



Scale: 5" / 100'
Measured Depth Log

Well Name WELLS RANCH AA35-67-1AHNA(HORZ)

Location SEC 36;T6N;R63W

State COLORADO

County WELD

Country USA

Rig Number H&P 322

API Number 05-123-38654-0000

AFE # 140199

Region DJ BASIN

Field WATTENBERG

Spud Date 2/22/2014

Drilling Completed 3/1/2014

Surface Coordinates

LAT: 40.44486°N

LONG: 104.3941°W

1929' FSL

168' FEL

Ground Elevation 4790'

K.B. Elevation 4814'

Logged Interval 5872' To 11094'

Total Depth 11094'

Formation NIOBRARA "A" MARL

Type of Drilling Fluid MUD;WATER;POLY

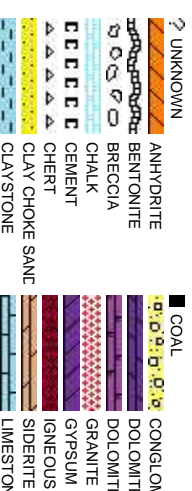
Company NOBLE ENERGY INC.

Address 1625 BROADWAY
DENVER, CO 80202
(303) 228-4000

Name JOHN READY;MIKE GREENE

Company COLUMBINE LOGGING INC.

Address 2385 S. LIPAN ST
DENVER, COLORADO 80223
(303) 289-7764



Operator

Fossils

- GASTROPOD
- INOCERAMUS
- OOLITE
- OSTRACOD
- PELECYPOD
- BIOCLASTIC
- BRACHIOPOD
- PISOLITE
- PLANT REMAINS
- PLANT SPORES
- CORAL
- CRINOID
- ECHINOID
- FISH
- FORAMINIFERA
- F. FOSSIL
- ARGILLITE GRAIN
- B BENTONITE
- H HEAVY MINERAL
- K KAOLIN
- BIT BITUMENOUS SUBSTANCE
- BRECCIA FRAGMENTS
- CALCAREOUS
- CARBONACEOUS FLAKES
- CHERT
- CHERT
- COAL - THIN BEDS
- DOLOMITIC
- FELDSPAR
- FERRUGINOUS PELLET
- FERRUGINOUS
- GLAUCONITE
- GYPSIFEROUS
- M MARLSTONE
- MICACEOUS
- MINERAL CRYSTALS
- N NODULES
- PHOSPHATE PELLETS
- PYRITE
- SALT CAST
- SANDY
- SILICEOUS
- SILTY
- TUFFACEOUS
- ANHYDRITE STRINGER
- BENTONITE STRINGER
- COAL STRINGER
- DOLOMITE STRINGER
- GYPSUM STRINGER
- LIMESTONE STRINGER
- MARLSTONE (CALC) STRG
- MARLSTONE (DOL) STRG
- SANDSTONE STRINGER
- SHALE STRINGER
- SILTSTONE STRINGER

Accessories

- ARGILLITE GRAIN
- B BENTONITE
- H HEAVY MINERAL
- K KAOLIN
- BIT BITUMENOUS SUBSTANCE
- BRECCIA FRAGMENTS
- CALCAREOUS
- CARBONACEOUS FLAKES
- CHERT
- CHERT
- COAL - THIN BEDS
- DOLOMITIC
- FELDSPAR
- FERRUGINOUS PELLET
- FERRUGINOUS
- GLAUCONITE
- GYPSIFEROUS
- M MARLSTONE
- MICACEOUS
- MINERAL CRYSTALS
- N NODULES
- PHOSPHATE PELLETS
- PYRITE
- SALT CAST
- SANDY
- SILICEOUS
- SILTY
- TUFFACEOUS

Stringer

Geologist

Rock Types

- MARLSTONE
- METAMORPHIC
- NO SAMPLE
- SALT
- SANDSTONE
- SALT-PEPPER SAND
- SHALE
- SHALE COLORED
- SHALE GRAY
- SHALY SANDSTONE
- SHALY SILTSTONE
- SILTY SHALE
- SILTSTONE
- TUFF
- WELDED TUFF

Oil Show

- P PINPOINT
- V VUGGY
- D DEAD
- E EVEN
- Q QUESTIONABLE
- BIT
- SPOTTED STAINING
- CONNECTION (UP)

Engineering

- DST INTERVAL
- FAULT
- FORMATION TOP
- GAS SHOW
- OIL SHOW
- MN DEPTH UP
- MN DEPTH (DOWN)
- CONNECTION (DOWN)
- CONNECTION GAS
- CONNECTION GAS (LEFT)
- TRIP GAS
- TRIP GAS (LEFT)
- INTERCRYSTALLINE
- DOWN TIME GAS
- DOWN TIME GAS (LEFT)
- CORE - LOST
- CORE - RECOVERED

Porosity

- E EARTHY
- F FENESTRAL
- F FRACTURE
- INTERCRYSTALLINE
- INTEROOLITIC
- MOLDIC
- ORGANIC

Other Symbols

- WIRELINE TESTED - LEFT
- WIRELINE TESTED - RT
- FINE LXXLN
- DRILL STEM TEST
- MN DEPTH
- L LITHOGRAPHIC
- MICRO LXXLN
- GS GRAINSTONE
- A ANGULAR
- R ROUNDED
- SUBANG
- SUBRID
- NORMAL FAULT
- OVERTURNED STRATA
- REVERSE FAULT
- CASING
- SIDEWALL CORE (LEFT)
- SIDEWALL CORE (RIGHT)
- SLIDE
- SURVEY
- CHALKY
- CRYPTOXLN
- P POOR
- W WELL
- M MODERATE
- WS WACKESTONE
- SORTING

Slide/Rotate

ROP
ROF
GAMMA

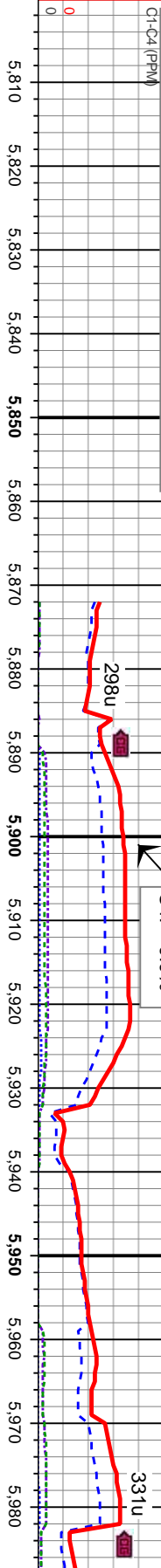
Began Build @ 5872' MD; 0216 hrs. 02/25/2014
LOG CONTINUED FROM: WELLS
GAS/RA RANCH AA35-67-1AHNA(VERT).mplot
BEGIN 50' SAMPLE INTERVALS

Total Gas & Chromatograph

GAS
C1
C2
C3
C4

COLUMBINE LOGGING INC. RIGGED UP ON
02/23/2014 MANNED 2-PERSON LOGGING WITH
BLOODHOUND GAS CHROMATOGRAPH UNIT
#0315

Depth Labels



% Lith

100% SLTY SH: m-dk gy occ gy brn, pty - sb
pty firm-sl sft, rthy-sl slty

100% SLTY SH: m-dk gy occ gy brn
sb pty firm-sl sft, rthy-sl slty

Well Bore
TVD

BHA #2
Bit Size: 8.750
Manufacturer: HDBS
Model: MMDS5M
Serial Number: 12394672
Nozzles: 5x16

Motor Number: 2
Manufacturer: Sperry Drilling
Model: Sperry Drill
Serial Number: 675-0155
Bend: 2.0

MD: 5,875'
TVD: 5,832.85'
Inclination: 0.14 °
Azimuth: 151.98 °
VS: 164.75'

MD: 5,925'
TVD: 5,882.85'
Inclination: 0.44 °
Azimuth: 241.54 °
VS: 164.88'

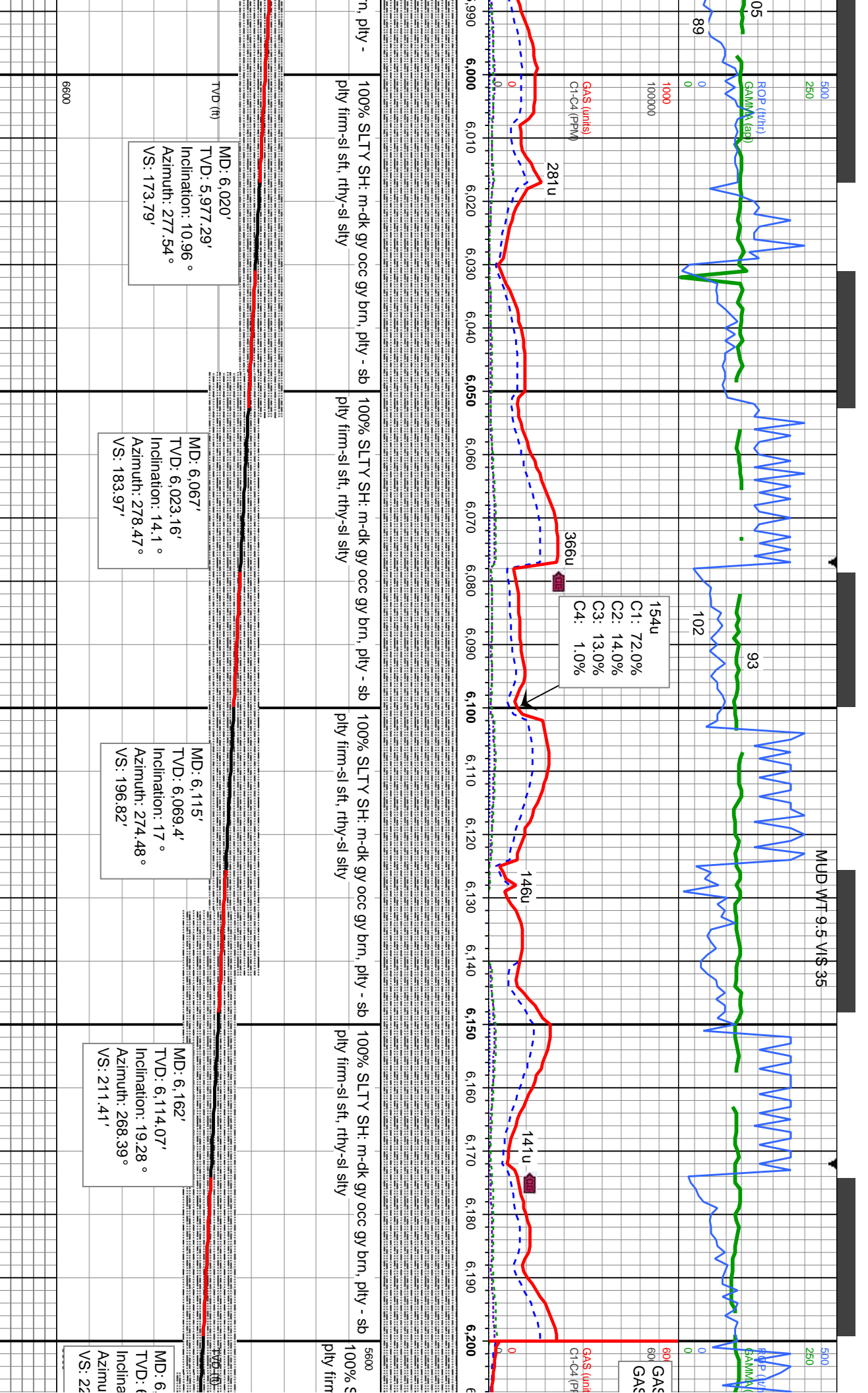
MD: 5,972'
TVD: 5,929.78'
Inclination: 5.1 °
Azimuth: 281.68 °
VS: 167.11'

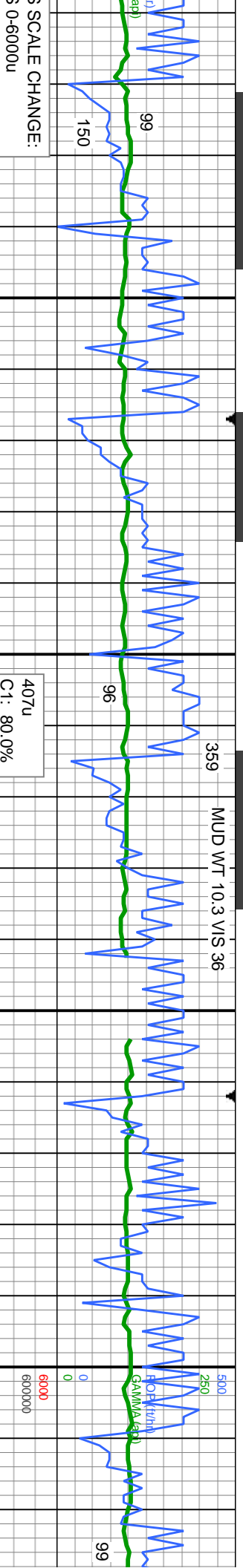
Oil Show

68
66
64
62
60
58
56
54
52
50
48
46

Images







PLUGGED FLOW LINE

1385u

407u
C1: 80.0%
C2: 13.0%
C3: 8.0%
C4: 1.0%

1909u

GA\$ (units)
C1-C4 (PPM)

SLTY SH: m-dk gy occ gy brn, pty - sb
100% SLTY SH: m-dk gy occ gy brn, pty - sb
100% SLTY SH: m-dk gy occ gy brn, pty - sb
100% SLTY SH: m-dk gy occ gy brn, pty - sb
100% SLTY SH: m-dk gy occ gy brn, pty - sb
100% SLTY SH: m-dk gy occ gy brn, pty - sb

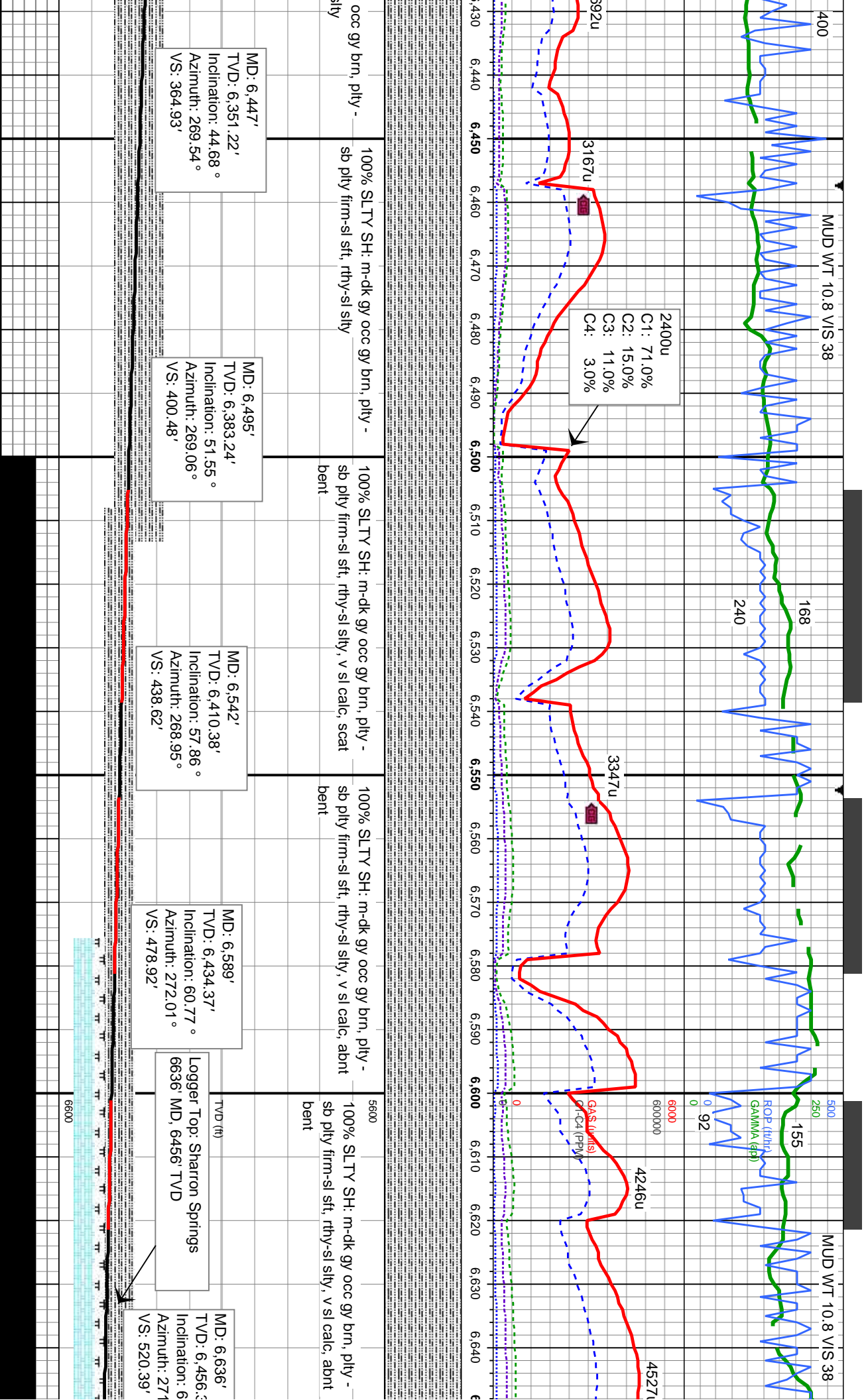
MD: 6,257'
TVD: 6,200.7'
Inclination: 29.4 °
Azimuth: 270.78 °
VS: 249.87'

MD: 6,305'
TVD: 6,241.42'
Inclination: 34.48 °
Azimuth: 274.52 °
VS: 275.23'

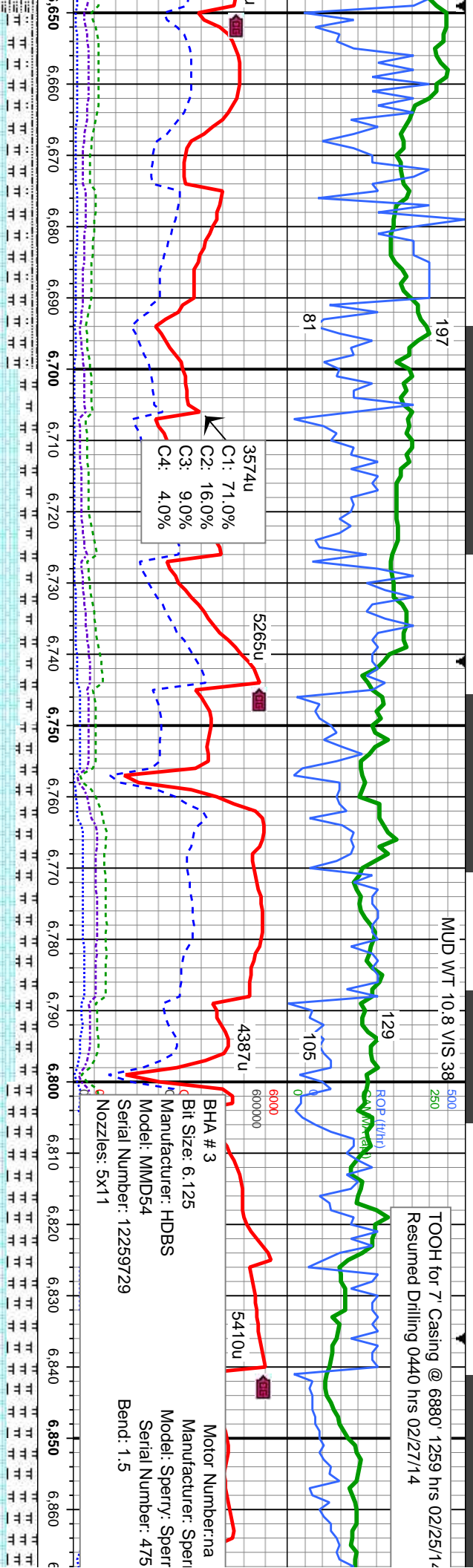
MD: 6,352'
TVD: 6,279.27'
Inclination: 38.21 °
Azimuth: 274.61 °
VS: 303.07'

MD: 6,400'
TVD: 6,316.51'
Inclination: 40.07 °
Azimuth: 271.56 °
VS: 333.35'



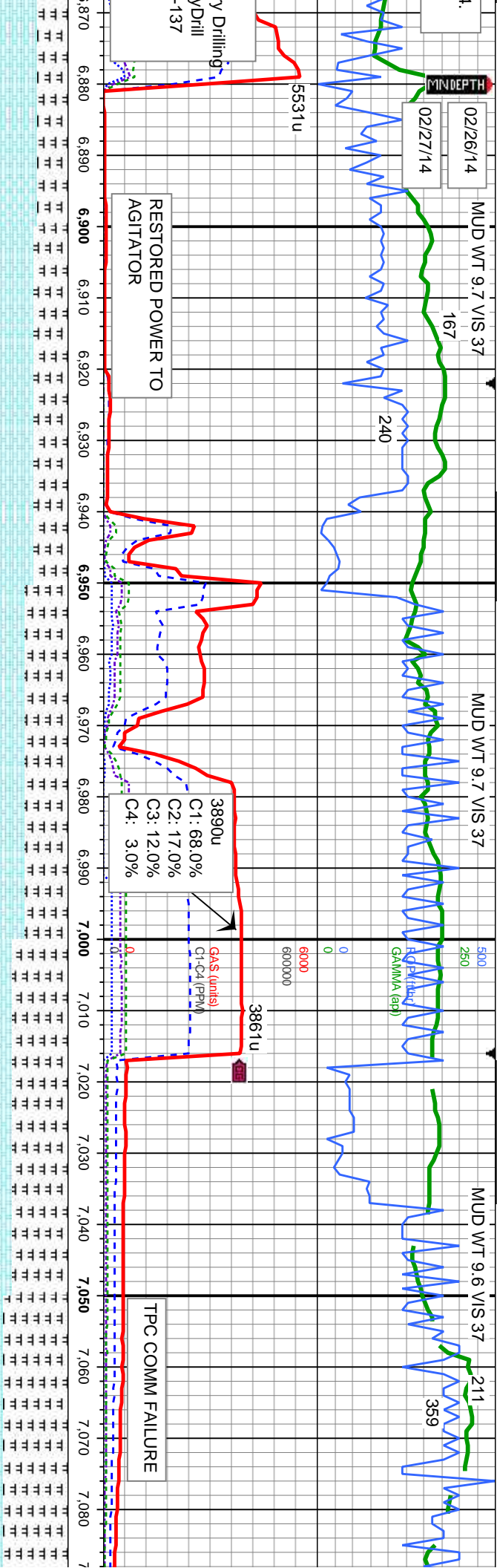


TOOH for 7" Casing @ 6880' 1259 hrs 02/25/14
Resumed Drilling 0440 hrs 02/27/14



65% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ firm, blkly - sbblky, wxy - rthy tex 25% MRL: m - dkgy, mod sft-sl firm, sbblky-sbblply, rthy-slly tex, sl mot, occ sl vit 10% SLTY SH: m-dk gy occ gy brn, ply - sb ply firm-sl sft, rthy-sl slty MD: 6.684' TVD: 6.476.44' Inclination: 67.14° Azimuth: 268.82° VS: 563.84'	80% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ firm, blkly - sbblky, wxy - rthy tex 20% MRL: m - dkgy, mod sft-sl firm, sbblky-sbblply, rthy-slly tex, sl mot, occ sl vit lstr, v calc	75% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ firm, blkly - sbblky, wxy - rthy tex 25% MRL: m - dkgy, mod sft-sl firm, sbblky-sbblply, rthy-slly tex, sl mot, occ sl vit lstr, v calc	SCALE CHANGE TVD 6500' - 6600'	MD: 6.823' TVD: 6.516.97' Inclination: 78.34° Azimuth: 267.27° VS: 695.47'	65% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ firm, blkly - sbblky, wxy - rthy tex 35% MRL: m - dkgy, mod sft-sl firm, sbblky-sbblply, rthy-slly tex, sl mot, occ sl vit lstr, v calc
MD: 6.731' TVD: 6.493.1' Inclination: 71.35° Azimuth: 266.84° VS: 607.45'	Logger Top: A CHALK 6744' MD, 6497' TVD	MD: 6.779' TVD: 6.506.91' Inclination: 75.2° Azimuth: 267.4° VS: 653'			Logger Top: A 6870' MD, 652

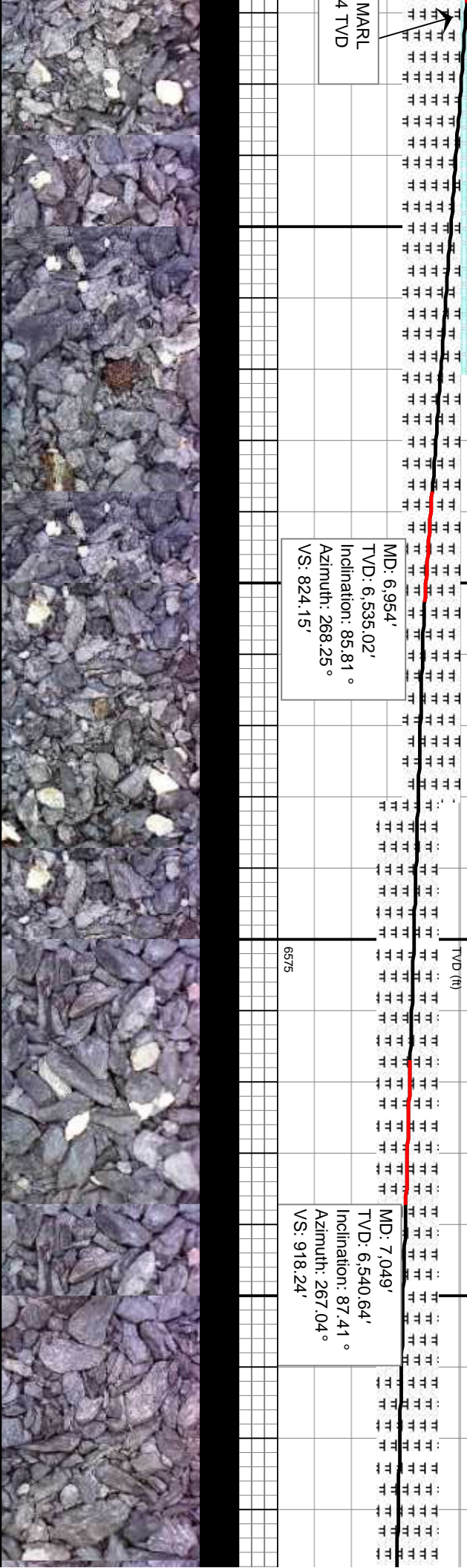


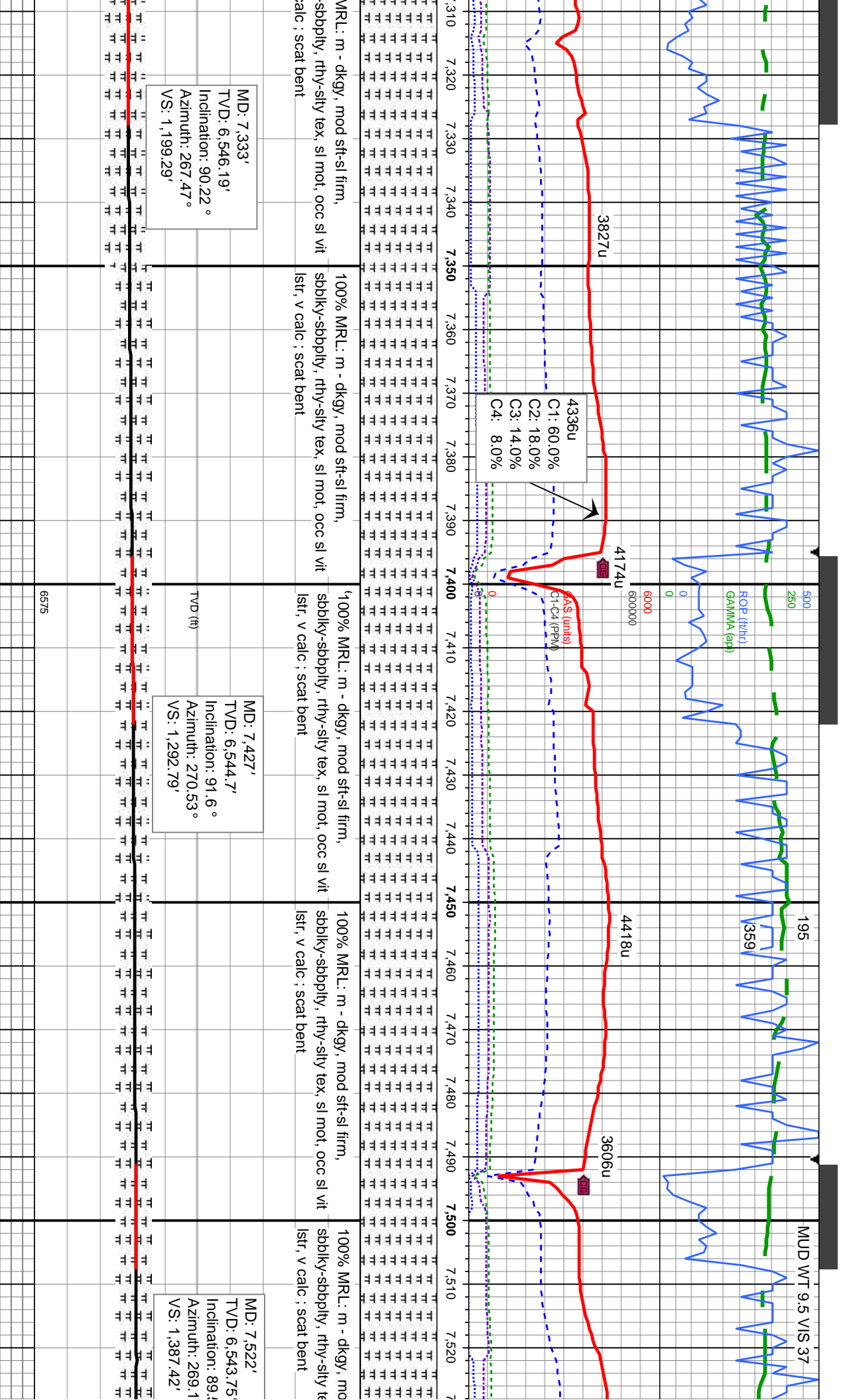


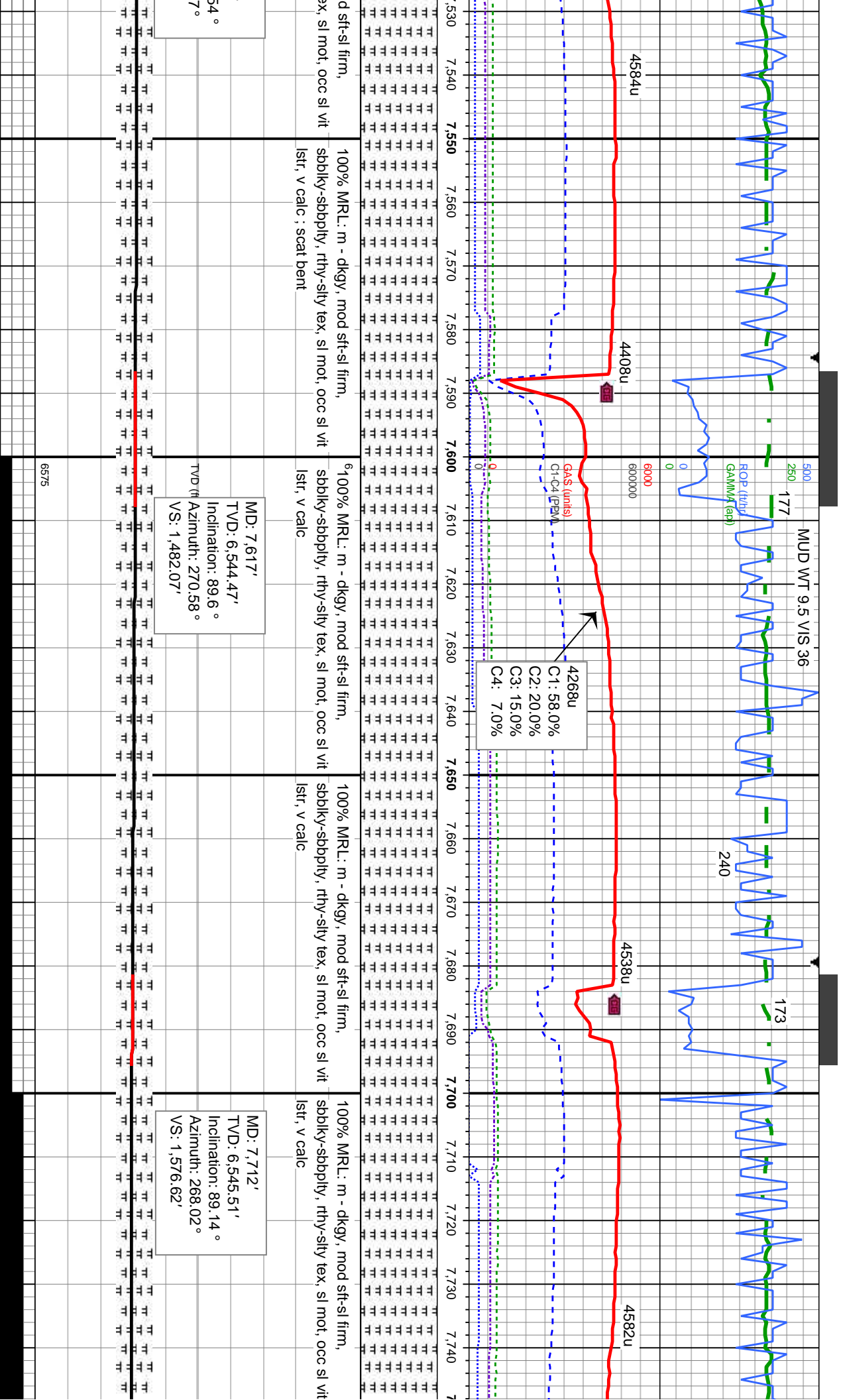
- gy, occ lt brn, mod sft - sft, sbblky, wxy - rthy tex	60% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ firm, blkly - sbblky, wxy - rthy tex	50% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ firm, blkly - sbblky, wxy - rthy tex	65% MRL: m - dkgy, mod sft-sl firm, sbblky-sbblpy, rthy-slty tex, sl mot, occ sl vit lstr, v calc	75% MRL: m - dkgy, mod sft-sl firm, sbblky-sbblpy, rthy-slty tex, sl mot, lstr, v calc
dkgy, mod sft-sl firm, rthy-slty tex, sl mot, occ sl vit	40% MRL: m - dkgy, mod sft-sl firm, sbblky-sbblpy, rthy-slty tex, sl mot, occ sl vit lstr, v calc	50% MRL: m - dkgy, mod sft-sl firm, sbblky-sbblpy, rthy-slty tex, sl mot, occ sl vit lstr, v calc	35% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ firm, blkly - sbblky, wxy - rthy tex	25% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ firm, blkly - sbblky, wxy - rthy tex

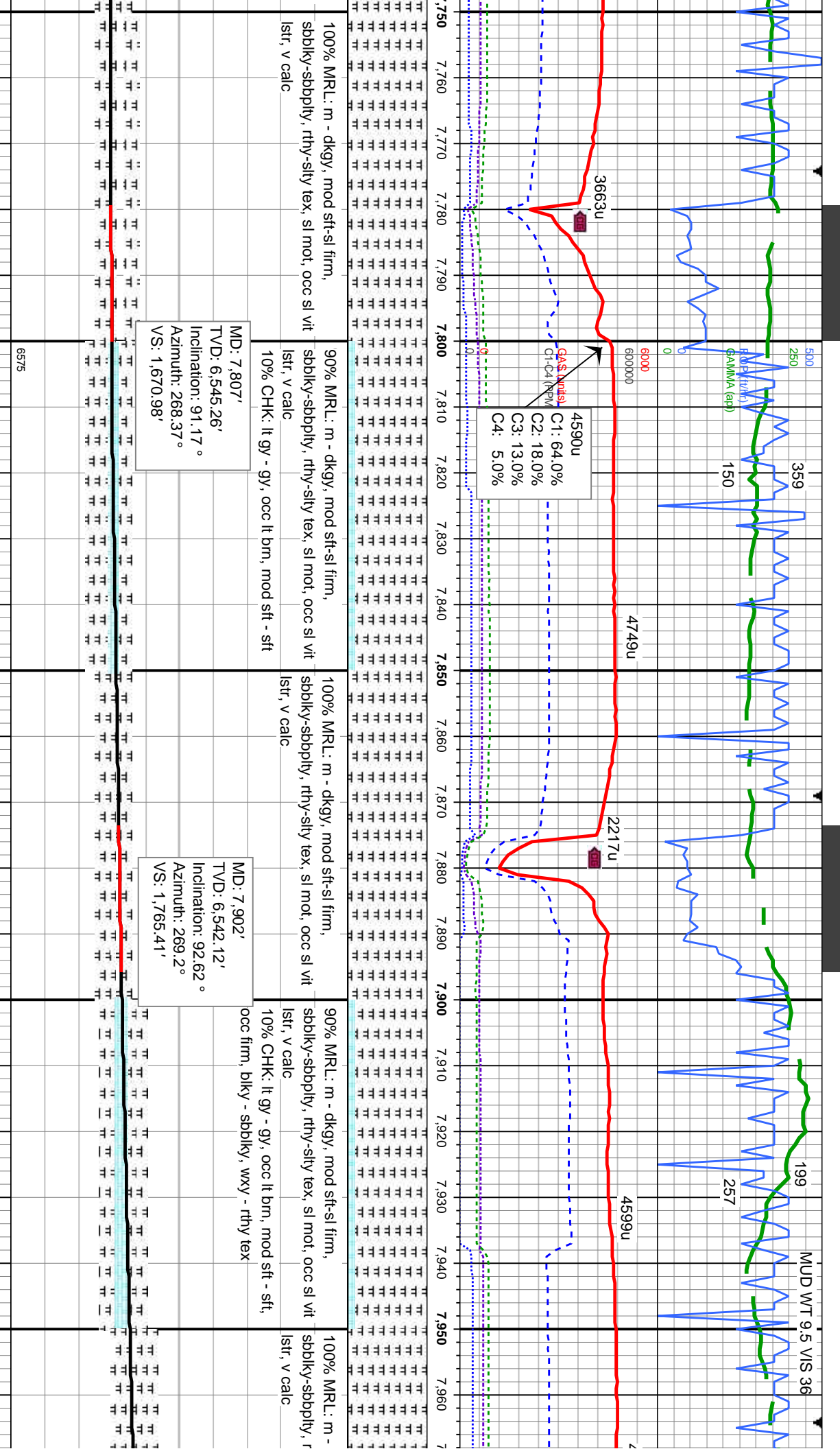
MD: 6.954'
TVD: 6.535.02'
Inclination: 85.81 °
Azimuth: 268.25 °
VS: 824.15'

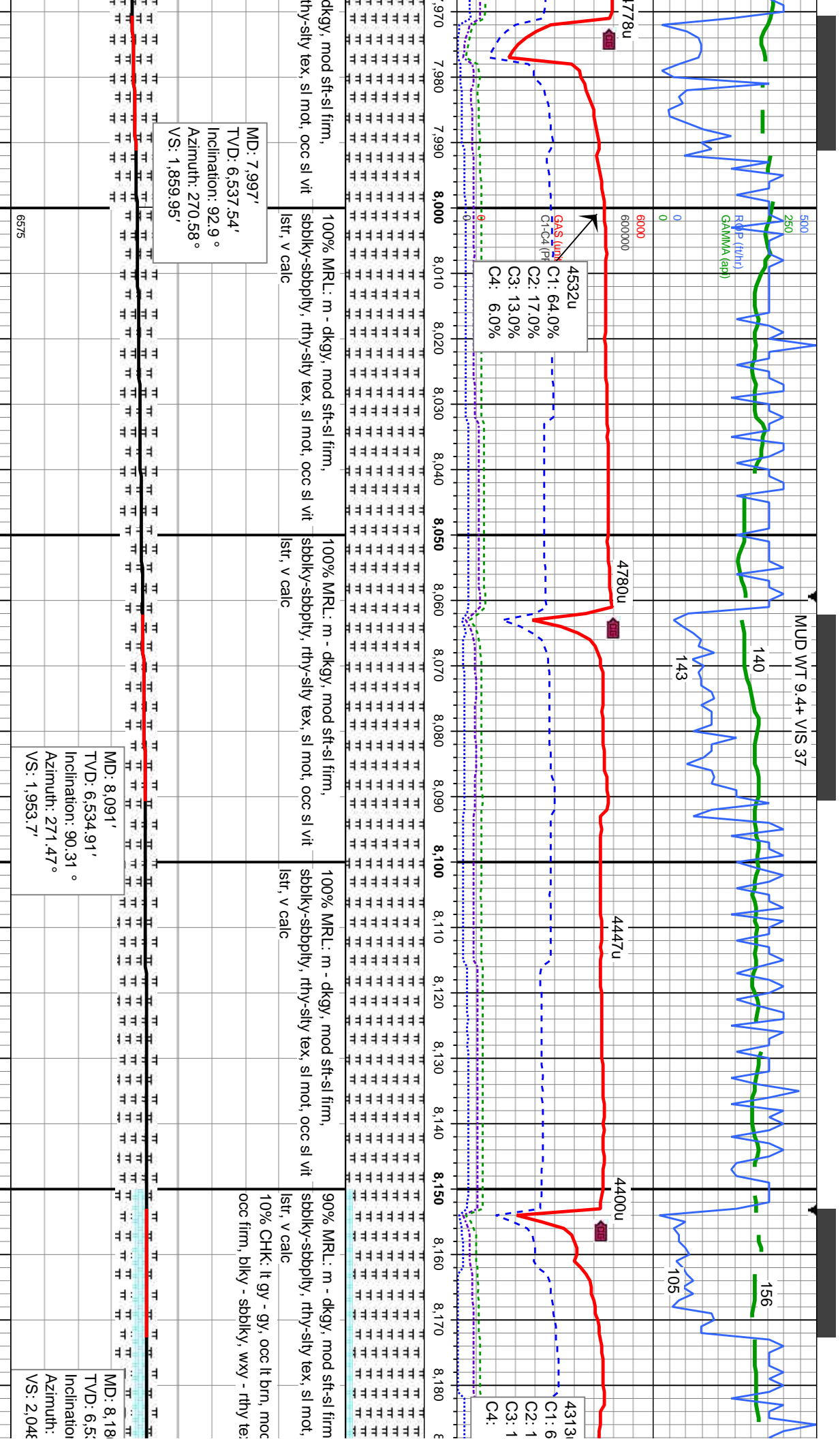
MD: 7.049'
TVD: 6.540.64'
Inclination: 87.41 °
Azimuth: 267.04 °
VS: 918.24'

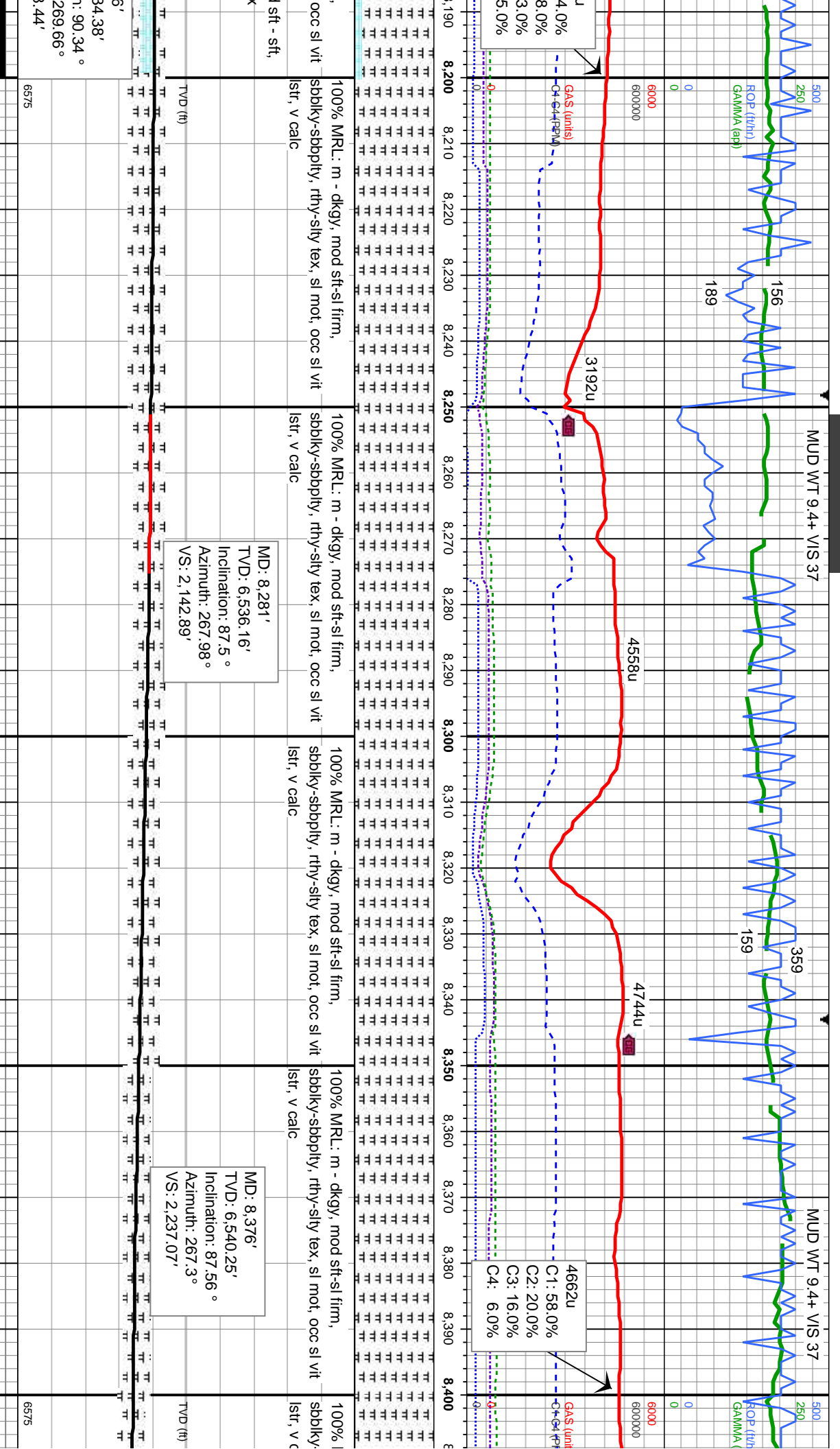


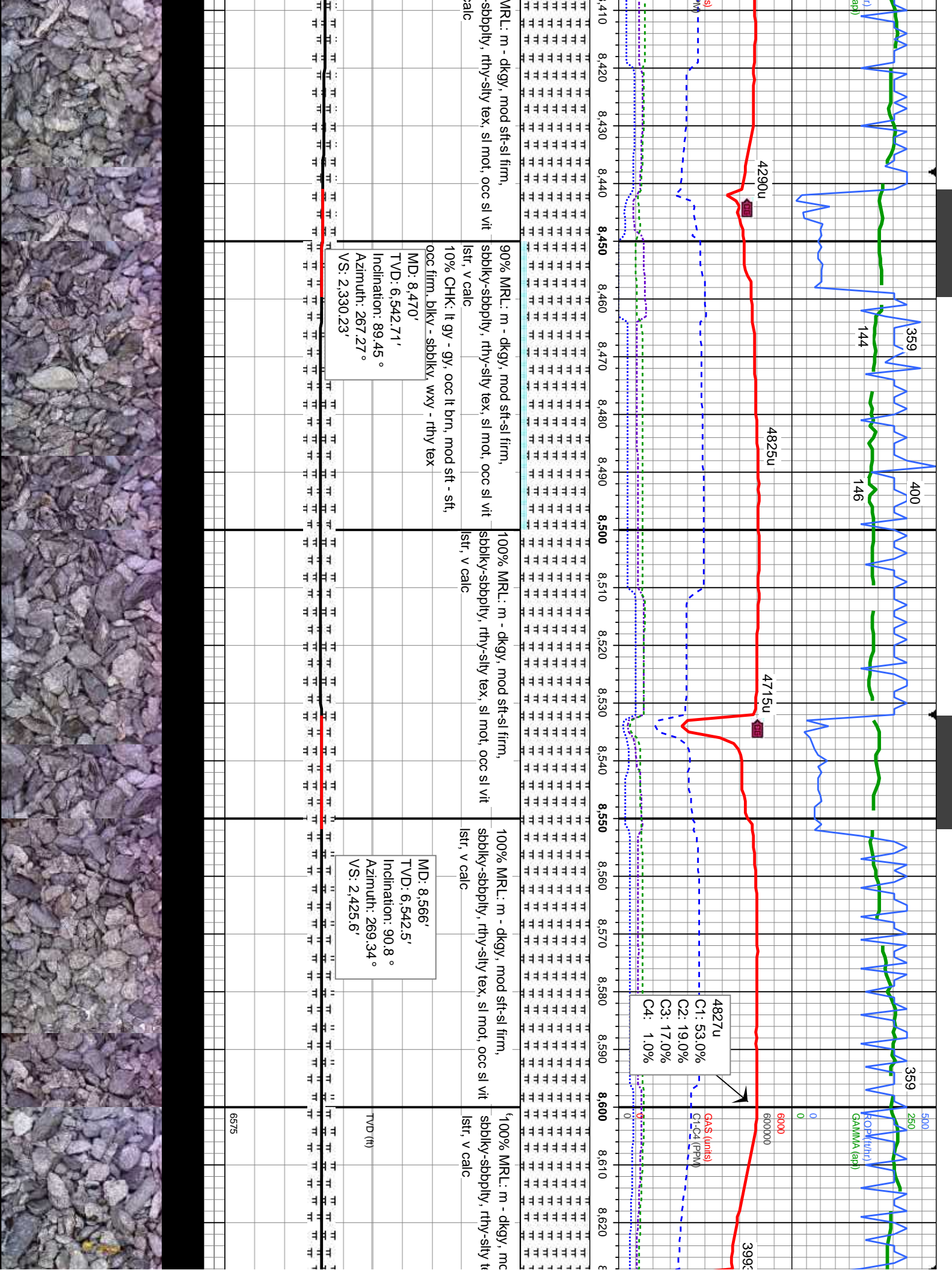






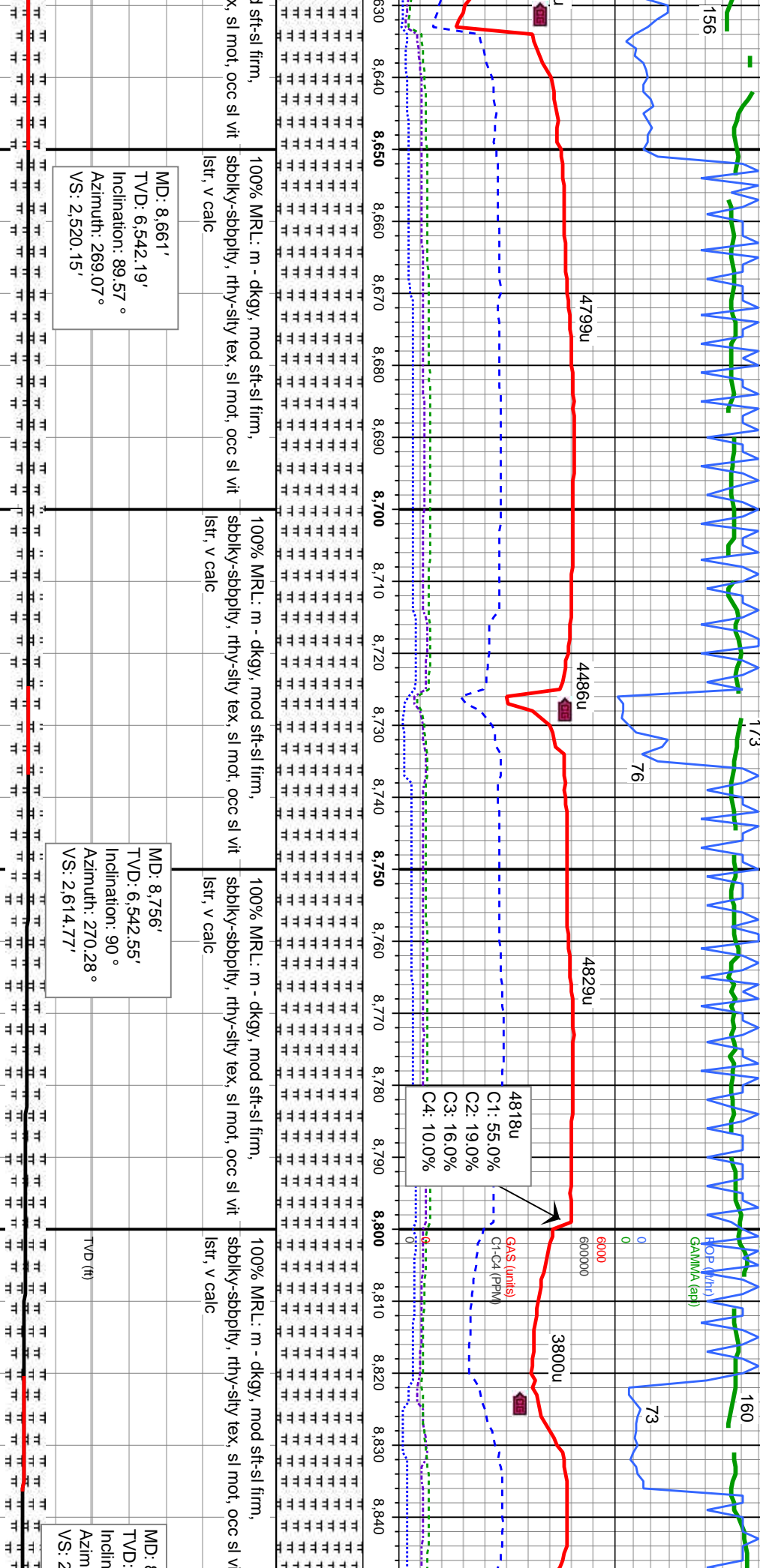


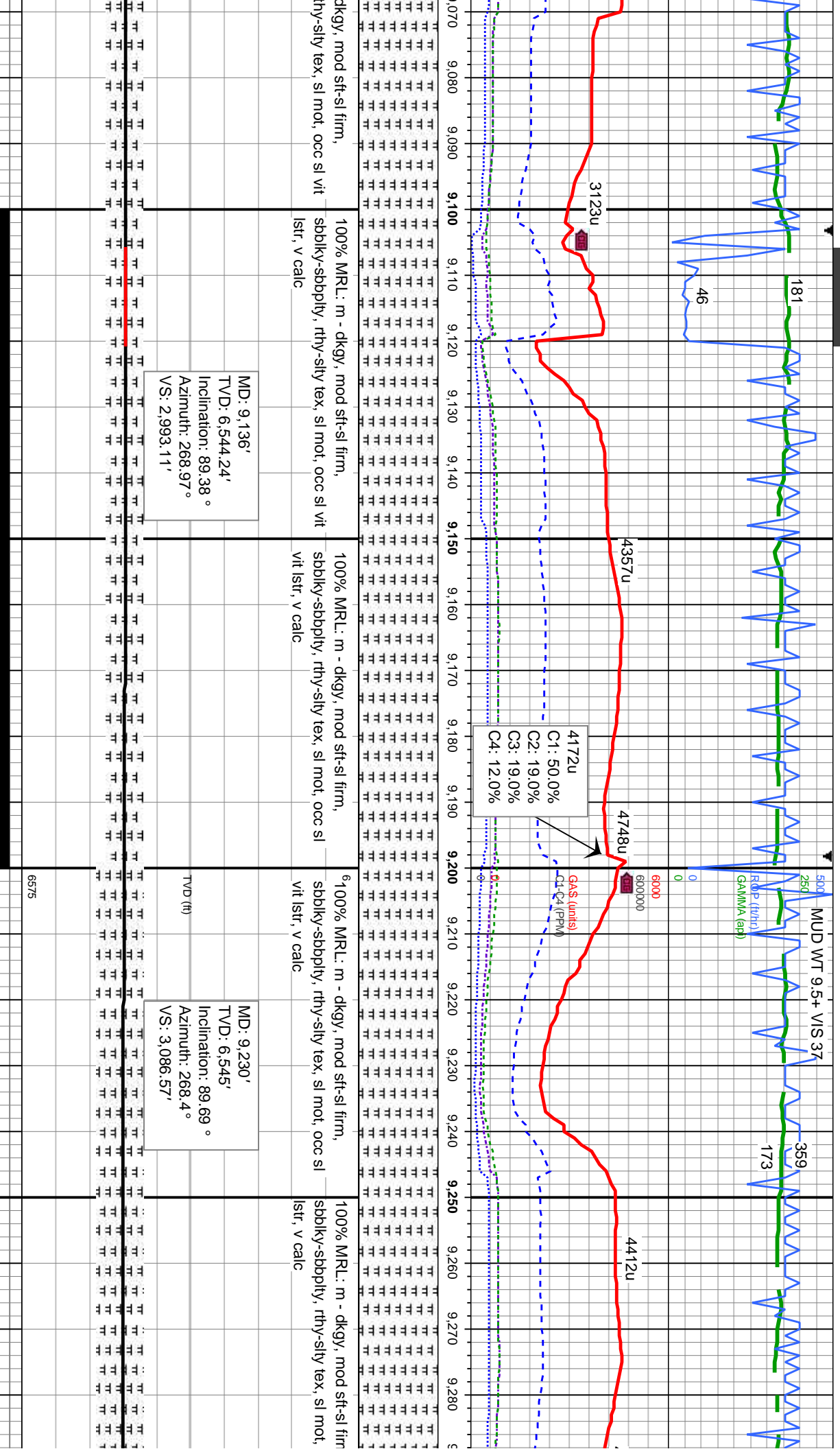


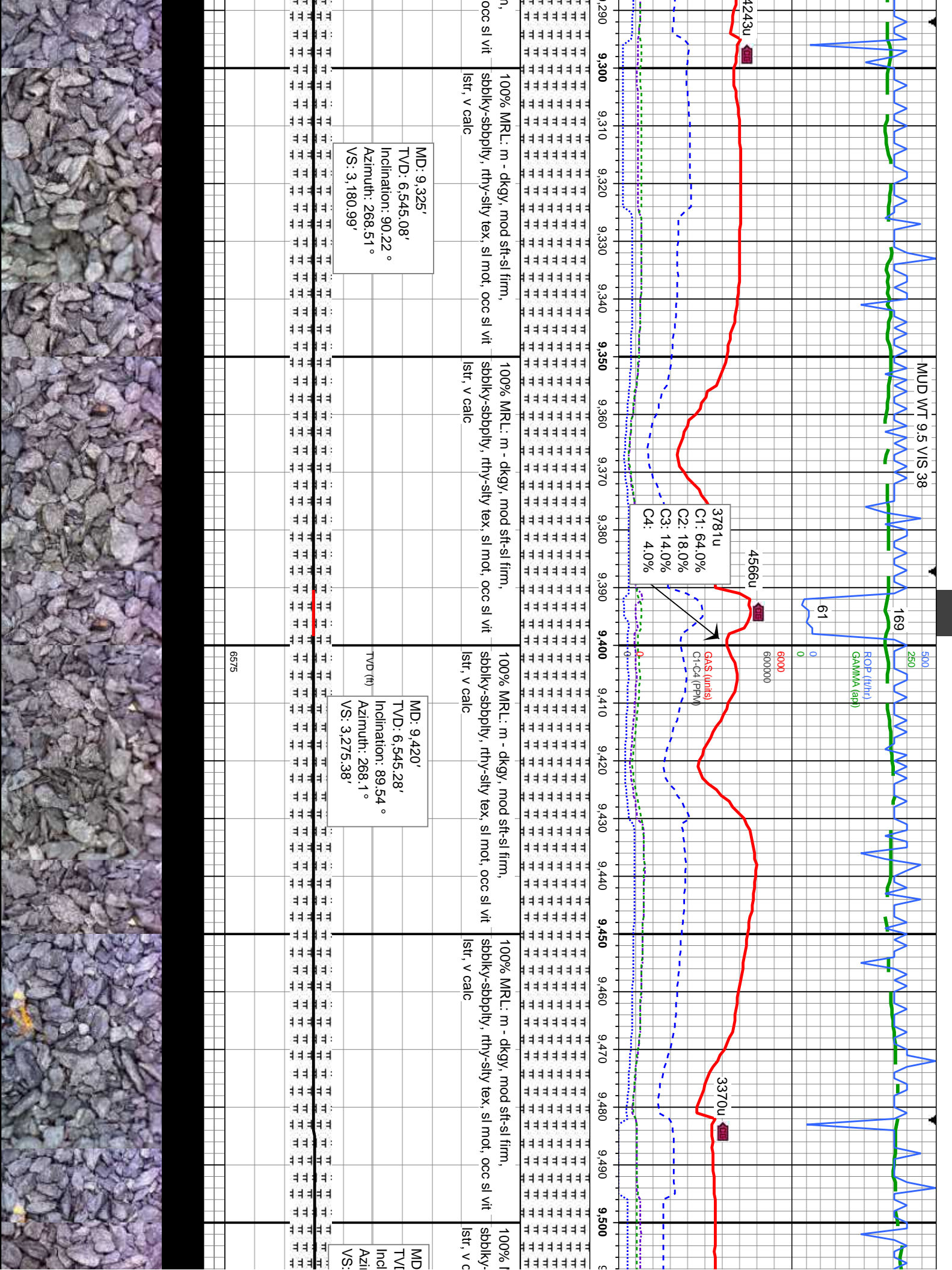


MUD WT 9.4+ VIS 37

MUD WT 9.5 VIS 37







MUD WT 9.5 VIS 38

ROP (ft/hr)
GAMMA (api)

3781u
C1: 64.0%
C2: 18.0%
C3: 14.0%
C4: 4.0%

GCS (units)
C1-C4 (ppm)

MD: 9,325'
TVD: 6,545.08'
Inclination: 90.22°
Azimuth: 268.51°
VS: 3,180.99'

MD: 9,420'
TVD: 6,545.28'
Inclination: 89.54°
Azimuth: 268.1°
VS: 3,275.38'

100% MR.L: m - dkgy, mod sft-sl firm,
sbbiky-sboply, rthy-slty tex, sl mot, occ sl vit
lsfr, v calc

100% MR.L: m - dkgy, mod sft-sl firm,
sbbiky-sboply, rthy-slty tex, sl mot, occ sl vit
lsfr, v calc

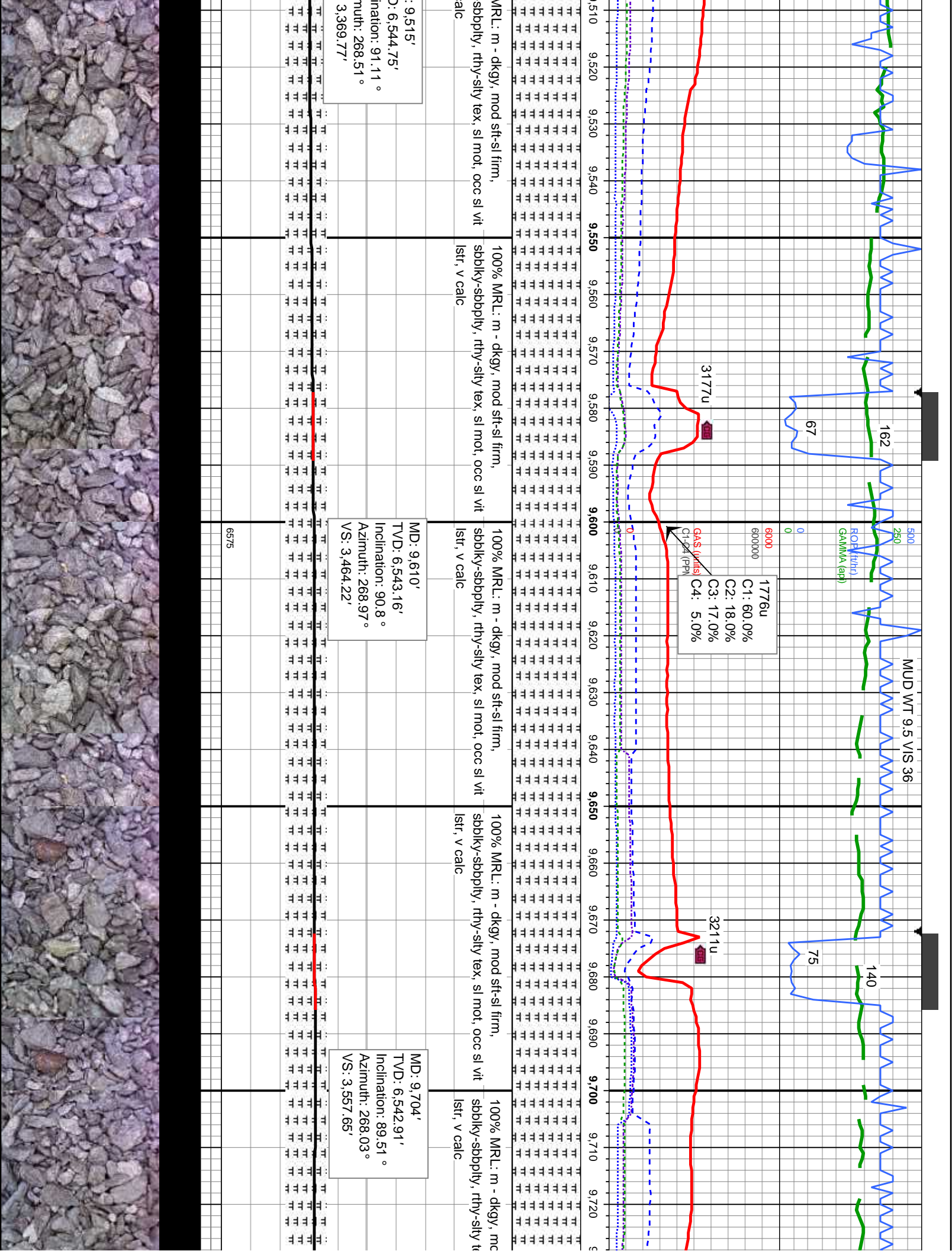
100% MR.L: m - dkgy, mod sft-sl firm,
sbbiky-sboply, rthy-slty tex, sl mot, occ sl vit
lsfr, v calc

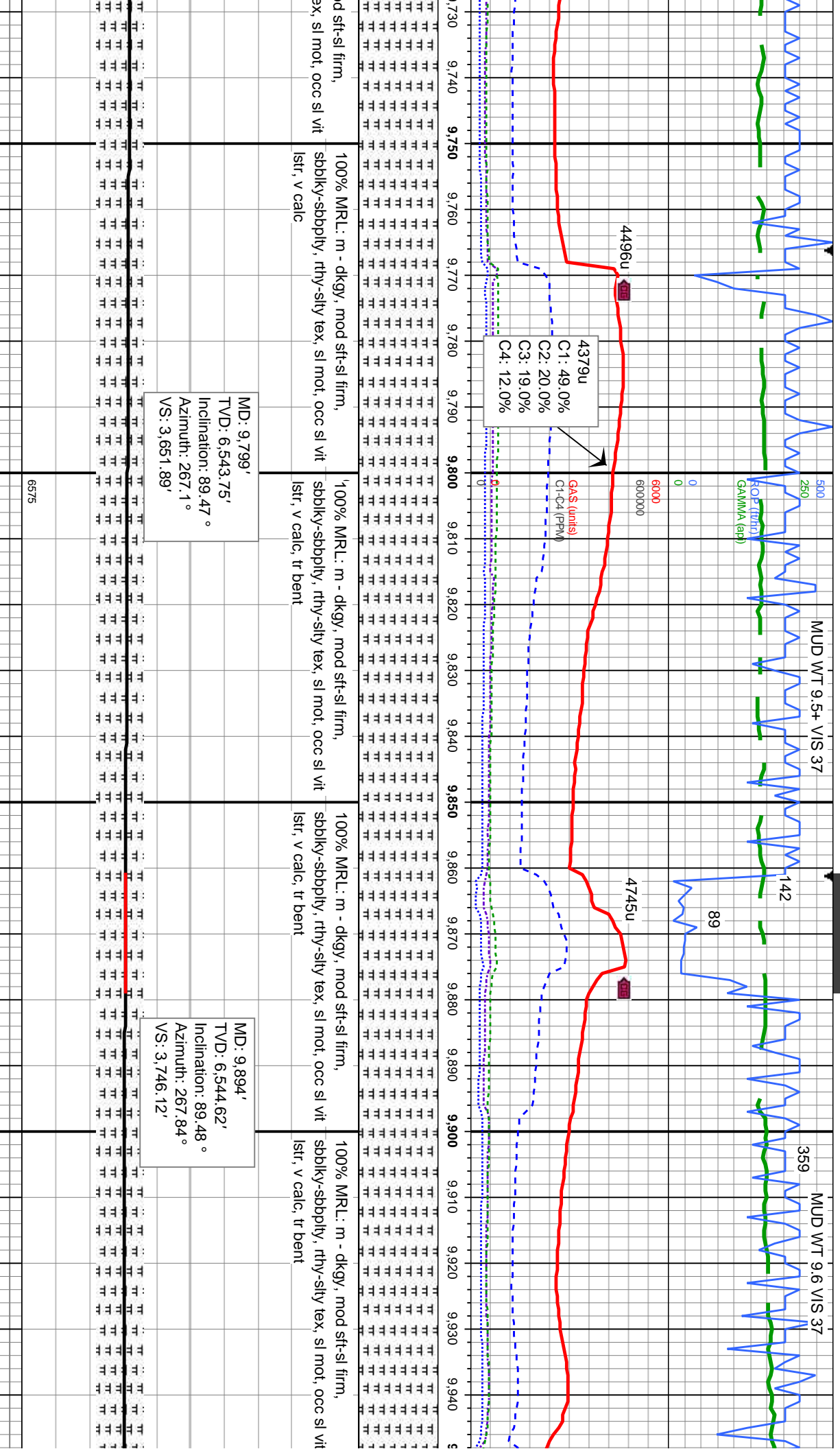
100% MR.L: m - dkgy, mod sft-sl firm,
sbbiky-sboply, rthy-slty tex, sl mot, occ sl vit
lsfr, v calc

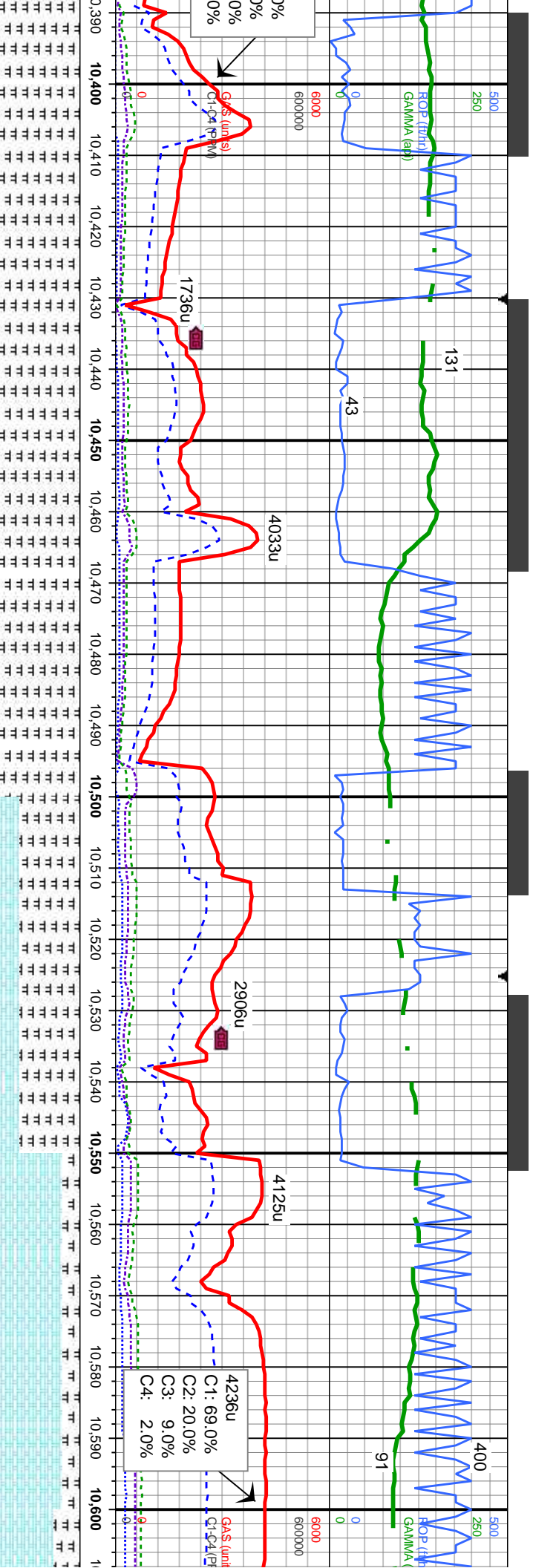
100% MR.L: m - dkgy, mod sft-sl firm,
sbbiky-sboply, rthy-slty tex, sl mot, occ sl vit
lsfr, v calc

6575

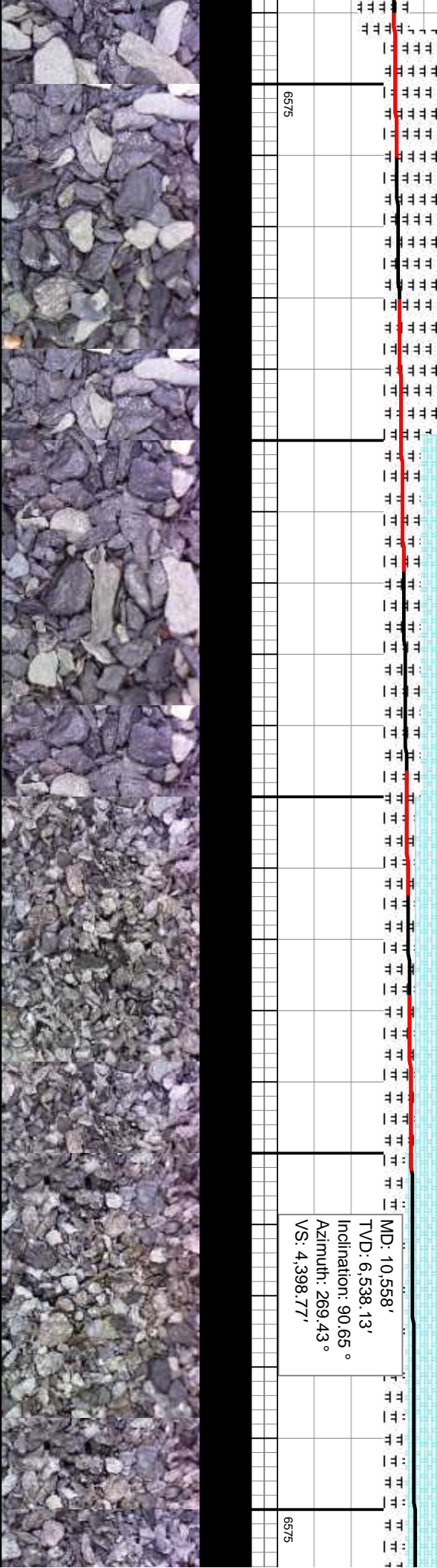


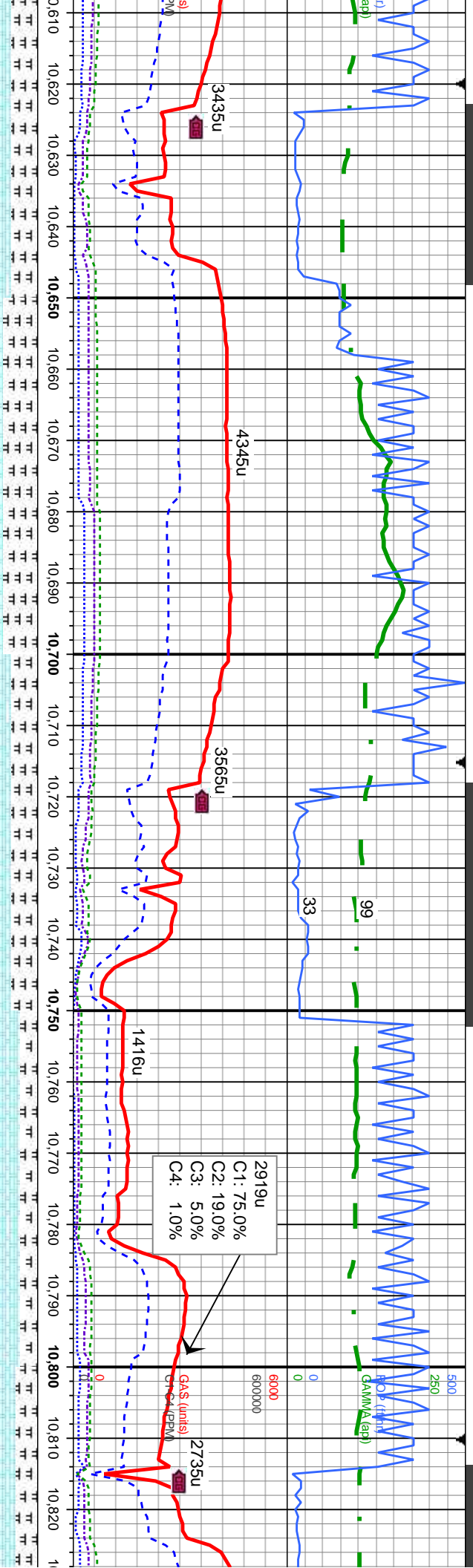






6100% MRL: m - dkgy, mod sft-sl firm, sbblky-sbbply, rthy-slty tex, sl mot, occ sl vit lstr, v calc, scat pyr	100% MRL: m - dkgy, mod sft-sl firm, sbblky-sbbply, rthy-slty tex, sl mot, occ sl vit lstr, v calc, scat pyr	70% MRL: m - dkgy, mod sft-sl firm, sbblky-sbbply, rthy-slty tex, sl mot, occ sl vit lstr, v calc, scat pyr	30% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ firm, blkly - sbblky, wxy - rthy tex	80% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ firm, blkly - sbblky, wxy - rthy tex	20% MRL: m - dkgy, mod sft-sl firm, sbblky-sbbply, rthy-slty tex, sl mot, occ sl vit lstr, v calc, scat pyr	30% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ firm, blkly - sbblky, wxy - rthy tex
MD: 10,463'	MD: 10,463'	MD: 10,463'	MD: 10,558'	MD: 10,558'	MD: 10,558'	MD: 10,558'
TVD: 6,540.66'	TVD: 6,540.66'	TVD: 6,540.66'	TVD: 6,538.13'	TVD: 6,538.13'	TVD: 6,538.13'	TVD: 6,538.13'
Inclination: 92.41°	Inclination: 92.41°	Inclination: 92.41°	Inclination: 90.65°	Inclination: 90.65°	Inclination: 90.65°	Inclination: 90.65°
Azimuth: 266.13°	Azimuth: 266.13°	Azimuth: 266.13°	Azimuth: 269.43°	Azimuth: 269.43°	Azimuth: 269.43°	Azimuth: 269.43°
VS: 4,304.53'	VS: 4,304.53'	VS: 4,304.53'	VS: 4,398.77'	VS: 4,398.77'	VS: 4,398.77'	VS: 4,398.77'



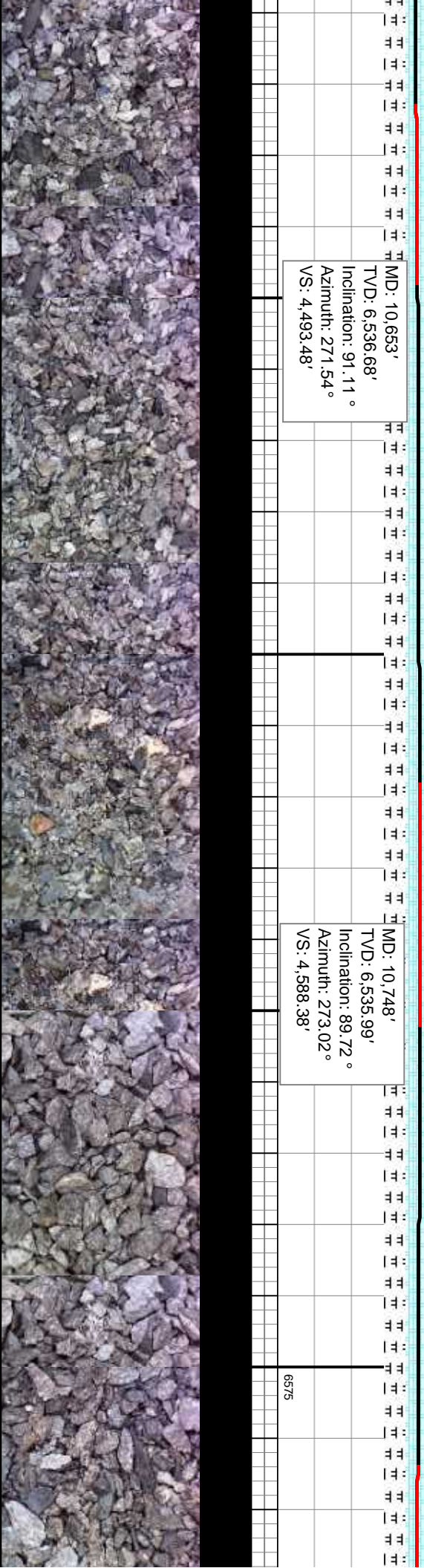


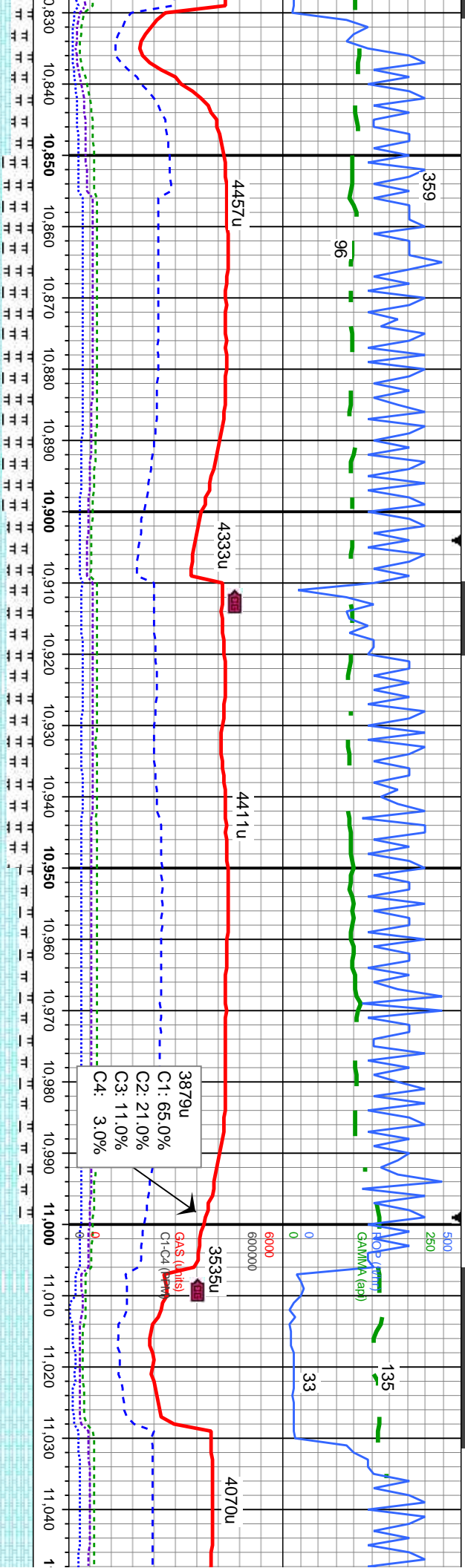
CHK: It gy - gy, occ It brn, mod sft - sft, m, biky - sbblky, wxy - rthy tex	60% CHK: It gy - gy, occ It brn, mod sft - sft, occ firm, biky - sbblky, wxy - rthy tex	70% CHK: It gy - gy, occ It brn, mod sft - sft, occ firm, biky - sbblky, wxy - rthy tex	80% CHK: It gy - gy, occ It brn, mod sft - sft, occ firm, biky - sbblky, wxy - rthy tex	75% CHK: It gy - gy, occ It brn, mod sft - sft, occ firm, biky - sbblky, wxy - rthy tex
MRL: m - dkgy, mod sft-sl firm, sbblky-sbblpy, rthy-sily tex, sl mot, occ sl vit lstr, v calc	40% MRL: m - dkgy, mod sft-sl firm, sbblky-sbblpy, rthy-sily tex, sl mot, occ sl vit lstr, v calc	30% MRL: m - dkgy, mod sft-sl firm, sbblky-sbblpy, rthy-sily tex, sl mot, occ sl vit lstr, v calc	20% MRL: m - dkgy, mod sft-sl firm, sbblky-sbblpy, rthy-sily tex, sl mot, occ sl vit lstr, v calc	25% MRL: m - dkgy, mod sft-sl firm, sbblky-sbblpy, rthy-sily tex, sl mot, occ sl vit lstr, v calc

MD: 10,653'
TVD: 6,536.68'
Inclination: 91.11 °
Azimuth: 271.54 °
VS: 4,493.48'

MD: 10,748'
TVD: 6,535.99'
Inclination: 89.72 °
Azimuth: 273.02 °
VS: 4,588.38'

6575





It brn, mod sft - sft,	65% CHK: It gy - gy, occ It brn, mod sft - sft, occ firm, blkly - sbbkly, wxy - rthy tex	70% CHK: It gy - gy, occ It brn, mod sft - sft, occ firm, blkly - sbbkly, wxy - rthy tex	85% CHK: It gy - gy, occ It brn, mod sft - sft, occ firm, blkly - sbbkly, wxy - rthy tex	6475
y - rthy tex				100% CHK: It gy - gy, occ It brn, mod sft - sft, occ firm, blkly - sbbkly, wxy - rthy tex, v
stl sl firm,	35% MRL: m - dkgy, mod sft-sl firm, sbbkly-sbbply, rthy-slty tex, sl mot, occ sl	30% MRL: m - dkgy, mod sft-sl firm, sbbkly-sbbply, rthy-slty tex, sl mot, occ sl	15% MRL: m - dkgy, mod sft-sl firm, sbbkly-sbbply, rthy-slty tex, sl mot, occ sl	calc
ex, sl mot, occ sl	vit lstr, v calc	vit lstr, v calc	vit lstr, v calc	

MD: 10,843'
TVD: 6,537.01'
Inclination: 89.04 °
Azimuth: 273.56 °
VS: 4,683.35'

MD: 10,937'
TVD: 6,537.49'
Inclination: 90.37 °
Azimuth: 272.16 °
VS: 4,777.29'

MD: 11,032'
TVD: 6,537.52'
Inclination: 89.6 °
Azimuth: 273.17 °
VS: 4,872.22'

6575

TVD (ft)

