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[WWW.HZMUD.COM/25](http://WWW.HZMUD.COM/25)

### Customer Information

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

**Geologist:** Teresa Malesardi  
Noble Energy Inc.

### Mud Logging Details

**Logger:** Robert Gulliksen &  
Brian Whitfield  
**Log Interval:** 6700' MD to 11446' MD  
**Start Date:** August 29, 2013  
**Release Date:** September 3, 2013


### Well Information


**Well Name:** Wells Ranch USX  
AA27-69-1HN Horizontal


**Location:** 27-6N-63W  
1369' FNL, 221' FWL


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


**Drilling Rig:** H&P 277  
**Total Depth:** 11446' MD  
**TD Date:** September 3, 2013  
**Formation:** Niobrara B Chalk  
**KB Elevation:** 4808'  
**GR Elevation:** 4784'  
**API Number:** 05-123-37138-0000

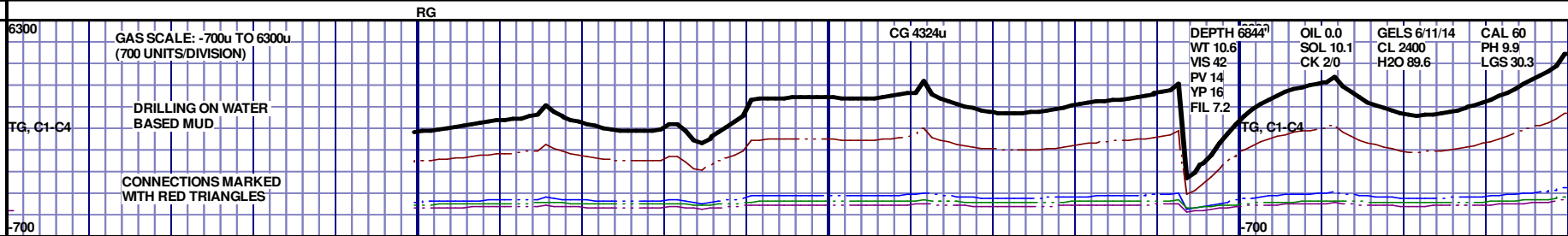
TG (Units) 

C1 (units) 

C2 (units) 

C3 (units) 

C4 (units) 

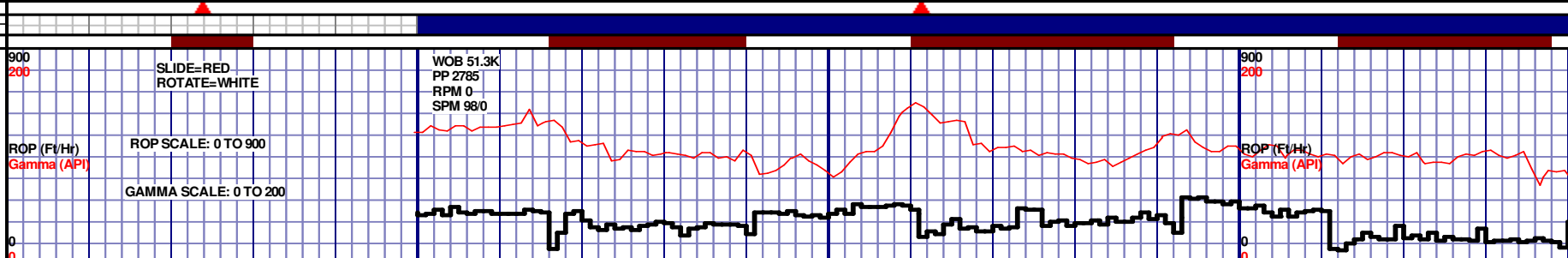


## Connections

**Slide/Rotate**

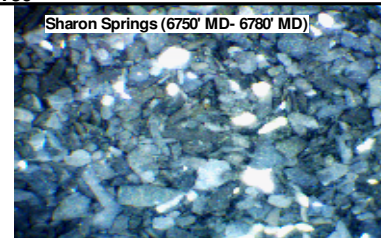
**ROP and Gamma**

|                    |       |
|--------------------|-------|
| ROP (Ft/Hr)        | _____ |
| <b>Gamma (API)</b> | _____ |



## Depth

## Photographs



Lithology %

|                        |  |
|------------------------|--|
| NOBLE ENERGY INC       |  |
| WELLS RANCH USX        |  |
| AA27-69-1HN HORIZONTAL |  |
| 27-6N-63W              |  |
| 1369' FNL, 221' FWL    |  |
| WELD CO., CO           |  |

H&amp;P 277

## Well Bore Cross Section

|                  |  |
|------------------|--|
| LOGGERS:         |  |
| BRIAN WHITFIELD  |  |
| ROBERT GULLIKSEN |  |

COMMENCED LOGGING @ DEPTH 6700' MD ON  
8/29/2013 W/BIT# 3 SIZE 8.75" TYPE SMITH SDI611  
(S/N) JG9182 IN @ 5900' MD

**TEEPEE BUTTES**  
5990' MD 5917' TVD

**SHARON SPRINGS**  
6760' MD 6501' TVD

**NIOBRARA**  
6810' MD 6527' TVD

6690' - 6720': SH: 85%  
MEDDRKG, FRI, SILTY  
TXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE  
SILT, NO STN, NO FLOR,  
IMMED BLUE STREAM  
CUT, YLW RNG

6720'- 6750' : SH: 90% MEDDRKGY,  
FRI, SILTYTXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE SILT, NO  
STN, NO FLOR, IMMED BLUE  
STREAM CUT. YLW RNG

6750'- 6780': SH: 90% MEDDRKGY, FRI,  
SILTYTXT, TRC IMBD PYR, IMBD  
CALC FLK, FREE SILT, NO STN, NO  
FLOR, IMMED BLUE STREAM CUT,  
YLWRNG

6780'- 6810': SH: 90% MEDDRKGY,  
FRI, SILTYTXT, TRC IMBD PYR,  
IMBD CALC FLK, FREE SILT, NO  
STN, NO FLOR, IMMED BLUE  
STREAM CUT. YLW RNG

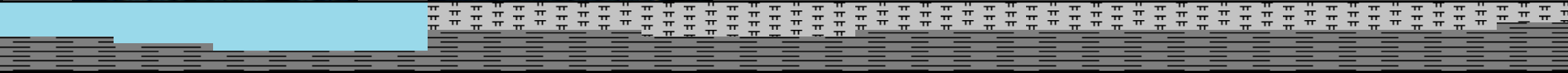
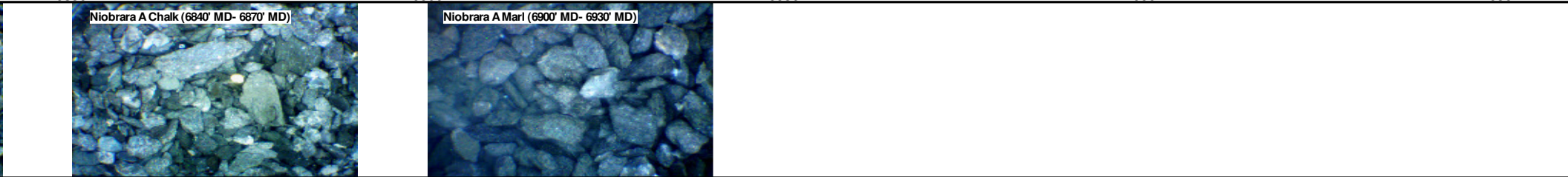
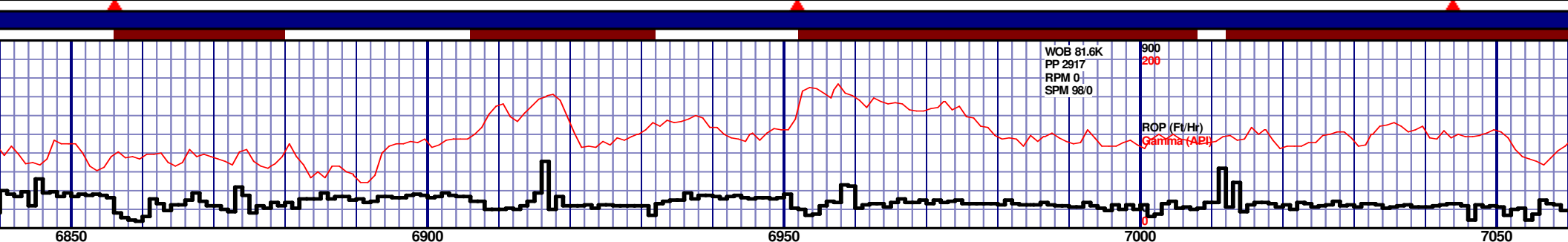
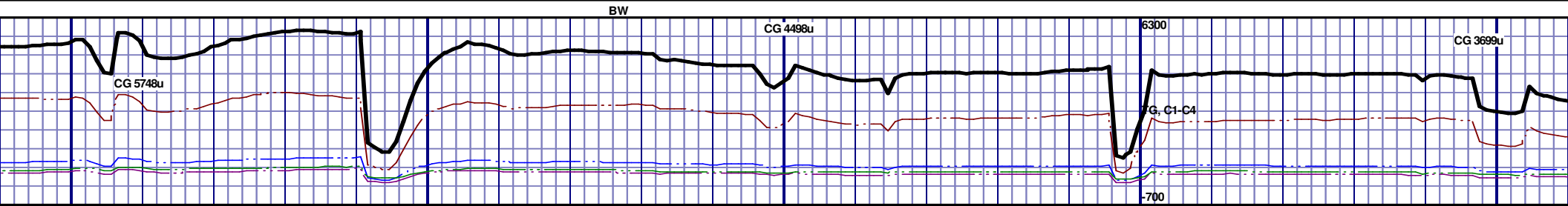
6810'-6840: MRL: 27%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR

## Survey Data

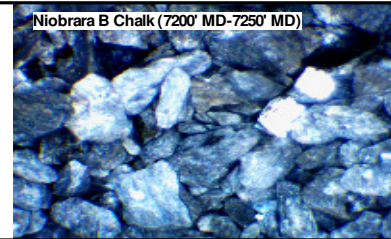
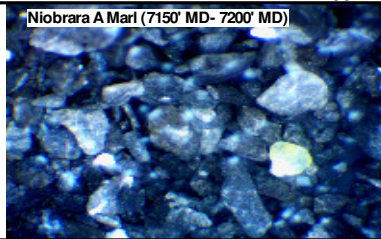
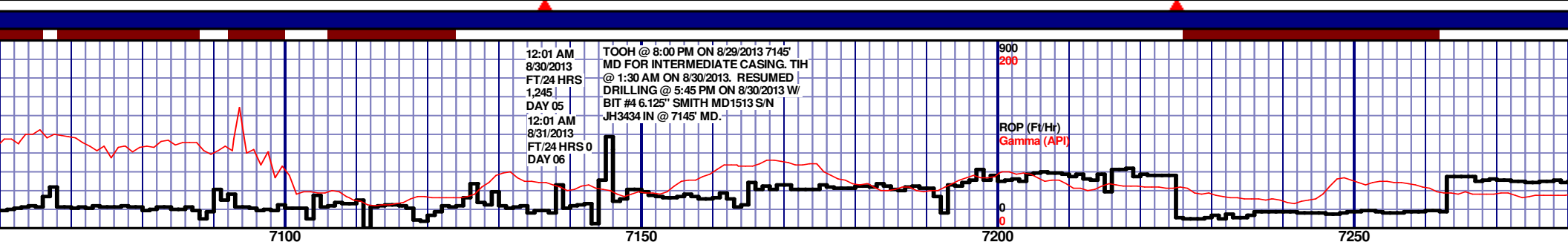
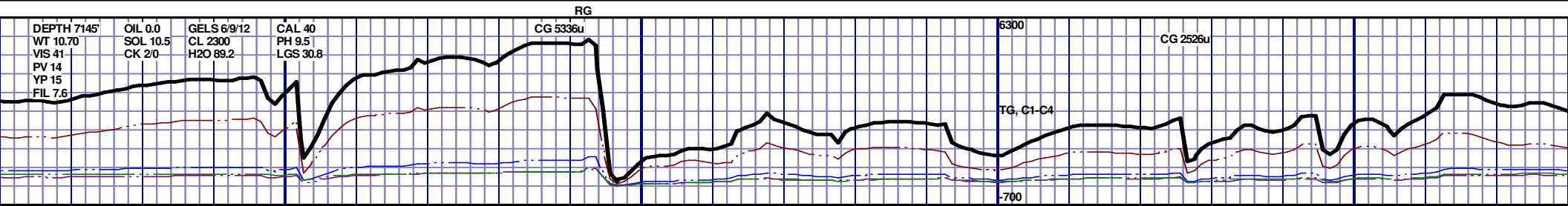
MD 6701 TVD 6469.93  
INC 56 AZ 66.6  
VS 331.37

MD 6749 TVD 6496.25  
INC 57.5 AZ 69.7  
VS 370.99

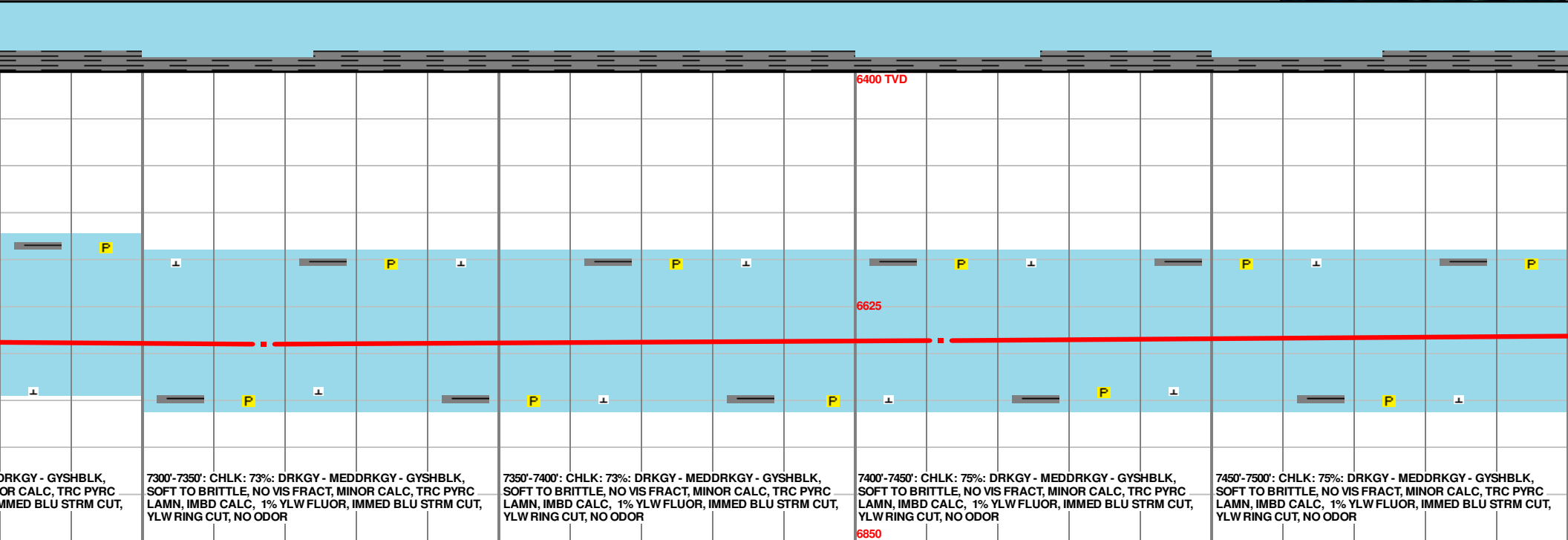
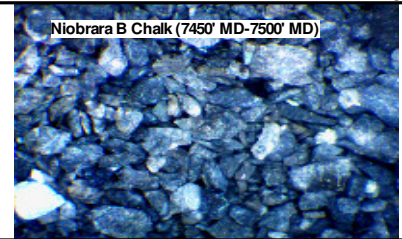
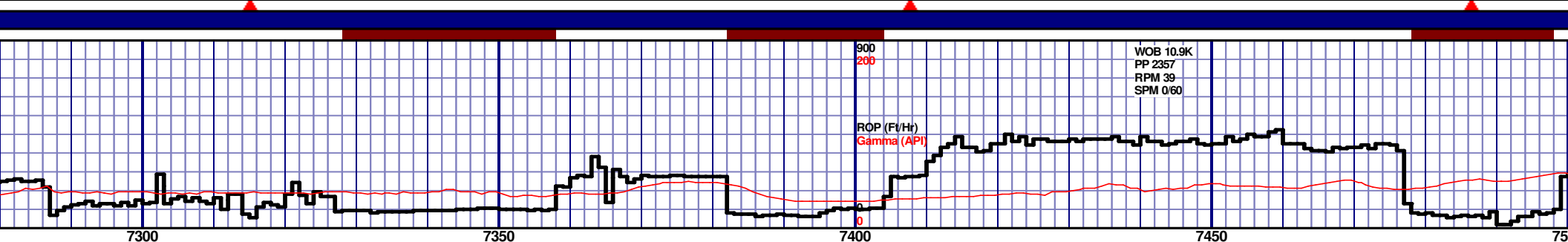
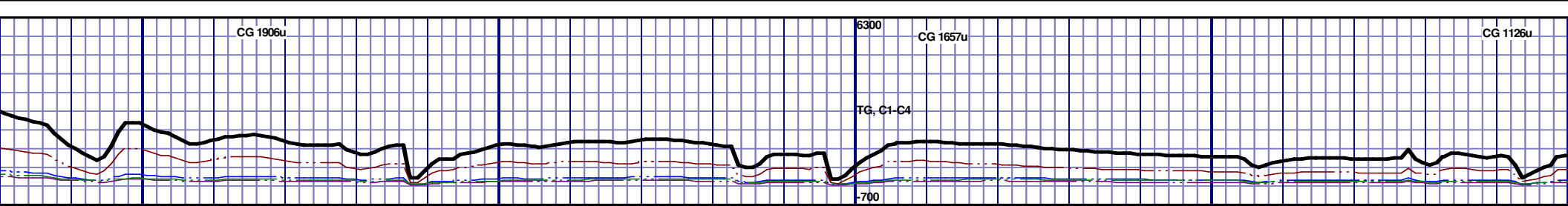
MD 6797 TVD 6521.3  
INC 59.6 AZ 73.2  
VS 411.71

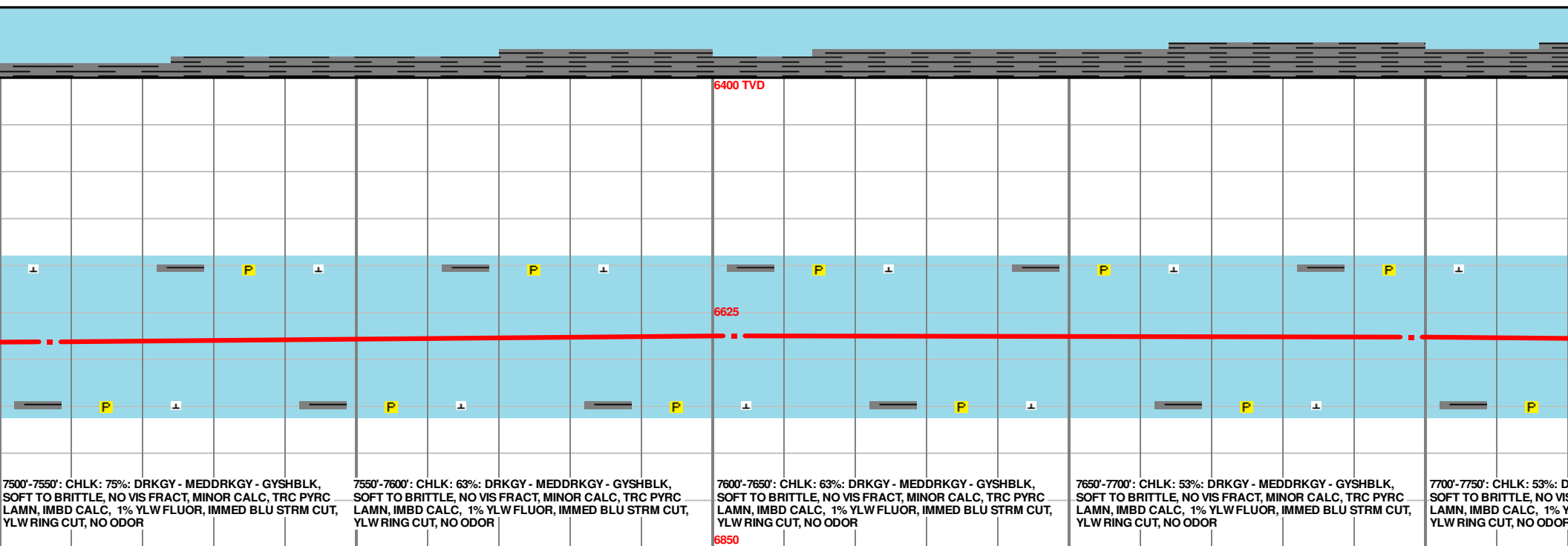
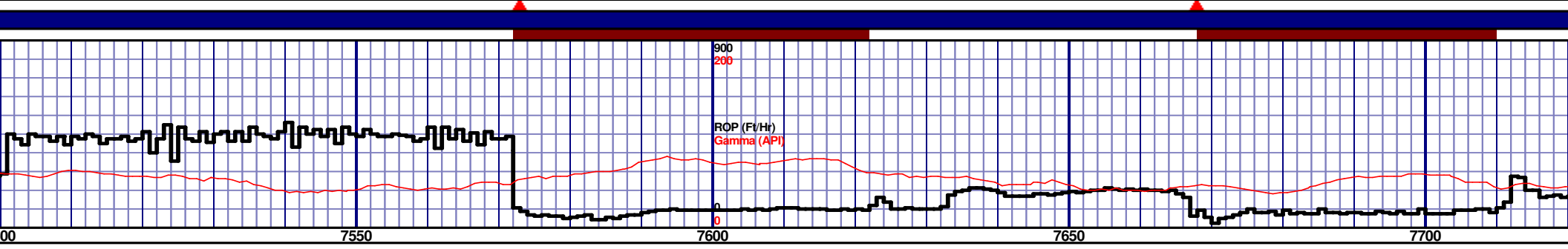
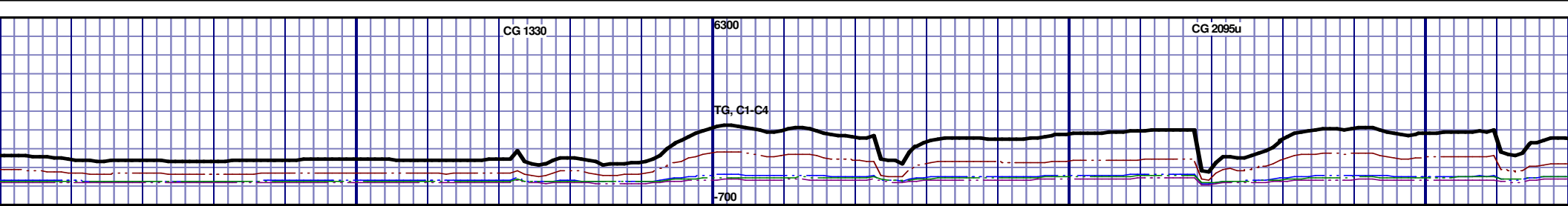


| NIOBRARA A CHALK<br>6854' MD 6548' TVD  |  | NIOBRARA A MARL<br>6918' MD 6576' TVD   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 6840'-6870': CHLK: 55%: DRKGY - MEDDRKGY - GYSHBLK, BLKY, SLTY TXT, SOFT TO BRITTLE, IMBD CALC FLK, IMBD PYR LAMN, NO FLOR, IMMED BLUE STRM CUT, YLW RING |  | 6870'-6900': CHLK: 70%: DRKGY - MEDDRKGY - GYSHBLK, BLKY, SLTY TXT, SOFT TO BRITTLE, IMBD CALC FLK, IMBD PYR LAMN, NO FLOR, IMMED BLUE STRM CUT, YLW RING |  | 6900'-6930': MRL: 48%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD BLU STRM CUT, YLW RING CUT, NO ODOR |  | 6930'-6960': MRL: 48%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD BLU STRM CUT, YLW RING CUT, NO ODOR |  | 6960'-6990': MRL: 38%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD BLU STRM CUT, YLW RING CUT, NO ODOR |  | 6990'-7020': MRL: 38%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD BLU STRM CUT, YLW RING CUT, NO ODOR |  | 7020'-7050': MRL: 38%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD BLU STRM CUT, YLW RING CUT, NO ODOR |  | 7050'-7080': MRL: 38%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD BLU STRM CUT, YLW RING CUT, NO ODOR |  |  |  |

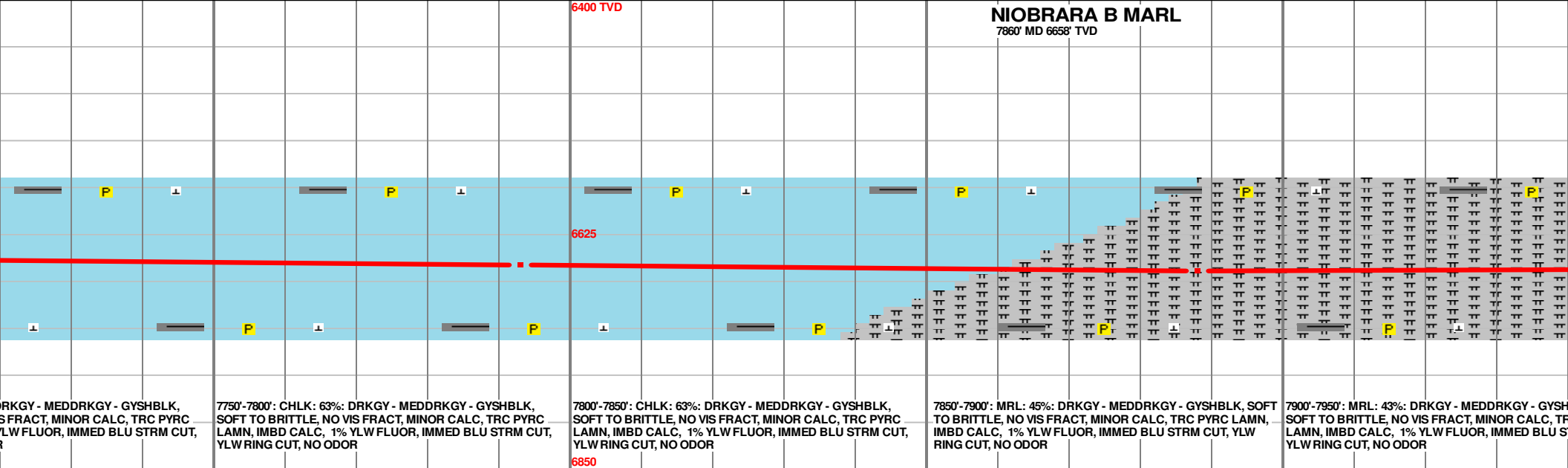
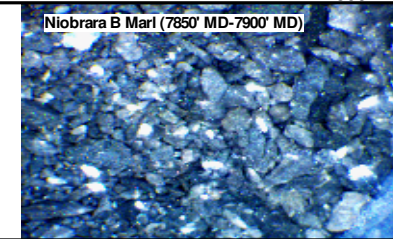
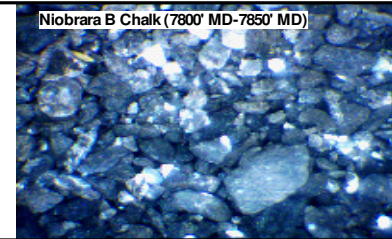
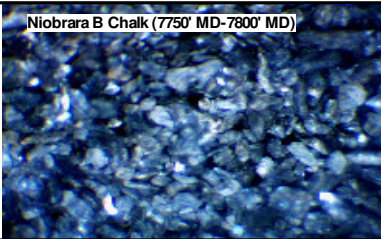
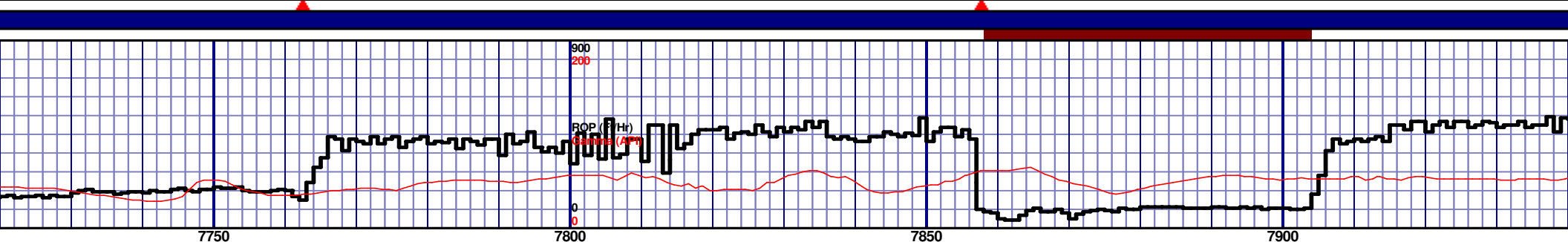
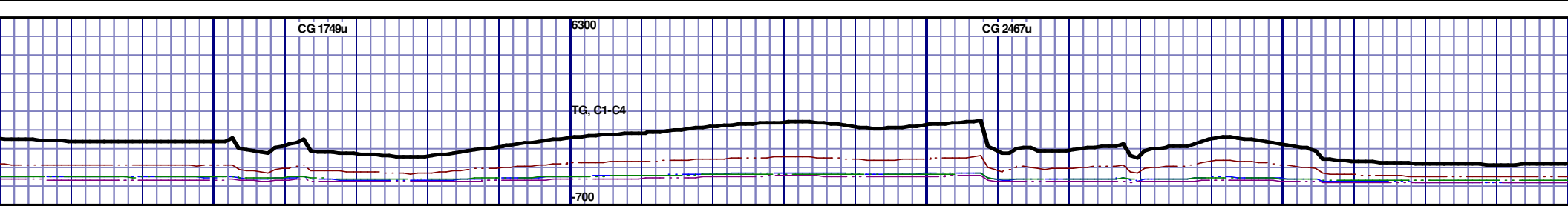


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|  |  |  |  |  |  | 6400 TVD | NIOBRARA B CHALK   |  |  |  |  |  |  |  |
|  |  |  |  |  |  |          | 7210' MD 6655' TVD |  |  |  |  |  |  |  |
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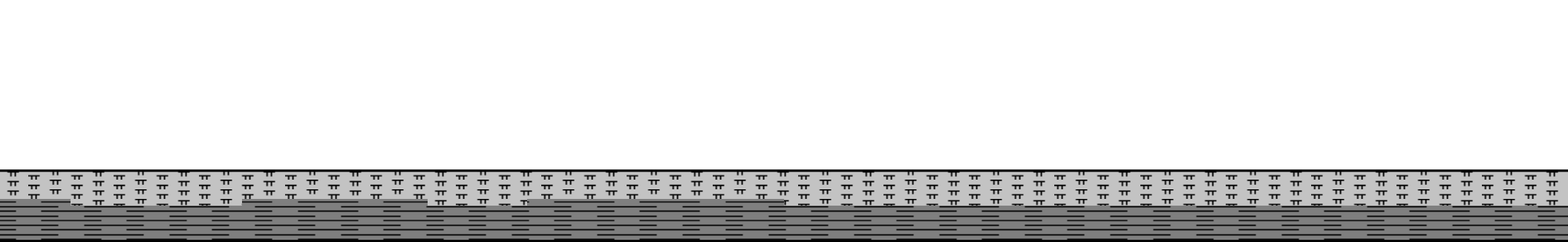
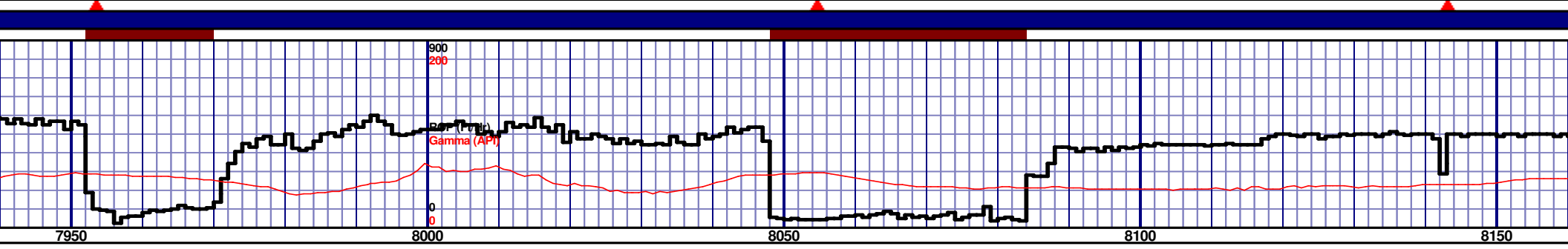
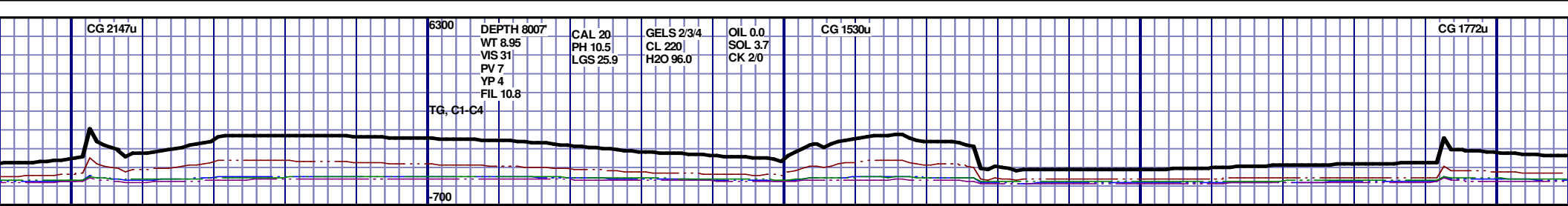


| MD 7507 TVD 6652.61<br>INC 93.5 AZ 89.5<br>VS 1065.26  | MD 7603 TVD 6647.83<br>INC 92.2 AZ 89.3<br>VS 1179.02  | MD 7698 TVD 6648.41<br>INC 87.1 AZ 87.3<br>VS 1272.25  |
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| 7500'-7550': CHLK: 75%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR | 7550'-7600': CHLK: 63%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR | 7600'-7650': CHLK: 63%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR |
| 7650'-7700': CHLK: 53%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR | 7700'-7750': CHLK: 53%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR | 7750'-7800': CHLK: 53%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR |

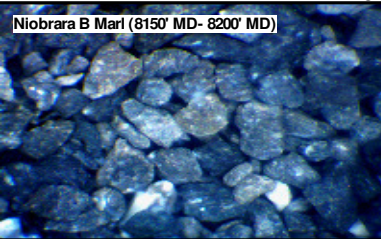
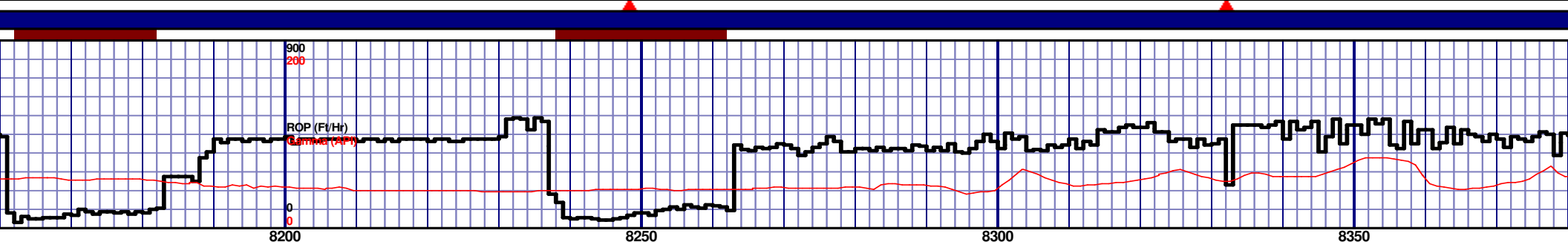
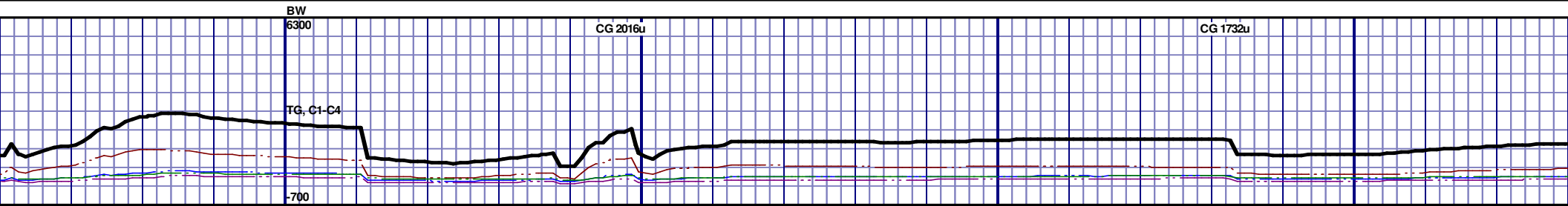


MD 7793 TVD 6654.55  
INC 85.5 AZ 87.2  
VS 1365.63

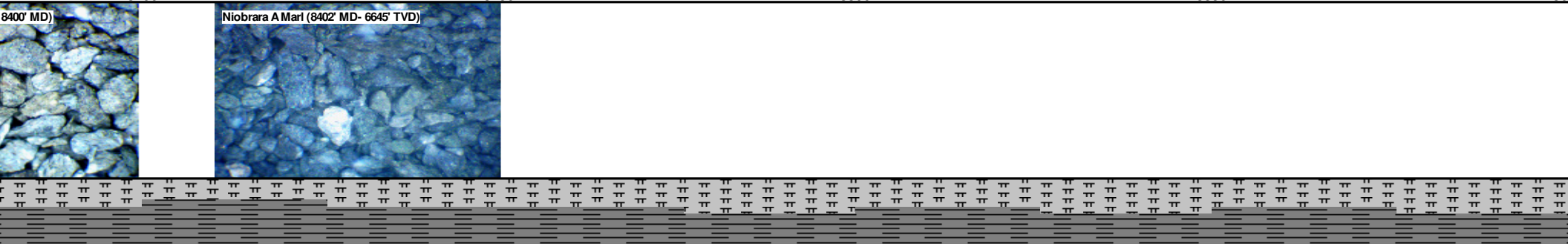
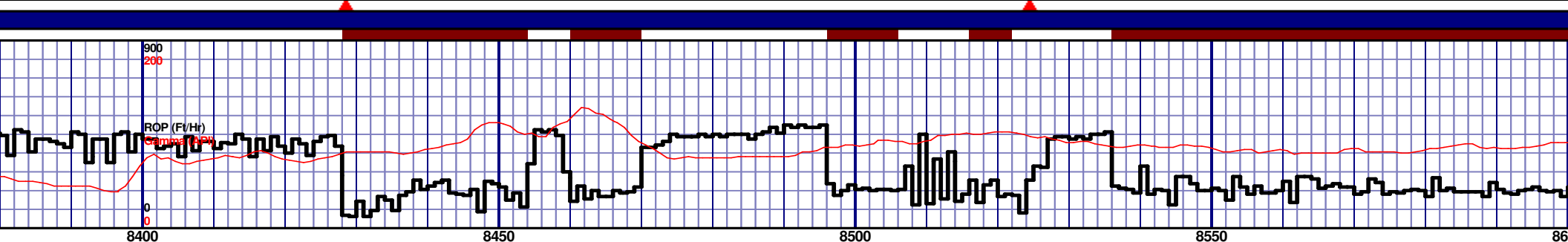
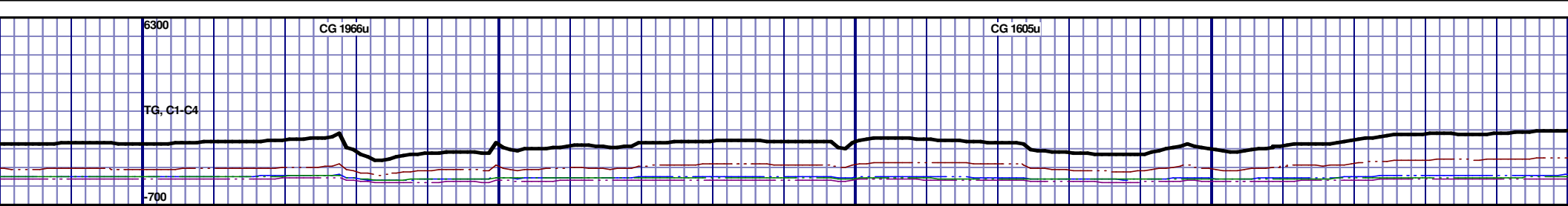
MD 7888 TVD 6659.35  
INC 88.7 AZ 90  
VS 1458.66



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| IBLK,<br>RC PYRC<br>TRM CUT, | 7750'-8000': MRL: 45%: DRKGY - MEDDRKGY - GYSHBLK,<br>SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC<br>LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT,<br>YLW RING CUT, NO ODOR | 7750'-8000': MRL: 45%: DRKGY - MEDDRKGY - GYSHBLK,<br>SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC<br>LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT,<br>YLW RING CUT, NO ODOR | 8050'-8100': MRL: 48%: DRKGY - MEDDRKGY - GYSHBLK, SOFT<br>TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC LAMN,<br>IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW<br>RING CUT, NO ODOR | 8100'-8150': MRL: 48%: DRKGY - MEDDRKGY - GYSHBLK,<br>SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC<br>LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT,<br>YLW RING CUT, NO ODOR | 8150'-8200': MRL: 48%: DRKGY - MEDDRKGY - GYSHBLK,<br>SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC<br>LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT,<br>YLW RING CUT, NO ODOR |
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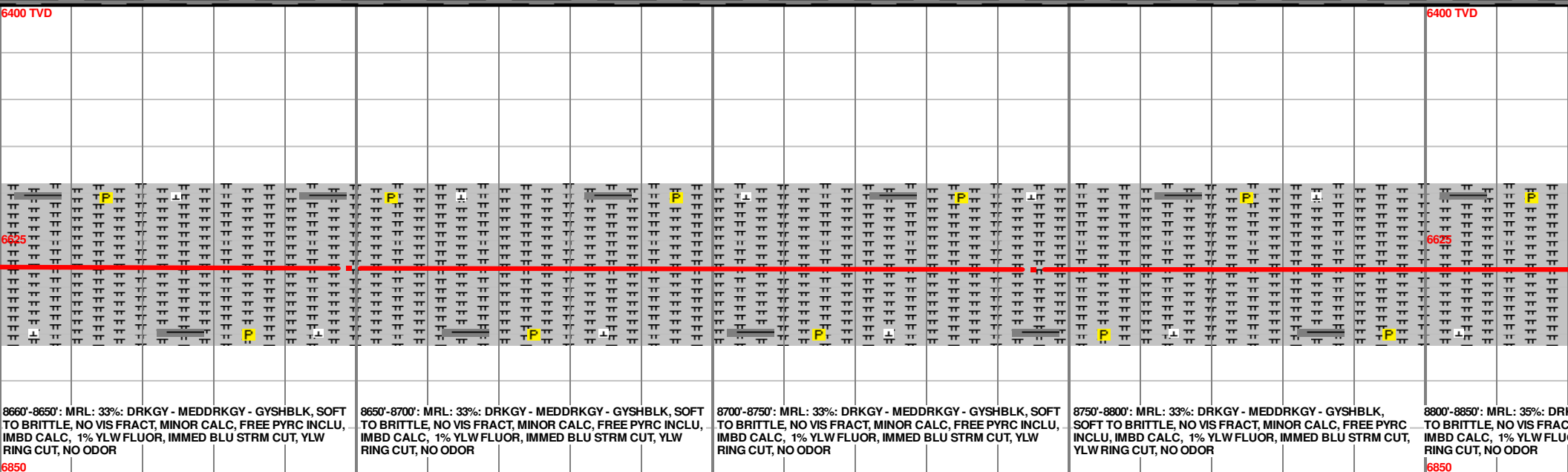
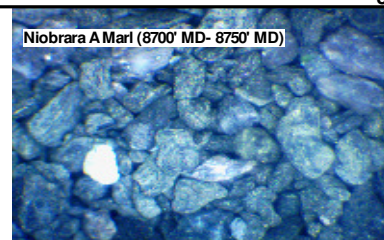
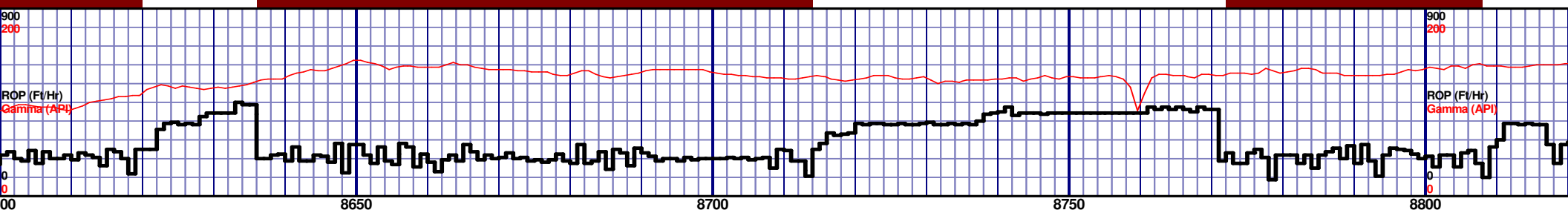
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| 6400 TVD  |  |  |  |  |  |  |  |  |  |
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| 6850  |  |  |  |  |  |  |  |  |  |
| MRL: 48%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC LAMN, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR                         |  |  |  |  |  |  |  |  |  |
| 8200'-8250': MRL: 48%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR |  |  |  |  |  |  |  |  |  |
| 8250'-8300': MRL: 48%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR |  |  |  |  |  |  |  |  |  |
| 8300'-8350': MRL: 38%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR |  |  |  |  |  |  |  |  |  |
| 8350'-8400': MRL: 38%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR |  |  |  |  |  |  |  |  |  |



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| 8400' TVD<br><b>NIOBRARA A MARL</b><br>8402' MD 6645' TVD                              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DRKGY - GYSHBLK, SOFT<br>ALC, TRC PYRC LAMN,<br>BLU STRM CUT, YLW<br>RING CUT, NO ODOR | 8400'-8450': MRL: 36%: DRKGY - MEDDRKGY - GYSHBLK, SOFT<br>TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC LAMN,<br>IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW<br>RING CUT, NO ODOR | 8450'-8500': MRL: 36%: DRKGY - MEDDRKGY - GYSHBLK, SOFT<br>TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC LAMN,<br>IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW<br>RING CUT, NO ODOR | 8500'-8550': MRL: 34%: DRKGY - MEDDRKGY - GYSHBLK, SOFT<br>TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC LAMN,<br>IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW<br>RING CUT, NO ODOR | 8550'-8600': MRL: 34%: DRKGY - MEDDRKGY - GYSHBLK, SOFT<br>TO BRITTLE, NO VIS FRACT, MINOR CALC, FREE PYRC INCLU,<br>IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW<br>RING CUT, NO ODOR |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

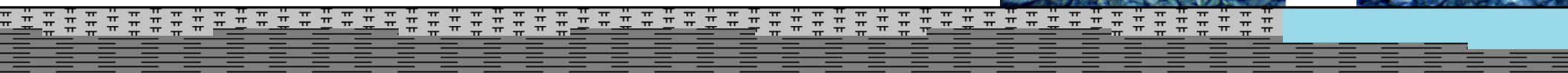
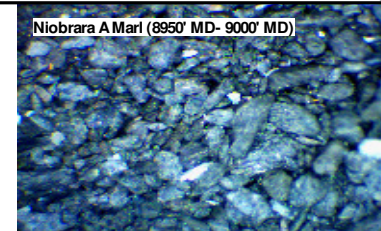
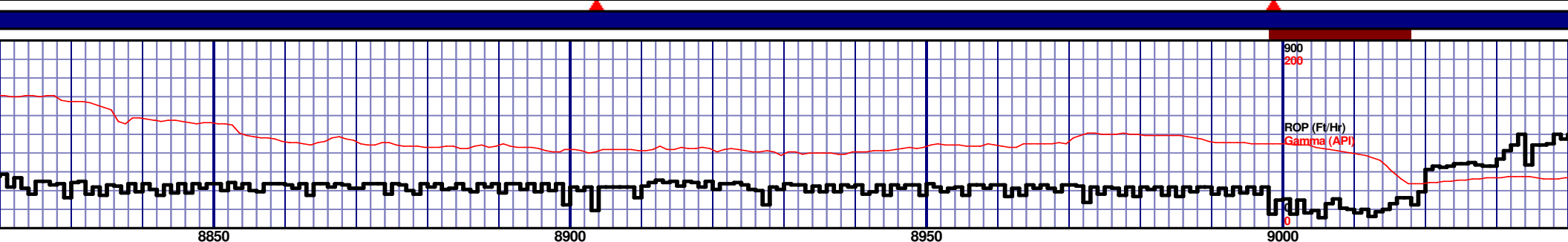
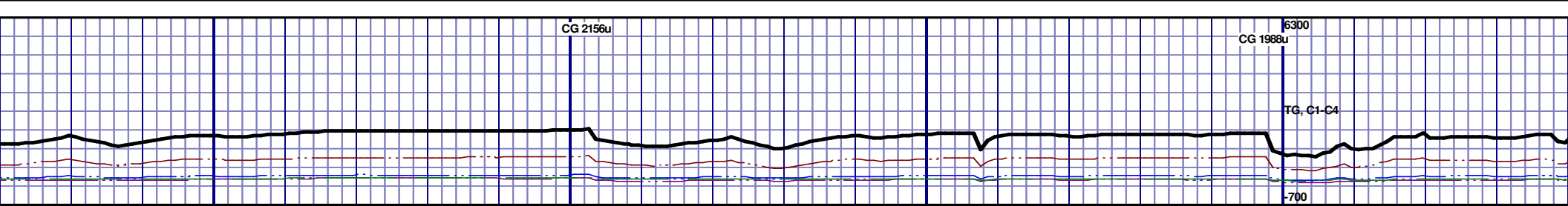
MD 8459 TVD 6646.41  
INC 87.9 AZ 89.5  
VS 2015.88

MD 8554 TVD 6649.64  
INC 88.2 AZ 89.4  
VS 2108.7



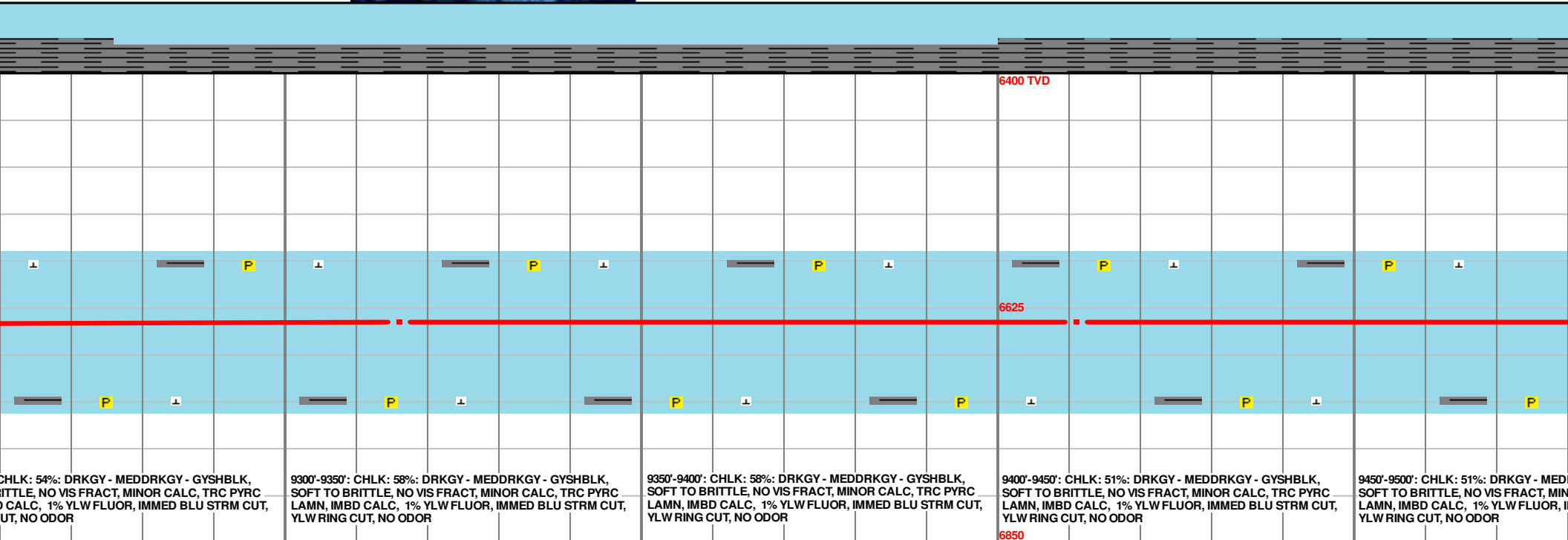
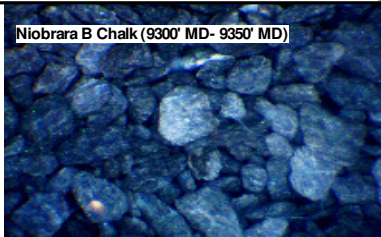
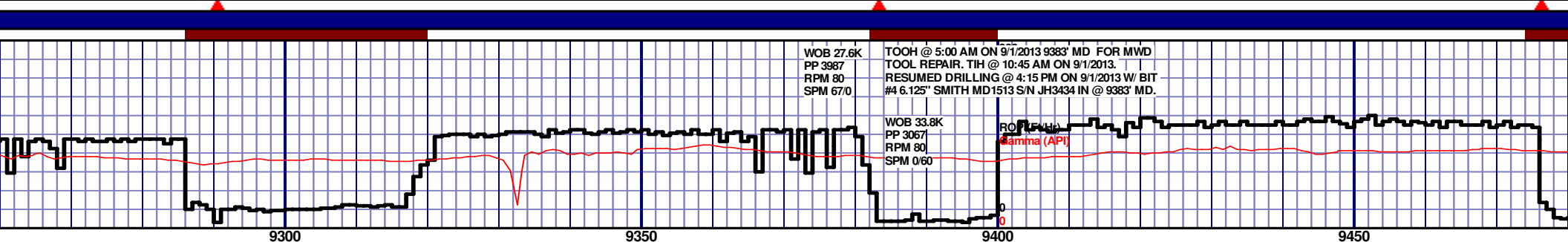
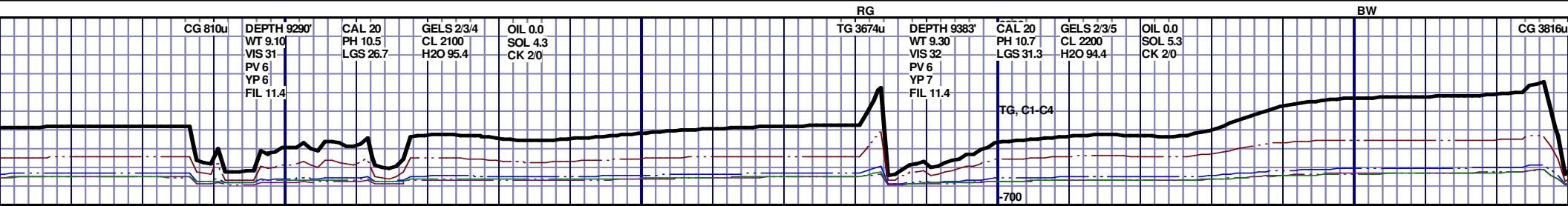
MD 8649 TVD 6652.37  
INC 88.5 AZ 88.8  
VS 2201.67

MD 8745 TVD 6653.55  
INC 90.1 AZ 89  
VS 2295.71



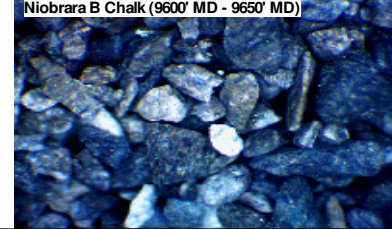
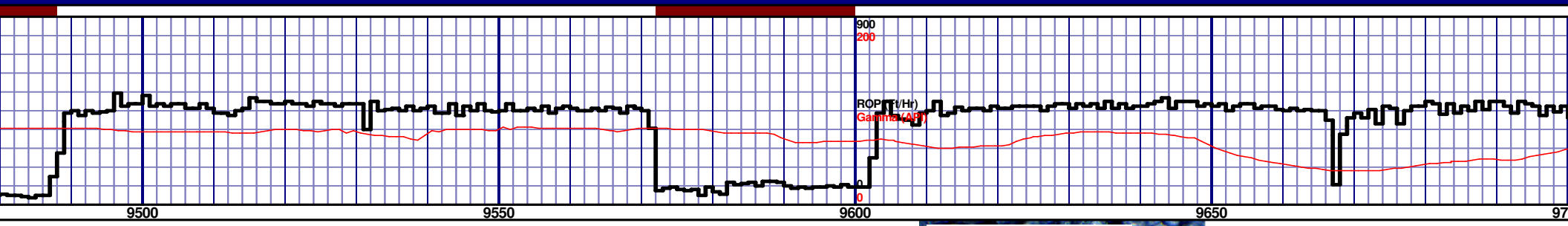
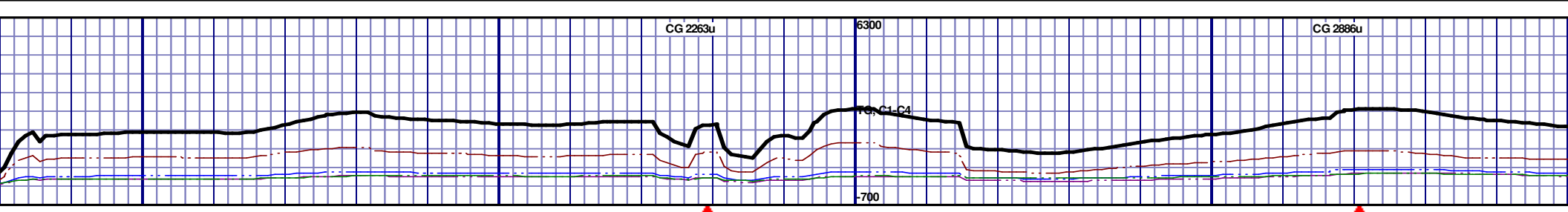
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|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |  |  |  |  |                                     |  |  |  |  |  |  |  |  |  |
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MD 9316 TVD 6638.33  
INC 90.4 AZ 90.1  
VS 2854.39

MD 9411 TVD 6638.25  
INC 89.7 AZ 89.1  
VS 2947.22

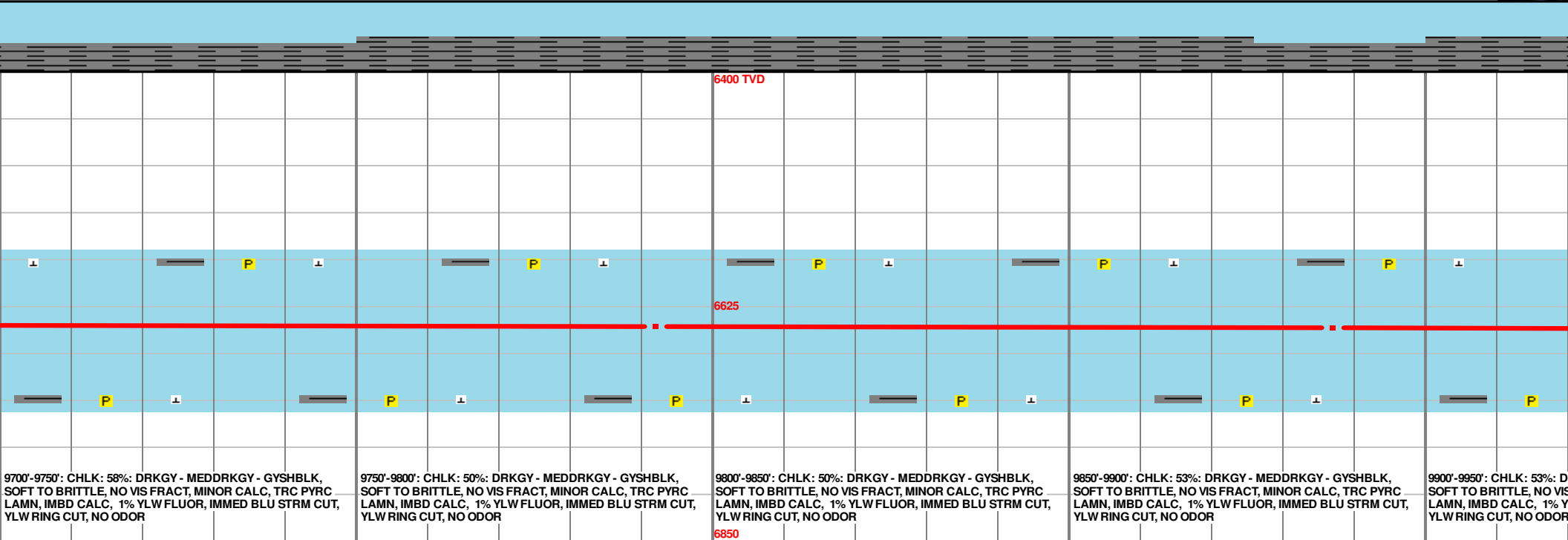
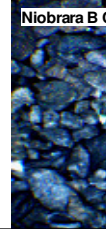
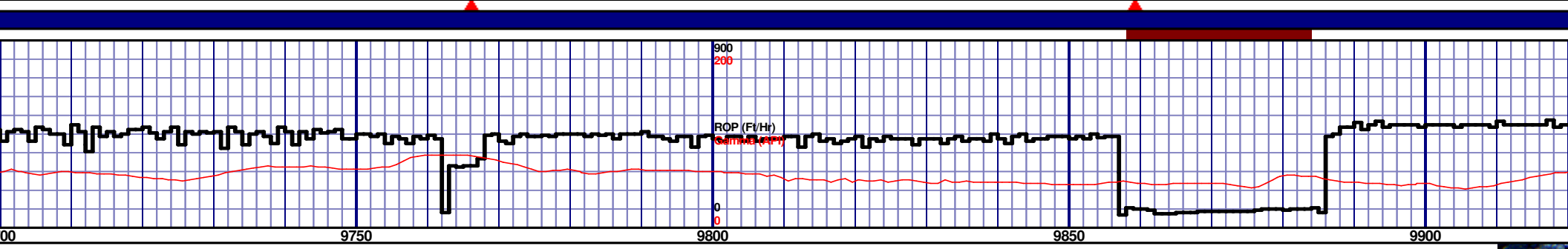
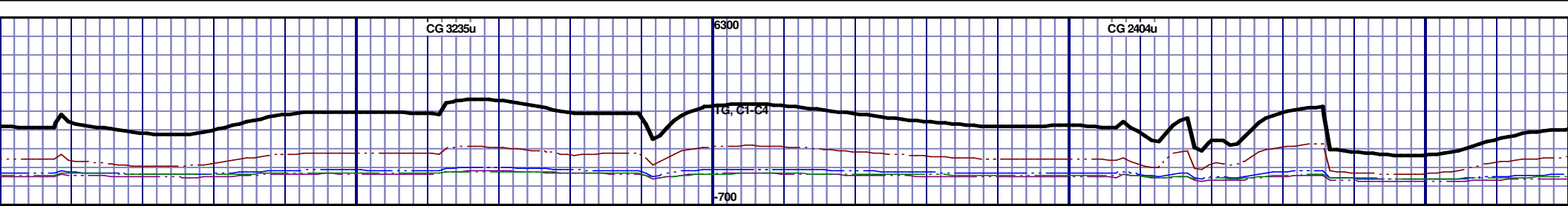


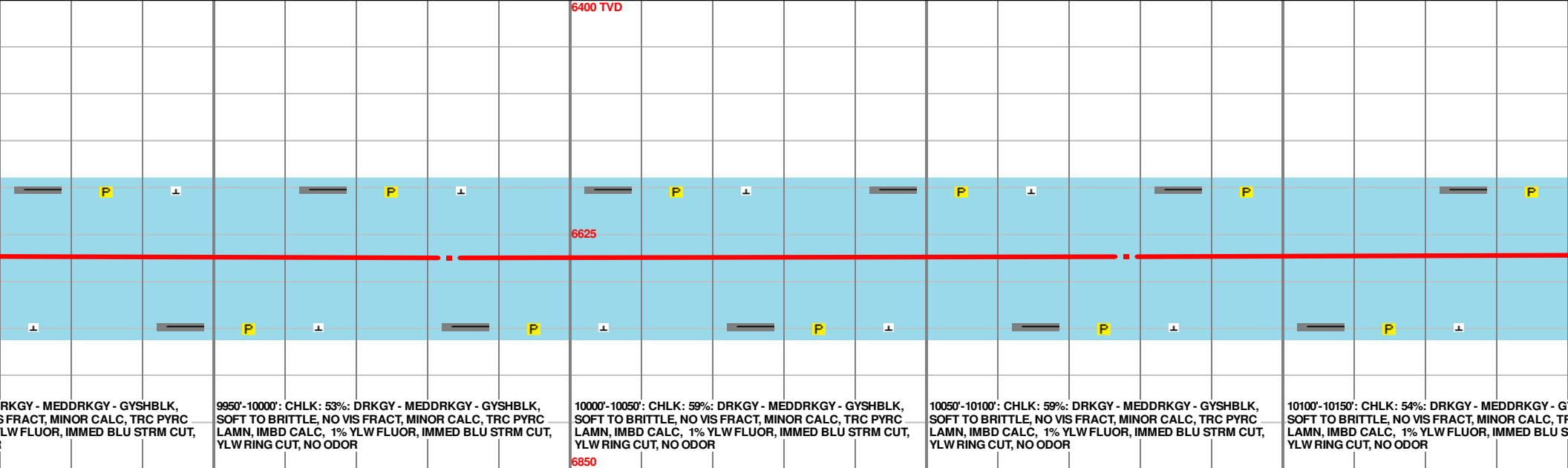
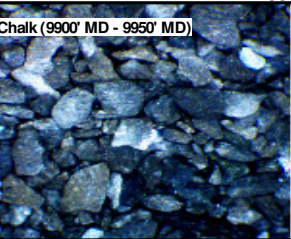
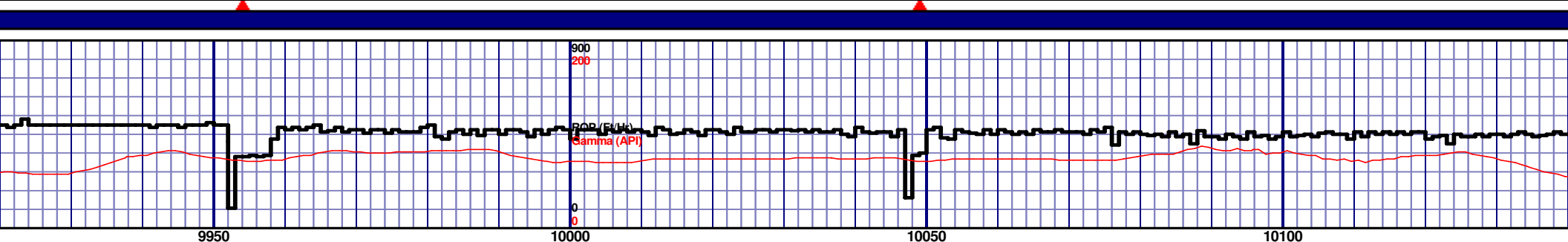
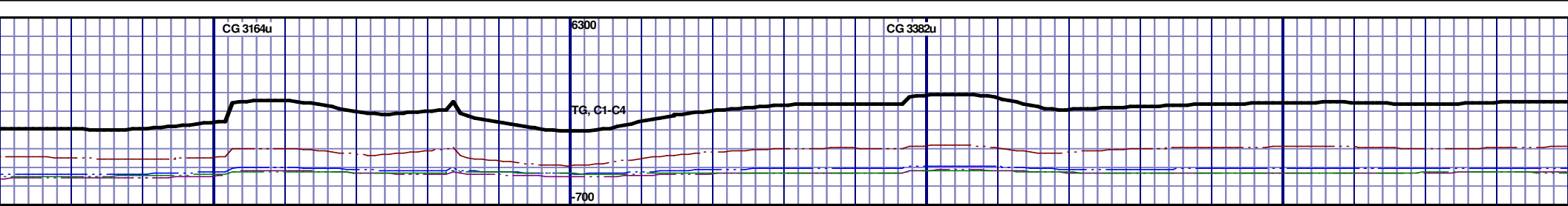
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|---|--|--|--|--|---|--|--|--|--|---|--|--|--|--|
| 6400 TVD  |  |  |  |  | 6625  |  |  |  |  | 6850  |  |  |  |  |
|   |  |  |  |  |   |  |  |  |  |   |  |  |  |  |
| DRKGY - GYSHBLK,<br>OR CALC, TRC PYRC<br>IMMED BLU STRM CUT,  |  |  |  |  | DRKGY - GYSHBLK,<br>OR CALC, TRC PYRC<br>IMMED BLU STRM CUT,  |  |  |  |  | DRKGY - GYSHBLK,<br>OR CALC, TRC PYRC<br>IMMED BLU STRM CUT,  |  |  |  |  |
| 9500'-9550': CHLK: 56%: DRKGY - MEDDRKGY - GYSHBLK,<br>SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC<br>LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT,<br>YLW RING CUT, NO ODOR |  |  |  |  | 9550'-9600': CHLK: 56%: DRKGY - MEDDRKGY - GYSHBLK,<br>SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC<br>LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT,<br>YLW RING CUT, NO ODOR |  |  |  |  | 9600'-9650': CHLK: 58%: DRKGY - MEDDRKGY - GYSHBLK,<br>SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC<br>LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT,<br>YLW RING CUT, NO ODOR |  |  |  |  |
| 9650'-9700': CHLK: 58%: DRKGY - MEDDRKGY - GYSHBLK,<br>SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC<br>LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT,<br>YLW RING CUT, NO ODOR |  |  |  |  |   |  |  |  |  |   |  |  |  |  |

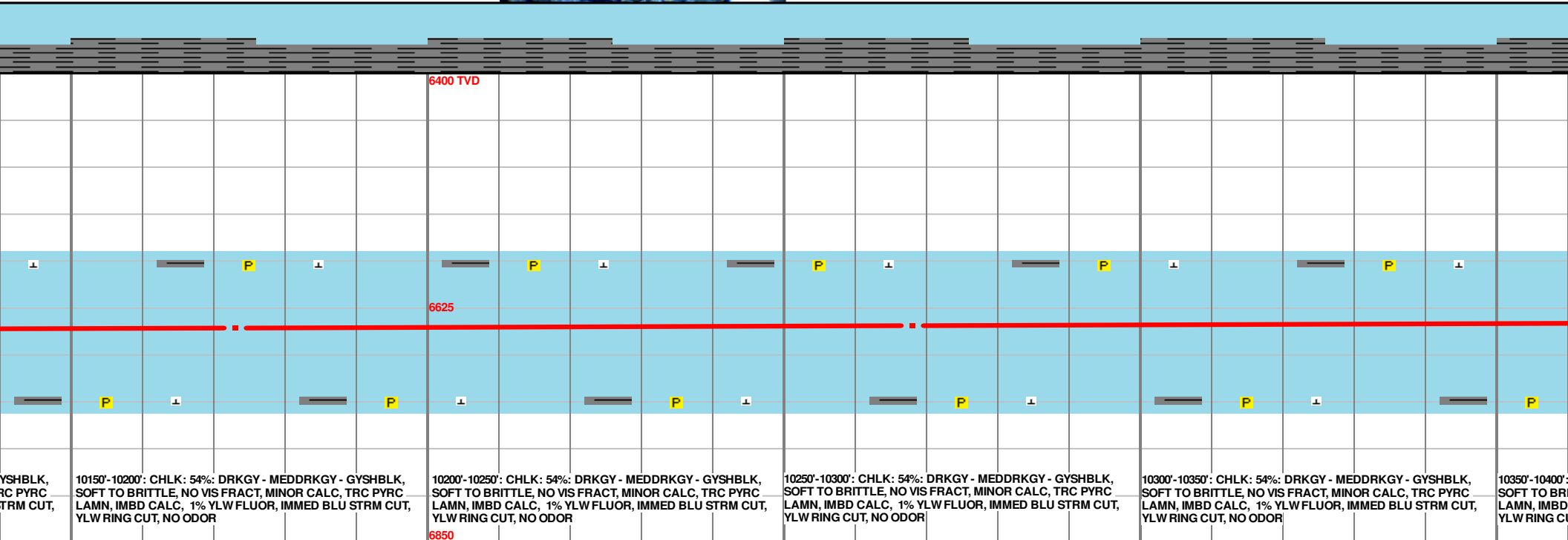
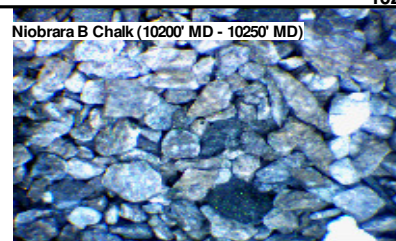
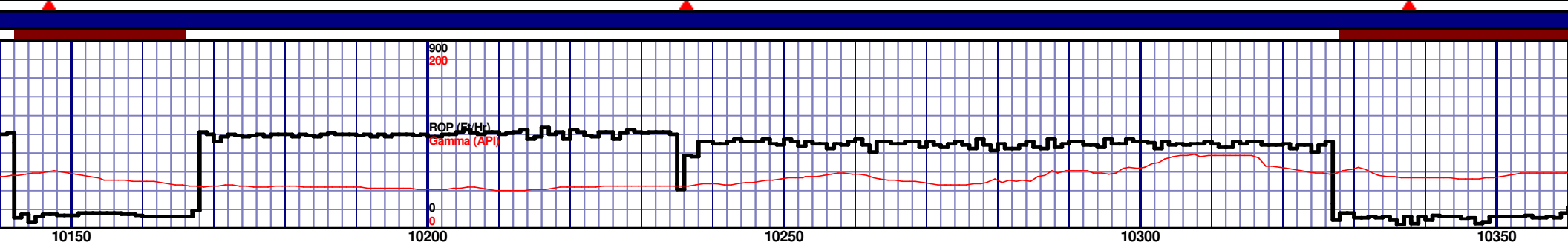
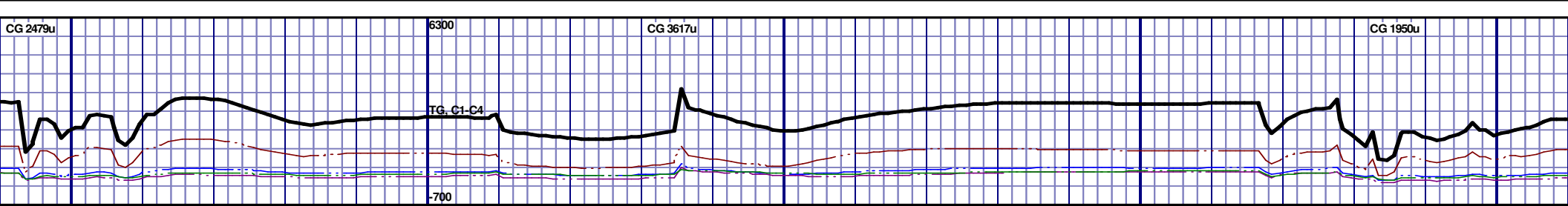
MD 9506 TVD 6638.83  
INC 89.6 AZ 89.3  
VS 3040.19

MD 9602 TVD 6640.76  
INC 88.1 AZ 89.3  
VS 3134.08

MD  
INC  
VS

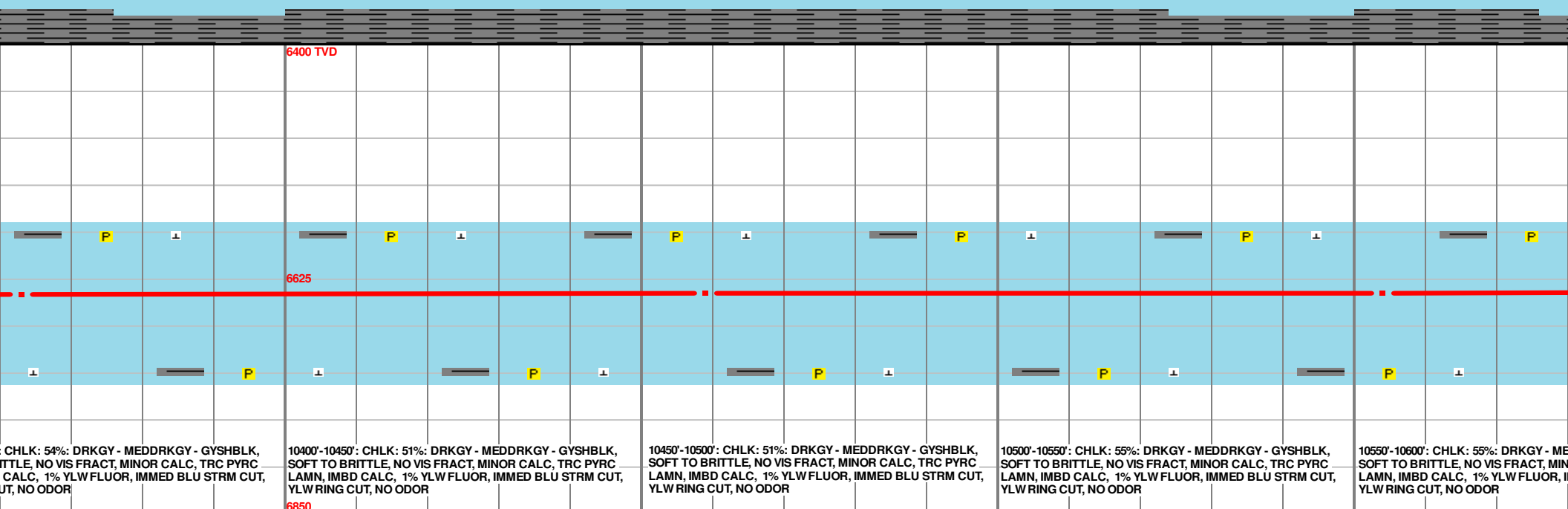
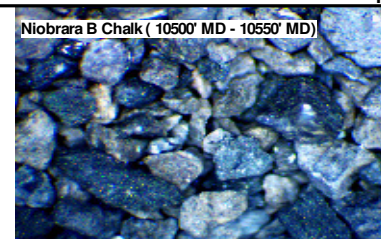
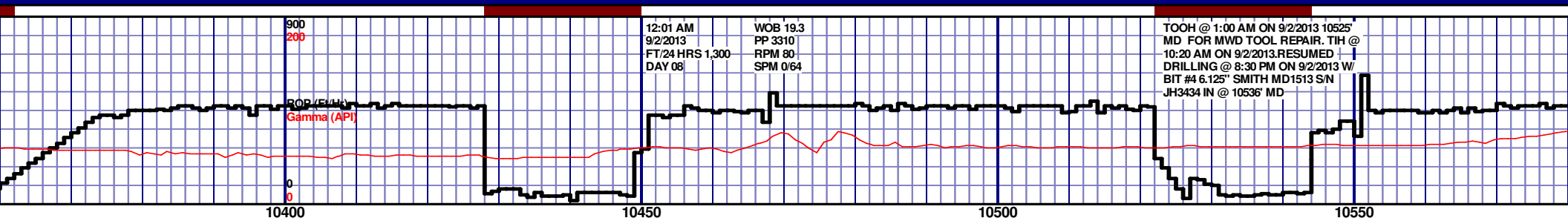
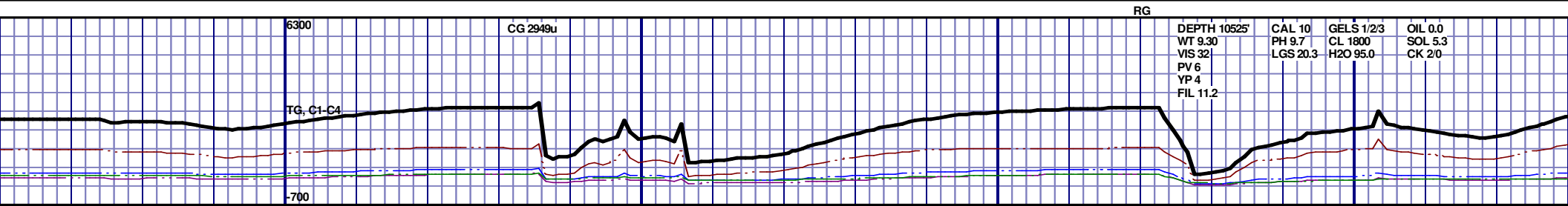






MD 10173 TVD 6644.34  
INC 90.6 AZ 91.5  
VS 3689.62

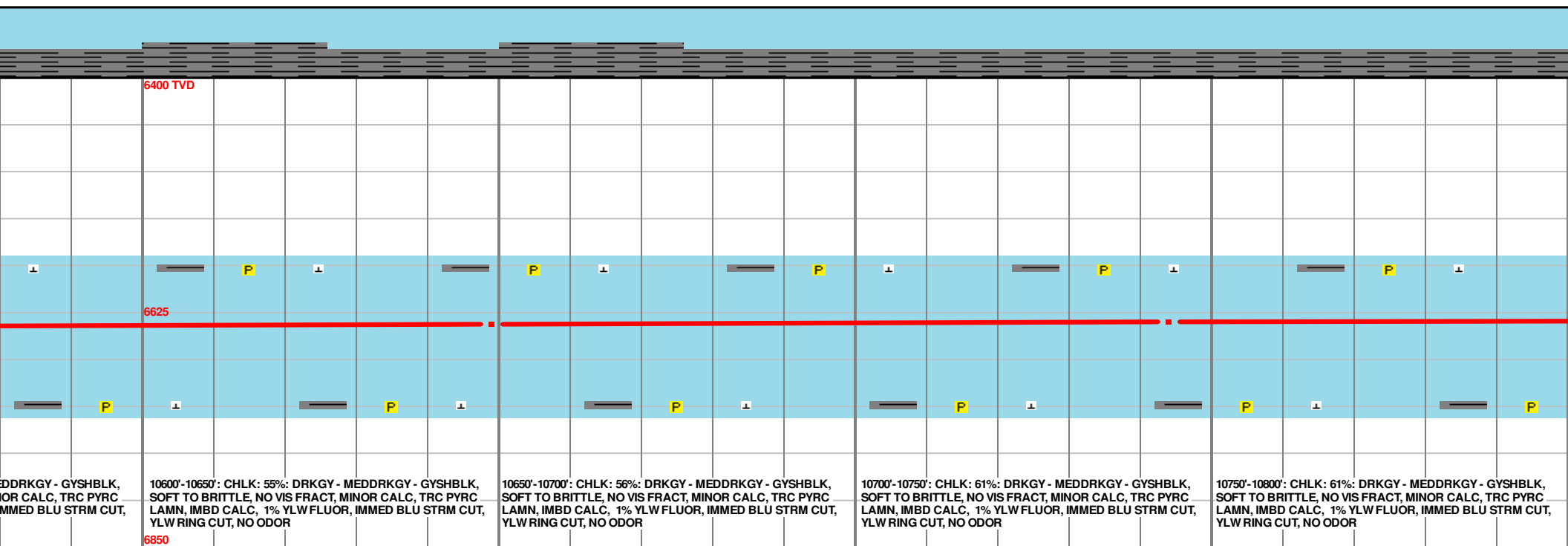
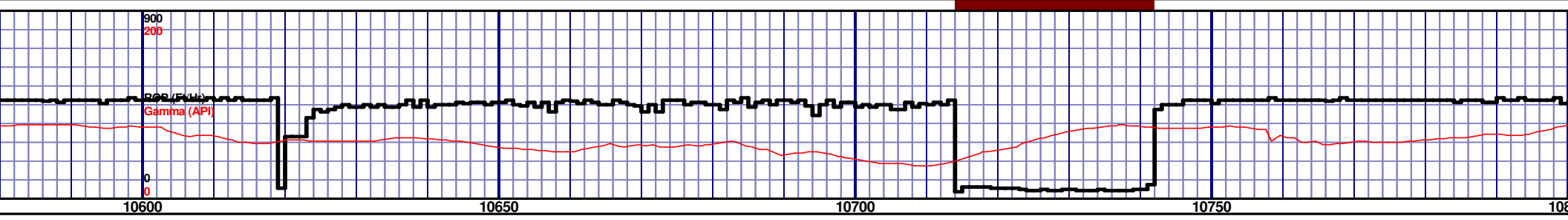
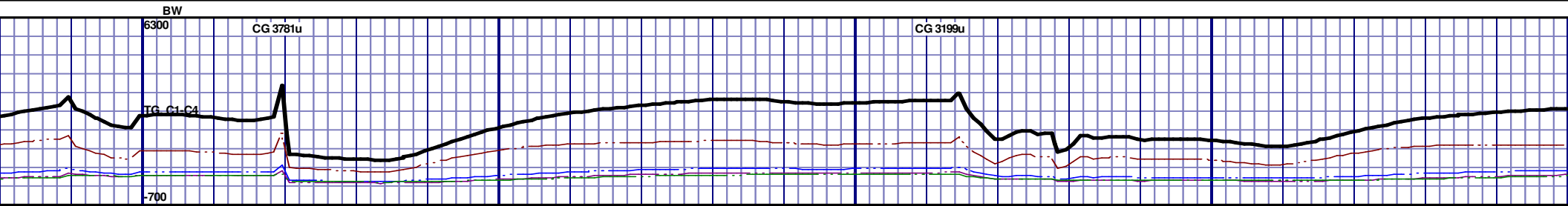
MD 10268 TVD 6642.01  
INC 92.2 AZ 91.8  
VS 3781.64



MD 10363 TVD 6639.53  
INC 90.8 AZ 91.2  
VS 3873.72

MD 10459 TVD 6638.61  
INC 90.3 AZ 90.2  
VS 3967.11

MD 10554 TVD 6638.11  
INC 90.3 AZ 88.2  
VS 4060.07



MD 10649 TVD 6636.53

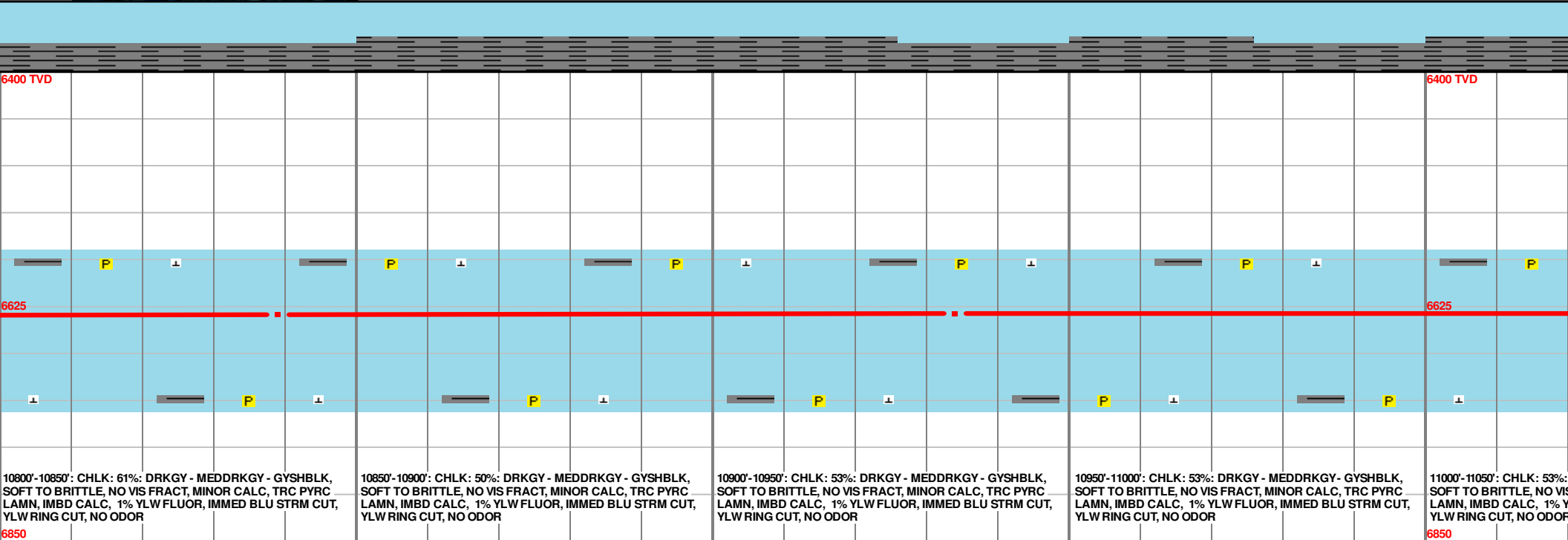
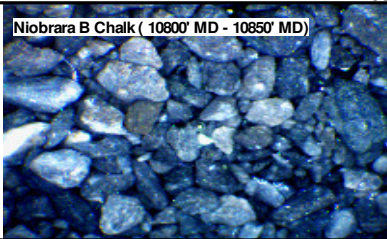
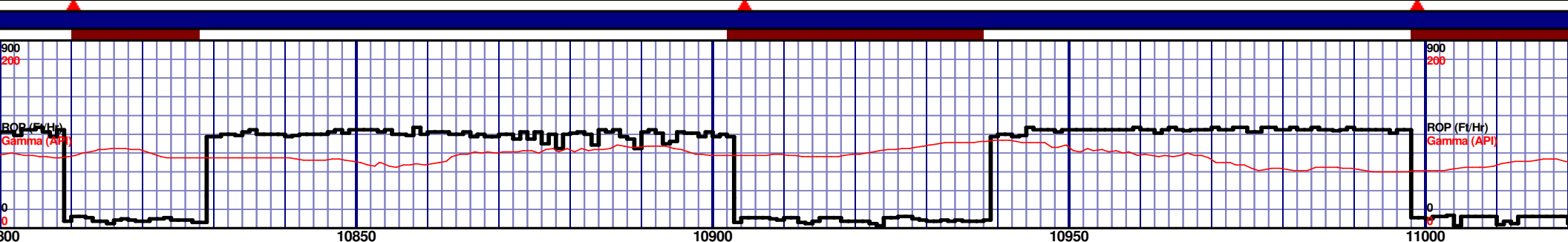
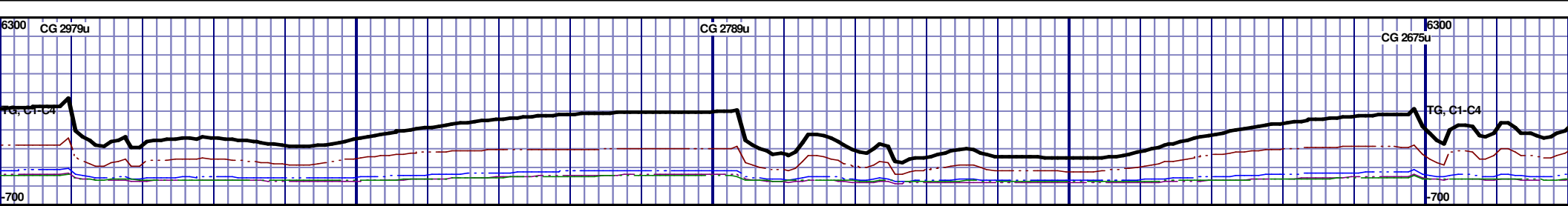
INC 91.6 AZ 87.3

VS 4153.49

MD 10744 TVD 6634.38

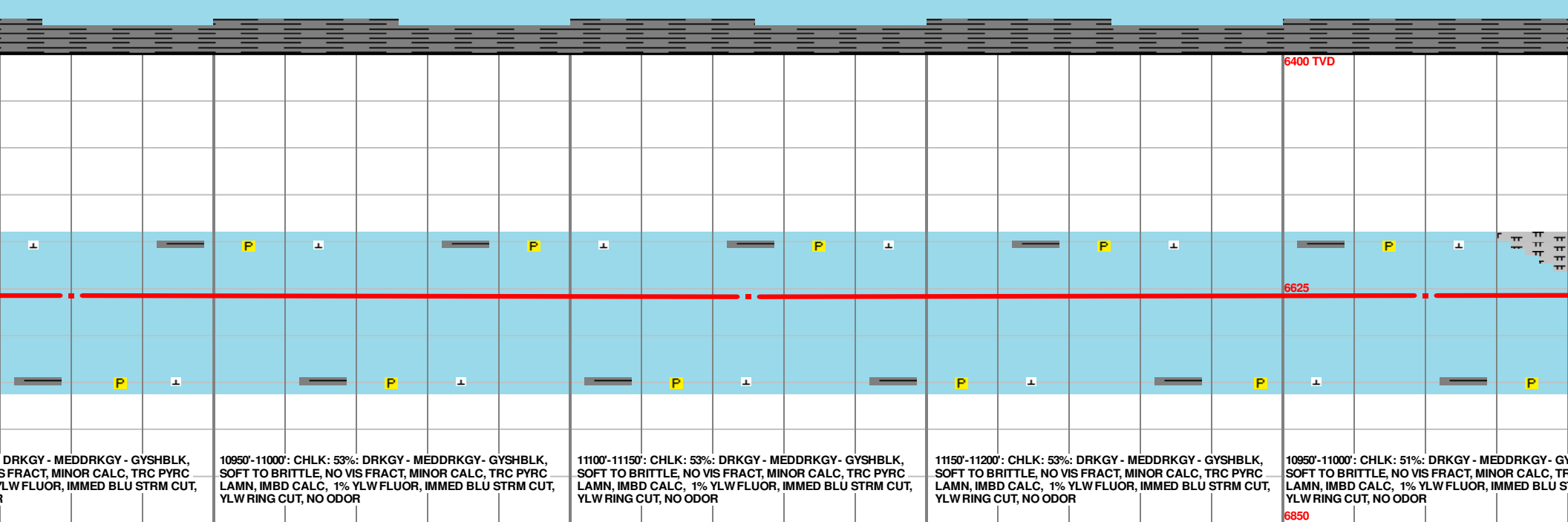
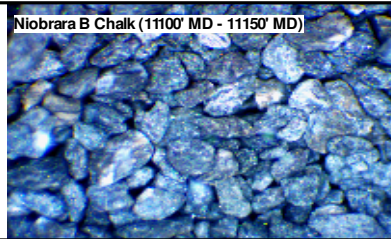
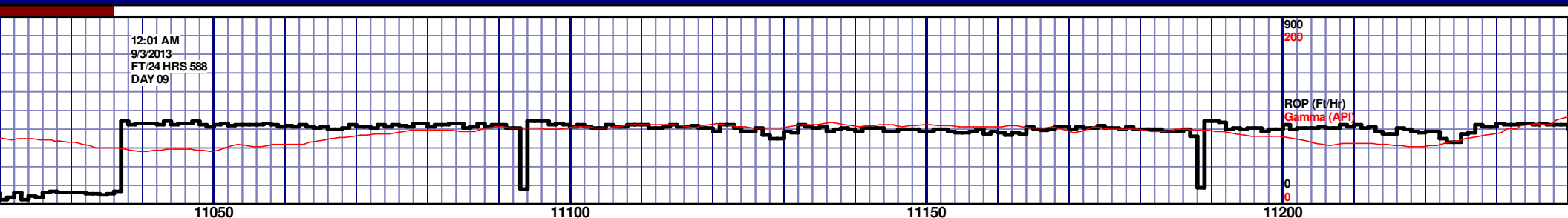
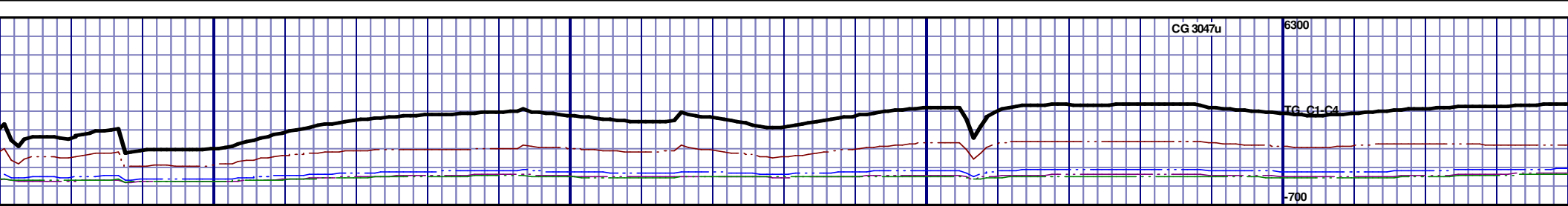
INC 91 AZ 89

VS 4246.77



MD 10839 TVD 6633.13  
INC 90.5 AZ 88.4  
VS 4339.9

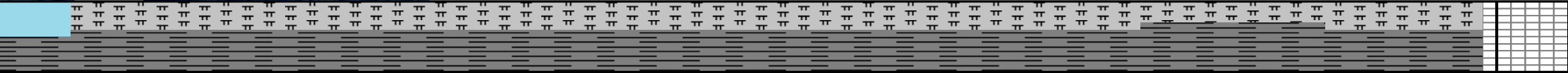
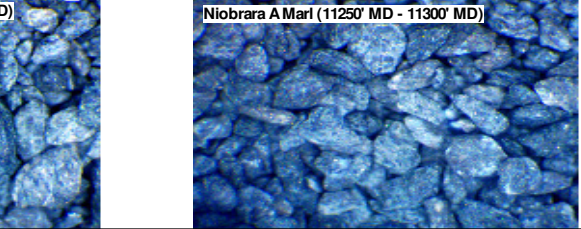
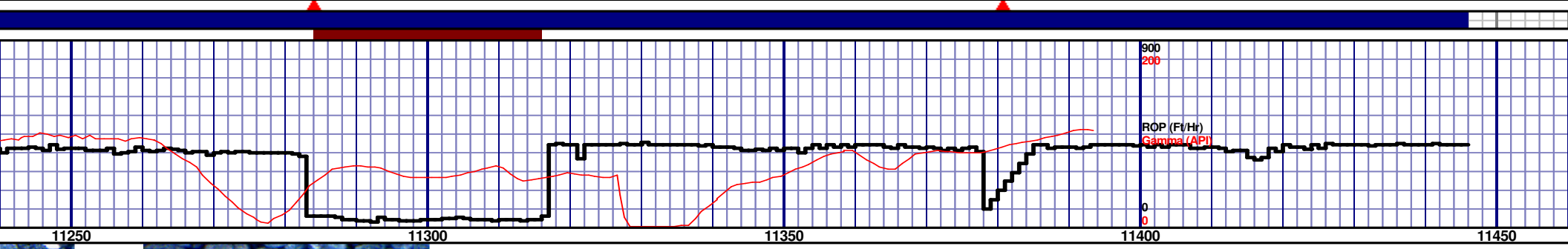
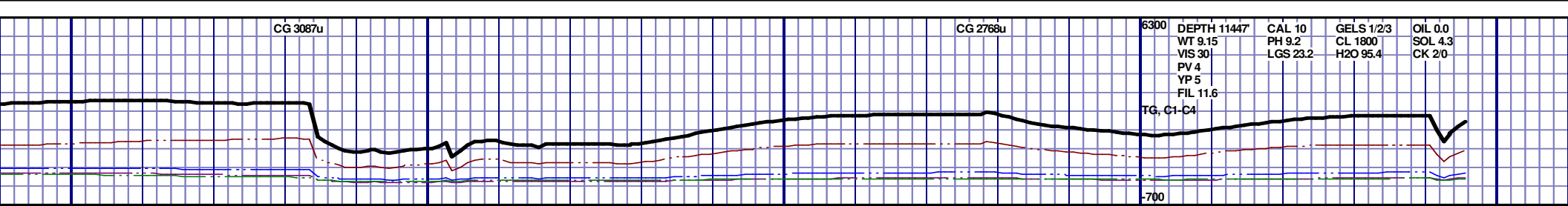
MD 10934 TVD 6632.14  
INC 90.7 AZ 87.8  
VS 4433.22



MD 11030 TVD 6632.14  
INC 89.3 AZ 89.2  
VS 4527.4

MD 11125 TVD 6632.8  
INC 89.9 AZ 89.4  
VS 4620.33

MD 11220 TVD 6631.73  
INC 91.4 AZ 89.2  
VS 4713.25



| NIOBRARA A MARL<br>11277' MD 6631' TVD  |  |  |  | 6400 TVD  |
|---|--|--|--|---|
|   |  |  |  |   |
| 11250'-11300': MRL: 40%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR |  |  |  | 11400'-11446': MRL: 36%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, TRC PYRC LAMN, IMBD CALC, 1% YLW FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR |

BOTTOMS UP GAS 2407u

DRILLER'S TD @ 11446'  
MD @ 4:00 AM ON  
9/3/2013

EASED ON 9/3/2013

TD @ 11446' MD

THANK YOU FROM  
ROBERT GULLIKSEN,  
CHRISTIAN WHITFIELD,  
AND HORIZON WELL  
LOGGING, LLC