



Scale: 5" / 100'  
Measured Depth Log

Well Name GREENLEAF 29C-2HZ

Location SESW, Sec 2, T2N, R65W, 6th PM

State COLORADO

County WELD

Country UNITED STATES OF AMERICA

Rig Number ENSIGN 145

API Number 05123406220000

Field WATTENBERG

Region DJ BASIN

Drilling Completed 1/15/2015

Spud Date 1/7/2015

Surface Coordinates 453' FSL & 1716' FWL

Bottom Hole Coordinates 460' FNL & 1550' FWL

Ground Elevation 4854'

K.B. Elevation 4867"

Logged Interval 6740' To 12733'

Total Depth 12733

Formation SUSSEX, SHARON SPRINGS, NIOBRARA A, NIOBRARA B, NIOBRARA C, FORT HAYS, CODELL

Type of Drilling Fluid FWLSND

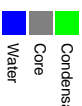
Company Anadarko Petroleum

Address 1099 18TH ST.  
DENVER, CO. 80202

Name Shanon Sadle

Company ANADARKO PETROLEUM  
Address 1099 18TH ST.  
Denver, CO 80202

SENIOR WELLSITE GEOLOGICAL  
WELLSITE GEOLOGICAL



Zon

Operator

Geologist

IM CORPORATION

ST David Hensley  
ST Tim Bright

Other

e Color Coding



Rock Types

UNKNOWN	COAL	MARLSTONE	SHALY SANDSTONE
ANHYDRITE	CONGLOMERATE	METAMORPHIC	SHALY SILTSTONE
BENTONITE	DOLOMITE	NO SAMPLE	SILTY SHALE
BRECCIA	DOLOMITIC LIMESTONE	SALT	SILTSTONE
CHALK	GRANITE	SANDSTONE	TILL
CEMENT	GYPSUM	SALT-PEPPER SAND	TUFF
CHERT	IGNEOUS	SHALE	WELDED TUFF
CLAY CHOKE SAND	SIDERITE or LIMONITE	SHALE COLORED	
CLAYSTONE	LIMESTONE	SHALE GRAY	

Accessories

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	PELECYPOD	CALCAREOUS	GYPSUM STRINGER
BIOCLASTIC	PELLET	CARBONACEOUS FLAKES	LIMESTONE STRINGER
BRACHIOPOD	PISOLITE	CHTDK	MARLSTONE (CALC) STRG
BRYOZOA	PLANT REMAINS	CHTLT	MARLSTONE (DOL) STRG
CEPHALOPOD	PLANT SPORES	COAL - THIN BEDS	SANDSTONE STRINGER
CORAL	SCAPHOPOD	DOLOMITIC	SHALE STRINGER
CRINOID	STROMATOPOROID	FELDSPAR	SILTSTONE STRINGER
ECHINOID		FERRUGINOUS PELLET	
FISH		FERRUGINOUS	TUFFACEOUS
FORAMINIFERA	ANHYDRITIC	GLAUCONITE	
FOSSIL	ARGILLACEOUS	GYPSEIFEROUS	

Stringer

Other Symbols

Oil Show

P PINPOINT	∴ DST INTERVAL	▽ WIRELINE TESTED - LEFT	E EARTHY
✓ VUGGY	⚡ FAULT	△ WIRELINE TESTED - RT	FX FINELYXLN

DEAD

Engineering

FORMATION TOP	DRILL STEM TEST	GS GRAINSTONE
✳ GAS SHOW	MINDEPTH MN DEPTH	L LITHOGRAPHIC

EVEN

QUESTIONABLE

BIT

OIL SHOW

MX MICROXLN

SPOTTED STAINING

▲ CONNECTION (UP)

MINDEPTH MN DEPTH UP

MS MUDDSTONE

Rounding

Prososity

▼ CONNECTION (DOWN)	MINDEPTH MN DEPTH (DOWN)	▲ ANGULAR	PS PACKSTONE
CONNECTION GAS	NORMAL FAULT	R ROUNDED	WS WACKESTONE
CONNECTION GAS (LEFT)	↕ OVERTURNED STRATA	▩ SUBANG	
TRIP GAS	↯ REVERSE FAULT	▩ SUBRND	

EARTHY

EENESTRAL

Sorting

RACTURE

CASING

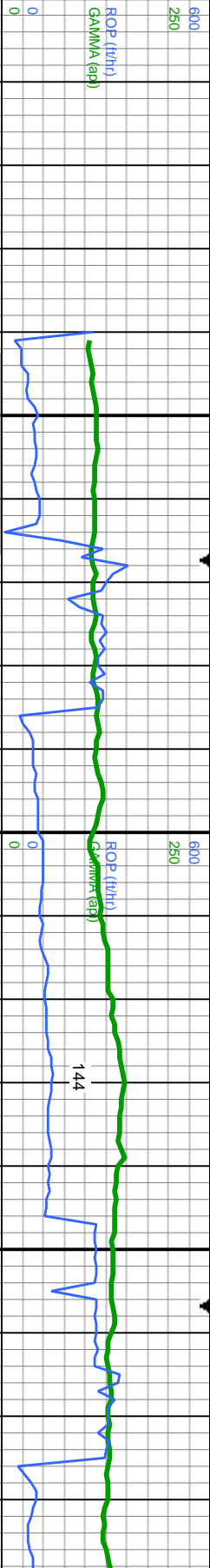
M MODERATE

Textures

INTERCRYSTALLINE	DOWN TIME GAS	▽ SIDEWALL CORE (LEFT)	P POOR
INTEROOLITIC	DOWN TIME GAS (LEFT)	▲ SIDEWALL CORE (RIGHT)	BS BOUNDSTONE
WELL	CORE - LOST	SLIDE	W WELL
ORGANIC	CORE - RECOVERED	SURVEY	CHALKY
			CRYPTOXLN

Slide/Rotate

ROP  
ROF  
GAMMA



Total Gas & Chromatograph

GAS  
C1  
C2  
C3  
C4

COLUMBINE 2 PERSON LOGGING  
RIGGED UP ON 01/07/2015  
BEGIN LOGGING 1:14 01/10/2015

GA\$ (units) REACHED KOP  
C1-C4 (PPH) 6740/MD @ 1:14  
01/10/2015

ROP & GAS DATA  
PROVIDED BY PASON

Bit Data  
Bit #: 1  
Type: Smith SD519  
Size: 8.75  
Jets: 7X16  
S/N: JK0694

MUD WT IN 10.1 VIS 38  
MUD WT OUT 10.1 VIS 38

GA\$ (units)  
C1-C4 (PPH) 183u

Depth Labels



50' Sample Intervals

MD: 6,721  
TVD: 6,489.61  
Inclination: 0.62  
Azimuth: 136.43  
VS: -1463.00

MD: 6,811  
TVD: 6,579.44  
Inclination: 6.26  
Azimuth: 356.36  
VS: -1458.45

Well Bore  
TVD

Acetone was used as the cutting agent with the dimple filled to the rim  
The ratings are based on 7 descriptors:  
None, Slight trace, Trace, Fair, Moderate, Good, and Excellent. The descriptor used is based on the loggers observations and best judgement of brilliance, color and longevity of the cut.

SLTY SH: lt - dk gy, sb pily - pily, silty tex, v f grn, sft - mod frm, v sl calc, v rr pyr, O SHW: slow cut, milky wht, some stmg, no sin, wht ring

SLTY SH: lt - dk gy, sb pily - pily, silty tex, v f grn, sft - mod frm, v sl calc, O SHW: dull mky wht cut, sl stmg, wh thn ring, tr sin

SLTY SH: lt - dk gy, sb pily - pily, silty grn, sft - mod frm, v sl calc, O SHW: c wht cut, sl stmg, wh thn ring, tr sin

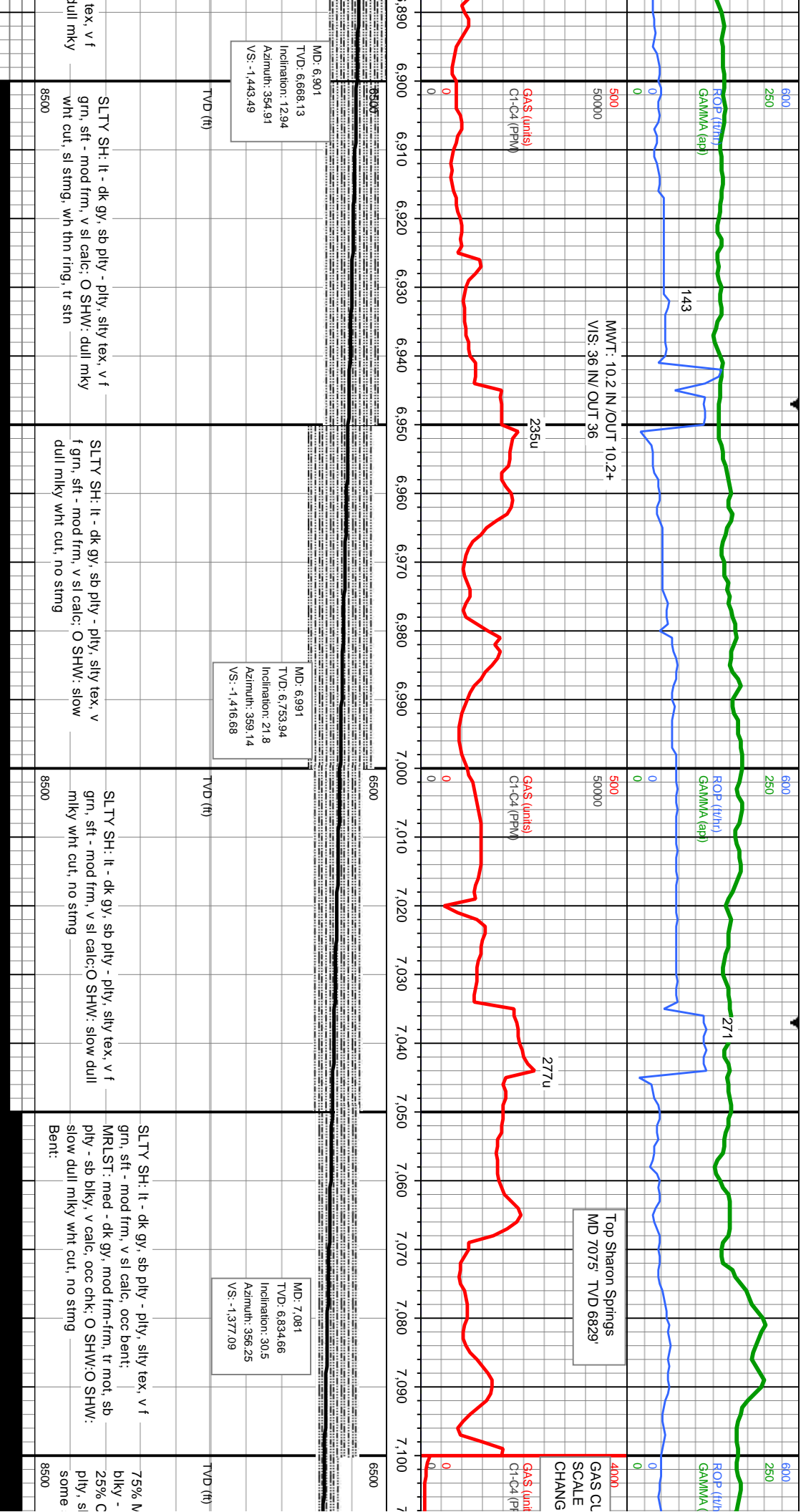
Oil Show

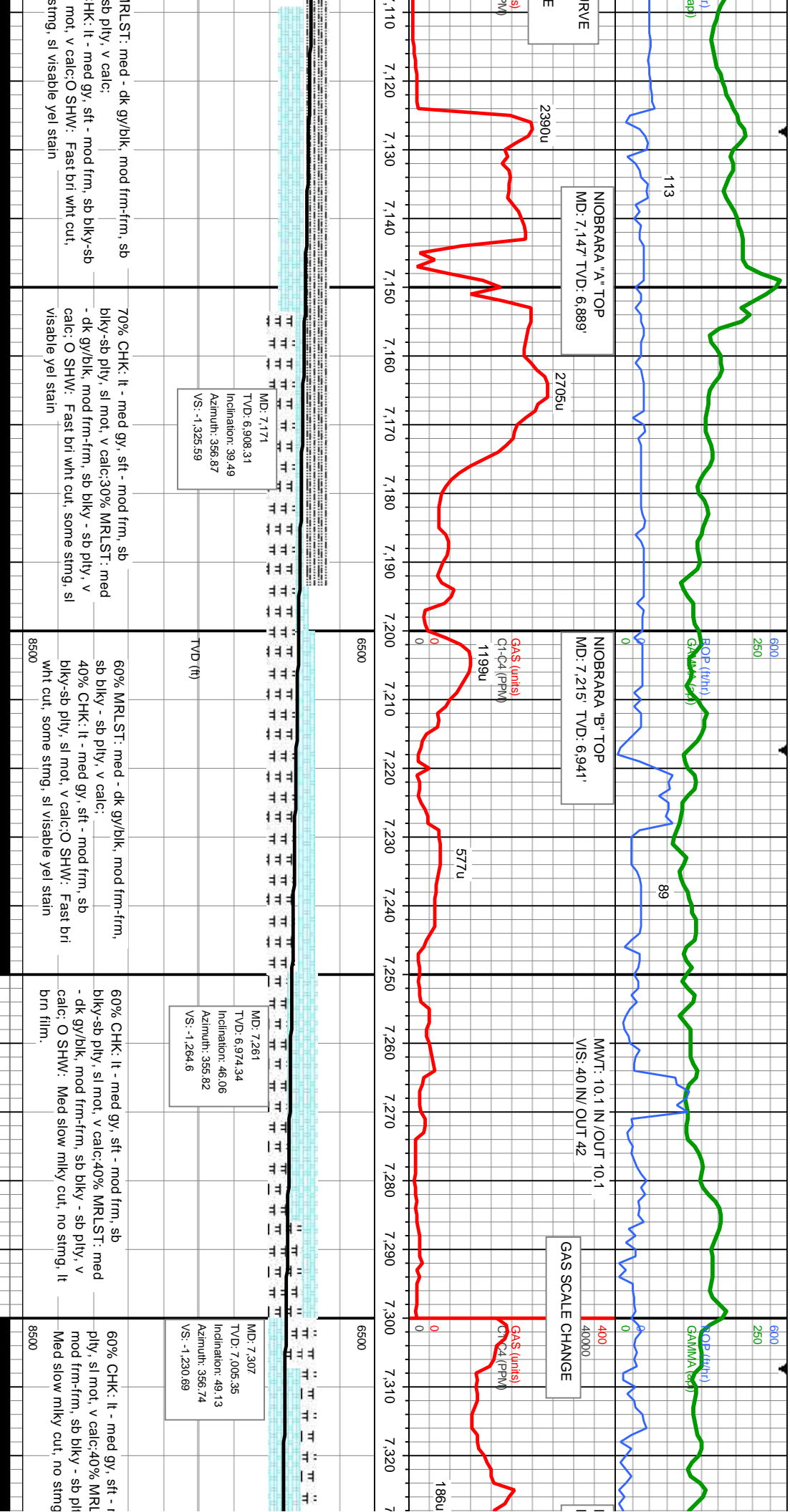
E  
G M  
FR  
TR  
SL

Images

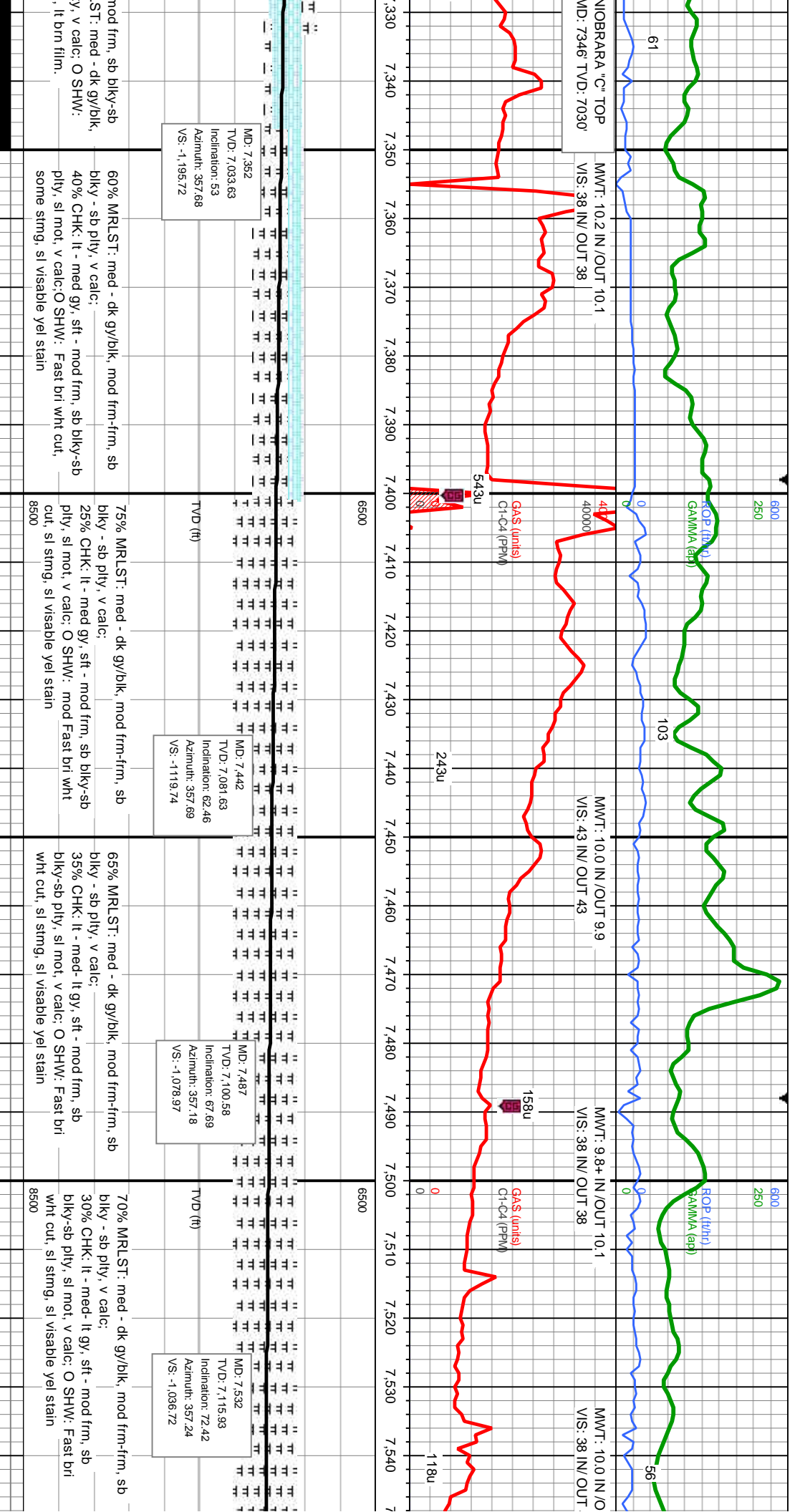






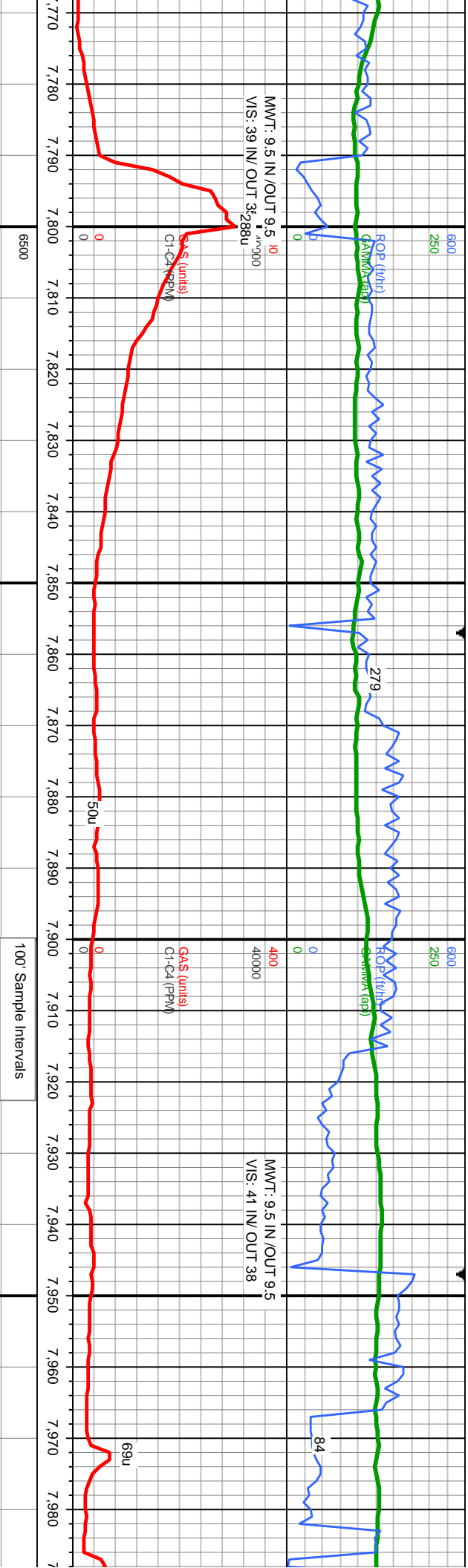












6500		100' Sample Intervals	
MD: 7.814 TVD: 7.140.3 Inclination: 90.59 Azimuth: 358.25 VS: -757.28		MD: 7.904 TVD: 7.139.82 Inclination: 90.03 Azimuth: 357.69 VS: -667.32	
TVD (ft)		TVD (ft)	
95% SS: med-dk brn/gy, sb blk-y - blk-y, v f - med grn, fr-p srl, sb rnd;		90% SS: med-dk brn/gy, sb blk-y - blk-y, v f - med grn, fr-p srl, sb rnd;	
5% SLTY SH: lt - dk gy, sb pily - pily, silty tex, v f grn, sft - mod frm, v sl calc; O SHW: mod bri wht cut, sl sting, sl visable yel stain		10% SLTY SH: lt - dk gy, sb pily - pily, silty tex, v f grn, sft - mod frm, v sl calc; O SHW: mod-fast bri wht cut, sl sting, sl visable yel stain	
8500		8500	

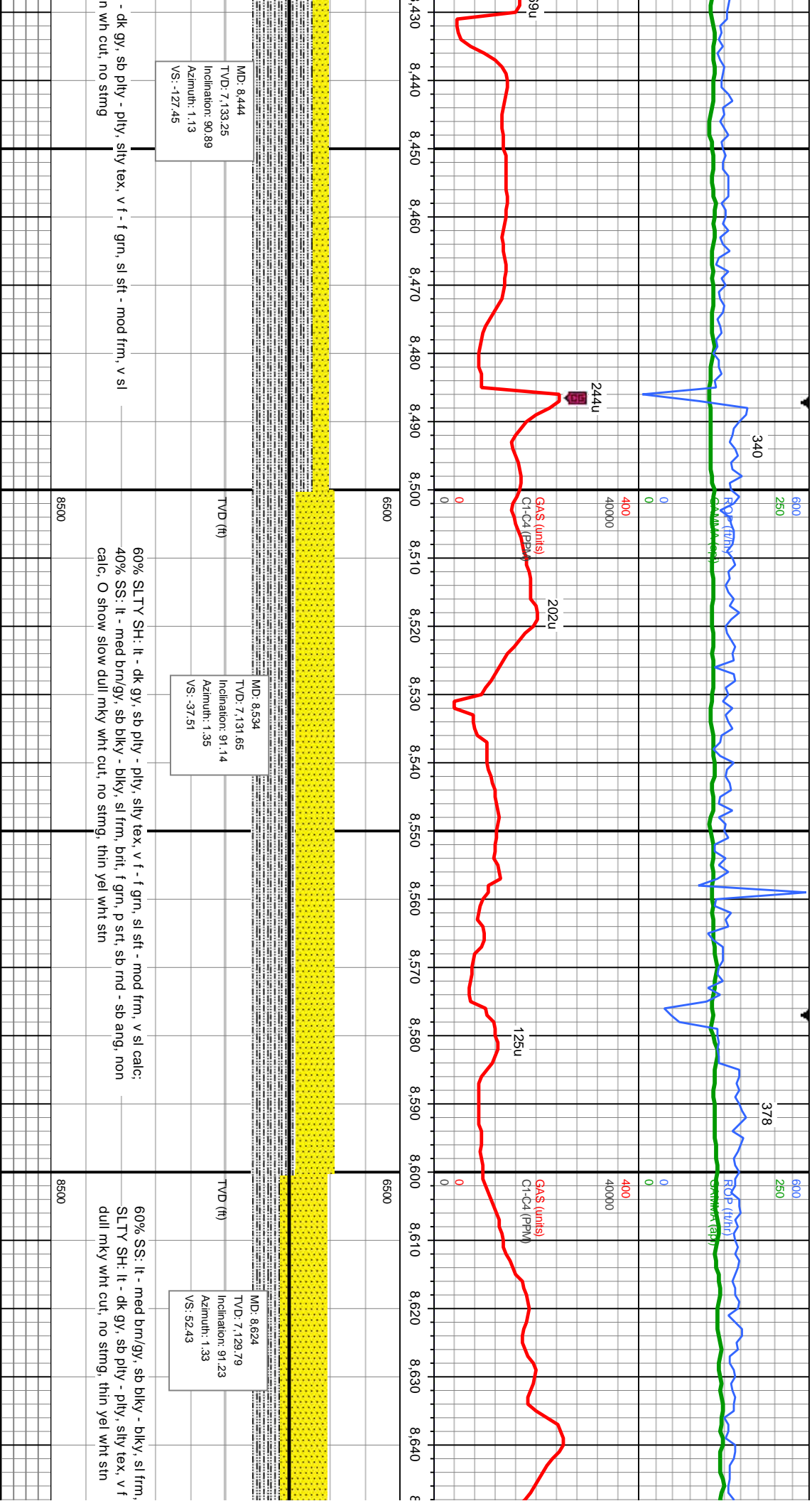


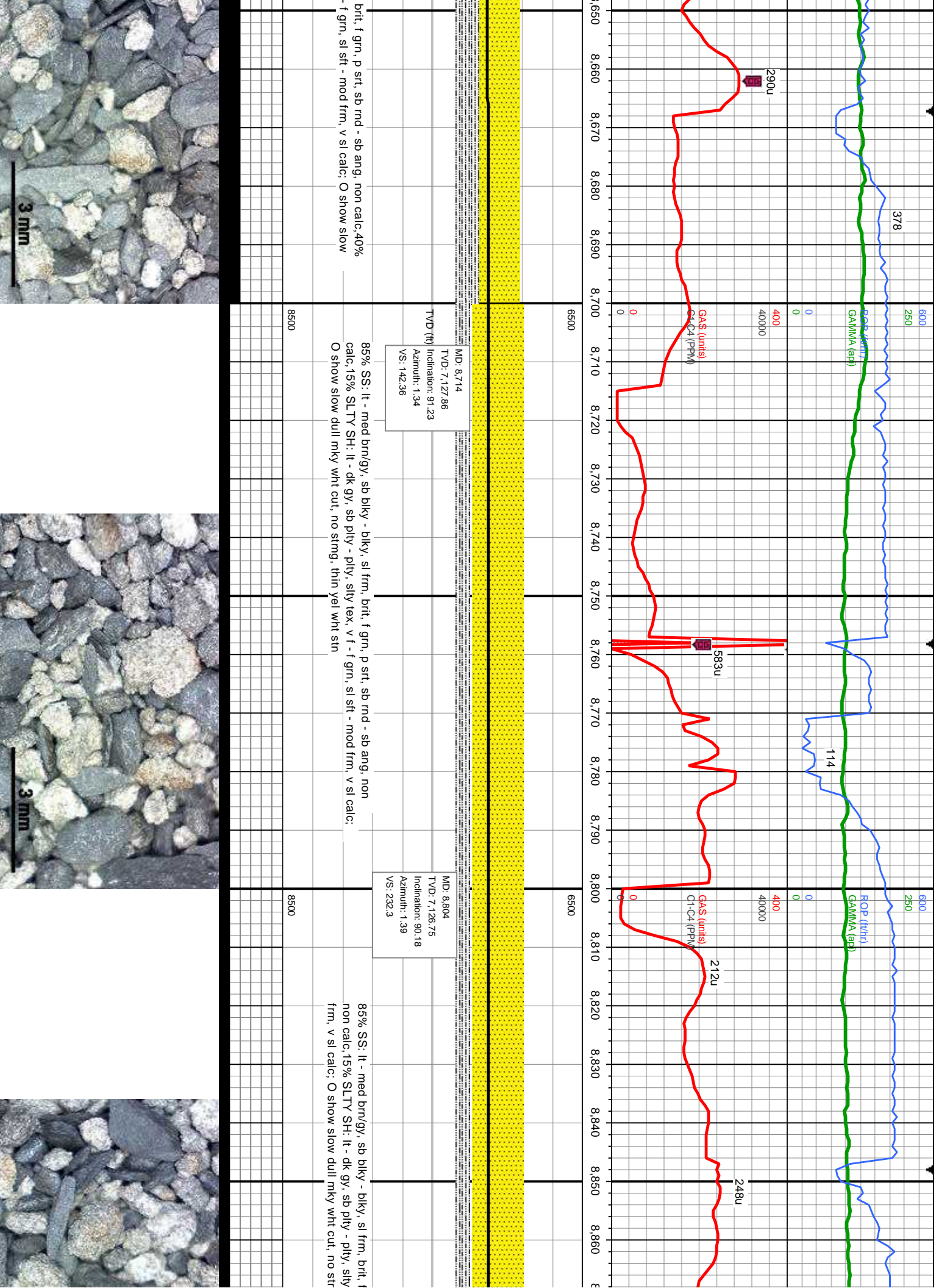








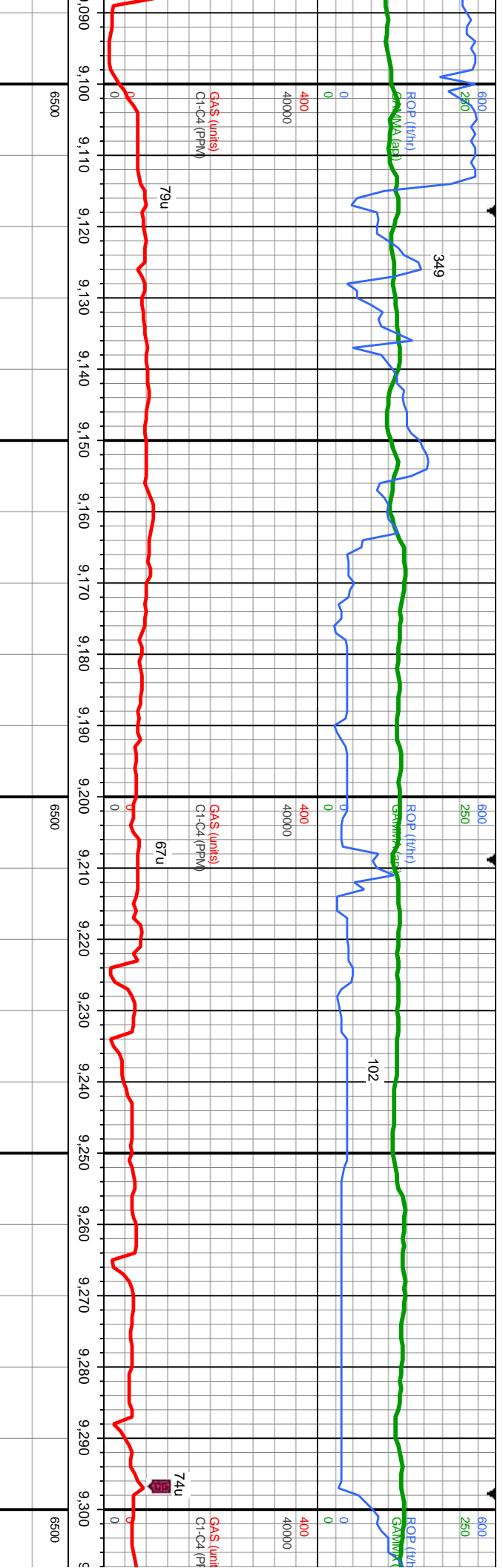












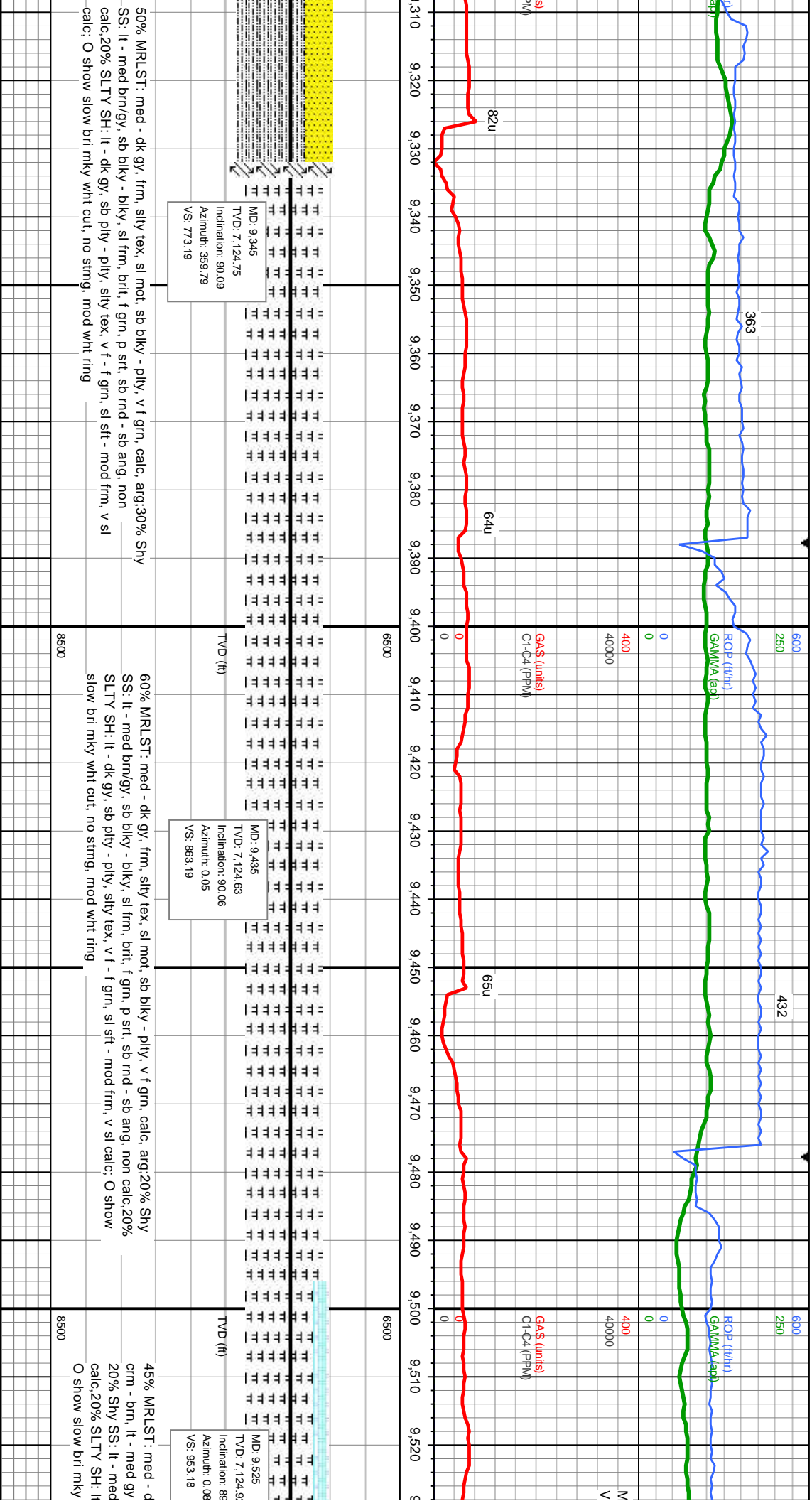
MD: 9,165  
TVD: 7,125.74  
Inclination: 90.1  
Azimuth: 0.4  
VS: 593.2

60% SS: It - med brn/gly, sb biky - biky, sl frm, brit, f grn, p srt, sb rnd - sb ang, non calc, 40% SLY SH: It - dk gy, sb ply - ply, silty tex, v f - f grn, sl sft - mod frm, v sl calc; O show slow dull mky wht cut, no string, thin yel wht sin

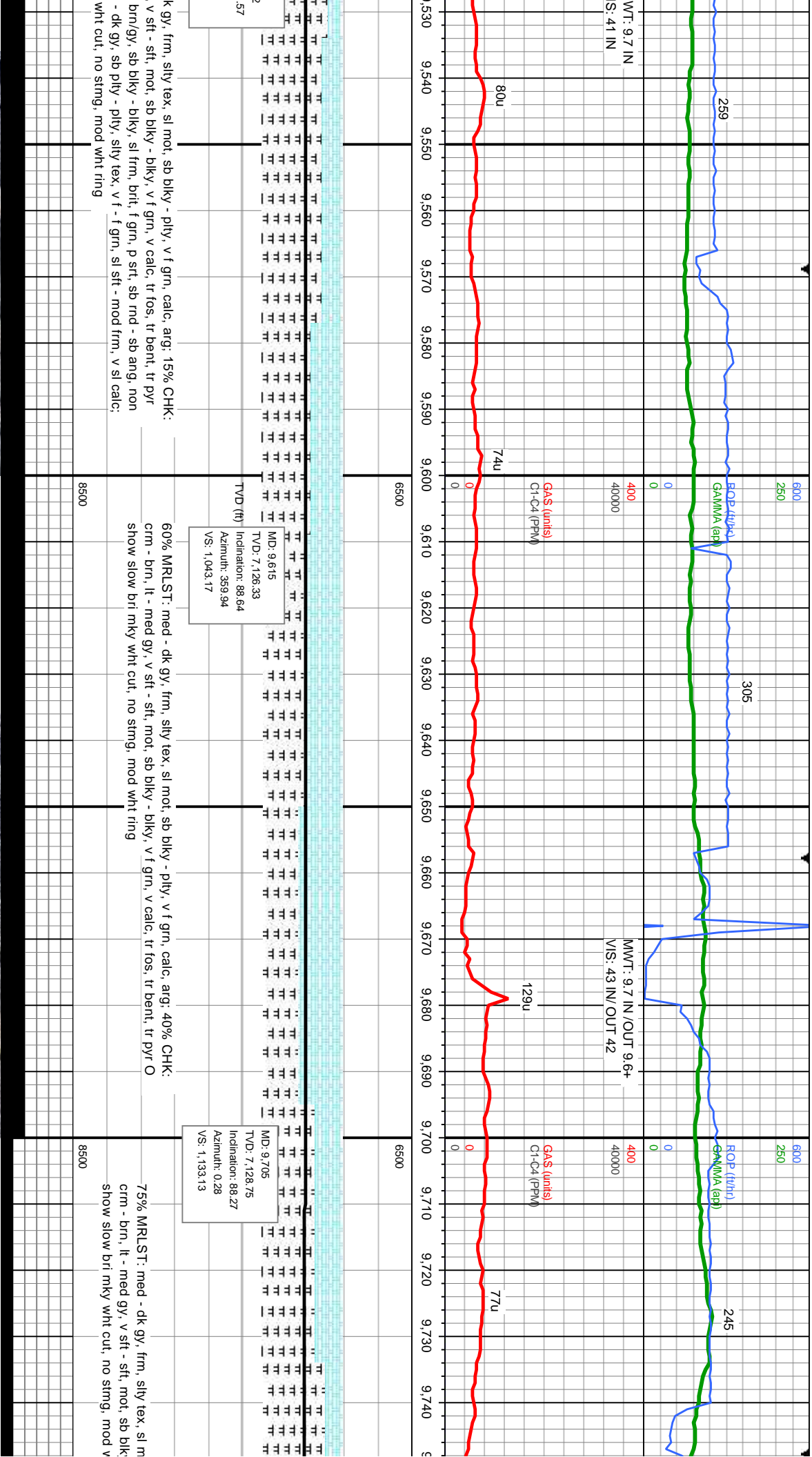
MD: 9,255
TVD: 7,125.13
Inclination: 90.4
Azimuth: 359.94
VS: 683.2

40% Shy SS: lt - med brn/gy, sb blkly - blkly, sl frm, brt, f grn, p srt, sb md - sb ang, non calc, 60% SLTY SH: lt - dk gy, sb plty - plty, slty tex, v f - f grn, sl sft - mod frm, v sl calc; O show slow dull mky wht cut, no stmg, thin yel wht stn









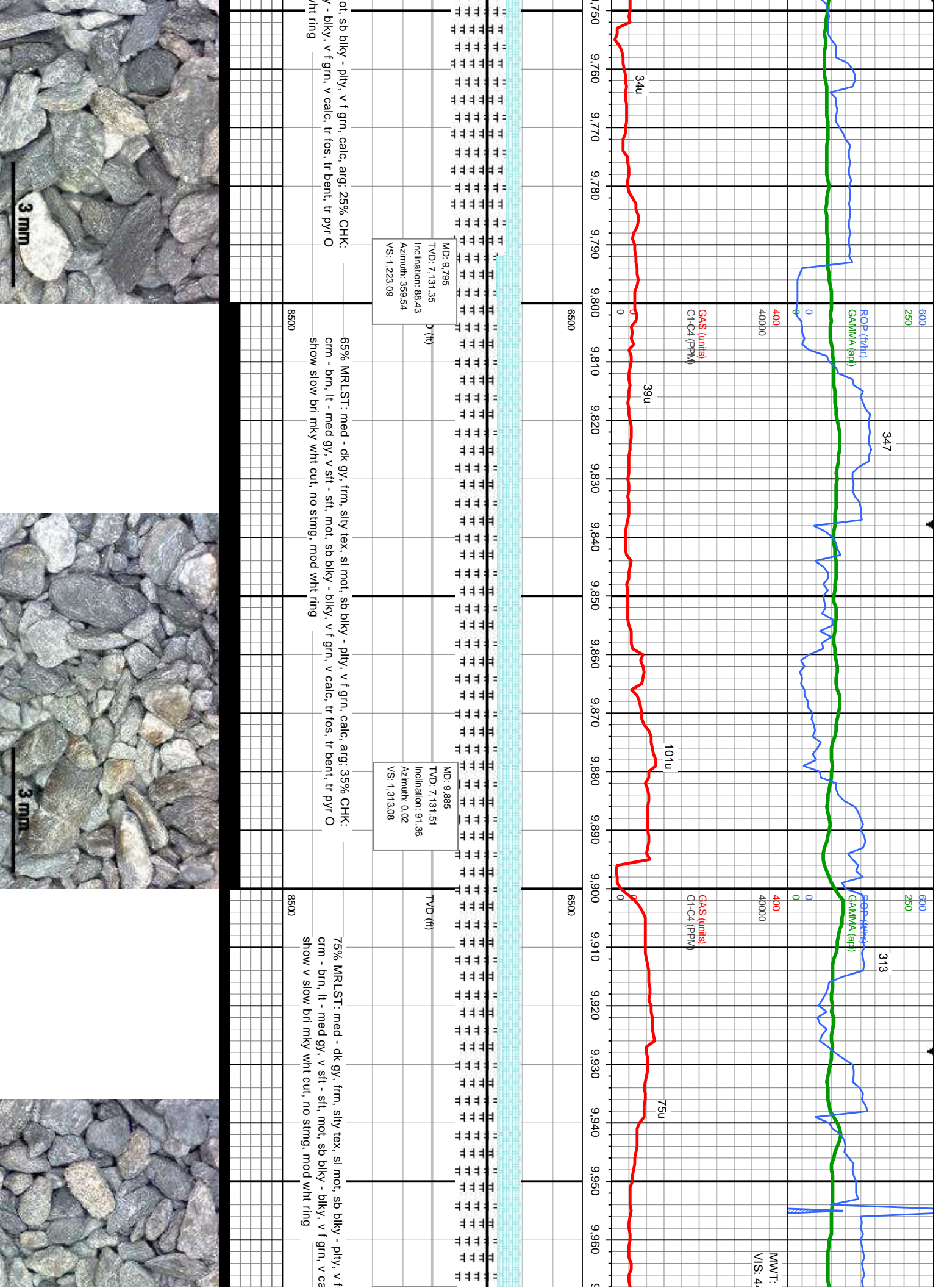
dk gy, frm, silty tex, sl mot, sb blkly - ply, v f grn, calc, arg; 15% CHK:  
v sft - sft, mot, sb blkly - blkly, v f grn, v calc, tr fos, tr bent, tr pyr  
brn/gy, sb blkly - blkly, sl frm, brt, f grn, p sft, sb rnd - sb ang, non  
- dk gy, sb ply - ply, silty tex, v f - f grn, sl sft - mod frm, v sl calc;  
wht cut, no stmg, mod wht ring



60% MRLST: med - dk gy, frm, silty tex, sl mot, sb blkly - ply, v f grn, calc, arg; 40% CHK:  
crn - brn, lt - med gy, v sft - sft, mot, sb blkly - blkly, v f grn, v calc, tr fos, tr bent, tr pyr O  
show slow brl mky wht cut, no stmg, mod wht ring

75% MRLST: med - dk gy, frm, silty tex, sl m  
crn - brn, lt - med gy, v sft - sft, mot, sb blk  
show slow brl mky wht cut, no stmg, mod v





ot, sb blkly - plty, v f grn, calc, arg; 25% CHK:  
v - blkly, v f grn, v calc, tr fos, tr bent, tr pyr O  
wh ring

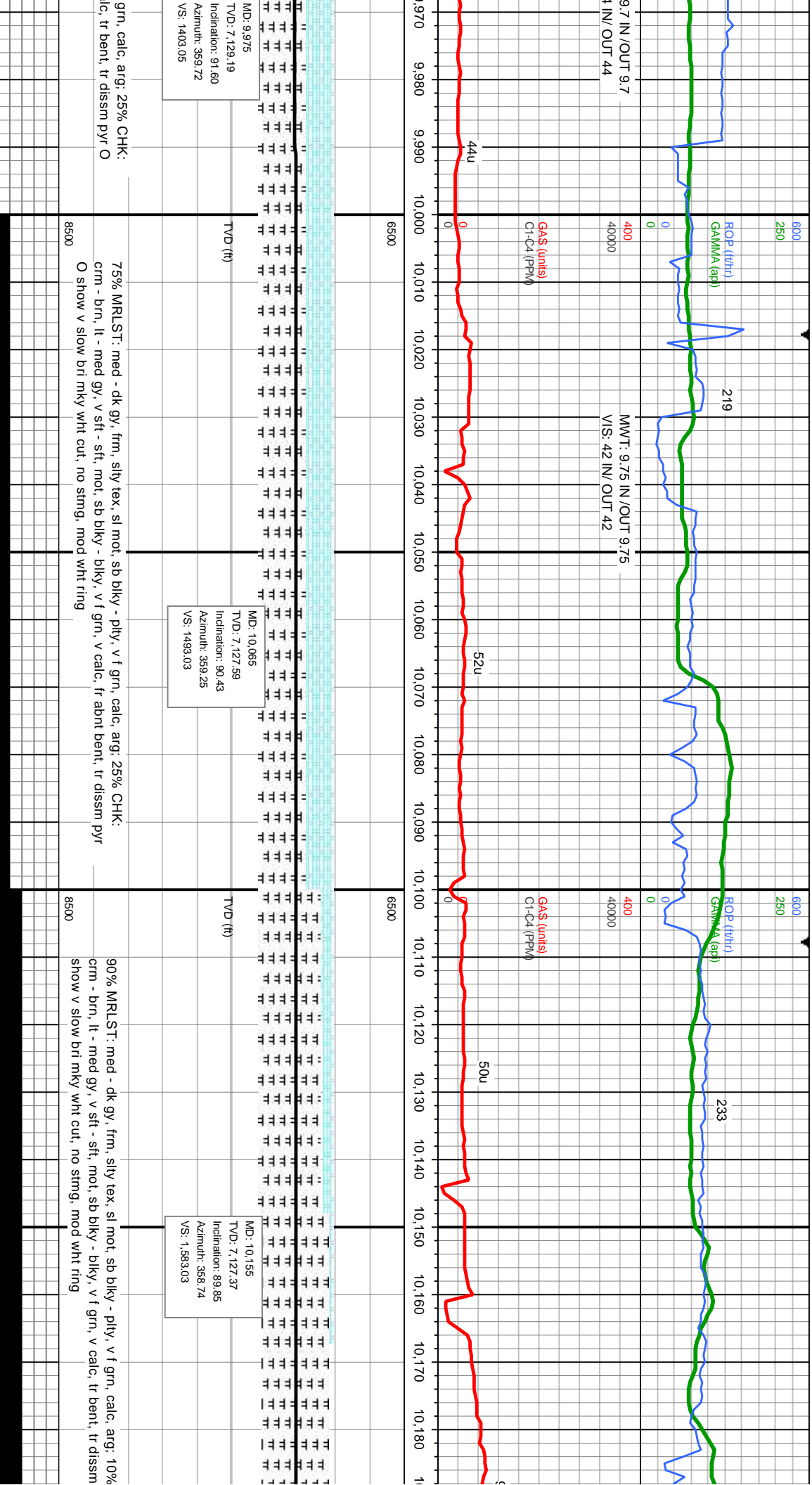
65% MRLST: med - dk gy, frm, silty tex, sl mot, sb blkly - plty, v f grn, calc, arg; 35% CHK:  
crm - brn, lt - med gy, v sft - sft, moi, sb blkly - blkly, v f grn, v calc, tr fos, tr bent, tr pyr O  
show slow bri mky wht cut, no sting, mod wht ring

75% MRLST: med - dk gy, frm, silty tex, sl mot, sb blkly - plty, v f grn, v calc, arg; 25% CHK:  
crm - brn, lt - med gy, v sft - sft, moi, sb blkly - blkly, v f grn, v calc, arg; 25% CHK:  
show v slow bri mky wht cut, no sting, mod wht ring

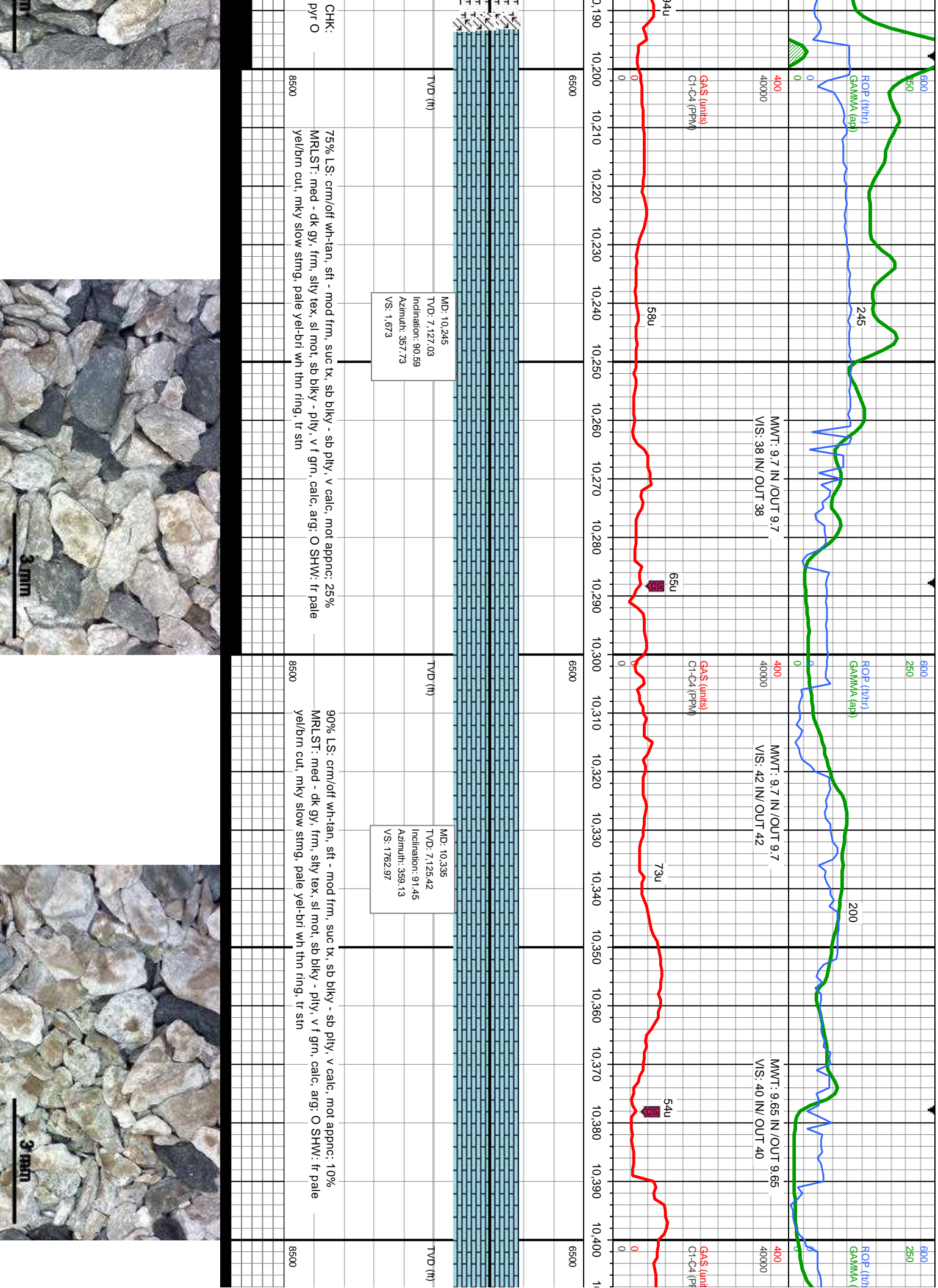
MD: 9.795  
TVD: 7,131.35  
Inclination: 88.43  
Azimuth: 359.54  
VS: 1,223.09

MD: 9.885  
TVD: 7,131.51  
Inclination: 91.36  
Azimuth: 0.02  
VS: 1,313.08

MWT:  
VS: 4











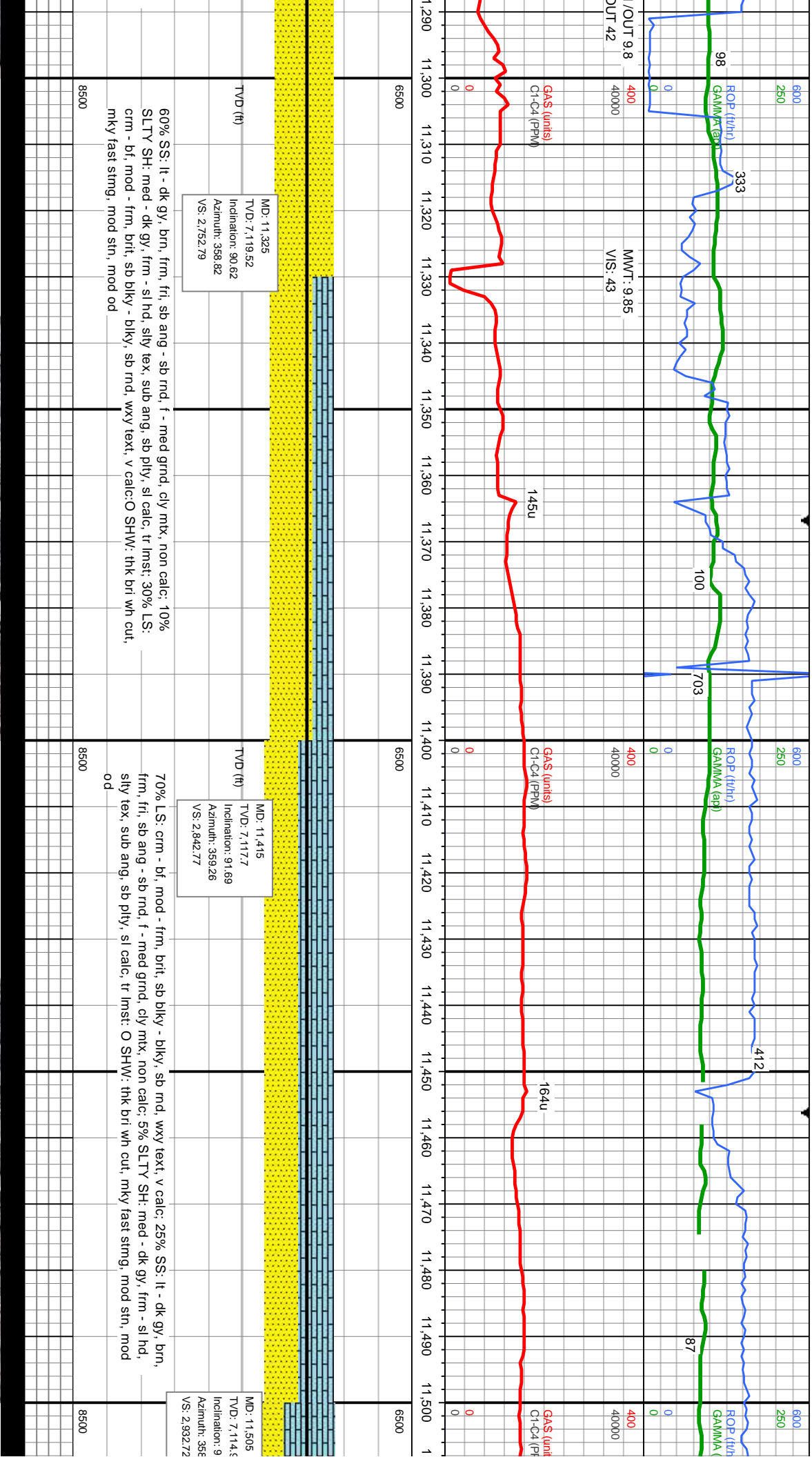


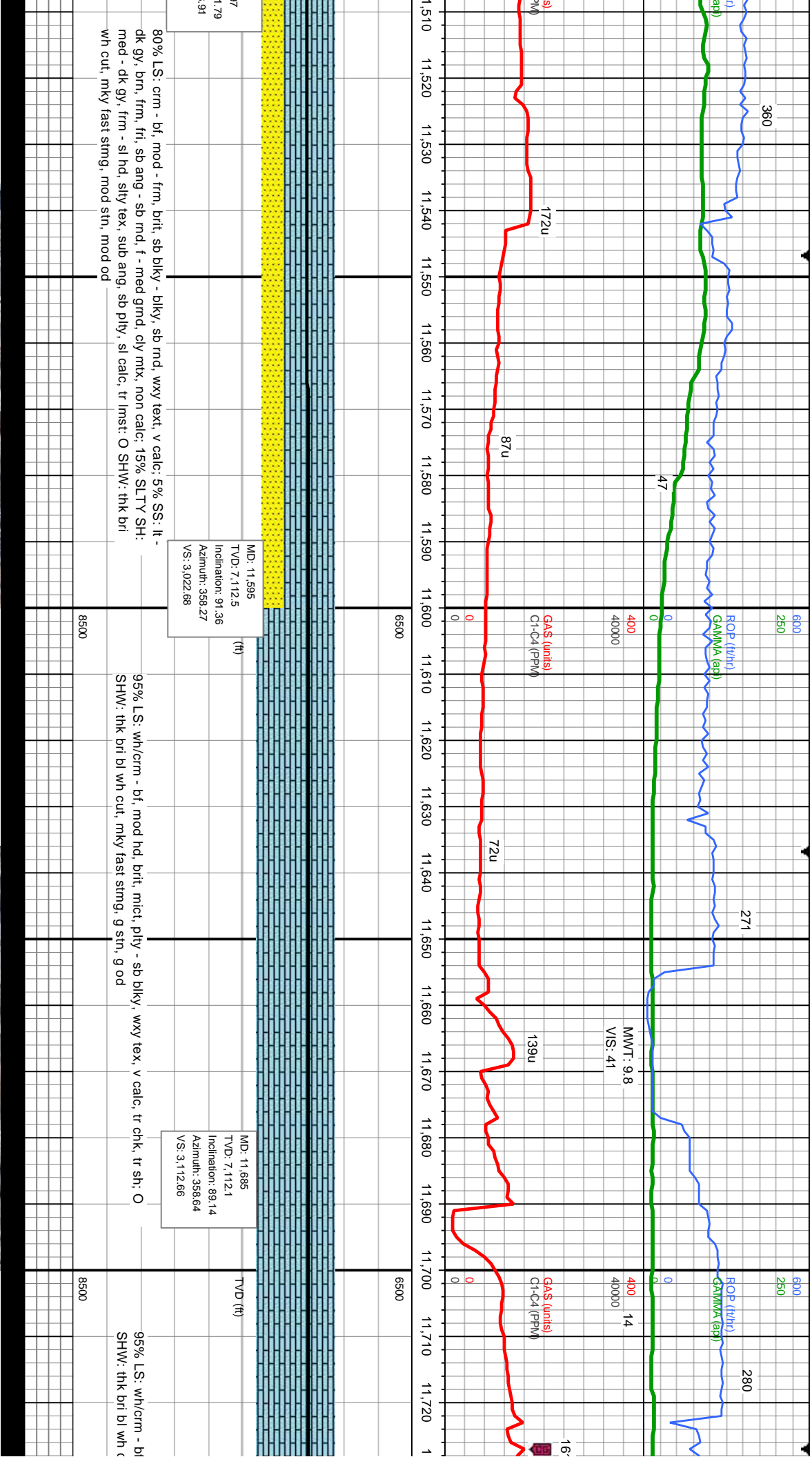




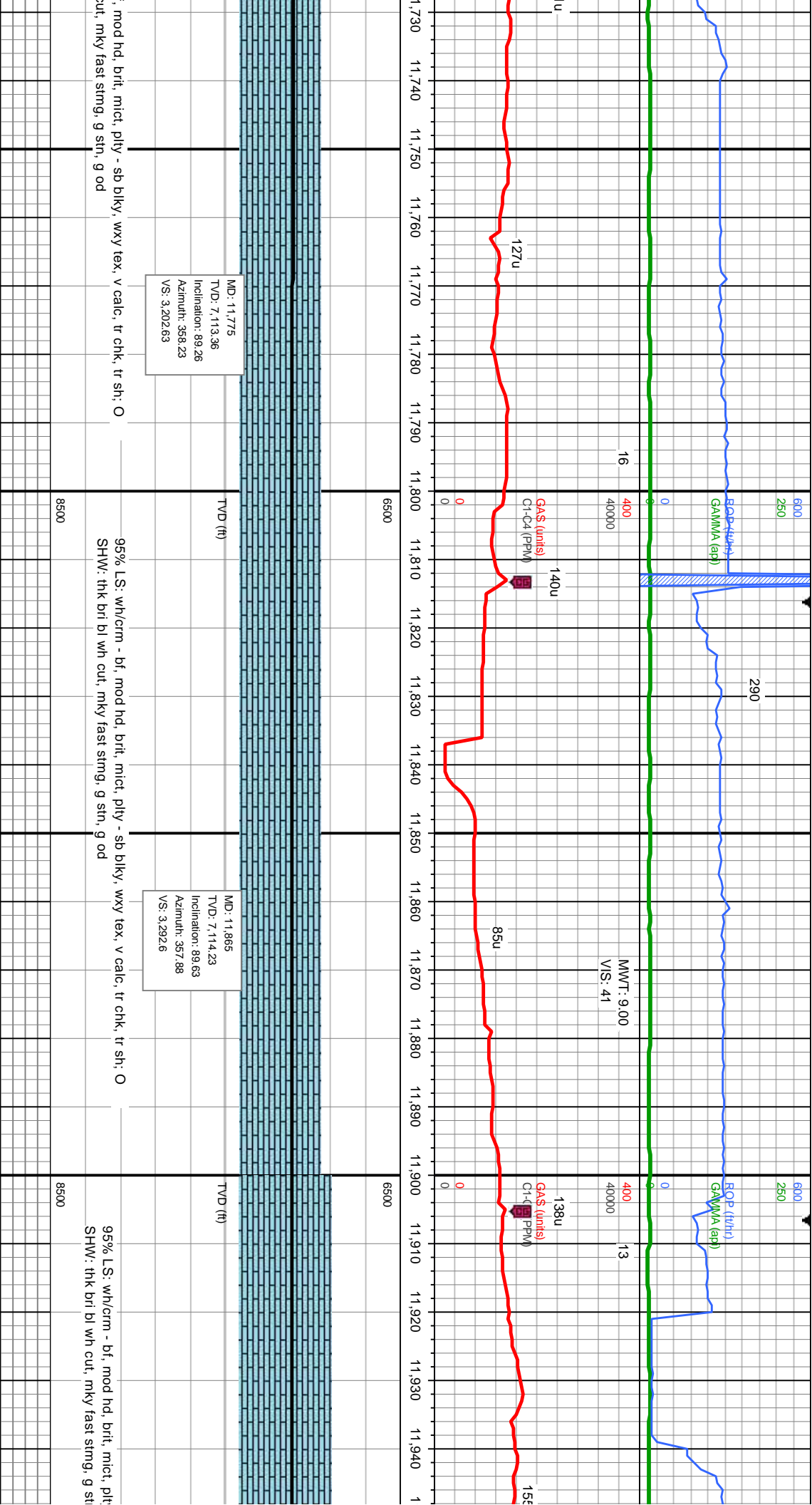


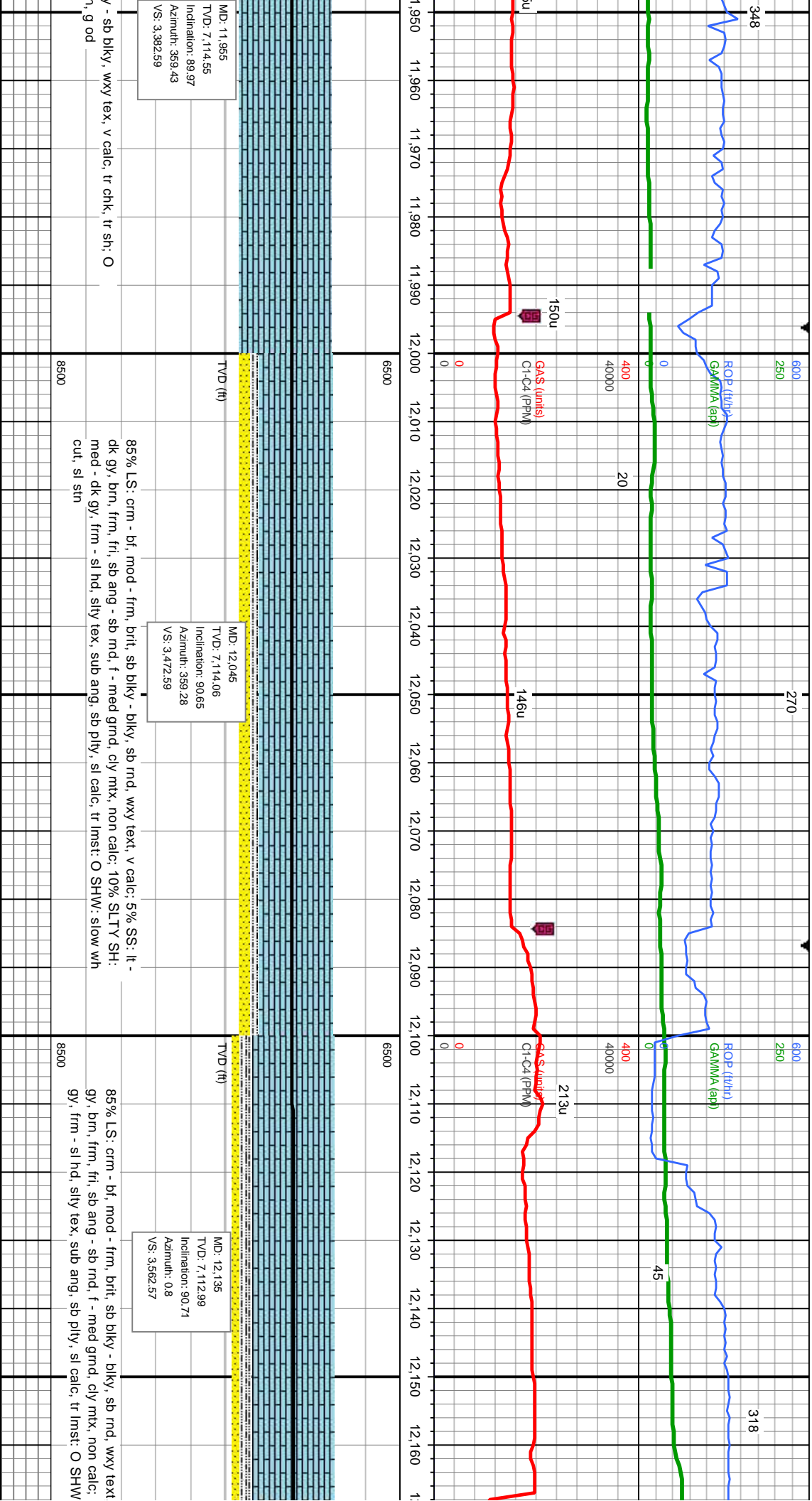












MD: 11.955  
TVD: 7,114.55  
Inclination: 89.97  
Azimuth: 359.43  
VS: 3.38259

MD: 12.045  
TVD: 7,114.06  
Inclination: 90.65  
Azimuth: 359.28  
VS: 3.47259

MD: 12.135  
TVD: 7,112.99  
Inclination: 90.71  
Azimuth: 0.8  
VS: 3.56257

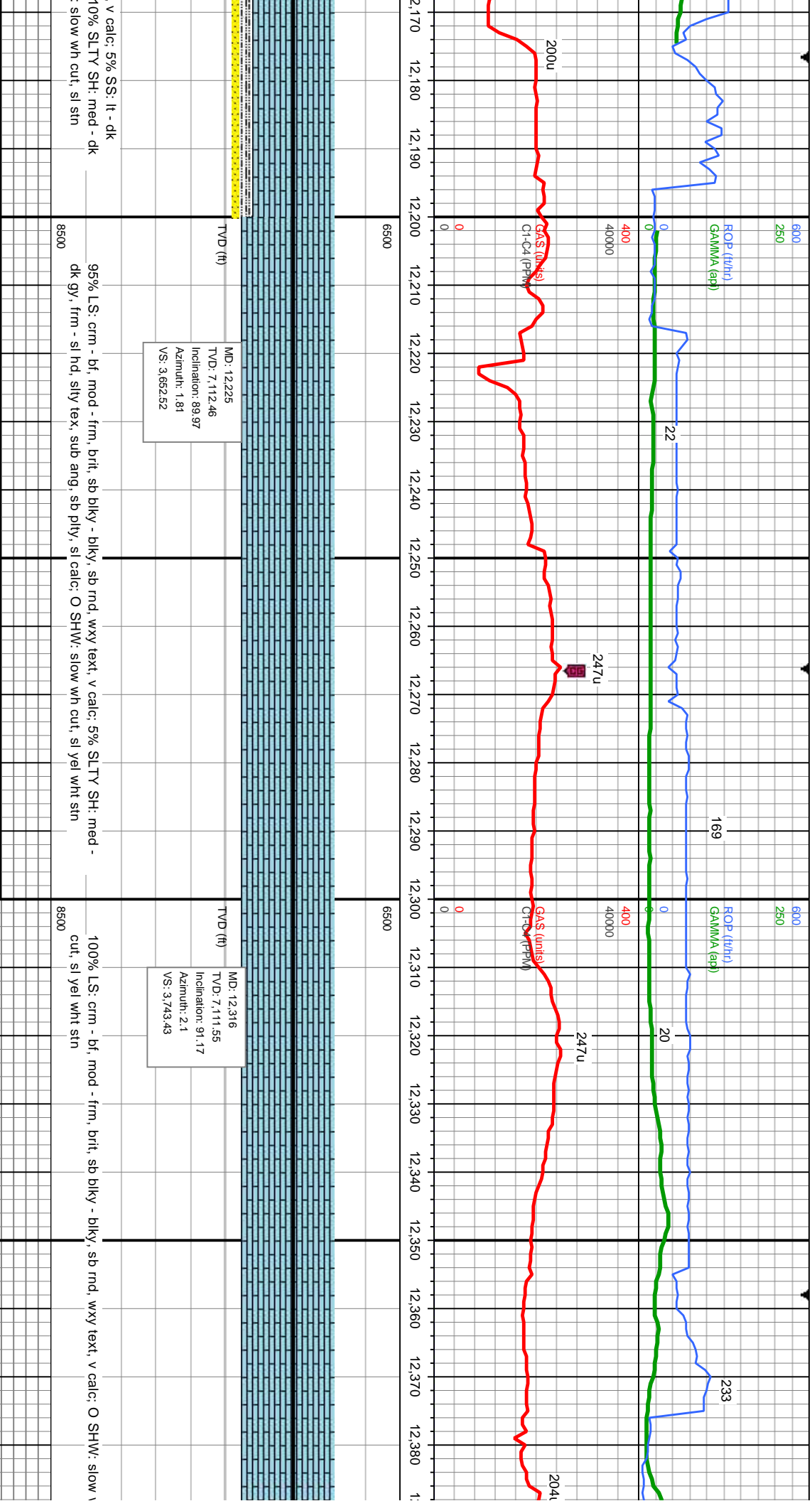
1, g od  
n, g od  
tr sh, O  
tr ch k,  
v calc,  
wxy tex,  
sb blk y,  
/-

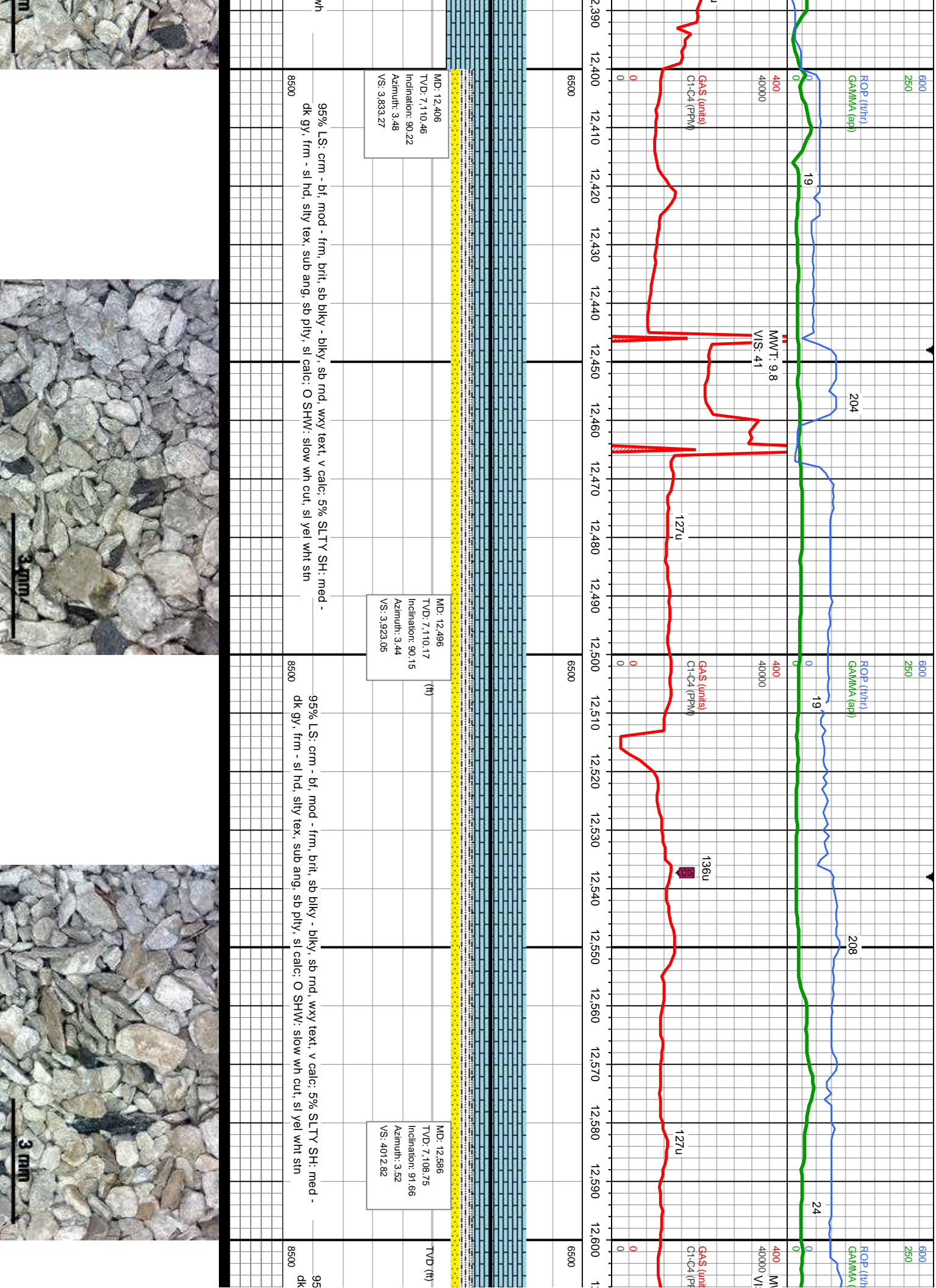
85% LS: crm - bf, mod - frm, brit, sb blk y - blk y, sb rnd, wxy text, v calc: 5% SS: lt - dk gy, brn, frm, fri, sb ang - sb rnd, f - med grnd, cly mtk, non calc: 10% SLTY SH: med - dk gy, frm - sl hd, silty tex, sub ang, sb ply, sl calc, tr lmst: O SHW: slow wh cut, sl sin

85% LS: crm - bf, mod - frm, brit, sb blk y - blk y, sb rnd, wxy text gy, brn, frm, fri, sb ang - sb rnd, f - med grnd, cly mtk, non calc: gy, frm - sl hd, silty tex, sub ang, sb ply, sl calc, tr lmst: O SHW

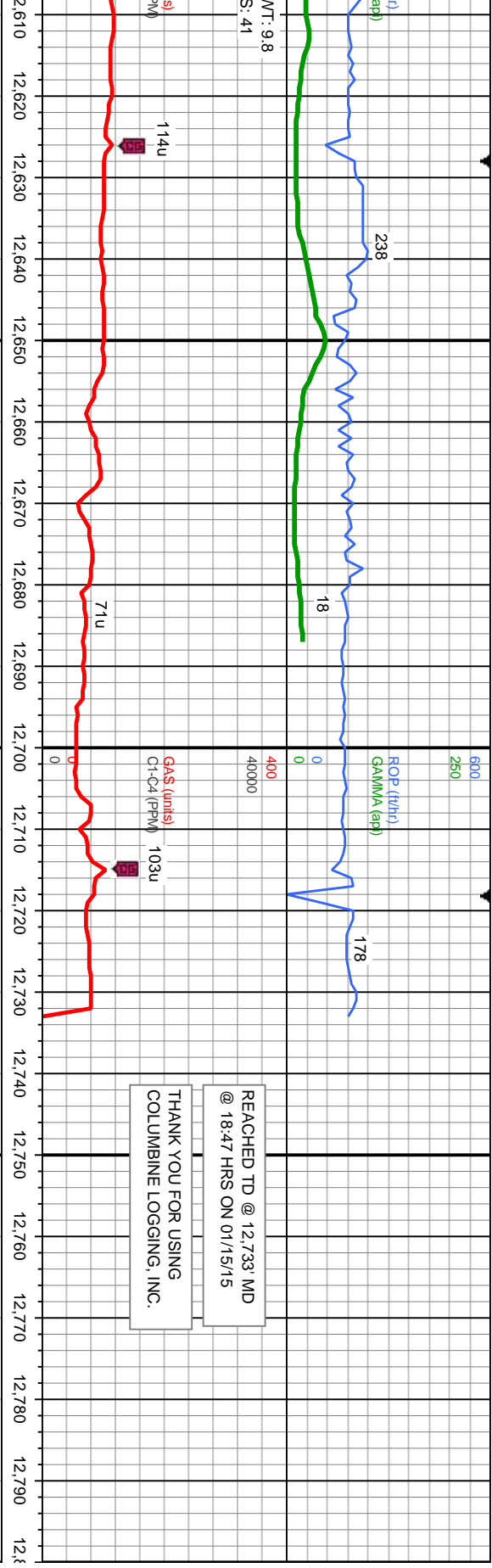












REACHED TD @ 12,733' MD  
@ 18.47 HRS ON 01/15/15

THANK YOU FOR USING  
COLUMBINE LOGGING, INC.

Projected

MD: 12,676	MD: 12,691
TVD: 7,104.95	TVD: 7,104.1
Inclination: 93.18	Inclination: 93.33
Azimuth: 3.56	Azimuth: 3.52
VS: 4102.51	VS: 4117.45

TVD (ft)	MD: 12,733
	TVD: 7,101.66
	Inclination: 93.33
	Azimuth: 3.52
	VS: 4,159.28

% LS: crm - bf, mod - frm, brlt, sb blkly - blkly, sb rnd, wxy text, v calc; 5% SLTY SH: med -  
gy, frm - sl hd, silty tex, sub ang, sb ply, sl calc; O SHW: slow wh cut, sl yel wht sin

95% LS: crm - bf, mod - frm, brlt, sb blkly -  
blkly, sb rnd, wxy text, v calc; 5% SLTY  
SH: med - dk gy, frm - sl hd, silty tex, sub  
ang, sb ply, sl calc; O SHW: slow wh  
cut, sl yel wht sin

