



Scale: 5" / 100'
Measured Depth Log

Well Name Heartland C31-78-1HN

Location SESE SEC25 T4N R65W

State COLORADO

County WELD

Country USA

Rig Number PRECISION 828

API Number 05-123-39554

AFE # 200378

Region DENVER-JULESBURG BASIN

Field WATTENBERG

Spud Date 9/19/2014

Drilling Completed 9/25/2014

Surface Coordinates 282' FSL, 275' FEL

Lat/Long: 40.27673/-104.60332

Ground Elevation 4846'

K.B. Elevation 4862'

Logged Interval 630' To 11987'

Total Depth 11987'

Formation PIERRE (TEEPEE BUTTES, SHARON SPRINGS), NIOBRARA (SMOKY HILL A & B LAYERS)

Type of Drilling Fluid LSND

Company NOBLE ENERGY INC.

Address 1625 Broadway
Denver, CO 80202

Name EVAN HOWELL

Company NOBLE ENERGY INC.

Address 1625 Broadway
Denver, CO 80202

WELL SITE GEOLOGISTS: GAR

C.S.

LOG

GEO

CHALK

TT TT TT

Operator

Geologist

Other

Y L. MYERS
METZ

CONTINUES FROM FILE: Heartland C31-78-1HN Vert.mplot

LOGICAL SERVICES PROVIDED BY COLUMBINE LOGGING, INC.

Rock Types

MARL STONE

SILTY SHALE

Other Symbols

Engineering

- BIT
- CONNECTION (DOWN)
- CONNECTION GAS
- CASING
- MINDEPTH MIN DEPTH

Survey Plan

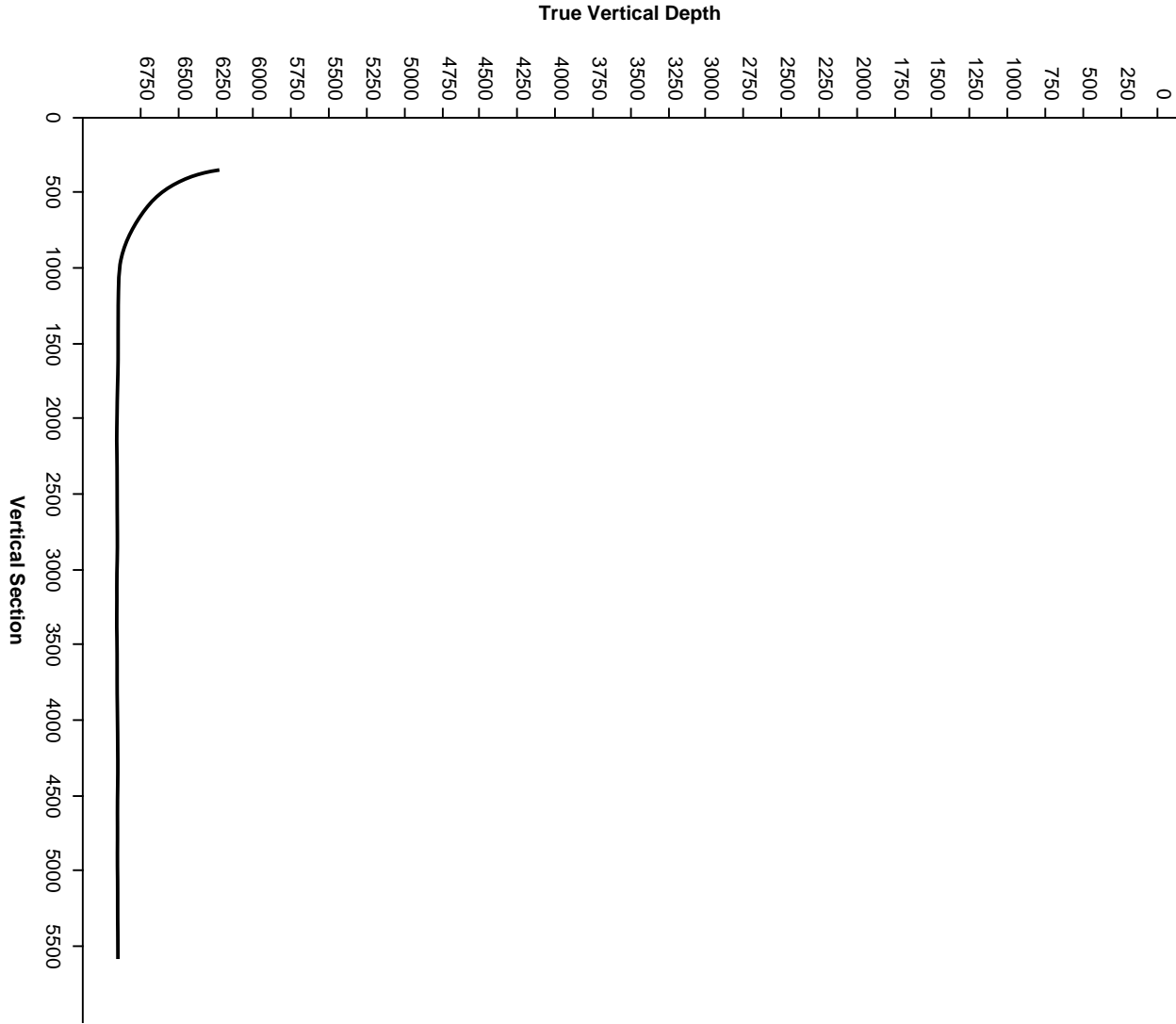
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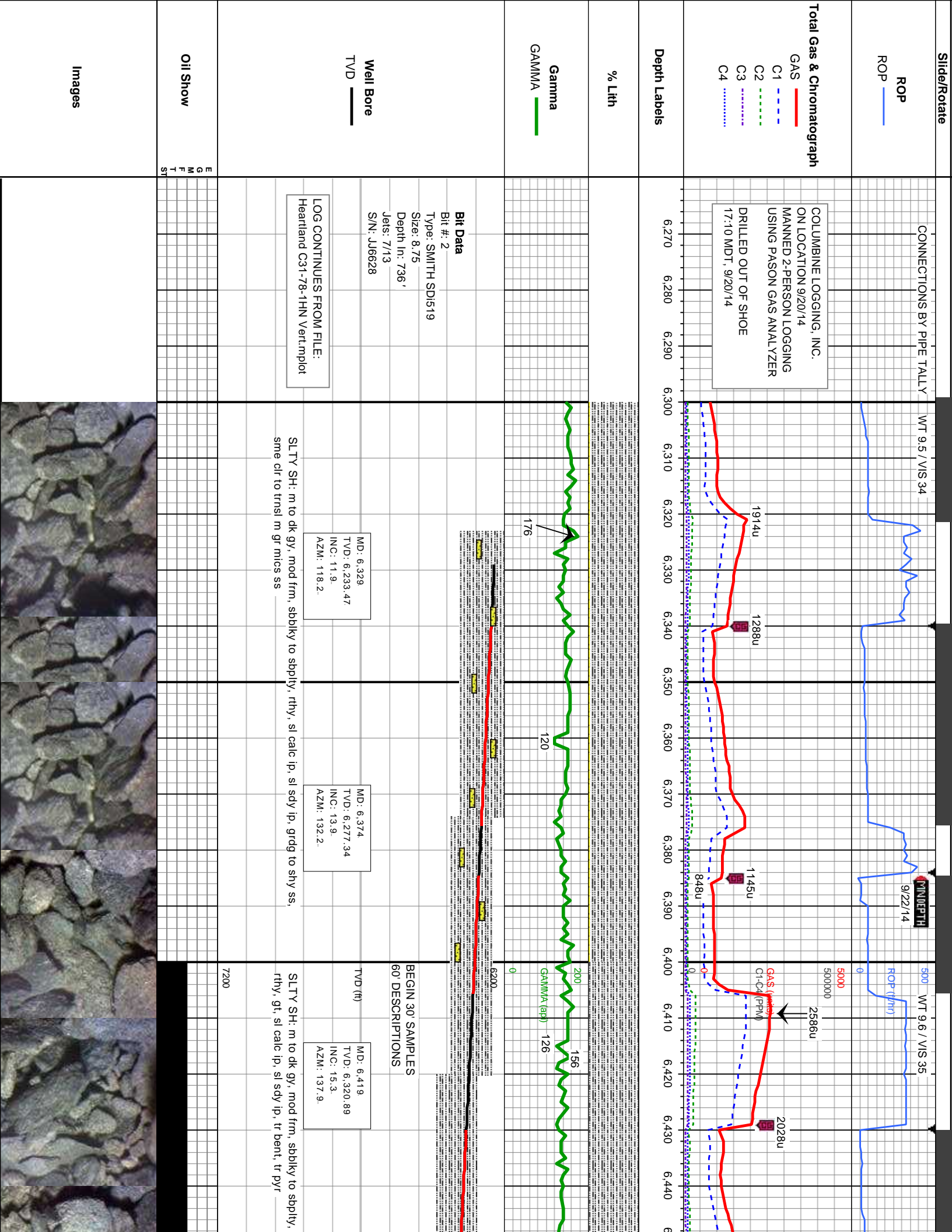
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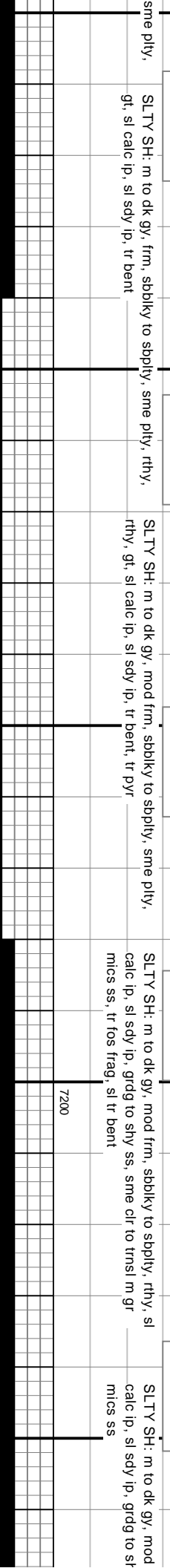
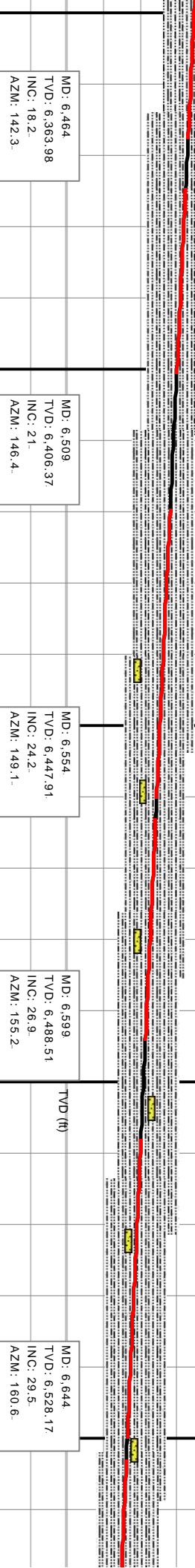
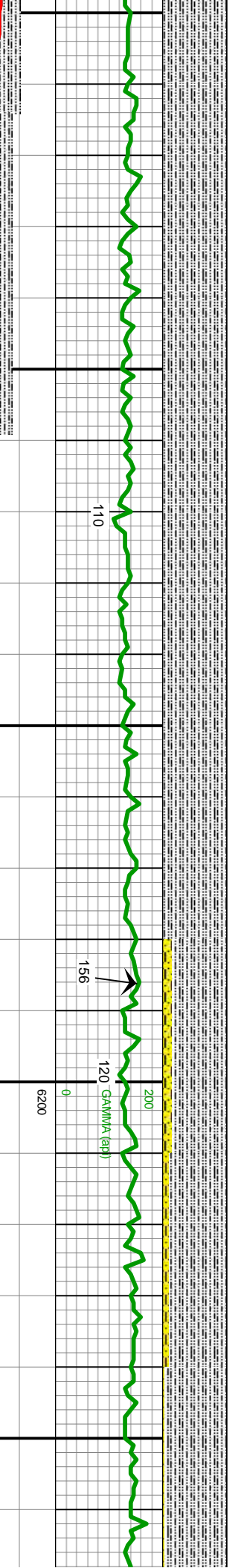
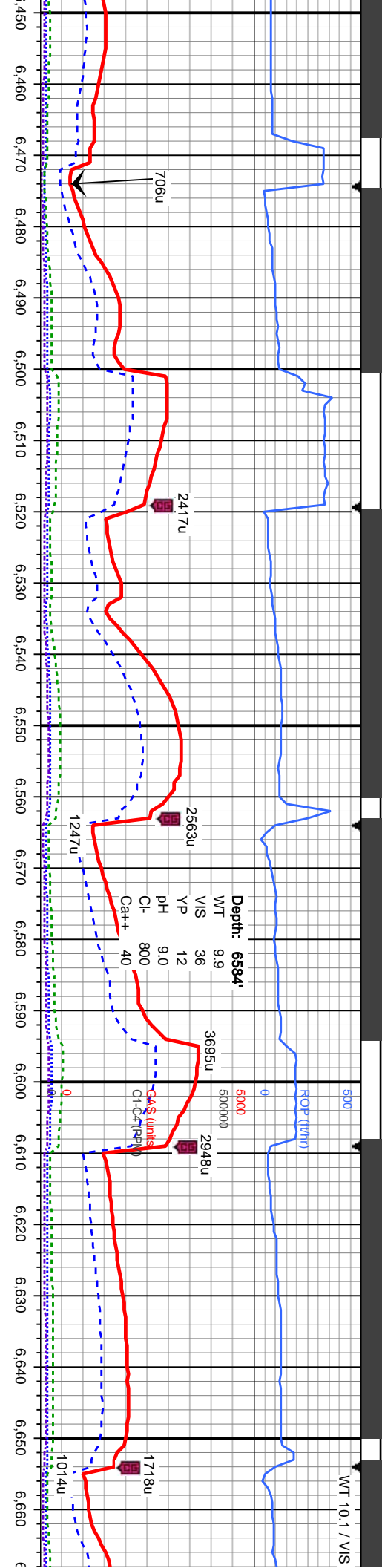
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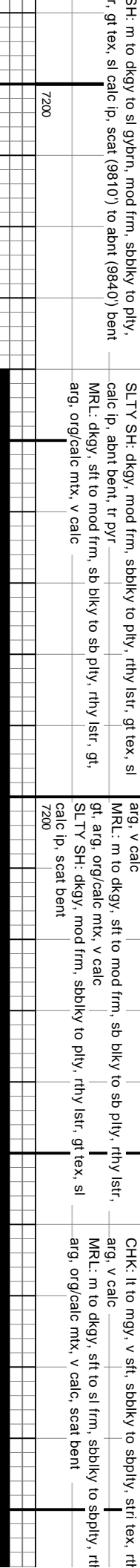
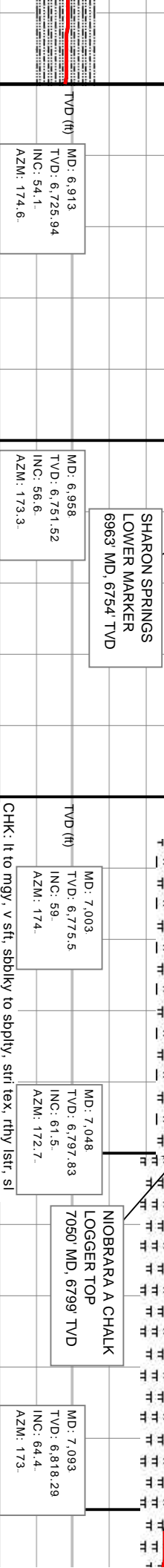
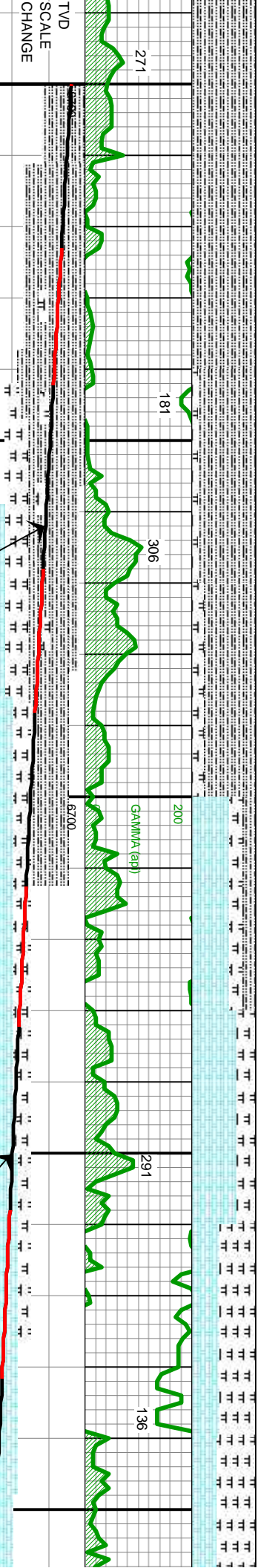
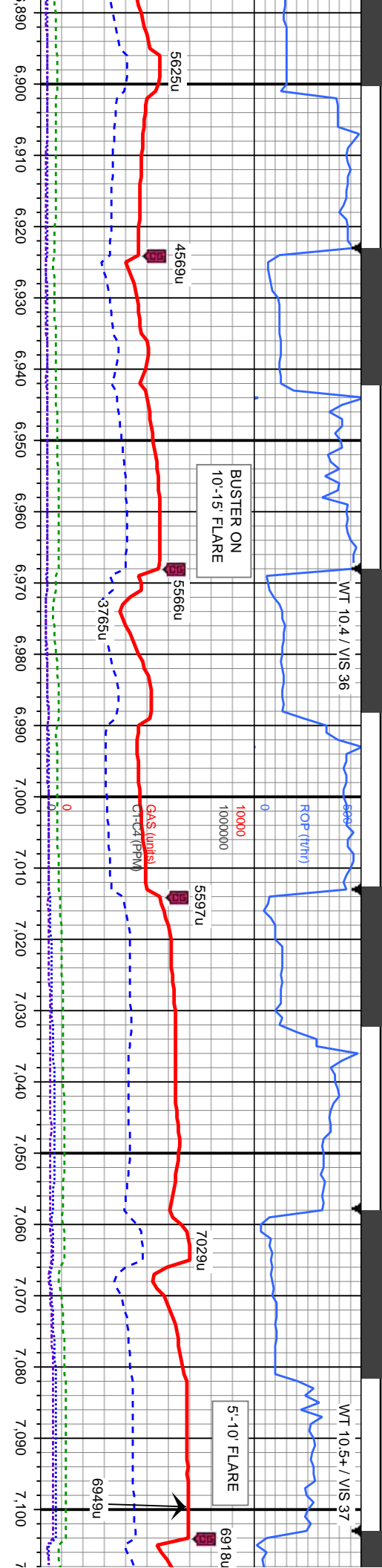
Easting

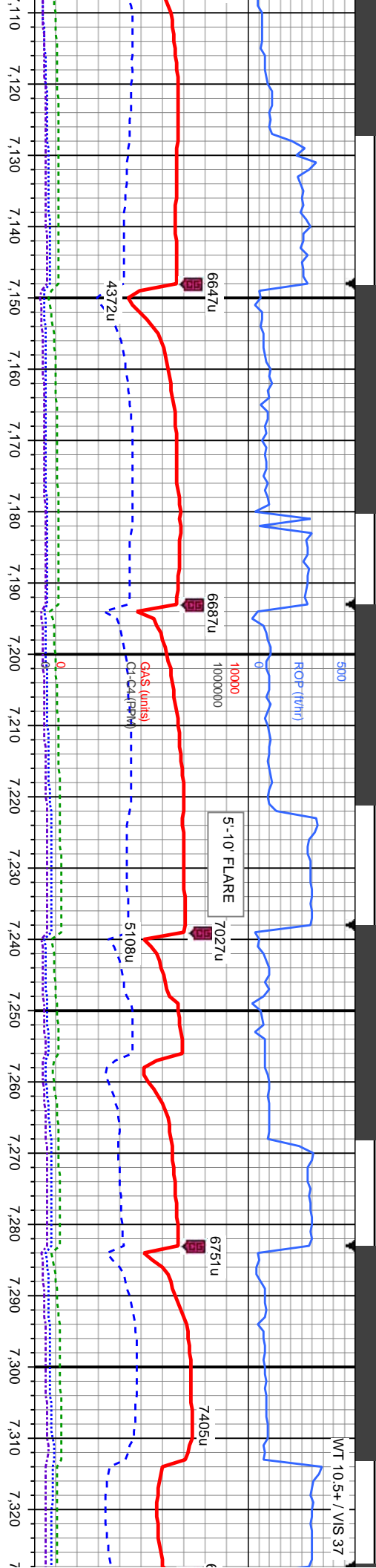
Survey Elevation



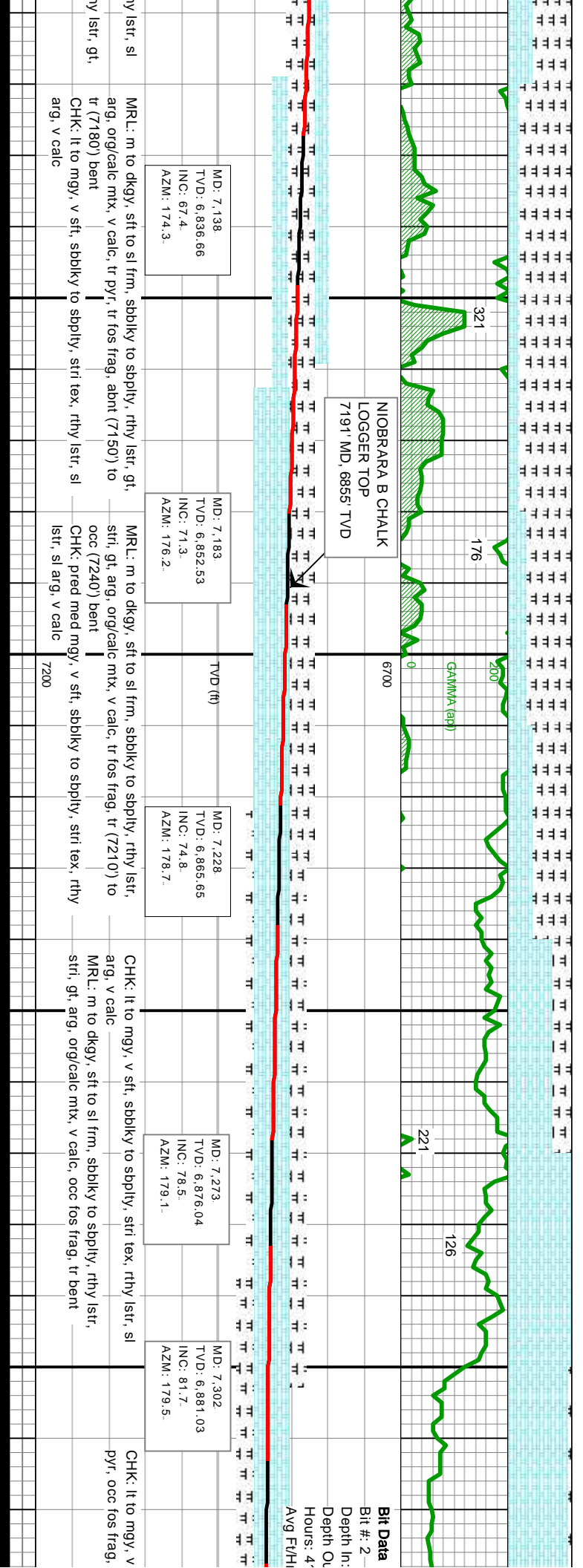


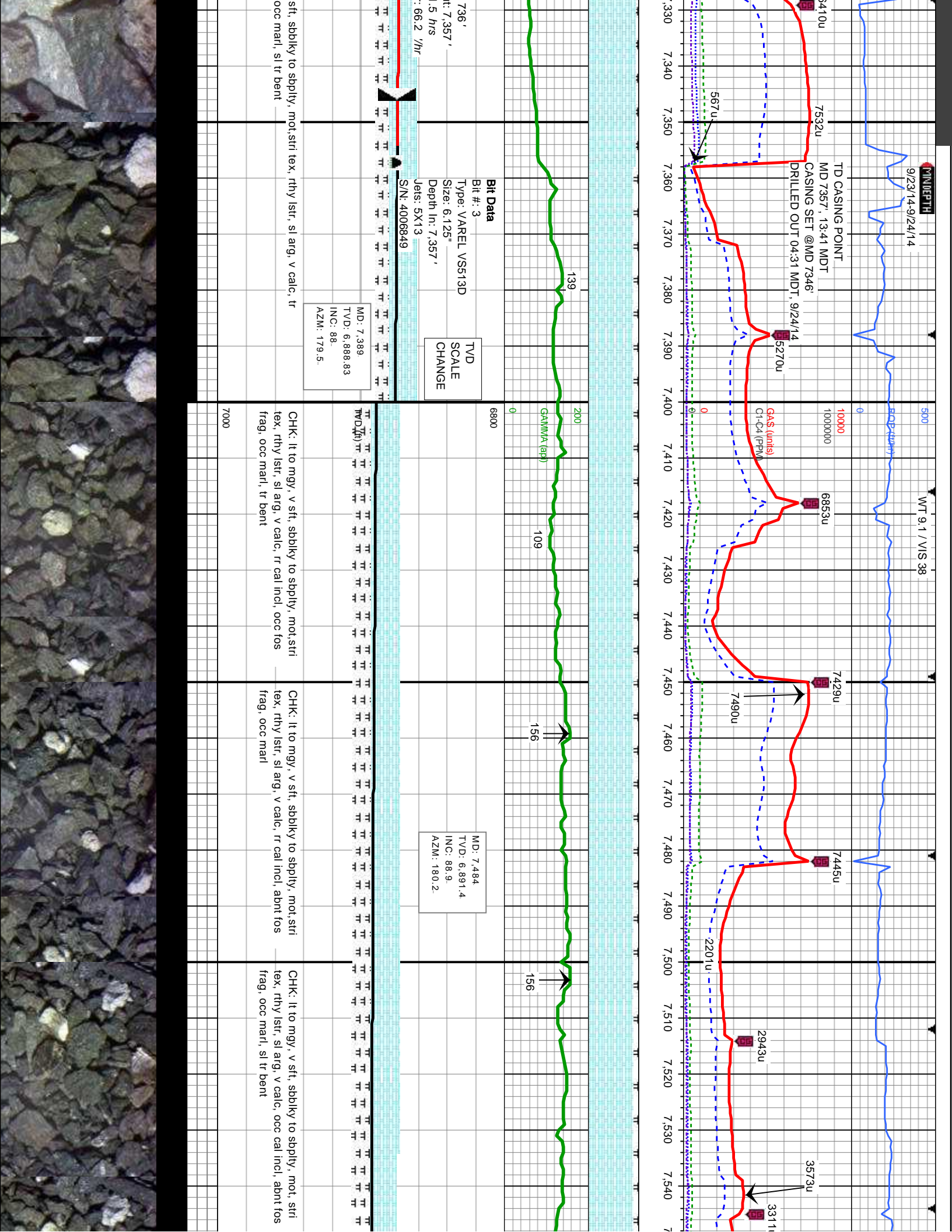


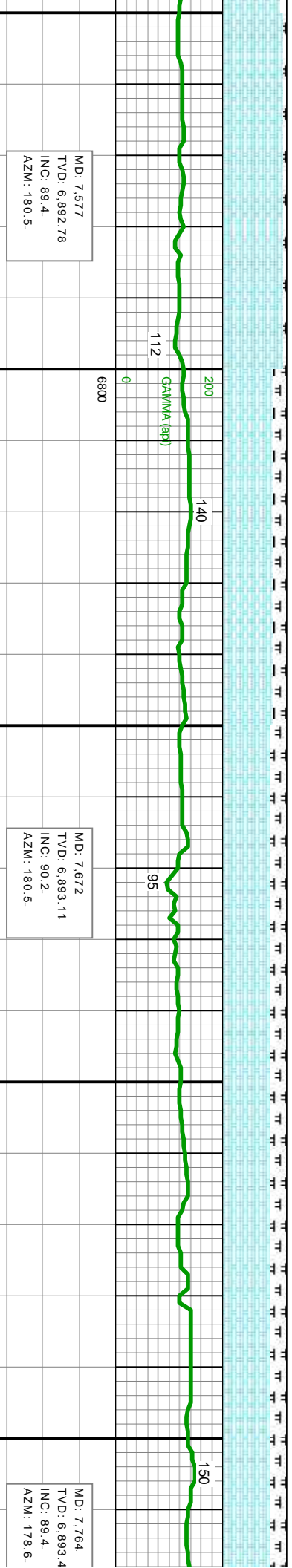
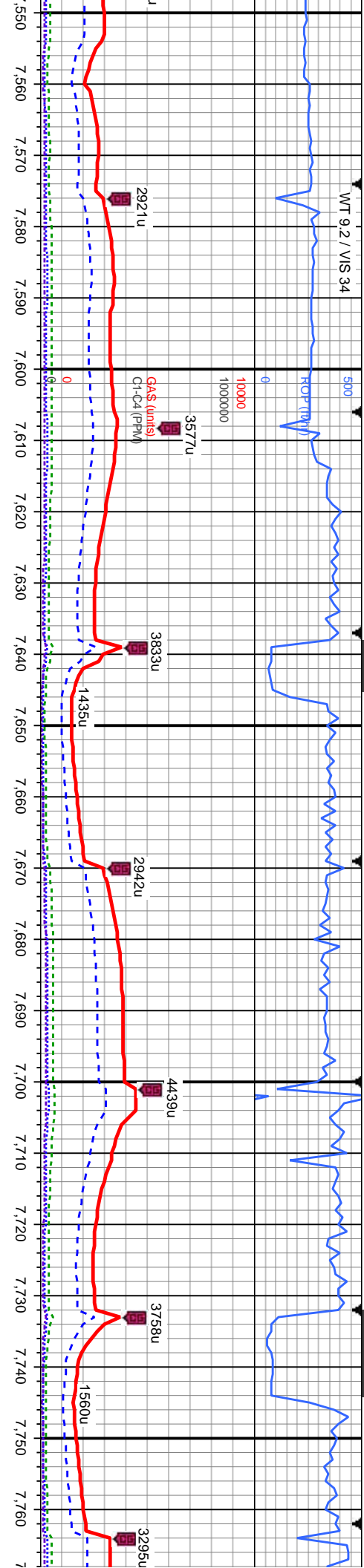




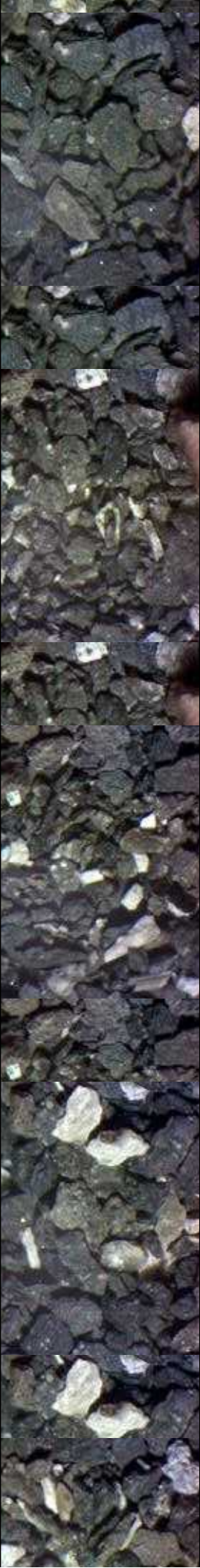
NIORARA B CHALK
LOGGER TOP
7191' MD, 6855' TVD

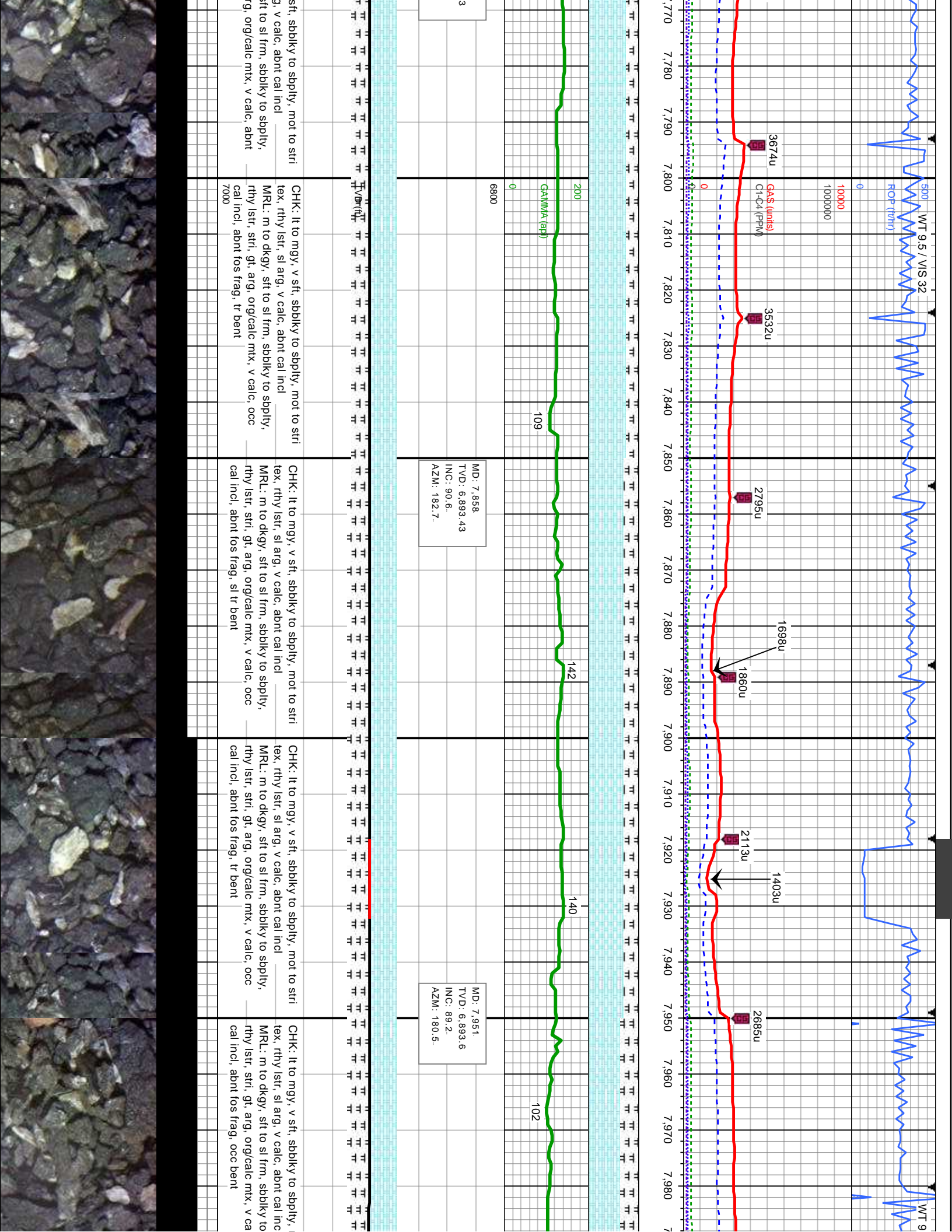


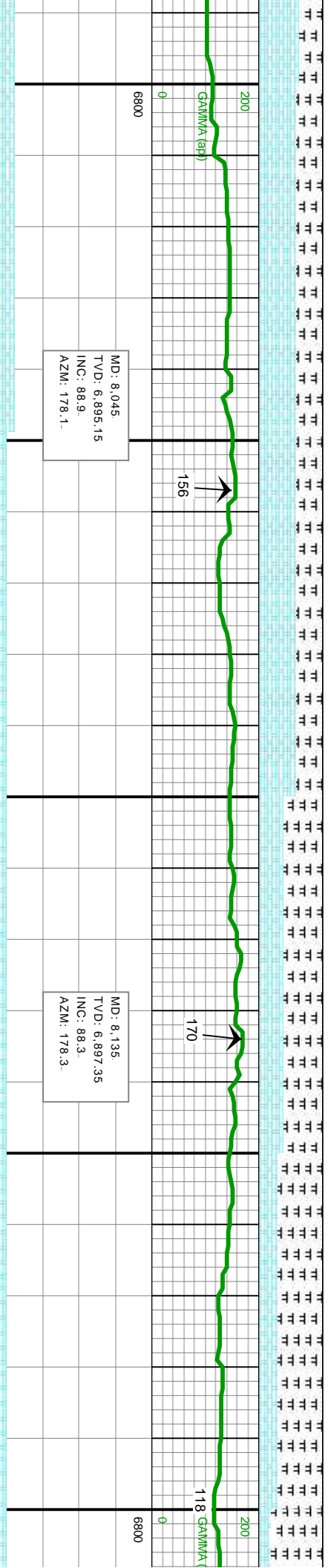
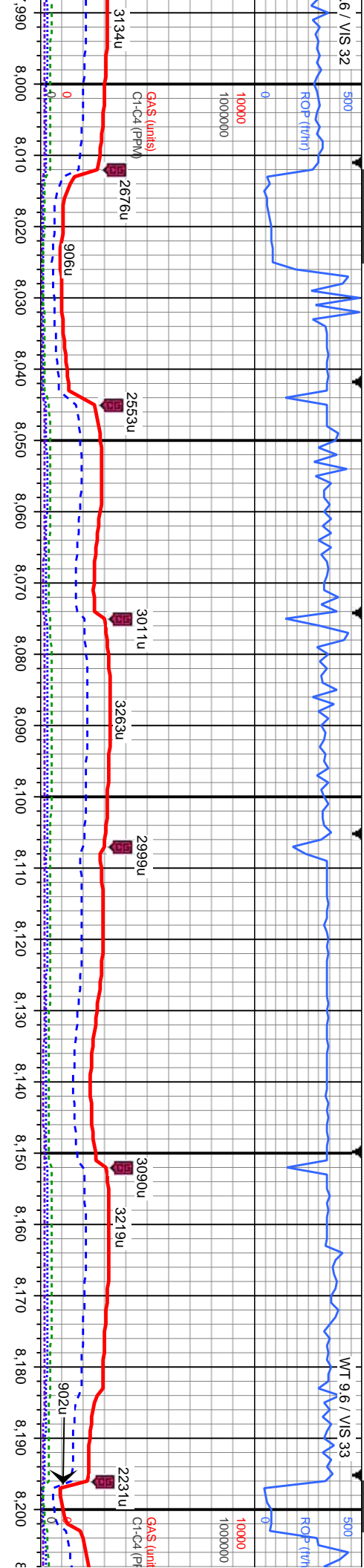




CHK: It to mgy, v sft, sbbkly to sbply, mot, strl tex, rthy lstr, sl arg, v calc, occ cal incl, abnt fos frag, occ marl, sl tr bent	CHK: It to mgy, v sft, sbbkly to sbply, mot to strl tex, rthy lstr, sl arg, v calc, abnt cal incl MRL: m to dkgy, sft to sl frm, sbbkly to sbply, rthy lstr, strl, gt, arg, org/calc mix, v calc, abnt fos frag, tr bent	CHK: It to mgy, v sft, sbbkly to sbply, mot to strl tex, rthy lstr, sl arg, v calc, abnt cal incl MRL: m to dkgy, sft to sl frm, sbbkly to sbply, rthy lstr, strl, gt, arg, org/calc mix, v calc, abnt fos frag, occ bent	CHK: It to mgy, v sft, sbbkly to sbply, mot to strl tex, rthy lstr, sl arg, v calc, abnt cal incl MRL: m to dkgy, sft to sl frm, sbbkly to sbply, rthy lstr, strl, gt, arg, org/calc mix, v calc, abnt fos frag, occ bent	CHK: It to mgy, v sft, sbbkly to sbply, mot to strl tex, rthy lstr, sl arg, v calc, abnt cal incl MRL: m to dkgy, sft to sl frm, sbbkly to sbply, rthy lstr, strl, gt, arg, org/calc mix, v calc, abnt fos frag, occ bent
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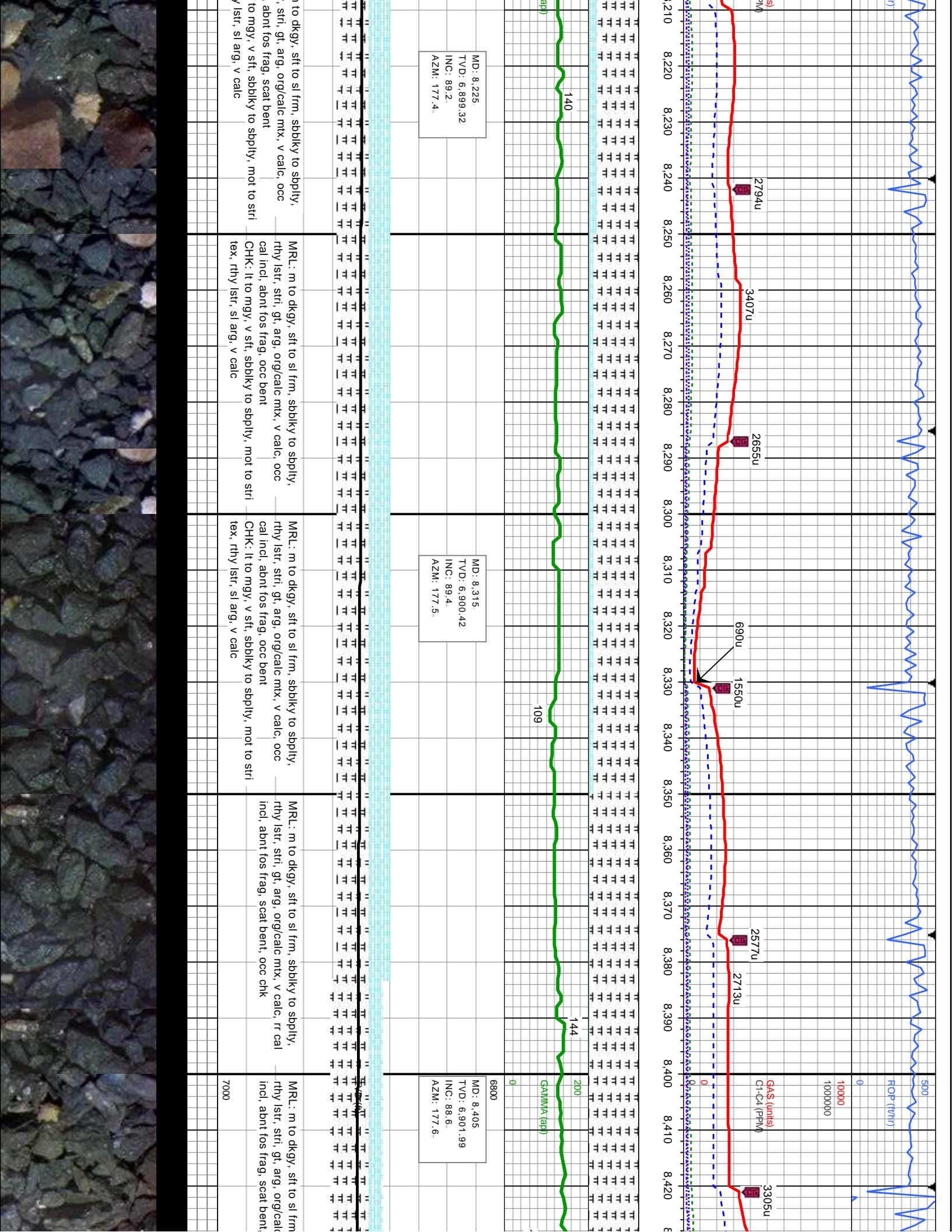


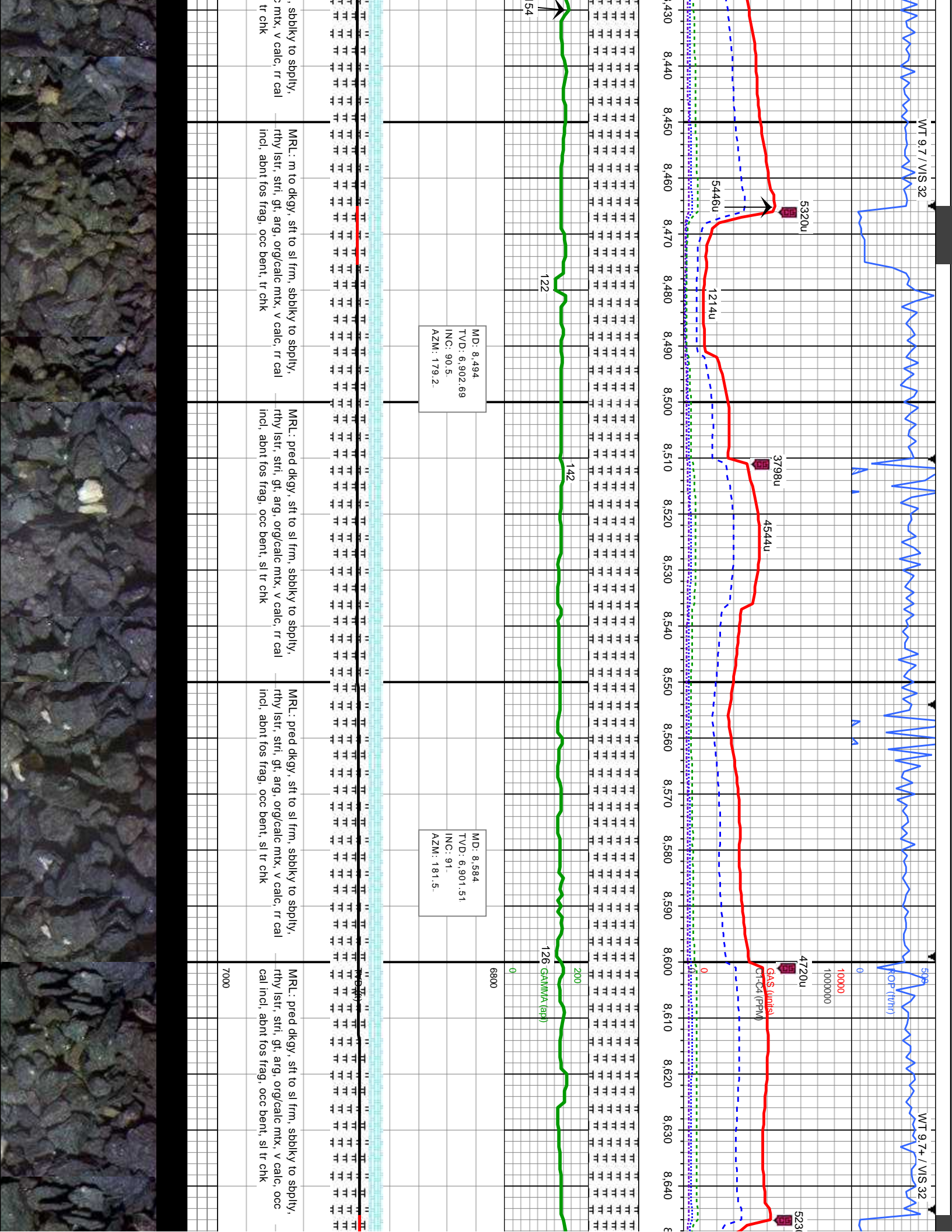


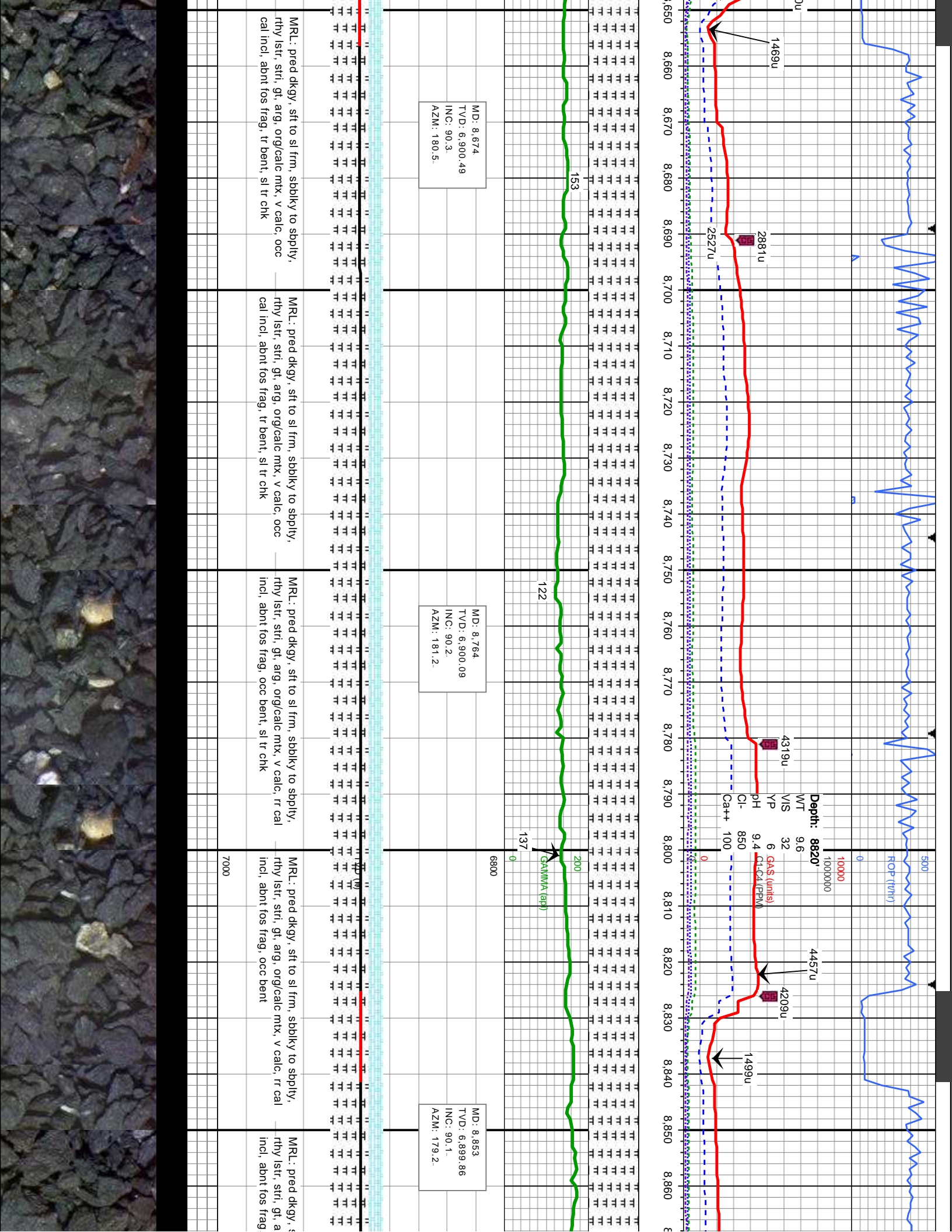


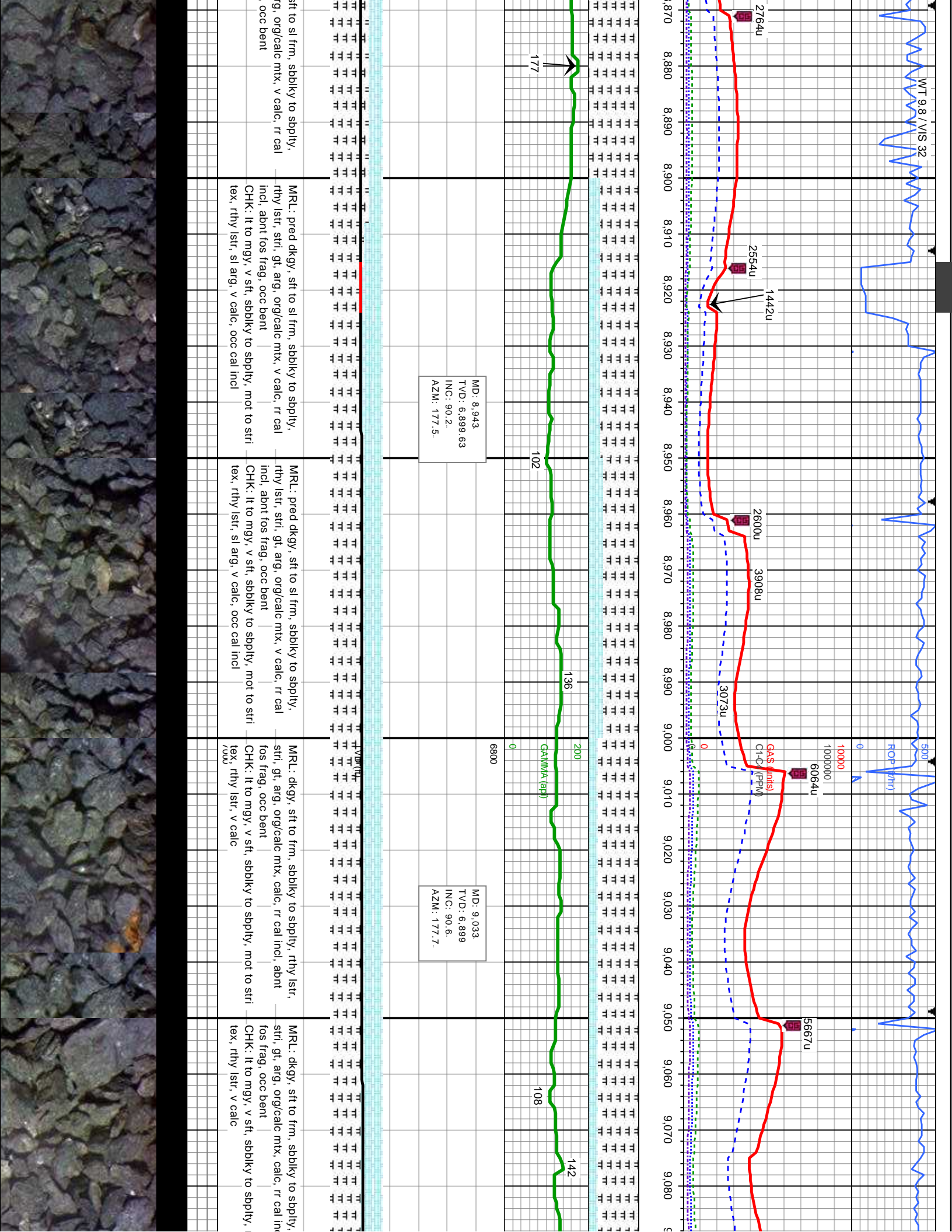
not to stri	CHK: It to mgy, v sft, sbbkly to sbply, mot to stri	CHK: It to mgy, v sft, sbbkly to sbply, mot to stri	MRL: m to dkgy, sft to sl frm, sbbkly to sbply, rthy lstr, sfti, gt, arg, org/calc mtx, v calc, occ	MRL: m to dkgy, sft to sl frm, sbbkly to sbply, rthy lstr, sfti, gt, arg, org/calc mtx, v calc, occ	MRL: m to dkgy, sft to sl frm, sbbkly to sbply, rthy lstr, sfti, gt, arg, org/calc mtx, v calc, occ	MRL: m to dkgy, sft to sl frm, sbbkly to sbply, rthy lstr, sfti, gt, arg, org/calc mtx, v calc, occ
sbply, cal, occ	MRL: m to dkgy, sft to sl frm, sbbkly to sbply, rthy lstr, sfti, gt, arg, org/calc mtx, v calc, occ	MRL: m to dkgy, sft to sl frm, sbbkly to sbply, rthy lstr, sfti, gt, arg, org/calc mtx, v calc, occ	CHK: It to mgy, v sft, sbbkly to sbply, mot to stri	CHK: It to mgy, v sft, sbbkly to sbply, mot to stri	CHK: It to mgy, v sft, sbbkly to sbply, mot to stri	CHK: It to mgy, v sft, sbbkly to sbply, mot to stri
7000	7000					7000

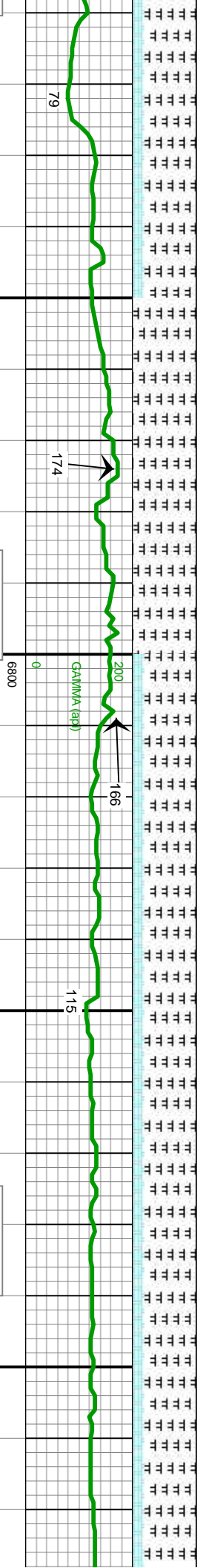
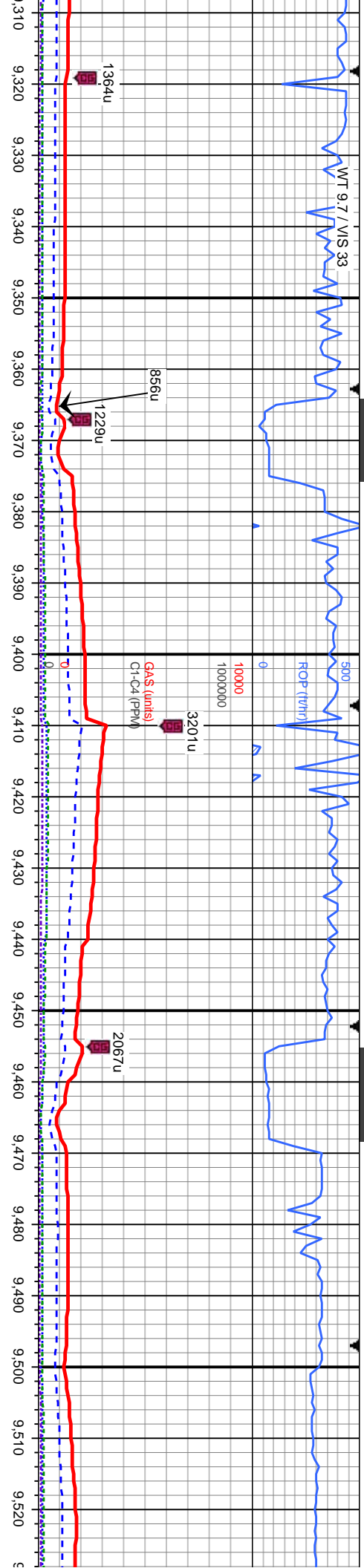








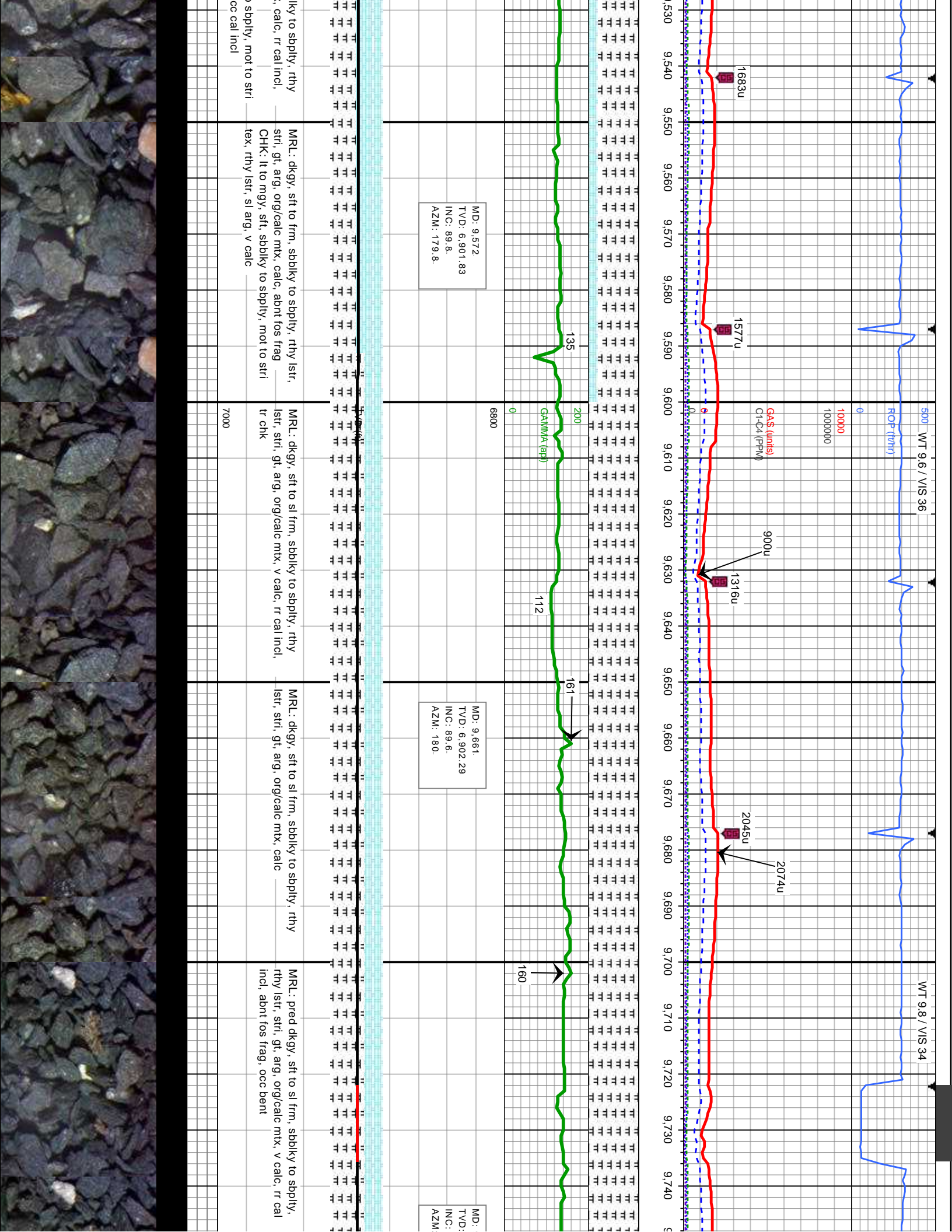


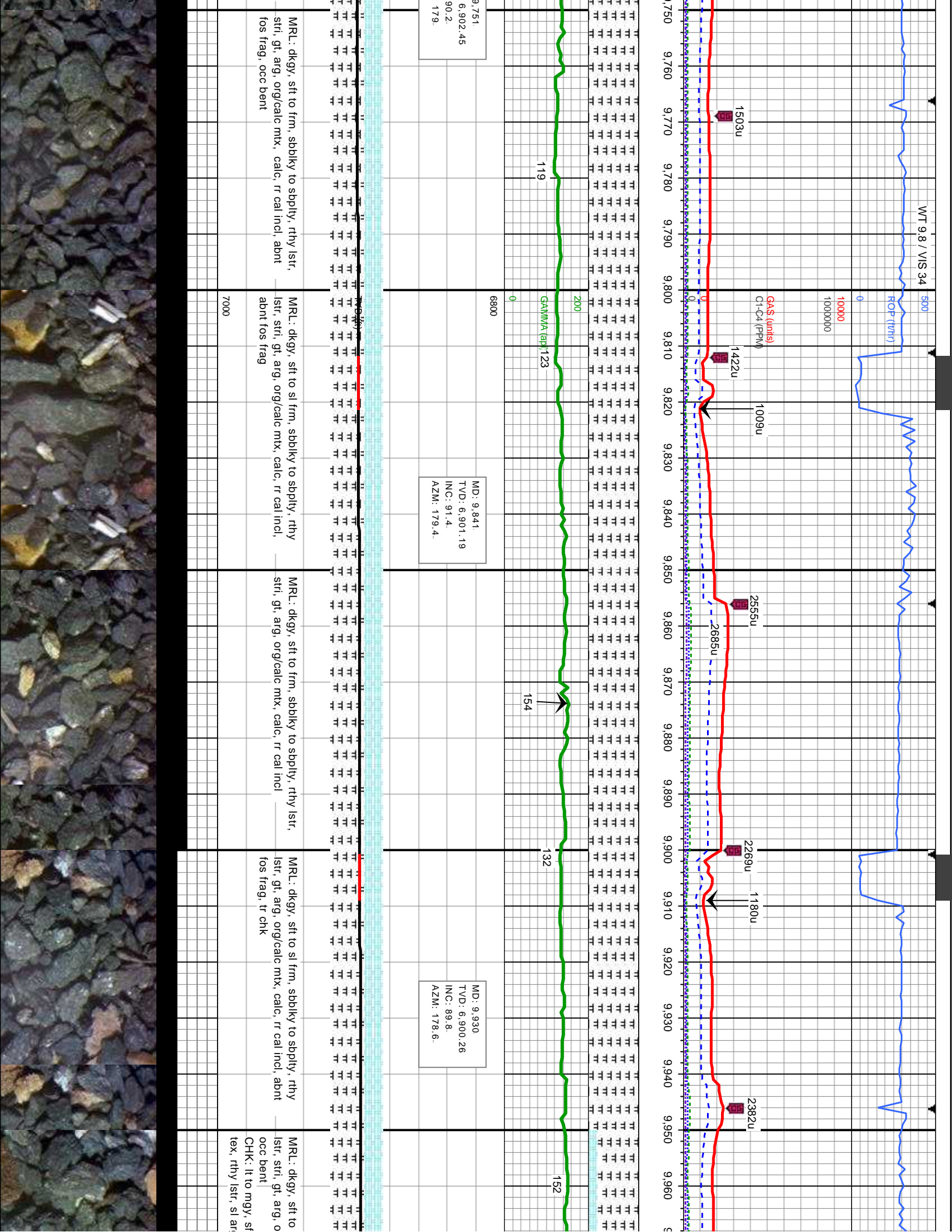


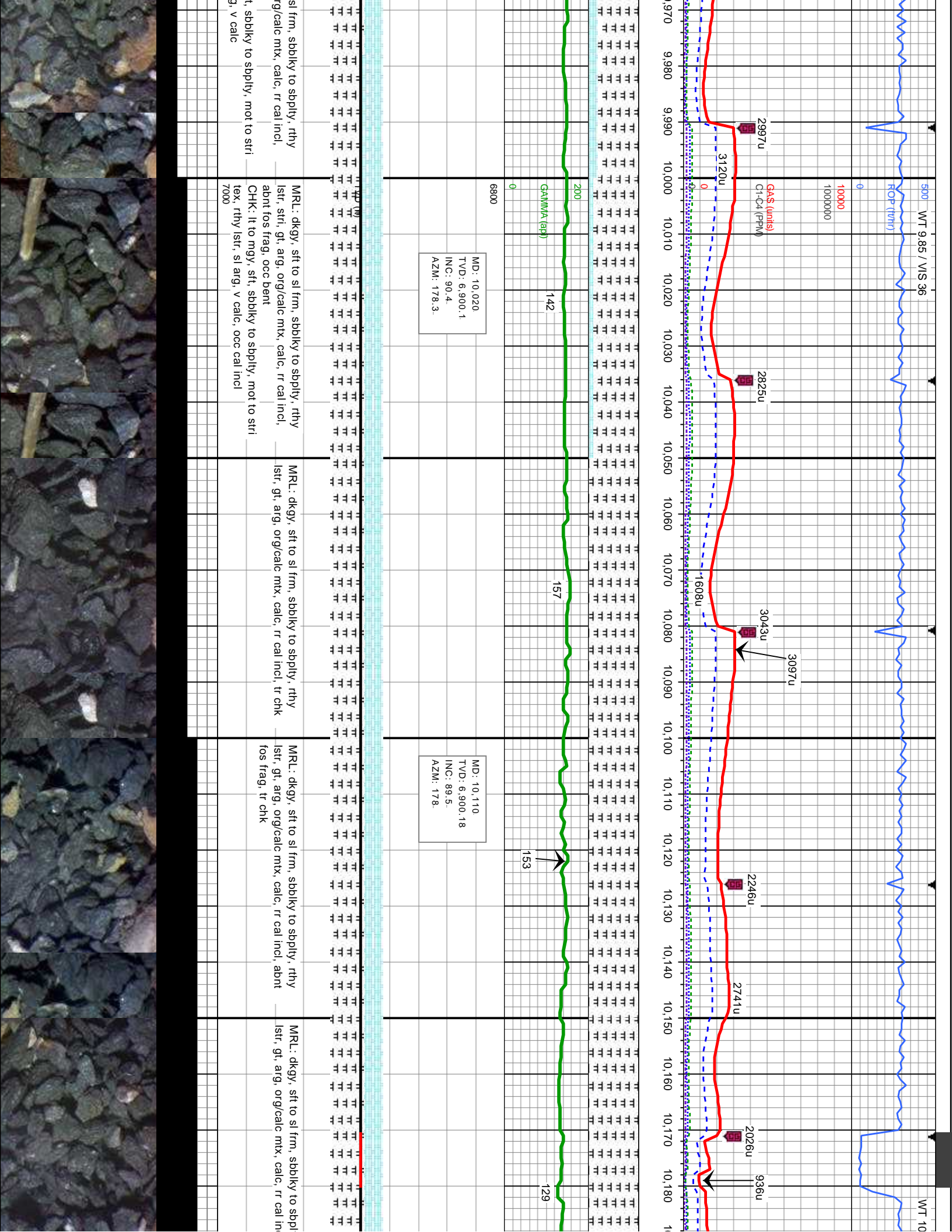
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TVD: 6,901.51'
INC: 88.8°
AZM: 178.6°

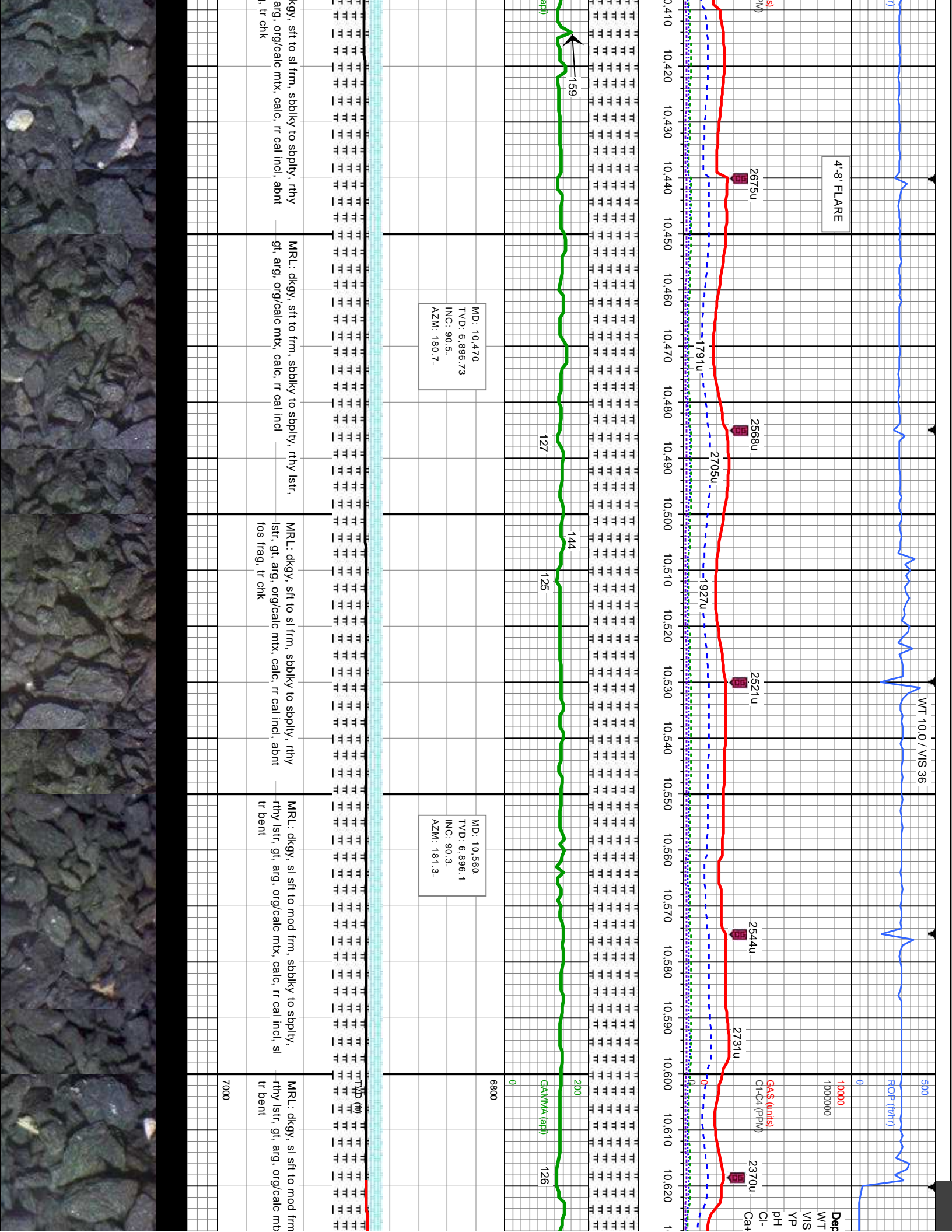
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INC: 90.5°
AZM: 180.1°

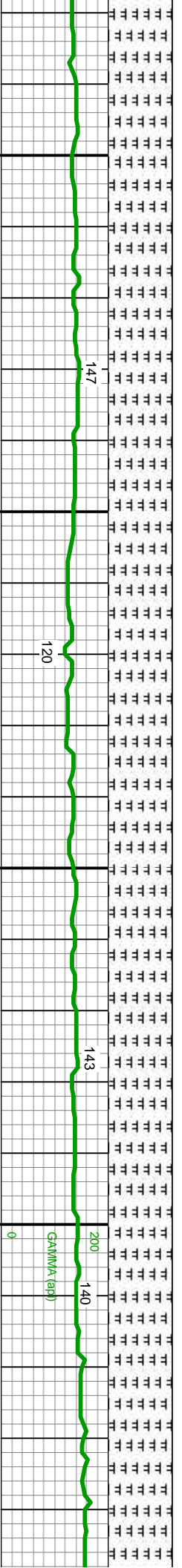
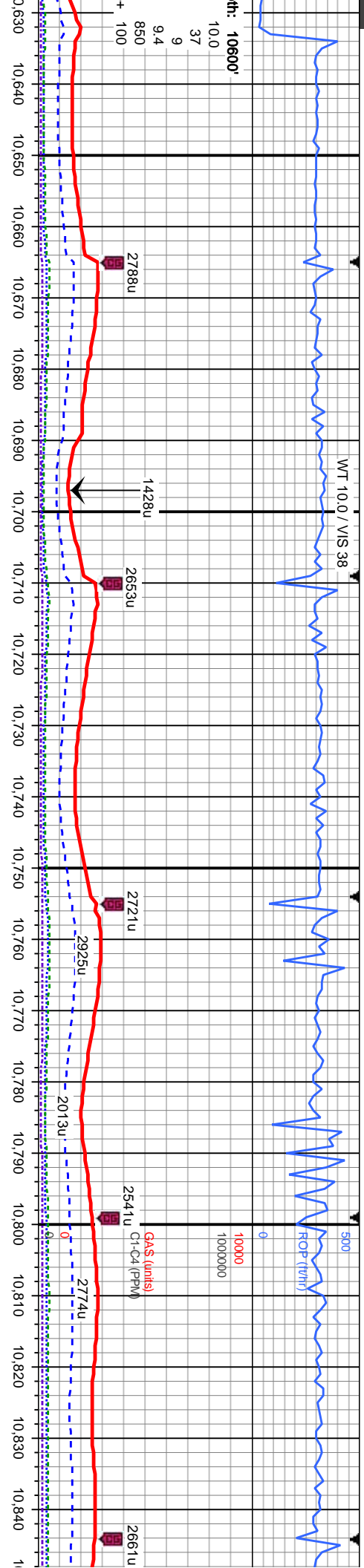
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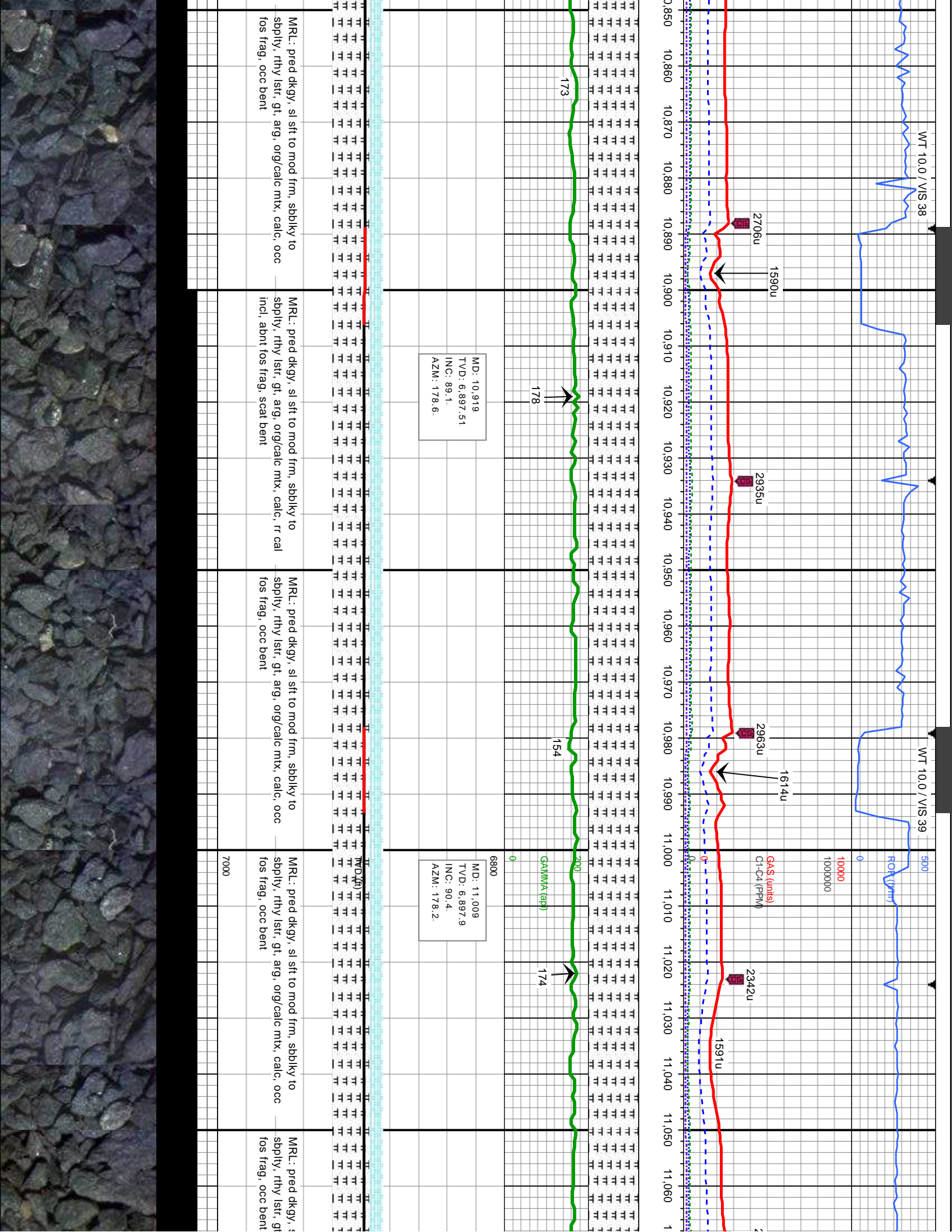


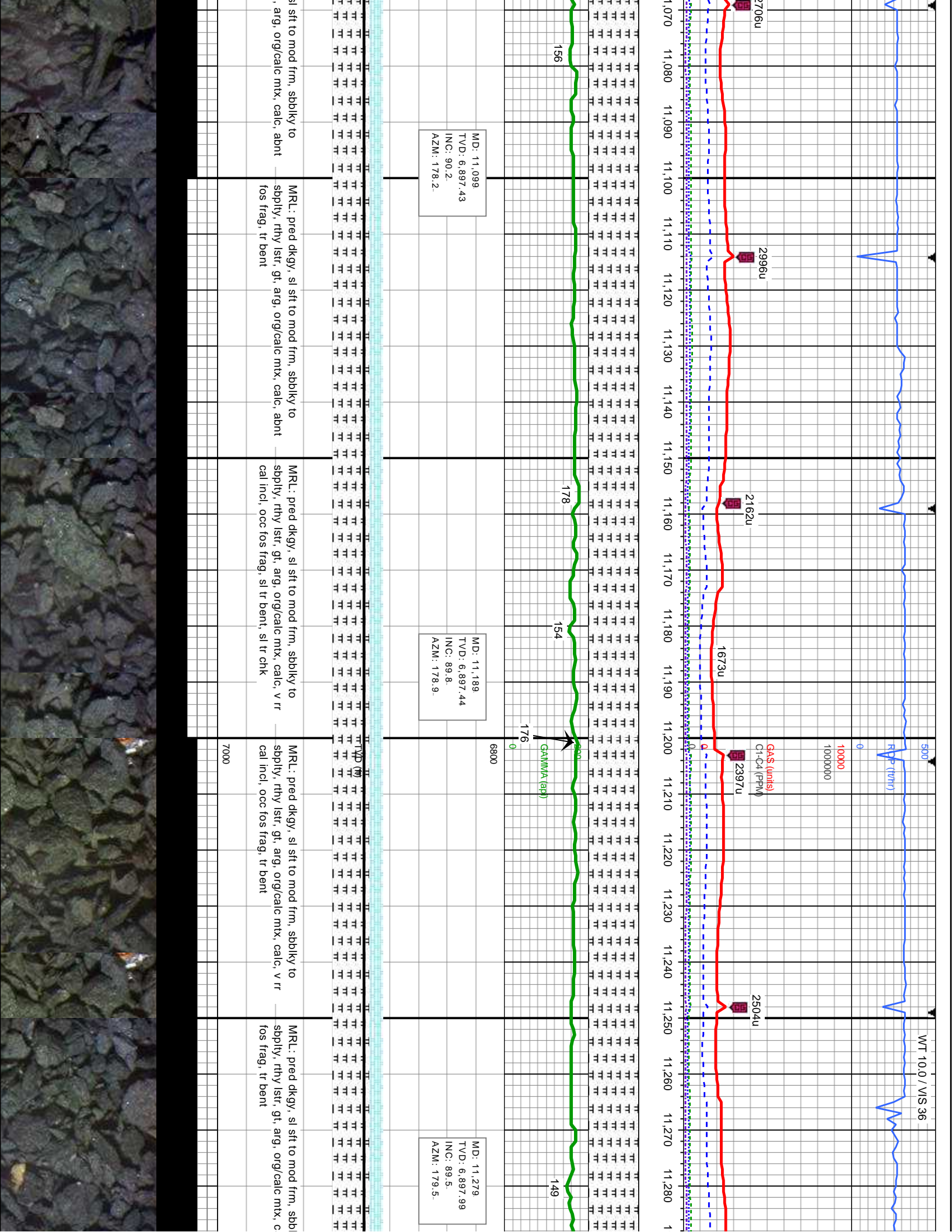


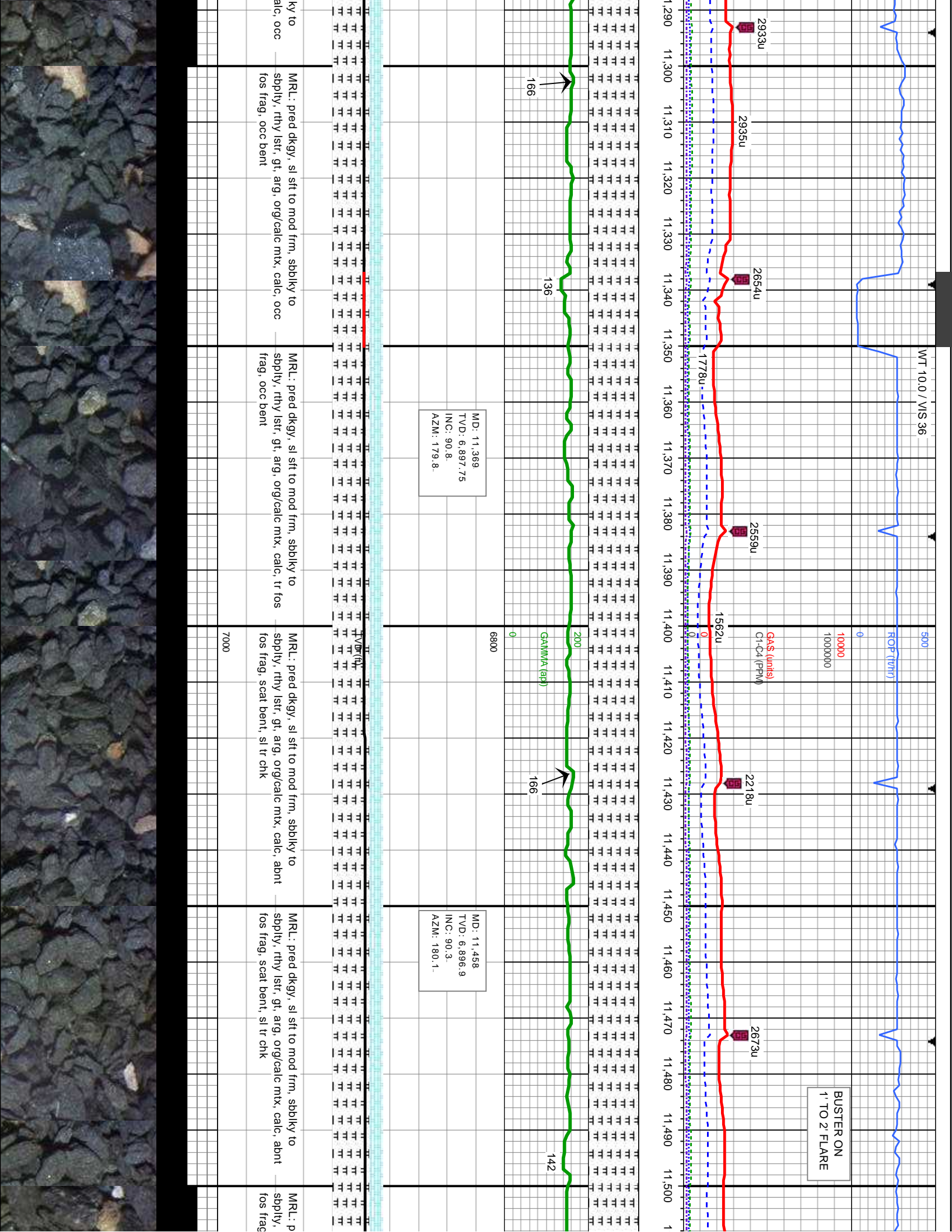


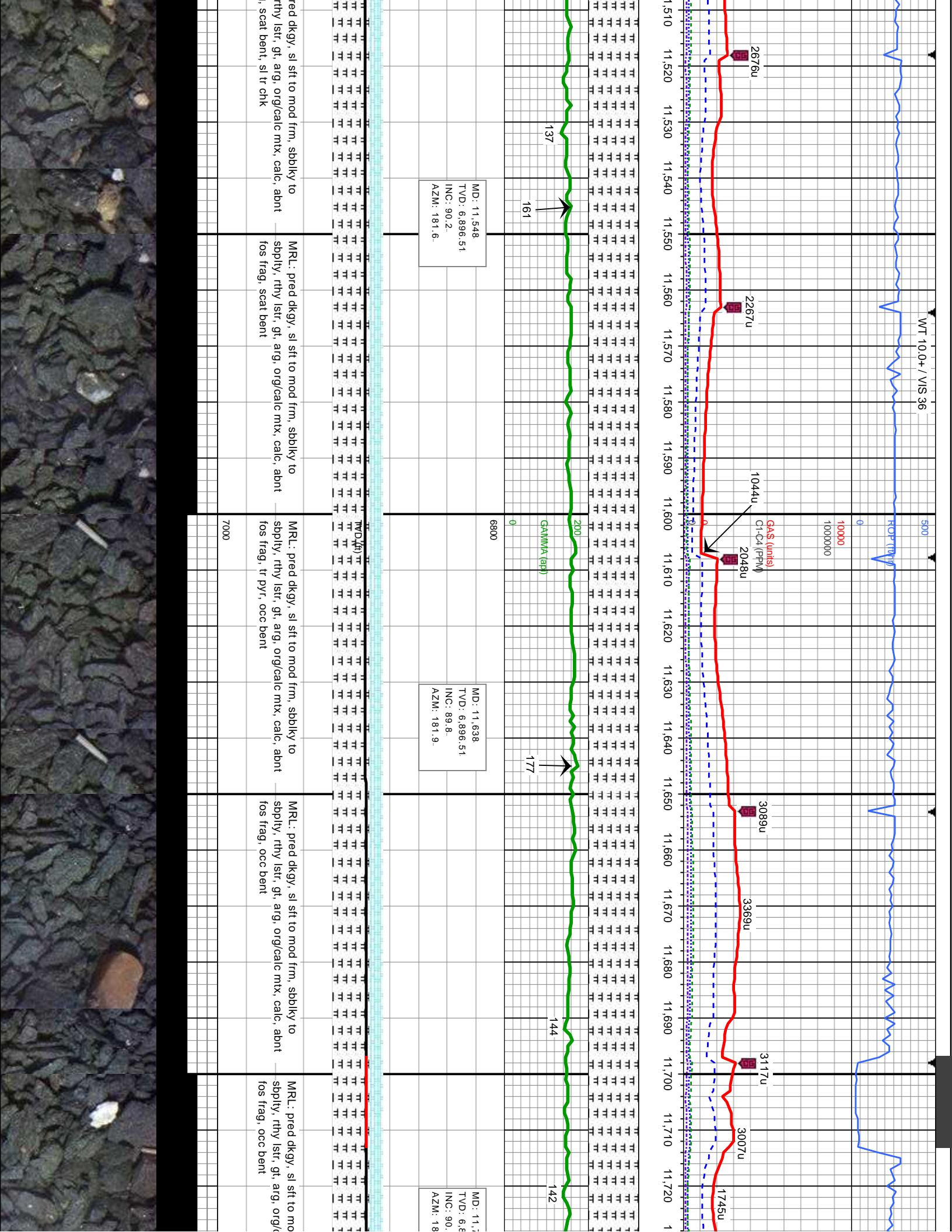
MD: 10.650 TVD: 6.895.55 INC: 90.4 AZM: 180.2	MD: 10.739 TVD: 6.895.55 INC: 89.6 AZM: 180.8	MD: 10.829 TVD: 6.896.33 INC: 89.4 AZM: 181.2
MRU: dkgy, sl sft to mod frm, sbblky to sbply, rthy lstr, gt, arg, org/calc mtx, calc, rr cal incl, tr bent	MRU: dkgy, sl sft to mod frm, sbblky to sbply, rthy lstr, gt, arg, org/calc mtx, calc, rr cal incl, occ fos frag, scat bent	MRU: pred dkgy, sl sft to mod frm, sbblky to sbply, rthy lstr, gt, arg, org/calc mtx, calc, rr cal incl, abnt fos frag, occ bent
7000	7000	7000

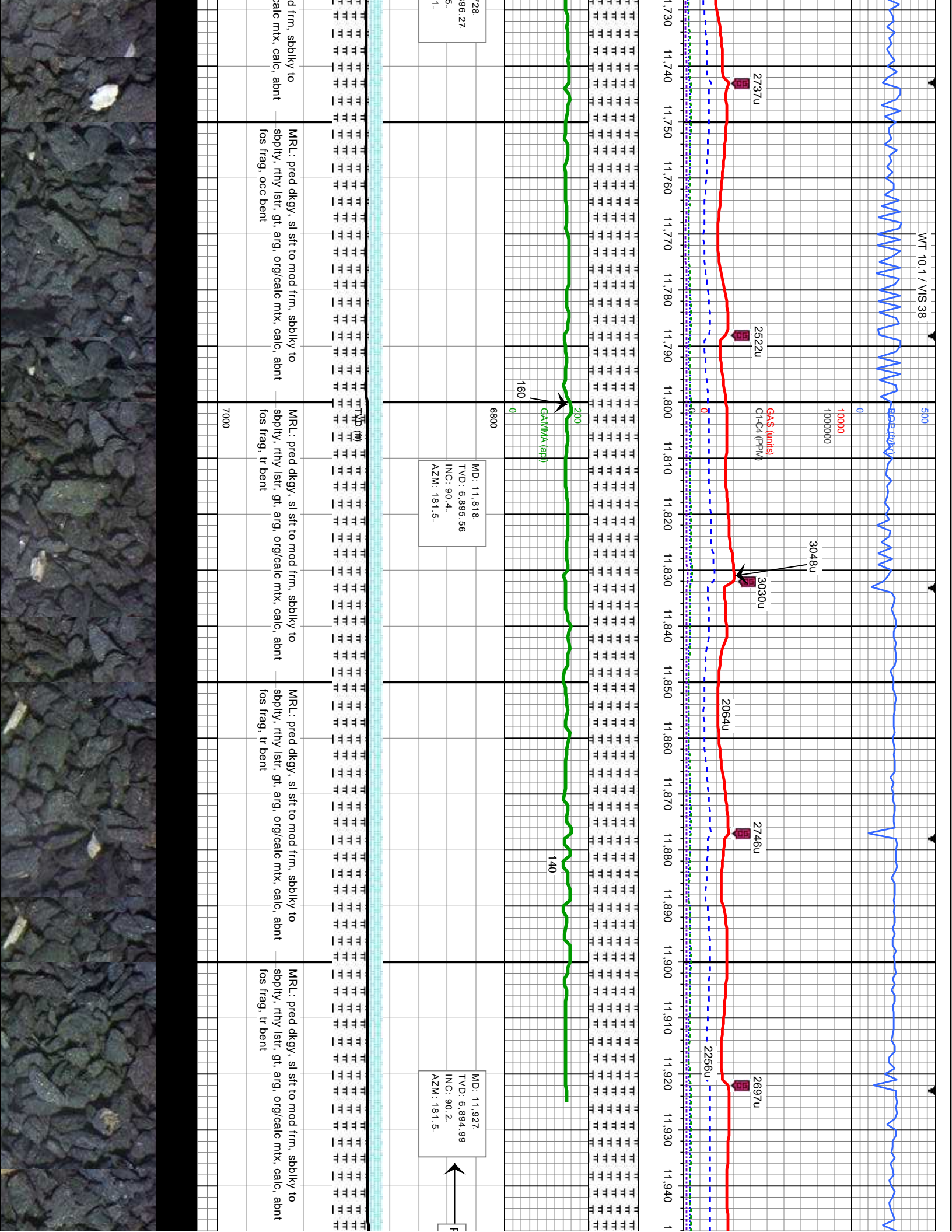




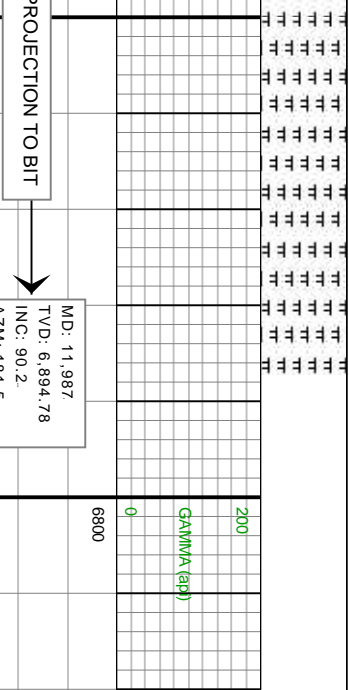
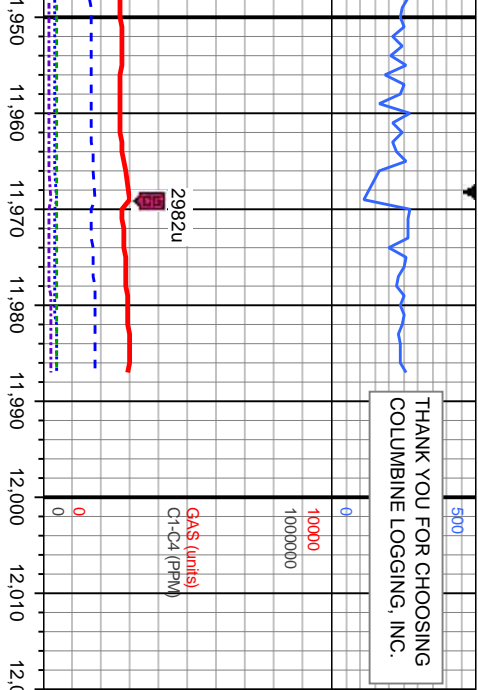








THANK YOU FOR CHOOSING
COLUMBINE LOGGING, INC.



MD: 11,987
TVD: 6,894.78
INC: 90.2
AZM: 181.5



Bit Data

Bit #: 3

MRL: pred dkgy, sl sft to mod frm,
sbbkly to sbply, rthy lstf, gt, arg,
org/calc mrx, calc, abnt fos frag, tr
bent

Depth In: 7,357 '
Depth Out: 11,987 '
Hours: 31 hrs
Avg Ft/Hr: 149.4 '/hr

7000

