



Scale: 6.98" / 100'  
Measured Depth Log

Well Name    Heartland State G36-75-1HN

Location    Sec. 25 T4N R65W

State    Colorado

Country    USA

API Number    05-123-39549

Region    DJ Basin

Spud Date    7/26/2014

Surface Coordinates    282' FSL ; 807' FEL  
40.27673 ; -104.60523

Bottom Hole Coordinates    75' FSL ; 2310' FEL  
40.26168 ; -104.61071

Ground Elevation    4834'

Logged Interval    6454'

Formation    Niobrara C chalk

Type of Drilling Fluid    FW LSND

County    Weld

Rig Number    PD 829

AFE #    141941

Field    Wattenberg

Drilling Completed    8/2/2014

K.B. Elevation    4850'

Total Depth    12323'

Company    Noble Energy Inc  
Address    1625 BROADWAY  
DENVER, CO 80202

Name    Melanie Peterson  
Company    Noble Energy, Inc  
Address    1625 BROADWAY  
DENVER, CO 80202

Columbine Logging, Inc.  
Well Site Geologists

Operator

c  
AY  
2022

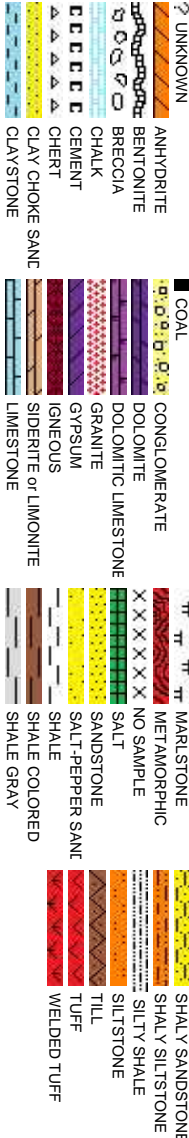
Geologist

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AY  
2022

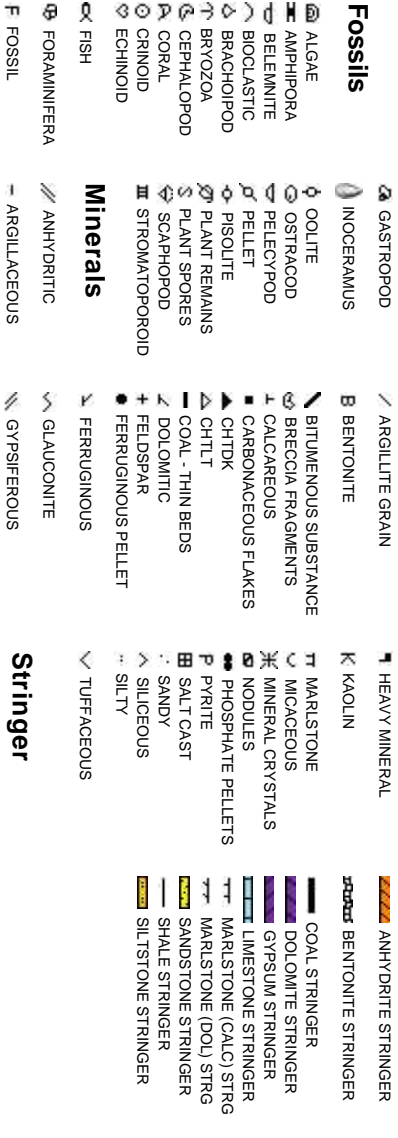
Other

2385 S. Lipan St.  
Denver, CO 80223  
  
Ryan Shilling  
Garrett Luallen  
Shannon Whitmore

Rock Types



Accessories



Other Symbols

**Oil Show** P PINPOINT V VUGGY

D DEAD **Engineering**

● EVEN ○ QUESTIONABLE BIT

● SPOTTED STAINING ▲ CONNECTION (UP)

⋮ DST INTERVAL ⚡ FAULT

⇄ FORMATION TOP

● GAS SHOW ● OIL SHOW

▽ WIRELINE TESTED - LEFT E EARTHY  
△ WIRELINE TESTED - RT FX FINELYXLN

LSB DRILL STEM TEST  
MNDEPTH MN DEPTH L LITHOGRAPHIC  
MX MICROXLN

MNDEPTH MN DEPTH UP MS MUDSTONE

Rounding

**Porosity** ▼ CONNECTION (DOWN) ▲ ANGULAR

CONNECTION GAS R ROUNDED  
CONNECTION GAS (LEFT) CONNECTION GAS (LEFT) SUBANG  
TRIP GAS TRIP GAS SUBRND

F FRACTURE CASING

INTERCRYSTALLINE DOWN TIME GAS

INTEROOLITIC DOWN TIME GAS (LEFT) SIDEWALL CORE (LEFT)

MOLDIC CORE - LOST

ORGANIC CORE - RECOVERED SURVEY

Textures

BS BOUNDSTONE

CHALKY

CRYPTOXLN

Sorting

M MODERATE

P POOR

W WELL

PS PACKSTONE

WACKSTONE

Slide/Rotate

ROP  
ROF  
GAMMA

ROP Scale  
0-700 ft/hr

Gamma Scale  
0 - 200 API

Total Gas & Chromatograph

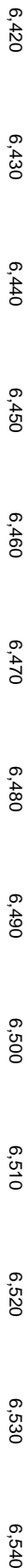
GAS

C1  
C2  
C3  
C4

Gas Scale  
0 - 5000 units

COLUMBINE LOGGING, INC. RIGGED UP ON  
07/27/2014 MANNED 2-PERSON LOGGING  
WITH BLOODHOUND GAS  
CHROMATOGRAPH UNIT # 0715

Depth Labels



% Lith

TVD SCALE  
6200'-7200'

BEGIN 50' SAMPLES

Bit Data

Bit #: 2  
Type: SD1519  
Size: 8.75  
Depth In: 7.44 '  
Depth Out: 7.593 '  
Jets: 7x16  
S/N: J14440

Well Bore  
TVD

Log Continued from Heartland State  
G36-75-1HN

Oil Show

exc  
mod  
7  
1  
sl

Images



87

68

3289u

3107u

KOP = 6454'

WT: 9.3 / VS: .37

2692u

C1: 68%  
C2: 17%  
C3: 1%  
C4: 4%

1786u

MD: 6,489 '

TVD: 6,314.16 '  
Inclination: 17.5 °  
Azimuth: 252.6 °  
VS: 381.05 '

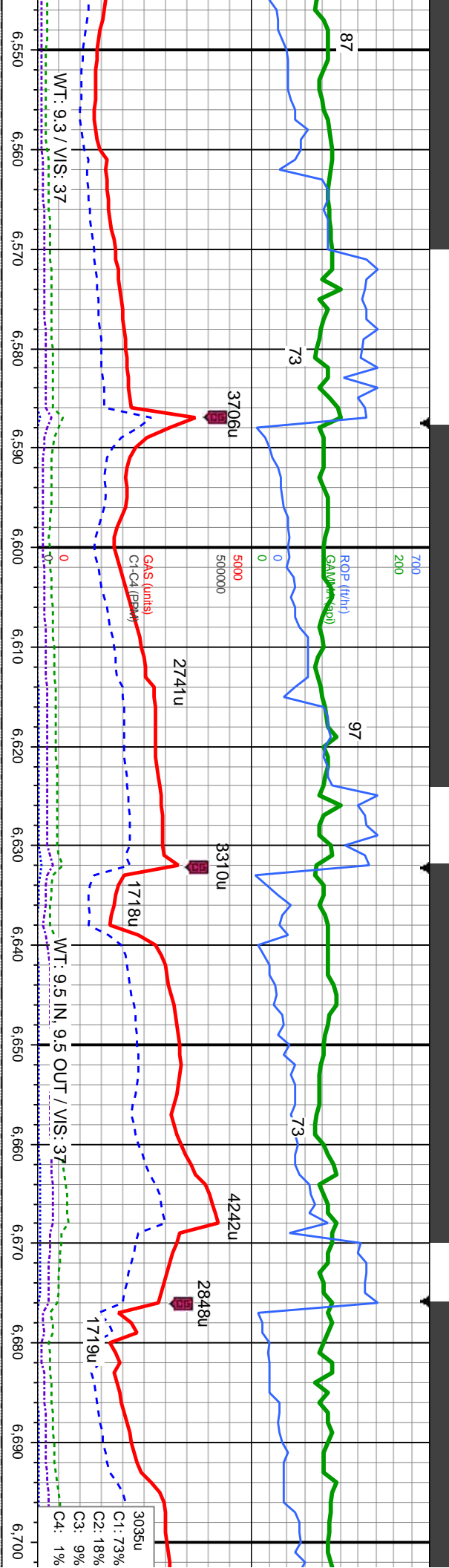
MD: 6,534 '

TVD: 6,356.67 '  
Inclination: 20.8 °  
Azimuth: 244.1 °  
VS: 389.91 '

65% SLTY SH: lt-med gy, ooc dk gy, sft-sl frm, sb ply-blky, vf gr, silty tex, sl calc; 30% SHY SS: wh-lt gy, s&p, blk, frm, v-f-f gr, sb md-ang, mod-w srt, cl sup, cly cnt, non calc; 5% SS: wh-lt gy, cl-frms, speck blk, sb md-ang, p srt, w cons, f gr, non calc

75% SLTY SH: lt-med gy, ooc dk gy, sft-sl frm, sb ply-blky, vf gr, silty tex, sl calc; 25% SHY SS: wh-lt gy, s&p, blk, frm, v-f-f gr, sb md-ang, mod-w srt, cl sup, cly cnt, non calc, tr SS





6100

MD: 6,579 '  
TVD: 6,398.53 '  
Inclination: 22.3 °  
Azimuth: 236.3 °  
VS: 401.56 '

MD: 6,623 '  
TVD: 6,439.12 '  
Inclination: 23.2 °  
Azimuth: 229.3 °  
VS: 415 '

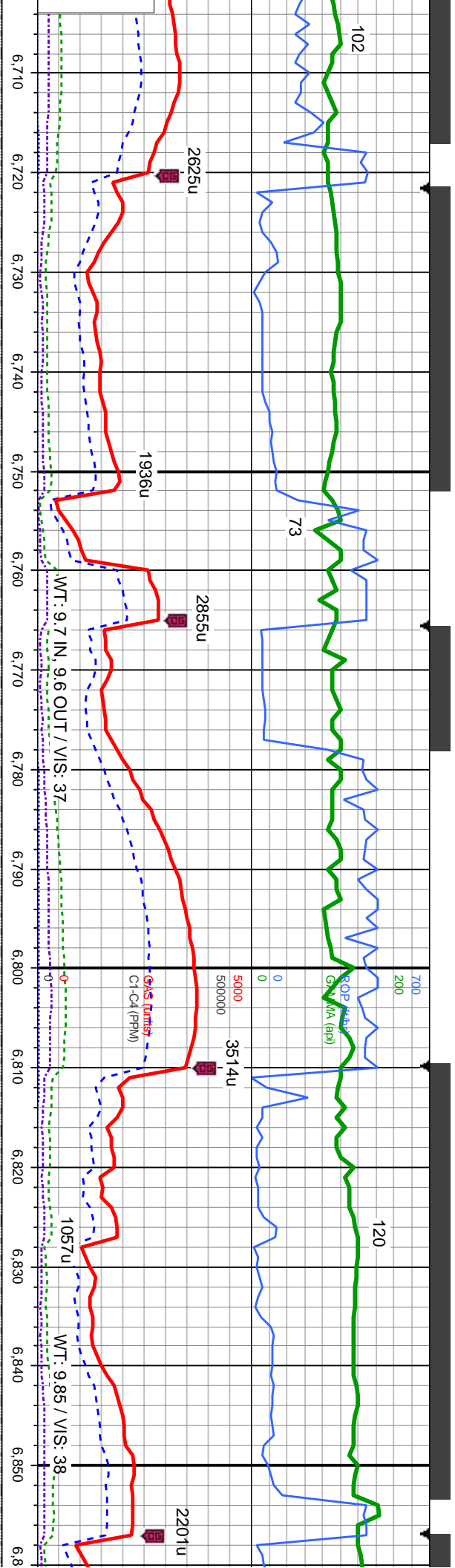
MD: 6,668 '  
TVD: 6,480.3 '  
Inclination: 24.4 °  
Azimuth: 221.1 °  
VS: 430.67 '

80% SLTY SH: lt-med gy, ooc dk gy, sft-sl frm, sb ply-biky, vf gr, silty  
tex, sl calc: 20% SHY SS: wh-lt gy, s&p, biky, frm, v f-f gr, sb md-ang,  
mod-w srt, cl sup, cly cnt, non calc; tr SS

85% SLTY SH: lt-med gy, ooc dk gy, sft-sl frm, sb ply-biky, vf gr, silty  
tex, sl calc: 15% SHY SS: wh-lt gy, s&p, biky, frm, v f-f gr, sb md-ang,  
mod-w srt, cl sup, cly cnt, non calc; tr SS

100% SLTY SH: lt-med gy, ooc dk gy, sft-sl frm, sb ply-biky, vf gr, silty  
tex, sl calc





MD: 6,713 '  
TVD: 6,520.73 '  
Inclination: 27.7 °  
Azimuth: 213.3 °  
VS: 448.96 '

MD: 6,757 '  
TVD: 6,559.18 '  
Inclination: 30.5 °  
Azimuth: 209 °  
VS: 469.51 '

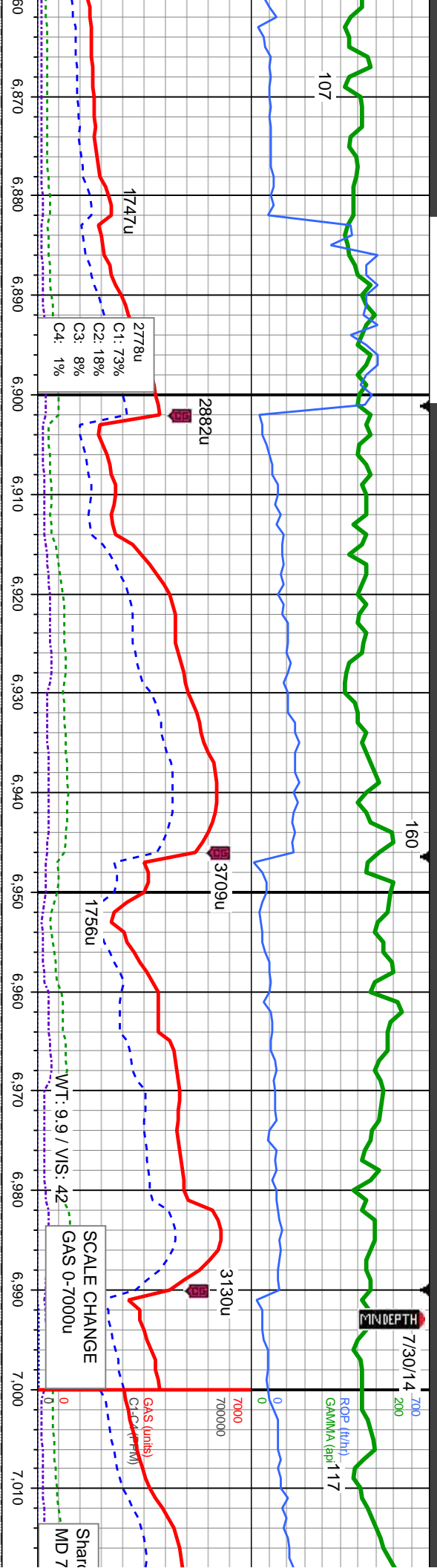
MD: 6,802 '  
TVD: 6,597.94 '  
Inclination: 30.6 °  
Azimuth: 205.4 °  
VS: 491.86 '

MD: 6,847 '  
TVD: 6,636.71 '  
Inclination: 30.4 °  
Azimuth: 204.8 °  
VS: 514.35 '

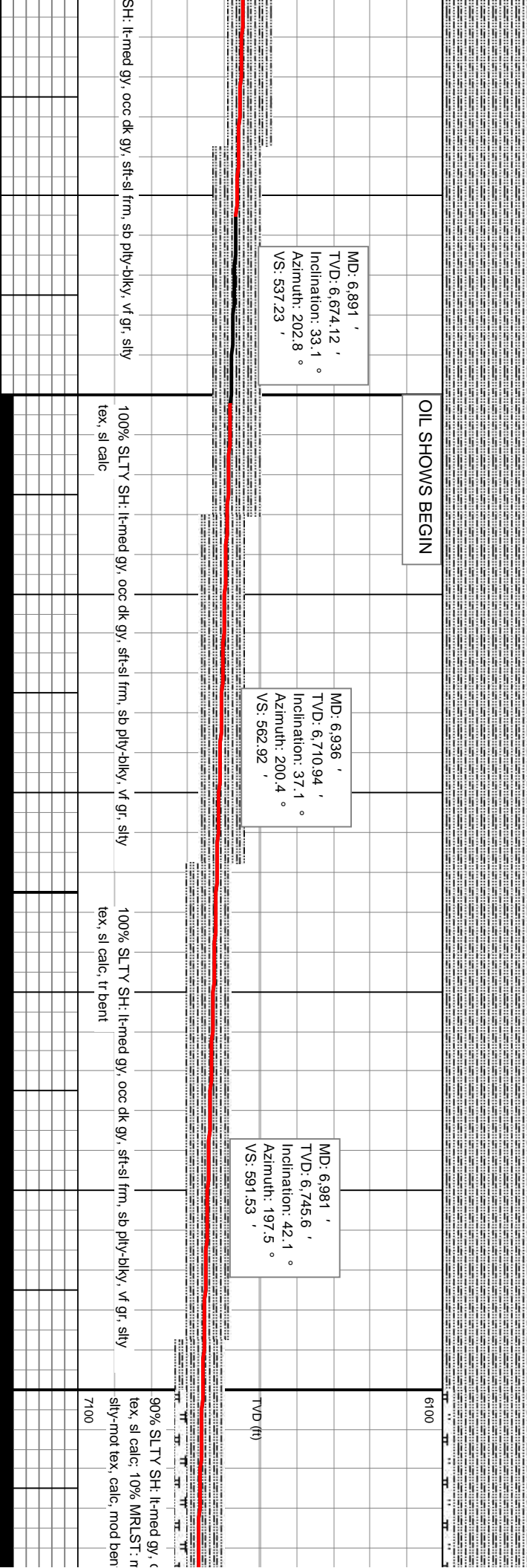
100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb pily-bkly, vf gr, silty  
100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb pily-bkly, vf gr, silty  
100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb pily-bkly, vf gr, silty  
100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb pily-bkly, vf gr, silty

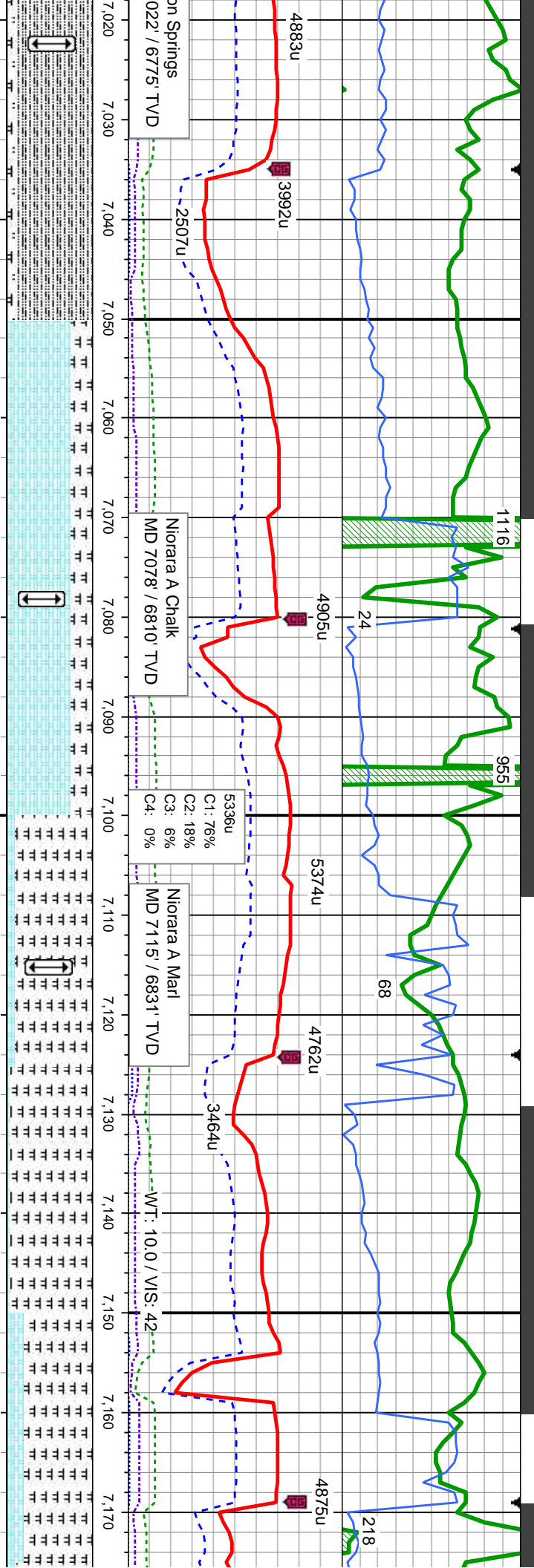






OIL SHOWS BEGIN





on Springs  
022' / 6775' TVD

Niorara A Chalk  
MD 7078' / 6810' TVD

Niorara A Marl  
MD 7115' / 6831' TVD

WT: 10.0 / VS: 42

MD: 7,026 '  
TVD: 6,777.38 '  
Inclination: 48 °  
Azimuth: 195.1 °  
VS: 623.35 '

MD: 7,071 '  
TVD: 6,805.85 '  
Inclination: 53.5 °  
Azimuth: 191 °  
VS: 658.15 '

MD: 7,115 '  
TVD: 6,831.25 '  
Inclination: 56 °  
Azimuth: 187.3 °  
VS: 693.88 '

MD: 7,160 '  
TVD: 6,855.46 '  
Inclination: 58.9 °  
Azimuth: 182.9 °  
VS: 731.22 '

75% CHK: crm-ilty to brn, mot, sft-mod frm, sb pily-biky, v calc, 25%  
MRLST: med-dk gy, sl frm-mod hd, sb pily-biky, silty-mot tex, calc, tr bent

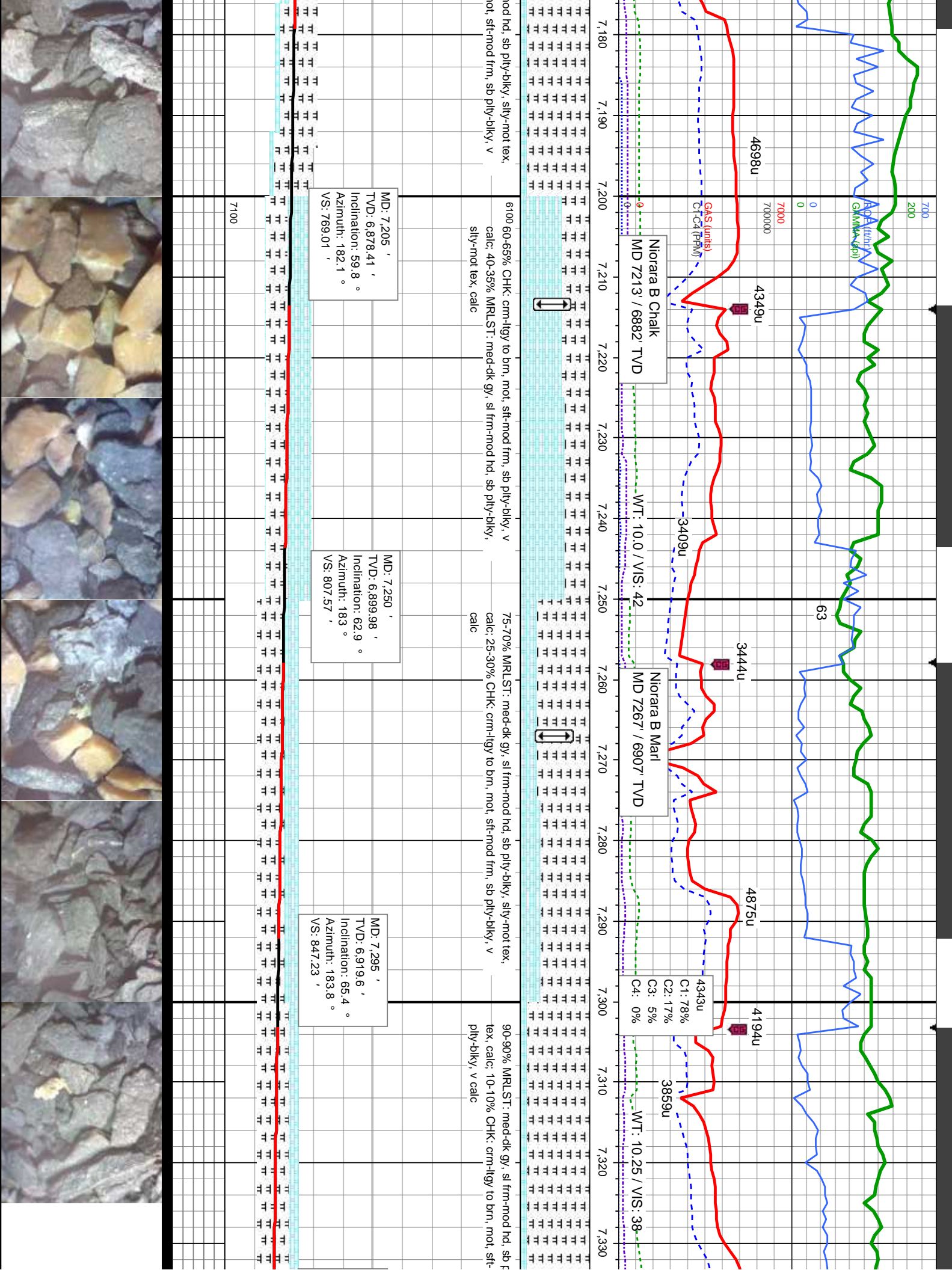
90-95% MRLST: med-dk gy, sl frm-mod hd, sb pily-biky, silty-mot tex, calc;  
10-5% CHK: crm-ilty to brn, mot, sft-mod frm, sb pily-biky, v calc

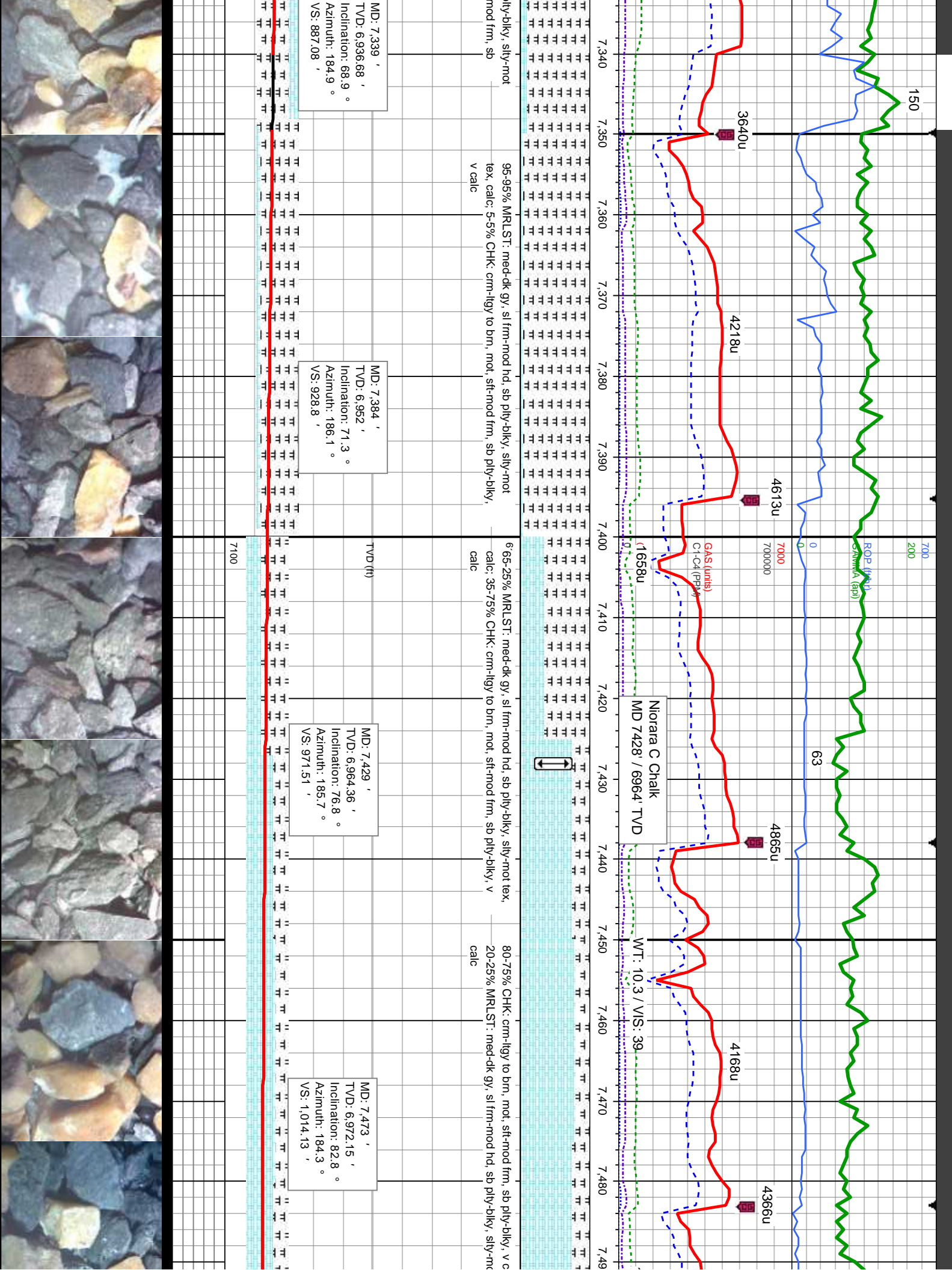
80-90% MRLST: med-dk gy, sl frm-mod hd, sb pily-biky, silty-mot tex, calc;  
20-10% CHK: crm-ilty to brn, mot, sft-mod frm, sb pily-biky, v calc

occ dk gy, sft-si frm, sb pily-biky, vt gf, silty  
med-dk gy, sl frm-mod hd, sb pily-biky.

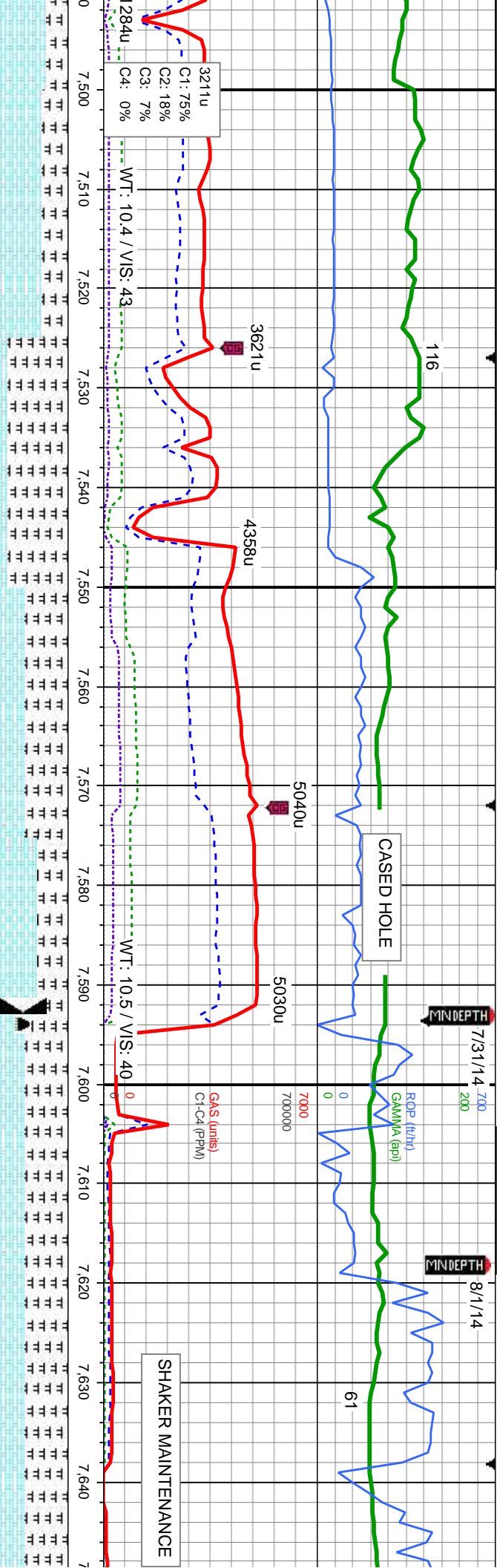












70-30% CHK: crm-lgty to brn, mot, sft-mod frm, sb ply-blky, v calc;  
30-70% MRLST: med-dk gy, sl frm-mod hd, sb ply-blky, silty-mot tex, calc

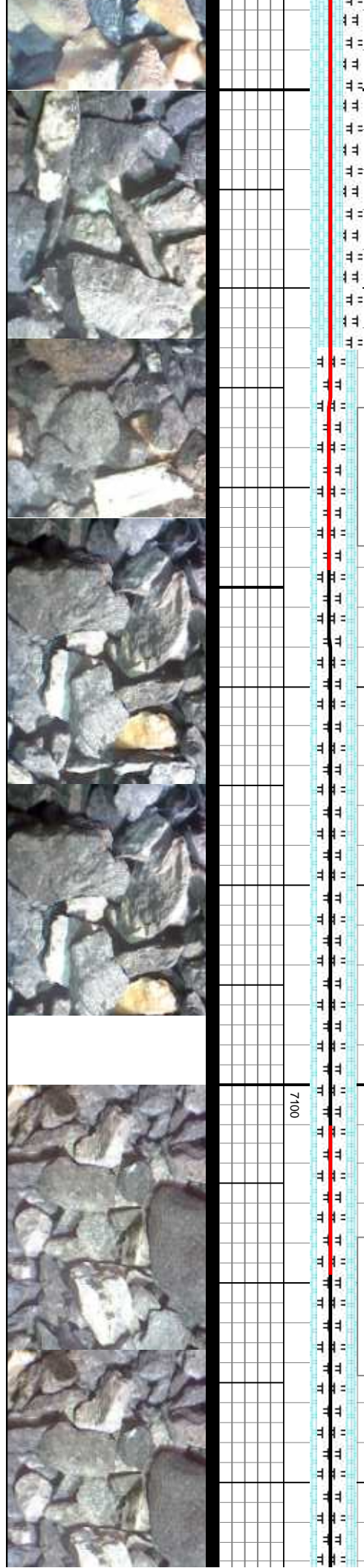
50-65% CHK: crm-lgty to brn, mot, sft-mod frm, sb ply-blky, v calc; 50-35% MRLST: med-dk gy, sl frm-mod hd, sb ply-blky, silty-mot tex, calc

6100 50% CHK: crm-lgty to brn, mot, sft-mod frm, sb ply-blky, v calc; 50% MRLST: med-dk gy, sl frm-mod hd, sb ply-blky, silty-mot tex, calc

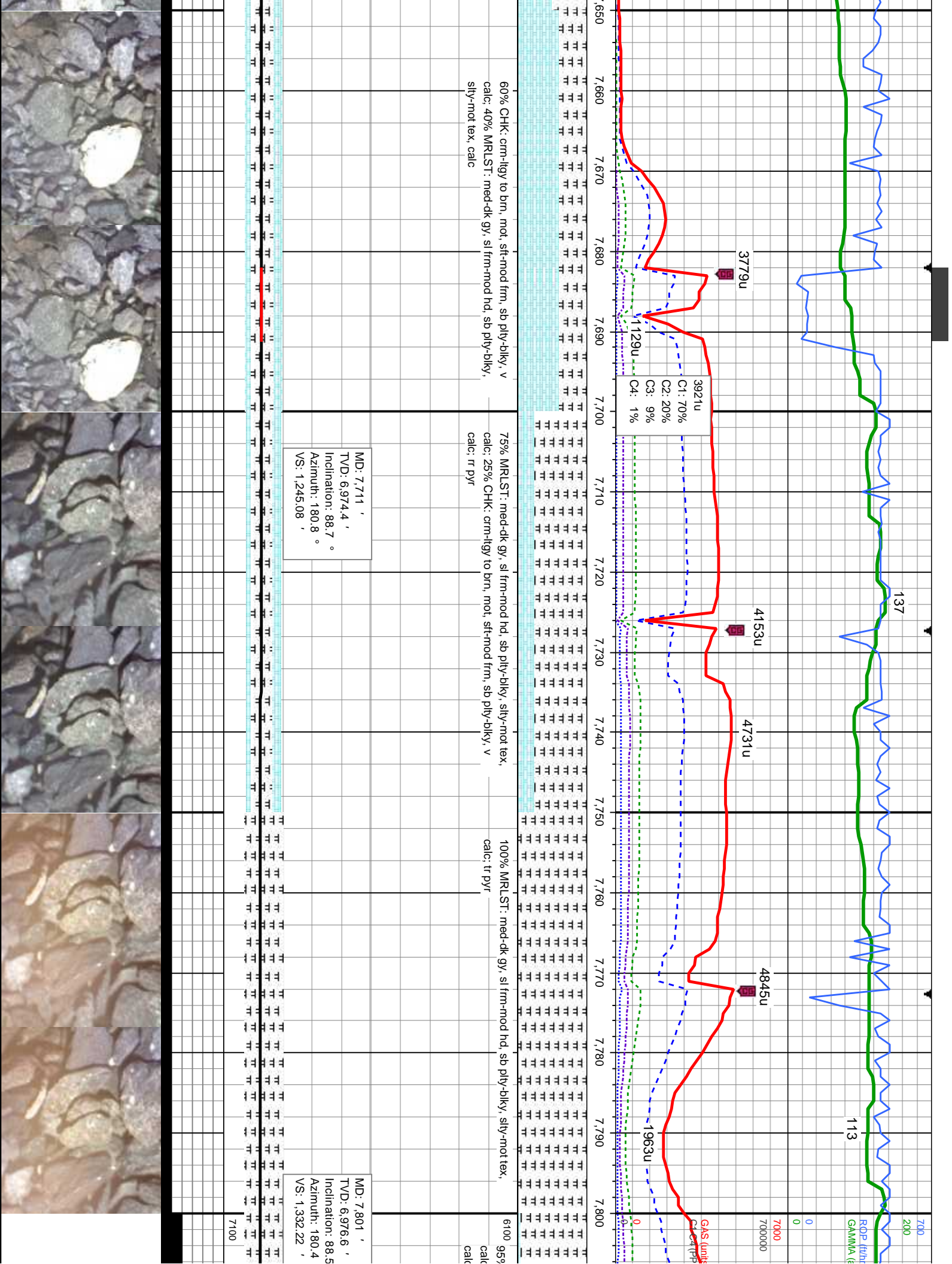
MD: 7.538 '  
TVD: 6.975.32 '  
Inclination: 91.6 °  
Azimuth: 181.1 °  
VS: 1.077.49 '

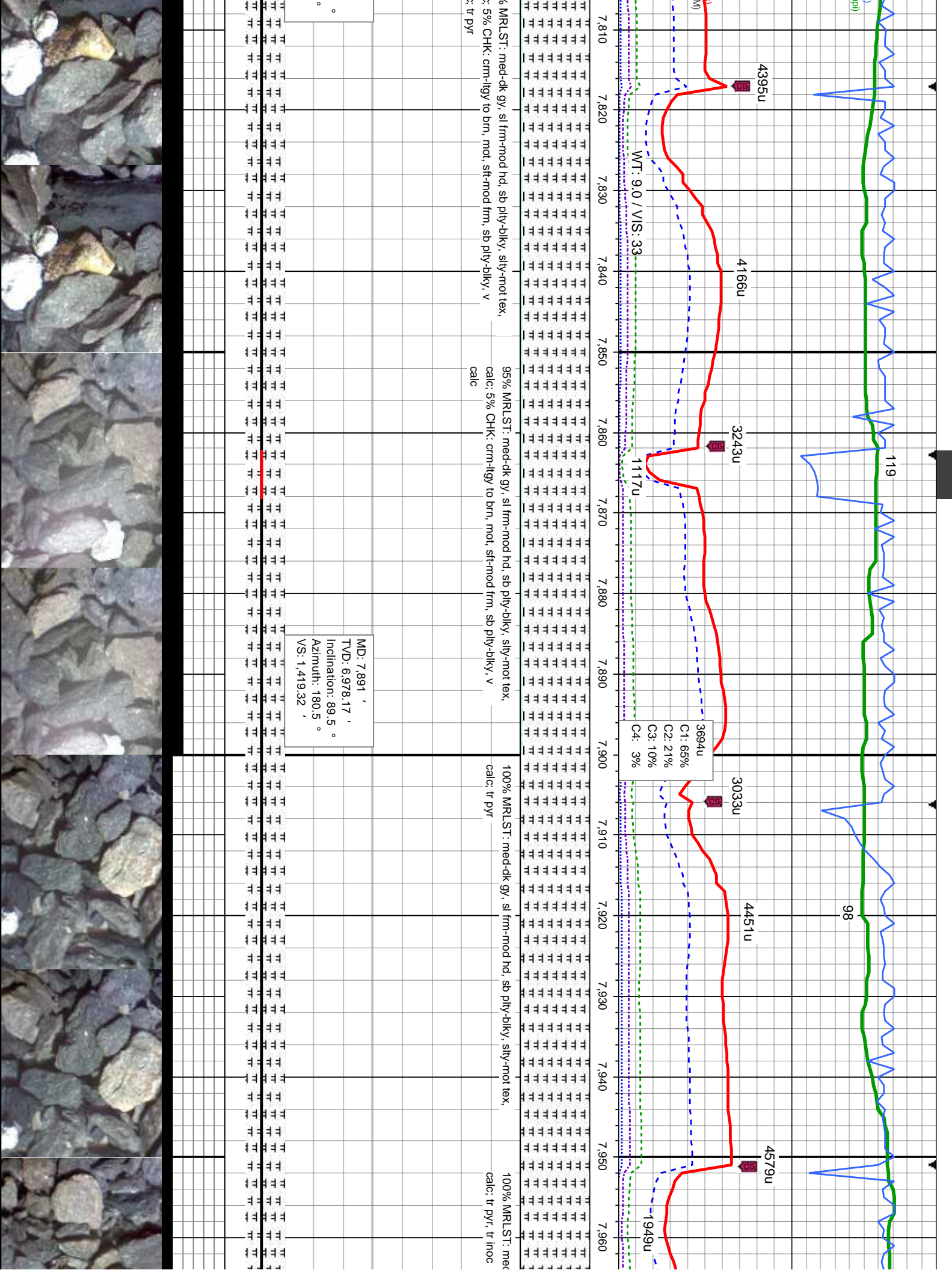
Bit Data  
Bit #: 3  
Type: MMD54  
Size: 6.12  
Depth In: 7.593 '  
Depth Out: 12.323 '  
Jets: 5x16  
S/N: 12487242

MD: 7.622 '  
TVD: 6.973.78 '  
Inclination: 90.5 °  
Azimuth: 180.4 °  
VS: 1.158.89 '

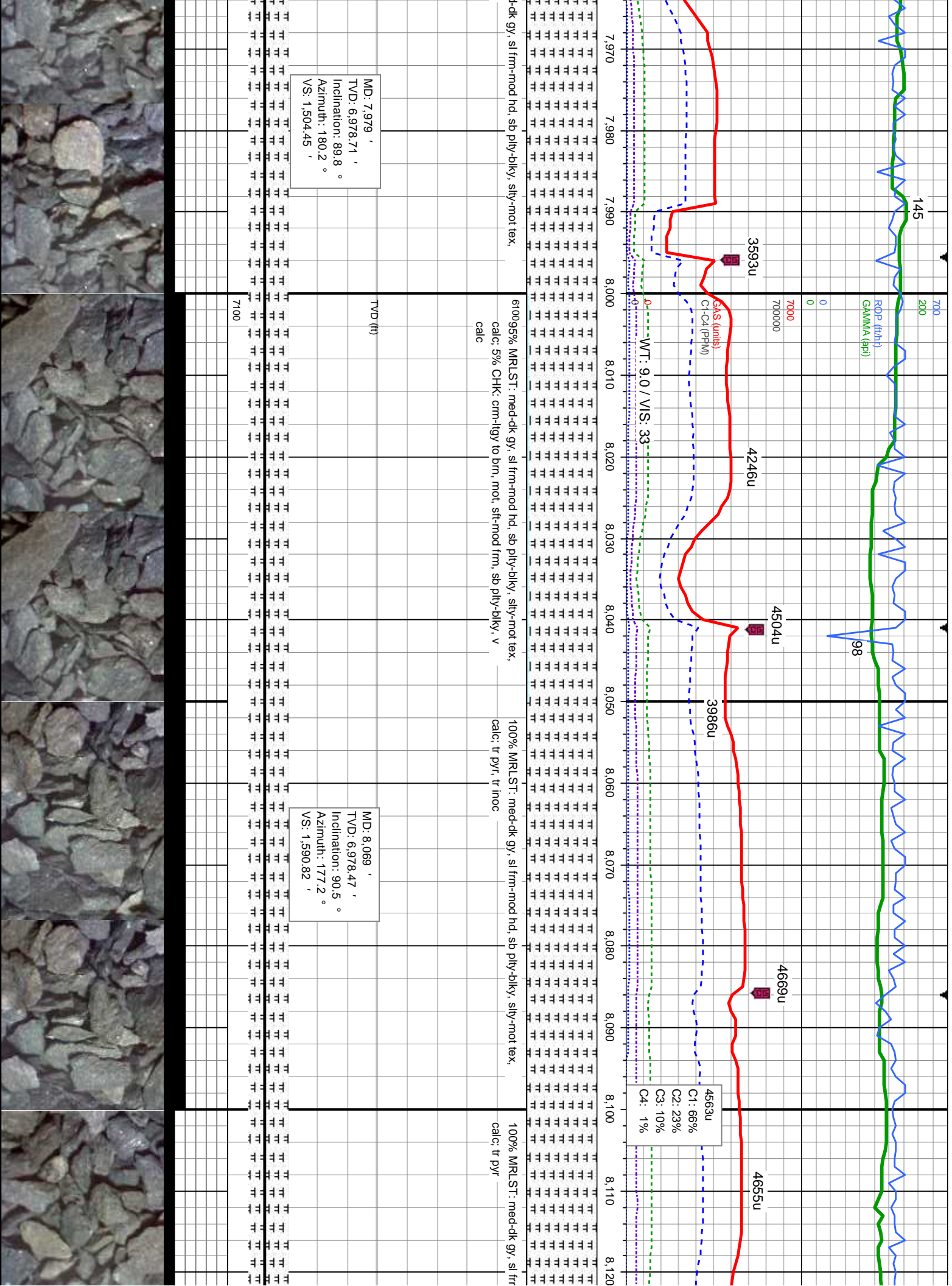




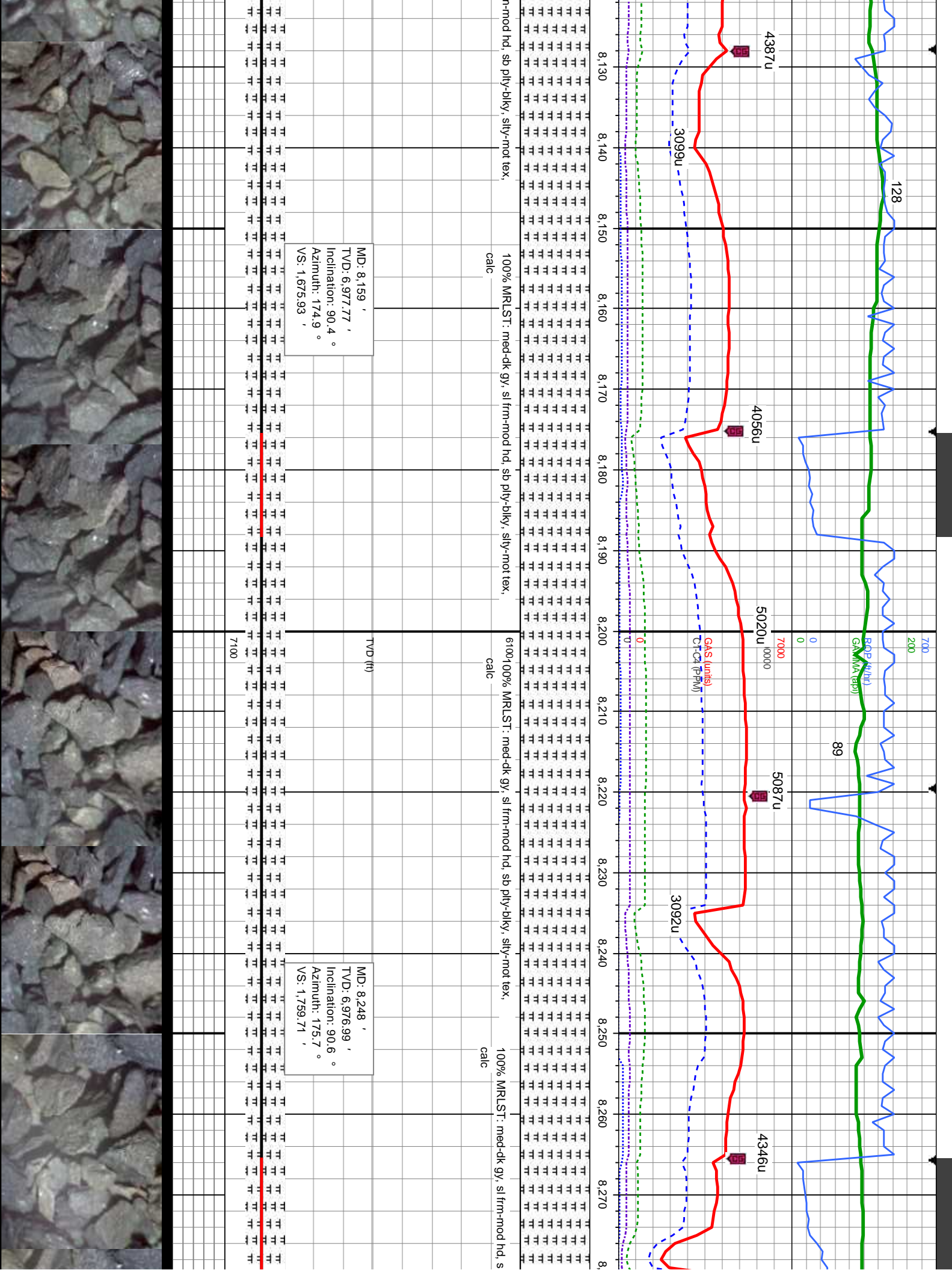






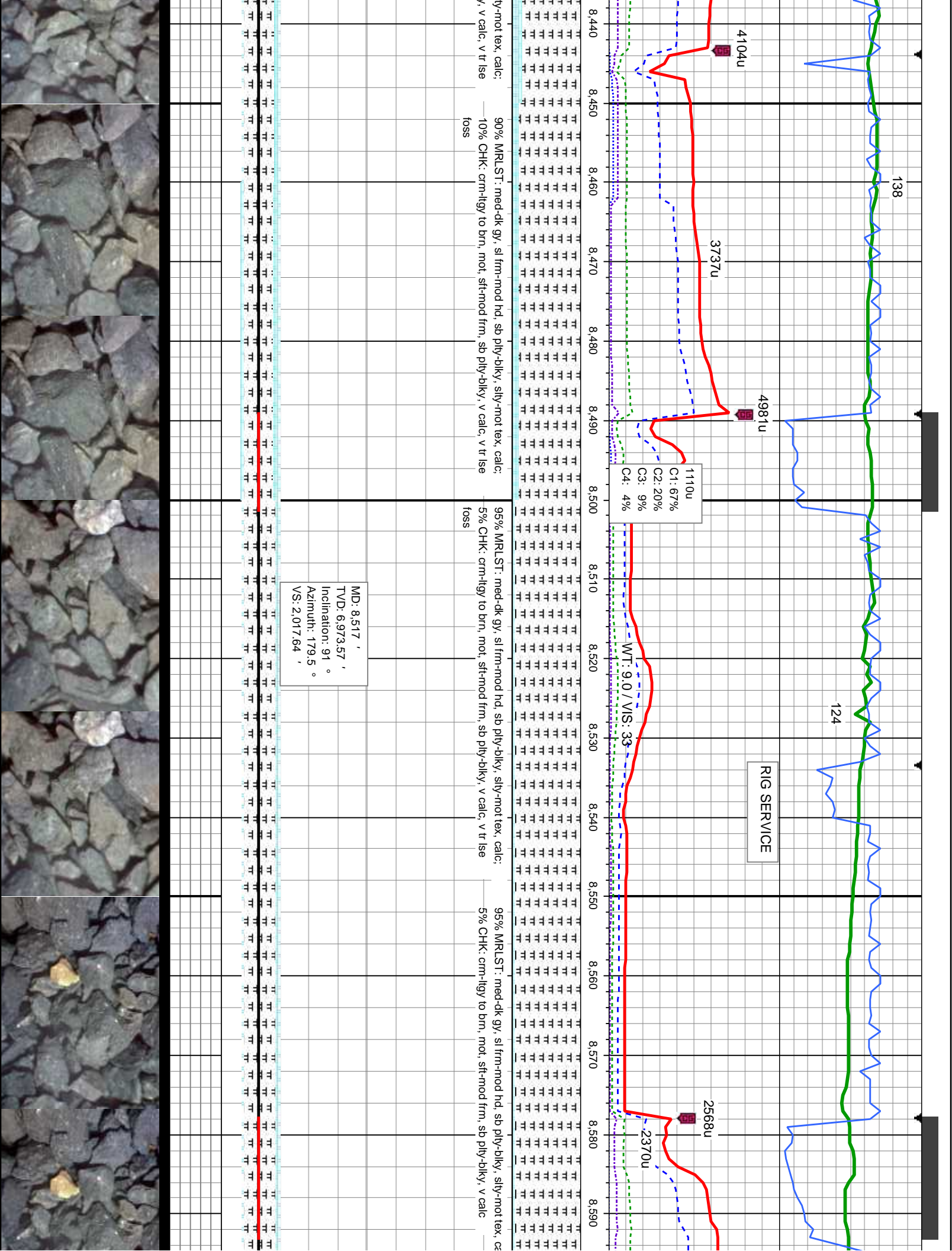




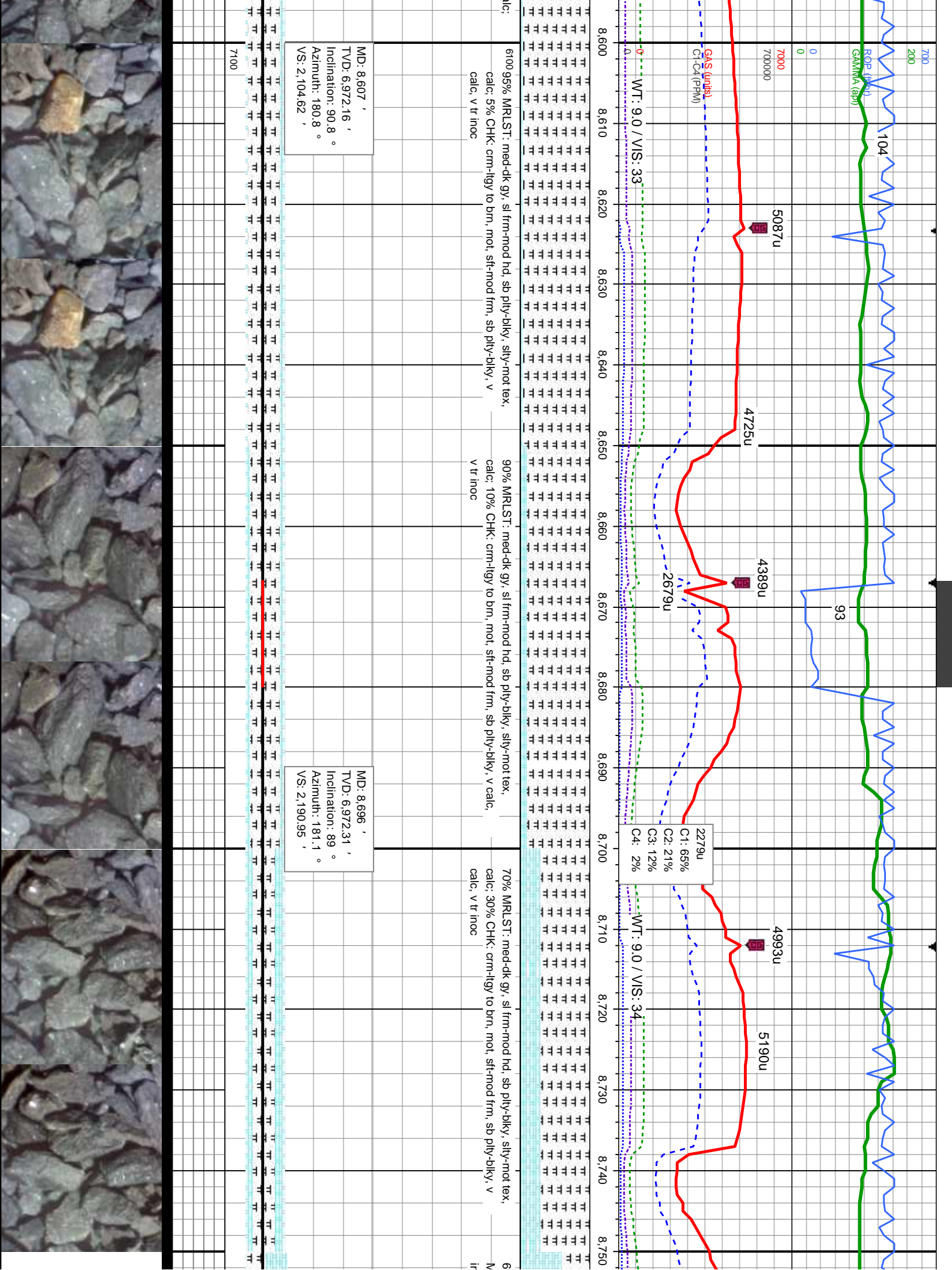


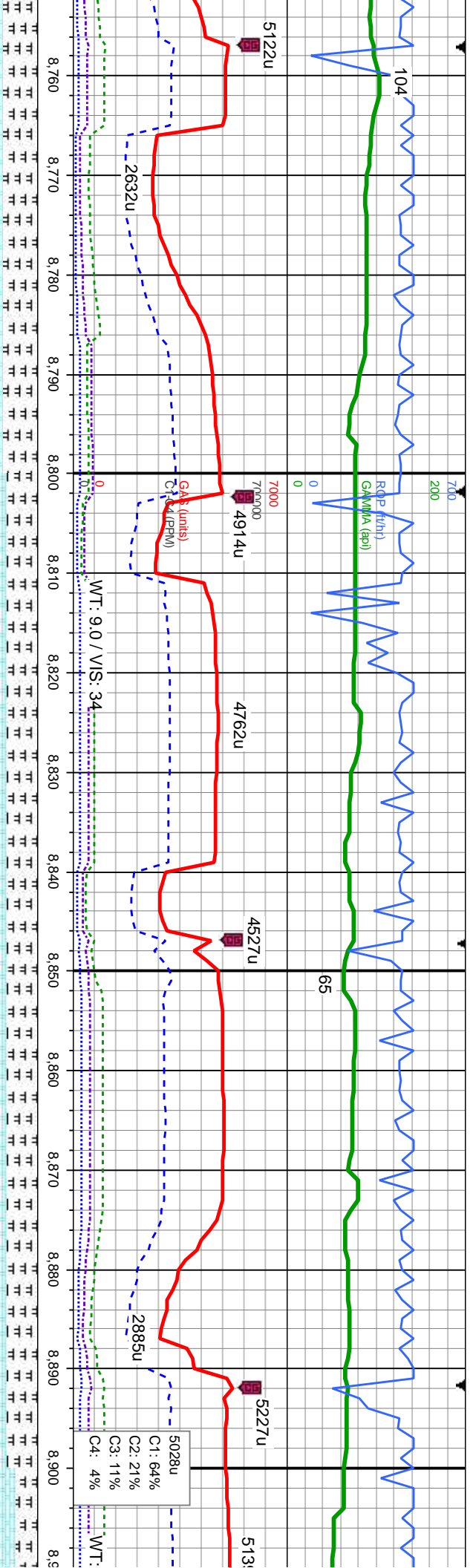












40% CHK: crm-lgly to brn, mot, sft-mod frm, sb ply-biky, v calc; 40%  
MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc, v tr  
ioc

6100 65% CHK: crm-lgly to brn, mot, sft-mod frm, sb ply-biky, v calc;  
35% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex,  
calc, v tr inoc

65% CHK: crm-lgly to brn, mot, sft-mod frm, sb ply-biky, v calc; 35%  
MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc

75% CHK:  
25% MRLS  
calc

MD: 8,786 '  
TVD: 6,973.73 '  
Inclination: 89.2 °  
Azimuth: 180.7 °  
VS: 2,278.23 '

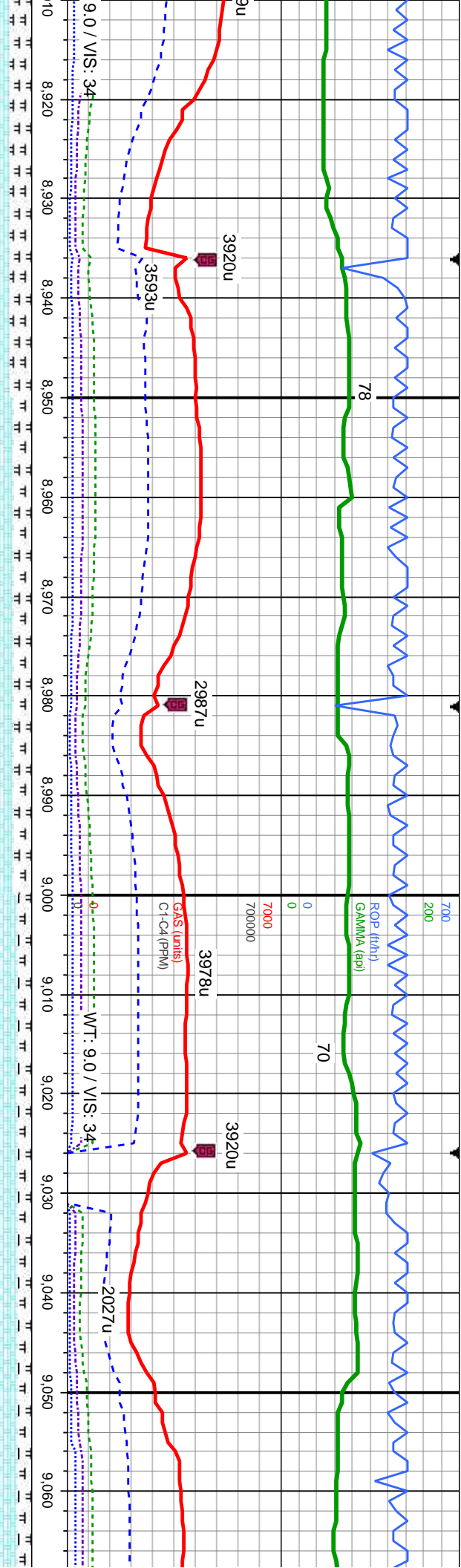
TVD (ft)

MD: 8,876 '  
TVD: 6,975.14 '  
Inclination: 89 °  
Azimuth: 180.1 °  
VS: 2,365.3 '

7100





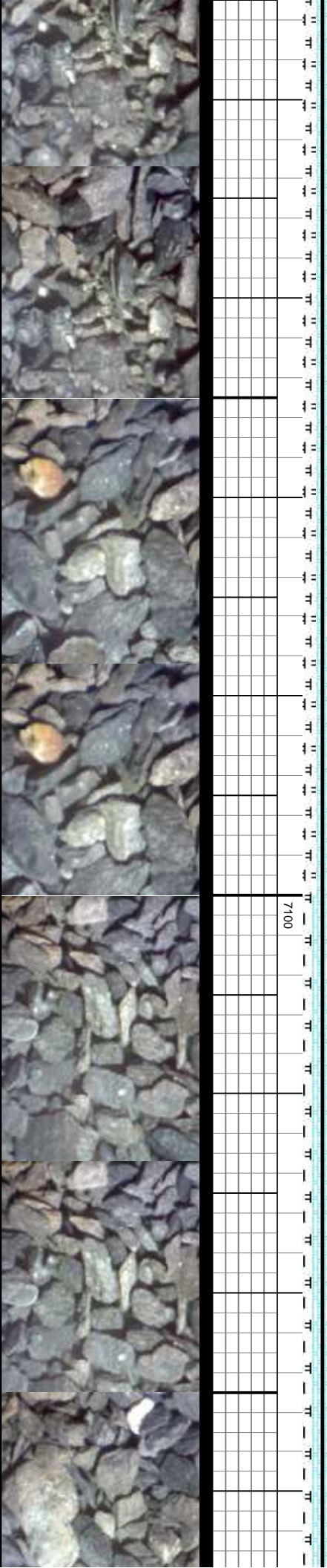


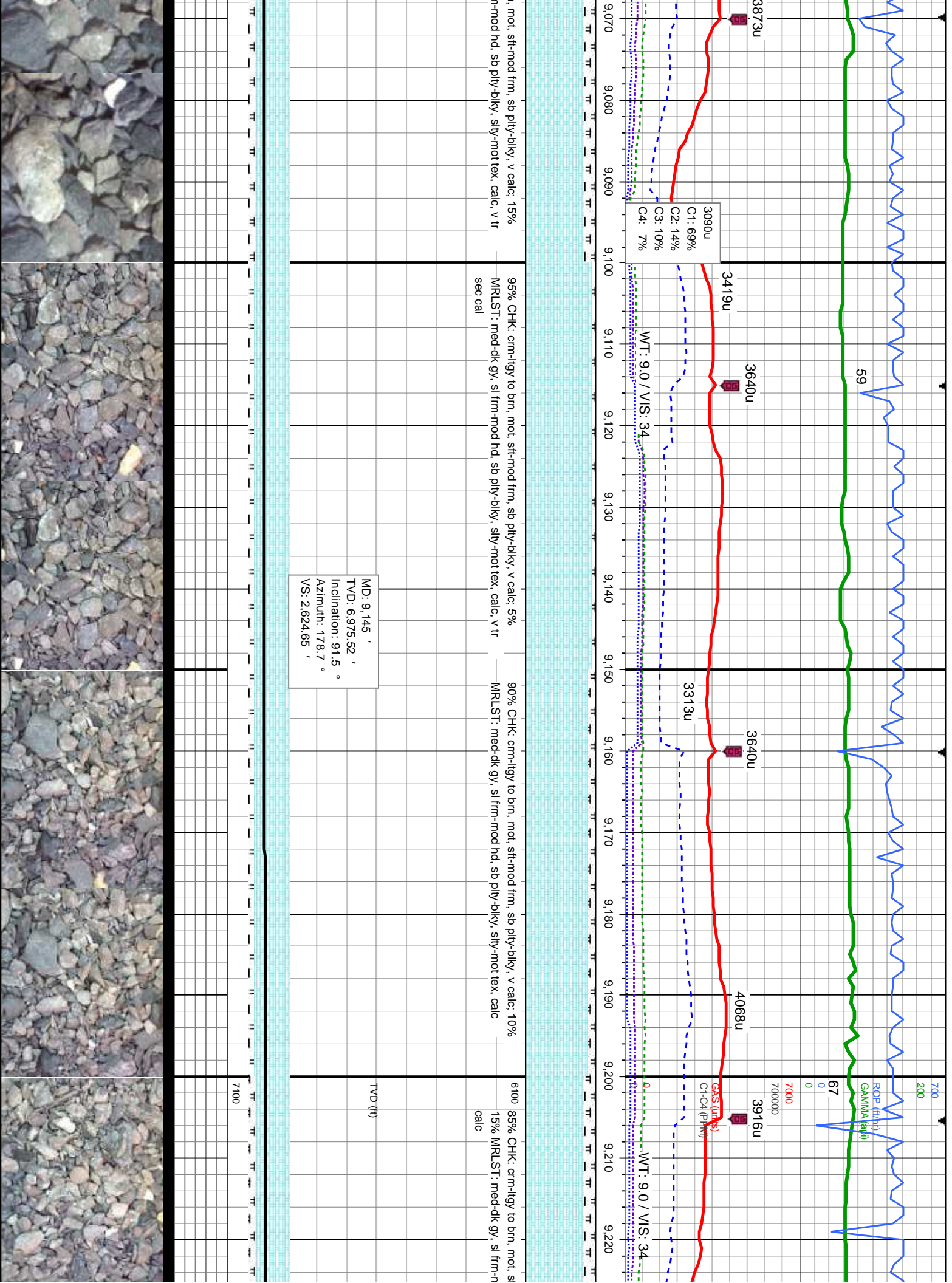
cm-lyg to brn, mot, sft-mod frm, sb pily-biky, v calc;  
T: med-dk gy, sl frm-mod hd, sb pily-biky, silty-mot tex,  
80% CHK: cm-lyg to brn, mot, sft-mod frm, sb pily-biky, v calc;  
20% MRLST: med-dk gy, sl frm-mod hd, sb pily-biky, silty-mot tex,  
calc

MD: 8,965 '  
TVD: 6,976.23 '  
Inclination: 89.6 °  
Azimuth: 179.8 °  
VS: 2,451.24 '

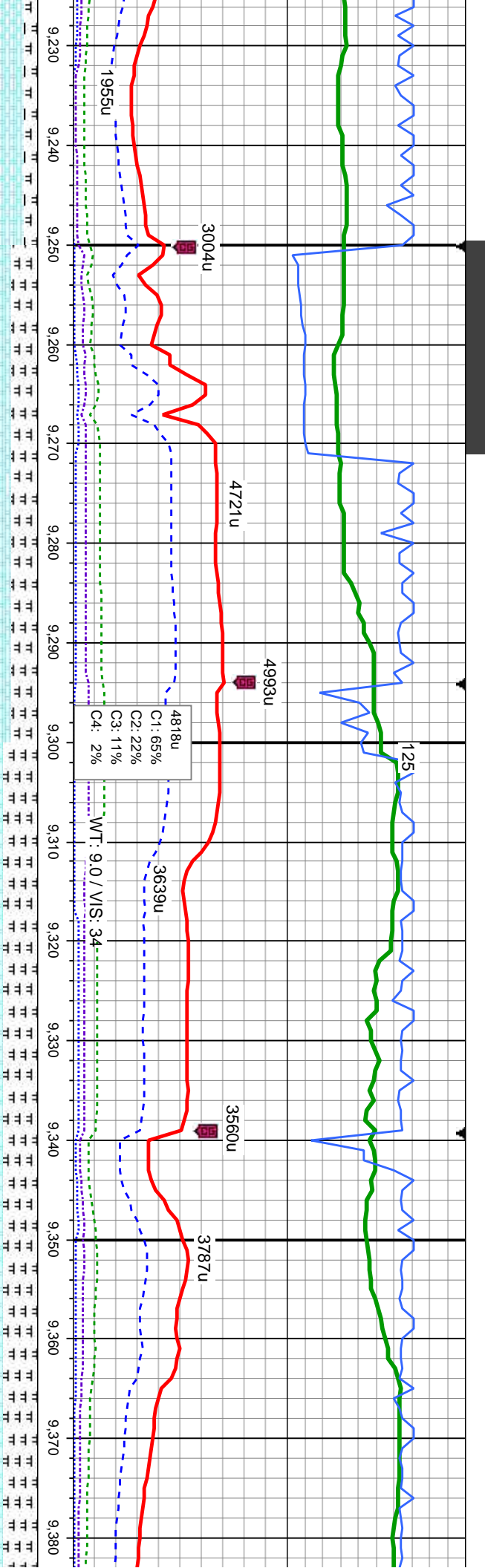
61085% CHK: cm-lyg to brn, mot, sft-mod frm, sb pily-biky, v calc;  
15% MRLST: med-dk gy, sl frm-mod hd, sb pily-biky, silty-mot tex,  
calc, v tr lse foss, v tr sec cal

MD: 9,055 '  
TVD: 6,976.62 '  
Inclination: 89.9 °  
Azimuth: 179.7 °  
VS: 2,538.07 '









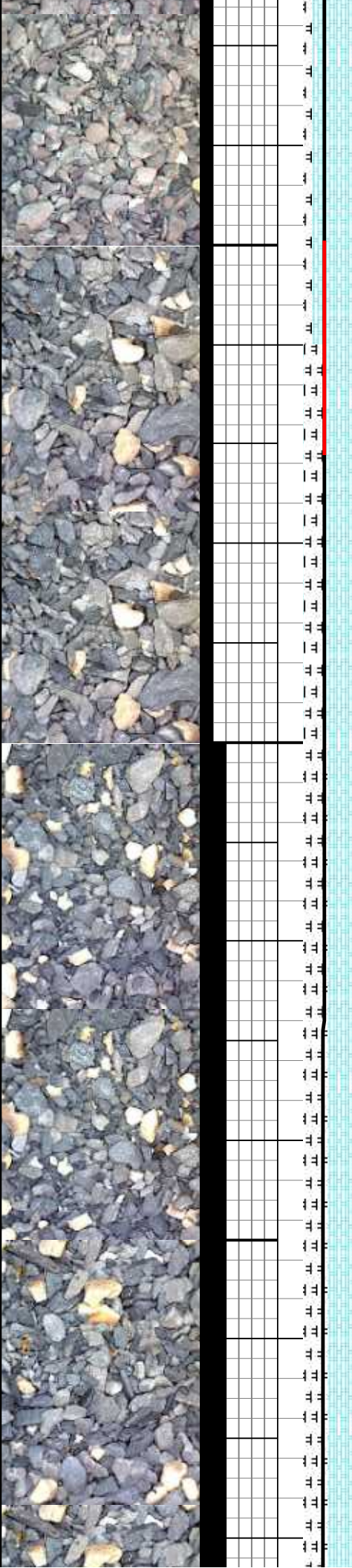
MD: 9.235 '  
TVD: 6,973.79 '  
Inclination: 90.7 °  
Azimuth: 176.5 °  
VS: 2,710.51 '

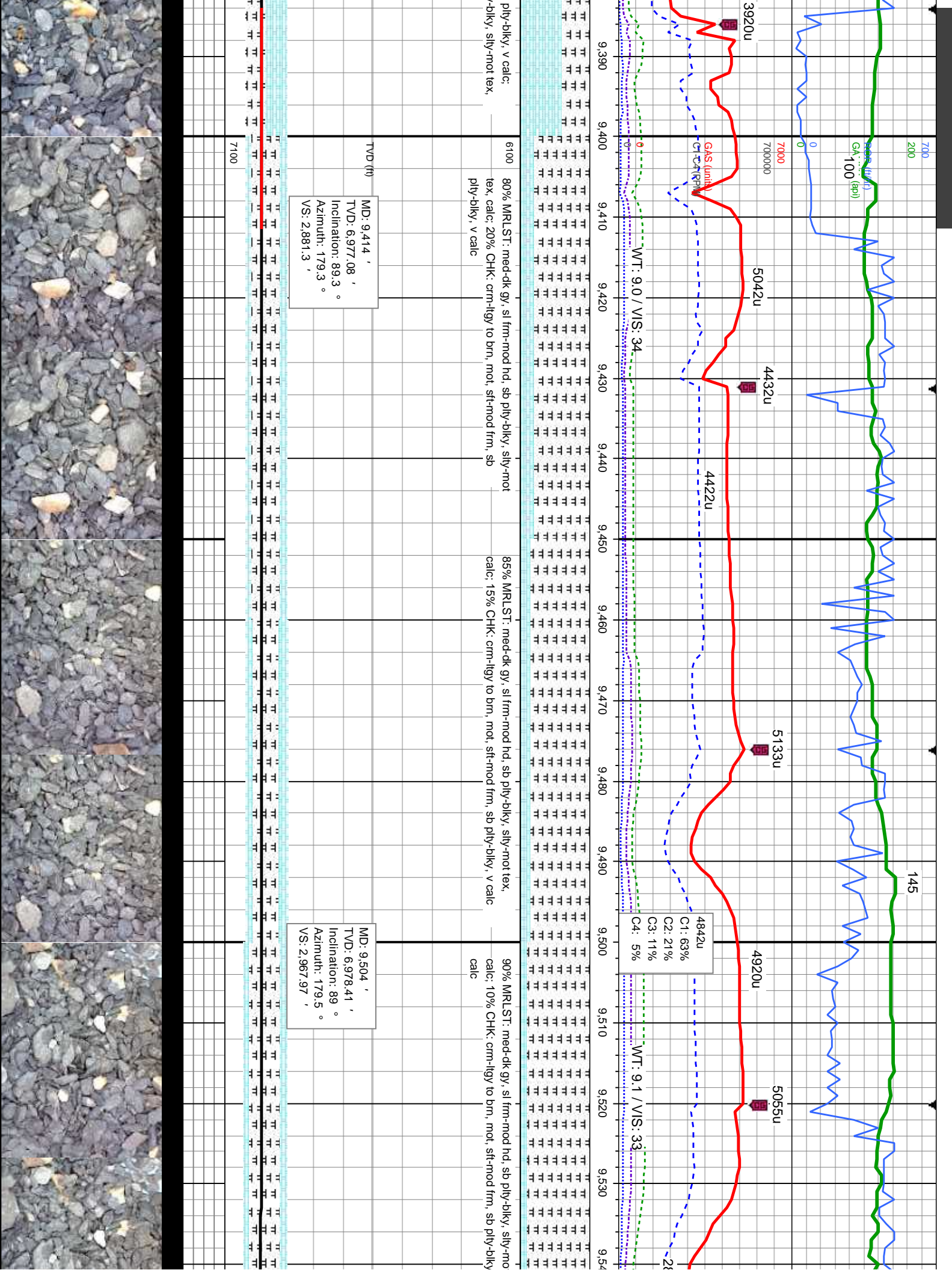
70% CHK: crm-llgy to brn, mot, sft-mod frm, sb ply-blky, v calc;  
30% MRLST: med-dk gy, sl frm-mod hd, sb ply-blky, silty-mot tex, calc

60% CHK: crm-llgy to brn, mot, sft-mod frm, sb ply-blky, v calc;  
40% MRLST: med-dk gy, sl frm-mod hd, sb ply-blky, silty-mot tex, calc

60% CHK: crm-llgy to brn, mot, sft-mod frm, sb ply-blky, v tr inoc  
40% MRLST: med-dk gy, sl frm-mod hd, sb ply-blky, v tr inoc

MD: 9.324 '  
TVD: 6,974.88 '  
Inclination: 87.9 °  
Azimuth: 177.4 °  
VS: 2,795.11 '



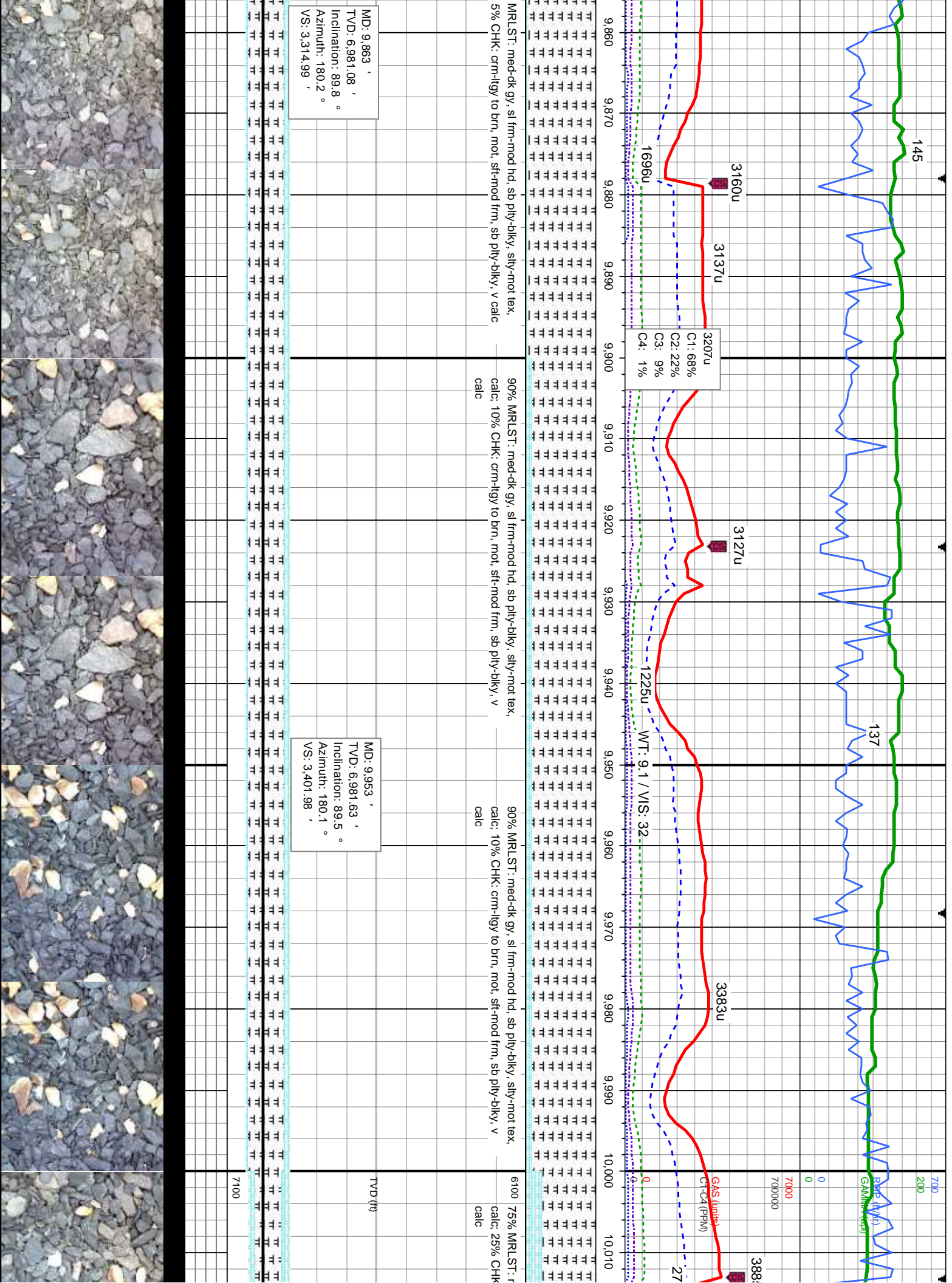


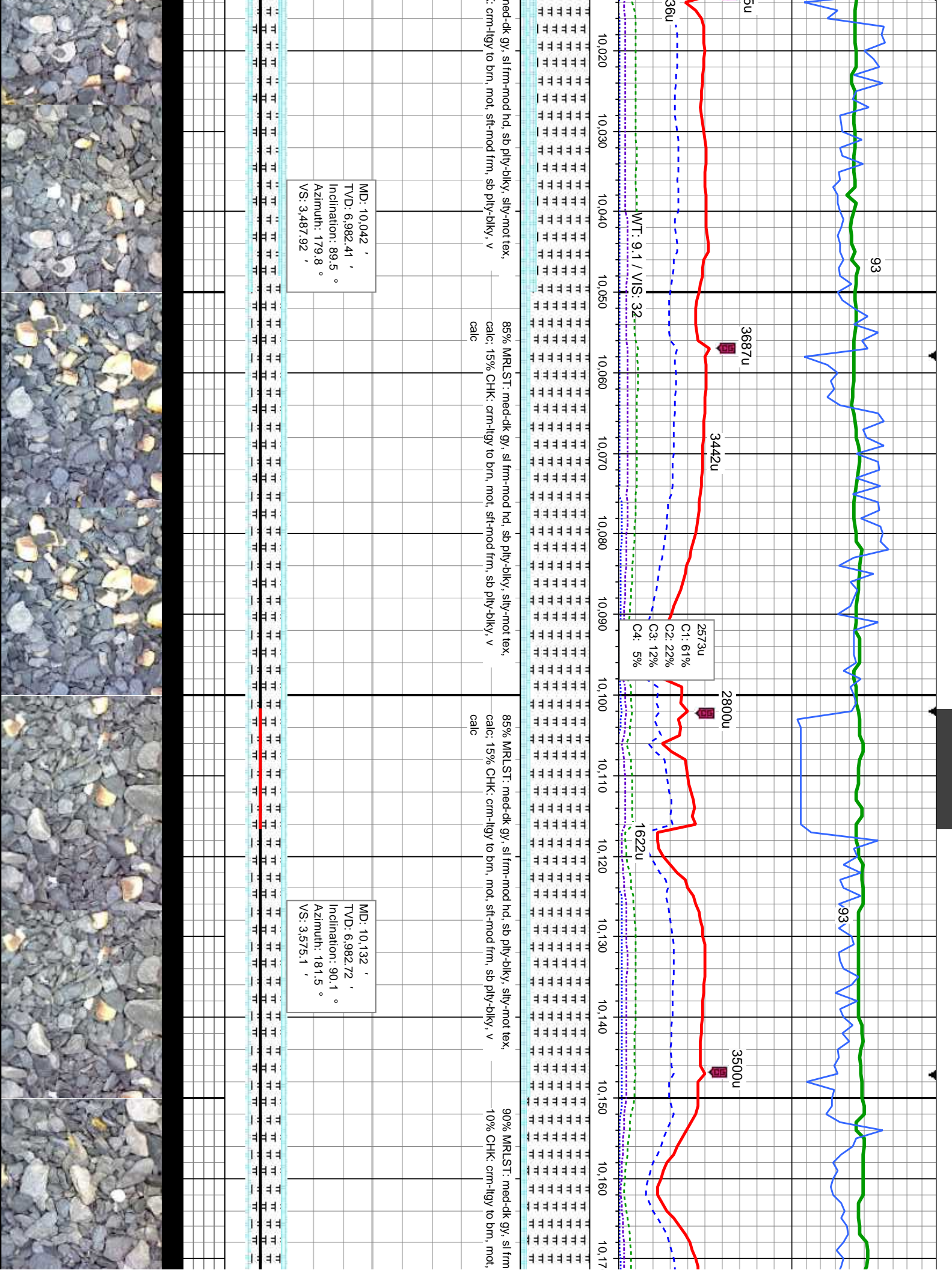




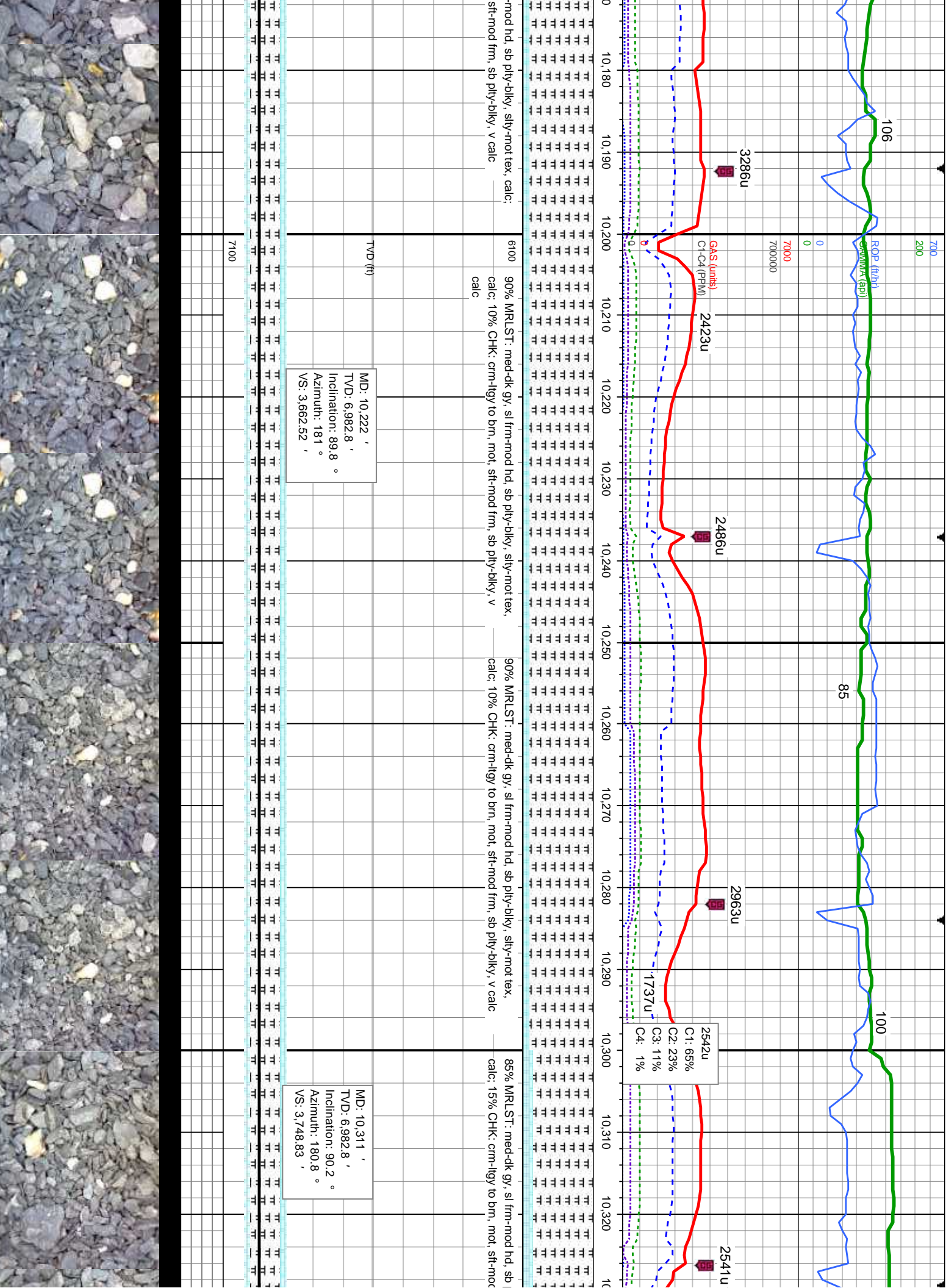


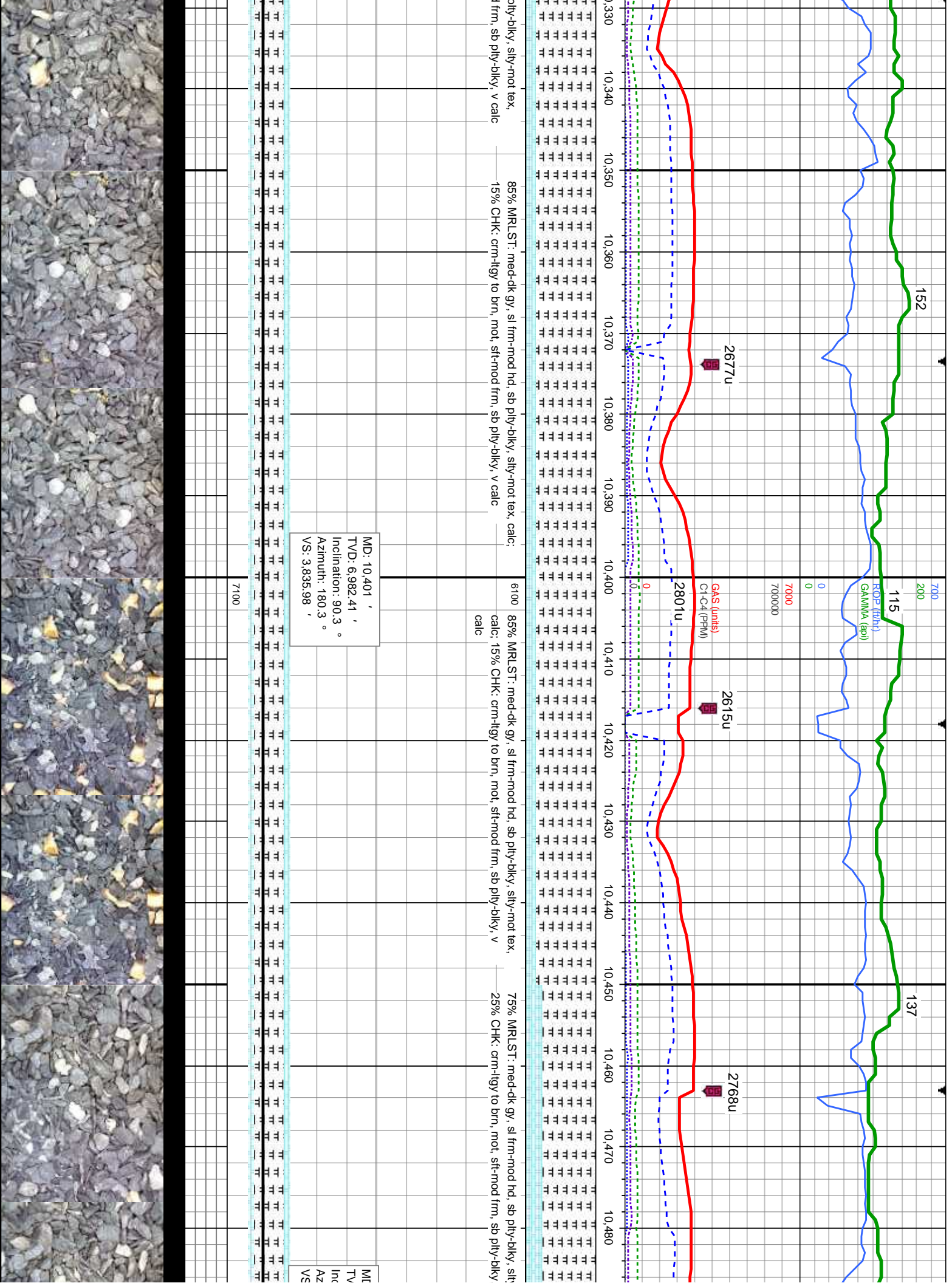




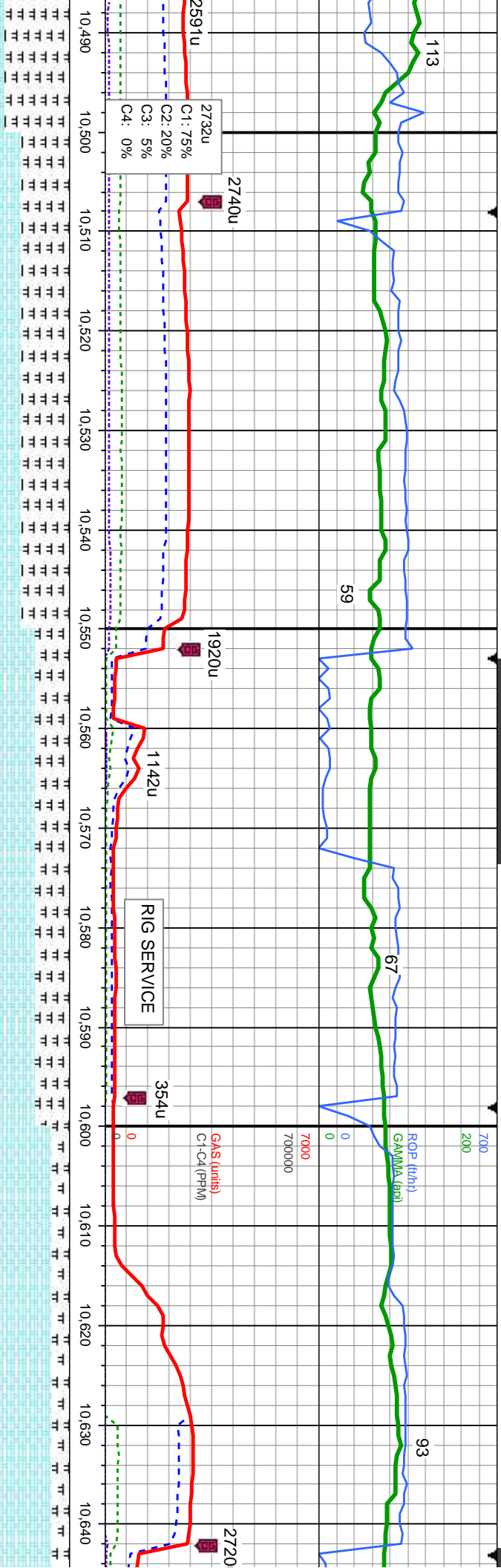












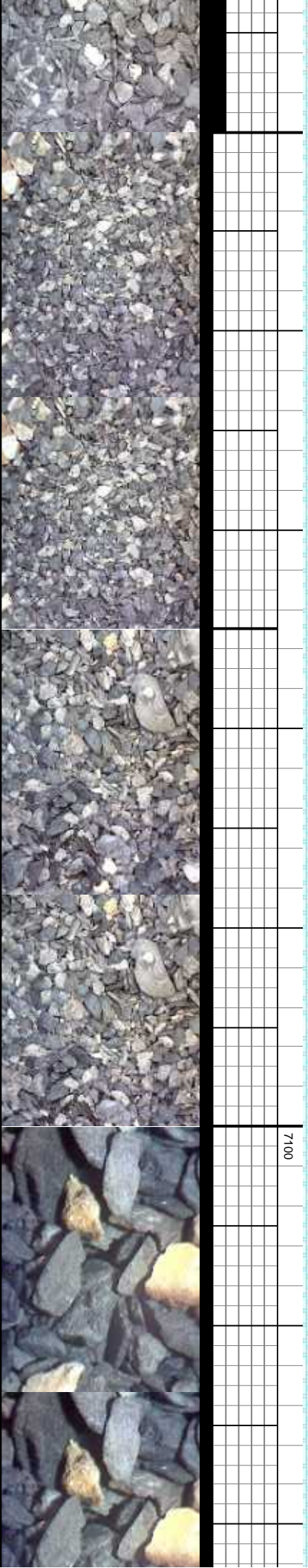
55% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc; 45% CHK: crm-illy to brn, mot, sft-mod frm, sb ply-biky, v calc

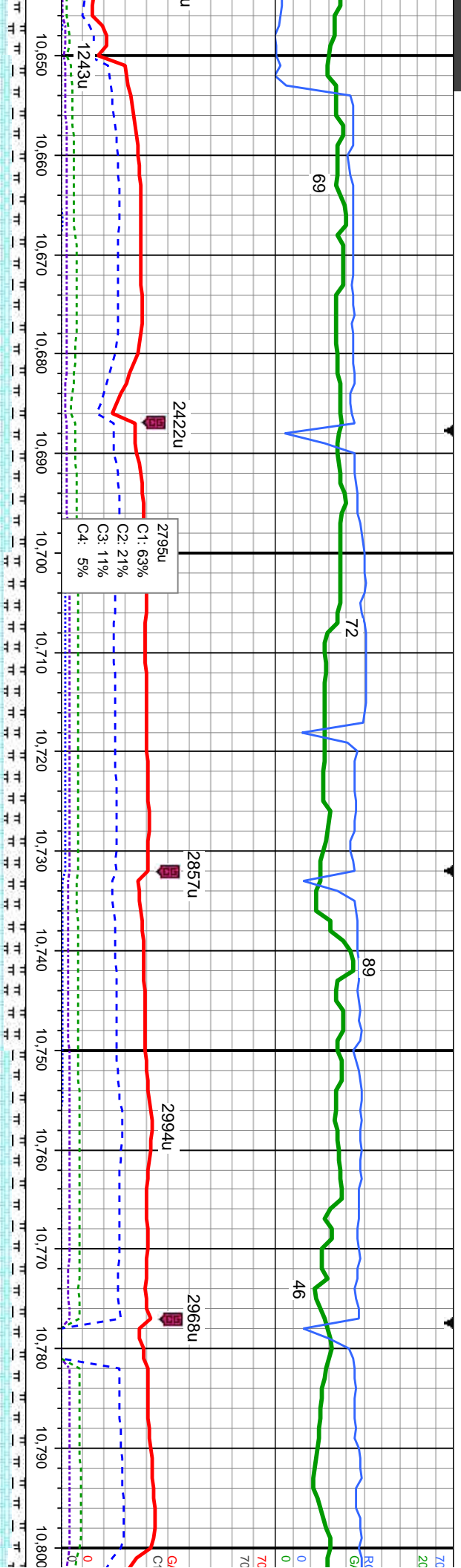
60% CHK: crm-illy to brn, mot, sft-mod frm, sb ply-biky, v calc; 40% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc

6100 80% CHK: crm-illy to brn, mot, sft-mod frm, sb ply-biky, v calc; 20% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc

MD: 10,580 ' TVD: 6,981.16 ' Inclination: 90.5 ° Azimuth: 180.4 ° VS: 4,008.76 '

D: 6,981.86 ' Inclination: 90.4 ° Azimuth: 179.4 ° VS: 3,922.85 '





85% CHK: crm-ligy to brn, mot, sft-mod frm, sb ply-blky, v calc, 15%  
MRLST: med-dk gy, sl frm-mod hd, sb ply-blky, silty-mot tex, calc

75% CHK: crm-ligy to brn, mot, sft-mod frm, sb ply-blky, v calc, 25%  
MRLST: med-dk gy, sl frm-mod hd, sb ply-blky, silty-mot tex, calc

85% CHK: crm-ligy to brn, mot, sft-mod frm, sb ply-blky, v calc, 15%  
MRLST: med-dk gy, sl frm-mod hd, sb ply-blky, silty-mot tex, calc

MD: 10,670 '  
TVD: 6,981.71 '  
Inclination: 88.8 °  
Azimuth: 180.8 °  
VS: 4,095.93 '

MD: 10,760 '  
TVD: 6,984.15 '  
Inclination: 88.1 °  
Azimuth: 180.1 °  
VS: 4,183.01 '





8/2/14

165

96

MINDEPTH

122

96

PE (f/LH)

AMMA (epi)

00

00000

2874u

2560u

2538u

2754u

2560u

1430u

WT: 9.2 / VIS: 33

C1: 75%  
C2: 20%  
C3: 5%  
C4: 0%

10,810 10,820 10,830 10,840 10,850 10,860 10,870 10,880 10,890 10,900 10,910 10,920 10,930 10,940 10,950

80% CHK: crm-lyg to brn, mot, sft-mod frm, sb ply-biky, v calc;  
20% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc

55% CHK: crm-lyg to brn, mot, sft-mod frm, sb ply-biky, v calc; 45%  
MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc

55% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc; 45% CHK: crm-lyg to brn, mot, sft-mod frm, sb ply-biky, v calc

70% CHK: c

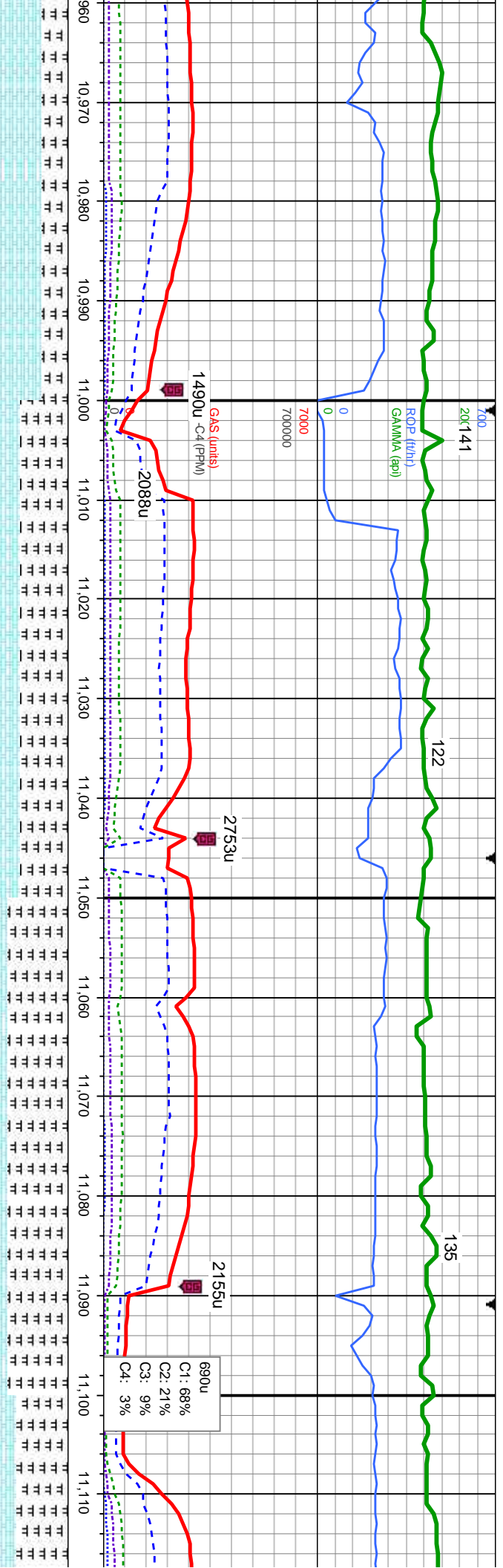
D (ft)

MD: 10,850 '  
TVD: 6,986.74 '  
Inclination: 88.6 °  
Azimuth: 180.8 °  
VS: 4,270.08 '

MD: 10,939 '  
TVD: 6,988.29 '  
Inclination: 89.4 °  
Azimuth: 181.9 °  
VS: 4,356.55 '

00





brn-llgy to brn, mot, sft-mod frm, sb ply-biky, v calc, 30%  
-dk gy, sl frm-mod hd, sb ply-biky, sily-mot tex, calc

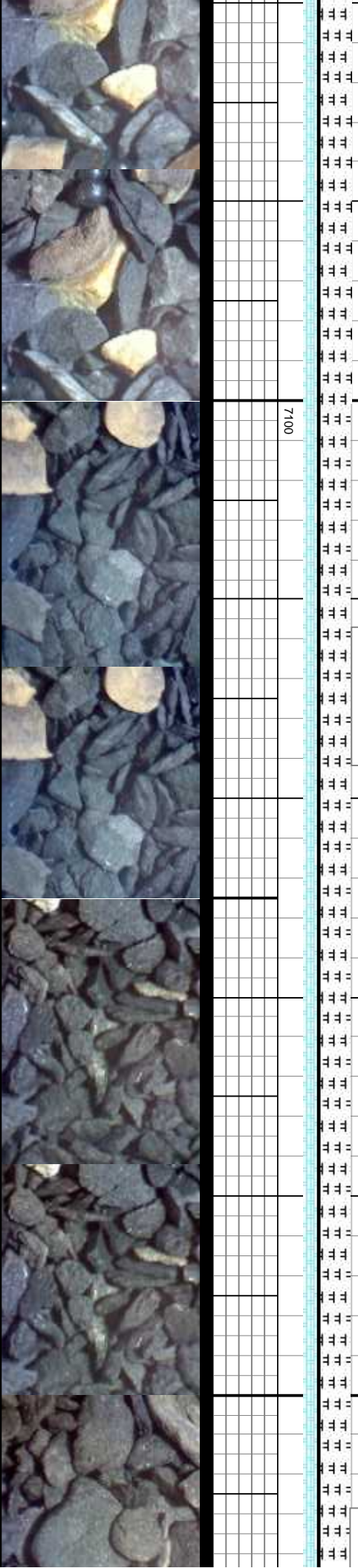
6100 55% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, sily-mot tex,  
calc: 45% CHK: crm-llgy to brn, mot, sft-mod frm, sb ply-biky, v  
calc

70% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, sily-mot tex,  
calc: 30% CHK: crm-llgy to brn, mot, sft-mod frm, sb ply-biky, v calc

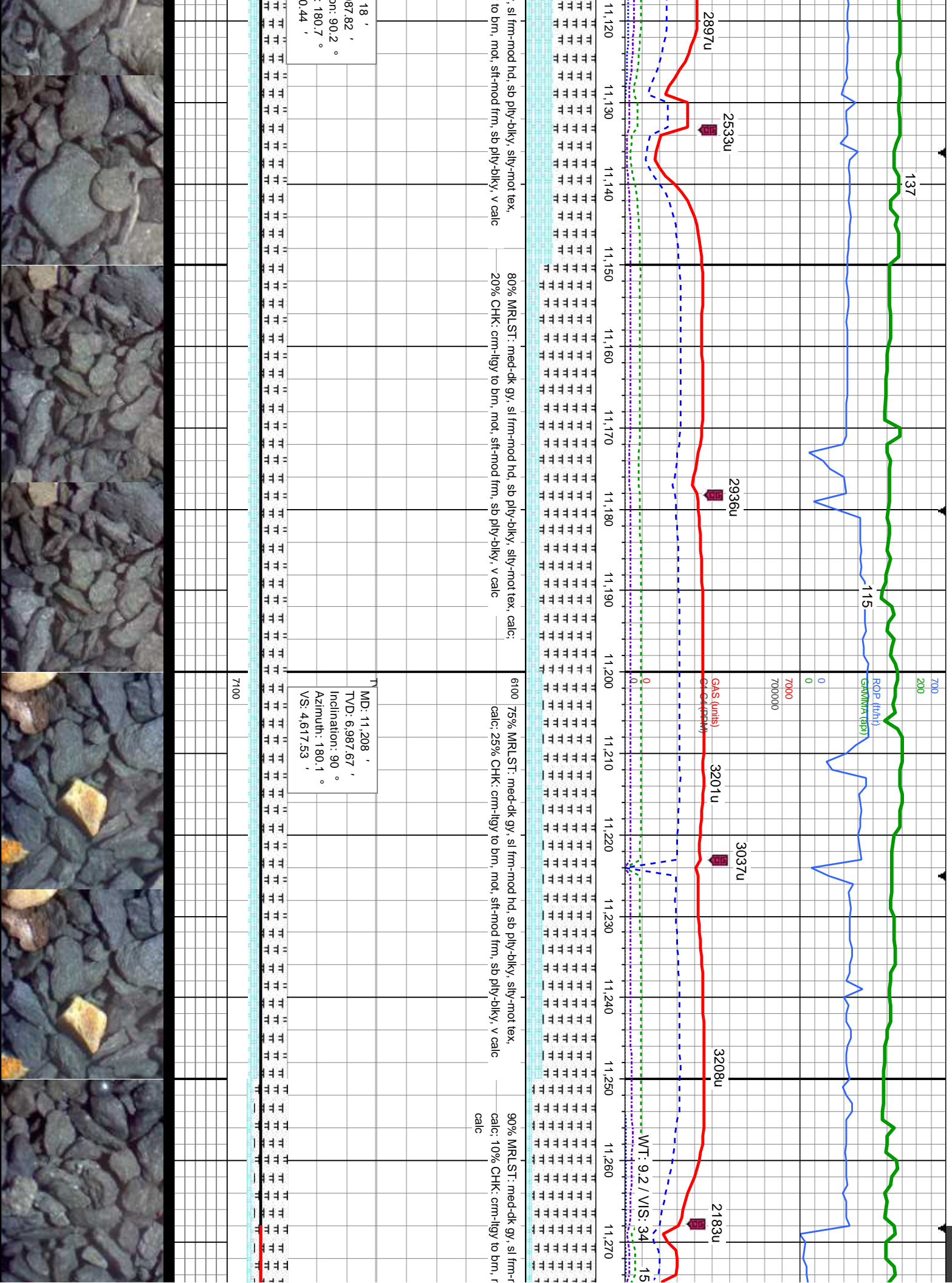
60% MRLST: med-dk gy,  
calc: 40% CHK: crm-llgy

TVD (ft)  
MD: 11,029 '  
TVD: 6,988.37 '  
Inclination: 90.5 °  
Azimuth: 181.3 °  
VS: 4,444.09 '

MD: 11,1  
TVD: 6.9  
Inclination  
Azimuth  
VS: 4.53



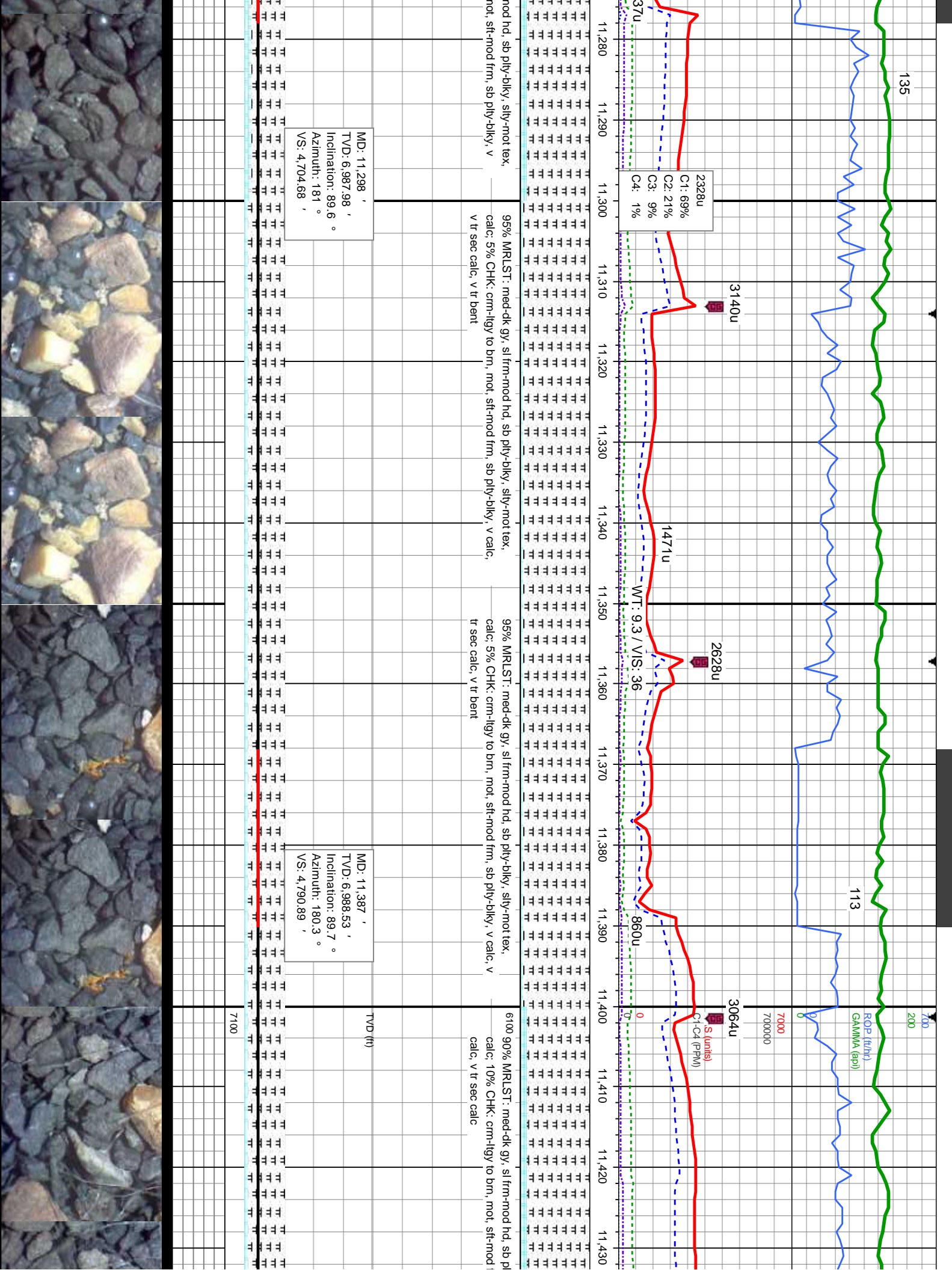




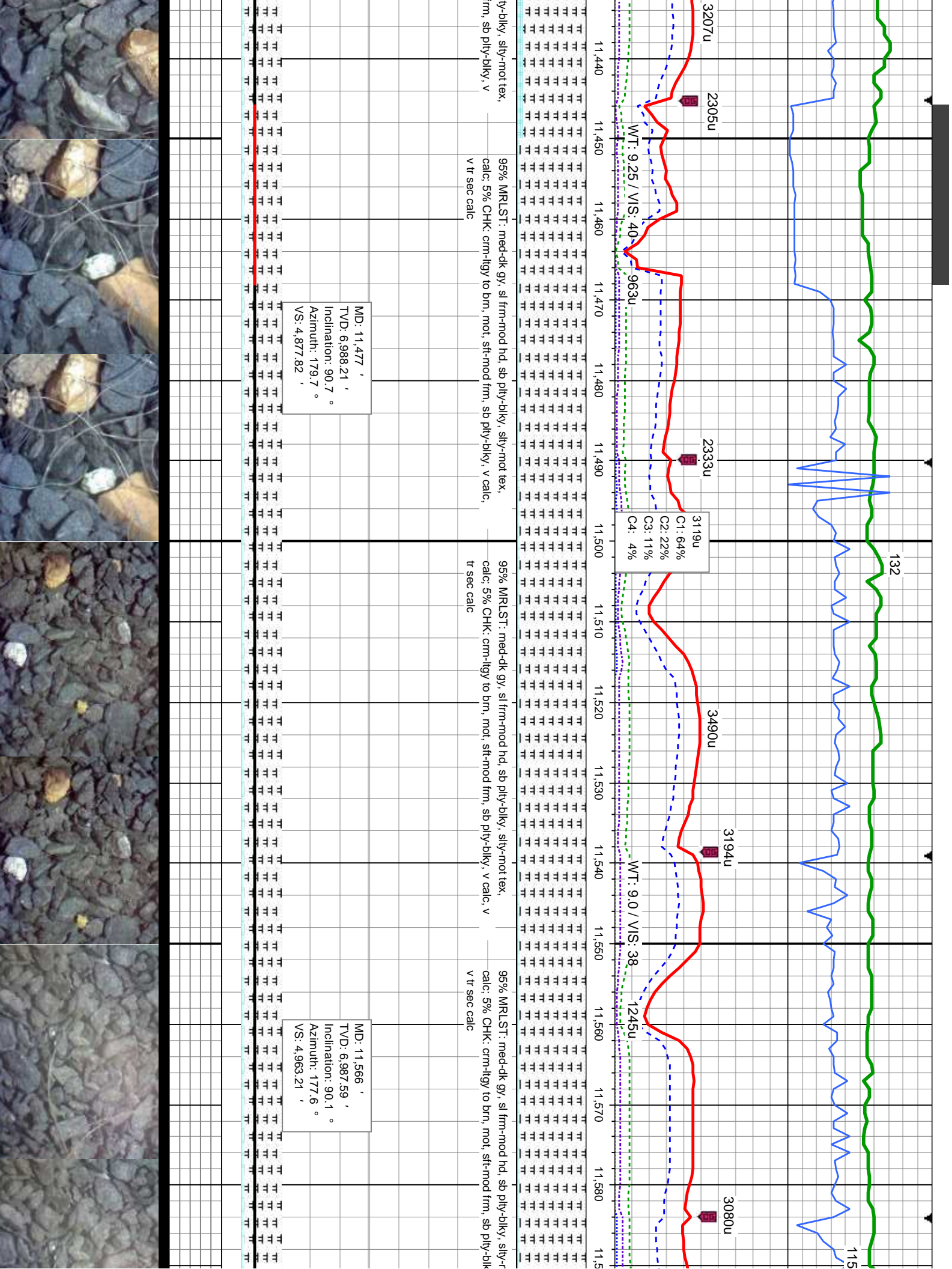
18 '  
87.82 '  
bn: 90.2 °  
180.7 °  
0.44 '

MD: 11,208 '  
TVD: 6,987.67 '  
Inclination: 90 °  
Azimuth: 180.1 °  
VS: 4.617.53 '

7100

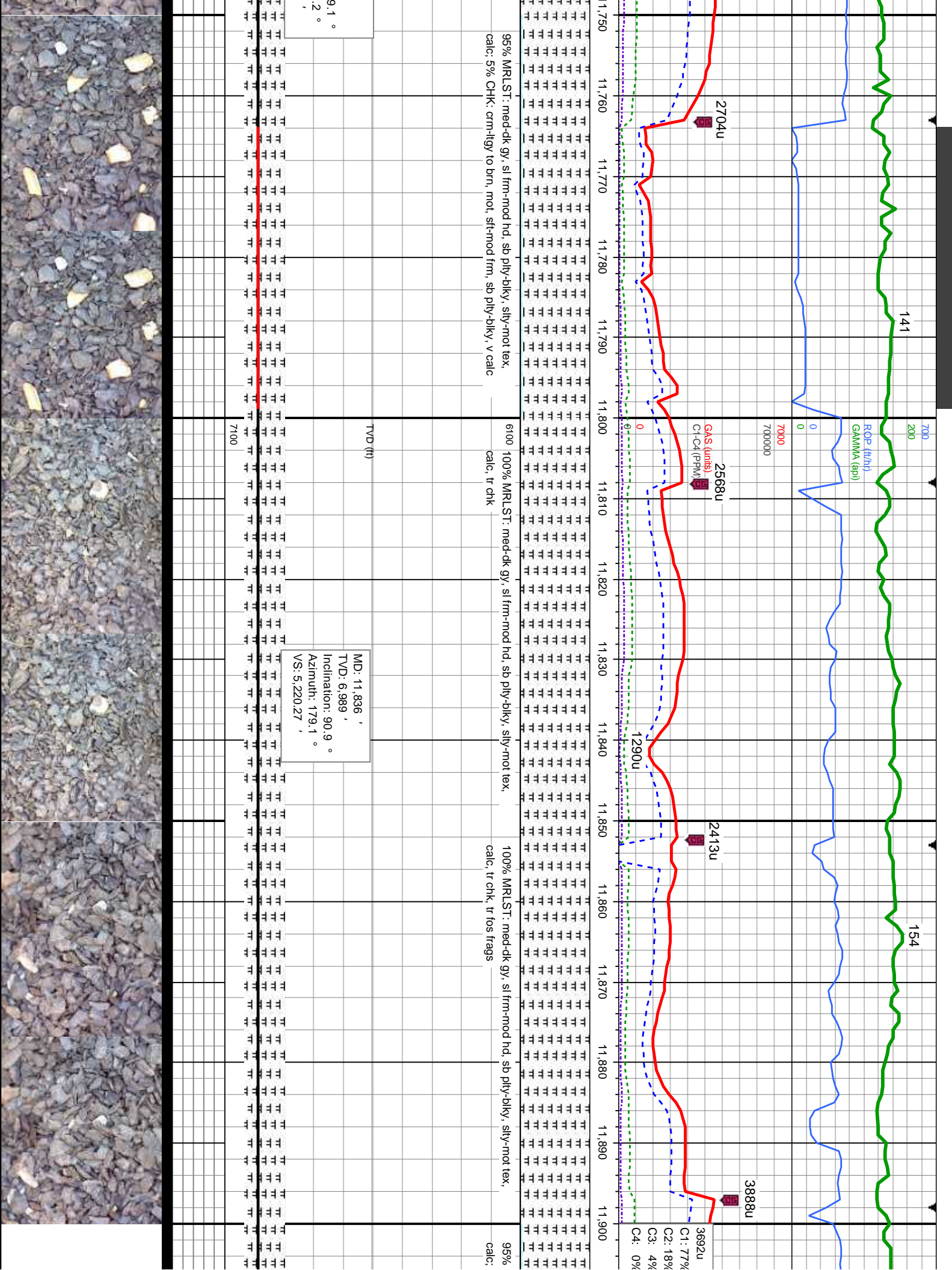


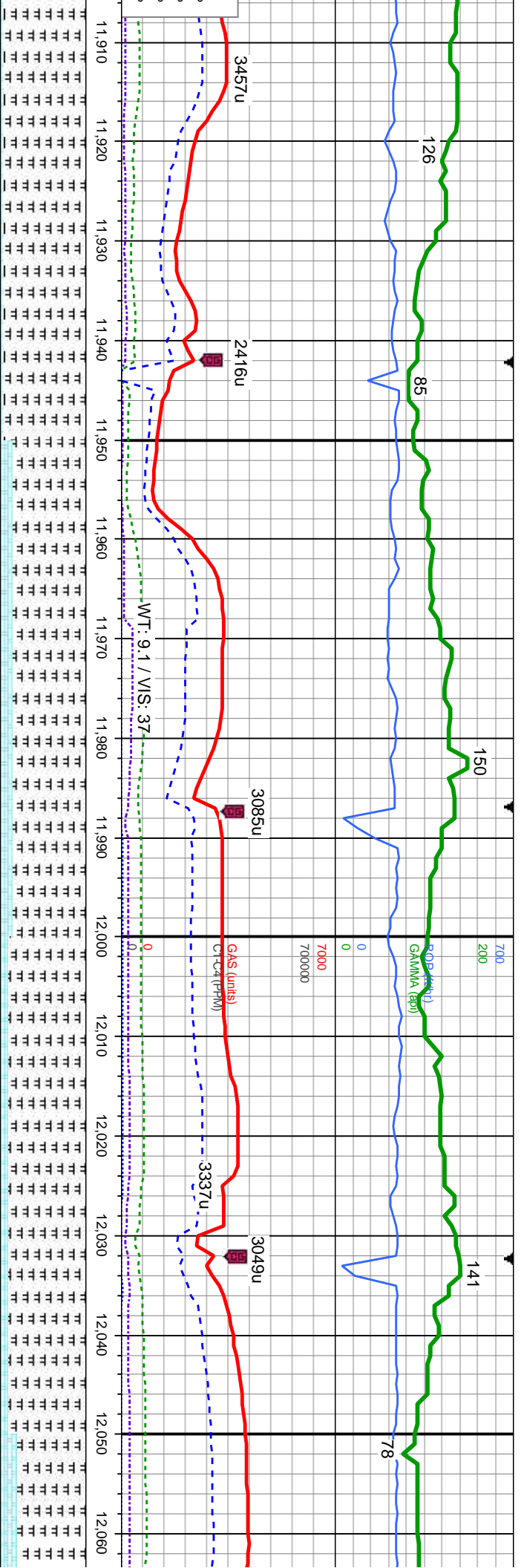










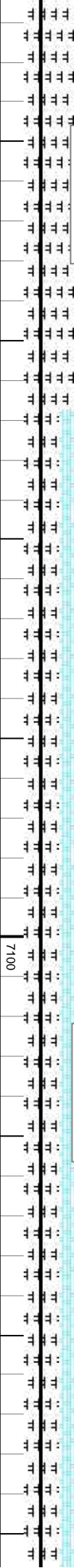


MRSLT: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc: 85% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc: 15% CHK: crm-ligy to brn, mot, sft-mod frm, sb ply-biky, v calc

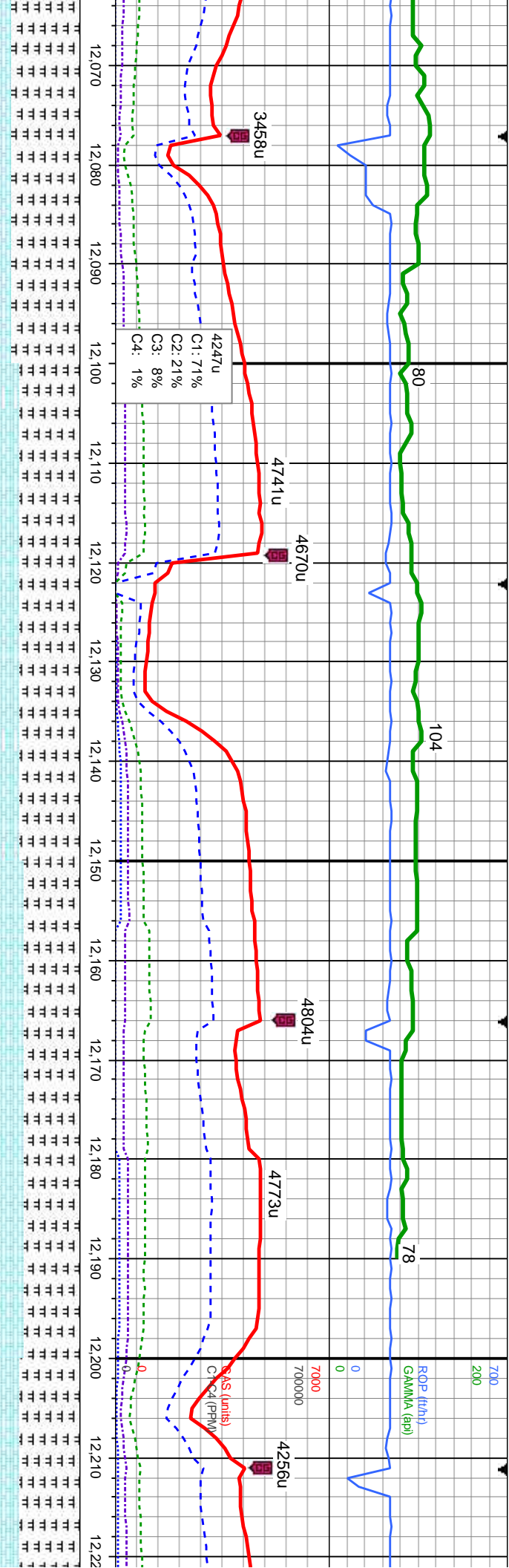
6100 90% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc: 10% CHK: crm-ligy to brn, mot, sft-mod frm, sb ply-biky, v calc

MD: 11,925 '  
TVD: 6,987.92 '  
Inclination: 90.5 °  
Azimuth: 178.7 °  
VS: 5,305.77 '

MD: 12,015 '  
TVD: 6,987.29 '  
Inclination: 90.3 °  
Azimuth: 178.6 °  
VS: 5,392.12 '





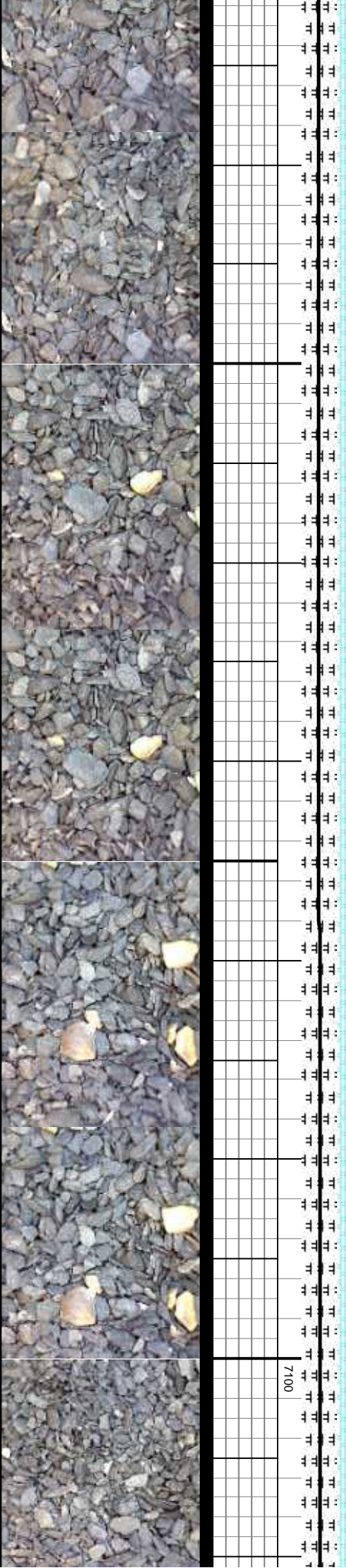


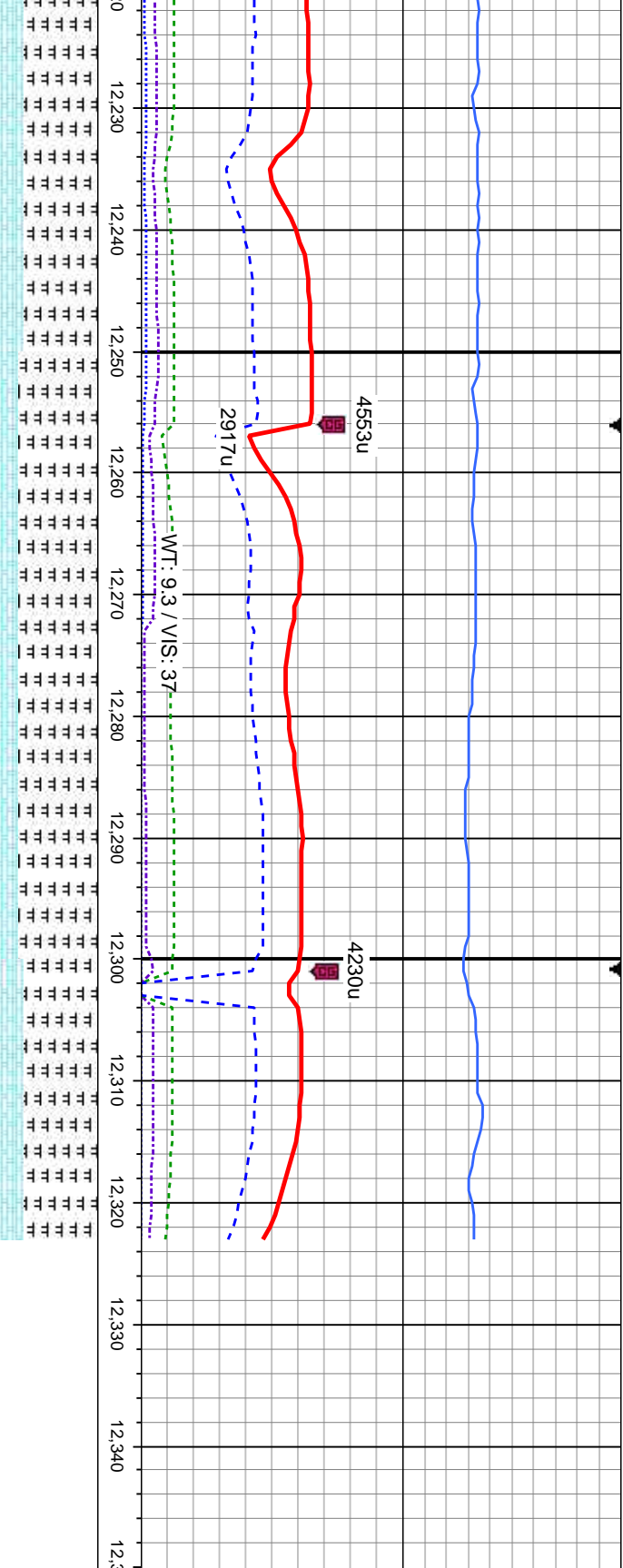
70% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc; 30% CHK: crm-lygy to brn, mot, sft-mod frm, sb ply-biky, v calc

65% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc; 35% CHK: crm-lygy to brn, mot, sft-mod frm, sb ply-biky, v calc

MD: 12,104 '  
TVD: 6,986.9 '  
Inclination: 90.2 °  
Azimuth: 178 °  
VS: 5,477.36 '

MD: 12,194 '  
TVD: 6,986.59 '  
Inclination: 90.2 °  
Azimuth: 177.8 °  
VS: 5,563.38 '





sl frm-mod hd, sb ply-bkly, silty-mot tex,  
o brn, mot, sft-mod frm, sb ply-bkly, v

75% MRLST: med-dk gy, sl frm-mod hd, sb ply-bkly, silty-mot tex,  
calc; 25% CHK: crn-ltgy to brn, mot, sft-mod frm, sb ply-bkly, v calc

70% MRLST: med-dk gy, sl  
frm-mod hd, sb ply-bkly, silty-mot  
tex, calc; 30% CHK: crn-ltgy to  
brn, mot, sft-mod frm, sb ply-bkly,  
v calc

TD Well @ 12,323'  
on 08/02/2014 - 19:35 MST

Thank You for Choosing  
Columbine Logging, Inc.

PTB

MD: 12,261 '  
TVD: 6,986.41 '  
Inclination: 90.1 °  
Azimuth: 177.4 °  
VS: 5,627.31 '

MD: 12,323 '  
TVD: 6,986.30 '  
Inclination: 90.1 °  
Azimuth: 177.4 °  
VS: 5,686.4 '

