



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

phone 918.925.9739

fax 866.534.4559

WWW.HZMUD.COM/25

Customer Information

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

Geologist: Holly Duncan
Noble Energy Inc.

Mud Logging Details

Logger: Casey Sensecqua &
Jeremy Needham

Log Interval: 6550' MD to 10665' MD

Start Date: October 14, 2013

Release Date: October 17, 2013

Well Information

Well Name: Wells Ranch AE20-64HN
Horizontal

Location: 20-T6N-R62W
1756' FSL, 215' FWL

County: Weld
State: Colorado

Drilling Rig: H&P 343

Total Depth: 10665' MD

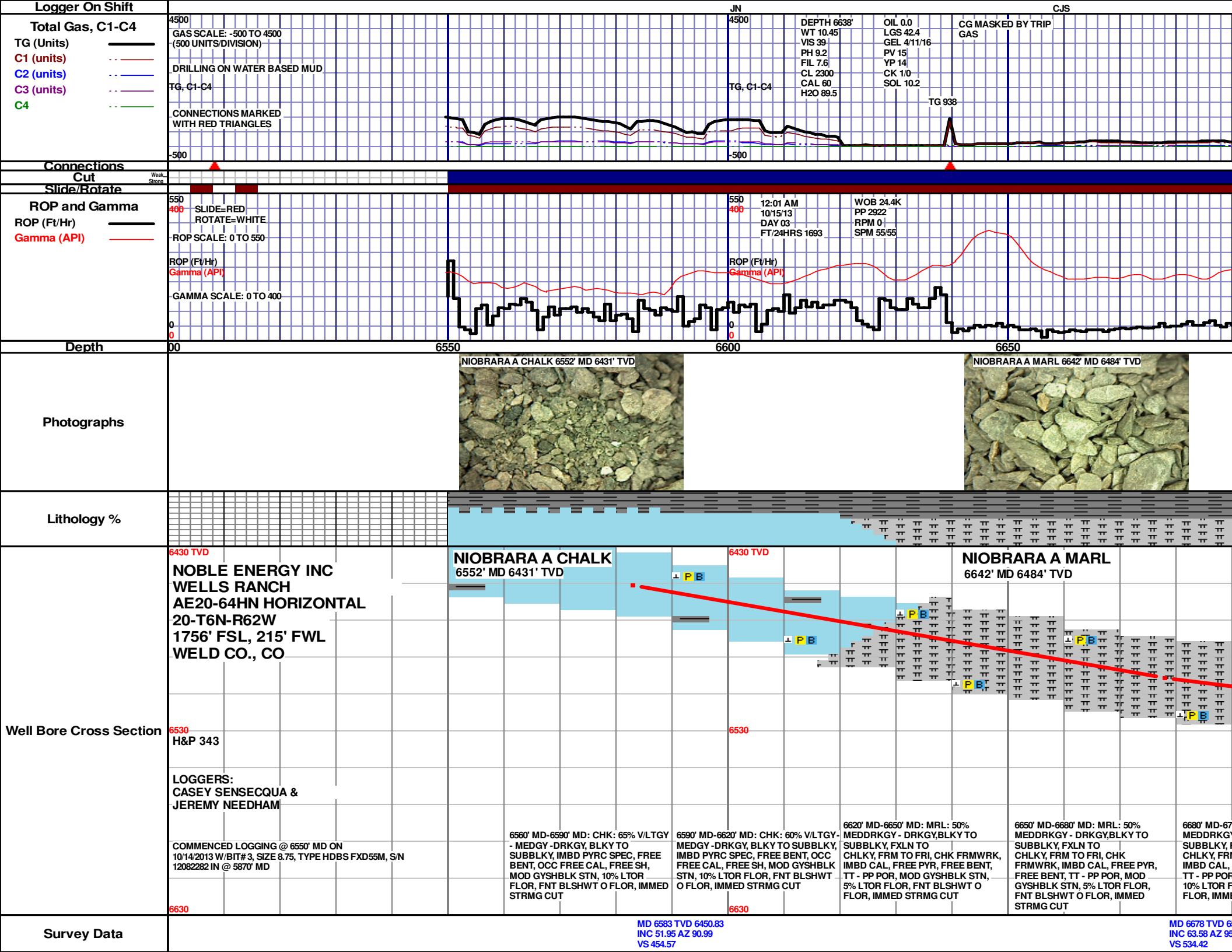
TD Date: October 17, 2013

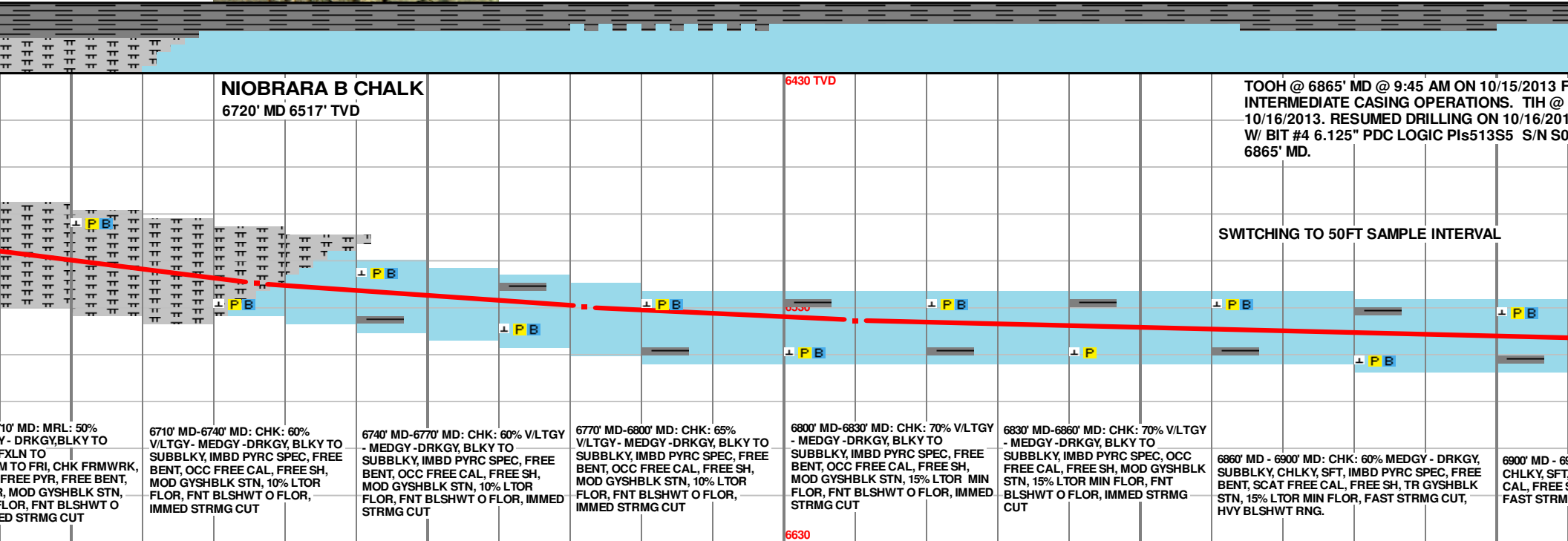
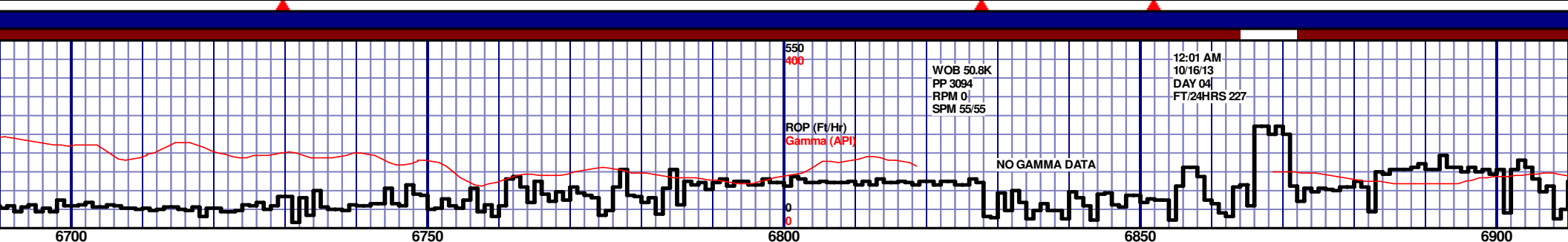
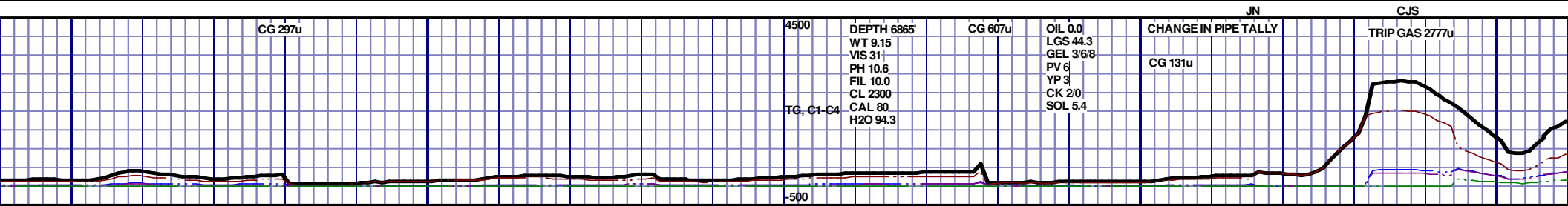
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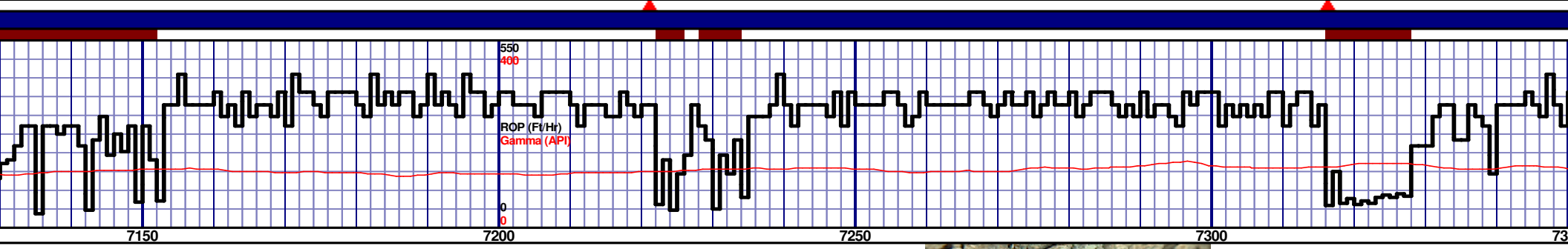
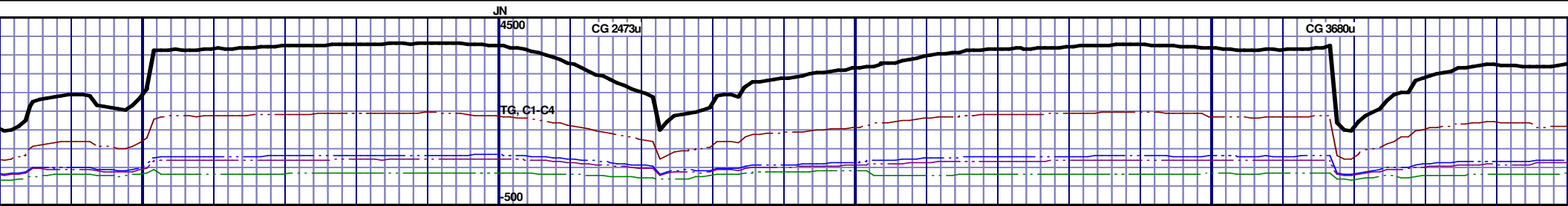
KB Elevation: 4809'

GR Elevation: 4785'

API Number: 05-123-37210-0000





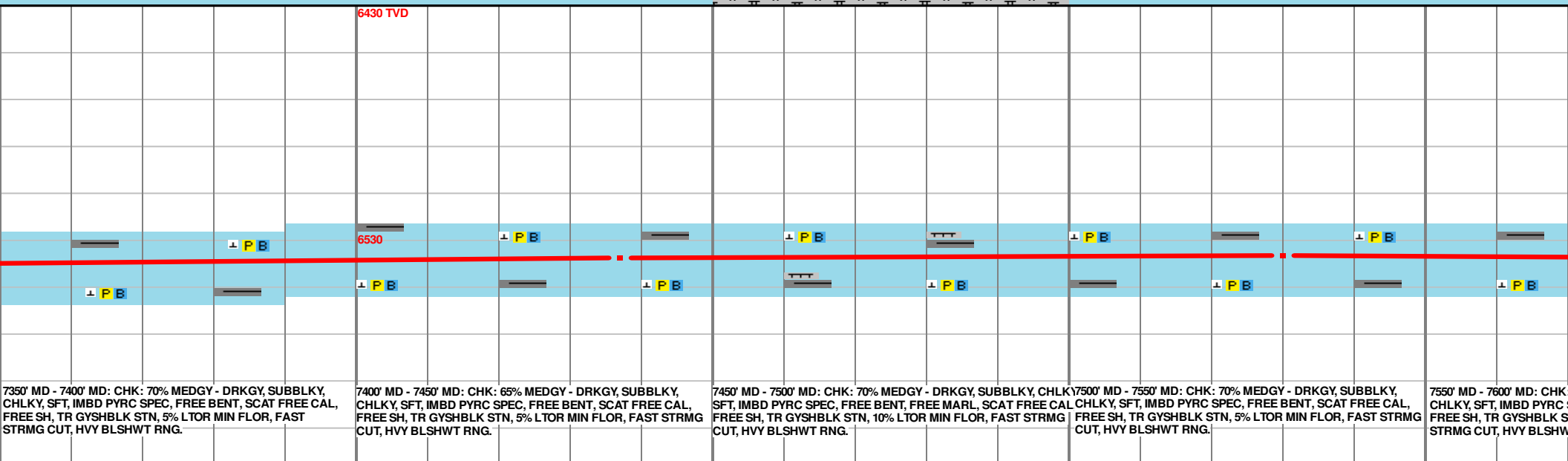
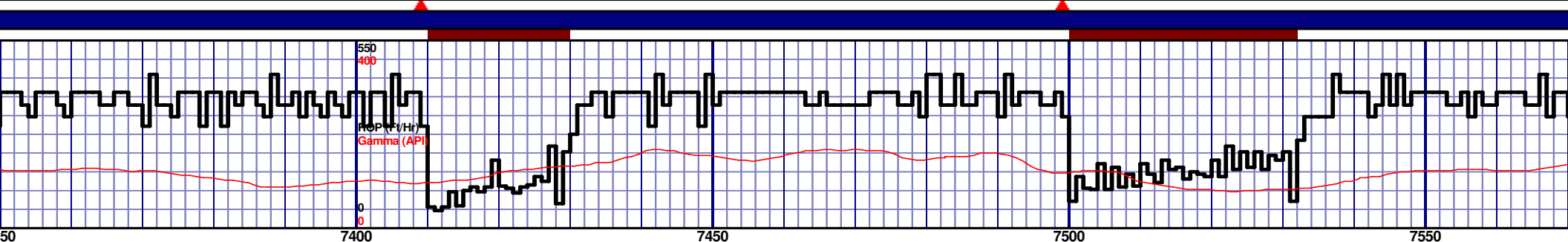
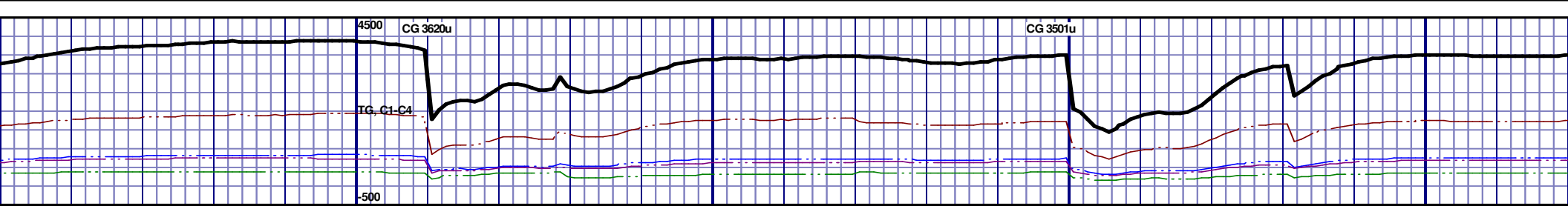


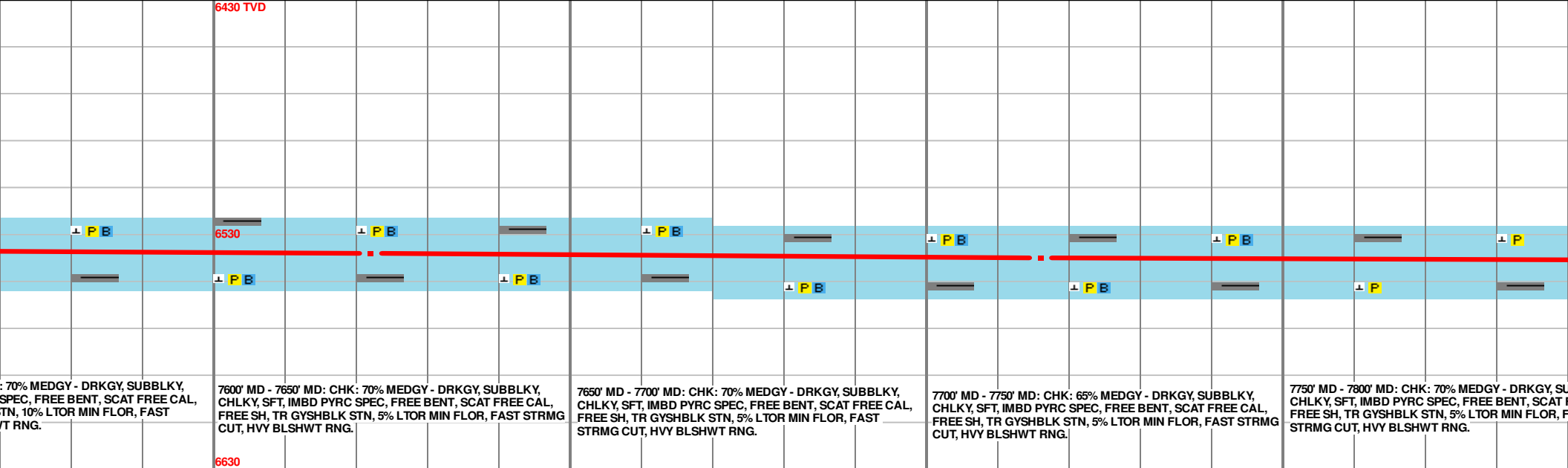
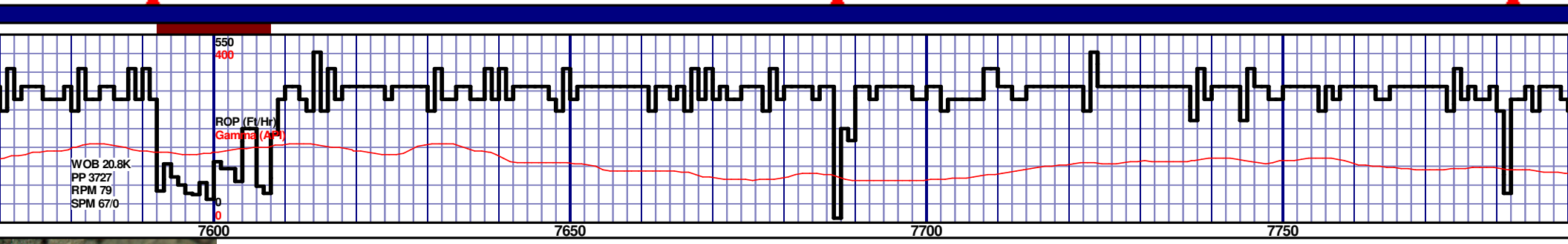
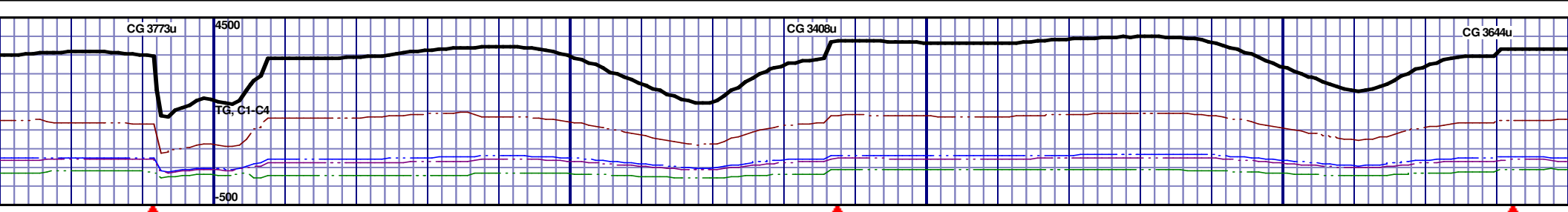
<p>7150' MD - 7200' MD: CHK: 65% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, FREE BENT, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, 20% LTOR MIN FLOR, FAST STRMG CUT, HVY BLSHWT RNG.</p>	<p>7200' MD - 7250' MD: CHK: 65% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, FREE BENT, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, 20% LTOR MIN FLOR, FAST STRMG CUT, HVY BLSHWT RNG.</p>	<p>7250' MD - 7300' MD: CHK: 70% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, FREE BENT, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, 20% LTOR MIN FLOR, FAST STRMG CUT, HVY BLSHWT RNG.</p>	<p>7300' MD - 7350' MD: CHK: 60% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, FREE BENT, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, 10% LTOR MIN FLOR, FAST STRMG CUT, HVY BLSHWT RNG.</p>
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MD 7159 TVD 6541.35
INC 90 AZ 89.6
VS 1007.84

MD 7251 TVD 6541.21
INC 90.18 AZ 89.46
VS 1099.62

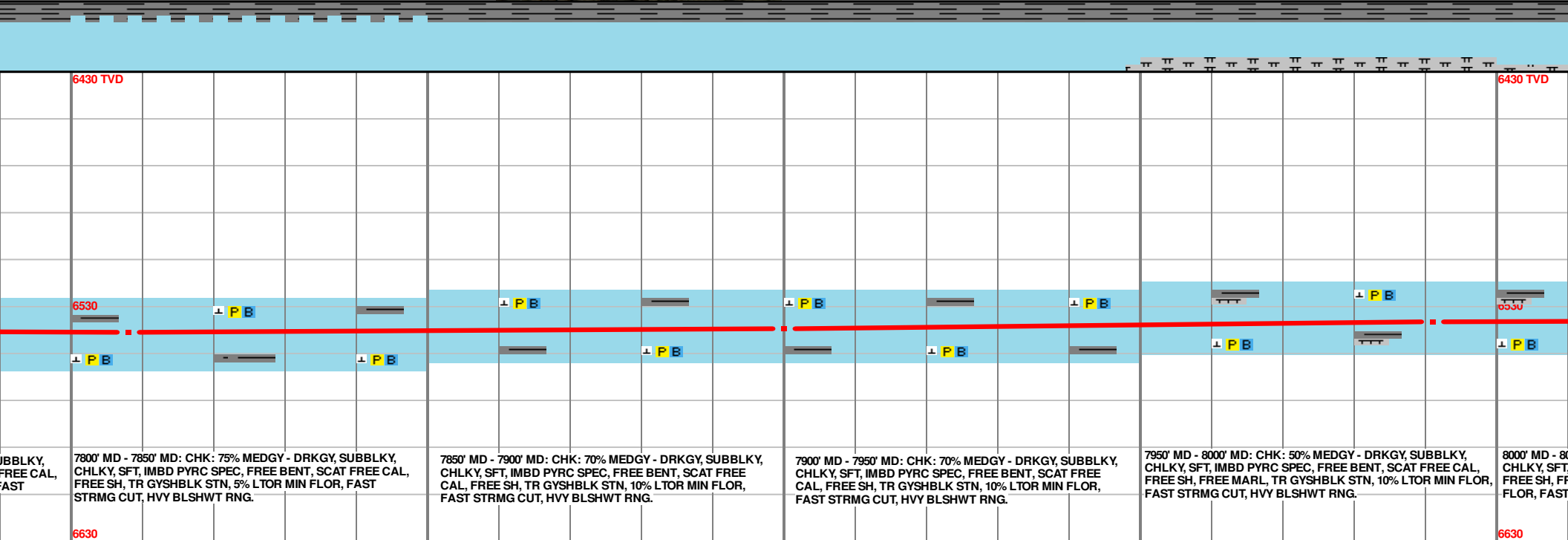
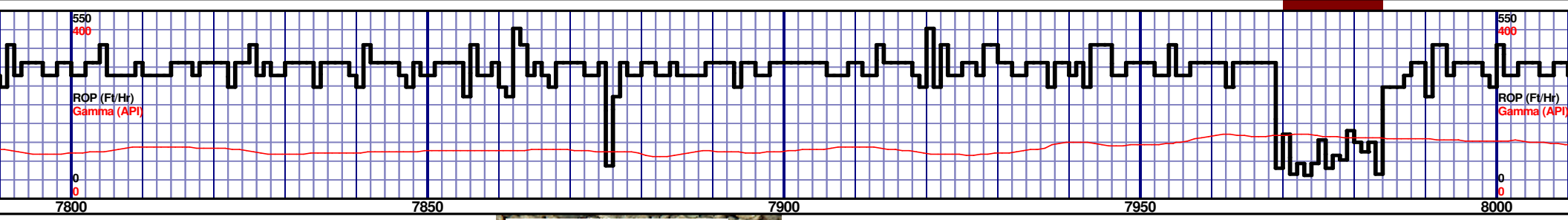
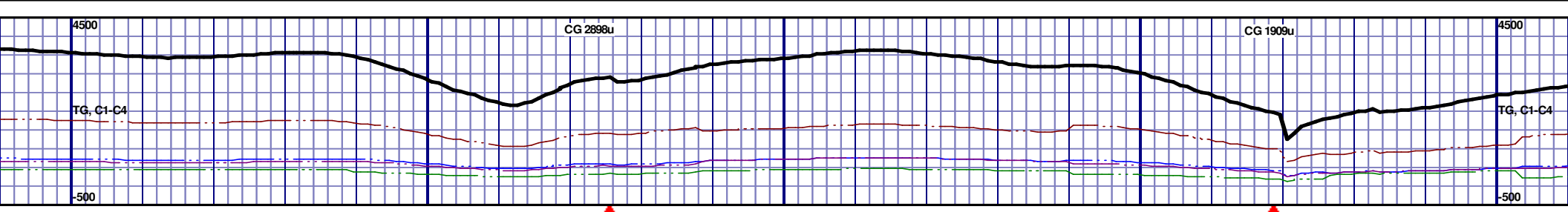
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INC 91.18 AZ 89.46
VS 1199.62





MD 7622 TVD 6538.09
INC 88.58 AZ 90.8
VS 1468.68

MD 7716 TVD 6539.96
INC 89.14 AZ 90.63
VS 1562.29



7800' MD - 7850' MD: CHK: 75% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, FREE BENT, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, 5% LTOR MIN FLOR, FAST STRMG CUT, HVY BLSHWT RNG.

7850' MD - 7900' MD: CHK: 70% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, FREE BENT, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, 10% LTOR MIN FLOR, FAST STRMG CUT, HVY BLSHWT RNG.

7900' MD - 7950' MD: CHK: 70% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, FREE BENT, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, 10% LTOR MIN FLOR, FAST STRMG CUT, HVY BLSHWT RNG.

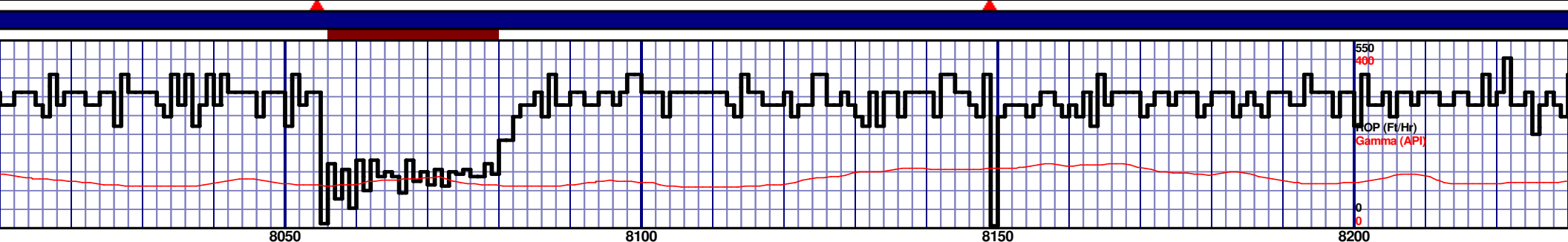
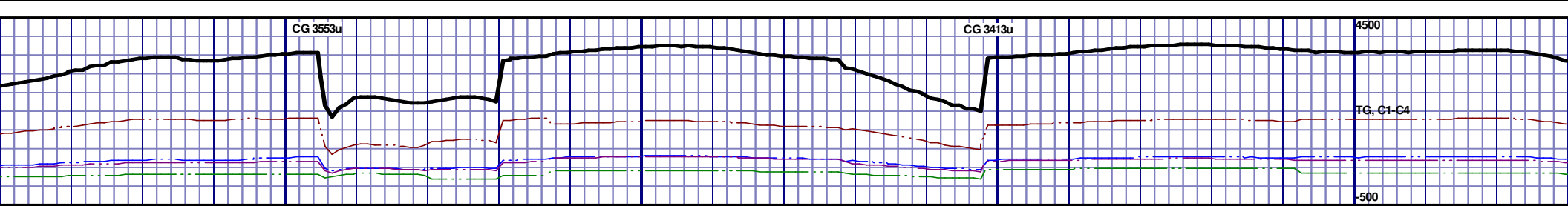
7950' MD - 8000' MD: CHK: 50% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, FREE BENT, SCAT FREE CAL, FREE SH, FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FAST STRMG CUT, HVY BLSHWT RNG.

8000' MD - 8050' MD: CHK: 50% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, FREE BENT, SCAT FREE CAL, FREE SH, FREE MARL, TR GYSHBLK STN, 10% LTOR MIN FLOR, FAST STRMG CUT, HVY BLSHWT RNG.

MD 7808 TVD 6540.95
INC 89.63 AZ 90.17
VS 1653.96

MD 7900 TVD 6539.56
INC 92.1 AZ 91.06
VS 1745.59

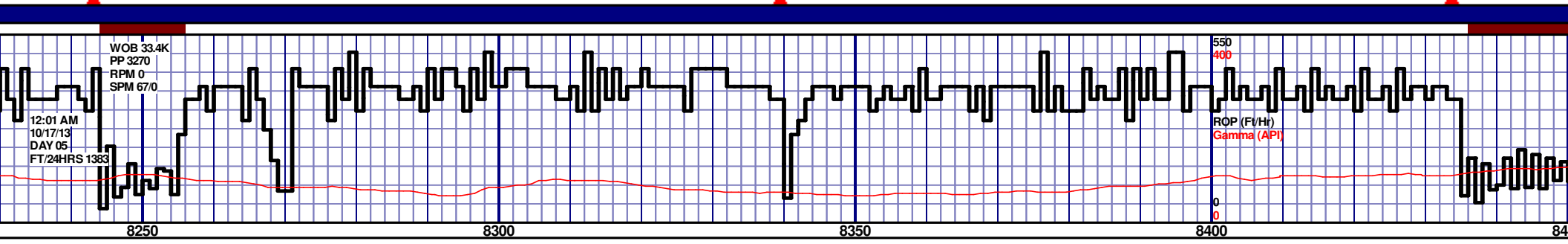
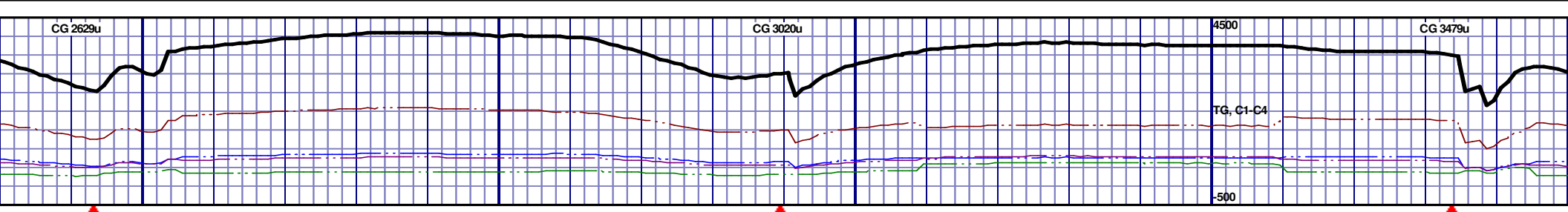
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INC 91.85 AZ 91.32
VS 1836.1



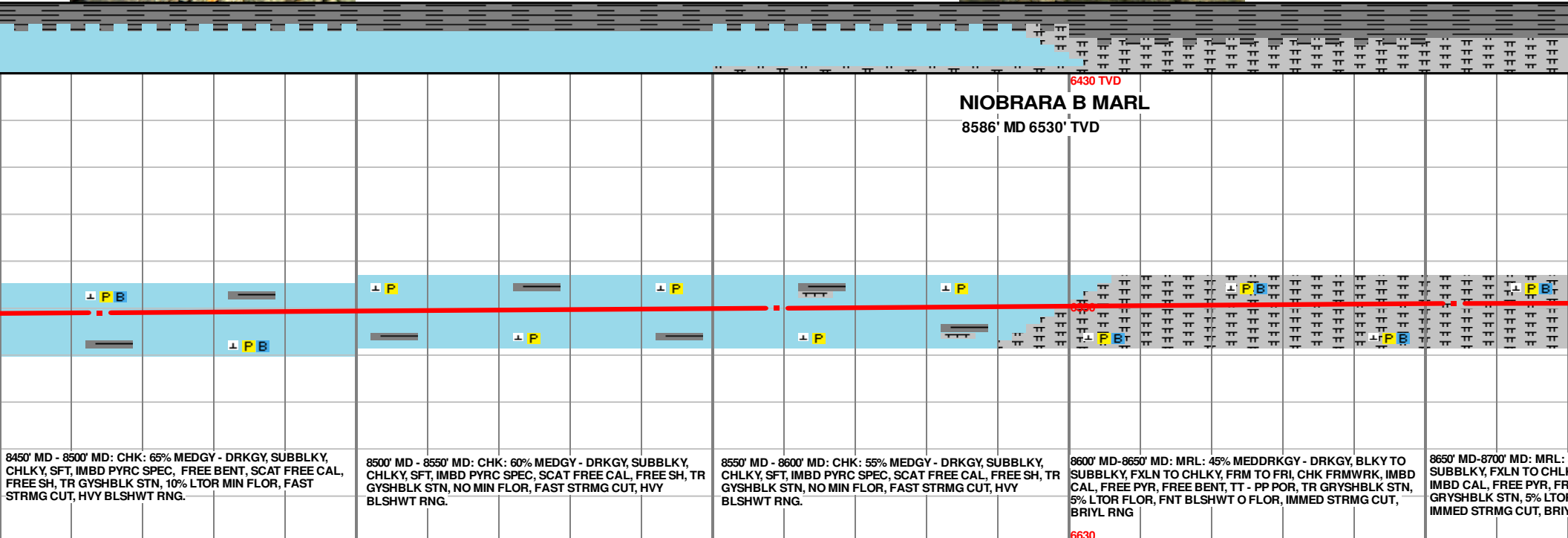
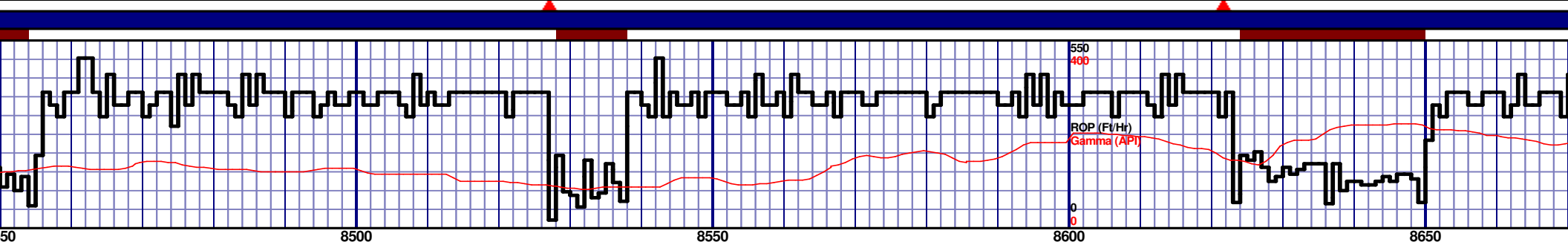
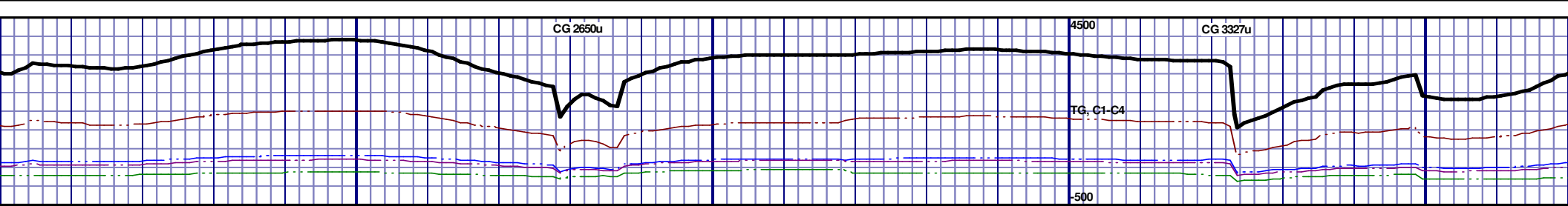
<p>8050' MD: CHK: 60% MEDGY - DRKGY, SUBBLKY, IMBD PYRC SPEC, FREE BENT, SCAT FREE CAL, FREE MARL, TR GYSHBLK STN, 5% LTOR MIN STRMG CUT, HVY BLSHWT RNG.</p>	<p>8050' MD - 8100' MD: CHK: 60% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, NO MIN FLOR, FAST STRMG CUT, HVY BLSHWT RNG.</p>	<p>8100' MD - 8150' MD: CHK: 65% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, NO MIN FLOR, FAST STRMG CUT, HVY BLSHWT RNG.</p>	<p>8150' MD - 8200' MD: CHK: 70% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, NO MIN FLOR, FAST STRMG CUT, HVY BLSHWT RNG.</p>	<p>8200' MD - 8250' MD: CHK: 65% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, FREE BENT, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, 10% LTOR MIN STRMG CUT, HVY BLSHWT RNG.</p>
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MD 8084 TVD 6535.34
INC 89.48 AZ 92.05
VS 1928.56

MD 8179 TVD 6535.72
INC 90.06 AZ 92.25
VS 2022.94



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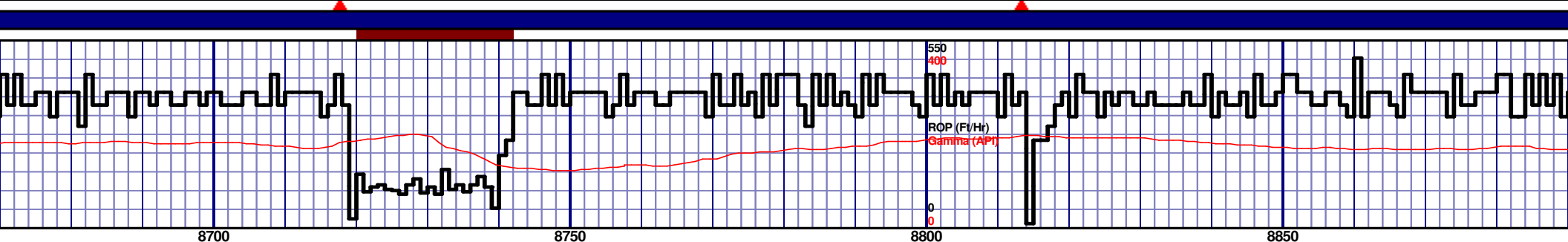
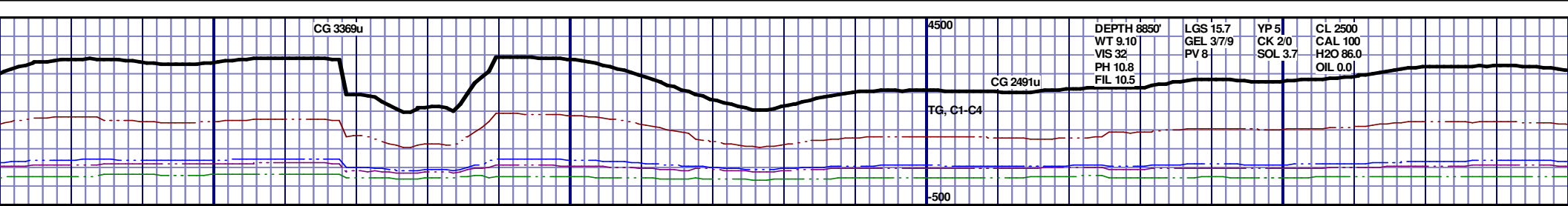
8450' MD - 8500' MD: CHK: 65% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, FREE BENT, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, 10% LTOR MIN FLOR, FAST STRMG CUT, HVY BLSHWT RNG.

8500' MD - 8550' MD: CHK: 60% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, NO MIN FLOR, FAST STRMG CUT, HVY BLSHWT RNG.

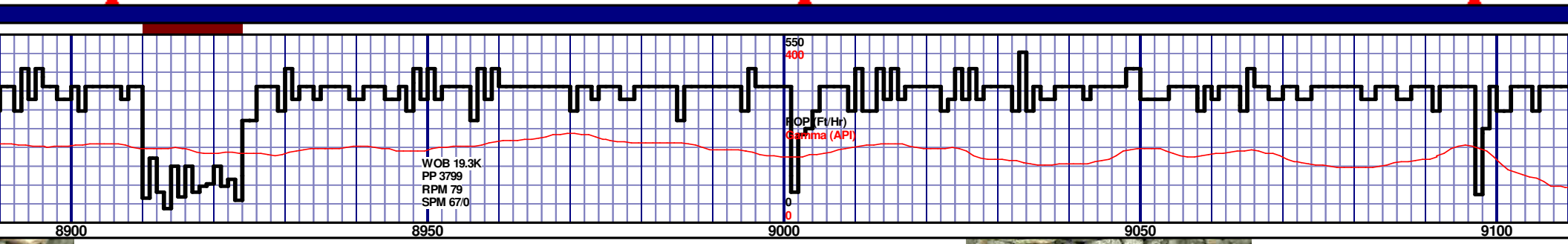
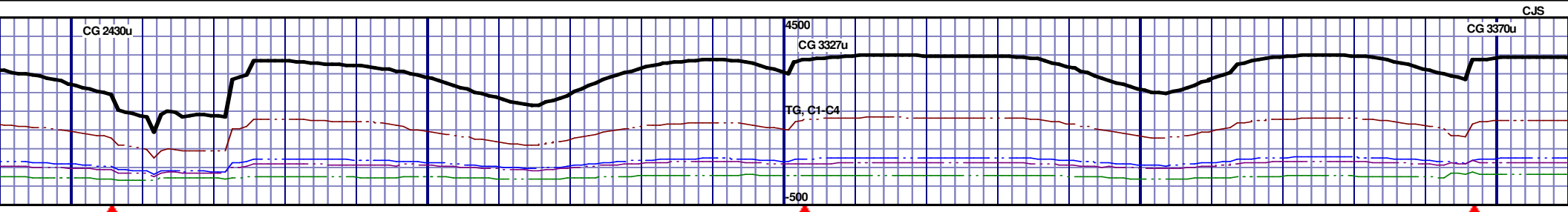
8550' MD - 8600' MD: CHK: 55% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, NO MIN FLOR, FAST STRMG CUT, HVY BLSHWT RNG.

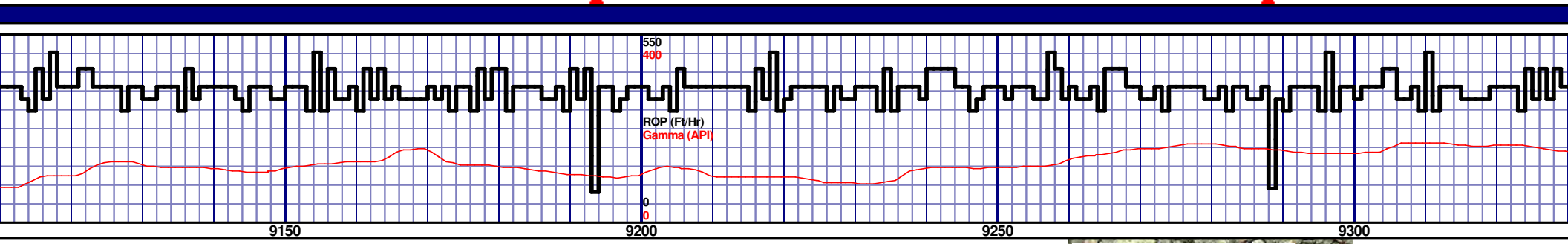
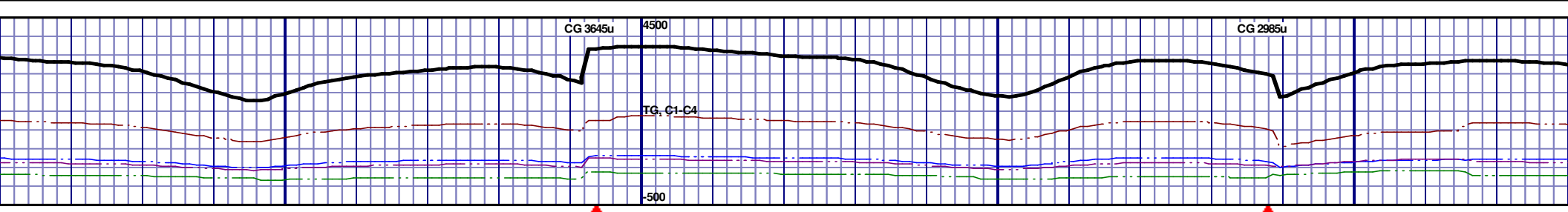
8600' MD-8650' MD: MRL: 45% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, TT - PP POR, TR GRYSHBLK STN, 5% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

8650' MD-8700' MD: MRL: SUBBLKY, FXLN TO CHLKY, IMBD CAL, FREE PYR, FR GRYSHBLK STN, 5% LTOR IMMED STRMG CUT, BRIYL



50% MEDDRKGY - DRKGY BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, TT - PP POR, TR GRYSHBLK STN, 5% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
8700' MD-8750' MD: MRL: 50% MEDDRKGY - DRKGY BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, TT - PP POR, TR GRYSHBLK STN, 5% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
8750' MD-8800' MD: MRL: 50% MEDDRKGY - DRKGY BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, TT - PP POR, TR GRYSHBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
8800' MD-8850' MD: MRL: 50% MEDDRKGY - DRKGY BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, TT - PP POR, TR GRYSHBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
8850' MD-8900' MD: MRL: 50% MEDDRKGY - DRKGY BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, TT - PP POR, TR GRYSHBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									



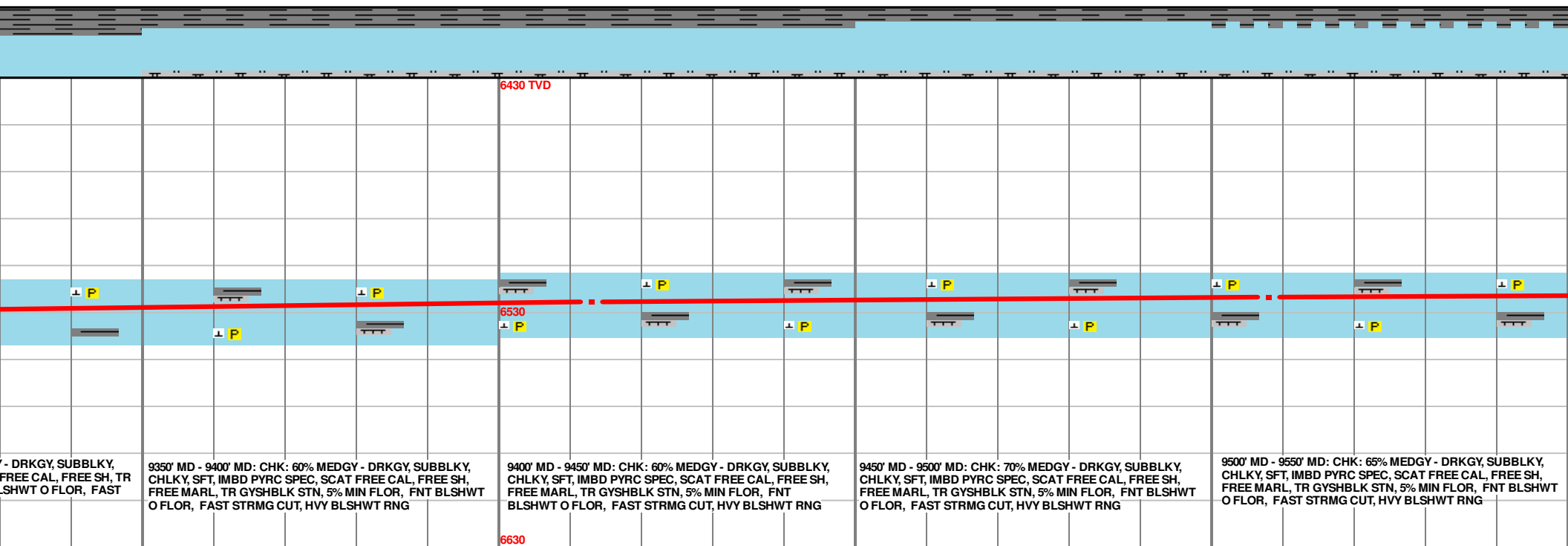
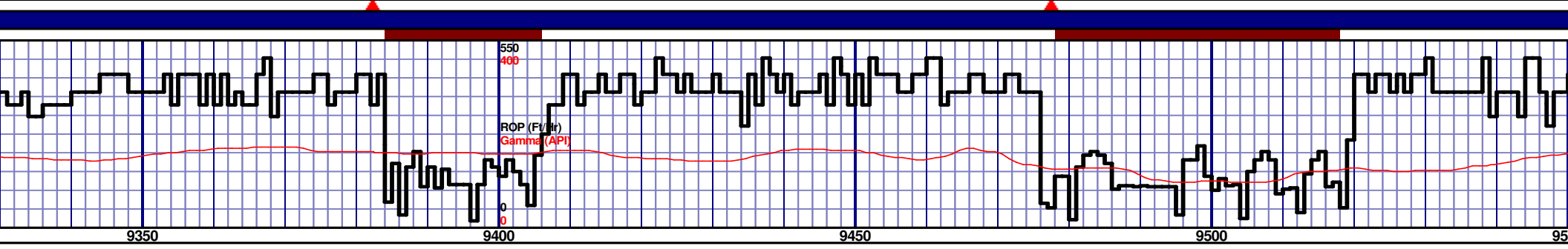
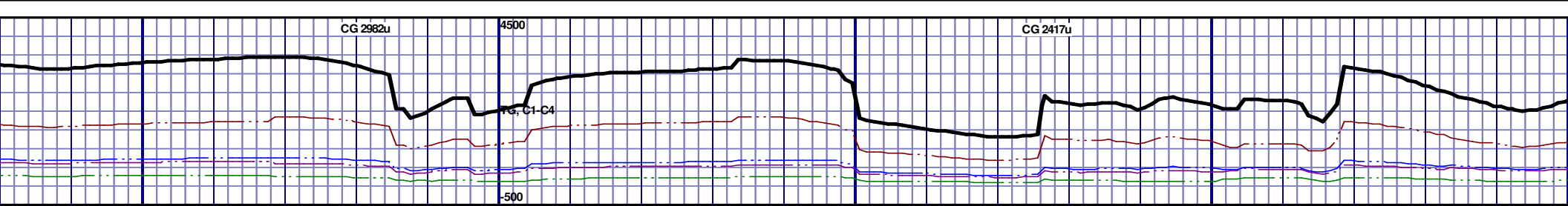


6430 TVD					6520					6630				
150' MD: CHK: 65% MEDGY - DRKGY, SUBBLKY, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG					9150' MD - 9200' MD: CHK: 70% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG					9200' MD - 9250' MD: CHK: 70% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG				
9250' MD - 9300' MD: CHK: 60% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG					9300' MD - 9350' MD: CHK: 60% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG									

MD 9128 TVD 6530.86
INC 89.63 AZ 90.05
VS 2967.77

MD 9223 TVD 6530.71
INC 90.55 AZ 90.35
VS 3062.46

MD 9318 TVD 6530.71
INC 91.54 AZ 90.35
VS 3157.13

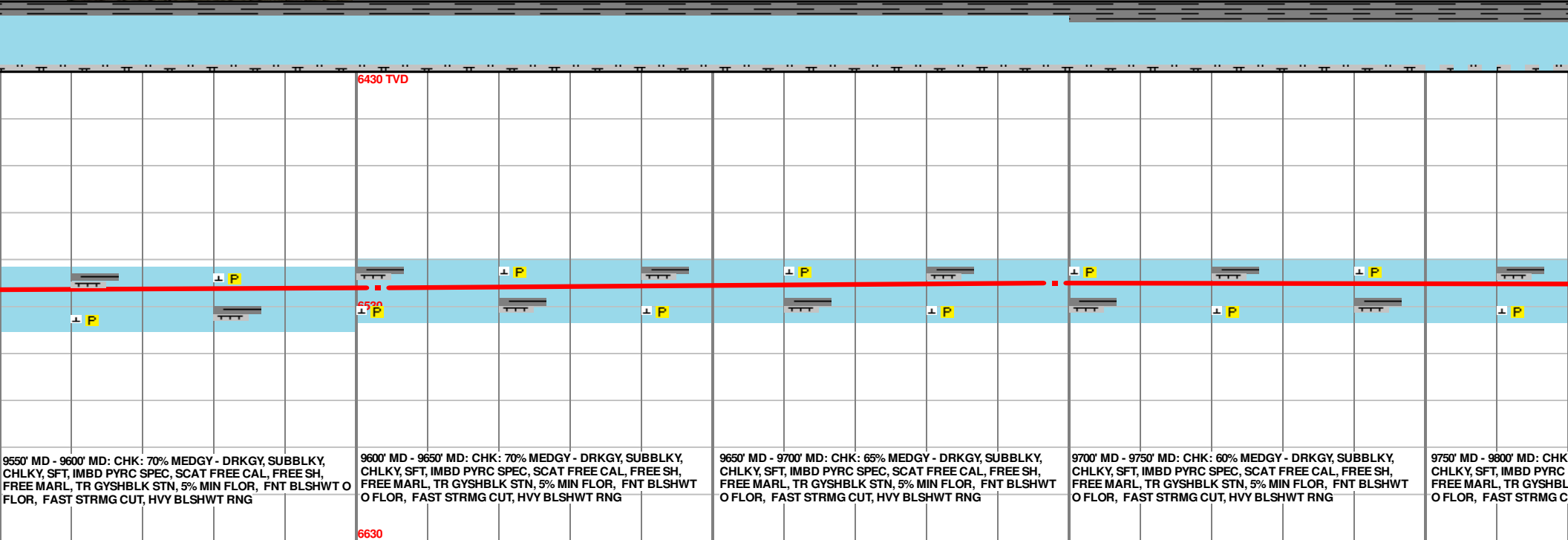
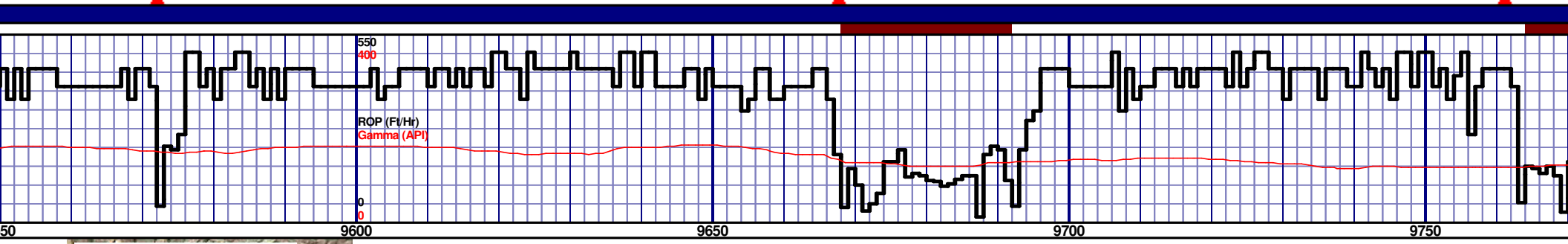
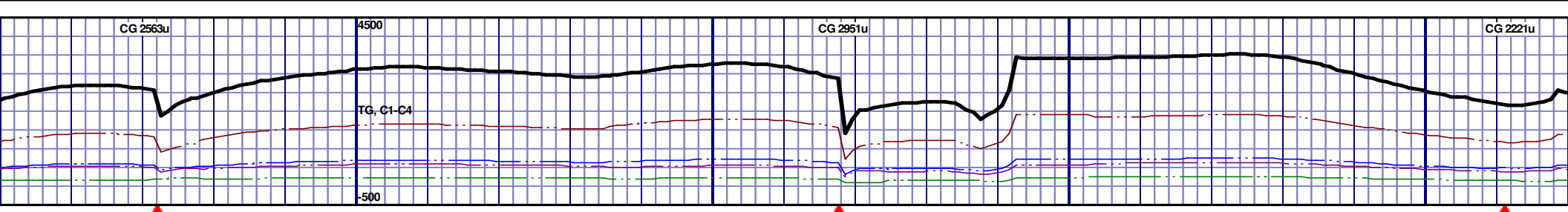


9350' MD - 9400' MD: CHK: 60% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, FREE MARL, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

9400' MD - 9450' MD: CHK: 60% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, FREE MARL, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

9450' MD - 9500' MD: CHK: 70% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, FREE MARL, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

9500' MD - 9550' MD: CHK: 65% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, FREE MARL, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG



9550' MD - 9600' MD: CHK: 70% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, FREE MARL, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

9600' MD - 9650' MD: CHK: 70% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, FREE MARL, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

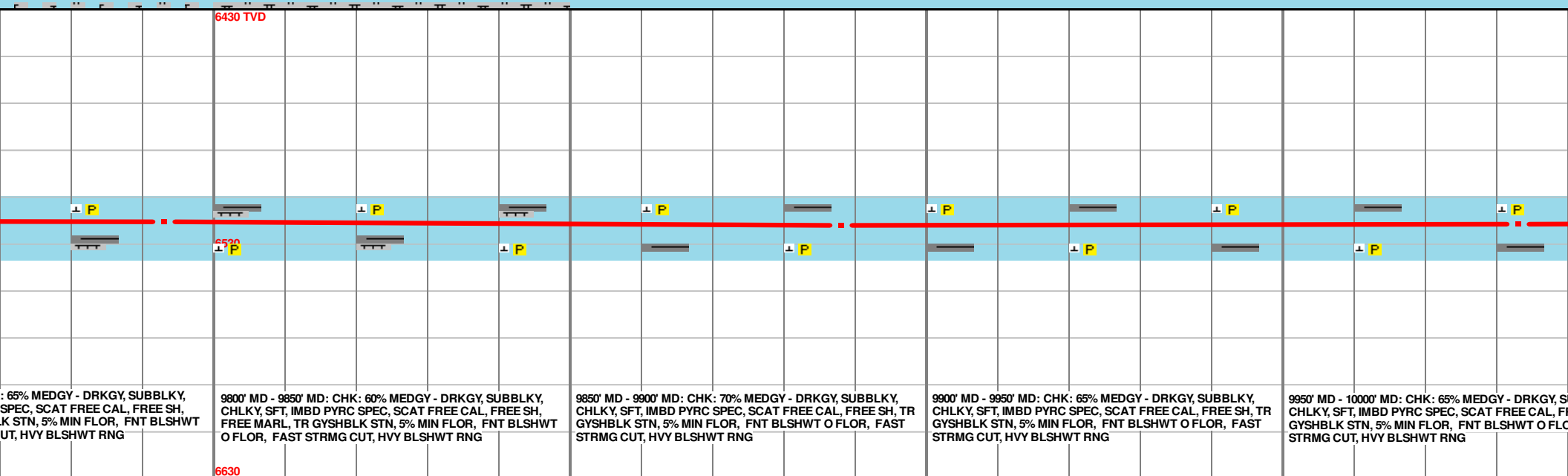
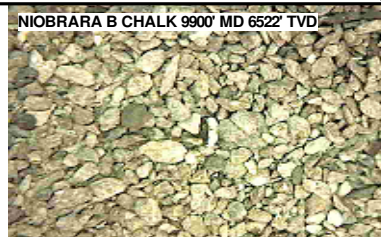
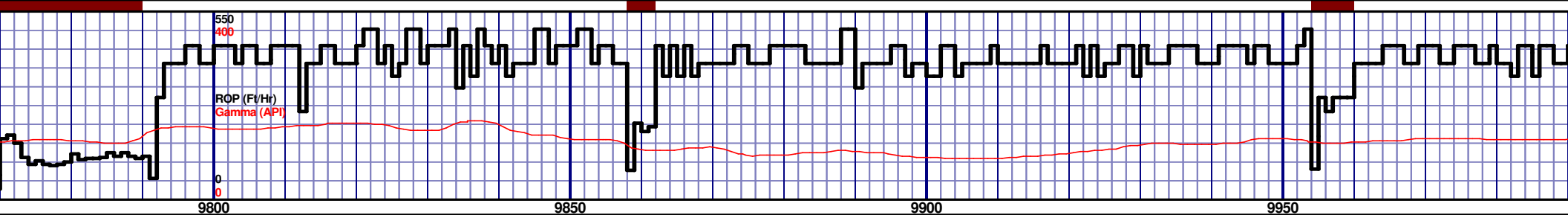
9650' MD - 9700' MD: CHK: 65% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, FREE MARL, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

9700' MD - 9750' MD: CHK: 60% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, FREE MARL, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

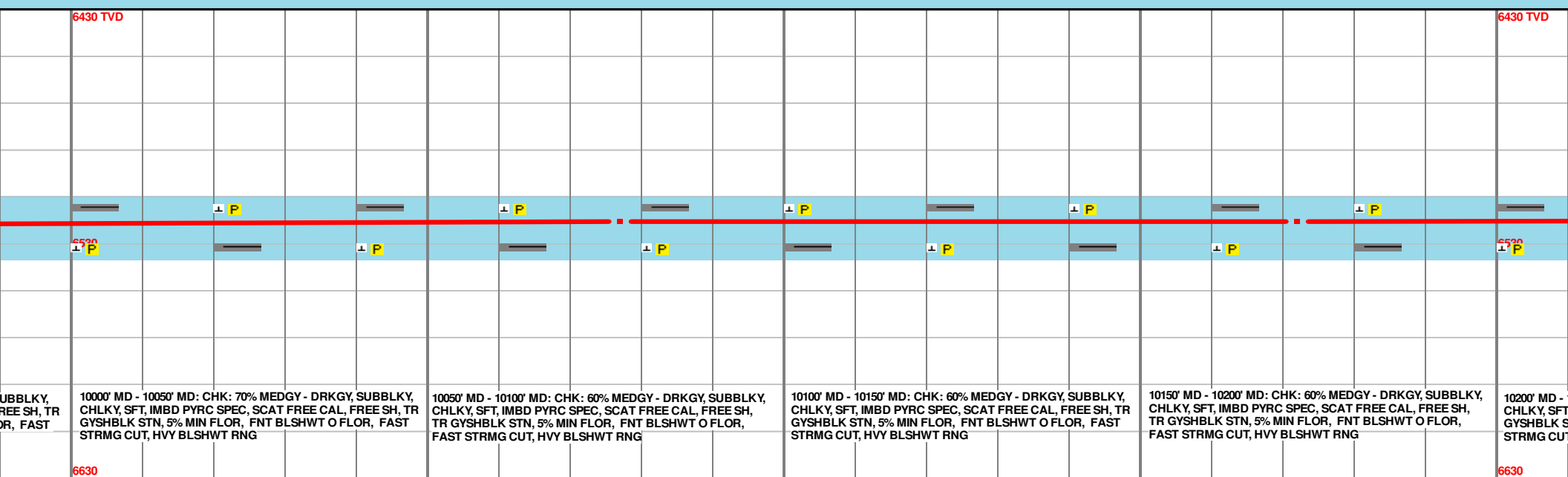
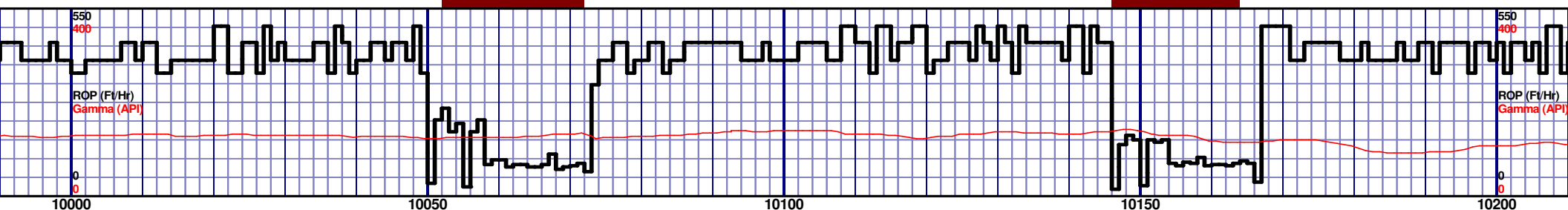
9750' MD - 9800' MD: CHK: CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, FREE MARL, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

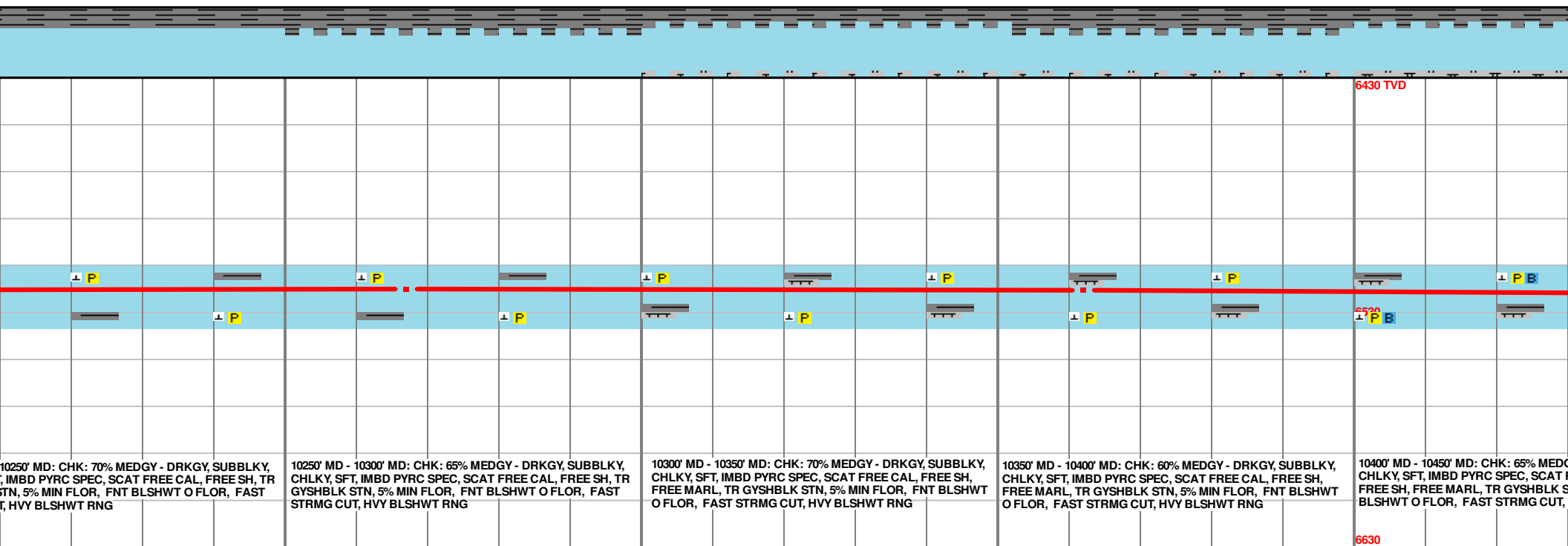
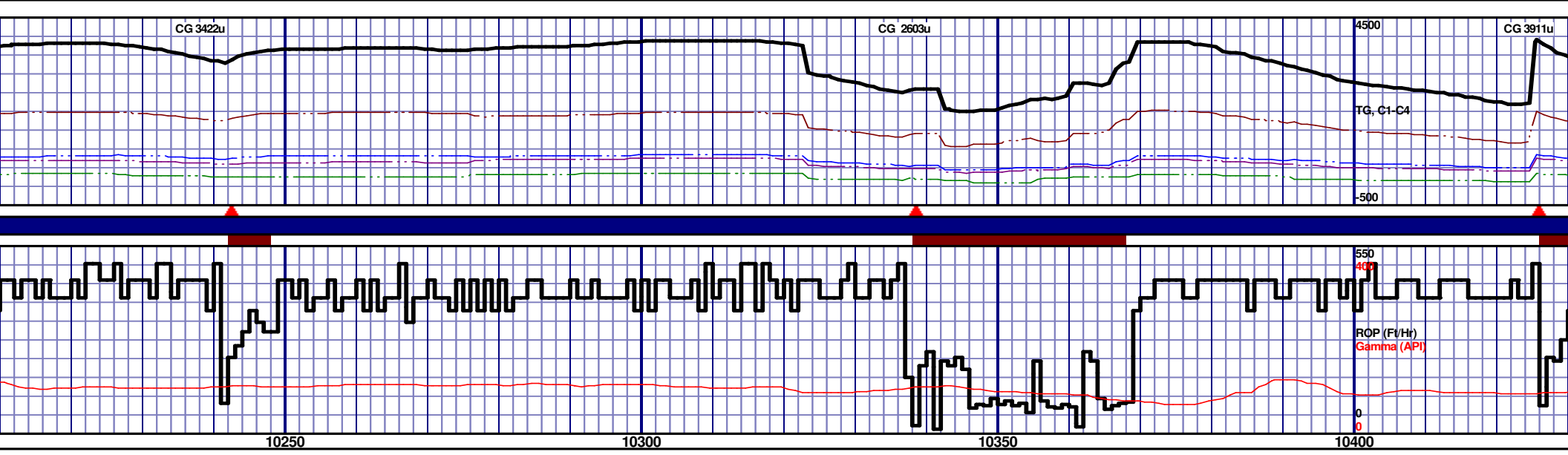
MD 9603 TVD 6521.8
INC 91.26 AZ 90.12
VS 3441.14

MD 9698 TVD 6520.09
INC 90.8 AZ 90.06
VS 3535.63



MD 9983
INC 90.7
VS 3820.0





10250' MD: CHK: 70% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

10250' MD - 10300' MD: CHK: 65% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

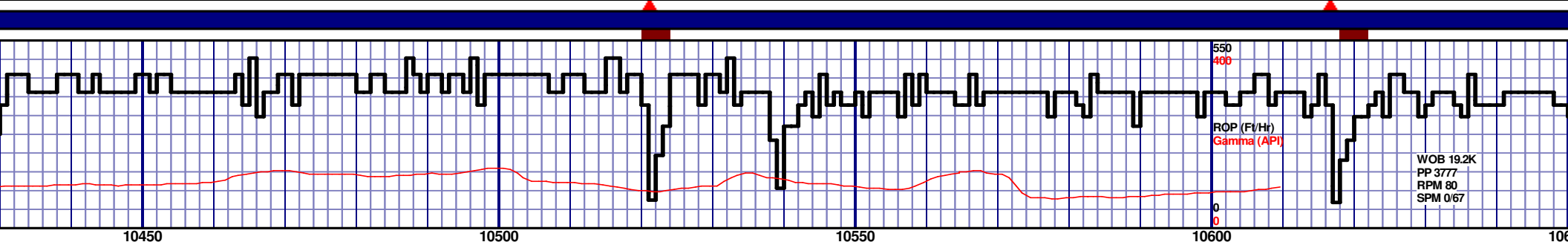
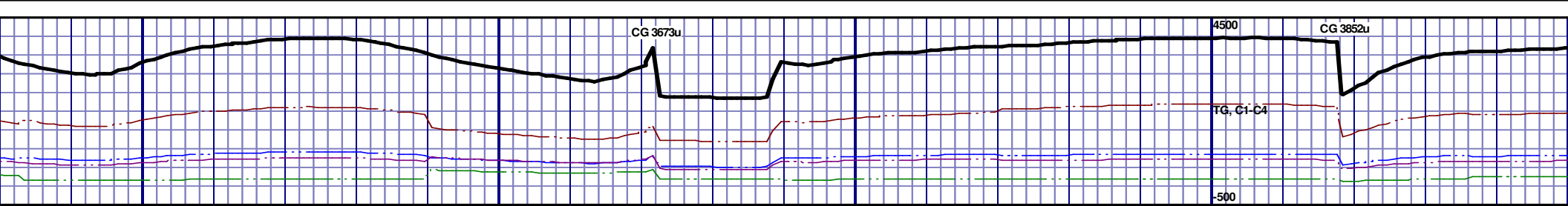
10300' MD - 10350' MD: CHK: 70% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, FREE MARL, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

10350' MD - 10400' MD: CHK: 60% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, FREE MARL, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

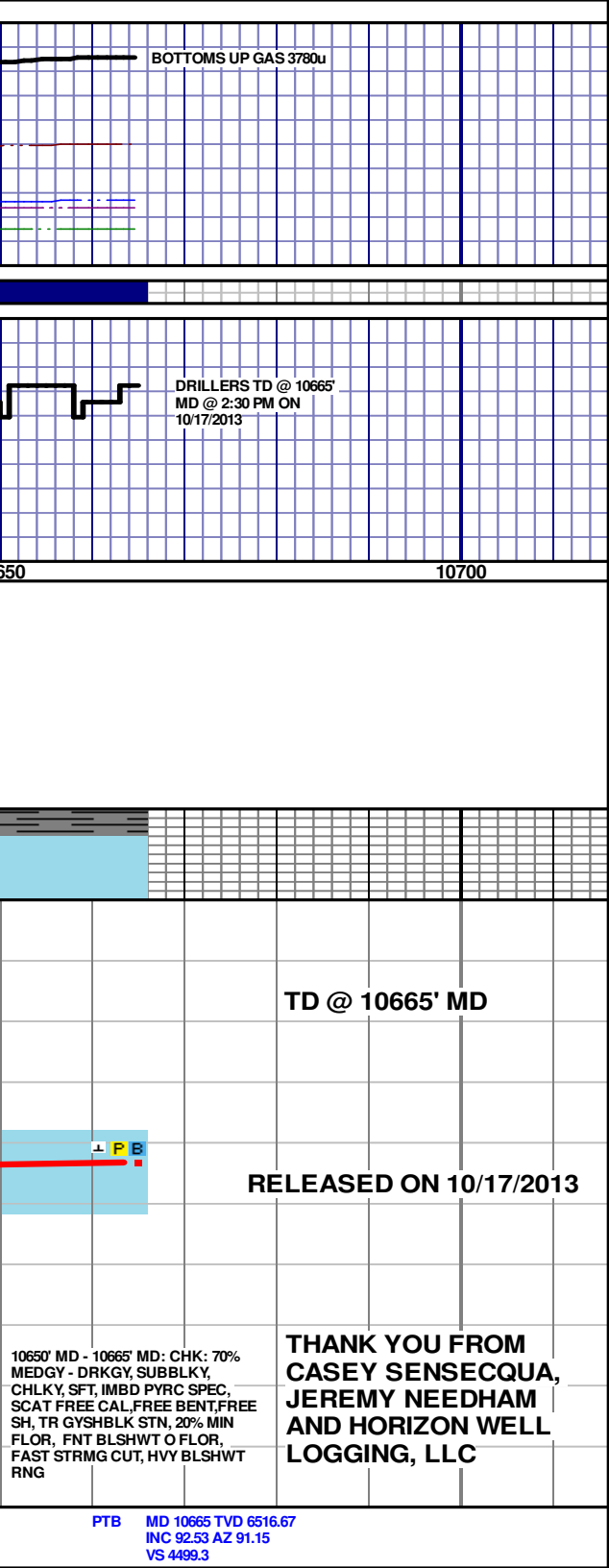
10400' MD - 10450' MD: CHK: 65% MEDGY - DRKGY, SUBBLKY, CHLKY, SFT, IMBD PYRC SPEC, SCAT FREE CAL, FREE SH, FREE MARL, TR GYSHBLK STN, 5% MIN FLOR, FNT BLSHWT O FLOR, FAST STRMG CUT, HVY BLSHWT RNG

MD 10267 TVD 6520.11
INC 91.17 AZ 90.31
VS 4103.07

MD 10362 TVD 6520.39
INC 88.49 AZ 89.97
VS 4197.76



																6430 TVD			



BOTTOMS UP GAS 3780u

DRILLERS TD @ 10665'
MD @ 2:30 PM ON
10/17/2013

TD @ 10665' MD

RELEASED ON 10/17/2013

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