



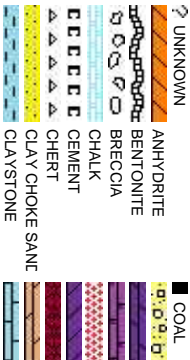
Scale: 5" / 100'
Measured Depth Log

Well Name	Cutthroat LC28-72HNB(HORZ)		
Location	SESE SEC 28, T9N, R59W		
State	COLORADO	County	WELD
Country	USA	Rig Number	H&P 326
API Number	05-123-38603		
Region	DJ BASIN	Field	WILDCAT
Spud Date	7/18/2014	Drilling Completed	7/24/2014
Surface Coordinates	340' FSL, 955' FEL 40.71503 -103.9767		
Ground Elevation	4837'	K.B. Elevation	4867'
Logged Interval	633'	To	10406'
		Total Depth	10406'
Formation	NIOBRARA, B MARL		
Type of Drilling Fluid	LSND		

Company Noble Energy Inc
Address 1625 Broadway Suite
Denver, CO 80202

Name EVAN HOWELL
Company NOBLE ENERGY INC
Address 1625 Broadway Suite
Denver, CO 80202

COLUMBINE LOGGING INC.



Operator

2000

Geologist

2000

Other

MIKE KERSCHEN
TRACY LAWSON

Rock Types

CONGLOMERATE

DOLOMITE

DOLOMITIC LIMESTONE

GRANITE

GYPSUM

IGNEOUS

SIDERITE or LIMONITE

LIMESTONE

MARLSTONE

METAMORPHIC

NO SAMPLE

SALT

SANDSTONE

SALT-PEPPER SANI

SHALE

SHALE COLORED

SHALE GRAY

SHALY SANDSTONE

SHALY SILTSTONE

SILTY SHALE

SILTSTONE

TILL

TUFF

WELDED TUFF

Accessories

GASTROPOD

INOCERAMUS

OOLITE

OSTRACOD

PELECYPOD

PELLET

PISOLITE

PLANT REMAINS

PLANT SPORES

SCAPHOPOD

STROMATOPOROID

ECHINOID

FISH

FORAMINIFERA

F FOSSIL

ARGILLITE GRAIN

B BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

CALCAREOUS

CARBONACEOUS FLAKES

CHITDK

CHTLT

COAL - THIN BEDS

DOLOMITIC

FELDSPAR

FERRUGINOUS PELLET

FERRUGINOUS

GLAUCONITE

GYPSEIFEROUS

HEAVY MINERAL

K KAOLIN

MARLSTONE

MICACEOUS

MINERAL CRYSTALS

MINODULES

PHOSPHATE PELLETS

P PYRITE

SALT CAST

SANDY

SILICEOUS

SILTY

TUFFACEOUS

ANHYDRITE STRINGER

BENTONITE STRINGER

COAL STRINGER

DOLOMITIC STRINGER

GYPSUM STRINGER

LIMESTONE STRINGER

MARLSTONE (CALC) STRG

MARLSTONE (DOL) STRG

SANDSTONE STRINGER

SHALE STRINGER

SILTSTONE STRINGER

FERRUGINOUS

FORAMINIFERA

F FOSSIL

ARGILLACEOUS

ANHYDRITIC

GLAUCONITE

GYPSEIFEROUS

FERRUGINOUS

GLAUCONITE

SILTSTONE

STRINGER

STRINGER

Other Symbols

OIL SHOW

QUESTIONABLE

SPOTTED STAINING

DEAD

EVEN

BIT

CONNECTION (UP)

CONNECTION (DOWN)

CONNECTION GAS

CONNECTION GAS (LEFT)

TRIP GAS

TRIP GAS (LEFT)

INTERCRYSTALLINE

INTEROOLITIC

MOLDIC

ORGANIC

DOWN TIME GAS

DOWN TIME GAS (LEFT)

CORE - LOST

CORE - RECOVERED

MINDEPTH

MINDEPTH

MINDEPTH (DOWN)

NORMAL FAULT

OVERTURNED STRATA

REVERSE FAULT

CASING

SIDEWALL CORE (LEFT)

SIDEWALL CORE (RIGHT)

SLIDE

SURVEY

ANGULAR

ROUNDED

SUBANG

SUBRND

TEXTURES

POOR

MODERATE

WELL

PACKSTONE

WACKSTONE

MUDSTONE

GRAINSTONE

LITHOGRAPHIC

MICROXLN

MUDSTONE

WIRELINE TESTED - LEFT

WIRELINE TESTED - RT

FINELXLN

DRILL STEM TEST

MINDEPTH

MINDEPTH

FORMATION TOP

GAS SHOW

OIL SHOW

FAULT

DST INTERVAL

VUGGY

PINPOINT

E EARTHY

FX FINELXLN

BS GRAINSTONE

L LITHOGRAPHIC

MX MICROXLN

MUDSTONE

Slide/Rotate

ROP

ROF

Total Gas & Chromatograph

GAS

C1

C2

C3

C4

Depth Labels

% Lith

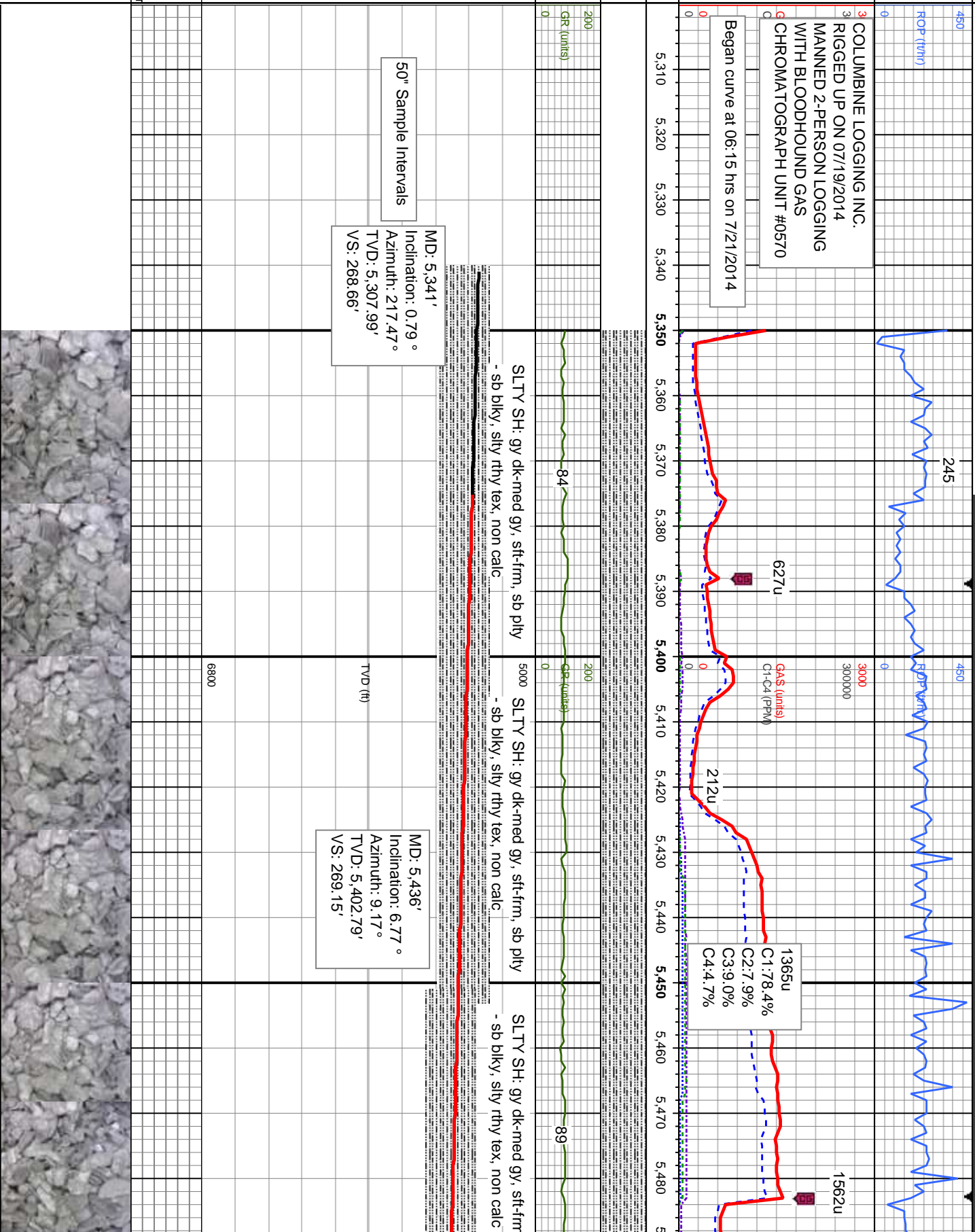
GAMMA

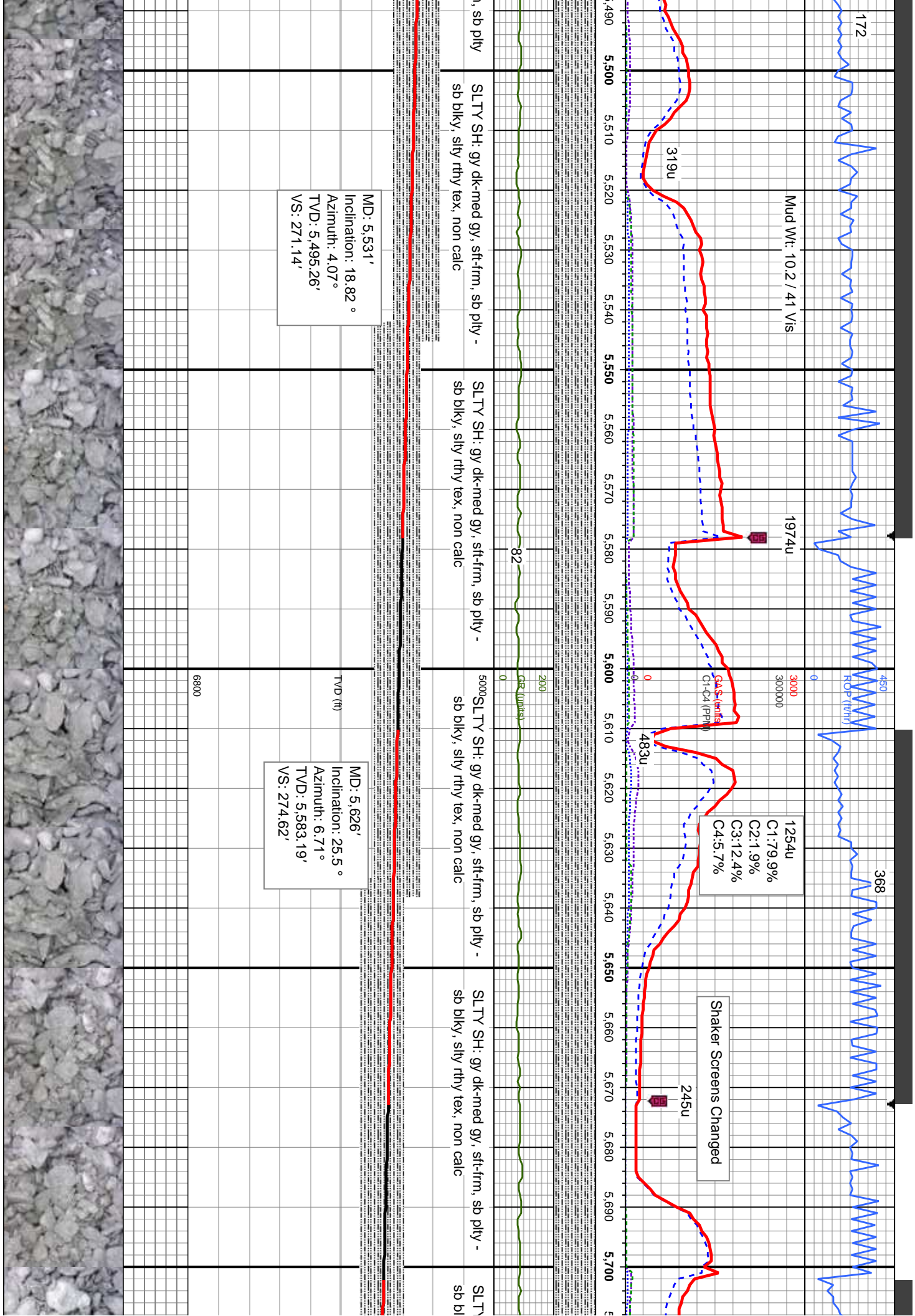
GR

Well Bore
TVD

Oil Show

Images

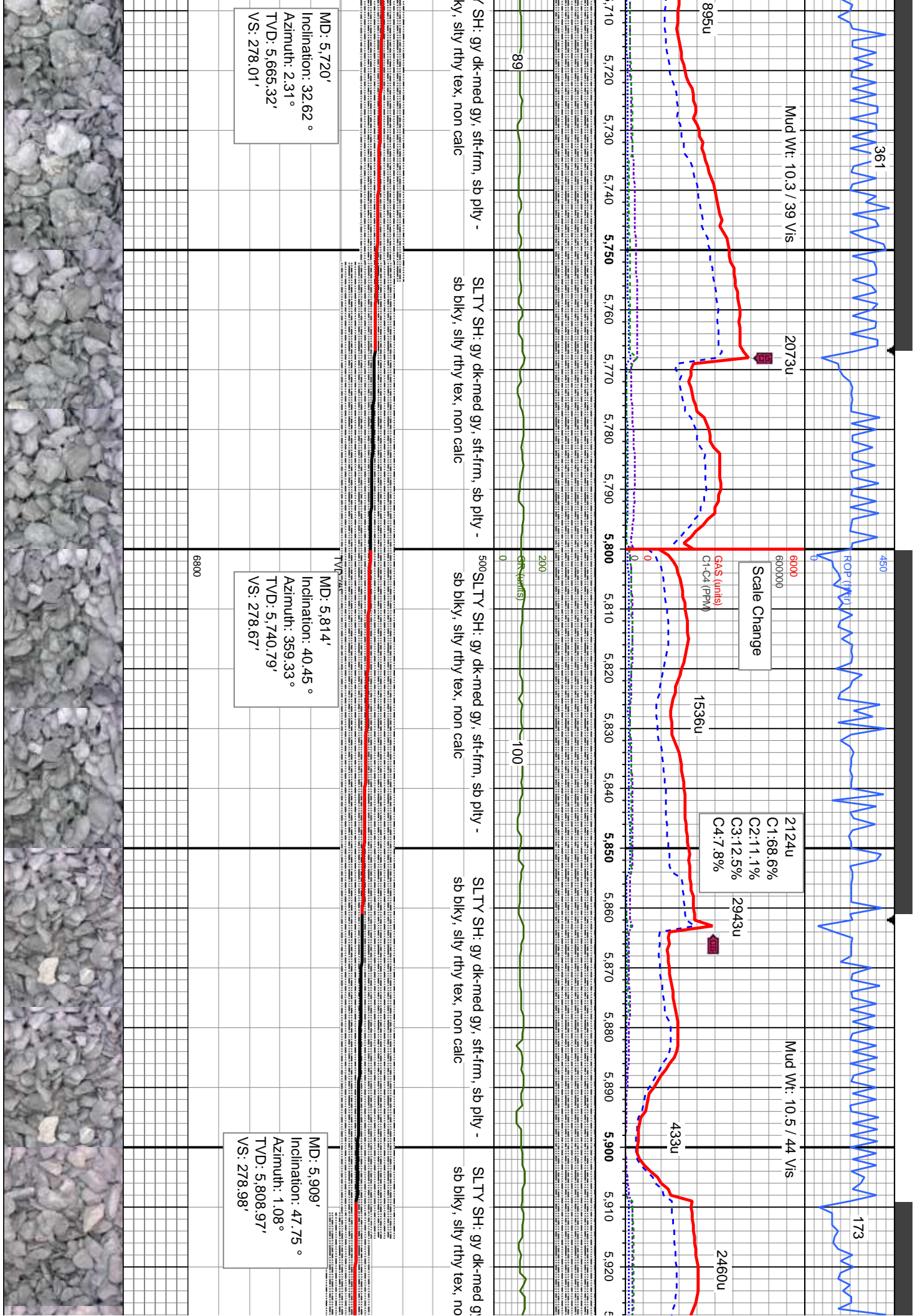


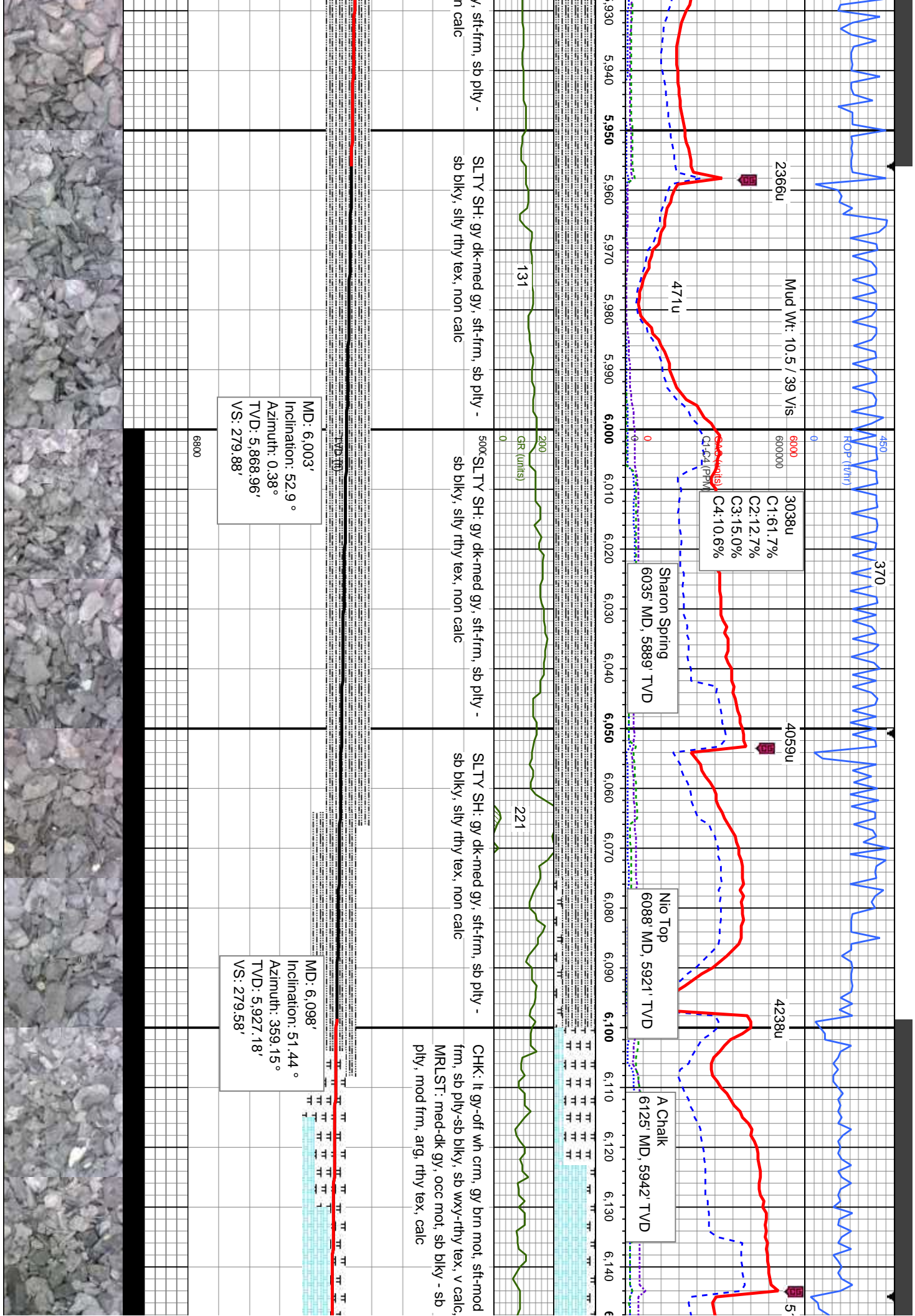


MD: 5,531'
Inclination: 18.82 °
Azimuth: 4.07 °
TVD: 5,495.26'
VS: 271.14'

MD: 5,626'
Inclination: 25.5 °
Azimuth: 6.71 °
TVD: 5,583.19'
VS: 274.62'

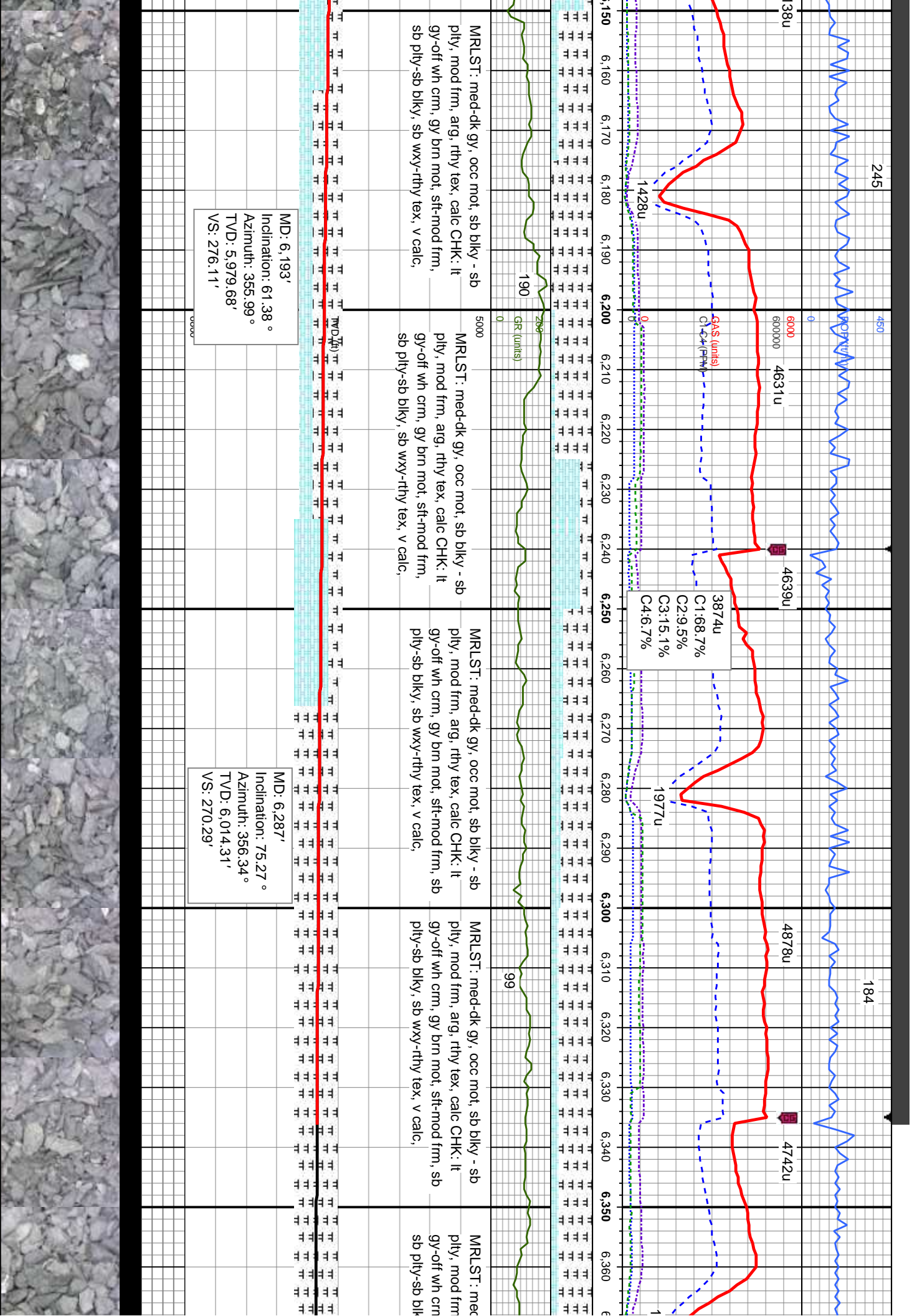
Shaker Screens Changed

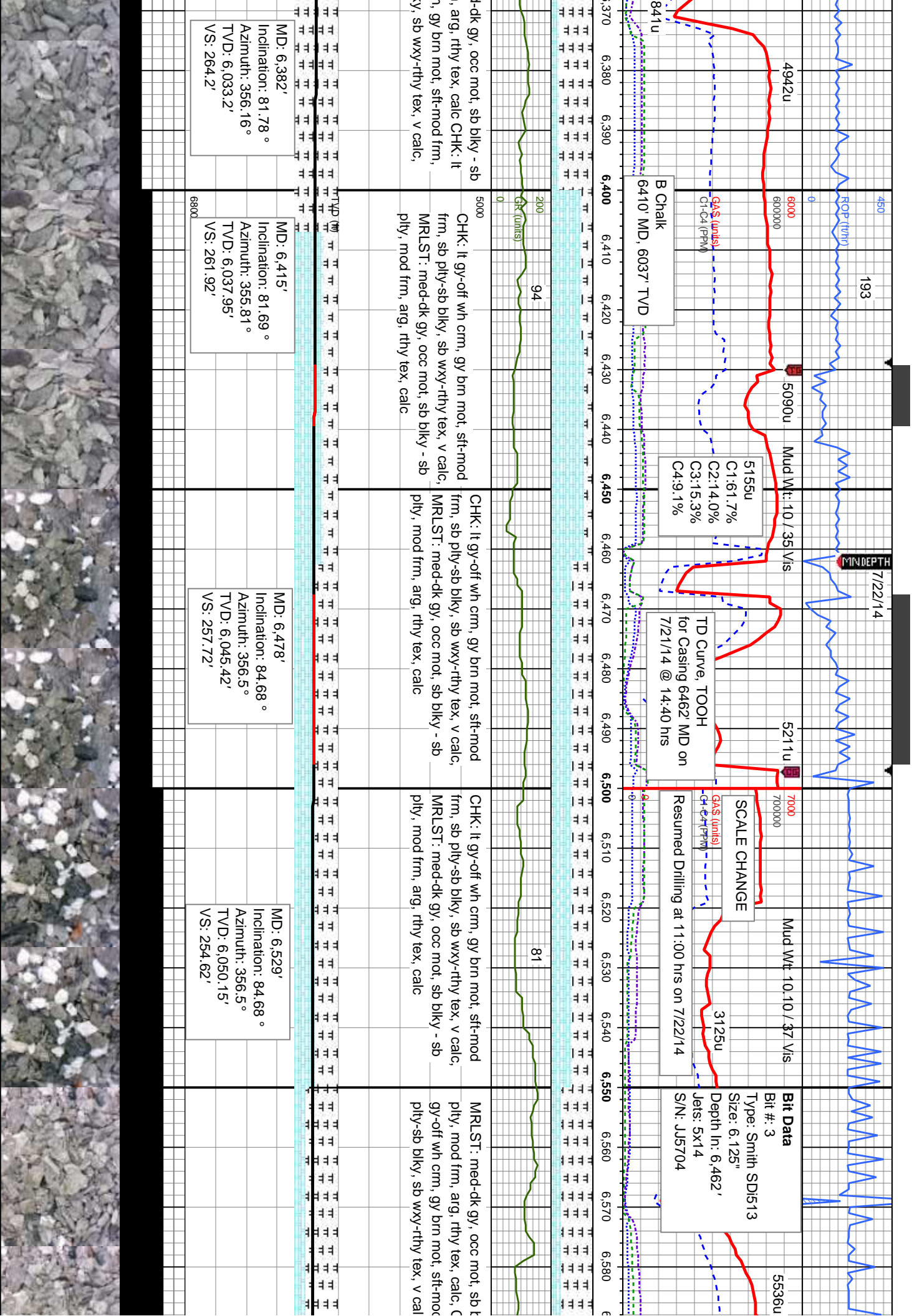


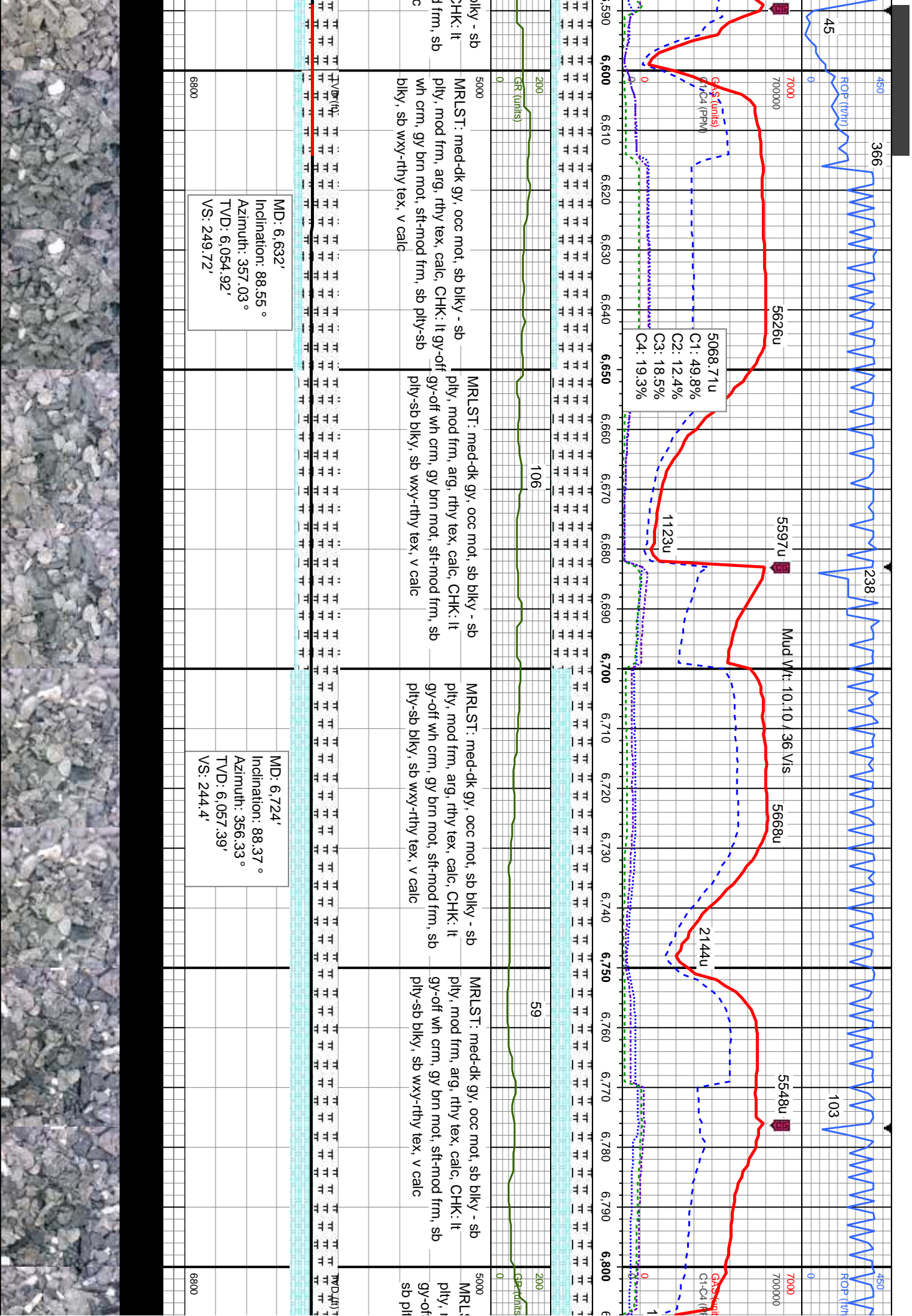


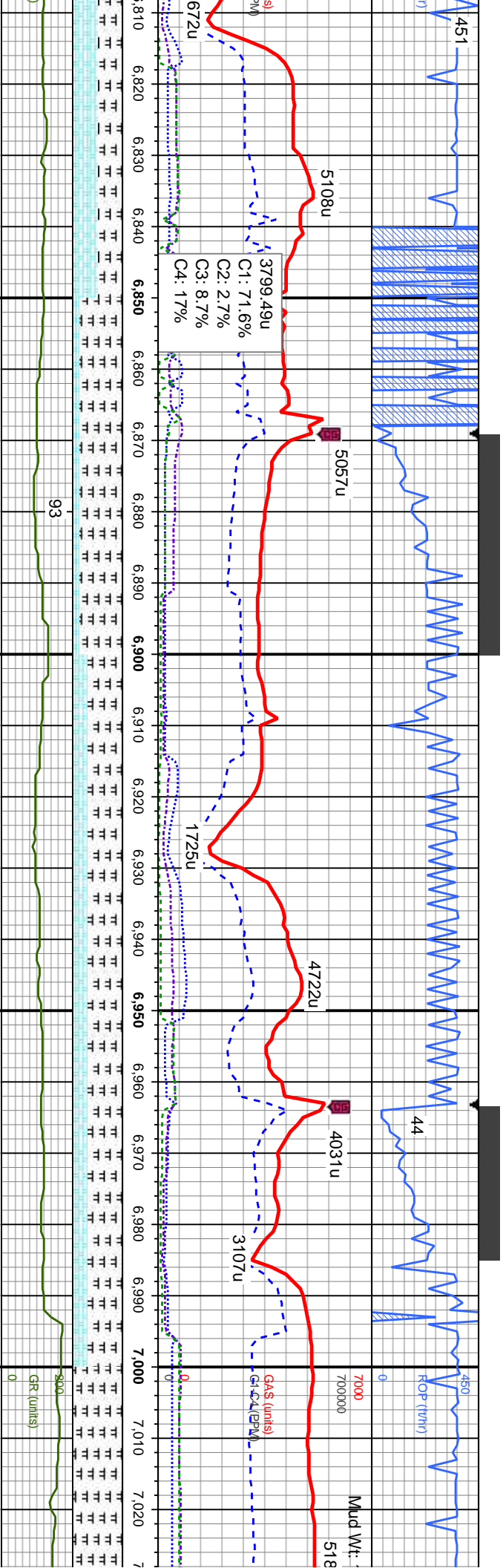
MD: 6,003'
Inclination: 52.9 °
Azimuth: 0.38 °
TVD: 5,868.96'
VS: 279.88'

MD: 6,098'
Inclination: 51.44 °
Azimuth: 359.15 °
TVD: 5,927.18'
VS: 279.58'









ST: med-dk gy, occ mot, sb blkly - sb
mod frm, arg, rthy tex, calc, CHK: lt
wh crm, gy brn mot, sft-mod frm,
y-sb blkly, sb wxy-rthy tex, v calc

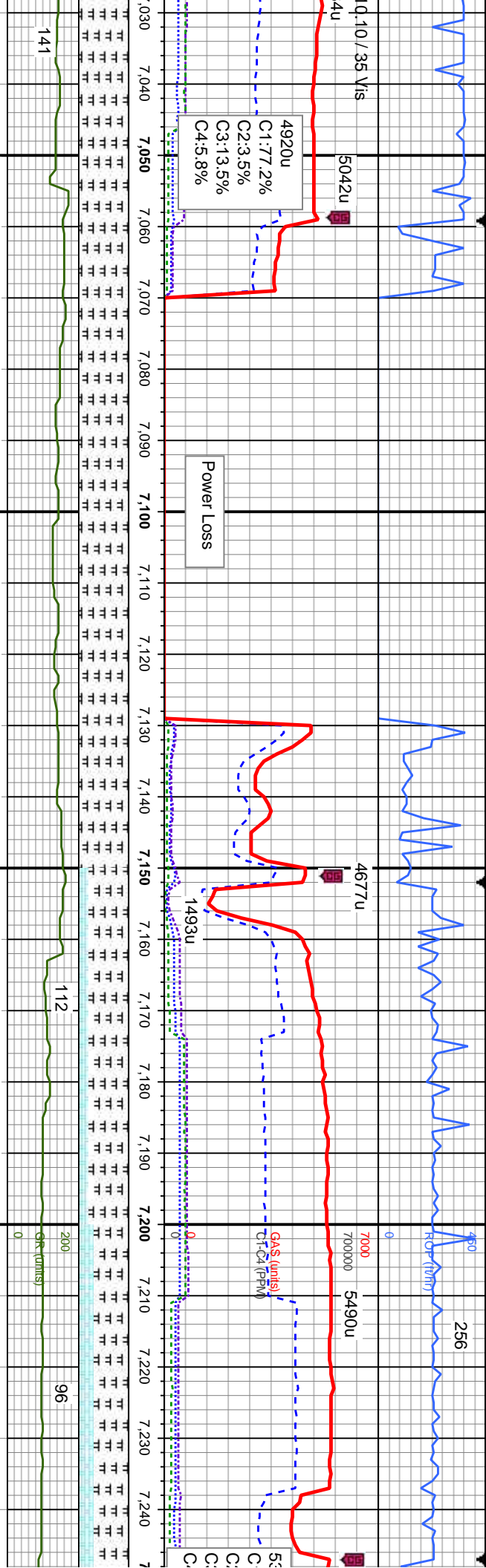
MRLST: med-dk gy, occ mot, sb blkly - sb
pty, mod frm, arg, rthy tex, calc, CHK: lt
gy-off wh crm, gy brn mot, sft-mod frm, sb
pty-sb blkly, sb wxy-rthy tex, v calc

MRLST: med-dk gy, occ mot, sb blkly - sb
pty, mod frm, arg, rthy tex, calc, CHK: lt
gy-off wh crm, gy brn mot, sft-mod frm, sb
pty-sb blkly, sb wxy-rthy tex, v calc

MRLST: med-dk gy, occ mot, sb blkly - sb
pty, mod frm, arg, rthy tex, calc, CHK: lt
gy-off wh crm, gy brn mot, sft-mod frm, sb
pty-sb blkly, sb wxy-rthy tex, v calc

MD: 6,818'		MD: 6,912'		MD: 7,006'	
Inclination: 88.46°		Inclination: 87.23°		Inclination: 90.04°	
Azimuth: 355.1°		Azimuth: 358.96°		Azimuth: 1.07°	
TVD: 6,059.99'		TVD: 6,063.53'		TVD: 6,065.77'	
VS: 237.37'		VS: 232.51'		VS: 232.53'	





mot, sb blkly - sb
x, calc

MRLST: med-dk gy, occ mot, sb blkly - sb
pity, mod frm, arg, rthy tex, calc

MRLST: med-dk gy, occ mot, sb blkly - sb
pity, mod frm, arg, rthy tex, calc

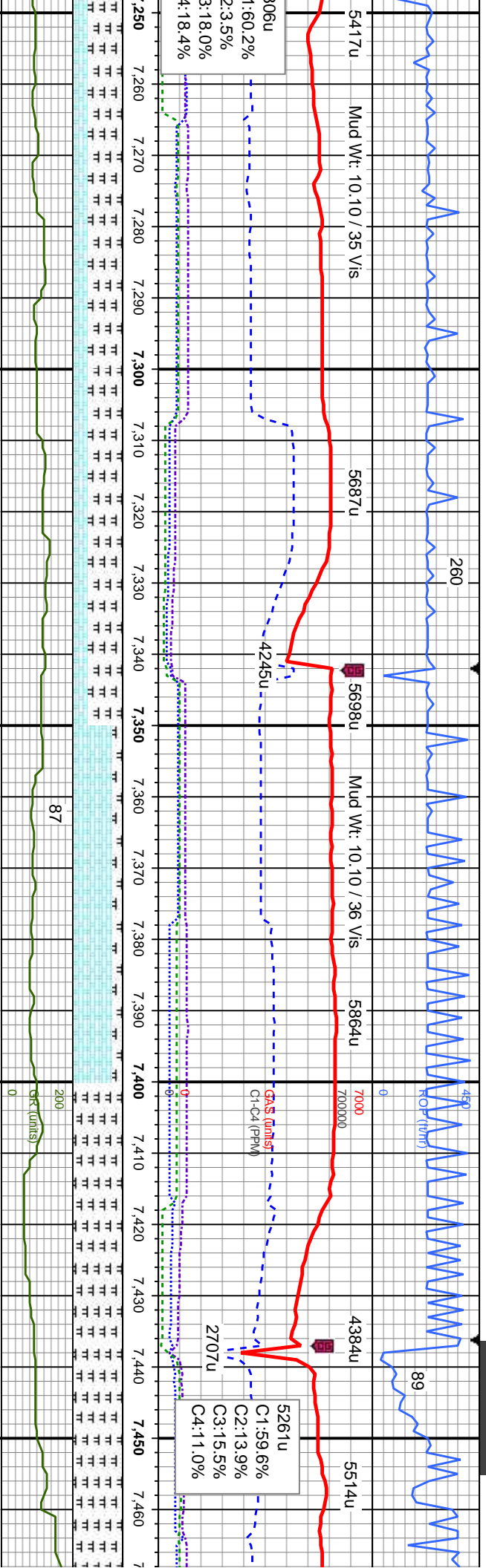
MRLST: med-dk gy, occ mot, sb blkly - sb
pity, mod frm, arg, rthy tex, calc, CHK: lt
gy-off wh crm, gy brn mot, sft-mod frm, sb
pity-sb blkly, sb wxy-rthy tex, v calc

MRLST: med-dk gy, occ mot, sb blkly - sb
pity, mod frm, arg, rthy tex, calc, CHK: lt
gy-off wh crm, gy brn mot, sft-mod frm,
sb pity-sb blkly, sb wxy-rthy tex, v calc

MD: 7,101'
Inclination: 90.4°
Azimuth: 1.07°
TVD: 6,065.4'
VS: 234.31'

MD: 7,196'
Inclination: 90.31°
Azimuth: 0.02°
TVD: 6,064.81'
VS: 235.21'

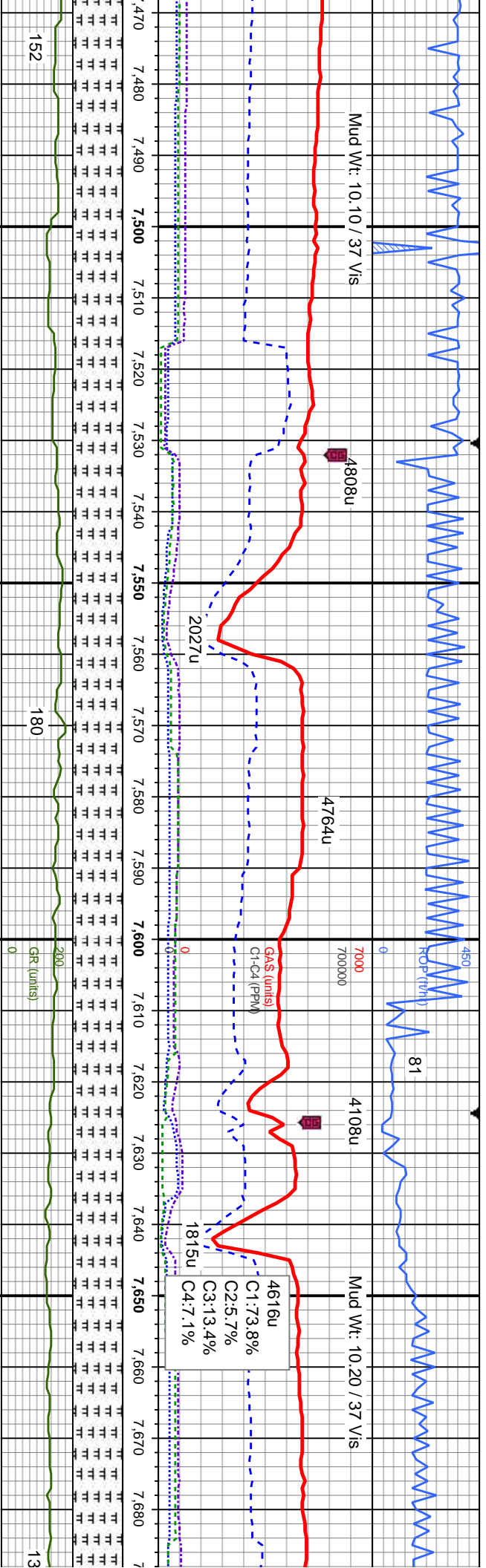




MD: 7,290'
Inclination: 89.96°
Azimuth: 358.61°
TVD: 6,064.59'
VS: 234.09'

MD: 7,384'
Inclination: 90.04°
Azimuth: 357.03°
TVD: 6,064.59'
VS: 230.51'





dk gy, occ mot, sb blk - sb
arg, rthy tex, calc, occ inoc

MRLST: med-dk gy, occ mot, sb blk - sb
ply, mod frm, arg, rthy tex, calc, occ inoc
frag, mic fos

MRLST: med-dk gy, occ mot, sb blk - sb
ply, mod frm, arg, rthy tex, calc, occ inoc
frag, mic fos

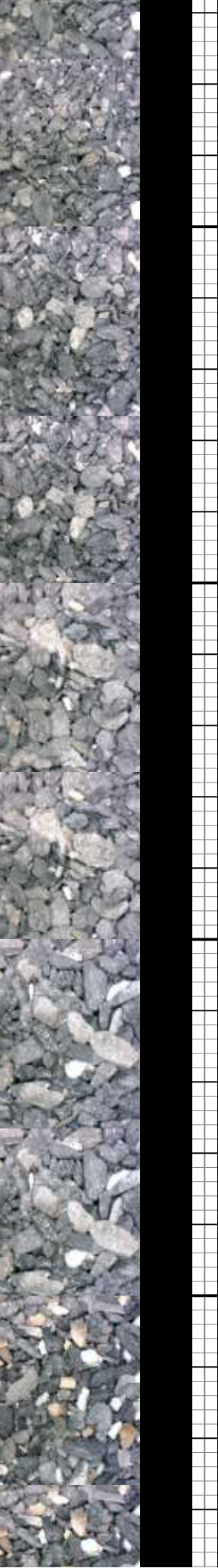
MRLST: med-dk gy, occ mot, sb blk - sb
ply, mod frm, arg, rthy tex, calc, occ inoc
frag, mic fos

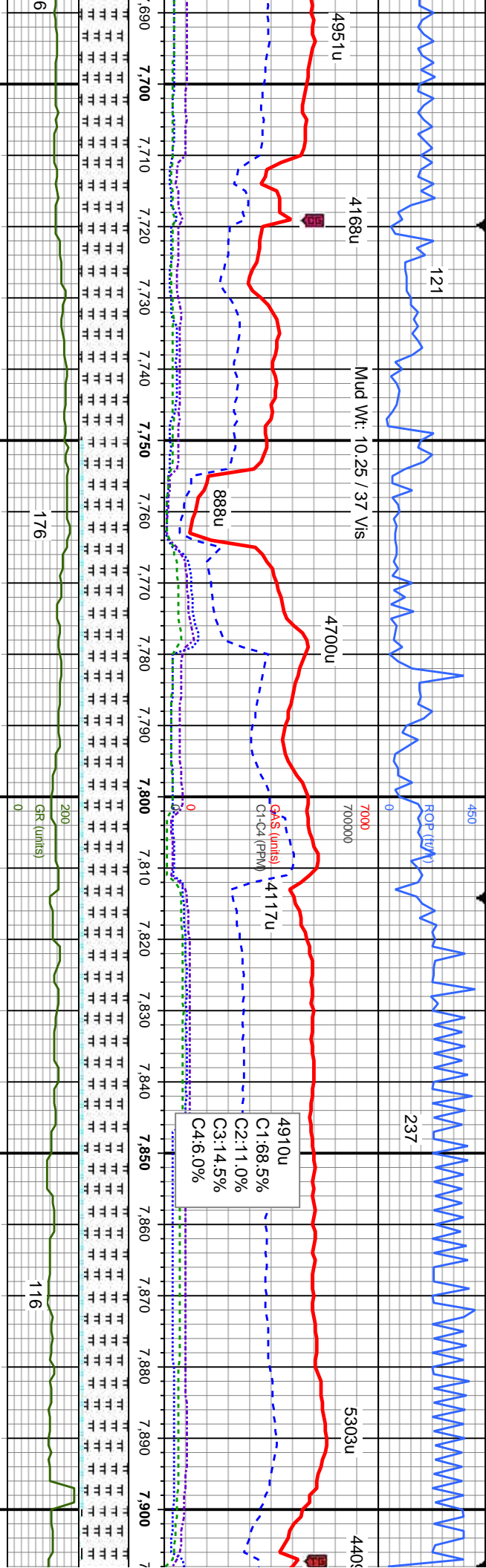
MRLST: med-dk gy, occ mot, sb blk - sb
ply, mod frm, arg, rthy tex, calc, occ inoc
frag, mic fos

MD: 7,479'
Inclination: 90.37°
Azimuth: 358.96°
TVD: 6,064.25'
VS: 227.19'

MD: 7,573'
Inclination: 90.4°
Azimuth: 358.79°
TVD: 6,063.62'
VS: 225.34'

MD: 7,663'
Inclination: 90.48°
Azimuth: 358.96°
TVD: 6,062.93'
VS: 223.58'



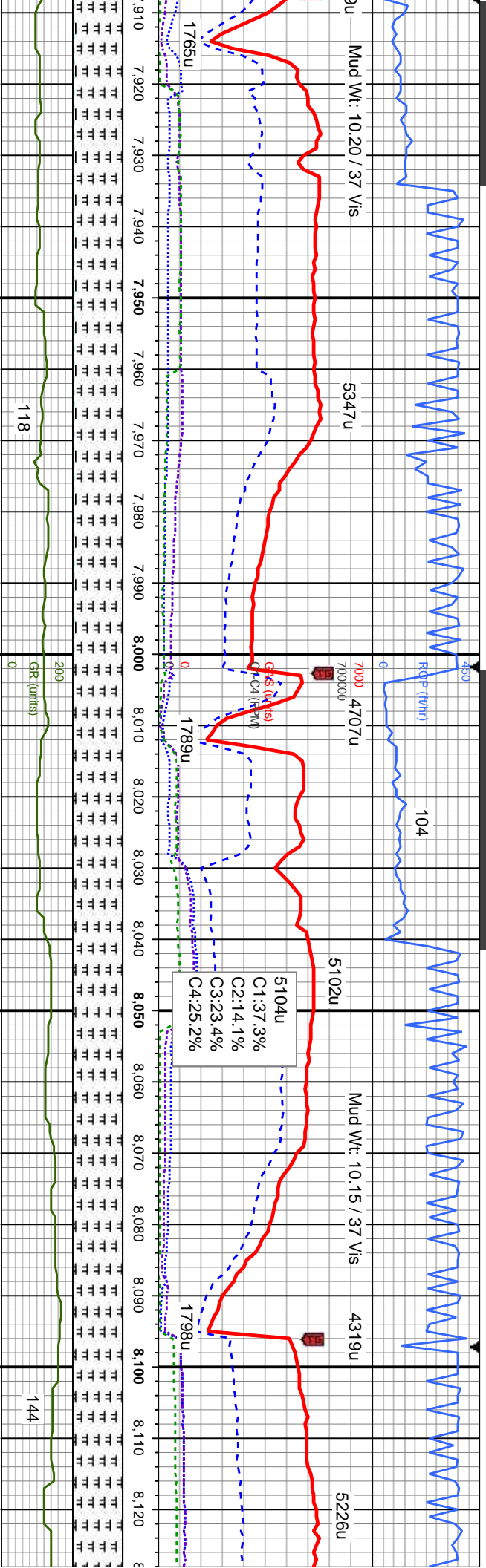


MRSLT: med-dk gy, occ mot, sb blkly - sb
ply, mod frm, arg, rthy tex, calc, CHK: lt
gy-off wh crm, gy brn mot, sft-mod frm, sb
ply-sb blkly, sb wxy-rthy tex, v calc, mic
foss

MD: 7,763'
Inclination: 89.6°
Azimuth: 358.09°
TVD: 6,062.86'
VS: 221'

MD: 7,857'
Inclination: 90.75°
Azimuth: 357.91°
TVD: 6,062.57'
VS: 217.72'





LST: med-dk gy, occ mot, sb blk - sb
mod frm, arg, rthy tex, calc, CHK: It
off wh crm, gy brn mot, sft-mod frm,
ply-sb blk, sb wxy-rthy tex, v calc,
foss, com Inoc frags

MRLST: med-dk gy, occ mot, sb blk - sb
ply, mod frm, arg, rthy tex, calc, CHK: It
gy-off wh crm, gy brn mot, sft-mod frm, sb
ply-sb blk, sb wxy-rthy tex, v calc, mic
foss, com Inoc frags

MRLST: med-dk gy, occ mot, sb blk - sb
ply, mod frm, arg, rthy tex, calc, mic foss,
com Inoc frags, tr chk

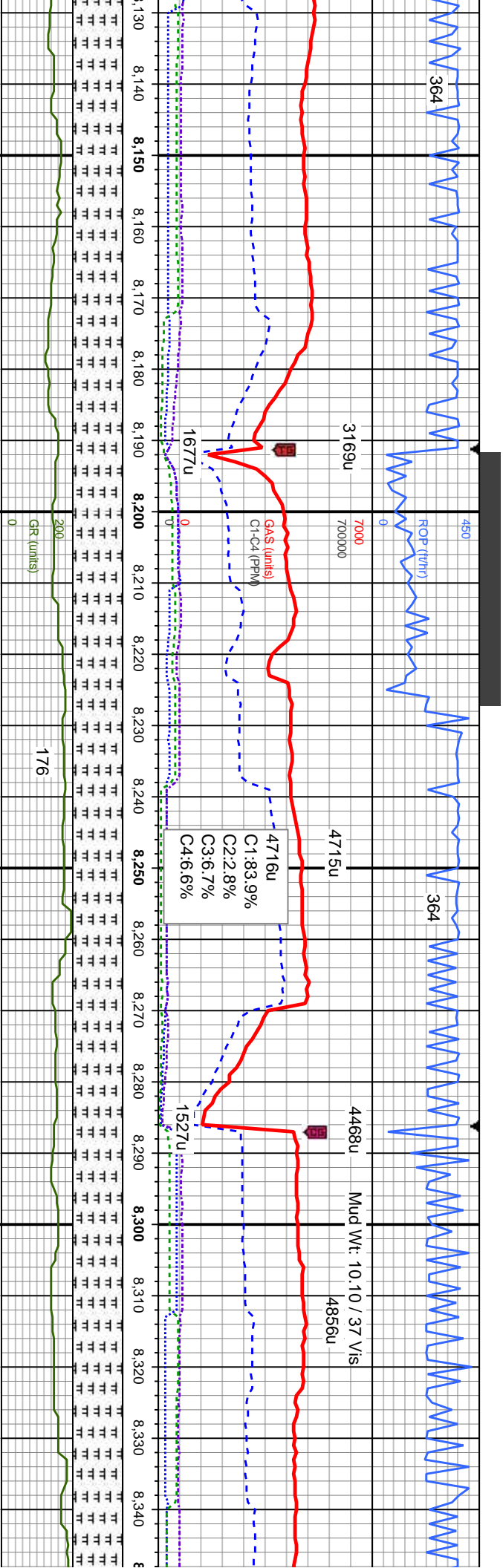
MRLST: med-dk gy, occ mot, sb blk - sb
ply, mod frm, arg, rthy tex, calc, mic foss,
com Inoc frags, tr chk

MRLST: med-dk gy, oc
ply, mod frm, arg, rthy
com Inoc frags, tr chk

MD: 7,951'
Inclination: 88.64 °
Azimuth: 356.85 °
TVD: 6,063.07'
VS: 213.42'

MD: 8,046'
Inclination: 88.72 °
Azimuth: 1.07 °
TVD: 6,065.26'
VS: 211.7'





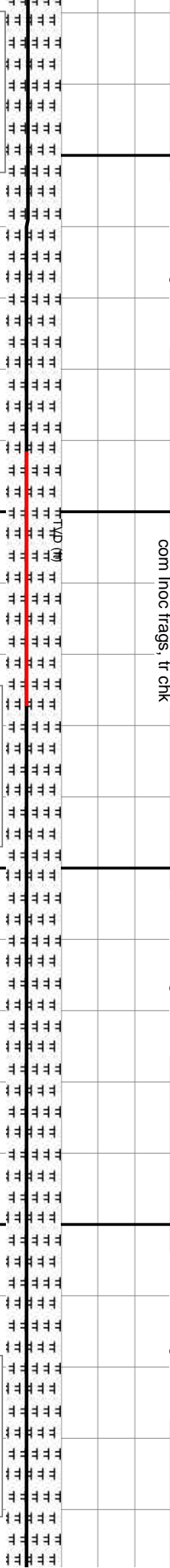
oc mot, sb blkly - sb
tex, calc, mic foss,

MRLST: med-dk gy, occ mot, sb blkly - sb
ply, mod frm, arg, rthy tex, calc, mic foss,
com Inoc frags, tr chk

5000

MRLST: med-dk gy, occ mot, sb blkly - sb
ply, mod frm, arg, rthy tex, calc, mic foss,
com Inoc frags, tr chk

MRLST: med-dk gy, occ mot, sb blkly - sb
ply, mod frm, arg, rthy tex, calc, mic foss,
com Inoc frags, tr chk

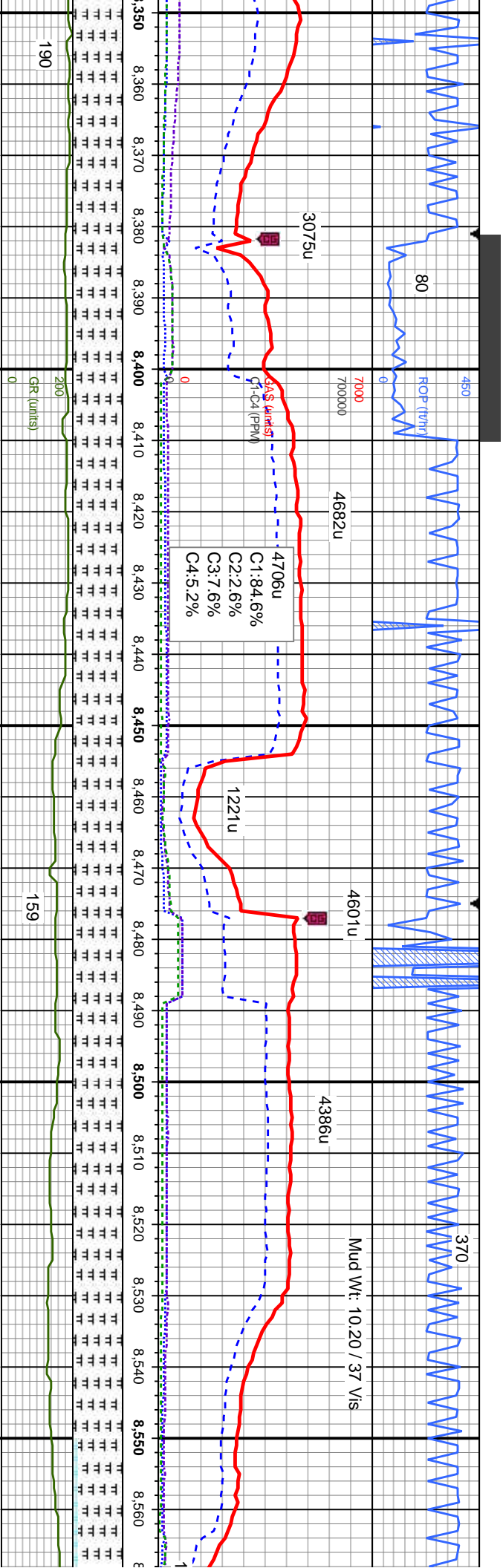


MD: 8,140'
Inclination: 87.49 °
Azimuth: 0.19°
TVD: 6,068.37'
VS: 212.73'

MD: 8,235'
Inclination: 90.31 °
Azimuth: 359.67°
TVD: 6,070.19'
VS: 212.62'

MD: 8,329'
Inclination: 89.34 °
Azimuth: 358.79°
TVD: 6,070.48'
VS: 211.35'





MRLST: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc, mic foss, com inoc frags, tr chk

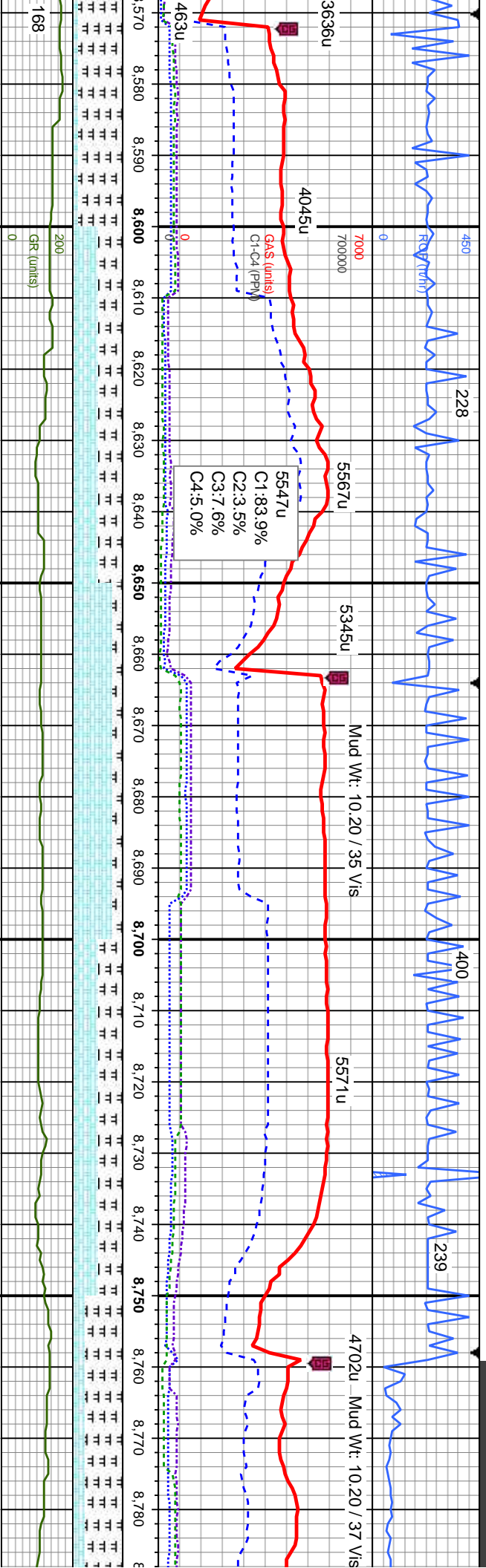
MRLST: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc, mic foss, com inoc frags, tr chk

MRLST: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc, mic foss, com inoc frags, tr chk

MRLST: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc, mic foss, occ inoc frags, tr chk

MRLST: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc, mic foss, occ inoc frags, tr chk





gy, occ mot, sb blkly - sb
g, rthy tex, calc, CHK: It
gy brn mot, sft-mod frm, sb
wxy-rthy tex, v calc, mic
ags

5000
MRLST: med-dk gy, occ mot, sb blkly - sb
ply, mod frm, arg, rthy tex, calc, CHK: It
gy-off wh crm, gy brn mot, sft-mod frm, sb
ply-sb blkly, sb wxy-rthy tex, v calc, mic
foss, occ inoc frags

CHK: It gy-off wh crm, gy brn mot, sft-mod
frm, sb ply-sb blkly, sb wxy-rthy tex, v calc,
mic foss, r inoc foss, MRLST: med-dk gy,
occ mot, sb blkly - sb ply, mod frm, arg,
rthy tex, calc

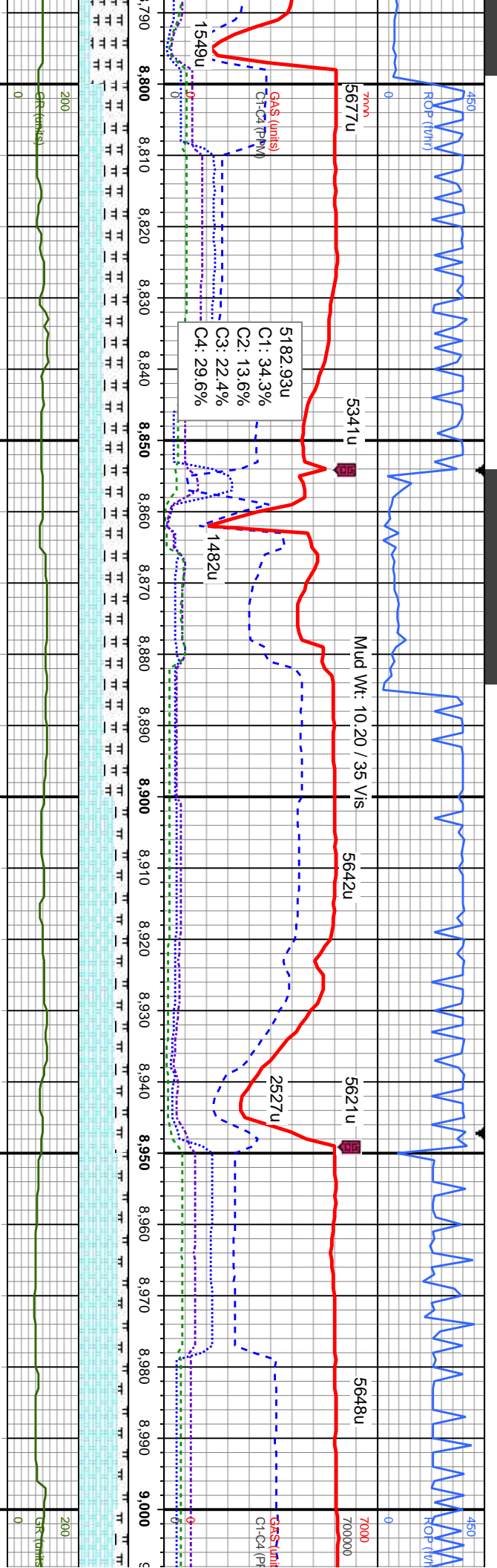
CHK: It gy-off wh crm, gy brn mot, sft-mod
frm, sb ply-sb blkly, sb wxy-rthy tex, v calc,
mic foss, r inoc foss, MRLST: med-dk gy,
occ mot, sb blkly - sb ply, mod frm, arg, rthy
tex, calc

MRLST: med-dk gy, occ mot, sb b
ply, mod frm, arg, rthy tex, calc, C
gy-off wh crm, gy brn mot, sft-mod
ply-sb blkly, sb wxy-rthy tex, v calc
foss, occ inoc frags

MD: 8,613'
Inclination: 91.36 °
Azimuth: 356.5 °
TVD: 6,062.74'
VS: 202.53'

MD: 8,707'
Inclination: 90.92 °
Azimuth: 353.69 °
TVD: 6,060.87'
VS: 194.49'

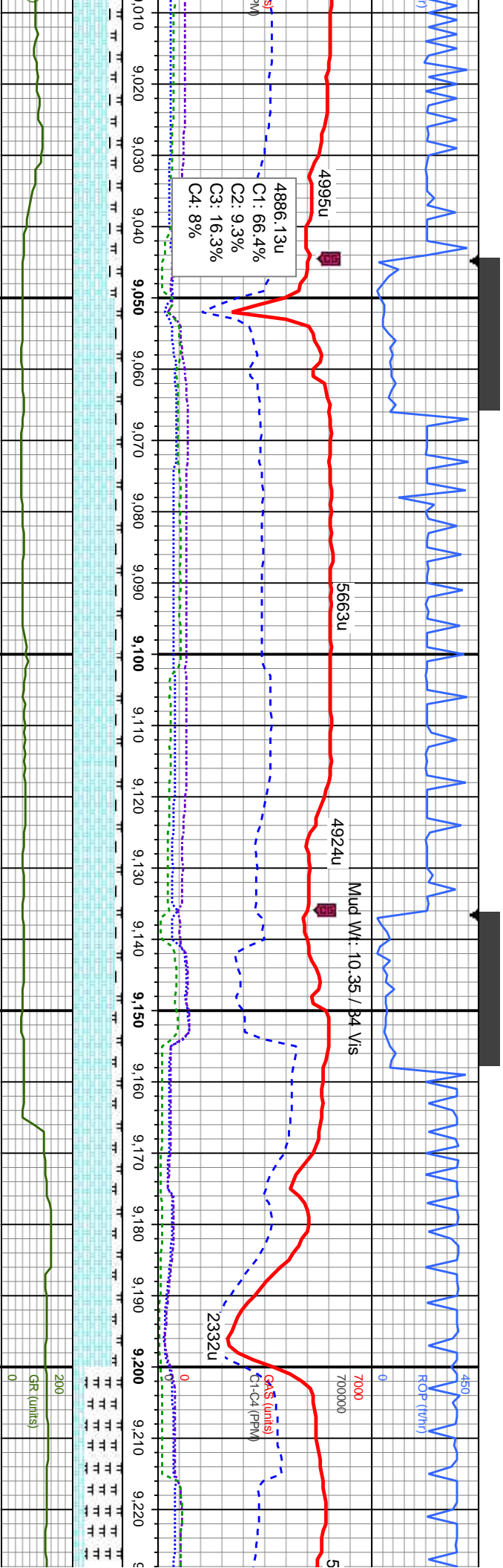




5000	MRSLT: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc, CHK: It gy-off wh crm, gy brn mot, sft-mod frm, sb ply-sb blkly, sb wxy-rthy tex, v calc	5000	MRSLT: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc, CHK: It gy-off wh crm, gy brn mot, sft-mod frm, sb ply-sb blkly, sb wxy-rthy tex, v calc	5000	CHK: It gy-off wh crm, gy brn mot, sft-mod frm, sb ply-sb blkly, sb wxy-rthy tex, v calc, mic foss, occ inoc foss, MRSLT: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc	5000	CHK: It gy-off wh crm, gy brn mot, sft-mod frm, sb ply-sb blkly, sb wxy-rthy tex, v calc, mic foss, occ inoc foss, MRSLT: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc
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MD: 8,802'	Inclination: 90.31°	MD: 8,896'	Inclination: 90.31°	MD: 8,991'	Inclination: 91.36°
Azimuth: 357.56°		Azimuth: 359.84°		Azimuth: 0.55°	
TVD: 6,059.85'		TVD: 6,059.34'		TVD: 6,057.96'	
VS: 187.25'		VS: 185.11'		VS: 185.44'	



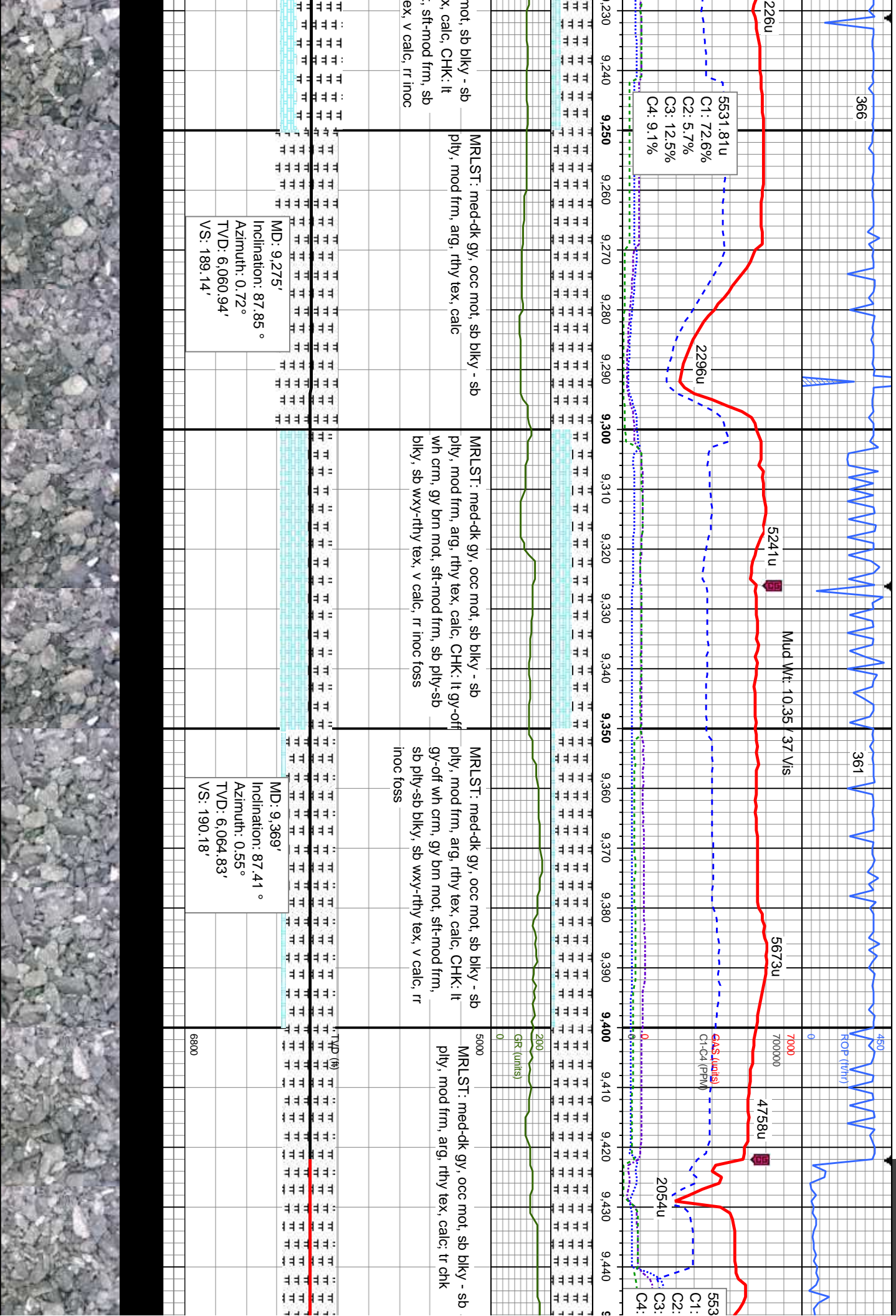


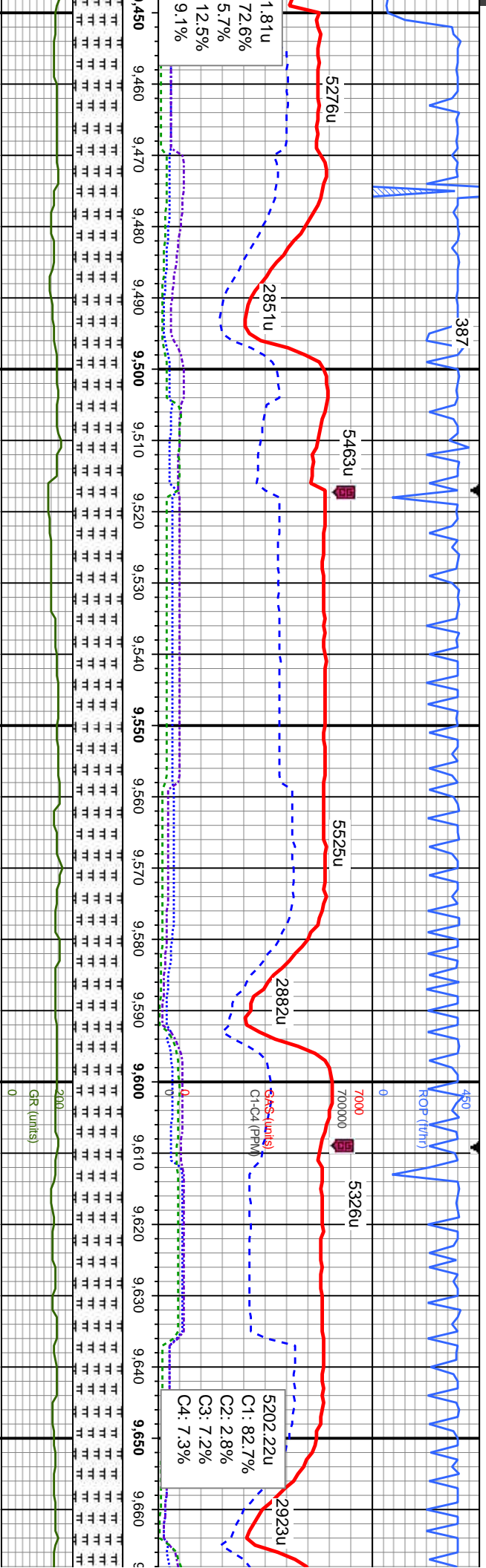
It gy-off wh crm, gy brn mot, sft-mod	CHK: It gy-off wh crm, gy brn mot, sft-mod	CHK: It gy-off wh crm, gy brn mot, sft-mod	CHK: It gy-off wh crm, gy brn mot, sft-mod	5000
ply-sb blk, sb wxy-rthy tex, v calc, MRLST: med-dk	frm, sb ply-sb blk, sb wxy-rthy tex, v calc, MRLST: med-dk	frm, sb ply-sb blk, sb wxy-rthy tex, v calc, MRLST: med-dk	frm, sb ply-sb blk, sb wxy-rthy tex, v calc, MRLST: med-dk	MRLST: med-dk gy, occ
occ inoc foss, MRLST: med-dk	mic foss, occ inoc foss, MRLST: med-dk	mic foss, occ inoc frags, MRLST: med-dk	mic foss, occ inoc frags, MRLST: med-dk	ply, mod frm, arg, rthy tex
c mot, sb blk - sb ply, mod frm, arg, rthy tex, calc	gy, occ mot, sb blk - sb ply, mod frm, arg, rthy tex, calc	gy, occ mot, sb blk - sb ply, mod frm, arg, rthy tex, calc	frm, arg, rthy tex, calc	gy-off wh crm, gy brn mot
				ply-sb blk, sb wxy-rthy tex
				foss

MD: 9,086'
Inclination: 90.04 °
Azimuth: 0.19 °
TVD: 6,056.8'
VS: 186.05'

MD: 9,180'
Inclination: 88.55 °
Azimuth: 1.42 °
TVD: 6,057.96'
VS: 187.37'







MRLST: med-dk gy, occ mot, sb blkly - sb
pity, mod frm, arg, rthy tex, calc; tr chk

MRLST: med-dk gy, occ mot, sb blkly - sb
pity, mod frm, arg, rthy tex, calc; tr chk

MRLST: med-dk gy, occ mot, sb blkly - sb
pity, mod frm, arg, rthy tex, calc; tr chk

MRLST: med-dk gy, occ mot, sb blkly -
sb pity, mod frm, arg, rthy tex, calc

MRLST: med

MD: 9,464'
Inclination: 89.69 °
Azimuth: 0.37°
TVD: 6,067.23'
VS: 190.95'

MD: 9,558'
Inclination: 89.69 °
Azimuth: 0.55°
TVD: 6,067.74'
VS: 191.7'

MD: 9,652'
Inclination: 89.43 °
Azimuth: 359.84°
TVD: 6,068.46'
VS: 192.02'



