



7136 South Yale Avenue, Suite 414  
Tulsa, Oklahoma 74136-6378

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WWW.HZMUD.COM

### Customer Information

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

**Geologist:** Renee Clackler  
Noble Energy Inc.

### Mud Logging Details

**Logger:** Scott Haney &  
Robert Gulliksen  
**Log Interval:** 6720' MD to 13793' MD  
**Start Date:** June 10, 2015  
**Release Date:** June 13, 2015

### Well Information

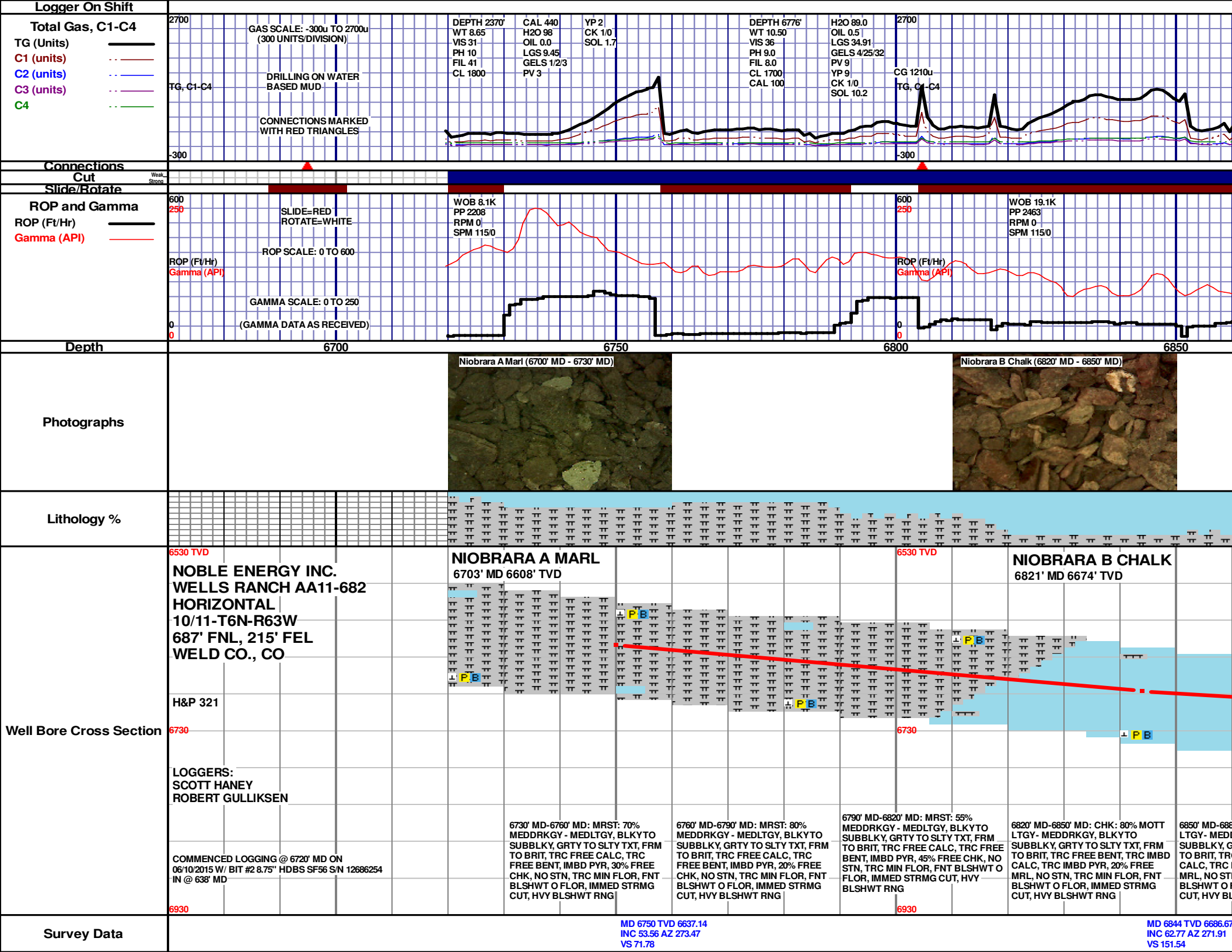
**Well Name:** Wells Ranch AA11-682  
**Horizontal**  
**Location:** 10/11-T6N-R63W  
687' FSL, 215' FEL

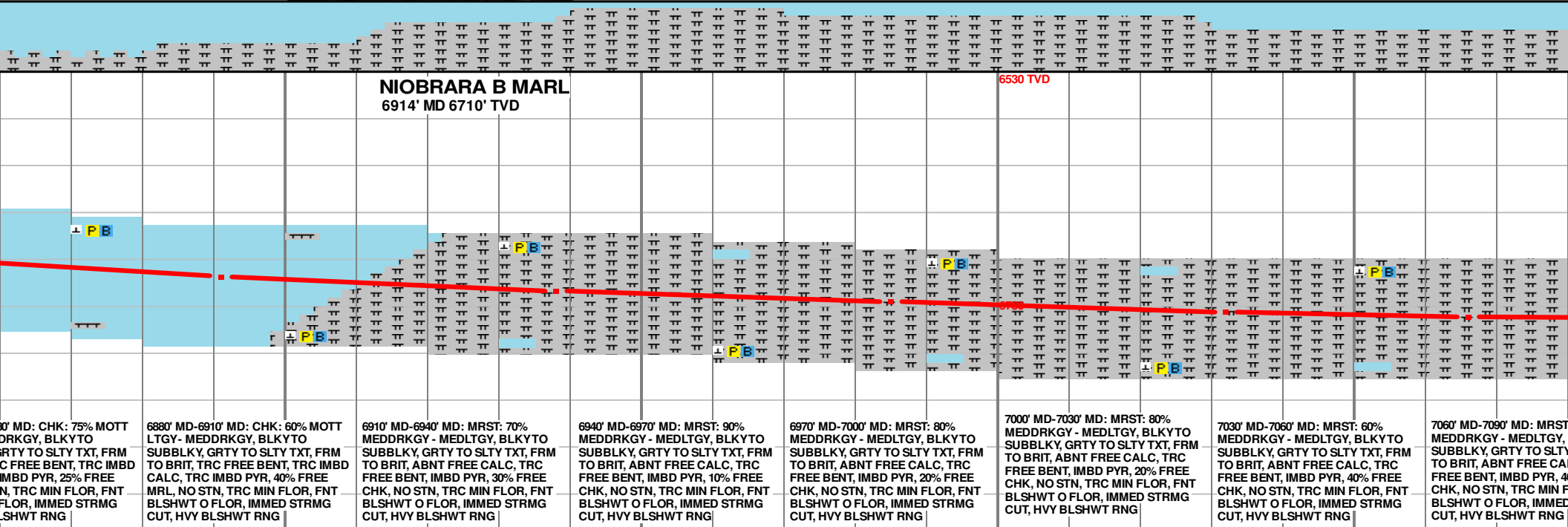
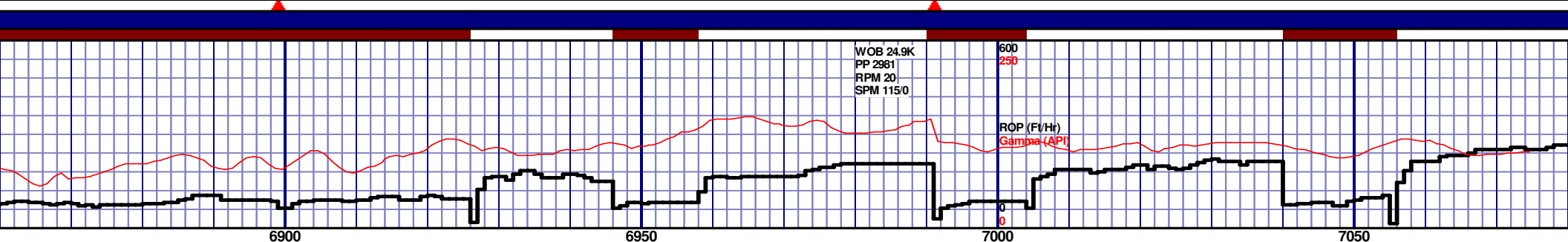
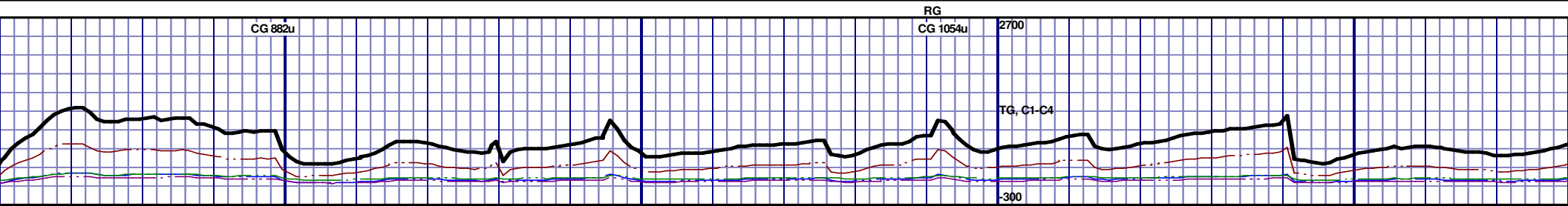
**County:** Weld  
**State:** Colorado

**Drilling Rig:** H&P 321  
**Total Depth:** 13793' MD  
**TD Date:** June 13, 2015  
**Formation:** Niobrara B Chalk  
**KB Elevation:** 4886'  
**GR Elevation:** 4856'  
**API Number:** 05-123-41210-0000

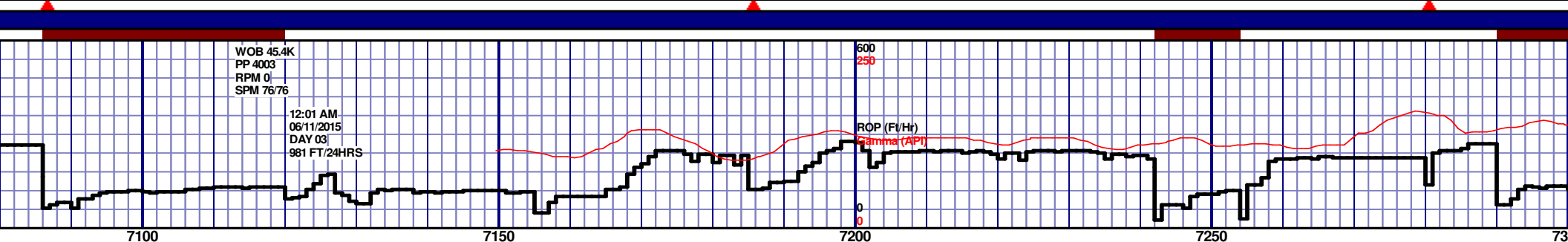
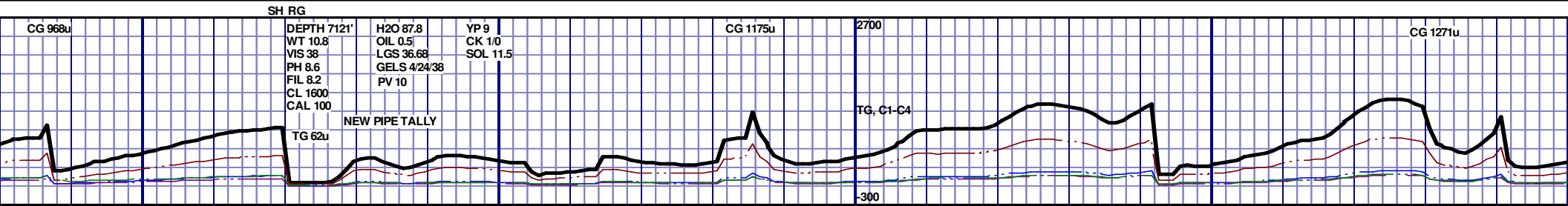
### ROCK TYPES

	Siltysh		Clyst		Gyp		Mrlst		Shgy		Carbonaceous s
	Anhy		Coal		Cmnt		Salt		Slst		Chk
	Bent		Congl		Lmst		Shale		Ss		Nosmpl
	Cht		Dol		Meta		Shcol		Till		

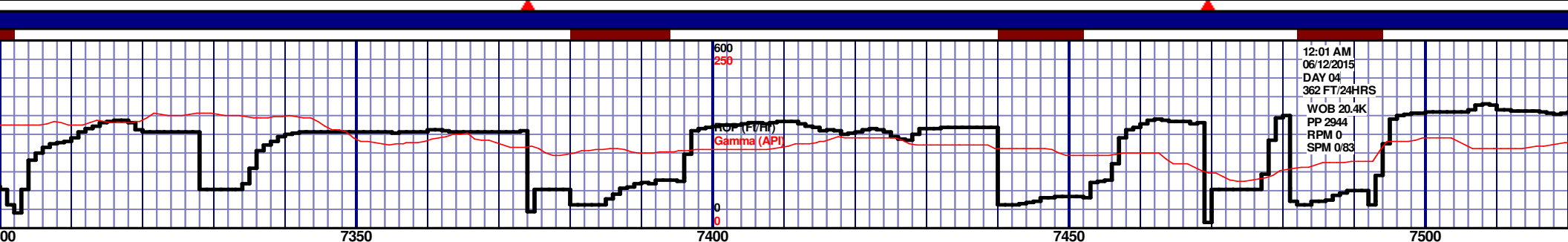
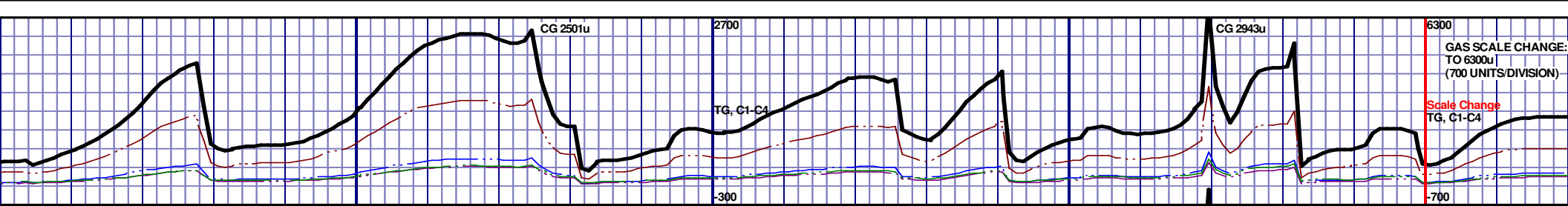




6880' MD-6910' MD: CHK: 60% MOTT LTGY - MEDDRKGY, BLKYO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE BENT, TRC IMBD CALC, TRC IMBD PYR, 40% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG	6910' MD-6940' MD: MRST: 70% MEDDRKGY - MEDLTGY, BLKYO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, TRC FREE BENT, IMBD PYR, 30% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG	6940' MD-6970' MD: MRST: 90% MEDDRKGY - MEDLTGY, BLKYO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, TRC FREE BENT, IMBD PYR, 10% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG	6970' MD-7000' MD: MRST: 80% MEDDRKGY - MEDLTGY, BLKYO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, TRC FREE BENT, IMBD PYR, 20% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG	7000' MD-7030' MD: MRST: 80% MEDDRKGY - MEDLTGY, BLKYO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, TRC FREE BENT, IMBD PYR, 20% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG	7030' MD-7060' MD: MRST: 60% MEDDRKGY - MEDLTGY, BLKYO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, TRC FREE BENT, IMBD PYR, 40% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG	7060' MD-7090' MD: MRST: MEDDRKGY - MEDLTGY, SUBBLKY, GRTY TO SLTY TO BRIT, ABNT FREE CA FREE BENT, IMBD PYR, 4 CHK, NO STN, TRC MIN FL SHWT O FLOR, IMMED CUT, HVY BLSHWT RNG
MD 6891 TVD 6704.75 INC 71.95 AZ 269.68 VS 194.86	MD 6938 TVD 6717.13 INC 77.48 AZ 267.67 VS 240.12	MD 6985 TVD 6726.49 INC 79.56 AZ 267.69 VS 286.08	MD 7032 TVD 6734.61 INC 80.52 AZ 267.95 VS 332.28	MD 7066 TVD 6735.88 INC 83.24 AZ 268.0 VS 365.88		



TOOH @ 7:30 PM ON 06/10/15 @ 7121' MD FOR INTERMEDIATE CASING OPERATIONS. TIIH @ 4:15 PM ON 06/11/2015. RESUMED DRILLING @ 8:30 PM ON 06/11/2015 W/ BIT #3, 6.125", SMITH SDI516, S/N JK3435 @ 7121' MD.									
SWITCHING TO 50FT SAMPLE INTERVAL									
60% BLKYTO TXT, FRM LC, TRC 0% FREE FLOR, FNT STRMG	7090' MD-7120' MD: CHK: 60% V/LTGY - MEDDRKGY, BLKYTO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, IMBD CALC, IMBD PYR, 40% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG	7120' MD-7150' MD: MRST: 60% MEDDRKGY - MEDLTGY, BLKYTO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, TRC FREE BENT, IMBD PYR, 40% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG	7150' MD-7200' MD: MRST: 55% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, TRC FREE BENT, IMBD PYR, 45% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG	7200' MD-7250' MD: MRST: 55% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, TRC FREE BENT, IMBD PYR, 45% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG	7250' MD-7300' MD: MRST: 60% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, TRC FREE BENT, IMBD PYR, 40% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG				

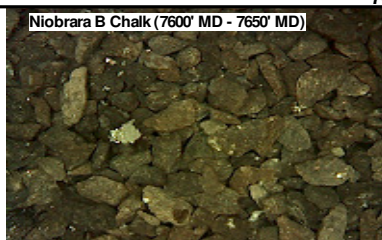
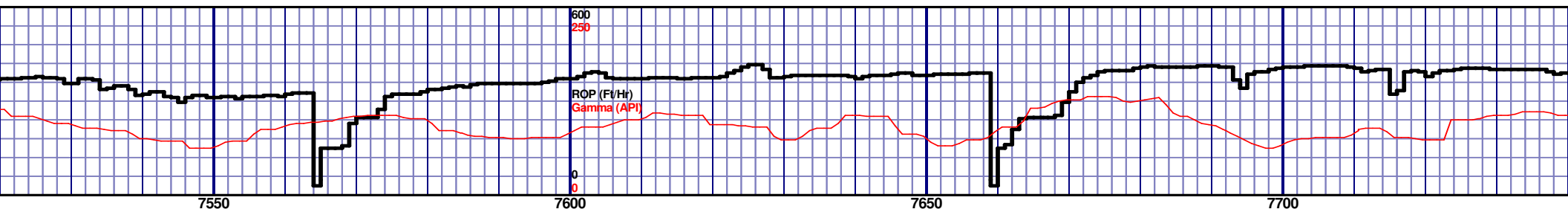
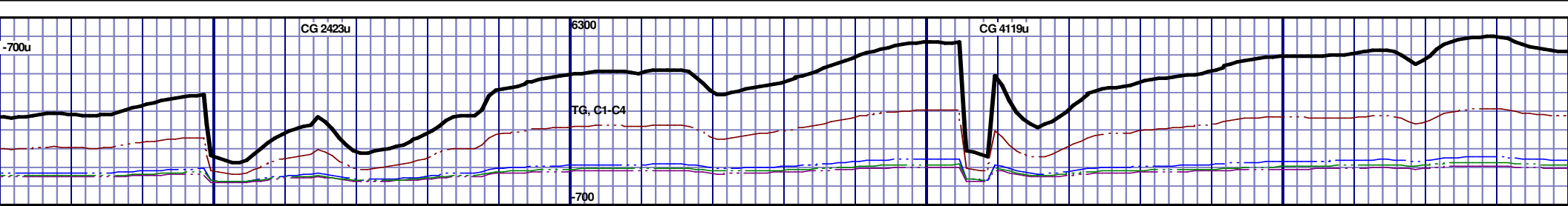


<b>NIOBRARA B CHALK</b> 7344' MD 6742' TVD									
6530 TVD									
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6930									
7300' MD-7350' MD: MRST: 60% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, TRC FREE BENT, IMBD PYR, 40% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
7350' MD-7400' MD: CHK: 55% V/LTGY - MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 45% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
7400' MD-7450' MD: CHK: 70% MOTT LTGY - MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 30% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
7450' MD-7500' MD: CHK: 70% MOTT LTGY - MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 30% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
7500' MD-7550' MD: CHK: 70% MOTT LTGY - MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 30% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									

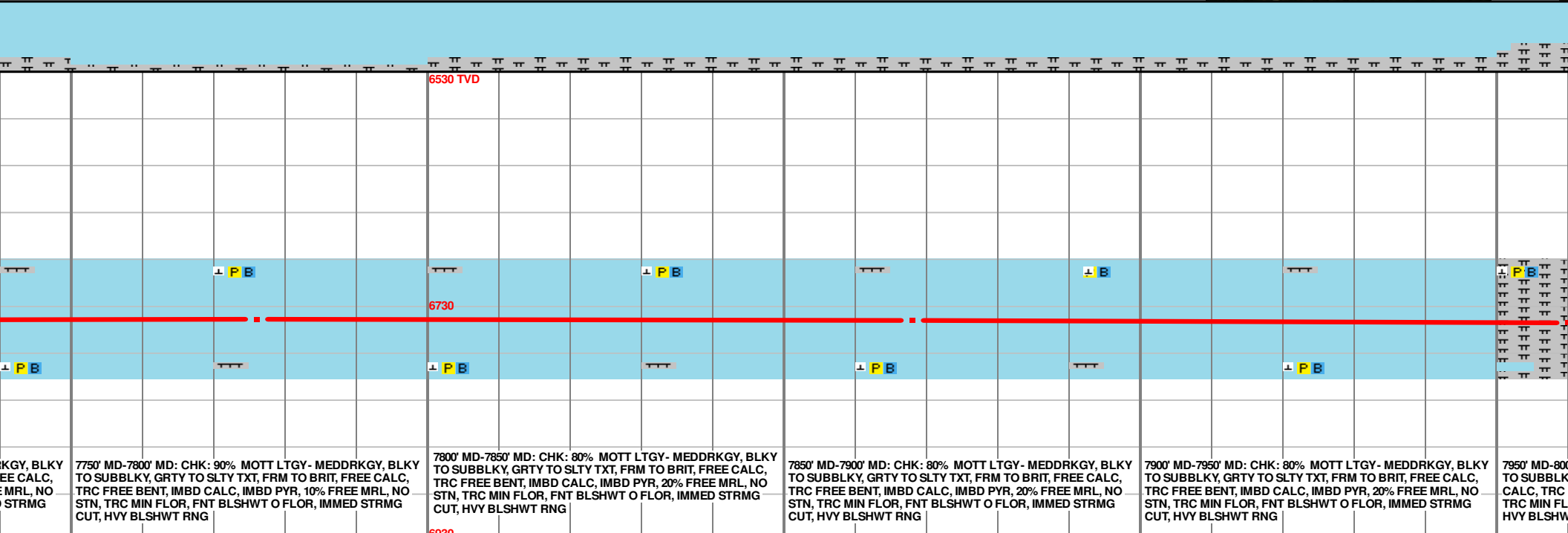
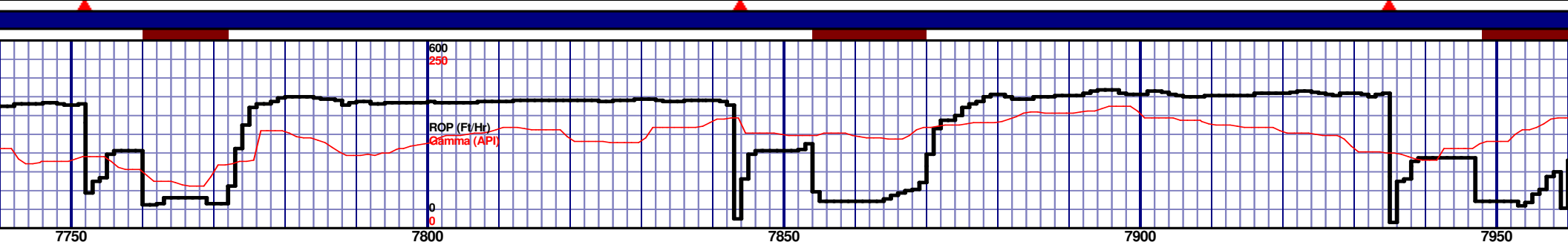
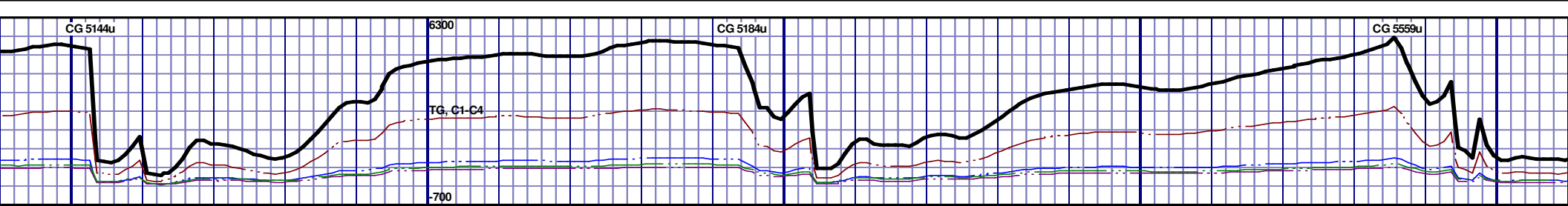
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INC 92.1 AZ 271.59  
VS 607.35

MD 7403 TVD 6740.59  
INC 91.2 AZ 272.51  
VS 702.3

MD 7498 TVD 6740.49  
INC 88.92 AZ 274.43  
VS 797.23



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7750' MD-7800' MD: CHK: 90% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 10% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

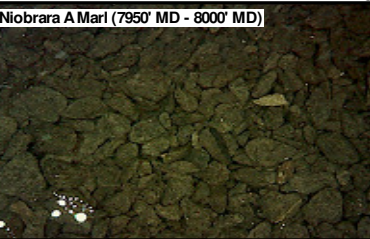
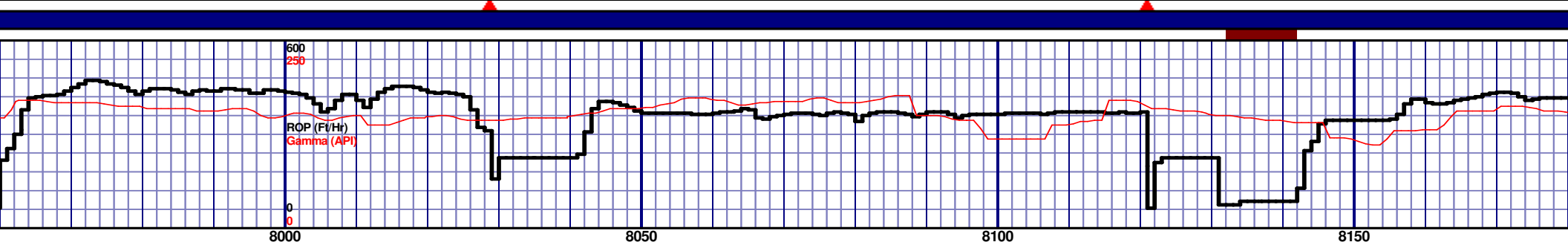
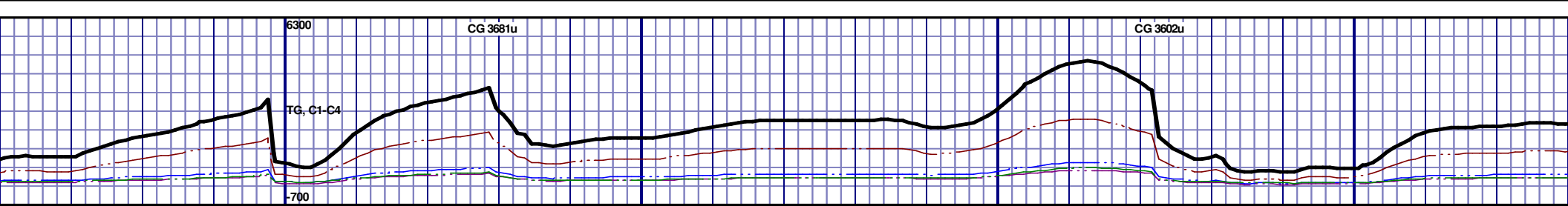
7800' MD-7850' MD: CHK: 80% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 20% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

7850' MD-7900' MD: CHK: 80% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 20% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

7900' MD-7950' MD: CHK: 80% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 20% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

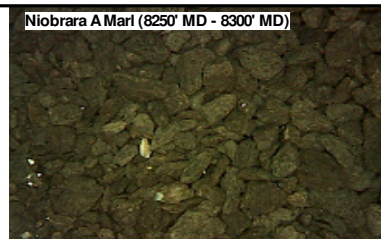
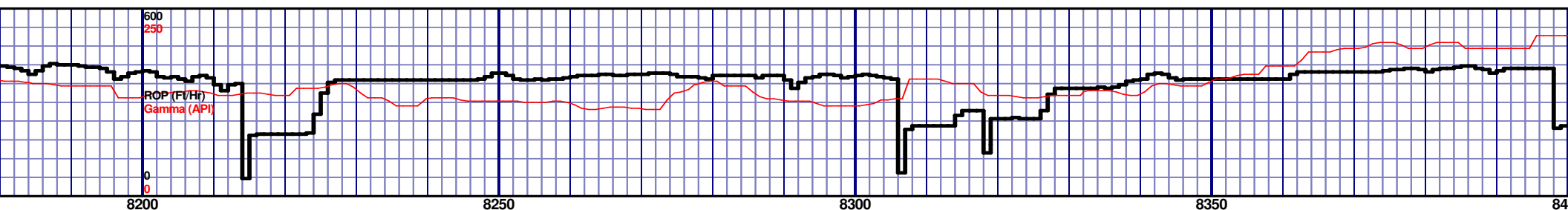
7950' MD-8000' MD: CHK: 80% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 20% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG





NIORARA A MARL 7962' MD 6743' TVD									
6530 TVD									
6730									
8000' MD-8050' MD: MRST: 70% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, TRC FREE BENT, IMBD PYR, 30% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
8050' MD-8100' MD: MRST: 55% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, TRC FREE BENT, IMBD PYR, 45% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
8100' MD-8150' MD: MRST: 60% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, TRC FREE BENT, IMBD PYR, 40% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
8150' MD-8200' MD: MRST: 55% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, TRC FREE BENT, IMBD PYR, 45% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									



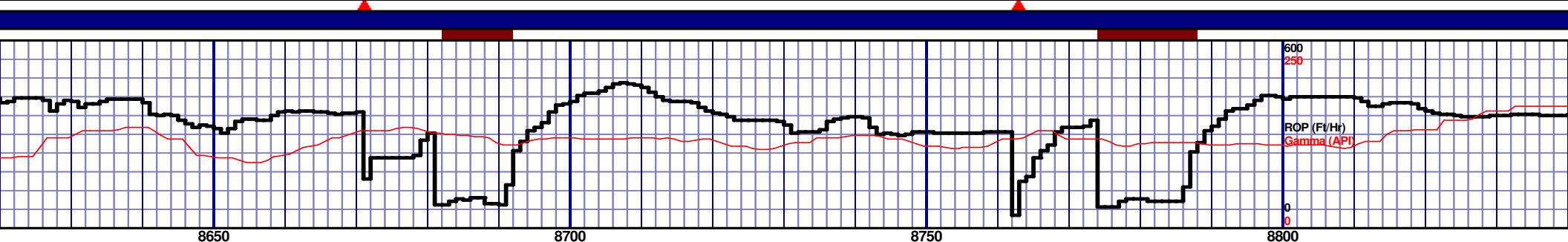
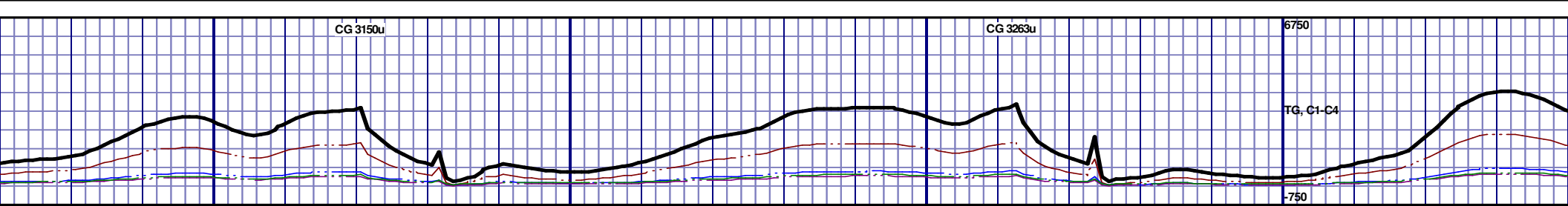


<p>8200' MD-8250' MD: MRST: 55% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, TRC FREE BENT, IMBD PYR, 45% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG</p>	<p>8250' MD-8300' MD: MRST: 55% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, TRC FREE BENT, IMBD PYR, 45% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG</p>	<p>8300' MD-8350' MD: MRST: 50% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, TRC FREE BENT, IMBD PYR, 50% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG</p>	<p>8350' MD-8400' MD: MRST: 60% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, TRC FREE BENT, IMBD PYR, 40% FREE CHK, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG</p>
<p>6930</p>	<p>6730</p>	<p>6530</p>	<p>6330</p>

MD 8237 TVD 6749.41  
INC 89.97 AZ 269.35  
VS 1535.75

MD 8329 TVD 6749.02  
INC 90.52 AZ 268.51  
VS 1627.66



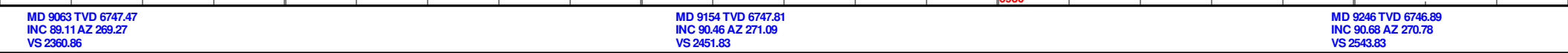


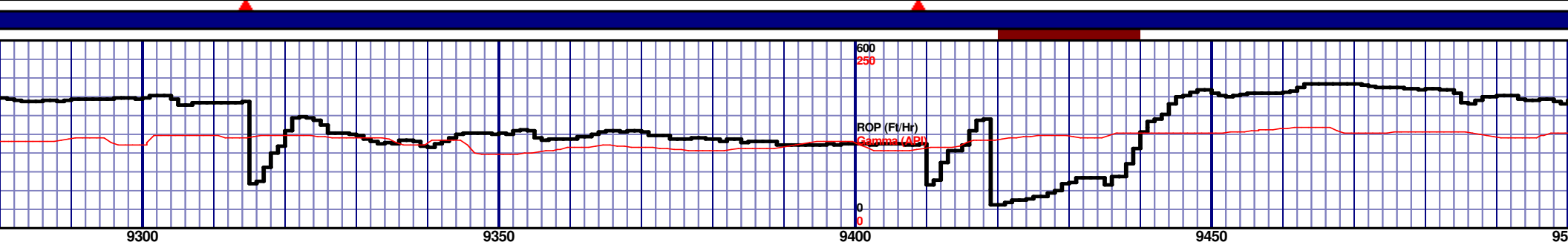
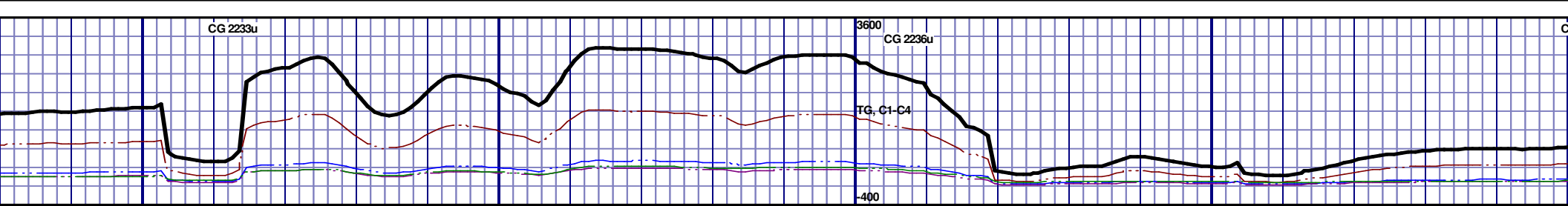
Niobrara B Marl (8650' MD - 8700' MD)									
65% MOTT LTGY- MEDDRKGY, Y TO SLTY TXT, FRM TO BRIT, TRC IMBD CALC, IMBD PYR, 35% FREE LOR, FNT BLSHWT O FLOR, IMMED BT RNG									
8650' MD-8700' MD: MRST: 60% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, ABNT FREE BENT, IMBD PYR, 40% FREE CHK, NO STN, 15% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
8700' MD-8750' MD: MRST: 70% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, ABNT FREE BENT, IMBD PYR, 30% FREE CHK, NO STN, 15% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
8750' MD-8800' MD: MRST: 80% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, ABNT FREE BENT, IMBD PYR, 20% FREE CHK, NO STN, 10% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
8800' MD-8850' MD: MRST: 80% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, ABNT FREE BENT, IMBD PYR, 20% FREE CHK, NO STN, 10% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									

MD 8695 TVD 6744.72  
INC 89.75 AZ 268.56  
VS 1993.04

MD 8787 TVD 6744.72  
INC 90.25 AZ 269.84  
VS 2084.97



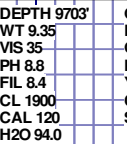




9300' MD-9350' MD: MRST: 80% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, FREE BENT, IMBD PYR, 20% FREE CHK, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG										9350' MD-9400' MD: MRST: 90% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, FREE BENT, IMBD PYR, 10% FREE CHK, NO STN, 10% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG										9400' MD-9450' MD: MRST: 90% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, FREE BENT, IMBD PYR, 10% FREE CHK, NO STN, 10% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG										9450' MD-9500' MD: MRST: 90% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, FREE BENT, IMBD PYR, 10% FREE CHK, NO STN, 15% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
9300' MD-9350' MD: MRST: 80% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, FREE BENT, IMBD PYR, 20% FREE CHK, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG										9350' MD-9400' MD: MRST: 90% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, FREE BENT, IMBD PYR, 10% FREE CHK, NO STN, 10% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG										9400' MD-9450' MD: MRST: 90% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, FREE BENT, IMBD PYR, 10% FREE CHK, NO STN, 10% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG										9450' MD-9500' MD: MRST: 90% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE CALC, FREE BENT, IMBD PYR, 10% FREE CHK, NO STN, 15% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									

MD 9341 TVD 6745.31  
INC 91.23 AZ 270.59  
VS 2638.8

MD 9435 TVD 6744.83  
INC 89.35 AZ 271.85  
VS 2732.8



6730

**P**

6930

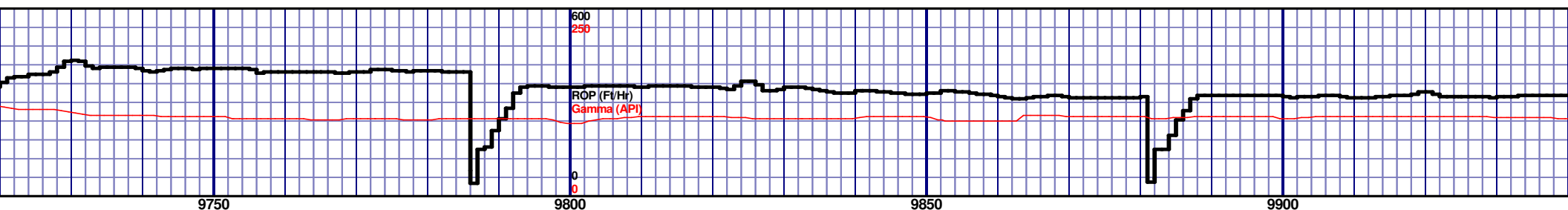
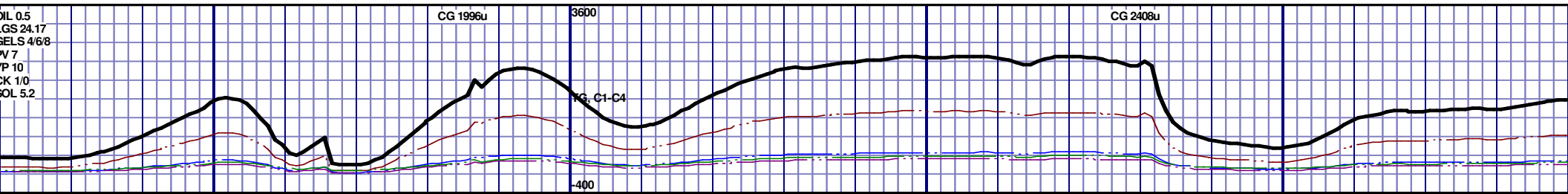
9550' MD-9600' MD: MRST: 80% MEDDRKGY - MEDLTGY, BLKY  
TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC,  
FREE BENT, IMBD PYR, 20% FREE CHK, NO STN, 10% MIN  
FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY  
BLSHWT RNG

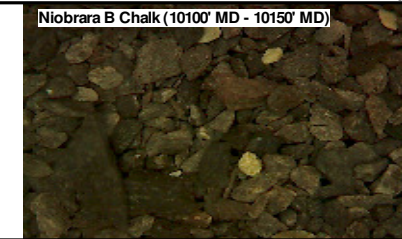
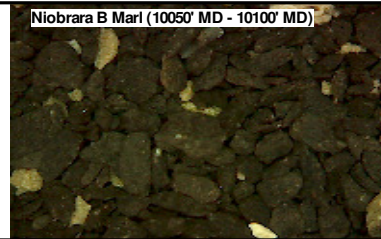
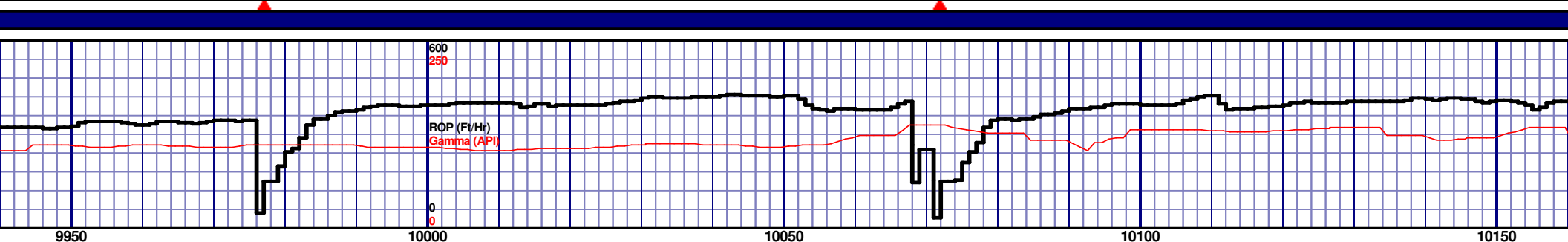
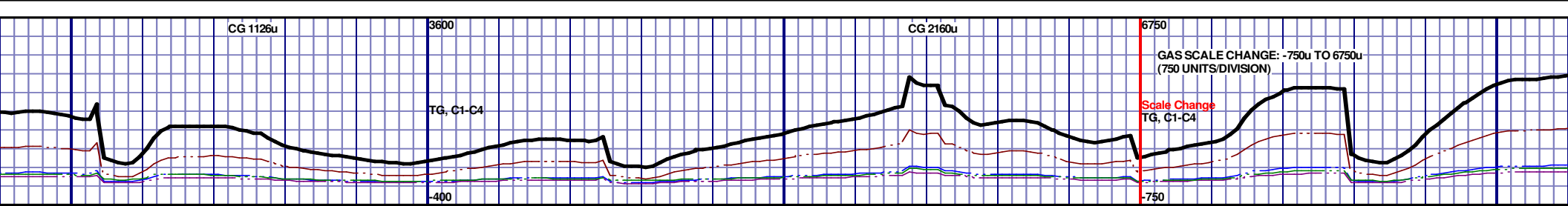
9650' MD-9700' MD: MRST: 95% MEDDRKGY - MEDLTGY, BLKY  
TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABNT FREE  
CALC, FREE BENT, IMBD PYR, 5% FREE CHK, NO STN, 10% MIN  
FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY  
BLSHWT RNG

9700' MD-9750' MD: MRST:  
TO SUBBLKY, GRTY TO S  
FREE BENT, IMBD PYR, 10  
FNT BLSHWT O FLOR, IM

MD 9625 TVD 6750.76  
INC 88.98 AZ 271.15  
VS 2922.68



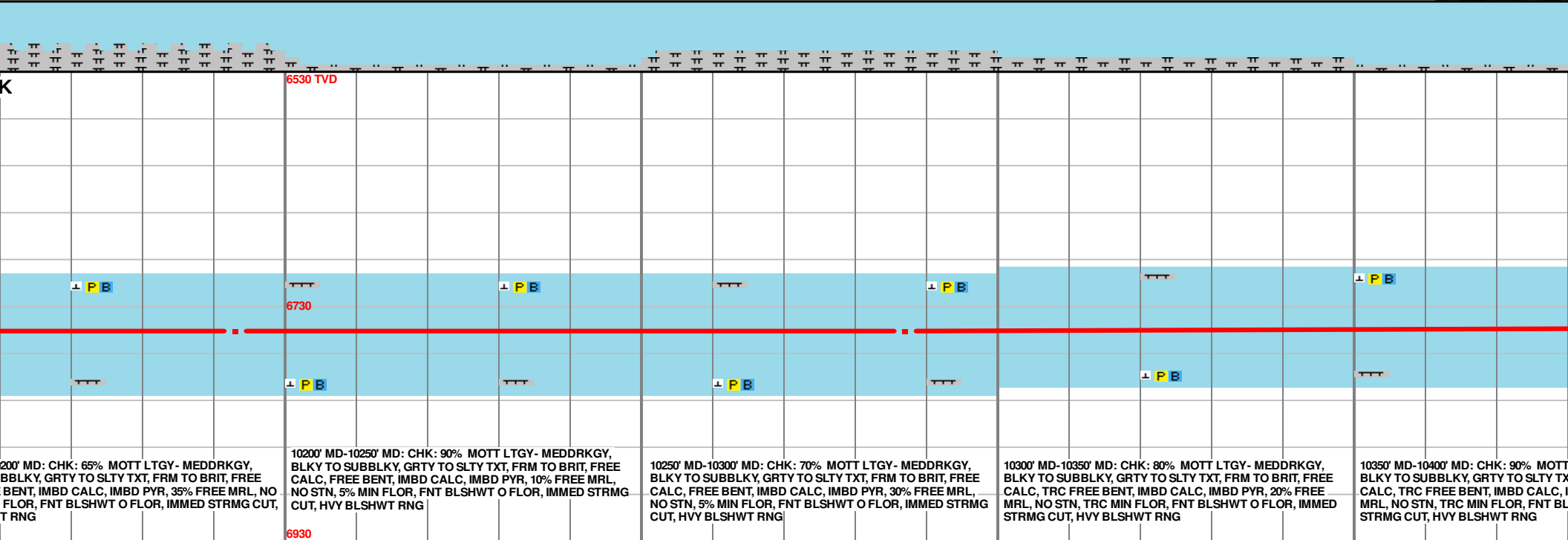
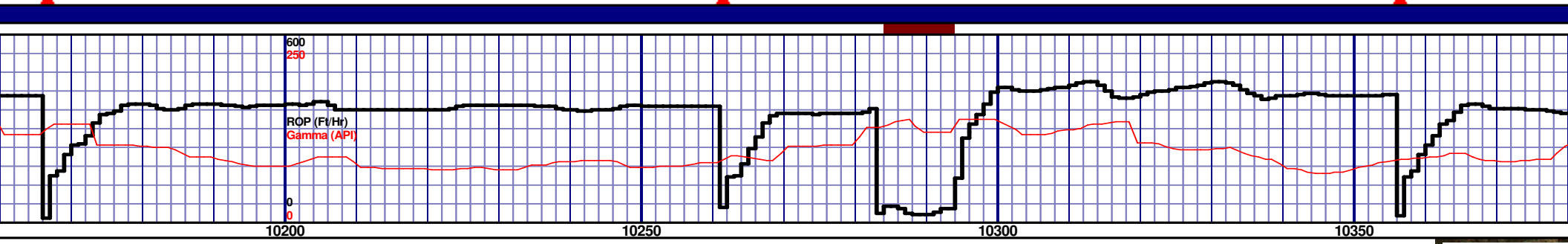
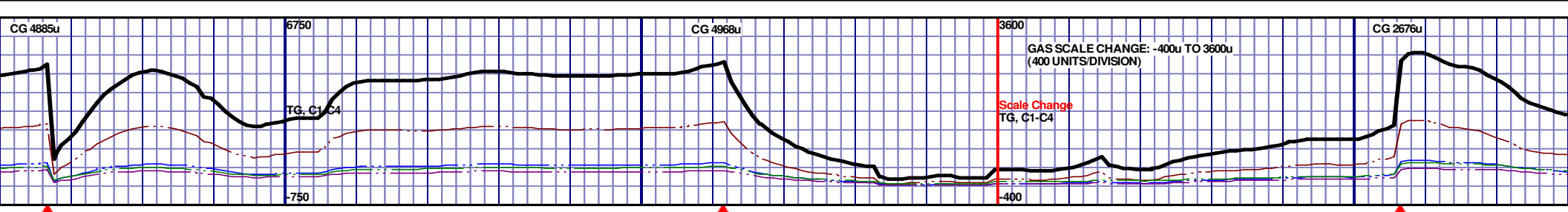
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6530 TVD										NIOBRARA B CHALK 10134' MD 6751' TVD									
6730																			
10000' MD-10050' MD: MRST: 90% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD PYR, 10% FREE CHK, NO STN, 10% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG										10050' MD-10100' MD: MRST: 80% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD PYR, 20% FREE CHK, NO STN, 10% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
6930																			
10100' MD-10150' MD: CHK: 70% MOTT LTGY - MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD CALC, IMBD PYR, 30% FREE MRL, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG										10150' MD-10150' MD: BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD CALC, IMBD PYR, 30% FREE MRL, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									

MD 10003 TVD 6751.41  
INC 90.03 AZ 269.33  
VS 3300.58

MD 10098 TVD 6751.23  
INC 90.18 AZ 269.72  
VS 3395.53



0200' MD: CHK: 65% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD CALC, IMBD PYR, 35% FREE MRL, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, T RNG

10200' MD-10250' MD: CHK: 90% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD CALC, IMBD PYR, 10% FREE MRL, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

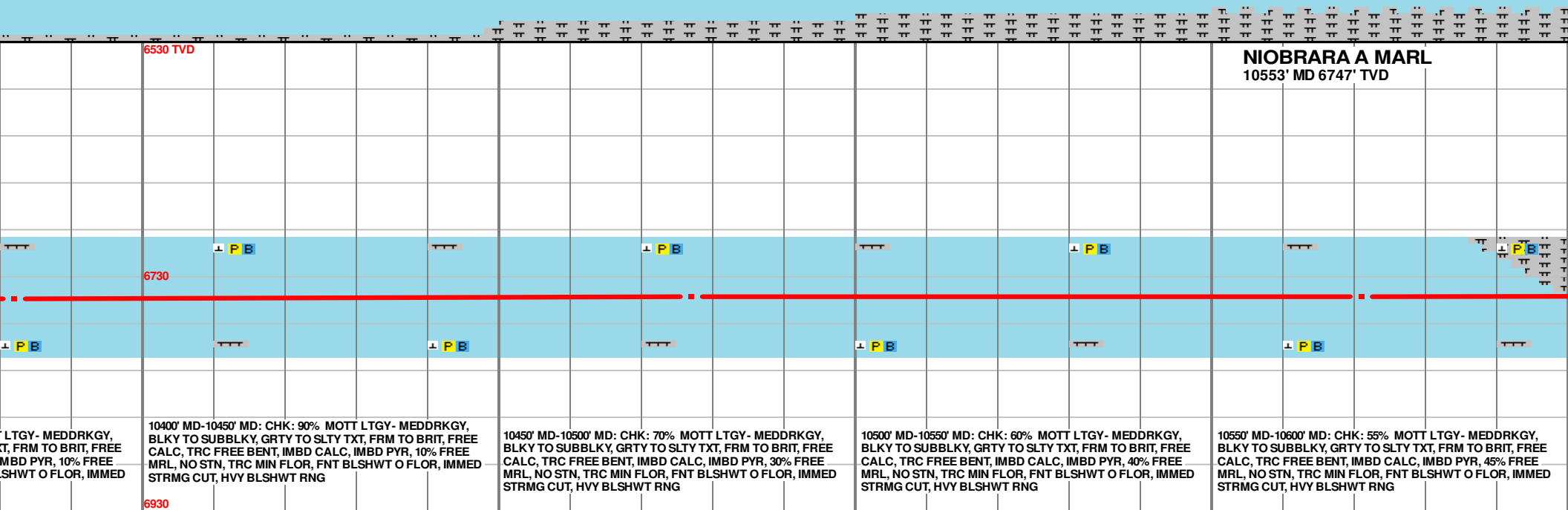
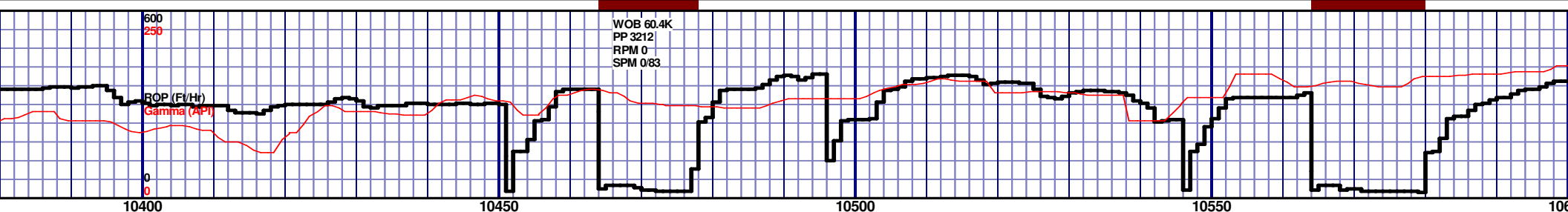
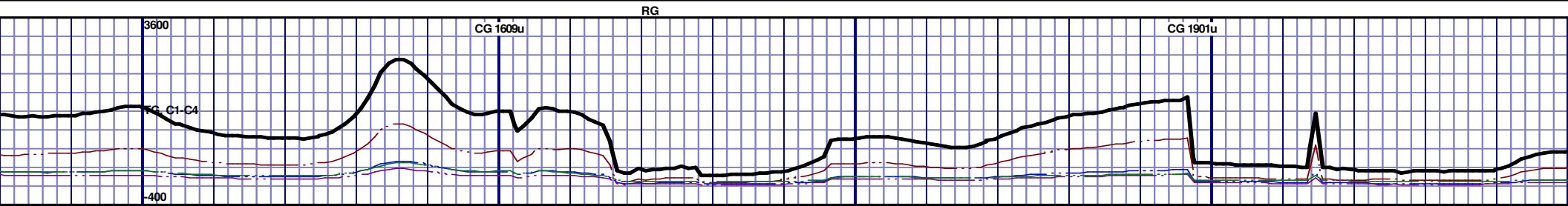
10250' MD-10300' MD: CHK: 70% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD CALC, IMBD PYR, 30% FREE MRL, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

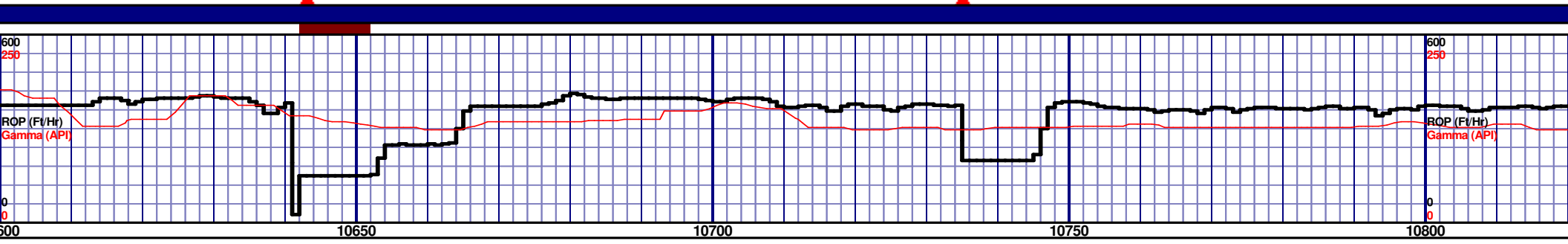
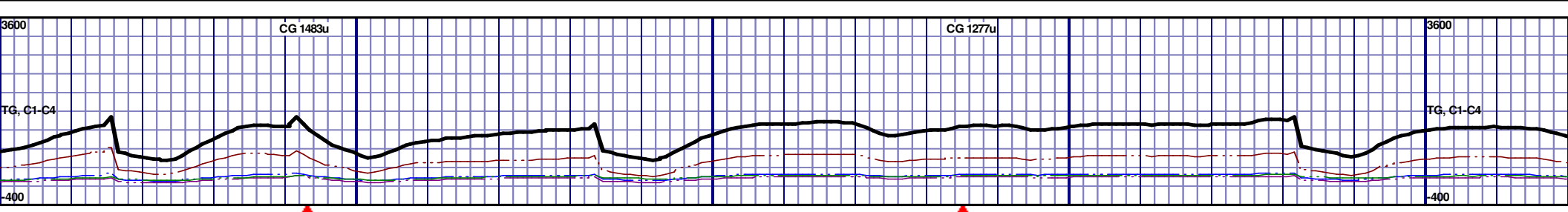
10300' MD-10350' MD: CHK: 80% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 20% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

10350' MD-10400' MD: CHK: 90% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 20% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

MD 10193 TVD 6751.08  
INC 90 AZ 269.19  
VS 3490.47

MD 10287 TVD 6750.58  
INC 90.62 AZ 270.39  
VS 3584.43





6530 TVD									
6730									
6930									
10600' MD-10650' MD: MRST: 55% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD PYR, 45% FREE CHK, NO STN, 10% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
10650' MD-10700' MD: MRST: 55% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD PYR, 45% FREE CHK, NO STN, 10% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
10700' MD-10750' MD: MRST: 60% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD PYR, 40% FREE CHK, NO STN, 10% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
10750' MD-10800' MD: MRST: 60% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD PYR, 40% FREE CHK, NO STN, 10% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
10800' MD-10850' MD: MRST: 60% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD PYR, 40% FREE CHK, NO STN, 10% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									

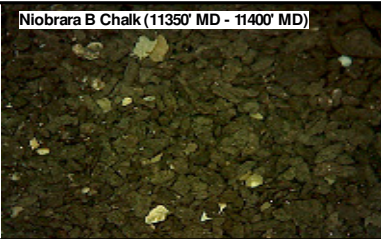
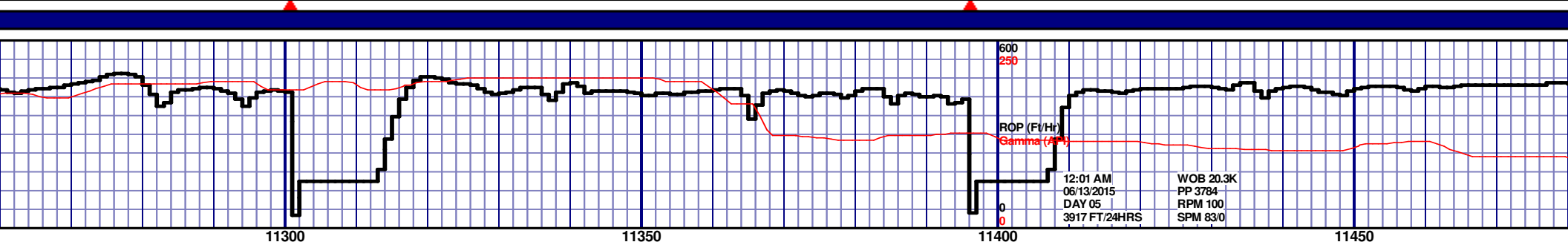
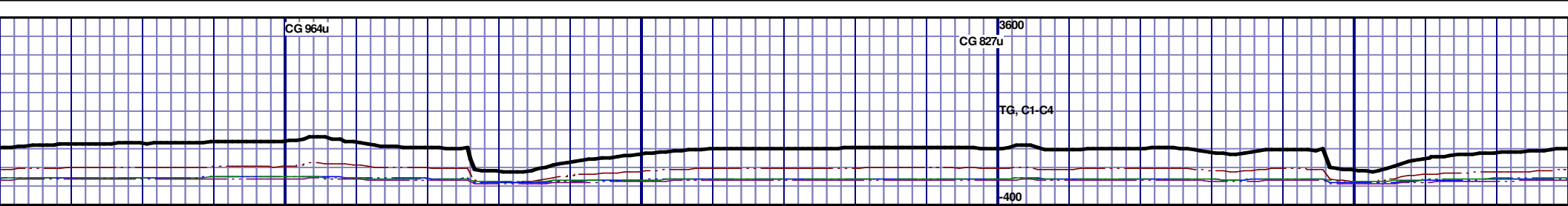
MD 10666 TVD 6746.37  
INC 90.22 AZ 269.86  
VS 3963.31

MD 10761 TVD 6746.31  
INC 89.85 AZ 268.98  
VS 4058.25





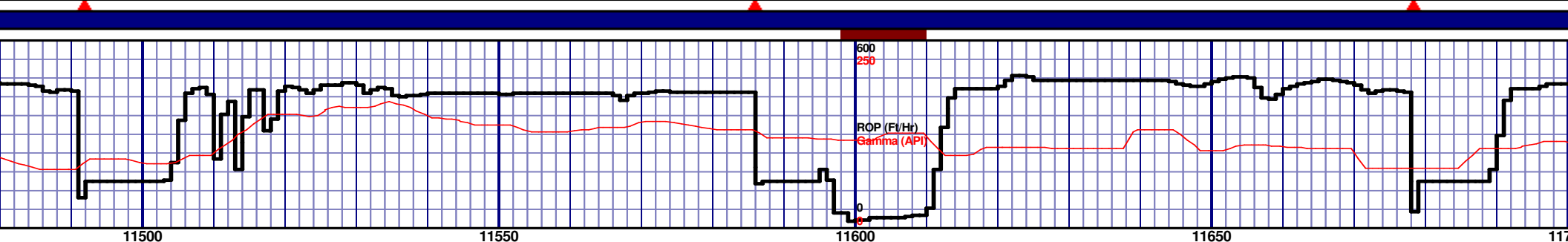
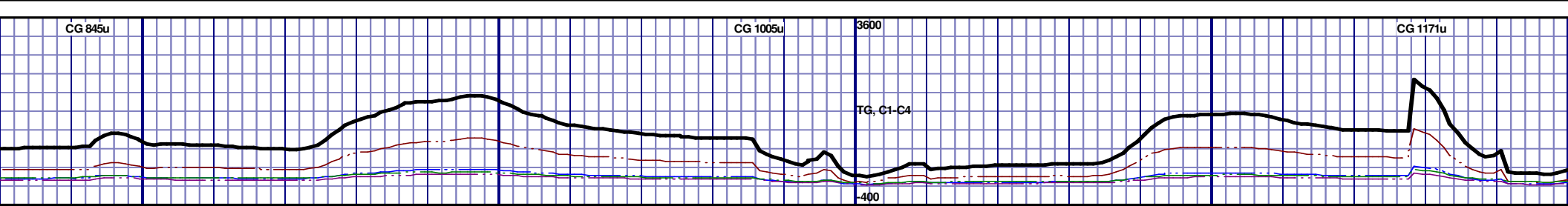




11300' MD - 11350' MD: MRST: 60% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD PYR, 40% FREE CHK, NO STN, 10% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
11350' MD - 11400' MD: MRST: 55% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD PYR, 45% FREE CHK, NO STN, 10% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
11400' MD - 11450' MD: CHK: 55% MOTT LTGY - MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD CALC, IMBD PYR, 45% FREE MRL, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
11450' MD - 11500' MD: CHK: 55% MOTT LTGY - MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD CALC, IMBD PYR, 45% FREE MRL, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									

MD 11329 TVD 6748.15  
INC 89.41 AZ 270.65  
VS 4625.94

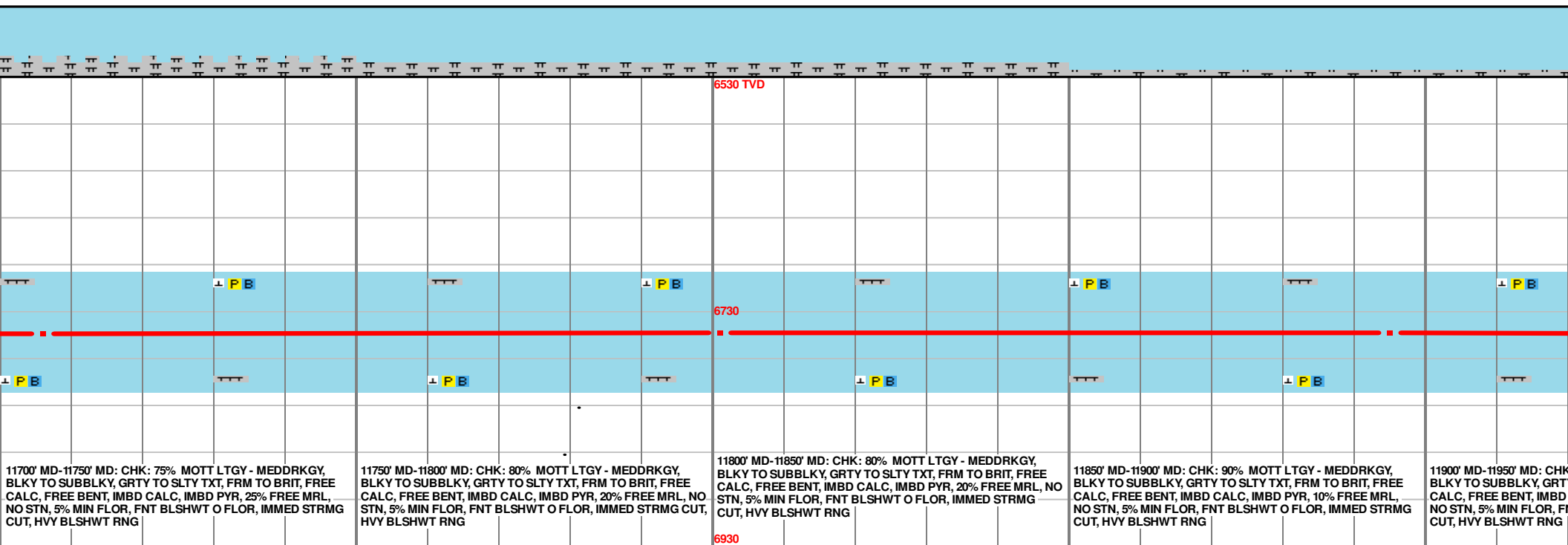
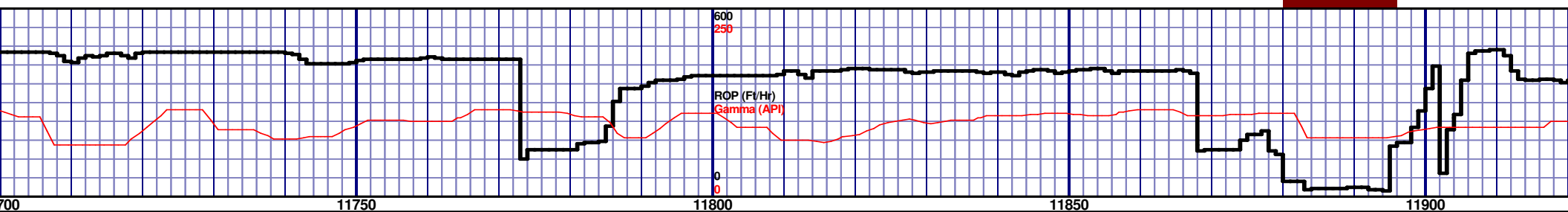
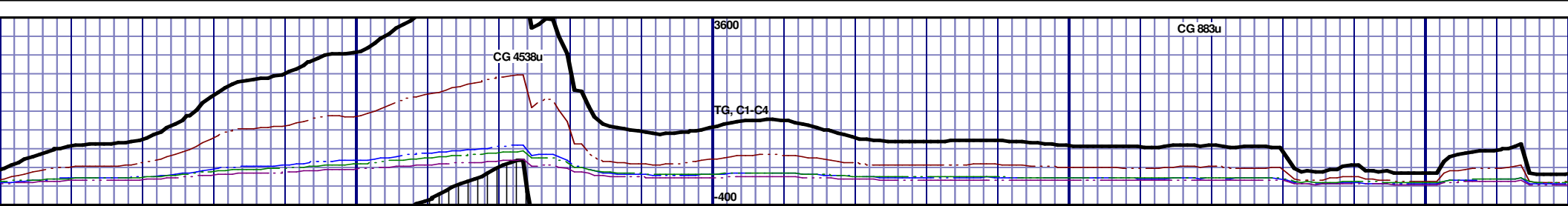
MD 11423 TVD 6748.66  
INC 89.97 AZ 270.64  
VS 4719.93



6530 TVD									
6730									
6930									
MOTT LTGY - MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD CALC, IMBD PYR, 45% FREE MRL, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
MOTT LTGY - MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD CALC, IMBD PYR, 40% FREE MRL, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
MOTT LTGY - MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD CALC, IMBD PYR, 30% FREE MRL, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
MOTT LTGY - MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD CALC, IMBD PYR, 25% FREE MRL, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									

MD 11517 TVD 6748.13  
INC 90.68 AZ 270.54  
VS 4813.92

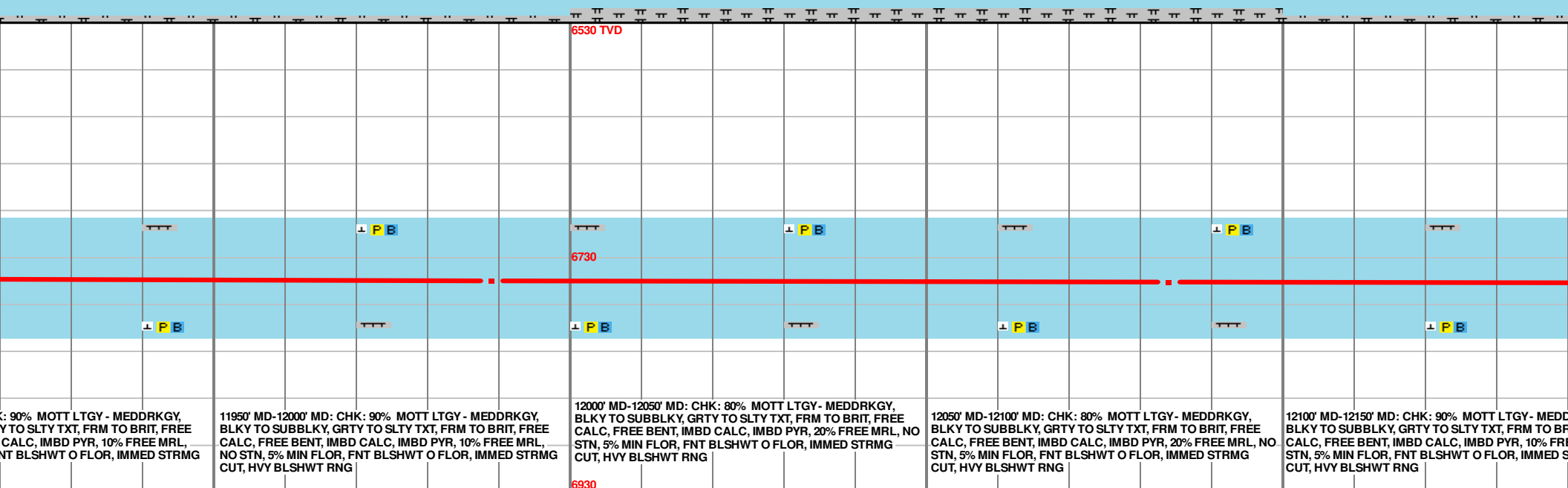
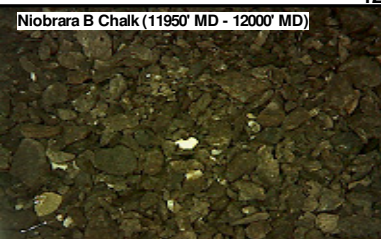
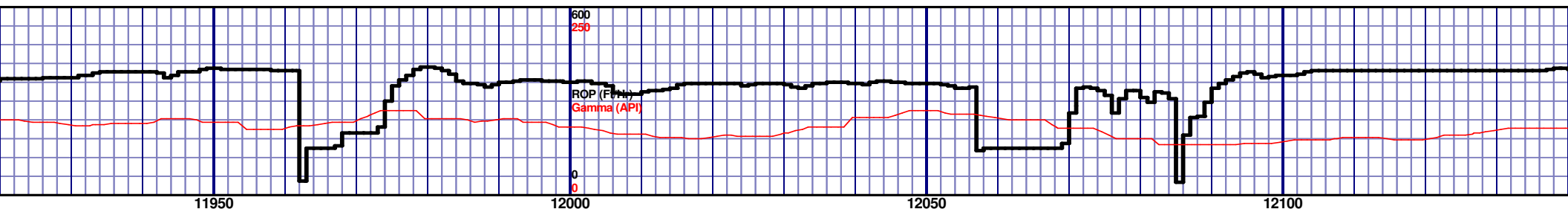
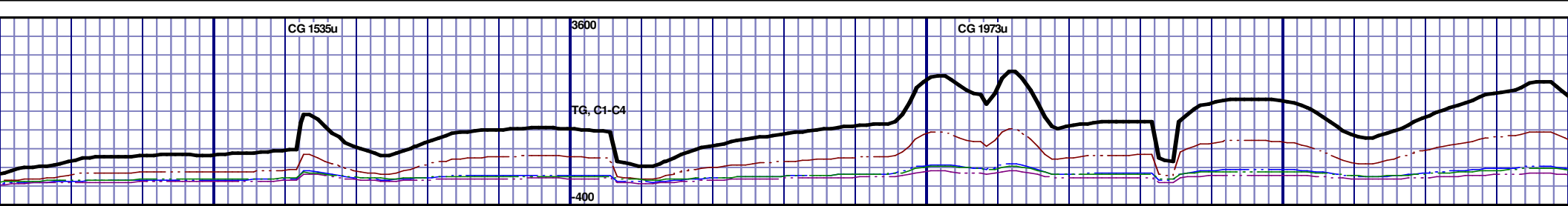
MD 11612 TVD 6748.15  
INC 89.29 AZ 272  
VS 4908.91



MD 11706 TVD 6748.83  
INC 89.88 AZ 271.14  
VS 5002.91

MD 11801 TVD 6748.09  
INC 91.02 AZ 271.06  
VS 5097.9

MD 11895 TVD 6748.14  
INC 88.92 AZ 271.01  
VS 5191.89



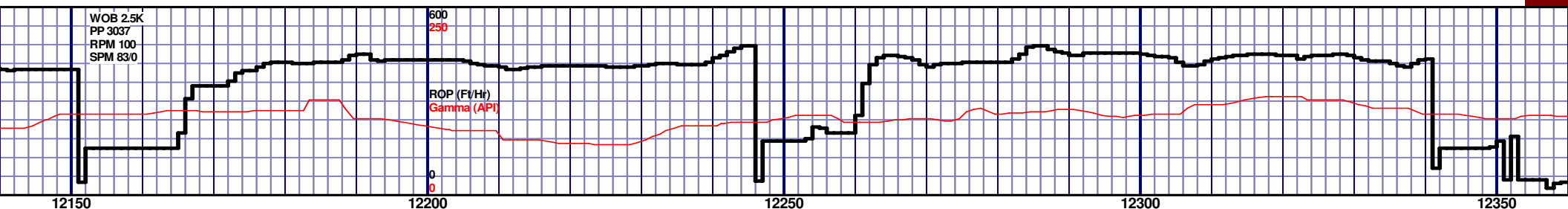
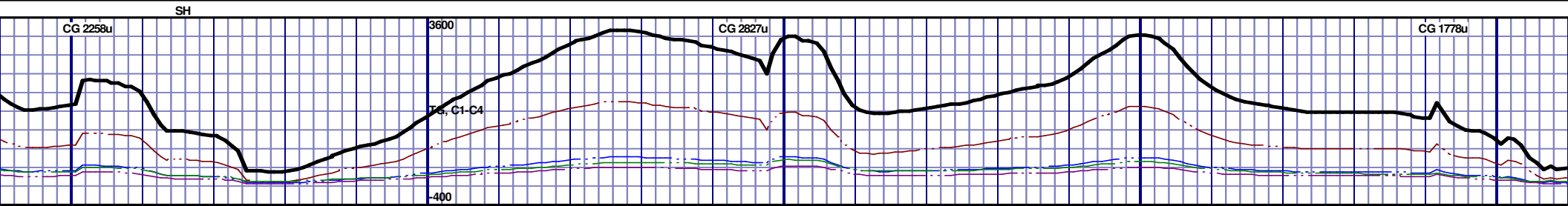
CHK: 90% MOTT LTGY - MEDDRKGY,  
Y TO SLTY TXT, FRM TO BRIT, FREE  
CALC, IMBD PYR, 10% FREE MRL,  
NT BLSHWT O FLOR, IMMED STRMG

11950' MD-12000' MD: CHK: 90% MOTT LTGY - MEDDRKGY,  
BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE  
CALC, FREE BENT, IMBD CALC, IMBD PYR, 10% FREE MRL,  
NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG  
CUT, HVY BLSHWT RNG

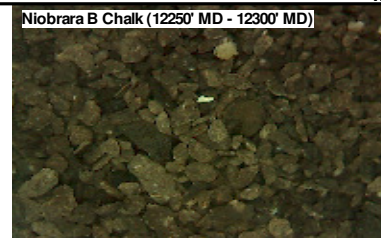
12000' MD-12050' MD: CHK: 80% MOTT LTGY - MEDDRKGY,  
BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE  
CALC, FREE BENT, IMBD CALC, IMBD PYR, 20% FREE MRL, NO  
STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG  
CUT, HVY BLSHWT RNG

12050' MD-12100' MD: CHK: 80% MOTT LTGY - MEDDRKGY,  
BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE  
CALC, FREE BENT, IMBD CALC, IMBD PYR, 20% FREE MRL, NO  
STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG  
CUT, HVY BLSHWT RNG

12100' MD-12150' MD: CHK: 90% MOTT LTGY - MEDDRKGY,  
BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE  
CALC, FREE BENT, IMBD CALC, IMBD PYR, 10% FREE MRL,  
NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG  
CUT, HVY BLSHWT RNG



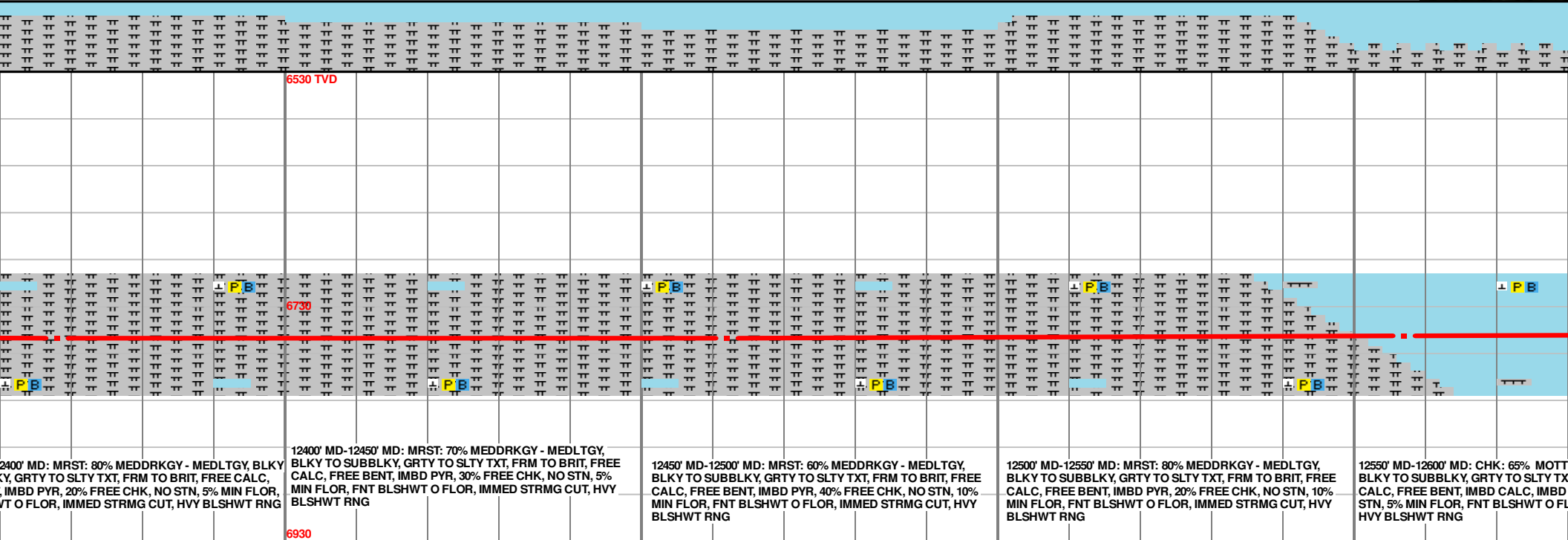
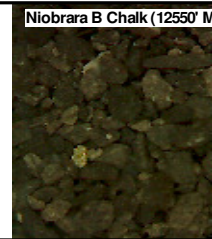
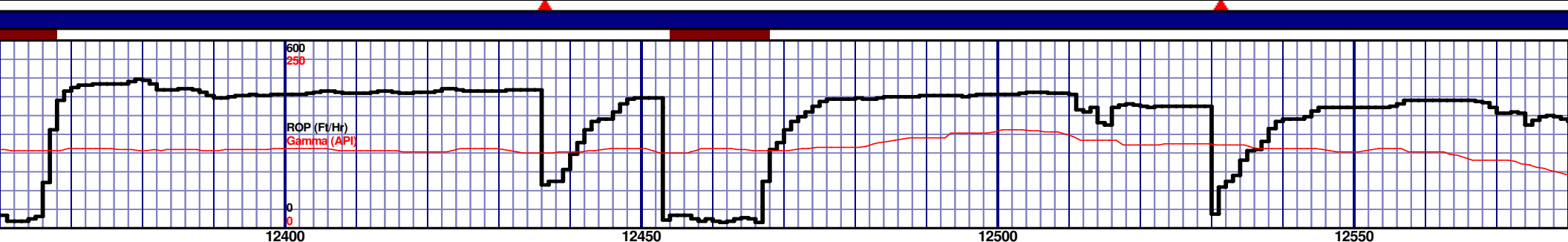
Niobrara B Chalk (12250' MD - 12300' MD)

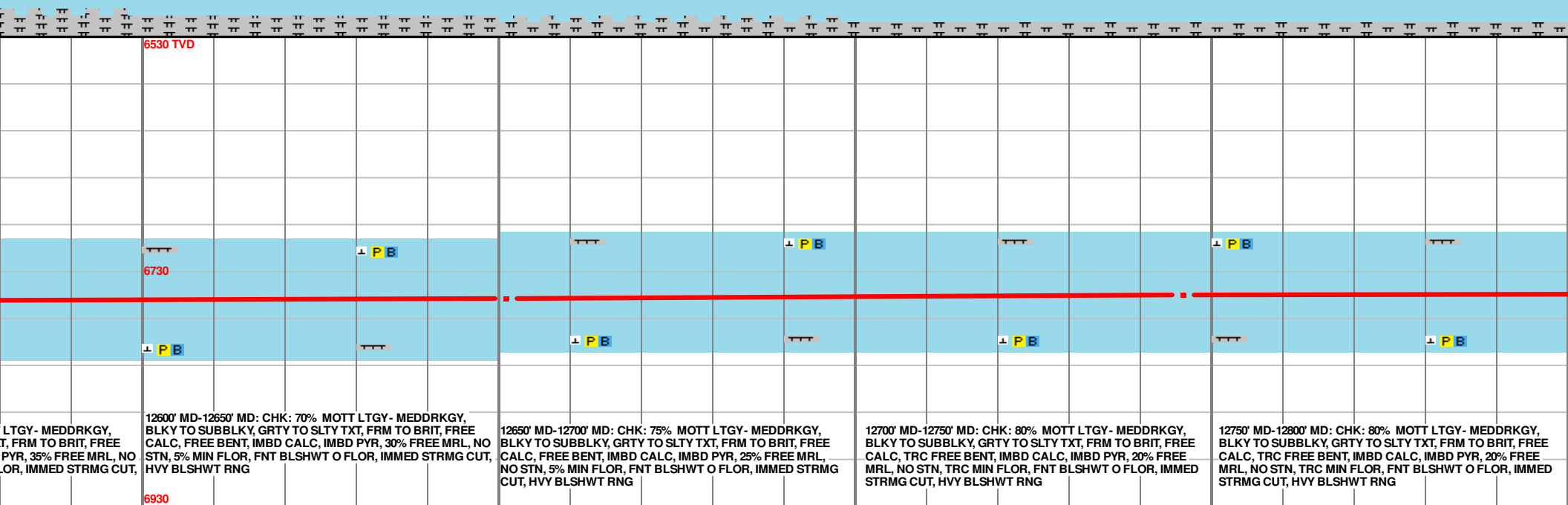
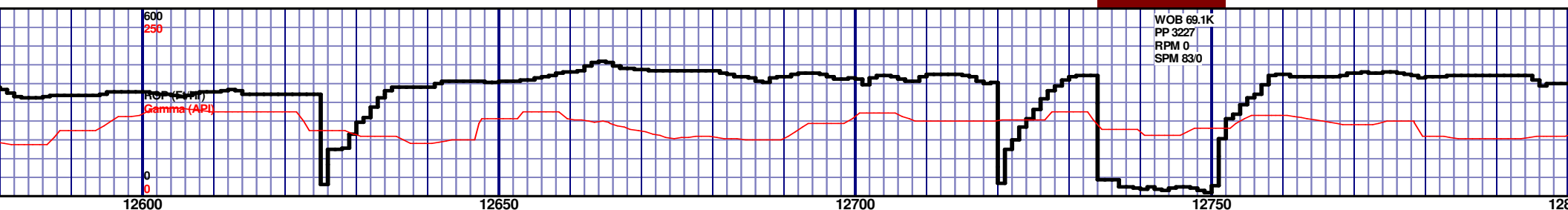
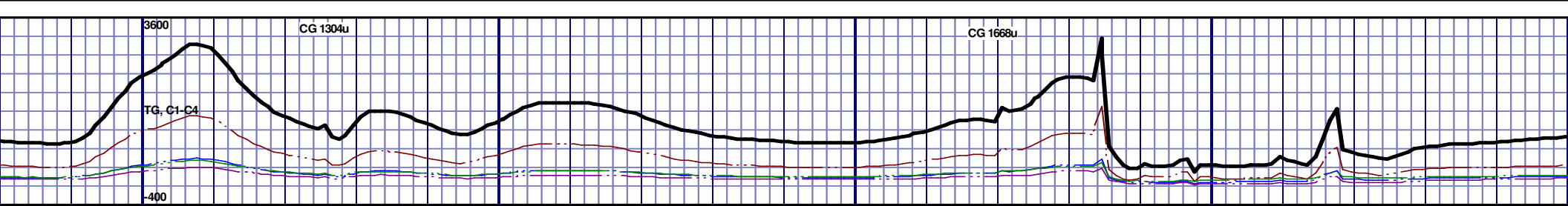


6530 TVD									
6730									
6930									
12150' MD-12200' MD: CHK: 70% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD CALC, IMBD PYR, 30% FREE MRL, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
12200' MD-12250' MD: CHK: 70% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 30% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
12250' MD-12300' MD: CHK: 75% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD CALC, IMBD PYR, 25% FREE MRL, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
12300' MD-12350' MD: MRST: 60% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD PYR, 40% FREE CHK, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
12350' MD-12400' MD: MRST: 60% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD PYR, 40% FREE CHK, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									

MD 12178 TVD 6752.2  
INC 88.8 AZ 270.53  
VS 5474.65

MD 12273 TVD 6754.6  
INC 88.3 AZ 270.23  
VS 5569.61

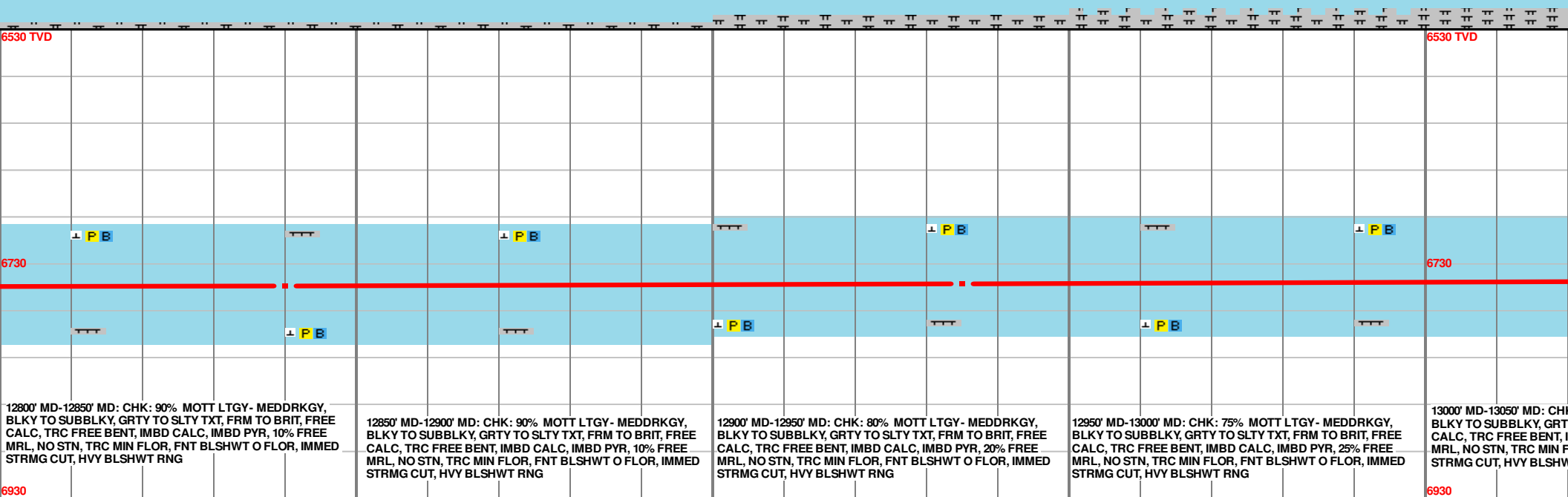
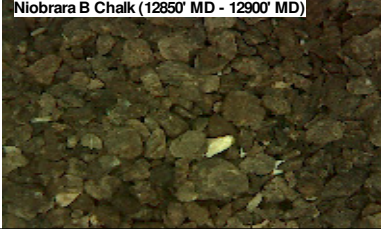
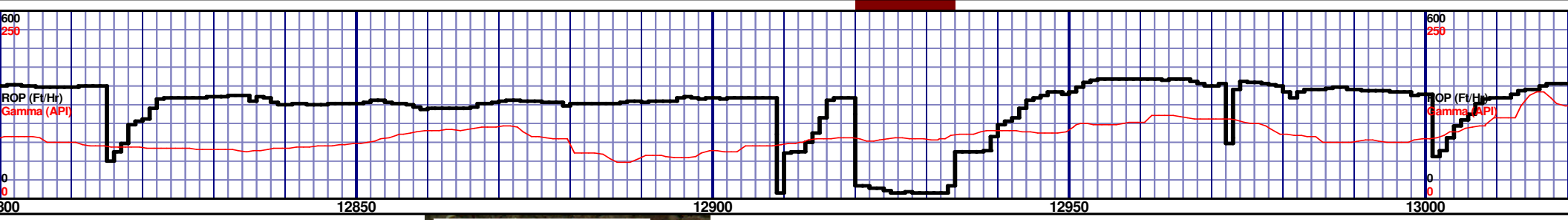
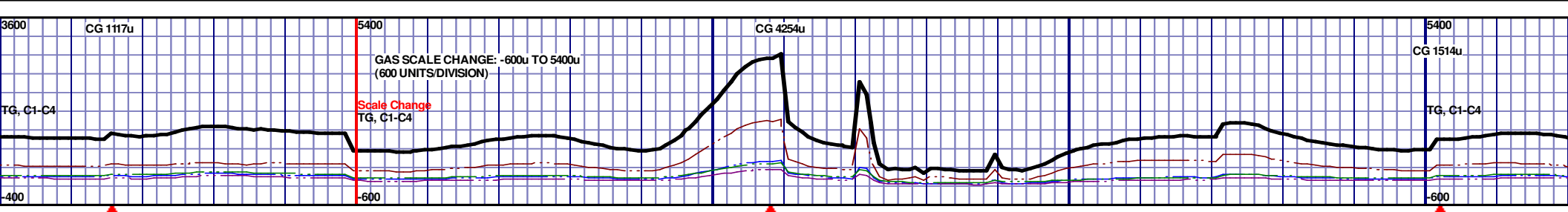




MD 12651 TVD 6752.56  
INC 91.73 AZ 268.42  
VS 5947.45

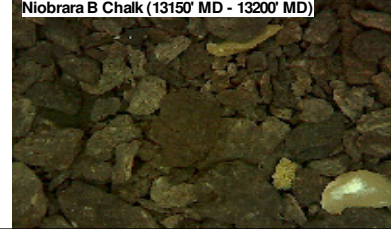
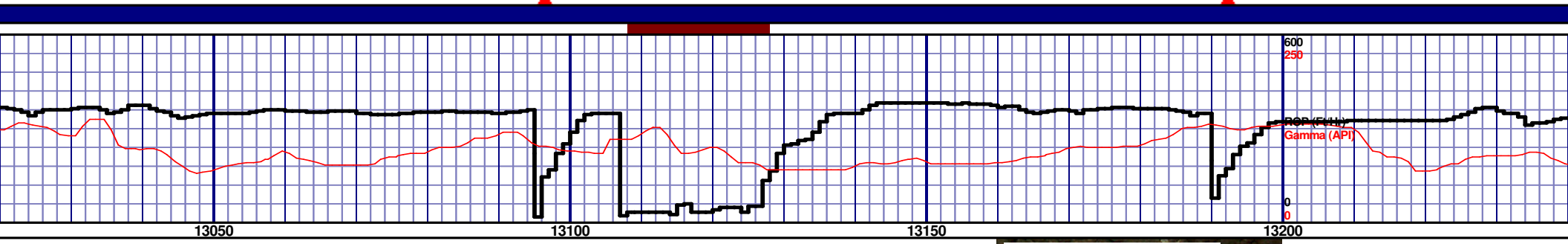
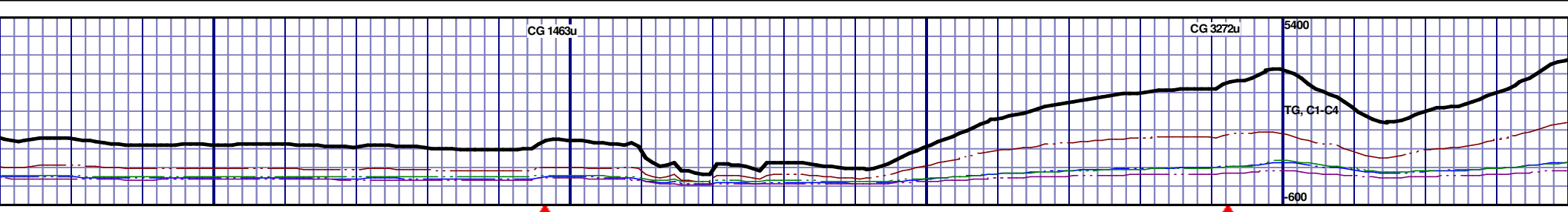
MD 12746 TVD 6750.44  
INC 90.83 AZ 269.25  
VS 6042.33



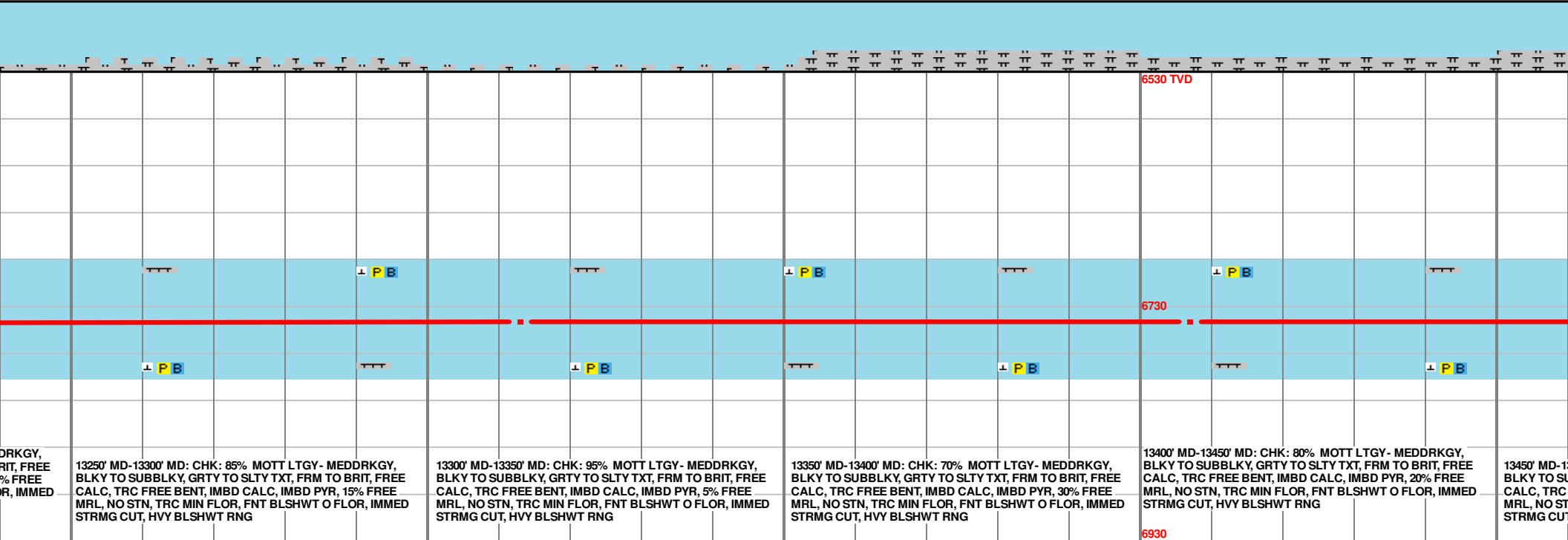
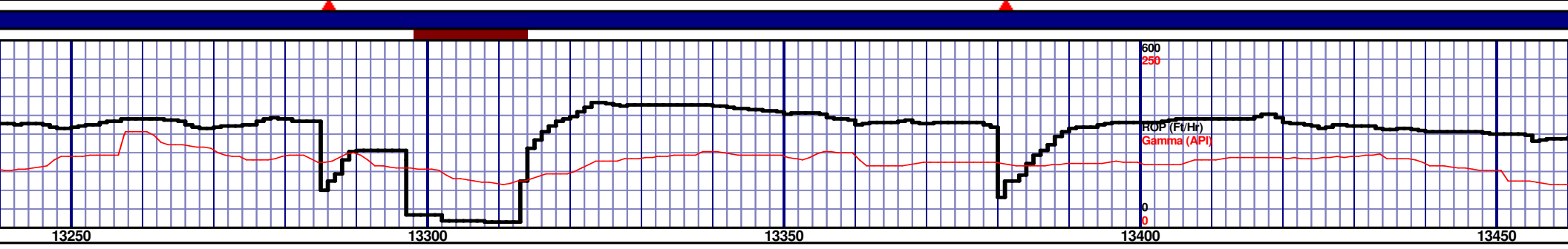
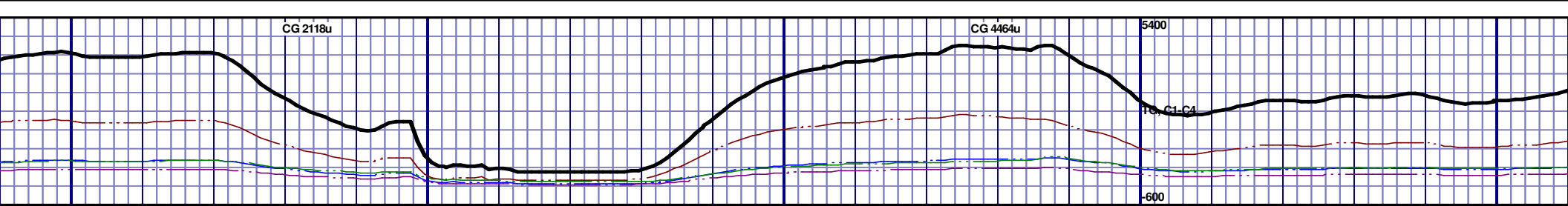


MD 12840 TVD 6748.57  
INC 91.45 AZ 269.02  
VS 6136.23

MD 12935 TVD 6746.94  
INC 90.52 AZ 270.5



13050' MD-13100' MD: CHK: 95% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 5% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG					13100' MD-13150' MD: CHK: 95% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 5% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG					13150' MD-13200' MD: CHK: 80% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD CALC, IMBD PYR, 20% FREE MRL, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG					13200' MD-13250' MD: CHK: 90% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 10% MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG				
13050' MD-13100' MD: CHK: 95% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 5% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG					13100' MD-13150' MD: CHK: 95% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 5% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG					13150' MD-13200' MD: CHK: 80% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD CALC, IMBD PYR, 20% FREE MRL, NO STN, 5% MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG					13200' MD-13250' MD: CHK: 90% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 10% MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG				



MD 13250' MD-13300' MD: CHK: 85% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 15% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

MD 13300' MD-13350' MD: CHK: 95% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 5% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

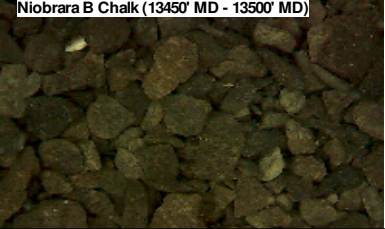
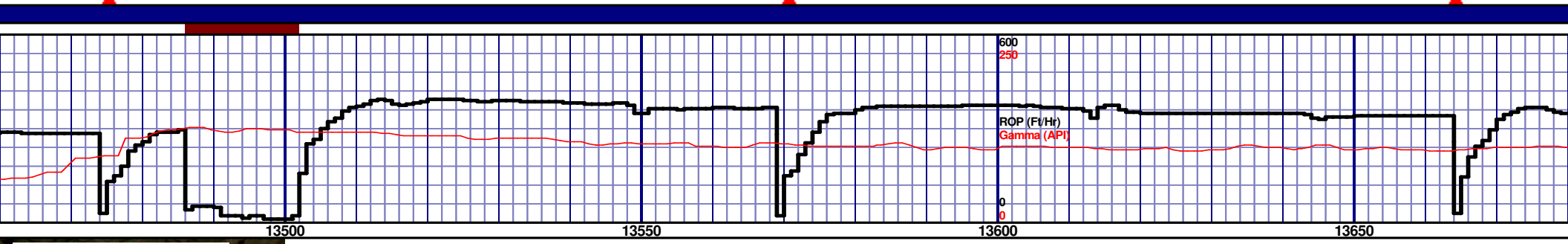
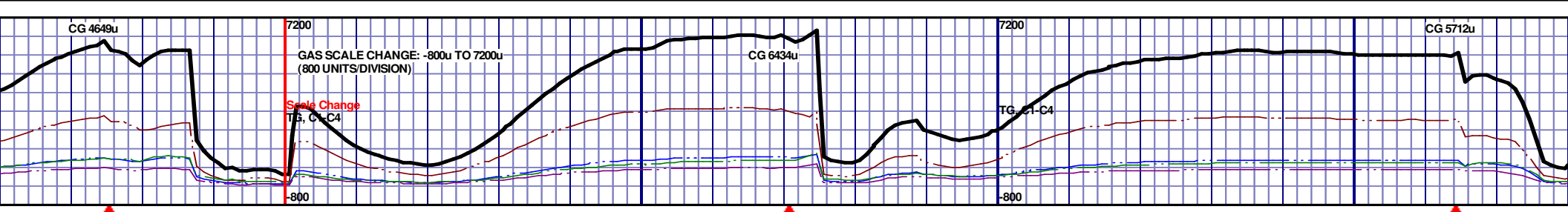
MD 13350' MD-13400' MD: CHK: 70% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 30% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

MD 13400' MD-13450' MD: CHK: 80% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 20% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

MD 13450' MD-13500' MD: CHK: 80% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 20% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

MD 13313 TVD 6743.11  
INC 89.88 AZ 270.86  
VS 6609.11

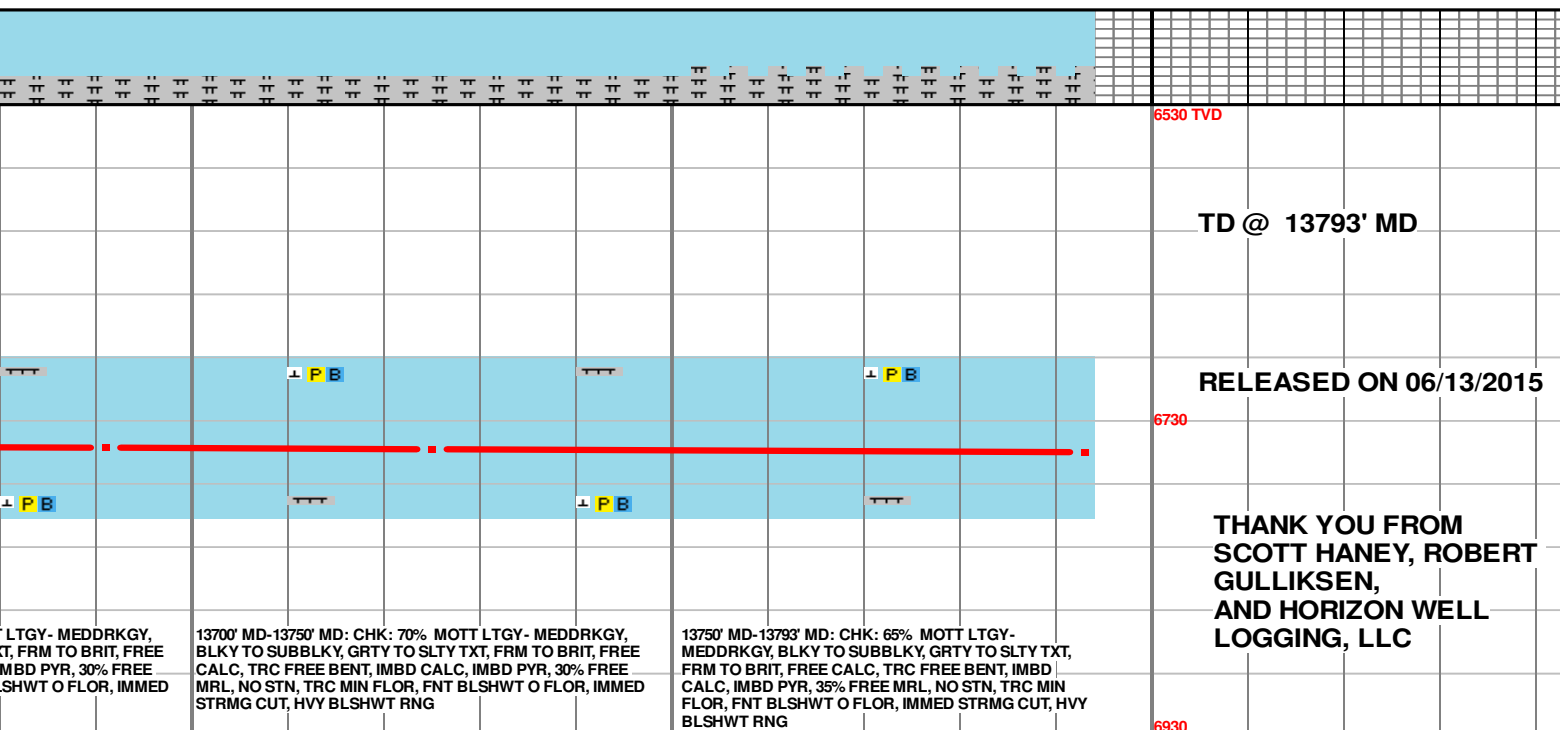
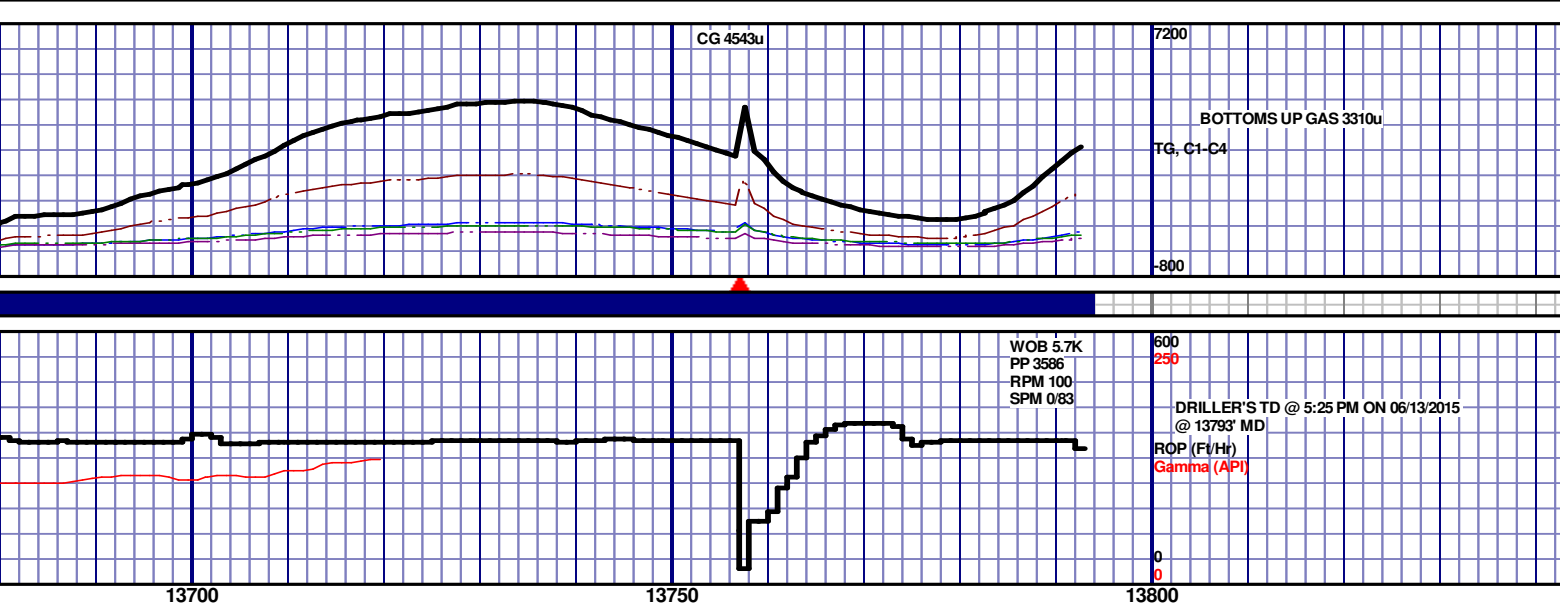
MD 13407 TVD 6742.88  
INC 90.4 AZ 270.39  
VS 6703.1



13500' MD-13550' MD: CHK: 70% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 30% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
13550' MD-13600' MD: CHK: 75% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 25% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
13600' MD-13650' MD: CHK: 60% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 40% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
13650' MD-13700' MD: CHK: 70% MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, IMBD CALC, IMBD PYR, 30% FREE MRL, NO STN, TRC MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									

MD 13502 TVD 6743.18  
INC 89.23 AZ 270.95  
VS 6798.09

MD 13596 TVD 6744.68  
INC 88.95 AZ 270.8  
VS 6892.07



MD 13691 TVD 6746.8  
INC 88.49 AZ 270.7  
VS 6987.04

MD 13725 TVD 6747.82  
INC 88.06 AZ 270.29  
VS 7021.02

PTB MD 13793 TVD 6750.12  
INC 88.06 AZ 270.29  
VS 7088.97