



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 &
Jeremy Needham

Log Interval: 6650' MD to 11077' MD
Start Date: October 21, 2013
Release Date: October 24, 2013

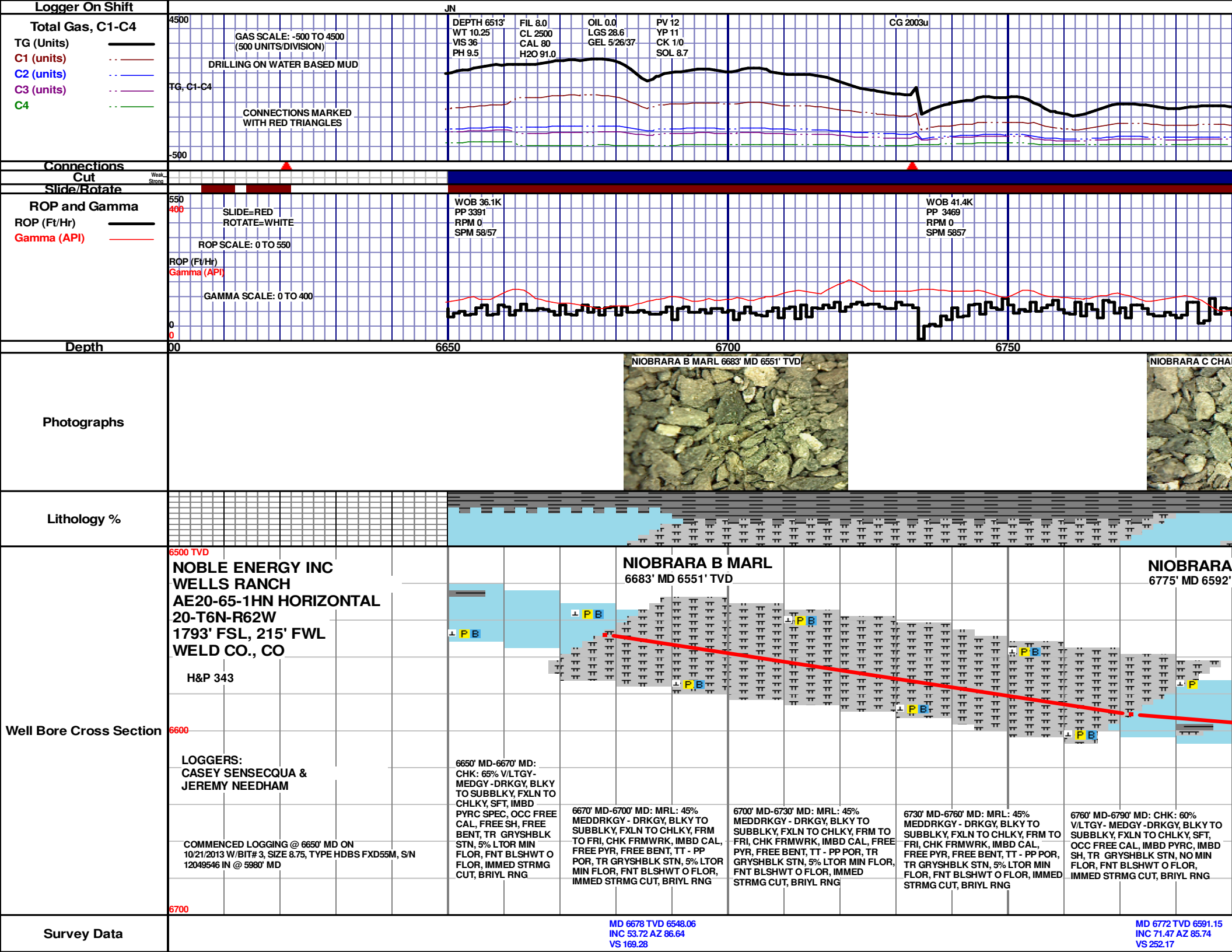
Well Information

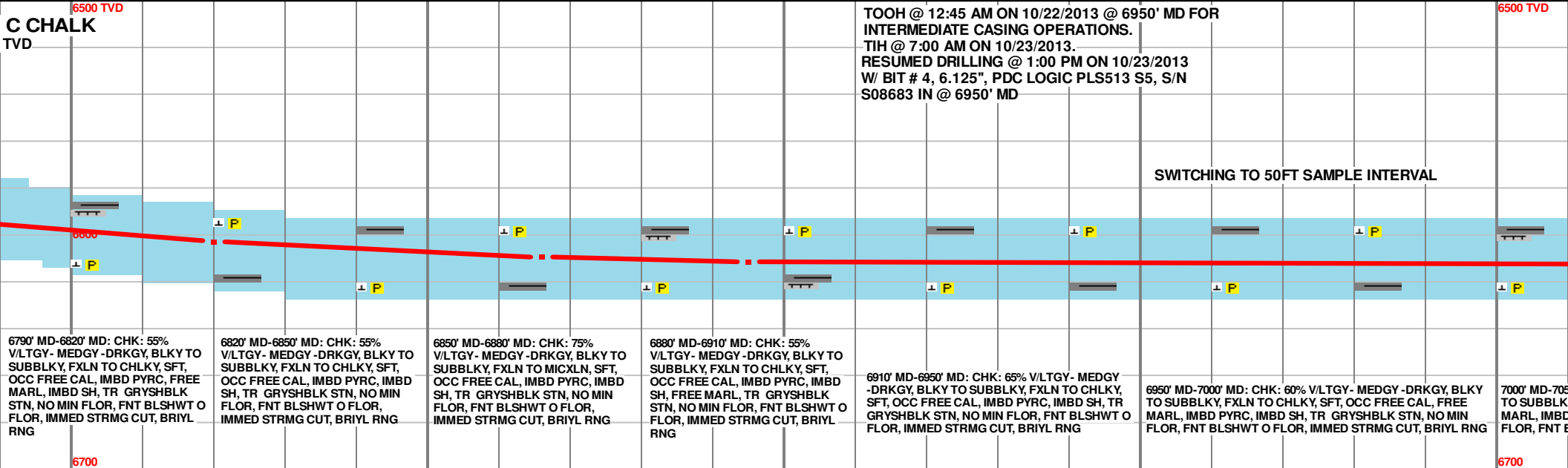
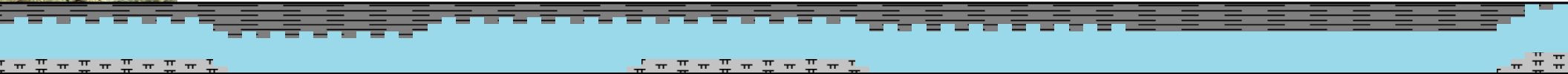
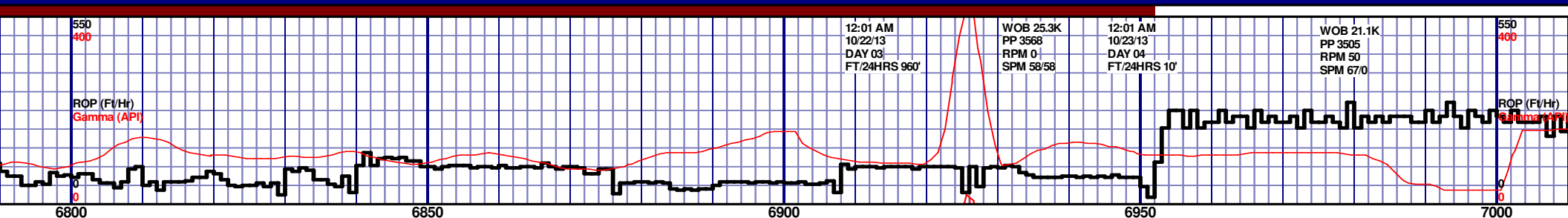
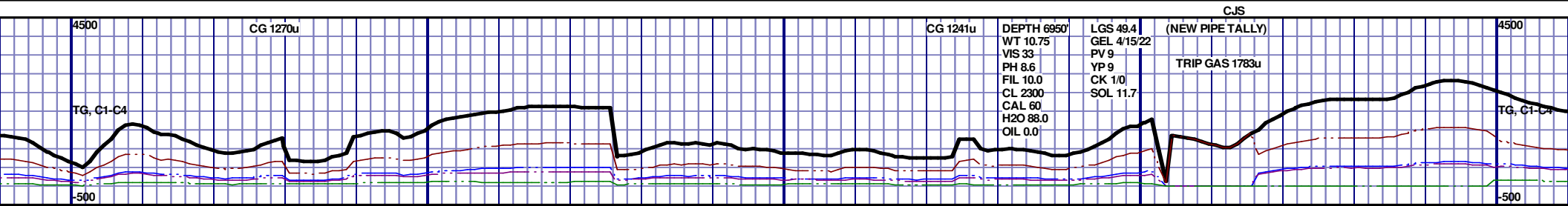
Well Name: Wells Ranch AE20-65-1HN
Horizontal

Location: 20-T6N-R62W
1793' FSL, 215' FWL

County: Weld
State: Colorado

Drilling Rig: H&P 343
Total Depth: 11077' MD
TD Date: October 24, 2013
Formation: Niobrara C Chalk
KB Elevation: 4809'
GR Elevation: 4785'
API Number: 05-123-37221-0000

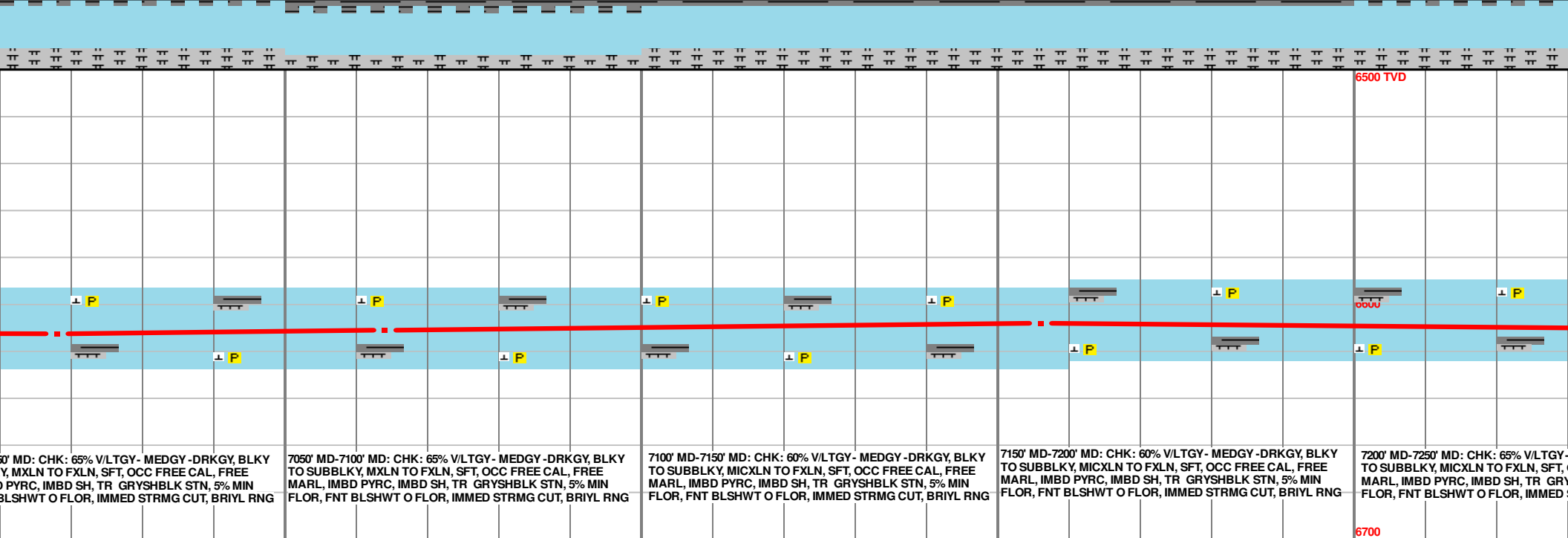
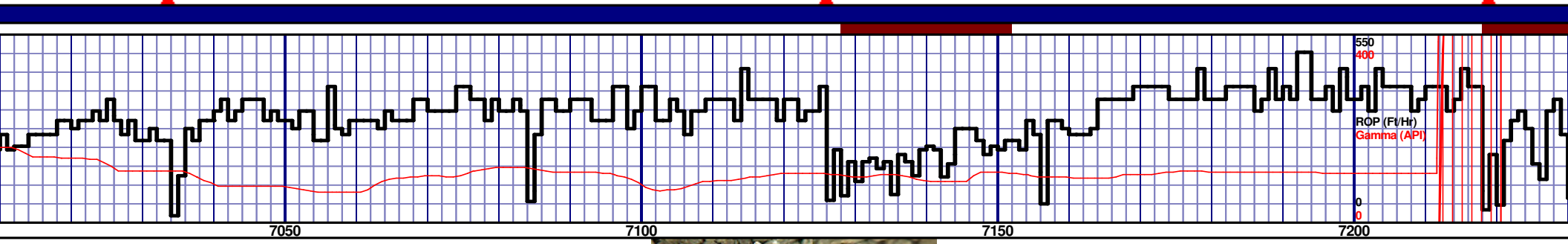
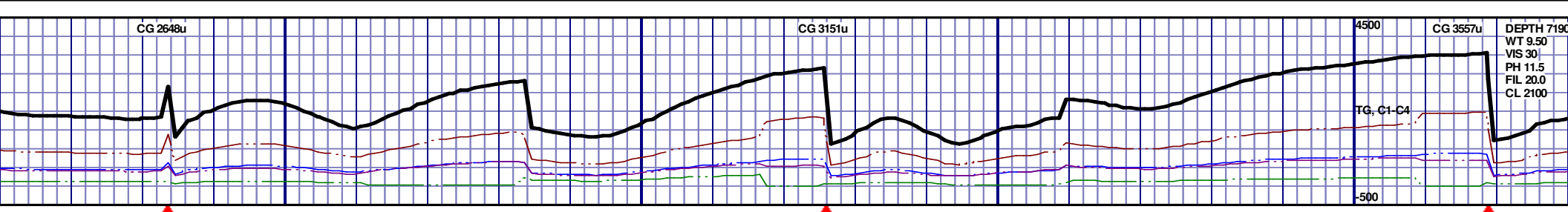




MD 6820 TVD 6602.93
INC 80.1 AZ 87.85
VS 298.48

MD 6866 TVD 6609.39
INC 83.77 AZ 89.43
VS 343.7

MD 6895 TVD 6611.64
INC 87.32 AZ 89.86
VS 372.34



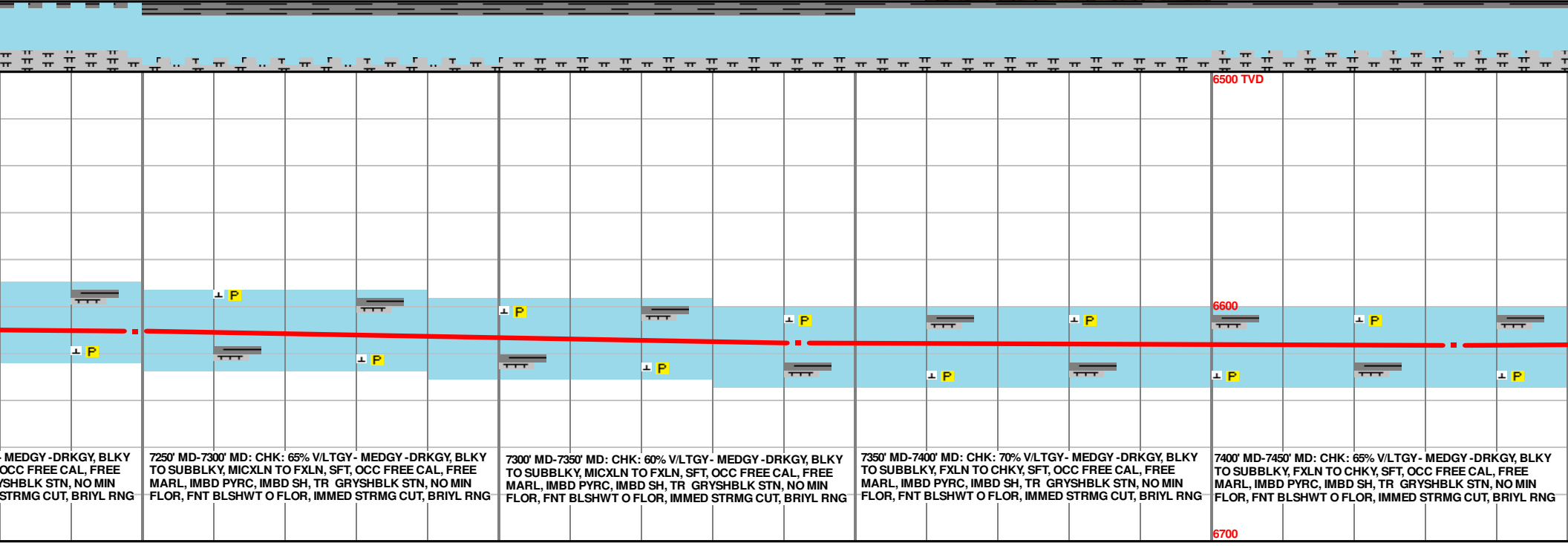
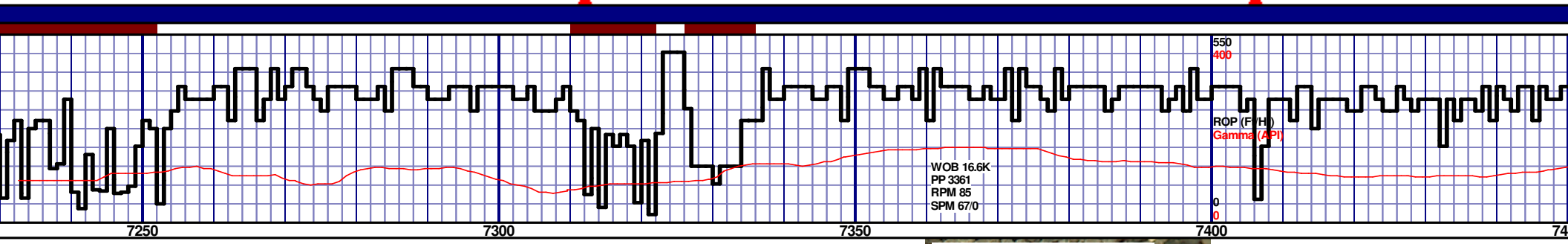
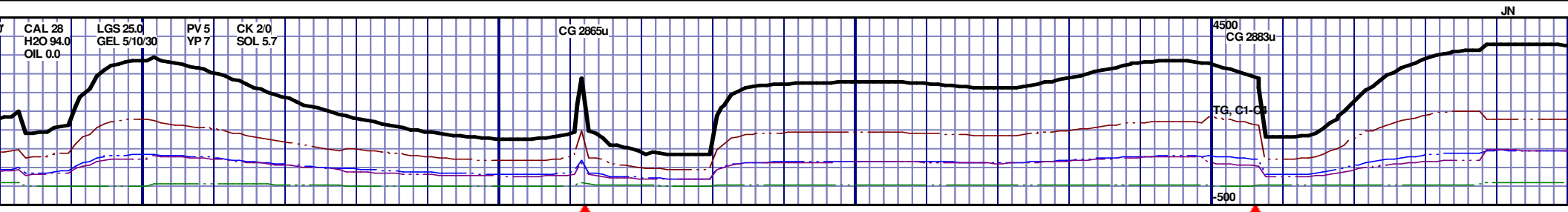
0' MD: CHK: 65% V/LTGY - MEDGY - DRKGY, BLKY
Y, MXLN TO FXLN, SFT, OCC FREE CAL, FREE
PYRC, IMBD SH, TR GRYSBLK STN, 5% MIN
BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

7050' MD-7100' MD: CHK: 65% V/LTGY - MEDGY - DRKGY, BLKY
TO SUBBLKY, MXLN TO FXLN, SFT, OCC FREE CAL, FREE
MARL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, 5% MIN
FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

7100' MD-7150' MD: CHK: 60% V/LTGY - MEDGY - DRKGY, BLKY
TO SUBBLKY, MICXLN TO FXLN, SFT, OCC FREE CAL, FREE
MARL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, 5% MIN
FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

7150' MD-7200' MD: CHK: 60% V/LTGY - MEDGY - DRKGY, BLKY
TO SUBBLKY, MICXLN TO FXLN, SFT, OCC FREE CAL, FREE
MARL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, 5% MIN
FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

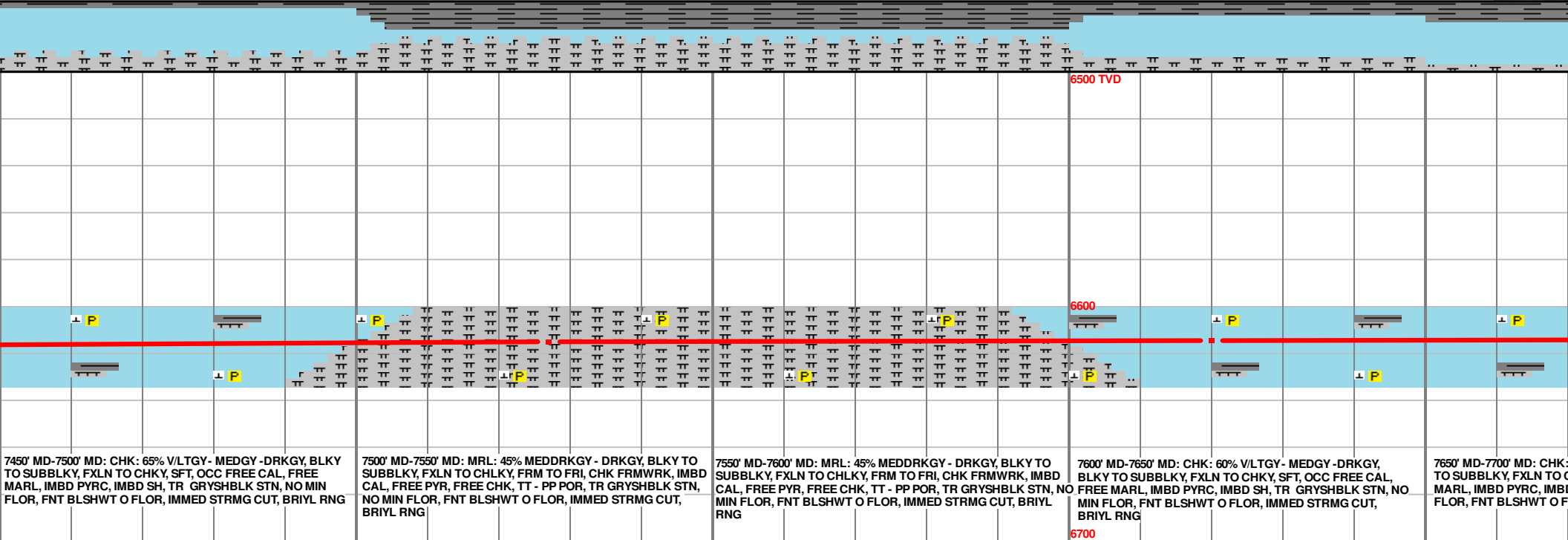
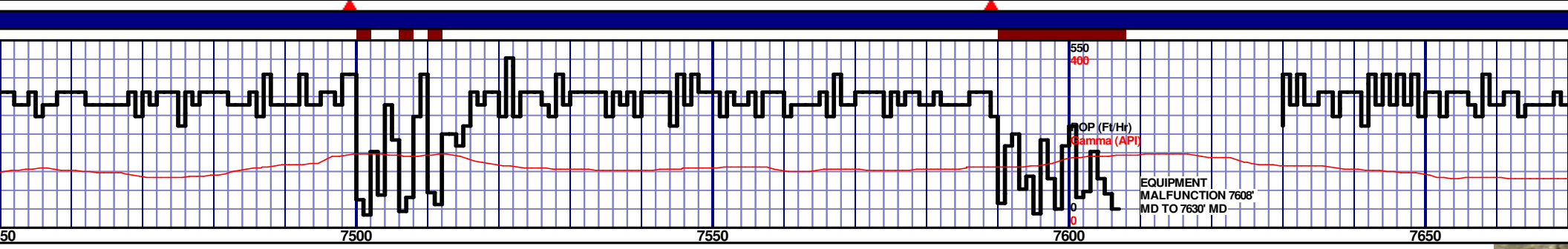
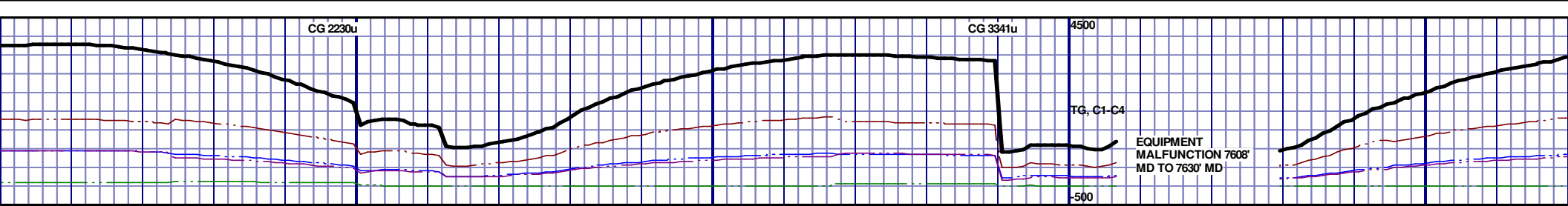
7200' MD-7250' MD: CHK: 65% V/LTGY -
TO SUBBLKY, MICXLN TO FXLN, SFT,
MARL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, 5% MIN
FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

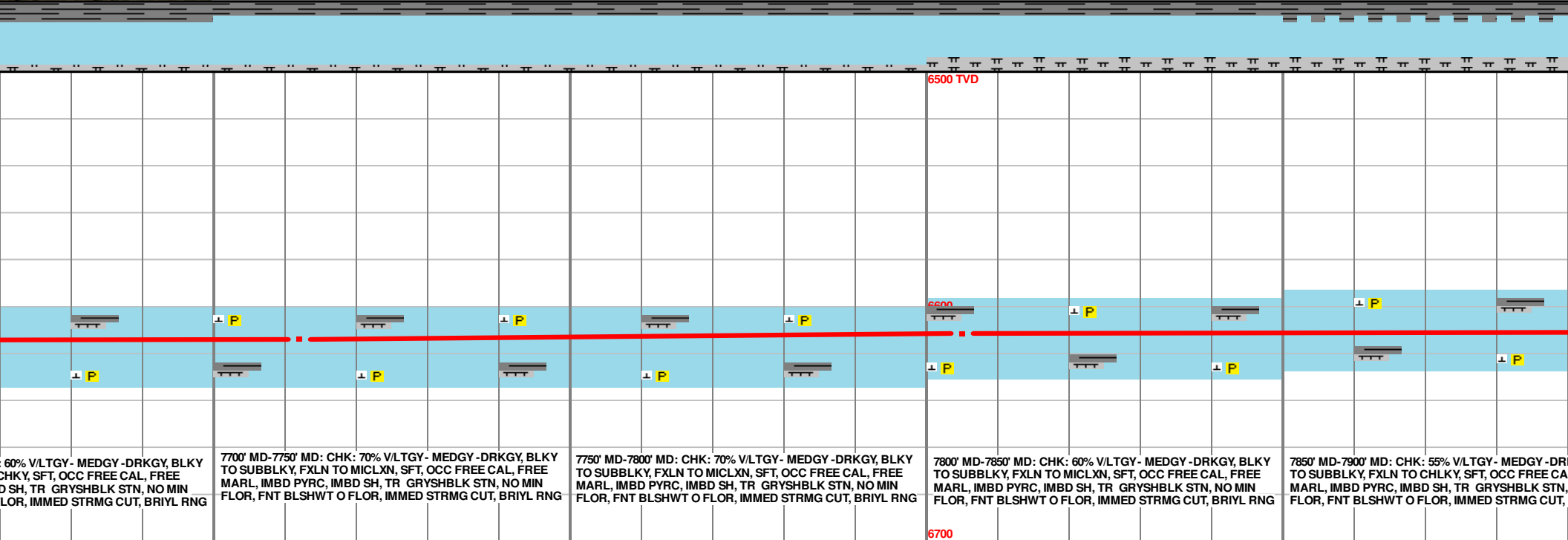
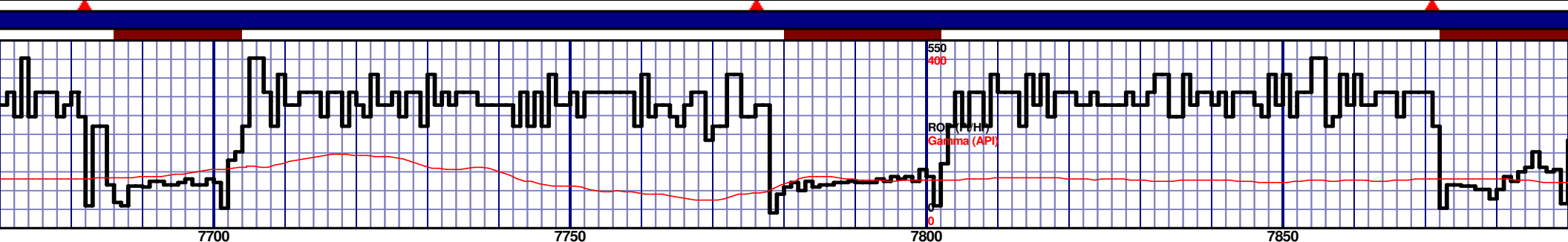
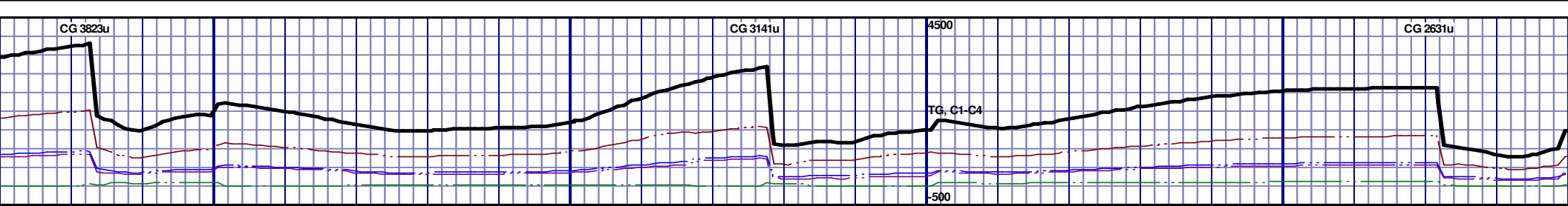


MD 7249 TVD 6610.46
INC 85.67 AZ 89.25
VS 722.68

MD 7342 TVD 6615.37
INC 88.27 AZ 89.08
VS 814.8

MD 7434 TVD 6616.46
INC 90.37 AZ 89.25
VS 906.05





60% V/LTGY - MEDGY - DRKGY, BLKY
CHKY, SFT, OCC FREE CAL, FREE
D SH, TR GRYSBLK STN, NO MIN
FLOR, IMMED STRMG CUT, BRIYL RNG

7700' MD-7750' MD: CHK: 70% V/LTGY - MEDGY - DRKGY, BLKY
TO SUBBLKY, FXLN TO MICLXN, SFT, OCC FREE CAL, FREE
MARL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, NO MIN
FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

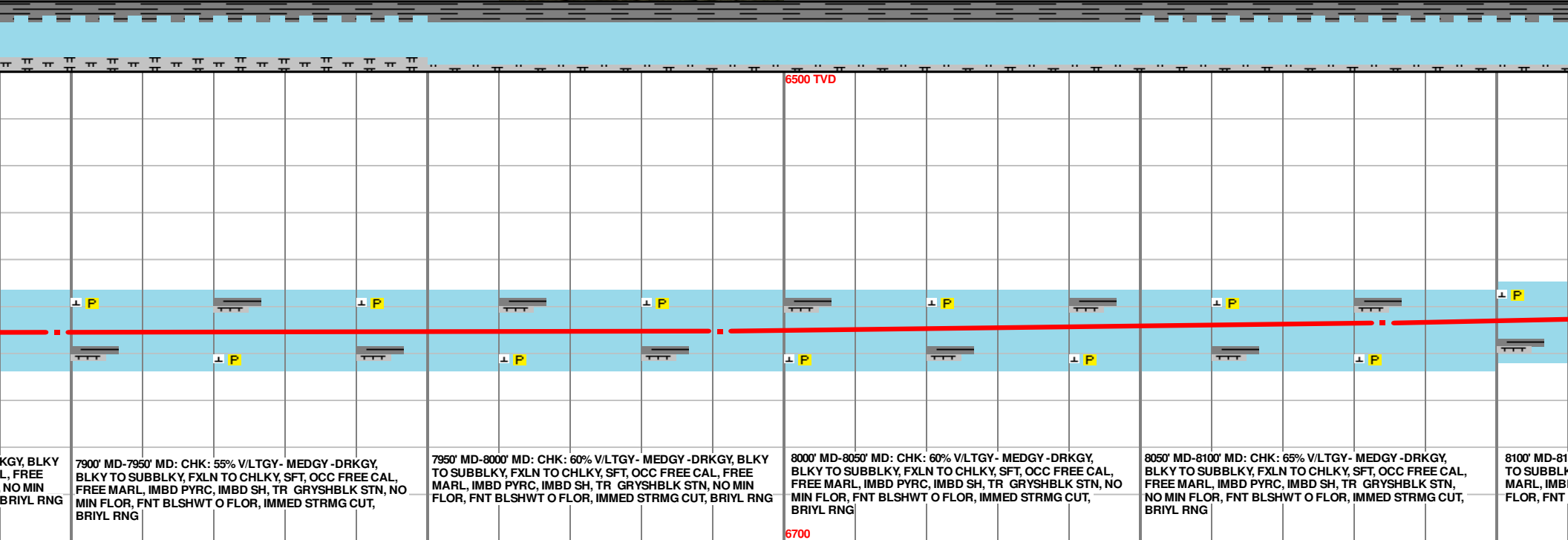
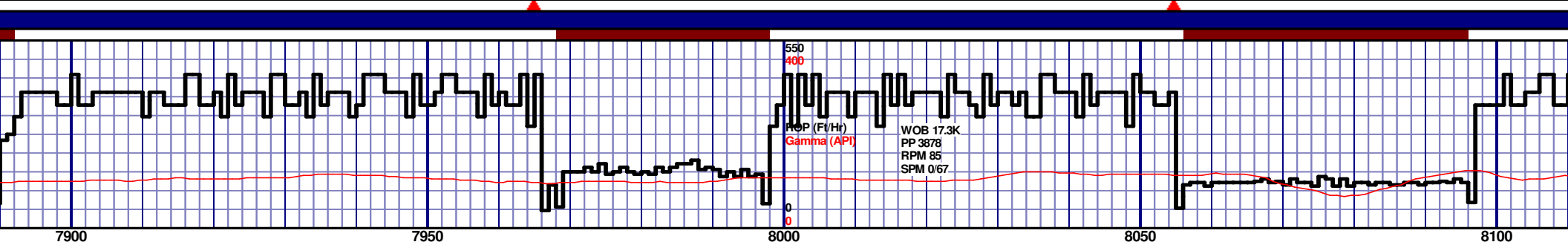
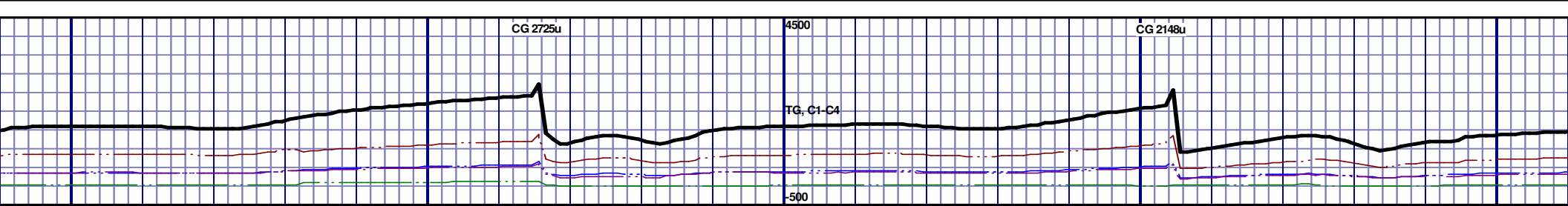
7750' MD-7800' MD: CHK: 70% V/LTGY - MEDGY - DRKGY, BLKY
TO SUBBLKY, FXLN TO MICLXN, SFT, OCC FREE CAL, FREE
MARL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, NO MIN
FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

7800' MD-7850' MD: CHK: 60% V/LTGY - MEDGY - DRKGY, BLKY
TO SUBBLKY, FXLN TO MICLXN, SFT, OCC FREE CAL, FREE
MARL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, NO MIN
FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

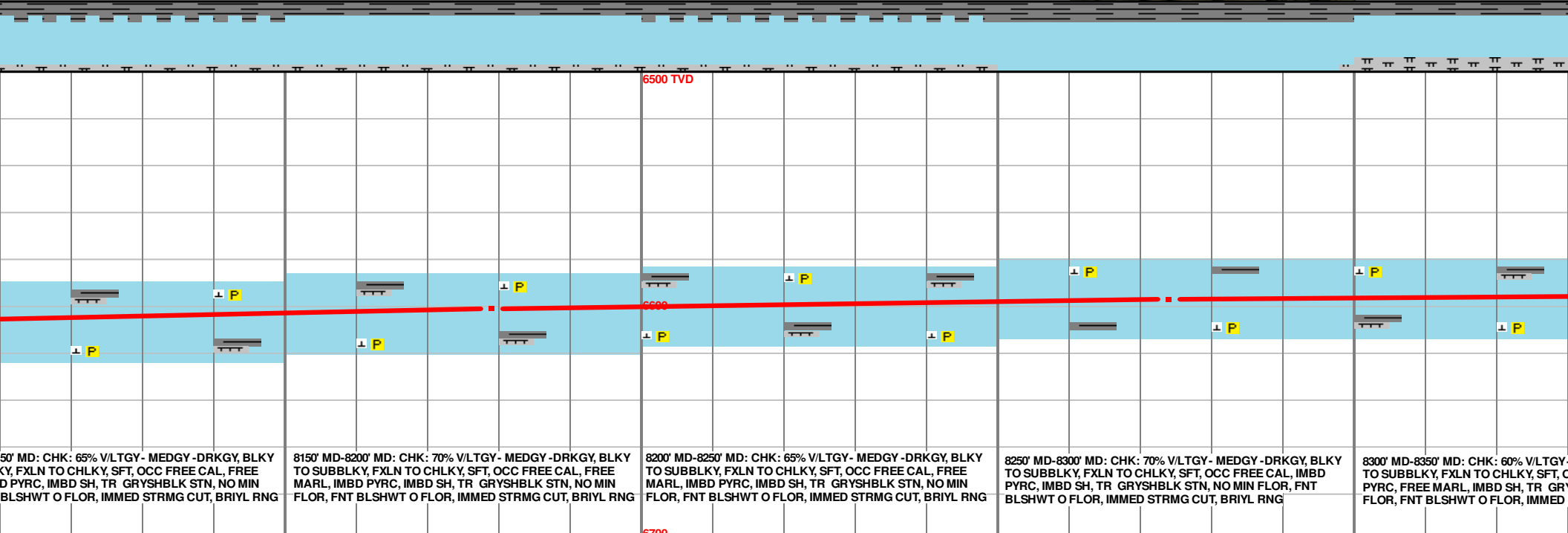
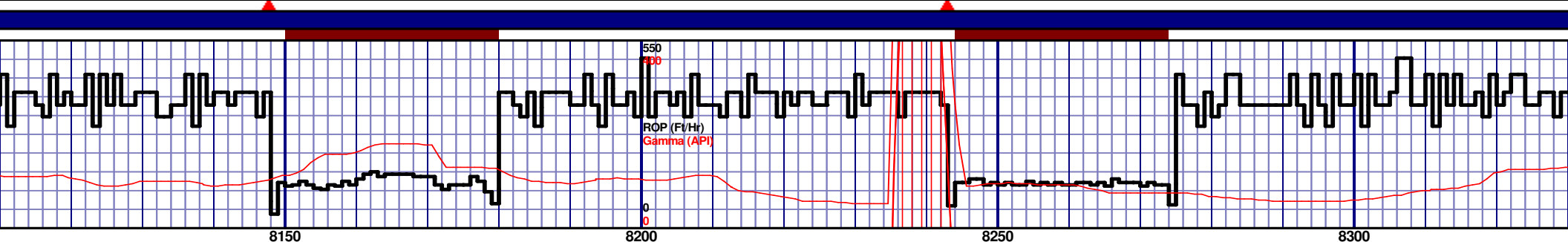
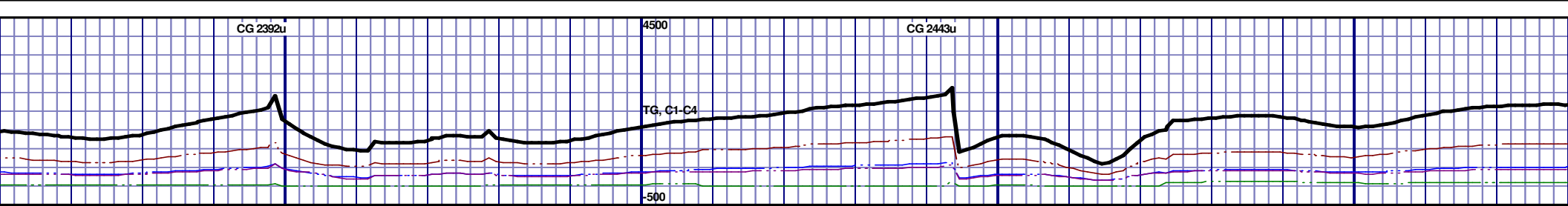
7850' MD-7900' MD: CHK: 55% V/LTGY - MEDGY - DRKGY, BLKY
TO SUBBLKY, FXLN TO CHLKY, SFT, OCC FREE CAL, FREE
MARL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, NO MIN
FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

MD 7712 TVD 6613.92
INC 92.22 AZ 87.42
VS 1182.64

MD 7805 TVD 6611.61
INC 90.62 AZ 85.94
VS 1275.28



<p>7900' MD-7950' MD: CHK: 55% V/LTGY- MEDGY-DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, OCC FREE CAL, FREE MARL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>7950' MD-8000' MD: CHK: 60% V/LTGY- MEDGY-DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, OCC FREE CAL, FREE MARL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>8000' MD-8050' MD: CHK: 60% V/LTGY- MEDGY-DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, OCC FREE CAL, FREE MARL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>8050' MD-8100' MD: CHK: 65% V/LTGY- MEDGY-DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, OCC FREE CAL, FREE MARL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>8100' MD-8150' MD: CHK: 65% V/LTGY- MEDGY-DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, OCC FREE CAL, FREE MARL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG</p>
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50' MD: CHK: 65% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, OCC FREE CAL, FREE PYRC, IMBD SH, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

8150' MD-8200' MD: CHK: 70% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, OCC FREE CAL, FREE MARL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

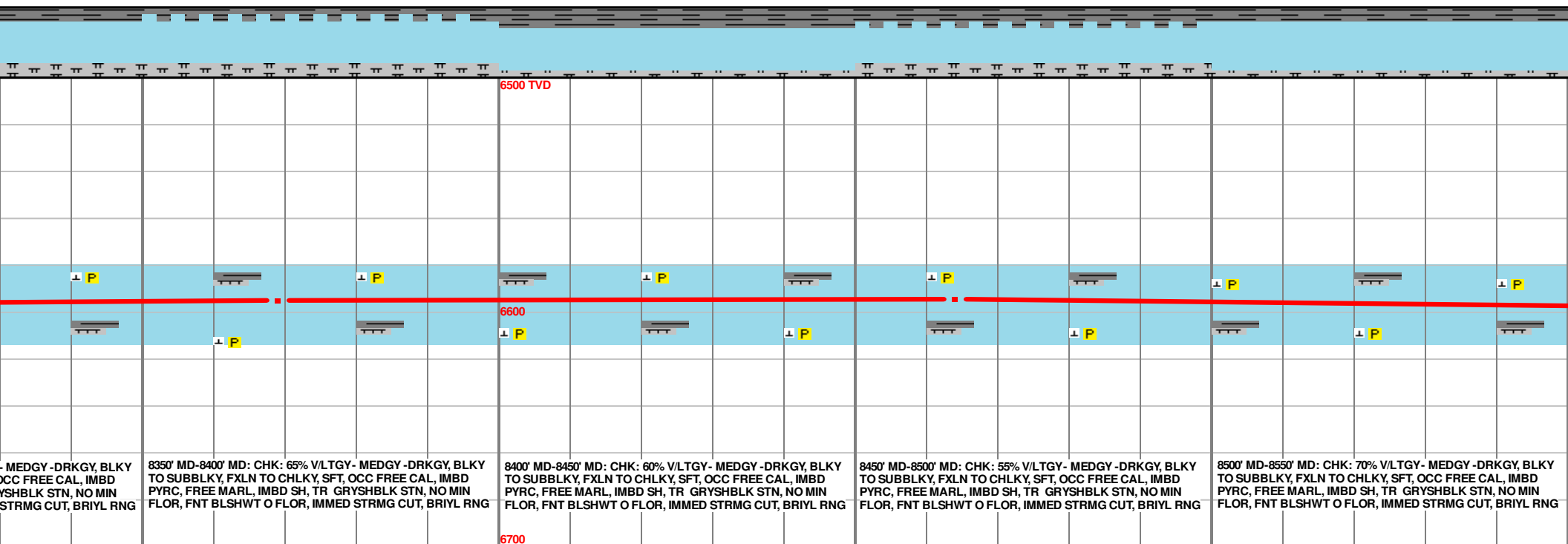
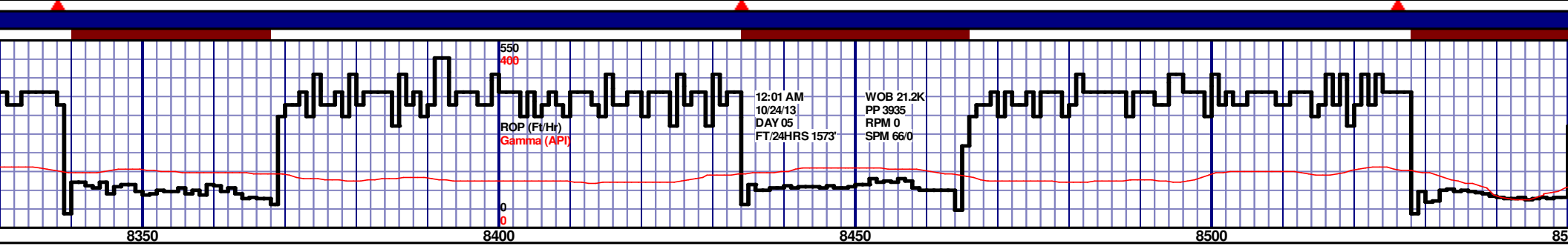
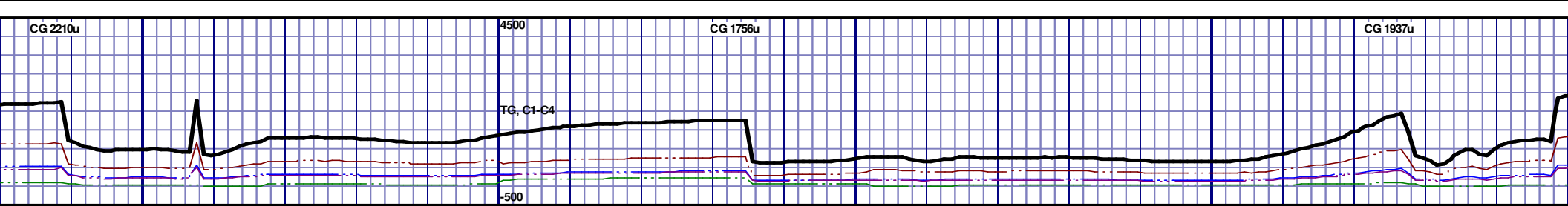
8200' MD-8250' MD: CHK: 65% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, OCC FREE CAL, FREE MARL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

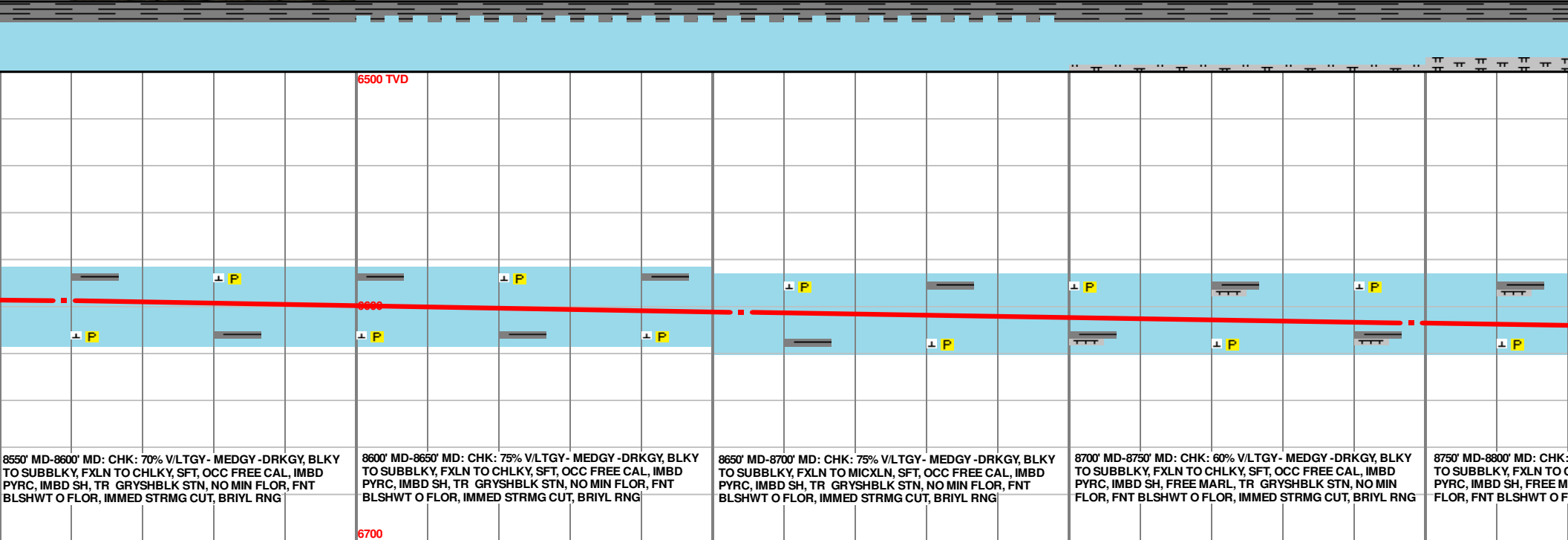
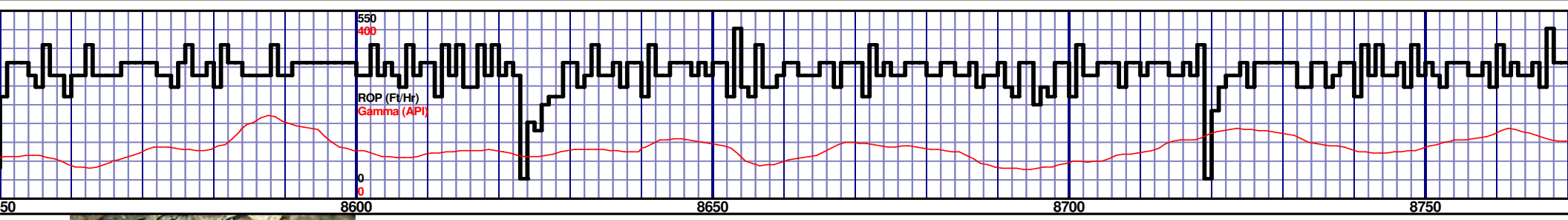
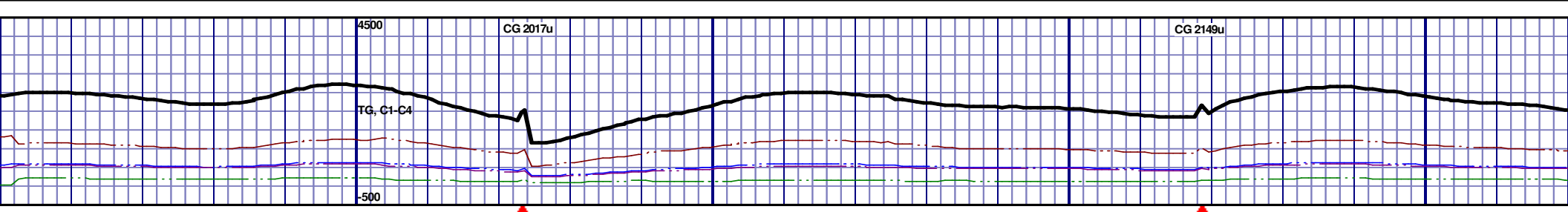
8250' MD-8300' MD: CHK: 70% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, OCC FREE CAL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

8300' MD-8350' MD: CHK: 60% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, OCC FREE CAL, FREE MARL, IMBD SH, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

MD 8179 TVD 6601.2
INC 92.99 AZ 89.53
VS 1647.86

MD 8274 TVD 6597.21
INC 91.82 AZ 91.97
VS 1741.64





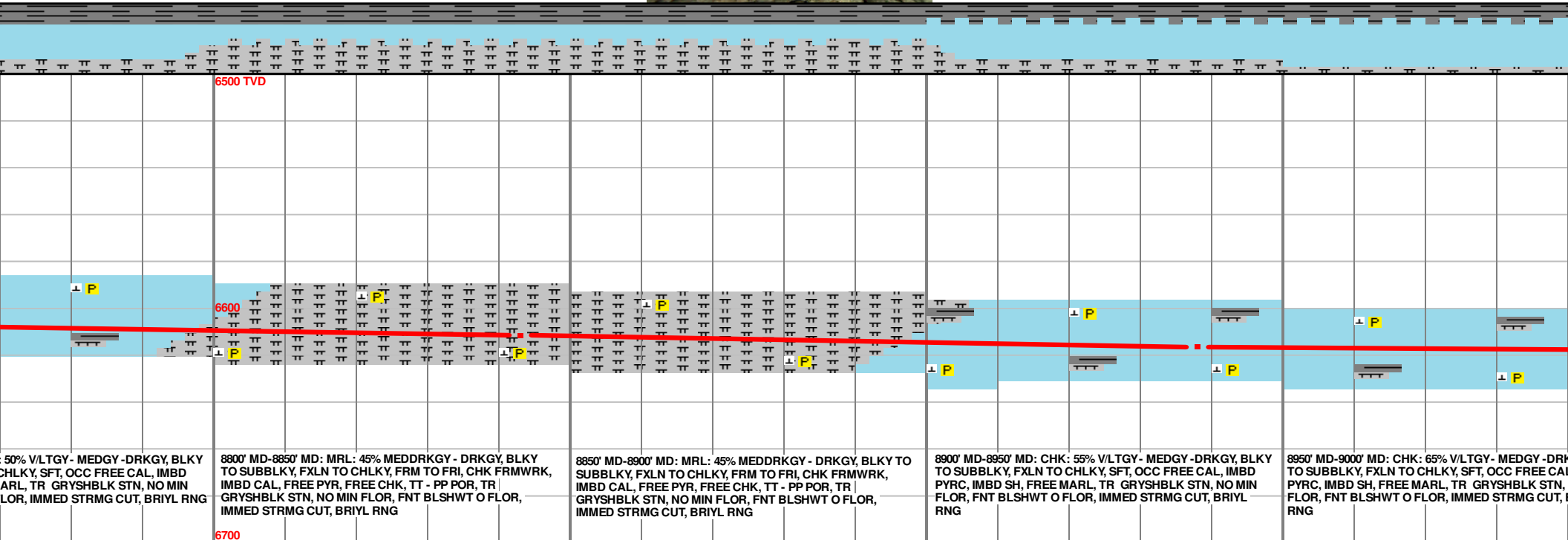
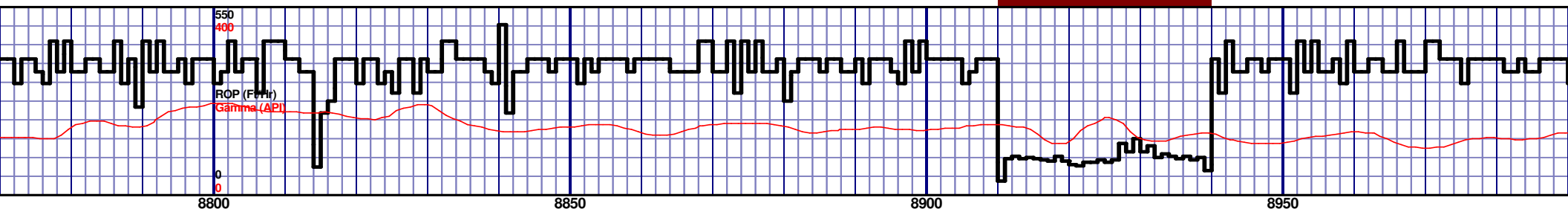
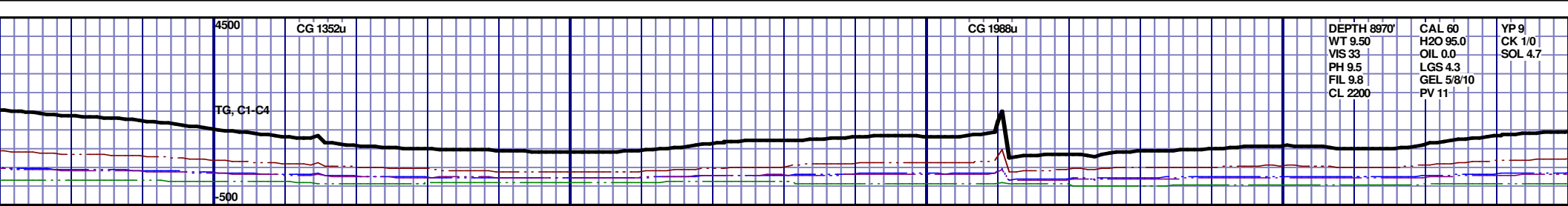
8550' MD-8600' MD: CHK: 70% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, OCC FREE CAL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

8600' MD-8650' MD: CHK: 75% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, OCC FREE CAL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

8650' MD-8700' MD: CHK: 75% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO MICXLN, SFT, OCC FREE CAL, IMBD PYRC, IMBD SH, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

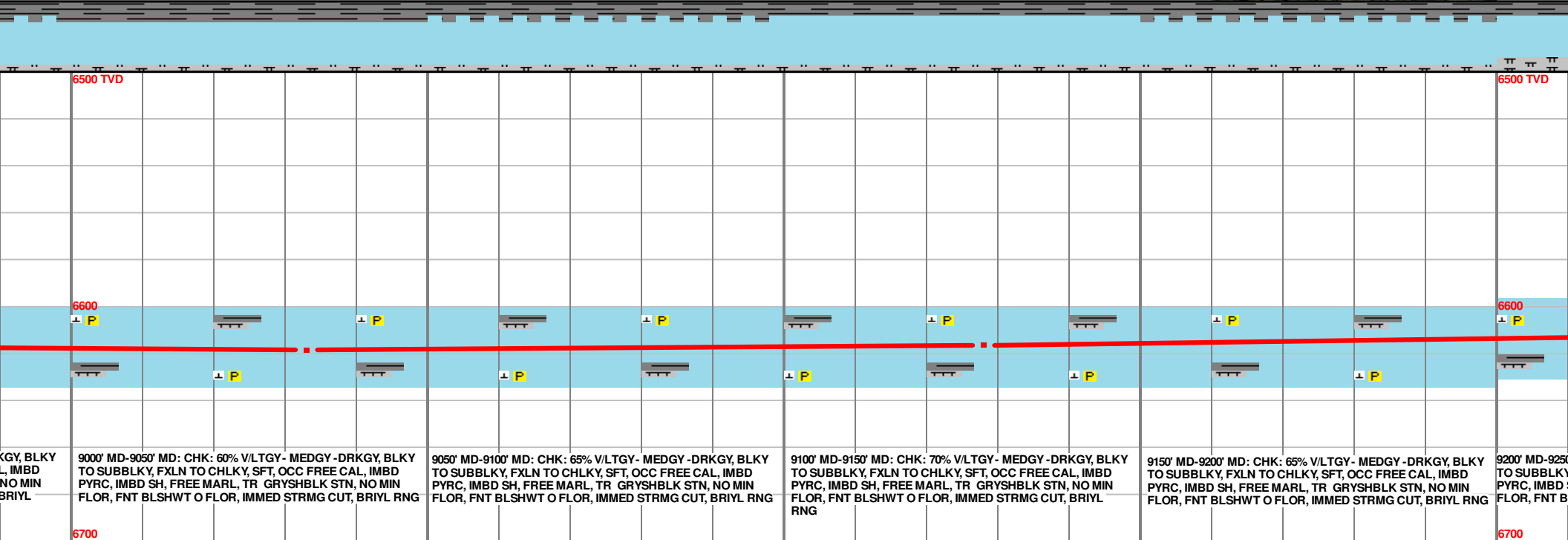
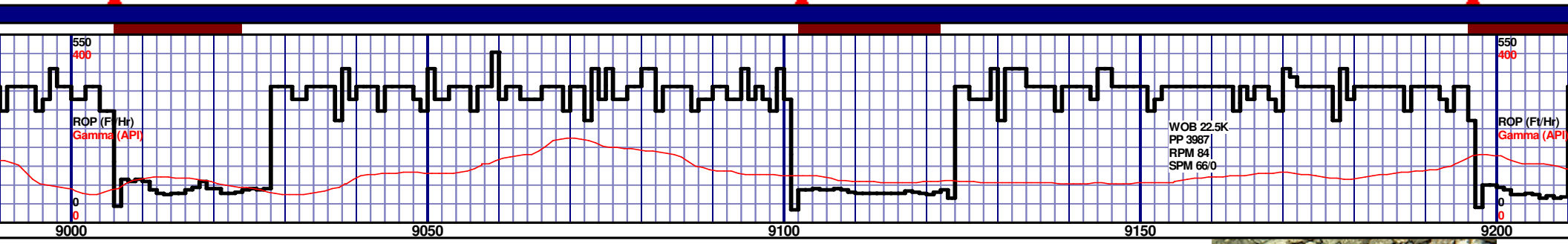
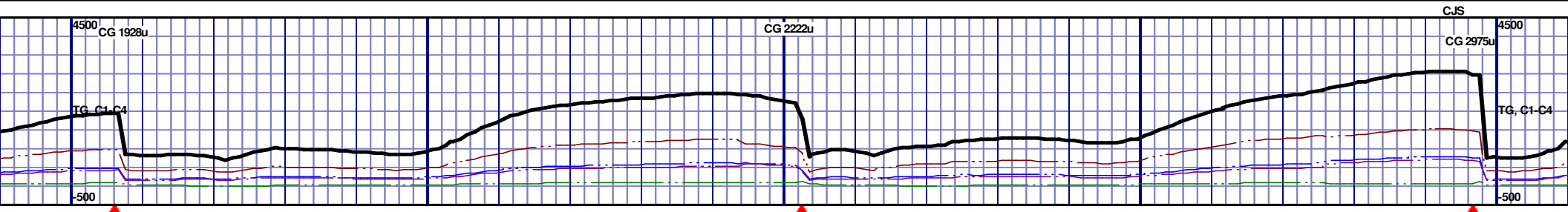
8700' MD-8750' MD: CHK: 60% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, OCC FREE CAL, IMBD PYRC, IMBD SH, FREE MARL, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

8750' MD-8800' MD: CHK: TO SUBBLKY, FXLN TO CHLKY, SFT, OCC FREE CAL, IMBD PYRC, IMBD SH, FREE MARL, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG



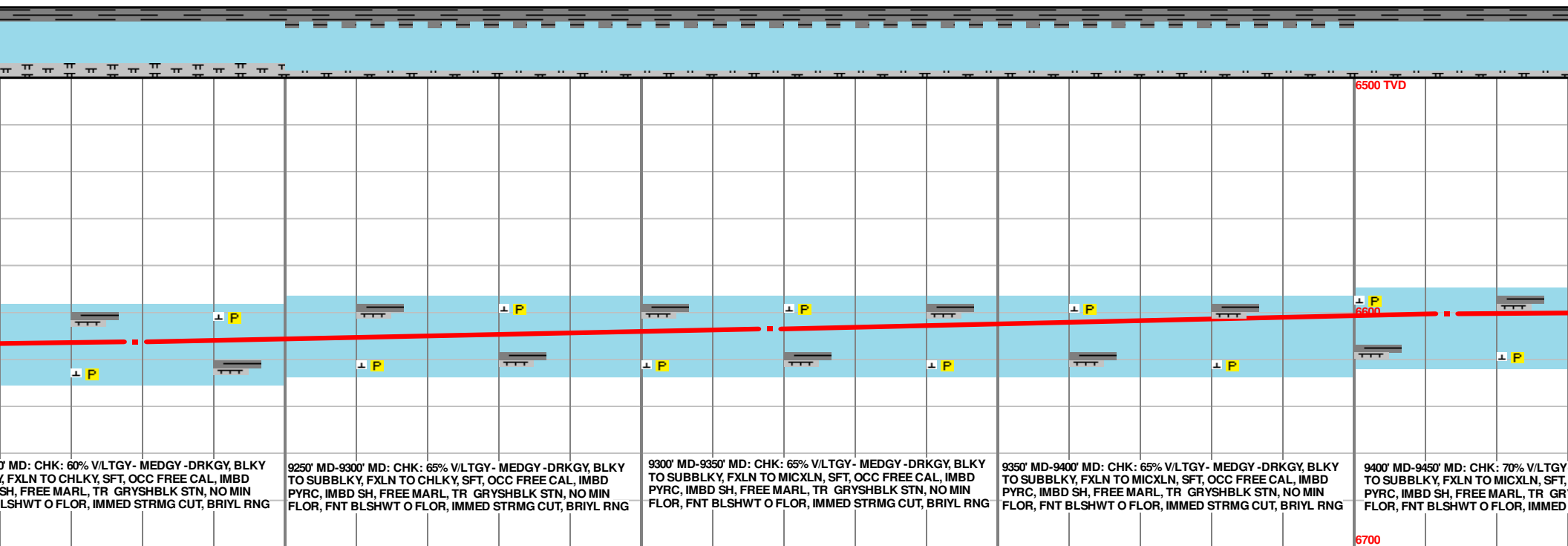
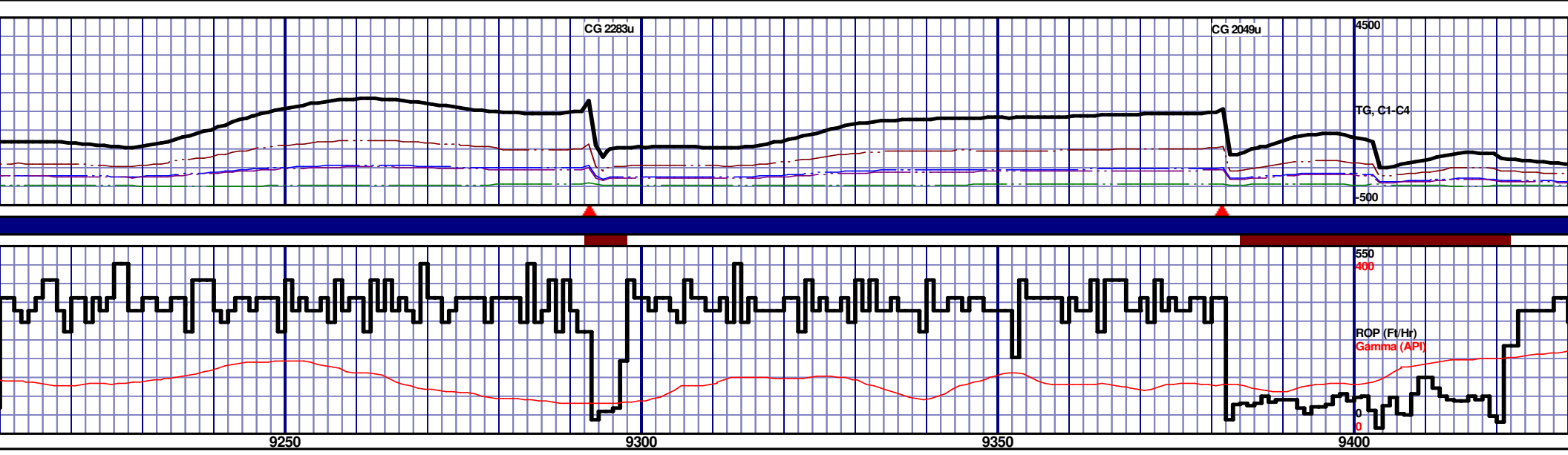
MD 8843 TVD 6611.38
INC 86.63 AZ 87.15
VS 2304.38

MD 8938 TVD 6616.29
INC 87.44 AZ 90.17
VS 2398.59



MD 9033 TVD 6618.59
INC 89.78 AZ 89.5
VS 2492.64

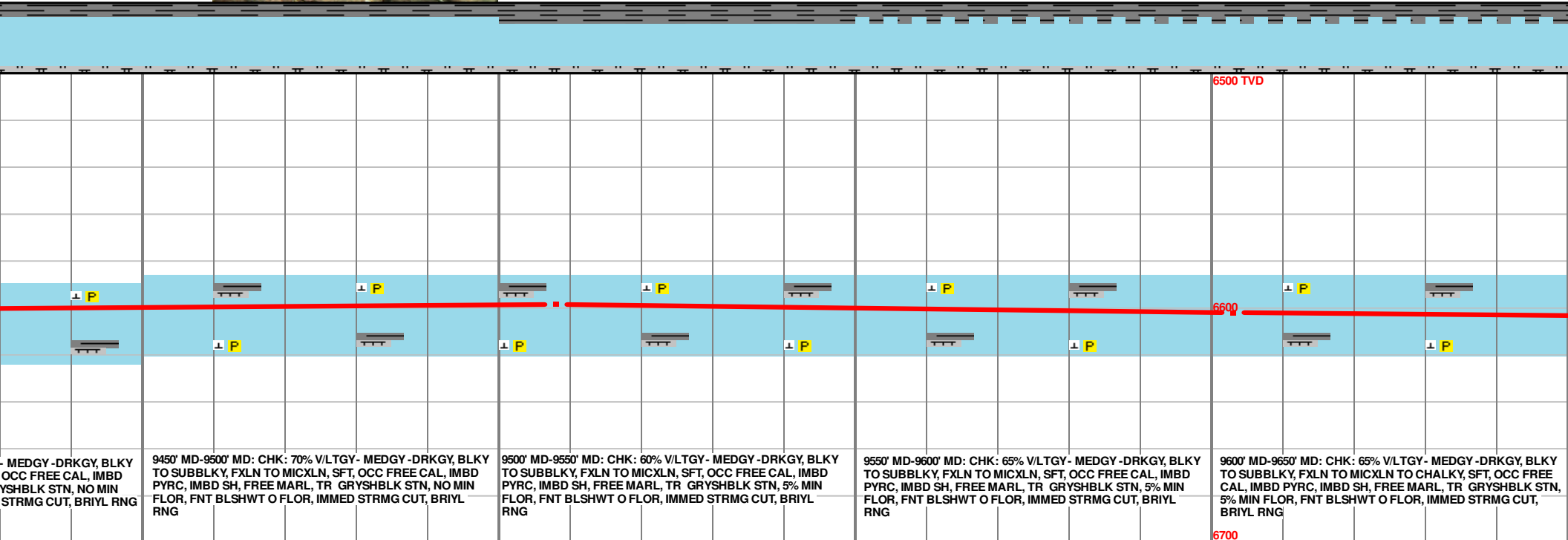
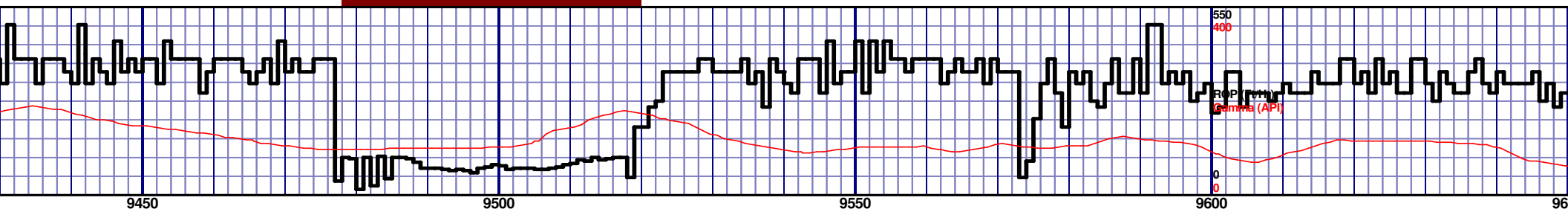
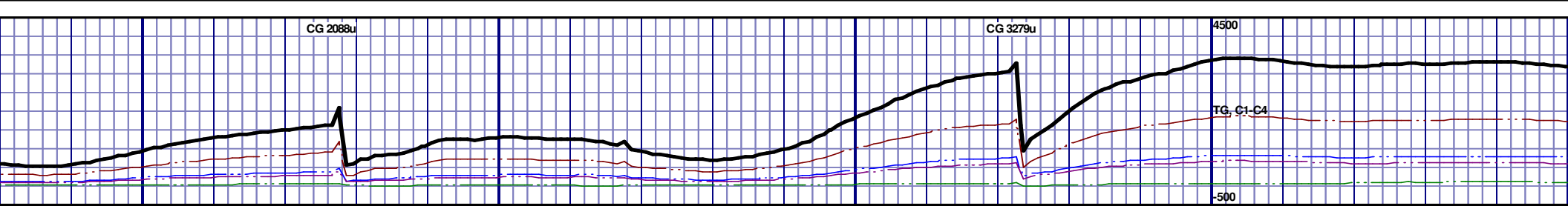
MD 9128 TVD 6616.68
INC 92.53 AZ 89.47
VS 2586.78



MD 9229 TVD 6612.47
INC 92.25 AZ 88.35
VS 2686.94

MD 9318 TVD 6607.1
INC 94.54 AZ 87.86
VS 2775.26

MD 9413 TVD 6600.35
INC 93.61 AZ 87.87
VS 2869.51



MEDGY-DRKGY, BLKY
OCC FREE CAL, IMBD
YSHBLK STN, NO MIN
STRMG CUT, BRIYL RNG

9450' MD-9500' MD: CHK: 70% V/LTGY- MEDGY-DRKGY, BLKY
TO SUBBLKY, FXLN TO MICXLN, SFT, OCC FREE CAL, IMBD
PYRC, IMBD SH, FREE MARL, TR GRYSHBLK STN, NO MIN
FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL
RNG

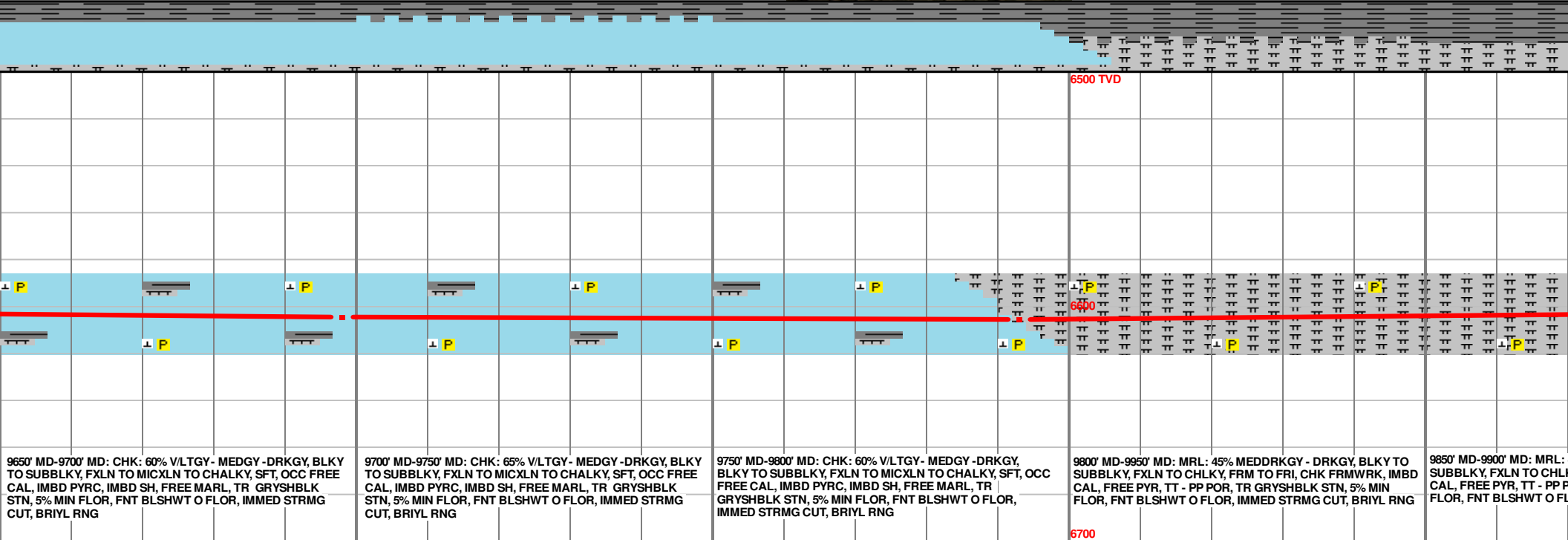
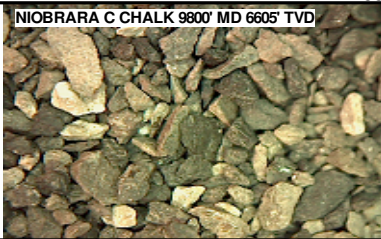
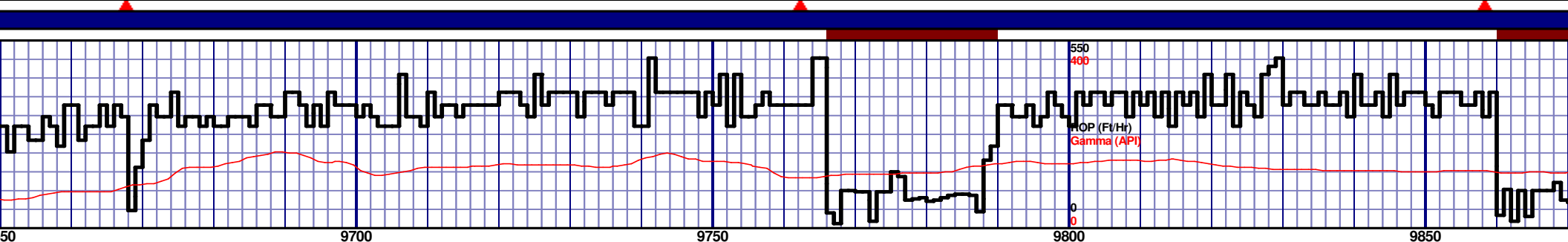
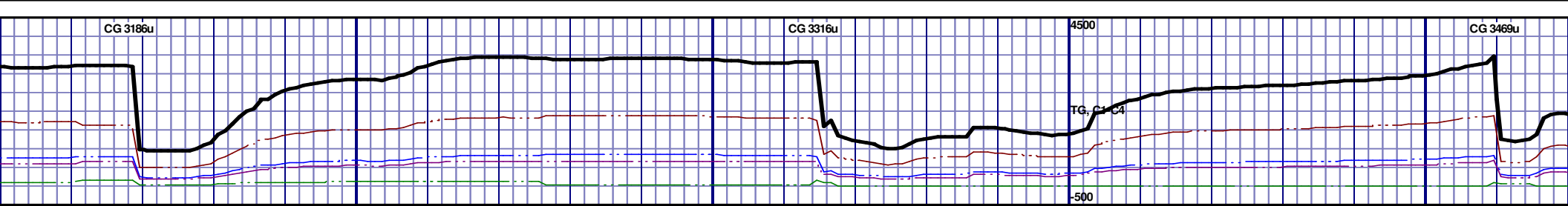
9500' MD-9550' MD: CHK: 60% V/LTGY- MEDGY-DRKGY, BLKY
TO SUBBLKY, FXLN TO MICXLN, SFT, OCC FREE CAL, IMBD
PYRC, IMBD SH, FREE MARL, TR GRYSHBLK STN, 5% MIN
FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL
RNG

9550' MD-9600' MD: CHK: 65% V/LTGY- MEDGY-DRKGY, BLKY
TO SUBBLKY, FXLN TO MICXLN, SFT, OCC FREE CAL, IMBD
PYRC, IMBD SH, FREE MARL, TR GRYSHBLK STN, 5% MIN
FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL
RNG

9600' MD-9650' MD: CHK: 65% V/LTGY- MEDGY-DRKGY, BLKY
TO SUBBLKY, FXLN TO MICXLN TO CHALKY, SFT, OCC FREE
CAL, IMBD PYRC, IMBD SH, FREE MARL, TR GRYSHBLK STN,
5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT,
BRIYL RNG

MD 9508 TVD 6598.73
INC 88.33 AZ 87.36
VS 2963.99

MD 9603 TVD 6601.75
INC 88.02 AZ 87.03
VS 3058.53



9650' MD-9700' MD: CHK: 60% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO MICXLN TO CHALKY, SFT, OCC FREE CAL, IMBD PYRC, IMBD SH, FREE MARL, TR GRYSBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

9700' MD-9750' MD: CHK: 65% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO MICXLN TO CHALKY, SFT, OCC FREE CAL, IMBD PYRC, IMBD SH, FREE MARL, TR GRYSBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

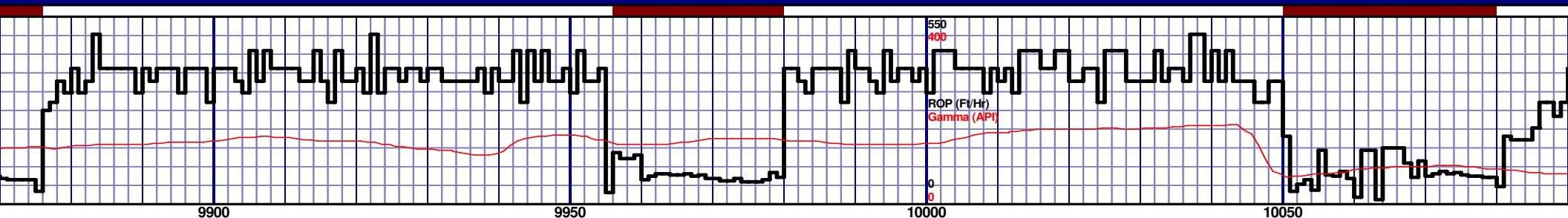
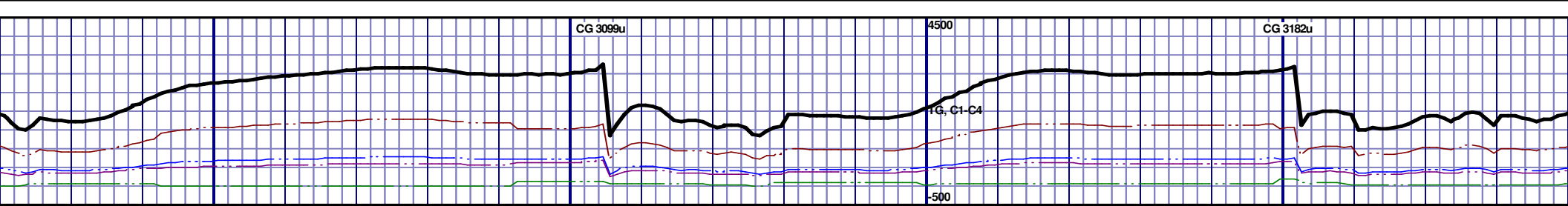
9750' MD-9800' MD: CHK: 60% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO MICXLN TO CHALKY, SFT, OCC FREE CAL, IMBD PYRC, IMBD SH, FREE MARL, TR GRYSBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

9800' MD-9850' MD: MRL: 45% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, TT - PP POR, TR GRYSBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

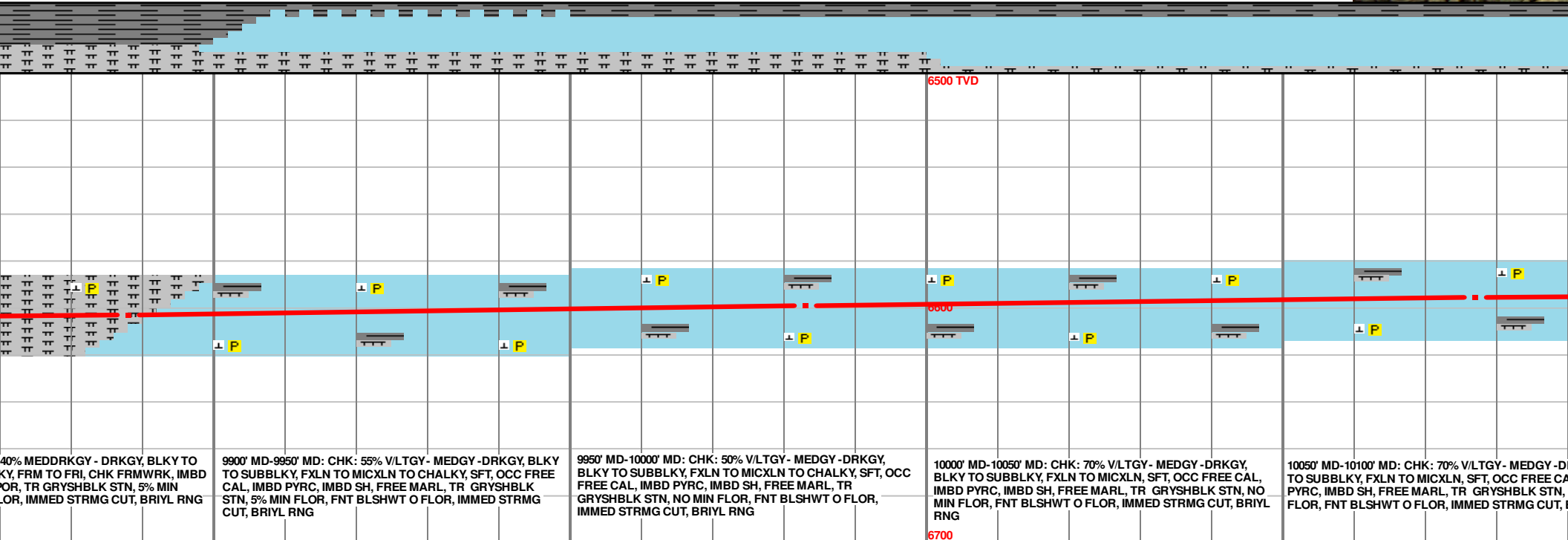
9850' MD-9900' MD: MRL: SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, TT - PP POR, TR GRYSBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

MD 9698 TVD 6604.47
INC 88.71 AZ 86.49
VS 3153.15

MD 9793 TVD 6605.46
INC 90.09 AZ 87.76
VS 3247.75



NIOBRARA C CHALK 10100' MD 6594' T



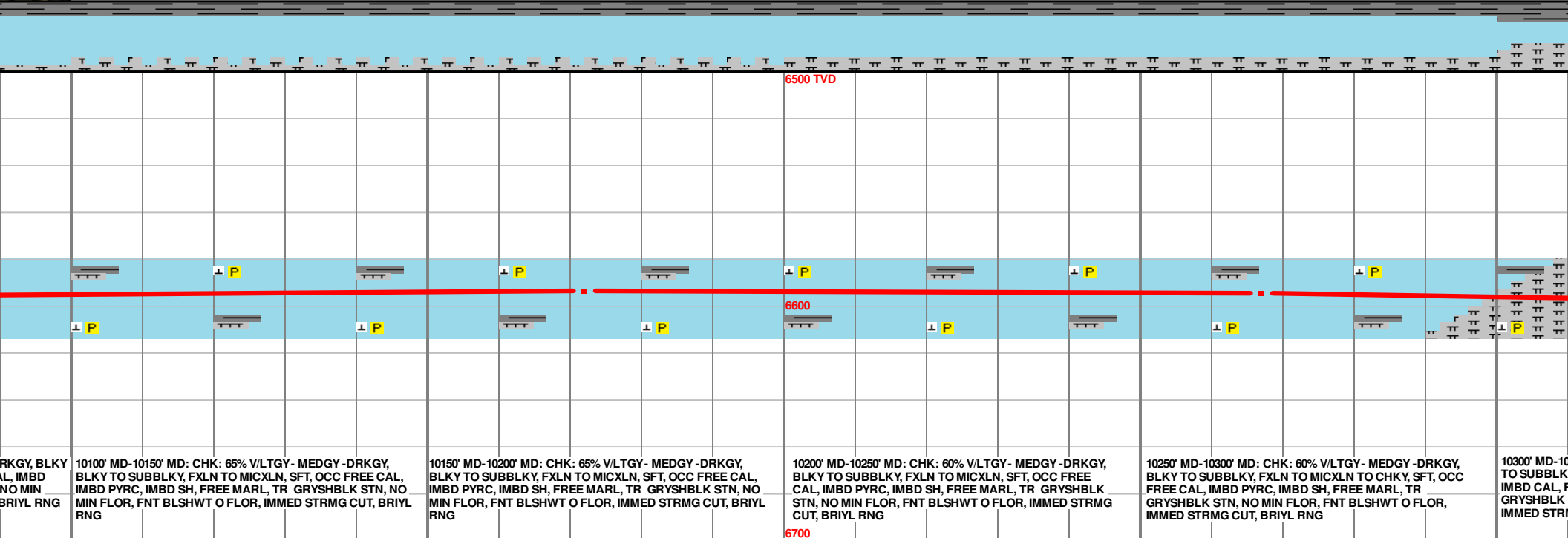
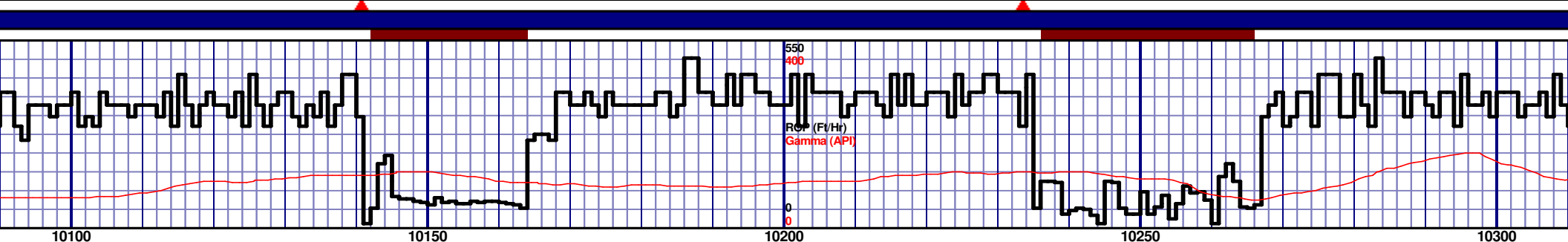
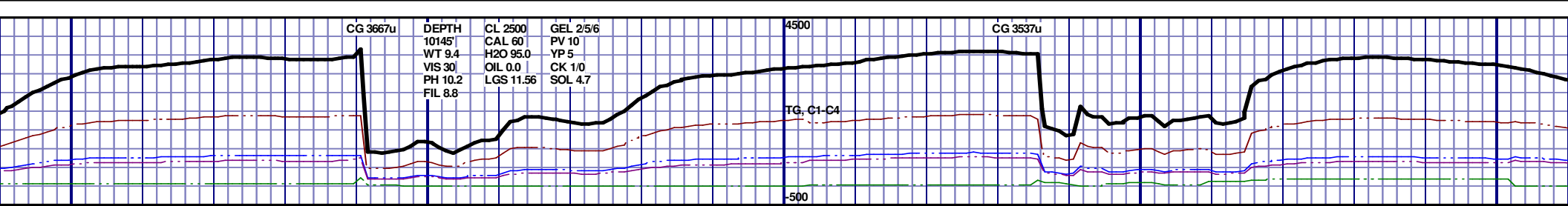
40% MEDDRKGY - DRKGY, BLKY TO KY, FRM TO FRI, CHK FRMWRK, IMBD POR, TR GRYSBLK STN, 5% MIN FLOR, IMMED STRMG CUT, BRIYL RNG

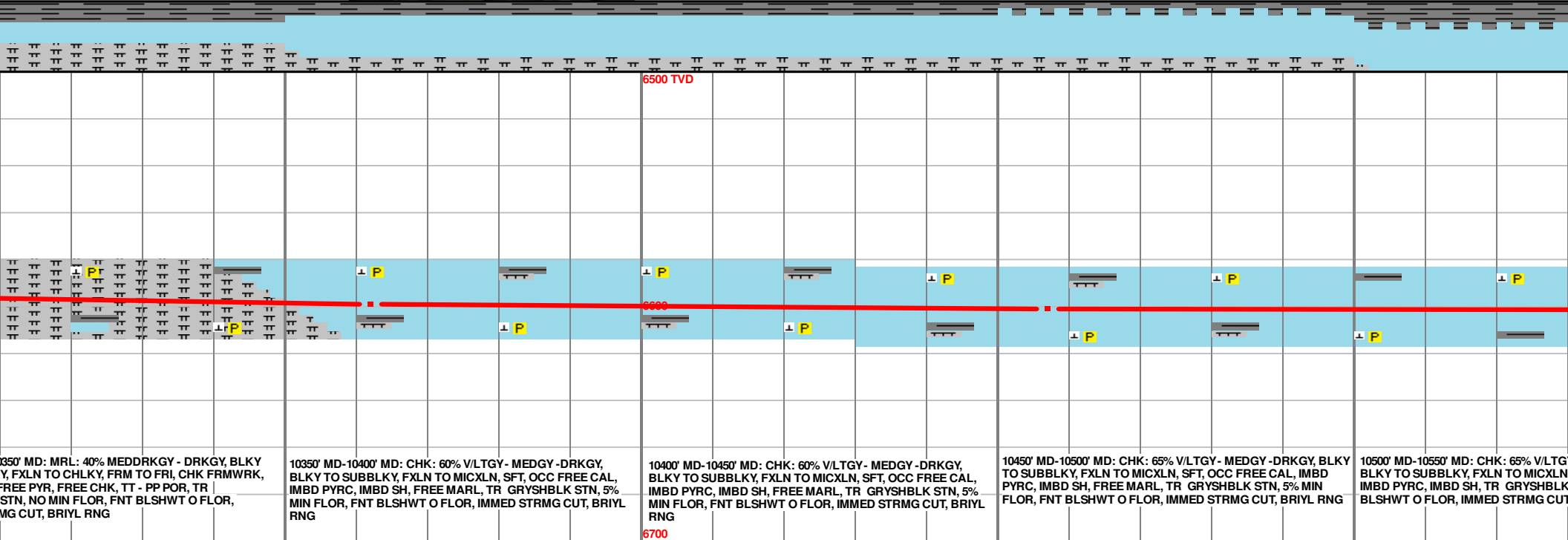
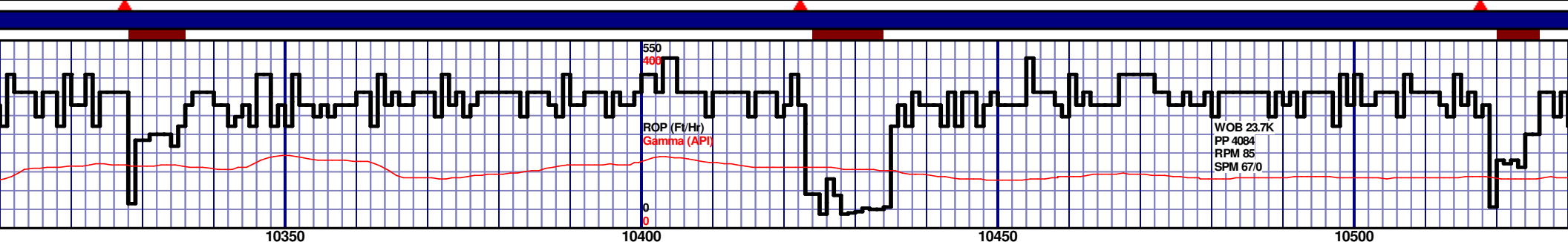
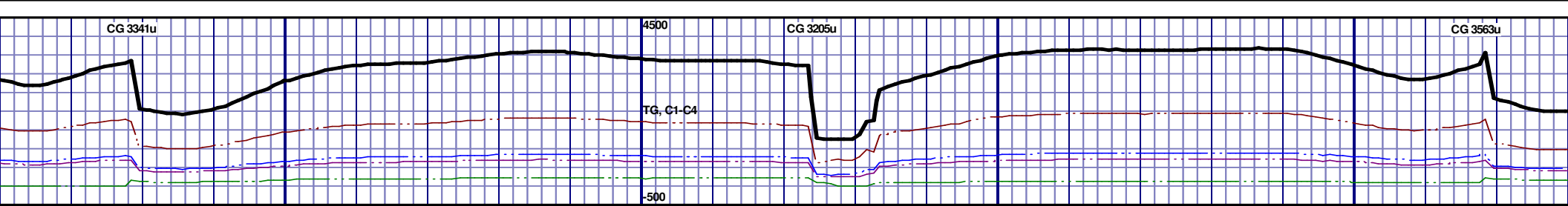
9900' MD-9950' MD: CHK: 55% V/LTGY - MEDGY-DRKGY, BLKY TO SUBBLKY, FXLN TO MICXLN TO CHALKY, SFT, OCC FREE CAL, IMBD PYRC, IMBD SH, FREE MARL, TR GRYSBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

9950' MD-10000' MD: CHK: 50% V/LTGY - MEDGY-DRKGY, BLKY TO SUBBLKY, FXLN TO MICXLN TO CHALKY, SFT, OCC FREE CAL, IMBD PYRC, IMBD SH, FREE MARL, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

10000' MD-10050' MD: CHK: 70% V/LTGY - MEDGY -DRKGY, BLKY TO SUBBLKY, FXLN TO MICXLN, SFT, OCC FREE CAL, IMBD PYRC, IMBD SH, FREE MARL, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

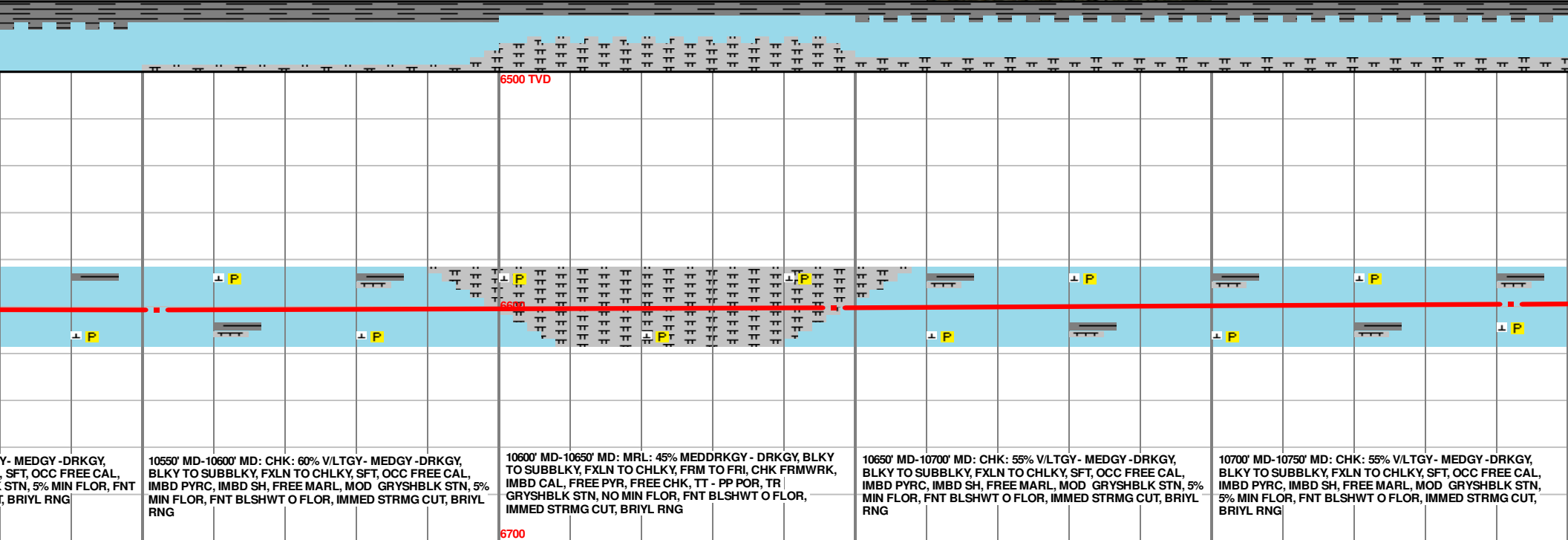
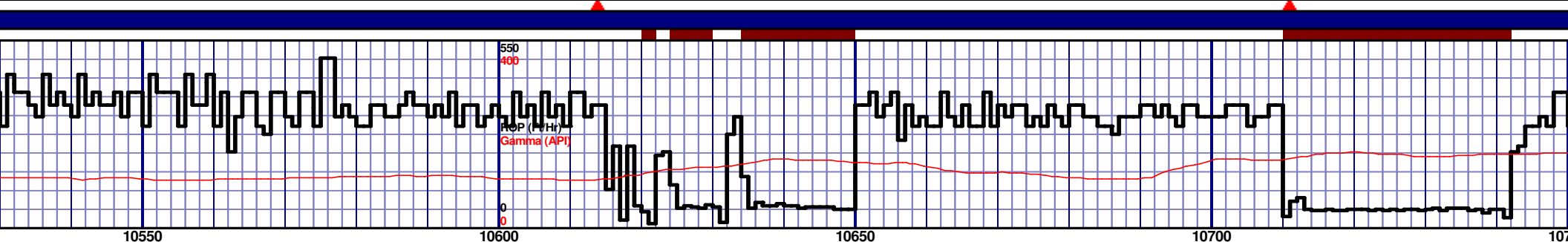
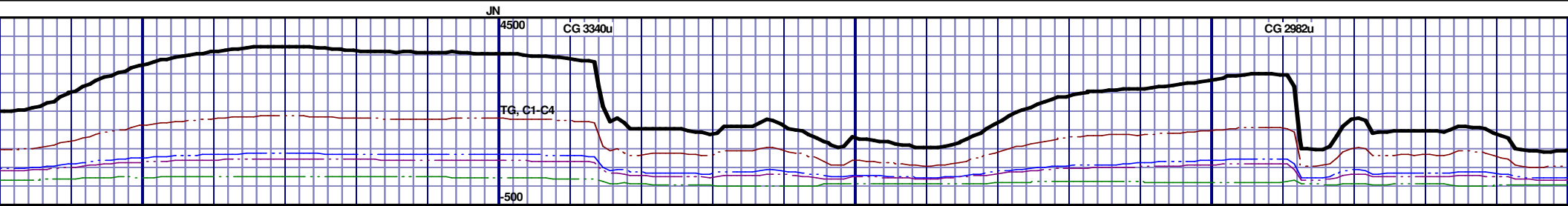
10050' MD-10100' MD: CHK: 70% V/LTGY - MEDGY -DRKGY, BLKY TO SUBBLKY, FXLN TO MICXLN, SFT, OCC FREE CAL, IMBD PYRC, IMBD SH, FREE MARL, TR GRYSBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG





MD 10362 TVD 6598.93
INC 87.47 AZ 87.89
VS 3812.09

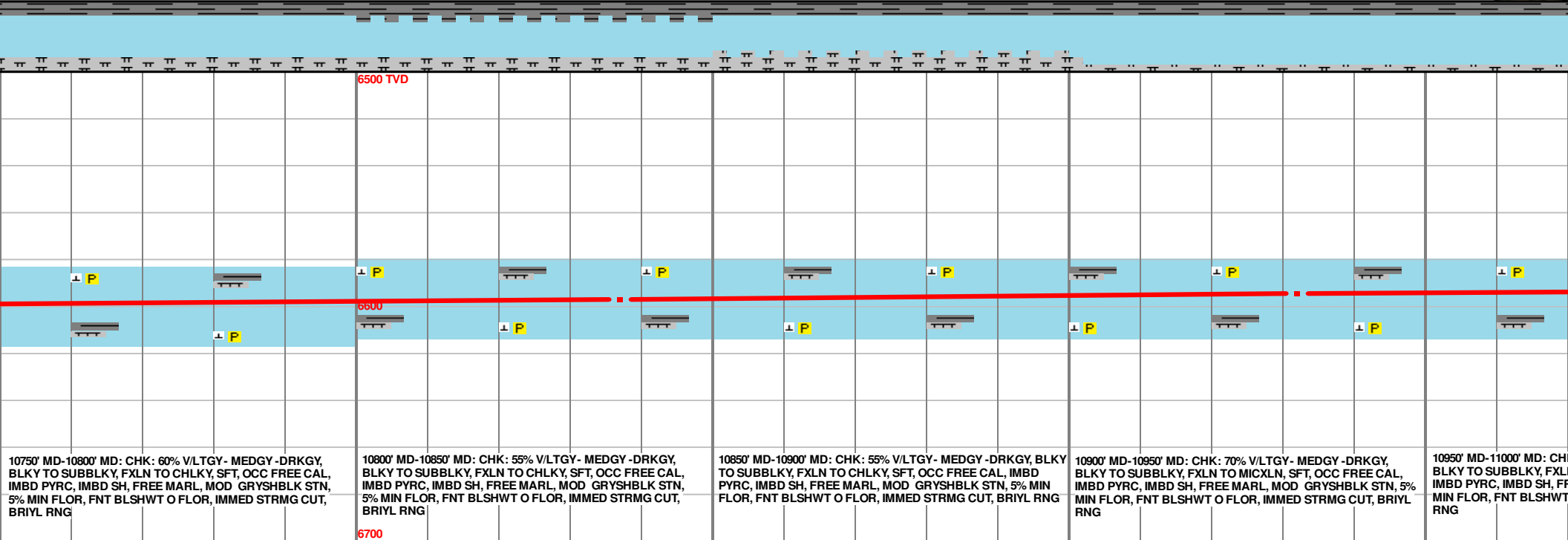
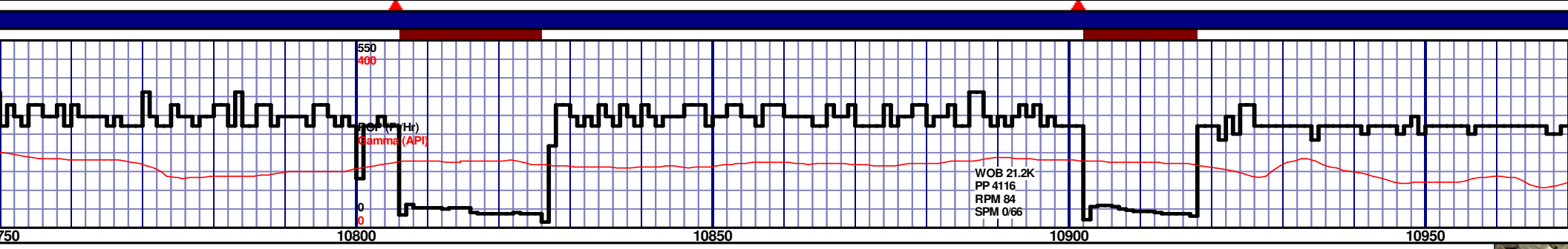
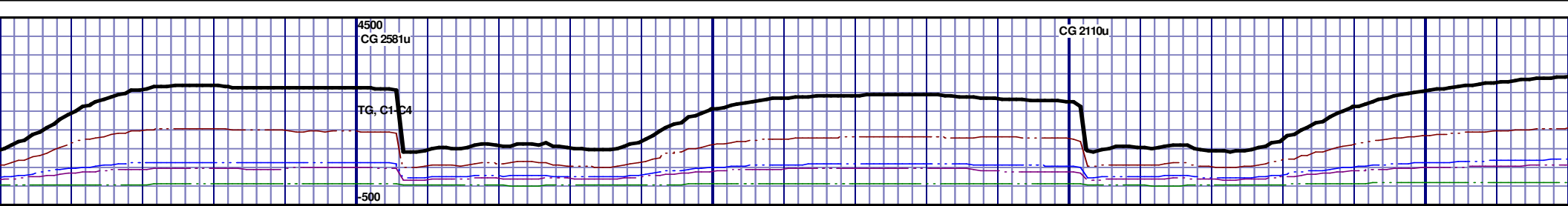
MD 10457 TVD 6601.23
INC 89.75 AZ 86.53
VS 3906.64

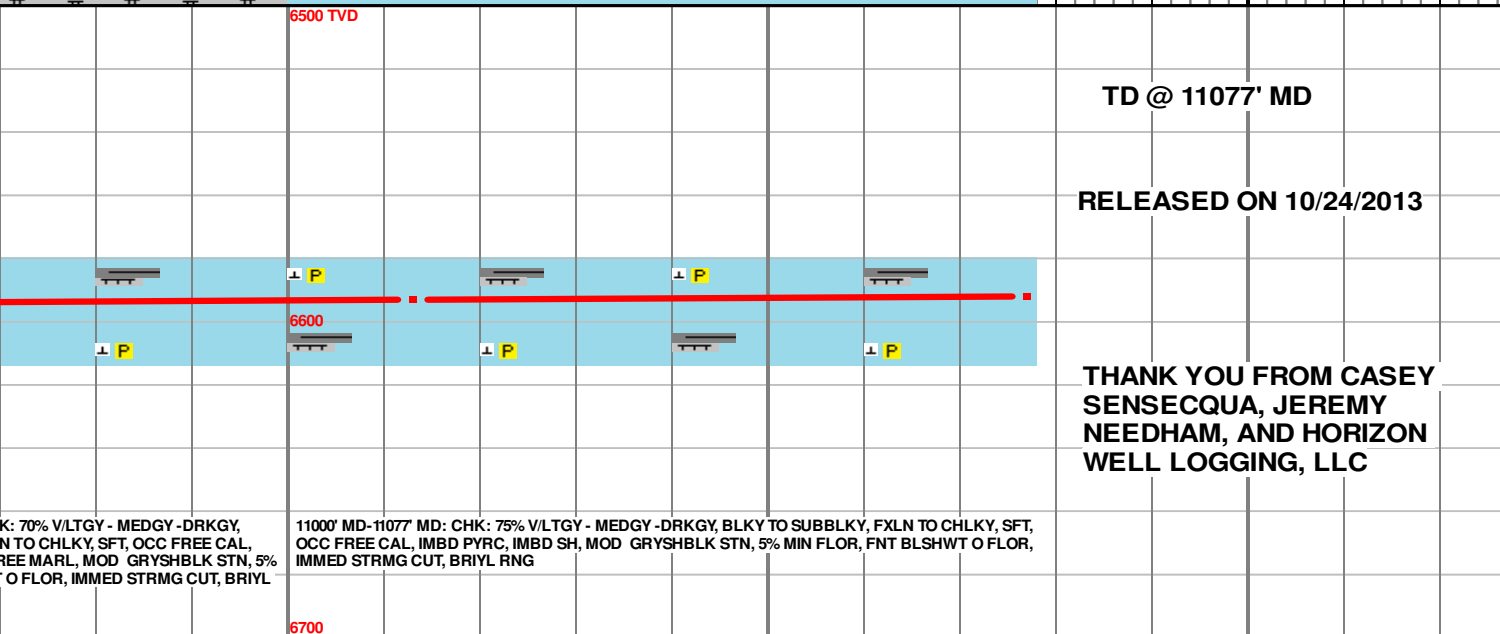
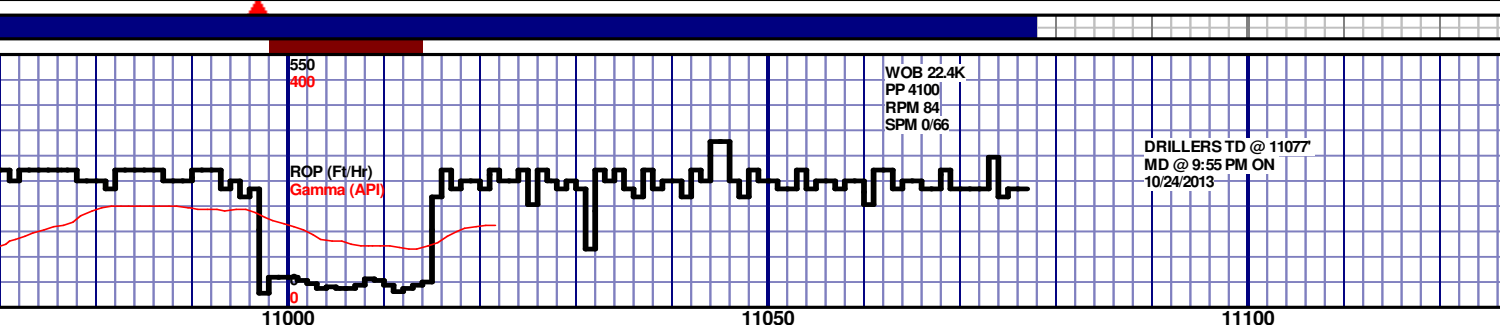
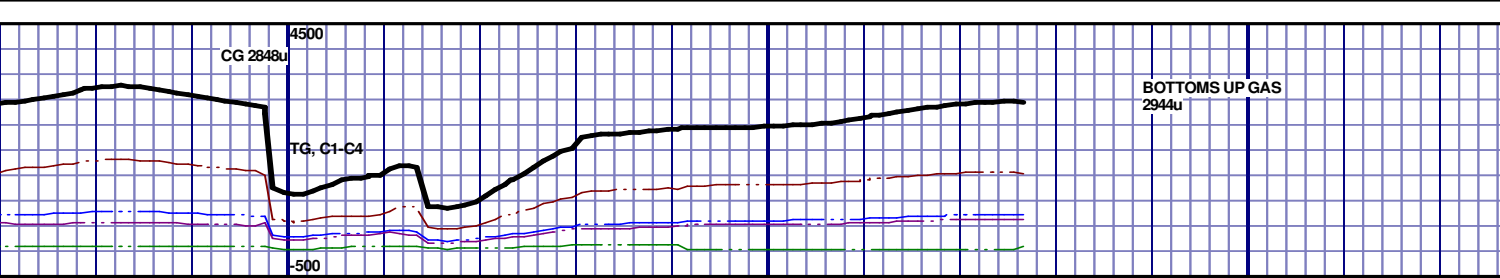


MD 10552 TVD 6601.56
INC 89.85 AZ 84.4
VS 4001.45

MD 10647 TVD 6600.54
INC 91.39 AZ 86.07
VS 4096.28

MD 10742
INC 90.71
VS 4190.92





70% V/LTGY - MEDGY - DRKGY,
N TO CHLKY, SFT, OCC FREE CAL,
FREE MARL, MOD GRYSBLK STN, 5%
O FLOR, IMMED STRMG CUT, BRIYL

11000' MD-11077' MD: CHK: 75% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT,
OCC FREE CAL, IMBD PYRC, IMBD SH, MOD GRYSBLK STN, 5% MIN FLOR, FNT BLSHW O FLOR,
IMMED STRMG CUT, BRIYL RNG

MD 11013 TVD 6593.01
INC 90.71 AZ 88.91
VS 4459.97

PTB: MD 11077 TVD 6592.22
INC 90.71 AZ 88.91
VS 4523.42

TD @ 11077' MD

RELEASED ON 10/24/2013

THANK YOU FROM CASEY
SENSECQUA, JEREMY
NEEDHAM, AND HORIZON
WELL LOGGING, LLC