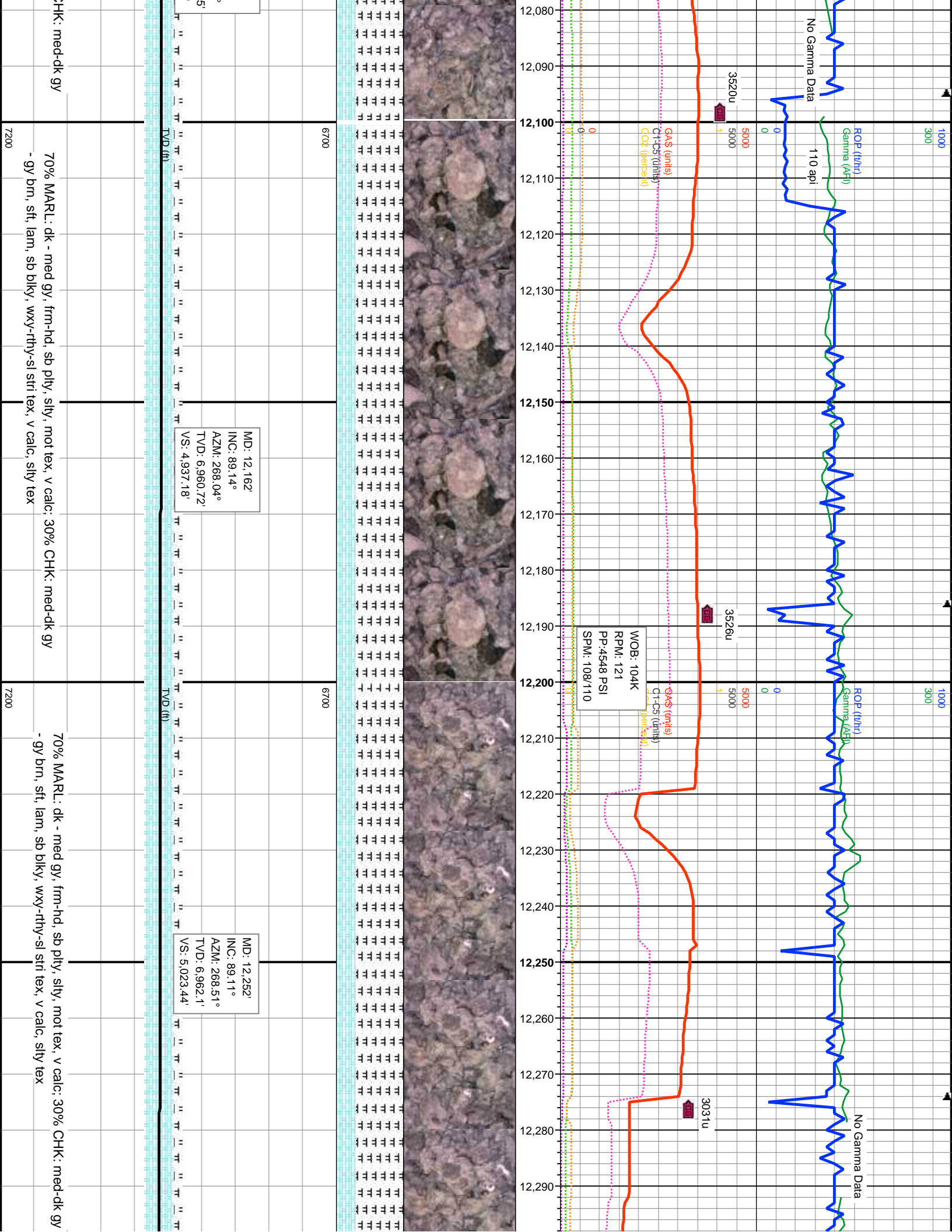
fos,rr pyr

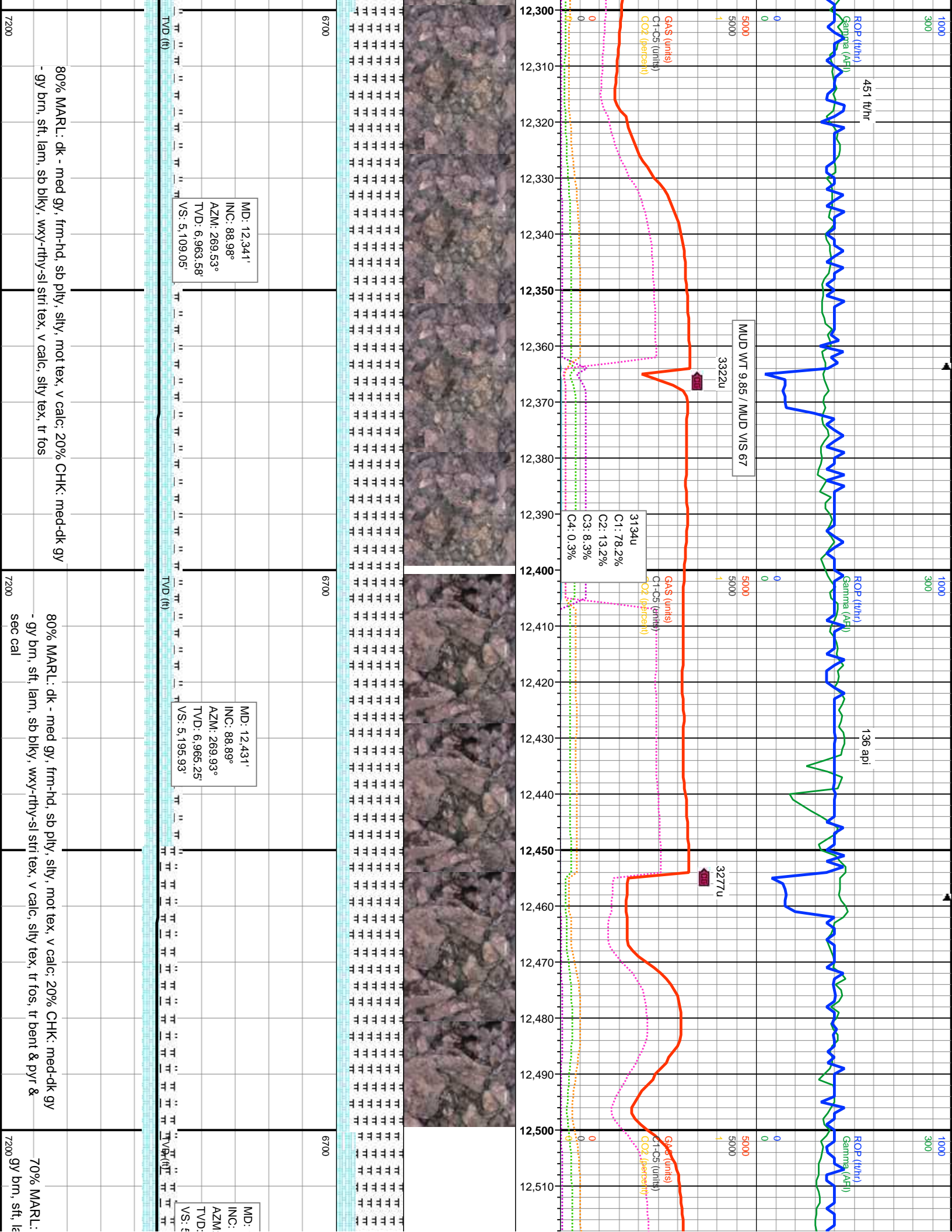


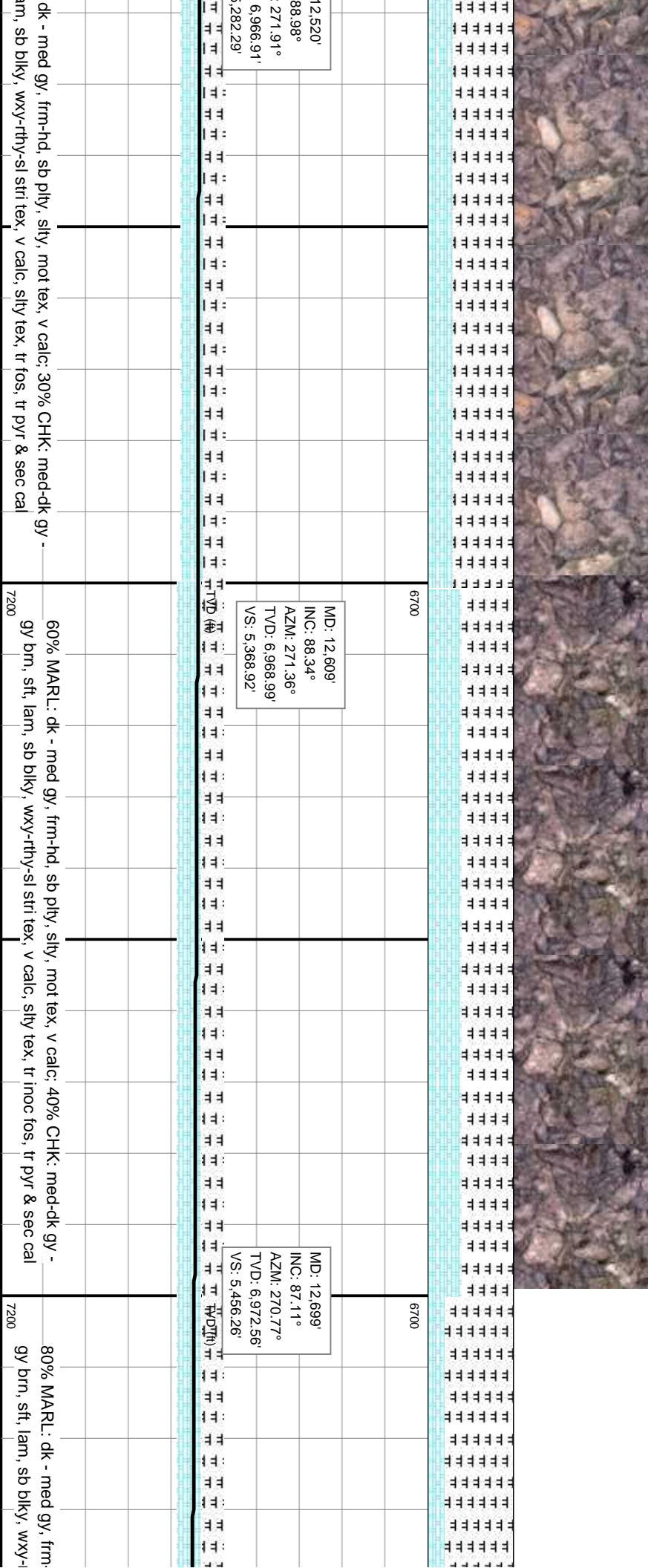
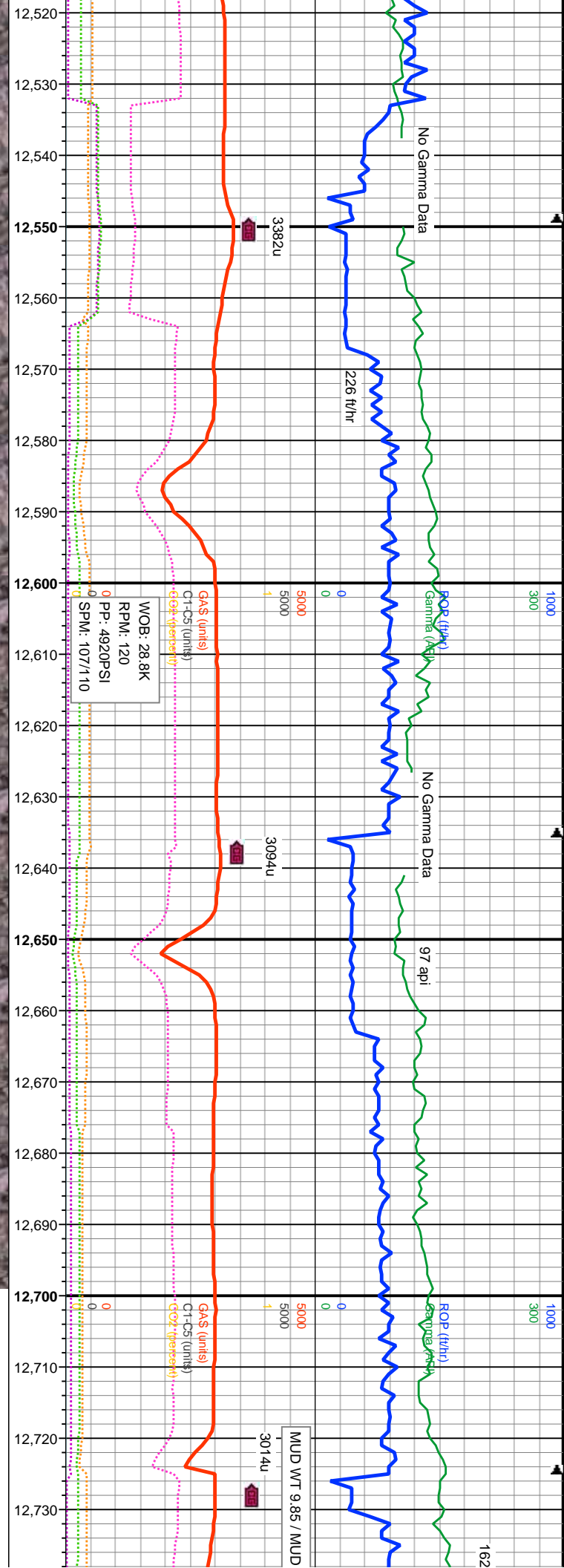


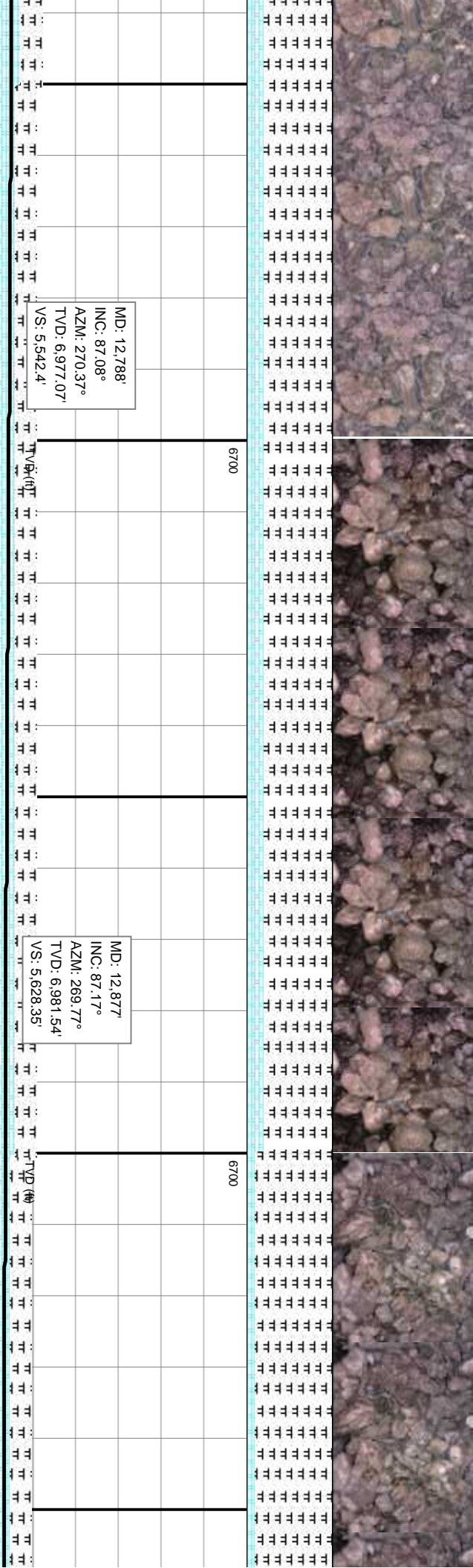
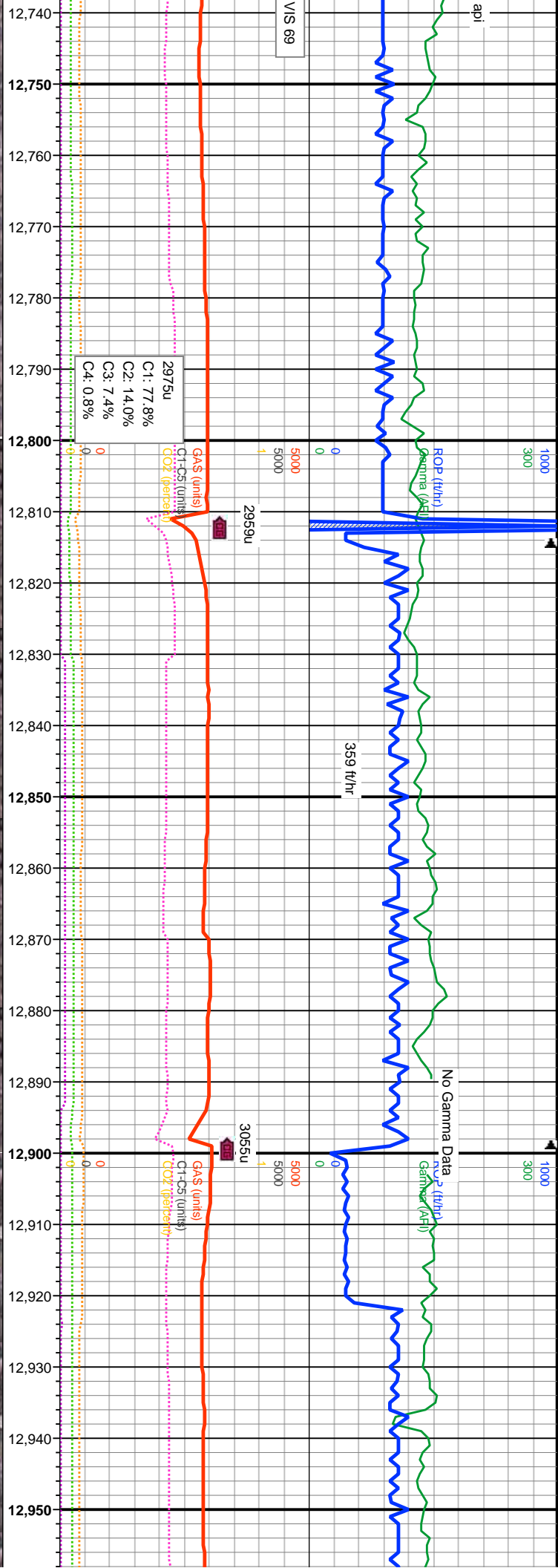
75% MARL: dk - med gy, frm-hd, sb pfty, sfty, mot tex, v calc; 25% CHK: med-dk gy
- gy brn, sft, lam, sb blk, wxy-rthy-sl stri tex, v calc, sfty tex

70% MARL: dk - med gy, frm-hd, sb pfty, sfty, mot tex, v calc; 30% C
- gy brn, sft, lam, sb blk, wxy-rthy-sl stri tex, v calc, sfty tex







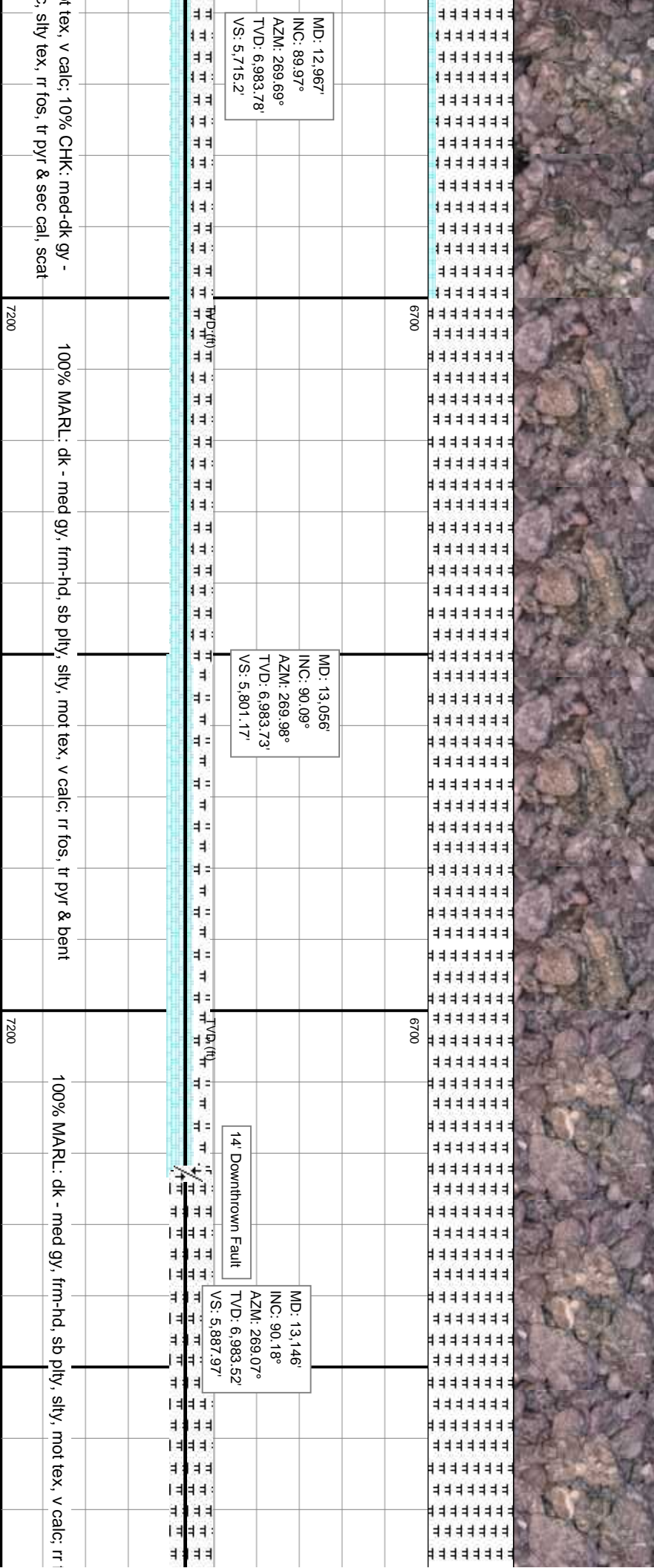
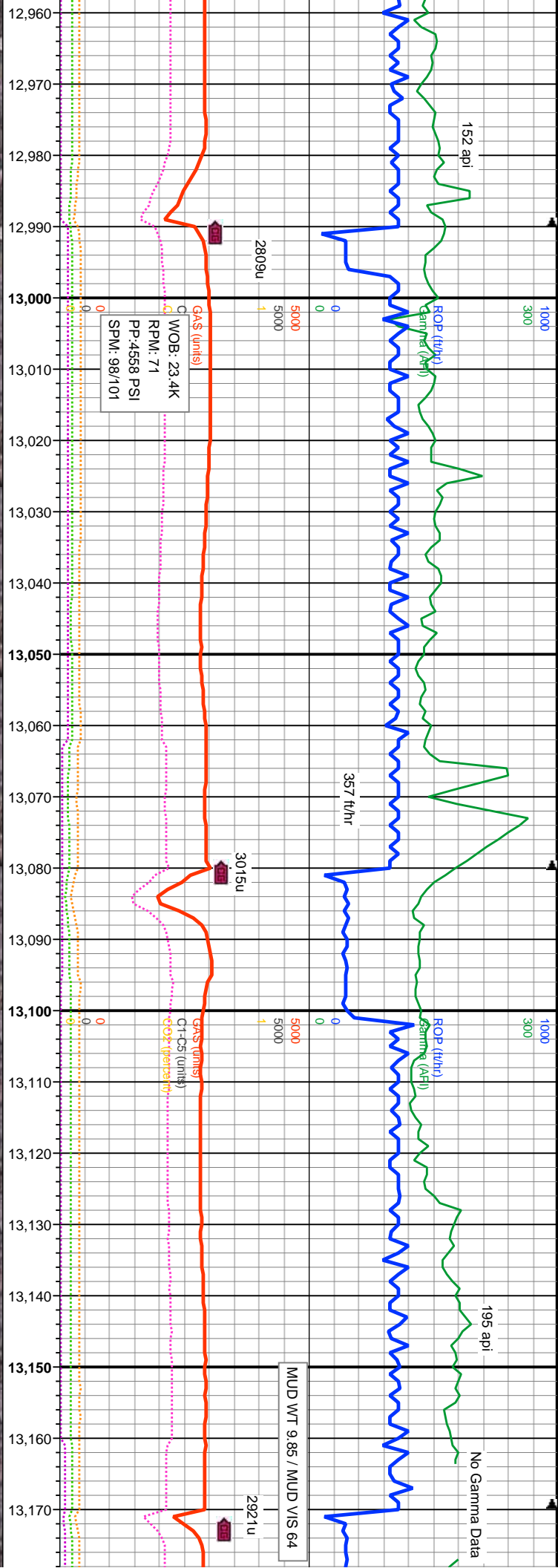


MD: 12,788'
 INC: 87.08°
 AZM: 270.37°
 TVD: 6,977.07'
 VS: 5,542.4'

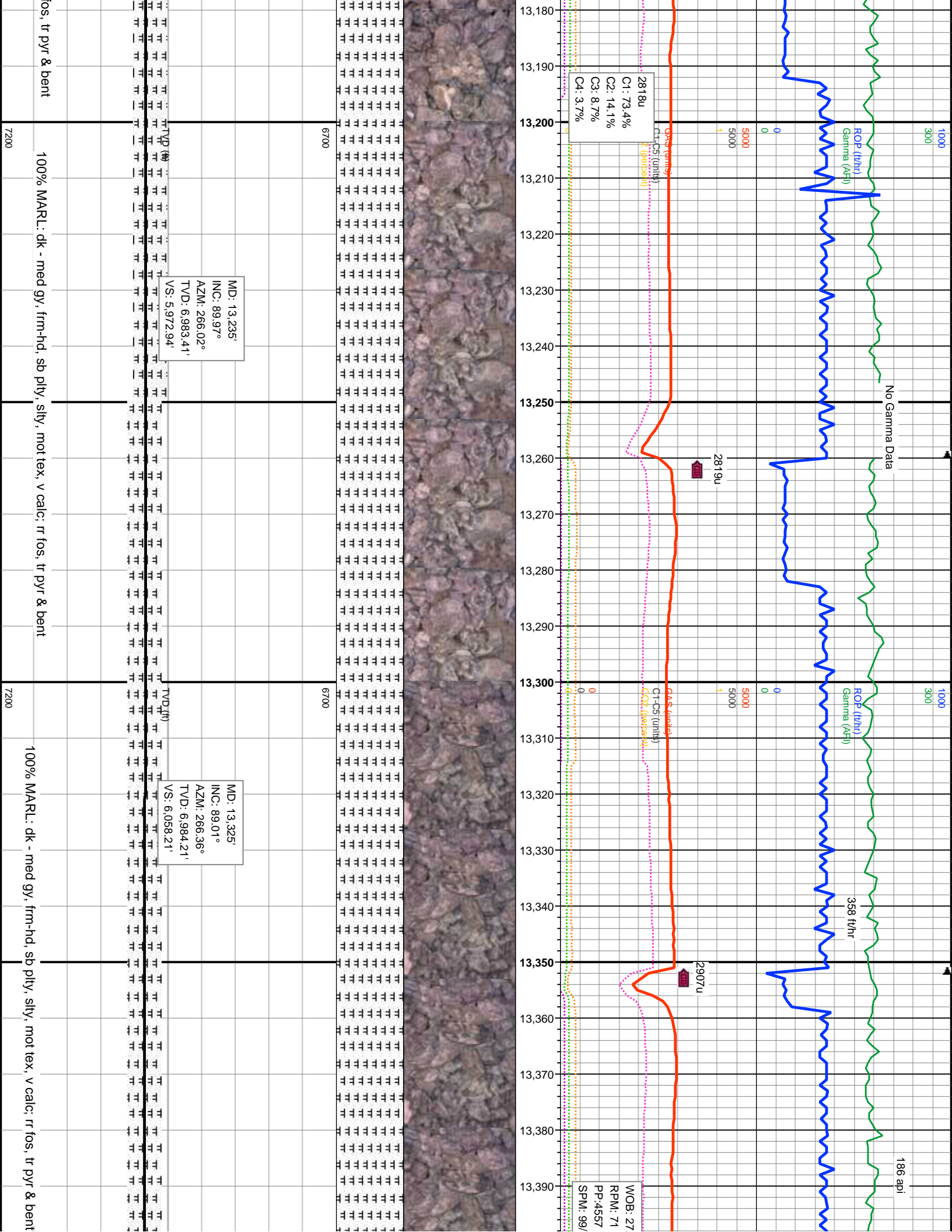
MD: 12,877'
 INC: 87.17°
 AZM: 269.77°
 TVD: 6,981.54'
 VS: 5,628.35'

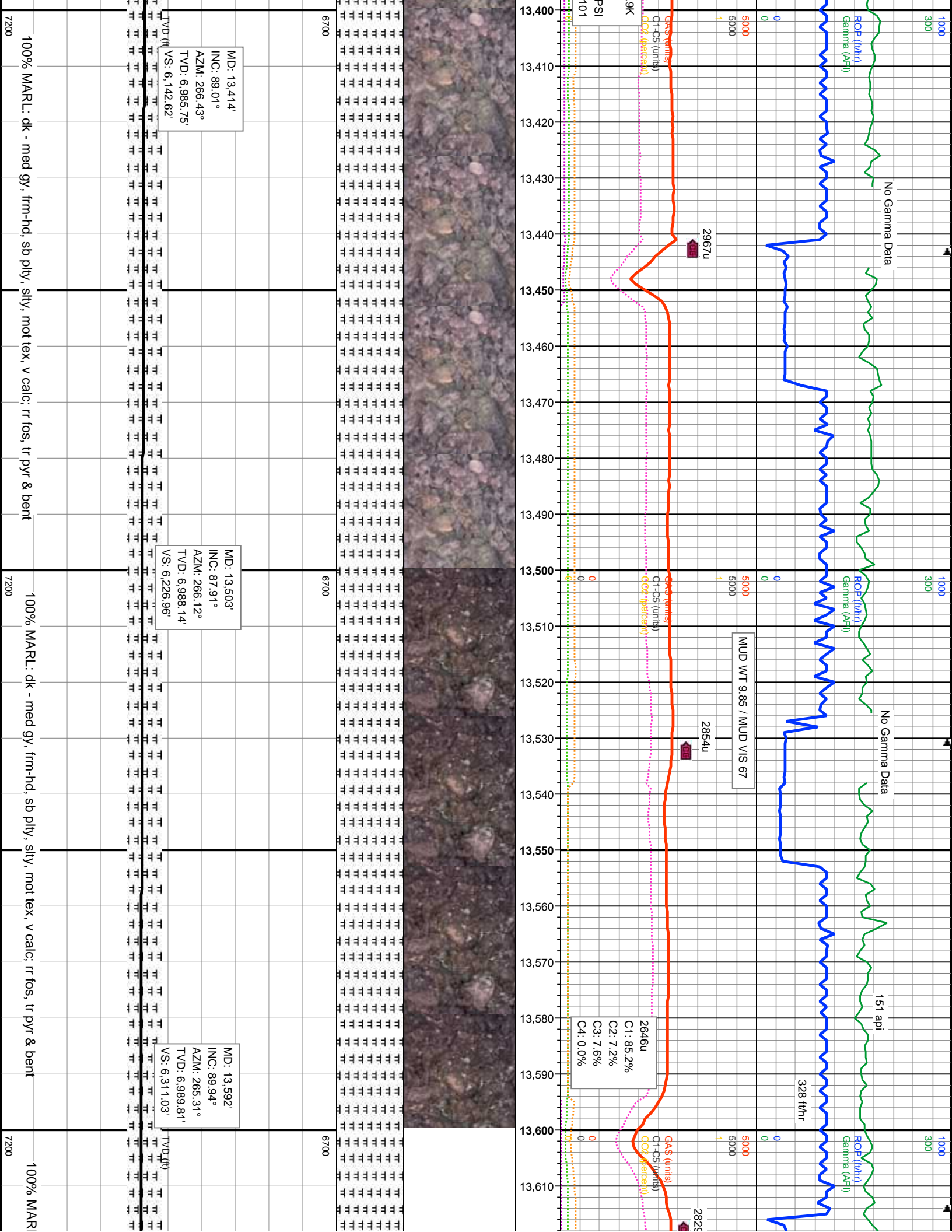
80% MARL: dk - med gy, frm-hd, sb plty, slty, mot tex, v calc; 20% CHK: med-dk gy -
 gy brn, sft, lam, sb blkly, wxy-rthy-sl stri tex, v calc; slty tex, tr fos, tr pyr & sec cal

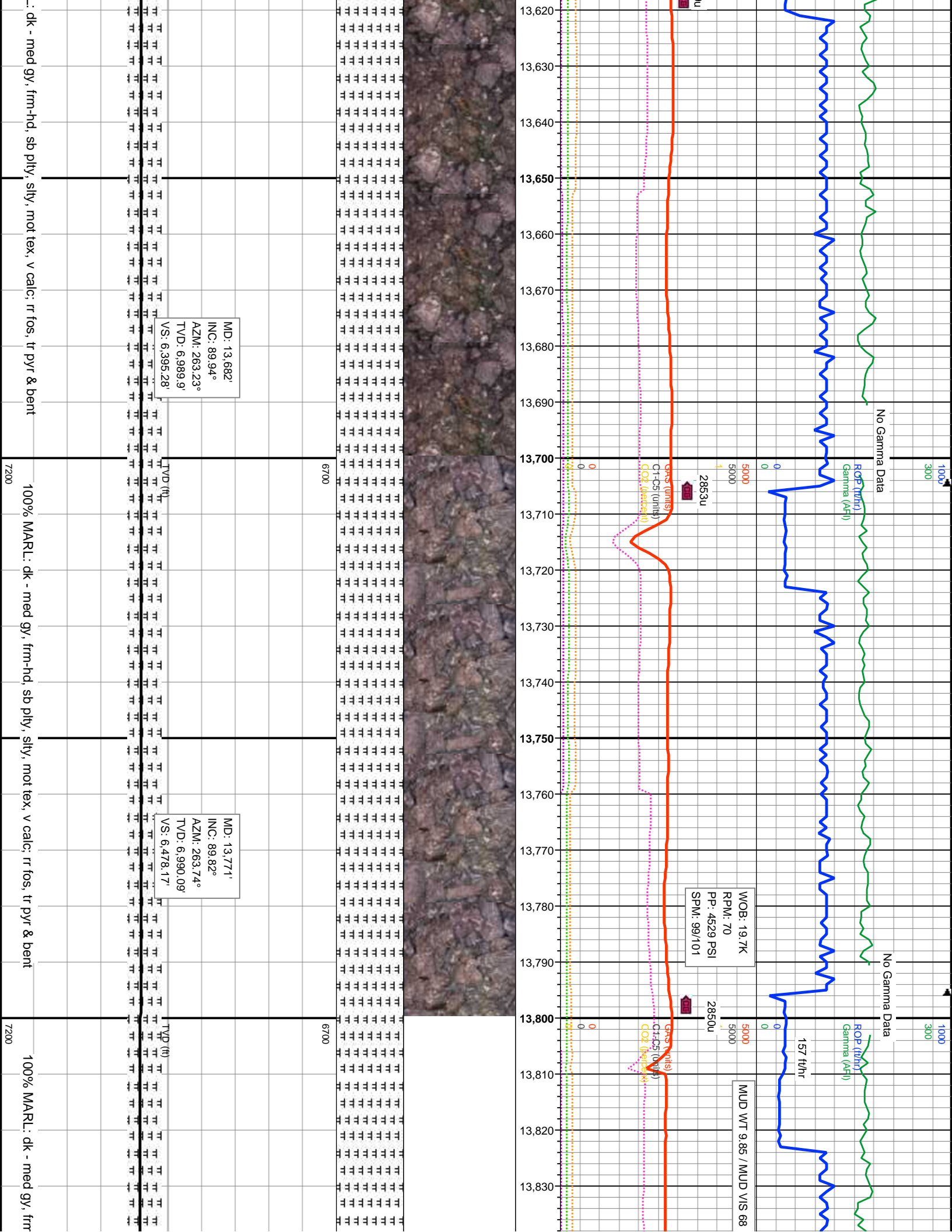
90% MARL: dk - med gy, frm-hd, sb plty, slty, mot tex, v calc; 20% CHK: med-dk gy -
 gy brn, sft, lam, sb blkly, wxy-rthy-sl stri tex, v calc; slty tex, tr fos, tr pyr & sec cal

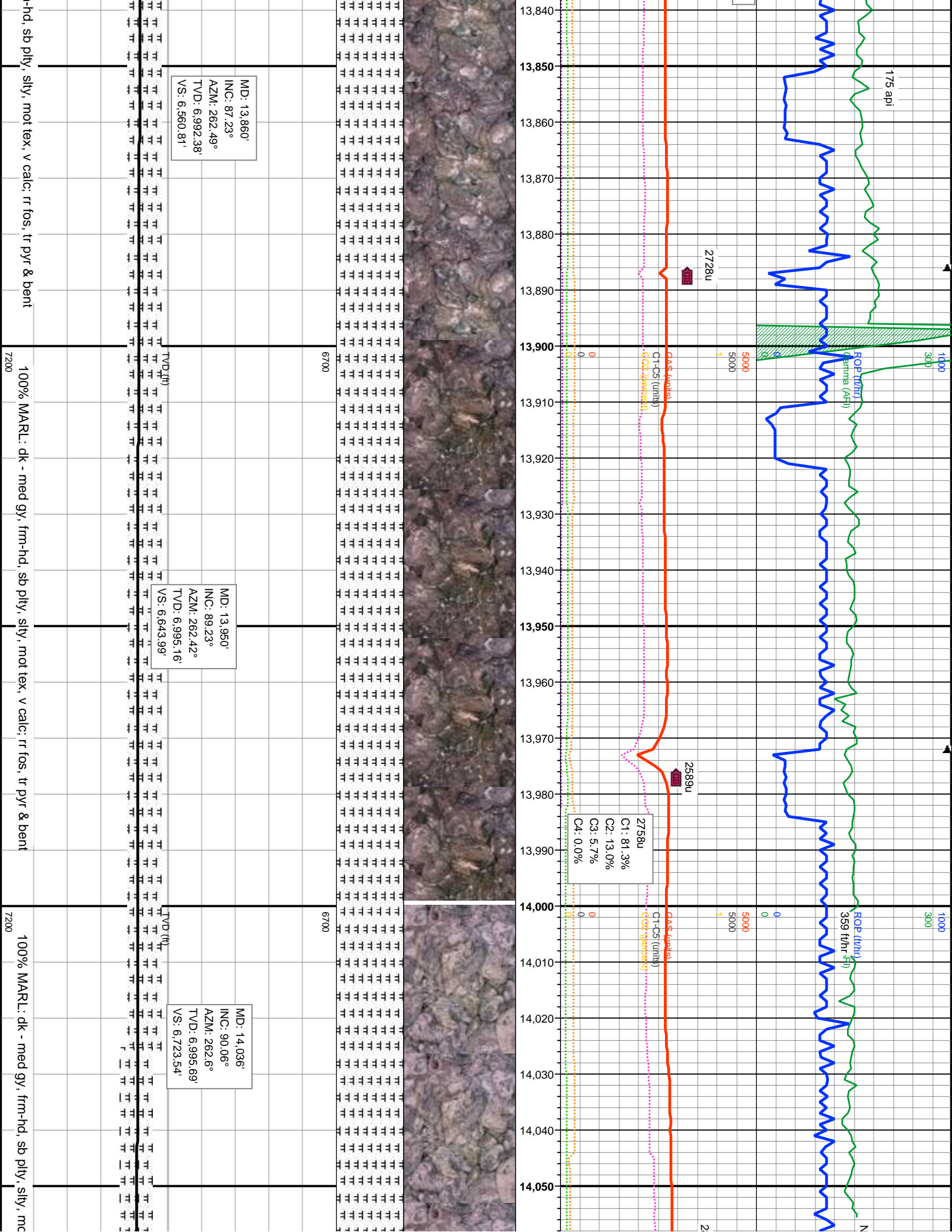


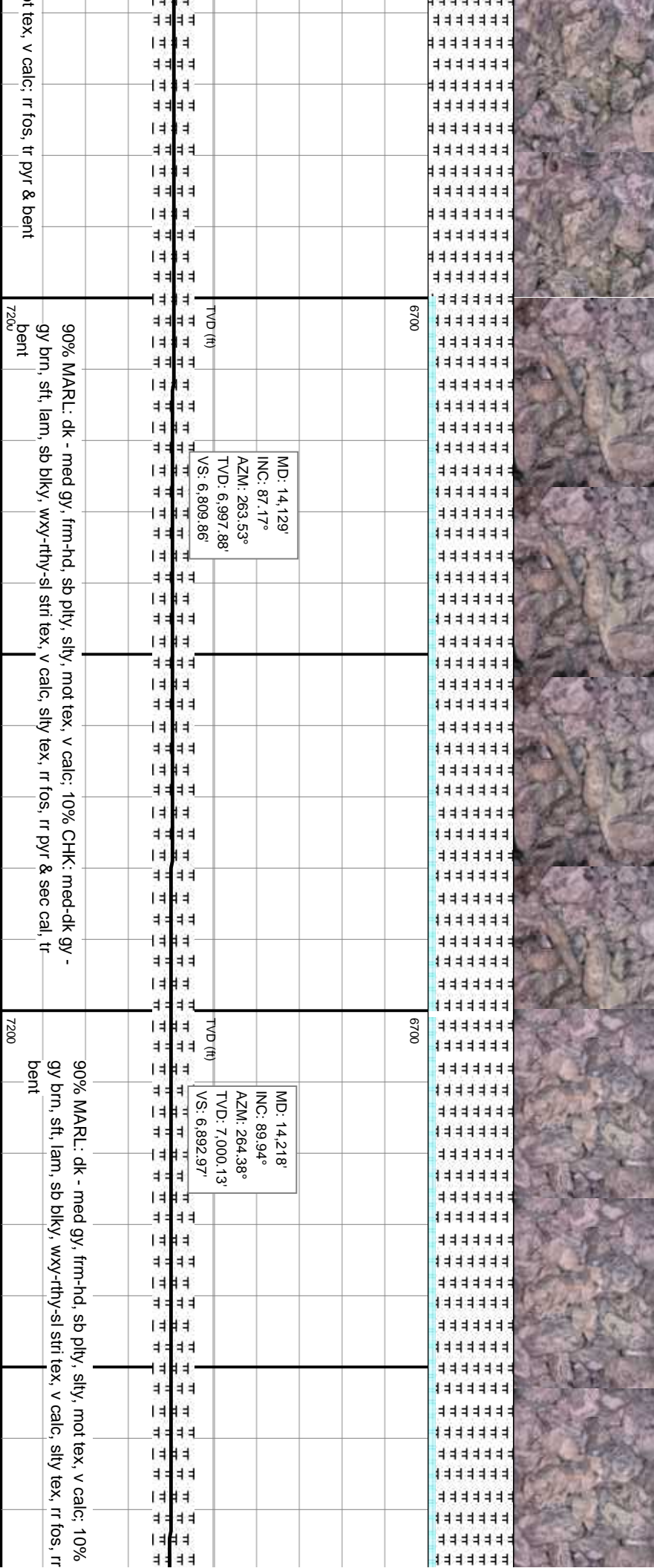
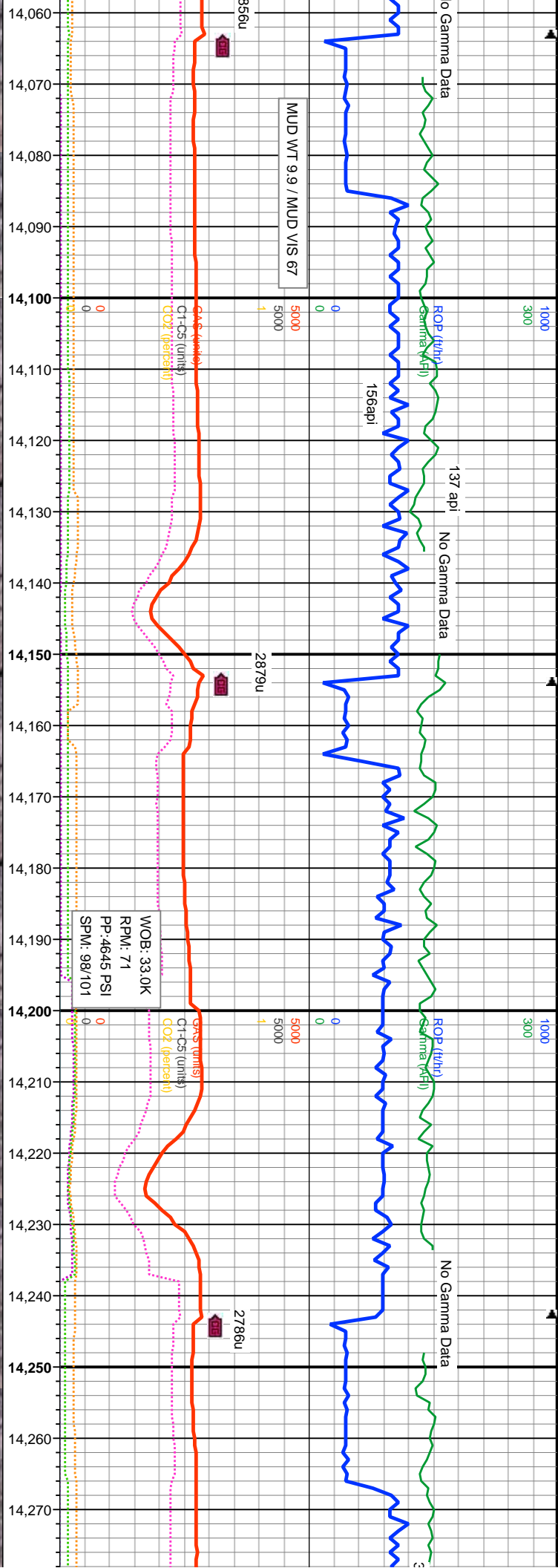
14' Downtrown Fault







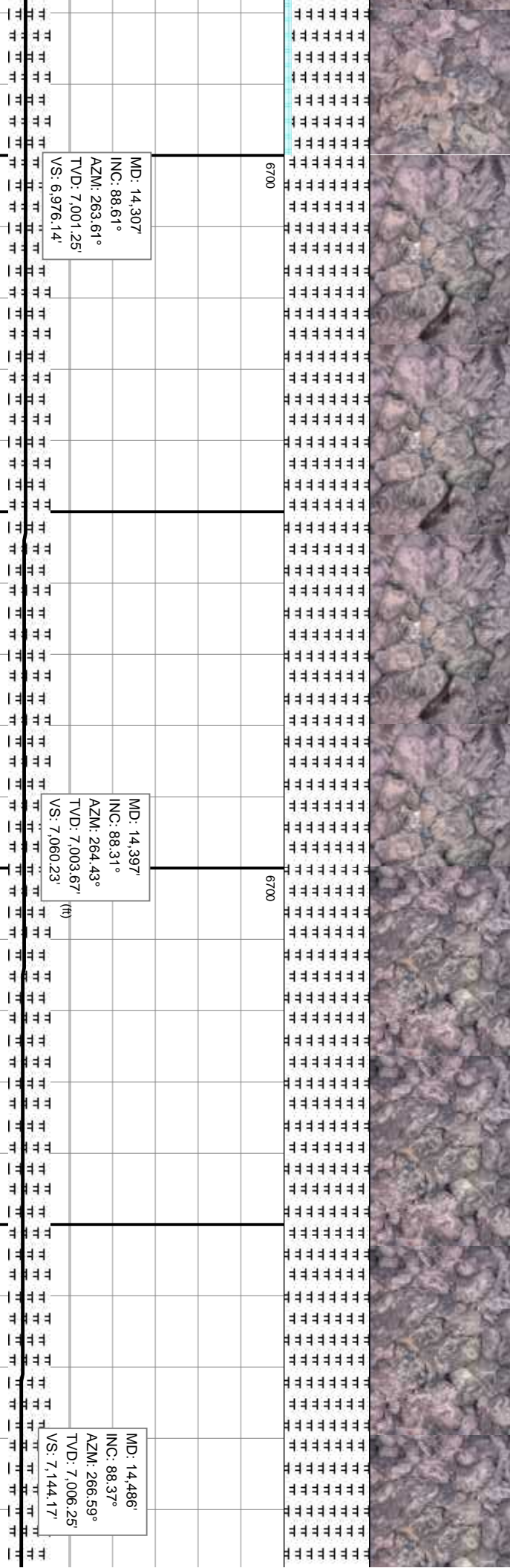
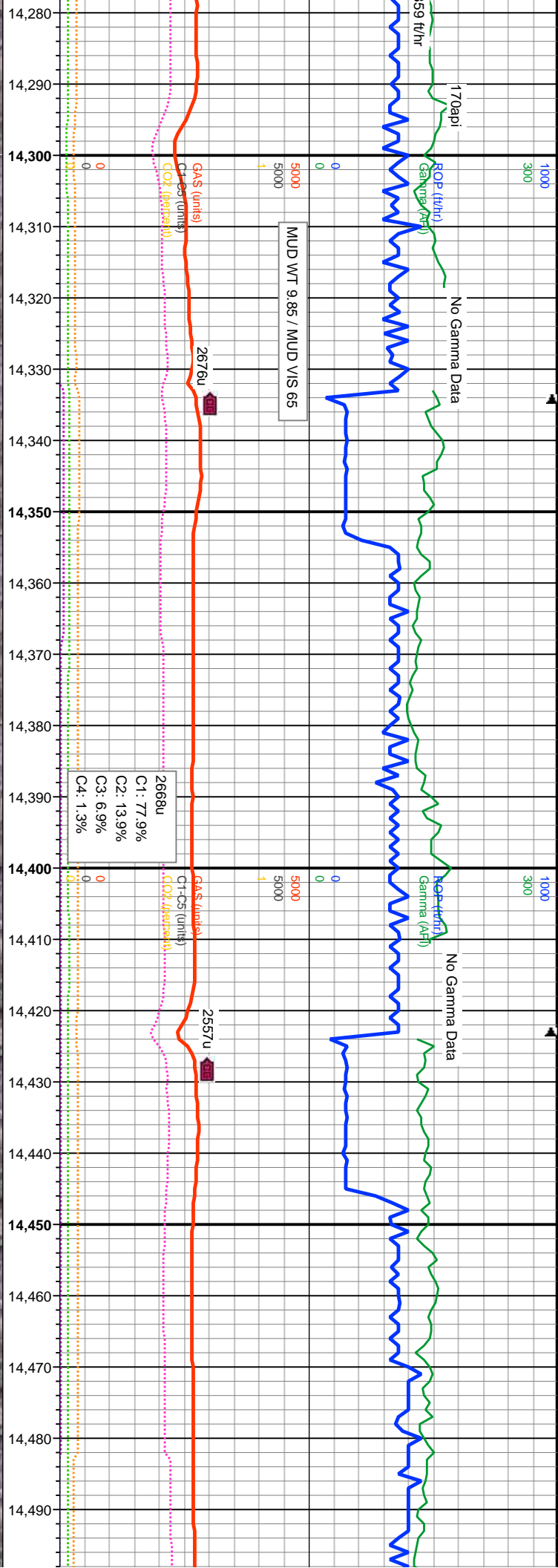




tex, v calc: rr fos, tr pyr & bent

90% MARL: dk - med gy, frm-hd, sb pty, sly, mot tex, v calc: 10% CHK: med-dk gy -
 gy brn, sft, lam, sb blkly, wxy-rthy-sl stri tex, v calc, sly tex, rr fos, rr pyr & sec cal, tr
 bent

90% MARL: dk - med gy, frm-hd, sb pty, sly, mot tex, v calc: 10%
 gy brn, sft, lam, sb blkly, wxy-rthy-sl stri tex, v calc, sly tex, rr fos, rr
 bent



MD: 14.307
 INC: 88.61°
 AZM: 263.61°
 TVD: 7.001,25'
 VS: 6.976,14'

MD: 14.397
 INC: 88.31°
 AZM: 264.43°
 TVD: 7.003,67'
 VS: 7.060,23'

MD: 14.486
 INC: 88.37°
 AZM: 266.59°
 TVD: 7.006,25'
 VS: 7.144,17'

CHK: med-dk gy -
 pyr & sec cal, tr
 7200

100% MARL: dk - med gy, frm-hd, sb ply, silty, mot tex, v calc, r fos, tr pyr & bent
 7200

100% MARL: dk - med gy, frm-hd, sb ply, silty, mot tex, v calc, r fos, tr pyr & bent
 7200

