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Tulsa, Oklahoma 74136-6378

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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: Brian Whitfield &
Michael Yeager

Log Interval: 6850' MD to 11206' MD

Start Date: November 4, 2013

Release Date: November 7, 2013

Well Information

Well Name: Crow Creek State
AC36-73-1HN HZ

Location: 36-7N-63W
270' FSL, 1425' FEL

County: Weld
State: Colorado

Drilling Rig: H&P 277

Total Depth: 11206' MD

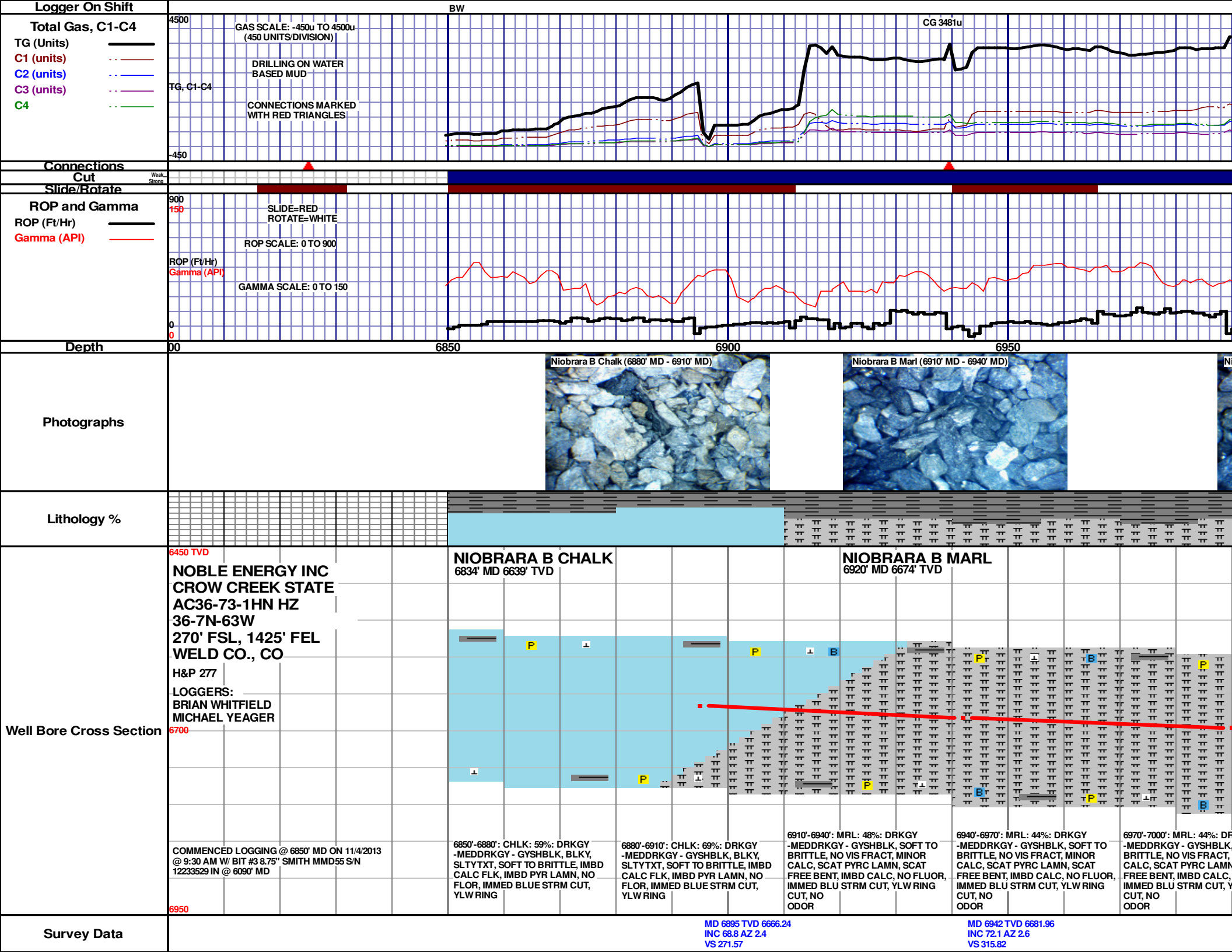
TD Date: November 6, 2013

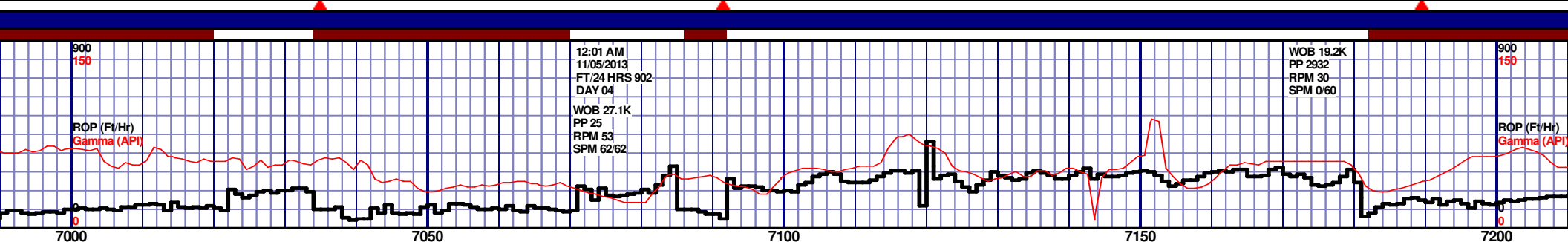
Formation: Niobrara C Chalk

KB Elevation: 4873'

GR Elevation: 4849'

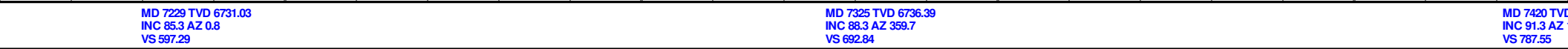
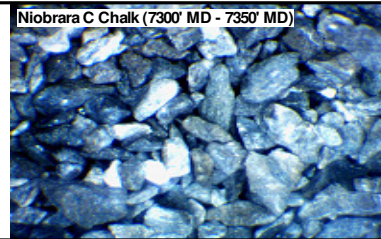
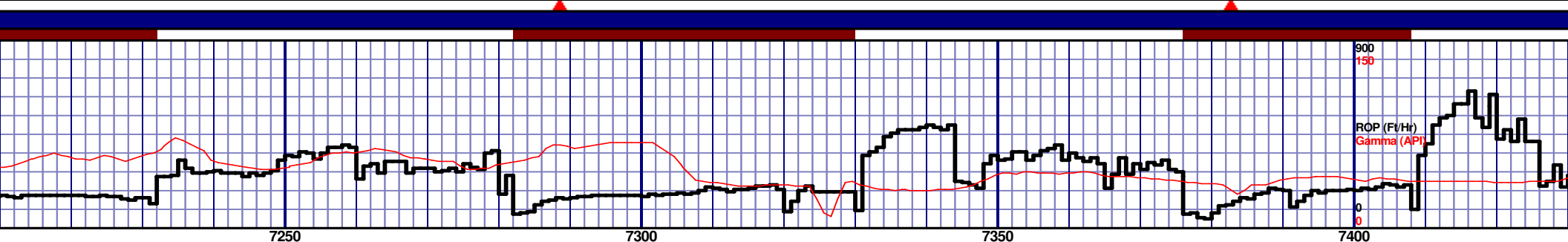
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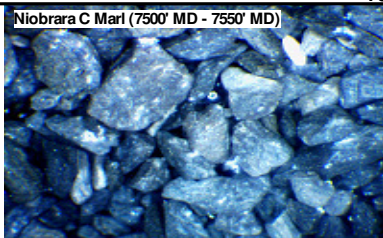
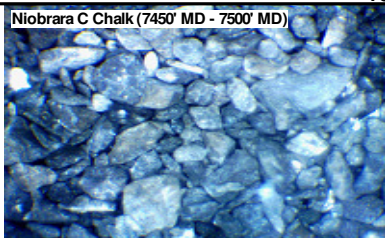
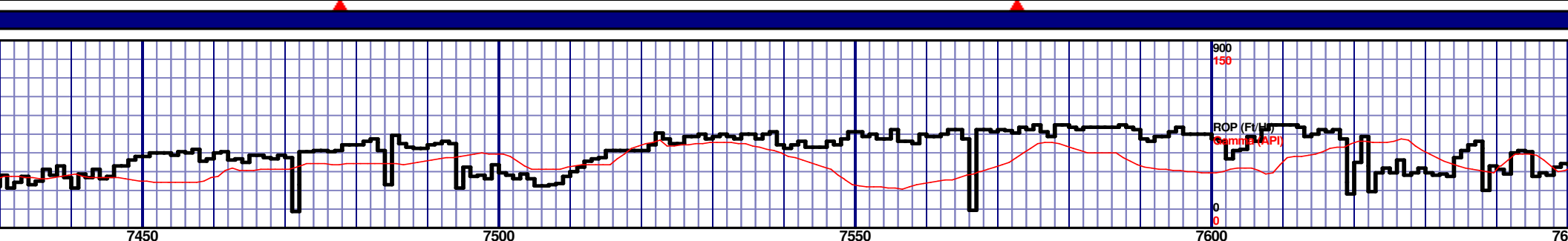


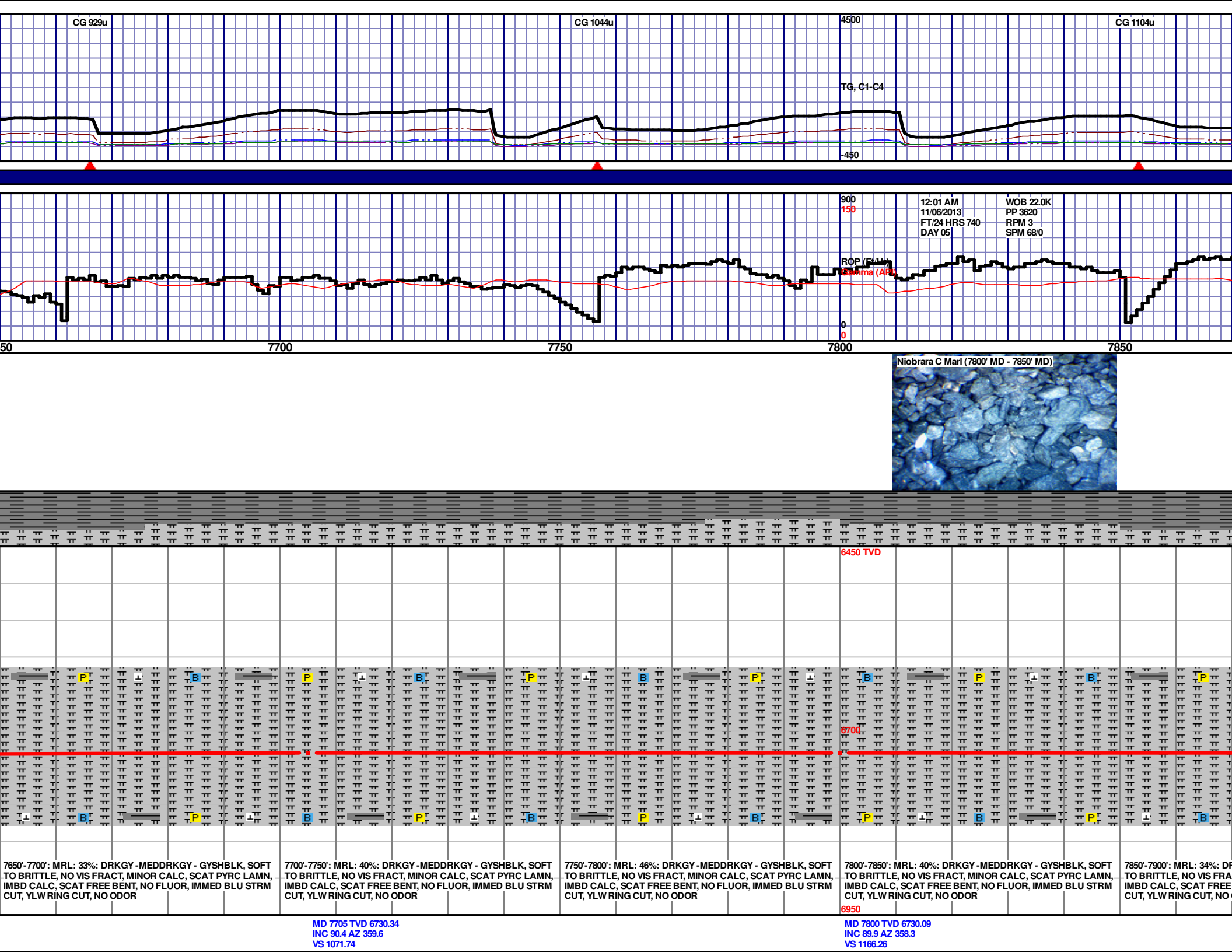


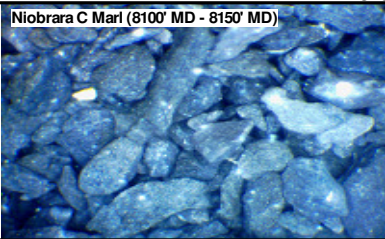
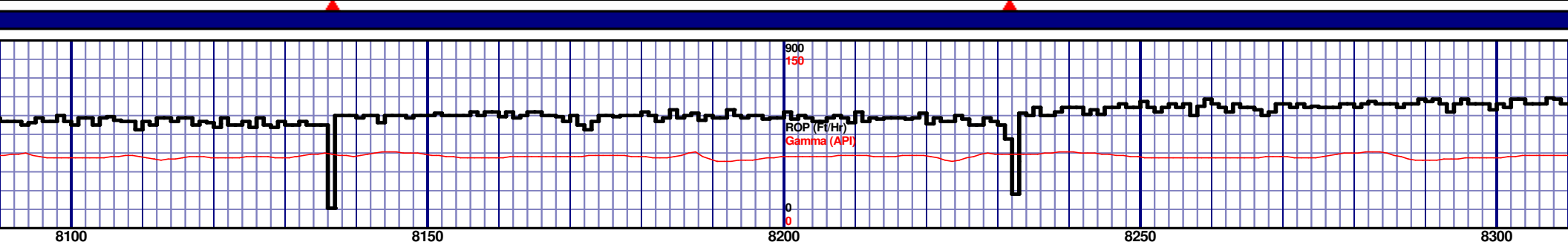
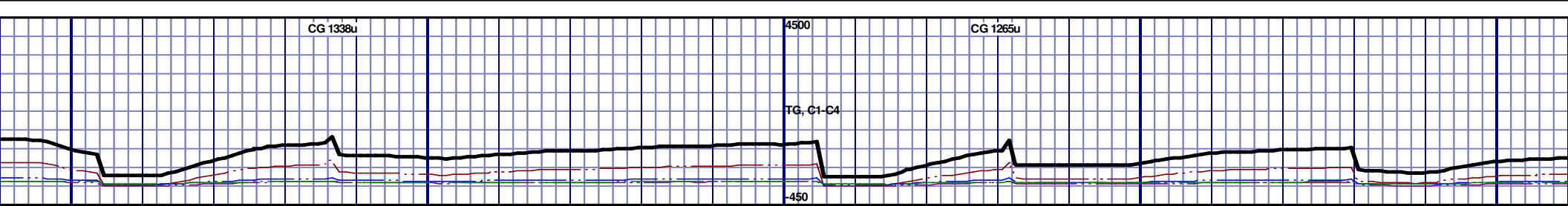
6450 TVD										NIOBRARA C CHALK 7050' MD 6708' TVD										TOOH @ 1:15 PM ON 11/4/13 @ 7082' MD FOR INTERMEDIATE CASING. TIH @ 3:30 PM ON 11/5/13. RESUMED DRILLING @ 7:40 PM ON 11/5/2013 W/ BIT #4 6.125" SMITH MDI513 S/N JH3434 IN @ 7082' MD.										6450 TVD																													
7000'-7030': MRL: 47%: DRKGY -MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, SCAT FREE BENT, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR										7030'-7060': CHLK: 53%: DRKGY -MEDDRKGY - GYSHBLK, DRKGY SOFT TO BRITTLE, IMBD CALC FLK, FREE CALC, IMBD PYR LAMN, SCAT FREE BENT, NO FLOR, IMMED BLUE STRM CUT, YLW RING										7060'-7100': CHLK: 54%: DRKGY -MEDDRKGY - GYSHBLK, BLKY, SOFT TO BRITTLE, IMBD CALC FLK, FREE CALC, IMBD PYR LAMN, NO FLOR, IMMED BLUE STRM CUT, YLW RING										7100'-7150': CHLK: 51%: DRKGY -MEDDRKGY - GYSHBLK, BLKY, SOFT TO BRITTLE, IMBD CALC FLK, FREE CALC, IMBD PYR LAMN, NO FLOR, IMMED BLUE STRM CUT, YLW RING										7150'-7200': MRL: 44%: DRKGY -MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR										7200'-7250': MRL: 44%: DRKGY -MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR									

MD 7134 TVD 6721.1
INC 82.7 AZ 0.1
VS 503.08

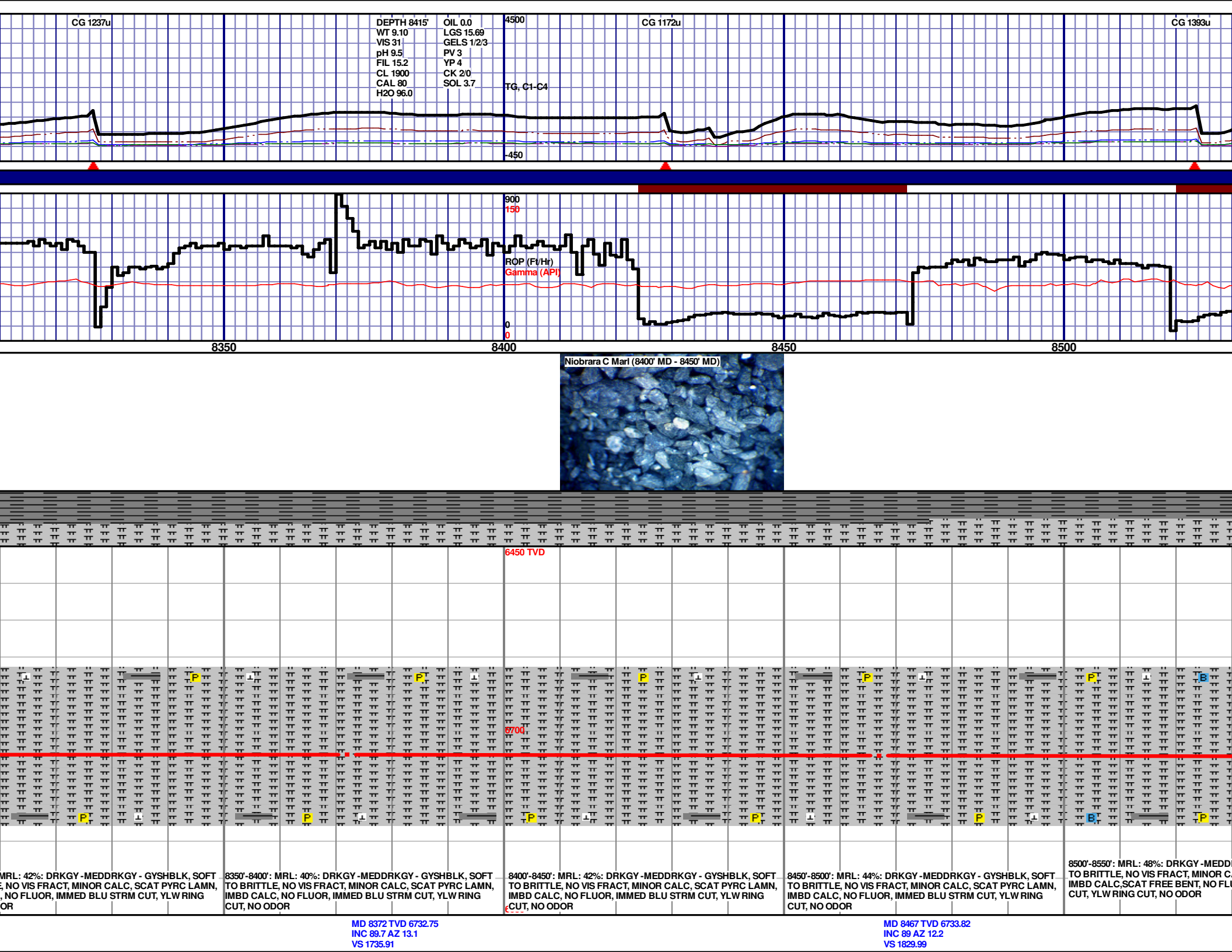


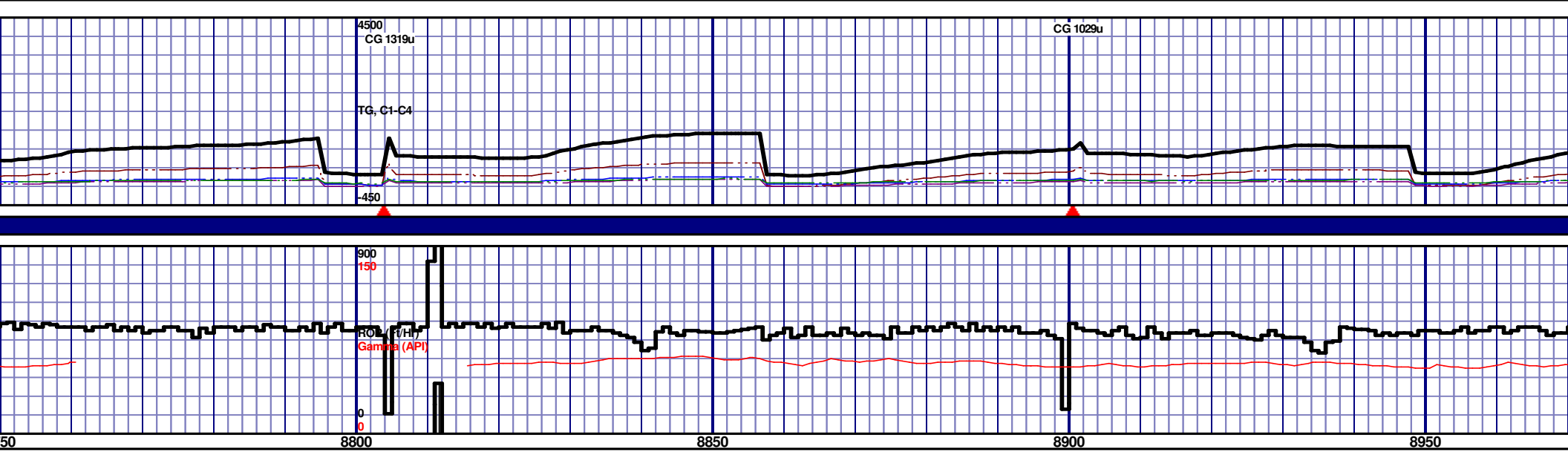
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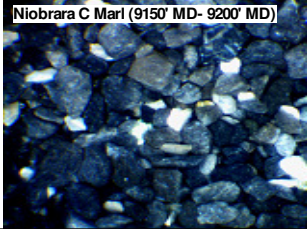
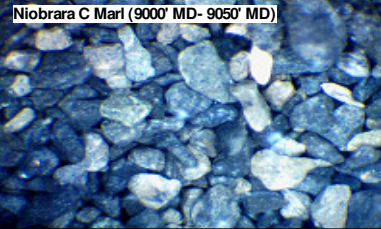
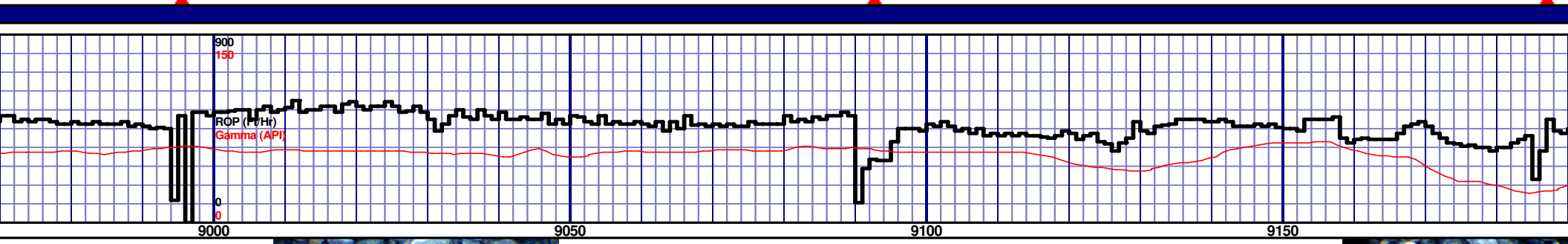
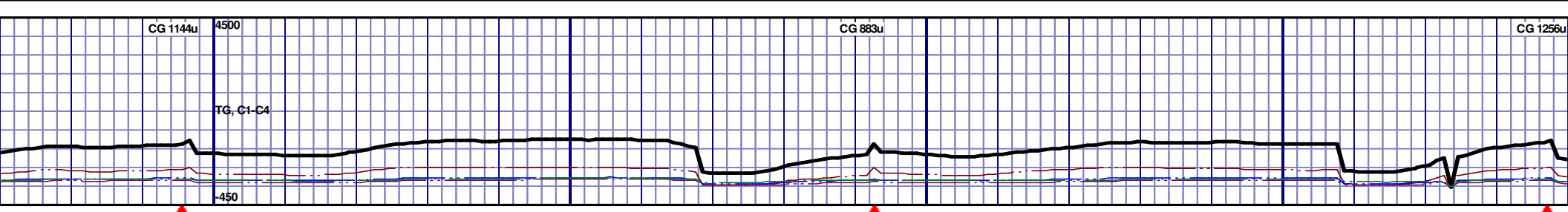


8100'-8150': MRL: 41%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, SCAT FREE BENT, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR					8150'-8200': MRL: 40%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR					8200'-8250': MRL: 42%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR					8250'-8300': MRL: 44%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR					8300'-8350': MRL: 46%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR				
8100'-8150': MRL: 41%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, SCAT FREE BENT, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR					8150'-8200': MRL: 40%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR					8200'-8250': MRL: 42%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR					8250'-8300': MRL: 44%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR					8300'-8350': MRL: 46%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR				





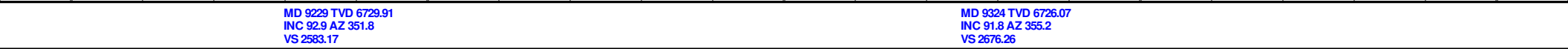
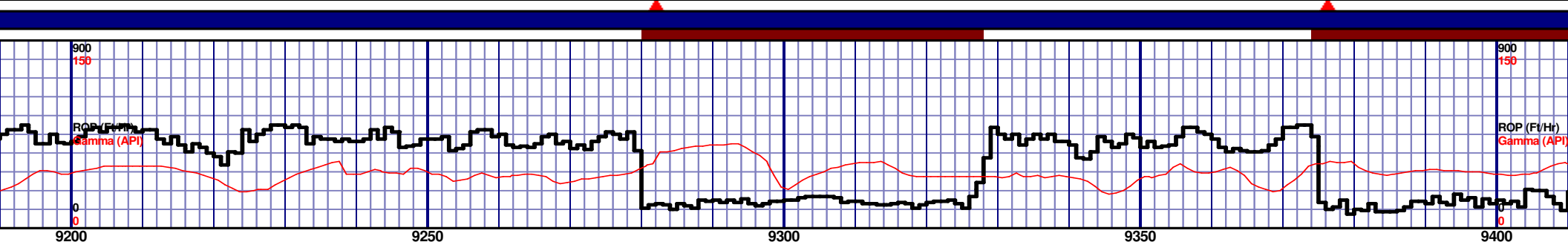
6450 TVD									
6700									
6950									
8800'-8850': MRL: 46%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR									
8850'-8900': MRL: 46%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR									
8900'-8950': MRL: 43%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR									
8950'-9000': MRL: 40%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR									

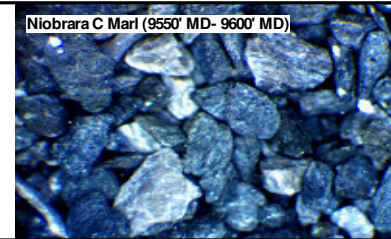
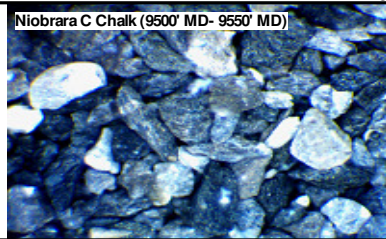
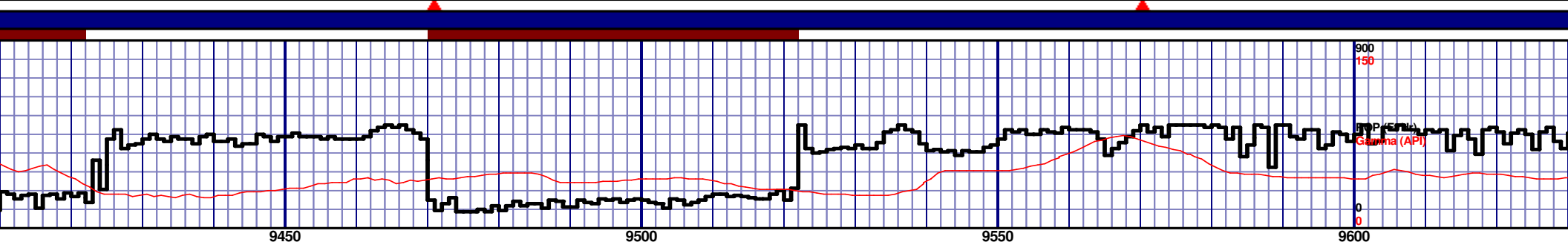
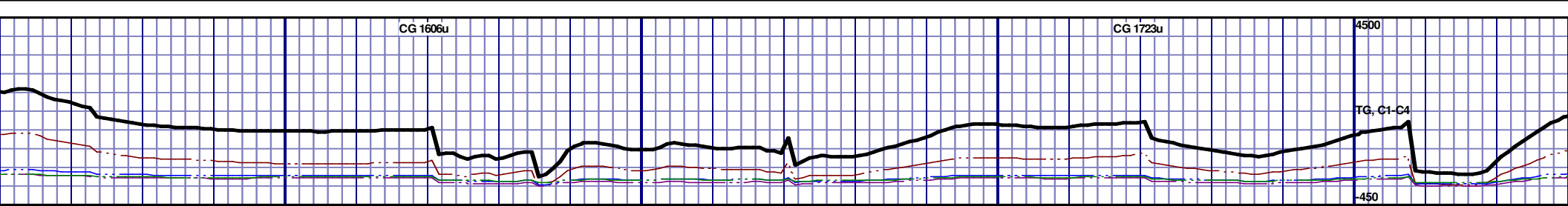


6450 TVD									
9000'-9050': MRL: 38%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR									
9050'-9100': MRL: 38%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR									
9100'-9150': MRL: 43%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR									
9150'-9200': MRL: 43%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR									

MD 9038 TVD 6734.49
INC 90.6 AZ 355
VS 2396.04

MD 9134 TVD 6733.15
INC 91 AZ 353.2
VS 2490.39





CHLK: 53%: DRKGY - MEDDRKGY - GYSHBLK, TO BRITTLE, IMBD CALC FLK, FREE CALC, IMBD NO FLOR, IMMED BLUE STRM CUT, YLW RING											
9450'-9500': CHLK: 53%: DRKGY - MEDDRKGY - GYSHBLK, BLKY, SOFT TO BRITTLE, IMBD CALC FLK, FREE CALC, IMBD PYR LAMN, NO FLOR, IMMED BLUE STRM CUT, YLW RING											
9500'-9550': CHLK: 53%: DRKGY - MEDDRKGY - GYSHBLK, BLKY, SOFT TO BRITTLE, IMBD CALC FLK, FREE CALC, IMBD PYR LAMN, NO FLOR, IMMED BLUE STRM CUT, YLW RING											
9550'-9600': MRL: 49%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR											
9600'-9650': MRL: 49%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR											

NIOBRARA C MARL
9567' MD 6727' TVD

9450 TVD

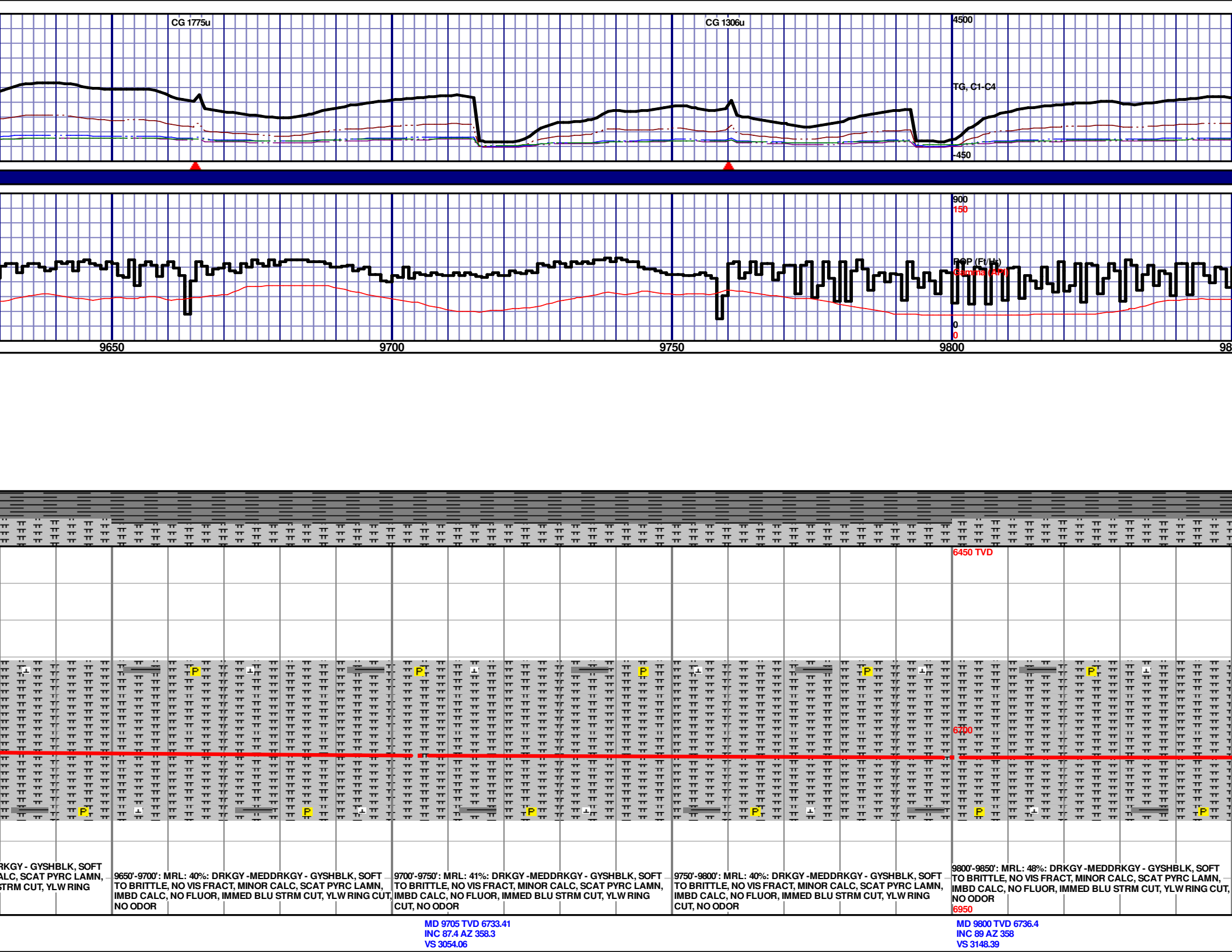
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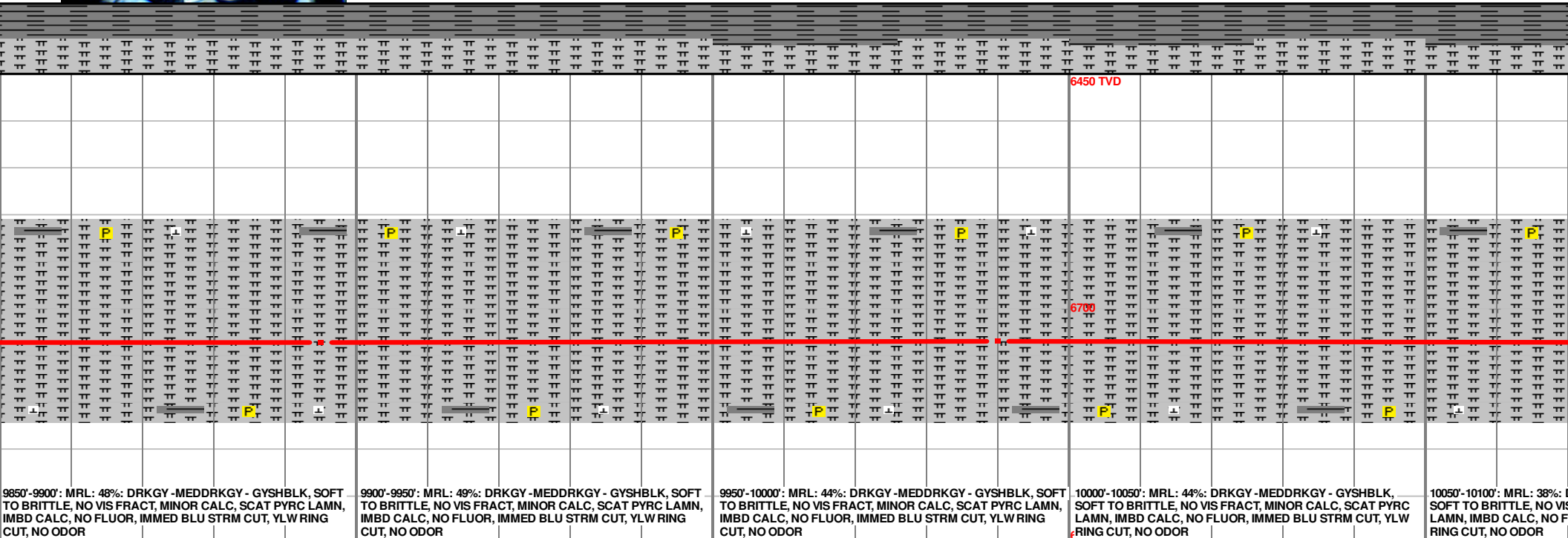
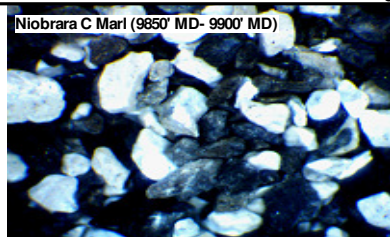
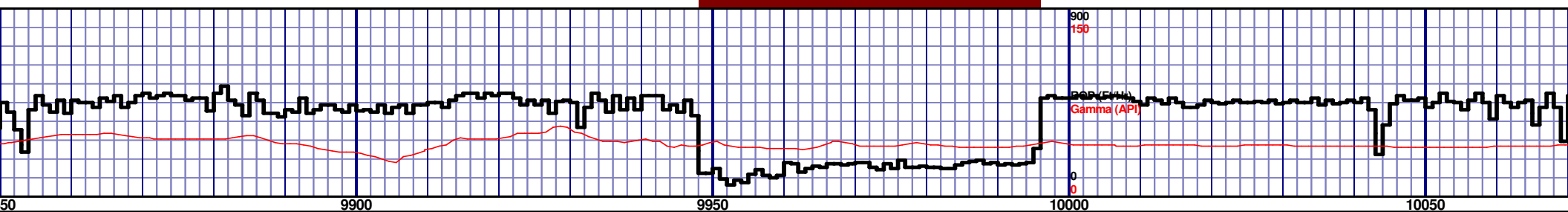
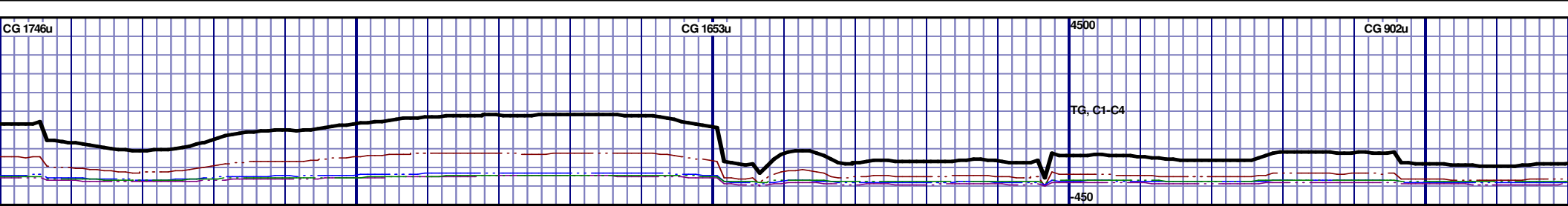
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INC 91.1 AZ 356.9
VS 2770.15

MD 9514 TVD 6724.41
INC 88 AZ 358.7
VS 2864.43

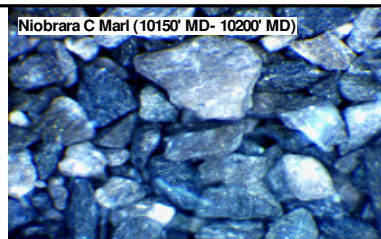
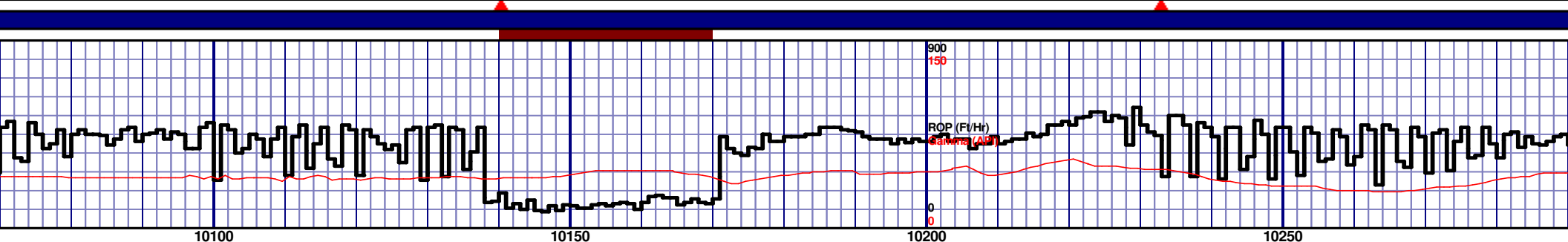
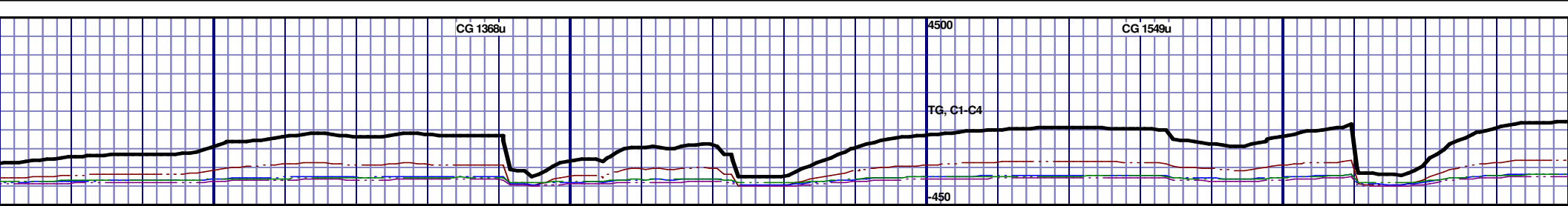
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INC 86.9 AZ 358.3
VS 2958.78



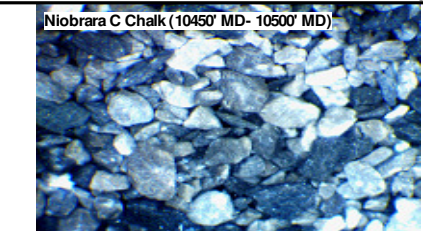
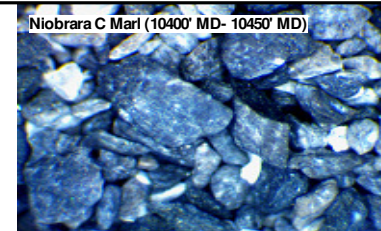
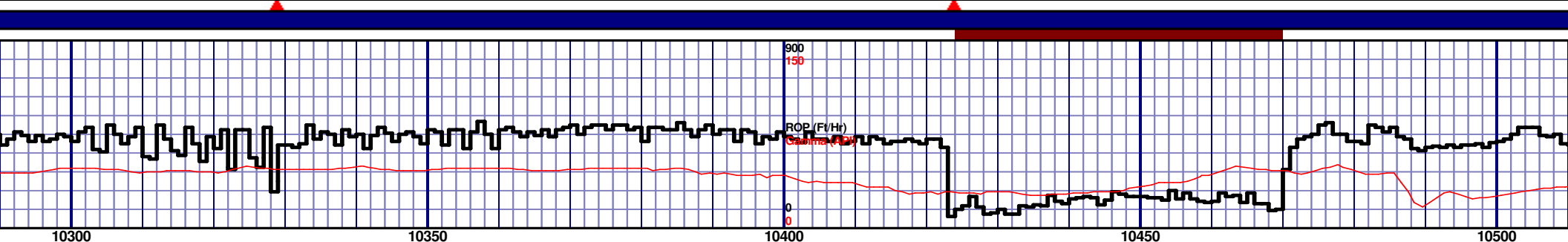
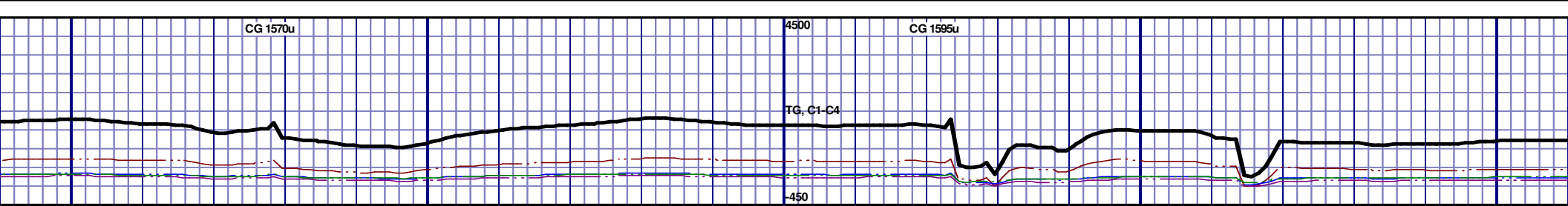


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INC 91.7 AZ 357.3
VS 3242.65

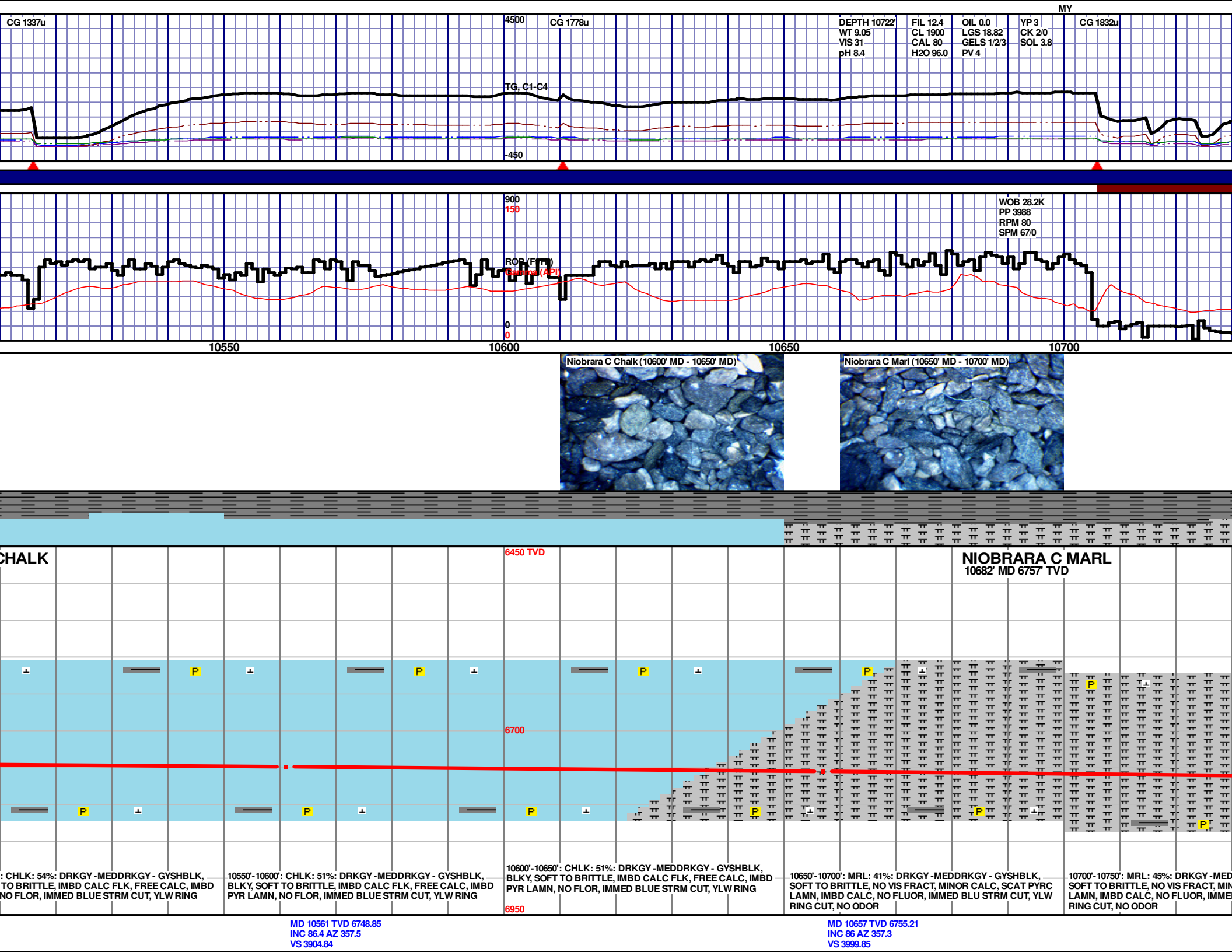
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INC 89 AZ 358.7
VS 3336.99

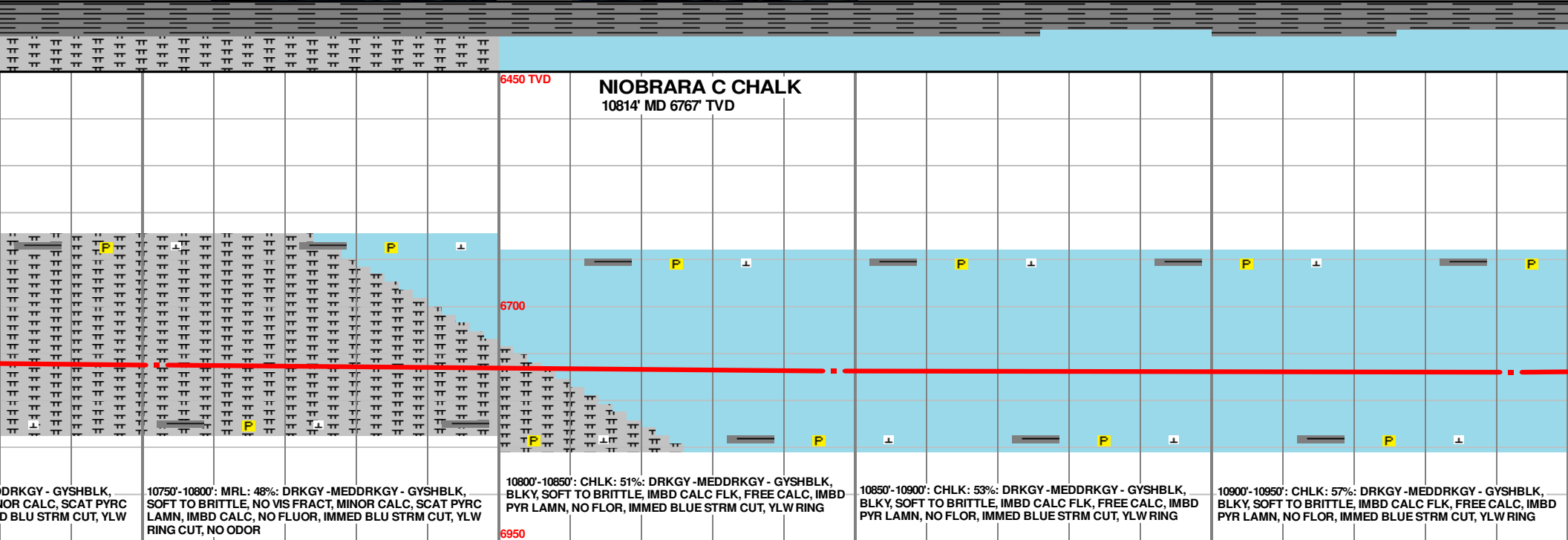
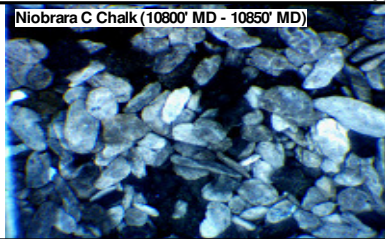
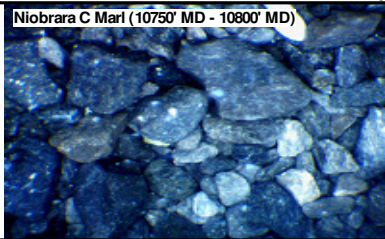
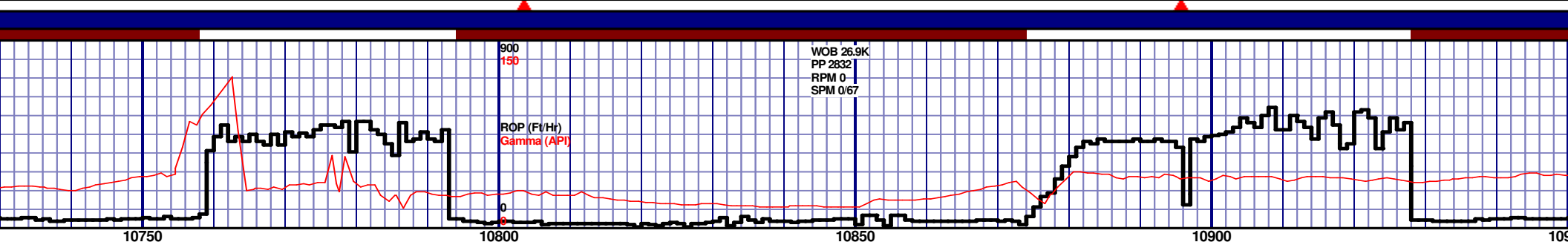
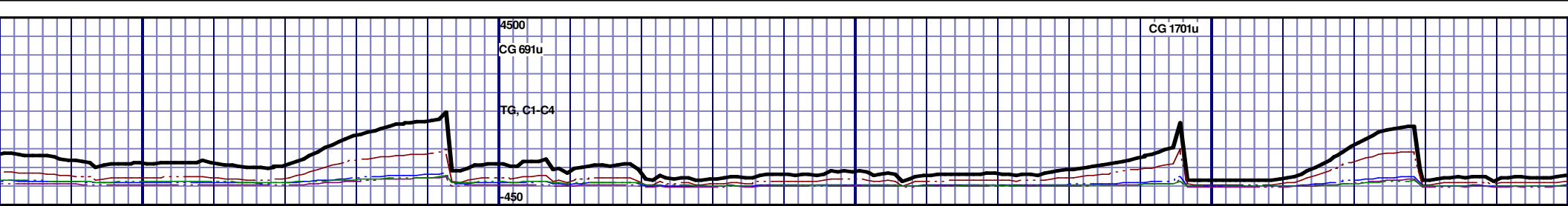


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6450 TVD										NIOBRARA C C 10490' MD 6743' TVD									
6490																			
6950																			
10300'-10350': MRL: 43%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR										10400'-10450': MRL: 48%: DRKGY - MEDDRKGY - GYSHBLK, TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR									
10350'-10400': MRL: 48%: DRKGY - MEDDRKGY - GYSHBLK, SOFT TO BRITTLE, NO VIS FRACT, MINOR CALC, SCAT PYRC LAMN, IMBD CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO ODOR										10450'-10500': CHLK: 51%: DRKGY - MEDDRKGY - GYSHBLK, BLKY, SOFT TO BRITTLE, IMBD CALC FLK, FREE CALC, IMBD PYR LAMN, NO FLOR, IMMED BLUE STRM CUT, YLW RING									
10500'-10550': BLKY, SOFT TO BRITTLE, IMBD CALC FLK, FREE CALC, IMBD PYR LAMN, NO FLOR, IMMED BLUE STRM CUT, YLW RING										10550'-10600': BLKY, SOFT TO BRITTLE, IMBD CALC FLK, FREE CALC, IMBD PYR LAMN, NO FLOR, IMMED BLUE STRM CUT, YLW RING									





MD 10752 TVD 6762.99
INC 84.6 AZ 356.9
VS 4093.69

MD 10847 TVD 6769.29
INC 87.8 AZ 0.6
VS 4187.94

MD 10942
INC 92 AZ
VS 4282.70

