Scale: 5" / 100'
Measured Depth Log

Well Name	Marcus LD 11-378HNX		
Location	SESE SEC 34 T1N R67W		
State	COLORADO	**County**	WELD
Country	USA	**Rig Number**	PRECISION 460
API Number	05-123-45387-000(	**AFE #**	17DC0135
Geographic Region	DJ BASIN	**Field**	WATTENBERG
Spud Date	10/31/2017	**Drilling Completed**	11/4/2017
Surface Coordinates	SESE Sec 34-T1N-R67W 832' FSL x 410' FEL		
Bottom Hole Coordinates	SESW SEC. 11-T1S-R67W 370' FSL X 756' FWL		
Ground Elevation	5043'	**K.B. Elevation**	5062'
Logged Interval	6000' **To** 16242'	**Total Depth**	16242'
Formation	NIO A CHALK		
Type of Drilling Fluid	OIL BASED MUD		

Operator

Company Great Western Oil and Gas

Address 1801 Broadway, Ste 500
Denver, CO 80202

Geologist

Name Gabe Rubio and Alec Walker

Company Terra Guidance

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

Color Coding

- Oil
- Note
- Error
- Condensate
- Core
- Water
- Gas
- Pressure
- Seal

Rock Types

- LIMESTONE
- Chalk
- Marl
- SHALE
- Silty Shale
- Shaly Siltstone
- Shaly Sandston
- SILTSTONE
- SANDSTONE
- BENTONITE
- CEMENT
- UNKNOWN
- ANHYDRITE
- GYPSUM
- SALT
- SIDERITE or LIMONITE
- DOLOMITE
- CHERT
- COAL
- MARLSTONE
- CLAYSTONE
- SHALE GRAY
- SHALE COLORED
- CONGLOMERATE
- BRECCIA
- TILL
- TUFF
- IGNEOUS
- METAMORPHIC
- CALCARIOUS SHALE

Accessories

Fossils

- ALGAE
- AMPHIPORA
- BELEMNITE
- BIOCLASTIC
- BRACHOIPOD
- BRYOZOA
- CEPHALOPOD
- CORAL
- CRINOID
- ECHINOID
- FISH
- FORAMINIFERA
- FOSSIL
- GASTROPOD
- OOLITE
- OSTRACOD
- PELECYPOD
- PELLET
- PISOLITE
- PLANT REMAINS
- PLANT SPORES
- SCAPHOPOD
- STROMATOPOROID

Minerals

- ANHYDRITIC
- ARGILLACEOUS
- ARGILLITE GRAIN
- BENTONITE
- BITUMENOUS SUBSTANCE
- BRECCIA FRAGMENTS
- CALCAREOUS
- CARBONACEOUS FLAKES
- CHTDK
- CHTLT
- COAL - THIN BEDS
- DOLOMITIC
- FELDSPAR
- FERRUGINOUS PELLET
- FERRUGINOUS
- GLAUCONITE
- GYPSIFEROUS
- HEAVY MINERAL
- KAOLIN
- MARLSTONE
- MINERAL CRYSTALS
- NODULES
- PHOSPHATE PELLETS
- PYRITE
- SALT CAST
- SANDY
- SILICEOUS
- SILTY
- TUFFACEOUS

Stringer

- ANHYDRITE STRINGER
- BENTONITE STRINGER
- COAL STRINGER
- DOLOMITE STRINGER
- GYPSUM STRINGER
- LIMESTONE STRINGER
- MARLSTONE (CALC) STRG
- MARLSTONE (DOL) STRG
- SANDSTONE STRINGER
- SHALE STRINGER
- SILTSTONE STRINGER

Ot

Oil Show

- ORGANIC
- PINPOINT
- DEAD
- VUGGY
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

Engineering

- BIT
- CASING

Porosity

- CONNECTION (LEFT)
- EARTHY
- CONNECTION (RIGHT)
- FENESTRAL
- CONNECTION GAS
- FRACTURE
- CORE - LOST
- INTERCRYSTALLINE
- CORE - RECOVERED
- INTEROOLITIC
- DST INTERVAL
- MOLDIC
- FAULT

her Symbols

FORMATION TOP

AS SHOW

EPTH MN DEPTH

RMAL FAULT

L SHOW

ERTURNED STRATA

VERSE FAULT

EWALL CORE (LEFT)

EWALL CORE (RIGHT)

DE

URVEY

RIP GAS

RELINE TESTED - LEFT

RELINE TESTED - RT

L LITHOGRAPHIC

Rounding

MX MICROXLN

A ANGULAR

MS MUDSTONE

R ROUNDED

PS PACKSTONE

a SUBANG

WS WACKESTONE

r SUBRND

Sorting

M MODERATE

Textures

BS BOUNDSTONE

P POOR

C CHALKY

W WELL

CX CRYPTOXLN

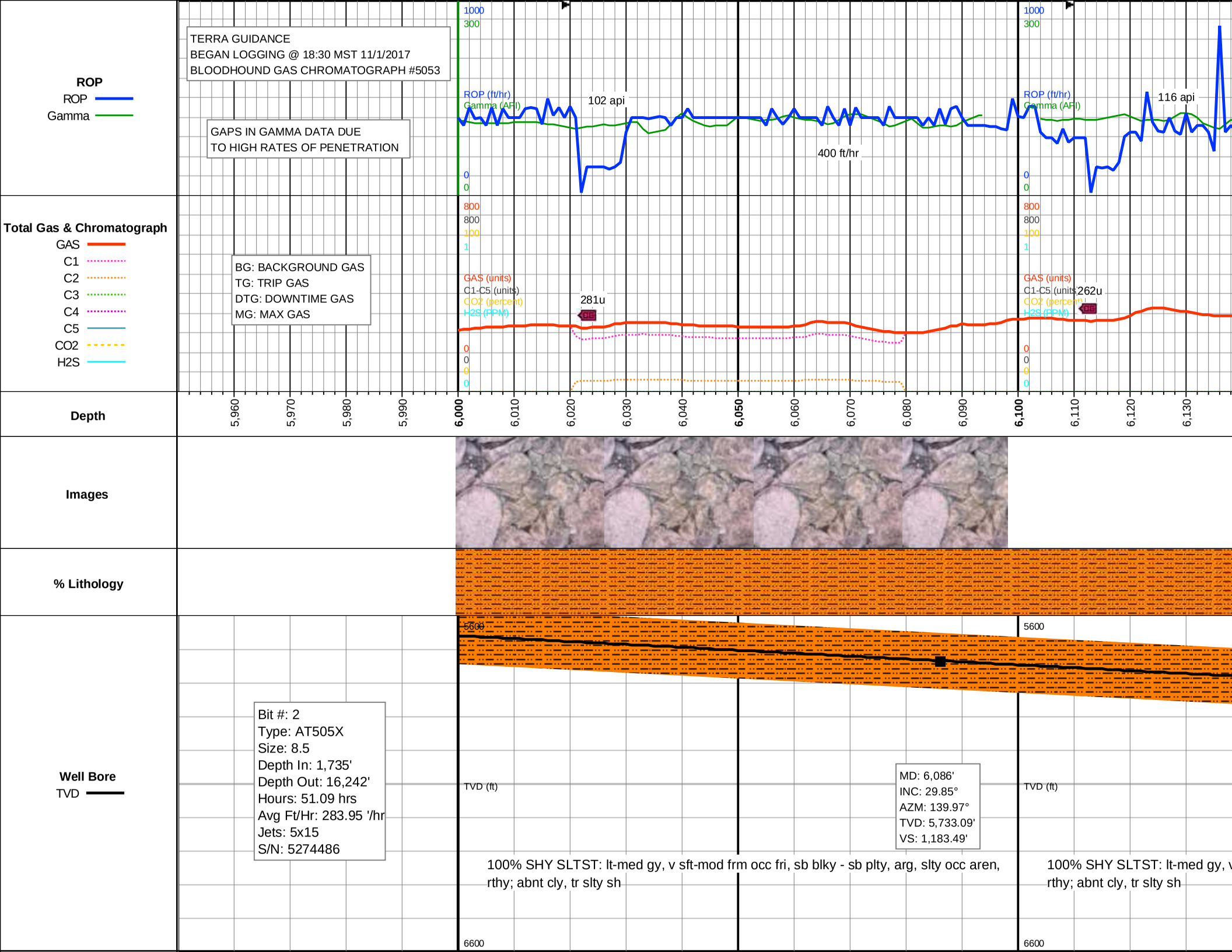
CALCARIUOS SHALE

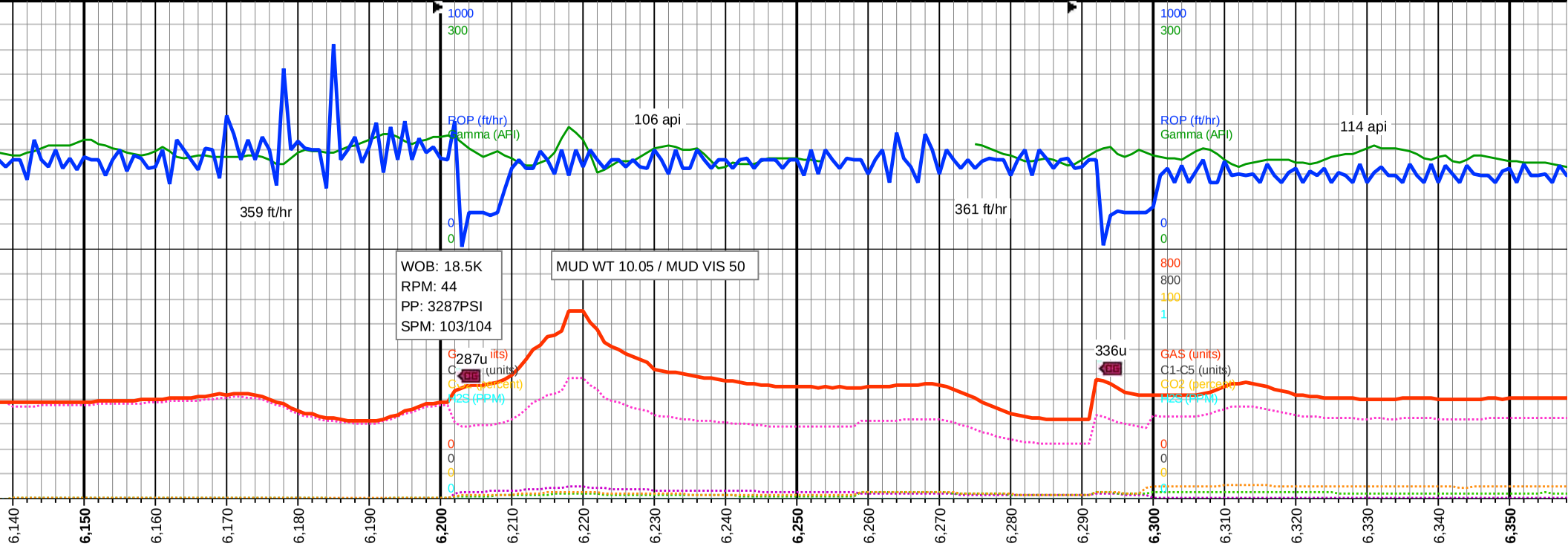
E EARTHY

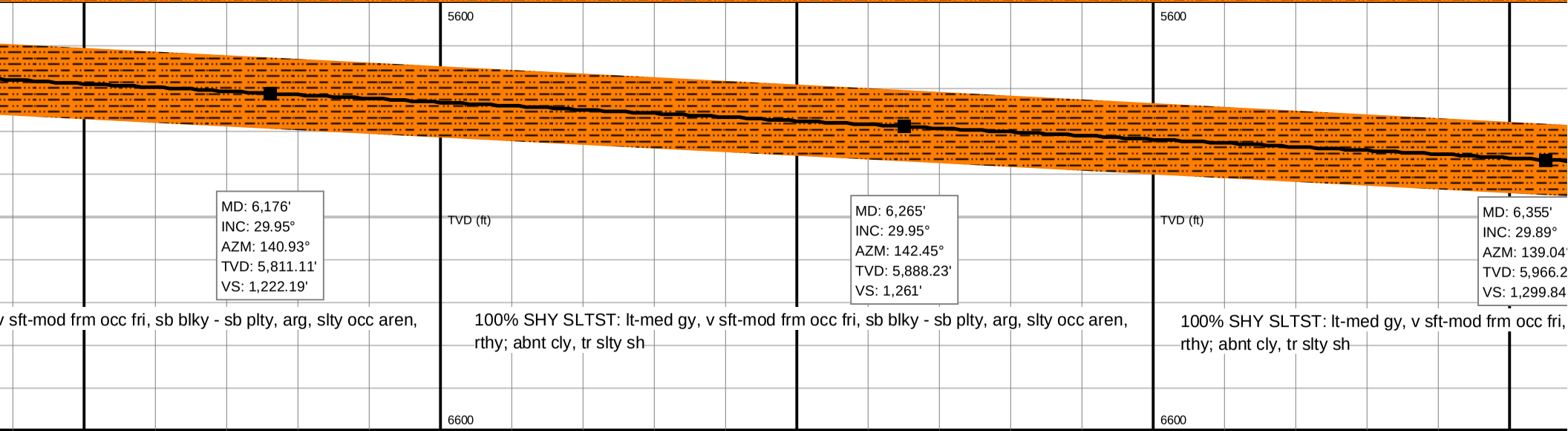
FX FINELYXLN

CALCARIOUS SHALE

GS GRAINSTONE


ROP
ROP
Gamma
TERRA GUIDANCE
BEGAN LOGGING @ 18:30 MST 11/1/2017
BLOODHOUND GAS CHROMATOGRAPH #5053
GAPS IN GAMMA DATA DUE
TO HIGH RATES OF PENETRATION
1000
300
ROP (ft/hr)
Gamma (API)
102 api
400 ft/hr
116 api
0
0
Total Gas & Chromatograph
GAS
C1
C2
C3
C4
C5
CO2
H2S
BG: BACKGROUND GAS
TG: TRIP GAS
DTG: DOWNTIME GAS
MG: MAX GAS
800
800
100
1
GAS (units)
C1-C5 (units)
CO2 (percent)
H2S (PPM)
281u
262u
BG
DTG
0
0
0
0
Depth
5,960
5,970
5,980
5,990
6,000
6,010
6,020
6,030
6,040
6,050
6,060
6,070
6,080
6,090
6,100
6,110
6,120
6,130
Images
% Lithology
Well Bore
TVD
5600
Bit #: 2
Type: AT505X
Size: 8.5
Depth In: 1,735'
Depth Out: 16,242'
Hours: 51.09 hrs
Avg Ft/Hr: 283.95 '/hr
Jets: 5x15
S/N: 5274486
TVD (ft)
MD: 6,086'
INC: 29.85°
AZM: 139.97°
TVD: 5,733.09'
VS: 1,183.49'
100% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren, rthy; abnt cly, tr slty sh
6600

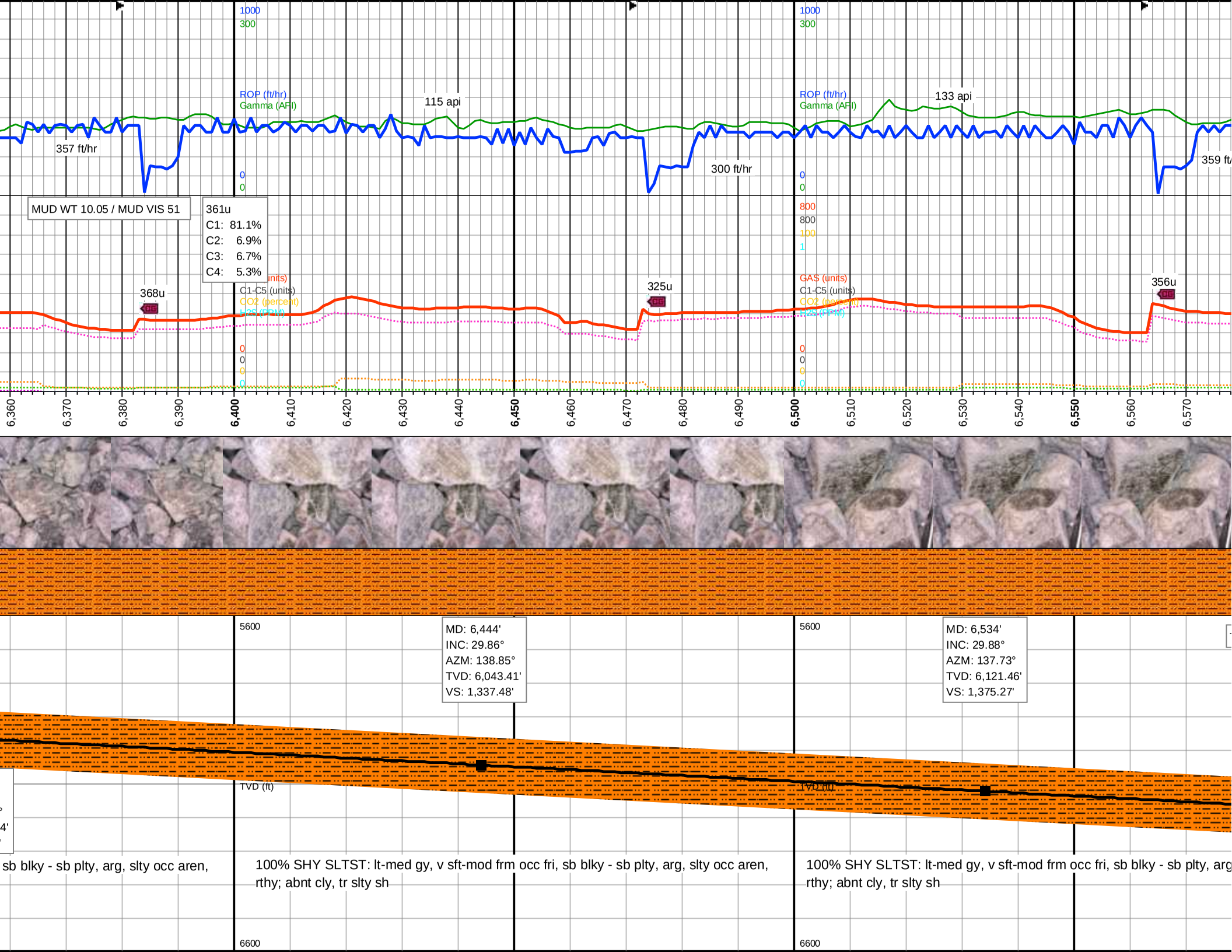


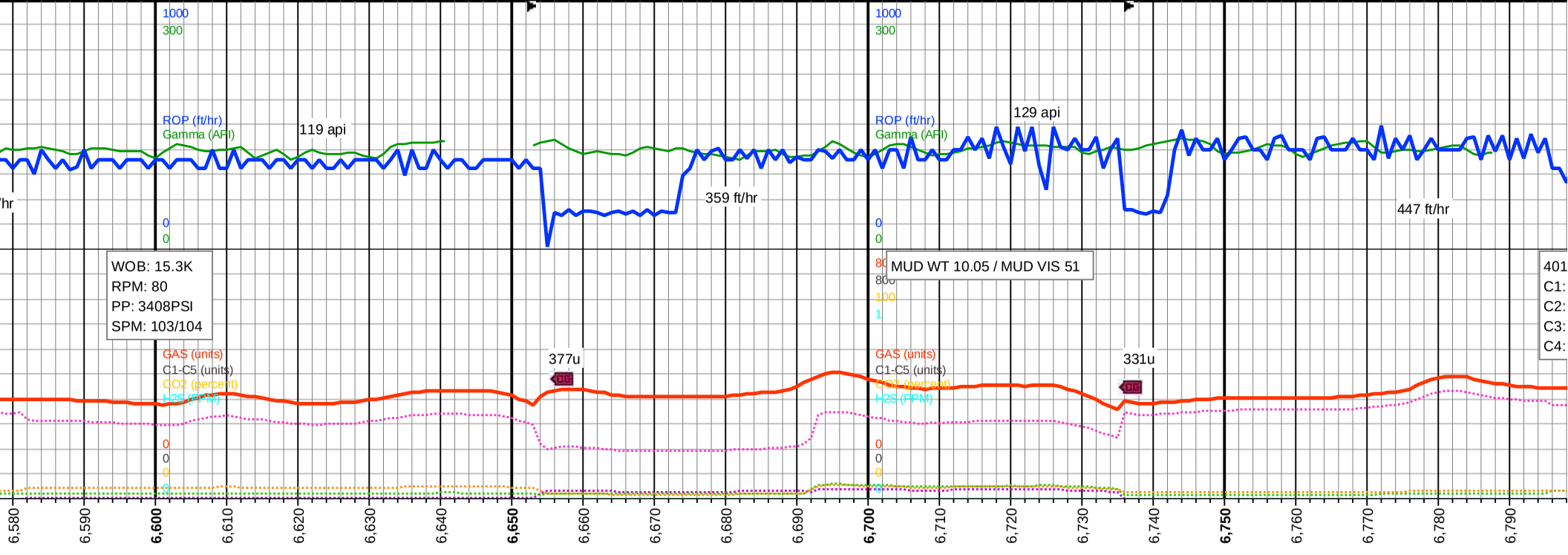


v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren,

100% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren, rthy; abnt cly, tr slty sh

100% SHY SLTST: lt-med gy, v sft-mod frm occ fri, rthy; abnt cly, tr slty sh


1000
300
ROP (ft/hr)
Gamma (AFI)
115 api
357 ft/hr
300 ft/hr
133 api
359 ft/
0
0
MUD WT 10.05 / MUD VIS 51
361u
C1: 81.1%
C2: 6.9%
C3: 6.7%
C4: 5.3%
800
800
100
1
GAS (units)
C1-C5 (units)
CO2 (percent)
H2S (PPM)
368u
325u
356u
6,360
6,370
6,380
6,390
6,400
6,410
6,420
6,430
6,440
6,450
6,460
6,470
6,480
6,490
6,500
6,510
6,520
6,530
6,540
6,550
6,560
6,570
5600
MD: 6,444'
INC: 29.86°
AZM: 138.85°
TVD: 6,043.41'
VS: 1,337.48'
MD: 6,534'
INC: 29.88°
AZM: 137.73°
TVD: 6,121.46'
VS: 1,375.27'
TVD (ft)
6600
sb blky - sb plty, arg, slty occ aren,
100% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren, rthy; abnt cly, tr slty sh
100% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg
rthy; abnt cly, tr slty sh



TVD SCALE CHANGE

6000

TVD (ft)

MD: 6,623'
INC: 29.95°
AZM: 137.8°
TVD: 6,198.6'
VS: 1,412.47'

, slty occ aren,

100% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren, rthy; abnt cly, tr slty sh

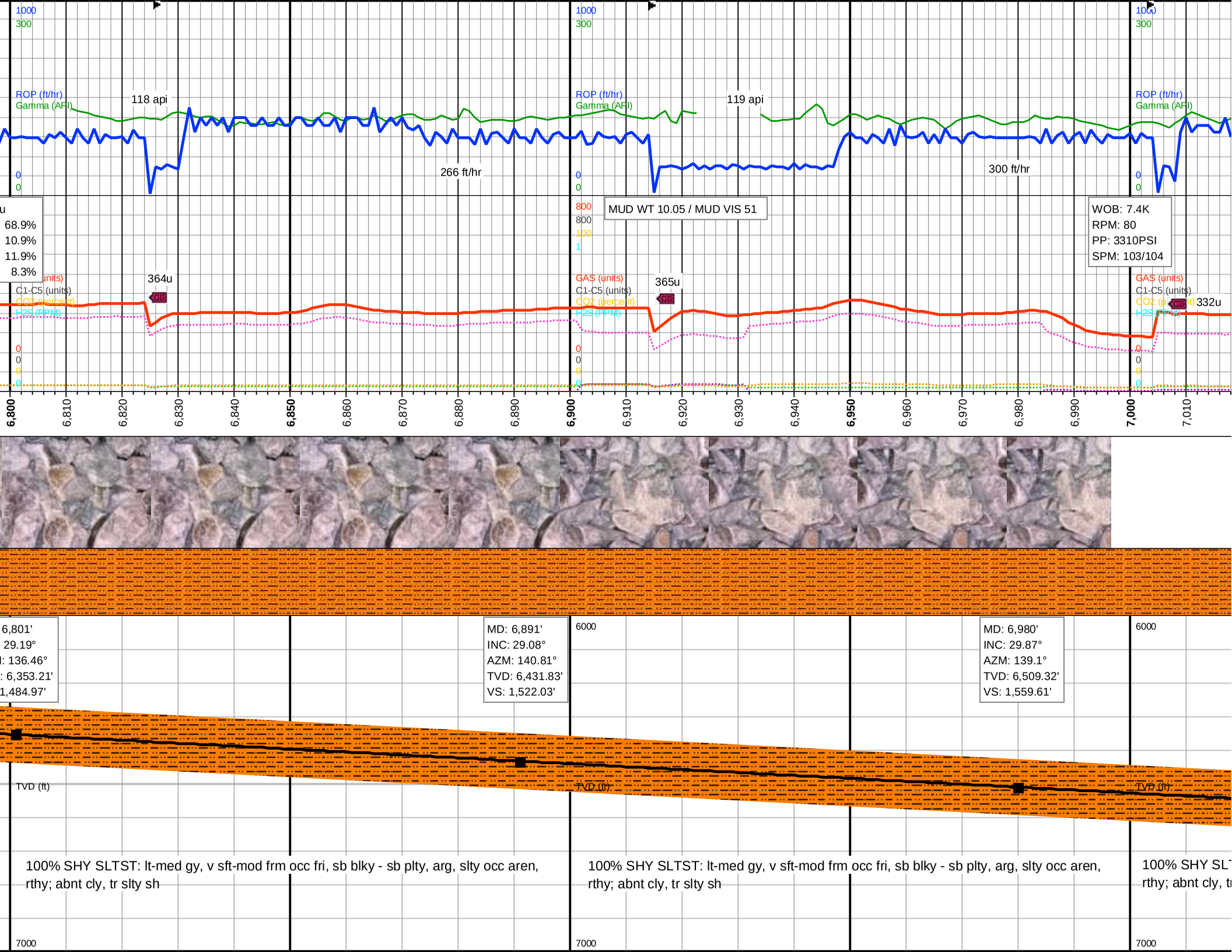
7000

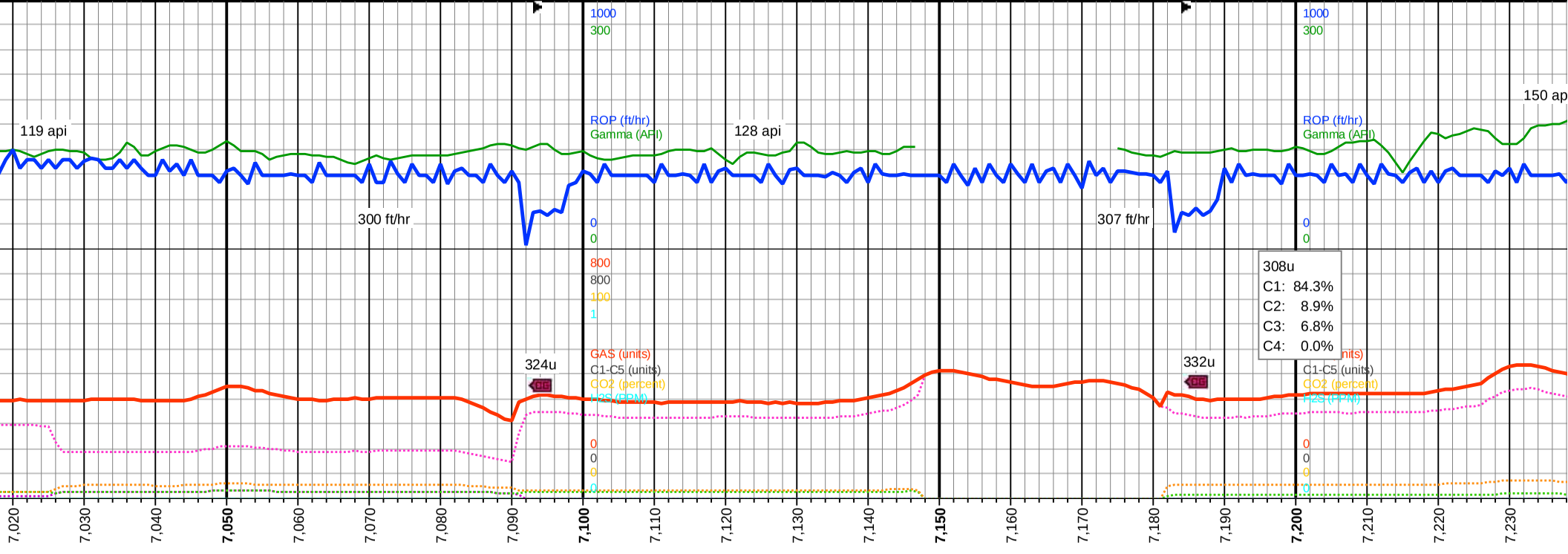
6000

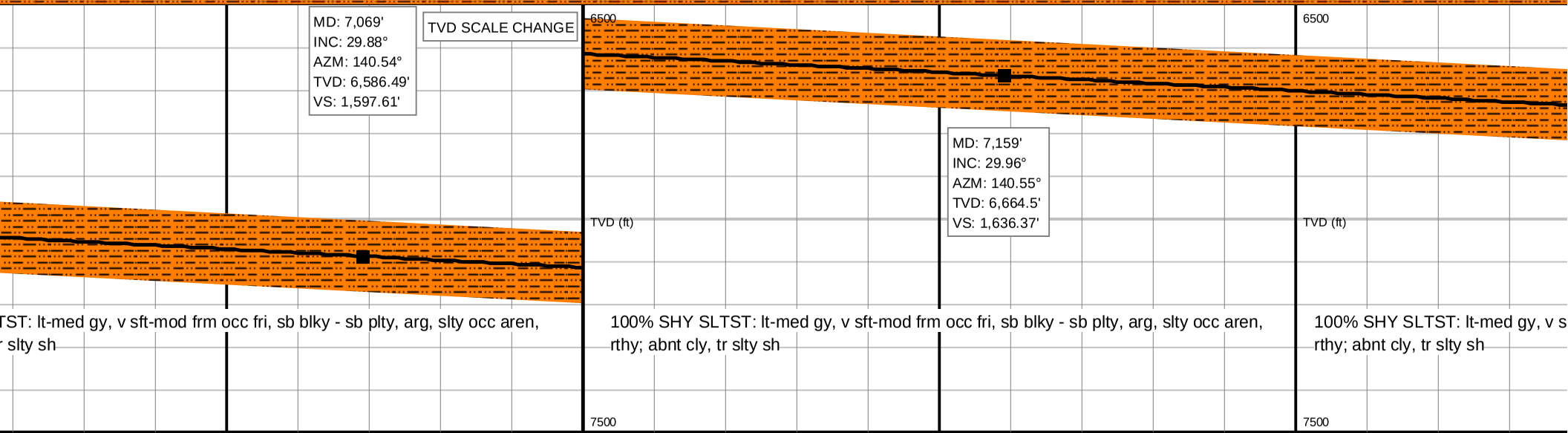
MD: 6,712'
INC: 29.84°
AZM: 135.08°
TVD: 6,275.76'
VS: 1,449.08'

100% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren, rthy; abnt cly, tr slty sh

7000


1000
300
ROP (ft/hr)
Gamma (API)
118 api
266 ft/hr
119 api
300 ft/hr
0
0
68.9%
10.9%
11.9%
8.3%
364u
365u
332u
GAS (units)
C1-C5 (units)
CO2 (percent)
H2S (PPM)
800
100
1
MUD WT 10.05 / MUD VIS 51
WOB: 7.4K
RPM: 80
PP: 3310PSI
SPM: 103/104
6,800
6,810
6,820
6,830
6,840
6,850
6,860
6,870
6,880
6,890
6,900
6,910
6,920
6,930
6,940
6,950
6,960
6,970
6,980
6,990
7,000
7,010
6,801'
29.19°
136.46°
6,353.21'
1,484.97'
MD: 6,891'
INC: 29.08°
AZM: 140.81°
TVD: 6,431.83'
VS: 1,522.03'
MD: 6,980'
INC: 29.87°
AZM: 139.1°
TVD: 6,509.32'
VS: 1,559.61'
6000
TVD (ft)
100% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren, rthy; abnt cly, tr slty sh
7000

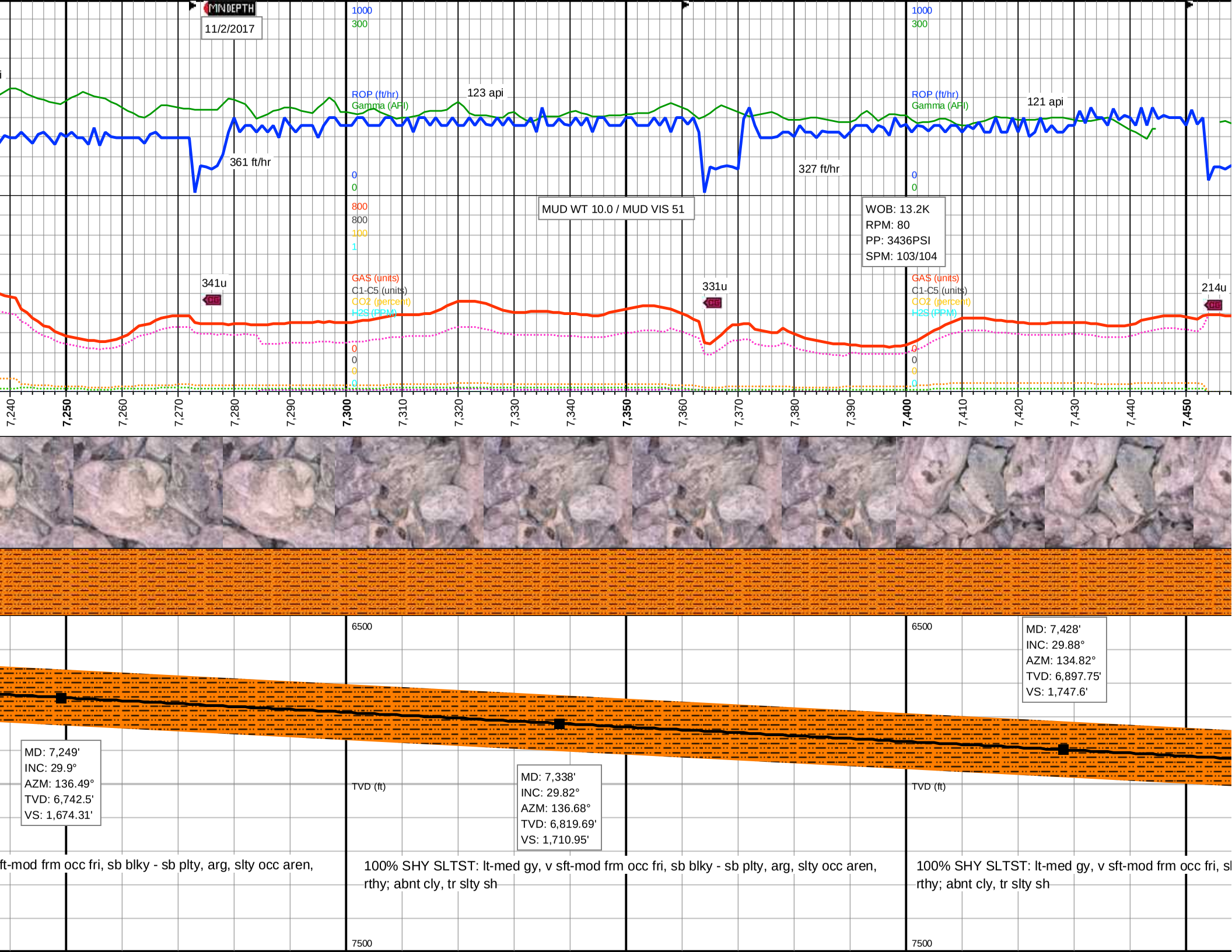


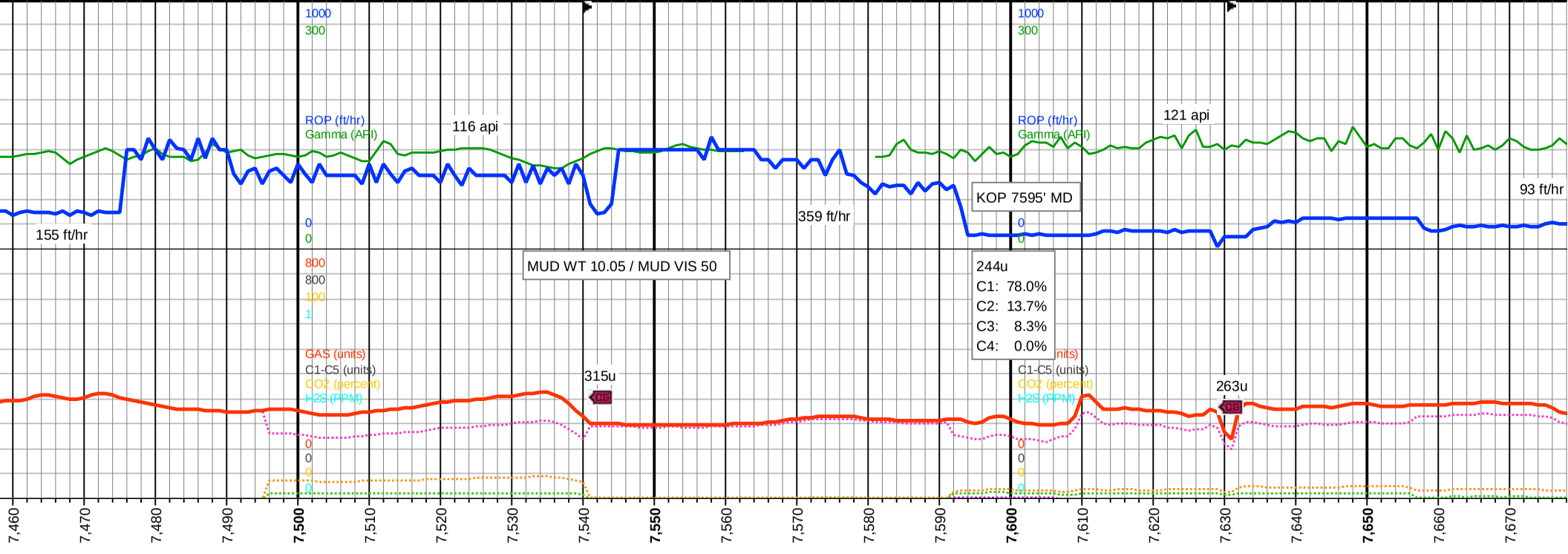


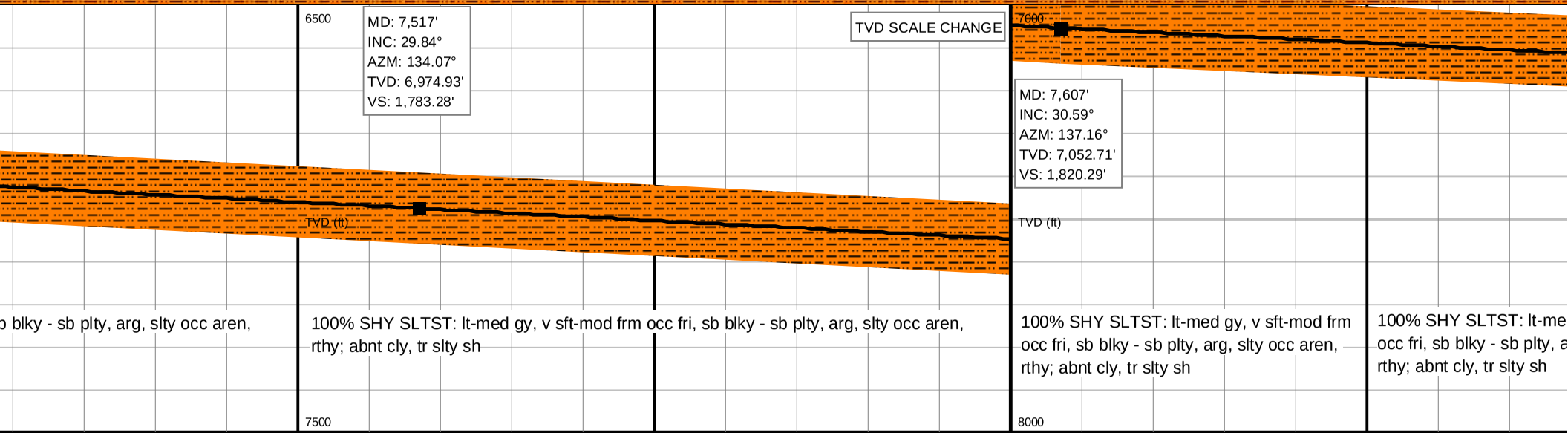
TST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren, r slty sh

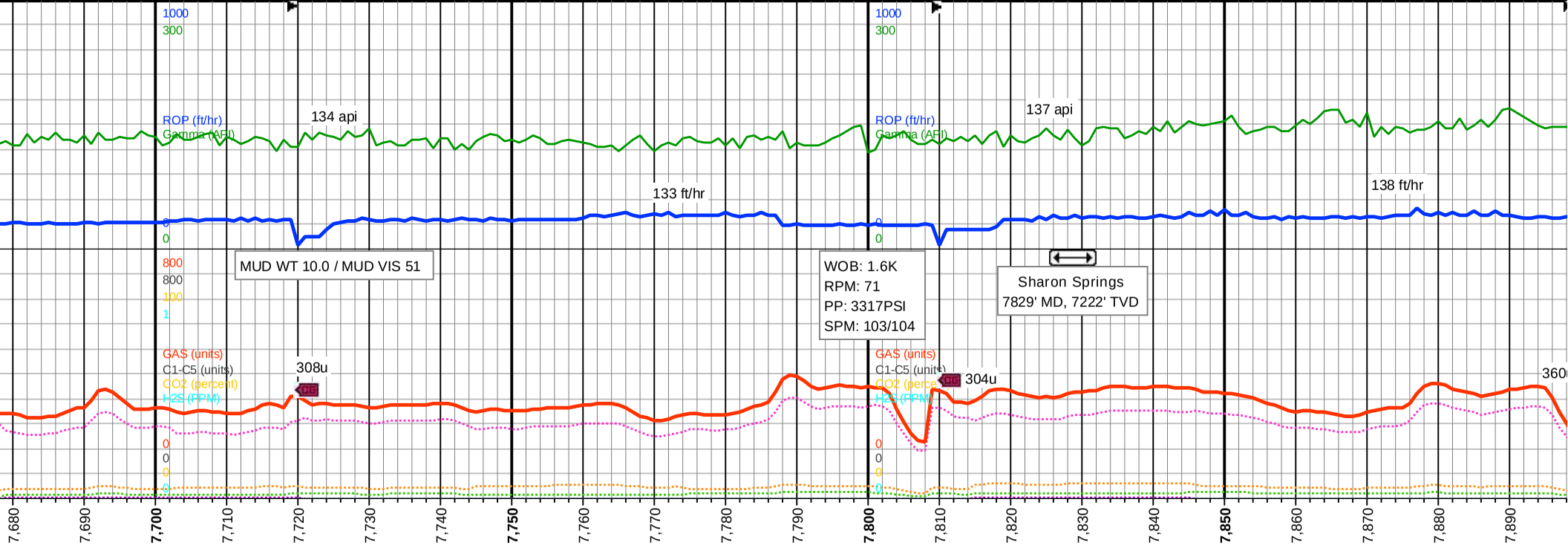
100% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren, rthy; abnt cly, tr slty sh

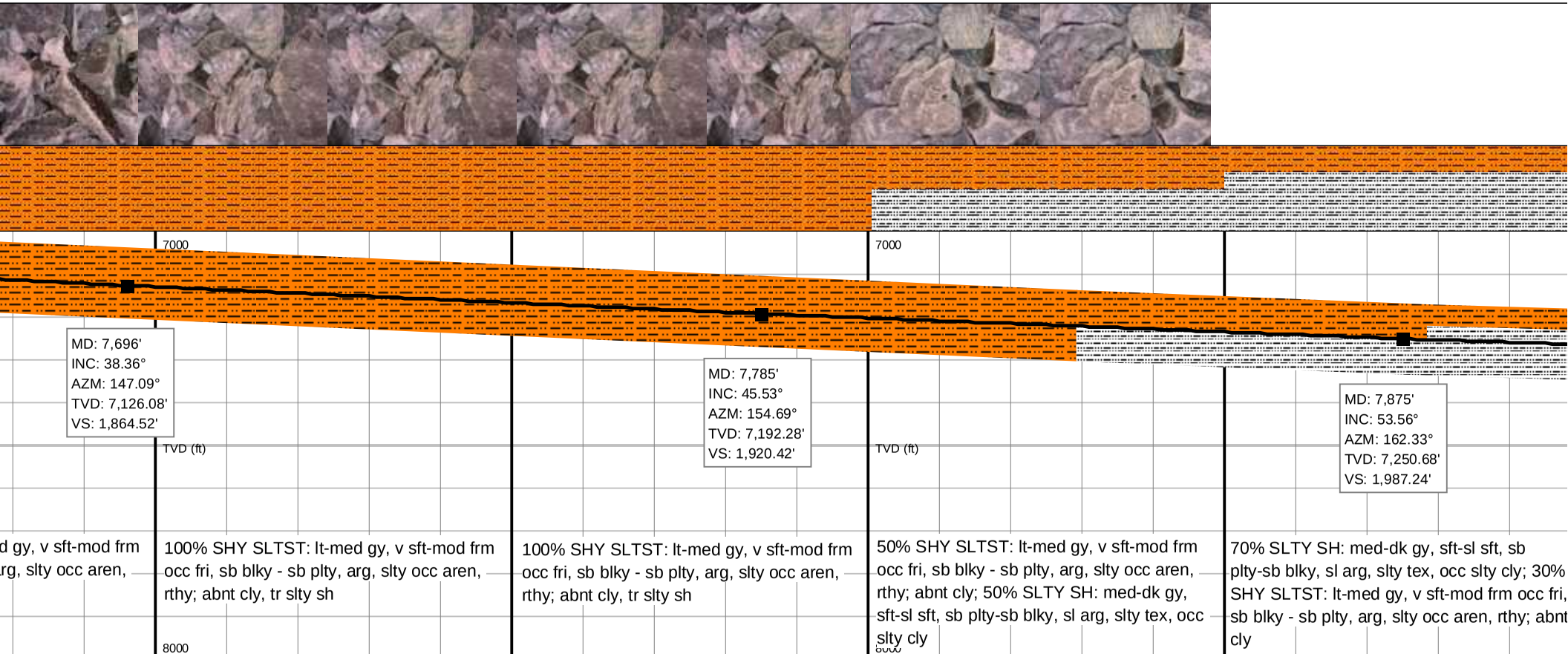
100% SHY SLTST: lt-med gy, v s rthy; abnt cly, tr slty sh


MNDEPTH
11/2/2017
1000
300
ROP (ft/hr)
Gamma (API)
123 api
361 ft/hr
327 ft/hr
121 api
0
0
800
800
100
1
GAS (units)
C1-C5 (units)
CO2 (percent)
H2S (PPM)
341u
331u
214u
MUD WT 10.0 / MUD VIS 51
WOB: 13.2K
RPM: 80
PP: 3436PSI
SPM: 103/104
7,240
7,250
7,260
7,270
7,280
7,290
7,300
7,310
7,320
7,330
7,340
7,350
7,360
7,370
7,380
7,390
7,400
7,410
7,420
7,430
7,440
7,450
6500
7500
TVD (ft)
MD: 7,249'
INC: 29.9°
AZM: 136.49°
TVD: 6,742.5'
VS: 1,674.31'
MD: 7,338'
INC: 29.82°
AZM: 136.68°
TVD: 6,819.69'
VS: 1,710.95'
MD: 7,428'
INC: 29.88°
AZM: 134.82°
TVD: 6,897.75'
VS: 1,747.6'
ft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren,
100% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren, rthy; abnt cly, tr slty sh
100% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sl
rthy; abnt cly, tr slty sh


1000
300
ROP (ft/hr)
Gamma (API)
116 api
121 api
155 ft/hr
359 ft/hr
93 ft/hr
KOP 7595' MD
MUD WT 10.05 / MUD VIS 50
244u
C1: 78.0%
C2: 13.7%
C3: 8.3%
C4: 0.0%
800
100
1
GAS (units)
C1-C5 (units)
CO2 (percent)
H2S (PPM)
315u
263u
7,460
7,470
7,480
7,490
7,500
7,510
7,520
7,530
7,540
7,550
7,560
7,570
7,580
7,590
7,600
7,610
7,620
7,630
7,640
7,650
7,660
7,670


6500
MD: 7,517'
INC: 29.84°
AZM: 134.07°
TVD: 6,974.93'
VS: 1,783.28'
TVD SCALE CHANGE
7000
MD: 7,607'
INC: 30.59°
AZM: 137.16°
TVD: 7,052.71'
VS: 1,820.29'
TVD (ft)
TVD (ft)
b blky - sb plty, arg, slty occ aren,
100% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren, rthy; abnt cly, tr slty sh
100% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren, rthy; abnt cly, tr slty sh
100% SHY SLTST: lt-me
occ fri, sb blky - sb plty, a
rthy; abnt cly, tr slty sh
7500
8000





d gy, v sft-mod frm
rg, slty occ aren,

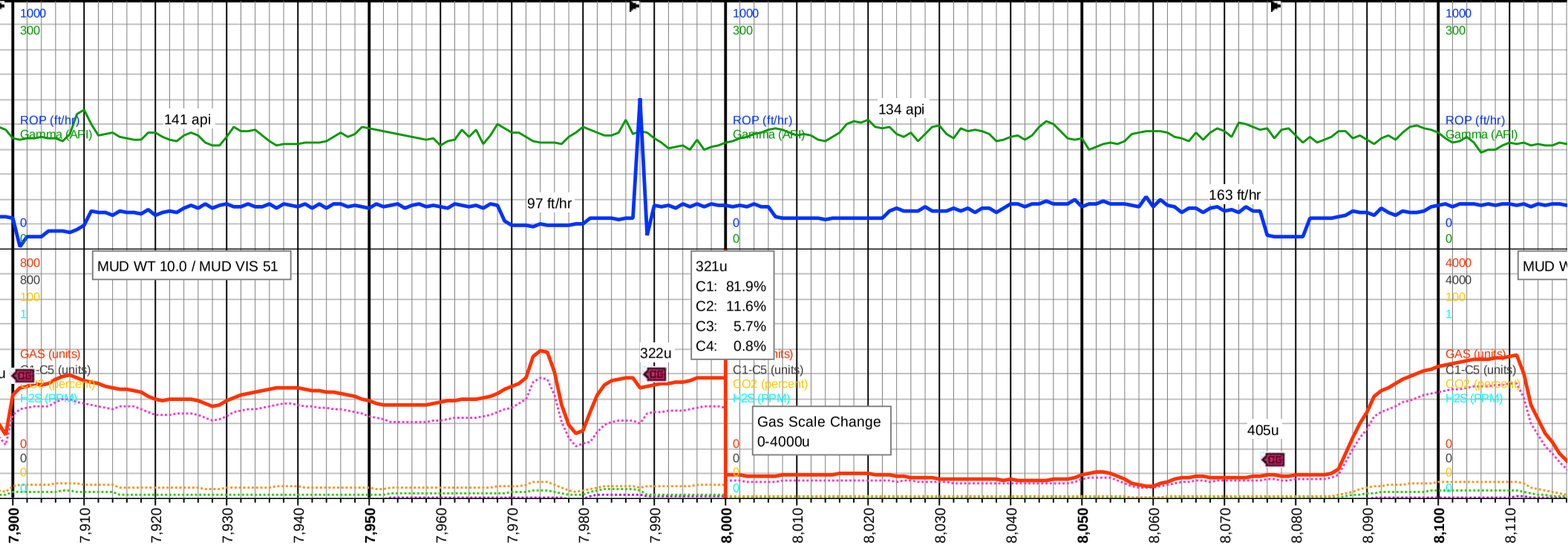
100% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren, rthy; abnt cly, tr slty sh

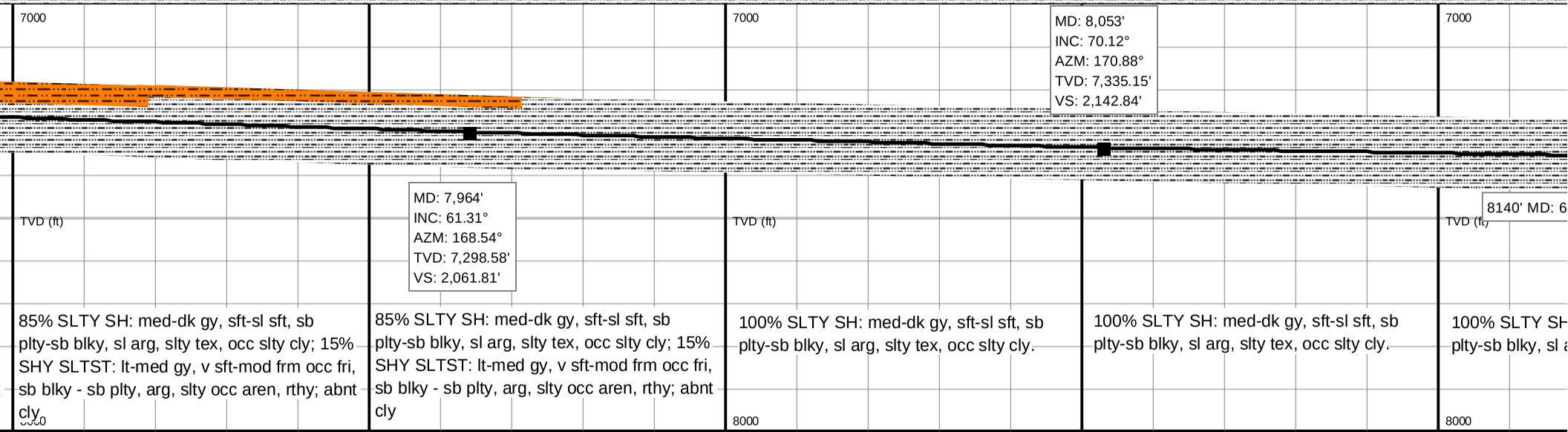
8000

100% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren, rthy; abnt cly, tr slty sh

50% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren, rthy; abnt cly; 50% SLTY SH: med-dk gy, sft-sl sft, sb plty-sb blky, sl arg, slty tex, occ slty cly

70% SLTY SH: med-dk gy, sft-sl sft, sb plty-sb blky, sl arg, slty tex, occ slty cly; 30% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren, rthy; abnt cly





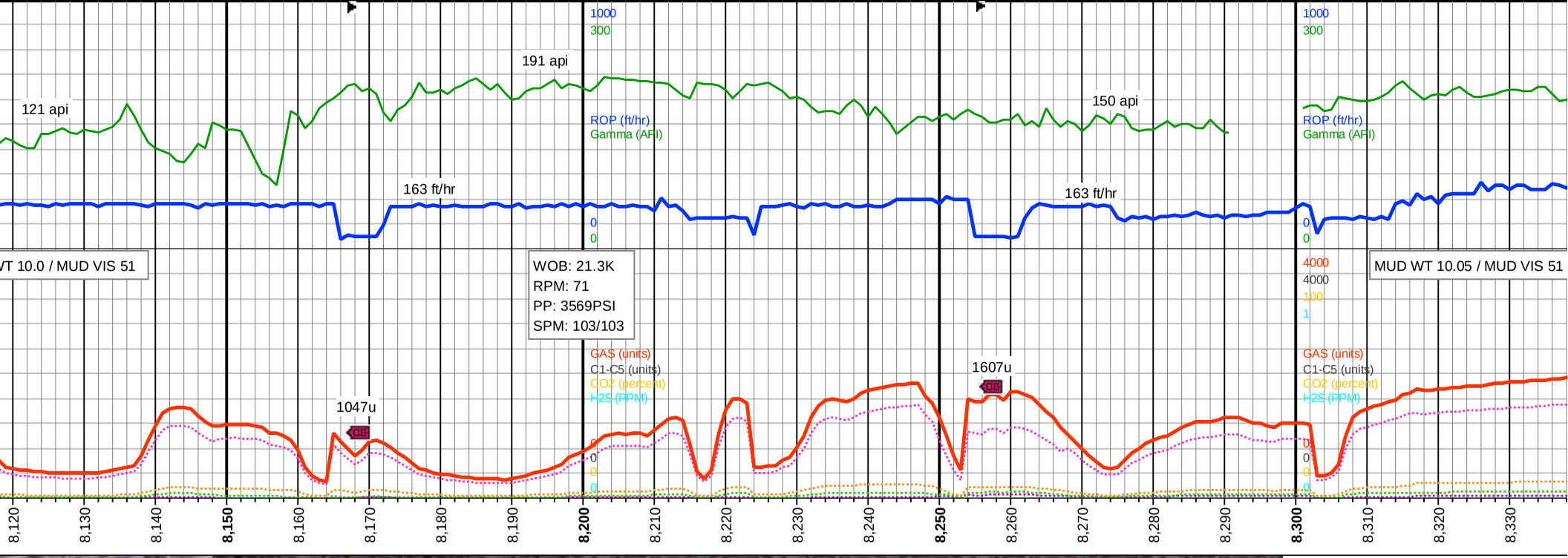
85% SLTY SH: med-dk gy, sft-sl sft, sb plty-sb blky, sl arg, slty tex, occ slty cly; 15% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren, rthy; abnt cly

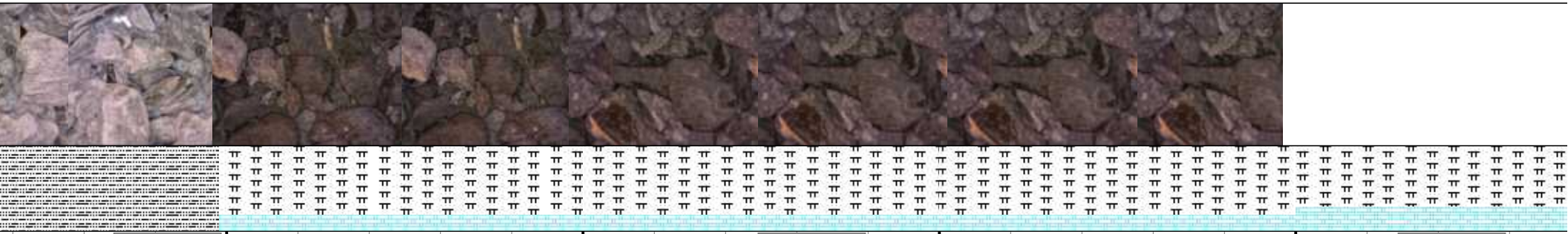
85% SLTY SH: med-dk gy, sft-sl sft, sb plty-sb blky, sl arg, slty tex, occ slty cly; 15% SHY SLTST: lt-med gy, v sft-mod frm occ fri, sb blky - sb plty, arg, slty occ aren, rthy; abnt cly

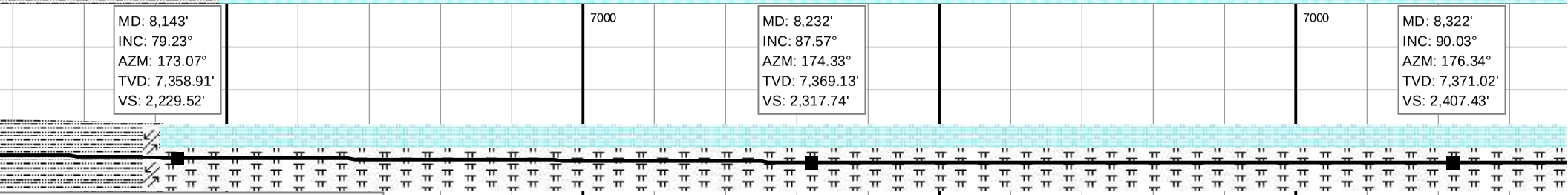
100% SLTY SH: med-dk gy, sft-sl sft, sb plty-sb blky, sl arg, slty tex, occ slty cly.

100% SLTY SH: med-dk gy, sft-sl sft, sb plty-sb blky, sl arg, slty tex, occ slty cly.

100% SLTY SH







l: med-dk gy, sft-sl sft, sb arg, slty tex, occ slty cly.

80% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 20% CHK: med gy-bri wht, pred sft, sb blky, rthy-wxy tex

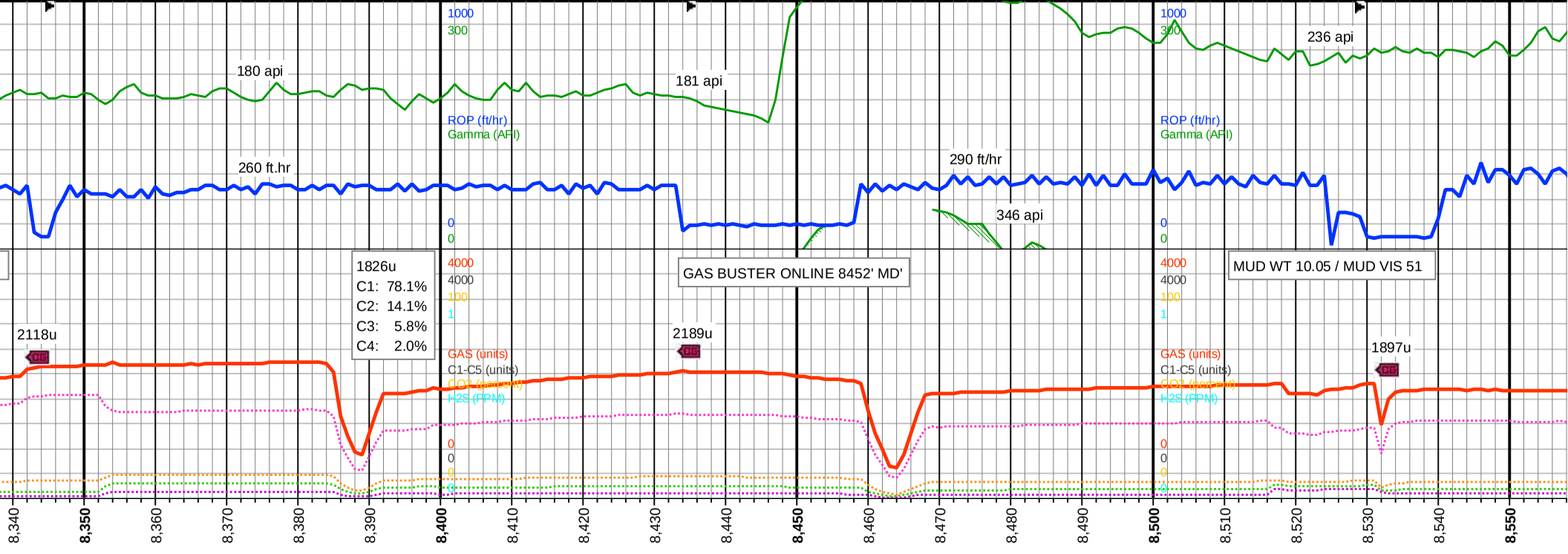
80% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 20% CHK: med gy-bri wht, pred sft, sb blky, rthy-wxy tex

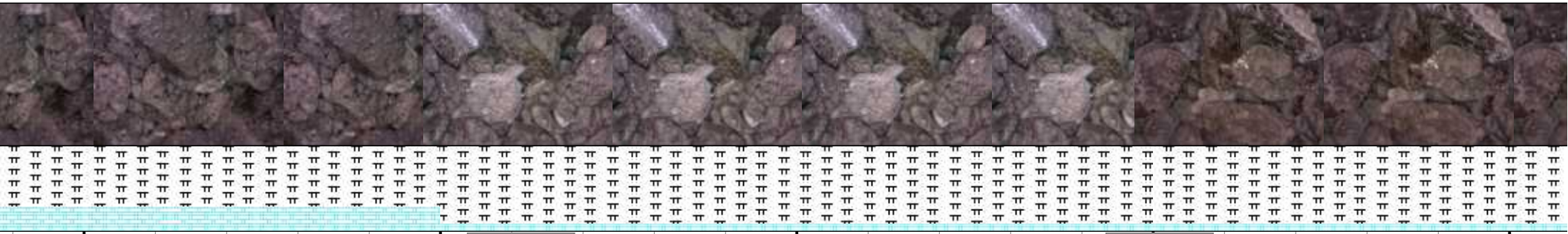
80% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 20% CHK: med gy-bri wht, pred sft, sb blky, rthy-wxy tex

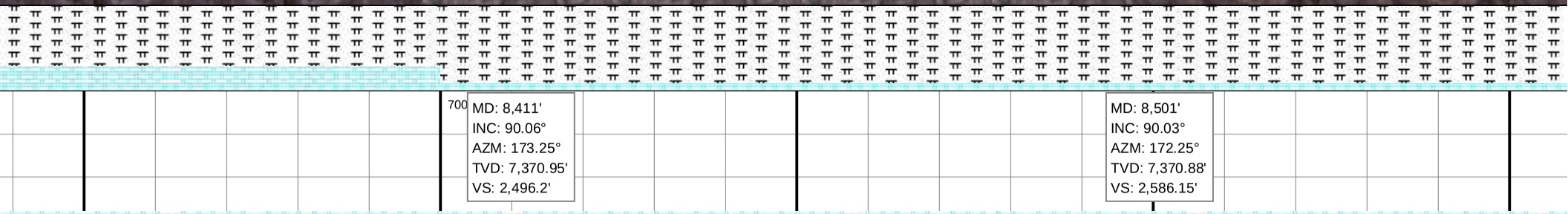
70% MRLST: dk gy-blk, frm, sb bl sft, sb blky, rthy-wxy tex

8000

8000



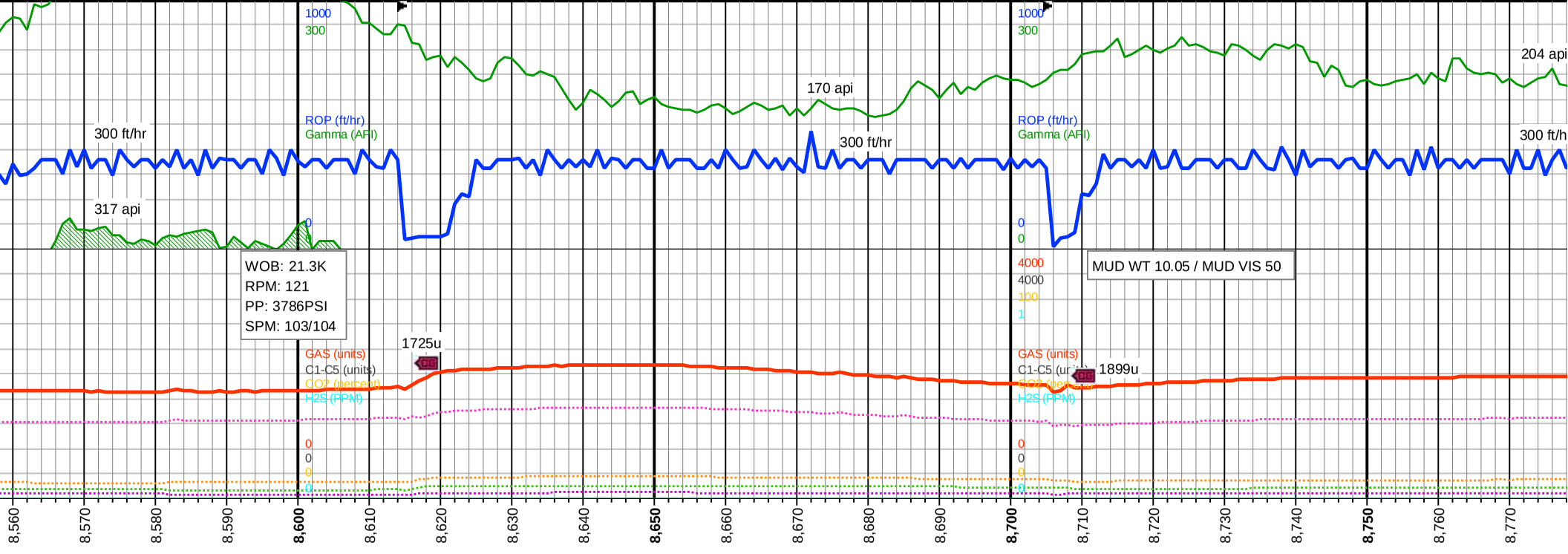


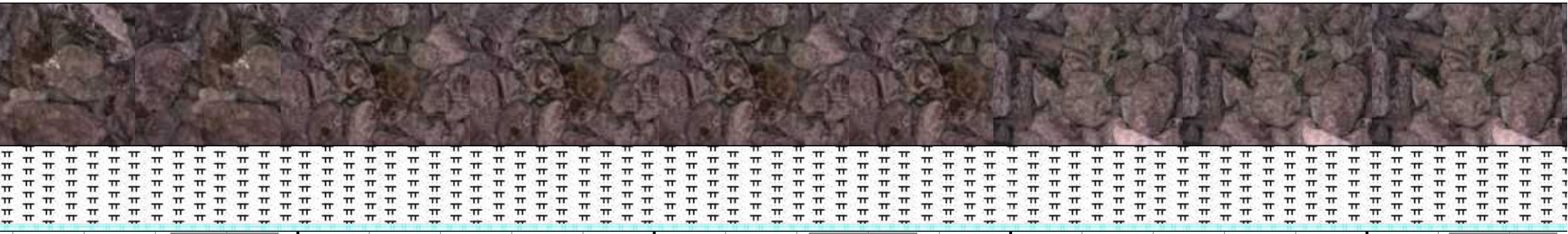


ky, arg-slty tex, v calc; 30% CHK: med gy-bri wht, pred

90% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 10% CHK: med gy-bri wht, pred sft, sb blky, rthy-wxy tex scat bent.

90% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v ca sft, sb blky, rthy-wxy tex scat bent.





MD: 8,590'
INC: 91.08°
AZM: 174.33°
TVD: 7,370.02'
VS: 2,675.06'

MD: 8,679'
INC: 91.11°
AZM: 173.98°
TVD: 7,368.32'
VS: 2,763.89'

MD: 8,769'
INC: 91.02°
AZM: 172.82°
TVD: 7,366.64'
VS: 2,853.78'

7000

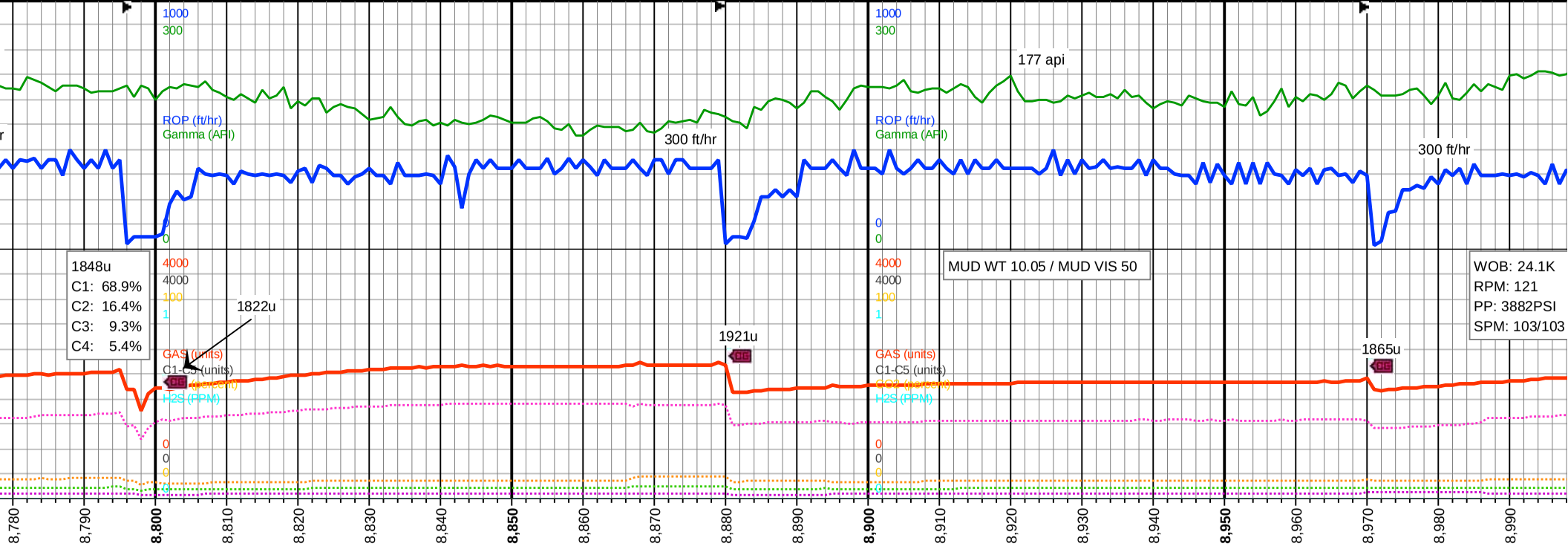
TVD (ft)

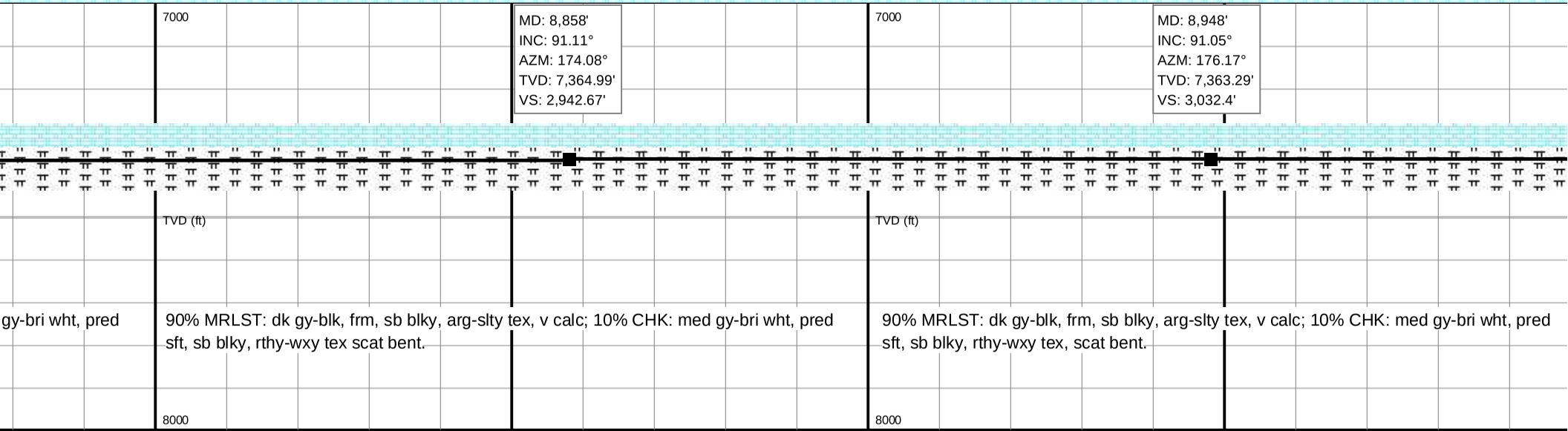
8000

lc; 10% CHK: med gy-bri wht, pred

90% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 10% CHK: med gy-bri wht, pred sft, sb blky, rthy-wxy tex scat bent.

90% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 10% CHK: med sft, sb blky, rthy-wxy tex scat bent.

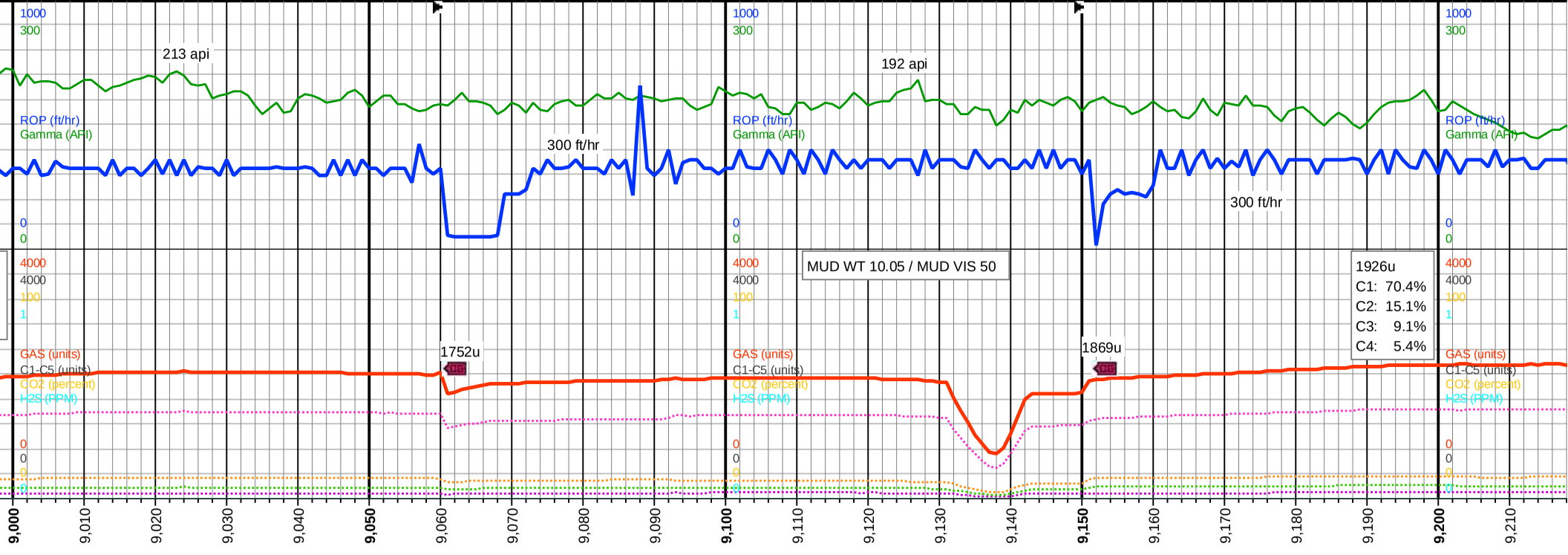




gy-bri wht, pred

90% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 10% CHK: med gy-bri wht, pred sft, sb blky, rthy-wxy tex scat bent.

90% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 10% CHK: med gy-bri wht, pred sft, sb blky, rthy-wxy tex, scat bent.



MD: 9,037'
INC: 90.98°
AZM: 177.49°
TVD: 7,361.71'
VS: 3,120.89'

MD: 9,127'
INC: 91.05°
AZM: 180.45°
TVD: 7,360.12'
VS: 3,209.96'

MD: 9,216
INC: 90.9
AZM: 182
TVD: 7,35
VS: 3,297

7000

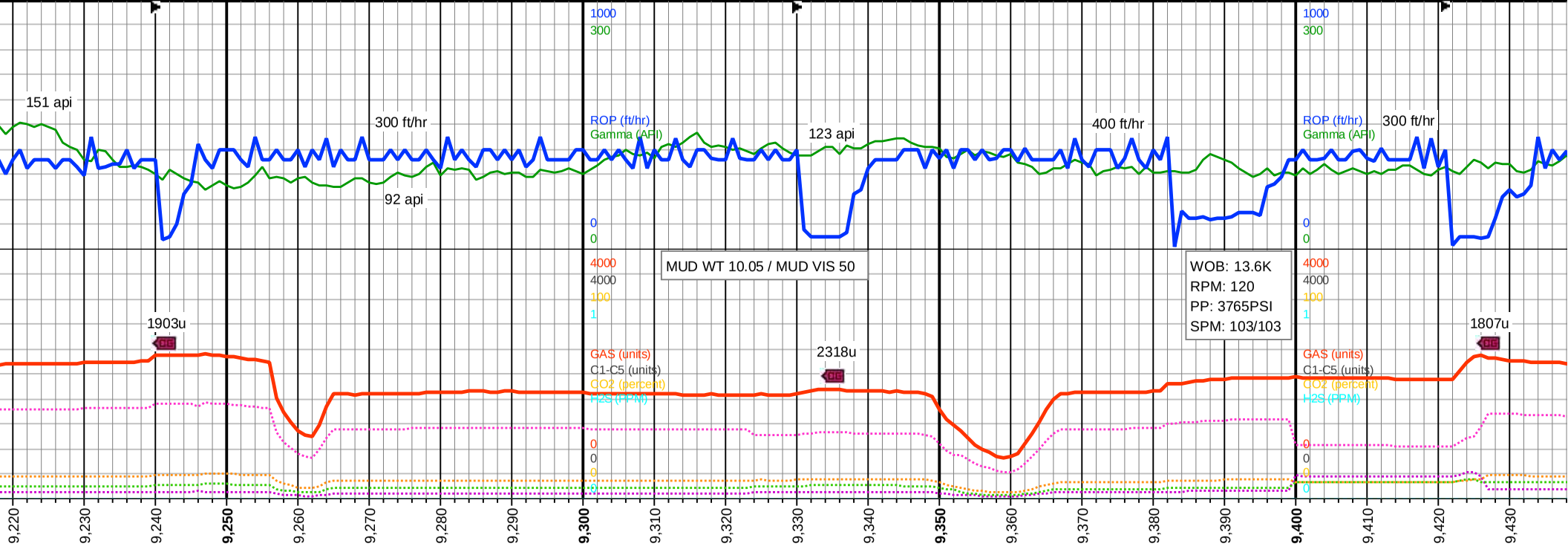
TVD (ft)

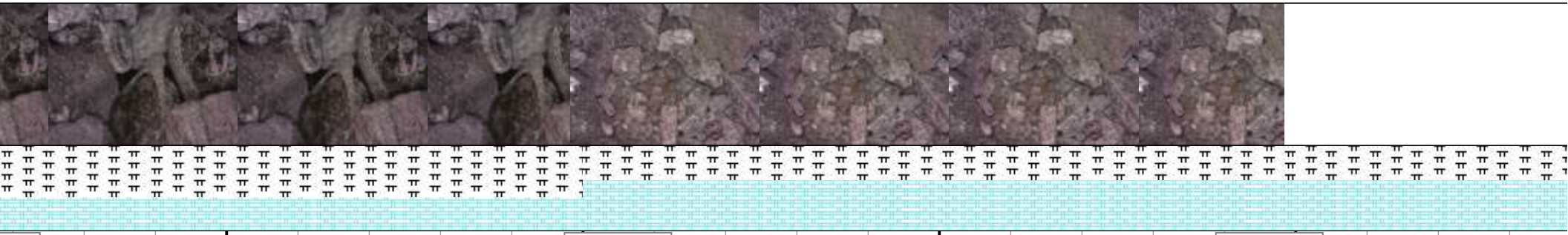
8000

90% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 10% CHK: med gy-bri wht, pred sft, sb blky, rthy-wxy tex, scat bent.

90% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 10% CHK: med gy-bri wht, pred sft, sb blky, rthy-wxy tex, scat bent.

60% MRLST: d
sft, sb blky, rthy





MD: 9,305'
INC: 91.08°
AZM: 184.25°
TVD: 7,356.99'
VS: 3,384.33'

MD: 9,395'
INC: 90.09°
AZM: 186.93°
TVD: 7,356.07'
VS: 3,471.34'

TVD (ft)

TVD (ft)

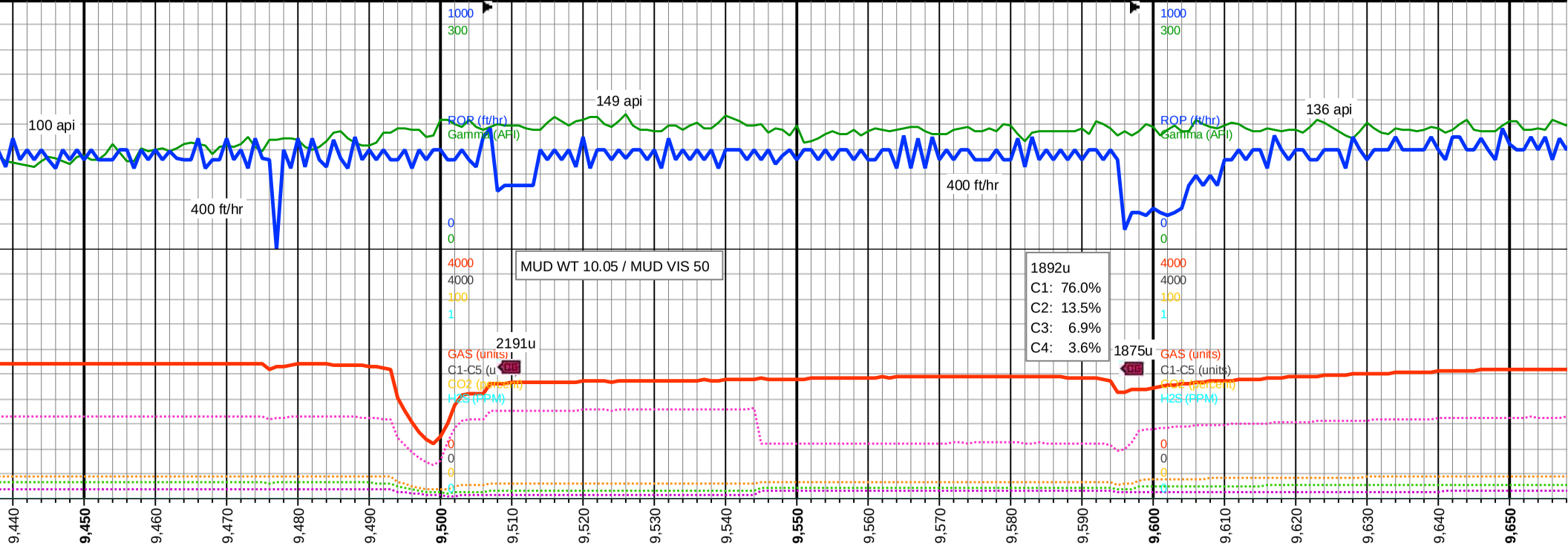
8000

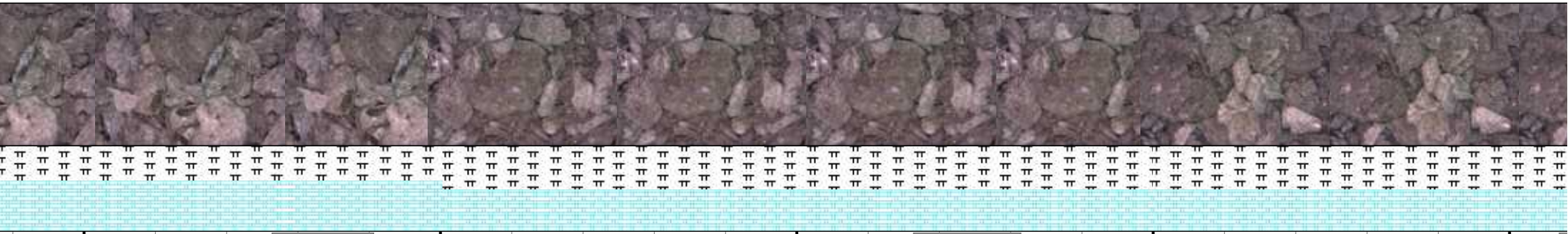
8000

k gy-blk, frm, sb blky, arg-slty tex, v calc; 40% CHK: med gy-bri wht, pred
y-wxy tex, scat bent.

60% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, sl tr bent

60% CHK: med gy - dk gy brn, v
40% MRLST: dk gy-blk, frm-hrd,





MD: 9,484'
INC: 90°
AZM: 185.64°
TVD: 7,356'
VS: 3,557.12'

MD: 9,574'
INC: 89.85°
AZM: 184.11°
TVD: 7,356.12'
VS: 3,644.42'

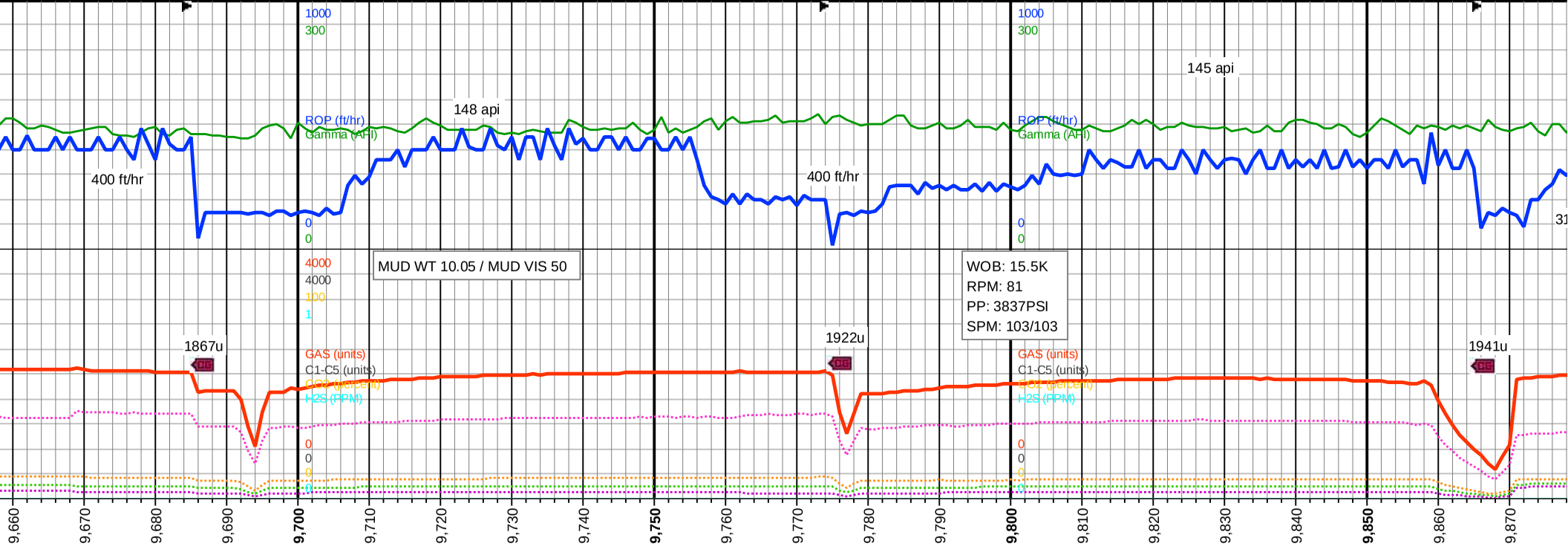
7000

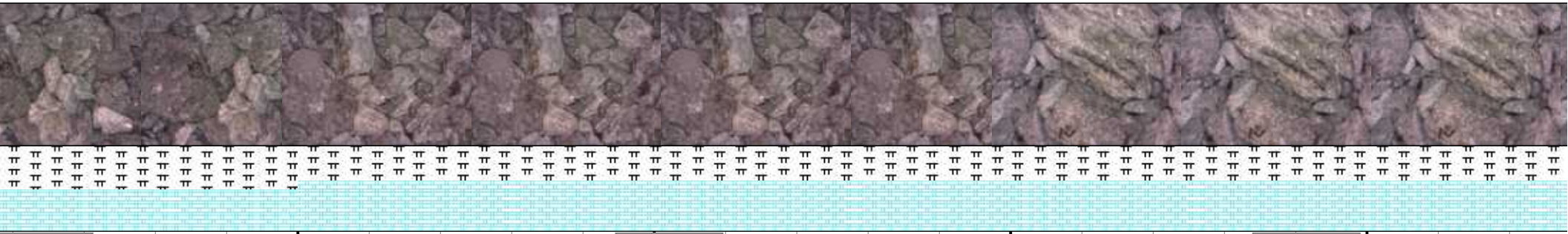
TVD (ft)

8000

mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
sb plty, sl slty tex, v calc; rr inoc fos, sl tr bent

50% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
50% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, sl tr bent





MD: 9,663'
INC: 90.43°
AZM: 184.85°
TVD: 7,355.9'
VS: 3,730.9'

MD: 9,752'
INC: 90.8°
AZM: 183.29°
TVD: 7,354.95'
VS: 3,817.52'

MD: 9,842'
INC: 89.91°
AZM: 176.77°
TVD: 7,354.39'
VS: 3,906.31'

7000

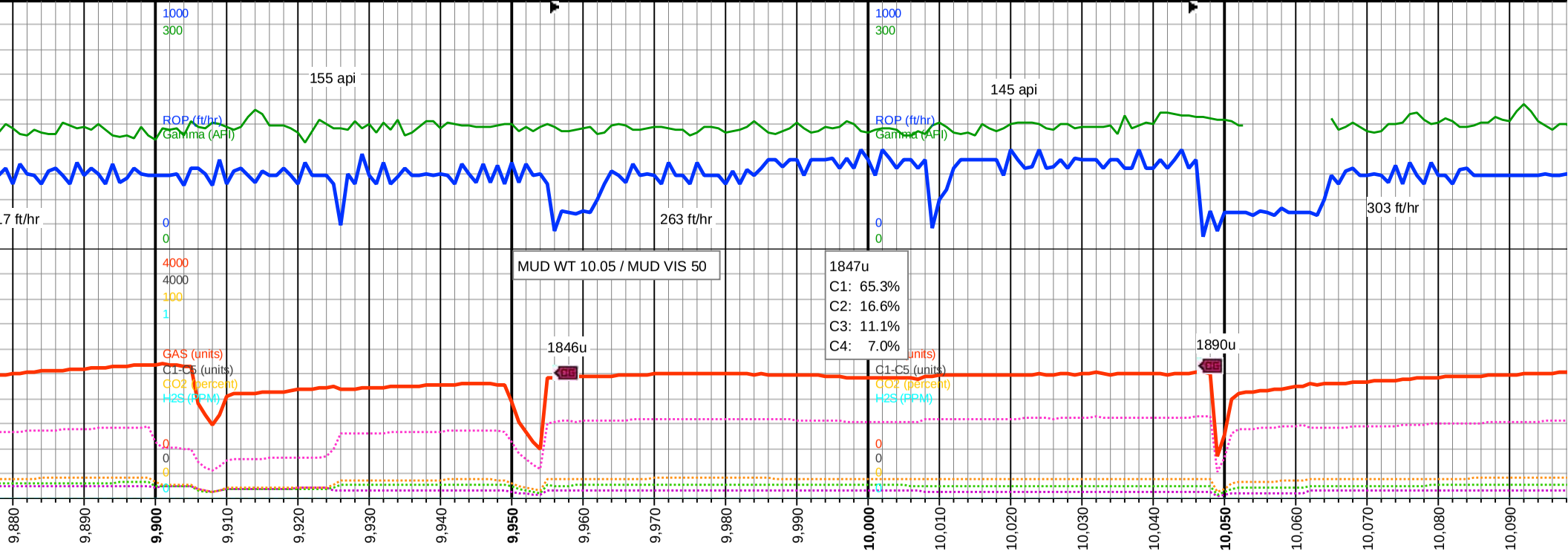
TVD (ft)

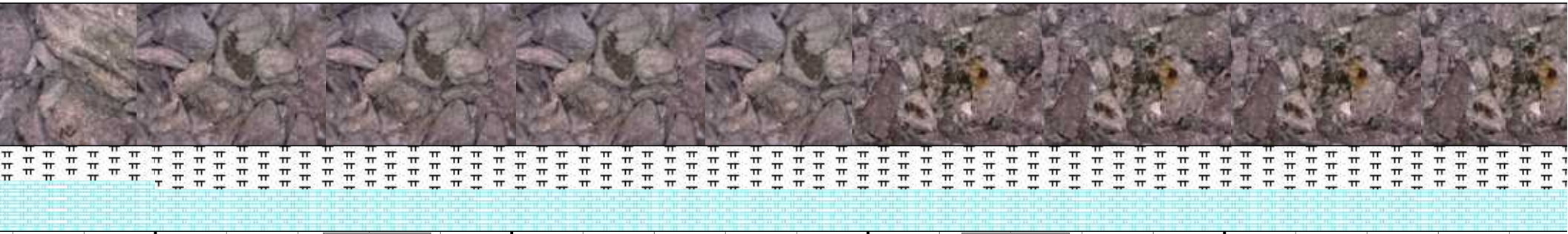
8000

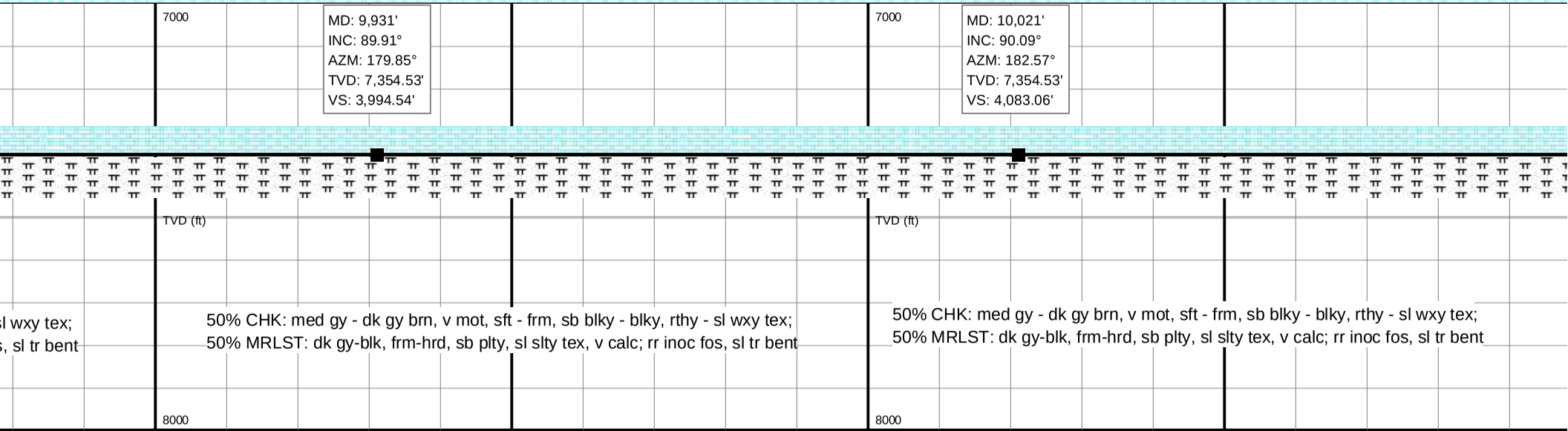
ky - blky, rthy - sl wxy tex;
v calc; rr inoc fos, sl tr bent

60% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, sl tr bent

60% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - s
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos



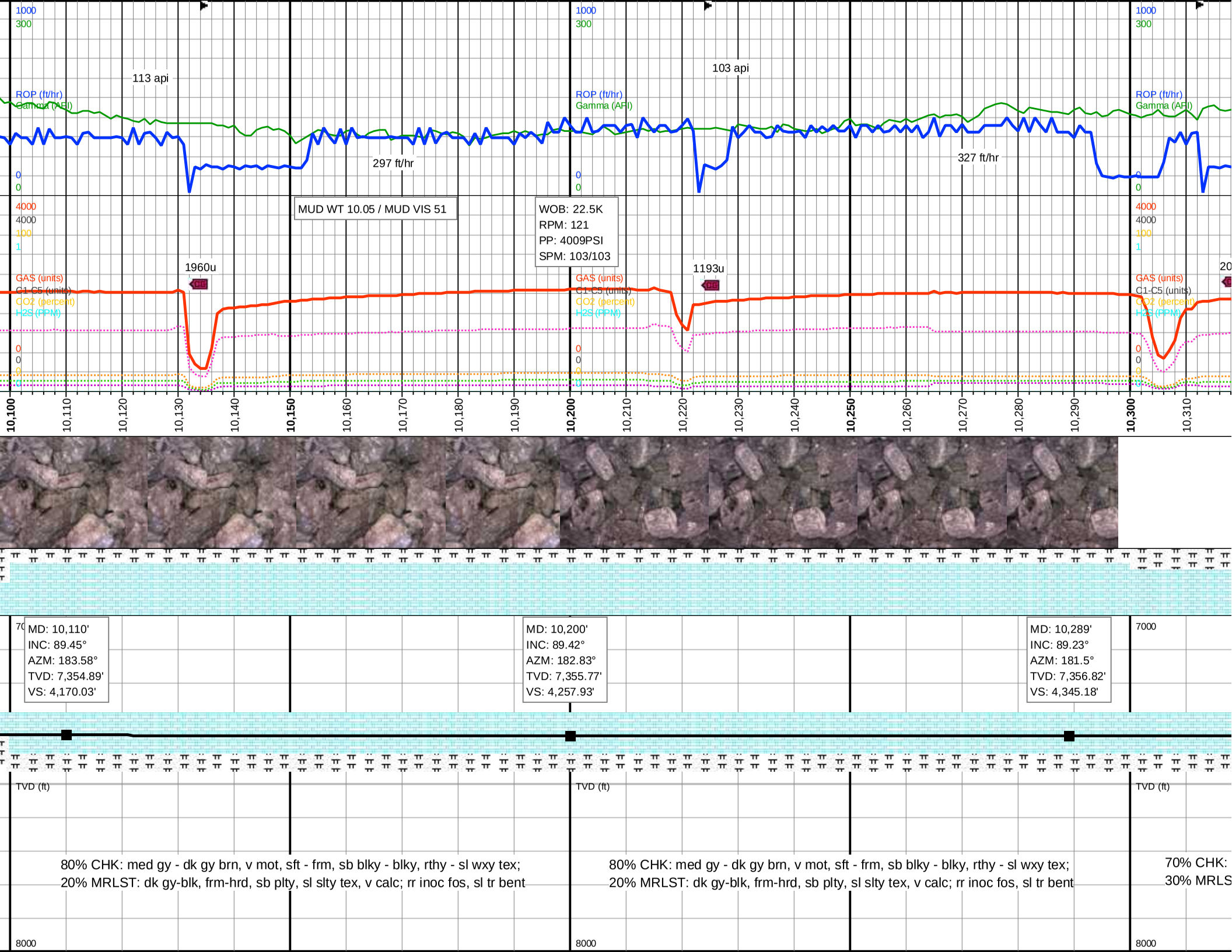


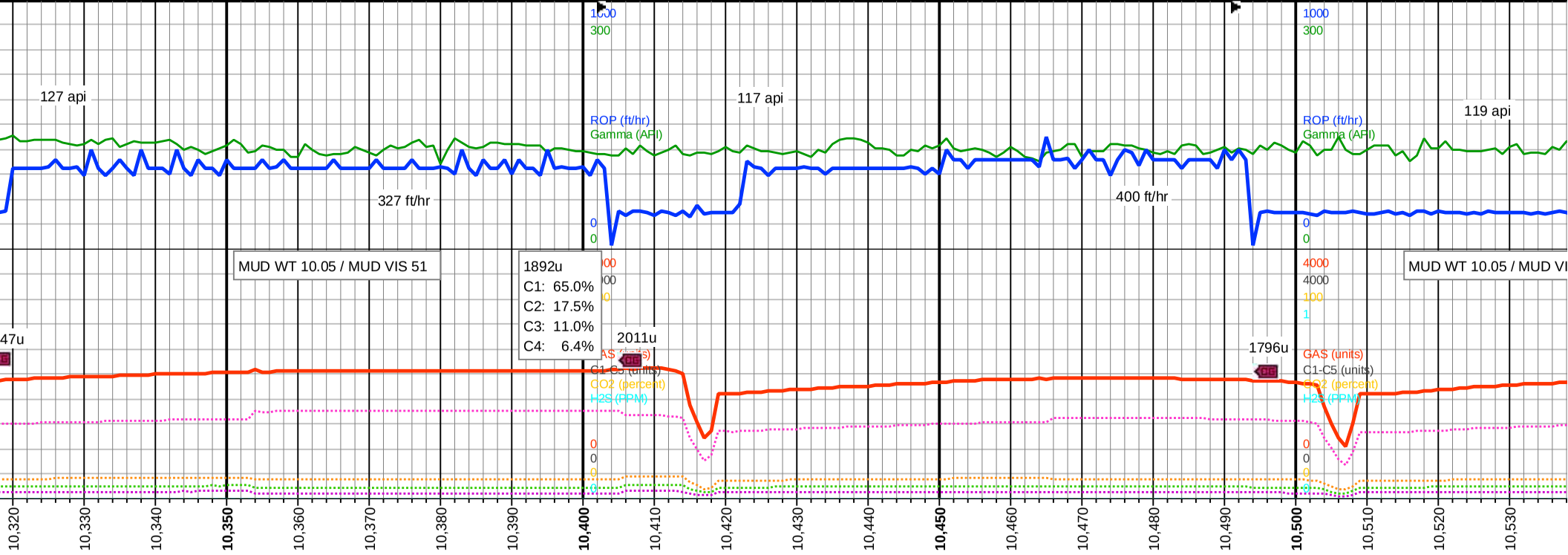


sl wxy tex;
s, sl tr bent

50% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
50% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, sl tr bent

50% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
50% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, sl tr bent


1000
300
ROP (ft/hr)
Gamma (API)
0
0
113 api
297 ft/hr
103 api
327 ft/hr
MUD WT 10.05 / MUD VIS 51
WOB: 22.5K
RPM: 121
PP: 4009PSI
SPM: 103/103
4000
4000
100
1
GAS (units)
C1-C5 (units)
CO2 (percent)
H2S (PPM)
1960u
1193u
10,100
10,110
10,120
10,130
10,140
10,150
10,160
10,170
10,180
10,190
10,200
10,210
10,220
10,230
10,240
10,250
10,260
10,270
10,280
10,290
10,300
10,310
MD: 10,110'
INC: 89.45°
AZM: 183.58°
TVD: 7,354.89'
VS: 4,170.03'
MD: 10,200'
INC: 89.42°
AZM: 182.83°
TVD: 7,355.77'
VS: 4,257.93'
MD: 10,289'
INC: 89.23°
AZM: 181.5°
TVD: 7,356.82'
VS: 4,345.18'
7000
TVD (ft)
8000
80% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
20% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, sl tr bent
70% CHK:
30% MRLS



MD: 10,379'
INC: 89.94°
AZM: 178.22°
TVD: 7,357.47'
VS: 4,434.05'

MD: 10,468'
INC: 89.94°
AZM: 178.23°
TVD: 7,357.57'
VS: 4,522.31'

7000

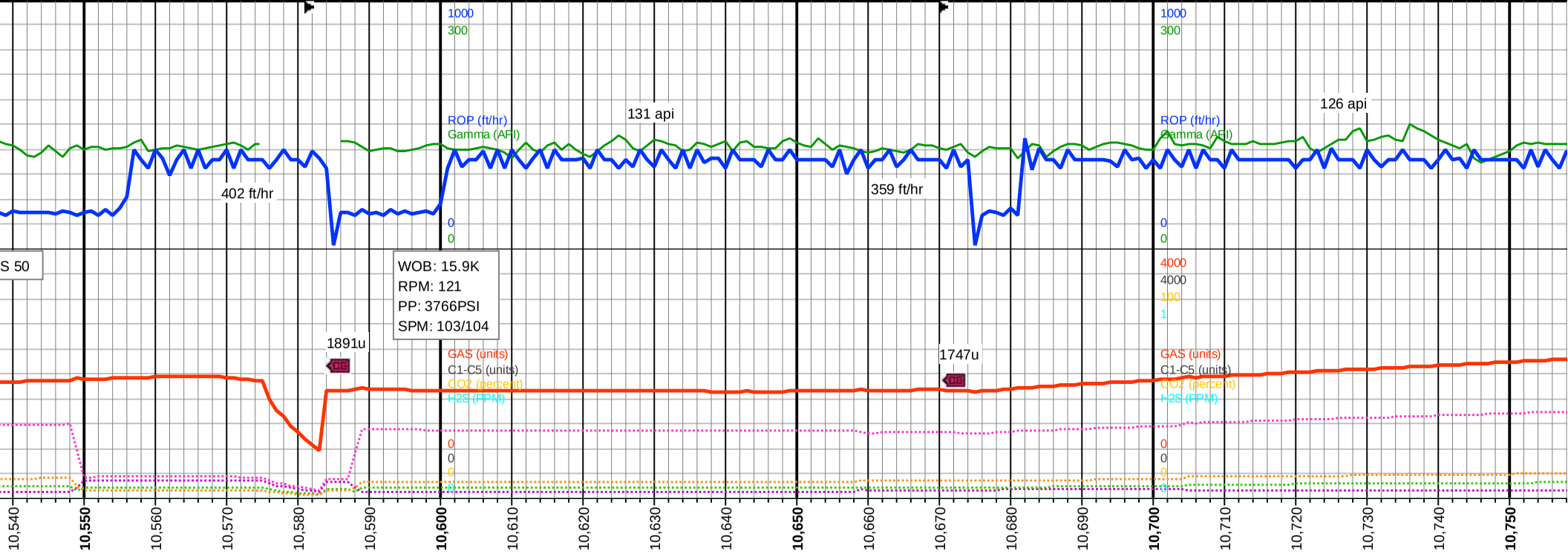
TVD (ft)

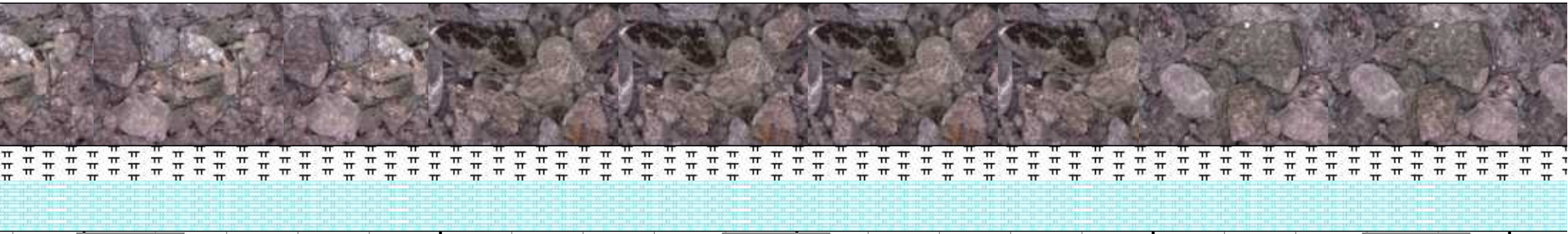
8000

med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
T: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, sl tr bent

70% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
30% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, sl tr bent

60% CHK: med gy - dk gy br
40% MRLST: dk gy-blk, frm-





MD: 10,557'
INC: 89.94°
AZM: 180.21°
TVD: 7,357.66'
VS: 4,610.35'

MD: 10,647'
INC: 90°
AZM: 181.38°
TVD: 7,357.71'
VS: 4,698.98'

MD: 10,736'
INC: 89.94°
AZM: 182.37°
TVD: 7,357.75'
VS: 4,786.33'

7000

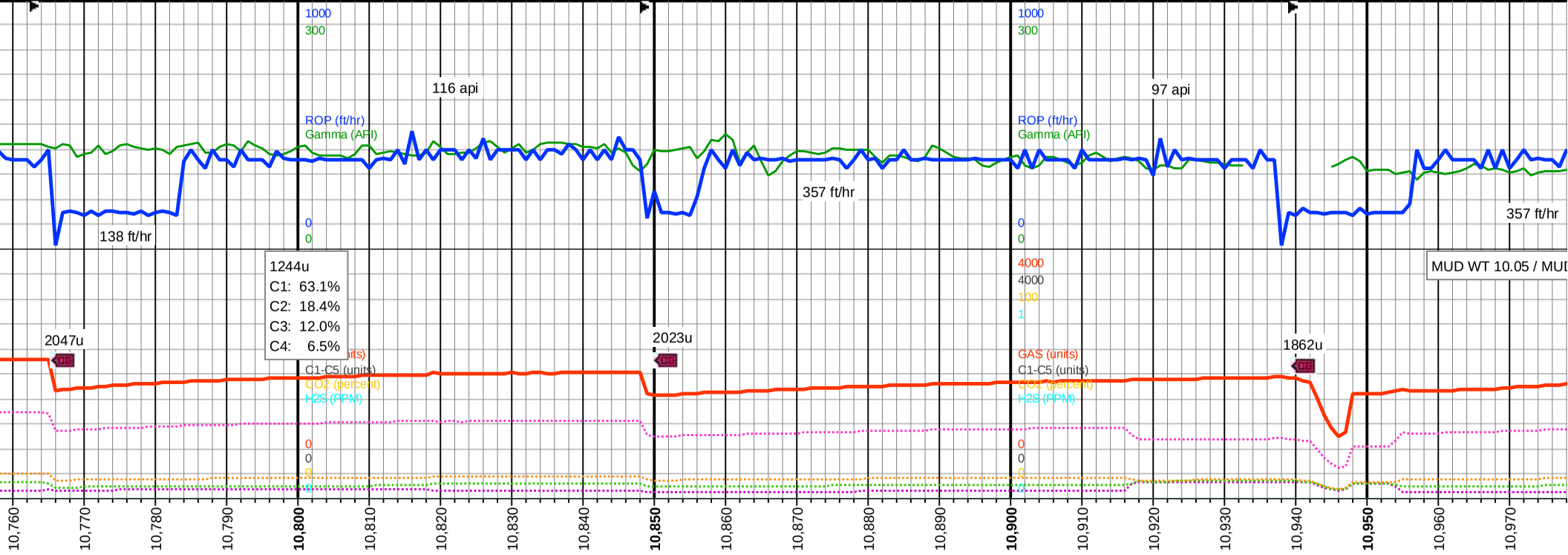
TVD (ft)

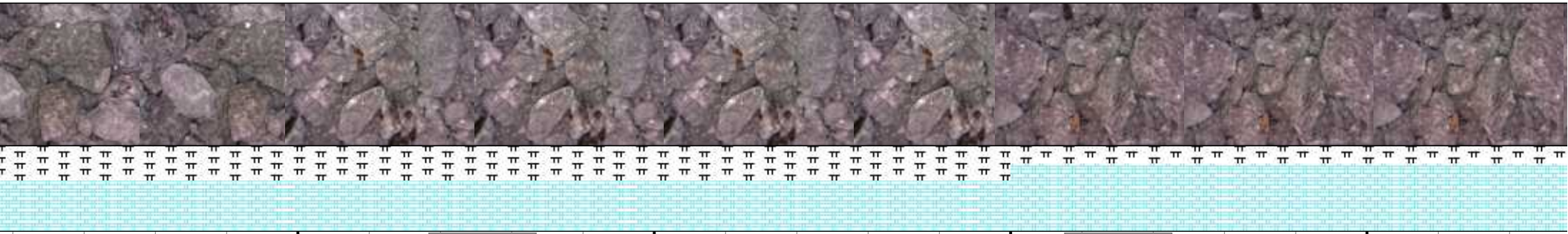
8000

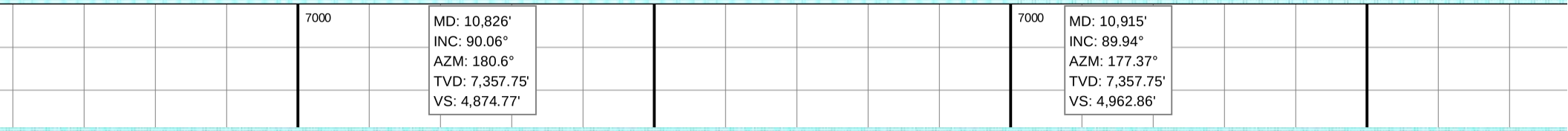
n, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
hrd, sb plty, sl slty tex, v calc; rr inoc fos, sl tr bent

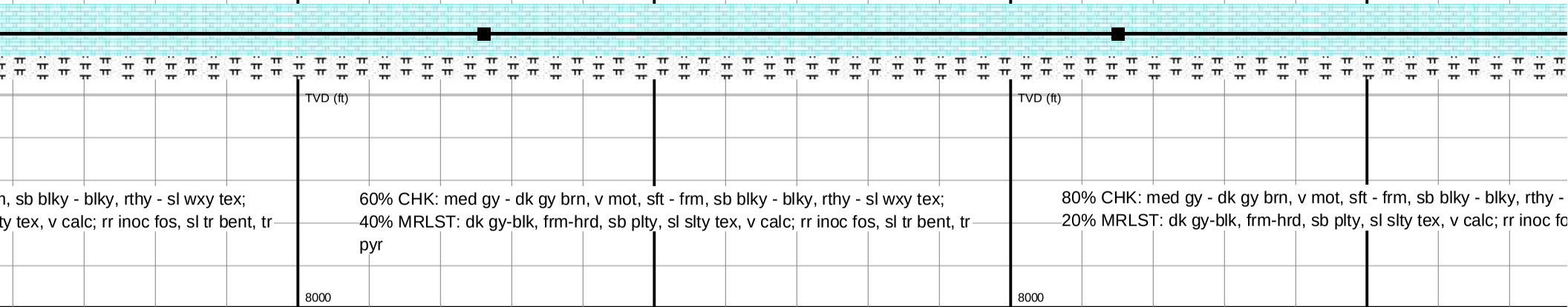
60% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, sl tr bent

60% CHK: med gy - dk gy brn, v mot, sft - frm
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl sl
pyr





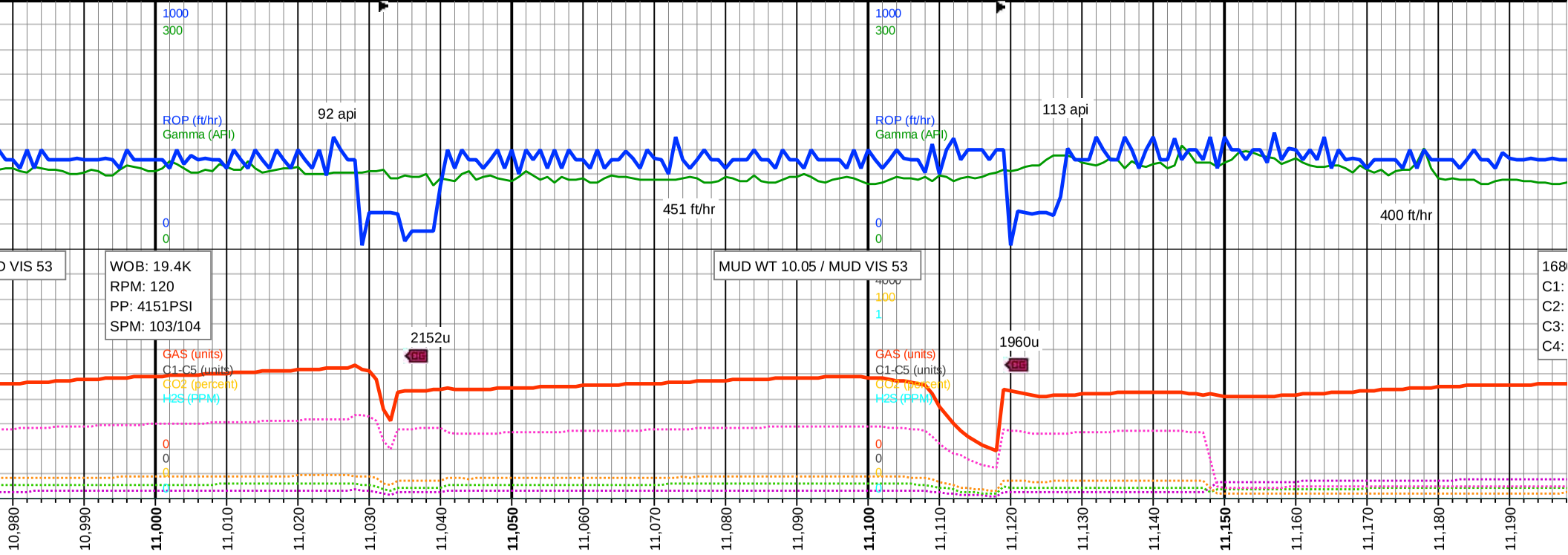


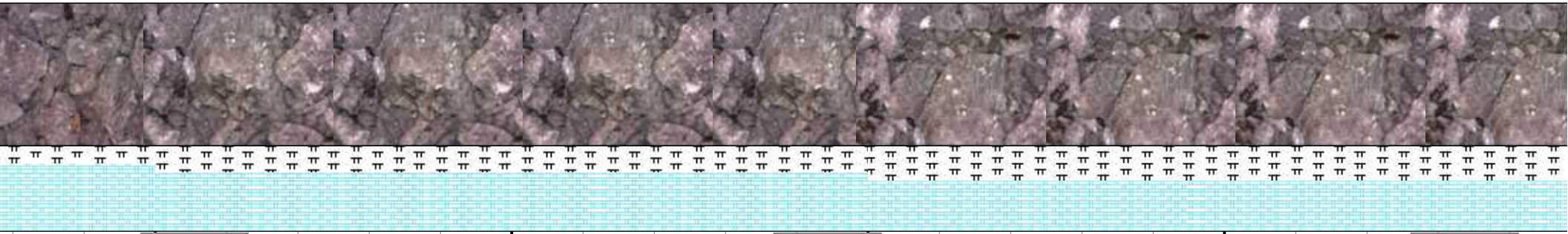


n, sb blky - blky, rthy - sl wxy tex;
ty tex, v calc; rr inoc fos, sl tr bent, tr

60% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, sl tr bent, tr pyr

80% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy -
20% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fo





MD: 11,005'
INC: 89.97°
AZM: 173.59°
TVD: 7,357.82'
VS: 5,052.55'

MD: 11,094'
INC: 89.94°
AZM: 173.73°
TVD: 7,357.89'
VS: 5,141.44'

MD: 11,184'
INC: 90°
AZM: 175.3°
TVD: 7,357.94'
VS: 5,231.25'

TVD (ft)

TVD (ft)

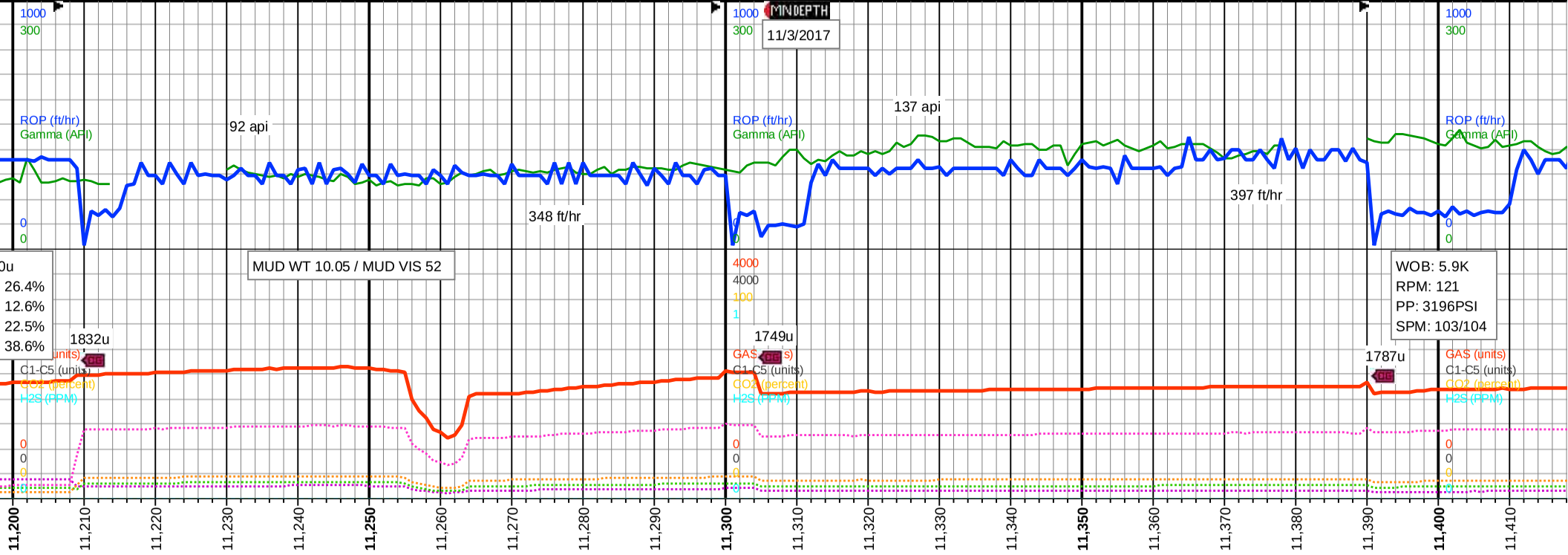
sl wxy tex;
os, sl tr bent

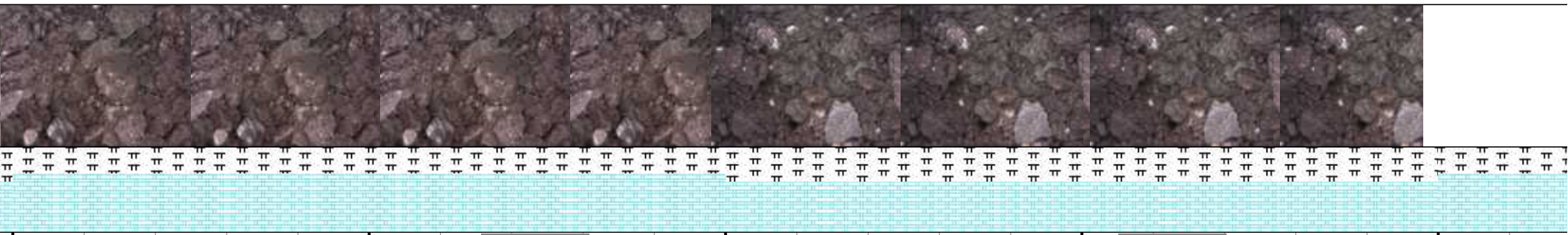
70% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
30% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, sl tr bent, tr pyr

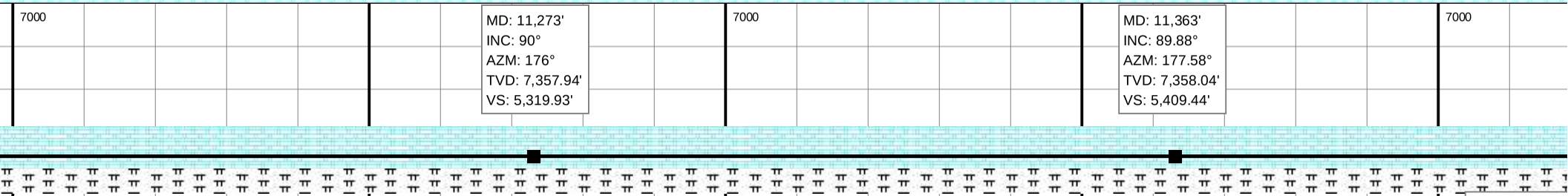
60% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, sl tr bent, occ pyr

8000

8000



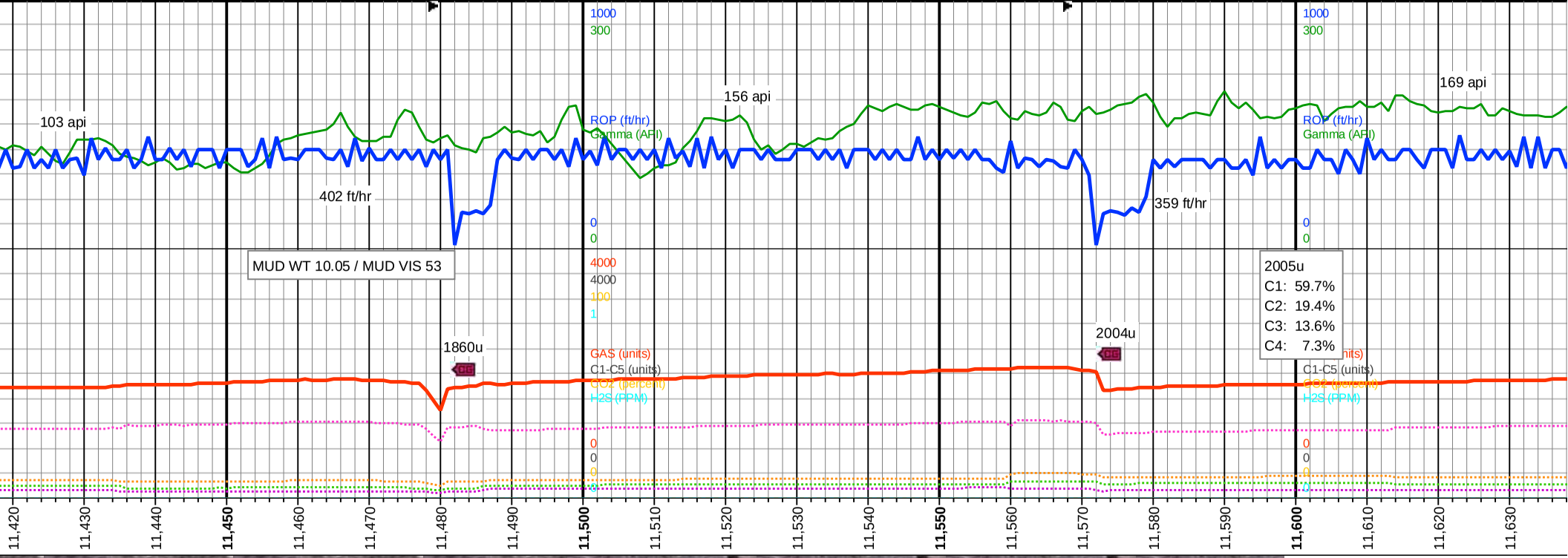




70% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
30% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, sl tr bent, occ pyr

60% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, occ bent, occ pyr

70% CHK: m
30% MRLST:
occ pyr



MD: 11,452'
INC: 90.03°
AZM: 179.14°
TVD: 7,358.11'
VS: 5,497.67'

MD: 11,542'
INC: 89.91°
AZM: 179.38°
TVD: 7,358.15'
VS: 5,586.69'

MD: 11,631'
INC: 89.91°
AZM: 180.24°
TVD: 7,358.29'
VS: 5,674.6'

7000

U/D Fault into Upper Nio A Chalk from Lower Nio A Chalk

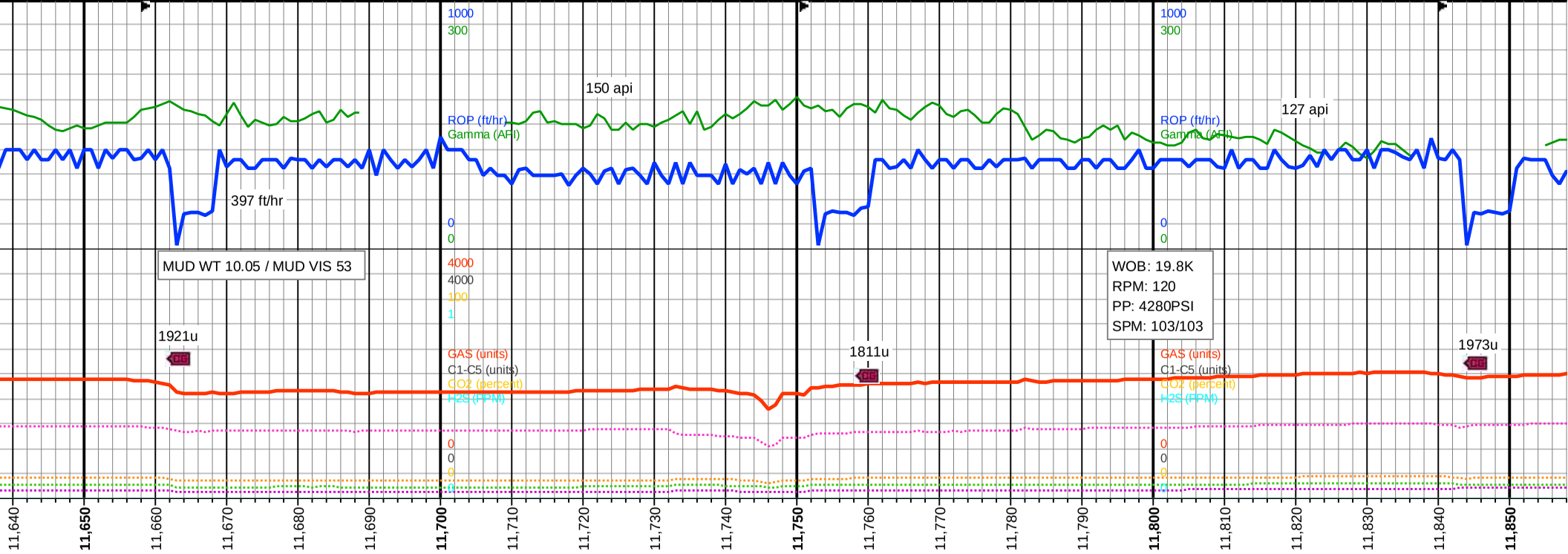
TVD (ft)

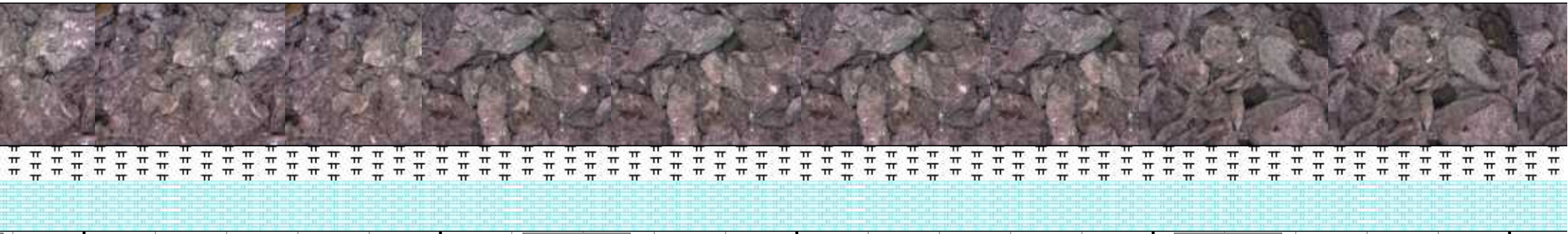
ed gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, occ bent,

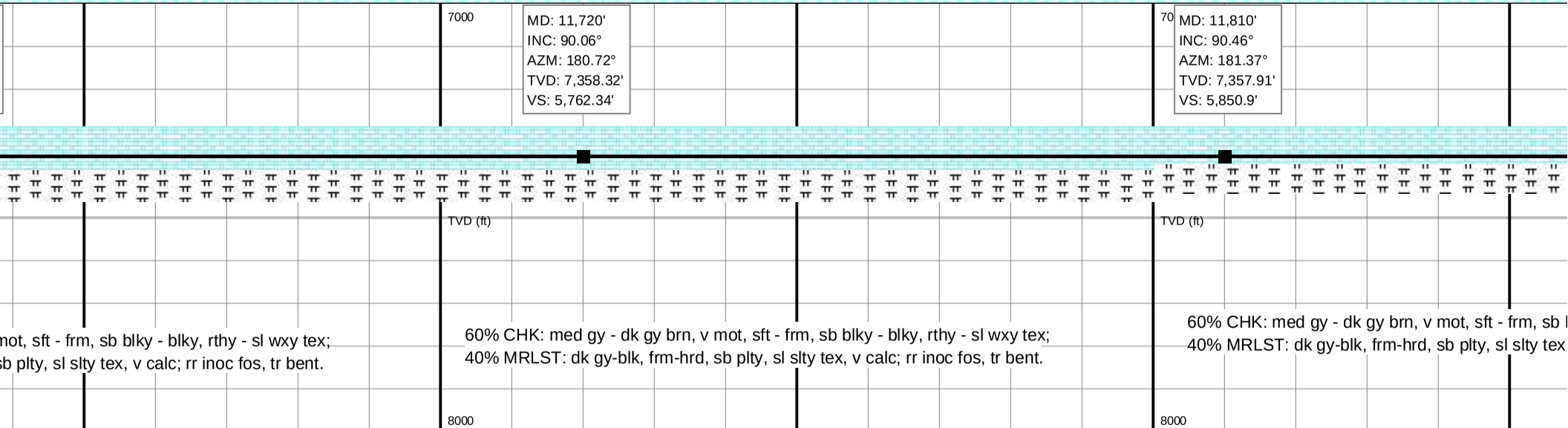
50% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
50% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, occ bent, tr pyr

60% CHK: med gy - dk gy brn, v
40% MRLST: dk gy-blk, frm-hrd, s

8000



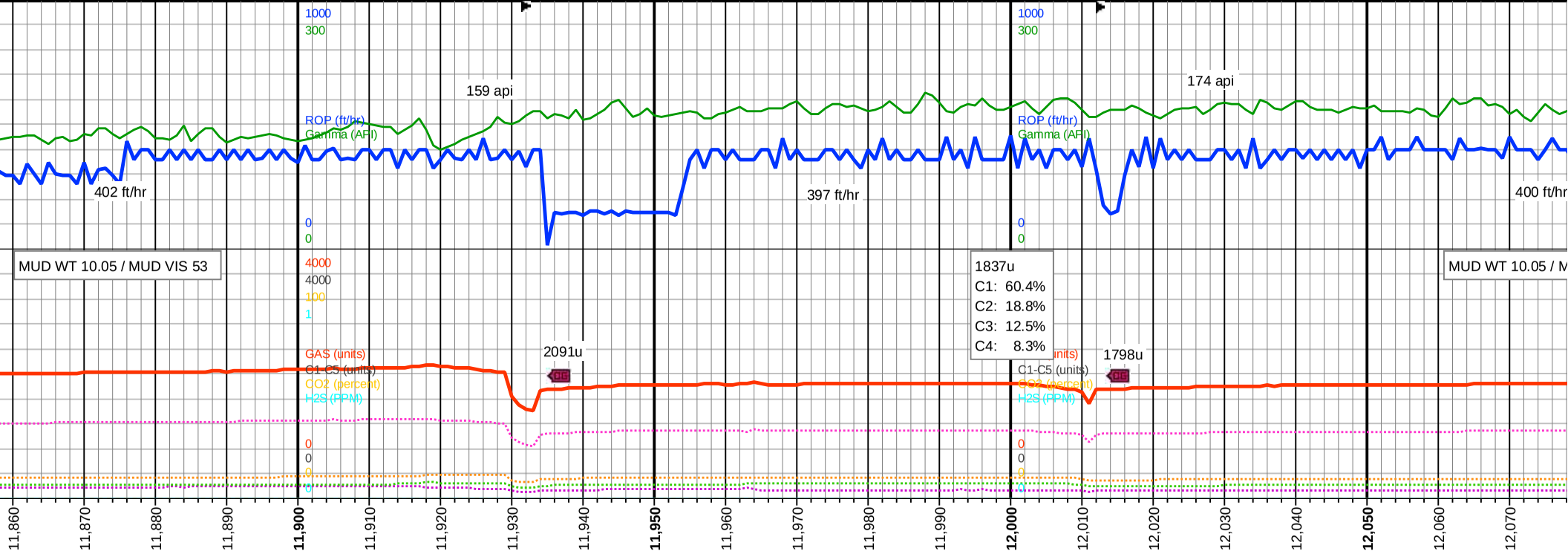


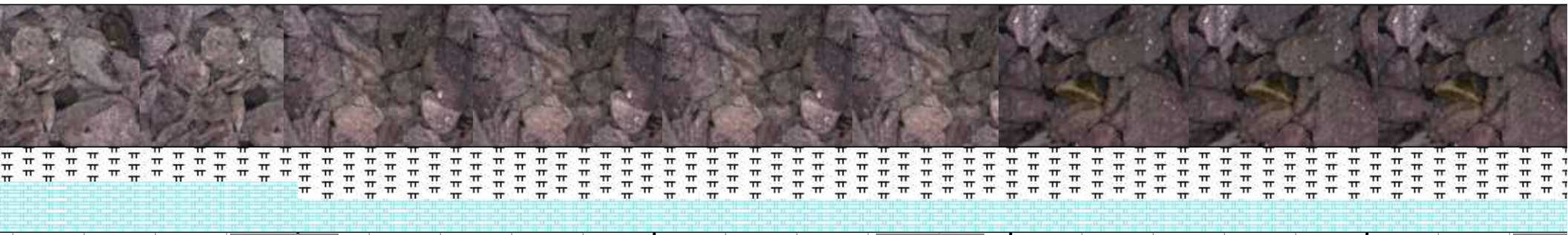


mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
sb plty, sl slty tex, v calc; rr inoc fos, tr bent.

60% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent.

60% CHK: med gy - dk gy brn, v mot, sft - frm, sb
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex





MD: 11,899'
INC: 90.49°
AZM: 183.43°
TVD: 7,357.17'
VS: 5,938.09'

MD: 11,989'
INC: 90.37°
AZM: 181.91°
TVD: 7,356.49'
VS: 6,026.16'

7000

MD: 12,
INC: 90
AZM: 18
TVD: 7,
VS: 6,1

TVD (ft)

TVD (ft)

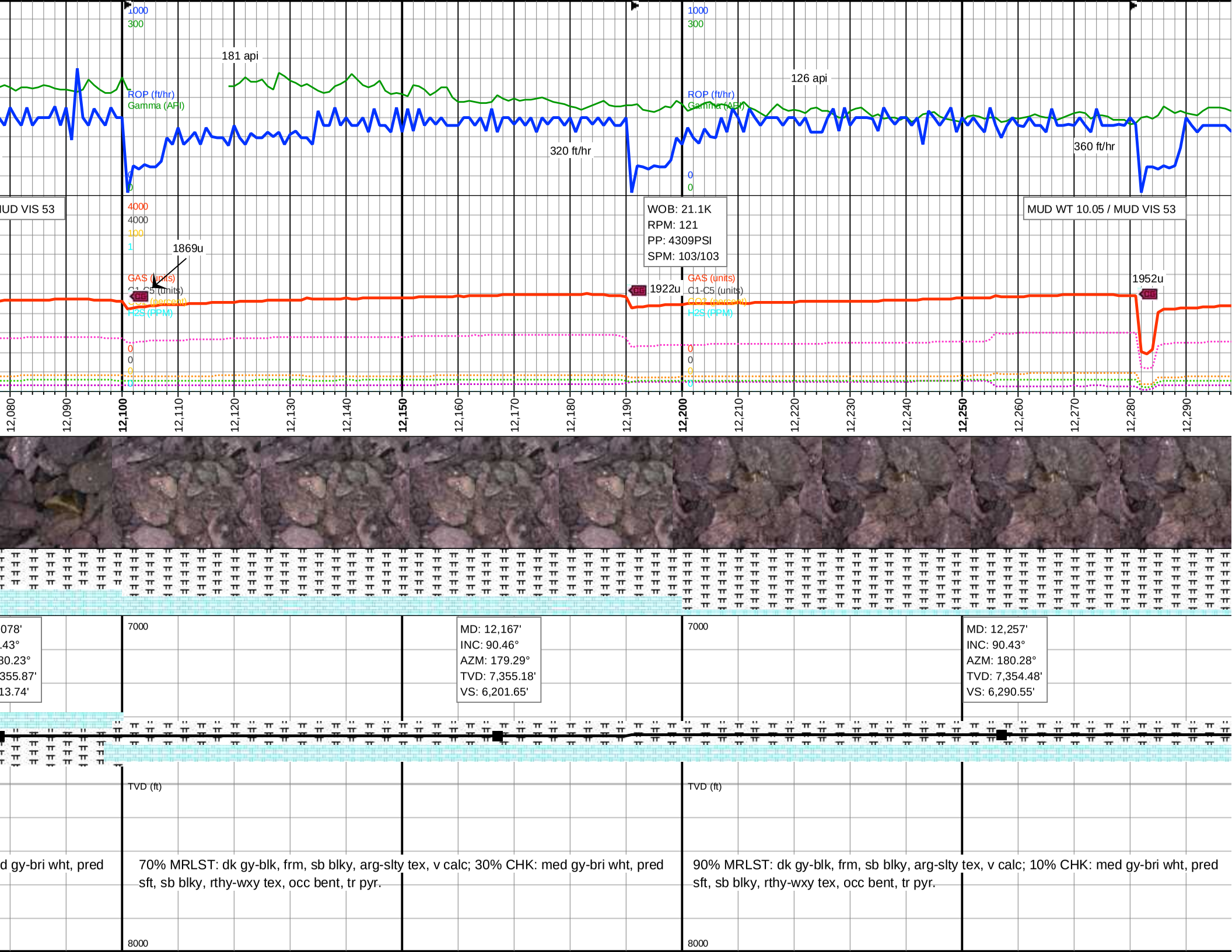
blky - blky, rthy - sl wxy tex;
, v calc; rr inoc fos, tr bent.

60% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 40% CHK: med gy-bri wht, pred sft, sb blky, rthy-wxy tex, occ bent.

60% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 40% CHK: me
sft, sb blky, rthy-wxy tex, occ bent, tr pyr.

8000

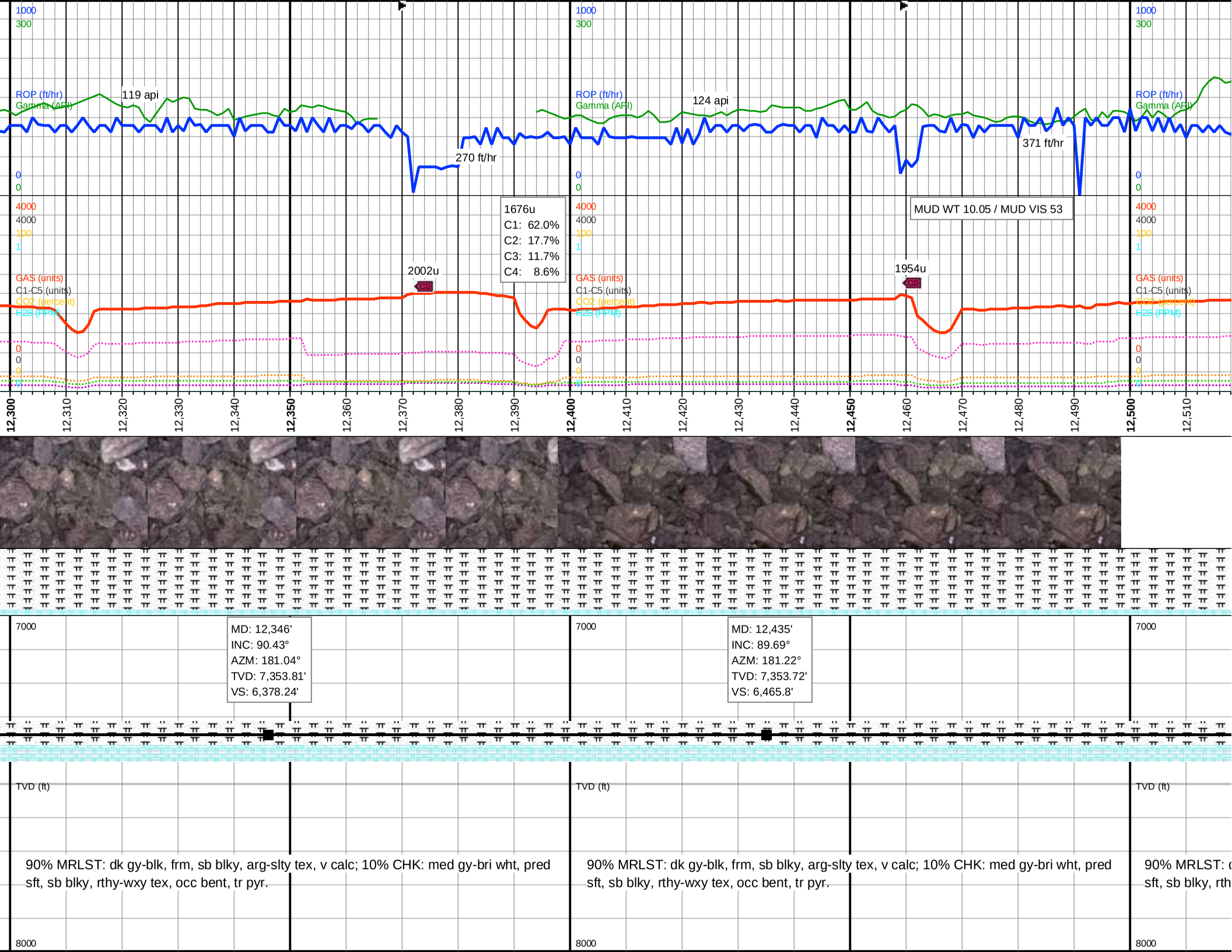
8000

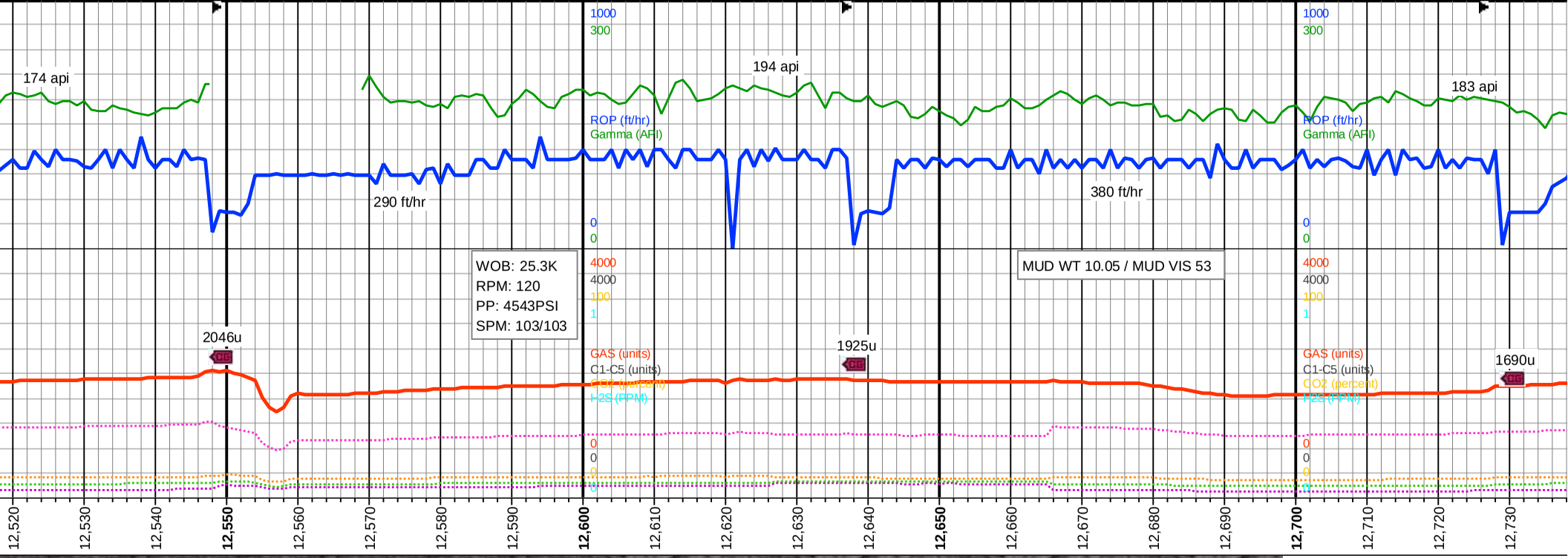


d gy-bri wht, pred

70% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 30% CHK: med gy-bri wht, pred sft, sb blky, rthy-wxy tex, occ bent, tr pyr.

90% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 10% CHK: med gy-bri wht, pred sft, sb blky, rthy-wxy tex, occ bent, tr pyr.


1000
300
ROP (ft/hr)
Gamma (API)
119 api
270 ft/hr
0
0
4000
4000
100
1
GAS (units)
C1-C5 (units)
CO2 (percent)
H2S (PPM)
2002u
1676u
C1: 62.0%
C2: 17.7%
C3: 11.7%
C4: 8.6%
0
0
0
0
12,300
12,310
12,320
12,330
12,340
12,350
12,360
12,370
12,380
12,390
12,400
7000
MD: 12,346'
INC: 90.43°
AZM: 181.04°
TVD: 7,353.81'
VS: 6,378.24'
TVD (ft)
8000
90% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 10% CHK: med gy-bri wht, pred sft, sb blky, rthy-wxy tex, occ bent, tr pyr.
1000
300
ROP (ft/hr)
Gamma (API)
124 api
371 ft/hr
0
0
4000
4000
100
1
GAS (units)
C1-C5 (units)
CO2 (percent)
H2S (PPM)
1954u
MUD WT 10.05 / MUD VIS 53
0
0
0
0
12,410
12,420
12,430
12,440
12,450
12,460
12,470
12,480
12,490
12,500
12,510
7000
MD: 12,435'
INC: 89.69°
AZM: 181.22°
TVD: 7,353.72'
VS: 6,465.8'
TVD (ft)
8000
90% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 10% CHK: med gy-bri wht, pred sft, sb blky, rthy-wxy tex, occ bent, tr pyr.
1000
300
ROP (ft/hr)
Gamma (API)
0
0
4000
4000
100
1
GAS (units)
C1-C5 (units)
CO2 (percent)
H2S (PPM)
0
0
0
0
7000
TVD (ft)
8000
90% MRLST: d
sft, sb blky, rth



MD: 12,525'
INC: 89.78°
AZM: 180.29°
TVD: 7,354.14'
VS: 6,554.45'

MD: 12,614'
INC: 89.94°
AZM: 179.52°
TVD: 7,354.35'
VS: 6,642.33'

MD: 12,703'
INC: 89.88°
AZM: 179.61°
TVD: 7,354.49'
VS: 6,730.29'

7000

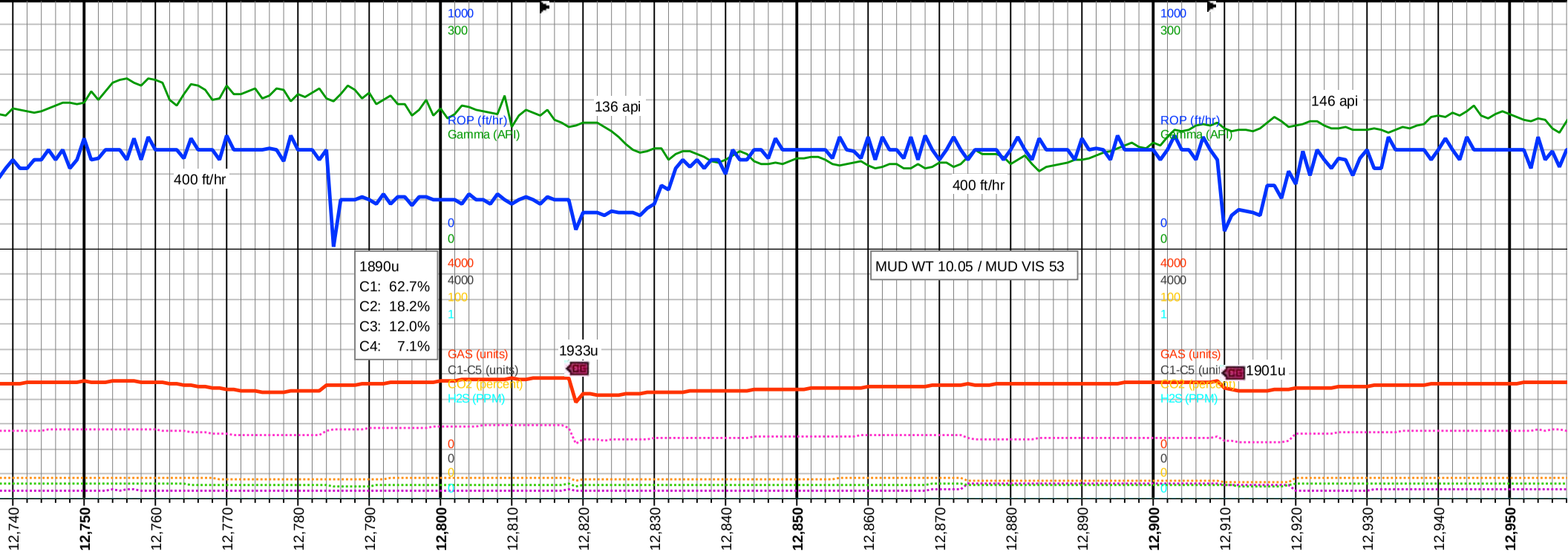
TVD (ft)

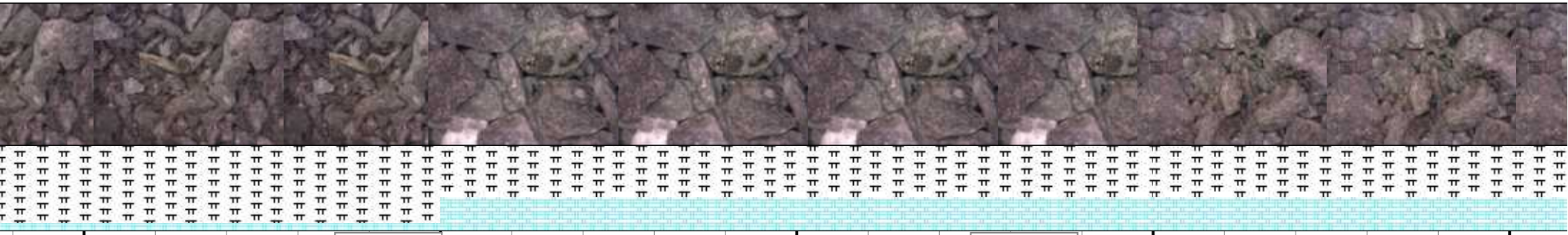
8000

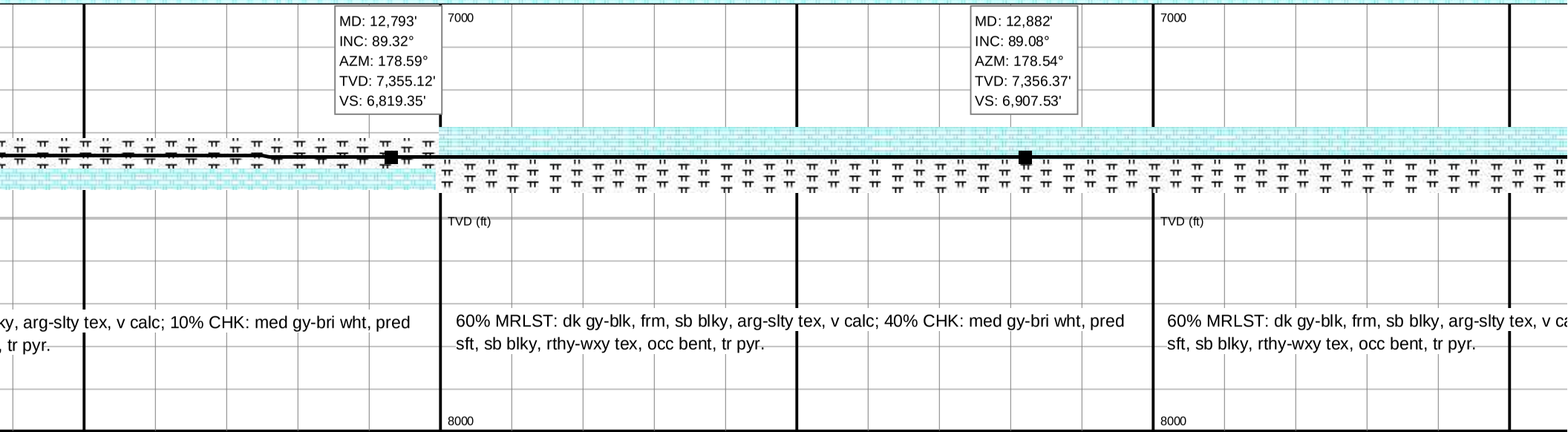
dk gy-blk, frm, sb blky, arg-slty tex, v calc; 10% CHK: med gy-bri wht, pred
y-wxy tex, occ bent, tr pyr.

90% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 10% CHK: med gy-bri wht, pred
sft, sb blky, rthy-wxy tex, occ bent, tr pyr.

90% MRLST: dk gy-blk, frm, sb bl
sft, sb blky, rthy-wxy tex, occ bent



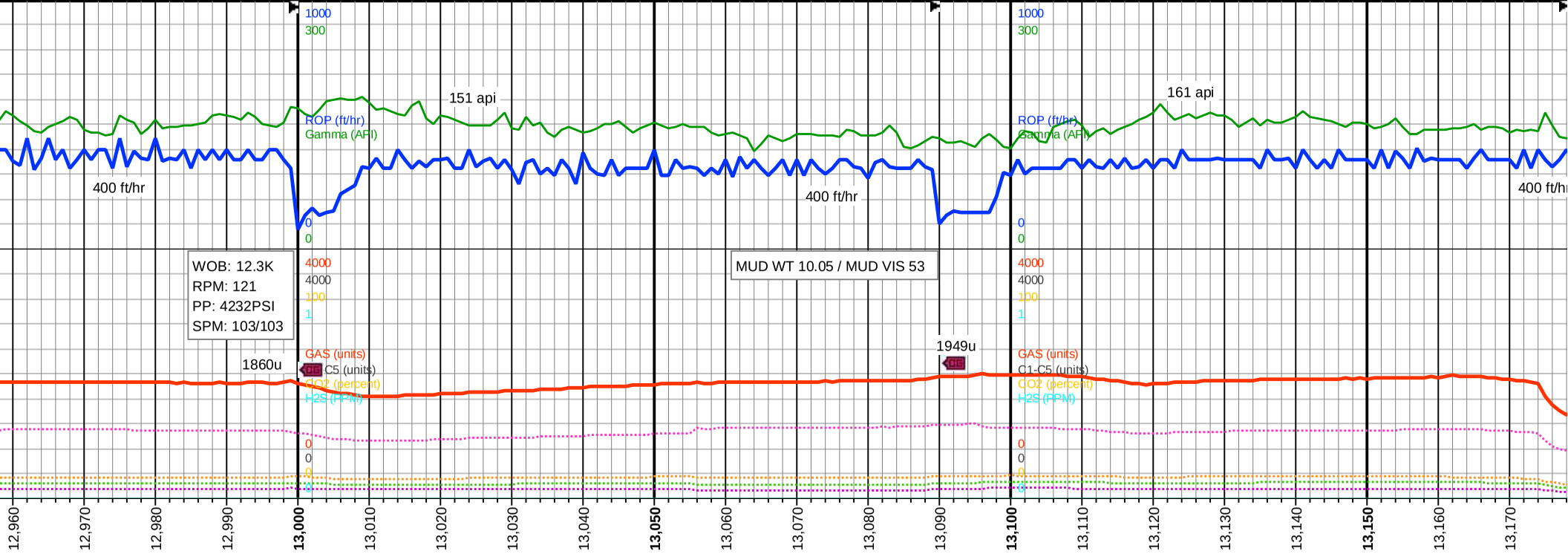


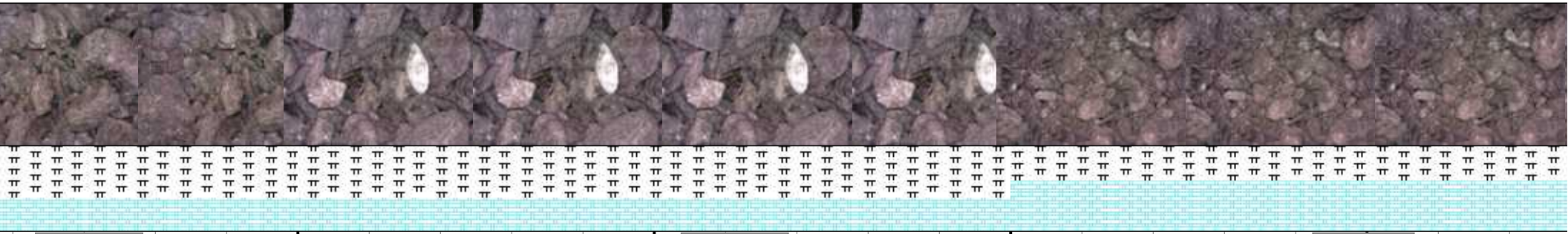


ky, arg-slty tex, v calc; 10% CHK: med gy-bri wht, pred
, tr pyr.

60% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 40% CHK: med gy-bri wht, pred sft, sb blky, rthy-wxy tex, occ bent, tr pyr.

60% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v ca
sft, sb blky, rthy-wxy tex, occ bent, tr pyr.





MD: 12,971'
INC: 89.14°
AZM: 179.06°
TVD: 7,357.75'
VS: 6,995.66'

MD: 13,061'
INC: 89.29°
AZM: 178.97°
TVD: 7,358.98'
VS: 7,084.73'

MD: 13,150'
INC: 89.14°
AZM: 179.12°
TVD: 7,360.2'
VS: 7,172.81'

7000

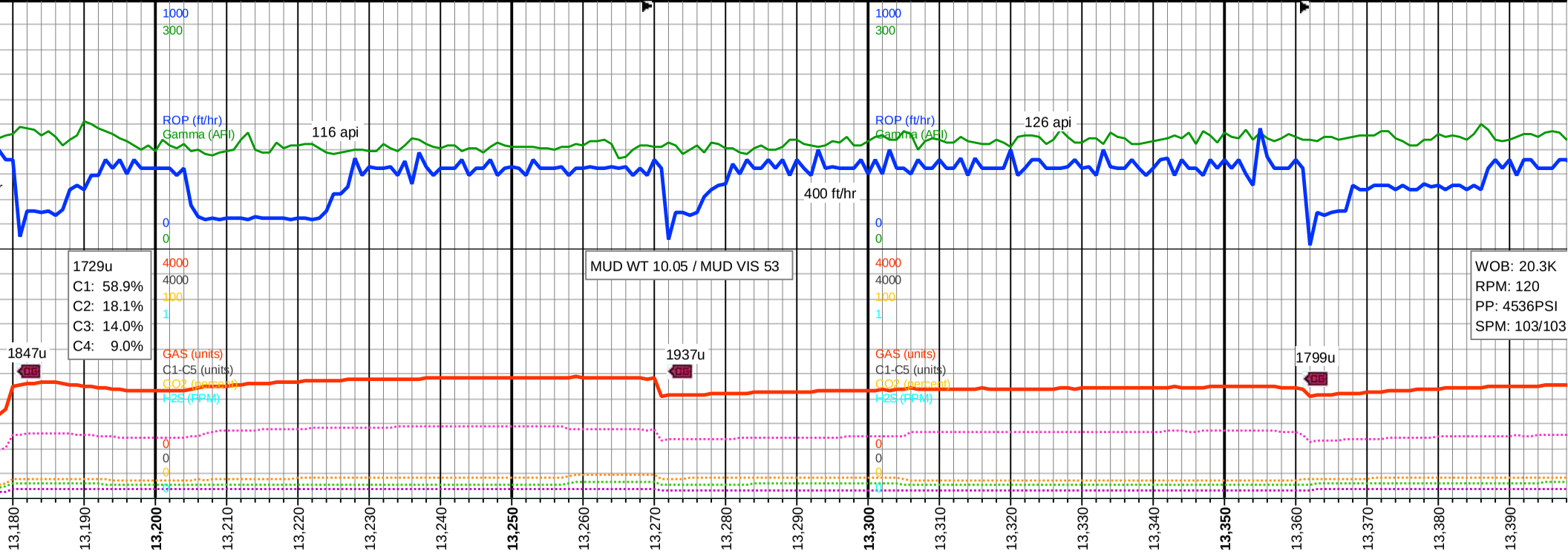
TVD (ft)

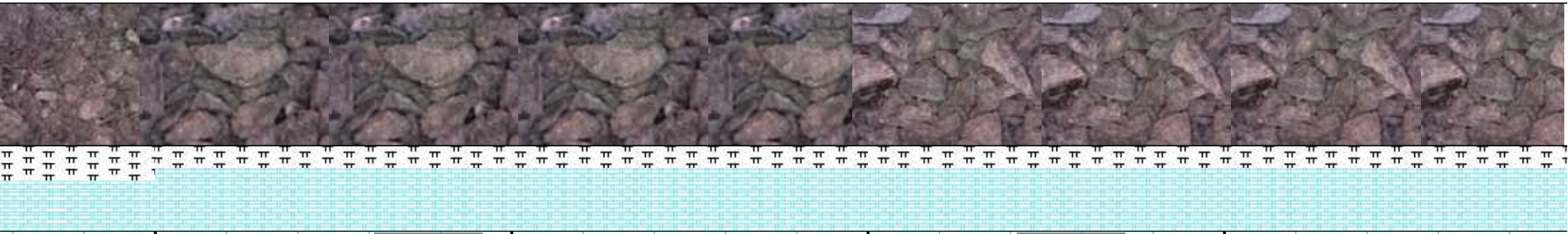
8000

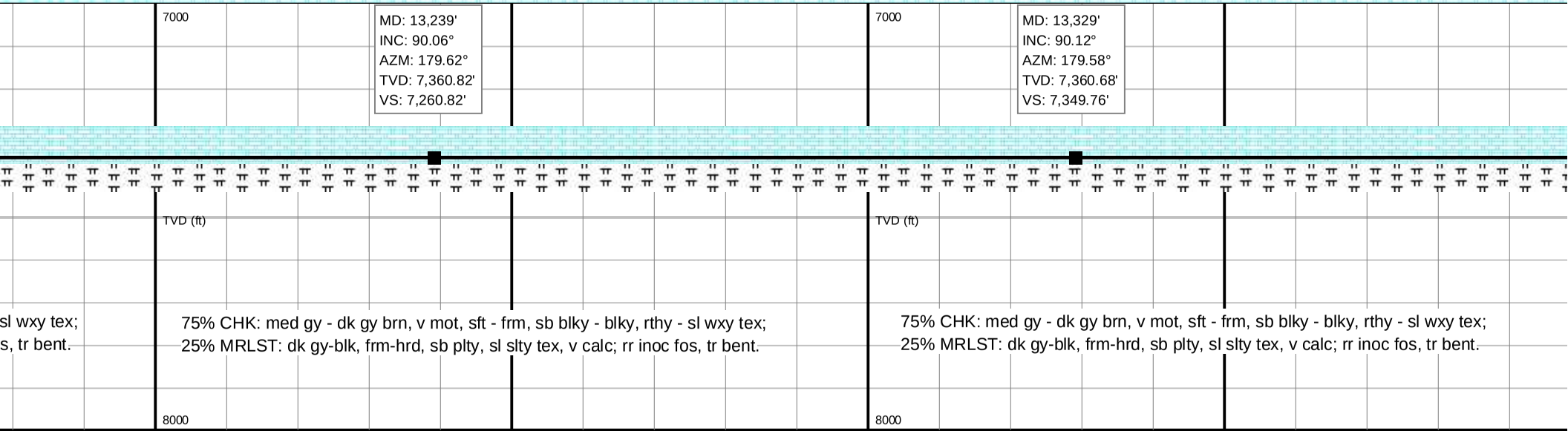
alc; 40% CHK: med gy-bri wht, pred

60% MRLST: dk gy-blk, frm, sb blky, arg-slty tex, v calc; 40% CHK: med gy-bri wht, pred sft, sb blky, rthy-wxy tex, occ bent, tr pyr.

60% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy -
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fo



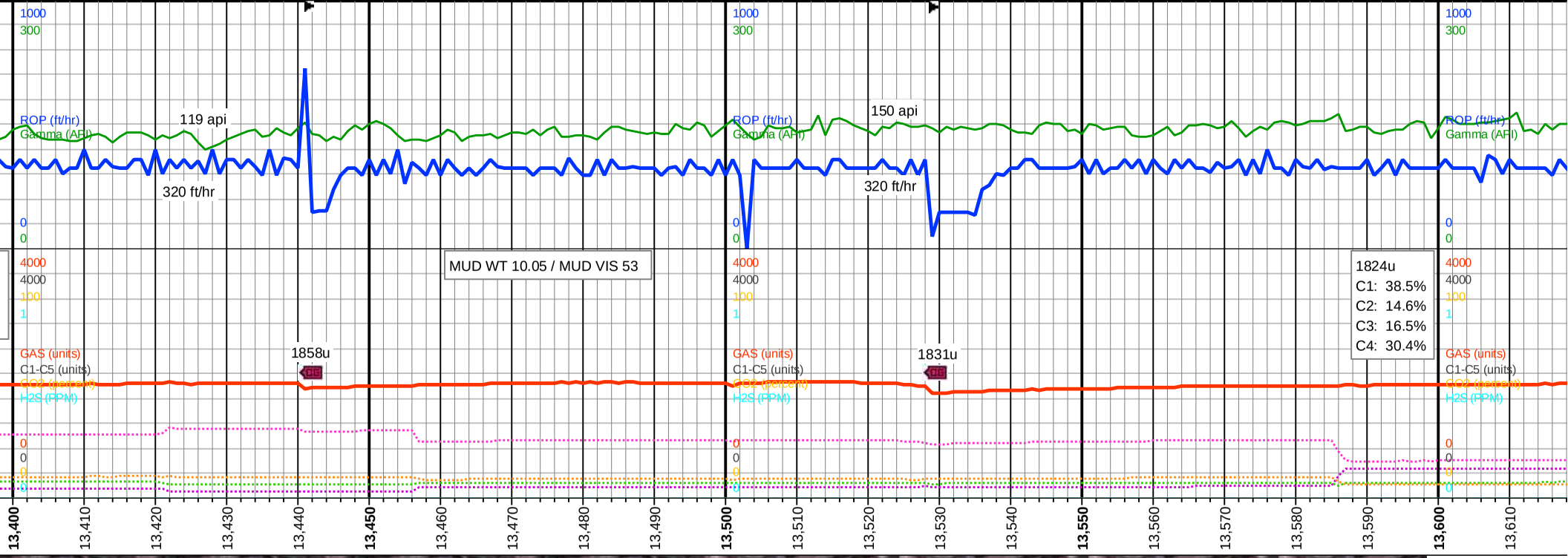


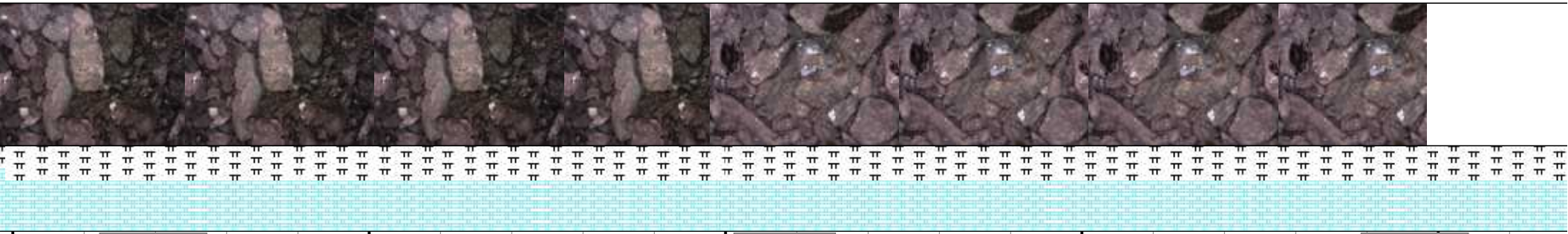


sl wxy tex;
s, tr bent.

75% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
25% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent.

75% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
25% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent.





7000

MD: 13,418'
INC: 90.12°
AZM: 179.33°
TVD: 7,360.49'
VS: 7,437.75'

MD: 13,507'
INC: 90°
AZM: 179.23°
TVD: 7,360.4'
VS: 7,525.78'

MD: 13,597'
INC: 90.15°
AZM: 179.4°
TVD: 7,360.28'
VS: 7,614.8'

TVD (ft)

TVD (ft)

TVD (ft)

60% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent.

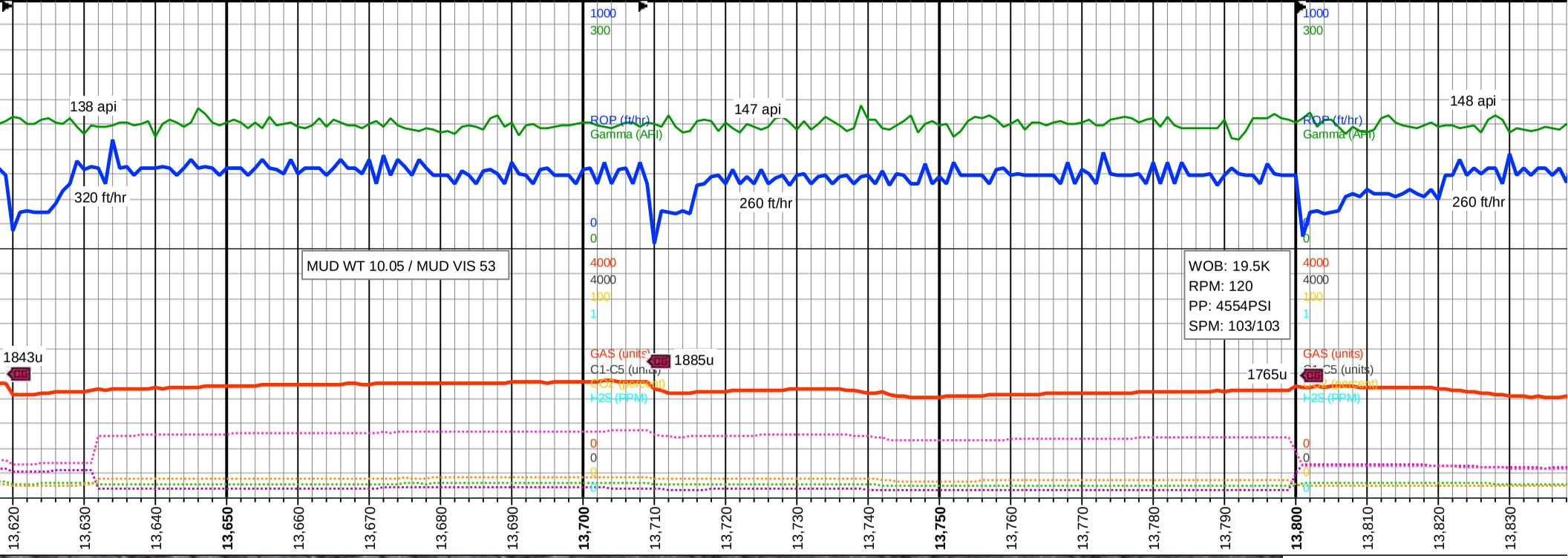
60% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent.

60% CHK: m
40% MRLST

8000

8000

8000



MD: 13,686'
INC: 90.06°
AZM: 179.33°
TVD: 7,360.12'
VS: 7,702.81'

MD: 13,776'
INC: 90.12°
AZM: 179.8°
TVD: 7,359.98'
VS: 7,791.76'

7000

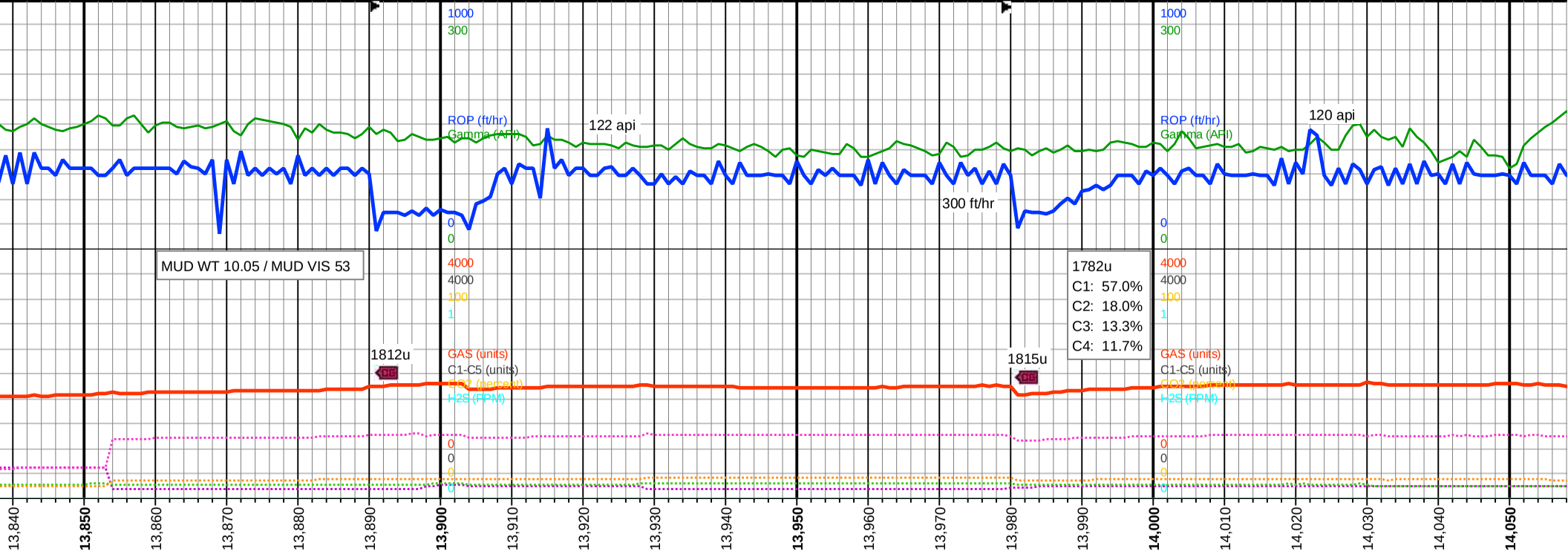
TVD (ft)

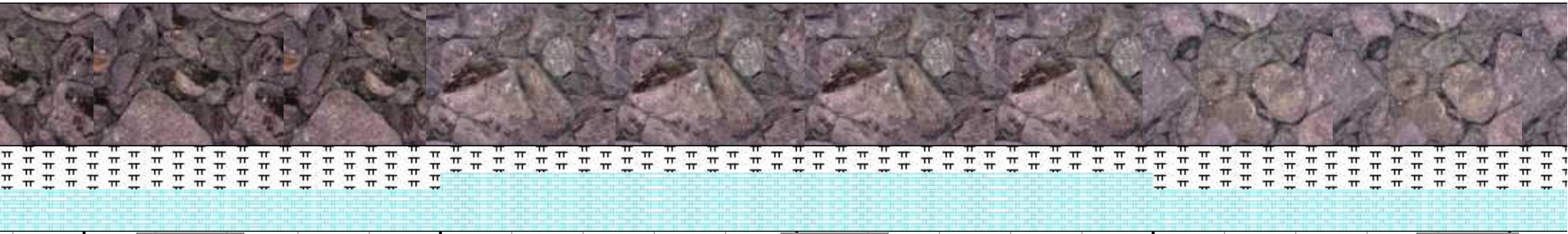
8000

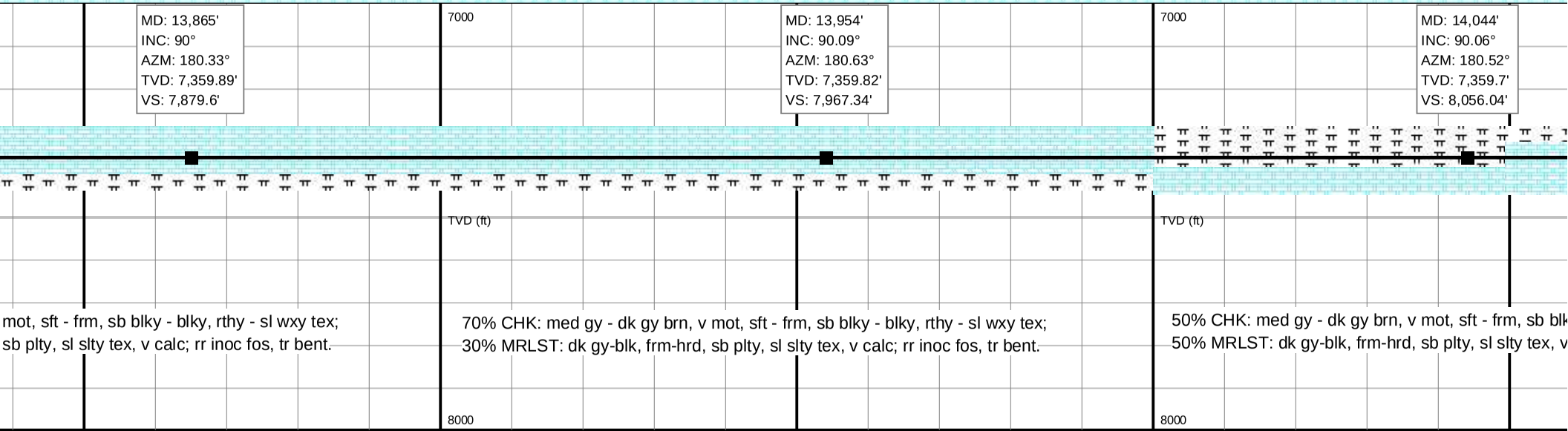
med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
T: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent.

60% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent.

50% CHK: med gy - dk gy brn, v
50% MRLST: dk gy-blk, frm-hrd,



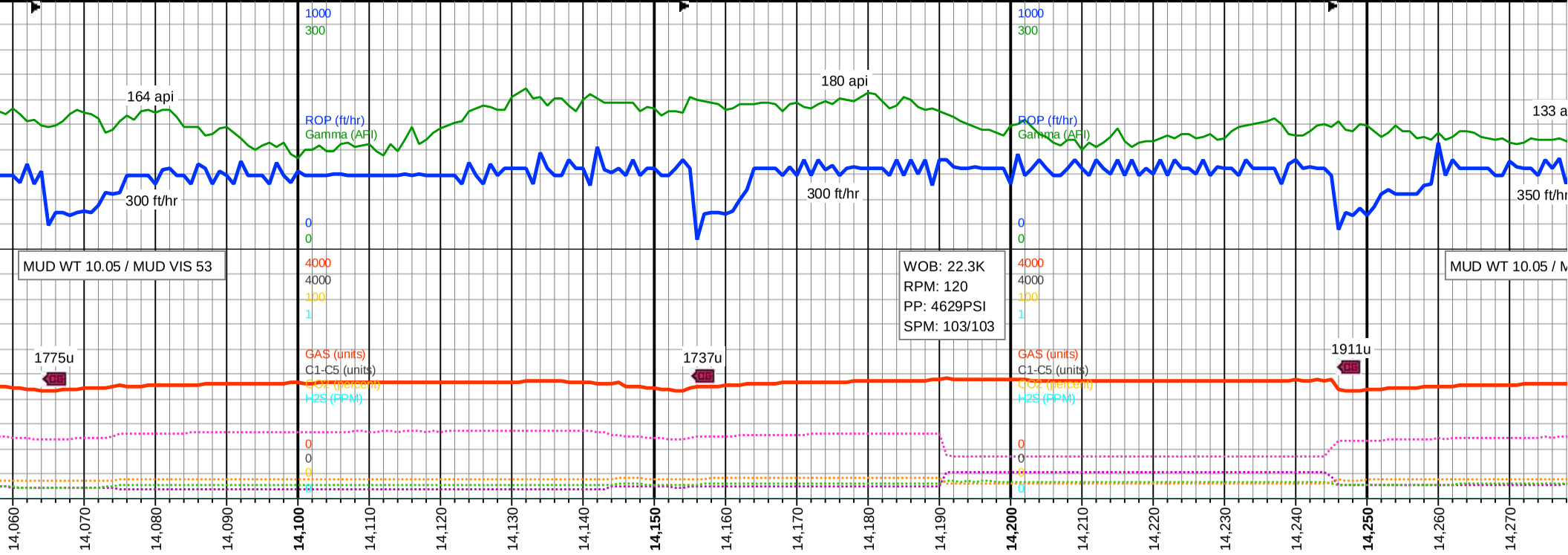


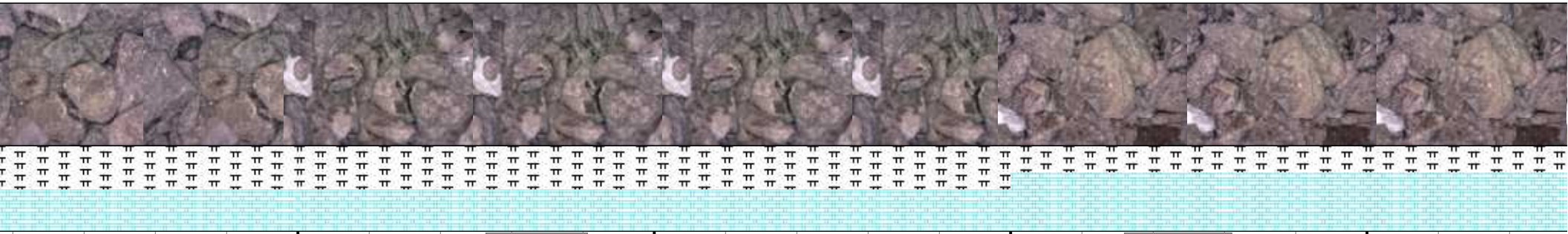


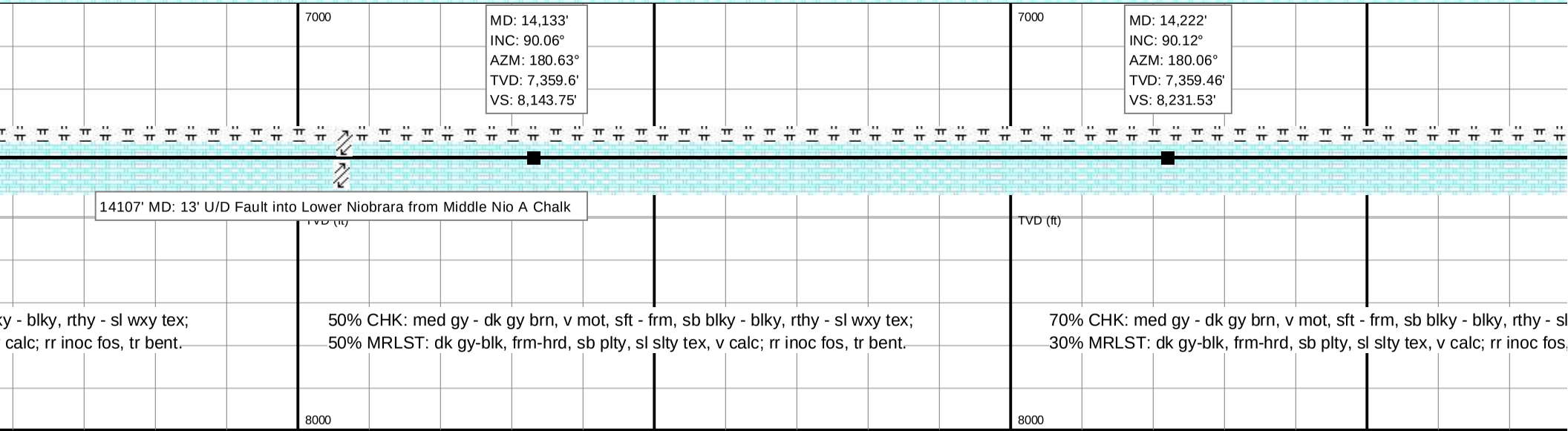
mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
sb plty, sl slty tex, v calc; rr inoc fos, tr bent.

70% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
30% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent.

50% CHK: med gy - dk gy brn, v mot, sft - frm, sb blk
50% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v



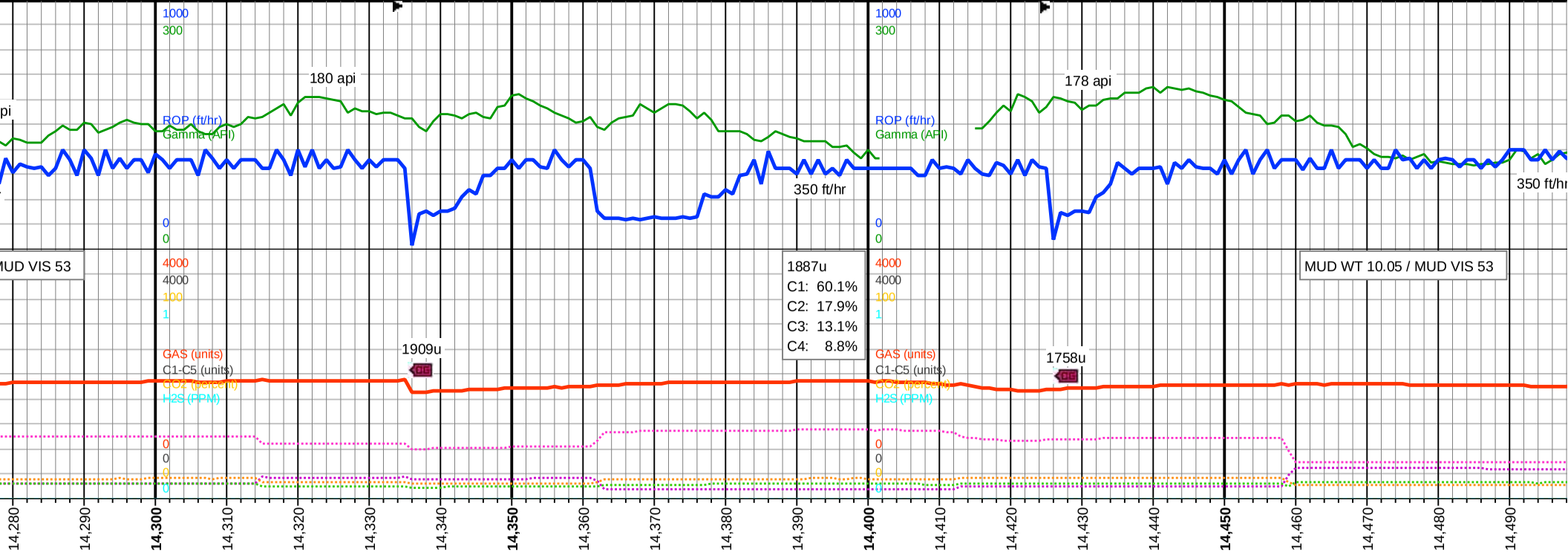


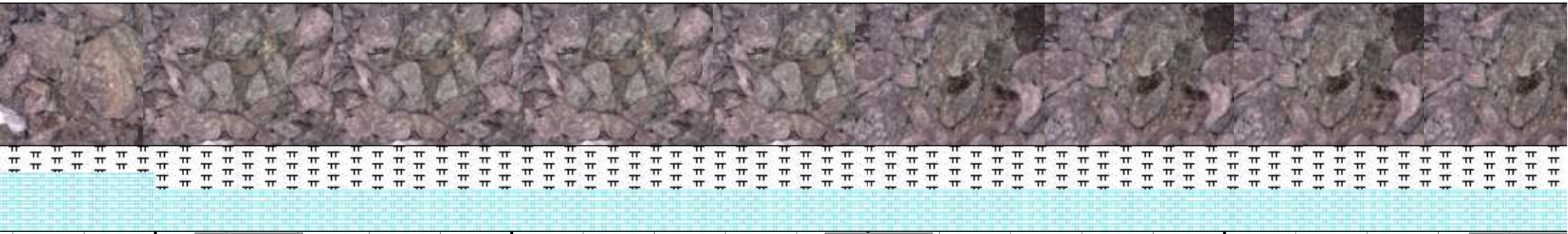


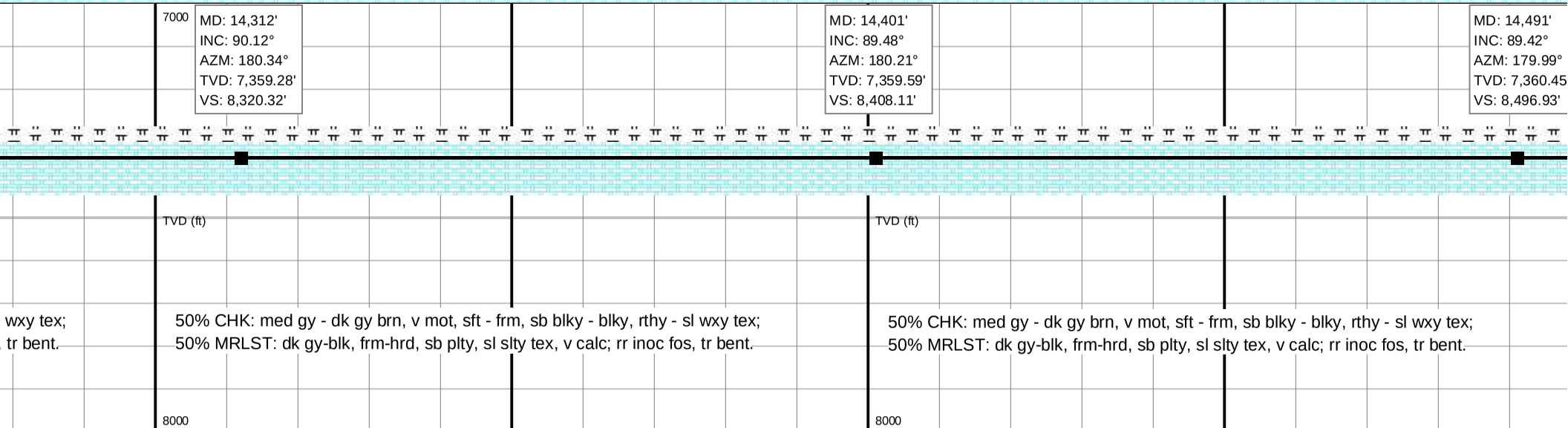
ky - blky, rthy - sl wxy tex;
calc; rr inoc fos, tr bent.

50% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
50% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent.

70% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl
30% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos,



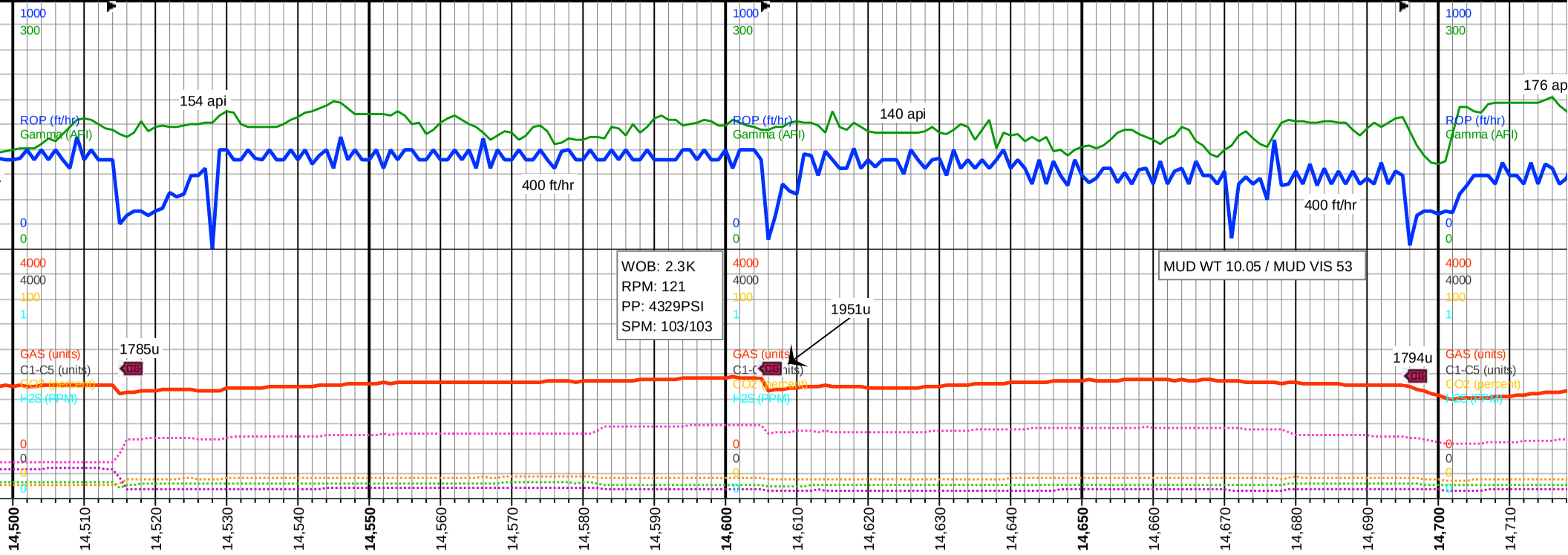


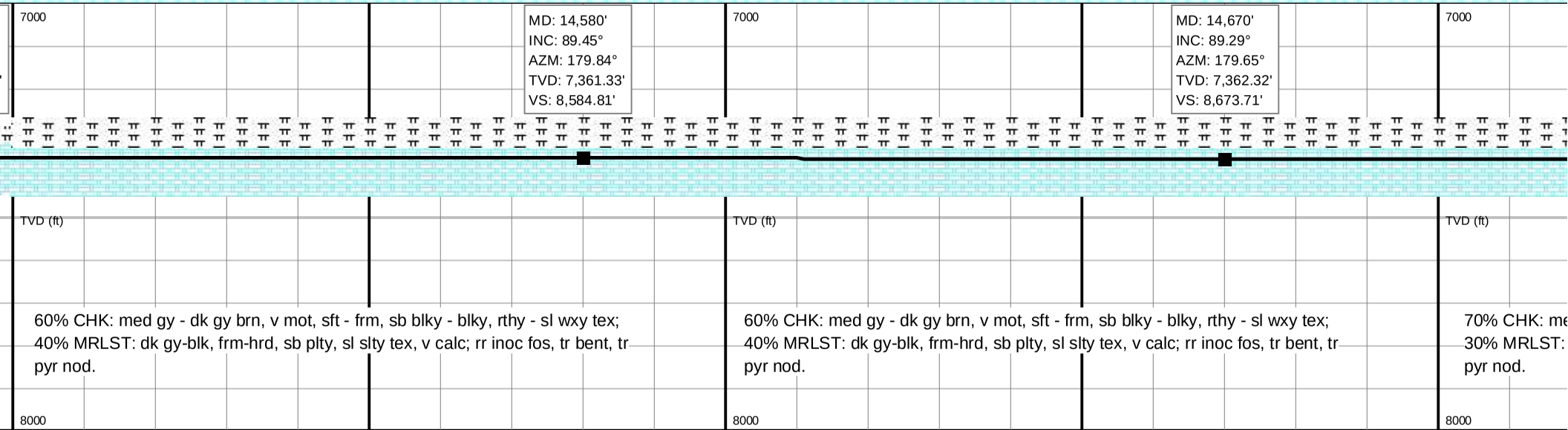


wxy tex;
tr bent.

50% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
50% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent.

50% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
50% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent.

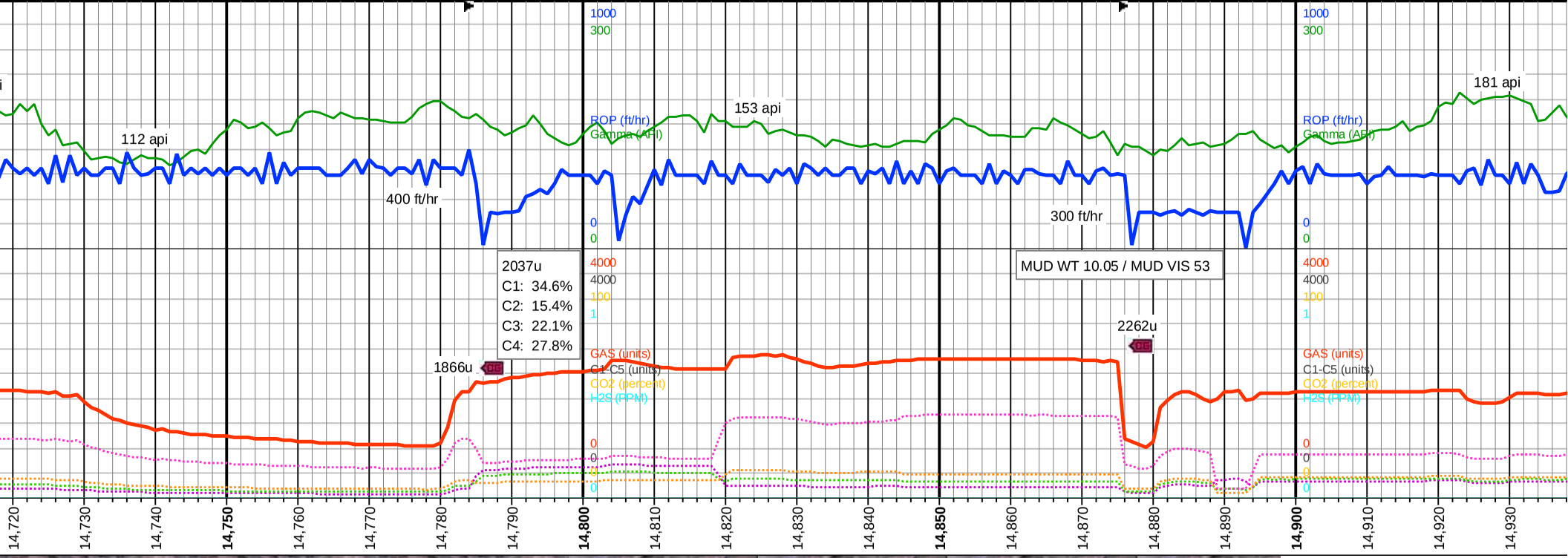




60% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex; 40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent, tr pyr nod.

60% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex; 40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent, tr pyr nod.

70% CHK: me
30% MRLST:
pyr nod.



MD: 14,759'
INC: 89.35°
AZM: 179.25°
TVD: 7,363.37'
VS: 8,761.7'

MD: 14,848'
INC: 89.45°
AZM: 179.38°
TVD: 7,364.31'
VS: 8,849.72'

MD: 14
INC: 89
AZM: 1
TVD: 7
VS: 8,9

7000

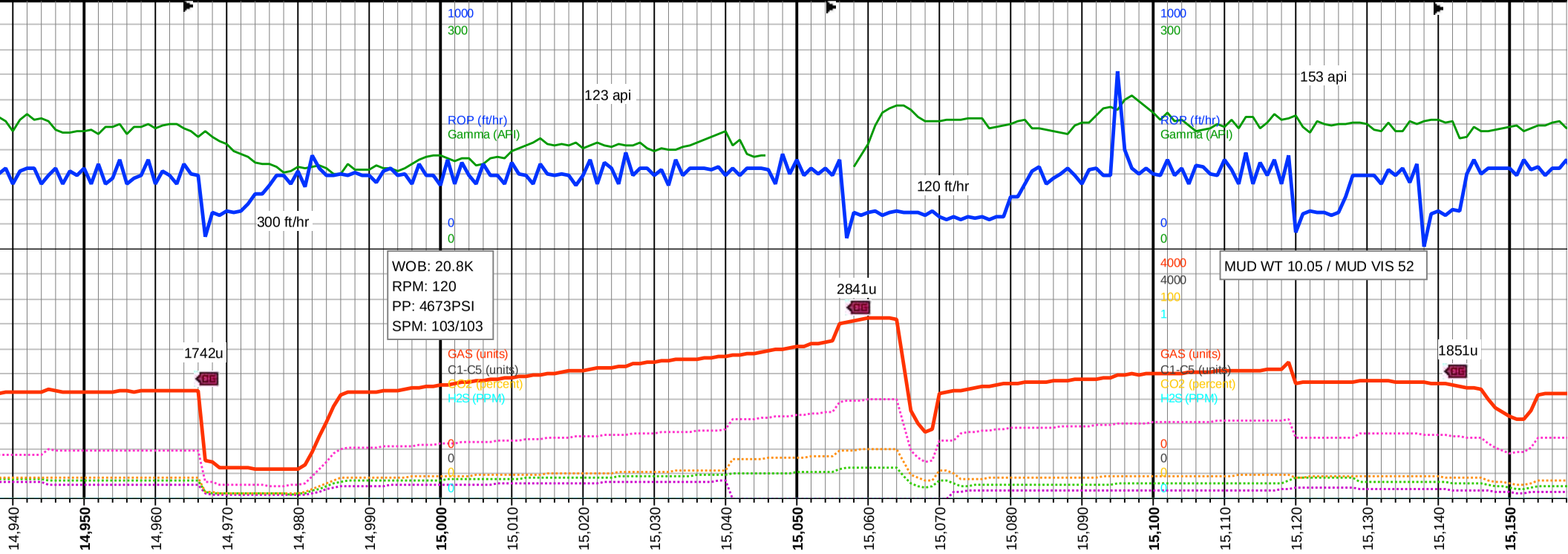
TVD (ft)

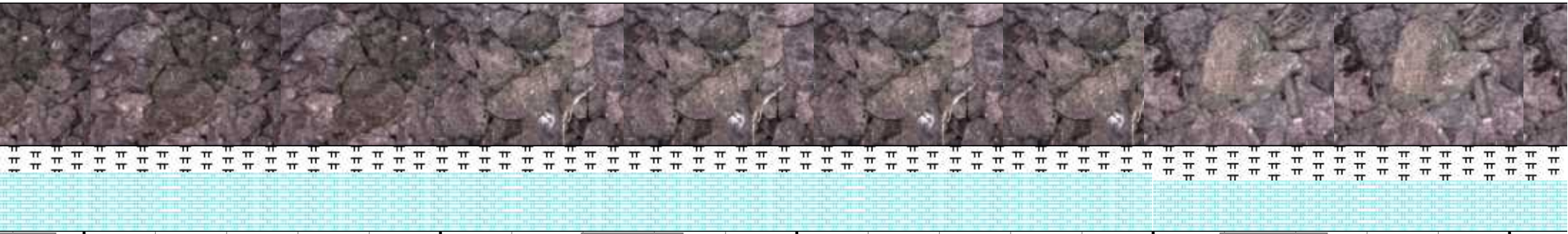
8000

ed gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent, tr

70% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
30% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent, tr pyr nod.

70% CHK: med gy - dk gy brn, v m
30% MRLST: dk gy-blk, frm-hrd, sb
pyr nod.





,938'
.75°
79.98°
,364.93'
38.64'

7000

MD: 15,027'
INC: 89.91°
AZM: 180.49°
TVD: 7,365.2'
VS: 9,026.44'

7000

MD: 15,116'
INC: 90°
AZM: 179.41°
TVD: 7,365.27'
VS: 9,114.31'

15058' MD: 10' U/D Fault into Upper-Middle Nio A Chalk from Lower Nio A Chalk

TVD (ft)

TVD (ft)

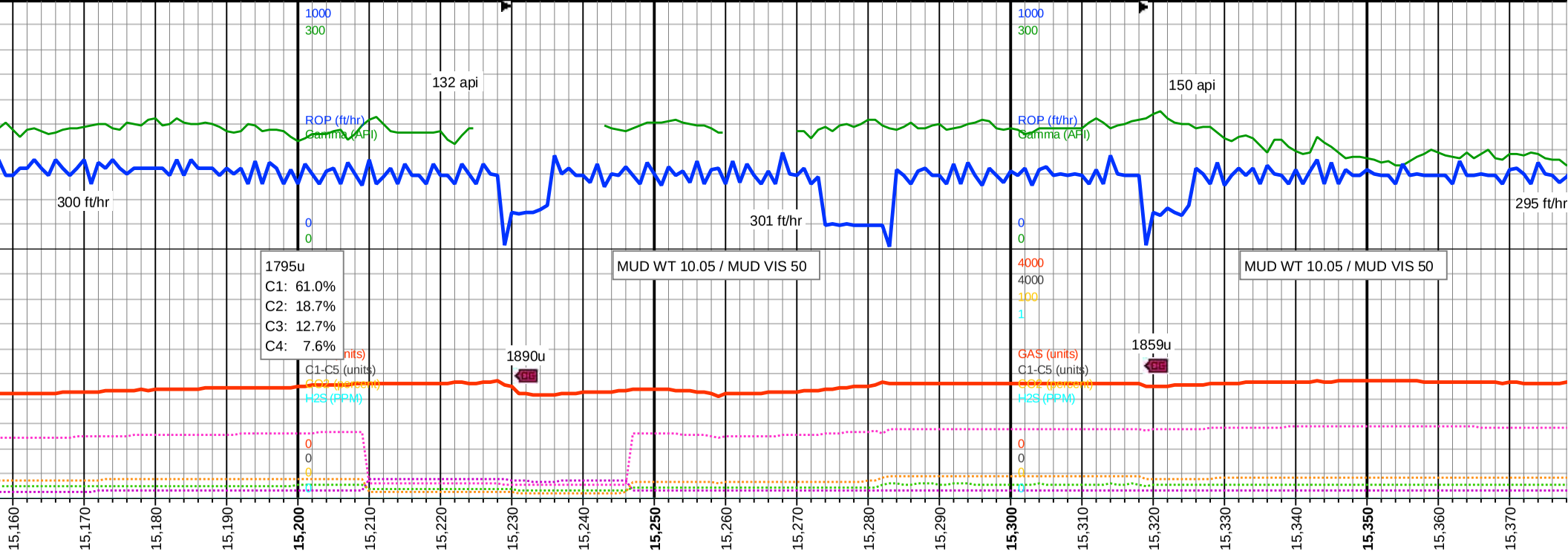
ot, sft - frm, sb blky - blky, rthy - sl wxy tex;
b plty, sl slty tex, v calc; rr inoc fos, rr bent, rr

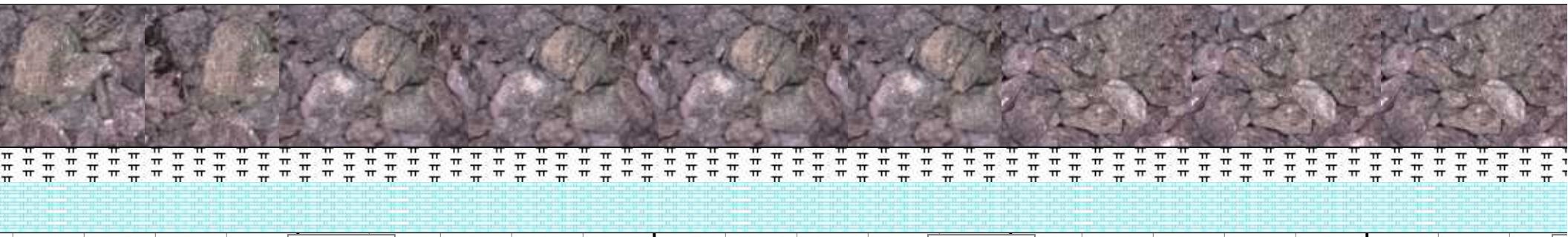
70% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
30% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, rr bent, rr pyr nod.

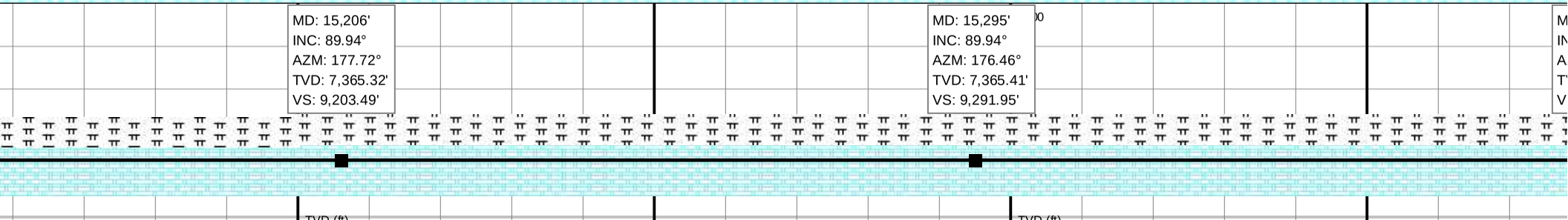
60% CHK: med gy - dk gy brn, v mot, sft - frm, s
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty t
pyr nod.

8000

8000







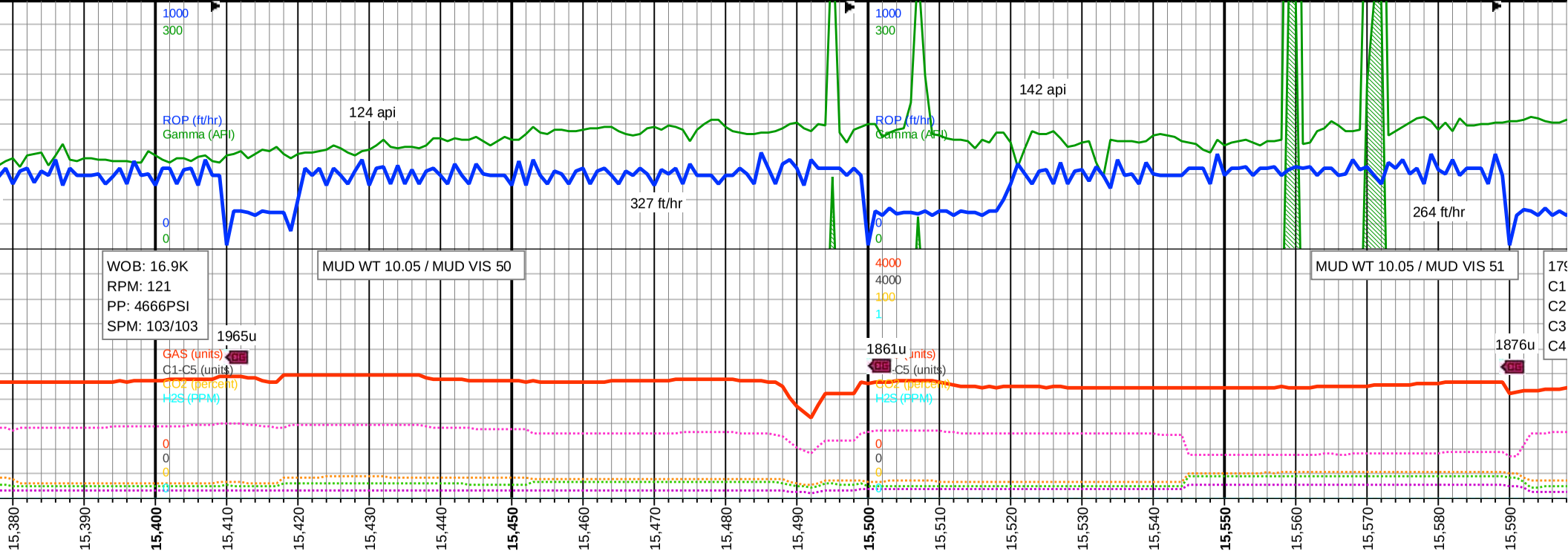
sb blky - blky, rthy - sl wxy tex;
ex, v calc; rr inoc fos, tr bent, tr

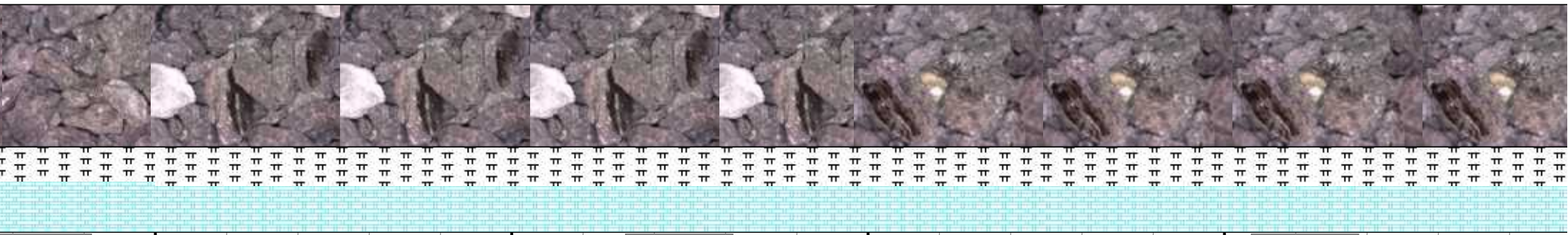
60% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, occ bent, tr pyr nod.

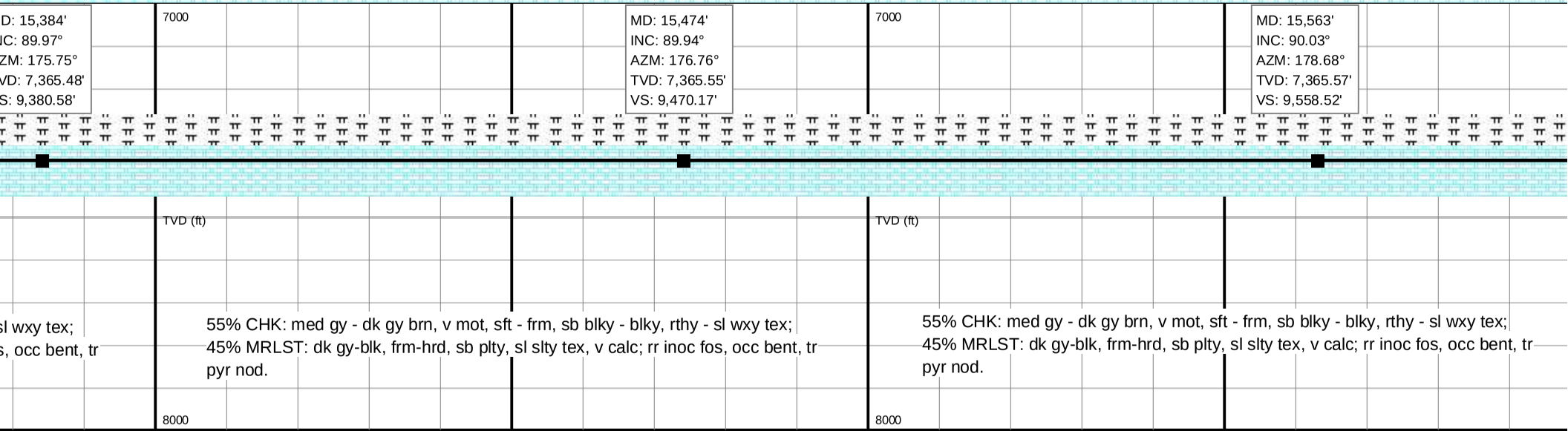
60% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - s
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos
pyr nod.

8000

8000



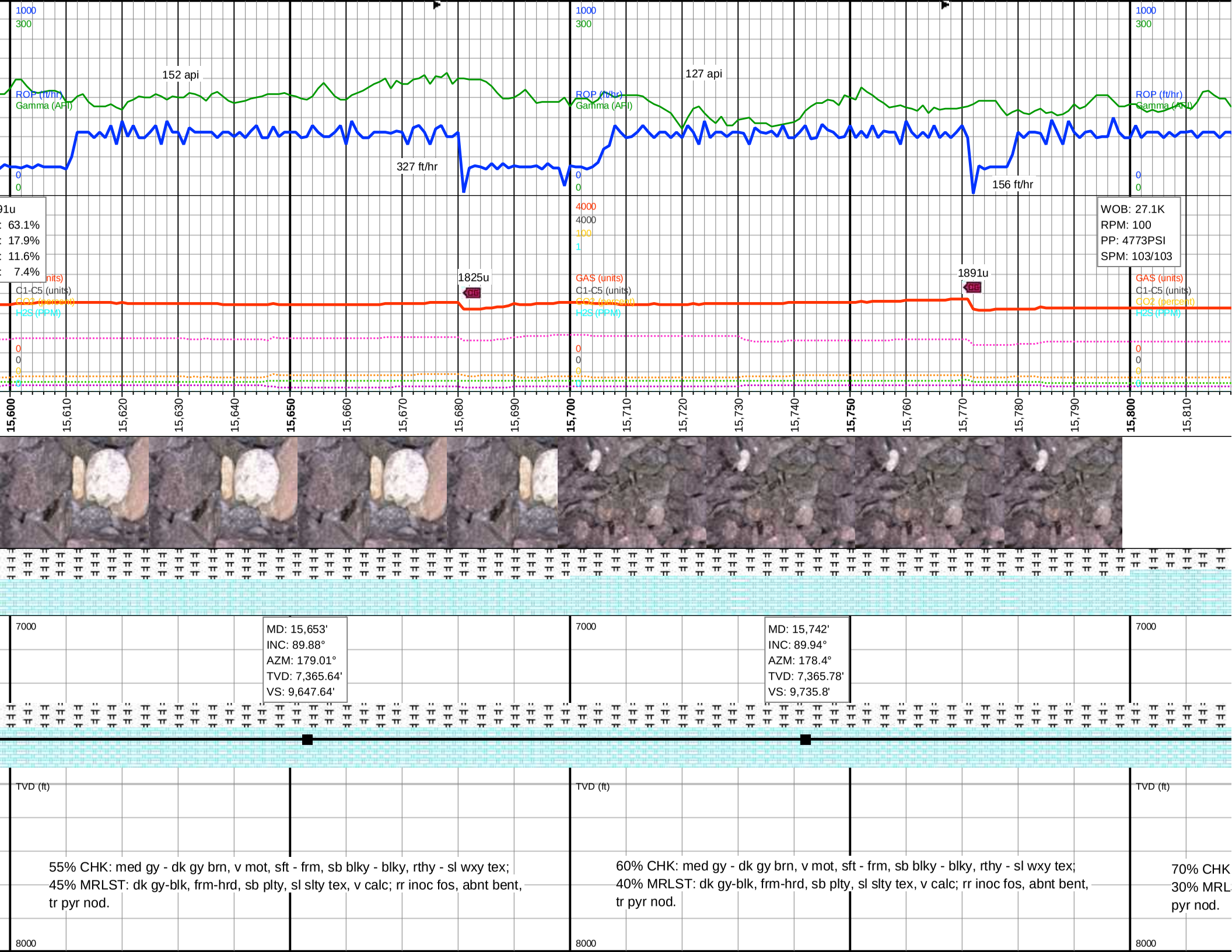




sl wxy tex;
s, occ bent, tr

55% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
45% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, occ bent, tr pyr nod.

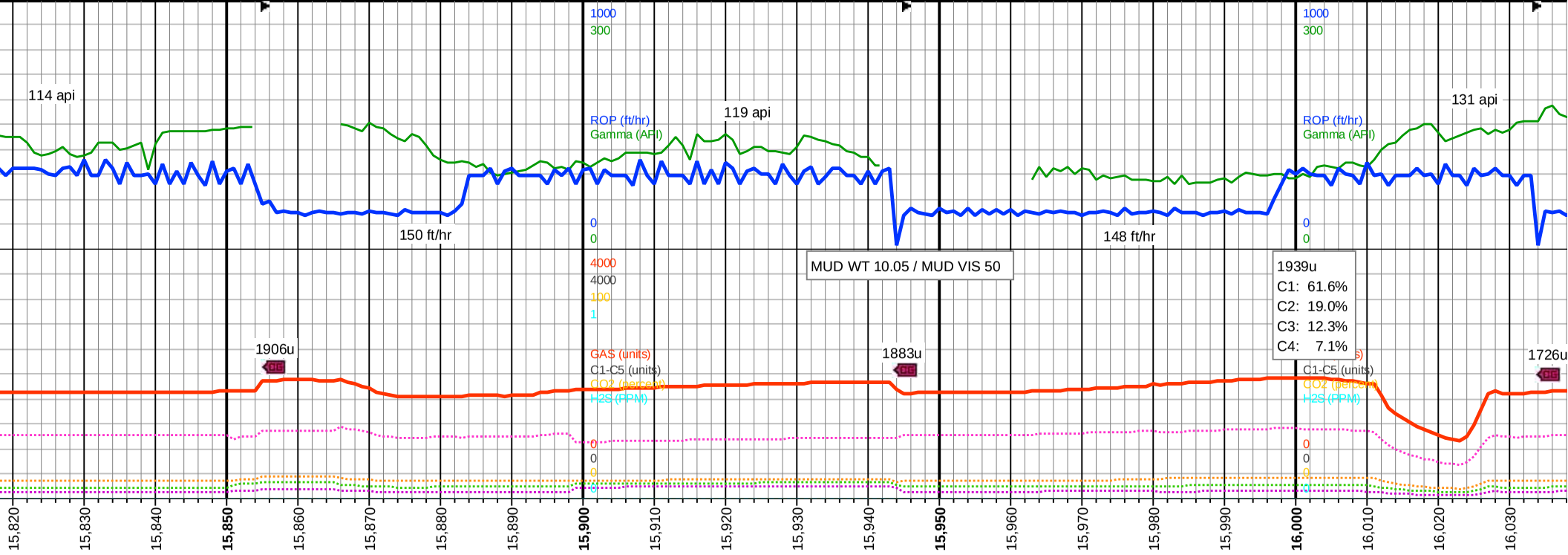
55% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
45% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, occ bent, tr pyr nod.

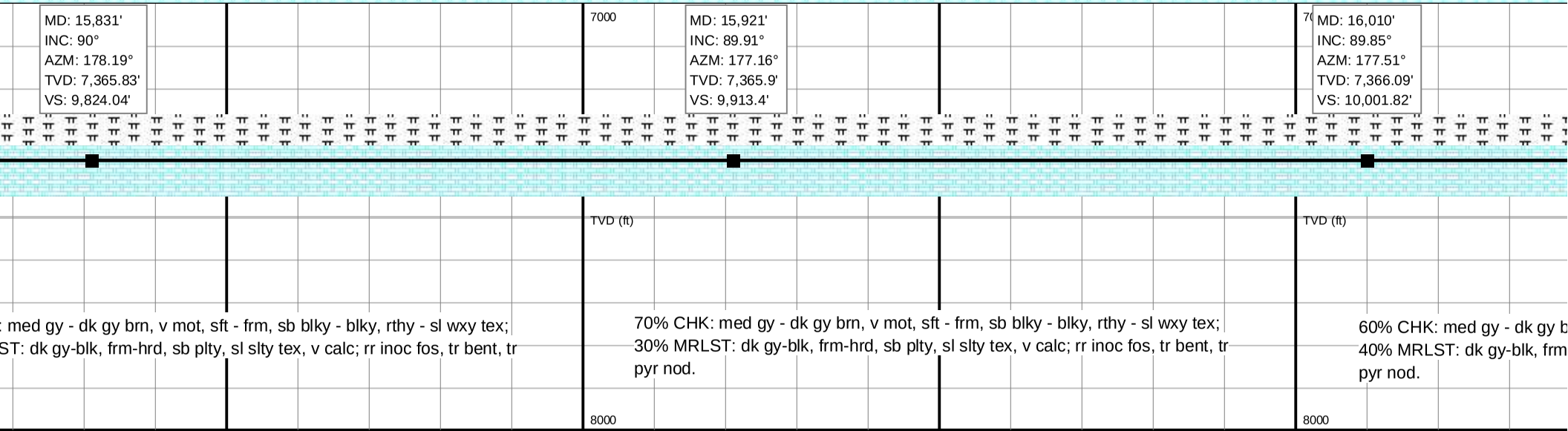


55% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
45% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, abnt bent, tr pyr nod.

60% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
40% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, abnt bent, tr pyr nod.

70% CHK
30% MRL
pyr nod.

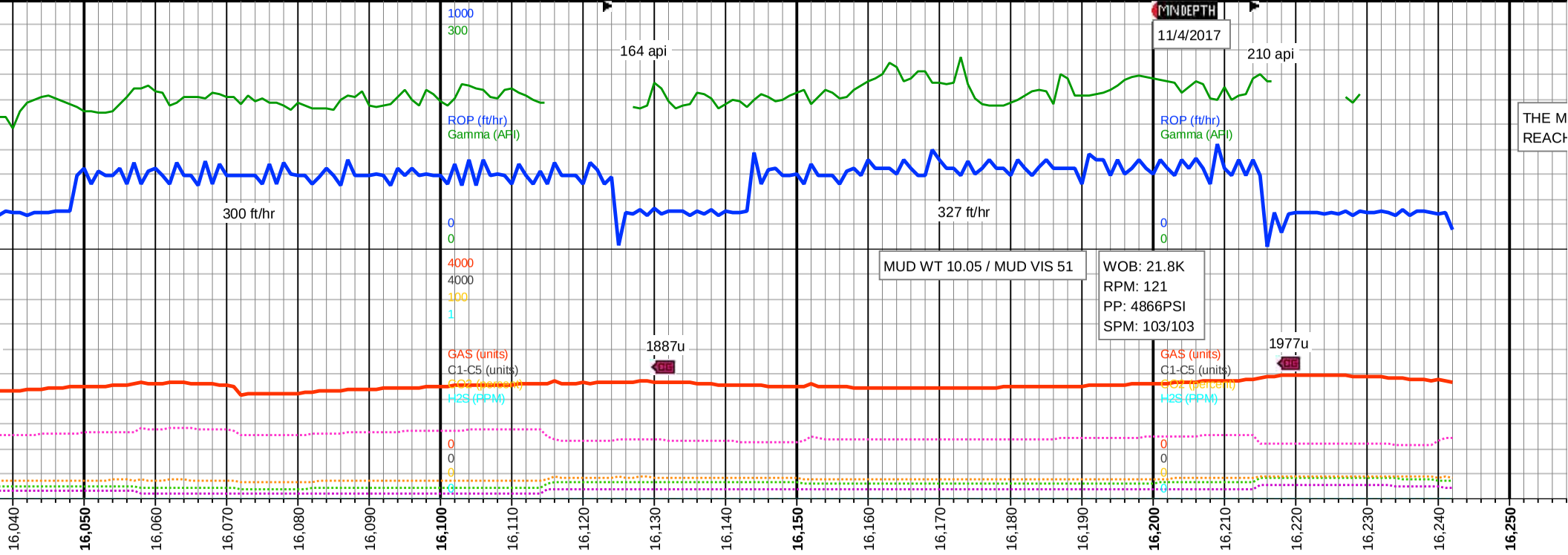


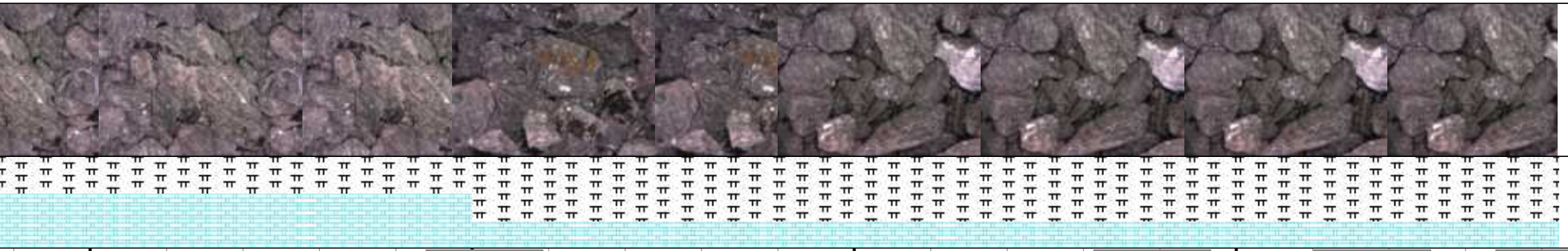


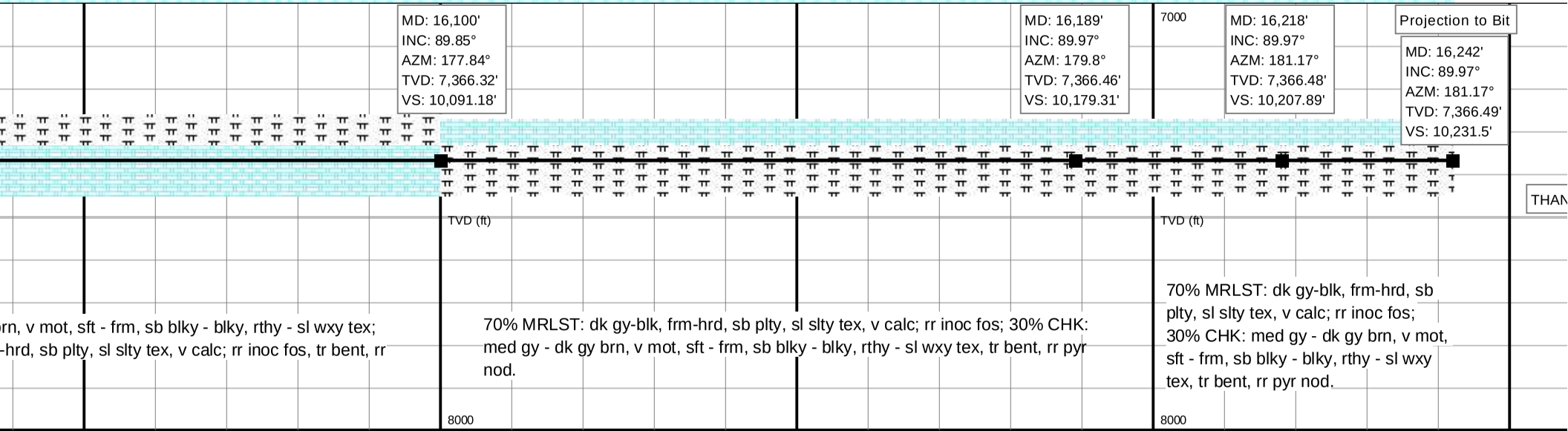
: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
ST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent, tr

70% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
30% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent, tr pyr nod.

60% CHK: med gy - dk gy b
40% MRLST: dk gy-blk, frm
pyr nod.


1000
300
ROP (ft/hr)
Gamma (API)
164 api
210 api
300 ft/hr
327 ft/hr
0
0
4000
4000
100
1
GAS (units)
C1-C5 (units)
CO2 (percent)
H2S (PPM)
1887u
1977u
MUD WT 10.05 / MUD VIS 51
WOB: 21.8K
RPM: 121
PP: 4866PSI
SPM: 103/103
MINDEPTH
11/4/2017
16,040
16,050
16,060
16,070
16,080
16,090
16,100
16,110
16,120
16,130
16,140
16,150
16,160
16,170
16,180
16,190
16,200
16,210
16,220
16,230
16,240
16,250




MD: 16,100'
INC: 89.85°
AZM: 177.84°
TVD: 7,366.32'
VS: 10,091.18'
MD: 16,189'
INC: 89.97°
AZM: 179.8°
TVD: 7,366.46'
VS: 10,179.31'
7000
MD: 16,218'
INC: 89.97°
AZM: 181.17°
TVD: 7,366.48'
VS: 10,207.89'
Projection to Bit
MD: 16,242'
INC: 89.97°
AZM: 181.17°
TVD: 7,366.49'
VS: 10,231.5'
TVD (ft)
TVD (ft)
THAN
rn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex;
-hrd, sb plty, sl slty tex, v calc; rr inoc fos, tr bent, rr
70% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos; 30% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex, tr bent, rr pyr nod.
70% MRLST: dk gy-blk, frm-hrd, sb plty, sl slty tex, v calc; rr inoc fos; 30% CHK: med gy - dk gy brn, v mot, sft - frm, sb blky - blky, rthy - sl wxy tex, tr bent, rr pyr nod.
8000
8000

16,260

16,270

16,280

16,290

16,300

ARCUS LD 11-278HNX WELLBORE
HED TD @ 00:15 MDT ON 11/4/2017

K YOU FOR USING TERRA GUIDANCE