



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

Well Name: Horsetail 07H-1816
Well Id: 05-123-41840-00
Location: Sec 7-T10N-R57W, Weld County Colorado
License Number: 05-123-41840-00
Spud Date: 5/6/2016
Surface Coordinates: Lat.: 40.853542

Region: Wildcat Field
Drilling Completed: 5/11/2016
Long.: -103.787011

**Bottom Hole
Coordinates:**
Ground Elevation (ft): 4912 **K.B. Elevation (ft):** 4933
Logged Interval (ft): 5175 **To:** 13990 **Total Depth (ft):** 13990
Formation: Pierre, Sharon Springs, Niobrara
Type of Drilling Fluid: Water Based Mud

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: Craig Dreiling, Kyle Newman
Company: Acme Geologic Consulting
Address: 108 Berry Street
Little Rock, AR 72205

Drilling Company

Unit 406


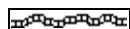
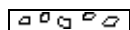
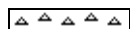
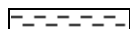

Gas Detection







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

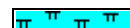
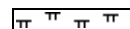




Comments






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 mrilst
 Mrilst
 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

OTHER SYMBOLS




POROSITY

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

SORTING





-  Well
-  Moderate
-  Poor

ROUNDING

-  Rounded
-  Subrnd
-  Subang

-  Angular

OIL SHOW

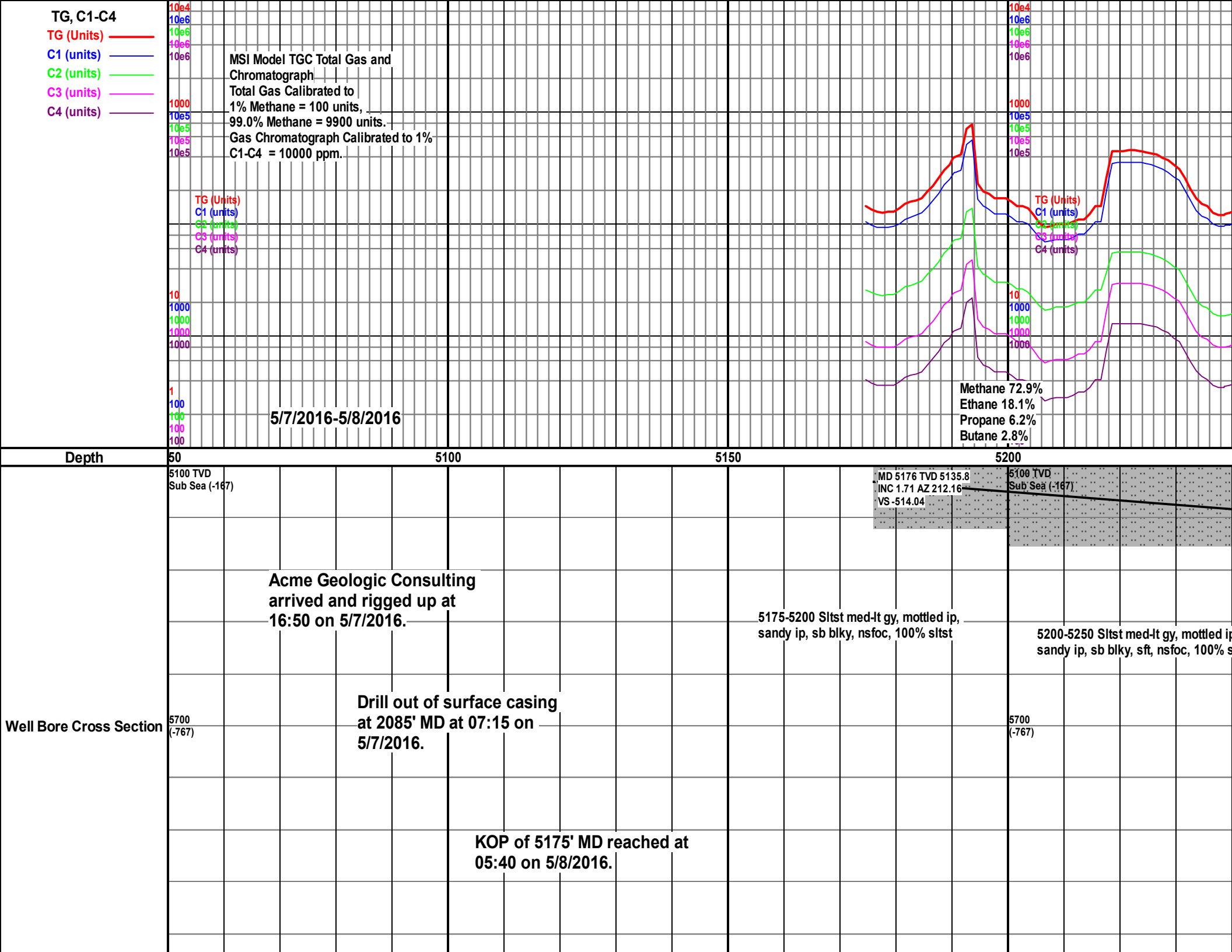
-  Even
-  Spotted
-  Ques
-  Dead

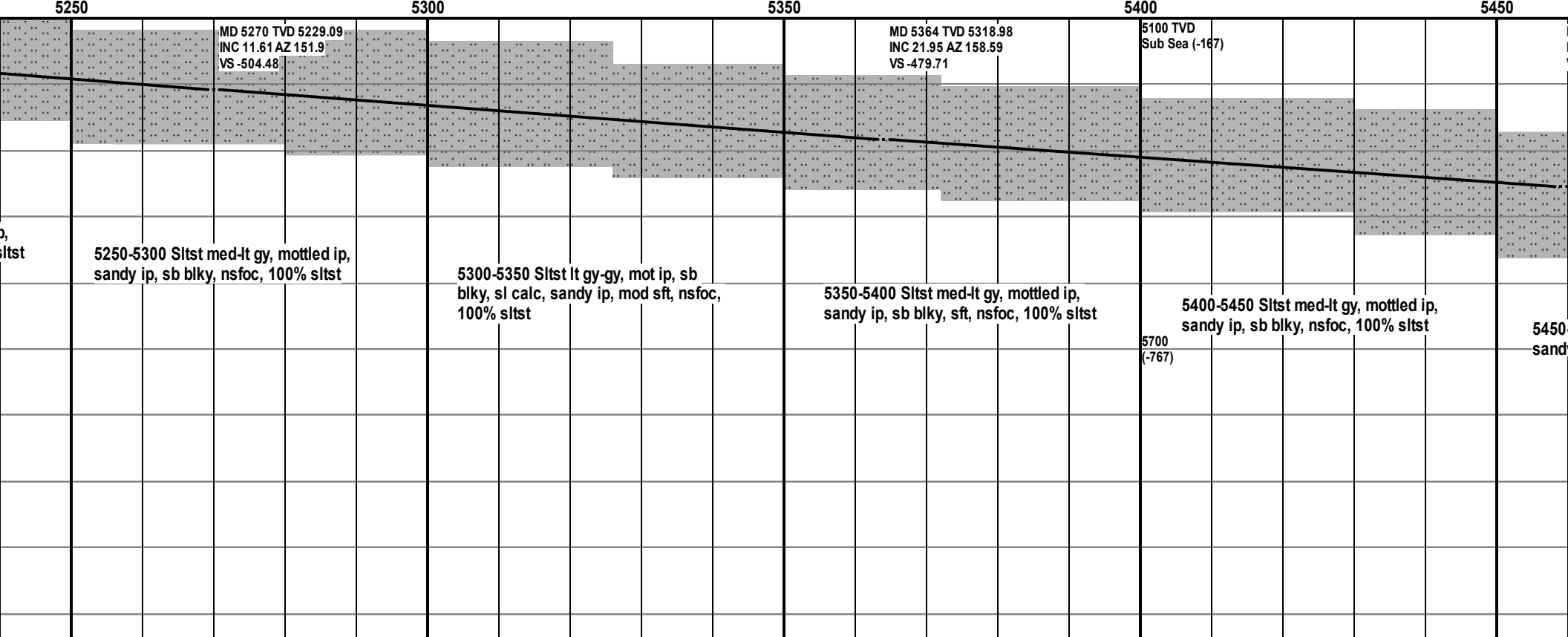
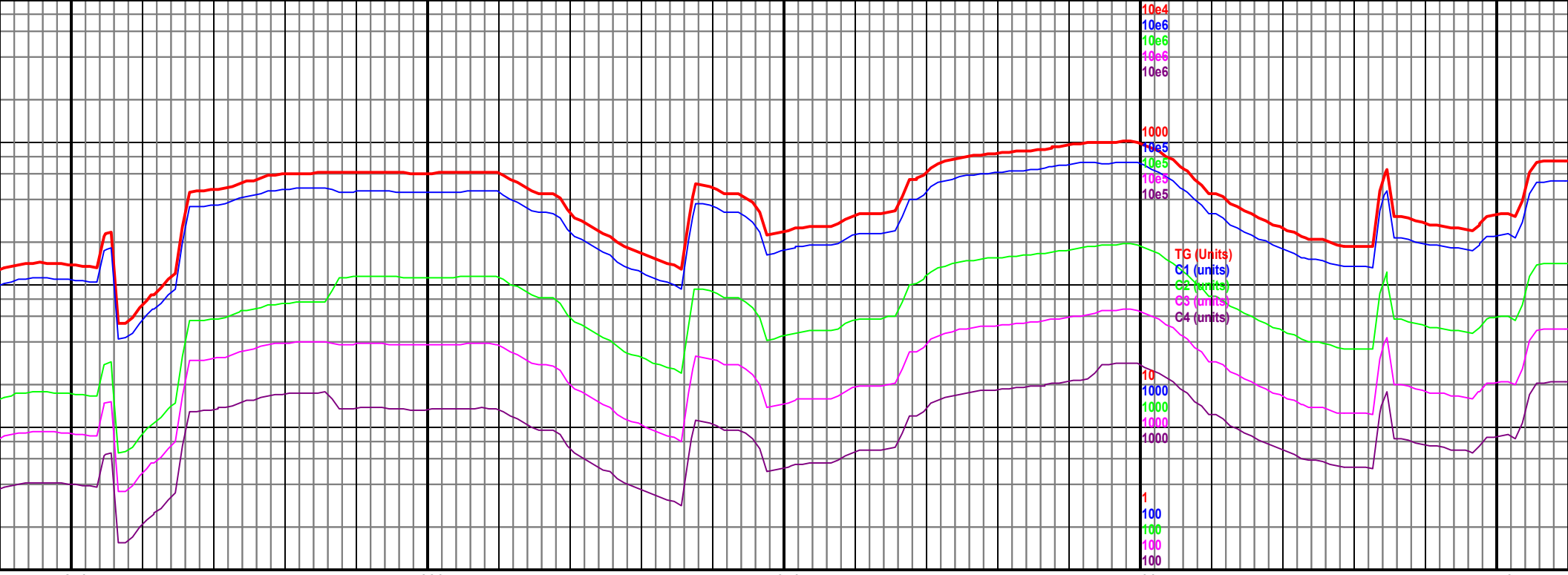
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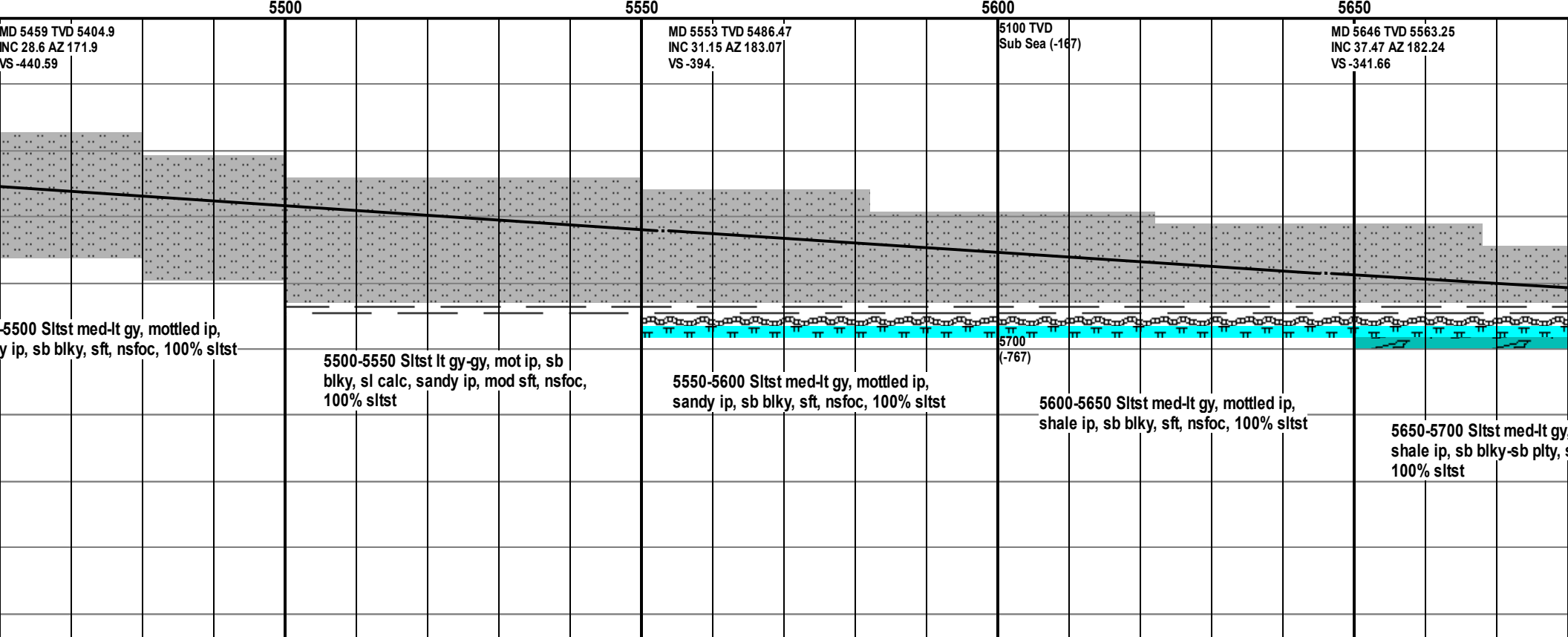
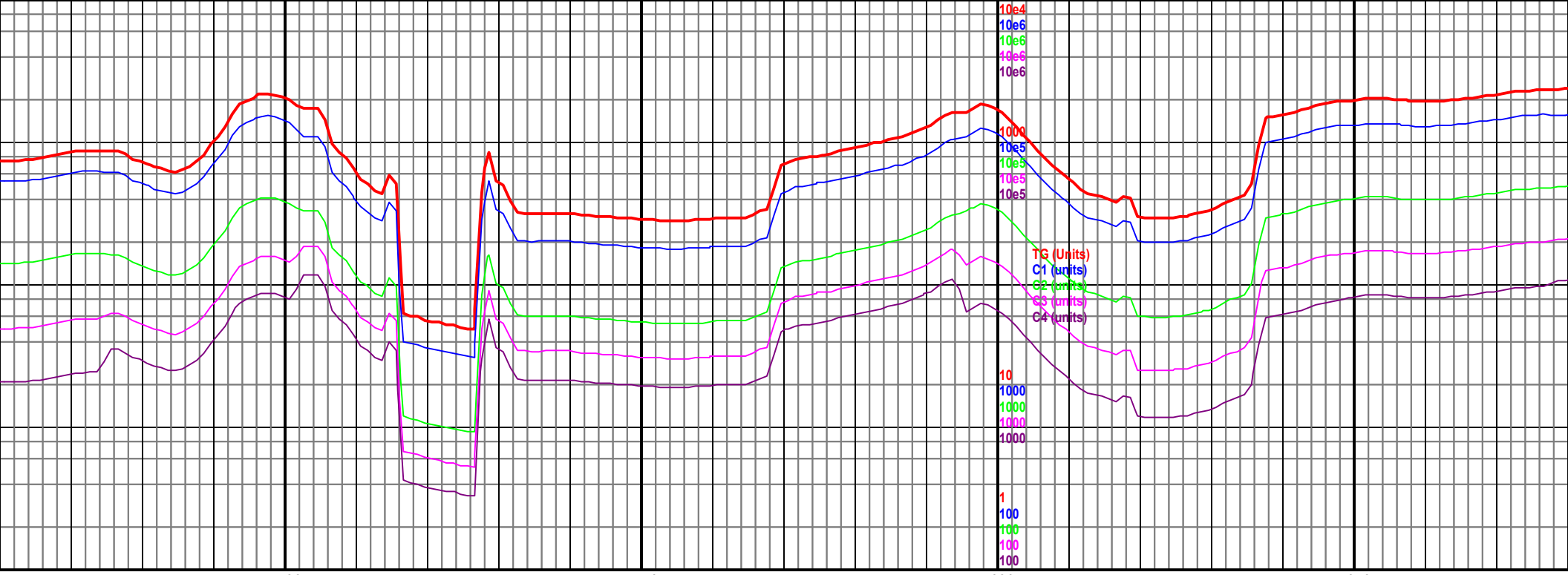
-  Core
-  Dst

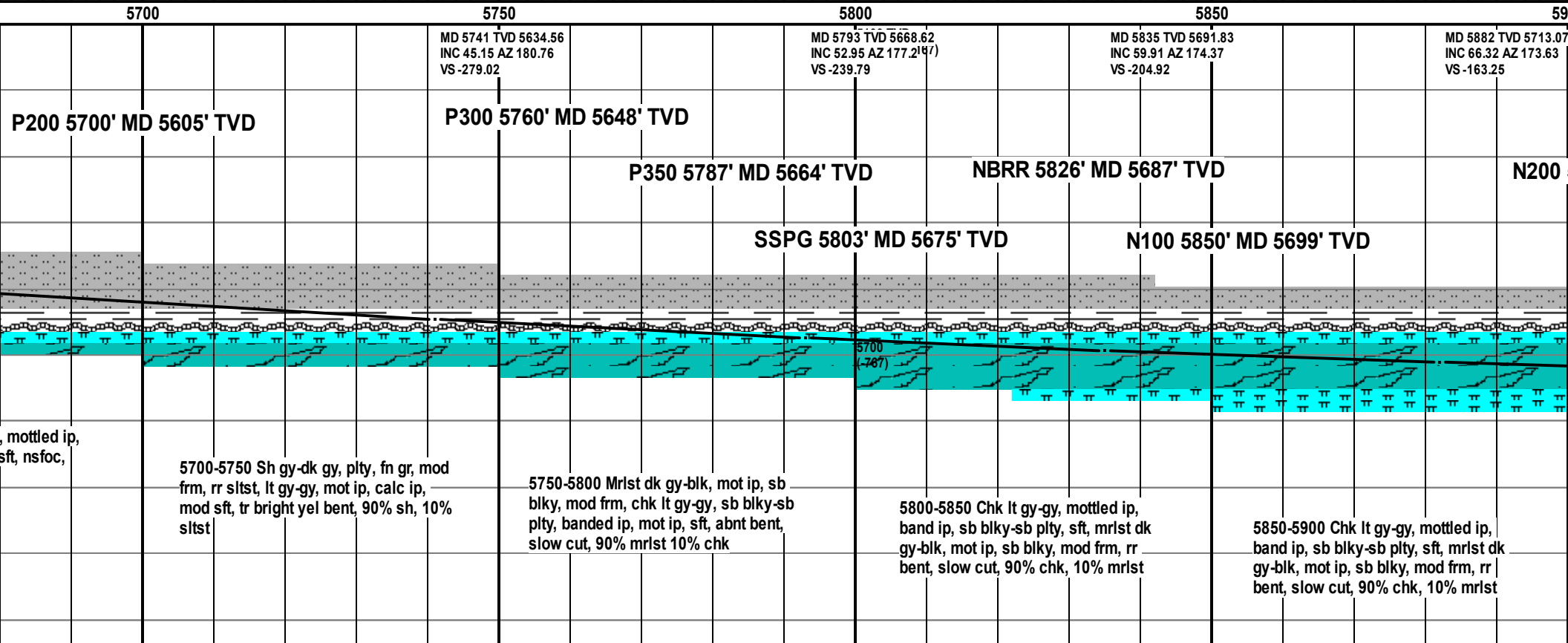
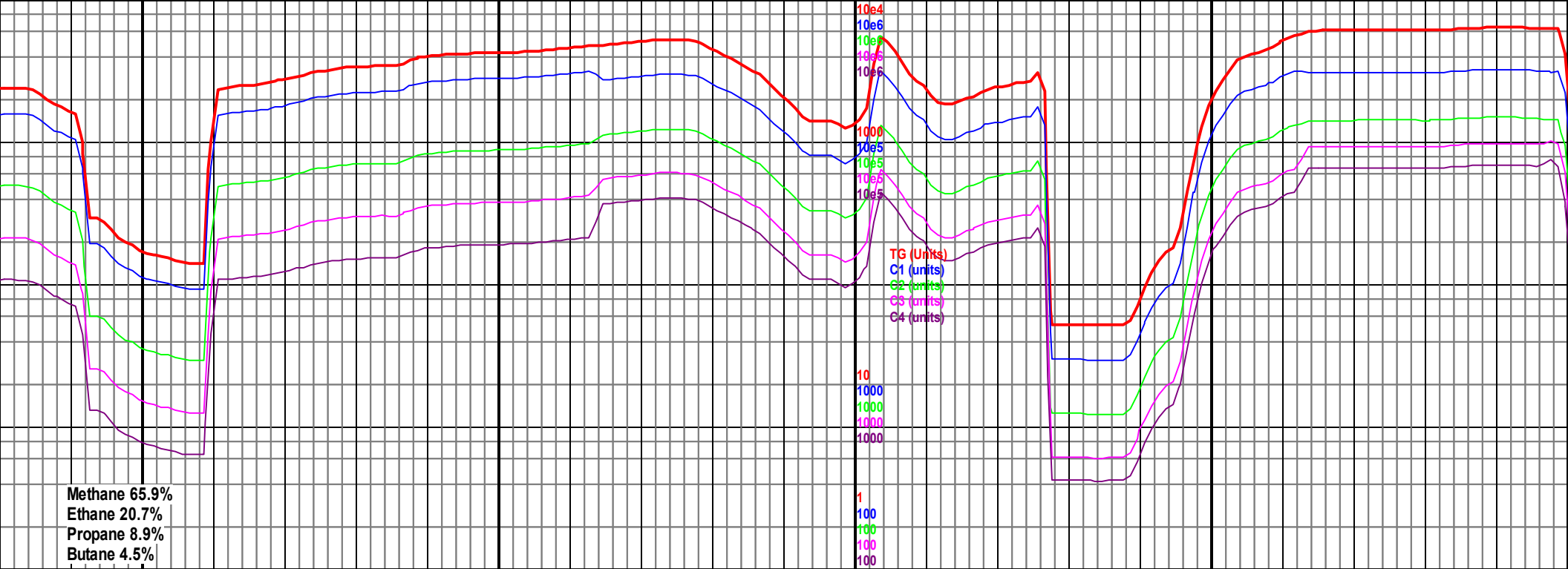
EVENT

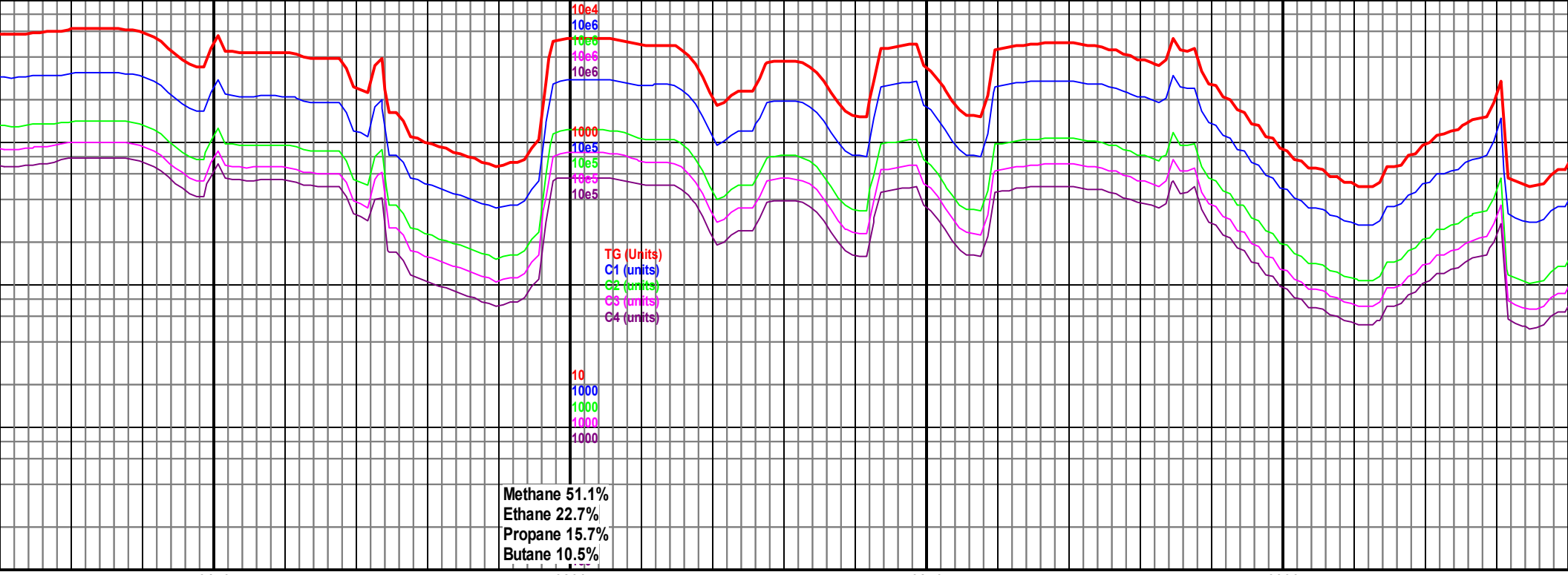
-  Rft
-  Sidewall





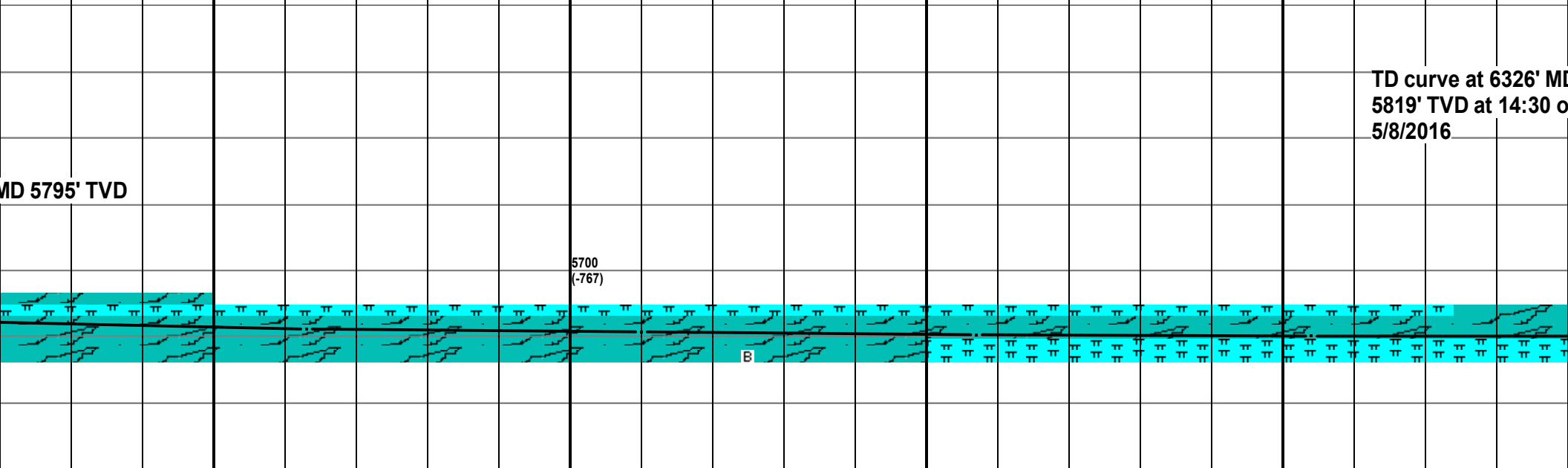






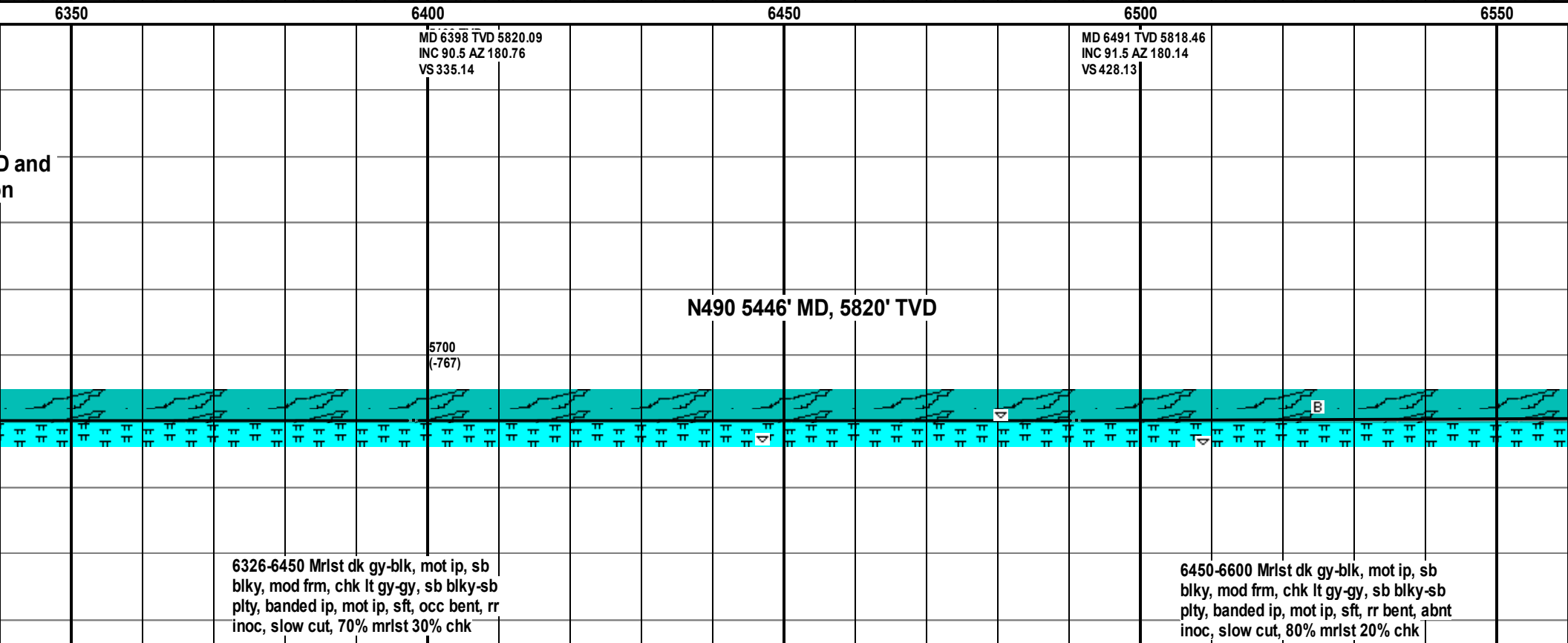
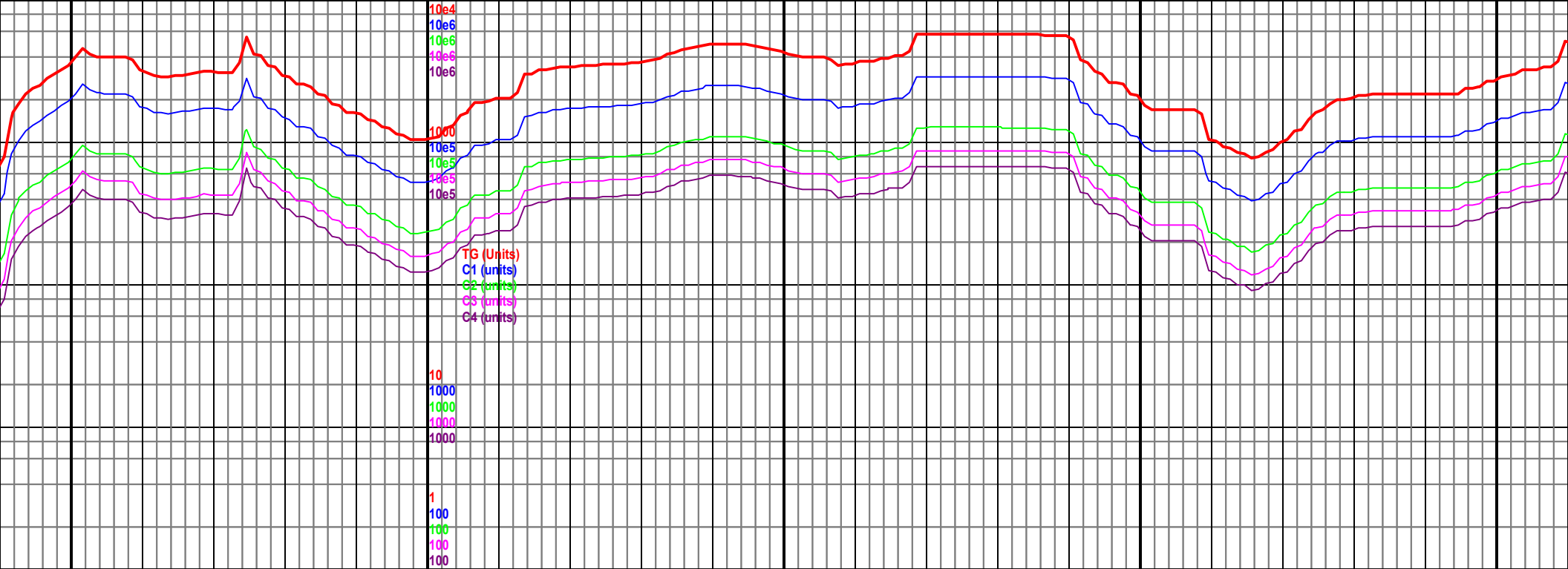
6150 6200 6250 6300

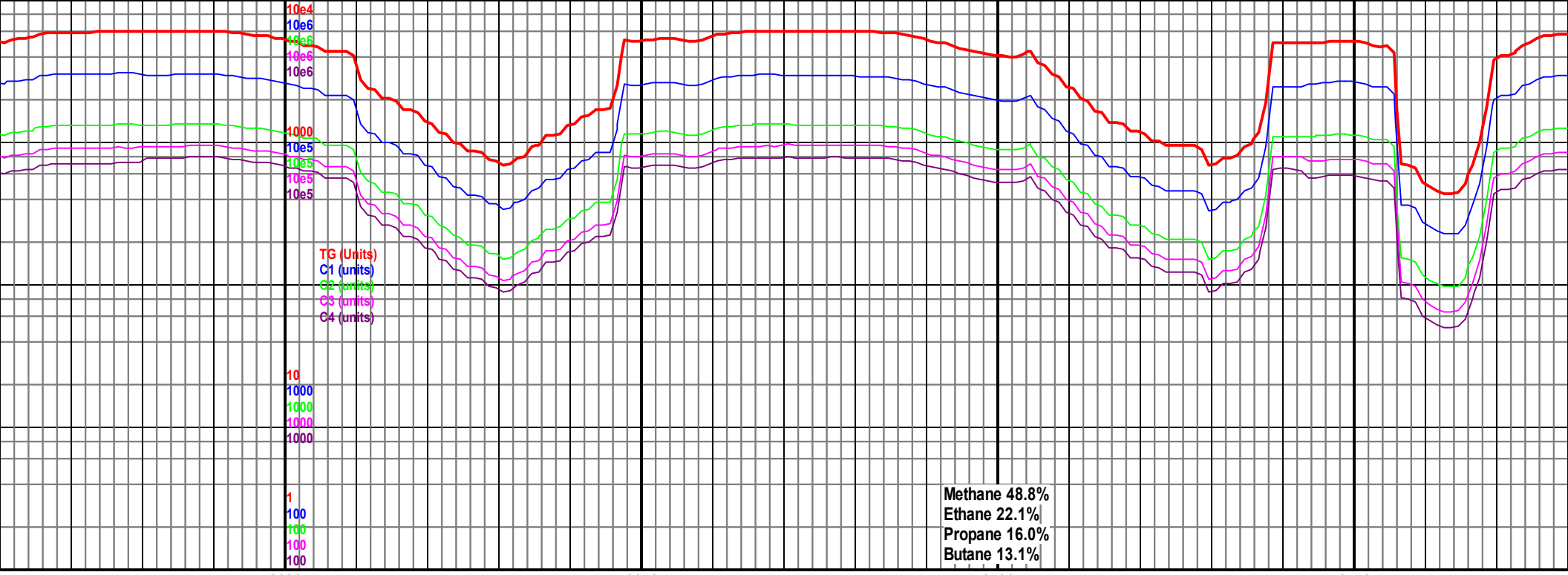
6116 TVD 5793.77 INC 74.58 AZ 182.57 VS 5.67	MD 6163 TVD 5804.81 INC 78.23 AZ 182.64 VS 101.3	5100 TVD Sub Sea (-16) MD 6210 TVD 5812.49 INC 82.97 AZ 182.76 VS 147.6	MD 6257 TVD 5816.76 INC 86.59 AZ 183.34 VS 194.33	MD 6304 TVD 5818.94 INC 88.1 AZ 182.93 VS 241.21
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MD 5795' TVD Lt gy-gy, mot ip, bnnd ip, sft, mrlst dk gy-blk, mot rr bent, fast cut, 80%	6150-6200 Chk Lt gy-gy, mot ip, bnnd ip, sb blk-y-sb plty, sft, mrlst dk gy-blk, mot ip, sb blk-y, frm, rr bent, fast cut, 80% chk, 20% mrlst	6200-6250 Chk Lt gy-gy, mot ip, bnnd ip, sb blk-y-sb plty, sft, mrlst dk gy-blk, mot ip, sb blk-y, frm, rr bent, fast cut, 90% chk, 10% mrlst	6250-6326 Mrlst dk gy-blk, mot ip, sb blk-y, mod frm, chk Lt gy-gy, sb blk-y-sb plty, banded ip, mot ip, sft, occ inoc, slow cut, 60% mrlst 40% chk
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TD curve at 6326' MD
 5819' TVD at 14:30 o
 5/8/2016





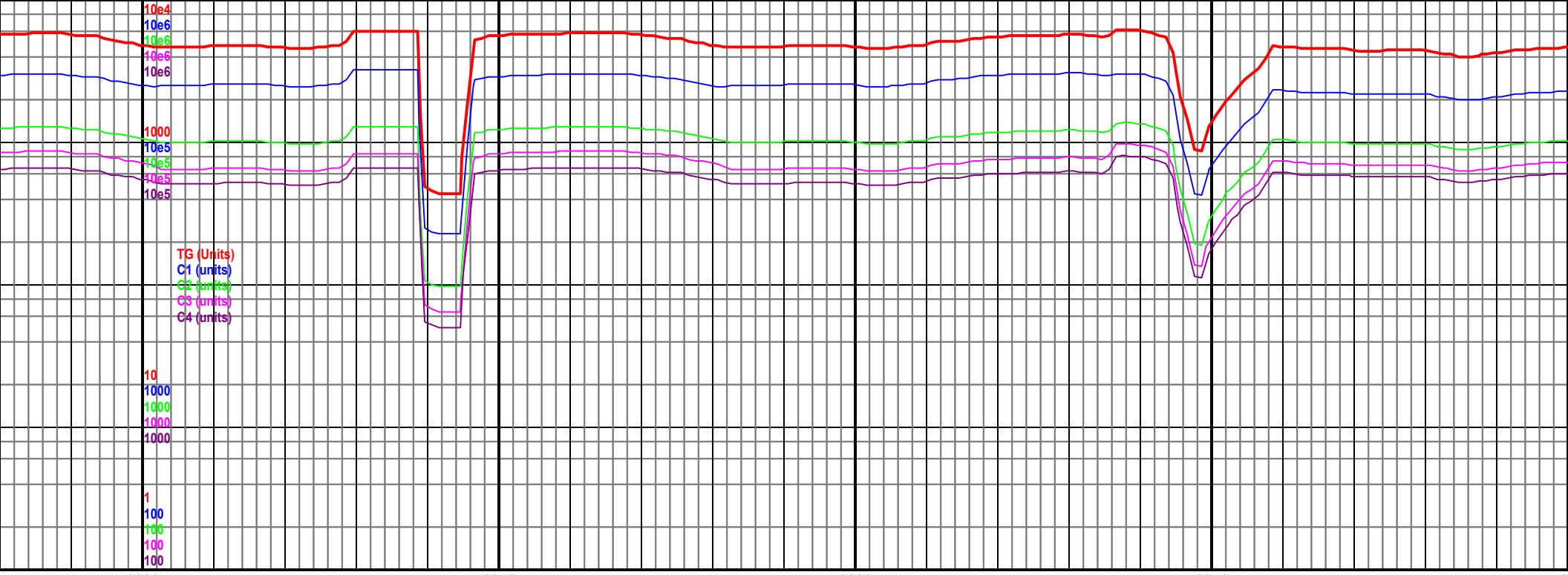
MD 6586 TVD 5814.86 TVD
INC 92.85 AZ 177.51 Sea (-167)
VS 523.03

MD 6681 TVD 5810.85
INC 91.98 AZ 177.52
VS 617.85

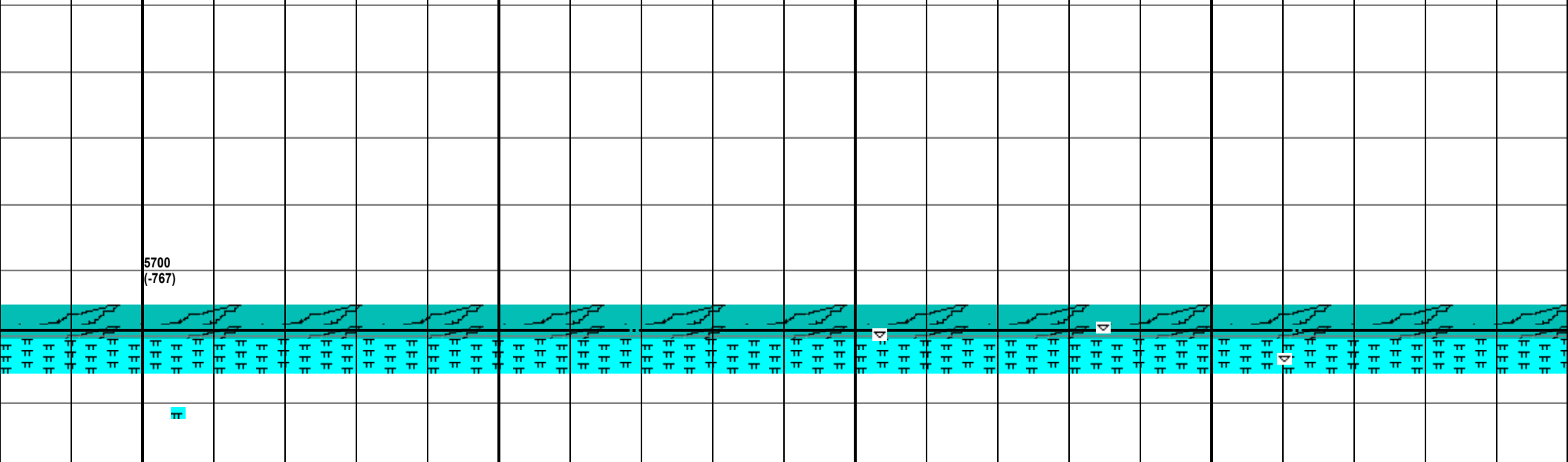
MD 6781 TVD 5810.85
INC 91.98 AZ 177.52
VS 617.85

5700
(-767)

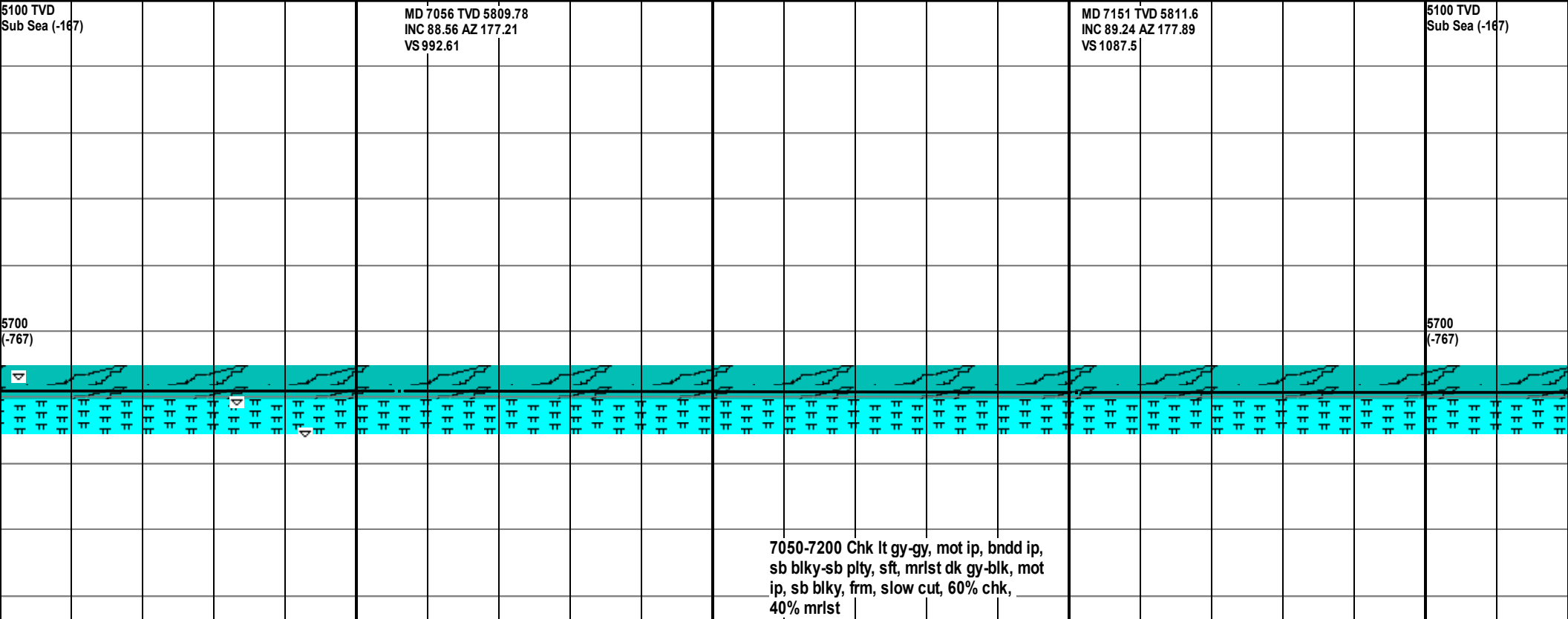
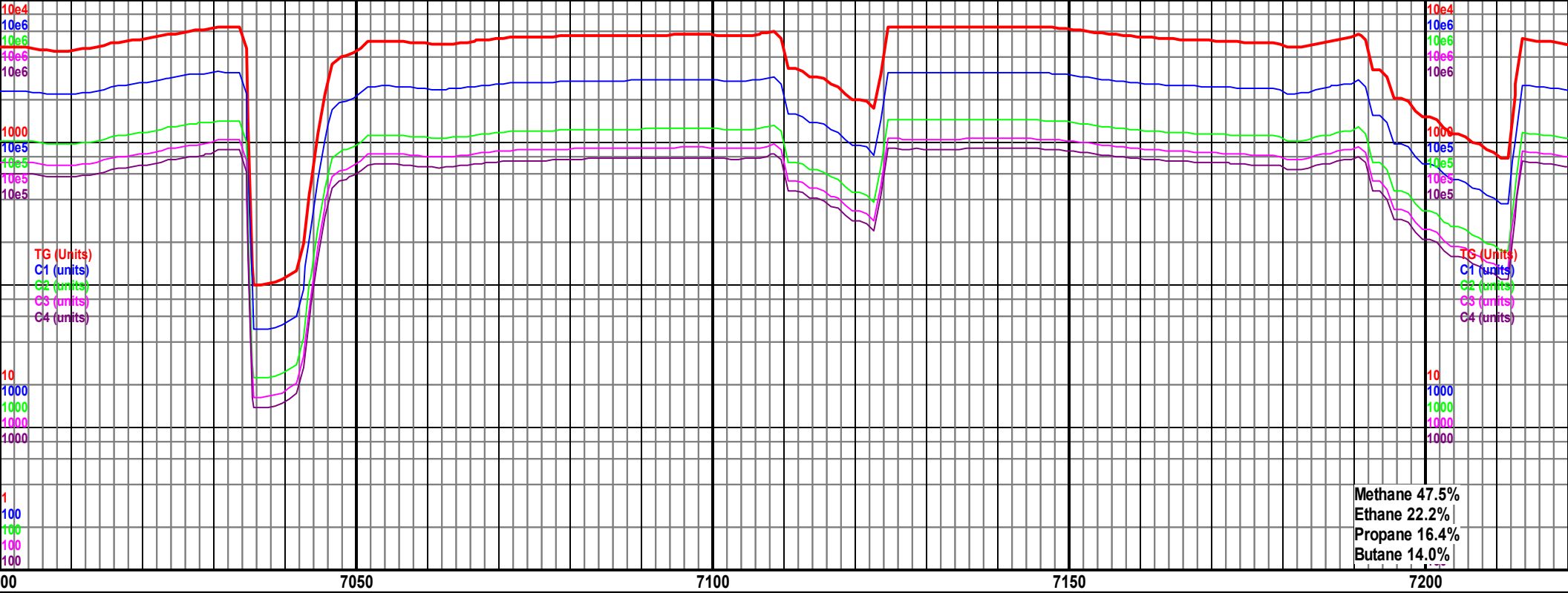
6600-6750 Chk lt gy-gy, mot ip, bnnd ip,
sb blk-y-sb plty, sft, mrlst dk gy-blk, mot
ip, sb blk-y, frm, rr bent, rr inoc, slow
cut, 80% chk, 20% mrlst

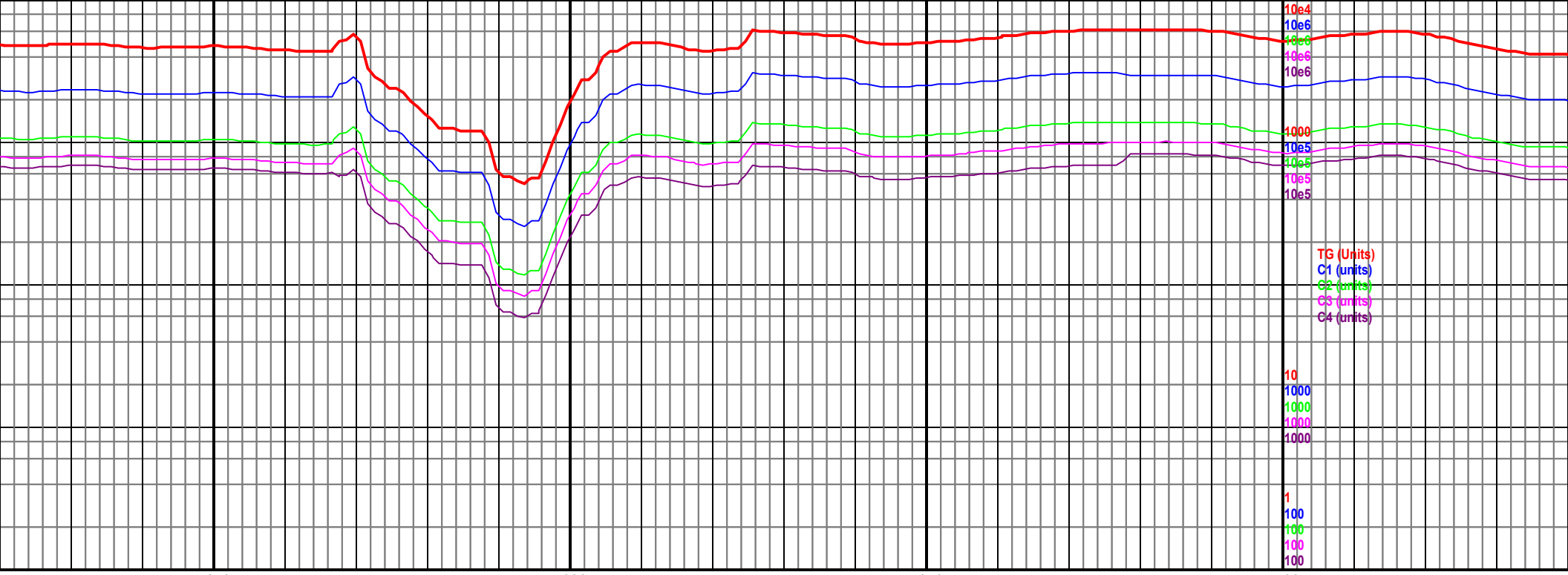


775 TVD 5809.8 9.3 AZ 178.6 1.78	5100 TVD Sub Sea (-167)	MD 6869 TVD 5809.59 INC 90.96 AZ 179.16 VS 805.76	MD 6962 TVD 5808.71 INC 90.13 AZ 177.6 VS 898.72
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6750-6900 Chk lt gy-gy, mot ip, bndd ip, sb blk-y-sb plty, sft, mrlst dk gy-blk, mot ip, sb blk-y, frm, rr bent, occ inoc, slow cut, 70% chk, 30% mrlst	6900-7050 Chk lt gy-gy, mot ip, bndd ip, sb blk-y-sb plty, sft, mrlst dk gy-blk, mot ip, sb blk-y, frm, abnt inoc, slow cut, 80% chk, 20% mrlst
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7250

7300

7350

7400

MD 7245 TVD 5812.2
INC 90.04 AZ 178.01
VS 1181.44

MD 7339 TVD 5811.33
INC 91.02 AZ 178.68
VS 1275.4

5100 TVD
Sub Sea (-167)

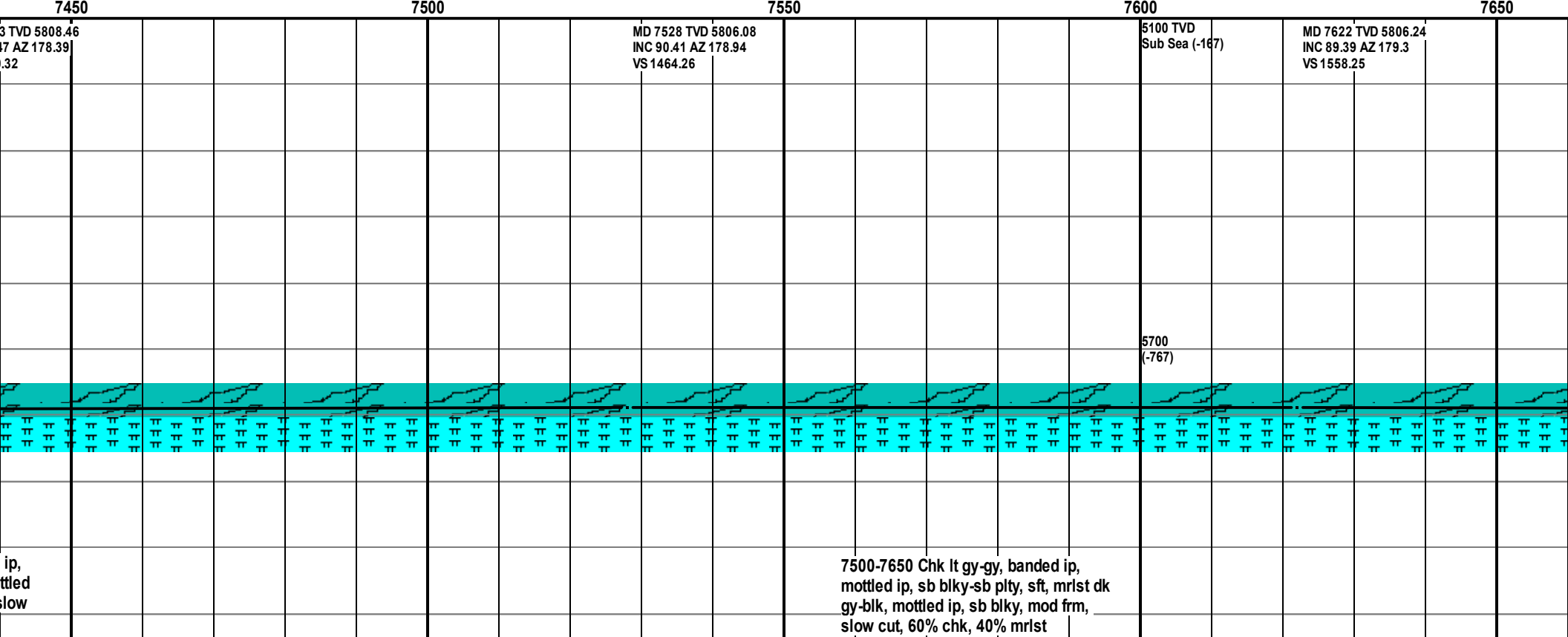
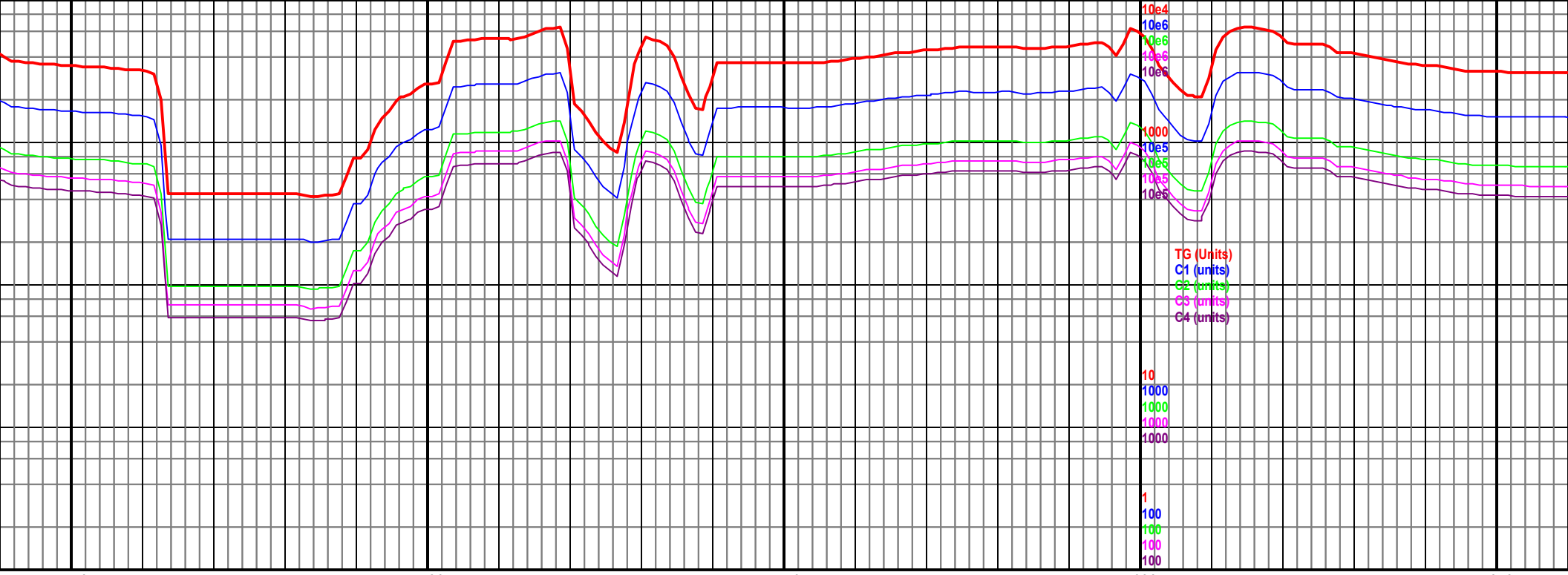
MD 7431 TVD 5811.33
INC 92.4 AZ 178.68
VS 1369.4

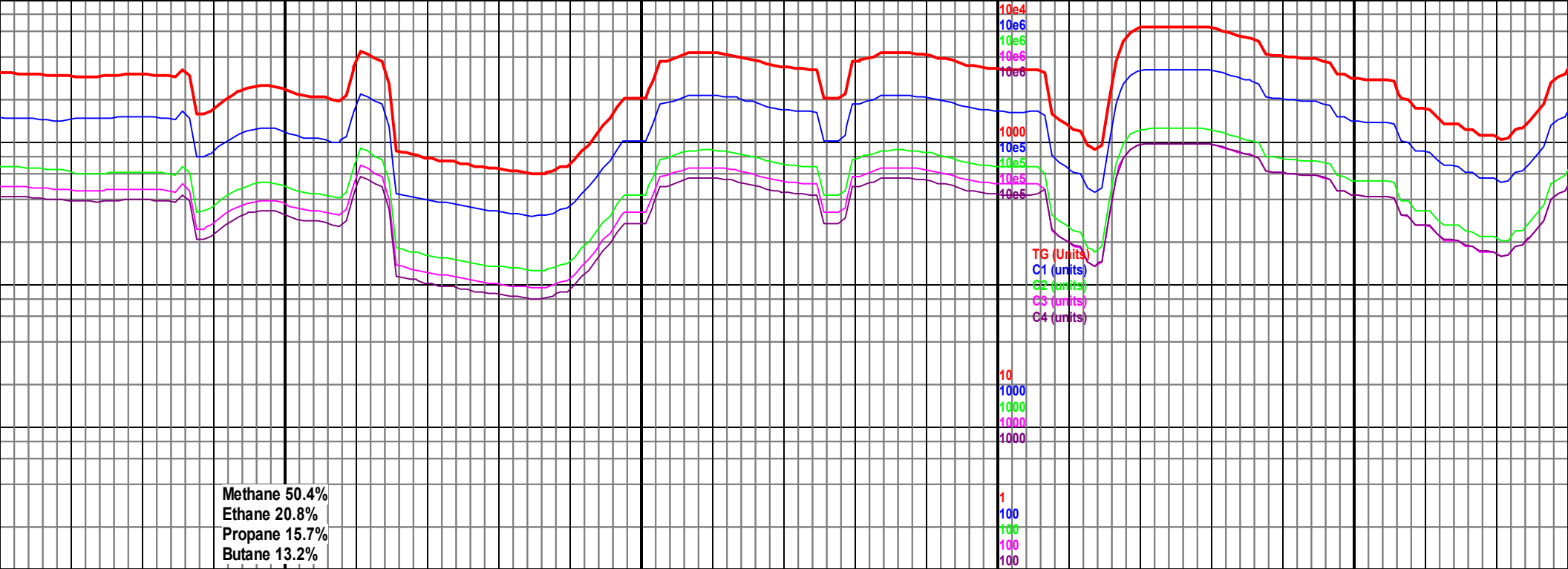


5700
(-767)

7200-7350 Mrlst dk gy-blk, mottled ip,
sb blk, mod frm, chk lt gy-gy, mottled
ip, banded ip, sb blk-sb plty, sft, slow
cut, 60% mrilst, 40% chk

7350-7500 Mrilst dk gy-blk, mottled
sb blk, mod frm, chk lt gy-gy, mo
ip, banded ip, sb blk-sb plty, sft, s
cut, 50% mrilst, 50% chk





Methane 50.4%
Ethane 20.8%
Propane 15.7%
Butane 13.2%

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

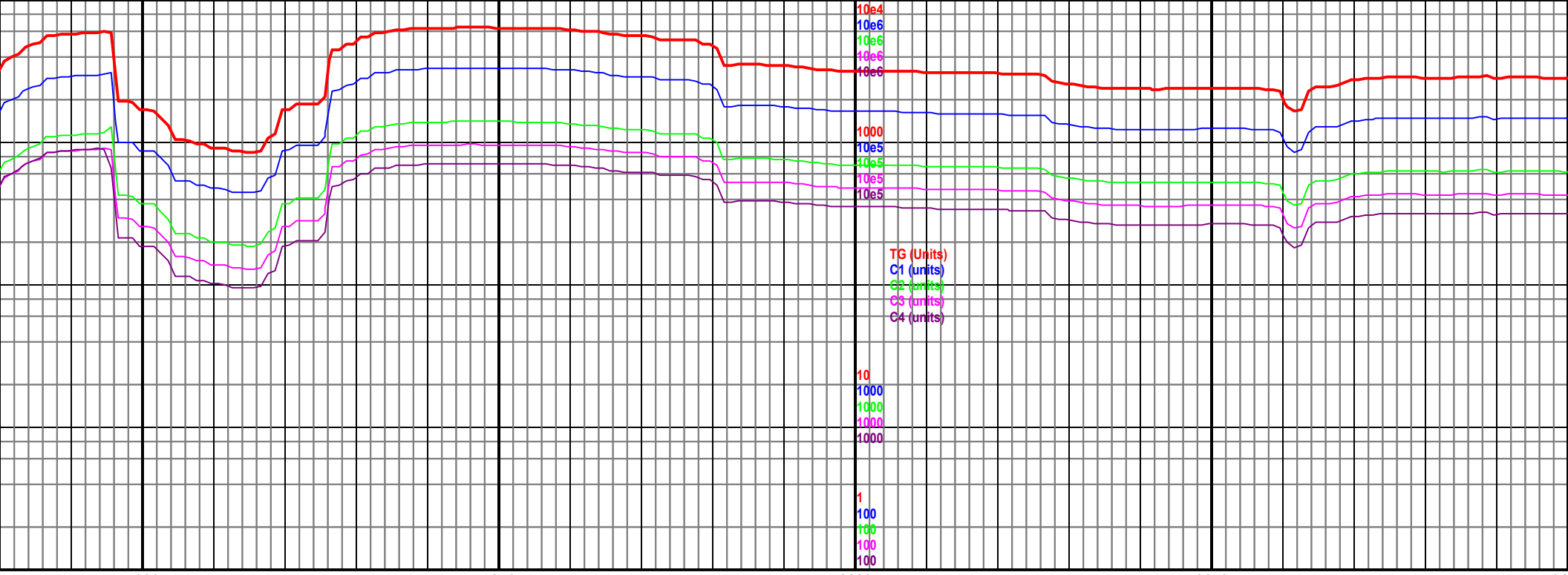
5100 TVD
Sub Sea (-167)

MD 7811 TVD 5810.7
INC 86.68 AZ 179.92
VS 1747.16

5700
(-767)

7650-7800 Mrst dk gy-blk, mottled ip,
sb blk, mod frm, chk lt gy-gy, mottled
ip, banded ip, sb blk-sb plty, sft, slow
cut, 70% mrst, 30% chk

7800-7950 Mrst dk gy
sb blk, mod frm, chk
ip, banded ip, sb blk
cut, 50% mrst, 50% c



7900

7950

8000

8050

8100

MD 7904 TVD 5815.41
INC 87.51 AZ 179.66
VS 1840.03

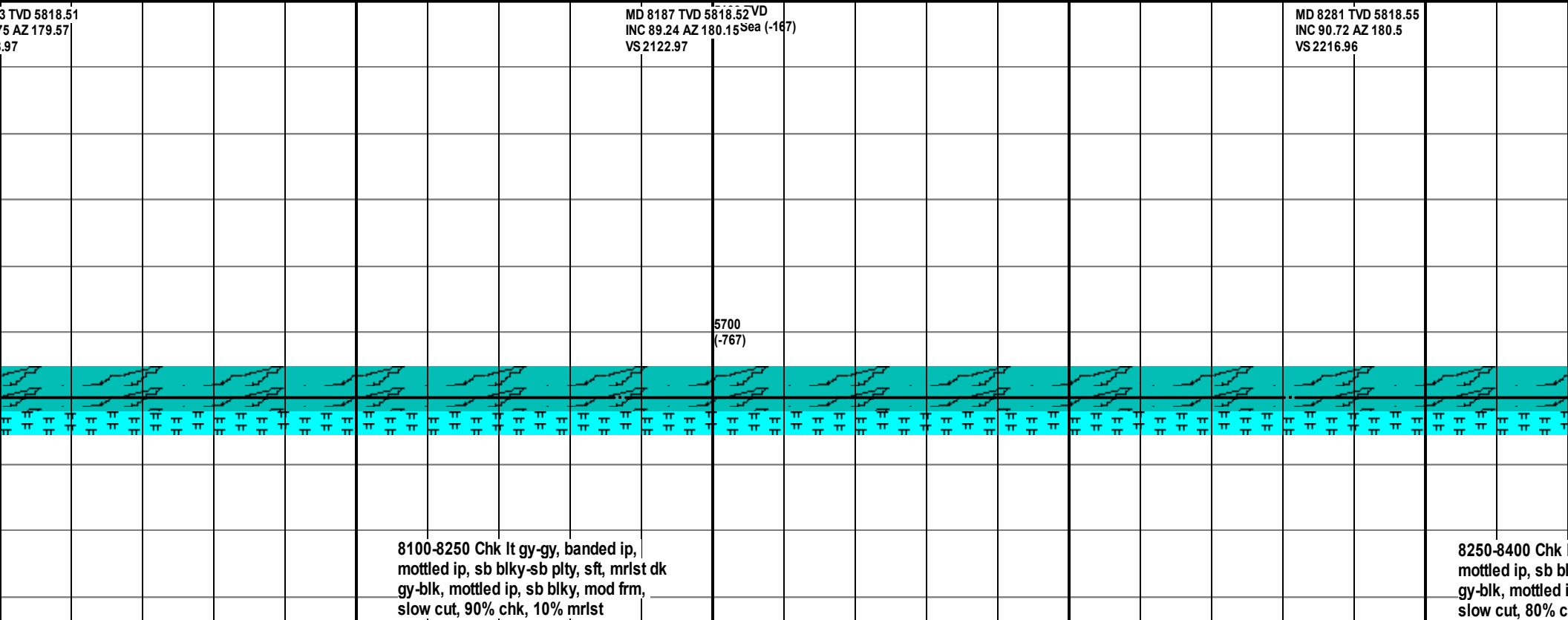
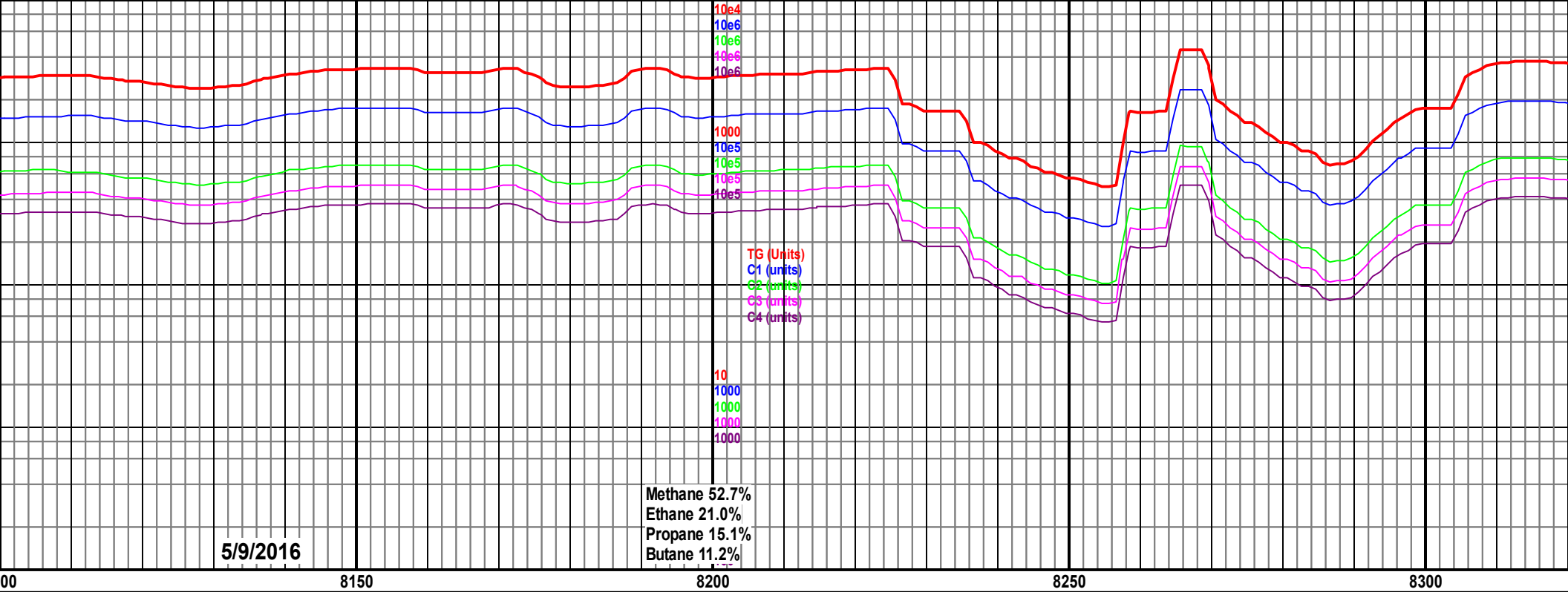
MD 7999 TVD 5818.3
INC 89 AZ 179.11
VS 1934.98

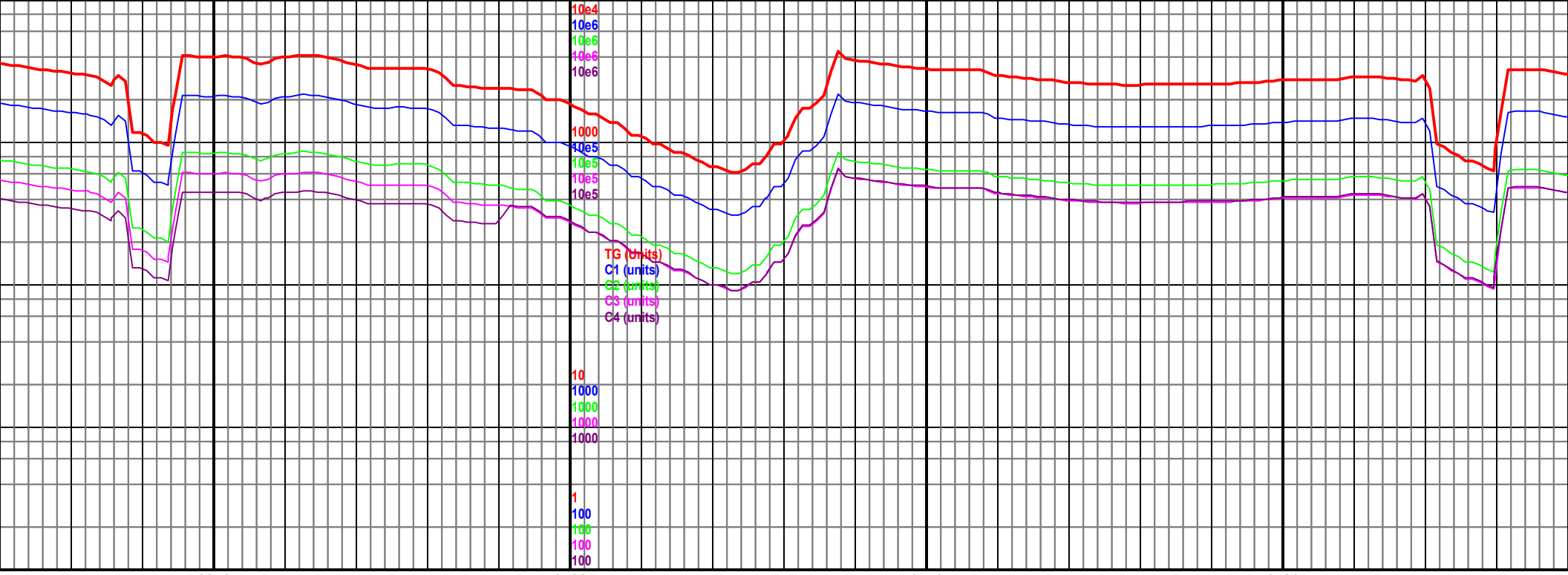
MD 8099 TVD 5818.3
INC 90.7 AZ 179.11
VS 2028.98

5700
(-767)

-blk, mottled ip,
lt gy-gy, mottled
sb plty, sft, slow
chk

7950-8100 Chk lt gy-gy, banded ip,
mottled ip, sb blk-sb plty, sft, mrlst dk
gy-blk, mottled ip, sb blk, mod frm,
mod cut, 90% chk, 10% mrlst





8350

8400

8450

8500

MD 8375 TVD 5818.58
INC 89.24 AZ 179.86
VS 2310.96

5100 TVD
Sub Sea (-167)

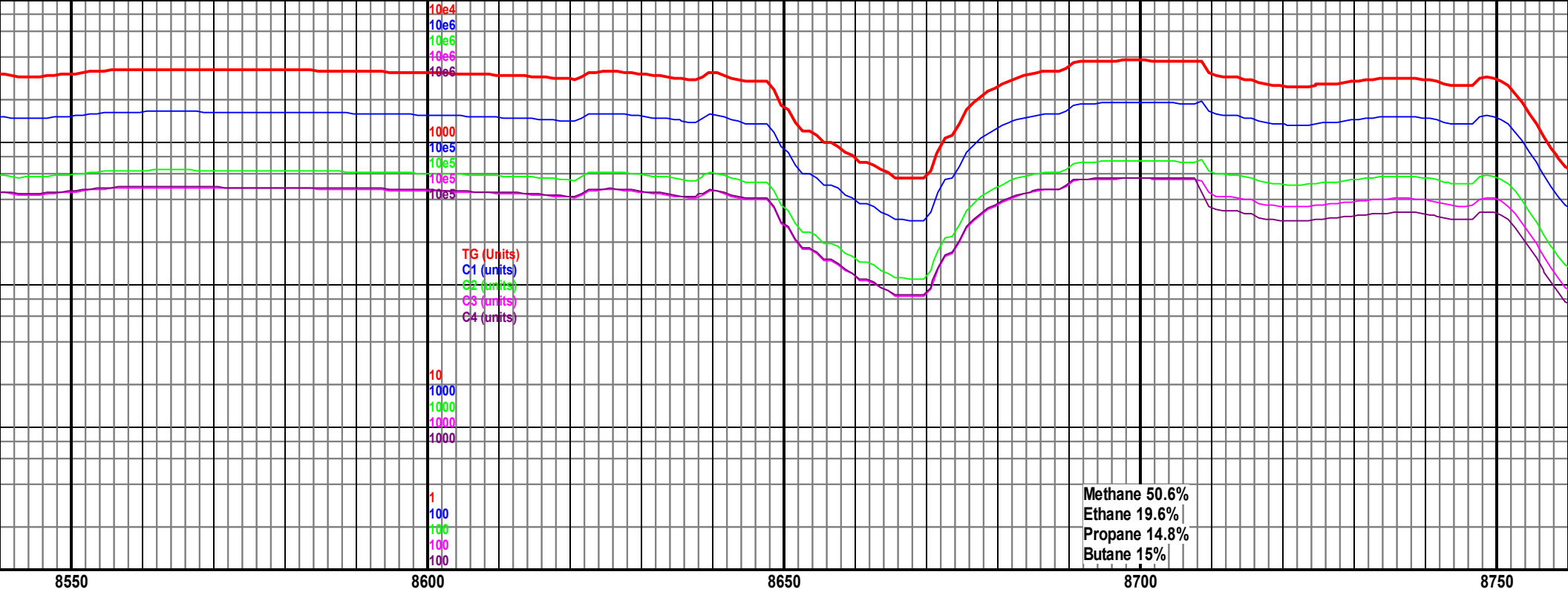
MD 8469 TVD 5819.17
INC 90.04 AZ 178.46
VS 2404.95

5700
(-767)



lt gy-gy, banded ip,
ky-sb plty, sft, mrlst dk
ip, sb blk, mod frm,
hk, 20% mrlst

8400-8550 Chk lt gy-gy, banded ip,
mottled ip, sb blk-sb plty, sft, mrlst dk
gy-blk, mottled ip, sb blk, mod frm, tr
inocs, slow cut, 80% chk, 20% mrlst



MD 8564 TVD 5820.56
 INC 88.29 AZ 179.53
 VS 2499.92

5100 TVD
 Sub Sea (-167)

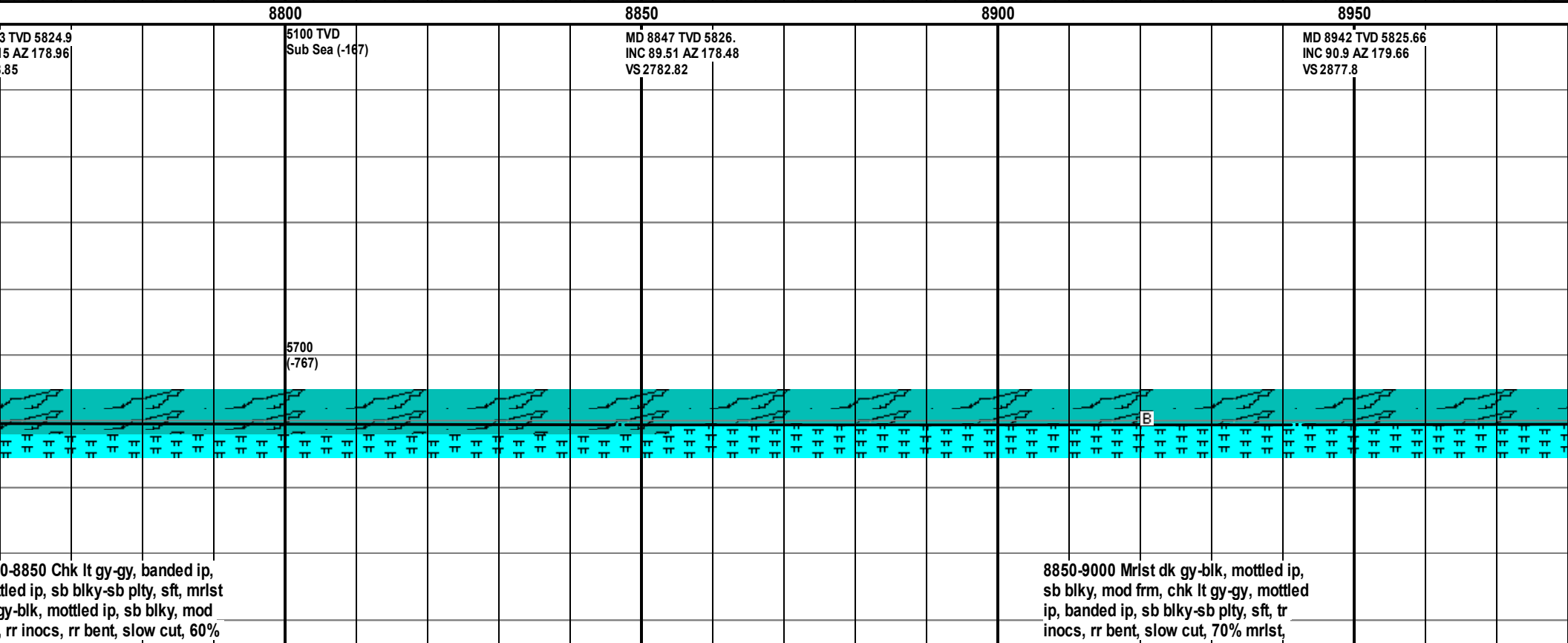
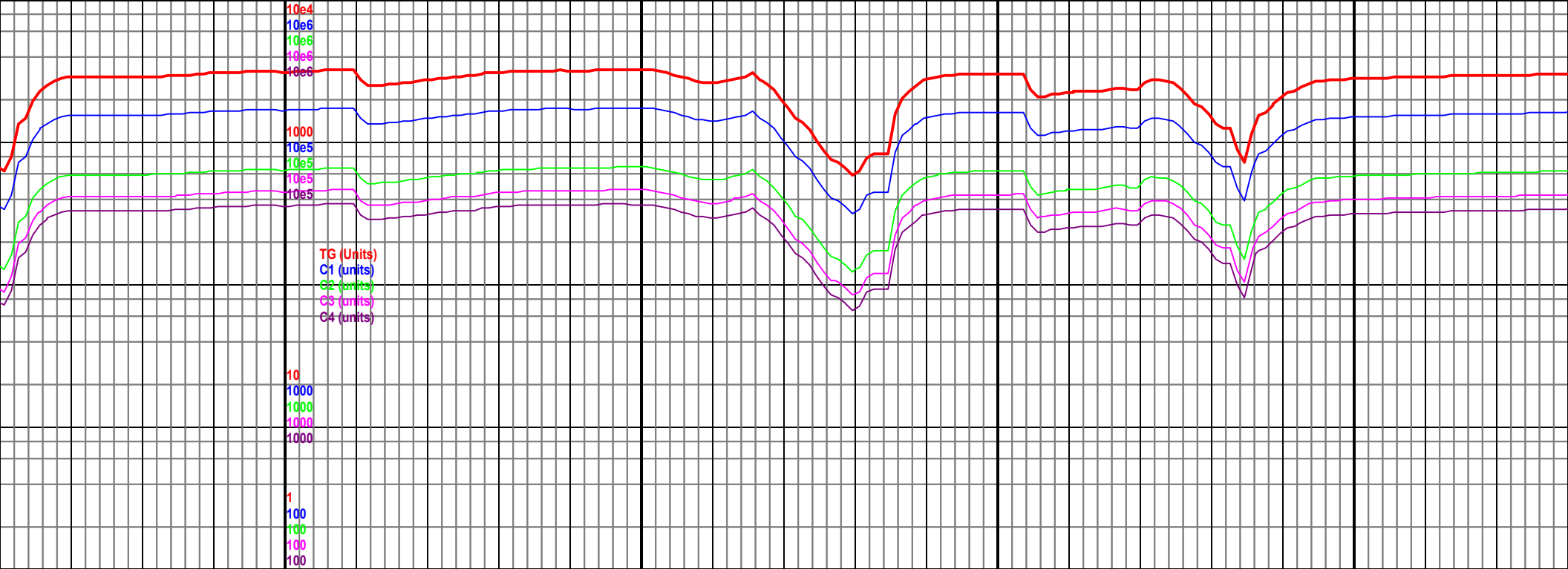
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 INC 88.65 AZ 179.5
 VS 2594.88

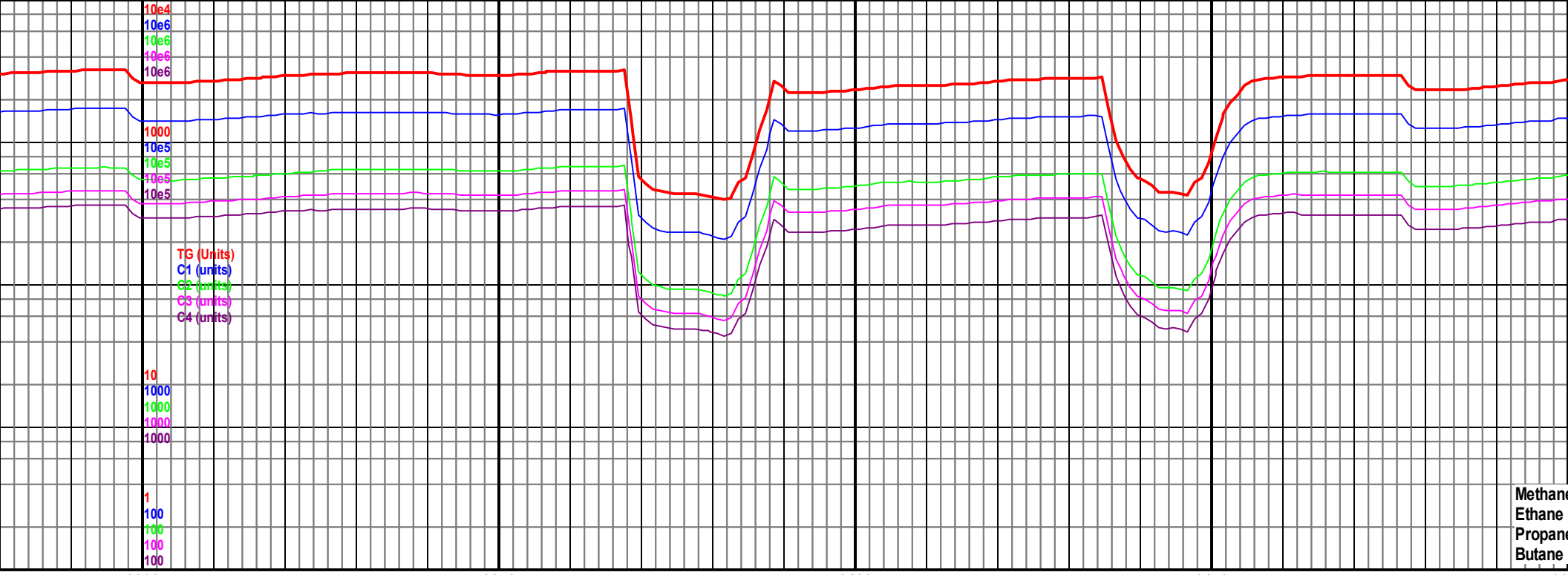
MD 8751 TVD 5825.09
 INC 89.15 AZ 179.5
 VS 2688.88

5700
 (-767)

8550-8700 Chk lt gy-gy, banded ip,
 mottled ip, sb blk-sb plty, sft, mrlst dk
 gy-blk, mottled ip, sb blk, mod frm, tr
 inocs, slow cut, 80% chk, 20% mrlst

8700-8750 Chk lt gy-gy, banded ip,
 mottled ip, sb blk-sb plty, sft, mrlst dk
 gy-blk, mottled ip, sb blk, mod frm, tr
 inocs, slow cut, 80% chk, 20% mrlst





Methane
Ethane
Propane
Butane

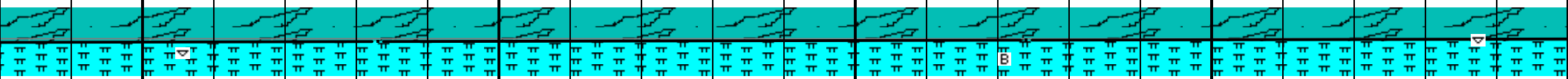
9000 9050 9100 9150 9200

5100 TVD
Sub Sea (-167)

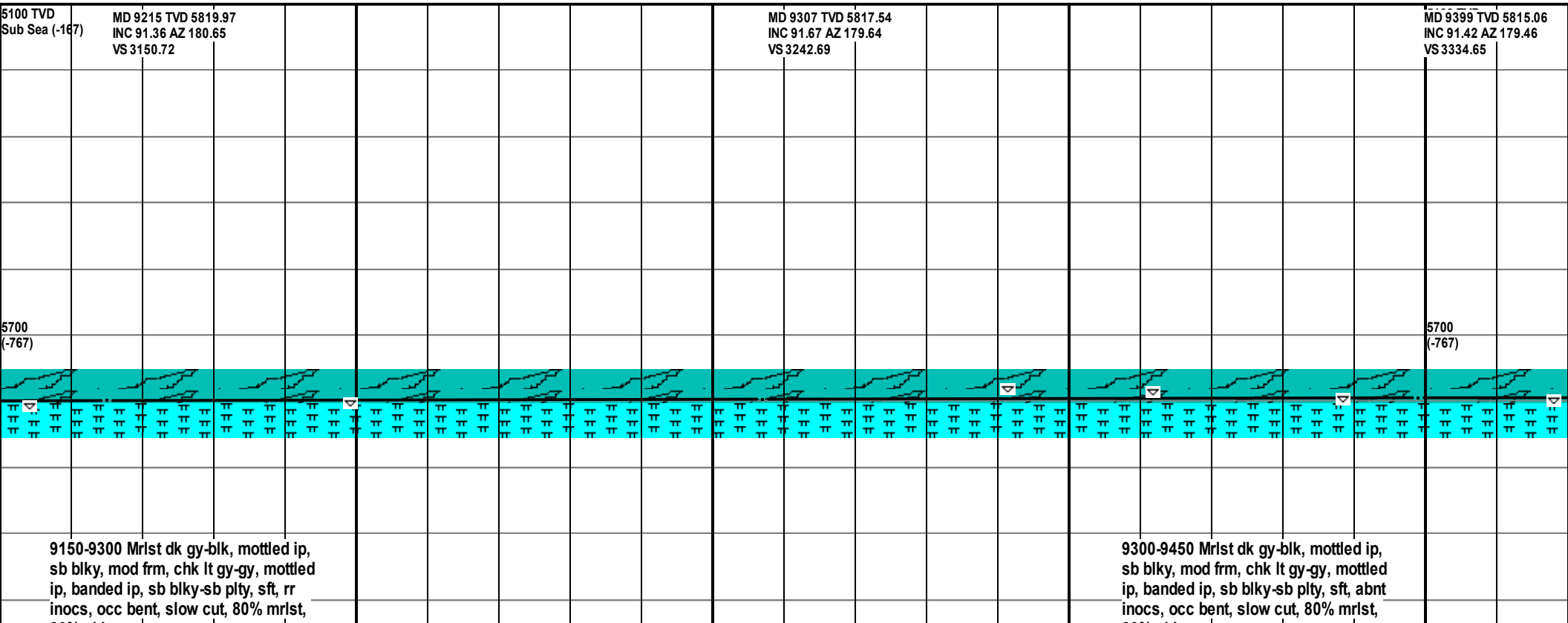
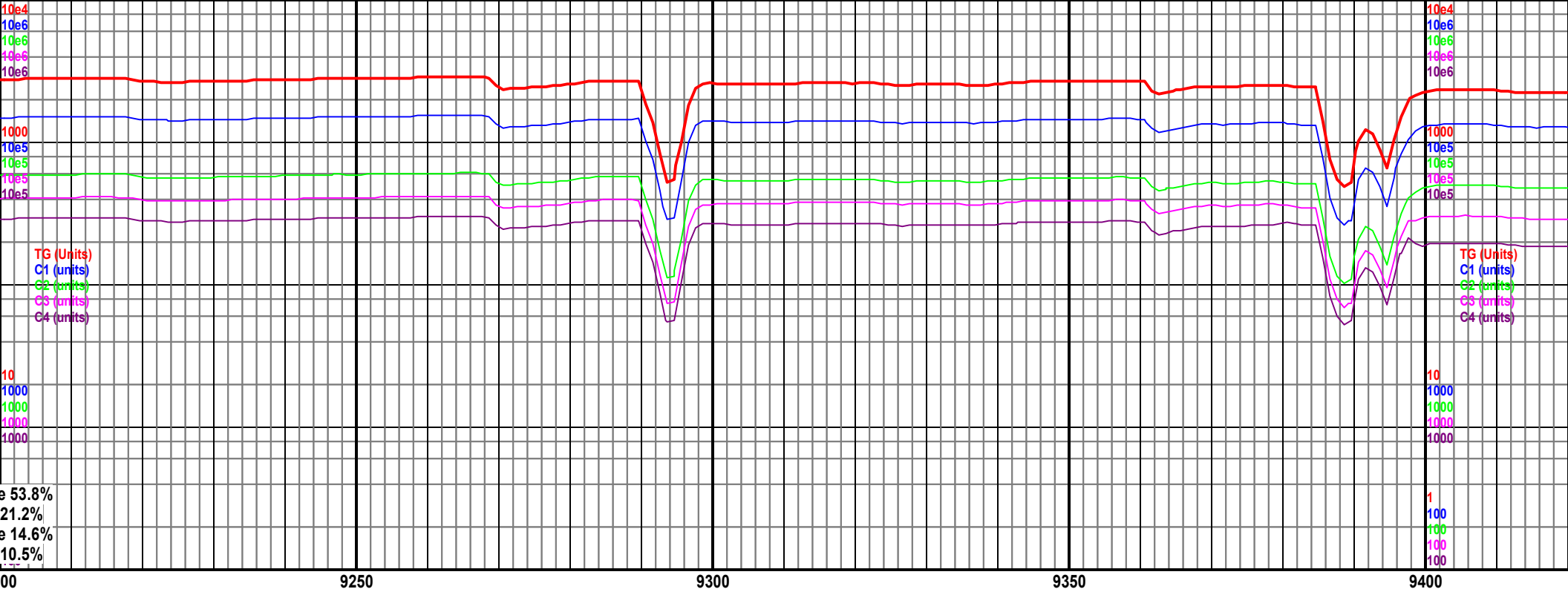
MD 9033 TVD 5824.15
INC 91 AZ 179.29
VS 2968.79

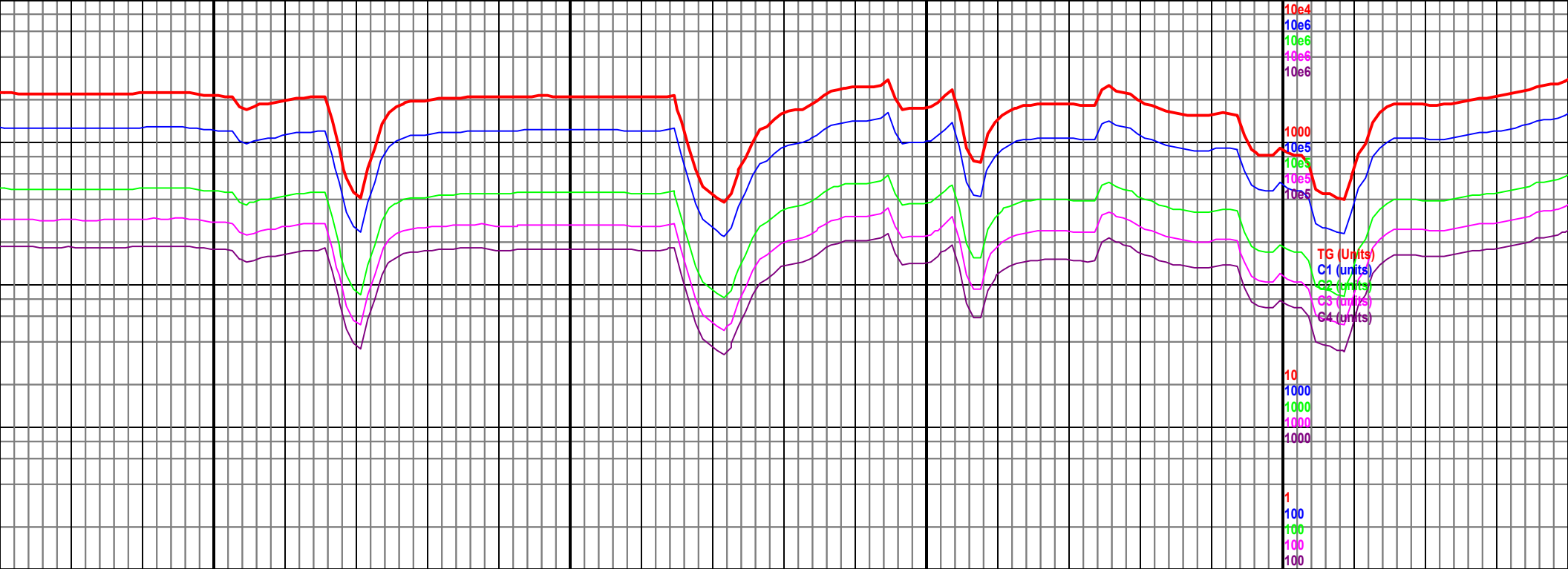
MD 9124 TVD 5822.2
INC 91.45 AZ 181.06
VS 3059.76

5700
(-767)



9000-9150 Mrst dk gy-blk, mottled ip,
sb blk, mod frm, chk lt gy-gy, mottled
ip, banded ip, sb blk-sb pty, sft, rr
inocs, occ bent, slow cut, 80% mrst,





9450

9500

9550

9600

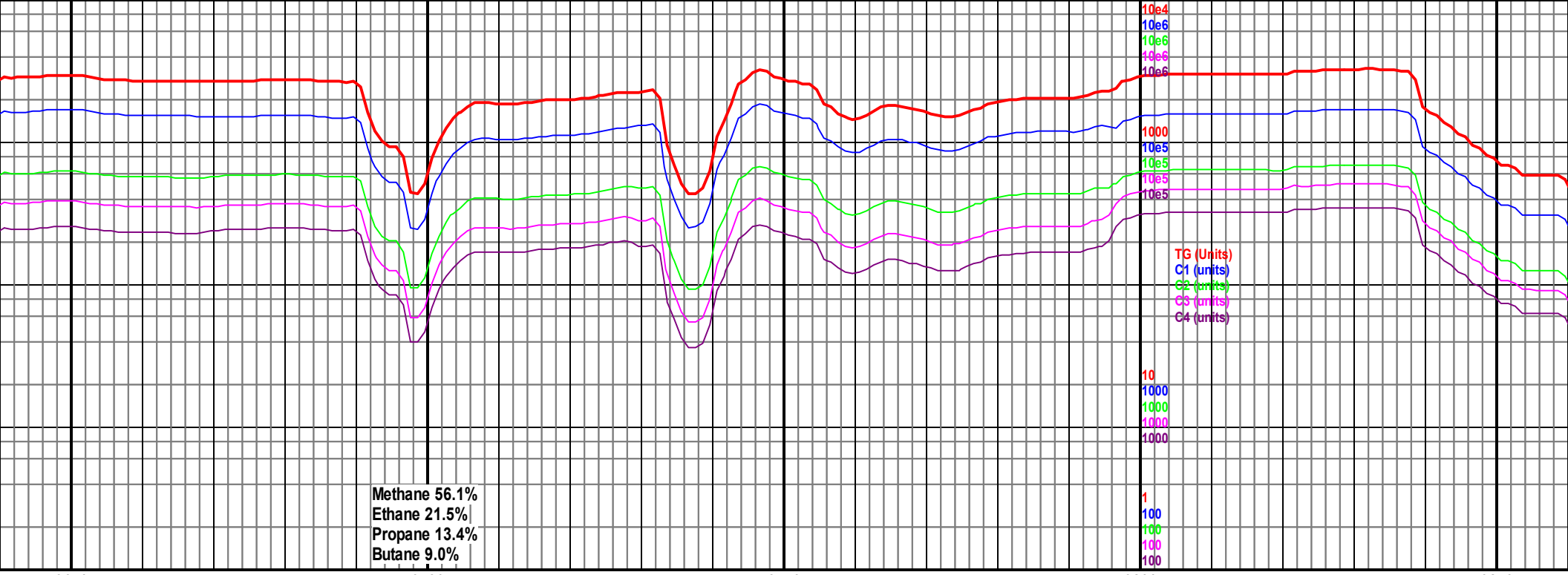
MD 9490 TVD 5813.19
INC 90.93 AZ 178.96
VS 3425.63

MD 9581 TVD 5810.93
INC 91.92 AZ 179.14
VS 3516.58

5100 TVD
Sub Sea (-167)

5700
(-767)

9450-9600 Mrlst dk gy-blk, mottled ip,
sb blk, mod frm, chk lt gy-gy, mottled
ip, banded ip, sb blk-sb plty, sft, abnt
inocs, rr bent, slow cut, 80% mrlist,



9650

9700

9750

9800

9850

MD 9673 TVD 5807.8
INC 91.98 AZ 178.63
VS 3608.51

MD 9763 TVD 5805.
INC 91.58 AZ 179.38
VS 3698.46

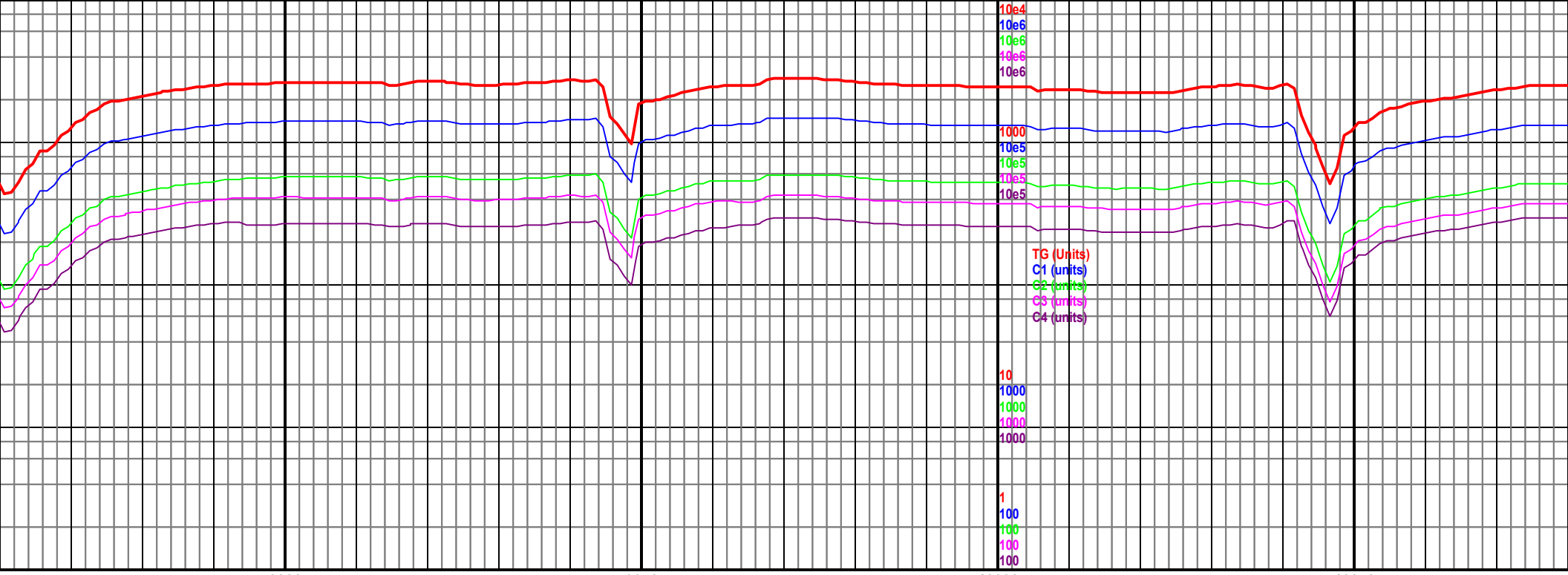
5100 TVD
Sub Sea (-167)

MD 9853 TVD 5805.
INC 91.58 AZ 179.38
VS 3698.46

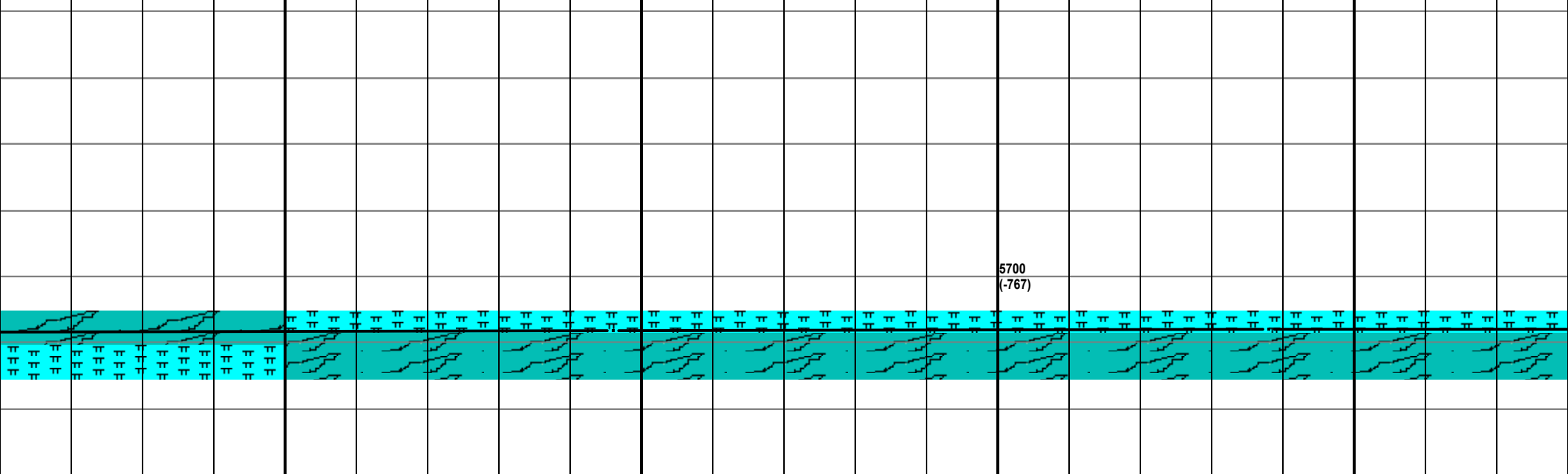
5700
(-767)

9600-9750 Chk lt gy-gy, banded ip,
mottled ip, sb blk-y-sb plty, sft, mrlst dk
gy-blk, mottled ip, sb blk-y, mod frm, rr
inocs, slow cut, 60% chk, 40% mrlst

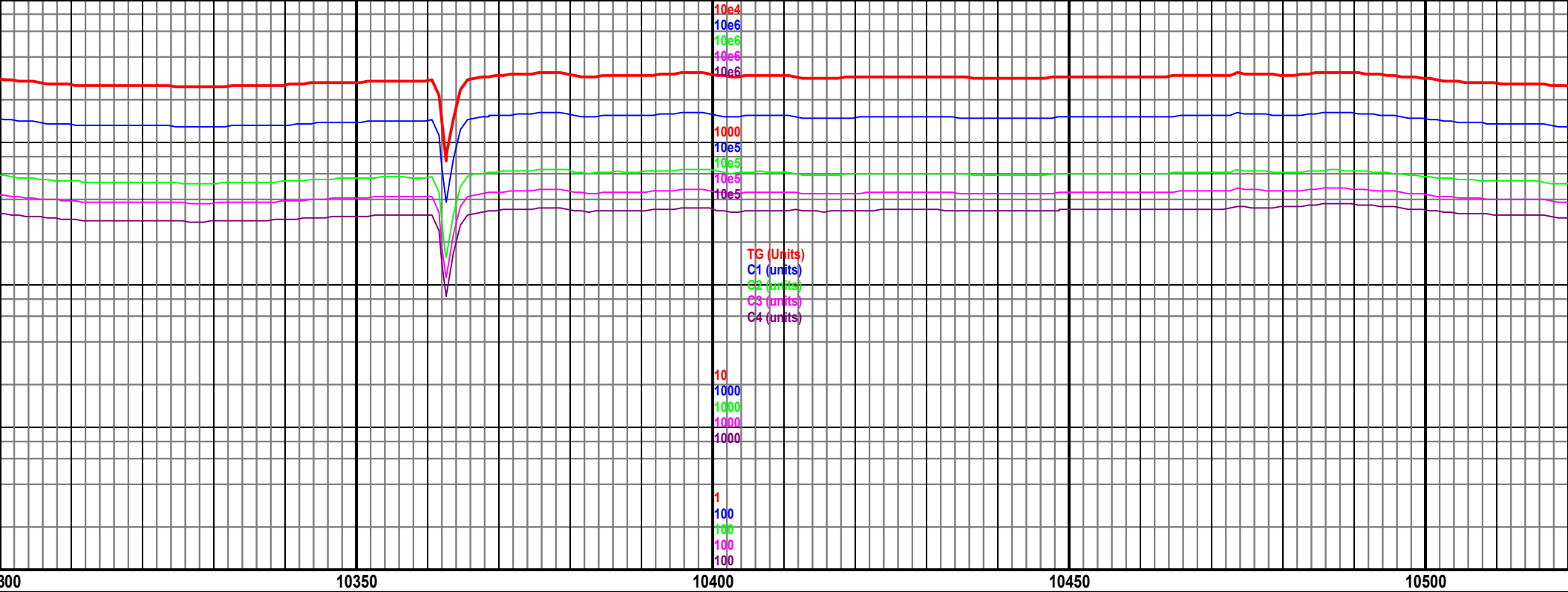
9750-9900 Chk lt gy-gy, banded ip,
mottled ip, sb blk-y-sb plty, sft, mrlst dk
gy-blk, mottled ip, sb blk-y, mod frm, rr
inocs, fast cut, 90% chk, 10% mrlst



855 TVD 5801.43 2.87 AZ 178.38 90.37	MD 9946 TVD 5797.26 INC 92.38 AZ 180 VS 3881.26	5100 TVD Sub Sea (-167)	MD 10038 TVD 5795. INC 90.44 AZ 179.58 VS 3973.22
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9900-10050 Mrlst dk gy-blk, mottled ip,
sb blk, mod frm, chk lt gy-gy, mottled
ip, banded ip, sb blk-sb pity, sft, slow
cut, 80% mrilst, 20% chk



MD 10312 TVD 5798.17
INC 90.66 AZ 180.98
VS 4247.15

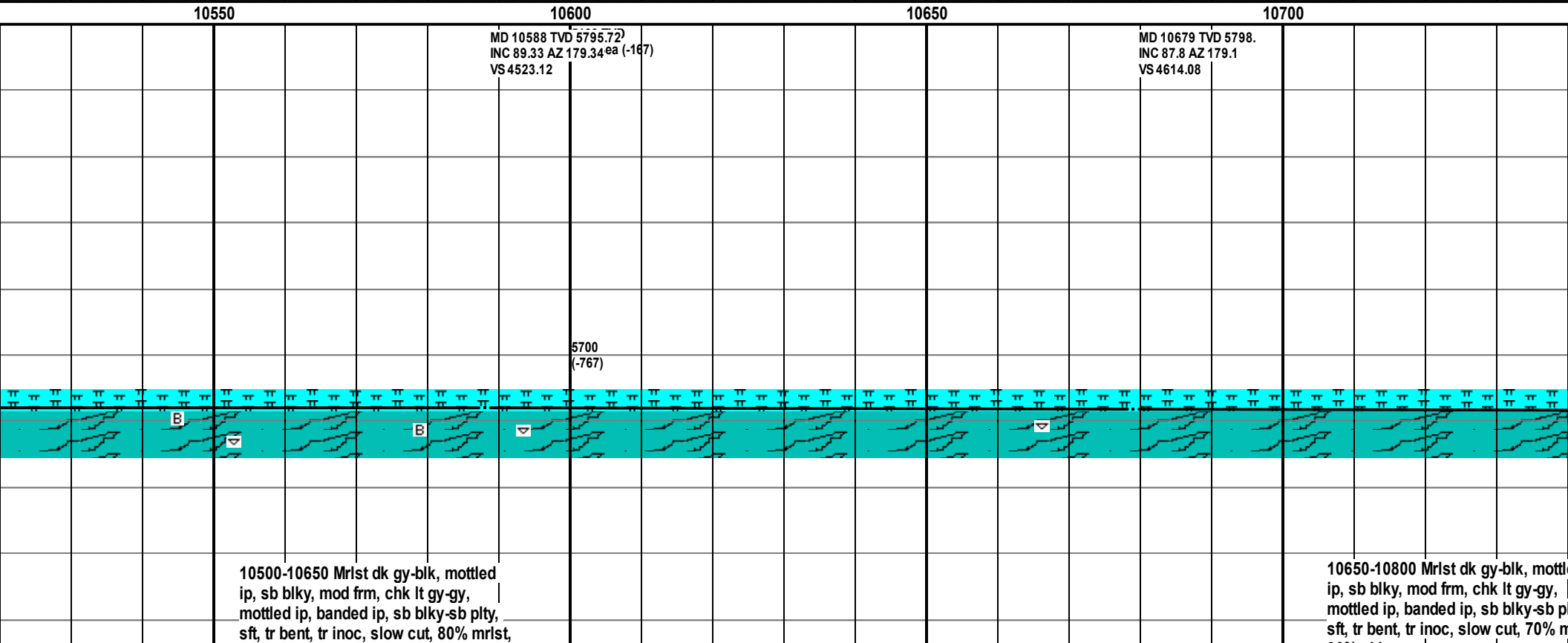
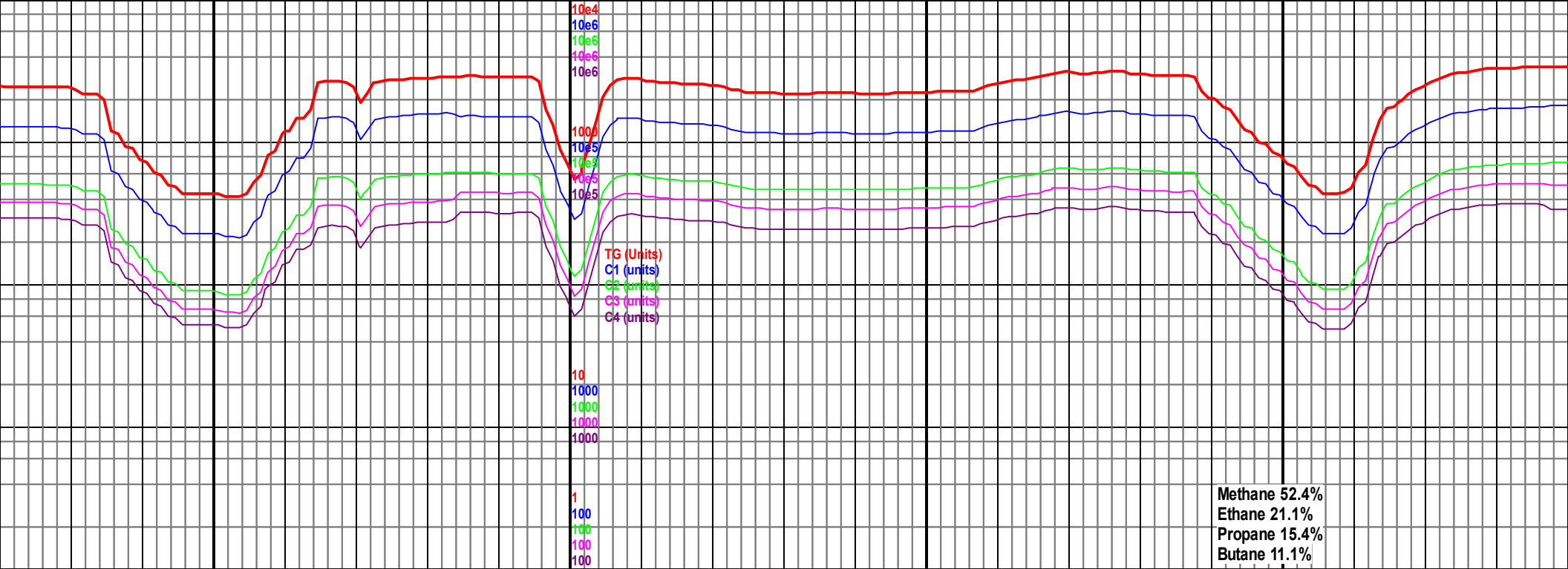
5100	MD 10404	TVD 5797.61
Sub S	INC 90.04	AZ 180.36
	VS 4339.14	

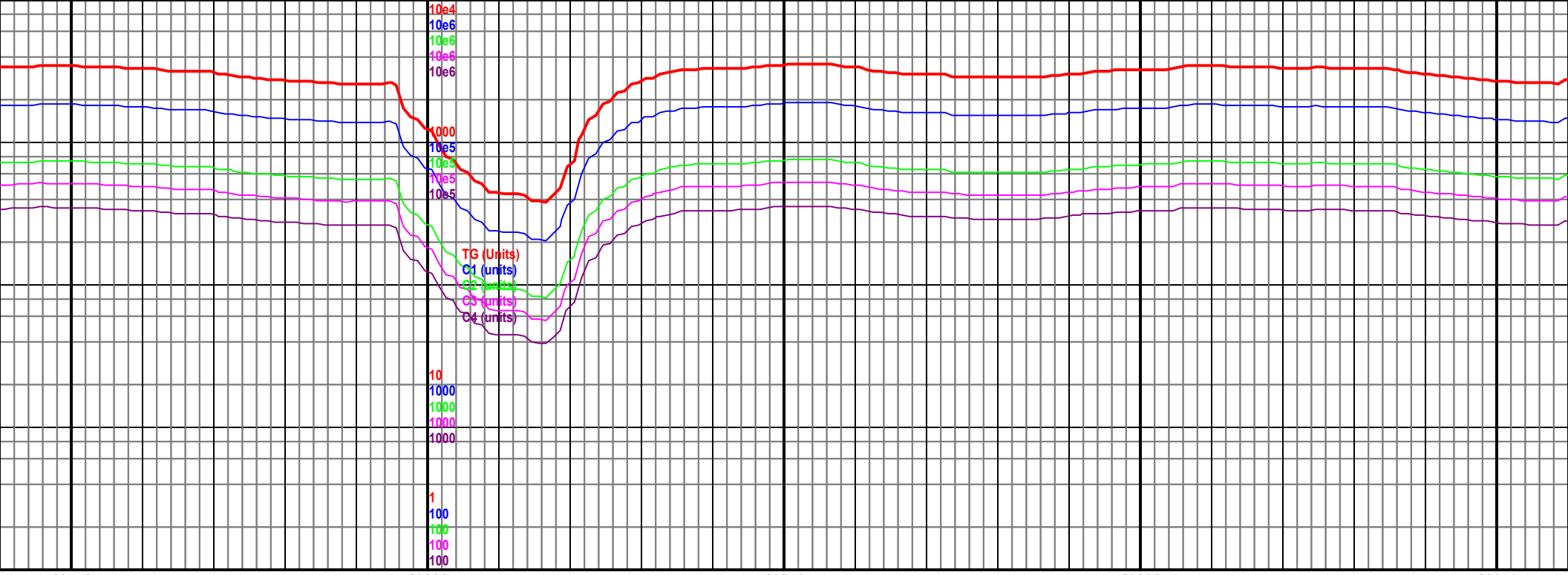
MD 10496 TVD 5796.38
INC 91.49 AZ 180.08
VS 4431.13

5700
(-767)

B

10350-10500 Mrlist dk gy-blk, mottled
ip, sb blkly, mod frm, chk lt gy-gy,
mottled ip, banded ip, sb blkly-sb plty,
sft, rr bent, slow cut, 80% mrlst, 20%





10750

10800

10850

10900

10950

MD 10771 TVD 5801.24
INC 88.16 AZ 179.4
VS 4706.01

5100 TVD
Sub Sea (-167)

MD 10861 TVD 5803.94
INC 88.41 AZ 178.95
VS 4795.96

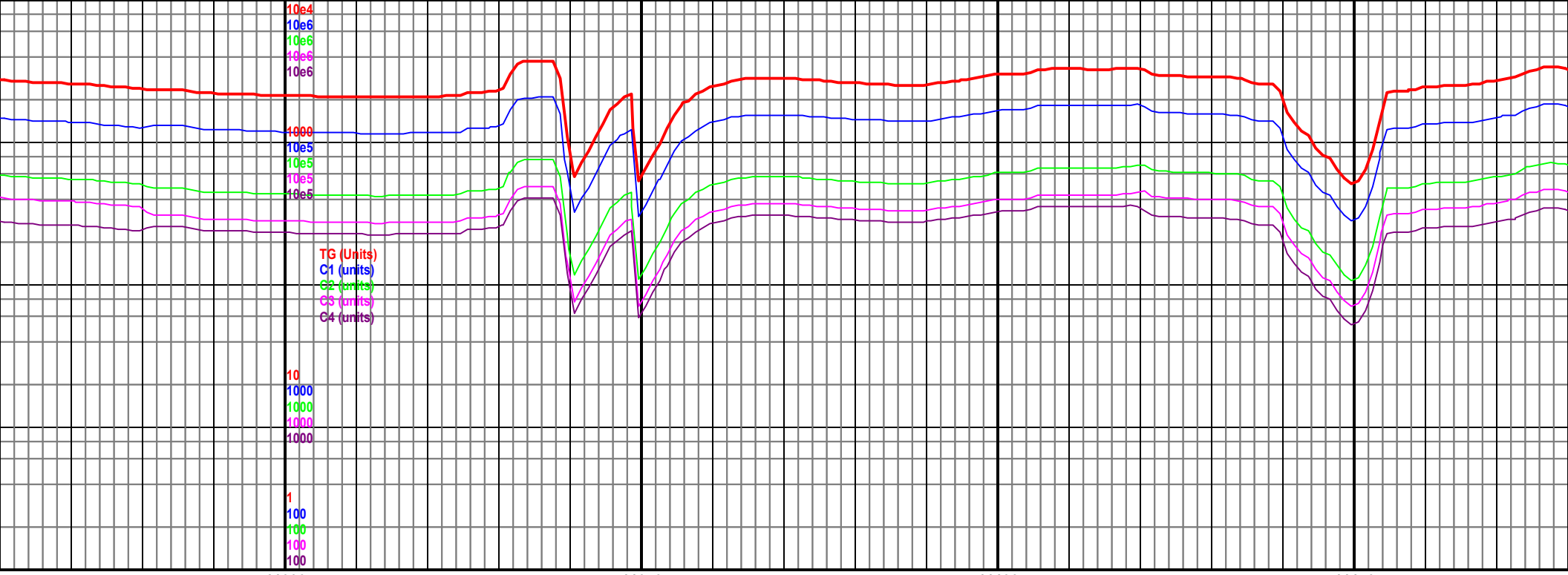
MD
INC
VS 4

5700
(-767)

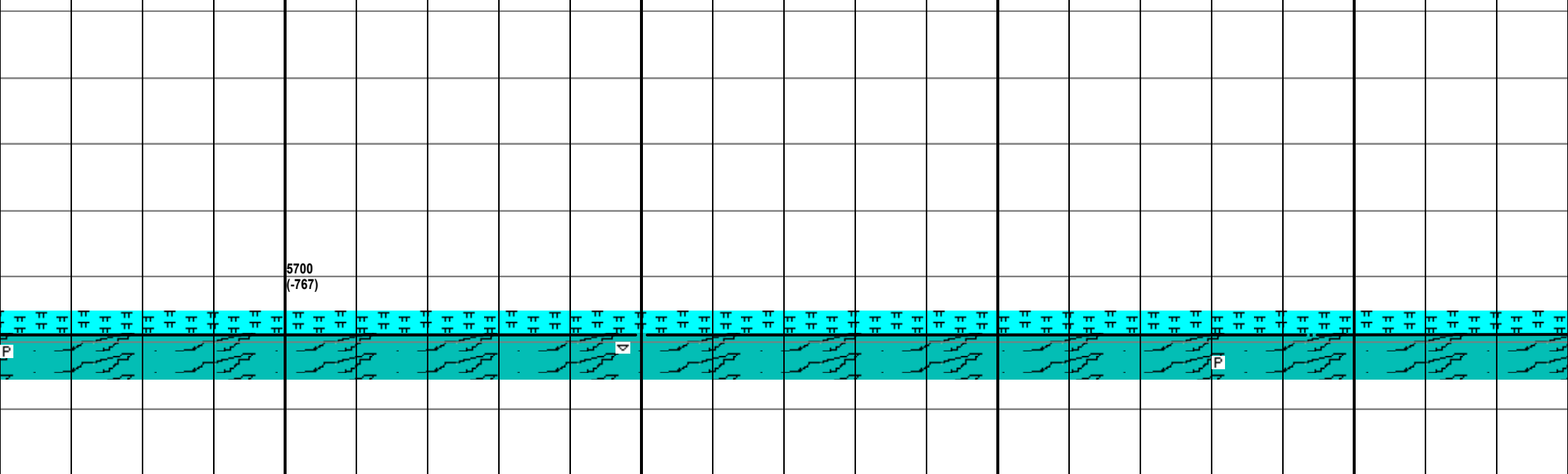


ed
ity,
hrst,

10800-10950 Mrst dk gy-blk, mottled
ip, sb blk, mod frm, chk lt gy-gy,
mottled ip, banded ip, sb blk-sb plty,
sft, rr bent, rr inoc, rr pyr, slow cut,

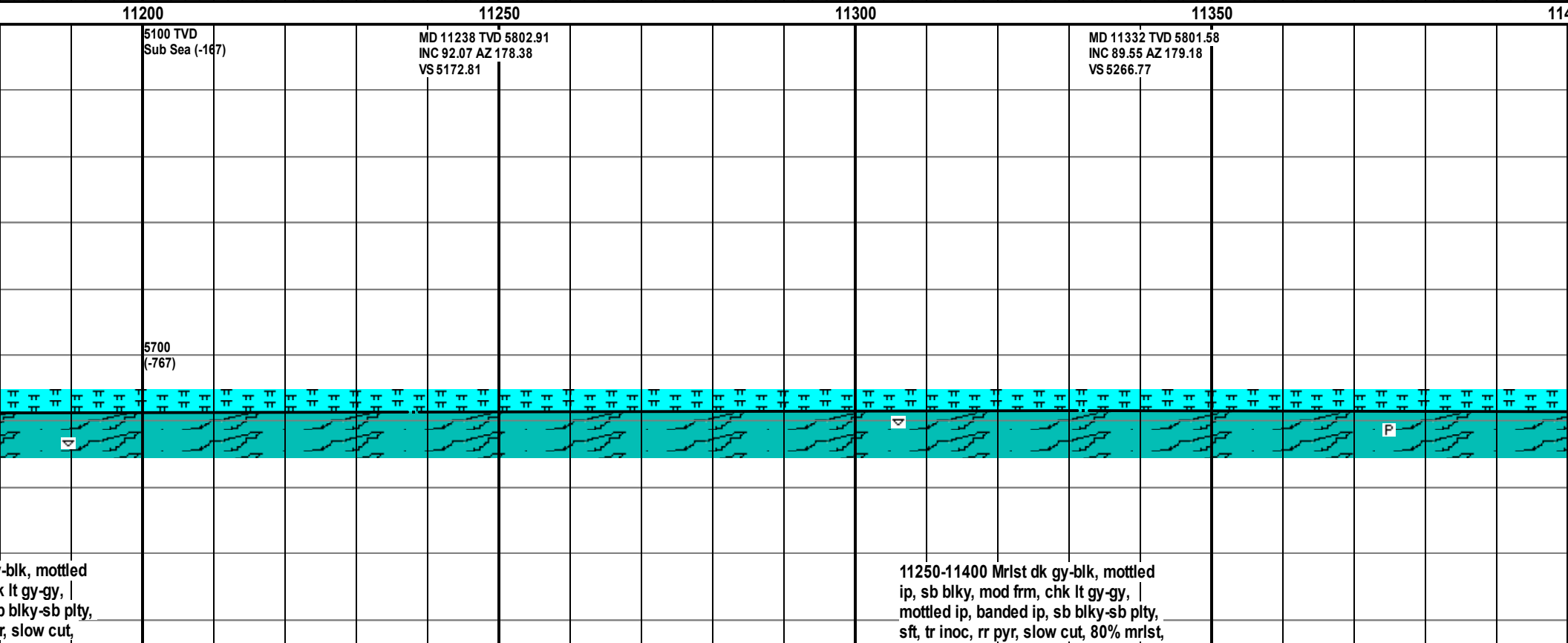
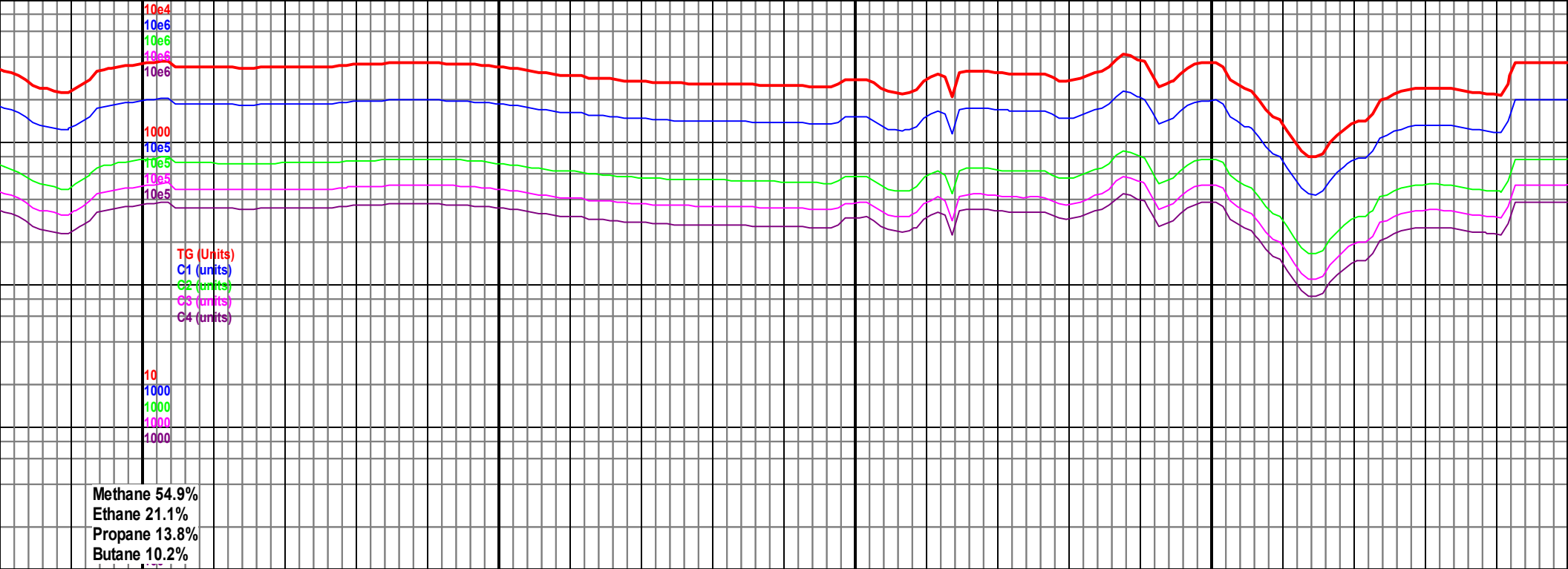


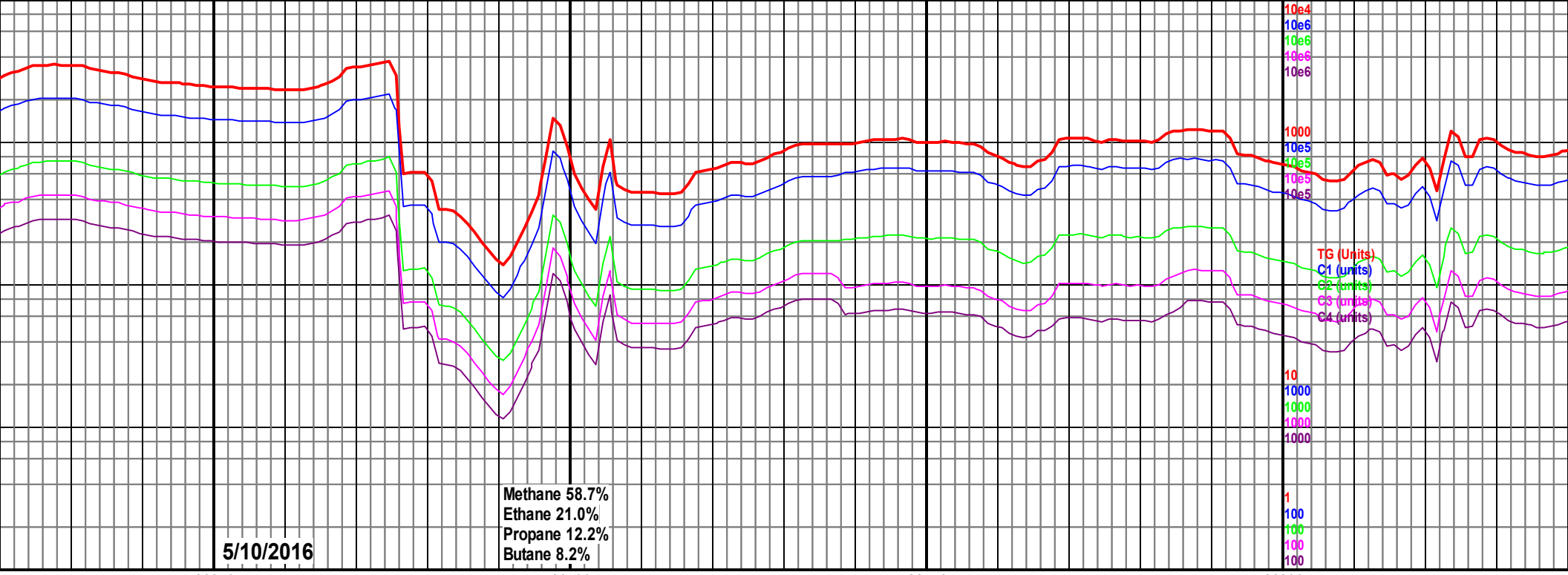
10956 TVD 5806.19 88.87 AZ 179.08 890.92	5100 TVD Sub Sea (-167)	MD 11050 TVD 5806.76 INC 90.44 AZ 179.39 VS 4984.91	MD 11144 TVD 5805.5 INC 91.09 AZ 178.53 VS 5078.88
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10950-11100 Mrlst dk gy-blk, mottled
ip, sb blk, mod frm, chk lt gy-gy,
mottled ip, banded ip, sb blk-sb plty,
sft, tr bent, rr inoc, rr pyr, slow cut,

11100-11250 Mrlst dk gy
ip, sb blk, mod frm, chk
mottled ip, banded ip, sb
sft, tr bent, rr inoc, rr pyr





1615 TVD 5802.81
8.74 AZ 179.05
49.71

MD 11709 TVD 5803.92
INC 89.91 AZ 178.02
VS 5643.67

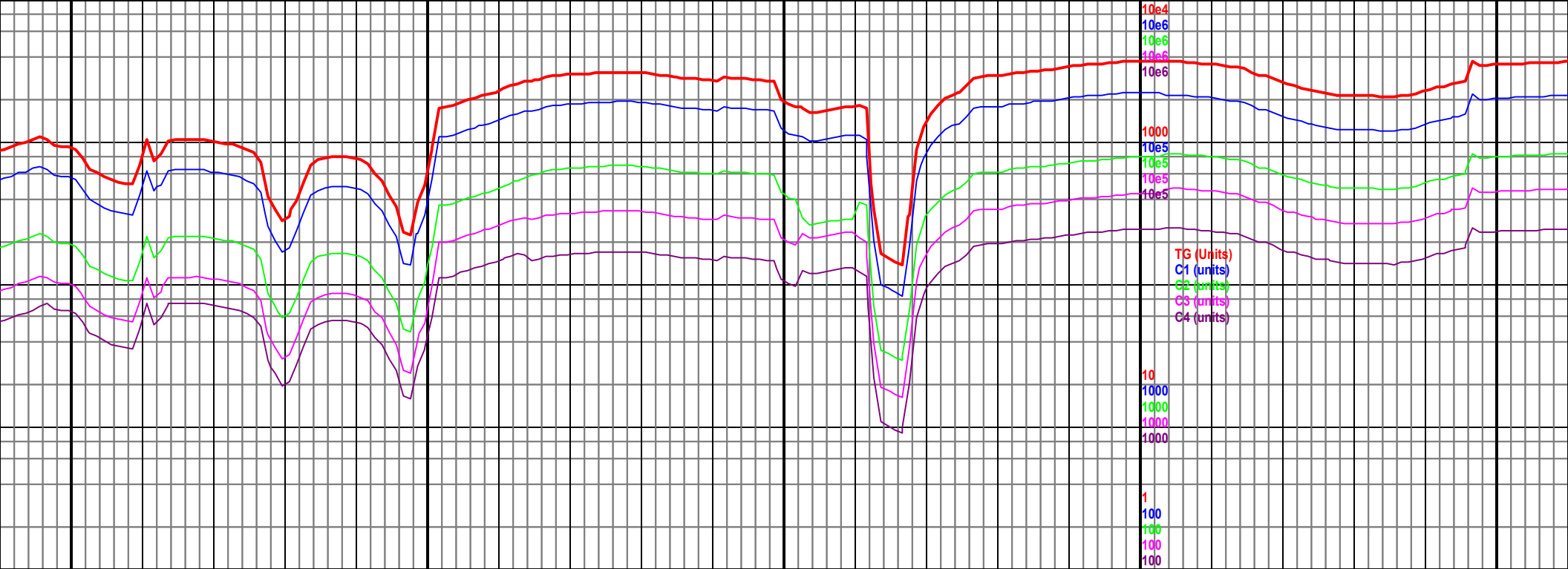
5100 MD 11804 TVD 5805.24
Sub S INC 88.5 AZ 179.07
VS 5738.63

TOOH for wiper trip due to
high torque rates at 11695'
MD at 00:45 on 5/10/2016.
Resumed drilling at 11:20

5700
(-767)

rlst dk gy-blk, mottled
d frm, chk lt gy-gy,
ded ip, sb blk-y-sb plty,
v cut, 80% mlst, 20%

11700-11850 Mrst dk gy-blk, mottled
ip, sb blk-y, mod frm, chk lt gy-gy,
mottled ip, banded ip, sb blk-y-sb plty,
sft, tr inoc, slow cut, 80% mlst, 20%

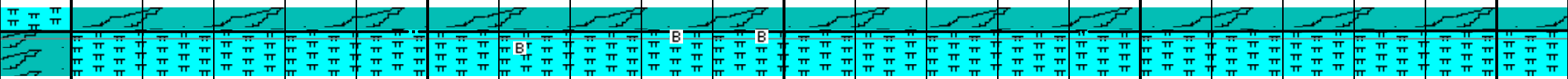


11850 11900 11950 12000 12050

MD 11898 TVD 5806.62
INC 89.82 AZ 178.31
VS 5832.59

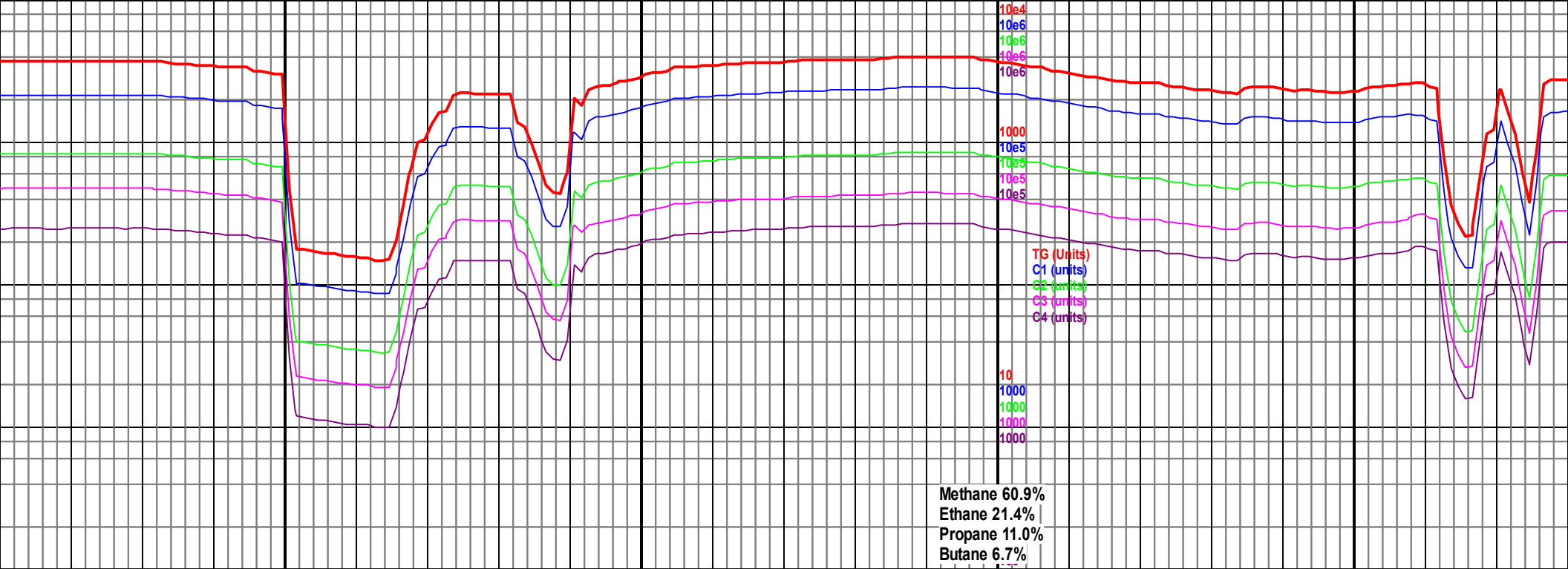
MD 11992 TVD 5806.28
INC 90.59 AZ 180.83
VS 5926.58

5700
(-767)



11850-12000 Mrlst dk gy-blk, mottled
ip, sb blk, mod frm, chk lt gy-gy,
mottled ip, banded ip, sb blk-sb pty,
sft, tr bent, slow cut, 80% mrlist, 20%

12000-12050
ip, s
mott
sft



12100

12150

12200

12250

MD 12086 TVD 5804.7
INC 91.33 AZ 181.12
VS 6020.55

MD 12180 TVD 5802.24
INC 91.67 AZ 179.43
VS 6114.52

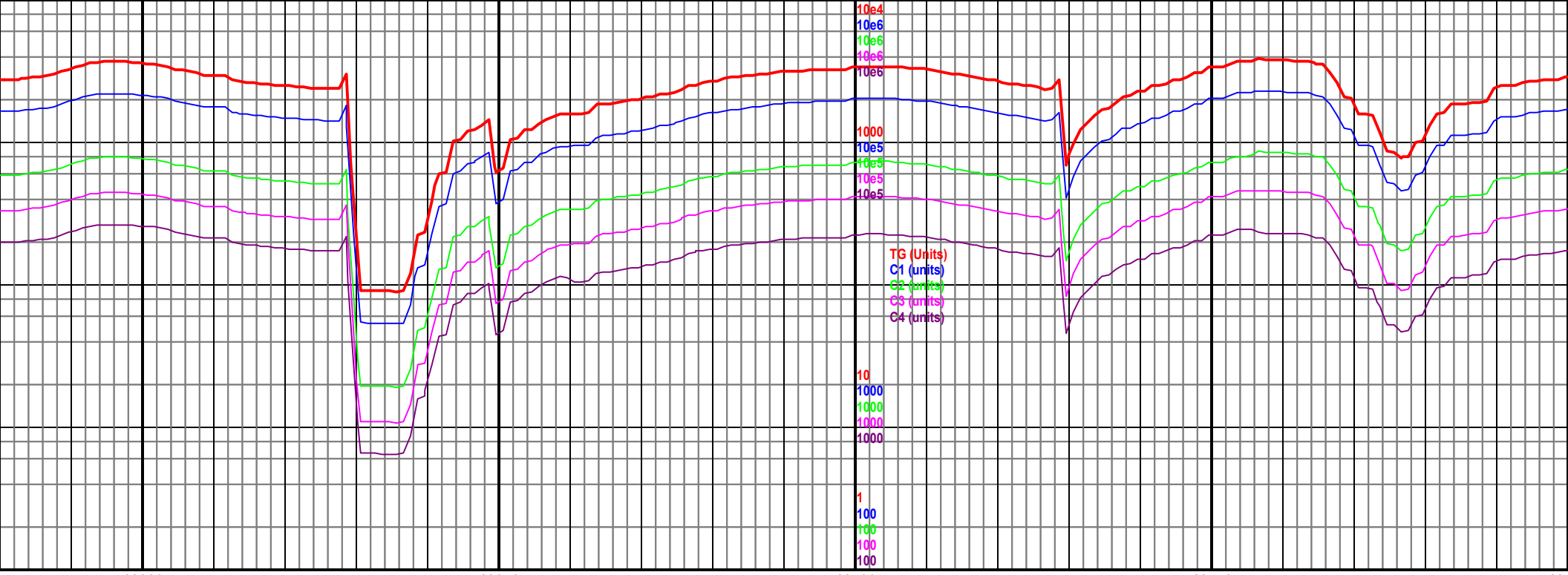
5100 TVD
Sub Sea (-167)

MD 12180 TVD 5802.24
INC 91.67 AZ 179.43
VS 6114.52

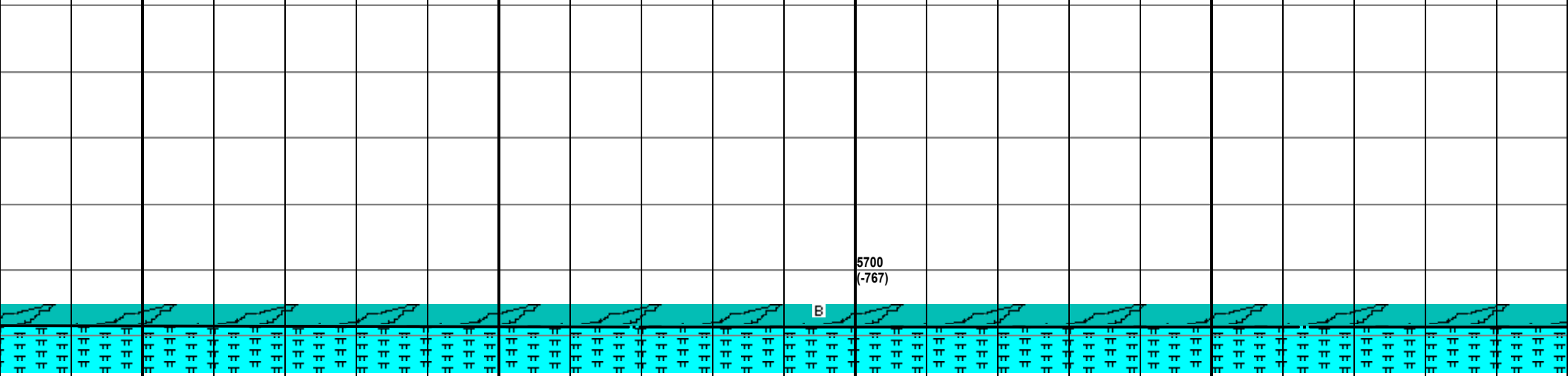
5700
(-767)

00-12150 Mrlst dk gy-blk, mottled
sb blk, mod frm, chk lt gy-gy,
mottled ip, banded ip, sb blk-sb plty,
tr bent, tr inocs, rr pyr, slow cut,

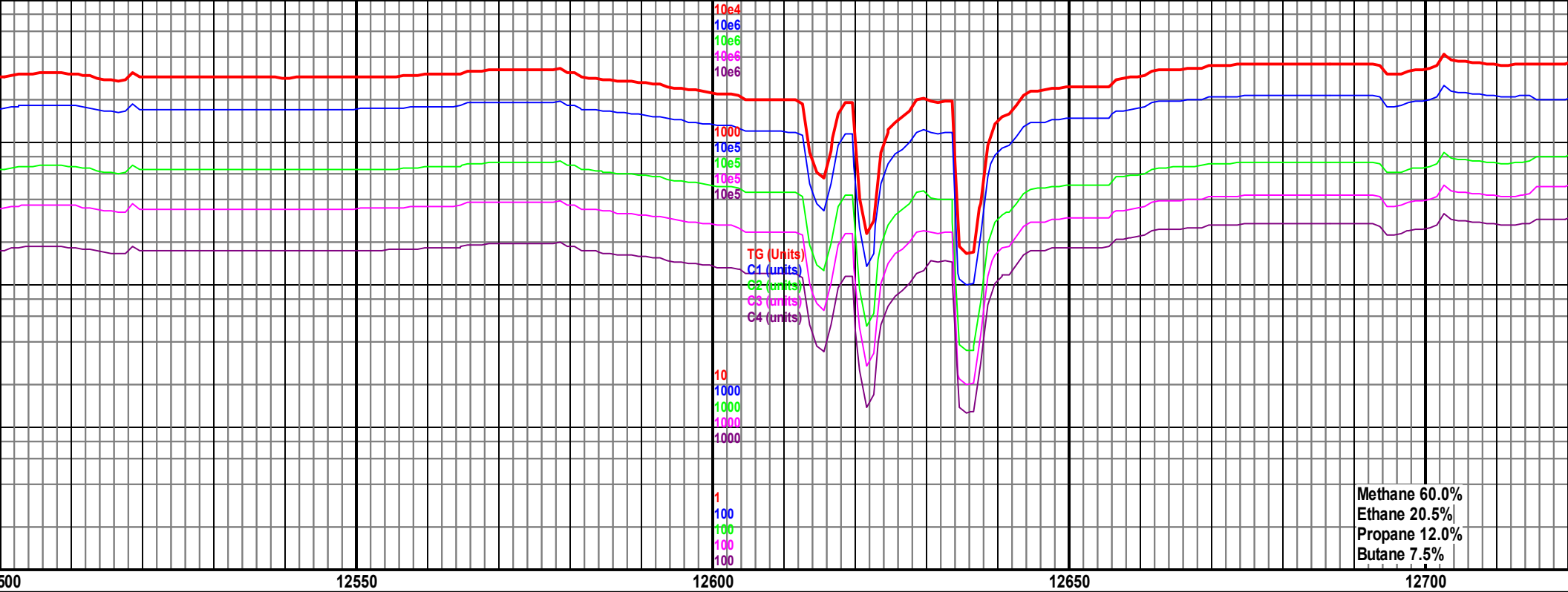
12150-12300 Mrlst dk gy-blk, mottled
ip, sb blk, mod frm, chk lt gy-gy,
mottled ip, banded ip, sb blk-sb plty,
sft, rr bent, rr inocs, rr pyr, slow cut,



274 TVD 5801.6 .12 AZ 180.56 8.51	MD 12369 TVD 5802.93 INC 89.27 AZ 179.84 VS 6303.49	5100 TVD Sub Sea (-167)	MD 12463 TVD 5803.42 INC 90.13 AZ 180.06 VS 6397.49
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12300-12450 Mrlst dk gy-blk, mottled
ip, sb blk, mod frm, chk lt gy-gy,
mottled ip, banded ip, sb blk-sb plty,
sft, rr bent, slow cut, 90% mrlst, 10%



MD 12558 TVD 5802.47
INC 91.02 AZ 180.05
VS 6492.49

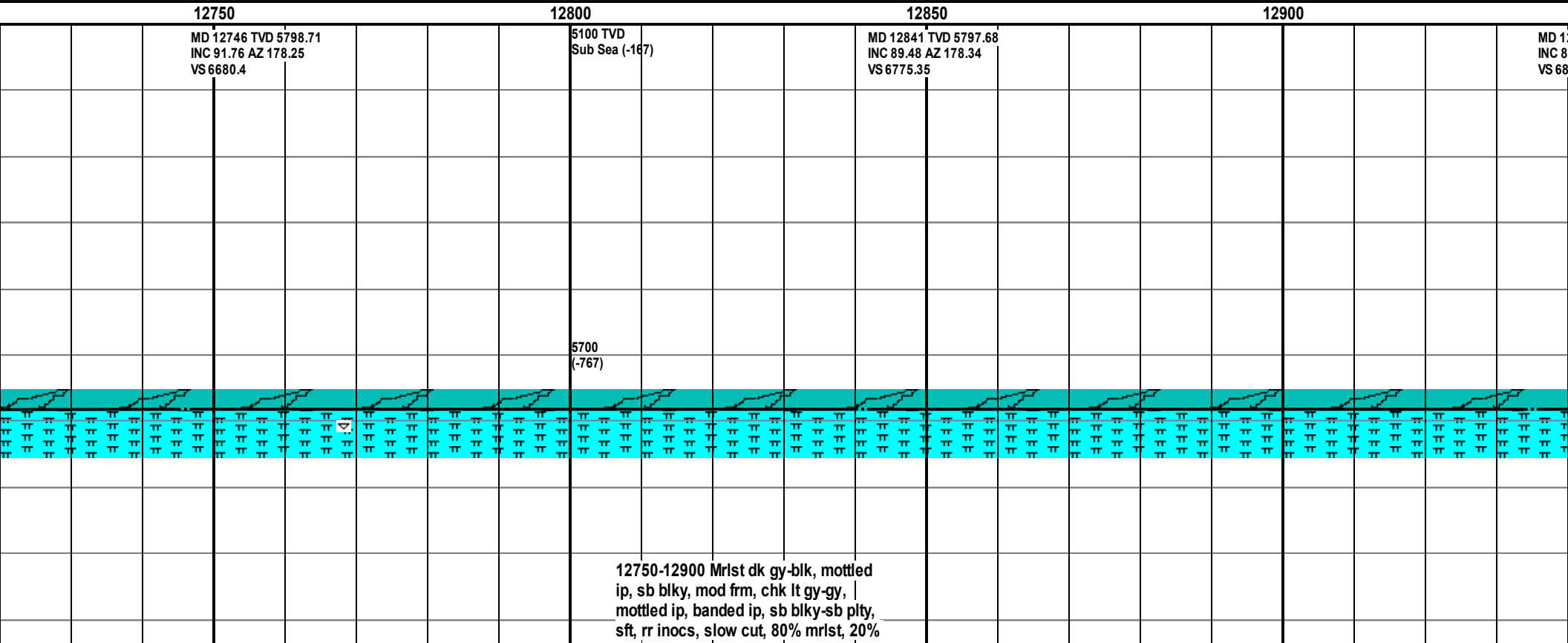
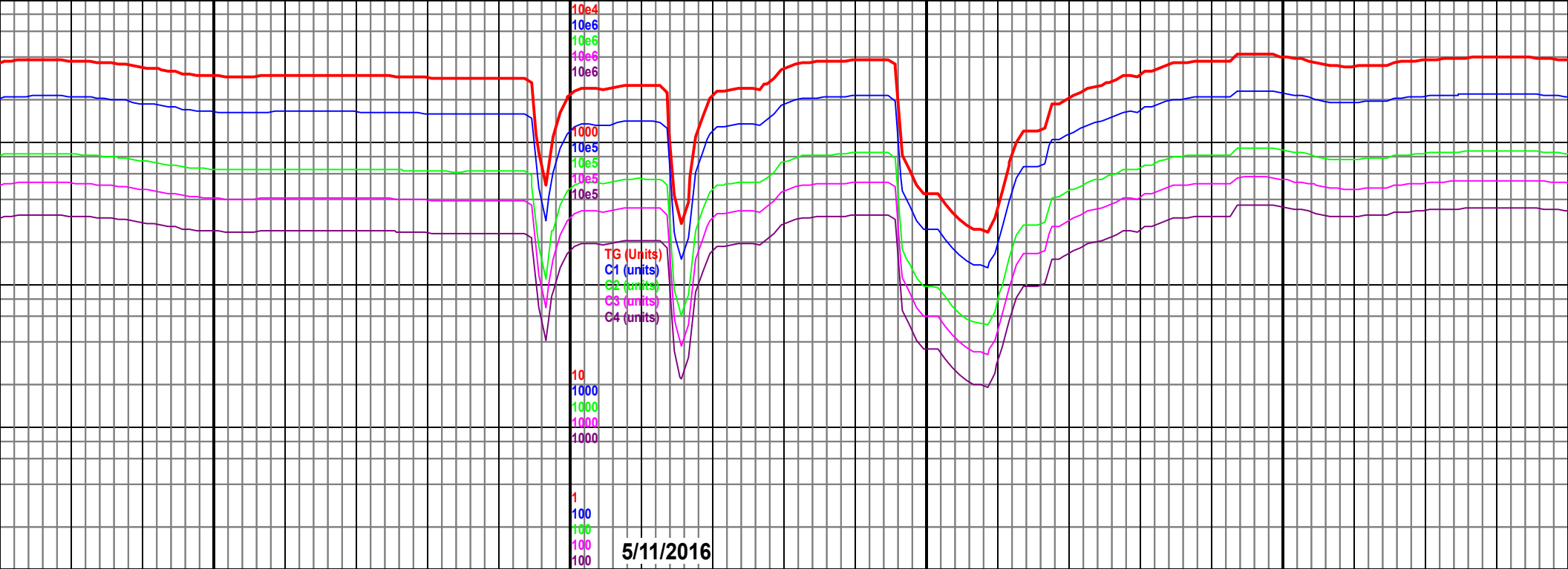
5100 TVD
Sub Sea (-167)

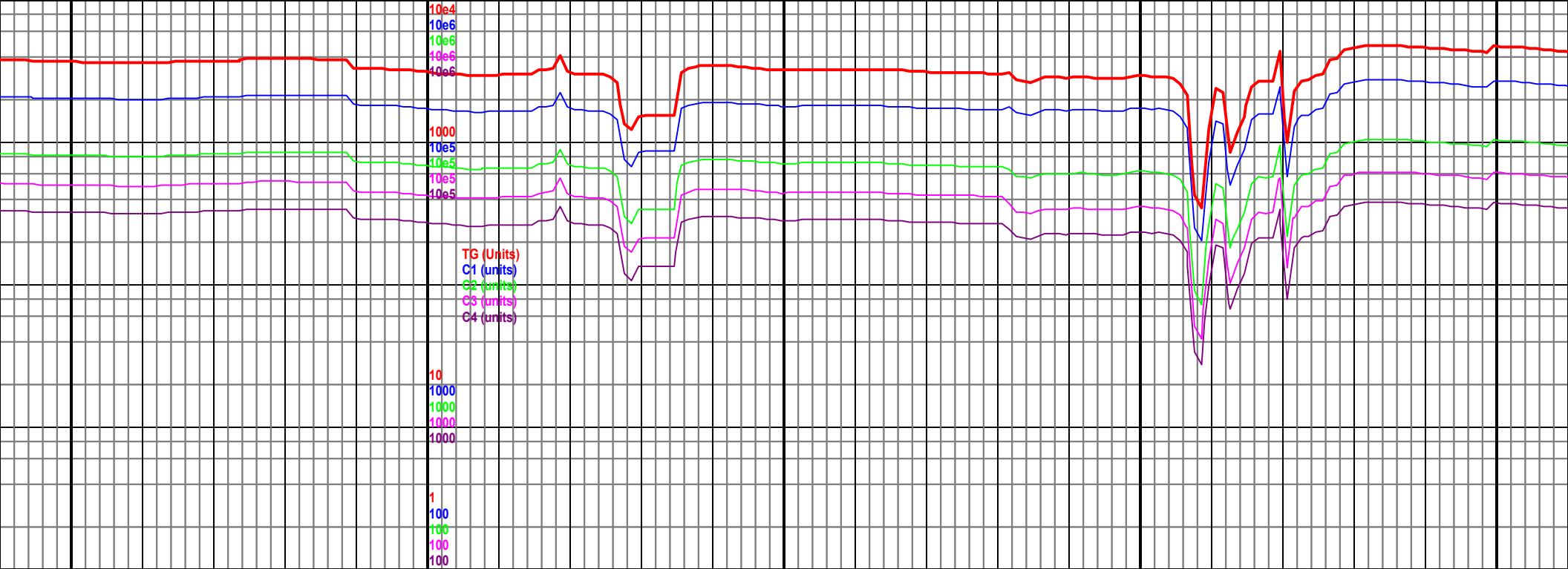
MD 12652 TVD 5800.89
INC 90.9 AZ 178.6
VS 6586.46

5700
(-767)

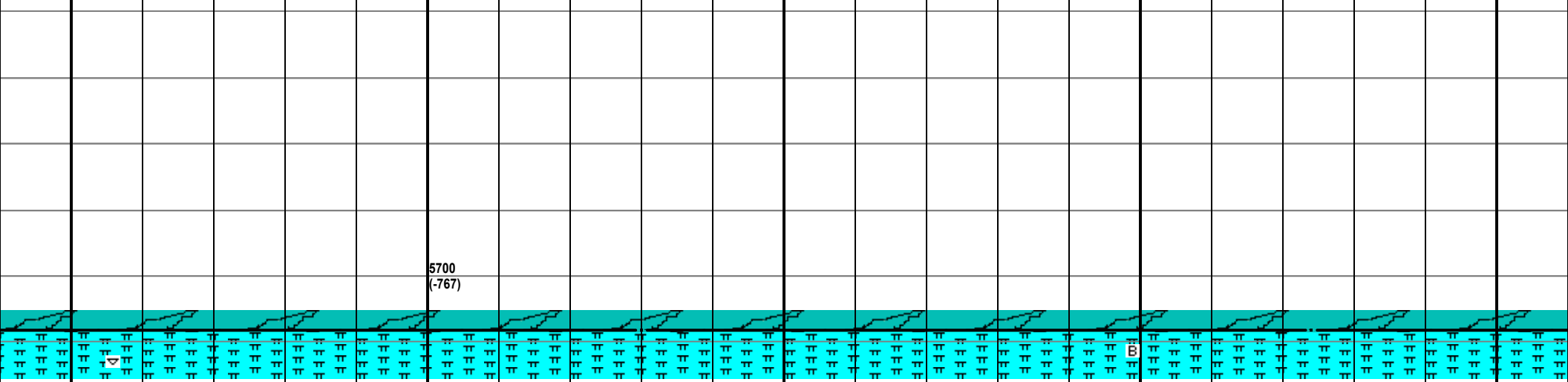
12450-12600 Mrlst dk gy-blk, mottled
ip, sb blk, mod frm, chk lt gy-gy,
mottled ip, banded ip, sb blk-sb plty,
sft, slow cut, 90% mrlst, 10% chk

12600-12750 Mrlst dk gy-blk, mottled
ip, sb blk, mod frm, chk lt gy-gy,
mottled ip, banded ip, sb blk-sb plty,
sft, slow cut, 80% mrlst, 20% chk



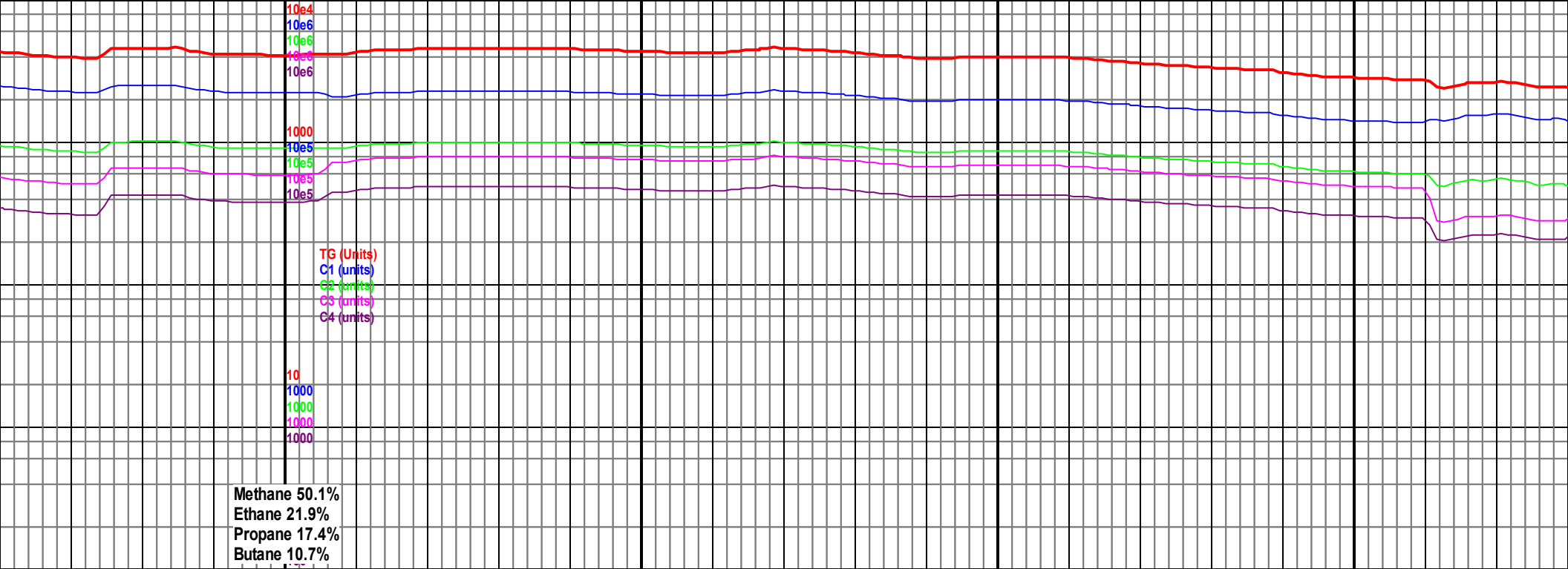


2935 TVD 5798.19 9.91 AZ 178.28 69.31	5100 TVD Sub Sea (-167)	MD 13030 TVD 5797.67 INC 90.71 AZ 178.38 VS 6964.26		MD 13124 TVD 5798.12 INC 88.74 AZ 178.4 VS 7058.22
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12900-13050 Mrlst dk gy-blk, mottled ip, sb blk, mod frm, chk lt gy-gy, mottled ip, banded ip, sb blk-sb plty, sft, tr inocs, rr bent, rr pyr, slow cut,

13050-13200 Chk lt gy-gy, banded ip, mottled ip, sb blk-sb plty, sft, mrst dk gy-blk, mottled ip, sb blk, mod frm, rr bent, slow cut, 90% chk, 10% mrst



13200 13250 13300 13350

5100 TVD
Sub Sea (-167)

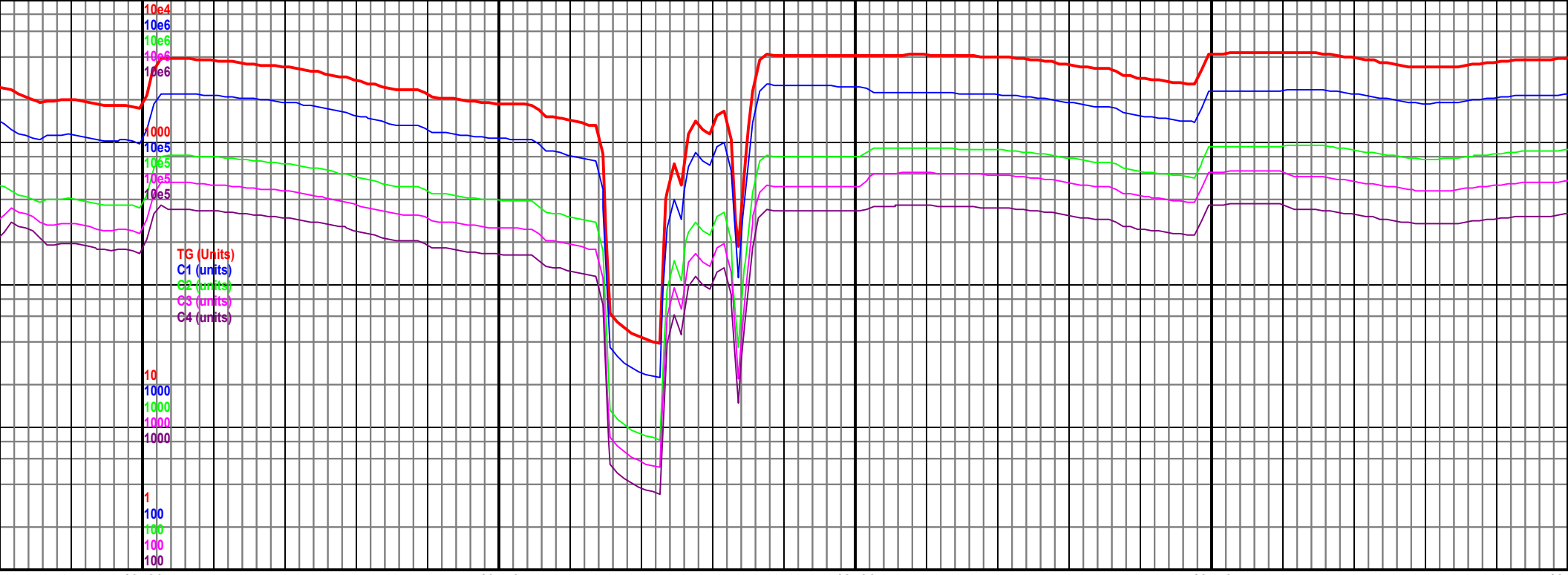
MD 13218 TVD 5799.07
INC 90.1 AZ 178.24
VS 7152.17

MD 13312 TVD 5797.5
INC 91.82 AZ 178.04
VS 7246.11

5700
(-767)



13200-13350 Chk It gy-gy, banded ip, mottled ip, sb blk-y-sb plty, sft, mrlst dk gy-blk, mottled ip, sb blk-y, mod frm, rr bent, rr inocs, slow cut, 90% chk, 10%



13400 13450 13500 13550 13600

5100 TVD MD 13406 TVD 5795.57
Sub Sea INC 90.53 AZ 178.35
VS 7340.04

MD 13500 TVD 5796.29
INC 88.59 AZ 179.22
VS 7434.01

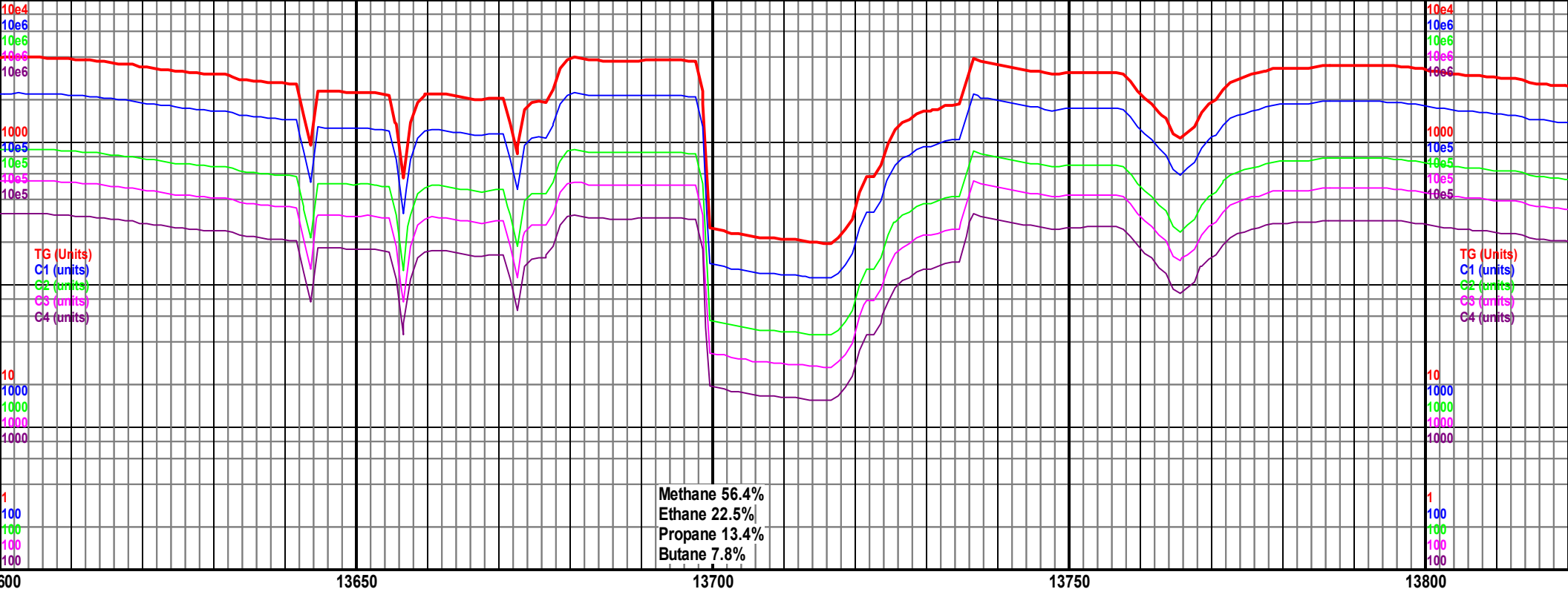
MD 13600 TVD 5796.29
INC 88.59 AZ 179.22
VS 7434.01

5700
(-767)



13350-13500 Chk It gy-gy, banded ip,
mottled ip, sb blk-y-sb plty, sft, mrlist dk
gy-blk, mottled ip, sb blk-y, mod frm, rr
bent, slow cut, 70% chk, 30% mrlist

13500-13650 Chk It gy-gy, banded ip,
mottled ip, sb blk-y-sb plty, sft, mrlist dk
gy-blk, mottled ip, sb blk-y, mod frm, rr
inoc, slow cut, 50% chk, 50% mrlist



594 TVD 5797.09
.44 AZ 179.01
7.99

MD 13687 TVD 5798.18
INC 88.22 AZ 179.64
VS 7620.97

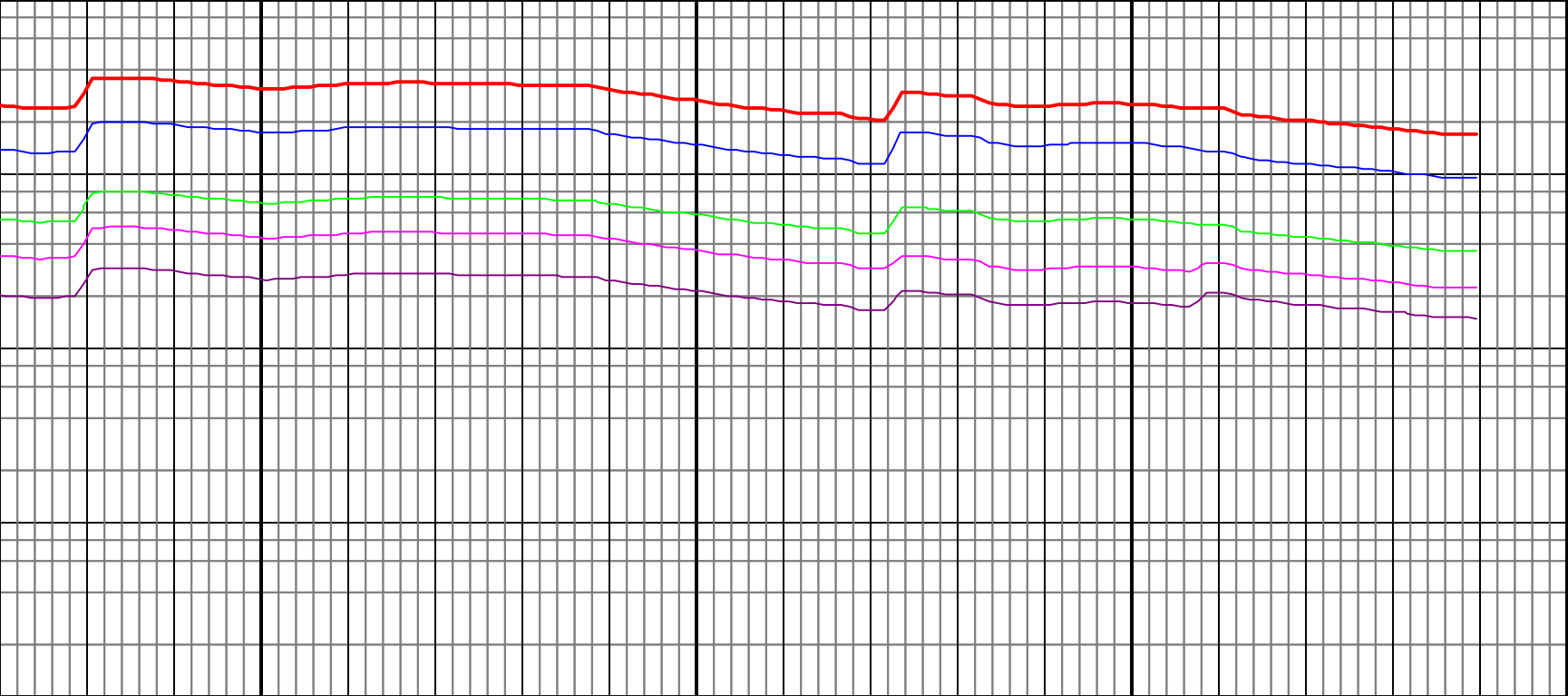
MD 13781 TVD 5800.11
INC 89.42 AZ 179.94
VS 7714.95

5100 TVD
Sub Sea (-167)

5700
(-767)

5700
(-767)

13650-13800 Mrlst dk gy-blk, mottled
ip, sb blk, mod frm, chk lt gy-gy,
mottled ip, banded ip, sb blk-sb plty,
sft. rr bent. slow cut. 70% mrlst. 30%



13850

13900

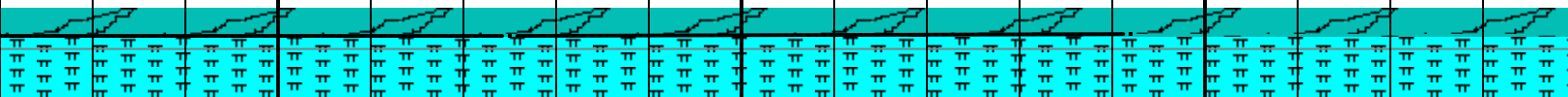
13950

14000

MD 13875 TVD 5799.62
INC 91.18 AZ 179.96
VS 7808.94

MD 13942 TVD 5797.56
INC 92.35 AZ 180.17
VS 7875.91

TD 13990' MD reached at
12:02 on 5/11/2016



13800-13990 Mrlst dk gy-blk, mottled
ip, sb blk, mod frm, chk lt gy-gy,
mottled ip, banded ip, sb blk-sb plty,
sft, slow cut, 70% mrlst, 30% chk