

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Five Rivers K07-62-1HN

Location SESE SEC8 T4N R66W

State COLORADO

Country USA

API Number 05-123-38086

Region DENVER-JULESBURG BASIN

Spud Date 12/24/2013

Surface Coordinates 884' FSL, 687' FEL

Lat/Long: 40.32138/-104.79468

Bottom Hole Coordinates SEC7 T4N R66W

330'FSL, 535' FWL

Ground Elevation 4702'

K.B. Elevation 4718'

Logged Interval 6300'

To 16152'

Total Depth 16152'

Formation Teepee Buttes, Sharon Springs, Niobrara

Type of Drilling Fluid LSND

Company Noble Energy Inc
Address 1625 Broadway
Denver, CO 80202

Name CASSIDY MILL
Company NOBLE ENERGY
Address 1625 Broadway
Denver, CO 80202

Wellsite Geologists: GARY F
WELLS
LOG CO

CHALK

Operator

ic

202

Geologist

ER

BY, INC.

202

Other

MYERS, WHITNEY JACKS, ELIZABETH VAN DIEPEN

ITE GEOLOGICAL SERVICES PROVIDED BY COLUMBINE LOGGING INC.

CONTINUES FROM FILE: Five Rivers K07-62-1HN Vert.mplot


Accessories


Stringer


 SANDSTONE STRINGER


Other Symbols


Engineering


 CONNECTION (DOWN)


 CONNECTION GAS


 TRIP GAS


 DOWN TIME GAS


 NORMAL FAULT

 CASING


 FAULT

 MN DEPTH

 BIT

 CONNECTION GAS (LEFT)

Rock Types

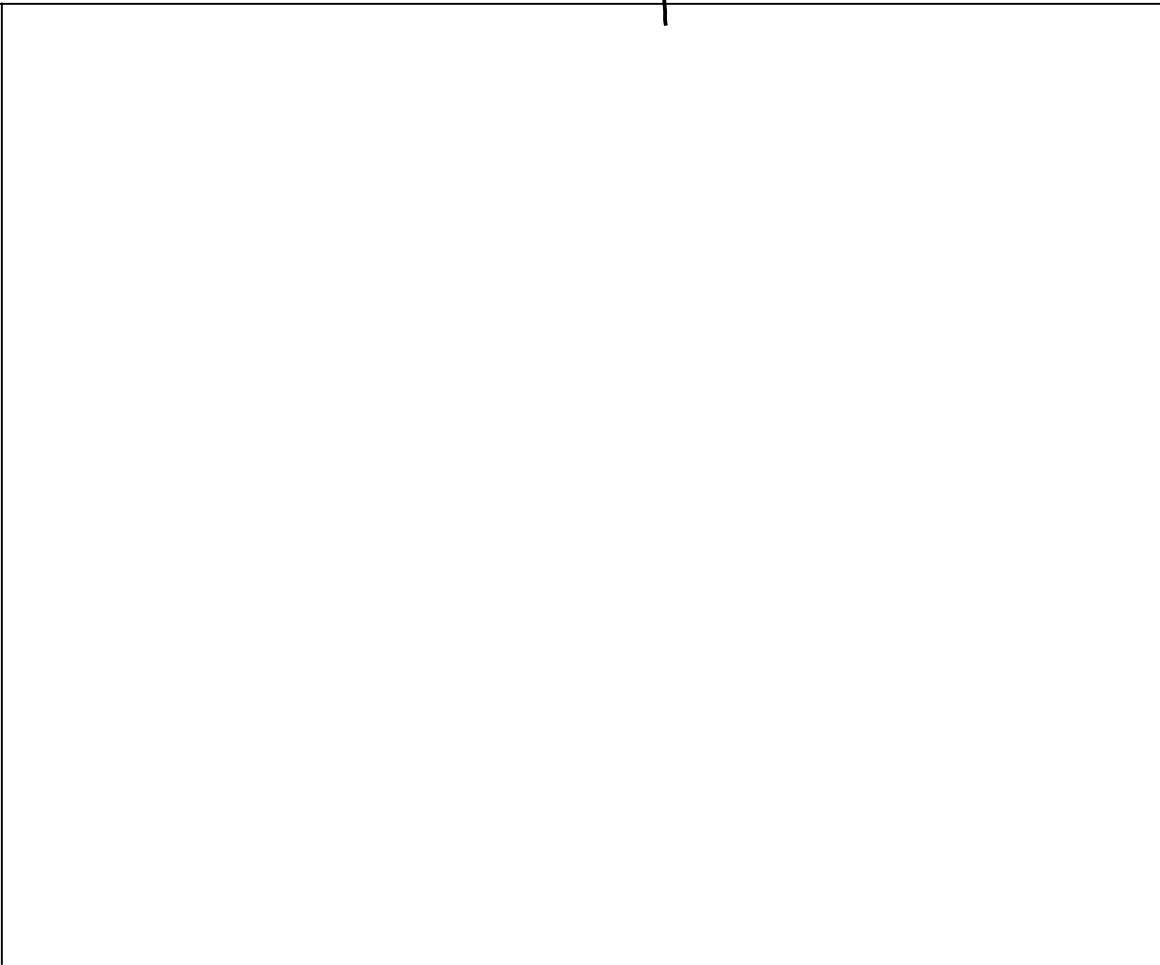
 MARLSTONE

 SILTY SHALE

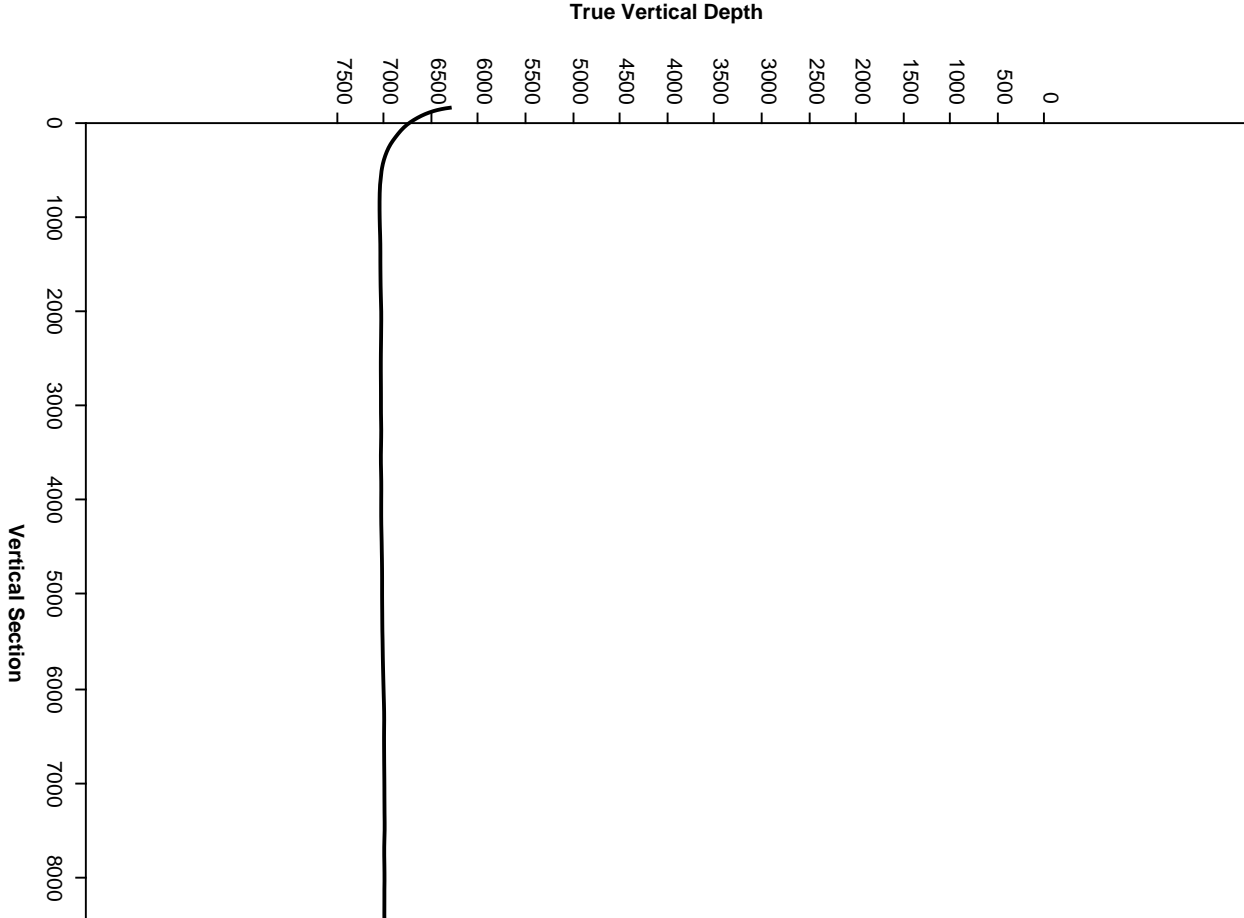
Northing

1
2-1000-500

Survey Plan

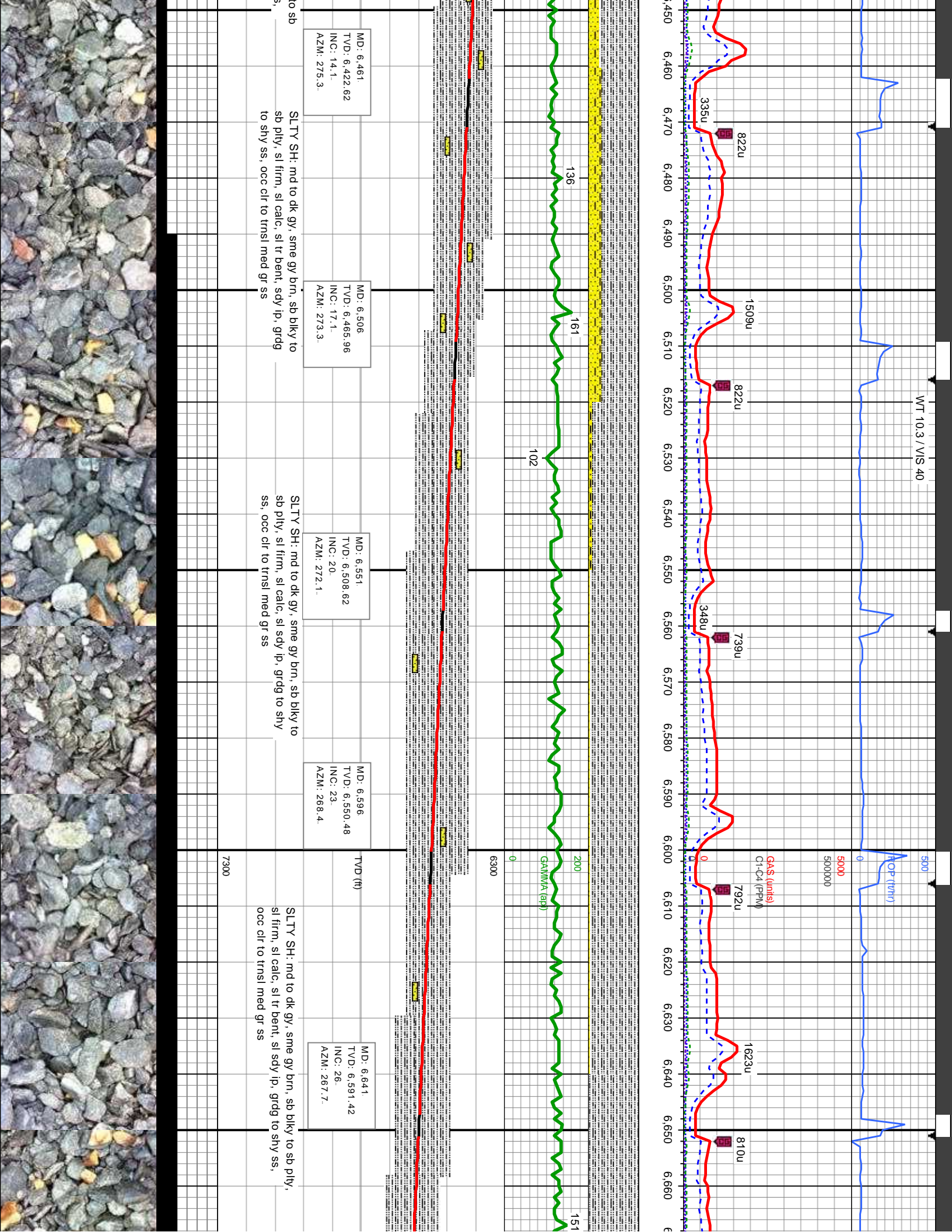


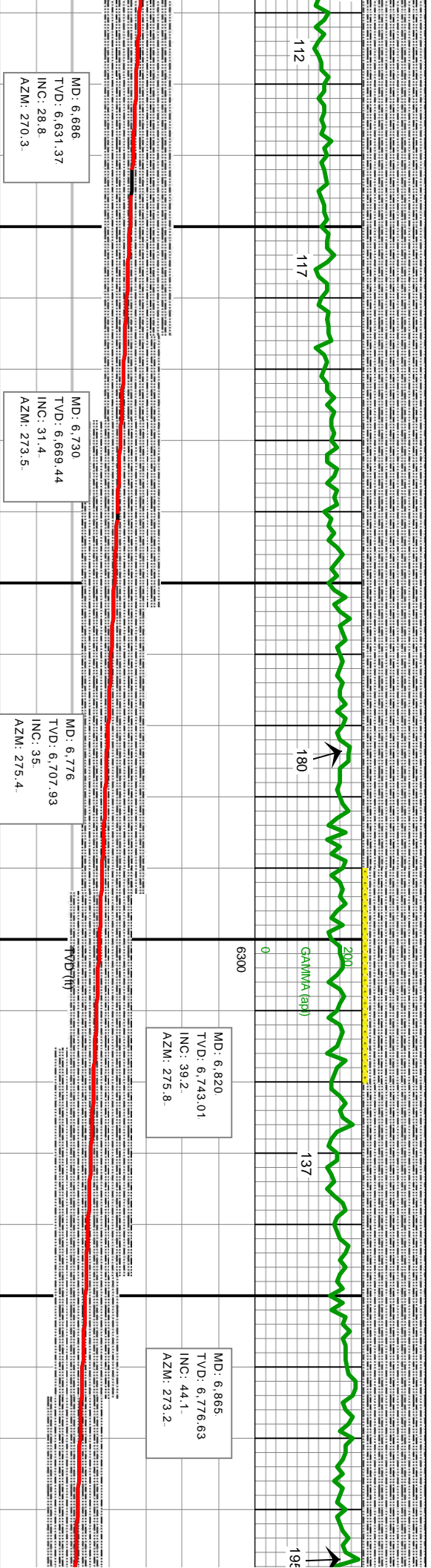
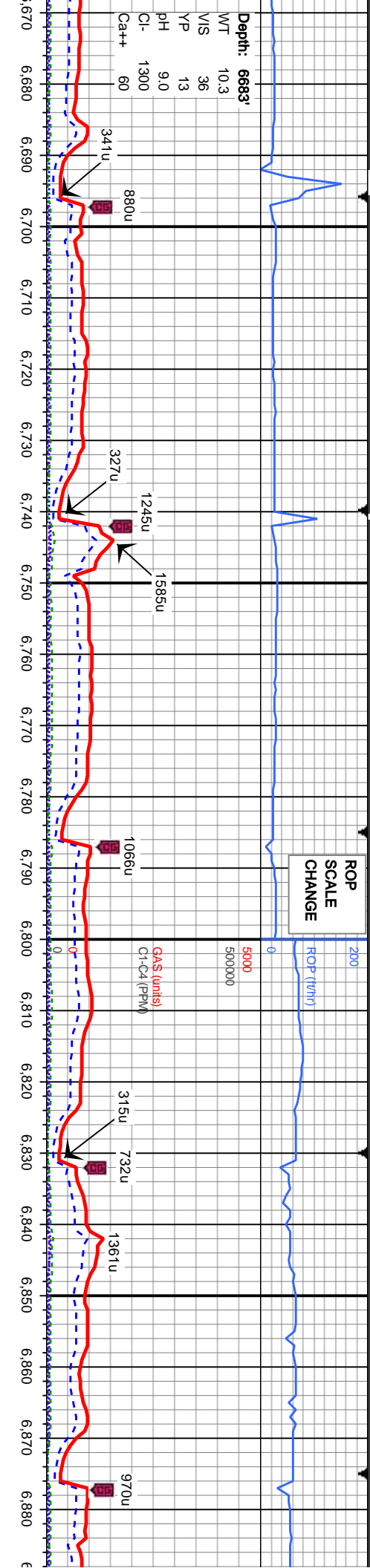
Survey Elevation



0006

1



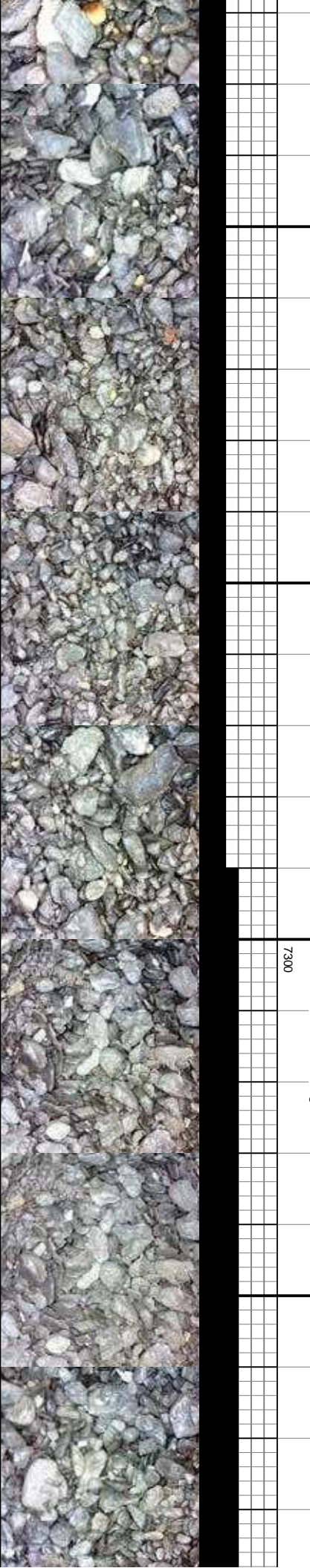


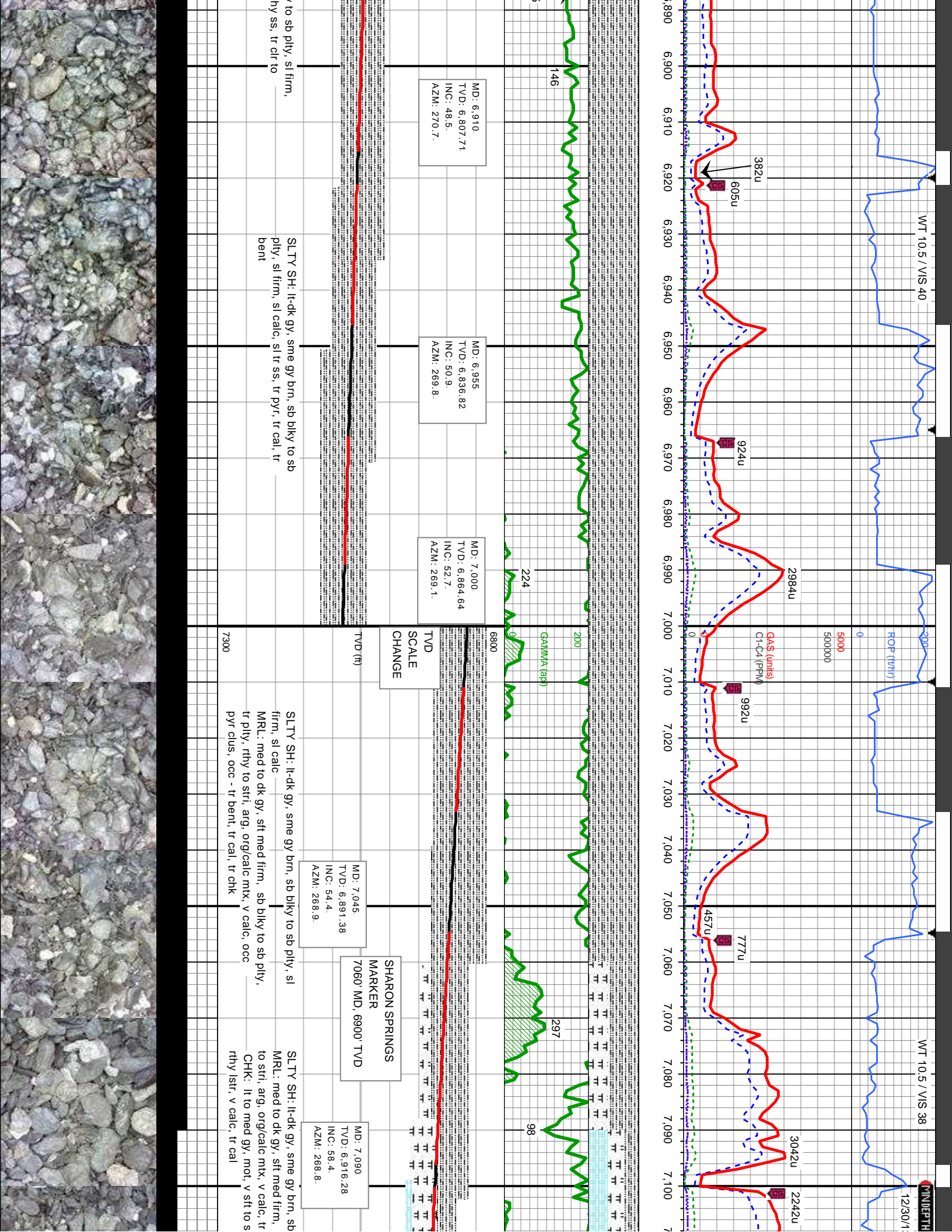
SLTY SH: md to dk gy, sme gy brn, sb blkly to sb plty, sl firm, sl calc, sl tr bent, sl sdy ip, grdg to shy ss, occ clr to trns med gr ss, tr ss

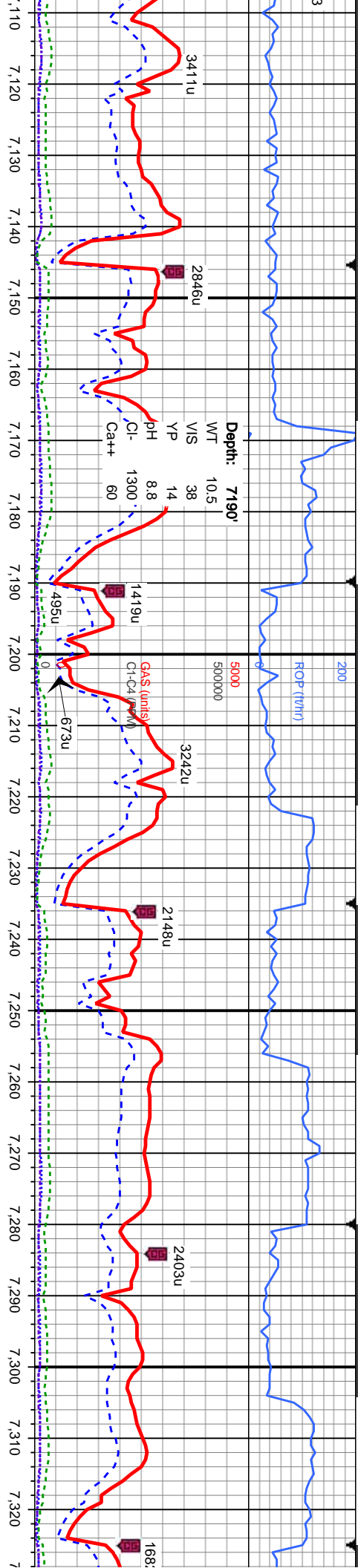
SLTY SH: md to dk gy, sme gy brn, sb blkly to sb plty, sl firm, sl calc, sl tr bent, sl sdy ip, grdg to shy ss, occ clr to trns med gr ss, mod ss, tr cal

SLTY SH: md to dk gy, sme gy brn, sb blkly to sb plty, sl firm, sl calc, sl tr bent, sl sdy ip, grdg to bent, sl sdy ip, grdg to shy ss, occ clr to trns med gr ss

SLTY SH: dk gy, sme gy brn, sb blkly to sb plty, sl calc, sl tr bent, sl sdy ip, grdg to trns med gr ss







NIORARA A CHALK
LOGGER TOP
7135' MD, 6938' TVD

MD: 7,135
TVD: 6,938.05
INC: 63.7
AZM: 268.4

MD: 7,180
TVD: 6,956.57
INC: 67.7
AZM: 269.3

MD: 7,225
TVD: 6,972.54
INC: 70.7
AZM: 270.7

MD: 7,270
TVD: 6,986.37
INC: 73.5
AZM: 269.6

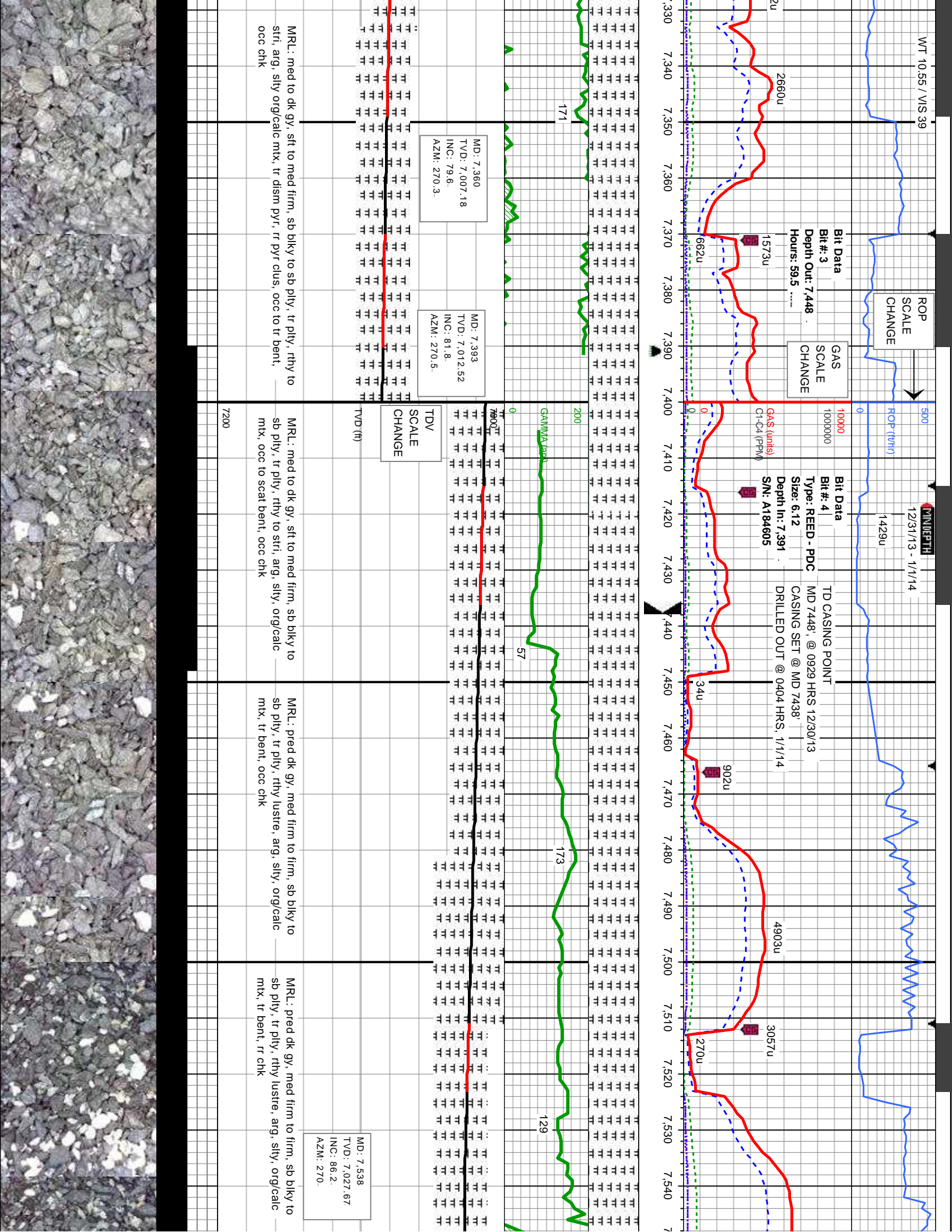
MD: 7,315
TVD: 6,997.94
INC: 76.7
AZM: 270.2

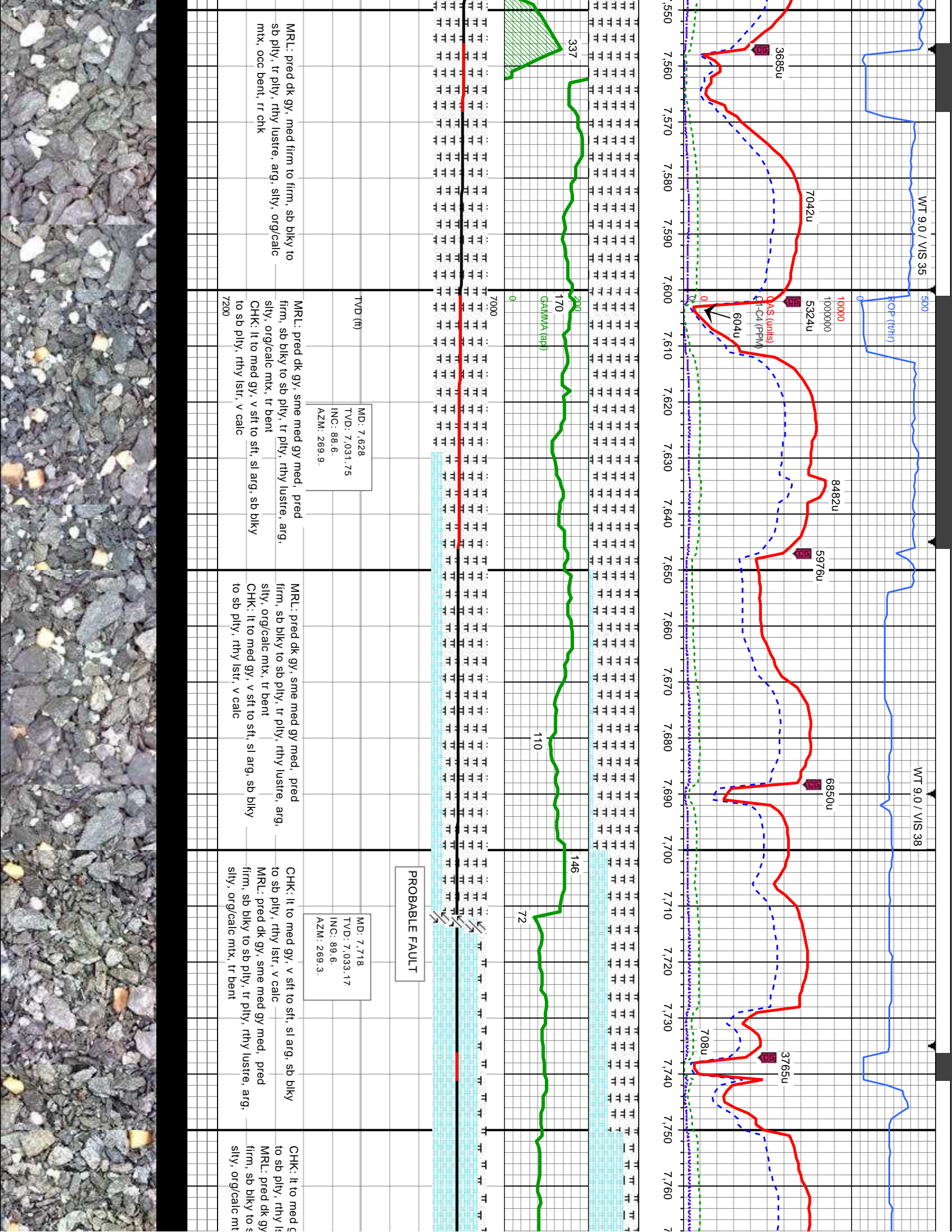
MR: med to dk gy, sft med firm, sb blkly to sb ply, tr
ply, rthy to strf, arg, org/calc mt, v calc, tr pyr clus, occ
fms, occ bent
CHK: lt to med gy, mot, v sft to sl firm, sl arg, sb blkly to
sb ply, rthy lstr, v calc, tr cal, tr pyr, decr in slty sh

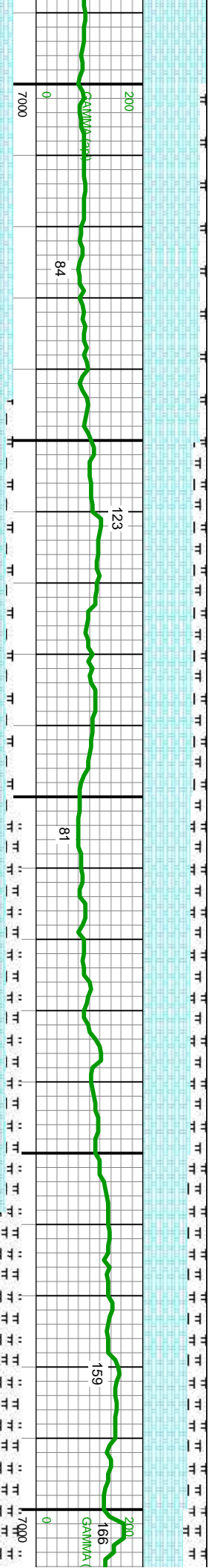
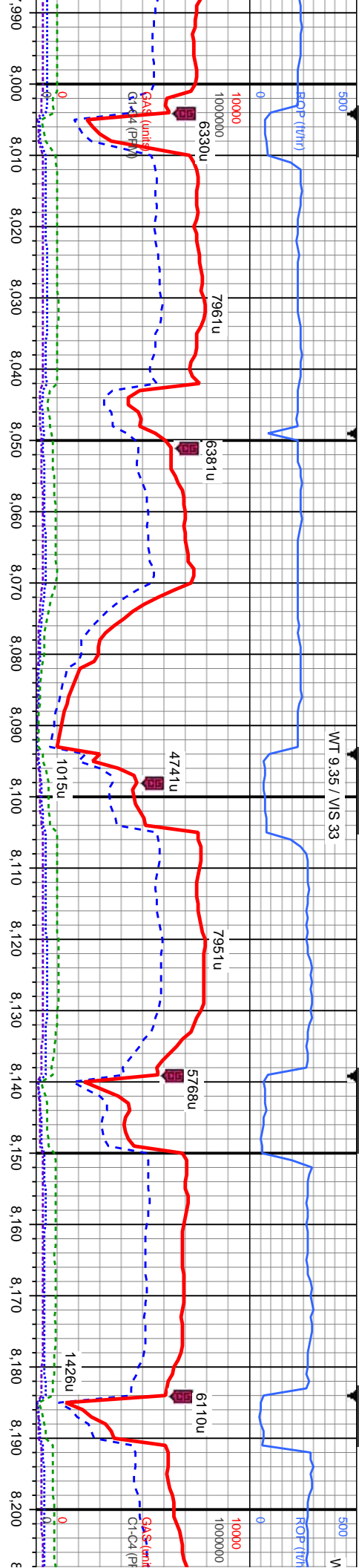
CHK: lt to med gy, v sft to strf, sl arg, sb blkly to
sb ply, rthy lstr, v calc
MR: med to dk gy, sft to med firm, sb blkly to
sb ply, tr ply, rthy to strf, arg, org/calc mt,
occ bent

MR: med to dk gy, sft to med firm, sb blkly to sb ply, tr ply, rthy to
strf, arg, org/calc mt, occ disj pyr, occ bent
CHK: lt to med gy, v sft to strf, sl arg, sb blkly to sb ply, rthy lstr, v calc



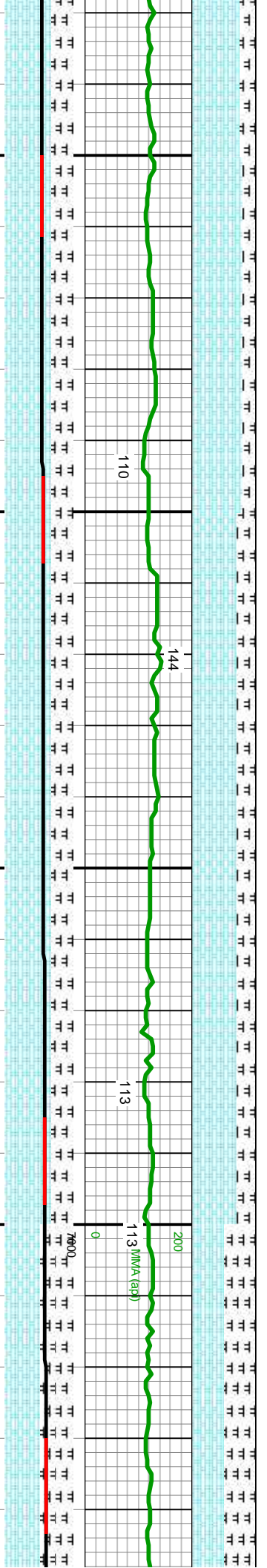
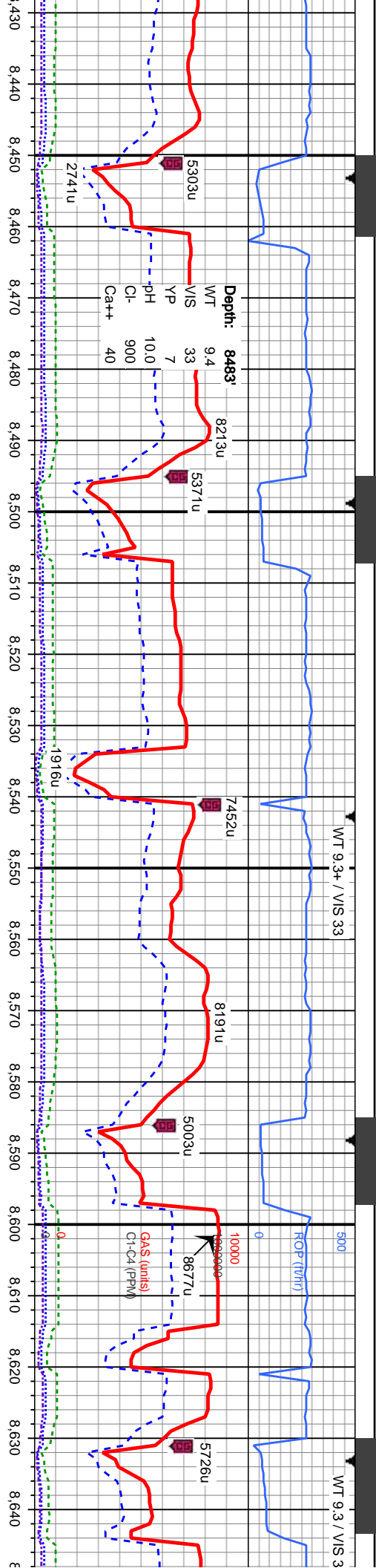






biky to	CHK: pred lt gy, v sft to sft, sl arg, sb biky to sb pily, rthy lstr, v calc MRL: med to dk gy, pred firm, sb biky to sb pily, tr pily, rthy lustr, arg, silty, org/calc mtx, occ fos frag, tr bent	MD: 8.077 TVD: 7.027.29 INC: 91.7. AZM: 266.8.	CHK: lt to med gy, v sft to sft, sl arg, sb biky to sb pily, rthy lstr, v calc MRL: med to dk gy, pred firm, sb biky to sb pily, tr pily, rthy to gt lstr, arg, silty, org/calc mtx, tr fos frag, tr pyr clus, tr bent	MD: 8.167 TVD: 7.025.17 INC: 91. AZM: 268.9.	CHK: lt to med gy, v sft to sft, sl arg, sb biky to sb pily, rthy lstr, v calc MRL: med to dk gy, pred firm, sb biky to sb pily, tr pily, rthy to gt lstr, arg, silty, org/calc mtx, tr fos frag, tr pyr clus, tr bent
	7200		7200		7200





MD: 8.436 TVD: 7.023.99 INC: 90.5 AZM: 274.8	MD: 8.526 TVD: 7.023.13 INC: 90.6 AZM: 273.02	MD: 8.616 TVD: 7.021.95 INC: 90.9 AZM: 274.59
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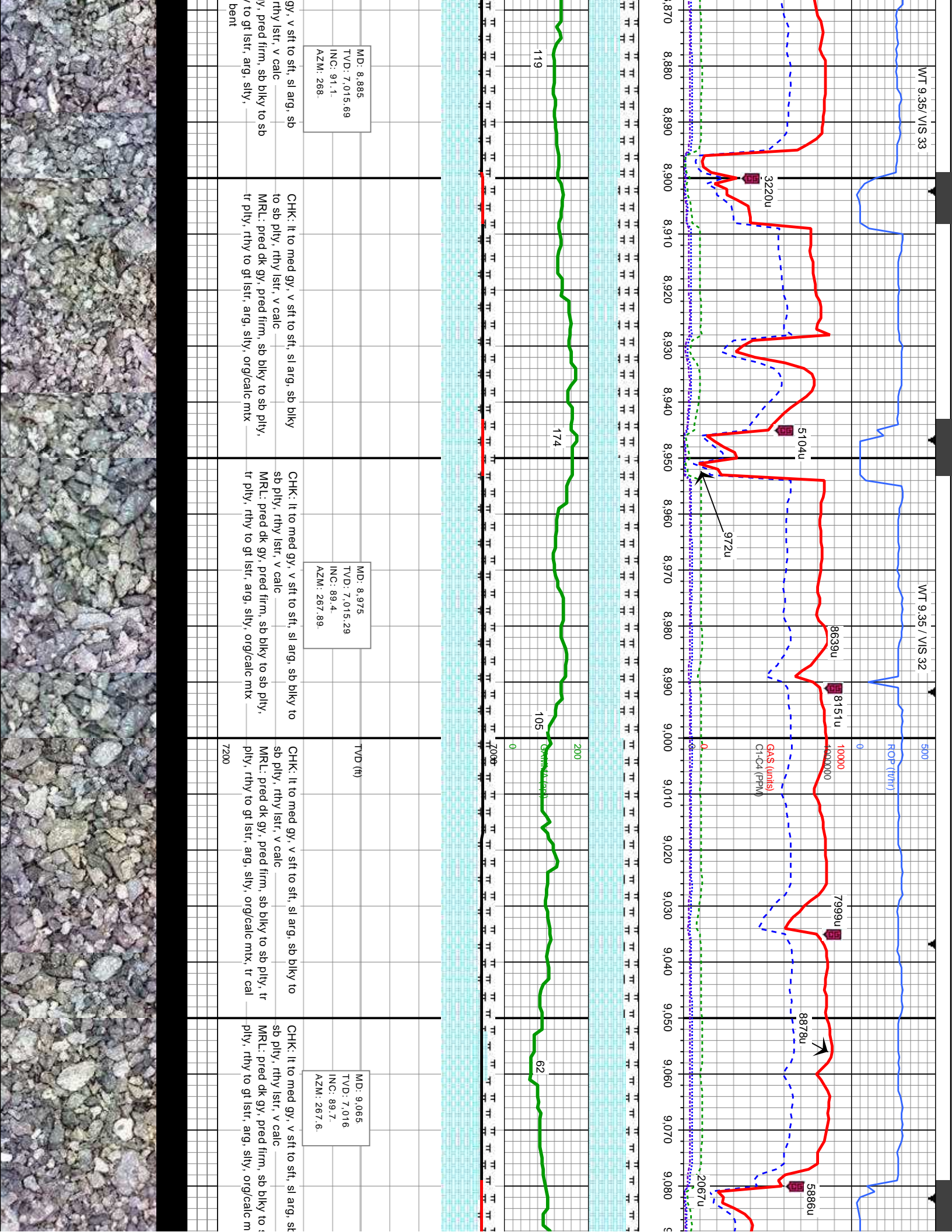
sfst, sl arg, sb biky
i, sb biky to sb plty,
tr plty, org/calc mtx, tr
bent

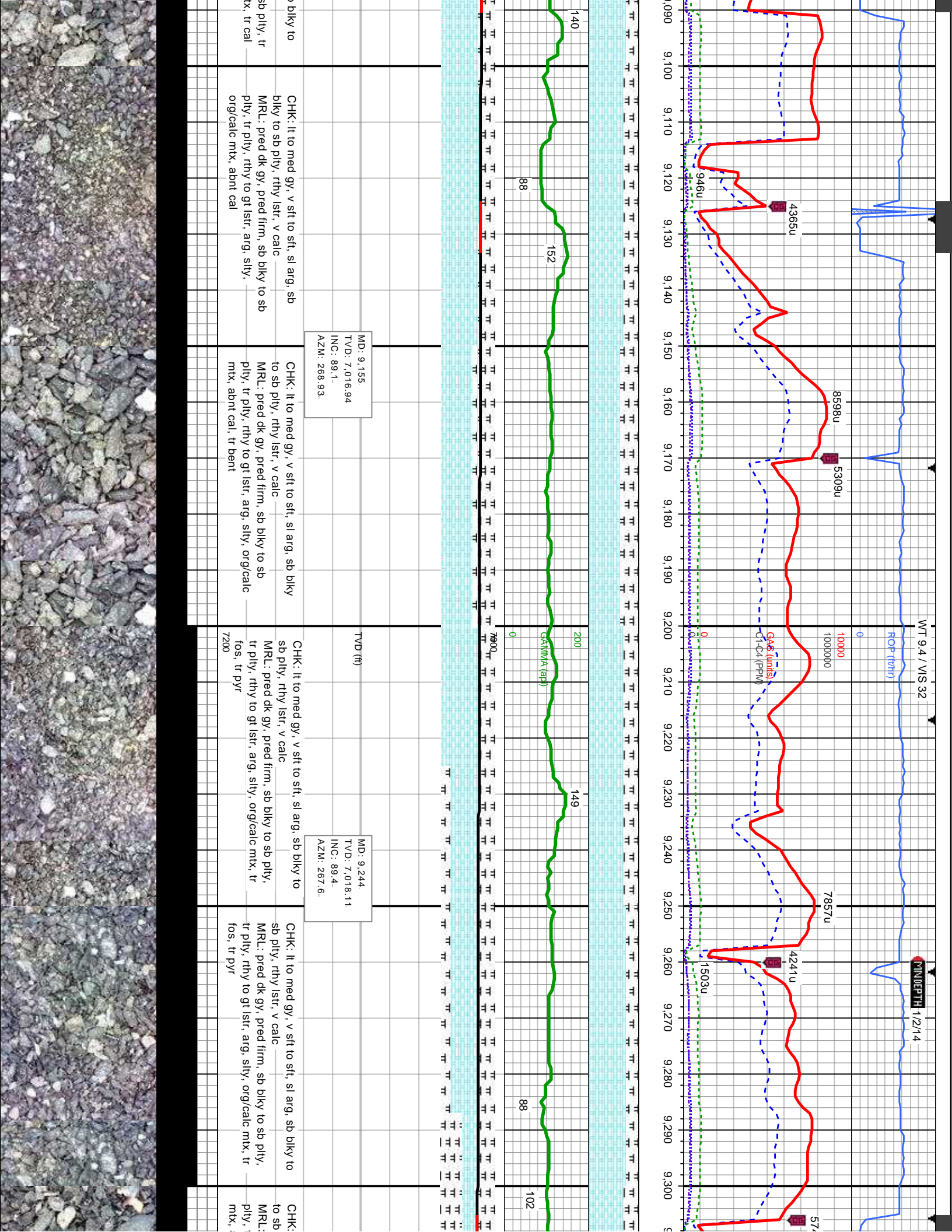
CHK: It to med gy, v sft to sft, sl arg, sb biky
to sb plty, rthy lstr, v calc
MRL: pred dk gy, pred firm, sb biky to sb plty,
tr plty, rthy to gt lstr, arg, silty, org/calc mtx, tr
bent

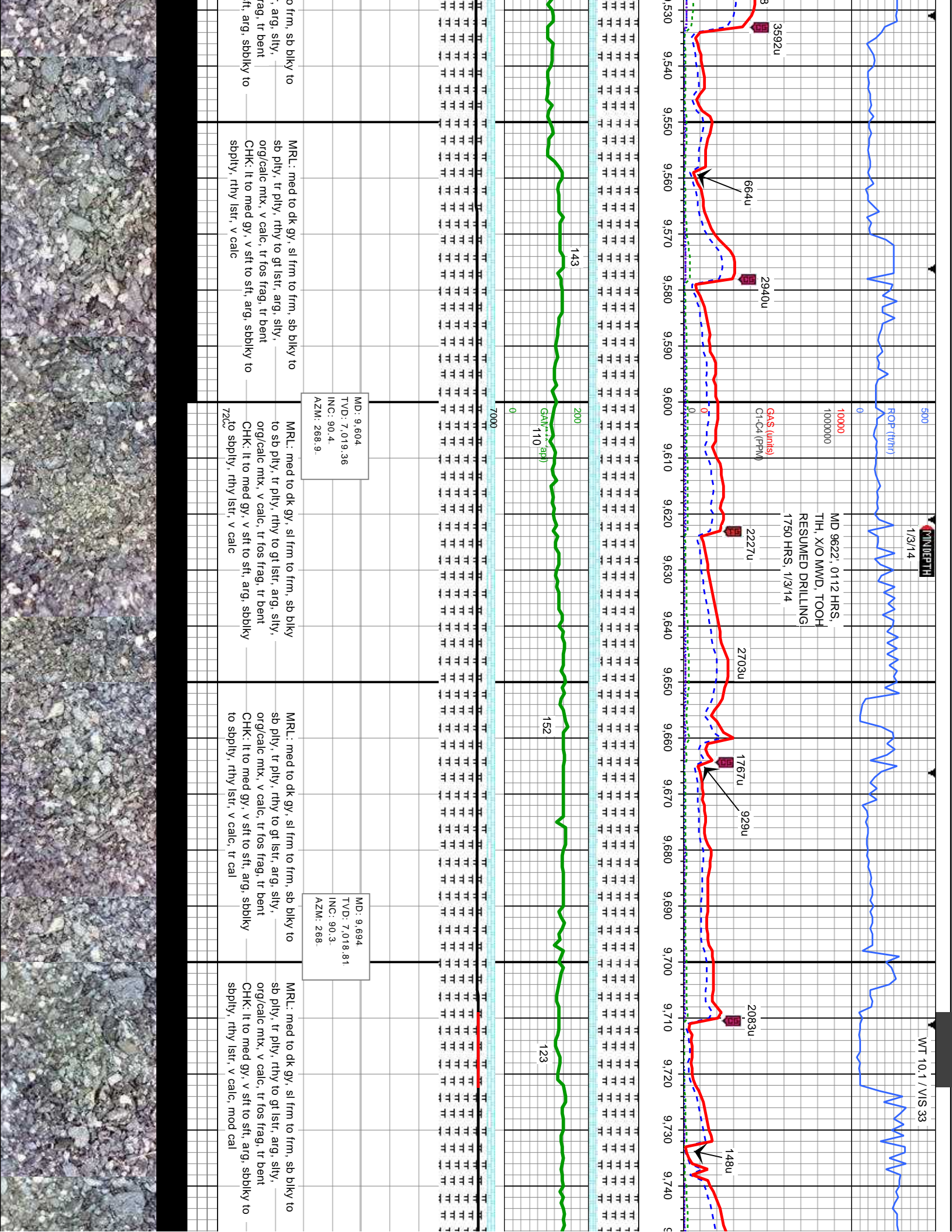
CHK: It to med gy, v sft to sft, sl arg, sb biky to
sb plty, rthy lstr, v calc
MRL: pred dk gy, pred firm, sb biky to sb plty,
tr plty, rthy to gt lstr, arg, silty, org/calc mtx, tr
bent, tr cal

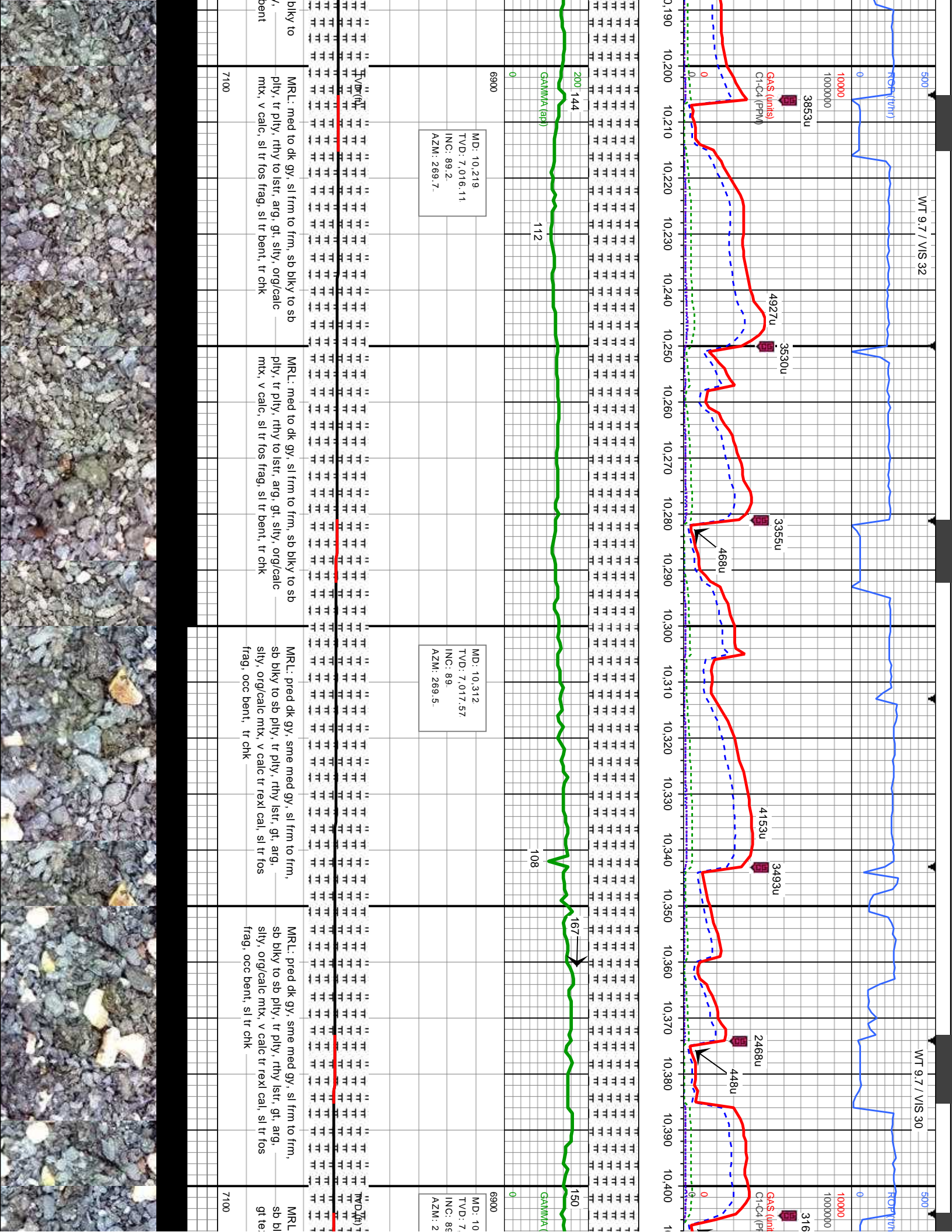
CHK: It to med gy, v sft to sft, sl arg, sb biky to
sb plty, rthy lstr, v calc
MRL: pred dk gy, pred firm, sb biky to sb plty, tr
plty, rthy to gt lstr, arg, silty, org/calc mtx, tr
bent, tr cal

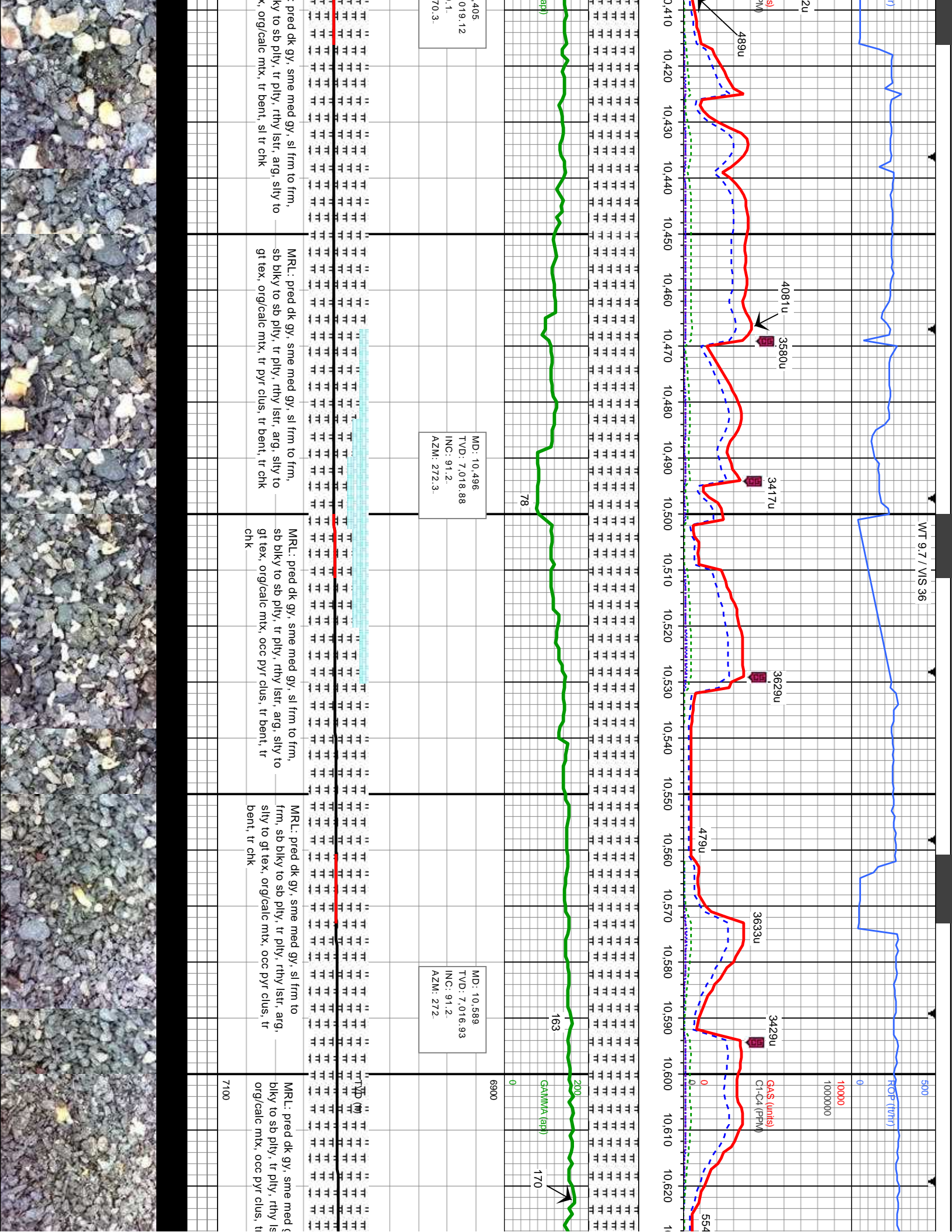


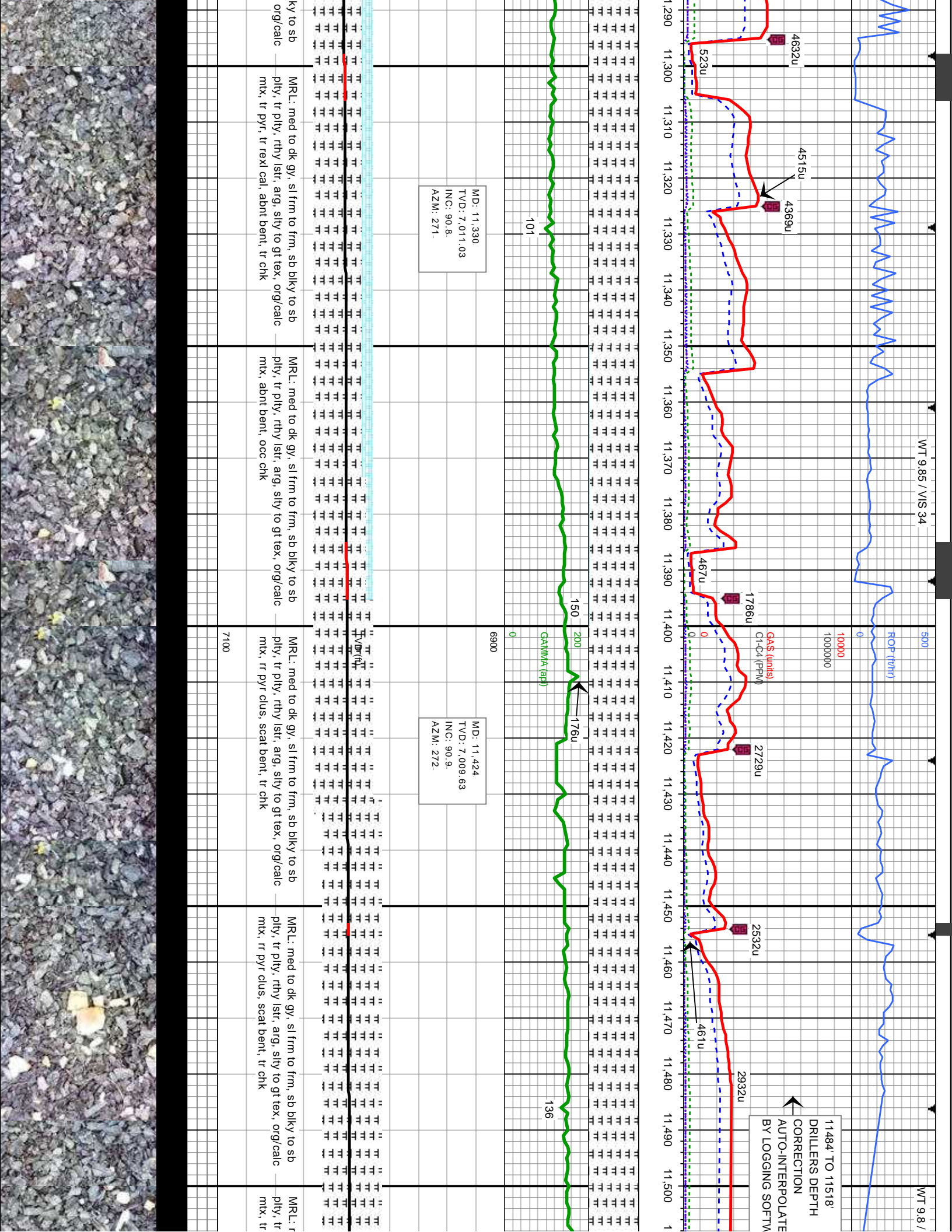












WT 9.85 / VIS 34

WT 9.8 /

ROP (ft/hr)

11484' TO 11518'
DRILLERS DEPTH
CORRECTION
AUTO-INTERPOLATE
BY LOGGING SOFTWARE

←

GA\$ (units)
C1-C4 (PPM)

2932u

2532u

2729u

1786u

467u

4369u

4515u

4632u

523u

461u

136

GAMMA (pp)

150

176u

101

MD: 11.330
TVD: 7.011.03
INC: 90.8
AZM: 271.

MD: 11.424
TVD: 7.009.63
INC: 90.9
AZM: 272.

ky to sb
oyg/calc
MRL: med to dk gy, sl frm to frm, sb blkly to sb pily, tr pily, rthy lsfr, arg, slty to gt tex, oyg/calc mx, tr pyr, tr rex cal, abnt bent, tr chk

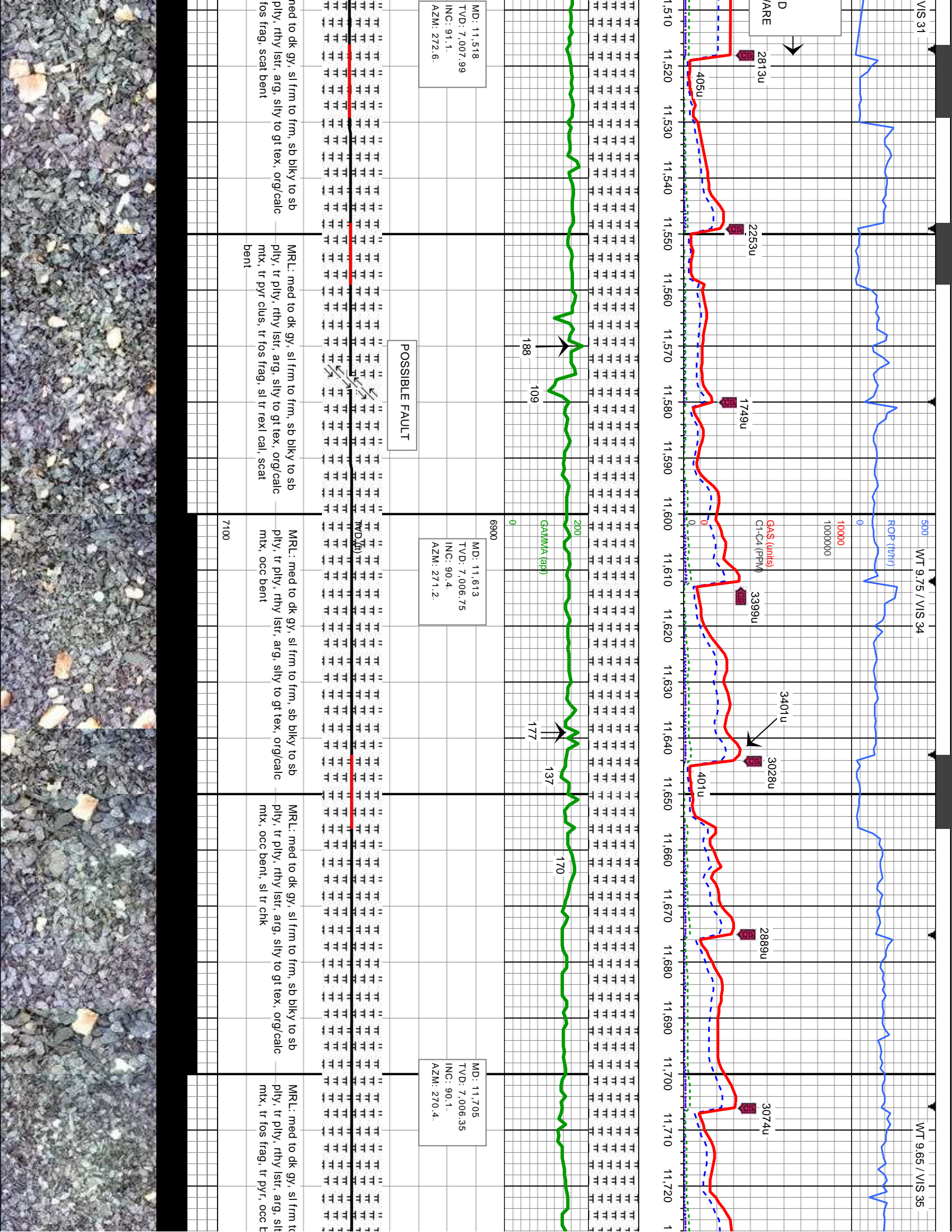
MRL: med to dk gy, sl frm to frm, sb blkly to sb pily, tr pily, rthy lsfr, arg, slty to gt tex, oyg/calc mx, abnt bent, occ chk

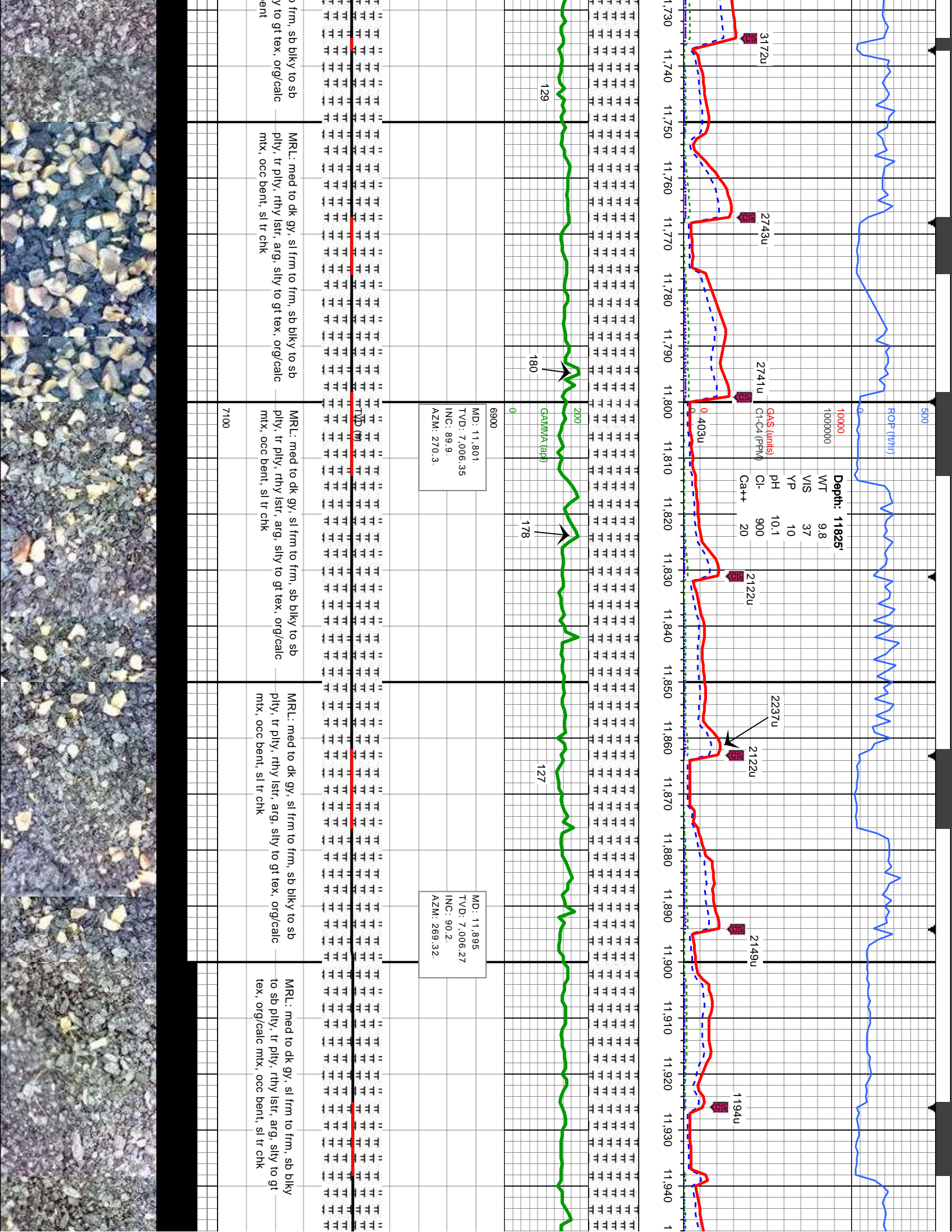
MRL: med to dk gy, sl frm to frm, sb blkly to sb pily, tr pily, rthy lsfr, arg, slty to gt tex, oyg/calc mx, tr pyr clus, scat bent, tr chk

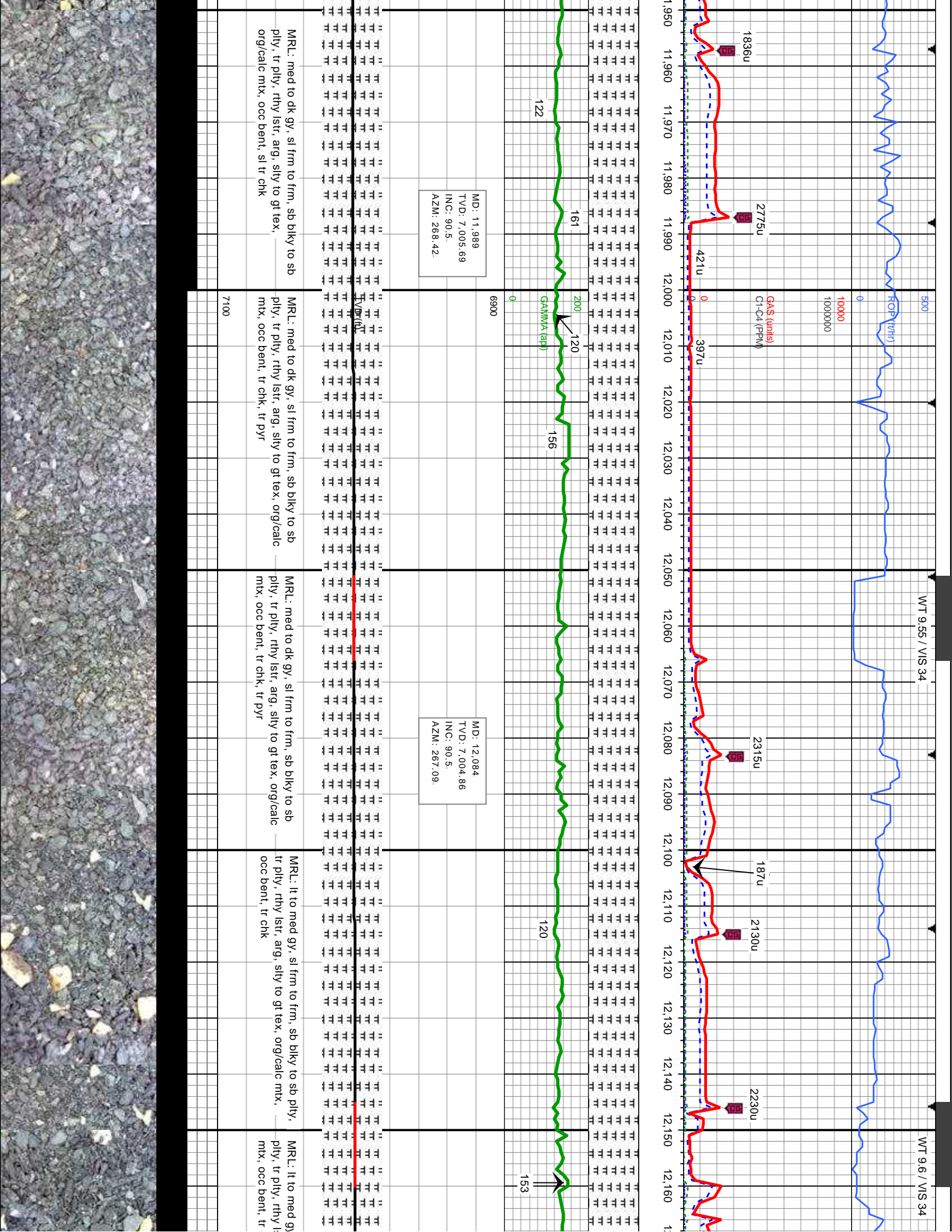
MRL: med to dk gy, sl frm to frm, sb blkly to sb pily, tr pily, rthy lsfr, arg, slty to gt tex, oyg/calc mx, tr pyr clus, scat bent, tr chk

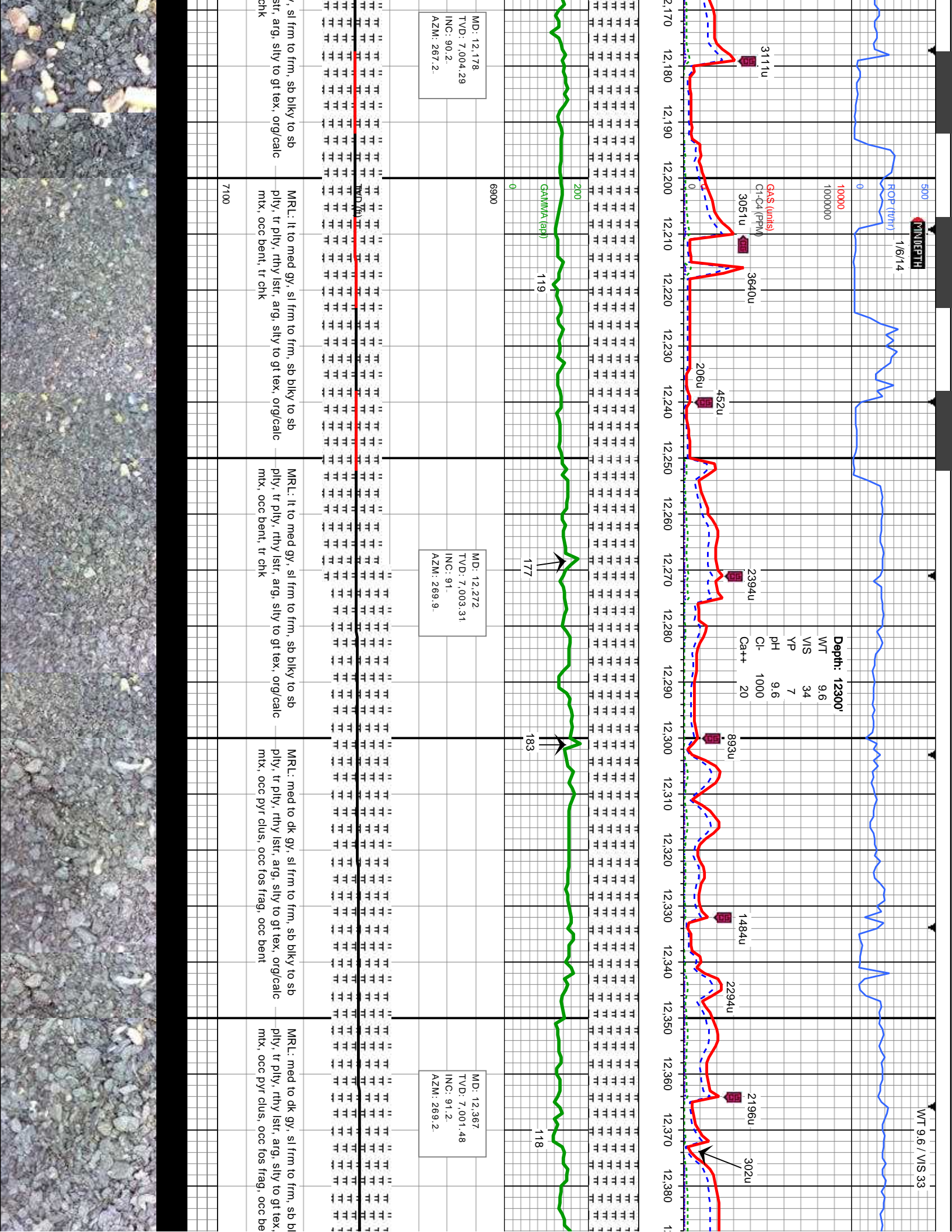
MRL: r
pily, tr
mx, tr

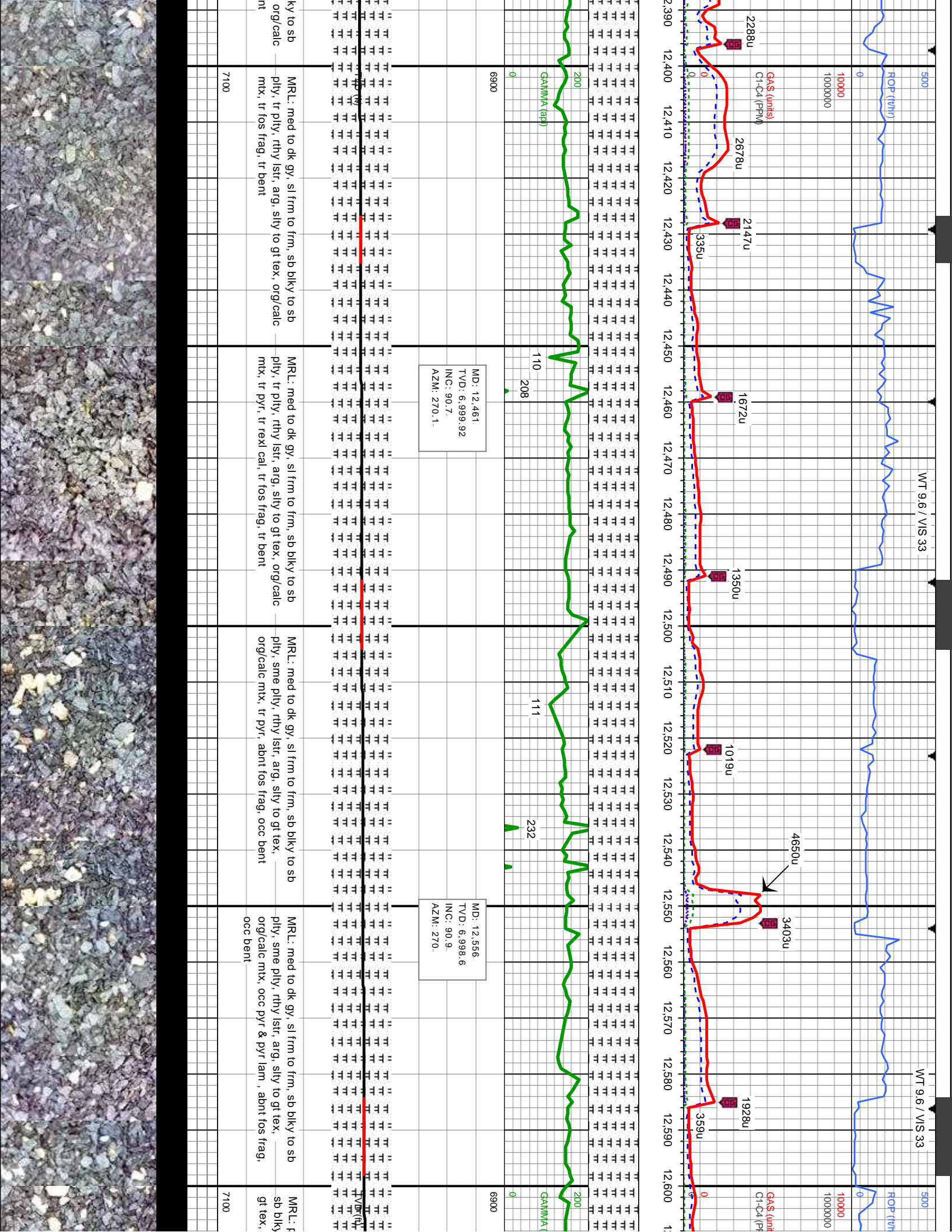
7100

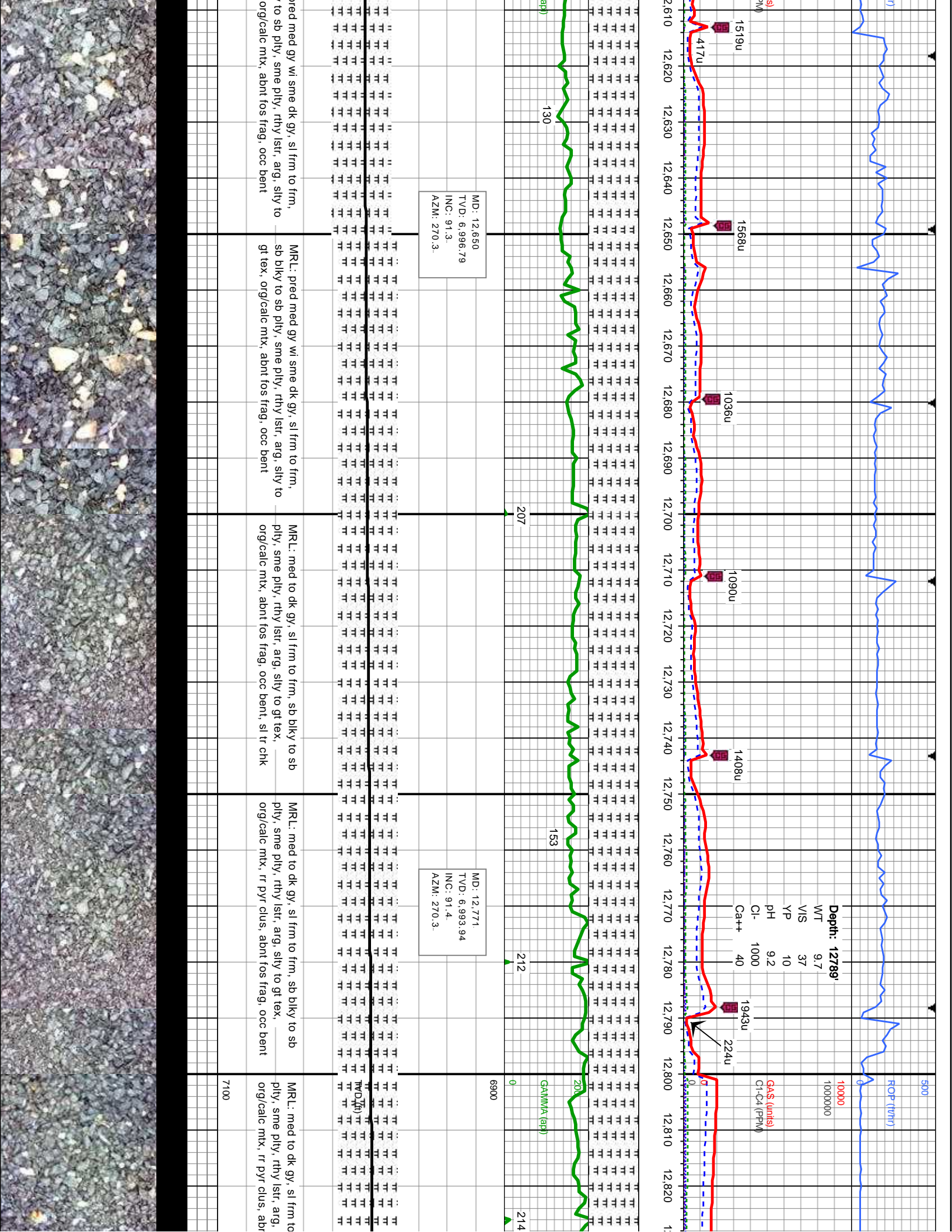


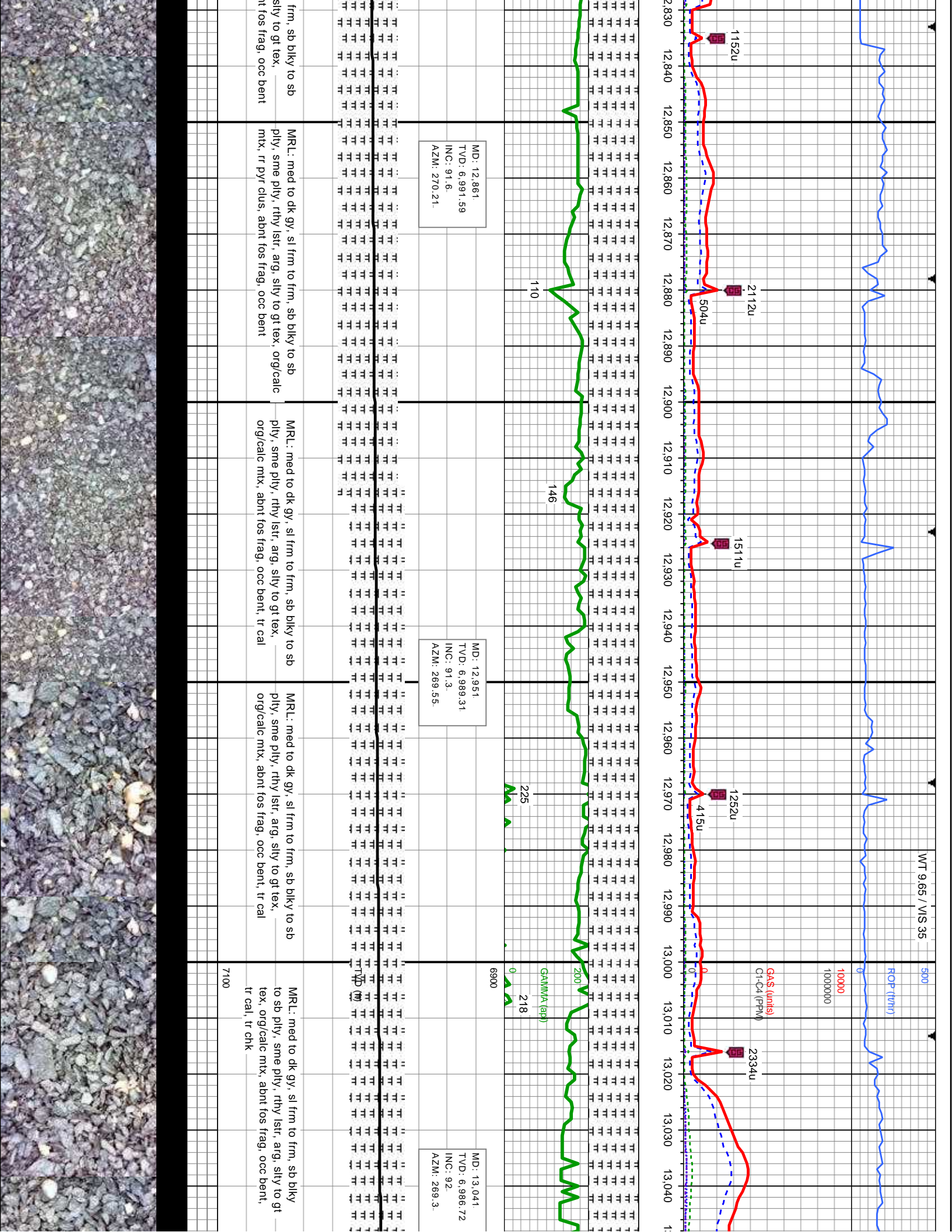


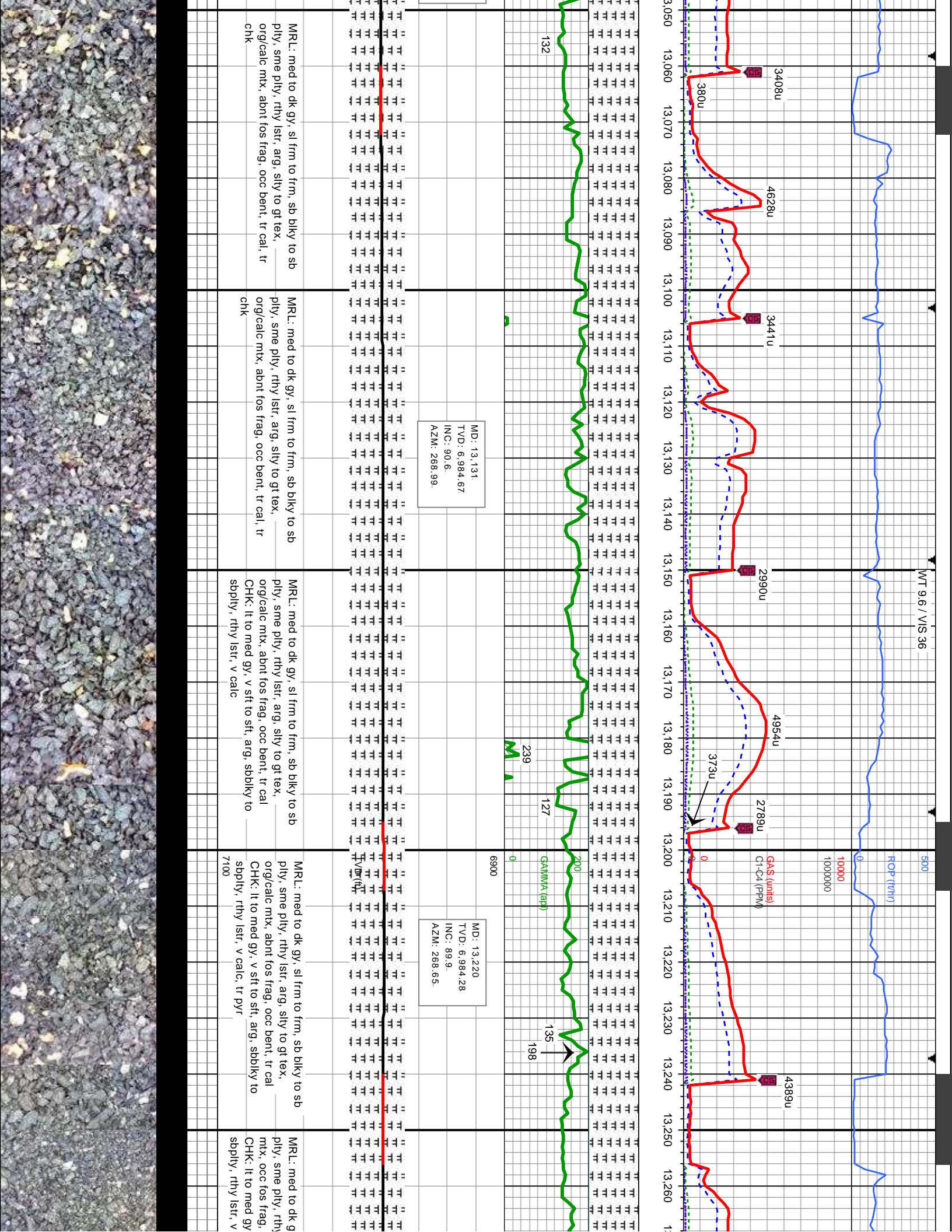












WT 9.65 / VIS 35
1/7/14

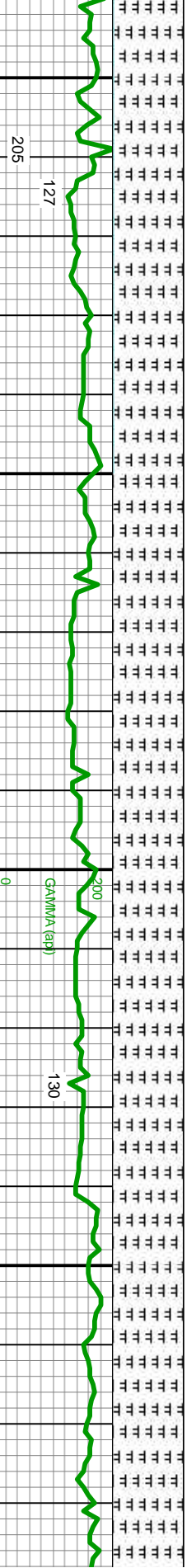
ROP (ft/hr)

Depth: 13416'
WT 9.5
VIS 37
YP 10
pH 8.7
Cl- 1000
Ca++ 60

GAS (units)
Cl-C4 (PPM)

2524u
363u
1919u
1337u
375u
2806u
1431u
2267u
312u

13,270 13,280 13,290 13,300 13,310 13,320 13,330 13,340 13,350 13,360 13,370 13,380 13,390 13,400 13,410 13,420 13,430 13,440 13,450 13,460 13,470 13,480



MD: 13.310
TVD: 6.985.15
INC: 89.
AZM: 270.5.

MD: 13.400
TVD: 6.985.77
INC: 90.2
AZM: 271.1.

MD: 1
TVD: 6.985.77
INC: 90.2
AZM: 271.1.

Y, sl frm to frm, sb blkly to sb
lstr, arg, silty to gt tex. org/calc
occ bent, tr cal
v sft to sft, arg, sbblkly to
calc

MRL: med to dk gy, sl frm to frm, sb blkly to sb
ply, sme ply, rthy lstr, arg, silty to gt tex.
org/calc mtx, abnt fos frag, occ bent, tr cal
CHK: it to med gy, v sft to sft, arg, sbblkly to
sbbply, rthy lstr, v calc

MRL: med to dk gy, sl frm to frm, sb blkly to sb
ply, sme ply, rthy lstr, arg, silty to gt tex, org/calc
mtx, tr rex cal, abnt fos frag, occ bent, tr chk

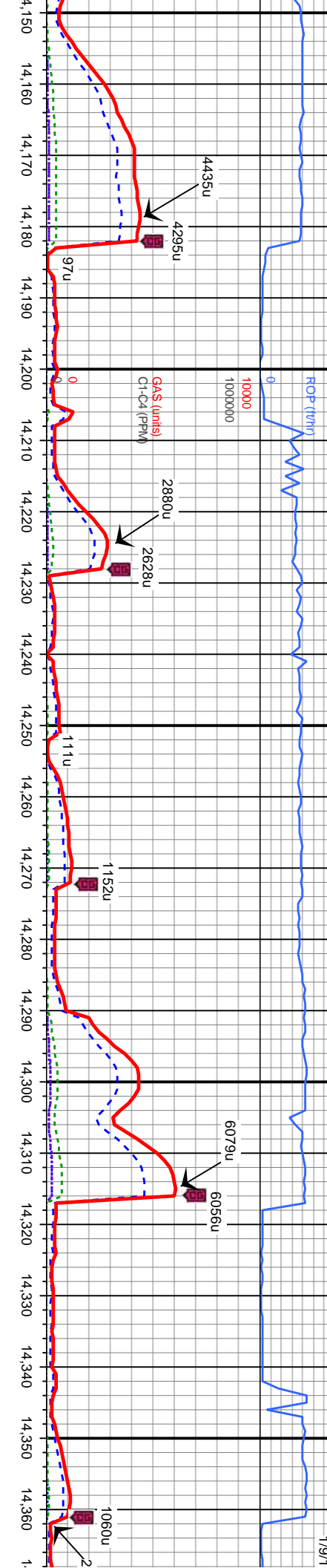
MRL: med to dk gy, sl frm to frm, sb blkly to sb
ply, sme ply, rthy lstr, arg, silty to gt tex, org/calc
mtx, tr rex cal, abnt fos frag, occ bent, tr chk

MRL: pred med gy wi sme dk gy, sl frm
blkly to sb ply, sme ply, rthy lstr, silty to
arg, org/calc mtx, tr rex cal, abnt fos fr
bent, tr chk



WT 9.8 / VIS 35

WT 9.8 / VIS 35



MD: 14,209
TVD: 6,980.6
INC: 90.2
AZM: 269.77.

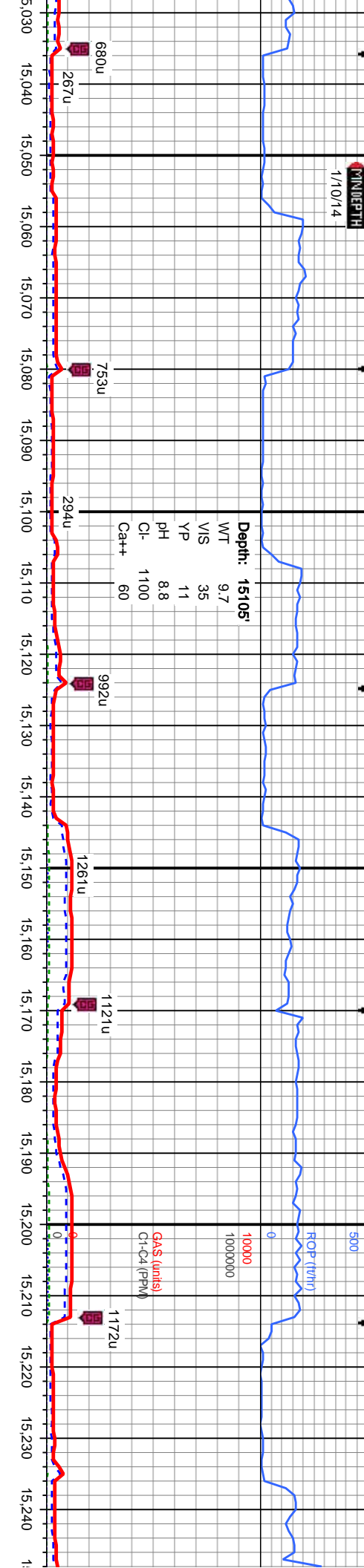
MD: 14,299
TVD: 6,979.5
INC: 91.2
AZM: 271.95.

MRL: med to dk gy, sl frm to frm, sb blkly to sb
ply, rthy lstr, slty to gt tex, org/calc mtx, arg, occ
rexl cal and cal incl, abnt fos frag, scat bent
CHK: It to med gy, slt to sl frm, sbblkly, sme
sbply, rthy lstr, slty to mot tex, arg, abnt cal incl,
v calc

MRL: med to dk gy, sl frm to frm, sb blkly to sb
ply, rthy lstr, slty to gt tex, org/calc mtx, arg, occ
rexl cal and cal incl, abnt fos frag, scat bent
CHK: It to med gy, slt to sl frm, sbblkly, sme
sbply, rthy lstr, slty to mot tex, arg, abnt cal incl,
v calc

MRL: med to dk gy, sl frm to frm, sb blkly to sb
ply, rthy lstr, slty to gt tex, org/calc mtx, arg, occ
rexl cal and cal incl, abnt fos frag, scat bent
CHK: It to med gy, slt to sl frm, sbblkly, sme
sbply, rthy lstr, slty to mot tex, arg, abnt cal incl,
v calc





MD: 15.107
TVD: 6.982.06
INC: 90.3
AZM: 268.9.

MD: 15.197
TVD: 6.982.14
INC: 89.6
AZM: 267.7.

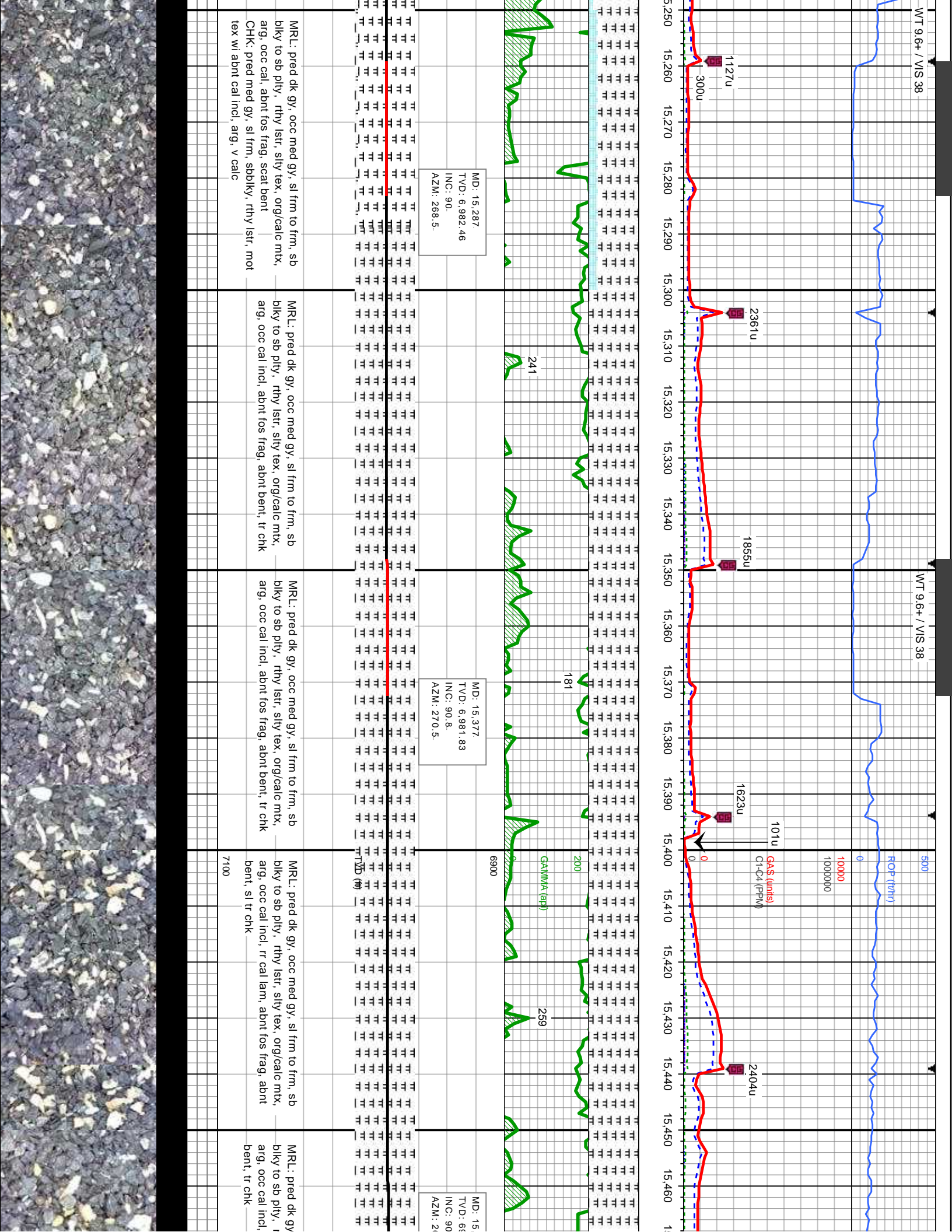
Y, sl frm to frm, sb
tex, org/calc mix,
a, tr rex cal, scat
frm, sbbly, rthy lstr,
stri tex, arg, v calc

MRL: pred dk gy, occ med gy, sl frm to frm, sb
bly to sb ply, rthy lstr, silty tex, org/calc mix,
arg, abnt fos frag, rr pyr clus, tr rex cal, scat
bent
CHK: lt to med gy, sft to sl frm, sbbly, rthy lstr,
stri tex, arg, v calc

MRL: pred dk gy, occ med gy, sl frm to frm, sb
bly to sb ply, rthy lstr, silty tex, org/calc mix,
arg, abnt fos frag, scat bent
CHK: lt to med gy, sft to sl frm, sbbly, rthy lstr,
mot to stri tex, arg, v calc

MRL: pred dk gy, occ med gy sl, frm to frm, sb
bly to sb ply, rthy lstr, silty tex, org/calc mix,
arg, abnt fos frag, scat bent, v sl tr chk
CHK: pred med gy, sl frm, sbbly, rthy lstr, mot
tex w/ abnt cal incl, arg, v calc





WT 9.7 / VIS 39

Depth: 15489'

WT

VIS

YP

pH

Cl-

Ca++

2710u

3471u

1203u

288u

933u

1138u

1068u

275u

ROP (t/n)

10000

1000000

GA\$ (units)

C1-C4 (PPM)

0

0

0

0

0

0

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MD: 15647
TVD: 6980.65
INC: 90.1
AZM: 268.91

MD: 15557
TVD: 6980.96
INC: 90.3
AZM: 269.8

MD: 467
TVD: 81.2
INC: 55.87

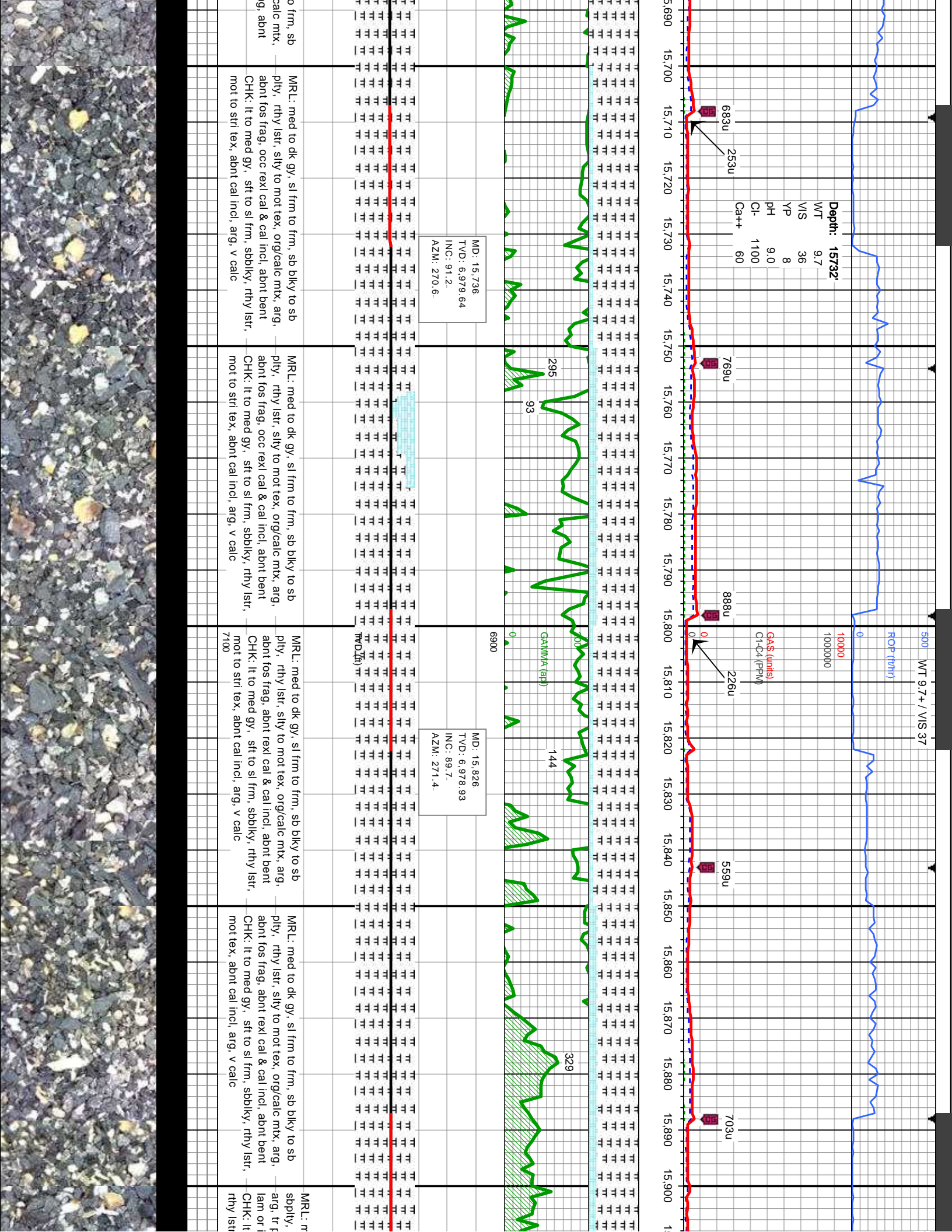
MRL: pred dk gy, occ med gy, sl frm to frm, blkly to sb plty, rthy lst, silty tex, org/calc arg, occ cal incl, tr cal lam, occ fos fra bent, tr chk

MRL: pred dk gy, occ med gy, sl frm to frm, sb blkly to sb plty, rthy lst, silty tex, org/calc mx, arg, abnt cal incl, tr cal lam, tr fos frag, abnt bent, tr pyr, tr chk

MRL: pred dk gy, occ med gy, sl frm to frm, sb blkly to sb plty, rthy lst, silty tex, org/calc mx, arg, occ cal incl, tr cal lam, occ fos frag, abnt bent, tr pyr, tr chk

MRL: pred dk gy, occ med gy, sl frm to frm, sb blkly to sb plty, rthy lst, silty tex, org/calc mx, arg, occ cal incl, tr cal lam, occ fos frag, abnt bent, tr pyr, tr chk

MRL: pred dk gy, sl frm to frm, sb blkly to sb plty, rthy lst, silty tex, org/calc mx, arg, occ cal incl, tr cal lam, occ fos frag, abnt bent, tr pyr, tr chk

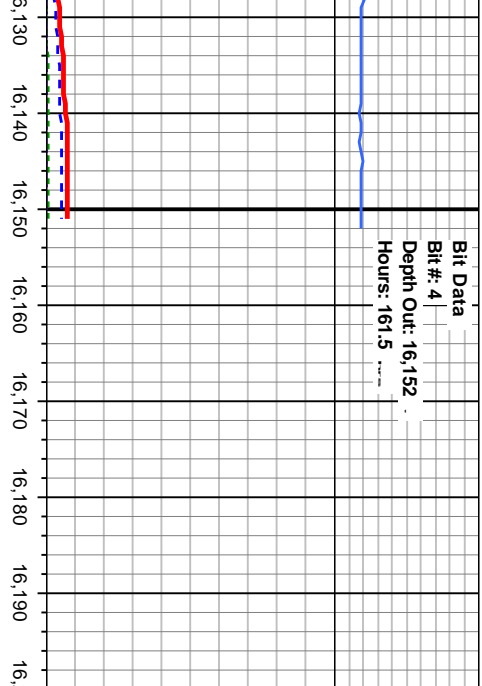




PROJECTION 7

MRL: med to dk gy, occ blk,
sbbly to sbbly, rthy lstr, s
mx, arg, abnt fos frag, abnt
tr pyr, tr chk

Bit Data
Bit #: 4
Depth Out: 16,152
Hours: 161.5



MD: 16152'
TVD: 6977.46'
Inc: 90.6°
Azim: 267.99°

TD: 16152' MD
@ 1755 hrs, 1/12/14

THANK YOU FOR CHOOSING
COLUMBINE LOGGING, INC.

sl firm to firm,
lly tex, org/calc
rex cal, abnt bent,

