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#### Customer Information

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

Geologist: **Cassidy Miller**  
Noble Energy Inc.

#### Mud Logging Details

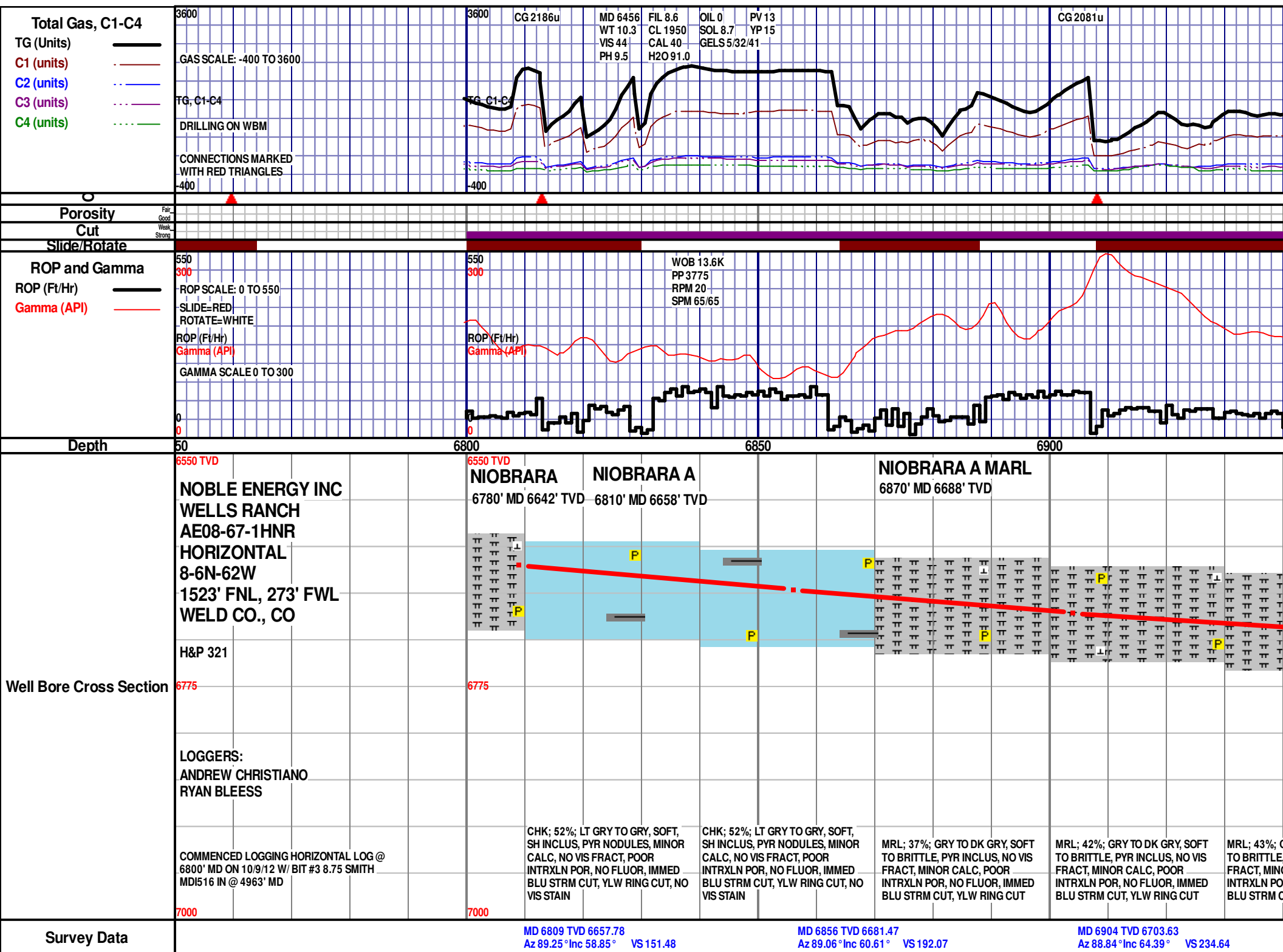
Logger: **Andrew Christiano & Ryan Bleess**  
Log Interval: 6800' MD to 1148' MD  
Start Date: October 9, 2012  
Release Date: October 12, 2012

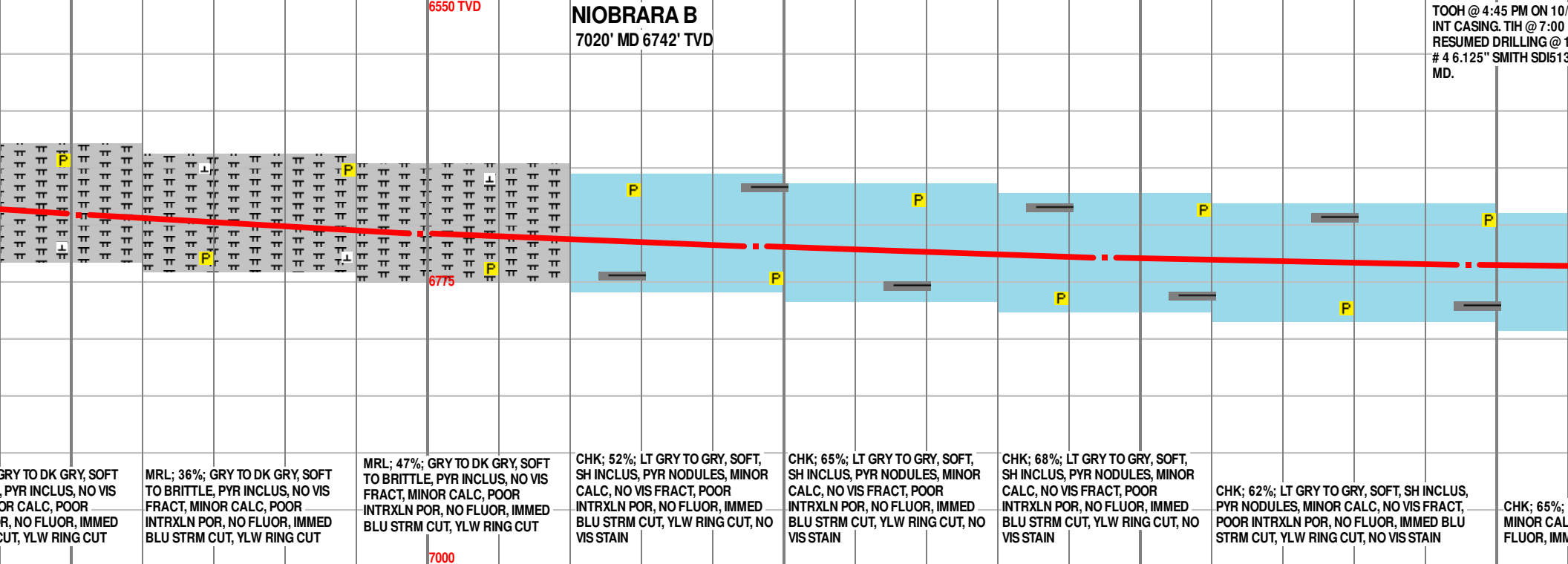
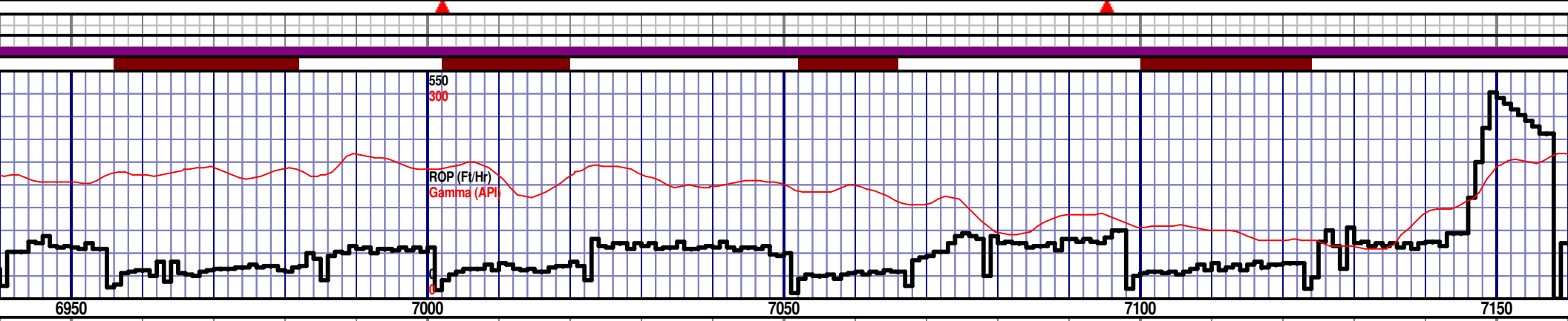
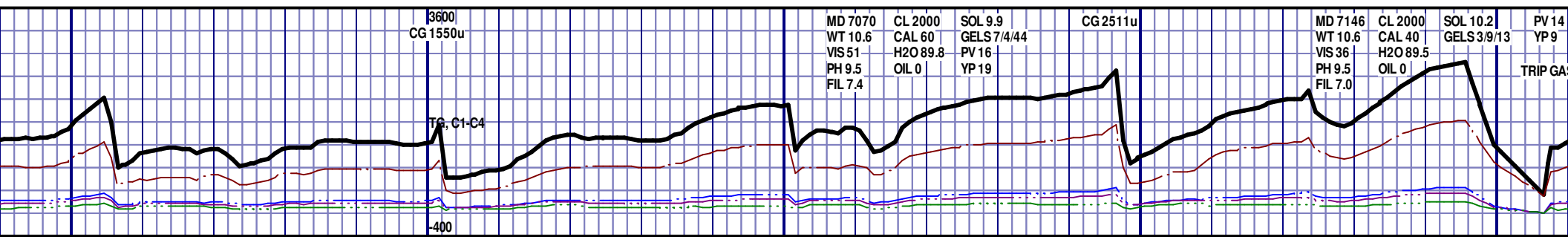
#### Well Information

Well Name: **Wells Ranch AE08-67-1HNR**  
**Horizontal**  
Location: **8-6N-62W**  
1523' FNL, 273' FWL

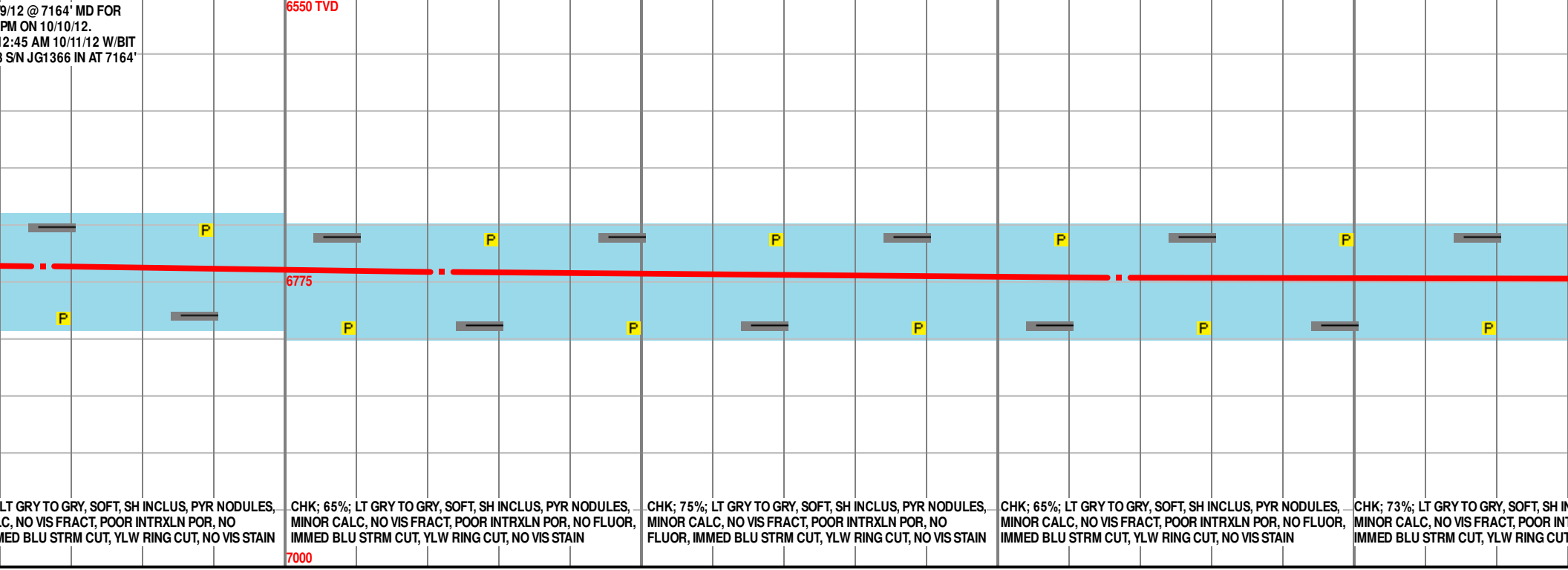
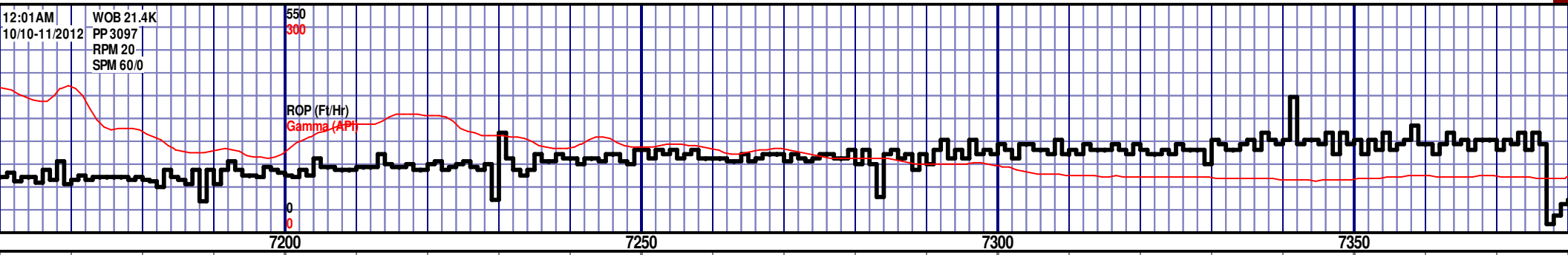
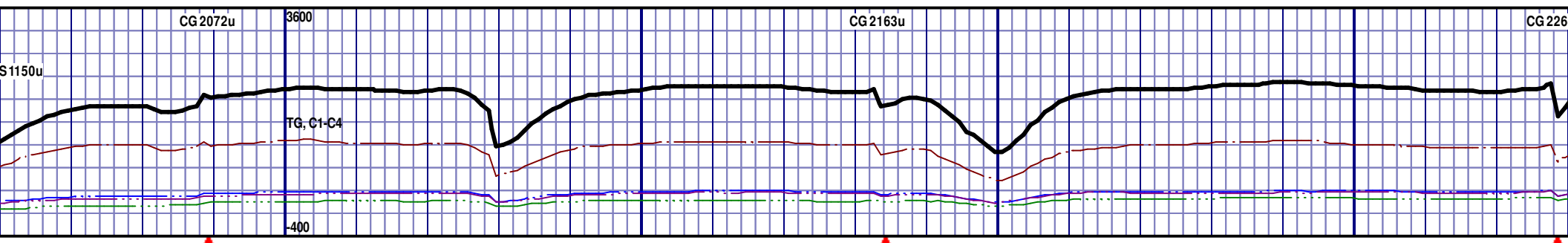
County: **Weld**  
State: **Colorado**

Drilling Rig: **H&P 321**  
Total Depth: **11148' MD**  
TD Date: **October 12, 2012**  
Formation: **Niobrara**  
KB Elevation: **5017'**  
GR Elevation: **4987'**  
API Number: **05-123-35642**





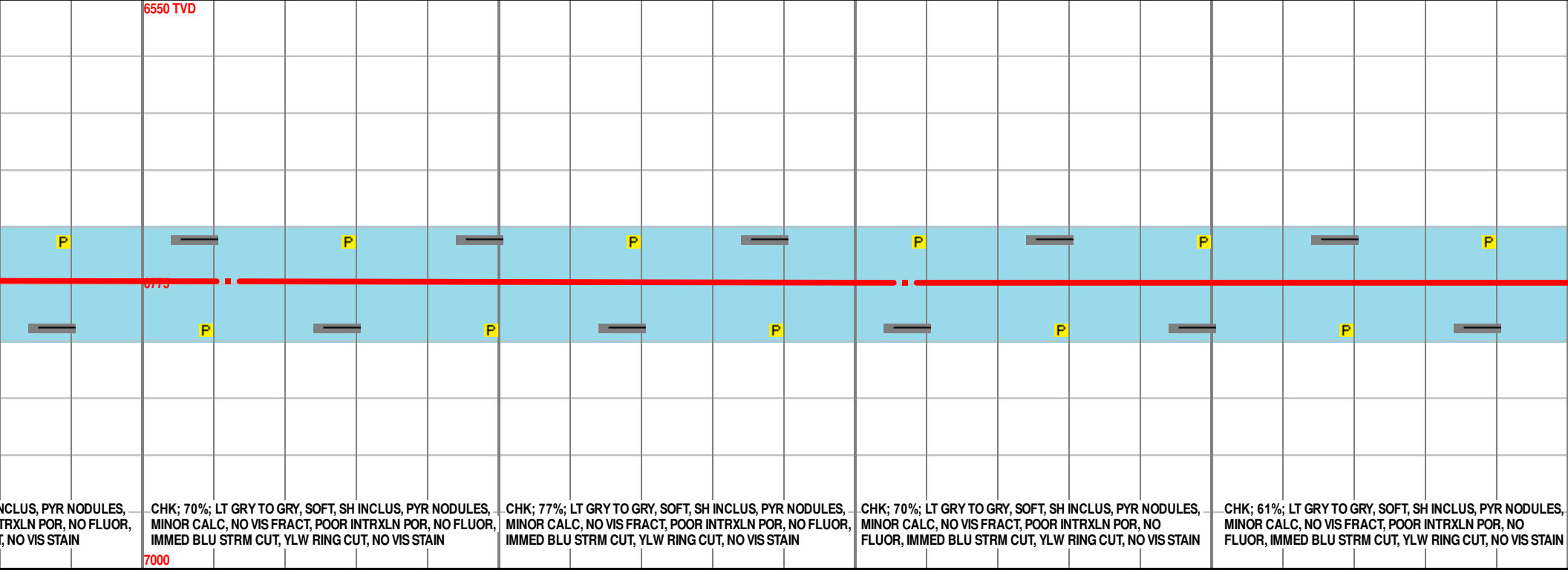
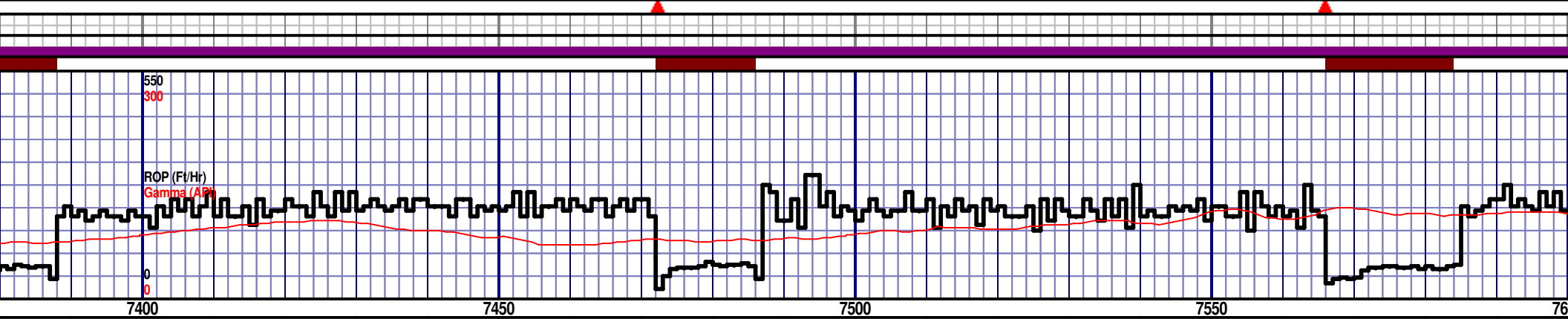
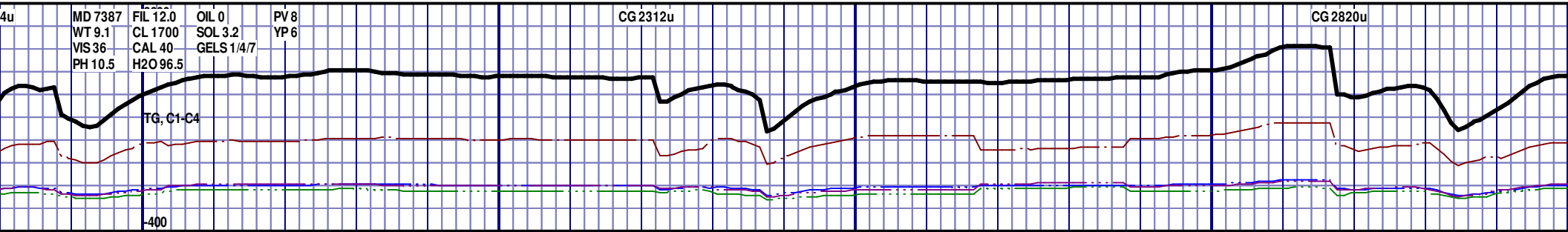
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|---|---|---|---|---|
| MD 6951 TVD 6722.01<br>Az 88.55° Inc 69.57° VS 277.08 | MD 6999 TVD 6736.63<br>Az 88.94° Inc 74.93° VS 323.58 | MD 7046 TVD 6747.41<br>Az 88.91° Inc 78.55° VS 369.32 | MD 7095 TVD 6755.58<br>Az 88.27° Inc 82.27° VS 417.59 | MD 7146 TVD 6763.63<br>Az 468.22 Az 88.27° Inc 85.1 |
|---|---|---|---|---|



60.95 MD 7166 TVD 6763.05 Az 87.07° Inc 85.64° VS 488.84

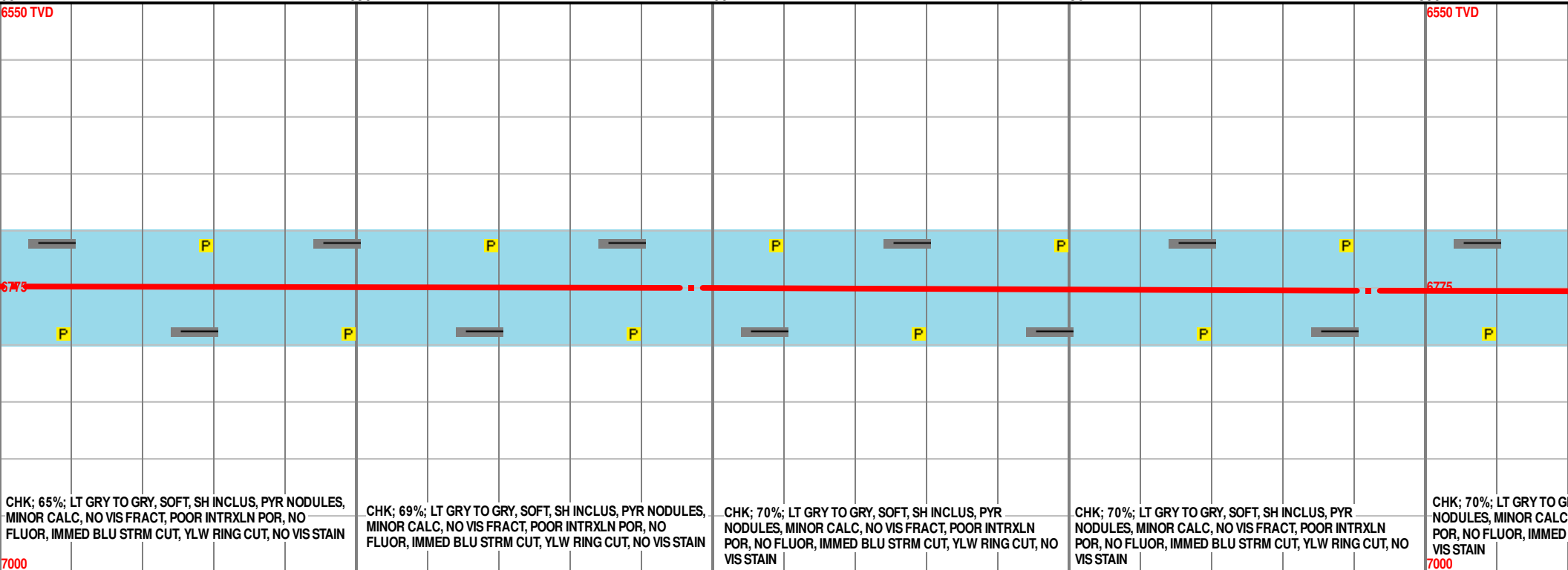
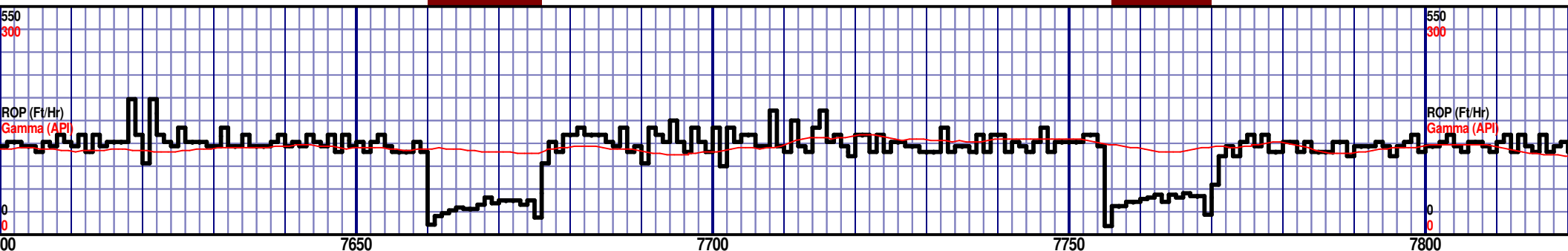
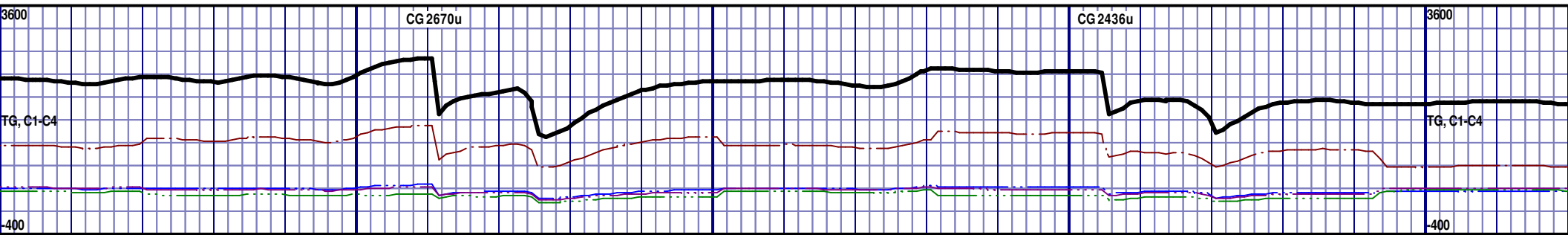
MD 7222 TVD 6766.92 Az 87.23° Inc 86.42° VS 544.65

MD 7317 TVD 6771.09 Az 88.33° Inc 88.55° VS 639.49



MD 7412 TVD 6773.1  
Az 89° Inc 89.01° VS 734.45

MD 7507 TVD 6773.9  
Az 87.72° Inc 90.03° VS 829.41



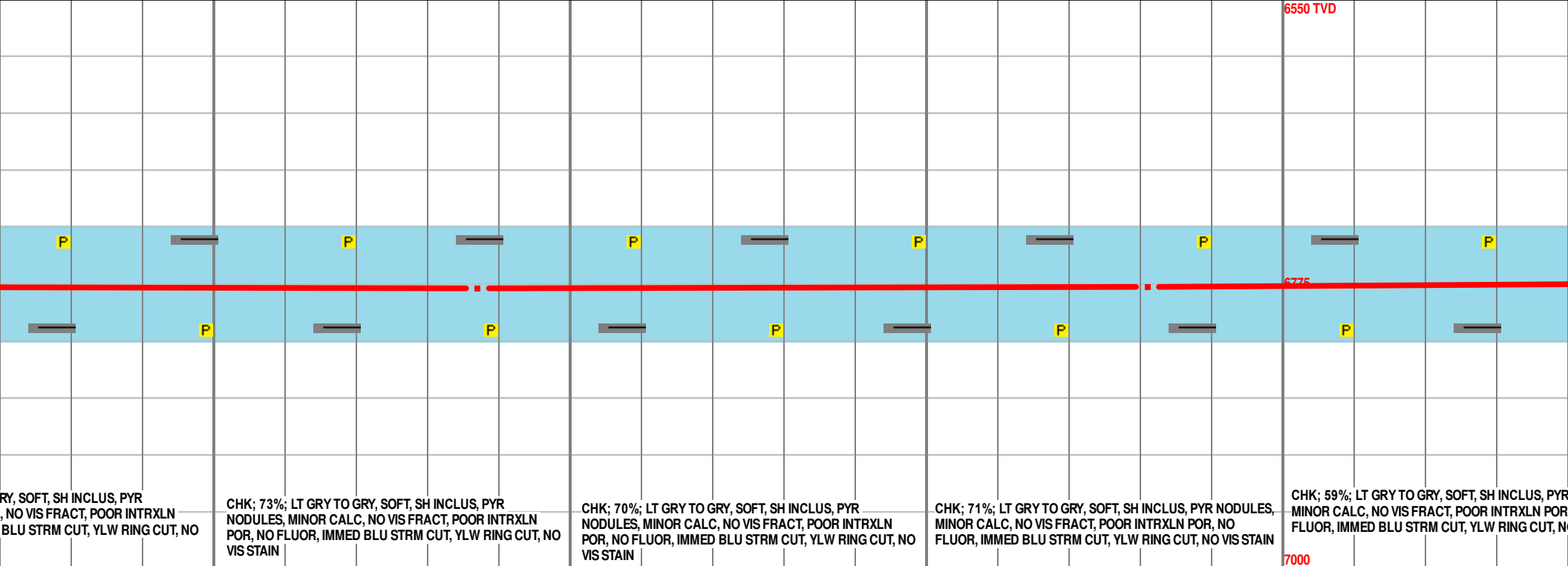
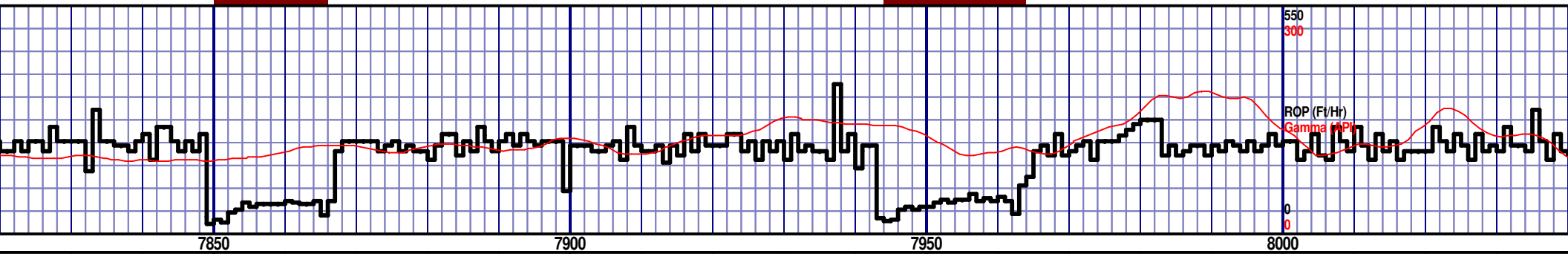
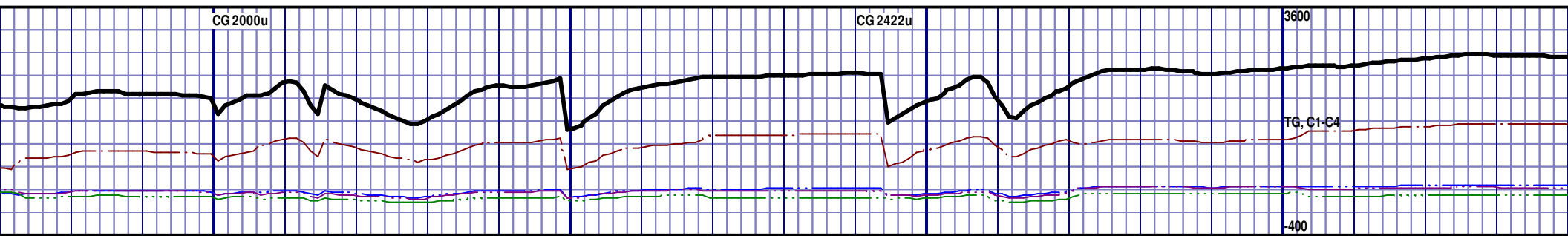
CHK; 65%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

CHK; 69%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

CHK; 70%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

CHK; 70%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

CHK; 70%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN



RY, SOFT, SH INCLUS, PYR  
NO VIS FRACT, POOR INTRXLN  
BLU STRM CUT, YLW RING CUT, NO  
VIS STAIN

CHK; 73%; LT GRY TO GRY, SOFT, SH INCLUS, PYR  
NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN  
POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO  
VIS STAIN

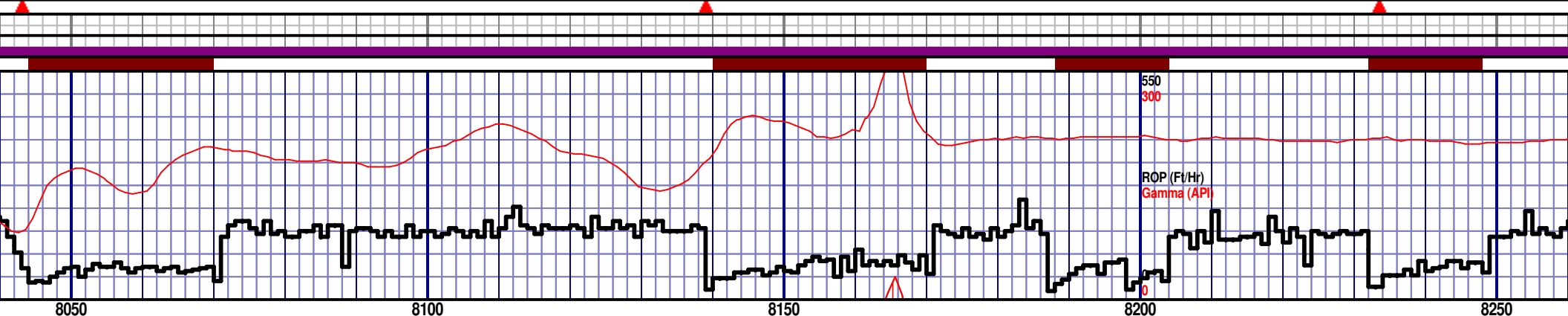
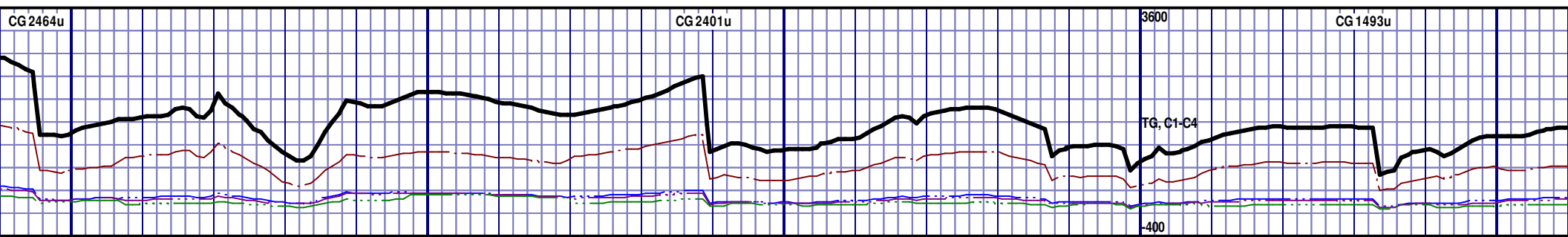
CHK; 70%; LT GRY TO GRY, SOFT, SH INCLUS, PYR  
NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN  
POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO  
VIS STAIN

CHK; 71%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES,  
MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO  
FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

CHK; 59%; LT GRY TO GRY, SOFT, SH INCLUS, PYR  
MINOR CALC, NO VIS FRACT, POOR INTRXLN POR  
FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO  
VIS STAIN

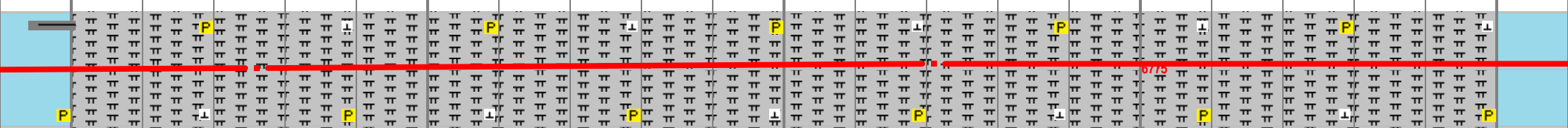
MD 7887 TVD 6778.88  
Az 86.7° Inc 90.86° VS 1208.79

MD 7981 TVD 6776.78  
Az 89.96° Inc 91.7° VS 1302.72



NIOBRARA B MARL  
8050' MD 6774' TVD

NIOBRARA B MARL  
8250' MD



NODULES,  
NO  
VIS STAIN

MRL; 47%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS,  
NO VIS FRACT, MINOR CALC, POOR INTRXLN POR, NO  
FLUOR, IMMED BLU STRM CUT, YLW RING CUT

MRL; 47%; GRY TO DK GRY, SOFT TO BRITTLE, PYR  
INCLUS, NO VIS FRACT, MINOR CALC, POOR INTRXLN POR,  
NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT

MRL; 47%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS,  
NO VIS FRACT, MINOR CALC, POOR INTRXLN POR, NO  
FLUOR, IMMED BLU STRM CUT, YLW RING CUT

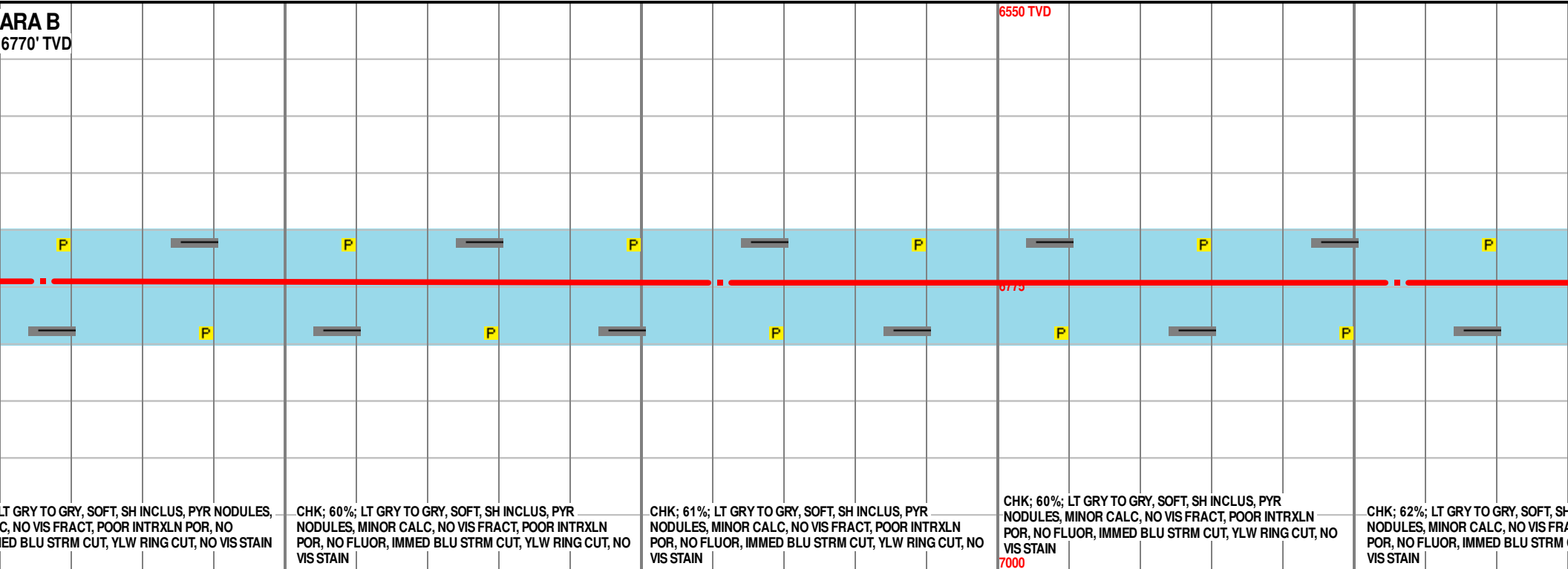
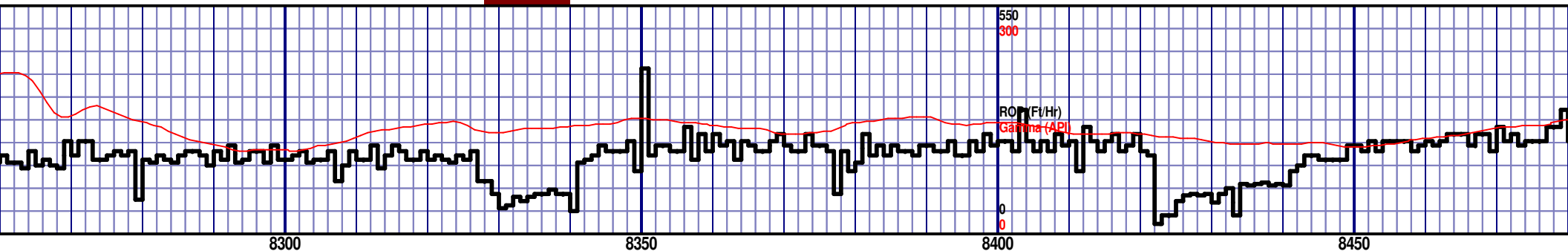
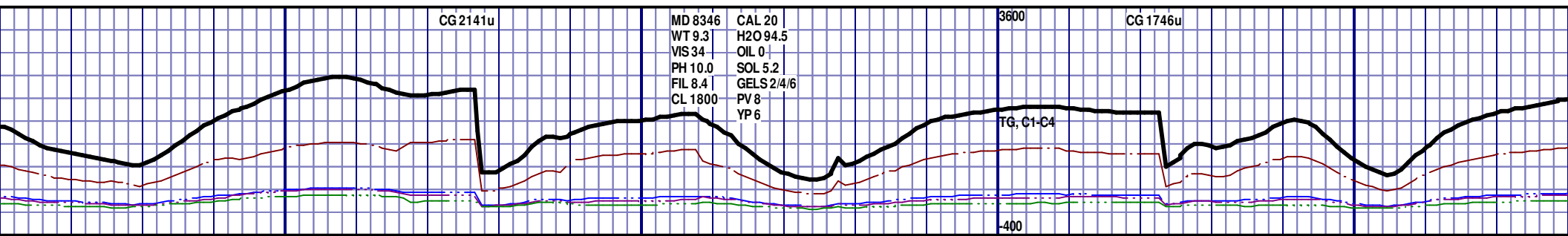
MRL; 45%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS,  
NO VIS FRACT, MINOR CALC, POOR INTRXLN POR, NO  
FLUOR, IMMED BLU STRM CUT, YLW RING CUT

CHK; 67%;  
MINOR CALC  
FLUOR, IMM

MD 8076 TVD 6773.6  
Az 89.5° Inc 92.13° VS 1397.67

MD 8171 TVD 6770.79  
Az 88.74° Inc 91.26° VS 1492.62

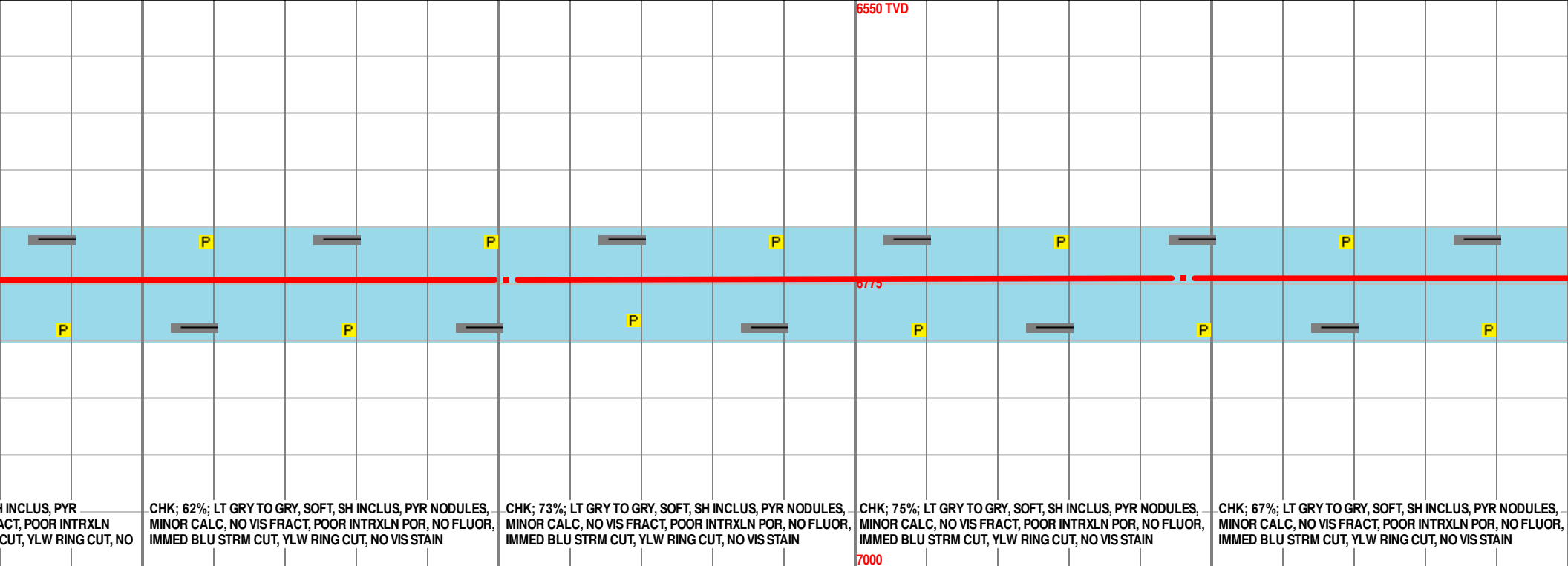
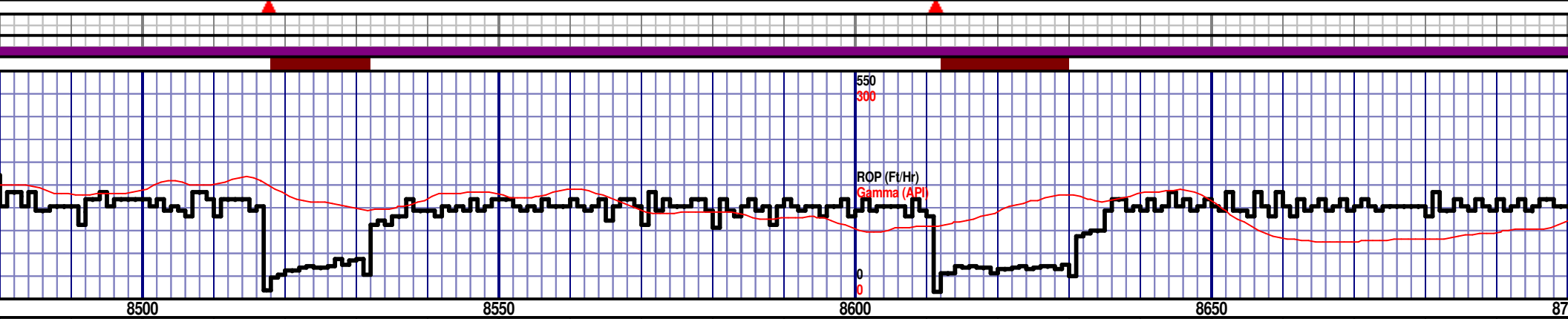
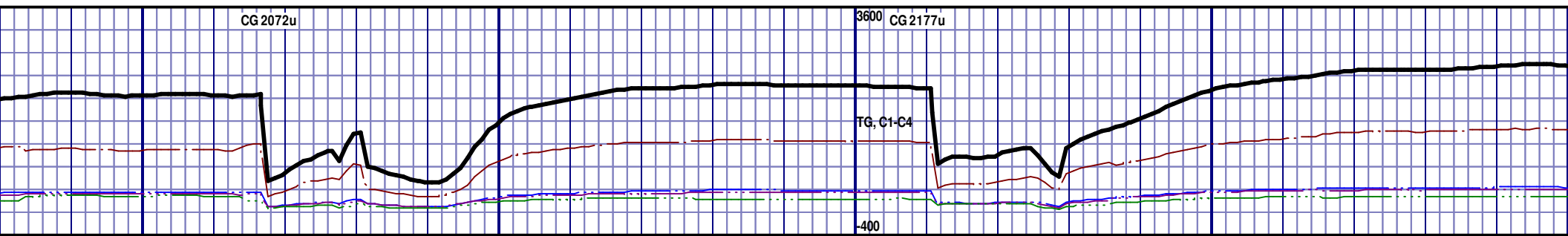


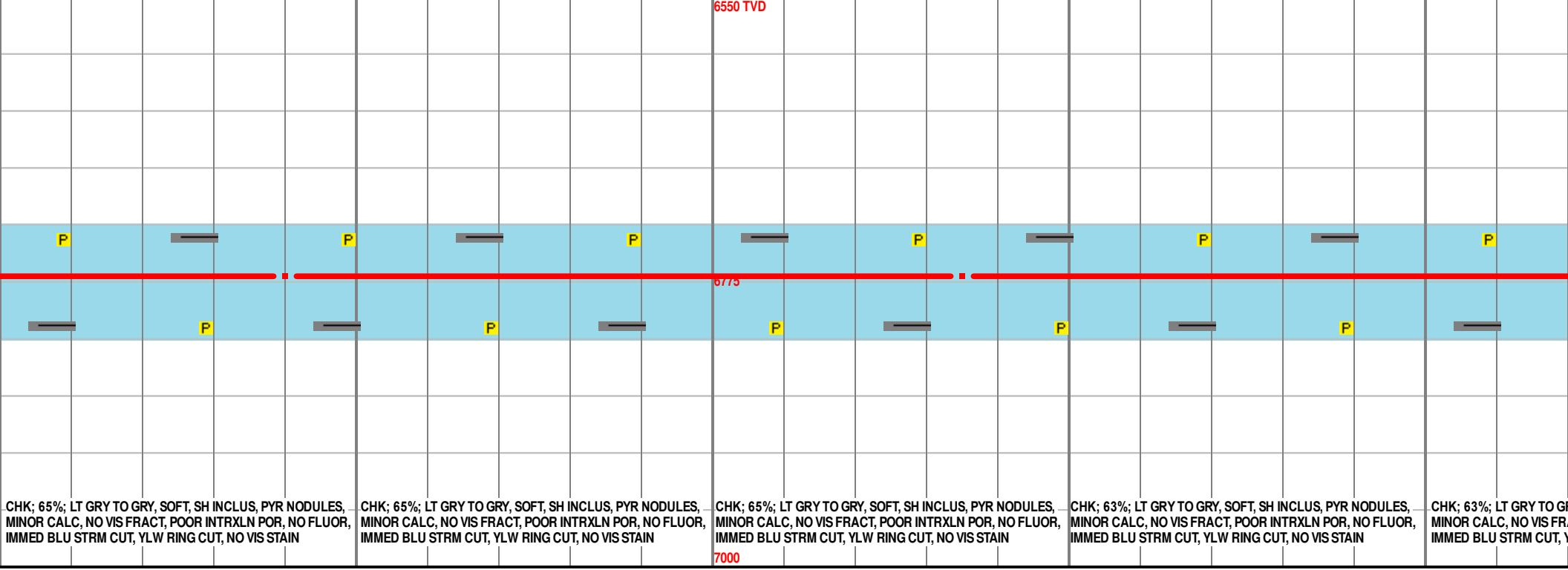
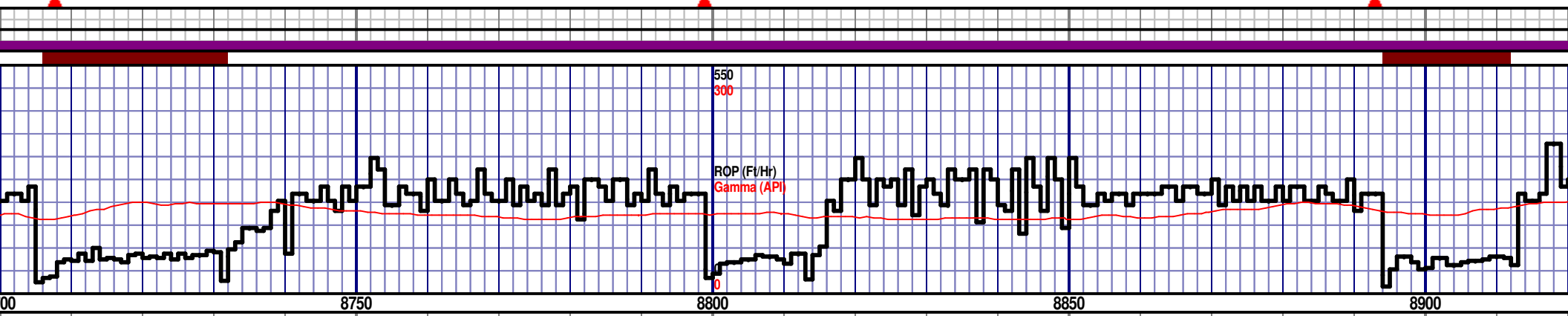
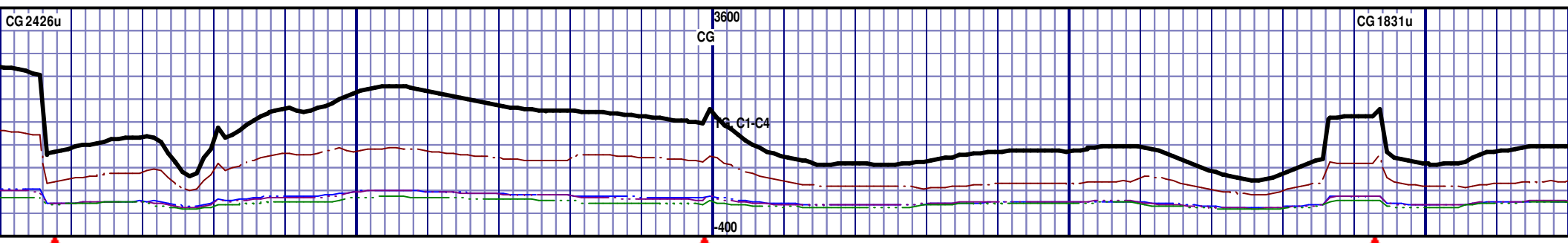


MD 8266 TVD 6770.54  
Az 88.4° Inc 89.04° VS 1587.59

MD 8361 TVD 6771.77  
Az 87.11° Inc 89.48° VS 1682.52

MD 8456 TVD 6772.12  
Az 88.66° Inc 90.09° VS 177





CHK; 65%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

CHK; 65%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

CHK; 65%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

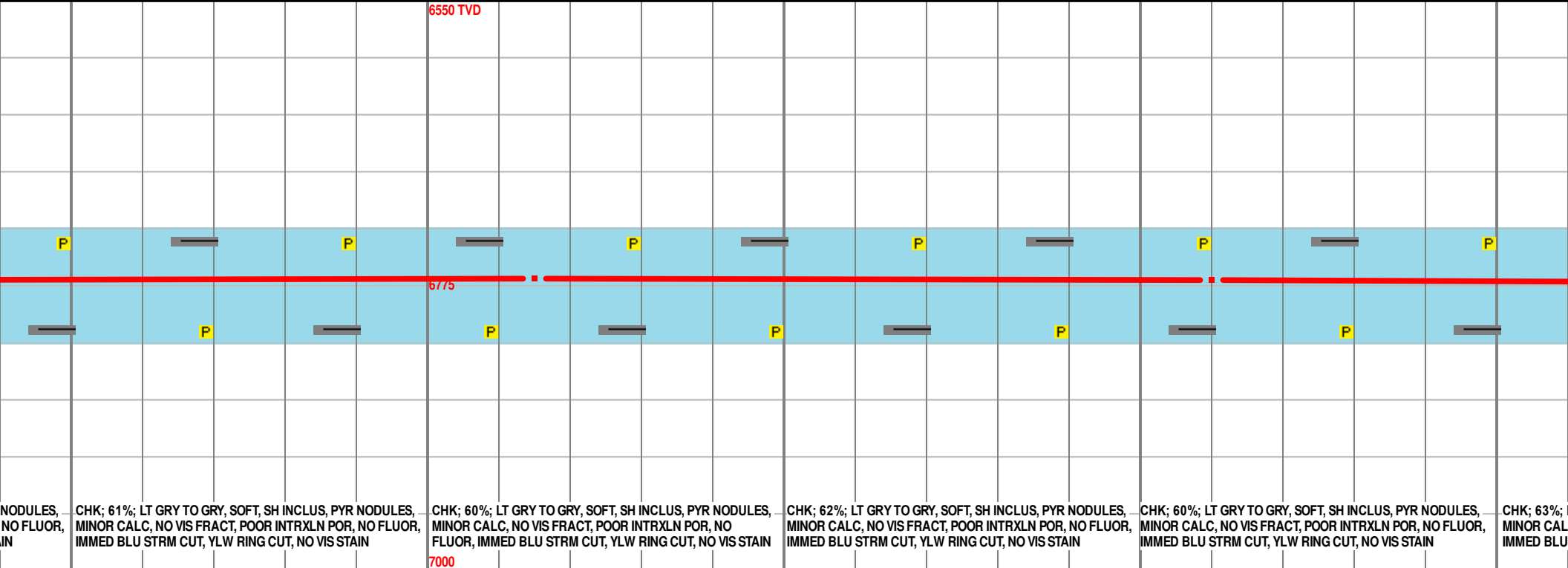
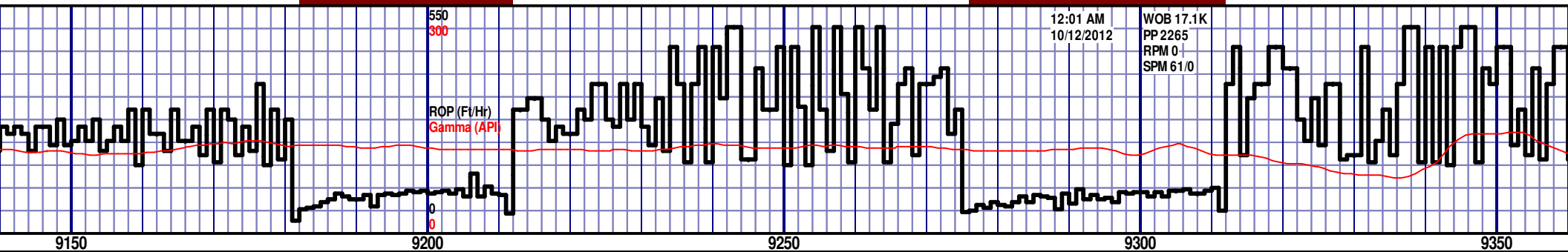
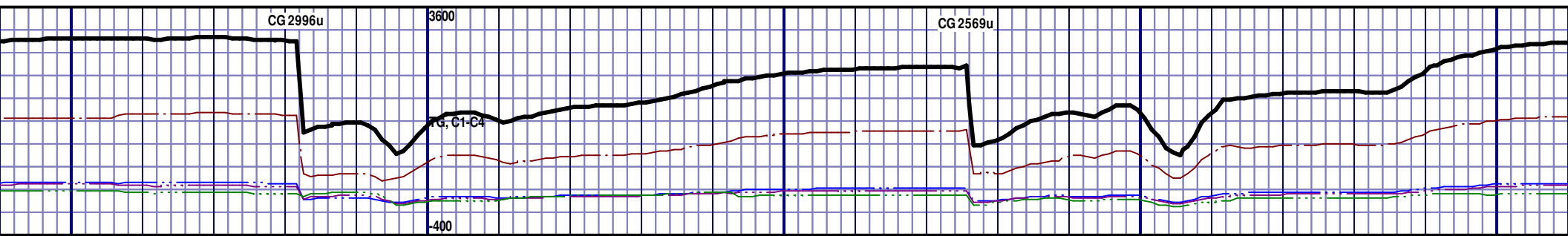
CHK; 63%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

CHK; 63%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

MD 8740 TVD 6770.23  
Az 89.49° Inc 89.04° VS 2061.40

MD 8835 TVD 6770.97  
Az 88.66° Inc 90.06° VS 2156.39

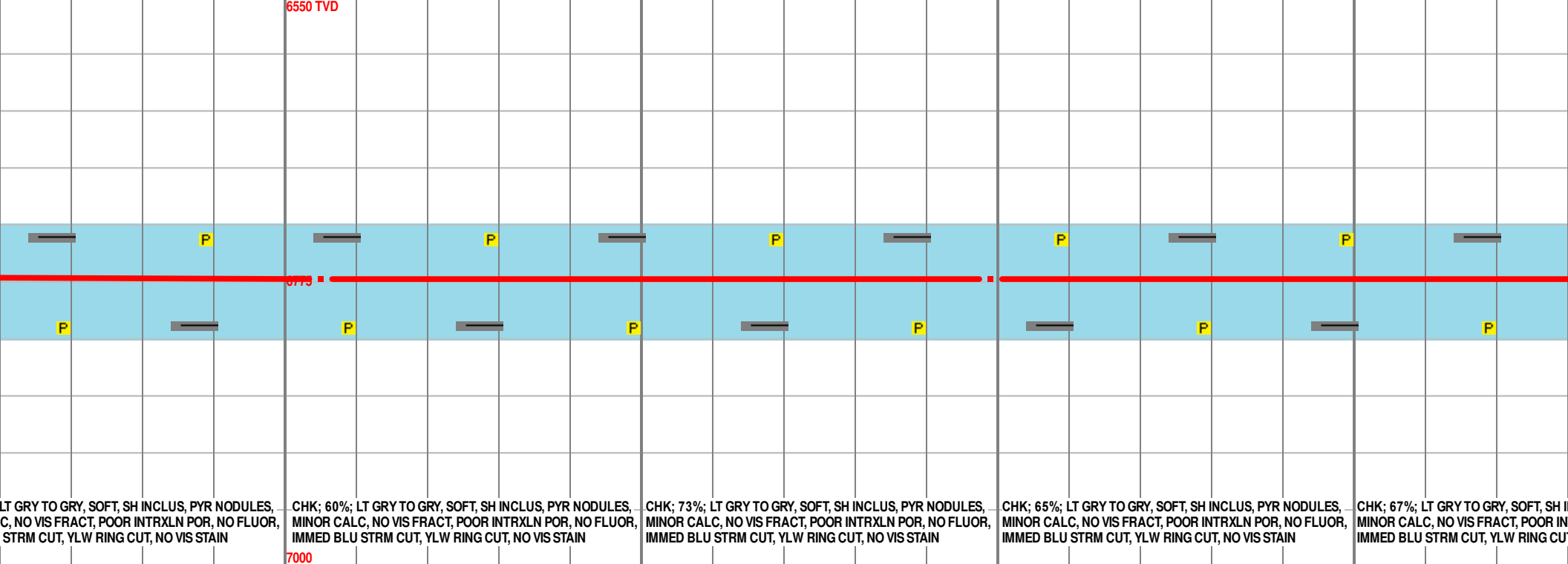
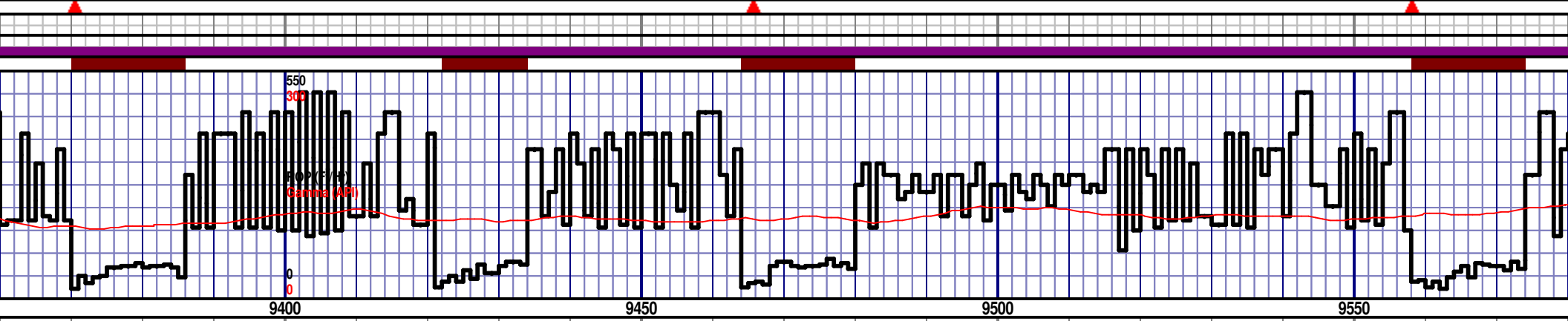
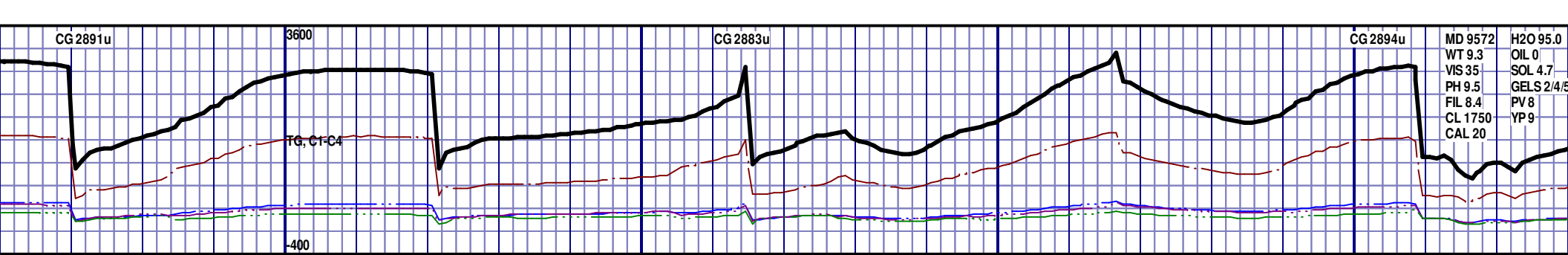




NODULES, NO FLUOR, IN  
CHK; 61%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN  
7000

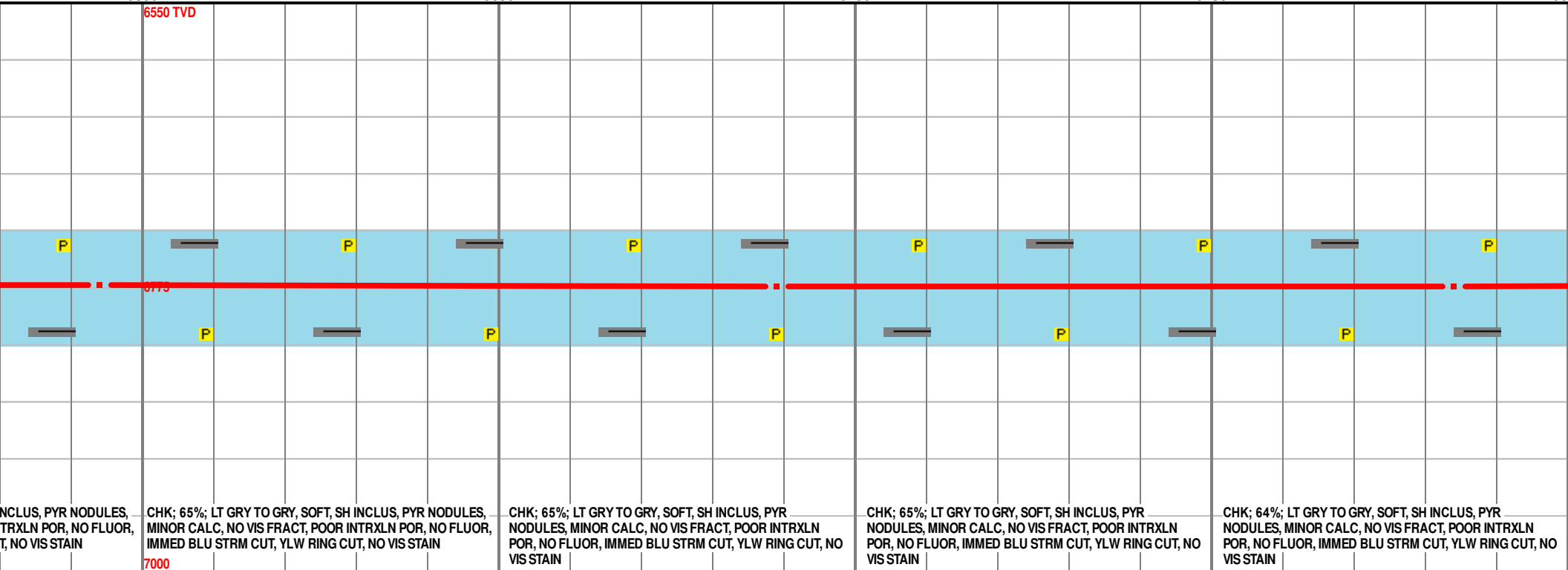
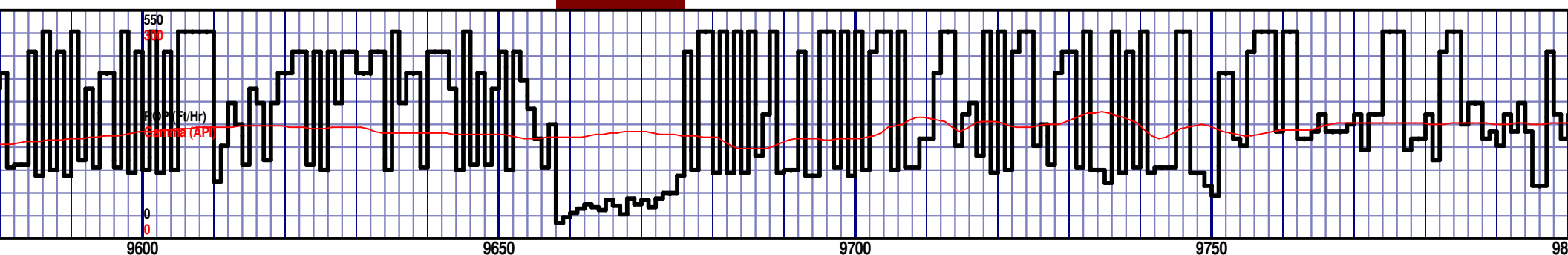
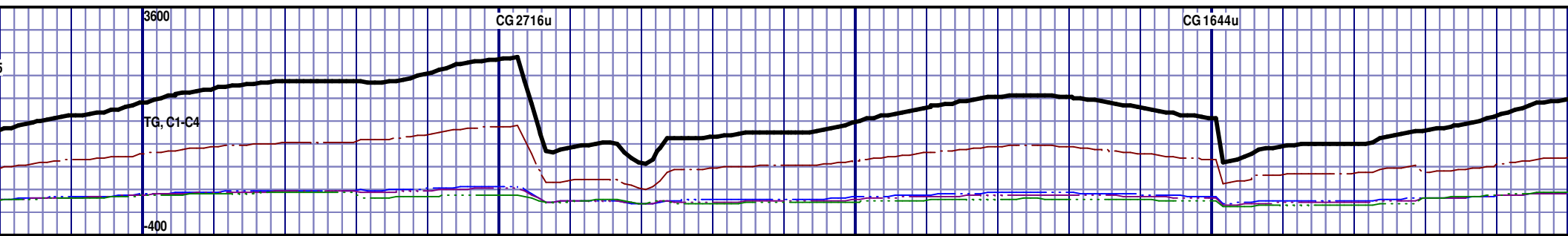
MD 9215 TVD 6769  
Az 88.3° Inc 91.02° VS 2536.35

MD 9310 TVD 6770.49  
Az 87.87° Inc 87.19° VS 2631.27



MD 9405 TVD 6772.75  
Az 88.3° Inc 90.09° VS 2726.19

MD 9499 TVD 6772.85  
Az 85.86° Inc 89.78° VS 2820.08

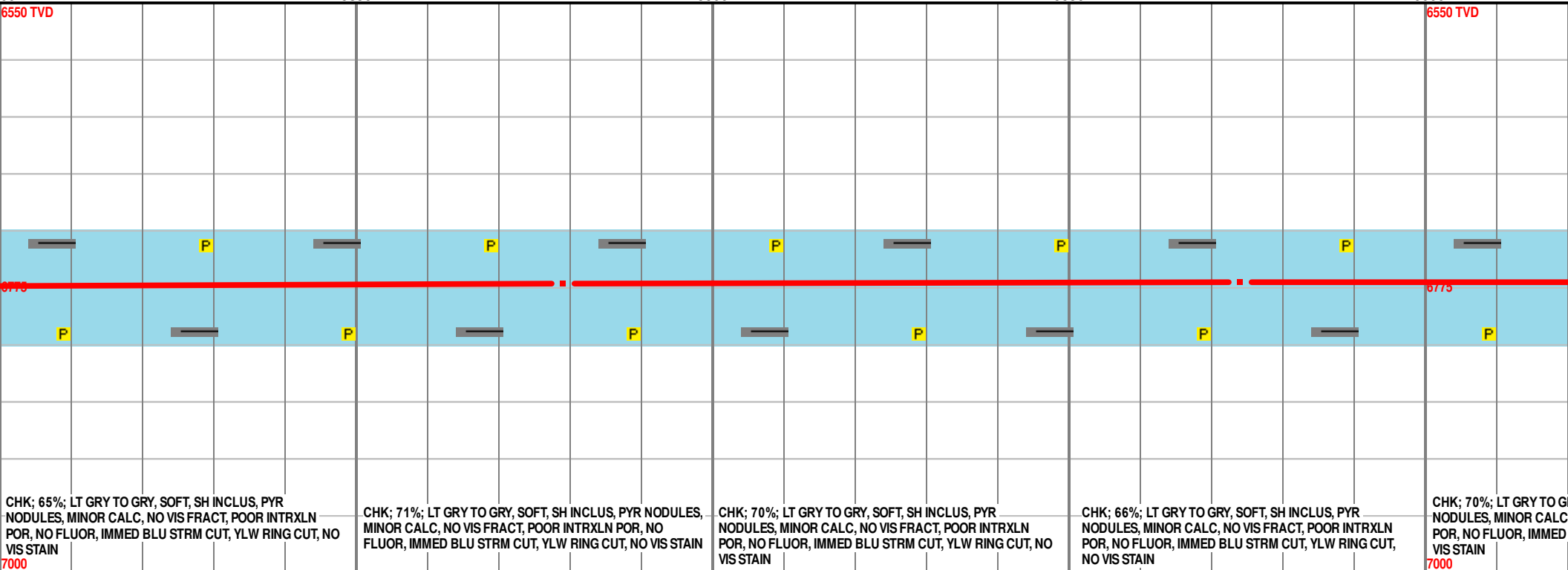
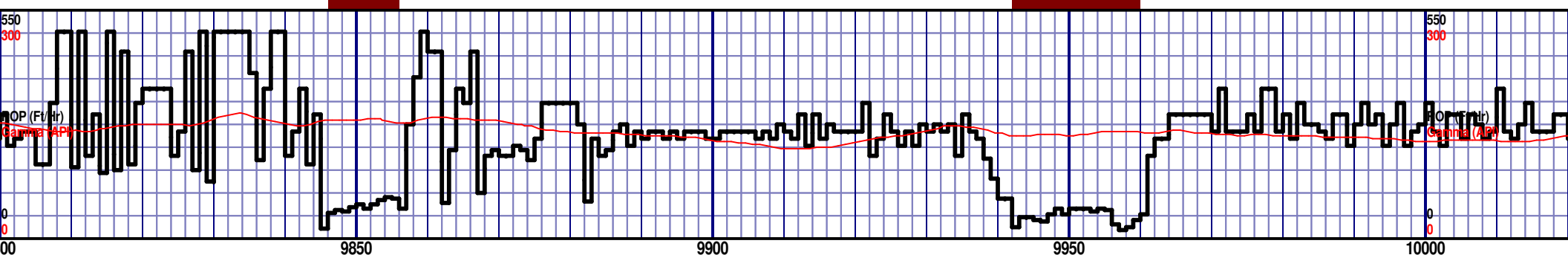
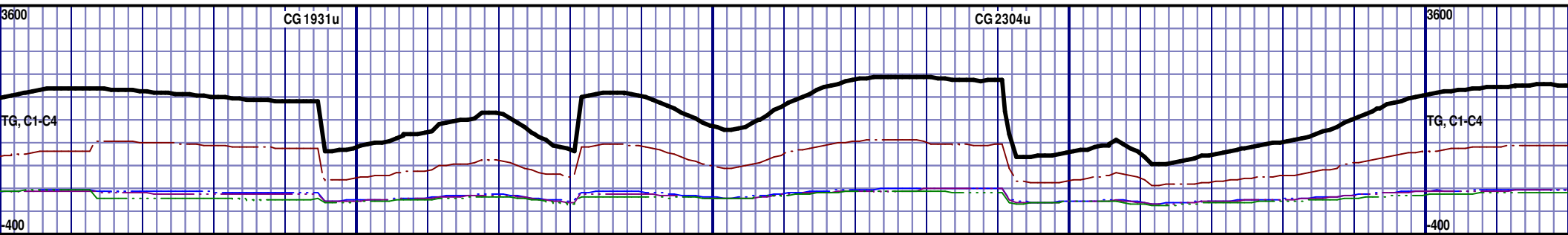


|   |   |   |   |   |
|---|---|---|---|---|
| INCLUS, PYR NODULES, TRXLN POR, NO FLUOR, T, NO VIS STAIN | CHK; 65%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN | CHK; 65%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN | CHK; 65%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN | CHK; 64%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN |
|---|---|---|---|---|

MD 9594 TVD 6772.85  
Az 88.58° Inc 90.22° VS 2914.97

MD 9689 TVD 6773.43  
Az 86.67° Inc 89.08° VS 3009.89

MD 9784 TVD 6773  
Az 87.05° Inc 90.86



CHK; 65%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

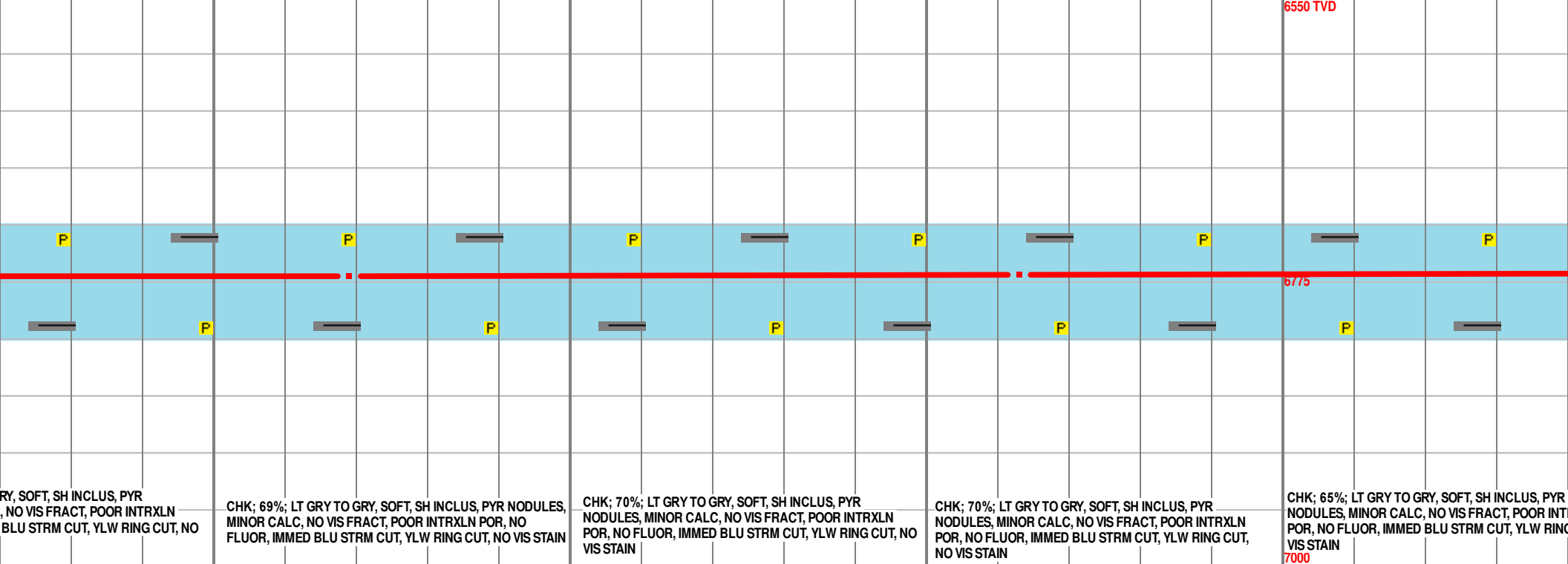
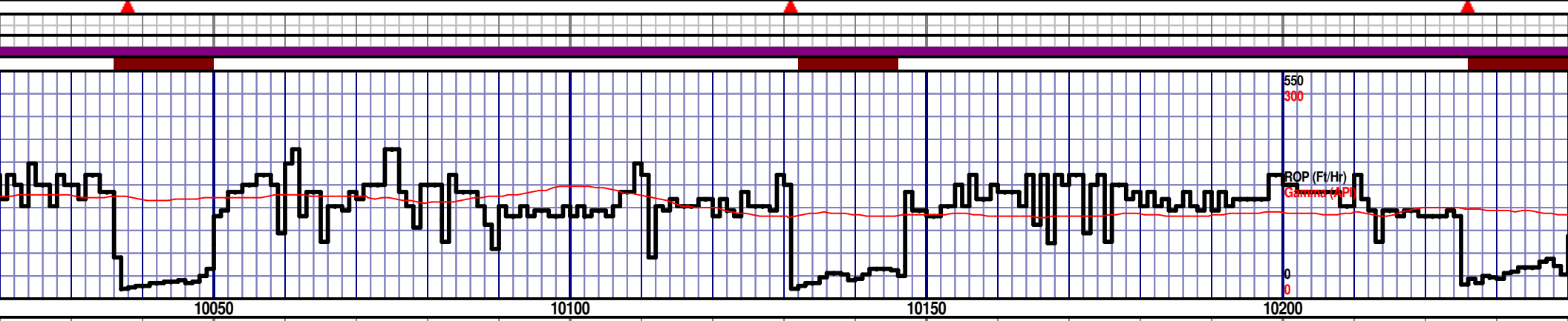
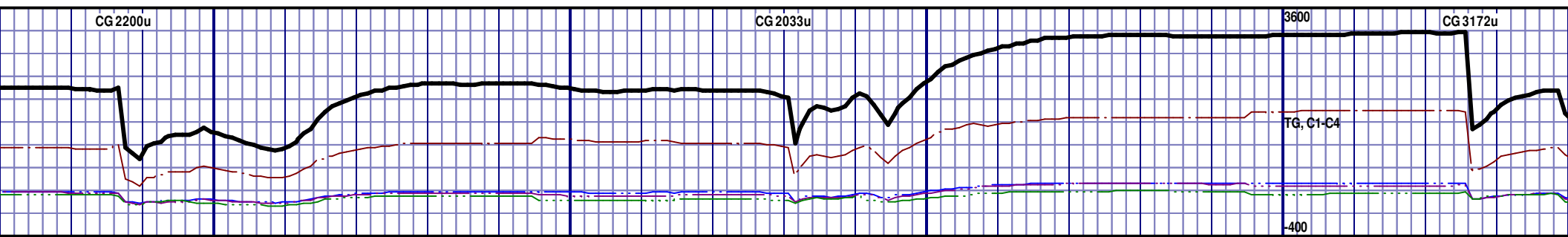
CHK; 71%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

CHK; 70%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

CHK; 66%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

CHK; 70%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN





RY, SOFT, SH INCLUS, PYR  
NO VIS FRACT, POOR INTRXLN  
BLU STRM CUT, YLW RING CUT, NO

CHK; 69%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES,  
MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO  
FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

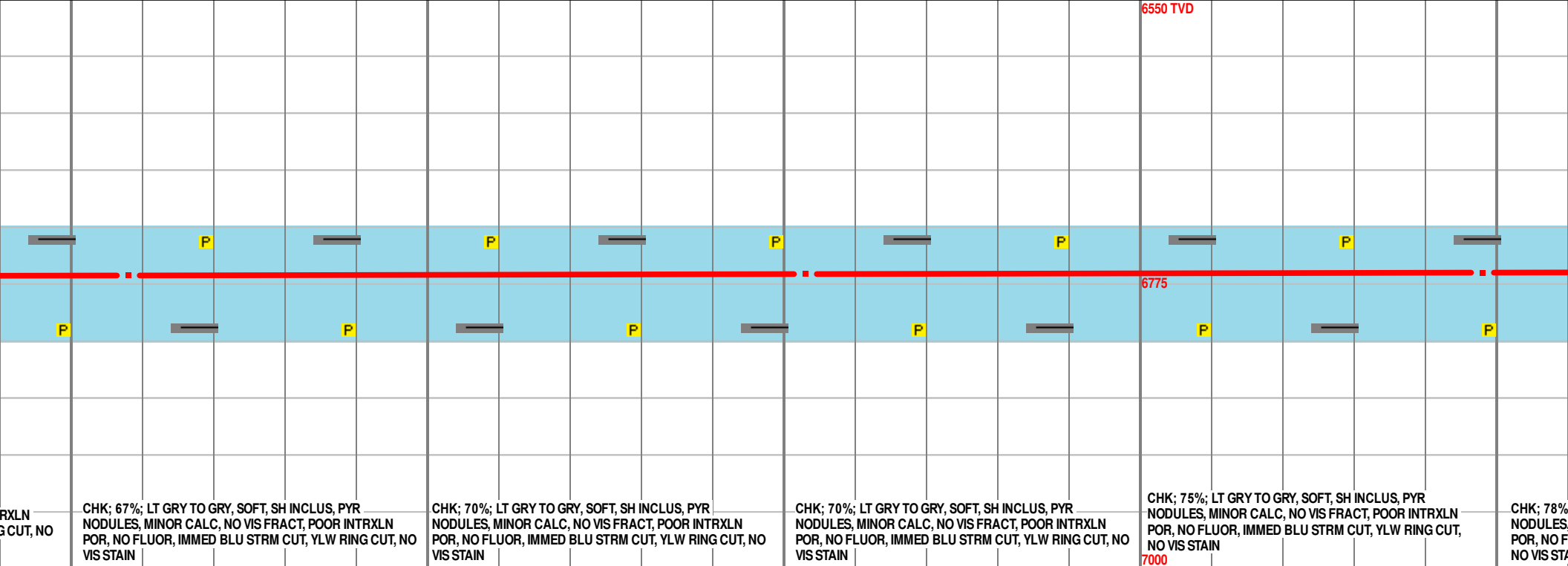
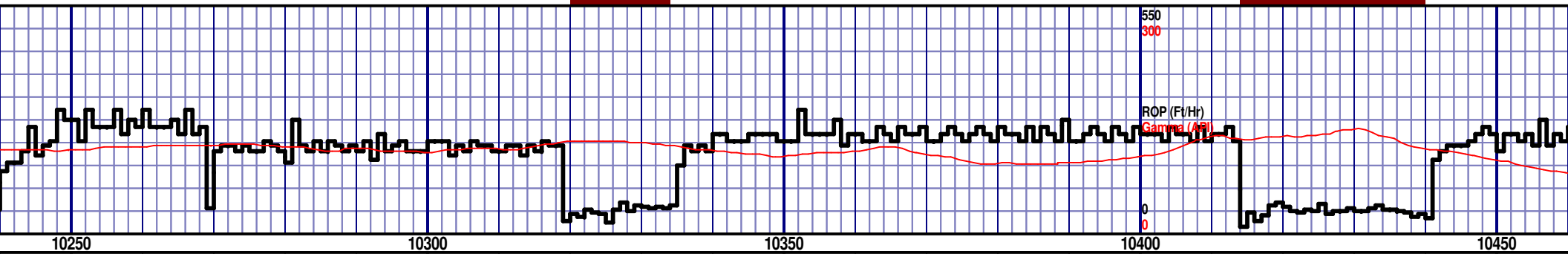
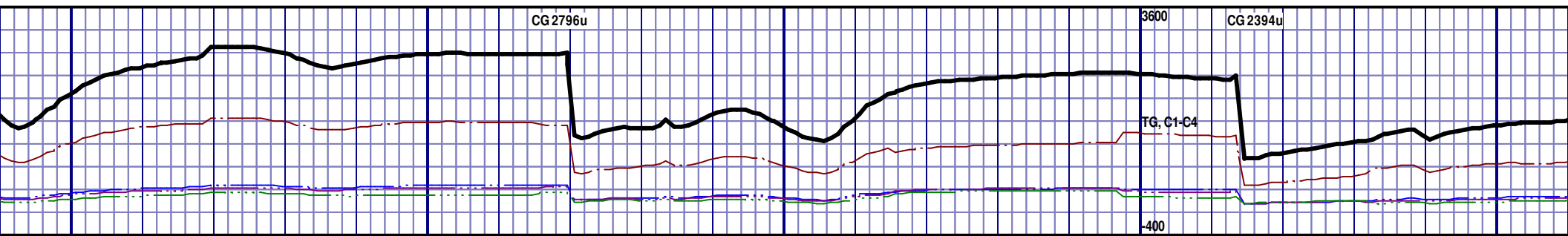
CHK; 70%; LT GRY TO GRY, SOFT, SH INCLUS, PYR  
NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN  
POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO  
VIS STAIN

CHK; 70%; LT GRY TO GRY, SOFT, SH INCLUS, PYR  
NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN  
POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT,  
NO VIS STAIN

CHK; 65%; LT GRY TO GRY, SOFT, SH INCLUS, PYR  
NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN  
POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT,  
VIS STAIN

MD 10069 TVD 6769.99  
Az 88.86° Inc 90.83° VS 3389.57

MD 10163 TVD 6768.97  
Az 90° Inc 90.4° VS 3483.57



INTRXLN  
G CUT, NO

CHK; 67%; LT GRY TO GRY, SOFT, SH INCLUS, PYR  
NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN  
POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO  
VIS STAIN

CHK; 70%; LT GRY TO GRY, SOFT, SH INCLUS, PYR  
NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN  
POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO  
VIS STAIN

CHK; 70%; LT GRY TO GRY, SOFT, SH INCLUS, PYR  
NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN  
POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO  
VIS STAIN

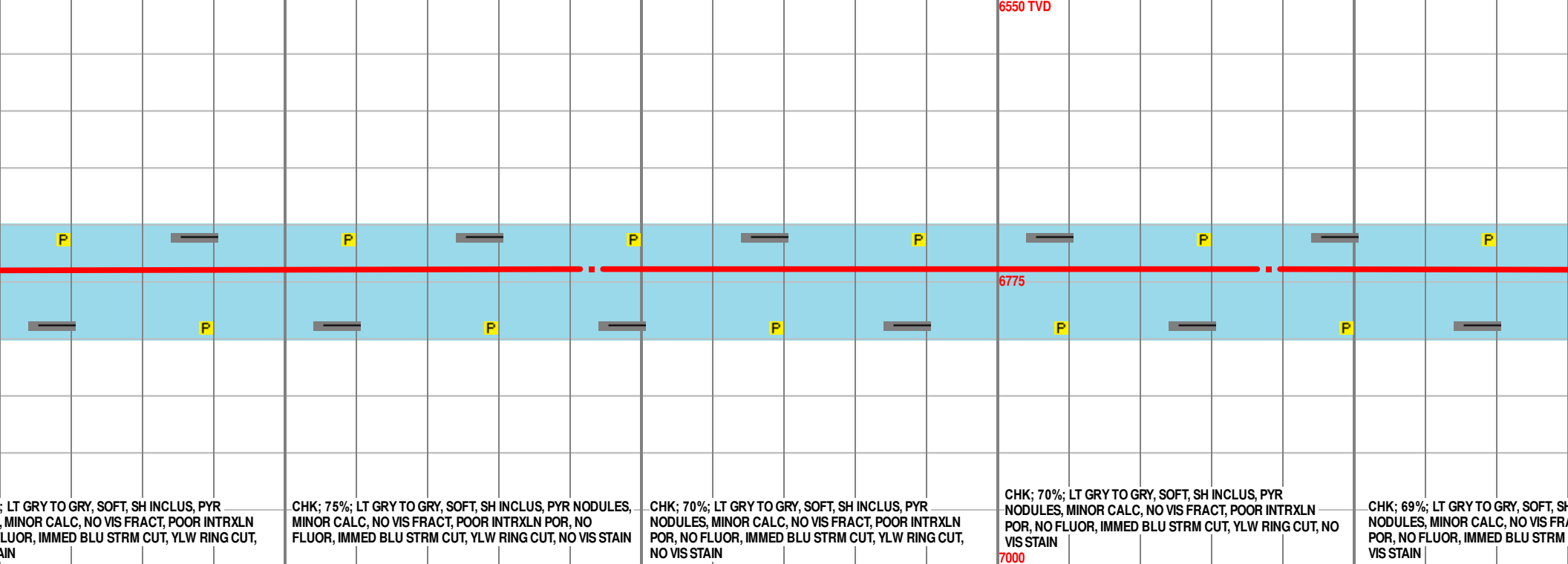
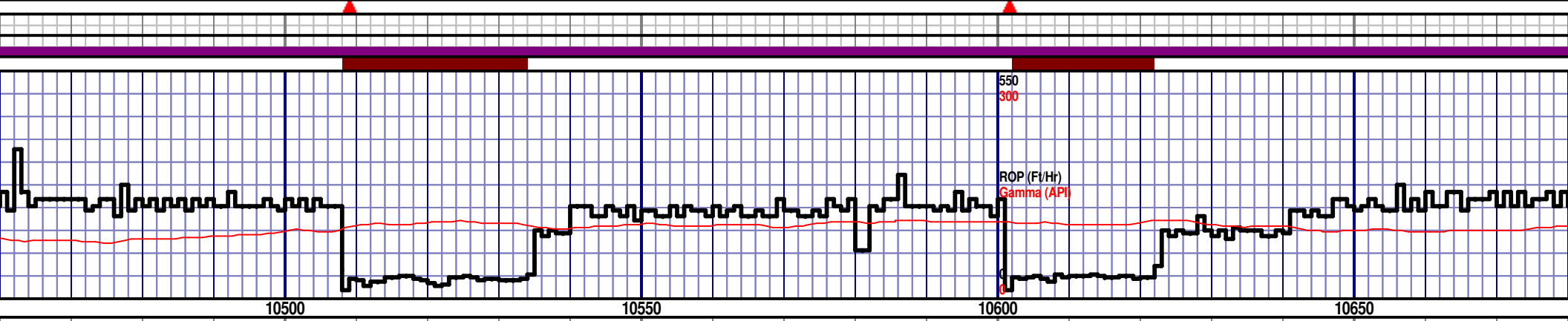
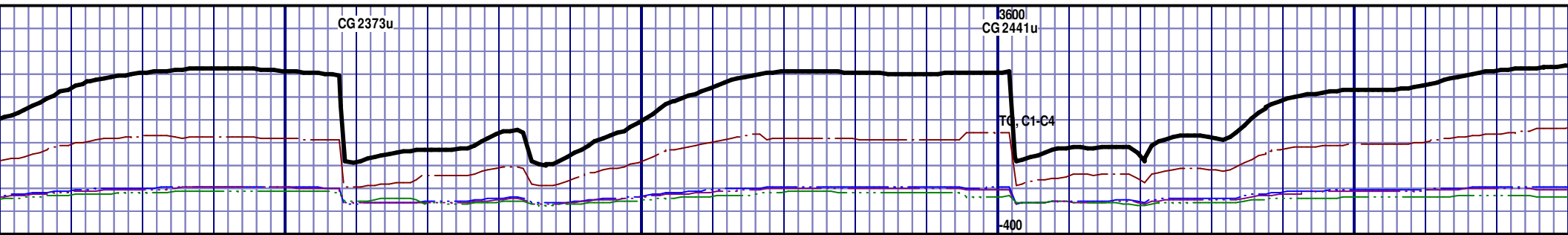
CHK; 75%; LT GRY TO GRY, SOFT, SH INCLUS, PYR  
NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN  
POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT,  
NO VIS STAIN

CHK; 78%  
NODULES,  
POR, NO F  
NO VIS STA

MD 10258 TVD 6768.67  
Az 90.24° Inc 89.97° VS 3578.56

MD 10353 TVD 6767.54  
Az 89.64° Inc 91.39° VS 3673.55

MD 10448 TVD  
Az 88° Inc 91.0



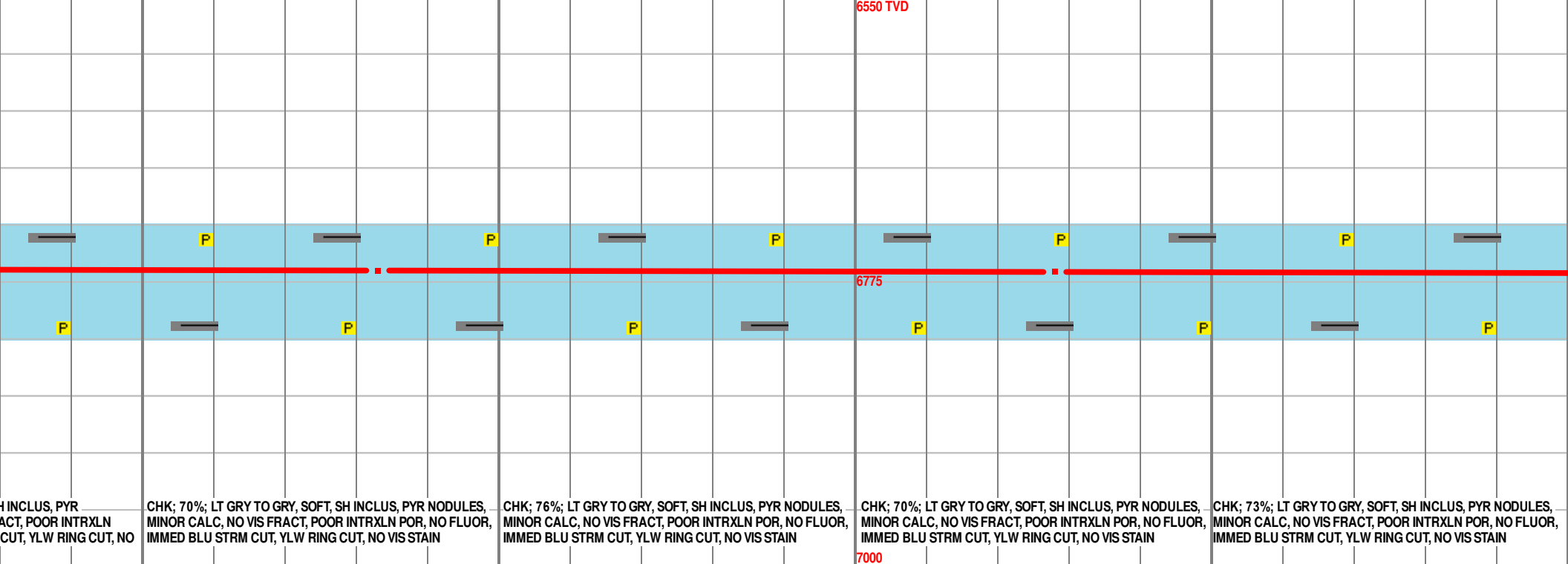
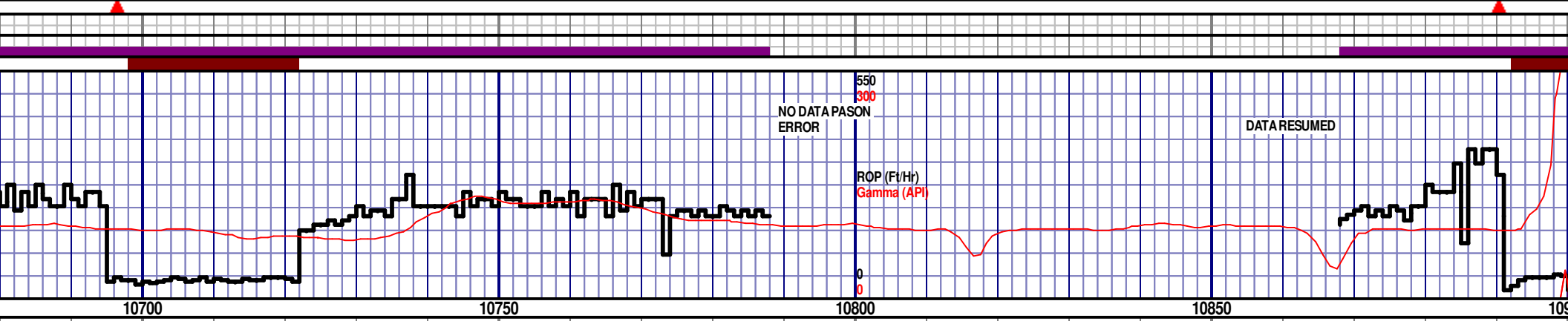
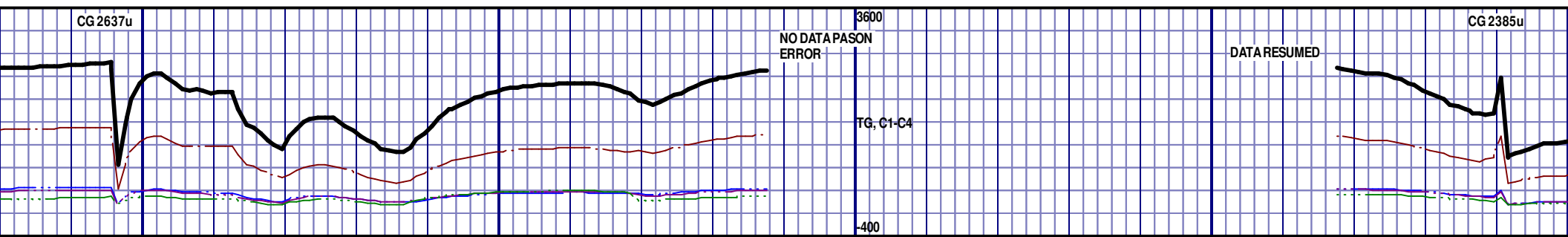
LT GRY TO GRY, SOFT, SH INCLUS, PYR  
MINOR CALC, NO VIS FRACT, POOR INTRXLN  
FLUOR, IMMED BLU STRM CUT, YLW RING CUT,  
AIN

CHK; 75%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES,  
MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO  
FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

CHK; 70%; LT GRY TO GRY, SOFT, SH INCLUS, PYR  
NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN  
POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT,  
NO VIS STAIN

CHK; 70%; LT GRY TO GRY, SOFT, SH INCLUS, PYR  
NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN  
POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO  
VIS STAIN

CHK; 69%; LT GRY TO GRY, SOFT, SH  
NODULES, MINOR CALC, NO VIS FRA  
POR, NO FLUOR, IMMED BLU STRM  
VIS STAIN



CHK; 70%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

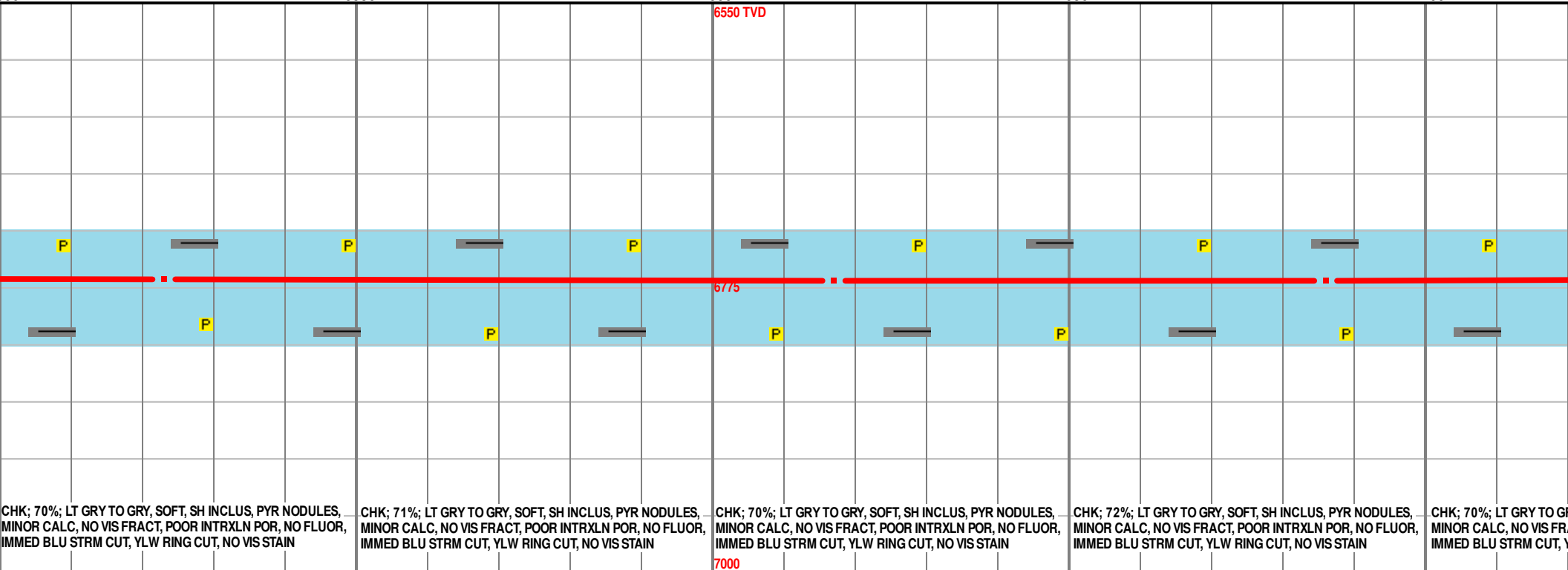
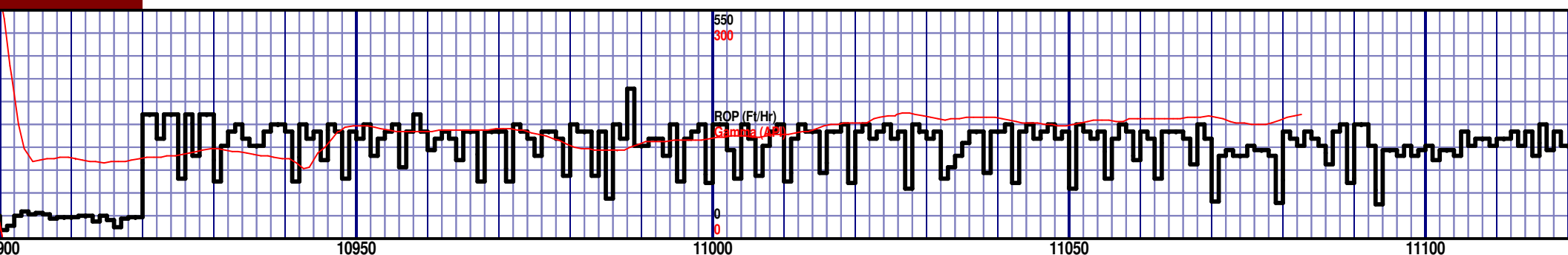
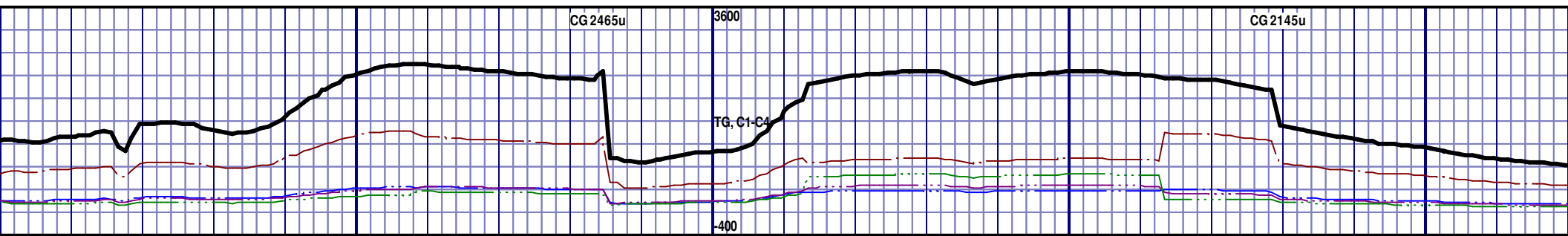
CHK; 76%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

CHK; 70%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

CHK; 73%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

MD 10733 TVD 6765.55  
Az 87.61° Inc 88.79° VS 4053.41

MD 10828 TVD 6766.62  
Az 87.94° Inc 89.91° VS 4148.35



CHK; 70%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

CHK; 71%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

CHK; 70%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

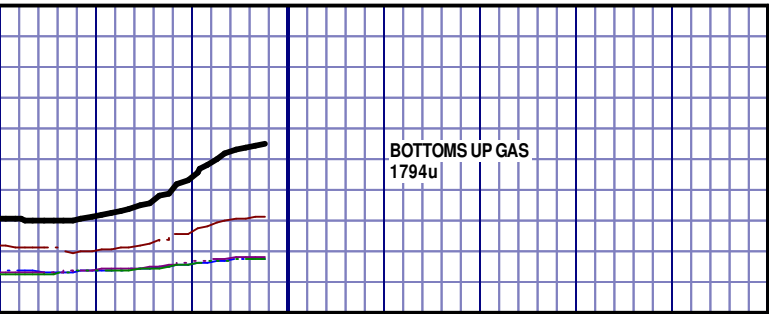
CHK; 72%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

CHK; 70%; LT GRY TO GRY, SOFT, SH INCLUS, PYR NODULES, MINOR CALC, NO VIS FRACT, POOR INTRXLN POR, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS STAIN

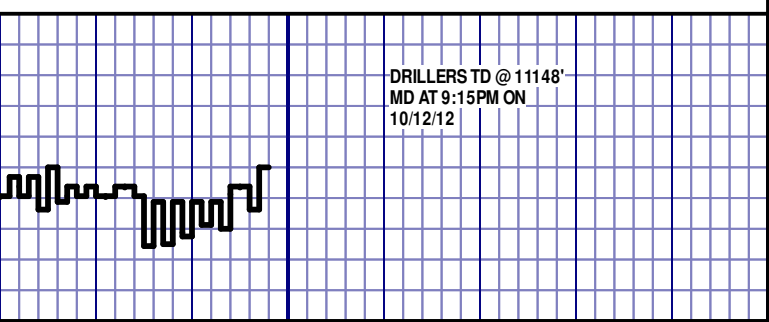
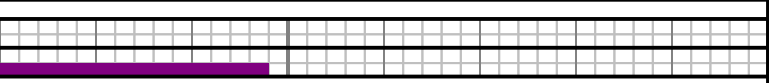
MD 10923 TVD 6767.98  
Az 87.86° Inc 88.46° VS 4243.28

MD 11017 TVD 6769.32  
Az 87.79° Inc 89.91° VS 4337.21

MD 11086 TVD 6768.82  
Az 89.07° Inc 90.93° VS 4406.19



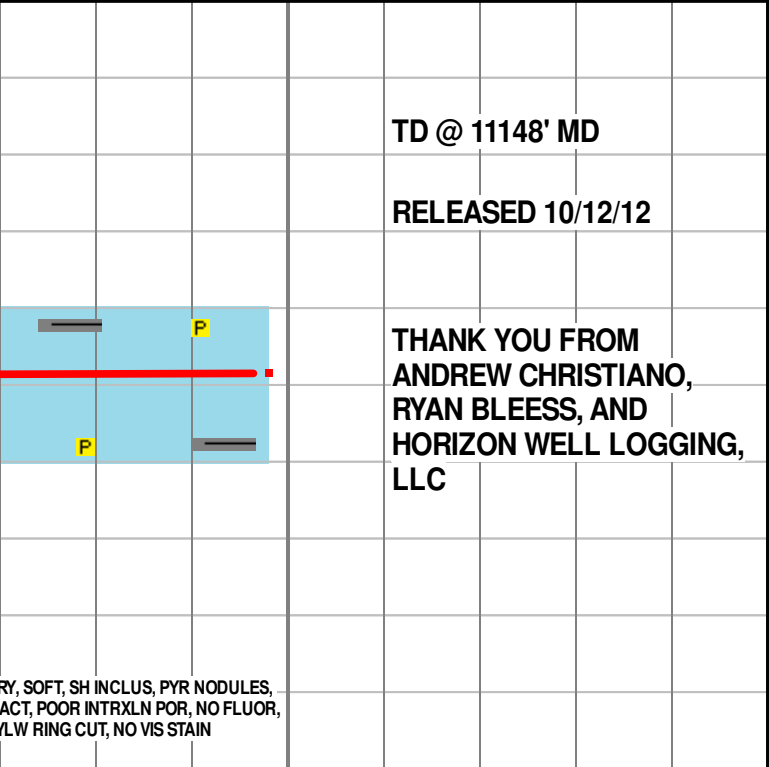
BOTTOMS UP GAS  
1794u



DRILLERS TD @ 11148'  
MD AT 9:15PM ON  
10/12/12

11150

111



TD @ 11148' MD

RELEASED 10/12/12

THANK YOU FROM  
ANDREW CHRISTIANO,  
RYAN BLEESS, AND  
HORIZON WELL LOGGING,  
LLC

RY, SOFT, SH INCLUS, PYR NODULES,  
ACT, POOR INTRXLN POR, NO FLUOR,  
YLW RING CUT, NO VIS STAIN