



Scale 1:240 (5"=100') Imperial
Measured Depth Log

Well Name: Horsetail 30E-1902

API: 051234288000

Location: Sec 30-T10N-R57W

License Number:

Spud Date: 10/23/2016

Surface Coordinates: 40.810703
-103.801231

Bottom Hole Coordinates:

Ground Elevation (ft): 4806

Logged Interval (ft): 5100

Formation: Niobrara

Type of Drilling Fluid: Water Based Mud

To: 13855

K.B. Elevation (ft): 4827

Total Depth (ft): 13855

Region: Wildcat Field

Drilling Completed: 10/25/2016

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

OPERATOR

Company: Whiting Oil & Gas Corp.

Address: 1700 Broadway Suite 2300
Denver, CO 80290

GEOLOGIST

Name: Kyle Newman, Craig Dreiling

Company: Acme Geologic Consulting

Address: 108 Berry Street
Little Rock, AR 72205

Drilling Company

Unit Drilling Company
Rig 406

Gas Detection

Mudlogging Systems, Inc., M Logger, Model TGC, Total Gas and Chromatograph

Comments

Lithologies and tops at drilled depths, not corrected to elogs. Where the well bore gas is 100% methane, the C1 line is moved to 85% for graphical purposes only.

ROCK TYPES

 Anhy
 Bent
 Brec
 Cht
 Clyst

 Coal
 Congl
 Dol
 Gyp
 Igne

 Lmst
 Meta
 Cyan mrlst
 Mrlst
 Salt

 Shale
 Shcol
 Shgy
 Sltst
 Ss







 Till
 Cyan chk
 Chalk

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


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

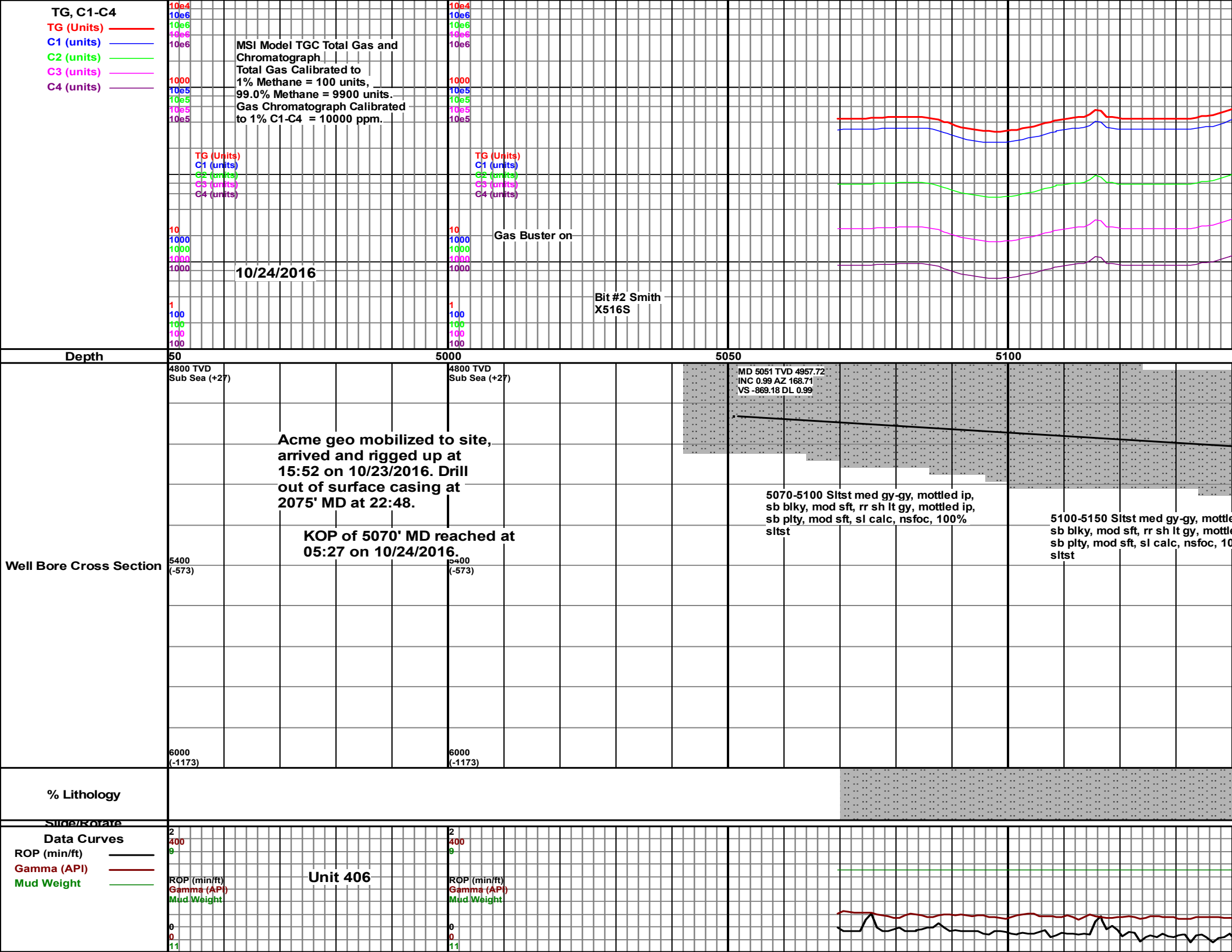
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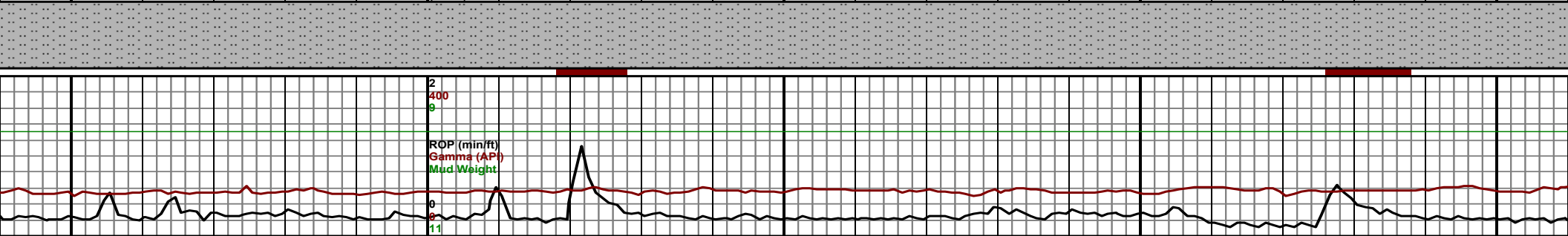
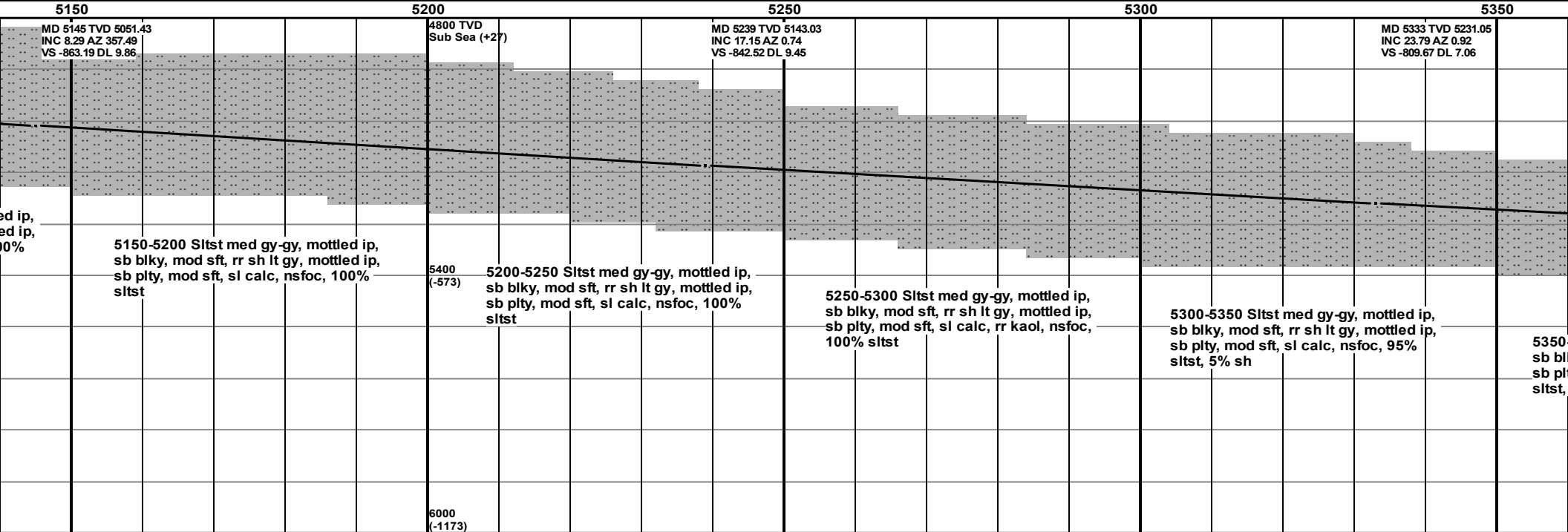
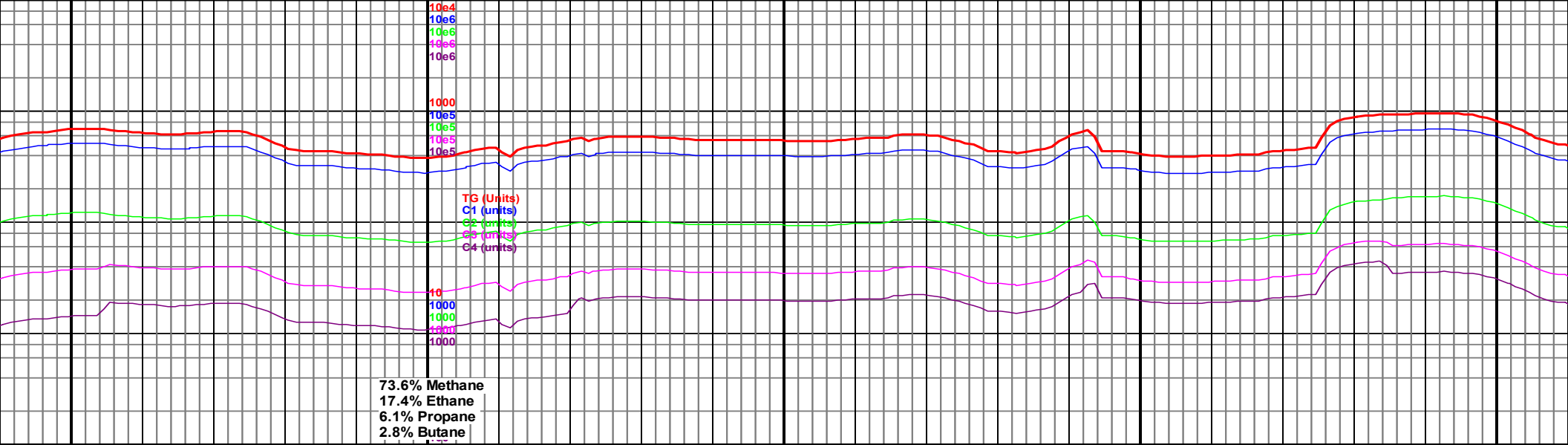


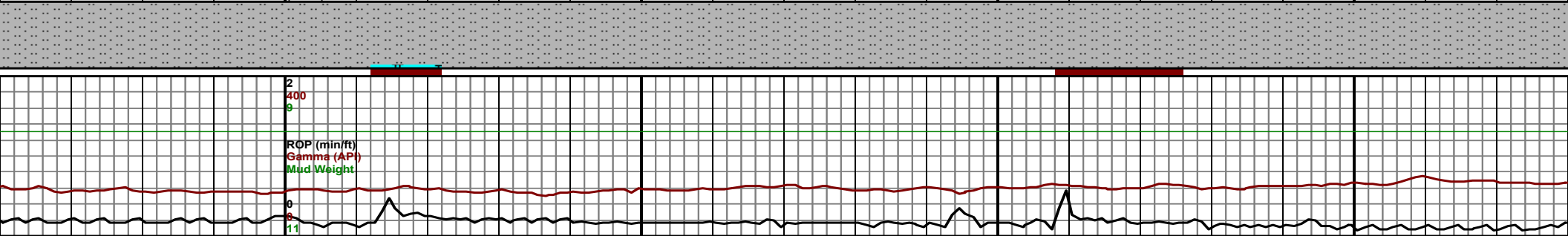
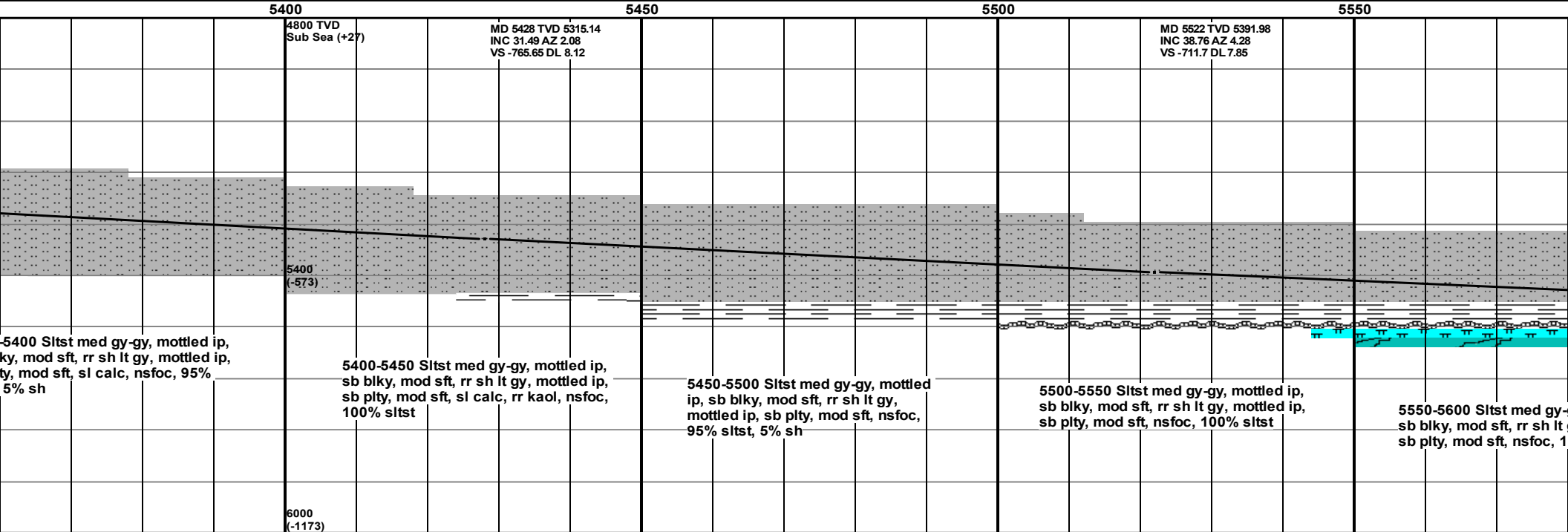
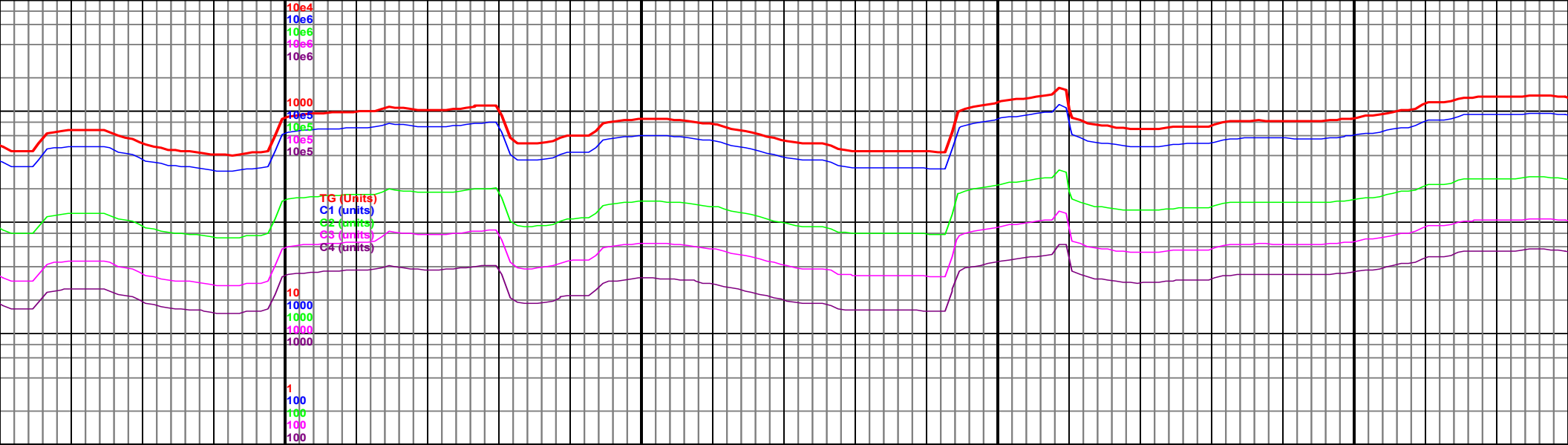
Rft

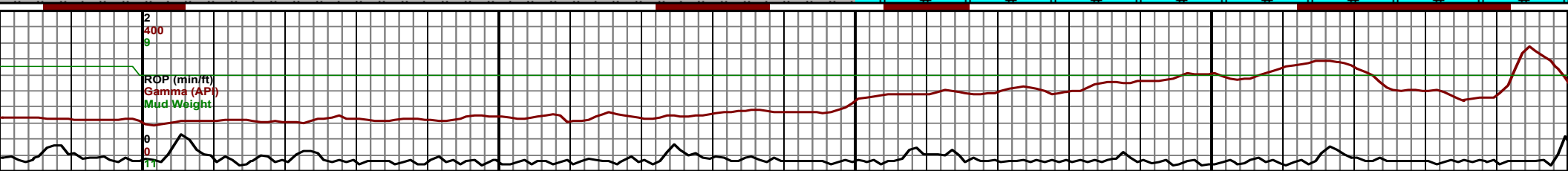
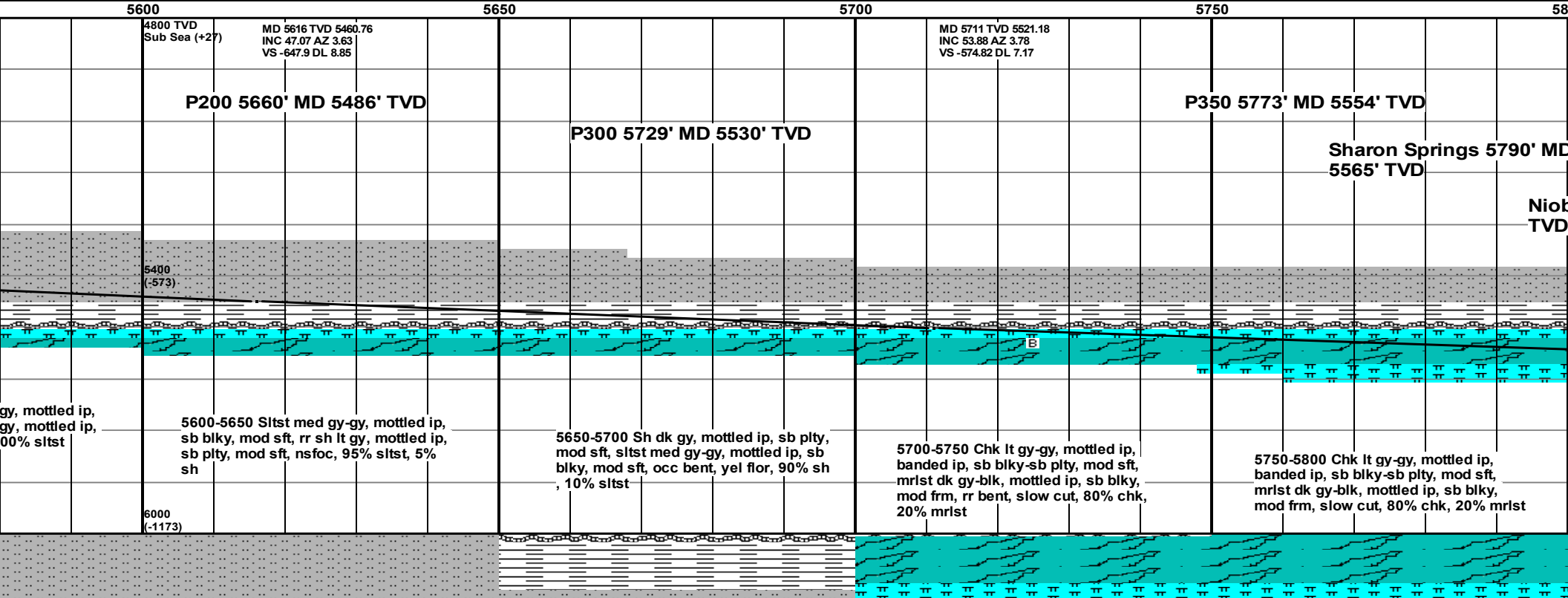
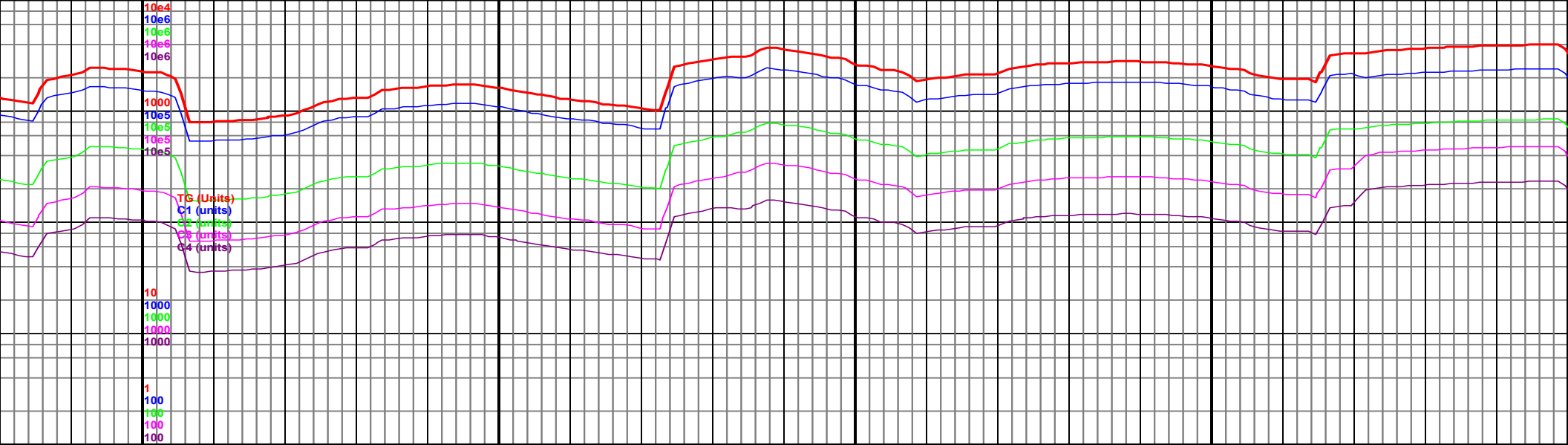


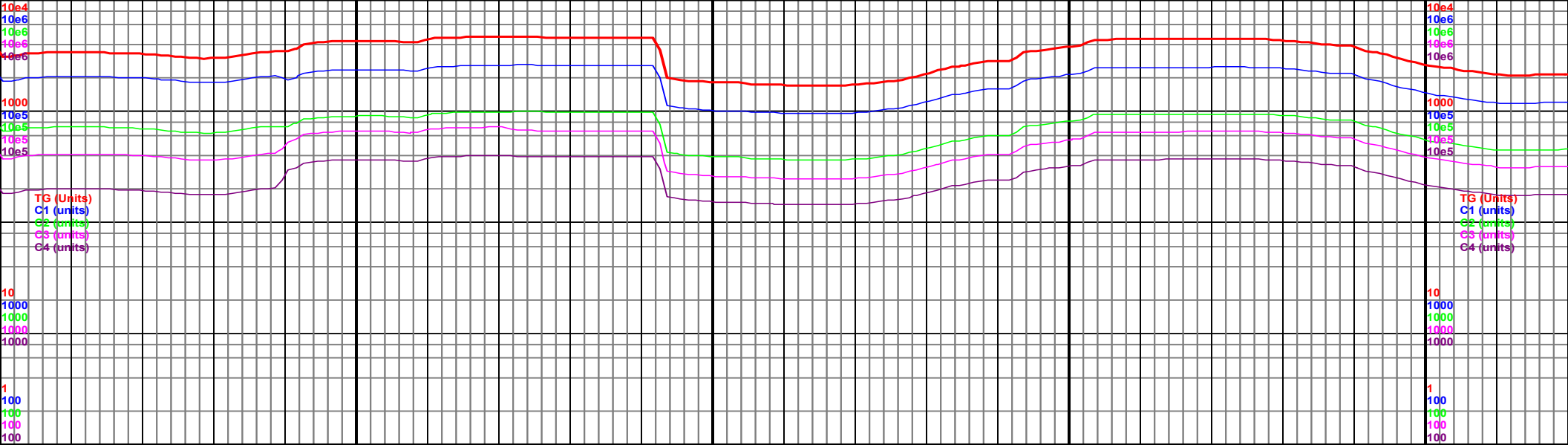
Sidewall









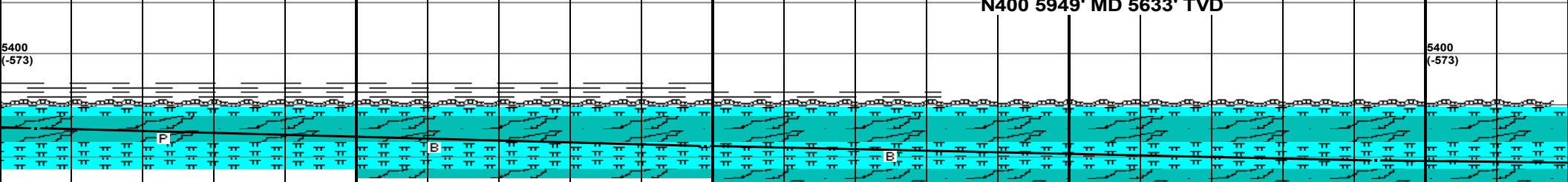


4800 TVD MD 5805 TVD 5572.22
Sub Se INC 60.32 AZ 1.05
VS -496.01 DL 7.27

MD 5899 TVD 5615.08
INC 65.41 AZ 358.42
VS -412.4 DL 5.96

MD 5993 TVD 5647.92
INC 73.68 AZ 2.77' (+27)
VS -324.43 DL 9.81

N100 5825' MD 5582' TVD
N200 5889' MD 5609' TVD
N250 5922' MD 5622' TVD
N400 5949' MD 5633' TVD
N430 6031' MD 5633' TVD



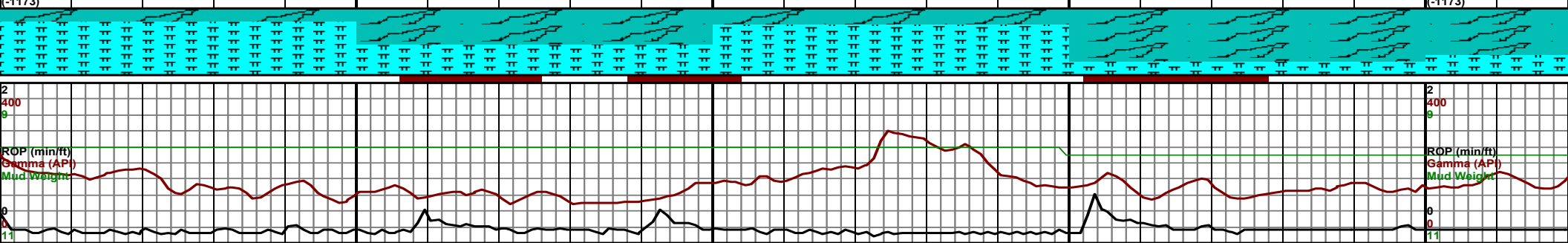
5800-5850 Mrlst dk gy-blk, mottled ip, sb blk, mod fr, chk lt gy-gy, mottled ip, banded ip, sb blk-sb pty, mod sft, rr pyr, slow cut, 80% mrlst, 20% chk

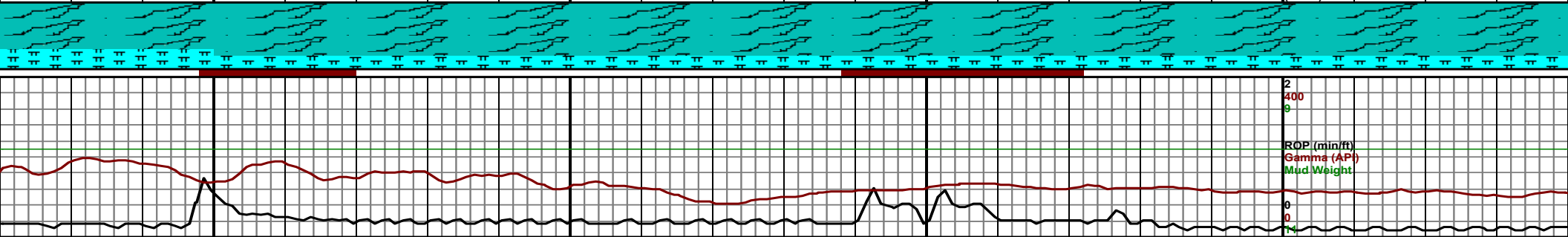
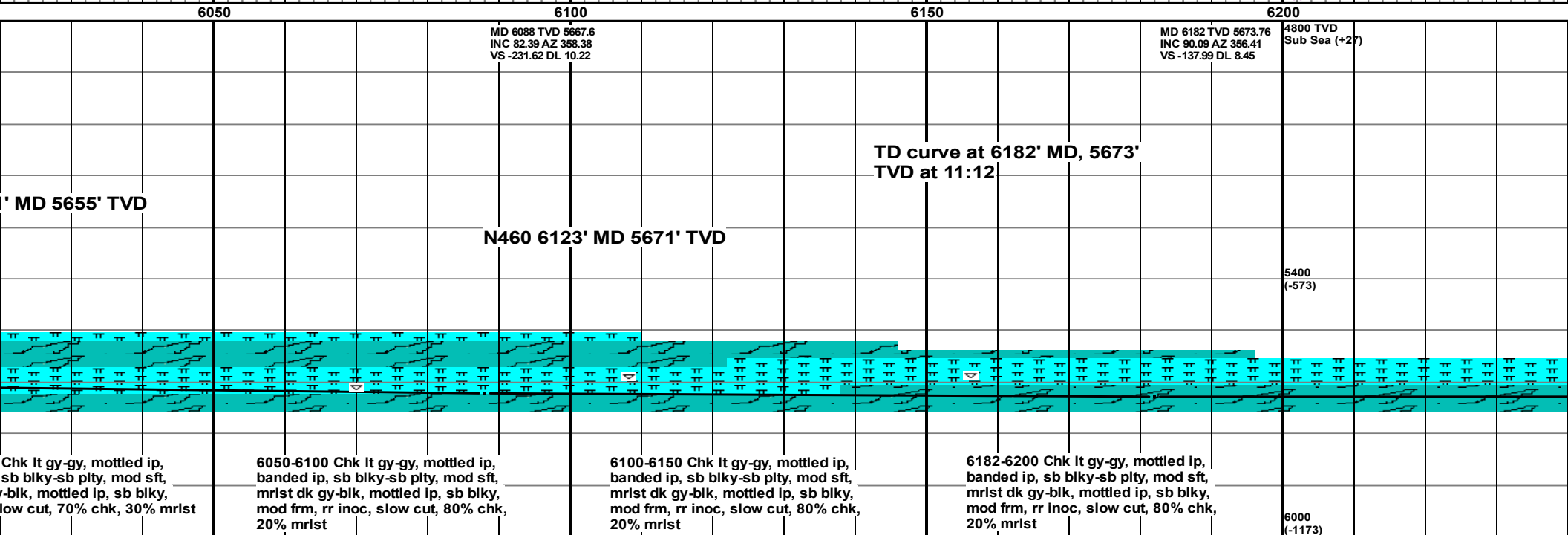
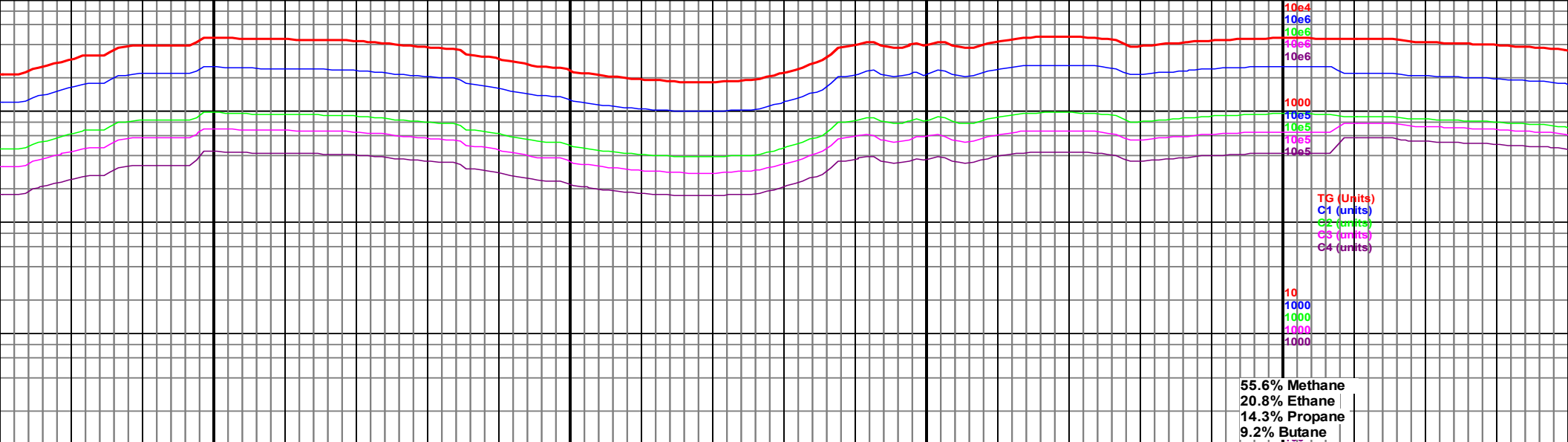
5850-5900 Mrlst dk gy-blk, mottled ip, sb blk, mod fr, chk lt gy-gy, mottled ip, banded ip, sb blk-sb pty, mod sft, rr bent, slow cut, 50% mrlst, 50% chk

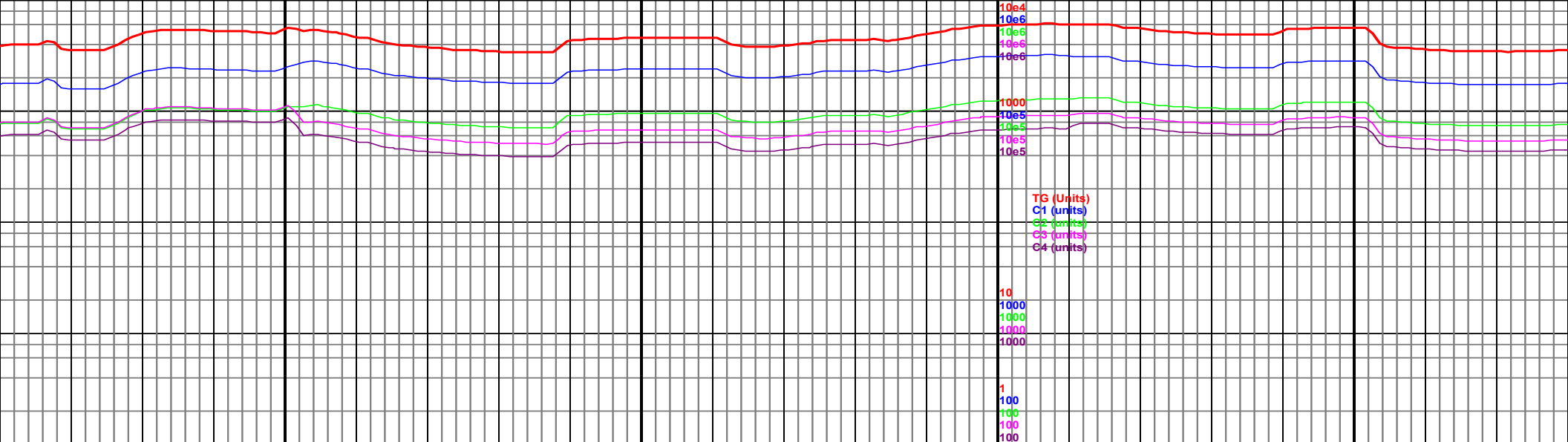
5900-5950 Mrlst dk gy-blk, mottled ip, sb blk, mod fr, chk lt gy-gy, mottled ip, banded ip, sb blk-sb pty, mod sft, rr bent, slow cut, 70% mrlst, 30% chk

5950-6000 Chk lt gy-gy, mottled ip, banded ip, sb blk-sb pty, mod sft, mrlst dk gy-blk, mottled ip, sb blk, mod frm, slow cut, 80% chk, 20% mrlst

6000-6050 banded ip, mrlst dk gy-blk, mod frm, s







6500

6550

6600

6650

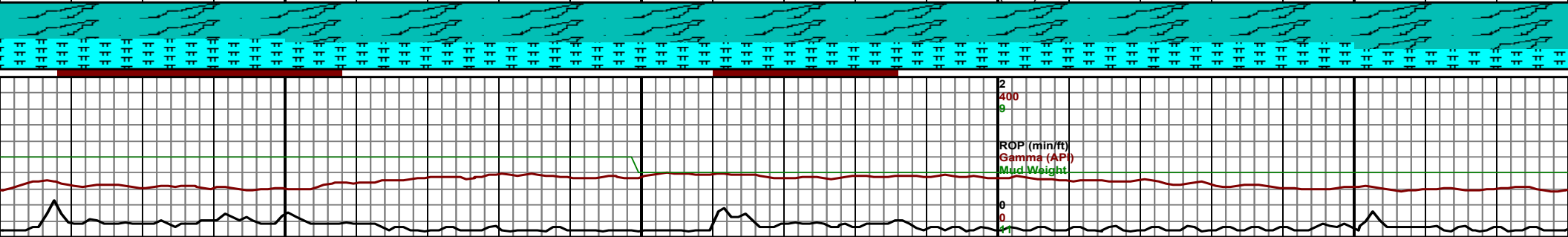
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INC 90.62 AZ 358.97
VS 181.29 DL 2.68

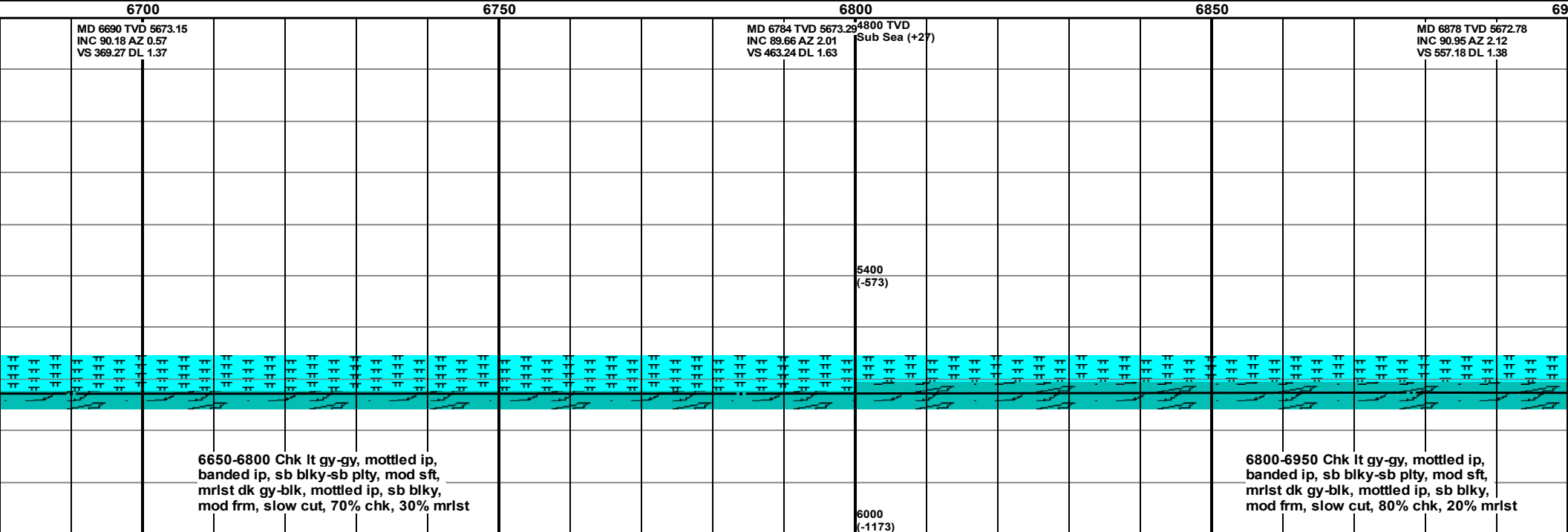
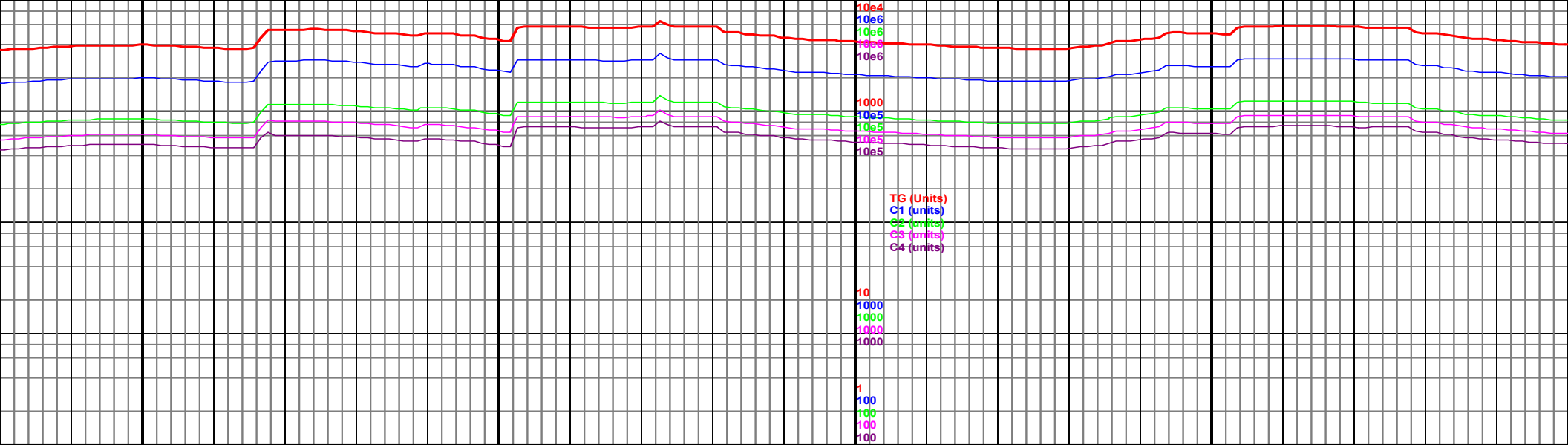
MD 6596 TVD 5672.42
INC 88.92 AZ 0.32
VS 275.28 DL 2.31

5400
(-573)

6500-6650 Chk lt gy-gy, mottled ip,
banded ip, sb blkgy-sb plty, mod sft,
mrlst dk gy-blk, mottled ip, sb blkgy,
mod frm, rr pyr, slow cut, 60% chk,
40% mrlst

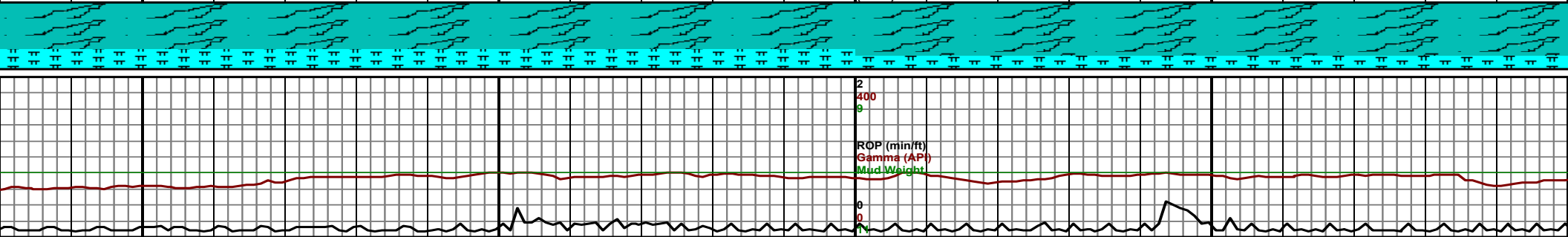
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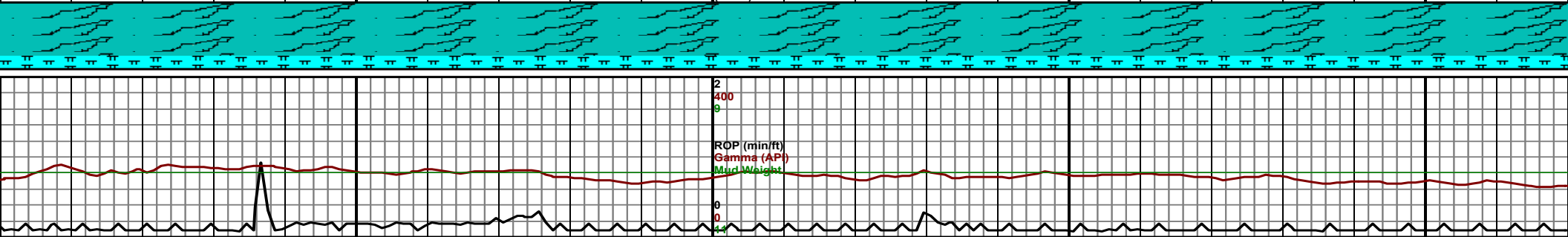
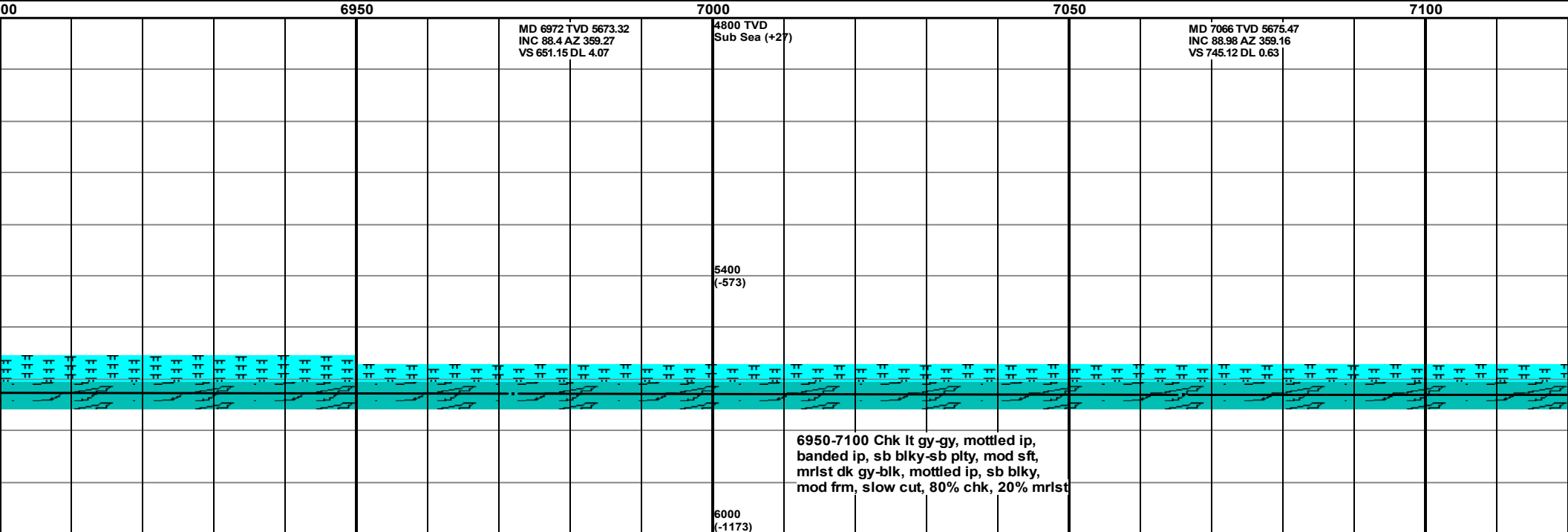
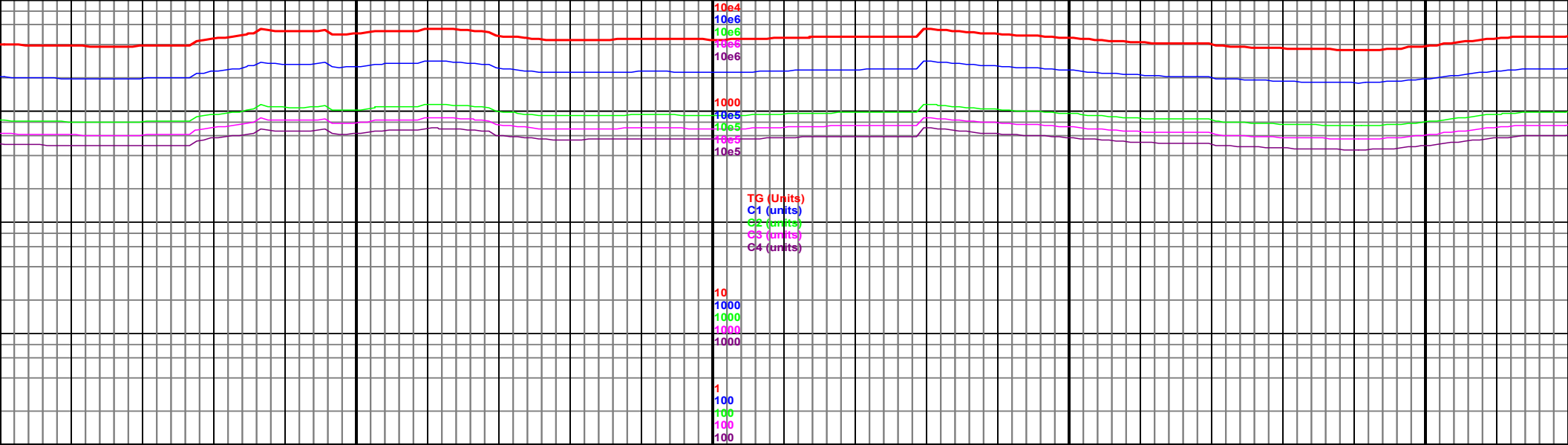


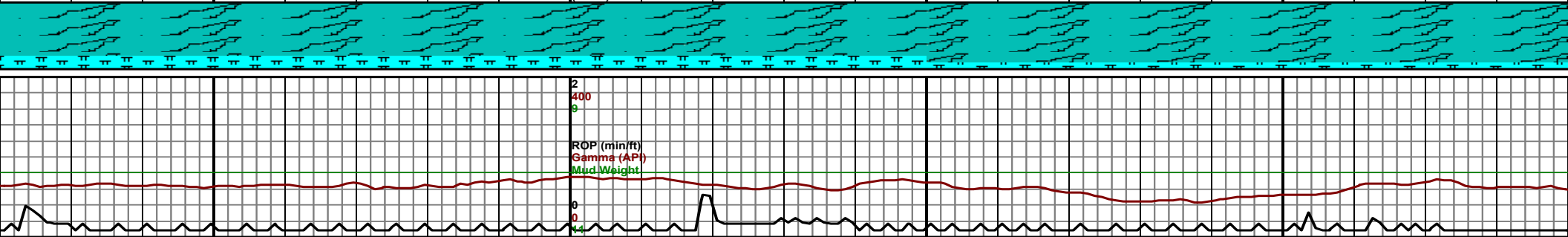
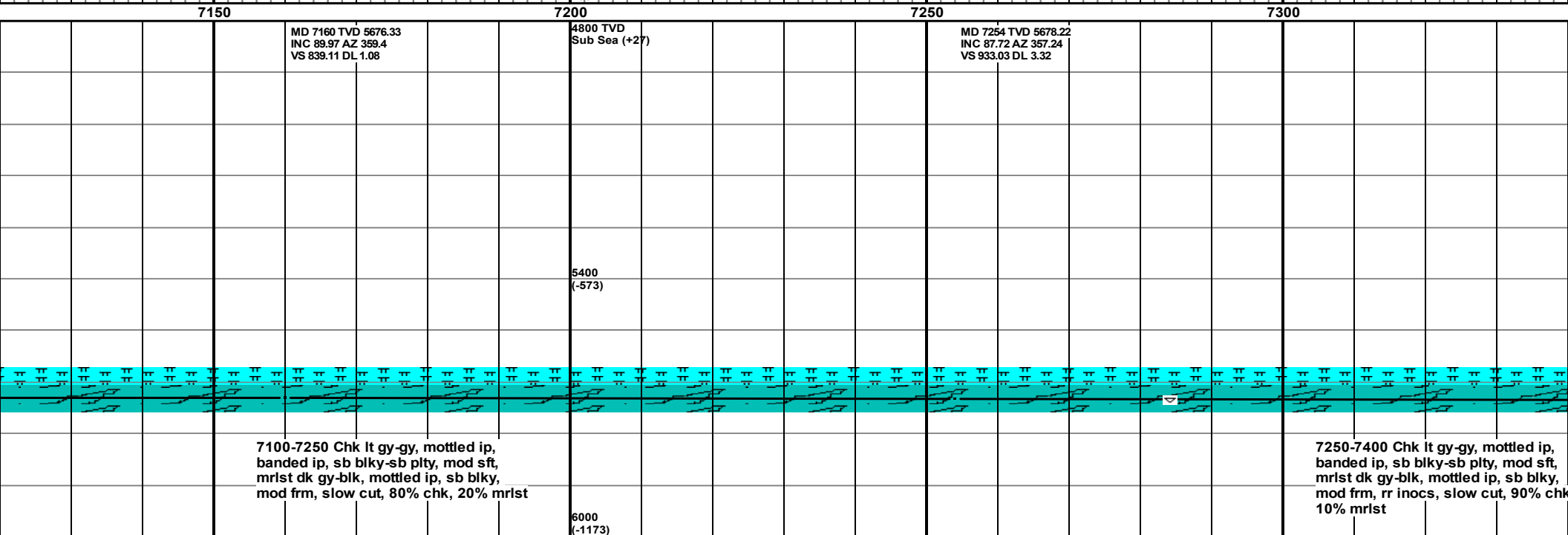
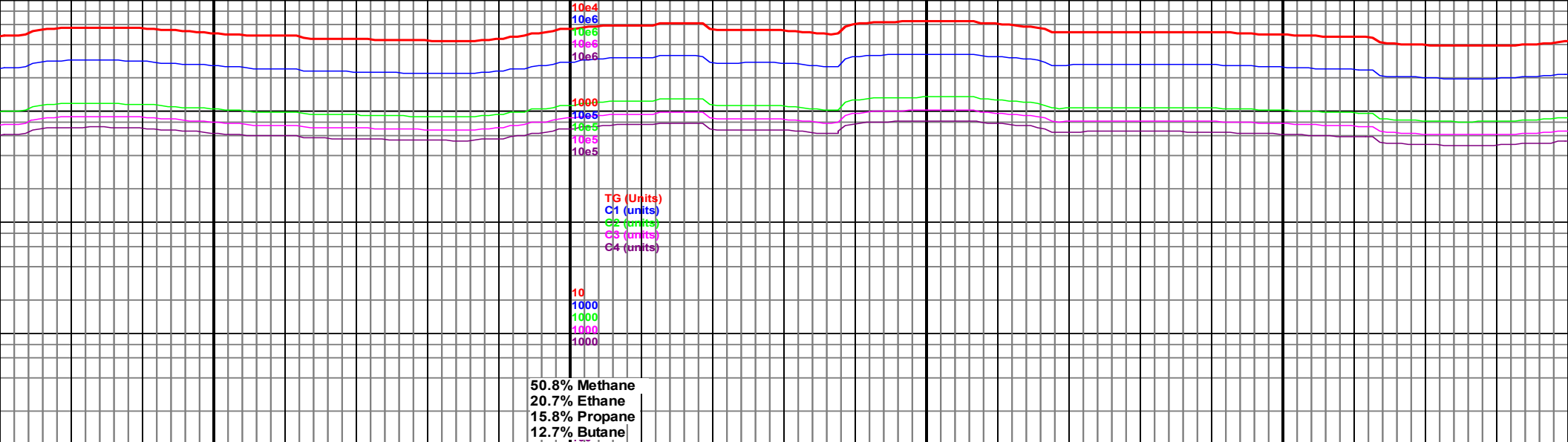


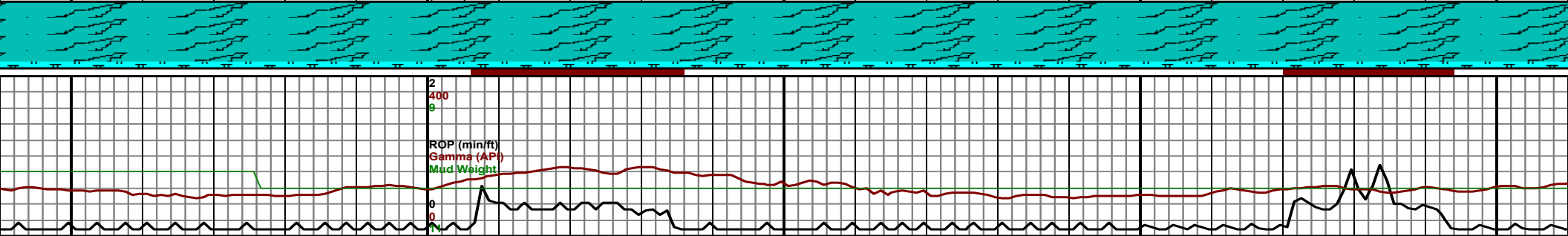
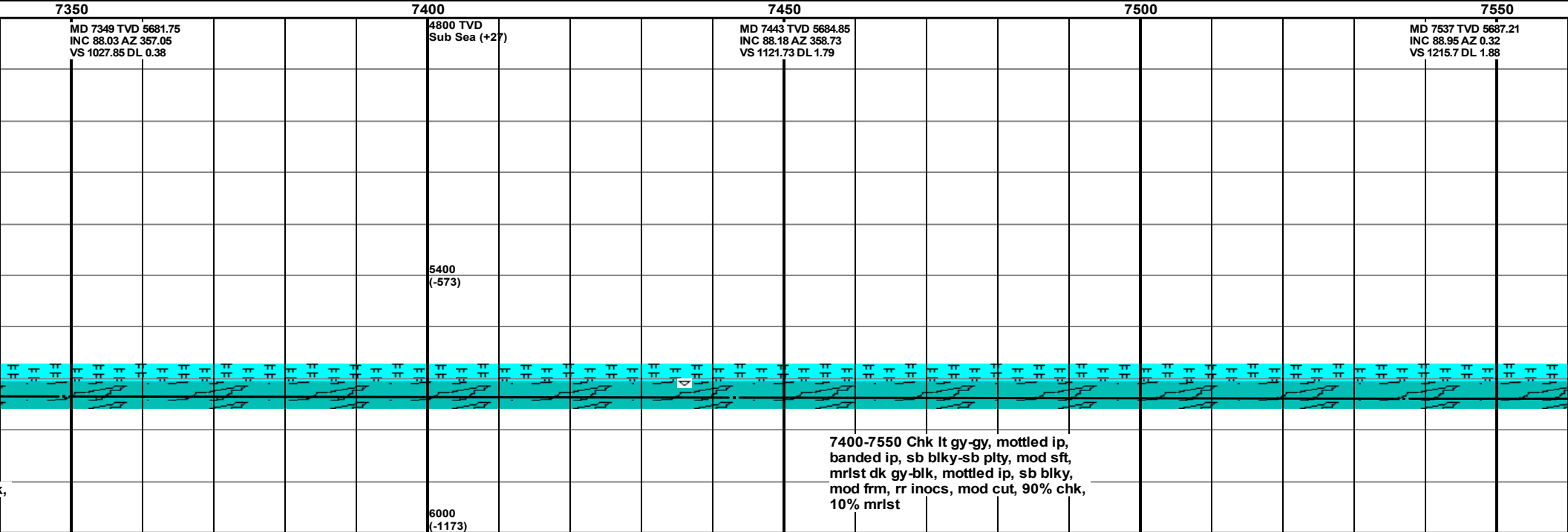
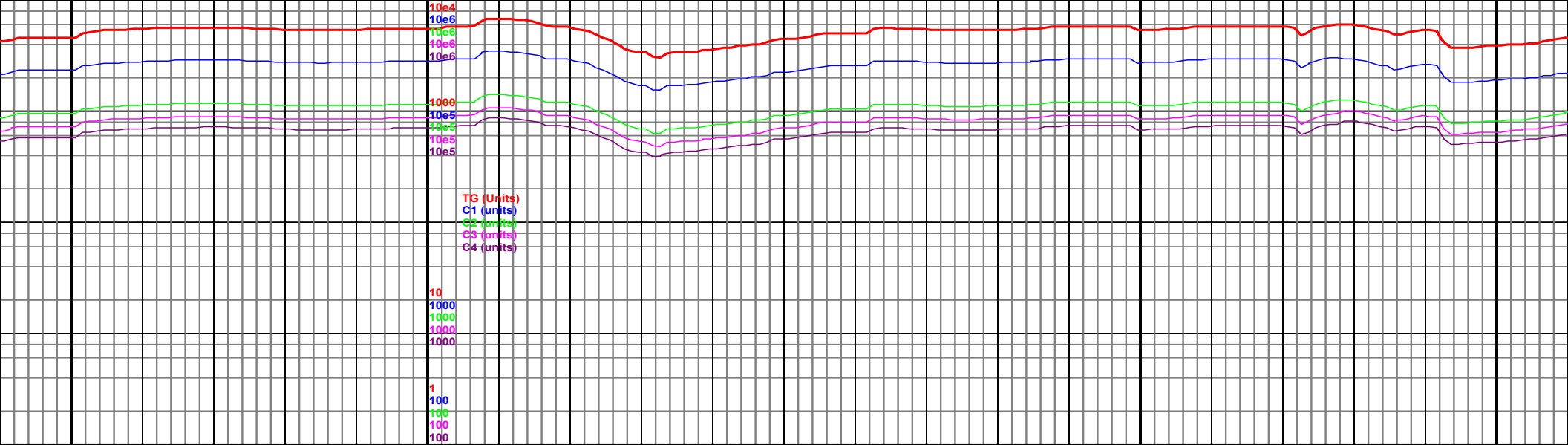
6650-6800 Chk lt gy-gy, mottled ip, banded ip, sb blk-y-sb plty, mod sft, mrlst dk gy-blk, mottled ip, sb blk-y, mod frm, slow cut, 70% chk, 30% mrlst

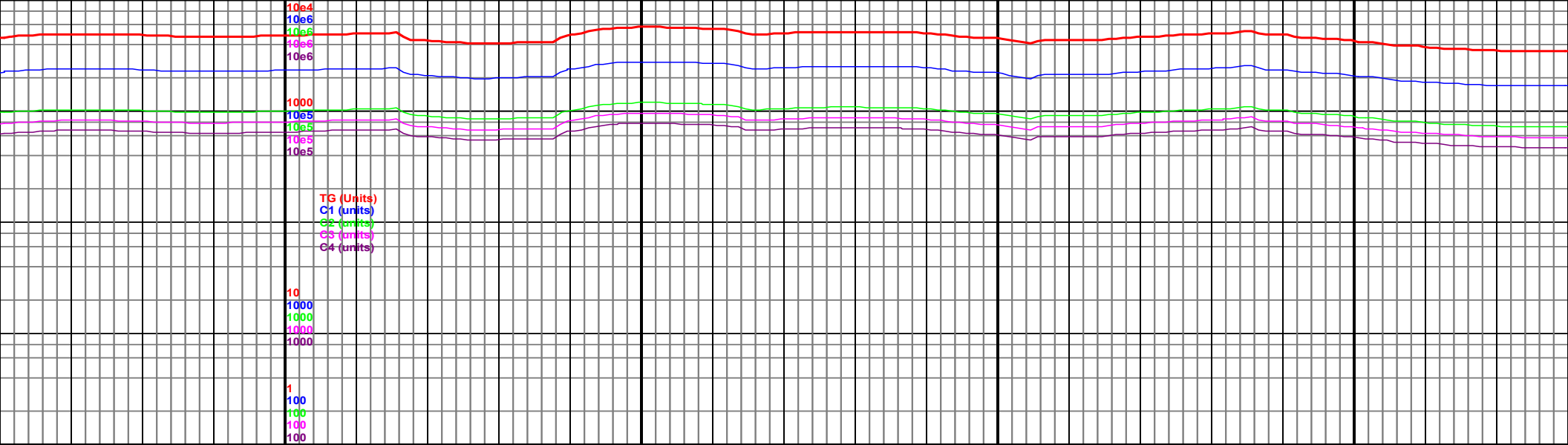
6800-6950 Chk lt gy-gy, mottled ip, banded ip, sb blk-y-sb plty, mod sft, mrlst dk gy-blk, mottled ip, sb blk-y, mod frm, slow cut, 80% chk, 20% mrlst











7600

7650

7700

7750

4800 TVD
Sub Sea (+27)

MD 7632 TVD 5688.29
INC 89.75 AZ 359.42
VS 1310.69 DL 1.27

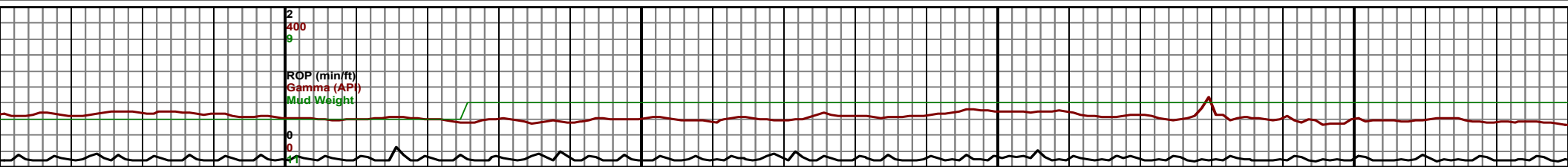
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INC 90.28 AZ 358.55
VS 1404.67 DL 1.08

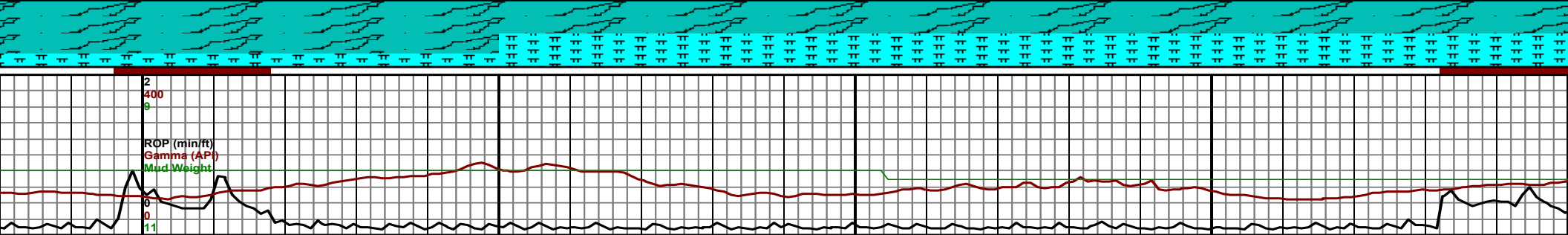
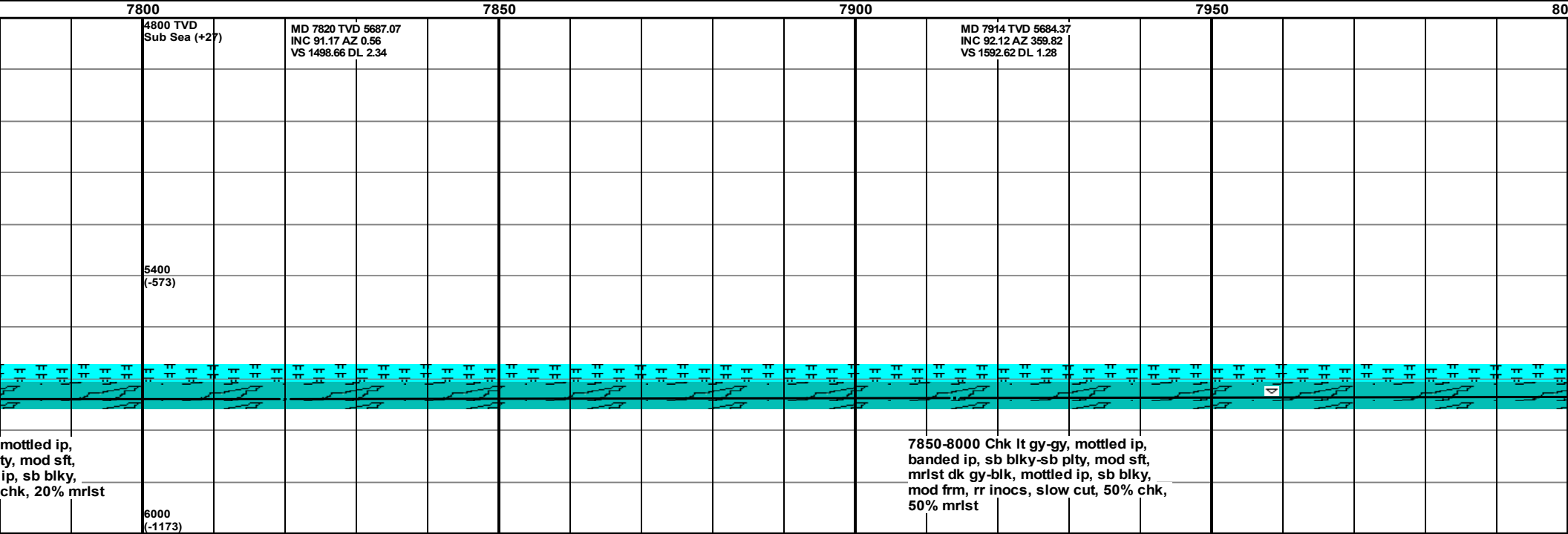
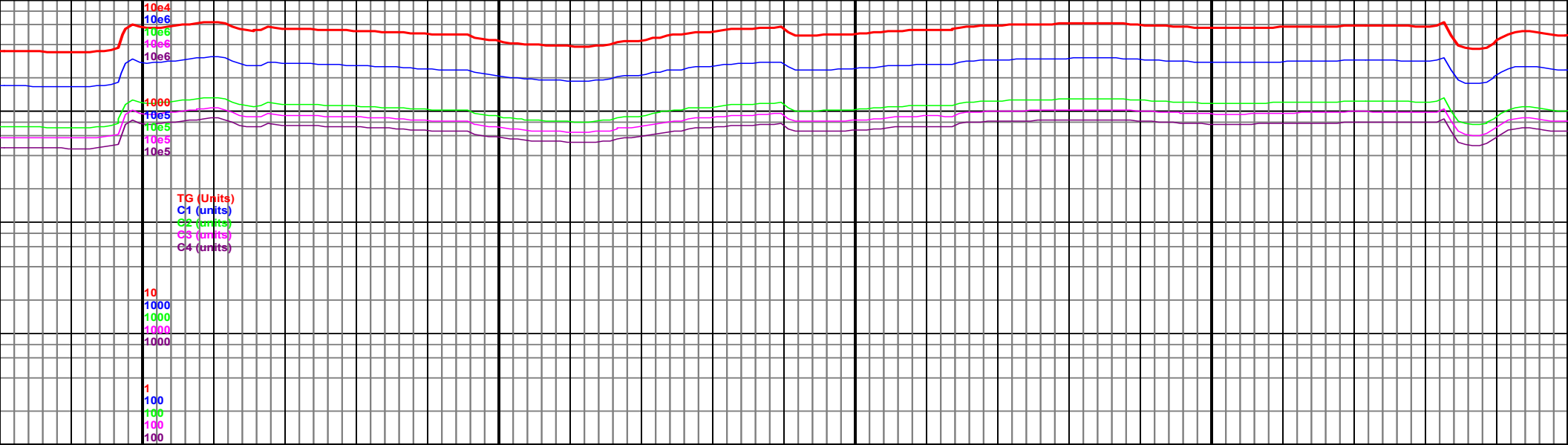
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(-573)

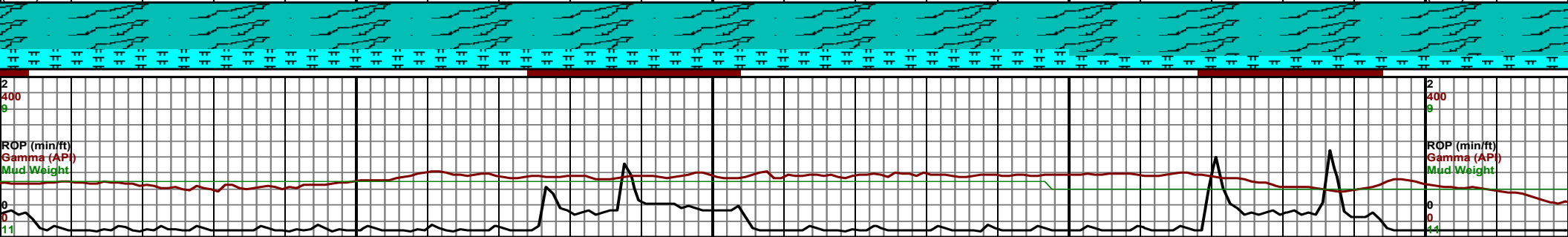
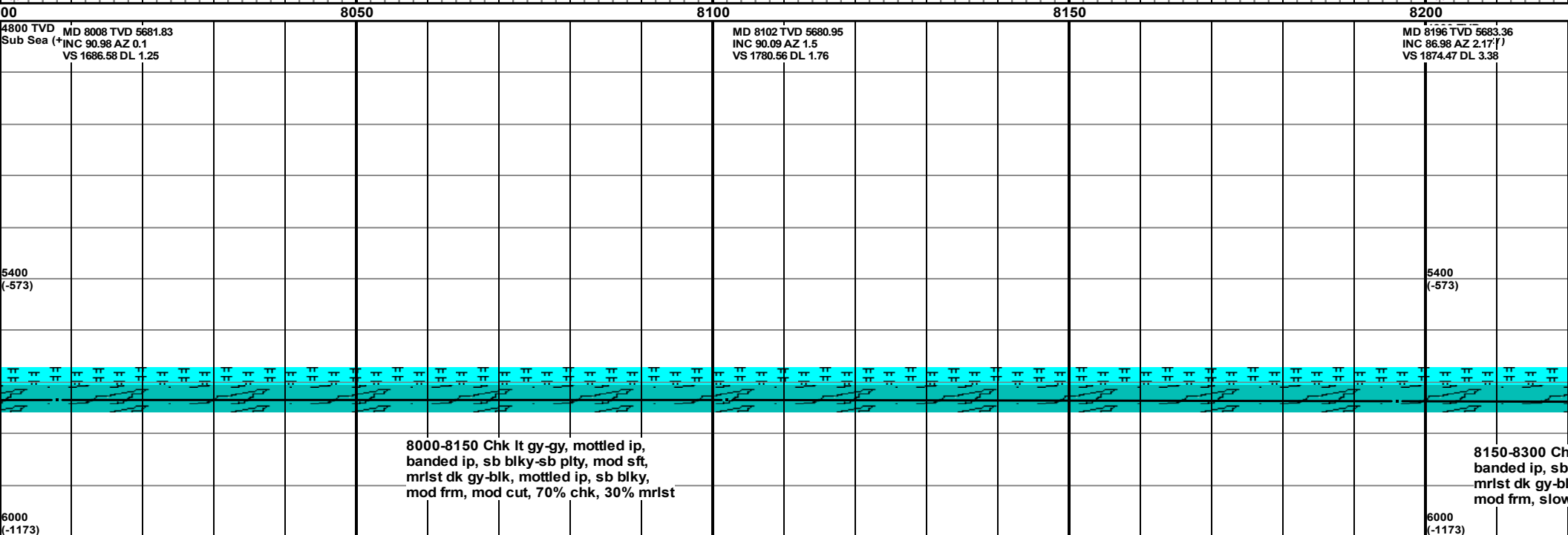
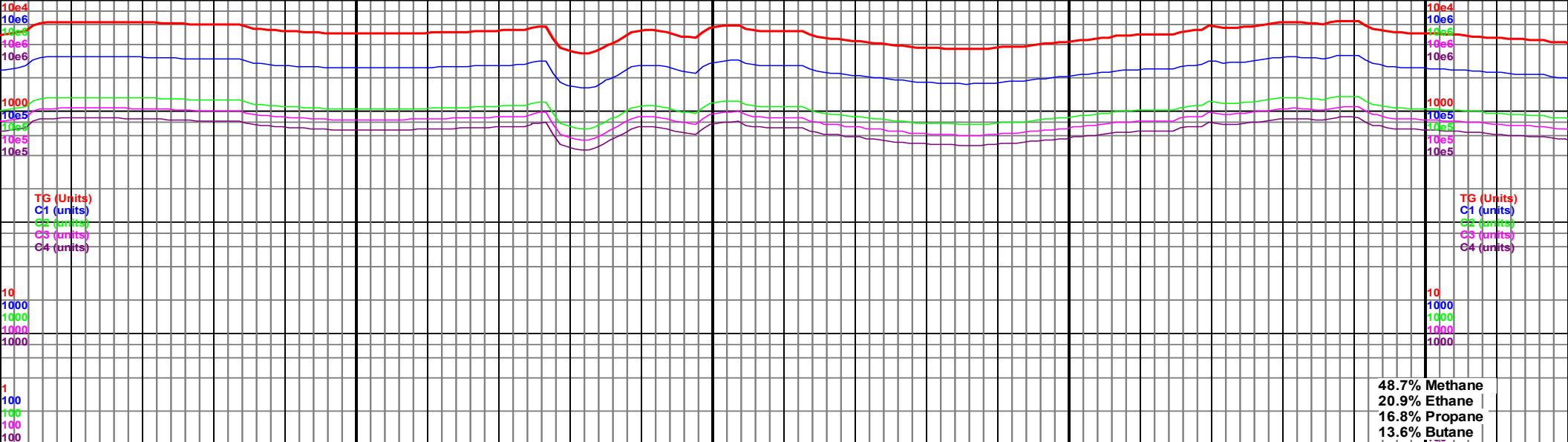
7550-7700 Chk lt gy-gy, mottled ip,
banded ip, sb blk-y-sb plty, mod sft,
mrst dk gy-blk, mottled ip, sb blk,
mod frm, rr inocs, slow cut, 90% chk,
10% mrst

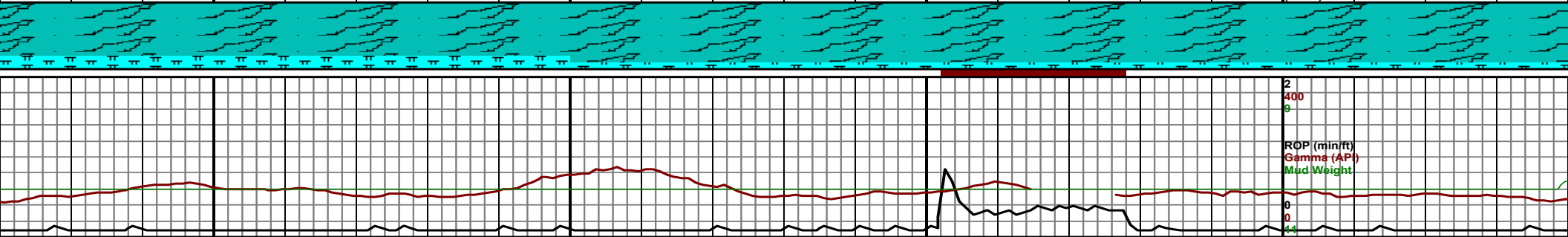
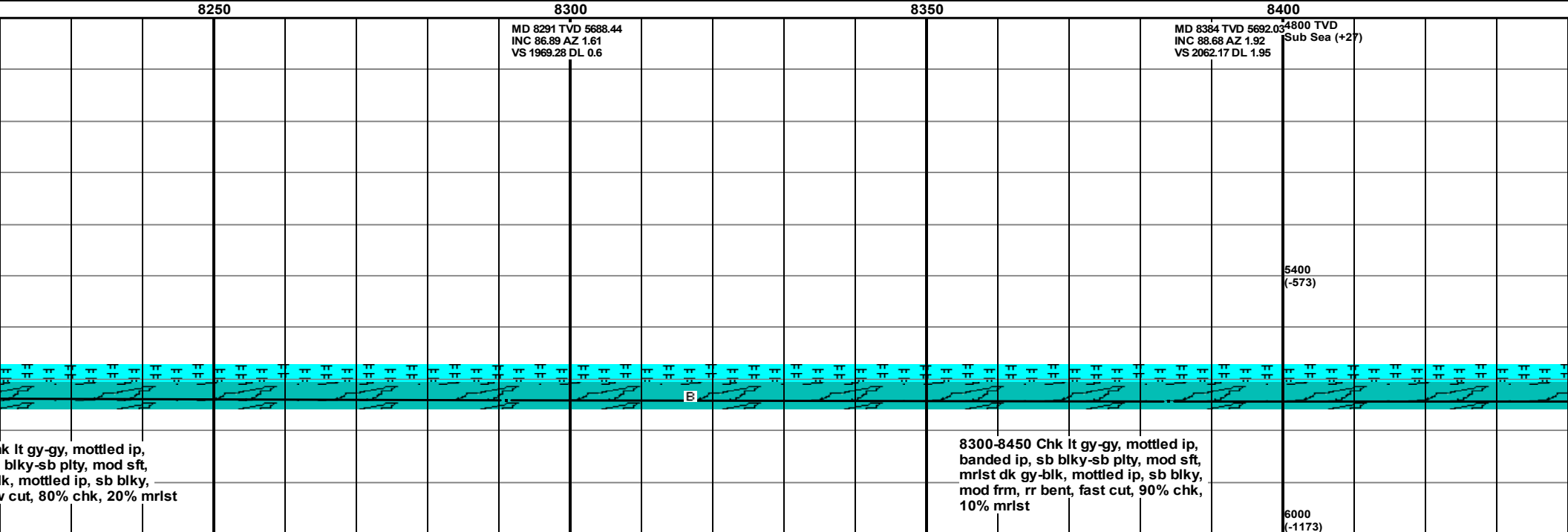
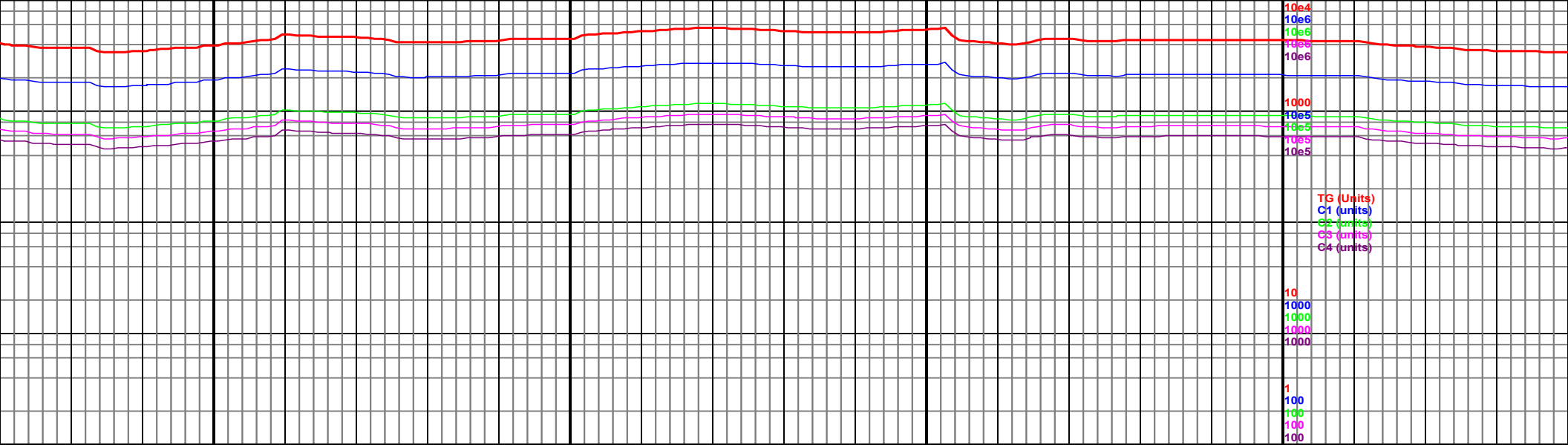
7700-7850 Chk lt gy-gy,
banded ip, sb blk-y-sb pl
mrst dk gy-blk, mottled
mod frm, slow cut, 80%

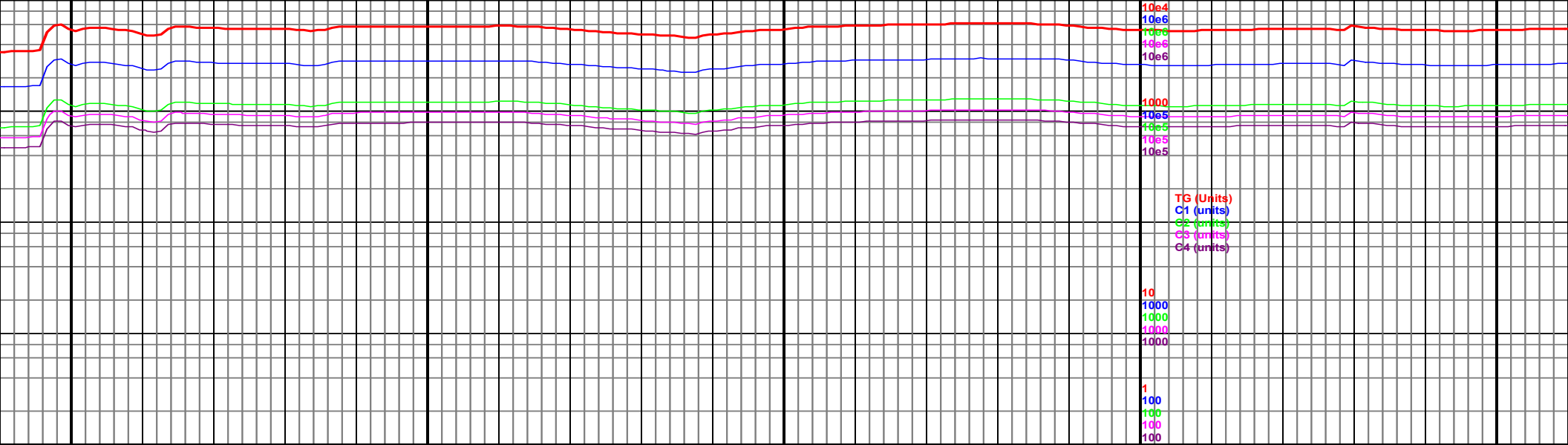
6000
(-1173)











8450

8500

8550

8600

8650

MD 8479 TVD 5692.92
INC 90.25 AZ 3.1
VS 2157.07 DL 2.07

MD 8573 TVD 5693.09
INC 89.54 AZ 3.25
VS 2250.92 DL 0.77

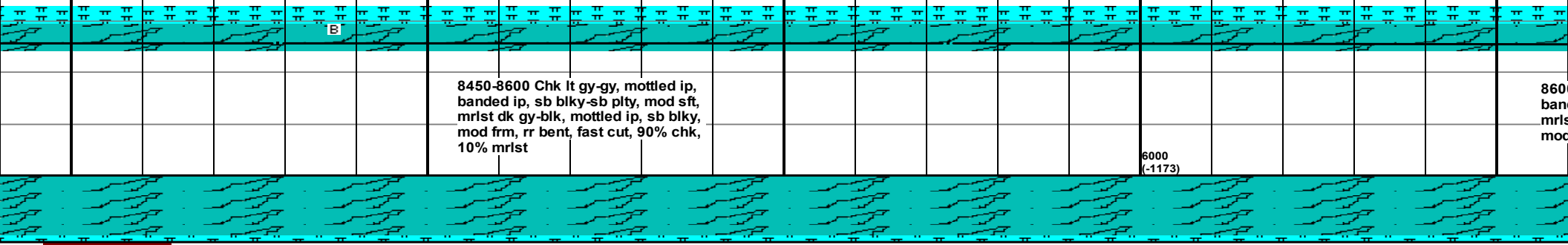
4800 TVD
Sub Sea (+27)

5400
(-573)

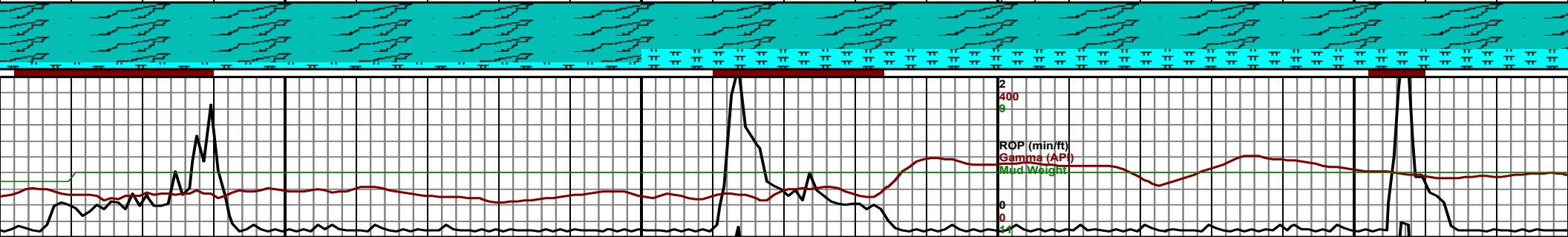
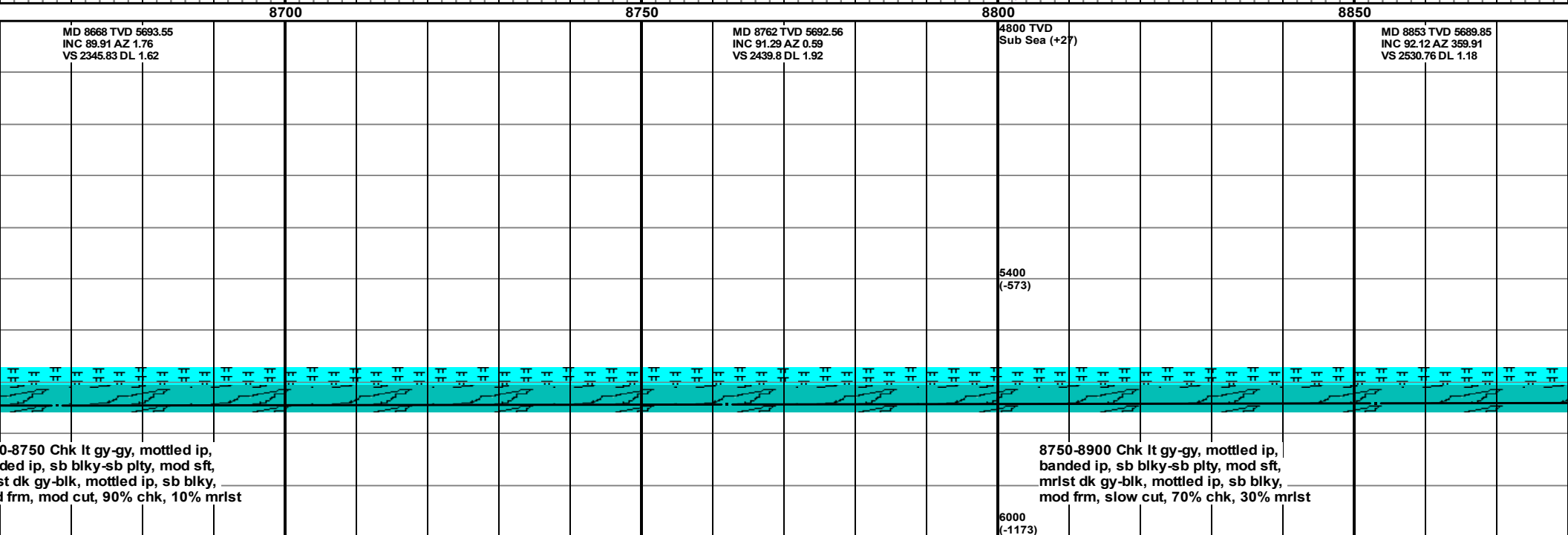
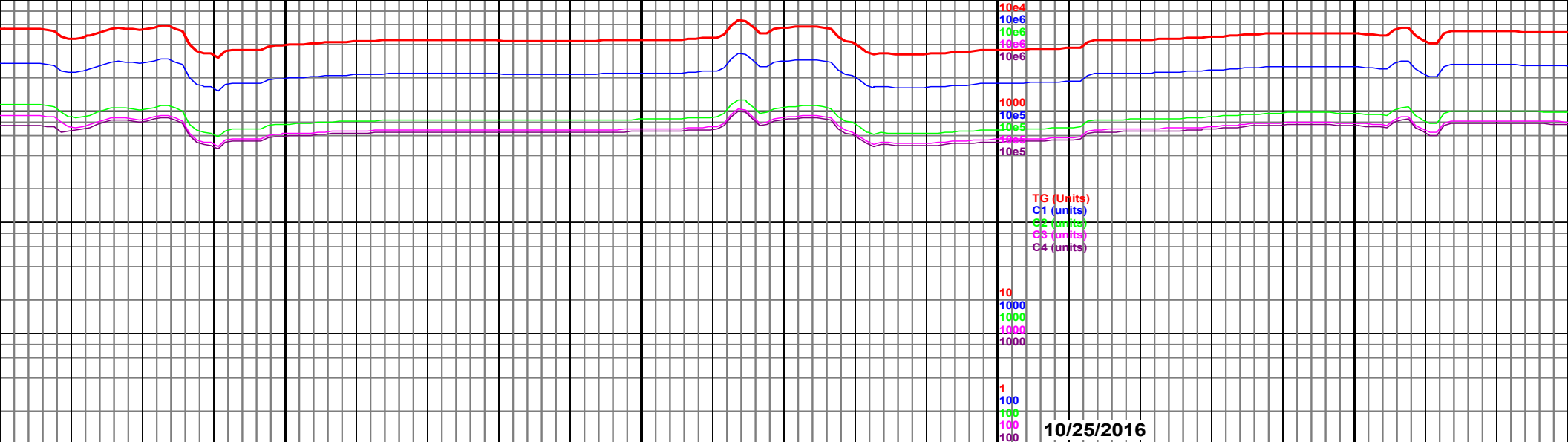
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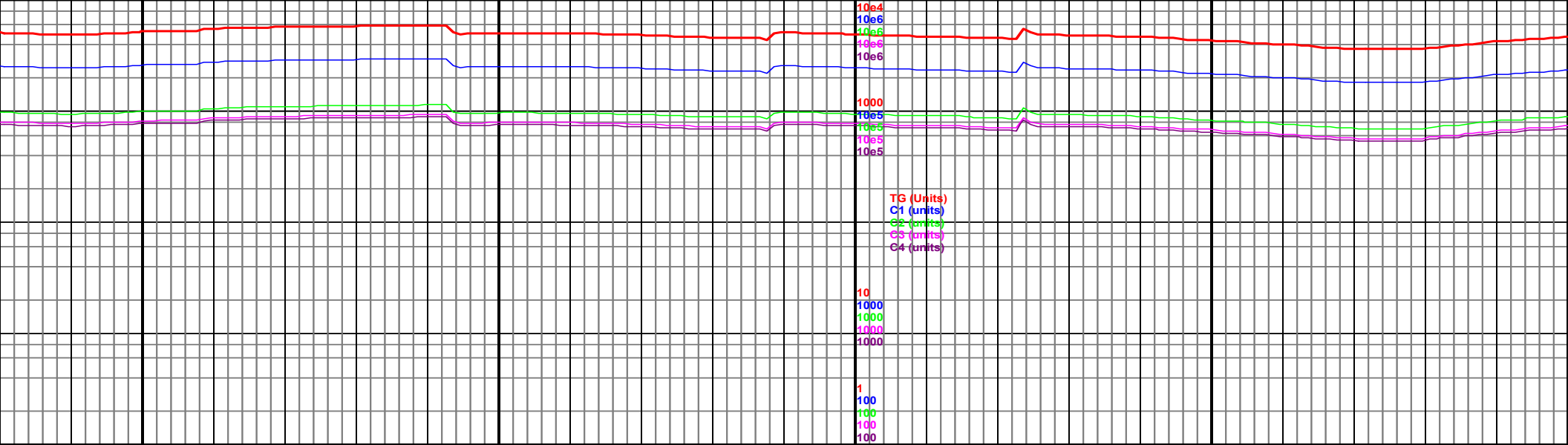
8450-8600 Chk lt gy-gy, mottled ip,
banded ip, sb blk-y-sb plty, mod sft,
mrlst dk gy-blk, mottled ip, sb blk,
mod frm, rr bent, fast cut, 90% chk,
10% mrlst

8600
banded
mrlst
mod



2
400
9
ROP (min/ft)
Gamma (API)
Mud Weight





8900

8950

9000

9050

9100

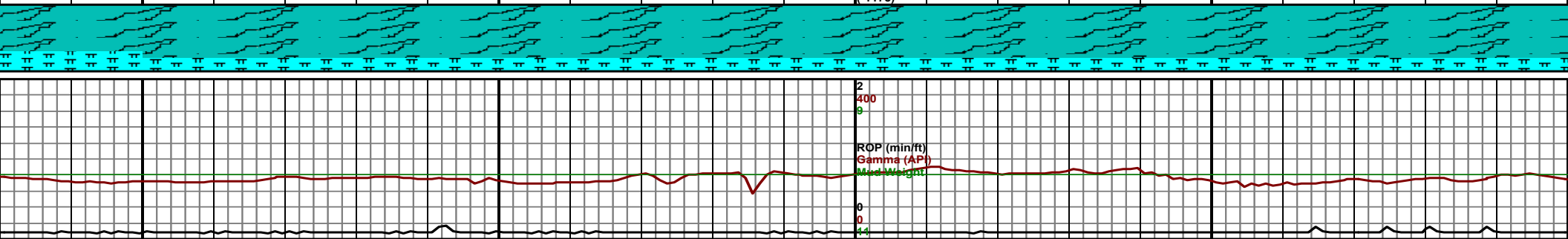
4800 TVD
Sub Sea (+27)

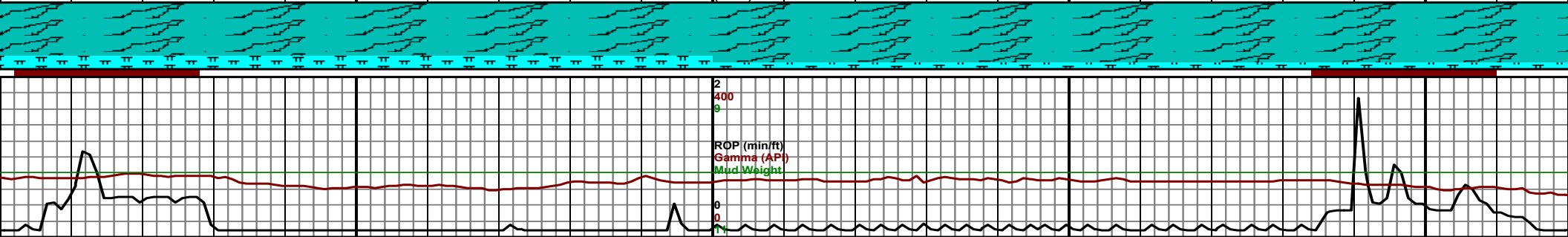
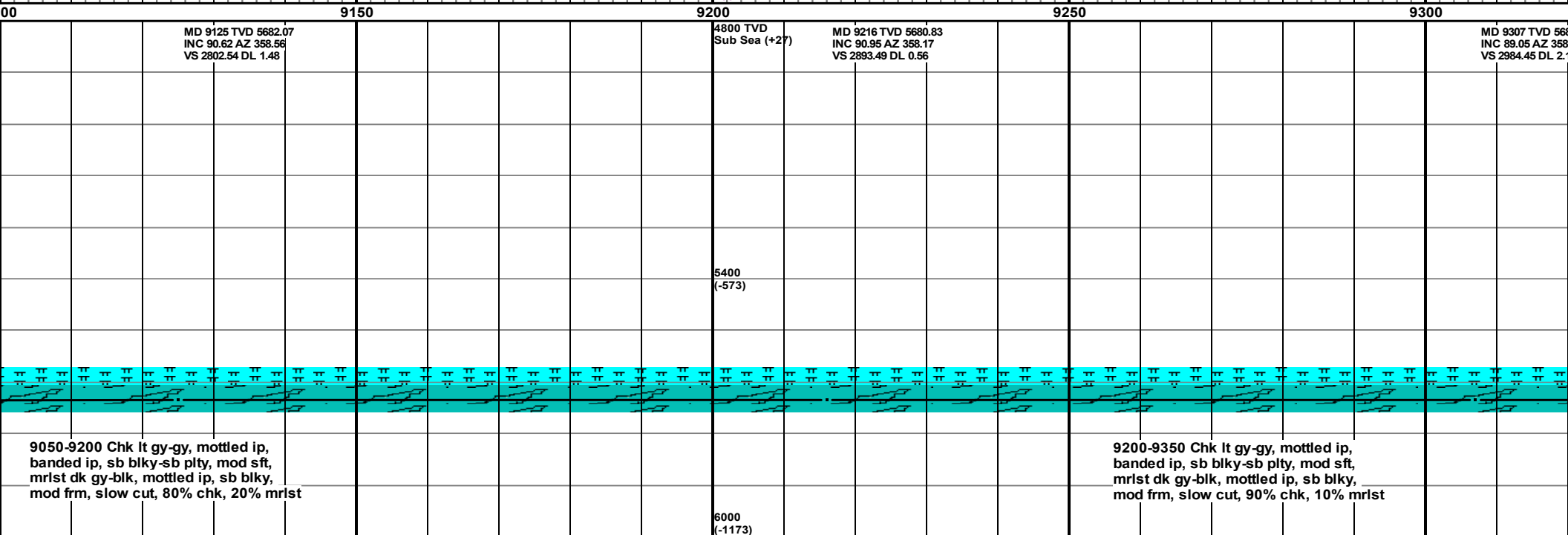
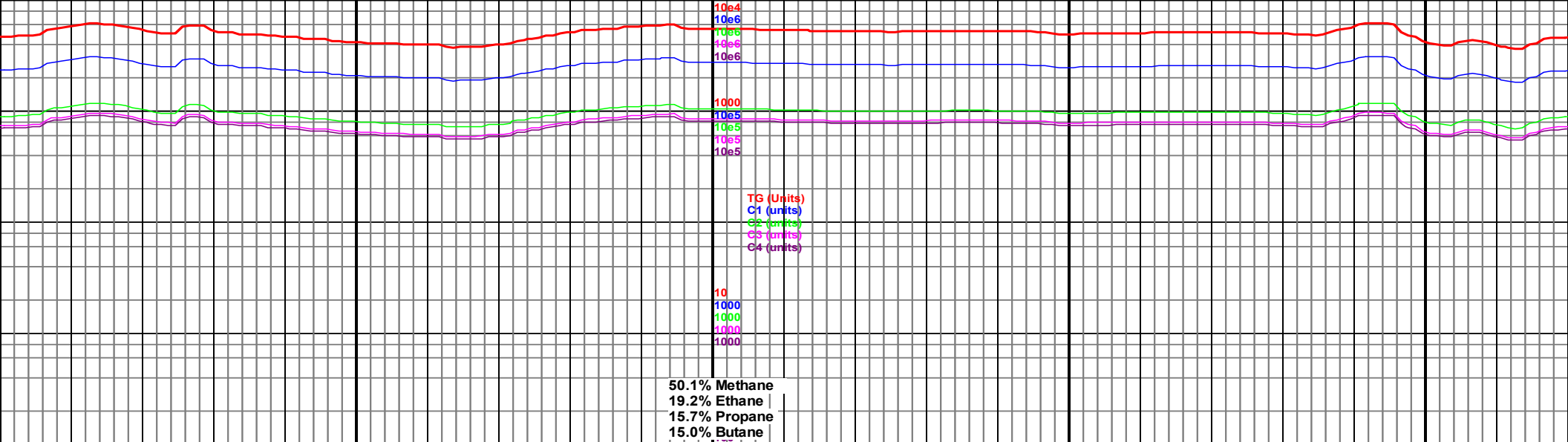
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INC 91.66 AZ 357.71
VS 2711.61 DL 1.24

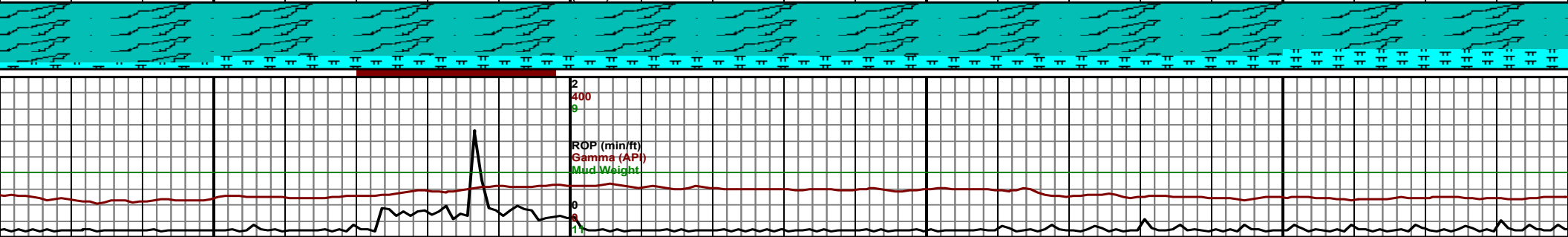
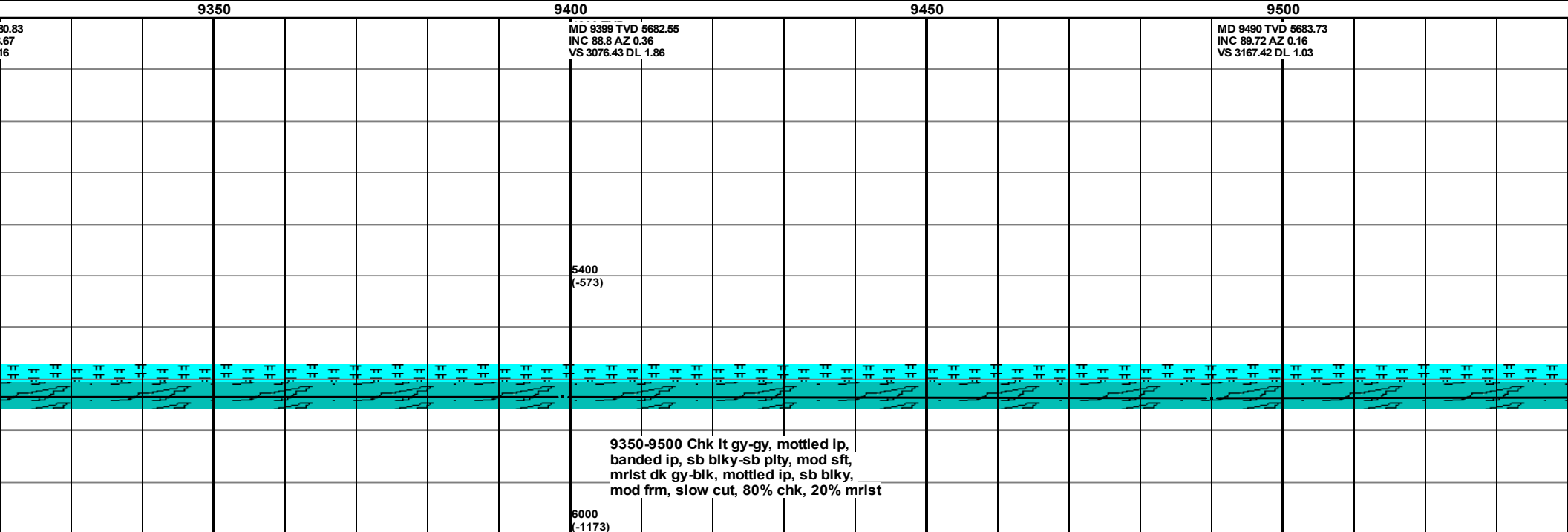
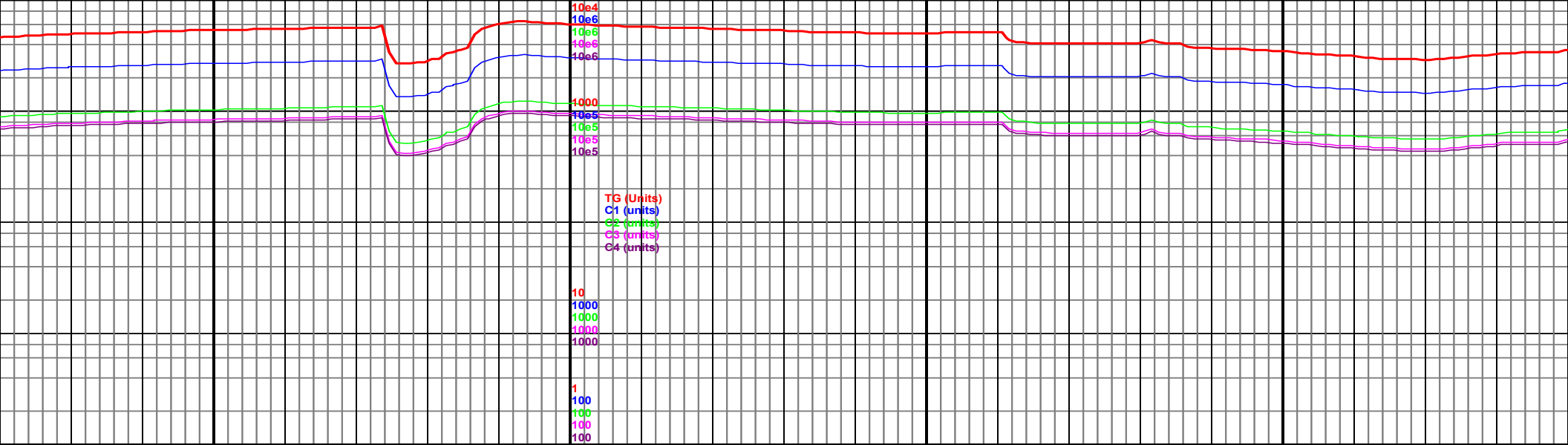
5400
(-573)

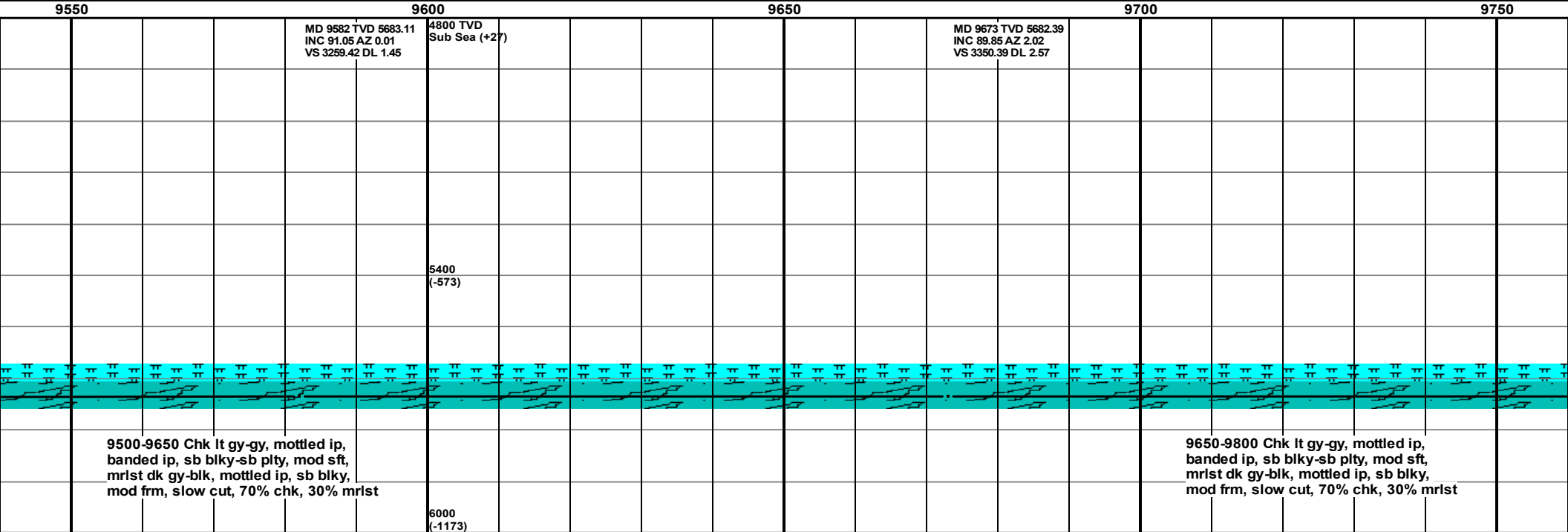
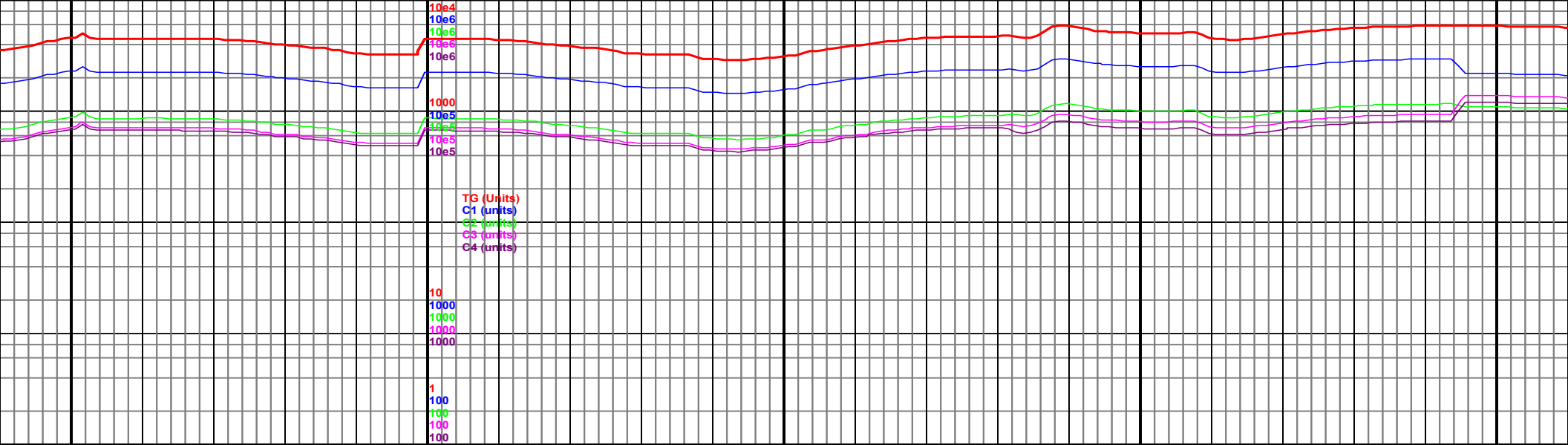
8900-9050 Chk lt gy-gy, mottled ip,
banded ip, sb blk-y-sb plty, mod sft,
mrst dk gy-blk, mottled ip, sb blk-y,
mod frm, slow cut, 80% chk, 20% mrst

6000
(-1173)



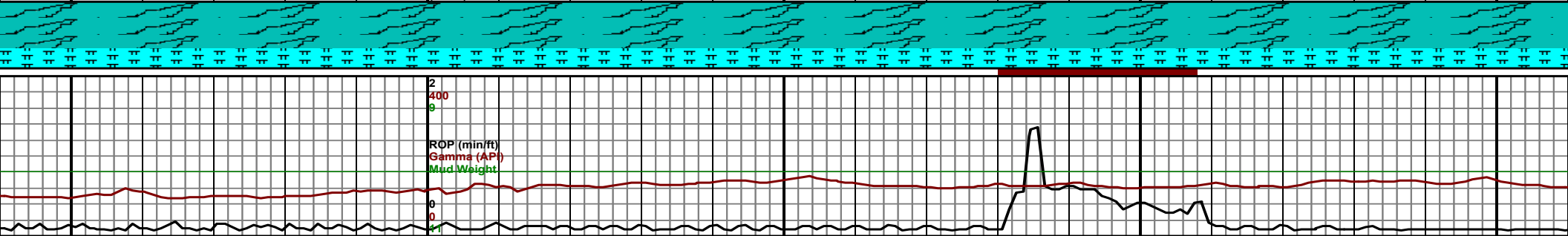


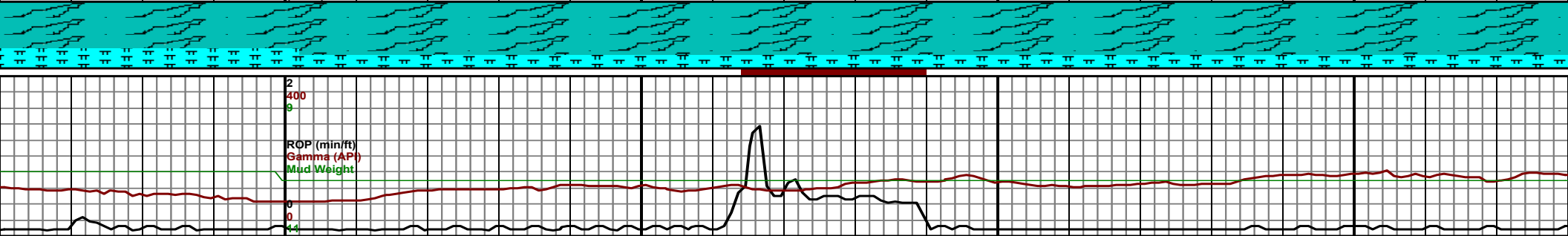
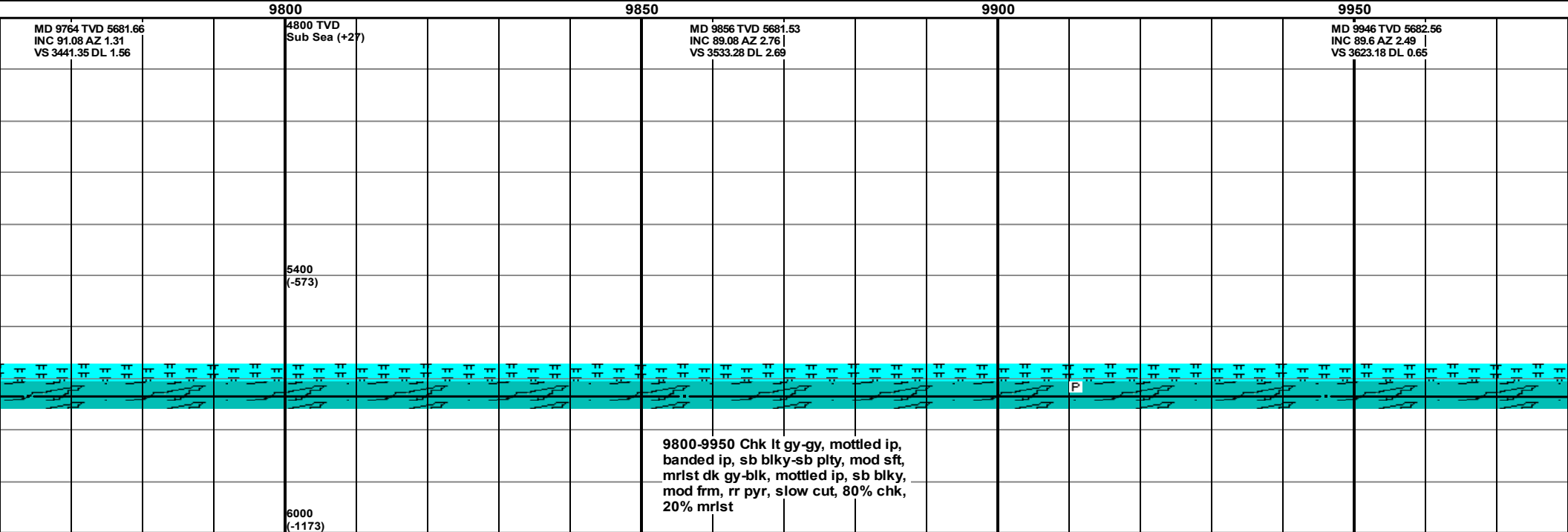
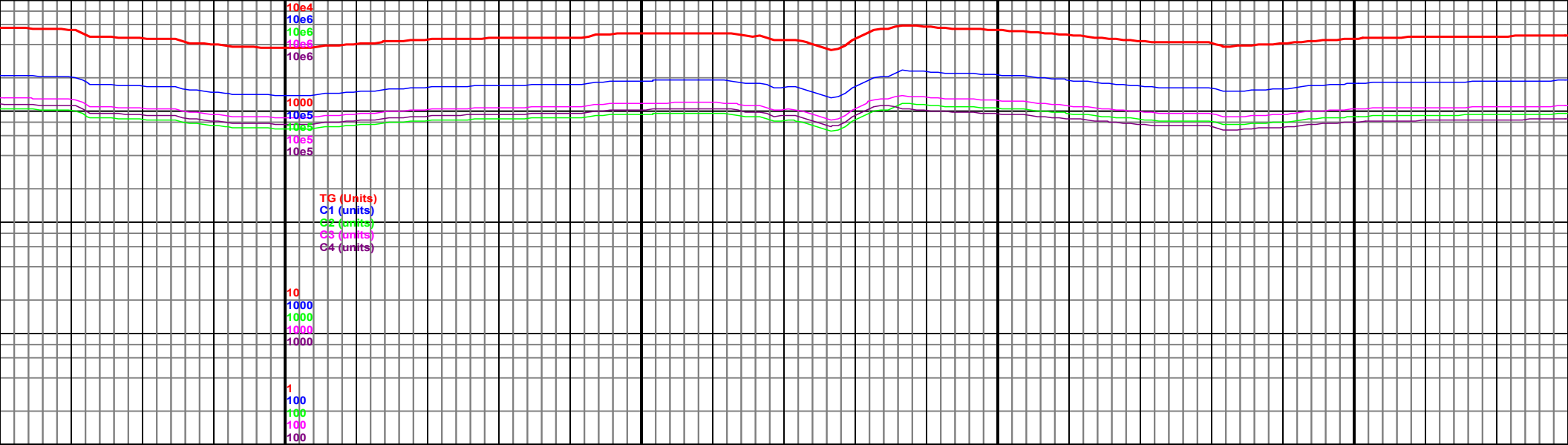


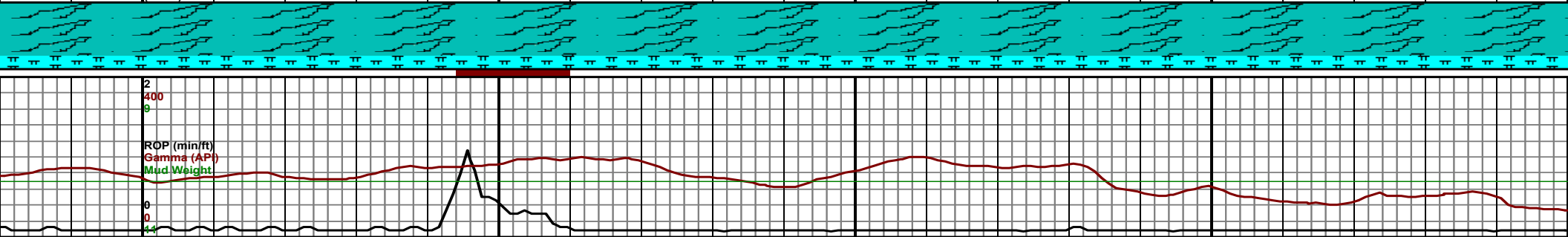
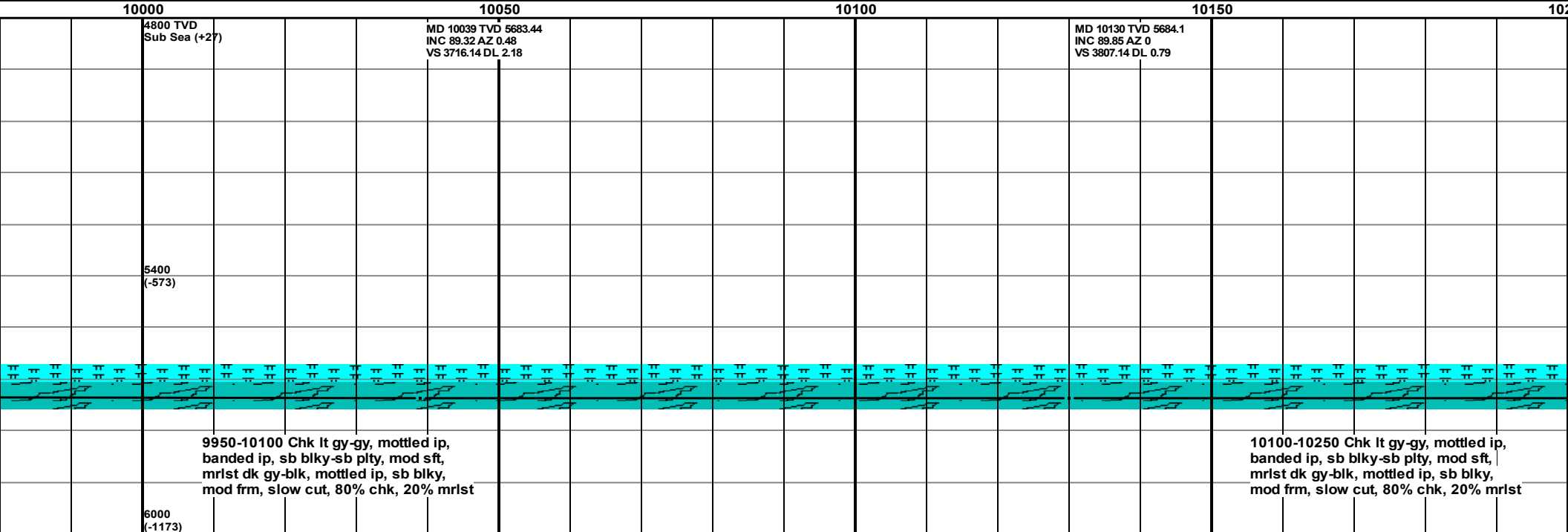
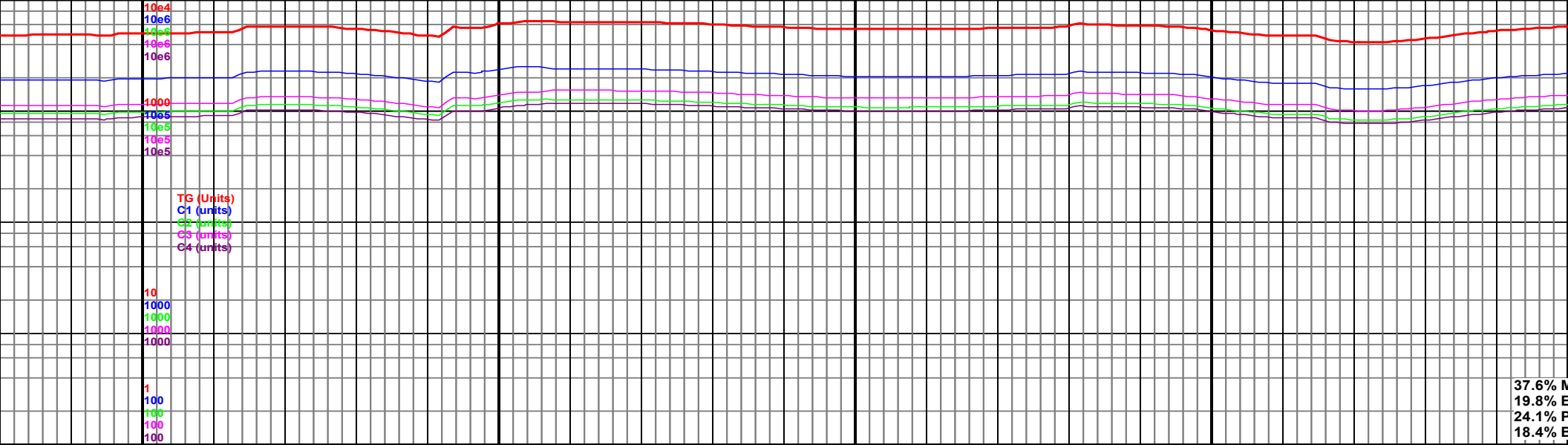


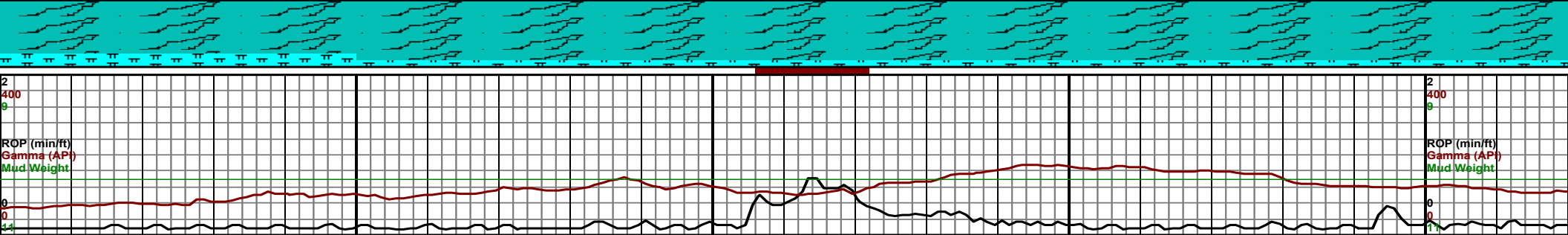
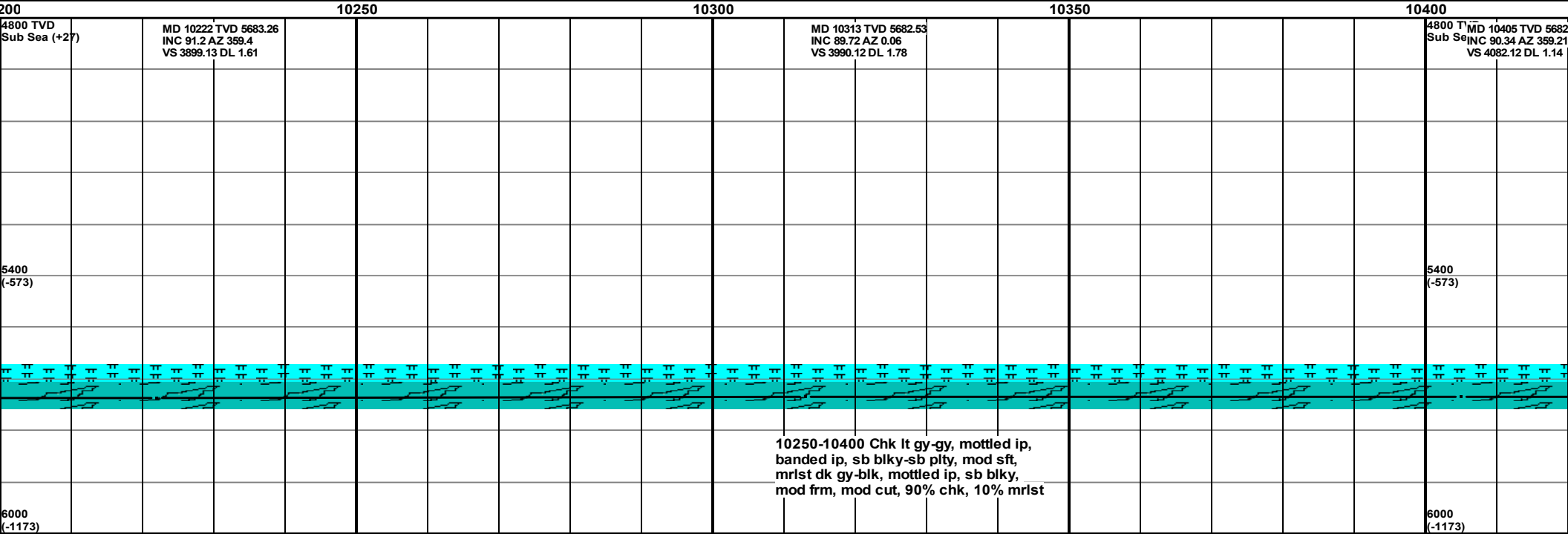
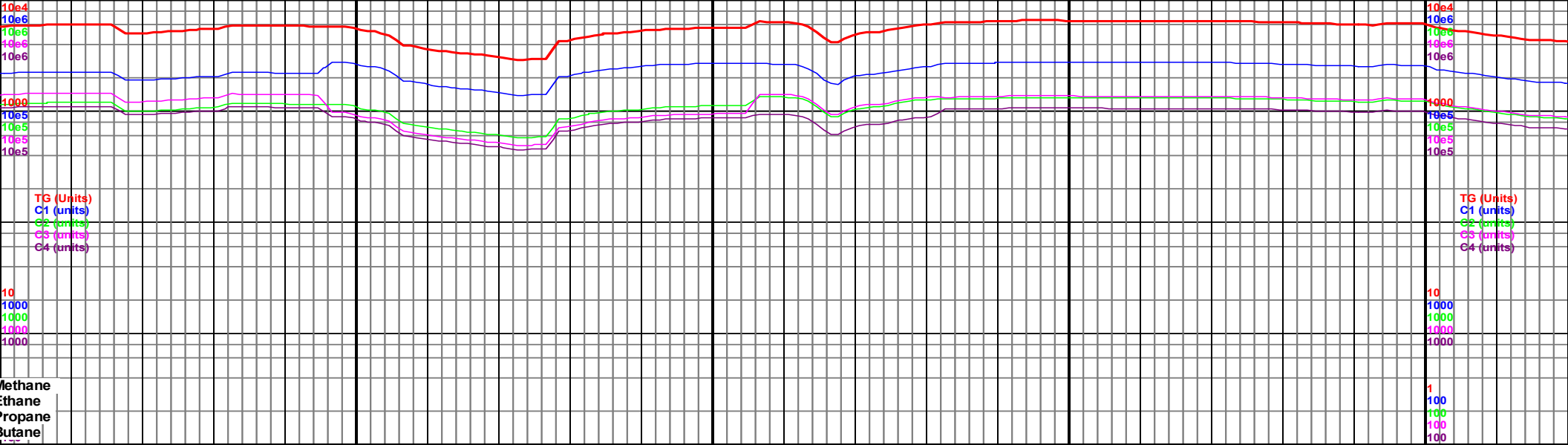
9500-9650 Chk lt gy-gy, mottled ip, banded ip, sb blk-y-sb plty, mod sft, mrlst dk gy-blk, mottled ip, sb blk-y, mod frm, slow cut, 70% chk, 30% mrlst

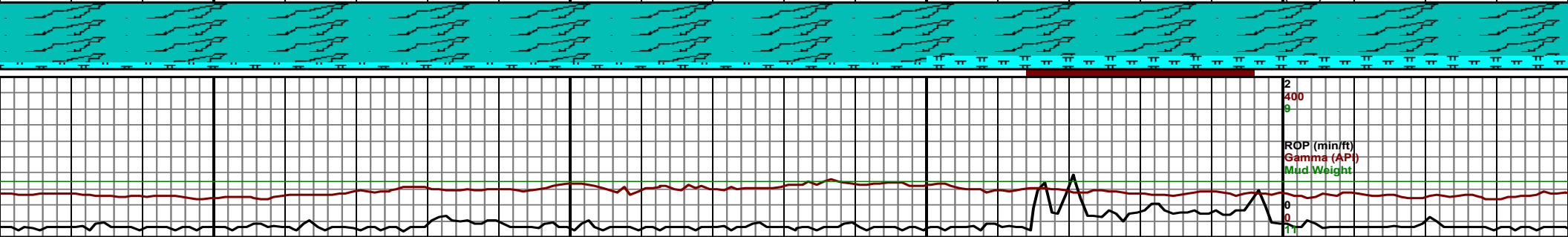
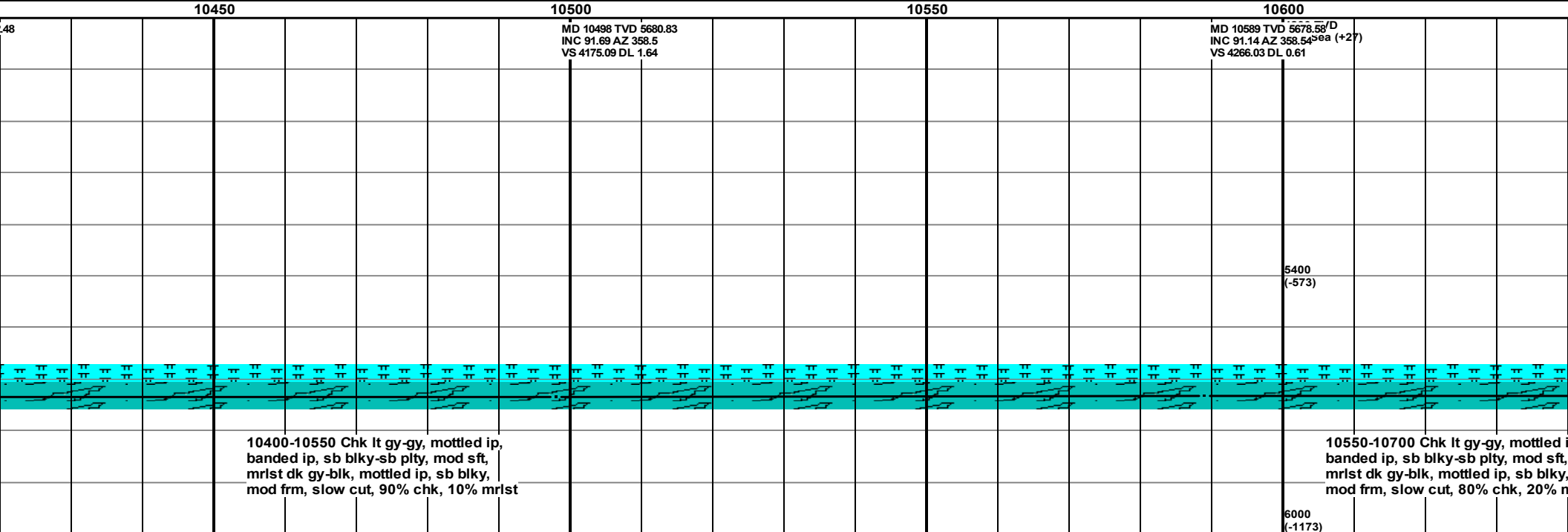
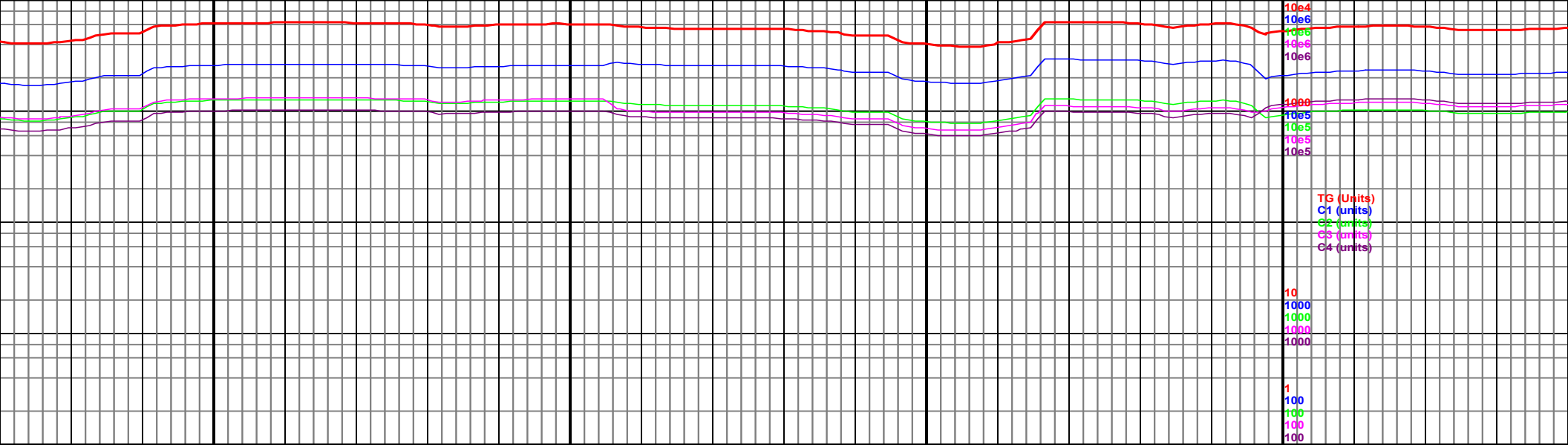
9650-9800 Chk lt gy-gy, mottled ip, banded ip, sb blk-y-sb plty, mod sft, mrlst dk gy-blk, mottled ip, sb blk-y, mod frm, slow cut, 70% chk, 30% mrlst

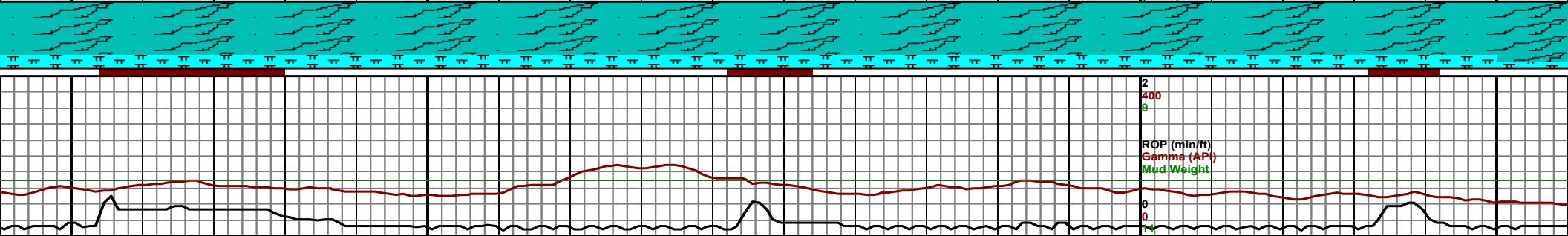
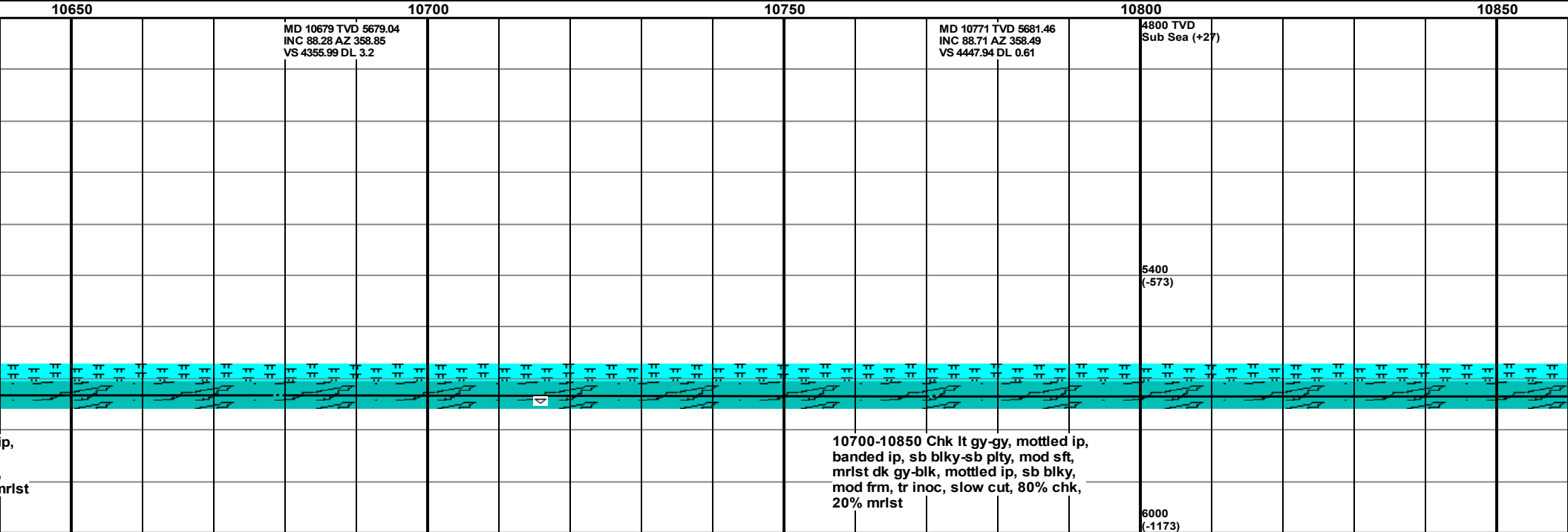
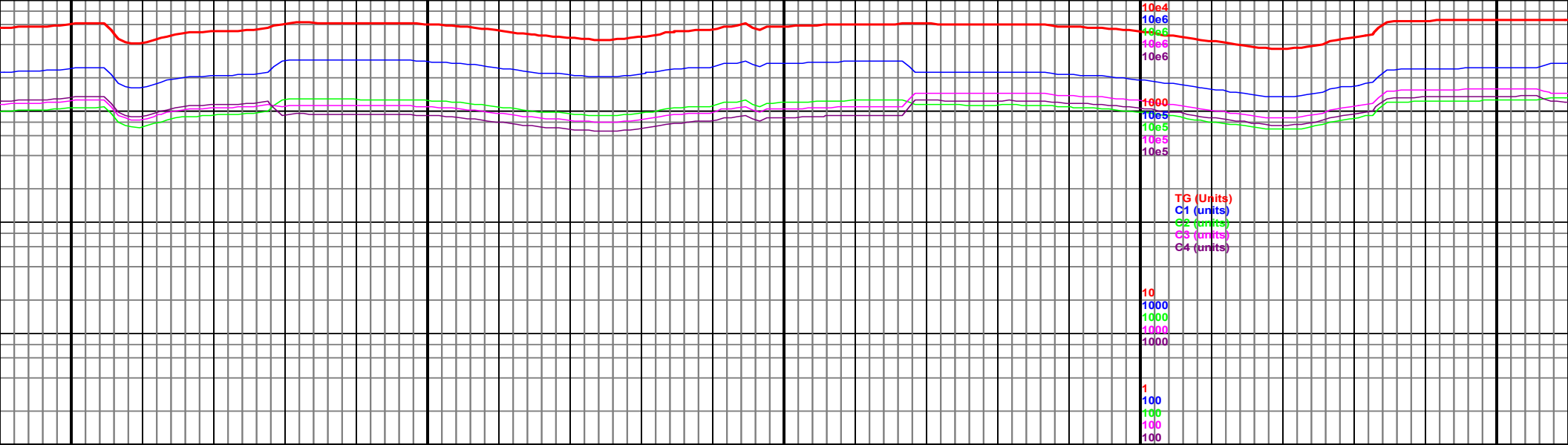


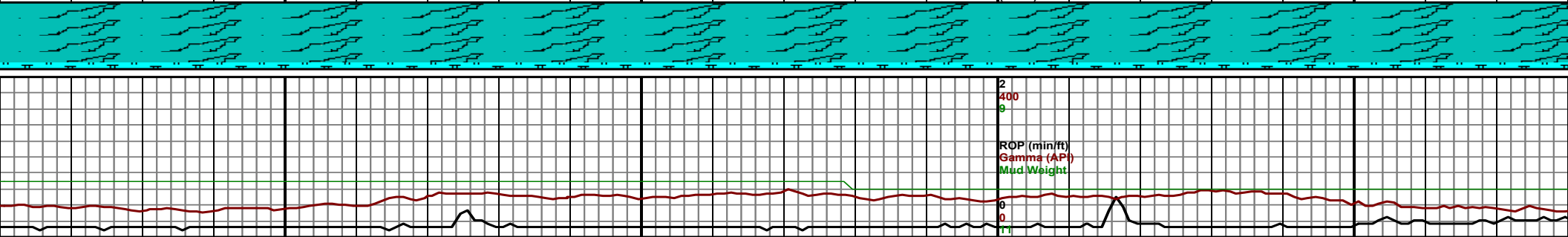
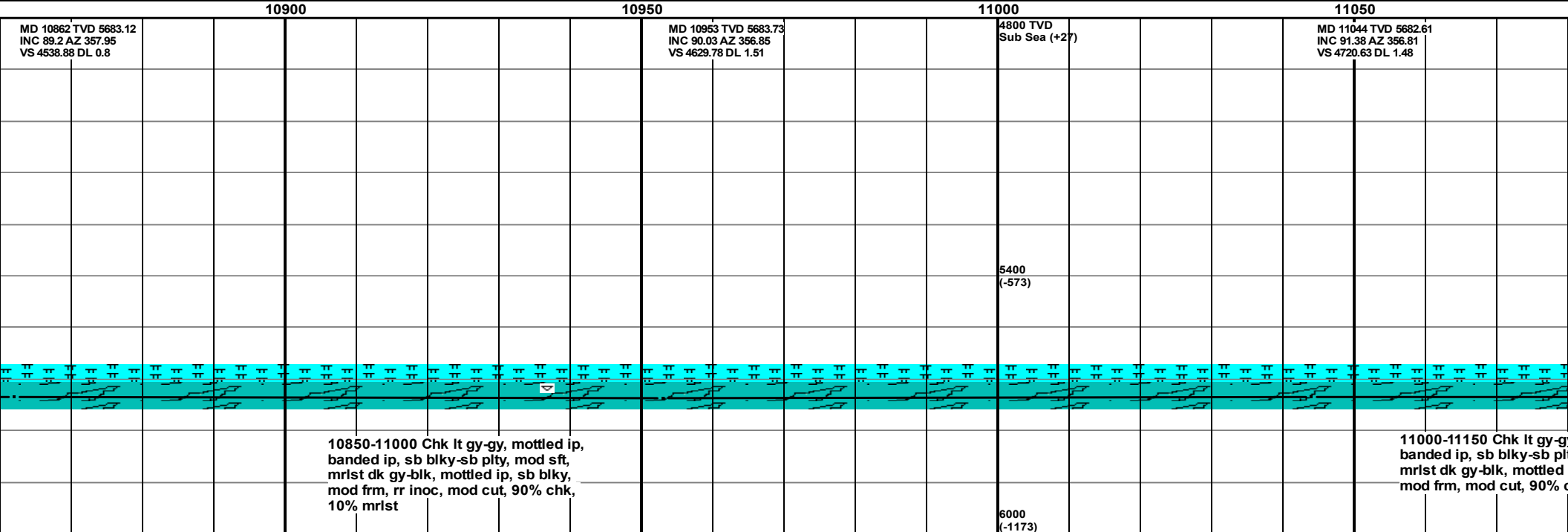
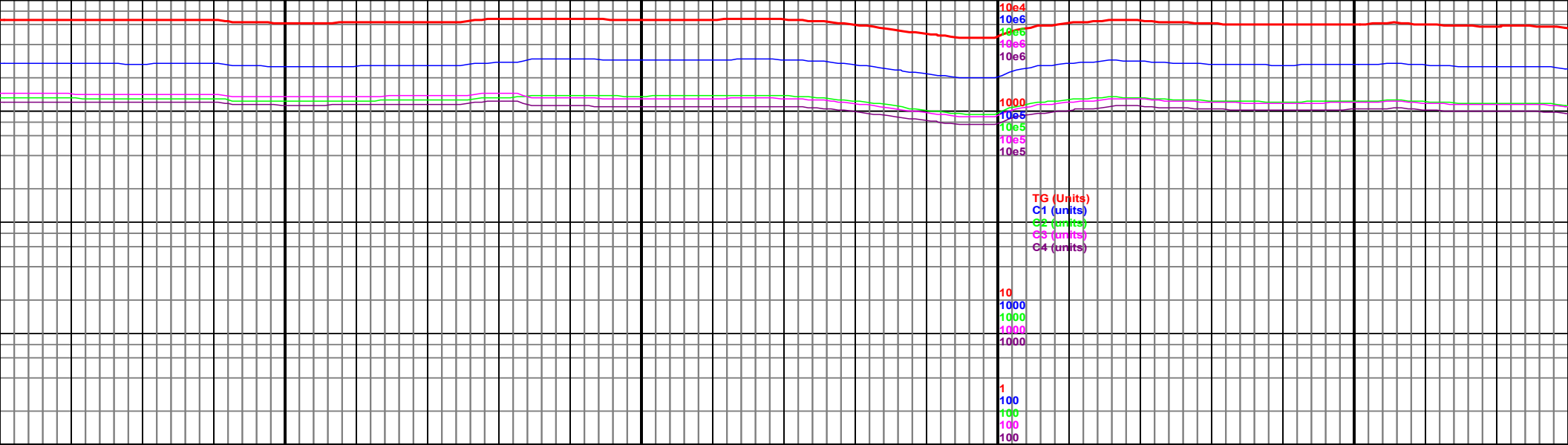


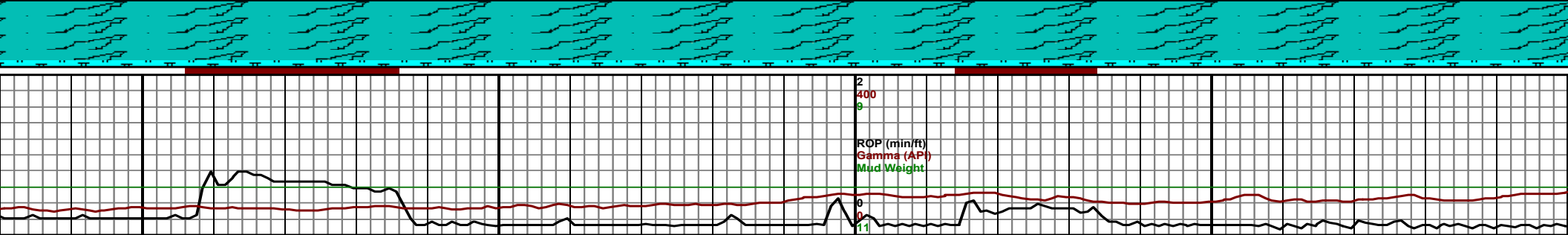
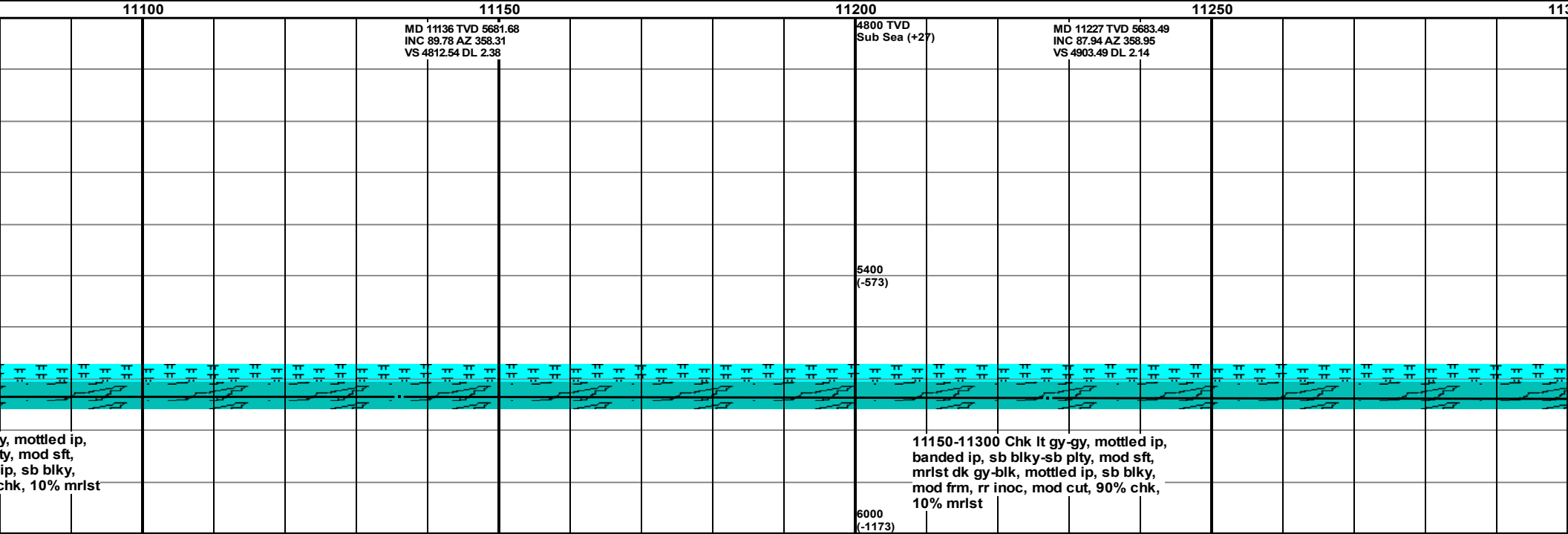
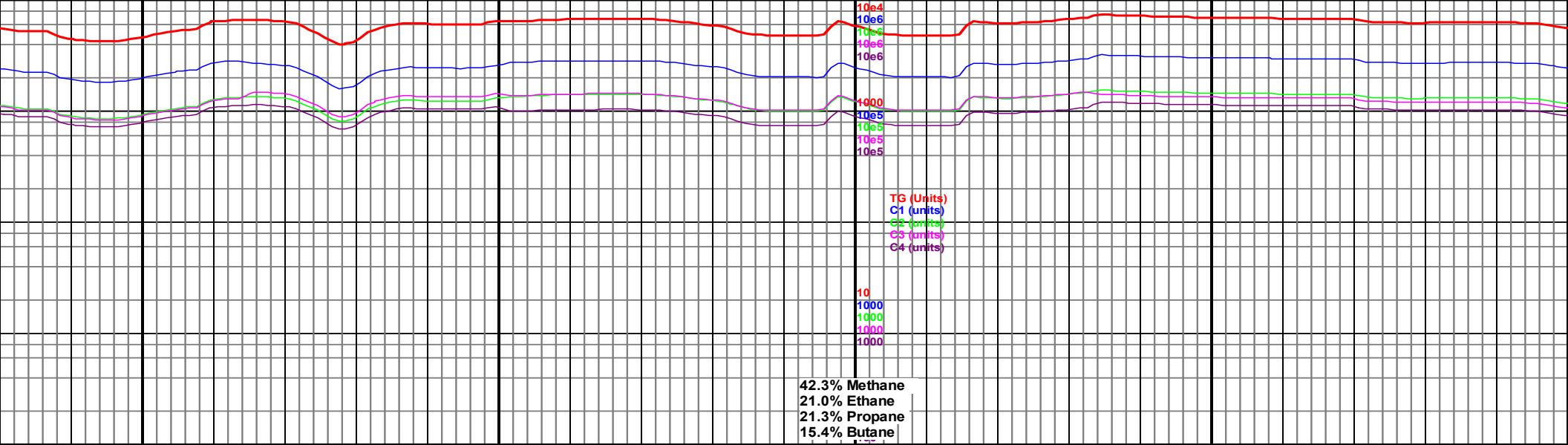


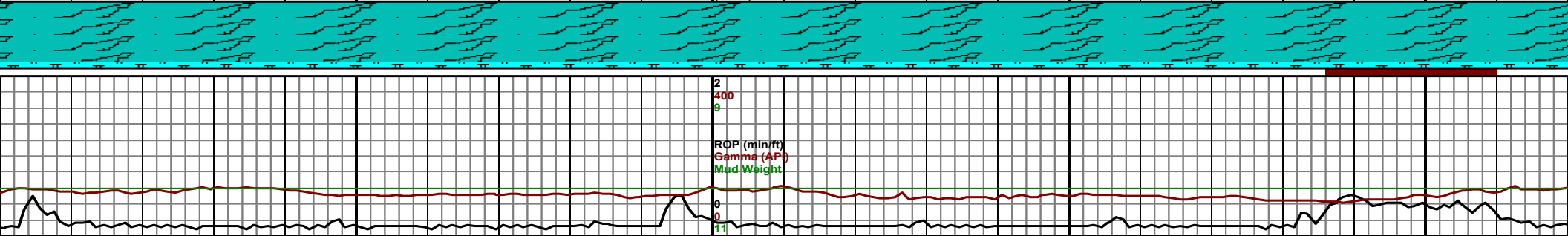
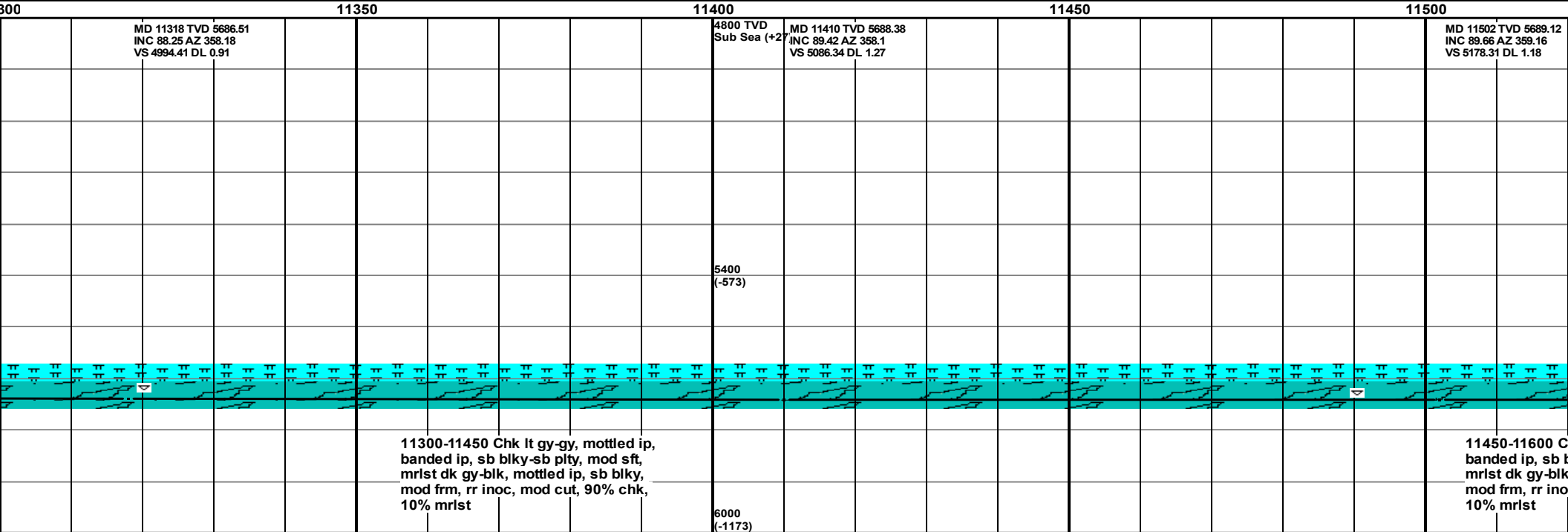
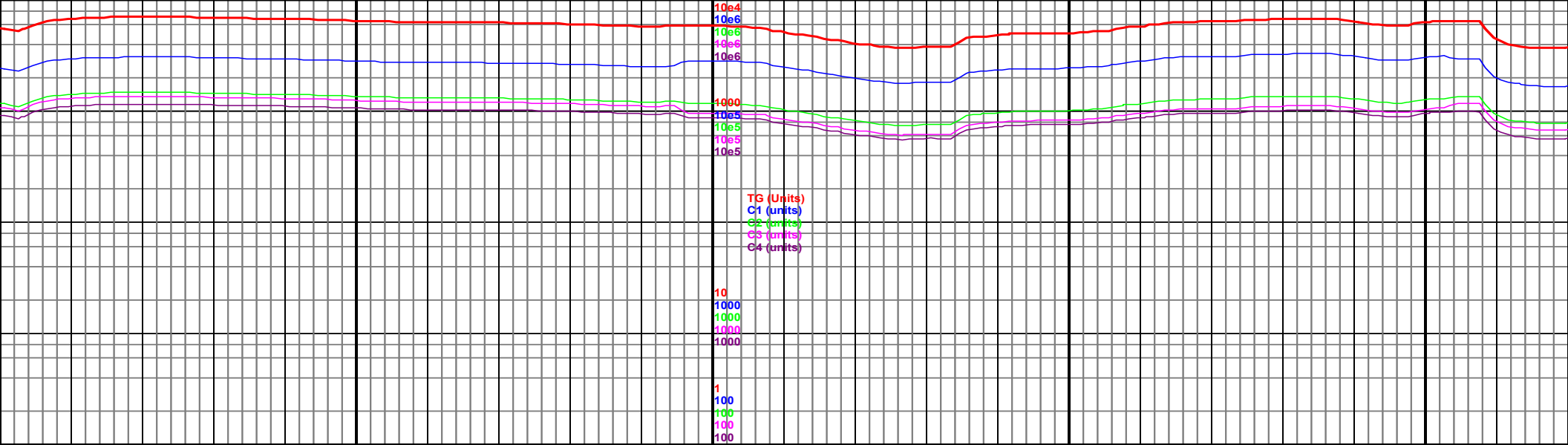


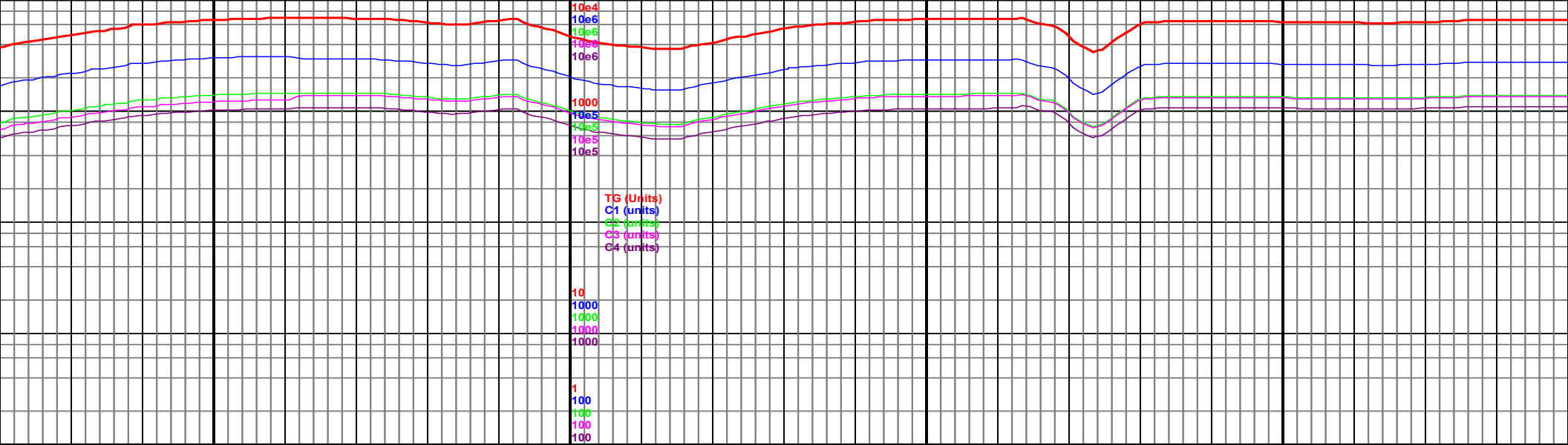












11550

11600

11650

11700

MD 11596 TVD 5689.25
INC 90.18 AZ 0.18
VS 5272.31 DL 1.22

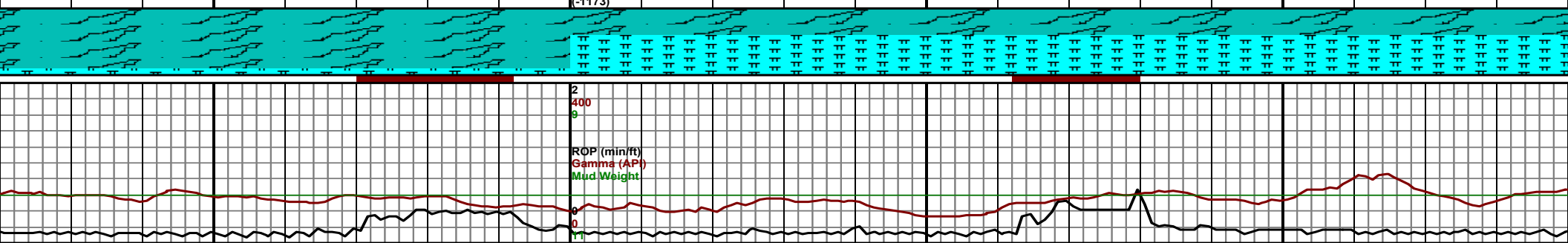
MD 11691 TVD 5688.39
INC 90.86 AZ 0.7
VS 5367.3 DL 0.9

5400
(-573)

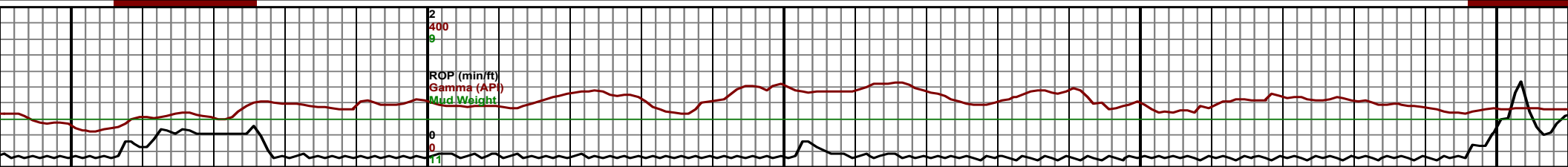
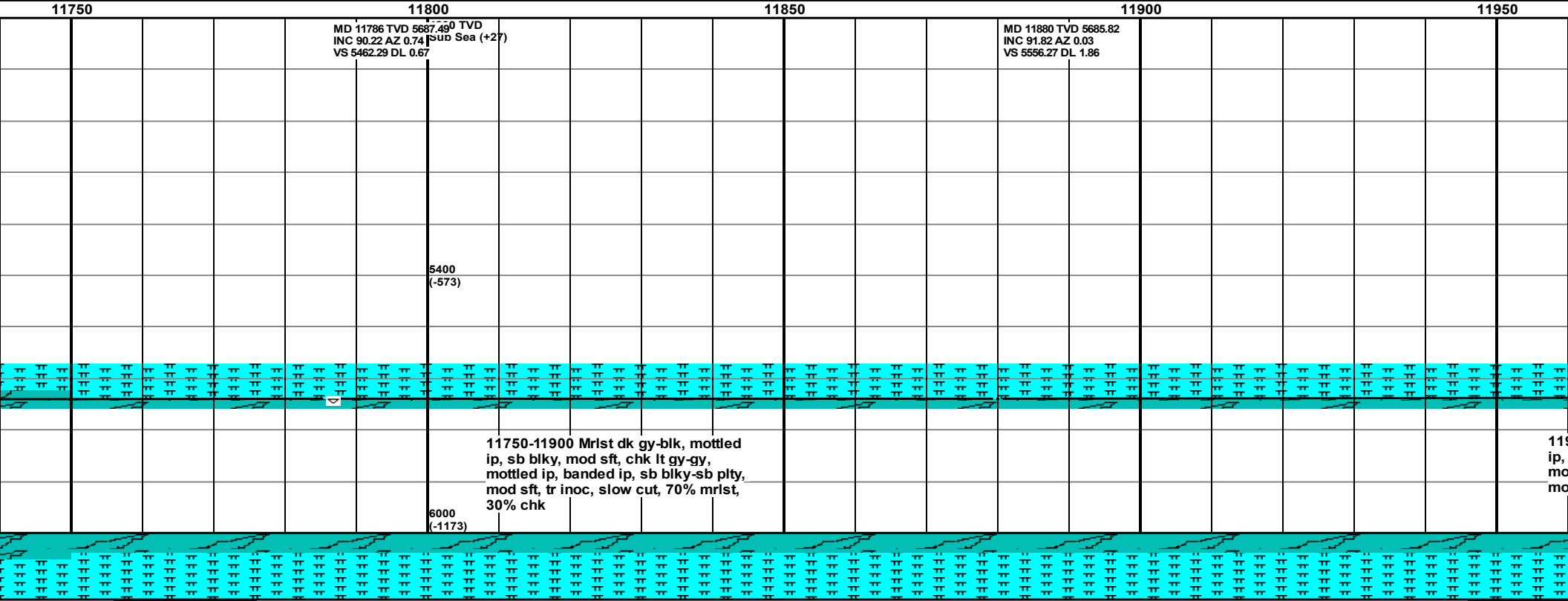
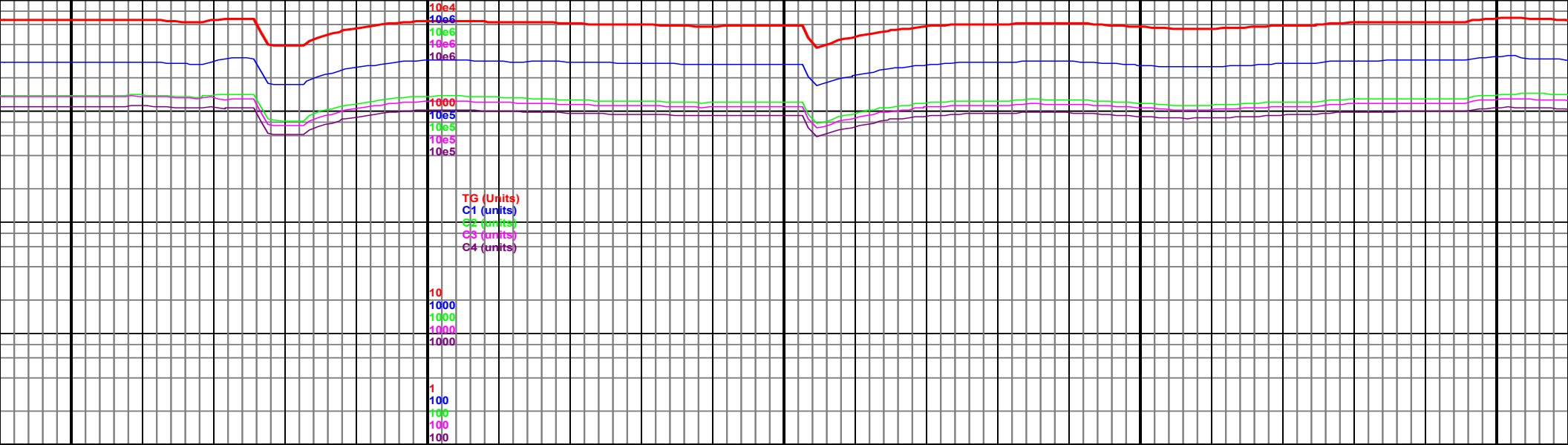
6000
(-1173)

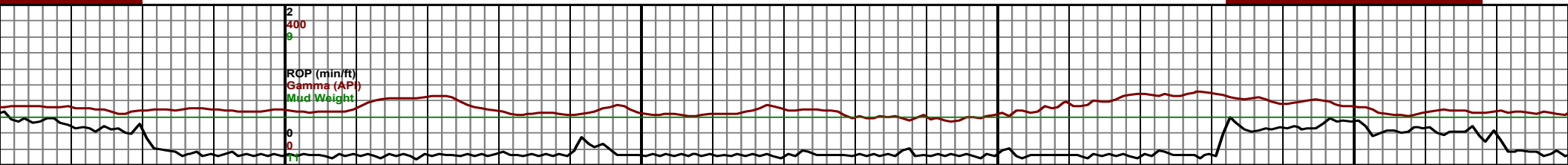
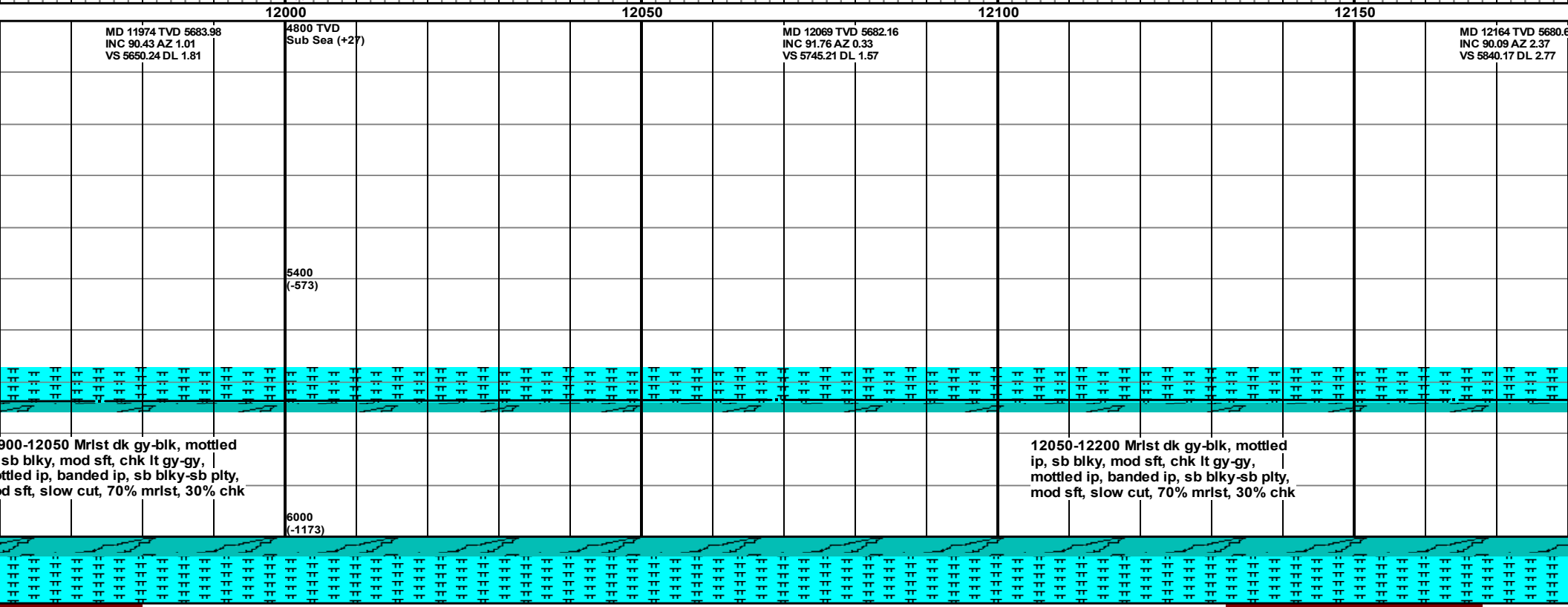
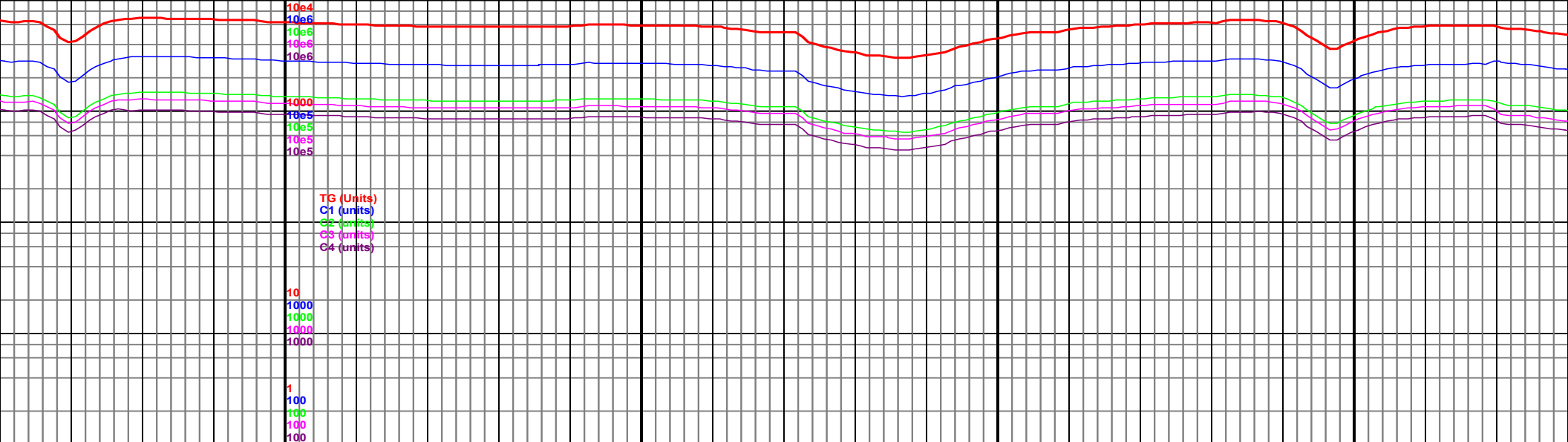
chk lt gy-gy, mottled ip,
blky-sb plty, mod sft,
, mottled ip, sb blky,
c, mod cut, 90% chk,

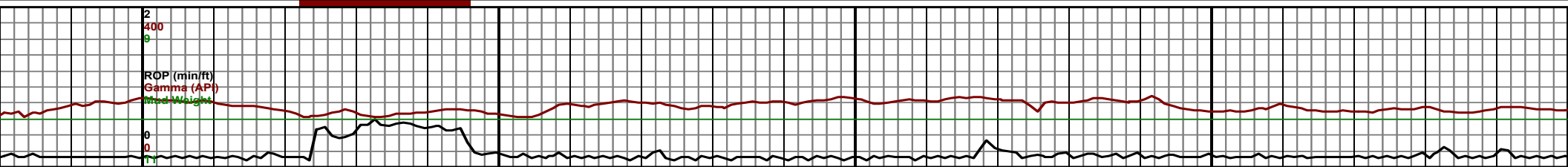
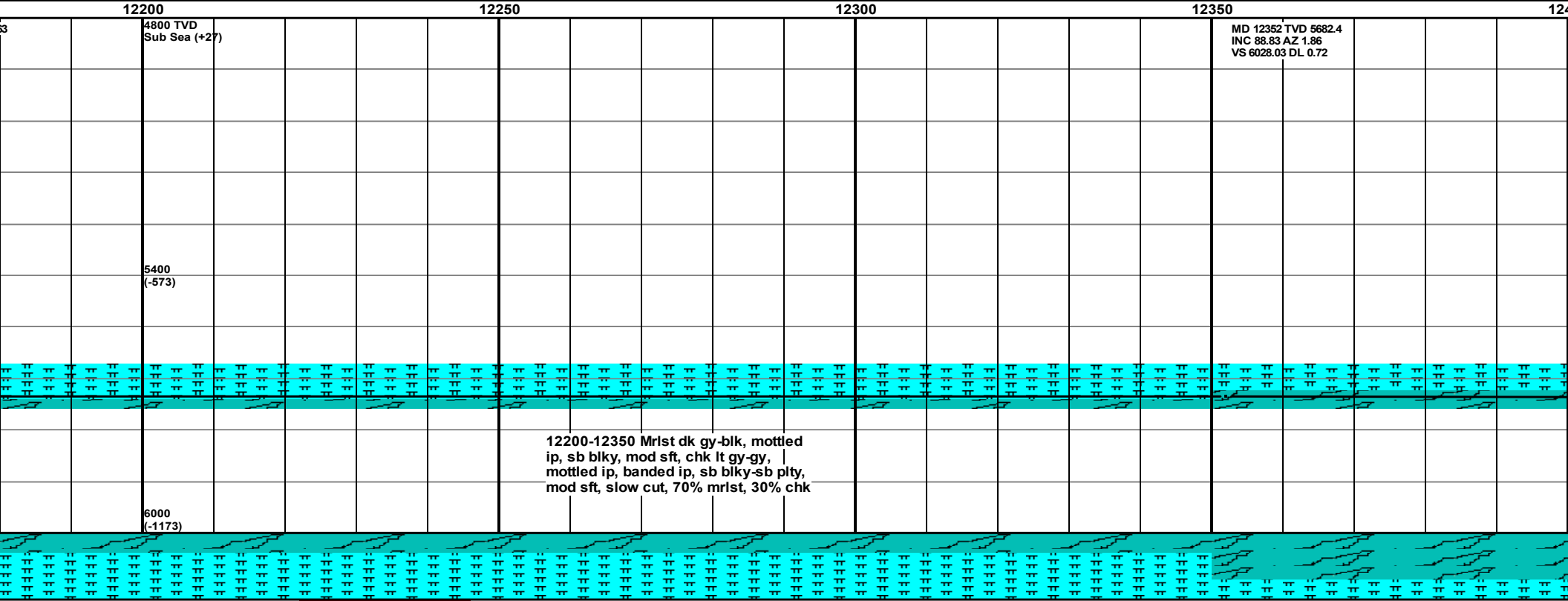
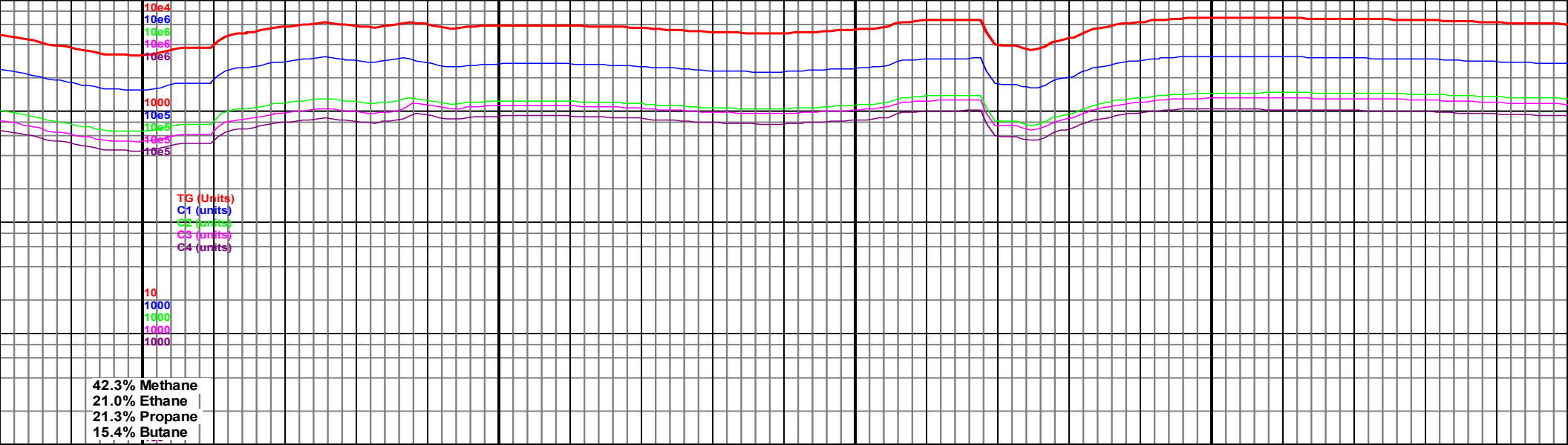
11600-11750 Mrlst dk gy-blk, mottled
ip, sb blky, mod sft, chk lt gy-gy,
mottled ip, banded ip, sb blky-sb plty,
mod sft, rr inoc, slow cut, 60% mrlst,
40% chk

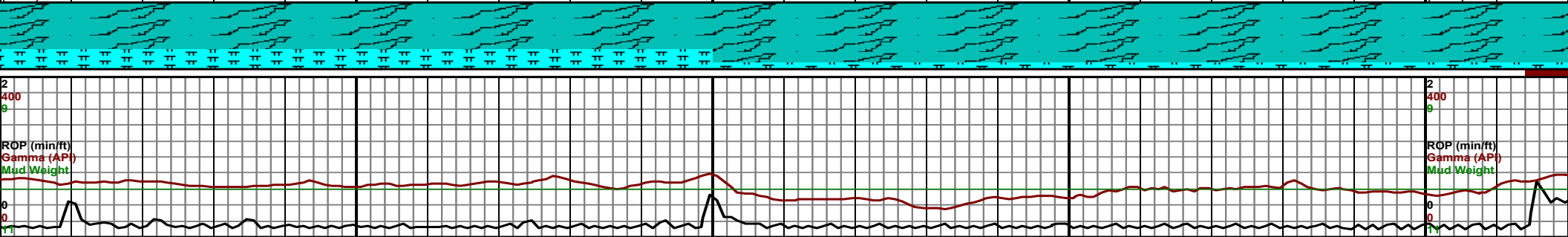
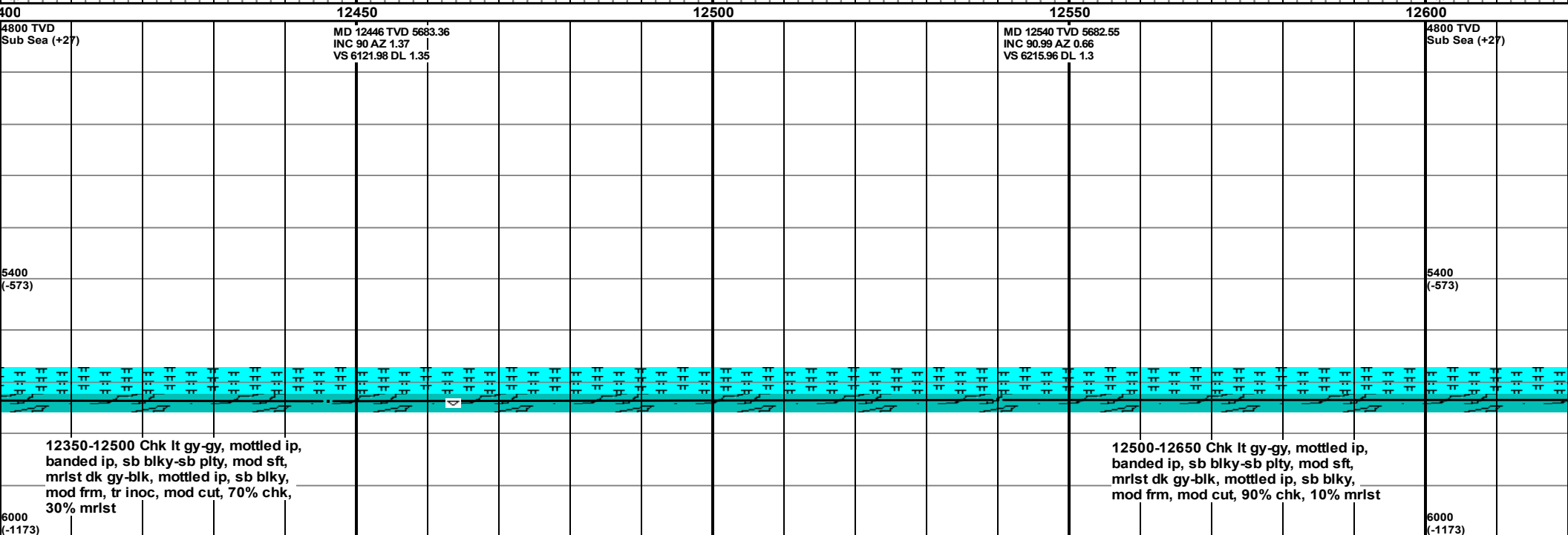
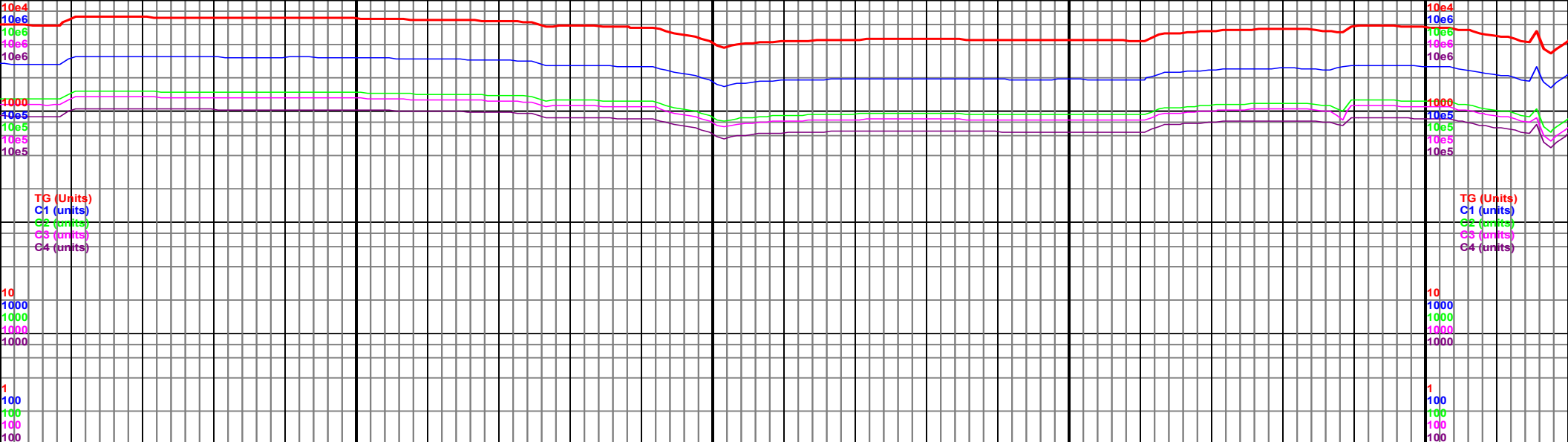


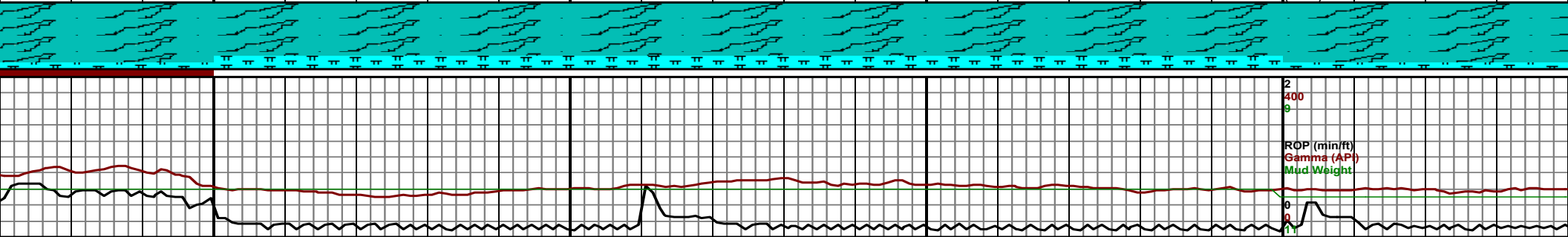
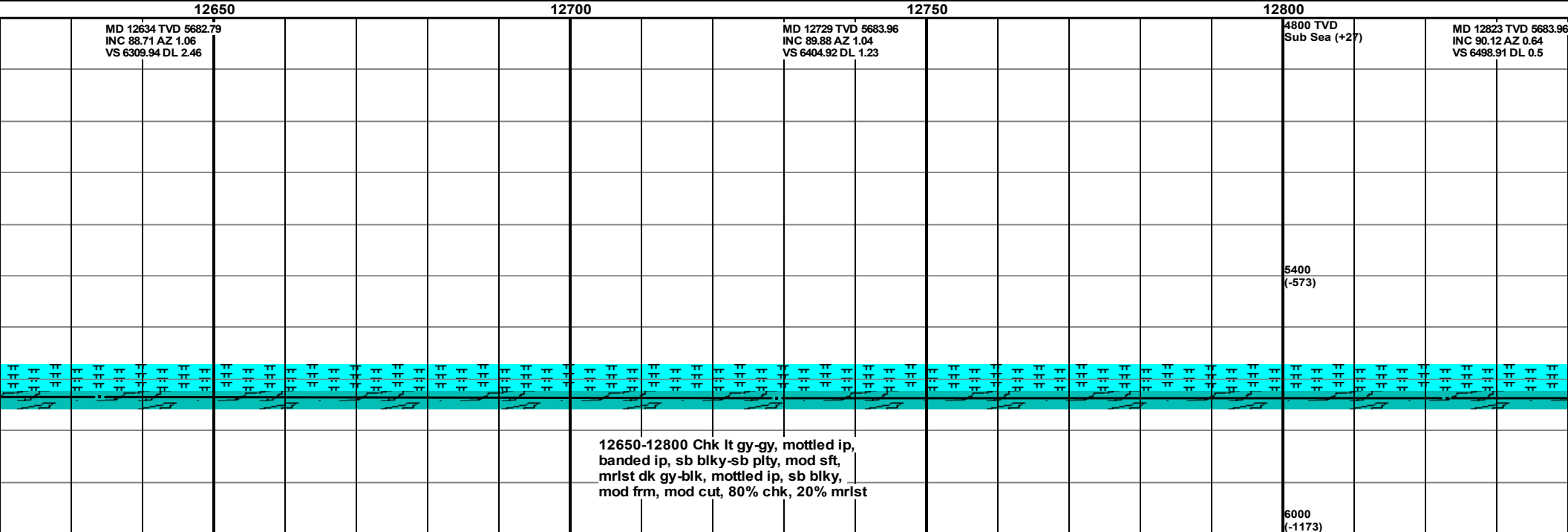
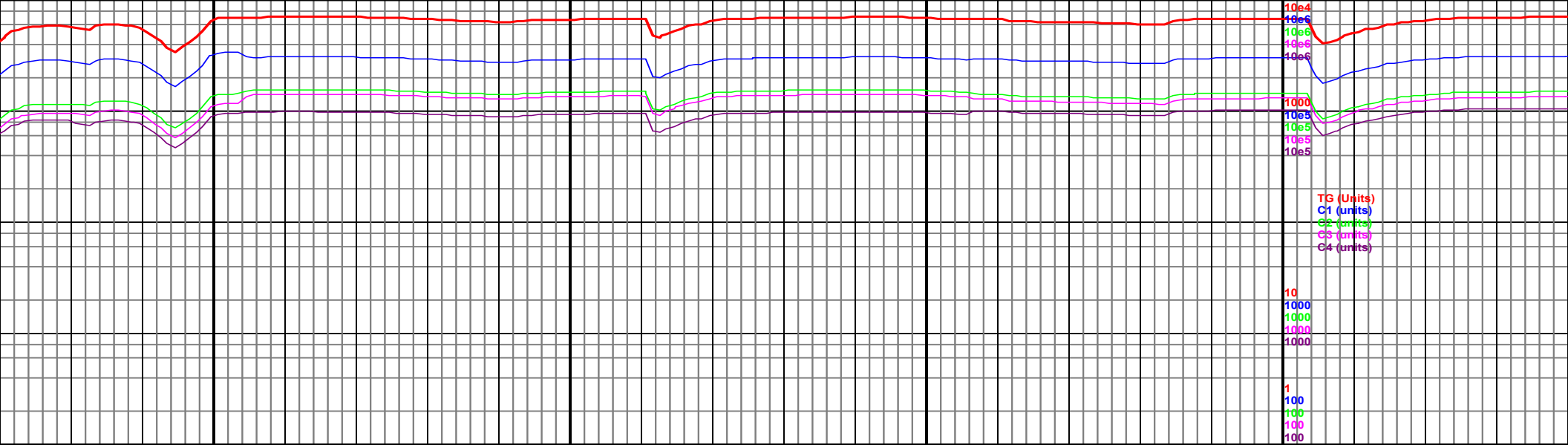
2
400
9
ROP (min/ft)
Gamma (API)
Mud Weight

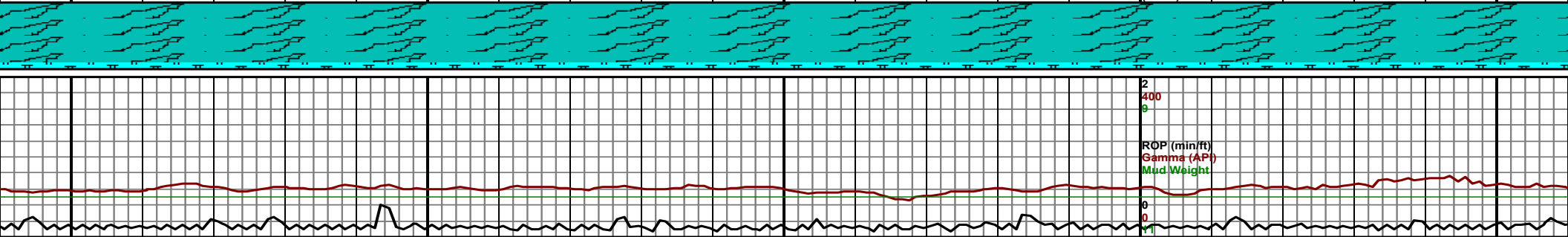
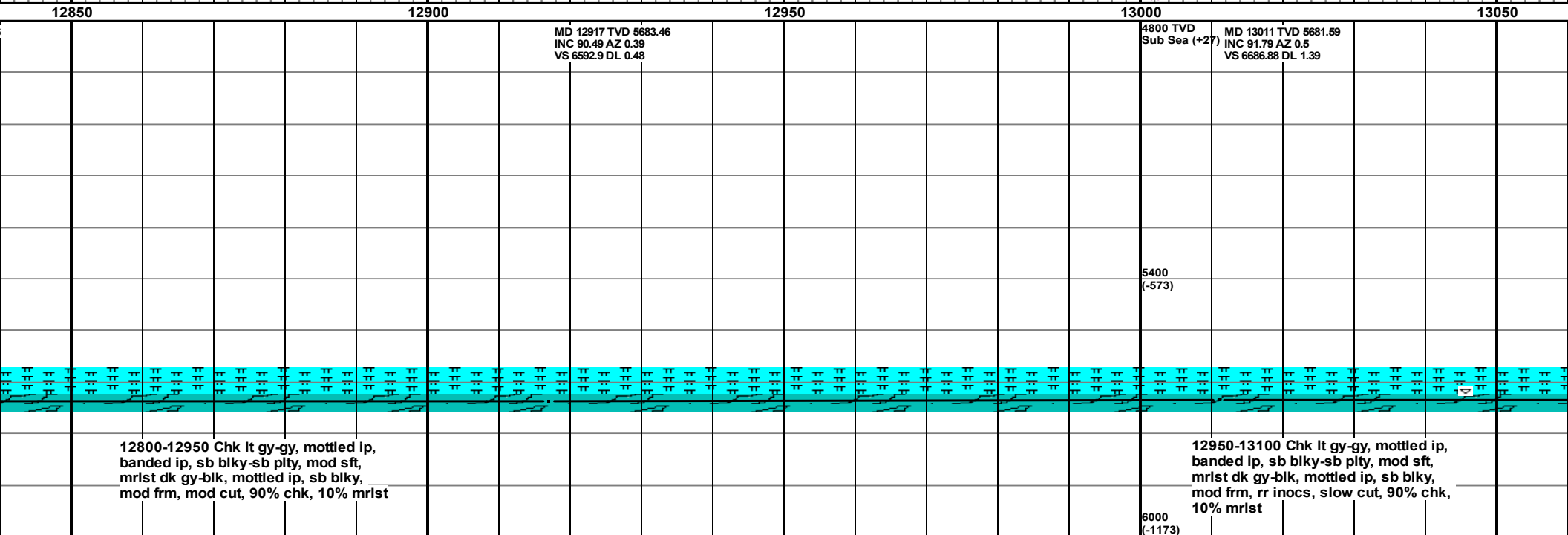
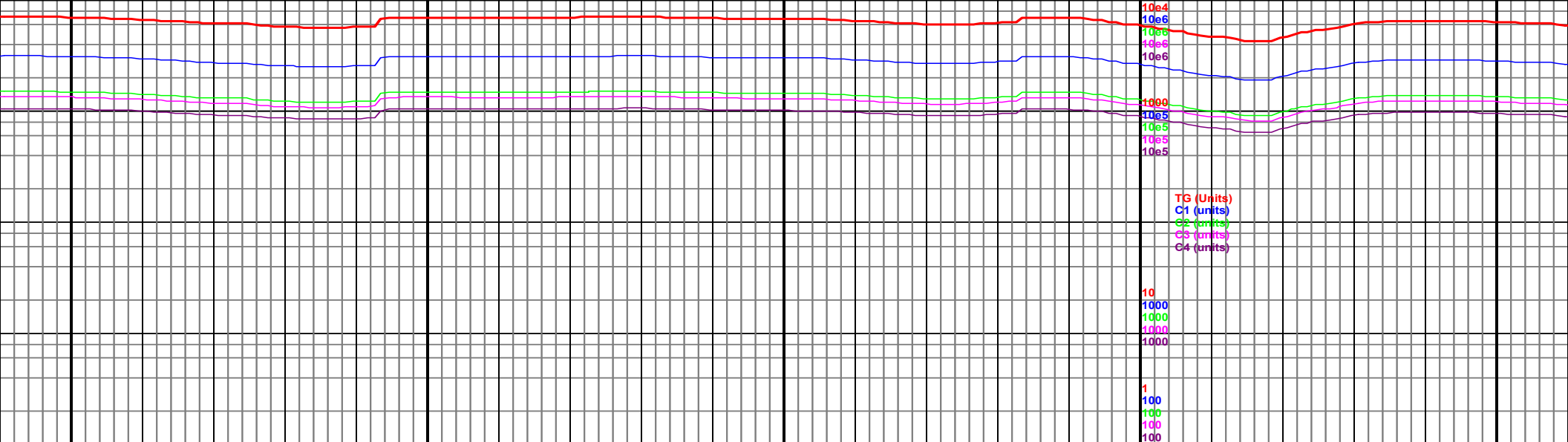


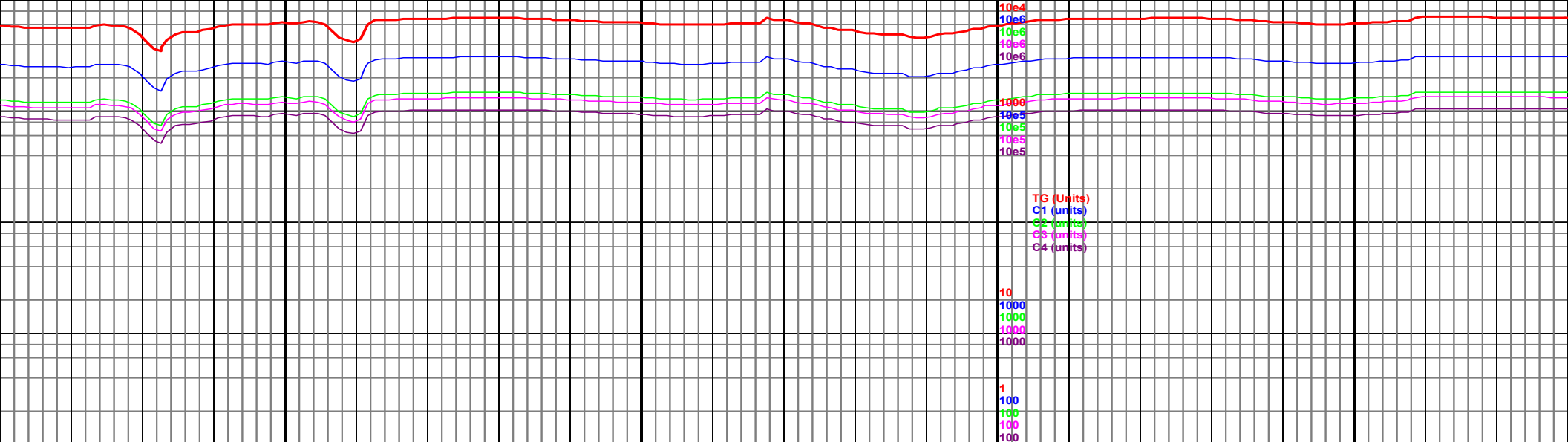












13100

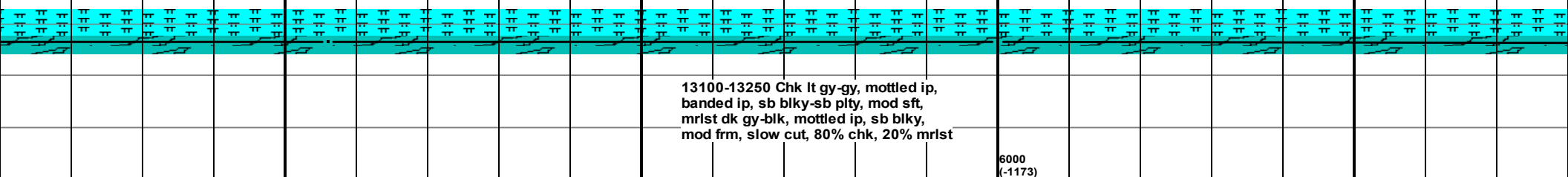
13150

13200

13250

MD 13106 TVD 5680.93
INC 89.01 AZ 0.96
VS 6781.86 DL 2.97

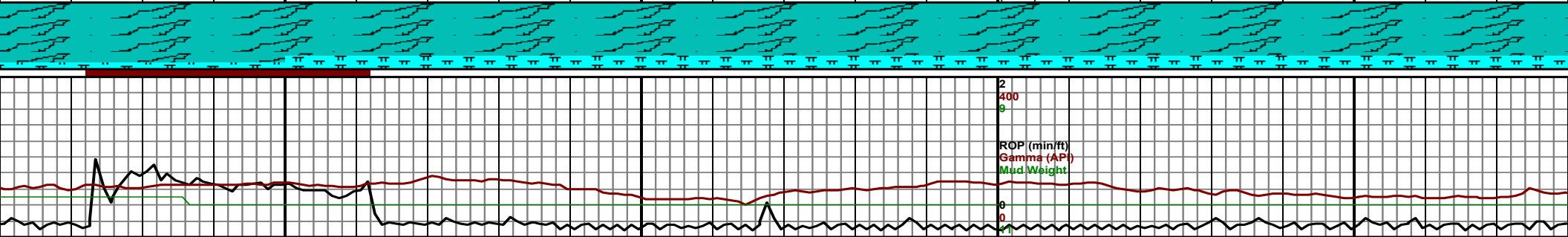
MD 13200 TVD 5682.54
INC 89.02 AZ 0.44
VS 6875.84 DL 0.55



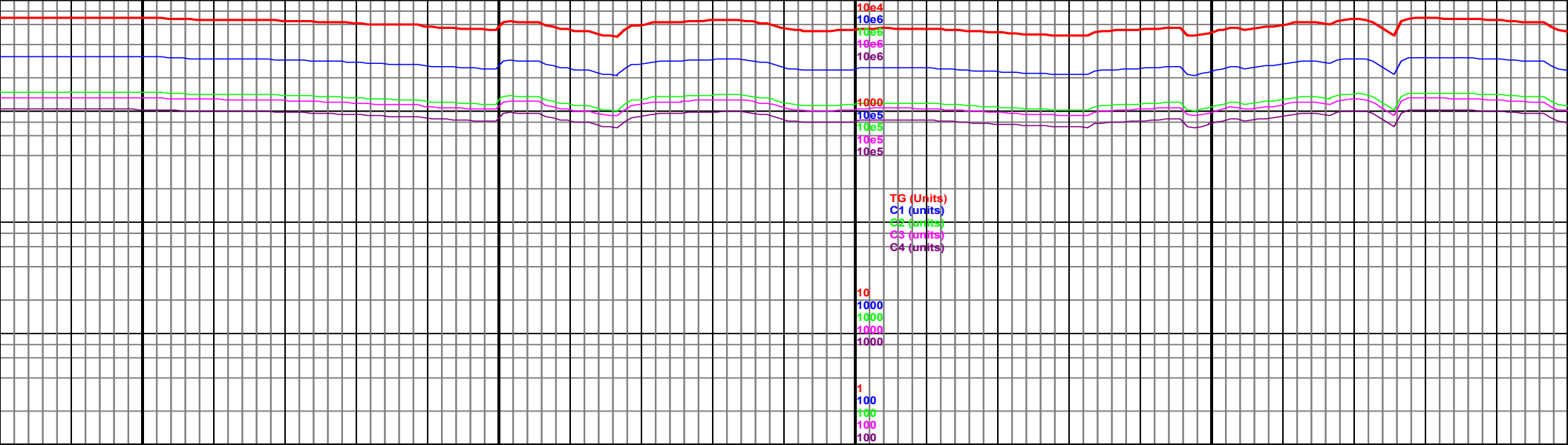
13100-13250 Chk lt gy-gy, mottled ip,
banded ip, sb blk-y-sb ply, mod sft,
mrlst dk gy-blk, mottled ip, sb blk,
mod frm, slow cut, 80% chk, 20% mrlst

5400
(-573)

6000
(-1173)



2
400
9
ROP (min/ft)
Gamma (API)
Mud Weight



13300
MD 13294 TVD 5683.35
INC 90 AZ 0.38
VS 6969.83 DL 1.04

13350

13400
MD 13388 TVD 5682.34
INC 91.23 AZ 359.44 Sea (+27)
VS 7063.82 DL 1.65

13450

13500
MD 13483 TVD 5682.01
INC 89.17 AZ 359.61
VS 7158.81 DL 2.18



13250-13400 Chk lt gy-gy, mottled ip,
banded ip, sb blk-sb plty, mod sft,
mrst dk gy-blk, mottled ip, sb blk,
mod frm, slow cut, 80% chk, 20% mrst

13400-13550 Chk lt gy-gy, mottled ip,
banded ip, sb blk-sb plty, mod sft,
mrst dk gy-blk, mottled ip, sb blk,
mod frm, rr bent, mod cut, 80% chk,
20% mrst

