



Scale: 5" / 100'
Measured Depth Log

Well Name Sidetrack State Antelope 44-41-12HNB

Location SWSE Section 12, T5N, R62W

State Colorado

Country USA

API Number 05-123-36599

Region DJ Basin

Spud Date 3/7/2013

Surface Coordinates 280' FSL x 1,923' FEL

Bottom Hole Coordinates 511' FNL x 672' FEL

County Weld

Rig Number Cade 22

Field Wattenberg

Drilling Completed 3/20/2013

Ground Elevation 4,597

K.B. Elevation 4,613

Logged Interval 7,020 **To** 10,798

Total Depth 10,798

Formation Niobrara B Chalk

Type of Drilling Fluid FW LSND

Company Bonanza Creek

Address 410 17th Street
Denver, CO 80202

Name Paul McKay

Company Bonanza Creek
410 17th Street
Denver, CO 80202

Columbine Logging, Inc.

Well-site Geologists

Operator

#1500
202

Geologist

Energy, Inc.

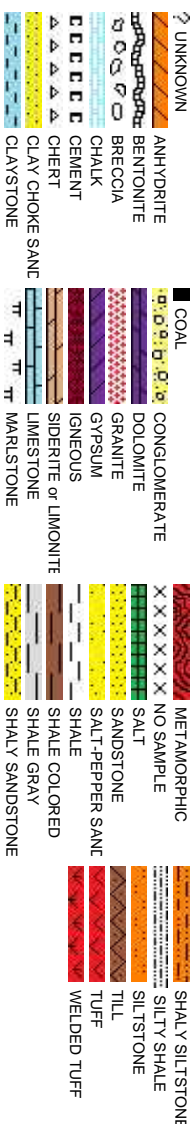
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202

Other

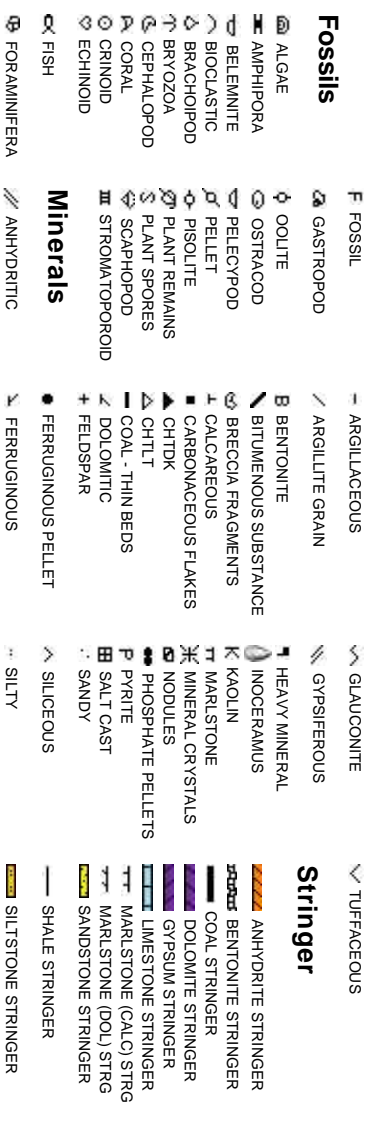
2385 S. Lipan St.
Denver, CO 80223

Joey Luce
Eli Smith

Rock Types



Accessories



Stringer



Other Symbols

Oil Show

- MOLDIC
- ORGANIC
- PINPOINT
- VUGGY
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

Engineering

- FAULT
- FORMATION TOP
- GAS SHOW
- MINDEPTH MN DEPTH
- NORMAL FAULT
- OIL SHOW
- OVERTURNED STRATA
- REVERSE FAULT
- SIDEWALL CORE (LEFT)
- SIDEWALL CORE (RIGHT)
- CONNECTION GAS
- CONNECTION (LEFT)
- CONNECTION (RIGHT)
- BIT
- CORE - LOST
- CORE - RECOVERED
- DST INTERVAL
- SLIDE
- SURVEY
- TRIP GAS

- WIRELINE TESTED - LEFT
- WIRELINE TESTED - RT
- ANGULAR
- ROUNDED
- SUBANG
- SUBRND
- FINELYXLN
- GRAINSTONE
- LITHOGRAPHIC
- MICROXLN
- MUDSTONE
- PACKSTONE
- WACKESTONE

Porosity

- EARTHLY
- FENESTRAL
- FRACTURE
- INTERCRYSTALLINE
- INTEROOLITIC

Textures

- BOUNDSTONE
- CHALKY
- CRYPTOXLN

Sorting

- MODERATE
- POOR
- WELL

Slide/Rotate

ROP
ROF
Gamma

ROP Limit
0 to 200 ft/hr
Gamma Limit
40 to 170 API

ROP (ft/hr)
Gamma (API)

MW 9.5/VIS 35

MW 9.3/VIS 37

Total Gas & Chromatograph

GAS
C1
C2
C3
C4

GAS (units)
C1-C4 (PPM)
Gas Limit
0 to 6000 units

GAS (units)
C1-C4 (PPM)

Depth Labels

6,970 6,980 6,990 7,000 7,010 7,020 7,030 7,040 7,050 7,060 7,070 7,080 7,090 7,100 7,110 7,120 7,130 7,140 7

% Lith

BHA #4
BIT: 6.125" VAREL
Type: CM24MRS
Serial #: 1276477
Jets: 3x20
Depth In: 6987'

50' Sample Interval

5400 90% CHK: lt gy, lt-med gy brn, crm, mot, str ip, ply-blky, sft-sl frm, fir-brt, rthy lstr, calc 10% MRLST: dk gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brt, silty tex, rthy lstr, calc mix, tr lnoc

95% CHK: lt gy, lt-med gy brn, crm, mot, str ip, ply-blky, sft-mod hd, fir-brt, rthy lstr, calc 5% MRLST: dk gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brt, silty tex, rthy lstr, calc mix, tr lnoc

90% CHK: lt-med gy, med gy brn, crm, mot, str ip, ply-blky, sft-mod hd, fir-brt, rthy lstr, calc 10% MRLST: dk gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brt, silty tex, rthy lstr, calc mix, tr lnoc

Well Bore

TVD

TVD (ft)

TVD (ft)

Columbine Logging Inc.
Rigged up March 10, 2013
Bloodhound Unit #0034
Sidetrack began 19:08 MST
on March 16, 2013

MD: 7,033
TVD: 6,110
Azimuth: 359.4
Inclination: 89.9
VS: 1,058.21
6600

MD: 7,036
TVD: 6,110.46
Azimuth: 3.6
Inclination: 88.5
VS: 1,090.2

MD: 7,068
TVD: 6,111.27
Azimuth: 4.7
Inclination: 88.6
VS: 1,121.55

MD: 7,100
TVD: 6,111.94
Azimuth: 4.8
Inclination: 89
VS: 1,152.97

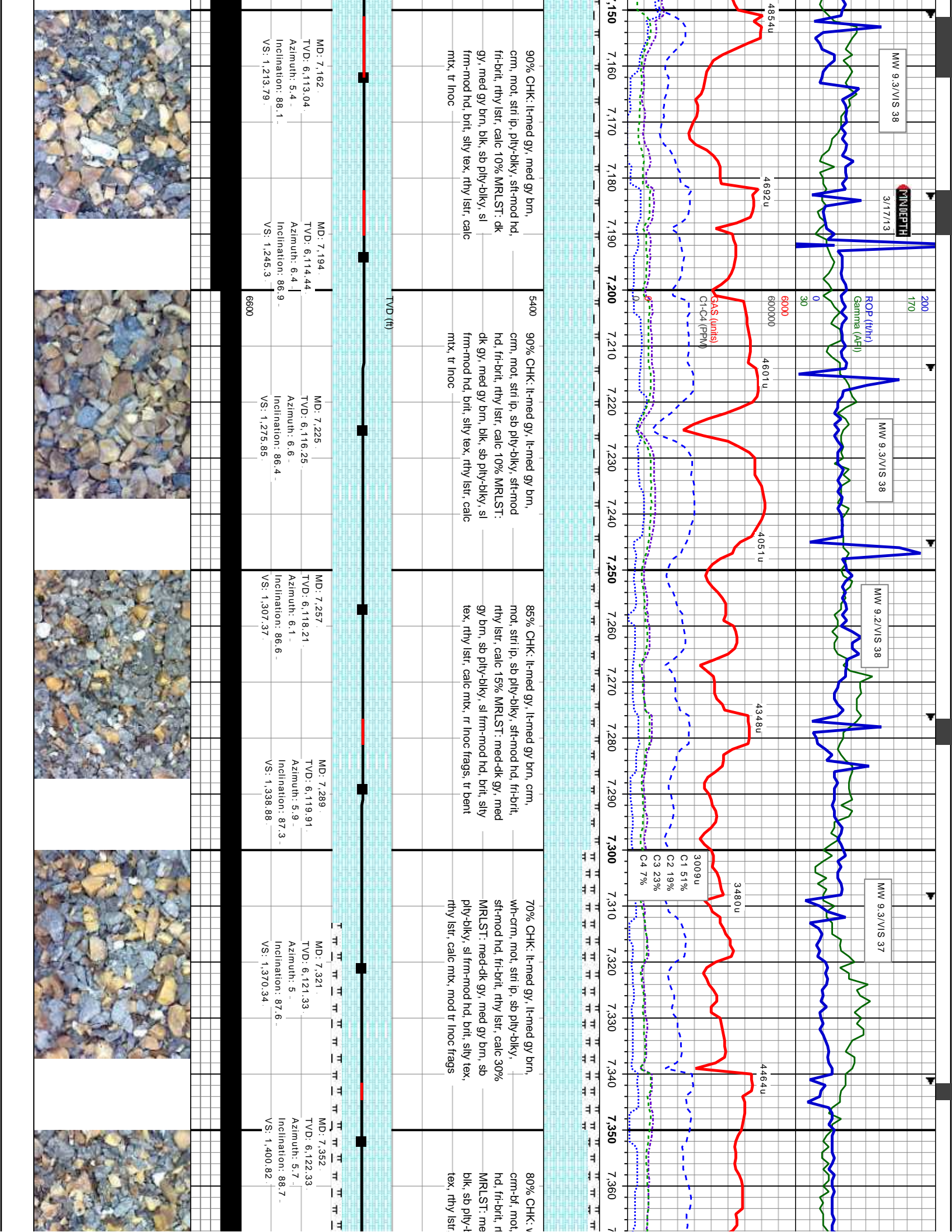
MD: 7,132
TVD: 6,112.39
Azimuth: 4
Inclination: 89.4
VS: 1,184.35

Oil Show

S
R
F
M
G

Images





MW 9.3/VIS 38

3/17/13

MW 9.3/VIS 38

MW 9.2/VIS 38

MW 9.3/VIS 37

ROP (ft/hr)

Gamma (API)

SAs (units)

C1-C4 (PPM)

90% CHK: lt-med gy, med gy brn, crm, mot, stri ip, ply-blky, sft-mod hd, fr-brit, rthy lstr, calc 10% MRLST: dk gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brit, silty tex, rthy lstr, calc mtx, tr inoc

5400 90% CHK: lt-med gy, lt-med gy brn, crm, mot, stri ip, sb ply-blky, sft-mod hd, fr-brit, rthy lstr, calc 10% MRLST: dk gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brit, silty tex, rthy lstr, calc mtx, tr inoc

85% CHK: lt-med gy, lt-med gy brn, crm, mot, stri ip, sb ply-blky, sft-mod hd, fr-brit, rthy lstr, calc 15% MRLST: med-dk gy, med gy brn, sb ply-blky, sl frm-mod hd, brit, silty tex, rthy lstr, calc mtx, tr inoc frags, tr bent

70% CHK: lt-med gy, lt-med gy brn, wh-crm, mot, stri ip, sb ply-blky, sft-mod hd, fr-brit, rthy lstr, calc 30% MRLST: med-dk gy, med gy brn, sb ply-blky, sl frm-mod hd, brit, silty tex, rthy lstr, calc mtx, mod tr inoc frags

80% CHK: v crm-bl, mot, hd, fr-brit, r MRLST: med blk, sb ply-bl tex, rthy lstr

MD: 7.162
TVD: 6,113.04
Azimuth: 5.4
Inclination: 88.1
VS: 1,213.79

MD: 7.194
TVD: 6,114.44
Azimuth: 6.4
Inclination: 86.9
VS: 1,245.3

MD: 7.225
TVD: 6,116.25
Azimuth: 6.6
Inclination: 86.4
VS: 1,275.85

MD: 7.257
TVD: 6,118.21
Azimuth: 6.1
Inclination: 86.6
VS: 1,307.37

MD: 7.289
TVD: 6,119.91
Azimuth: 5.9
Inclination: 87.3
VS: 1,338.88

MD: 7.321
TVD: 6,121.33
Azimuth: 5
Inclination: 87.6
VS: 1,370.34

MD: 7.352
TVD: 6,122.33
Azimuth: 5.7
Inclination: 88.7
VS: 1,400.82

TVD (ft)

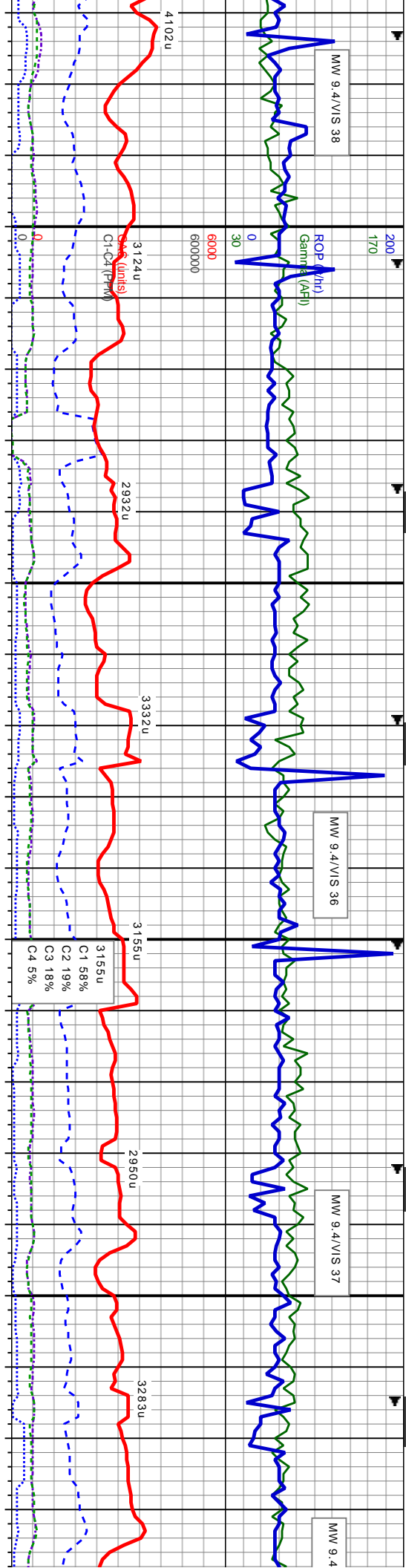


MW 9.4/VIS 38

MW 9.4/VIS 36

MW 9.4/VIS 37

MW 9.4



Wh-lt gy, lt-med gy brn, str ip, sb ply-blky, stf-mod hly lstr, wxy, calc 20%
 -dk gy, med gy brn, occ blky, sl frm-mod hd, brit, silty calc mx, mod tr inoc frags

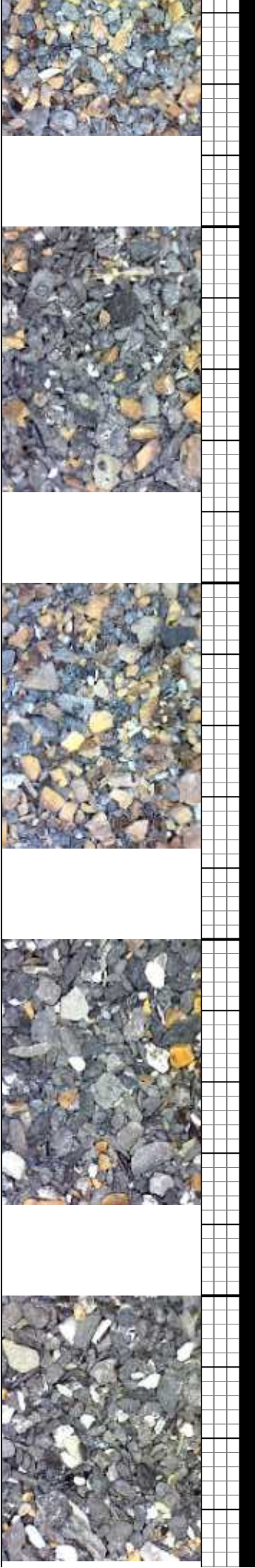
5400 50% CHK, lt-med gy, med gy brn, mot, str ip, sb ply-blky, stf-mod hd, fri-brit, rthy lstr, calc, inbd w/ 50% MRLST: med-dk gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brit, silty tex, rthy lstr, calc mx, abnt inoc frags, mod tr bent

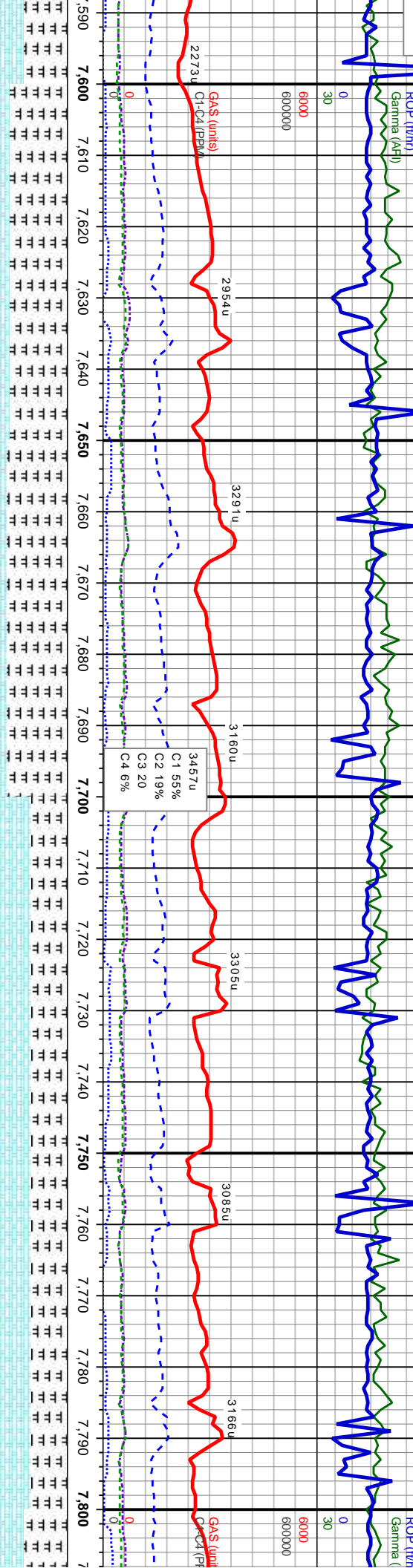
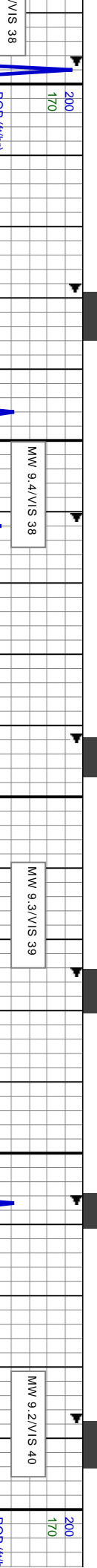
50% CHK, lt-med gy, med gy brn, occ wh, mot, str ip, sb ply-blky, stf-mod hd, fri-brit, rthy lstr, calc, inbd w/ 50% MRLST: med-dk gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brit, silty tex, rthy lstr, calc mx, mod tr inoc frags, tr bent

55% MRLST: med-dk gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brit, silty tex, rthy lstr, calc mx, mod tr inoc frags, mod tr bent w/ dissm pyr 45% CHK: lt-med gy, med gy brn, occ wh, mot, str ip, sb ply-blky, stf-mod hd, fri-brit, rthy lstr, calc, inbd w/ mlst

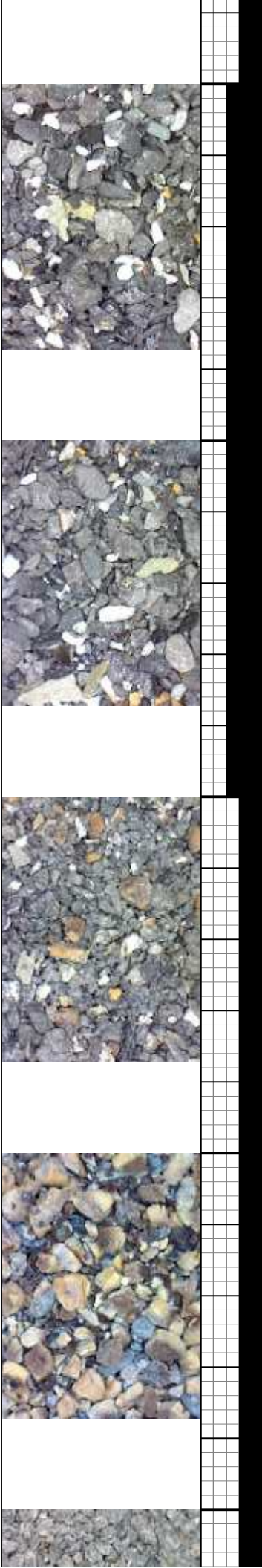
65% MRLST: med-dk gy, med gy brn, sb ply-blky, sl frm-mod hd, brit, silty tex, rthy lstr, calc mx, mod tr inoc frags, tr bent w/ dissm pyr 35% CHK: lt-med gy brn, mot, sb ply-blky, stf-mod hd, fri-brit, rthy lstr, calc, inbd w/ mlst

MD: 7,384	MD: 7,416	MD: 7,449	MD: 7,480	MD: 7,512	MD: 7,544	MD: 7,576
TVD: 6,123.14	TVD: 6,124.59	TVD: 6,124.67	TVD: 6,124.7	TVD: 6,124.72	TVD: 6,124.75	TVD: 6,124.58
Azimuth: 5.9	Azimuth: 5.7	Azimuth: 5	Azimuth: 3.8	Azimuth: 3.1	Azimuth: 2.7	Azimuth: 3.4
Inclination: 88.4	Inclination: 86.4	Inclination: 89.4	Inclination: 90.5	Inclination: 89.4	Inclination: 90.5	Inclination: 90.1
VS: 1,432.34	VS: 1,463.83	VS: 1,496.32	VS: 1,526.72	VS: 1,558	VS: 1,589.21	VS: 1,620.44





Depth (ft)	Description	MD (ft)	TVD (ft)	Azimuth (°)	Inclination (°)	VS
5400	80% MRLST: med-dk gy, med gy brn, blk, sp pily-blky, sl frm-mod hd, brit, sily tex, rthy lstr, calc mix, mod tr inoc frags, mod tr bent 20% CHK: lt-med gy, lt-med gy brn, occ wh, mot, sb pily-blky, stf-mod hd, fri-brit, rthy lstr, calc, inbnd w/ mlst	7.608	6,124.67	2.9	89.6	1,651.68
		7.640	6,124.53	2	90.9	1,682.83
		7.672	6,124.42	1.7	89.5	1,713.91
		7.704	6,124.28	1.3	91	1,744.93
		7.736	6,123.91	0.4	90.3	1,775.87
		7.768	6,123.61	359	90.8	1,806.64
		7.800	6,123.08	357.5	91.1	1,837.17



MW 9.3/VIS 38

MW 9.2/VIS 38

MW 9.3/VIS 39

MW 9.2/VIS 38

MW 9.2/VIS 37

MINDEPTH
170

3/18/13

ROP (ft/hr)

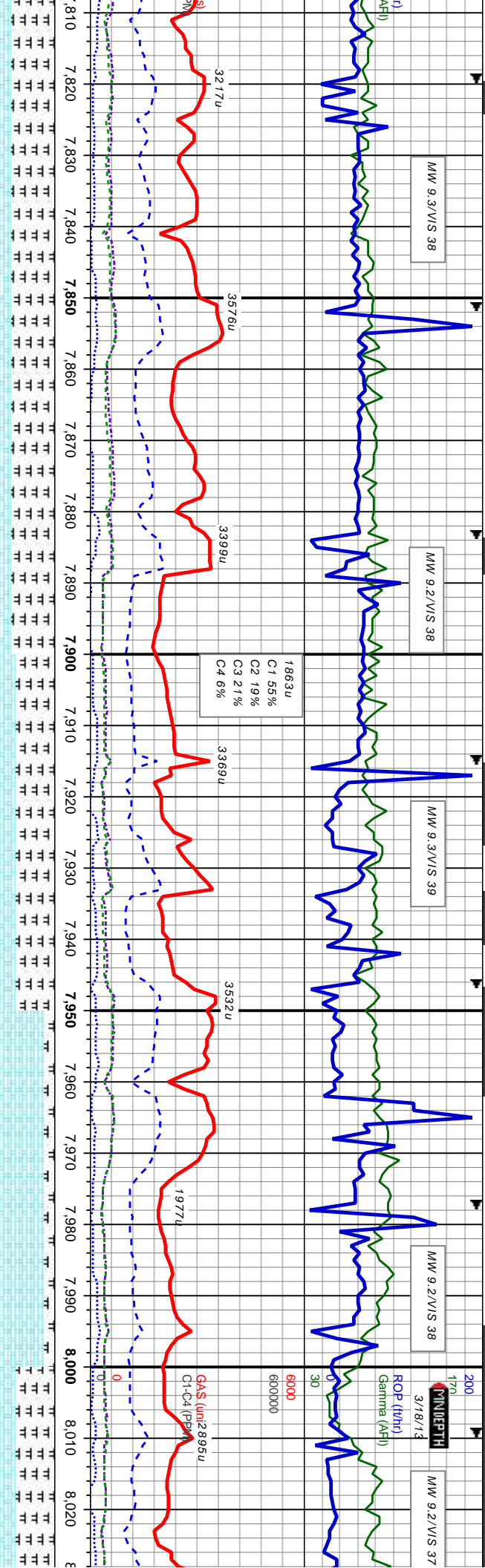
Gamma (API)

30

6000

6000000

GA\$ (m)2895u
C1-C4 (ppm)



7810 7820 7830 7840 7850 7860 7870 7880 7890 7900 7910 7920 7930 7940 7950 7960 7970 7980 7990 8000 8010 8020

3217u
3576u
3399u
1863u
C1 55%
C2 19%
C3 21%
C4 6%
3369u
3532u
1977u

% MRLST: dk gy, med-dk gy brn, blk, pily-blky, sl frm-mod hd, brit, sily tex, gy istr, calc mix 40% CHK; lt gy, lt gy brn, mot, sb pily-blky, md, sft-occ hd, brit, rthy istr, calc, occ inbnd w/ mlst, inno, tr pyr

60% MRLST: dk gy, med-dk gy brn, blk, sb pily-blky, sl frm-mod hd, brit, sily tex, rthy istr, calc mix 40% CHK; lt gy, lt gy brn, mot, sb pily-blky, sft-occ hd, fri-brit, rthy istr, calc, occ inbnd w/ mlst, tr inno, tr pyr

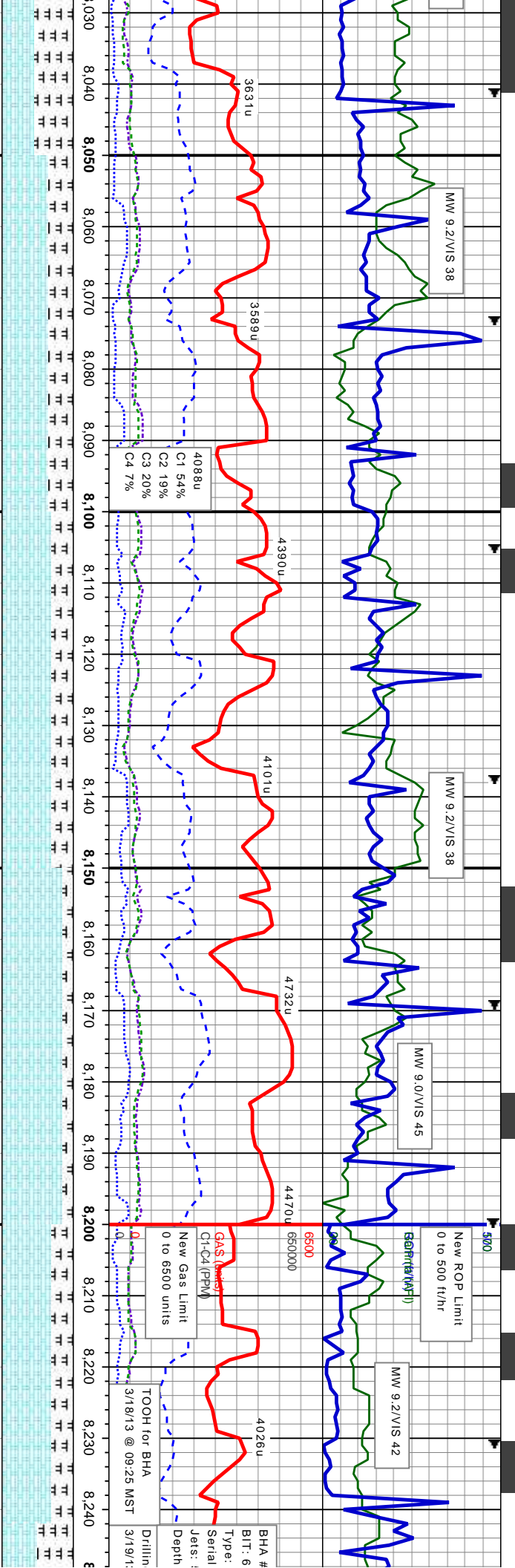
55% MRLST: med-dk gy, med gy brn, blk, sb pily-blky, sl frm-mod hd, brit-fri, sily tex, rthy istr, calc mix 40% CHK; lt gy, lt-med gy brn, mot, sb pily-blky, sft-occ hd, fri-brit, rthy istr, calc, occ inbnd w/ mlst, tr inno, tr pyr, tr bent

85% CHK: lt-med gy, med gy brn, mot, sb pily-blky, sft-mod hd, fri-brit, rthy istr, calc 15% MRLST: med-dk gy, med gy brn, blk, sb pily-blky, sl frm-mod hd, brit-fri, sily tex, rthy istr, calc mix, tr inno, tr pyr, tr bent

5400 55% MRLST: med-dk gy, blk, sb pily-blky, sl frm-mod hd, brit-fri, sily tex, rthy istr, calc mix, lt-med gy, med gy brn, mot, sft-mod hd, fri-brit, rthy istr, calc, occ inbnd w/ mlst, tr inno, tr bent

MD: 7,832'	MD: 7,863'	MD: 7,895'	MD: 7,926'	MD: 7,958'	MD: 7,990'	MD: 8,022'
TVD: 6,122.21'	TVD: 6,120.94'	TVD: 6,119.26'	TVD: 6,117.99'	TVD: 6,117.32'	TVD: 6,116.88'	TVD: 6,117.57'
Azimuth: 356.1°	Azimuth: 355.2°	Azimuth: 355.7°	Azimuth: 356.2°	Azimuth: 356.2°	Azimuth: 358.2°	Azimuth: 358.°
Inclination: 92°	Inclination: 92.7°	Inclination: 93.3°	Inclination: 91.4°	Inclination: 91°	Inclination: 90.6°	Inclination: 86°
VS: 1,867.44'	VS: 1,896.54'	VS: 1,926.53'	VS: 1,955.69'	VS: 1,986.04'	VS: 2,016.56'	VS: 2,047.09'



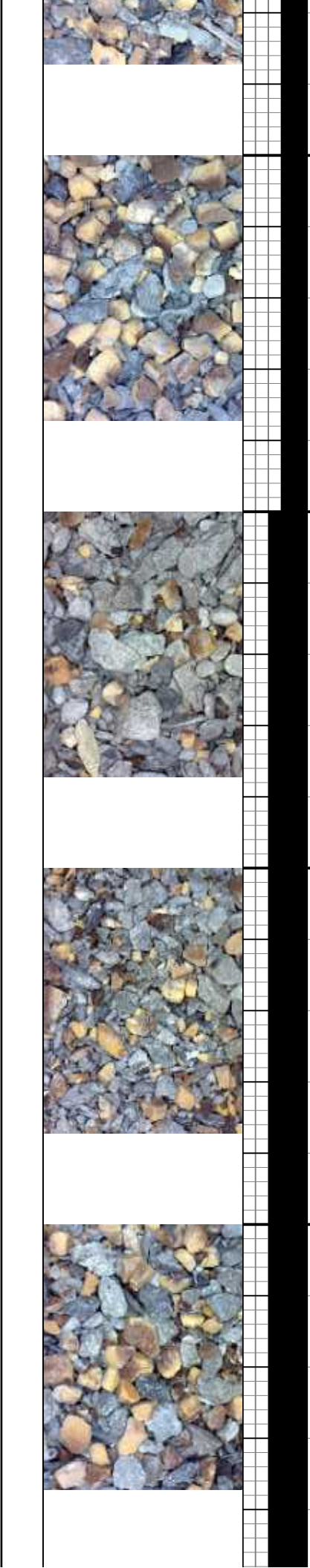


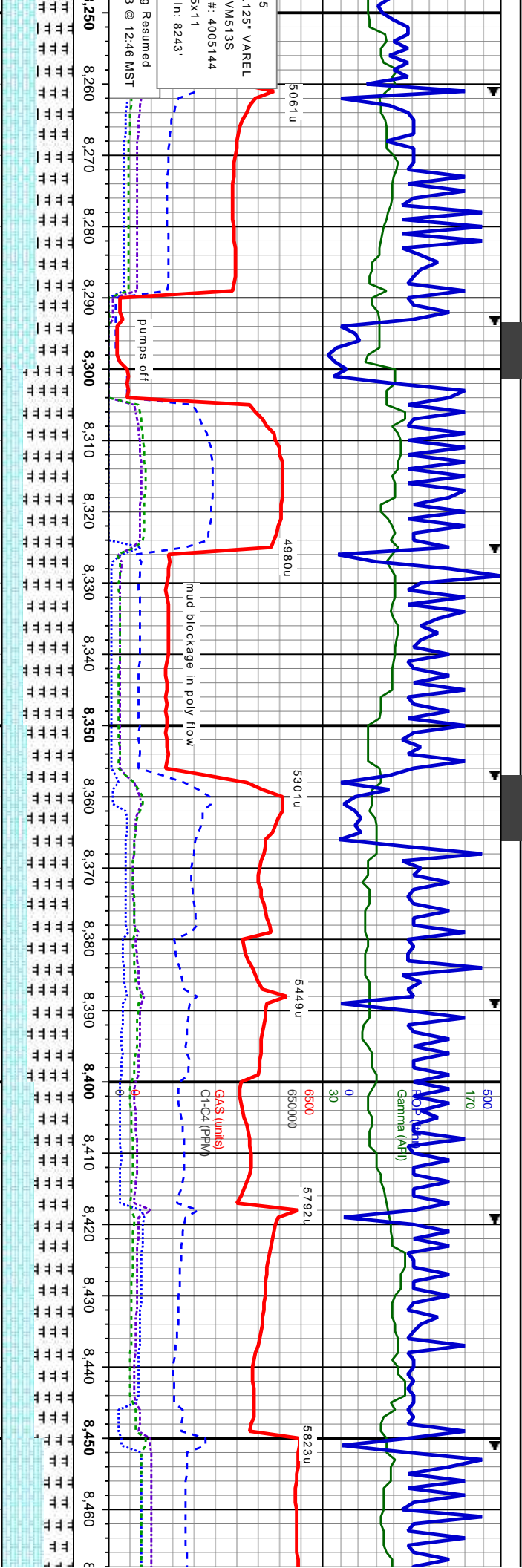
med gy brn, occ wh, 65% CHK: lt-med gy, med gy brn, occ wh, 70% CHK: lt-med gy, med gy brn, occ wh, 85% CHK: lt-med gy, med gy brn, wh-cm, mot, sb ply-bkly, sft-mod hd, fr-brit, rthy lstr, wxy, calc 15% MRLST: med-dk gy, med gy brn, blk ip, sb ply-bkly, sl frm-mod hd, brit-fri, silty tex, rthy lstr, calc mtx, tr inoc frags, tr bent

Small D/U Fault upper B marl to lower B chalk

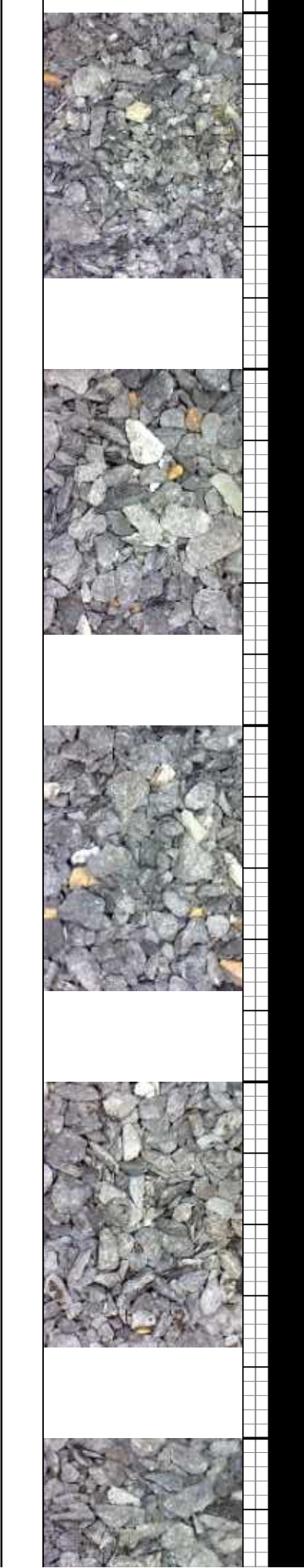
5400 70% CHK: lt-med gy, med gy brn, wh-cm, mot, sb ply-bkly, sft-mod hd, fr-brit, rthy lstr, wxy ip, calc 30% MRLST: med-dk gy, med gy brn, blk, sb ply-bkly, sl frm-mod hd, brit-fri, silty tex, rthy lstr, calc mtx, tr inoc frags, tr bent

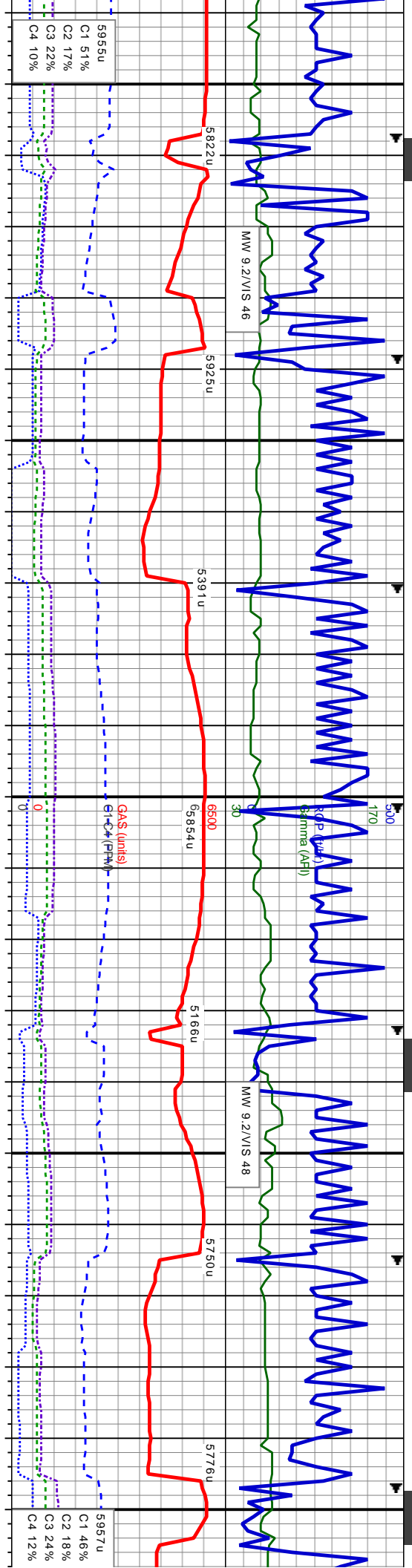
MD: 8.054	MD: 8.085	MD: 8.115	MD: 8.147	MD: 8.179	MD: 8.210	MD: 8.242
TVD: 6,119.75	TVD: 6,122.29	TVD: 6,124.46	TVD: 6,126.5	TVD: 6,128.17	TVD: 6,128.85	TVD: 6,128.66
Azimuth: 358.9	Azimuth: 358.9	Azimuth: 359.2	Azimuth: 359.4	Azimuth: 359.4	Azimuth: 359.6	Azimuth: 359
Inclination: 85.3	Inclination: 85.3	Inclination: 86.4	Inclination: 86.3	Inclination: 87.7	Inclination: 89.8	Inclination: 90
VS: 2,077.53	VS: 2,107.05	VS: 2,135.72	VS: 2,166.25	VS: 2,196.82	VS: 2,226.59	VS: 2,257.29





Depth (ft)	Description	MD	TVD	Azimuth	Inclination	VS
8250 - 8270	50% CHK: lk-med gy, med gy brn, wh ip, mot, sb ply-blky, sft-mod hd, fri-brit, rthy istr, calc 50% MRLST: med-dk gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brit-fri, rthy istr, calc mtx, tr inoc frags, rthy frags, tr bent	8,274	6,128.12	359.7	91	2,288
8270 - 8300	70% MRLST: med-dk gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brit-fri, silty tex, rthy istr, calc mtx, tr inoc frags, tr bent 30% CHK: med gy-med gy brn, wh ip, mot, sb ply-blky, sft-mod hd, fri-brit, rthy istr, calc, inbd wi mlst	8,306	6,127.9	359.2	89.8	2,318.73
8300 - 8330	65% MRLST: med-dk gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brit-fri, rthy istr, calc mtx, tr inoc frags, tr bent 35% CHK: med gy-med gy brn, wh ip, mot, sb ply-blky, sft-mod hd, fri-brit, rthy istr, calc, inbd wi mlst	8,338	6,128.07	359.2	89.6	2,349.42
8330 - 8360	5400 65% MRLST: med-dk gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brit-fri, rthy istr, calc 50% MRLST: med-dk gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brit-fri, rthy istr, calc mtx, tr inoc frags, rthy frags, tr bent	8,370	6,127.98	359.9	90.7	2,380.16
8360 - 8400	55% MRLST: med-dk gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brit-fri, silty tex, rthy istr, calc mtx, rr inoc frags, rr bent 45% CHK: lk-med gy, med gy brn, wh ip, mot, sb ply-blky, sft-mod hd, fri-brit, rthy istr, wxy ip, calc, ooc inbd wi mlst	8,402	6,127.45	0.1	91.2	2,410.97
8400 - 8430	60% CHK: lk-med gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brit-fri, rthy istr, calc 50% MRLST: med-dk gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brit-fri, rthy istr, calc mtx, tr inoc frags, rthy frags, tr bent	8,434	6,126.78	0.4	91.2	2,441.82
8430 - 8450	60% CHK: lk-med gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brit-fri, rthy istr, calc 50% MRLST: med-dk gy, med gy brn, blk, sb ply-blky, sl frm-mod hd, brit-fri, rthy istr, calc mtx, tr inoc frags, rthy frags, tr bent	8,474	6,126.12	0.1	91.2	2,471.70





86% CHK: lt-med gy, lt-med gy brn, wh, crm-bf, mot, sb ply-bkly, sft-mod hd, frt-brit, rthy lstr, wxy, calc 15% MRLST: med-dk gy, med gy brn, sb ply-bkly, sl frm-mod hd, brit-fri, sily tex, rthy lstr, calc mtx, tr inoc frags

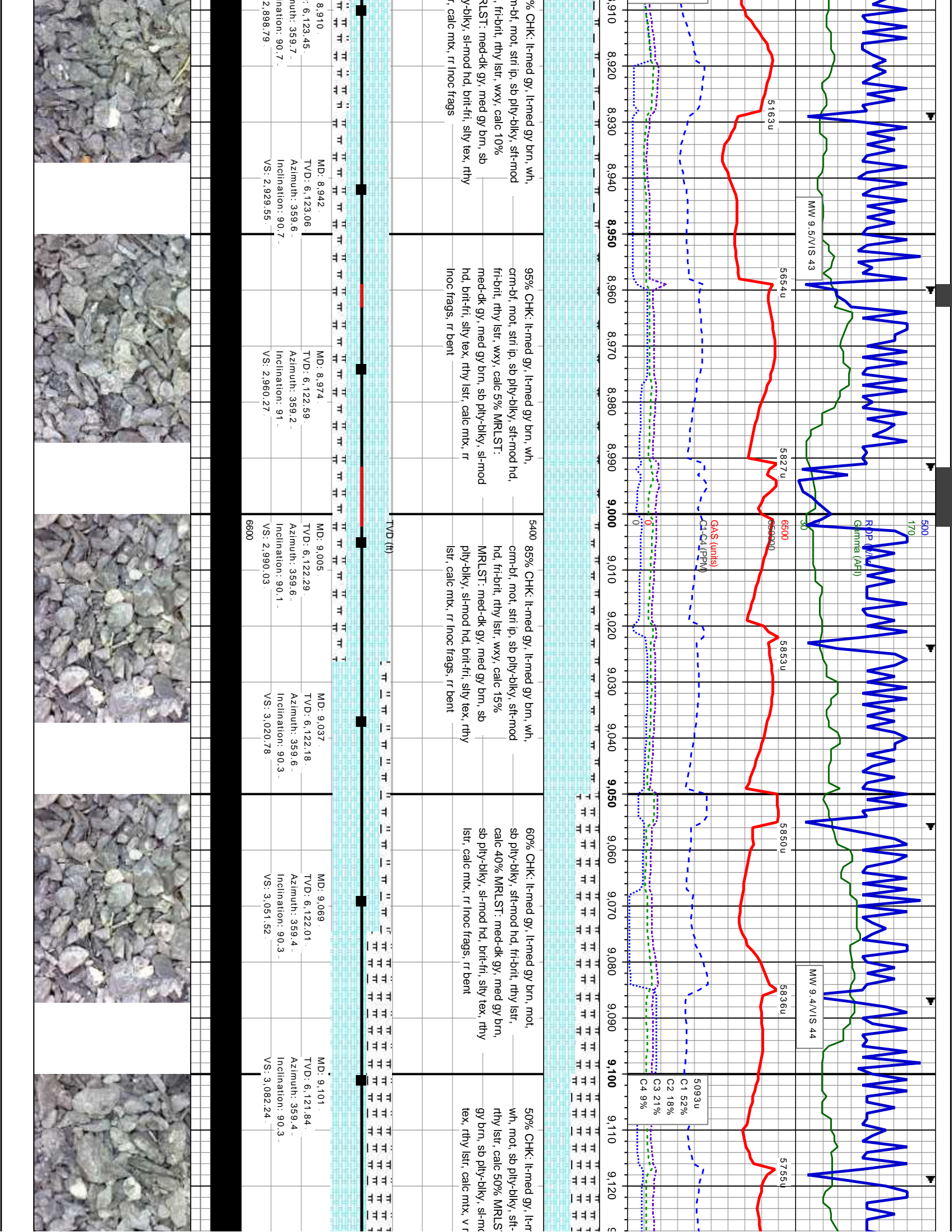
80% CHK: lt-med gy, lt-med gy brn, wh, crm-bf, mot, sb ply-bkly, sft-mod hd, frt-brit, rthy lstr, wxy, calc, rr dissm pyr 20% MRLST: med-dk gy, med gy brn, sb ply-bkly, sl frm-mod hd, brit-fri, sily tex, rthy lstr, calc mtx, tr inoc frags, rr bent

75% CHK: lt-med gy, lt-med gy brn, wh, crm-bf, mot, sb ply-bkly, sft-mod hd, frt-brit, rthy lstr, wxy, calc, rr dissm pyr 25% MRLST: med-dk gy, med gy brn, sb ply-bkly, sl frm-mod hd, brit-fri, sily tex, rthy lstr, calc mtx, tr inoc frags, rr bent

90% CHK: lt-med gy, lt-med gy brn, wh, crm-bf, mot, sb ply-bkly, sft-mod hd, frt-brit, rthy lstr, wxy, calc 10% MRLST: med-dk gy, med gy brn, sb ply-bkly, sl frm-mod hd, brit-fri, sily tex, rthy lstr, calc mtx, rr inoc frags

MD	TVD	Azimuth	Inclination	VS
8.689	6,122.17	359.6	89.7	2,686.61
8.721	6,122.08	359.7	89.7	2,717.37
8.752	6,122.52	359.2	89.7	2,747.14
8.783	6,122.52	358.9	89.3	2,776.84
8.814	6,122.9	358.7	89.3	2,806.51
8.846	6,123.23	359.9	89.5	2,837.21
8.878	6,123.51	359.9	89.5	2,868.01





95% CHK: lt-med gy, lt-med gy brn, wh, crn-bt, mot, stri ip, sb pily-blky, sft-mod hd, fri-brit, rthy istr, wxy, calc 10%
 MRLST: med-dk gy, med gy brn, sb pily-blky, sl-mod hd, brit-fi, sily tex, rthy istr, calc mtx, rr inoc frags

95% CHK: lt-med gy, lt-med gy brn, wh, crn-bt, mot, stri ip, sb pily-blky, sft-mod hd, fri-brit, rthy istr, wxy, calc 5% MRLST: med-dk gy, med gy brn, sb pily-blky, sl-mod hd, brit-fi, sily tex, rthy istr, calc mtx, rr inoc frags, rr bent

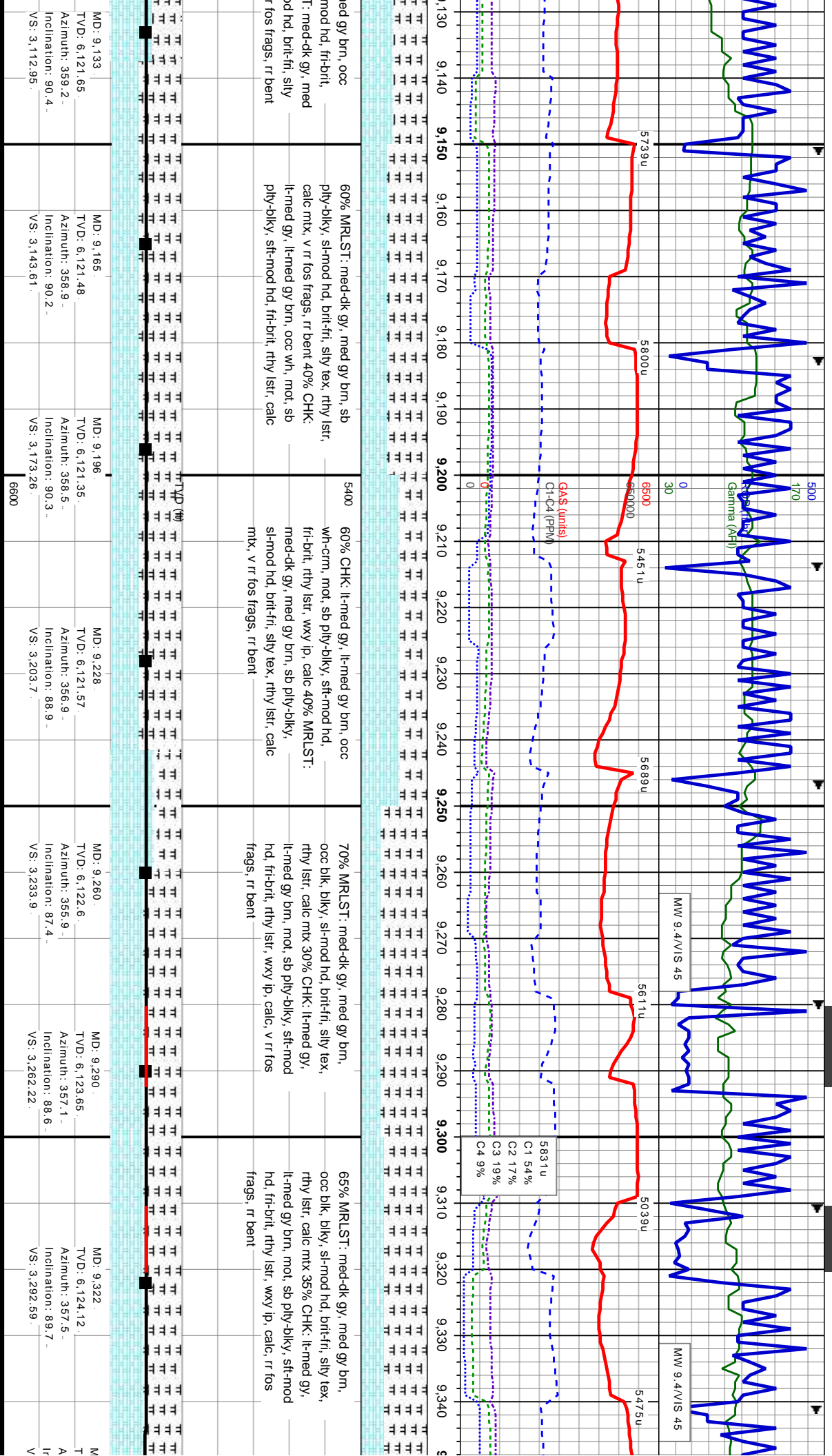
5400 85% CHK: lt-med gy, lt-med gy brn, wh, crn-bt, mot, stri ip, sb pily-blky, sft-mod hd, fri-brit, rthy istr, wxy, calc 15% MRLST: med-dk gy, med gy brn, sb pily-blky, sl-mod hd, brit-fi, sily tex, rthy istr, calc mtx, rr inoc frags, rr bent

60% CHK: lt-med gy, lt-med gy brn, mot, sb pily-blky, sft-mod hd, fri-brit, rthy istr, calc 40% MRLST: med-dk gy, med gy brn, sb pily-blky, sl-mod hd, brit-fi, sily tex, rthy istr, calc mtx, rr inoc frags, rr bent

50% CHK: lt-med gy, lt-med gy brn, mot, sb pily-blky, sft-mod hd, fri-brit, rthy istr, calc 50% MRLST: med-dk gy, med gy brn, sb pily-blky, sl-mod hd, brit-fi, sily tex, rthy istr, calc mtx, rr inoc frags

MD	TVD	Azimuth	Inclination	VS
8,910	6,123.06	359.6	90.7	2,929.55
8,974	6,122.59	359.2	91	2,960.27
9,005	6,122.29	359.6	90.1	2,990.03
9,037	6,122.18	359.6	90.3	3,020.78
9,069	6,122.01	359.4	90.3	3,051.52
9,101	6,121.84	359.4	90.3	3,082.24





med gy brn, occ
mod hd, fri-bri,
r med-dk gy, med
hd, bri-fi, silty
f frags, rr bent

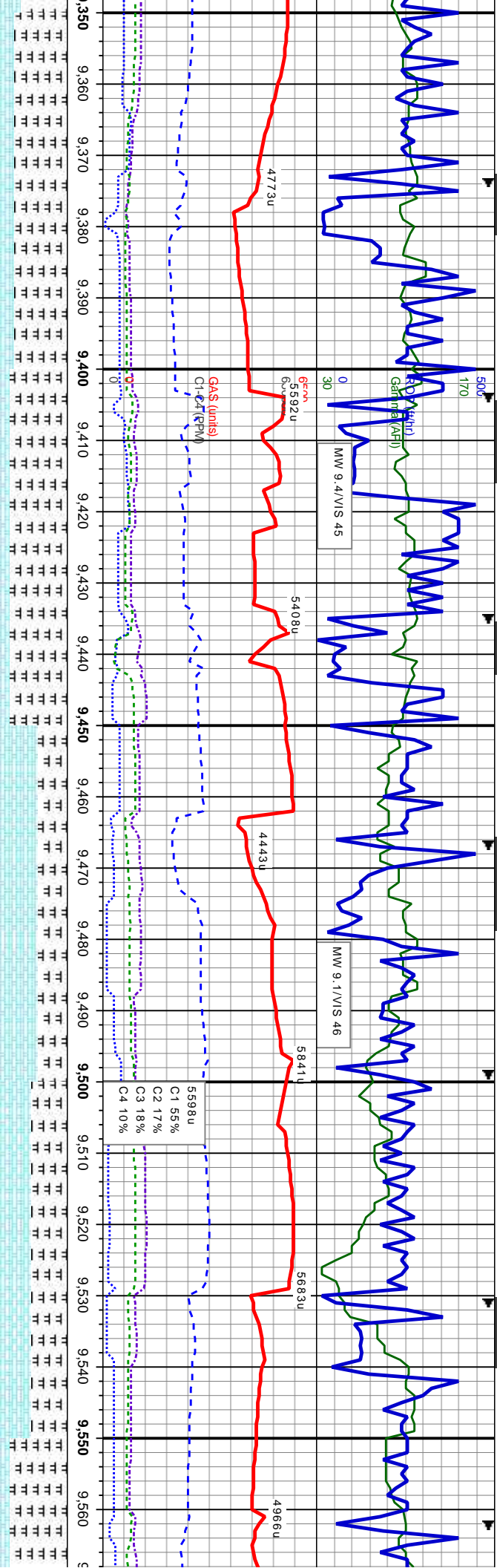
60% MRLST: med-dk gy, med gy brn, sb
ply-blky, sl-mod hd, bri-fi, silty tex, rthy istr,
calc mx, v rr fos frags, rr bent 40% CHK:
ll-med gy, ll-med gy brn, occ wh, mot, sb
ply-blky, stf-mod hd, fri-brit, rthy istr, calc

5400
60% CHK, ll-med gy, ll-med gy brn, occ
wh-crm, mot, sp ply-blky, stf-mod hd,
fri-brit, rthy istr, wxy lp, calc 40% MRLST:
med-dk gy, med gy brn, sb ply-blky,
sl-mod hd, bri-fi, silty tex, rthy istr, calc
mx, v rr fos frags, rr bent

70% MRLST: med-dk gy, med gy brn,
occ blk, blk, sl-mod hd, bri-fi, silty tex,
rthy istr, calc mx 30% CHK, ll-med gy,
ll-med gy brn, mot, sb ply-blky, stf-mod
hd, fri-brit, rthy istr, wxy lp, calc, v rr fos
frags, rr bent

65% MRLST: med-dk gy, med gy brn,
occ blk, blk, sl-mod hd, bri-fi, silty tex,
rthy istr, calc mx 35% CHK, ll-med gy,
ll-med gy brn, mot, sb ply-blky, stf-mod
hd, fri-brit, rthy istr, wxy lp, calc, rr fos
frags, rr bent





75% MRLST: med-dk gy, med gy brn, occ blk, sb ply-bkly, sl-mod hd, brit-fri, silty tex, rthy lstr, calc mtx 25% CHK: lt-med gy, lt-med gy brn, mot, sb ply-bkly, sft-mod hd, fri-brit, rthy lstr, wxy ip, calc, v rr fos frags, v rr bent

5400 80% MRLST: med-dk gy, med gy brn, occ blk, sb ply-bkly, sl-mod hd, brit-fri, silty tex, rthy lstr, calc mtx 20% CHK: lt-med gy, lt-med gy brn, mot, sb ply-bkly, sft-mod hd, fri-brit, rthy lstr, wxy ip, calc, v rr fos frags, v rr bent

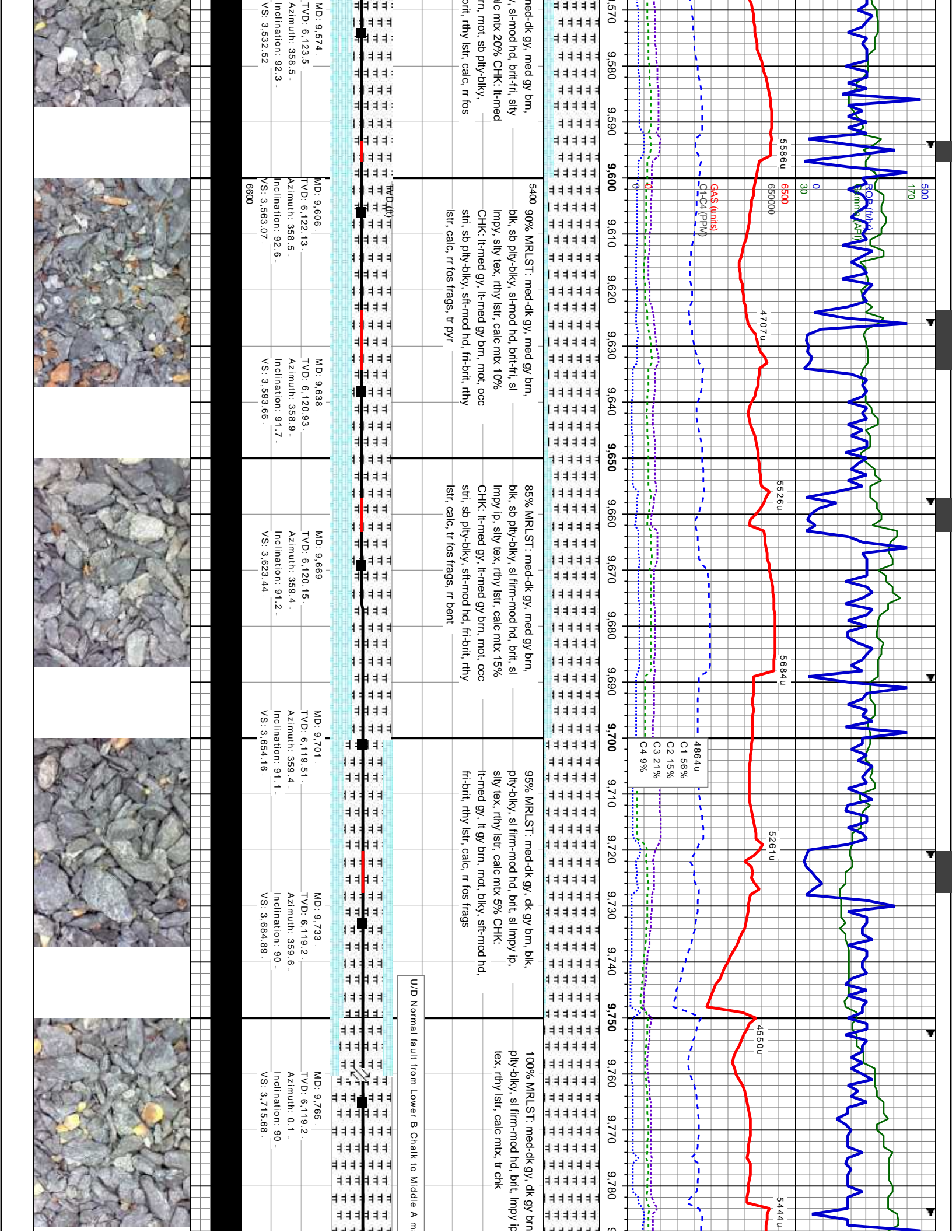
60% CHK: lt-med gy, lt-med gy brn, mot, sb ply-bkly, sft-mod hd, fri-brit, rthy lstr, wxy ip, calc 40% MRLST: med-dk gy, med gy brn, occ blk, sb ply-bkly, sl-mod hd, brit-fri, silty tex, rthy lstr, calc mtx: rr fos frags, rr pyr

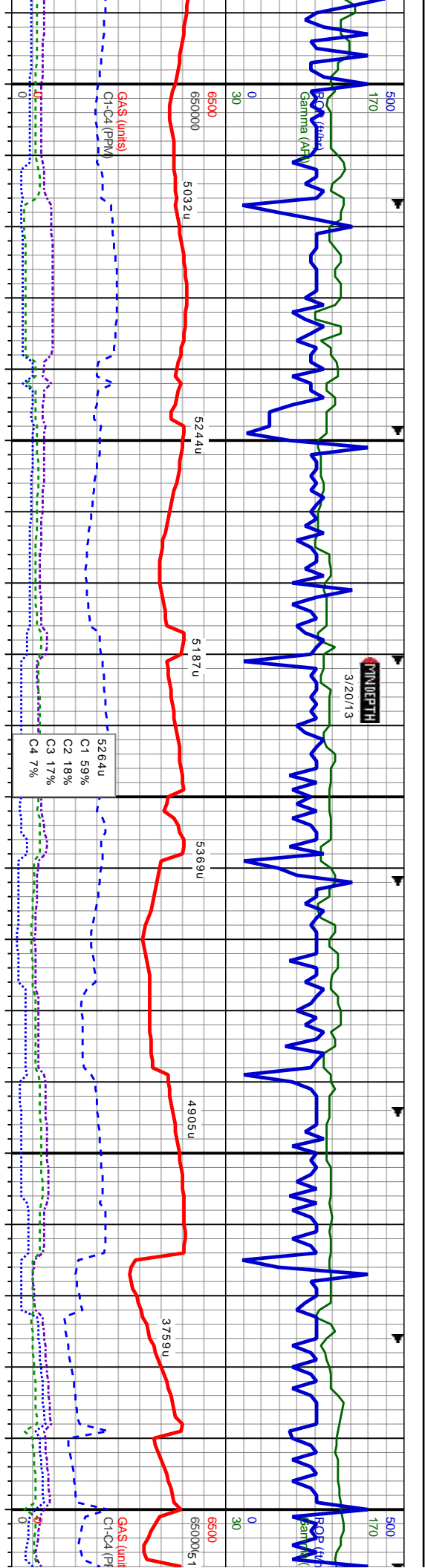
50% CHK: lt-med gy, lt-med gy brn, mot, sb ply-bkly, sft-mod hd, fri-brit, rthy lstr, wxy ip, calc 50% MRLST: med-dk gy, med gy brn, occ blk, sb ply-bkly, sl-mod hd, brit-fri, silty tex, rthy lstr, calc mtx: v rr fos frags, rr pyr

80% MRLST: r blk, sb ply-bkly, tex, rthy lstr, ce gy, lt-med gy b sft-mod hd, fri-b frags, lt pyr

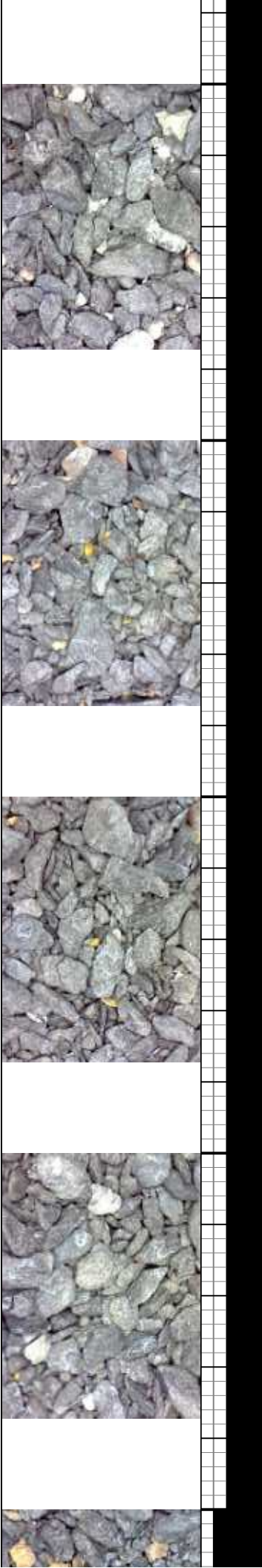
D: 9.353	MD: 9.384	MD: 9.415	MD: 9.447	MD: 9.479	MD: 9.511	MD: 9.543
V.D: 6.124.56	TVD: 6.125.1	TVD: 6.125.5	TVD: 6.125.84	TVD: 6.125.78	TVD: 6.125.36	TVD: 6.124.61
Azimuth: 356.2	Azimuth: 357.3	Azimuth: 358.2	Azimuth: 358.2	Azimuth: 358.7	Azimuth: 358	Azimuth: 358.5
Inclination: 88.7	Inclination: 89.3	Inclination: 89.2	Inclination: 89.6	Inclination: 90.6	Inclination: 90.9	Inclination: 91.8
VS: 3.321.93	VS: 3.351.26	VS: 3.380.75	VS: 3.411.28	VS: 3.441.85	VS: 3.472.4	VS: 3.502.92



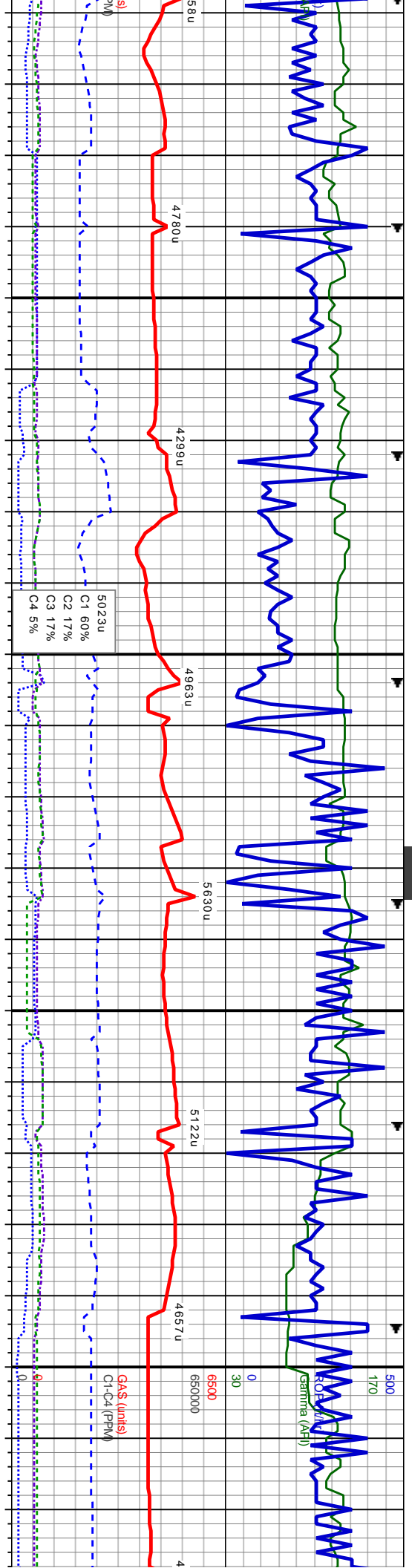




MD: 9.797	TVD: 6.119.28	Azimuth: 359.7	Inclination: 89.7	VS: 3.746.48	6600
MD: 9.829	TVD: 6.119.53	Azimuth: 359	Inclination: 89.4	VS: 3.777.19	6600
MD: 9.861	TVD: 6.119.9	Azimuth: 359	Inclination: 89.3	VS: 3.807.85	6600
MD: 9.893	TVD: 6.120.29	Azimuth: 358.9	Inclination: 89.3	VS: 3.838.5	6600
MD: 9.925	TVD: 6.120.71	Azimuth: 359	Inclination: 89.2	VS: 3.869.15	6600
MD: 9.957	TVD: 6.121.18	Azimuth: 358.5	Inclination: 89.1	VS: 3.899.76	6600
MD: 9.989	TVD: 6.121.66	Azimuth: 357.8	Inclination: 89.2	VS: 3.930.28	6600

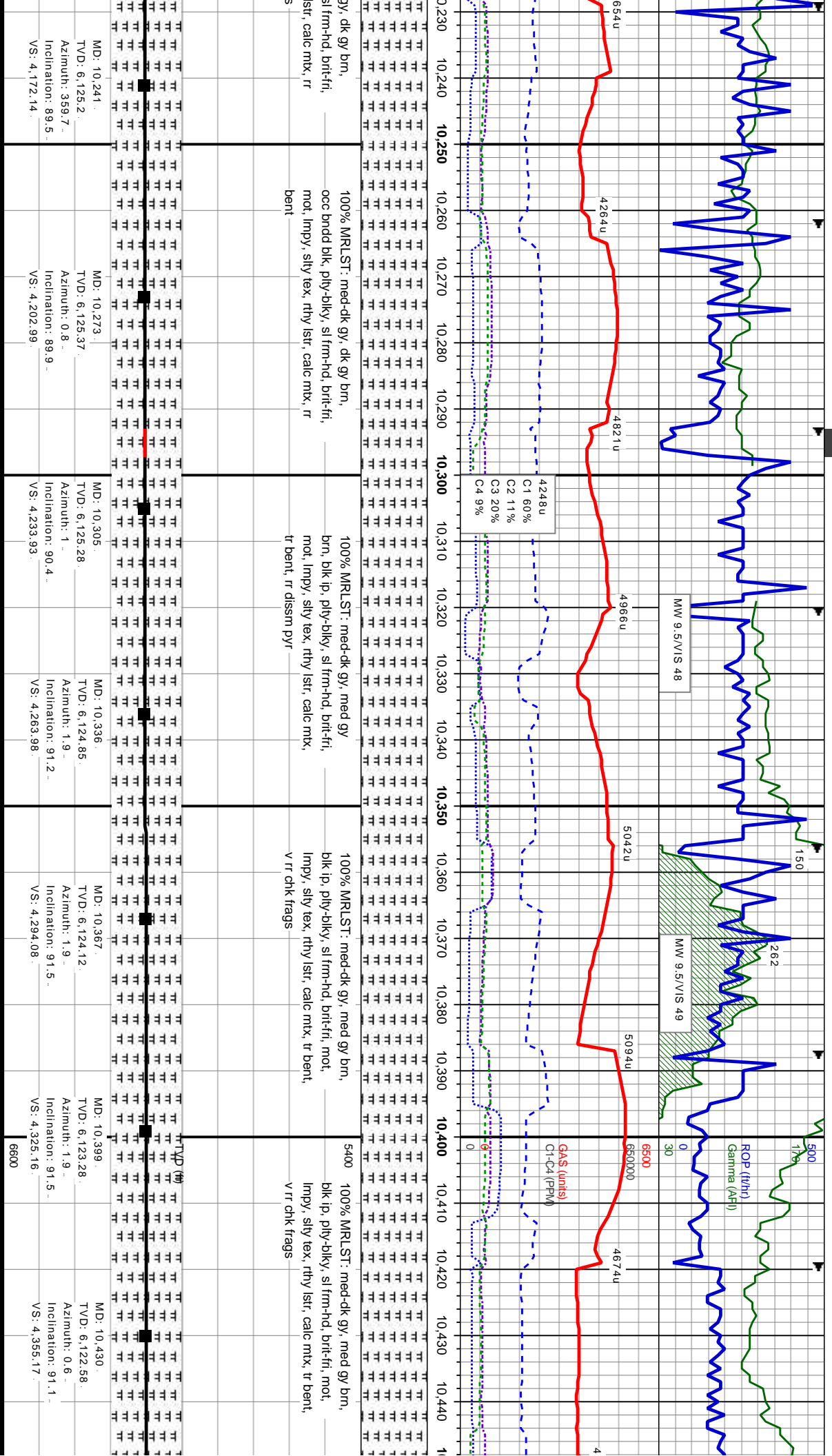


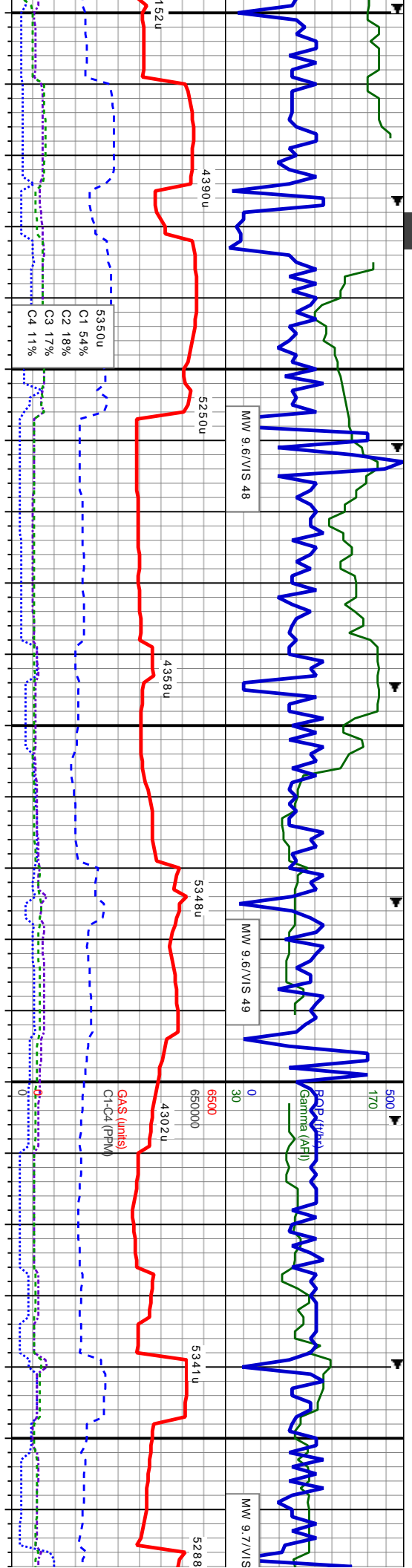
blk, sily
 5400 100% MRSLST: dk gy, dk gy brn, blk, ply-bkly, sl firm-hd, brt, lmpy ip, sily tex, rthy lstr, calc mtx, tr clk
 100% MRSLST: dk gy, dk gy brn, blk, sb ply-bkly, sl firm-hd, brt-frt, lmpy ip, sily tex, rthy lstr, calc mtx
 100% MRSLST: dk gy, dk gy brn, blk, rthy lstr, calc mtx
 100% MRSLST: dk gy, dk gy brn, blk, rthy lstr, calc mtx
 100% MRSLST: dk gy, dk gy brn, blk, rthy lstr, calc mtx
 5400 100% MRSLST: dk gy, dk gy brn, blk, rthy lstr, calc mtx



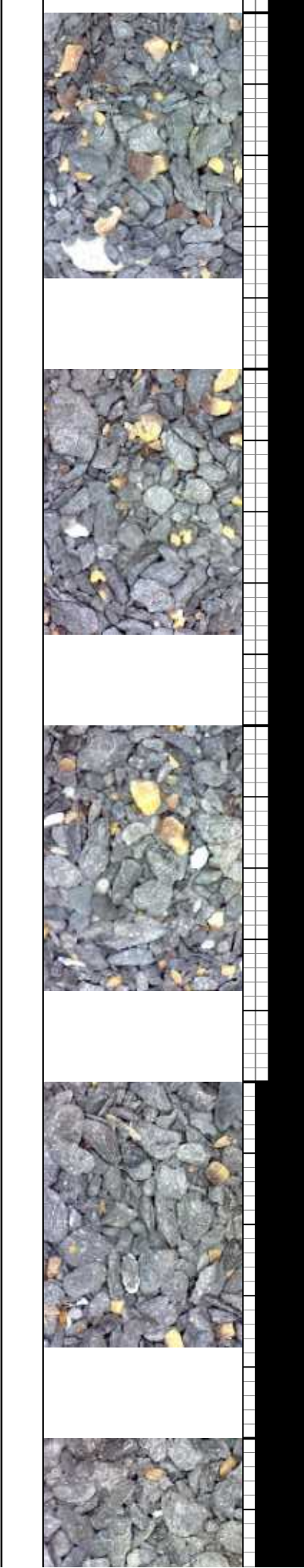
100% MRLST: dk gy, dk gy brn, blk, -blkly, sl frm-hd, brt-fr, lmpy, silty tex, v lstr, calc mtx	100% MRLST: med-dk gy, dk gy brn, occ brndd blk, pily-blky, sl frm-hd, brt-fr, mot, lmpy, silty tex, rthy lstr, calc mtx, rr bent, rr chk frags	100% MRLST: med-dk gy, dk gy brn, occ brndd blk, pily-blky, sl frm-hd, brt-fr, mot, lmpy, silty tex, rthy lstr, calc mtx, rr bent, rr chk frags	100% MRLST: med-dk gy, dk gy brn, occ brndd blk, pily-blky, sl frm-hd, brt-fr, mot, lmpy, silty tex, rthy lstr, calc mtx, rr bent, rr chk frags	100% MRLST: med-dk gy, dk gy brn, occ brndd blk, pily-blky, sl frm-hd, brt-fr, mot, lmpy, silty tex, rthy lstr, calc mtx, rr bent, rr chk frags	100% MRLST: med-dk gy, dk gy brn, occ brndd blk, pily-blky, sl frm-hd, brt-fr, mot, lmpy, silty tex, rthy lstr, calc mtx, rr bent, rr chk frags	100% MRLST: med-dk gy, dk gy brn, occ brndd blk, pily-blky, sl frm-hd, brt-fr, mot, lmpy, silty tex, rthy lstr, bent, rr pyr, v rr fos frags	5400 100% MRLST: med-dk gy, dk gy brn, occ brndd blk, pily-blky, sl frm-hd, brt-fr, mot, lmpy, silty tex, rthy bent, rr pyr, v rr fos frags
MD: 10.021 TVD: 6.122.19 Azimuth: 359 Inclination: 88.9 VS: 3.960.83	MD: 10.053 TVD: 6.123.24 Azimuth: 358.9 Inclination: 89.1 VS: 3.991.48	MD: 10.083 TVD: 6.123.24 Azimuth: 358.9 Inclination: 89 VS: 4.020.2	MD: 10.114 TVD: 6.123.78 Azimuth: 359.7 Inclination: 89 VS: 4.049.94	MD: 10.146 TVD: 6.124.31 Azimuth: 0.1 Inclination: 89.1 VS: 4.080.74	MD: 10.178 TVD: 6.124.71 Azimuth: 359.7 Inclination: 89.5 VS: 4.111.53	MD: 10.210 TVD: 6.124.96 Azimuth: 359.9 Inclination: 89.6 VS: 4.142.32	6600

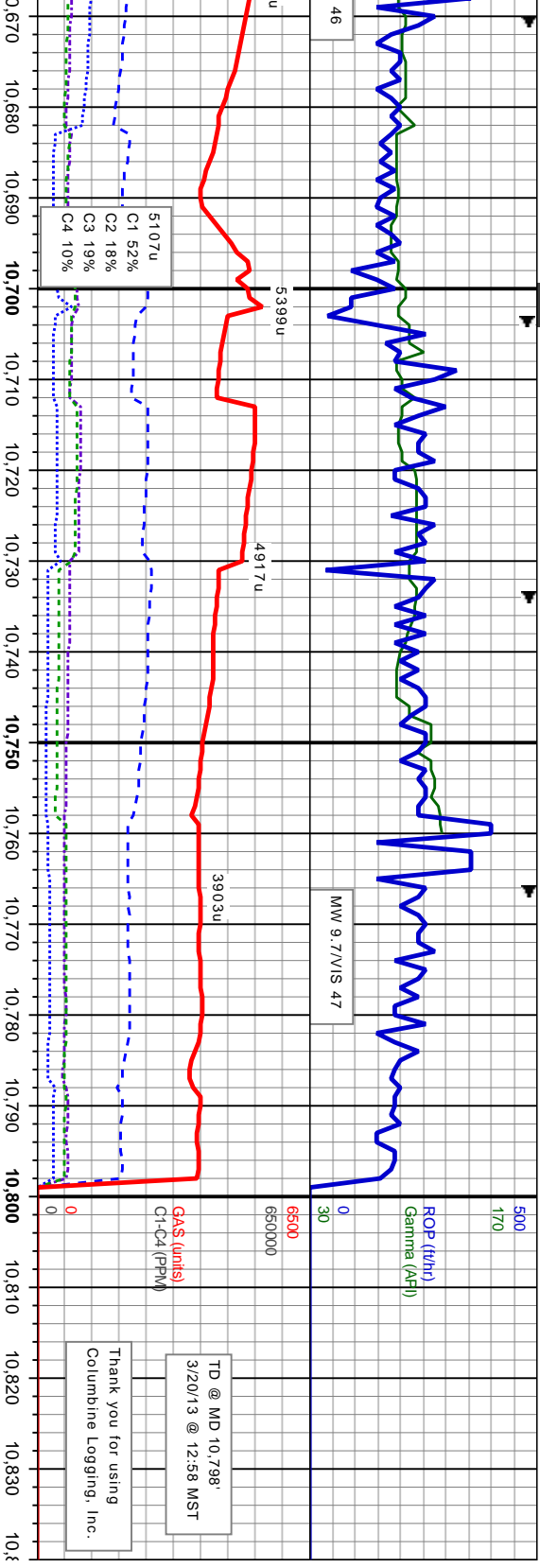






100% MRLST: med-dk gy, med gy brn. blk ip, ply-dlky, sl frm-hd, brit-frt, mot Impy, silty tex, rthy lstr, calc mtx, tr bent	MD: 10.462. TVD: 6.121.91 Azimuth: 0.4 Inclination: 91.3 VS: 4.386.06	100% MRLST: med-dk gy, med gy brn, blk ip, ply-dlky, sl frm-hd, brit-frt, mot, Impy, silty tex, rthy lstr, calc mtx, tr bent, rr pyr	MD: 10.493. TVD: 6.121.37 Azimuth: 0.4 Inclination: 90.7 VS: 4.415.96	95% MRLST: med-dk gy, med gy brn, blk ip, ply-dlky, sl frm-hd, brit-frt, mot, Impy, silty tex, rthy lstr, calc mtx, tr bent, rr pyr, rr fos frags 5% med gy-med gy brn, wh ip, ply-sb dlky, sft-sl frm, brit, mot, rthy lstr, v calc	MD: 10.525. TVD: 6.120.98 Azimuth: 0.3 Inclination: 90.7 VS: 4.446.82	5400 100% MRLST: med-dk gy, med gy brn, blk, ply-dlky, sl frm-hd, brit-frt, mot, Impy, silty tex, rthy lstr, calc mtx, tr bent, tr fos frags	MD: 10.557. TVD: 6.120.59 Azimuth: 0.1 Inclination: 90.7 VS: 4.477.66	6600 100% MRLST: med-dk gy, med gy brn, blk, ply-dlky, sl frm-hd, brit-frt, mot, Impy, silty tex, rthy lstr, calc mtx, tr bent, tr fos frags	MD: 10.588. TVD: 6.120.51 Azimuth: 0.6 Inclination: 89.6 VS: 4.507.56	6600 100% MRL blk, ply-dlky Impy, silty t bent, tr fos	MD: 10.620. TVD: 6.120.67 Azimuth: 359.4 Inclination: 89.8 VS: 4.538.38	MD: 10.651. TVD: 6.120.78 Azimuth: 359.4 Inclination: 89.8 VS: 4.568.14
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ST: med-dk gy, med gy brn, gy, sil frm-hd, brit-fri, mot, ex, rthy lst, calc mx, frags

100% MRLST: med-dk gy, med-dk gy brn, blk, ply-bkly, sil frm-hd, brit-fri, mot, limpy, silty tex, rthy lst, calc mx, tr bent, tr lnoc frags, rr pyr

100% MRLST: med-dk gy, med-dk gy brn, blk, ply-bkly, sil frm-hd, brit-fri, mot, limpy, silty tex, rthy lst, calc mx, tr bent, tr lnoc frags, rr pyr

MD: 10,683	TVD: 6,121	Azimuth: 359.4	Inclination: 89.4	VS: 4,598.83
MD: 10,715	TVD: 6,121.54	Azimuth: 358.7	Inclination: 88.7	VS: 4,629.46
MD: 10,747	TVD: 6,122.65	Azimuth: 357.5	Inclination: 88.5	VS: 4,659.94

