Scale 1:200 Imperial
Measured Depth Log

Well Name:	**NRC 3C-4HZX**		
Location:	**Weld County, CO.**		
License Number:	**05123386070100**	**Region:**	**DJ Basin**
Spud Date:	**02/28/14 (03/20/14)**	**Drilling Completed:**	**03/22/14**
Surface Coordinates:	**350'FSL & 1980'FWL, SEC.9, T1N-R67W**		
Bottom Hole Coordinates:	**460'FNL & 2290'FWL, SEC.4, T1N-R67W**		
Ground Elevation (ft):	**5052'**	**K.B. Elevation (ft):**	**5068'**
Logged Interval (ft):	**7800' To: 17375'**	**Total Depth (ft):**	**17375'**
Formation:	**Codell**		
Type of Drilling Fluid:	**Water Base Vertical / Oil Base Horizontal**		

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

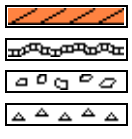
Name: Scott Crozier / Ben Thompson
Company: Great Divide Consulting, Inc.
Address: P.O. Box 630263
Highlands Ranch, CO 80163

Cores

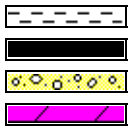
DSTs

Comments

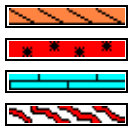
ROCK TYPES



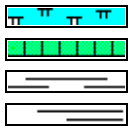
Anhy
Bent
Brec
Cht



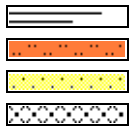
Clyst
Coal
Congl
Dol



Gyp
Igne
Lmst
Meta



Mrlst
Salt
Shale
Shcol



Shgy
Sltst
Ss
Till

ACCESSORIES

MINERAL

Anhy
Arggrn
Arg
Bent
Bit
Brecfrag
Calc
Carb
Chtdk
Chtlt
Dol
Feldspar
Ferrpel
Ferr
Glau

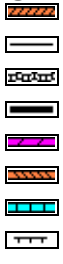
Gyp
Hvymin
Kaol
Marl
Minxl
Nodule
Phos
Pyr
Salt
Sandy
Silt
Sil
Sulphur
Tuff

FOSSIL

Algae
Amph
Belm
Bioclst
Brach
Bryozoa
Cephal
Coral
Crin
Echin
Fish
Foram
Fossil
Gastro
Oolite

Ostra
Pelec
Pellet
Pisolite
Plant
Strom

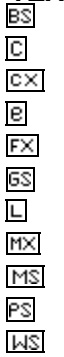
STRINGER



Anhy
Arg
Bent
Coal
Dol
Gyp
Ls
Mrst

Sltstrg
Ssstrg

TEXTURE



Boundst
Chalky
Cryxln
Earthy
Finexln
Grainst
Lithogr
Microxln
Mudst
Packst
Wackest

OTHER SYMBOLS

POROSITY
- Earthy
- Fenest
- Fracture
- Inter
- Moldic
- Organic
- Pinpoint
- Vuggy

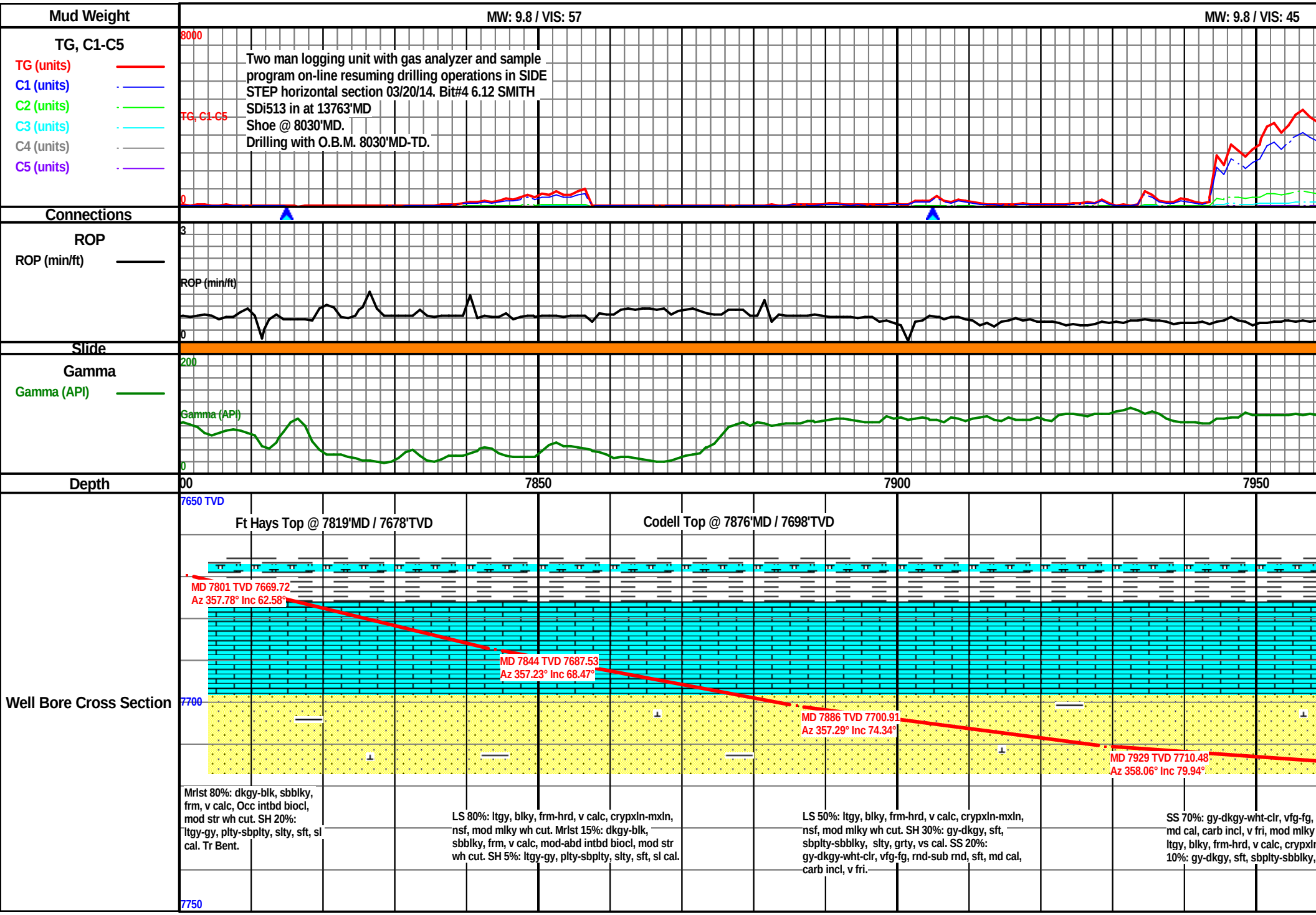
SORTING
- Well
- Moderate
- Poor

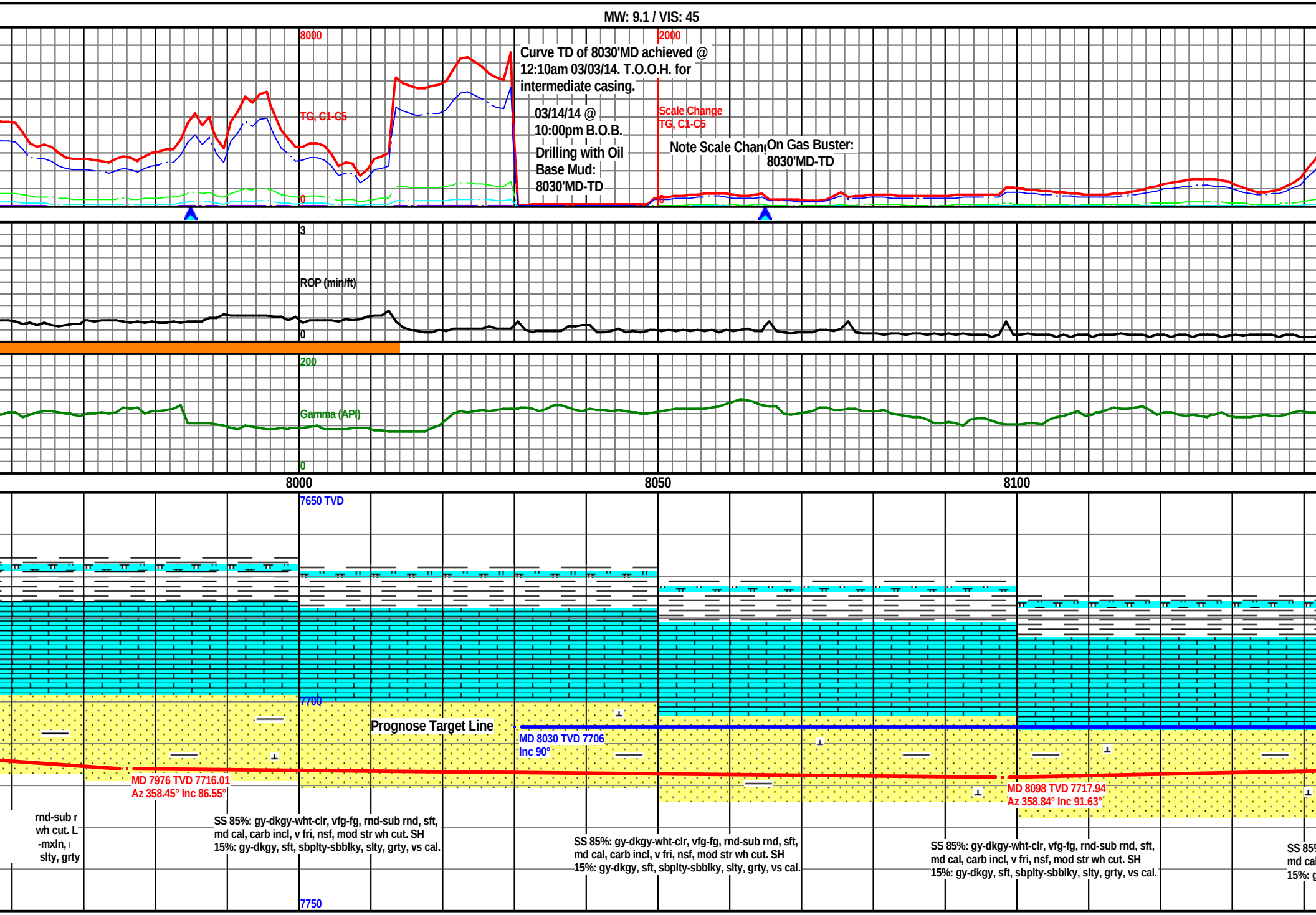
ROUNDING
- Rounded
- Subrnd
- Subang
- Angular

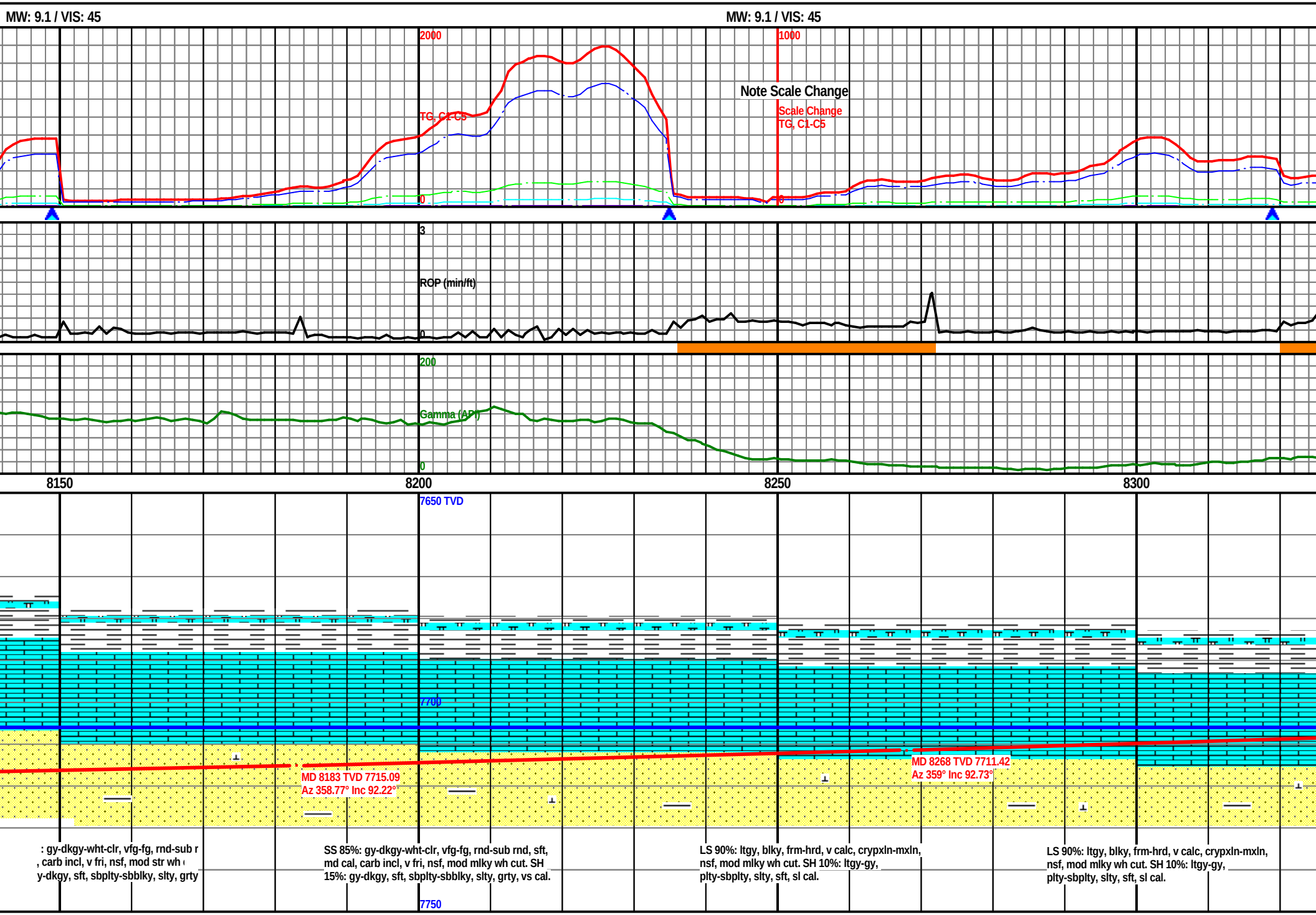
OIL SHOW
- Even
- Spotted
- Ques
- Dead

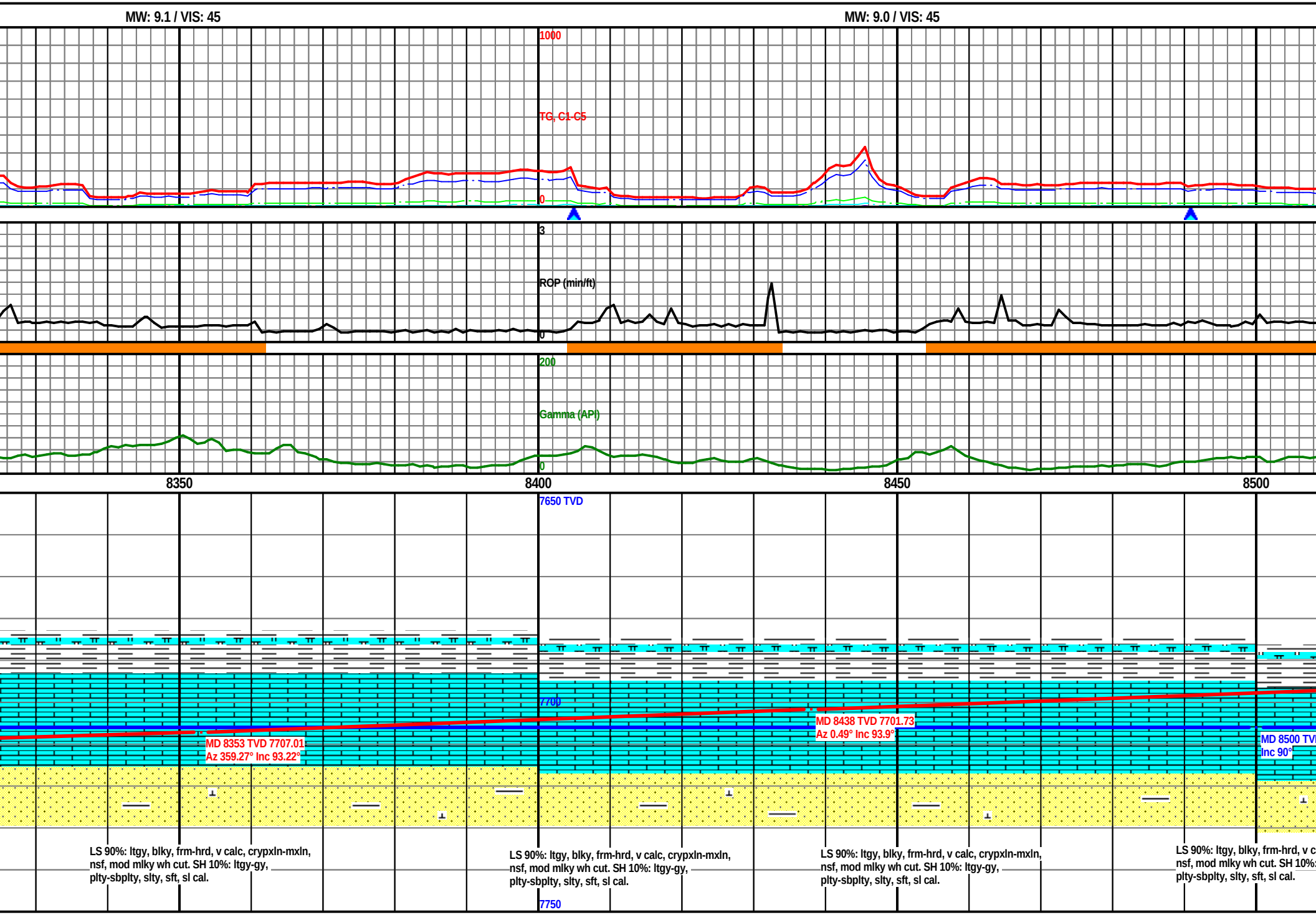
INTERVAL
- Core
- Dst

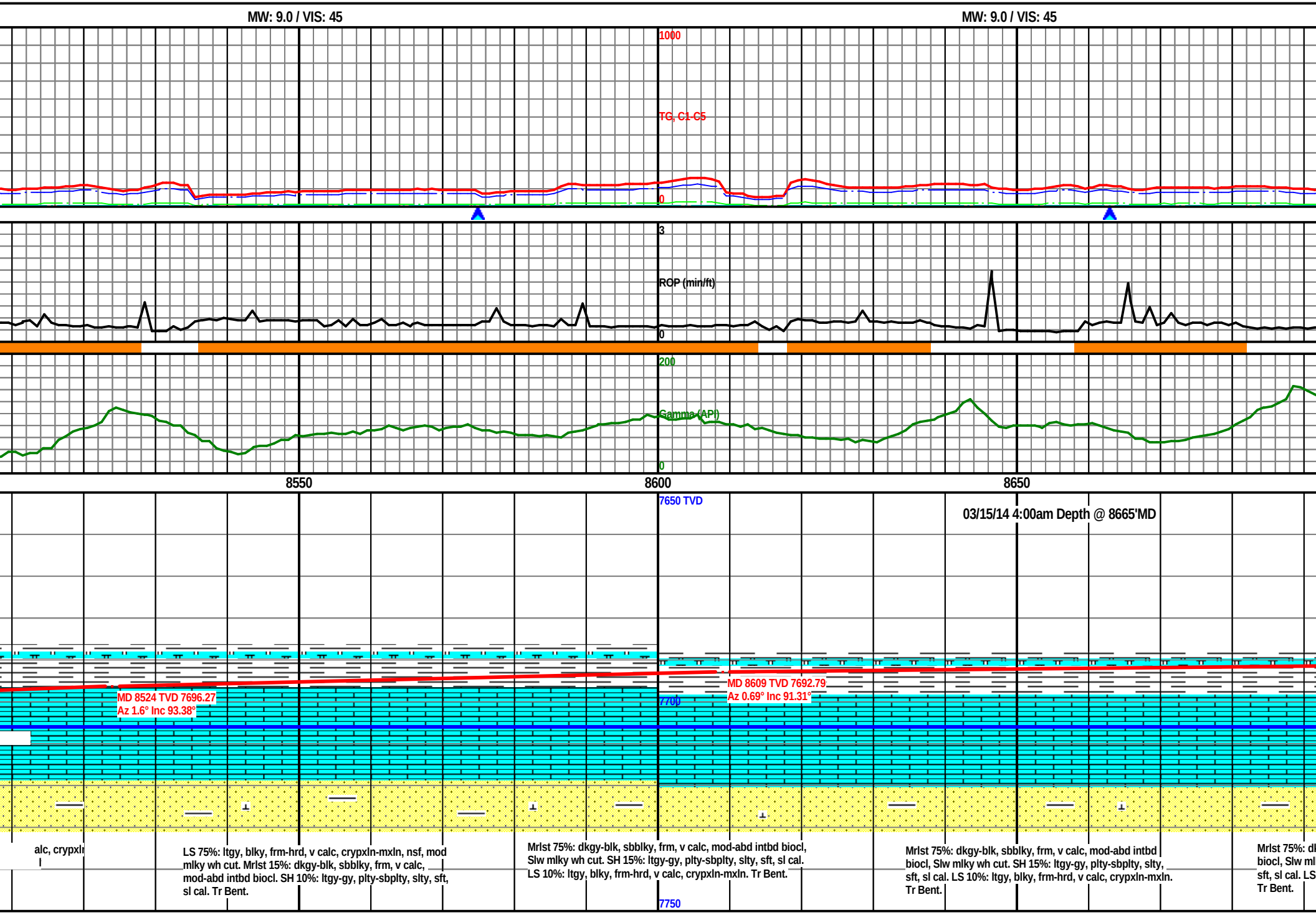
EVENT
- Rft
- Connection

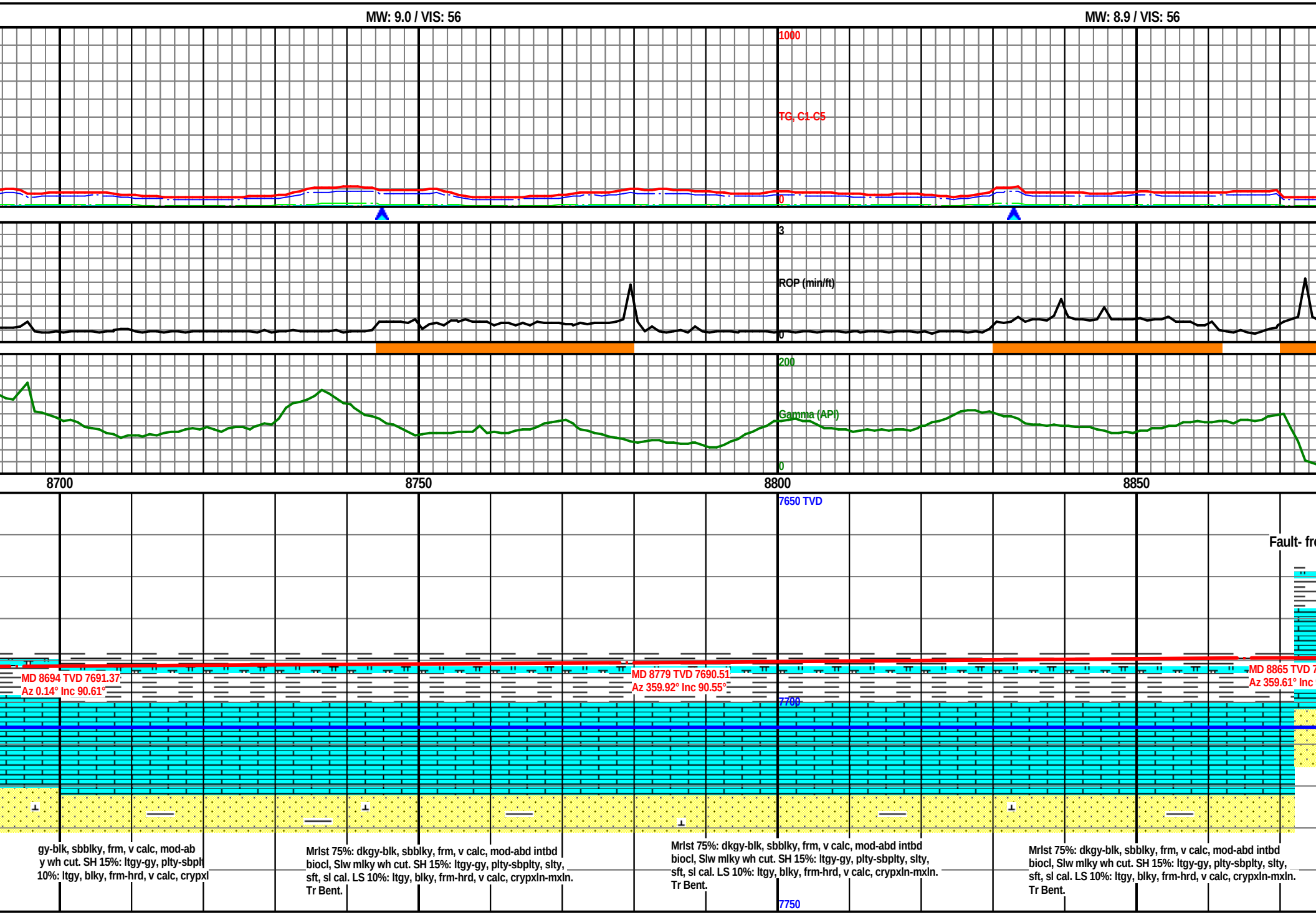

Mud Weight
MW: 9.8 / VIS: 57
MW: 9.8 / VIS: 45
TG, C1-C5
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
C5 (units)
8000
TG, C1-C5
0
Two man logging unit with gas analyzer and sample program on-line resuming drilling operations in SIDE STEP horizontal section 03/20/14. Bit#4 6.12 SMITH SDi513 in at 13763'MD
Shoe @ 8030'MD.
Drilling with O.B.M. 8030'MD-TD.
Connections
ROP
ROP (min/ft)
3
ROP (min/ft)
0
Slide
Gamma
Gamma (API)
200
Gamma (API)
0
Depth
00
7850
7900
7950
Well Bore Cross Section
7650 TVD
Ft Hays Top @ 7819'MD / 7678'TVD
Codell Top @ 7876'MD / 7698'TVD
MD 7801 TVD 7669.72
Az 357.78° Inc 62.58°
MD 7844 TVD 7687.53
Az 357.23° Inc 68.47°
MD 7886 TVD 7700.91
Az 357.29° Inc 74.34°
MD 7929 TVD 7710.48
Az 358.06° Inc 79.94°
7700
7750
Mrlst 80%: dkgy-blk, sbblky, frm, v calc, Occ intbd biocl, mod str wh cut. SH 20%: ltgy-gy, plty-sbplty, slty, sft, sl cal. Tr Bent.
LS 80%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. Mrlst 15%: dkgy-blk, sbblky, frm, v calc, mod-abd intbd biocl, mod str wh cut. SH 5%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 50%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 30%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal. SS 20%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri.
SS 70%: gy-dkgy-wht-clr, vfg-fg, md cal, carb incl, v fri, mod mlky ltgy, blky, frm-hrd, v calc, crypxln 10%: gy-dkgy, sft, sbplty-sbblky,

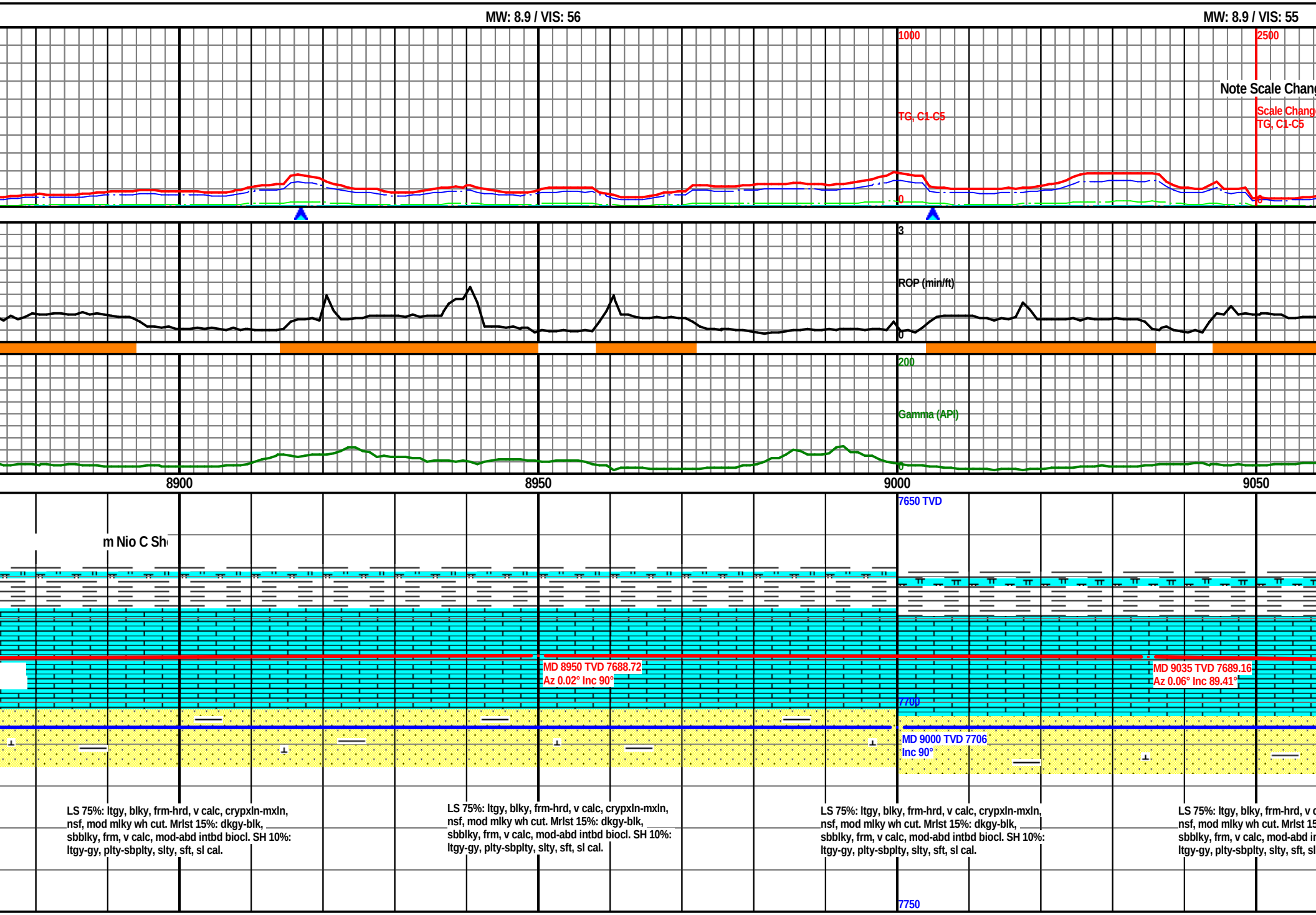

MW: 9.1 / VIS: 45
8000
2000
TG, C1-C5
0
Curve TD of 8030'MD achieved @ 12:10am 03/03/14. T.O.O.H. for intermediate casing.
03/14/14 @ 10:00pm B.O.B.
Drilling with Oil Base Mud:
8030'MD-TD
Scale Change
TG, C1-C5
Note Scale Chan
On Gas Buster:
8030'MD-TD
3
ROP (min/ft)
0
200
Gamma (API)
0
8000
8050
8100
7650 TVD
7700
7750
Prognose Target Line
MD 8030 TVD 7706
Inc 90°
MD 7976 TVD 7716.01
Az 358.45° Inc 86.55°
MD 8098 TVD 7717.94
Az 358.84° Inc 91.63°
rnd-sub r
wh cut. L
-mxln,
slty, grty
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.

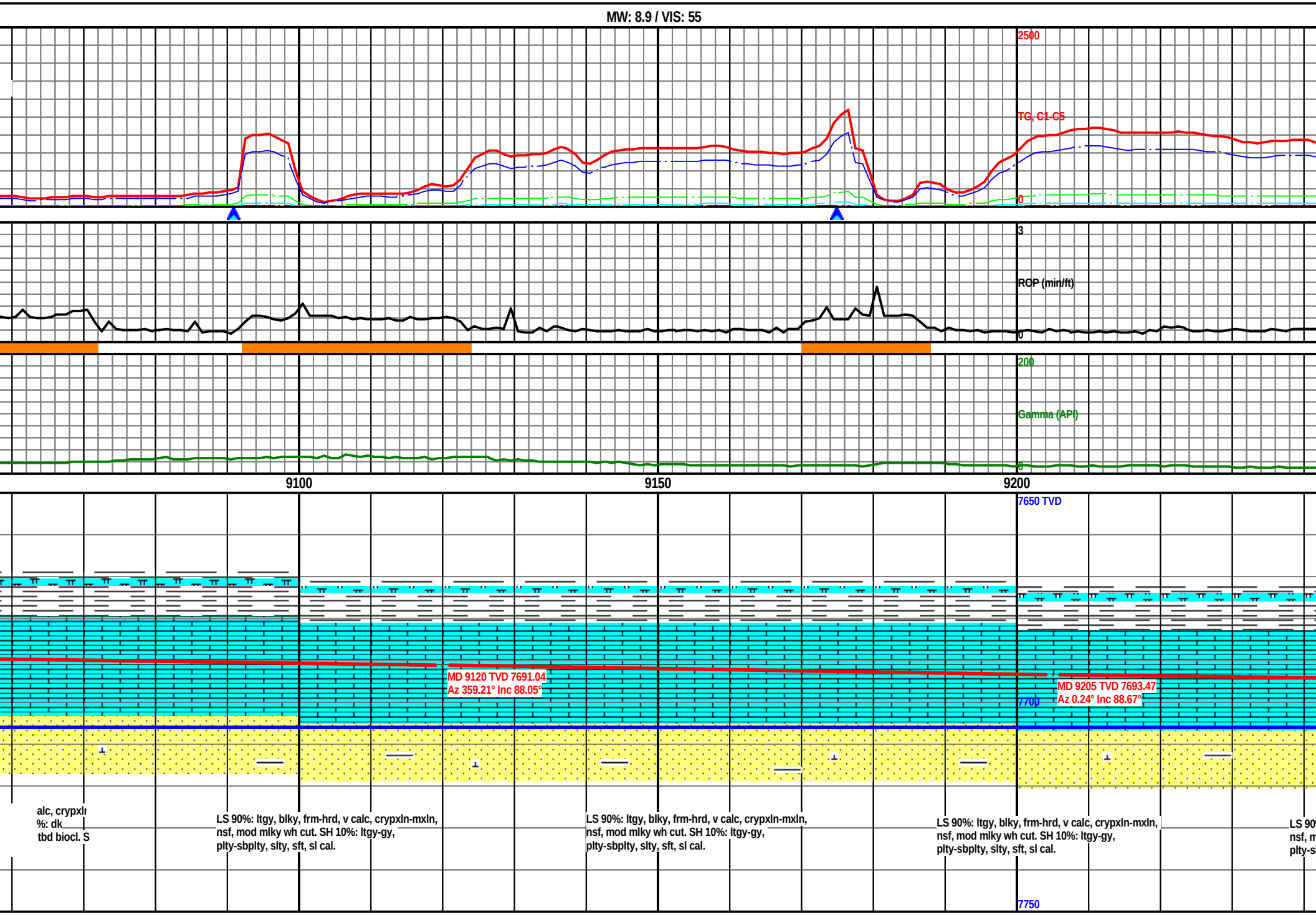

MW: 9.1 / VIS: 45
MW: 9.1 / VIS: 45
2000
TG, C1-C5
0
1000
Note Scale Change
Scale Change
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
8150
8200
8250
8300
7650 TVD
7700
7750
MD 8183 TVD 7715.09
Az 358.77° Inc 92.22°
MD 8268 TVD 7711.42
Az 359° Inc 92.73°
: gy-dkgy-wht-clr, vfg-fg, rnd-sub r
, carb incl, v fri, nsf, mod str wh
y-dkgy, sft, sbplty-sbblky, slty, grty
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod mlky wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.

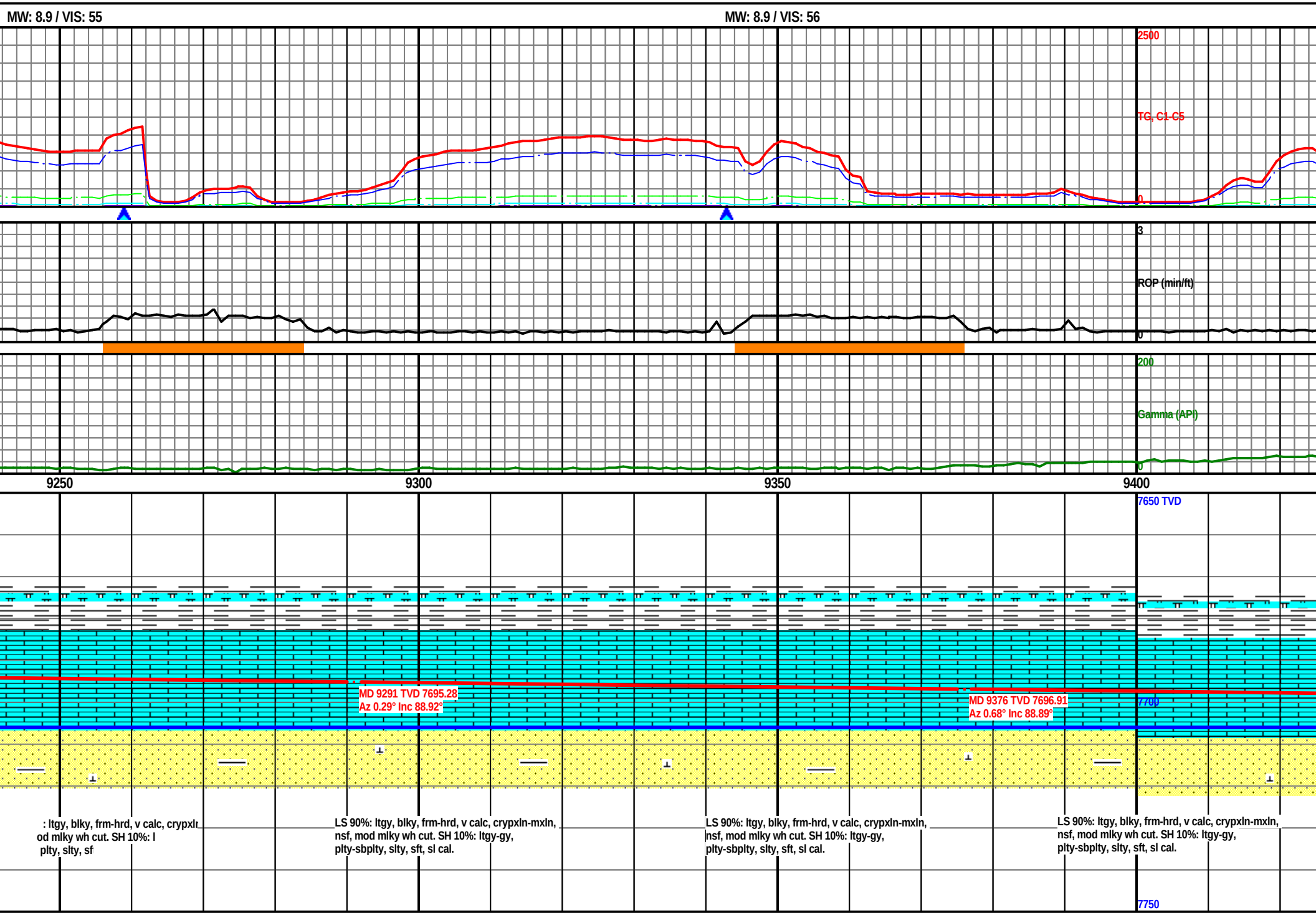

MW: 9.1 / VIS: 45
MW: 9.0 / VIS: 45
1000
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
8350
8400
8450
8500
7650 TVD
7700
7750
MD 8353 TVD 7707.01
Az 359.27° Inc 93.22°
MD 8438 TVD 7701.73
Az 0.49° Inc 93.9°
MD 8500 TV
Inc 90°
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v c
nsf, mod mlky wh cut. SH 10%:
plty-sbplty, slty, sft, sl cal.

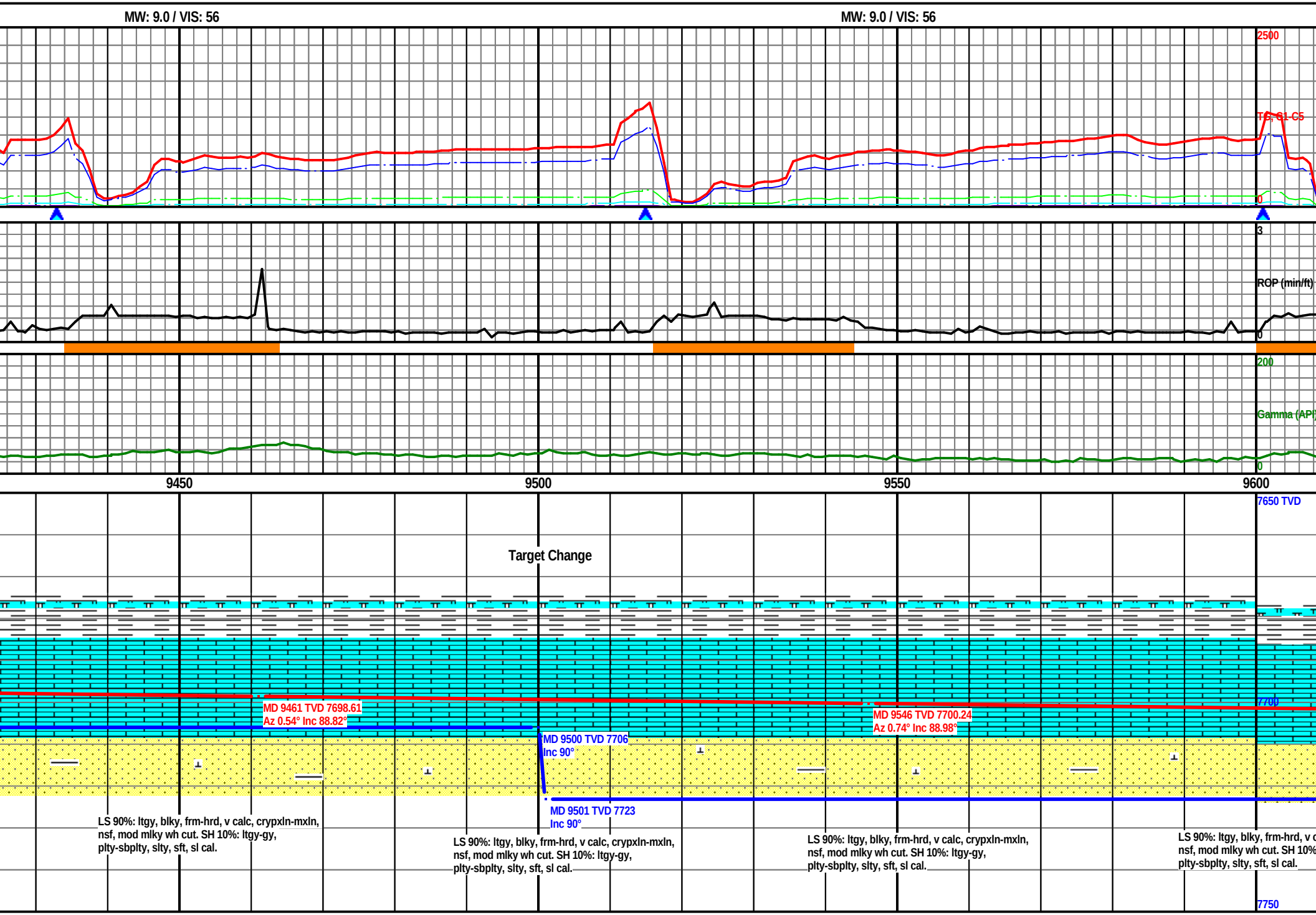

MW: 9.0 / VIS: 45
MW: 9.0 / VIS: 45
1000
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
8550
8600
8650
7650 TVD
03/15/14 4:00am Depth @ 8665'MD
MD 8524 TVD 7696.27
Az 1.6° Inc 93.38°
MD 8609 TVD 7692.79
Az 0.69° Inc 91.31°
7700
7750
alc, crypxln
LS 75%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. Mrlst 15%: dkgy-blk, sbblky, frm, v calc, mod-abd intbd biocl. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal. Tr Bent.
Mrlst 75%: dkgy-blk, sbblky, frm, v calc, mod-abd intbd biocl, Slw mlky wh cut. SH 15%: ltgy-gy, plty-sbplty, slty, sft, sl cal. LS 10%: ltgy, blky, frm-hrd, v calc, crypxln-mxln. Tr Bent.
Mrlst 75%: dkgy-blk, sbblky, frm, v calc, mod-abd intbd biocl, Slw mlky wh cut. SH 15%: ltgy-gy, plty-sbplty, slty, sft, sl cal. LS 10%: ltgy, blky, frm-hrd, v calc, crypxln-mxln. Tr Bent.
Mrlst 75%: dl
biocl, Slw ml
sft, sl cal. LS
Tr Bent.

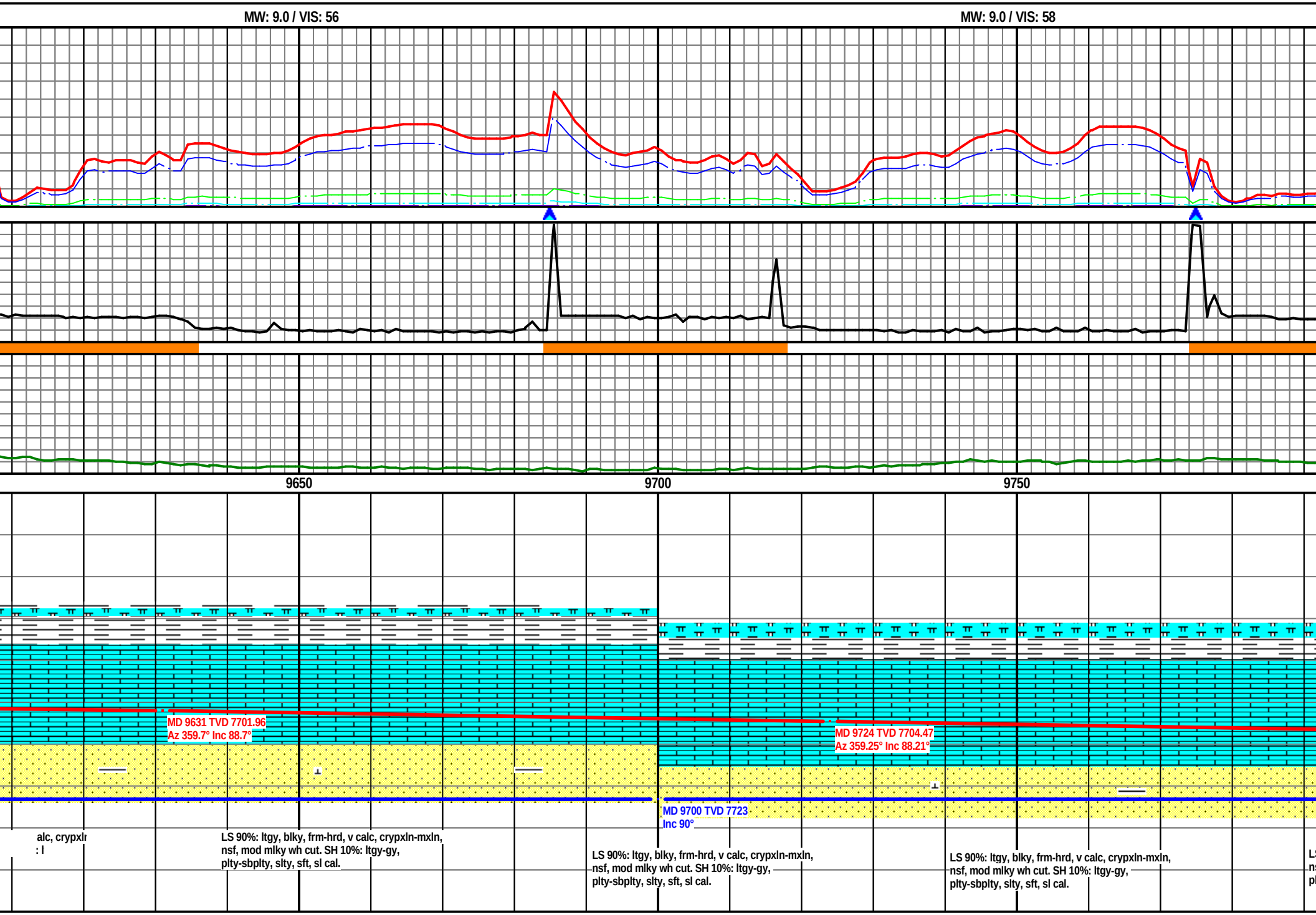

MW: 9.0 / VIS: 56
MW: 8.9 / VIS: 56
1000
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
8700
8750
8800
8850
7650 TVD
Fault- fr
MD 8694 TVD 7691.37
Az 0.14° Inc 90.61°
MD 8779 TVD 7690.51
Az 359.92° Inc 90.55°
MD 8865 TVD 7
Az 359.61° Inc
7700
gy-blk, sbblky, frm, v calc, mod-ab
y wh cut. SH 15%: ltgy-gy, plty-sbpl
10%: ltgy, blky, frm-hrd, v calc, crypxl
Mrlst 75%: dkgy-blk, sbblky, frm, v calc, mod-abd intbd biocl, Slw mlky wh cut. SH 15%: ltgy-gy, plty-sbplty, slty, sft, sl cal. LS 10%: ltgy, blky, frm-hrd, v calc, crypxln-mxln. Tr Bent.
Mrlst 75%: dkgy-blk, sbblky, frm, v calc, mod-abd intbd biocl, Slw mlky wh cut. SH 15%: ltgy-gy, plty-sbplty, slty, sft, sl cal. LS 10%: ltgy, blky, frm-hrd, v calc, crypxln-mxln. Tr Bent.
Mrlst 75%: dkgy-blk, sbblky, frm, v calc, mod-abd intbd biocl, Slw mlky wh cut. SH 15%: ltgy-gy, plty-sbplty, slty, sft, sl cal. LS 10%: ltgy, blky, frm-hrd, v calc, crypxln-mxln. Tr Bent.
7750

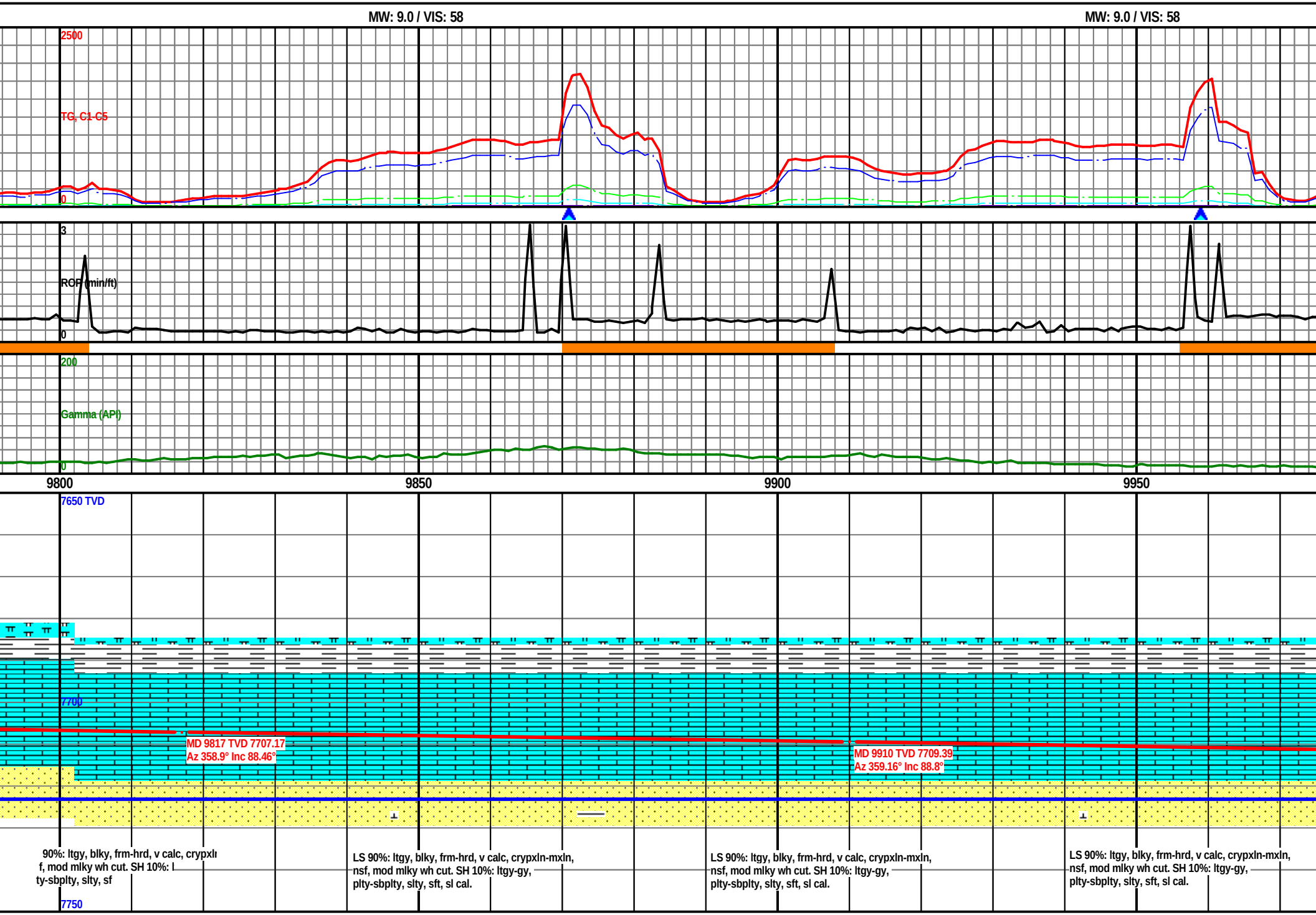

MW: 8.9 / VIS: 56
MW: 8.9 / VIS: 55
1000
2500
Note Scale Chang
Scale Chang
TG, C1-C5
TG, C1-C5
0
0
3
ROP (min/ft)
0
200
Gamma (API)
0
8900
8950
9000
9050
7650 TVD
m Nio C Sh
MD 8950 TVD 7688.72
Az 0.02° Inc 90°
MD 9035 TVD 7689.16
Az 0.06° Inc 89.41°
7700
MD 9000 TVD 7706
Inc 90°
LS 75%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. Mrlst 15%: dkgy-blk, sbblky, frm, v calc, mod-abd intbd biocl. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 75%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. Mrlst 15%: dkgy-blk, sbblky, frm, v calc, mod-abd intbd biocl. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 75%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. Mrlst 15%: dkgy-blk, sbblky, frm, v calc, mod-abd intbd biocl. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
7750

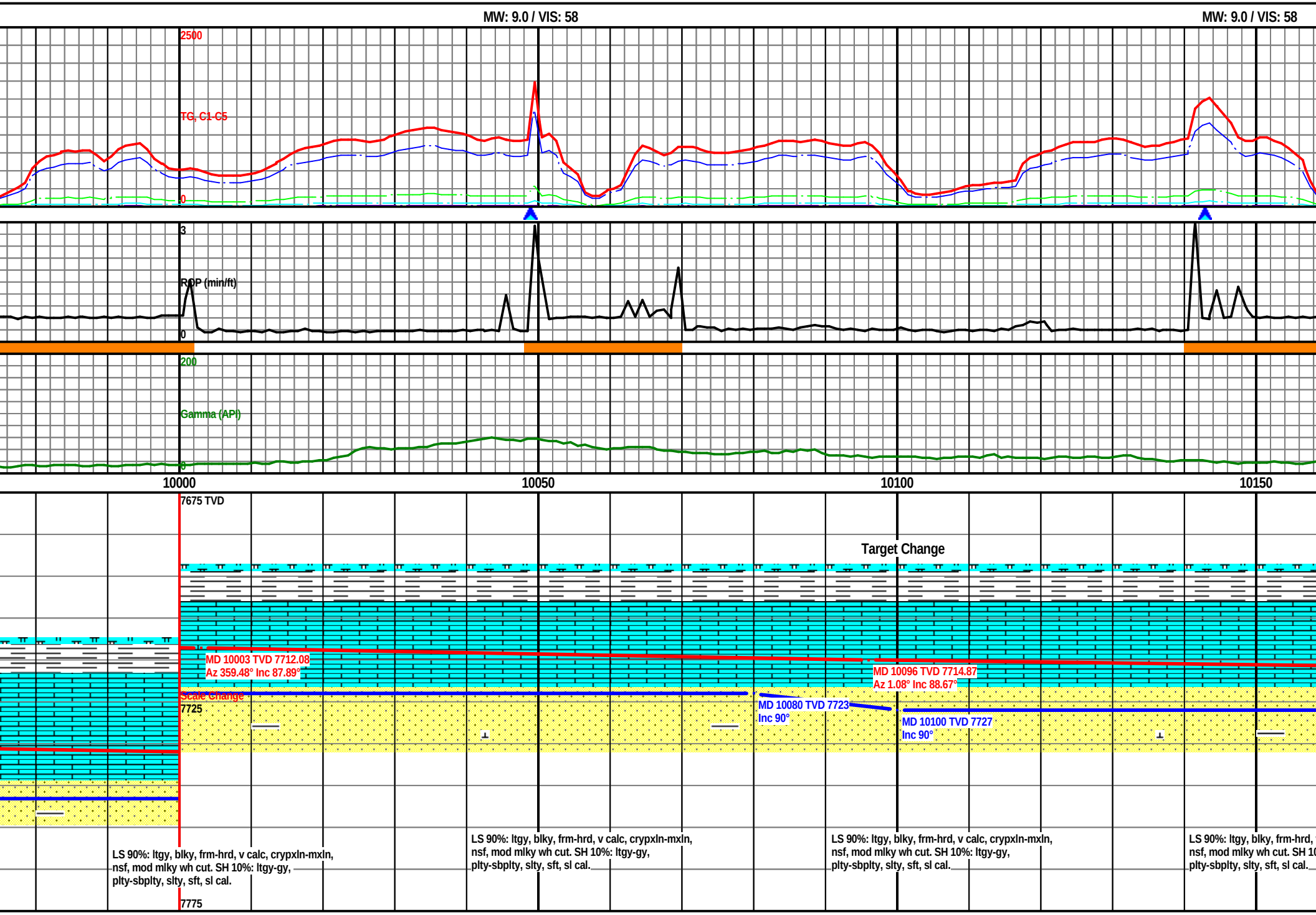

MW: 8.9 / VIS: 55
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
9100
9150
9200
7650 TVD
MD 9120 TVD 7691.04
Az 359.21° Inc 88.05°
MD 9205 TVD 7693.47
Az 0.24° Inc 88.67°
7700
7750
alc, crypxln
%: dk
tbd biocl. S
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.

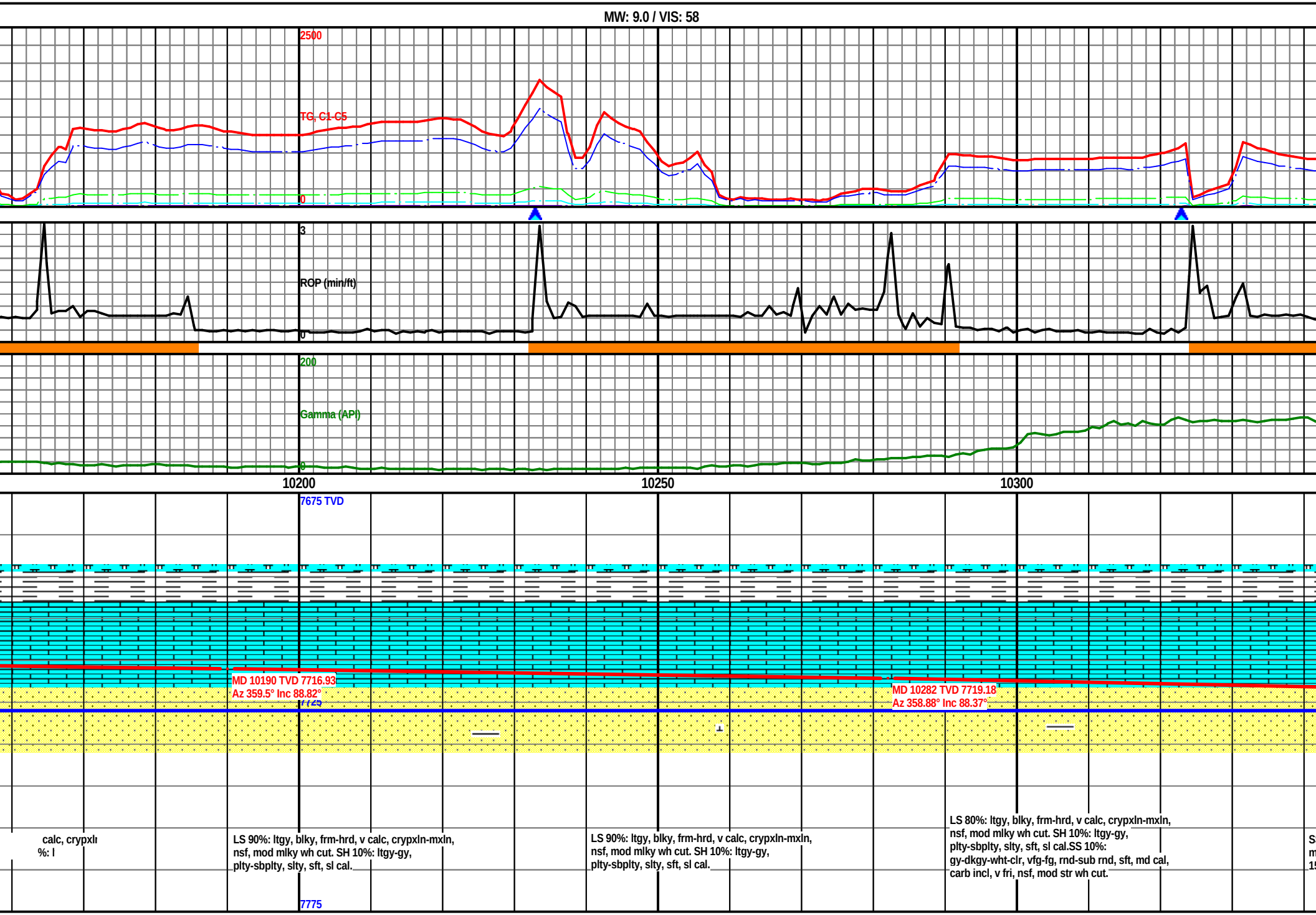

MW: 8.9 / VIS: 55
MW: 8.9 / VIS: 56
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
9250
9300
9350
9400
7650 TVD
MD 9291 TVD 7695.28
Az 0.29° Inc 88.92°
MD 9376 TVD 7696.91
Az 0.68° Inc 88.89°
7700
: ltgy, blky, frm-hrd, v calc, crypxln
od mlky wh cut. SH 10%: l
plty, slty, sf
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
7750

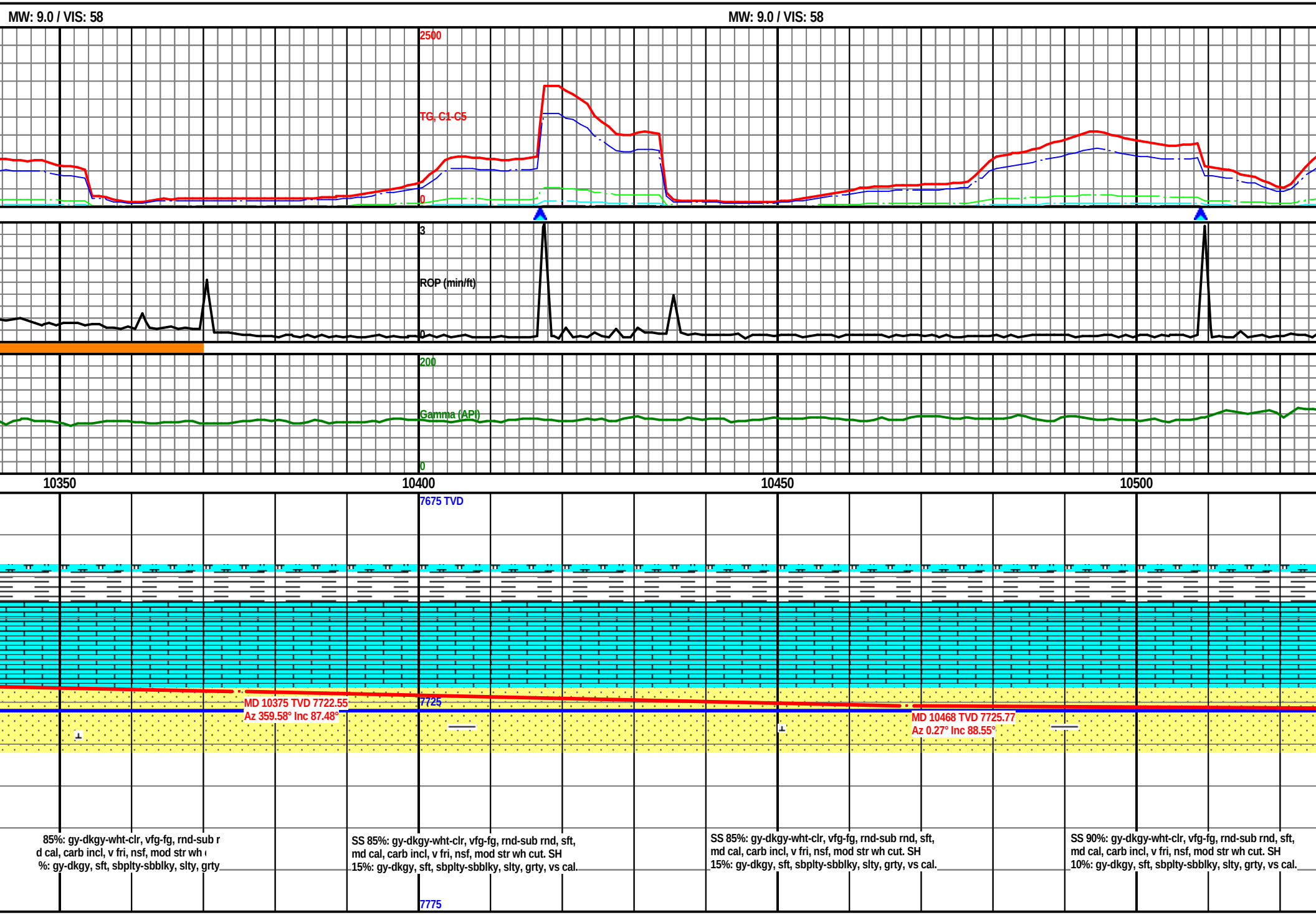

MW: 9.0 / VIS: 56
MW: 9.0 / VIS: 56
2500
TG: G1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
9450
9500
9550
9600
7650 TVD
Target Change
7700
7750
MD 9461 TVD 7698.61
Az 0.54° Inc 88.82°
MD 9500 TVD 7706
Inc 90°
MD 9501 TVD 7723
Inc 90°
MD 9546 TVD 7700.24
Az 0.74° Inc 88.98°
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v c
nsf, mod mlky wh cut. SH 10%
plty-sbplty, slty, sft, sl cal.

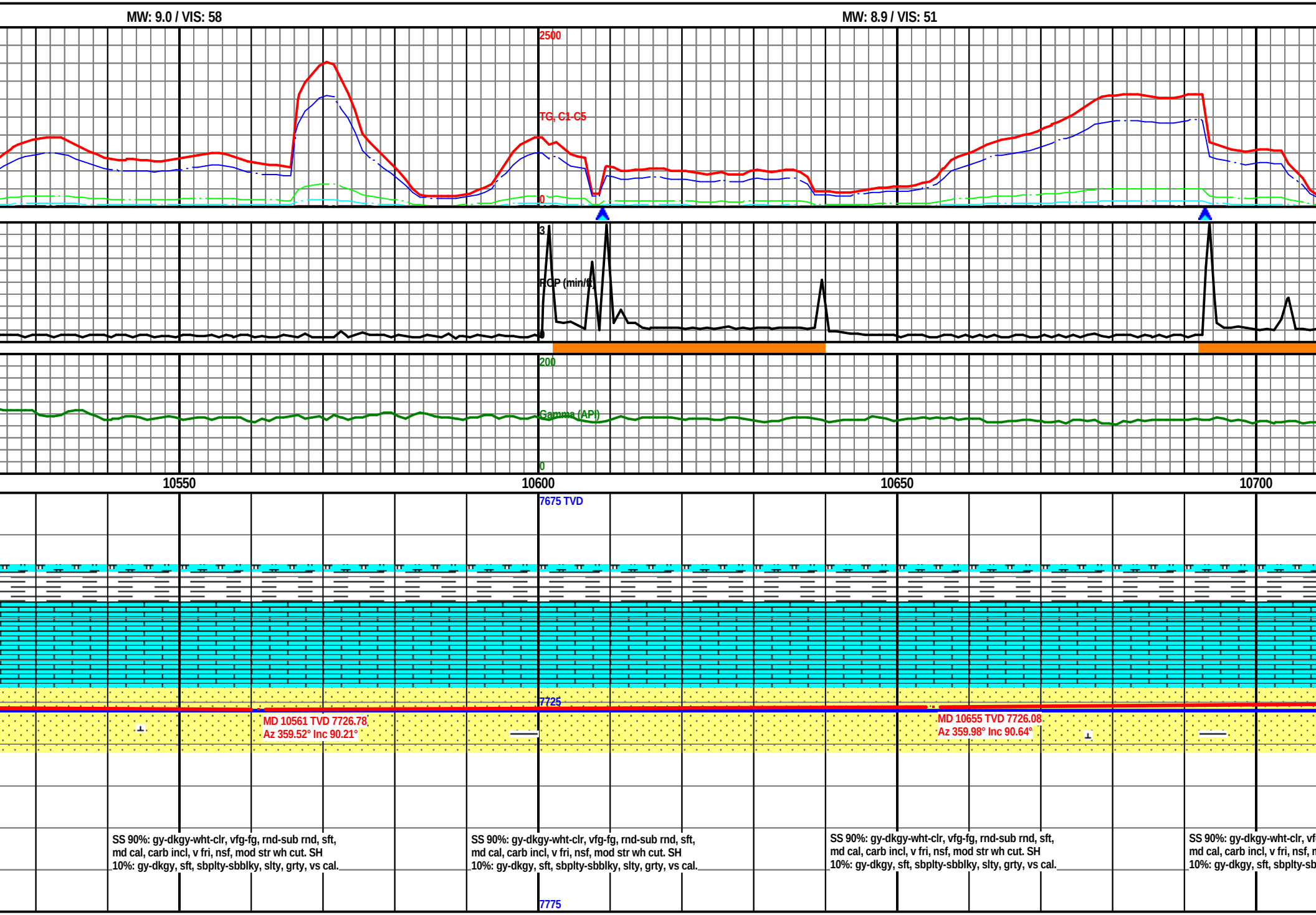

MW: 9.0 / VIS: 56
MW: 9.0 / VIS: 58
9650
9700
9750
MD 9631 TVD 7701.96
Az 359.7° Inc 88.7°
MD 9724 TVD 7704.47
Az 359.25° Inc 88.21°
MD 9700 TVD 7723
Inc 90°
alc, crypxln
: l
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.

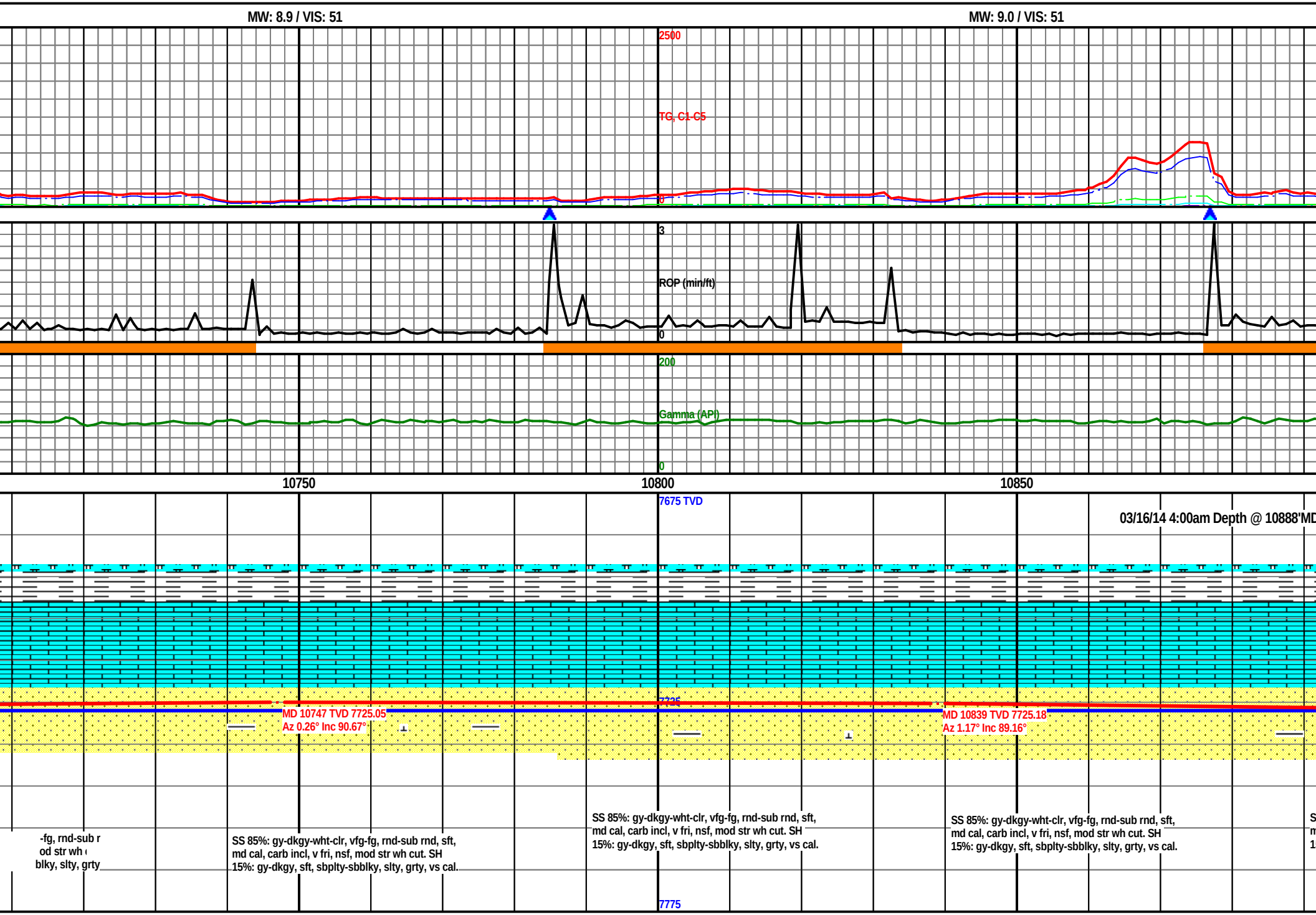

MW: 9.0 / VIS: 58
MW: 9.0 / VIS: 58
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
9800
9850
9900
9950
7650 TVD
7700
MD 9817 TVD 7707.17
Az 358.9° Inc 88.46°
MD 9910 TVD 7709.39
Az 359.16° Inc 88.8°
7750
90%: ltgy, blky, frm-hrd, v calc, crypxln
f, mod mlky wh cut. SH 10%: l
ty-sbplty, slty, sf
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.

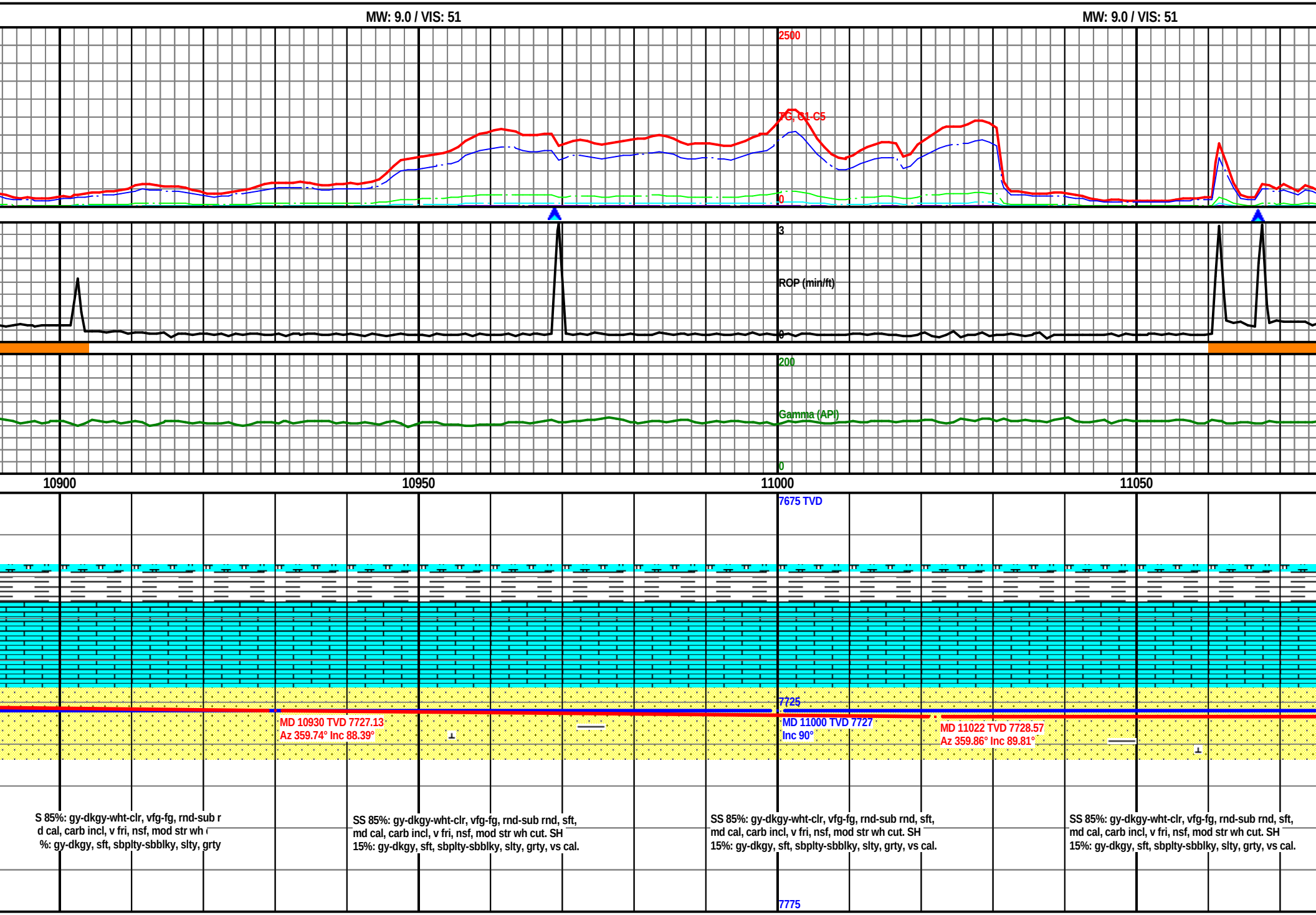

MW: 9.0 / VIS: 58
MW: 9.0 / VIS: 58
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
10000
10050
10100
10150
7675 TVD
Target Change
MD 10003 TVD 7712.08
Az 359.48° Inc 87.89°
Scale Change
7725
MD 10096 TVD 7714.87
Az 1.08° Inc 88.67°
MD 10080 TVD 7723
Inc 90°
MD 10100 TVD 7727
Inc 90°
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, nsf, mod mlky wh cut. SH 10 plty-sbplty, slty, sft, sl cal.
7775

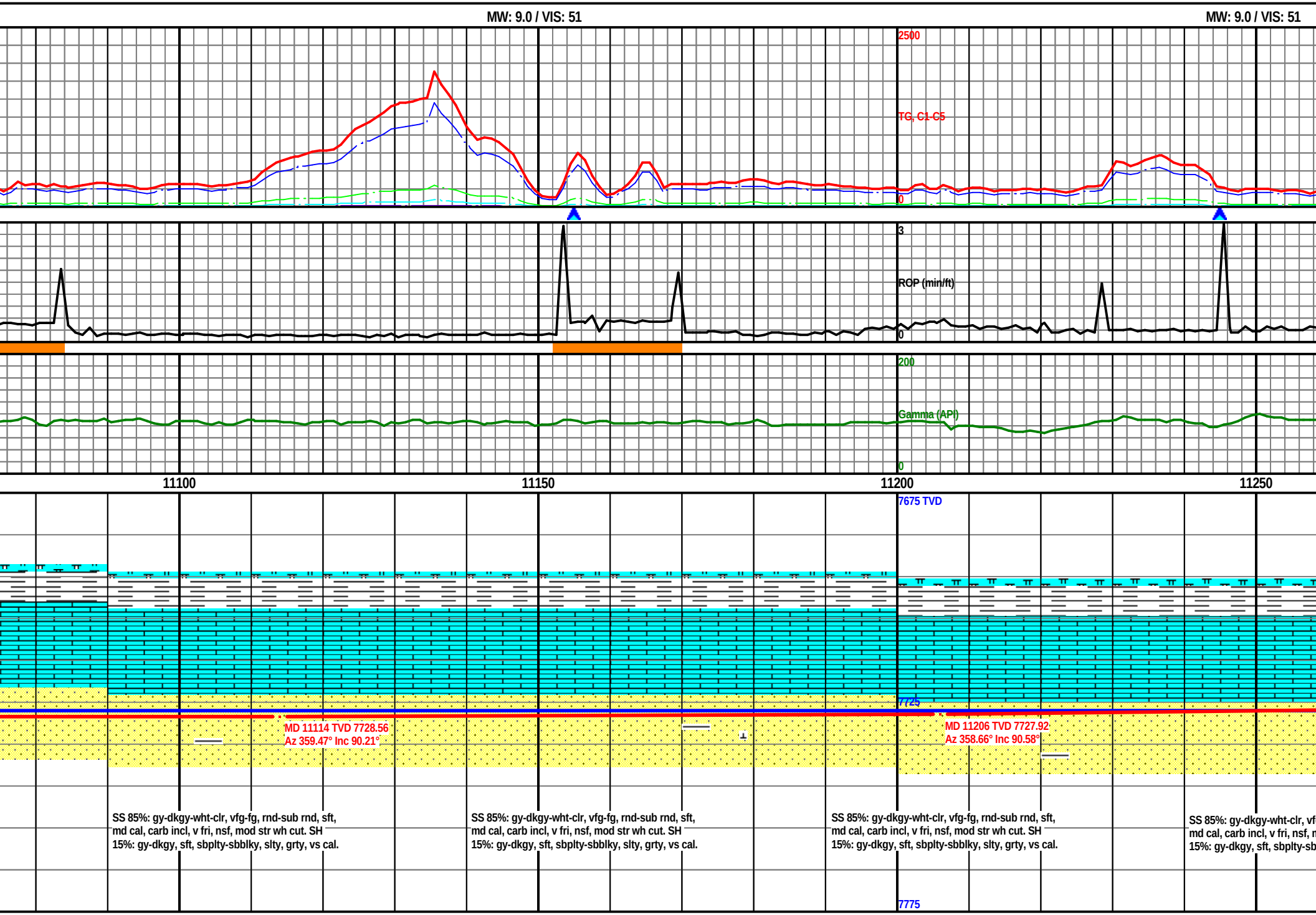

MW: 9.0 / VIS: 58
2500
TG, C1 C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
10200
10250
10300
7675 TVD
MD 10190 TVD 7716.93
Az 359.5° Inc 88.82°
MD 10282 TVD 7719.18
Az 358.88° Inc 88.37°
calc, crypxln
%: l
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
LS 80%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.SS 10%:
gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal,
carb incl, v fri, nsf, mod str wh cut.
7775

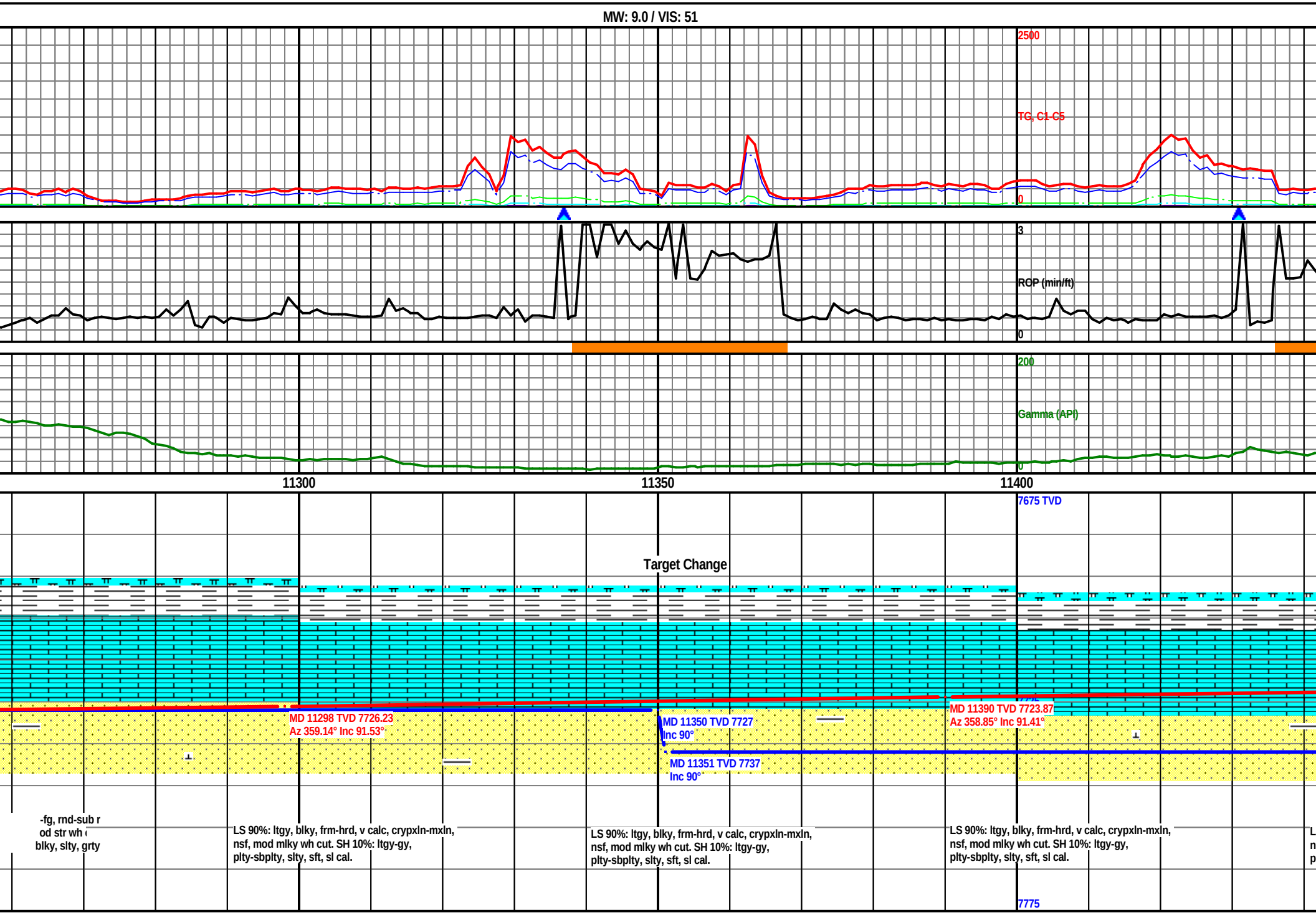

MW: 9.0 / VIS: 58
MW: 9.0 / VIS: 58
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
10350
10400
10450
10500
7675 TVD
MD 10375 TVD 7722.55
Az 359.58° Inc 87.48°
7725
MD 10468 TVD 7725.77
Az 0.27° Inc 88.55°
85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub r
d cal, carb incl, v fri, nsf, mod str wh
%: gy-dkgy, sft, sbplty-sbblky, slty, grty
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
7775
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.

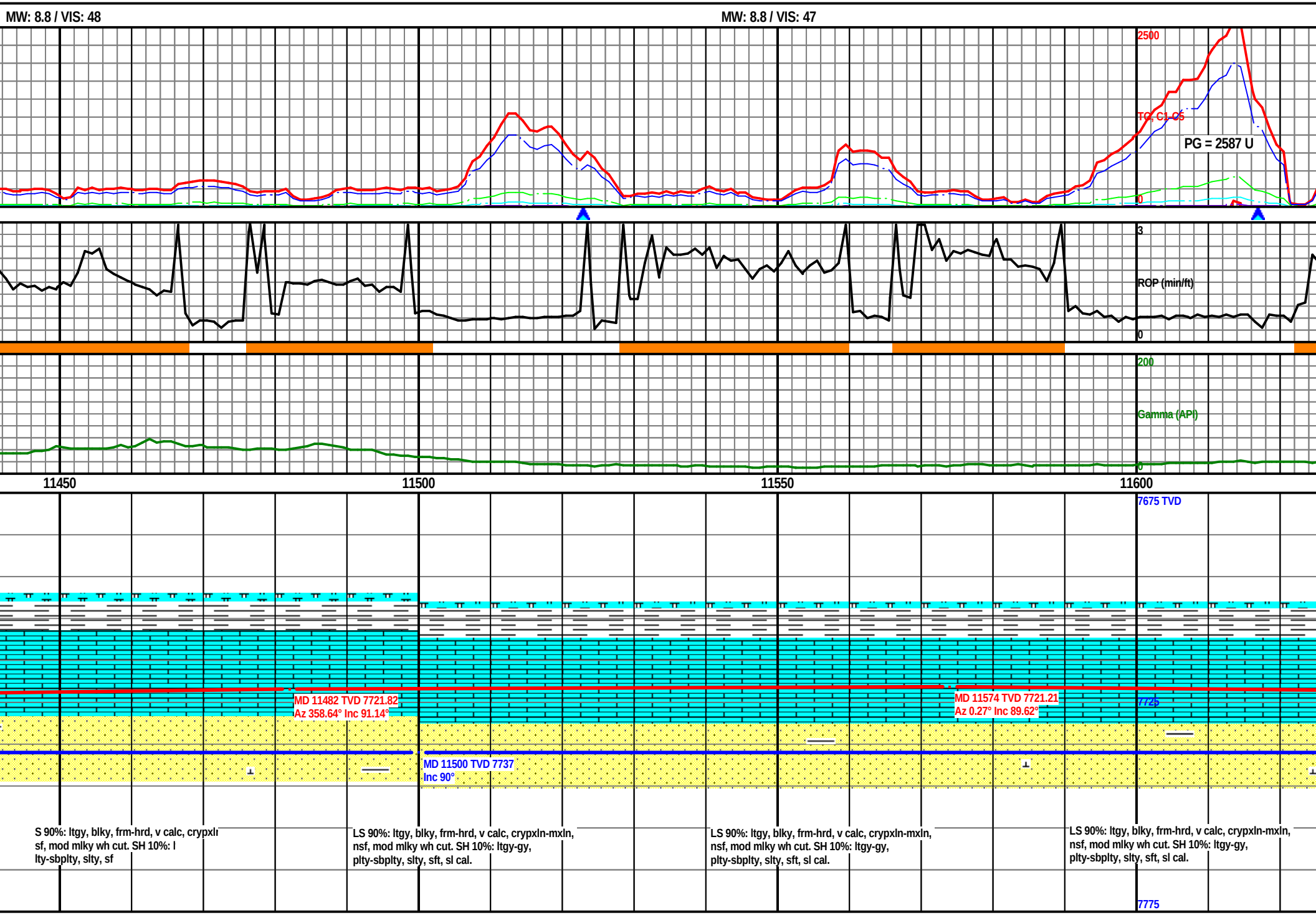

MW: 9.0 / VIS: 58
MW: 8.9 / VIS: 51
2500
TG, C1-C5
0
3
ROP (min/ft)
200
Gamma (API)
0
10550
10600
10650
10700
7675 TVD
7725
MD 10561 TVD 7726.78
Az 359.52° Inc 90.21°
MD 10655 TVD 7726.08
Az 359.98° Inc 90.64°
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
7775

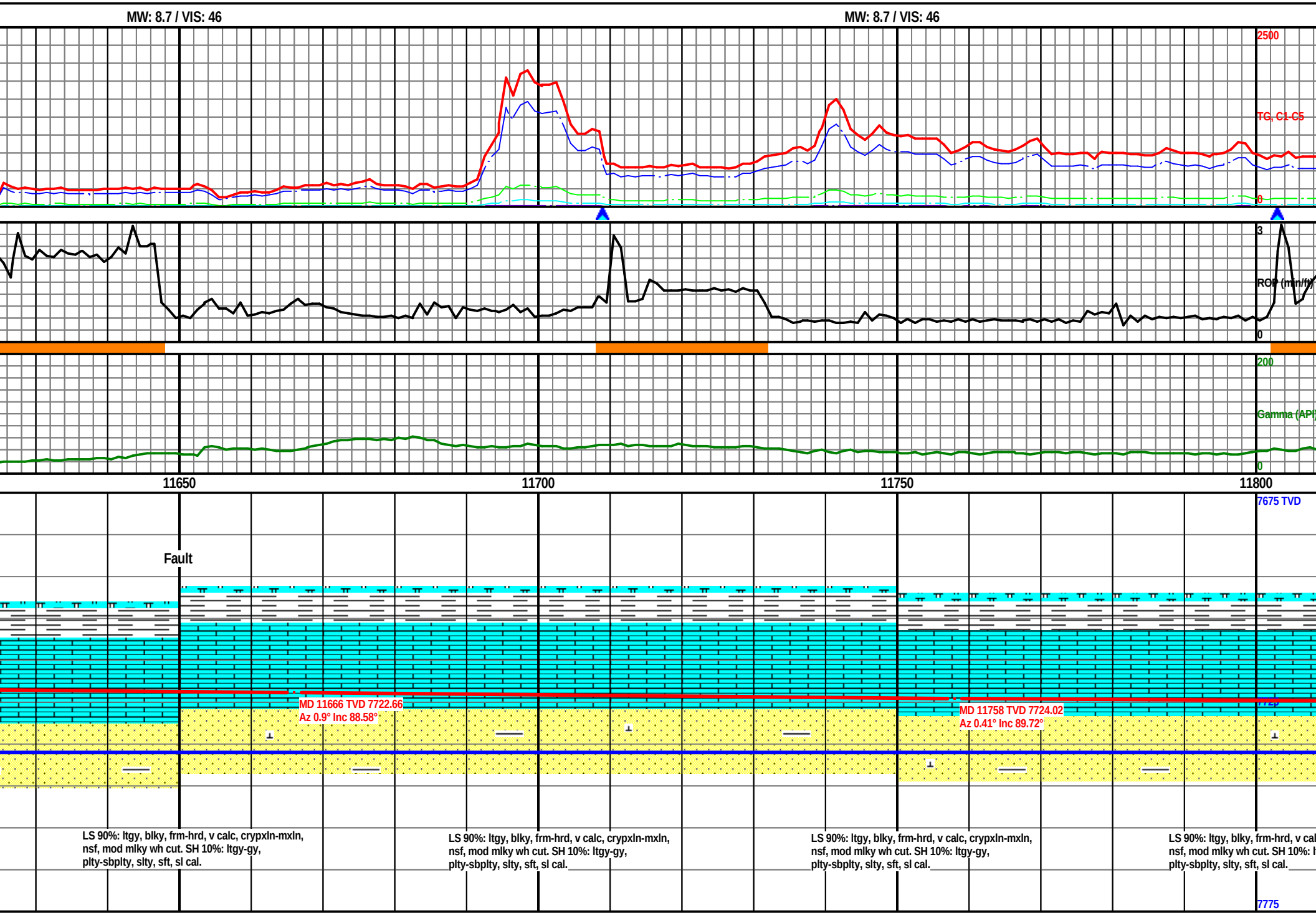

MW: 8.9 / VIS: 51
MW: 9.0 / VIS: 51
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
10750
10800
10850
7675 TVD
03/16/14 4:00am Depth @ 10888'MD
7725
MD 10747 TVD 7725.05
Az 0.26° Inc 90.67°
MD 10839 TVD 7725.18
Az 1.17° Inc 89.16°
-fg, rnd-sub r
od str wh
blky, slty, grty
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
7775

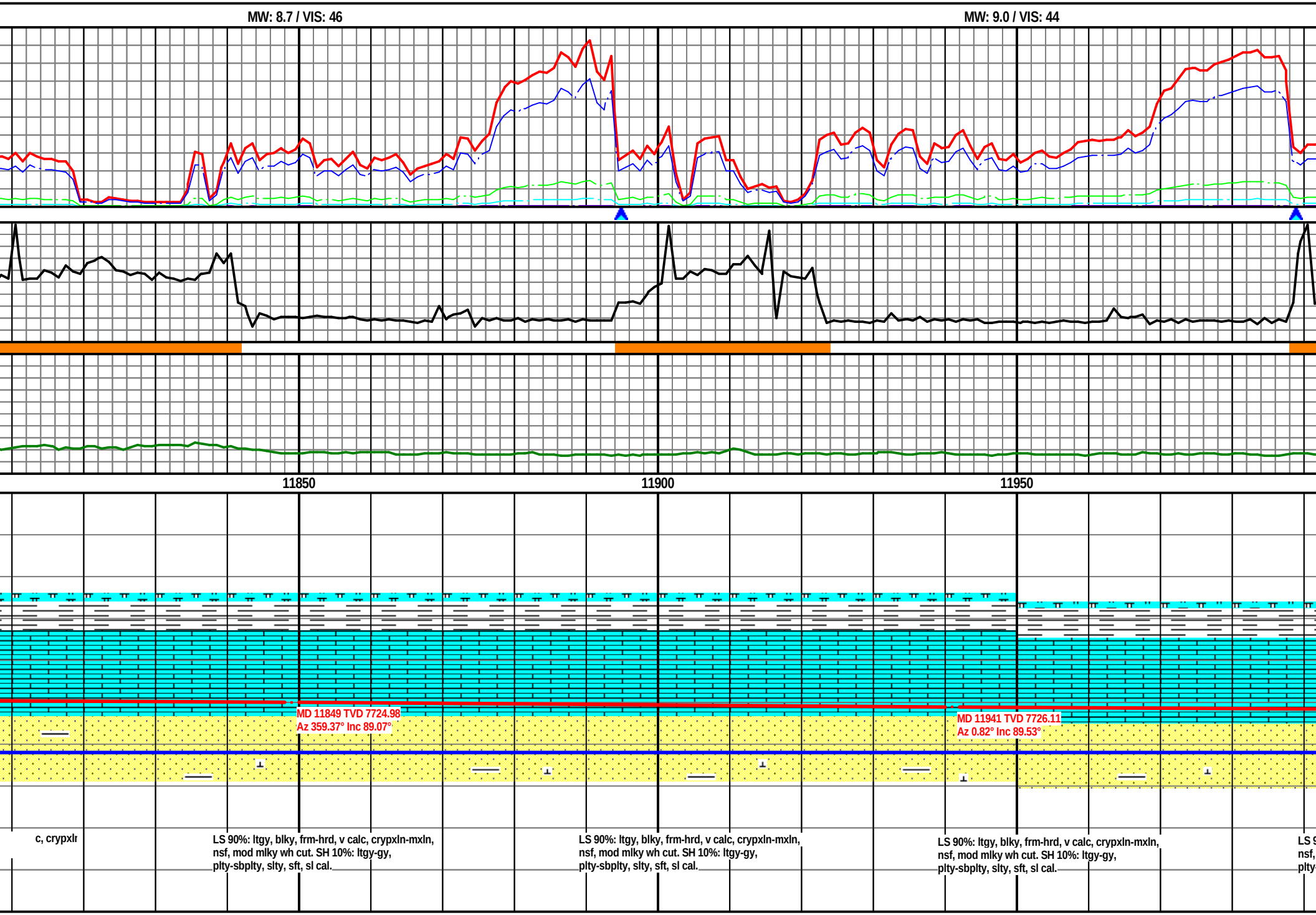

MW: 9.0 / VIS: 51
MW: 9.0 / VIS: 51
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
10900
10950
11000
11050
7675 TVD
7725
7775
MD 10930 TVD 7727.13
Az 359.74° Inc 88.39°
MD 11000 TVD 7727
Inc 90°
MD 11022 TVD 7728.57
Az 359.86° Inc 89.81°
S 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub r
d cal, carb incl, v fri, nsf, mod str wh
%: gy-dkgy, sft, sbplty-sbblky, slty, grty
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.

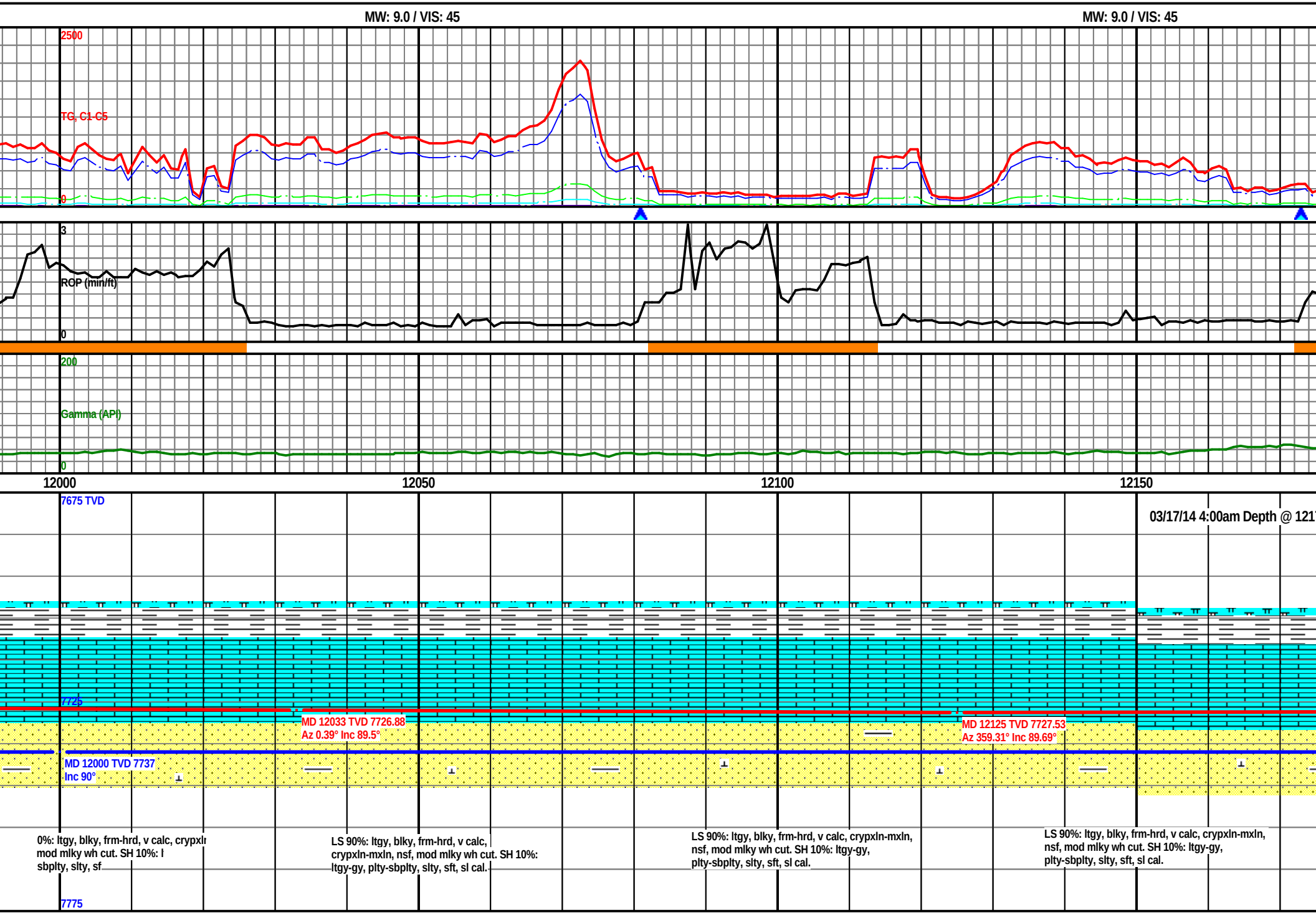

MW: 9.0 / VIS: 51
MW: 9.0 / VIS: 51
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
11100
11150
11200
11250
7675 TVD
7725
7775
MD 11114 TVD 7728.56
Az 359.47° Inc 90.21°
MD 11206 TVD 7727.92
Az 358.66° Inc 90.58°
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vf
md cal, carb incl, v fri, nsf, m
15%: gy-dkgy, sft, sbplty-sb

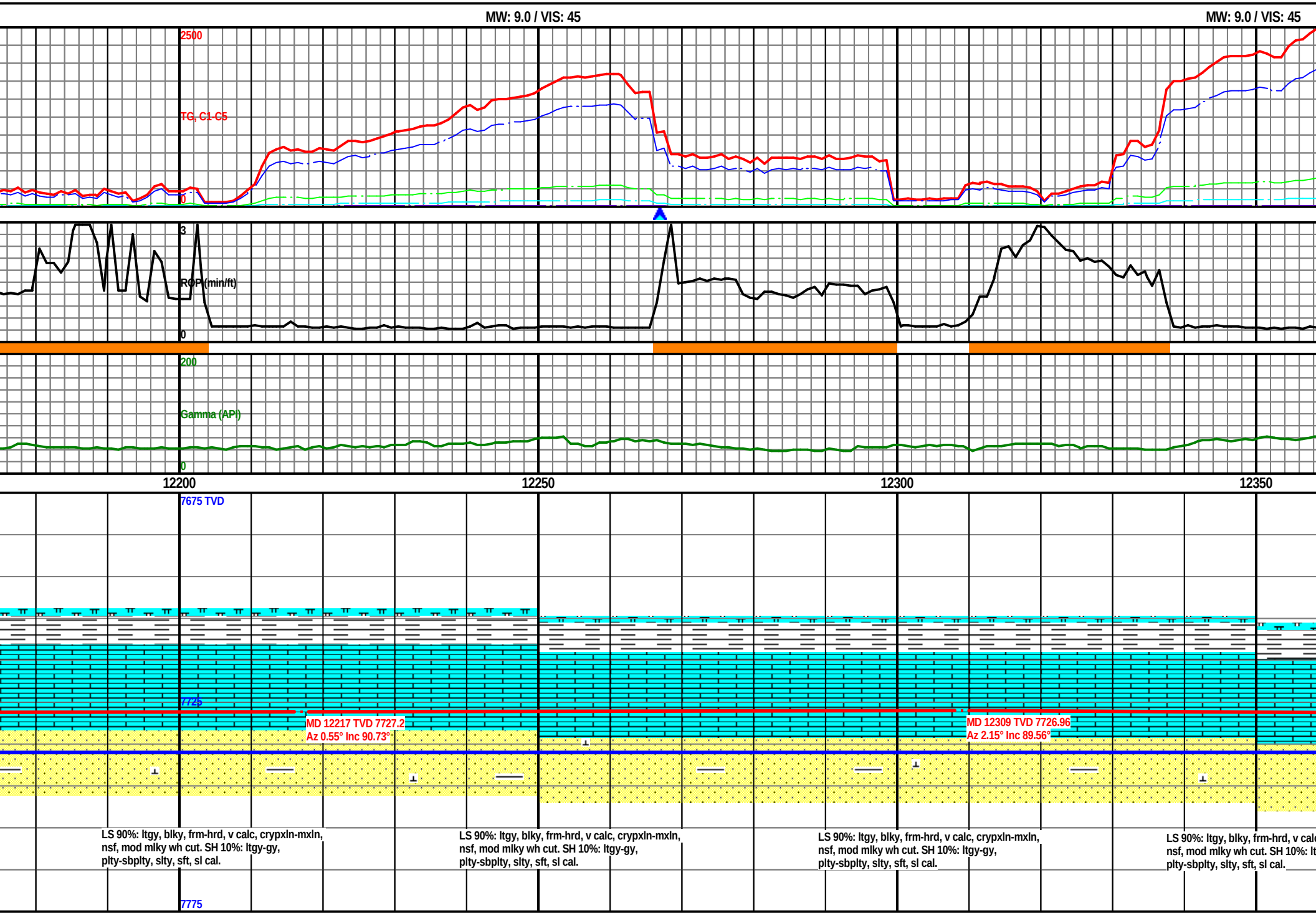

MW: 9.0 / VIS: 51
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
11300
11350
11400
7675 TVD
Target Change
MD 11298 TVD 7726.23
Az 359.14° Inc 91.53°
MD 11350 TVD 7727
Inc 90°
MD 11351 TVD 7737
Inc 90°
MD 11390 TVD 7723.87
Az 358.85° Inc 91.41°
-fg, rnd-sub r
od str wh
blky, slty, grty
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
7775

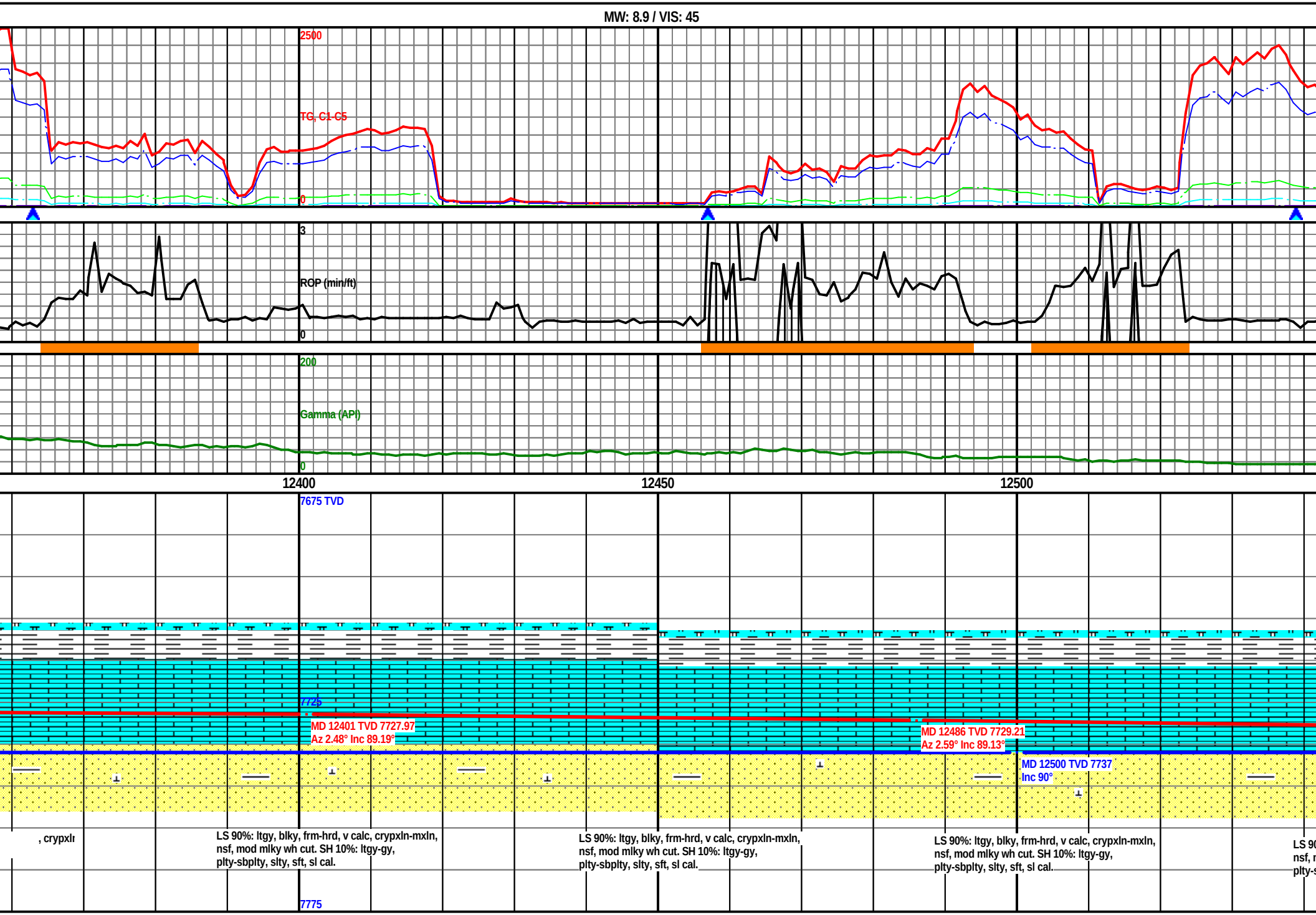

MW: 8.8 / VIS: 48
MW: 8.8 / VIS: 47
2500
TG, C1, C5
PG = 2587 U
0
3
ROP (min/ft)
0
200
Gamma (API)
0
11450
11500
11550
11600
7675 TVD
MD 11482 TVD 7721.82
Az 358.64° Inc 91.14°
MD 11500 TVD 7737
Inc 90°
MD 11574 TVD 7721.21
Az 0.27° Inc 89.62°
7725
7775
S 90%: ltgy, blky, frm-hrd, v calc, crypxln
sf, mod mlky wh cut. SH 10%: l
lty-sbplty, slty, sf
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.

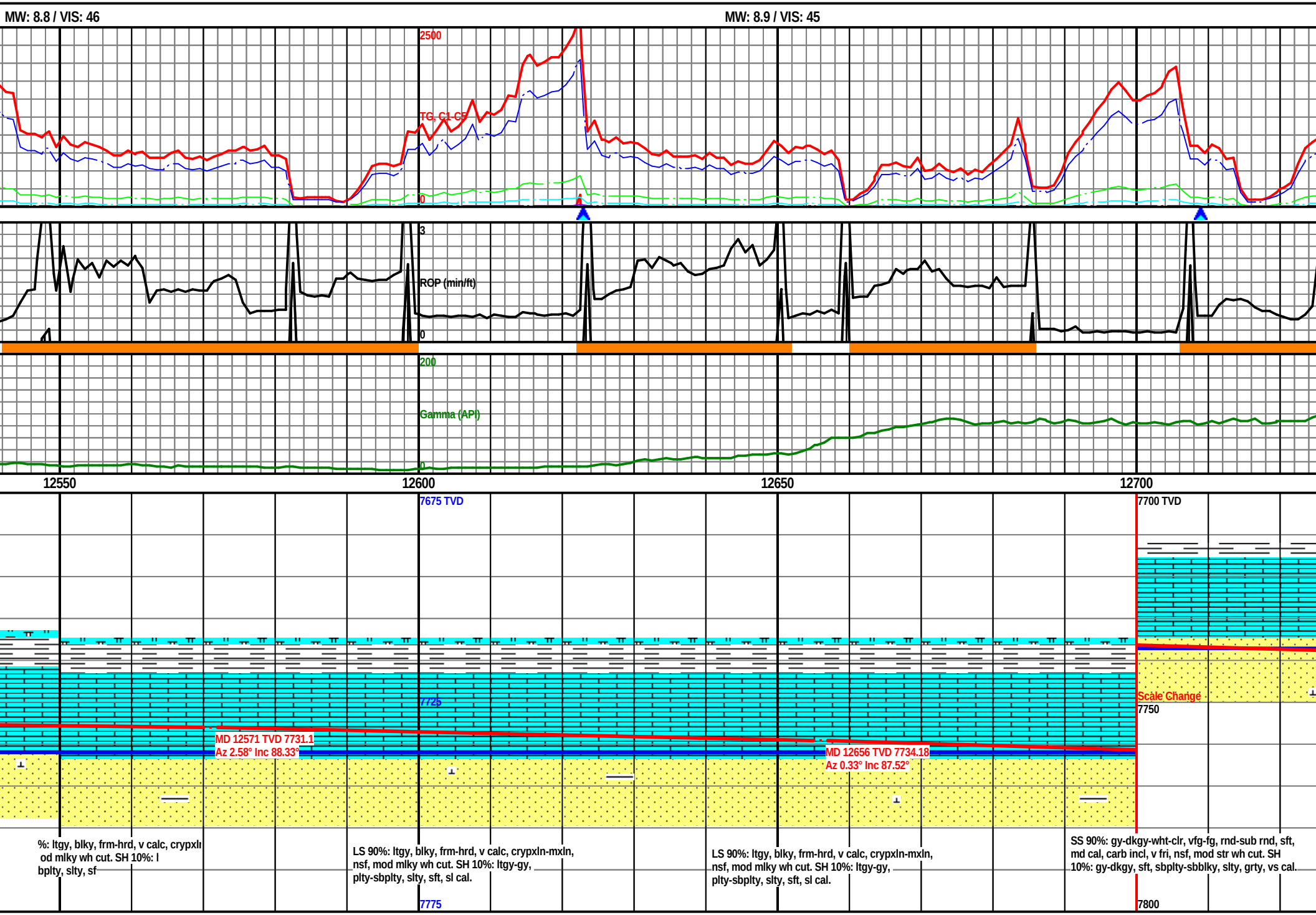

MW: 8.7 / VIS: 46
MW: 8.7 / VIS: 46
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
11650
11700
11750
11800
7675 TVD
Fault
MD 11666 TVD 7722.66
Az 0.9° Inc 88.58°
MD 11758 TVD 7724.02
Az 0.41° Inc 89.72°
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
7775

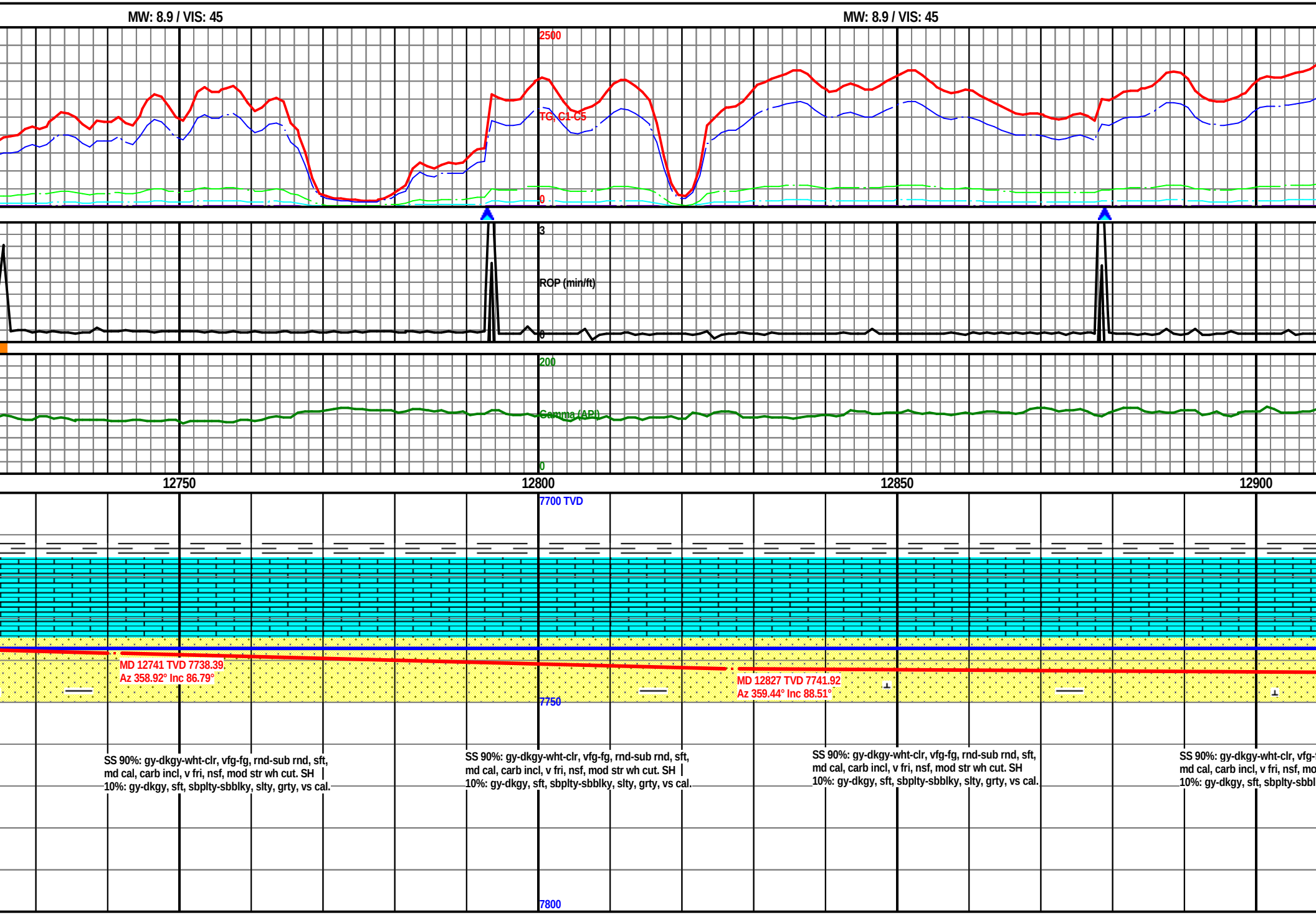

MW: 8.7 / VIS: 46
MW: 9.0 / VIS: 44
11850
11900
11950
MD 11849 TVD 7724.98
Az 359.37° Inc 89.07°
MD 11941 TVD 7726.11
Az 0.82° Inc 89.53°
c, crypxln
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.

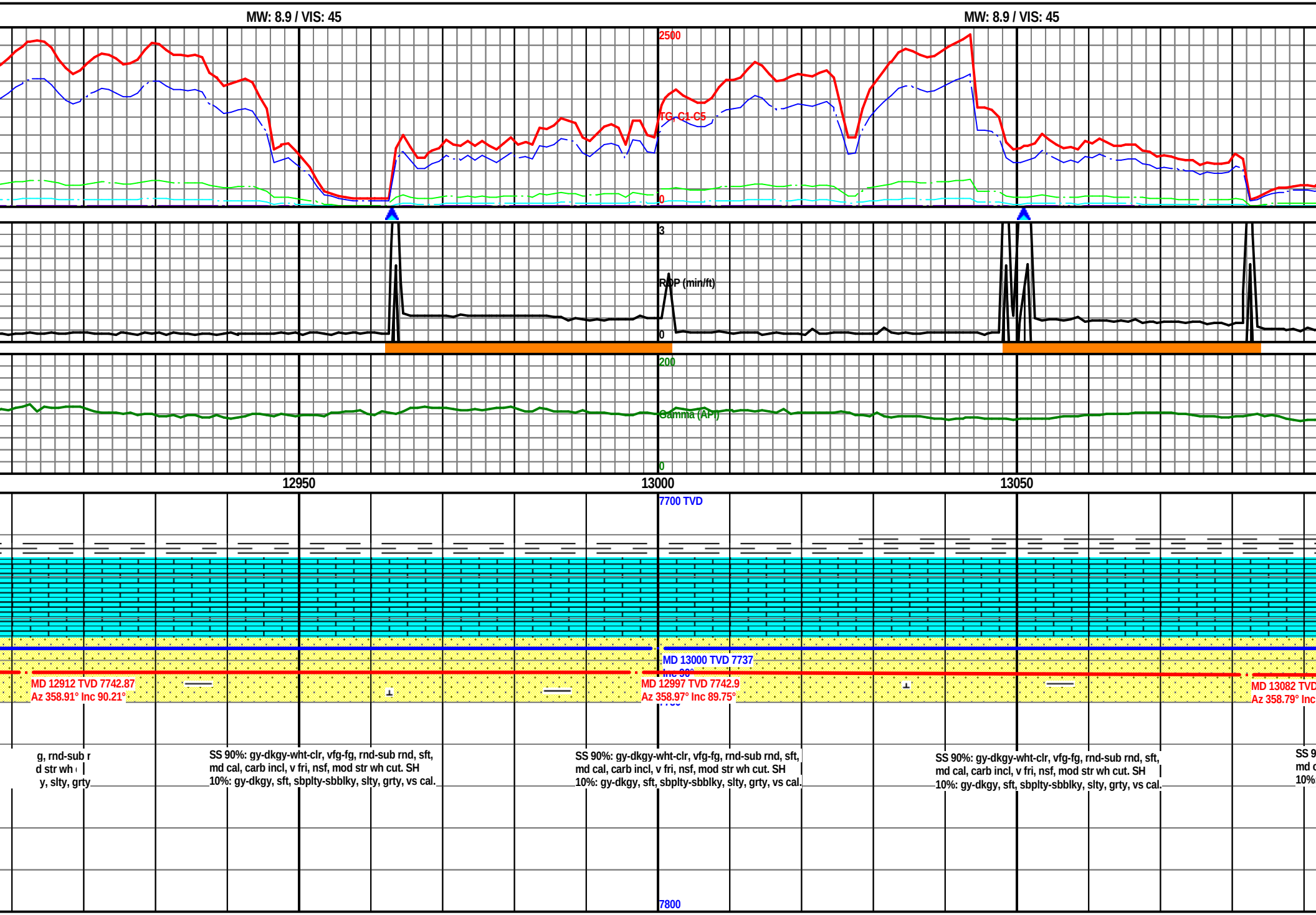

MW: 9.0 / VIS: 45
MW: 9.0 / VIS: 45
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
12000
12050
12100
12150
7675 TVD
03/17/14 4:00am Depth @ 121
7725
MD 12033 TVD 7726.88
Az 0.39° Inc 89.5°
MD 12125 TVD 7727.53
Az 359.31° Inc 89.69°
MD 12000 TVD 7737
Inc 90°
0%: ltgy, blky, frm-hrd, v calc, crypxl
mod mlky wh cut. SH 10%: l
sbplty, slty, sf
LS 90%: ltgy, blky, frm-hrd, v calc,
crypxln-mxln, nsf, mod mlky wh cut. SH 10%:
ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
7775

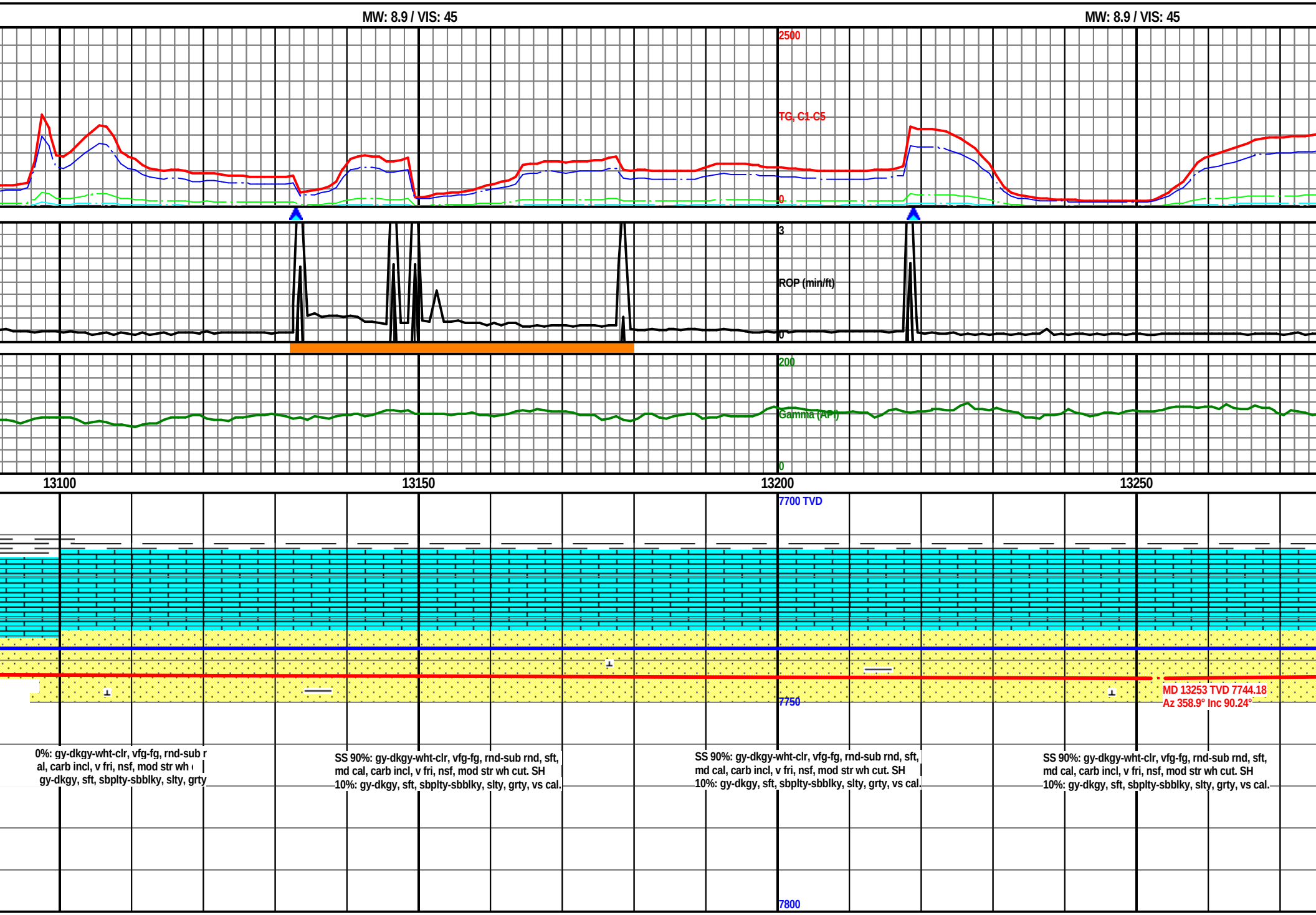

MW: 9.0 / VIS: 45
MW: 9.0 / VIS: 45
2500
TG, C1-C5
0
3
ROP(min/ft)
0
200
Gamma (API)
0
12200
12250
12300
12350
7675 TVD
7725
MD 12217 TVD 7727.2
Az 0.55° Inc 90.73°
MD 12309 TVD 7726.96
Az 2.15° Inc 89.56°
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln, nsf, mod mlky wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, sl cal.
7775

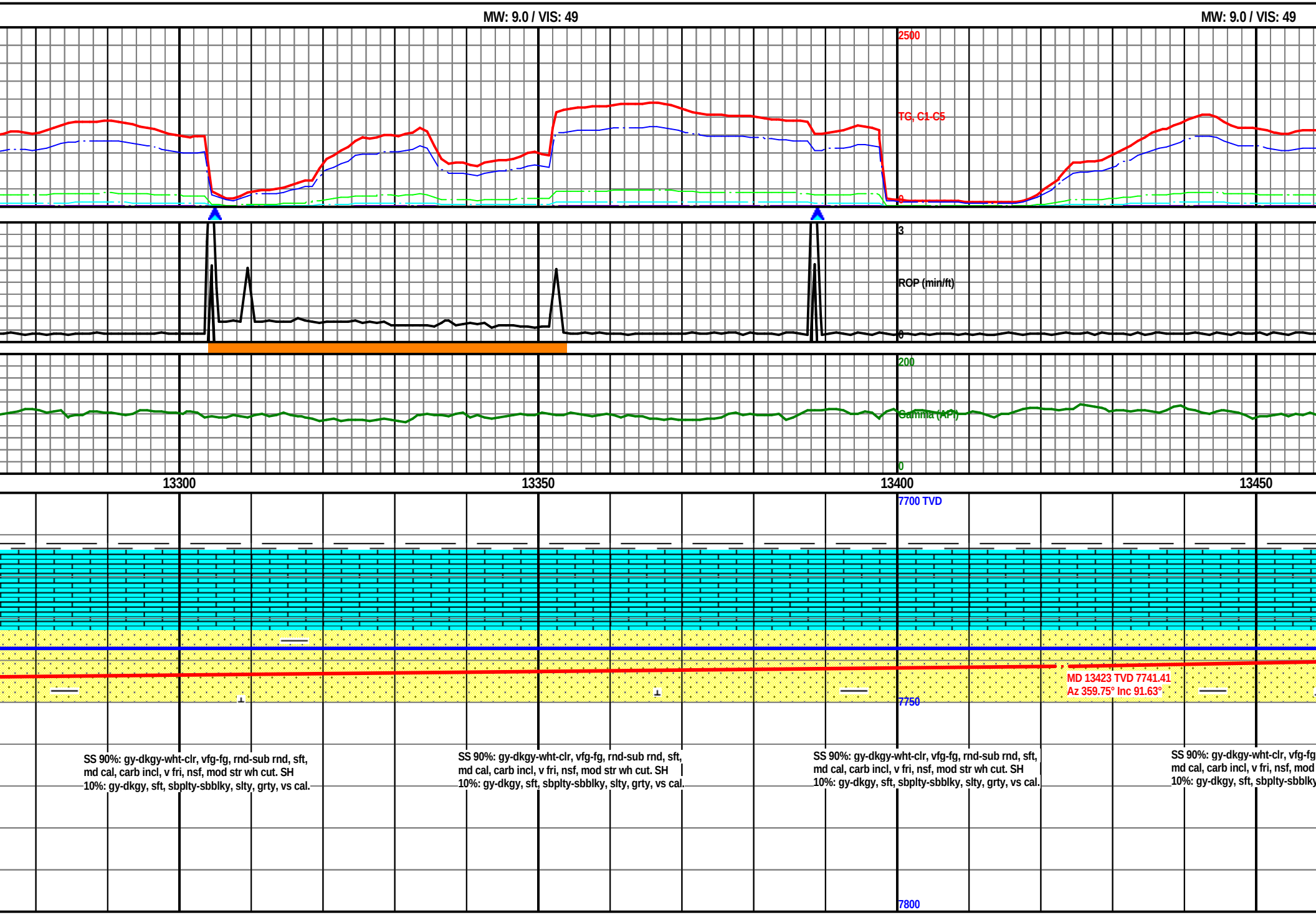

MW: 8.9 / VIS: 45
2500
TG, C1 C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
12400
12450
12500
7675 TVD
7725
MD 12401 TVD 7727.97
Az 2.48° Inc 89.19°
MD 12486 TVD 7729.21
Az 2.59° Inc 89.13°
MD 12500 TVD 7737
Inc 90°
, crypxln
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
7775

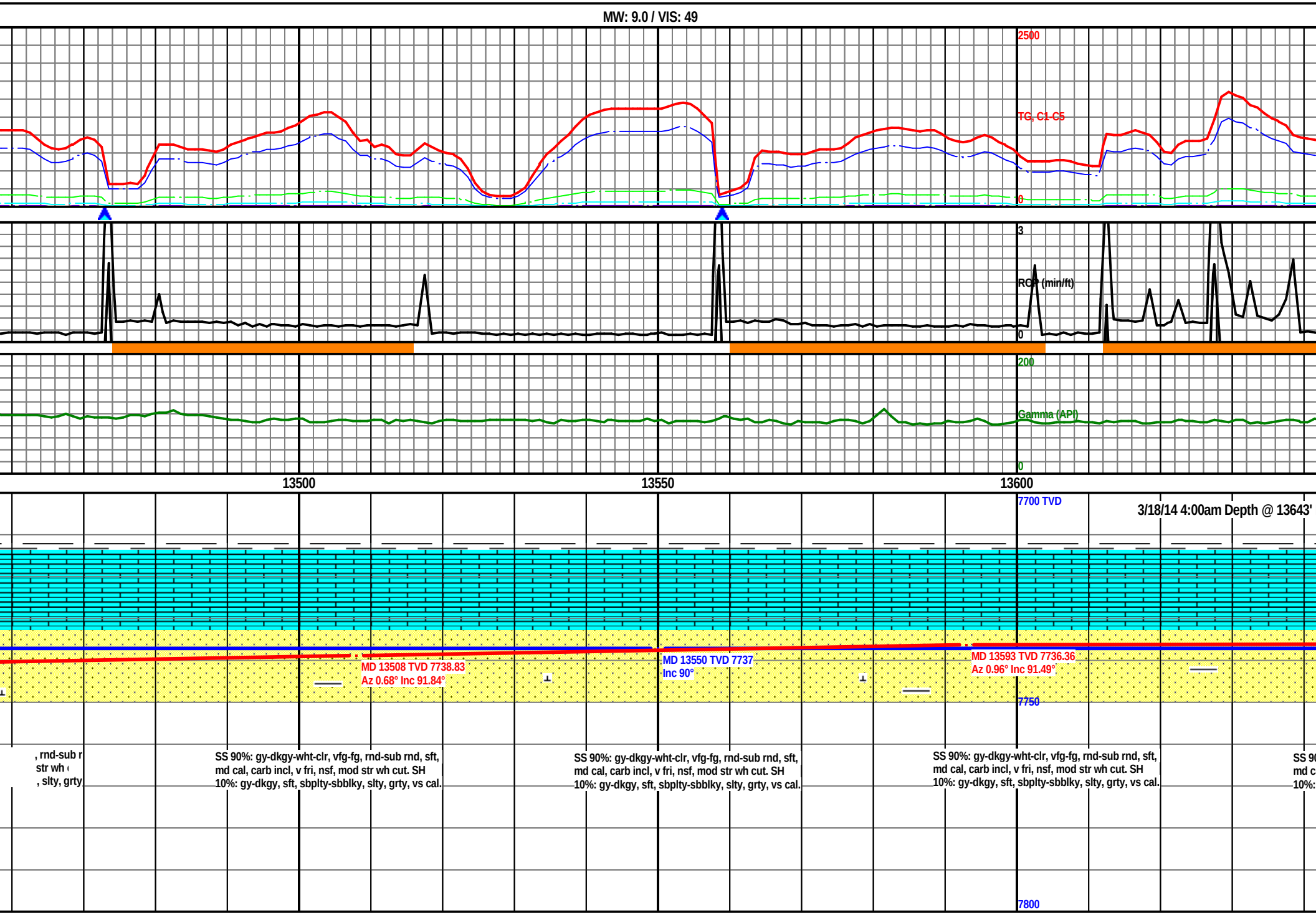

MW: 8.8 / VIS: 46
MW: 8.9 / VIS: 45
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
12550
12600
12650
12700
7675 TVD
7700 TVD
7725
Scale Change
7750
MD 12571 TVD 7731.1
Az 2.58° Inc 88.33°
MD 12656 TVD 7734.18
Az 0.33° Inc 87.52°
%: ltgy, blky, frm-hrd, v calc, crypxln
od mlky wh cut. SH 10%: l
bplty, slty, sf
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
7775
LS 90%: ltgy, blky, frm-hrd, v calc, crypxln-mxln,
nsf, mod mlky wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, sl cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
7800

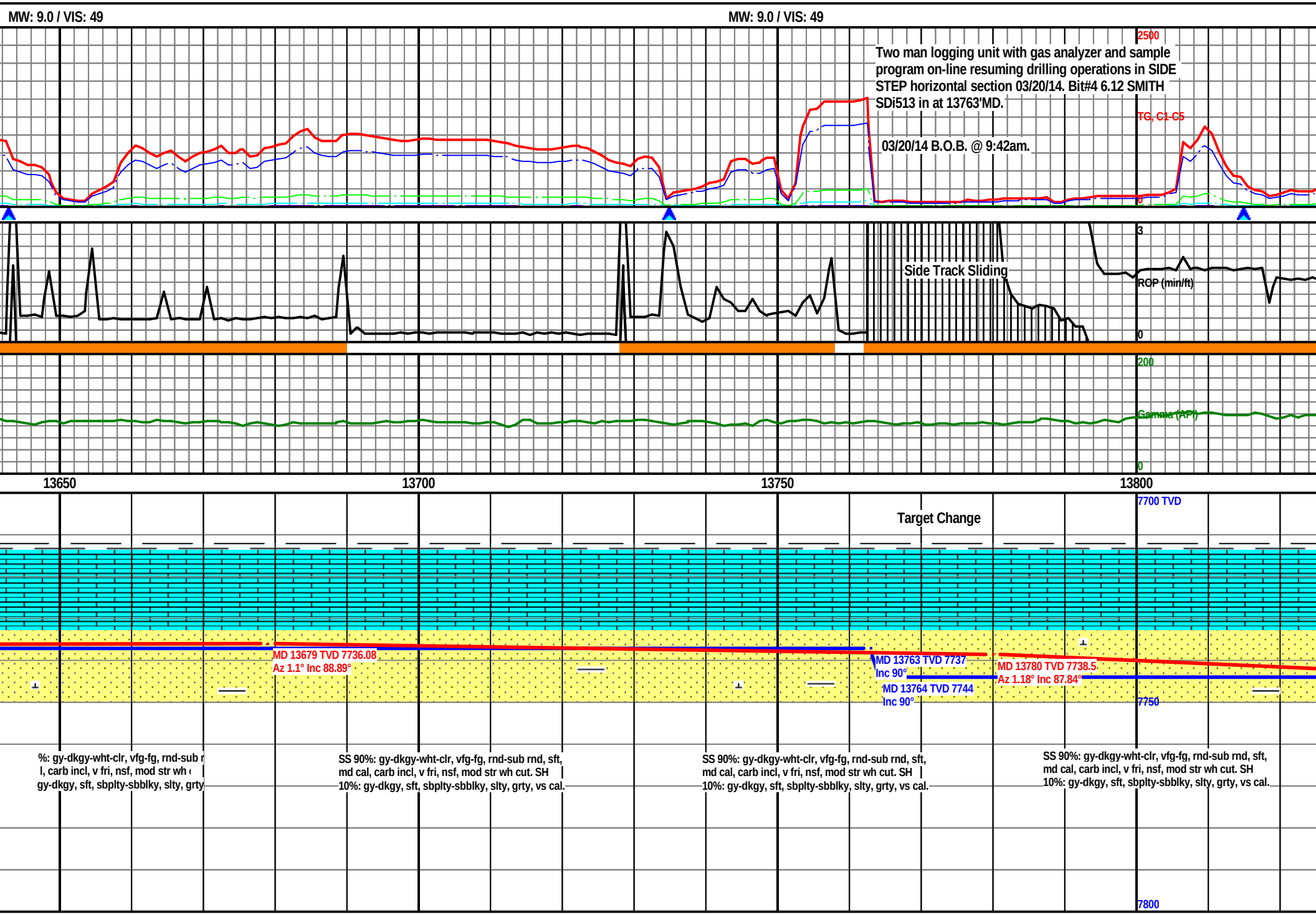

MW: 8.9 / VIS: 45
MW: 8.9 / VIS: 45
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
12750
12800
12850
12900
7700 TVD
MD 12741 TVD 7738.39
Az 358.92° Inc 86.79°
MD 12827 TVD 7741.92
Az 359.44° Inc 88.51°
7750
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg- md cal, carb incl, v fri, nsf, mo 10%: gy-dkgy, sft, sbplty-sbbl
7800

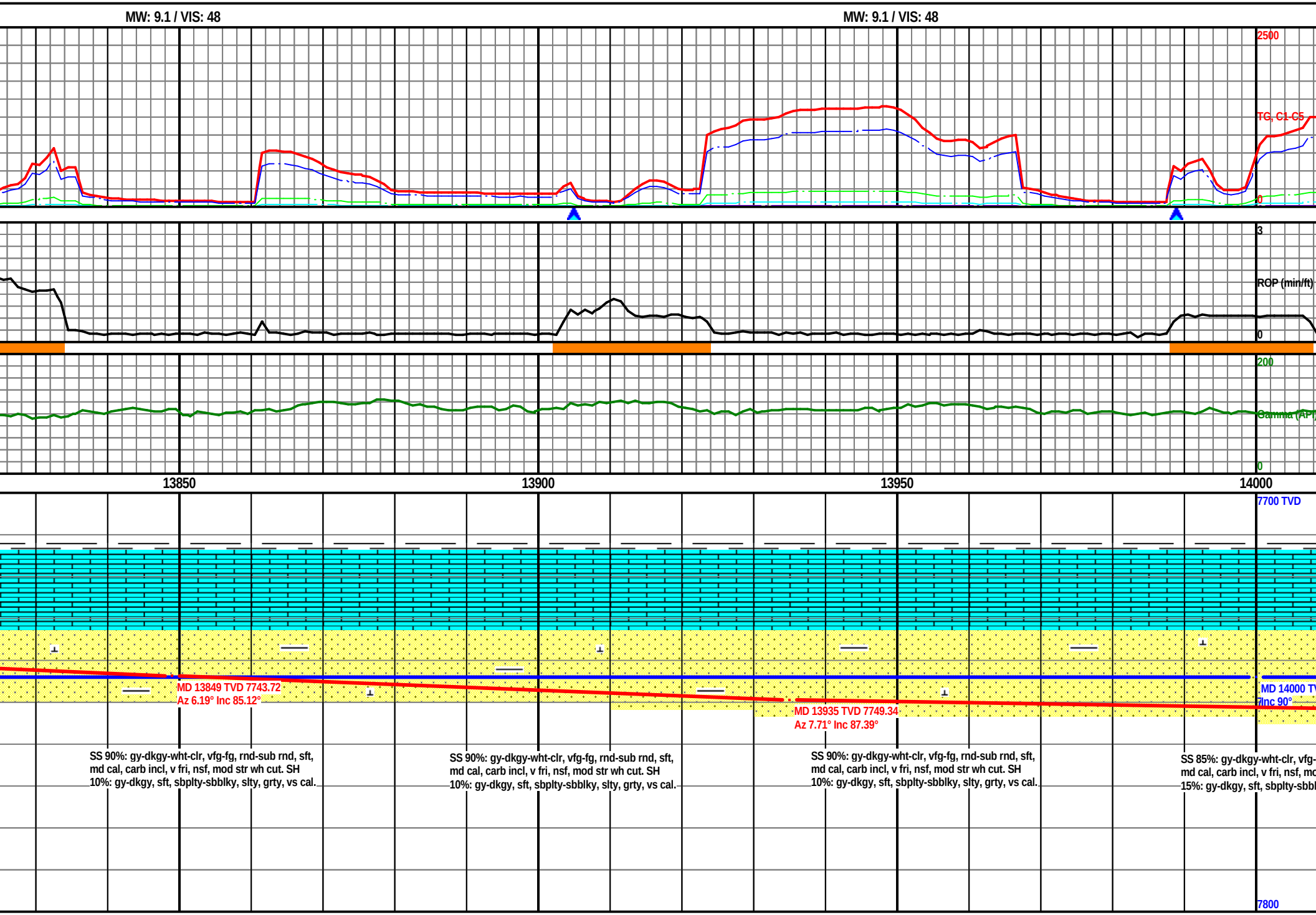

MW: 8.9 / VIS: 45
MW: 8.9 / VIS: 45
2500
TG_C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
12950
13000
13050
7700 TVD
MD 12912 TVD 7742.87
Az 358.91° Inc 90.21°
MD 13000 TVD 7737
MD 12997 TVD 7742.9
Az 358.97° Inc 89.75°
MD 13082 TVD
Az 358.79° Inc
g, rnd-sub r
d str wh
y, slty, grty
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 9
md c
10%
7800

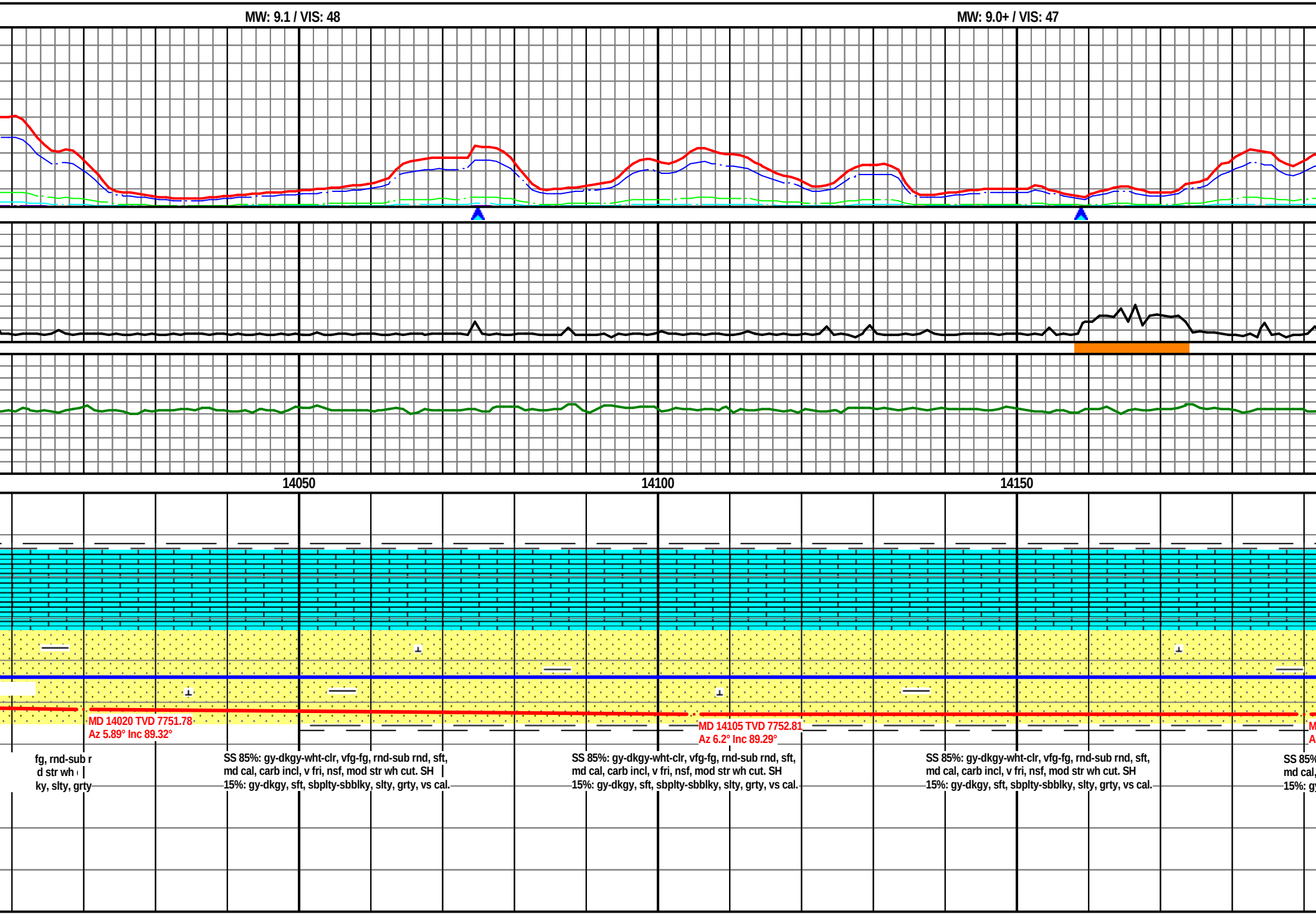

MW: 8.9 / VIS: 45
MW: 8.9 / VIS: 45
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
13100
13150
13200
13250
7700 TVD
7750
7800
MD 13253 TVD 7744.18
Az 358.9° Inc 90.24°
0%: gy-dkgy-wht-clr, vfg-fg, rnd-sub r
al, carb incl, v fri, nsf, mod str wh
gy-dkgy, sft, sbplty-sbblky, slty, grty
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.

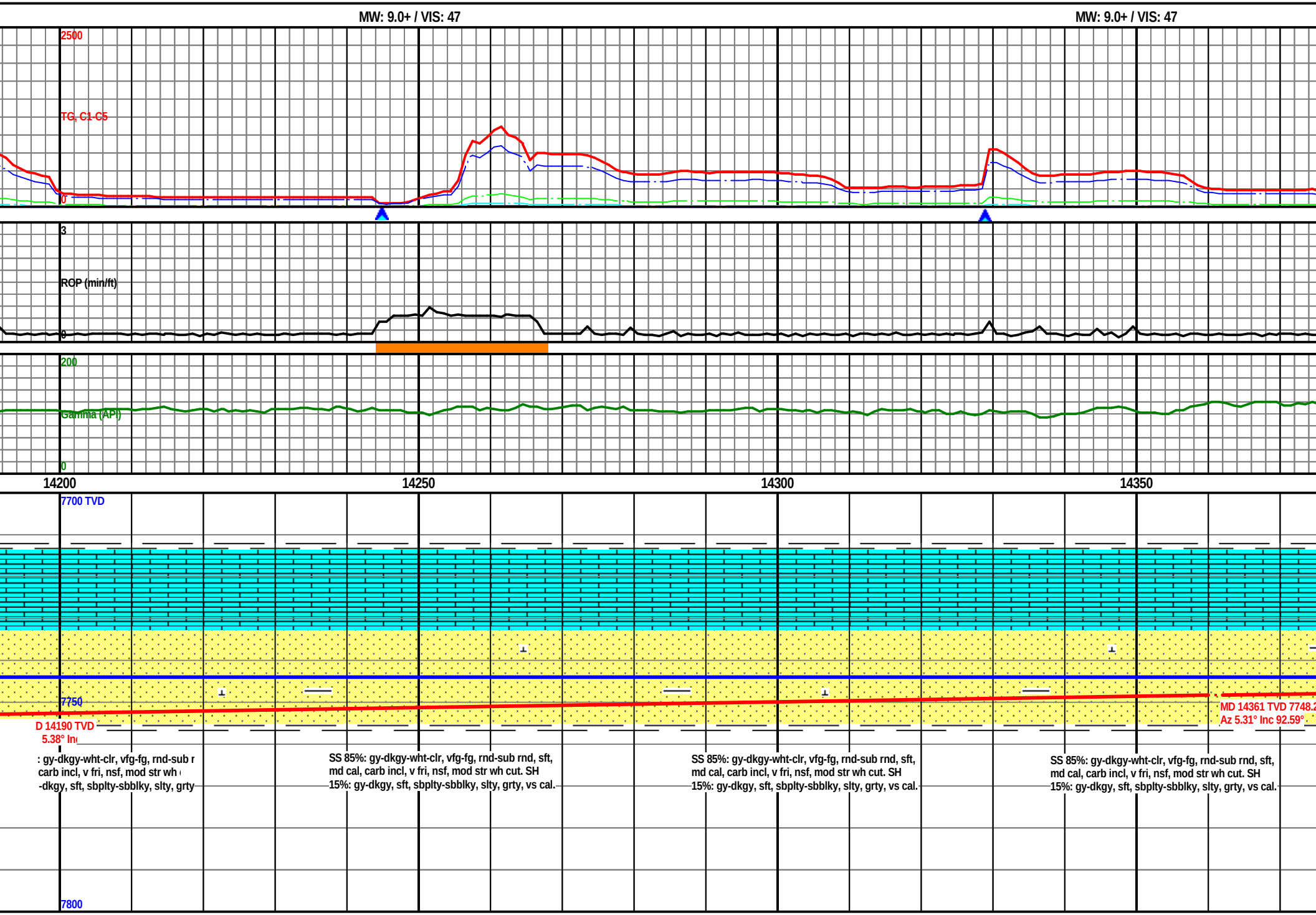

MW: 9.0 / VIS: 49
MW: 9.0 / VIS: 49
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
13300
13350
13400
13450
7700 TVD
MD 13423 TVD 7741.41
Az 359.75° Inc 91.63°
7750
7800
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg
md cal, carb incl, v fri, nsf, mod
10%: gy-dkgy, sft, sbplty-sbblky

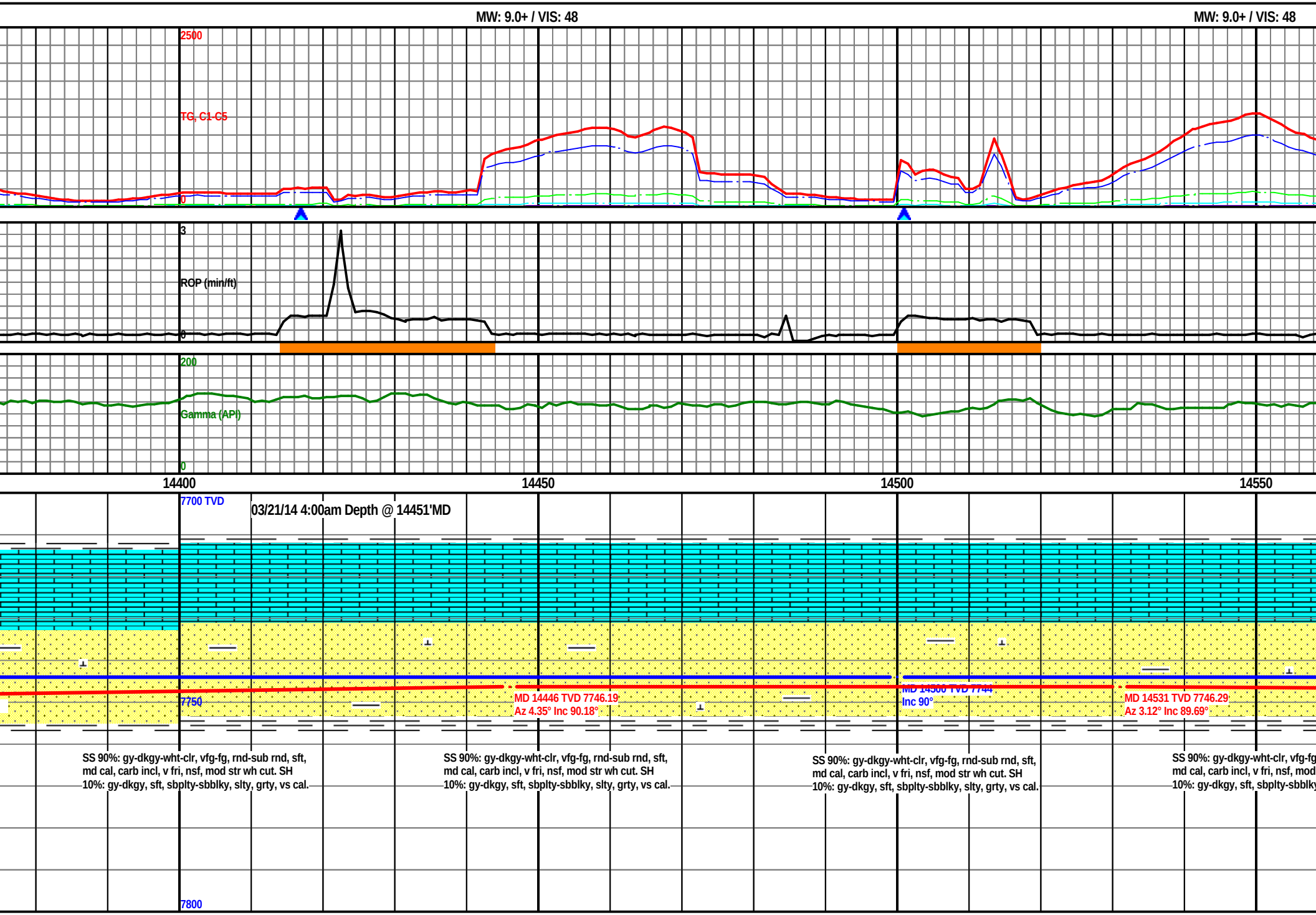

MW: 9.0 / VIS: 49
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
13500
13550
13600
7700 TVD
3/18/14 4:00am Depth @ 13643'
MD 13508 TVD 7738.83
Az 0.68° Inc 91.84°
MD 13550 TVD 7737
Inc 90°
MD 13593 TVD 7736.36
Az 0.96° Inc 91.49°
7750
, rnd-sub r
str wh
, slty, grty
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
7800

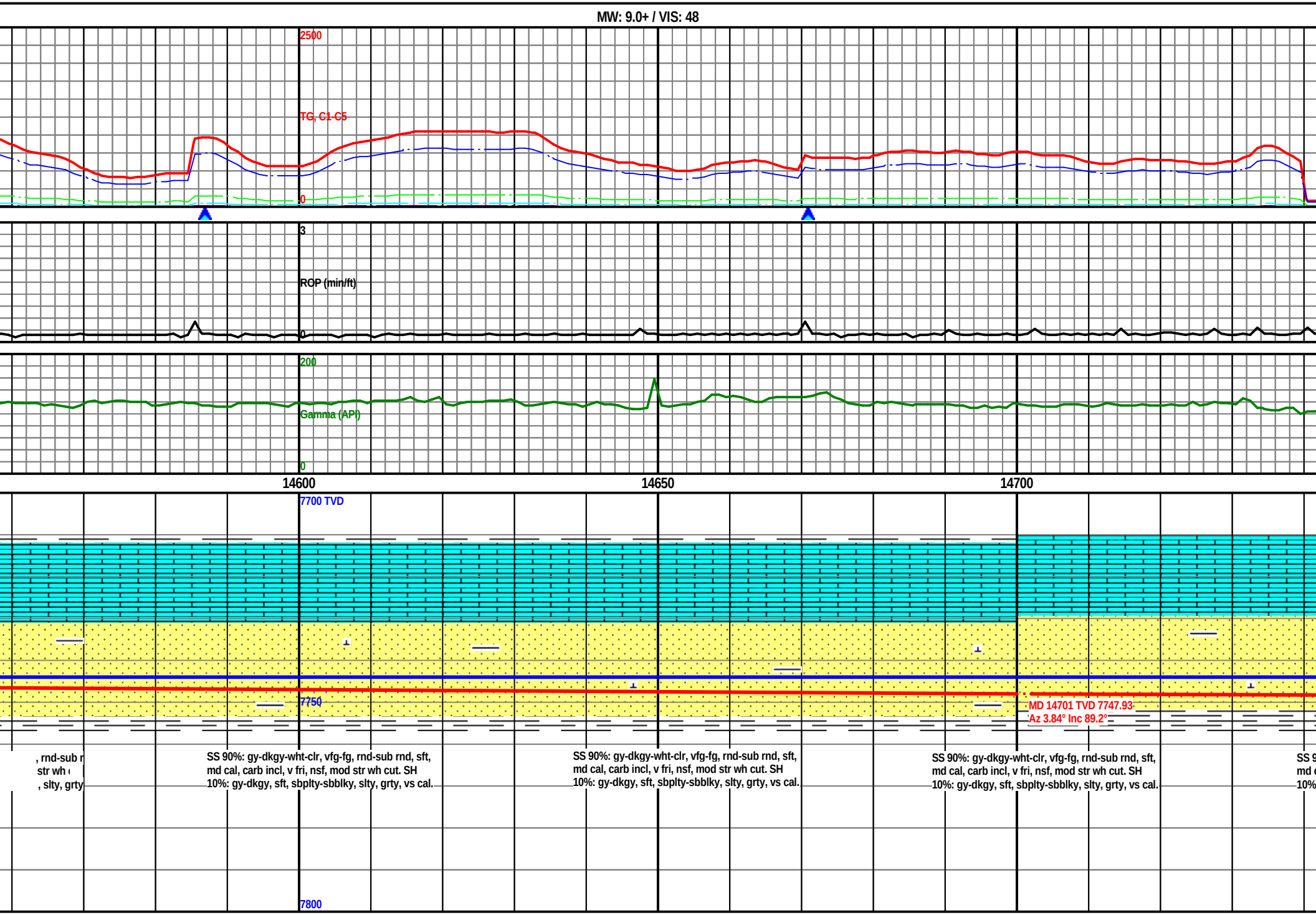

MW: 9.0 / VIS: 49
MW: 9.0 / VIS: 49
Two man logging unit with gas analyzer and sample program on-line resuming drilling operations in SIDE STEP horizontal section 03/20/14. Bit#4 6.12 SMITH SDi513 in at 13763'MD.
03/20/14 B.O.B. @ 9:42am.
2500
TG, C1-C5
0
Side Track Sliding
3
ROP (min/ft)
0
200
Gamma (API)
0
13650
13700
13750
13800
7700 TVD
Target Change
MD 13679 TVD 7736.08
Az 1.1° Inc 88.89°
MD 13763 TVD 7737
Inc 90°
MD 13764 TVD 7744
Inc 90°
MD 13780 TVD 7738.5
Az 1.18° Inc 87.84°
7750
7800
%: gy-dkgy-wht-clr, vfg-fg, rnd-sub r
l, carb incl, v fri, nsf, mod str wh
gy-dkgy, sft, sbplty-sbblky, slty, grty
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.

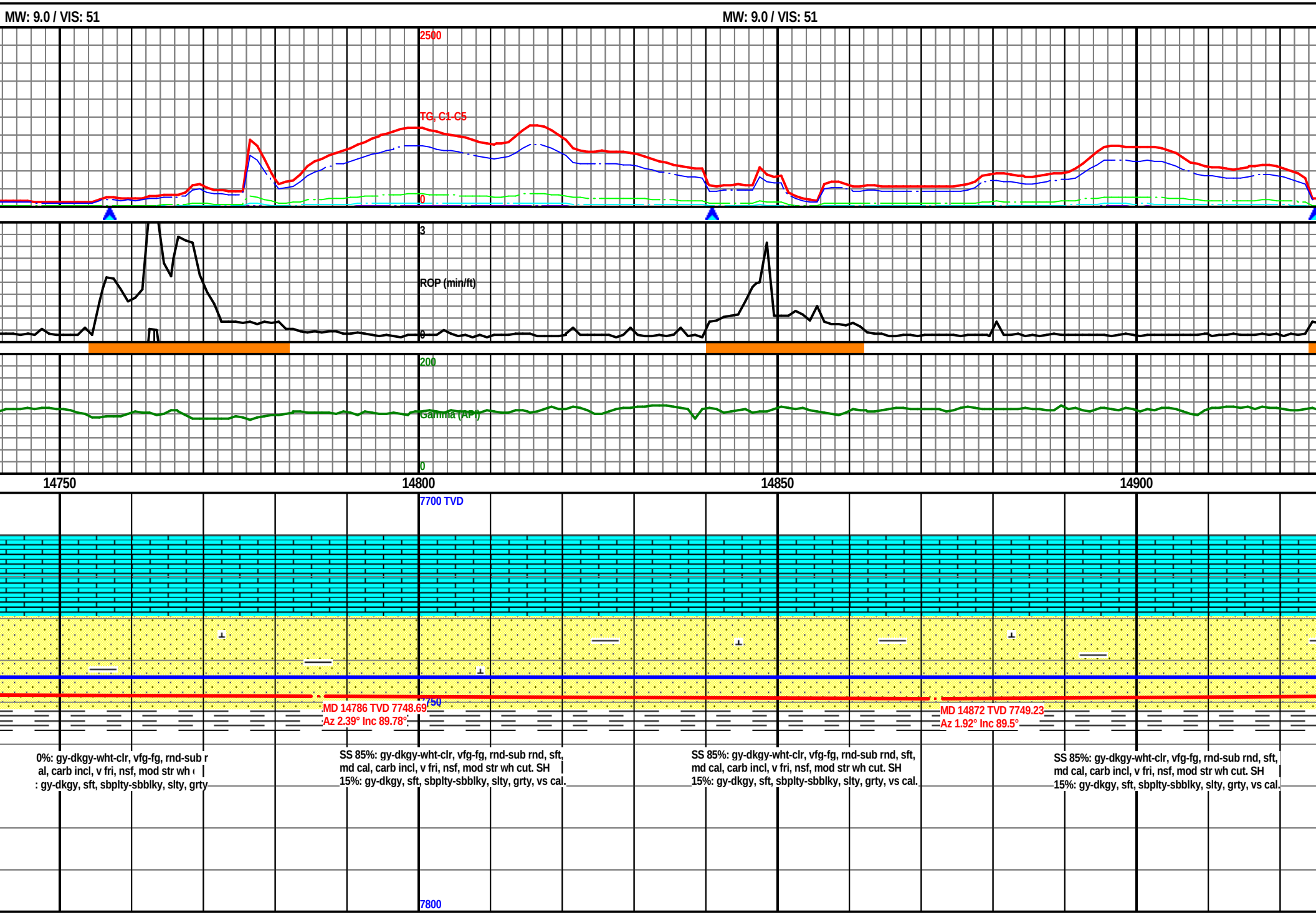

MW: 9.1 / VIS: 48
MW: 9.1 / VIS: 48
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
13850
13900
13950
14000
7700 TVD
MD 13849 TVD 7743.72
Az 6.19° Inc 85.12°
MD 13935 TVD 7749.34
Az 7.71° Inc 87.39°
MD 14000 TV
Inc 90°
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vfg-
md cal, carb incl, v fri, nsf, mo
15%: gy-dkgy, sft, sbplty-sbbl
7800

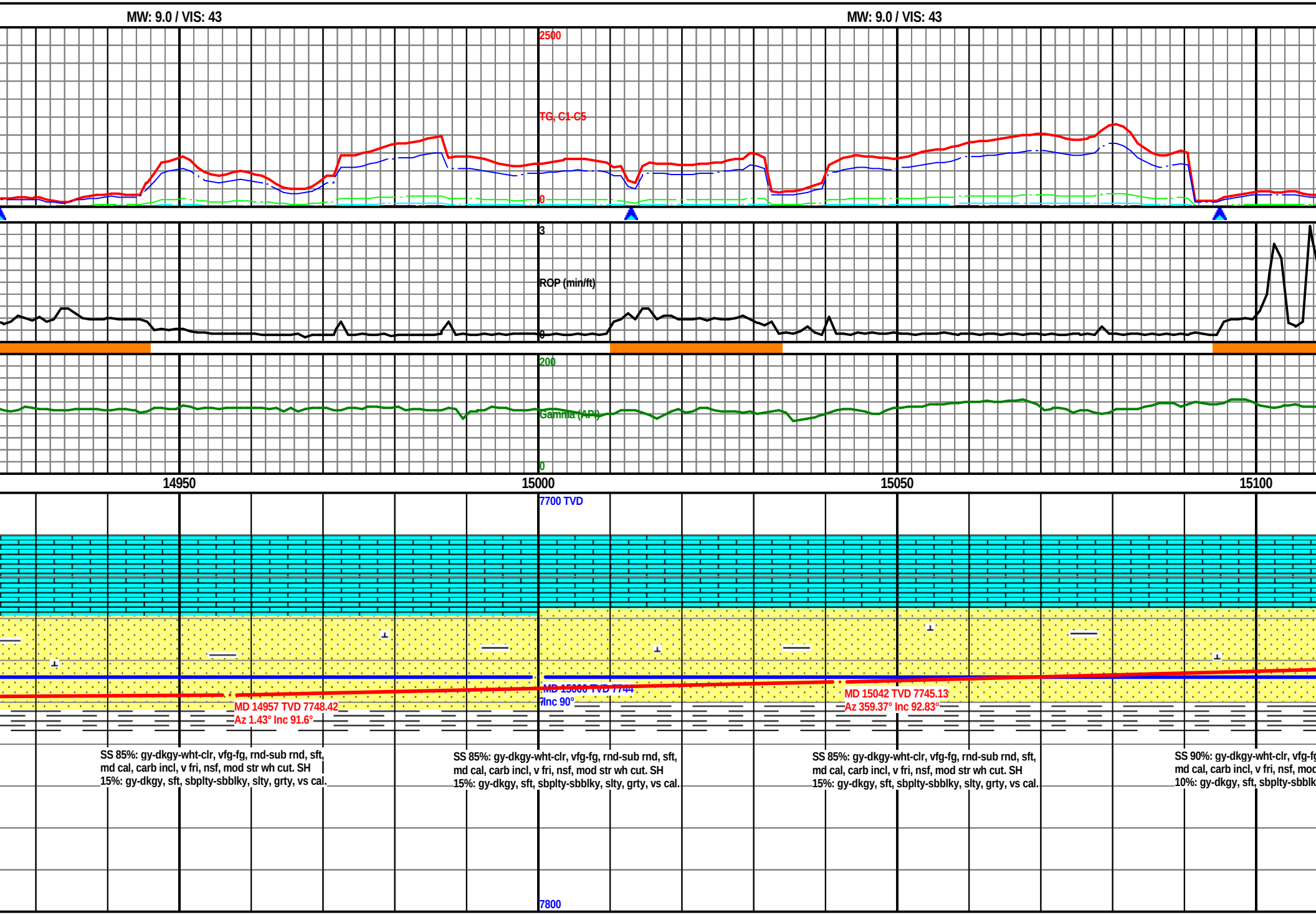

MW: 9.1 / VIS: 48
MW: 9.0+ / VIS: 47
14050
14100
14150
MD 14020 TVD 7751.78
Az 5.89° Inc 89.32°
MD 14105 TVD 7752.81
Az 6.2° Inc 89.29°
fg, rnd-sub r
d str wh
ky, slty, grty
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.

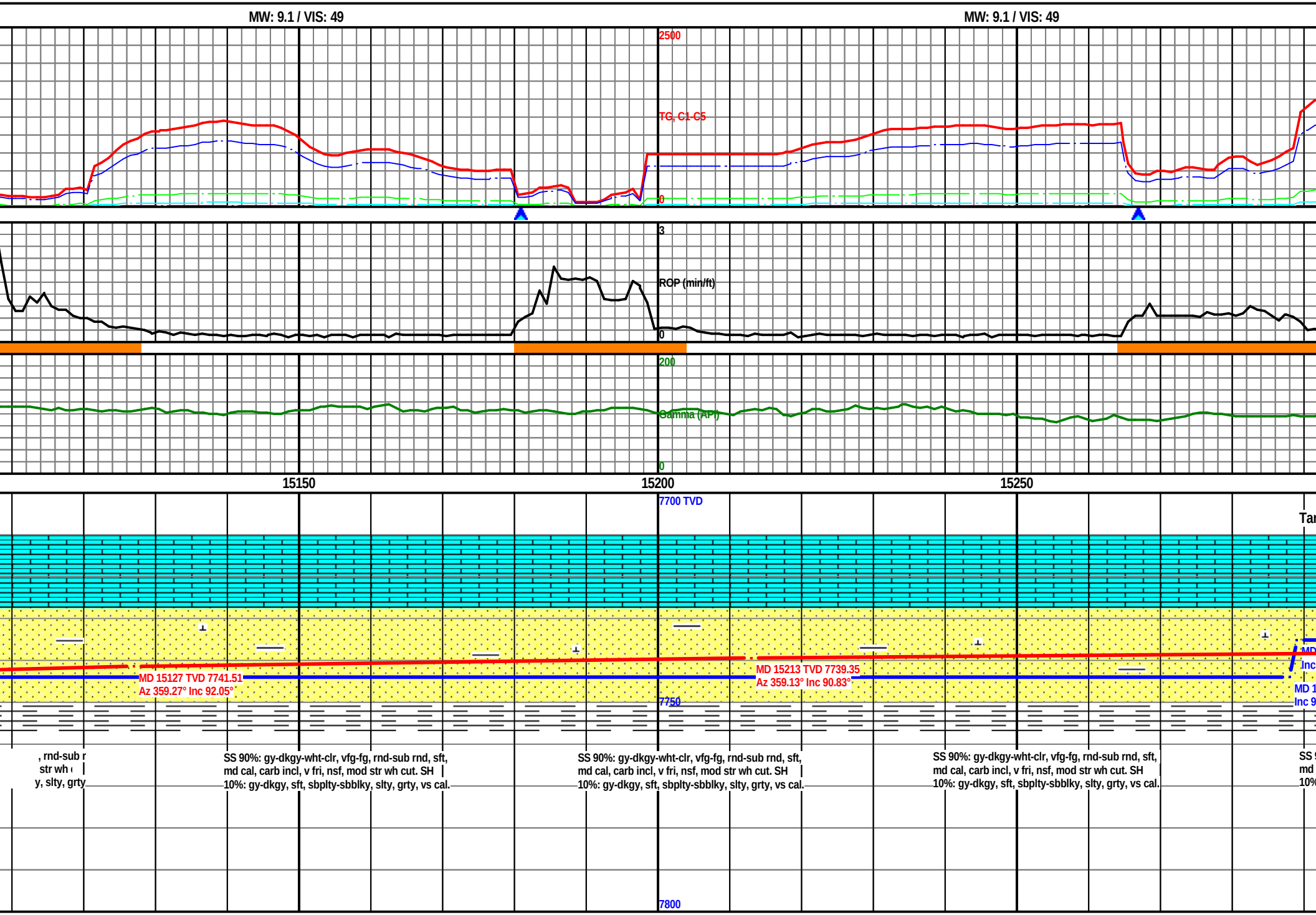

MW: 9.0+ / VIS: 47
MW: 9.0+ / VIS: 47
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
14200
14250
14300
14350
7700 TVD
7750
7800
D 14190 TVD
5.38° In
MD 14361 TVD 7748.2
Az 5.31° Inc 92.59°
: gy-dkgy-wht-clr, vfg-fg, rnd-sub r
carb incl, v fri, nsf, mod str wh
-dkgy, sft, sbplty-sbblky, slty, grty
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.

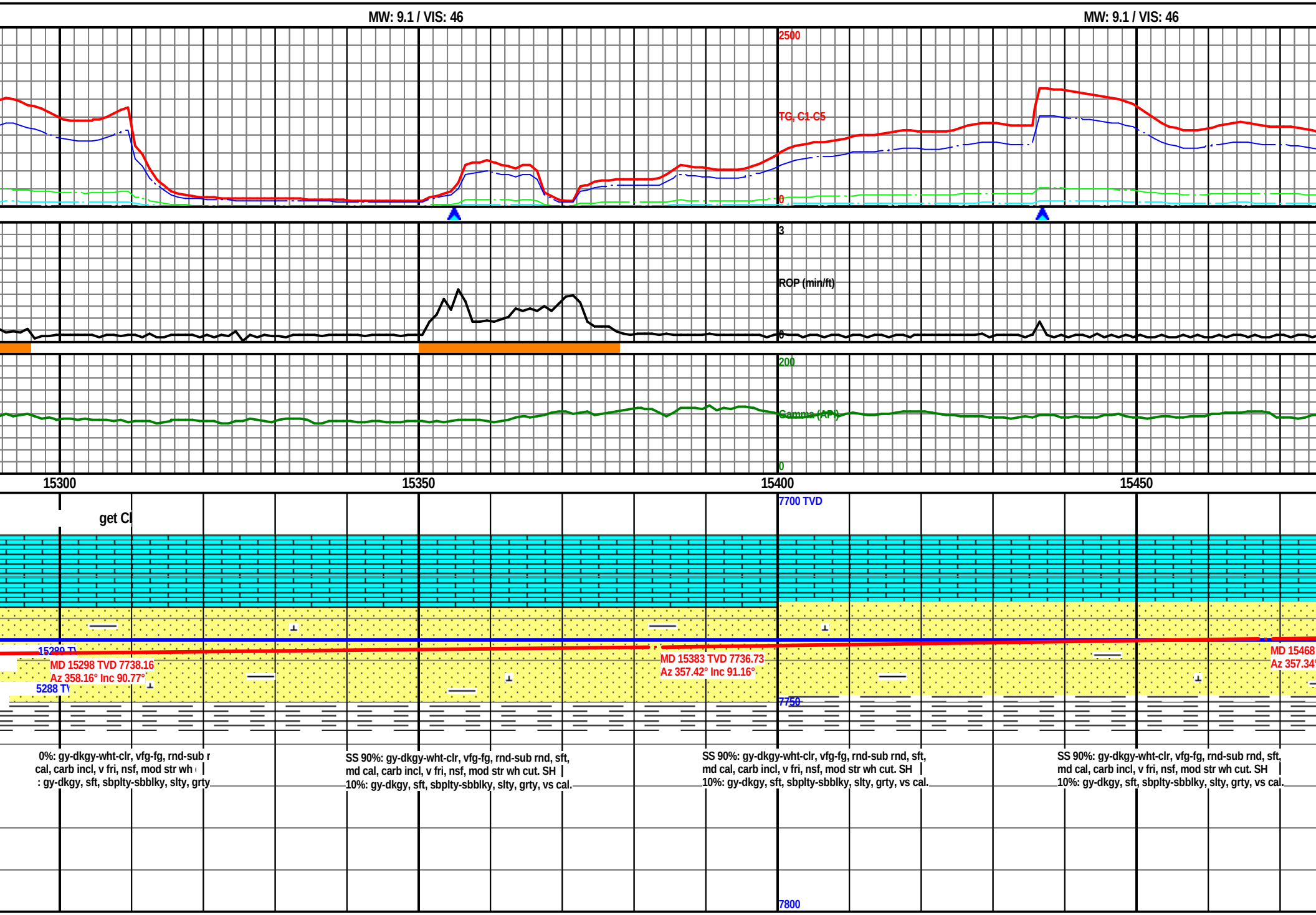

MW: 9.0+ / VIS: 48
MW: 9.0+ / VIS: 48
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
14400
14450
14500
14550
7700 TVD
03/21/14 4:00am Depth @ 14451'MD
7750
7800
MD 14446 TVD 7746.19'
Az 4.35° Inc 90.18°
Inc 90°
MD 14531 TVD 7746.29'
Az 3.12° Inc 89.69°
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg
md cal, carb incl, v fri, nsf, mod
10%: gy-dkgy, sft, sbplty-sbblky

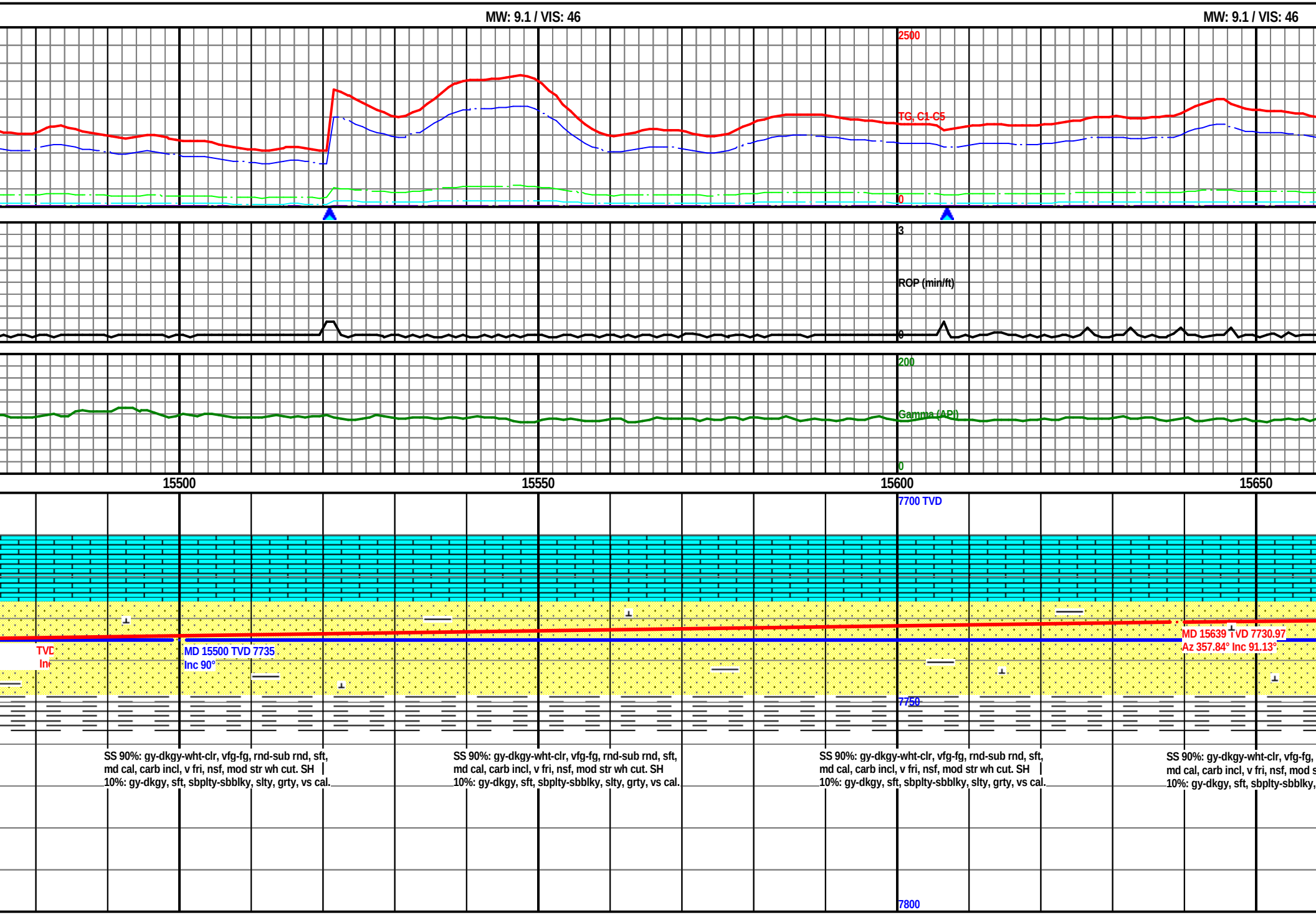

MW: 9.0+ / VIS: 48
2500
TG, C1 C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
14600
14650
14700
7700 TVD
7750
7800
MD 14701 TVD 7747.93
Az 3.84° Inc 89.2°
, rnd-sub r
str wh
, slty, grty
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 9
md
10%

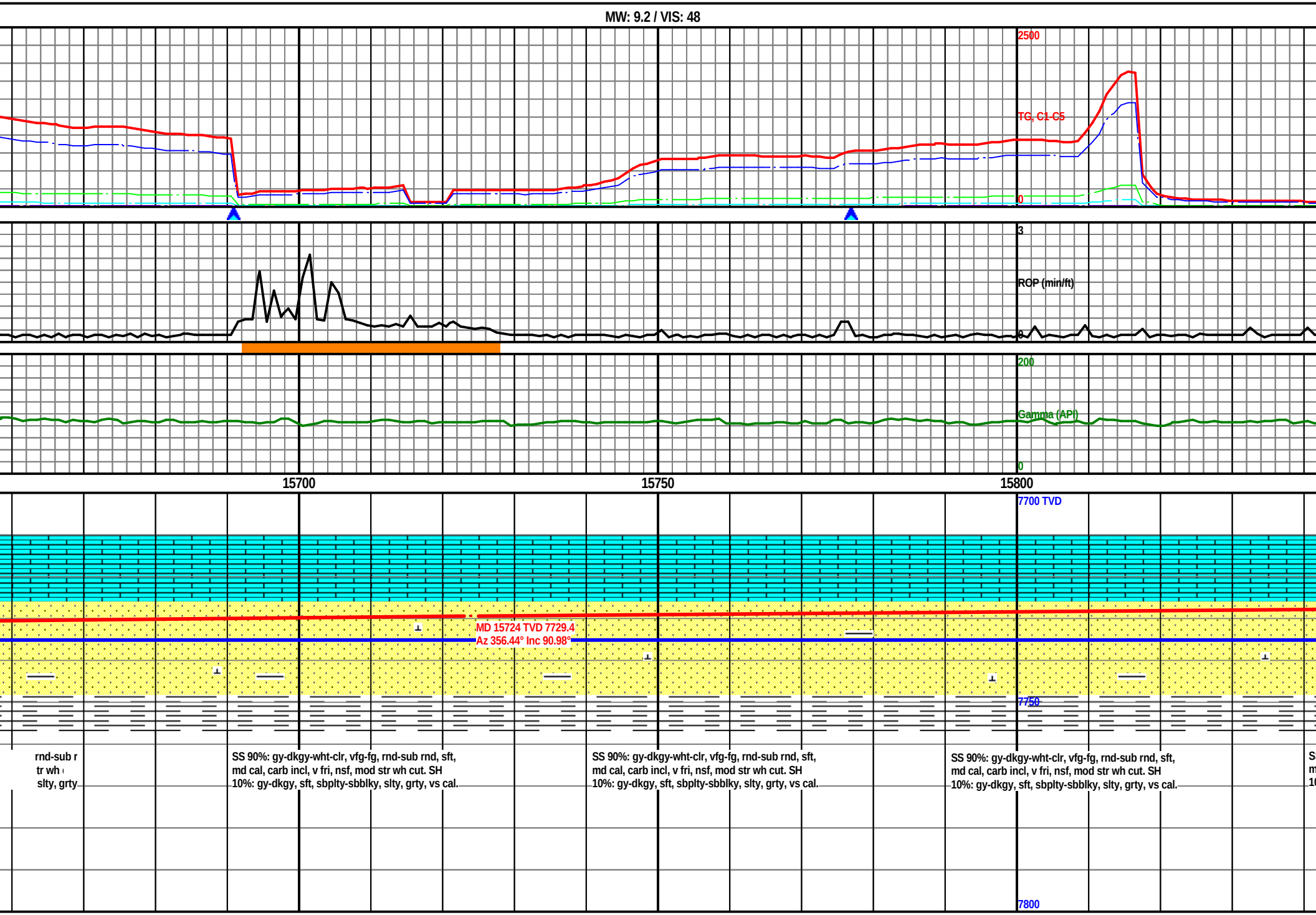

MW: 9.0 / VIS: 51
MW: 9.0 / VIS: 51
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
14750
14800
14850
14900
7700 TVD
7750
7800
MD 14786 TVD 7748.69
Az 2.39° Inc 89.78°
MD 14872 TVD 7749.23
Az 1.92° Inc 89.5°
0%: gy-dkgy-wht-clr, vfg-fg, rnd-sub r
al, carb incl, v fri, nsf, mod str wh
: gy-dkgy, sft, sbplty-sbblky, slty, grty
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.

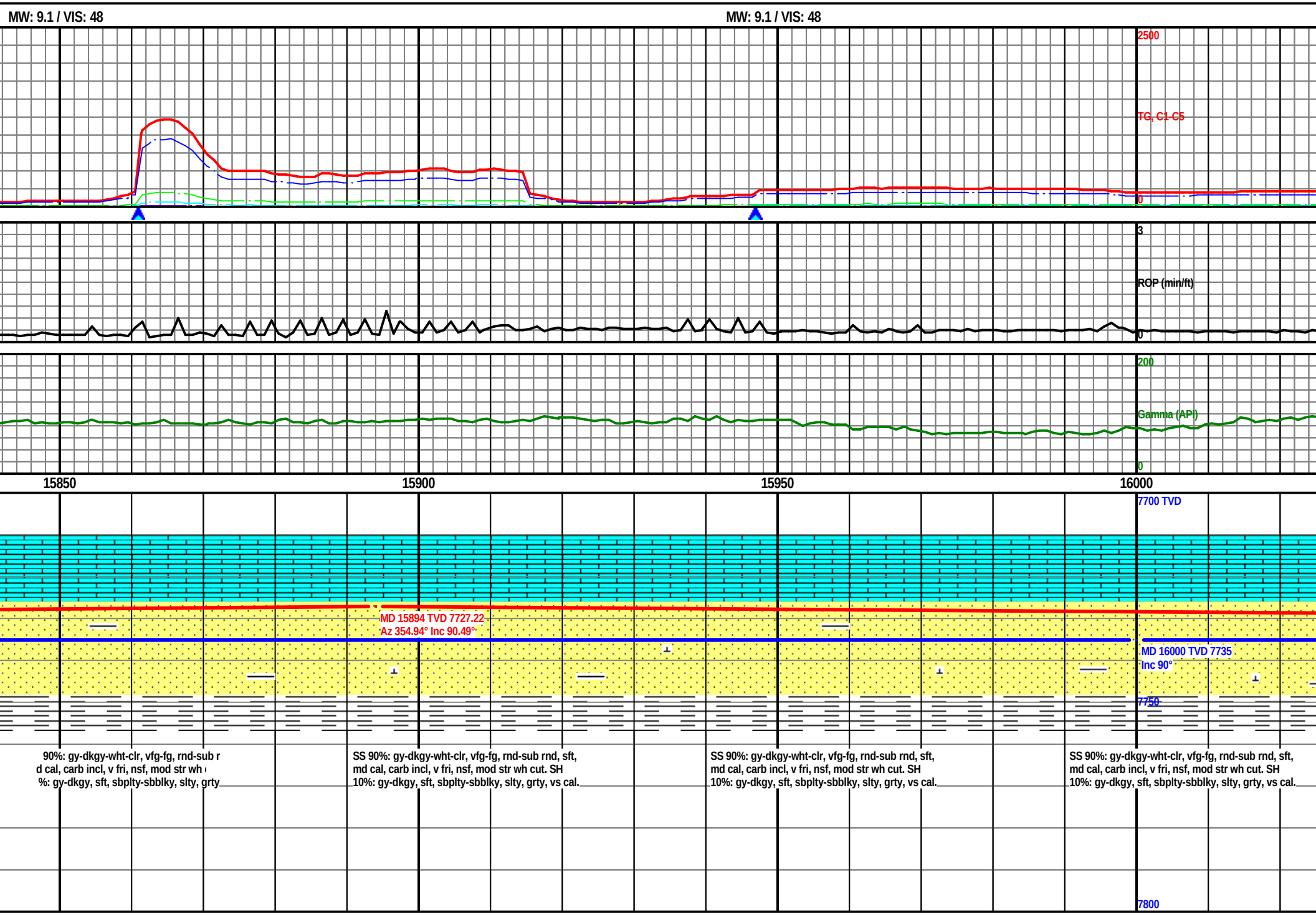

MW: 9.0 / VIS: 43
MW: 9.0 / VIS: 43
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
14950
15000
15050
15100
7700 TVD
MD 14957 TVD 7748.42
Az 1.43° Inc 91.6°
MD 15042 TVD 7745.13
Az 359.37° Inc 92.83°
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 85%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 15%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg
md cal, carb incl, v fri, nsf, mod
10%: gy-dkgy, sft, sbplty-sbblk
7800

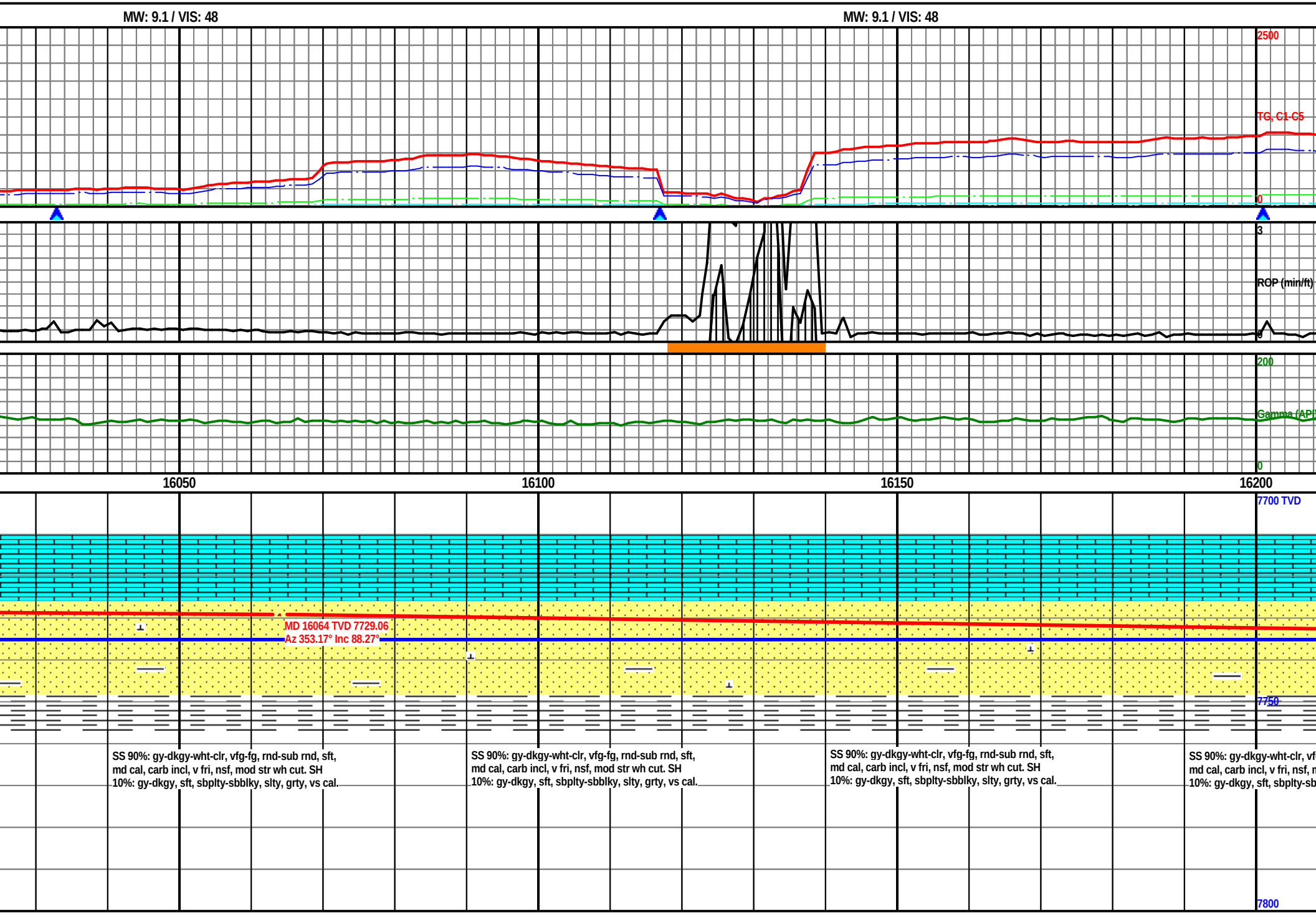

MW: 9.1 / VIS: 49
MW: 9.1 / VIS: 49
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
15150
15200
15250
7700 TVD
MD 15127 TVD 7741.51
Az 359.27° Inc 92.05°
MD 15213 TVD 7739.35
Az 359.13° Inc 90.83°
7750
7800
, rnd-sub r
str wh
y, slty, grty
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.

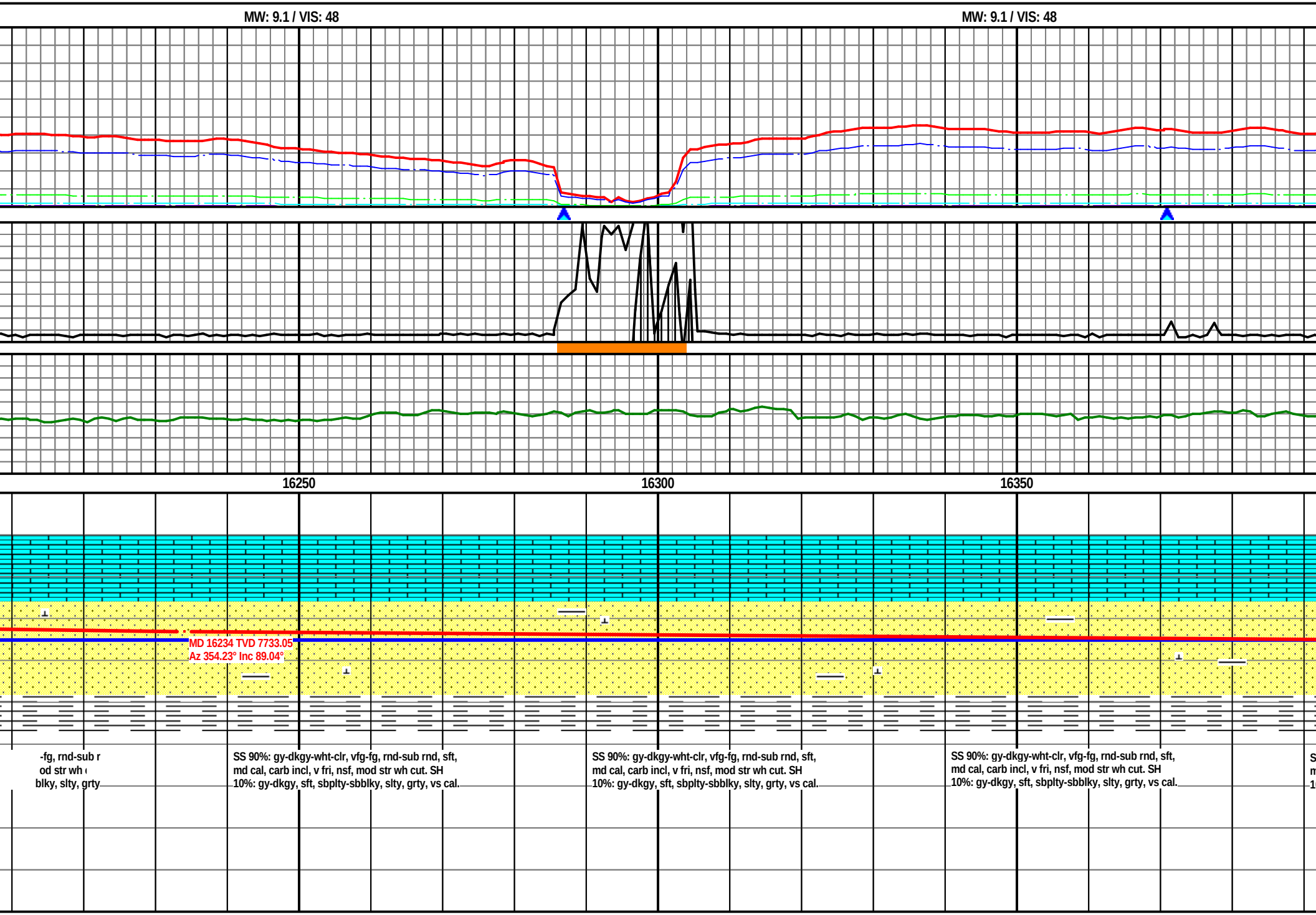

MW: 9.1 / VIS: 46
MW: 9.1 / VIS: 46
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
15300
15350
15400
15450
7700 TVD
get Cl
MD 15298 TVD 7738.16
Az 358.16° Inc 90.77°
5288 TV
MD 15383 TVD 7736.73
Az 357.42° Inc 91.16°
MD 15468
Az 357.34°
7750
7800
0%: gy-dkgy-wht-clr, vfg-fg, rnd-sub r
cal, carb incl, v fri, nsf, mod str wh
: gy-dkgy, sft, sbplty-sbblky, slty, grty
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.

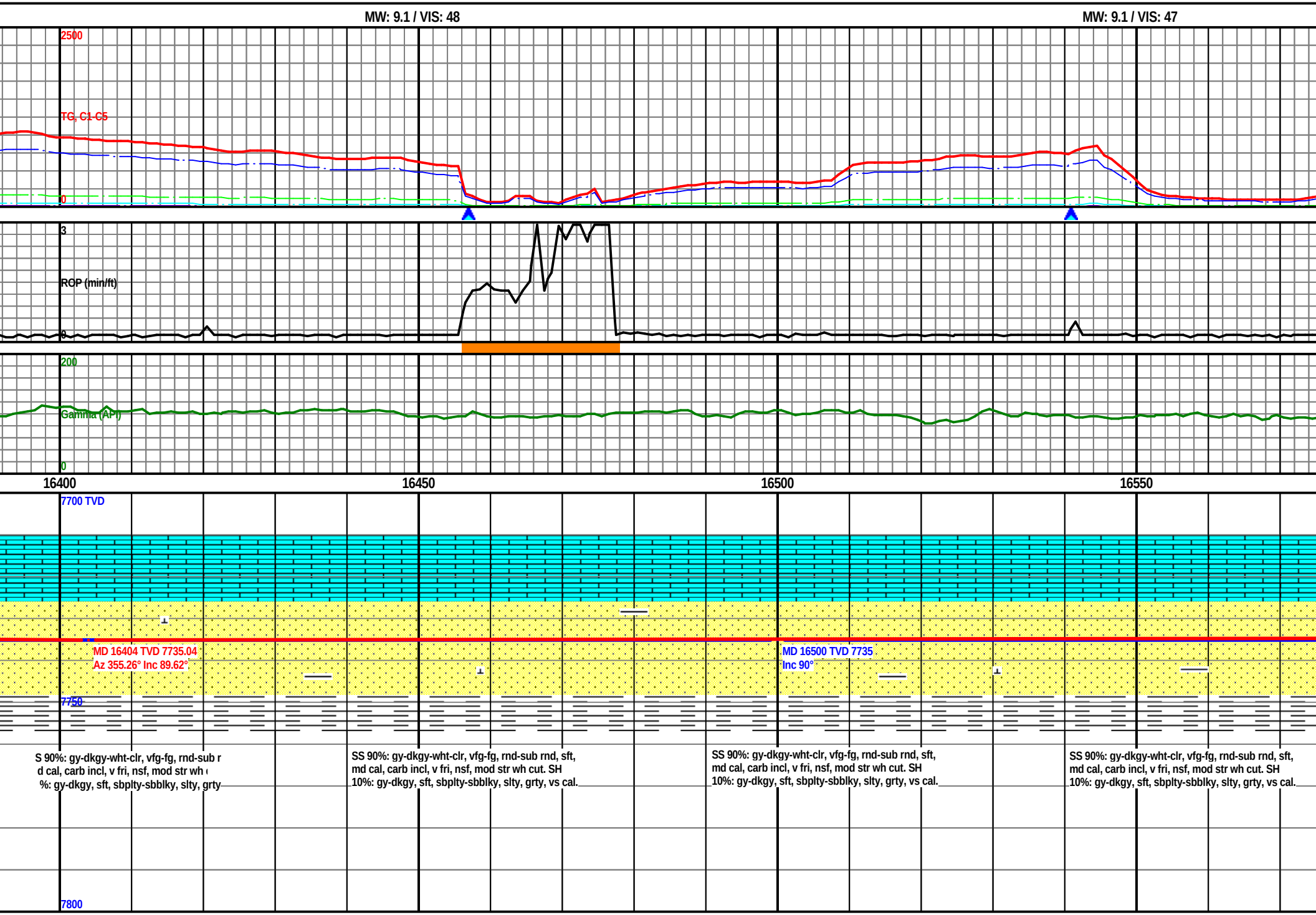

MW: 9.1 / VIS: 46
MW: 9.1 / VIS: 46
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
15500
15550
15600
15650
7700 TVD
MD 15500 TVD 7735
Inc 90°
MD 15639 TVD 7730.97
Az 357.84° Inc 91.13°
7750
7800
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, md cal, carb incl, v fri, nsf, mod 10%: gy-dkgy, sft, sbplty-sbblky,

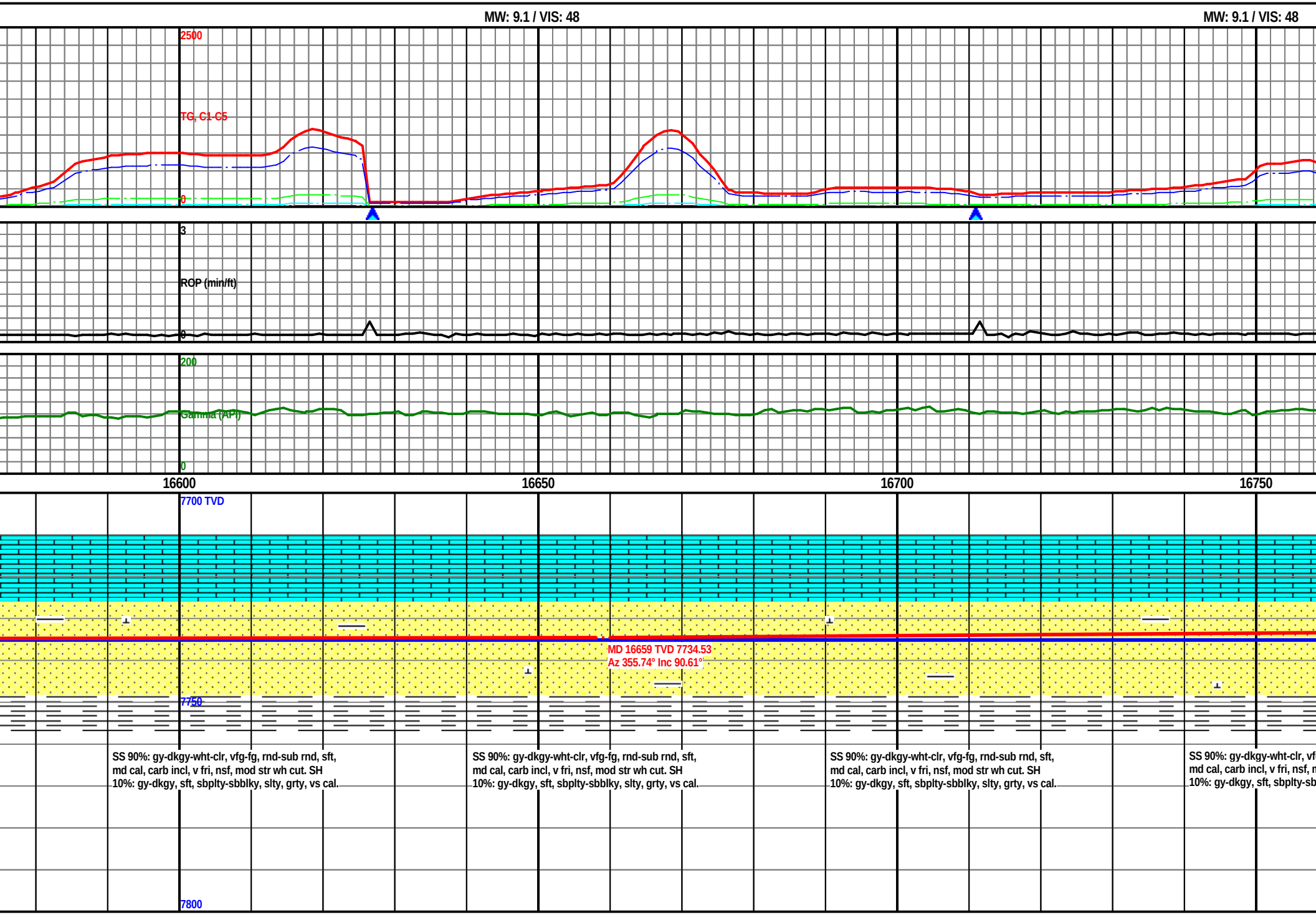

MW: 9.2 / VIS: 48
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
15700
15750
15800
7700 TVD
MD 15724 TVD 7729.4
Az 356.44° Inc 90.98°
7750
7800
rnd-sub r
tr wh
slty, grty
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.

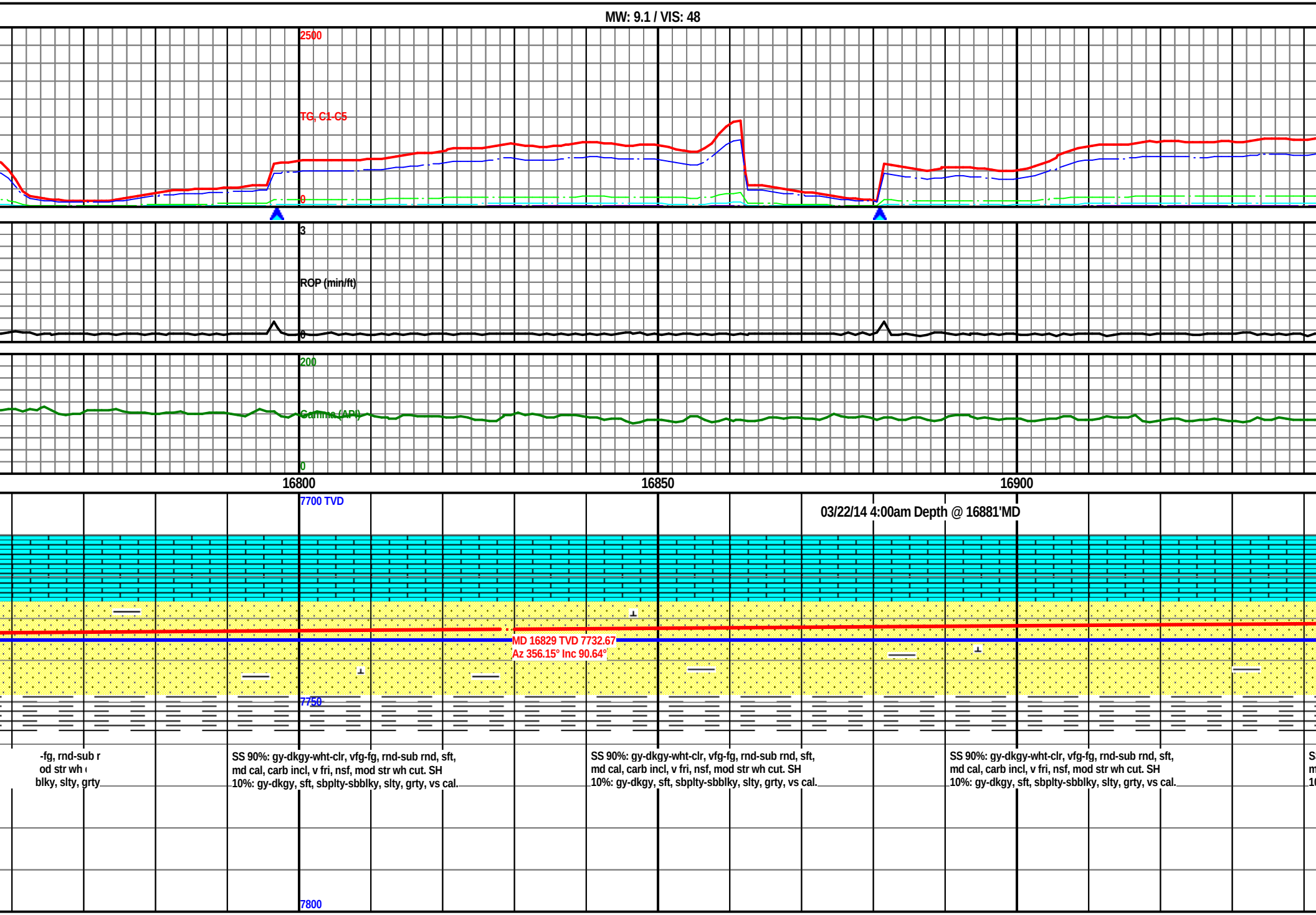

MW: 9.1 / VIS: 48
MW: 9.1 / VIS: 48
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
15850
15900
15950
16000
7700 TVD
MD 15894 TVD 7727.22
Az 354.94° Inc 90.49°
MD 16000 TVD 7735
Inc 90°
7750
7800
90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub r
d cal, carb incl, v fri, nsf, mod str wh
%: gy-dkgy, sft, sbplty-sbblky, slty, grty
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.

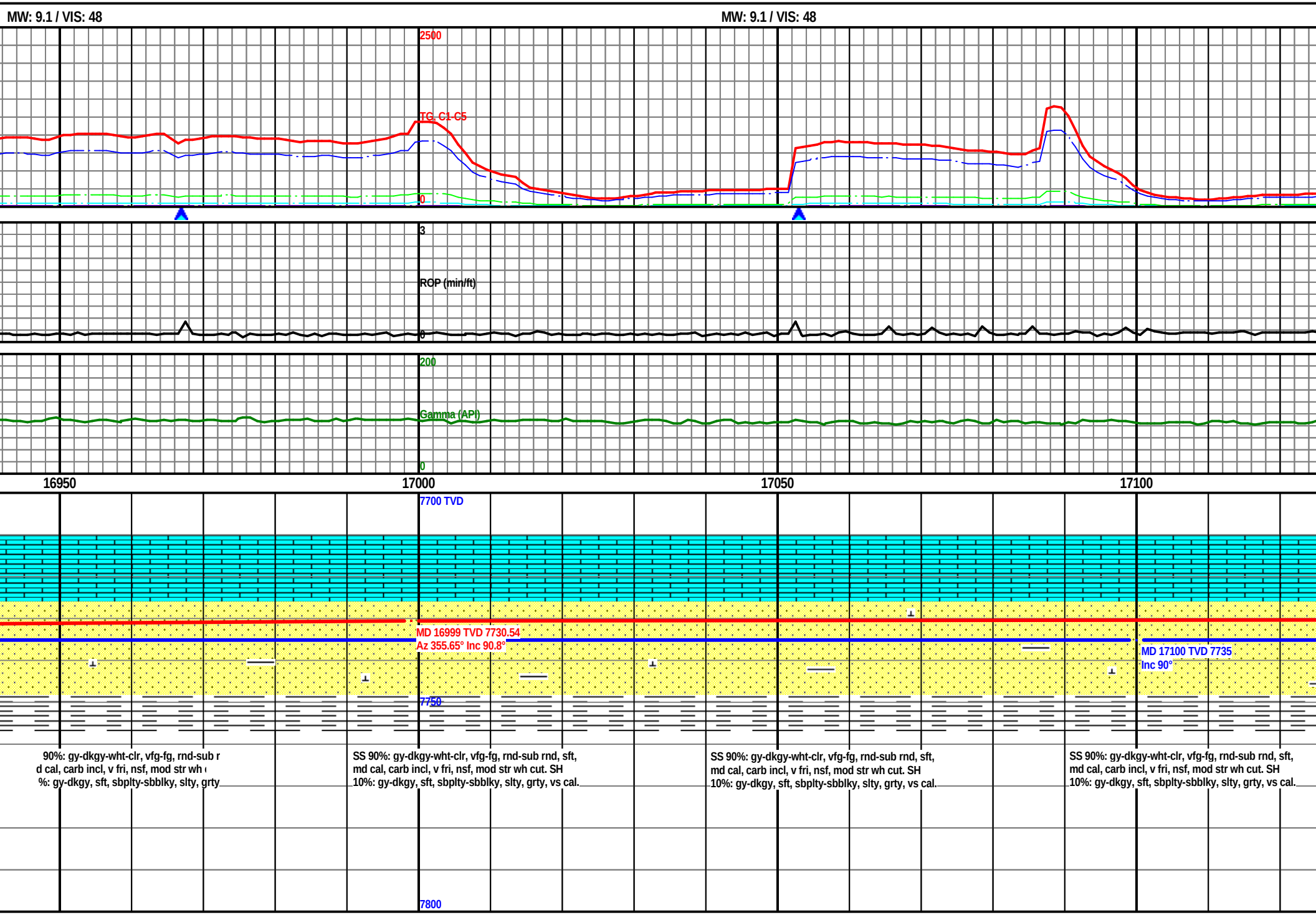

MW: 9.1 / VIS: 48
MW: 9.1 / VIS: 48
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
16050
16100
16150
16200
7700 TVD
MD 16064 TVD 7729.06
Az 353.17° Inc 88.27°
7750
7800
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vf
md cal, carb incl, v fri, nsf, m
10%: gy-dkgy, sft, sbplty-sb

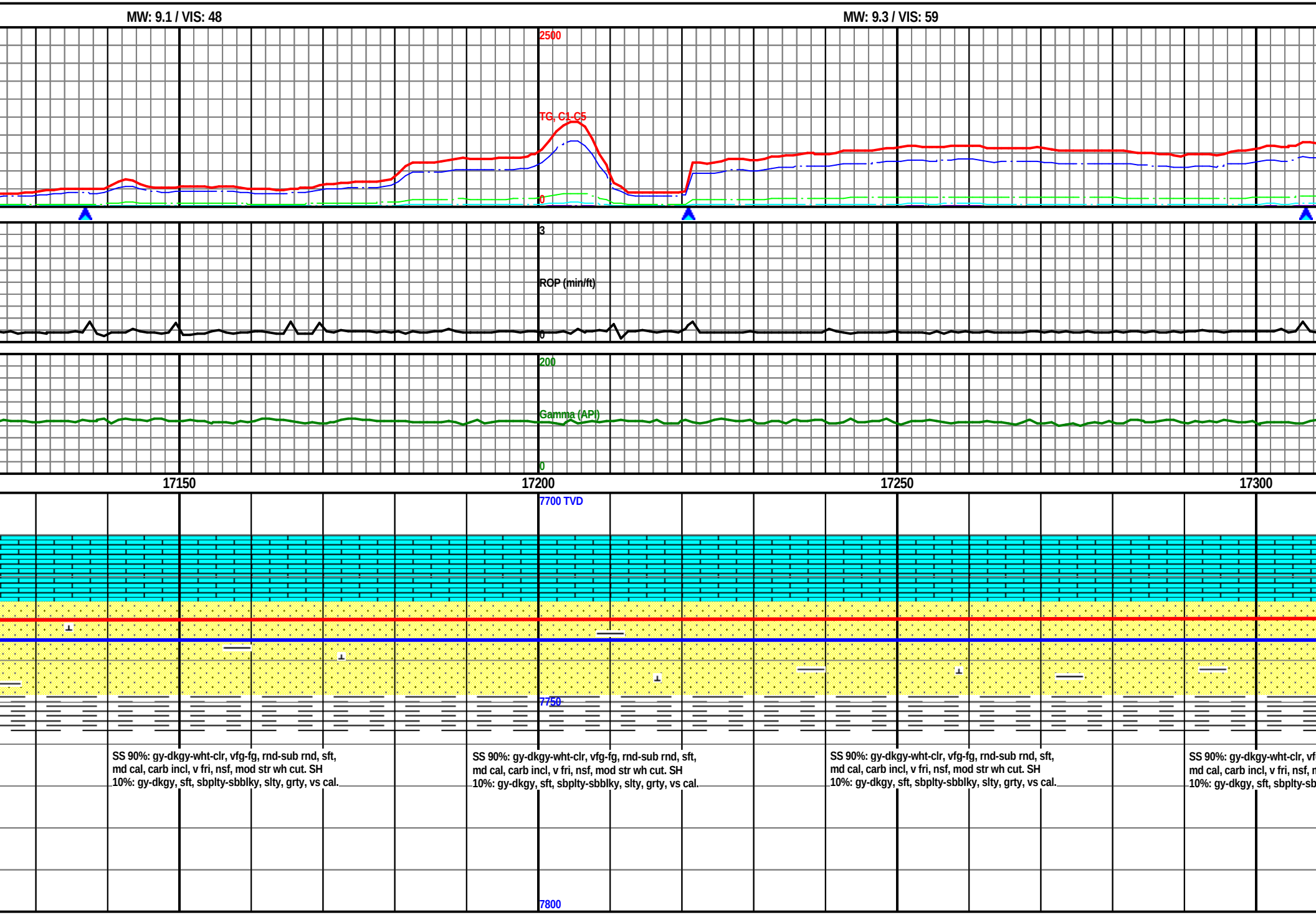

MW: 9.1 / VIS: 48
MW: 9.1 / VIS: 48
16250
16300
16350
MD 16234 TVD 7733.05
Az 354.23° Inc 89.04°
-fg, rnd-sub r
od str wh
blky, slty, grty
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.

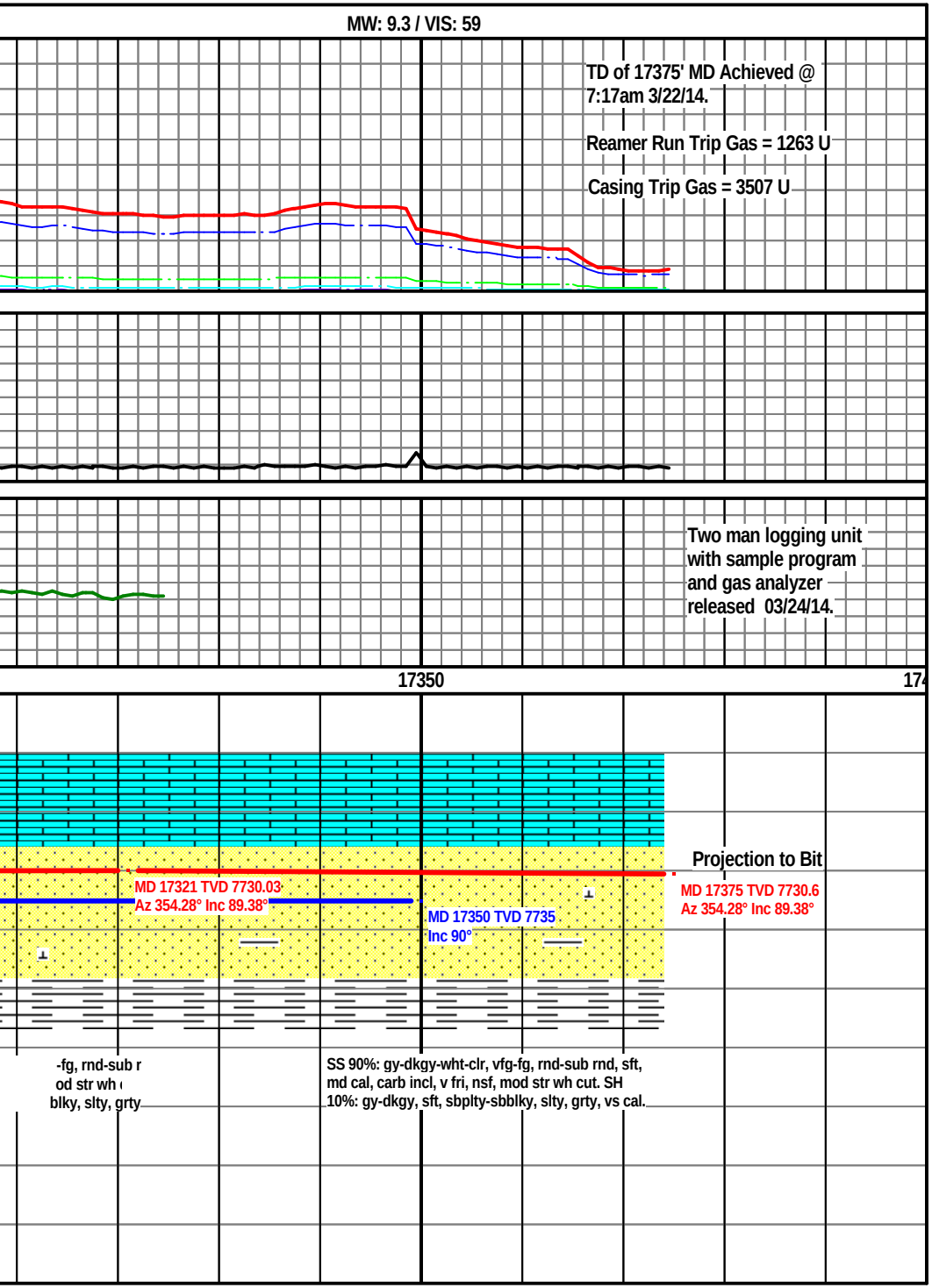

MW: 9.1 / VIS: 48
MW: 9.1 / VIS: 47
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
16400
16450
16500
16550
7700 TVD
MD 16404 TVD 7735.04
Az 355.26° Inc 89.62°
MD 16500 TVD 7735
Inc 90°
7750
S 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub r
d cal, carb incl, v fri, nsf, mod str wh
%: gy-dkgy, sft, sbplty-sbblky, slty, grty
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
7800


MW: 9.1 / VIS: 48
MW: 9.1 / VIS: 48
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
16600
16650
16700
16750
7700 TVD
MD 16659 TVD 7734.53
Az 355.74° Inc 90.61°
7750
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vf
md cal, carb incl, v fri, nsf, m
10%: gy-dkgy, sft, sbplty-sb
7800


MW: 9.1 / VIS: 48
2500
TG, C1 C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
16800
16850
16900
7700 TVD
03/22/14 4:00am Depth @ 16881'MD
MD 16829 TVD 7732.67
Az 356.15° Inc 90.64°
7750
7800
-fg, rnd-sub r
od str wh
blky, slty, grty
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.


MW: 9.1 / VIS: 48
MW: 9.1 / VIS: 48
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
16950
17000
17050
17100
7700 TVD
MD 16999 TVD 7730.54
Az 355.65° Inc 90.8°
MD 17100 TVD 7735
Inc 90°
7750
7800
90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub r
d cal, carb incl, v fri, nsf, mod str wh
%: gy-dkgy, sft, sbplty-sbblky, slty, grty
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft,
md cal, carb incl, v fri, nsf, mod str wh cut. SH
10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.


MW: 9.1 / VIS: 48
MW: 9.3 / VIS: 59
2500
TG, C1-C5
0
3
ROP (min/ft)
0
200
Gamma (API)
0
17150
17200
17250
17300
7700 TVD
7750
7800
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.


MW: 9.3 / VIS: 59
TD of 17375' MD Achieved @ 7:17am 3/22/14.
Reamer Run Trip Gas = 1263 U
Casing Trip Gas = 3507 U
Two man logging unit with sample program and gas analyzer released 03/24/14.
17350
17
Projection to Bit
MD 17321 TVD 7730.03
Az 354.28° Inc 89.38°
MD 17350 TVD 7735
Inc 90°
MD 17375 TVD 7730.6
Az 354.28° Inc 89.38°
-fg, rnd-sub r
od str wh
blky, slty, grty
SS 90%: gy-dkgy-wht-clr, vfg-fg, rnd-sub rnd, sft, md cal, carb incl, v fri, nsf, mod str wh cut. SH 10%: gy-dkgy, sft, sbplty-sbblky, slty, grty, vs cal.