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

Well Name:	**Razor 27J-3409A**		
Well Id:			
Location:	**NWSW 27-T10N-R58W**		
License Number:	**05-123-38064**	**Region:**	**Redtail Field**
Spud Date:	**9/20/2014**	**Drilling Completed:**	
Surface Coordinates:	**Lat.: 40.808664 Long.: -103.848444**		
Bottom Hole Coordinates:			
Ground Elevation (ft):	**4767**	**K.B. Elevation (ft):**	**4789**
Logged Interval (ft):	**5100** **To:**	**Total Depth (ft):**	
Formation:	**Pierre, Sharon Springs, Niobrara A**		
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: **Lauren Roddy, Christian VanWyngarden**
Company: **Acme Geologic Consulting**
Address: **108 Berry Street**
Little Rock, AR 72205

Drilling Company

Frontier Drilling
Rig #26

Gas Detection

Mudlogging Systems, Inc., M Logger, Model TGC, Total Gas and Chromatograph, #394

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

- 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

- BS Boundst
- C Chalky
- CX Cryxln
- E Earthy
- FX Finexln
- GS Grainst
- L Lithogr
- MX Microxln
- MS Mudst
- PS Packst
- WS Wackest

OTHER SYMBOLS

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

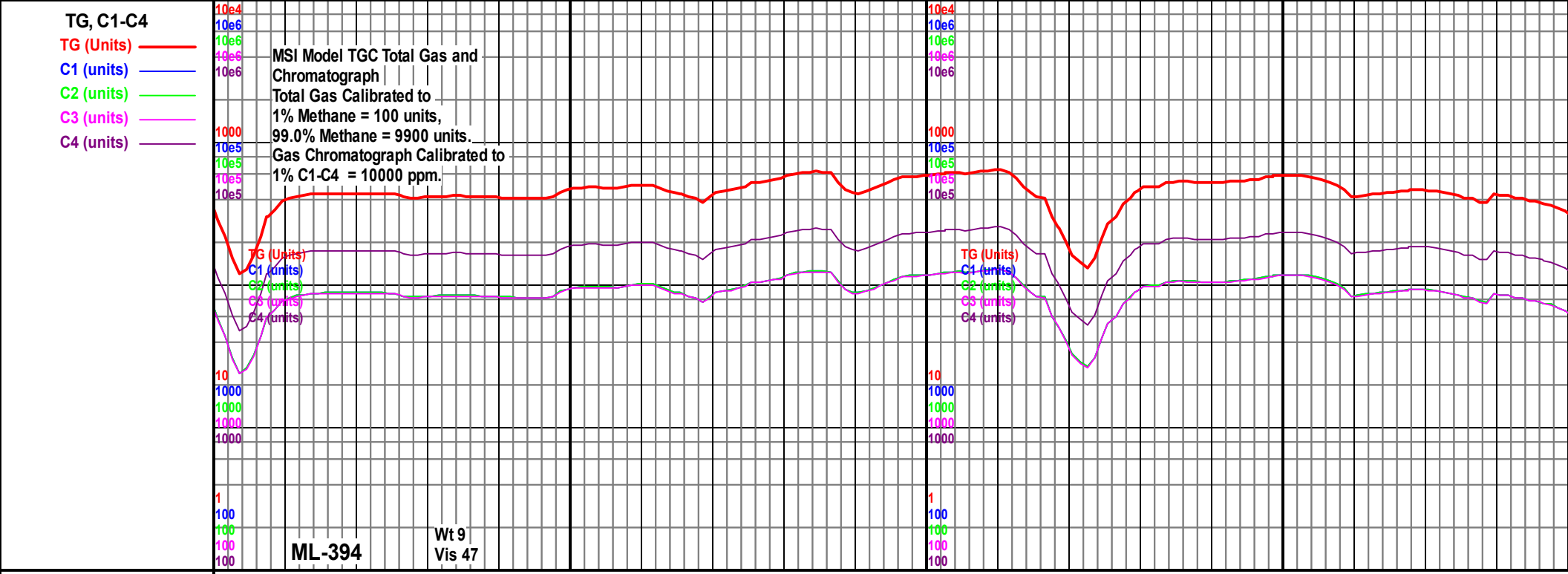
SORTING
- Well
- Moderate
- Poor

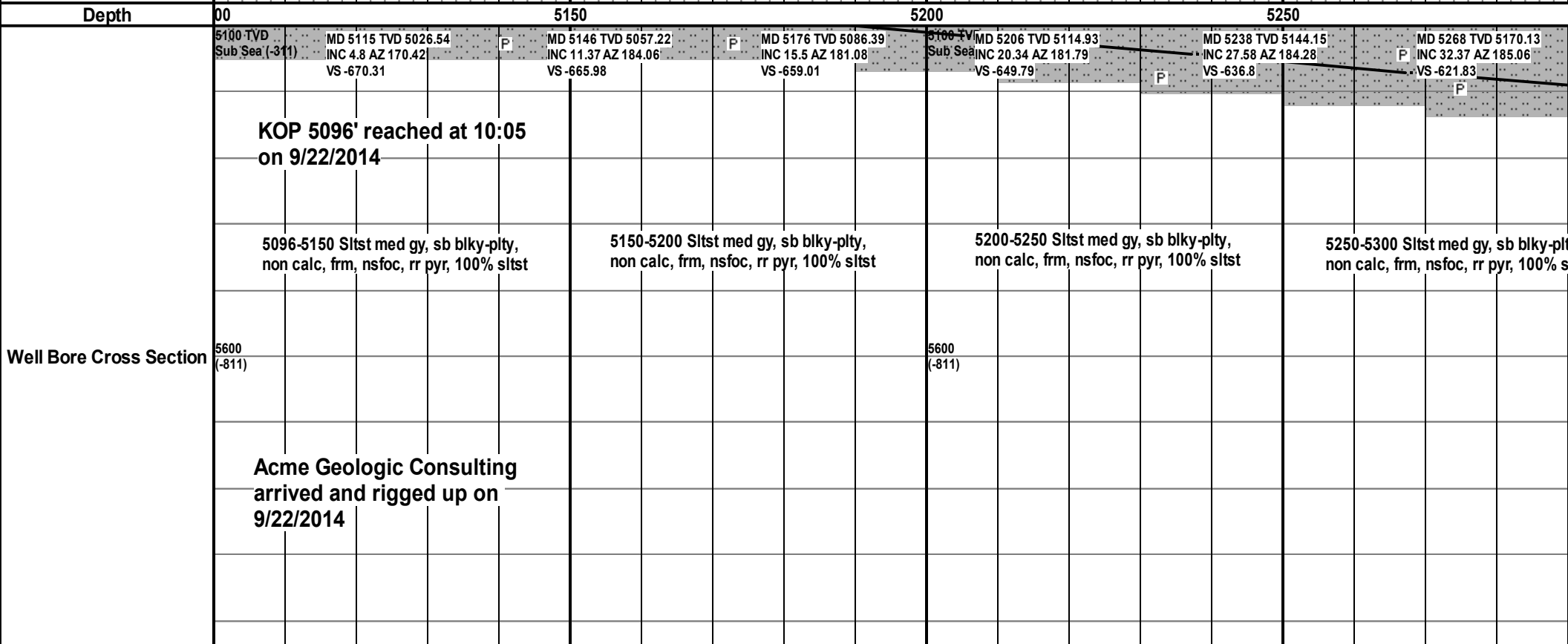
ROUNDING
- Rounded
- Subrnd
- Subang
- Angular

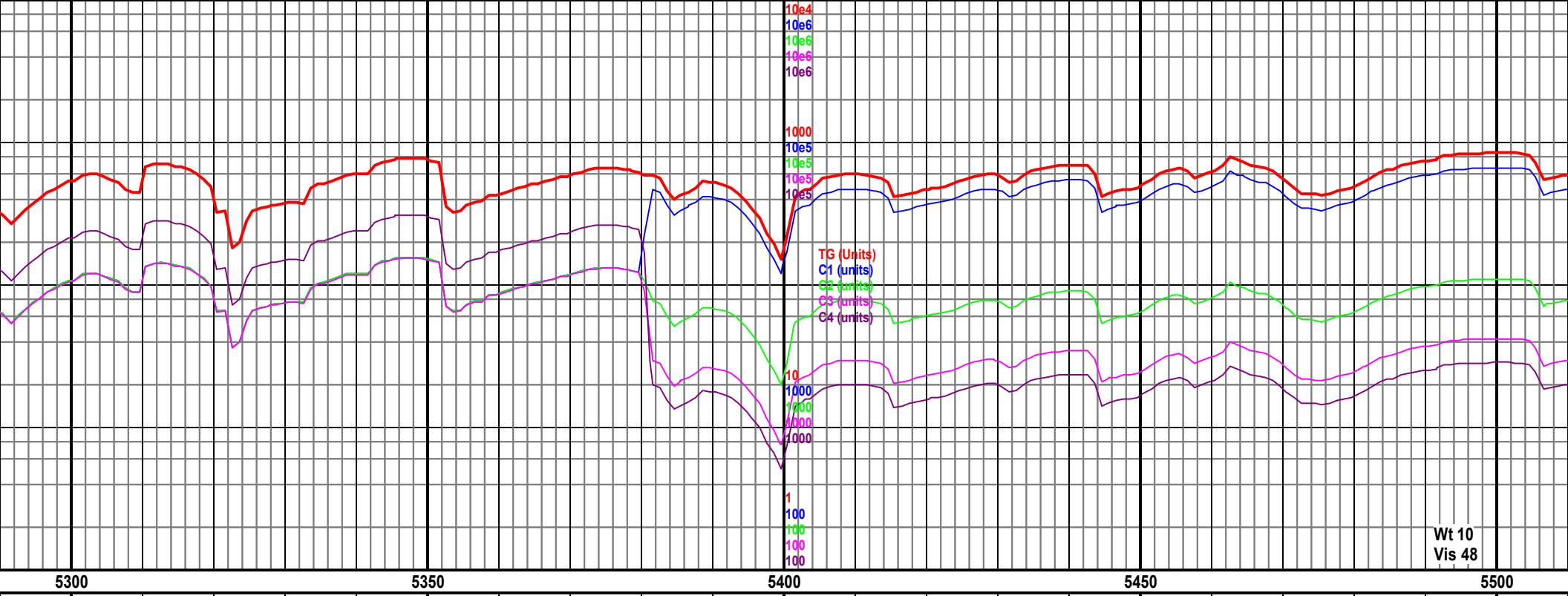
OIL SHOW
- Even
- Spotted
- Ques
- Dead

INTERVAL
- Core
- Dst

EVENT
- Rft
- 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.
ML-394
Wt 9
Vis 47


Depth
00
5150
5200
5250
5100 TVD Sub Sea (-311)
MD 5115 TVD 5026.54
INC 4.8 AZ 170.42
VS -670.31
MD 5146 TVD 5057.22
INC 11.37 AZ 184.06
VS -665.98
MD 5176 TVD 5086.39
INC 15.5 AZ 181.08
VS -659.01
MD 5206 TVD 5114.93
INC 20.34 AZ 181.79
VS -649.79
MD 5238 TVD 5144.15
INC 27.58 AZ 184.28
VS -636.8
MD 5268 TVD 5170.13
INC 32.37 AZ 185.06
VS -621.83
KOP 5096' reached at 10:05 on 9/22/2014
5096-5150 Sltst med gy, sb blky-plty, non calc, frm, nsfoc, rr pyr, 100% sltst
5150-5200 Sltst med gy, sb blky-plty, non calc, frm, nsfoc, rr pyr, 100% sltst
5200-5250 Sltst med gy, sb blky-plty, non calc, frm, nsfoc, rr pyr, 100% sltst
5250-5300 Sltst med gy, sb blky-plt non calc, frm, nsfoc, rr pyr, 100% s
Well Bore Cross Section
5600 (-811)
Acme Geologic Consulting arrived and rigged up on 9/22/2014


10e4
10e6
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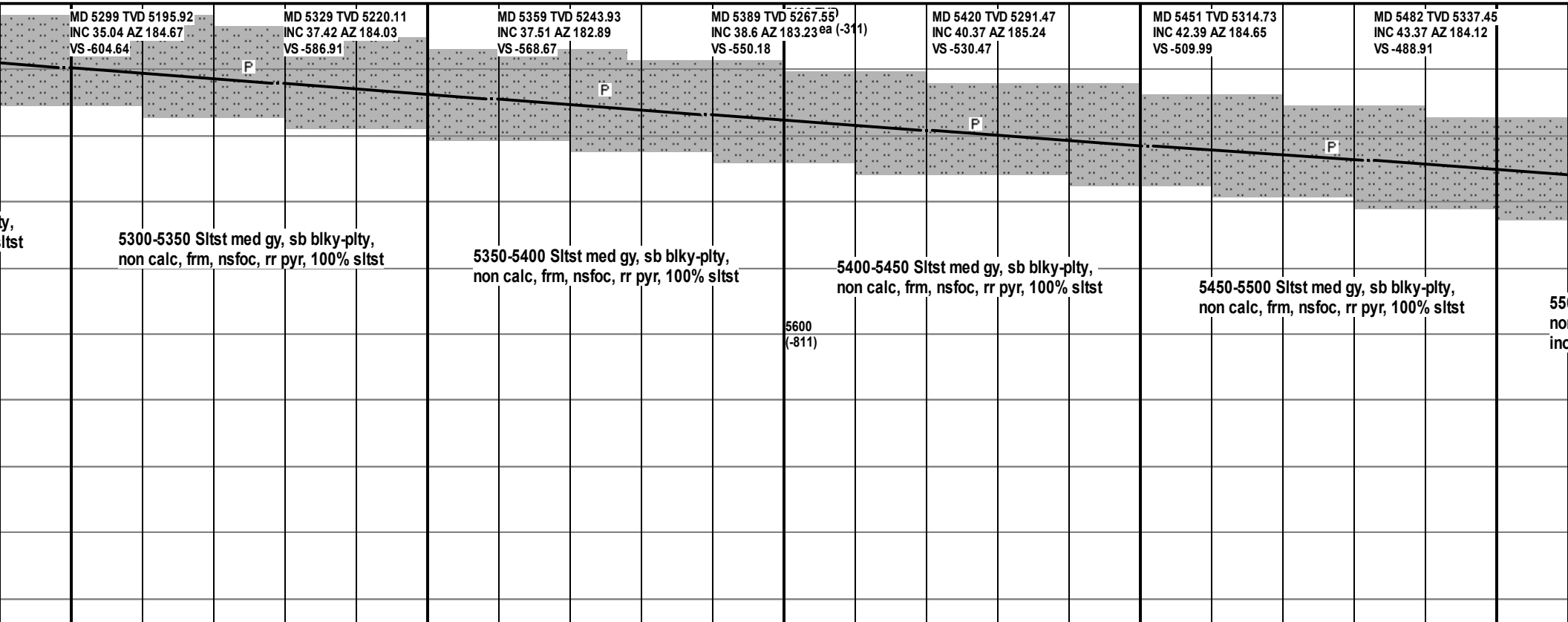
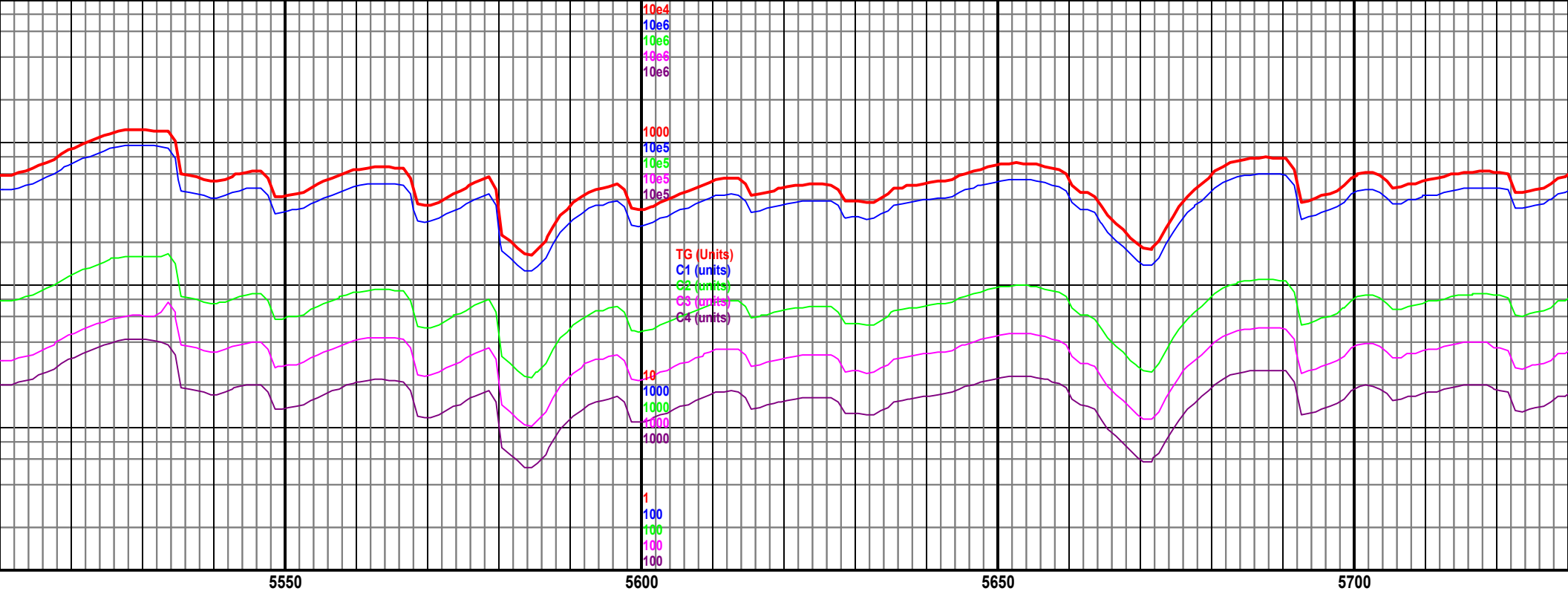
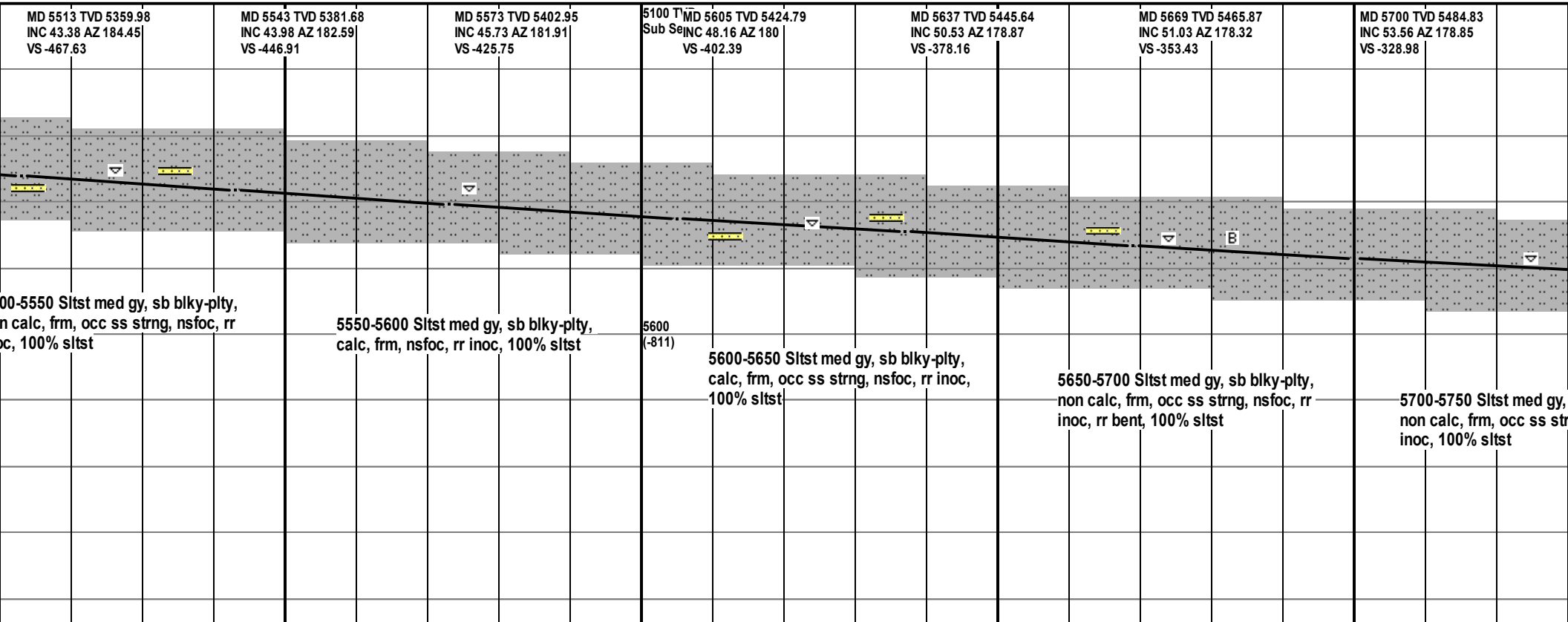
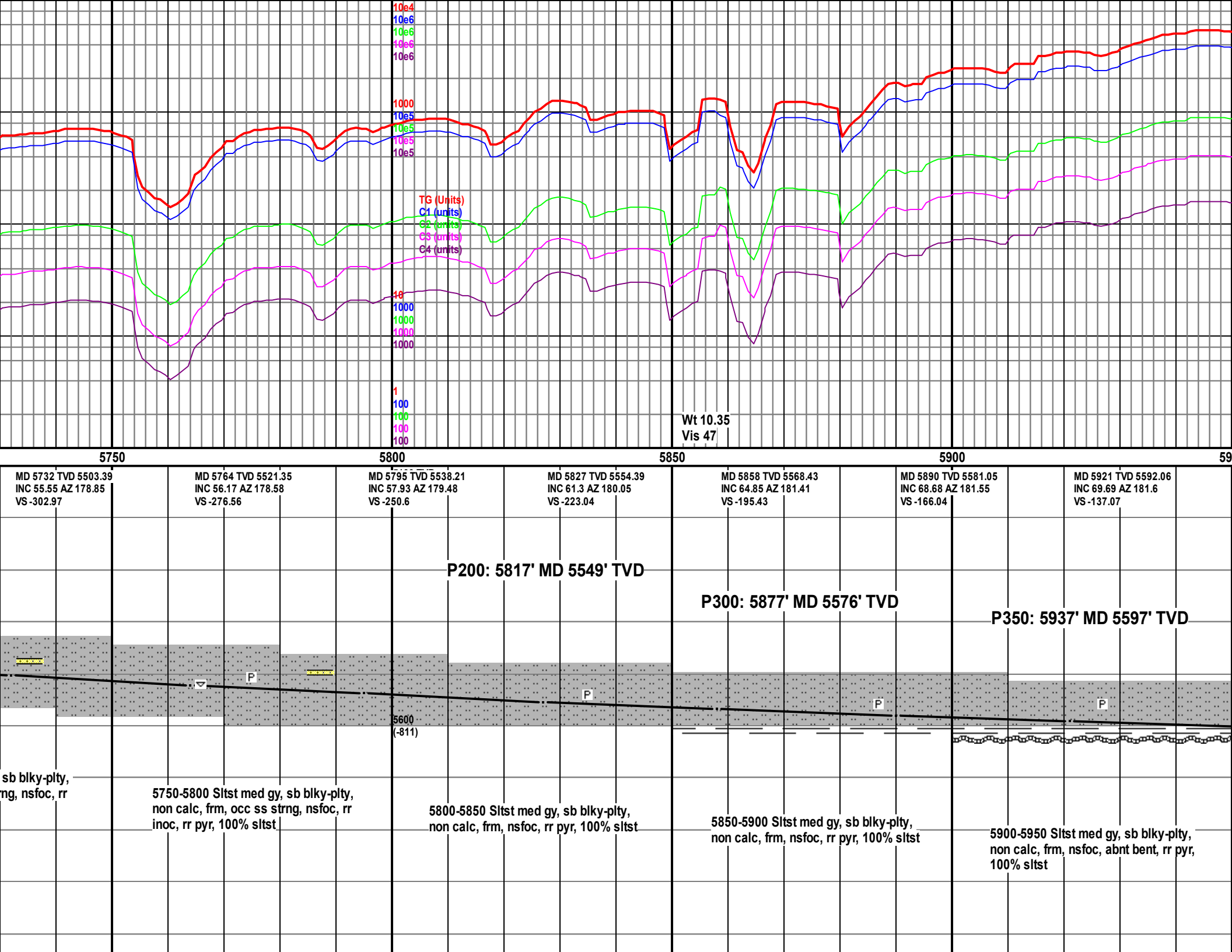
10e6
1000
10e5
10e5
10e5
10e5
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
10
1000
1000
1000
1000
1
100
100
100
100
Wt 10
Vis 48
5300
5350
5400
5450
5500


MD 5299 TVD 5195.92
INC 35.04 AZ 184.67
VS -604.64
MD 5329 TVD 5220.11
INC 37.42 AZ 184.03
VS -586.91
MD 5359 TVD 5243.93
INC 37.51 AZ 182.89
VS -568.67
MD 5389 TVD 5267.55
INC 38.6 AZ 183.23
VS -550.18
MD 5420 TVD 5291.47
INC 40.37 AZ 185.24
VS -530.47
MD 5451 TVD 5314.73
INC 42.39 AZ 184.65
VS -509.99
MD 5482 TVD 5337.45
INC 43.37 AZ 184.12
VS -488.91
P
P
P
P
5300-5350 Sltst med gy, sb blky-plty,
non calc, frm, nsfoc, rr pyr, 100% sltst
5350-5400 Sltst med gy, sb blky-plty,
non calc, frm, nsfoc, rr pyr, 100% sltst
5400-5450 Sltst med gy, sb blky-plty,
non calc, frm, nsfoc, rr pyr, 100% sltst
5450-5500 Sltst med gy, sb blky-plty,
non calc, frm, nsfoc, rr pyr, 100% sltst
5600
(-811)


10e4
10e6
10e6
10e6
10e6
1000
10e5
10e5
10e5
10e5
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
10
1000
1000
1000
1000
1
100
100
100
100
5550
5600
5650
5700


MD 5513 TVD 5359.98
INC 43.38 AZ 184.45
VS -467.63
MD 5543 TVD 5381.68
INC 43.98 AZ 182.59
VS -446.91
MD 5573 TVD 5402.95
INC 45.73 AZ 181.91
VS -425.75
5100 T
Sub Se
MD 5605 TVD 5424.79
INC 48.16 AZ 180
VS -402.39
MD 5637 TVD 5445.64
INC 50.53 AZ 178.87
VS -378.16
MD 5669 TVD 5465.87
INC 51.03 AZ 178.32
VS -353.43
MD 5700 TVD 5484.83
INC 53.56 AZ 178.85
VS -328.98
00-5550 Sltst med gy, sb blky-plty,
n calc, frm, occ ss strng, nsfoc, rr
oc, 100% sltst
5550-5600 Sltst med gy, sb blky-plty,
calc, frm, nsfoc, rr inoc, 100% sltst
5600
(-811)
5600-5650 Sltst med gy, sb blky-plty,
calc, frm, occ ss strng, nsfoc, rr inoc,
100% sltst
5650-5700 Sltst med gy, sb blky-plty,
non calc, frm, occ ss strng, nsfoc, rr
inoc, rr bent, 100% sltst
5700-5750 Sltst med gy,
non calc, frm, occ ss str
inoc, 100% sltst


10e4
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1000
10e5
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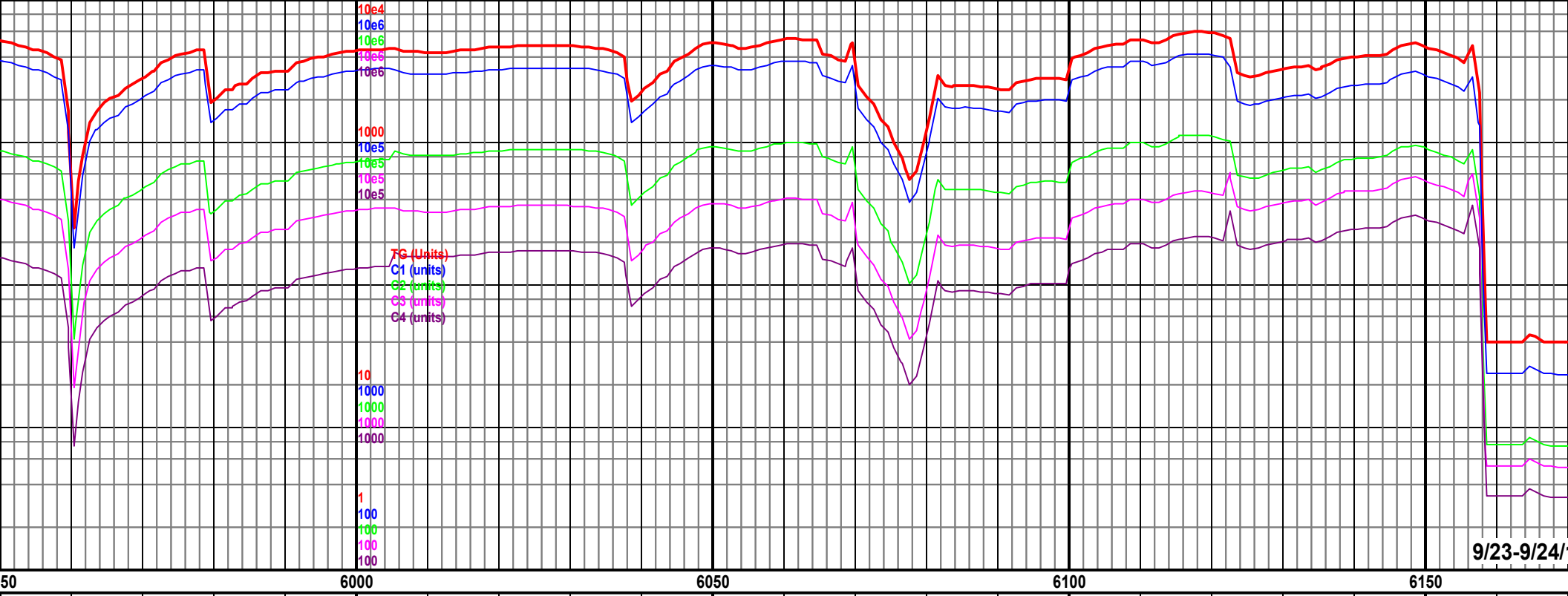
10e5
10e5
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
10
1000
1000
1000
1000
1
100
100
100
100
Wt 10.35
Vis 47
5750
5800
5850
5900
59
MD 5732 TVD 5503.39
INC 55.55 AZ 178.85
VS -302.97
MD 5764 TVD 5521.35
INC 56.17 AZ 178.58
VS -276.56
MD 5795 TVD 5538.21
INC 57.93 AZ 179.48
VS -250.6
MD 5827 TVD 5554.39
INC 61.3 AZ 180.05
VS -223.04
MD 5858 TVD 5568.43
INC 64.85 AZ 181.41
VS -195.43
MD 5890 TVD 5581.05
INC 68.68 AZ 181.55
VS -166.04
MD 5921 TVD 5592.06
INC 69.69 AZ 181.6
VS -137.07
P200: 5817' MD 5549' TVD
P300: 5877' MD 5576' TVD
P350: 5937' MD 5597' TVD
P
5600
(-811)
sb blky-plty,
rng, nsfoc, rr
5750-5800 Sltst med gy, sb blky-plty,
non calc, frm, occ ss strng, nsfoc, rr
inoc, rr pyr, 100% sltst
5800-5850 Sltst med gy, sb blky-plty,
non calc, frm, nsfoc, rr pyr, 100% sltst
5850-5900 Sltst med gy, sb blky-plty,
non calc, frm, nsfoc, rr pyr, 100% sltst
5900-5950 Sltst med gy, sb blky-plty,
non calc, frm, nsfoc, abnt bent, rr pyr,
100% sltst



MD 5953 TVD 5602.81
INC 71.07 AZ 181.34
VS -106.93

MD 5984 TVD 5612.02
INC 74.36 AZ 180.86
VS -77.35

00 TVD
ub Sea (-311)

MD 6016 TVD 5620.39
INC 75.29 AZ 181.31
VS -46.48

MD 6047 TVD 5627.67
INC 77.57 AZ 180.49
VS -16.37

MD 6079 TVD 5633.6
INC 81.05 AZ 179.77
VS 15.04

MD 6112 TVD 5638.42
INC 82.15 AZ 179.43
VS 47.63

Intermediate c
at 21:10 on 9/2
Resumed drill
on 9/24/2014.

SSPG: 5964' MD 5606' TVD

NBRR: 5998' MD 5616' TVD

N100: 6054' MD 5625' TVD

5600
(-811)

B

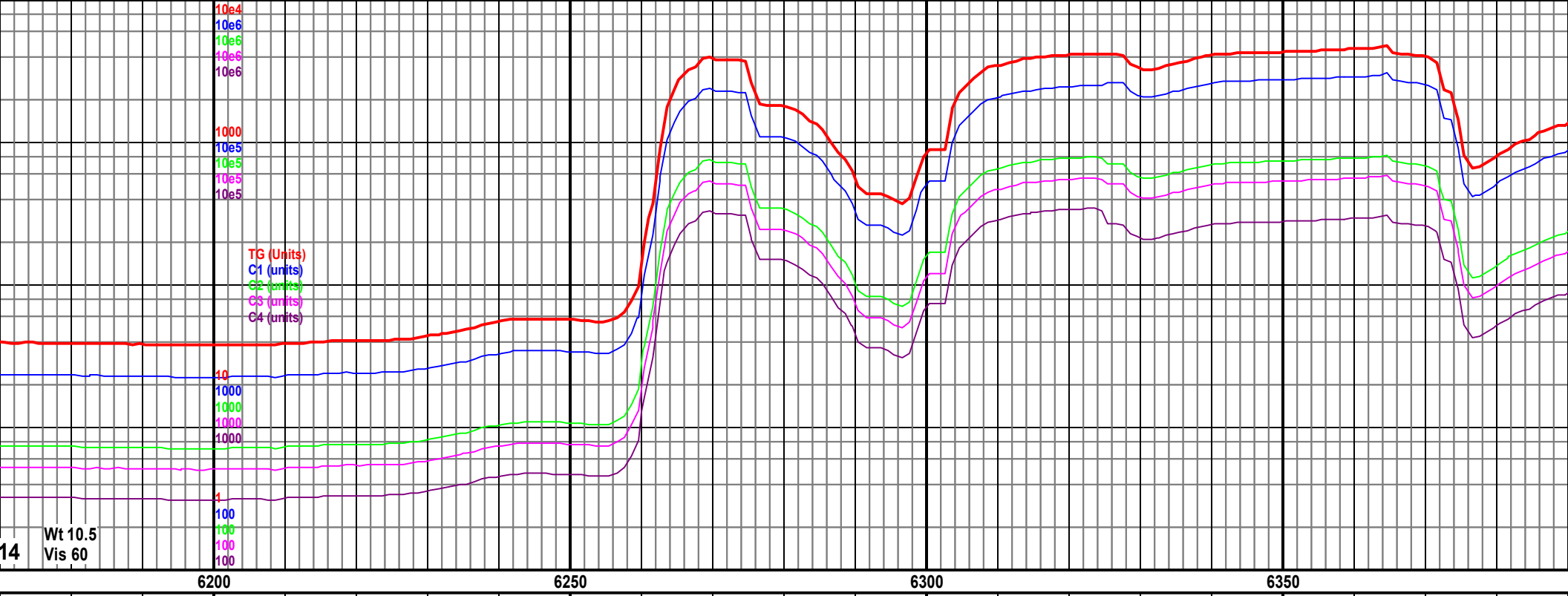
5950-6000 Sh med-dk gy, sb blky-sb plty, frm, rr Sltst lt gy-gy, sb plty, mod sft-mod frm, abnt bent, tan-orng, abnt bri yel min flor, 80% sh, 20% sltst

6000-6050 Sh med-dk gy, sb blky-sb plty, frm, rr Mrlst med-dk gy, sb blky-blky, frm, abnt bent, abnt bri yel min flor, 80% sh, 20% Mrlst

6050-6100 Chk lt gy, sft-sl frm, sb blky-sb flky, v calc, occ Mrlst dk gy, sl frm, sb blky, tr bent, abnt bri yel min flor, sl cut, 60% Chk, 40% Mrlst

6100-6165 Chk lt gy, sft-sl frm, sb blky-sb flky, v calc, occ Mrlst dk gy, sl frm, sb blky, rr bent, abnt bri yel min flor, sl cut, 60% Chk, 40% Mrlst

6165-6200 Chl
blky-sb flky, v
frm, sb blky, r
flor, sl cut, 60%



5100 TVD
Sub Sea (-311)

MD 6221 TVD 5648.72
INC 87.01 AZ 179.99
VS 155.95

MD 6315 TVD 5654.56
INC 85.86 AZ 179.35
VS 249.62

casing 6165'
22/2014.
ing at 04:07

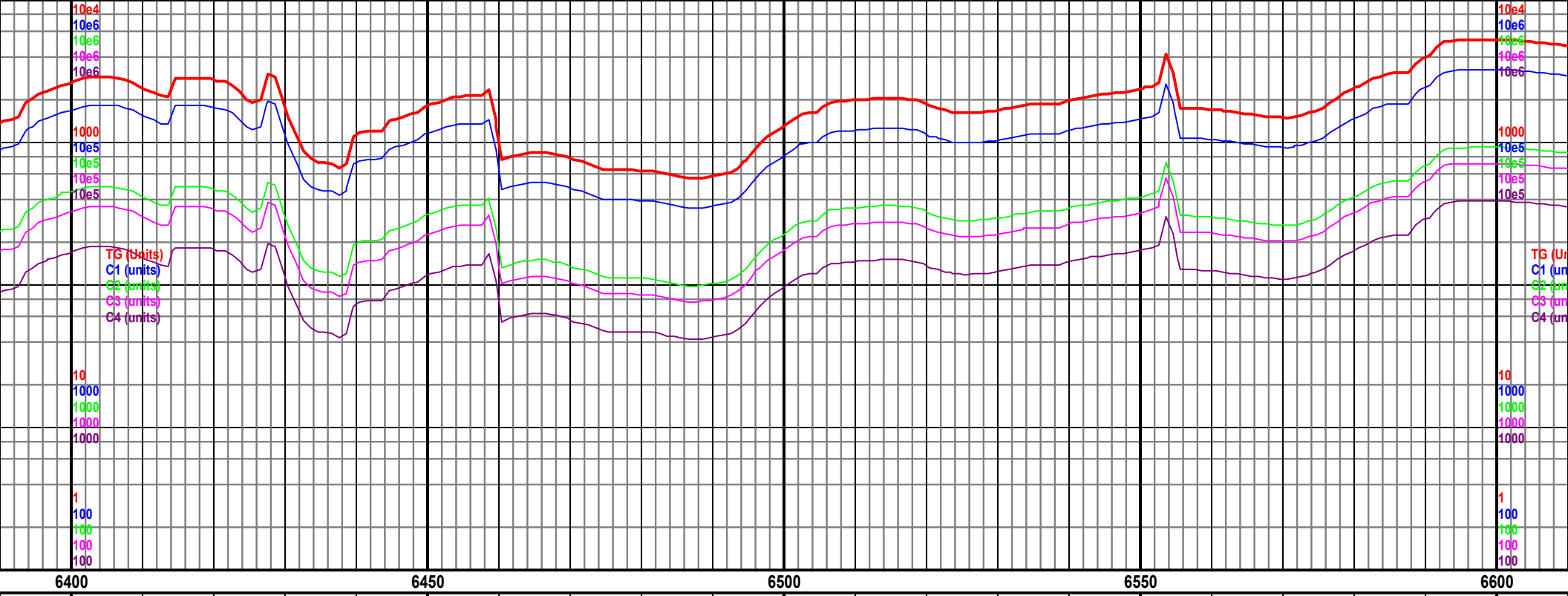
5600
(-811)

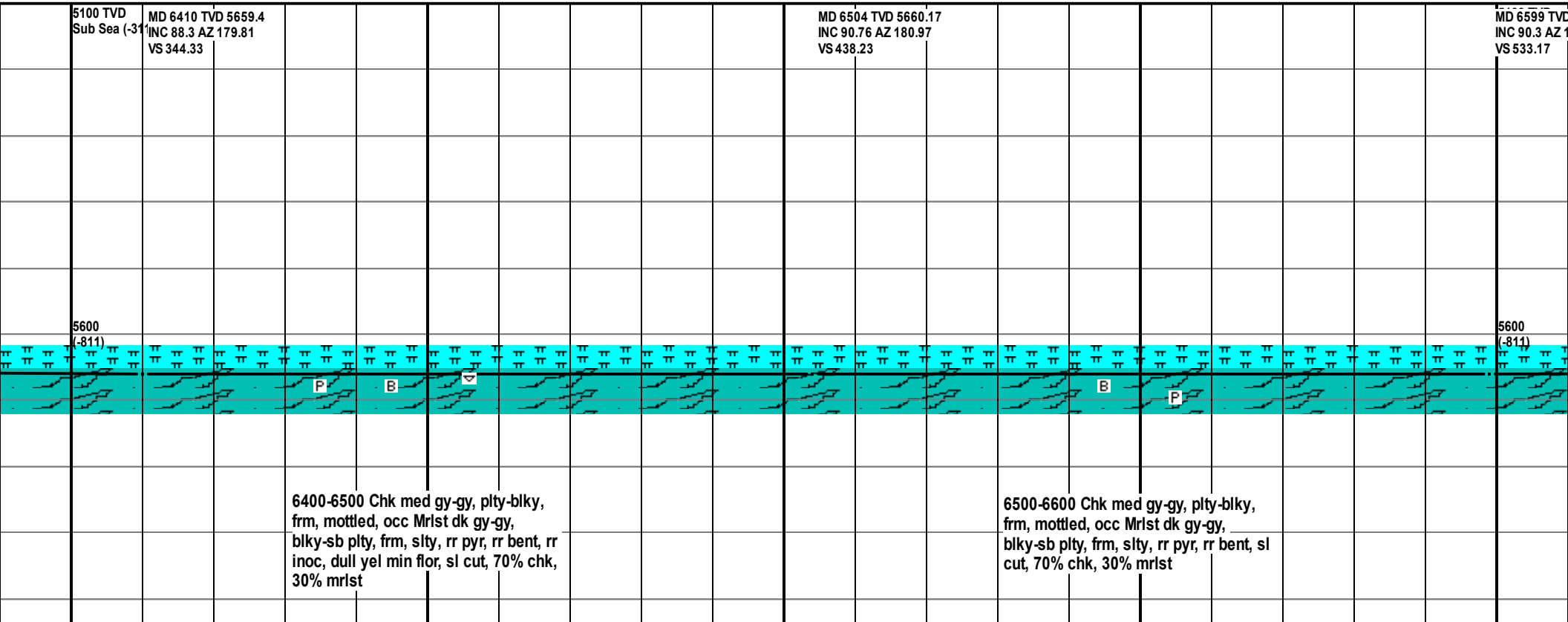
B

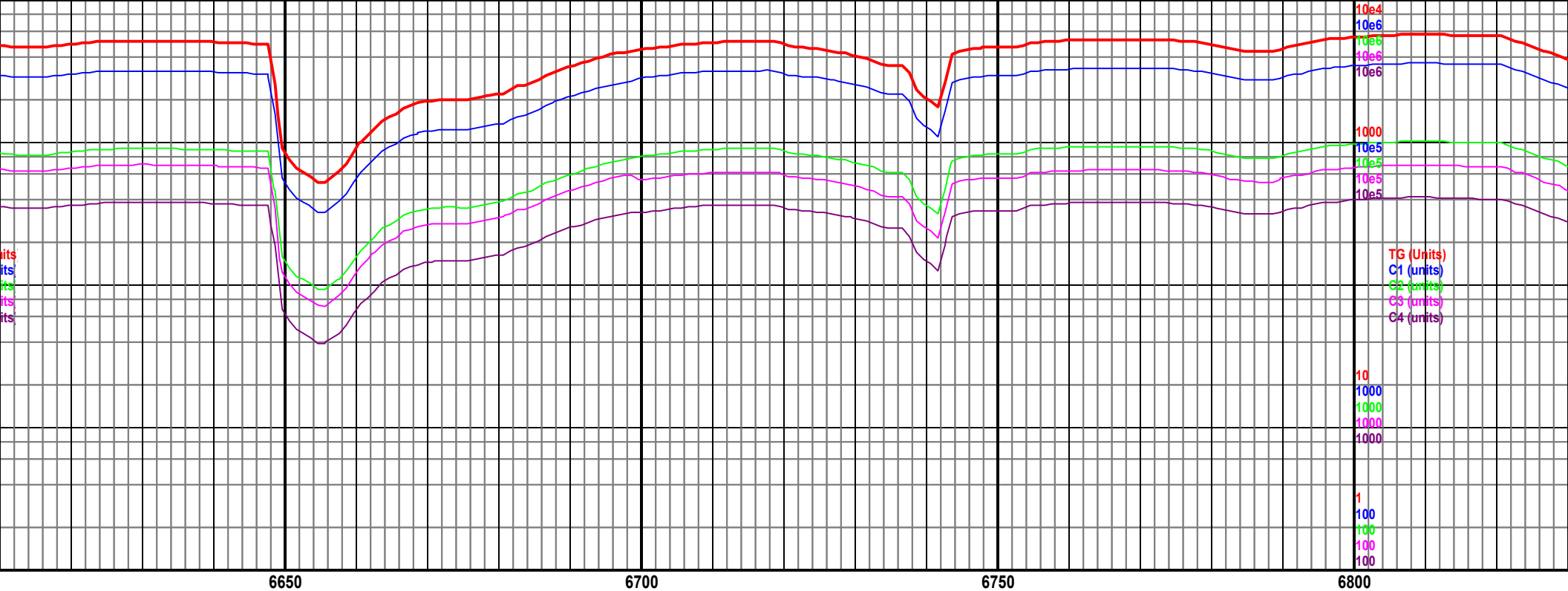
k lt gy, sft-sl frm, sb
calc, occ Mrlst dk gy, sl
r bent, abnt bri yel min
% Chk, 40% Mrlst

6200-6300 Chk med gy-gy, plty-blky, frm, mottled, tr Mrlst dk gy-gy, blky-sb plty, frm, slty, bri yel min flor, sl cut, 80% chk, 20% mrlst

6300-6400 Chk med gy-gy, plty-blky, frm, mottled, tr Mrlst dk gy-gy, blky-sb plty, frm, slty, bri yel min flor, sl cut, 90% chk, 10% mrlst


TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
6400
6450
6500
6550
6600


5100 TVD
Sub Sea (-311
MD 6410 TVD 5659.4
INC 88.3 AZ 179.81
VS 344.33
MD 6504 TVD 5660.17
INC 90.76 AZ 180.97
VS 438.23
MD 6599 TVD
INC 90.3 AZ 1
VS 533.17
5600
(-811)
P
B
B
P
6400-6500 Chk med gy-gy, plty-blky, frm, mottled, occ Mrlst dk gy-gy, blky-sb plty, frm, slty, rr pyr, rr bent, rr inoc, dull yel min flor, sl cut, 70% chk, 30% mrlst
6500-6600 Chk med gy-gy, plty-blky, frm, mottled, occ Mrlst dk gy-gy, blky-sb plty, frm, slty, rr pyr, rr bent, sl cut, 70% chk, 30% mrlst


10e4
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10e5
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
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1000
1000
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100
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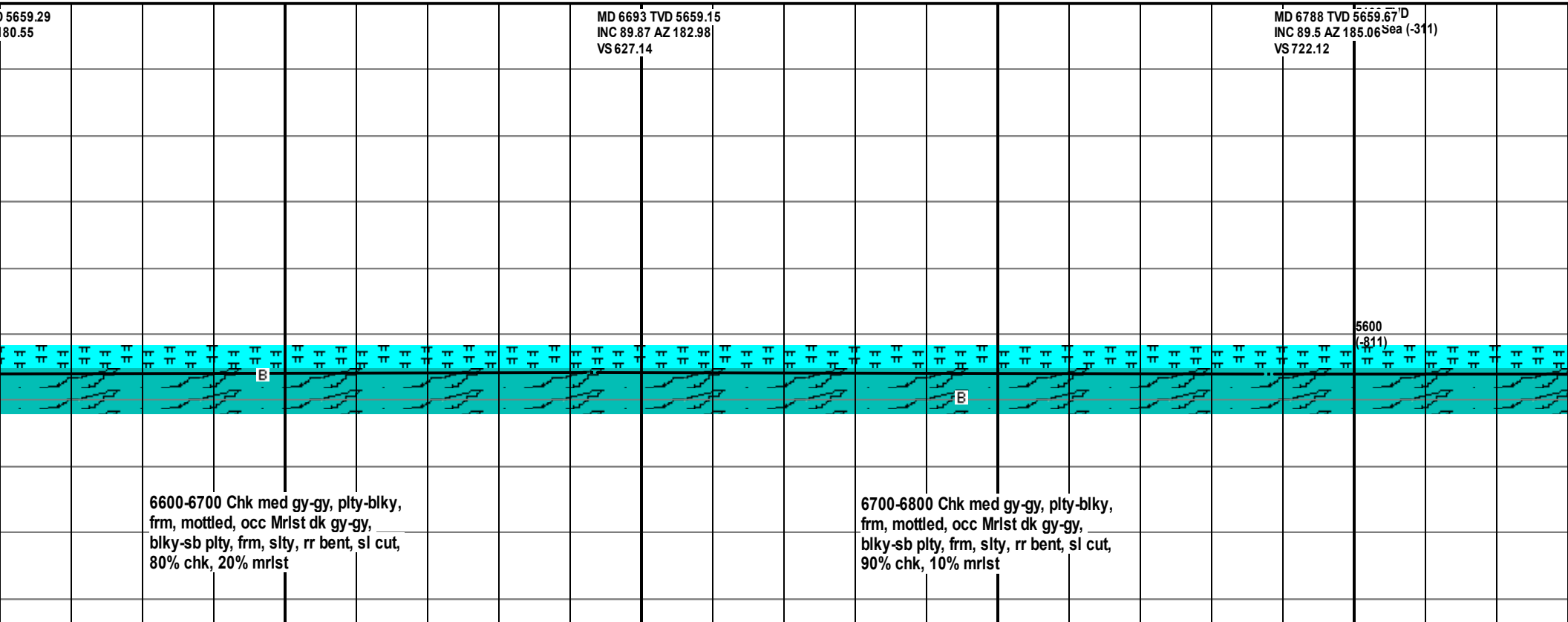
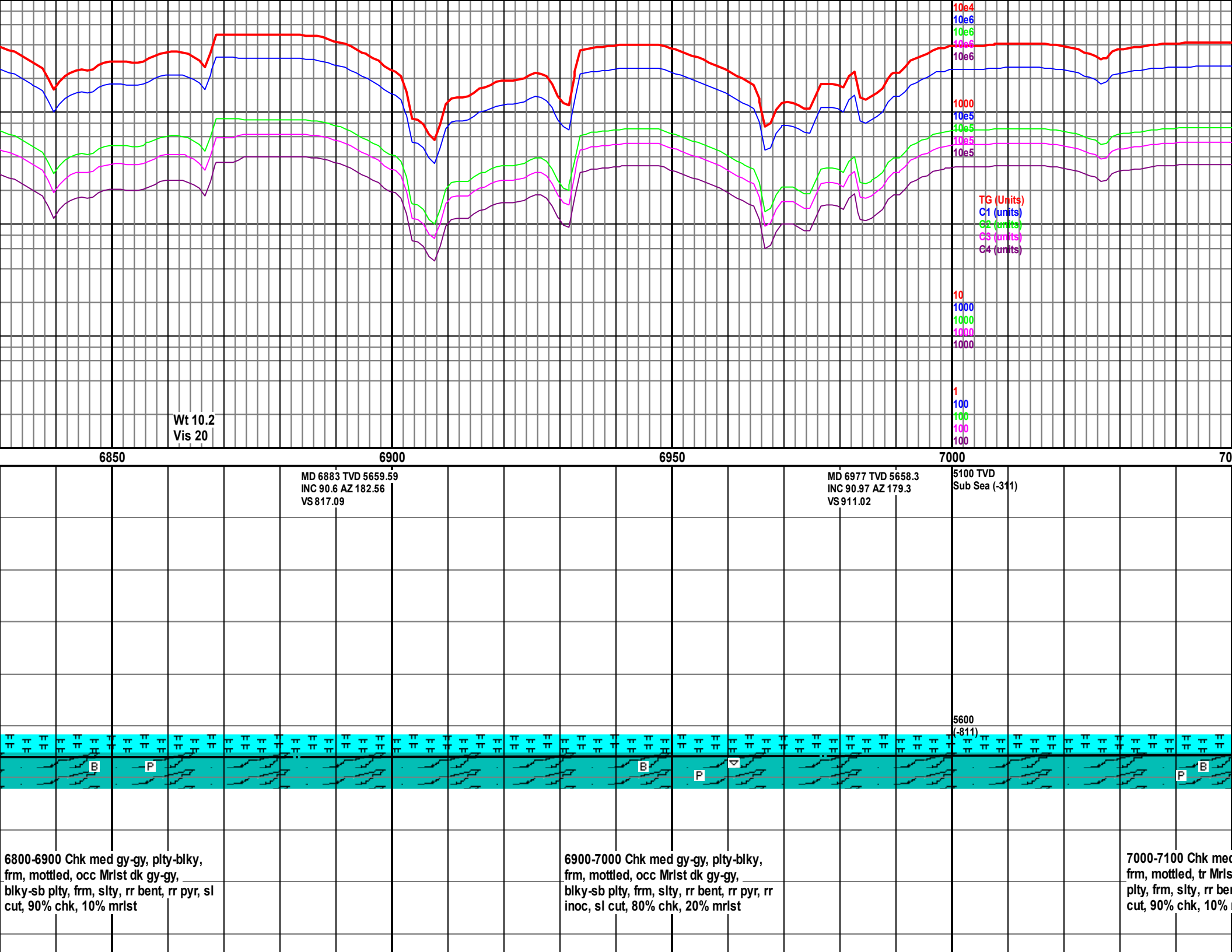
6700
6750
6800


D 5659.29
180.55
MD 6693 TVD 5659.15
INC 89.87 AZ 182.98
VS 627.14
MD 6788 TVD 5659.67
INC 89.5 AZ 185.06
VS 722.12
Sea (-311)
5600
(-811)
B
B
6600-6700 Chk med gy-gy, plty-blky, frm, mottled, occ Mrlst dk gy-gy, blky-sb plty, frm, slty, rr bent, sl cut, 80% chk, 20% mrlst
6700-6800 Chk med gy-gy, plty-blky, frm, mottled, occ Mrlst dk gy-gy, blky-sb plty, frm, slty, rr bent, sl cut, 90% chk, 10% mrlst


10e4
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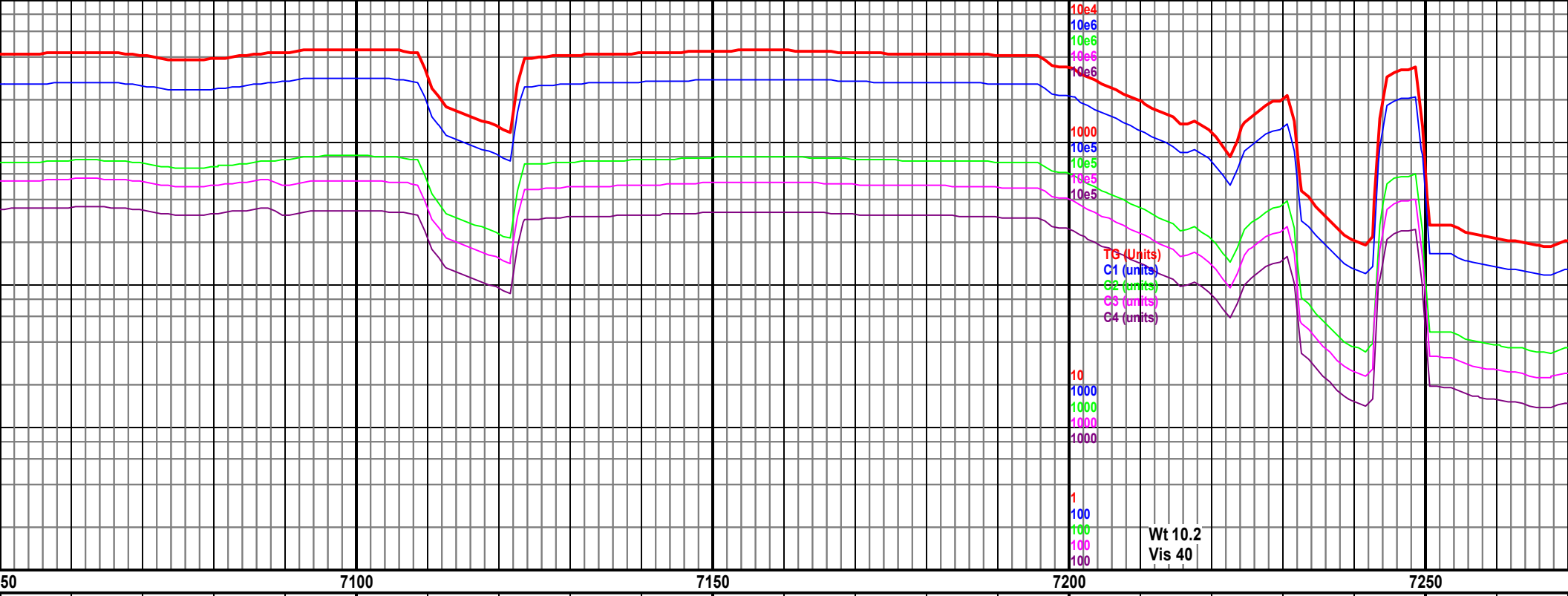
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
10
1000
1000
1000
1000
1
100
100
100
100
Wt 10.2
Vis 20
6850
6900
6950
7000
70
MD 6883 TVD 5659.59
INC 90.6 AZ 182.56
VS 817.09
MD 6977 TVD 5658.3
INC 90.97 AZ 179.3
VS 911.02
5100 TVD
Sub Sea (-311)
5600
(-811)
B
P
B
P
P
B
6800-6900 Chk med gy-gy, plty-blky, frm, mottled, occ Mrlst dk gy-gy, blky-sb plty, frm, slty, rr bent, rr pyr, sl cut, 90% chk, 10% mrlst
6900-7000 Chk med gy-gy, plty-blky, frm, mottled, occ Mrlst dk gy-gy, blky-sb plty, frm, slty, rr bent, rr pyr, rr inoc, sl cut, 80% chk, 20% mrlst
7000-7100 Chk med
frm, mottled, tr Mrls
plty, frm, slty, rr be
cut, 90% chk, 10%


10e4
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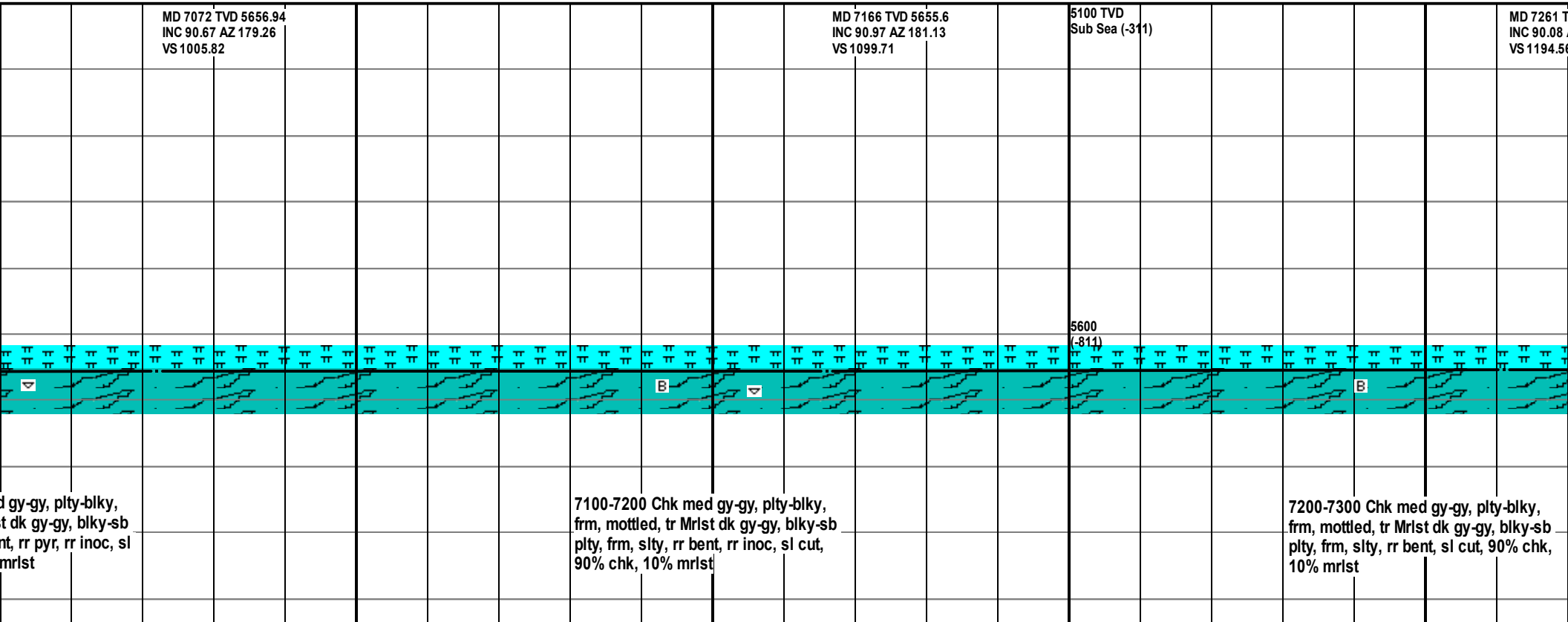
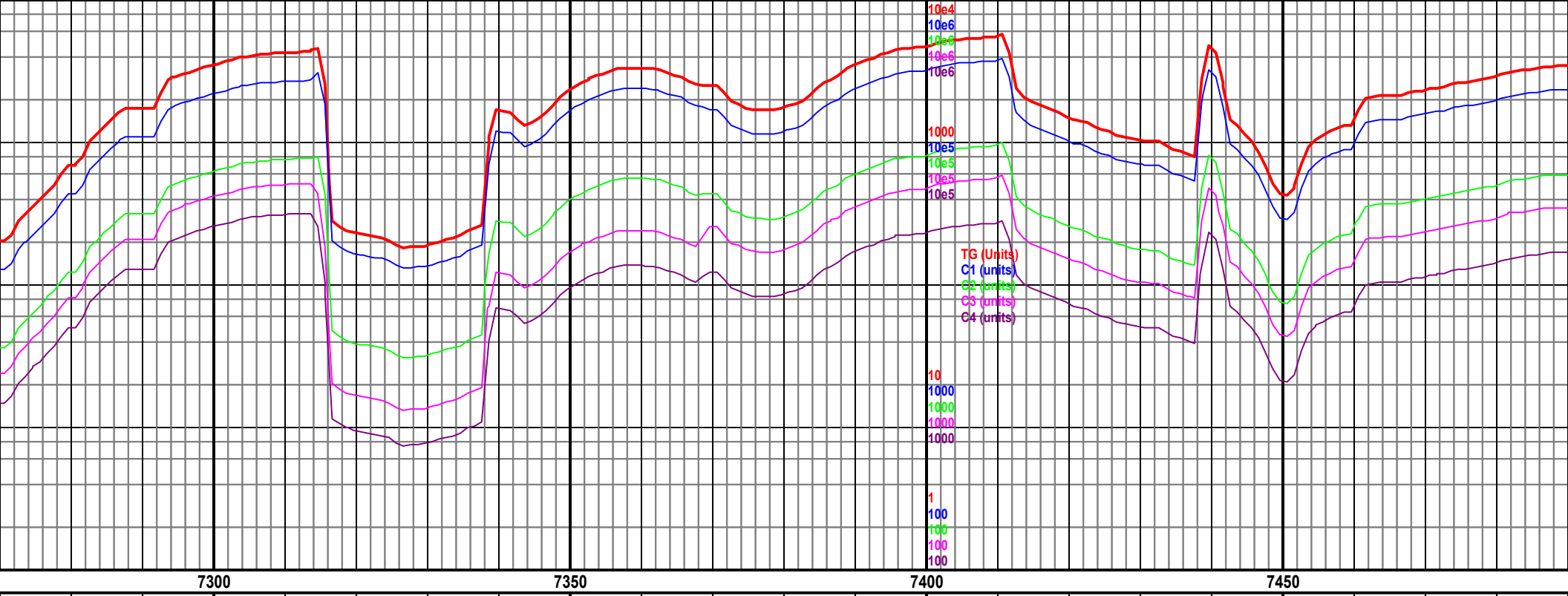
10e5
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
10
1000
1000
1000
1000
1
100
100
100
100
Wt 10.2
Vis 40
50
7100
7150
7200
7250


MD 7072 TVD 5656.94
INC 90.67 AZ 179.26
VS 1005.82
MD 7166 TVD 5655.6
INC 90.97 AZ 181.13
VS 1099.71
5100 TVD
Sub Sea (-311)
MD 7261 T
INC 90.08
VS 1194.56
5600
(-811)
B
B
d gy-gy, plty-blky,
t dk gy-gy, blky-sb
nt, rr pyr, rr inoc, sl
mrlst
7100-7200 Chk med gy-gy, plty-blky,
frm, mottled, tr Mrlst dk gy-gy, blky-sb
plty, frm, slty, rr bent, rr inoc, sl cut,
90% chk, 10% mrlst
7200-7300 Chk med gy-gy, plty-blky,
frm, mottled, tr Mrlst dk gy-gy, blky-sb
plty, frm, slty, rr bent, sl cut, 90% chk,
10% mrlst


10e4
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TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
10
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1000
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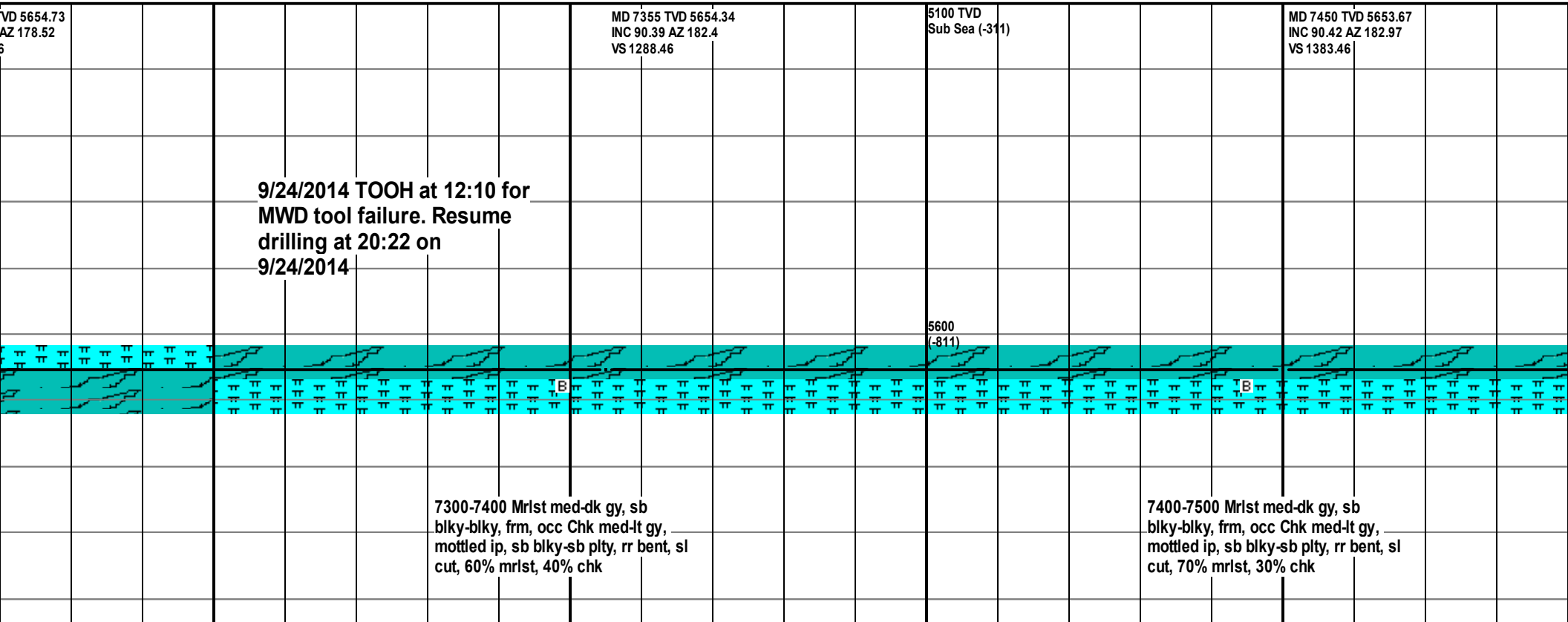
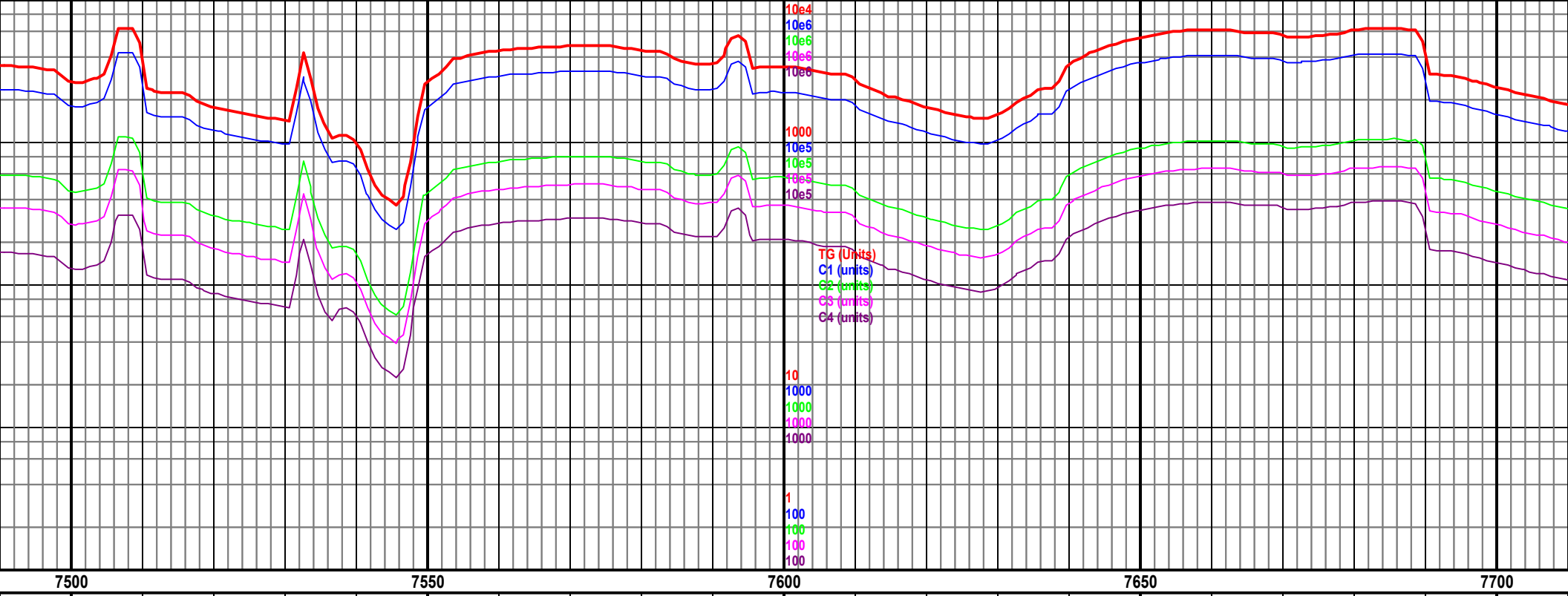
1000
1
100
100
100
100
7300
7350
7400
7450


VD 5654.73
AZ 178.52
MD 7355 TVD 5654.34
INC 90.39 AZ 182.4
VS 1288.46
5100 TVD
Sub Sea (-311)
MD 7450 TVD 5653.67
INC 90.42 AZ 182.97
VS 1383.46
9/24/2014 TOOH at 12:10 for MWD tool failure. Resume drilling at 20:22 on 9/24/2014
5600
(-811)
B
B
7300-7400 Mrlst med-dk gy, sb blky-blky, frm, occ Chk med-lt gy, mottled ip, sb blky-sb plty, rr bent, sl cut, 60% mrlst, 40% chk
7400-7500 Mrlst med-dk gy, sb blky-blky, frm, occ Chk med-lt gy, mottled ip, sb blky-sb plty, rr bent, sl cut, 70% mrlst, 30% chk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TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
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1000
1000
1000
1000
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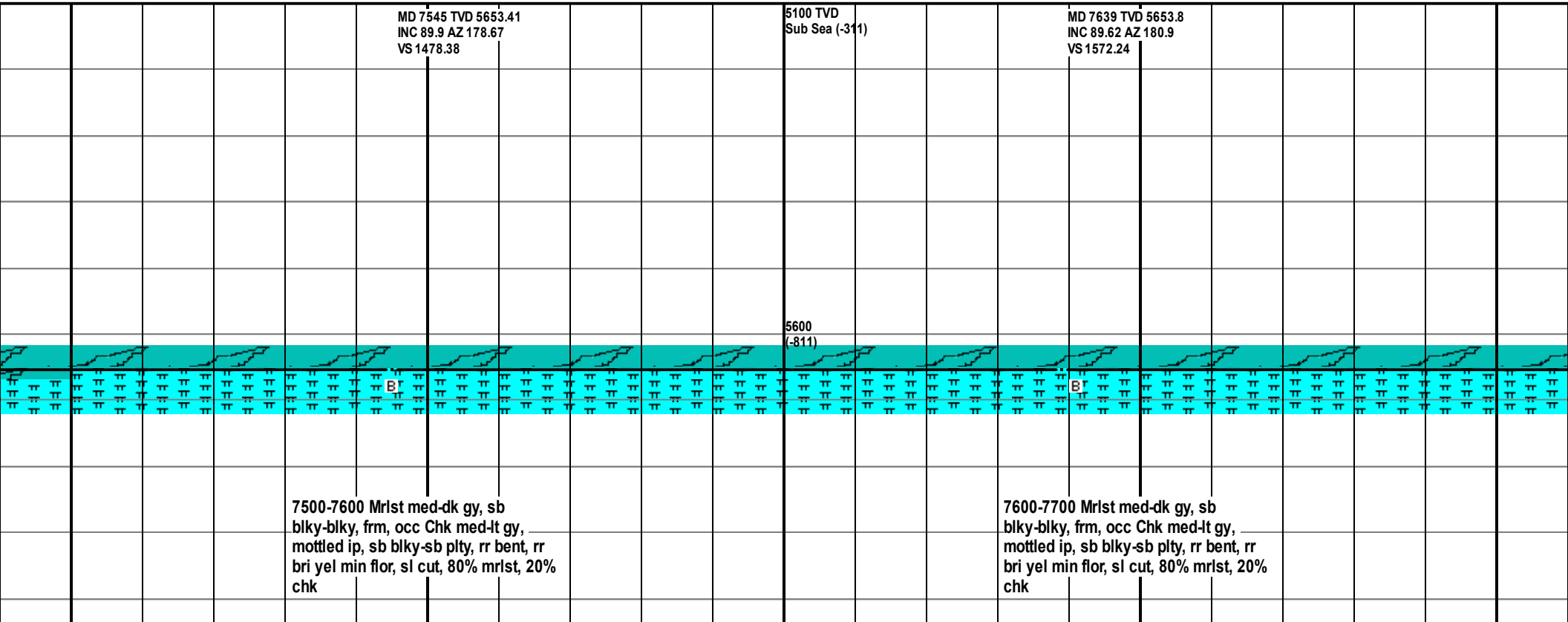
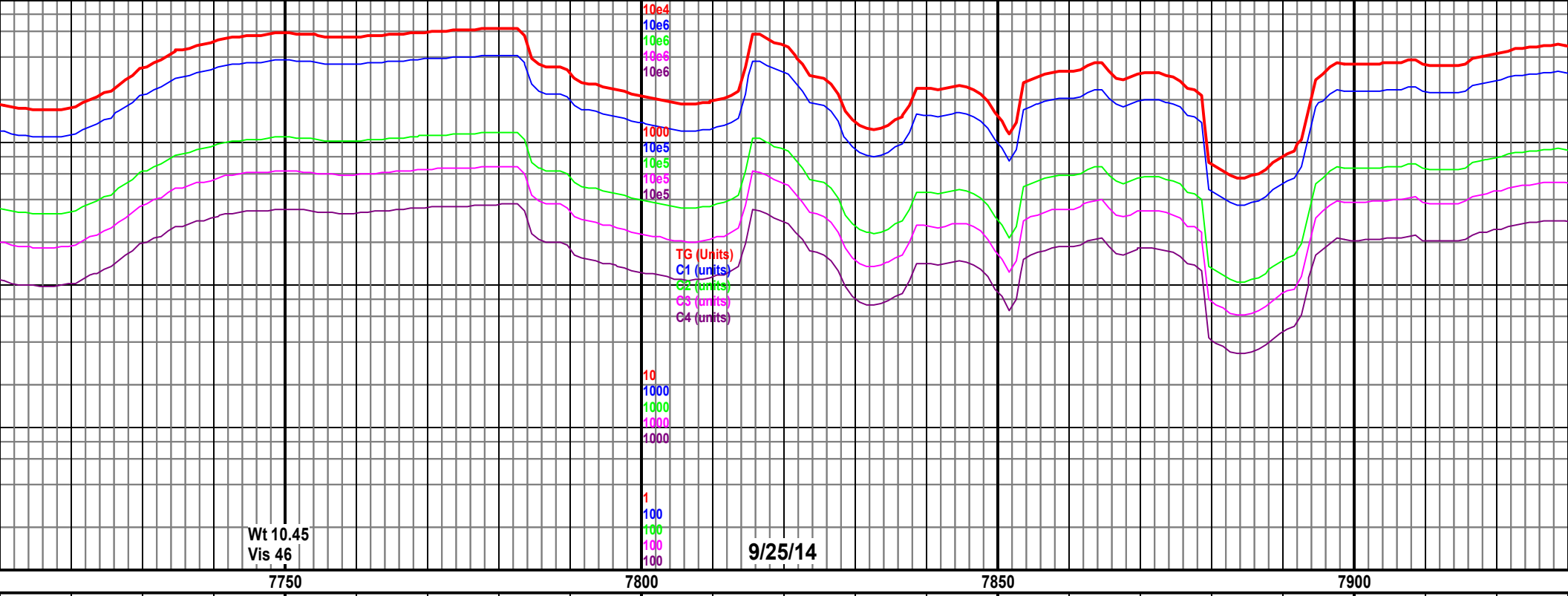
100
100
7500
7550
7600
7650
7700


MD 7545 TVD 5653.41
INC 89.9 AZ 178.67
VS 1478.38
5100 TVD
Sub Sea (-311)
MD 7639 TVD 5653.8
INC 89.62 AZ 180.9
VS 1572.24
5600
(-811)
B
B
7500-7600 Mrlst med-dk gy, sb blky-blky, frm, occ Chk med-lt gy, mottled ip, sb blky-sb plty, rr bent, rr bri yel min flor, sl cut, 80% mrlst, 20% chk
7600-7700 Mrlst med-dk gy, sb blky-blky, frm, occ Chk med-lt gy, mottled ip, sb blky-sb plty, rr bent, rr bri yel min flor, sl cut, 80% mrlst, 20% chk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TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
10
1000
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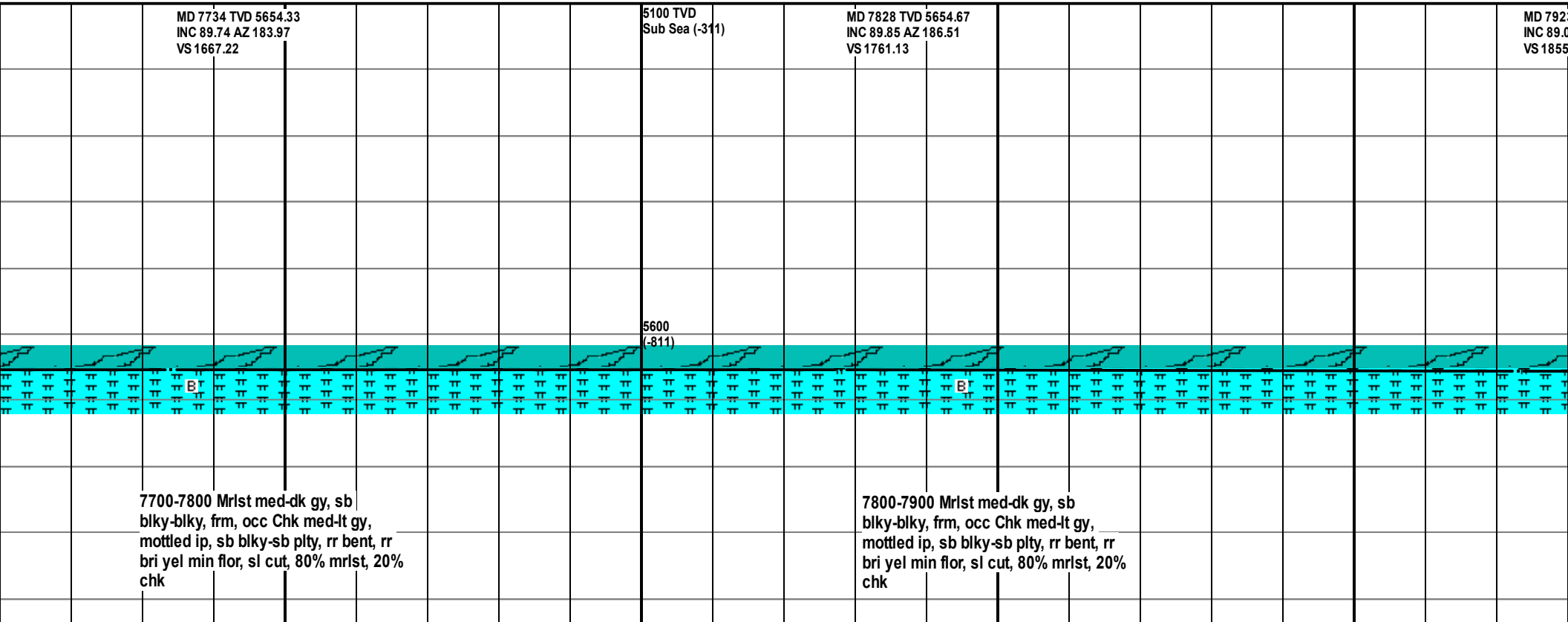
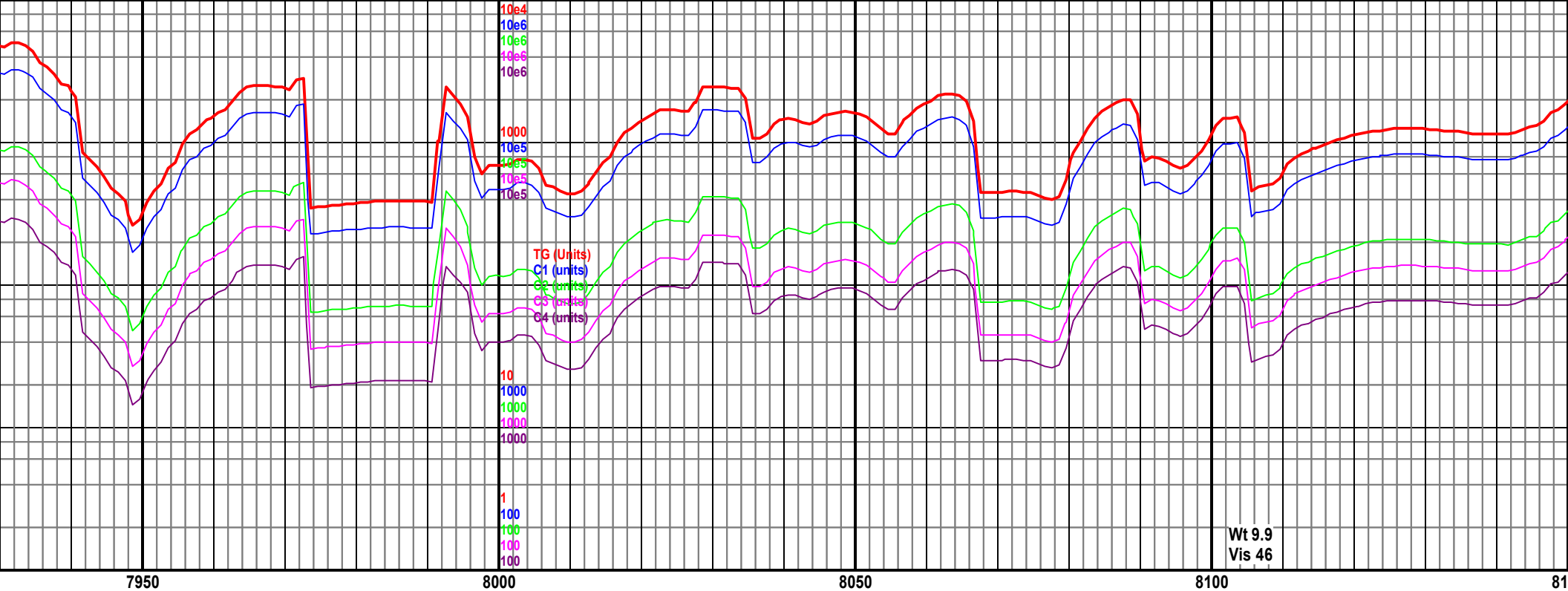
100
100
100
Wt 10.45
Vis 46
9/25/14
7750
7800
7850
7900


MD 7734 TVD 5654.33
INC 89.74 AZ 183.97
VS 1667.22
5100 TVD
Sub Sea (-311)
MD 7828 TVD 5654.67
INC 89.85 AZ 186.51
VS 1761.13
MD 792
INC 89.0
VS 1855
5600
(-811)
B
B
7700-7800 Mrlst med-dk gy, sb blky-blky, frm, occ Chk med-lt gy, mottled ip, sb blky-sb plty, rr bent, rr bri yel min flor, sl cut, 80% mrlst, 20% chk
7800-7900 Mrlst med-dk gy, sb blky-blky, frm, occ Chk med-lt gy, mottled ip, sb blky-sb plty, rr bent, rr bri yel min flor, sl cut, 80% mrlst, 20% chk



3 TVD 5655.59
04 AZ 175.16
.91

5100 TVD
Sub Sea (-311)

MD 8018 TVD 5656.78
INC 89.53 AZ 177.19
VS 1950.26

MD 8113 TVD 5657.14
INC 90.03 AZ 178.4
VS 2044.88

5600
(-811)

B

B

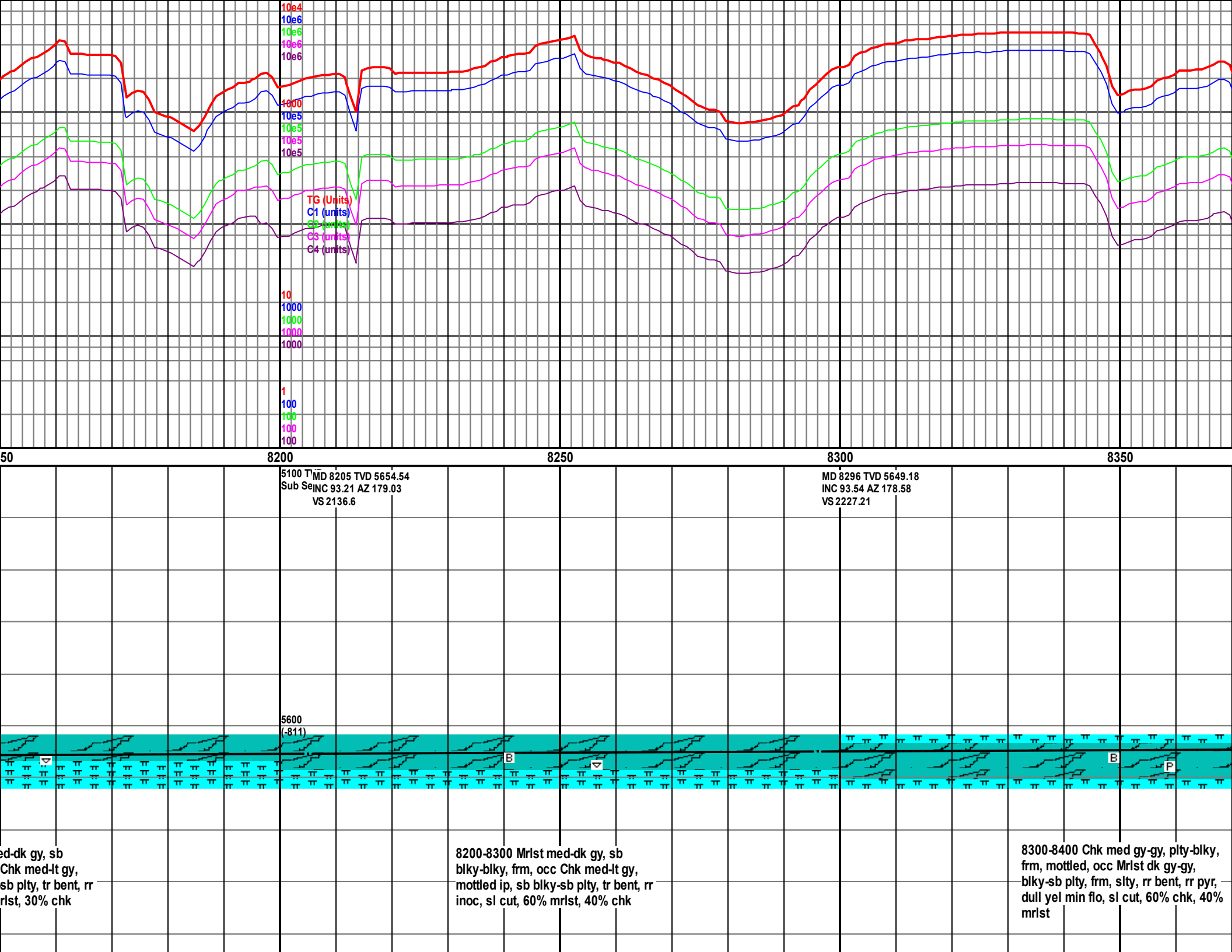
P

B

7900-8000 Mrlst med-dk gy, sb blky-blky, frm, occ Chk med-lt gy, mottled ip, sb blky-sb plty, rr bent, rr bri yel min flor, sl cut, 80% mrlst, 20% chk

8000-8100 Mrlst med-dk gy, sb blky-blky, frm, occ Chk med-lt gy, mottled ip, sb blky-sb plty, tr bent, rr pyr, sl cut, 80% mrlst, 20% chk

8100-8200 Mrlst me
blky-blky, frm, occ
mottled ip, sb blky-
inoc, sl cut, 70% m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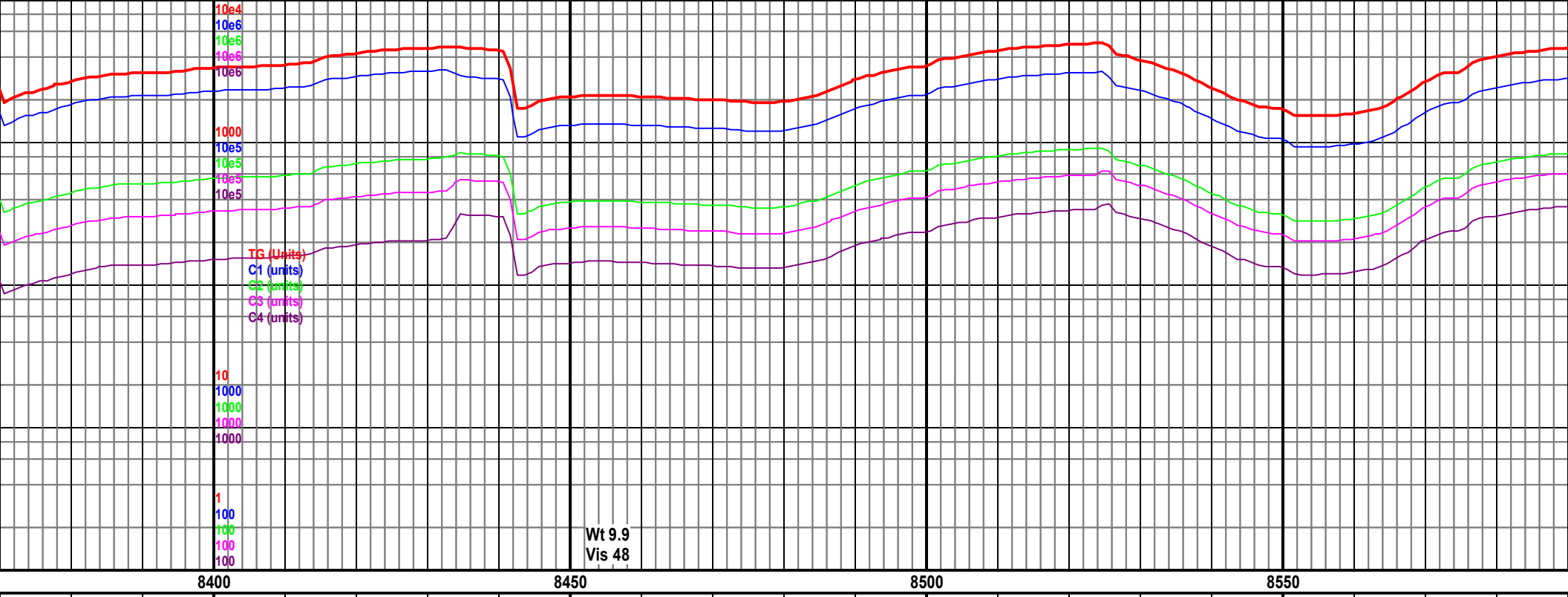
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
10
1000
1000
1000
1000
1
100
100
100
100
50
8200
8250
8300
8350
5100 T
Sub Se
MD 8205 TVD 5654.54
INC 93.21 AZ 179.03
VS 2136.6
MD 8296 TVD 5649.18
INC 93.54 AZ 178.58
VS 2227.21
5600
(-811)
B
B
P
ed-dk gy, sb
Chk med-lt gy,
sb plty, tr bent, rr
rlst, 30% chk
8200-8300 Mrlst med-dk gy, sb
blky-blky, frm, occ Chk med-lt gy,
mottled ip, sb blky-sb plty, tr bent, rr
inoc, sl cut, 60% mrlst, 40% chk
8300-8400 Chk med gy-gy, plty-blky,
frm, mottled, occ Mrlst dk gy-gy,
blky-sb plty, frm, slty, rr bent, rr pyr,
dull yel min flo, sl cut, 60% chk, 40%
mrlst


10e4
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1000
10e5
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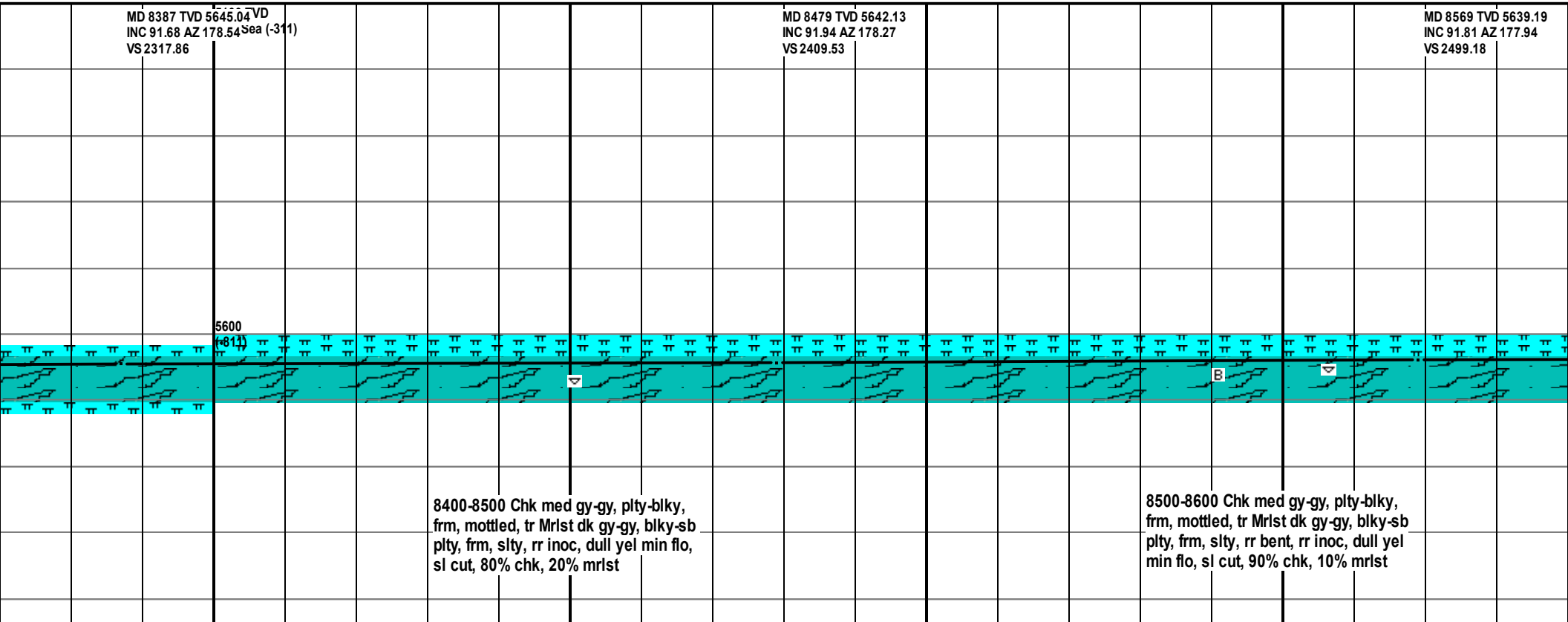
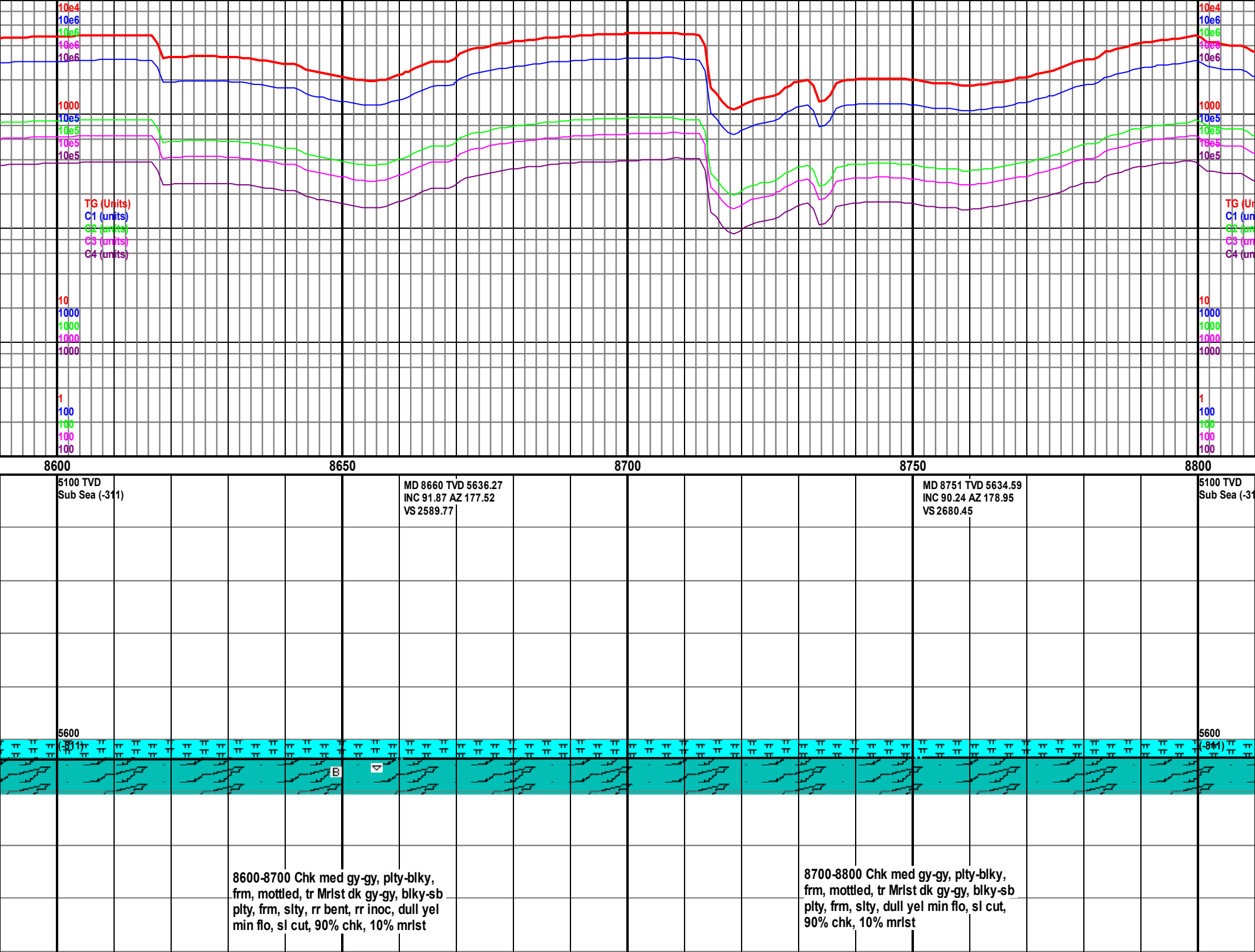
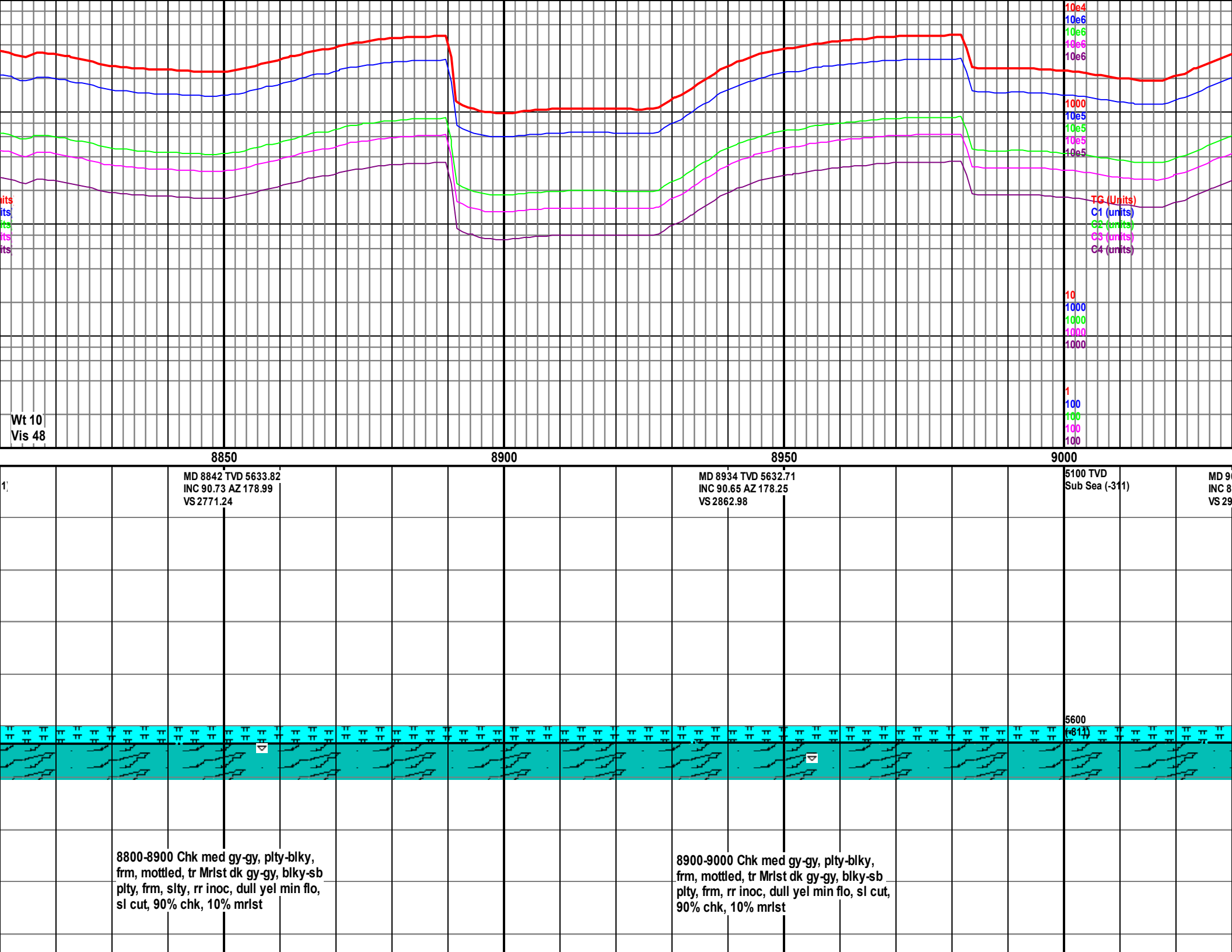
10e5
10e5
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
10
1000
1000
1000
1000
1
100
100
100
100
Wt 9.9
Vis 48
8400
8450
8500
8550


MD 8387 TVD 5645.04
INC 91.68 AZ 178.54
VS 2317.86
Sea (-311)
MD 8479 TVD 5642.13
INC 91.94 AZ 178.27
VS 2409.53
MD 8569 TVD 5639.19
INC 91.81 AZ 177.94
VS 2499.18
5600
(-811)
B
8400-8500 Chk med gy-gy, plty-blky, frm, mottled, tr Mrlst dk gy-gy, blky-sb plty, frm, slty, rr inoc, dull yel min flo, sl cut, 80% chk, 20% mrlst
8500-8600 Chk med gy-gy, plty-blky, frm, mottled, tr Mrlst dk gy-gy, blky-sb plty, frm, slty, rr bent, rr inoc, dull yel min flo, sl cut, 90% chk, 10% mrlst


TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
8600
8650
8700
8750
8800
5100 TVD
Sub Sea (-311)
MD 8660 TVD 5636.27
INC 91.87 AZ 177.52
VS 2589.77
MD 8751 TVD 5634.59
INC 90.24 AZ 178.95
VS 2680.45
5600
(-811)
8600-8700 Chk med gy-gy, plty-blky, frm, mottled, tr Mrlst dk gy-gy, blky-sb plty, frm, slty, rr bent, rr inoc, dull yel min flo, sl cut, 90% chk, 10% mrlst
8700-8800 Chk med gy-gy, plty-blky, frm, mottled, tr Mrlst dk gy-gy, blky-sb plty, frm, slty, dull yel min flo, sl cut, 90% chk, 10% mrlst


10e4
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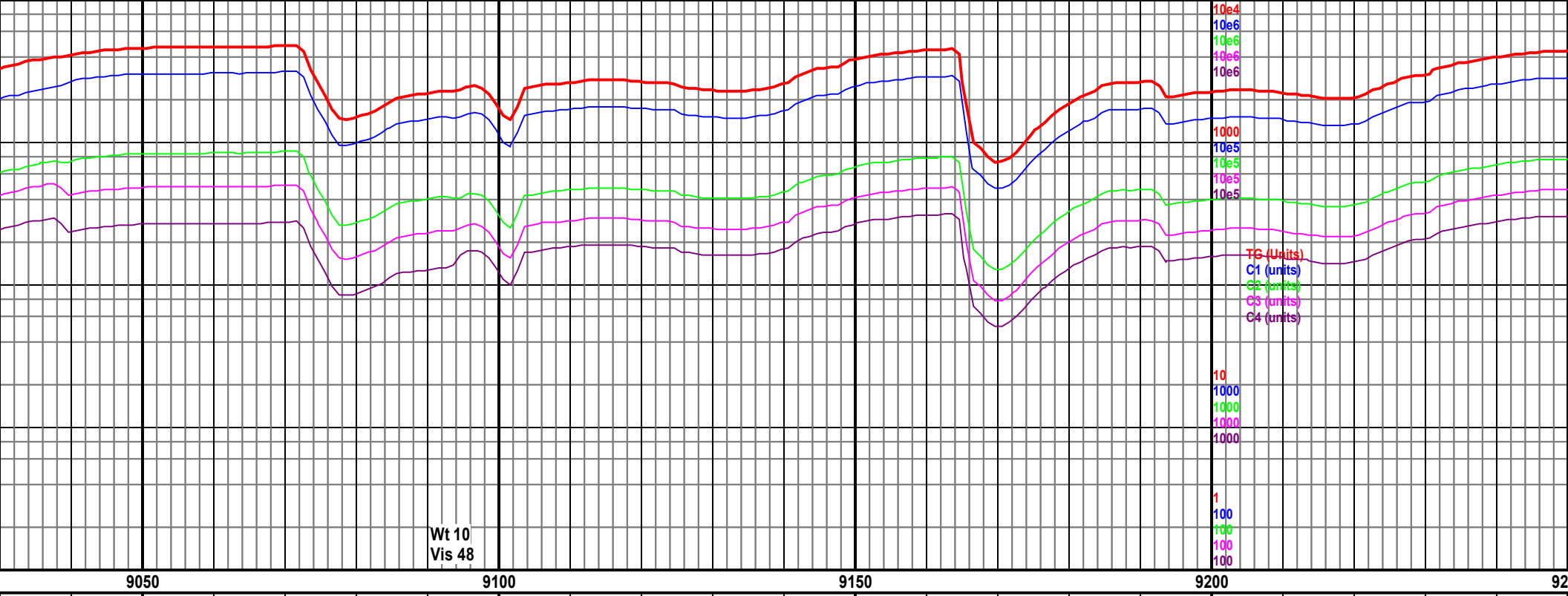
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
10
1000
1000
1000
1000
1
100
100
100
100
Wt 10
Vis 48
8850
8900
8950
9000
MD 8842 TVD 5633.82
INC 90.73 AZ 178.99
VS 2771.24
MD 8934 TVD 5632.71
INC 90.65 AZ 178.25
VS 2862.98
5100 TVD
Sub Sea (-311)
5600
8800-8900 Chk med gy-gy, plty-blky, frm, mottled, tr Mrlst dk gy-gy, blky-sb plty, frm, slty, rr inoc, dull yel min flo, sl cut, 90% chk, 10% mrlst
8900-9000 Chk med gy-gy, plty-blky, frm, mottled, tr Mrlst dk gy-gy, blky-sb plty, frm, rr inoc, dull yel min flo, sl cut, 90% chk, 10% mrlst


10e4
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TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
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1000
1000
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100
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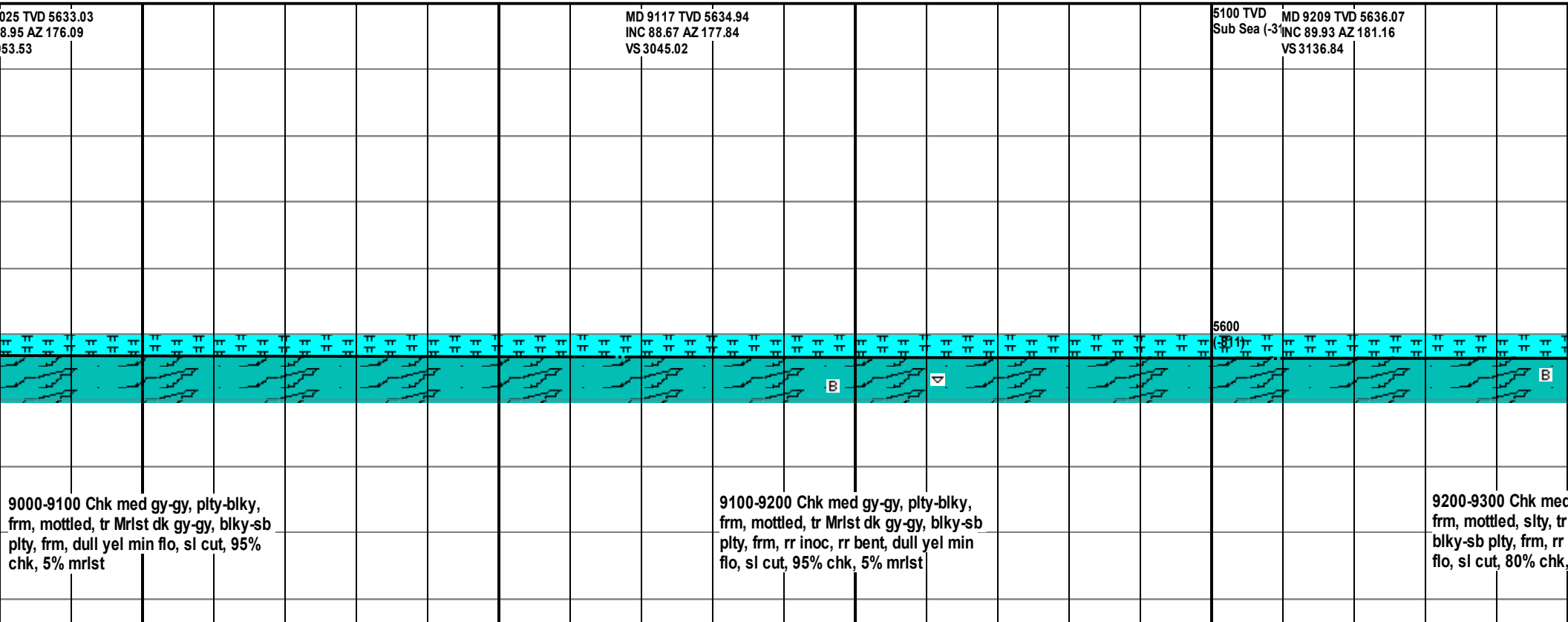
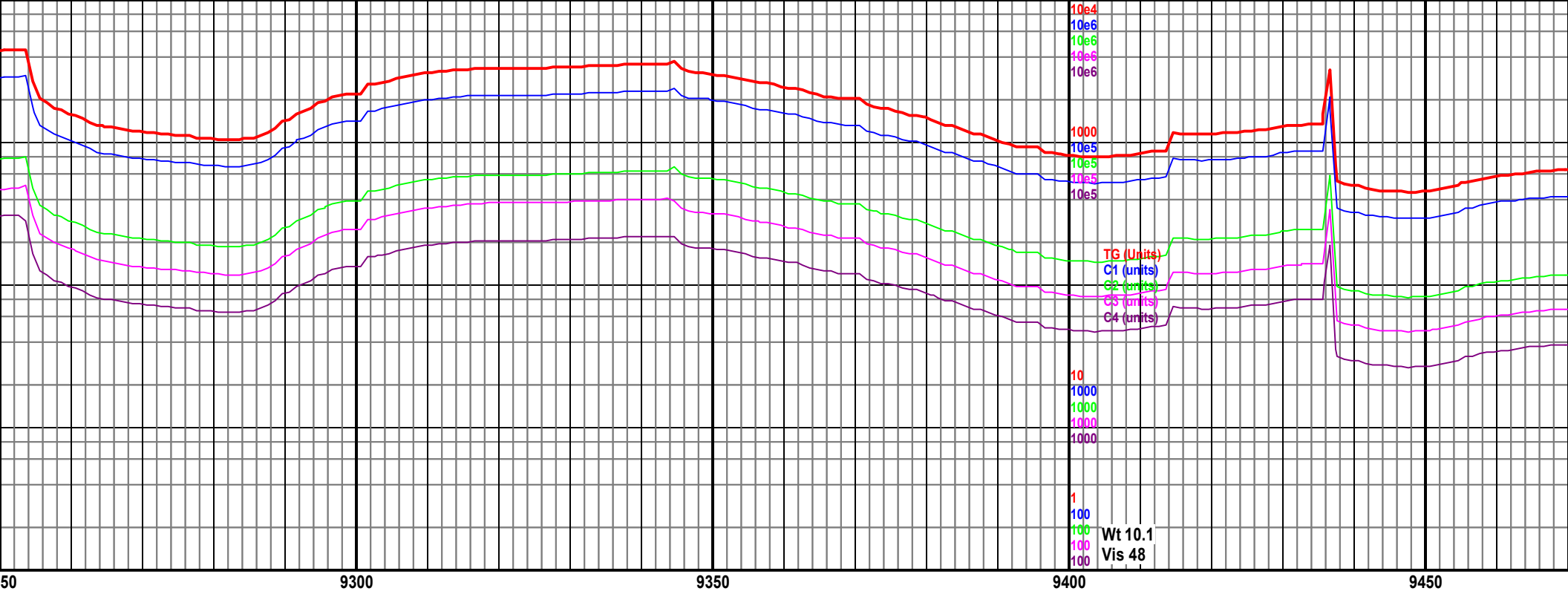
100
100
Wt 10
Vis 48
9050
9100
9150
9200
92


025 TVD 5633.03
8.95 AZ 176.09
53.53
MD 9117 TVD 5634.94
INC 88.67 AZ 177.84
VS 3045.02
5100 TVD
Sub Sea (-31
MD 9209 TVD 5636.07
INC 89.93 AZ 181.16
VS 3136.84
5600
(-811)
B
B
9000-9100 Chk med gy-gy, plty-blky, frm, mottled, tr Mrlst dk gy-gy, blky-sb plty, frm, dull yel min flo, sl cut, 95% chk, 5% mrlst
9100-9200 Chk med gy-gy, plty-blky, frm, mottled, tr Mrlst dk gy-gy, blky-sb plty, frm, rr inoc, rr bent, dull yel min flo, sl cut, 95% chk, 5% mrlst
9200-9300 Chk med
frm, mottled, slty, tr
blky-sb plty, frm, rr
flo, sl cut, 80% chk,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10e5
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
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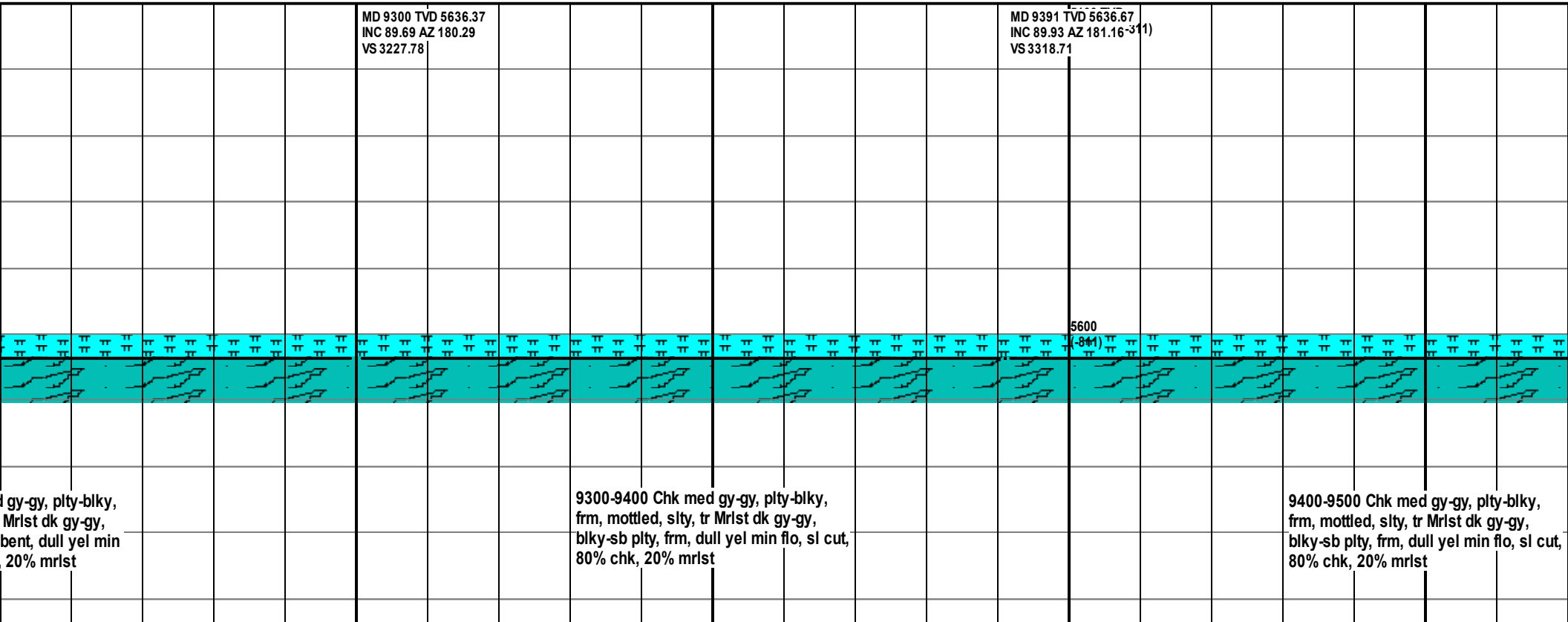
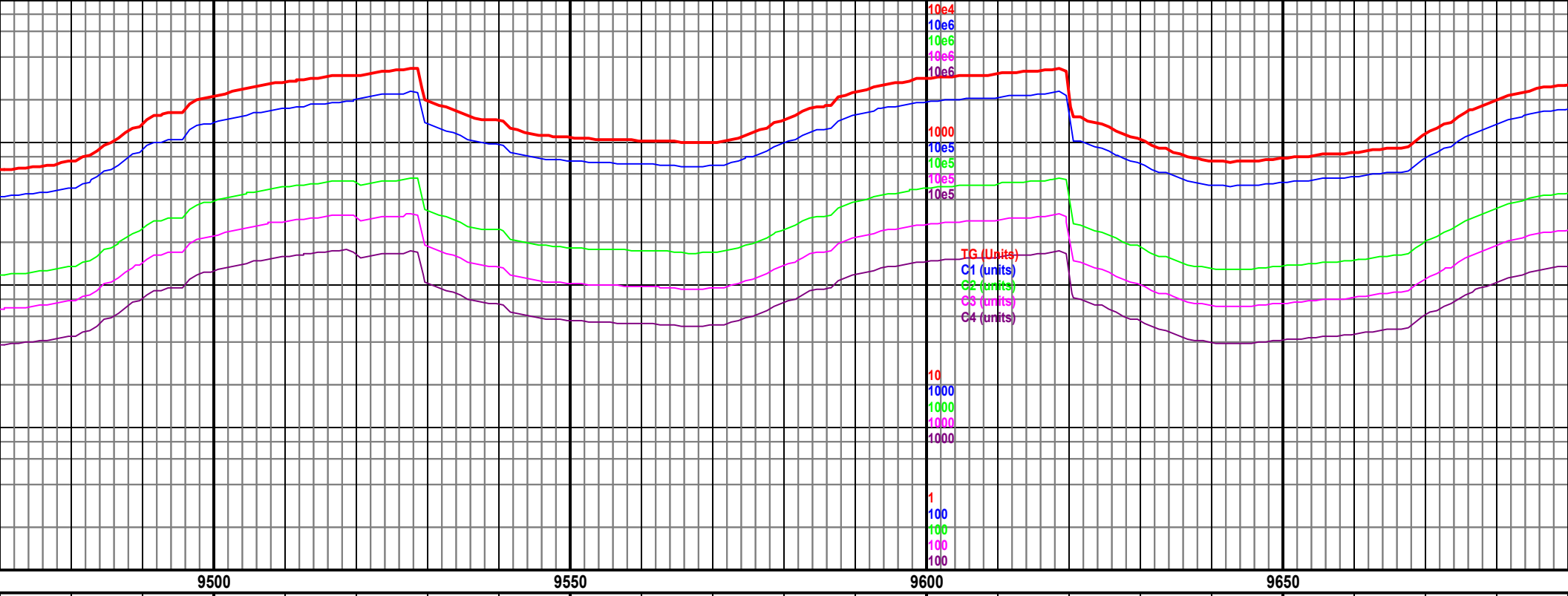
Wt 10.1
Vis 48
50
9300
9350
9400
9450


MD 9300 TVD 5636.37
INC 89.69 AZ 180.29
VS 3227.78
MD 9391 TVD 5636.67
INC 89.93 AZ 181.16
VS 3318.71
5600
d gy-gy, plty-blky,
Mrlst dk gy-gy,
bent, dull yel min
20% mrlst
9300-9400 Chk med gy-gy, plty-blky,
frm, mottled, slty, tr Mrlst dk gy-gy,
blky-sb plty, frm, dull yel min flo, sl cut,
80% chk, 20% mrlst
9400-9500 Chk med gy-gy, plty-blky,
frm, mottled, slty, tr Mrlst dk gy-gy,
blky-sb plty, frm, dull yel min flo, sl cut,
80% chk, 20% mrlst


10e4
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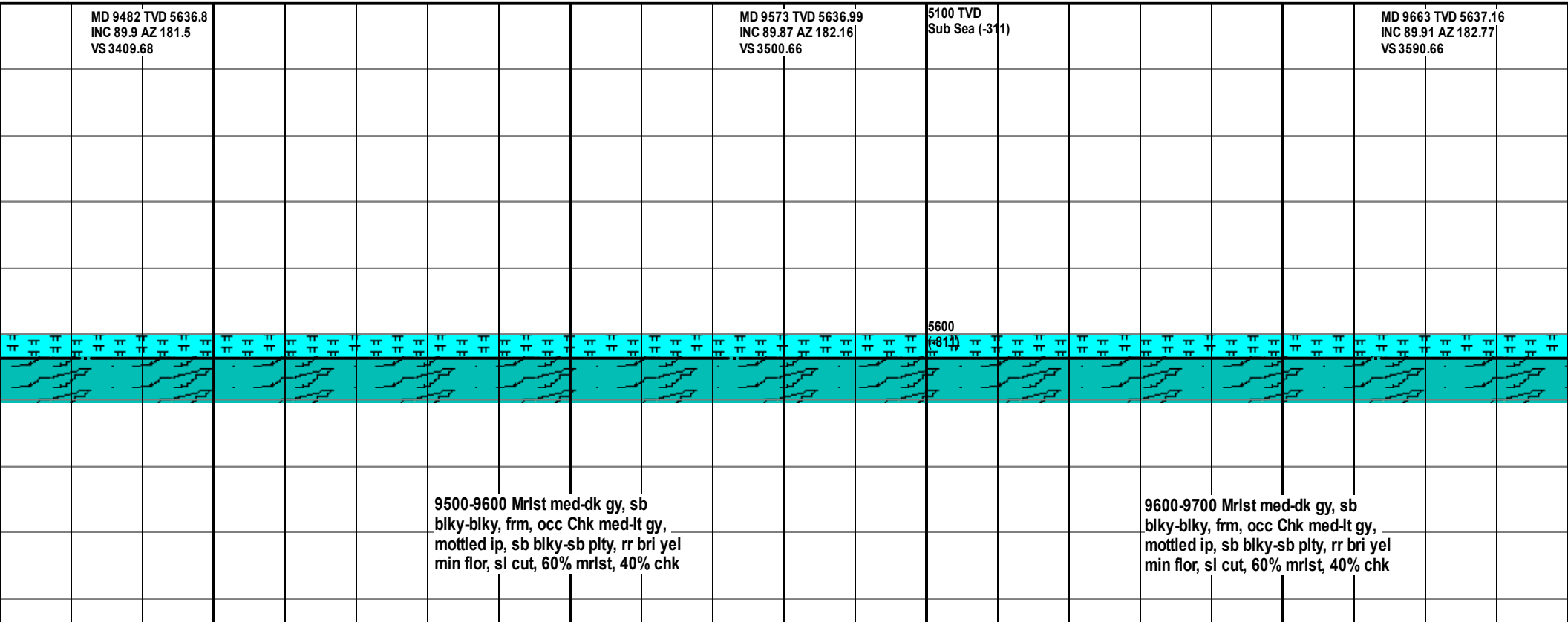
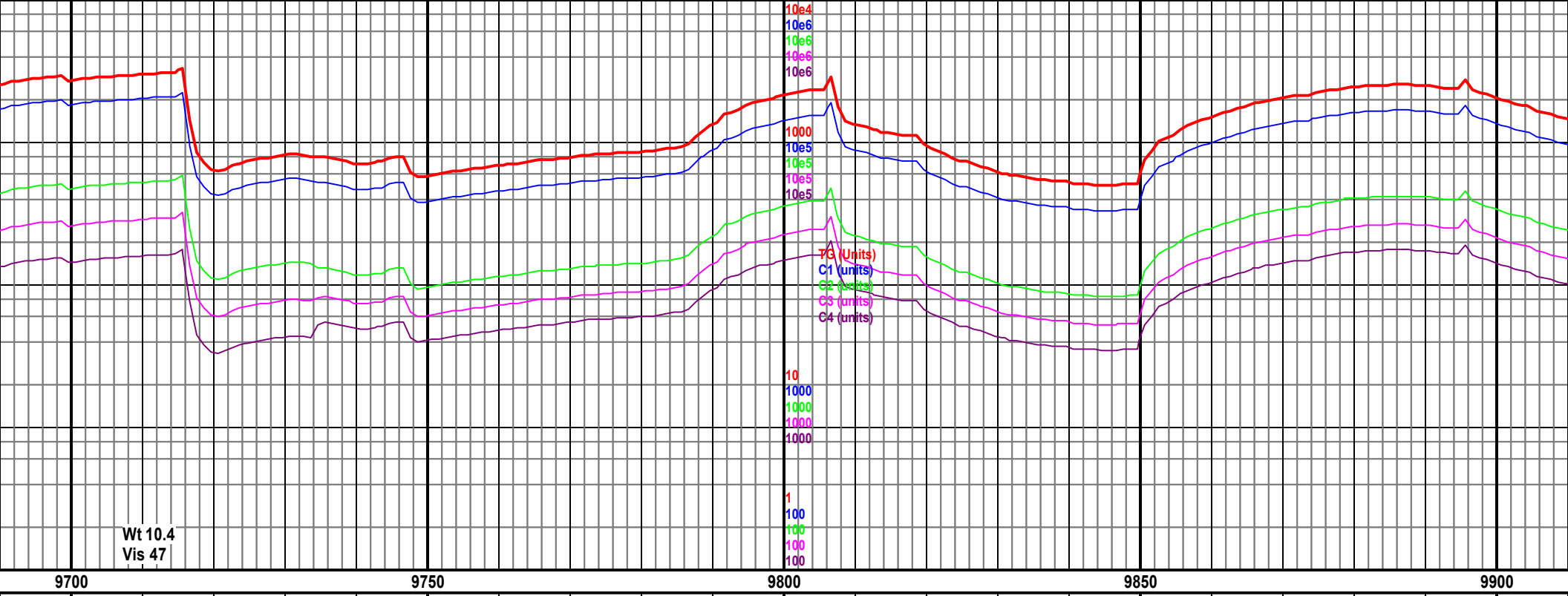
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
10
1000
1000
1000
1000
1
100
100
100
100
9500
9550
9600
9650


MD 9482 TVD 5636.8
INC 89.9 AZ 181.5
VS 3409.68
MD 9573 TVD 5636.99
INC 89.87 AZ 182.16
VS 3500.66
5100 TVD
Sub Sea (-311)
MD 9663 TVD 5637.16
INC 89.91 AZ 182.77
VS 3590.66
5600
(-811)
9500-9600 Mrlst med-dk gy, sb blky-blky, frm, occ Chk med-lt gy, mottled ip, sb blky-sb plty, rr bri yel min flor, sl cut, 60% mrlst, 40% chk
9600-9700 Mrlst med-dk gy, sb blky-blky, frm, occ Chk med-lt gy, mottled ip, sb blky-sb plty, rr bri yel min flor, sl cut, 60% mrlst, 40% chk


10e4
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10e5
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
10
1000
1000
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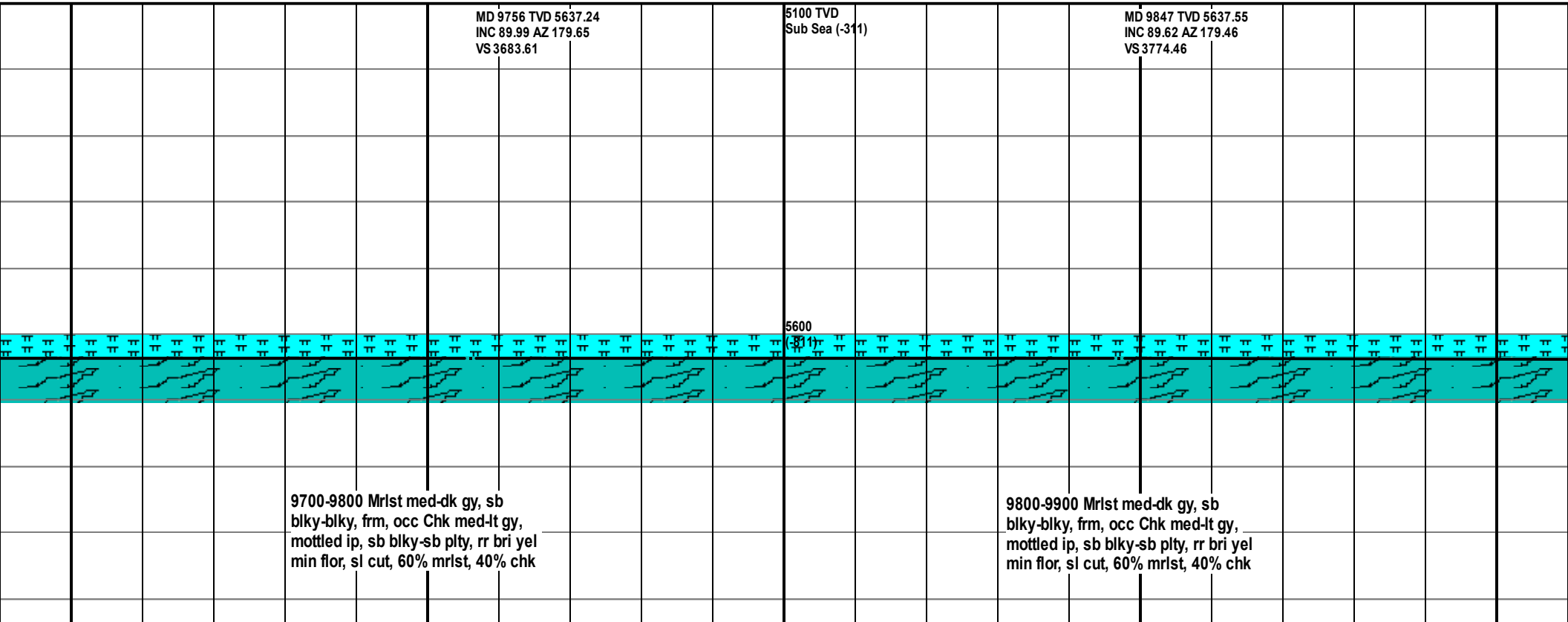
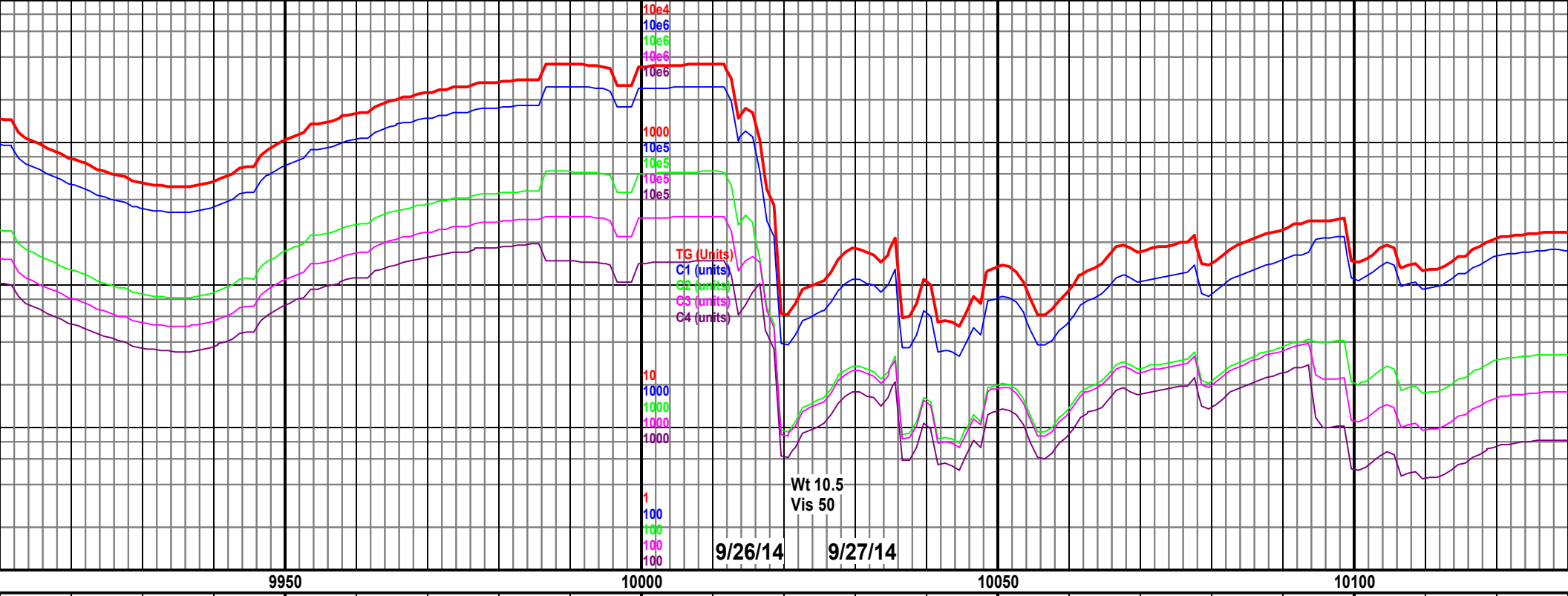
1000
1
100
100
100
100
Wt 10.4
Vis 47
9700
9750
9800
9850
9900


MD 9756 TVD 5637.24
INC 89.99 AZ 179.65
VS 3683.61
5100 TVD
Sub Sea (-311)
MD 9847 TVD 5637.55
INC 89.62 AZ 179.46
VS 3774.46
5600
(-811)
9700-9800 Mrlst med-dk gy, sb blky-blky, frm, occ Chk med-lt gy, mottled ip, sb blky-sb plty, rr bri yel min flor, sl cut, 60% mrlst, 40% chk
9800-9900 Mrlst med-dk gy, sb blky-blky, frm, occ Chk med-lt gy, mottled ip, sb blky-sb plty, rr bri yel min flor, sl cut, 60% mrlst, 40% chk



MD 9939 TVD 5638.29
INC 89.46 AZ 179.95
VS 3866.32

5100 TVD
Sub Sea (-311)

MD 10029 TVD 5638.31
INC 90.51 AZ 180.91
VS 3956.24

MD 10121
INC 91.91
VS 4048.14

9/26/2014 TOOH at at 10020' 00:50 for mud motor. Resume drilling at 22:57 on 9/26/2014

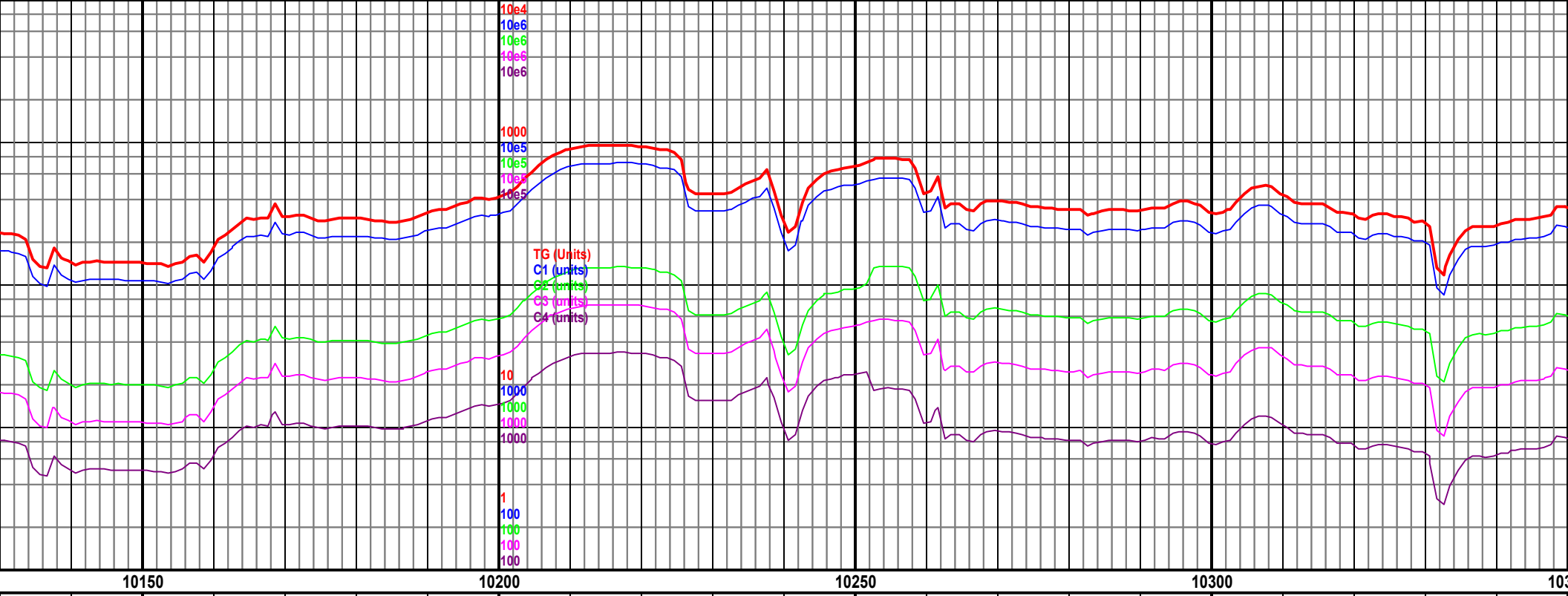
5600
(-841)

B

B

9900-10000 Chk med gy-gy, plty-blky, frm, mottled, occ Mrlst dk gy-gy, blky-sb plty, frm, slty, rr bent, dull yel min flo, sl cut, 60% chk, 40% mrlst

10000-10100 Abnt LCM, Chk med gy-gy, plty-blky, frm, mottled, occ Mrlst dk gy-gy, blky-sb plty, frm, slty, rr bent, dull yel min flo, sl cut, 80% chk, 20% mrlst


10e4
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TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
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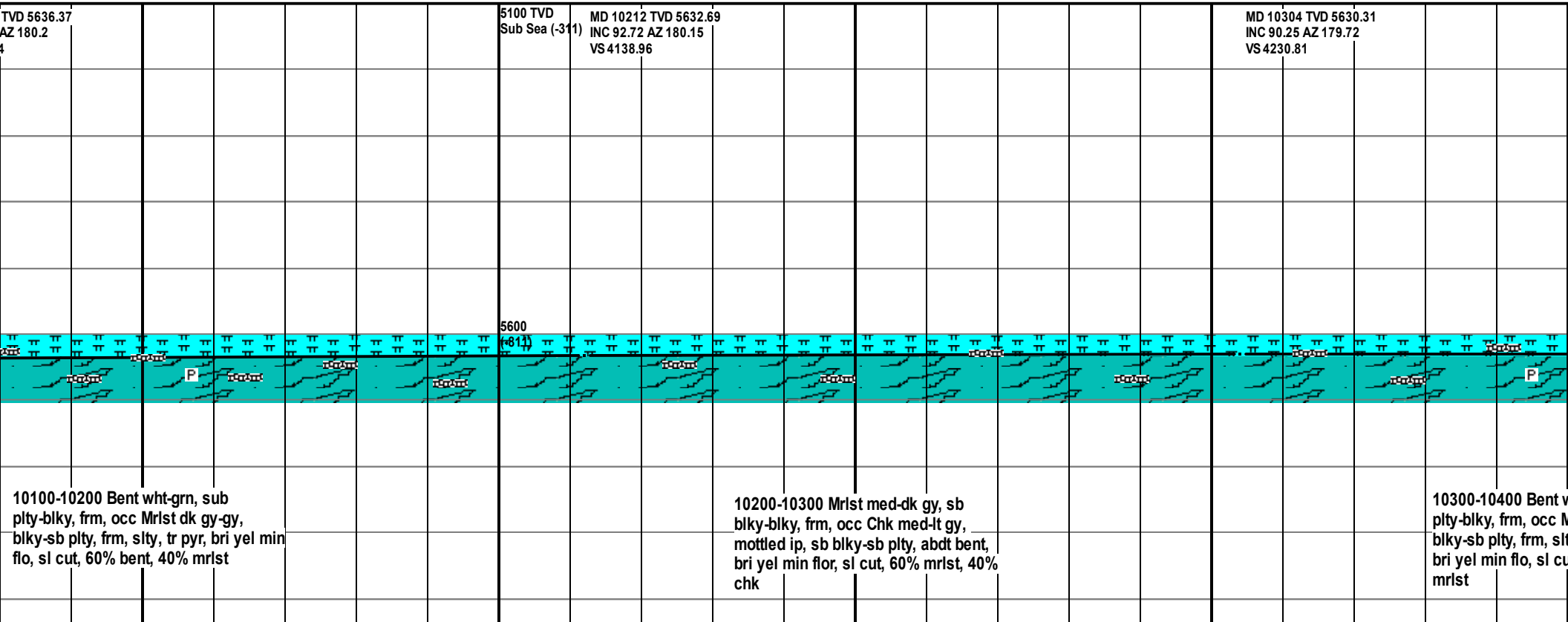
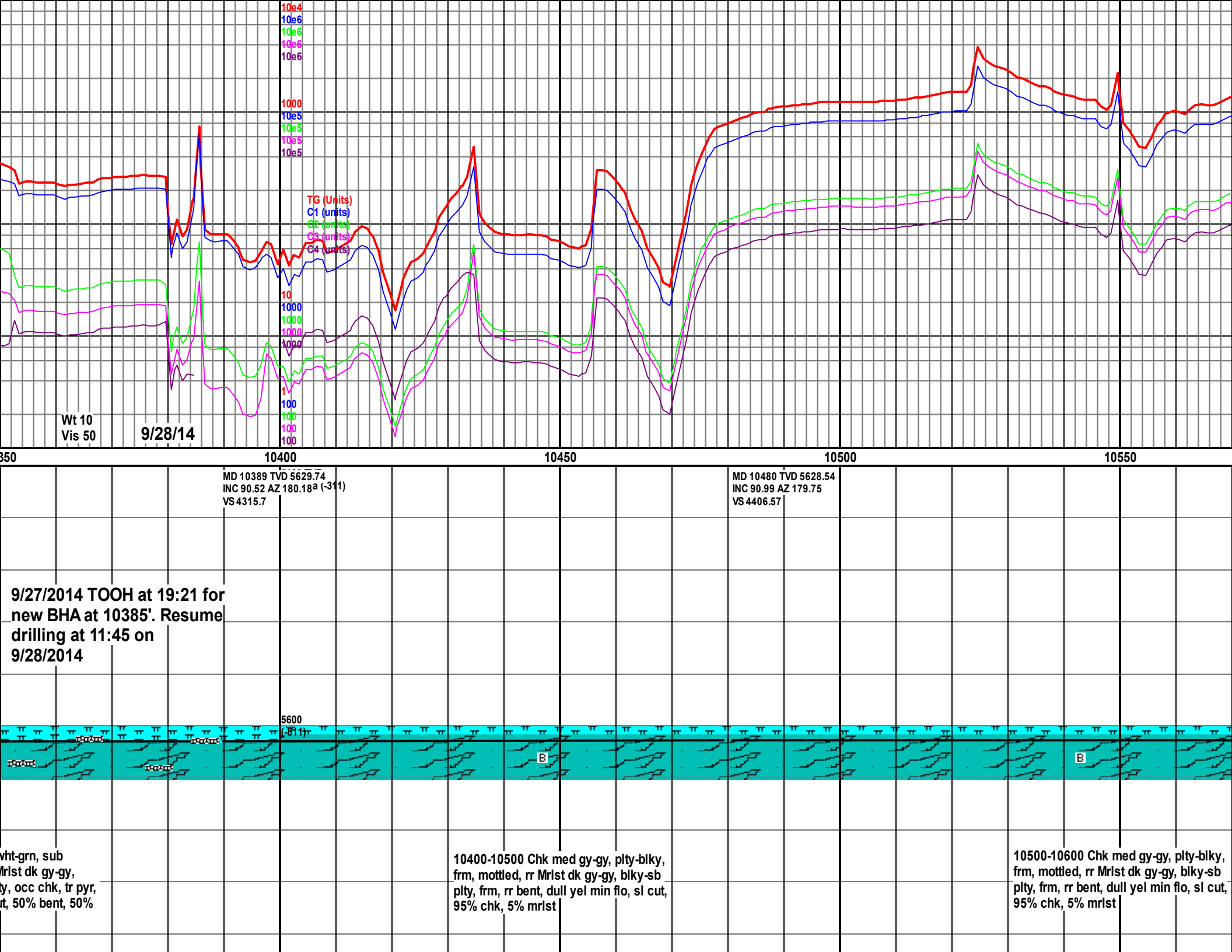
100
100
100
100
10150
10200
10250
10300


TVD 5636.37
AZ 180.2
4
5100 TVD
Sub Sea (-311)
MD 10212 TVD 5632.69
INC 92.72 AZ 180.15
VS 4138.96
MD 10304 TVD 5630.31
INC 90.25 AZ 179.72
VS 4230.81
5600
(-811)
P
P
10100-10200 Bent wht-grn, sub plty-blky, frm, occ Mrlst dk gy-gy, blky-sb plty, frm, slty, tr pyr, bri yel min flo, sl cut, 60% bent, 40% mrlst
10200-10300 Mrlst med-dk gy, sb blky-blky, frm, occ Chk med-lt gy, mottled ip, sb blky-sb plty, abdt bent, bri yel min flor, sl cut, 60% mrlst, 40% chk
10300-10400 Bent w
plty-blky, frm, occ M
blky-sb plty, frm, slt
bri yel min flo, sl cu
mrlst


10e4
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1000
10e5
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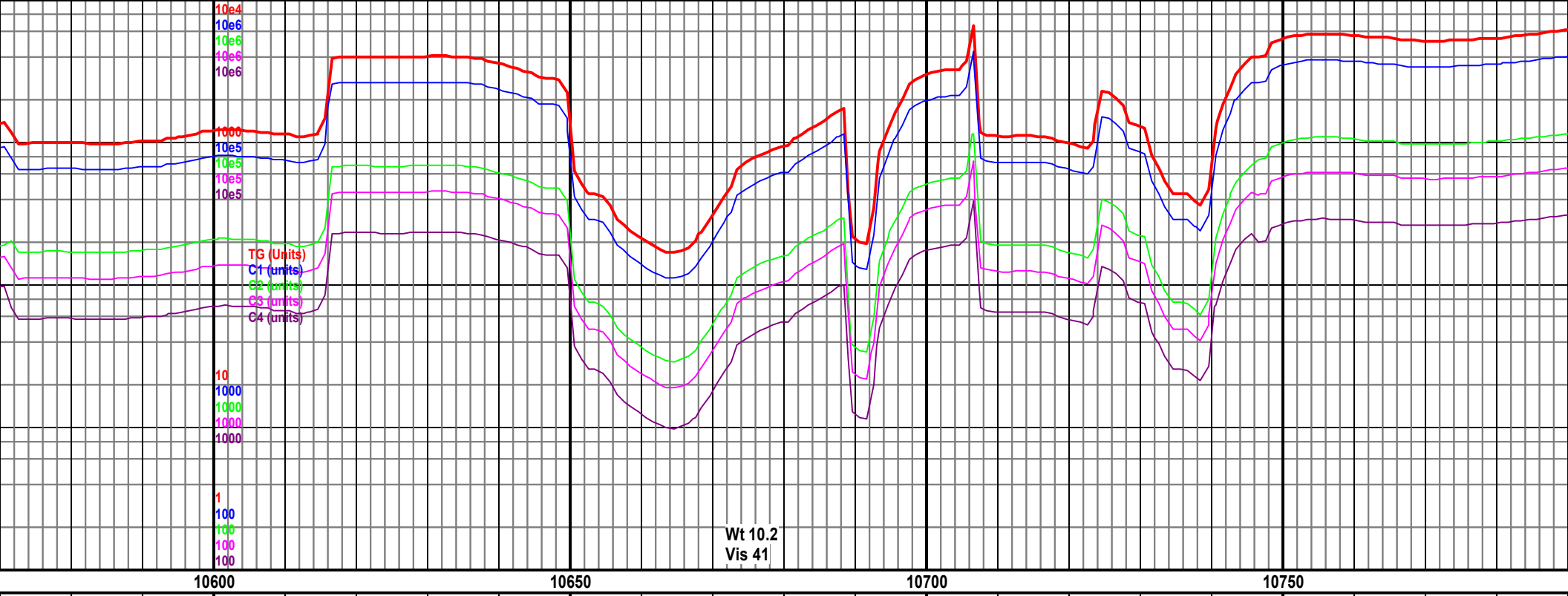
10e5
10e5
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
10
1000
1000
1000
1000
1
100
100
100
100
Wt 10
Vis 50
9/28/14
350
10400
10450
10500
10550
MD 10389 TVD 5629.74
INC 90.52 AZ 180.18a (-311)
VS 4315.7
MD 10480 TVD 5628.54
INC 90.99 AZ 179.75
VS 4406.57
9/27/2014 TOOH at 19:21 for new BHA at 10385'. Resume drilling at 11:45 on 9/28/2014
5600
(-811)
B
B
vht-grn, sub
Mrlst dk gy-gy,
ty, occ chk, tr pyr,
ut, 50% bent, 50%
10400-10500 Chk med gy-gy, plty-blky, frm, mottled, rr Mrlst dk gy-gy, blky-sb plty, frm, rr bent, dull yel min flo, sl cut, 95% chk, 5% mrlst
10500-10600 Chk med gy-gy, plty-blky, frm, mottled, rr Mrlst dk gy-gy, blky-sb plty, frm, rr bent, dull yel min flo, sl cut, 95% chk, 5% mrlst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10e5
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TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
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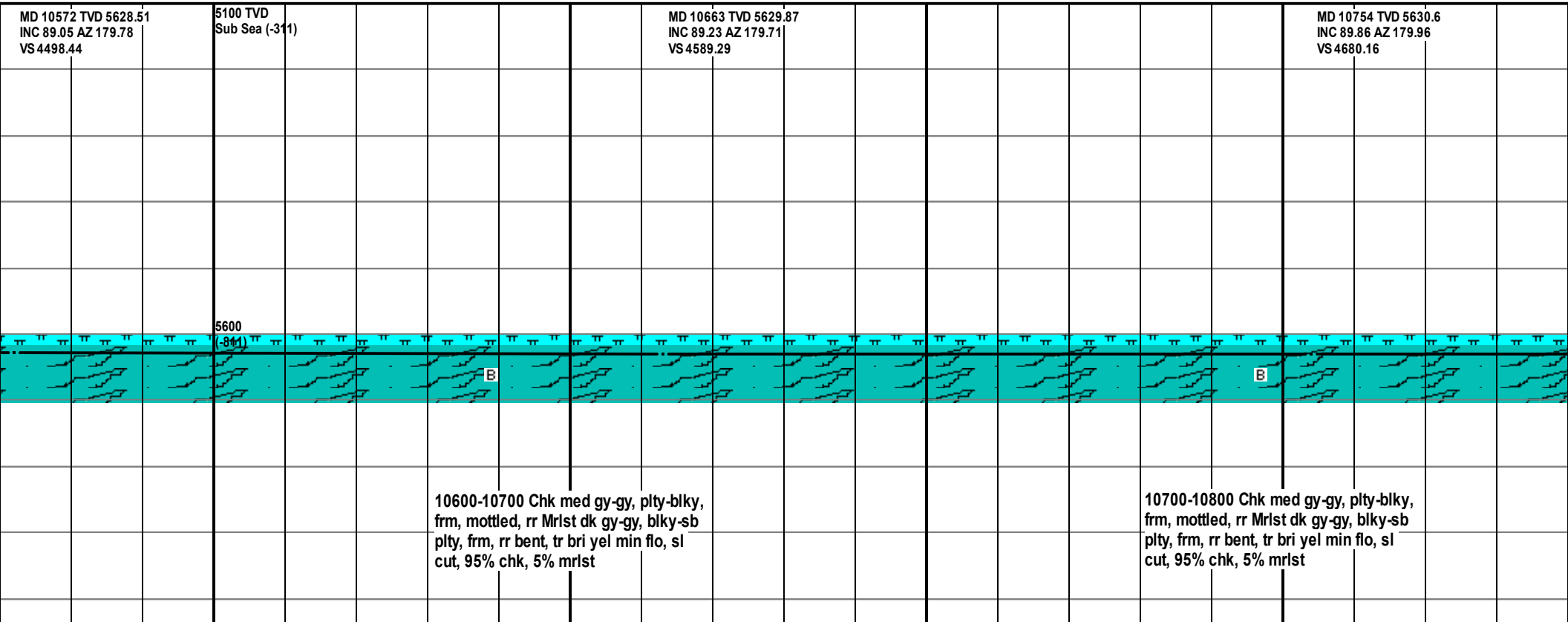
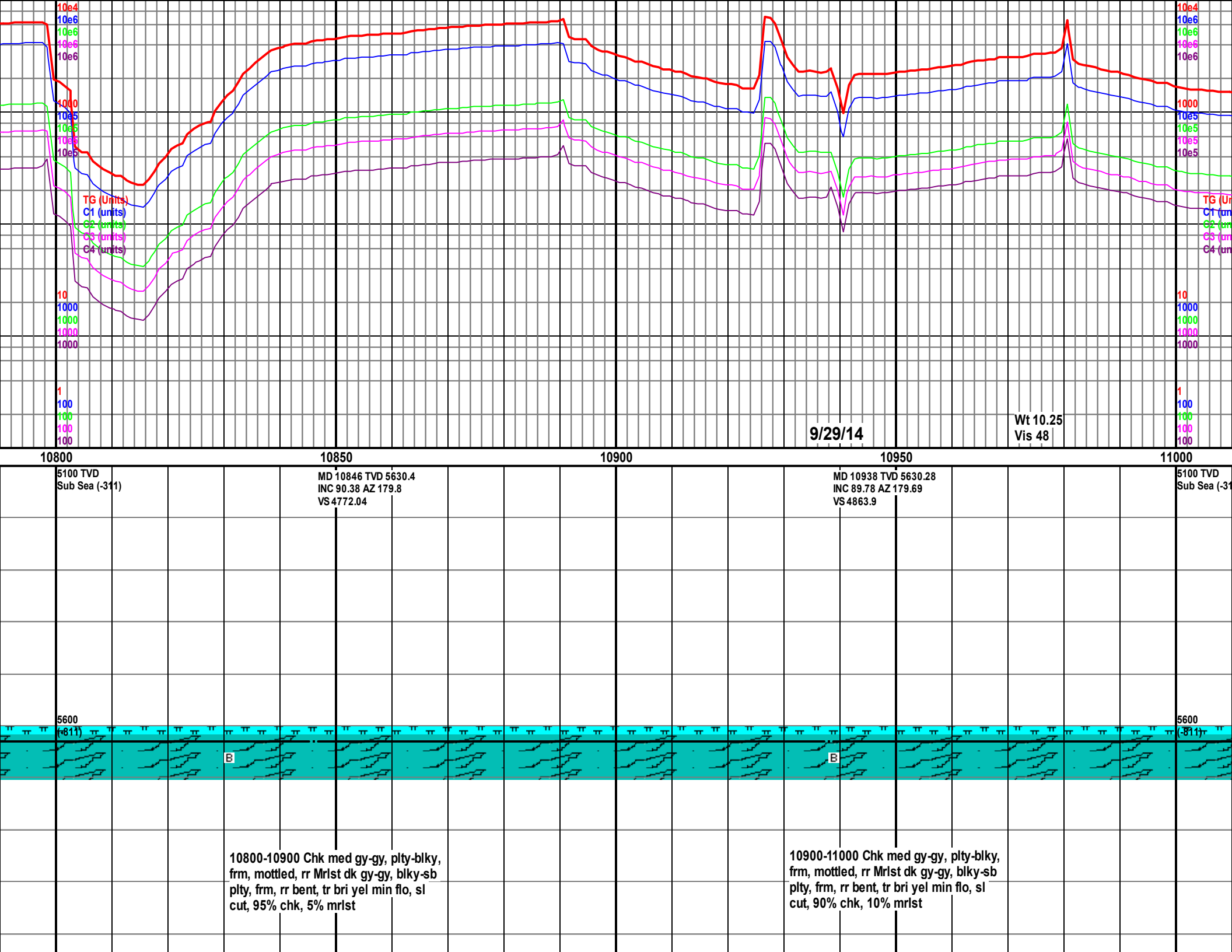
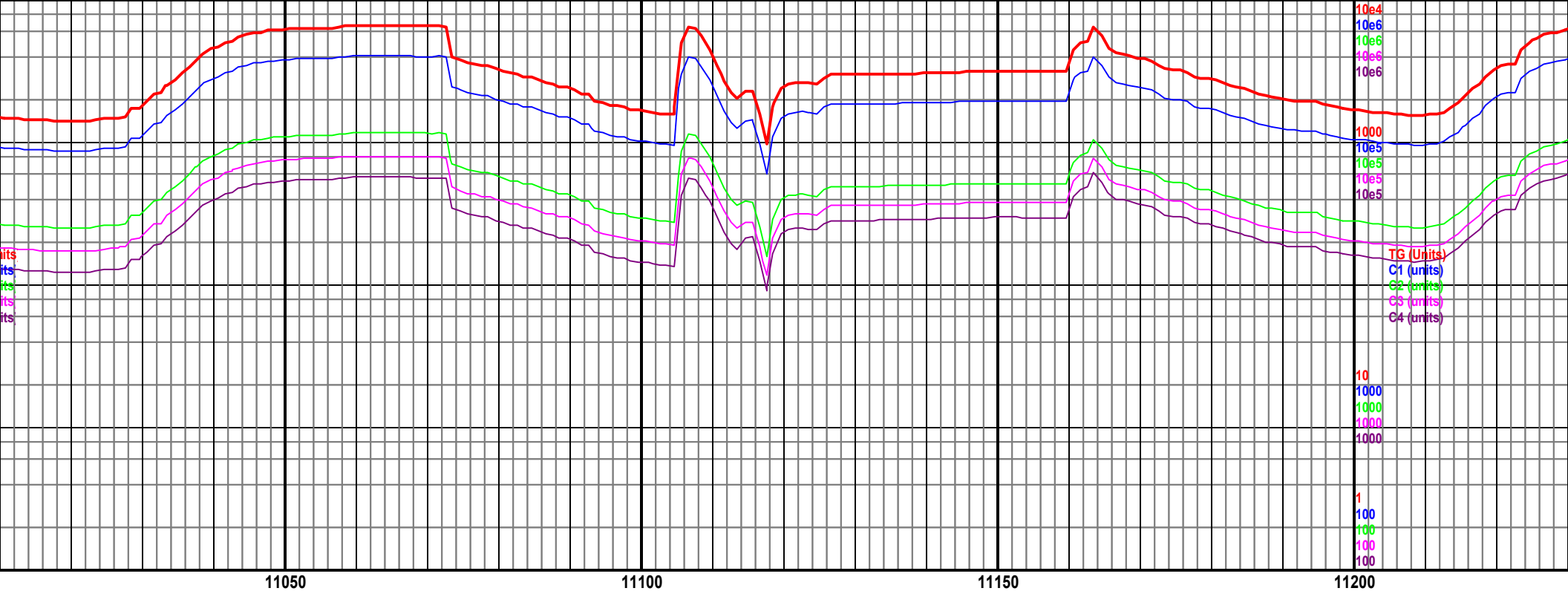
Wt 10.2
Vis 41
10600
10650
10700
10750


MD 10572 TVD 5628.51
INC 89.05 AZ 179.78
VS 4498.44
5100 TVD
Sub Sea (-311)
MD 10663 TVD 5629.87
INC 89.23 AZ 179.71
VS 4589.29
MD 10754 TVD 5630.6
INC 89.86 AZ 179.96
VS 4680.16
5600
(-811)
B
B
10600-10700 Chk med gy-gy, plty-blky, frm, mottled, rr Mrlst dk gy-gy, blky-sb plty, frm, rr bent, tr bri yel min flo, sl cut, 95% chk, 5% mrlst
10700-10800 Chk med gy-gy, plty-blky, frm, mottled, rr Mrlst dk gy-gy, blky-sb plty, frm, rr bent, tr bri yel min flo, sl cut, 95% chk, 5% mrlst


TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
9/29/14
Wt 10.25
Vis 48
10800
10850
10900
10950
11000
5100 TVD
Sub Sea (-311)
MD 10846 TVD 5630.4
INC 90.38 AZ 179.8
VS 4772.04
MD 10938 TVD 5630.28
INC 89.78 AZ 179.69
VS 4863.9
5600
(-811)
B
10800-10900 Chk med gy-gy, plty-blky, frm, mottled, rr Mrlst dk gy-gy, blky-sb plty, frm, rr bent, tr bri yel min flo, sl cut, 95% chk, 5% mrlst
10900-11000 Chk med gy-gy, plty-blky, frm, mottled, rr Mrlst dk gy-gy, blky-sb plty, frm, rr bent, tr bri yel min flo, sl cut, 90% chk, 10% mrlst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10e6
1000
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10e5
10e5
10e5
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
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1000
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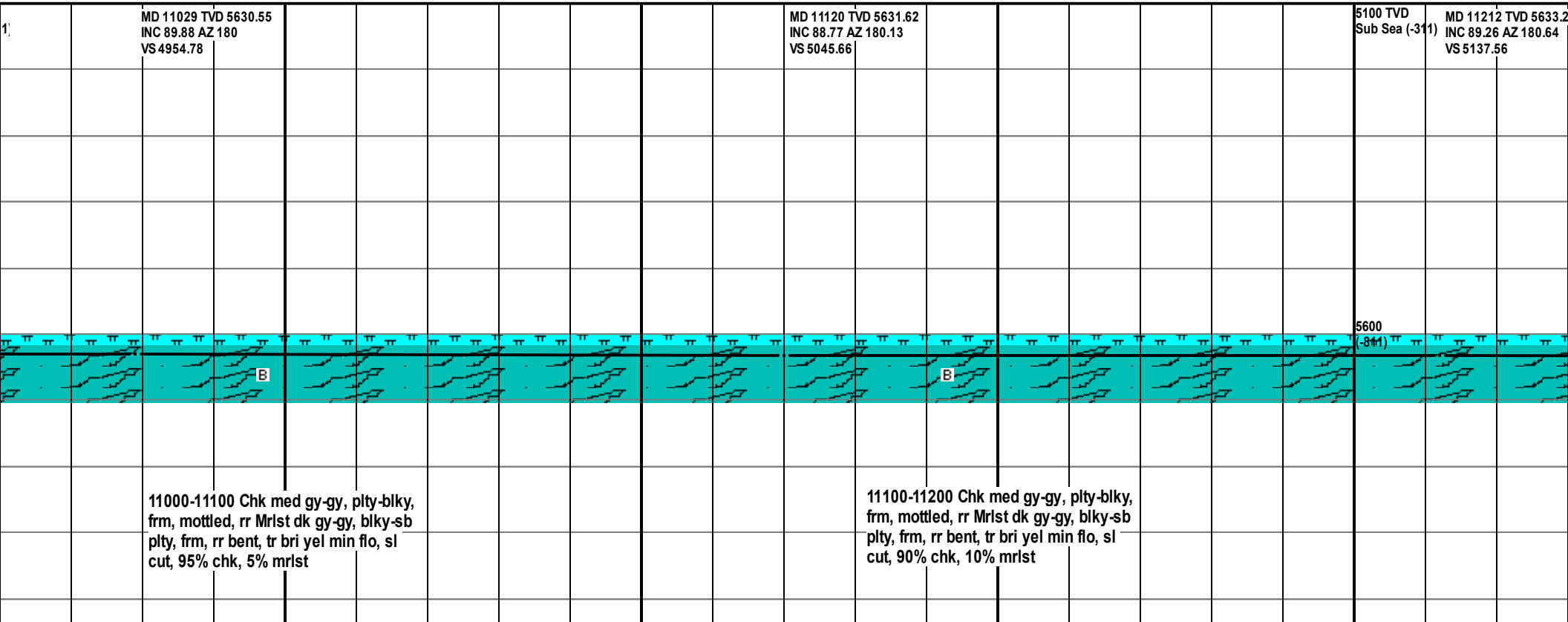
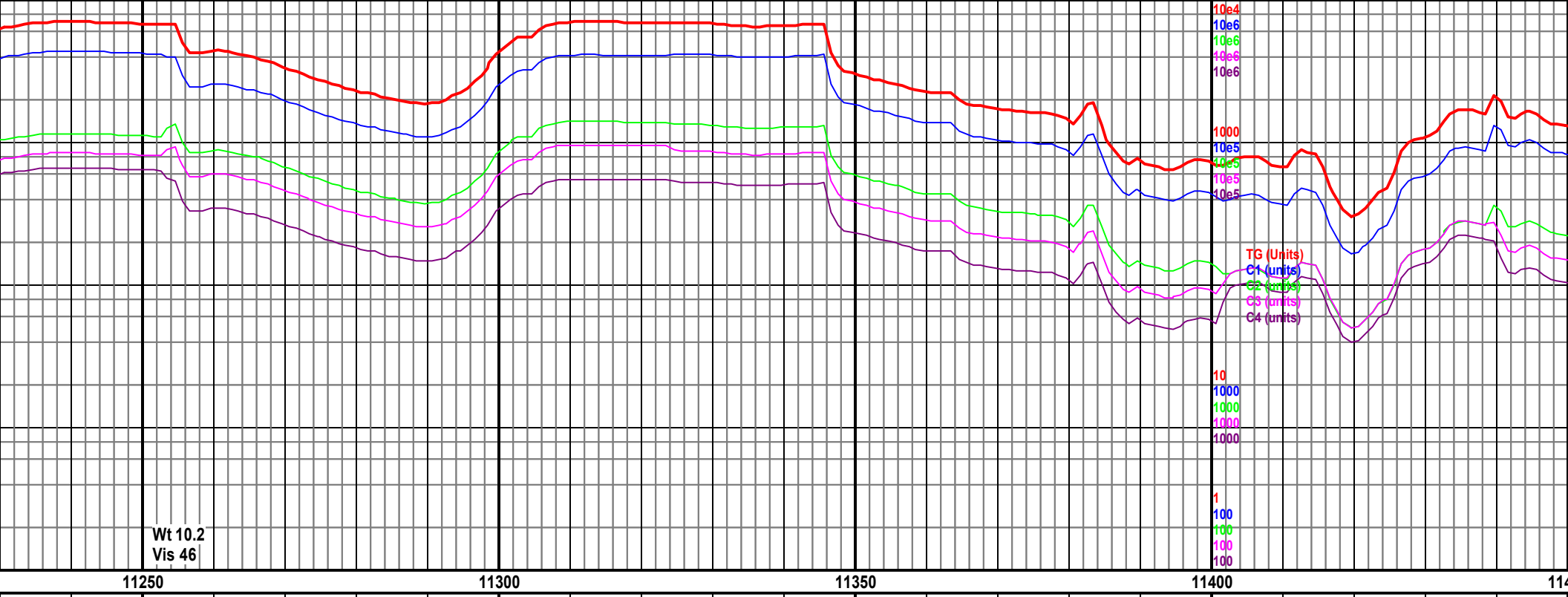
11200


MD 11029 TVD 5630.55
INC 89.88 AZ 180
VS 4954.78
MD 11120 TVD 5631.62
INC 88.77 AZ 180.13
VS 5045.66
5100 TVD
Sub Sea (-311)
MD 11212 TVD 5633.2
INC 89.26 AZ 180.64
VS 5137.56
5600
(-811)
B
B
11000-11100 Chk med gy-gy, plty-blky, frm, mottled, rr Mrlst dk gy-gy, blky-sb plty, frm, rr bent, tr bri yel min flo, sl cut, 95% chk, 5% mrlst
11100-11200 Chk med gy-gy, plty-blky, frm, mottled, rr Mrlst dk gy-gy, blky-sb plty, frm, rr bent, tr bri yel min flo, sl cut, 90% chk, 10% mrlst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10e6
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1000
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10e5
10e5
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
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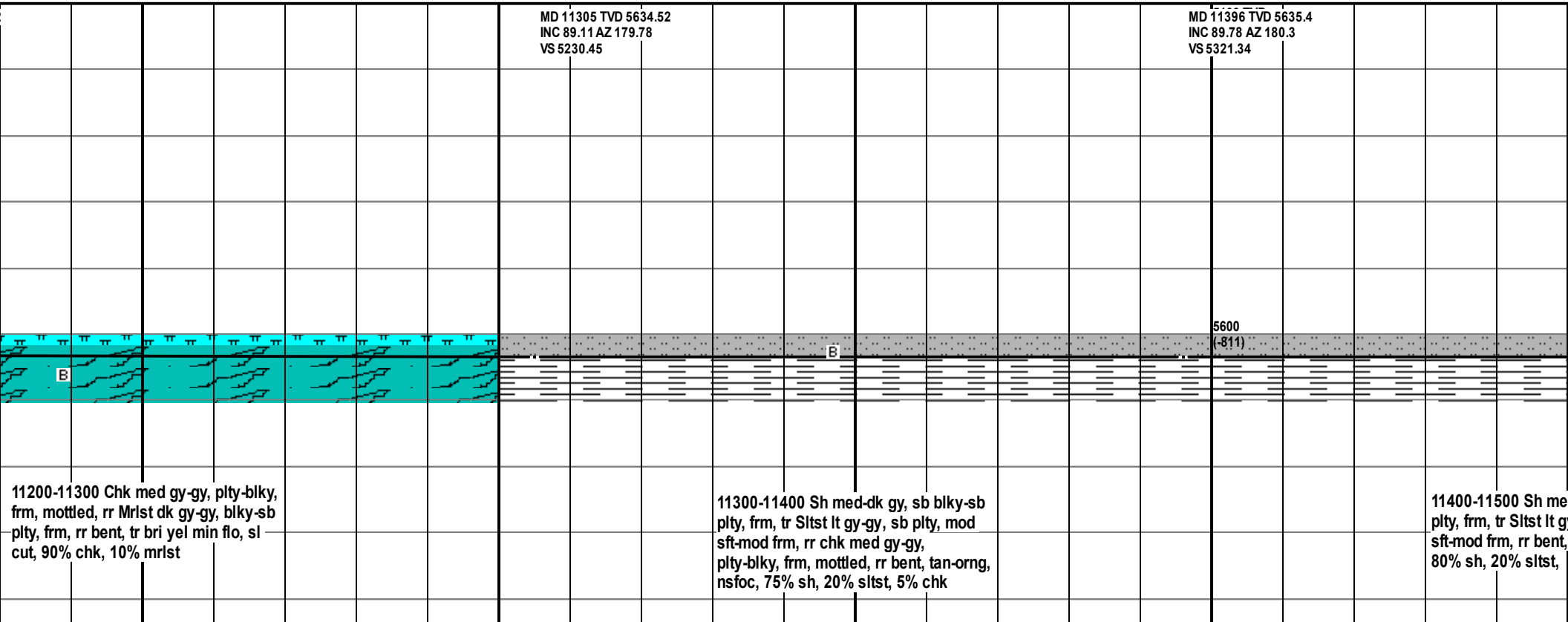
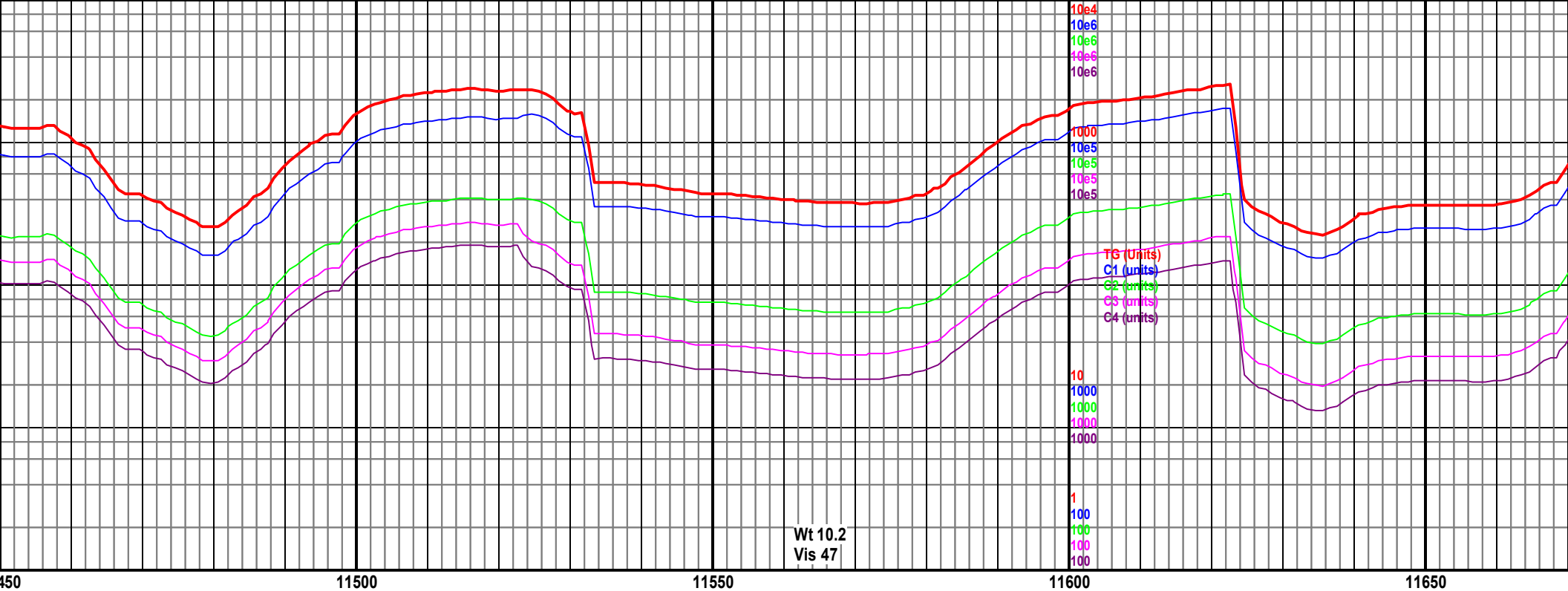
1000
1000
1
100
100
100
100
Wt 10.2
Vis 46
11250
11300
11350
11400


MD 11305 TVD 5634.52
INC 89.11 AZ 179.78
VS 5230.45
MD 11396 TVD 5635.4
INC 89.78 AZ 180.3
VS 5321.34
5600
(-811)
B
B
11200-11300 Chk med gy-gy, plty-blky, frm, mottled, rr Mrlst dk gy-gy, blky-sb plty, frm, rr bent, tr bri yel min flo, sl cut, 90% chk, 10% mrlst
11300-11400 Sh med-dk gy, sb blky-sb plty, frm, tr Sltst lt gy-gy, sb plty, mod sft-mod frm, rr chk med gy-gy, plty-blky, frm, mottled, rr bent, tan-orng, nsfoc, 75% sh, 20% sltst, 5% chk
11400-11500 Sh me
plty, frm, tr Sltst lt g
sft-mod frm, rr bent,
80% sh, 20% sltst,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1000
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10e5
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
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1000
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100
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100
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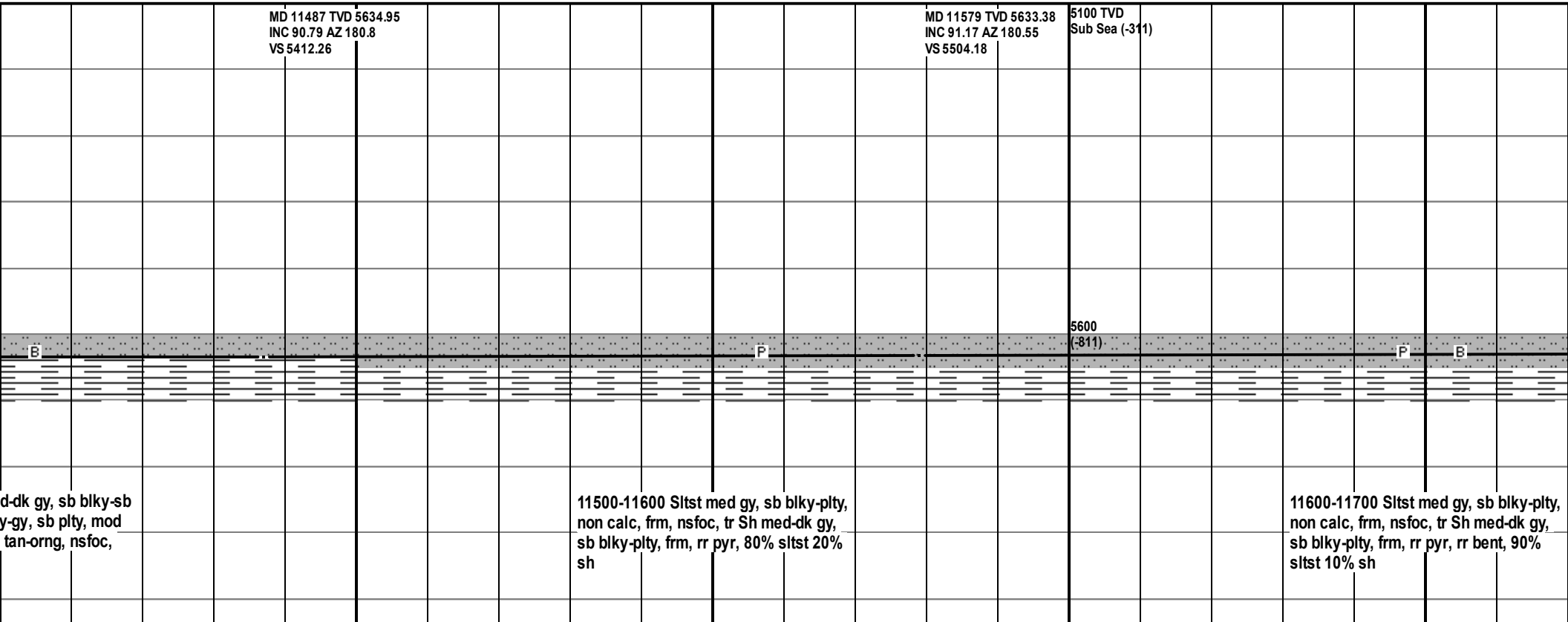
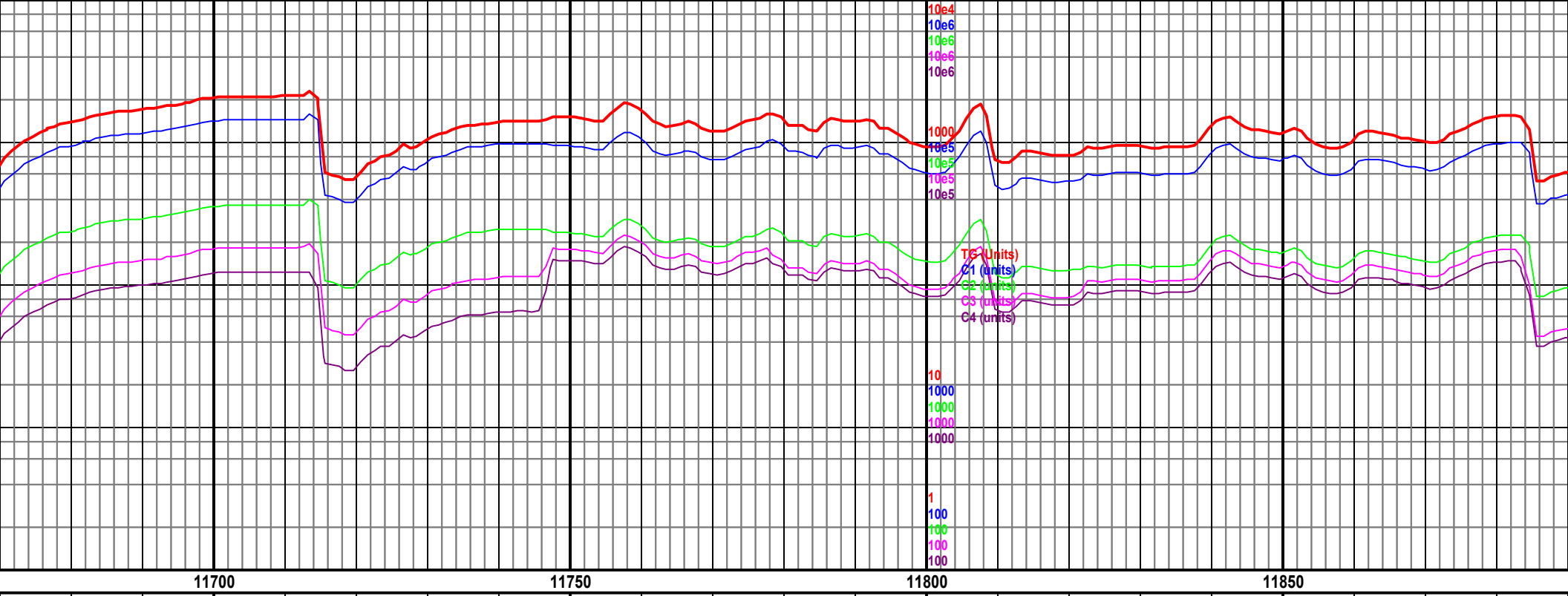
Wt 10.2
Vis 47
450
11500
11550
11600
11650


MD 11487 TVD 5634.95
INC 90.79 AZ 180.8
VS 5412.26
MD 11579 TVD 5633.38
INC 91.17 AZ 180.55
VS 5504.18
5100 TVD
Sub Sea (-311)
5600
(-811)
B
P
P
B
d-dk gy, sb blky-sb
y-gy, sb plty, mod
tan-orng, nsfoc,
11500-11600 Sltst med gy, sb blky-plty, non calc, frm, nsfoc, tr Sh med-dk gy, sb blky-plty, frm, rr pyr, 80% sltst 20% sh
11600-11700 Sltst med gy, sb blky-plty, non calc, frm, nsfoc, tr Sh med-dk gy, sb blky-plty, frm, rr pyr, rr bent, 90% sltst 10% sh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10e5
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
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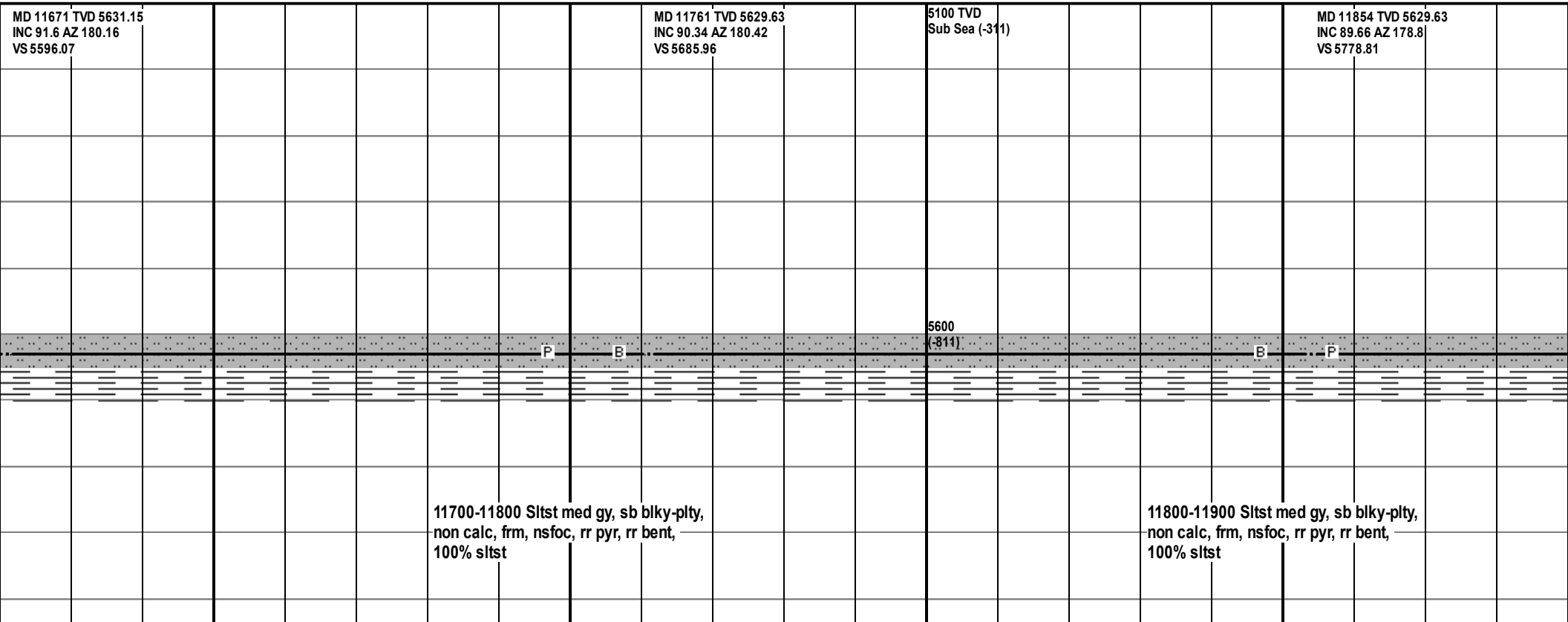
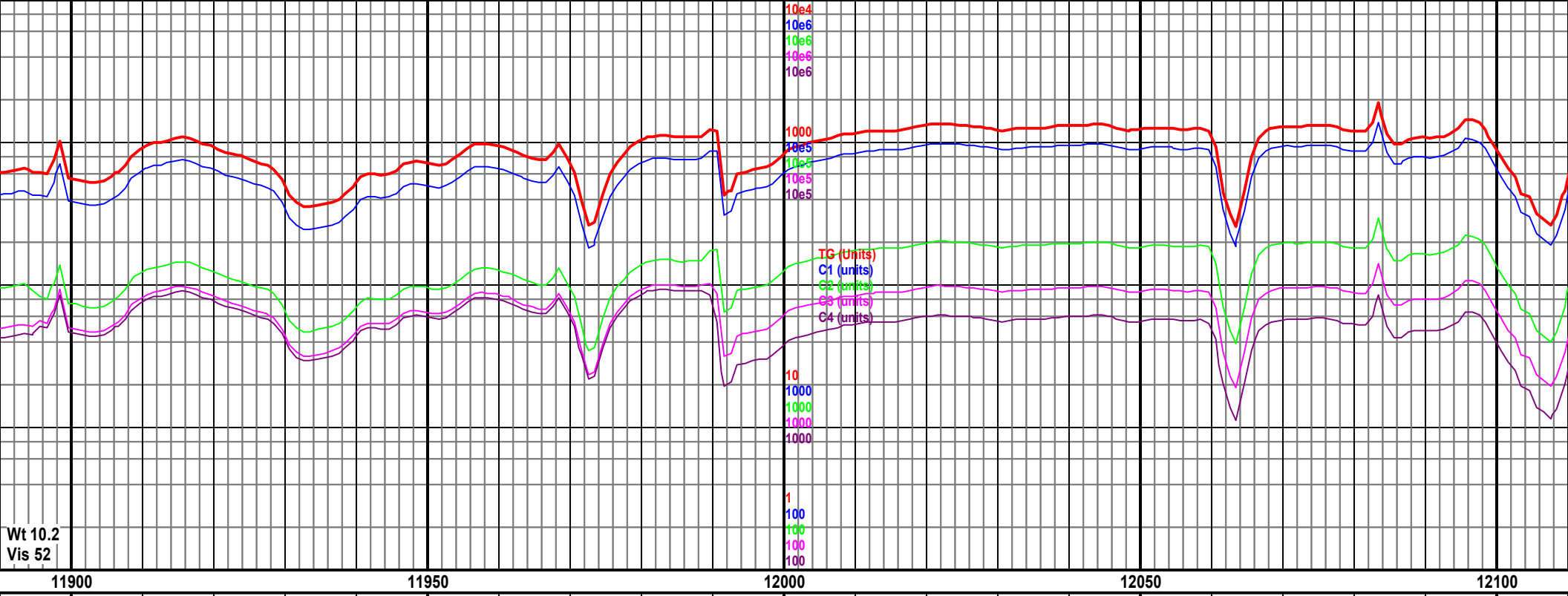
11800
11850


MD 11671 TVD 5631.15
INC 91.6 AZ 180.16
VS 5596.07
MD 11761 TVD 5629.63
INC 90.34 AZ 180.42
VS 5685.96
5100 TVD
Sub Sea (-311)
MD 11854 TVD 5629.63
INC 89.66 AZ 178.8
VS 5778.81
5600
(-811)
P
B
B
P
11700-11800 Sltst med gy, sb blky-plty, non calc, frm, nsfoc, rr pyr, rr bent, 100% sltst
11800-11900 Sltst med gy, sb blky-plty, non calc, frm, nsfoc, rr pyr, rr bent, 100% sltst


10e4
10e6
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1000
10e5
10e5
10e5
10e5
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
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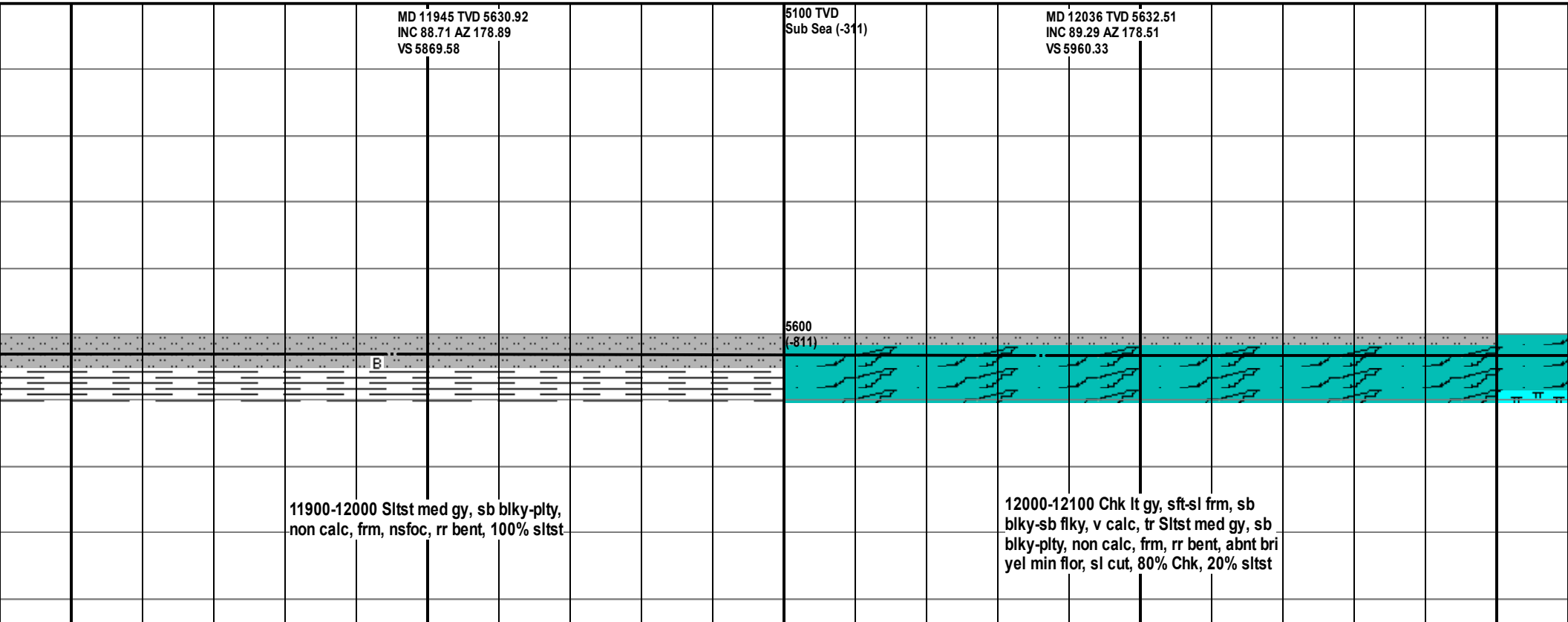
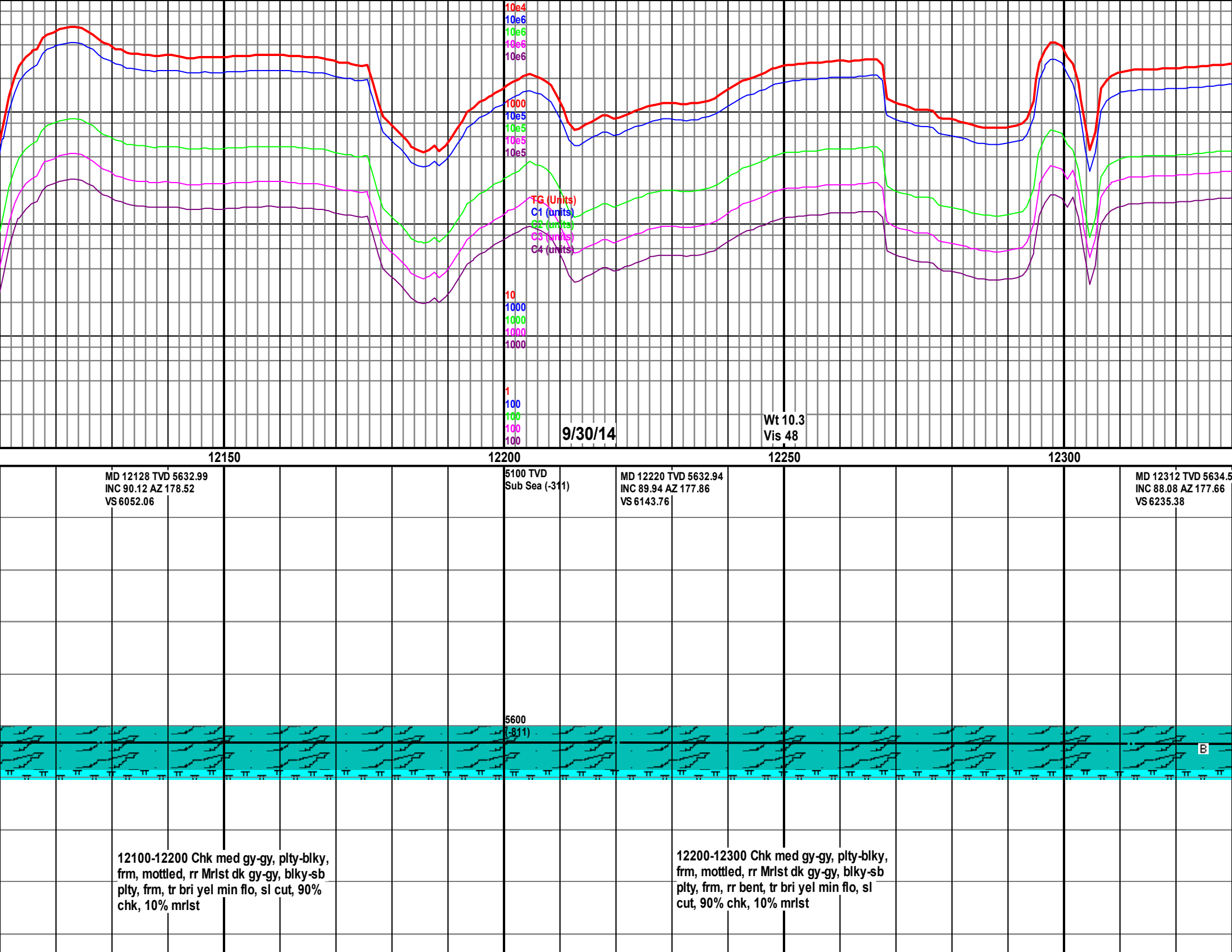
1000
1000
1000
1000
1
100
100
100
100
Wt 10.2
Vis 52
11900
11950
12000
12050
12100


MD 11945 TVD 5630.92
INC 88.71 AZ 178.89
VS 5869.58
5100 TVD
Sub Sea (-311)
MD 12036 TVD 5632.51
INC 89.29 AZ 178.51
VS 5960.33
5600
(-811)
B
11900-12000 Sltst med gy, sb blky-plty, non calc, frm, nsfoc, rr bent, 100% sltst
12000-12100 Chk lt gy, sft-sl frm, sb blky-sb flky, v calc, tr Sltst med gy, sb blky-plty, non calc, frm, rr bent, abnt bri yel min flor, sl cut, 80% Chk, 20% sltst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10e5
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
10
1000
1000
1000
1000
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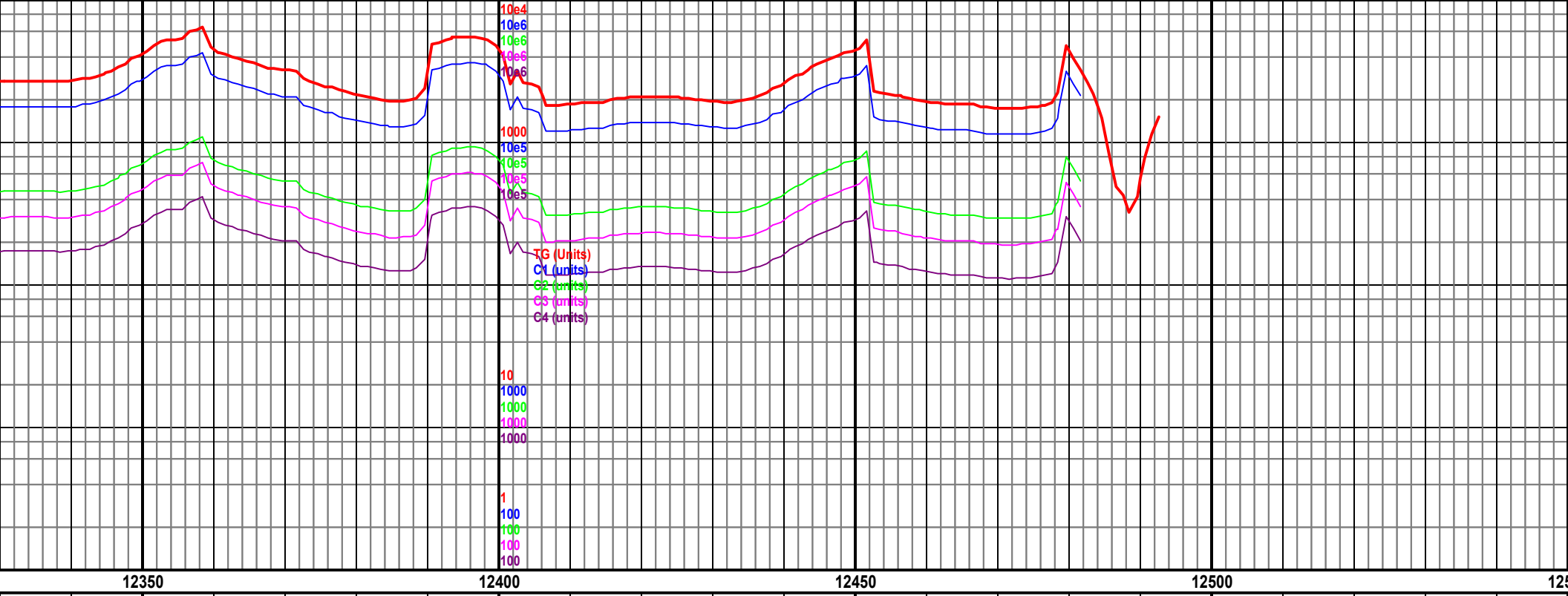
100
100
100
100
9/30/14
Wt 10.3
Vis 48
12150
12200
12250
12300
MD 12128 TVD 5632.99
INC 90.12 AZ 178.52
VS 6052.06
5100 TVD
Sub Sea (-311)
MD 12220 TVD 5632.94
INC 89.94 AZ 177.86
VS 6143.76
MD 12312 TVD 5634.5
INC 88.08 AZ 177.66
VS 6235.38
5600
(-811)
B
12100-12200 Chk med gy-gy, plty-blky, frm, mottled, rr Mrlst dk gy-gy, blky-sb plty, frm, tr bri yel min flo, sl cut, 90% chk, 10% mrlst
12200-12300 Chk med gy-gy, plty-blky, frm, mottled, rr Mrlst dk gy-gy, blky-sb plty, frm, rr bent, tr bri yel min flo, sl cut, 90% chk, 10% mrlst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10e5
10e5
TG (Units)
C1 (units)
C2 (units)
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100
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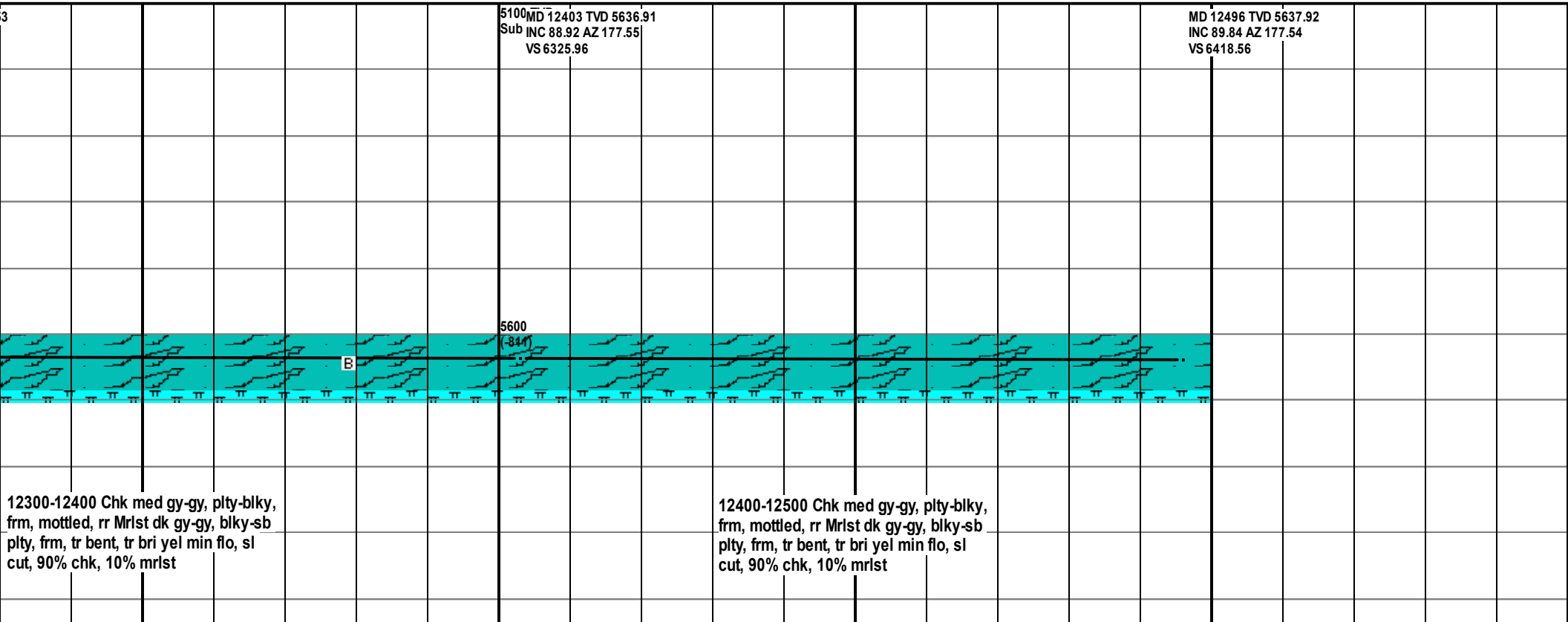
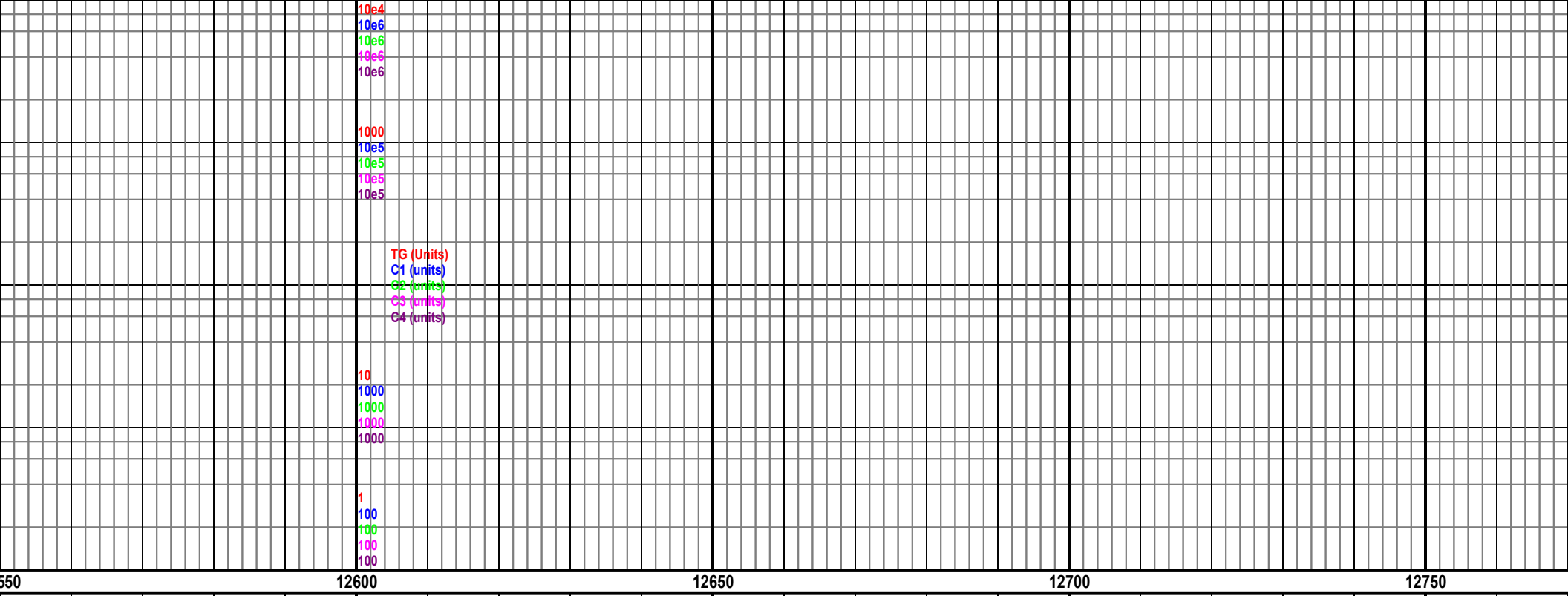
12450
12500

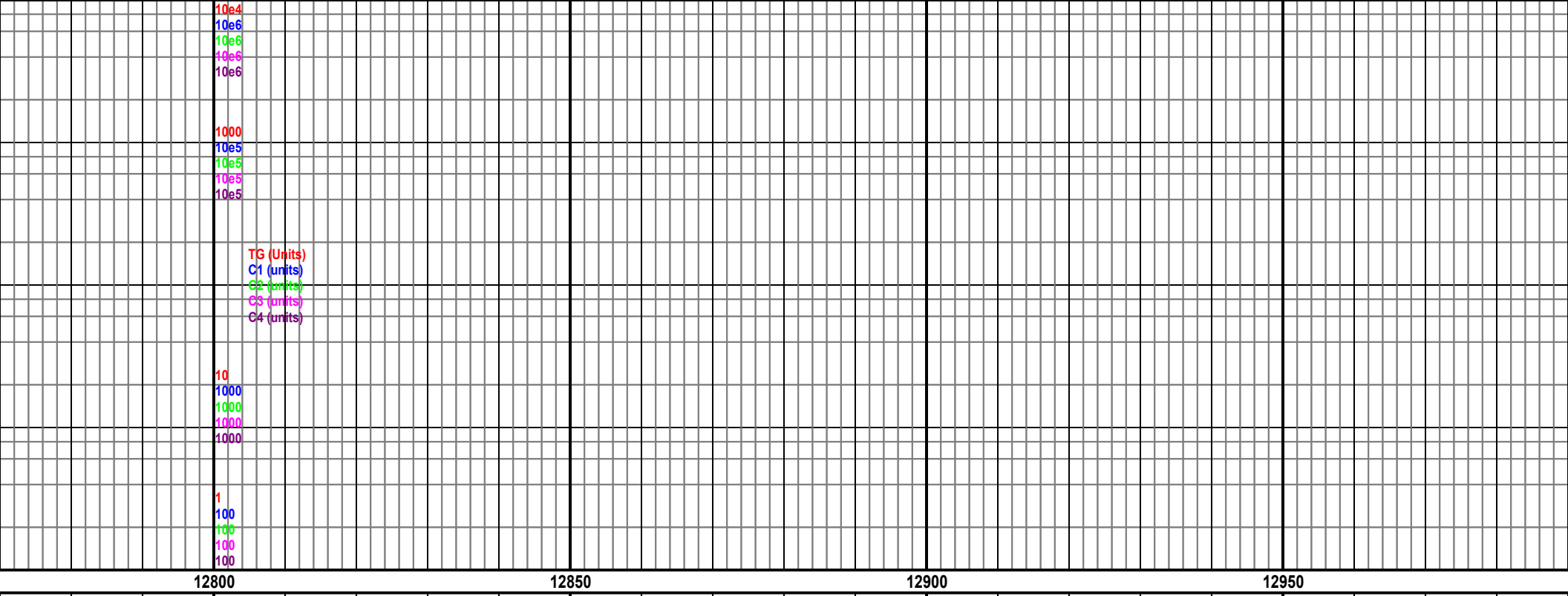

5100
Sub
MD 12403 TVD 5636.91
INC 88.92 AZ 177.55
VS 6325.96
MD 12496 TVD 5637.92
INC 89.84 AZ 177.54
VS 6418.56
5600
(-841)
B
12300-12400 Chk med gy-gy, plty-blky, frm, mottled, rr Mrlst dk gy-gy, blky-sb plty, frm, tr bent, tr bri yel min flo, sl cut, 90% chk, 10% mrlst
12400-12500 Chk med gy-gy, plty-blky, frm, mottled, rr Mrlst dk gy-gy, blky-sb plty, frm, tr bent, tr bri yel min flo, sl cut, 90% chk, 10% mrlst



550 12600 12650 12700 12750

5100 TVD
Sub Sea (-311)

5600
(-811)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10e6
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10e6
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1000
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10e5
10e5
10e5
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
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1000
1000
1000
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100
100
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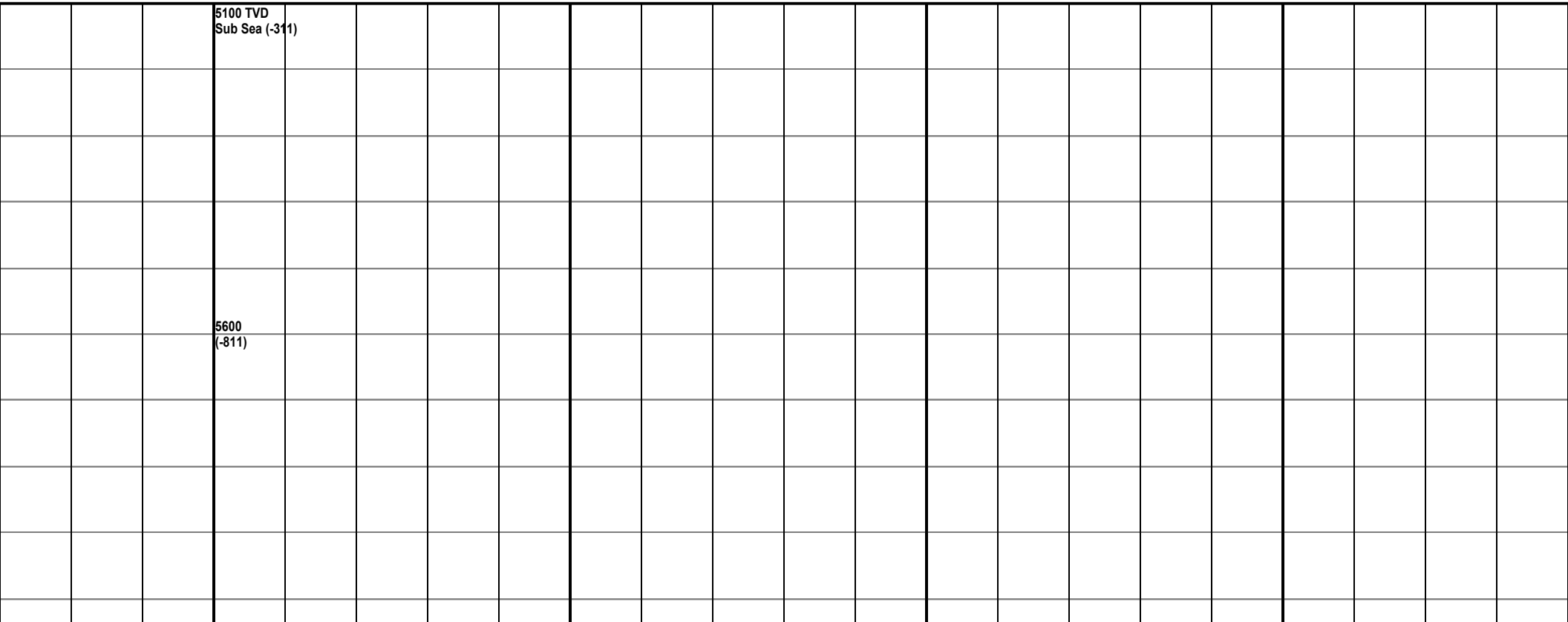
12950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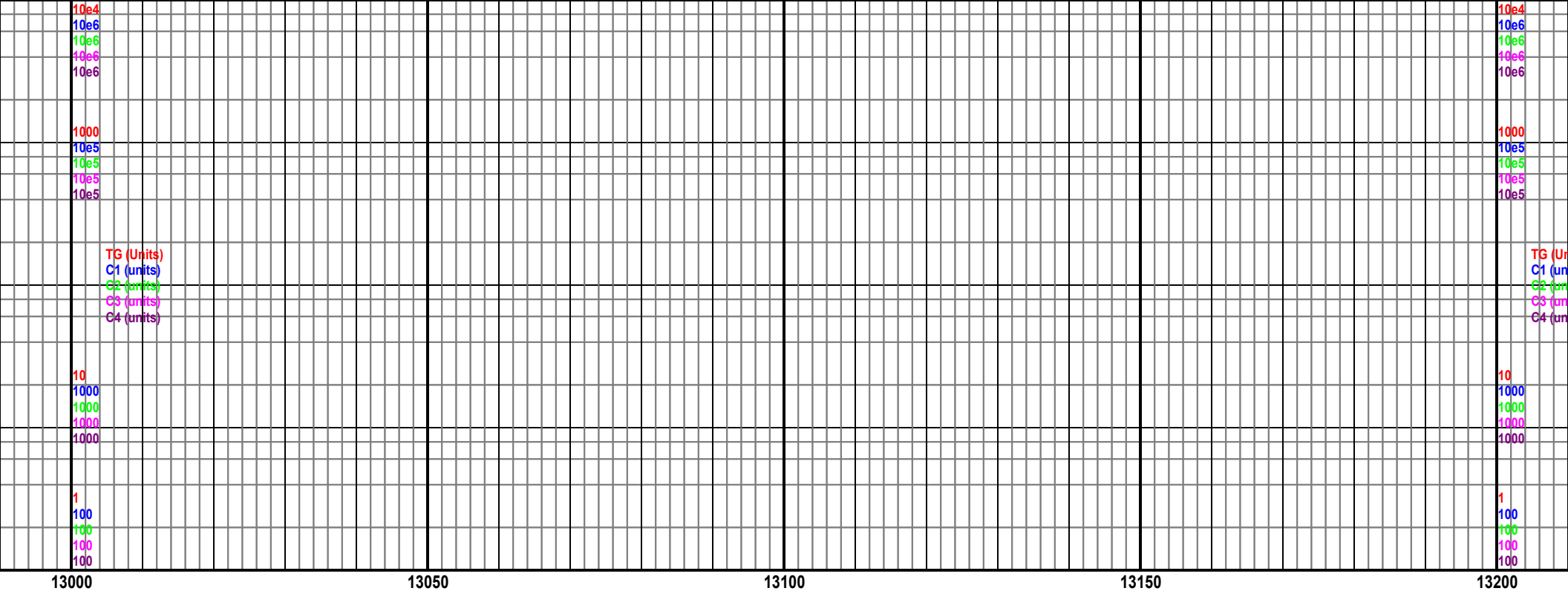
Sub Sea (-311)
5600
(-811)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TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
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1000
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1000
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100
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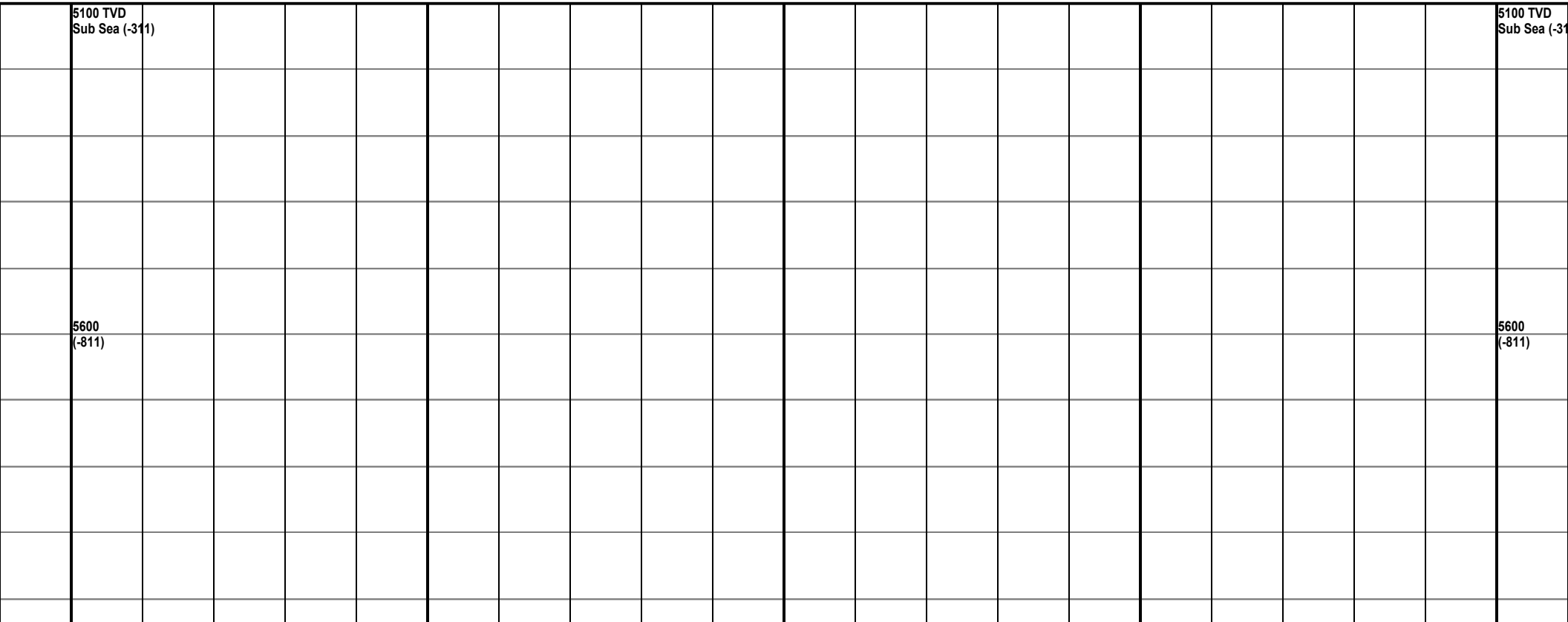
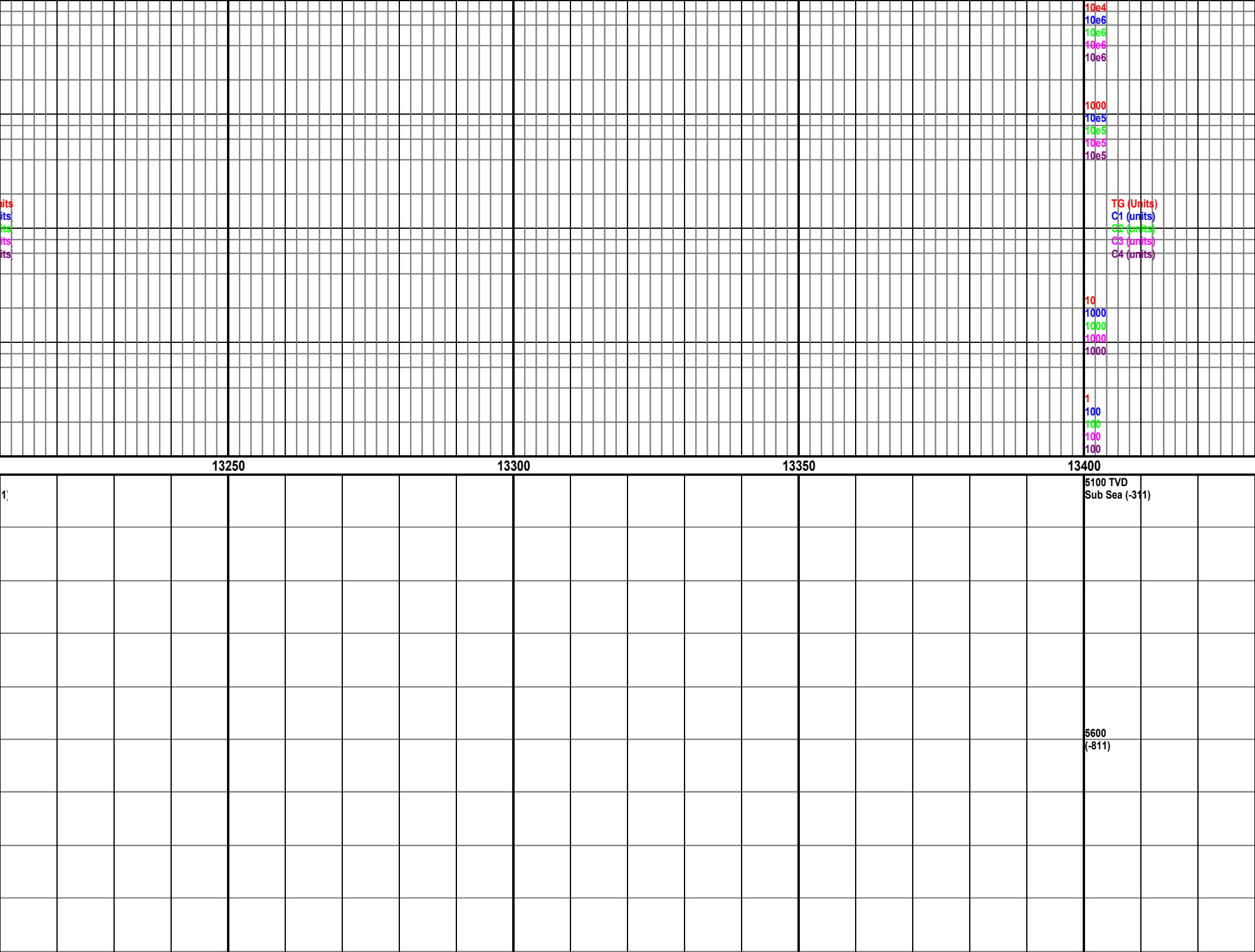
13150
13200


5100 TVD
Sub Sea (-311)
5600
(-811)


10e4
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10e6
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10e5
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
10
1000
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1000
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100
100
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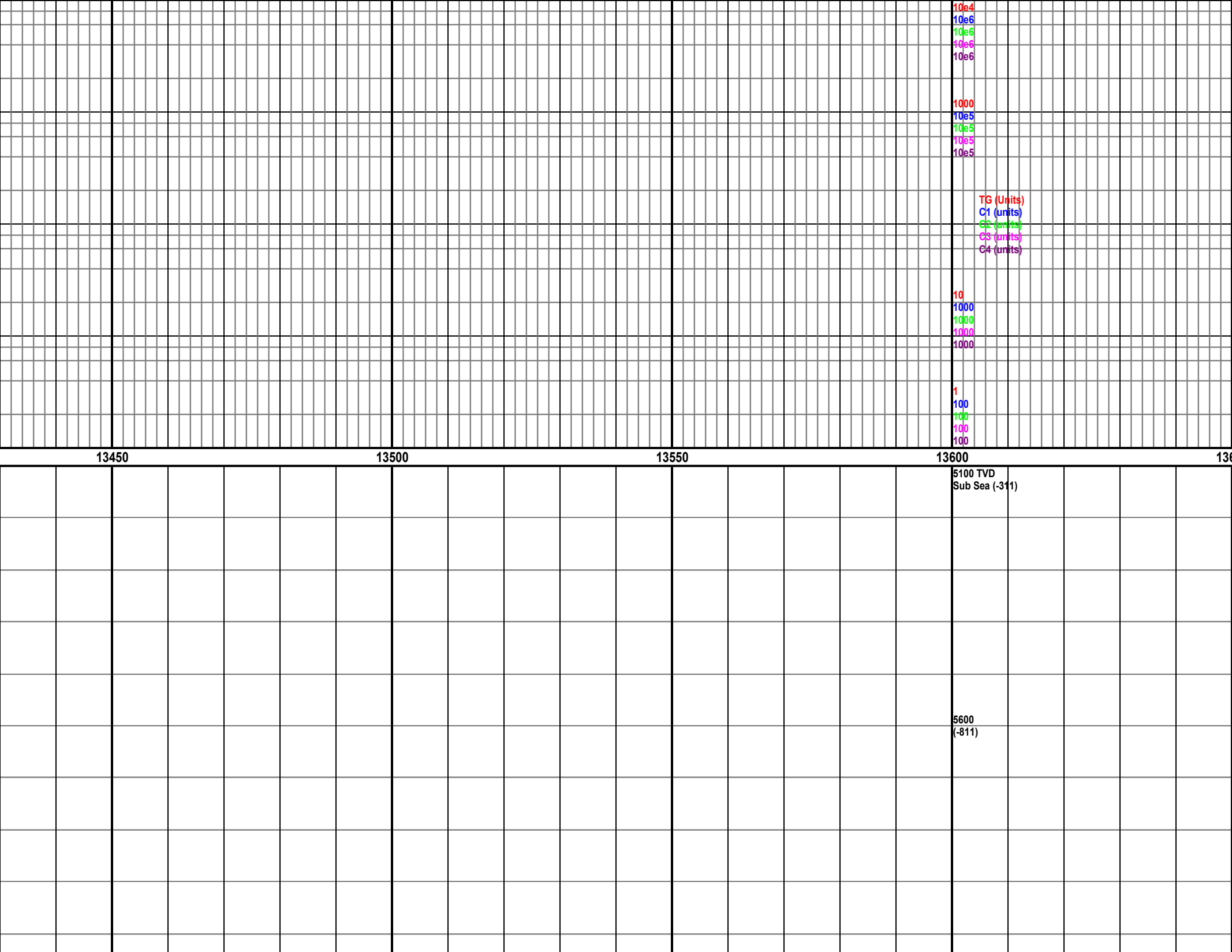
13300
13350
13400
5100 TVD
Sub Sea (-311)
5600
(-811)


10e4
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10e6
10e6
1000
10e5
10e5
10e5
10e5
TG (Units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
10
1000
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100
100
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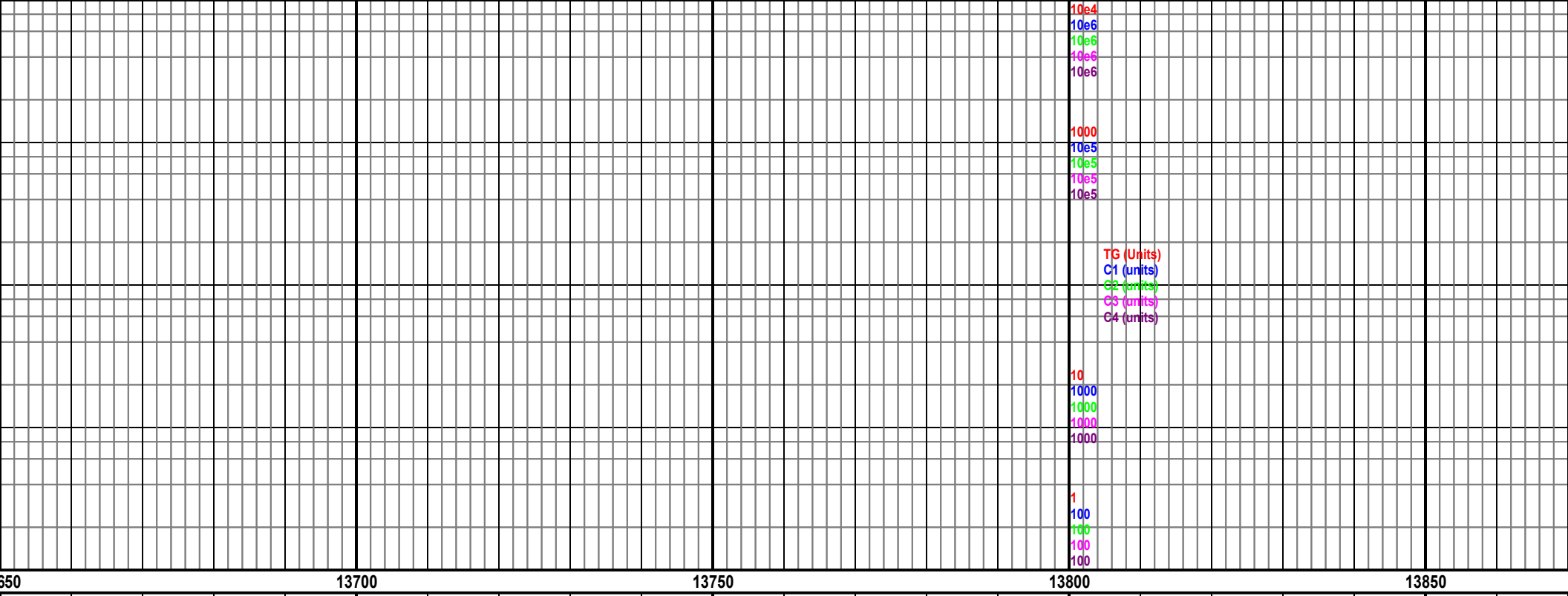
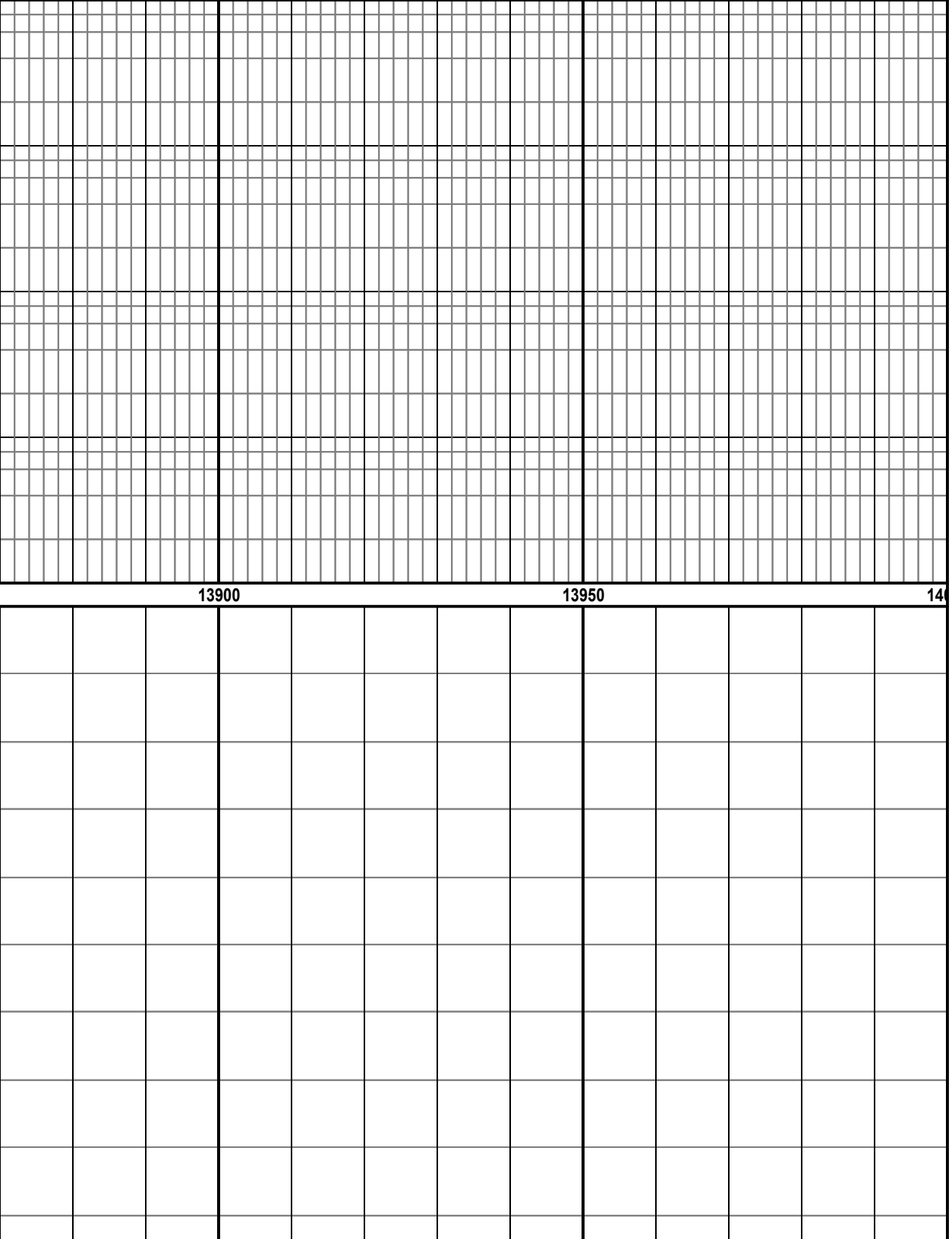
13450
13500
13550
13600
5100 TVD
Sub Sea (-311)
5600
(-811)



650 13700 13750 13800 13850

5100 TVD
Sub Sea (-311)

5600
(-811)


13900
13950
14