



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

Well Name: Razor 27K-3406B
Location: NESW 27-T10N-R58W
License Number: 05-123-37708
Spud Date: 8/17/2013
Surface Coordinates: Lat.: 40.808608 Long.: -103.853381
Region: Redtail Field
Drilling Completed: 08/26/2013
Bottom Hole Coordinates: Lat.: 40.787981 Long.: -103.854572
Ground Elevation (ft): 4750 **K.B. Elevation (ft):** 4767
Logged Interval (ft): 5200 **To:** 12382 **Total Depth (ft):** 12382
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: Brian Reddick, Lois Martin, Kyle Newman
Company: Acme Geologic Consulting
Address: 108 Berry Street
Little Rock, AR 72205

Drilling Company

Cade Drilling, LLC
Rig #23

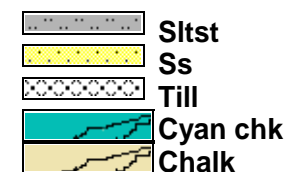
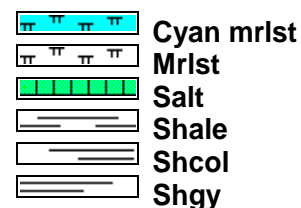
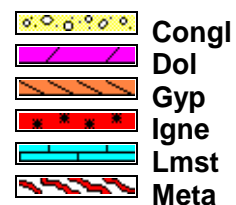
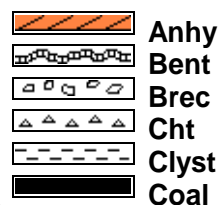
Gas Detection

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

Comments

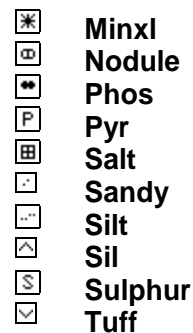
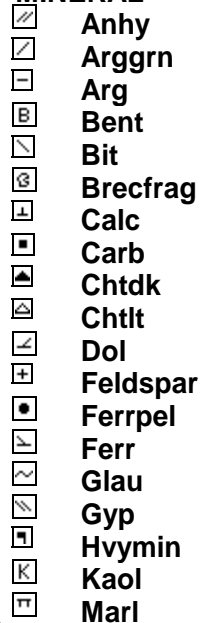
Lithologies and tops at drilled depths, not corrected to elogs. Where the well bore gas is 100% methane, the C1 line is moved to 85% for graphical purposes only.

ROCK TYPES

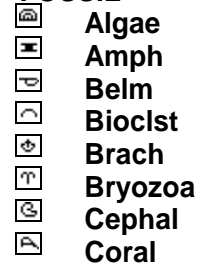


ACCESSORIES

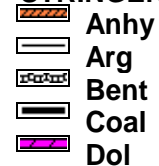
MINERAL



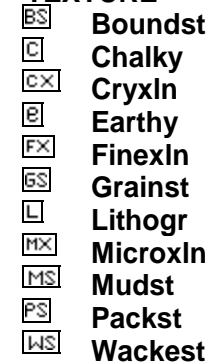
FOSSIL



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

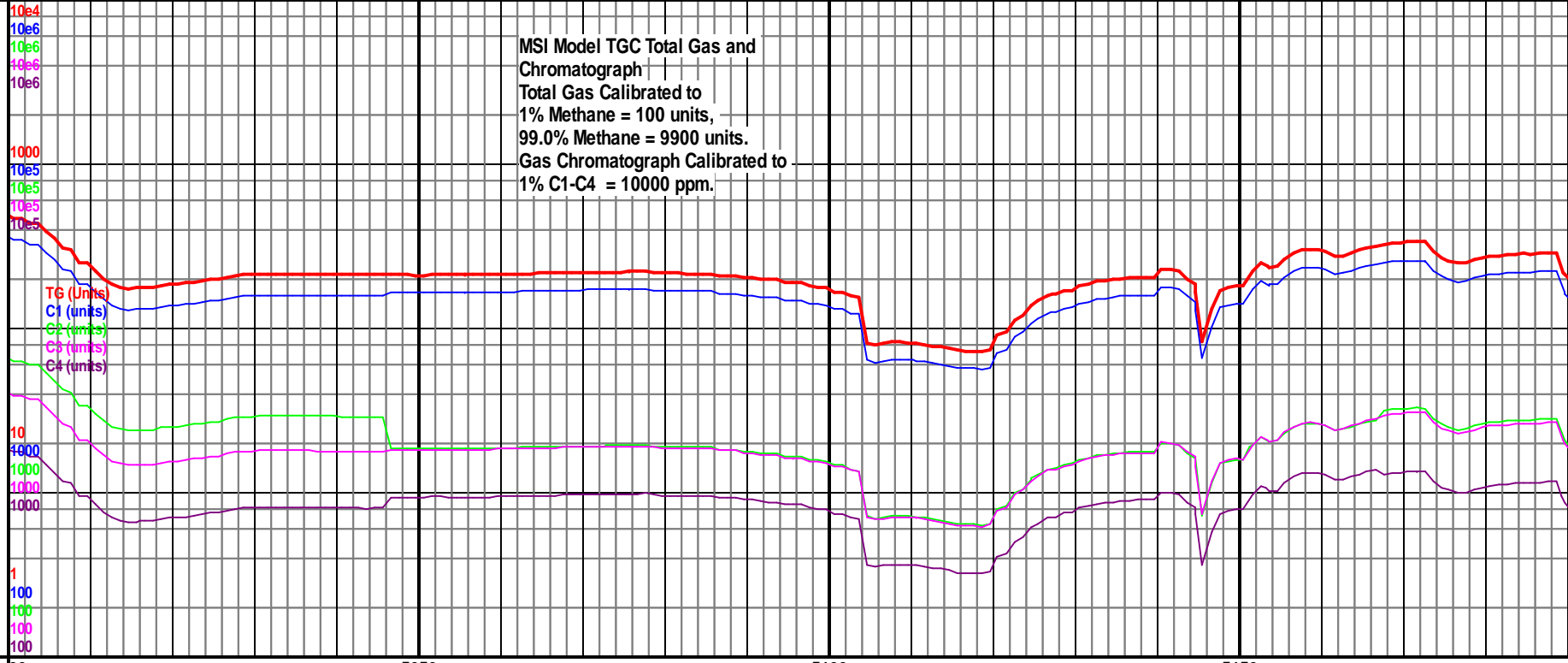
EVENT

	Rft
	Sidewall

TG, C1-C4

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

MSI Model TGC Total Gas and
Chromatograph
Total Gas Calibrated to
1% Methane = 100 units,
99.0% Methane = 9900 units.
Gas Chromatograph Calibrated to
1% C1-C4 = 10000 ppm.



Depth

00 5050 5100 5150

5000 TVD
Sub Sea (-238) MD 5144 TVD 5142.16 MD 5175 TVD 5177.16
INC 6.3 AZ 178.4 INC 9.4 AZ 187.1
VS 45.1 VS 49.31

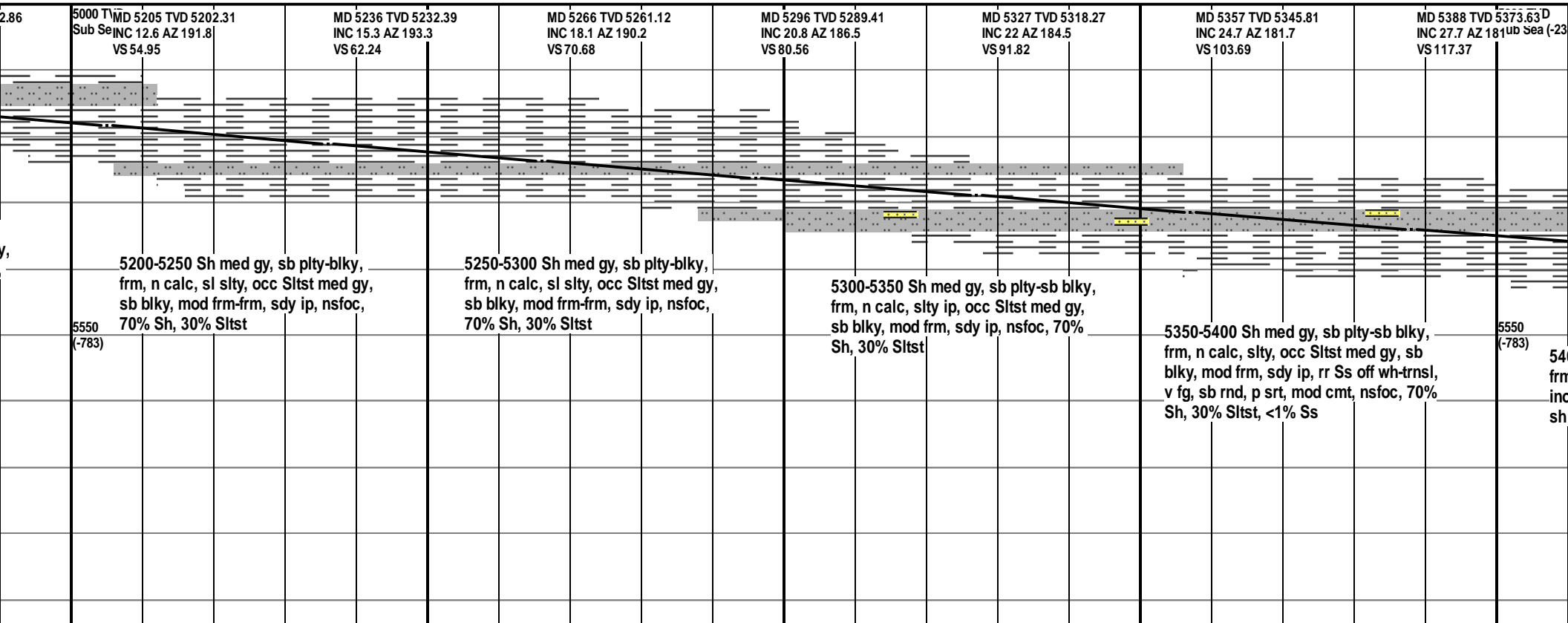
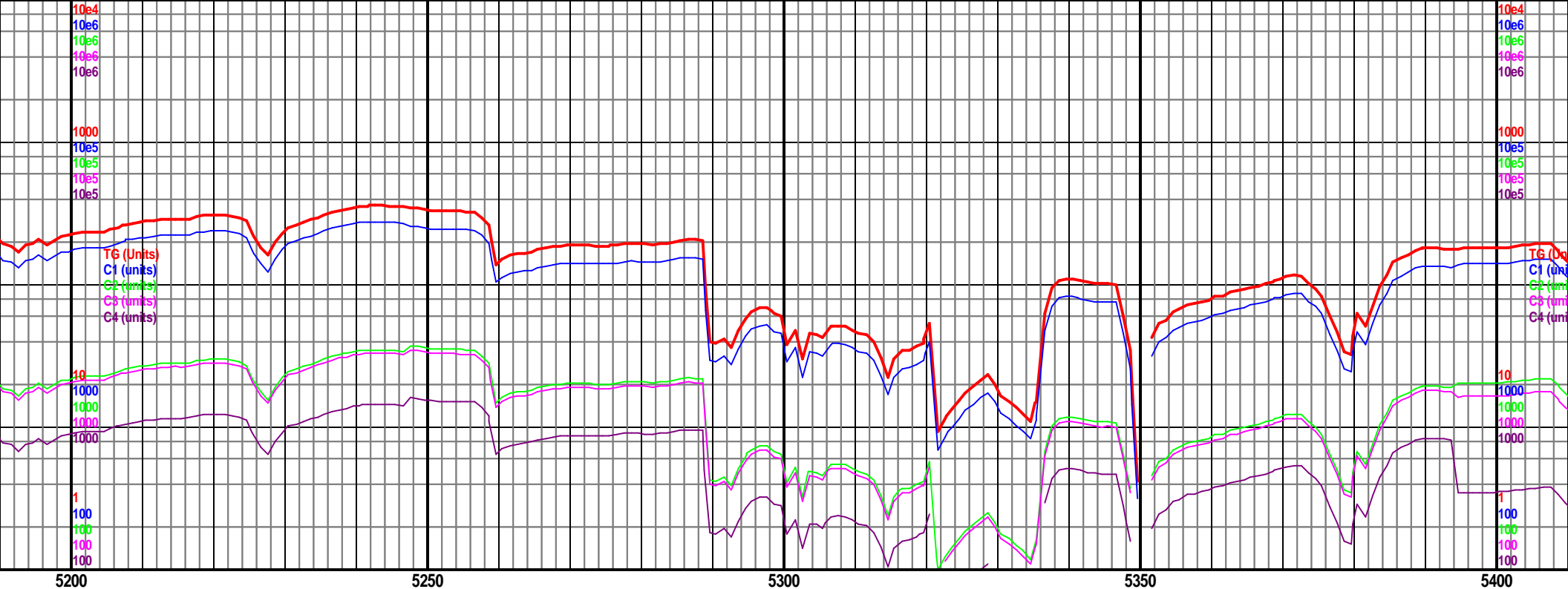
KOP 5104' reached at 16:00
on 8/20/2013

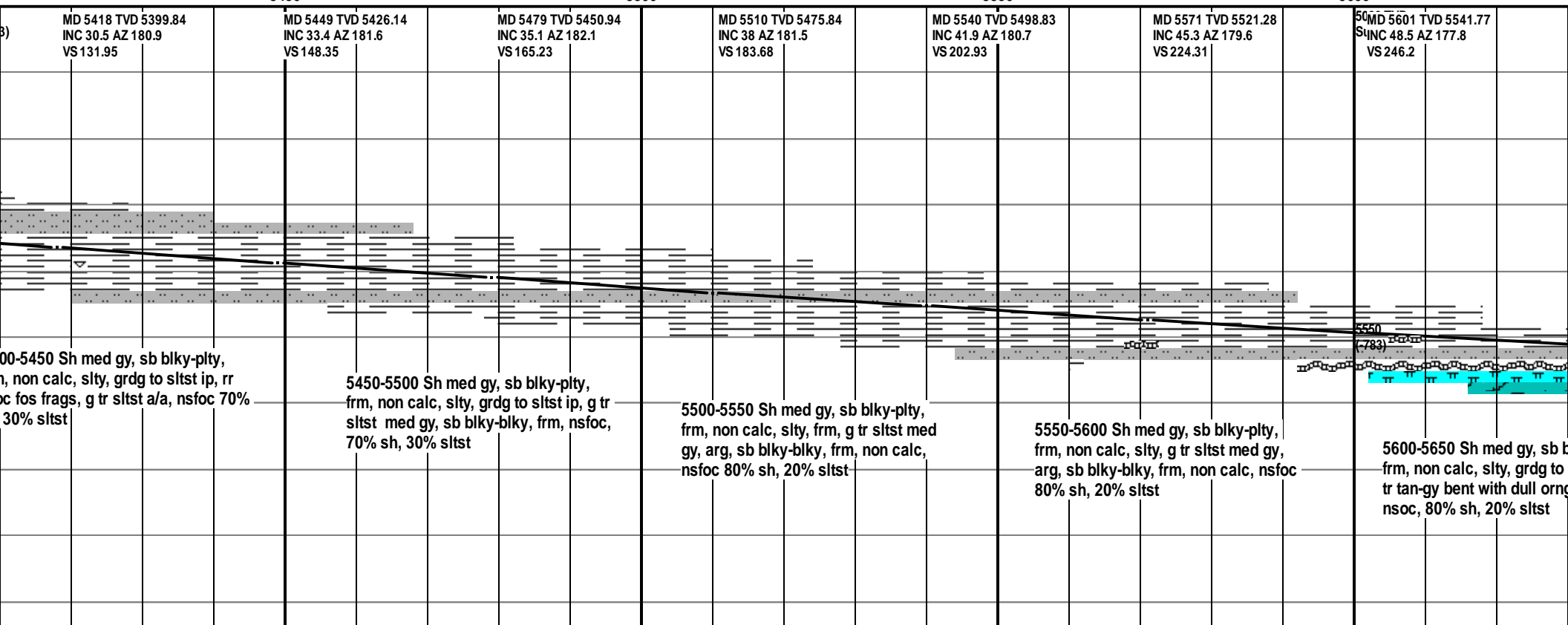
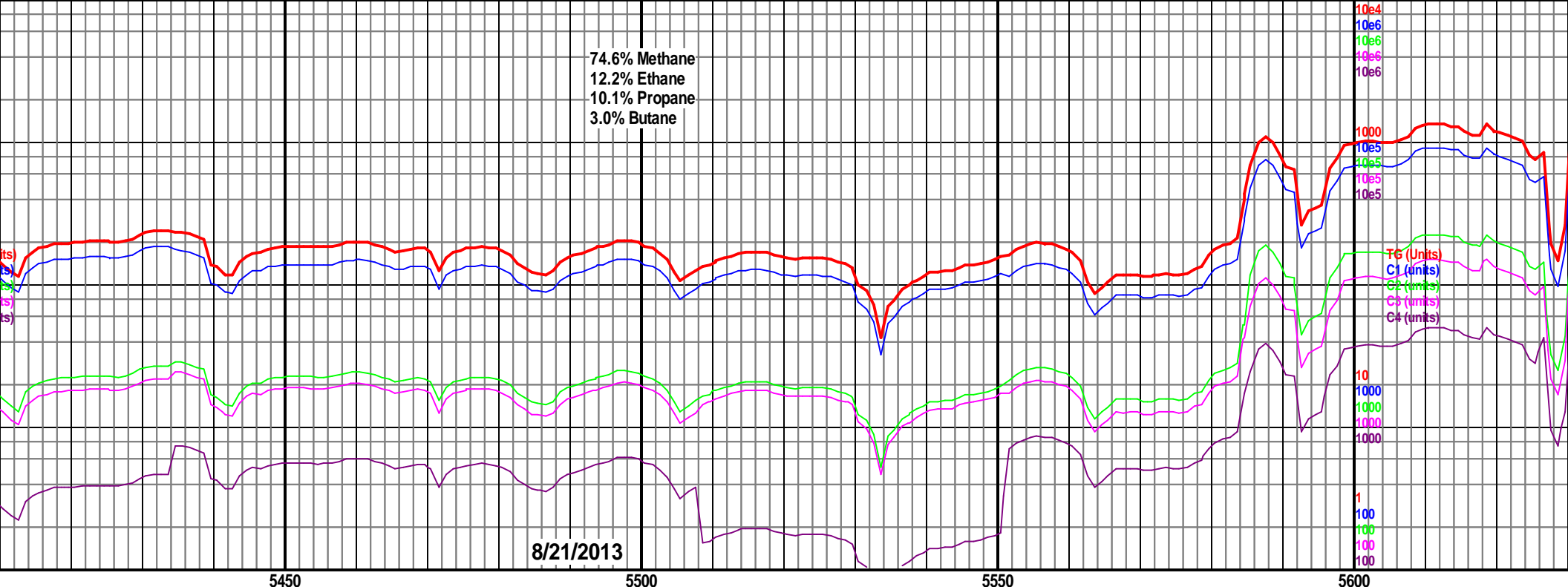
5100-5150 Sh med gy, sb plty-blky,
frm, n calc, sl slty, occ Sltst med gy,
sb blky, mod frm-frm, sdy ip, nsfoc,
70% Sh, 30% Sltst

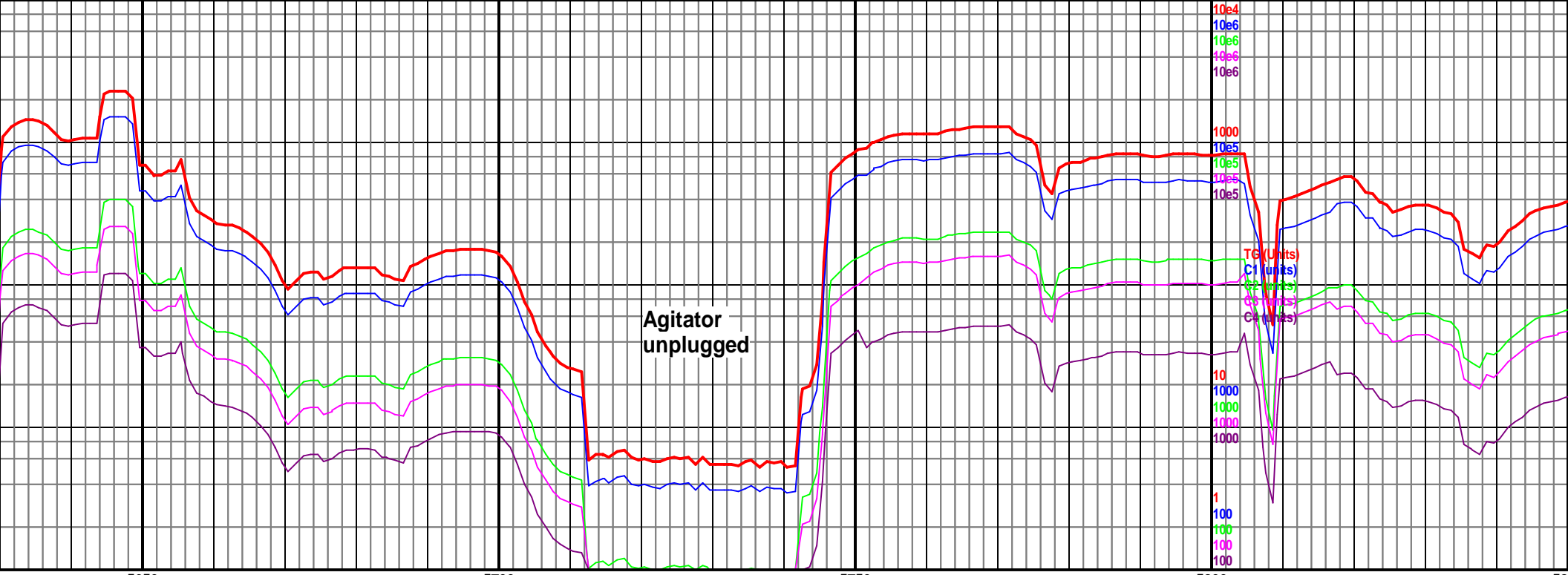
5150-5200 Sh med gy, sb plty-blky,
frm, n calc, sl slty, occ Sltst med gy,
sb blky, mod frm-frm, sdy ip, nsfoc,
70% Sh, 30% Sltst

Well Bore Cross Section

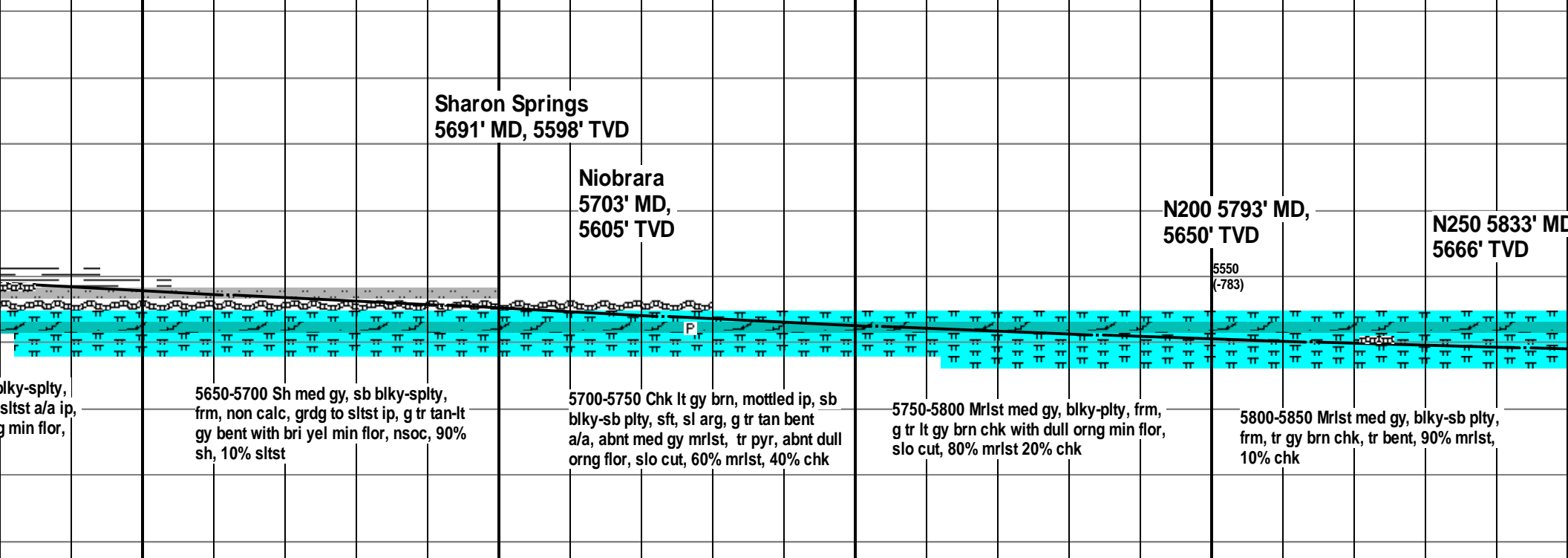
5550
(-783)

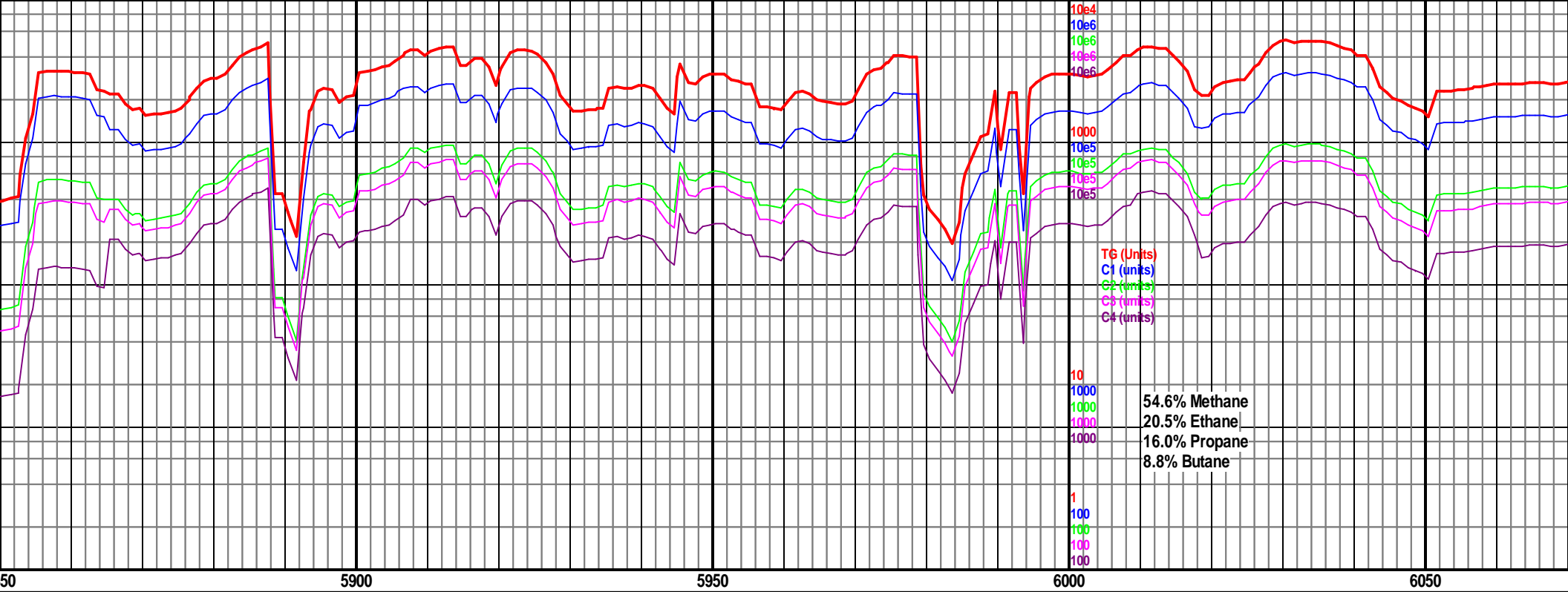




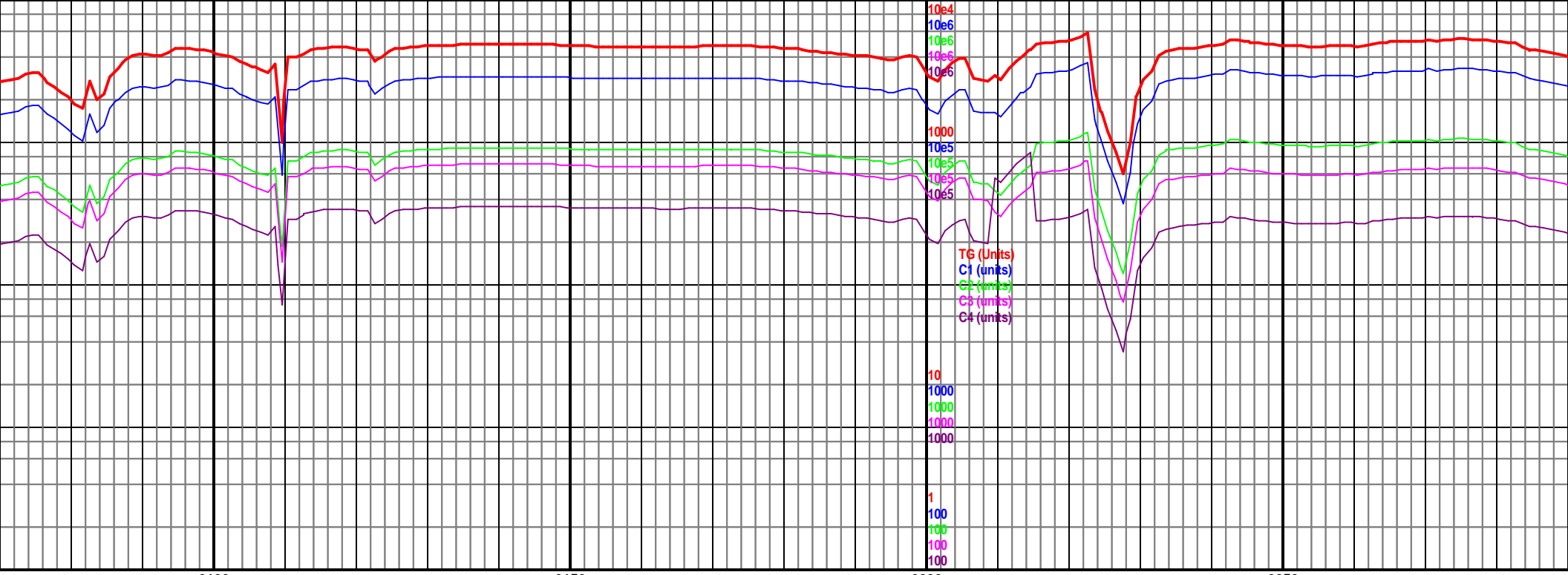


MD 5631 TVD 5561.23 INC 50.6 AZ 178.1 VS 269.01	MD 5662 TVD 5580.62 INC 52 AZ 179.9 VS 293.2	MD 5692 TVD 5598.57 INC 54.5 AZ 181 VS 317.24	MD 5723 TVD 5616.06 INC 56.8 AZ 182.6 VS 342.81	MD 5753 TVD 5631.84 INC 59.7 AZ 183.6 VS 368.28	MD 5784 TVD 5646.68 INC 63.1 AZ 184.2 VS 395.43	MD 5814 TVD 5659.14 INC 67.8 AZ 184.4 VS 422.64	MD 5844 TVD 5673.14 INC 71.8 AZ 184.4 VS 450.14
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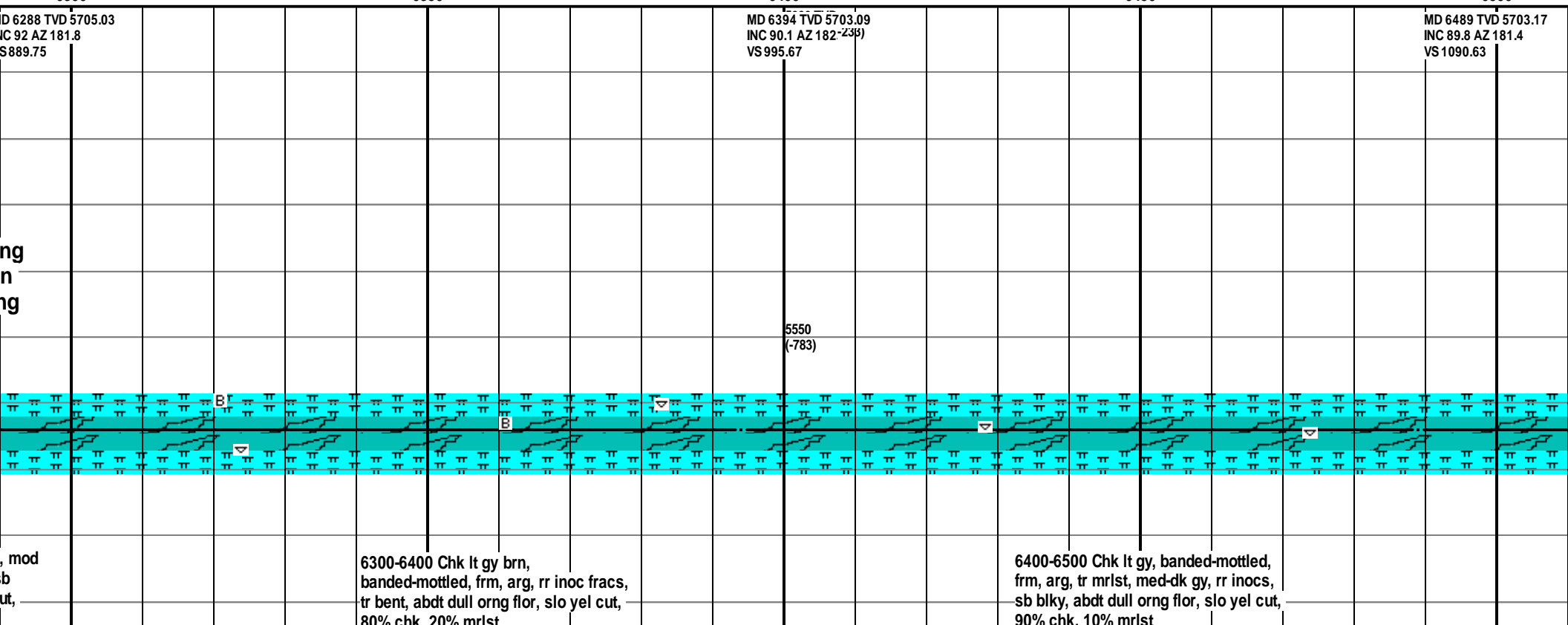
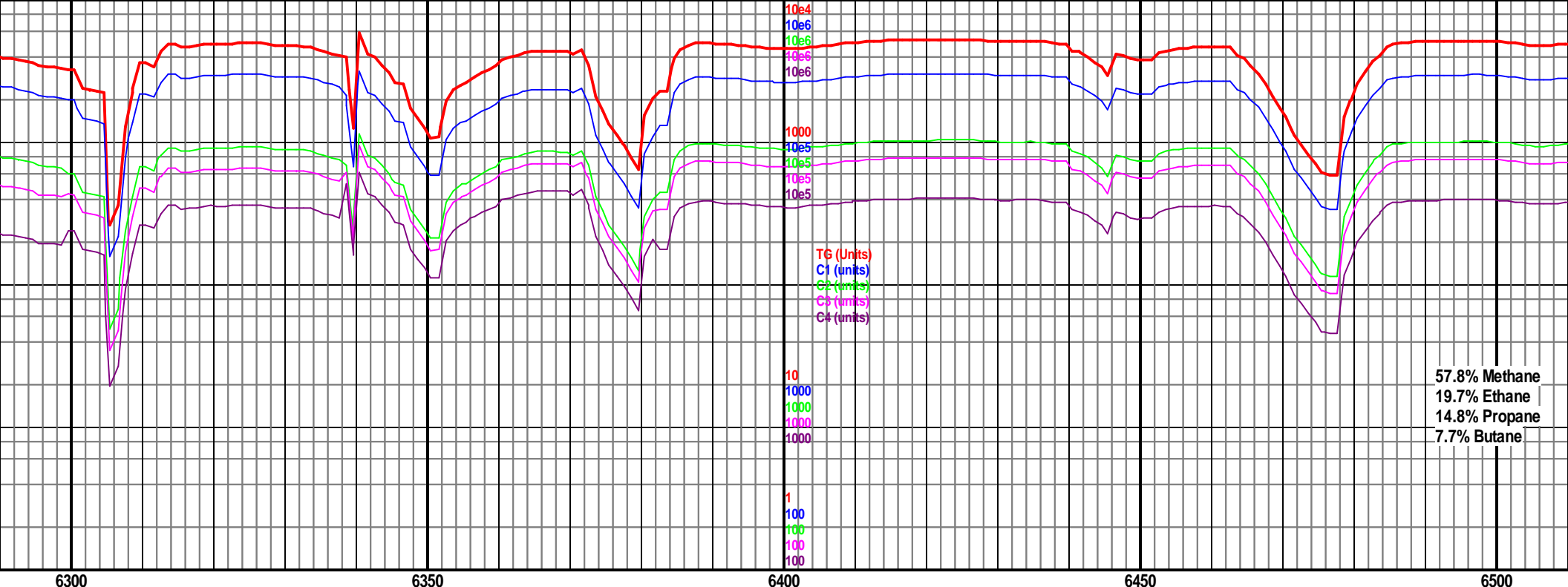
44 TVD 5669.47 9.9 AZ 183.8 VS 72	MD 5875 TVD 5678.22 INC 75.3 AZ 184 VS 480.39	MD 5905 TVD 5685.35 INC 77.2 AZ 184 VS 509.46	MD 5935 TVD 5703.76 INC 72.4 AZ 154.9 VS 308.98	MD 5966 TVD 5712.12 INC 76.3 AZ 154.5 VS 321.74	MD 5998 TVD 5718.5 INC 80.7 AZ 154.9 VS 335.13	MD 6028 TVD 5706.39 INC 84.1 AZ 183.4 VS 630.31	MD 6058 TVD 5718.5 INC 86.7 AZ 183.4 VS 660.32
N400 5854' MD, 5672' TVD		N430 5959' MD, 5697' TVD		N460 6037' MD, 5707' TVD			
5850-5900 Mrlst med gy, blkly-splty, frm, g tr lt gy brn chk, mottled, tr bent, tr pyr, tr dull orng flor, slo cut, 80% mrlst, 20% chk		5900-5950 Mrlst med gy, blkly-splty, frm, g tr lt gy-brn chk, mottled, tr bent, tr dull orng flor, slo cut, 80% mrlst, 20% chk		5950-6000 Mrlst med gy, blkly-splty, frm, g tr lt gy chk, mottled, tr bent, tr dull orng flor, 80% mrlst, 20% chk		6000-6050 Mrlst med gy, sb blkly-splty, frm, occ lt gy chk, g tr bent, tr dull orng flor, 70% mrlst, 30% chk	
						6050-6100 M frm, abnt lt g dull orng flor chk	

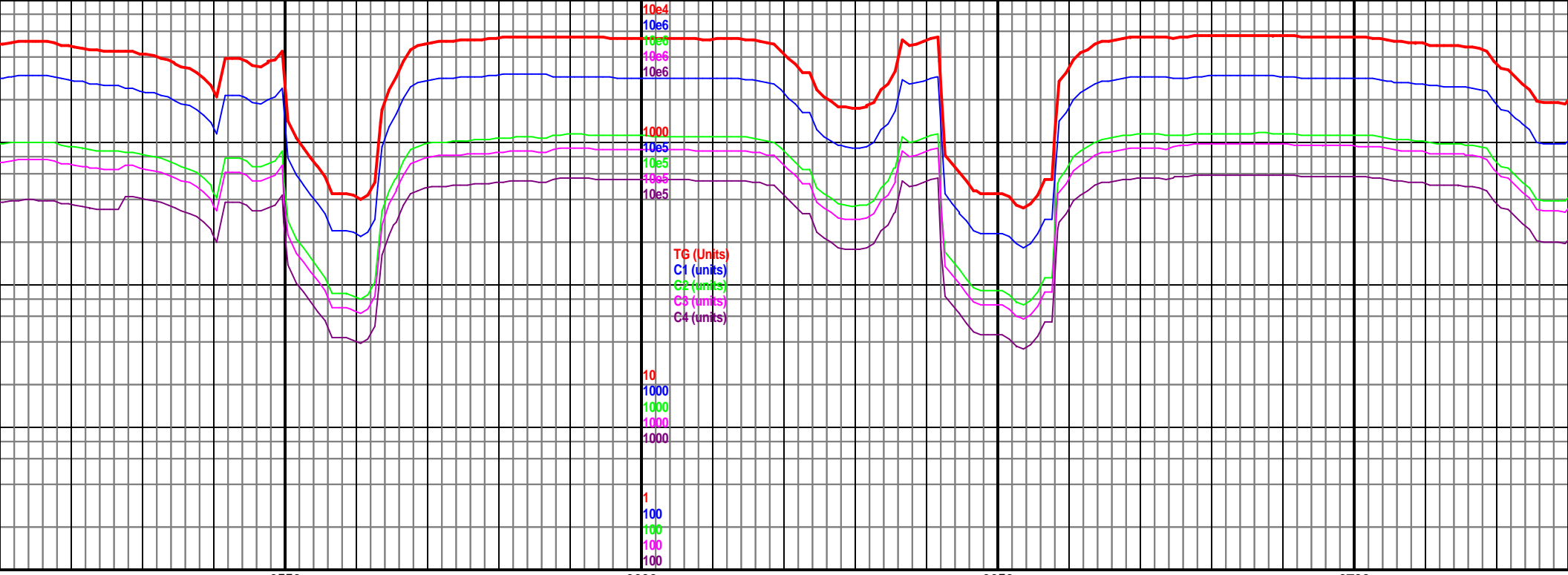


5708.8 33.1	6100	6150	6200	6250	
MD 6153 TVD 5709.79 INC 92.1 AZ 183.3 VS 754.97		MD 6184 TVD 5708.52 INC 92.6 AZ 182.6 VS 785.9	MD 6216 TVD 5707.27 INC 91.9 AZ 182.5 VS 817.85	MD 6248 TVD 5706.29 INC 91.6 AZ 182.7 VS 849.8	MD 6280 TVD 5705.29 INC 91.3 AZ 182.7 VS 881.8
6100-6150 Mrlst med gy, sb blkly-splty, y chk, mottled, tr bent, occ , slo cut, 60% mrlst, 40%	6100-6150 Mrlst med gy, sb blkly-splty, frm, abnt lt gy chk, sb blkly, mod frm, mottled, tr bent, g tr dul orng flor, slo cut, 50% mrlst, 50% chk	6150-6200 Mrlst med gy, sb blkly-splty, frm, abnt lt gy chk, sb blkly, mod frm, mottled, tr bent, g tr dul orng flor, slo cut, 50% mrlst, 50% chk	6200-6250 Chk, lt gy, sb blkly-blky, mod frm, mottled, abnt mrlst, med gy, sb blkly, frm, abnt dull orng flor, slo cut, 50% chk, 50% mrlst	6250-6300 Chk, lt gy, sb blkly-blky frm, mottled, abnt mrlst, med gy, s blkly, frm, abnt dull orng flor, slo c 50% chk, 50% mrlst	

6340', Intermediate casing
point reached at 22:00 on
8/21/2013, resume drilling
at 03:20 on 8/23/2013

5550
(-783)





6550

6600

6650

6700

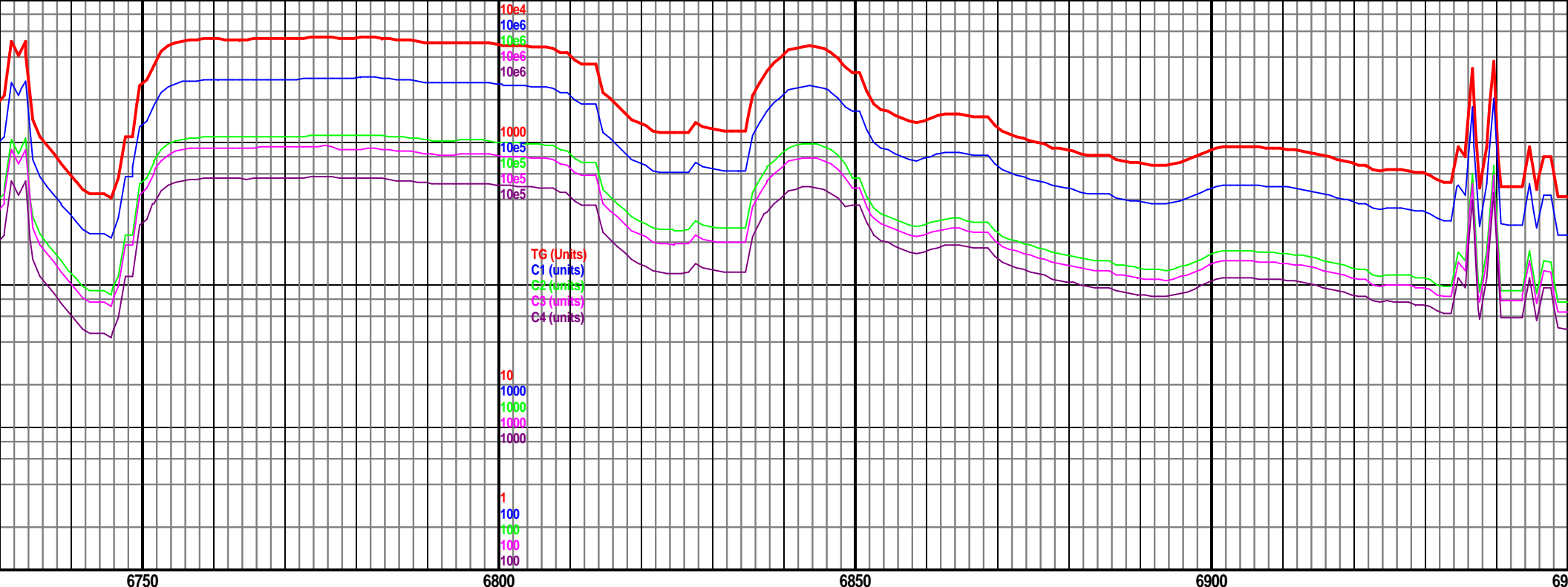
MD 6584 TVD 5703.84
INC 89.4 AZ 181
VS 1185.6

MD 6678 TVD 5705.07
INC 89.1 AZ 180.8
VS 1279.58

5550
(-783)

6500-6600 Chk lt gy, banded-mottled,
frm, arg, tr mrlst, med-dk gy, sb blk, tr
abdt dull org flr, slo yel cut, 85%
chk, 15% mrlst

6600-6700 Chk lt gy, banded-mottled,
frm, arg, tr mrlst, med-dk gy, sb blk, tr
dull org flr, slo yel cut, 90% chk,
10% mrlst



MD 6773 TVD 5706.48
INC 89.2 AZ 180.3
VS 1374.57

5000 TVD
Sub Sea (-238)

MD 6868 TVD 5708.71
INC 88.1 AZ 180.9
VS 1469.53

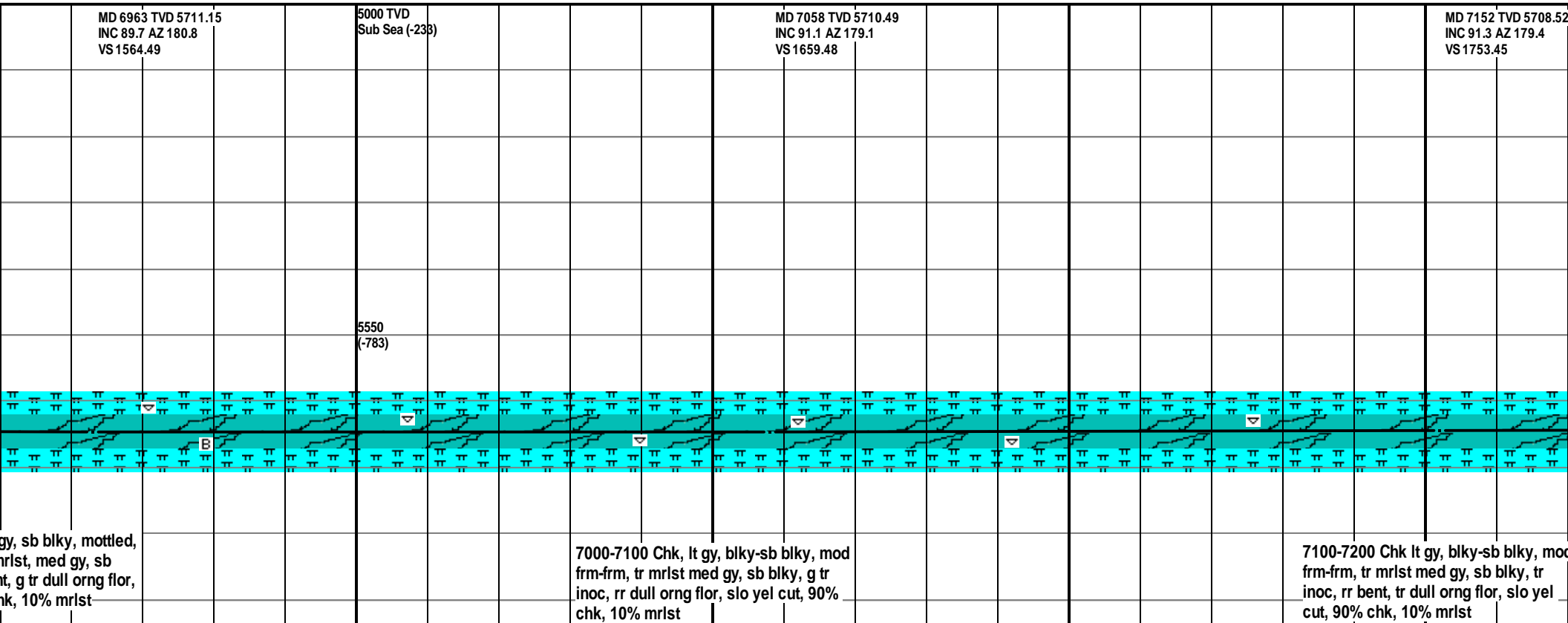
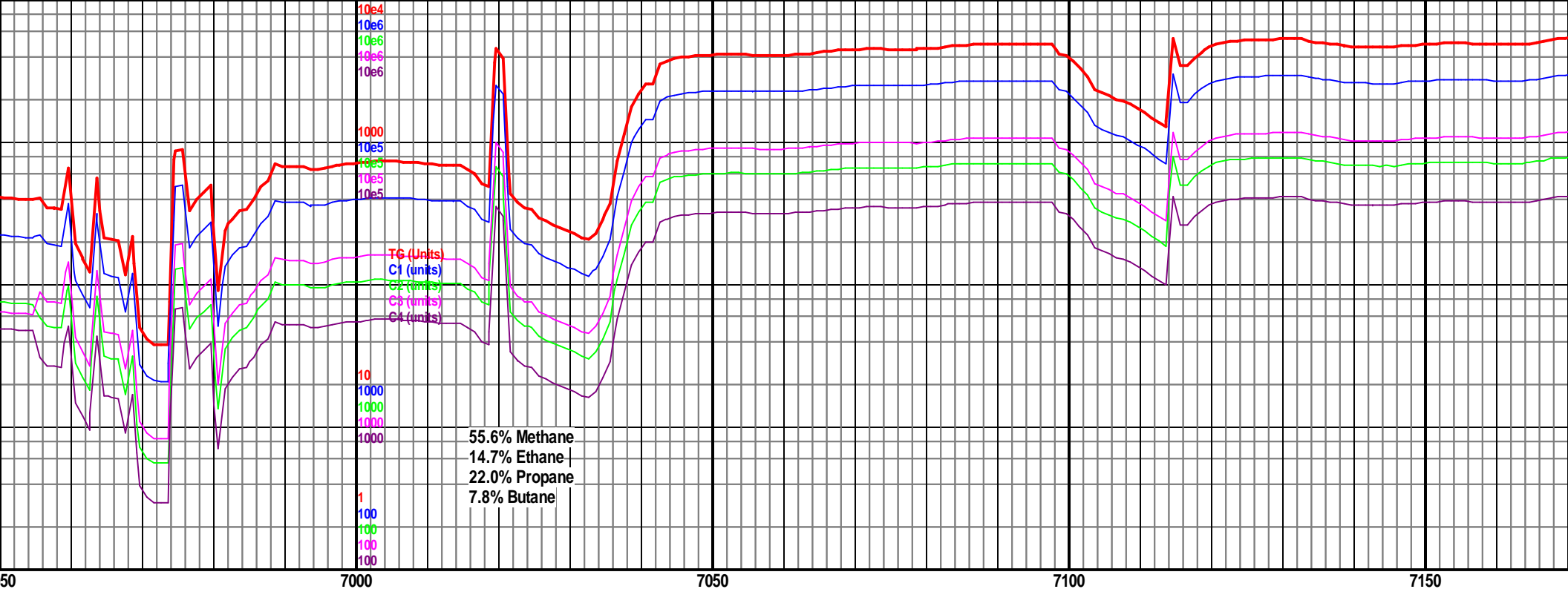
MD 6900 TVD 5709.83
INC 87.9 AZ 180.9
VS 1501.51

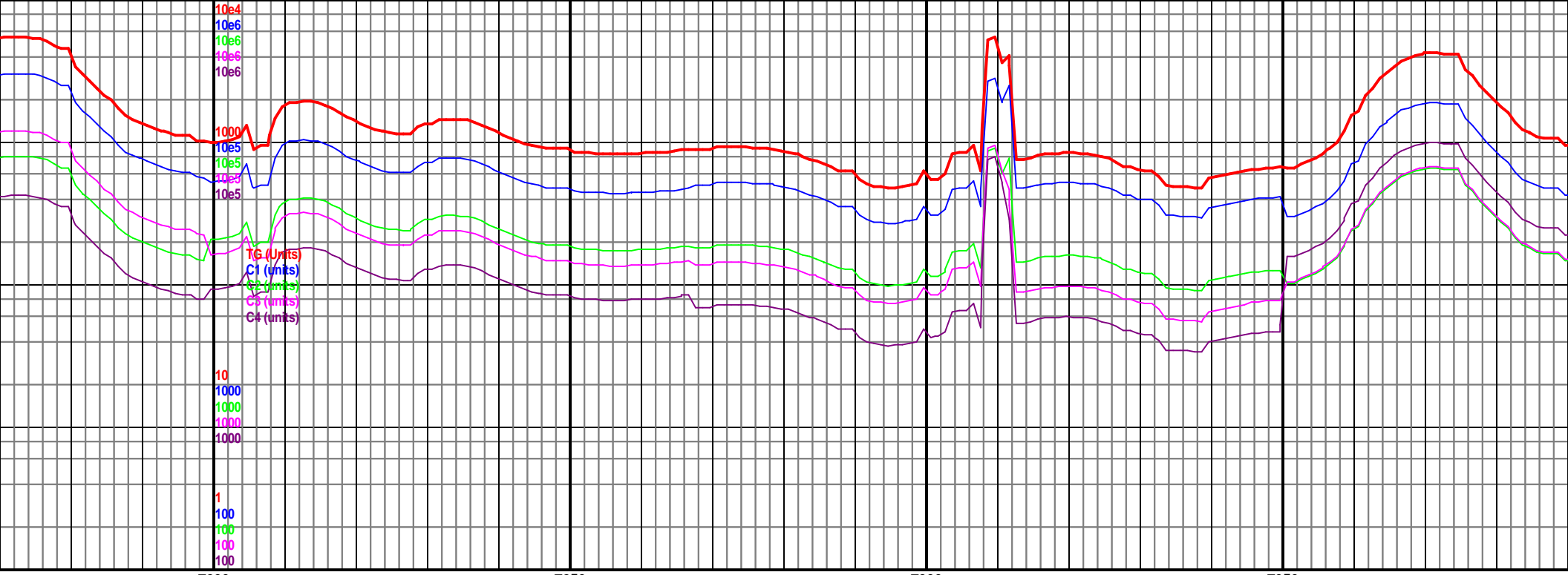
5550
(-783)

6700-6800 Chk lt gy, banded-mottled,
frm, arg, tr mrlst, med-dk gy, sb blk, tr
inocs, tr dull orng flr, slo yel cut, 95%
chk, 5% mrlst

6800-6900 Chk lt gy, banded-mottled,
frm, arg, tr mrlst, med-dk gy, sb blk, tr
inocs, rr bent, tr dull orng flr, slo yel
cut, 90% chk, 10% mrlst

6900-7000 Chk, lt g
mod frm-frm, g tr m
blk, tr inoc, rr ber
slo yel cut, 90% ch





7200

7250

7300

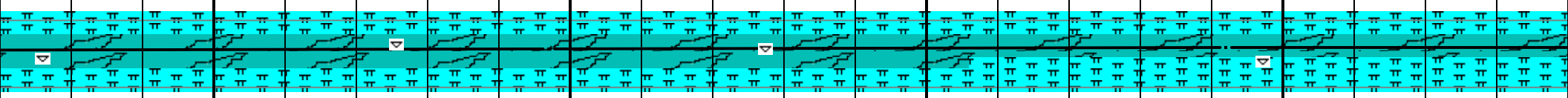
7350

5000 TVD
Sub Sea (-233)

MD 7247 TVD 5706.78
INC 90.8 AZ 177.3
VS 1848.39

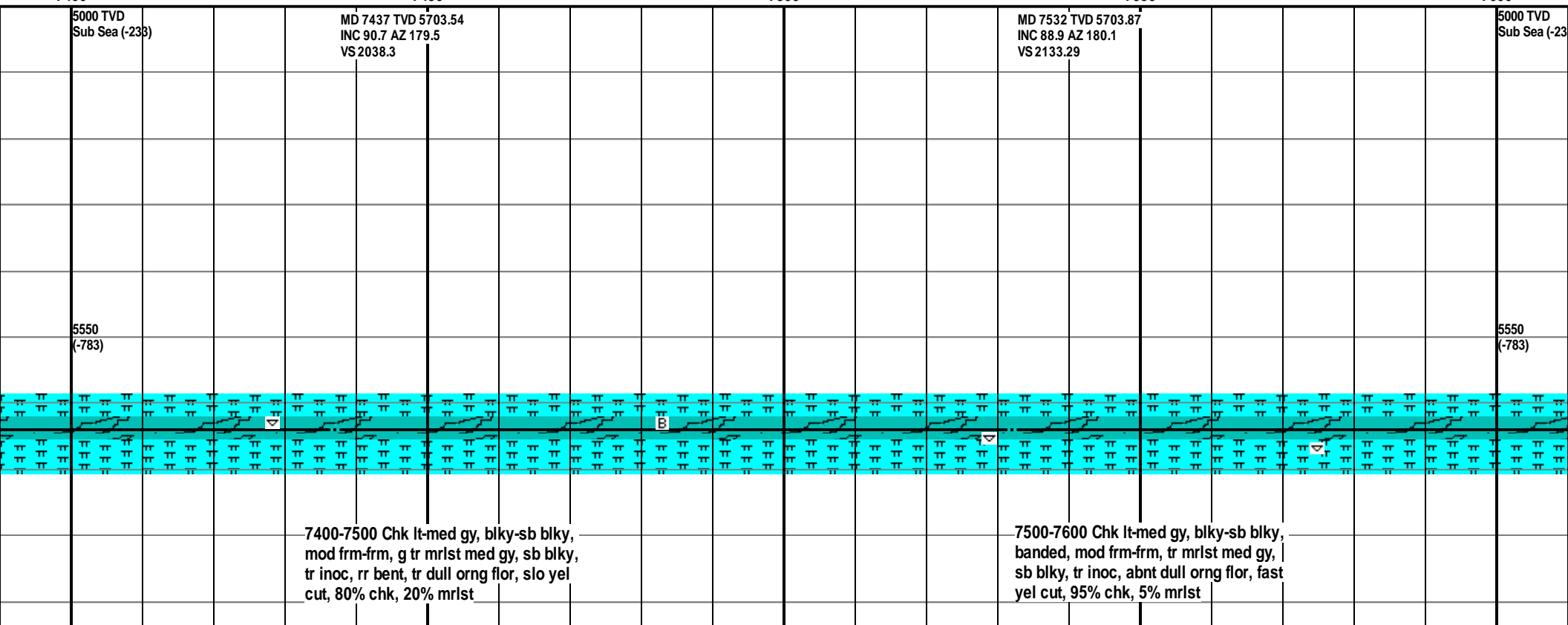
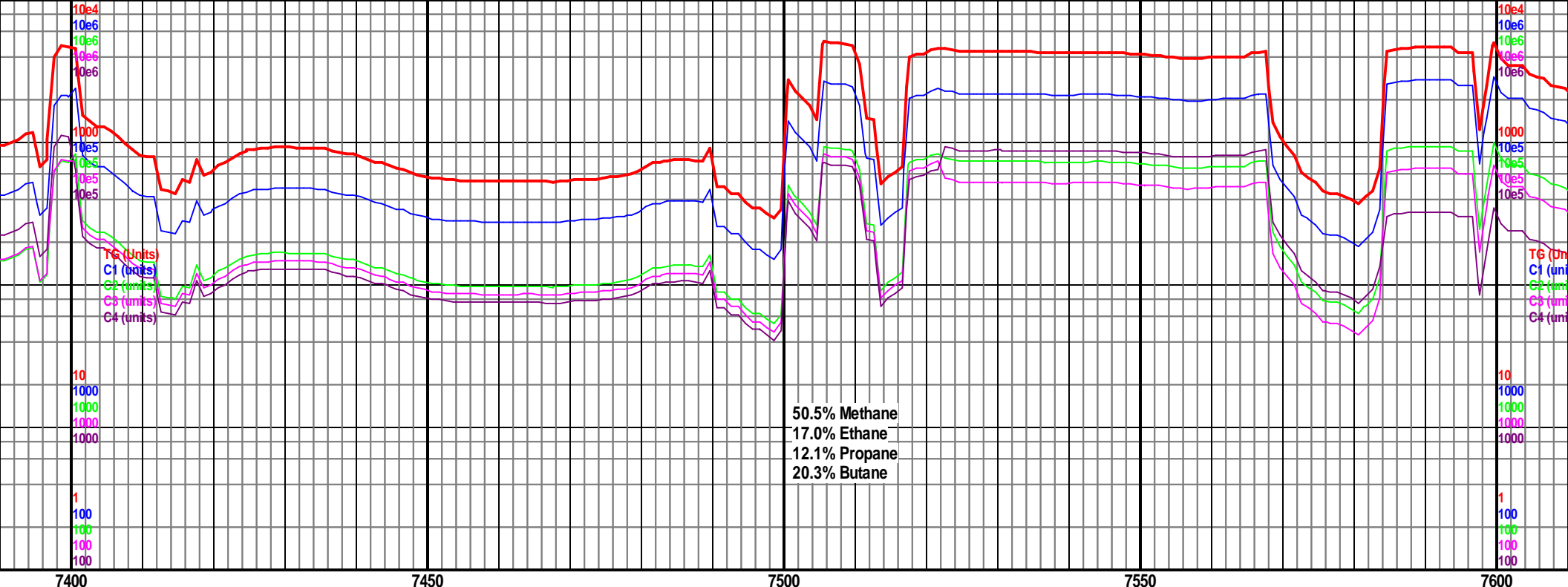
MD 7342 TVD 5705.12
INC 91.2 AZ 179
VS 1943.32

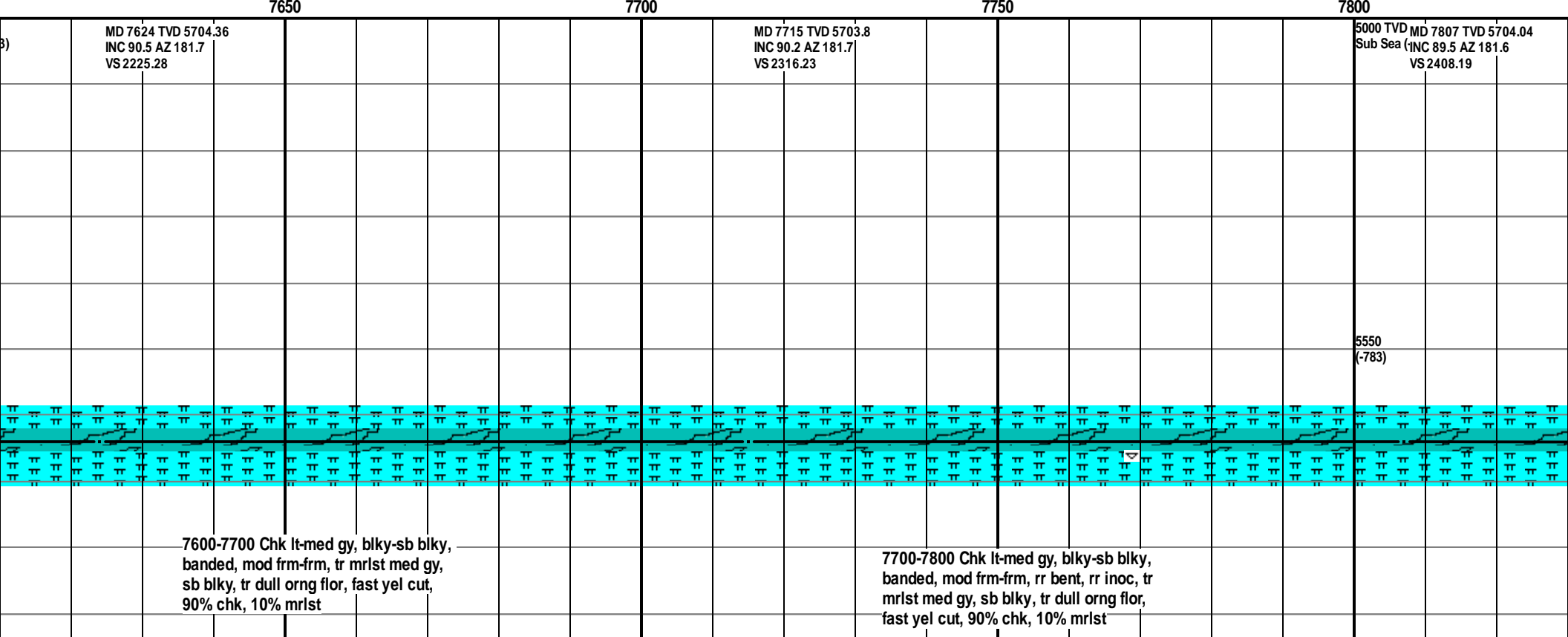
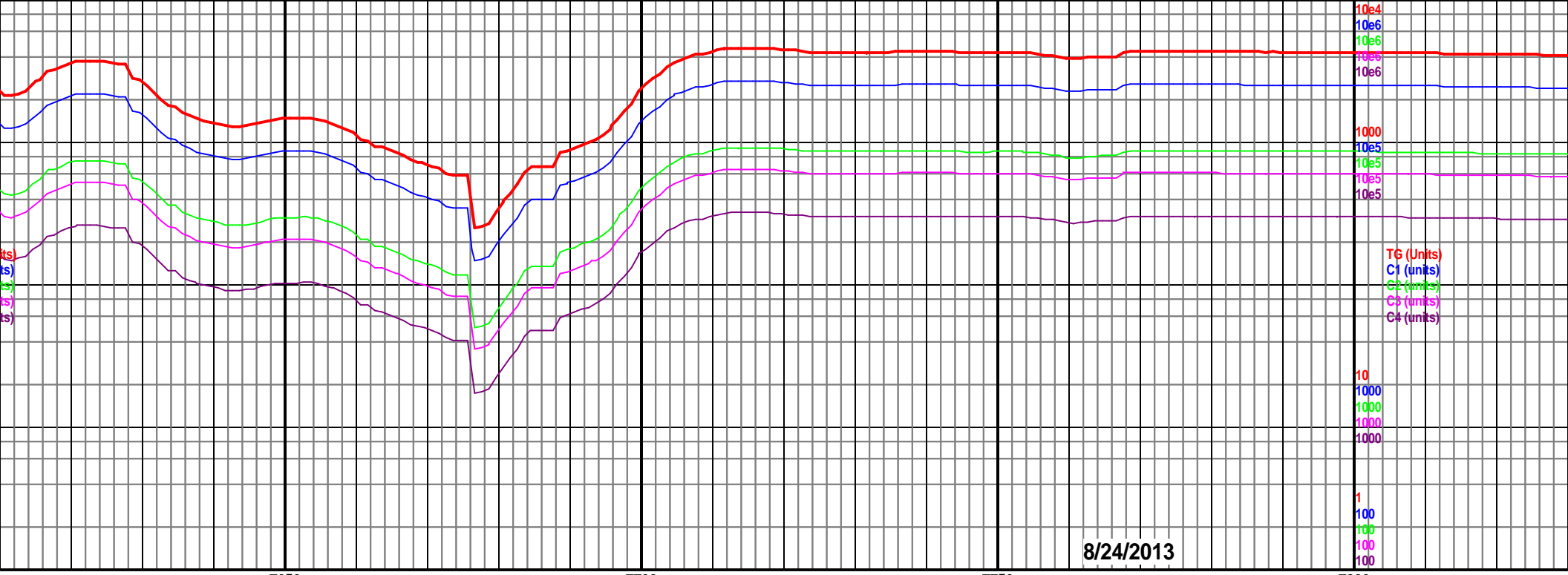
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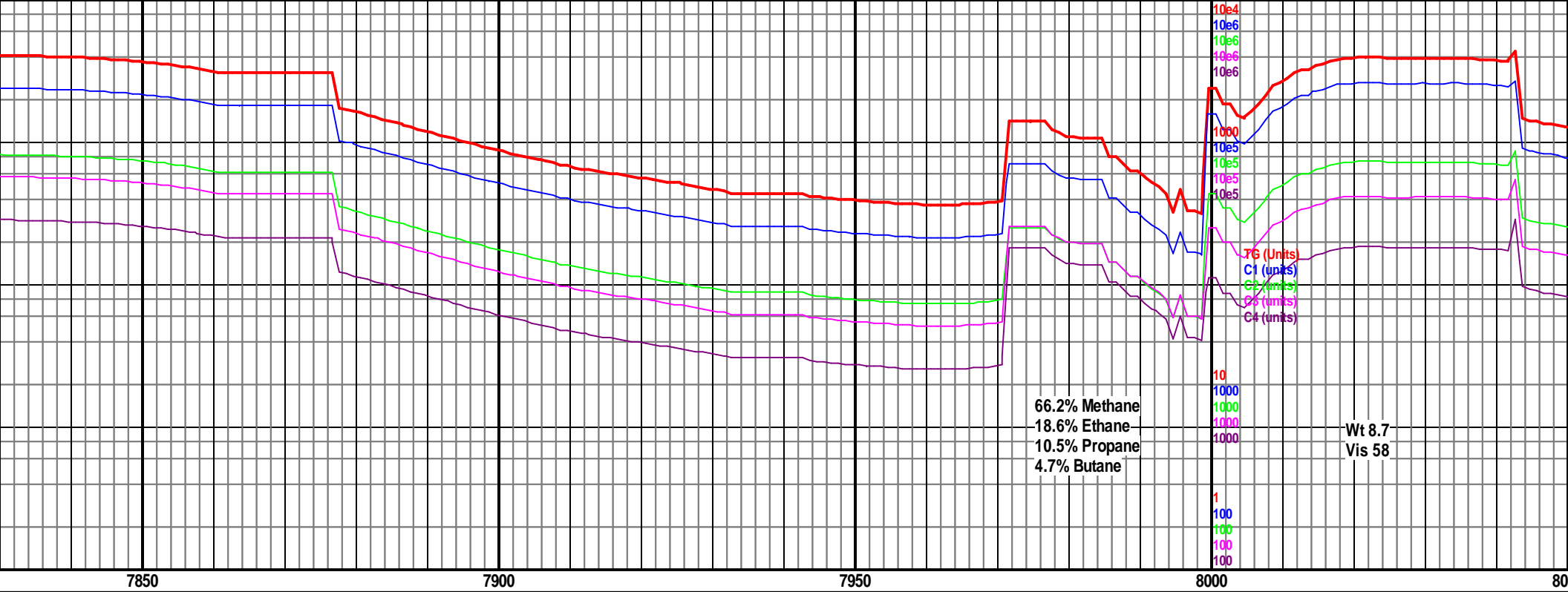


7200-7300 Chk lt gy, blk-y-sb blk-y, mod
frm-frm, tr mrlst med gy, sb blk-y, tr
inoc, tr dull orng flor, yel cut, 90% chk,
10% mrlst

7300-7400 Chk lt gy, blk-y, mod frm-frm,
g tr mrlst med gy, sb blk-y, rr inoc, tr
dull orng flor, g yel cut, 80% chk, 20%
mrlst



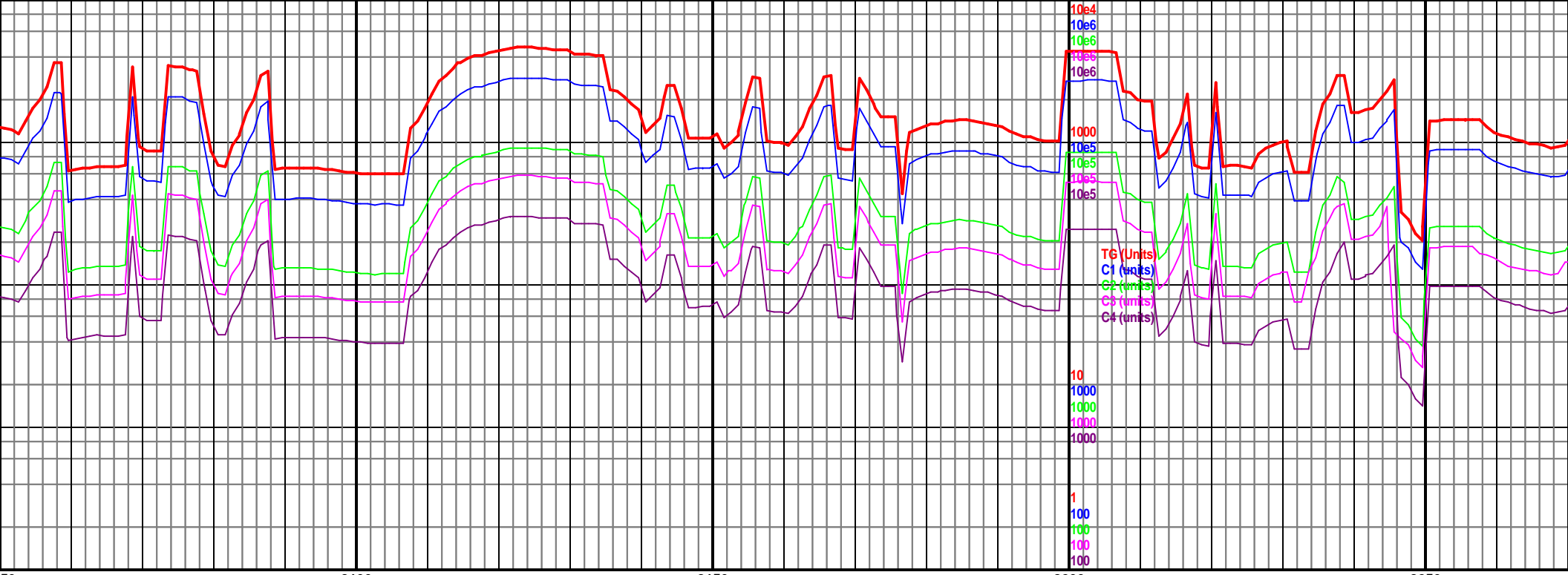




7800 -7900 Chk lt-med gy, blkly-sb blkly,
banded, mod frm-frm, rr bent, rr inoc, tr
mrlst med gy, sb blkly, tr dull orng flor,
fast yel cut, 90% chk, 10% mrlst

7900-8000 Chk lt-med gy, blkly-sb blkly,
banded, mod frm-frm, rr bent, rr inoc, tr
mrlst med gy, sb blkly, abnt dull orng
flor, fast yel cut, 90% chk, 10% mrlst

8000-8100 Chk lt-med gy, blkly-sb blkly,
banded, mod frm-frm, rr bent, rr inoc, tr
mrlst med gy, sb blkly, abnt dull orng
flor, fast yel cut, 90% chk, 10% mrlst



8050 8100 8150 8200 8250

MD 8081 TVD 5710.09
INC 89.5 AZ 181.6
VS 2682.08

MD 8172 TVD 5710.25
INC 90.3 AZ 181.8
VS 2773.04

5000 TVD
Sub Sea (-238)

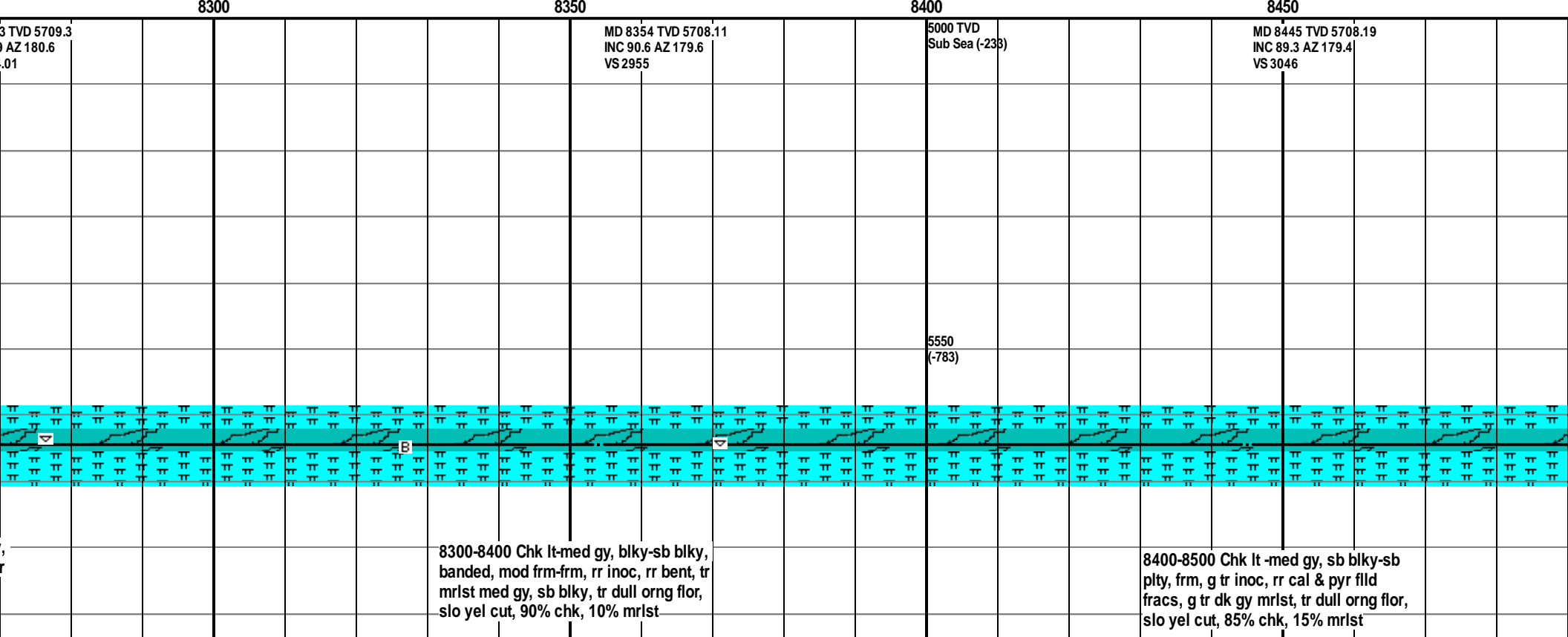
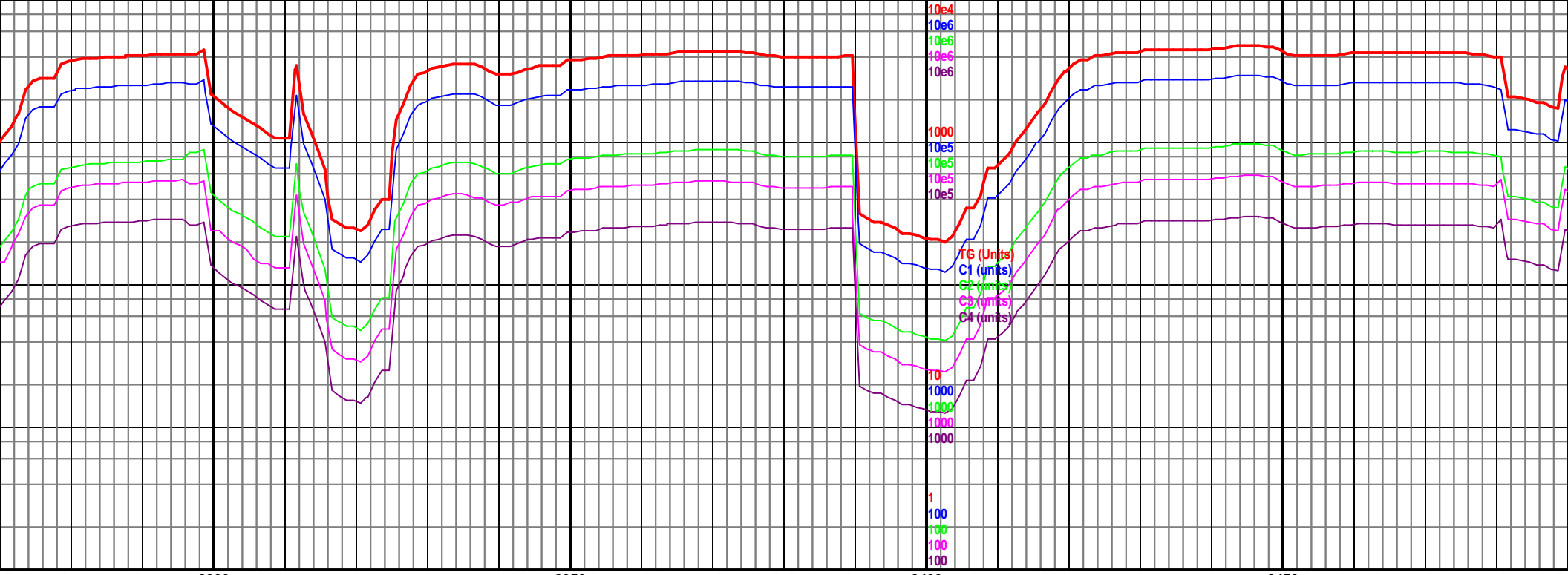
MD 8263 TVD 5710.25
INC 90.3 AZ 181.8
VS 2864.08

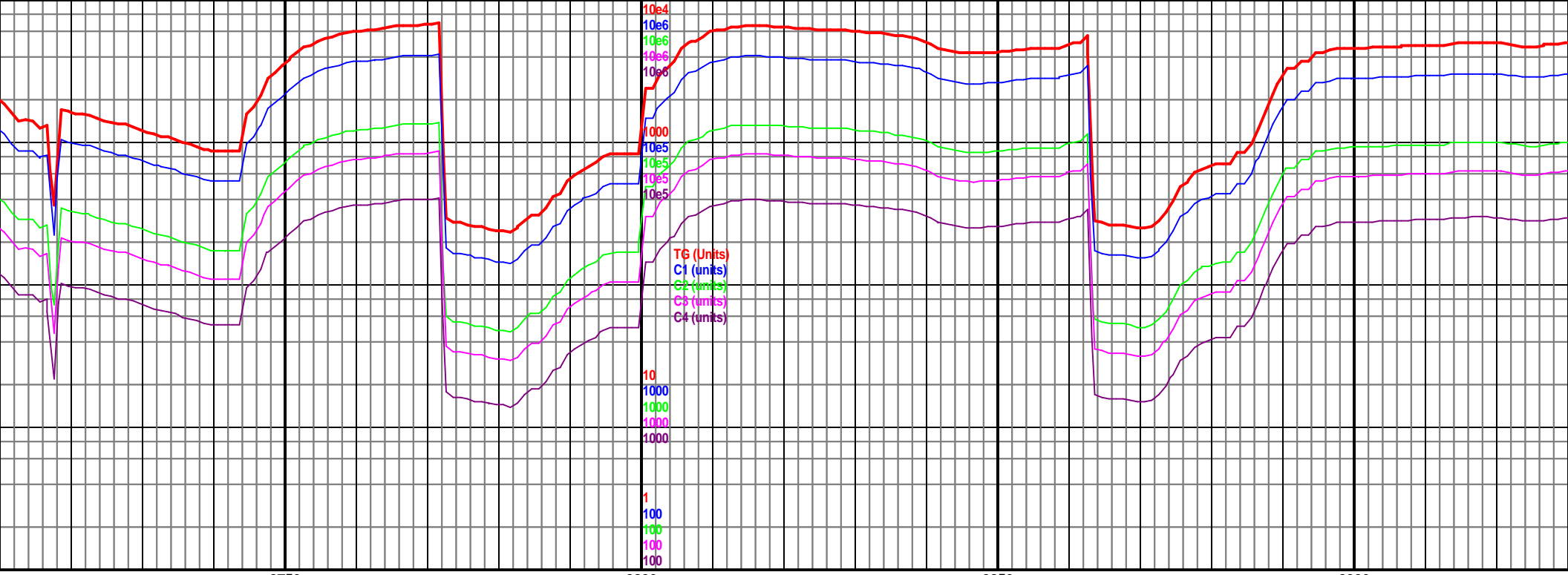
5550
(-783)

med gy, blk-sb blk, mod frm, rr inoc, tr mrlst
dull org flor, fast
10% mrlst

8100-8200 Chk lt-med gy, blk-sb blk, banded, mod frm-frm, tr inoc, tr mrlst
med gy, sb blk, tr dull org flor, slo
yel cut, 80% chk, 20% mrlst

8200-8300 Chk lt-med gy, blk-sb blk, banded, mod frm-frm, tr inoc, tr bent, tr mrlst
med gy, sb blk, g tr dull org flor, slo yel cut, 90% chk, 10% mrlst





8750

8800

8850

8900

MD 8719 TVD 5711.62
INC 90 AZ 181.7
VS 3319.9

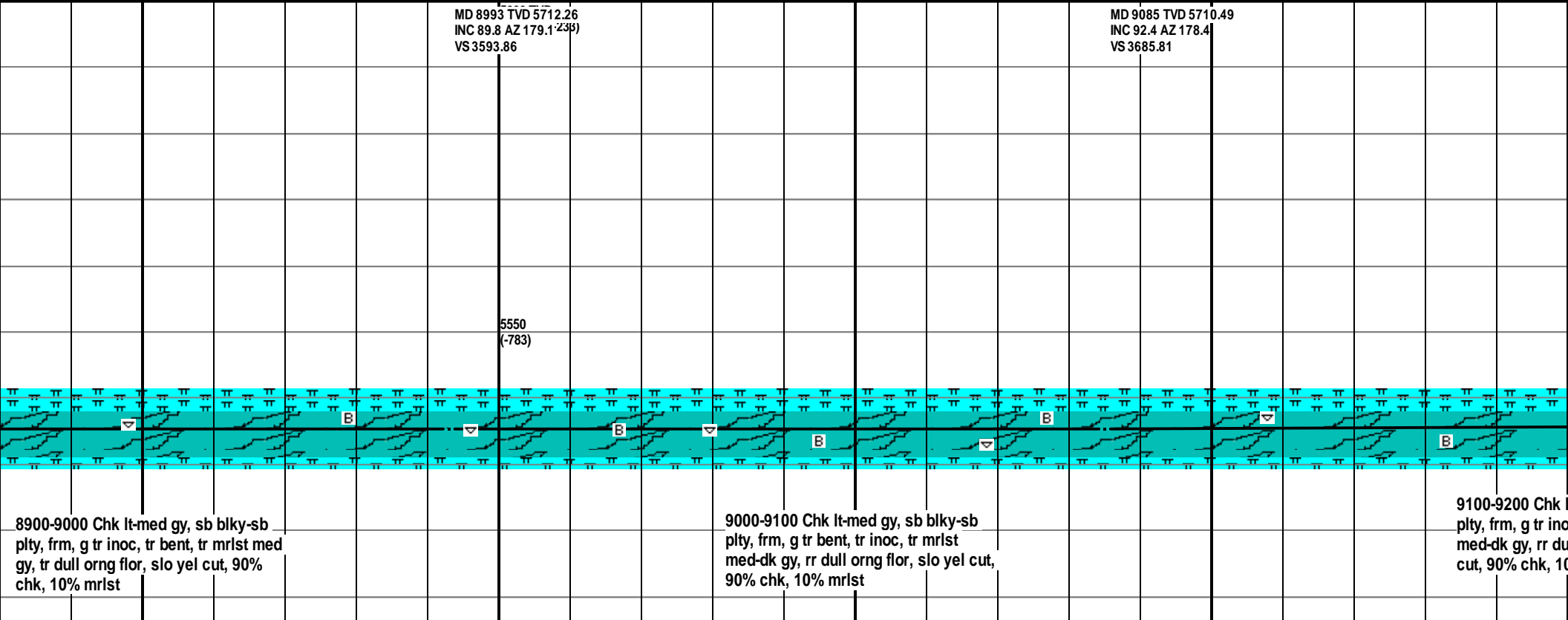
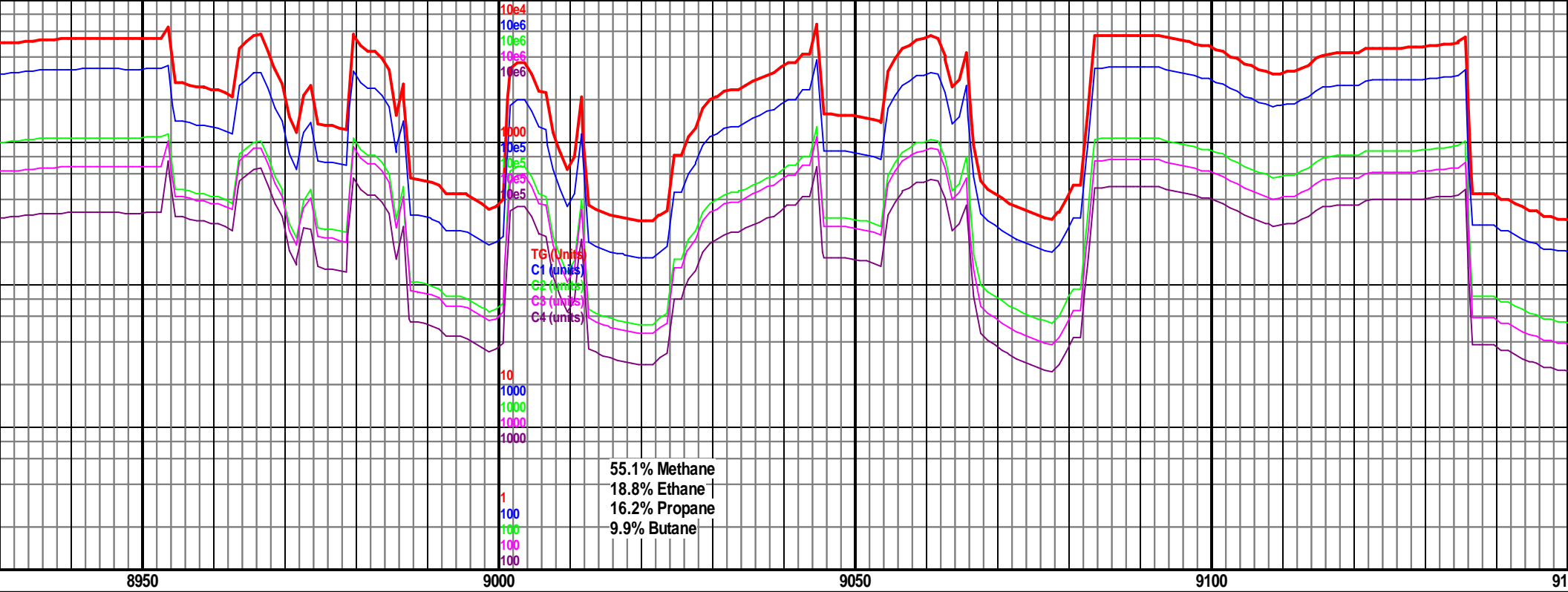
5000 TVD
Sub Sea (-23)
MD 8810 TVD 5711.22
INC 90.5 AZ 181.1
VS 3410.88

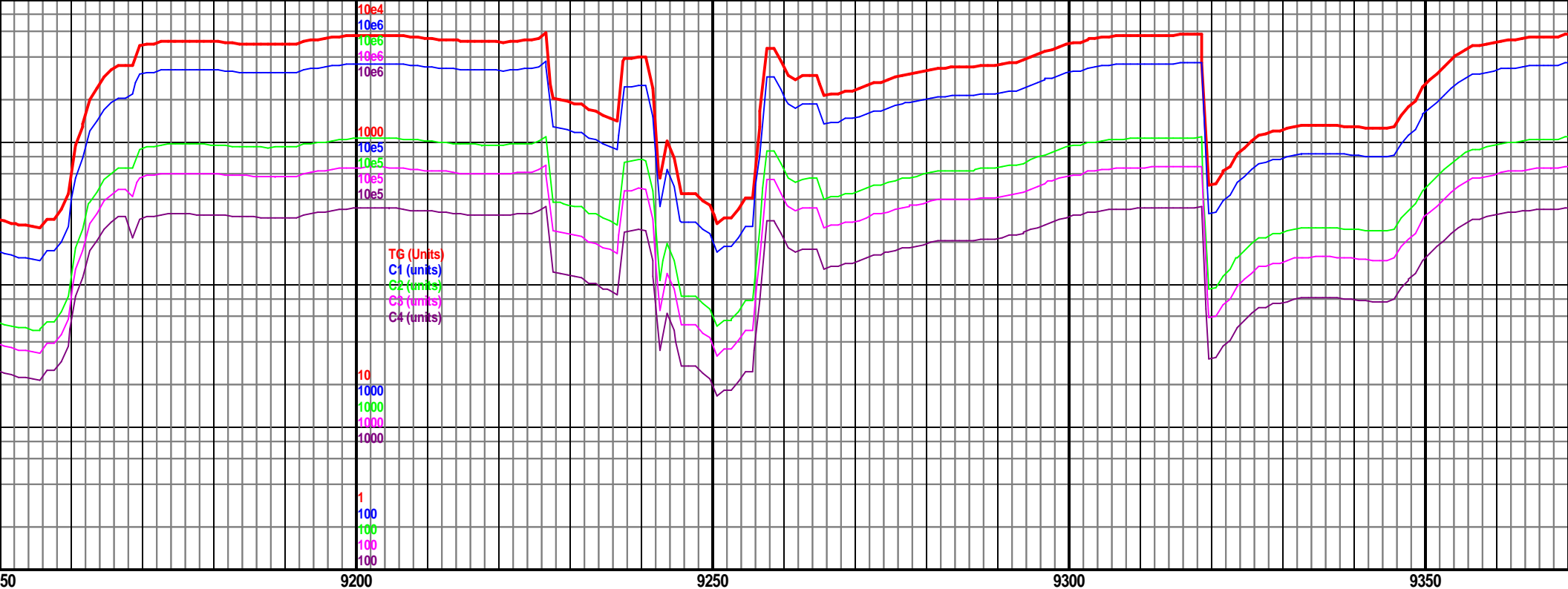
MD 8902 TVD 5711.46
INC 89.2 AZ 180.4
VS 3502.86

5550
(-783)

8700-8800 Chk lt-med gy, sb blkly-sb
plty, frm, g tr inoc, g tr bent, g tr mrlst
med gy, sb blkly, mod frm, tr dull org
flor, slo yel cut, 80% chk, 20% mrlst

8800-8900 Chk lt-med gy, sb blkly-sb
plty, frm, g tr inoc, tr bent, tr mrlst med
gy, tr dull org flor, slo yel cut, 90%
chk, 10% mrlst





MD 9176 TVD 5706.92
 INC 92.1 AZ 178
 VS 3776.7

5000 TVD
 Sub Sea (-238)

MD 9267 TVD 5706.2
 INC 88.8 AZ 178.4
 VS 3867.63

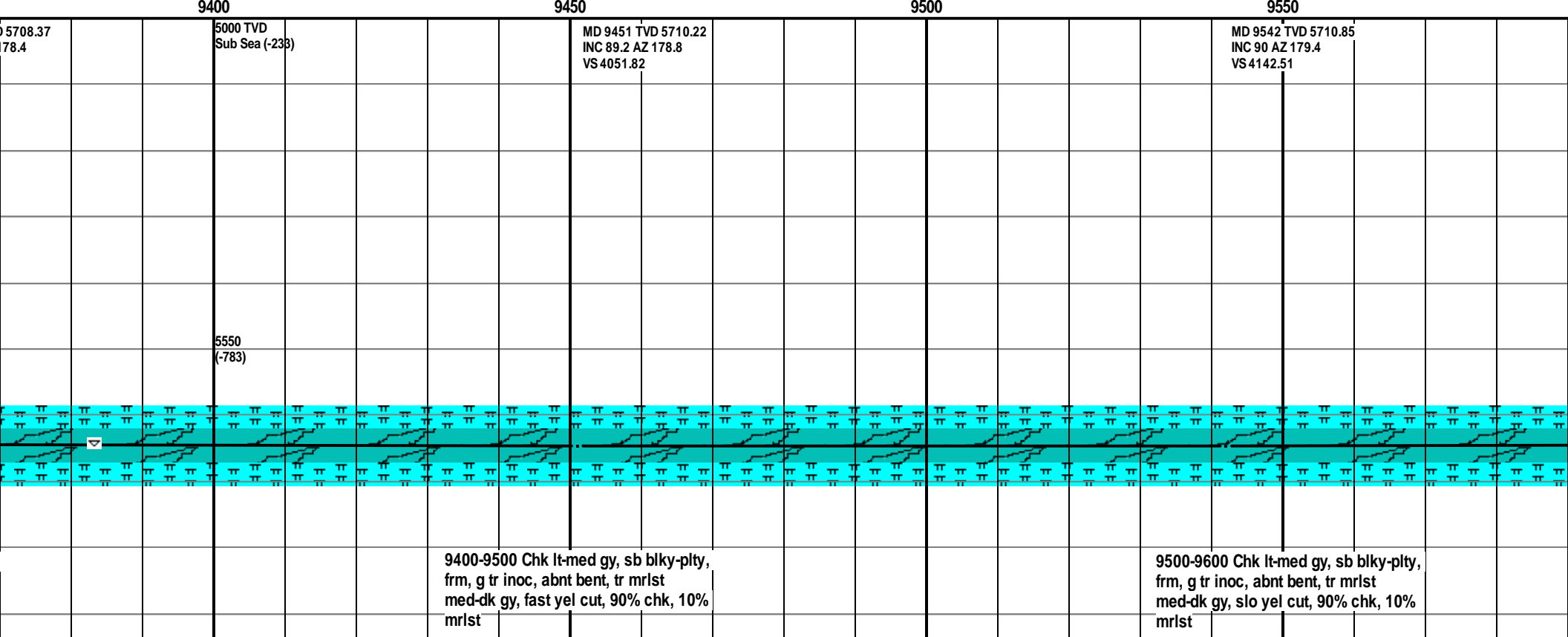
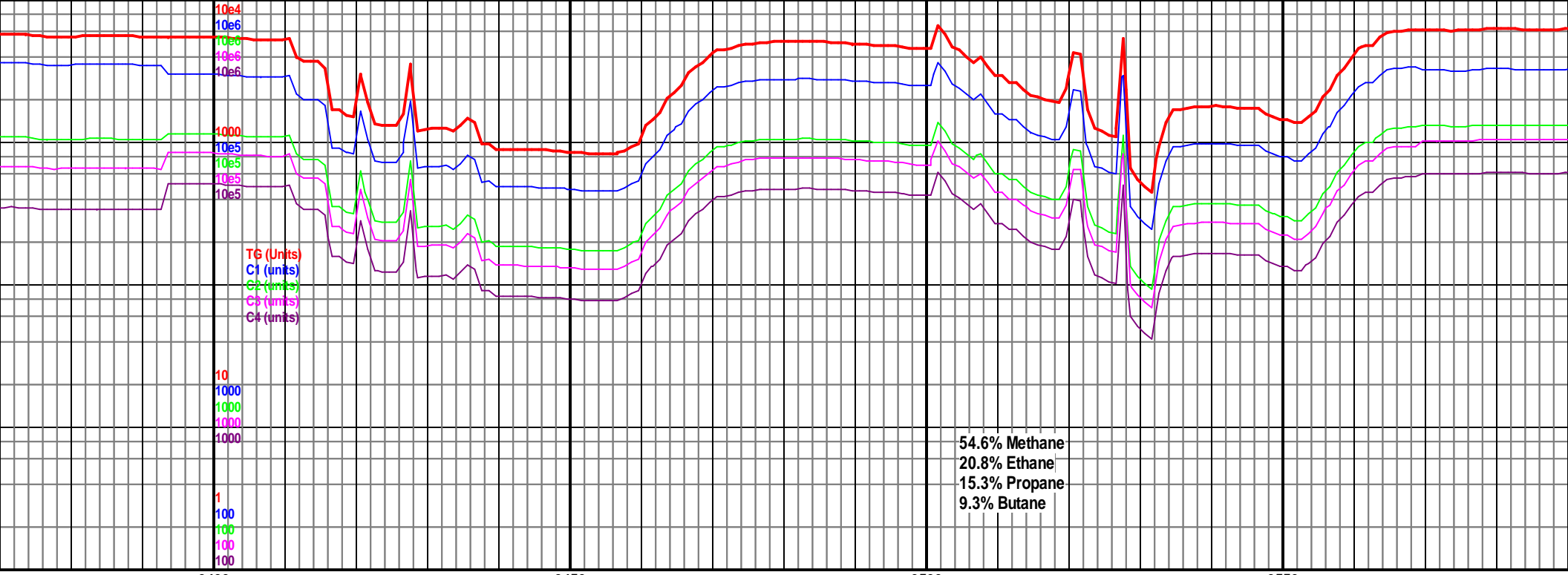
MD 9359 TVD
 INC 88.5 AZ 178.4
 VS 3959.57

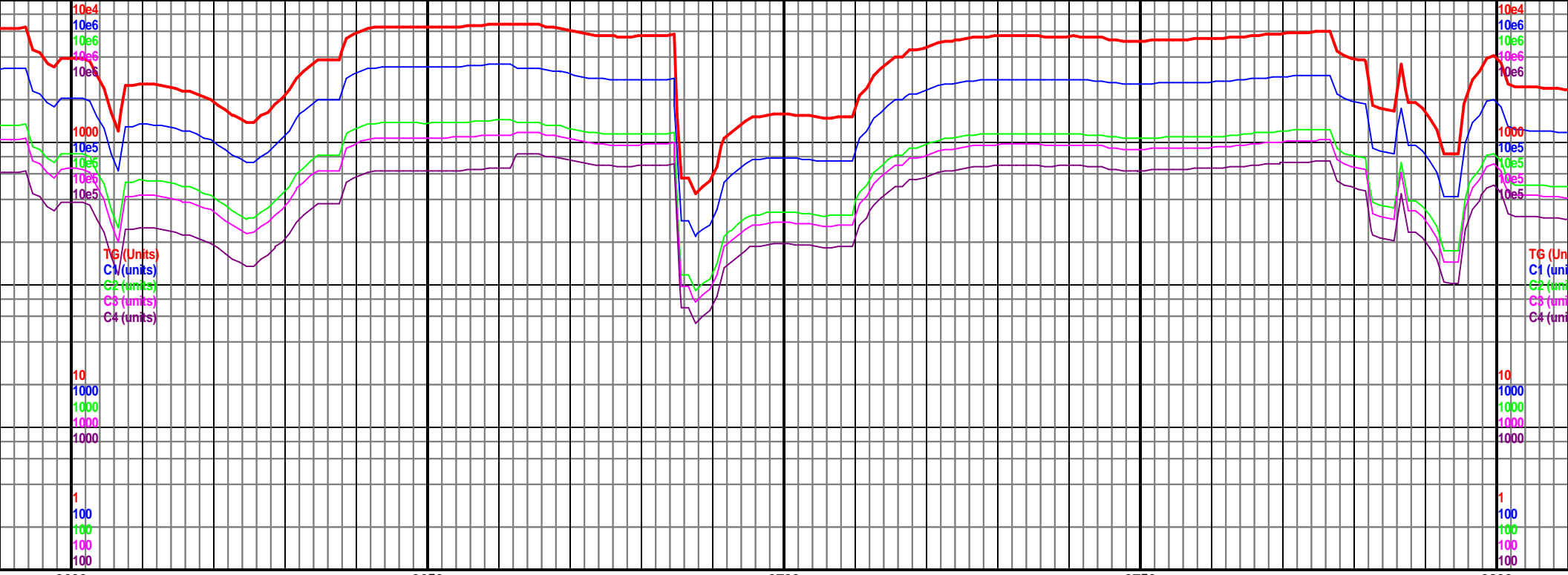
5550
 (-783)

It-med gy, sb bkly-sb
 oc, rr bent, g tr mrlst
 ll orgn flr, v slo yel
 0% mrlst

9200-9300 Chk It-med gy, sb bkly-plty,
 frm, g tr inoc, rr bent, g tr mrlst med-dk
 gy, rr dull orgn flr, slo yel cut, 90%
 chk, 10% mrlst

9300-9400 Chk It-med gy, sb bkly-plty,
 frm, g tr inoc, tr mrlst med-dk gy, slo
 yel cut, 90% chk, 10% mrlst





9600 9650 9700 9750 9800

5000 TVD
Sub Sea (-238)

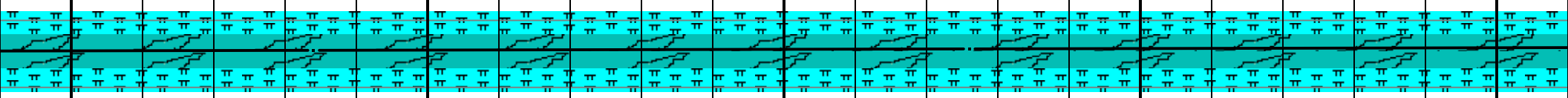
MD 9634 TVD 5709.73
INC 91.4 AZ 179.9
VS 4234.5

MD 9726 TVD 5707.32
INC 91.6 AZ 179.4
VS 4326.47

5000 TVD
Sub Sea (-238)

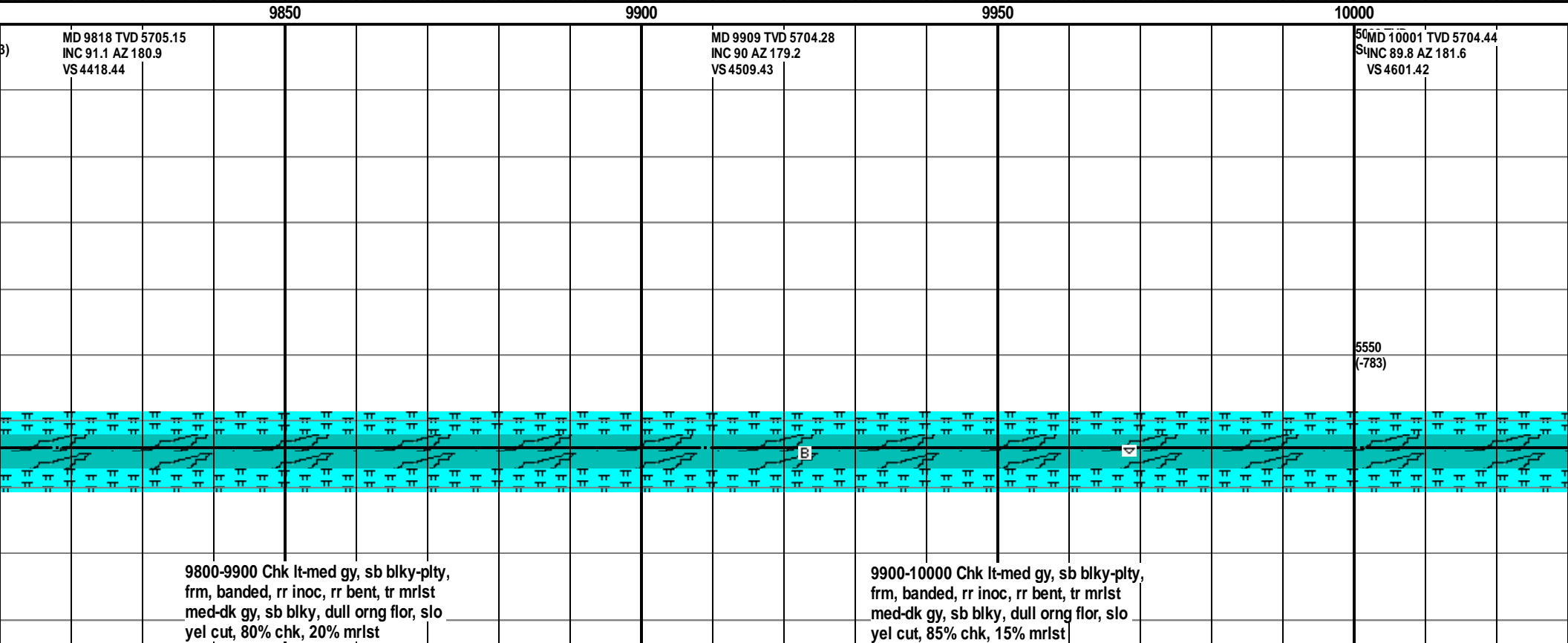
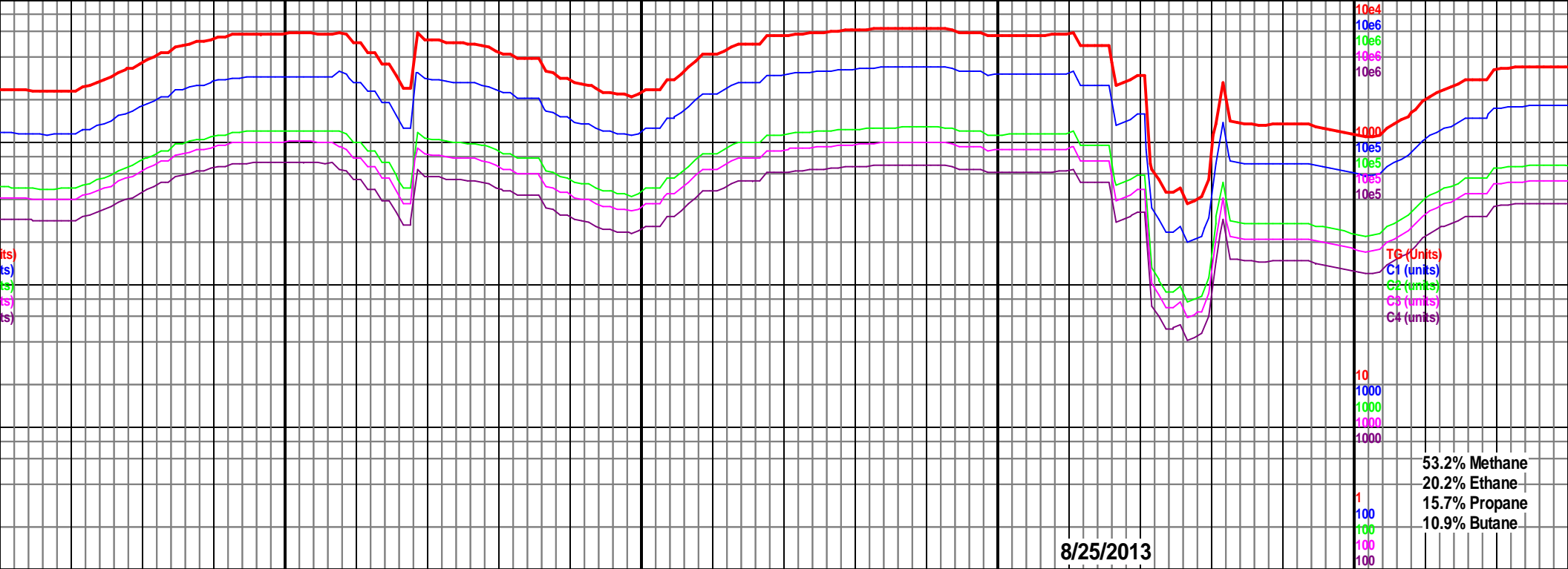
5550
(-783)

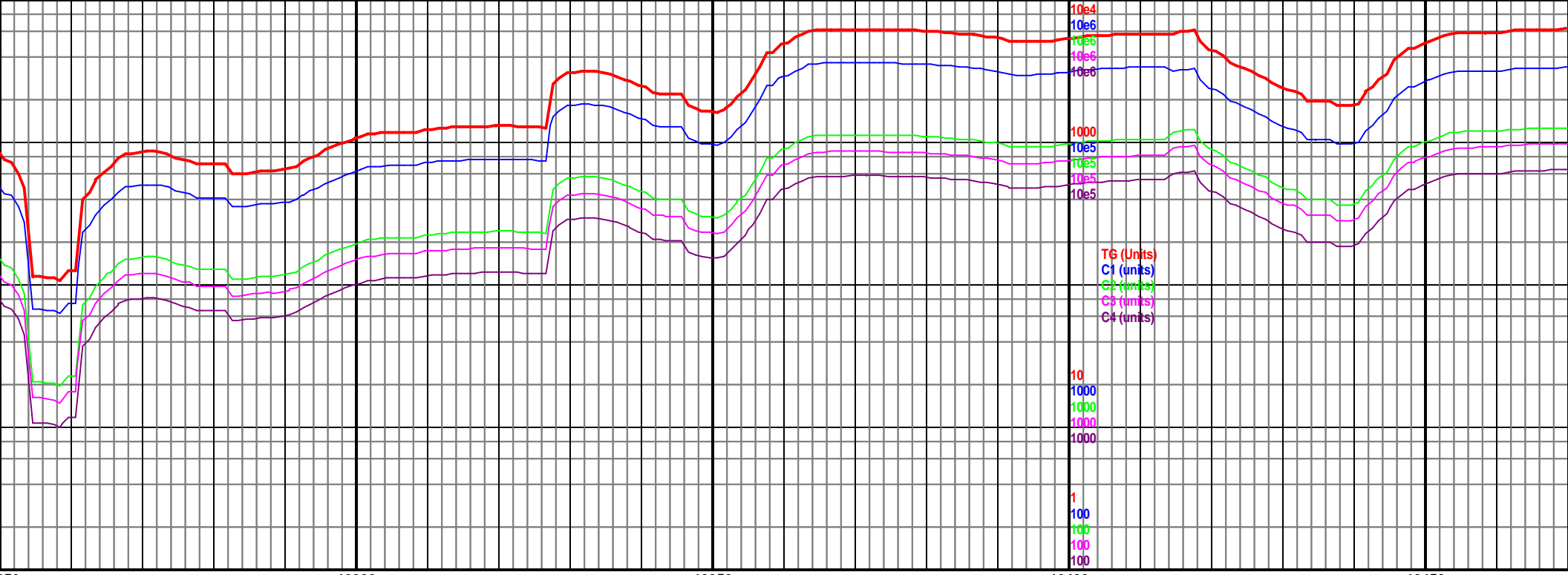
5550
(-783)



9600-9700 Chk lt-med gy, sb blk-y-pty,
frm, banded, tr inoc, abnt bent, tr mrlst
med-dk gy, sb blk-y, dull org flor, slo
yel cut, 85% chk, 15% mrlst

9700-9800 Chk lt-med gy, sb blk-y-pty,
frm, banded, tr inoc, tr bent, tr mrlst
med-dk gy, sb blk-y, dull org flor, slo
yel cut, 80% chk, 20% mrlst





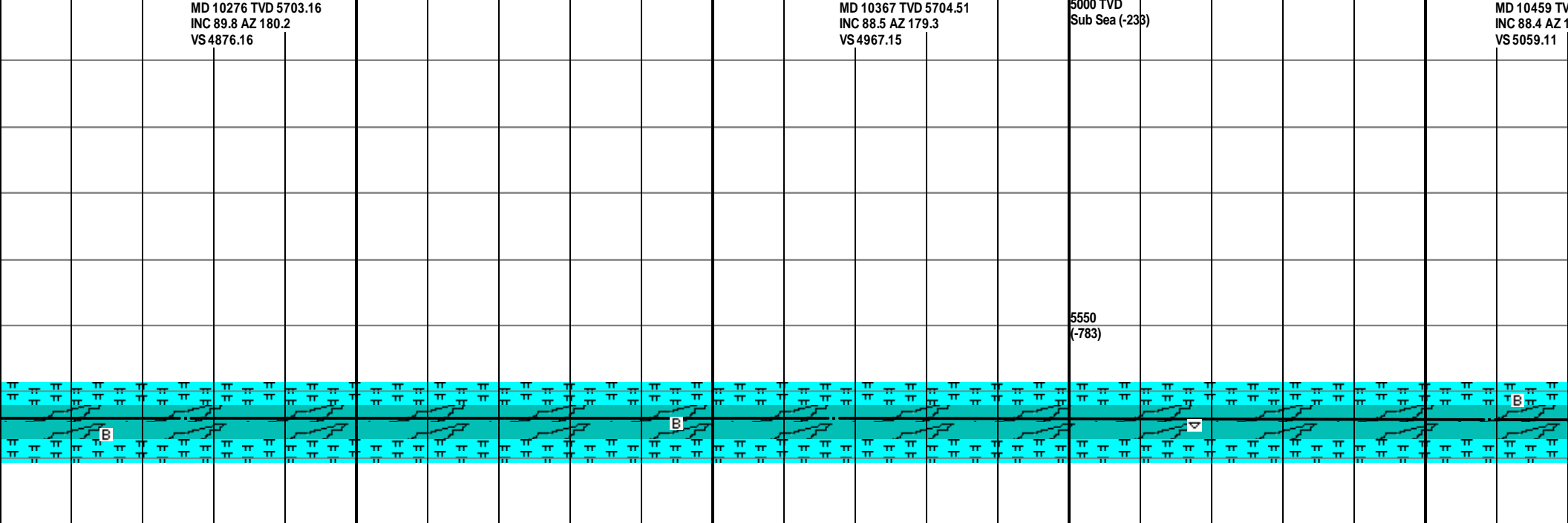
10250 10300 10350 10400 10450

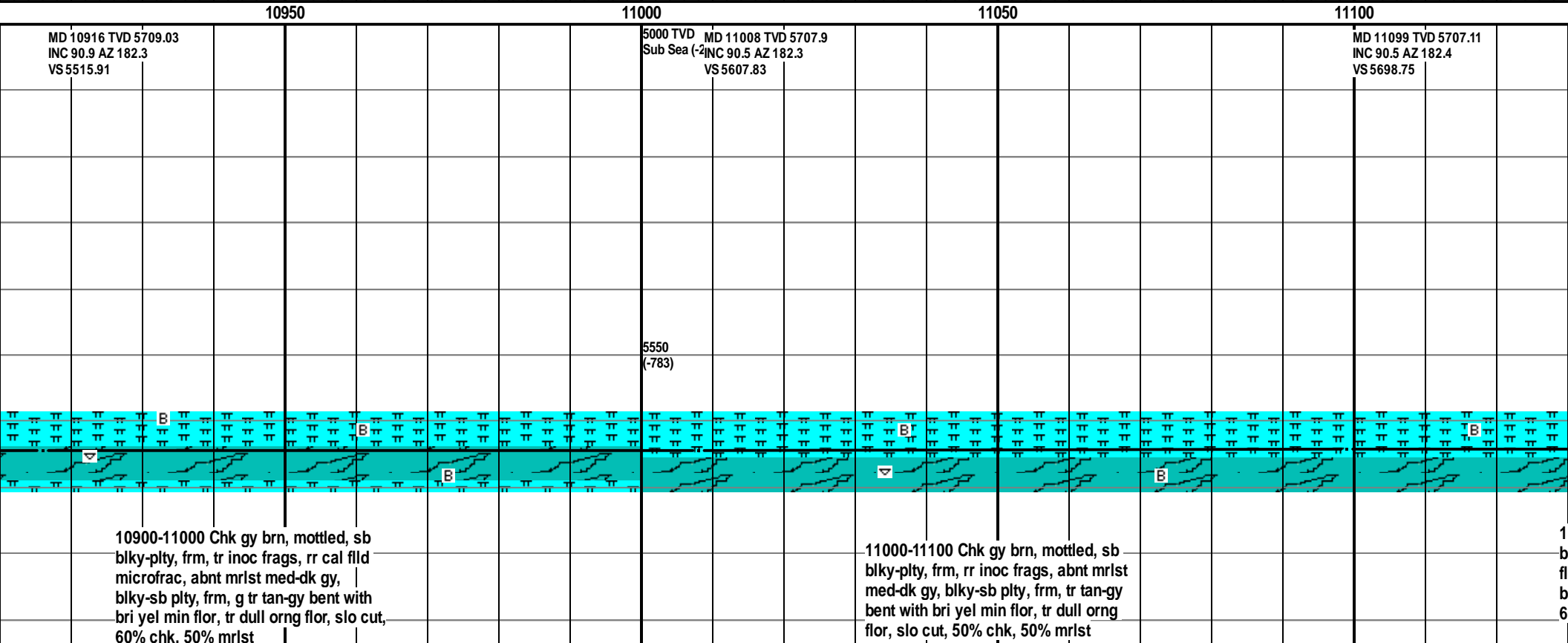
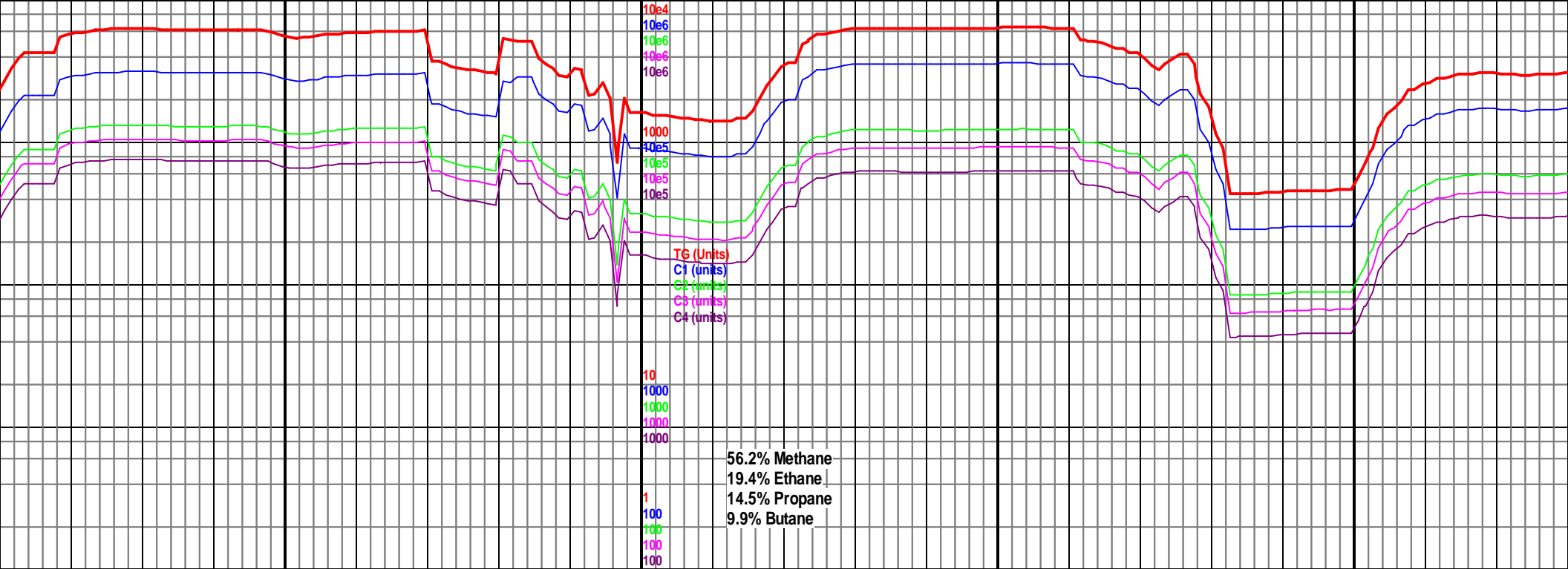
MD 10276 TVD 5703.16
INC 89.8 AZ 180.2
VS 4876.16

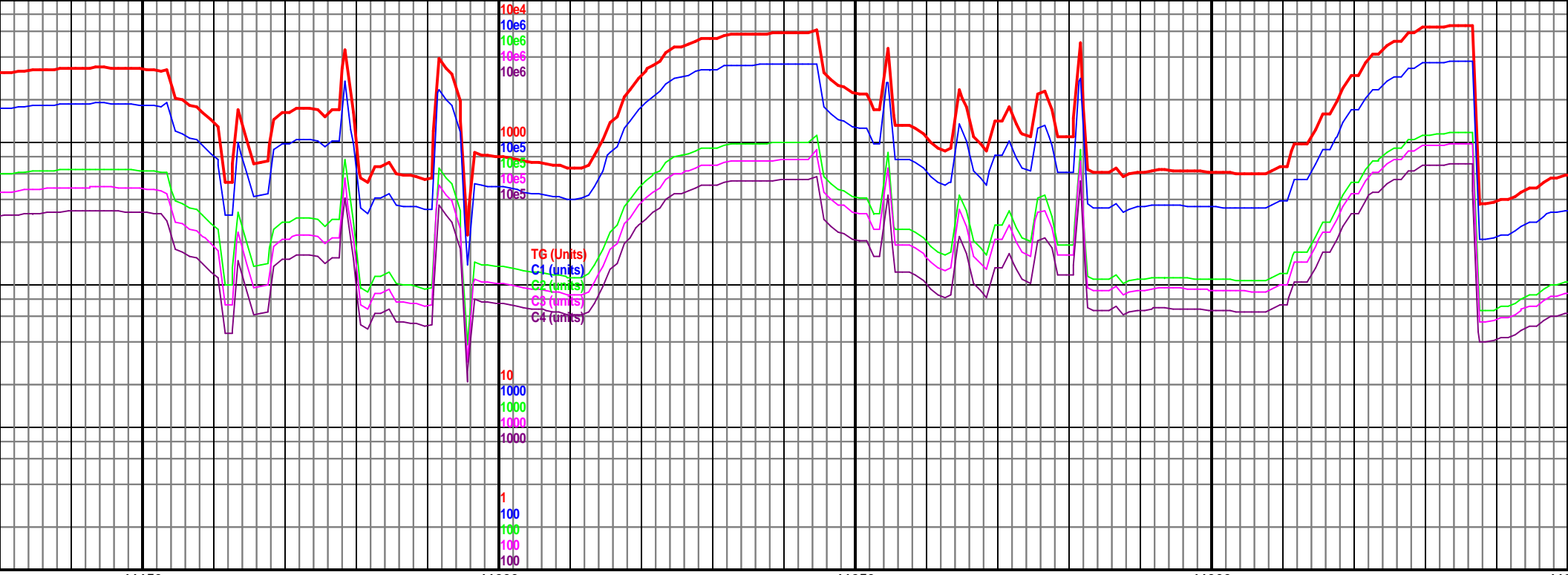
MD 10367 TVD 5704.51
INC 88.5 AZ 179.3
VS 4967.15

5000 TVD
Sub Sea (-238)

MD 10459 TVD 5705.11
INC 88.4 AZ 179.3
VS 5059.11







11150

11200

11250

11300

11350

MD 11191 TVD 5706.22
INC 90.6 AZ 182.8^a (-23^β)
VS 5790.65

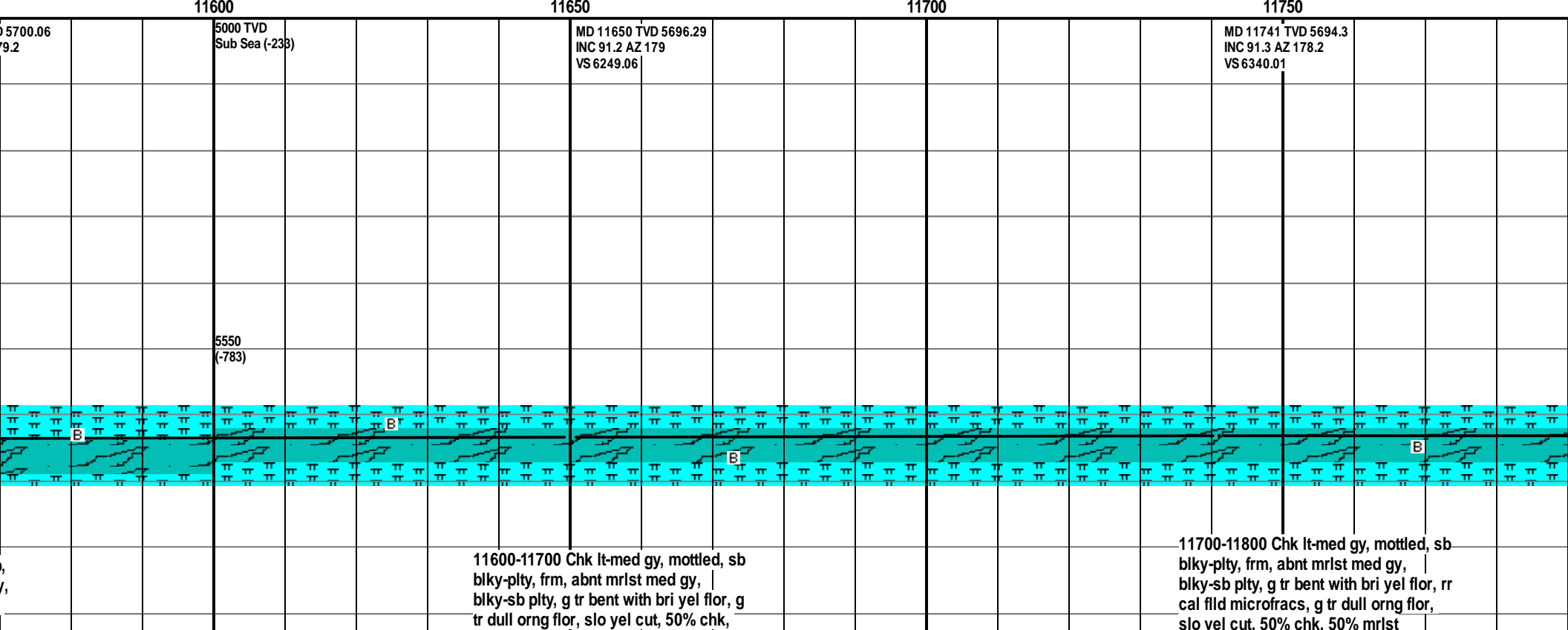
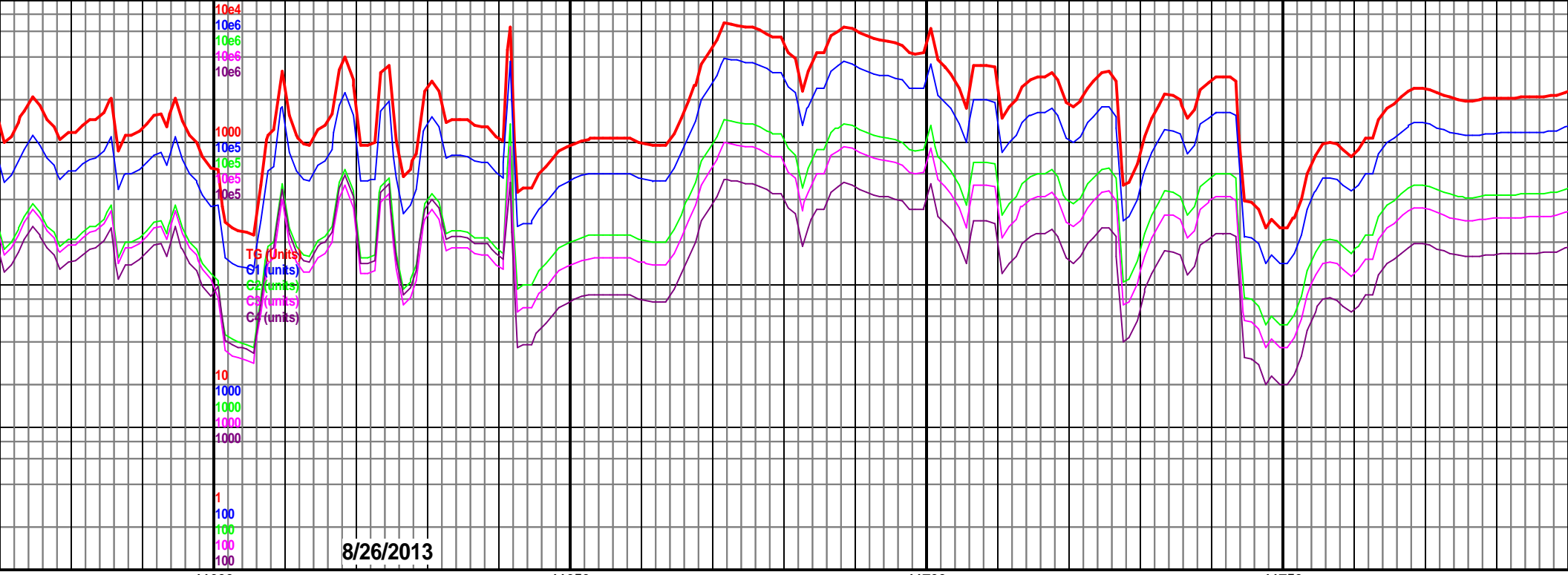
MD 11283 TVD 5705.66
INC 90.1 AZ 183.3
VS 5882.52

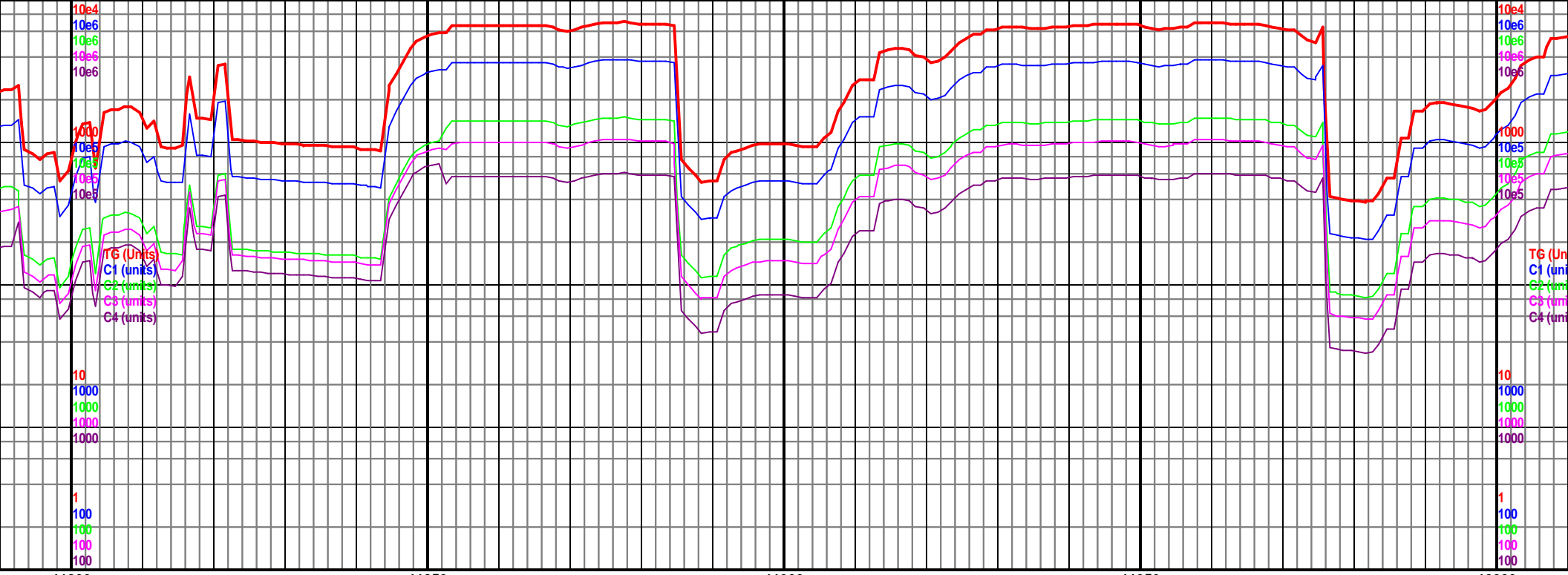
5550
(-783)

1100-11200 Chk gy brn, mottled, sb
blky-plty, frm, occ tan bent with bri yel
flor, rr inoc, abnt mrslt med-dk gy,
blky-sb blky, slo yel cut, 40% chk,
0% mrlst

11200-11300 Chk gy brn, mottled, sb
blky-plty, frm, occ tan bent with bri yel
flor, rr inoc, abnt mrslt med-dk gy,
blky-sb blky, slo yel cut, 40% chk,
60% mrlst

11300-11400 Chk gy
blky-plty, frm, occ m
blky-sb blky, tr bent
50% mrlst





5000 TVD
Sub Sea (-238)

MD 11832 TVD 5693.66
INC 89.5 AZ 177.8
VS 6430.94

MD 11924 TVD 5694.47
INC 89.5 AZ 177.4
VS 6522.86

5000 TVD
Sub Sea (-238)

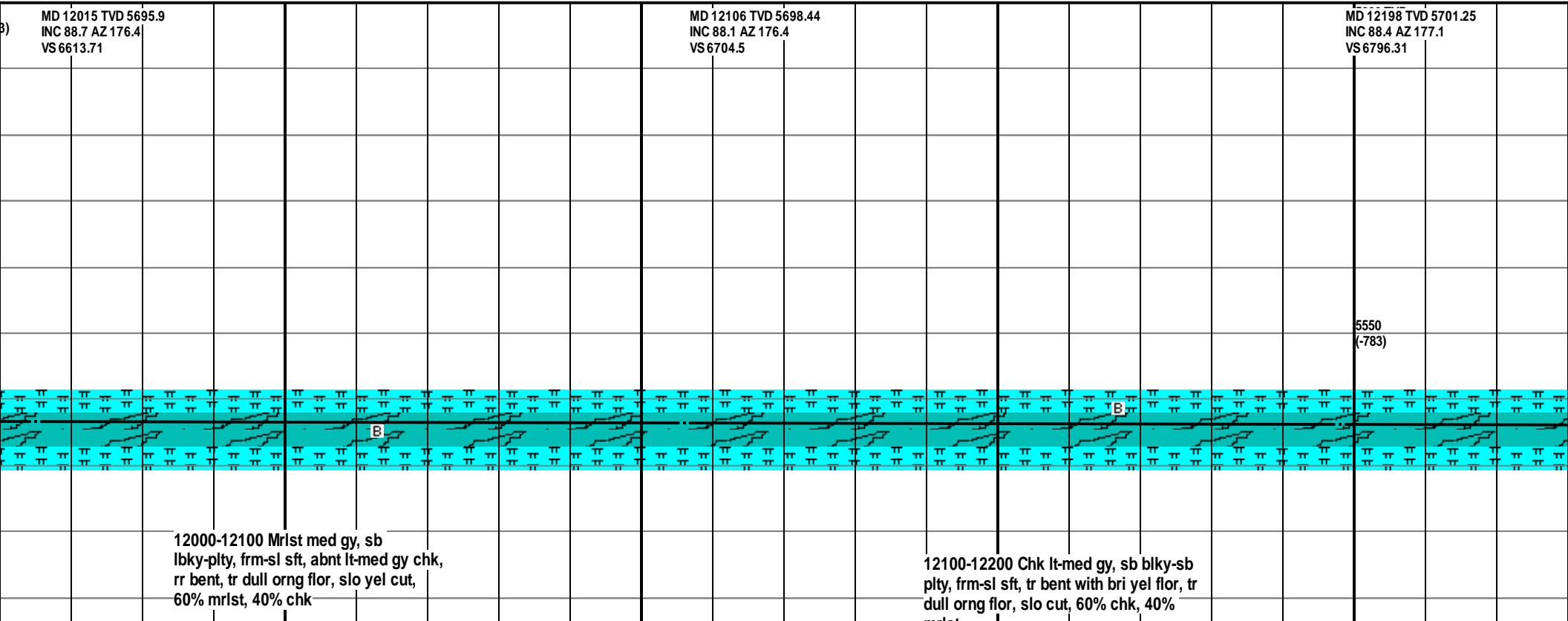
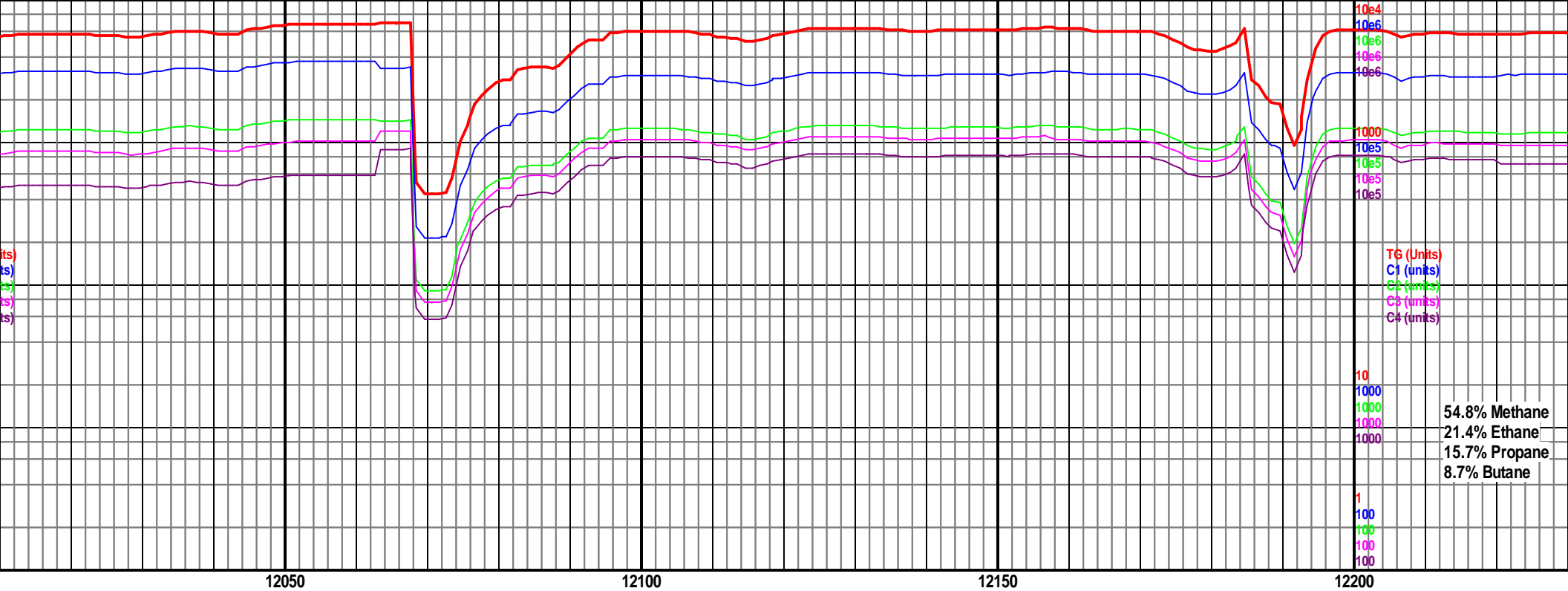
5550
(-783)

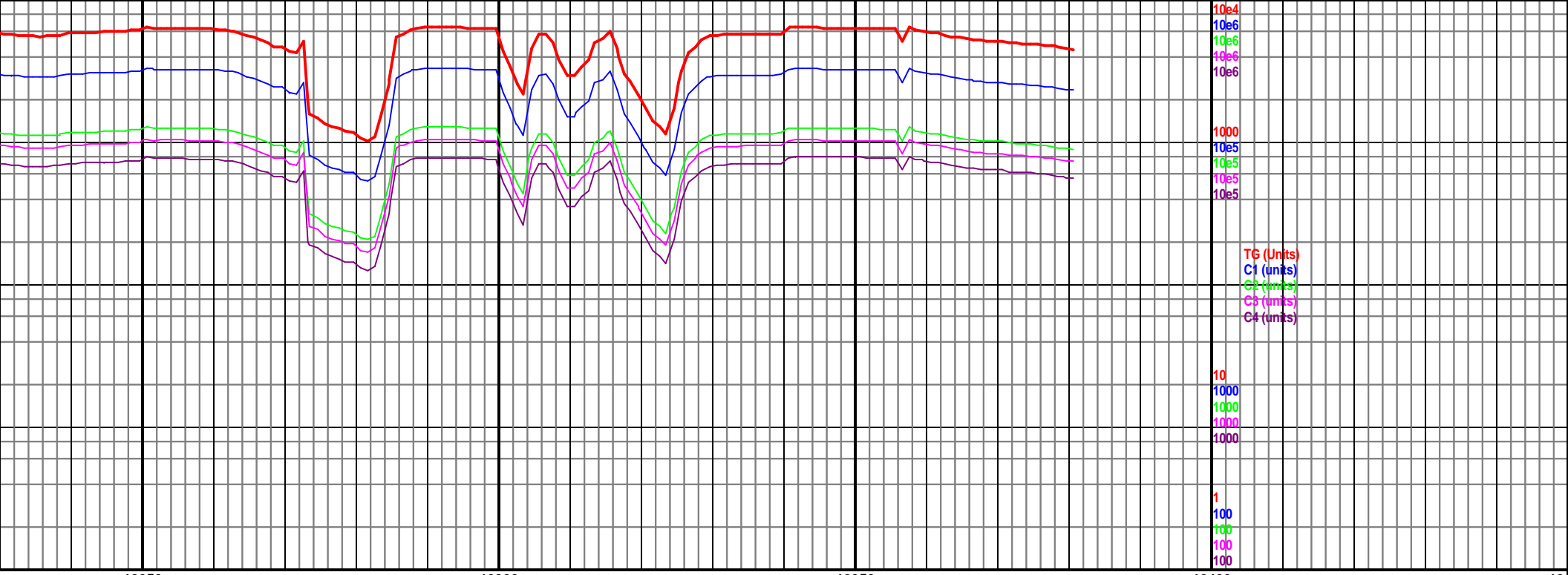
5550
(-783)



11800-11900 Mrlst med gy, sb
blky-blky, frm-sl hd, abnt chk cont a/a,
rr bent, tr dull orng flor, slo cut, 60%
mrlst, 40% chk

11900-12000 Chk lt-med gy, sb
blky-pty, frm-sl sft, abnt mrlst a/a, rr
bent, tr dull orng flor, slo cut, 50% chk,
50% mrlst





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

10
1000
1000
1000
1
100
100
100
100

12250

12300

12350

12400

12450

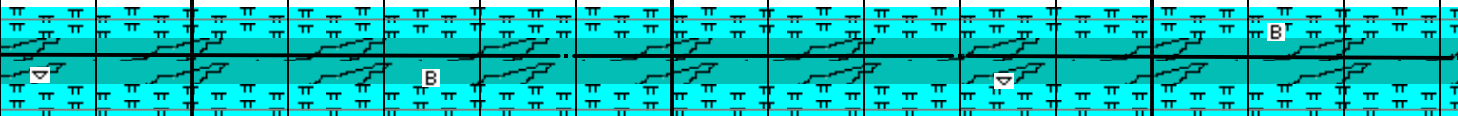
MD 12289 TVD 5703.47
INC 88.8 AZ 177.3
VS 6887.17

MD 12330 TVD 5704.29
INC 88.9 AZ 177.8
VS 6928.12

MD 12382 TVD 5706.7
INC 88.9 AZ 177.8
VS 6980.05

5000 TVD
Sub Sea (-238)

5550
(-783)



12200-12300 Chk lt-med gy, sb blk-y-sb
plty, frm, arg, tr bent, tr inoc, tr dull
org flr, slo fnt cut, 50% chk, 50%
mrlst

12300-12382 Chk lt-med gy, sb blk-y-sb
plty, frm, arg, tr bent, tr inoc, tr dull
org flr, slo fnt cut, 50% chk, 50%
mrlst