7136 South Yale Avenue, Suite 414
Tulsa, Oklahoma 74136-6378
phone 918.925.9739
fax 866.534.4559
WWW.HZMUD.COM/25

Customer Information

Operator: **Noble Energy Inc**
1625 Broadway
Suite 2200
Denver, Colorado 80202

Geologist: **Holly Duncan**
Noble Energy Inc.

Mud Logging Details

Logger: **Casey Sensecqua & Ross Apodaca**
Log Interval: **6700' MD to 16225' MD**
Start Date: **December 09, 2013**
Release Date: **December 14, 2013**

Well Information

Well Name: **NCLP PC AA04-64-1HN Horizontal**
Location: **4-T6N-R63W**
2163' FSL, 250' FWL

County: **Weld**
State: **Colorado**

Drilling Rig: **H&P 343**
Total Depth: **16225' MD**
TD Date: **December 14, 2013**
Formation: **Niobrara B Chalk**
KB Elevation: **4735'**
GR Elevation: **4711'**
API Number: **05-123-37171-0000**

Logger On Shift

CJS

Total Gas, C1-C4

TG (Units)

C1 (units)

C2 (units)

C3 (units)

C4

4500

DRILLING ON WATER BASED MUD

GAS SCALE: -500 TO 4500
(500 UNITS/DIVISION)

CONNECTIONS MARKED
WITH RED TRIANGLES

-500

CG 2297u

CG 2111u

TG, C1-C4

Connections

Cut

Weak
Strong

Slide/Rotate

ROP and Gamma

ROP (Ft/Hr)

Gamma (API)

SLIDE=RED
ROTATE=WHITE

ROP SCALE: 0 TO 550
ROP (Ft/Hr)
Gamma (API)

GAMMA SCALE: 0 TO 250

0

WOB 44.8K
PP 4013
RPM 0
SPM 63/63

550
250

ROP (Ft/Hr)
Gamma (API)

Depth

50

6700

6750

6800

Photographs

NIOBRARA A MARL 6724' MD 6563' TVD

NIOBRARA B CHALK 6814' MD 6

Lithology %

Well Bore Cross Section

6500 TVD

NOBLE ENERGY INC
NCLP PC AA04-64-1HN
HORIZONTAL
4-T6N-R63W
2163' FSL, 250' FWL
WELD CO., CO

H&P 343

6650

LOGGERS:
CASEY SENSECQUA &
ROSS APODACA

COMMENCED LOGGING @ 6700' MD ON
12/09/2013 W/BIT# 3, SIZE 8.75, TYPE HDBS MMD55M, S/N
12262948 IN @ 5926' MD

6800

NIOBRARA A MARL
6724' MD 6563' TVD

P B

6710' MD-6740' MD: CHK: 100% (CaCO3 75%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, MOD GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

6740' MD-6770' MD: MRL: 90% (CaCO3 45%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, FREE CHALK, NO STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

6770' MD-6800' MD: MRL: 90% (CaCO3 45%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, FREE CHALK, NO STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

6500 TVD

NIOBRARA B CHAL
6814' MD 6607' TVD

6650

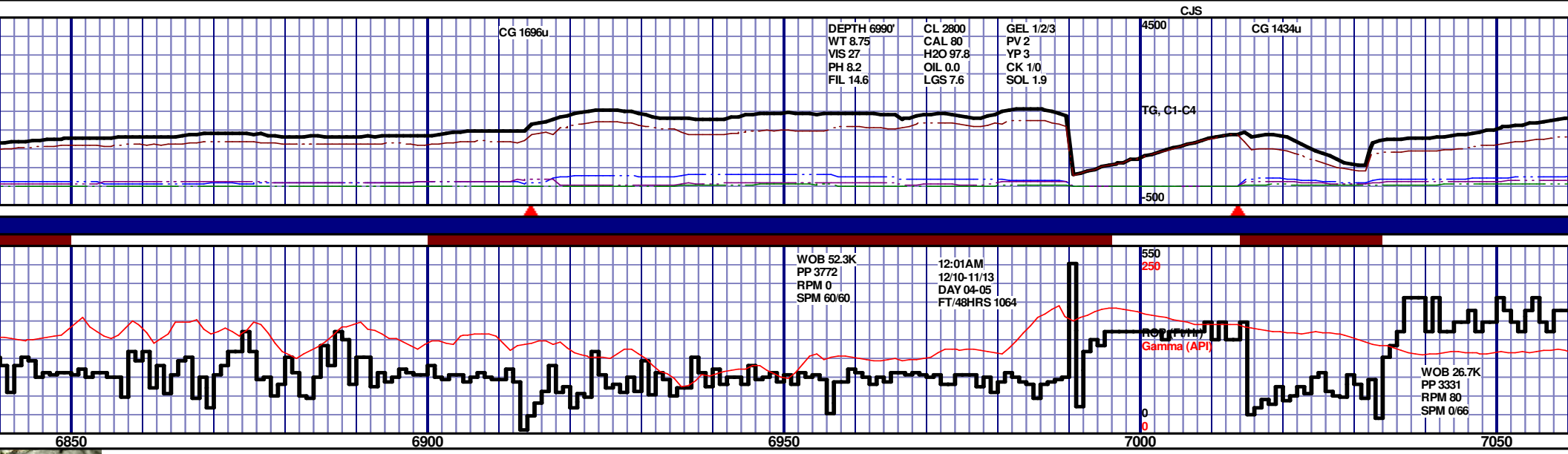
6800' MD-6830' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CAL, FREE PYR, FREE MARL, FREE BENT, MOD GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

6830' MD-68
(CaCO3 70%
BLKY TO SU
CHLKY, SFT
CAL, FREE
BENT, MOD
LTOR MIN F
FLOR, IMME
BLSHWT RI

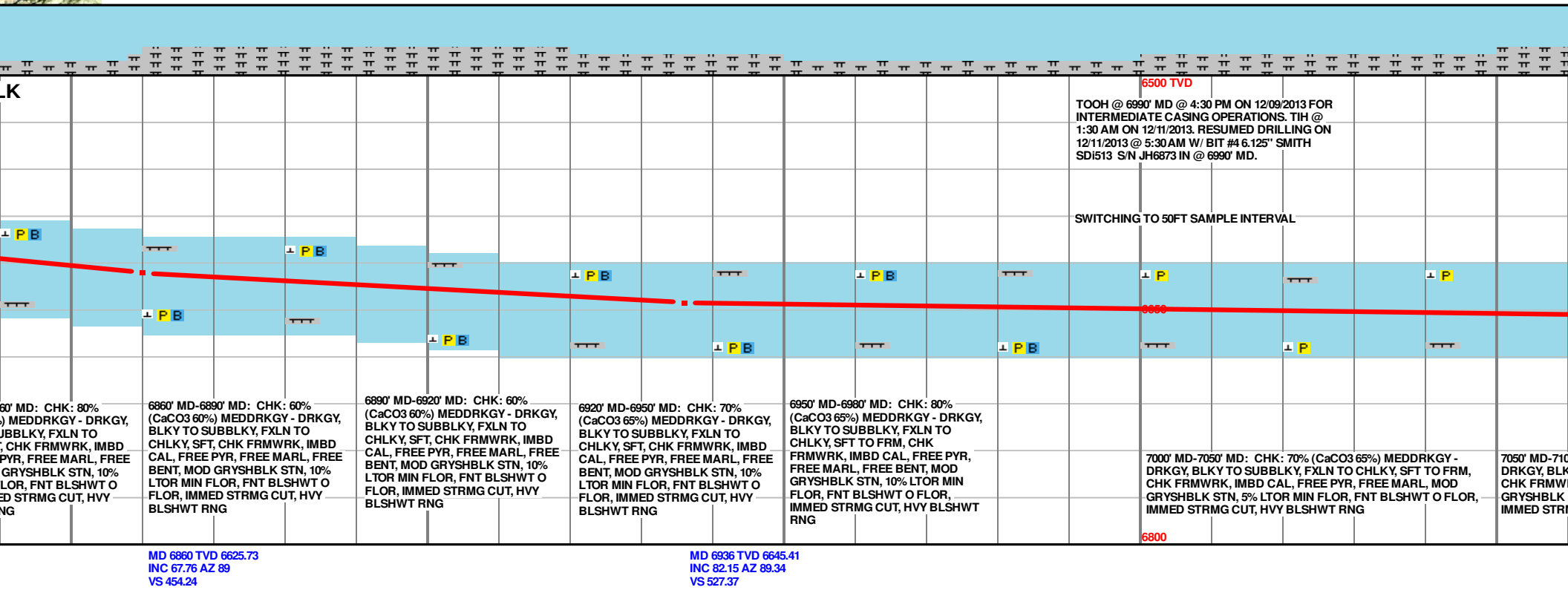
6800

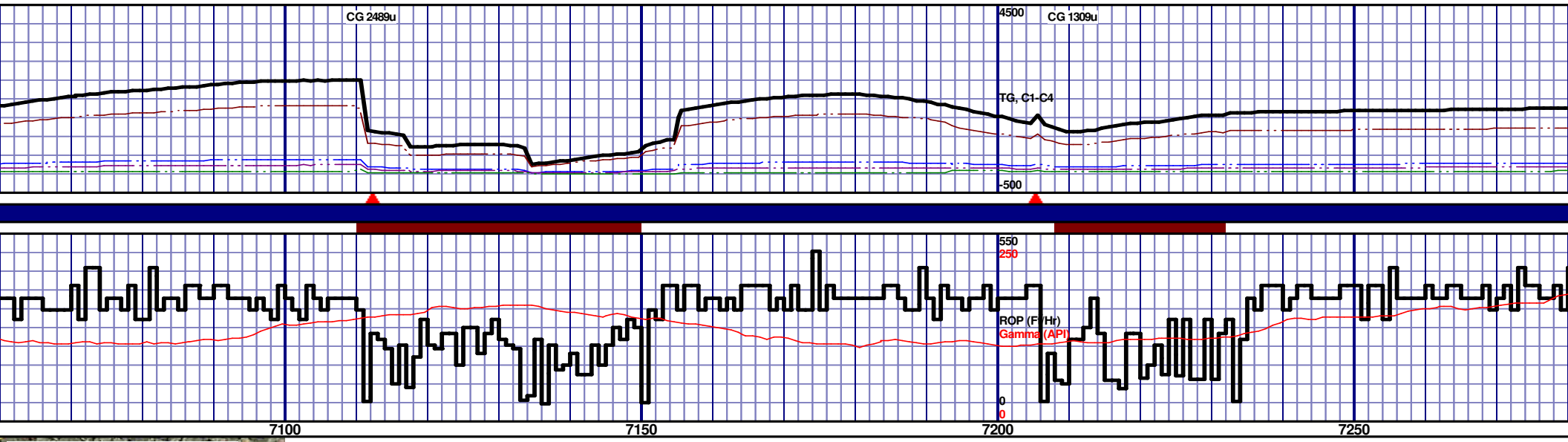
Survey Data

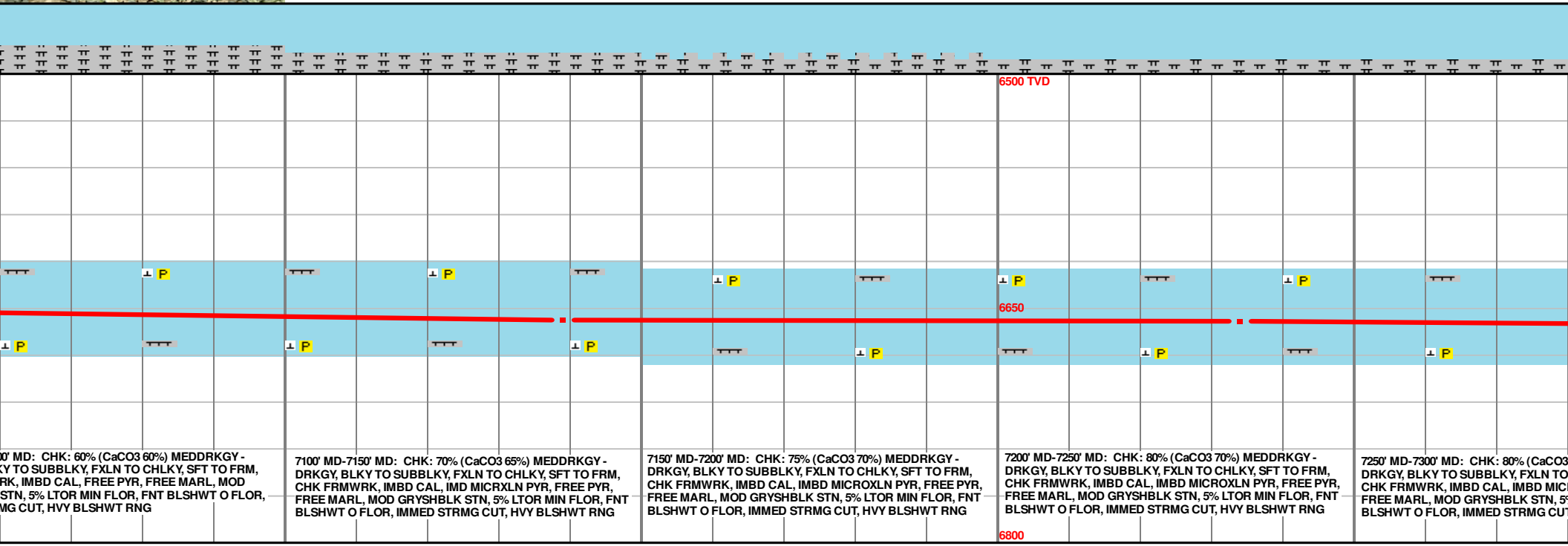
MD 6765 TVD 6583.82
INC 59.84 AZ 91.29
VS 353.46


CJS
CG 1696u
DEPTH 6990'
WT 8.75
VIS 27
PH 8.2
FIL 14.6
CL 2800
CAL 80
H2O 97.8
OIL 0.0
LGS 7.6
GEL 1/2/3
PV 2
YP 3
CK 1/0
SOL 1.9
4500
CG 1434u
TG, C1-C4
-500
WOB 52.3K
PP 3772
RPM 0
SPM 60/60
12:01AM
12/10-11/13
DAY 04-05
FT/48HRS 1064
550
250
ROP (FPH)
Gamma (API)
0
0
WOB 26.7K
PP 3331
RPM 80
SPM 0/66
6850
6900
6950
7000
7050

6607' TVD


LK
6500 TVD
TOOH @ 6990' MD @ 4:30 PM ON 12/09/2013 FOR INTERMEDIATE CASING OPERATIONS. TIH @ 1:30 AM ON 12/11/2013. RESUMED DRILLING ON 12/11/2013 @ 5:30 AM W/ BIT #4 6.125" SMITH SDi513 S/N JH6873 IN @ 6990' MD.
SWITCHING TO 50FT SAMPLE INTERVAL
P B
P
60' MD: CHK: 80%) MEDDRKGY - DRKGY, UBBLKY, FXLN TO , CHK FRMWRK, IMBD PYR, FREE MARL, FREE GRYSHBLK STN, 10% LOR, FNT BLSHWT O ED STRMG CUT, HVY NG
6860' MD-6890' MD: CHK: 60% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CAL, FREE PYR, FREE MARL, FREE BENT, MOD GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
6890' MD-6920' MD: CHK: 60% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CAL, FREE PYR, FREE MARL, FREE BENT, MOD GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
6920' MD-6950' MD: CHK: 70% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CAL, FREE PYR, FREE MARL, FREE BENT, MOD GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
6950' MD-6980' MD: CHK: 80% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, FREE PYR, FREE MARL, FREE BENT, MOD GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
7000' MD-7050' MD: CHK: 70% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
6800
7050' MD-710 DRKGY, BLK CHK FRMW GRYSHBLK IMMED STRI
MD 6860 TVD 6625.73
INC 67.76 AZ 89
VS 454.24
MD 6936 TVD 6645.41
INC 82.15 AZ 89.34
VS 527.37





0' MD: CHK: 60% (CaCO3 60%) MEDDRKGY - KY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, RK, IMBD CAL, FREE PYR, FREE MARL, MOD STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, MG CUT, HVY BLSHWT RNG

7100' MD-7150' MD: CHK: 70% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMD MICRXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

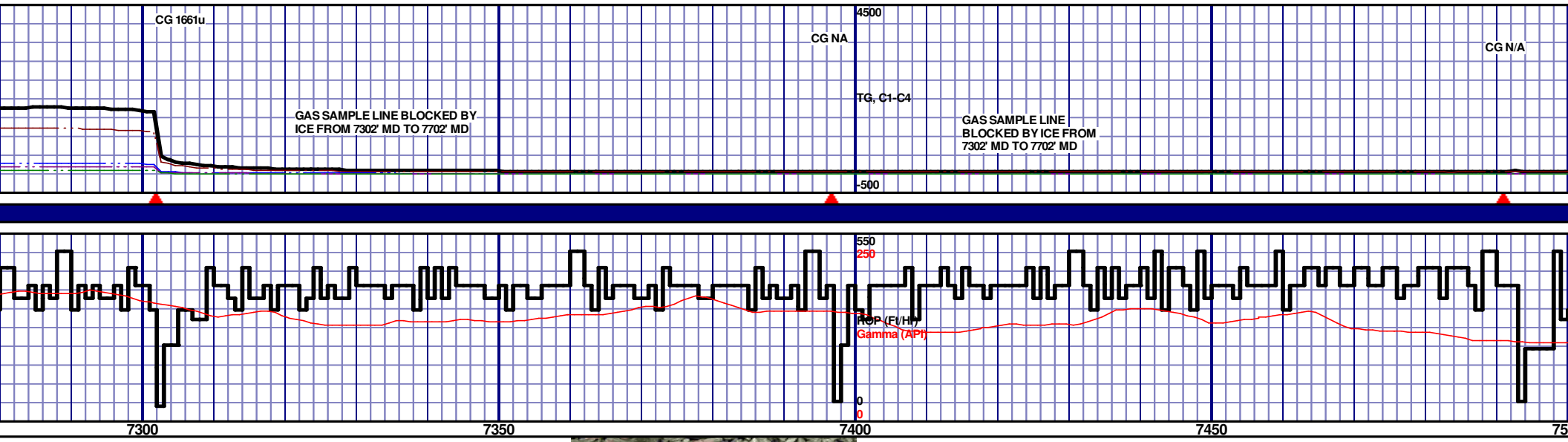
7150' MD-7200' MD: CHK: 75% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

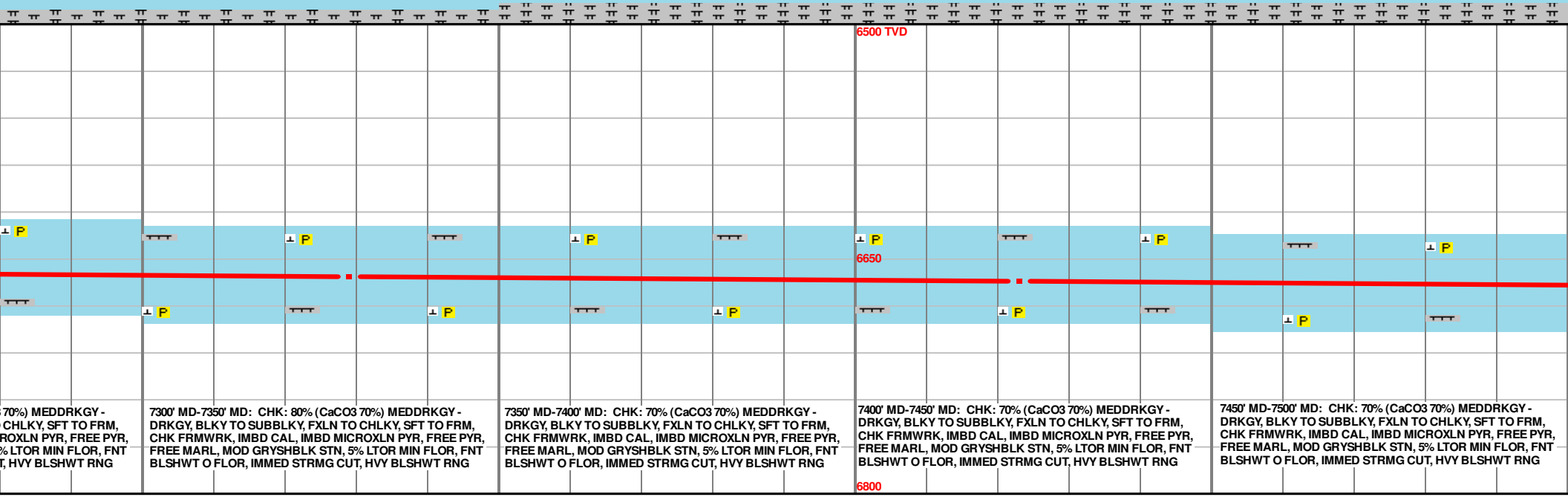
7200' MD-7250' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

7250' MD-7300' MD: CHK: 80% (CaCO3 DRKGY, BLKY TO SUBBLKY, FXLN TO CHK FRMWRK, IMBD CAL, IMBD MIC FREE MARL, MOD GRYSHBLK STN, 5 BLSHWT O FLOR, IMMED STRMG CUT

MD 7139 TVD 6657.49
INC 91.02 AZ 85.42
VS 729.17

MD 7234 TVD 6658.21
INC 88.12 AZ 86.23
VS 823.65





70%) MEDDRKGY - CHLKY, SFT TO FRM, ROXLN PYR, FREE PYR, % LTOR MIN FLOR, FNT T, HVY BLSHWT RNG

7300' MD-7350' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

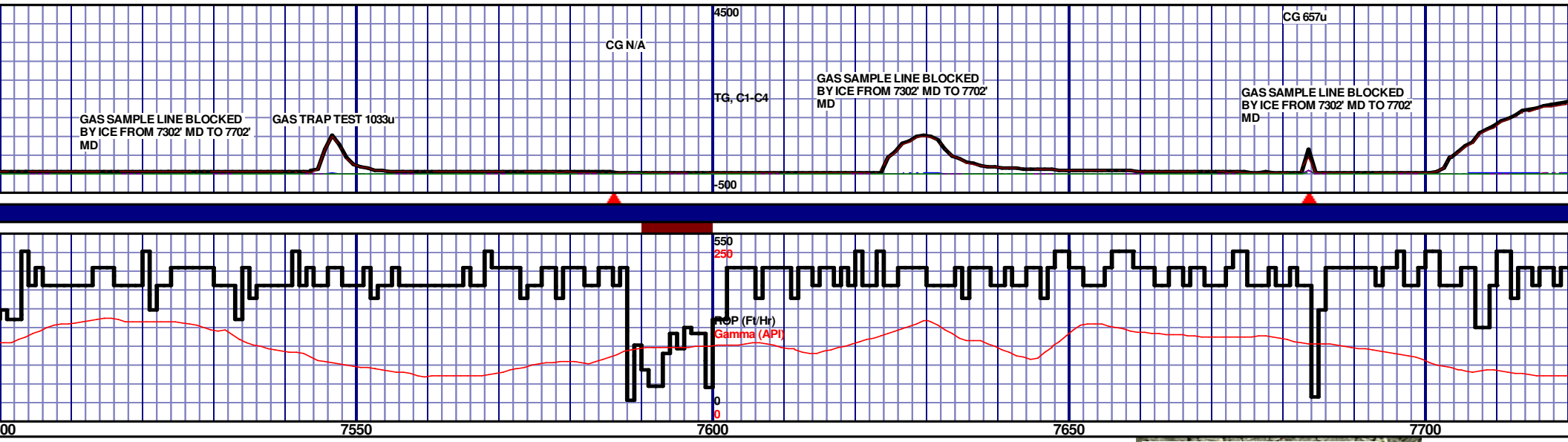
7350' MD-7400' MD: CHK: 70% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

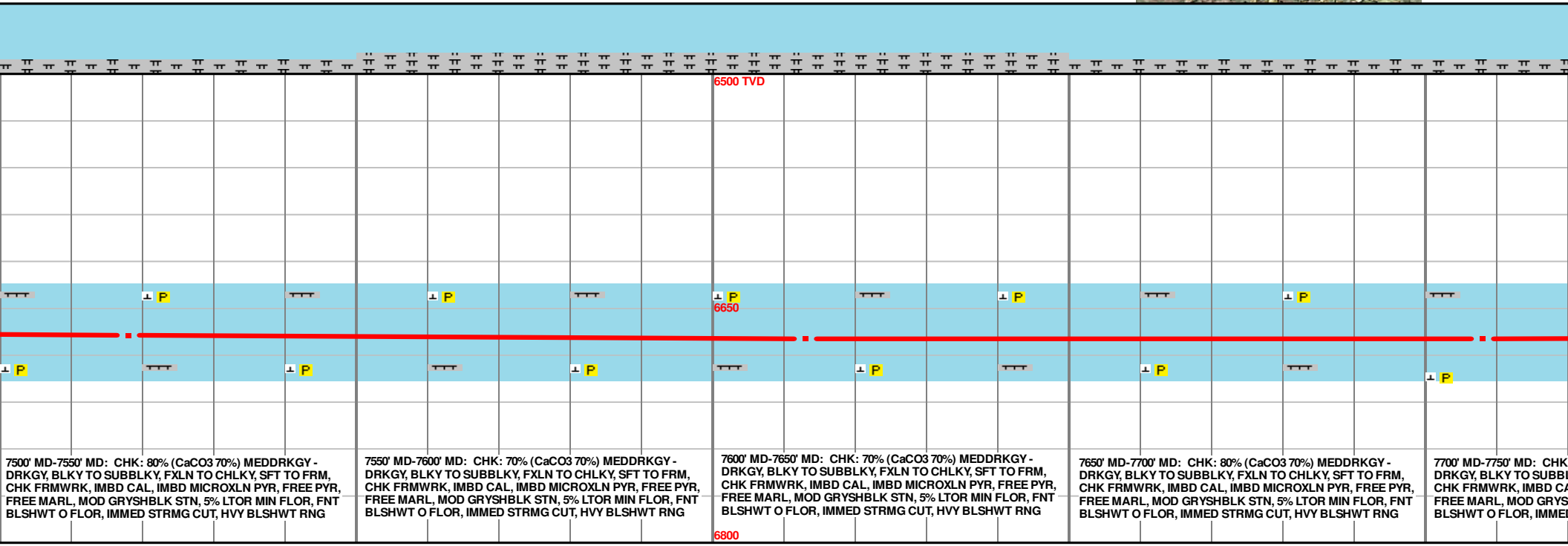
7400' MD-7450' MD: CHK: 70% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

7450' MD-7500' MD: CHK: 70% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

MD 7329 TVD 6661.35
INC 88.09 AZ 86.29
VS 918.16

MD 7423 TVD 6664.48
INC 88.09 AZ 86.42
VS 1011.69





7500' MD-7550' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

7550' MD-7600' MD: CHK: 70% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

7600' MD-7650' MD: CHK: 70% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

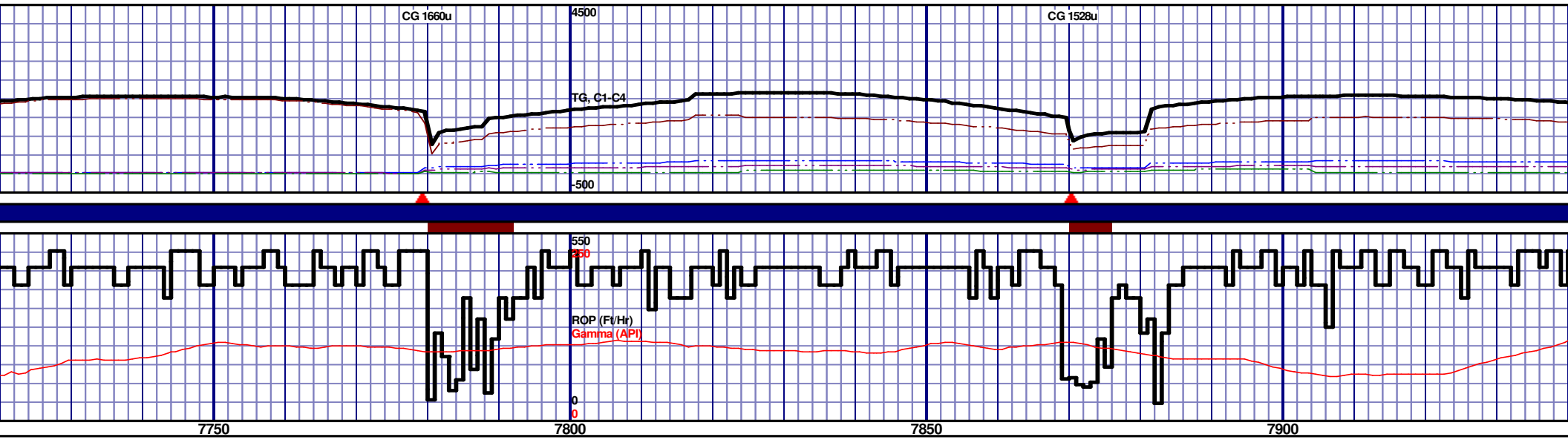
7650' MD-7700' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

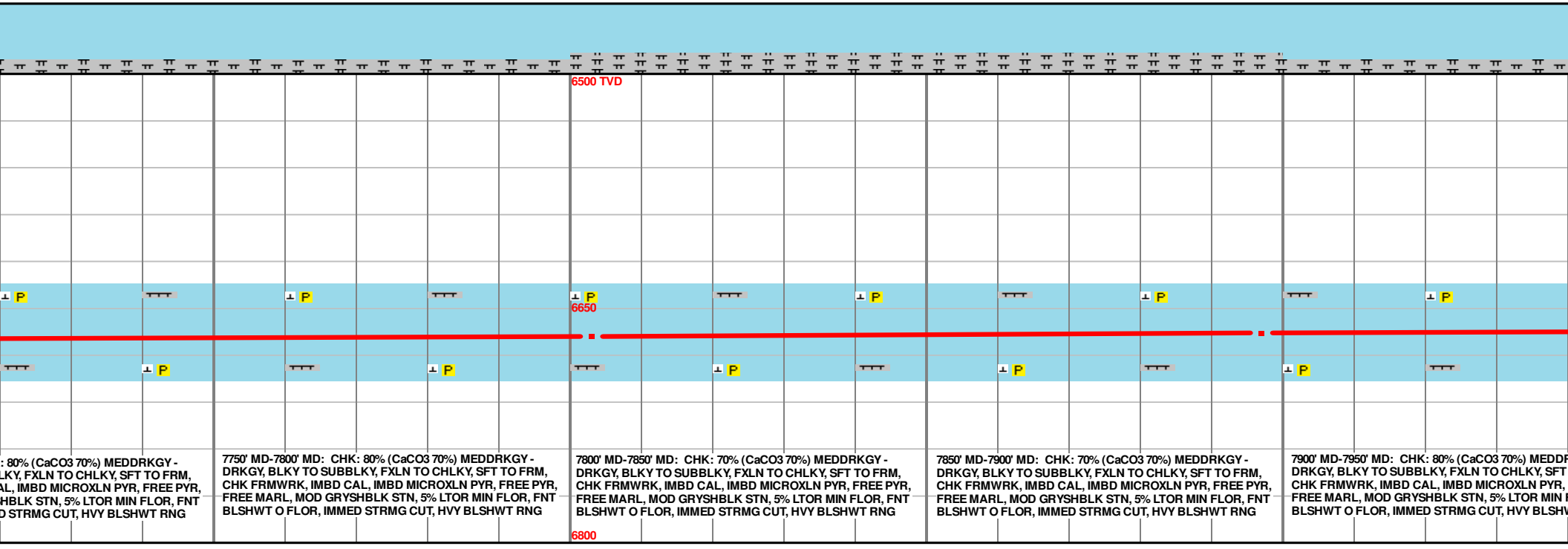
7700' MD-7750' MD: CHK DRKGY, BLKY TO SUBBL CHK FRMWRK, IMBD CA FREE MARL, MOD GRYS BLSHWT O FLOR, IMMEI

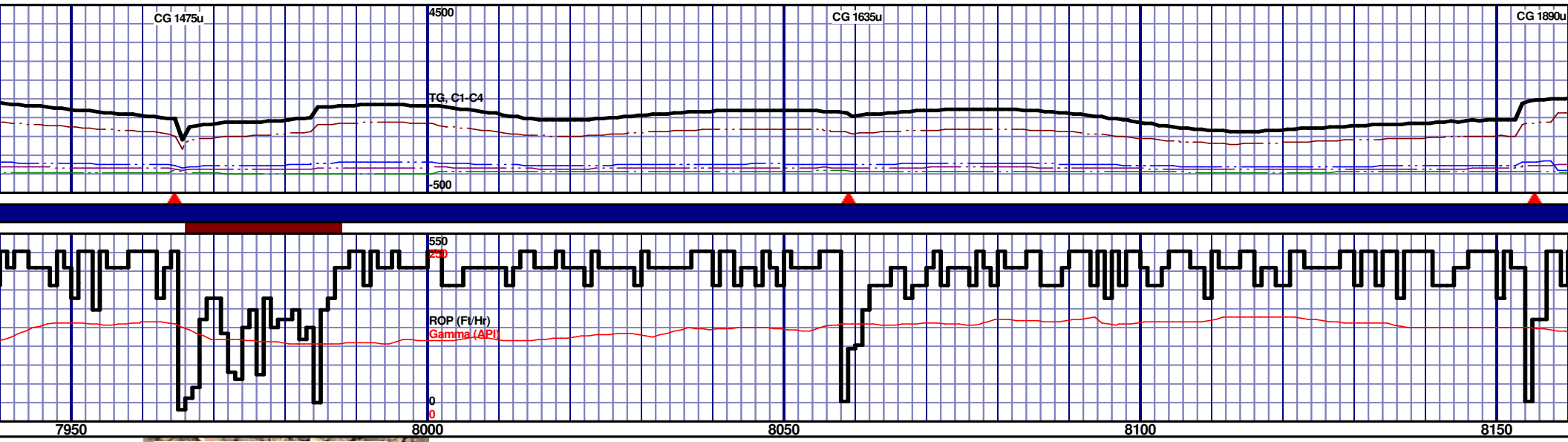
MD 7518 TVD 6667.52
INC 88.24 AZ 85.7
VS 1106.17

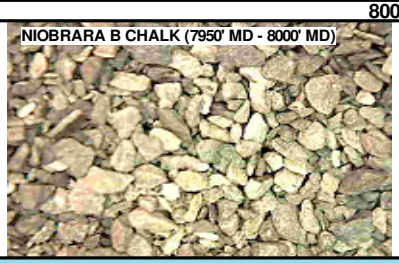
MD 7613 TVD 6669.29
INC 89.63 AZ 86.79
VS 1200.71

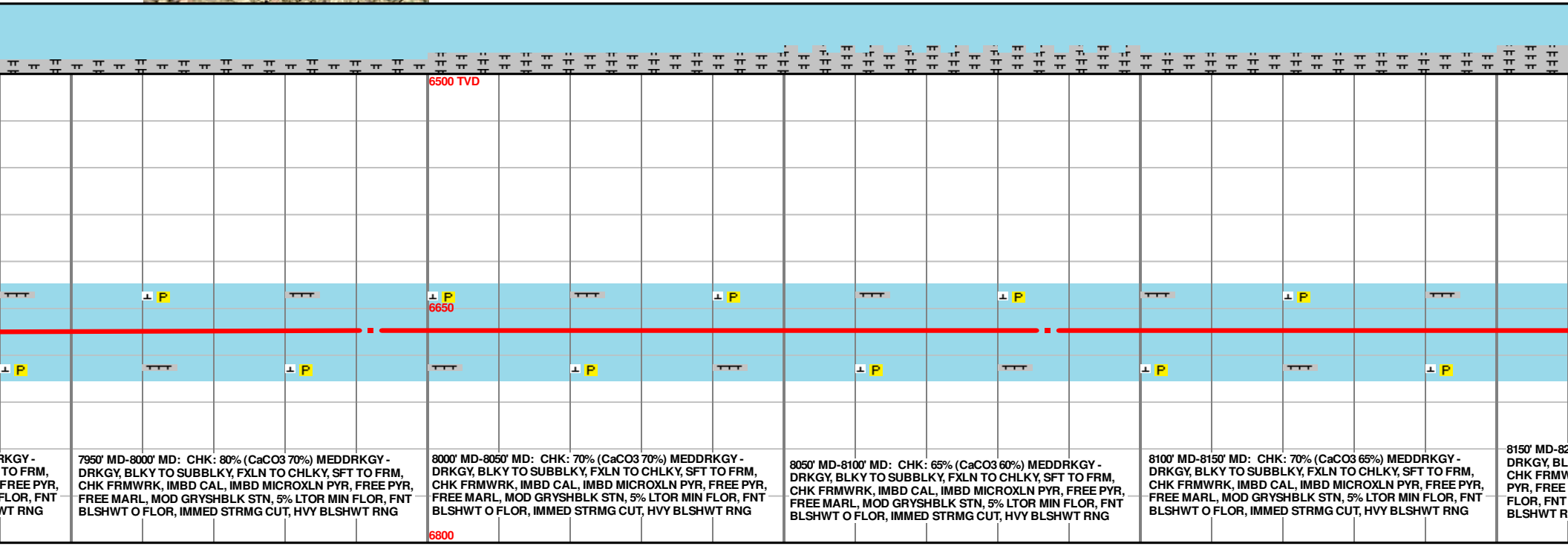
MD 7708 TVD 6
INC 90.15 AZ 86
VS 1295.34


CG 1660u
4500
TG, C1-C4
-500
CG 1528u
550
ROP (Ft/Hr)
Gamma (API)
0
0
7750
7800
7850
7900


6500 TVD
6650
6800
: 80% (CaCO3 70%) MEDDRKGY - LKY, FXLN TO CHLKY, SFT TO FRM, AL, IMBD MICROXLN PYR, FREE PYR, HBLK STN, 5% LTOR MIN FLOR, FNT D STRMG CUT, HVY BLSHWT RNG
7750' MD-7800' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
7800' MD-7850' MD: CHK: 70% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
7850' MD-7900' MD: CHK: 70% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
7900' MD-7950' MD: CHK: 80% (CaCO3 70%) MEDDR DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHW
669.47
.59
MD 7803 TVD 6668.27
INC 91.3 AZ 87.75
VS 1390.02
MD 7897 TVD 6665.76
INC 91.76 AZ 89.2
VS 1483.83







RKGY - TO FRM, FREE PYR, FLOR, FNT WT RNG

7950' MD-8000' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

8000' MD-8050' MD: CHK: 70% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

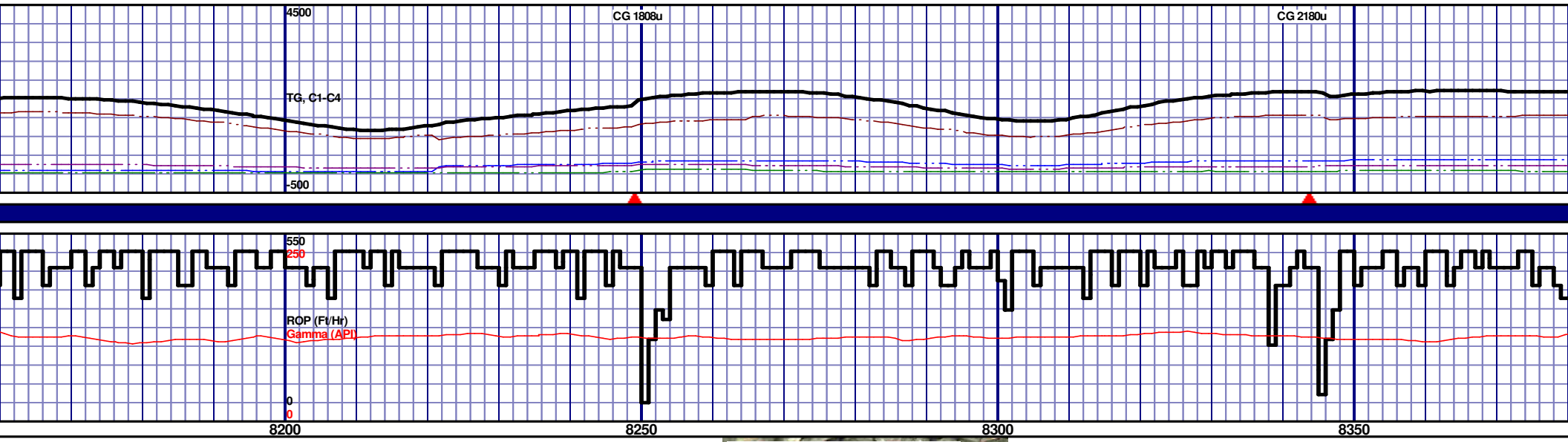
8050' MD-8100' MD: CHK: 65% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

8100' MD-8150' MD: CHK: 70% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

8150' MD-82 DRKGY, BL CHK FRMW PYR, FREE FLOR, FNT BLSHWT R

MD 7992 TVD 6664.3
INC 90 AZ 90.09
VS 1578.75

MD 8087 TVD 6664.48
INC 89.78 AZ 89.71
VS 1673.7



6500 TVD

6650

6800

200' MD: CHK: 60% (CaCO3 65%) MEDDRKGY - KY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, VRK, IMBD CAL, IMBD MICROXLN PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN BLSHWT O FLOR, IMMED STRMG CUT, HVY NG

8200' MD-8250' MD: CHK: 70% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

8250' MD-8300' MD: CHK: 70% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

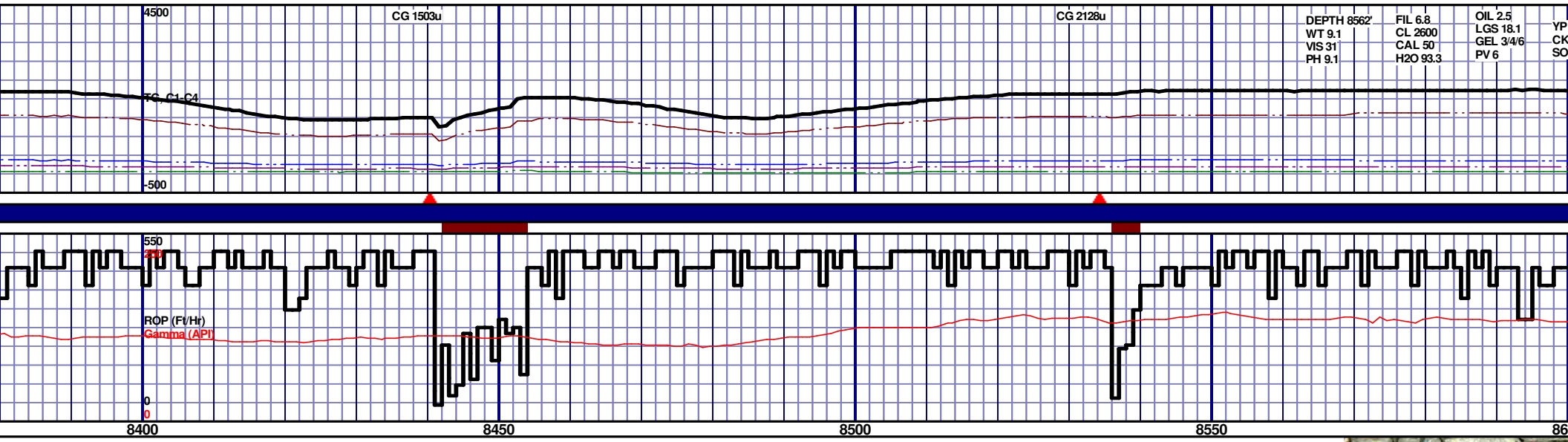
8300' MD-8350' MD: CHK: 70% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE MARL, MOD GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

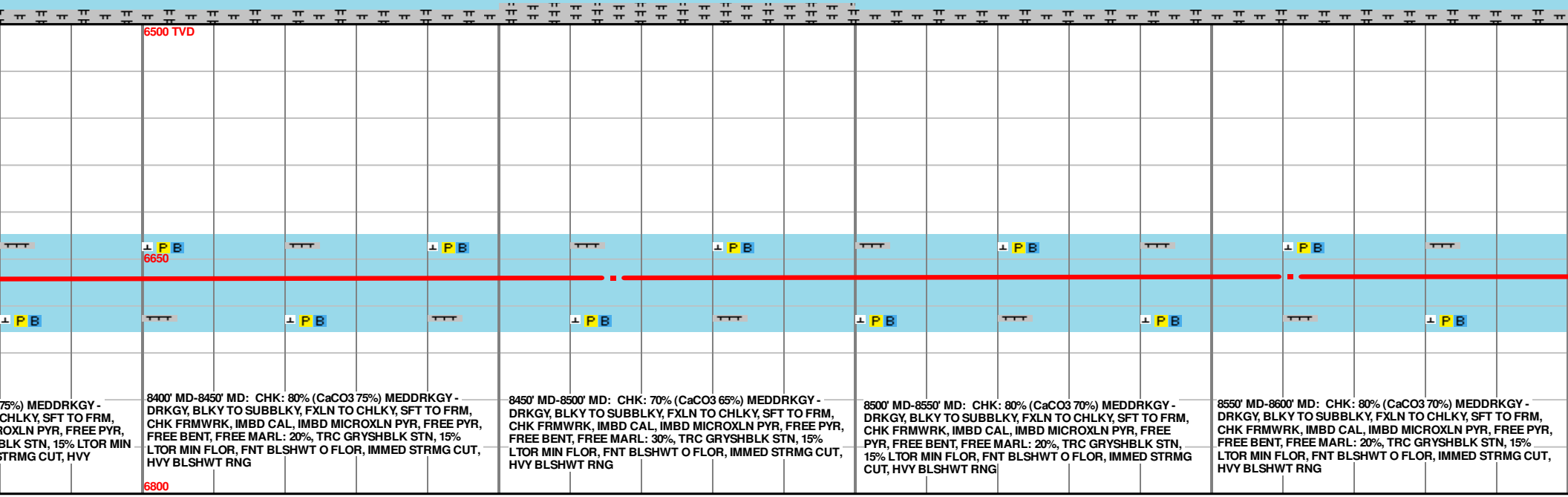
8350' MD-8400' MD: CHK: 80% (CaCO3 DRKGY, BLKY TO SUBBLKY, FXLN TO CHK FRMWRK, IMBD CAL, IMBD MICR FREE BENT, FREE MARL, TRC GRYSHI FLOR, FNT BLSHWT O FLOR, IMMED S BLSHWT RNG

MD 8182 TVD 6664.23
INC 90.52 AZ 88.9
VS 1768.61

MD 8277 TVD 6663.37
INC 90.52 AZ 88.43
VS 1863.47

MD 8372 T
INC 90.37
VS 1958.2

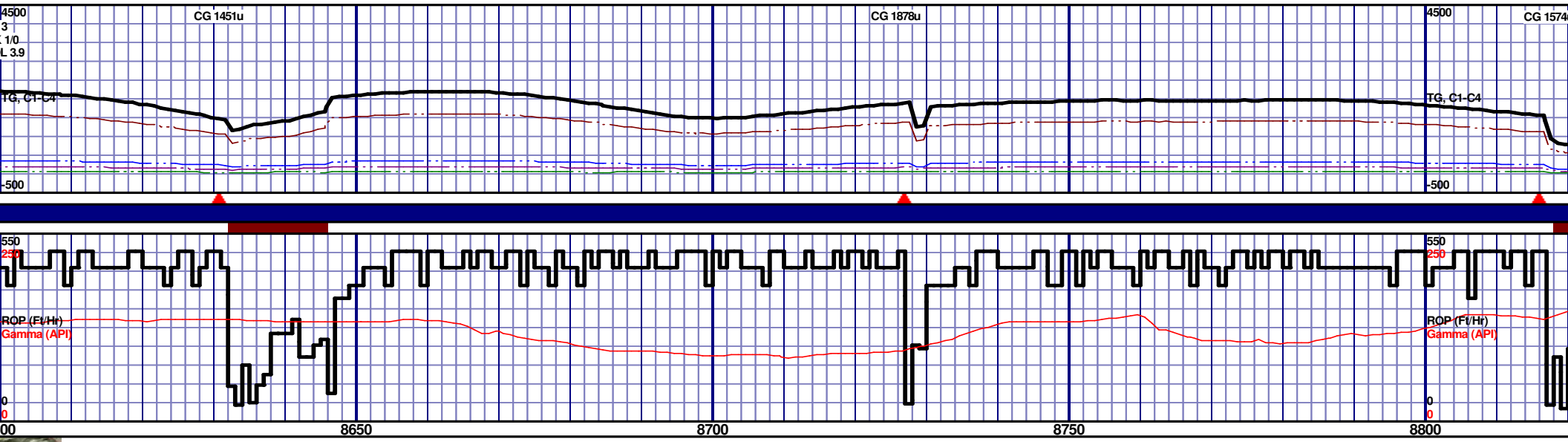


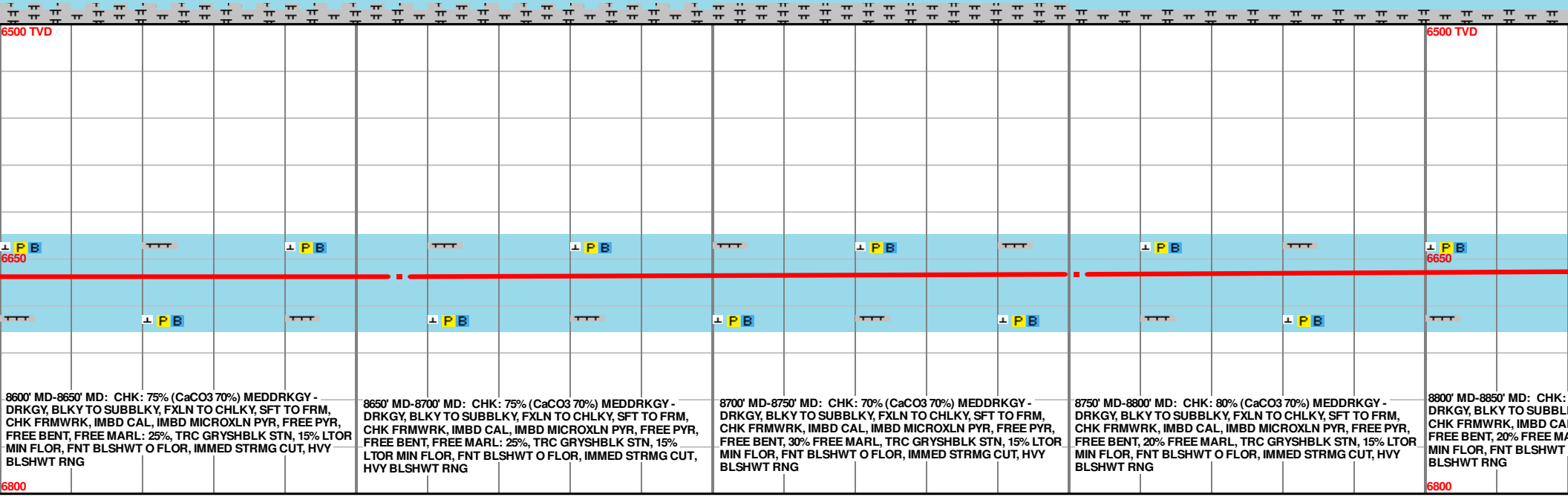


TVD 6662.63
AZ 88.09

MD 8466 TVD 6661.9
INC 90.52 AZ 88.9
VS 2052.13

MD 8561 TVD 6660.98
INC 90.59 AZ 88.5
VS 2146.99





MD 8656 TVD 6660.9
INC 89.51 AZ 89.88
VS 2241.89

MD 8751 TVD 6659.67
INC 91.97 AZ 90.95
VS 2336.85

RA

CG 1946u

4500 CG 2053u

TG, C1, C2

-500

550

250

ROP (Ft/Hr)

Gamma (API)

0

0

WOB 32.7K
PP 2466
RPM 80
SPM 66/0

8850 8900 8950 9000

NIOBRARA B CHALK (8850' MD - 8900' MD)

6500 TVD

6650

6800

80% (CaCO3 70%) MEDDRKGY - KY, FXLN TO CHLKY, SFT TO FRM, L, IMBD MICROXLN PYR, FREE PYR, ARL, TRC GRYSHBLK STN, 15% LTOR O FLOR, IMMED STRMG CUT, HVY

8850' MD-8900' MD: CHK: 90% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, FREE BENT, 10% FREE MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

8900' MD-8950' MD: CHK: 90% (CaCO3 75%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

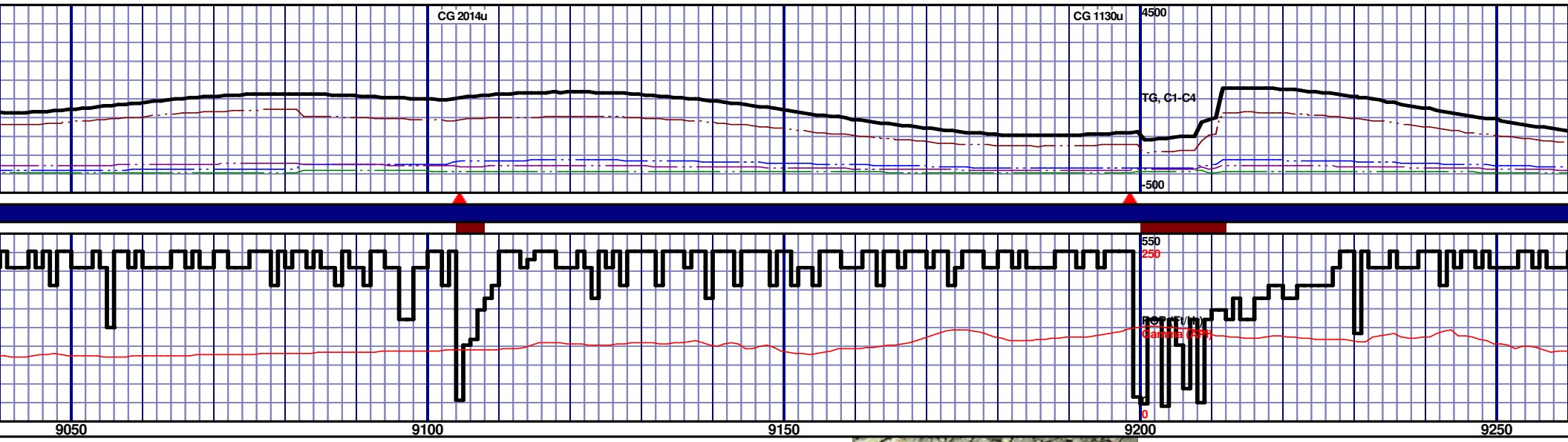
8950' MD-9000' MD: CHK: 90% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

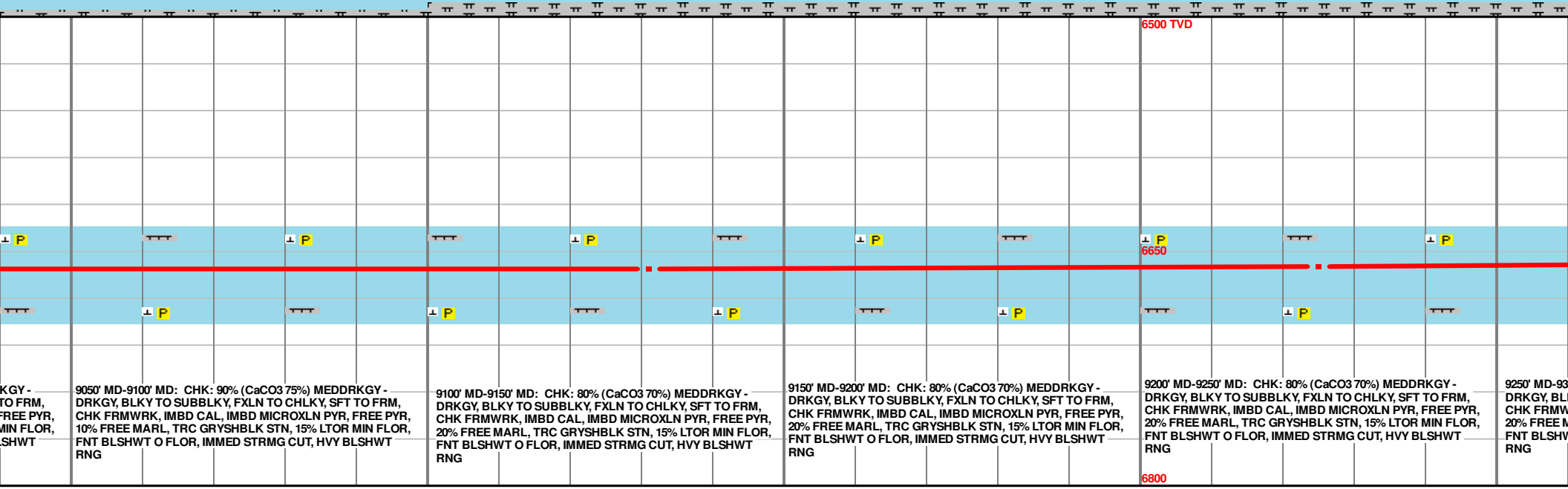
9000' MD-9050' MD: CHK: 90% (CaCO3 80%) MEDDR DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, 10% FREE MARL, TRC GRYSHBLK STN, 15% LTOR FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BL RNG

MD 8846 TVD 6657.47
INC 90.69 AZ 90.51
VS 2431.81

MD 8941 TVD 6660.55
INC 88.89 AZ 90.51
VS 2526.78

MD
INC
VS 2





KGY - TO FRM, FREE PYR, MIN FLOR, LSHWT

9050' MD-9100' MD: CHK: 90% (CaCO3 75%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

9100' MD-9150' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

9150' MD-9200' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

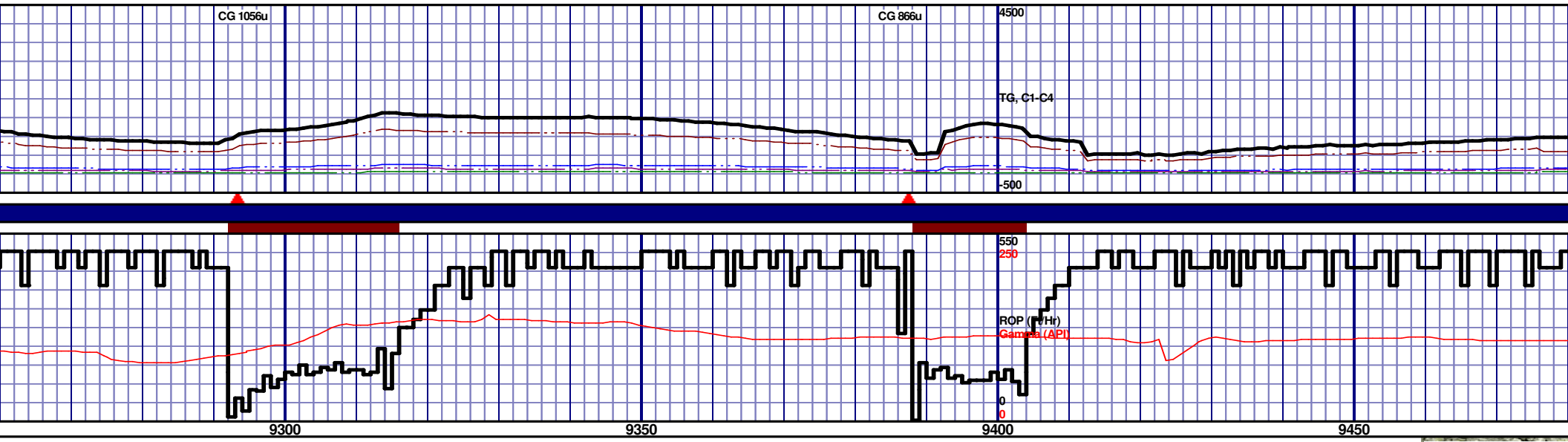
9200' MD-9250' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

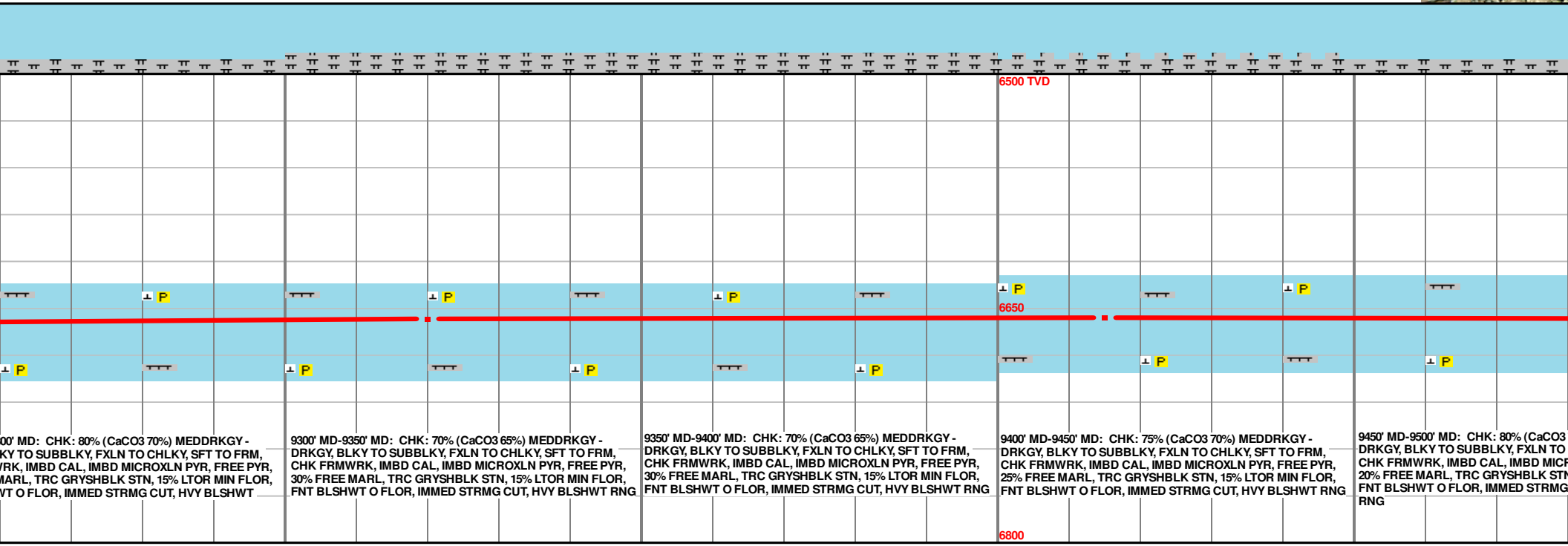
9250' MD-93 DRKGY, BL CHK FRMW 20% FREE M FNT BLSHW RNG

9036 TVD 6661.35
90.15 AZ 90.21
621.75

MD 9131 TVD 6661.27
INC 89.94 AZ 90.43
VS 2716.72

MD 9225 TVD 6659.73
INC 91.94 AZ 90.17
VS 2810.67





00' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - KY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, VRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, VT O FLOR, IMMED STRMG CUT, HVY BLSHWT

9300' MD-9350' MD: CHK: 70% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 30% FREE MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

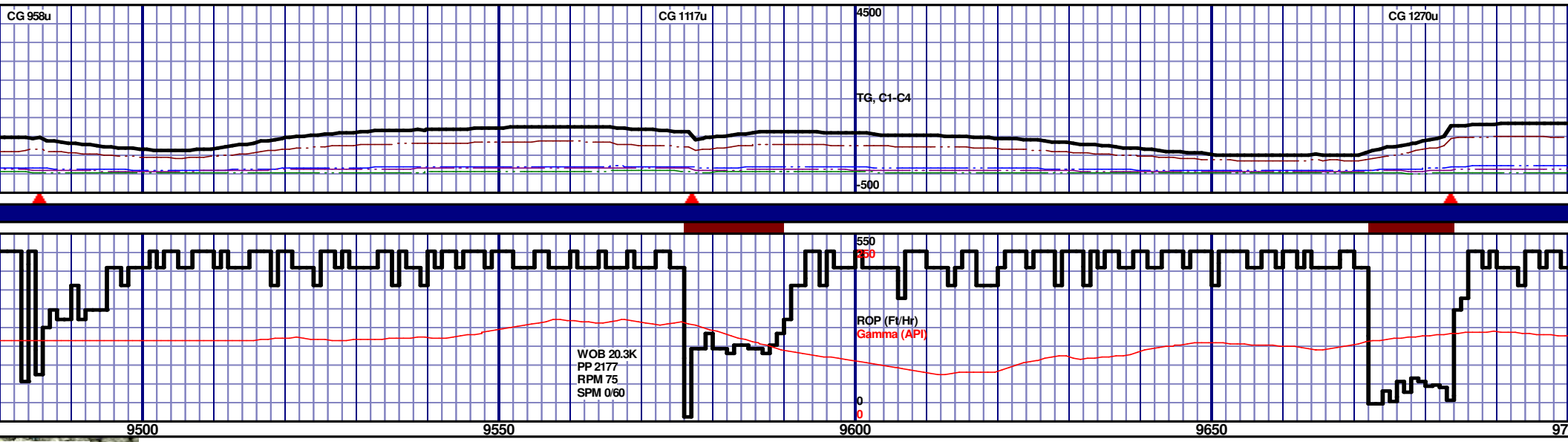
9350' MD-9400' MD: CHK: 70% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 30% FREE MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

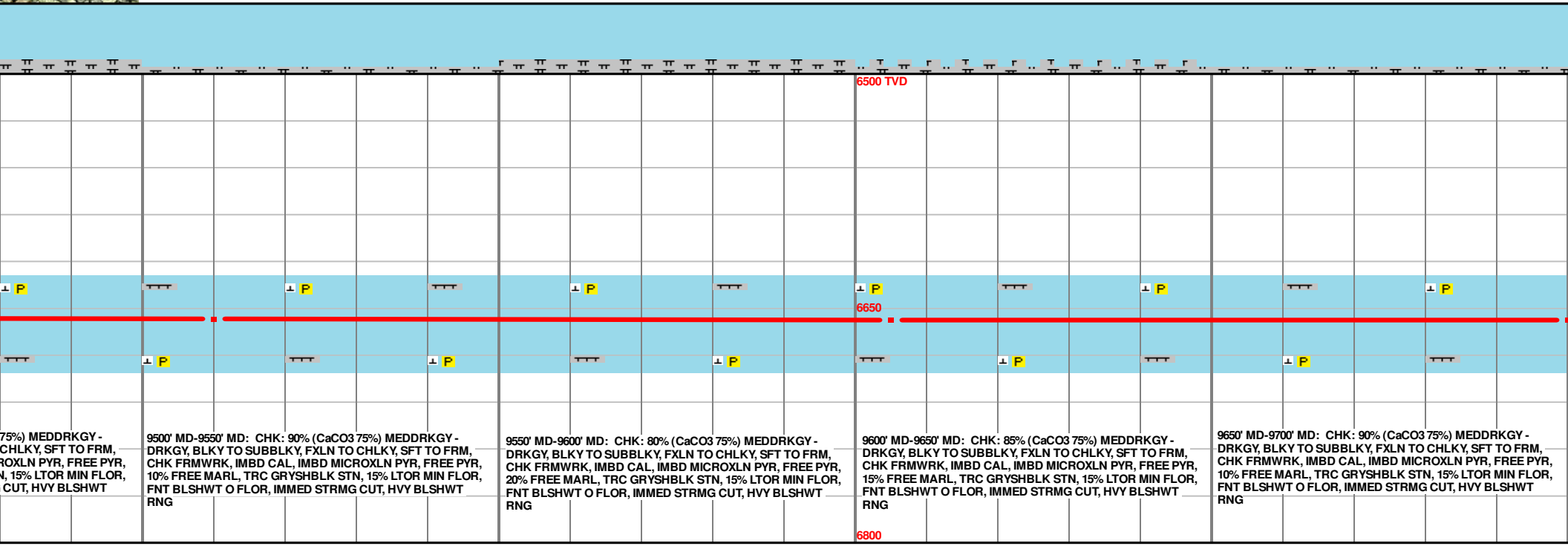
9400' MD-9450' MD: CHK: 75% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 25% FREE MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

9450' MD-9500' MD: CHK: 80% (CaCO3 DRKGY, BLKY TO SUBBLKY, FXLN TO CHK FRMWRK, IMBD CAL, IMBD MICR 20% FREE MARL, TRC GRYSHBLK STN FNT BLSHWT O FLOR, IMMED STRMG RNG

MD 9320 TVD 6657
INC 91.36 AZ 89.07
VS 2905.56

MD 9415 TVD 6656.36
INC 89.41 AZ 88.69
VS 3000.44





75%) MEDDRKGY - CHLKY, SFT TO FRM, ROXLN PYR, FREE PYR, N, 15% LTOR MIN FLOR, CUT, HVY BLSHWT

9500' MD-9550' MD: CHK: 90% (CaCO3 75%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

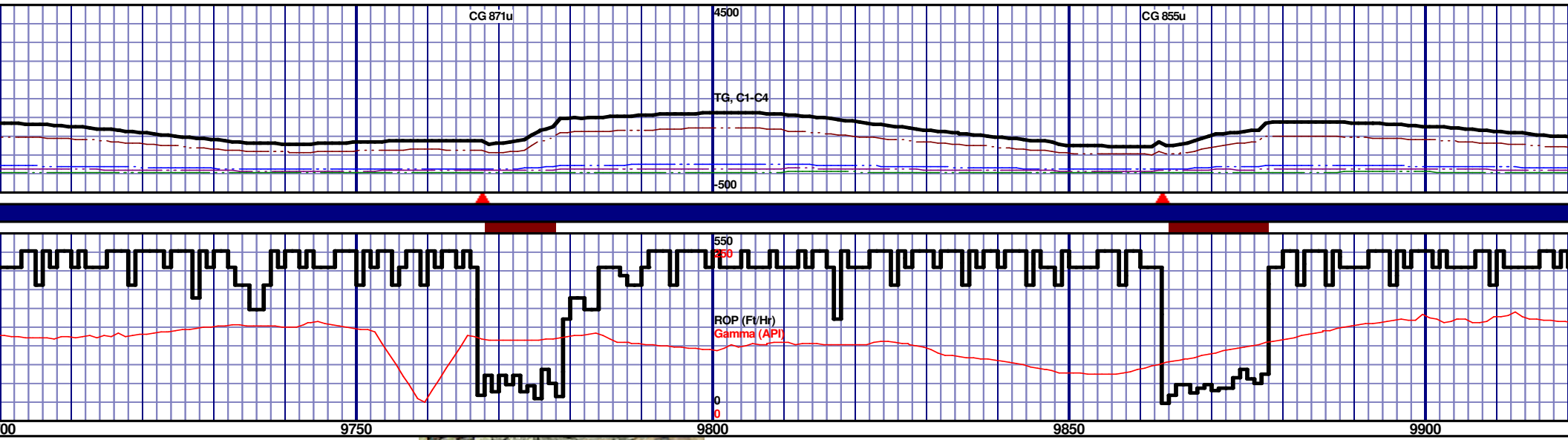
9550' MD-9600' MD: CHK: 80% (CaCO3 75%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

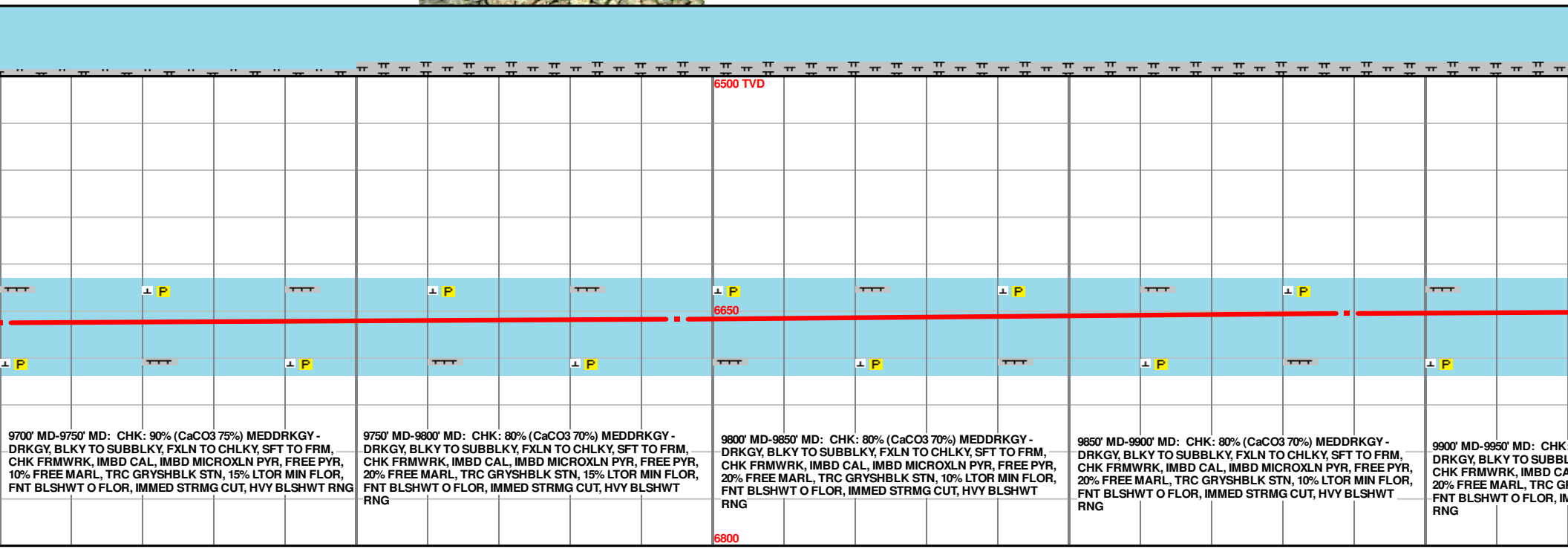
9600' MD-9650' MD: CHK: 85% (CaCO3 75%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 15% FREE MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

9650' MD-9700' MD: CHK: 90% (CaCO3 75%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

MD 9510 TVD 6657.03
INC 89.78 AZ 88.69
VS 3095.3

MD 9605 TVD 6657.49
INC 89.66 AZ 88.22
VS 3190.14





9700' MD-9750' MD: CHK: 90% (CaCO3 75%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

9750' MD-9800' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

9800' MD-9850' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

9850' MD-9900' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

9900' MD-9950' MD: CHK DRKGY, BLKY TO SUBBL CHK FRMWRK, IMBD CA 20% FREE MARL, TRC GI FNT BLSHWT O FLOR, IM RNG

MD 9700 TVD 6657.49
INC 90.34 AZ 87.48
VS 3284.92

MD 9795 TVD 6655.04
INC 92.62 AZ 88.6
VS 3379.68

MD 9889 TVD 6651.35
INC 91.88 AZ 88.28
VS 3473.45

CG 642u

CG 1022u

4500

TG, C1-C4

-500

550

ROP (FT/Hr)

Gamma (API)

0

9950

10000

10050

10100

NIOBRARA B CHALK (10050' MD - 10100' MD)

6500 TVD

6650

6800

: 80% (CaCO3 70%) MEDDRKGY - LKY, FXLN TO CHLKY, SFT TO FRM, AL, IMBD MICROXLN PYR, FREE PYR, RYSHBLK STN, 10% LTOR MIN FLOR, MMED STRMG CUT, HVY BLSHWT

9950' MD-10000' MD: CHK: 85% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 15% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

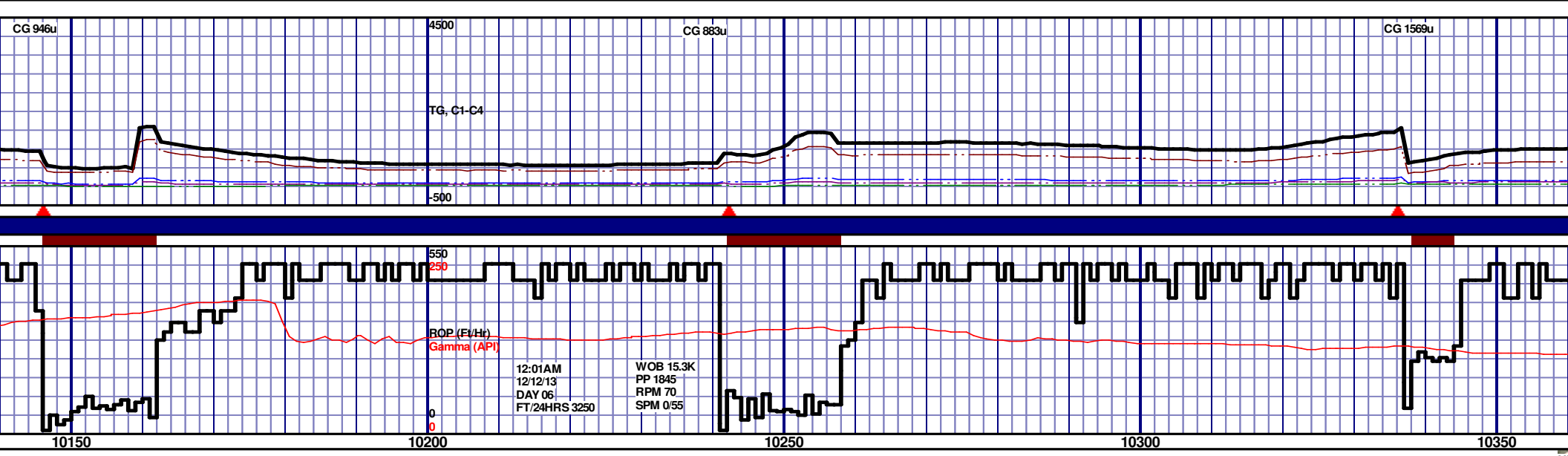
10000' MD-10050' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

10050' MD-10100' MD: CHK: 75% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 25% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

10100' MD-10150' MD: CHK: 70% (CaCO3 65%) MED DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, 30% FREE MARL, TRC GRYSHBLK STN, 5% LTOR M FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY B RNG

MD 9984 TVD 6649.08
INC 90.86 AZ 89.81
VS 3568.31

MD 10079 TVD 6647.04
INC 91.6 AZ 88.02
VS 3663.16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CG 883u
CG 1569u
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250
ROP (Ft/Hr)
Gamma (API)
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DAY 06
FT/24HRS 3250
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10200
10250
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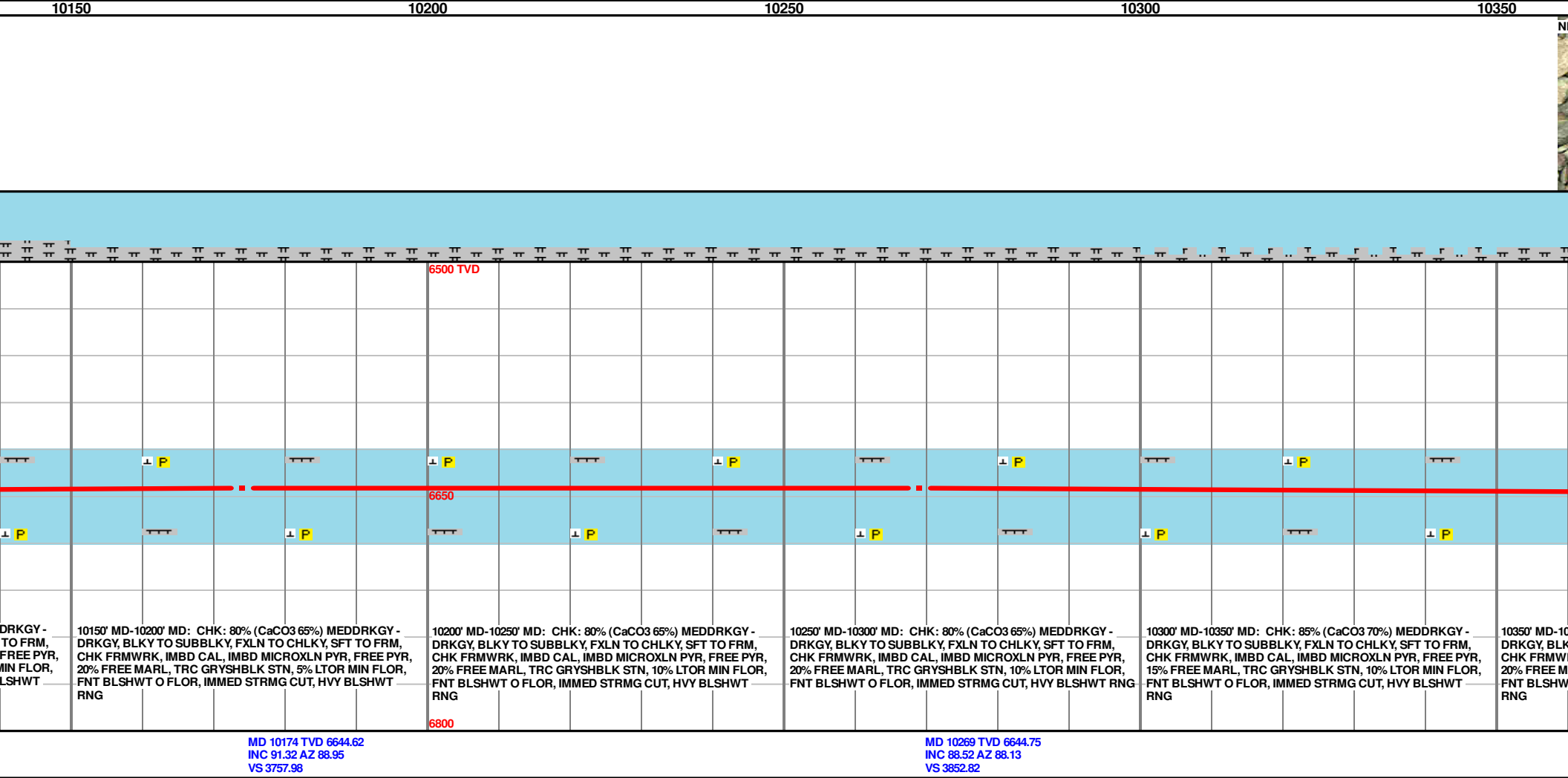
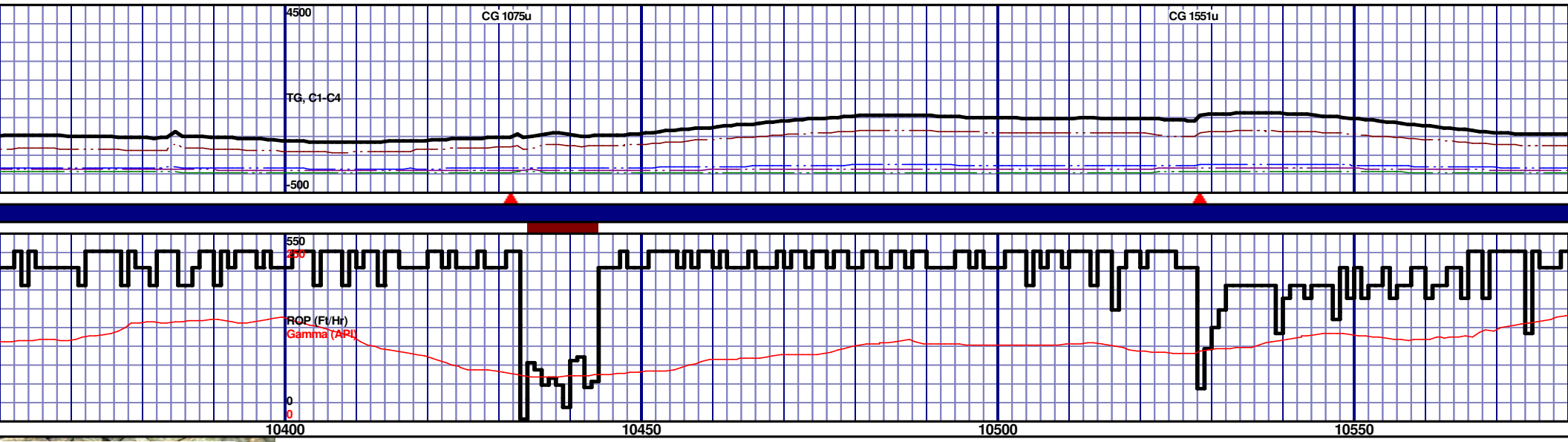
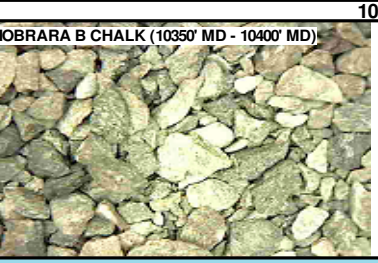
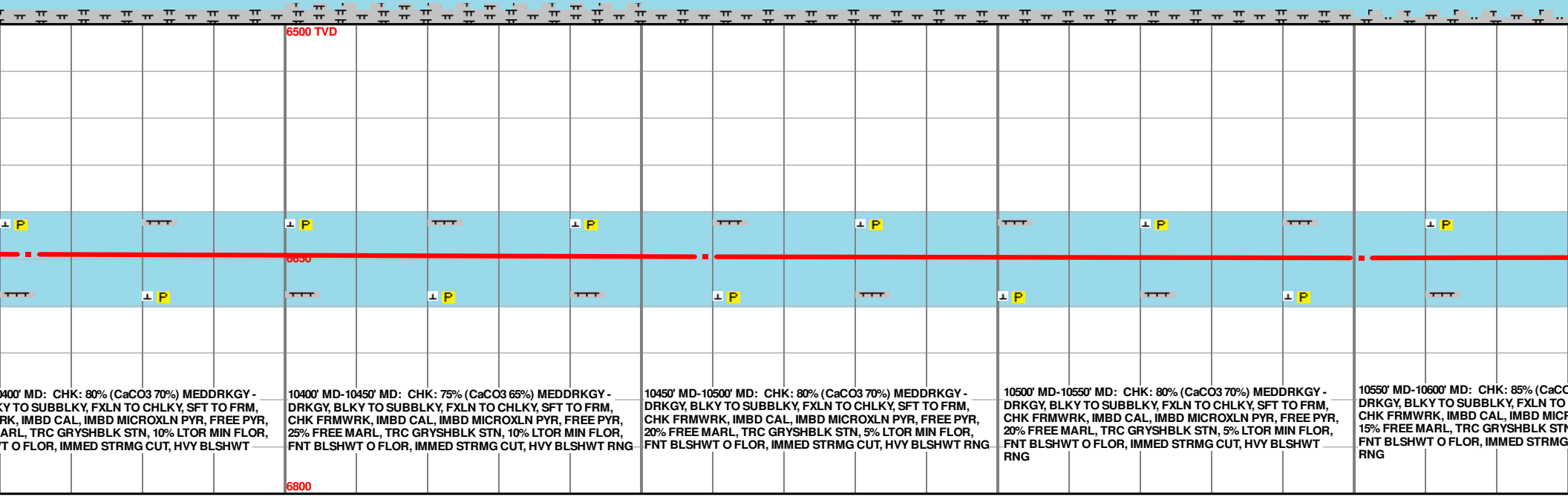

6500 TVD
6650
6800
10150' MD-10200' MD: CHK: 80% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
10200' MD-10250' MD: CHK: 80% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
10250' MD-10300' MD: CHK: 80% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
10300' MD-10350' MD: CHK: 85% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 15% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
MD 10174 TVD 6644.62
INC 91.32 AZ 88.95
VS 3757.98
MD 10269 TVD 6644.75
INC 88.52 AZ 88.13
VS 3852.82







0400' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - KY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, RK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, ARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, T O FLOR, IMMED STRMG CUT, HVY BLSHWT

10400' MD-10450' MD: CHK: 75% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 25% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

10450' MD-10500' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

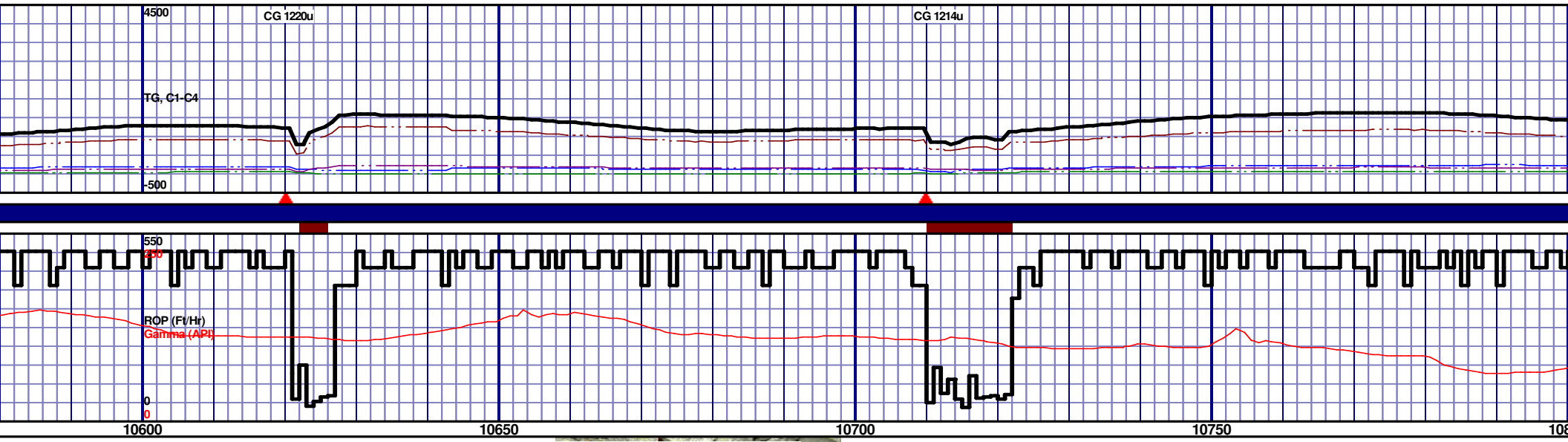
10500' MD-10550' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

10550' MD-10600' MD: CHK: 85% (CaC DRKGY, BLKY TO SUBBLKY, FXLN TO CHK FRMWRK, IMBD CAL, IMBD MICR 15% FREE MARL, TRC GRYSHBLK STN FNT BLSHWT O FLOR, IMMED STRMG RNG

MD 10364 TVD 6646.92
INC 88.86 AZ 87.84
VS 3947.59

MD 10459 TVD 6648.27
INC 89.51 AZ 88.1
VS 4042.37

MD 10551 TVD 6649.08
INC 89.48 AZ 88.09
VS 4134.18



6500 TVD

6650

6800

03 70%) MEDDRKGY - CHLKY, SFT TO FRM, ROXLN PYR, FREE PYR, N, 10% LTOR MIN FLOR, CUT, HVY BLSHWT

10600' MD-10650' MD: CHK: 85% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 15% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

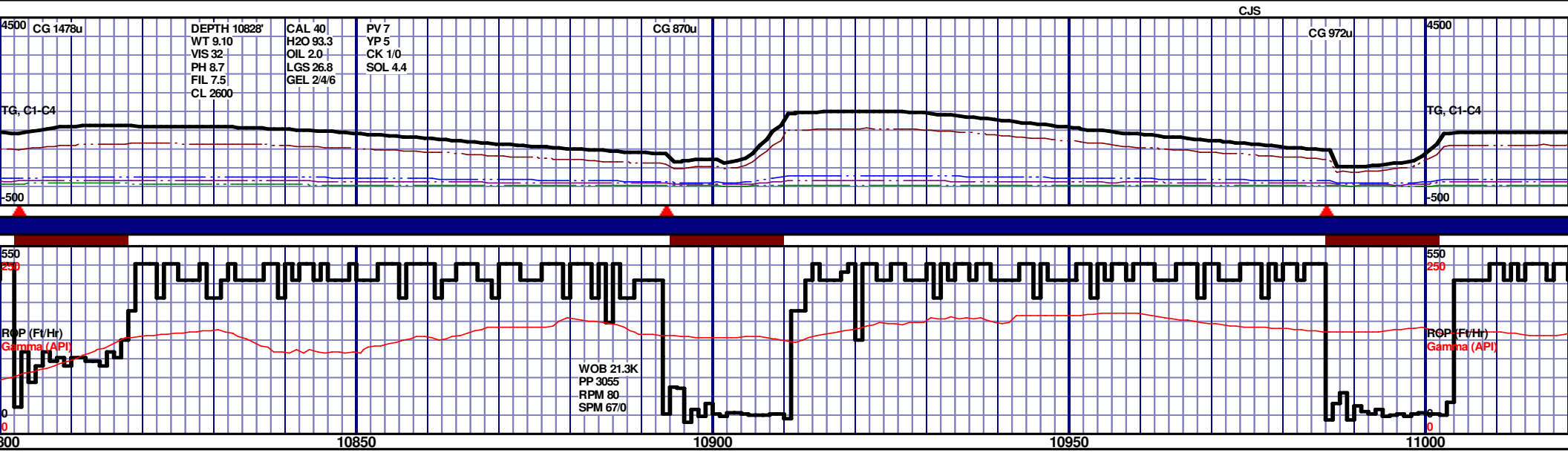
10650' MD-10700' MD: CHK: 90% (CaCO3 75%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

10700' MD-10750' MD: CHK: 85% (CaCO3 73%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 15% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

10750' MD-10800' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

MD 10643 TVD 6648.79
INC 90.89 AZ 87.76
VS 4225.97

MD 10736 TVD 6646.79
INC 91.57 AZ 88.63
VS 4318.76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PH 8.7
FIL 7.5
CL 2600
CAL 40
H2O 93.3
OIL 2.0
LGS 26.8
GEL 2/4/6
PV 7
YP 5
CK 1/0
SOL 4.4
CG 870u
CG 972u
4500
TG, C1-C4
TG, C1-C4
-500
-500
550
250
ROP (Ft/Hr)
Gamma (API)
WOB 21.3K
PP 3055
RPM 80
SPM 67/0
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250
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Gamma (API)
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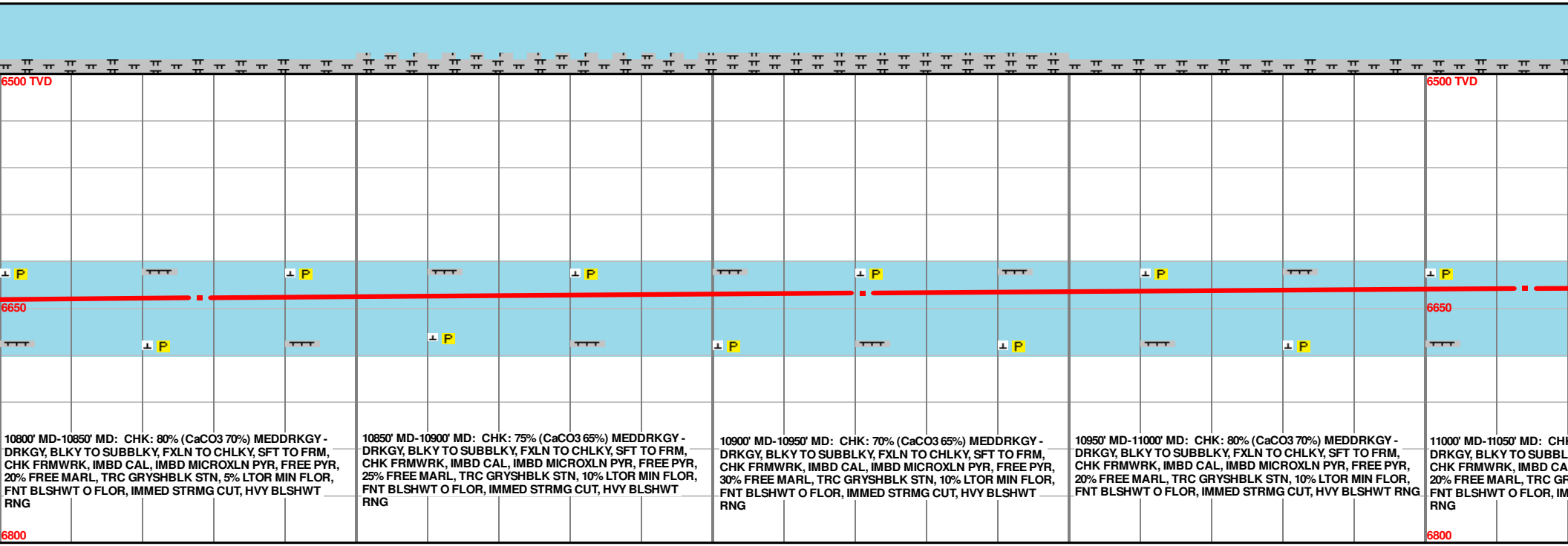
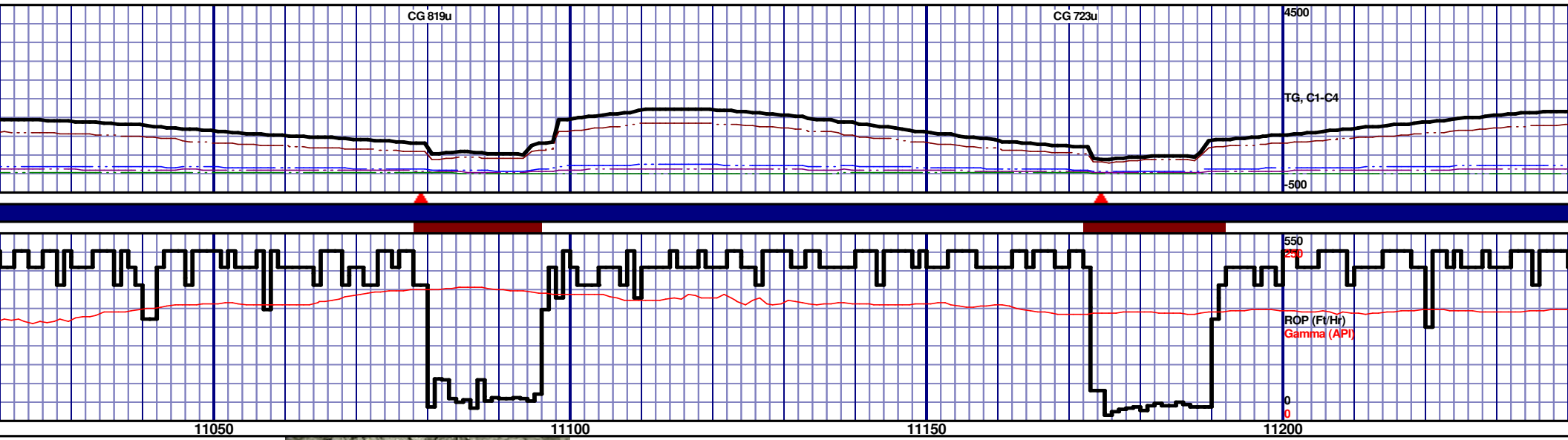
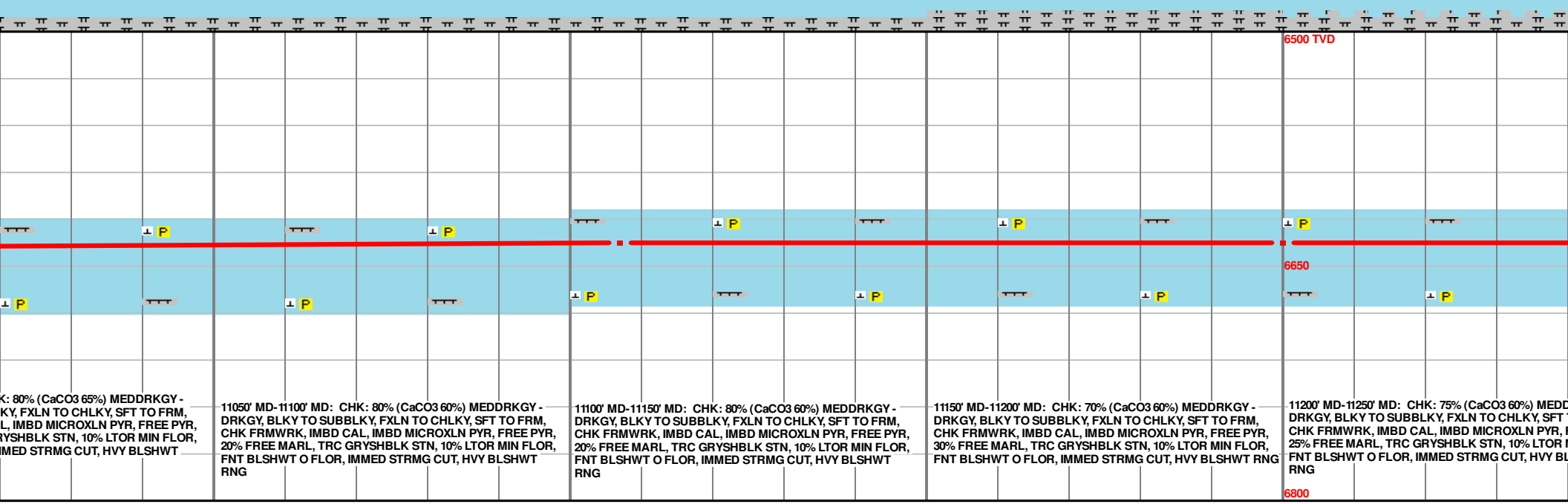
10850
10900
10950
11000


6500 TVD
6500 TVD
6650
6650
6800
6800
10800' MD-10850' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
10850' MD-10900' MD: CHK: 75% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 25% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
10900' MD-10950' MD: CHK: 70% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 30% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
10950' MD-11000' MD: CHK: 80% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
11000' MD-11050' MD: CHK: DRKGY, BLKY TO SUBBL CHK FRMWRK, IMBD CA 20% FREE MARL, TRC GR FNT BLSHWT O FLOR, IM RNG
MD 10828 TVD 6643.48
INC 92.56 AZ 87.86
VS 4410.53
MD 10921 TVD 6639.95
INC 91.79 AZ 89.08
VS 4503.31
MD 110
INC 91.
VS 459





K: 80% (CaCO3 65%) MEDDRKGY - KY, FXLN TO CHLKY, SFT TO FRM, L, IMBD MICROXLN PYR, FREE PYR, RYSHBLK STN, 10% LTOR MIN FLOR, MED STRMG CUT, HVY BLSHWT

11050' MD-11100' MD: CHK: 80% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

11100' MD-11150' MD: CHK: 80% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

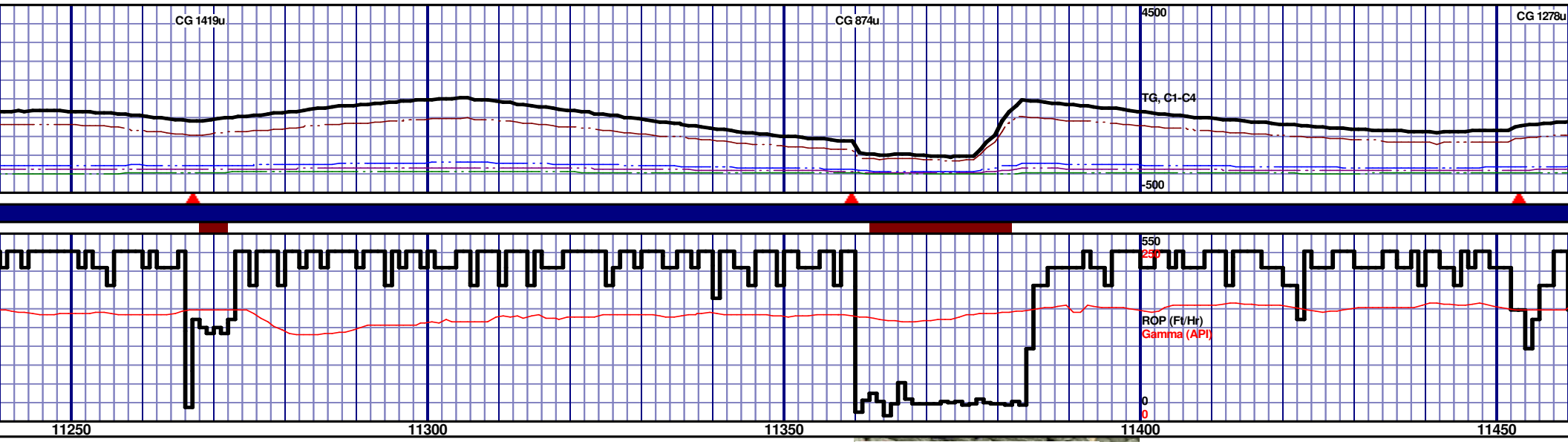
11150' MD-11200' MD: CHK: 70% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 30% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

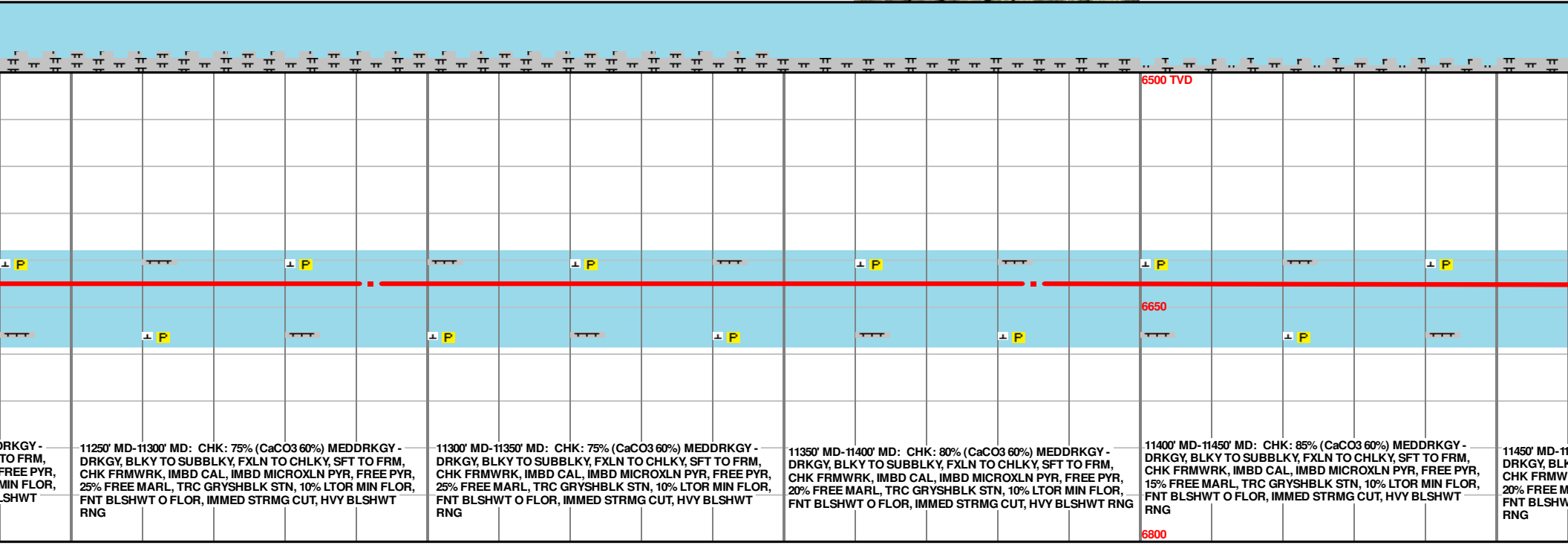
11200' MD-11250' MD: CHK: 75% (CaCO3 60%) MEDD DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, 25% FREE MARL, TRC GRYSHBLK STN, 10% LTOR FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BL RNG

914 TVD 6637.22
57 AZ 90.34
6.21

MD 11107 TVD 6635.32
INC 90.77 AZ 90.35
VS 4689.16

MD 11200 TVD 6635.07
INC 89.54 AZ 90.71
VS 4782.13





DRKGY - TO FRM, FREE PYR, MIN FLOR, LSHWT

11250' MD-11300' MD: CHK: 75% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 25% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

11300' MD-11350' MD: CHK: 75% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 25% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

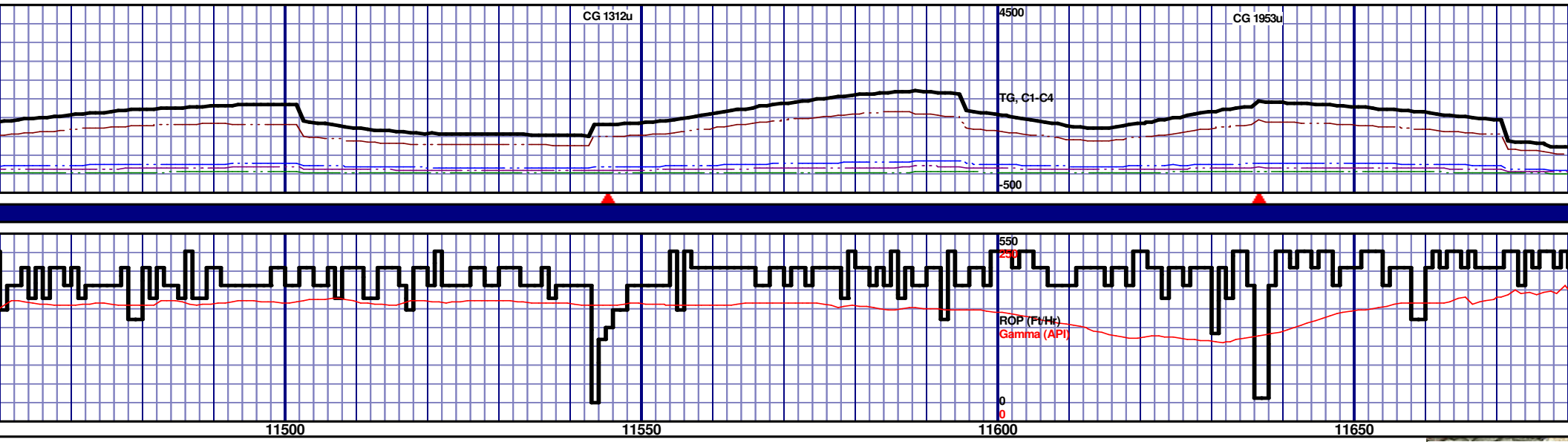
11350' MD-11400' MD: CHK: 80% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

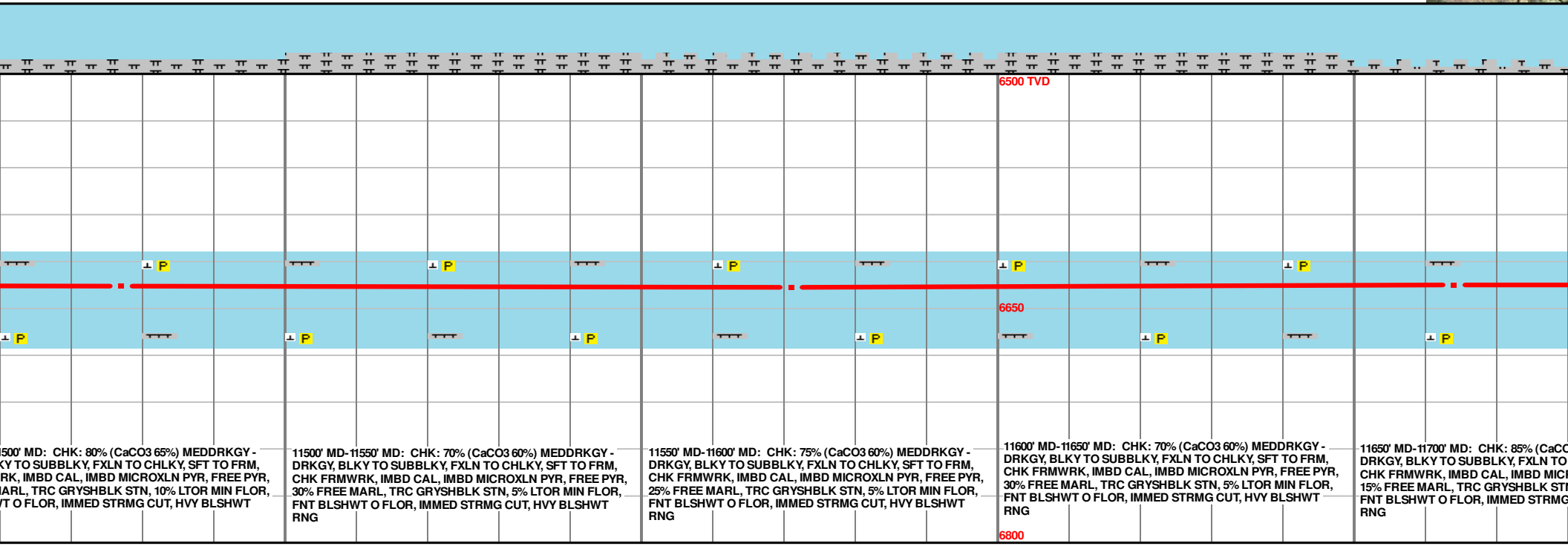
11400' MD-11450' MD: CHK: 85% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 15% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

11450' MD-11 DRKGY, BLK CHK FRMW 20% FREE M FNT BLSHW RNG

MD 11292 TVD 6634.72
INC 90.89 AZ 91.37
VS 4874.12

MD 11385 TVD 6634.68
INC 89.17 AZ 88.78
VS 4967.07





500' MD: CHK: 80% (CaCO3 65%) MEDDRKGY - KY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, RK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, ARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, T O FLOR, IMMED STRMG CUT, HVY BLSHWT

11500' MD-11550' MD: CHK: 70% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 30% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

11550' MD-11600' MD: CHK: 75% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 25% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

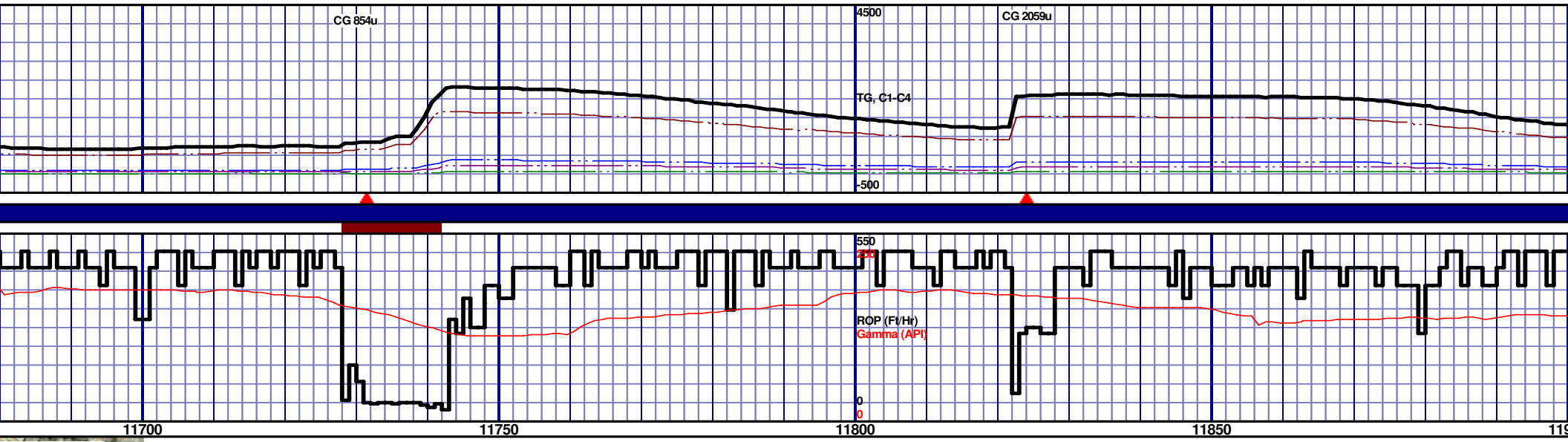
11600' MD-11650' MD: CHK: 70% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 30% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

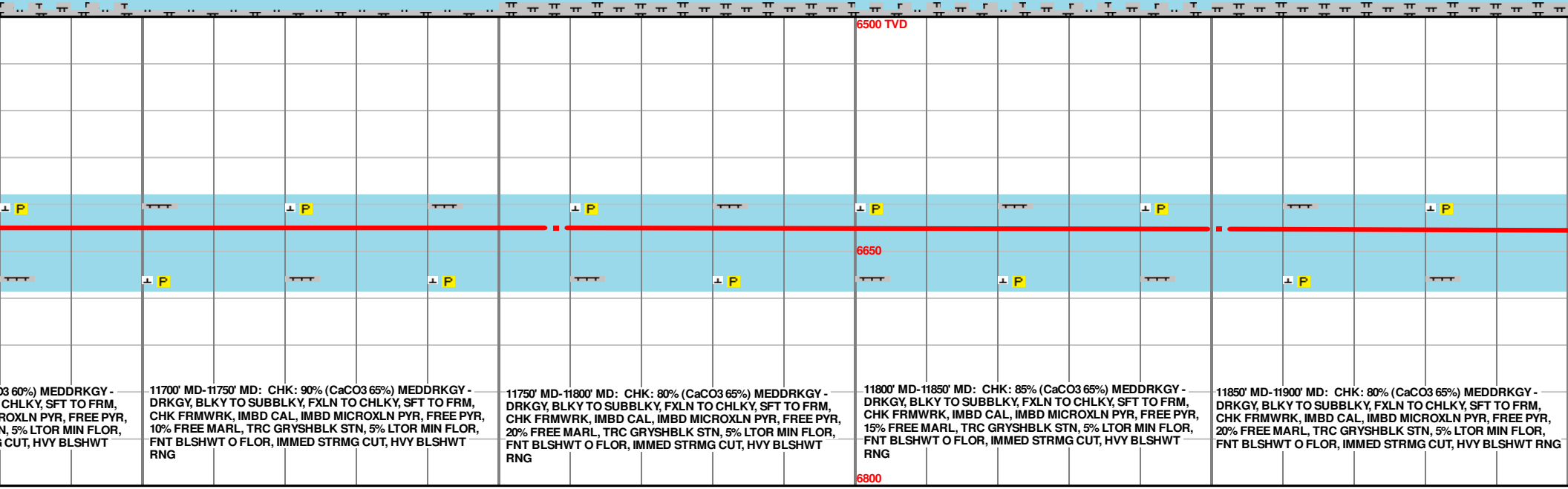
11650' MD-11700' MD: CHK: 85% (CaC DRKGY, BLKY TO SUBBLKY, FXLN TO CHK FRMWRK, IMBD CAL, IMBD MICI 15% FREE MARL, TRC GRYSHBLK STI FNT BLSHWT O FLOR, IMMED STRMG RNG

MD 11477 TVD 6635.76
INC 89.48 AZ 88.51
VS 5058.93

MD 11571 TVD 6636.21
INC 89.97 AZ 88.16
VS 5152.76

MD 11664 TVD 6635.3
INC 91.14 AZ 88.22
VS 5235.75





03 60%) MEDDRKGY - CHLKY, SFT TO FRM, ROXLN PYR, FREE PYR, N, 5% LTOR MIN FLOR, G CUT, HVY BLSHWT

11700' MD-11750' MD: CHK: 90% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

11750' MD-11800' MD: CHK: 80% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

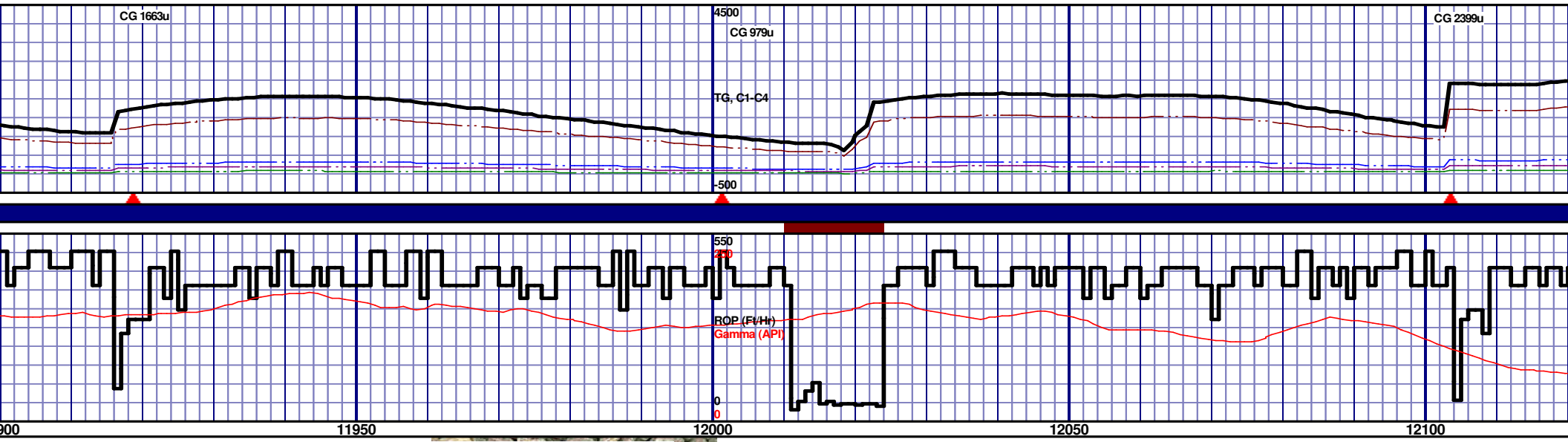
11800' MD-11850' MD: CHK: 85% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 15% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

11850' MD-11900' MD: CHK: 80% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

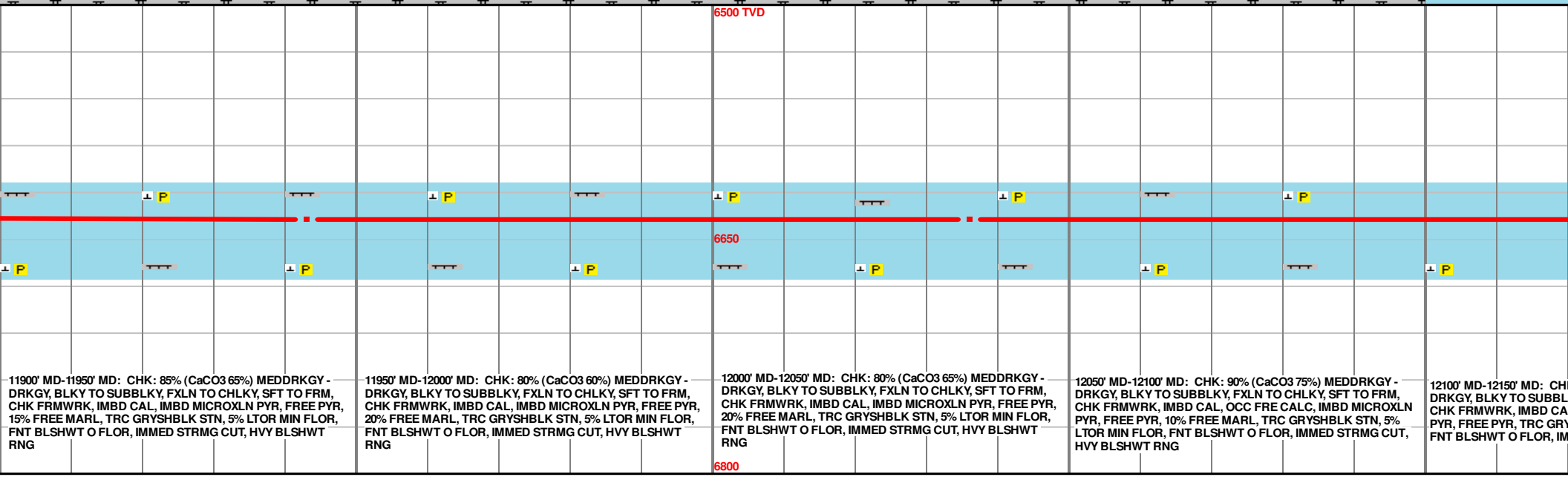
81

MD 11758 TVD 6634.8
INC 89.48 AZ 87.82
VS 5329.68

MD 11851 TVD 6635.73
INC 89.38 AZ 87.24
VS 5422.59



NIOBRARA B CHALK (11950' MD - 12000' MD)



11900' MD-11950' MD: CHK: 85% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 15% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

11950' MD-12000' MD: CHK: 80% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

12000' MD-12050' MD: CHK: 80% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

12050' MD-12100' MD: CHK: 90% (CaCO3 75%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FRE CALC, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

12100' MD-12150' MD: CH
DRKGY, BLKY TO SUBBL
CHK FRMWRK, IMBD CA
PYR, FREE PYR, TRC GR
FNT BLSHWT O FLOR, IM

MD 11943 TVD 6636.96
INC 89.08 AZ 87.38
VS 5514.48

MD 12036 TVD 6637.43
INC 90.34 AZ 87.6
VS 5607.39

6500 TVD

6650

6800

K: 100% (CaCO3 75%) MEDDRKGY - KY, FXLN TO CHLKY, SFT TO FRM, L, OCC FREE CALC, IMBD MICROXLN YSHBLK STN, 5% LTOR MIN FLOR, IMED STRMG CUT, HVY BLSHWT RNG

12150' MD-12200' MD: CHK: 90% (CaCO3 75%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

12200' MD-12250' MD: CHK: 95% (CaCO3 75%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, 5% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

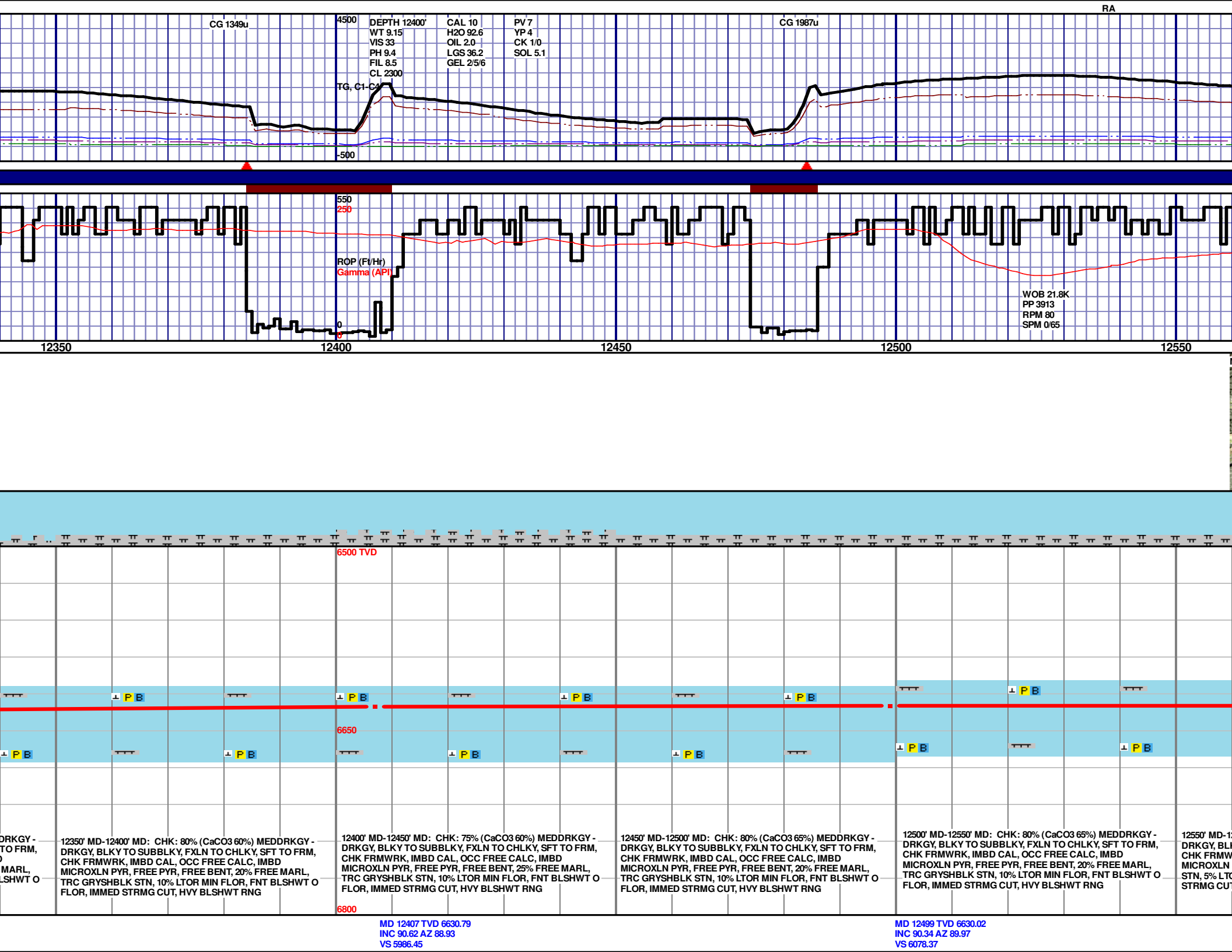
12250' MD-12300' MD: CHK: 85% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, 15% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

12300' MD-12350' MD: CHK: 85% (CaCO3 70%) MEDD DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, FREE BENT, 15% FREE TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BL FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

MD 12130 TVD 6637.11
INC 90.06 AZ 87.3
VS 5710.3

MD 12222 TVD 6636.04
INC 91.27 AZ 87.22
VS 5802

MD 12314 TVD 6633.16
INC 92.31 AZ 87.31
VS 5893.68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CAL 10
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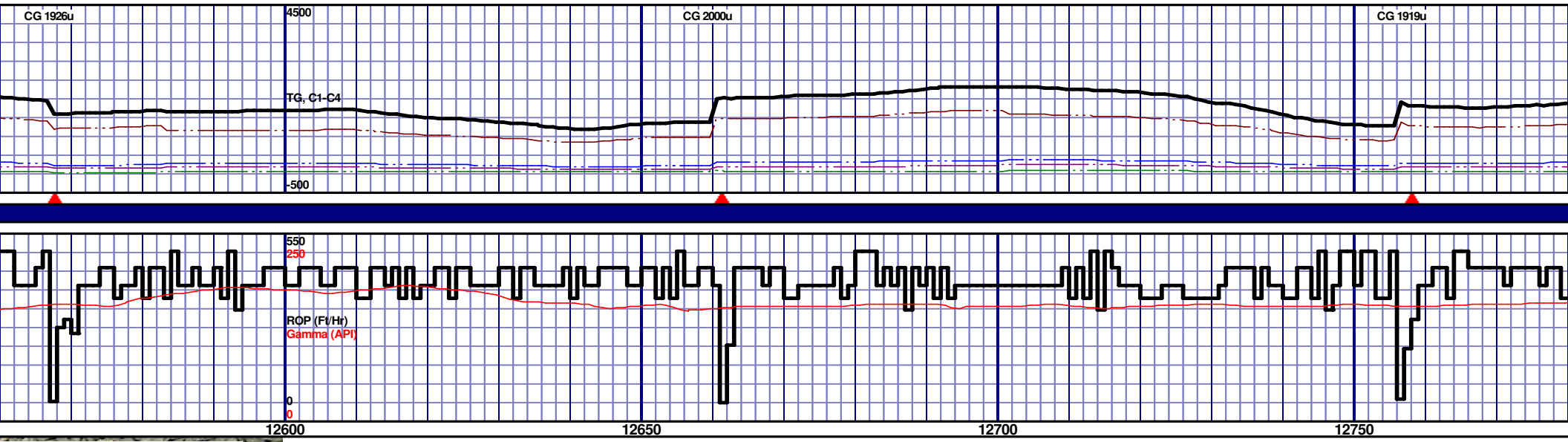
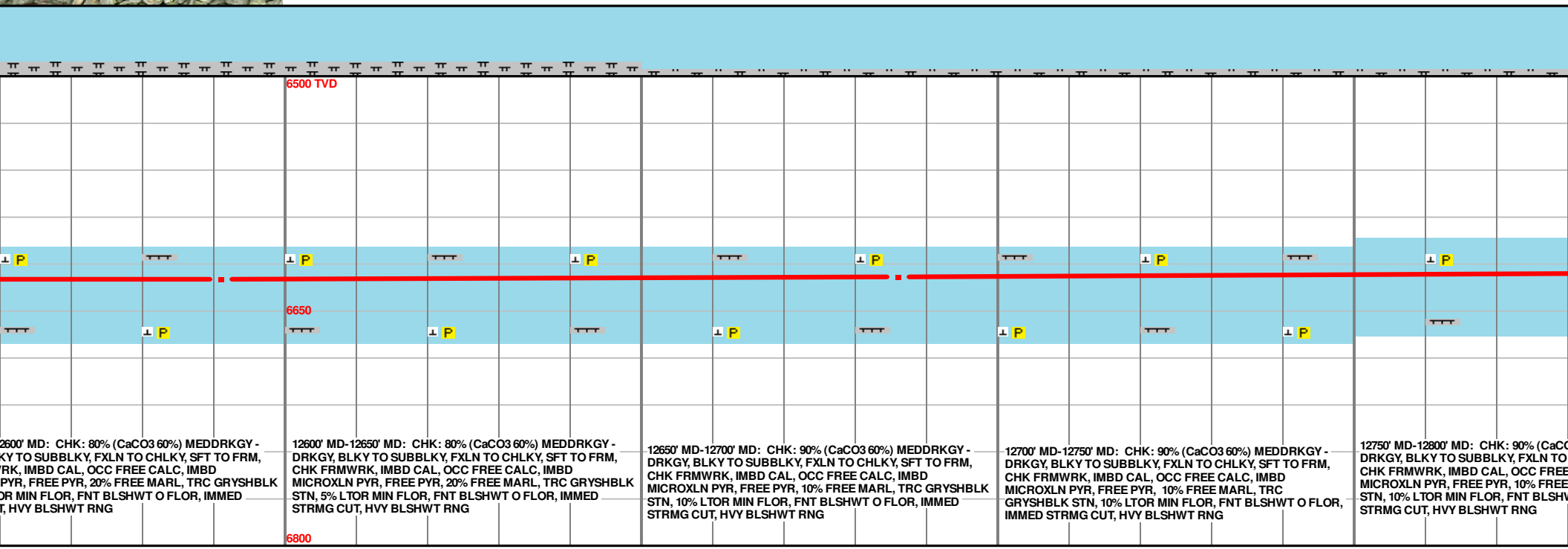
OIL 2.0
LGS 36.2
GEL 2/5/6
PV 7
YP 4
CK 1/0
SOL 5.1
TG, C1-C4
-500
CG 1987u
550
250
ROP (Ft/Hr)
Gamma (API)
0
0
WOB 21.8K
PP 3913
RPM 80
SPM 0/65
12350
12400
12450
12500
12550
6500 TVD
6650
6800
12350' MD-12400' MD: CHK: 80% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, FREE BENT, 20% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
12400' MD-12450' MD: CHK: 75% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, FREE BENT, 25% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
12450' MD-12500' MD: CHK: 80% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, FREE BENT, 20% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
12500' MD-12550' MD: CHK: 80% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, FREE BENT, 20% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
MD 12407 TVD 6630.79
INC 90.62 AZ 88.93
VS 5986.45
MD 12499 TVD 6630.02
INC 90.34 AZ 89.97
VS 6078.37





2600' MD: CHK: 80% (CaCO3 60%) MEDDRKGY - KY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, RK, IMBD CAL, OCC FREE CALC, IMBD PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK OR MIN FLOR, FNT BLSHWT O FLOR, IMMED T, HVY BLSHWT RNG

12600' MD-12650' MD: CHK: 80% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

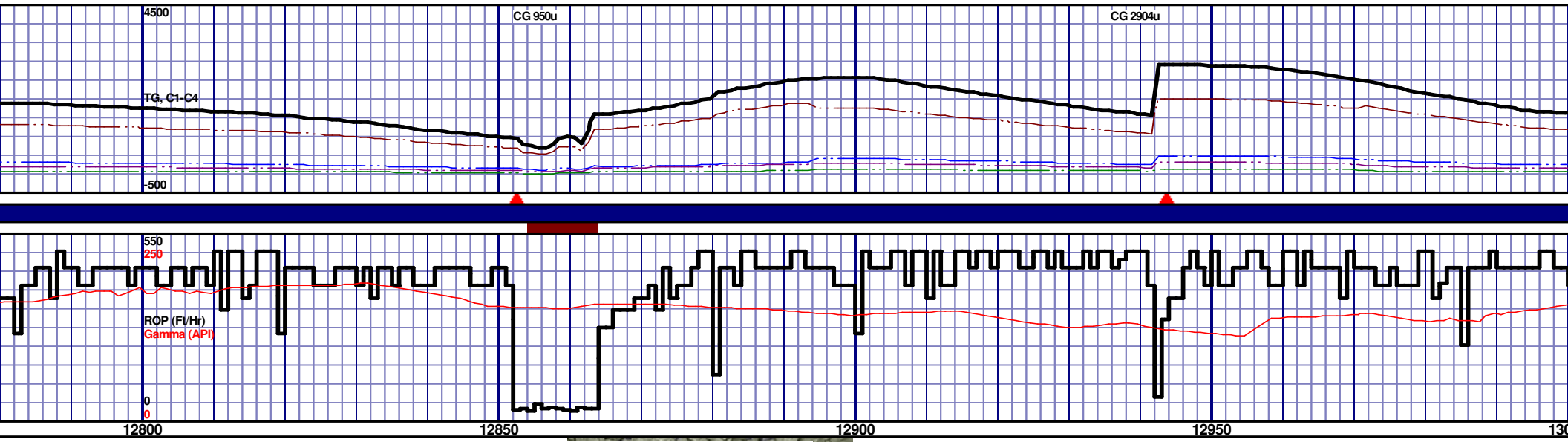
12650' MD-12700' MD: CHK: 90% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

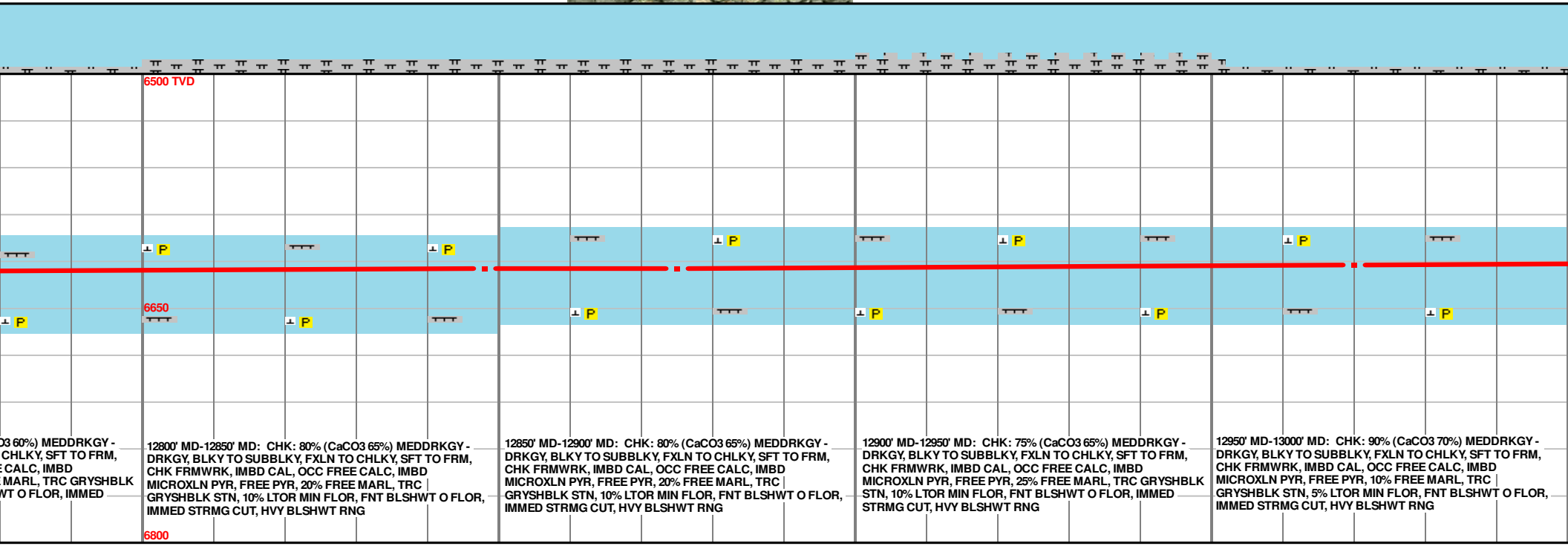
12700' MD-12750' MD: CHK: 90% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

12750' MD-12800' MD: CHK: 90% (CaC DRKGY, BLKY TO SUBBLKY, FXLN TO CHK FRMWRK, IMBD CAL, OCC FREE MICROXLN PYR, FREE PYR, 10% FREE STN, 10% LTOR MIN FLOR, FNT BLSHW STRMG CUT, HVY BLSHWT RNG

MD 12591 TVD 6629.45
INC 90.37 AZ 89.43
VS 6170.31

MD 12686 TVD 6628.29
INC 91.02 AZ 89.13
VS 6265.21





O3 60%) MEDDRKGY - CHLKY, SFT TO FRM, E CALC, IMBD MARL, TRC GRYSHBLK WT O FLOR, IMMED

12800' MD-12850' MD: CHK: 80% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

12850' MD-12900' MD: CHK: 80% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, 20% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

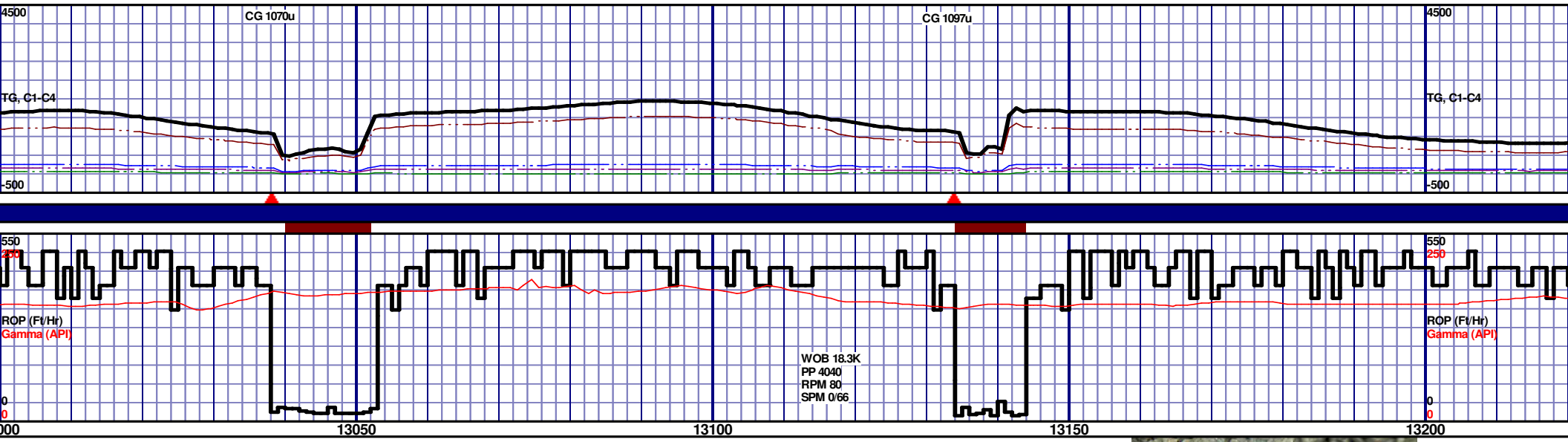
12900' MD-12950' MD: CHK: 75% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, 25% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

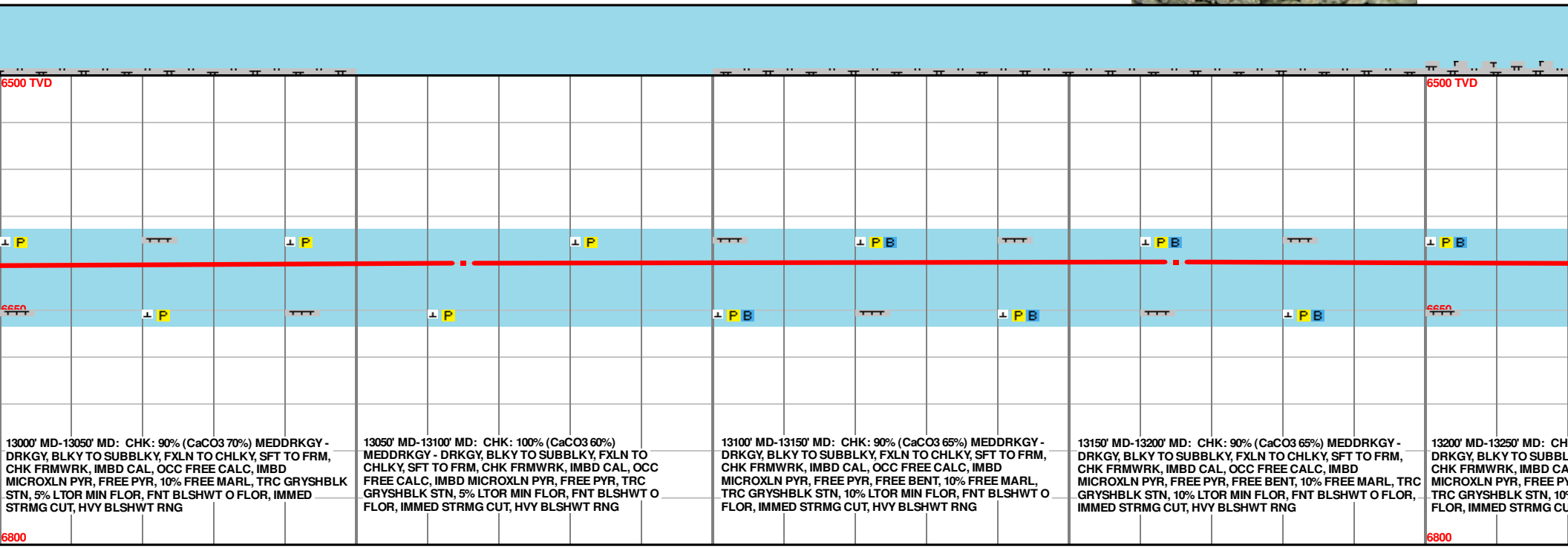
12950' MD-13000' MD: CHK: 90% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

MD 12848 TVD 6624.8
INC 91.45 AZ 88.64
VS 6426.97

MD 12875 TVD 6624.27
INC 90.8 AZ 89.51
VS 6453.94

MD 12970 TVD 6622.26
INC 91.63 AZ 89.39
VS 6548.84





13000' MD-13050' MD: CHK: 90% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

13050' MD-13100' MD: CHK: 100% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

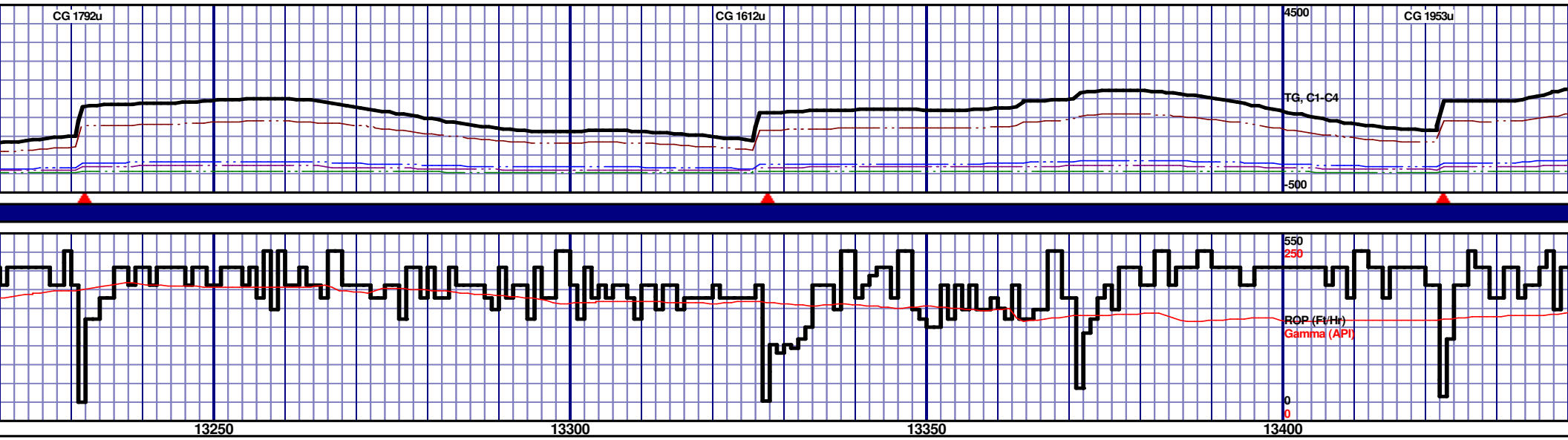
13100' MD-13150' MD: CHK: 90% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, FREE BENT, 10% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

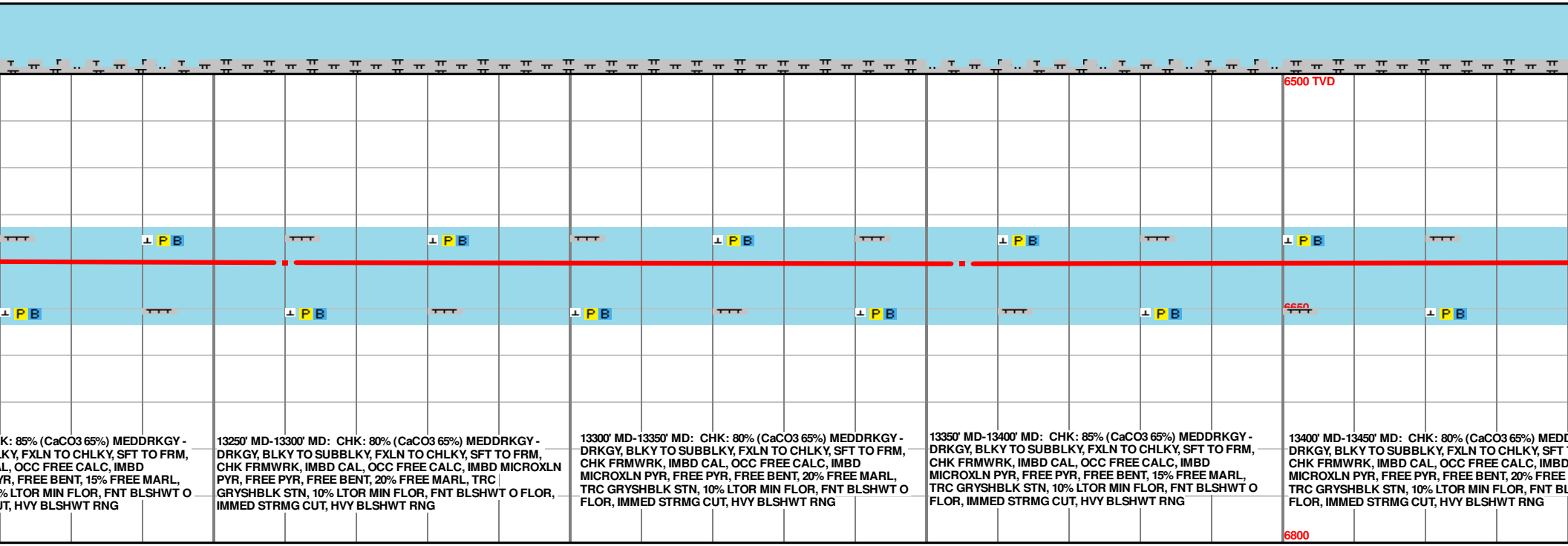
13150' MD-13200' MD: CHK: 90% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, FREE BENT, 10% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

13200' MD-13250' MD: CH
DRKGY, BLKY TO SUBBL
CHK FRMWRK, IMBD CA
MICROXLN PYR, FREE PY
TRC GRYSHBLK STN, 10
FLOR, IMMED STRMG CU

MD 13065 TVD 6619.94
INC 91.17 AZ 90.32
VS 6643.75

MD 13165 TVD 6619.56
INC 89.26 AZ 89.82
VS 6743.71





K: 85% (CaCO3 65%) MEDDRKGY - LKY, FXLN TO CHLKY, SFT TO FRM, L, OCC FREE CALC, IMBD YR, FREE BENT, 15% FREE MARL, % LTOR MIN FLOR, FNT BLSHWT O UT, HVY BLSHWT RNG

13250' MD-13300' MD: CHK: 80% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, FREE BENT, 20% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

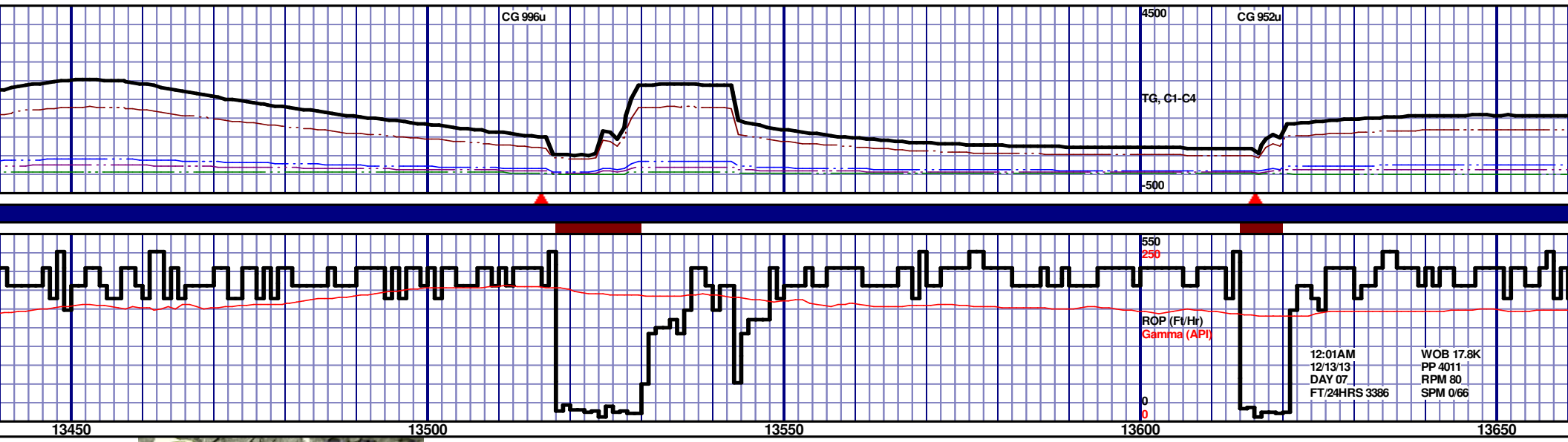
13300' MD-13350' MD: CHK: 80% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, FREE BENT, 20% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

13350' MD-13400' MD: CHK: 85% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, FREE BENT, 15% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

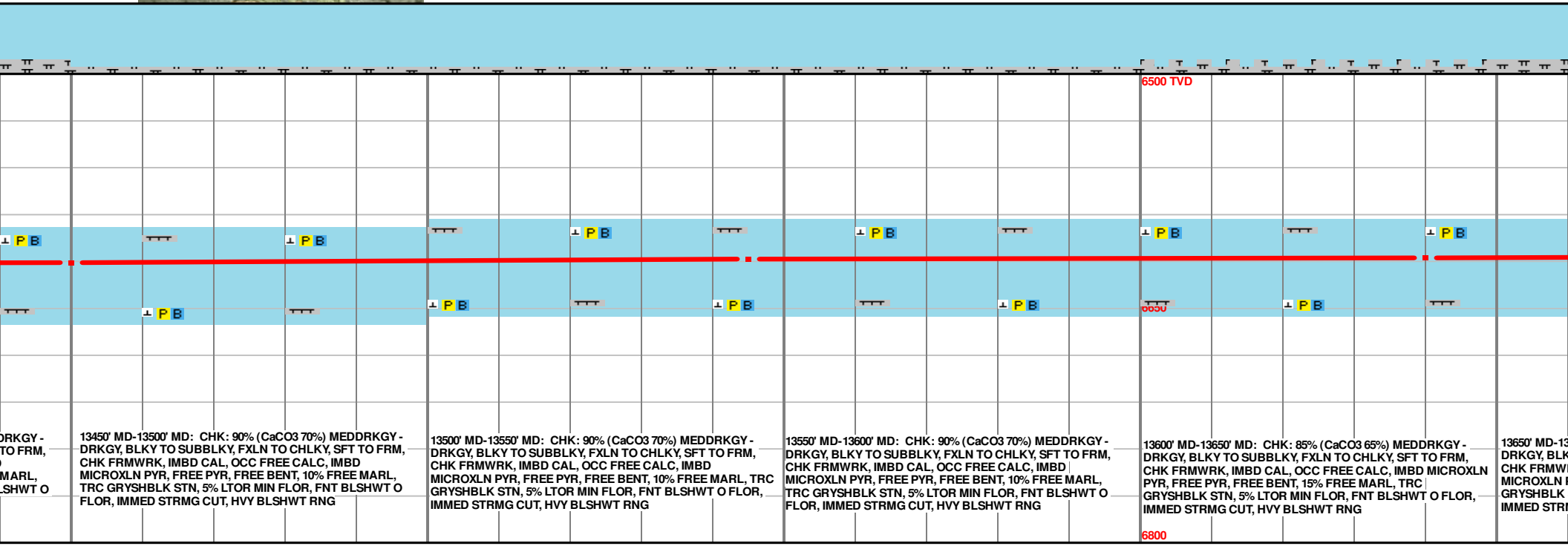
13400' MD-13450' MD: CHK: 80% (CaCO3 65%) MEDD DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, FREE BENT, 20% FREE TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BL FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

MD 13260 TVD 6620.69
INC 89.38 AZ 89.49
VS 6838.63

MD 13355 TVD 6621.38
INC 89.78 AZ 89.35
VS 6933.55



NIOBRARA B CHALK (13450' MD - 13500' MD)



13450' MD-13500' MD: CHK: 90% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, FREE BENT, 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

13500' MD-13550' MD: CHK: 90% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, FREE BENT, 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

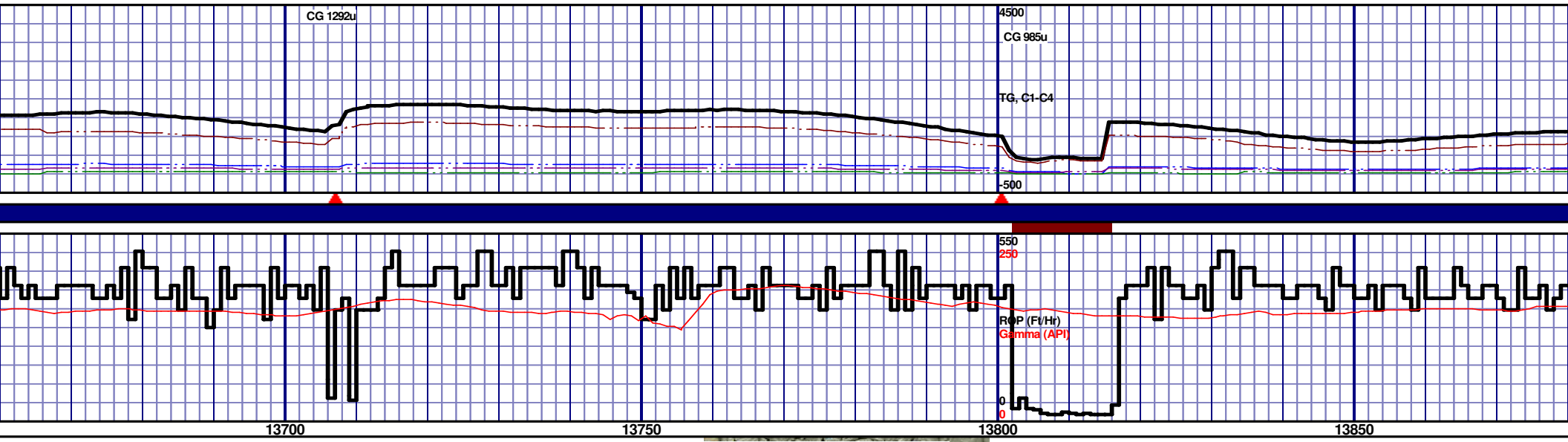
13550' MD-13600' MD: CHK: 90% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, FREE BENT, 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

13600' MD-13650' MD: CHK: 85% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, FREE BENT, 15% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

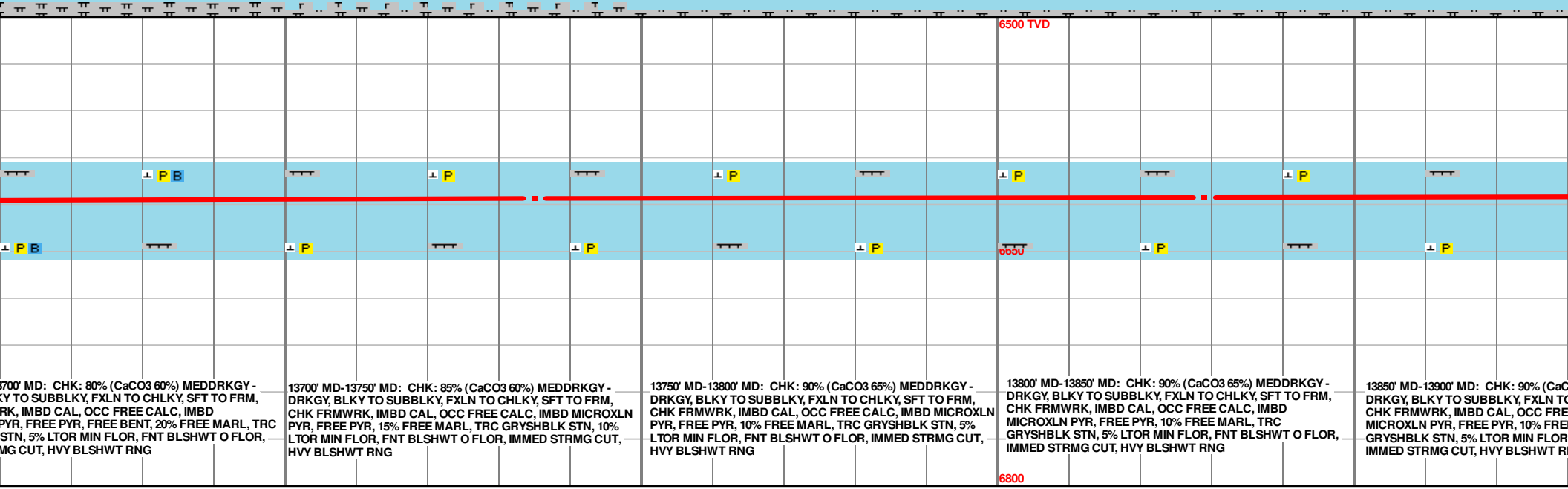
MD 13450 TVD 6620.46
INC 91.33 AZ 89.39
VS 7028.46

MD 13545 TVD 6618.85
INC 90.77 AZ 89.57
VS 7123.38

MD 13640 TVD 6618.06
INC 90.19 AZ 89.71
VS 7218.31



NIOBRARA B CHALK (13750' MD - 13800' MD)



3700' MD: CHK: 80% (CaCO3 60%) MEDDRKGY - KY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, RK, IMBD CAL, OCC FREE CALC, IMBD PYR, FREE PYR, FREE BENT, 20% FREE MARL, TRC STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, MG CUT, HVY BLSHWT RNG

13700' MD-13750' MD: CHK: 85% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, 15% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

13750' MD-13800' MD: CHK: 90% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

13800' MD-13850' MD: CHK: 90% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

13850' MD-13900' MD: CHK: 90% (CaC DRKGY, BLKY TO SUBBLKY, FXLN TO CHK FRMWRK, IMBD CAL, OCC FRE MICROXLN PYR, FREE PYR, 10% FRE GRYSHBLK STN, 5% LTOR MIN FLOR IMMED STRMG CUT, HVY BLSHWT R

MD 13735 TVD 6616.51
INC 91.67 AZ 89.65
VS 7313.24

MD 13829 TVD 6615.27
INC 89.85 AZ 88.27
VS 7407.11

CJS

CG 1236u

CG 737u

4500

TG, C1-C4

-500

DEPTH 14077'
WT 9.10
VIS 32
PH 8.7

FIL 9
CL 2200
CAL 20
H2O 94.4

CG 1081u

550

250

ROP (Ft/Hr)

Gamma (API)

0

0

WOB 33.3K
PP 3512
RPM 40
SPM 67/0

13900

13950

14000

14050

NIOBRARA B CHALK (14050' MD - 14100' MD)

6500 TVD

6650

6800

CO3 65%) MEDDRKGY - O CHLKY, SFT TO FRM, E CALC, IMBD E MARL, TRC , FNT BLSHWT O FLOR, NG

13900' MD-13950' MD: CHK: 90% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

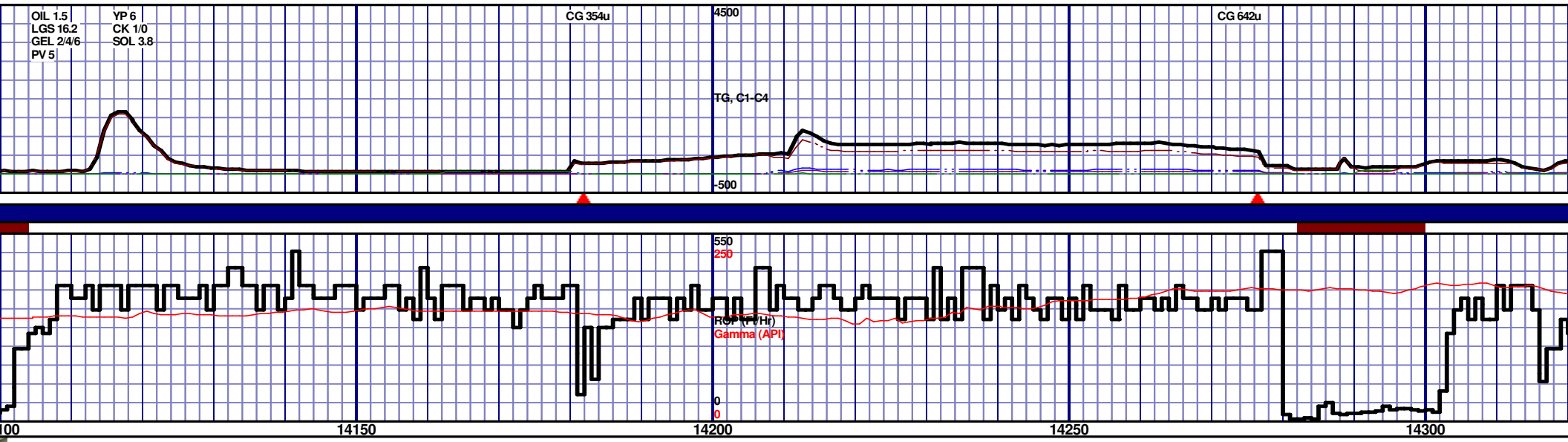
13950' MD-14000' MD: CHK: 100% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

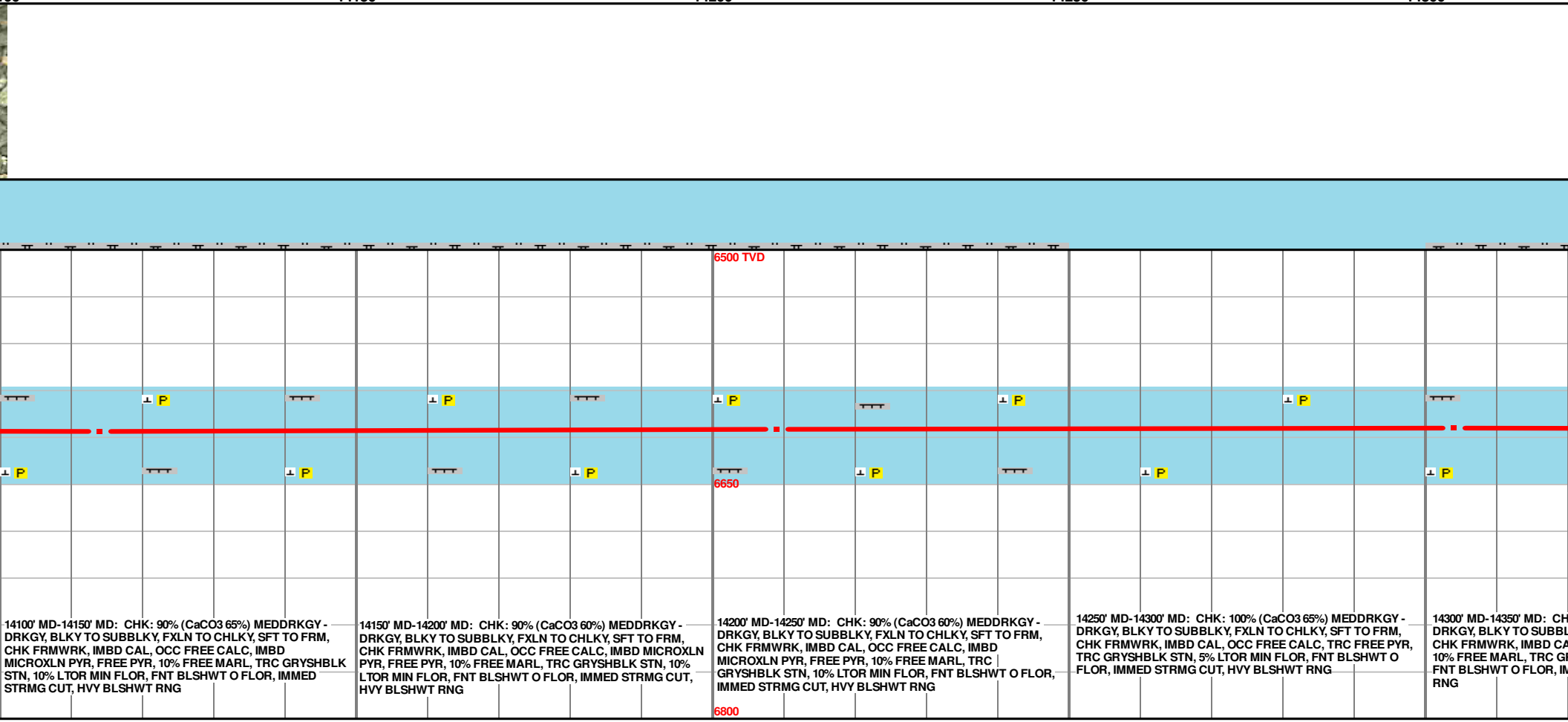
14000' MD-14050' MD: CHK: 100% (CaCO3 70%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

14050' MD-14100' MD: CHK: 90% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, OCC FREE CALC, IMBD MICROXLN PYR, FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

MD 13924 TVD 6615.11
INC 90.34 AZ 87.84
VS 7501.91

MD 14019 TVD 6615.82
INC 88.8 AZ 87.01
VS 7596.63





MD 14114 TVD 6616.61
INC 90.25 AZ 89.31
VS 7691.43

MD 14209 TVD 6614.92
INC 91.79 AZ 89.48
VS 7786.33

MD 14304 TVD 6614.0
INC 89.23 AZ 88.58
VS 7881.21

CG 805u

CG 536u

GAS TRAP TEST 3357u

4500

TG, C1-C4

-500

550

250

ROP (FPH)

Gamma (API)

0

0

14350

14400

14450

14500

NIOBRARA B CHALK (14350' MD - 14400' MD)

6500 TVD

6650

6800

IK: 90% (CaCO3 60%) MEDDRKGY - LKY, FXLN TO CHLKY, SFT TO FRM, AL, OCC FREE CALC, TRC FREE PYR, RYSHBLK STN, 5% LTOR MIN FLOR, MMED STRMG CUT, HVY BLSHWT

14350' MD-14400' MD: CHK: 90% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, TRC FREE CALC, TRC FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

14400' MD-14450' MD: CHK: 90% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, TRC FREE CALC, TRC FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

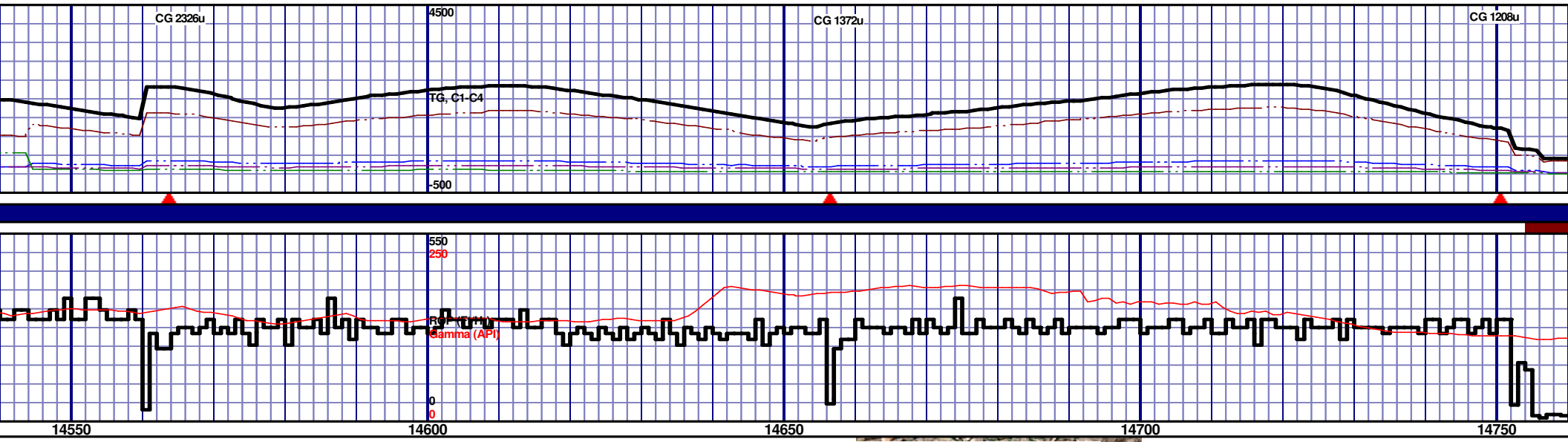
14450' MD-14500' MD: CHK: 90% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, TRC FREE CALC, TRC FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

14500' MD-14550' MD: CHK: 90% (CaCO3 65%) MED DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT CHK FRMWRK, IMBD CAL, TRC FREE CALC, TRC 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR M FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY B RNG

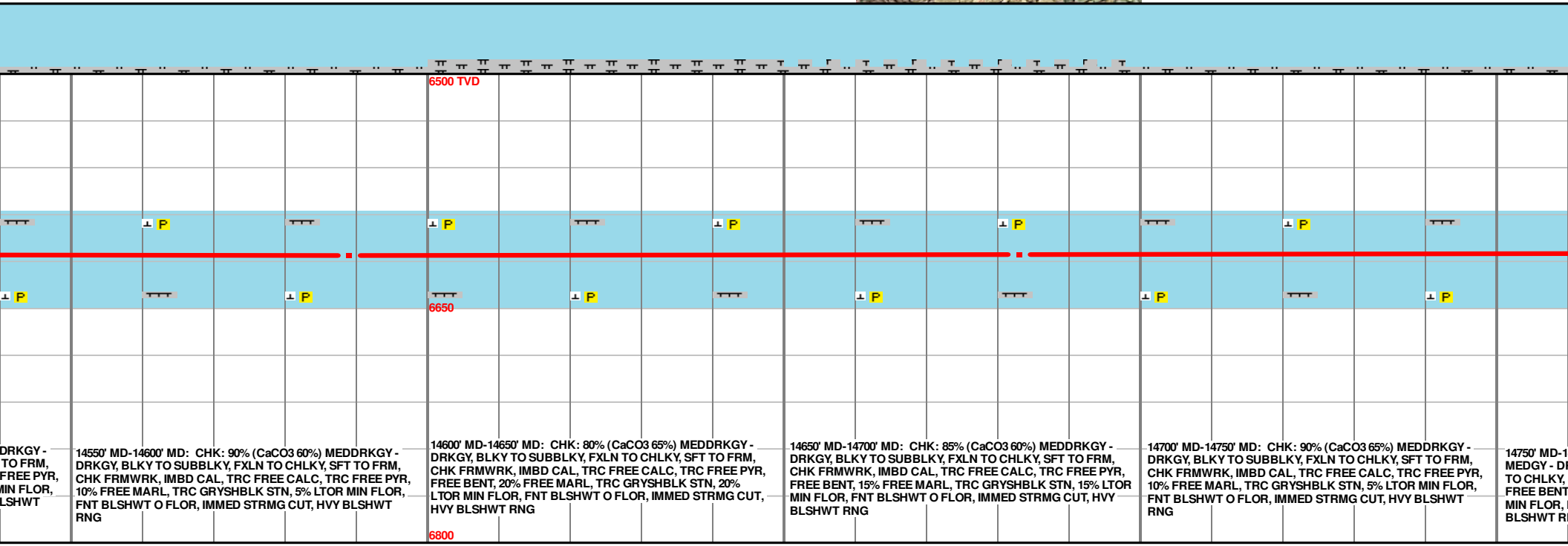
07

MD 14399 TVD 6614.59
INC 90.15 AZ 88.01
VS 7976.04

MD 14494 TVD 6615.26
INC 89.04 AZ 87.57
VS 8070.81



NIOBRARA B CHALK (14650' MD - 14700' MD)



DRKGY - TO FRM, FREE PYR, MIN FLOR, LSHWT

14550' MD-14600' MD: CHK: 90% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, TRC FREE CALC, TRC FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

14600' MD-14650' MD: CHK: 80% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, TRC FREE CALC, TRC FREE PYR, FREE BENT, 20% FREE MARL, TRC GRYSHBLK STN, 20% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

14650' MD-14700' MD: CHK: 85% (CaCO3 60%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, TRC FREE CALC, TRC FREE PYR, FREE BENT, 15% FREE MARL, TRC GRYSHBLK STN, 15% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

14700' MD-14750' MD: CHK: 90% (CaCO3 65%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT TO FRM, CHK FRMWRK, IMBD CAL, TRC FREE CALC, TRC FREE PYR, 10% FREE MARL, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

14750' MD-1 MEDGY - DI TO CHLKY, FREE BENT MIN FLOR, BLSHWT RI

MD 14589 TVD 6616.18
INC 89.85 AZ 87.35
VS 8165.53

MD 14683 TVD 6615.7
INC 90.74 AZ 85.61
VS 8259.13

MY

DEPTH 14764'
WT 9.1
VIS 32
PH 9.0
FIL 8.5
CL 2000
CAL 20
H2O 94.0

OIL 1.5
LGS 23.55
GEL 2/4/6
PV 6
YP 6
CK 1/0
SOL 4.2

4500
CG N/A
TG, C1-C4
EQUIPMENT MALFUNCTION FROM
14779' MD TO 14867' MD
-500
CG 521u

550
250
ROP (Ft/Hr)
Gamma (API)
EQUIPMENT MALFUNCTION FROM
14779' MD TO 14867' MD
0
0
WOB 77.1K
PP 2931
RPM 86
RPM 0/60

14800
14850
14900
14950

NIOBRARA B CHALK (149

6500 TVD
6650
6800

4800' MD: CHK: 90% (CaCO3 70%) MOTT WH - RKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT , 10% FREE MARL, TR GYSHBLK STN, 10% LTOR FNT BLSHWT O FLOR, FAST STRMG CUT, HVY NG

14800' MD-14850' MD: CHK: 90% (CaCO3 70%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

14850' MD-14900' MD: CHK: 90% (CaCO3 70%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

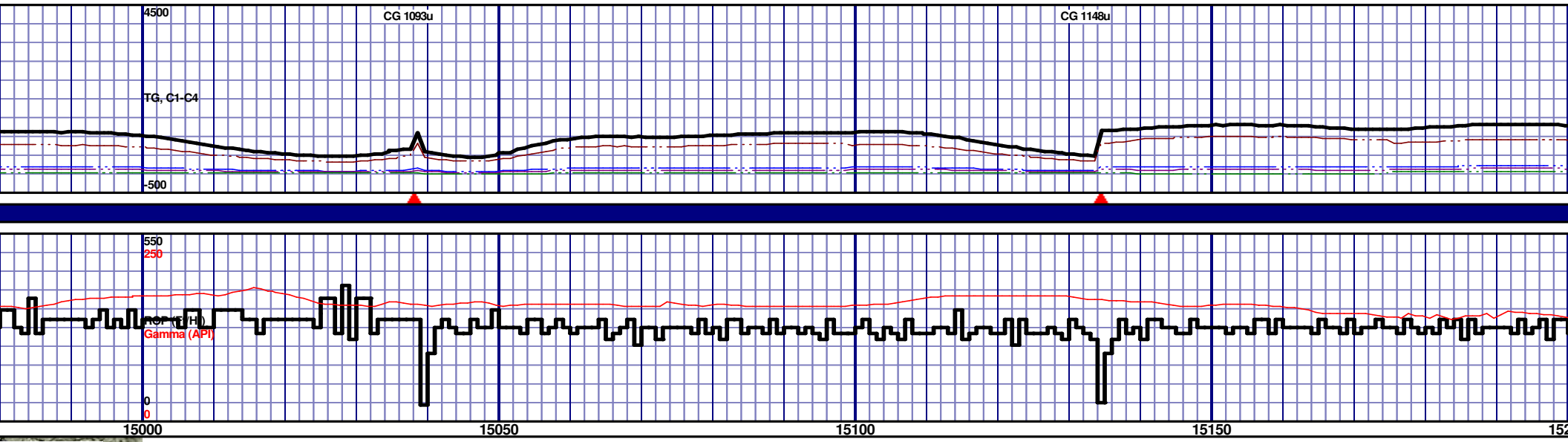
14900' MD-14950' MD: CHK: 90% (CaCO3 70%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

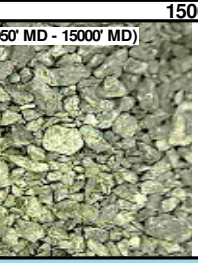
14950' MD-15000' MD: CHK: 90% (CaCO MEDGY - DRKGY, PRED SUBBLKY TO CHLKY, SFT TO FRM, IMBD CAL, TR FR MARL, TR GYSHBLK STN, 5% LTOR MI FLOR, FAST STRMG CUT, HVY BLSHW

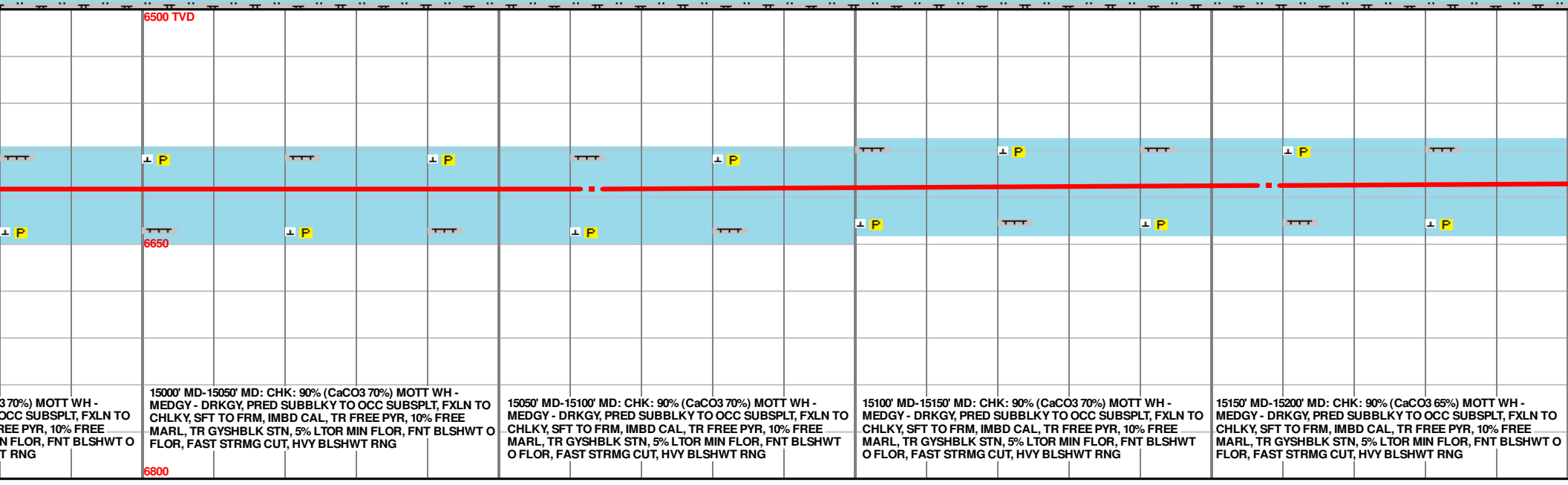
MD 14778 TVD 6614.73
INC 90.43 AZ 88.19
VS 8353.77

MD 14873 TVD 6614.58
INC 89.75 AZ 88.77
VS 8448.62

MD 14968 TVD
INC 89.66 AZ 90
VS 8543.54







3 70%) MOTT WH - OCC SUBSPLT, FXLN TO REE PYR, 10% FREE N FLOR, FNT BLSHWT O T RNG

15000' MD-15050' MD: CHK: 90% (CaCO3 70%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, 10% FREE MARL, TR GYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

15050' MD-15100' MD: CHK: 90% (CaCO3 70%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, 10% FREE MARL, TR GYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

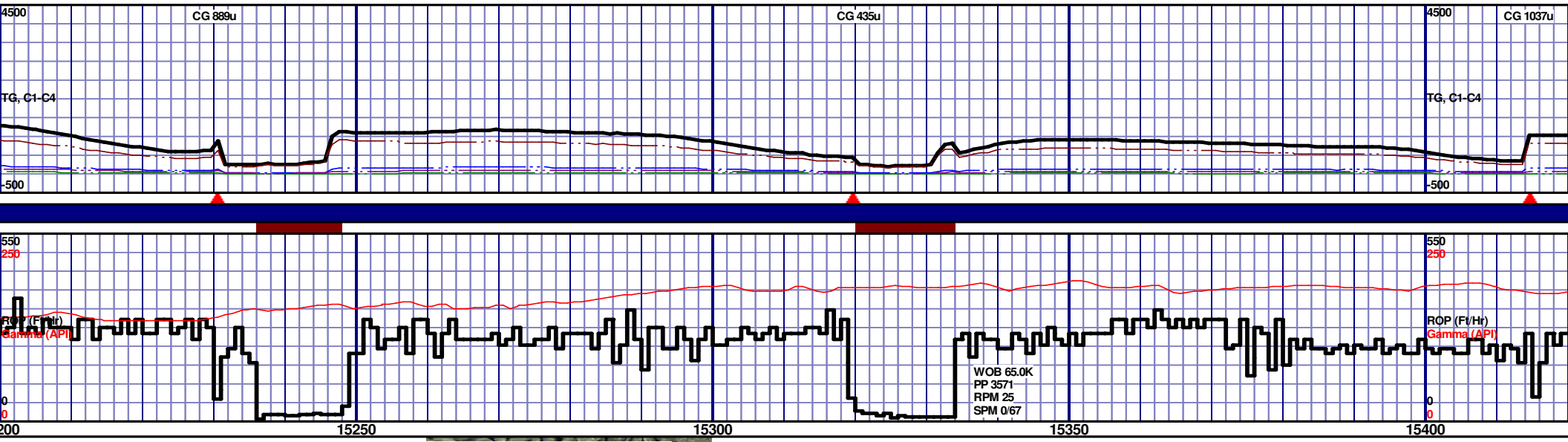
15100' MD-15150' MD: CHK: 90% (CaCO3 70%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, 10% FREE MARL, TR GYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

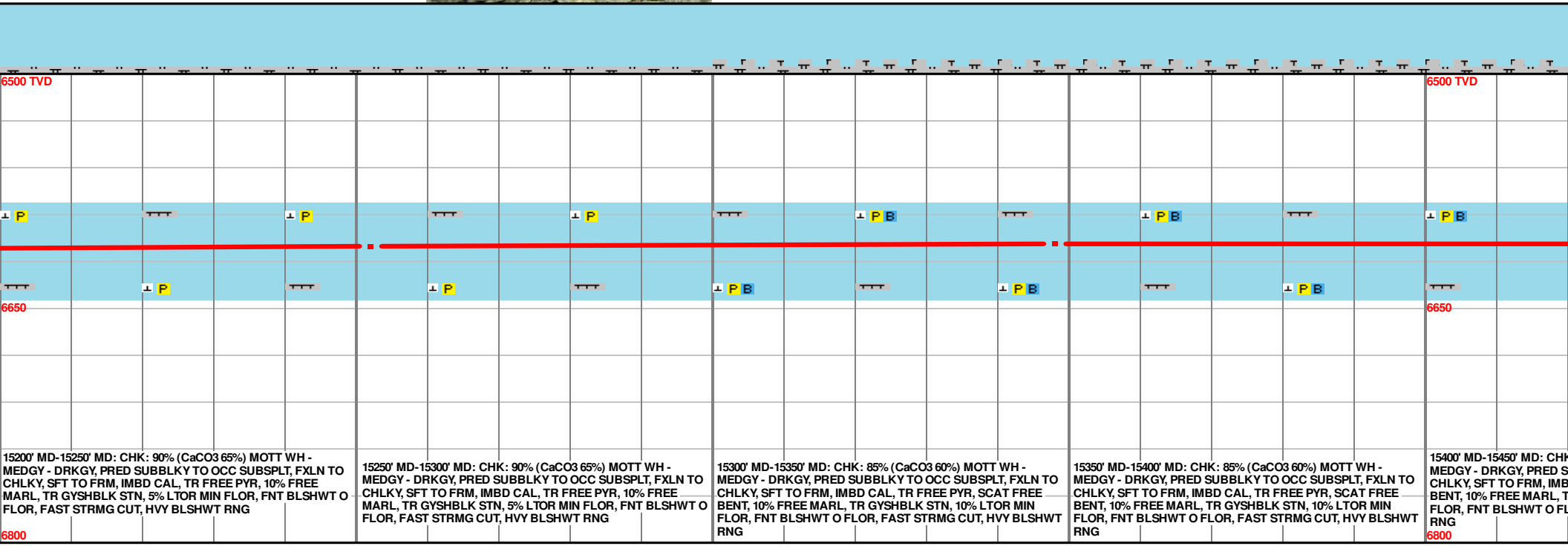
15150' MD-15200' MD: CHK: 90% (CaCO3 65%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, 10% FREE MARL, TR GYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

6615.07
0.17

MD 15063 TVD 6614.78
INC 90.68 AZ 90.24
VS 8638.5

MD 15158 TVD 6612.76
INC 91.76 AZ 89.42
VS 8733.42





15200' MD-15250' MD: CHK: 90% (CaCO3 65%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, 10% FREE MARL, TR GYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

6800

15250' MD-15300' MD: CHK: 90% (CaCO3 65%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, 10% FREE MARL, TR GYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

MD 15252 TVD 6610.15
INC 91.42 AZ 90.24
VS 8827.33

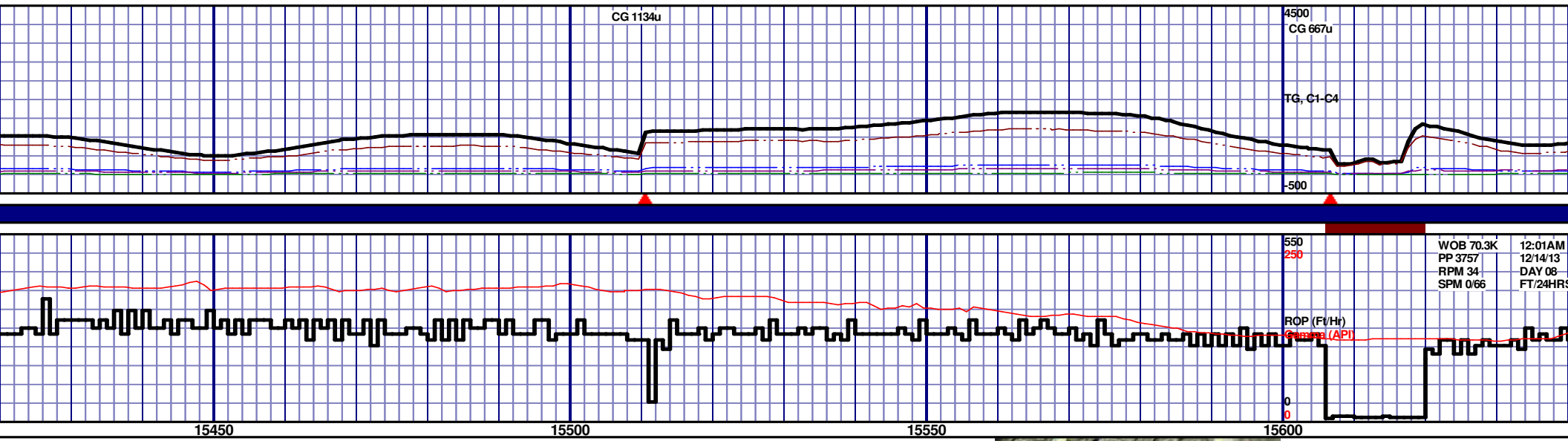
15300' MD-15350' MD: CHK: 85% (CaCO3 60%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

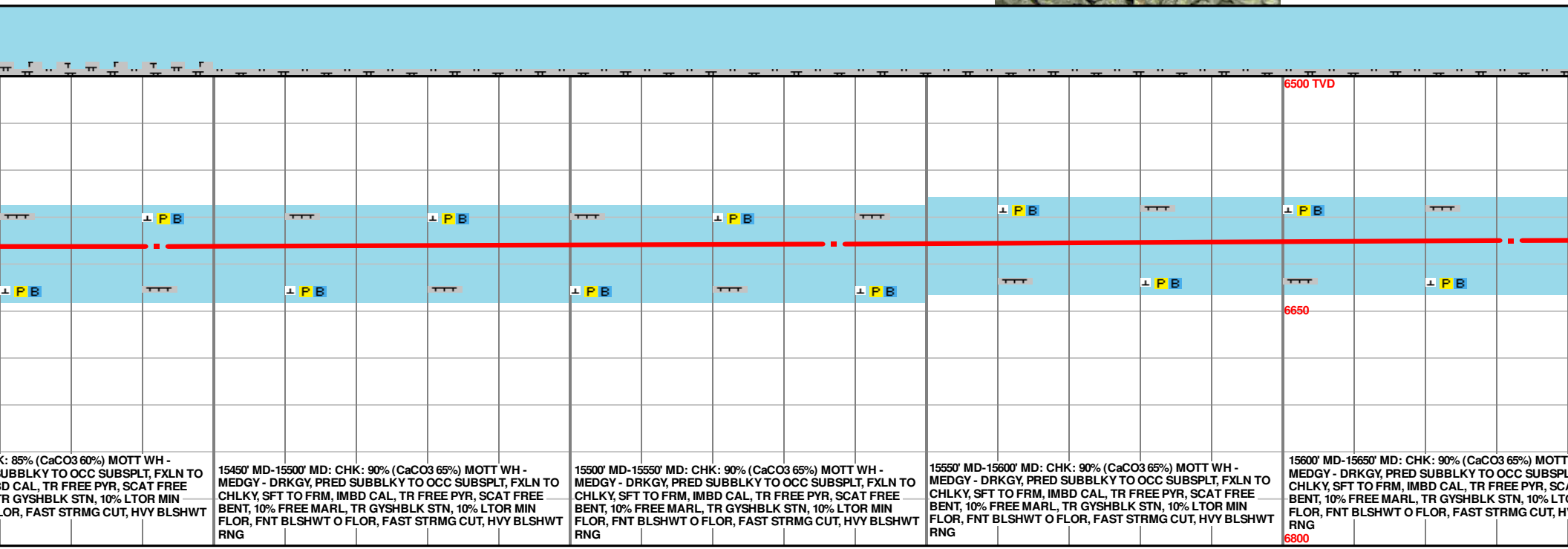
15350' MD-15400' MD: CHK: 85% (CaCO3 60%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

MD 15348 TVD 6609.04
INC 89.91 AZ 88.78
VS 8923.25

15400' MD-15450' MD: CHK
MEDGY - DRKGY, PRED S
CHLKY, SFT TO FRM, IMB
BENT, 10% FREE MARL, T
FLOR, FNT BLSHWT O FL
RNG

6800





K: 85% (CaCO3 60%) MOTT WH - UBBLKY TO OCC SUBSPLT, FXLN TO D CAL, TR FREE PYR, SCAT FREE R GYSHBLK STN, 10% LTOR MIN LOR, FAST STRMG CUT, HVY BLSHWT

15450' MD-15500' MD: CHK: 90% (CaCO3 65%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

15500' MD-15550' MD: CHK: 90% (CaCO3 65%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

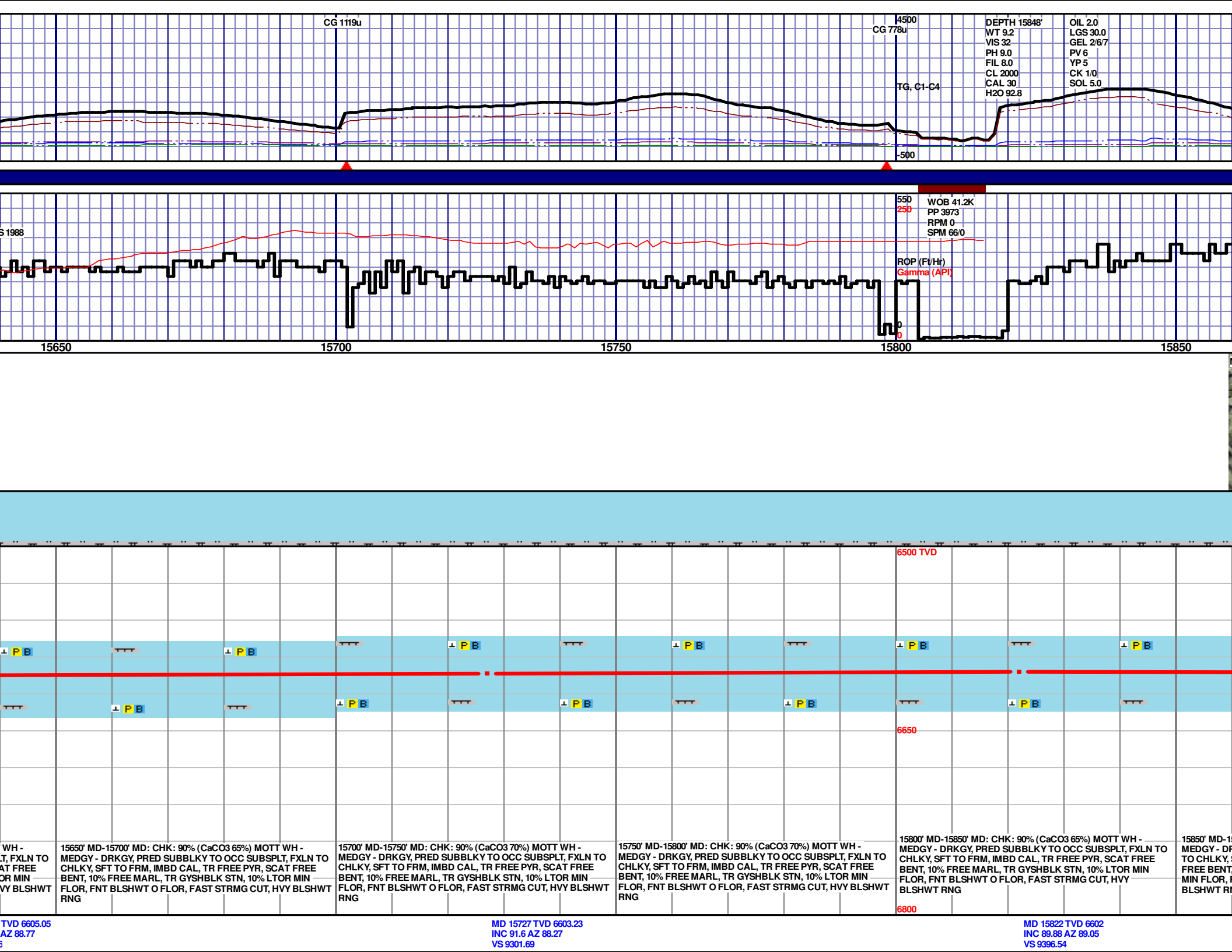
15550' MD-15600' MD: CHK: 90% (CaCO3 65%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

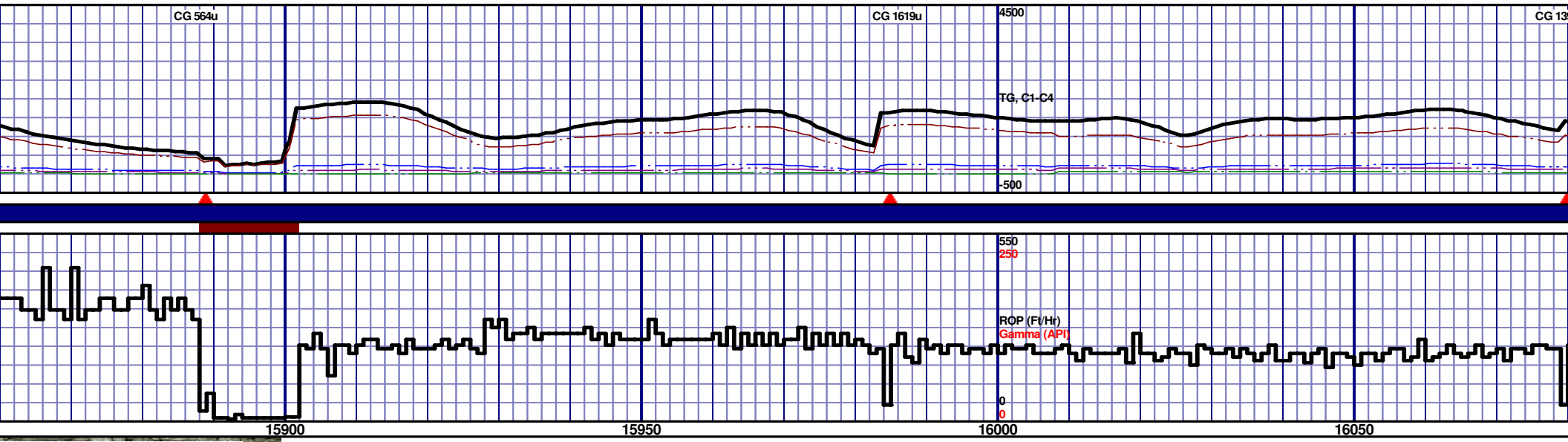
15600' MD-15650' MD: CHK: 90% (CaCO3 65%) MOTT MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPL CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SC BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LT FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, H RNG

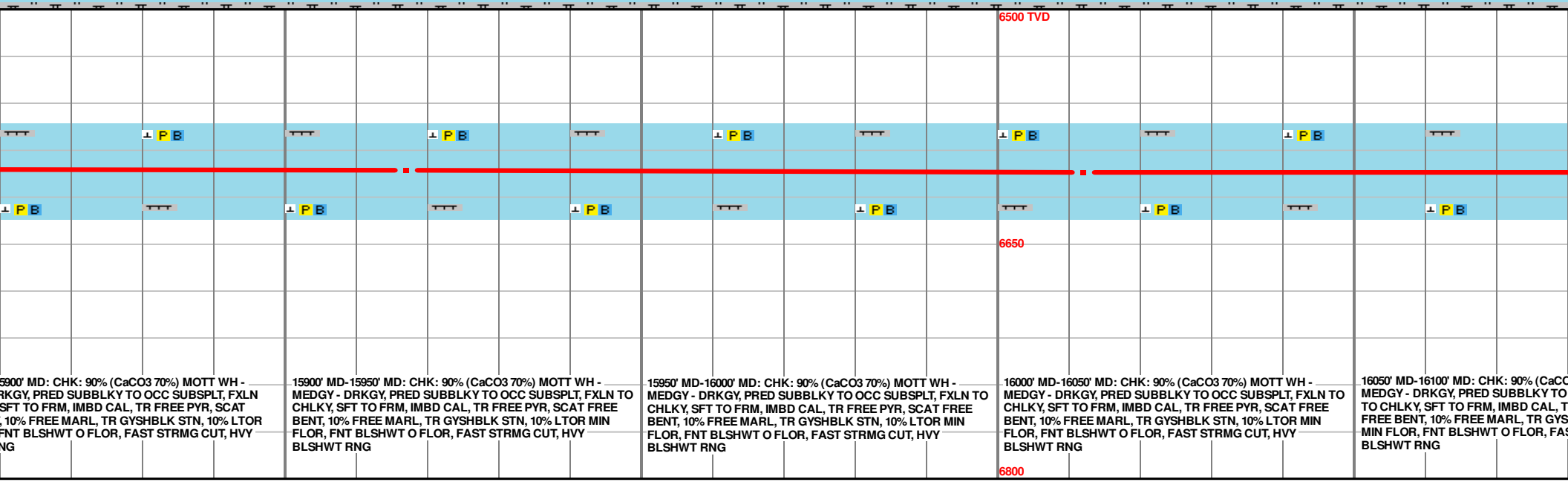
MD 15442 TVD 6608.69
INC 90.52 AZ 89.07
VS 9017.13

MD 15537 TVD 6606.9
INC 91.64 AZ 88.93
VS 9112

MD 15632
INC 90.59
VS 9206.8


CG 1119u
CG 778u
4500
-500
TG, C1-C4
DEPTH 15848'
WT 9.2
VIS 32
PH 9.0
FIL 8.0
CL 2000
CAL 30
H2O 92.8
OIL 2.0
LGS 30.0
GEL 2/6/7
PV 6
YP 5
CK 1/0
SOL 5.0
S 1988
550
250
WOB 41.2K
PP 3973
RPM 0
SPM 66/0
ROP (Ft/Hr)
Gamma (API)
0
0
15650
15700
15750
15800
15850
6500 TVD
6650
6800
15650' MD-15700' MD: CHK: 90% (CaCO3 65%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG
15700' MD-15750' MD: CHK: 90% (CaCO3 70%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG
15750' MD-15800' MD: CHK: 90% (CaCO3 70%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG
15800' MD-15850' MD: CHK: 90% (CaCO3 65%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG
TVD 6605.05
AZ 88.77
MD 15727 TVD 6603.23
INC 91.6 AZ 88.27
VS 9301.69
MD 15822 TVD 6602
INC 89.88 AZ 89.05
VS 9396.54





5900' MD: CHK: 90% (CaCO3 70%) MOTT WH - RKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT , 10% FREE MARL, TR GYSHBLK STN, 10% LTOR FNT BLSHWT O FLOR, FAST STRMG CUT, HVY NG

15900' MD-15950' MD: CHK: 90% (CaCO3 70%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

15950' MD-16000' MD: CHK: 90% (CaCO3 70%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

16000' MD-16050' MD: CHK: 90% (CaCO3 70%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

16050' MD-16100' MD: CHK: 90% (CaCO TO CHLKY, SFT TO FRM, IMBD CAL, T FREE BENT, 10% FREE MARL, TR GYS MIN FLOR, FNT BLSHWT O FLOR, FAS BLSHWT RNG

MD 15917 TVD 6602.87
INC 89.08 AZ 88.71
VS 9491.41

MD 16012 TVD 6604.06
INC 89.48 AZ 88.44
VS 9586.26

93u

CG 1755u

4500

TG, C1-C4

BOTTOMS UP GAS 1163u

-500

550

250

WOB 7.9K
PP 3880
RPM 80
SPM 62/0

ROP (Ft/Hr)

Gamma (API)

DRILLERS TD @ 16225' MD
@ 8:00 AM ON 12/14/2013

0

0

16100 16150 16200 16250

NIOBRARA B CHALK (16150' MD - 16200' MD)

6500 TVD

TD @ 16225' MD

RELEASED ON 12/14/2013

6650

THANK YOU FROM CASEY SENSECQUA, ROSS APODACA AND HORIZON WELL LOGGING, LLC

03 70%) MOTT WH - OCC SUBSPLT, FXLN R FREE PYR, SCAT HBLK STN, 10% LTOR ST STRMG CUT, HVY

16100' MD-16150' MD: CHK: 90% (CaCO3 70%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

16150' MD-16200' MD: CHK: 90% (CaCO3 70%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

16200' MD-16225' MD: CHK: 90% (CaCO3 70%) MOTT WH - MEDGY - DRKGY, PRED SUBBLKY TO OCC SUBSPLT, FXLN TO CHLKY, SFT TO FRM, IMBD CAL, TR FREE PYR, SCAT FREE BENT, 10% FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

6800

MD 16107 TVD 6604.42
INC 90.09 AZ 88.05
VS 9681.08

MD 16158 TVD 6604.05
INC 90.74 AZ 87.97
VS 9731.97

PTB

MD 16225 TVD 6603.18
INC 90.74 AZ 87.97
VS 9798.82