

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Scooter D18-79HN_HORIZ

Location NWNW SEC. 18, T3N, R64W

State COLORADO

Country USA

API Number 05-123-37980

Region DJ BASIN

Spud Date 12/13/2013

Surface Coordinates 305' FNL x 657' FWL

Bottom Hole Coordinates 535' FSL x 75' FEL

County WELD

Rig Number PRECISION 829

Field WATTENBERG

Drilling Completed 12/21/2013

Ground Elevation 4811'

K.B. Elevation 4827'

Logged Interval 6300' To 11410'

Total Depth 11410'

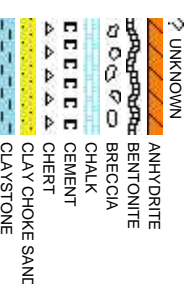
Formation NIOBRARA C MARL

Type of Drilling Fluid LSND

Company Noble Energy Inc
Address 1625 BROADWAY
DENVER, CO

Name Holly Duncan
Company Noble Energy Inc
Address 1625 BROADWAY
DENVER, CO
303.389.3600

Wellsite Geologists



Operator

AY, SUITE 2200
ORADO 80202

Geologist

AY, SUITE 2200
ORADO 80202

Other

Eli Smith
Liz van Diepen

Rock Types

CONGLOMERATE	MARLSTONE	SHALY SANDSTONE
DOLomite	METAMORPHIC	SHALY SILTSTONE
DOLOMITIC LIMESTONE	NO SAMPLE	SILTY SHALE
GRANITE	SALT	SILTSTONE
GYPsUM	SANDSTONE	TILL
IGNEOUS	SALT-PEPPER SALT	TUFF
SIDERITE or LIMONITE	SHALE	WELDED TUFF
LIMESTONE	SHALE COLORED	
	SHALE GRAY	

Accessories

Fossils

GASTROPOD	ARGILLITE GRAIN	HEAVY MINERAL	ANHYDRITE STRINGER
INOCERAMUS	BENTONITE	KAOLIN	BENTONITE STRINGER
ALGAE	BITUMENOUS SUBSTANCE	MARLSTONE	COAL STRINGER
AMPHIPORA	BRECCIA FRAGMENTS	MICACEOUS	DOLomite STRINGER
BELEMNITE	CALCAREOUS	MINERAL CRYSTALS	GYPsUM STRINGER
BIOCLASTIC	CARBONACEOUS FLAKES	NODULES	LIMESTONE STRINGER
BRACHIOPOD	CHITL	PHOSPHATE PELLETS	MARLSTONE (CALC) STRG
BRYOZOA	CHITL	COAL - THIN BEDS	MARLSTONE (IDOL) STRG
CEPHALOPOD	PLANT REMAINS	DOLOMITIC	SANDSTONE STRINGER
CORAL	PLANT SPORES	FELDSPAR	SHALE STRINGER
CRINOID	SCAPHOPOD	FERRUGINOUS PELLETT	SILTSTONE STRINGER
ECHINOID	STROMATOPOROID		

Minerals

FISH	FERRUGINOUS	TUFFACEOUS
FORAMINIFERA	ANHYDRITIC	GLAUCONITE
F FOSSIL	ARGILLACEOUS	GYPsIFEROUS

Stringer

Other Symbols

Oil Show

P PINPOINT	DST INTERVAL	WIRELINE TESTED - LEFT	E EARTHY
V VUGGY	FAULT	WIRELINE TESTED - RT	Fx FINELYYLN

Engineering

D DEAD	FORMATION TOP	DRILL STEM TEST	GS GRAINSTONE
EVEN	GAS SHOW	MN DEPTH	L LITHOGRAPHIC
QUESTIONABLE	BIT		MX MICROXLN
SPOTTED STAINING	CONNECTION (UP)		MS MUDSTONE

Rounding

CONNECTION (DOWN)	ANGULAR	PS PACKSTONE
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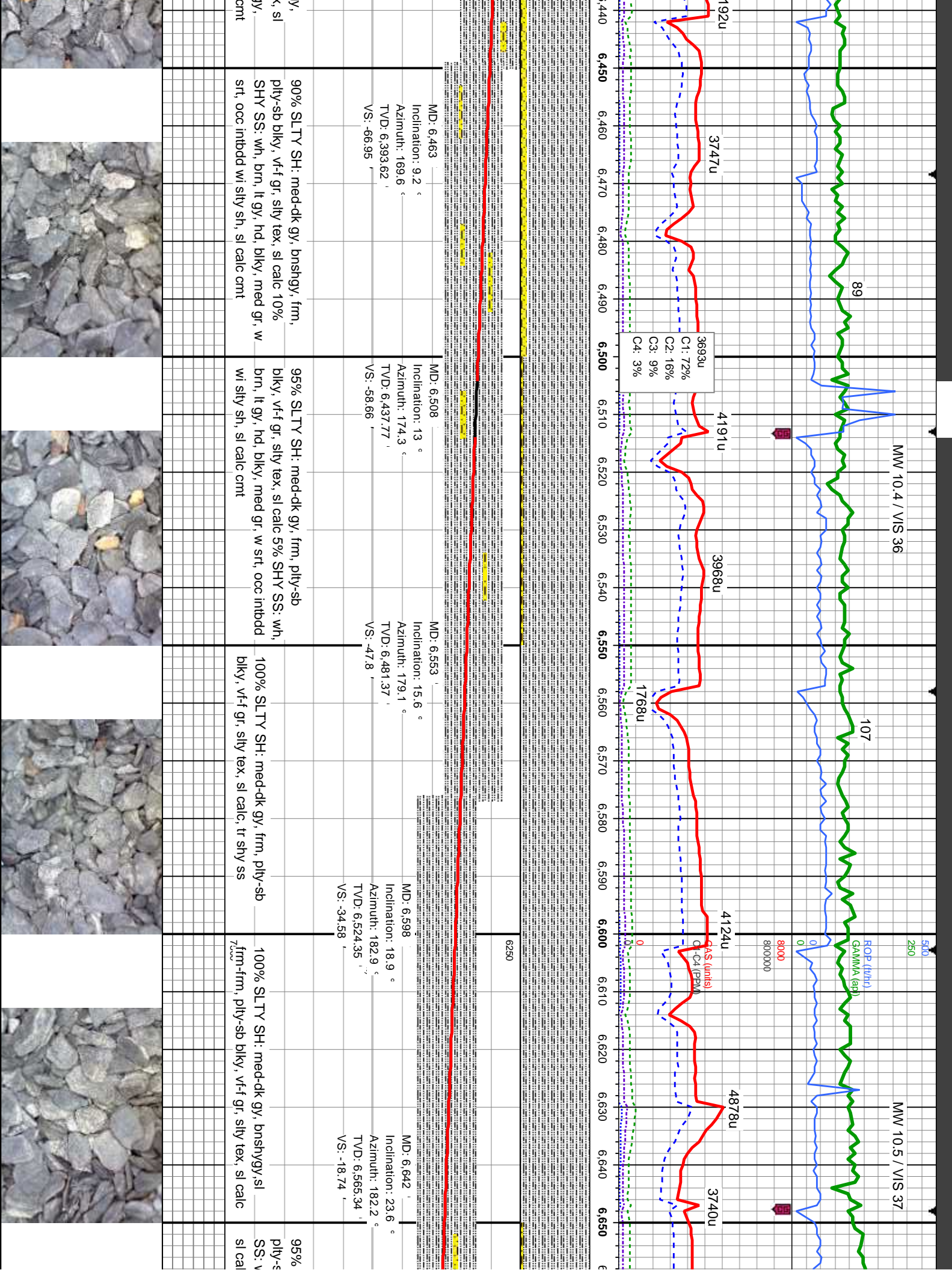
Porosity

E EARTHY	NORMAL FAULT	R ROUNDED	WS WACKSTONE
F FENESTRAL	CONNECTION GAS (LEFT)	SUBANG	
F FRACTURE	TRIP GAS	REVERSE FAULT	R SUBRND
INTERCRYSTALLINE	TRIP GAS (LEFT)	CASING	
INTEROOLITIC	DOWN TIME GAS	SIDEWALL CORE (LEFT)	
MOLDIC	DOWN TIME GAS (LEFT)	SIDEWALL CORE (RIGHT)	
ORGANIC	CORE - LOST	SLIDE	
	CORE - RECOVERED	SURVEY	

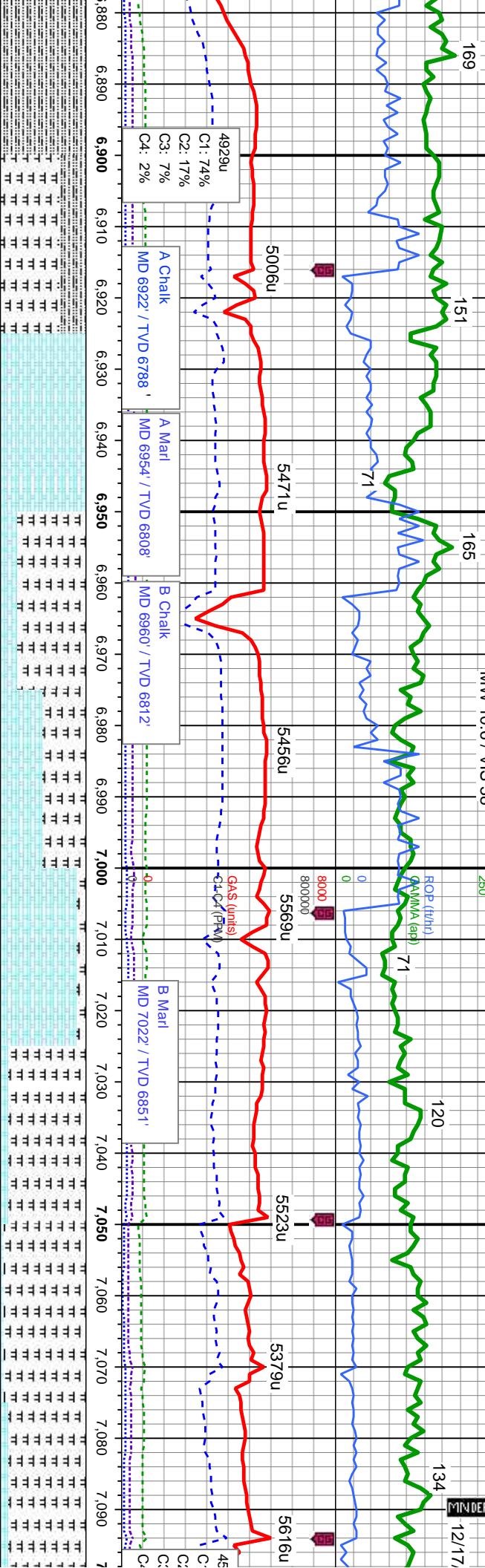
Textures

P POOR	M MODERATE
W WELL	

Sorting



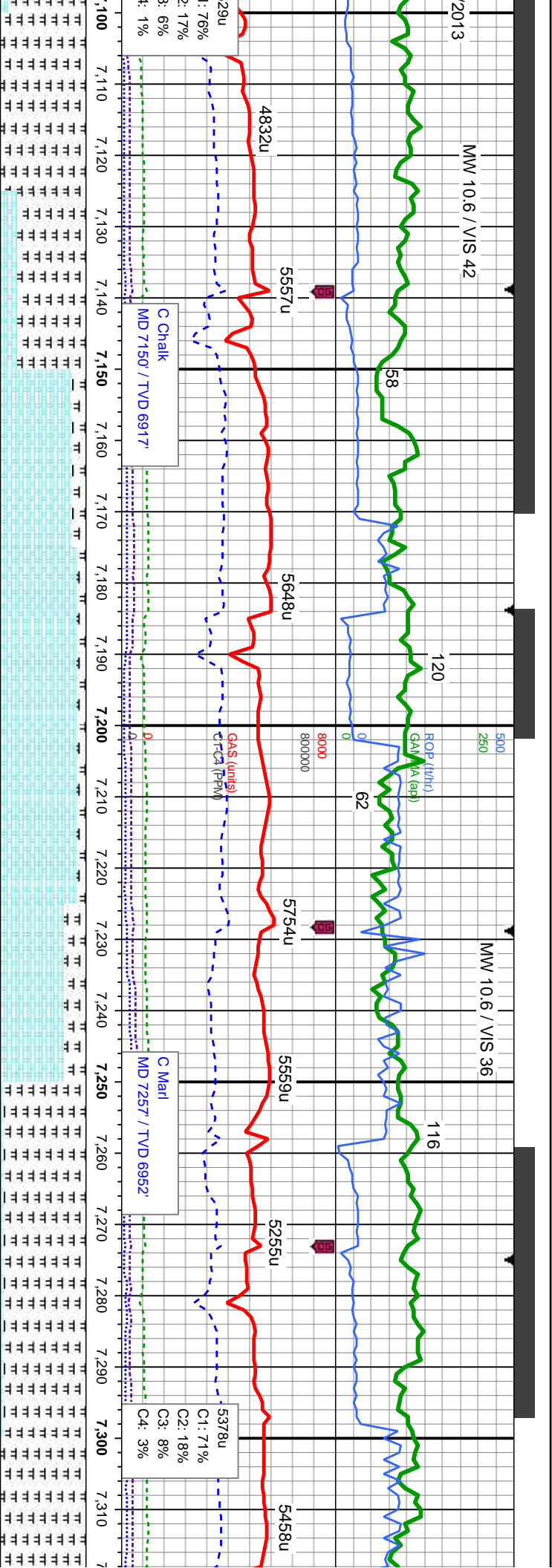
MW 10.6 / VIS 38



MD: 6.911 Inclination: 49.5 ° Azimuth: 180.8 ° TVD: 6.780.99 VS: 136.95	MD: 6.956 Inclination: 51 ° Azimuth: 178 ° TVD: 6.809.77 VS: 171.06	MD: 7.001 Inclination: 50.3 ° Azimuth: 178.7 ° TVD: 6.838.3 VS: 205.26	MD: 7.046 Inclination: 53.4 ° Azimuth: 179.1 ° TVD: 6.866.1 VS: 240.1	MD: 7.090 Inclination: 58.5 ° Azimuth: 179.8 ° TVD: 6.890.6 VS: 276.12
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70-0% MRLST: blk, sft-mod frm, sb pfty-blky, sl impy, oocly pfty, sily tex, calc mtx, 30-0% SLTY SH: dk gy, blk ip sft-frm, pfty-sb blky, vrf gr, sily tex, sl calc, 0-100% CHK: ltgy-wh, mot, sl frm-mod hd, sb pfty-blky, occ strf, v calc, abnt cal incl, occ bent, tr pyr, tr shy ss	80-50% MRLST: med-dk gy, blk ip, sft-mod frm, sb pfty-blky, sl impy, oocly pfty, sily tex, calc mtx, 20-50% CHK: ltgy-wh, mot, sl frm-mod hd, sb pfty-blky, v calc, occ cal incl, tr bent, tr pyr, tr shy ss, tr sily sh	90-10% CHK: ltgy-wh, mot, sl frm-mod hd, sb pfty-blky, v calc, 10-90% MRLST: med-dk gy, sft-mod frm, sb pfty-blky, sl impy, oocly pfty, sily tex, calc mtx, occ cal incl, tr inoc fos frag	95-90% MRLST: med-dk gy, blk, sft-mod frm, sb pfty-blky, sl impy, oocly pfty, sily tex, calc mtx, 5-10% CHK: ltgy-wh, mot, sl frm-mod hd, sb pfty-blky, v calc, occ cal incl, tr inoc fos frag, tr bent, tr pyr
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MD: 7,135
Inclination: 65.2 °
Azimuth: 178.5 °
TVD: 6,911.68
VS: 315.27

MD: 7,180
Inclination: 70.5 °
Azimuth: 178.4 °
TVD: 6,928.64
VS: 356.23

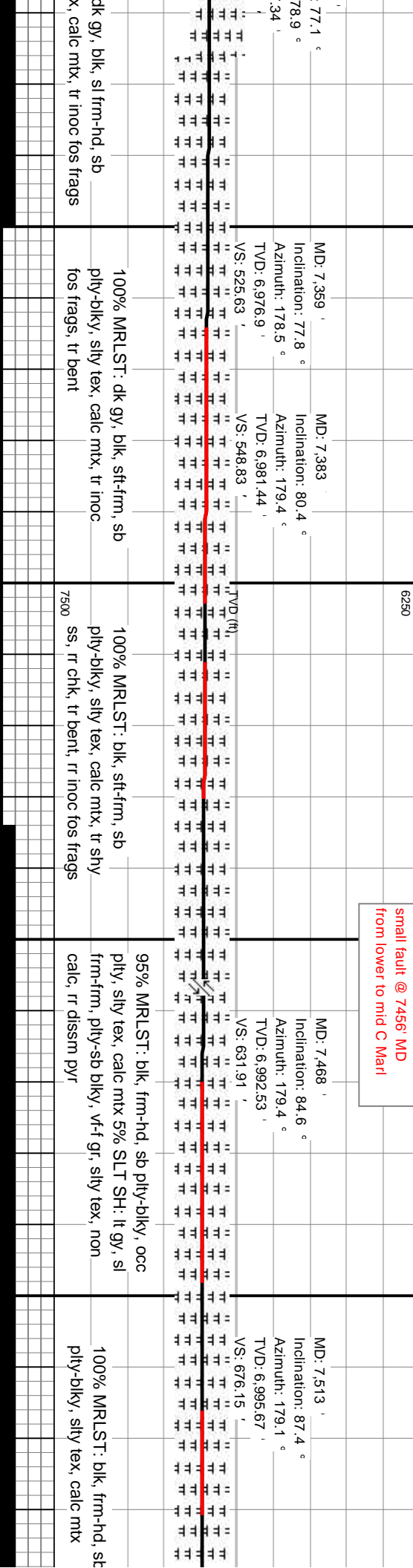
MD: 7,225
Inclination: 72.2 °
Azimuth: 178.4 °
TVD: 6,943.03
VS: 398.14

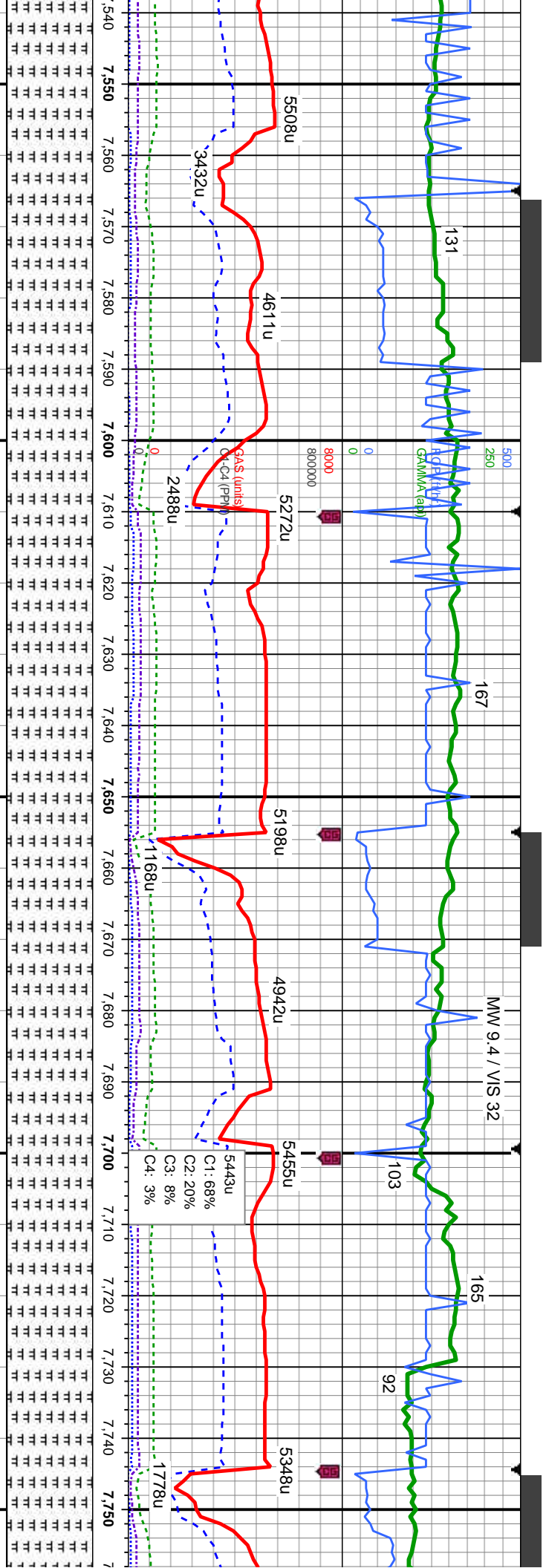
MD: 7,270
Inclination: 74 °
Azimuth: 178.7 °
TVD: 6,956.11
VS: 440.48

MD: 7,315
Inclination:
Azimuth: 1
TVD: 6,967
VS: 483.37

100-80% MRLST: dk gy, blk, sft-mod frm, sb pily-blky, sl lmpy, oocly pily, silty tex, calc mtx, 0-20% CHK: ltgy-wh, mot, sl frm-mod hcd, sb pily-blky, v cal, tr cal incl, tr inoc fos frag, tr bent, tr pyr, tr chk, tr silty ss	85-90% CHK: ltgy-wh, mot, sl frm-mod hcd, sb pily-blky, v cal, abnt cal incl, 15-10% MRLST: med-dk gy, blk, sft-mod frm, sb pily-blky, sl lmpy, oocly pily, silty tex, calc mtx, tr inoc fos frag	90-75% CHK: ltgy, brn, mot, sl frm-mod hcd, sb pily-blky, v cal, abnt cal incl, 10-25% MRLST: med-dk gy, blk, sft-mod frm, sb pily-blky, sl lmpy, oocly pily, silty tex, calc mtx, tr cal incl	95% MRLST: dk gy, blk, sl frm-hd, sb pily-blky, oocly pily, silty tex, calc mtx 5% CHK: lt brn, frm-hd, sb pily-blky, v cal, tr bent, tr inoc fos frags	100% MRLST: pily-blky, silty te
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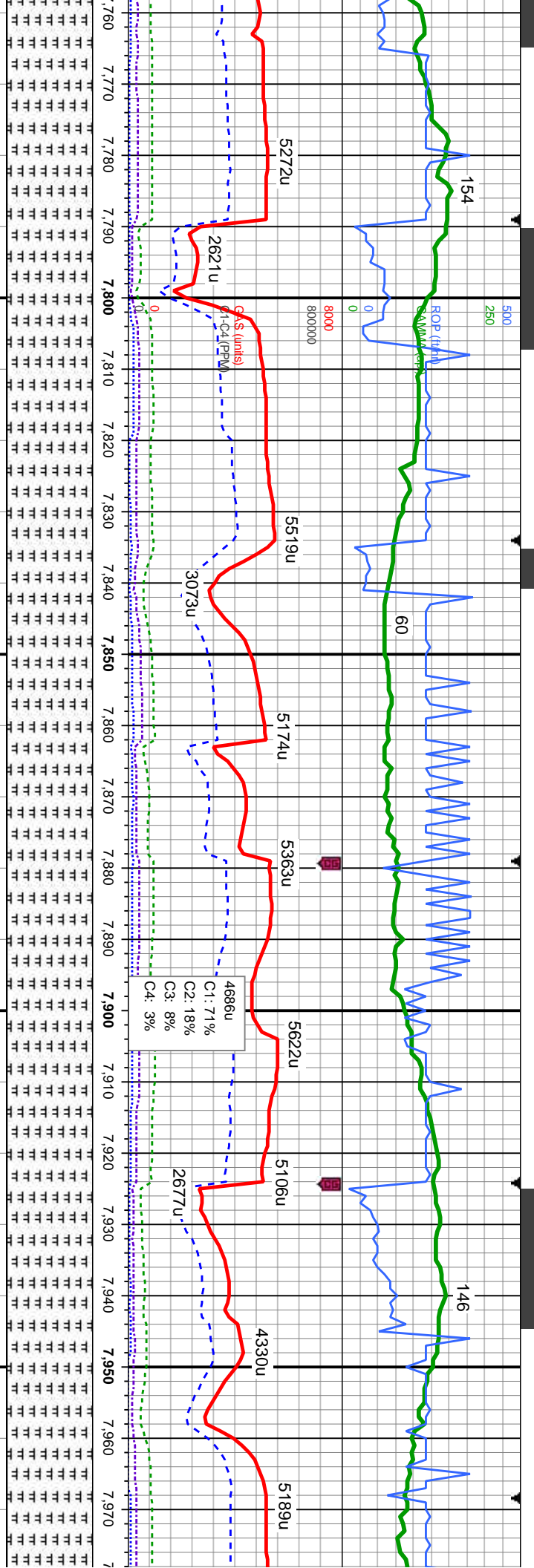




MD: 7,558 Inclination: 89.4 ° Azimuth: 179.1 ° TVD: 6,996.92 VS: 720.46	MD: 7,602 Inclination: 92.2 ° Azimuth: 178.5 ° TVD: 6,996.31 VS: 763.76	MD: 7,647 Inclination: 93 ° Azimuth: 179.1 ° TVD: 6,994.27 VS: 808.01	MD: 7,692 Inclination: 92.2 ° Azimuth: 178.7 ° TVD: 6,992.85 VS: 852.23
100% MRLST: blk, frm-hd, sb pty-biky, silty tex, calc mtx, tr inoc fos frags	100% MRLST: blk, frm-hd, sb pty-biky, silty tex, calc mtx	100% MRLST: blk, frm-hd, sb pty-biky, silty tex, calc mtx	100% MRLST: blk, frm-hd, sb pty-biky, silty tex, calc mtx, tr silty sh

small fault within C Marl
@ 7730 MD

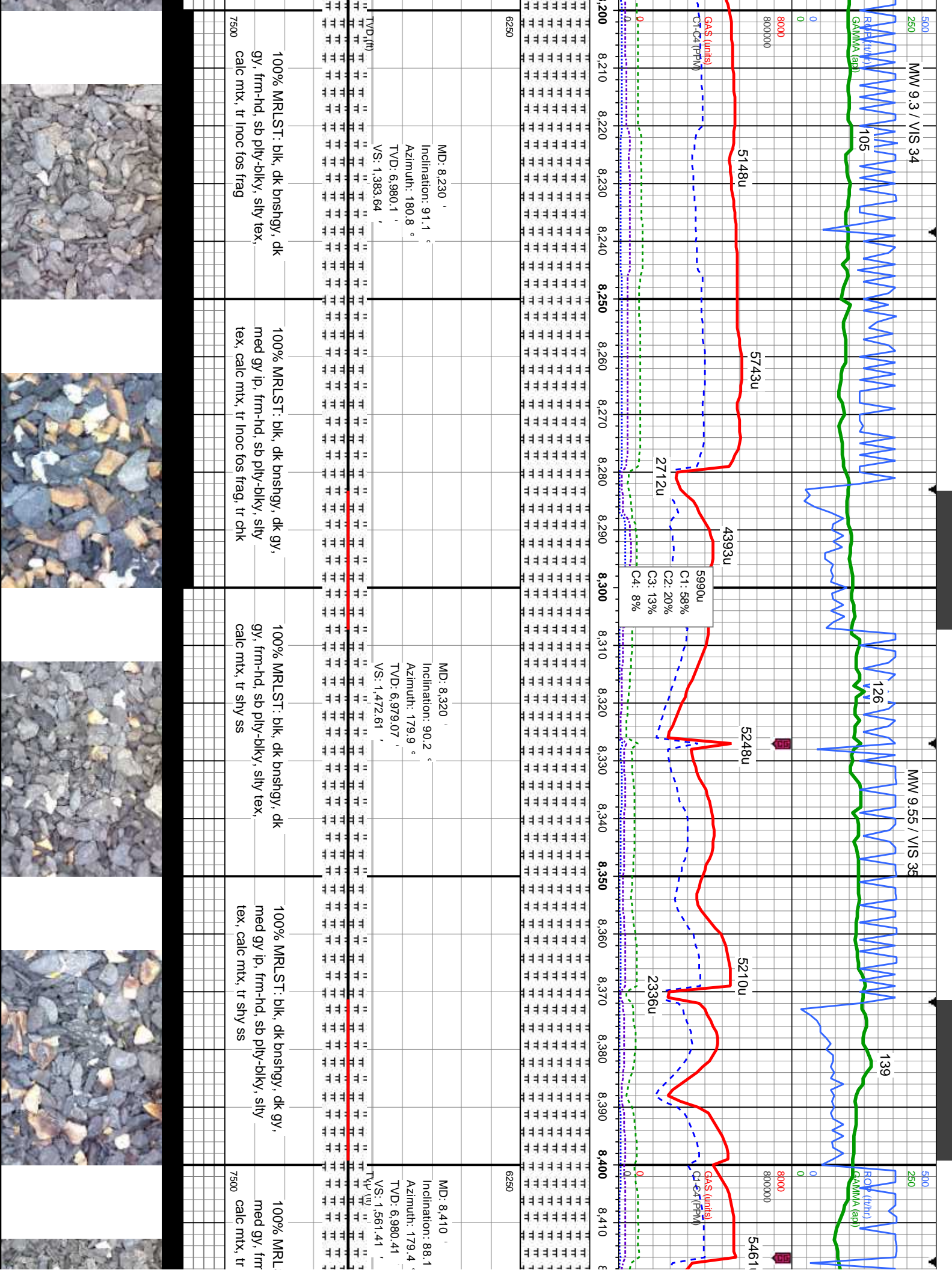


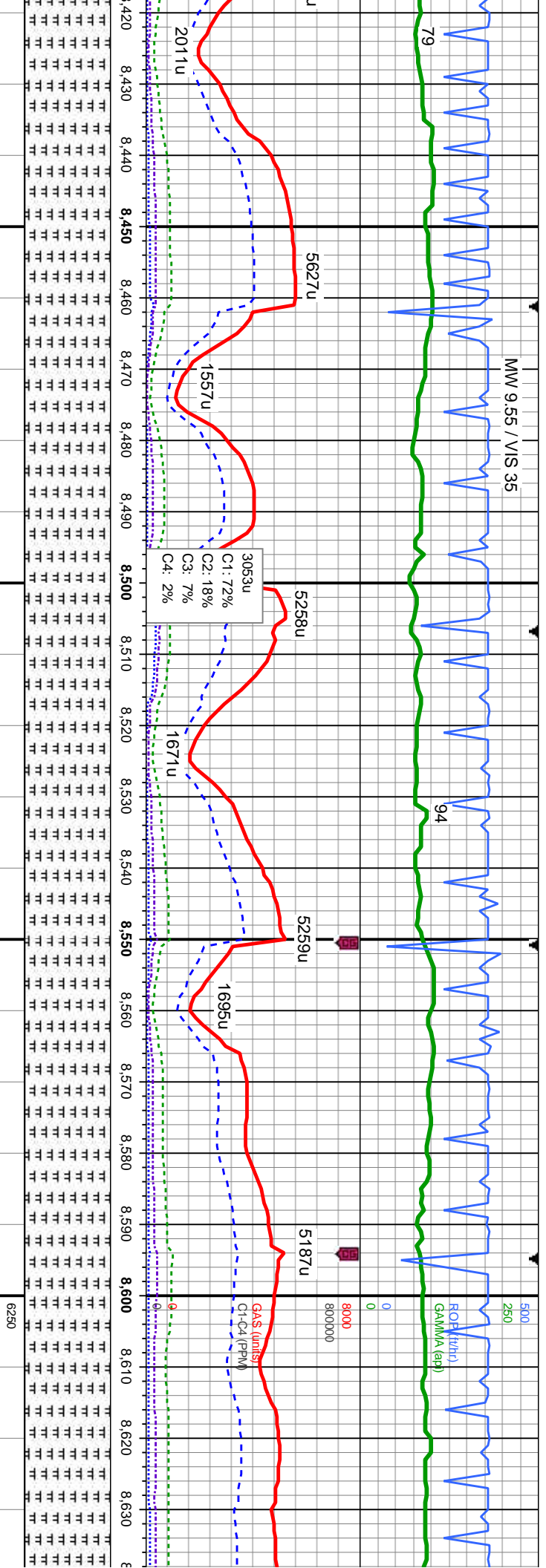


MD: 7.782 ° Inclination: 91.5 ° Azimuth: 178.7 ° TVD: 6.989.95 ° VS: 940.73 °	7,760 7,770 7,780 7,790 7,800 7,810 7,820 7,830 7,840 7,850 7,860 7,870 7,880 7,890 7,900 7,910 7,920 7,930 7,940 7,950 7,960 7,970	6250
ROP (ft/hr)		
G.S. (units)		
C1: 71%		
C2: 18%		
C3: 8%		
C4: 3%		

% MRLST: blk, frm-hd, sb -biky, stly tex, calc mtx, tr bent	100% MRLST: blk, dk bnshgy, frm-hd, sb pity-biky, stly tex, calc mtx, rr bent	100% MRLST: blk, dk bnshgy, frm-hd, sb pity-biky, stly tex, calc mtx, tr chlk	100% MRLST: blk, occ dk bnshgy, frm-hd, sb pity-biky, stly tex, calc mtx, tr bent, tr inoc fcs frags	100% MRLST: blk, o frm-hd, sb pity-biky, s mtx, tr bent, tr inoc fcs
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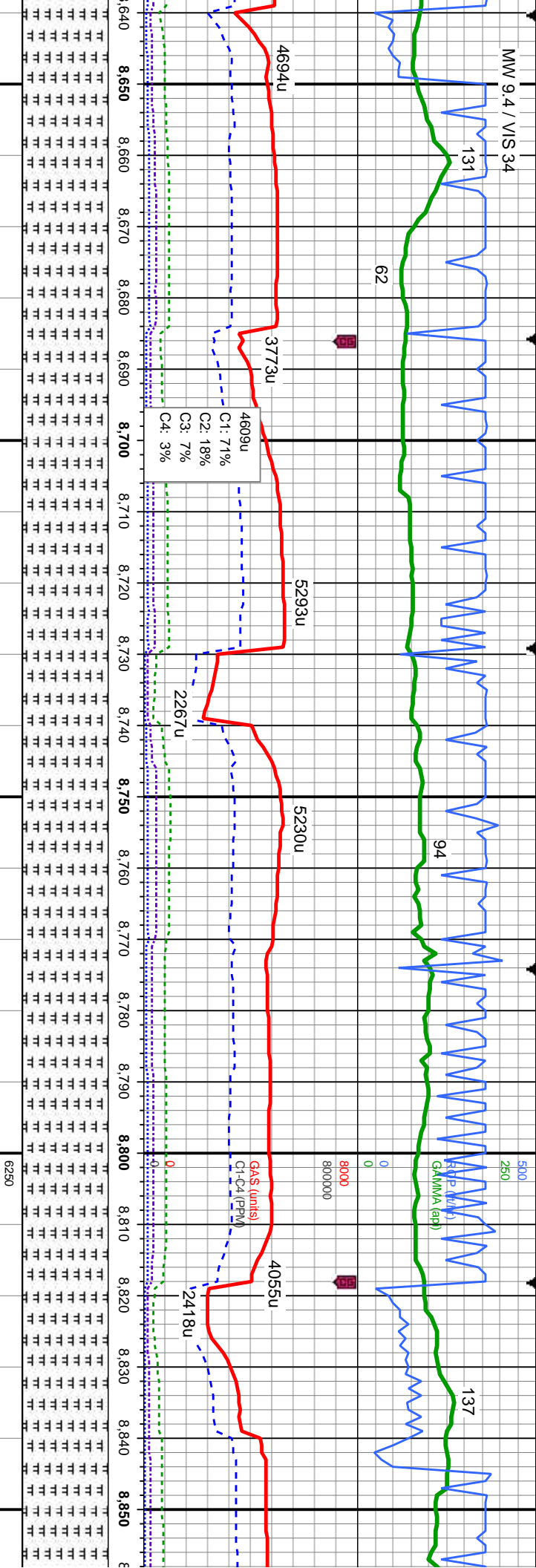


MD: 8,499
Inclination: 89.1 °
Azimuth: 179.4 °
TVD: 6,982.58
VS: 1,649.14

MD: 8,589
Inclination: 90.3 °
Azimuth: 179.1 °
TVD: 6,983.06
VS: 1,737.84

ST: blk, dk bnshgy, dk gy, hd, sb pily-blky, silty tex, sny ss	100% MRLST: blk, dk bnshgy, dk gy, med gy, frm-hd, sb pily-blky, silty tex, calc mtx, tr sny ss	100% MRLST: blk, dk bnshgy, dk gy, gy, frm-hd, sb pily-blky, silty tex, calc mtx	100% MRLST: blk, dk bnshgy, dk gy, med gy, frm-hd, sb pily-blky, silty tex, calc mtx	100% MRLST: blk, dk bnshgy, dk gy, med gy, frm-hd, sb pily-blky, silty tex, calc mtx	100% MRLST: blk, dk bnshgy, dk gy, frm-hd, sb pily-blky, silty tex, calc 7500
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MD: 8.679 '
Inclination: 90 °
Azimuth: 179.1 °
TVD: 6,982.82 '
VS: 1,826.5 '

MD: 8.768 '
Inclination: 91.6 °
Azimuth: 178.9 °
TVD: 6,981.58 '
VS: 1,914.15 '

MD: 8.8 '
Inclination: 91.6 °
Azimuth: 178.9 °
TVD: 6,981.58 '
VS: 2,000.00 '

dk gy, c mtx
100% MRLST: blk, dk bnshgy, dk gy, frm-hd, sb ply-blky, silty tex, calc mtx

100% MRLST: blk, dk bnshgy, dk gy, frm-hd, sb ply-blky, silty tex, calc mtx

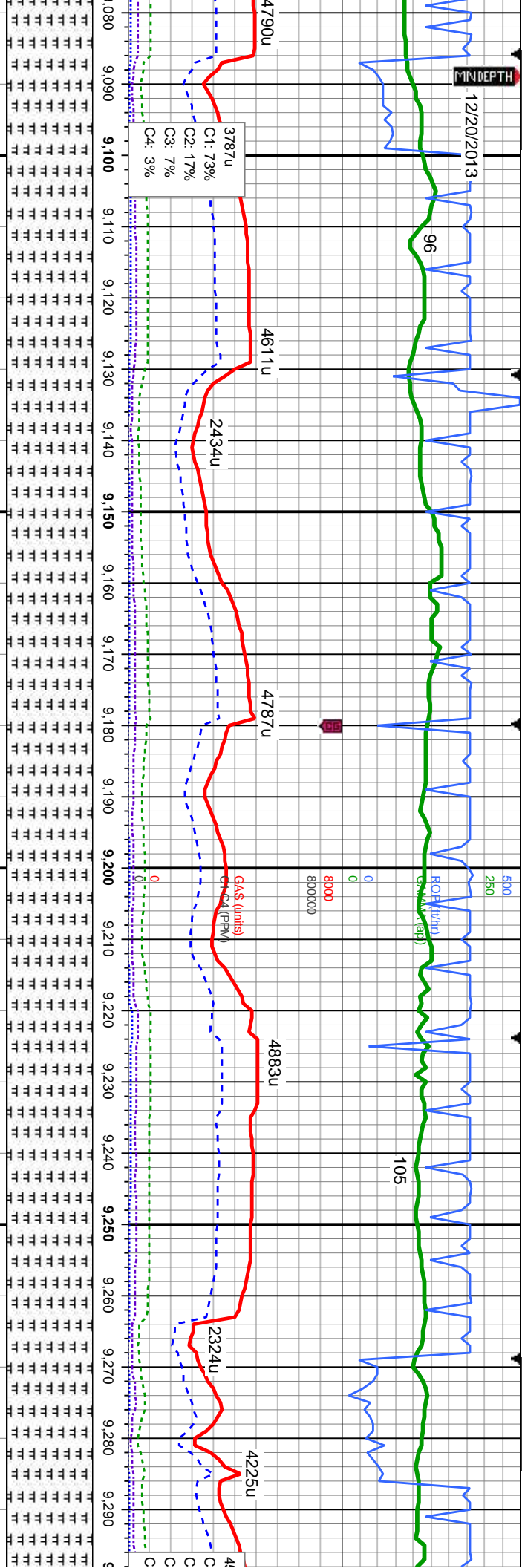
100% MRLST: blk, dk bnshgy, dk gy, frm-hd, sb ply-blky, silty tex, calc mtx, tr inoc fos frag, tr cal incl

100% MRLST: blk, dk bnshgy, dk gy, med gy, frm-hd, sb ply-blky, silty tex, calc mtx, tr chk, tr cal incl

100% MRLST: blk, dk bnshgy, dk gy, med gy, frm-hd, sb ply-blky, silty tex, calc mtx, tr chk, tr cal incl



12/20/2013
MINDEPTH

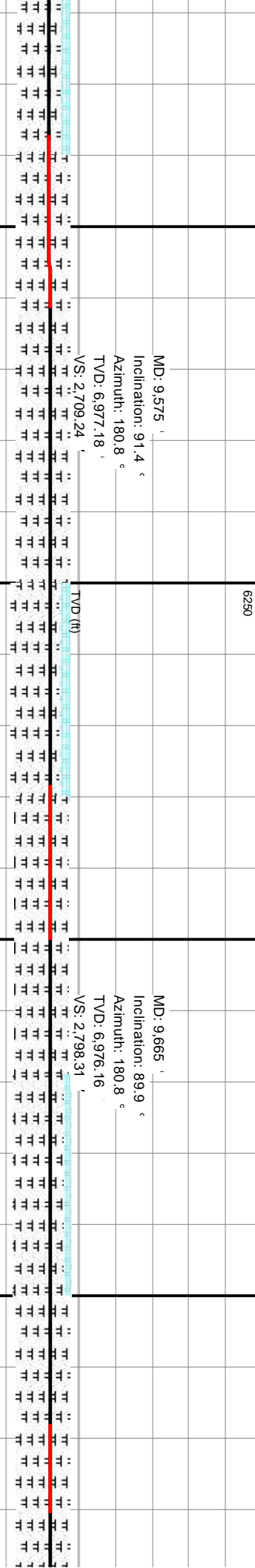
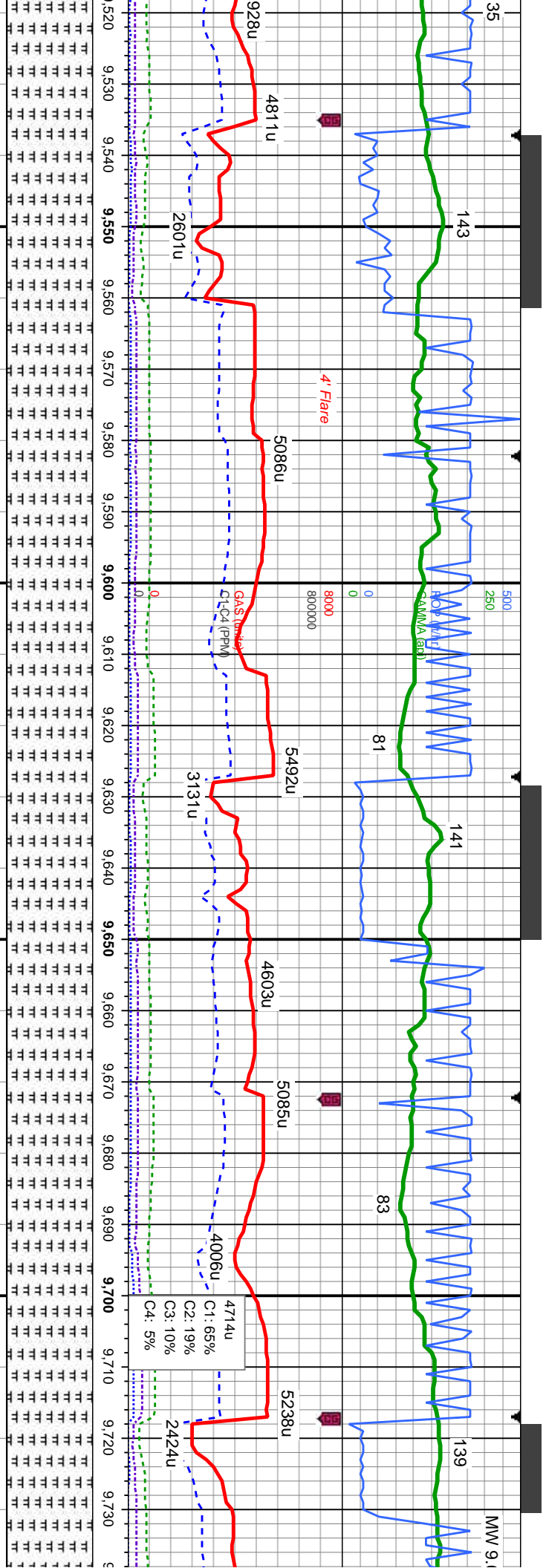


MD: 9,127 '
Inclination: 89.4 °
Azimuth: 179.1 °
TVD: 6,980.94 '
VS: 2,267.15 '

MD: 9,216 '
Inclination: 90.1 °
Azimuth: 179.2 °
TVD: 6,981.33 '
VS: 2,354.84 '

bnshgy, frm-hd, sb gy, tr inoc fos frag.	100% MRLST: blk, dk bnshgy, med gy, frm-hd, sb pty-blky, silty tex, calc mtx, tr cal incl	100% MRLST: blk, dk bnshgy, med gy, frm-hd, sb pty-blky, silty tex, calc mtx, tr cal incl	100% MRLST: blk, dk bnshgy, frm-hd, sb pty-blky, silty tex, calc mtx	100% MRLST: blk, dk bnshgy, med gy ip, frm-hd, sb pty-blky, silty tex, calc mtx
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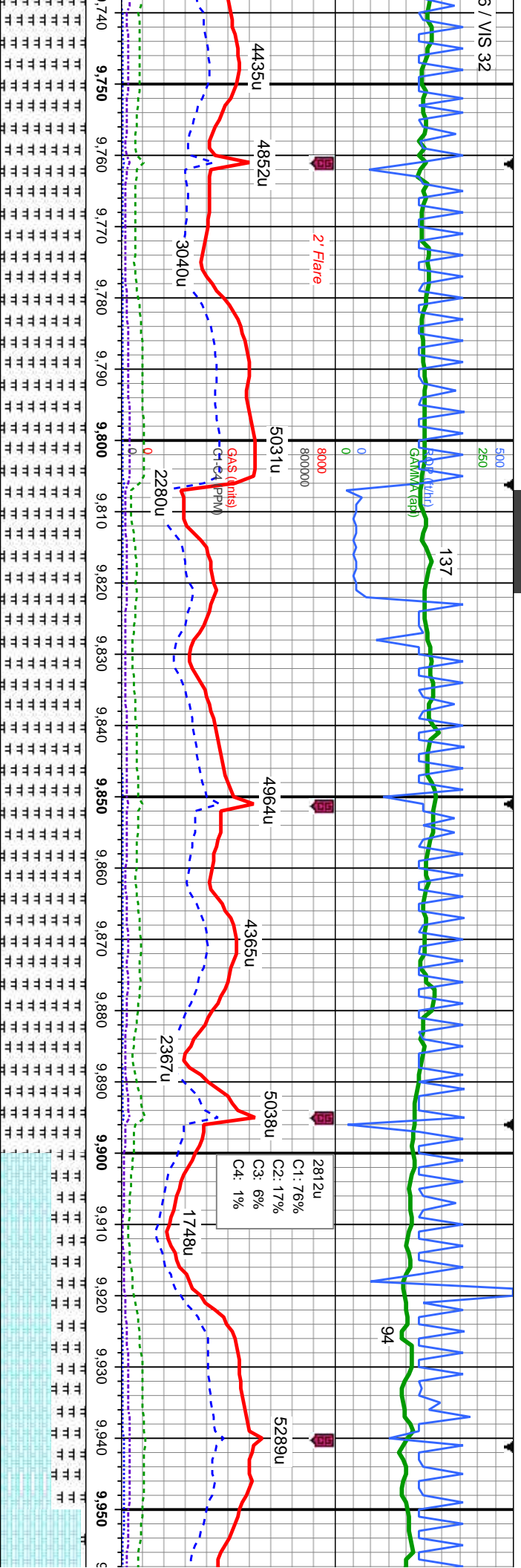




100% MRLST: blk, dk bnshgy, frn-hd, sb pily-blky, stly tex, calc mtX, tr bent, rr chl	100% MRLST: blk, dk bnshgy, frn-hd, sb pily-blky, stly tex, calc mtX, tr bent	100% MRLST: blk, dk bnshgy, frn-hd, sb pily-blky, stly tex, calc mtX, tr bent, inoc fos frags	100% MRLST: blk, dk bnshgy, frn-hd, sb pily-blky, stly tex, calc mtX, tr i frags
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3 / VIS 32

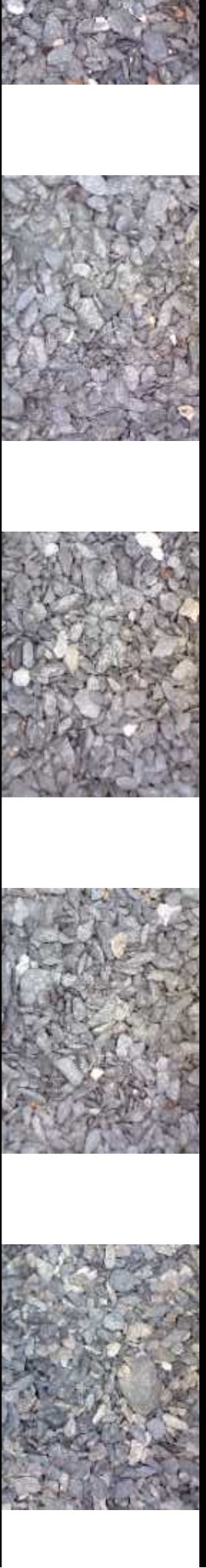


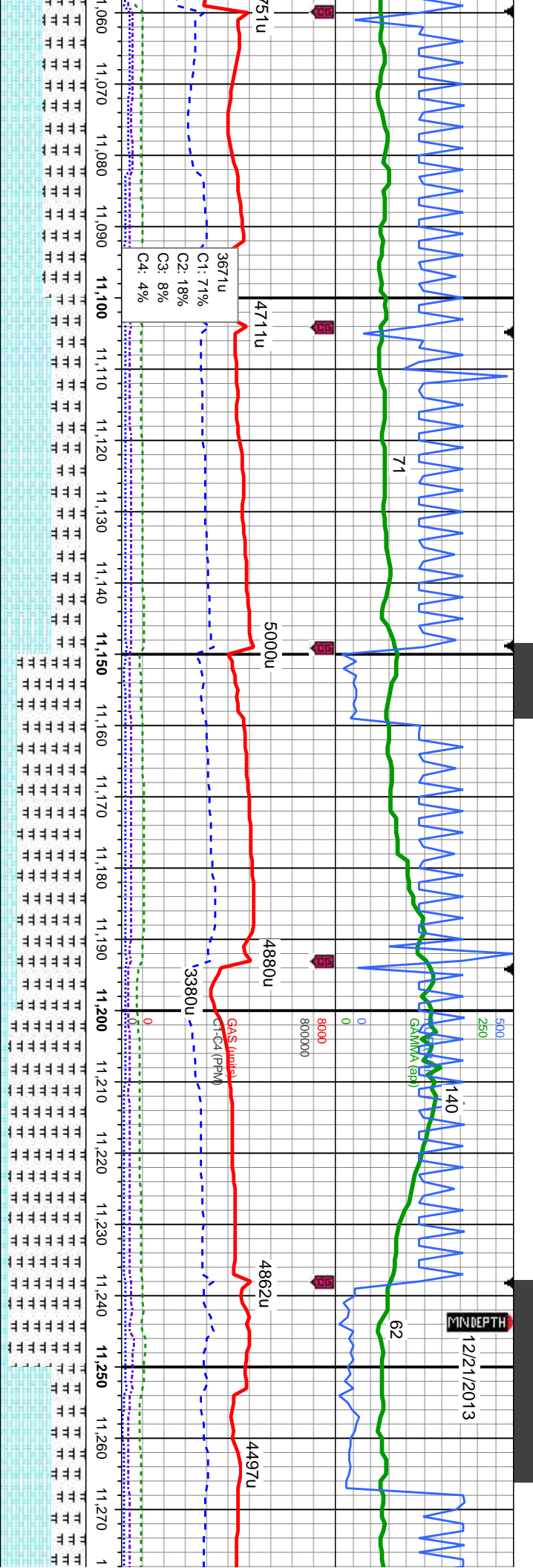
MD: 9,754
Inclination: 89.6 °
Azimuth: 180.8 °
TVD: 6,976.55
VS: 2,886.4

MD: 9,844
Inclination: 88.9 °
Azimuth: 180.7 °
TVD: 6,977.73
VS: 2,975.47

MD: 9,933
Inclination: 89.4 °
Azimuth: 180.5 °
TVD: 6,979.05
VS: 3,063.51

n-hd, inoc fos	100% MRLST: blk, sl frm-hd, sb pty-blky, occ pty, silty tex, calc mtx, tr inoc fos frags	100% MRLST: blk, sl frm-hd, sb pty-blky, silty tex, calc mtx, tr inoc fos frags, tr silty sh	100% MRLST: blk, sl frm-hd, sb pty-blky, silty tex, calc mtx, frags, tr silty sh, v rr chk	60% CHK: lt brn, tan, sl mot, frm-hd, sb pty-blky, v calc, abnt calc incl 40% MRLST: blk, sl frm-hd, sb pty-blky, silty tex, calc mtx, tr inoc fos frags, rr silty sh	95% sb MFL silty
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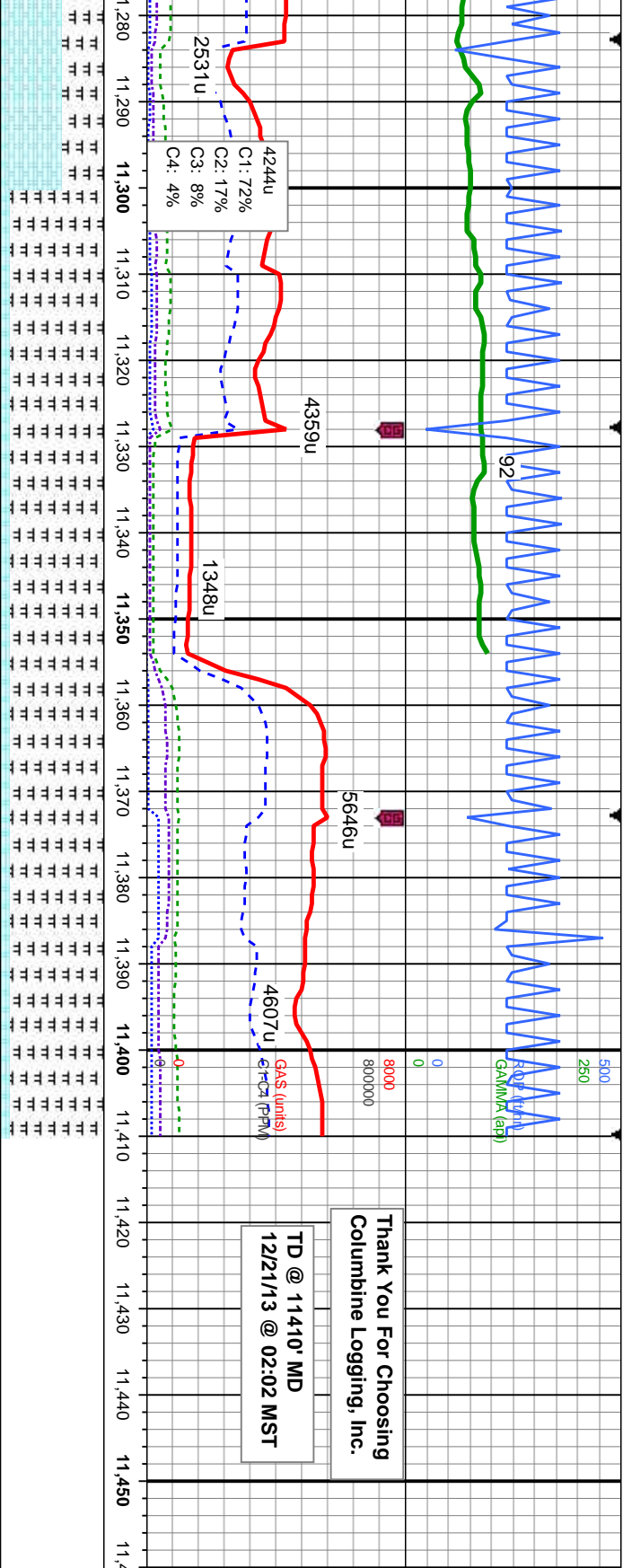
MD: 11,099 '
Inclination: 90.2 °
Azimuth: 180.7 °
TVD: 6,980.77 '
VS: 4,214.72 '

MD: 11,189 '
Inclination: 91.3 °
Azimuth: 180.1 °
TVD: 6,979.59 '
VS: 4,303.71 '

MD: 11, '
Inclination: '
Azimuth: '
TVD: 6, '
VS: 4,303.71 '

MRLST: blk, sl frm-hd, sb pily-blky, tex, calc mtx, 50% CHK: med-dk brn, sl frm-hd, sb pily-blky, v calc, rr inoc ag, tr cal, rr bent	60% CHK: med-dk brn, mot, sl frm-hd, sb pily-blky, v calc 40% MRLST: blk, sl frm-hd, sb pily-blky, silty tex, calc mtx, rr inoc fos frag, tr cal	80% MRLST: blk, sl frm-hd, sb pily-blky, silty tex, calc mtx, 20% CHK: med-dk brn, mot, sl frm-hd, sb pily-blky, v calc, tr inoc fos frag, tr cal	90% MRLST: blk, sl frm-hd, sb pily-blky, silty tex, calc mtx, 10% CHK: med-dk brn, mot, sl frm-hd, sb pily-blky, v calc, tr inoc fos frag, tr cal	60% CHK: med-dk brn, sb pily-blky, v calc 40% MRLST: blk, sl frm-hd, sb pily-blky, inoc fos frag, tr cal
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278' 0.91° 178.4° 3977.8' 31.4'		MD: 11,358' Inclination: 92.0° Azimuth: 178.9° TVD: 6,975.71' VS: 4,470.08'	
, mot, sl frm-hd, % MRLST: blk, sl		90% MRLST: blk, sl frm-hd, sb ply-biky, silty tex, calc mtx, 10% CHK: med-dk brn, mot, sl frm-hd, sb ply-biky, v calc, tr inoc	
y tex, calc mtx, r		90% MRLST: blk, sl frm-hd, sb ply-biky, silty tex, calc mtx, 10% CHK: med-dk brn, mot, sl frm-hd, sb ply-biky, v calc, tr bent	
		7500	

