

# COLUMBINE LOGGING

Scale: 5" / 100'  
Measured Depth Log

**Well Name** Carlson C-15-16HN

**Location** NENE Sec 15 T5N R65W

**State** Colorado

**County** Weld

**Country** United States

**Rig Number** Frontier (Utah) 8

**API Number** 05-123-41711

**AFE #** 2014WELDC15.16HN\_1

**Region** DJ Basin

**Field** Wattenberg

**Spud Date** 7/10/2015

**Drilling Completed** 9/2/2015

**Surface Coordinates** N 40.403695 W 104.640916

**Ground Elevation** 4621'

**K.B. Elevation** 4643'

**Logged Interval** 6000' To 14752'

**Total Depth** 14752'

**Formation** Niobrara

**Type of Drilling Fluid** FWLSND

## Operator

**Company** Bayswater Exploration & Production, LLC.

**Address** 730 17th St.  
Denver, CO 80202

## Geologist

**Name** Mark E. Brown

**Company** Bayswater Exploration & Production, LLC.

**Address** 730 17th St.  
Denver, CO 80202



## Other

**Robert Davis** Wellsite Geologist

**Ben Katka** Wellsite Geologist

**Shanna Gilbert** Wellsite Geologist

**Reid Odde** Wellsite Geologist

**Columbine Logging Computer** 148

**Bloodhound Unit** 298

Zone Color Coding

Oil

Note

Error

Condensate

Core

Water

Gas

Pressure

Seal

Rock Types

UNKNOWN

ANHYDRITE

BENTONITE

BRECCIA

CHALK

CEMENT

CHERT

CLAY CHOKE SANIC

CLAYSTONE

COAL

CONGLOMERATE

DOLOMITE

DOLOMITIC LIMESTONE

GRANITE

GYPSUM

IGNEOUS

SIDERITE or LIMONITE

LIMESTONE

MARLSTONE

METAMORPHIC

NO SAMPLE

SALT

SANDSTONE

SALT-PEPPER SANIC

SHALE

SHALE COLORED

SHALE GRAY

SHALY SANDSTONE

SHALY SILTSTONE

SILTY SHALE

SILTSTONE

TILL

TUFF

WELDED TUFF

Accessories

**Fossils**

GASTROPOD

INOCERAMUS

OOLITE

OSTRACOD

PELECYPOD

PELLET

PISOLITE

PLANT REMAINS

PLANT SPORES

SCAPHOPOD

STROMATOPOROID

ECHINOID

FISH

FORAMINIFERA

FOSSIL

**Minerals**

ARGILLITE GRAIN

BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

CALCAREOUS

CARBONACEOUS FLAKES

CHTCK

CHTTL

COAL - THIN BEDS

DOLOMITIC

FELDSPAR

FERRUGINOUS PELLET

FERRUGINOUS

GLAUCONITE

GYPSIFEROUS

**Stringer**

ANHYDRITE STRINGER

BENTONITE STRINGER

COAL STRINGER

DOLOMITIC STRINGER

GYPSUM STRINGER

LIMESTONE STRINGER

MARLSTONE (CALC) STRG

MARLSTONE (DOL) STRG

SANDSTONE STRINGER

SHALE STRINGER

SILTSTONE STRINGER

HEAVY MINERAL

KAOLIN

MARCASITE

MARLSTONE

MICACEOUS

MINERAL CRYSTALS

NOODULES

PHOSPHATE PELLETS

PYRITE

SALT CAST

SANDY

SIDERITE

SILICEOUS

SILTY

TUFFACEOUS

Oil Show

PINPOINT

VUGGY

Engineering

DEAD

EVEN

QUESTIONABLE

BIT

SPOTTED STAINING

CONNECTION (UP)

CONNECTION (DOWN)

CONNECTION GAS (LEFT)

TRIP GAS

TRIP GAS (LEFT)

INTERCRYSTALLINE

DOWN TIME GAS

INTEROOLITIC

DOWN TIME GAS (LEFT)

MOLDIC

CORE - LOST

ORGANIC

CORE - RECOVERED

Porosity

CONNECTION GAS

CONNECTION (DOWN)

CONNECTION GAS (LEFT)

TRIP GAS

TRIP GAS (LEFT)

INTERCRYSTALLINE

DOWN TIME GAS

INTEROOLITIC

DOWN TIME GAS (LEFT)




































MOLDIC

CORE - LOST

ORGANIC

CORE - RECOVERED

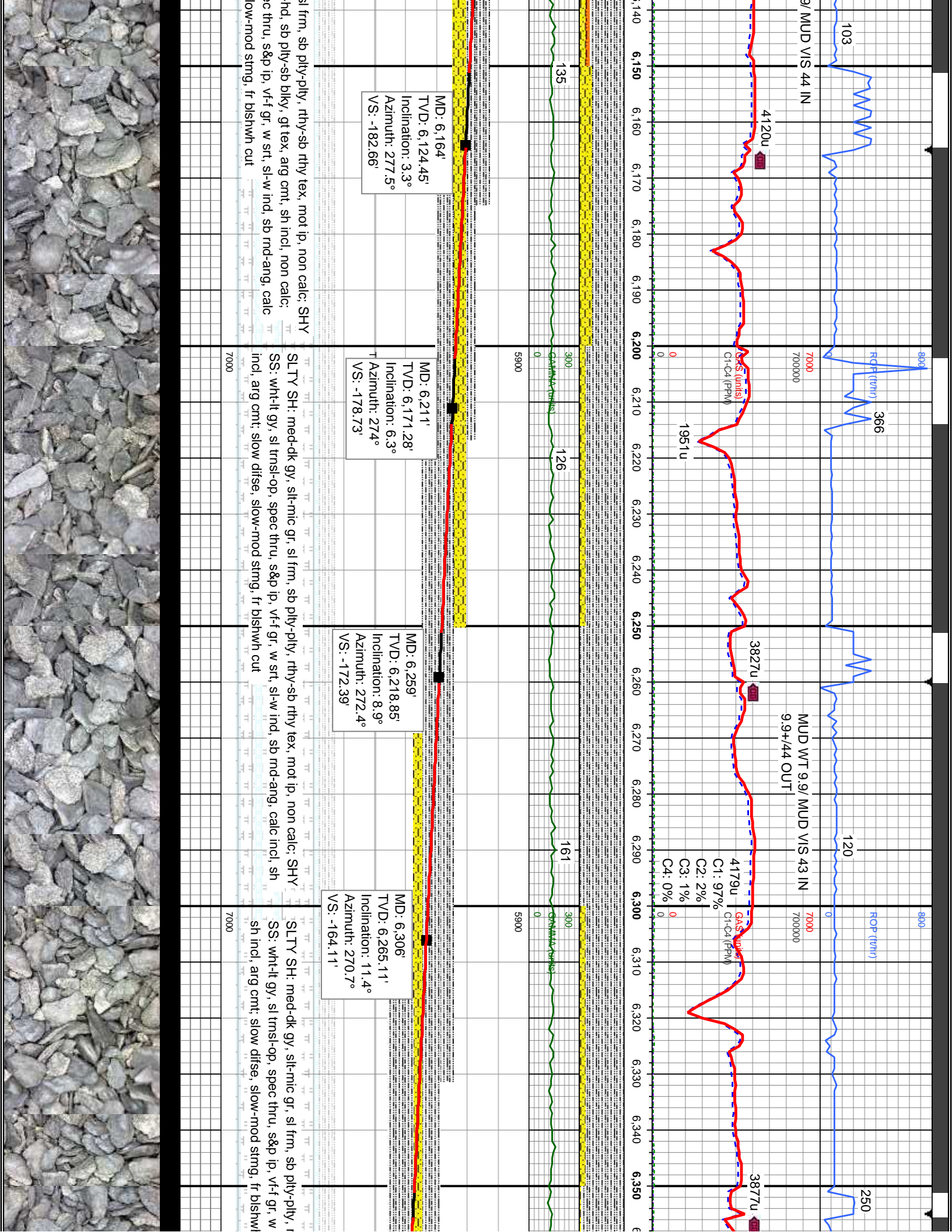
## Other Symbols

	DST INTERVAL		WIRELINE TESTED - LEFT		E EARTHY
	FAULT		WIRELINE TESTED - RT		FX FINELYXLN
	FORMATION TOP		DRILL STEM TEST		BS GRAINSTONE
	GAS SHOW		MINDEPTH MN DEPTH		L LITHOGRAPHIC
	OIL SHOW				MX MICROXLN
	MN DEPTH UP				MS MUDSTONE
	MN DEPTH (DOWN)		A ANGULAR		PS PACKSTONE
	NORMAL FAULT		R ROUNDED		WS WACKSTONE
	OVERTURNED STRATA		B SUBANG		
	REVERSE FAULT		N SUBRND		
	CASING				M MODERATE
<b>Textures</b>					
	SIDEWALL CORE (LEFT)				P POOR
	SIDEWALL CORE (RIGHT)		BS BOUNDSTONE		W WELL
	SLIDE		C CHALKY		
	SURVEY		CX CRYPTOXLN		

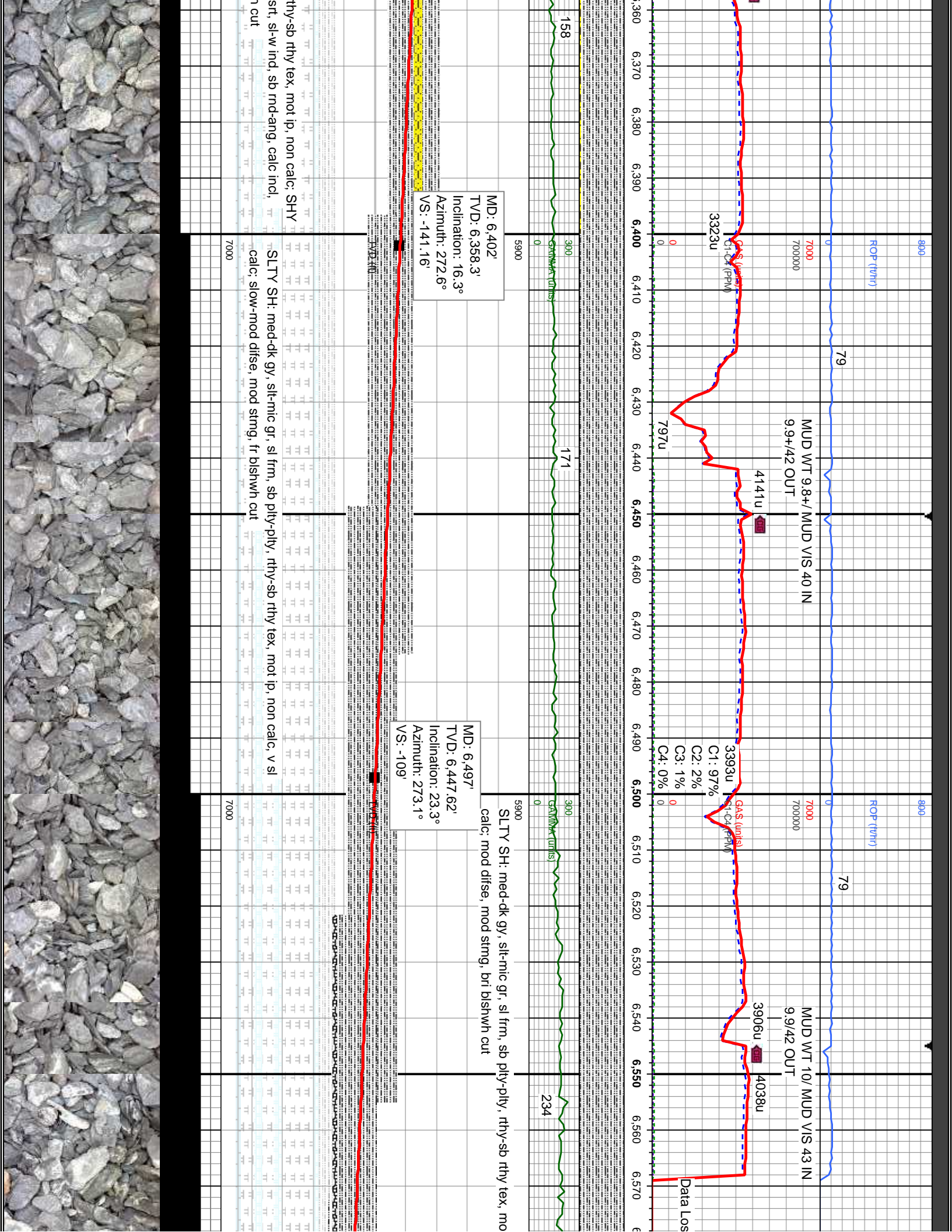
## Sorting

Slide/Rotate																					
ROP ROP																					
Total Gas & Chromatograph		<div>COLUMBINE LOGGING RIGGED UP ON 8/3/2015 MANNED 2-PERSON LOGGING WITH BLOODHOUND GAS CHROMATOGRAPH #0298</div> <div><div>GAS C1 C2 C3 C4</div><div><div>366</div><div>769</div><div>4604u</div><div>3900u</div><div>3151u</div></div></div>																			
Depth Labels		5.960 5.970 5.980 5.990 6.000 6.010 6.020 6.030 6.040 6.050 6.060 6.070 6.080 6.090 6.100 6.110 6.120 6.130 6.140																			
% Lith																					
Gamma GAMMA		<div><div>300</div><div>148</div><div>144</div><div>300</div></div> <div><div>5999</div><div>5900</div></div>																			
Well Bore TVD		<div>BEGIN LOGGING F / 6000' MD @ 10:15 HRS ON 8/3/2015</div> <div><div>MD: 6.021' TVD: 5.981.48' Inclination: 0.7° Azimuth: 49° VS: -183.6'</div><div>MD: 6.069' TVD: 6.029.48' Inclination: 0.7° Azimuth: 62.6° VS: -184.06'</div><div>MD: 6.116' TVD: 6.076.48' Inclination: 0.4° Azimuth: 312.3° VS: -184.17'</div></div>																			
Oil Show		<div>SLTY SH: med-dk gy, silt-mic gr, sl frm, sb ply-pily, rthy-sb rthy tex, mot ip; SHY SLTST: lt-med gy, silt-vf gr, sl frm-hd, sb ply-sb blkly, gt tex, arg cnt, sh incl, non calc; slow difse, slow strng, fnt bl cut</div> <div>SLTY SH: med-dk gy, silt-mic gr, s SLTST: lt-med gy, silt-vf gr, sl frm- SHY SS: whlt gy, sl trnsf-op, spe incl, sh incl, arg cnt; slow difse, s</div>																			
Images																					









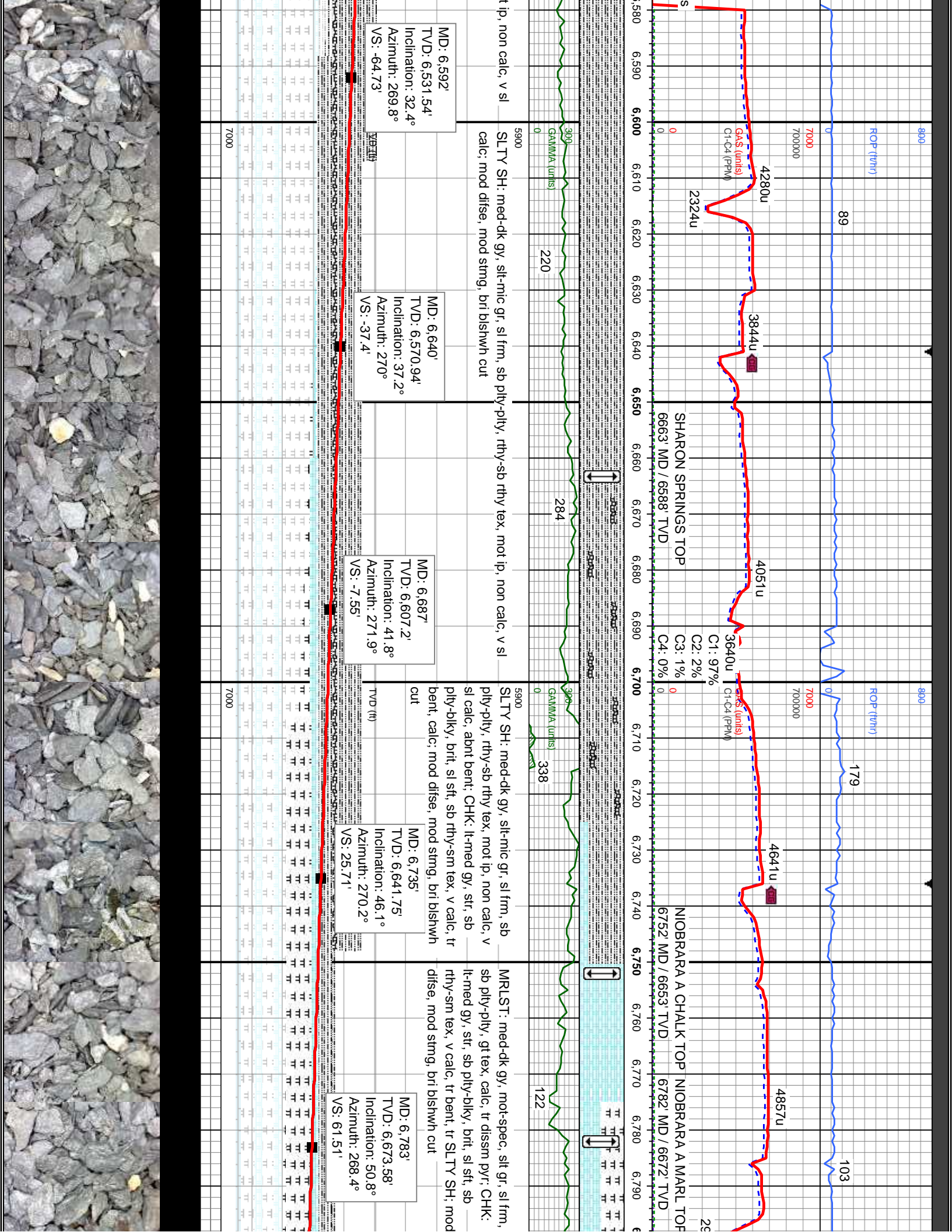
MD: 6,402'  
TVD: 6,358.3'  
Inclination: 16.3°  
Azimuth: 272.6°  
VS: -141.16'

MD: 6,497'  
TVD: 6,447.62'  
Inclination: 23.3°  
Azimuth: 273.1°  
VS: -109'

SLTY SH: med-dk gy, slt-mic gr, sl frm, sb ply-pty, rthy-sb rthy tex, mot ip, non calc, v sl calc, slow-mod difse, mod sting, fr bishwh cut

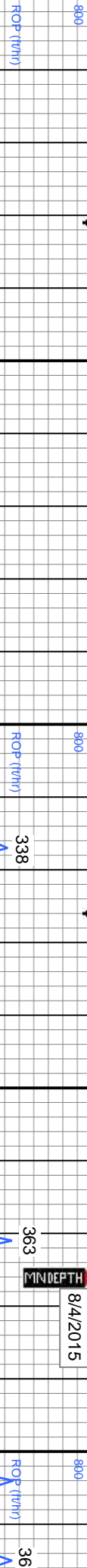
SLTY SH: med-dk gy, slt-mic gr, sl frm, sb ply-pty, rthy-sb rthy tex, mo calc, mod difse, mod sting, bri bishwh cut



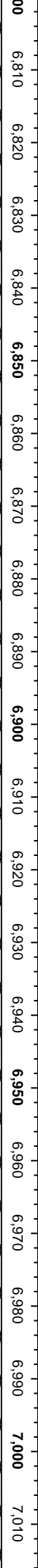
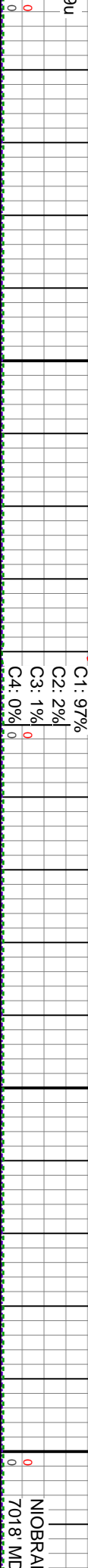




8/4/2015



MUD WT 9.9/ MUD VIS 43 IN 9.9/44 OUT



MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pily-pily, gt tex, calc, tr dissn pyr; CHK: lt-med gy, str, sb pily-biky, bri, sl sft, sb rthy-sm tex, v calc, tr bent, mod difse, mod stmg, bri bishwn cut

MD: 6,831'  
TVD: 6,702.05'  
Inclination: 56.4°  
Azimuth: 268.4°  
VS: 99.97'

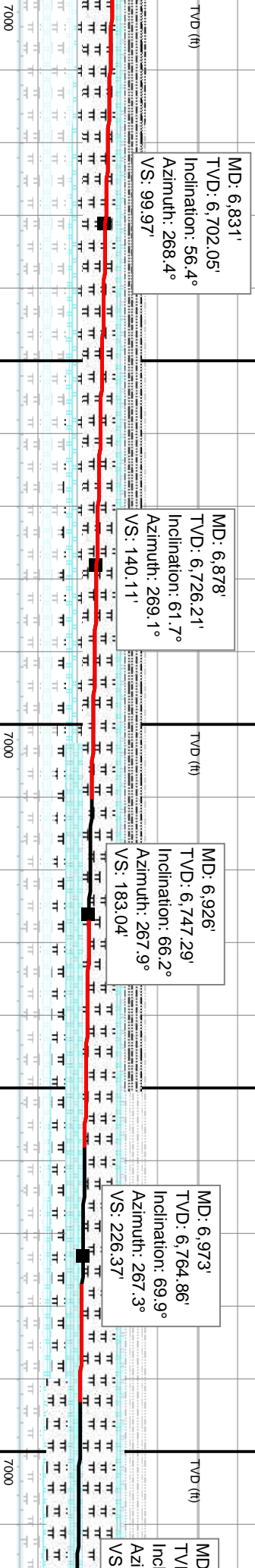
MD: 6,878'  
TVD: 6,726.21'  
Inclination: 61.7°  
Azimuth: 269.1°  
VS: 140.11'

MD: 6,926'  
TVD: 6,747.29'  
Inclination: 66.2°  
Azimuth: 267.9°  
VS: 183.04'

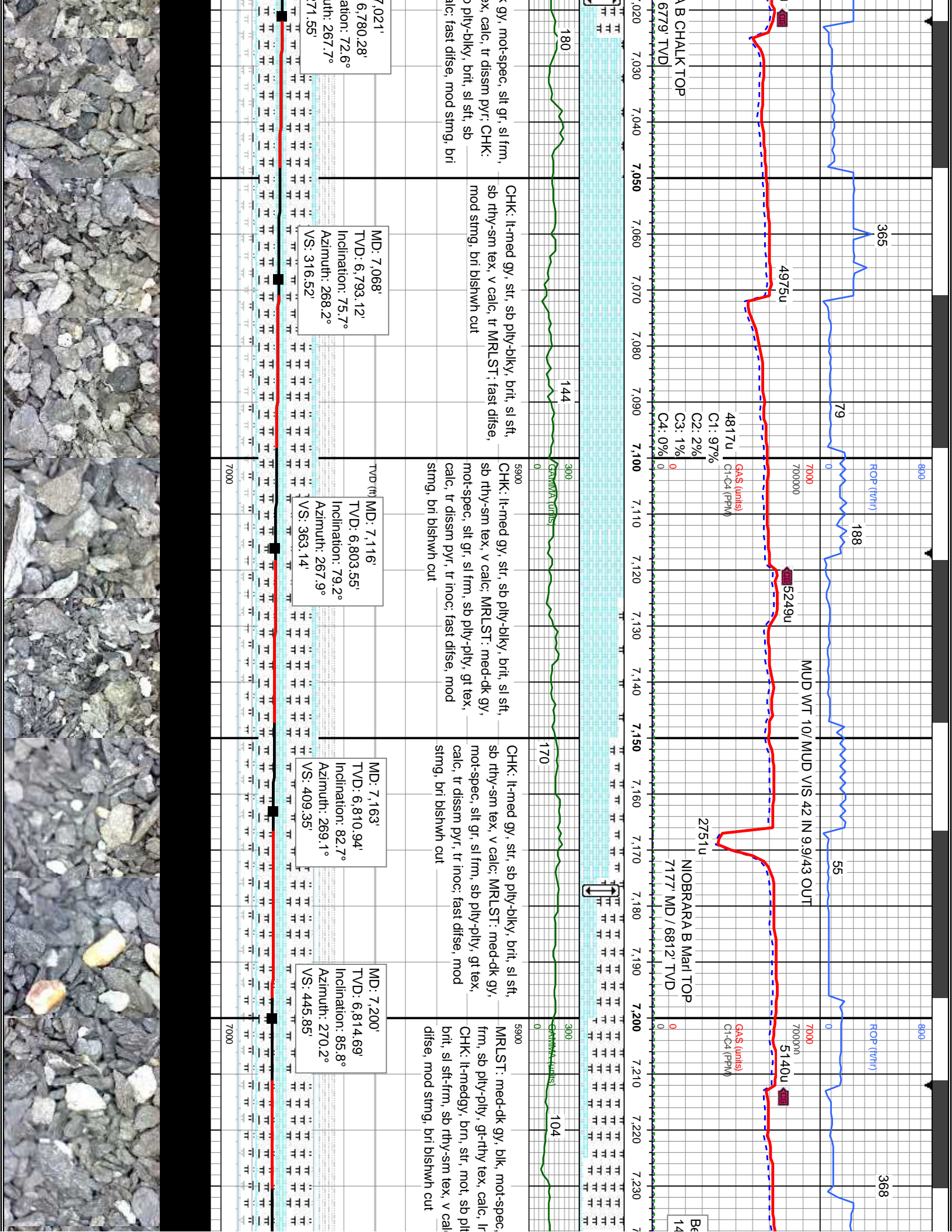
MD: 6,973'  
TVD: 6,764.86'  
Inclination: 69.9°  
Azimuth: 267.3°  
VS: 226.37'

MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pily-pily, gt tex, calc, tr dissn pyr; CHK: lt-med gy, str, sb pily-biky, bri, sl sft, sb rthy-sm tex, v calc, mod difse, mod stmg, bri bishwn cut

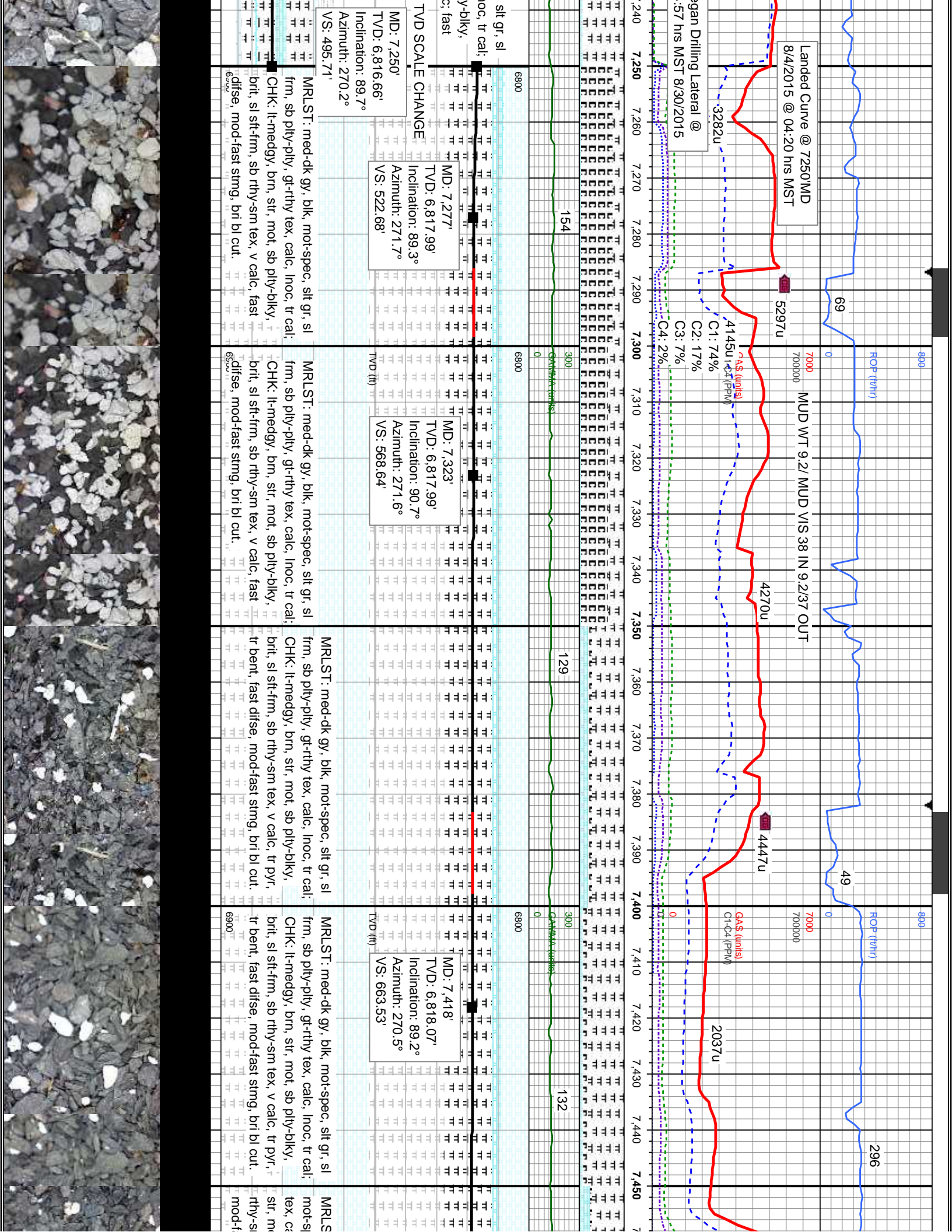
MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pily-pily, gt tex, calc, tr dissn pyr; CHK: lt-med gy, str, sb pily-biky, bri, sl sft, sb rthy-sm tex, v calc, mod difse, mod stmg, bri bishwn cut





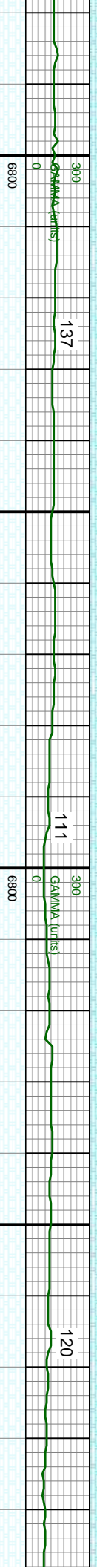
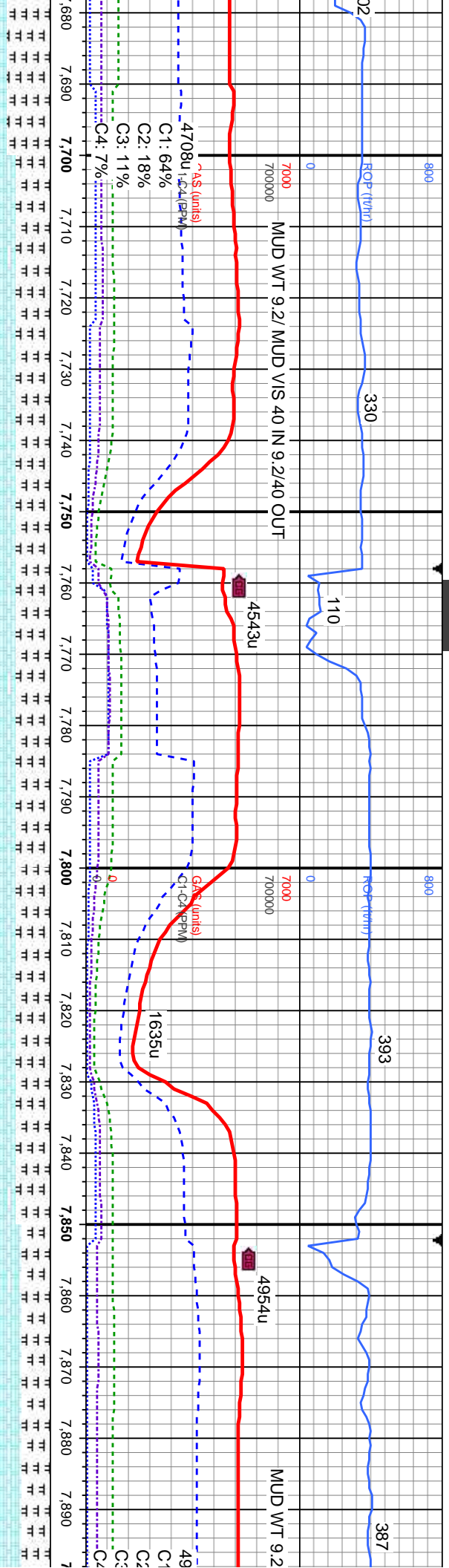












MD: 7,701'  
TVD: 6,820.87'  
Inclination: 90°  
Azimuth: 268.6°  
VS: 945.61'

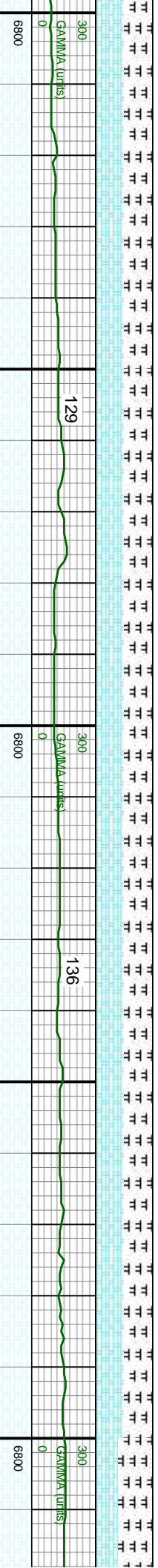
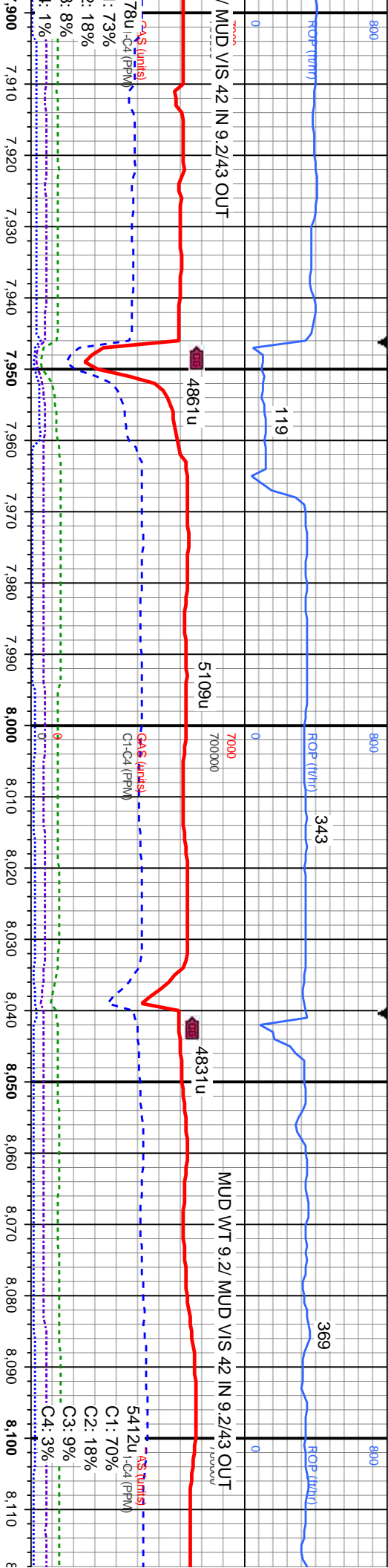
MD: 7,795'  
TVD: 6,820.95'  
Inclination: 89.9°  
Azimuth: 270.3°  
VS: 1,039.35'

MD: 7,889'  
TVD: 6,820.38'  
Inclination: 90.8°  
Azimuth: 268.7°  
VS: 1,133.08'

sil silver lstr,	MRSLT: med-dk gy, blk, sl silver lstr,	MRSLT: med-dk gy, blk, sl silver lstr,	MRSLT: med-dk gy, blk, sl silver lstr,
b pty-ply, gt-rthy	mot-spec, slt gr, sl frm, sb pty-ply, gt-rthy	mot-spec, slt gr, sl frm, sb pty-ply, gt-rthy	mot-spec, slt gr, sl frm, sb pty-ply, gt-rthy
CHK: lt-medgy, brn,	tex, calc, tr inoc, tr cal; CHK: lt-medgy, brn,	tex, calc, tr inoc, tr cal; CHK: lt-medgy, brn,	tex, calc, tr inoc, tr cal; CHK: lt-medgy, brn,
, sl sft-firm, sb	str, mot, sb pty-blky, brt, sl sft-firm, sb	str, mot, sb pty-blky, brt, sl sft-firm, sb	str, mot, sb pty-blky, brt, sl sft-firm, sb
tr bent, fast difse,	rthy-sm tex, v calc, tr pyr, abnt bent, fast	rthy-sm tex, v calc, tr pyr, abnt bent, fast	rthy-sm tex, v calc, tr pyr, abnt bent, fast
difse, mod-fast stmg, brl bl cut.	difse, mod-fast stmg, brl bl cut.	difse, mod-fast stmg, brl bl cut.	difse, mod-fast stmg, brl bl cut.

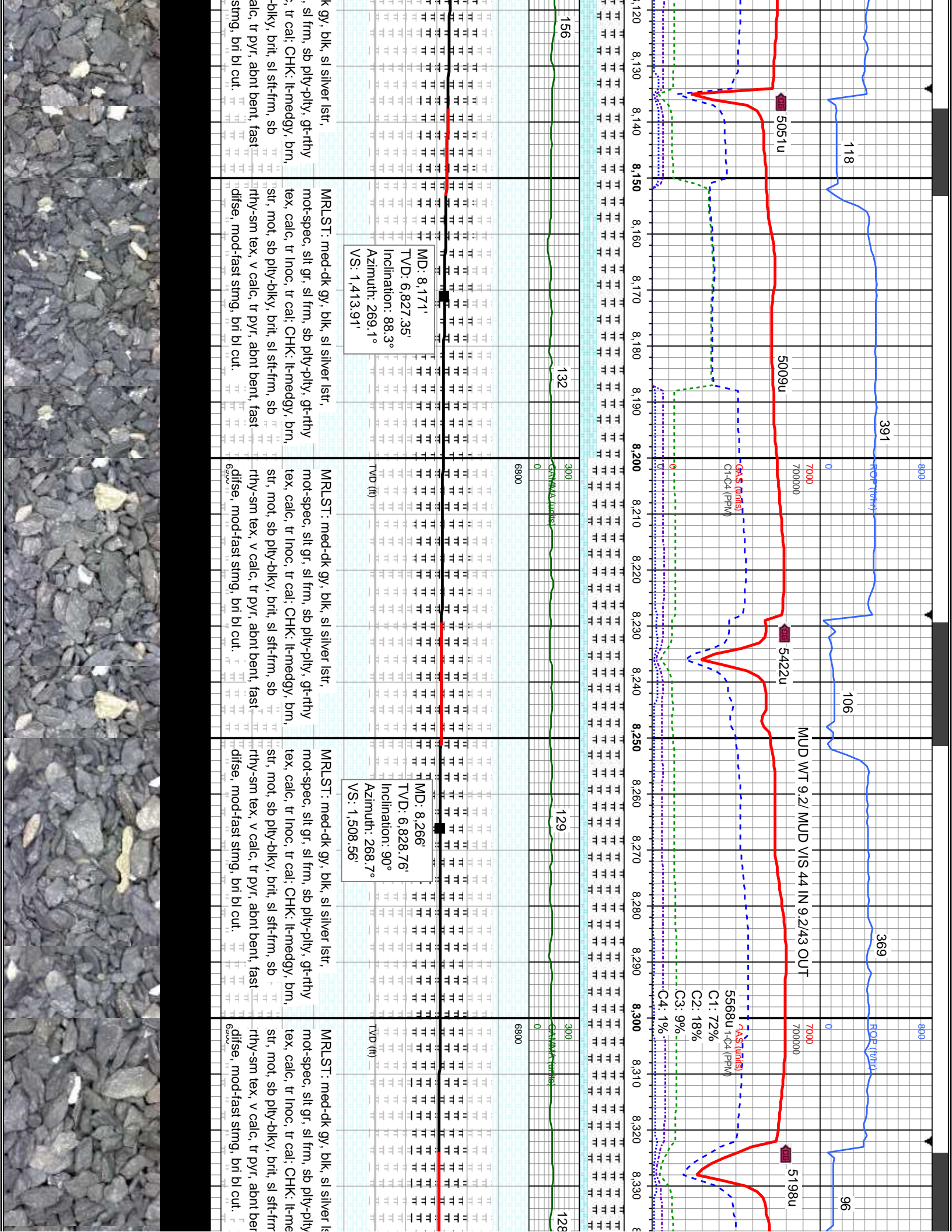




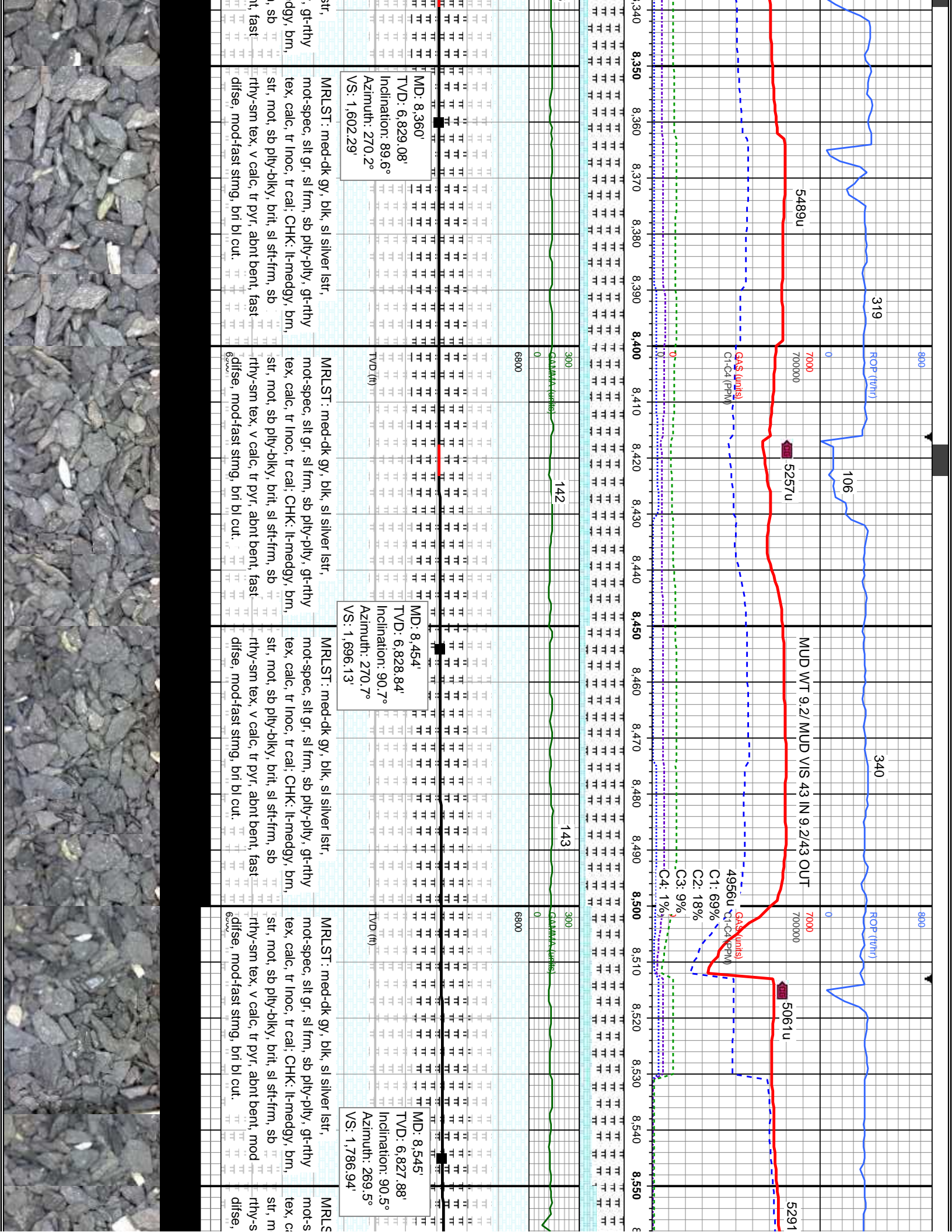


300	6800	300	6800	300	6800
GAMMA (units)	GAMMA (units)	GAMMA (units)	GAMMA (units)	GAMMA (units)	GAMMA (units)
0	129	0	136	0	0
6800	6800	6800	6800	6800	6800
TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)
MD: 7.983'	MD: 7.983'	MD: 8.077'	MD: 8.077'	MD: 8.077'	MD: 8.077'
TVD: 6.821.03'	TVD: 6.821.03'	TVD: 6.824.15'	TVD: 6.824.15'	TVD: 6.824.15'	TVD: 6.824.15'
Inclination: 88.4°	Inclination: 88.4°	Inclination: 87.8°	Inclination: 87.8°	Inclination: 87.8°	Inclination: 87.8°
Azimuth: 269.1°	Azimuth: 269.1°	Azimuth: 268.4°	Azimuth: 268.4°	Azimuth: 268.4°	Azimuth: 268.4°
VS: 1.226.74'	VS: 1.226.74'	VS: 1.320.33'	VS: 1.320.33'	VS: 1.320.33'	VS: 1.320.33'
MRLST: med-dk gy, blk, sl silver lst,	MRLST: med-dk gy, blk, sl silver lst,	MRLST: med-dk gy, blk, sl silver lst,	MRLST: med-dk gy, blk, sl silver lst,	MRLST: med-dk gy, blk, sl silver lst,	MRLST: med-dk gy, blk, sl silver lst,
mot-spec, slt gr, sl frm, sb pily-pily, gt-rthy	mot-spec, slt gr, sl frm, sb pily-pily, gt-rthy	mot-spec, slt gr, sl frm, sb pily-pily, gt-rthy	mot-spec, slt gr, sl frm, sb pily-pily, gt-rthy	mot-spec, slt gr, sl frm, sb pily-pily, gt-rthy	mot-spec, slt gr, sl frm, sb pily-pily, gt-rthy
tex, calc, tr inoc, tr cal; CHK: lt-medgy, brn,	tex, calc, tr inoc, tr cal; CHK: lt-medgy, brn,	tex, calc, tr inoc, tr cal; CHK: lt-medgy, brn,	tex, calc, tr inoc, tr cal; CHK: lt-medgy, brn,	tex, calc, tr inoc, tr cal; CHK: lt-medgy, brn,	tex, calc, tr inoc, tr cal; CHK: lt-medgy, brn,
str, mot, sb pily-biky, brit, sl sft-frm, sb	str, mot, sb pily-biky, brit, sl sft-frm, sb	str, mot, sb pily-biky, brit, sl sft-frm, sb	str, mot, sb pily-biky, brit, sl sft-frm, sb	str, mot, sb pily-biky, brit, sl sft-frm, sb	str, mot, sb pily-biky, brit, sl sft-frm, sb
rthy-sm tex, v calc, tr pyr, abnt bent, fast	rthy-sm tex, v calc, tr pyr, abnt bent, fast	rthy-sm tex, v calc, tr pyr, abnt bent, fast	rthy-sm tex, v calc, tr pyr, abnt bent, fast	rthy-sm tex, v calc, tr pyr, abnt bent, fast	rthy-sm tex, v calc, tr pyr, abnt bent, fast
dfise, mod-fast stmg, bri bl cut.	dfise, mod-fast stmg, bri bl cut.	dfise, mod-fast stmg, bri bl cut.	dfise, mod-fast stmg, bri bl cut.	dfise, mod-fast stmg, bri bl cut.	dfise, mod-fast stmg, bri bl cut.









8/31/2015

ROP (ft/hr)

68

5448u

7000

7000

MUD WT 9.3/ MUD VIS 44 IN 9.3/44 OUT

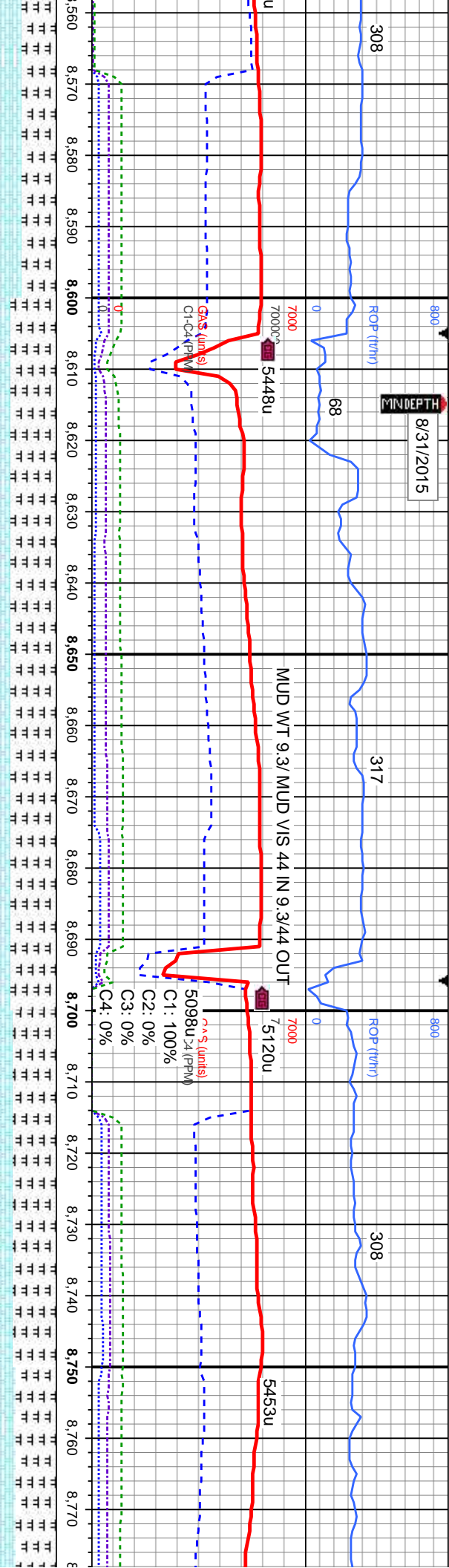
ROP (ft/hr)

5120u

7000

7000

5453u



132

138

148

MD: 8.637'  
TVD: 6.827.16'  
Inclination: 90.4°  
Azimuth: 270.2°  
VS: 1.878.73'

MD: 8.728'  
TVD: 6.827.4'  
Inclination: 89.3°  
Azimuth: 268.6°  
VS: 1.969.46'

TT: med-dk gy, blk, sl silver lst, spec, sit gr, sl frm, sb ply-pty, gr-rthy alac, tr inoc, tr cal; CHK: lt-medgy, bm, sb ply-blky, brit, sl sft-frm, sb mod tex, v calc, tr pyr, abnt bent, mod-fast stmg, bri bl cut.

MRLST: med-dk gy, blk, sl silver lst, mot-spec, sit gr, sl frm, sb ply-pty, gr-rthy tex, calc, tr inoc, tr cal; CHK: lt-medgy, bm, str, mot, sb ply-blky, brit, sl sft-frm, sb rthy-sm tex, v calc, tr pyr, abnt bent, mod difse, mod-fast stmg, bri bl cut.

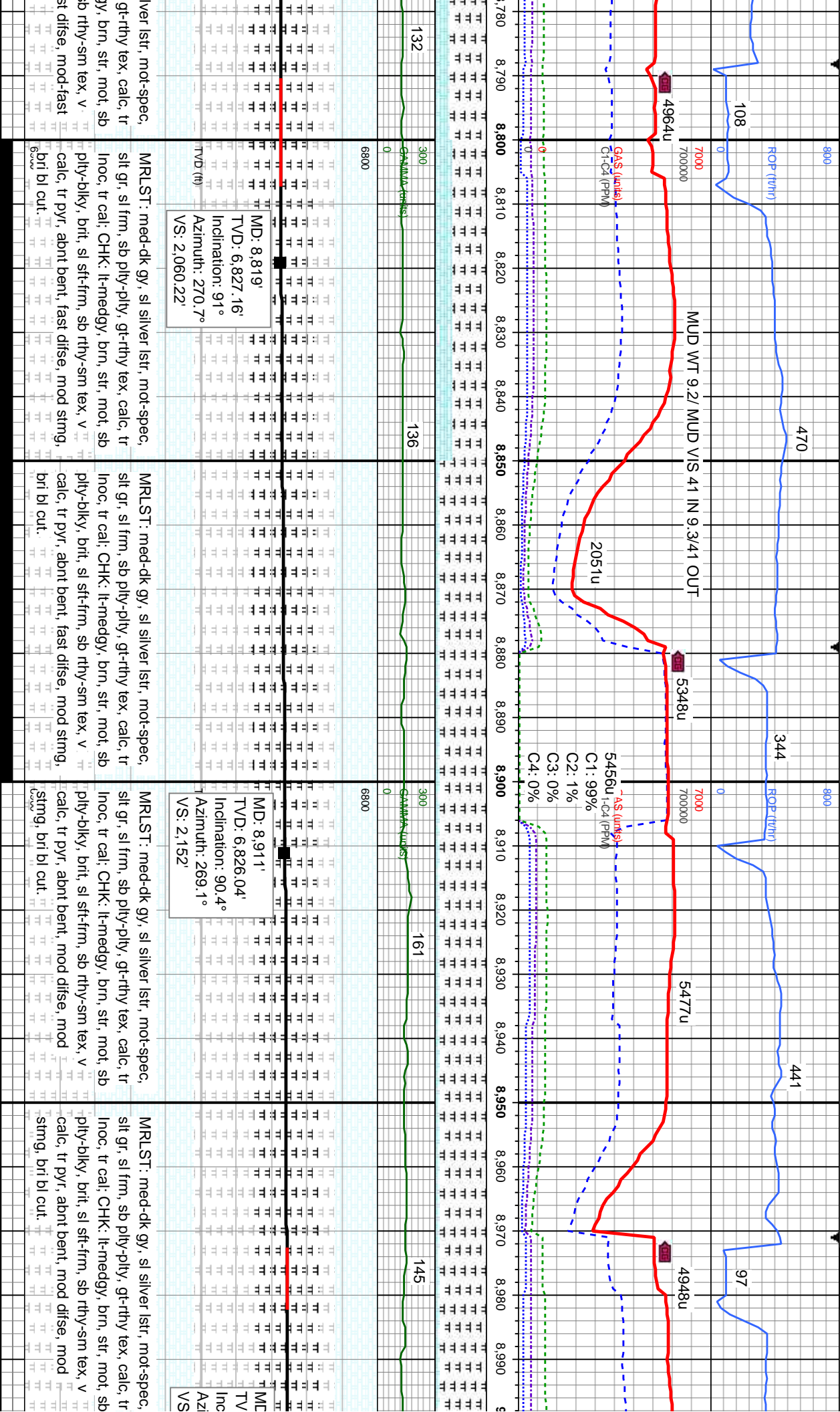
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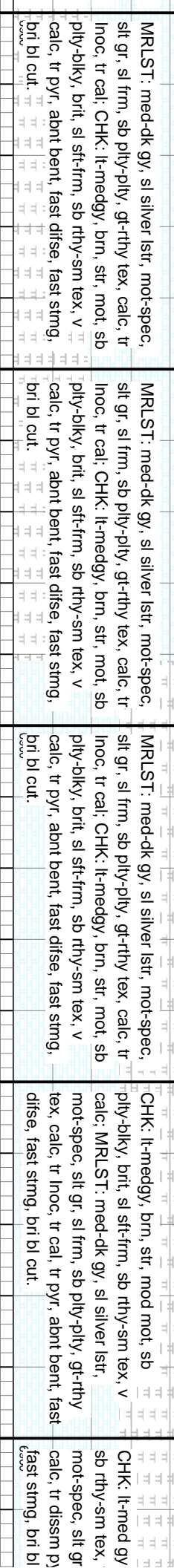
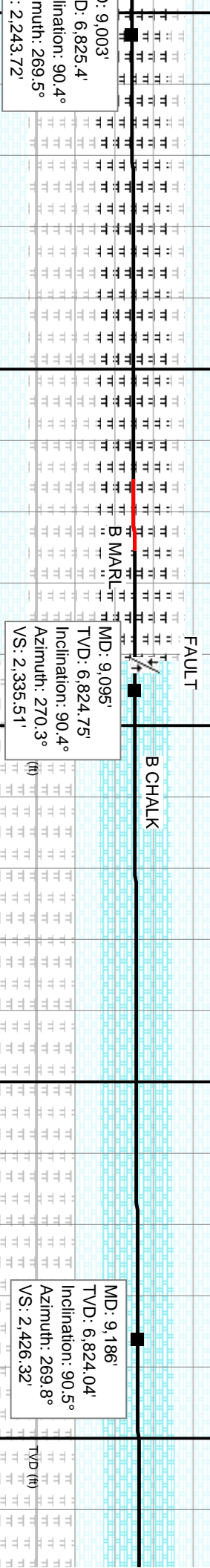
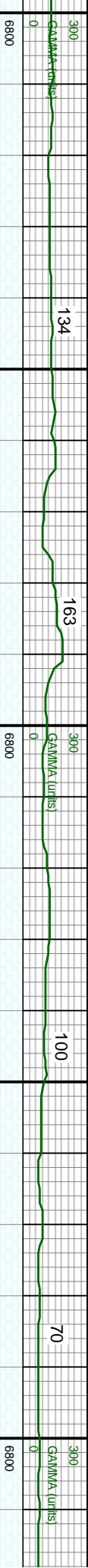
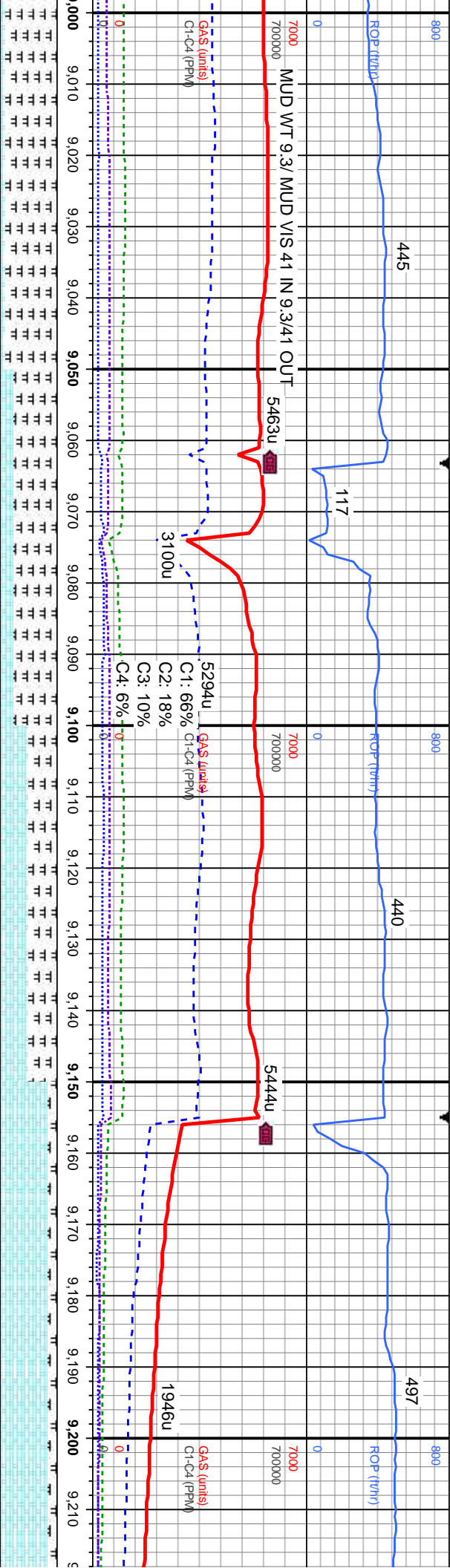
MRLST: med-dk gy, blk, sl silver lst, mot-spec, sit gr, sl frm, sb ply-pty, gr-rthy tex, calc, tr inoc, tr cal; CHK: lt-medgy, bm, str, mot, sb ply-blky, brit, sl sft-frm, sb rthy-sm tex, v calc, tr pyr, abnt bent, mod difse, mod-fast stmg, bri bl cut.

MRLST: med-dk gy, sl sit gr, sl frm, sb ply-pty, inoc, tr cal; CHK: lt-medgy, sb ply-blky, brit, sl sft-frm, s calc, tr pyr, abnt bent, fast stmg, bri bl cut.

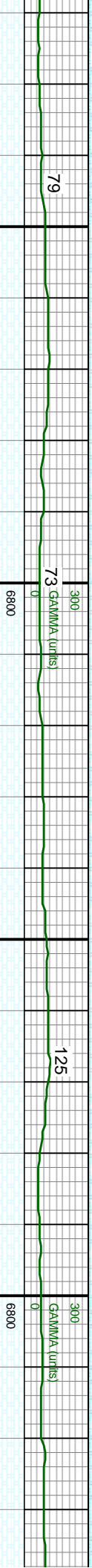
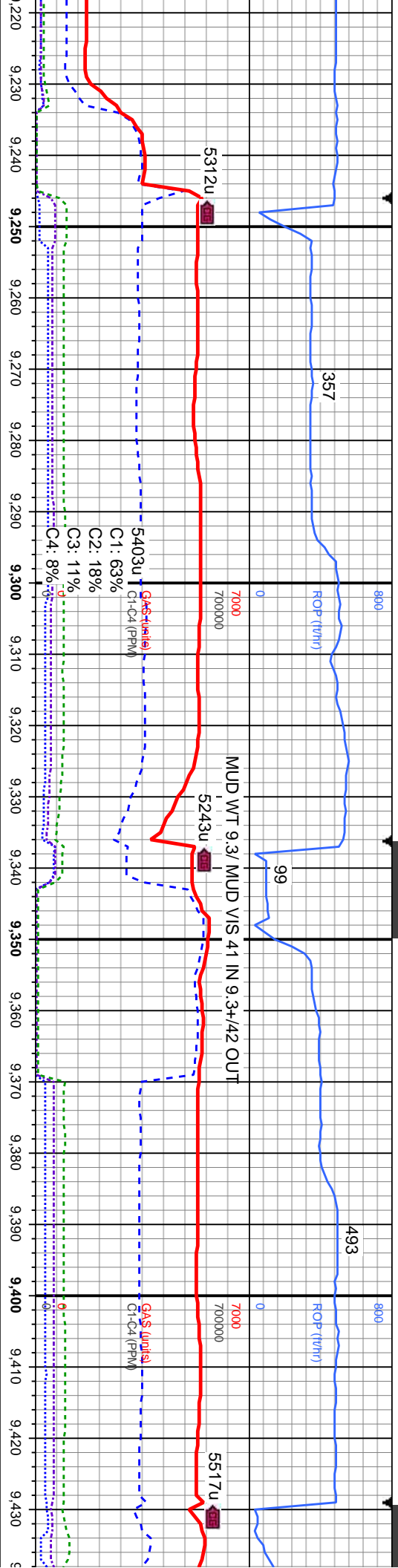












MD: 9,278'

TVD: 6,822.51'

Inclination: 91.4°

Azimuth: 270.2°  
VS: 2518.1'

V0.2,010.1

str, sb ply-bilky, brit, sl sft, v calc; MRLST: med-dk gy, , sl frm, sb ply-pity, gt tex, tr inoc, bent, fast dfse, cut.

CHK: li-med gy, str, sb ply-diky, brit, sl sft, sb rthy-sm tex, v calc; MRLST: med-dk gy mot-spec, sit gr, sl frm, sb ply-ply, gt tex, calc, tr dissim pyr, tr inoc, bent, fast disse, fast strng, bri bl cut.

CHK: It-med gy, str, sb ply-biky, brit, sl sft, sb rhy-sm tex, v calc; MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb ply-ply, gt tex, calc, tr dissim pyr, tr inoc, bent, fast disse, fast string, bri bl cut.

CHK: It-med gy, str, sb plyt-dlky, brit, sl sft, sb rthy-sm tex, v calc; MRLST: med-dk gy, mot-spec, sl gr, sl frm, sb plyt-ply, gt tex, calc, tr dissn pyr, tr inoc, bent, fast difse, fast smng, bri bl cut.

CHK: lt-med gy, str, sb pily-dlky, b  
sb rhy-sm tex, v calc; MRLST: me  
mot-spec, sit gr, sl frm, sb pily-pily  
calc, tr dissm pyr, tr inoc, tr bent, f  
fast string, bri bl cut.

MD: 9,369

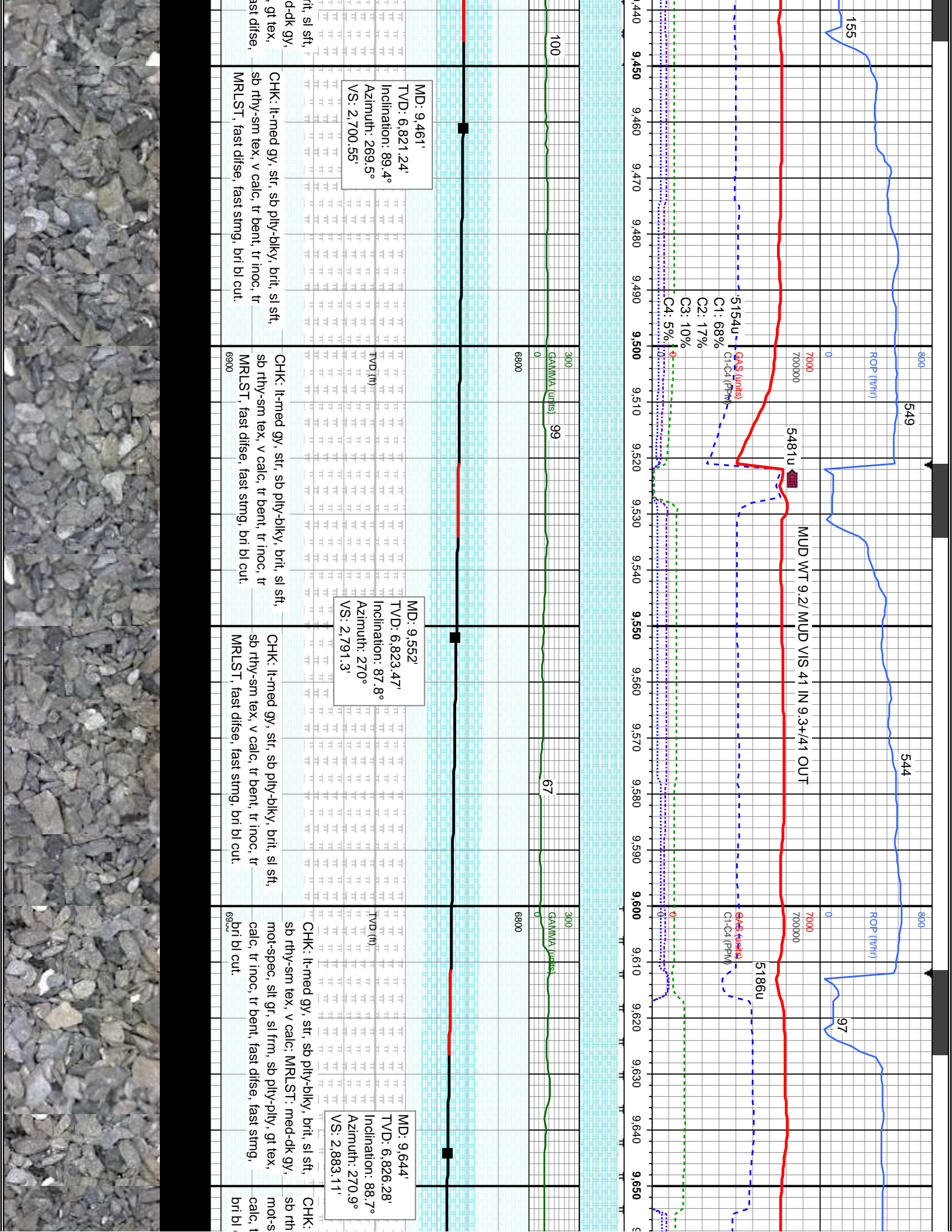
TVD: 6,821.08'

Incubation: 90.4°  
A-zimuth: 268.0°

VS. 2 608 84

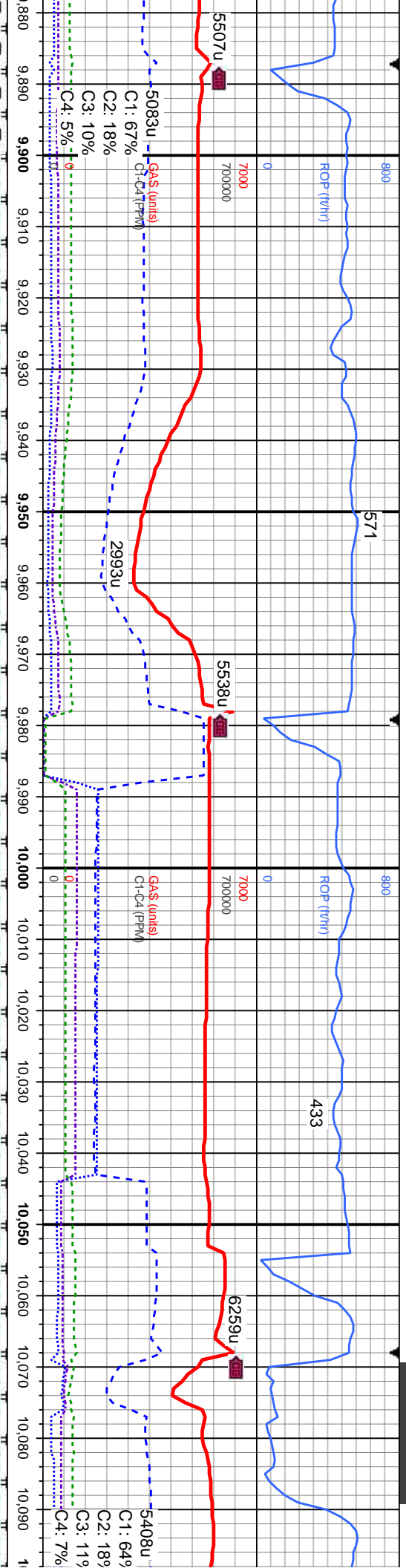
1. **Introduction**

CHK: lt-med gy, str, sb pily-dlky, b  
sb rhy-sm tex, v calc; MRLST: me  
mot-spec, sit gr, sl frm, sb pily-pily  
calc, tr dissm pyr, tr inoc, tr bent, f  
fast string, bri bl cut.





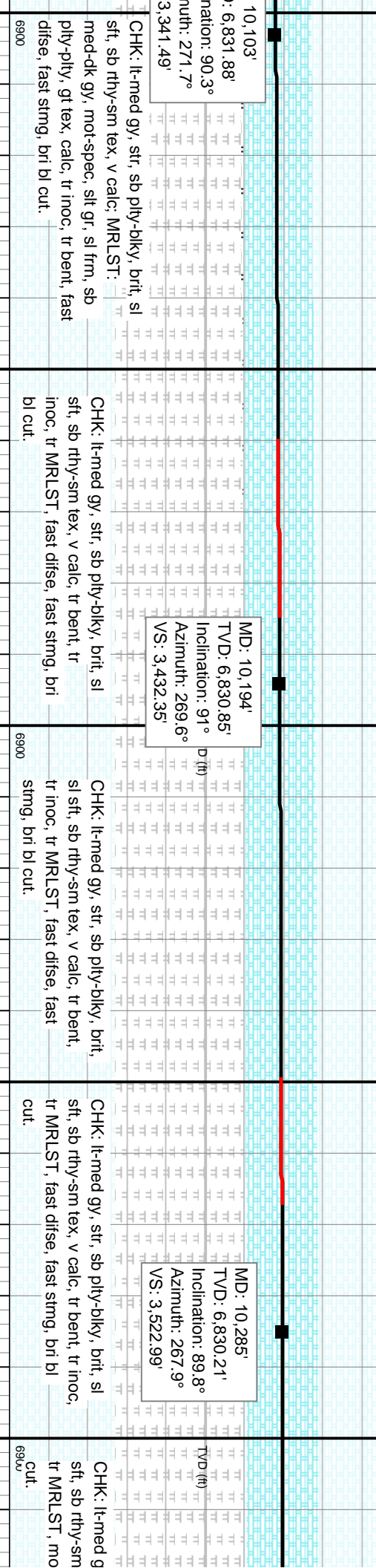
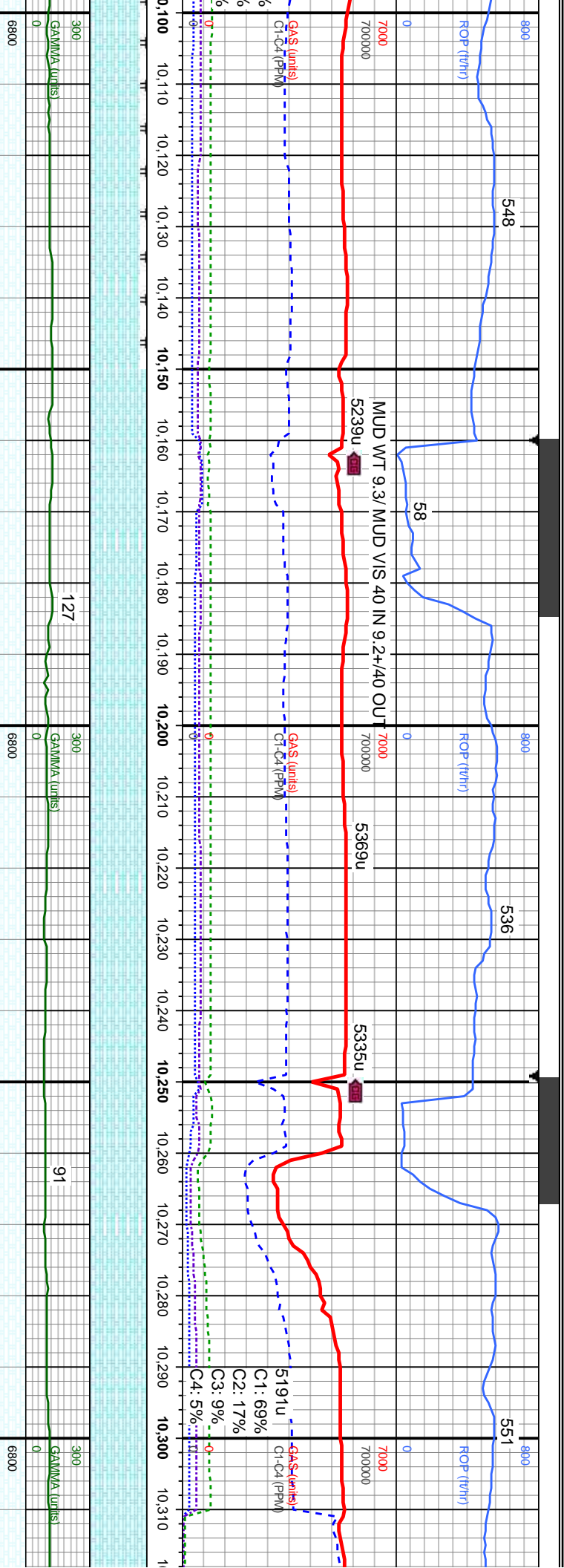




300	115	114	300	120
GAMMA (units)	GAMMA (units)	GAMMA (units)	GAMMA (units)	GAMMA (units)
0	0	0	0	0
6800	6800	6800	6800	6800
6900	6900	6900	6900	6900
MD: 9,919'				
TVD: 6,830.84'				
Inclination: 89.8°				
Azimuth: 270.9°				
VS: 3,157.64'				
CHK: It-med gy, str, sb pty-blky, brit, sl sft, sb rthy-sm tex, v calc; MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pty-pty, gt tex, calc, tr inoc, tr bent, fast difse, fast string, bri bl cut.				
MD: 10,011'				
TVD: 6,831.56'				
Inclination: 89.3°				
Azimuth: 271.7°				
VS: 3,249.55'				
CHK: It-med gy, str, sb pty-blky, brit, sl sft, sb rthy-sm tex, v calc; MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pty-pty, gt tex, calc, tr inoc, tr bent, fast difse, fast string, bri bl cut.				
MD: 10,011'				
TVD: 6,831.56'				
Inclination: 89.3°				
Azimuth: 271.7°				
VS: 3,249.55'				
CHK: It-med gy, str, sb pty-blky, brit, sl sft, sb rthy-sm tex, v calc; MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pty-pty, gt tex, calc, tr inoc, tr bent, fast difse, fast string, bri bl cut.				







MD: 10,103'  
TVD: 6,831.88'  
Inclination: 90.3°  
Azimuth: 271.7°  
VS: 3,341.49'

CHK: It-med gy, str, sb pty-blky, brit, sl  
sft, sb rthy-sm tex, v calc, MRLST:  
med-dk gy, mot-spec, sft gr, sl frm, sb  
pty-pty, gt tex, calc, tr inoc, tr bent, fast  
dise, fast stmg, bri bl cut.

MD: 10,194'  
TVD: 6,830.85'  
Inclination: 91°  
Azimuth: 269.6°  
VS: 3,432.35'

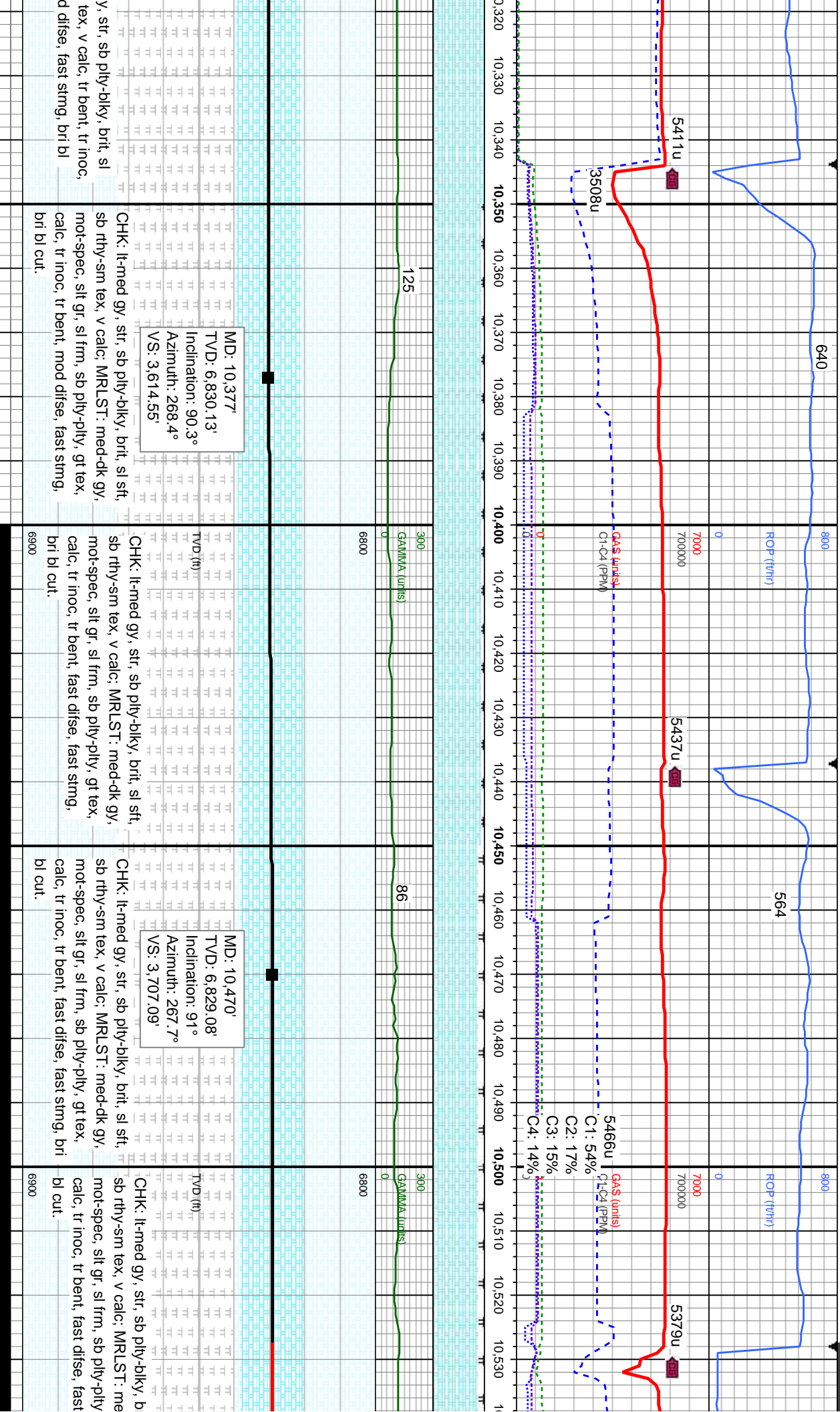
CHK: It-med gy, str, sb pty-blky, brit, sl  
sft, sb rthy-sm tex, v calc, tr bent, tr  
inoc, tr MRLST, fast dise, fast stmg, bri  
bl cut.

MD: 10,285'  
TVD: 6,830.21'  
Inclination: 89.8°  
Azimuth: 267.9°  
VS: 3,522.99'

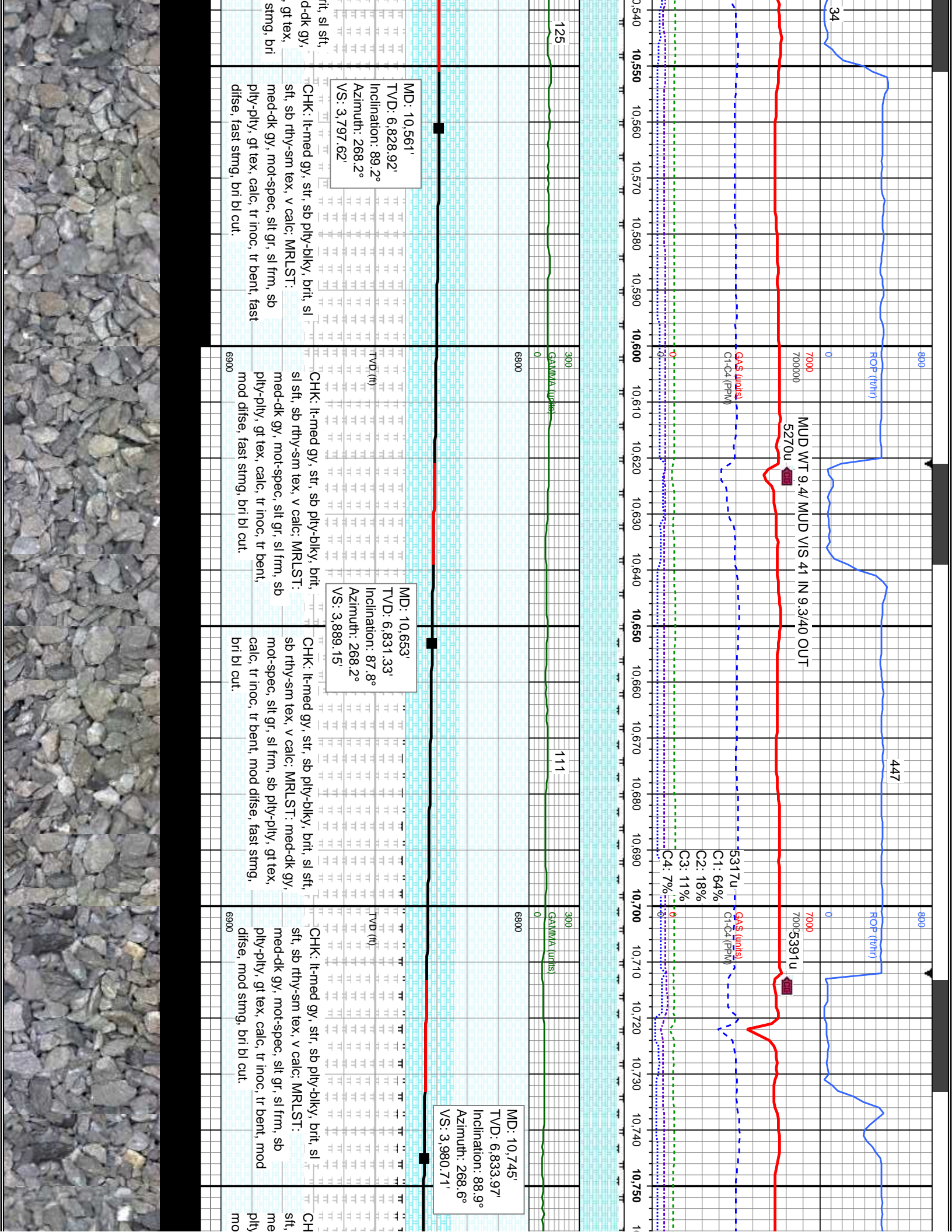
CHK: It-med gy, str, sb pty-blky, brit, sl  
sft, sb rthy-sm tex, v calc, tr bent, tr inoc,  
tr MRLST, fast dise, fast stmg, bri bl  
cut.

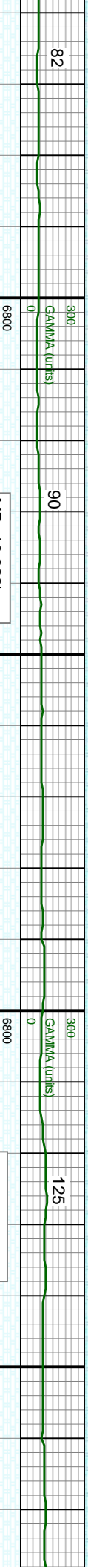
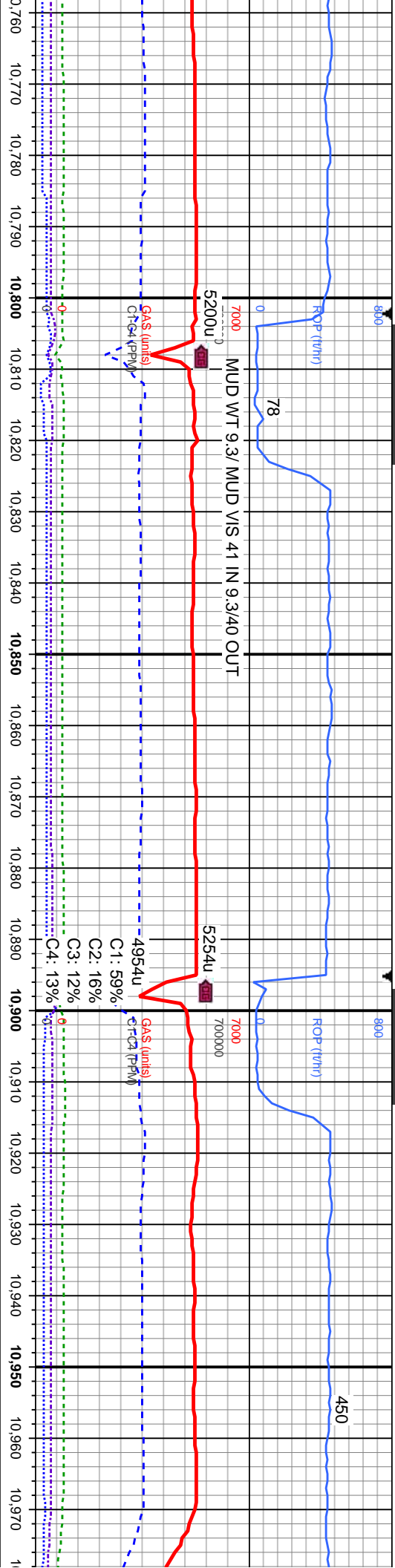
CHK: It-med g  
sft, sb rthy-sm  
tr MRLST, mo  
cut.











MD: 10,836'  
TVD: 6,834.85'  
Inclination: 90°  
Azimuth: 268.7°  
VS: 4,071.34'

MD: 10,928'  
TVD: 6,834.85'  
Inclination: 90°  
Azimuth: 270.2°  
VS: 4,163.08'

K: il-med gy, str, sb ply-blky, brrt, sb rhy-sm tex, v calc; MRST: d-dk gy, mot-spec, slt gr, sl frm, sb ply, gr tex, calc, tr inoc, tr bent, difse, mod stmg, bri bl cut.

CHK: l=med gy, str, sb pily-diky, brt, s  
sft, sb rhy-sm tex, v calc, MRLST:  
med-dk gy, mot-spec, sit gr, si frm, sb  
pily-pily, gt tex, calc, tr inoc, tr bent, fast  
dise, fast smng, bri bl cut.

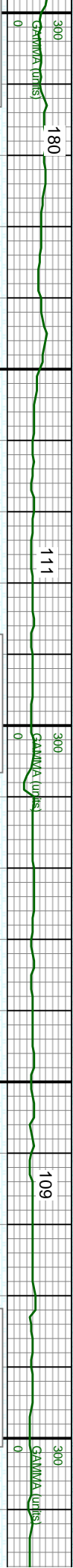
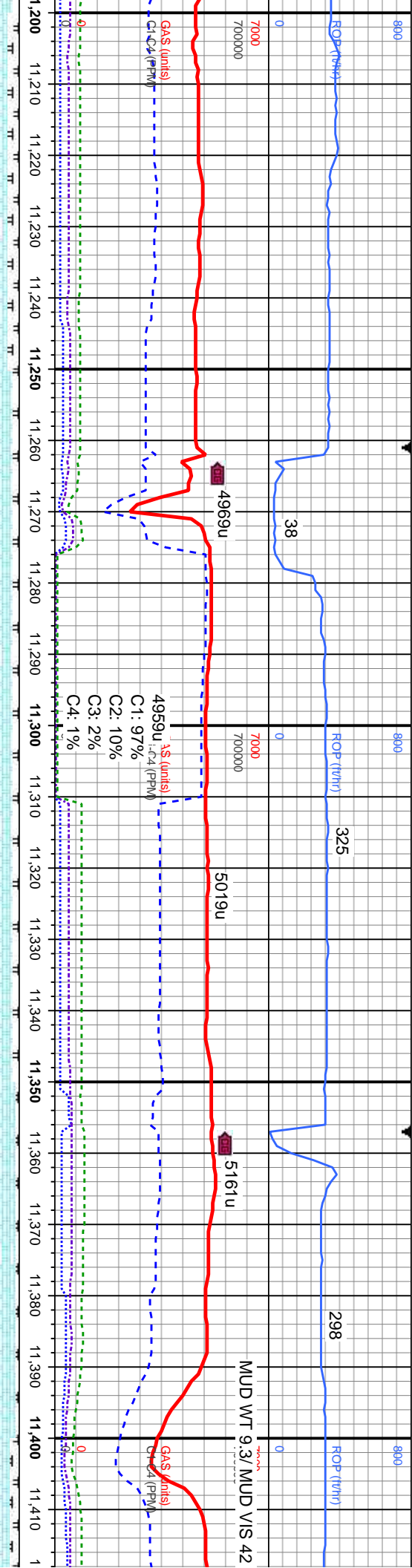
CHK: lt-med gy, str, sb ply-blk/, brit, sl sft, sb rthy-sm tex, v calc; MRLST: med-dk gy/ mot-spec, slt gr, sl frm, sb ply-ply, gt tex, calc, tr inoc, tr bent, fast difse, fast strng, bri bl cut.

sb rthy-sm tex, v calc: MRLST: med-dk gy  
mot-spec, silt gr, sl frm, sb ply-ply, gt tex,  
calc, tr inoc, tr bent, fast difse, fast string,  
bri bl cut.

CHK: It-med gy, str, sb  
sft, sb rthy-sm tex, v ca  
med-dk gy, mot-spec, s  
ply-ply, gt tex, calc, tr  
dise, fast stmg, bri bl c







11,203'  
D: 6,832.84'  
Inclination: 91.1°  
muht: 268.9°  
4,437.24'

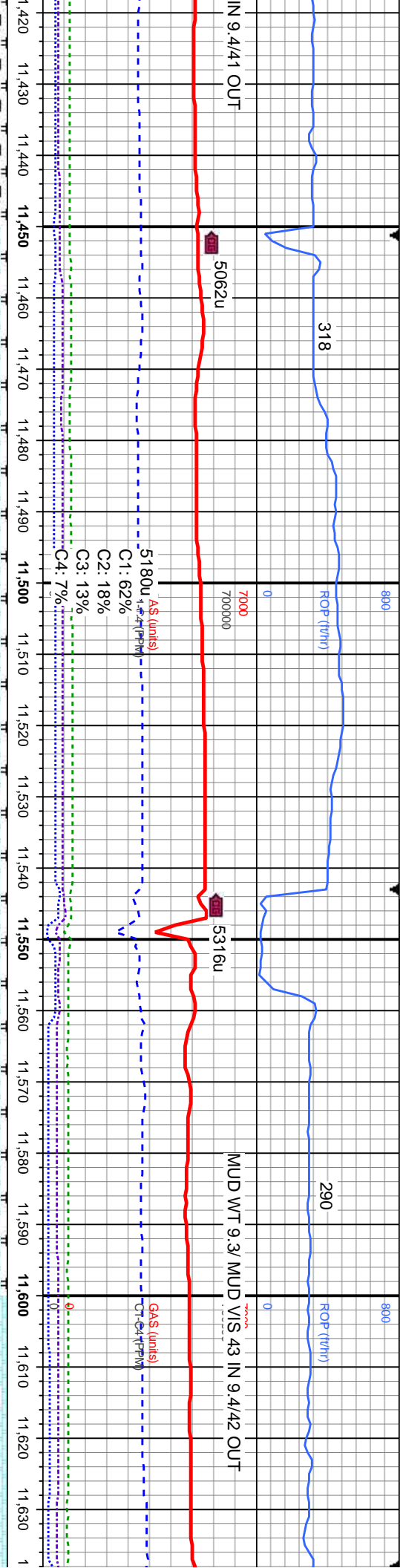
MD: 11,297'  
TVD: 6,832.19'  
Inclination: 89.7°  
Azimuth: 269.8°  
VS: 4,530.96'

MD: 11,391'  
TVD: 6,832.68'  
Inclination: 89.7°  
Azimuth: 270.5°  
VS: 4,624.77'

TYD (ft)	11,200	11,210	11,220	11,230	11,240	11,250	11,260	11,270	11,280	11,290	11,300	11,310	11,320	11,330	11,340	11,350	11,360	11,370	11,380	11,390	11,400	11,410
CHK: It-med gy, str, sb pty-blky, brit, sl sft, sb rthy-sm tex, v calc; MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pty-pty, gt tex, calc, tr inoc, tr bent, fast difse, fast stmg, bri bl cut.	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT
CHK: It-med gy, str, sb pty-blky, brit, sl sft, sb rthy-sm tex, v calc; MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pty-pty, gt tex, calc, tr inoc, tr bent, mod difse, mod-fast stmg, bri bl cut.	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT
CHK: It-med gy sl brn, str, sb pty-blky, brit, sl sft, sb rthy-sm tex, v calc; MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pty-pty, gt tex, calc, tr inoc, tr bent, mod difse, mod-fast stmg, bri bl cut.	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT
CHK: It-med gy sl brn, str, sb pty-blky, brit, sl sft, sb rthy-sm tex, v calc; MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pty-pty, gt tex, calc, tr inoc, tr bent, fast difse, fast stmg, bri bl cut.	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT

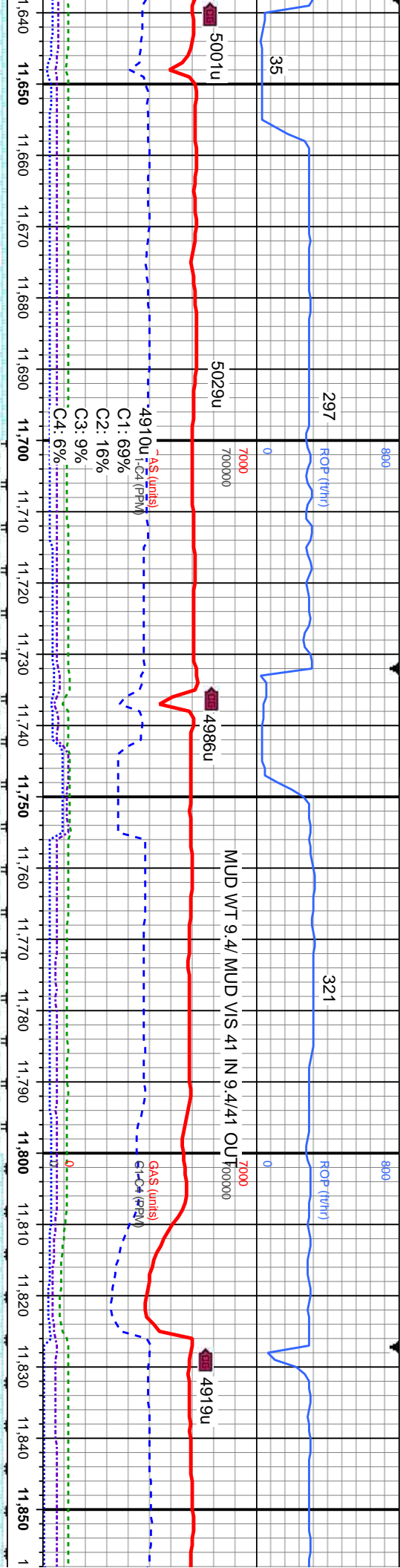






104	300	100	102	300
GAMMA (units)	GAMMA (units)	GAMMA (units)	GAMMA (units)	GAMMA (units)
0	0	0	0	0
6800	6800	6800	6800	6800
6900	6900	6900	6900	6900
sl brn, str, sb pty-blky, rhy-sm tex, v calc; MRLST: s-spec, slt gr, sl frm, sb calc, tr inoc, tr bent, fast , bri bl cut.	CHK: lt-med gy sl brn, str, sb pty-blky, brit, sl sft, sb rhy-sm tex, v calc; MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pty-pty, gt tex, calc, tr inoc, tr bent, fast difse, fast stmg, bri bl cut.	CHK: lt-med gy sl brn, str, sb pty-blky, brit, sl sft, sb rhy-sm tex, v calc; MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pty-pty, gt tex, calc, tr inoc, tr bent, fast difse, fast stmg, bri bl cut.	CHK: lt-med gy sl brn, str, sb pty-blky, brit, sl sft, sb rhy-sm tex, v calc; MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pty-pty, gt tex, calc, tr inoc, tr bent, fast difse, fast stmg, bri bl cut.	CHK: lt-med gy sl brn, str, sb pty-blky, brit, sl sft, sb rhy-sm tex, tr mrlst, t calc, fast difse, fast stmg, bri bl cut





MD: 11,674'  
TVD: 6,833.99'  
Inclination: 89.1°  
Azimuth: 268.7°  
VS: 4,906.94'

MD: 11,768'  
TVD: 6,835.55'  
Inclination: 89°  
Azimuth: 270.9°  
VS: 5,000.69'

MD:  
TVD  
Inclir  
Azim  
VS: :

CHK: lt-med gy sl brn, str, sb pty-blky, brit, sl sft, sb rthy-sm tex, tr mlst, tr inoc, v calc, fast difse, fast strng, bri bl cut.

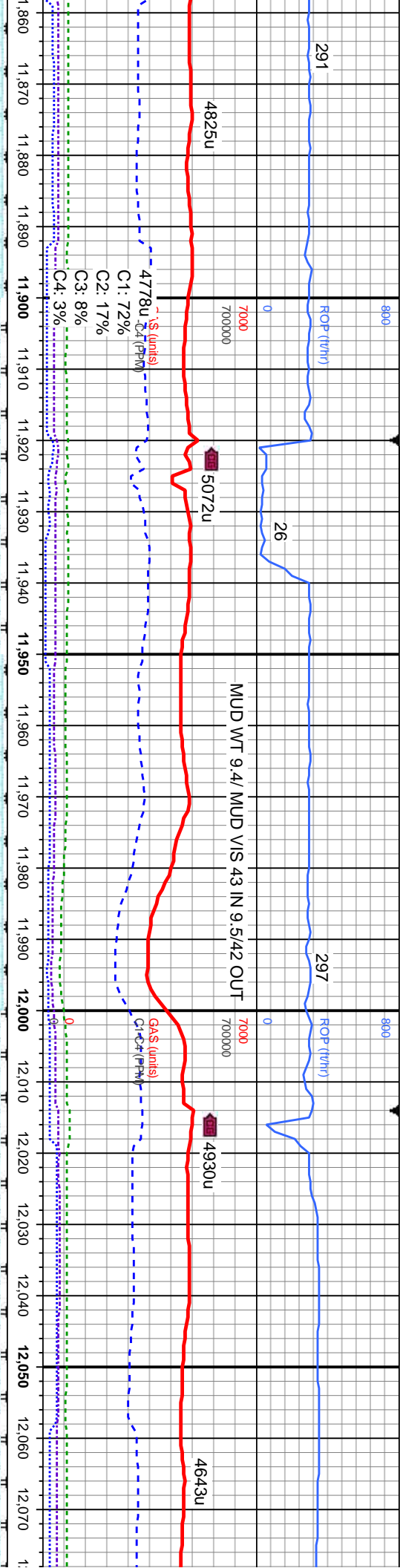
CHK: lt-med gy sl brn, str, sb pty-blky, brit, sl sft, sb rthy-sm tex, v calc; MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pty-pty, gt tex, calc, tr inoc, tr bent, fast difse, fast strng, bri bl cut.

CHK: lt-med gy sl brn, str, sb pty-blky, brit, sl sft, sb rthy-sm tex, v calc; MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pty-pty, gt tex, calc, tr inoc, tr bent, fast difse, fast strng, bri bl cut.

CHK: lt-med gy sl brn, str, sb pty-blky, brit, s med- pty-p difse,





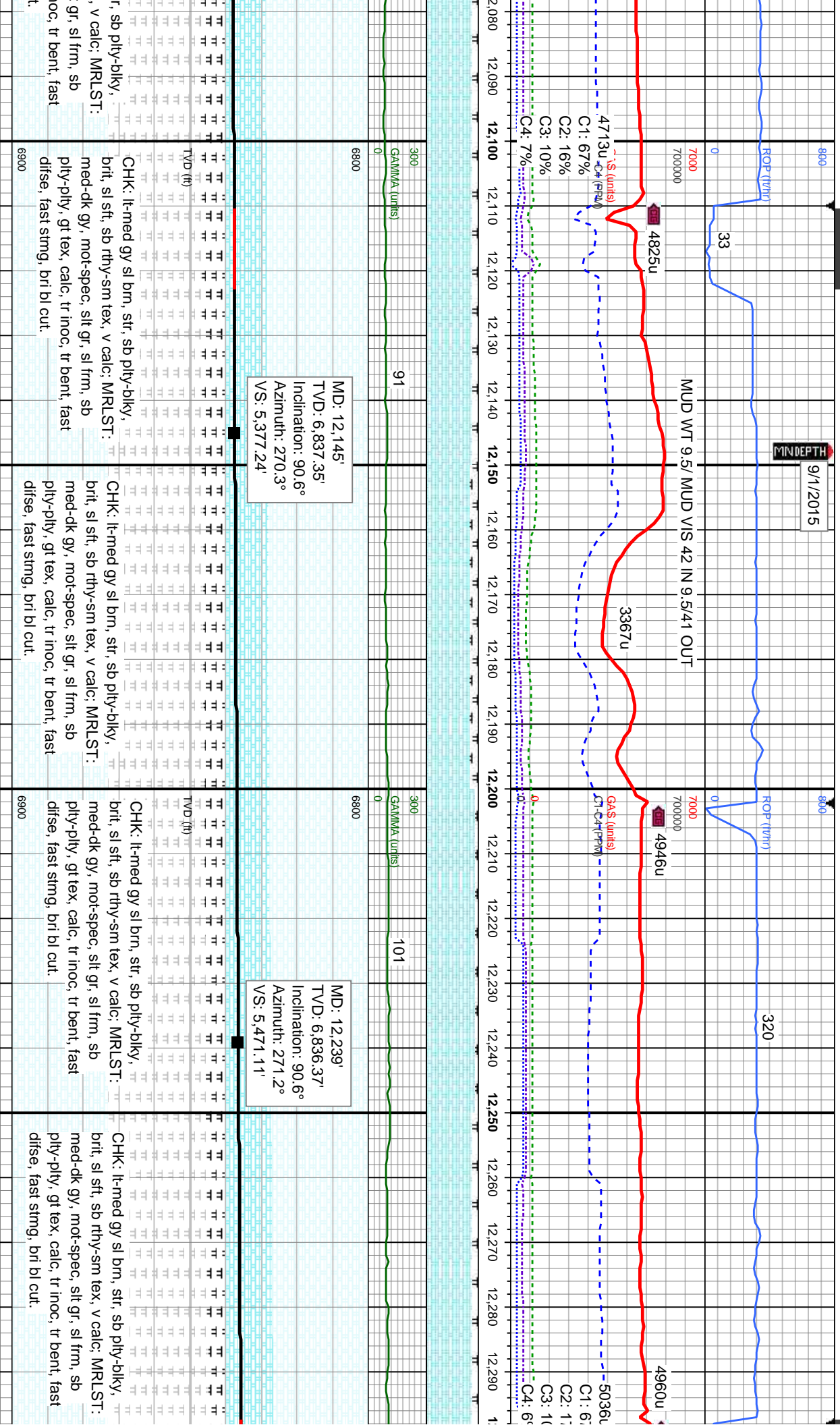


11,862'  
6,837.36'  
ation: 88.8°  
uth: 270.2°  
5,094.53'

MD: 11,956'  
TVD: 6,838.18'  
Inclination: 90.2°  
Azimuth: 271.6°  
VS: 5,188.4'

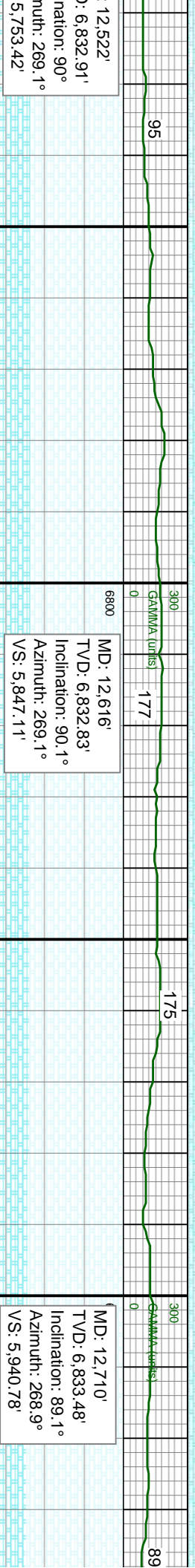
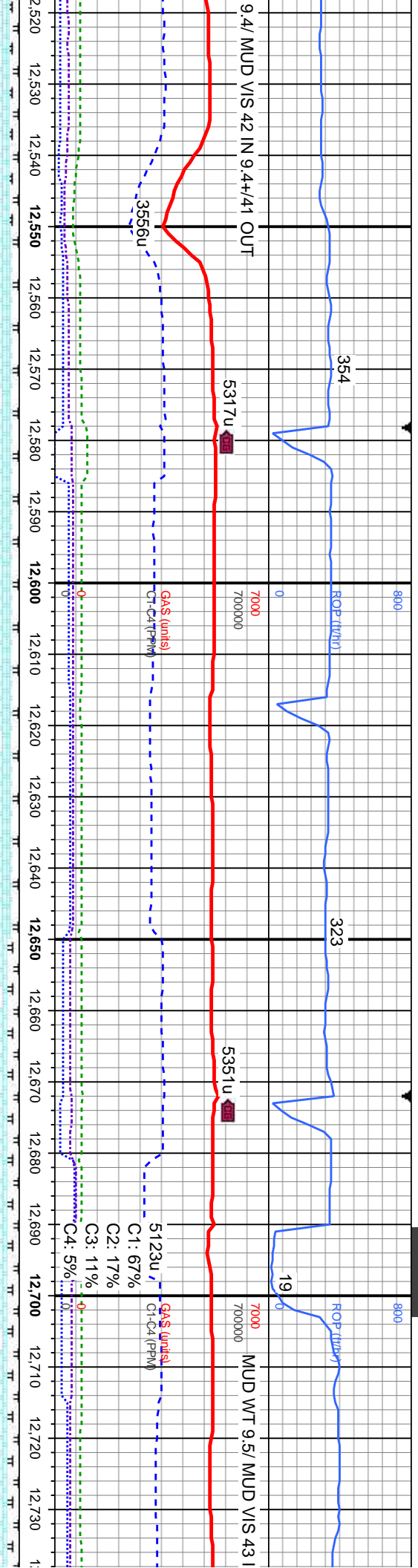
MD: 12,051'  
TVD: 6,837.93'  
Inclination: 90.1°  
Azimuth: 271.9°  
VS: 5,283.35'

11,860	11,870	11,880	11,890	11,900	11,910	11,920	11,930	11,940	11,950	11,960	11,970	11,980	11,990	12,000	12,010	12,020	12,030	12,040	12,050	12,060	12,070
ROP (ft/hr)	291						26						297								
MUD WT (9.4)																					
MUD VIS (43 IN 9.5/42 OUT)																					
C1: 72%																					
C2: 17%																					
C3: 8%																					
C4: 3%																					
ROP (ft/hr)	291						26						297								
MUD WT (9.4)																					
MUD VIS (43 IN 9.5/42 OUT)																					
C1: 72%																					
C2: 17%																					
C3: 8%																					
C4: 3%																					
ROP (ft/hr)	291						26						297								
MUD WT (9.4)																					
MUD VIS (43 IN 9.5/42 OUT)																					
C1: 72%																					
C2: 17%																					
C3: 8%																					
C4: 3%																					
ROP (ft/hr)	291						26						297								
MUD WT (9.4)																					
MUD VIS (43 IN 9.5/42 OUT)																					
C1: 72%																					
C2: 17%																					
C3: 8%																					
C4: 3%																					
ROP (ft/hr)	291						26						297								
MUD WT (9.4)																					
MUD VIS (43 IN 9.5/42 OUT)																					
C1: 72%																					
C2: 17%																					
C3: 8%																					
C4: 3%																					
ROP (ft/hr)	291						26						297								
MUD WT (9.4)																					
MUD VIS (43 IN 9.5/42 OUT)																					
C1: 72%																					
C2: 17%																					
C3: 8%																					
C4: 3%																					
ROP (ft/hr)	291						26						297								
MUD WT (9.4)																					
MUD VIS (43 IN 9.5/42 OUT)																					
C1: 72%																					
C2: 17%																					
C3: 8%																					
C4: 3%																					
ROP (ft/hr)	291						26						297								
MUD WT (9.4)																					
MUD VIS (43 IN 9.5/42 OUT)																					
C1: 72%																					
C2: 17%																					
C3: 8%																					
C4: 3%																					
ROP (ft/hr)	291						26						297								
MUD WT (9.4)																					
MUD VIS (43 IN 9.5/42 OUT)																					
C1: 72%																					
C2: 17%																					
C3: 8%																					
C4: 3%																					
ROP (ft/hr)	291						26						297								
MUD WT (9.4)																					
MUD VIS (43 IN 9.5/42 OUT)																					
C1: 72%																					
C2: 17%																					
C3: 8%																					
C4: 3%																					
ROP (ft/hr)	291						26						297								
MUD WT (9.4)																					
MUD VIS (43 IN 9.5/42 OUT)																					
C1: 72%																					
C2: 17%																					
C3: 8%																					
C4: 3%																					
ROP (ft/hr)	291						26						297								
MUD WT (9.4)																					
MUD VIS (43 IN 9.5/42 OUT)																					
C1: 72%																					
C2: 17%																					
C3: 8%																					
C4: 3%																					
ROP (ft/hr)	291						26						297								
MUD WT (9.4)																					
MUD VIS (43 IN 9.5/42 OUT)																					
C1: 72%																					
C2: 17%																					
C3: 8%																					
C4: 3%																					
ROP (ft/hr)	291						26						297								
MUD WT (9.4)																					
MUD VIS (43 IN 9.5/42 OUT)																					
C1: 72%																					
C2: 17%																					
C3: 8%																					
C4: 3%																					
ROP (ft/hr)	291						26						297								
MUD WT (9.4)																					
MUD VIS (43 IN 9.5/42 OUT)																					
C1: 72%																					
C2: 17%																					
C3: 8%																					
C4: 3%																					
ROP (ft/hr)	291						26						297								
MUD WT (9.4)																					
MUD VIS (43 IN 9.5/42 OUT)																					
C1: 72%																					
C2: 17%																					
C3: 8%																					
C4: 3%																					
ROP (ft/hr)	291						26						297								
MUD WT (9.4)																					
MUD VIS (43 IN 9.5/42 OUT)																					
C1: 72%																					
C2: 17%																					





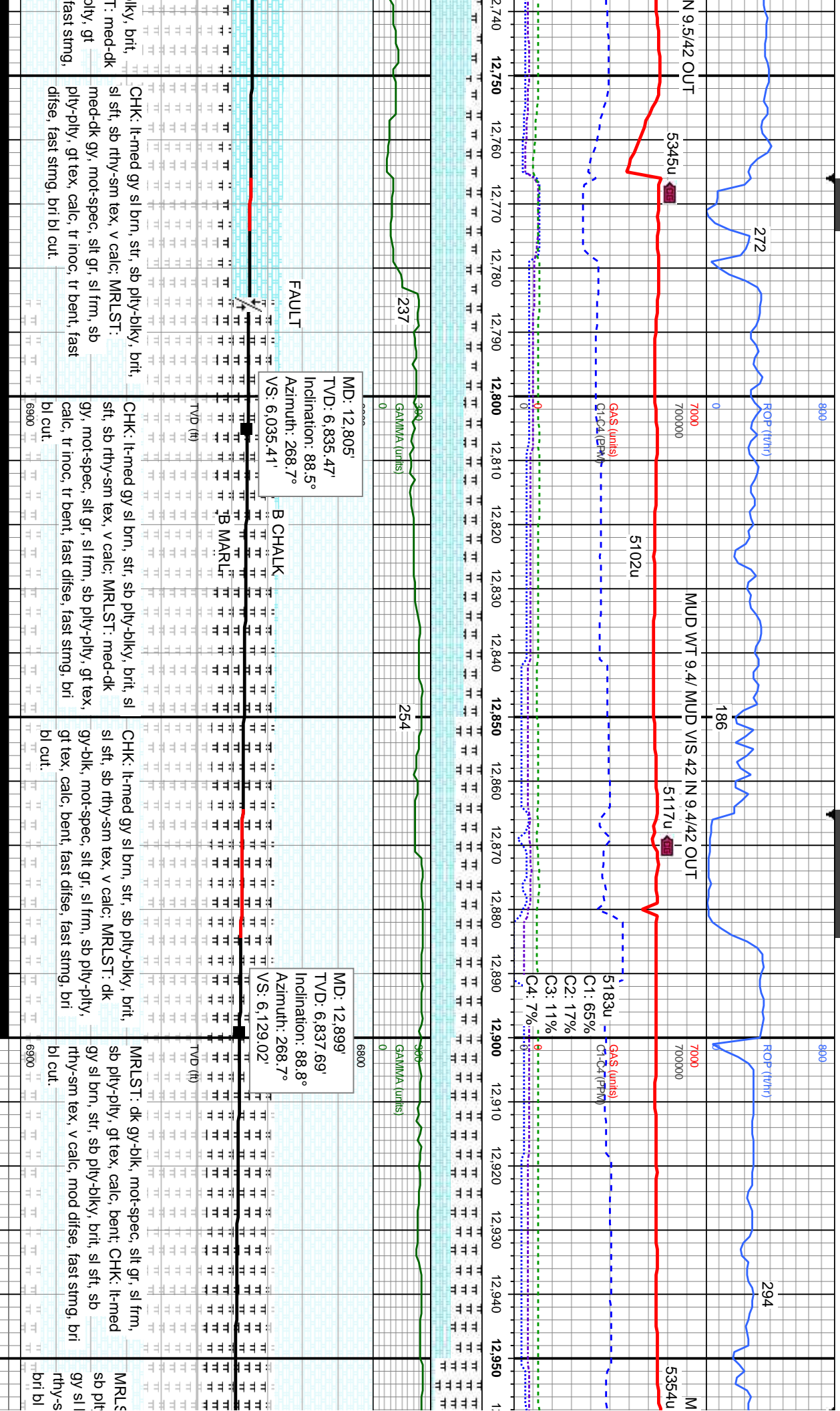


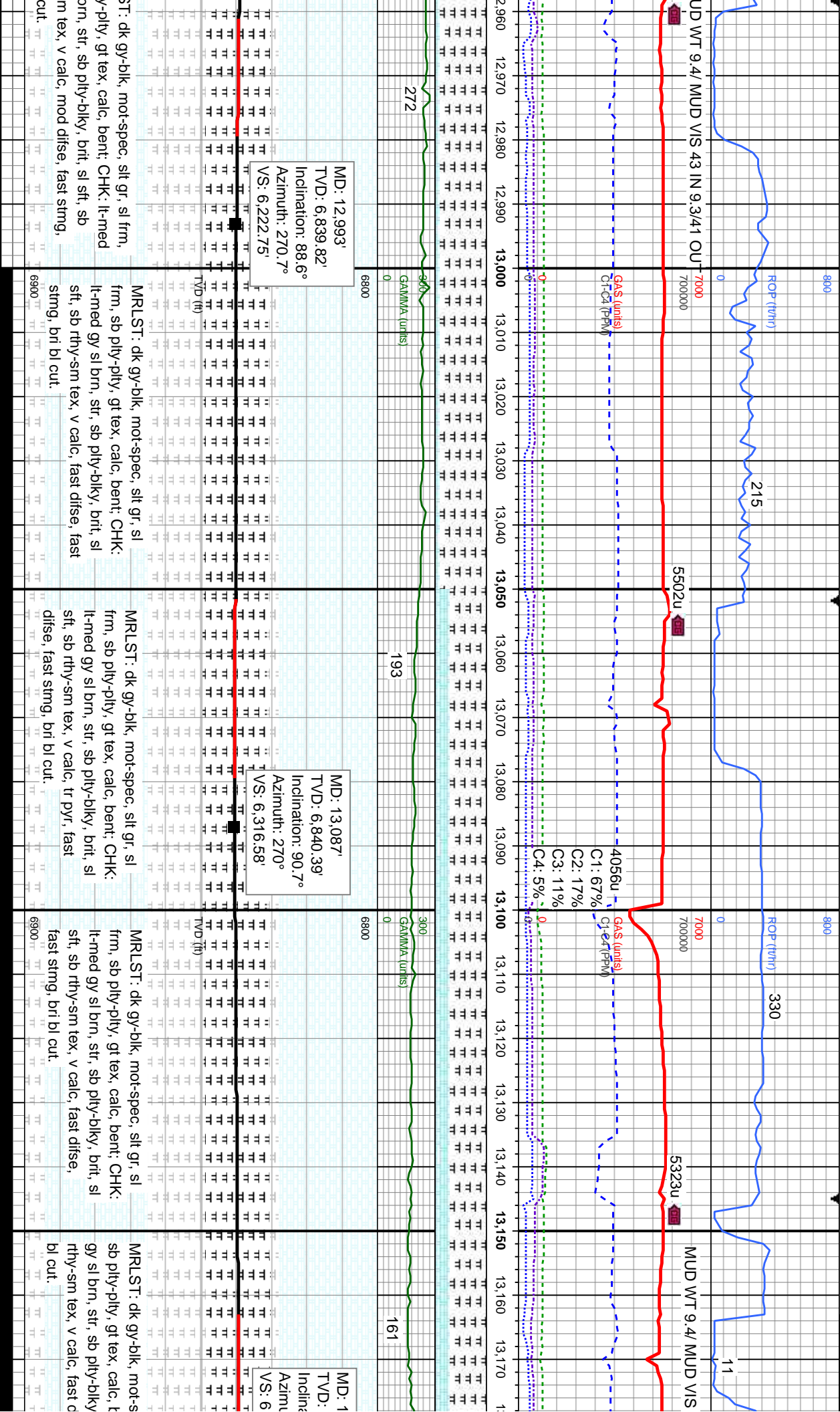


12,522'	sl brn, str, sb pily-biky, brit, n tex, v calc; MRLST: -spec, slt gr, sl frm, sb calc, tr inoc, tr bent, fast bri bl cut.	CHK: It-med gy sl brn, str, sb pily-biky, brit, sl sft, sb rthy-sm tex, v calc; MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pily-pily, gt tex, calc, tr inoc, tr bent, fast difse, fast stmg, bri bl cut.	CHK: It-med gy sl brn, str, sb pily-biky, brit, sl sft, sb rthy-sm tex, v calc; MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pily-pily, gt tex, calc, tr inoc, tr bent, fast difse, fast stmg, bri bl cut.	CHK: It-med gy sl brn, str, sb pily-biky, brit, sl sft, sb rthy-sm tex, v calc; MRLST: med-dk gy, mot-spec, slt gr, sl frm, sb pily-pily, gt tex, calc, tr inoc, tr bent, fast difse, fast stmg, bri bl cut.
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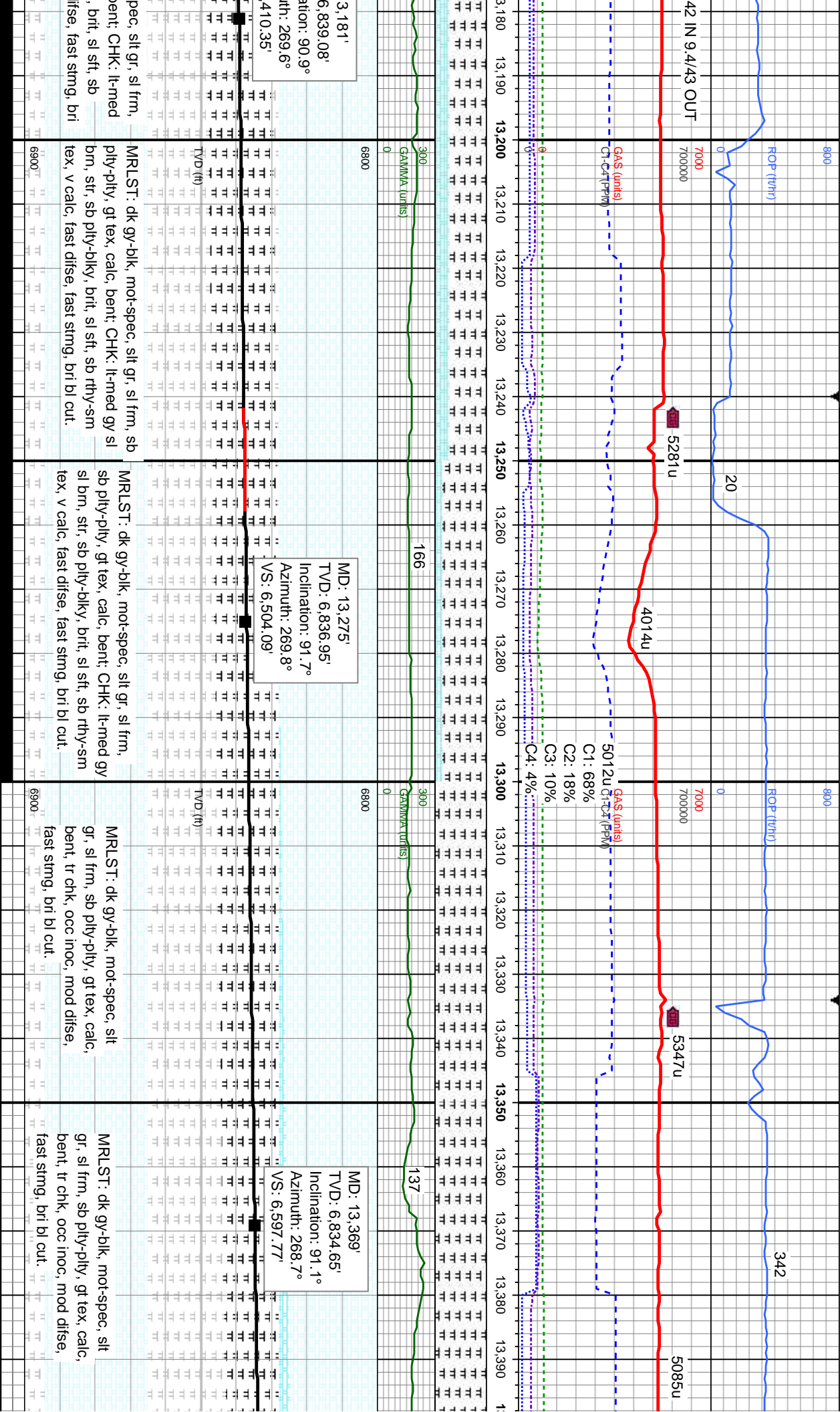


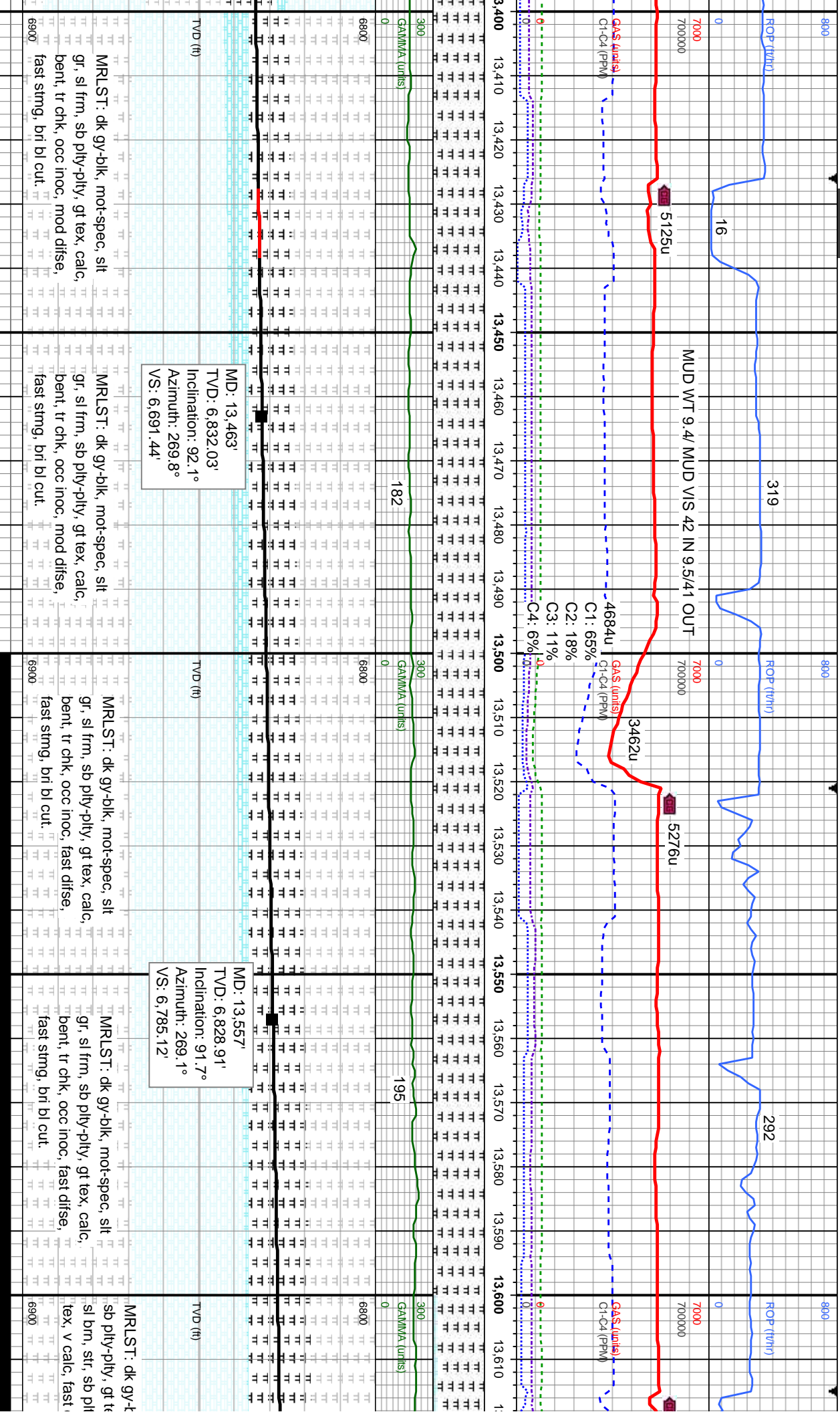




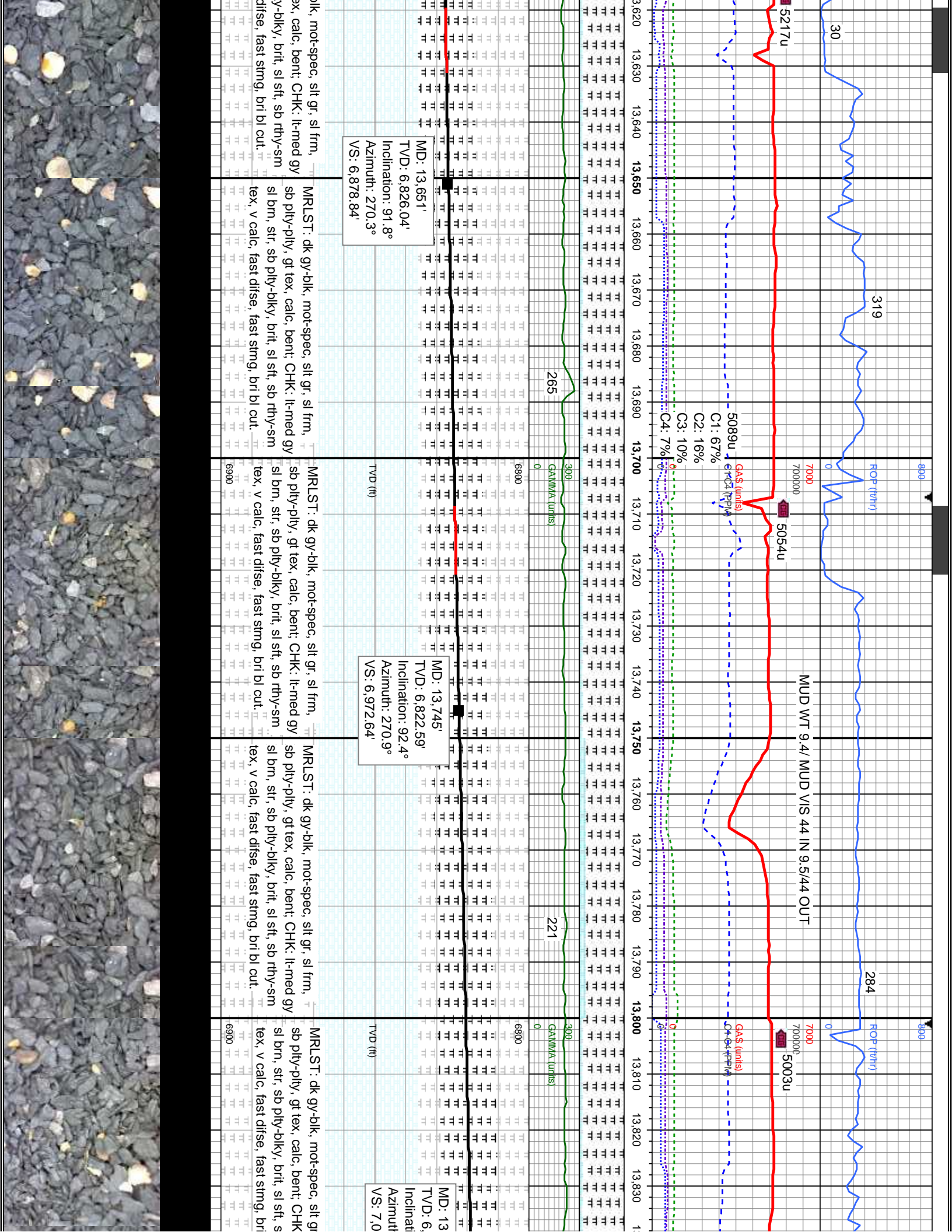


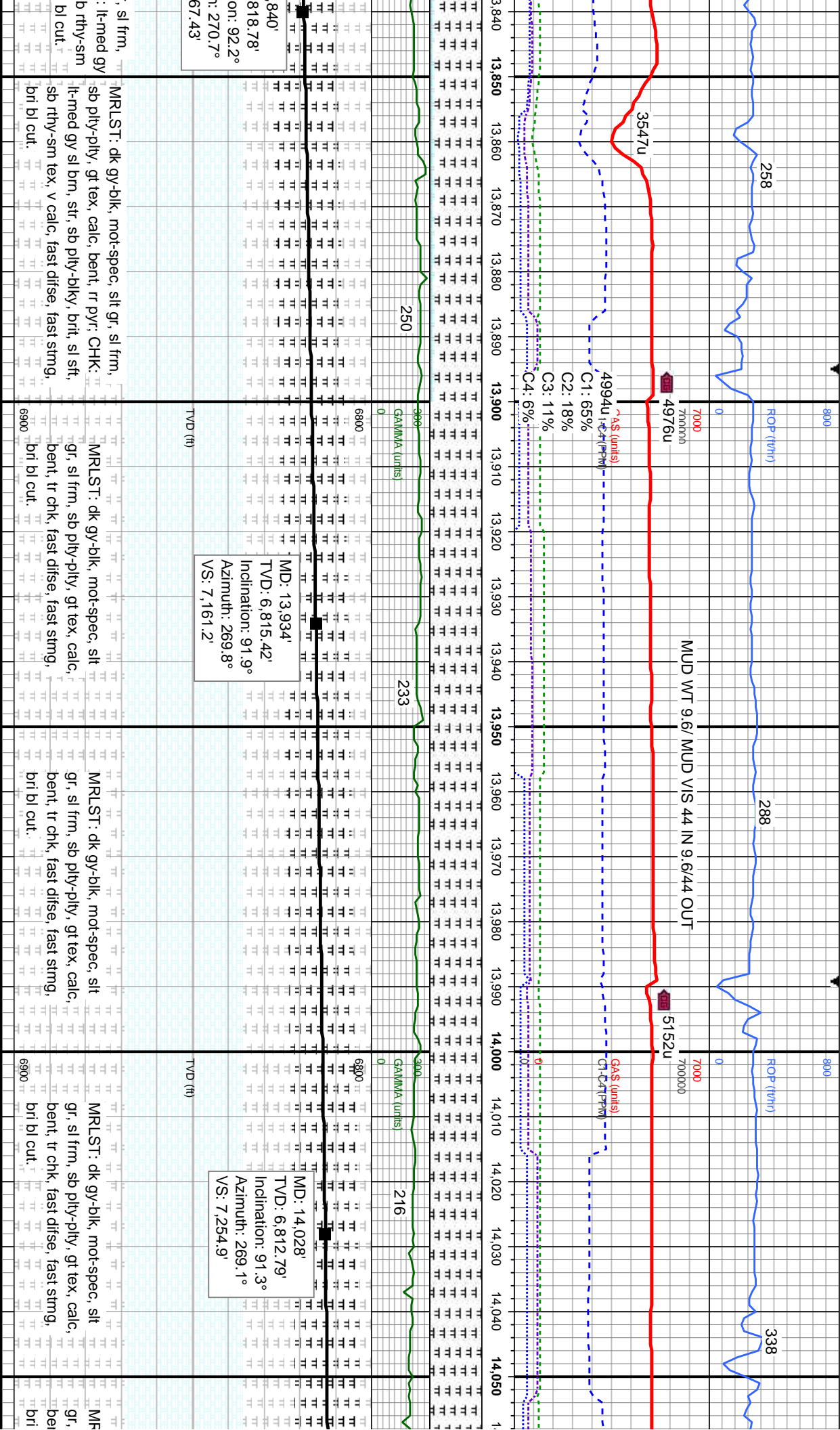






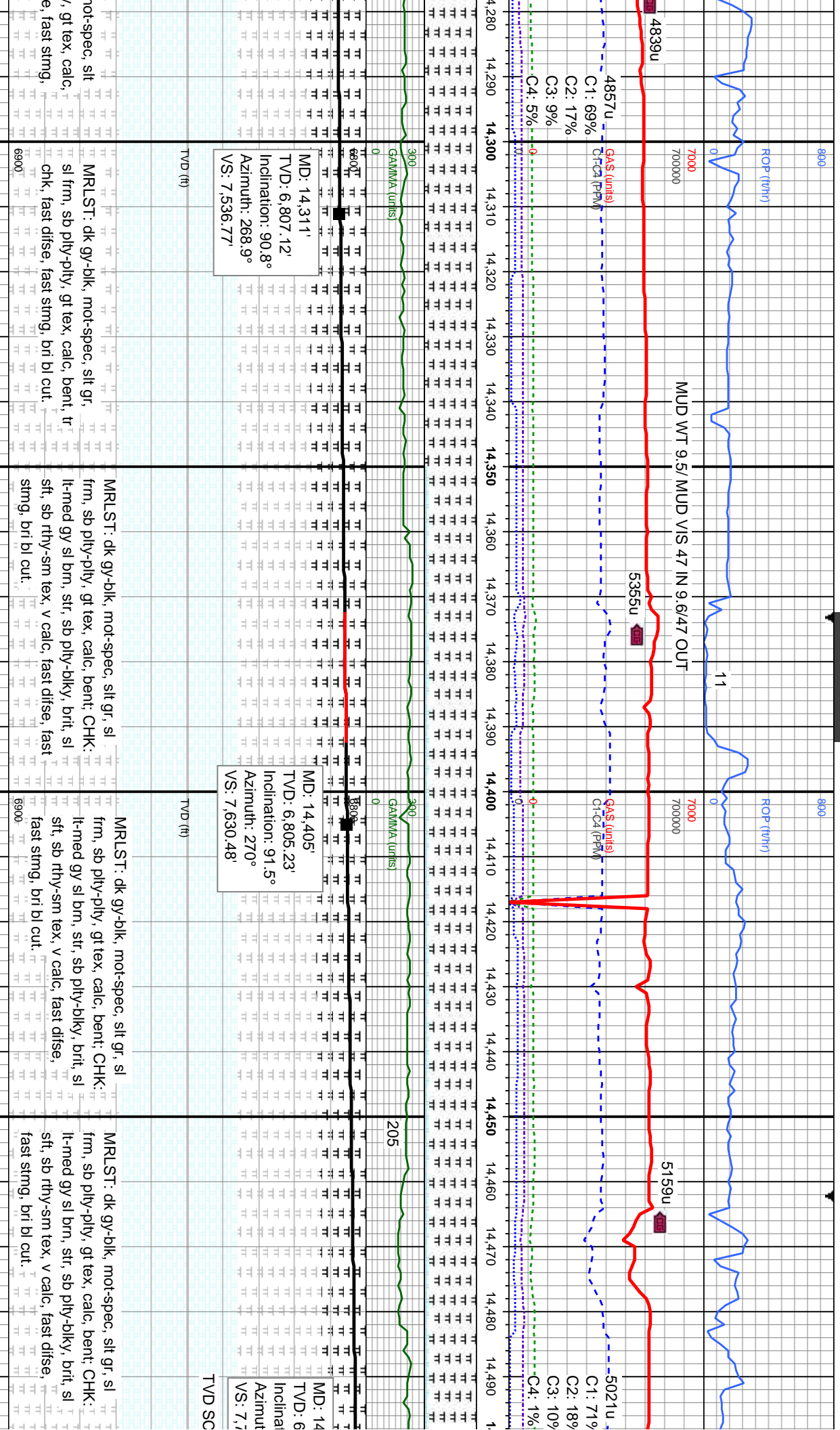




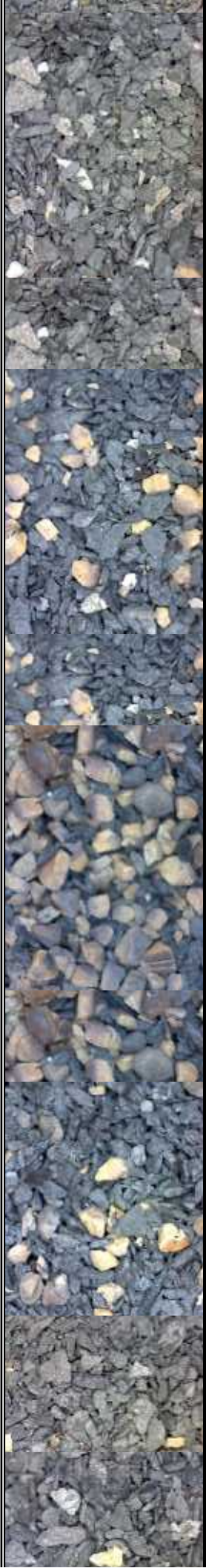
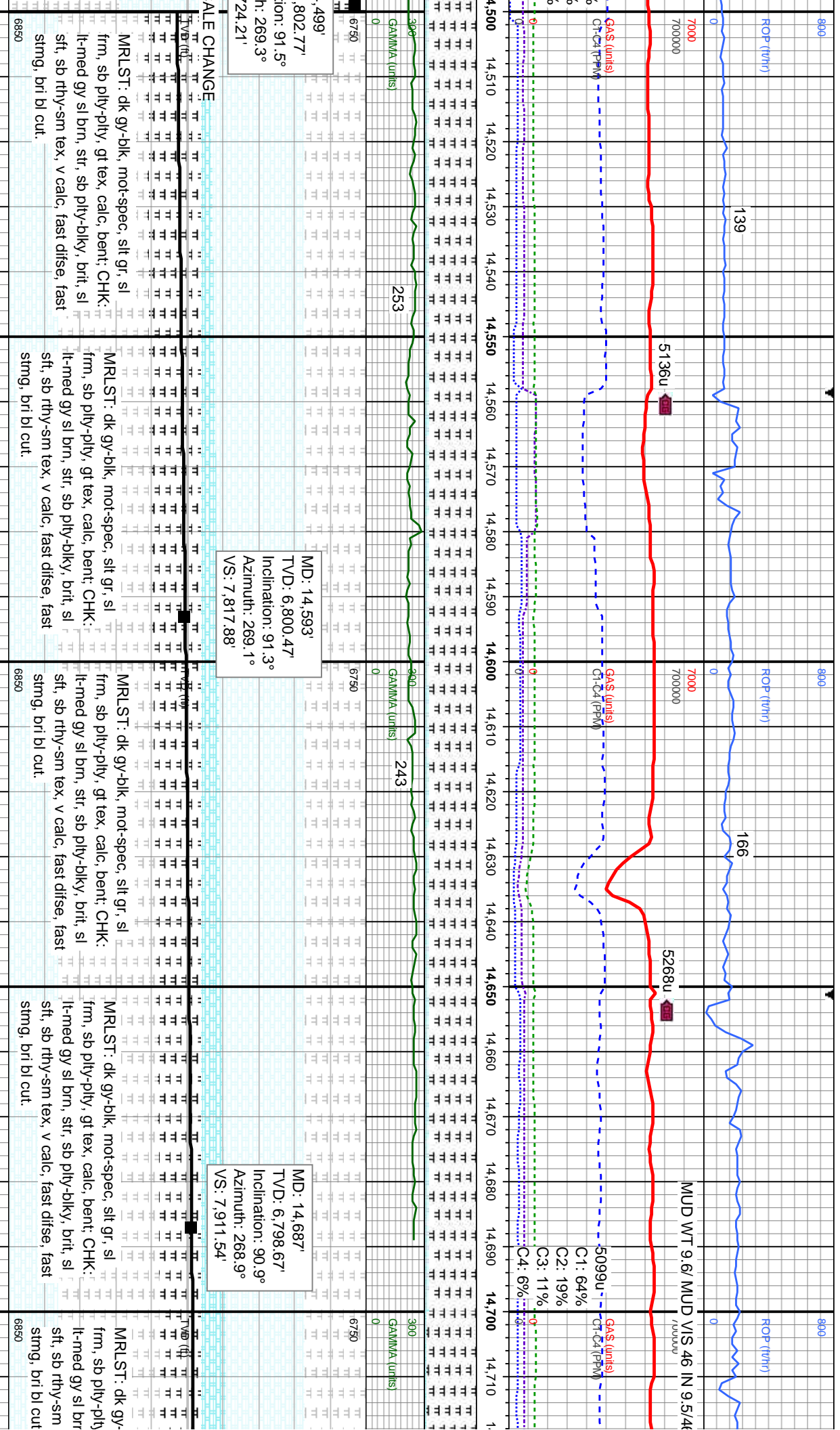












Landed Lateral Section on  
9/2/2015 @ 06:45 AM MST

Thank you for using Columbine  
Logging, Inc.

5258u

SOOT

244

14,720 14,730 14,740 14,750 14,760 14,770 14,780 14,790 14,800

PROJECTION TO BIT

MD: 14,752'  
TVD: 6,797.65'  
Inclination: 90.9°  
Azimuth: 268.9°  
VS: 7.976.3

blk, mot-spec, sit gr, sl  
, gt tex, calc, bent, CHK:  
, str, sb ply-bkly, brit, sl  
tex, v calc, fast difse, fast

