



Scale: 5" / 100'
Measured Depth Log

Well Name Raindance FC 23-232HN

Location Section 30, TWP 6N, 67W

State COLORADO

County WELD

Country UNITED STATES

Rig Number PD 462

API Number 05123515810000

AFE # 20DC0372

Geographic Region DJ BASIN

Field WATTENBERG

Ground Elevation 4788'

K.B. Elevation 4808'

Logged Interval 6000'MD To 21273'

Total Depth 21273'

Formation Niobrara C Chalk

Type of Drilling Fluid OIL BASED MUD

Operator

Company Great Western Petroleum, LLC

Address 1001 17th Street, Suite 2000
Denver, CO 80202



Geologist

Name THOMAS YULL, TODD NAKATA, GERARDO CARPIN

Company TERRA GUIDANCE, LLC

Address 67 W FLOYD AVE
STE 105
ENGLEWOOD, CO 80110

Other

MUDLOG START DATE 09/22/2021

MUDLOG END DATE 10/1/2021

Rock Types



LIMESTONE



Chalk



Marl



Shaly Siltstone

Accessories

Minerals

B BENTONITE


Stringer

Stringer BENTONITE STRINGER


TEYRO

Other Symbols


Engineering




CONNECTION (RIGHT)



CONNECTION GAS



FAULT



MINDEPTH MN DEPTH

Onsite Geological Services provided by
Terra Guidance

Loggers on Location: 09/22/2021

Logging Depth Reached:

05:57 MT, 09/23/2021

Bloodhound Unit: #5933

Sample Collection/Description Interval:

Curve 50'

Tangent/Lateral 100'

ROP SCALE (FT/HR): 0-1000

GAMMA SCALE (API): 0-300

GAS SCALE: 0-2000cu

Total Gas & Chromatograph

GAS

C1

C2

C3

C4

CO2

Depth



Images



% Lithology

TVD SCALE: 5500' - 8500'

Well Bore
TVD

Bit #: 1

Size: 8.5"

Make: Ulterra

Model: SPL616

Jets: 8x11

S/N: 57493

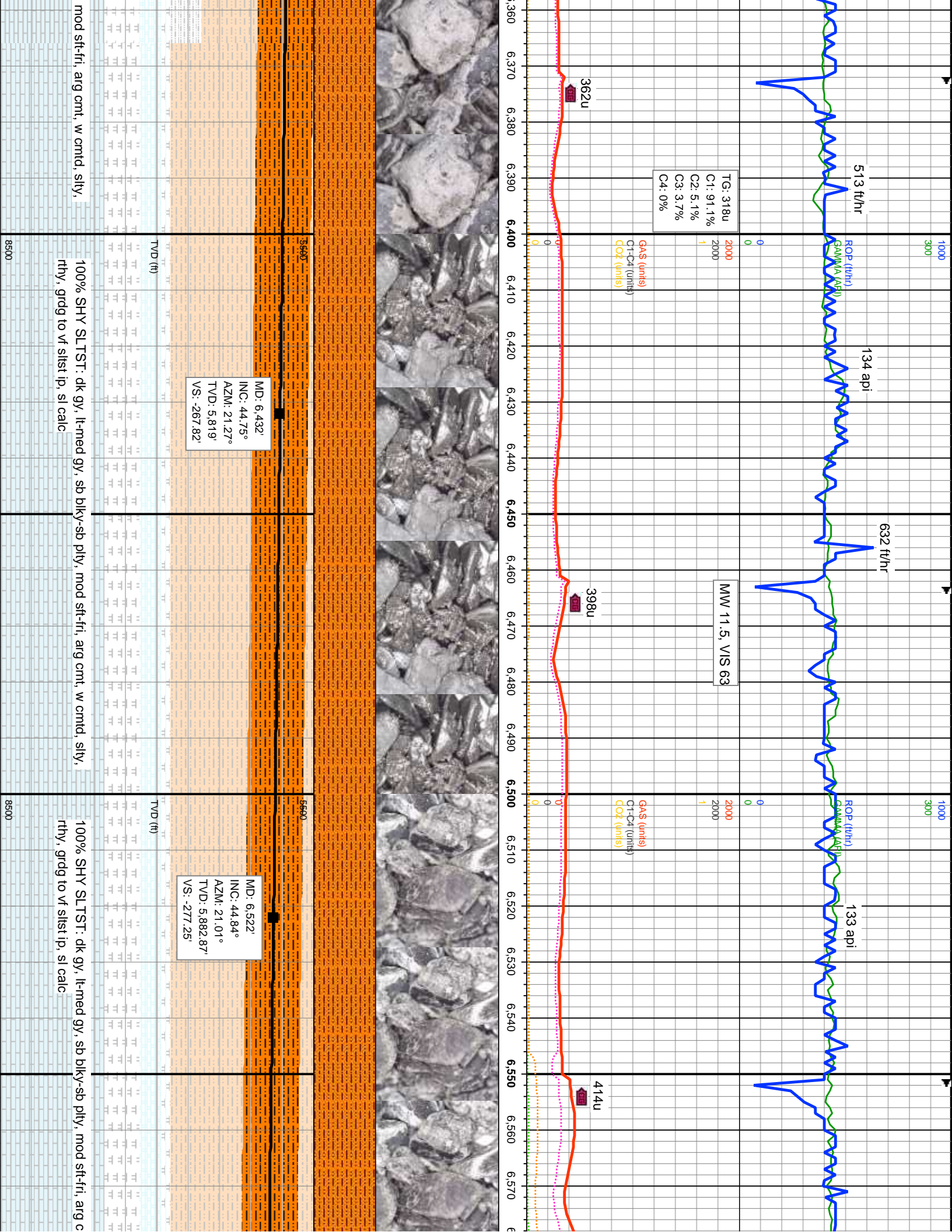
Depth In: 2,072'

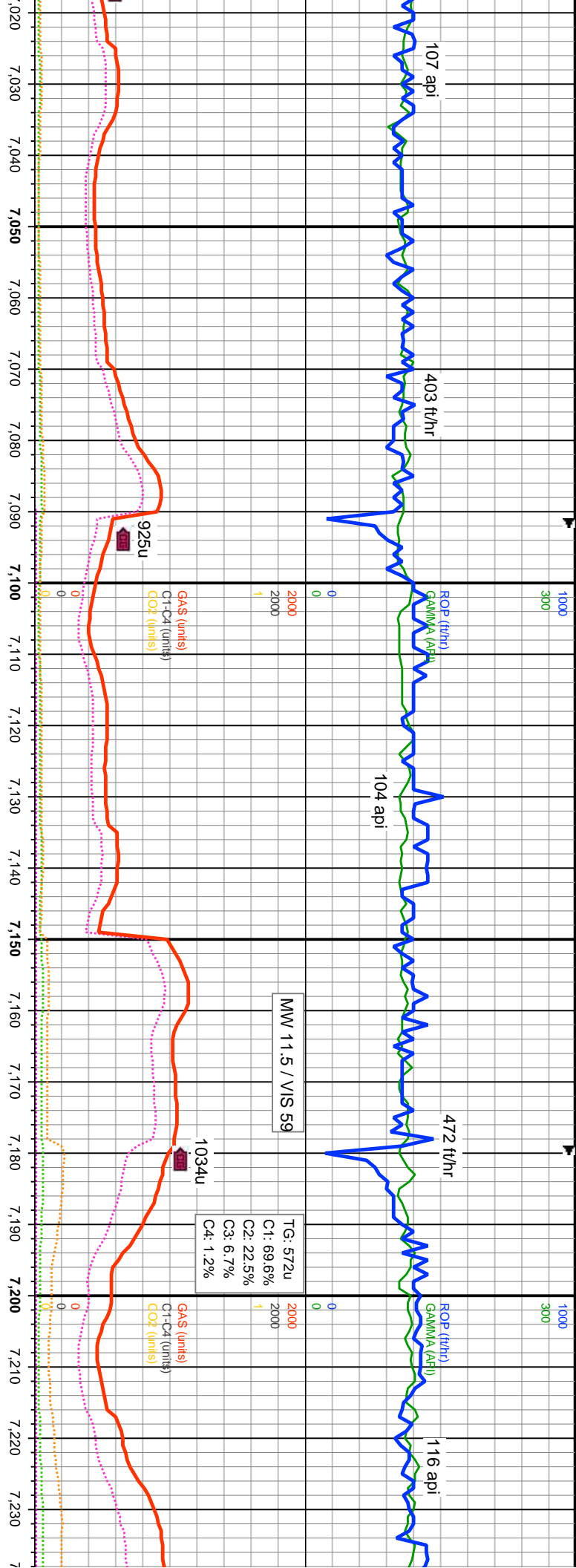
MD: 6.074'
INC: 44.62°
AZM: 21.1°
TVD: 5,564.77'
VS: -230.06'

100% SHY SLTST: dk gy, lt-med gy, sb blk-y-sb pty, mod st-fr, arg cm, w cmtd, slty, rthy, grdg to vf slst ip, sl calc

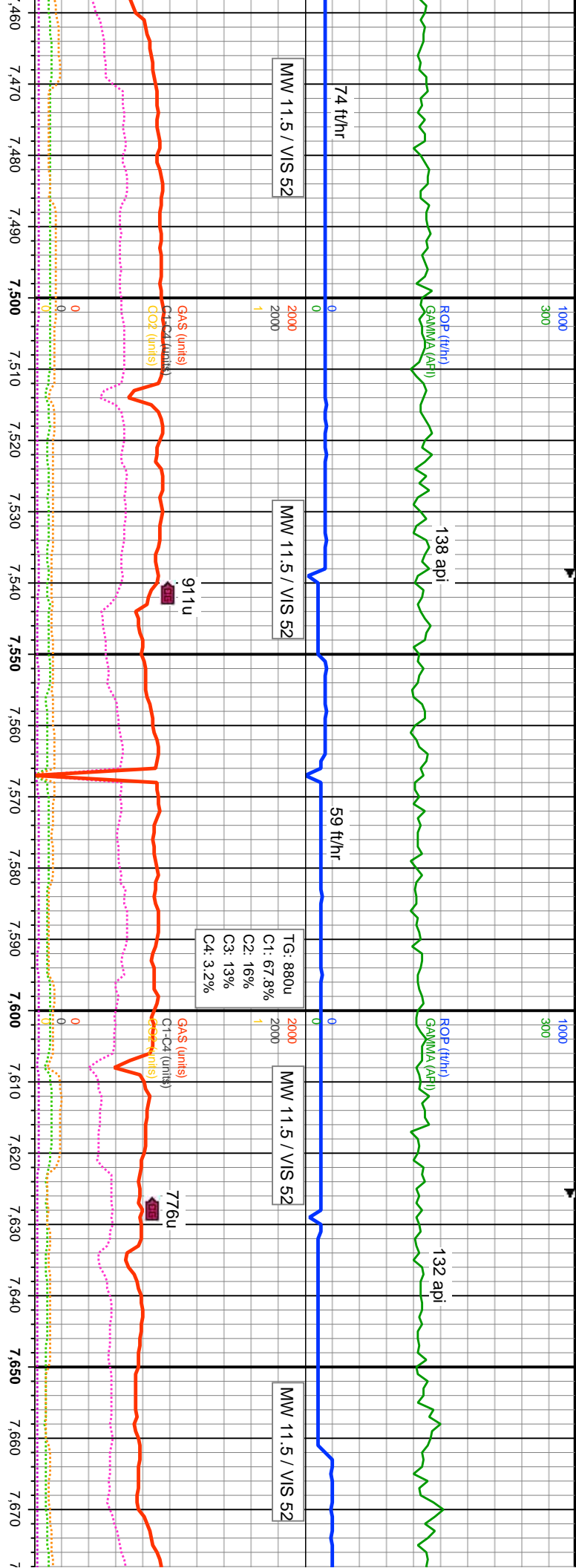
100% SHY SLTST: dk gy, lt-med gy, sb blk-y-sb pty, mod st-fr, arg cm, w cmtd, slty, rthy, grdg to vf slst ip, sl calc

MW 11.5 / VIS

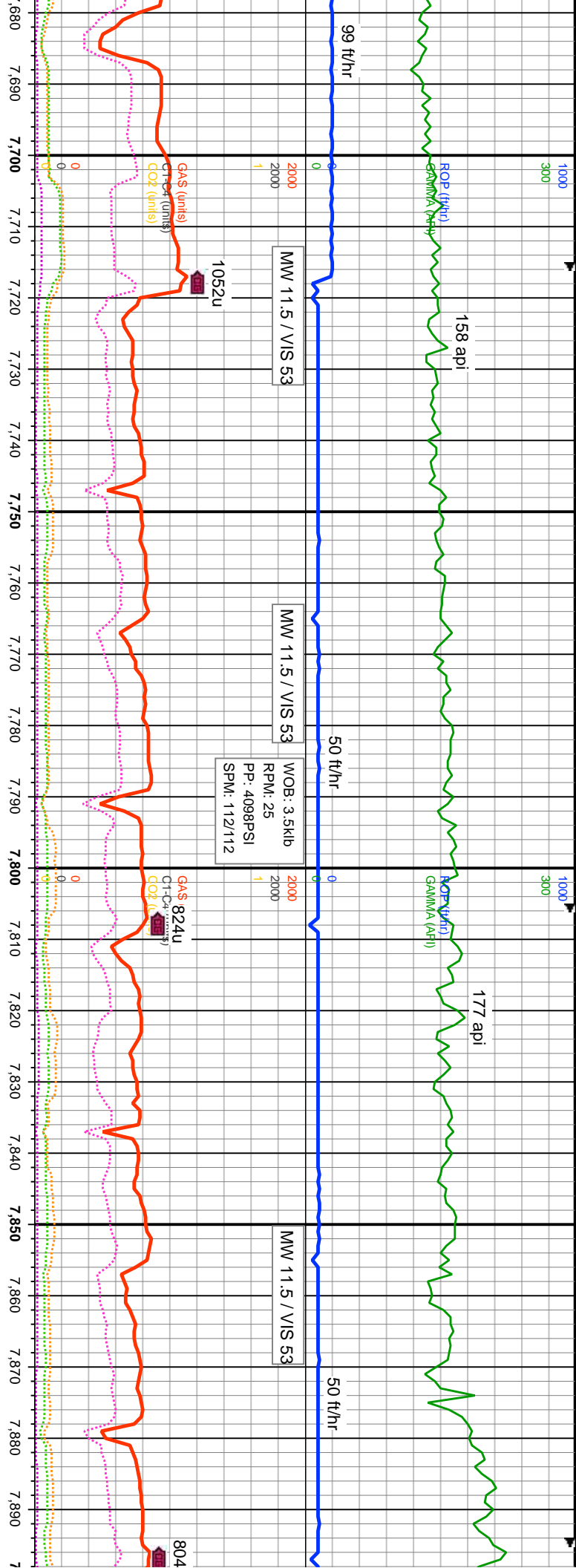




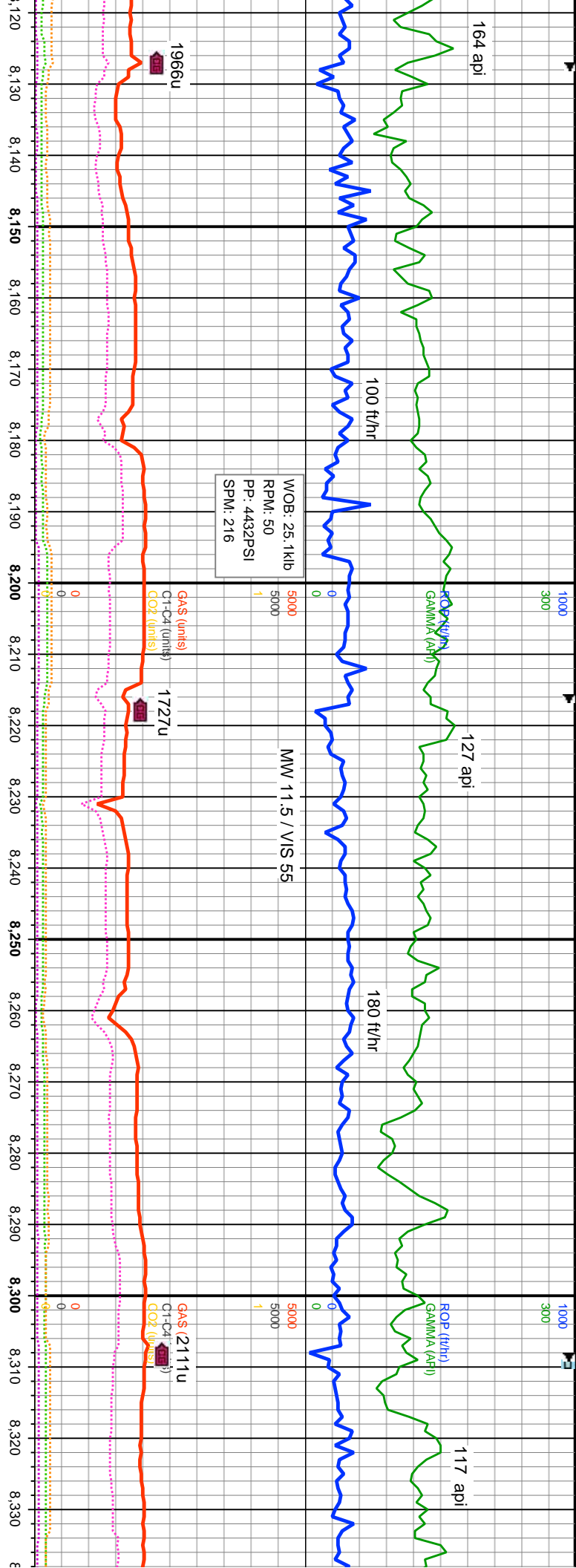
TST: lt-med gy, lt brn, sb blk-y-sb pty, mod sft-fr, arg cmt, silty, rthy, grdg sl calc: 10% SLTY SH: med-dkgy, dk gysbhn, mod sft-sl frm, ip brit, sb silty, com fis, silty, arg cmt, mod cmt'd, v sl calc		80% SHY SLTST: lt-med gy, lt brn, sb blk-y-sb pty, mod sft-fr, arg cmt, silty, rthy, grdg to v f silst ip, sl calc: 20% SLTY SH: med-dkgy, dk gysbhn, mod sft-sl frm, ip brit, sb blk-y-ang, rr pty, com fis, silty, arg cmt, mod cmt'd, v sl calc	
MD: 7.060' INC: 44.7° AZM: 22.15° TVD: 6,264.84' VS: -336.11'		MD: 7.150' INC: 44.79° AZM: 21.62° TVD: 6,328.76' VS: -346.35'	
5500		5500	
8500		8500	
TVD (ft)		TVD (ft)	
8500		8500	
MD: 7.150' INC: 44.79° AZM: 21.62° TVD: 6,328.76' VS: -346.35'		MD: 7.150' INC: 44.79° AZM: 21.62° TVD: 6,328.76' VS: -346.35'	
5500		5500	
8500		8500	
TVD (ft)		TVD (ft)	
8500		8500	
MD: 7.150' INC: 44.79° AZM: 21.62° TVD: 6,328.76' VS: -346.35'		MD: 7.150' INC: 44.79° AZM: 21.62° TVD: 6,328.76' VS: -346.35'	
5500		5500	
8500		8500	
TVD (ft)		TVD (ft)	
8500		8500	



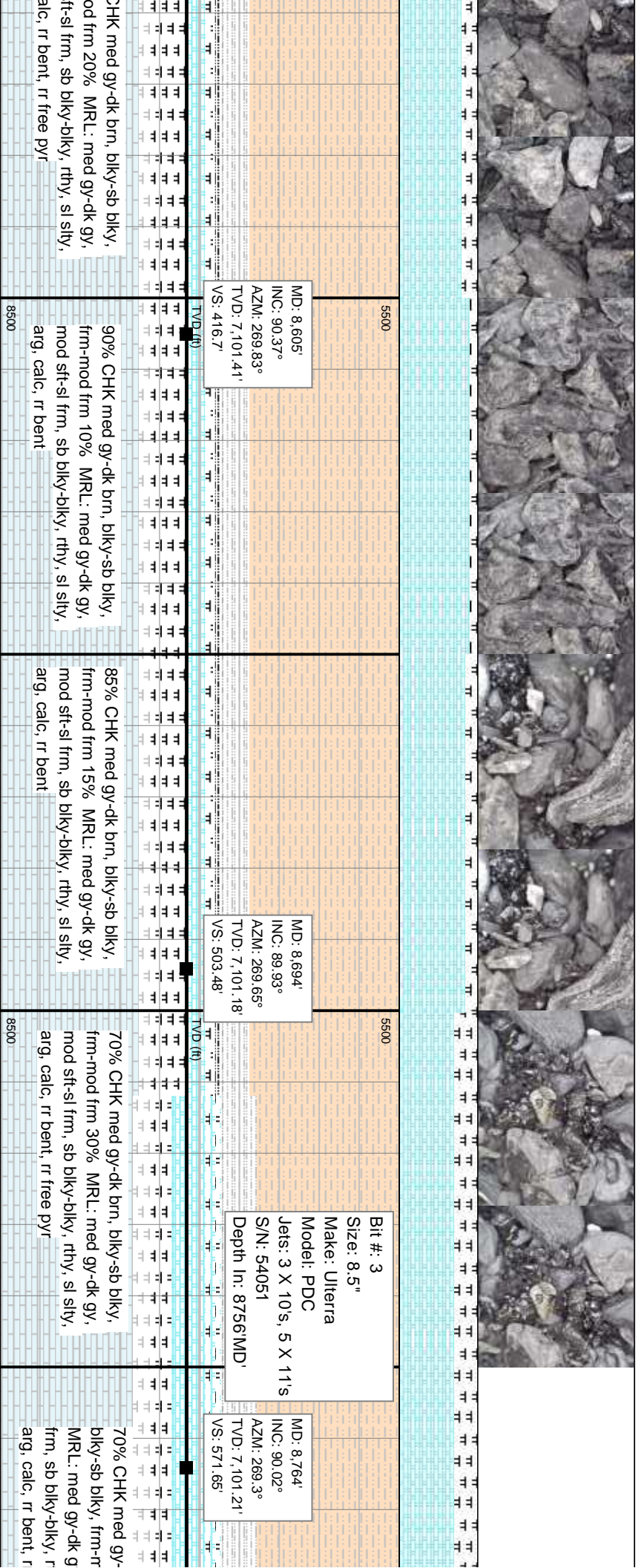
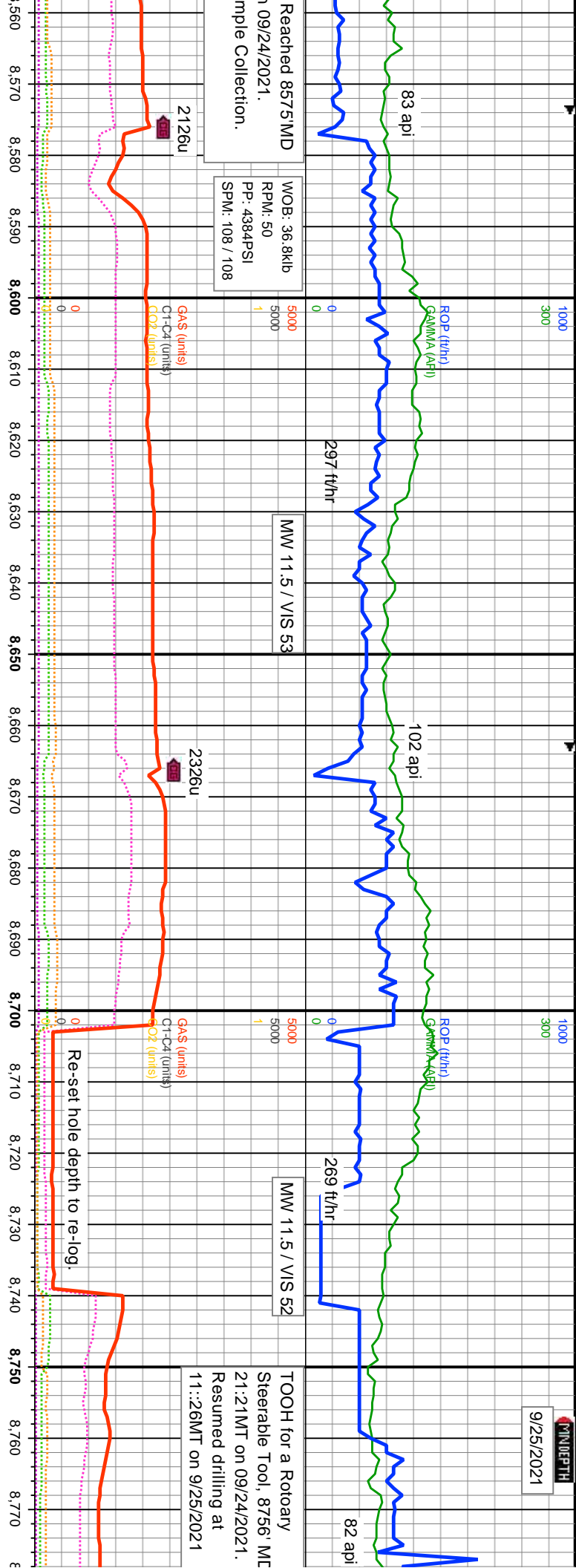
MD: 7.509' INC: 44.57° AZM: 357.72° TVD: 6.586.21' VS: -350.62'		MD: 7.598' INC: 46.95° AZM: 349.54° TVD: 6.648.35' VS: -329.86'	
75% SLTY SH: med-dky, dk gysbhn, mod sft-sl frm, sb blk-ang, rr ply, com fis, sily, arg cnt, mod cntd, v sl calc, 25% SHY SLTST: lt-med gy, lt brn, sb blk-sb ply, mod sft-fr, arg cnt, sily, rthy, grdg to vf slst ip, sl calc		90% SLTY SH: med-dky, dk gysbhn, mod sft-sl frm, sb blk-ang, rr f sily, arg cnt, mod cntd, v sl calc, 10% SHY SLTST: lt-med gy, lt brn, mod sft-fr, arg cnt, sily, rthy, grdg to vf slst ip, sl calc	

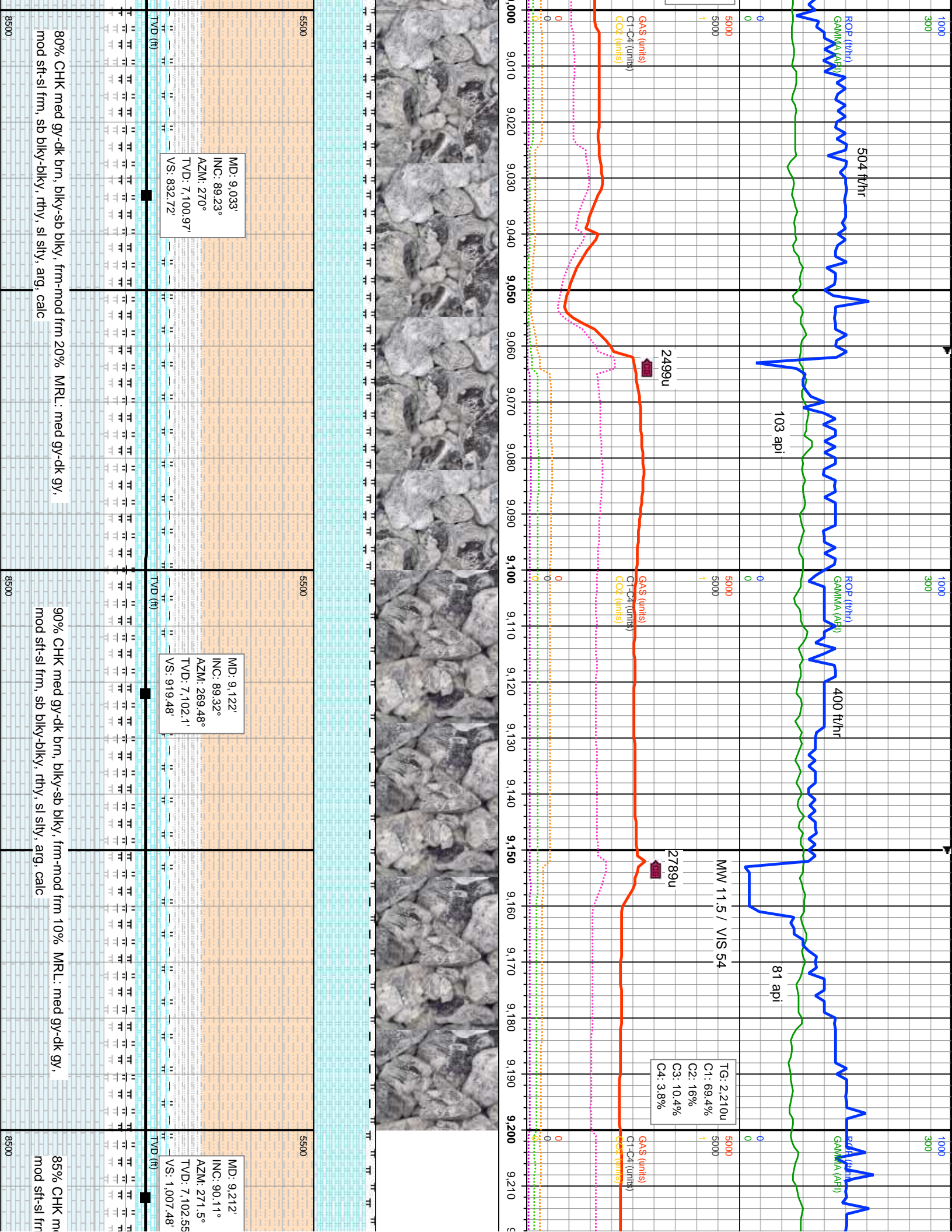


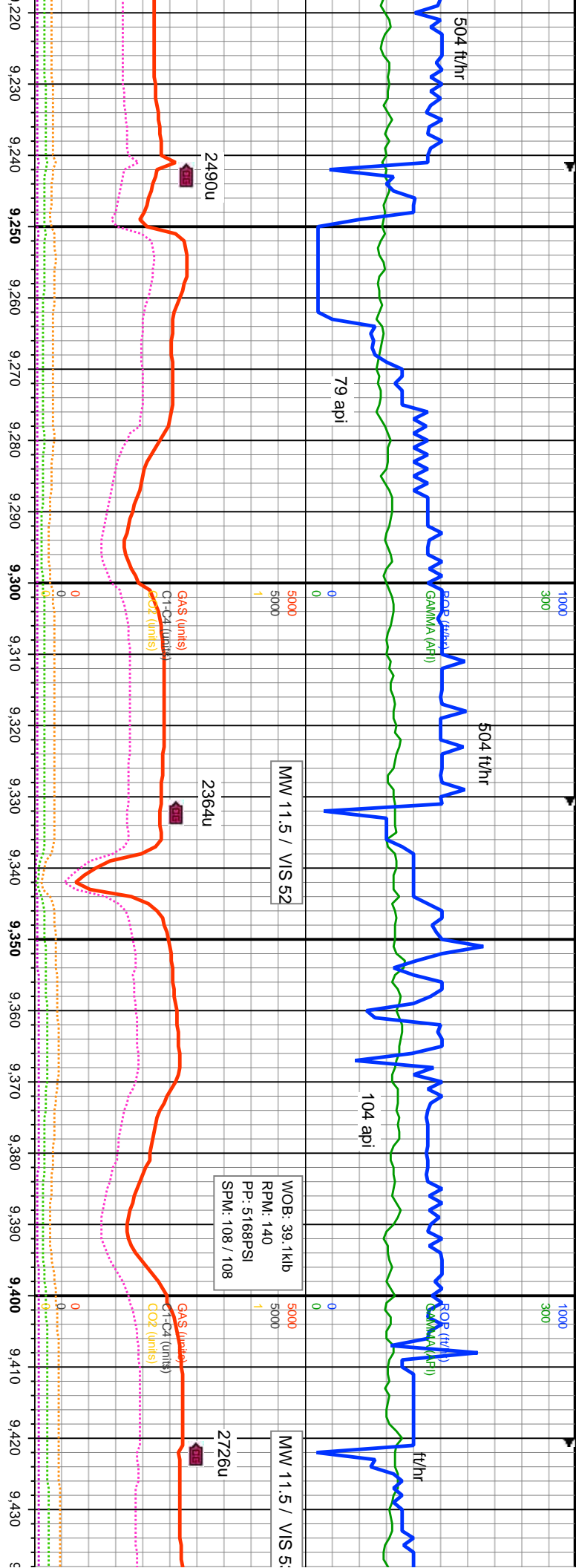
MD: 7.688' INC: 48.7° AZM: 342.34° TVD: 6,708.82' VS: -299.93'	5500 100% SL TV SH: med-dkgy, dk gysbhn, sft-sl frm, sb blk-y-ang, rr pty, com fis, stly, arg cmt, mod cmtid	5500 100% SL TV SH: med-dkgy, dk gysbhn, sft-sl frm, sb blk-y-ang, rr pty, com fis, stly, arg cmt, mod cmtid	5500 100% SL TV SH: med-dkgy, dk gysbhn, sft-sl frm, sb blk-y-ang, rr pty, com fis, stly, arg cmt, mod cmtid	MD: 7.867' INC: 50.24° AZM: 324.32° TVD: 6,825.35' VS: -214.37'
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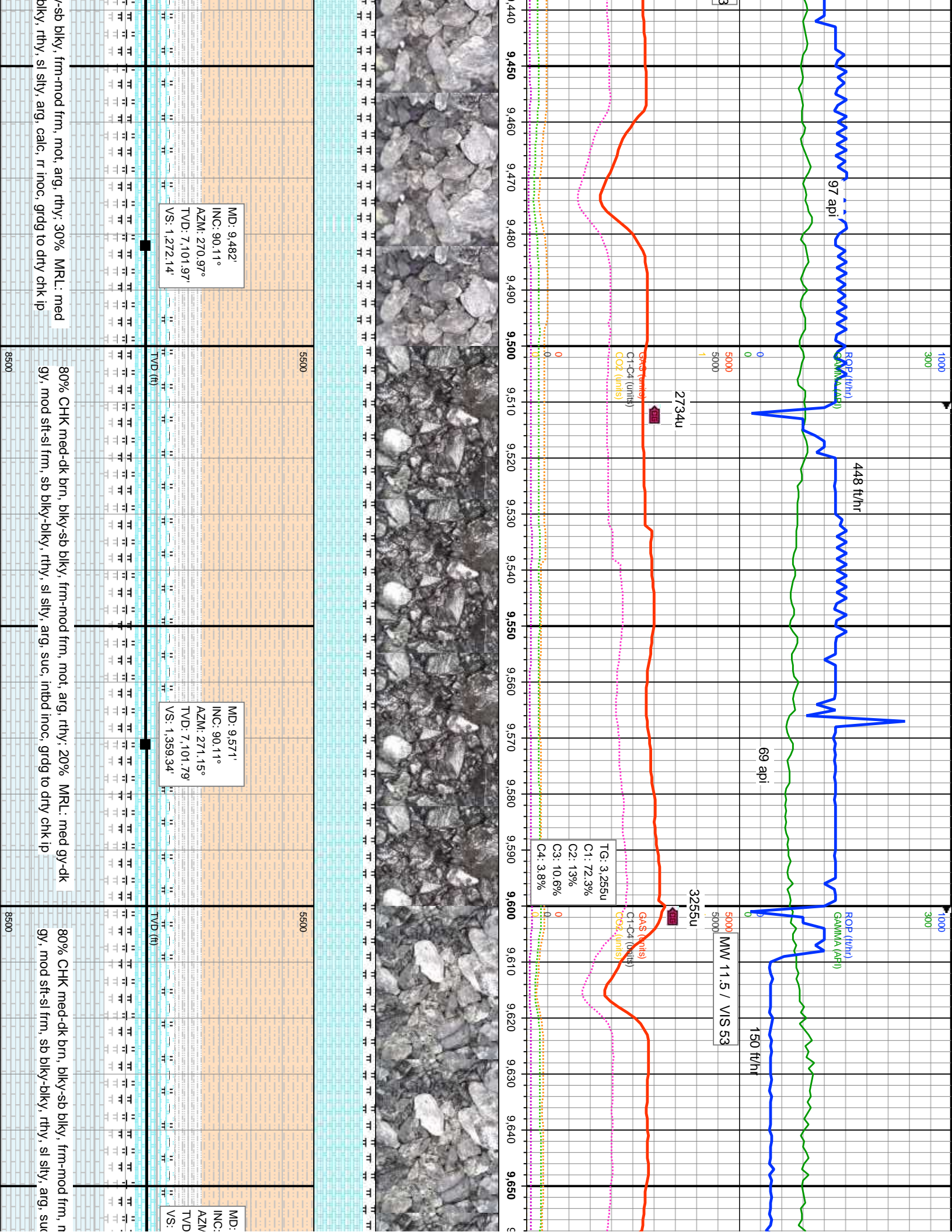
										5500										5500										5500																													
J/T Fault										MD: 8.156° INC: 59.52° AZM: 293.91° TVD: 6.997.1' VS: -10.21'										TVD (ft)										MD: 8.246° INC: 65.32° AZM: 289.6° TVD: 7.038.77' VS: 68.5'										TVD (ft)										MD: 8.335° INC: 74.46° AZM: 286.0° TVD: 7.066° VS: 151.62°									
										gy-dk gy, mod sft-sl frm, rthy, sl silty, arg, calc; 20% blk brn, blkly-sb blkly, intbd inoc, tr bent																				80% MRL: med gy-dk gy, mod sft-sl frm, sb blkly-blky, rthy, sl silty, arg, calc; 20% CHK med gy-dk brn, blkly-sb blkly, frm-mod frm, intbd inoc																				80% MRL: med gy-dk gy, mod sft-sl frm, sb blkly-blky, rthy, sl silty, arg, calc; 20% CHK med gy-dk brn, blkly-sb blkly, frm-mod frm, intbd inoc									
										8500																				8500																				8500									

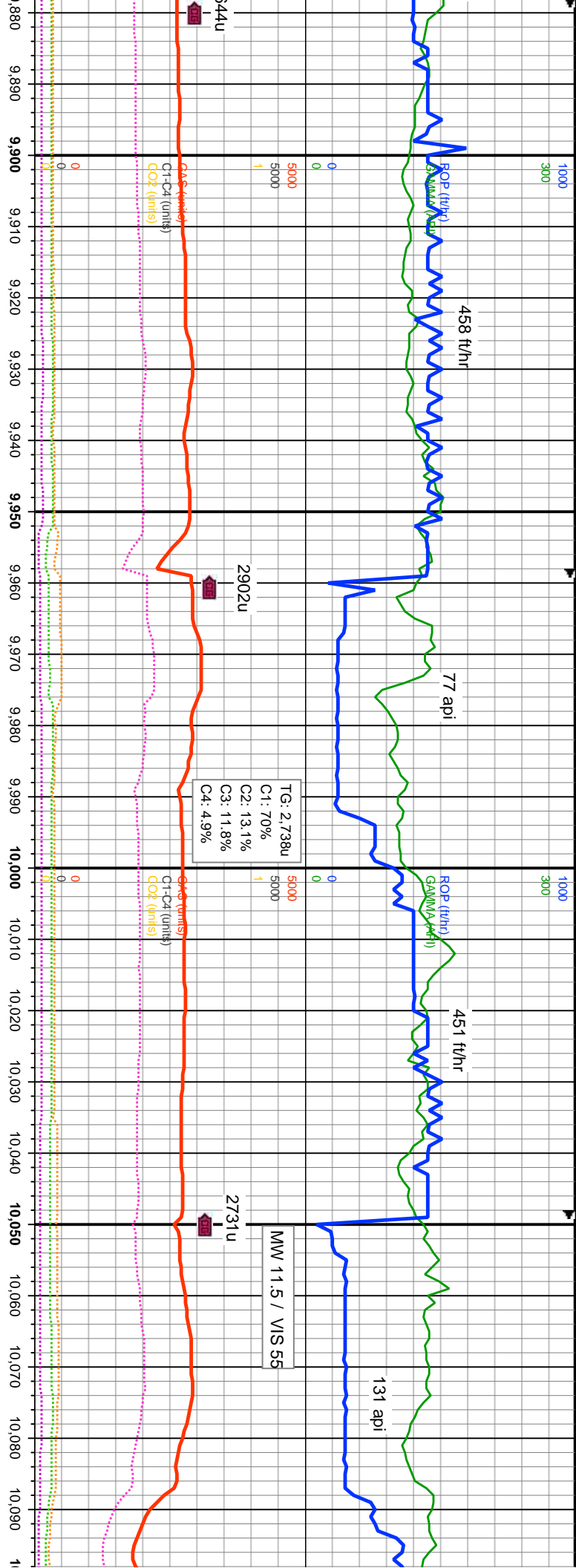






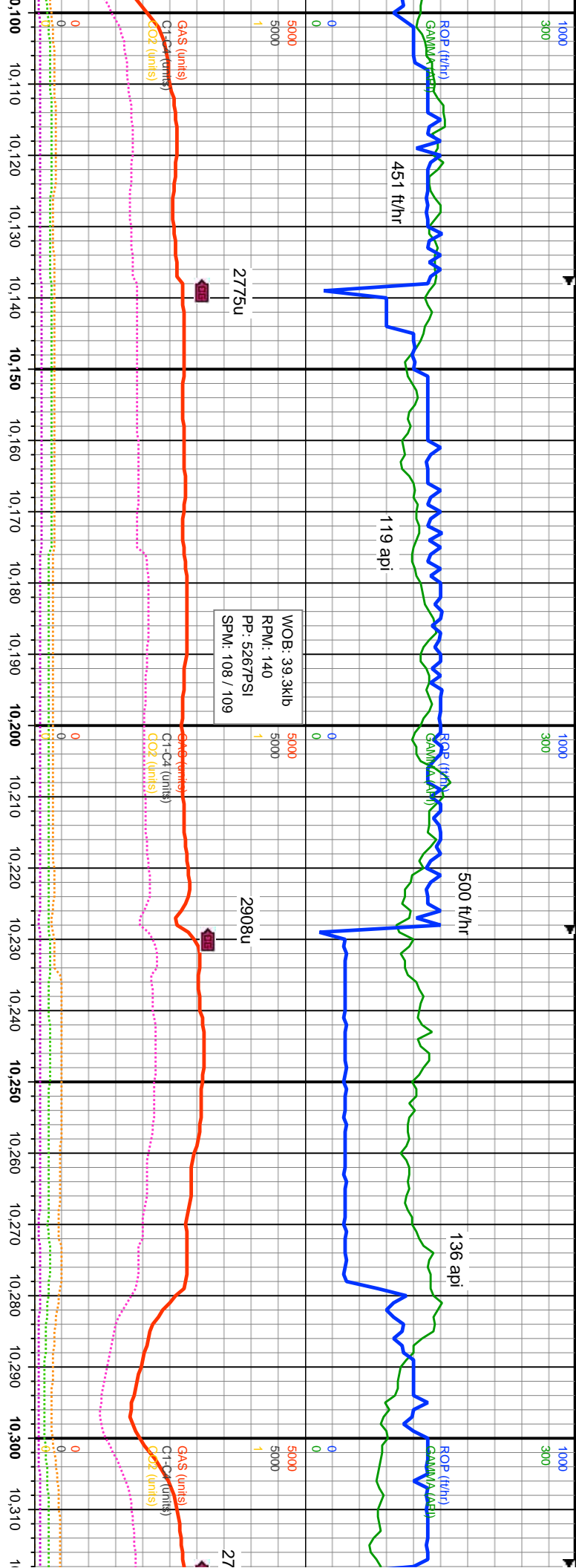
ed gy-dk brn, blk-ly-sb blk-ly, frm-mod frm 15% MRL: med gy-dk gy, sb blk-ly-blk-ly, rthy, slsly, arg, calc	MD: 9.302' INC: 90.11° AZM: 271.23° TVD: 7,102.37' VS: 1,095.76'	90% CHK med gy-dk brn, blk-ly-sb blk-ly, frm-mod frm 10% MRL: med gy-dk gy, mod sft-sl frm, sb blk-ly-blk-ly, rthy, slsly, arg, calc	MD: 9.392' INC: 90.15° AZM: 271.06° TVD: 7,102.17' VS: 1,183.97'	70% CHK med-dk brn, gy lp, blk-ly gy-dk gy, mod sft-sl frm, sb blk-ly-
8500	5500	8500	5500	8500



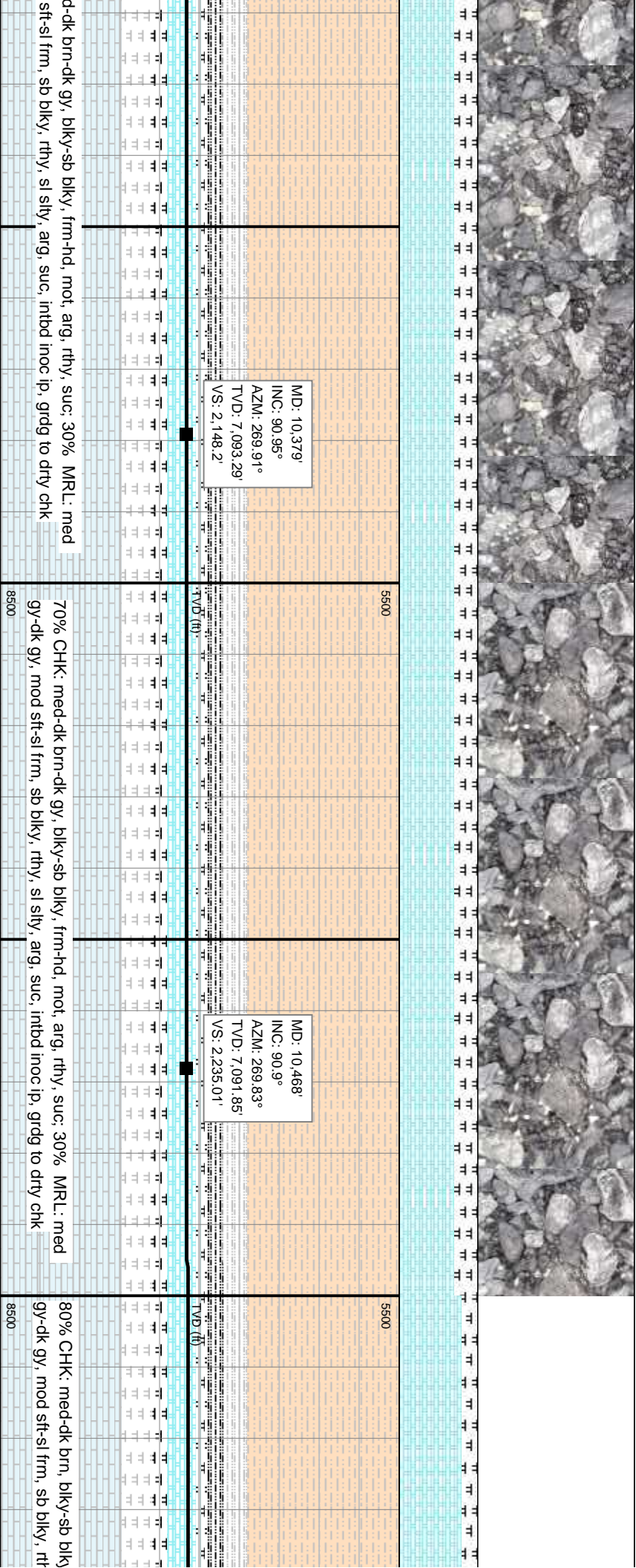
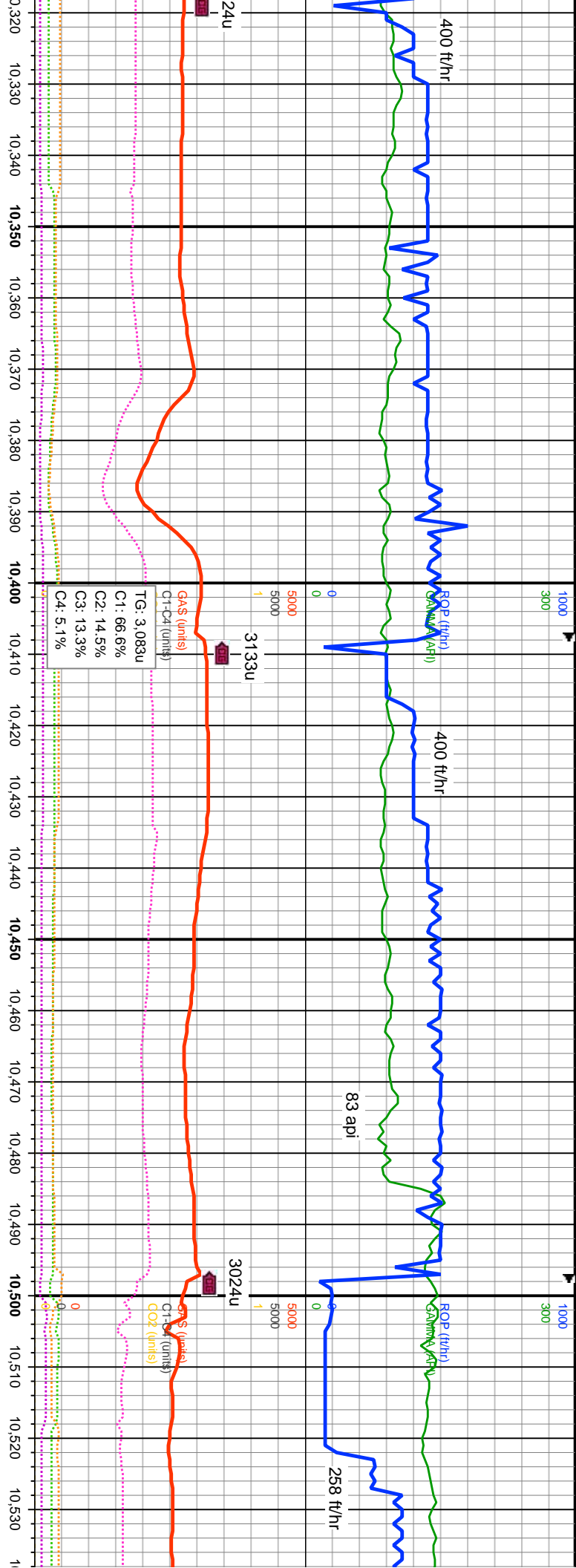


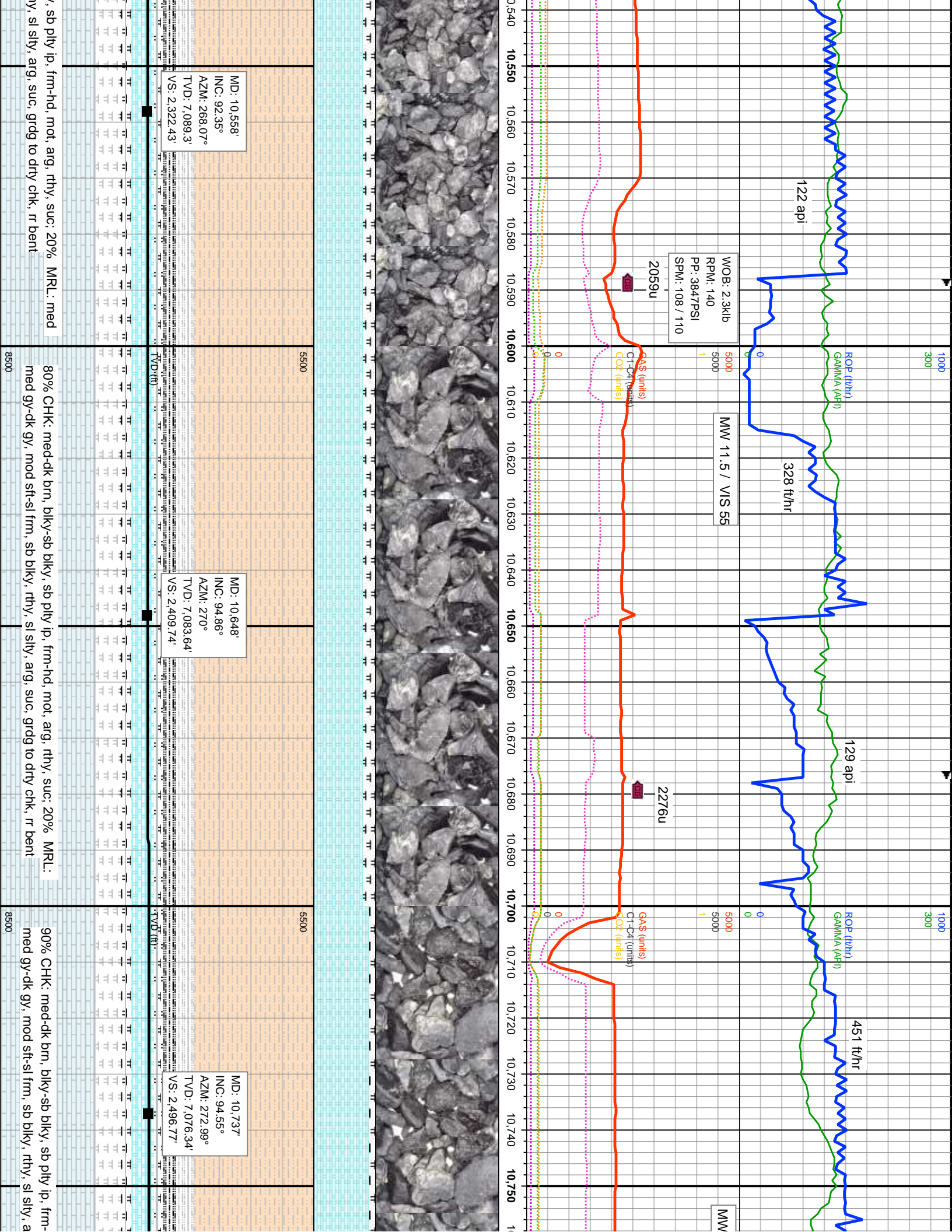
5500	MD: 9.930' INC: 90.95° AZM: 267.72° TVD: 7.096.44' VS: 1.709.14'	5500	MD: 10.020' INC: 90.42° AZM: 270.27° TVD: 7.095.36' VS: 1.796.6'
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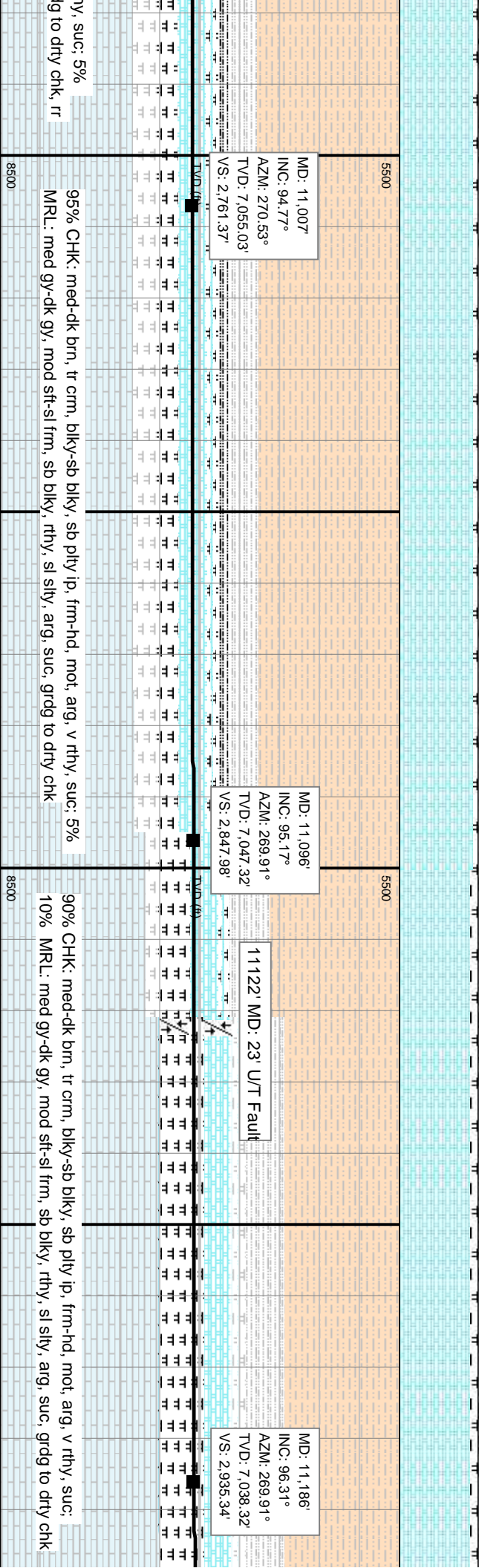
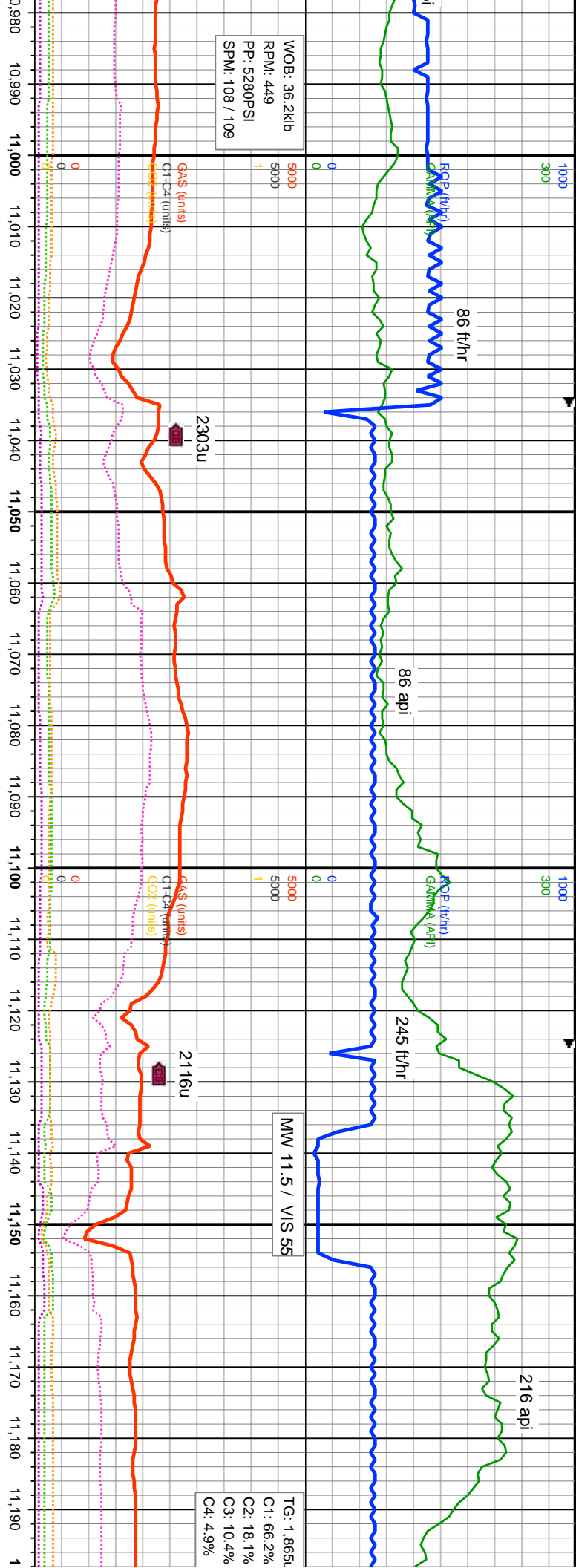
20% MRL: med dry chk ip, rr bent	90% CHK med-dk brn, dk gy ip, blk-y-sb blk-y, frm-mod frm, mot, arg, rthy, 10% MRL: med gy-dk gy, mod sft-sl frm, sb blk-y, rthy, sl sily, arg, suc, intbd inoc, grdg to dry chk	90% CHK med-dk brn, dk gy ip, blk-y-sb blk-y, frm-mod frm, mot, arg, rthy, 10% MRL: med med gy-dk gy, mod sft-sl frm, sb blk-y, rthy, sl sily, arg, suc, intbd inoc, grdg to dry chk
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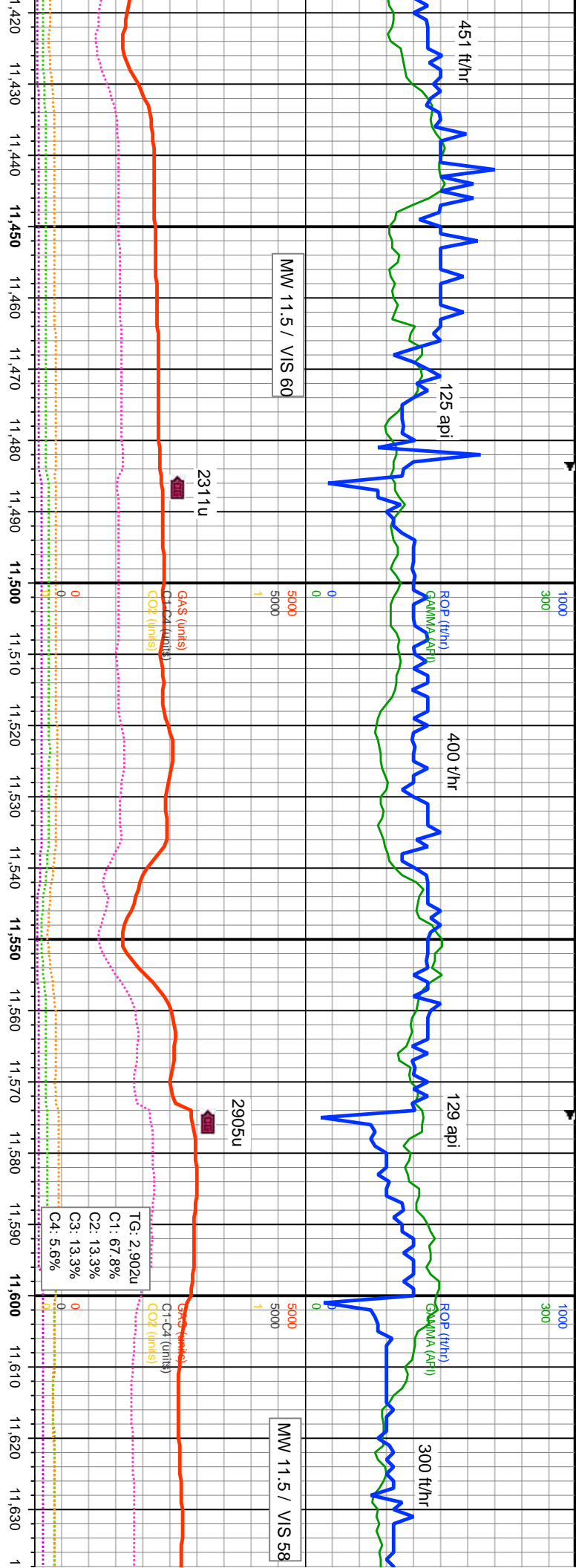


90% CHK med-dk brn, blkly-sb blkly, frm-mod frm, mot, arg, rthy, grdg to mltst ip; 10% MRL: med gy-dk gy, mod sft-sl frm, sb blkly, rthy, sl sfty, arg, suc, intbd inoc, grdg to dry chk, rr inoc		70% CHK: med-dk brn-dk gy, blkly-sb blkly, frm-mod frm, mot, arg, rthy, rr dsm pyr; 30% MRL: med gy-dk gy, mod sft-sl frm, sb blkly, rthy, sl sfty, arg, suc, intbd inoc ip, grdg to dry chk		70% CHK: me gy-dk gy, mod	
MD: 10,109' INC: 90.11° AZM: 271.41° TVD: 7,094.95' VS: 1,883.74'		MD: 10,199' INC: 90.07° AZM: 271.15° TVD: 7,094.81' VS: 1,971.99'		MD: 10,289' INC: 90.46° AZM: 271.15° TVD: 7,094.39' VS: 2,060.2'	
TVD (ft)		TVD (ft)		TVD (ft)	
5500		5500		5500	
8500		8500		8500	









MD: 11,455'
INC: 94.51°
AZM: 268.07°
TVD: 7,009.13'
VS: 3,195.89'

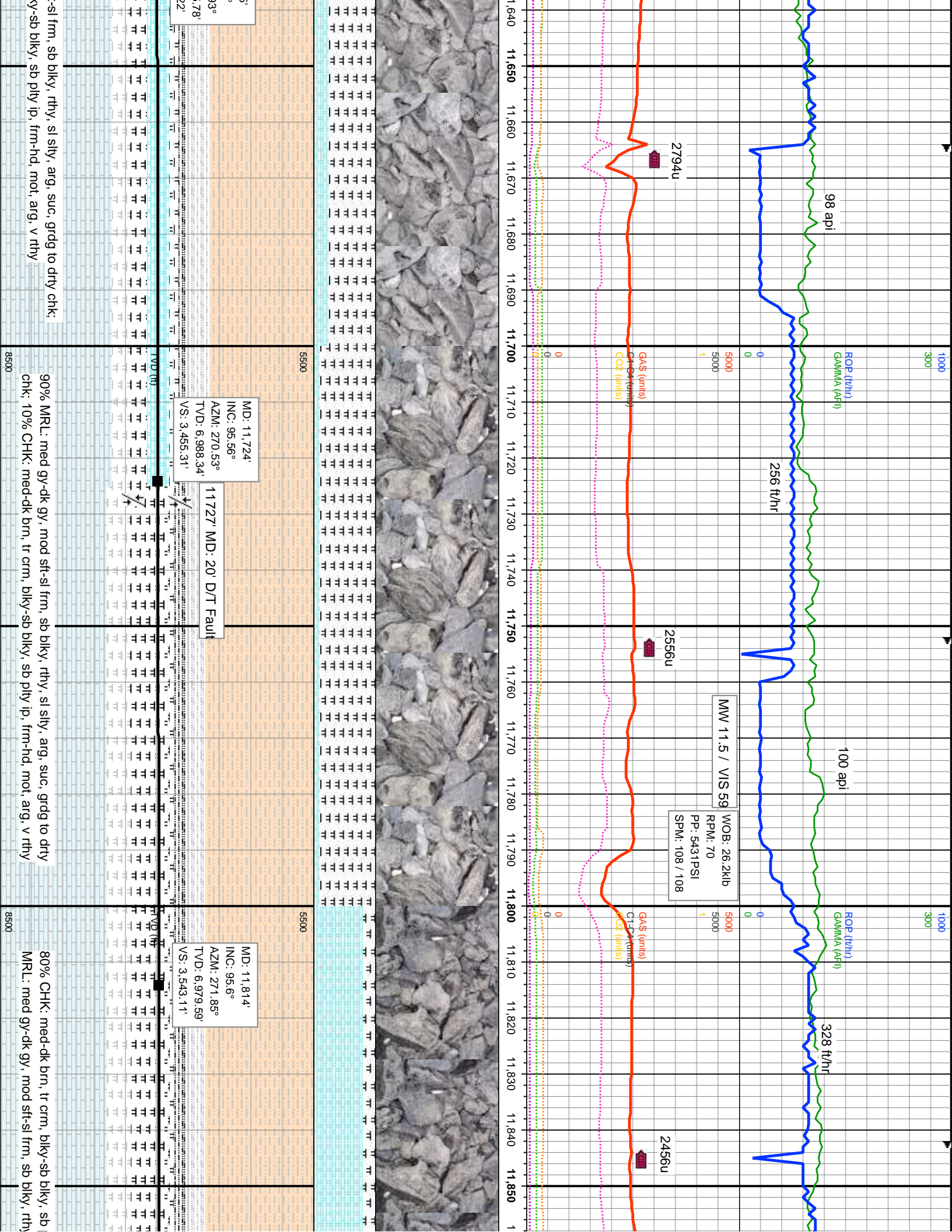
11463 MD: 31' D/T Fault

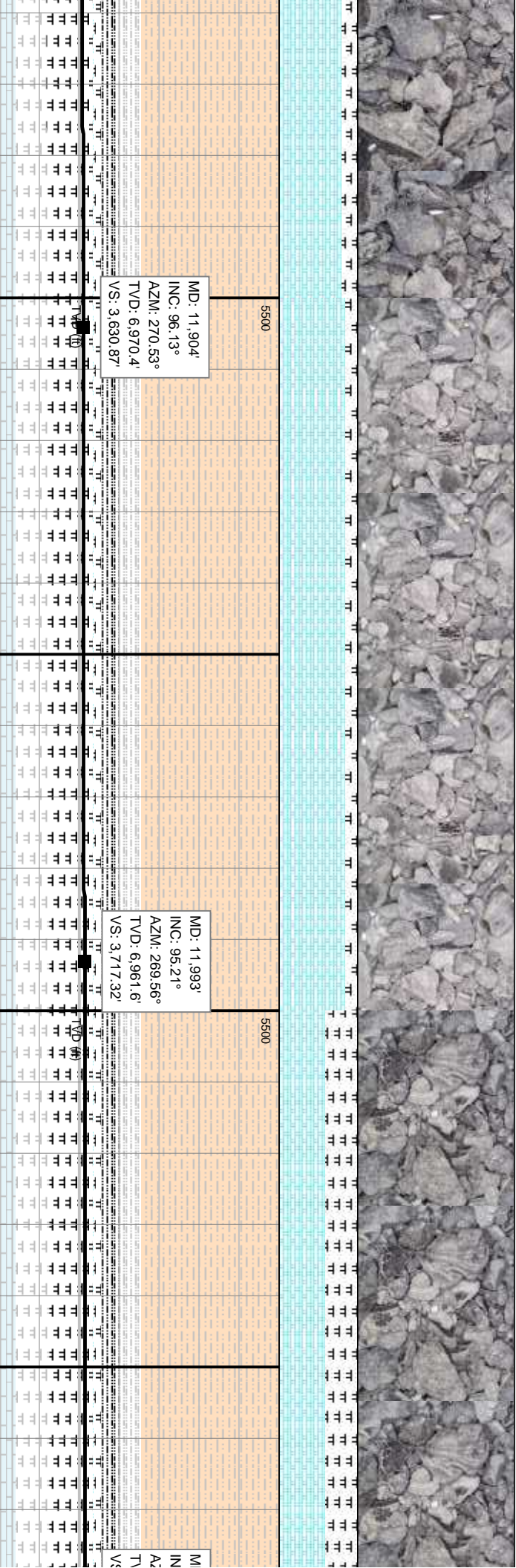
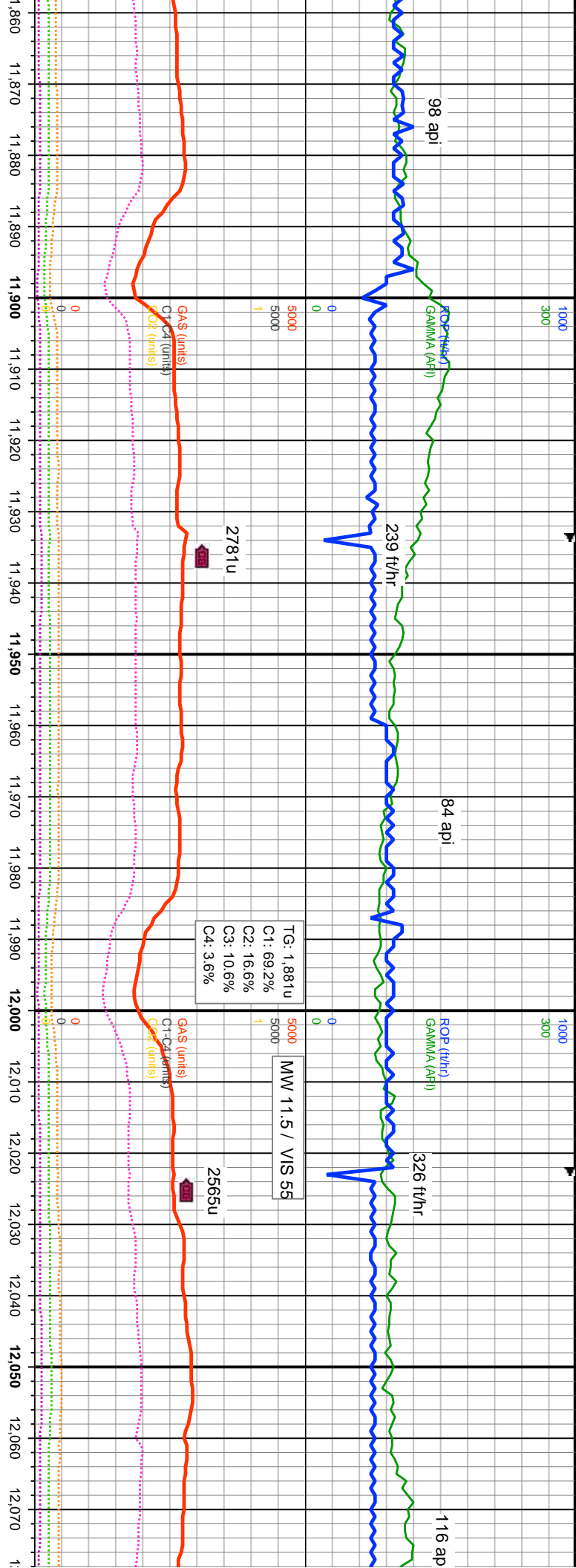
MD: 11,545'
INC: 94.24°
AZM: 267.54°
TVD: 7,002.26'
VS: 3,282.66'

MD: 11,633'
INC: 94.02°
AZM: 266.5°
TVD: 6,996'
VS: 3,369.2'

70% MRL: med gy-dk gy, mod sft-sl frm, sb blk, rthy, sl sly, arg, suc, grdg to drty
chk: 30% CHK: med-dk brn, tr crm, blk-yl sb blk, sb ply ip, frm-hd, mot, arg, v rthy

75% MRL: med gy-dk gy, mod sft
25% CHK: med-dk brn, tr crm, blk

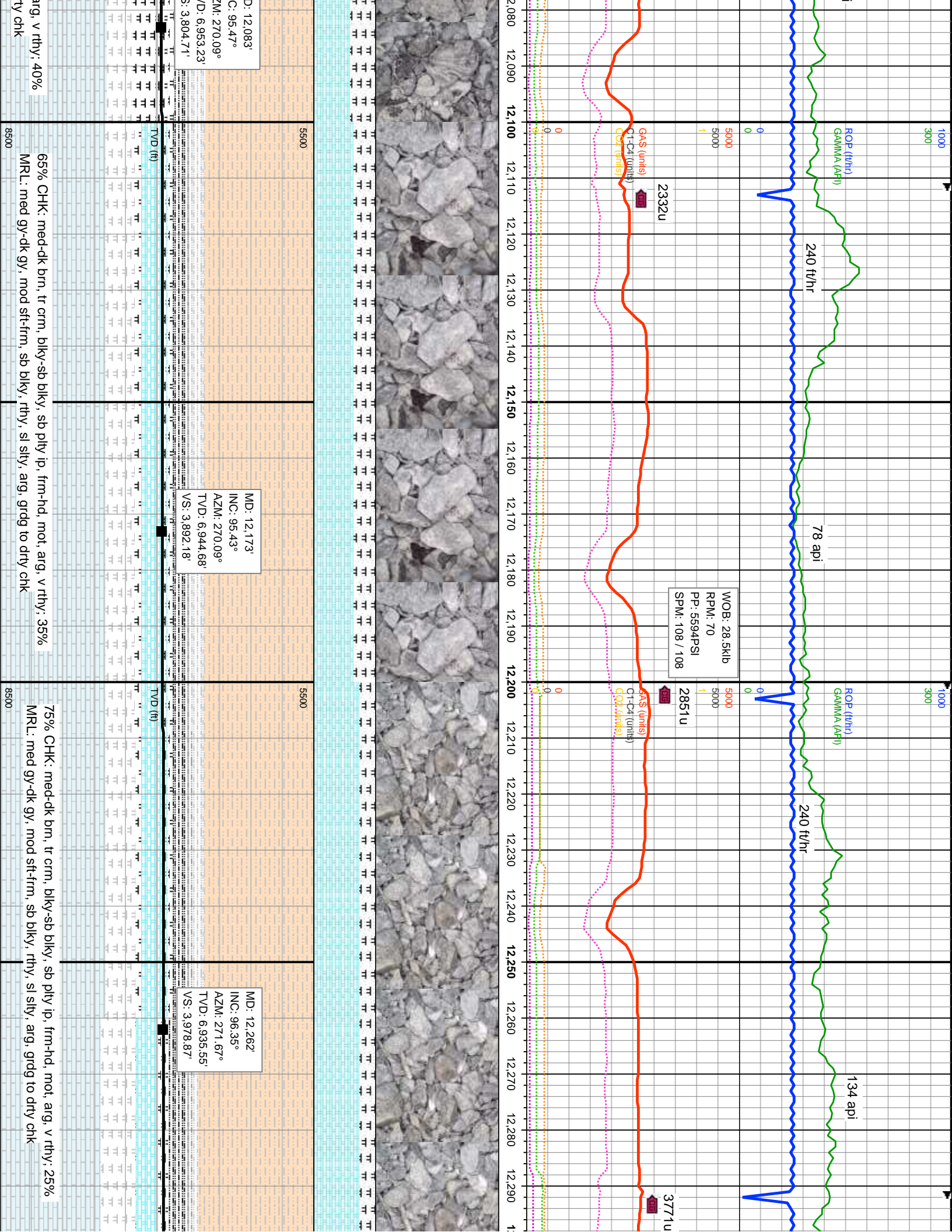


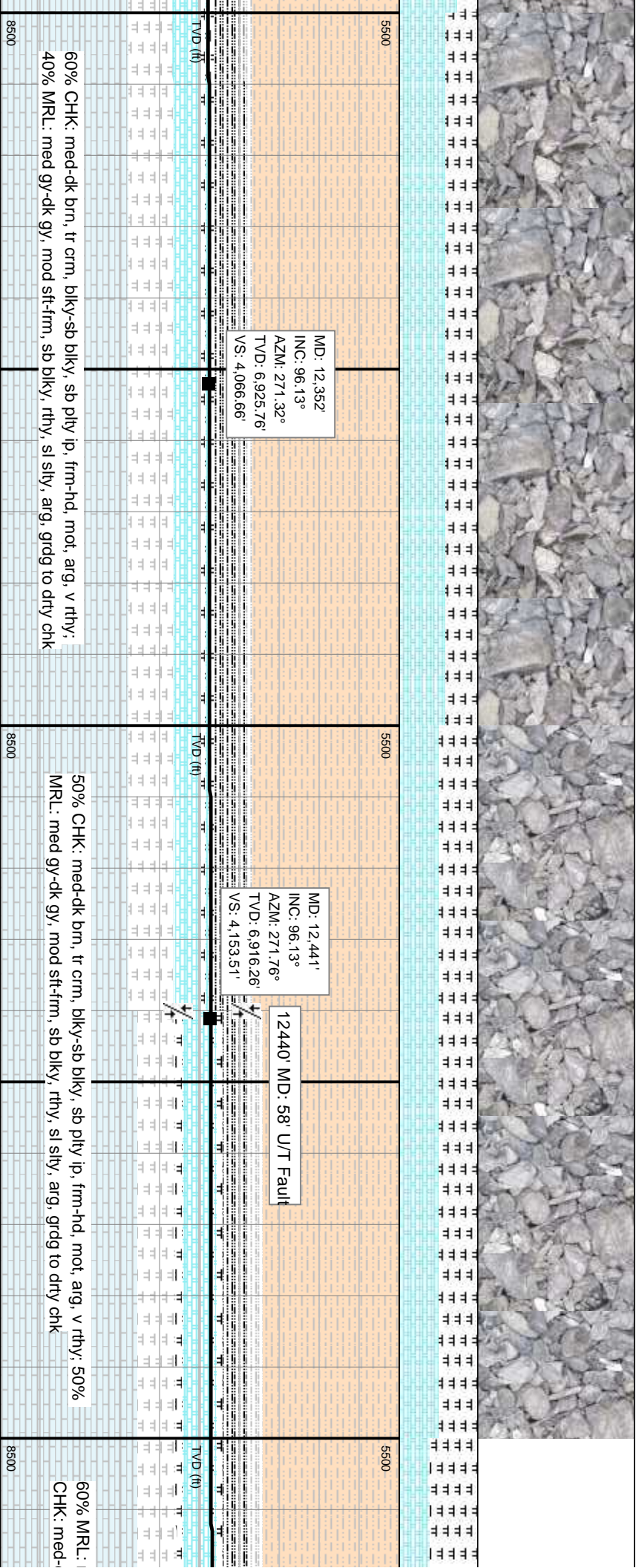
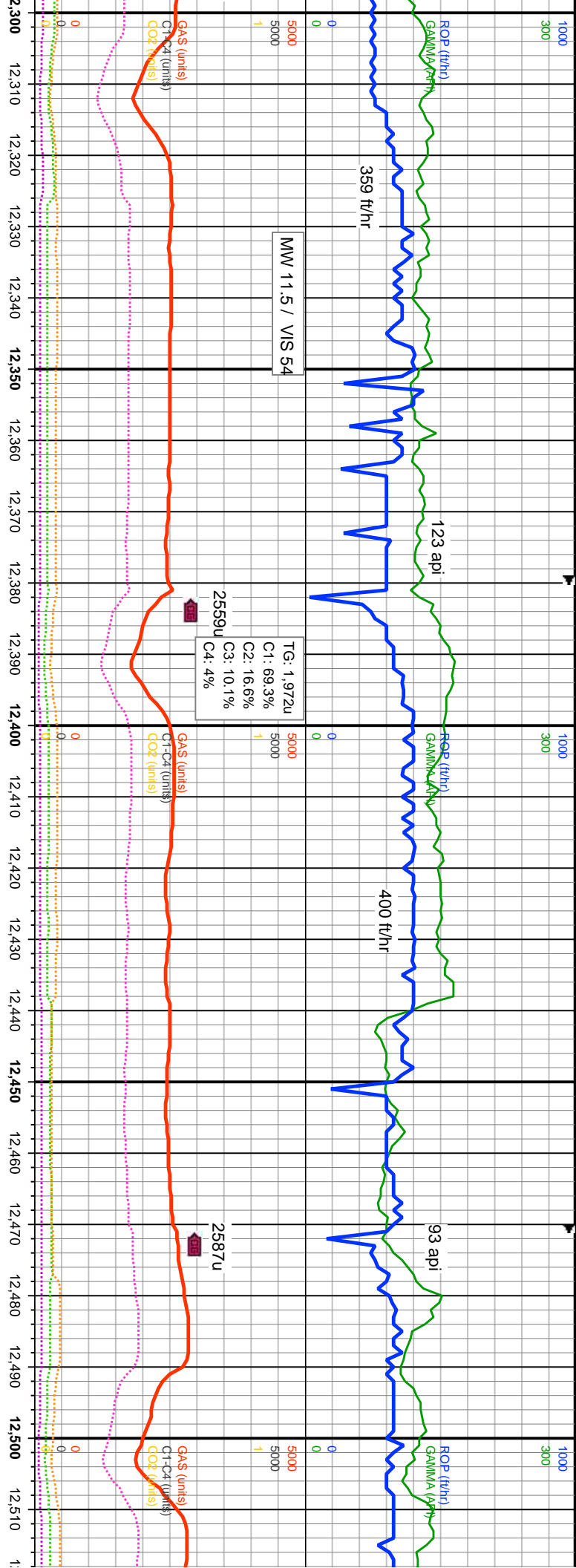


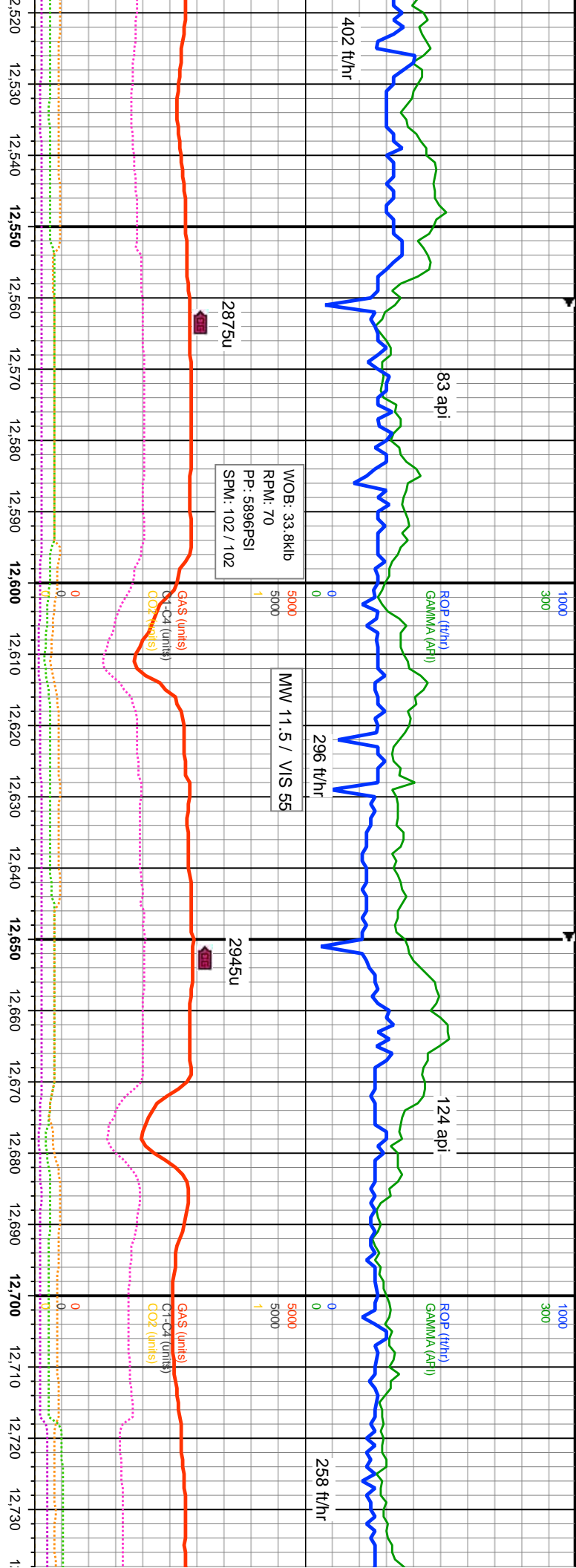
ply ip, frm-hd, mot, arg, v rthy, 20%
sl stly, arg, suc, gridg to drty chk

85% CHK: med-dk brn, tr crm, blkly-sb blkly, sb ply ip, frm-hd, mot, arg, v rthy, 15%
MRL: med gy-dk gy, mod sft-sl frm, sb blkly, rthy, sl stly, arg, suc, gridg to drty chk

60% CHK: med-dk brn, tr crm, blkly-sb blkly, sb ply ip, frm-hd, mot, arg, v rthy, 15%
MRL: med gy-dk gy, mod sft-frm, sb blkly, rthy, sl stly, arg, gridg to drty chk





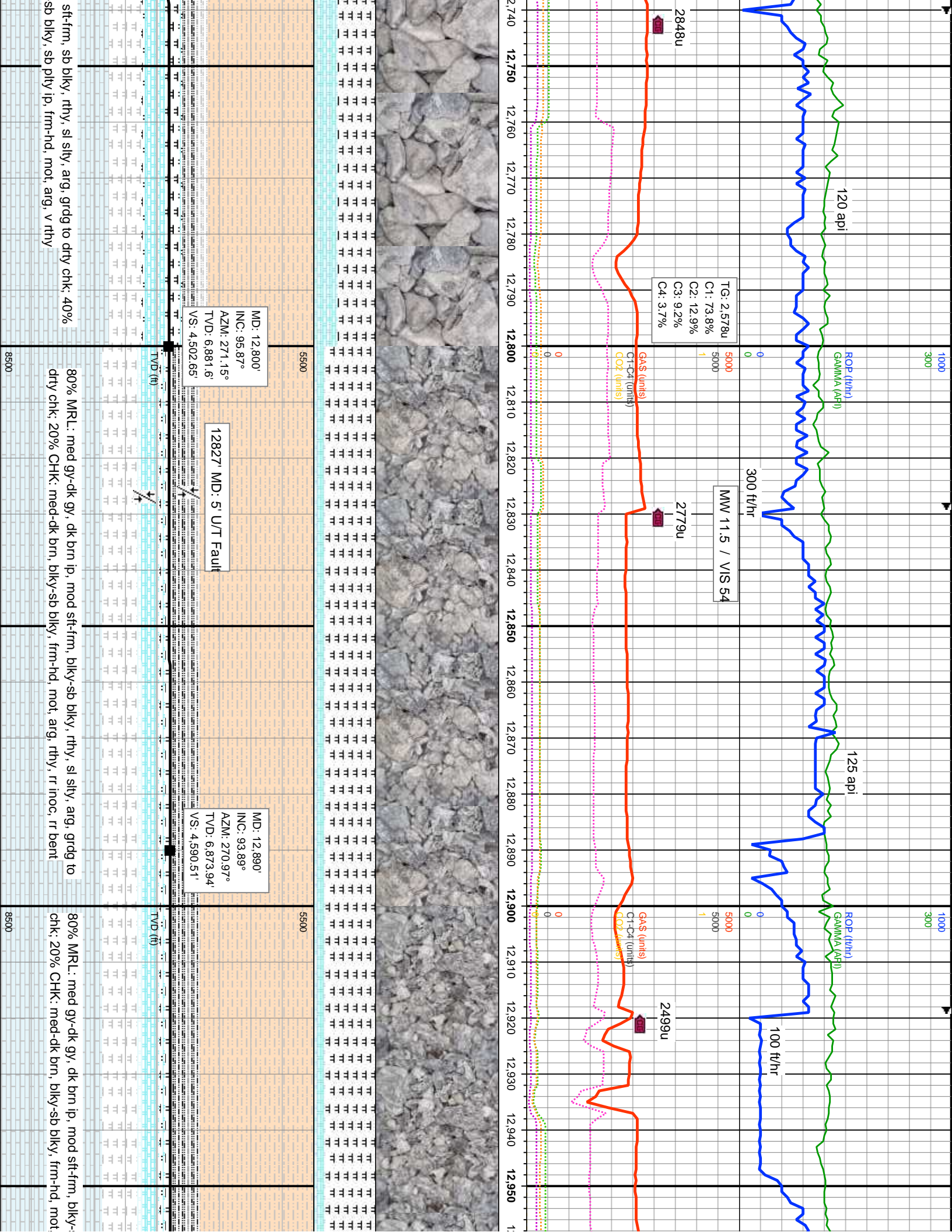


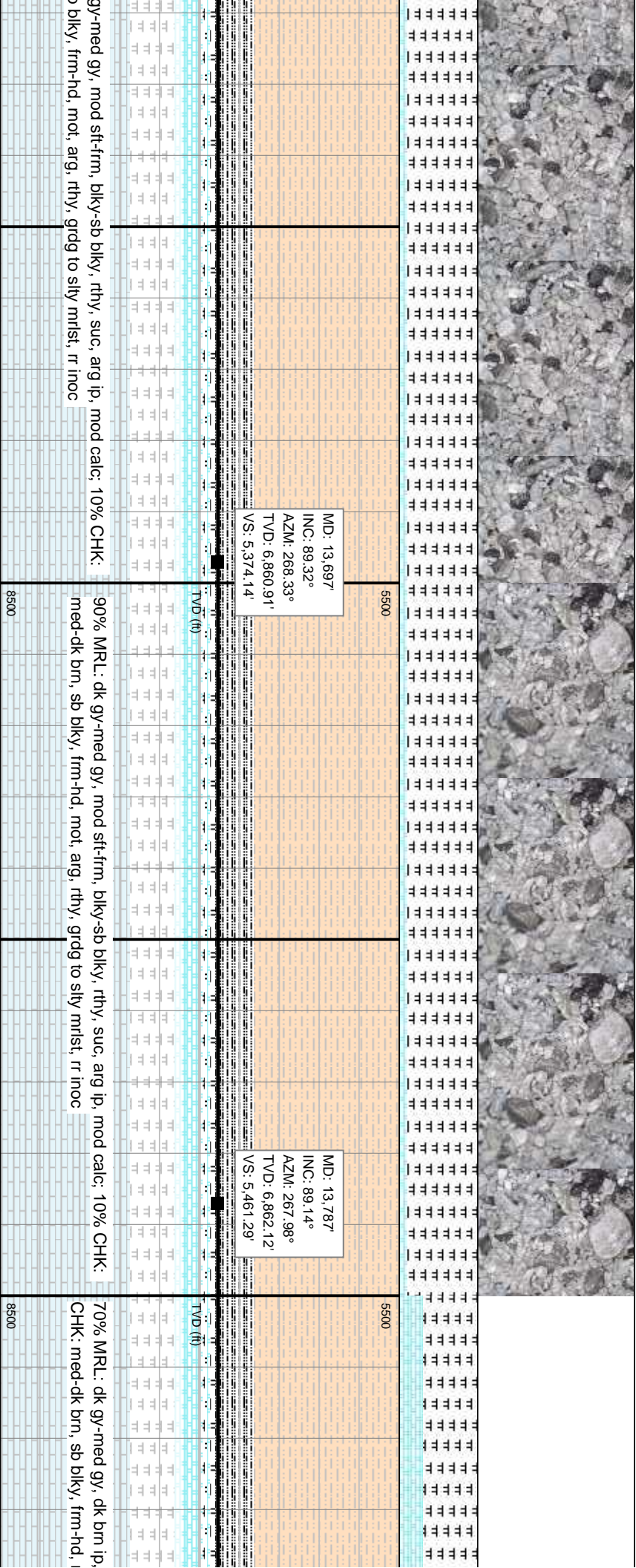
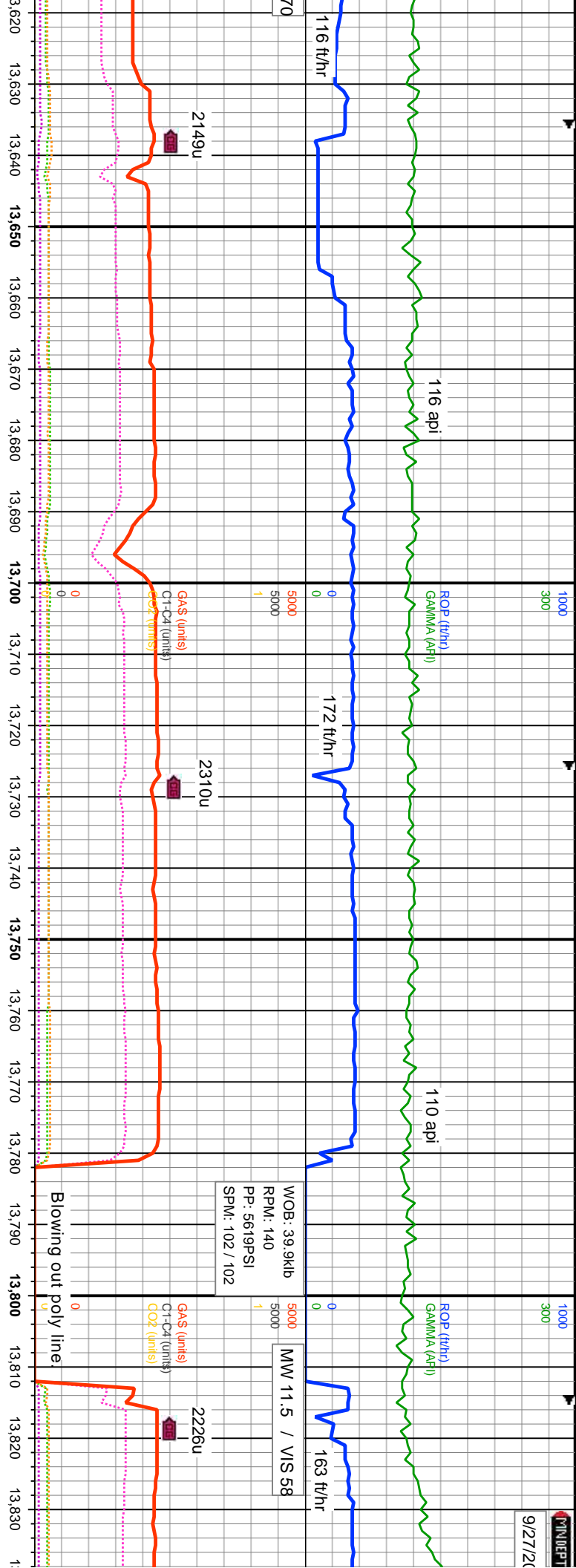
MD: 12.531'
INC: 95.56°
AZM: 270.27°
TVD: 6.907.09
VS: 4.241.22

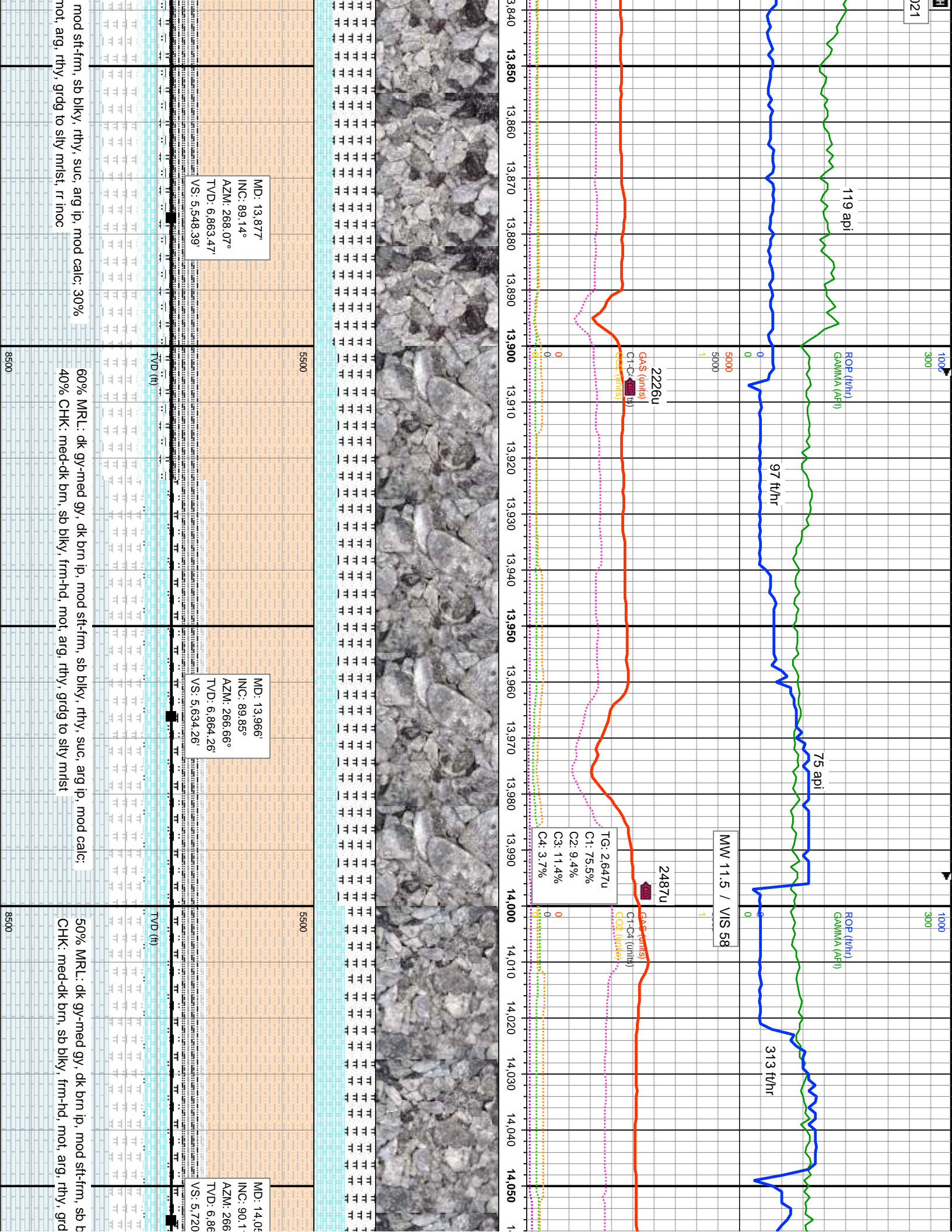
MD: 12.621'
INC: 95.39°
AZM: 269.91°
TVD: 6.898.51
VS: 4.328.69

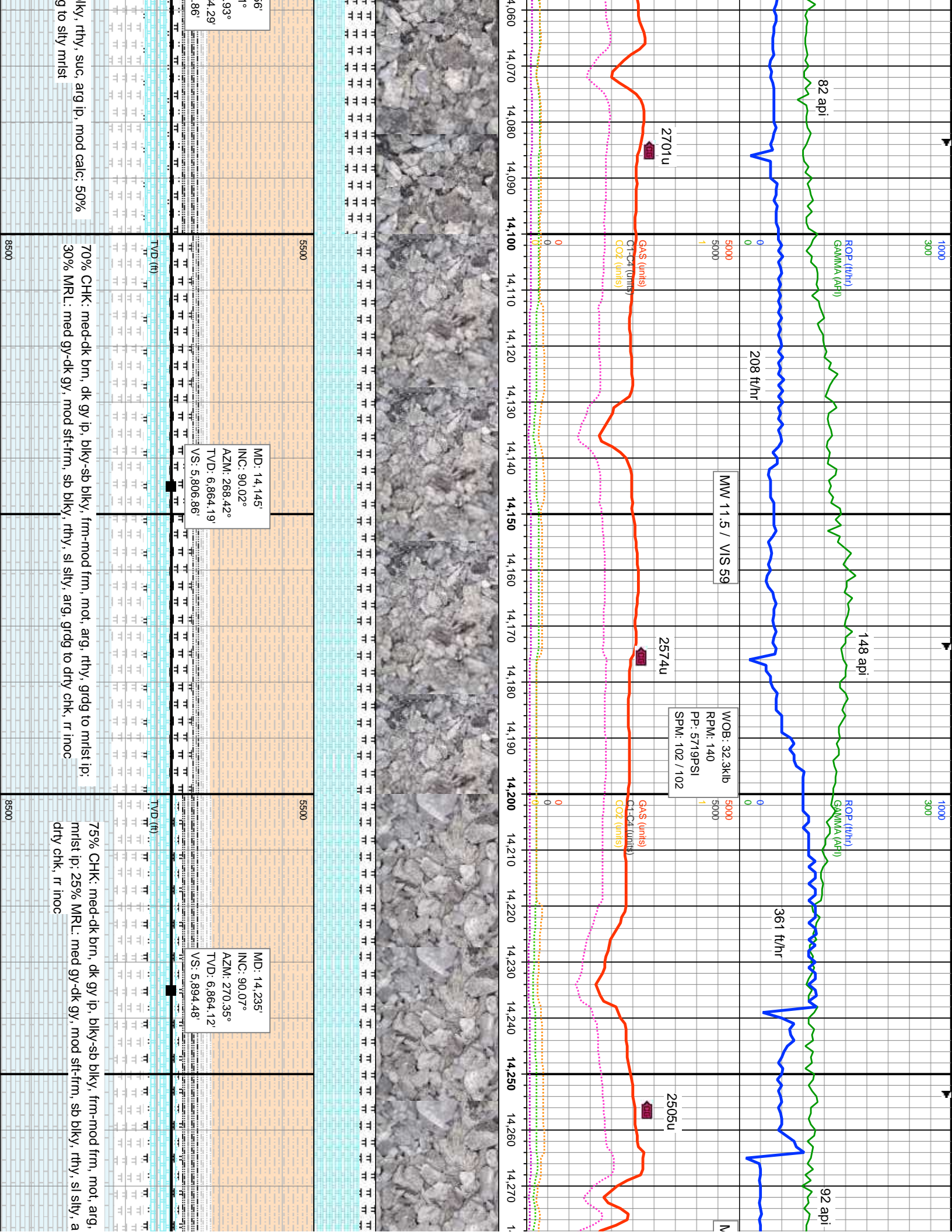
MD: 12.711'
INC: 95.21°
AZM: 269.65°
TVD: 6.890.19
VS: 4.416.07

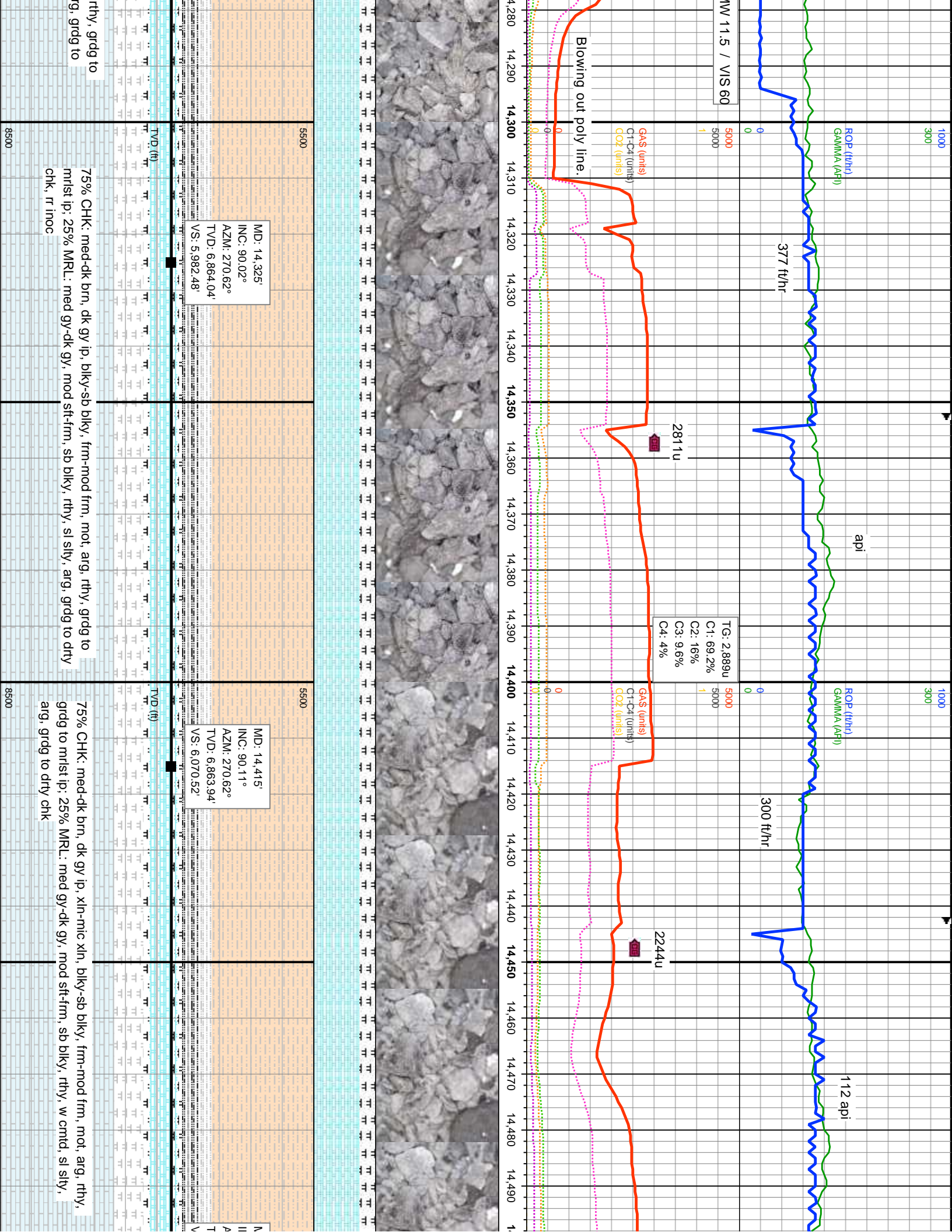
med gy-dk gy, mod sft-fm, sb blk, rthy, sl stly, arg, grdg to drty chk, 40% dk brn, tr cm, blkysb blk, sb pily ip, frm-hd, mot, arg, v rthy	5500	TVD (ft)	60% MRL: med gy-dk gy, mod sft-fm, sb blk, rthy, sl stly, arg, grdg to drty chk, 40% CHK: med-dk brn, tr cm, blkysb blk, sb pily ip, frm-hd, mot, arg, v rthy
60% MRL: med gy-dk gy, mod sft-fm, sb blk, rthy, sl stly, arg, grdg to drty chk, 40% CHK: med-dk brn, tr cm, blkysb blk, sb pily ip, frm-hd, mot, arg, v rthy	5500	TVD (ft)	60% MRL: med gy-dk gy, mod sft-fm, sb blk, rthy, sl stly, arg, grdg to drty chk, 40% CHK: med-dk brn, tr cm, blkysb blk, sb pily ip, frm-hd, mot, arg, v rthy

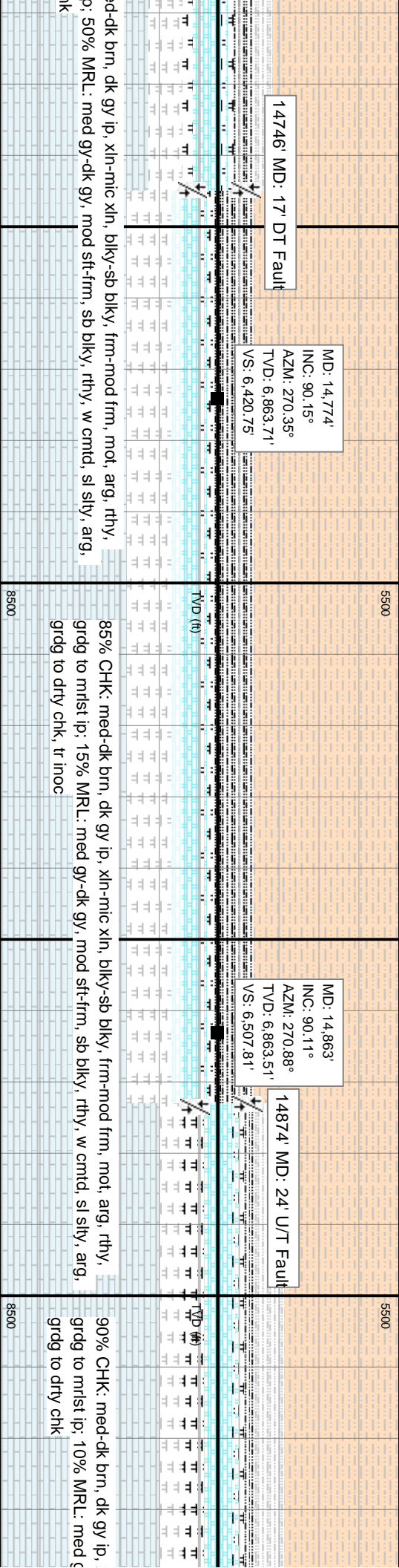
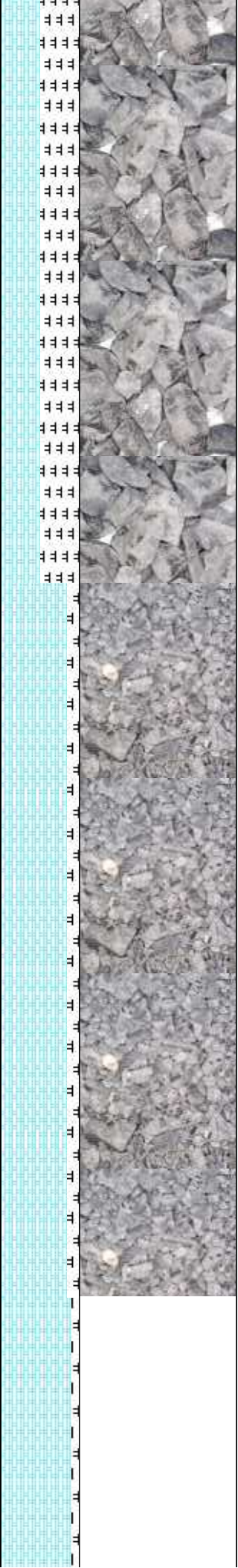
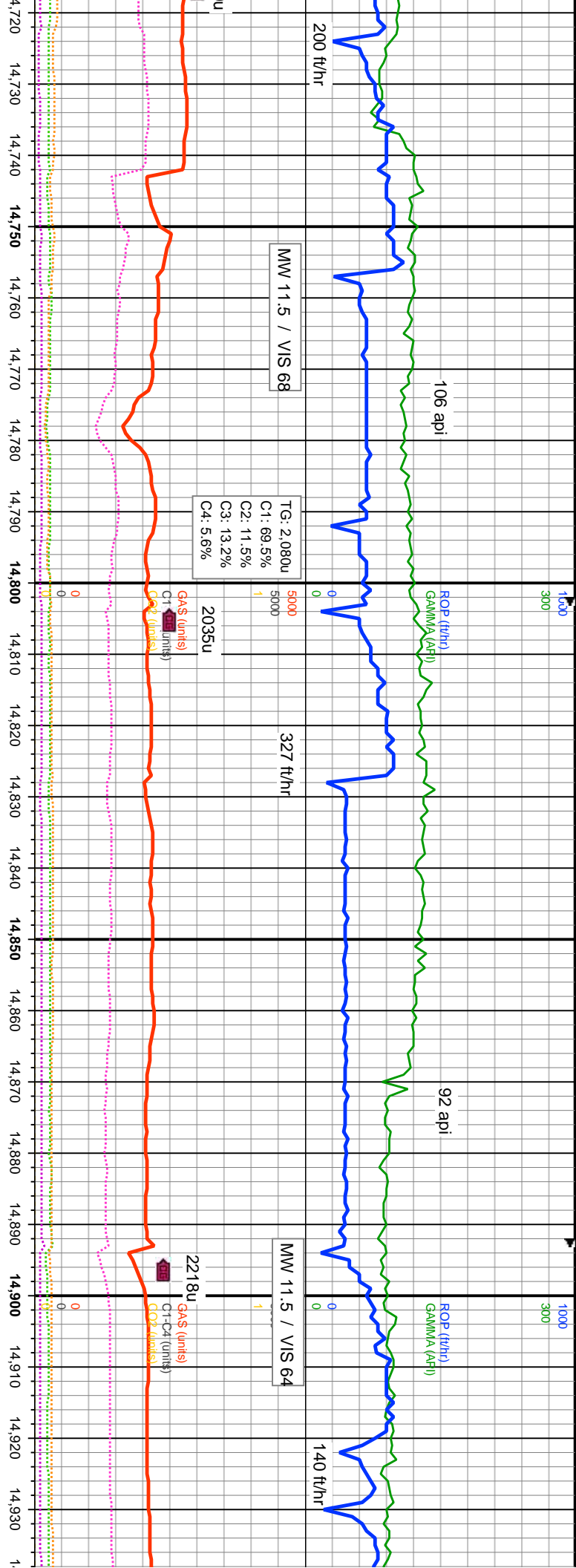


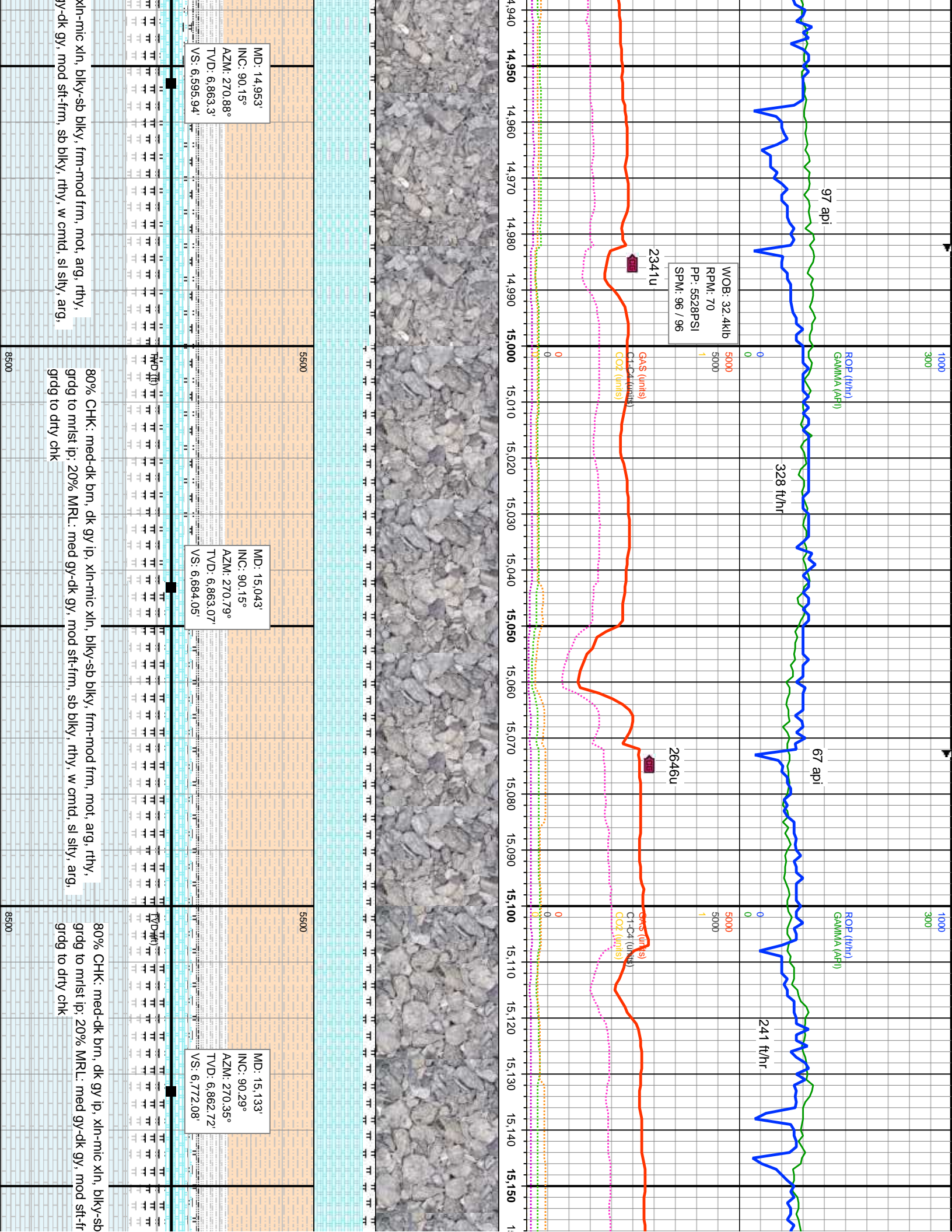


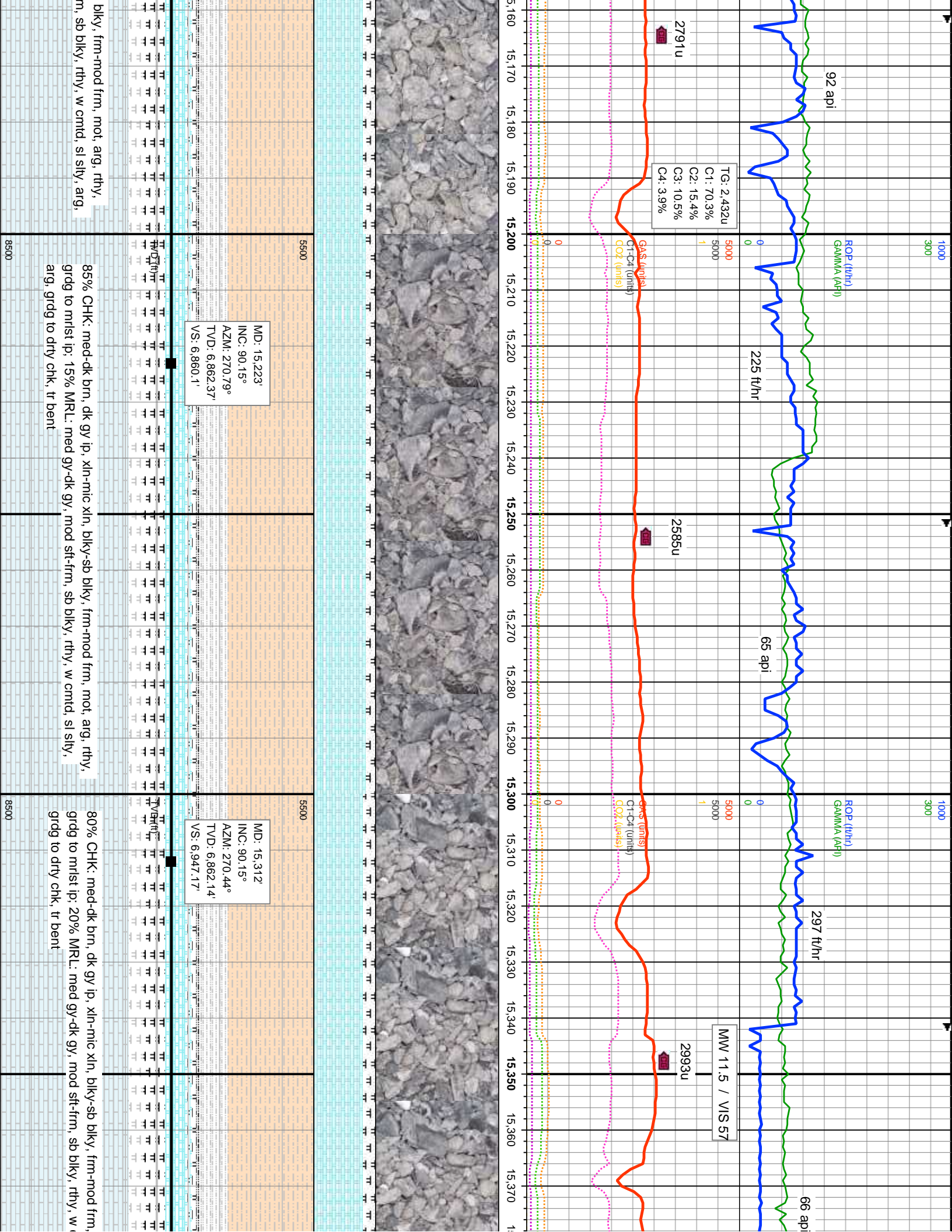


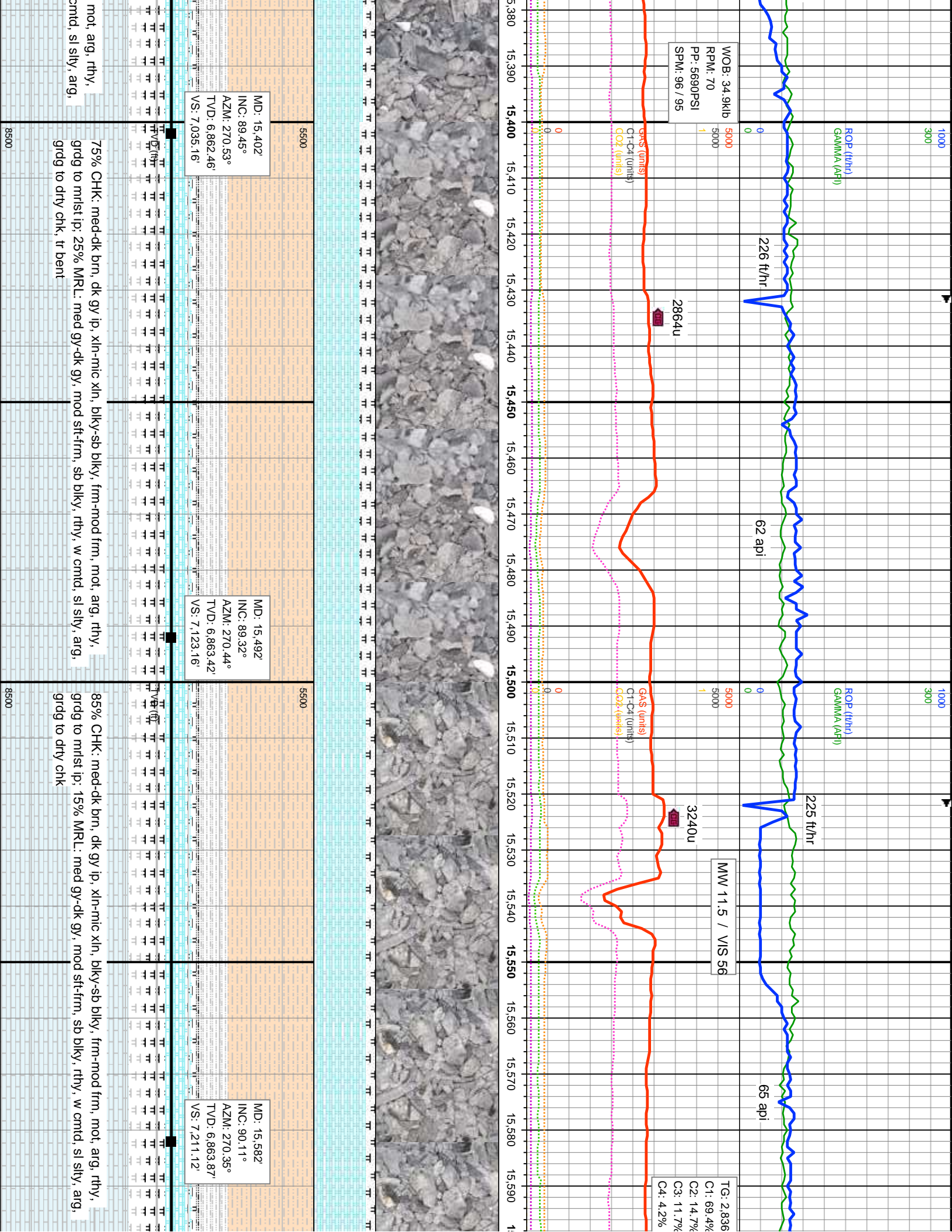


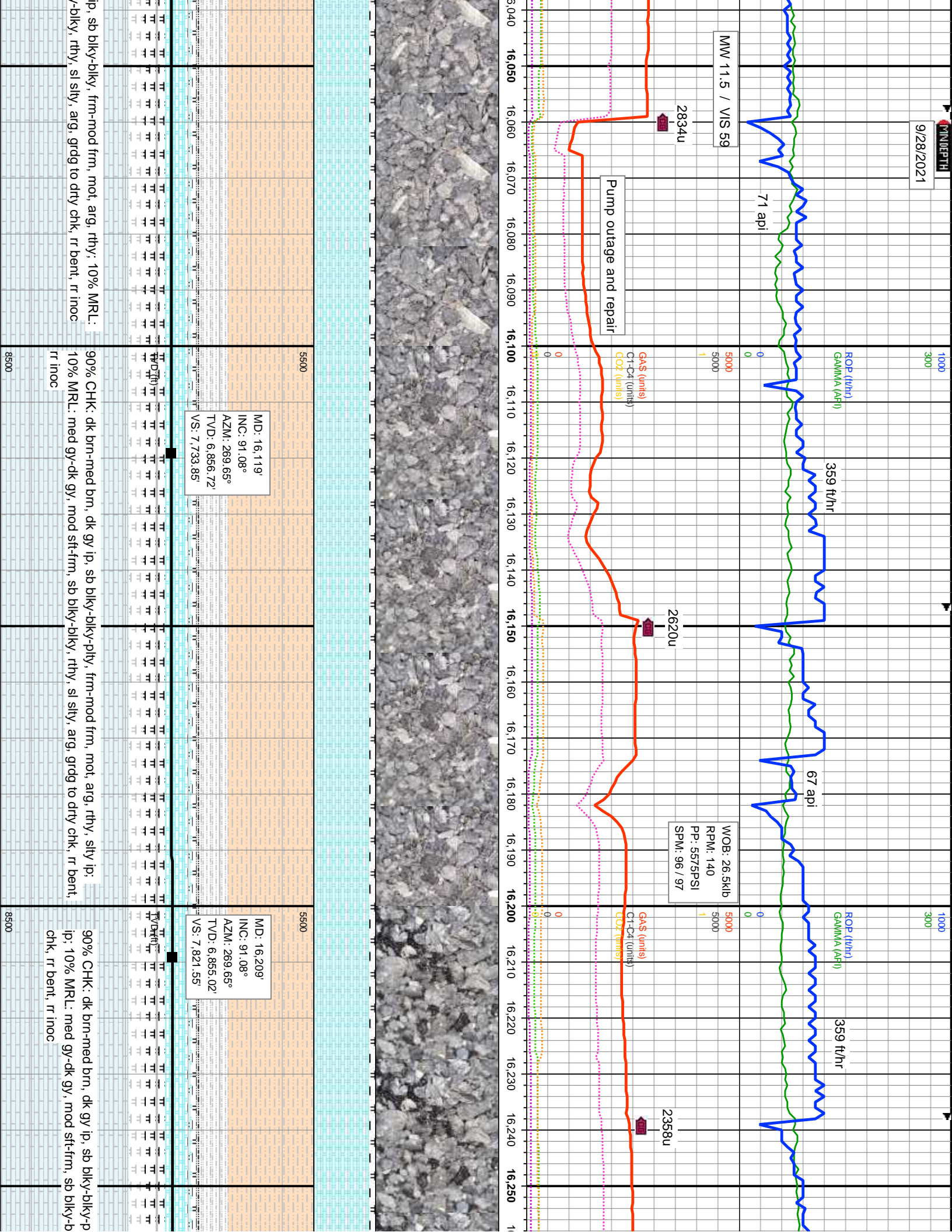


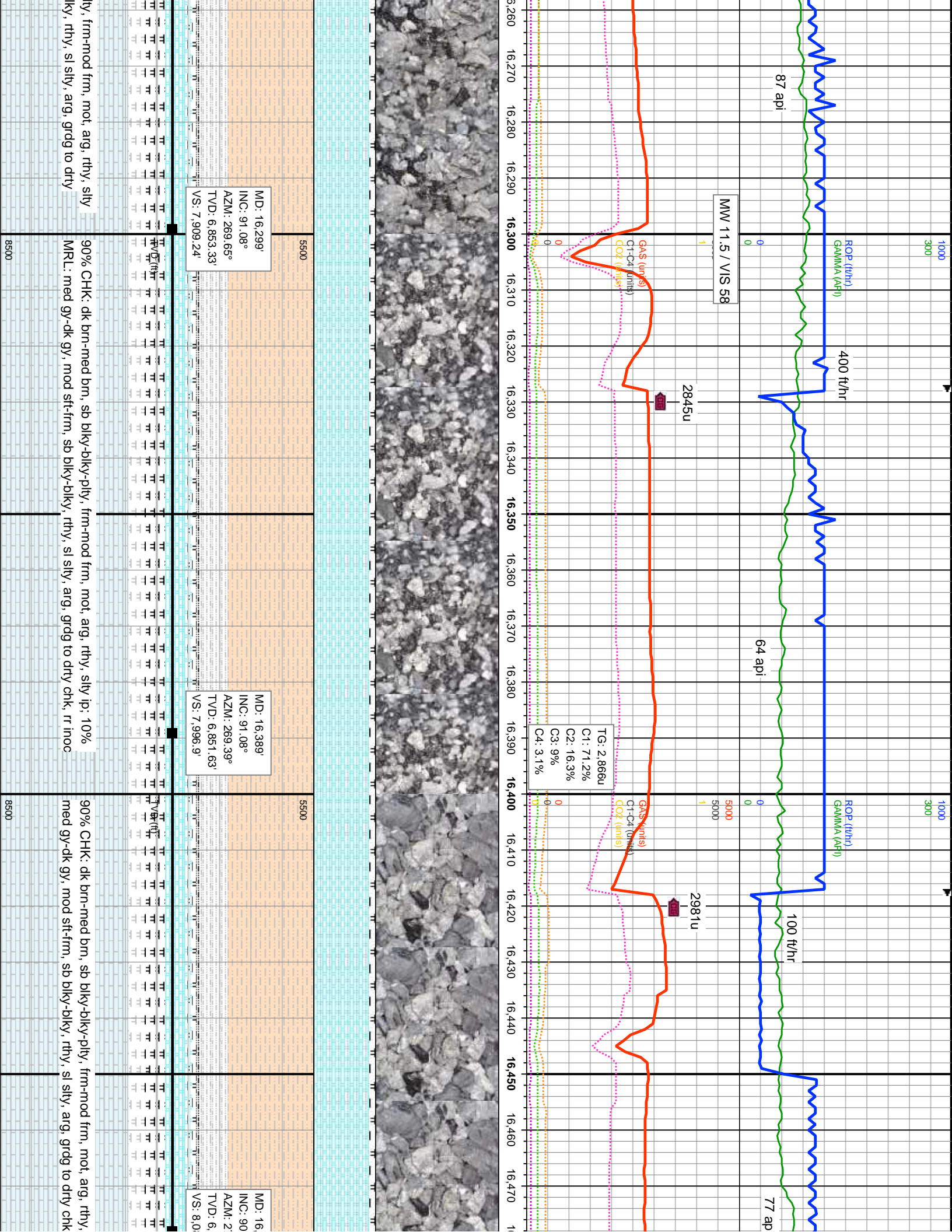


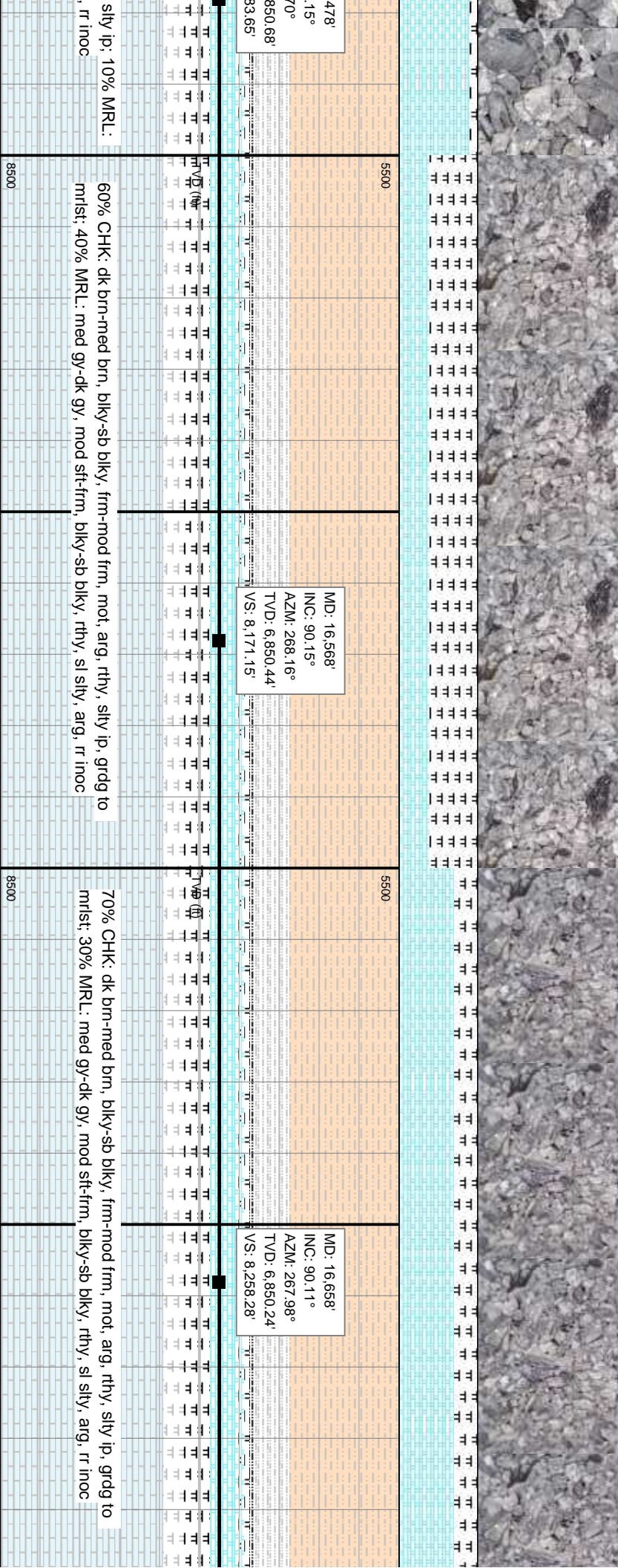
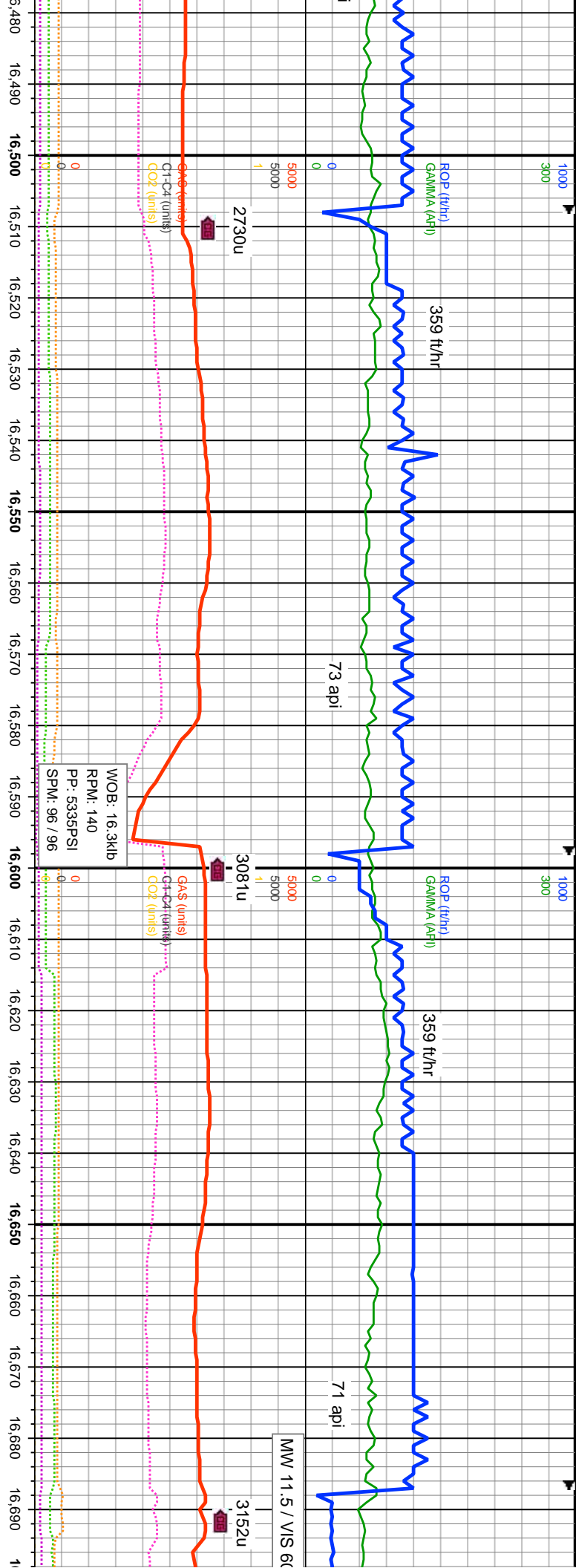


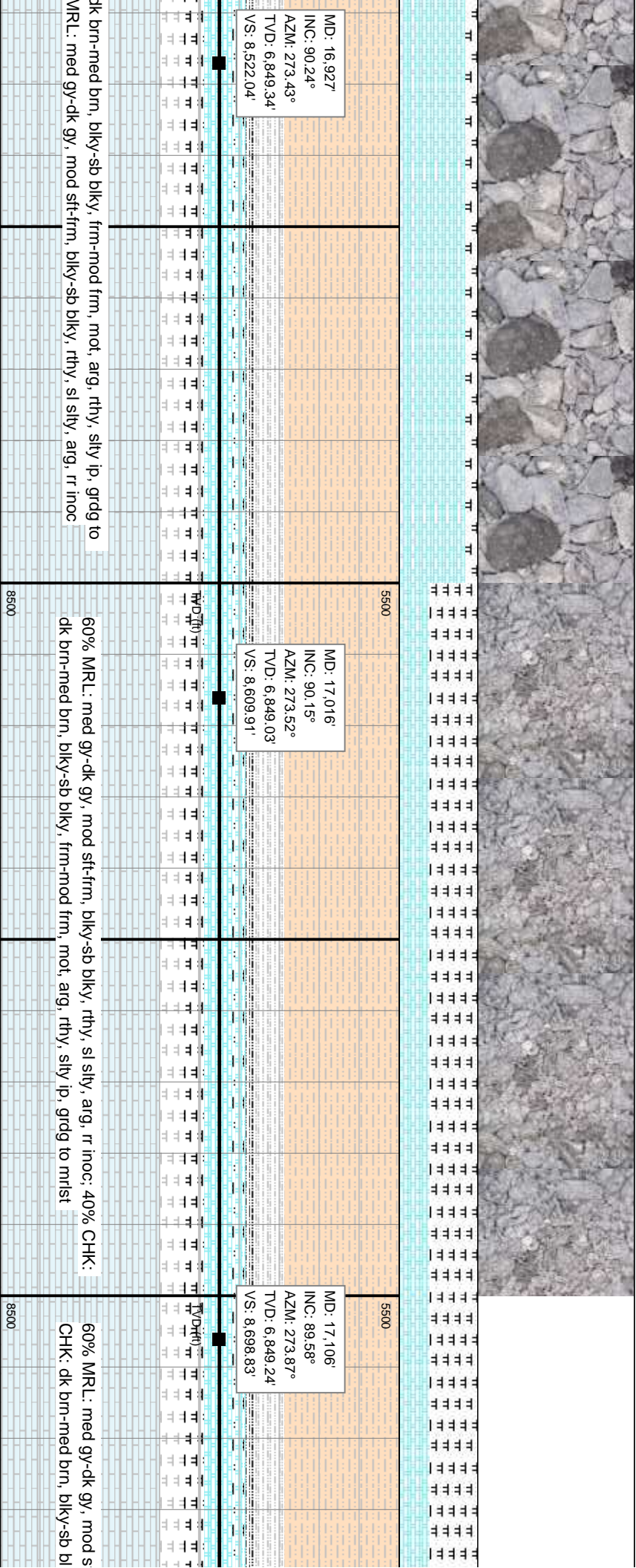
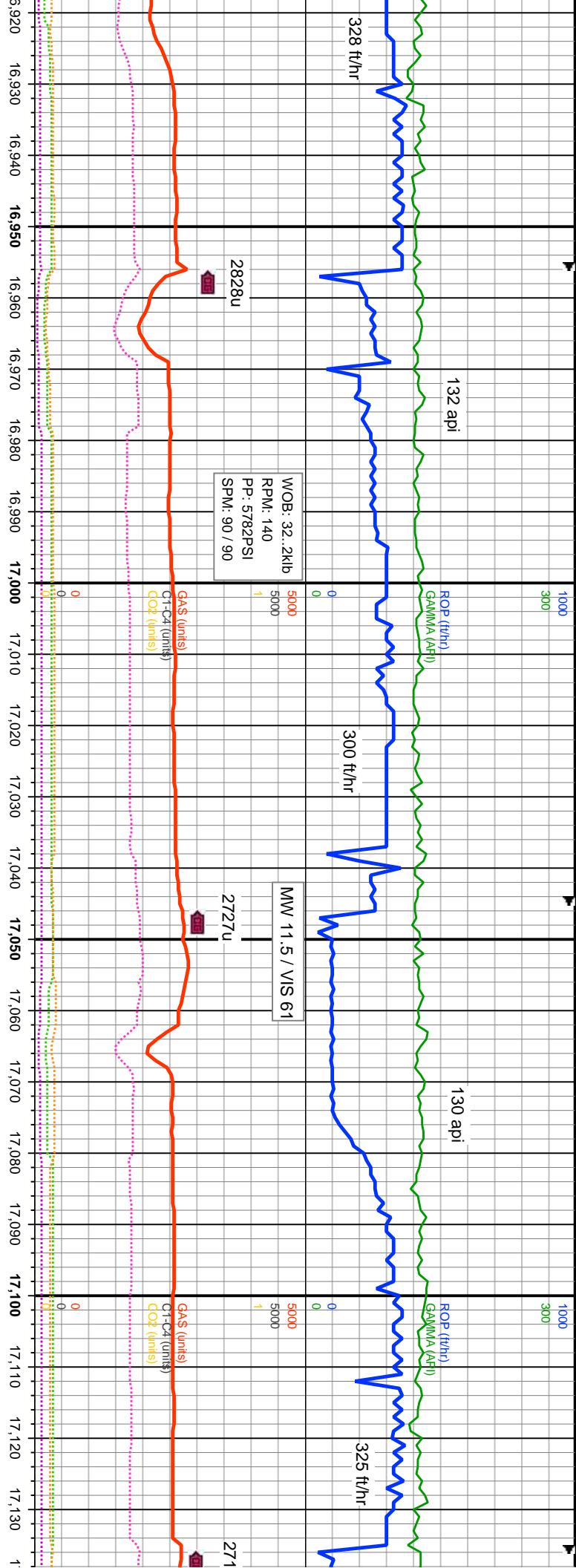


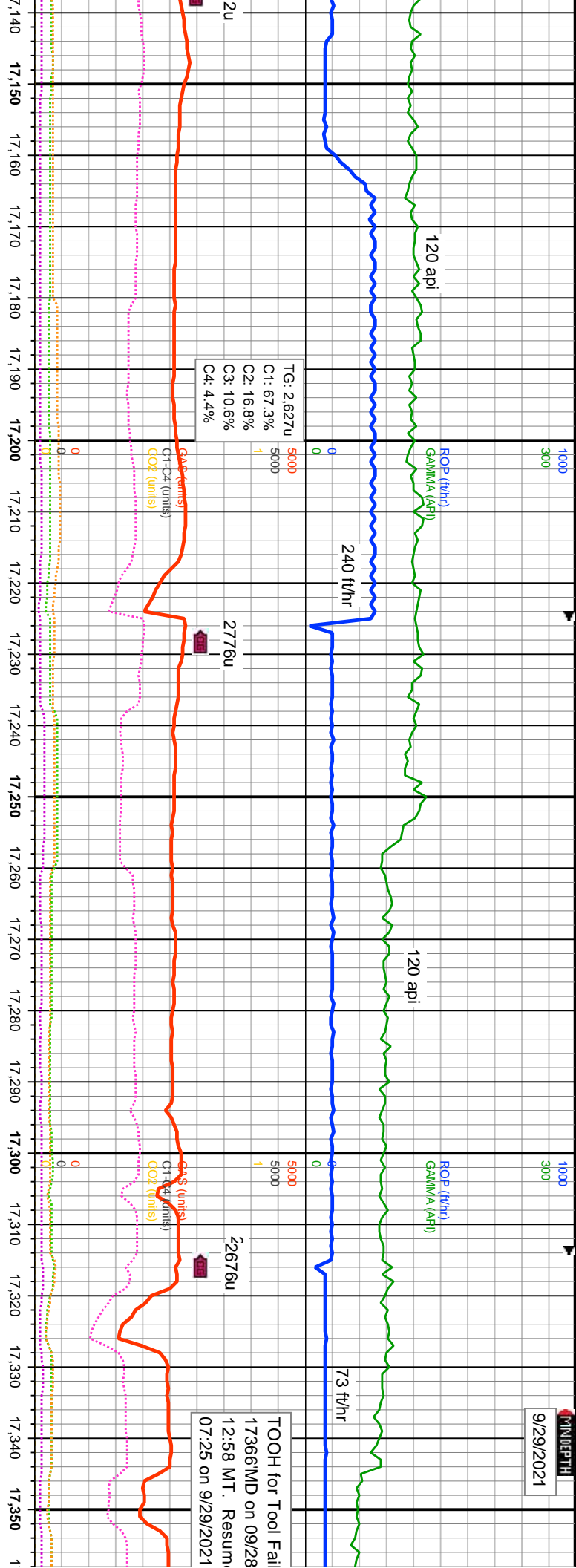












MD: 17,196'
INC: 89.71°
AZM: 273.96°
TVD: 6,849.8'
VS: 8,787.8'

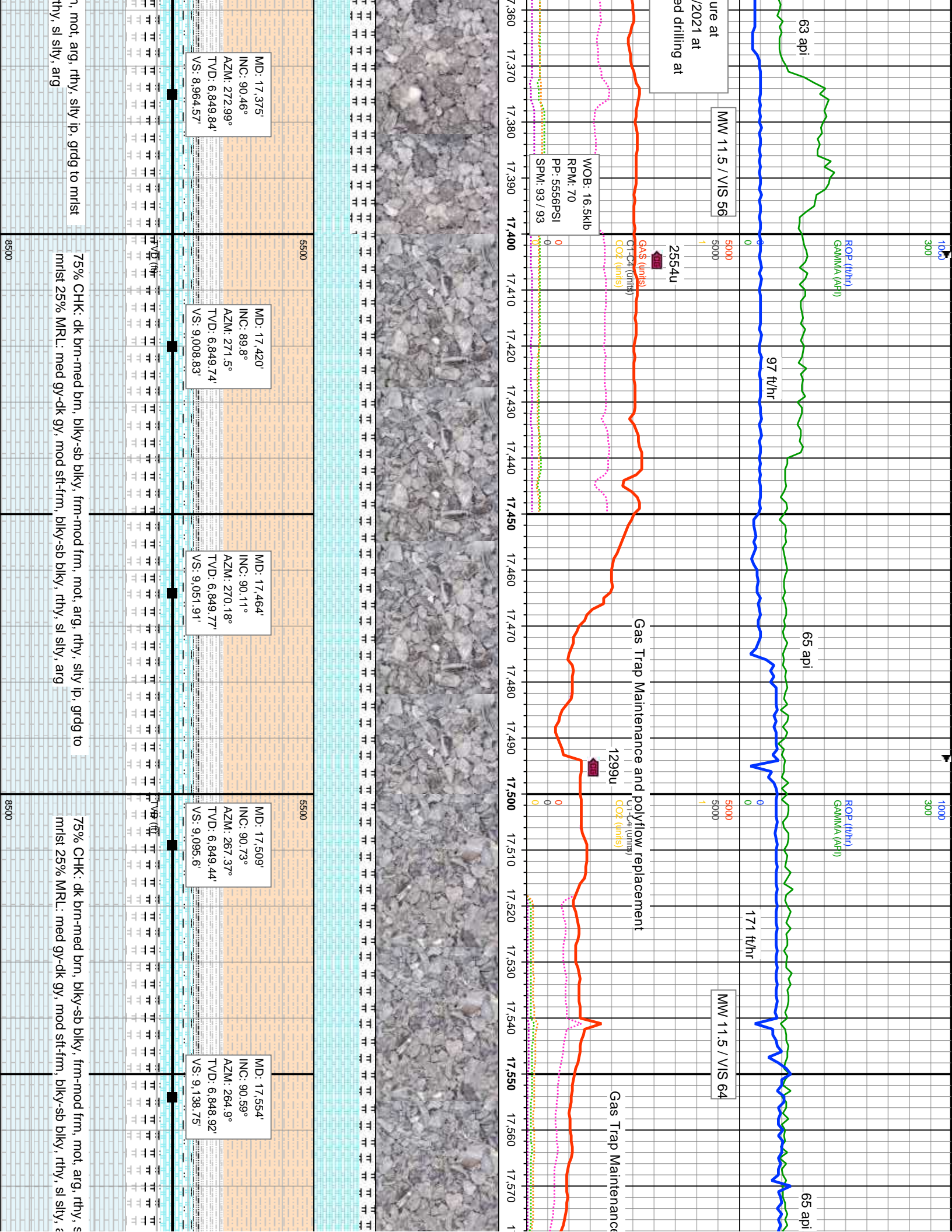
MD: 17,285'
INC: 89.89°
AZM: 273.61°
TVD: 6,850.11'
VS: 8,875.75'

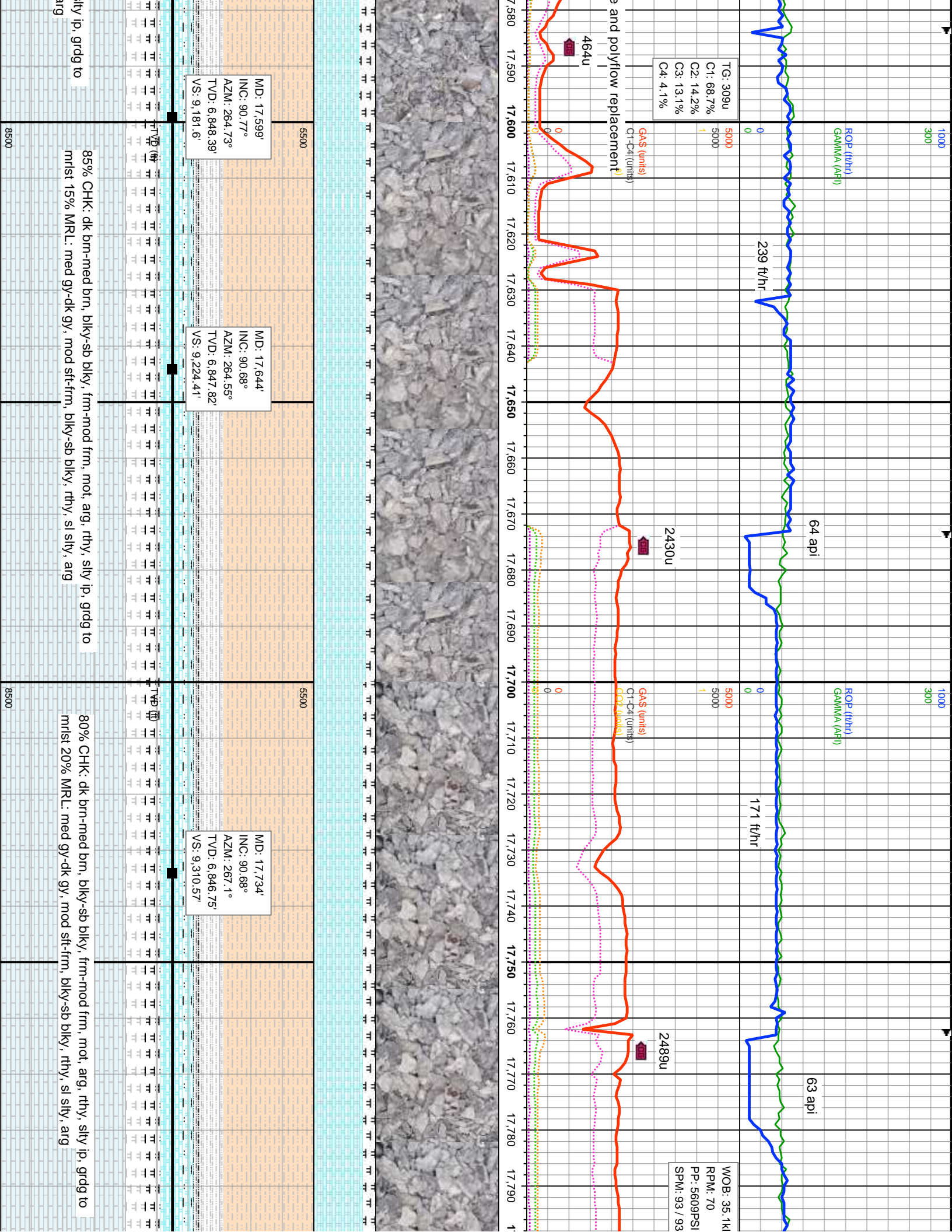
Bit #: 4
Size: 8.5"
Make: Ulterra
Model: PDC
Jets: 8 x 1'S
S/N: 54101
Depth In: 17,366'

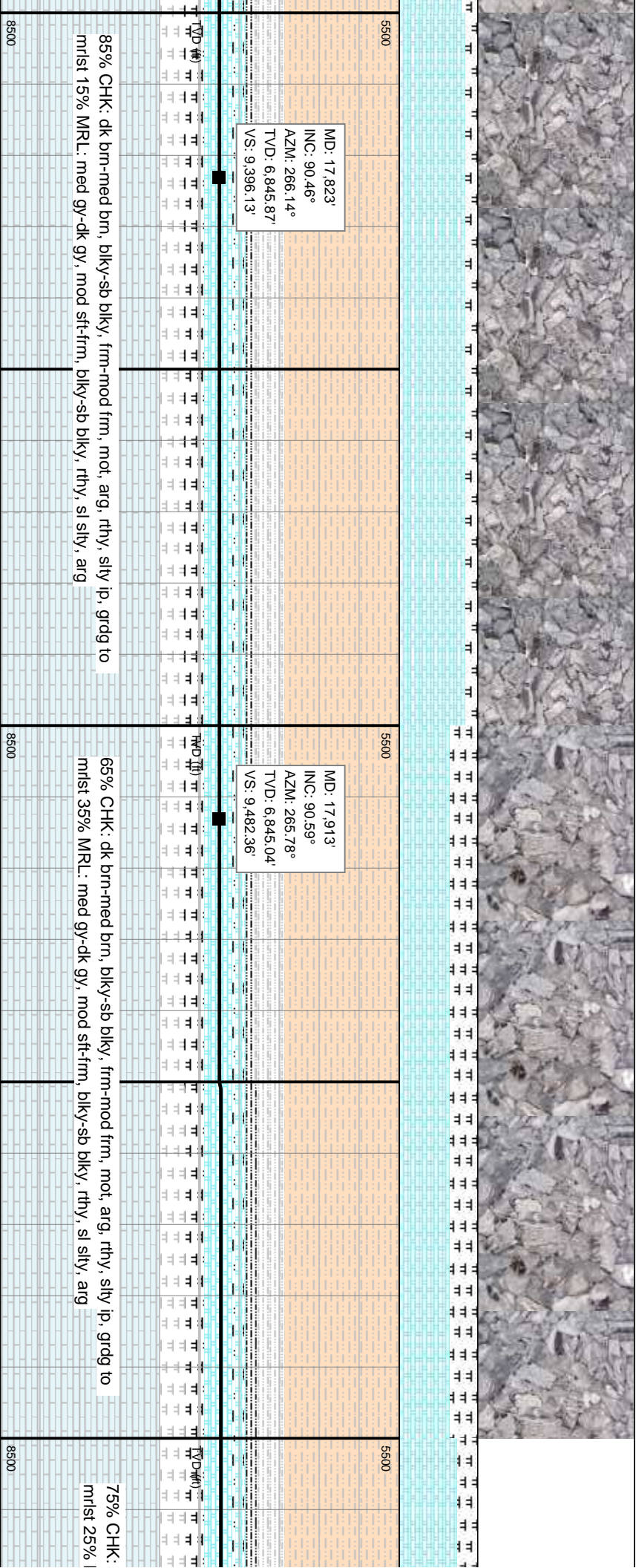
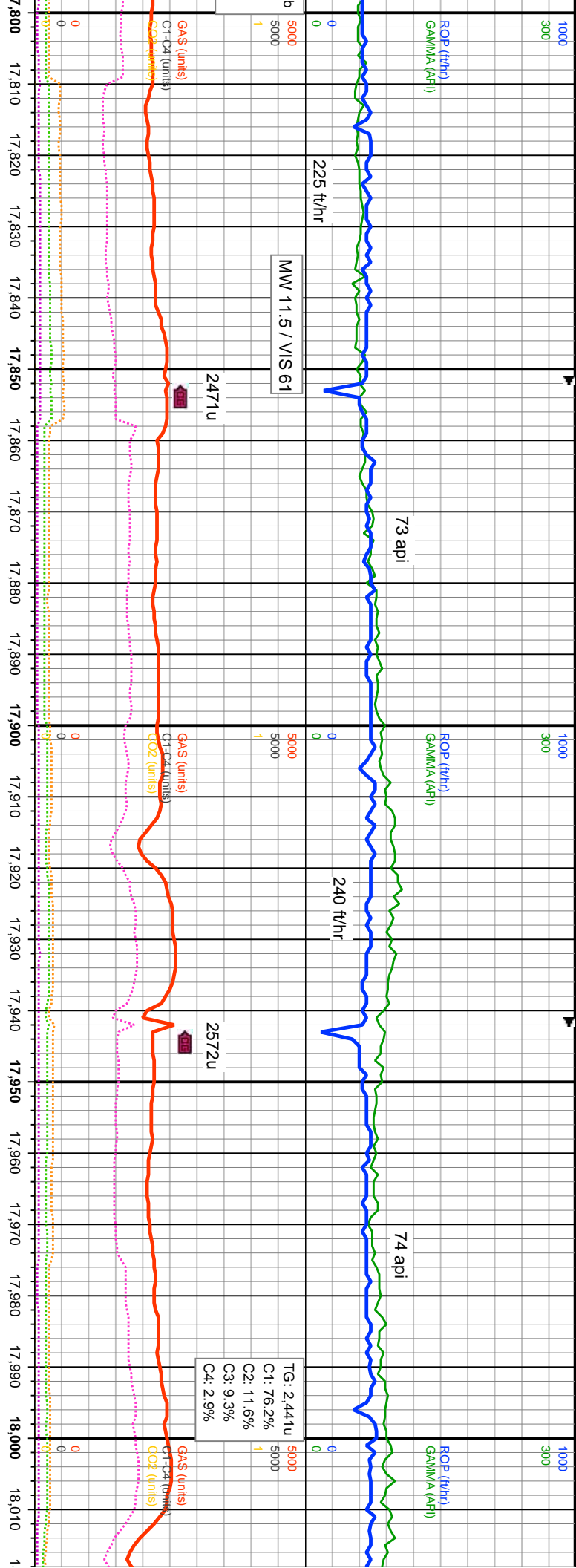
fr-firm, blkly-sb blkly, rthy, sl silty, arg, rr inoc: 40%
ky, frm-mod frm, mot, arg, rthy, silty ip, grdg to mlst

80% CHK: dk brn-med brn, blkly-sb blkly, frm-mod frm, mot, arg, rthy, silty ip, grdg to
mlst 20% MRL: med gy-dk gy, mod sft-frm, blkly-sb blkly, rthy, sl silty, arg, rr inoc

60% CHK: dk brn-med brn, blkly-sb blkly, frm-mod frm
40% MRL: med gy-dk gy, mod sft-frm, blkly-sb blkly, r







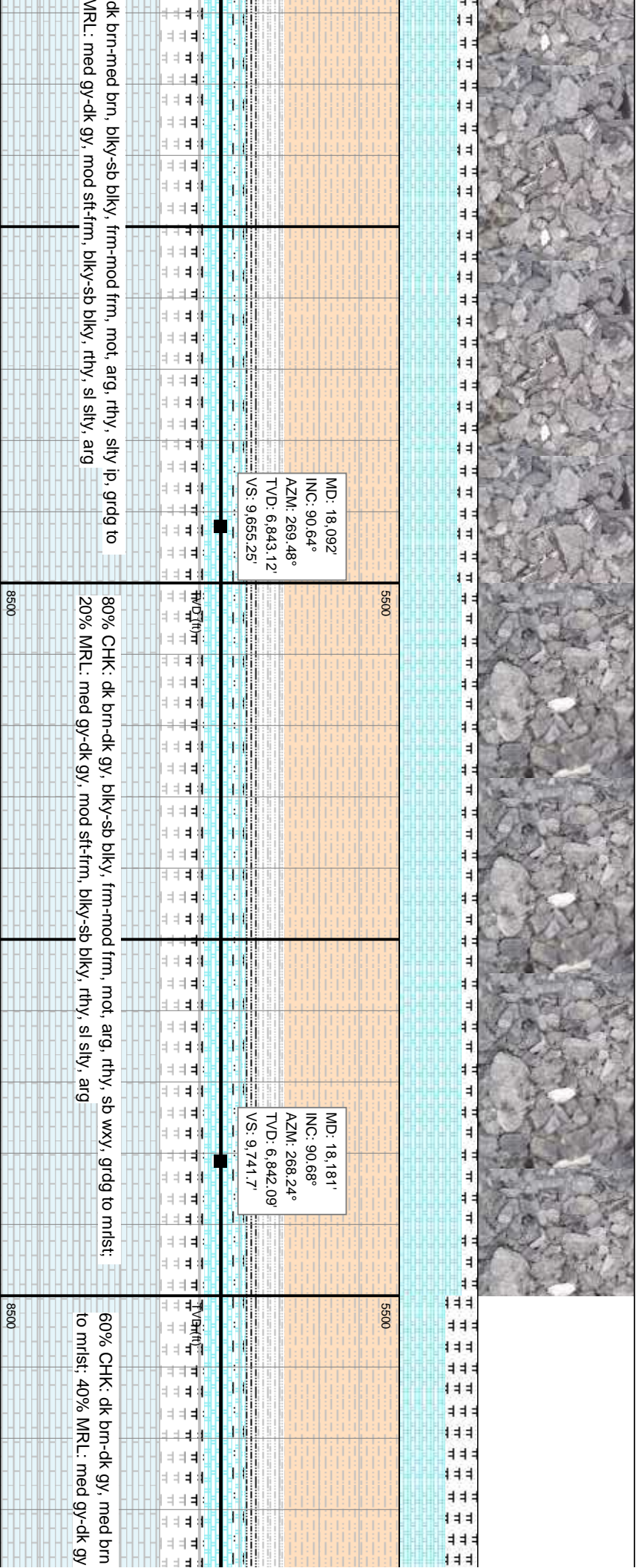
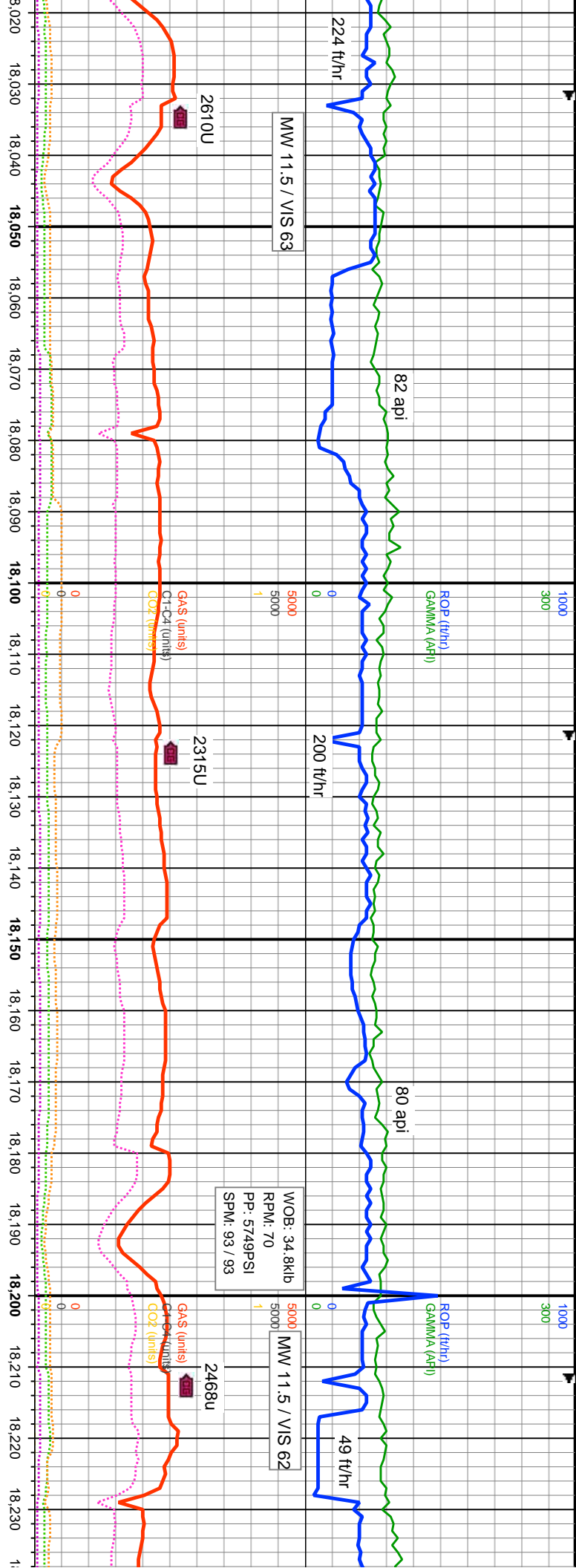
MD: 17,823'
INC: 90.46°
AZM: 266.14°
TVD: 6,845.87'
VS: 9,396.13'

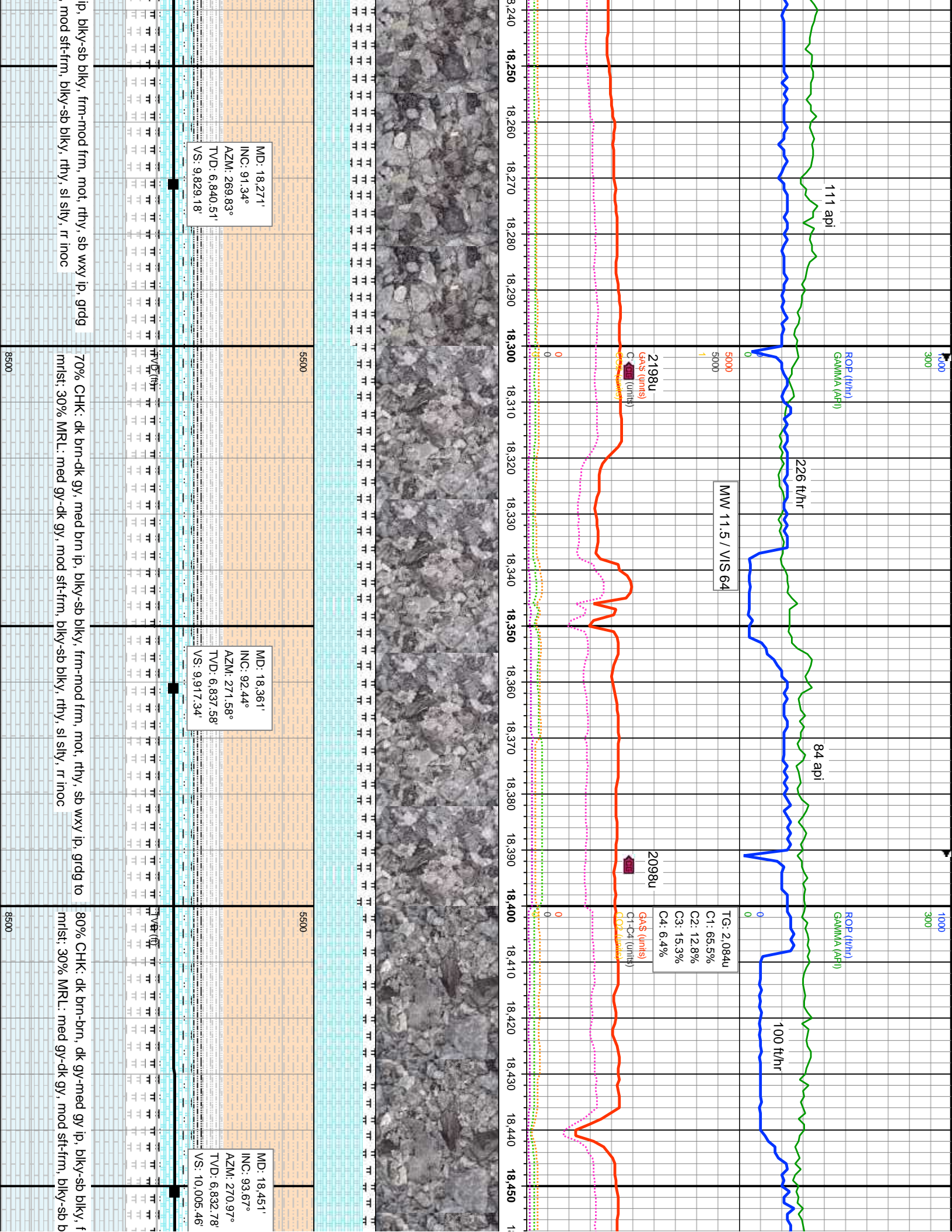
MD: 17,913'
INC: 90.59°
AZM: 266.78°
TVD: 6,845.04'
VS: 9,482.36'

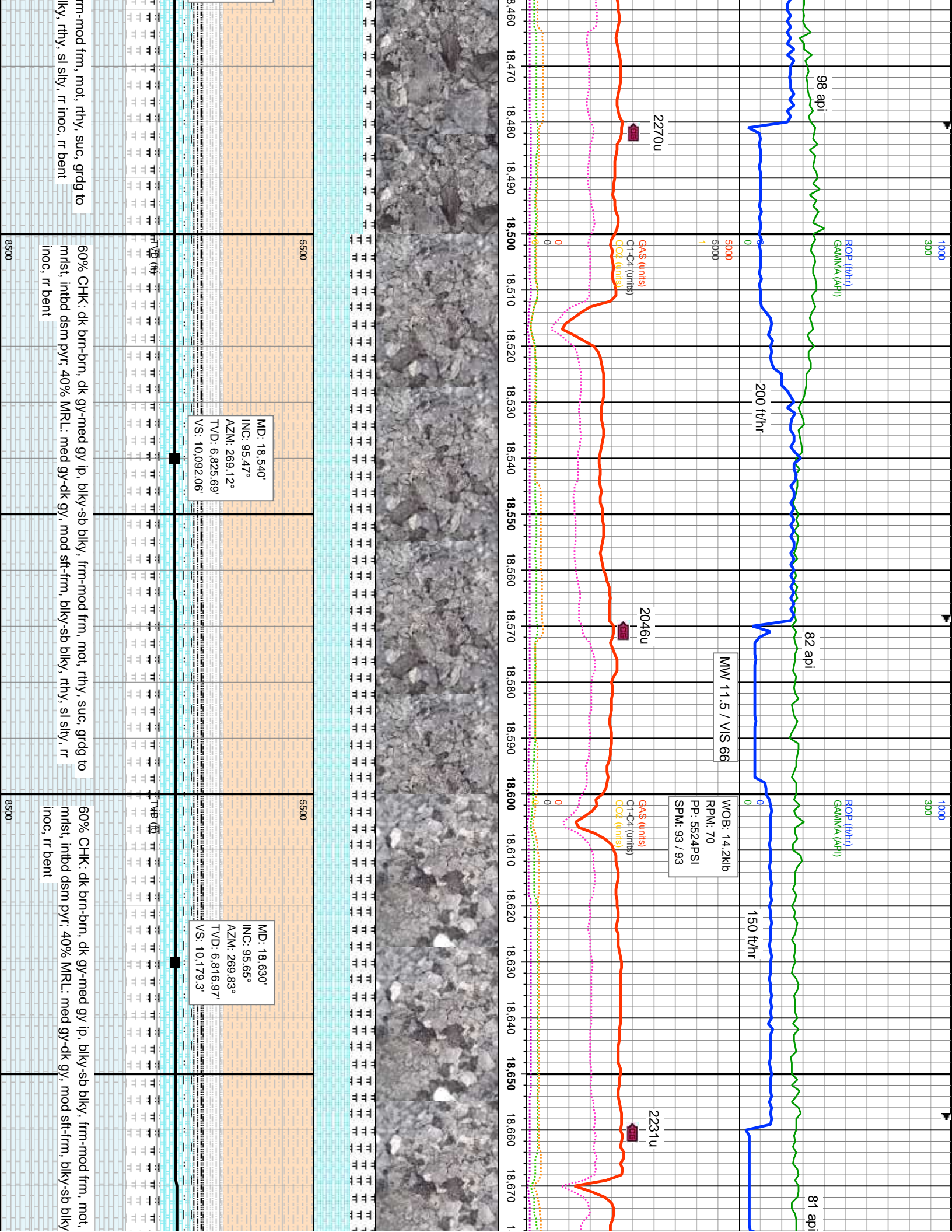
85% CHK: dk brn-med brn, blk-y-sb blk-y, frm-mod frm, mot, arg, rthy, silty ip, grdg to mlst 15% MRL: med gy-dk gy, mod sft-frm, blk-y-sb blk-y, rthy, sl silty, arg

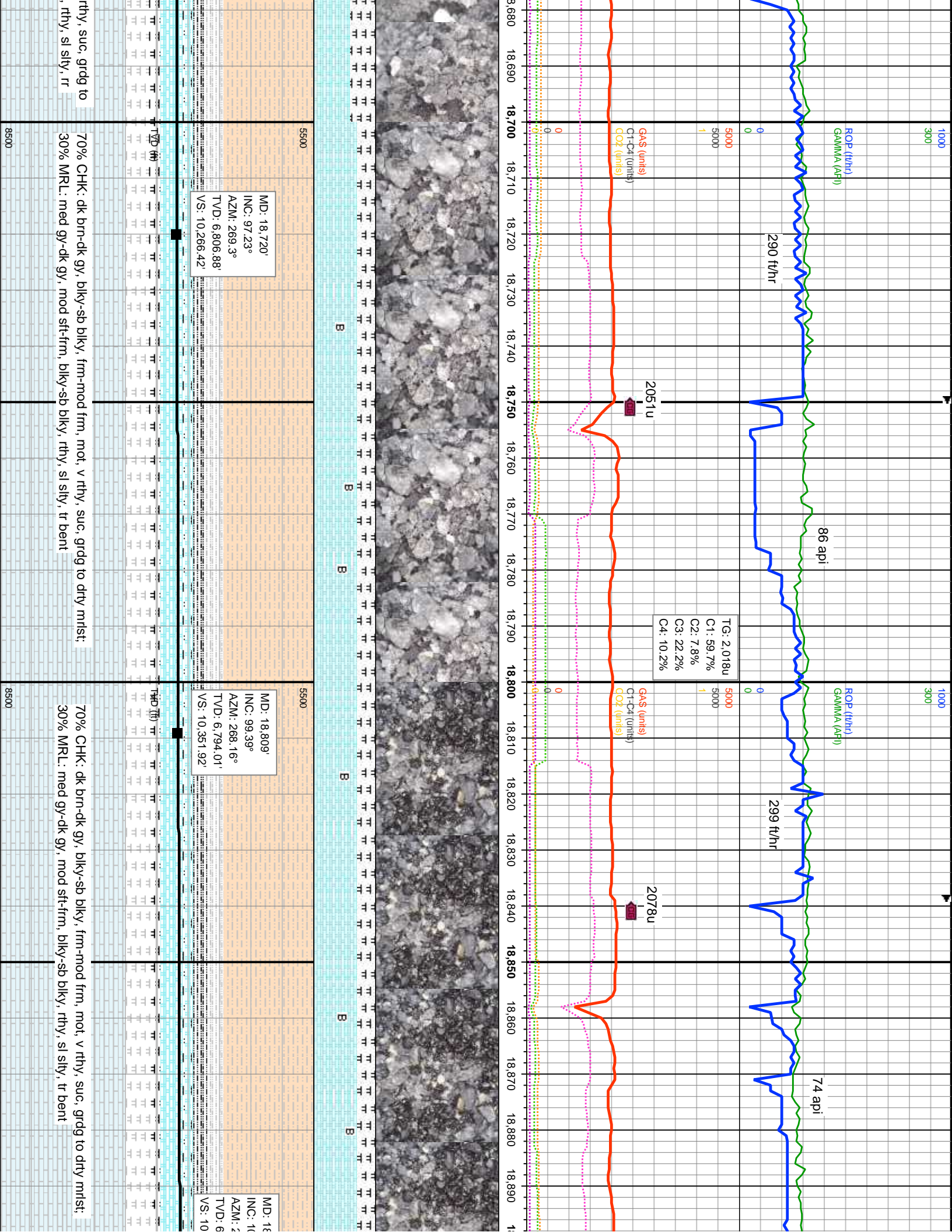
65% CHK: dk brn-med brn, blk-y-sb blk-y, frm-mod frm, mot, arg, rthy, silty ip, grdg to mlst 35% MRL: med gy-dk gy, mod sft-frm, blk-y-sb blk-y, rthy, sl silty, arg

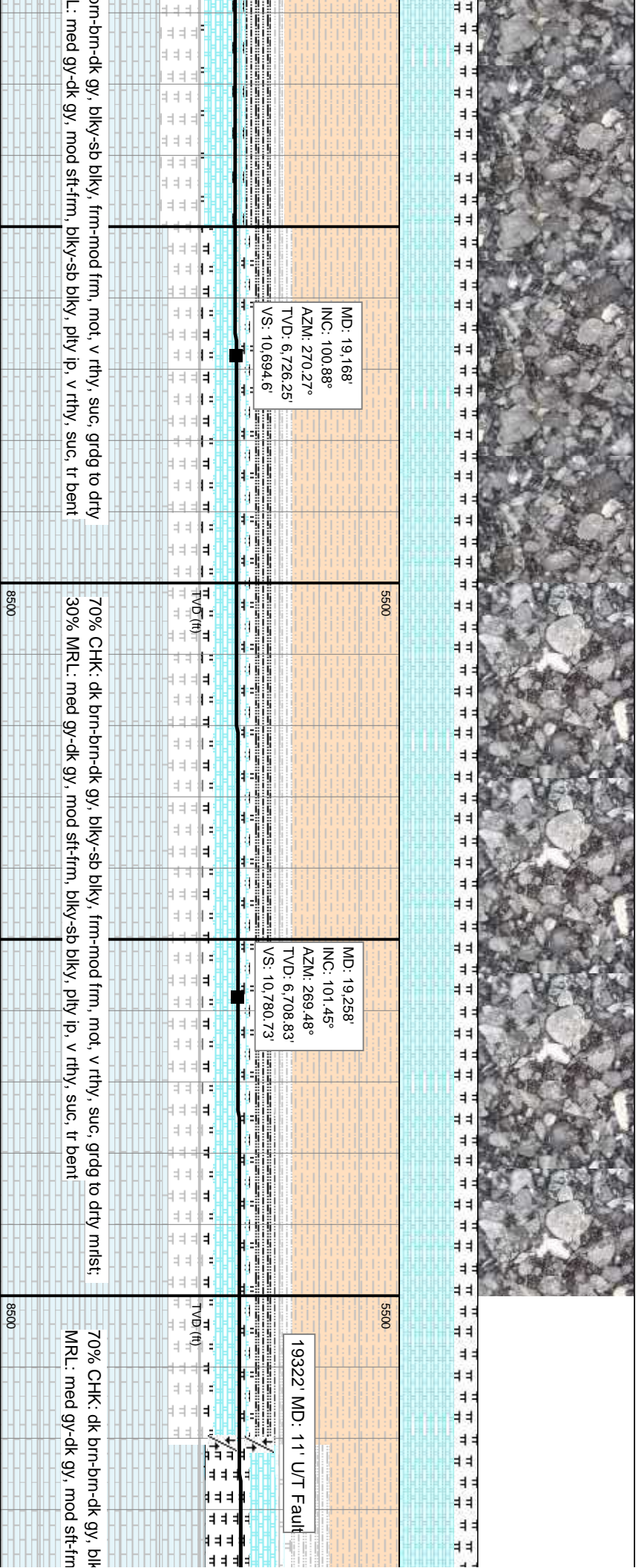
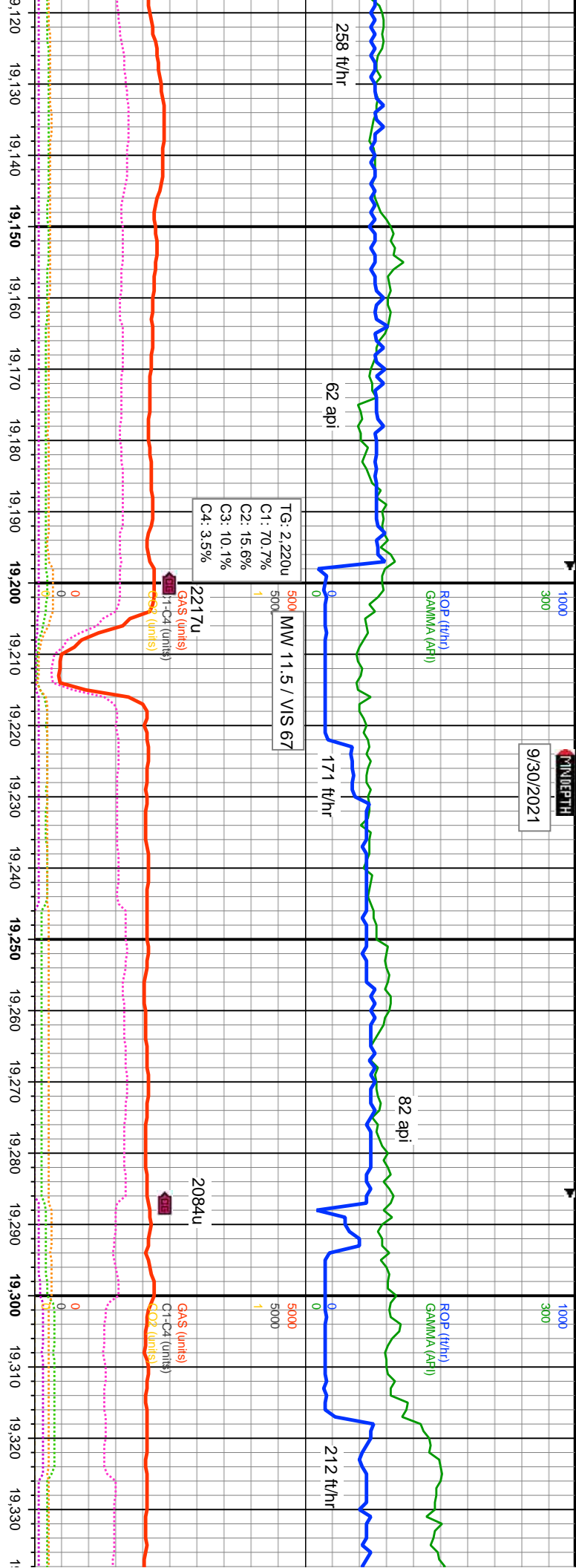
75% CHK: mlst 25%

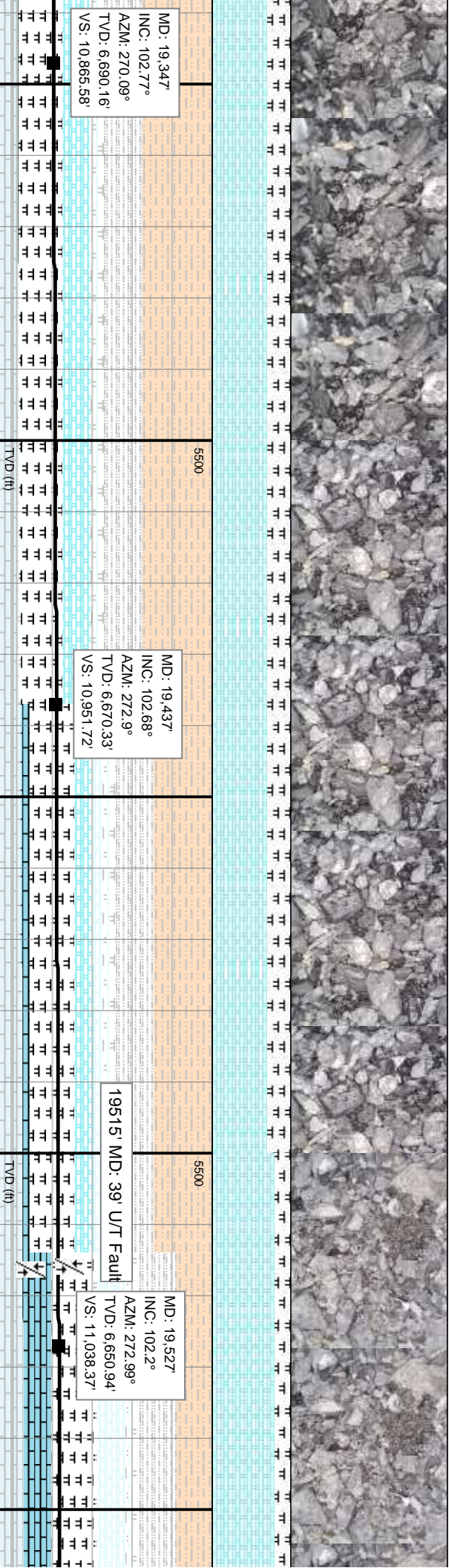
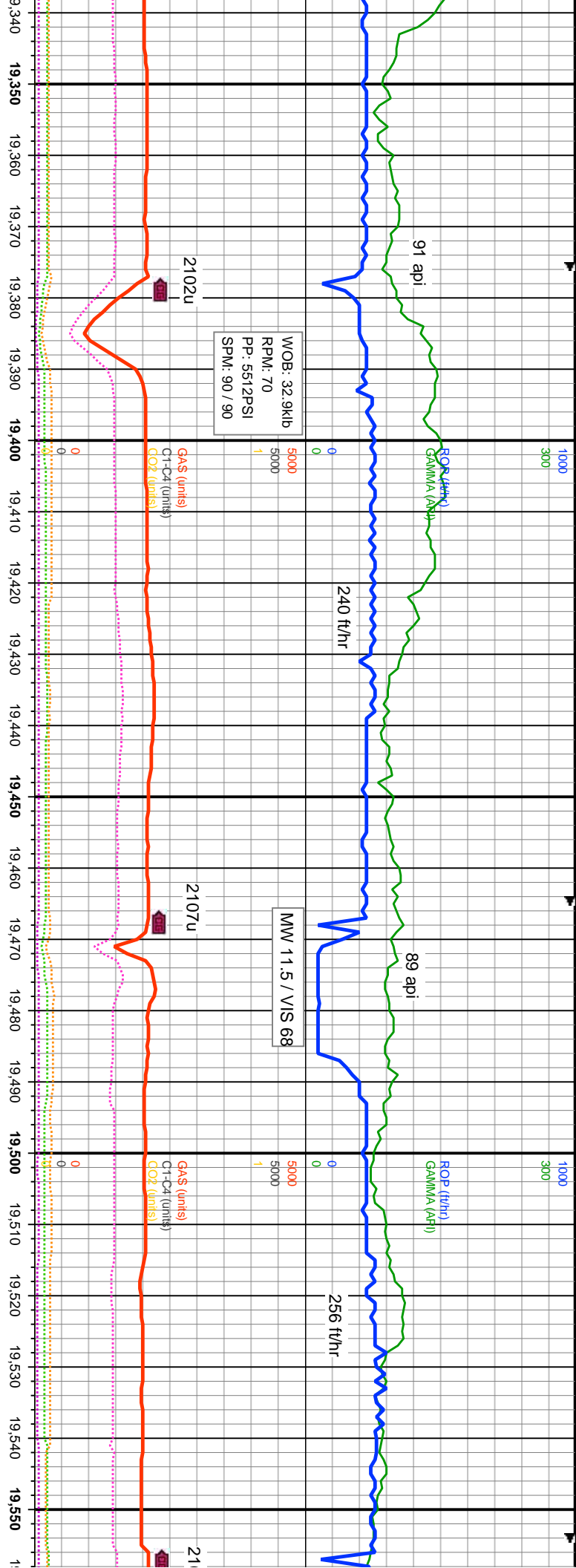












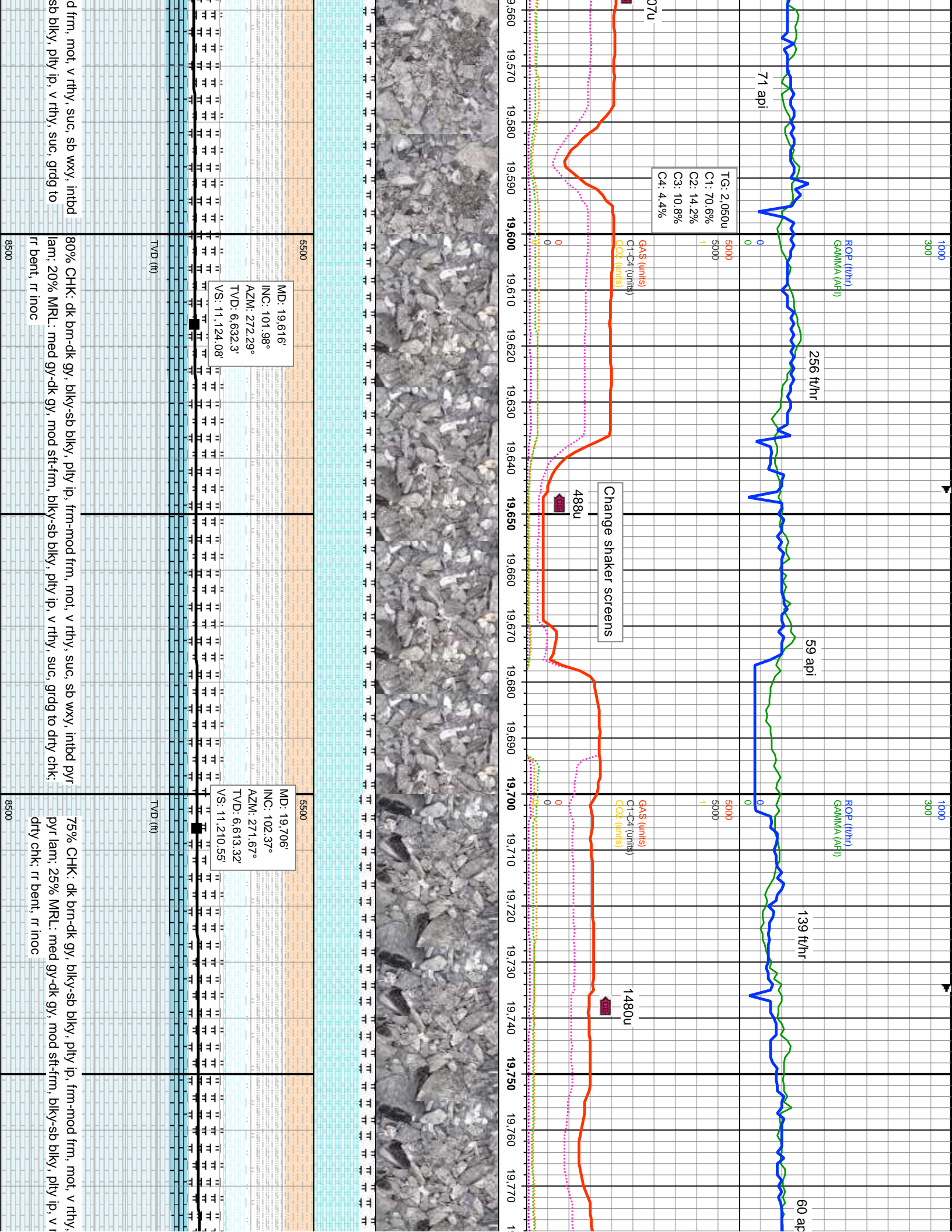
ly-sb blkly, frm-mod frm, mot, v rthy, suc, sb wxy: 30%
n, blkly-sb blkly, plty ip, v rthy, suc, rr bent, rr inoc

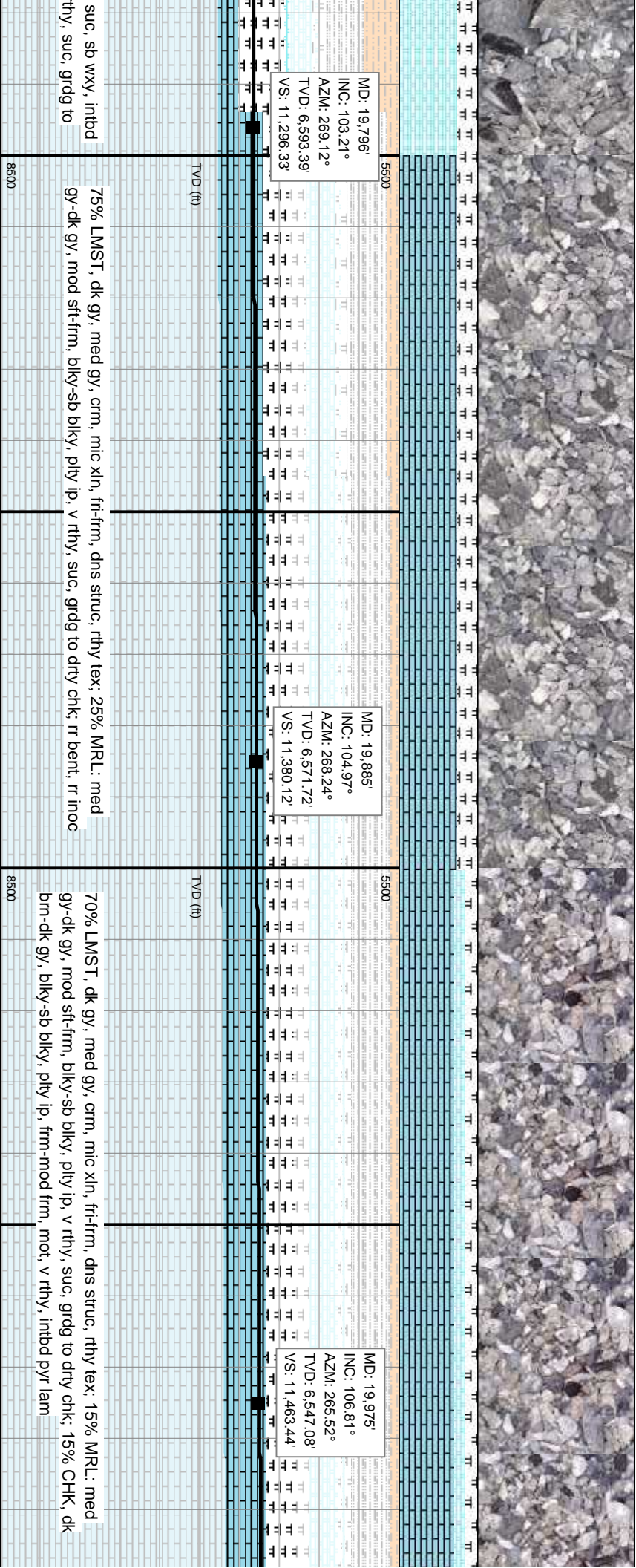
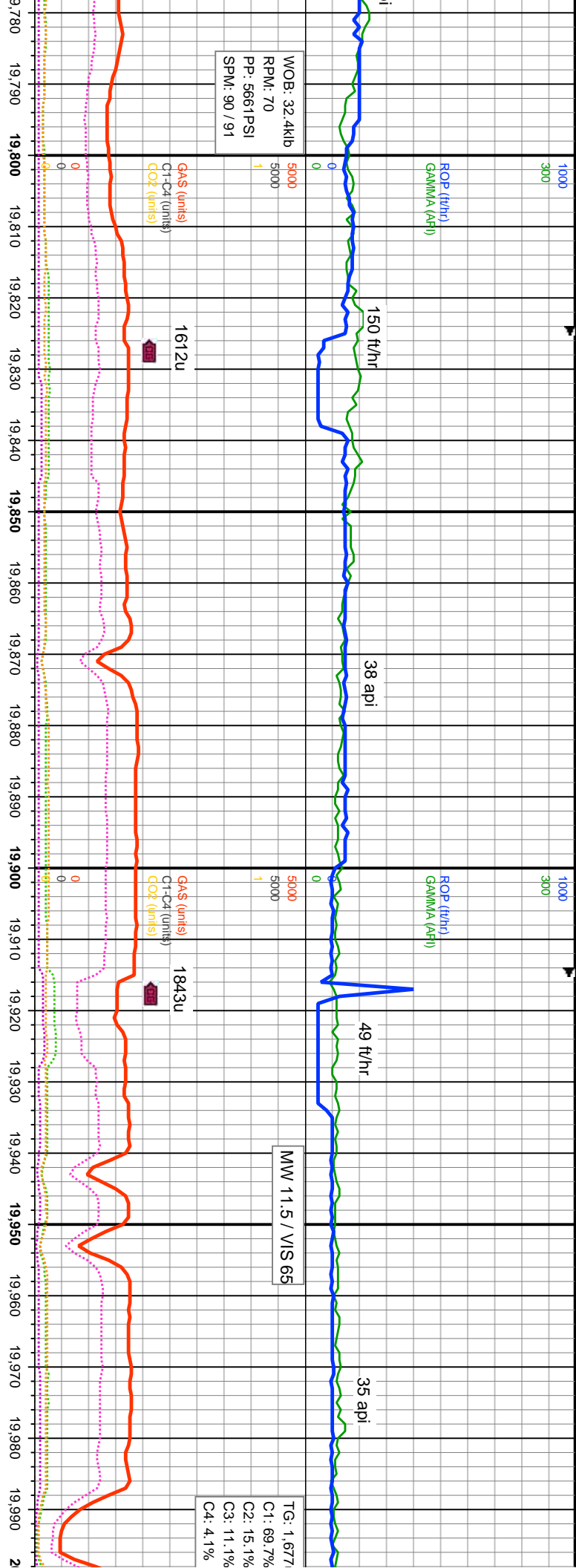
70% CHK: dk brn-brn-dk gy, blkly-sb blkly, frm-mod frm, mot, v rthy, suc, sb wxy: 30% MRL:
med gy-dk gy, mod sft-frm, blkly-sb blkly, plty ip, v rthy, suc, grdg to drty chk: rr bent, rr inoc

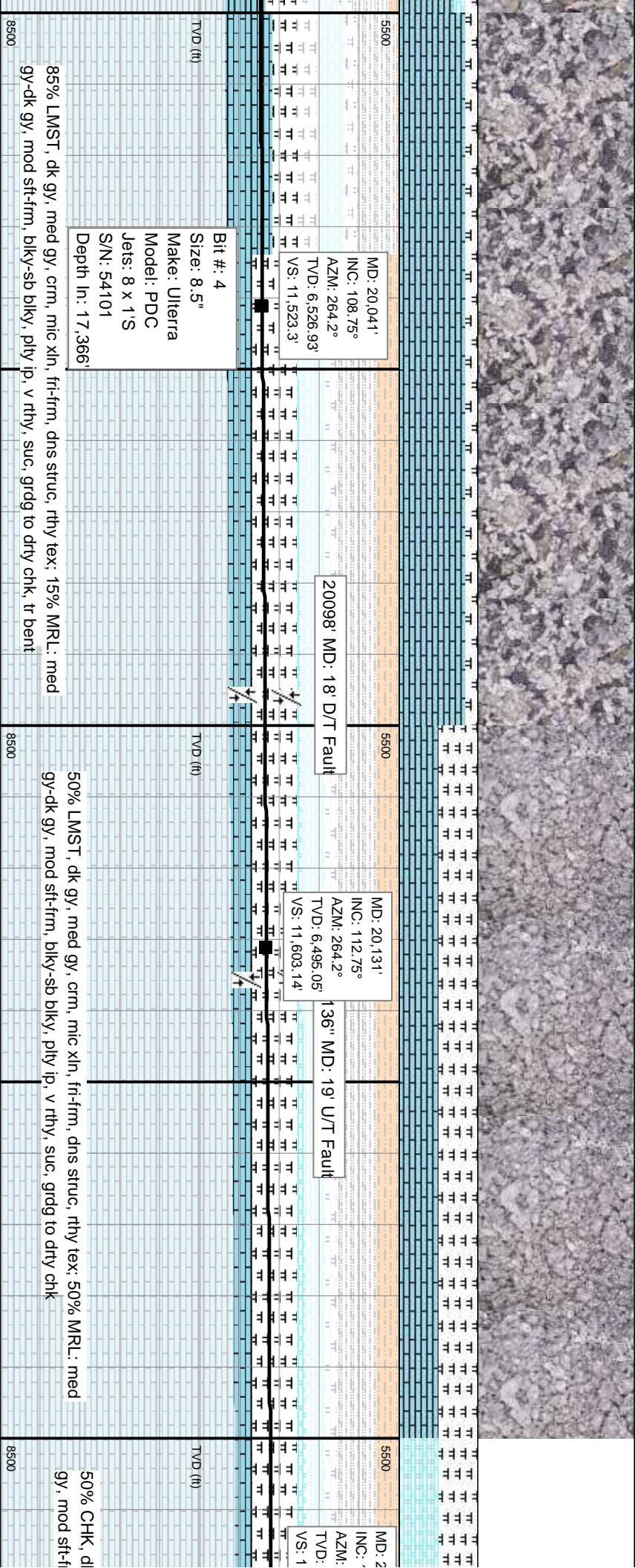
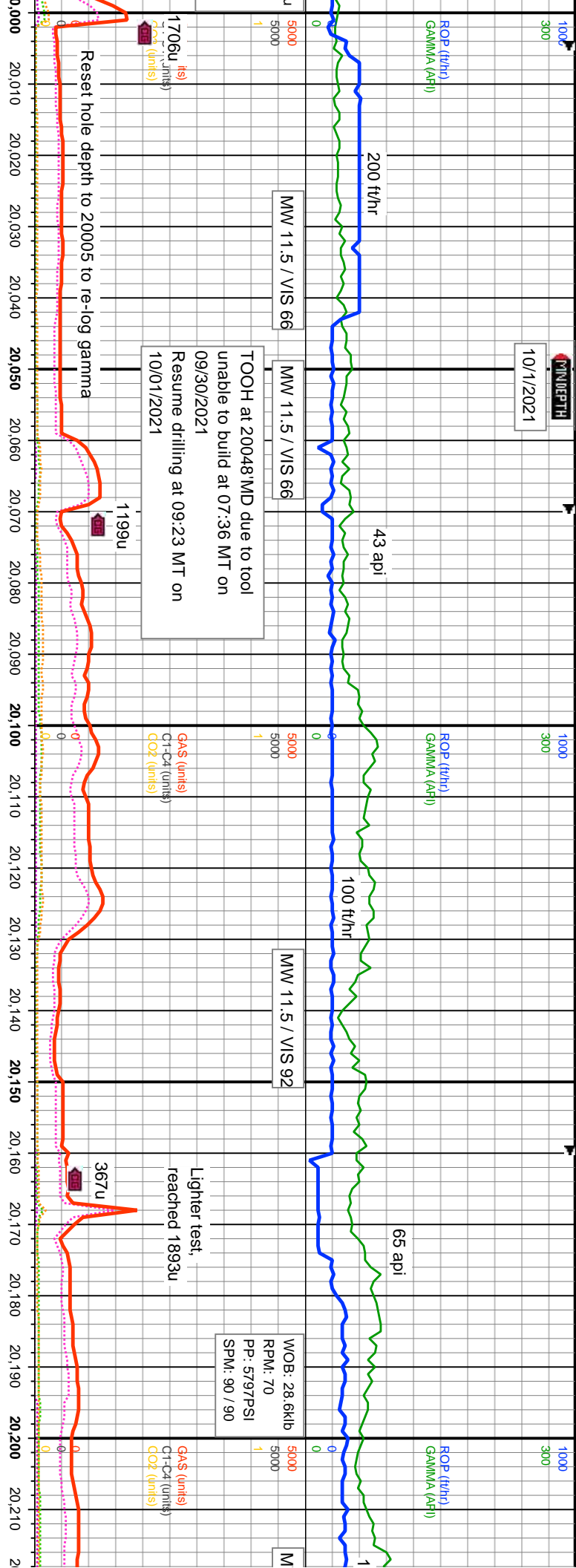
80% CHK: dk brn-dk gy, blkly-sb blkly, plty ip, frm-mo
pyr lam: 20% MRL: med gy-dk gy, mod sft-frm, blkly-
drty chk: rr bent, rr inoc

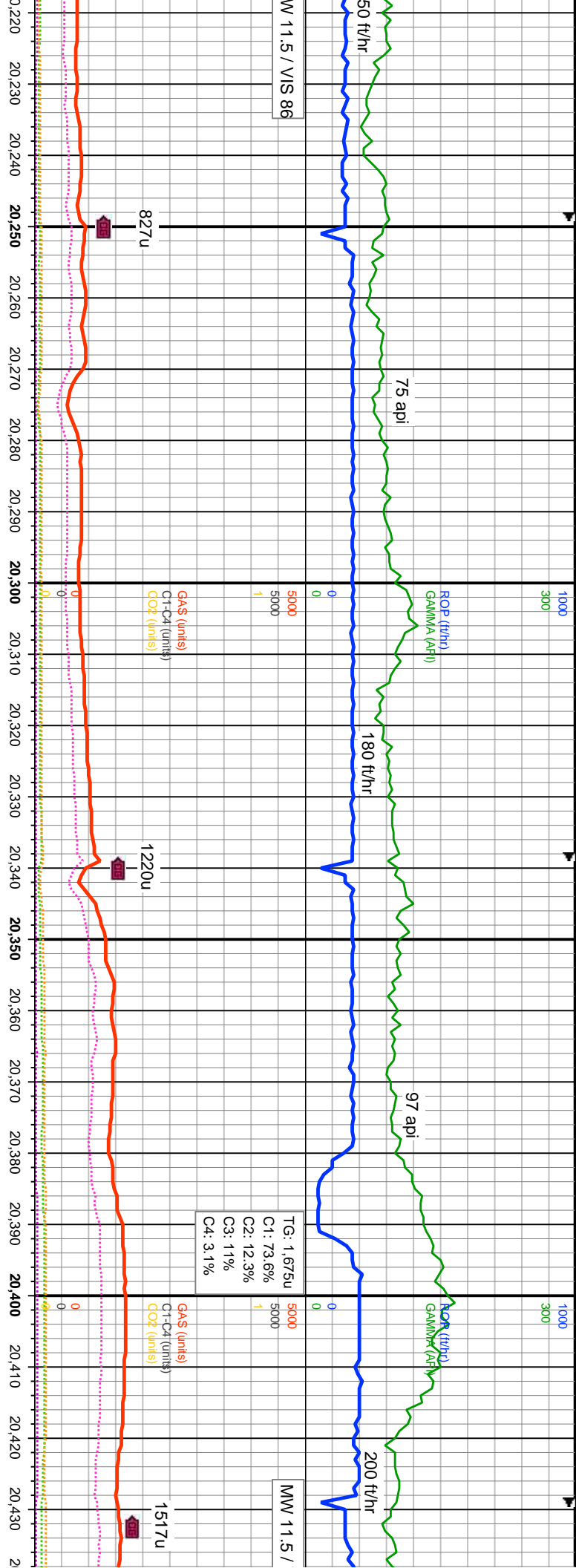
5500 8500

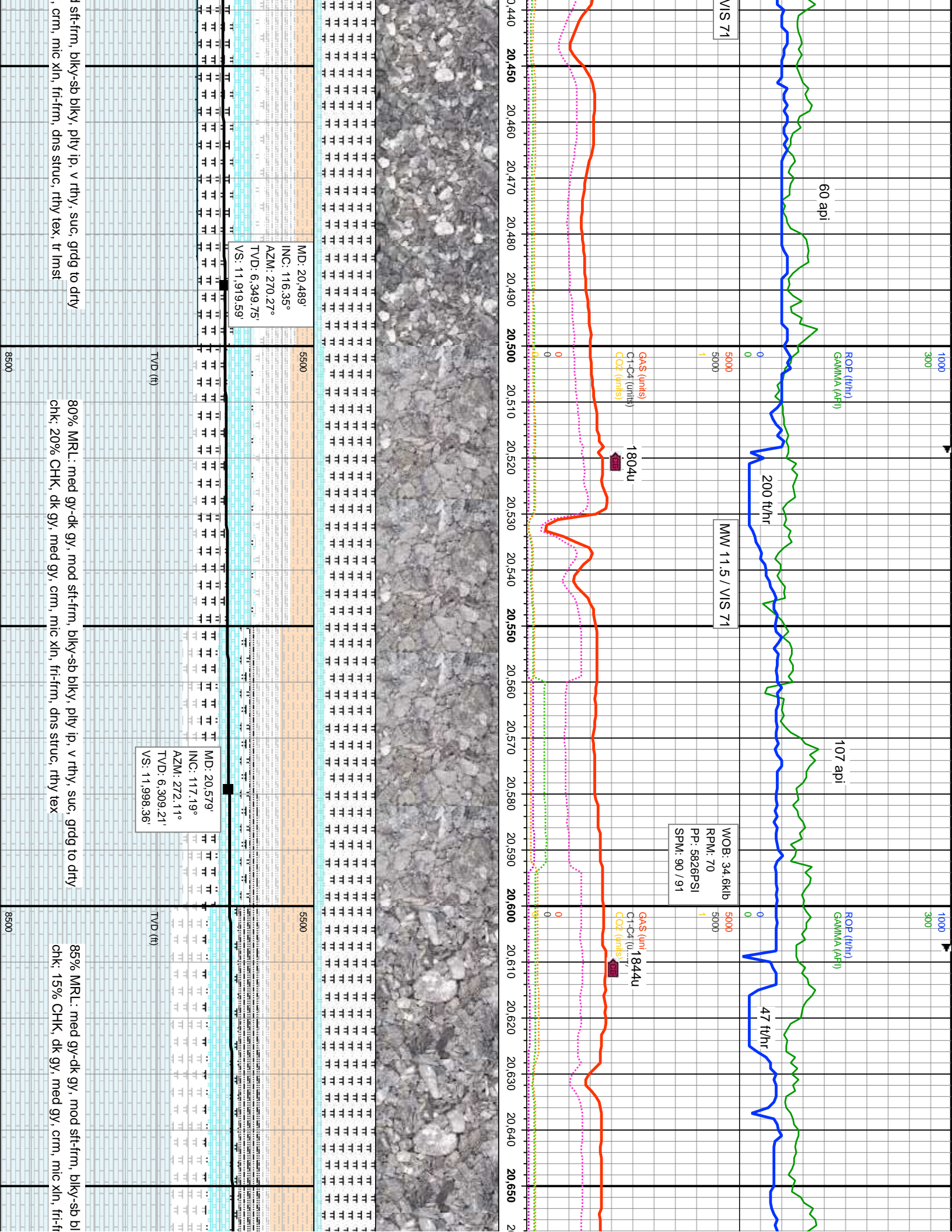
5500 8500







[illegible]



sft-frn, blk-y-sb blk-y, pty ip, v rthy, suc, grgd to dry
cm, mic xln, fr-frn, dns struc, rthy tex, tr lmsl

80% MRL: med gy-dk gy, mod sft-frn, blk-y-sb blk-y, pty ip, v rthy, suc, grgd to dry
chk: 20% CHK, dk gy, med gy, crm, mic xln, fr-frn, dns struc, rthy tex

85% MRL: med gy-dk gy, mod sft-frn, blk-y-sb blk-y, pty ip, v rthy, suc, grgd to dry
chk: 15% CHK, dk gy, med gy, crm, mic xln, fr-frn, dns struc, rthy tex

