



**Scale 1:200 Imperial
Measured Depth Log**

Well Name: Howard 3C-28HZ
Location: Weld County, CO.
License Number: 05123376770000
Spud Date: 09/02/13
Surface Coordinates: 246'FSL & 1882'FWL, SEC.28, T1N-R67W
Region: Weld County
Drilling Completed: 09/07/13
Bottom Hole Coordinates: 1'FNL & 1890'FWL, SEC.28, T1N-R67W
Ground Elevation (ft): 5036' **K.B. Elevation (ft):** 5049'
Logged Interval (ft): 7850' **To:** 12707' **Total Depth (ft):** 12707'
Formation: Codell
Type of Drilling Fluid: Water Based

Printed by HORIZONTAL.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

OPERATOR

Company: Anadarko Petroleum Corporation
Address: Granite Tower
1099 18th St., Suite 1800
Denver, CO 80202

GEOLOGIST

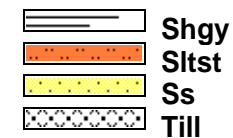
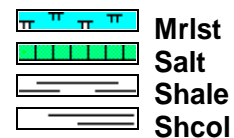
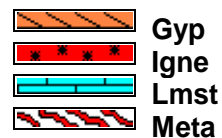
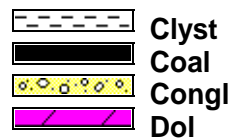
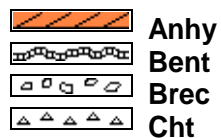
Name: Scott Crozier / Ben Thompson
Company: Great Divide Consulting, Inc.
Address: P.O. Box 630263
Highlands Ranch, CO 80163

Cores

DSTs

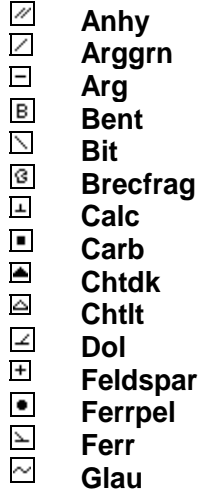
Comments

ROCK TYPES

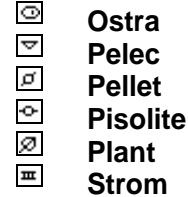
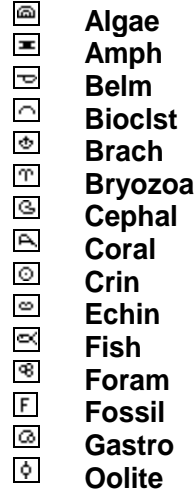


ACCESSORIES

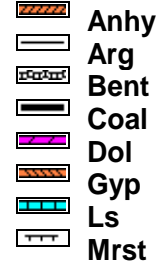
MINERAL



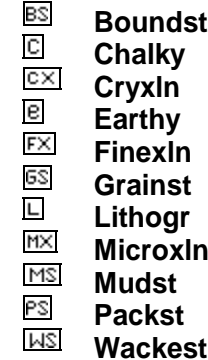
FOSSIL










STRINGER



TEXTURE







POROSITY

 Earthy
 Fenest
 Fracture
 Inter
 Moldic
 Organic
 Pinpoint

**Vuggy****SORTING**

 Well
 Moderate
 Poor



OTHER SYMBOLS**ROUNDING**

 Rounded
 Subrnd
 Subang
 Angular


OIL SHOW

 Even

**Spotted**

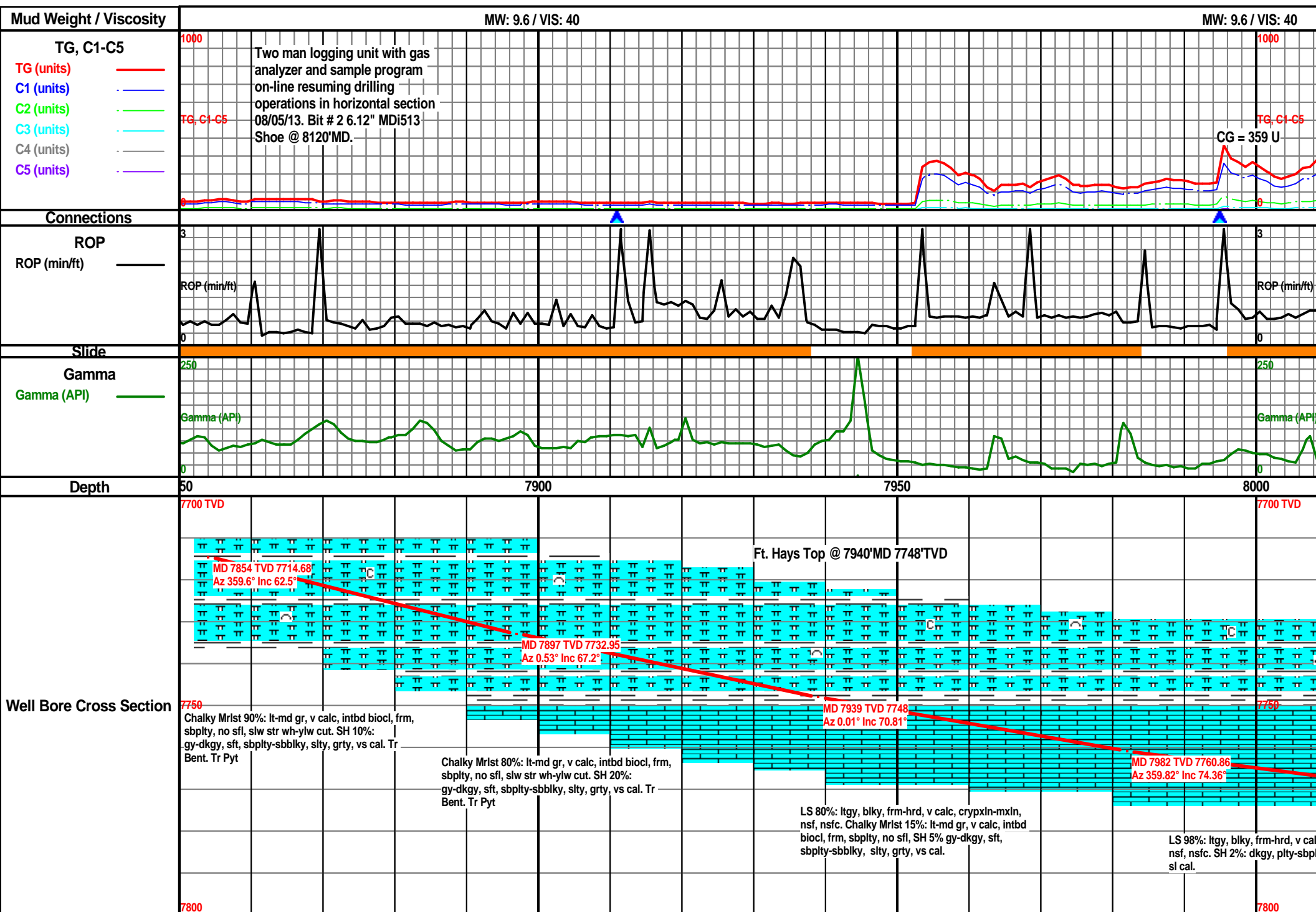
 Ques
 Dead

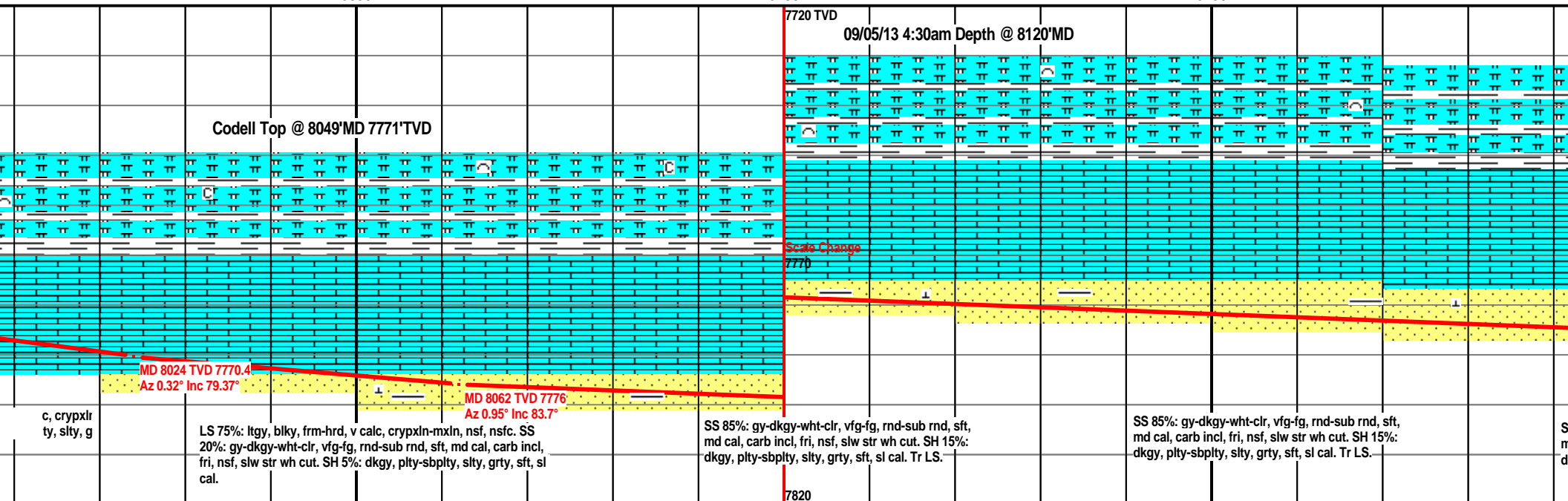
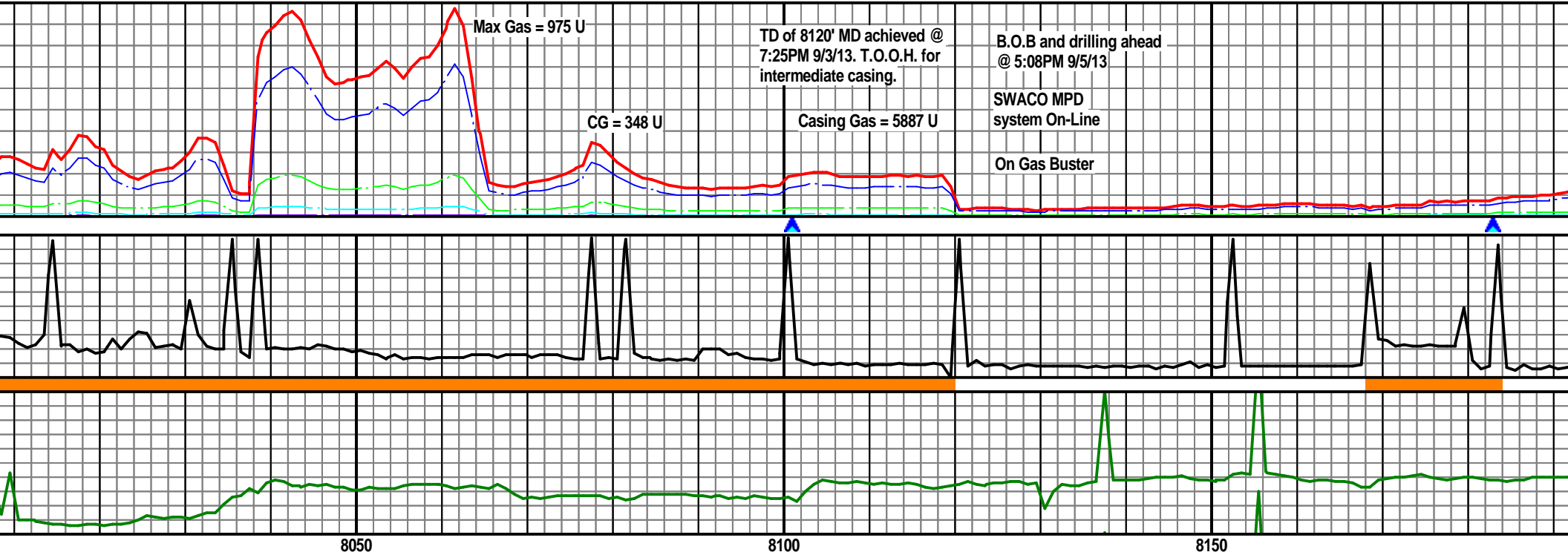
INTERVAL

 Core
 Dst

EVENT

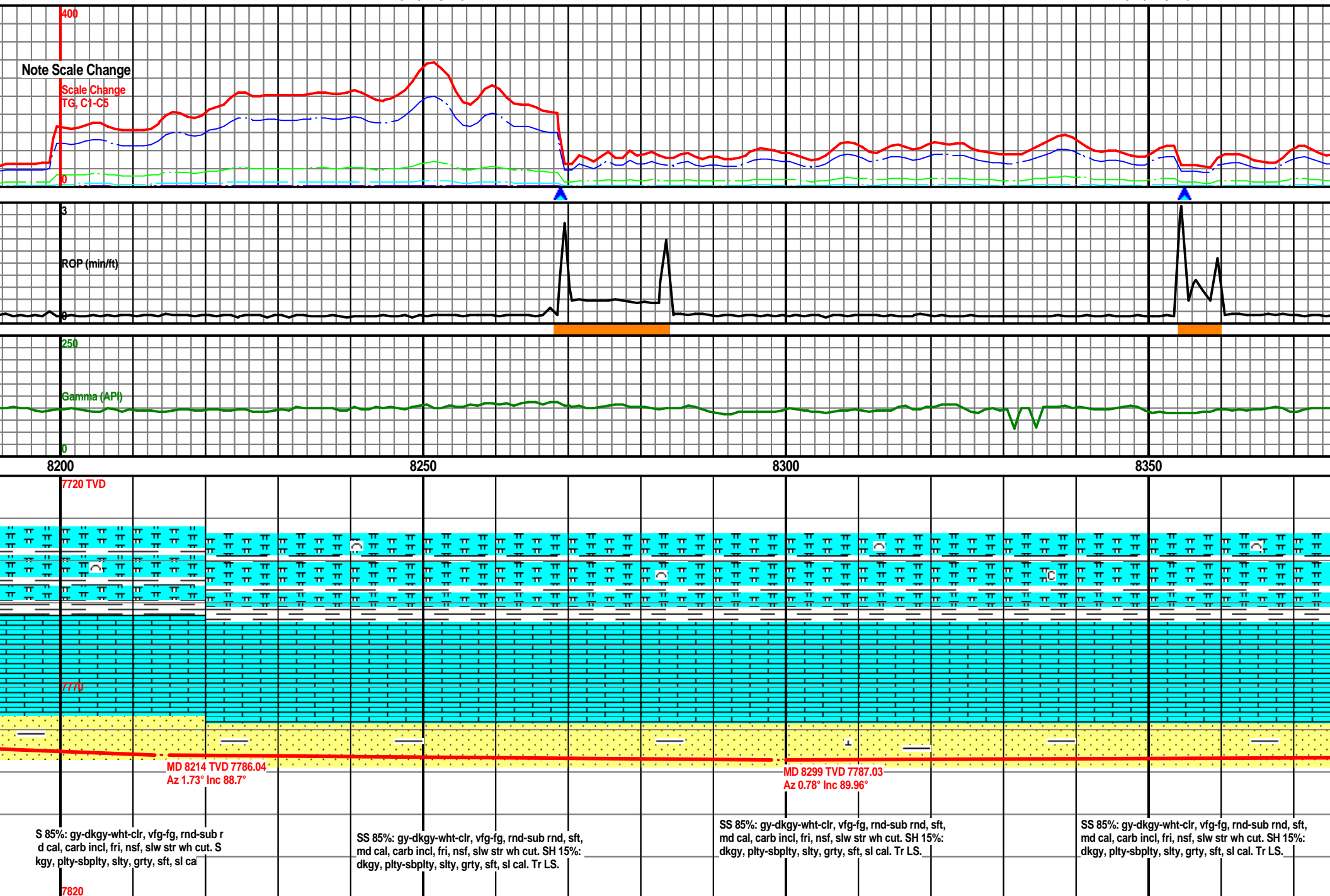
 Rft
 Connection





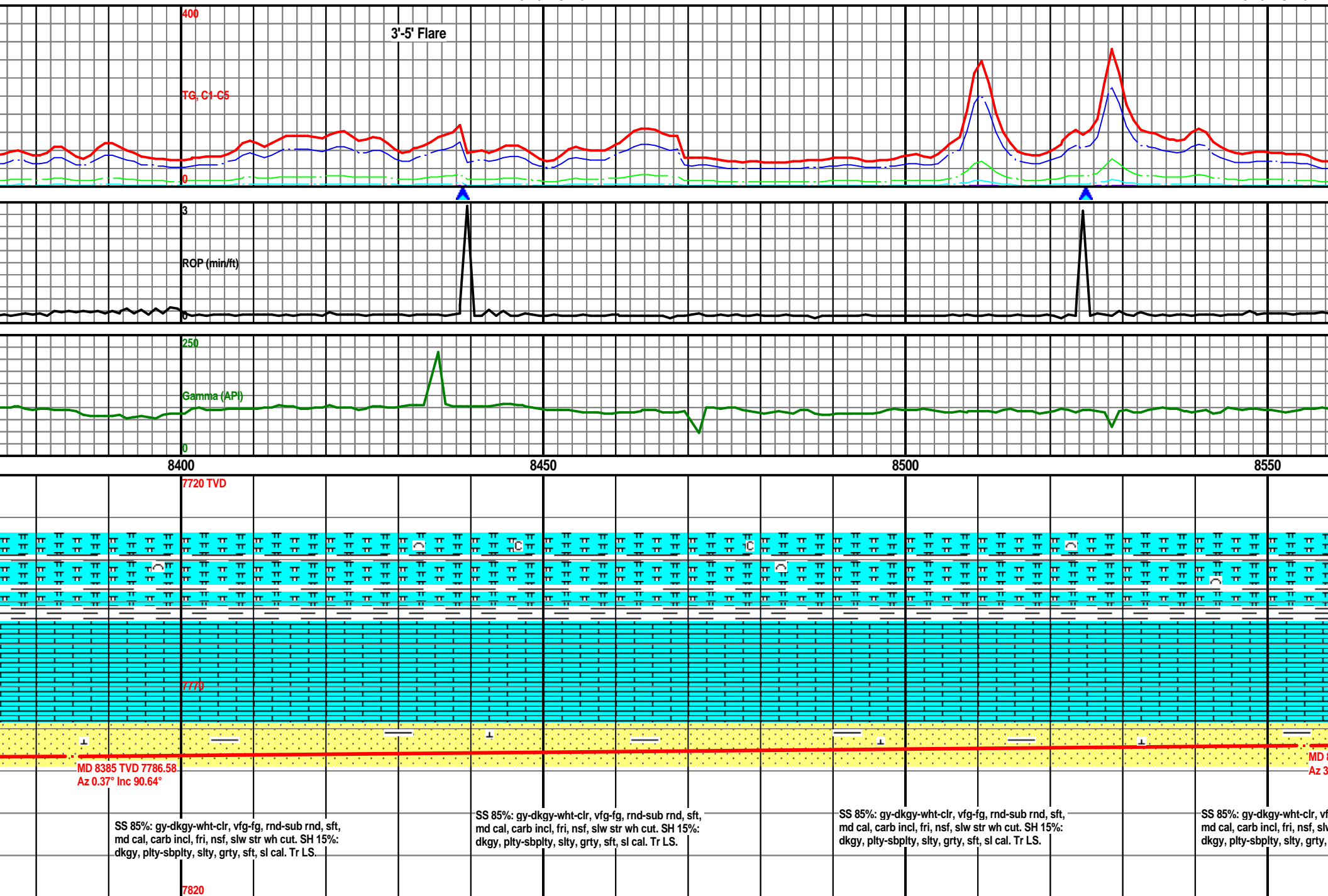
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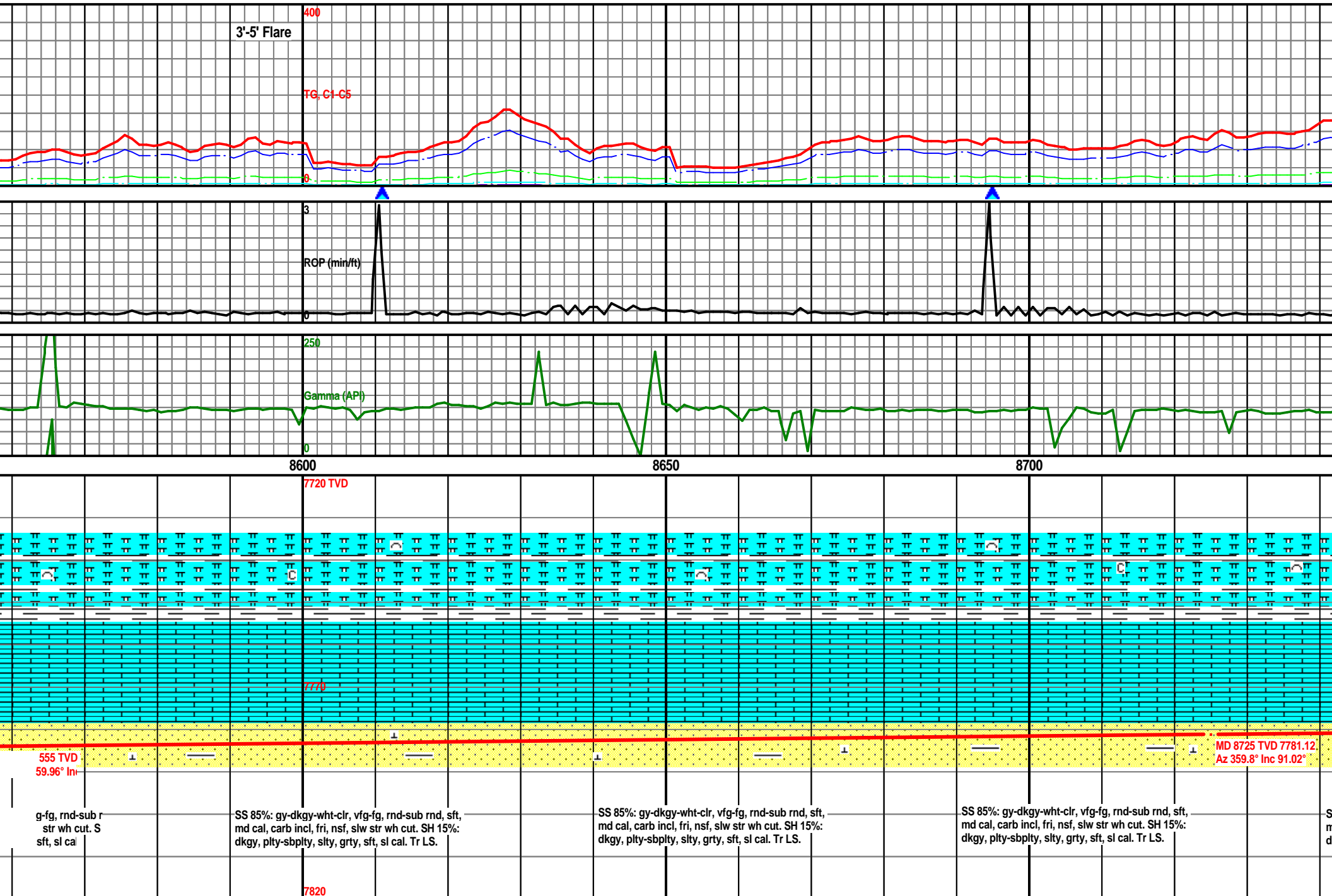
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MW: 9.1 / VIS: 43

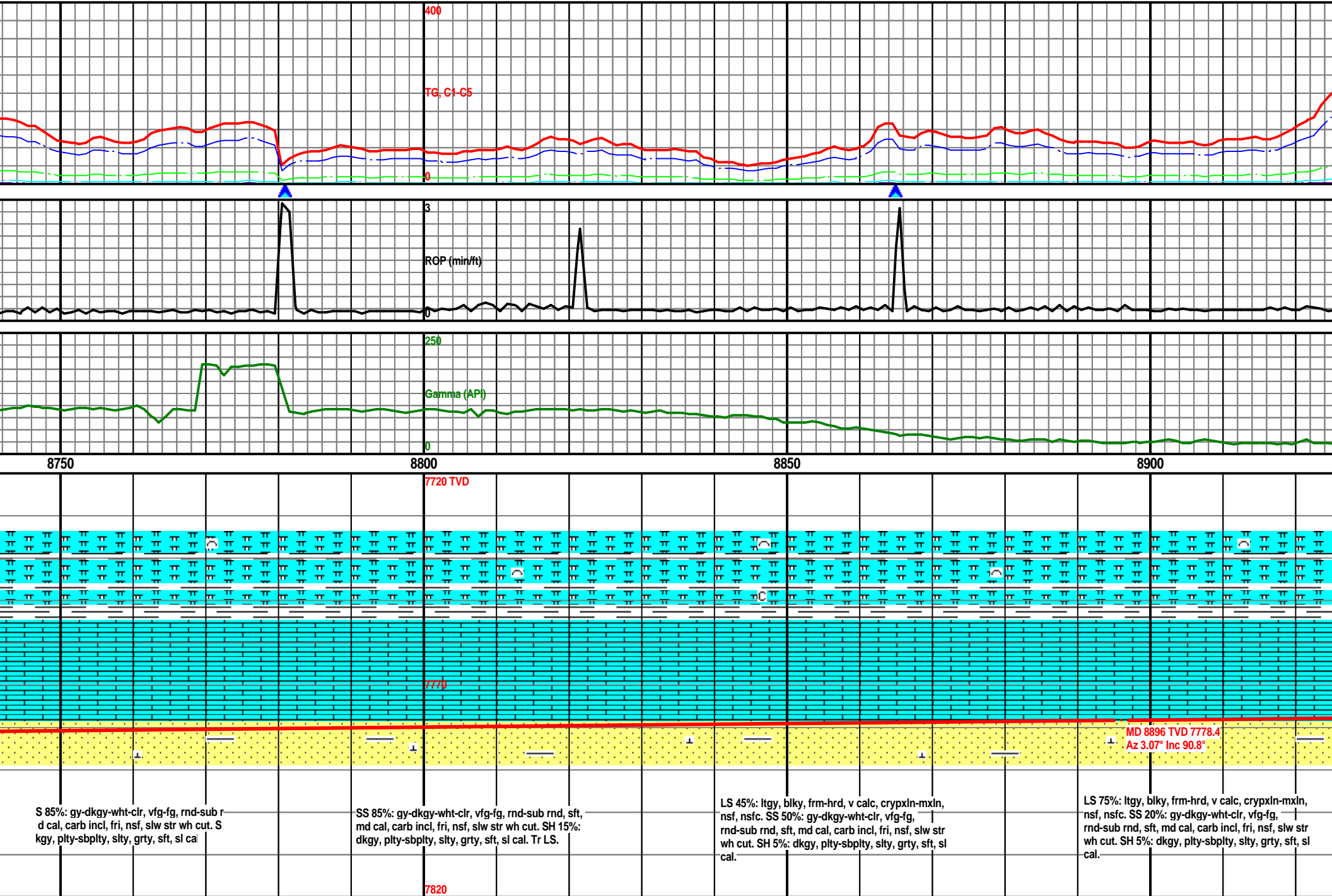
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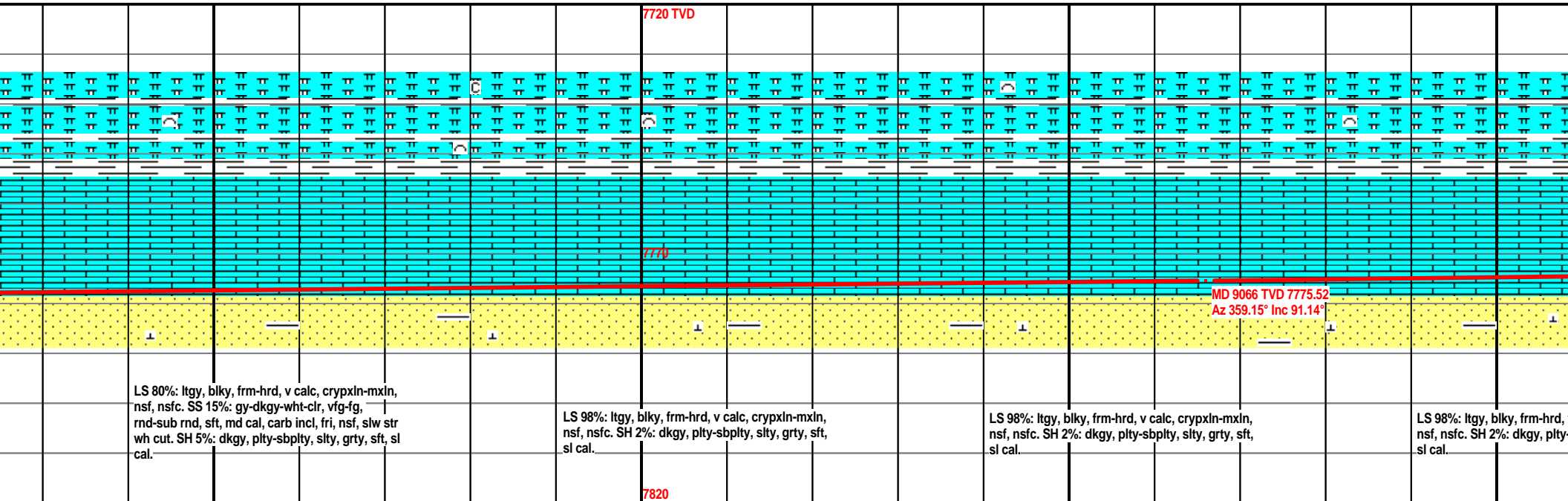
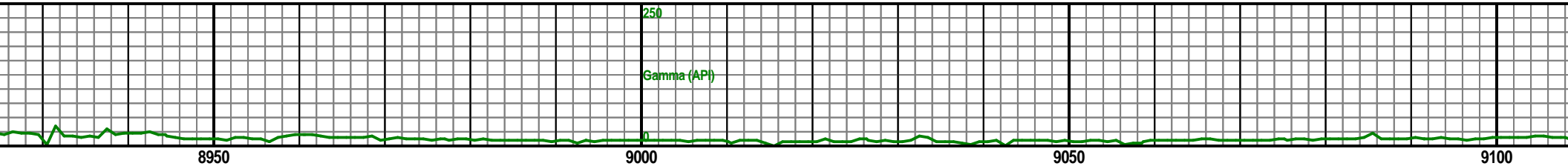
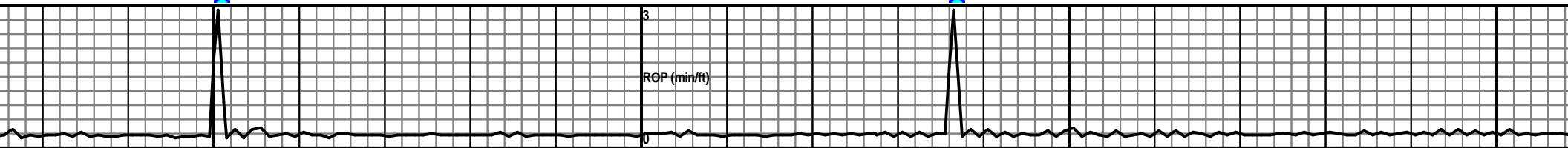
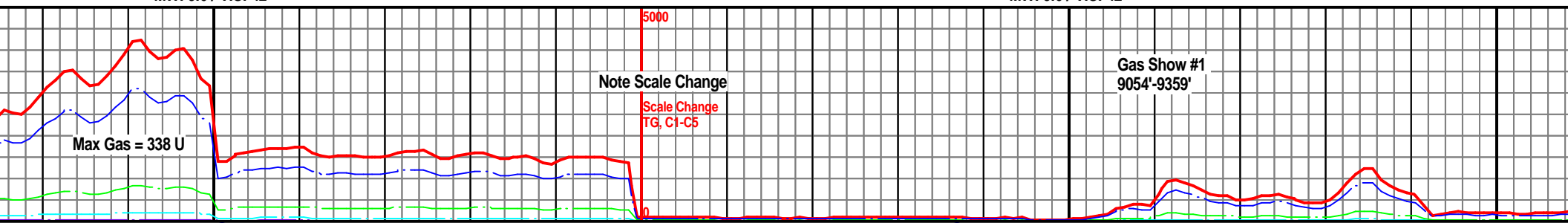
MW: 9.1 / VIS: 43

MW: 9.0 / VIS: 42



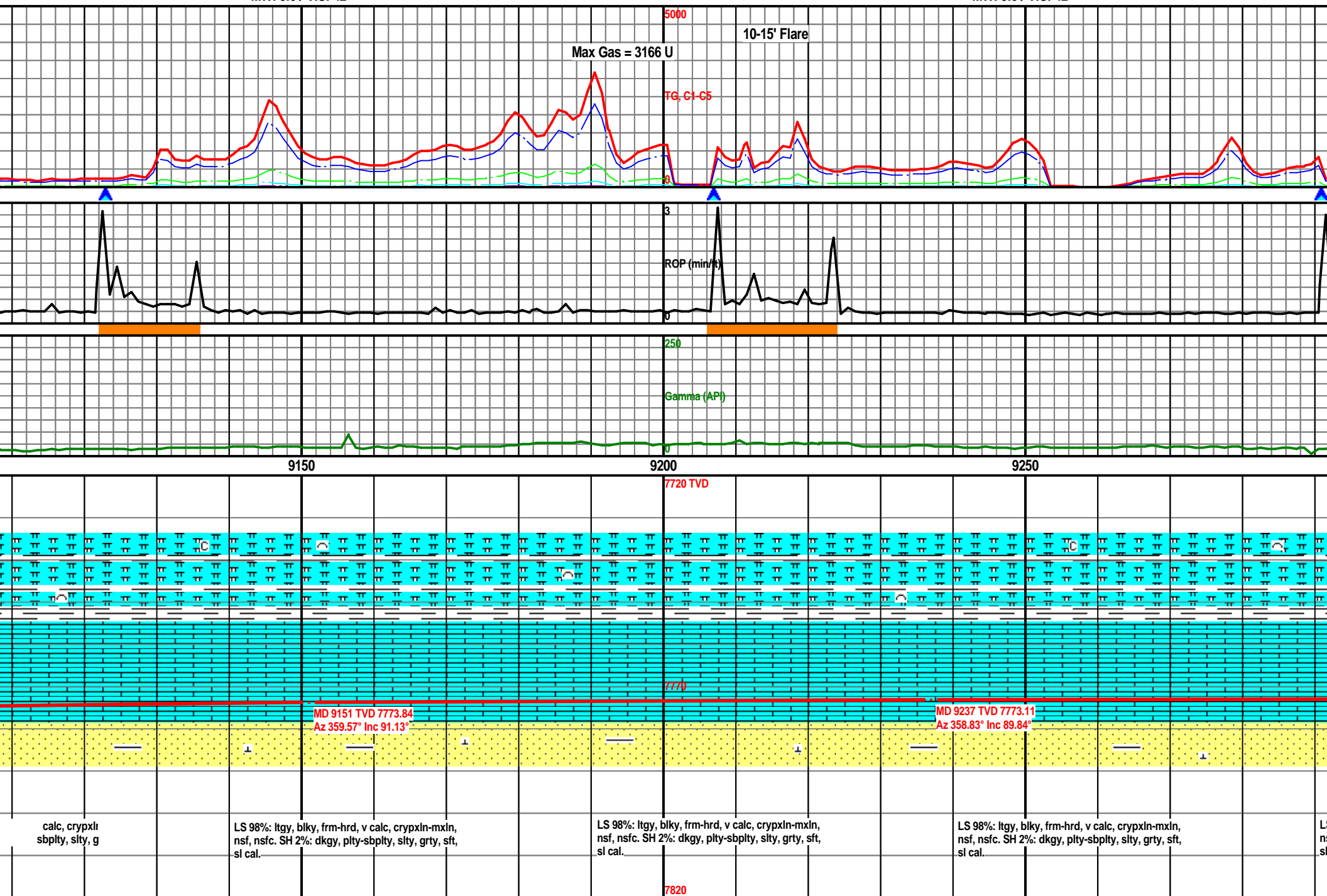
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MW: 9.0 / VIS: 42



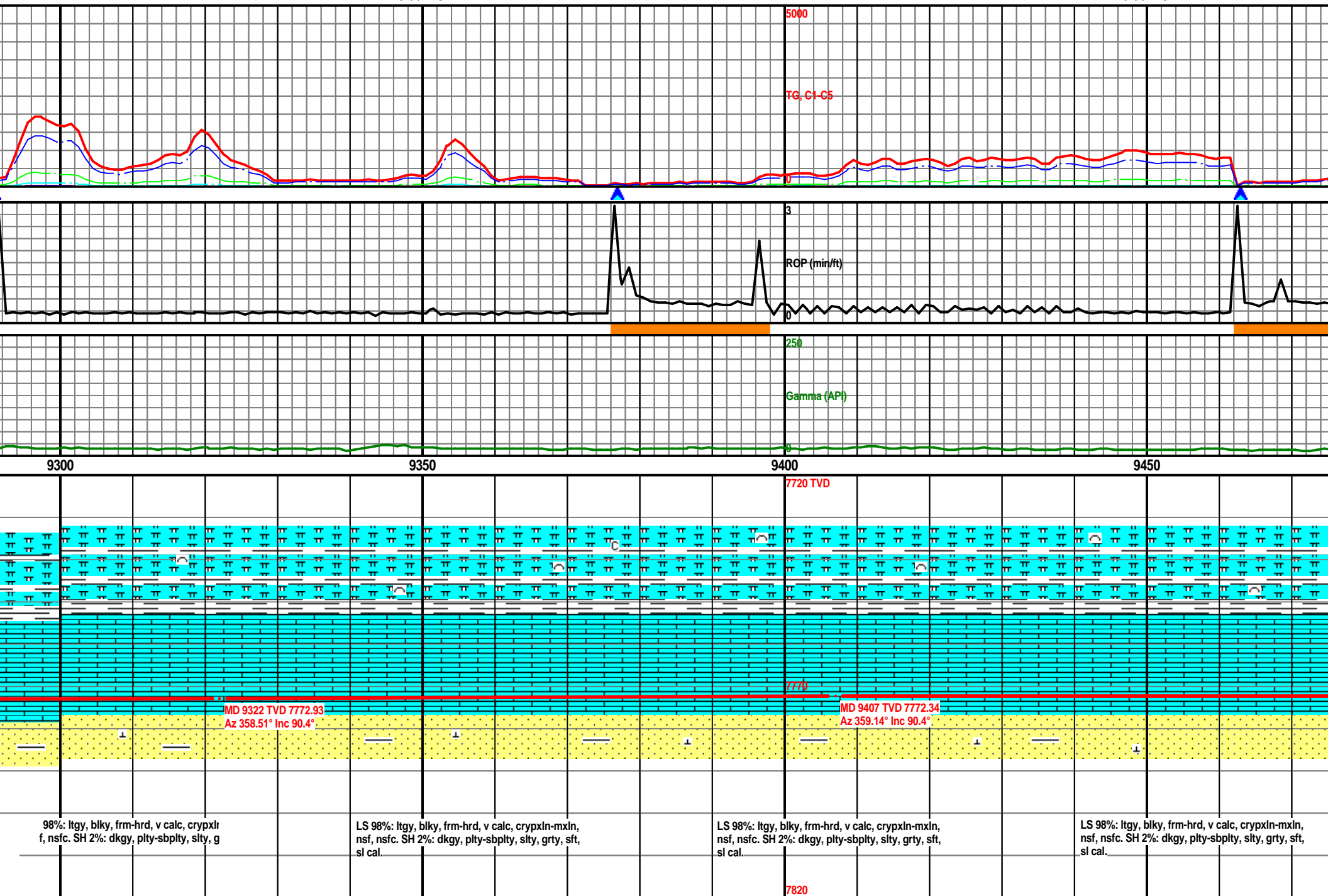
MW: 9.0 / VIS: 42

MW: 9.0 / VIS: 42



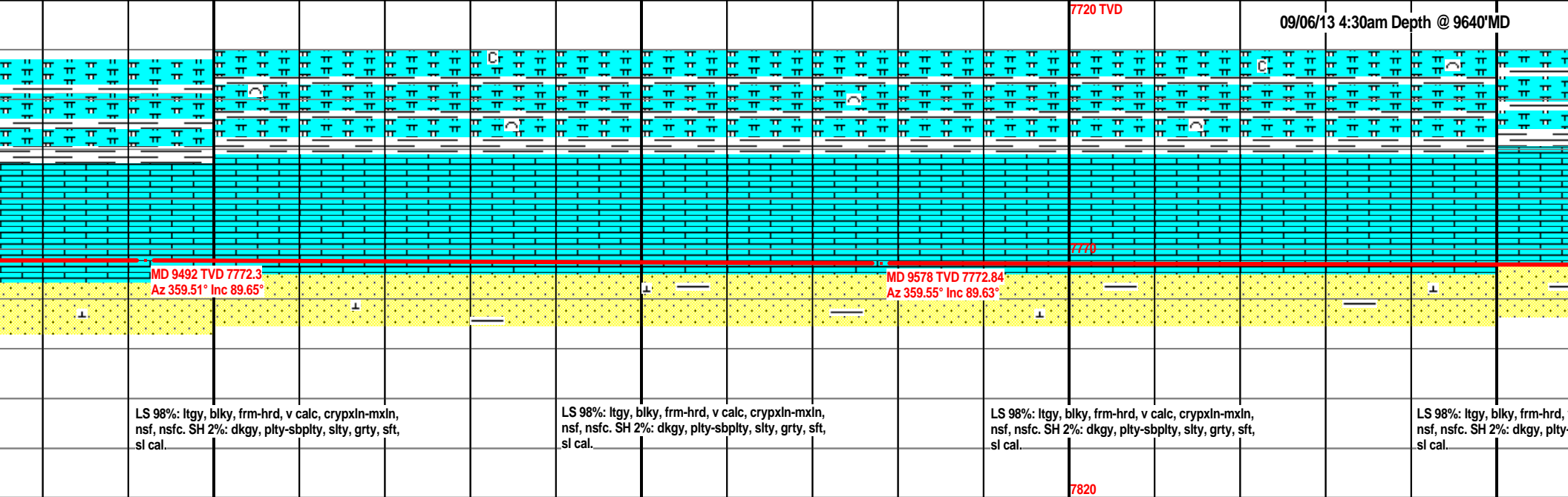
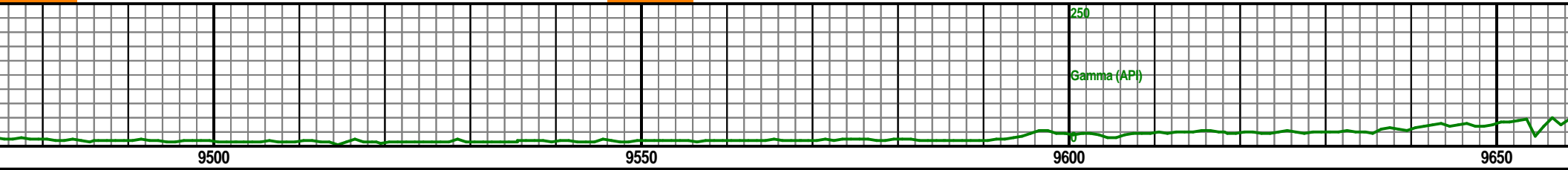
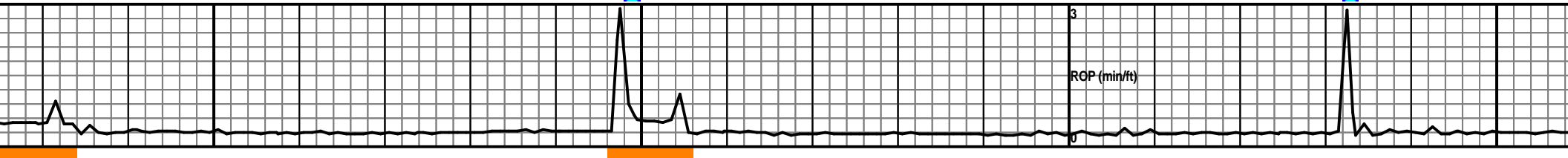
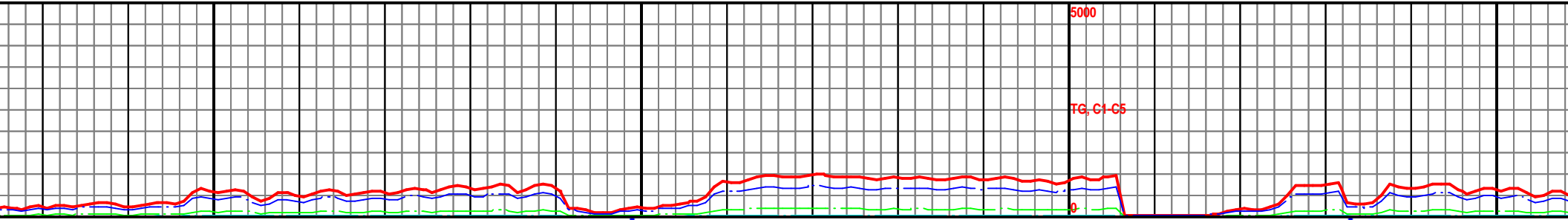
MW: 9.0 / VIS: 42

MW: 9.0 / VIS: 42



MW: 9.0 / VIS: 43

MW: 9.0 / VIS: 43



MW: 9.0 / VIS: 43

Gas Show #2
9780'-10714'

5000

TG, C1-C5

0

3

RGF (min/ft)

0

250

Gamma (API)

0

9700

9750

9800

7720 TVD

MD 9663 TVD 7773.19
Az 0.26° Inc 89.9°

MD 9748 TVD 7774.23
Az 359.27° Inc 88.7°

7710

calc, crypxli
sbplty, slty, g

LS 98%: ltgy, blkly, frm-hrd, v calc, crypxln-mxin,
nsf, nsfc. SH 2%: dkgy, plty-sbplty, slty, grty, sft,
sl cal.

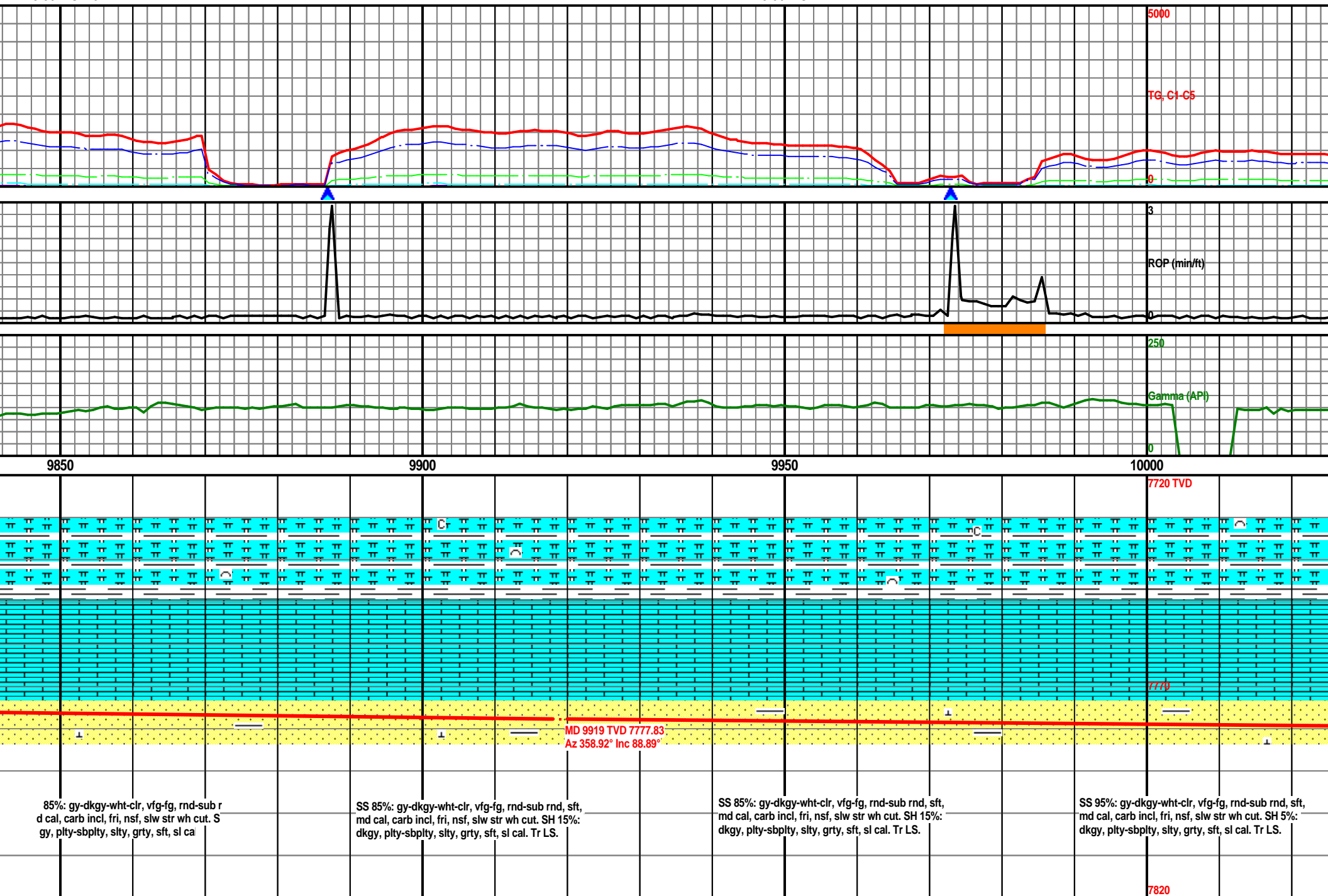
LS 75%: ltgy, blkly, frm-hrd, v calc, crypxln-mxin,
nsf, nsfc. SS 20%: gy-dkgy-wht-clr, vfg-fg,
rnd-sub rnd, sft, md cal, carb incl, fri, nsf, slw str
wh cut. SH 5%: dkgy, plty-sbplty, slty, grty, sft, sl
cal.

LS 20%: ltgy, blkly, frm-hrd, v calc, crypxln-mxin,
nsf, nsfc. SS 75%: gy-dkgy-wht-clr, vfg-fg,
rnd-sub rnd, sft, md cal, carb incl, fri, nsf, slw str
wh cut. SH 5%: dkgy, plty-sbplty, slty, grty, sft, sl
cal.

7820

MW: 9.0 / VIS: 43

MW: 9.0 / VIS: 41



MW: 9.0 / VIS: 41

MW: 9.0 / VIS: 41

5000

TG, C1-C5

0

3

RGP (min/ft)

250

Gamma (API)

0

10050

10100

10150

10200

7720 TVD

7710

MD 10089 TVD 7780.35
Az 359.73° Inc 89.41°

MD 10174 TVD 7780.1
Az 0.32° Inc 90.92°

SS 95%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, fri, nsf, slw str wh cut. SH 5%:
dkgy, plty-sbplty, silty, grty, sft, sl cal. Tr LS.

SS 95%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, fri, nsf, slw str wh cut. SH 5%:
dkgy, plty-sbplty, silty, grty, sft, sl cal. Tr LS.

SS 95%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, fri, nsf, slw str wh cut. SH 5%:
dkgy, plty-sbplty, silty, grty, sft, sl cal. Tr LS.

SS 95%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, fri, nsf, slw str wh cut. SH 5%:
dkgy, plty-sbplty, silty, grty, sft, sl cal. Tr LS.

7820

MW: 9.0 / VIS: 40

MW: 9.0 / VIS: 40

CG = 1397 U

10250

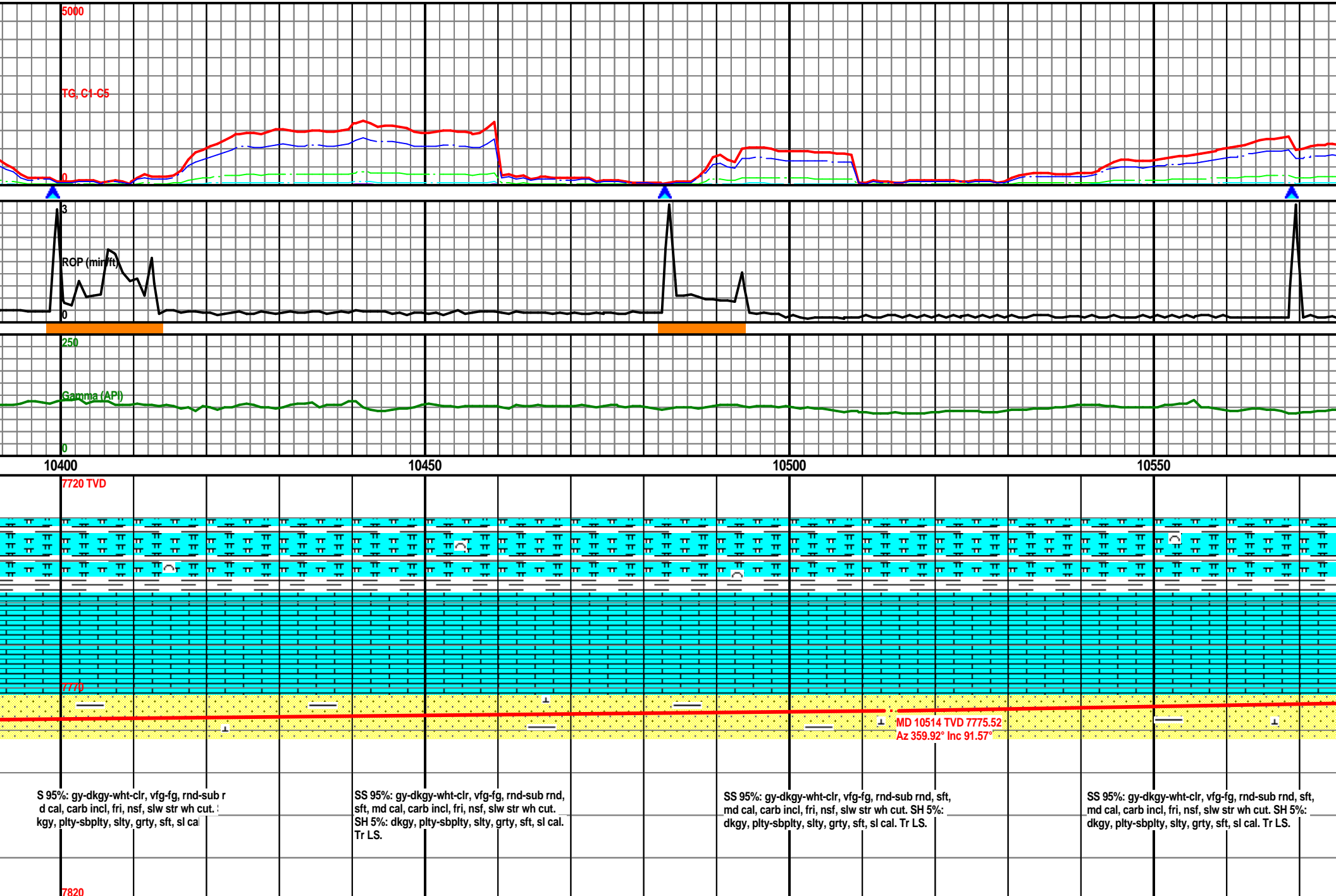
10300

10350

MD 10344 TVD 7778.29
Az 0.01° Inc 90.3°-fg, rnd-sub r
str wh cut. :
sft, sl caSS 95%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, fri, nsf, slw str wh cut. SH 5%:
dkgy, plty-sbplty, slty, grty, sft, sl cal. Tr LS.SS 95%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd,
sft, md cal, carb incl, fri, nsf, slw str wh cut.
SH 5%: dkgy, plty-sbplty, slty, grty, sft, sl cal.
Tr LS.SS 95%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, fri, nsf, slw str wh cut. SH 5%:
dkgy, plty-sbplty, slty, grty, sft, sl cal. Tr LS.

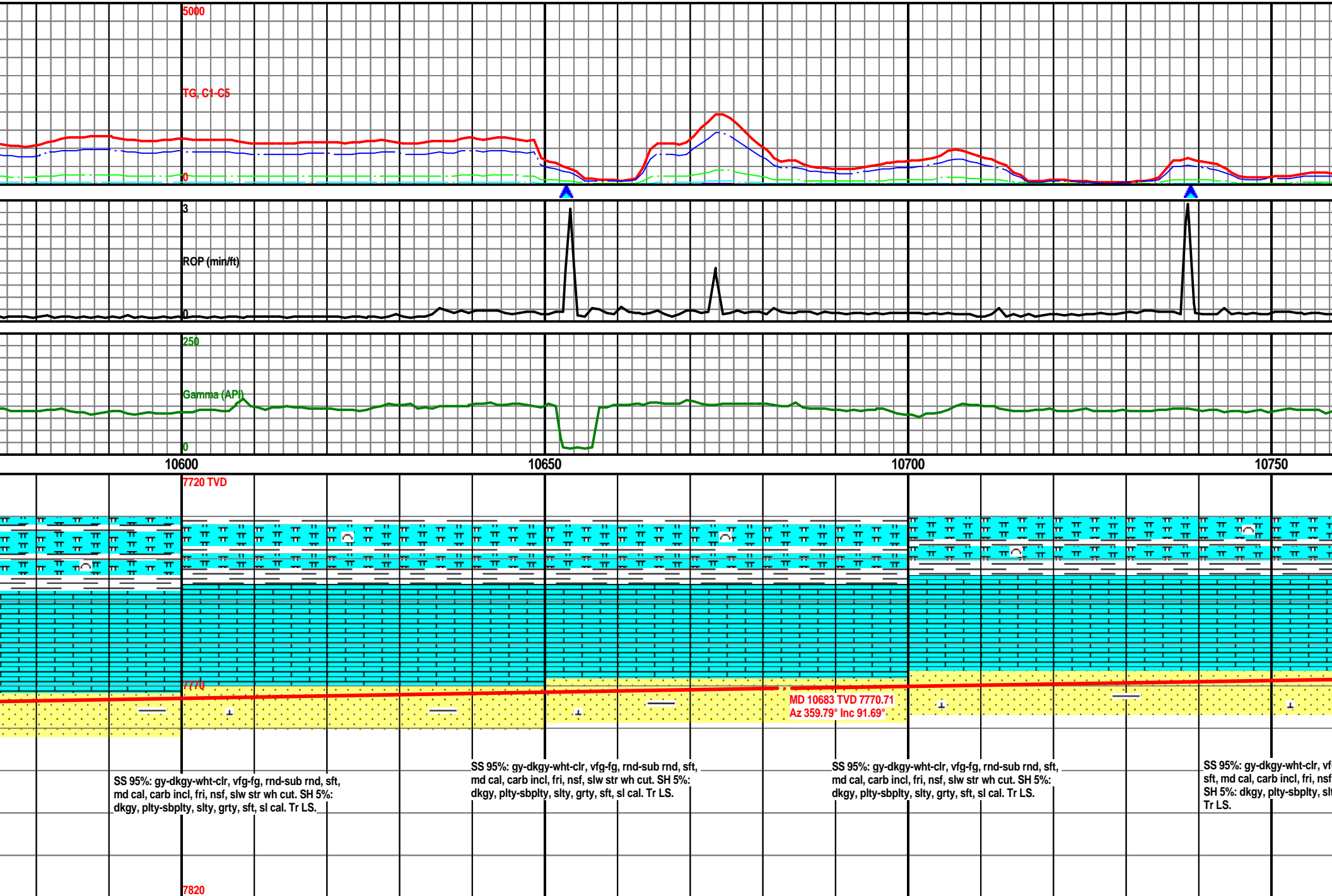
MW: 9.0 / VIS: 40

MW: 8.9 / VIS: 40

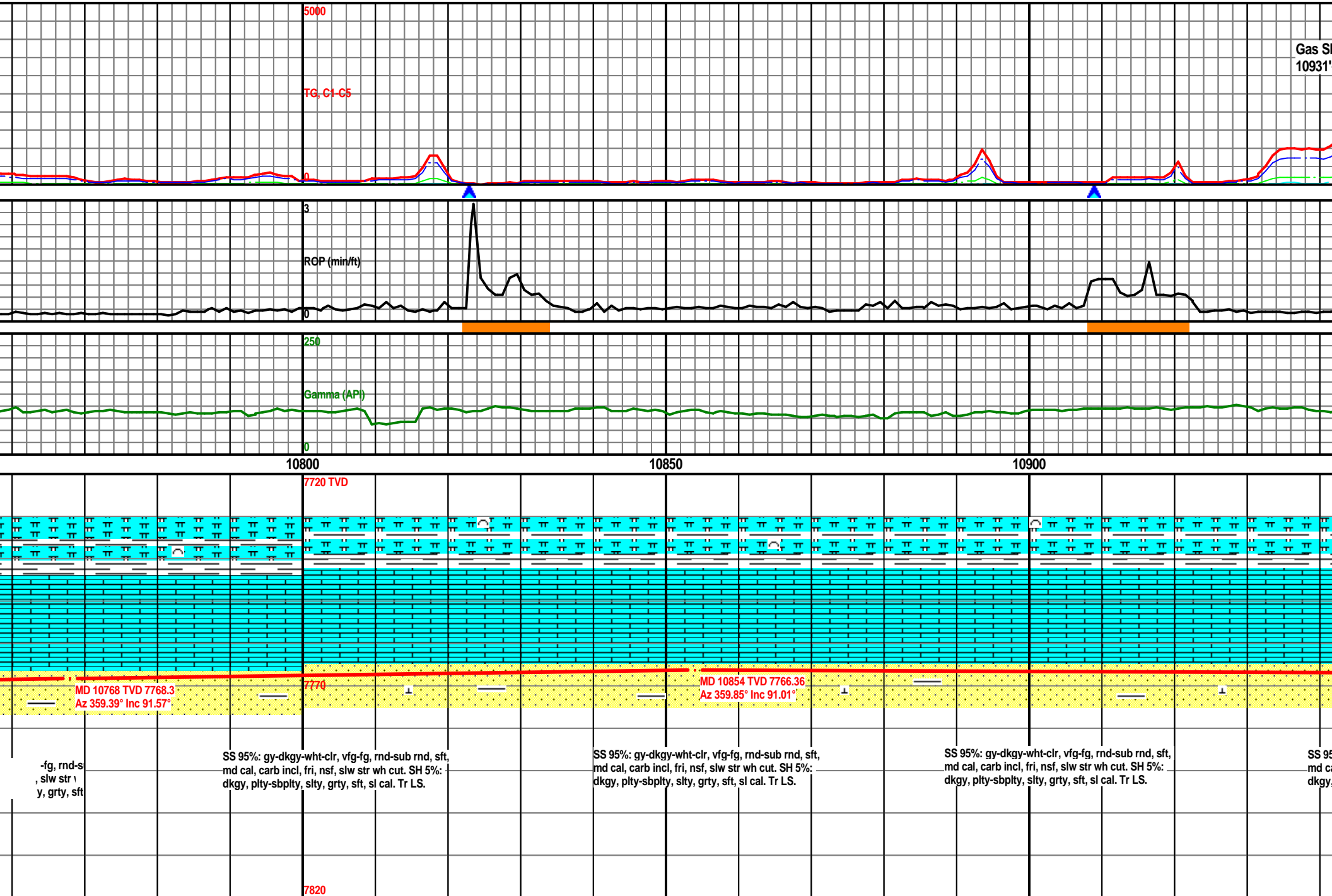


MW: 8.9 / VIS: 40

MW: 9.0 / VIS: 40

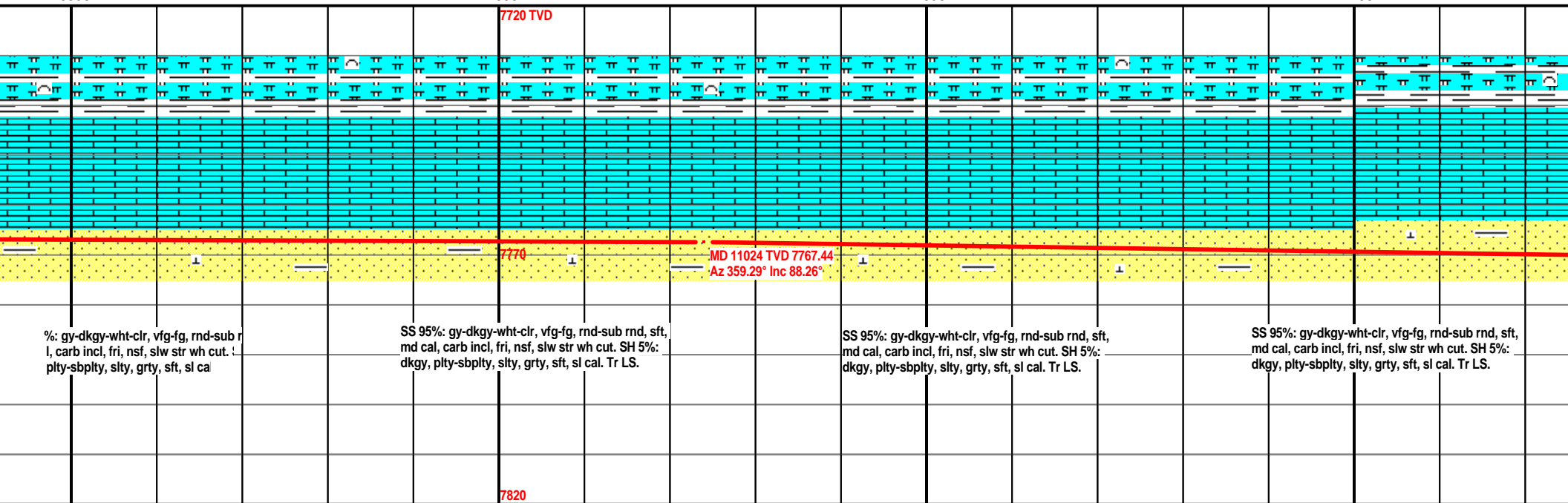
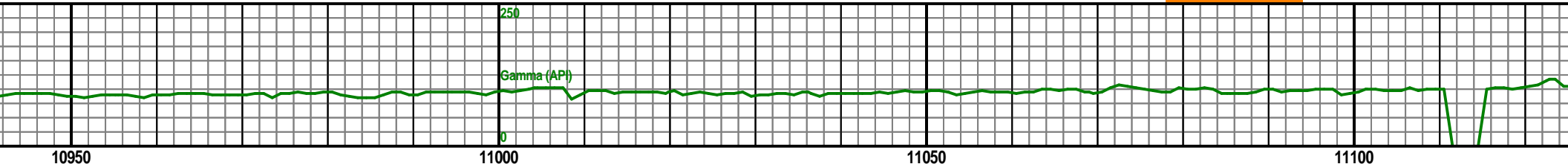
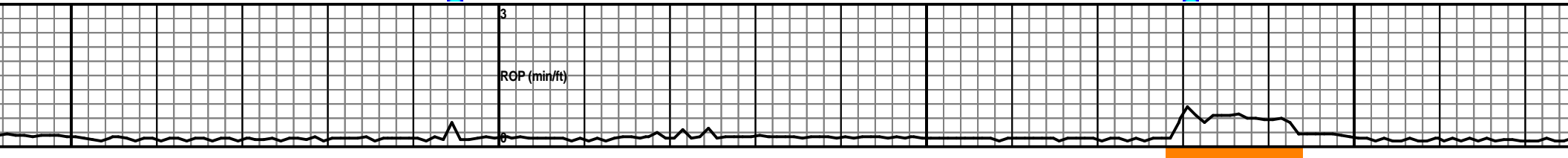
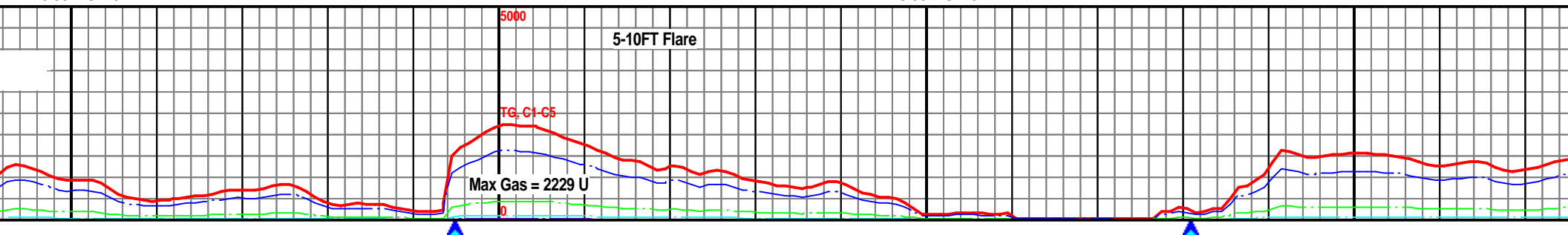


MW: 9.0 / VIS: 40



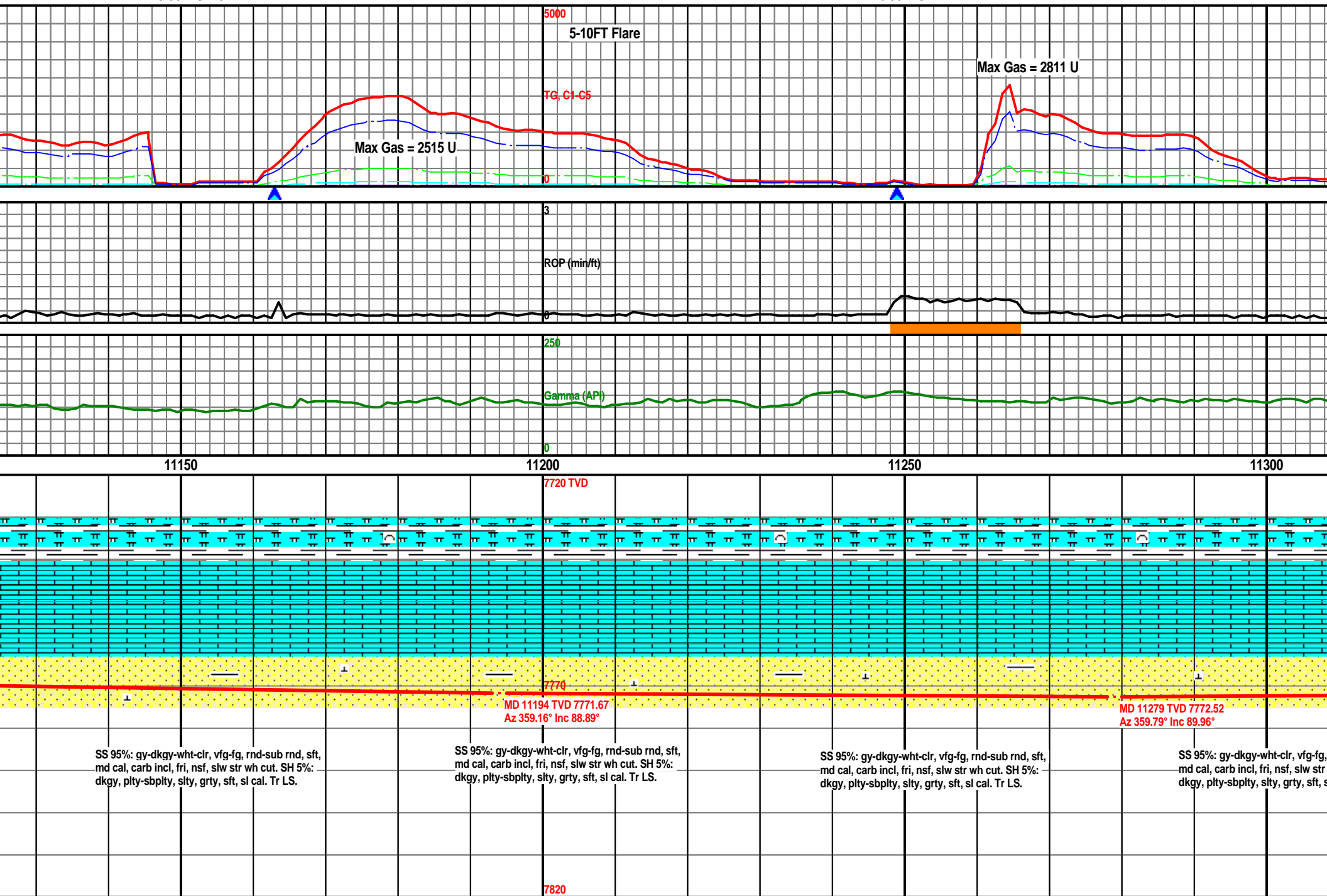
MW: 9.0 / VIS: 40

MW: 9.0 / VIS: 40



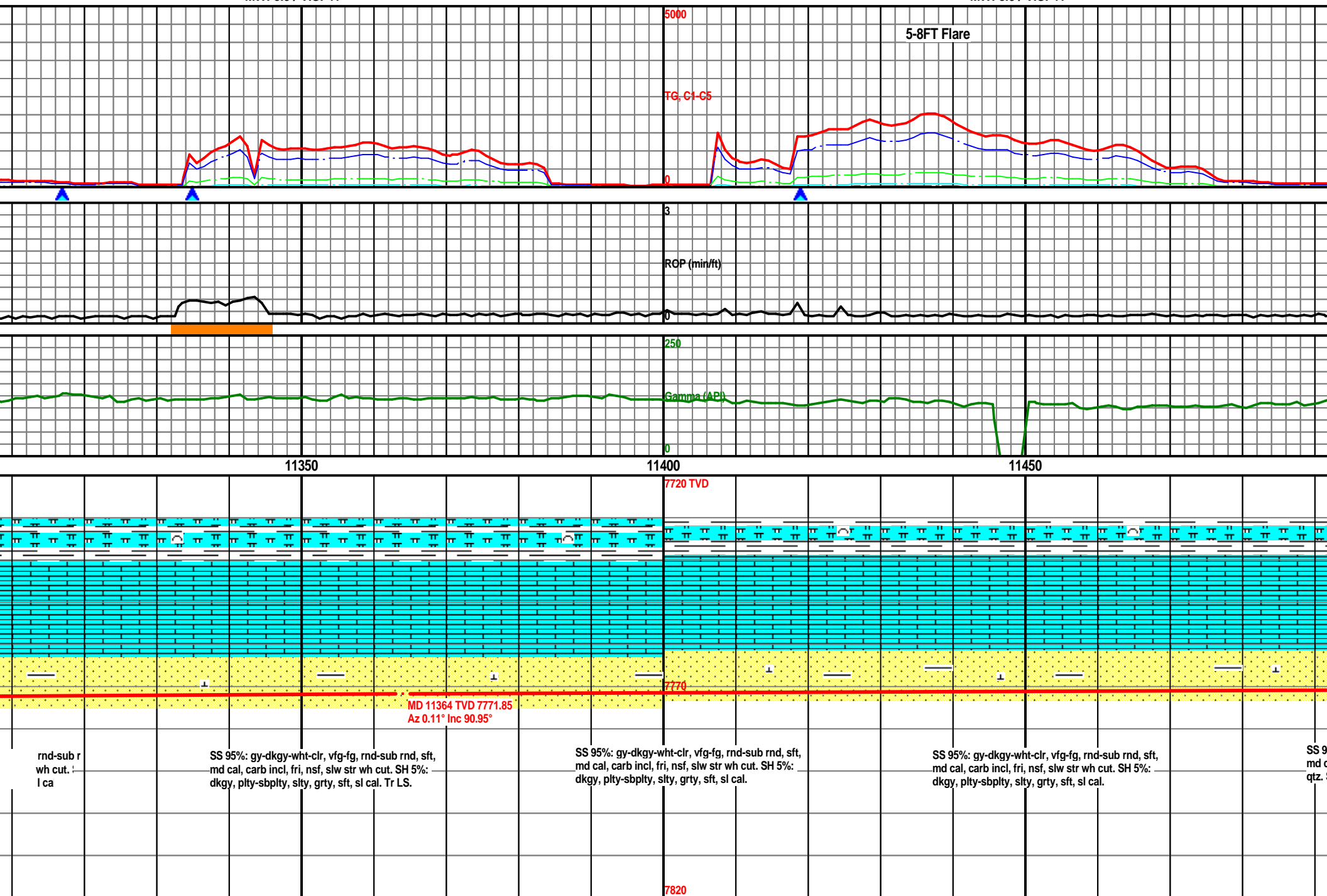
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MW: 8.9 / VIS: 41



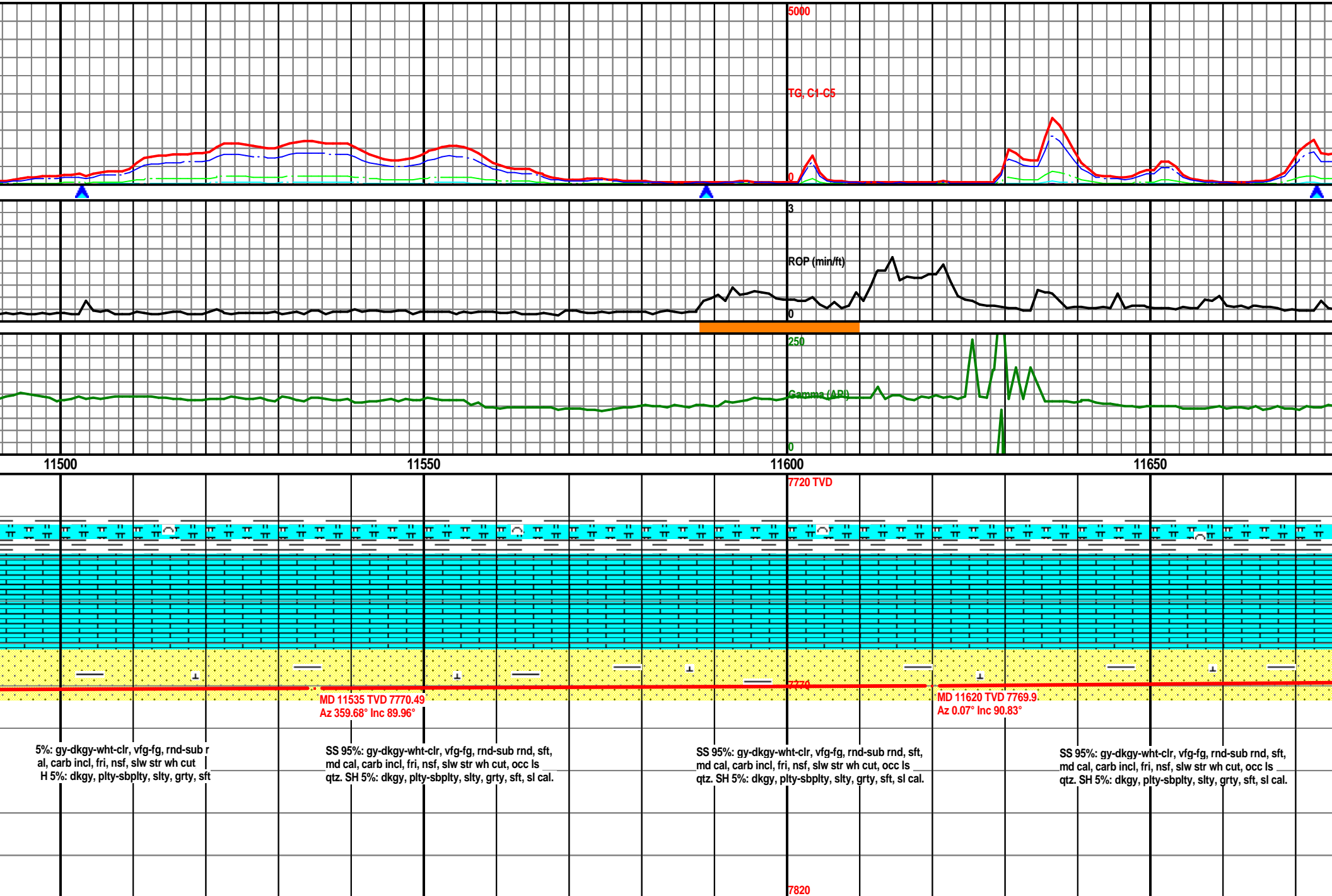
MW: 8.9 / VIS: 41

MW: 8.9 / VIS: 41



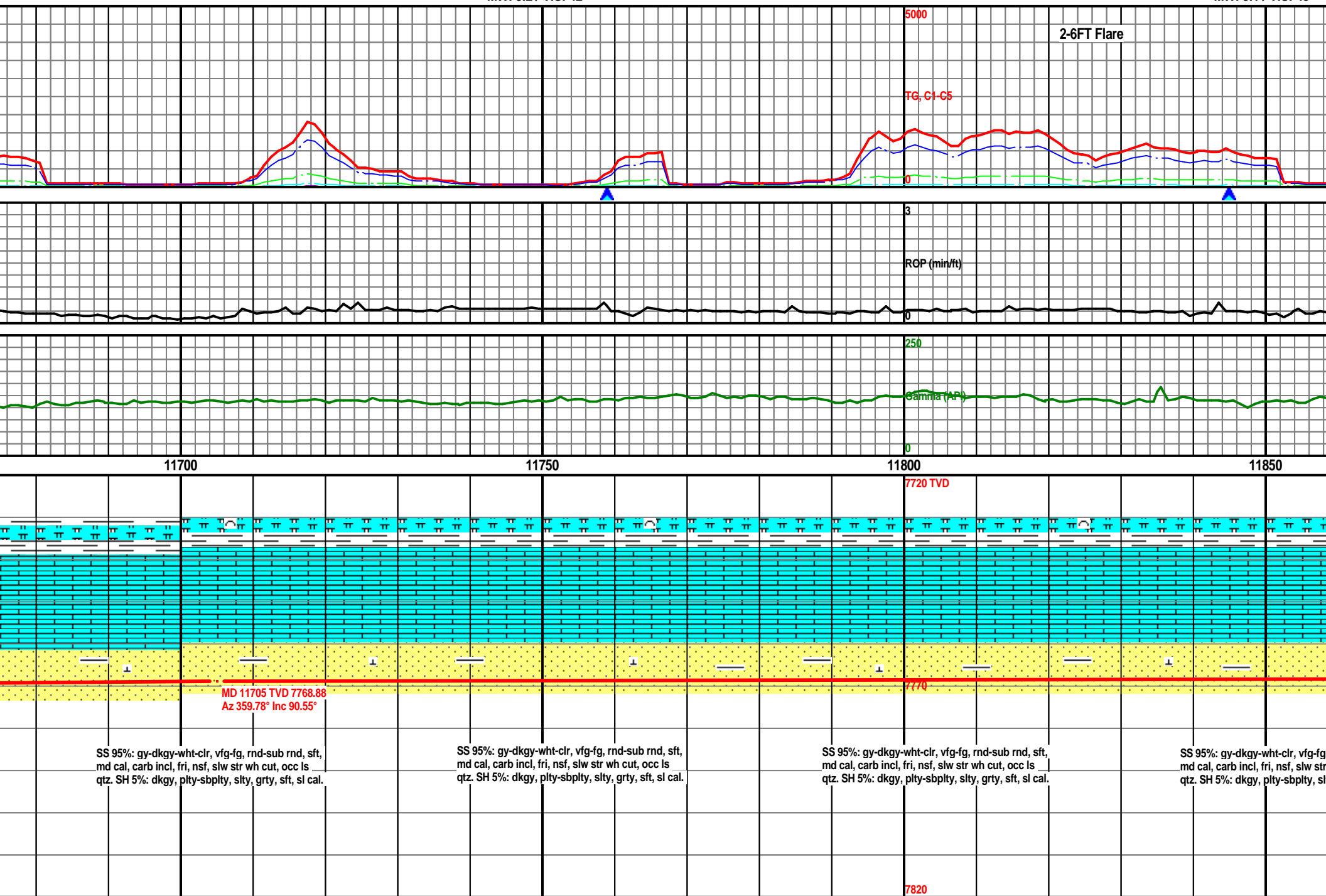
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MW: 9.2 / VIS: 42

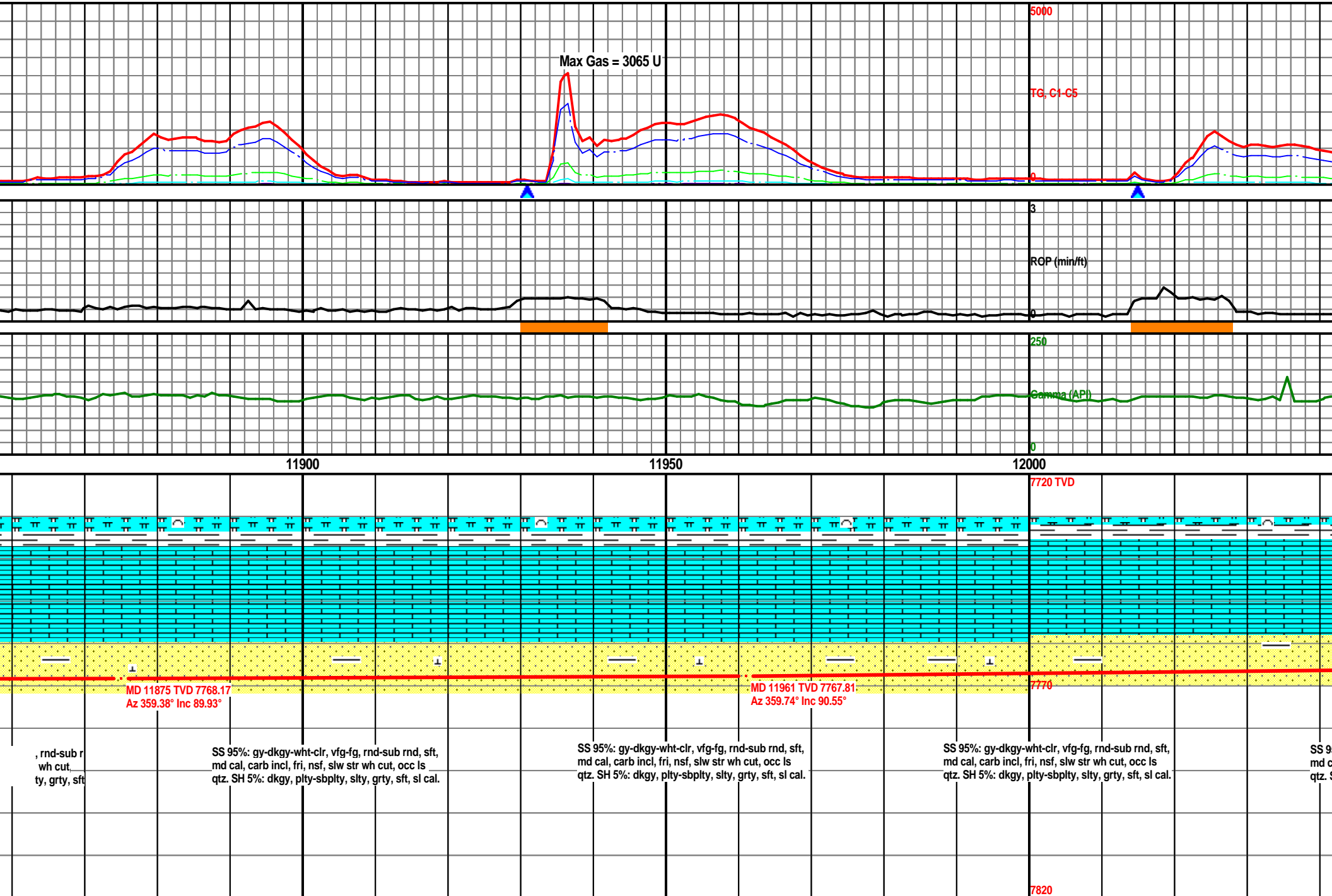


MW: 9.2 / VIS: 42

MW: 9.1 / VIS: 43

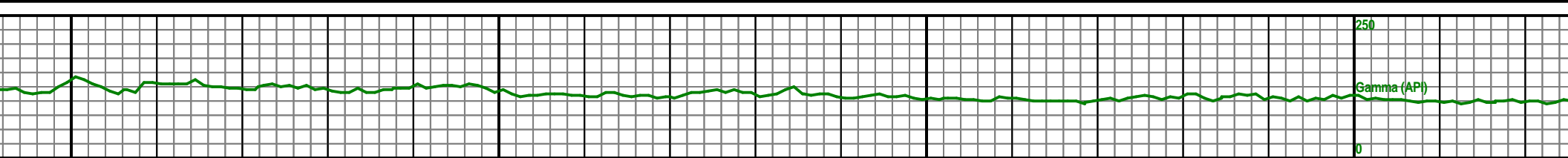
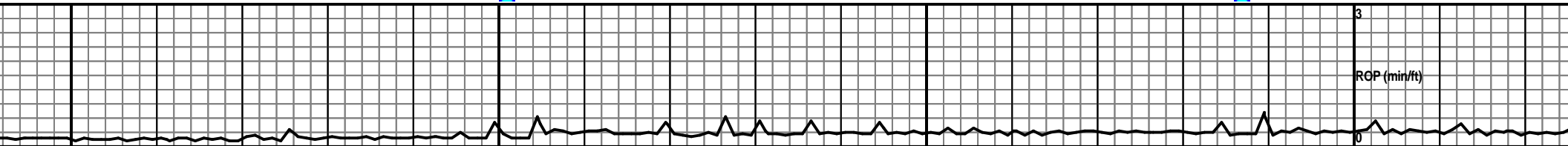
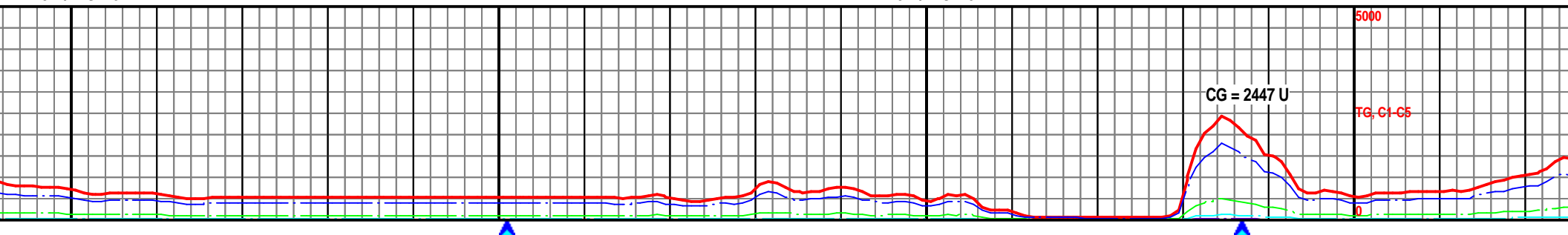


MW: 9.1 / VIS: 43



MW: 9.1 / VIS: 43

MW: 9.1 / VIS: 43

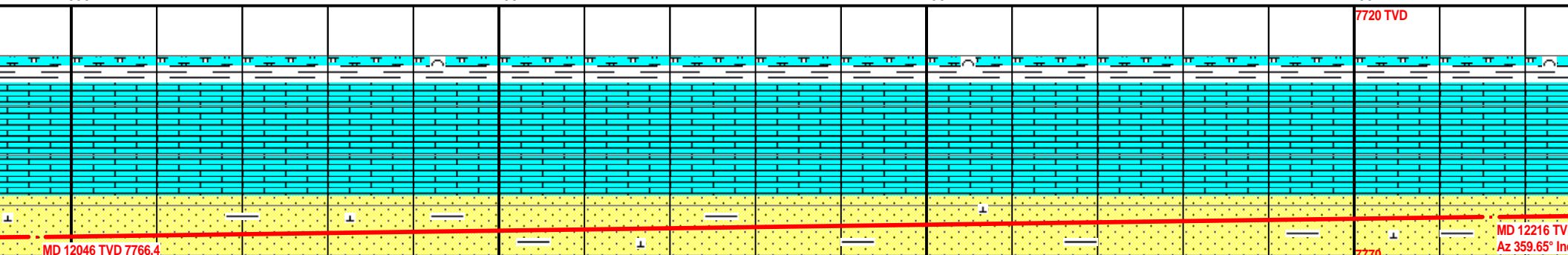


12050

12100

12150

12200



MD 12046 TVD 7766.4
Az 0.13° Inc 91.35°

MD 12216 TVD
Az 359.65° Inc

%: gy-dkgy-wht-clr, vfg-fg, rnd-sub r
al, carb incl, fri, nsf, slw str wh cut
H 5%: dkgy, plty-sbplty, slty, grty, sft

SS 95%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, fri, nsf, slw str wh cut, occ ls
qtz. SH 5%: dkgy, plty-sbplty, slty, grty, sft, sl cal.

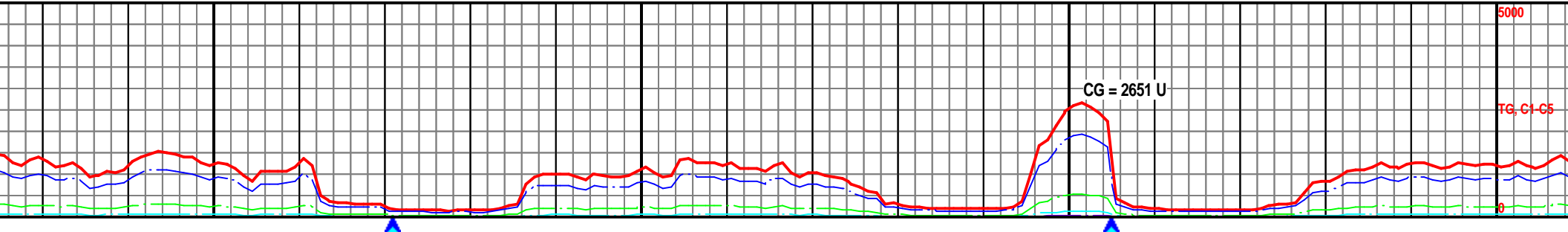
SS 95%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, fri, nsf, slw str wh cut, occ ls
qtz. SH 5%: dkgy, plty-sbplty, slty, grty, sft, sl cal.

SS 95%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, fri, nsf, slw str wh cut, occ ls
qtz. SH 5%: dkgy, plty-sbplty, slty, grty, sft, sl cal.

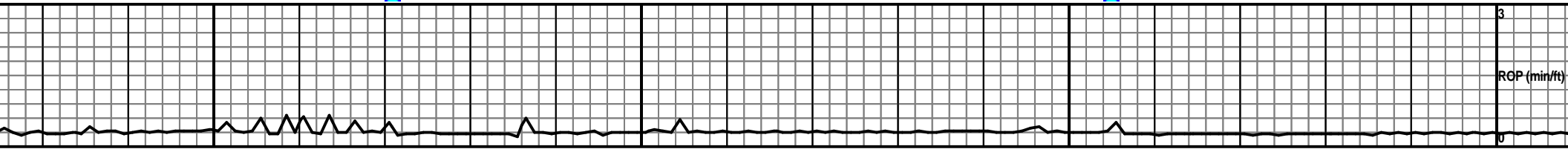
7820

MW: 9.1 / VIS: 43

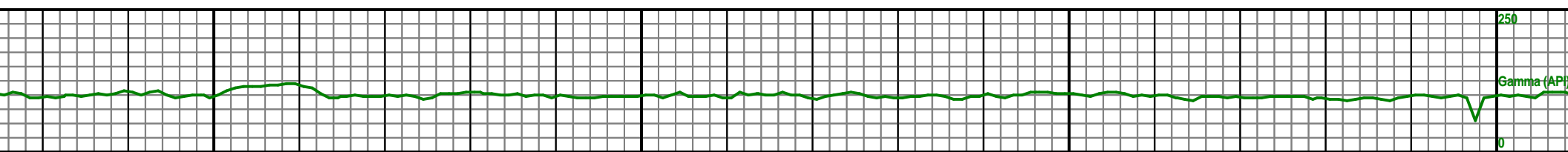
MW: 9.1 / VIS: 43



TG, C1-C5



ROP (min/ft)



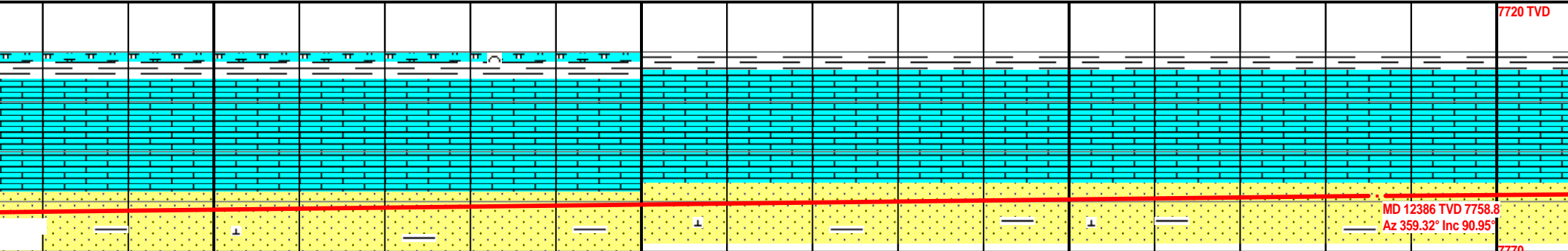
Gamma (API)

12250

12300

12350

12400



7720 TVD

MD 12386 TVD 7758.8
Az 359.32° Inc 90.95°

7770

SS 95%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, fri, nsf, slw str wh cut, occ ls
qtz. SH 5%: dkgy, plty-sbplty, slty, grty, sft, sl cal.

SS 95%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, fri, nsf, slw str wh cut, occ ls
qtz. SH 5%: dkgy, plty-sbplty, slty, grty, sft, sl cal.

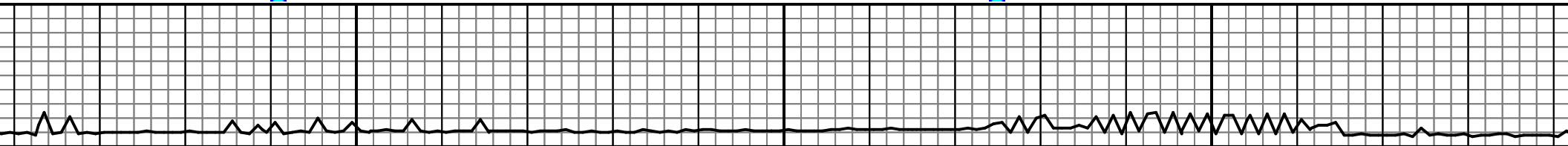
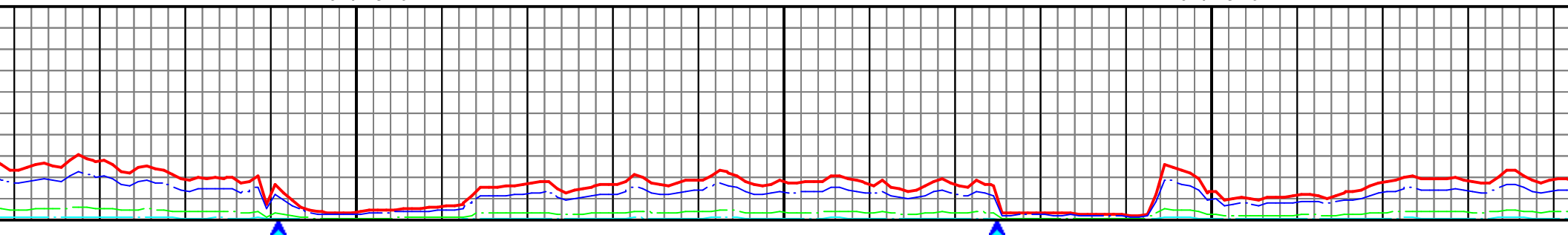
SS 95%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, fri, nsf, slw str wh cut, occ ls
qtz. SH 5%: dkgy, plty-sbplty, slty, grty, sft, sl cal.

SS 95%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, fri, nsf, slw str wh cut, occ ls
qtz. SH 5%: dkgy, plty-sbplty, slty, grty, sft, sl cal.

7820

MW: 9.1 / VIS: 43

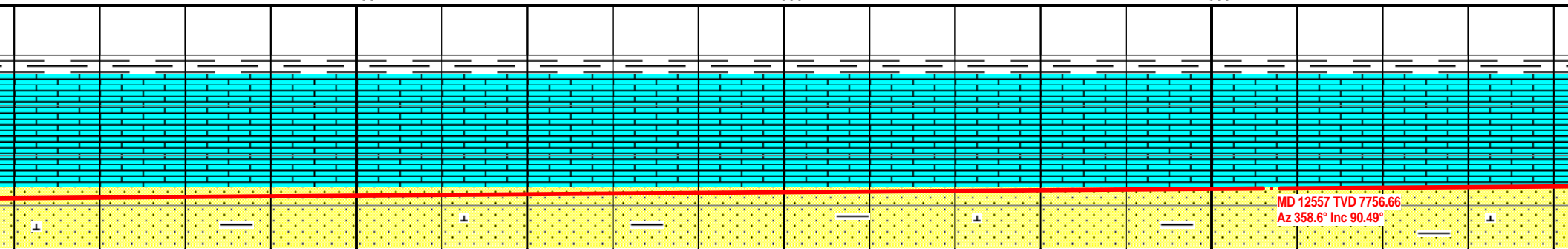
MW: 9.1 / VIS: 43



12450

12500

12550



g, rnd-sub r
tr wh cut
silty, grty, sft

SS 95%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, fri, nsf, slw str wh cut, occ ls
qtz. SH 5%: dkgy, plty-sbplty, silty, grty, sft, sl cal.

SS 95%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, fri, nsf, slw str wh cut, occ ls
qtz. SH 5%: dkgy, plty-sbplty, silty, grty, sft, sl cal.

LS 98%: ltgy, blkgy, frm-hrd, v calc, crypxln-mxln,
nsf, nsfc. SH 2%: dkgy, plty-sbplty, silty, grty, sft,
sl cal. Tr SS.

LS 98%
nsf, m
sl cal

MW: 9.1 / VIS: 43

5000

TG, C1-C5

0

TD of 12707' MD
Achieved 09/07/13
1:20am. T.O.O.H to
run liner.

Casing Gas = 5876 U

3

RGP (min/ft)

0

250

Gamma (API)

0

Two man logging unit
with sample program and
gas analyzer released
09/08/13.

12600

12650

12700

7720 TVD

7770

MD 12652 TVD 7755.39
Az 358.29° Inc 91.08°

%: ltgy, blk, frm-hrd, v calc, crypxln
sfc. SH 2%: dkgy, plty-sbplty, slty, grty, sft,

LS 98%: ltgy, blk, frm-hrd, v calc, crypxln-mxin,
nsf, nsfc. SH 2%: dkgy, plty-sbplty, slty, grty, sft,
sl cal. Tr SS.

LS 98%: ltgy, blk, frm-hrd, v calc, crypxln-mxin,
nsf, nsfc. SH 2%: dkgy, plty-sbplty, slty, grty, sft,
sl cal. Tr SS.

7820