



Scale: 5" / 100'  
Measured Depth Log

**Well Name** Crow Creek AE06-709

**Location** Sec. 1 T6N R63W

**State** Colorado

**Country** USA

**API Number** 05-123-40153

**Region** DJ Basin

**Spud Date** 12/4/2014

**Surface Coordinates** 290 FNL ; 1175 FEL  
40.52208 ; -104.37907

**Bottom Hole Coordinates** 30 FNL ; 1 FEL  
40.50832 ; -104.37484

**Ground Elevation** 4857'

**Logged Interval** 6065'

**Formation** Niobrara B chalk

**Type of Drilling Fluid** FW LSND

**County** Weld

**Rig Number** PD 829

**AFE #** 200449

**Field** Wattenberg

**Drilling Completed** 12/11/2014

**K.B. Elevation** 4873'

**Total Depth** 11500'

**Company** Noble Energy Inc  
**Address** 1625 BROADWAY  
DENVER, CO 80202

**Name** Holly Duncan  
**Company** Noble Energy, Inc  
**Address** 1625 BROADWAY  
DENVER, CO 80202

Columbine Logging, INC.  
Well Site Geologits

Operator

c  
AY  
2022

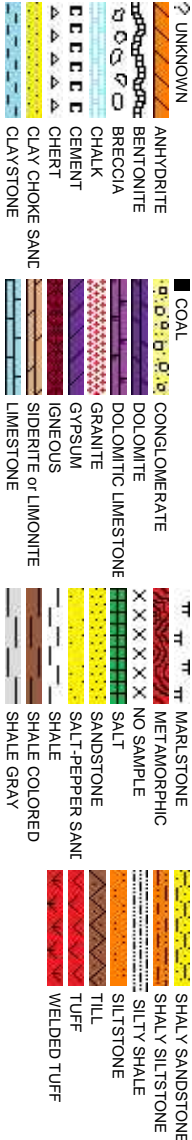
Geologist

c.  
AY  
2022

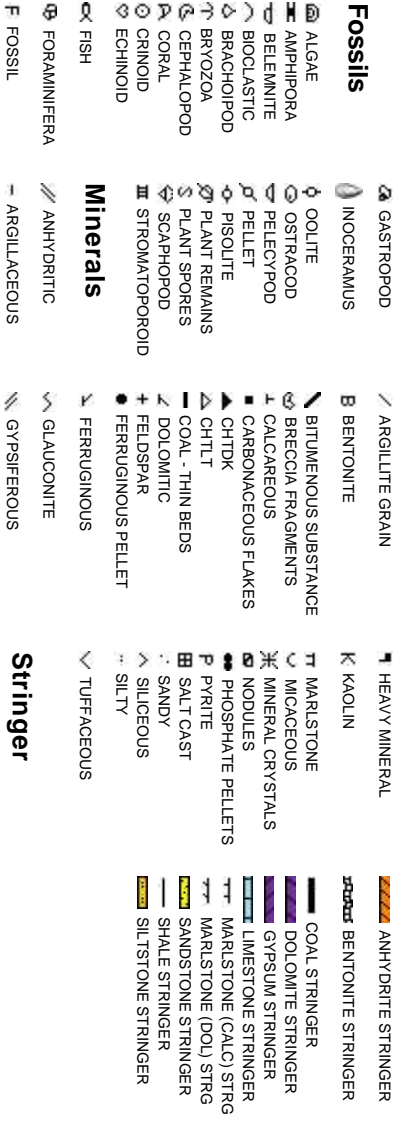
Other

602 S. Lipan St.  
Denver CO, 80223  
  
Ryan Shilling  
Ted Stockwell

Rock Types



Accessories



Other Symbols

<b>Oil Show</b>	P PINPOINT V VUGGY	DST INTERVAL FAULT	WIRELINE TESTED - LEFT WIRELINE TESTED - RT	E EARTHY FX FINELYXLN
D DEAD	<b>Engineering</b>	FORMATION TOP	DRILL STEM TEST	GS GRAINSTONE
● EVEN	BIT	GAS SHOW OIL SHOW	MNDEPTH MN DEPTH	L LITHOGRAPHIC MX MICROXLN
○ QUESTIONABLE	SPOTTED STAINING	MNDEPTH UP	<b>Rounding</b>	MS MUDSTONE
▲ CONNECTION (UP)	CONNECTION (DOWN)	MNDEPTH (DOWN)	A ANGULAR	PS PACKSTONE
<b>Porosity</b>	CONNECTION GAS	NORMAL FAULT	R ROUNDED	WS WACKESTONE
E EARTHY	CONNECTION GAS (LEFT)	OVERTURNED STRATA	B SUBANG	
F FENESTRAL	TRIP GAS	REVERSE FAULT	P SUBRND	<b>Sorting</b>
F FRACTURE	TRIP GAS (LEFT)	CASING		M MODERATE
X INTERCRYSTALLINE	DOWN TIME GAS	SIDEWALL CORE (LEFT)	<b>Textures</b>	P POOR
◊ INTEROOLITIC	DOWN TIME GAS (LEFT)	SIDEWALL CORE (RIGHT)	BS BOUNDSTONE	W WELL
Δ MOLDIC	CORE - LOST	SLIDE	C CHALKY	
◊ ORGANIC	CORE - RECOVERED	SURVEY	CX CRYPTOXLN	

Slide/Rotate

ROP  
ROF  
GAMMA

ROP Scale  
0-800 ft/hr  
GAMMA Scale  
0 - 200 API

Total Gas & Chromatograph

GAS  
C1  
C2  
C3  
C4

Gas Scale  
0 - 2000 units  
KOP = 6050'

COLUMBINE LOGGING, INC. RIGGED UP  
ON 12/05/2014 MANNED 2-PERSON  
LOGGING WITH BLOODHOUND GAS  
CHROMATOGRAPH UNIT # 0312

Depth Labels

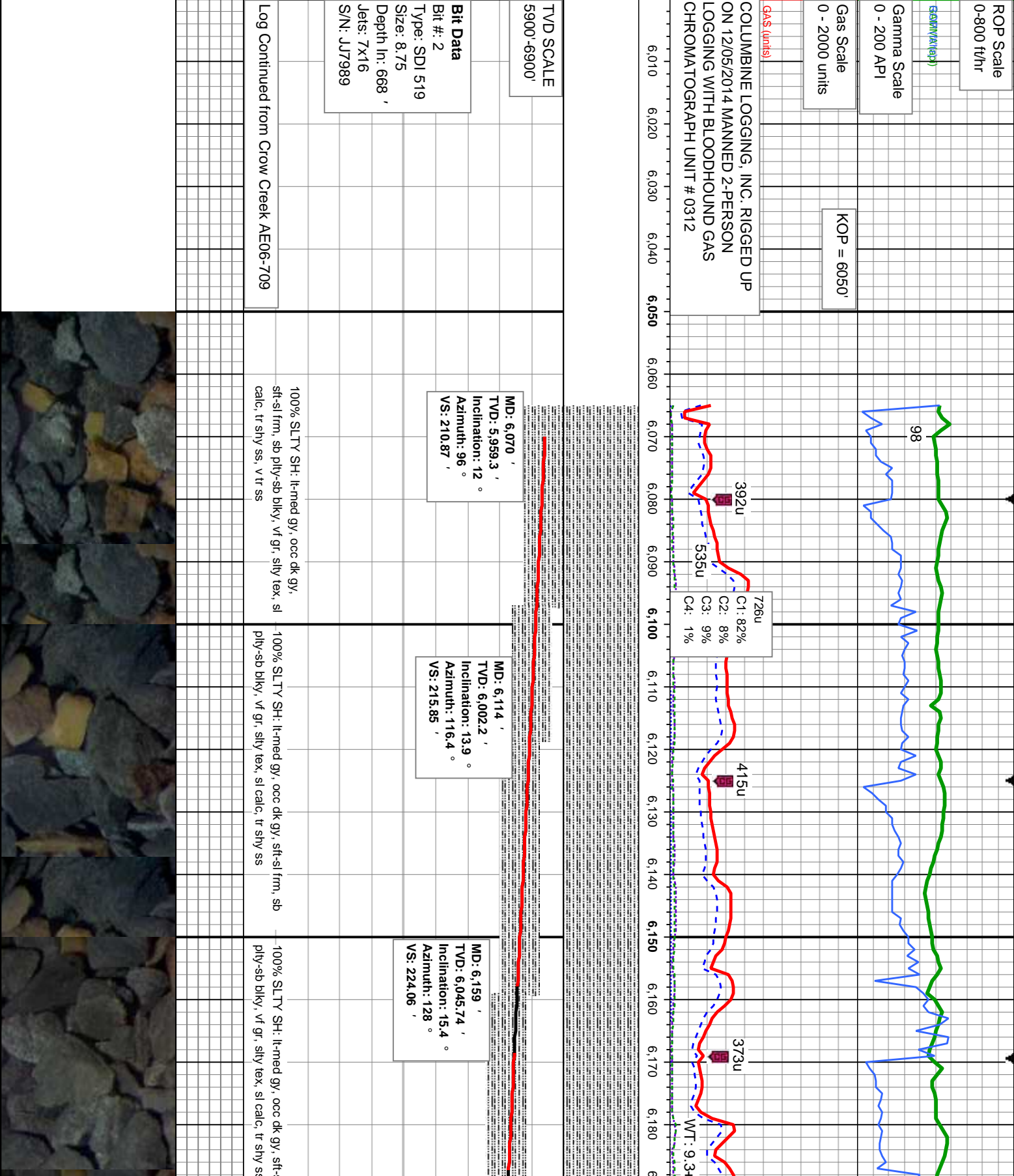
% Lith

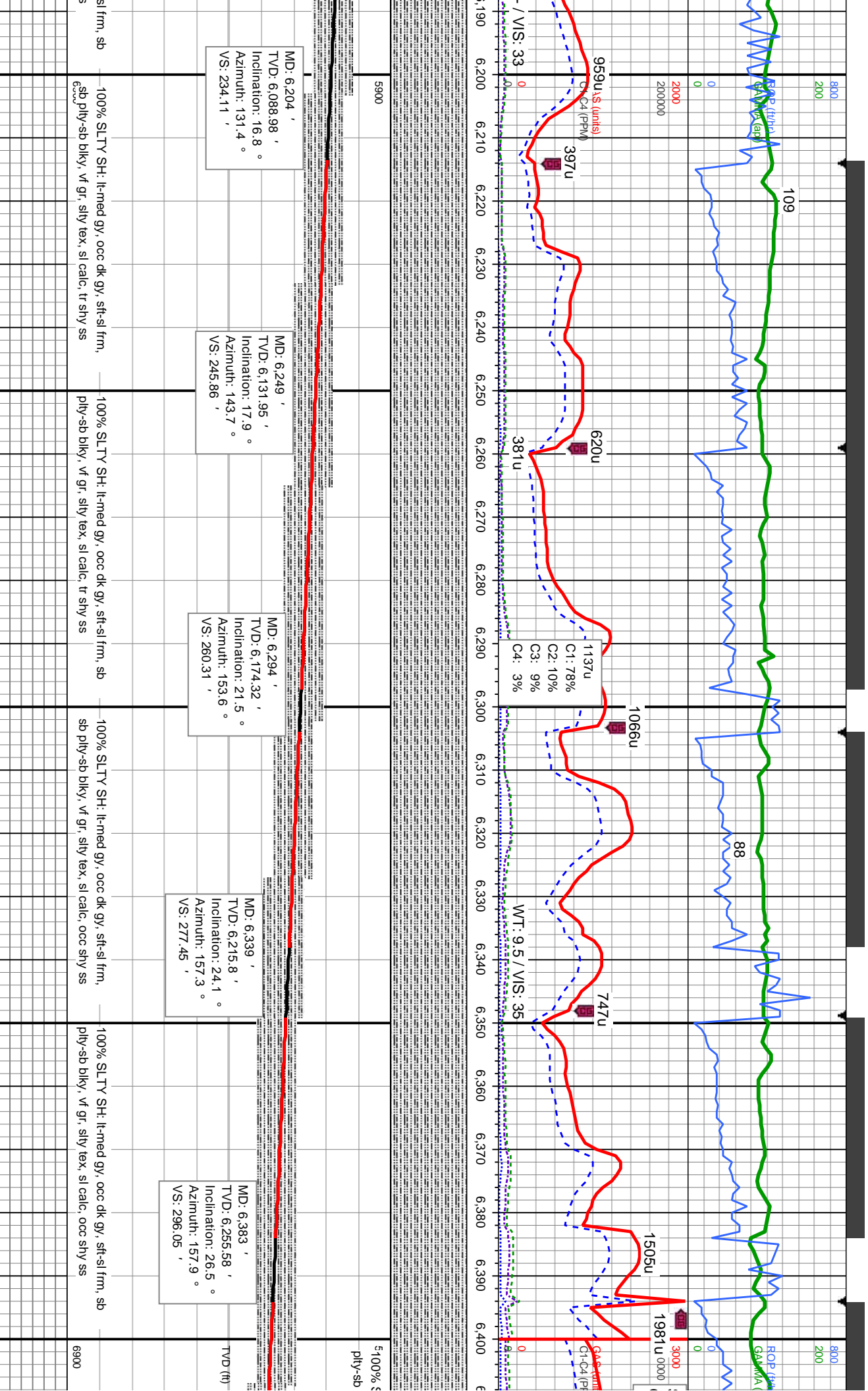
Well Bore  
TVD

Oil Show

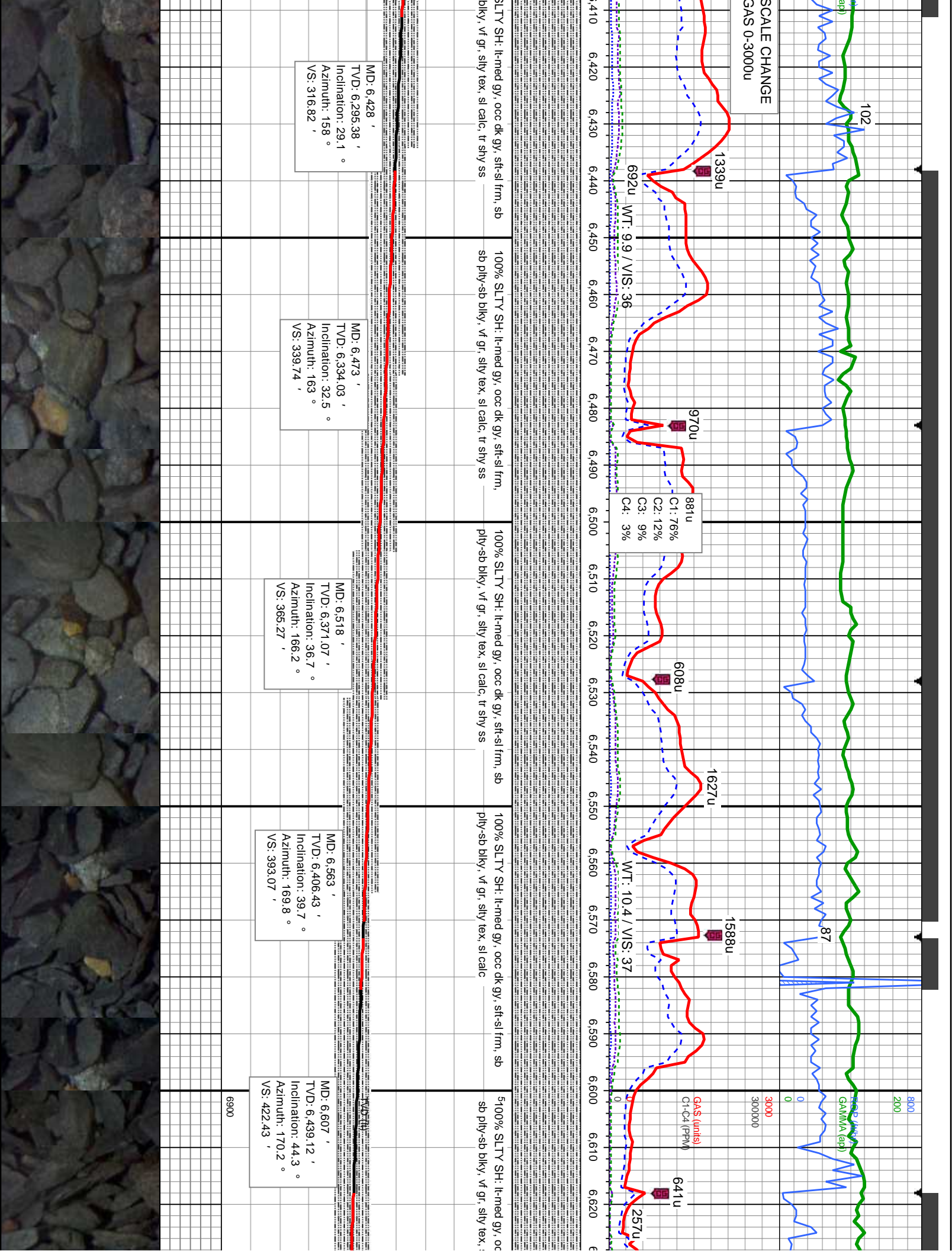
exc  
mod  
tr  
sl

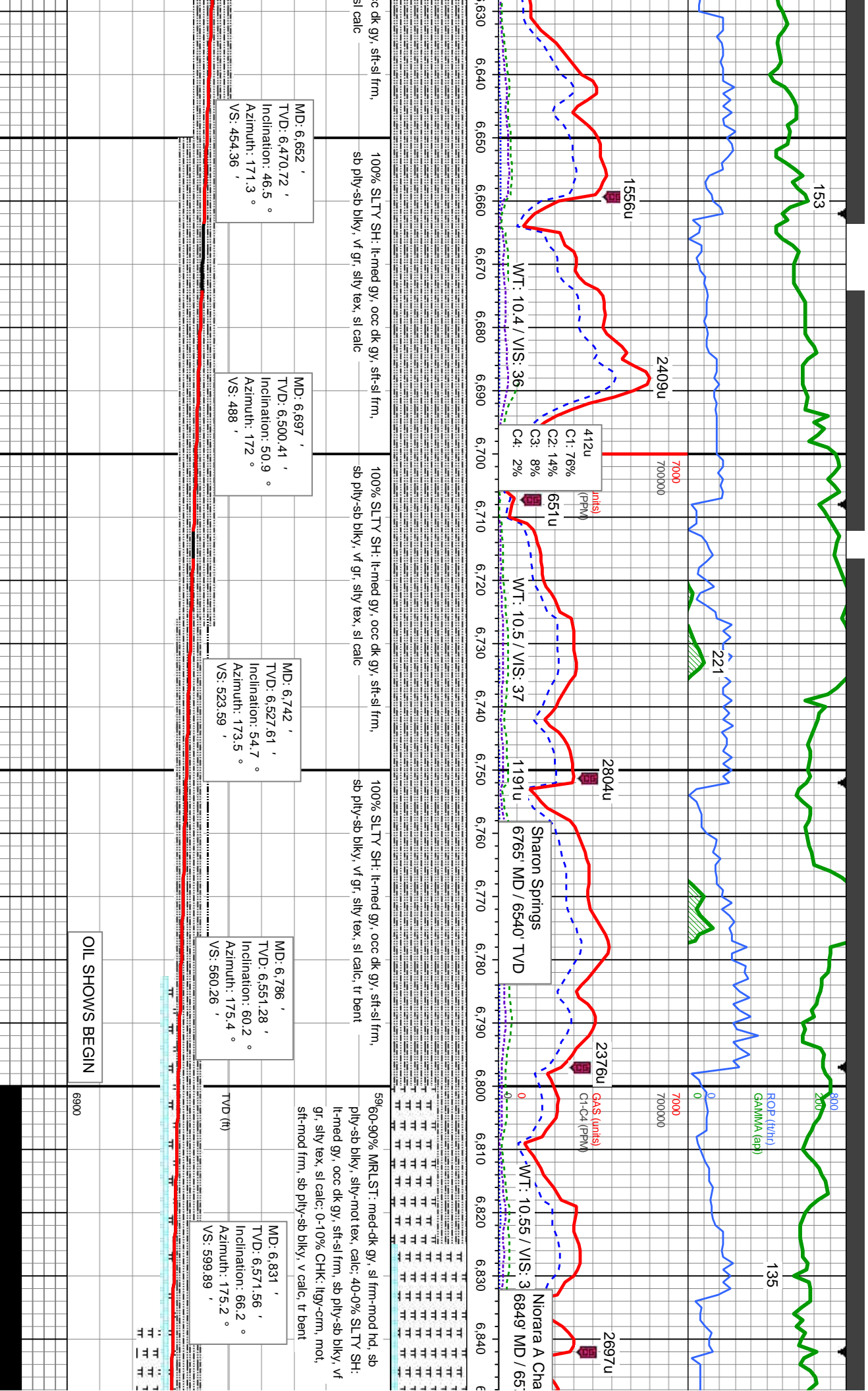
Images







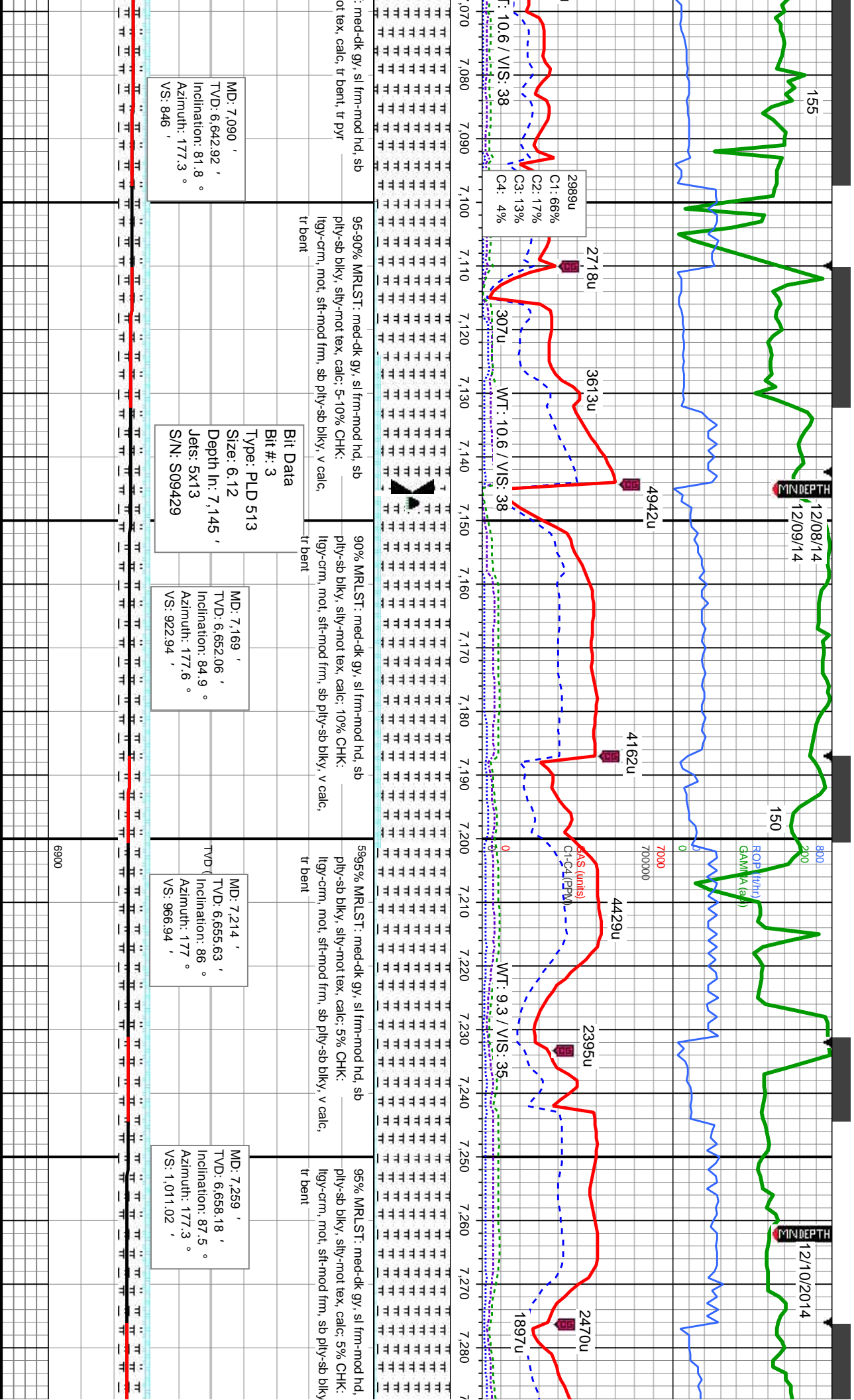


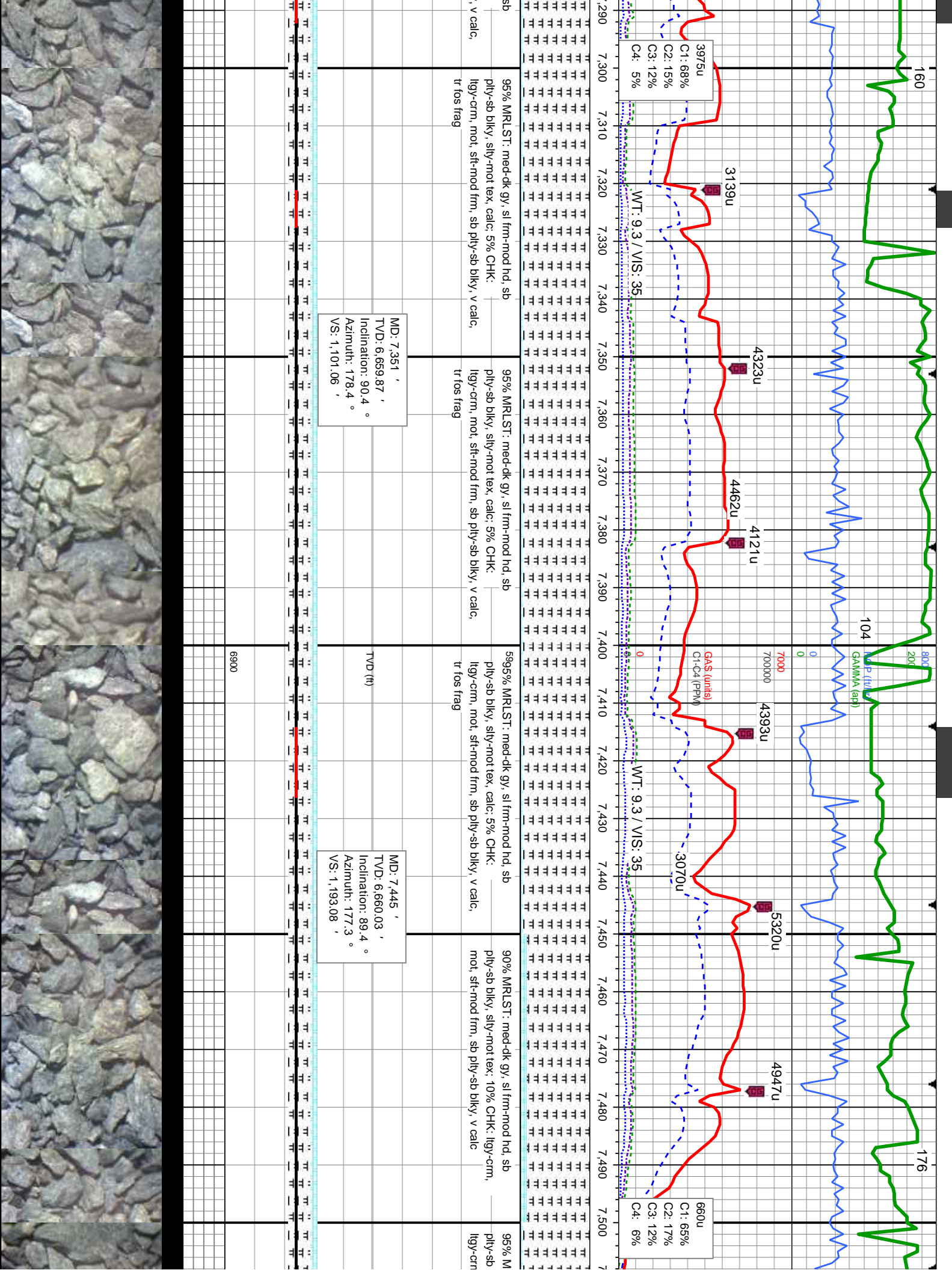














SCALE CHANGE  
GAMMA 0-300 API

Changed Out  
Shaker Screens

192u

217

4602u

7000

4879u

4861u

4636u

3415u

5096u

4971

G.S (units)  
C4 (PPM)

WT: 9.3 / VIS: 35

C1: 71%  
C2: 16%  
C3: 10%  
C4: 3%

WT: 9.3 / VIS: 3

1, med-dk gy, sl frm-mod hd, sb  
sily-mot tex, calc: 5% CHK:  
mot, stl-mod frm, sb pily-sb blkly, v calc

95% MRLST: med-dk gy, sl frm-mod hd, sb  
pily-sb blkly, sily-mot tex, calc: 5% CHK:  
llyg-crm, mot, stl-mod frm, sb pily-sb blkly, v calc

5, 100% MRLST: med-dk gy, sl frm-mod hd, sb  
pily-sb blkly, sily-mot tex, calc, tr bent

100% MRLST: med-dk gy, sl frm-mod hd, sb  
pily-sb blkly, sily-mot tex, calc, tr bent

100% MRLST: med-dk gy, sl frm-mod hd, sb  
pily-sb blkly, sily-mot tex, calc, tr bent

MD: 7,540 '  
TVD: 6,661.03 '  
Inclination: 89.4 °  
Azimuth: 176.6 °  
VS: 1,286.36 '

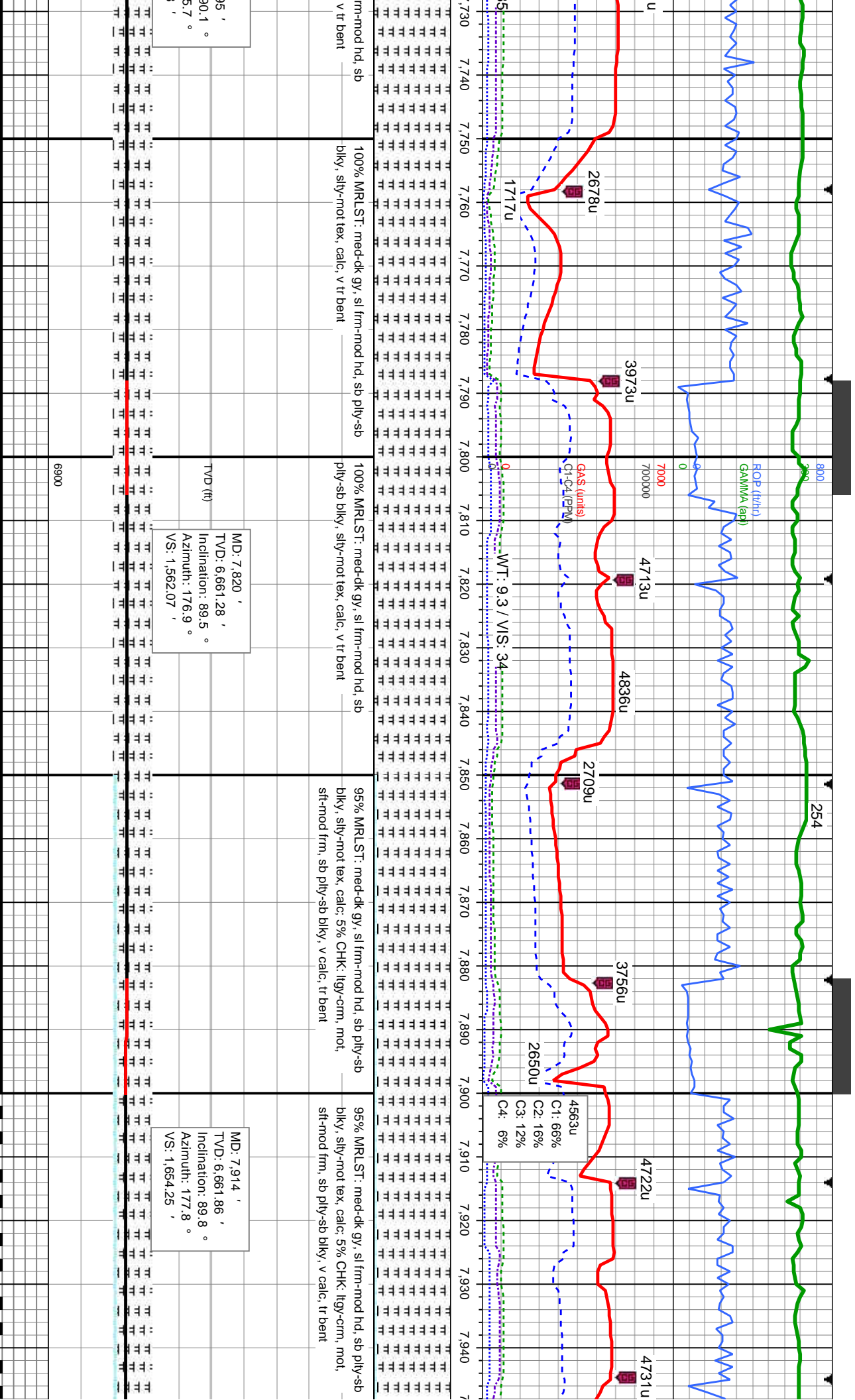
TVD (ft)

MD: 7,633 '  
TVD: 6,661.27 '  
Inclination: 90.3 °  
Azimuth: 175.8 °  
VS: 1,377.89 '

MD: 7,725 '  
TVD: 6,660.5 '  
Inclination: 90.3 °  
Azimuth: 175.8 °  
VS: 1,468.56 '

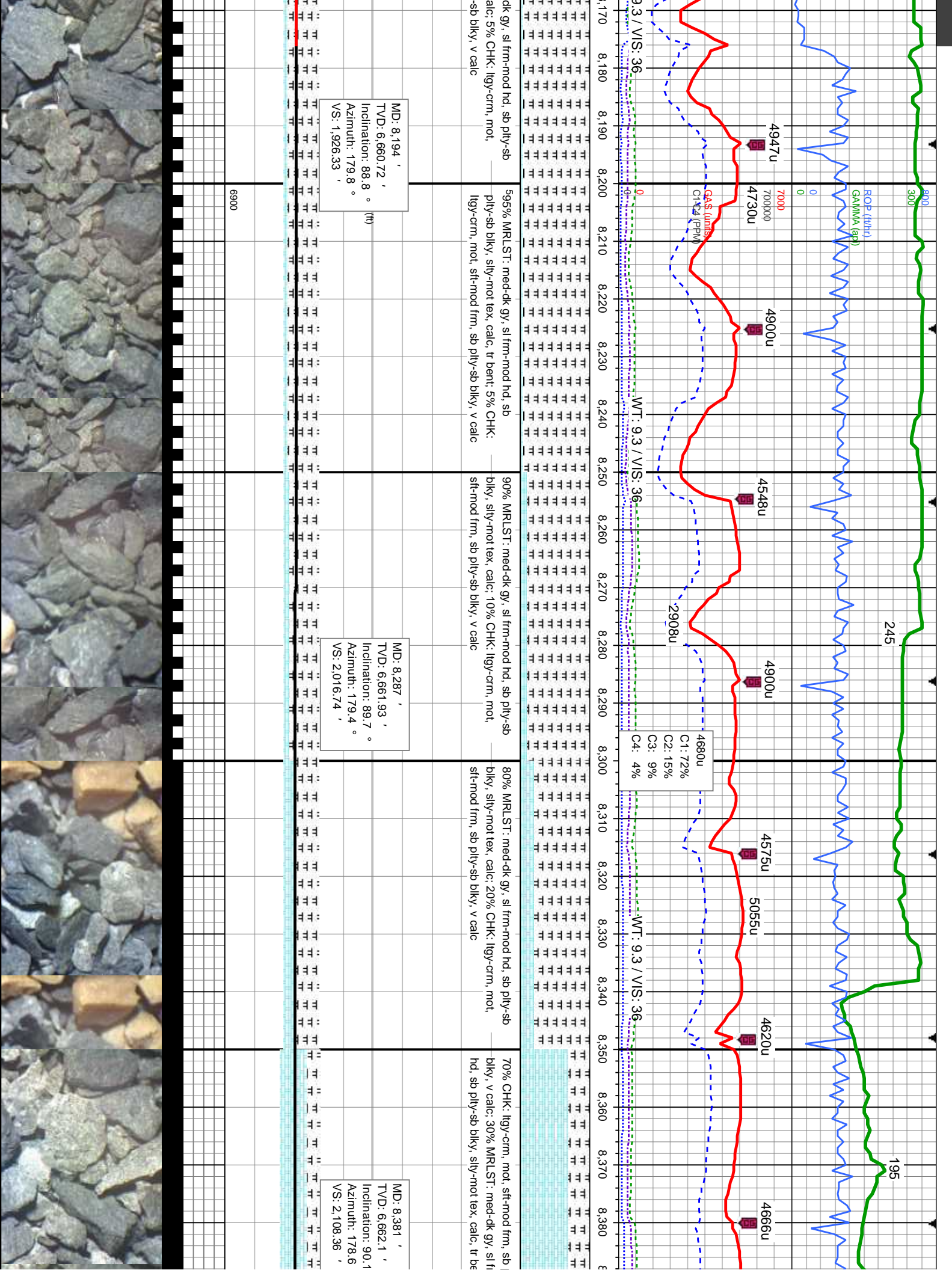
6900



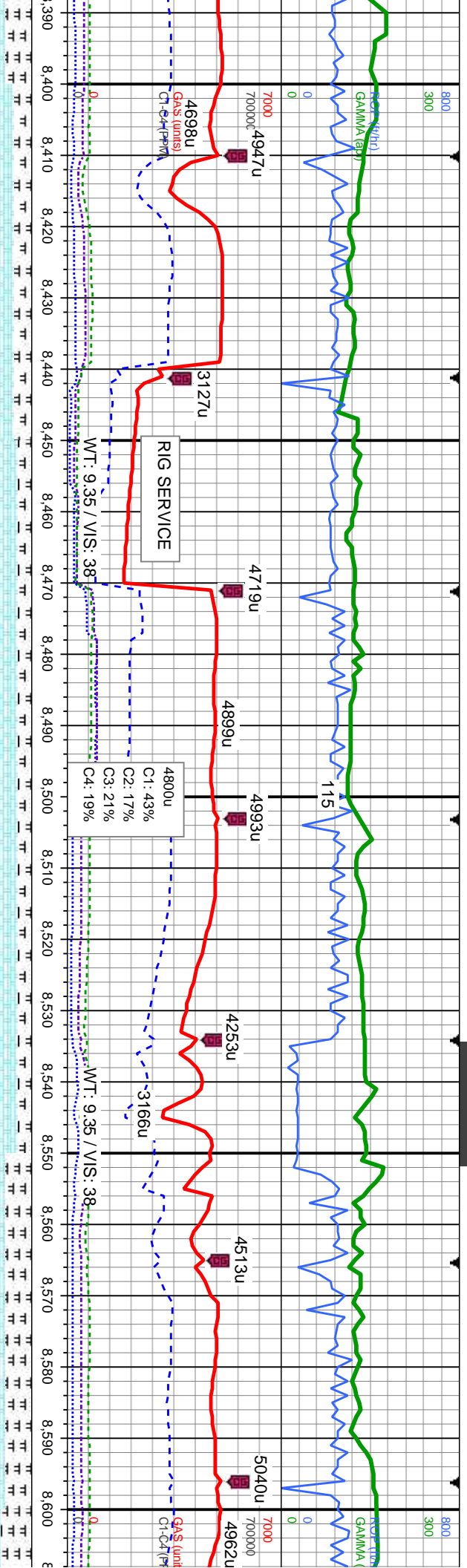




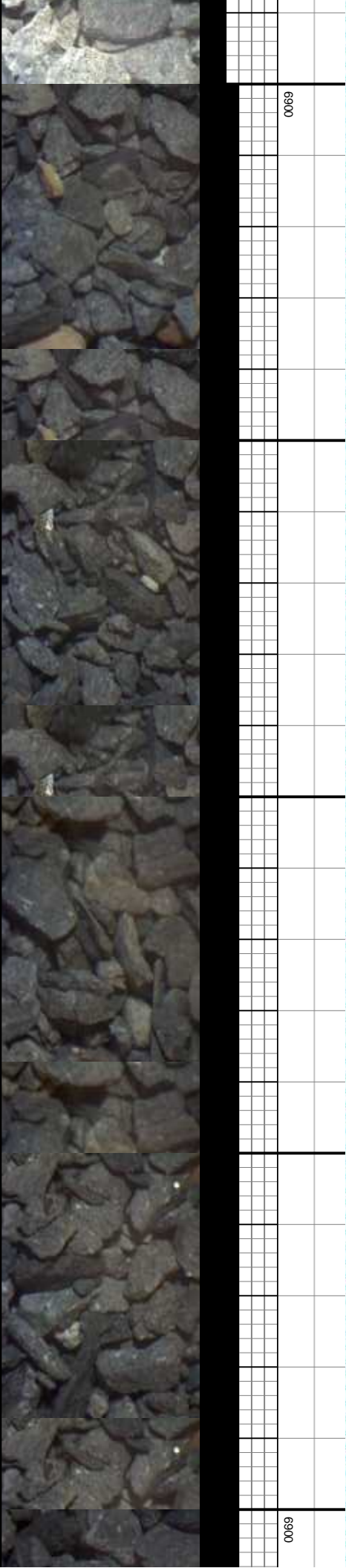


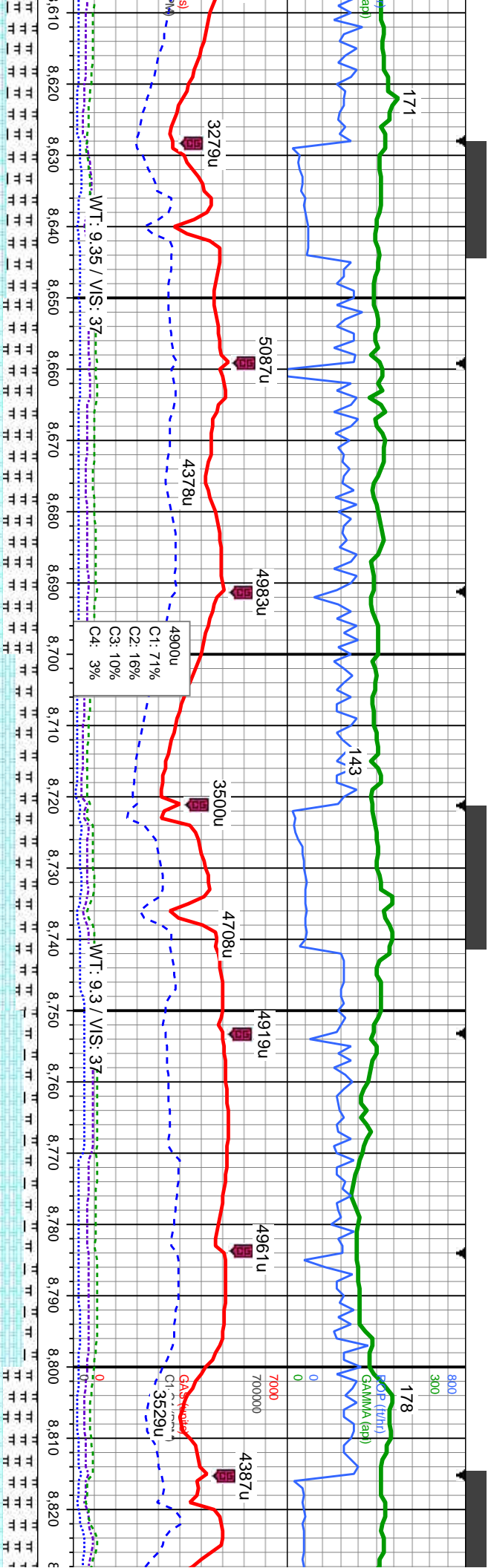






80% CHK: lly-crm, mot, sft-mod frm, sb ply-sb bly, v calc: 20% MRLST: med-dk gy, sl frm-mod hd, sb ply-sb bly, silv-mot tex, calc, tr bent	85% CHK: lly-crm, mot, sft-mod frm, sb ply-sb bly, v calc: 15% MRLST: med-dk gy, sl frm-mod hd, sb ply-sb bly, silv-mot tex, calc, tr bent	85% CHK: lly-crm, mot, sft-mod frm, sb ply-sb bly, v calc: 15% MRLST: med-dk gy, silv-mot tex, calc, tr bent	70% CHK: lly-crm, mot, sft-mod frm, sb ply-sb bly, v calc: 30% MRLST: med-dk gy, sl frm-mod hd, sb ply-sb bly, silv-mot tex, calc, tr bent	65% CHK: lly-crm, mot, sft-mod frm, sb ply-sb bly, v calc: 30% MRLST: med-dk gy, sl frm-mod hd, sb ply-sb bly, silv-mot tex, calc, tr bent
MD: 8,474 ' TVD: 6,661.77 ' Inclination: 90.3 ° Azimuth: 177.8 ° VS: 2,199.28 '	MD: 8,569 ' TVD: 6,661.77 ' Inclination: 89.7 ° Azimuth: 178.3 ° VS: 2,292.21 '	MD: 8,474 ' TVD: 6,661.77 ' Inclination: 90.3 ° Azimuth: 177.8 ° VS: 2,199.28 '	MD: 8,569 ' TVD: 6,661.77 ' Inclination: 89.7 ° Azimuth: 178.3 ° VS: 2,292.21 '	MD: 8,474 ' TVD: 6,661.77 ' Inclination: 90.3 ° Azimuth: 177.8 ° VS: 2,199.28 '





CHK: lgy-crm, mot, sft-mod frm, sb ply-sb  
calc: 35% MRLST: med-dk gy, sl frm-mod  
bly-sb bly, sly-mot tex, calc, tr bent, tr

60% CHK: lgy-crm, mot, sft-mod frm, sb ply-sb  
bly, v calc: 40% MRLST: med-dk gy, sl frm-mod  
hd, sb ply-sb bly, sly-mot tex, calc, tr bent, tr  
Inoc

75% CHK: lgy-crm, mot, sft-mod frm, sb ply-sb  
bly, v calc: 25% MRLST: med-dk gy, sl frm-mod  
hd, sb ply-sb bly, sly-mot tex, calc, occ inoc, tr  
bent

85% CHK: lgy-crm, mot, sft-mod frm, sb ply-sb  
bly, v calc: 15% MRLST: med-dk gy, sl frm-mod  
hd, sb ply-sb bly, sly-mot tex, calc, occ inoc, tr  
bent

60% CHK: lgy-crm, mot, sft-mod frm, sb ply-sb  
bly, v calc: 40% MRLST: med-dk gy, sl frm-mod  
hd, sb ply-sb bly, sly-mot tex, calc, tr bent

MD: 8.662 '  
TVD: 6.661.61 '  
Inclination: 90.5 °  
Azimuth: 180.3 °  
VS: 2.382.74 '

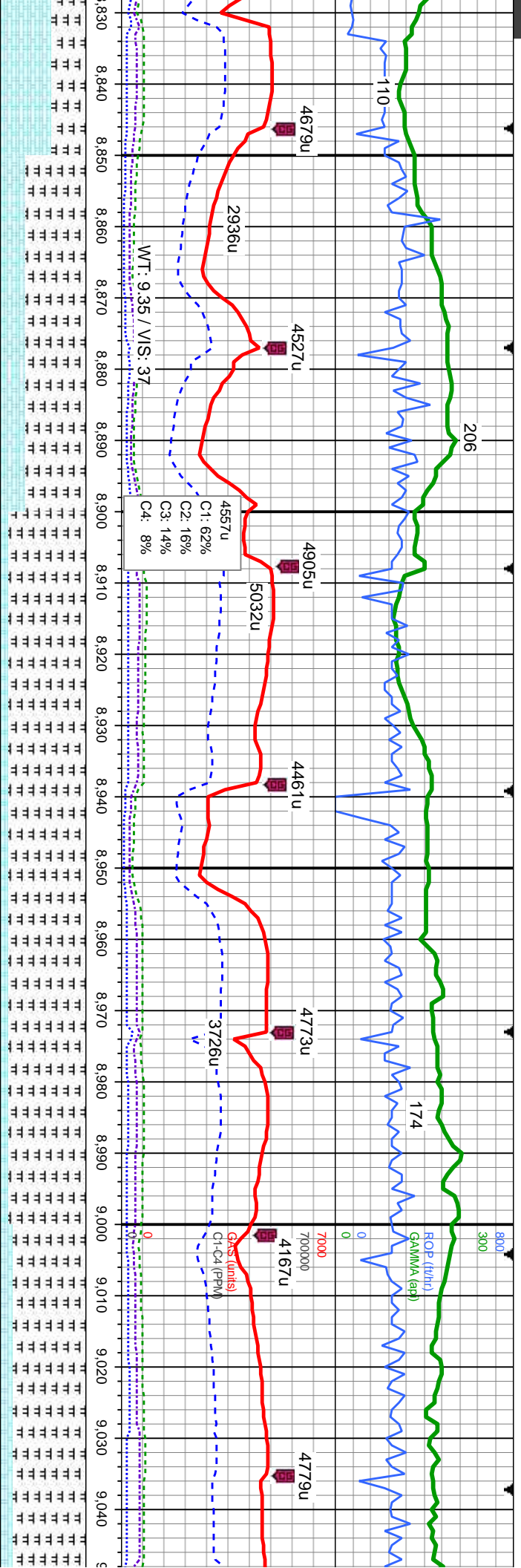
MD: 8.757 '  
TVD: 6.662.69 '  
Inclination: 88.2 °  
Azimuth: 179.1 °  
VS: 2.475.05 '

TVD (ft)

6900







mod frm, sb ply-sb  
-dk gy, sl frm-mod  
calc, occ inoc, tr

70% MRLST: med-dk gy, sl frm-mod hd, sb ply-sb  
-dk gy, slty-mot tex, calc: 30% CHK: lty-crm, mot,  
sft-mod frm, sb ply-sb blk, v calc, occ inoc, tr  
bent

90% MRLST: med-dk gy, sl frm-mod hd, sb ply-sb  
-dk gy, slty-mot tex, calc: 10% CHK: lty-crm, mot,  
sft-mod frm, sb ply-sb blk, v calc, occ inoc, tr  
bent

90% MRLST: med-dk gy, sl frm-mod hd, sb ply-sb  
-dk gy, slty-mot tex, calc: 10% CHK: lty-crm, mot,  
sft-mod frm, sb ply-sb blk, v calc, occ inoc, tr  
bent

585% MRLST: med-dk gy, sl frm-mod hd, sb ply-sb  
-dk gy, slty-mot tex, calc: 15% CHK: lty-crm, mot,  
sft-mod frm, sb ply-sb blk, v calc, occ inoc, tr  
bent

MD: 8.851 '  
TVD: 6.665.81 '  
Inclination: 88 °  
Azimuth: 180.4 °  
VS: 2.566.33 '

MD: 8.943 '  
TVD: 6.669.1 '  
Inclination: 87.9 °  
Azimuth: 179.7 °  
VS: 2.655.55 '

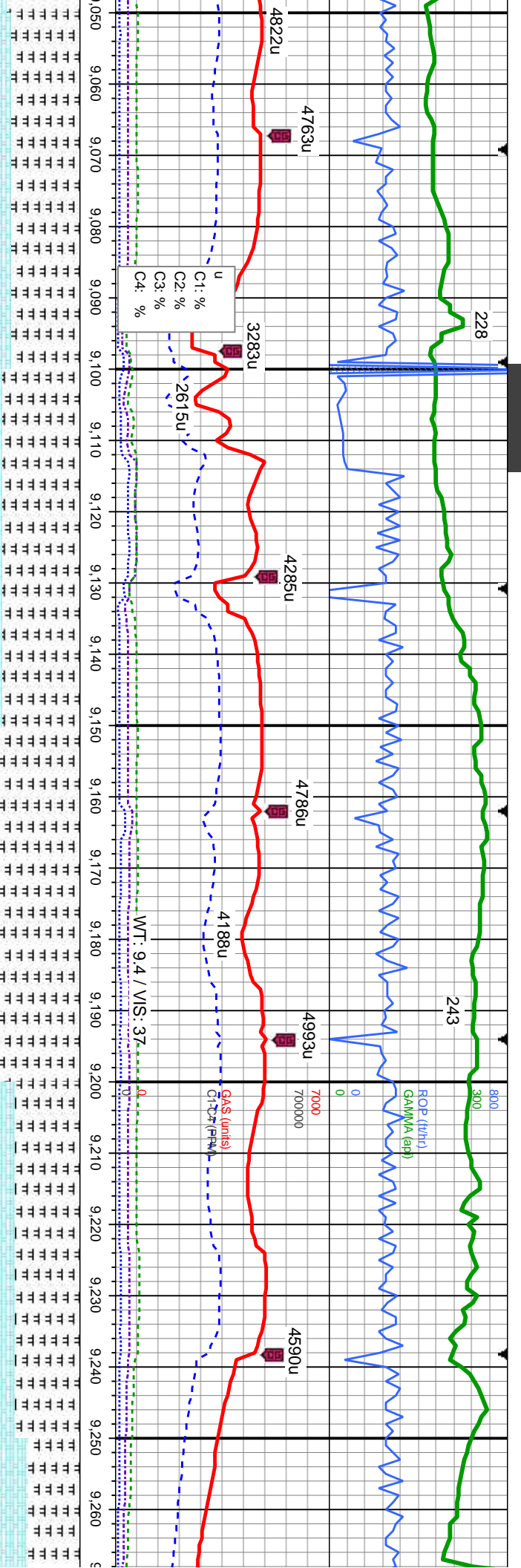
MD: 9.038 '  
TVD: 6.672.91 '  
Inclination: 87.5 °  
Azimuth: 179.1 °  
VS: 2.747.91 '

6900

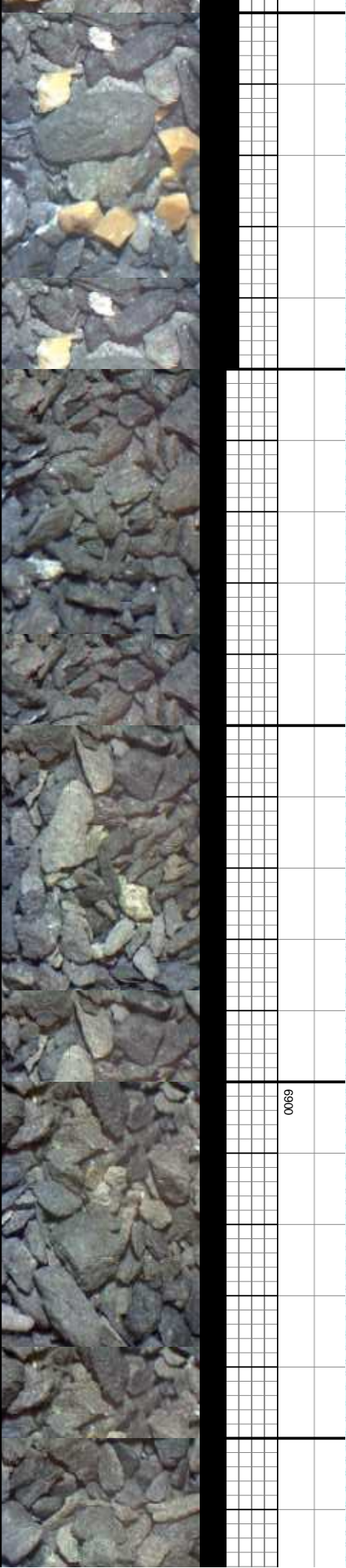
TVD (ft)

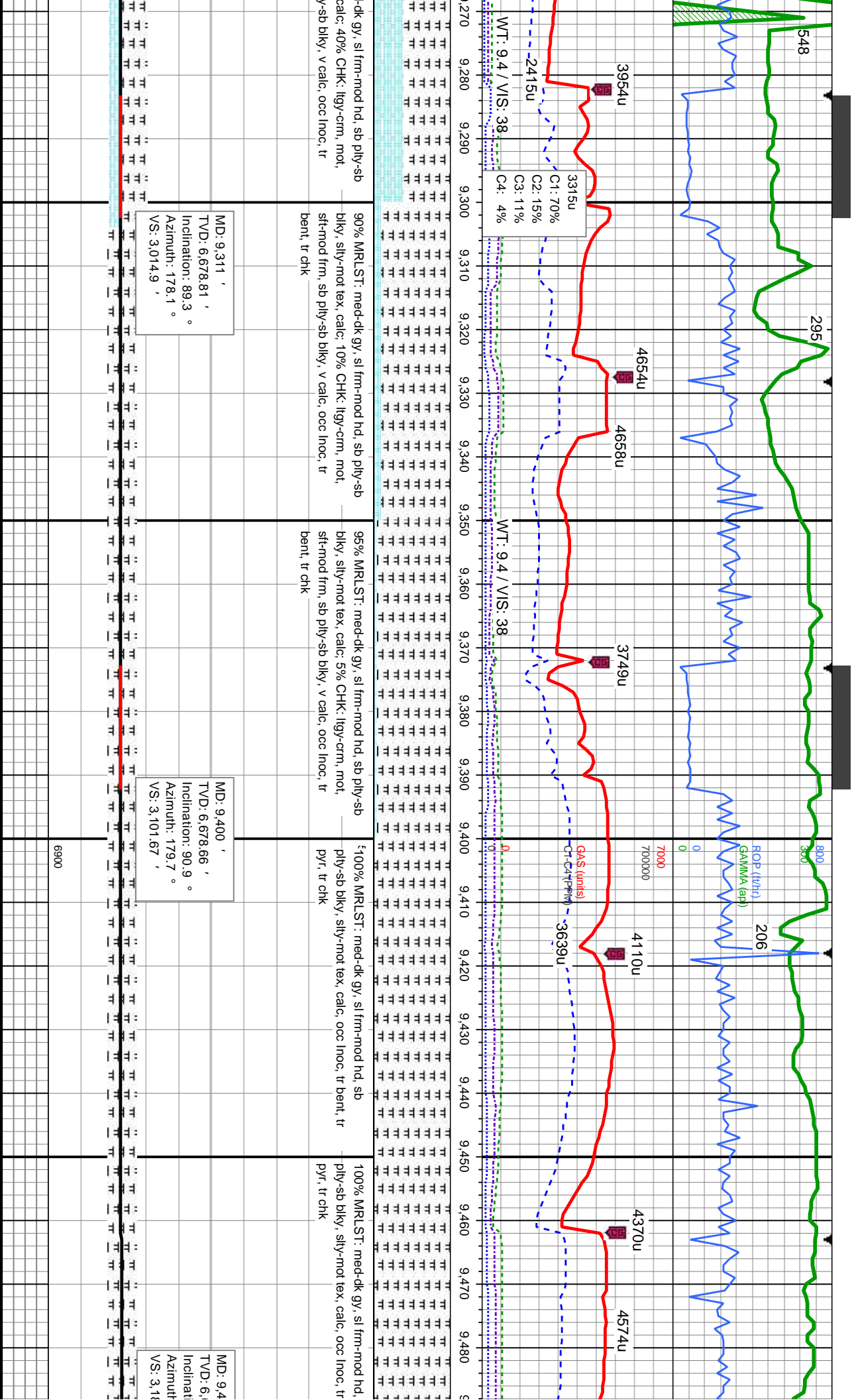




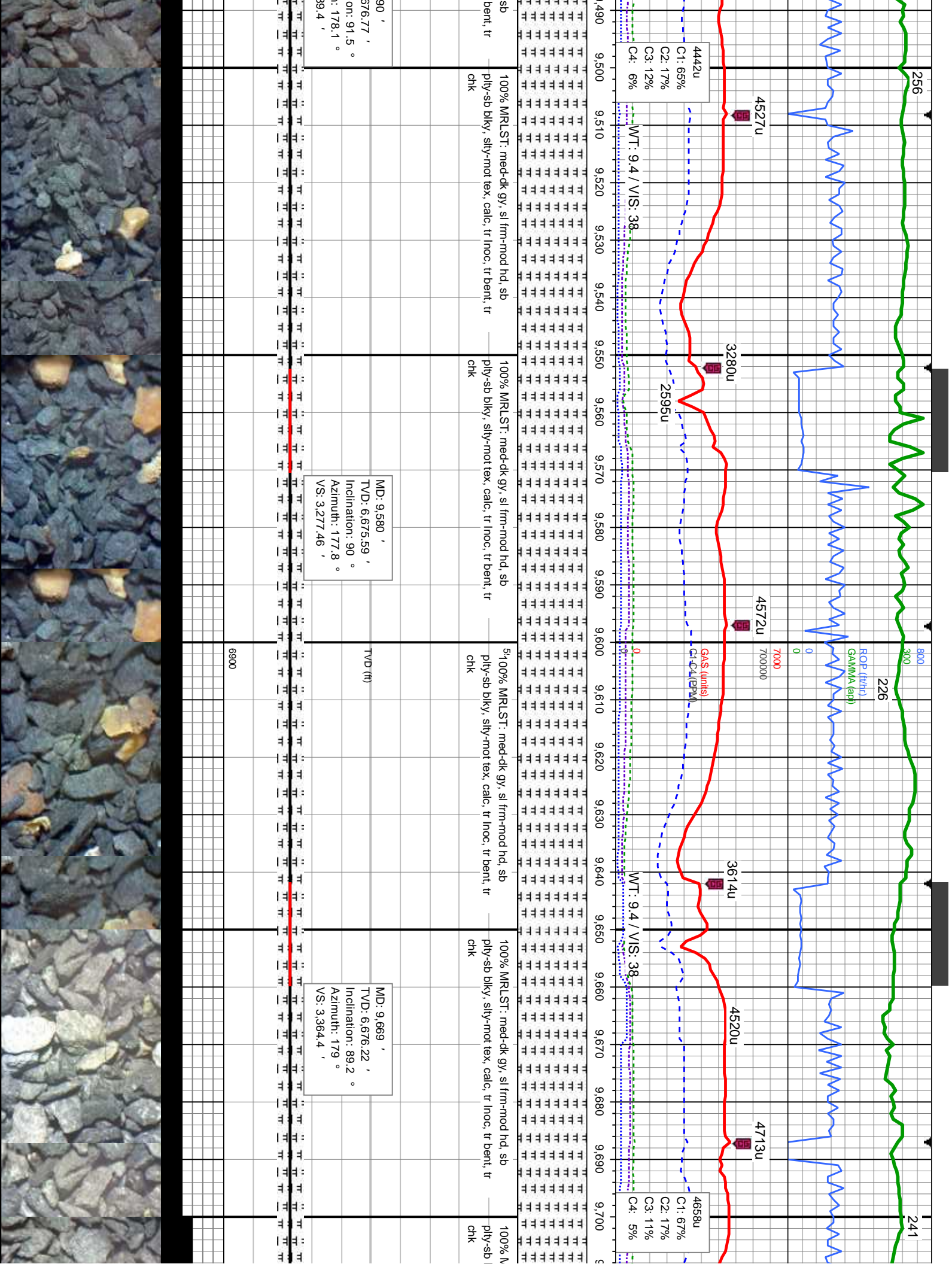


80% MRLST: med-dk gy, sl frm-mod hd, sb ply-sb blkly, silty-mot tex, calc: 20% CHK: lgy-crm, mot, sft-mod frm, sb ply-sb blkly, v calc, occ inoc, tr bent	100% MRLST: med-dk gy, sl frm-mod hd, sb ply-sb blkly, silty-mot tex, calc, occ inoc, tr bent	100% MRLST: med-dk gy, sl frm-mod hd, sb ply-sb blkly, silty-mot tex, calc, occ inoc, tr bent	75% MRLST: med-dk gy, sl frm-mod hd, sb ply-sb blkly, silty-mot tex, calc: 25% CHK: lgy-crm, mot, sft-mod frm, sb ply-sb blkly, v calc, occ inoc, tr bent, tr chk	60% MRLST: med-dk gy, sl frm-mod hd, sb ply-sb blkly, silty-mot tex, calc: 20% CHK: lgy-crm, mot, sft-mod frm, sb ply-sb blkly, v calc, occ inoc, tr bent
MD: 9.131 ' TVD: 6,675.75 ' Inclination: 89 ° Azimuth: 178.1 ° VS: 2,838.65 '	MD: 9.221 ' TVD: 6,677.4 ' Inclination: 88.9 ° Azimuth: 177.4 ° VS: 2,926.77 '	MD: 9.221 ' TVD: 6,677.4 ' Inclination: 88.9 ° Azimuth: 177.4 ° VS: 2,926.77 '	MD: 9.221 ' TVD: 6,677.4 ' Inclination: 88.9 ° Azimuth: 177.4 ° VS: 2,926.77 '	MD: 9.221 ' TVD: 6,677.4 ' Inclination: 88.9 ° Azimuth: 177.4 ° VS: 2,926.77 '

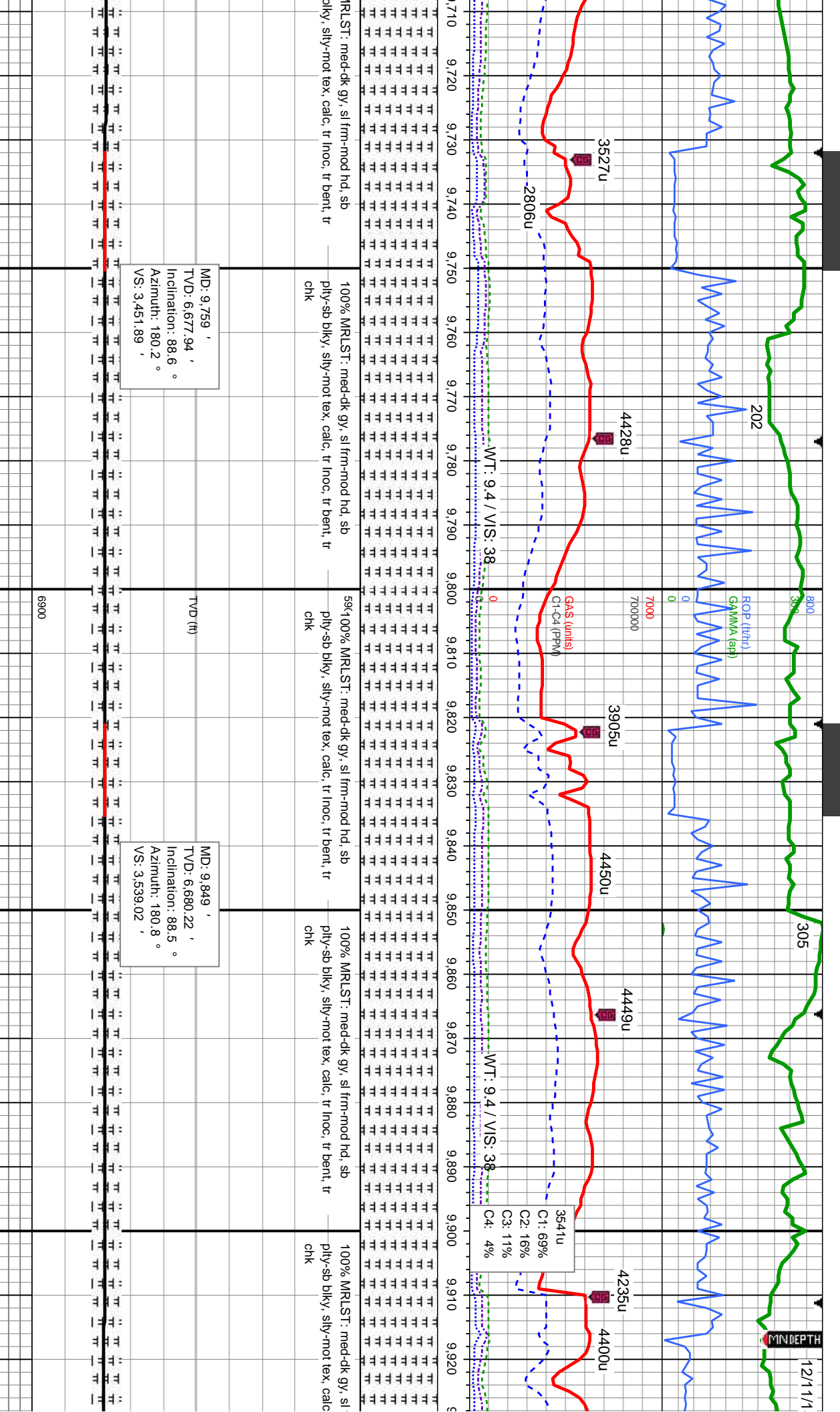


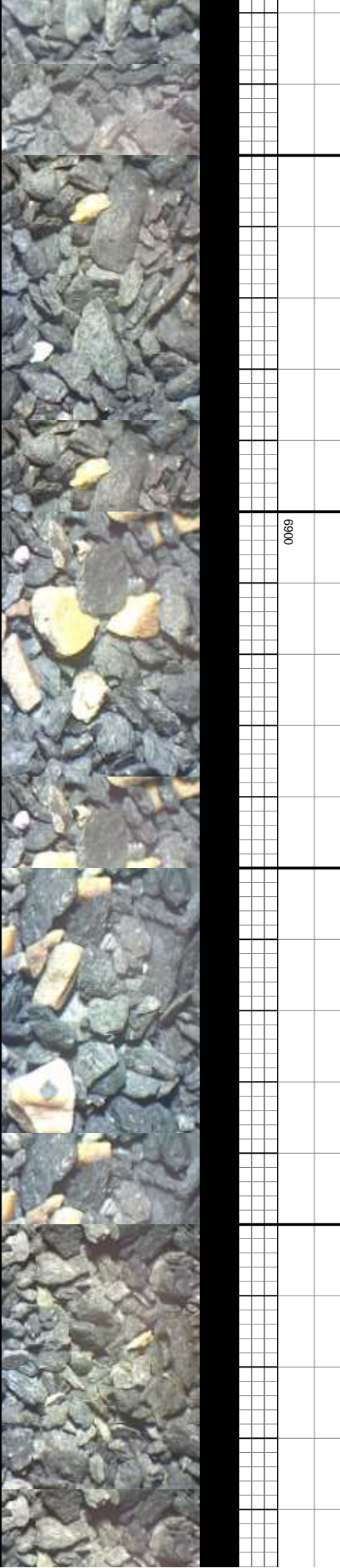
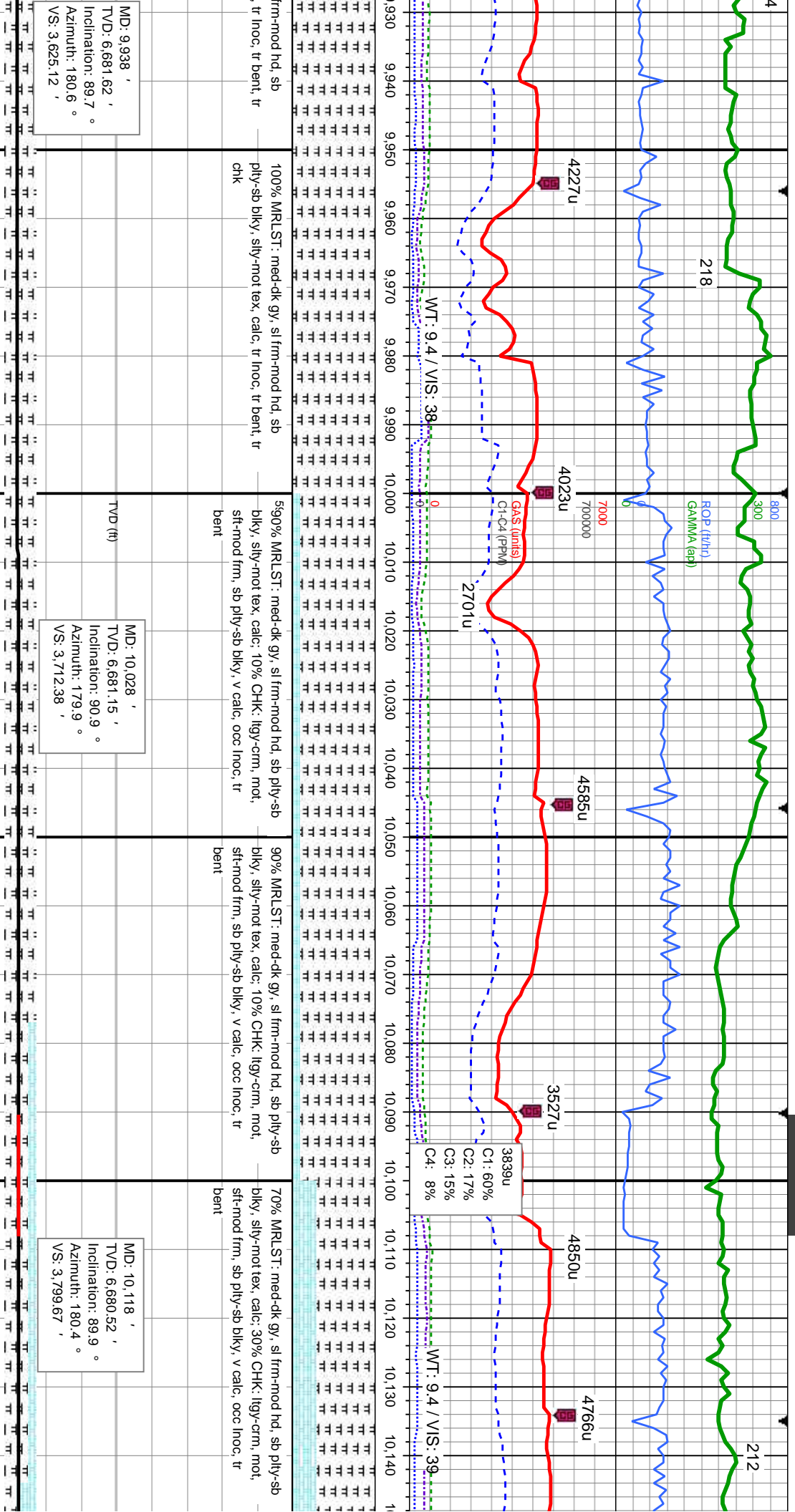




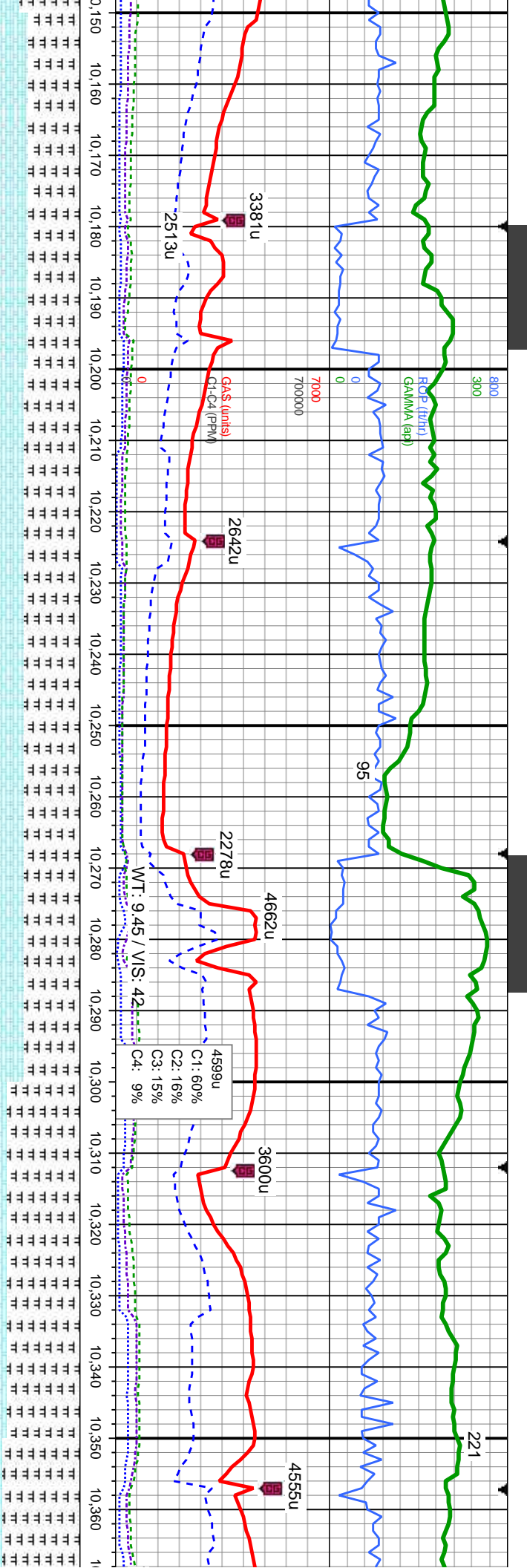












60% MRLST: med-dk gy, sl frm-mod hd, sb pily-sb  
biky, silty-mot tex, calc: 40% CHK: itgy-crm, mot,  
sft-mod frm, sb pily-sb biky, v calc, occ inoc, tr  
bent

65% MRLST: med-dk gy, sl frm-mod hd, sb pily-sb  
biky, silty-mot tex, calc: 35% CHK: itgy-crm, mot,  
sft-mod frm, sb pily-sb biky, v calc, occ inoc, tr  
bent

65% MRLST: med-dk gy, sl frm-mod hd, sb pily-sb  
biky, silty-mot tex, calc: 35% CHK: itgy-crm, mot,  
sft-mod frm, sb pily-sb biky, v calc, occ inoc, tr  
bent

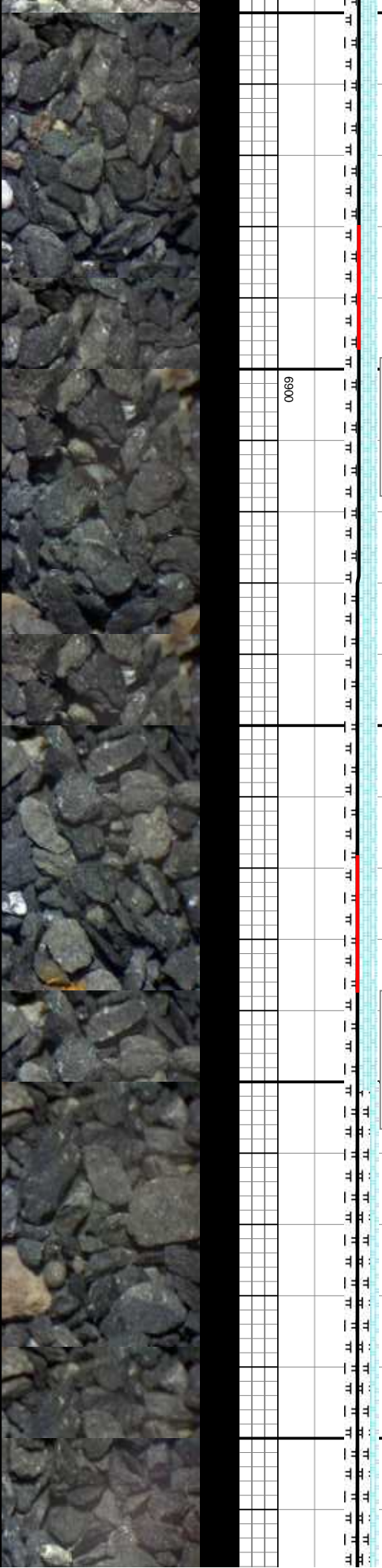
85% MRLST: med-dk gy, sl frm-mod hd, sb pily-sb  
biky, silty-mot tex, calc: 15% CHK: itgy-crm, mot,  
sft-mod frm, sb pily-sb biky, v calc, occ inoc, occ  
sec cal, tr bent

90% MRLST: med  
biky, silty-mot tex, (c  
sft-mod frm, sb pily  
sec cal, tr bent

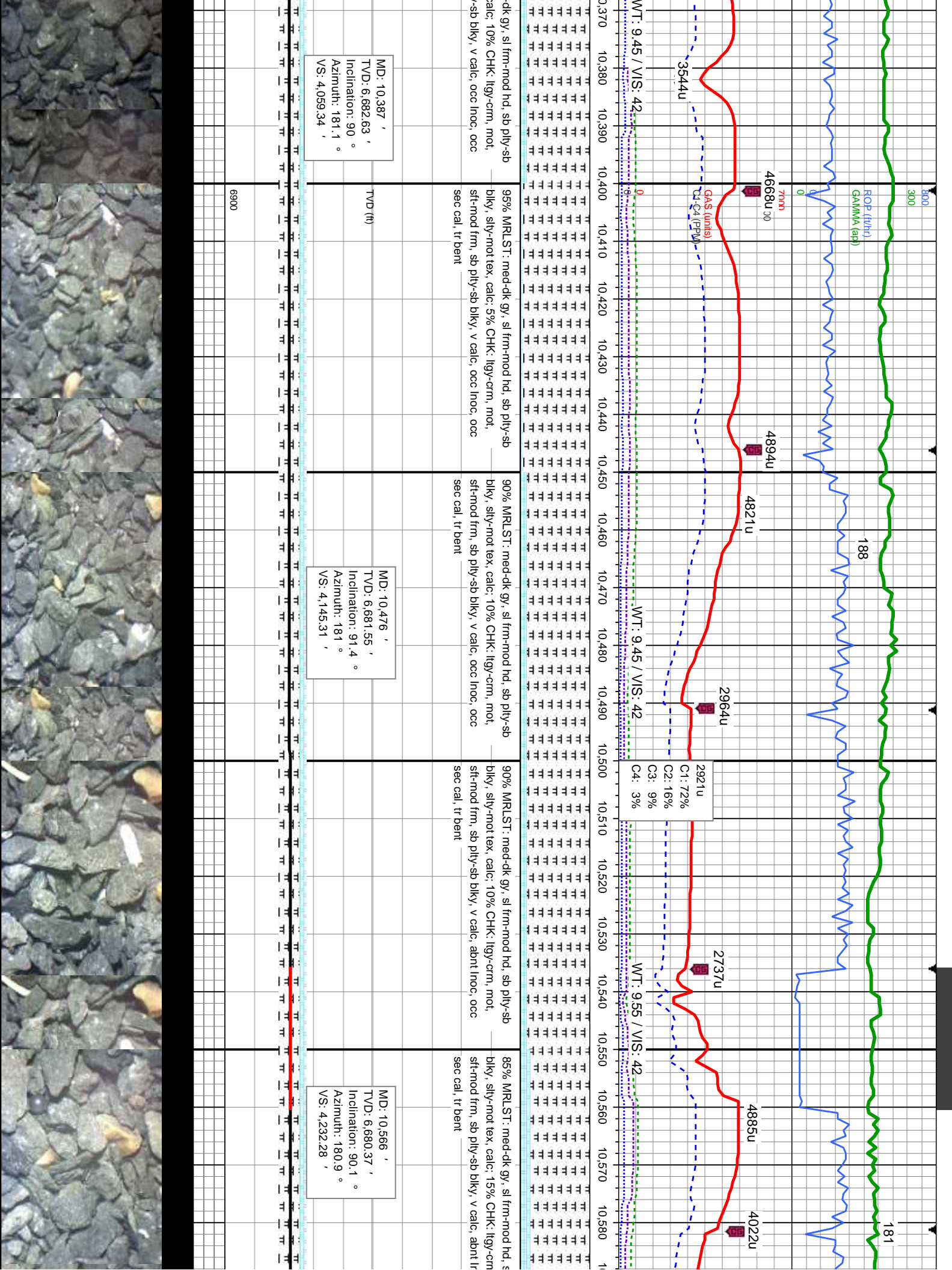
MD: 10,207 '  
TVD: 6,680.99 '  
Inclination: 89.5 °  
Azimuth: 180.9 °  
VS: 3,885.8 '

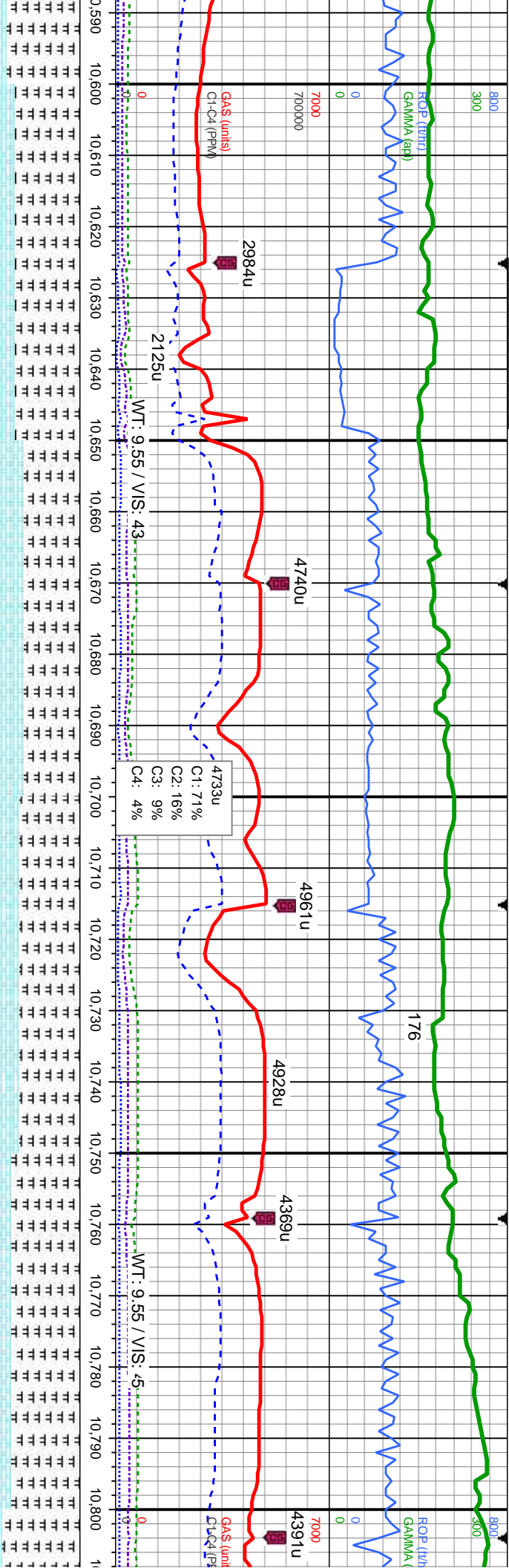
MD: 10,297 '  
TVD: 6,682.01 '  
Inclination: 89.2 °  
Azimuth: 181.9 °  
VS: 3,972.59 '

6900



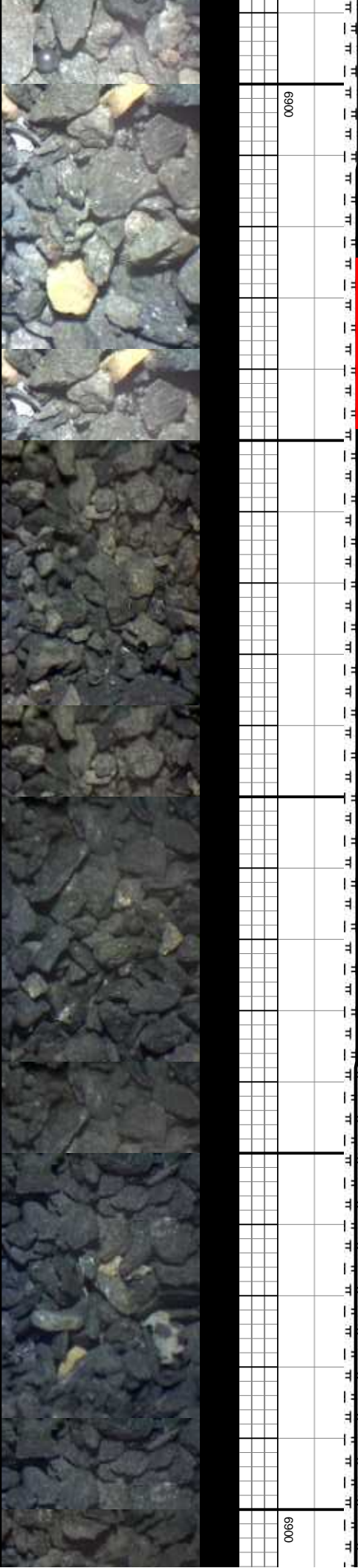




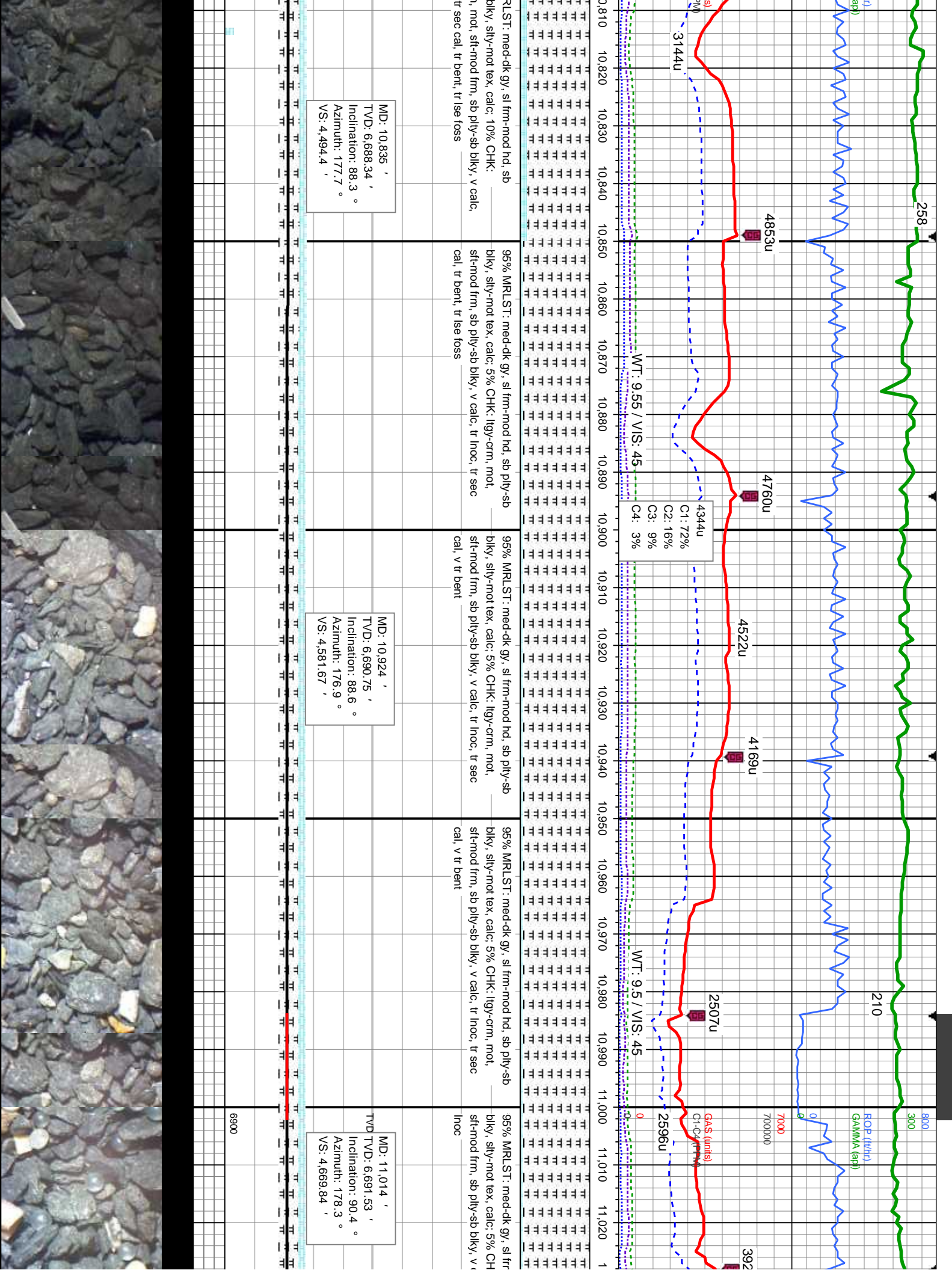


Depth (ft)	ROP (ft/h)	GAMMA (api)	GAS (units)	WT (9.55 / VIS: 43)	MD (ft)	TVD (ft)	Inclination (°)	Azimuth (°)	VS (ft)
10,590									
10,600									
10,610									
10,620									
10,630									
10,640									
10,650									
10,660									
10,670									
10,680									
10,690									
10,700									
10,710									
10,720									
10,730									
10,740									
10,750									
10,760									
10,770									
10,780									
10,790									
10,800									

Depth (ft)	ROP (ft/h)	GAMMA (api)	GAS (units)	WT (9.55 / VIS: 43)	MD (ft)	TVD (ft)	Inclination (°)	Azimuth (°)	VS (ft)
10,590									
10,600									
10,610									
10,620									
10,630									
10,640									
10,650									
10,660									
10,670									
10,680									
10,690									
10,700									
10,710									
10,720									
10,730									
10,740									
10,750									
10,760									
10,770									
10,780									
10,790									
10,800									







MWD TOOL FAILURE

237

243



ROP (ft/hr)  
GAMMA (api)

3219u

Gravel  
Cl-Cr (ppm)

2969u

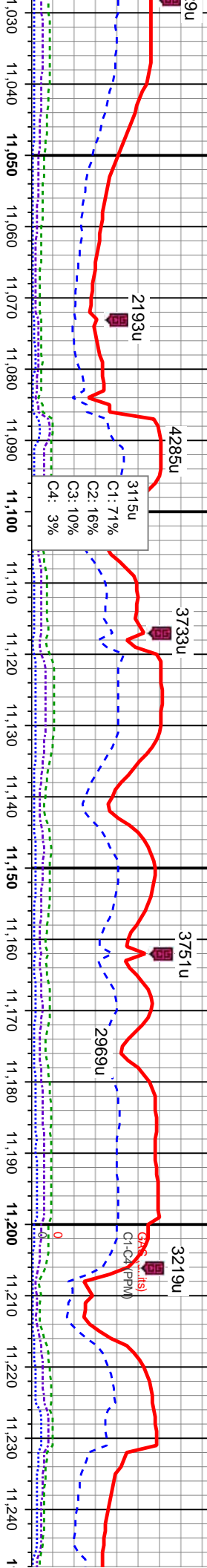
3751u

3733u

C1: 71%  
C2: 16%  
C3: 10%  
C4: 3%

4285u

2193u



95% MRLST: med-dk gy, sl frm-mod hd, sb ply-sb  
biky, silty-mot tex, calc: 5% CHK: llyy-crm, mot,  
sft-mod frm, sb ply-sb biky, v calc, tr bent, tr inoc,  
tr lse fos

95% MRLST: med-dk gy, sl frm-mod hd, sb ply-sb  
biky, silty-mot tex, calc: 5% CHK: llyy-crm, mot,  
sft-mod frm, sb ply-sb biky, v calc, tr bent, tr inoc,  
tr lse fos

95% MRLST: med-dk gy, sl frm-mod hd, sb ply-sb  
biky, silty-mot tex, calc: 5% CHK: llyy-crm, mot,  
sft-mod frm, sb ply-sb biky, v calc, tr bent, tr inoc,  
tr lse fos

95% MRLST: med-dk gy, sl frm-mod hd, sb ply-sb  
biky, silty-mot tex, calc: 5% CHK: llyy-crm, mot,  
sft-mod frm, sb ply-sb biky, v calc, occ bent, tr  
inoc

9u  
mod hd, sb ply-sb  
K: llyy-crm, mot,  
calc, occ bent, tr

MWD TOOL FAILURE

TVD (ft)

6900





