



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

**Well Name:** Razor 27I-3415A  
**Location:** NESE 27-T10N-R58W  
**License Number:** 05-123-37898  
**Spud Date:** 12/16/2013  
**Surface Coordinates:** Lat.: 40.808925 Long.: -103.843675  
**Region:** Redtail Field  
**Drilling Completed:** 12/21/2013  
**Bottom Hole Coordinates:** Lat.: 40.788008 Long.: -103.842525  
**Ground Elevation (ft):** 4758 **K.B. Elevation (ft):** 4775  
**Logged Interval (ft):** 5100 **To:** 12525 **Total Depth (ft):** 12525  
**Formation:** Pierre, Sharon Springs, Niobrara  
**Type of Drilling Fluid:** Water Based Mud

Printed by WellSight Log Viewer from WellSight Systems 1-800-447-1534 [www.WellSight.com](http://www.WellSight.com)

**OPERATOR**

**Company:** Whiting Oil & Gas Corp.  
**Address:** 1700 Broadway Suite 2300  
Denver, CO 80290

**GEOLOGIST**

**Name:** Brian Reddick, Todd Nakata  
**Company:** Acme Geologic Consulting  
**Address:** 108 Berry Street  
Little Rock, AR 72205

## Drilling Company

Cade Drilling, LLC  
Rig #23

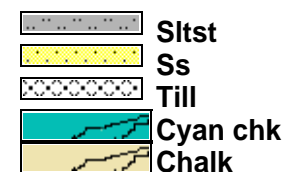
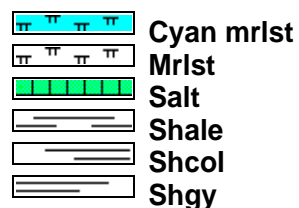
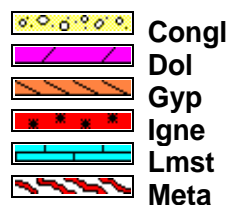
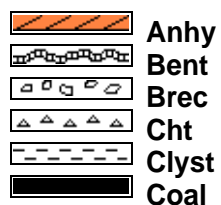
## Gas Detection

Mudlogging Systems, Inc., M Logger, Model TGC, Total Gas and Chromatograph, #149

## Comments

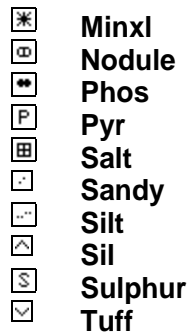
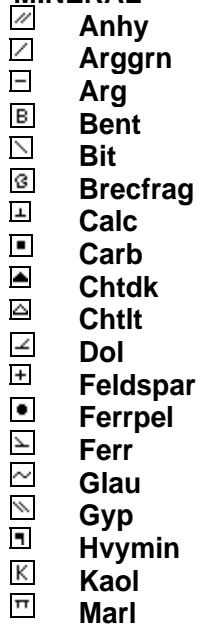
Lithologies and tops at drilled depths, not corrected to elogs. Where the well bore gas is 100% methane, the C1 line is moved to 85% for graphical purposes only.

## ROCK TYPES

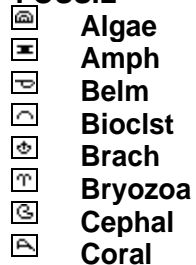


## ACCESSORIES

### MINERAL



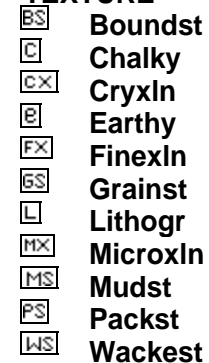
### FOSSIL



### STRINGER











### TEXTURE



OTHER SYMBOLS




POROSITY

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

SORTING





-  Well
-  Moderate
-  Poor

ROUNDING


-  Rounded
-  Subrnd
-  Subang

-  Angular

OIL SHOW

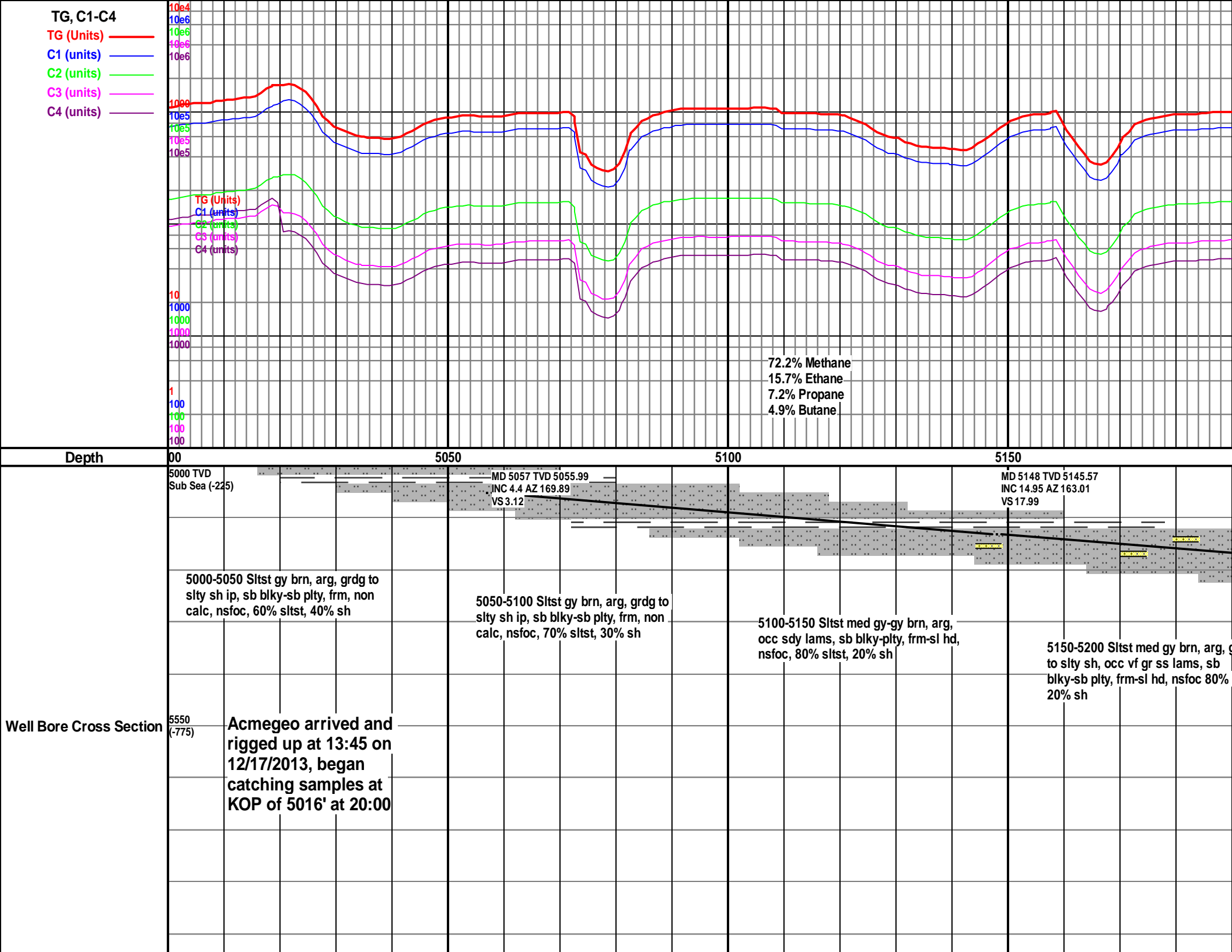
-  Even
-  Spotted
-  Ques
-  Dead

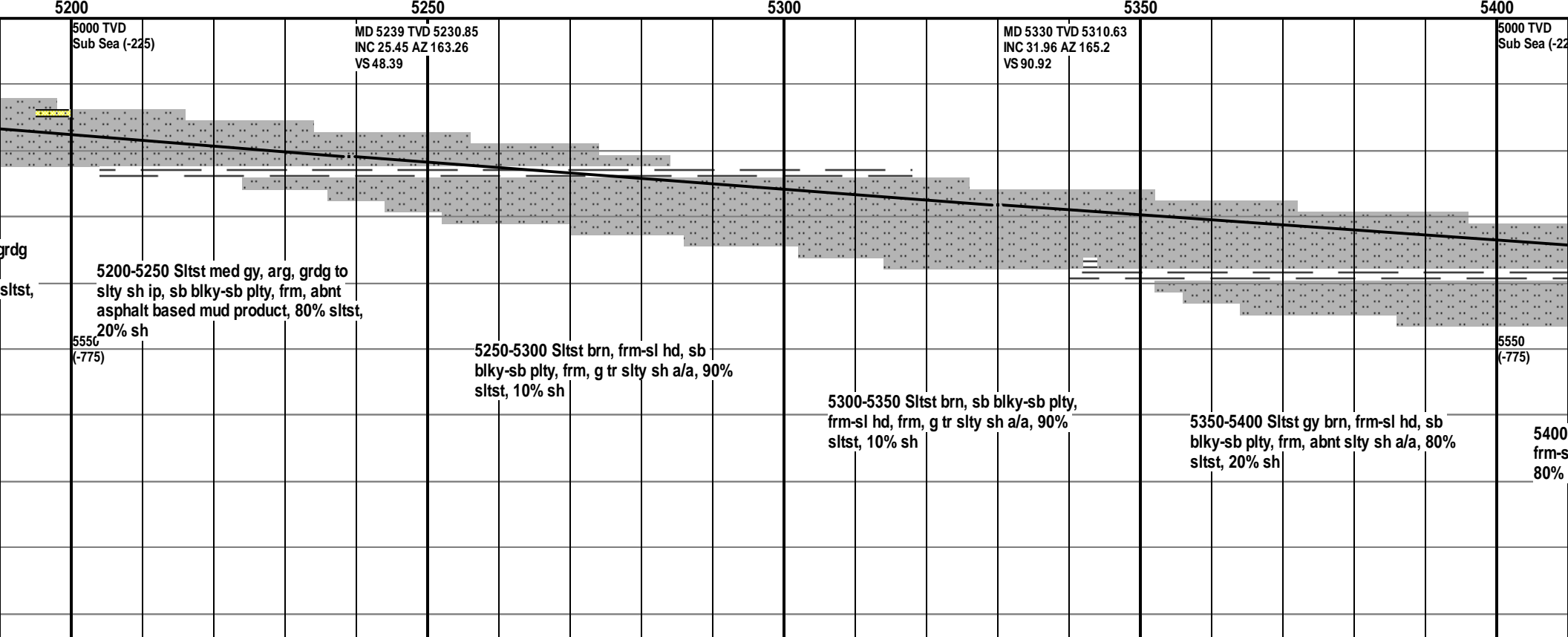
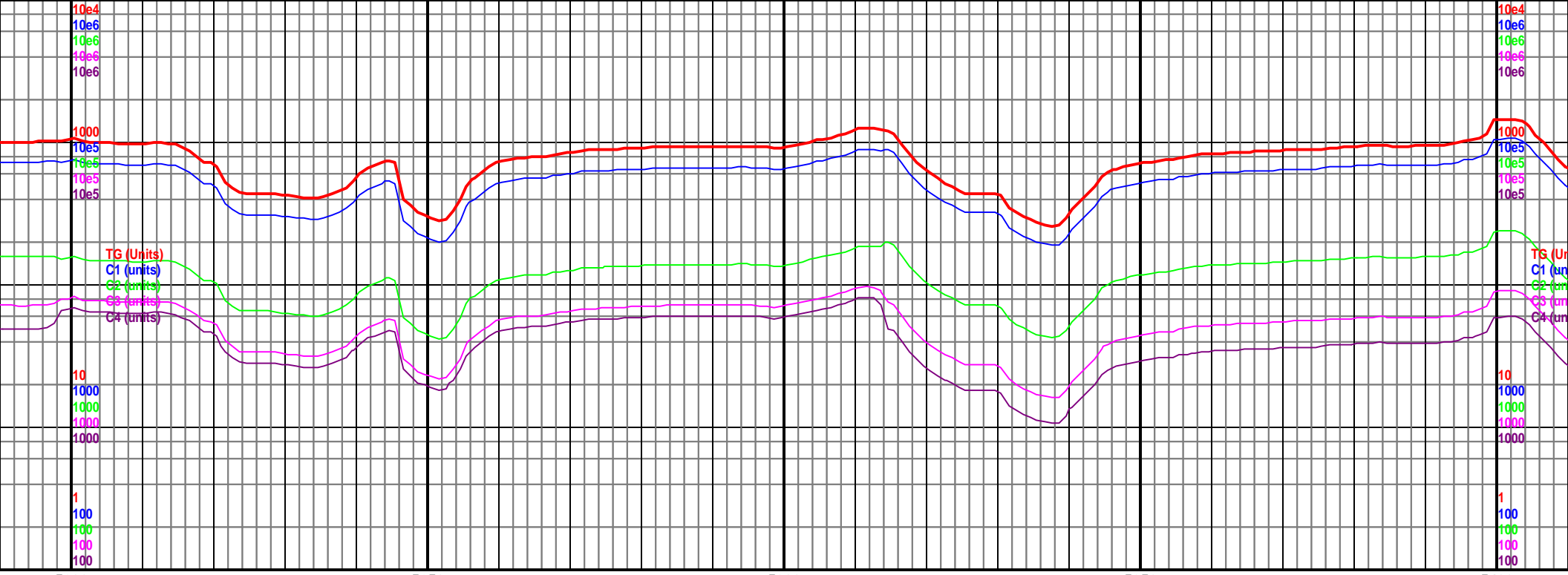
INTERVAL

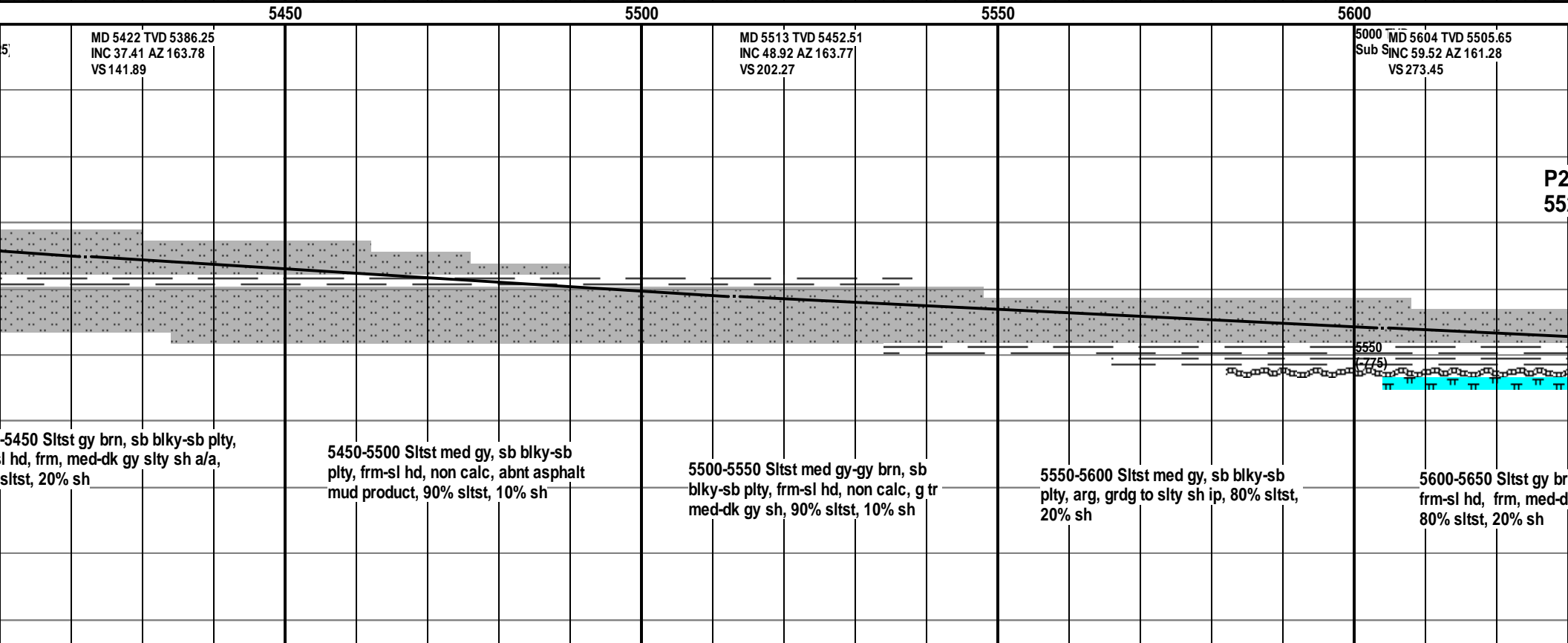
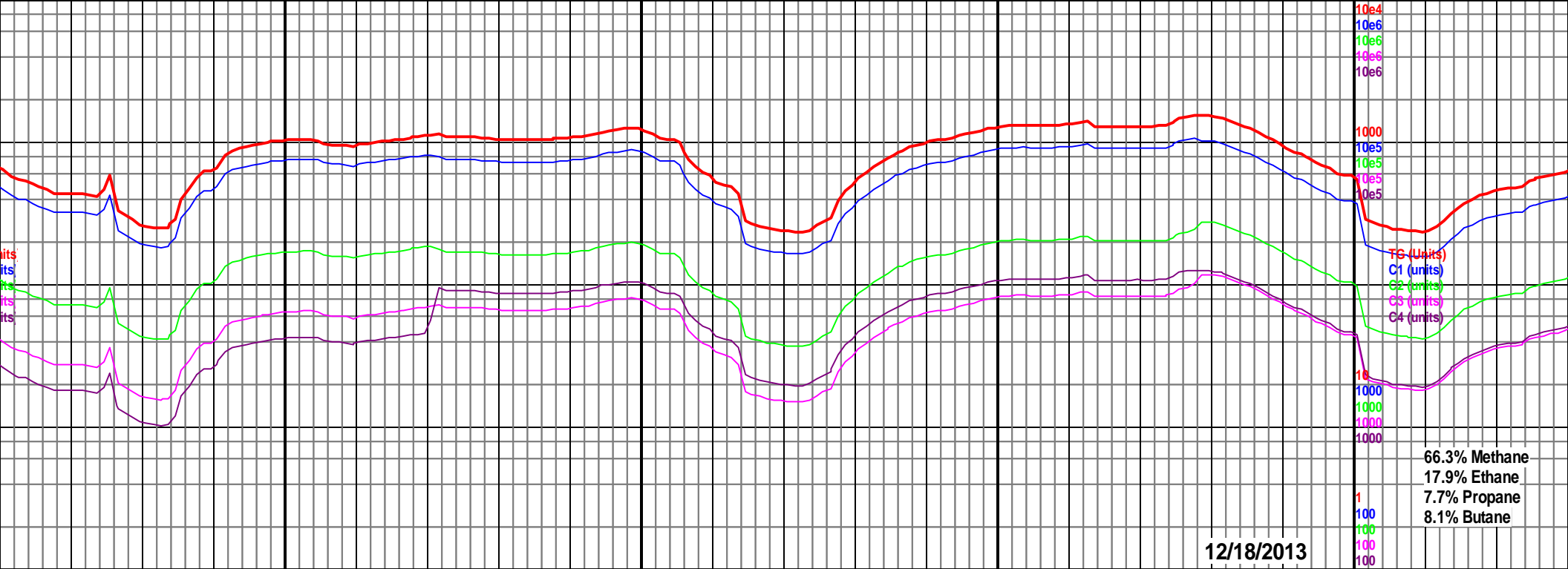
-  Core
-  Dst

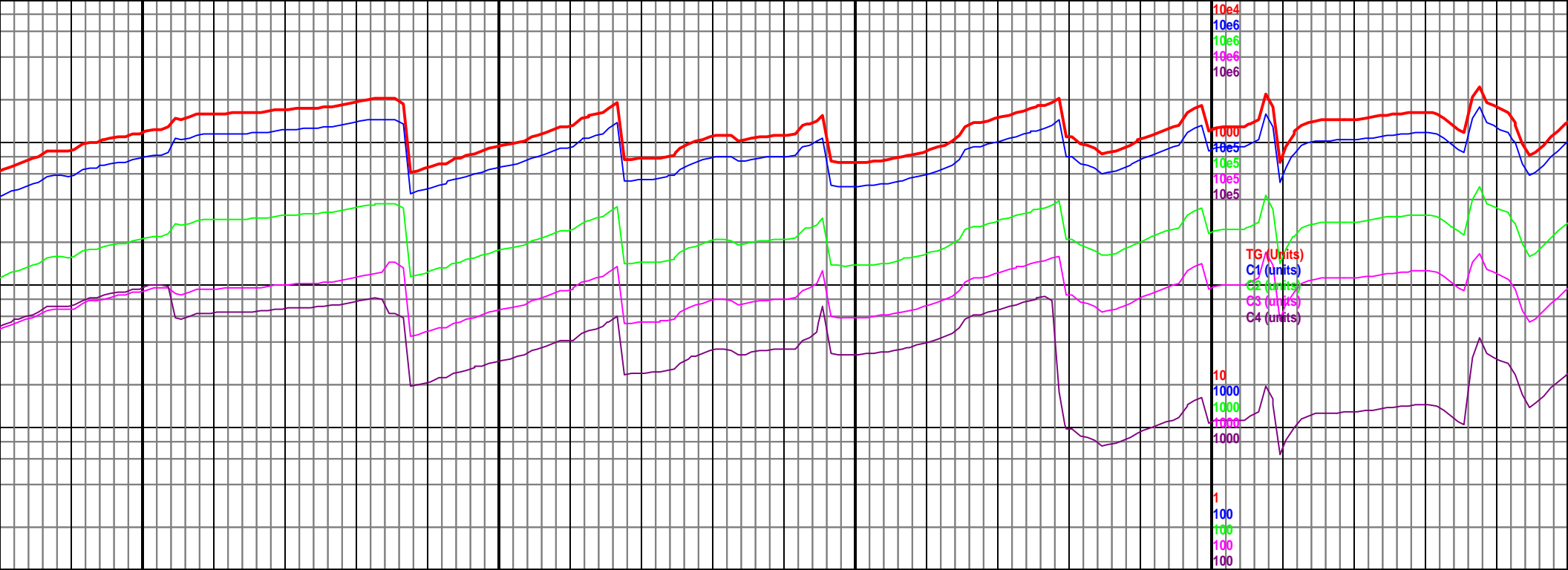
EVENT

-  Rft
-  Sidewall

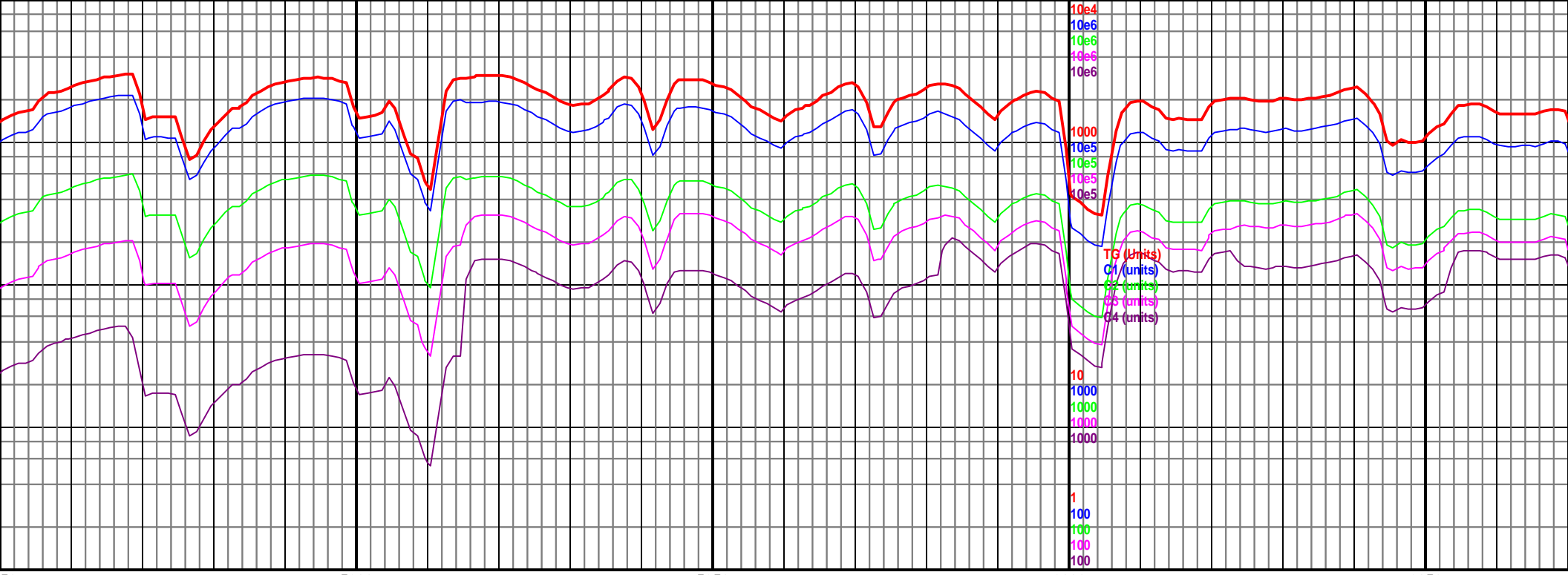




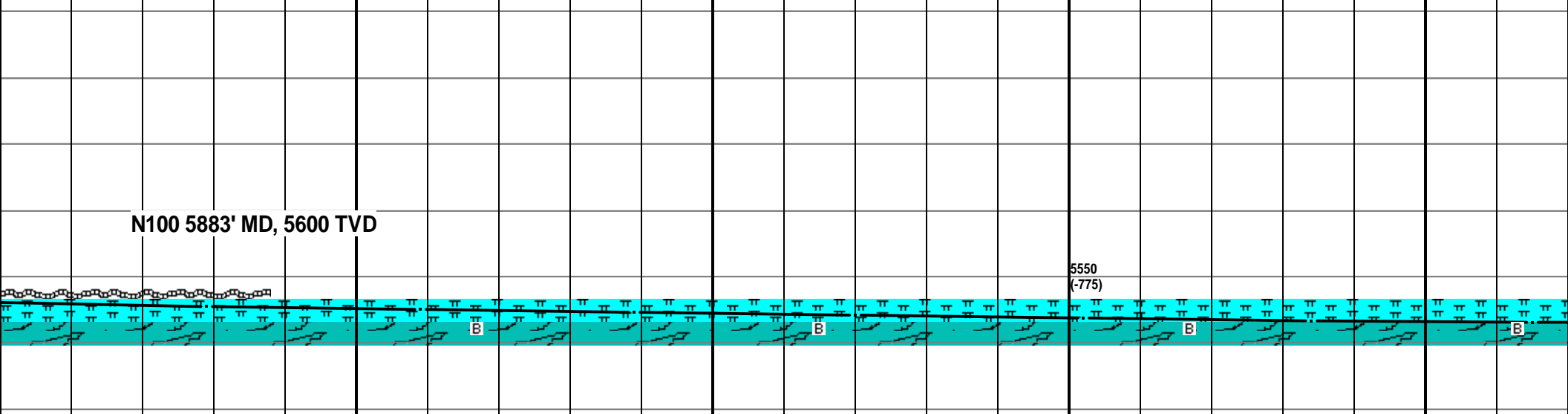




5650	5700	5750	5800
MD 5635 TVD 5520.4 INC 63.65 AZ 161.06 VS 299.61	MD 5665 TVD 5533.23 INC 65.71 AZ 159.77 VS 325.53	MD 5696 TVD 5545.47 INC 67.78 AZ 156.33 VS 352.37	MD 5727 TVD 5556.77 INC 69.45 AZ 153.91 VS 379.06
MD 5757 TVD 5566.82 INC 71.43 AZ 154.81 VS 405.05	MD 5787 TVD 5576.07 VD INC 72.62 AZ 154.69 Sea (-225) VS 431.37	MD 5818 TVD 5584.86 INC 74.46 AZ 154.51 VS 458.75	
00 5650' MD, 27' TVD	P300 5707' MD, 5550' TVD	P350 5758' MD, 5567' TVD	Sharon Springs 5796' MD, 5579' TVD
			Niobrara 5810' MD, 5583' TVD
n, sb blkly-sb plty, k gy sily sh a/a,	5650-5700 Siltst med gy, sb blkly-plty, frm-sl hd, non calc, g tr med-dk gy sh, 90% siltst, 10% sh	5700-5750 Sh med gy-dk gy brn, plty-splty, frm, siltst med gy, sb blkly-sb plty, frm-sl hd, 60% siltst, 40% sh	5750-5800 Sh med-dk gy, plty-sb plty, sft-frm, sl sily ip, g tr siltst a/a, g tr bent, crm-tan, splty, sft, g tr dis pyr, bri yel min flor, 80% sh, 15% siltst, 5% bent
			5800-5850 Sh dk gy, splty-sb plty, frm-sft, sl sily, non-mod calc, grdg to mrlst ip, g tr bent a/a, 65% sh, 20% mrlst, 10% siltst, 5% bent



MD 5848 TVD 5592.24 INC 77.05 AZ 153.8 VS 485.45	MD 5879 TVD 5598.74 INC 78.73 AZ 153.81 VS 513.2	MD 5909 TVD 5604.16 INC 80.44 AZ 154.26 VS 540.27	MD 5939 TVD 5609.26 INC 80 AZ 154.78 VS 567.48	MD 5970 TVD 5614.41 INC 80.88 AZ 155.33 VS 595.74	MD 6002 TVD 5619.08 INC 82.33 AZ 158.03 VS 625.32	MD 6034 TVD 5622.71 INC 84.66 AZ 159.06 VS 655.39	MD 6066 TVD 5626.42 INC 86.99 AZ 160.12 VS 685.96
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N100 5883' MD, 5600 TVD

5850-5900 Mrlst med gy, sb blkyl-sb  
plty, arg, tr bent cont a/a, 95% mrlst,  
5% bent

5900-5950 Mrlst med gy, sb blkyl-sb  
plty, frm, rr bent with bri yel min flor, tr  
dull yel flor, fst oil cut, 90% mrlst, 10%  
chk

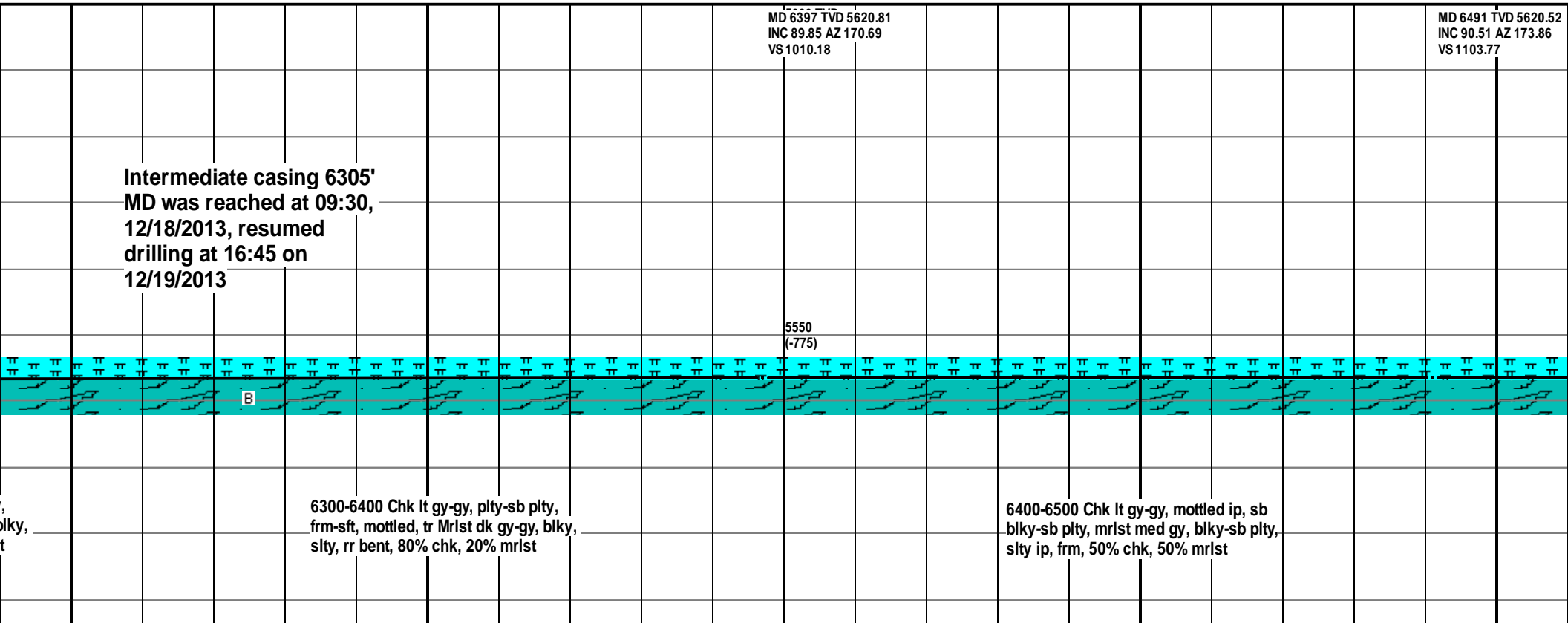
5950-6000 Chk lt-med gy, mottled ip,  
frm-sft, rr bent a/a, g tr dull yel flor,  
abnt asphalt in mud, 50% chk,  
50% mrlst

6000-6050 Chk lt-med gy, mottled ip,  
frm-sft, rr bent a/a, g tr dull yel flor,  
abnt asphalt in mud, 50% chk,  
50% mrlst

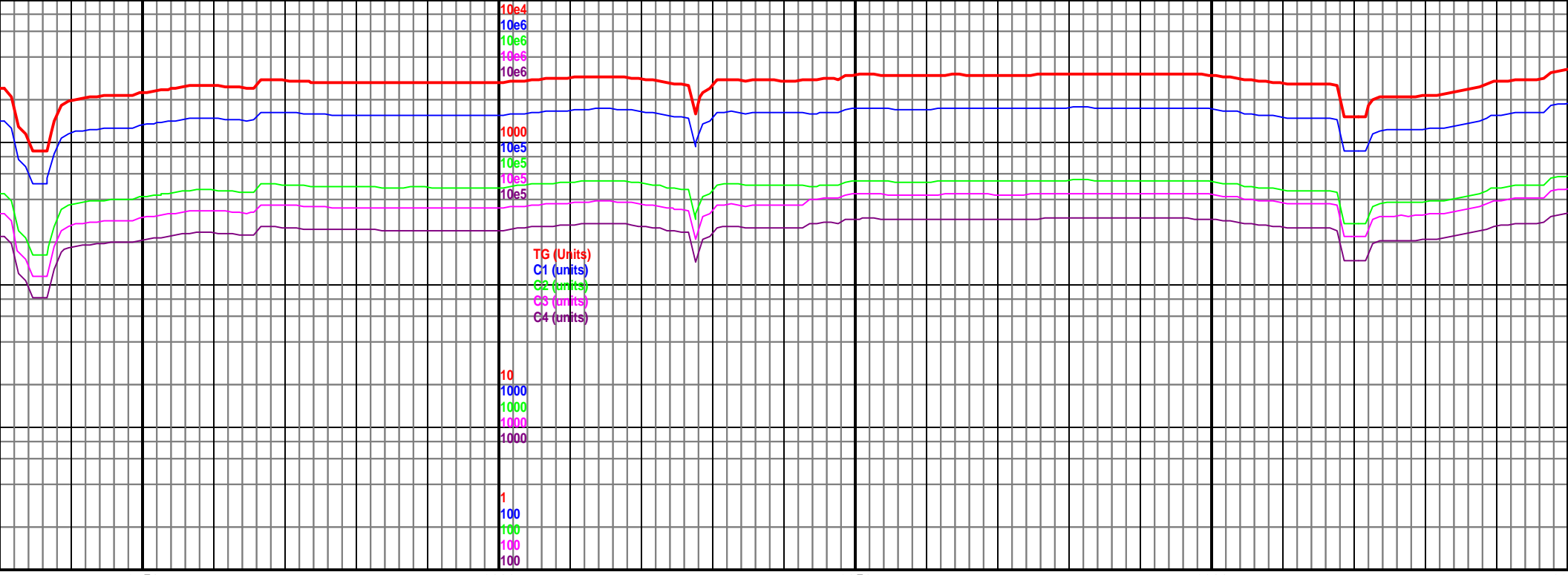
6050-6100 Chk lt-med gy, mottled ip,  
frm-sft, mottled ip, rr bent  
slty ip, rr bent  
20% mrlst











6750

6800

6850

6900

6950

MD 6776 TVD 5620.04  
INC 89.45 AZ 180.1  
VS 1388.5

5000 TVD  
Sub Sea (-225)

MD 6871 TVD 5620.22  
INC 90.33 AZ 183.41  
VS 1483.23

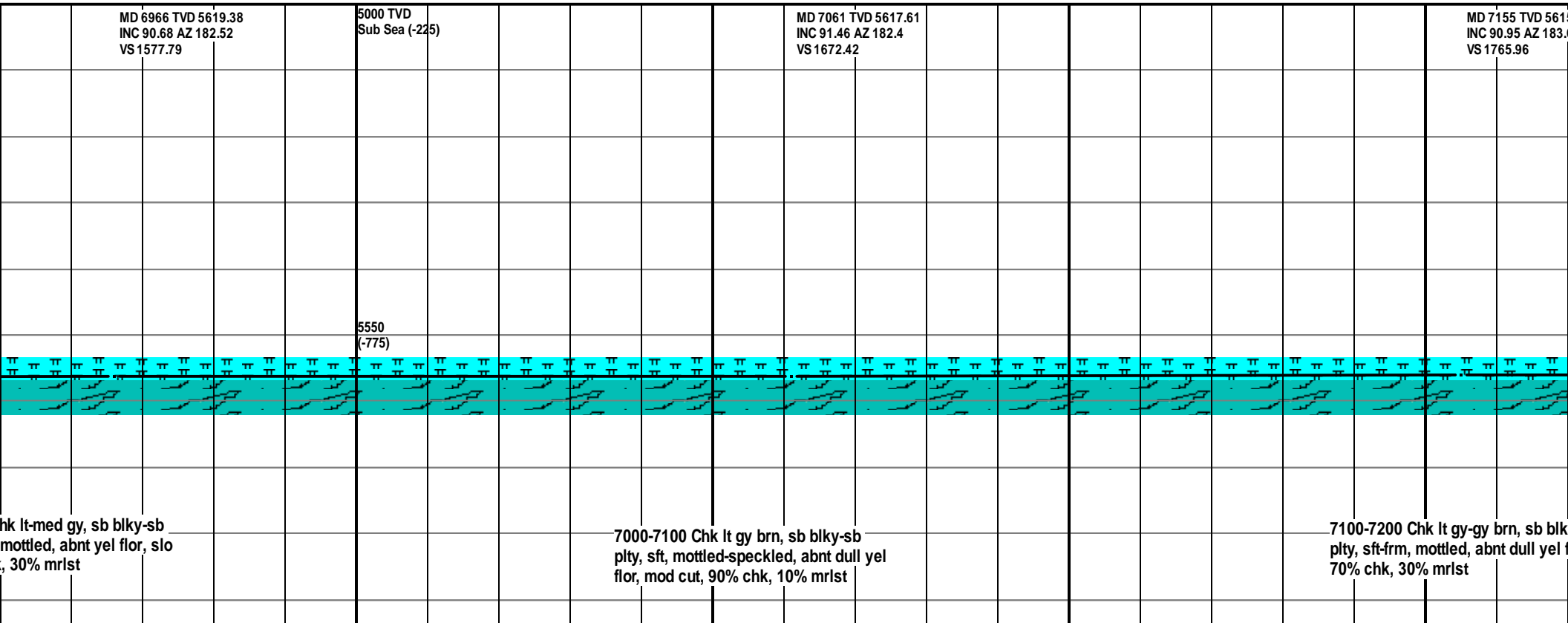
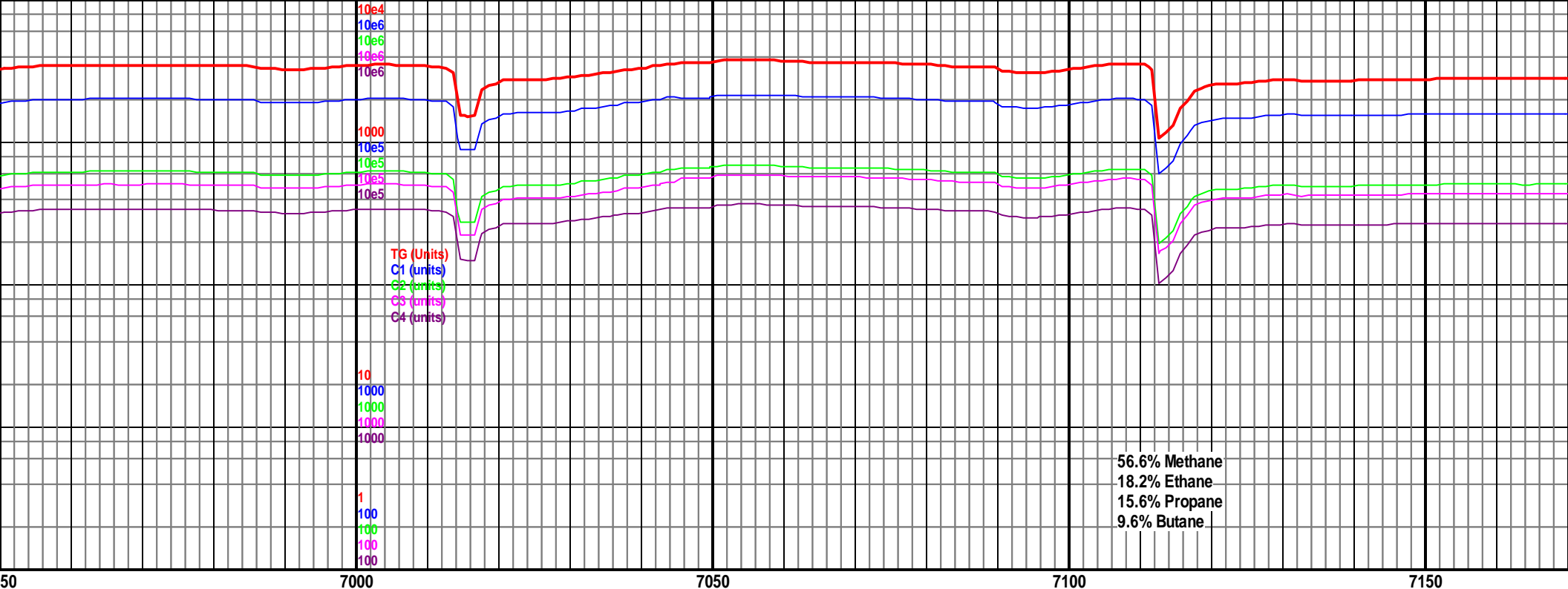
5550  
(-775)

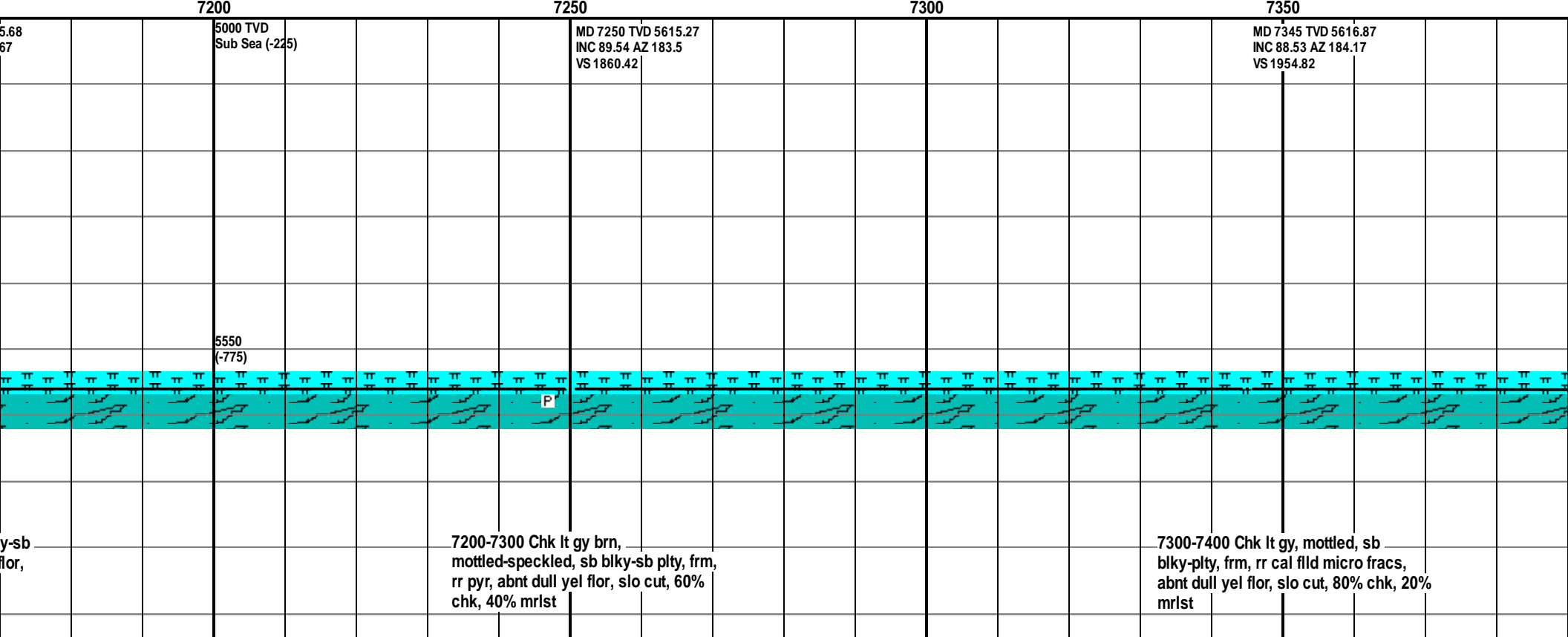
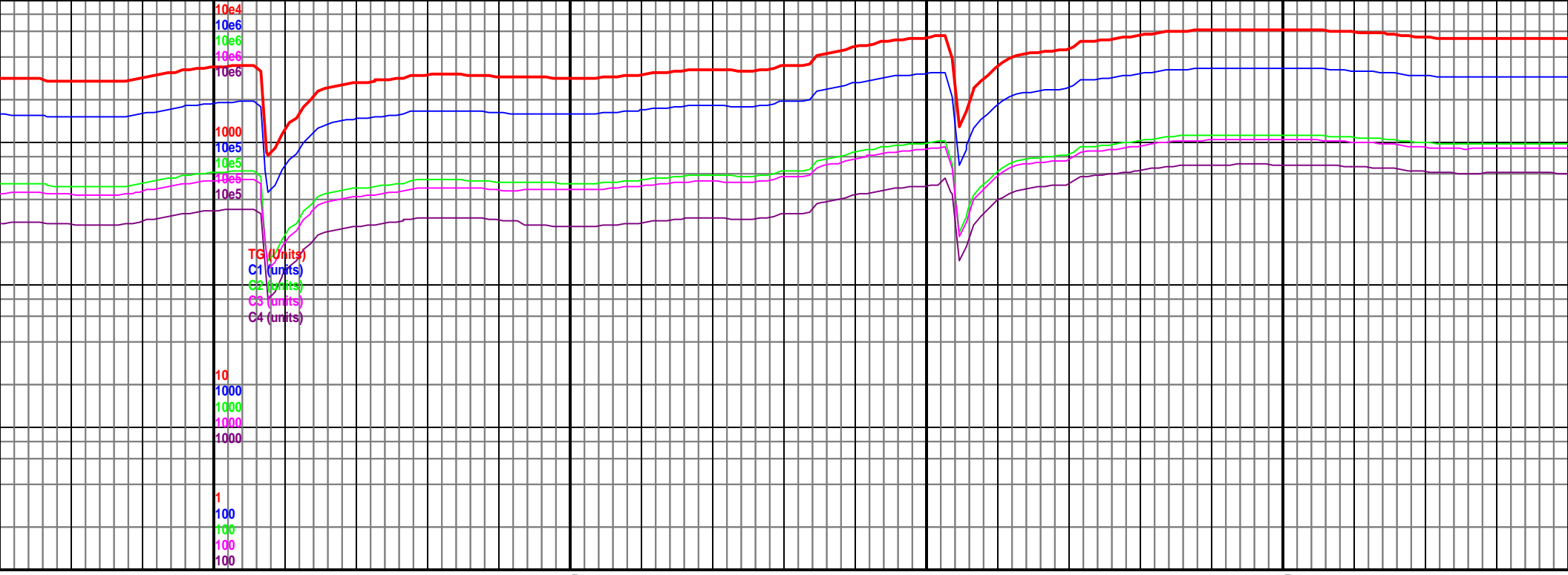


6700-6800 Mrlst med gy, sb blkly-blky,  
frm, abnt chk lt gy-mottled, sft-frm, arg,  
g tr dull yel flor, slo oil cut, 70% mrlst,  
30% chk

6800-6900 Chk lt gy-gy brn, sb blkly-sb  
plty, sft, mottled-speckled, g tr mrlst  
a/a abnt yel flor, slo cut, 70% chk, 30%  
mrlst

6900-7000 C  
plty, sft, occ  
cut, 70% chk





5.68  
67

5000 TVD  
Sub Sea (-225)

MD 7250 TVD 5615.27  
INC 89.54 AZ 183.5  
VS 1860.42

MD 7345 TVD 5616.87  
INC 88.53 AZ 184.17  
VS 1954.82

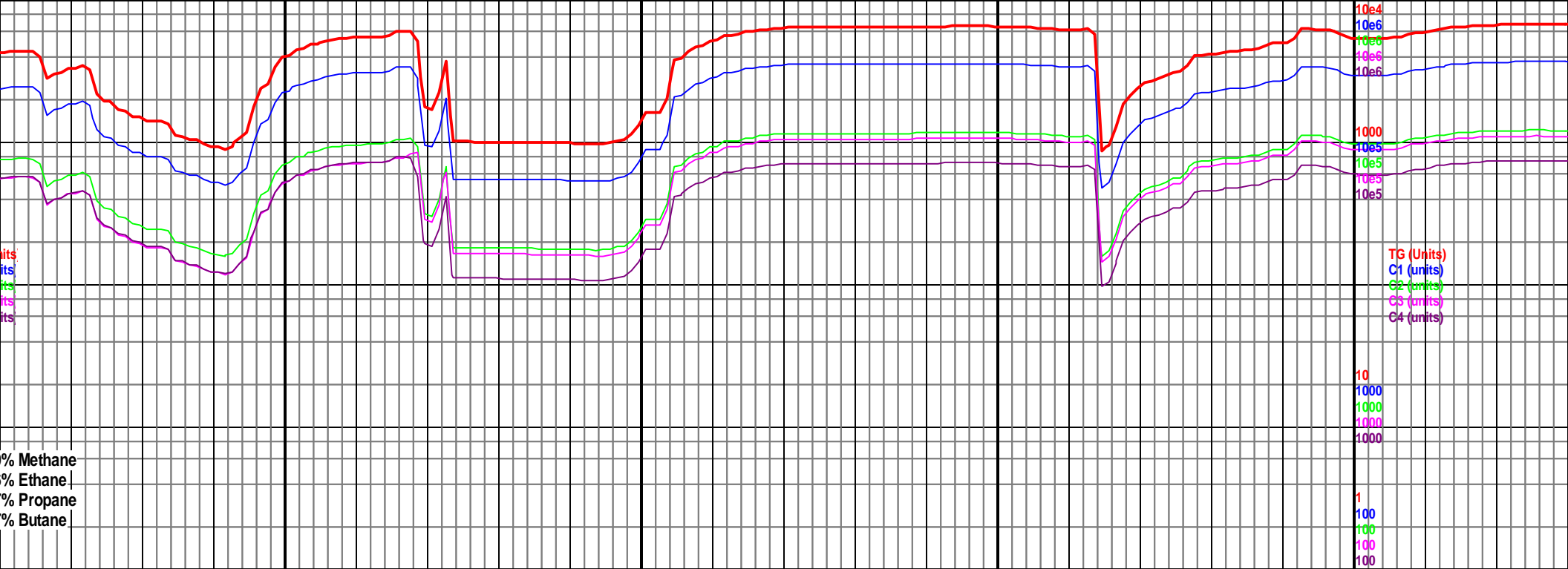
5550  
(-775)

y-sb  
flor,

7200-7300 Chk lt gy brn,  
mottled-speckled, sb blk-y-sb plty, frm,  
rr pyr, abnt dull yel flor, slo cut, 60%  
chk, 40% mrlst

7300-7400 Chk lt gy, mottled, sb  
blk-y-plty, frm, rr cal fld micro fracs,  
abnt dull yel flor, slo cut, 80% chk, 20%  
mrlst





% Methane  
% Ethane  
% Propane  
% Butane

TG (Units)  
C1 (units)  
C2 (units)  
C3 (units)  
C4 (units)

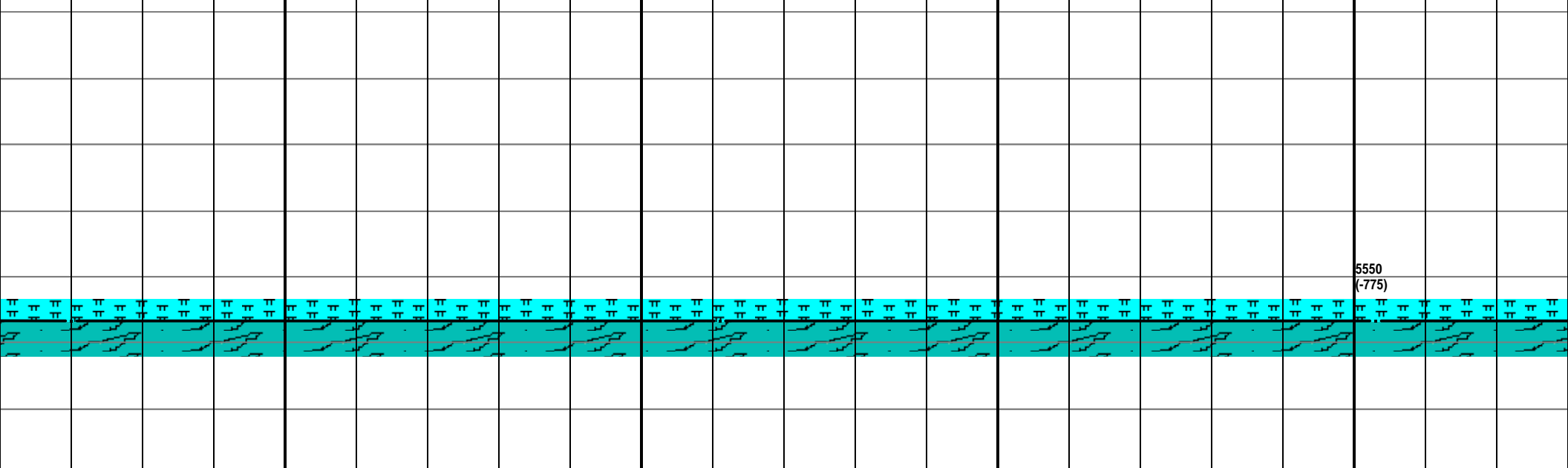
10  
1000  
1000  
1000  
1000  
1  
100  
100  
100  
100

7650 7700 7750 7800

MD 7620 TVD 5622.62  
INC 89.58 AZ 182.15  
VS 2227.44

MD 7711 TVD 5623.36  
INC 89.49 AZ 179.03  
VS 2318.29

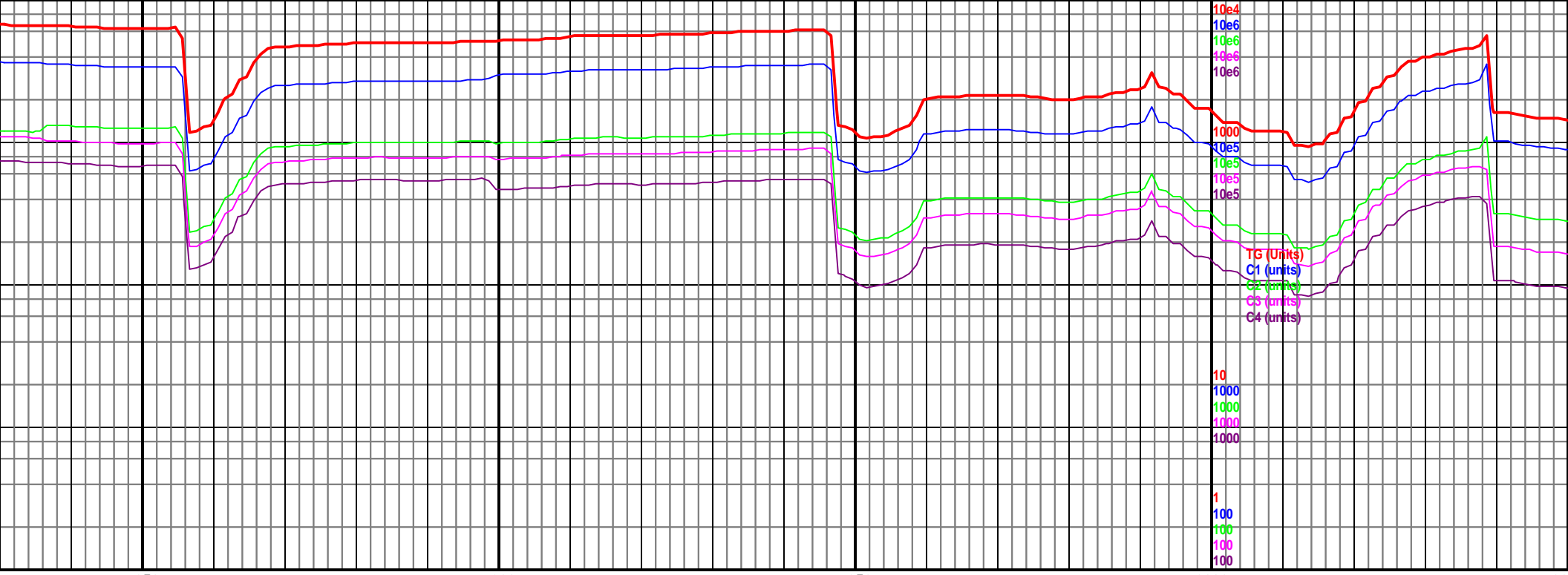
MD 7803 TVD 5624.17  
Sub INC 89.49 AZ 180.22  
VS 2410.22



7600-7700 Chk lt gy, speckled-mottled,  
sft-sl frm, abnt dull yel flor, g cut, 100%  
chk

7700-7800 Chk lt gy brn, sb blk-y-sb  
ply, speckled-lam, mottled ip, frm-sft,  
rr mrlst, abnt dul yel flor, slo oil cut,  
100% mrlst





7850

7900

7950

8000

8100

MD 7895 TVD 5624.35  
INC 90.29 AZ 179.85  
VS 2502.13

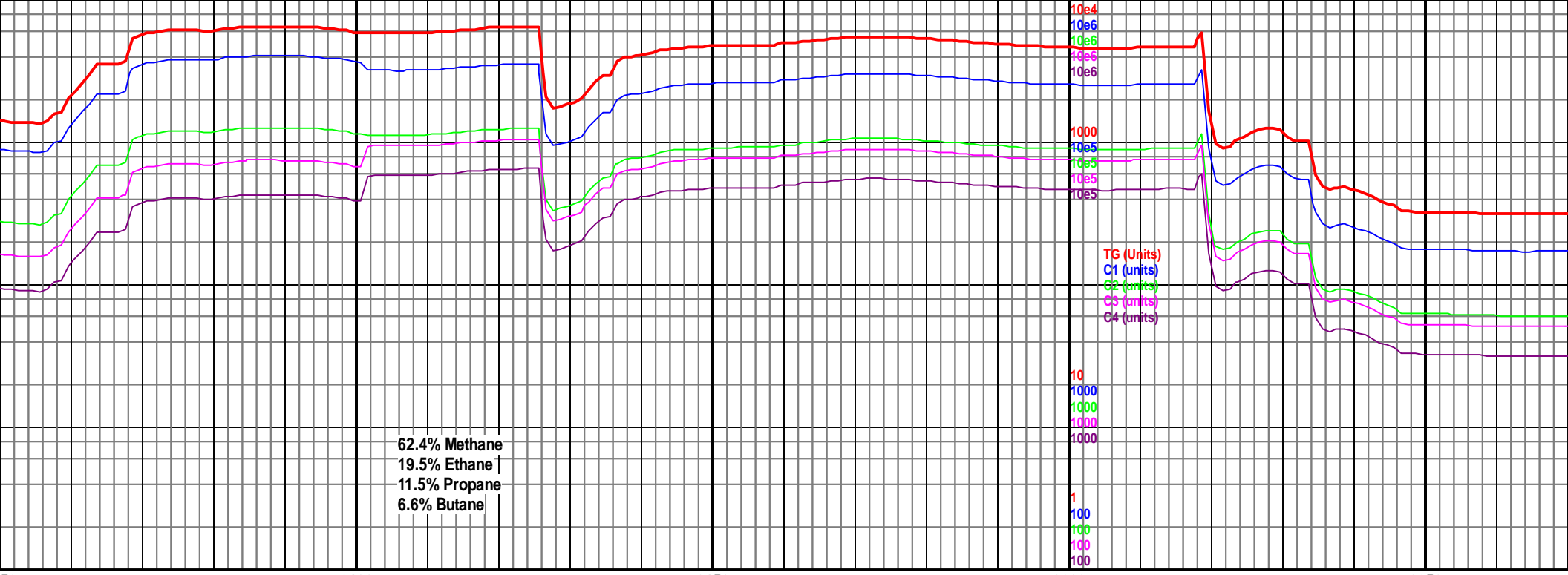
MD 7986 TVD 5623.83 TVD  
INC 90.37 AZ 180.27 Sea (-225)  
VS 2593.04

5550  
(-775)

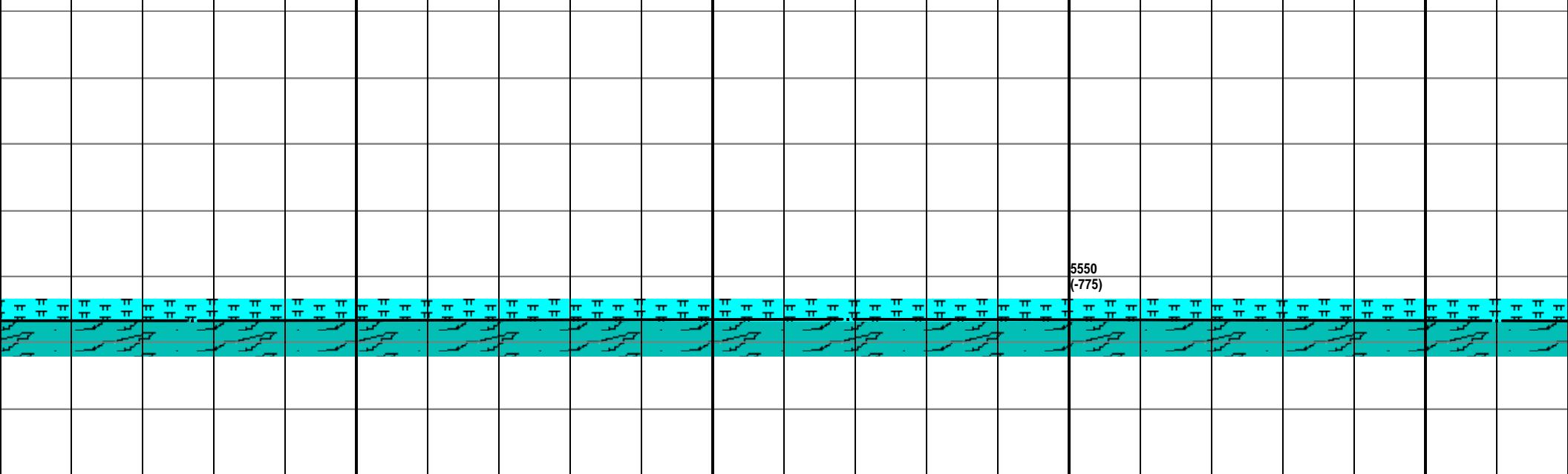
7800-7900 Chk lt gy brn, speckled-  
mottled, sb blk-y-sb plty, sft-fm, rr cal  
fld microfrac, abnt yel flor, g oil cut,  
100% mrlst

7900-8000 Mrlst med gy, sb blk-y-sb  
plty, frm, abnt chk a/a, 70% mrlst, 30%  
chk

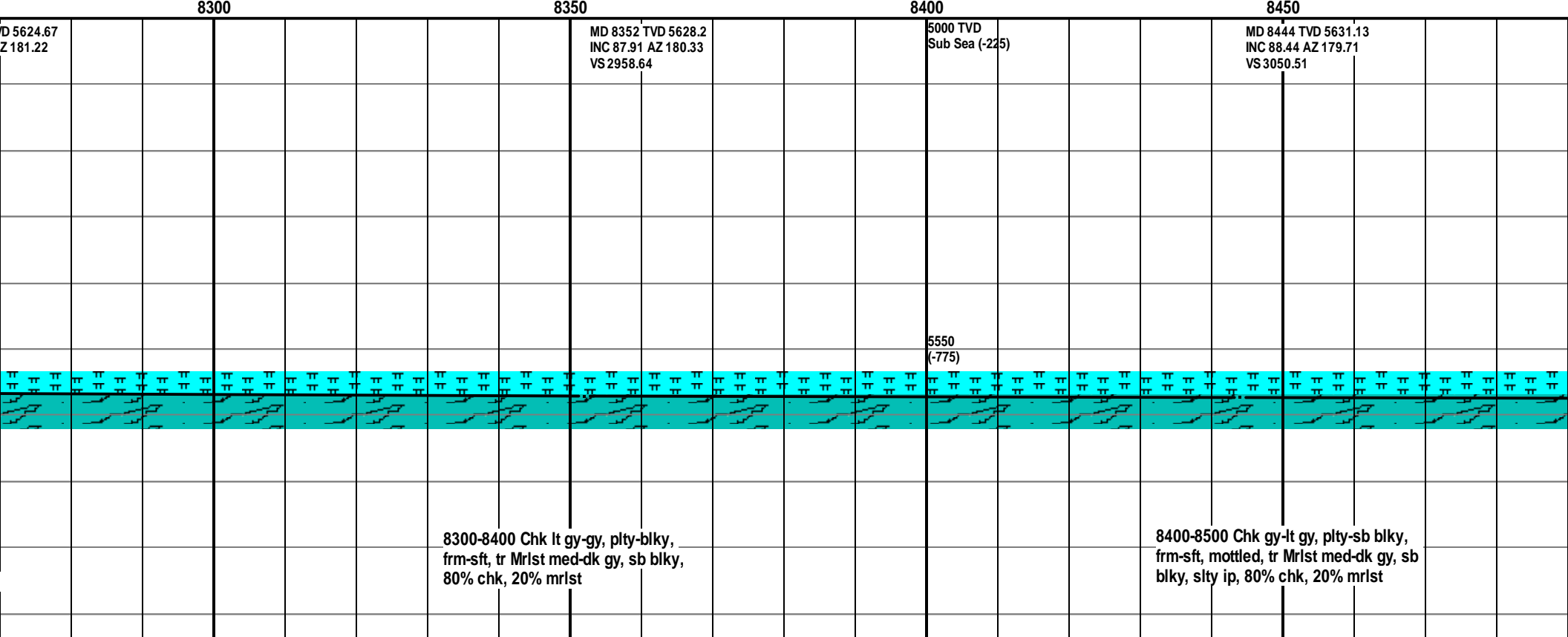
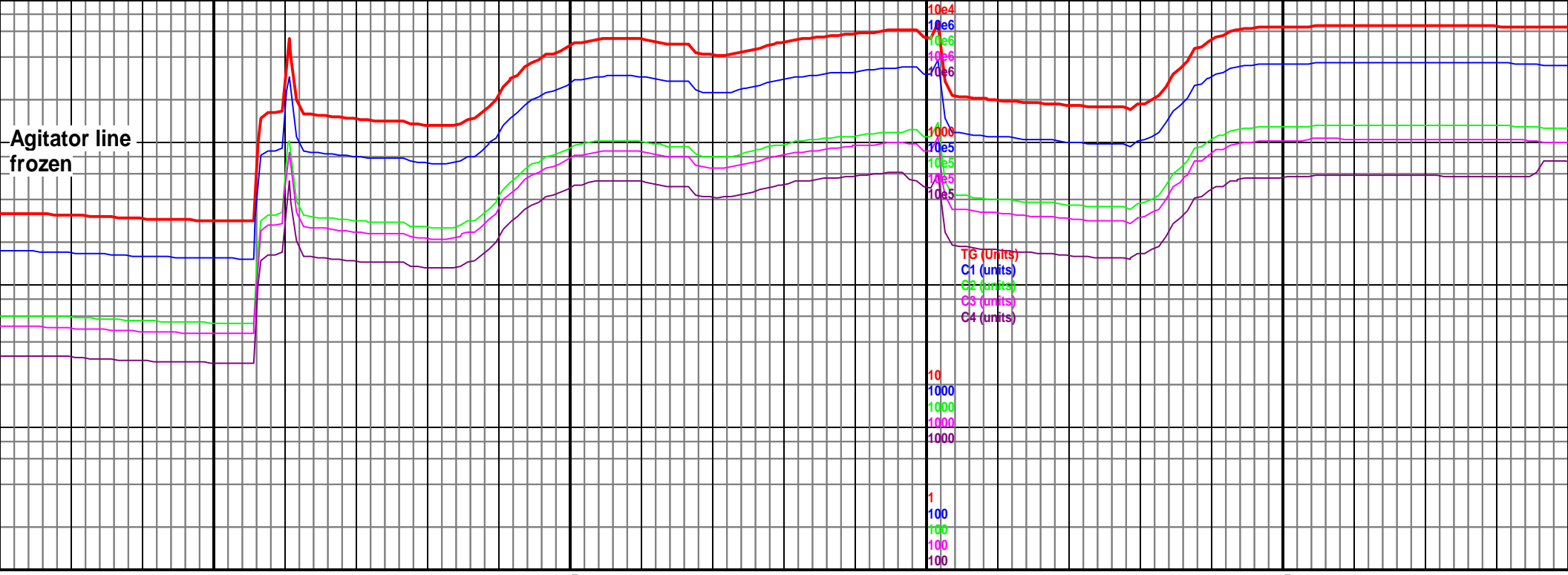
8000-8100 Chk l  
plty, sft-fm, mrls  
80% chk, 20% m

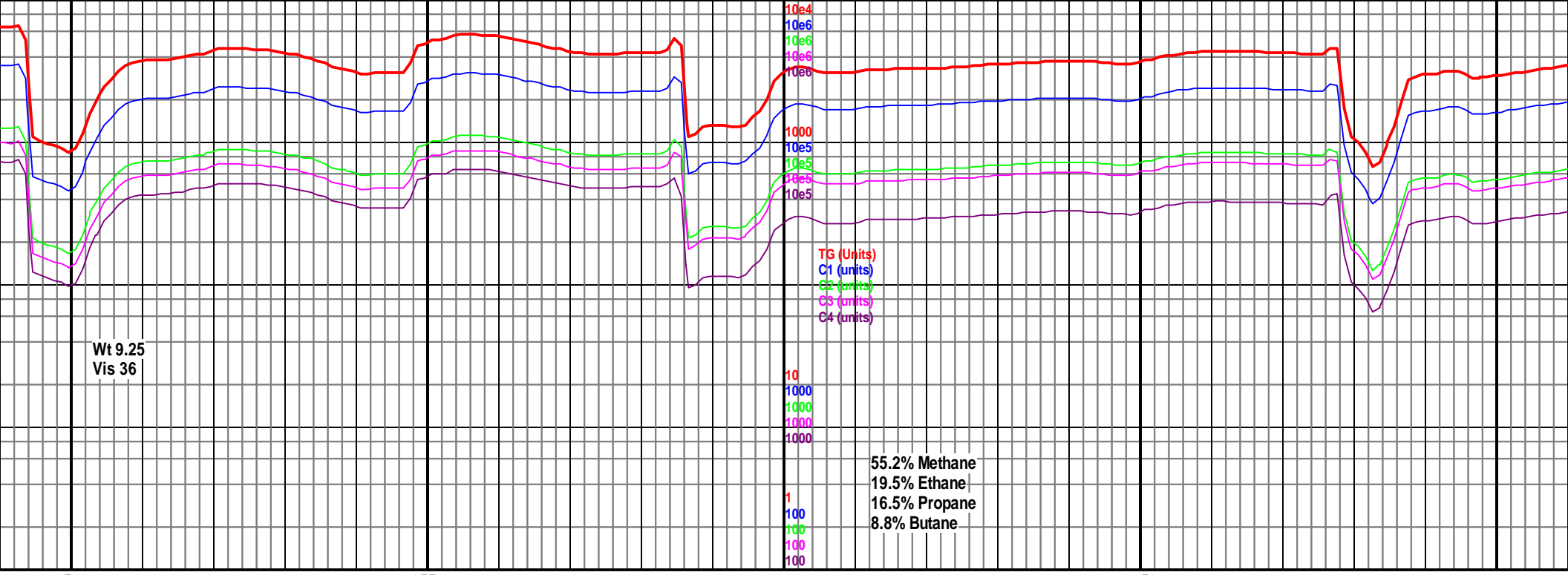


50	8100	8150	8200	8250
MD 8077 TVD 5622.64 INC 91.12 AZ 179.66 VS 2683.95		MD 8169 TVD 5622.29 INC 89.32 AZ 177.95 VS 2775.91	5000 TVD Sub Sea (-225)	MD 8260 TV INC 87.69 A VS 2866.81



lt-med gy, sb blkly-sb st med gy, blkly, frm, mrst	8100-8200 Chk lt-med gy, sb blkly-sb plty, frm, grdg to mrst ip, mottled ip, 60% chk, 40% mrst	8200-8300 Chk lt-med gy, sb blkly, frm-sft, mrst med-dk gy, blkly-sb blkly, g tr yel flor, 50% chk, 50% mrst
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8500

8550

8600

8650

8700

MD 8535 TVD 5633.68  
INC 88.35 AZ 180.66  
VS 3141.37

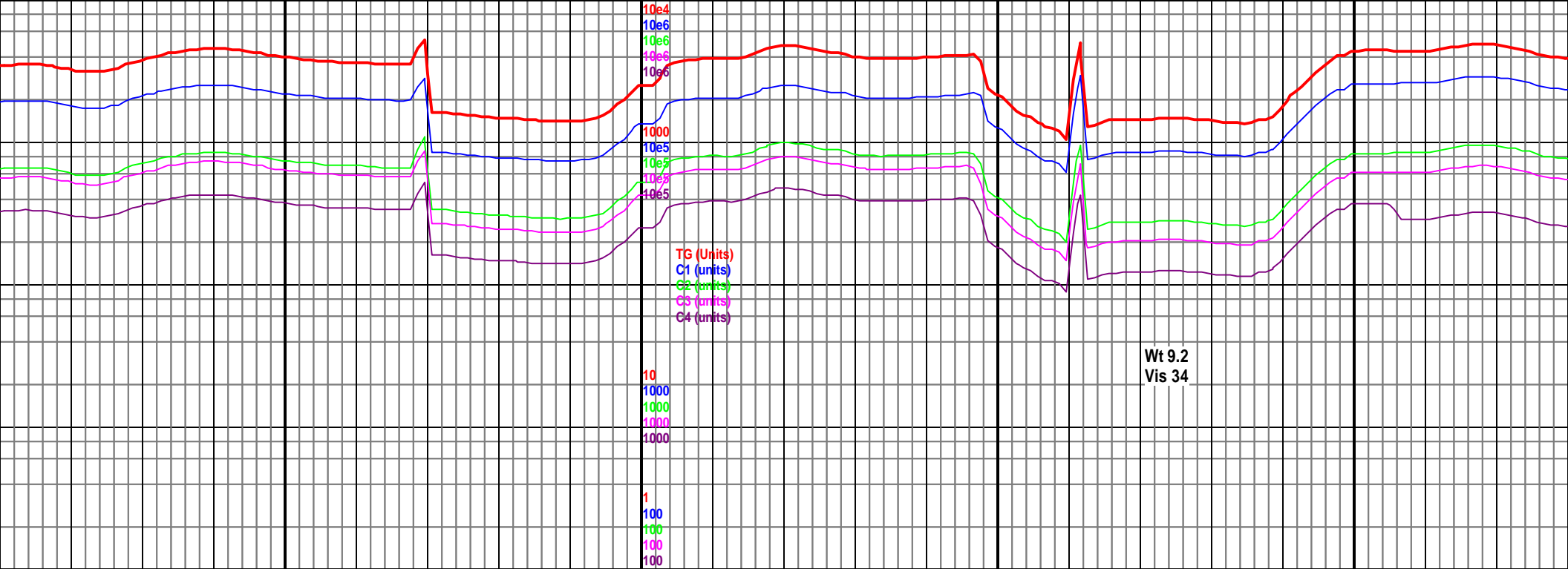
5000 TVD  
Sub Sea (-225)

MD 8626 TVD 5636.19  
INC 88.48 AZ 182.21  
VS 3232.12

5550  
(-775)

8500-8600 Chk gy-lt gy, sb plty-plty,  
frm-sft, tr Mrlst med-dk gy, sb blk, slty  
ip, 70% chk, 30% mrlst

8600-8700 Chk gy-lt gy, sb plty-plty,  
frm-sft, grdg to mrlst ip, occ Mrlst  
med-dk gy, sb blk, slty ip, 60% chk,  
40% mrlst



8750

8800

8850

8900

MD 8717 TVD 5638.01  
INC 89.23 AZ 182.09  
VS 3322.8

5000 TVD MD 8809 TVD 5638.51  
Sub Sea (-24) INC 90.15 AZ 183.15  
VS 3414.43

MD 8901 TVD 5638.83  
INC 89.45 AZ 181.01  
VS 3506.13

5550  
(-775)

8700-8800 Chk gy-lt gy, sb plty-plty,  
frm-sft, grdg to mrlst ip, occ Mrlst  
med-dk gy, sb blk, slty ip, 60% chk,  
40% mrlst

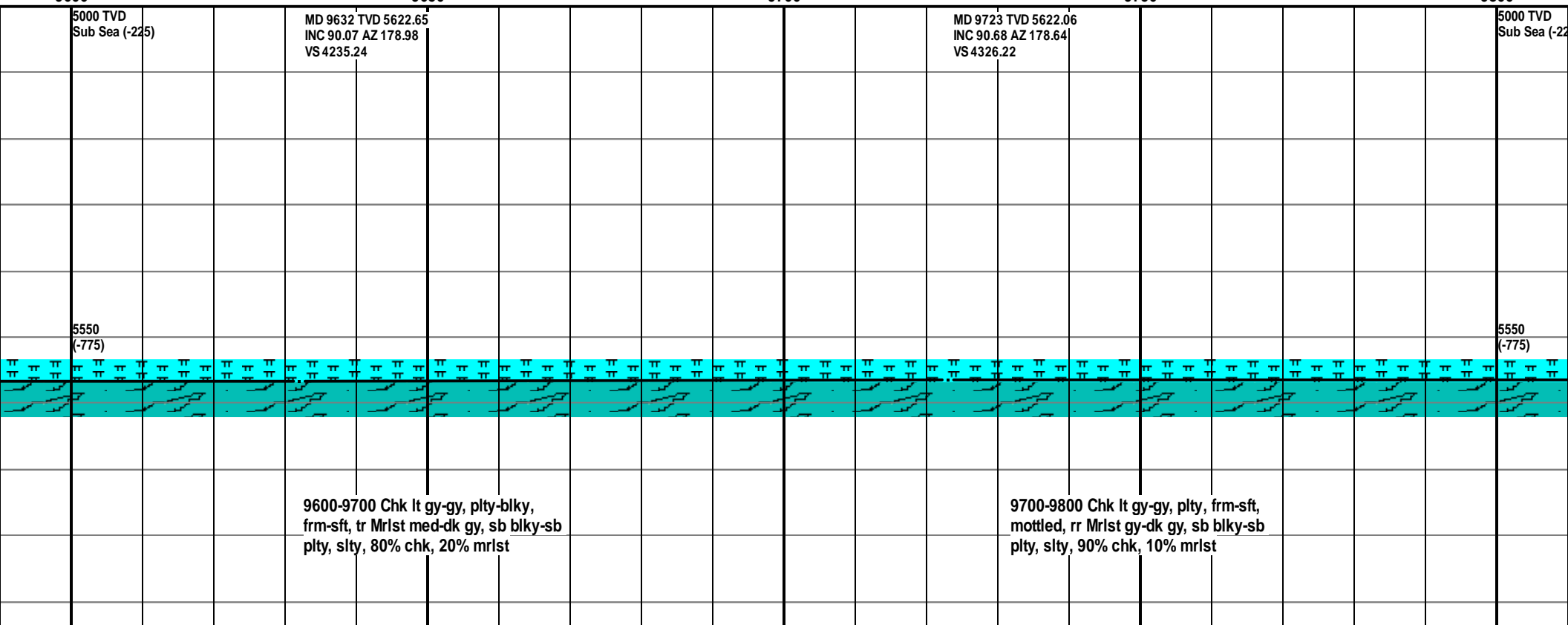
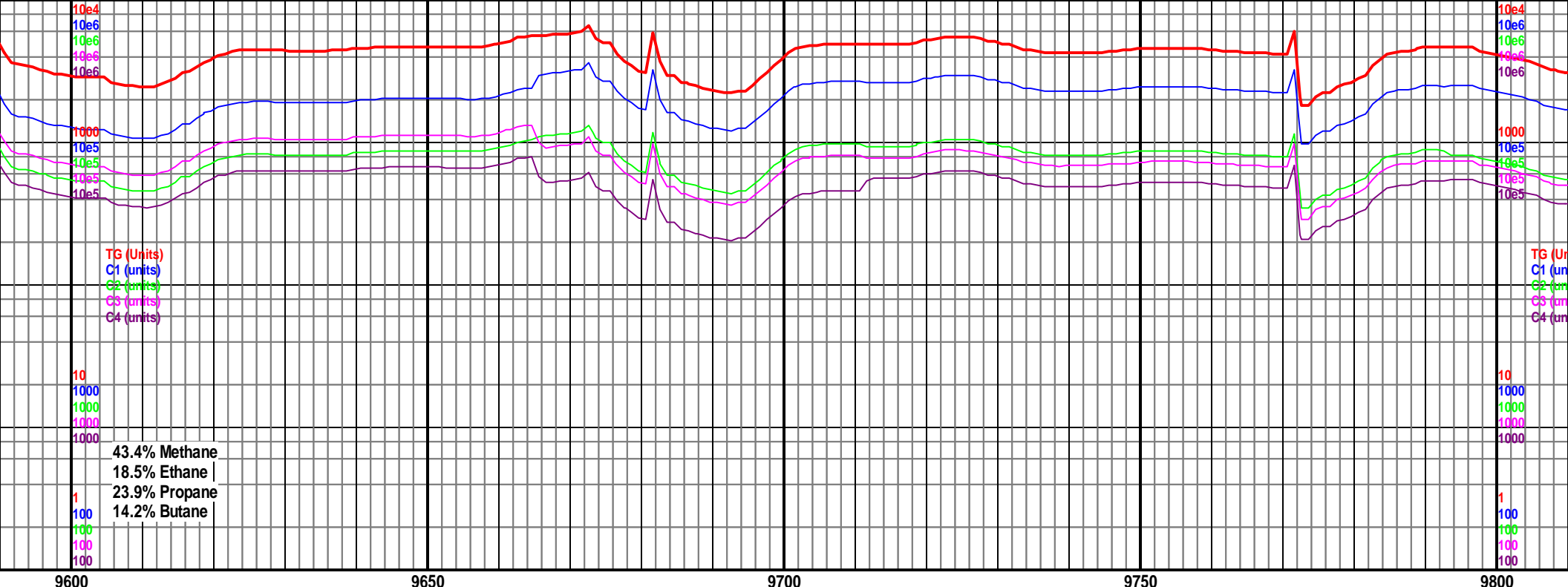
8800-8900 Chk gy-lt gy, sb plty-plty,  
frm-sft, mottled, grdg to mrlst ip, abnt  
Mrlst med-dk gy, sb blk, slty ip, tr bent  
50% chk, 50% mrlst



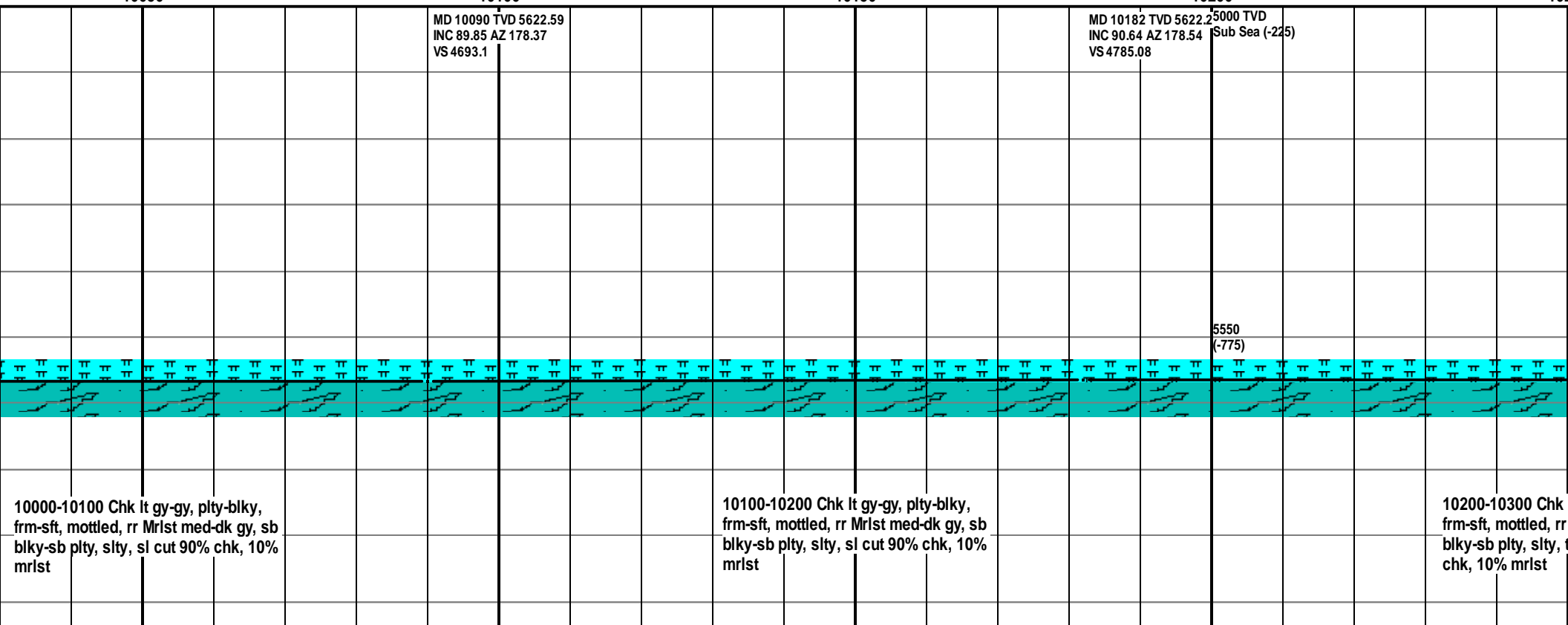
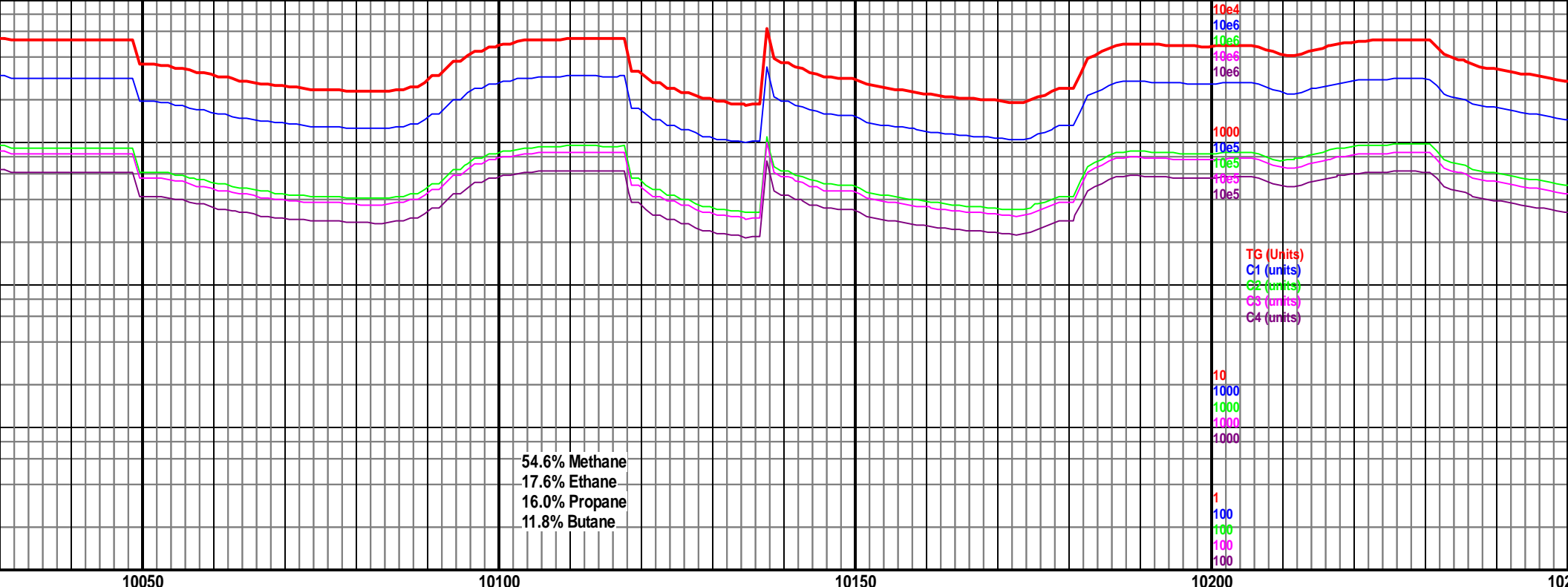


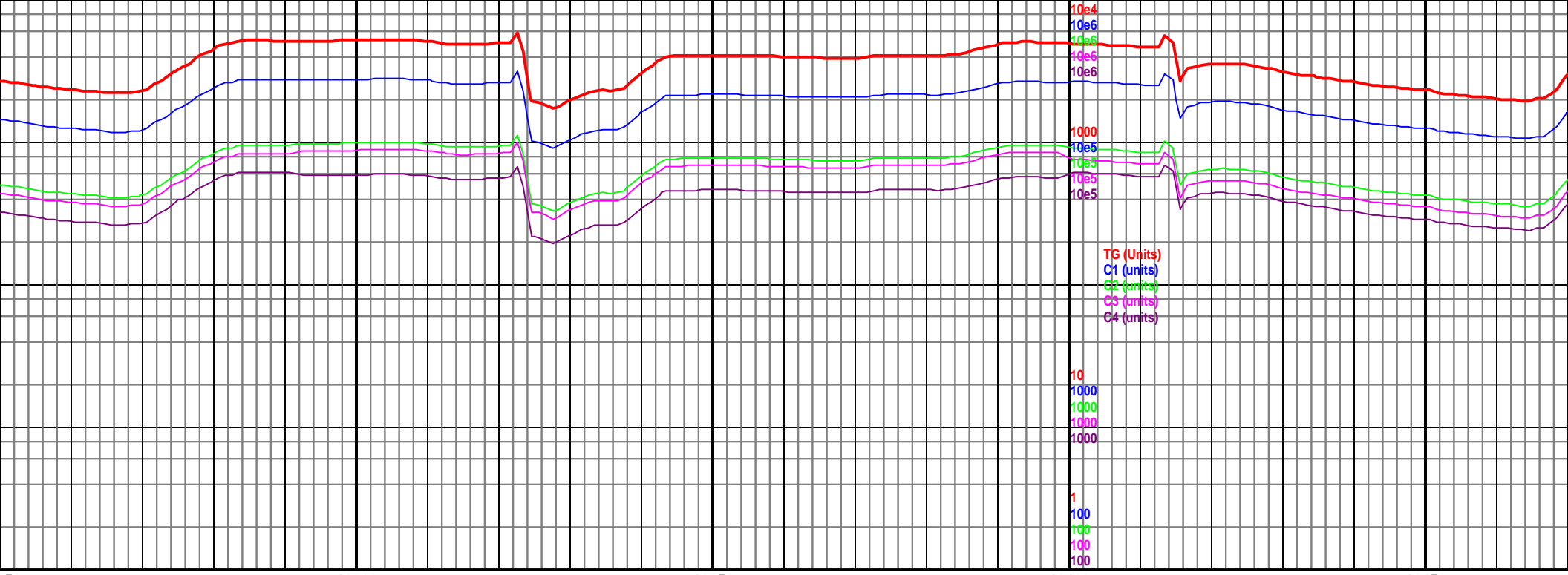












10250 10300 10350 10400 10450

MD 10273 TVD 5620.87  
INC 91.03 AZ 177.75  
VS 4876.06

MD 10365 TVD 5620.31  
INC 89.67 AZ 177.74  
VS 4968.06

5000 TVD  
Sub Sea (-225)

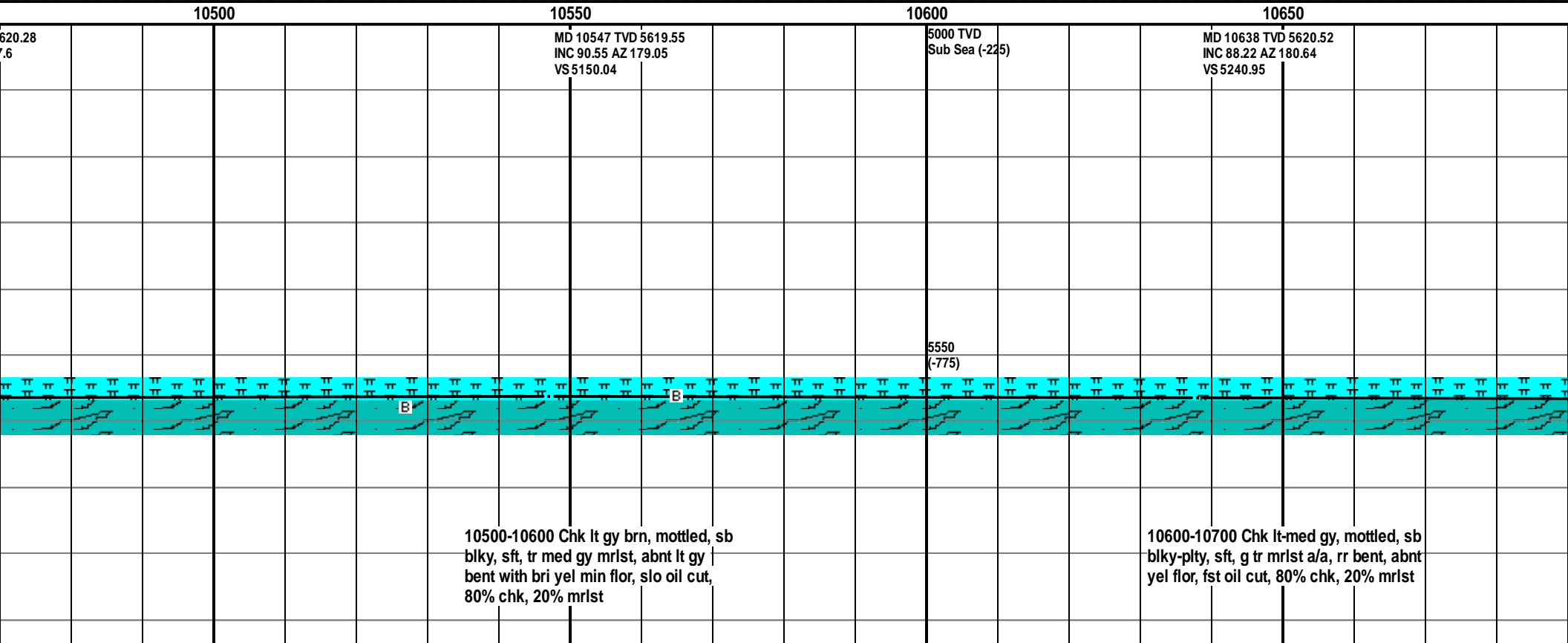
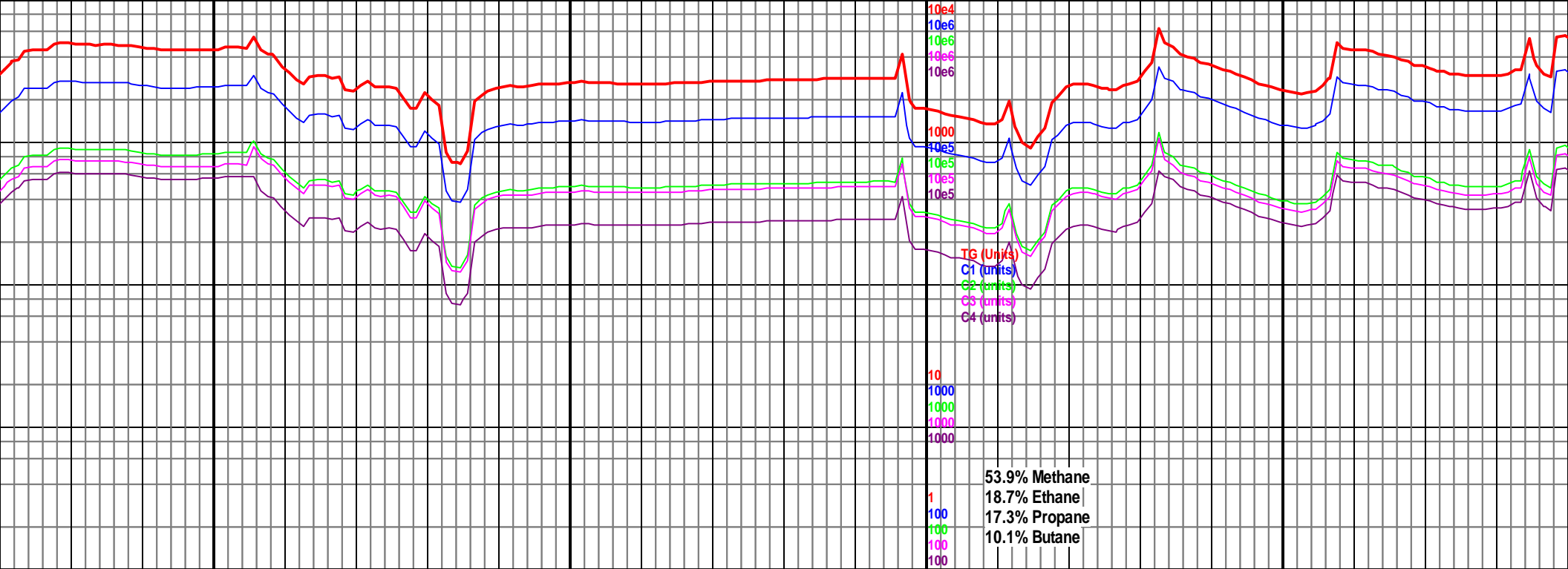
MD 10456 TVD 5620.31  
INC 90.37 AZ 177.74  
VS 5059.06

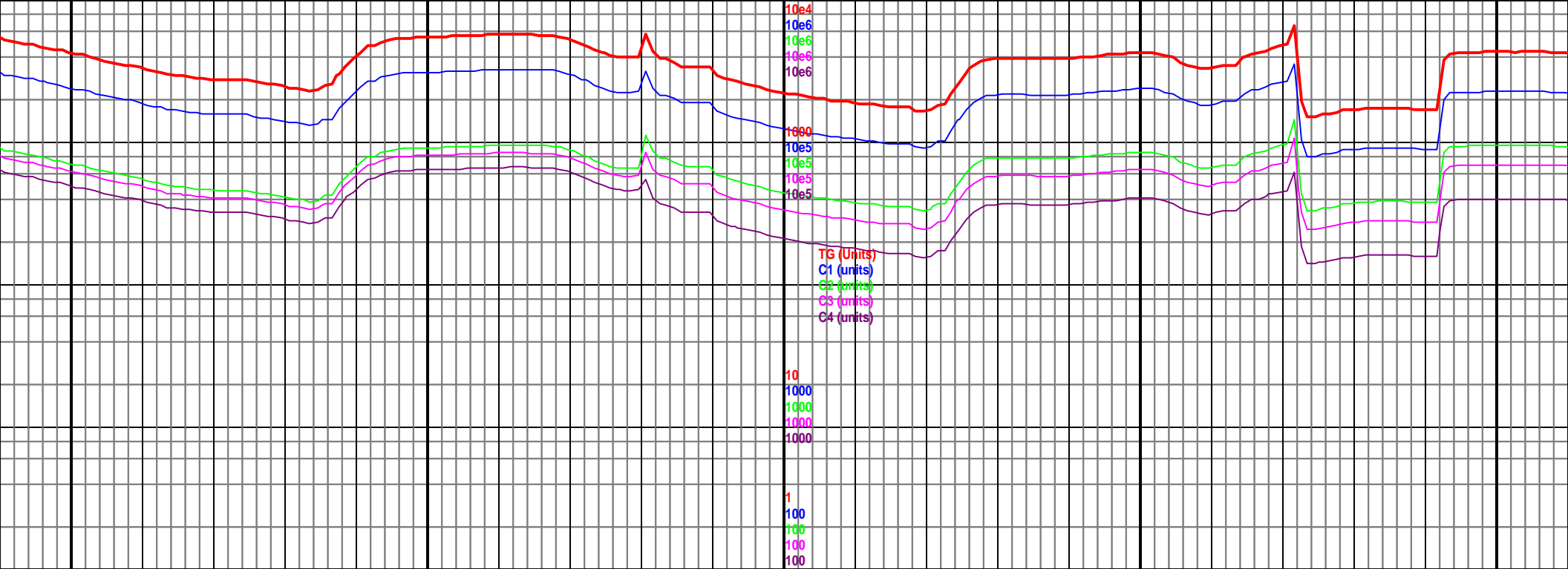
5550  
(-775)

lt gy-gy, plty-blky,  
Mrlst med gy, sb  
r oil on sample 90%

10300-10400 Chk lt gy-gy, sb blky-sb  
plty, frm-sft, mottled, tr mrlst med gy,  
sb blky-sb plty, sl slty, slo oil cut, 90%  
chk, 10% mrlst

10400-10500 Chk lt gy, mottled, sb  
blky, sft, tr cal flld micro frac, tr med gy  
mrlst with framb pyr, slo oil cut, 90%  
chk, 10% mrlst





10700

10750

10800

10850

10900

MD 10729 TVD 5623.14  
INC 88.48 AZ 180.24  
VS 5331.8

5000 TVD  
Sub Sea (-225)

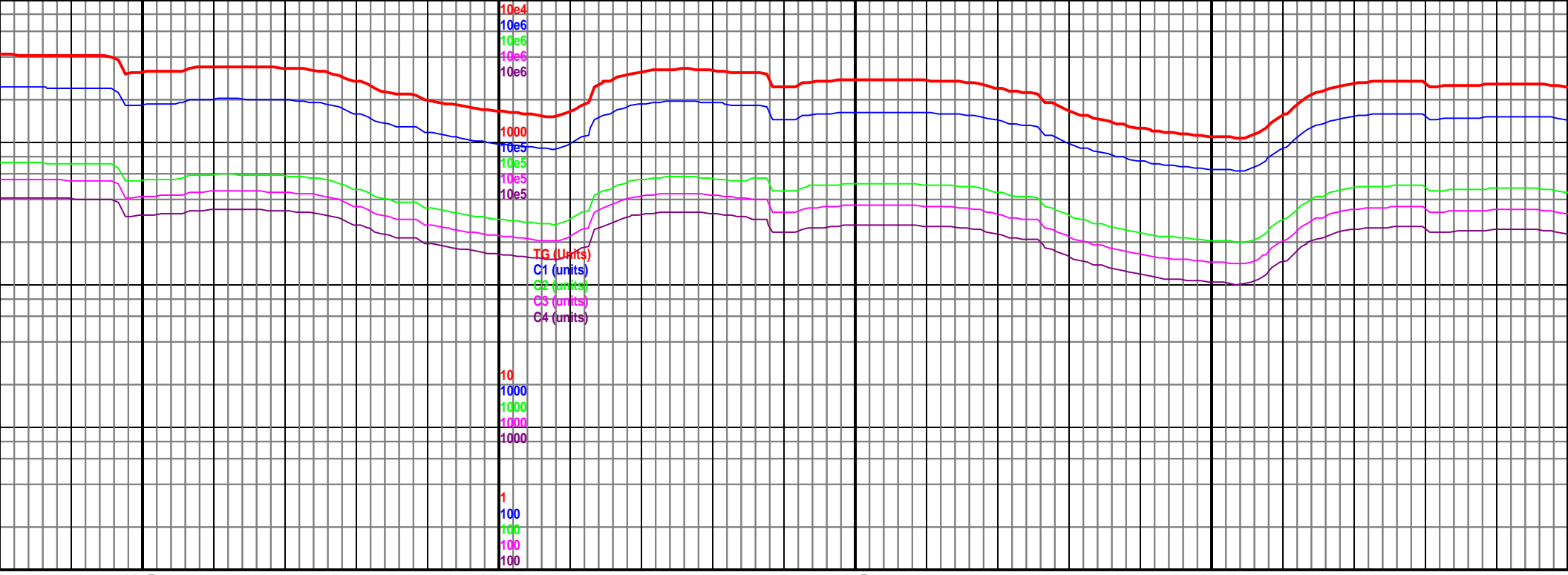
MD 10820 TVD 5625.06  
INC 89.1 AZ 180.35  
VS 5422.67

5550  
(-775)

10700-10800 Chk lt gy, mottled, sb  
blky-plty, sft-frn, mrlst med gy, frm, sb  
blky-sb plty, g tr tan bent, 60% chk,  
40% mrlst

10800-10900 Chk lt gy-gy brn,  
mottled-speckled, sb blky-sb plty,  
frm-sft, rr cal fld microfracs, g tr mrlst  
med-dk gy, sb blky, frm, abnt yel flor, g  
yel cut, 80% chk, 20% mrlst





11150

11200

11250

11300

11350

MD 11186 TVD 5624.34 VD  
INC 91.16 AZ 179.45° Sea (-225)  
VS 5788.37

MD 11278 TVD 5622.64  
INC 90.95 AZ 178.61  
VS 5880.32

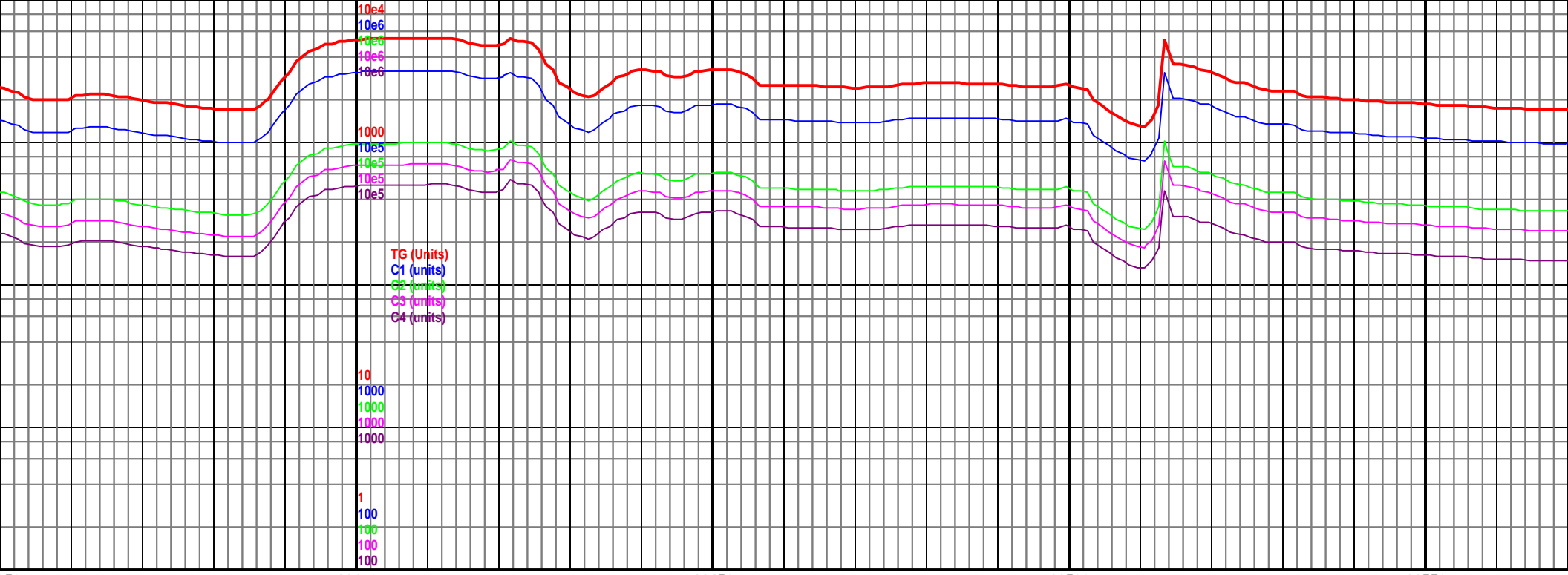
5550  
(-775)

11100-11200 Chk lt-med gy, mottled, sb  
blky-ptly, sft, g tr mrlst a/a, g tr bent  
with bri yel min flor, abnt yel flor, fst oil  
cut, 80% chk, 20% mrlst

11200-11300 Chk lt-med gy, mottled ip,  
sb blky-ptly, sft-frn, mrlst med gy,  
blky-sb blky, frm, tr bent with bri yel  
min flor, 60% chk, 40% mrlst

11300-11400 Chk lt-med gy, mottled ip,  
sb blky-sb ptly, frm,  
chk, 40% mrlst





11350 11400 11450 11500 11550

MD 11369 TVD 5621.6  
INC 90.37 AZ 177.12  
VS 5971.31

5000 TVD  
Sub Sea (-225)

MD 11460 TVD 5620.44  
INC 91.08 AZ 180.44  
VS 6062.27

MD 11552 TVD 5618.0  
INC 92.04 AZ 180.9  
VS 6154.09

5550  
(-775)



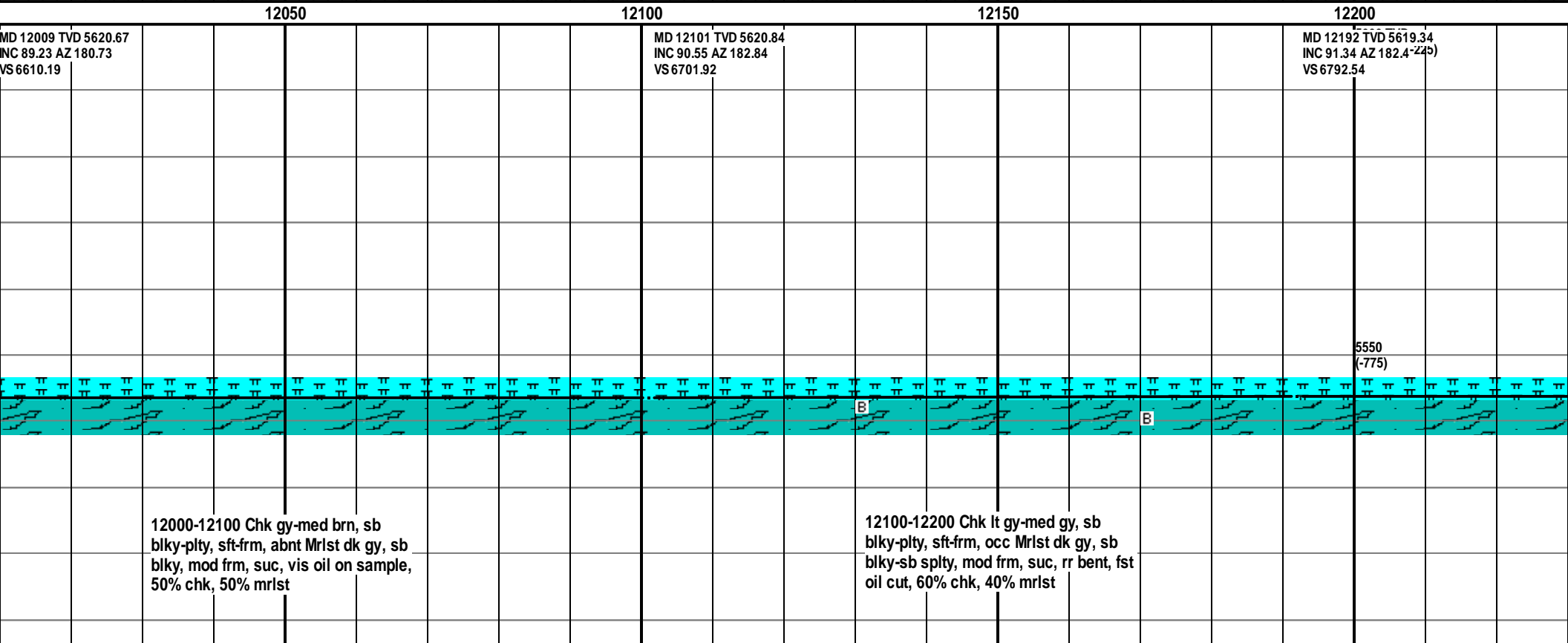
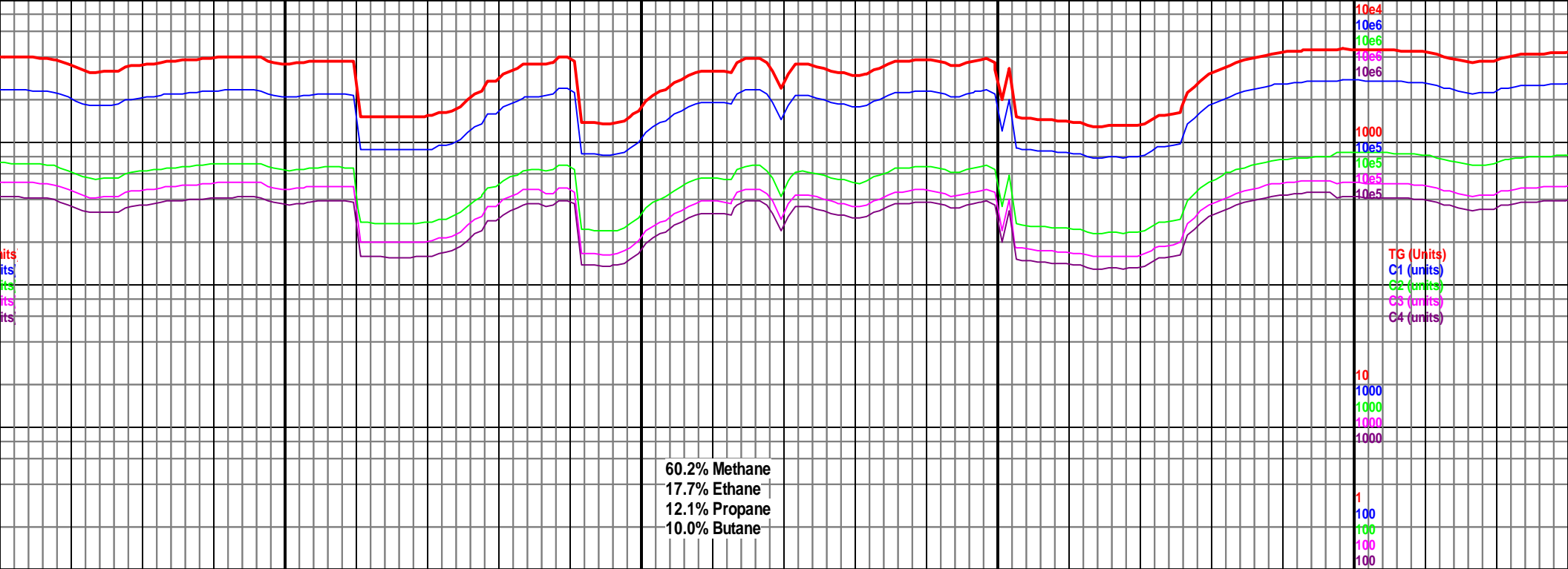
med gy, mottled ip,  
abnt mrlst, 60%

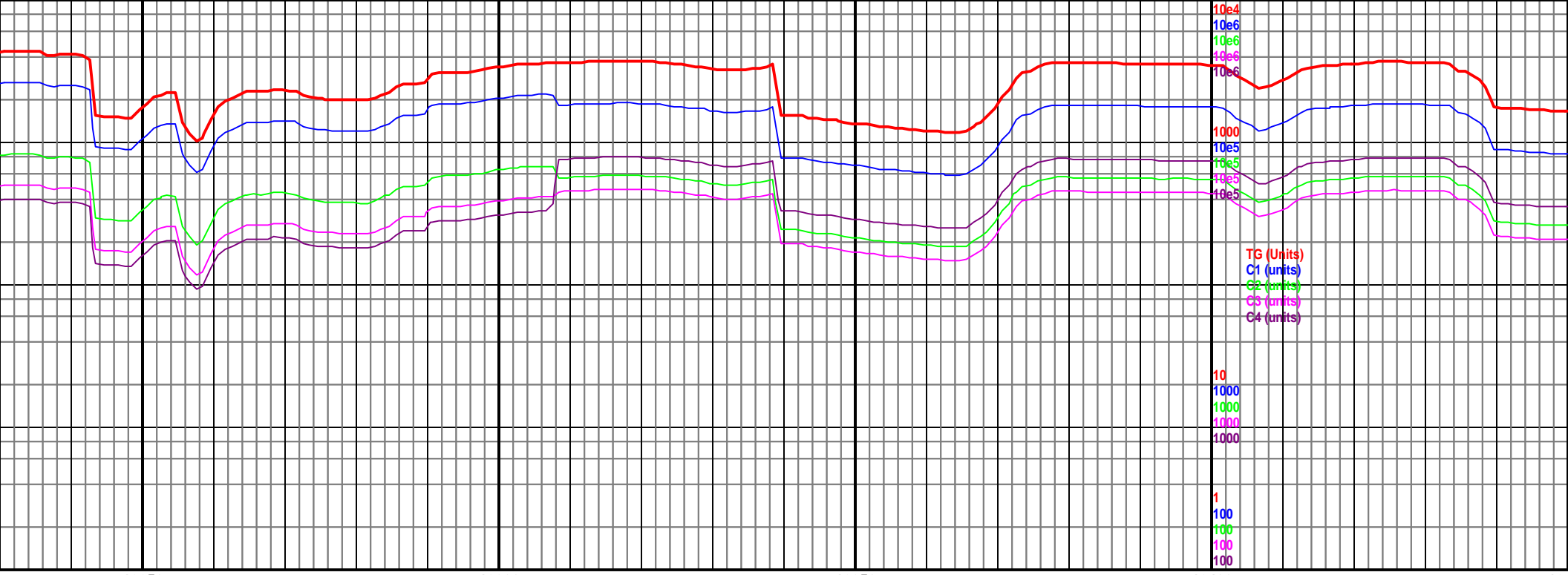
11400-11500 Chk lt gy brn-med gy, sb  
bky-sply, sft frm, occ foram, tr tan  
bent, g tr mrlst a/a, abnt yel flor, fst oil  
cut, 80% chk, 20% mrlst

11500-11600 Chk lt gy, mottled, sb  
blky-sb plty, sft frm, rr tan bent, fr oil  
cut, 80% chk, 20% mrlst









TG (Units)  
C1 (units)  
C2 (units)  
C3 (units)  
C4 (units)

10  
1000  
1000  
1000  
1000

1  
100  
100  
100  
100

12250

12300

12350

12400

12450

MD 12287 TVD 5618.58  
INC 89.58 AZ 181.5  
VS 6887.25

MD 12382 TVD 5619.42  
INC 89.41 AZ 181.03  
VS 6982.04

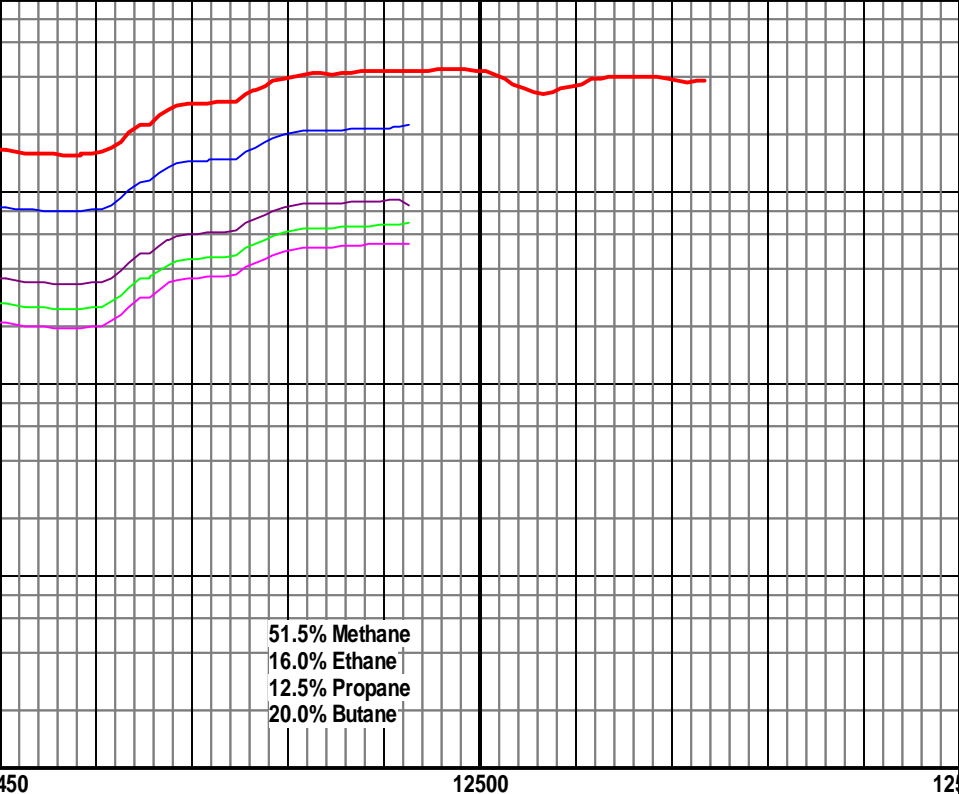
2000 TVD  
Sub Sea (-225)

5550  
(-775)

12200-12300 Chk lt gy-gy, sb plty-plty,  
sft frm, mottled, tr Mrlst dk gy, plty,  
suc, rr bent, oil cut, 80% chk, 20%  
mrilst

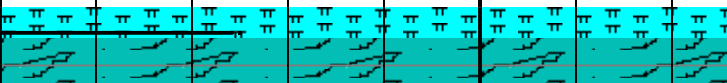
12300-12400 Chk lt gy-gy, sb plty-plty,  
sft frm, mottled, tr Mrlst dk gy, plty,  
suc, rr bent, oil cut, 80% chk, 20%  
mrilst

12400-12525 Chk lt  
sft frm, mottled, tr M  
suc, rr bent, oil cut,  
mrilst



MD 12475 TVD 5619.81  
INC 90.11 AZ 180.37  
VS 7074.89

TD 12525' reached at 12:30  
on 12/21/2013



gy-gy, sb plty-plty,  
1st dk gy, plty,  
80% chk, 20%