

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name King 3-65 28-29 3CH

Location SEC 28 T3S-R65W

State COLORADO

County ADAMS

Country USA

Rig Number Nabors B16

API Number 050011022500

AFE # WAY.CDR.7062

Geographic Region DJ BASIN

Field Niobrara

Spud Date 5/20/2019

Drilling Completed 6/3/2019

Surface Coordinates 1554ft FSL 435ft FEL SEC 28 T3S-R65W

SL Lat: 39° 45' 31.55" (NAD83)

SL Long: 104° 39' 39.58" (NAD83)

Bottom Hole Coordinates Proposed BHL:

1849ft FSL 325ft FWL SEC 29 T 3S-R65W

Ground Elevation 5585'

K.B. Elevation 5610'

Logged Interval 6000' To 17867'

Total Depth 17867'

Formation Niobrara C Chalk

Type of Drilling Fluid OBM

Operator

Company Conoco Phillips

Address 600 N. Dairy Ashford Rd.
Houston, TX 77079-1175



Geologist

Name Dave Aldridge

Company Conoco Phillips Central Rockies Implementation

Address Dave.E.Aldridge@conocophillips.com

Office:(832)486-3983

600 N Dairy Ashford EC3 14-W134

Houston, TX 77079



Other

Columbine Logging Inc. Mud Logging Company

Geologists/Geosteers on Location: Todd Thiesse, Dustin Morgan

Gas Detection: Bloodhound chromatograph gas unit #311

DD/MWD: Baker Hughes

Columbine Computer 87A

Color Coding

- Oil
- Ndle
- Error
- Condensate
- Core
- Water
- Gas
- Pressure
- Seal

Rock Types

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

Fossils

- GASTROPOD
- INOCERAMUS
- OOLITE
- OSTRACOD
- PELECYPOD
- PELLET
- PISOLITE
- PLANT REMAINS
- PLANT SPORES
- SCAPHOPOD
- STROMATOPOROID
- ECHINOID
- FISH
- FORAMINIFERA
- FOSSIL
- ANHYDRITIC
- ARGILLACEOUS

Minerals

Oil Show

- P PINPOINT
- V VUGGY

Engineering

- DEAD
- EVEN
- QUESTIONABLE
- BIT
- SPOTTED STAINING
- CONNECTION (UP)

Porosity

- CONNECTION (DOWN)
- CONNECTION GAS
- CONNECTION GAS
- TRIP GAS
- TRIP GAS (LEFT)
- INTERCRYSTALLINE
- DOWN TIME GAS
- INTEROOLITIC
- DOWN TIME GAS (L
- MOLDIC
- CORE - LOST
- ORGANIC
- CORE - RECOVERED

Accessories

ARGILLITE GRAIN	HEAVY MINERAL	
BENTONITE	KAOLIN	
BITUMENOUS SUBSTANCE	MARCASTITE	
BRECCIA FRAGMENTS	MARLSTONE	ANHYDRITE STRINGER
CLACAREOUS	MICACEOUS	BENTONITE STRINGER
CARBONACEOUS FLAKES	MINERAL CRYSTALS	COAL STRINGER
CHITDK	NODULES	DOLomite STRINGER
COAL - THIN BEDS	PHOSPHATE PELLETS	GYPSUM STRINGER
DOLOMITIC	PYRITE	LIMESTONE STRINGER
ELDSPAR	SALT CAST	MARLSTONE (CALC) STRG
FERRUGINOUS PELLET	SANDY	MARLSTONE (DOL) STRG
FERRUGINOUS	SIDERITE	SANDSTONE STRINGER
GLAUCONITE	SILICEOUS	SHALE STRINGER
GYPSIFEROUS	SILTY	SILTSTONE STRINGER
	TUFFACEOUS	

Stringer

Other Symbols

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

COLUMBINE LOGGING

ROP (ft/hr)
Columbine Logging Inc. Rigged Up 2 man logging 5/30/2019 Chromatograph Gas Unit #316, began logging from 6000' MD at 2:30 PM, MDT on 5/30/2019.

Gamma Data, ROP and Survey Data
Provided by Baker Hughes.

Total Gas & Chromatograph

GAS
C1
C2
C3
C4

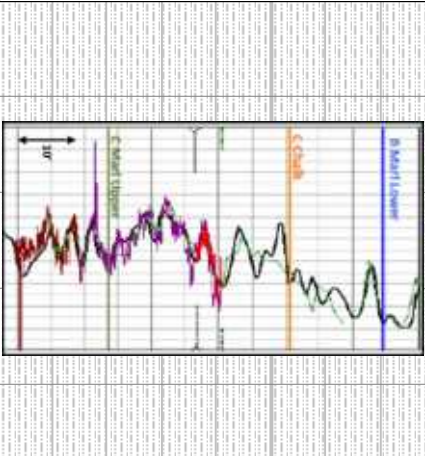
Gas Data From Bloodhound Unit #0316.
data imported via Rig Watch and Gaschart

Depth Labels

% Lith

Well Bore
TVD

Target Formation/Member:
Niobrara C Chalk



Bit Data
Bit #: 2
Type: HCC AT605F
Size: 8.5
Depth In: 2204'
Depth Out: 8461'
Jets: 5x14
S/N: 5294678

ROP: 32 ft/hr
RPM: 100
SPP: 2347 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 10 klbs

MUD WT IN: 9.4 V/S: 54
MUD WT OUT: 9.4 V/S: 54

TG: 484u
C1: 99.4%
C2: 0.2%
C3: 0.3%
C4: 0%

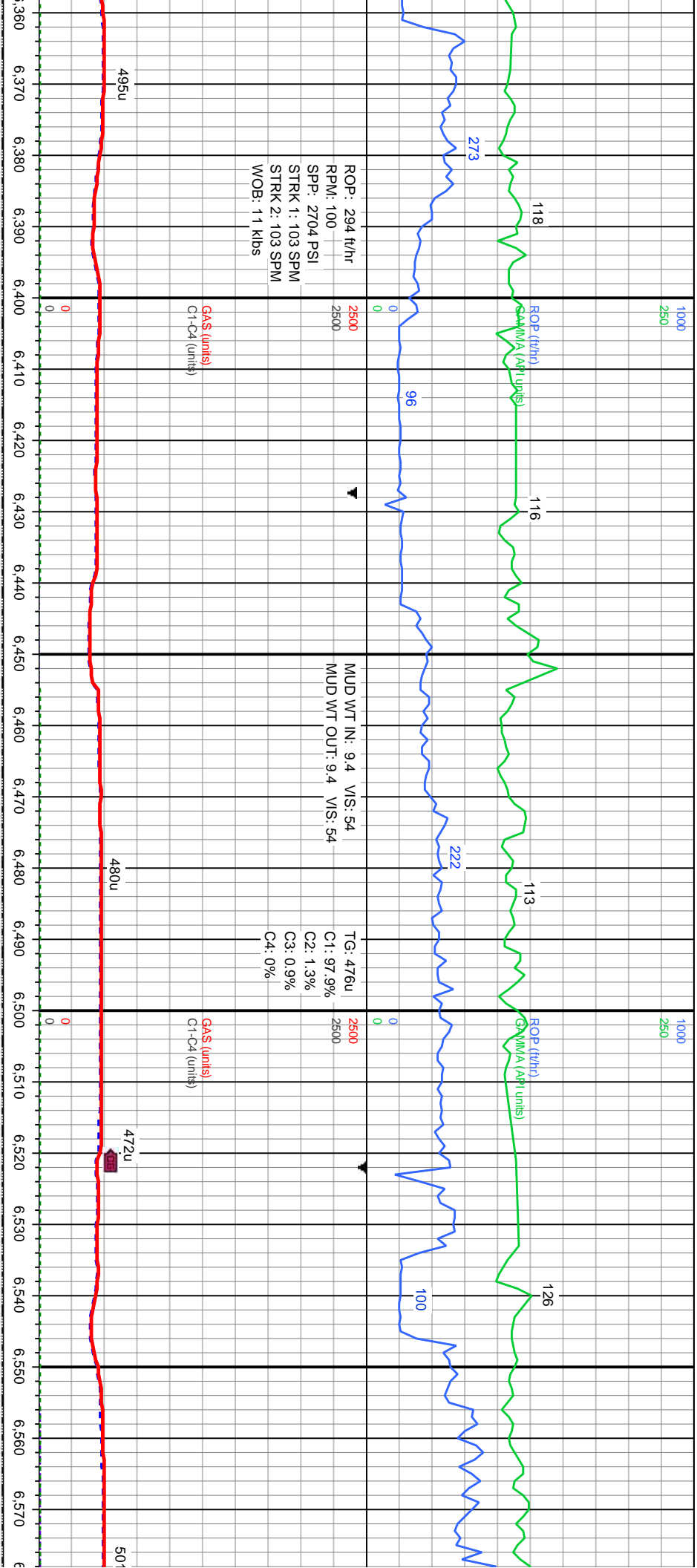
SLTY SH: gy-dk gy, occ lt gy, v sft - sft, sb ply-pty, silty to rthy tex, tr grdg to slst in pt, sl calc with some tr SLTST: med gy- gy, sl frm, sb biky- occ sb ply, rthy-silty tex, sl calc.

SLTY SH: dk gy-gy, occ lt gy, sb ply-pty, v sft-sft, silty to rthy tex, silty, grdg to clyst in pt, sl- non calc.

5000
SLTY SH: dk gy-gy, occ lt gy, sb ply-pty, v sft-sft, silty to rthy tex, silty, grdg to clyst- non calc.

MD: 6,028'
Inclination: 8.48°
Azimuth: 70.36°
TVD: 6,025.04'
VS: -51.35'

MD: 6,122'
Inclination: 10.24°
Azimuth: 71.21°
TVD: 6,117.79'
VS: -65.61'



Y SH: dk gy-gy, occ lt gy, sb pily-plty, v
sft-sft, silty to rthy tex, silty, grgd to clyst in
pt, sl- non calc.

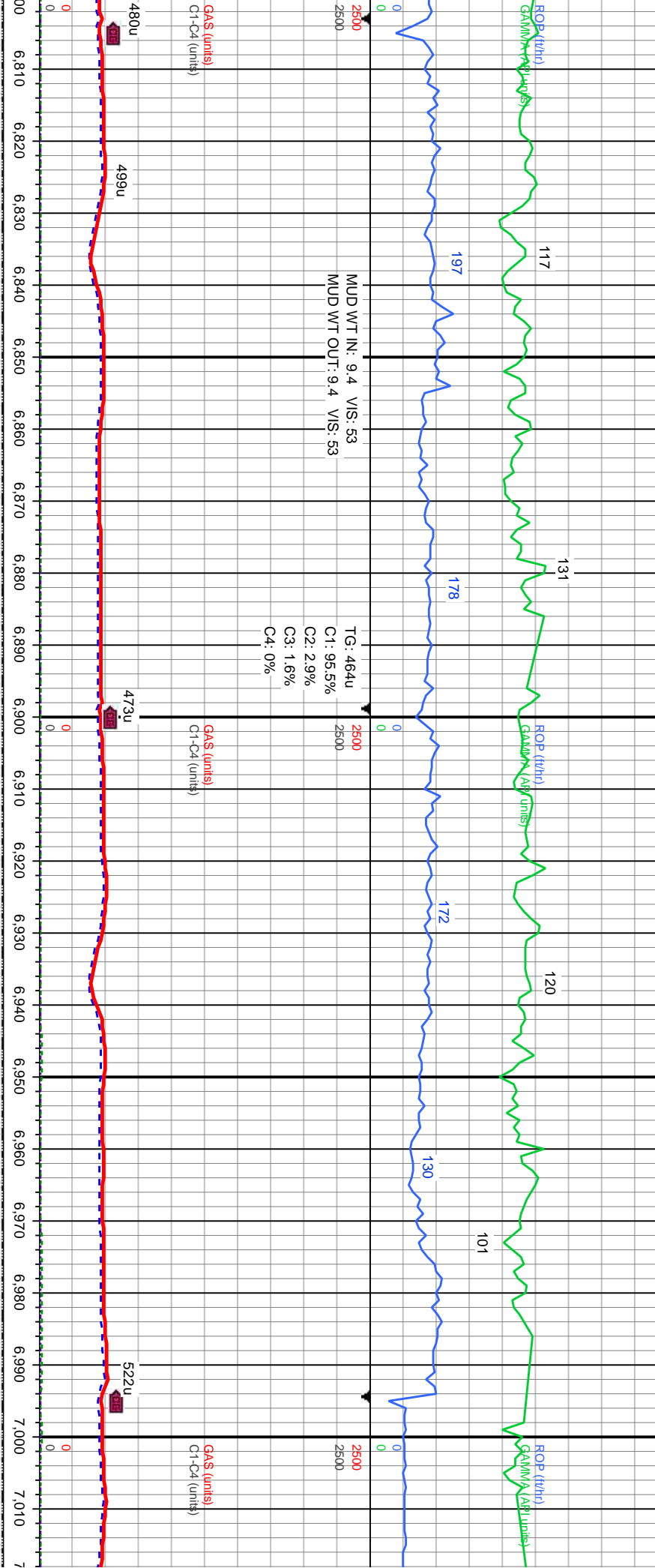
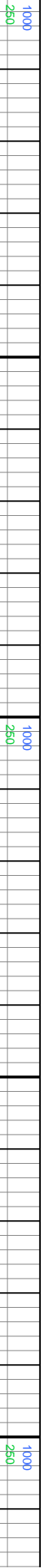
SLTY SH: dk gy-gy, occ lt gy, sb pily-plty, v
sft-sft, silty to rthy tex, silty, grgd to clyst in
pt, sl- non calc.

SLTY SH: dk gy-gy, occ lt gy, sb pily-plty, v
sft-sft, silty to rthy tex, silty, grgd to clyst in
pt, sl- non calc.

SLTY SH: dk gy-gy, occ lt gy, sb pily-plty, v
sft-sft, silty to rthy tex, silty, grgd to clyst in
pt, sl- non calc.

MD: 6,405'
Inclination: 14.04°
Azimuth: 74.37°
TVD: 6,394.32'
VS: -122.54'

MD: 6,499'
Inclination: 16.91°
Azimuth: 69.37°
TVD: 6,484.91'
VS: -146.03'



MUD WT IN: 9.4 VIS: 53
MUD WT OUT: 9.4 VIS: 53

TG: 464u
C1: 95.5%
C2: 2.9%
C3: 1.6%
C4: 0%

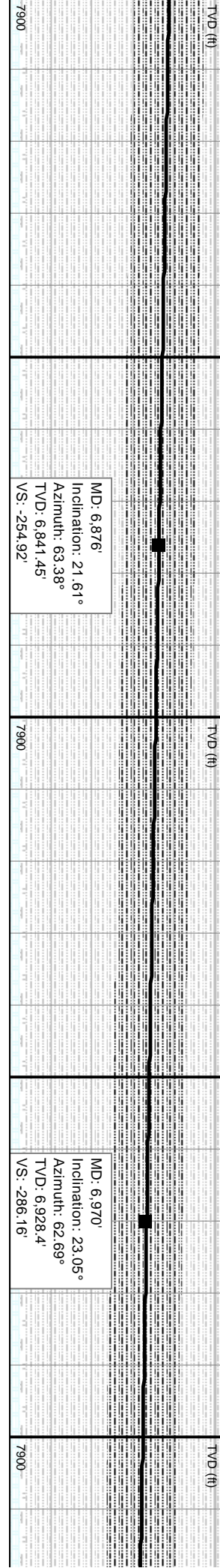
5000
SLTY SH: dk gy-gy, tr lt gy, sb pily-pily, v
sft-sft, silty to rthy tex, silty, grdg to clyst in
pt, sl- non calc.

5000
SLTY SH: dk gy-gy, tr lt gy, sb pily-pily, v
sft-sft, silty to rthy tex, silty, grdg to clyst in
pt, sl- non calc.

5000
SLTY SH: dk gy-gy, tr lt gy, sb pily-pily, v
sft-sft, silty to rthy tex, silty, grdg to clyst in
pt, sl- non calc.

5000
SLTY SH: dk gy-gy, tr lt gy, sb pily-pily, v
sft-sft, silty to rthy tex, silty, grdg to clyst in
pt, sl- non calc.

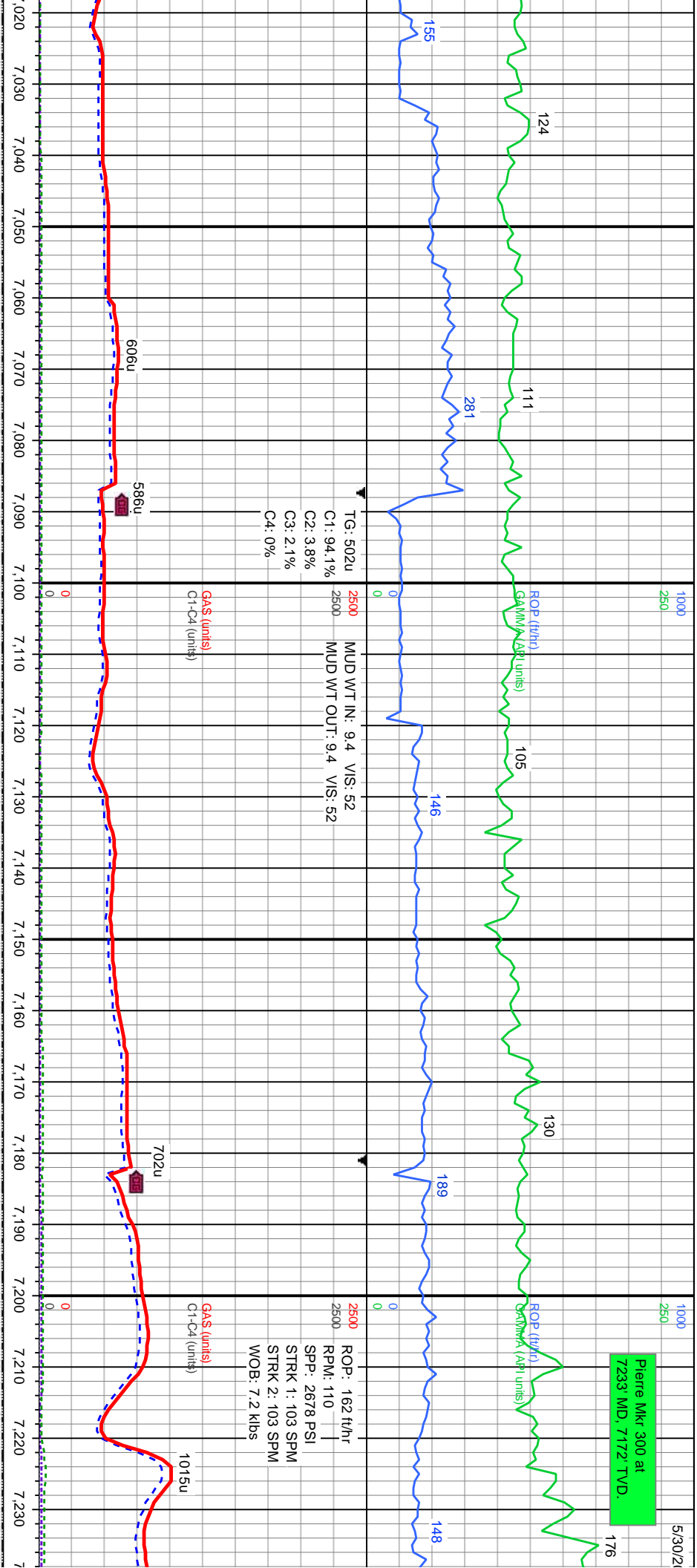
5000
SLTY SH: dk gy-gy, tr lt gy, sb pily-pily, v
sft-sft, silty to rthy tex, silty, grdg to clyst in
pt, sl- non calc.



MD: 6,876'
Inclination: 21.61°
Azimuth: 63.38°
TVD: 6,841.45'
VS: -254.92'

MD: 6,970'
Inclination: 23.05°
Azimuth: 62.69°
TVD: 6,928.4'
VS: -286.16'

Pierre Mkt 300 at
7233 MD, 7172 TVD.



TG: 502u
C1: 94.1%
C2: 3.8%
C3: 2.1%
C4: 0%
MUD WT IN: 9.4
MUD WT OUT: 9.4
VIS: 52

GAS (units)
C1-C4 (units)

606u

586u

702u

1015u

SLTY SH: dk gy-gy, tr lt gy, sb pily-pily, v
sft-sft, silty to rthy tex, silty, grdg to clyst in
pt, sl- non calc.

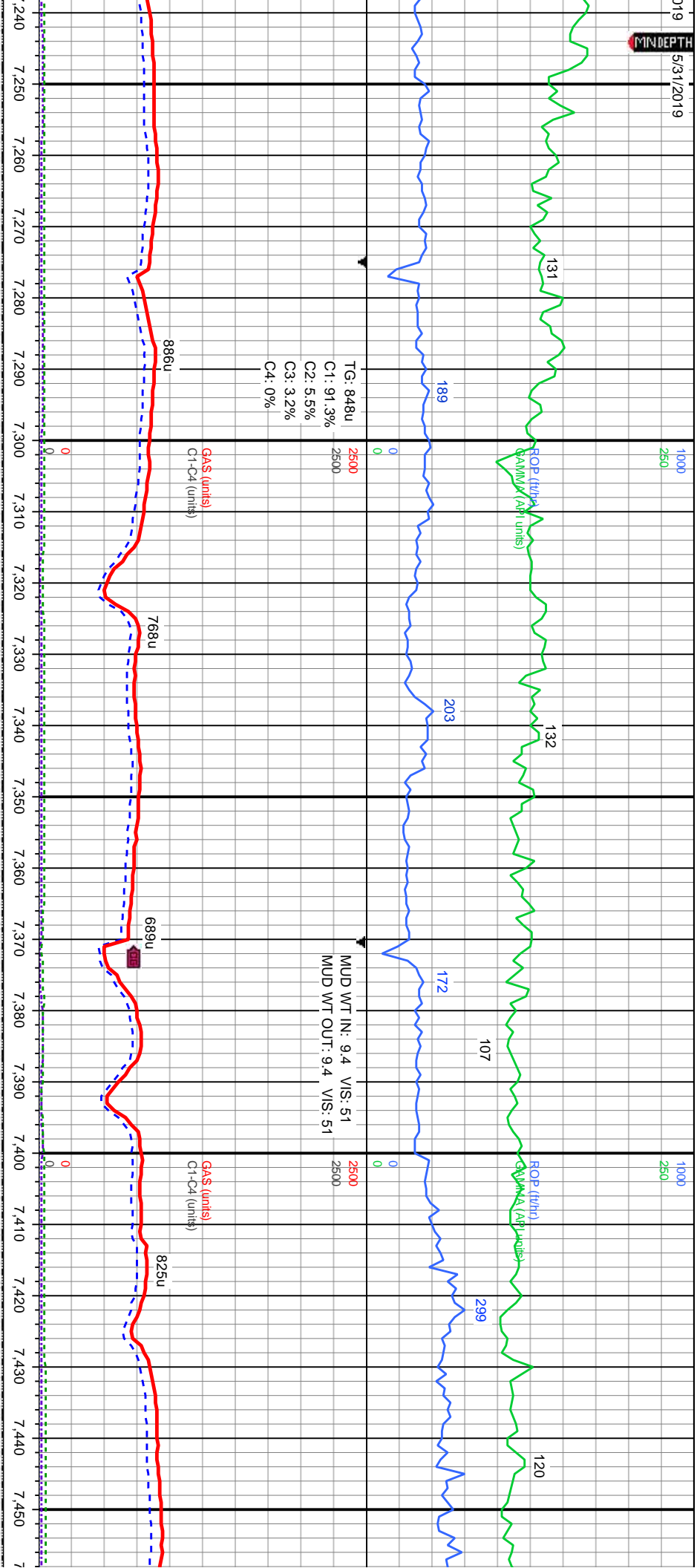
MD: 7,065'
Inclination: 23.67°
Azimuth: 62.23°
TVD: 7,015.61'
VS: -318.92'

TVD (ft)

SLTY SH: dk gy-gy, tr lt gy, sb pily-pily, v
sft-sft, silty to rthy tex, silty, grdg to clyst in
pt, sl- non calc.

MD: 7,159'
Inclination: 21.52°
Azimuth: 54.03°
TVD: 7,102.42'
VS: -348.9'

TVD (ft)



SLTY SH: dk gy-gy, tr lt gy, sb pily-pily, v
sft-sft, slty to rthy tex, slty, grdg to clyst in
pt, sl- non calc.

5000
SLTY SH: dk gy-gy, tr lt gy, sb pily-pily, v
sft-sft, slty to rthy tex, slty, grdg to clyst in
pt, sl- non calc.

5000
SLTY SH: dk gy-gy, tr lt gy, sb pily-pily, v
sft-sft, slty to rthy tex, slty, grdg to clyst in
pt, sl- non calc.

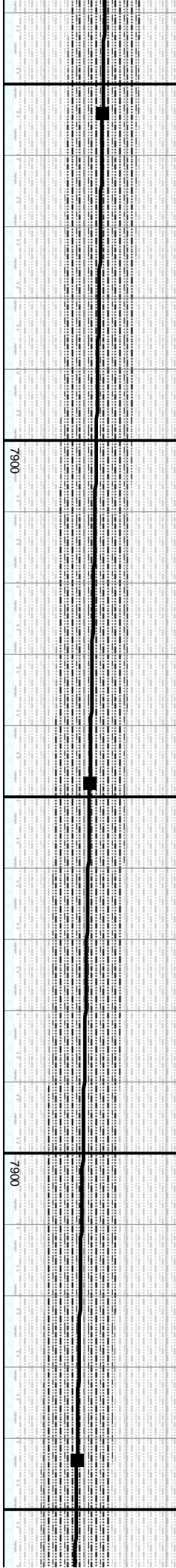
5000
SLTY SH: dk gy-gy, tr lt gy, sb pily-pily, v
sft-sft, slty to rthy tex, slty, grdg to clyst in
pt, sl- non calc.

SLTY
sft-sft
pt, sl-

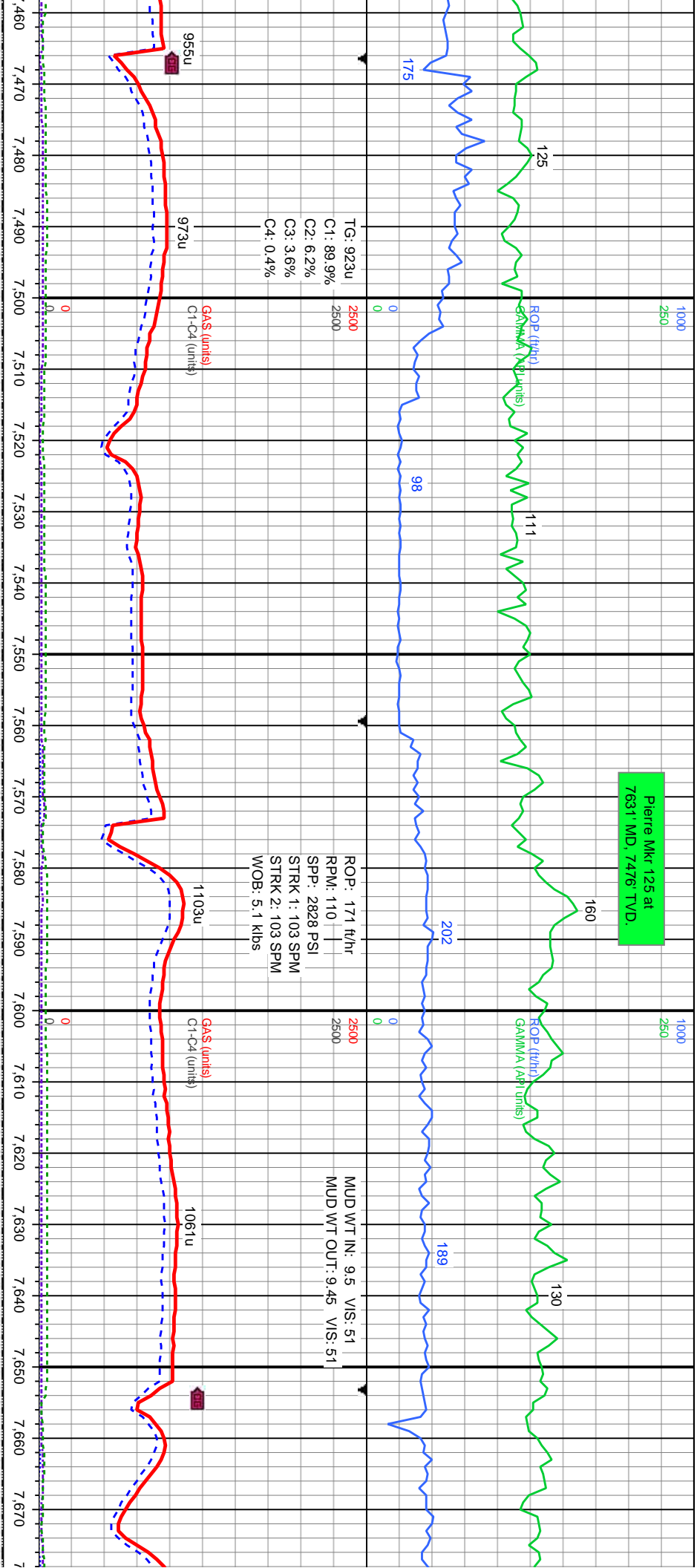
MD: 7.254'
Inclination: 15.88°
Azimuth: 25.22°
TVD: 7,192.55'
VS: -367.8'

MD: 7.348'
Inclination: 13.45°
Azimuth: 346.21°
TVD: 7,283.7'
VS: -369.9'

MD: 7.443'
Inclination: 17.31°
Azimuth: 311.4°
TVD: 7,375.47'
VS: -355.93'



Pierre Mkr 125 at 7631' MD, 7476' TVD.



SH: dk gy-gy, tr lt gy, sb pily-pily, v
, sily to rthy tex, sily, grdg to clyst in
non calc.

5000
SLTY SH: dk gy-gy, tr lt gy, sb pily-pily, v
sft-sft, sily to rthy tex, sily, grdg to clyst in
pt, sl- non calc.

6500
SLTY SH: dk gy-gy, tr lt gy, sb pily-pily, v
sft-sft, sily to rthy tex, sily, grdg to clyst in
pt, sl- non calc.

SLTY SH: dk gy-gy, tr lt g
sft-sft, sily to rthy tex, sit
pt, sl- non calc.

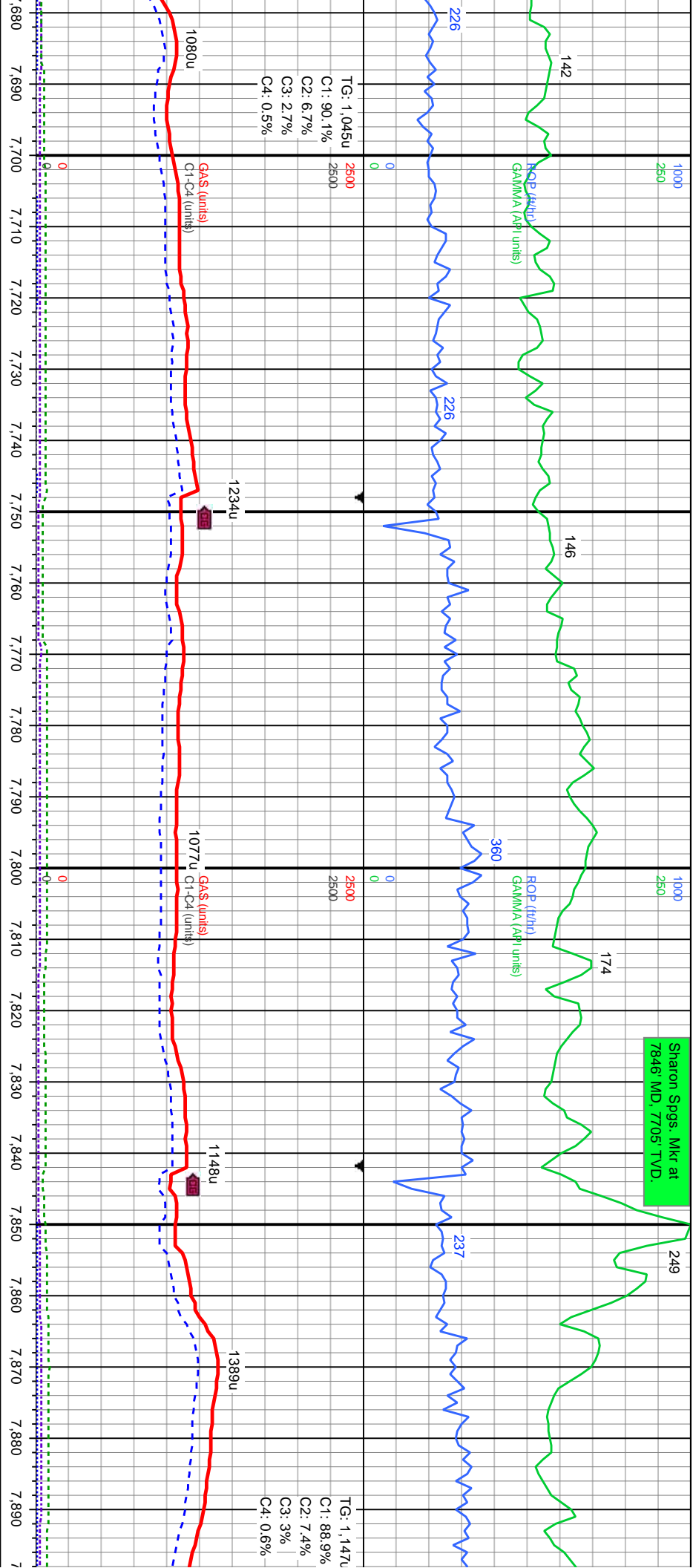
MD: 7.537'
Inclination: 22.19°
Azimuth: 292.38°
TVD: 7.464'
VS: -328.43'

NOTE: Scale Change.

NOTE: Scale Change.



Sharon Spgs. Mkr at
7846' MD, 7705' TVD.



TG: 1.045u
C1: 90.1%
C2: 6.7%
C3: 2.7%
C4: 0.5%

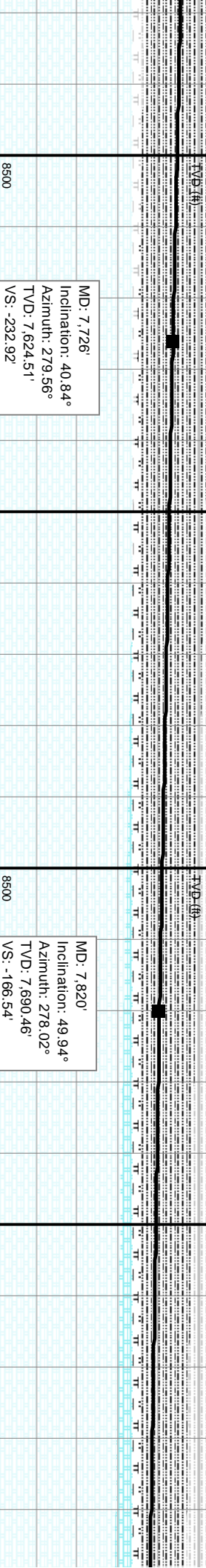
TG: 1.147u
C1: 88.9%
C2: 7.4%
C3: 3%
C4: 0.6%

SLTY SH: dk gy-gy, occ lt gy, sb pily-pily, v
sft-sft, silty to rthy tex, silty-arg, grdg to clyst
in pt, sil- non calc. w/ BENT strgs: lt gy-wh,
silty, v sft.

SLTY SH: dk gy-gy, occ lt gy, sb pily-pily, v
sft-sft, silty to rthy tex, silty-arg, grdg to clyst in pt,
sil- non calc. w/ BENT strgs: lt gy-wh, silty, v sft.

SLTY SH: dk gy-gy, occ lt gy, sb pily-pily, v
sft-sft, silty to rthy tex, silty-arg, grdg to clyst in
pt, sil calc. w/ BENT strgs: lt gy-wh, silty, v sft.

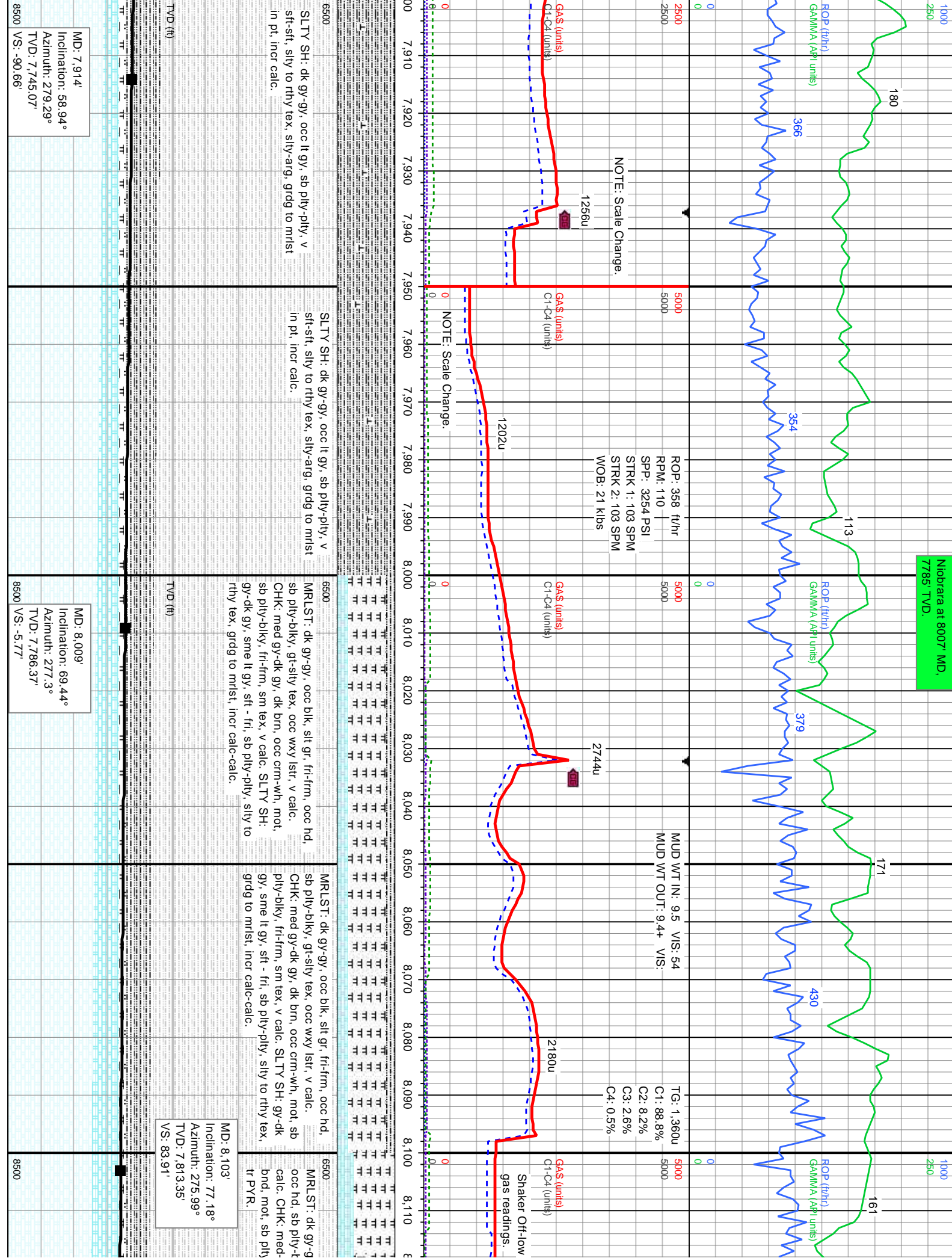
SLTY SH: dk gy-gy, occ lt gy, sb pily-pily, v
sft-sft, silty to rthy tex, silty-arg, grdg to clyst in
pt, non calc. w/ BENT strgs: lt gy-wh, silty, v
sft.



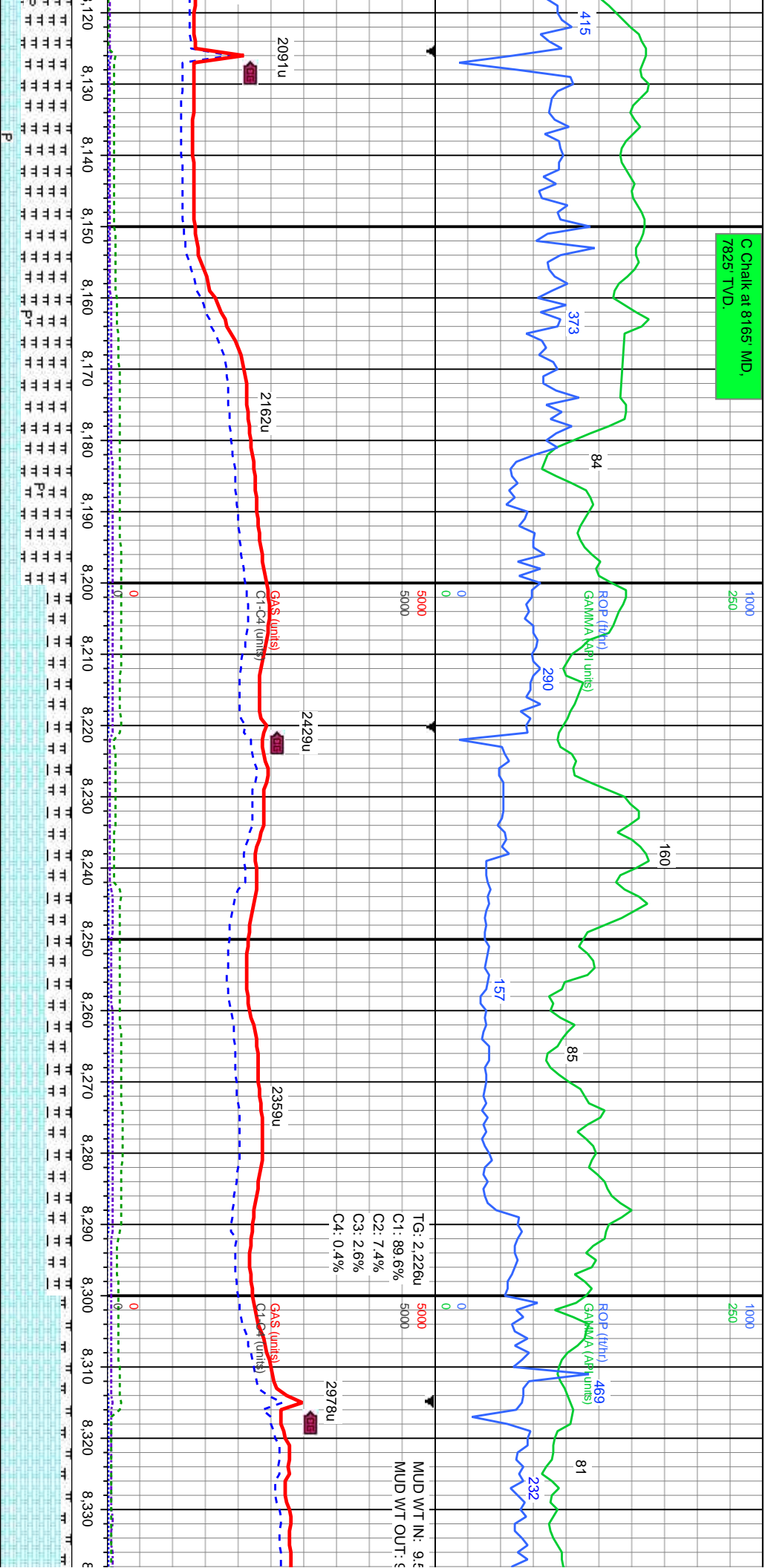
MD: 7,726'
Inclination: 40.84°
Azimuth: 279.56°
TVD: 7,624.51'
VS: -232.92'

MD: 7,820'
Inclination: 49.94°
Azimuth: 278.02°
TVD: 7,690.46'
VS: -166.54'

Niobrara at 8007' MD,
7785' TVD.



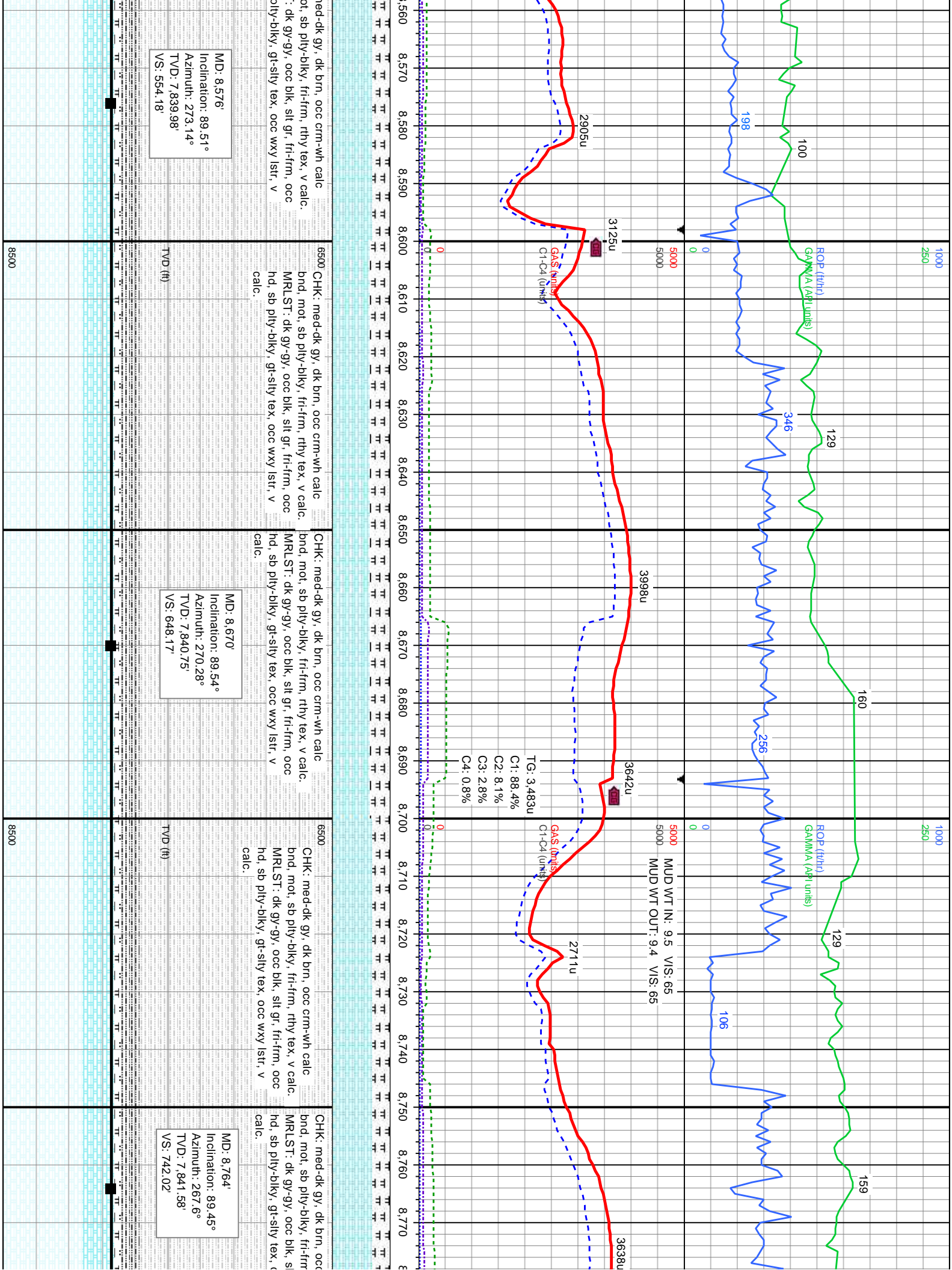
C Chalk at 8165' MD,
7825' TVD

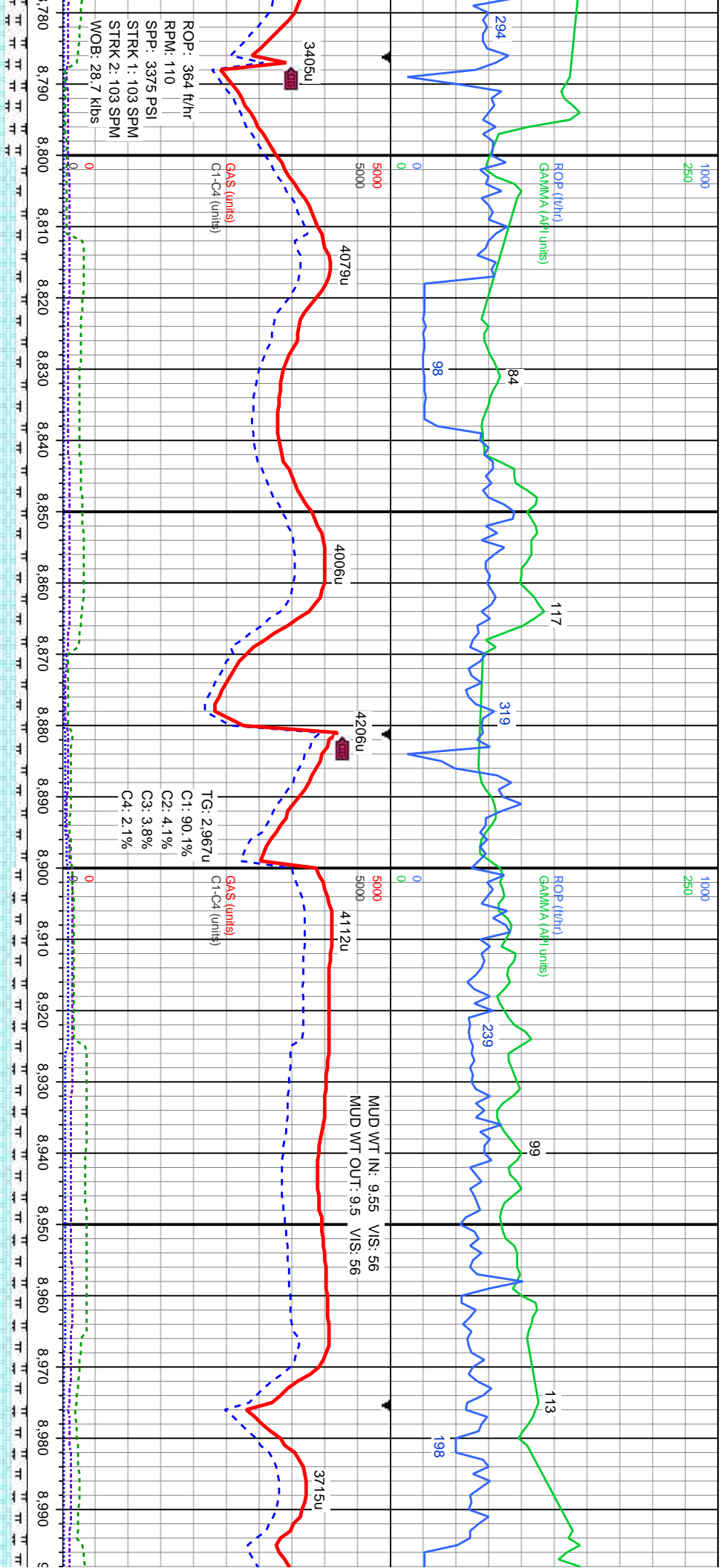


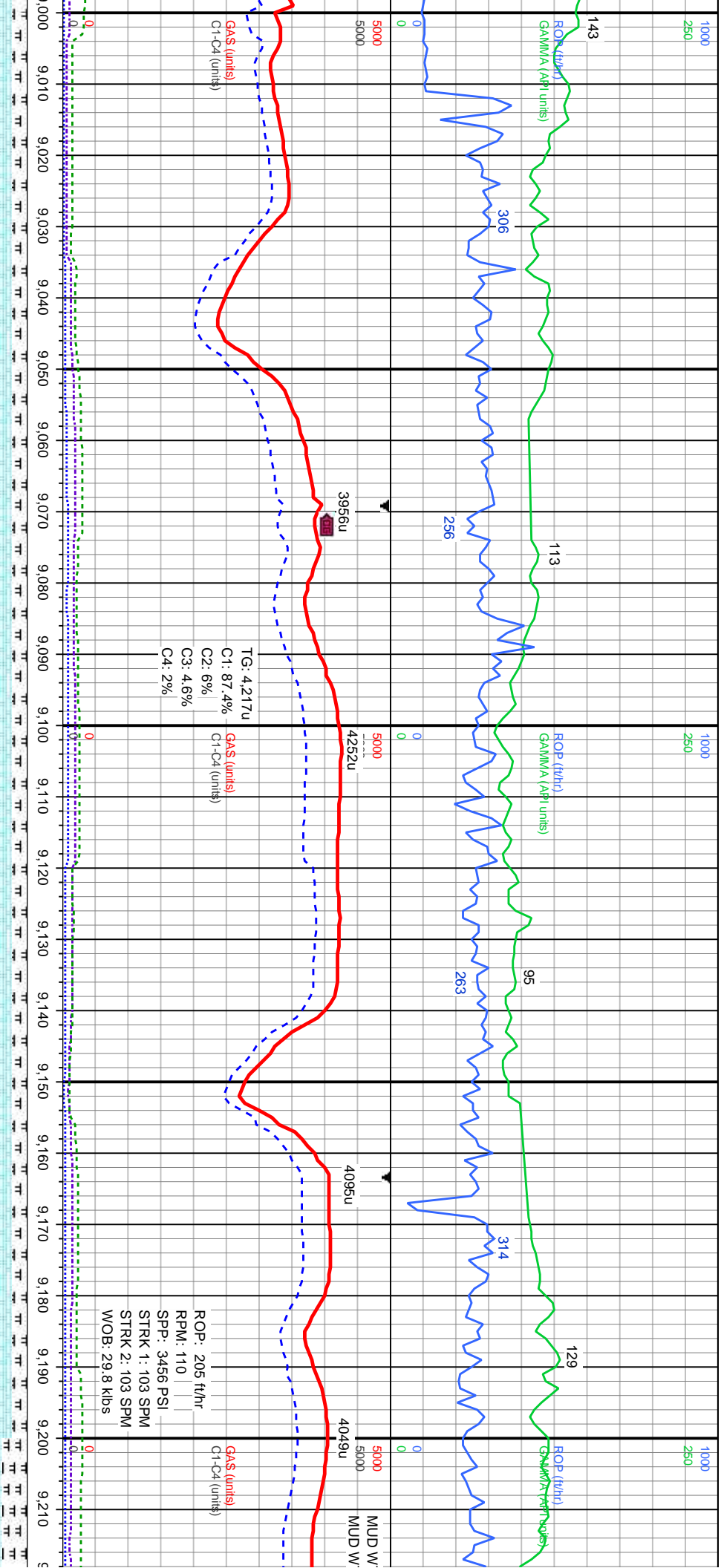
MD: 8,198'
Inclination: 81.04°
Azimuth: 275.38°
TVD: 7,831.3'
VS: 176.99'

MD: 8,293'
Inclination: 89.17°
Azimuth: 274.12°
TVD: 7,839.4'
VS: 271.45'

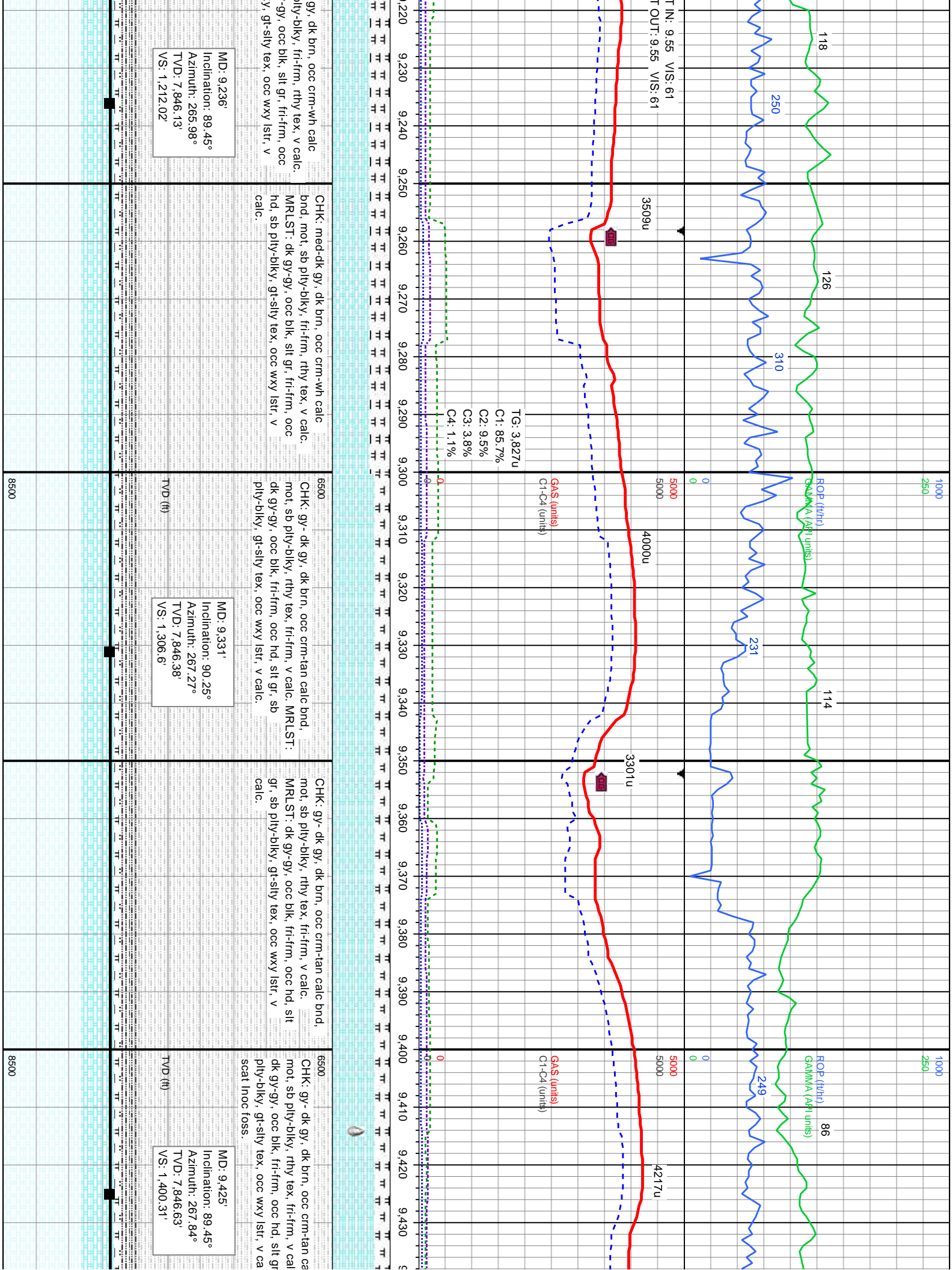
TVD (ft)

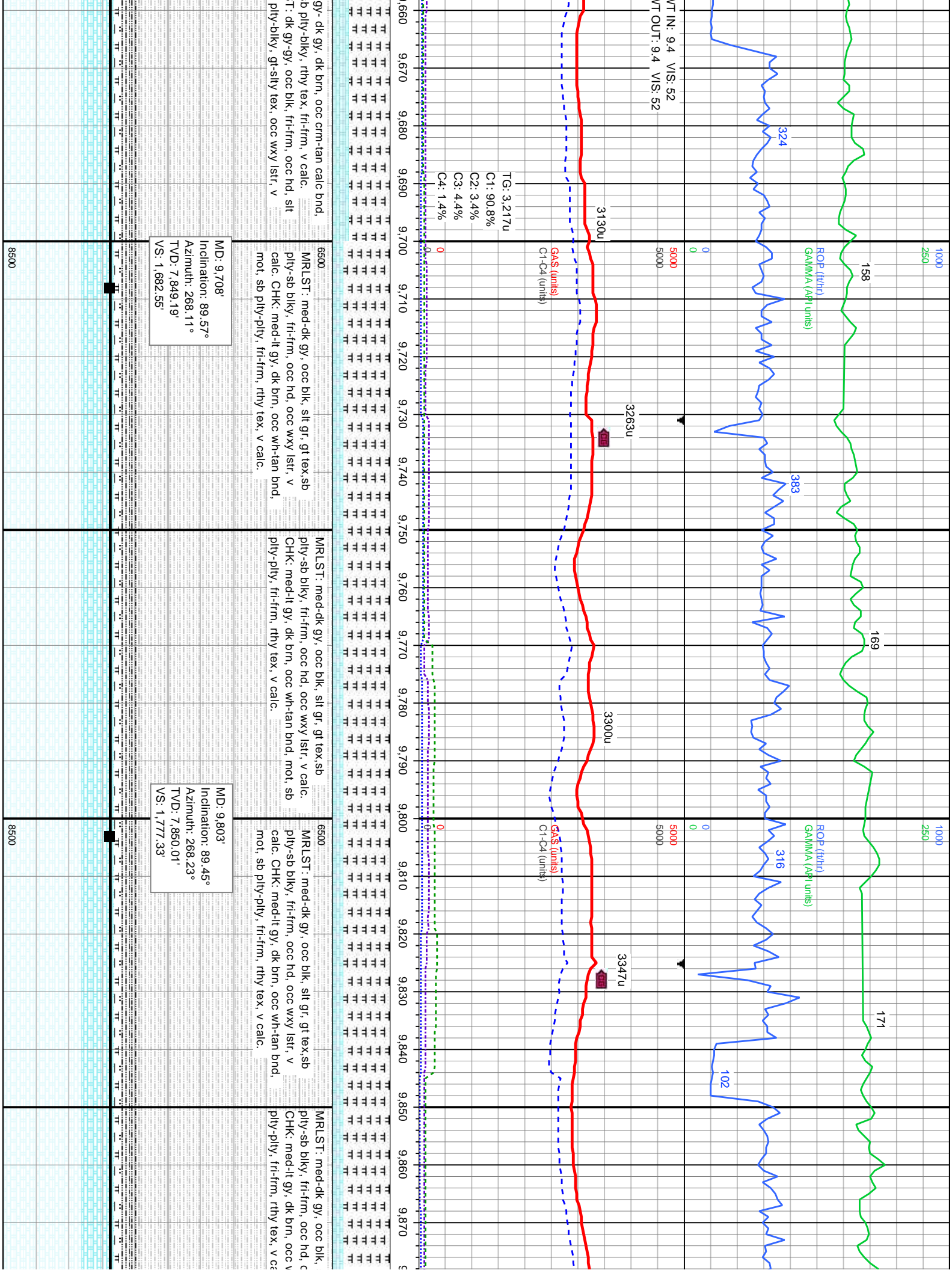


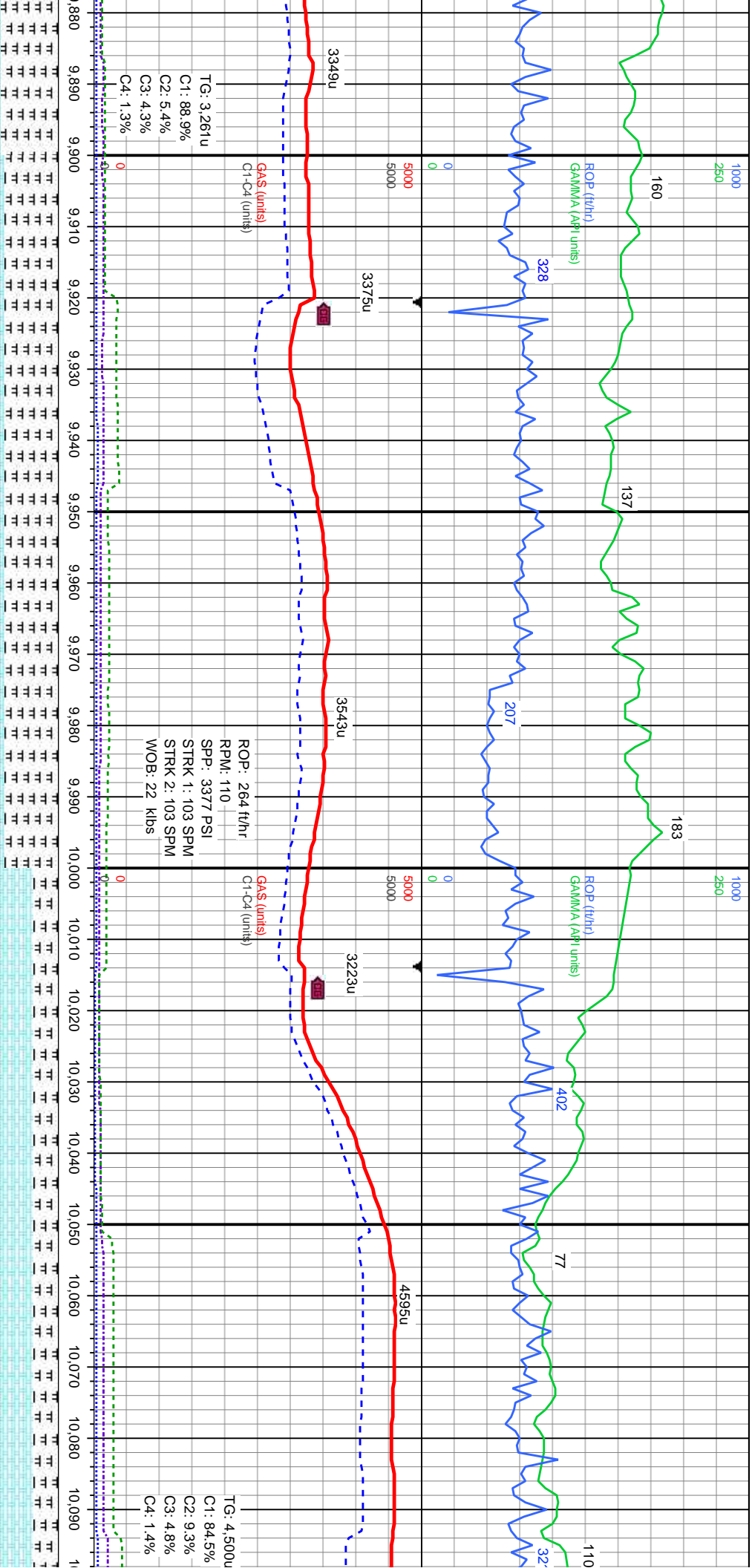




6500	CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb ply-blky, fri-frn, rthy tex, v calc. MRLST: dk gy-gy, occ blk, sit gr, fri-frn, occ hd, sb ply-blky, gt-sily tex, occ wxy lstr, v calc.	CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb ply-blky, fri-frn, rthy tex, v calc. MRLST: dk gy-gy, occ blk, sit gr, fri-frn, occ hd, sb ply-blky, gt-sily tex, occ wxy lstr, v calc.	6500	CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb ply-blky, fri-frn, rthy tex, v calc. MRLST: dk gy-gy, occ blk, sit gr, fri-frn, occ hd, sb ply-blky, gt-sily tex, occ wxy lstr, v calc.	6500	CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb ply-blky, fri-frn, rthy tex, v calc. MRLST: dk gy-gy, occ blk, sit gr, fri-frn, occ hd, sb ply-blky, gt-sily tex, occ wxy lstr, v calc.	6500	CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb ply-blky, fri-frn, rthy tex, v calc. MRLST: dk gy-gy, occ blk, sit gr, fri-frn, occ hd, sb ply-blky, gt-sily tex, occ wxy lstr, v calc.
<div>MD: 9.047' Inclination: 89.29° Azimuth: 266.99° TVD: 7,844.18' VS: 1,023.93'</div>				<div>MD: 9.142' Inclination: 89.45° Azimuth: 266.44° TVD: 7,845.23' VS: 1,118.51'</div>				
TVD (ft)			TVD (ft)				TVD (ft)	
8500			8500				8500	





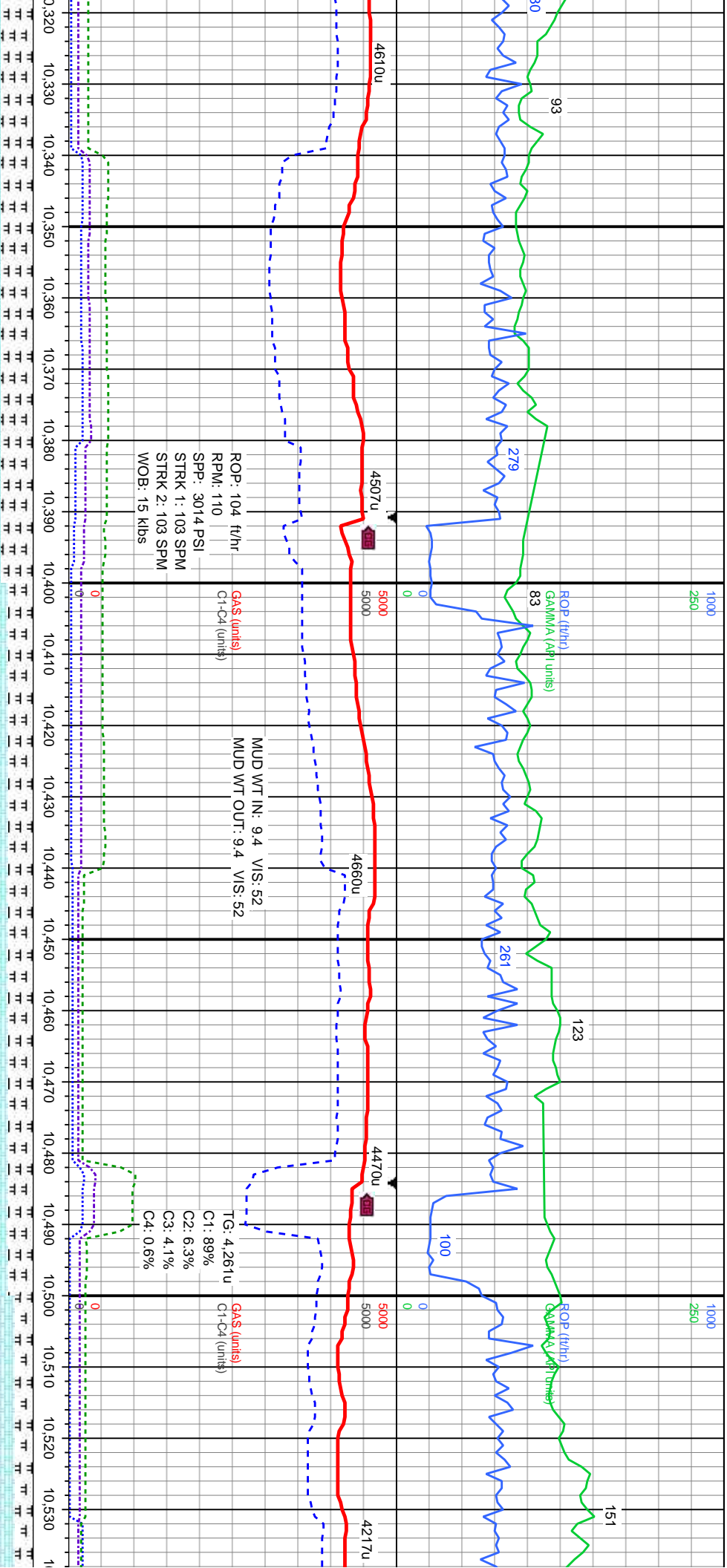


MD: 9.897'
Inclination: 89.48°
Azimuth: 268.78°
TVD: 7.850.88'
VS: 1.871.15'

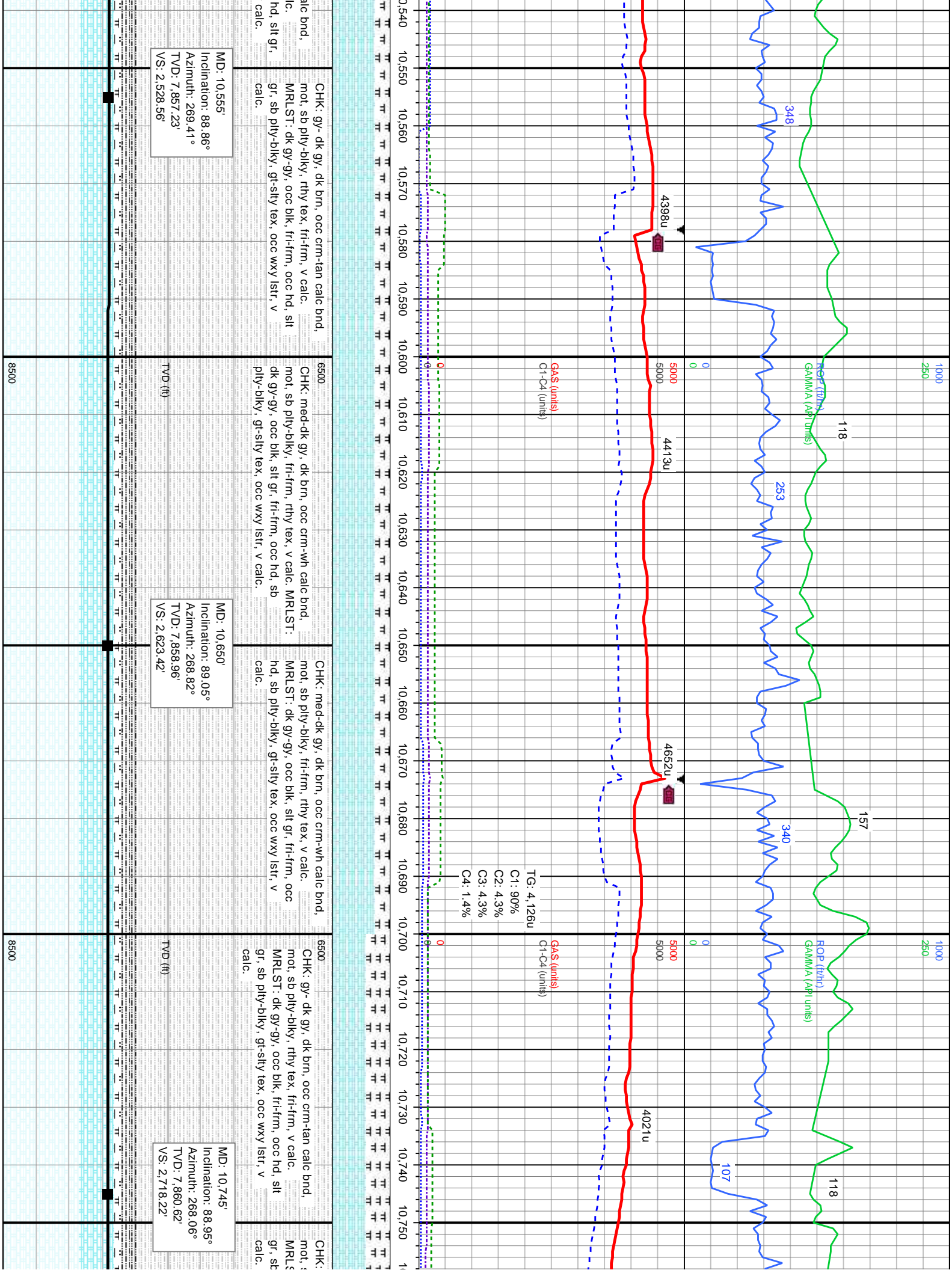
MD: 9.991'
Inclination: 89.48°
Azimuth: 269.18°
TVD: 7.851.74'
VS: 1.965.01'

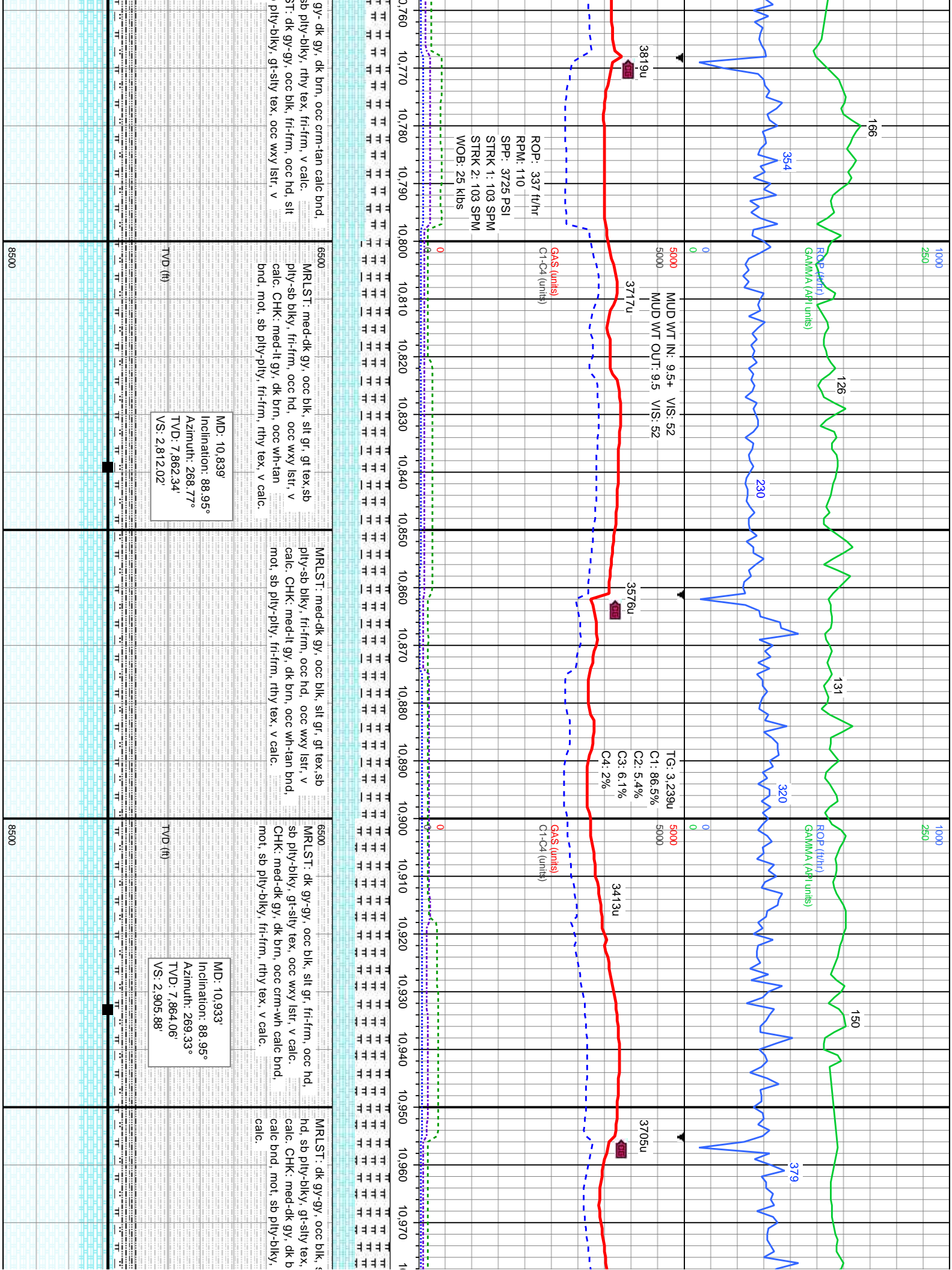
MD: 10.085'
Inclination: 89.42°
Azimuth: 268.94°
TVD: 7.852.64'
VS: 2.058.88'

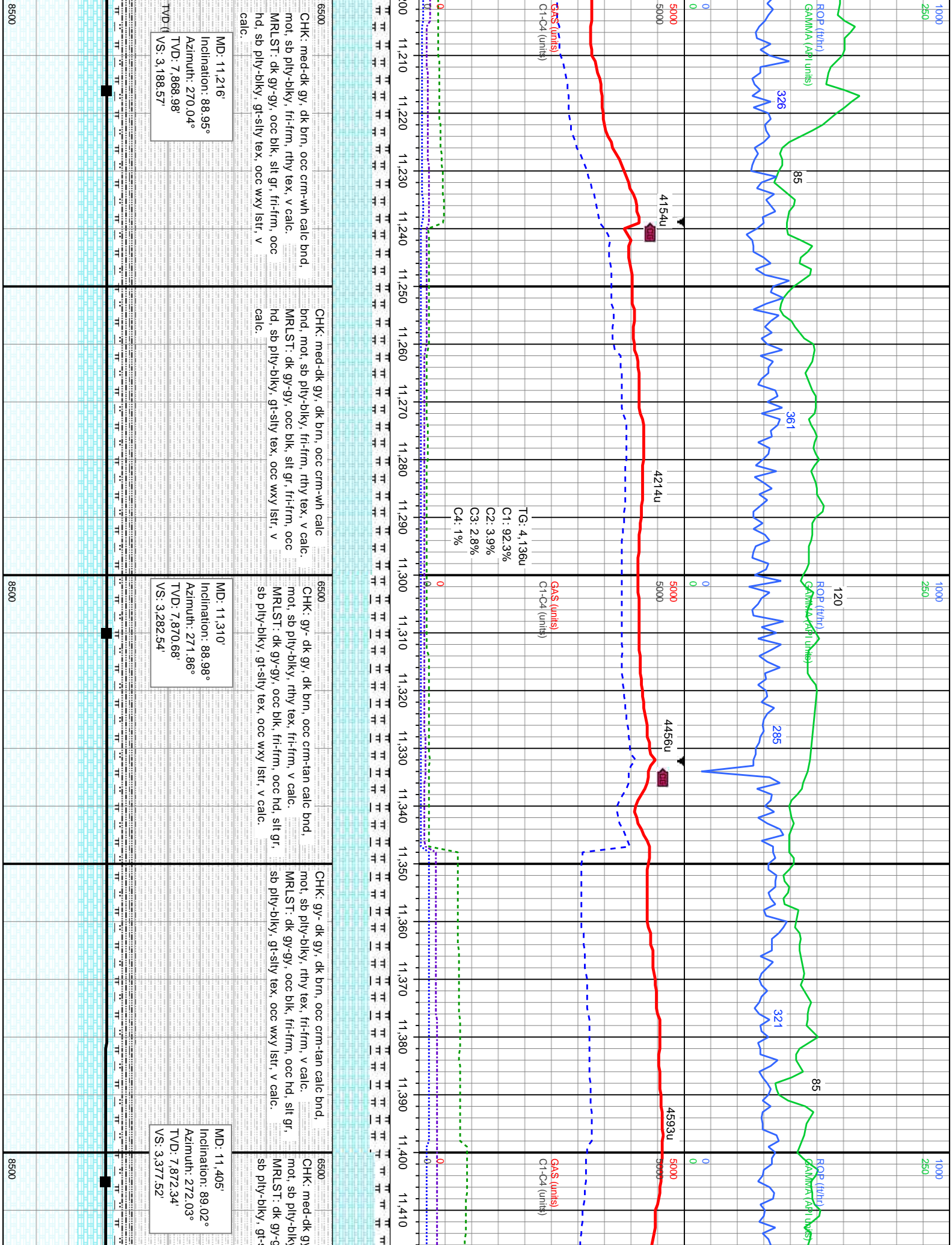
stl gr, gt tex, sb	6500	MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ nd, hd, sb ply-blky, gt-sily tex, occ wxy lstr, v calc.	CHK: med-dk gy, dk brn, occ crm-wh calc bnd, bnd, mot, sb ply-blky, fri-frm, rthy tex, v calc.	MD: 9.897' Inclination: 89.48° Azimuth: 268.78° TVD: 7.850.88' VS: 1.871.15'
occ wxy lstr, v calc.				
stl gr, gt tex, sb	6500	MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ nd, hd, sb ply-blky, gt-sily tex, occ wxy lstr, v calc.	CHK: med-dk gy, dk brn, occ crm-wh calc bnd, bnd, mot, sb ply-blky, fri-frm, rthy tex, v calc.	MD: 9.991' Inclination: 89.48° Azimuth: 269.18° TVD: 7.851.74' VS: 1.965.01'
occ wxy lstr, v calc.				
stl gr, gt tex, sb	6500	MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ nd, hd, sb ply-blky, gt-sily tex, occ wxy lstr, v calc.	CHK: med-dk gy, dk brn, occ crm-wh calc bnd, bnd, mot, sb ply-blky, fri-frm, rthy tex, v calc.	MD: 10.085' Inclination: 89.42° Azimuth: 268.94° TVD: 7.852.64' VS: 2.058.88'
occ wxy lstr, v calc.				

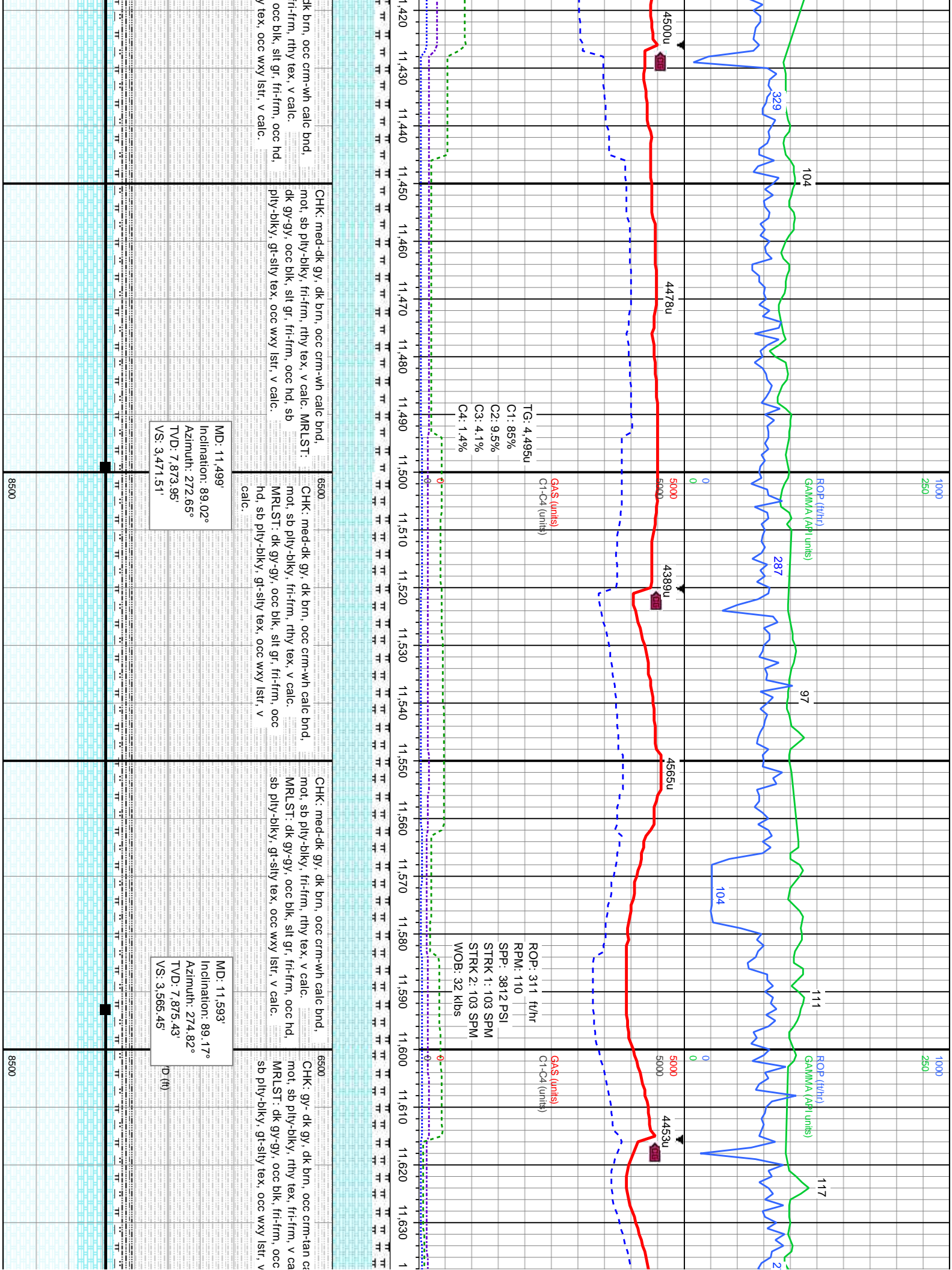


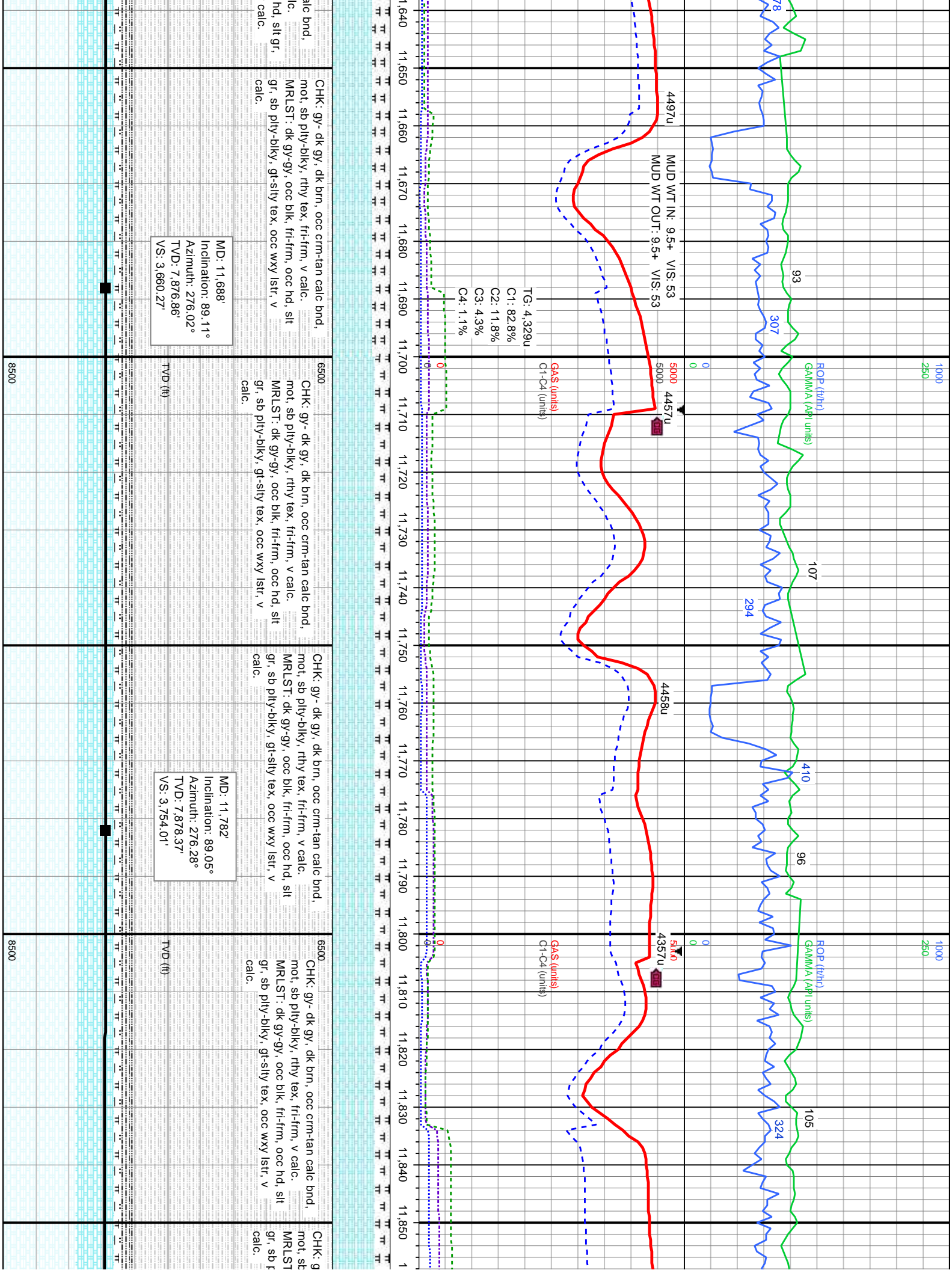
dk brn, occ crm-tan calc bnd, rthy tex, fri-frn, v calc, occ blk, fri-frn, occ hd, sit	CHK: gy- dk gy, dk brn, occ crm-tan calc bnd, mot, sb ply-biky, rthy tex, fri-frn, v calc. MRLST: dk gy-gy, occ blk, fri-frn, occ hd, sit gr, sb ply-biky, gr-sily tex, occ wxy lstr, v	6500	CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb ply-biky, fri-frn, rthy tex, v calc. MRLST: dk gy-gy, occ blk, sit gr, fri-frn, occ hd, sb ply-biky, gr-sily tex, occ wxy lstr, v calc.	6500	CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb ply-biky, fri-frn, rthy tex, v calc. MRLST: dk gy-gy, occ blk, sit gr, fri-frn, occ hd, sb ply-biky, gr-sily tex, occ wxy lstr, v calc.	6500	CHK: gy- dk gy, dk brn, occ crm-tan calc bnd, mot, sb ply-biky, rthy tex, fri-frn, v calc. MRLST: dk gy-gy, occ blk, fri-frn, occ hd, sit gr, sb ply-biky, gr-sily tex, occ wxy lstr, v	6500
MD: 10.368 Inclination: 89.54° Azimuth: 271.3° TVD: 7.854.86' VS: 2.341.63'		TVD (ft)		MD: 10.462 Inclination: 89.35° Azimuth: 271.13° TVD: 7.855.77' VS: 2.435.62'		TVD (ft)		

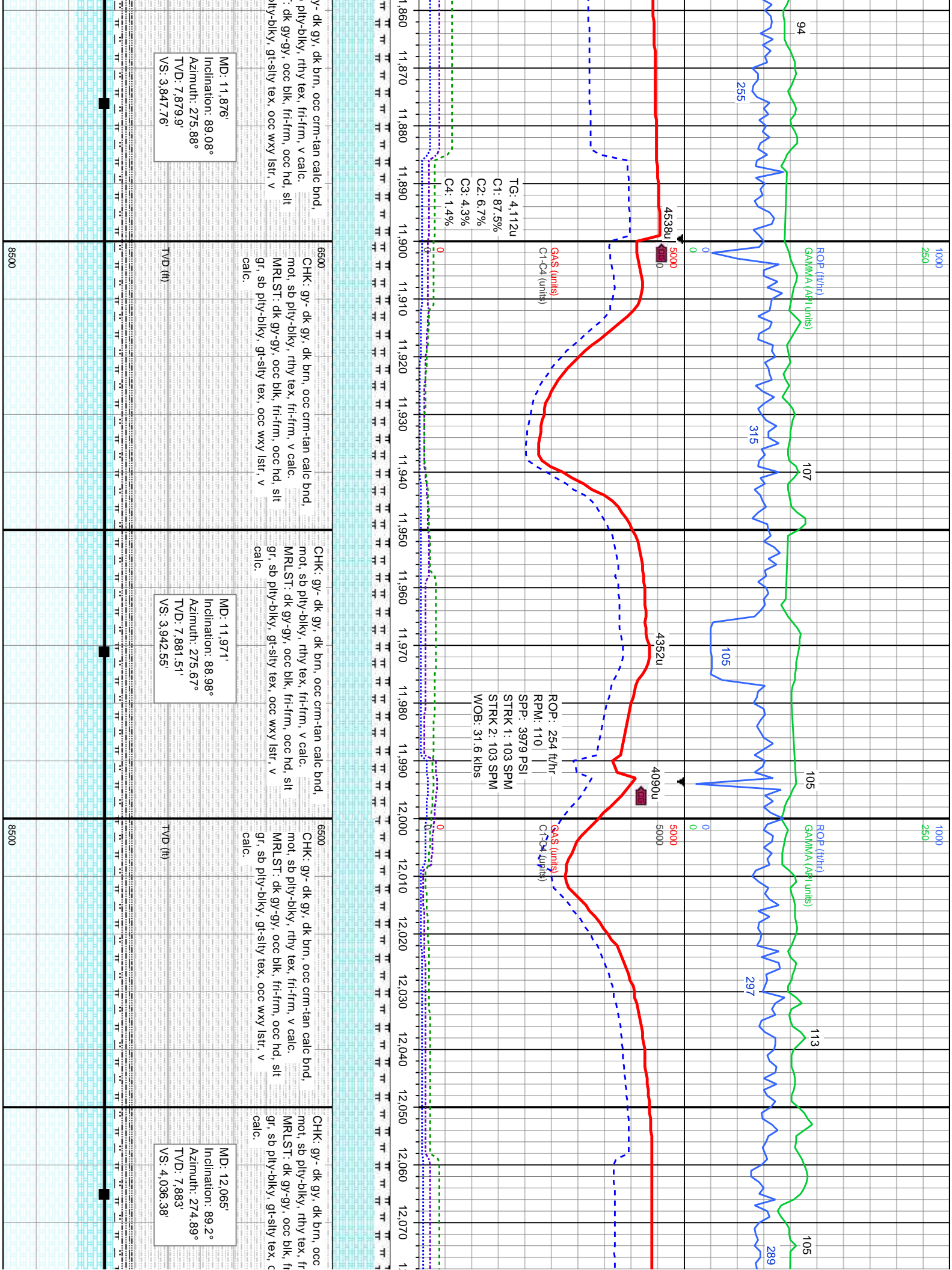


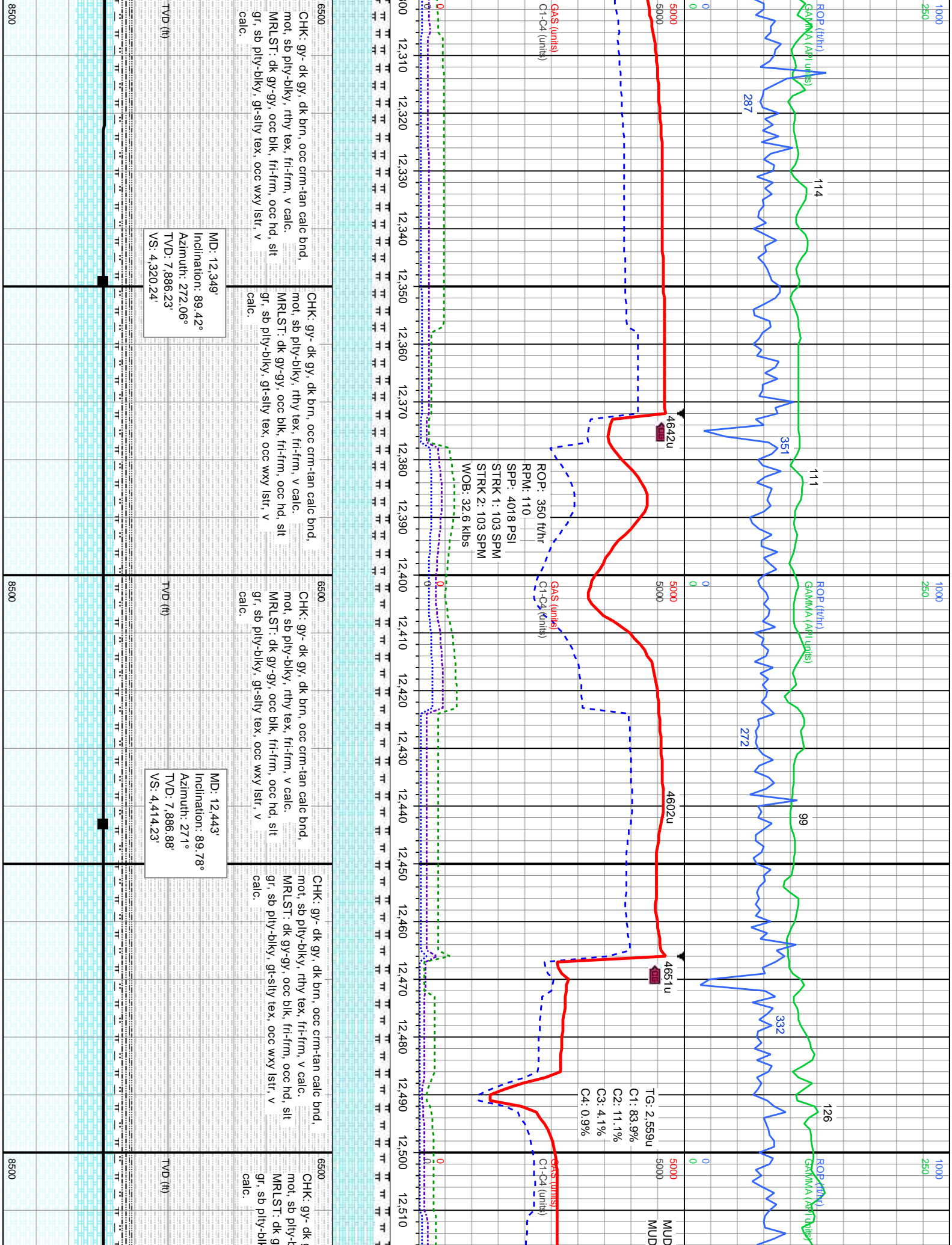


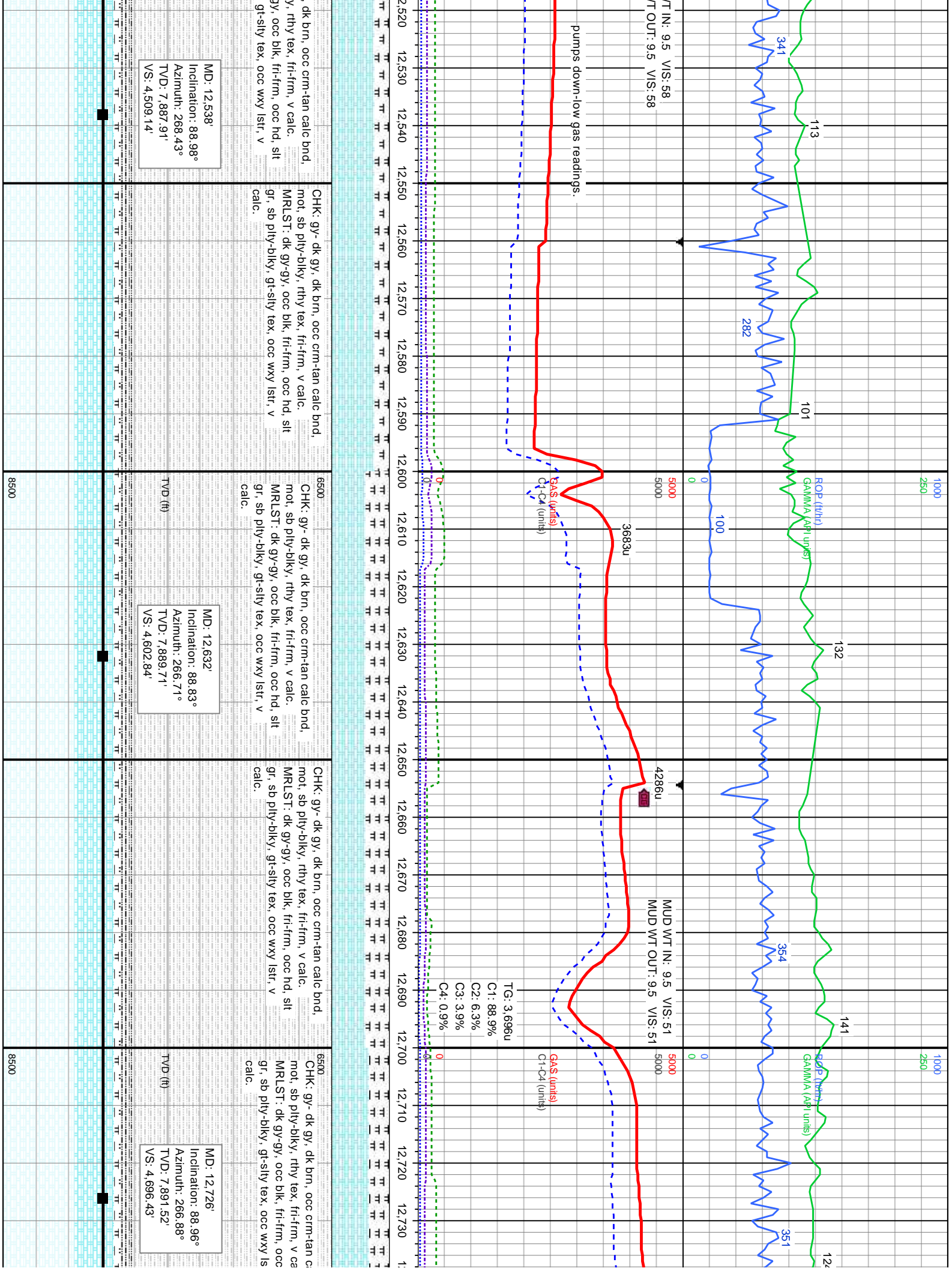


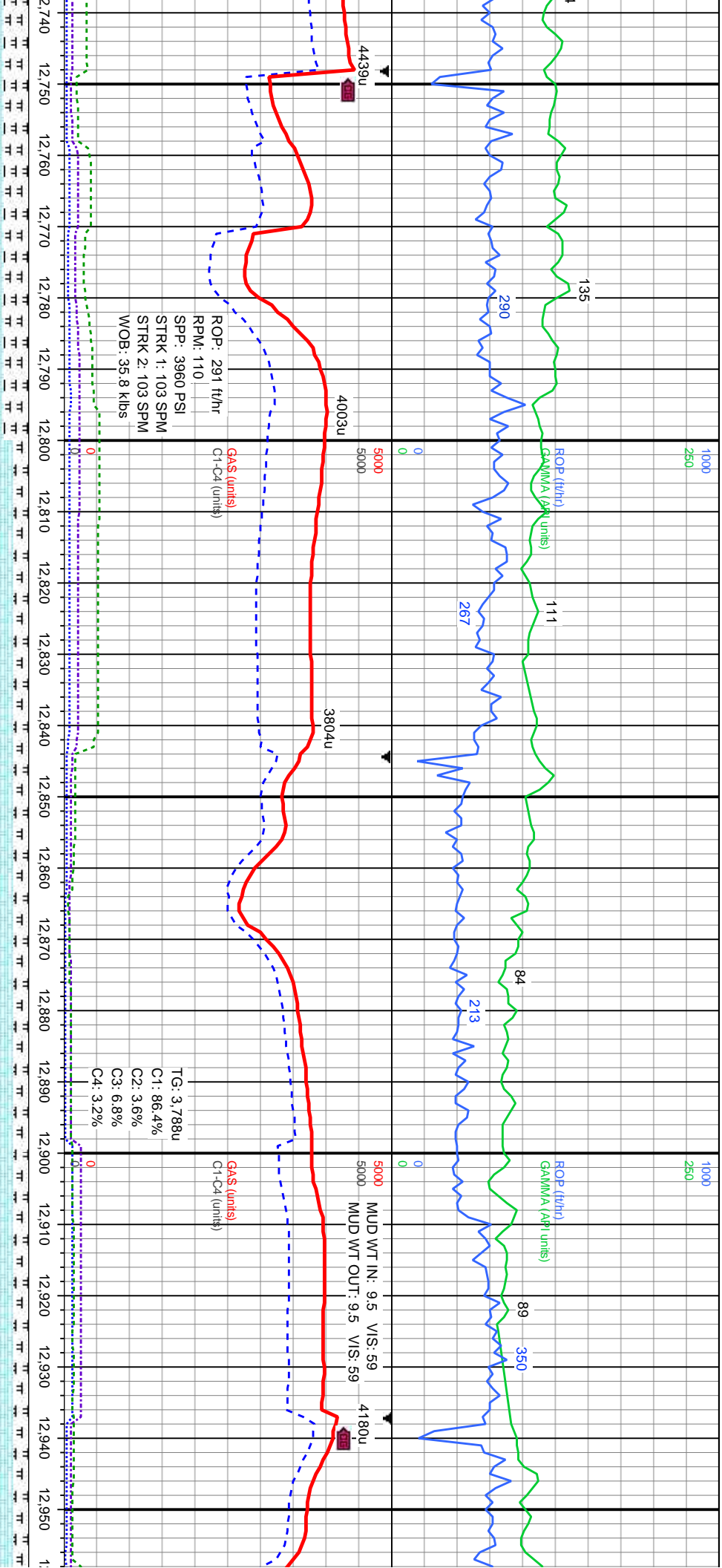












CHK: gy- dk gy, dk brn, occ crm-tan calc bnd, mot, sb pily-biky, rthy tex, fri-frn, v calc. MRLST: dk gy-gy, occ blk, fri-frn, occ hd, sit gr, sb pily-biky, gr-sily tex, occ wxy lstr, v calc.

CHK: gy- dk gy, dk brn, occ crm-tan calc bnd, mot, sb pily-biky, rthy tex, fri-frn, v calc. MRLST: dk gy-gy, occ blk, fri-frn, occ hd, sit gr, sb pily-biky, gr-sily tex, occ wxy lstr, v calc.

CHK: gy- dk gy, dk brn, occ crm-tan calc bnd, mot, sb pily-biky, rthy tex, fri-frn, v calc. MRLST: dk gy-gy, occ blk, fri-frn, occ hd, sit gr, sb pily-biky, gr-sily tex, occ wxy lstr, v calc.

MD: 12,820'
Inclination: 89.23°
Azimuth: 266.43°
TVD: 7,893.01'
VS: 4,790'

MD: 12,914'
Inclination: 88.95°
Azimuth: 266.74°
TVD: 7,894.51'
VS: 4,883.57'

6/1/2019 6/2/2019

MINDEPTH

1000
250

1000
250

ROP (ft/hr)
GAMMA (API units)

317
138
317
107
80
98
118
220

4099u

3913u

3900u

3612u

3698u

MUD WT IN: 9.5 V/S: 56
MUD WT OUT: 9.5 V/S: 56

GAS (units)
C1-C4 (units)

GAS (units)
C1-C4 (units)

TG: 2.865u
C1: 82.7%
C2: 9.2%
C3: 5.9%
C4: 2.1%

y- dk gy, dk brn, occ crm-tan calc bnd,
ply-bkly, rthy tex, fri-frm, v calc.
dk gy-gy, occ blk, fri-frm, occ hd, slit
ply-bkly, gr-sily tex, occ wxy lstr, v

6500
CHK: gy- dk gy, dk brn, occ crm-tan calc bnd,
mot, sb ply-bkly, rthy tex, fri-frm, v calc.
MRLST: dk gy-gy, occ blk, fri-frm, occ hd, slit
gr, sb ply-bkly, gr-sily tex, occ wxy lstr, v
calc.

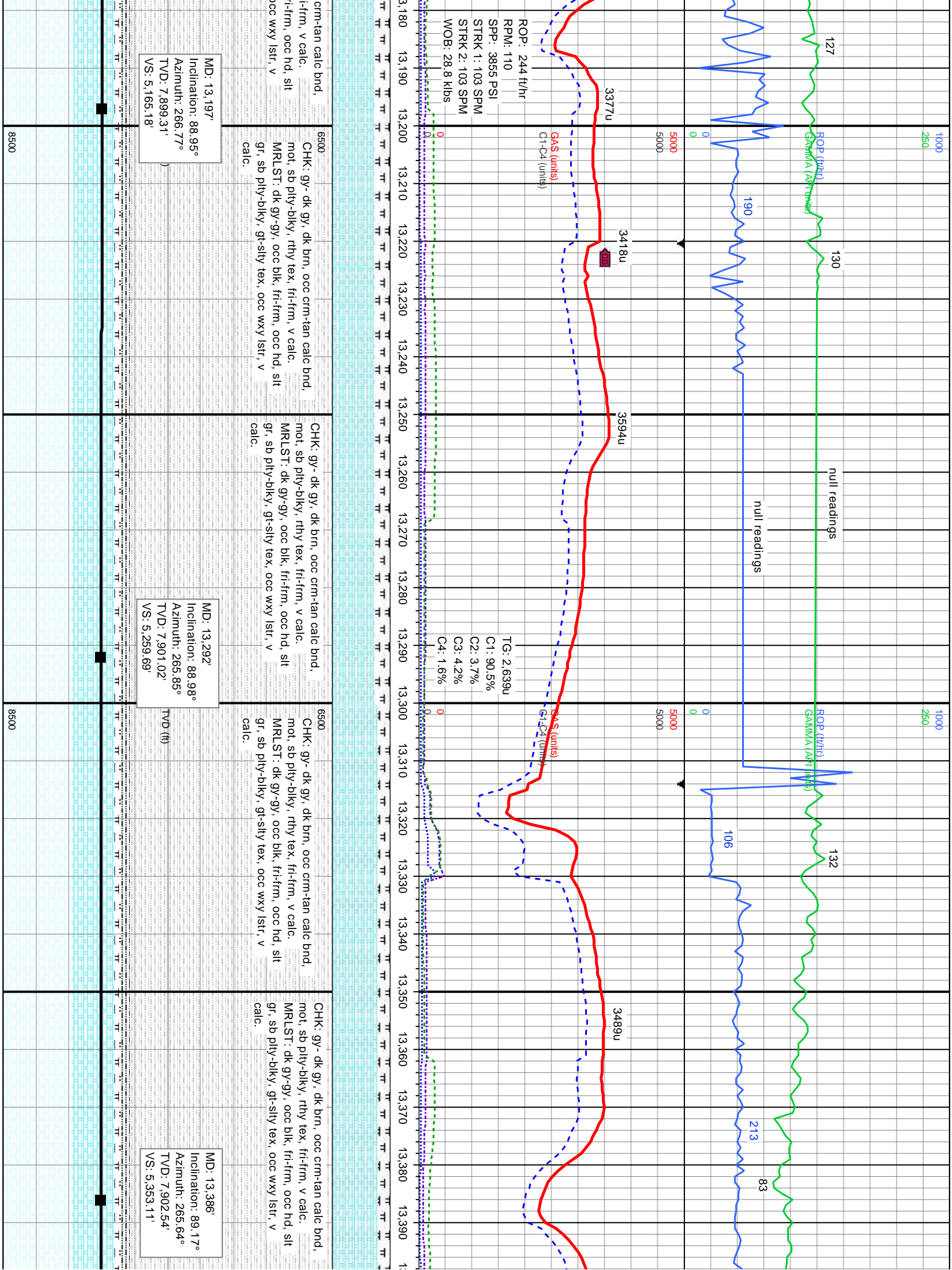
6500
CHK: gy- dk gy, dk brn, occ crm-tan calc bnd,
mot, sb ply-bkly, rthy tex, fri-frm, v calc.
MRLST: dk gy-gy, occ blk, fri-frm, occ hd, slit
gr, sb ply-bkly, gr-sily tex, occ wxy lstr, v
calc.

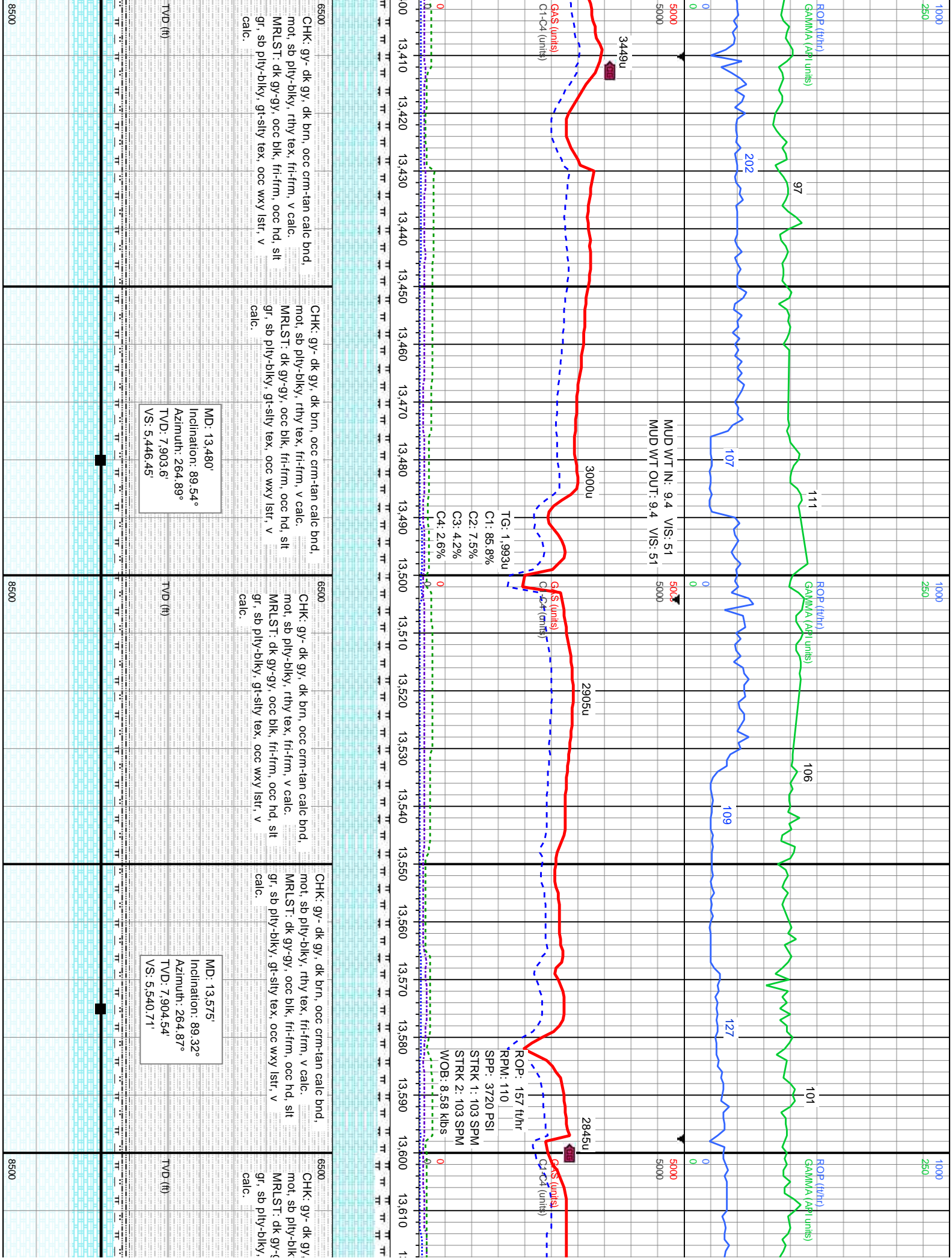
6500
CHK: gy- dk gy, dk brn, occ crm-tan calc bnd,
mot, sb ply-bkly, rthy tex, fri-frm, v calc.
MRLST: dk gy-gy, occ blk, fri-frm, occ hd, slit
gr, sb ply-bkly, gr-sily tex, occ wxy lstr, v
calc.

CHK: gy- dk gy, dk brn, occ
mot, sb ply-bkly, rthy tex, fri-frm, v calc.
MRLST: dk gy-gy, occ blk, fri-frm, occ hd, slit
gr, sb ply-bkly, gr-sily tex, occ wxy lstr, v
calc.

MD: 13.009'
Inclination: 89.11°
Azimuth: 266.17°
TVD: 7.896.11'
VS: 4.978.11'

MD: 13.103'
Inclination: 89.02°
Azimuth: 266.33°
TVD: 7.897.64'
VS: 5.071.62'





6500
CHK: gy- dk gy, dk brn, occ crm-tan calc bnd,
mot, sb pily-blky, rthy tex, fri-frn, v calc.
MRLST: dk gy-gy, occ blk, fri-frn, occ hd, sit
gr, sb pily-blky, gt-sily tex, occ wxy lstr, v
calc.

6500
CHK: gy- dk gy, dk brn, occ crm-tan calc bnd,
mot, sb pily-blky, rthy tex, fri-frn, v calc.
MRLST: dk gy-gy, occ blk, fri-frn, occ hd, sit
gr, sb pily-blky, gt-sily tex, occ wxy lstr, v
calc.

MD: 13,480'
Inclination: 89.54°
Azimuth: 264.89°
TVD: 7,903.6'
VS: 5,446.45'

6500
CHK: gy- dk gy, dk brn, occ crm-tan calc bnd,
mot, sb pily-blky, rthy tex, fri-frn, v calc.
MRLST: dk gy-gy, occ blk, fri-frn, occ hd, sit
gr, sb pily-blky, gt-sily tex, occ wxy lstr, v
calc.

6500
CHK: gy- dk gy, dk brn, occ crm-tan calc bnd,
mot, sb pily-blky, rthy tex, fri-frn, v calc.
MRLST: dk gy-gy, occ blk, fri-frn, occ hd, sit
gr, sb pily-blky, gt-sily tex, occ wxy lstr, v
calc.

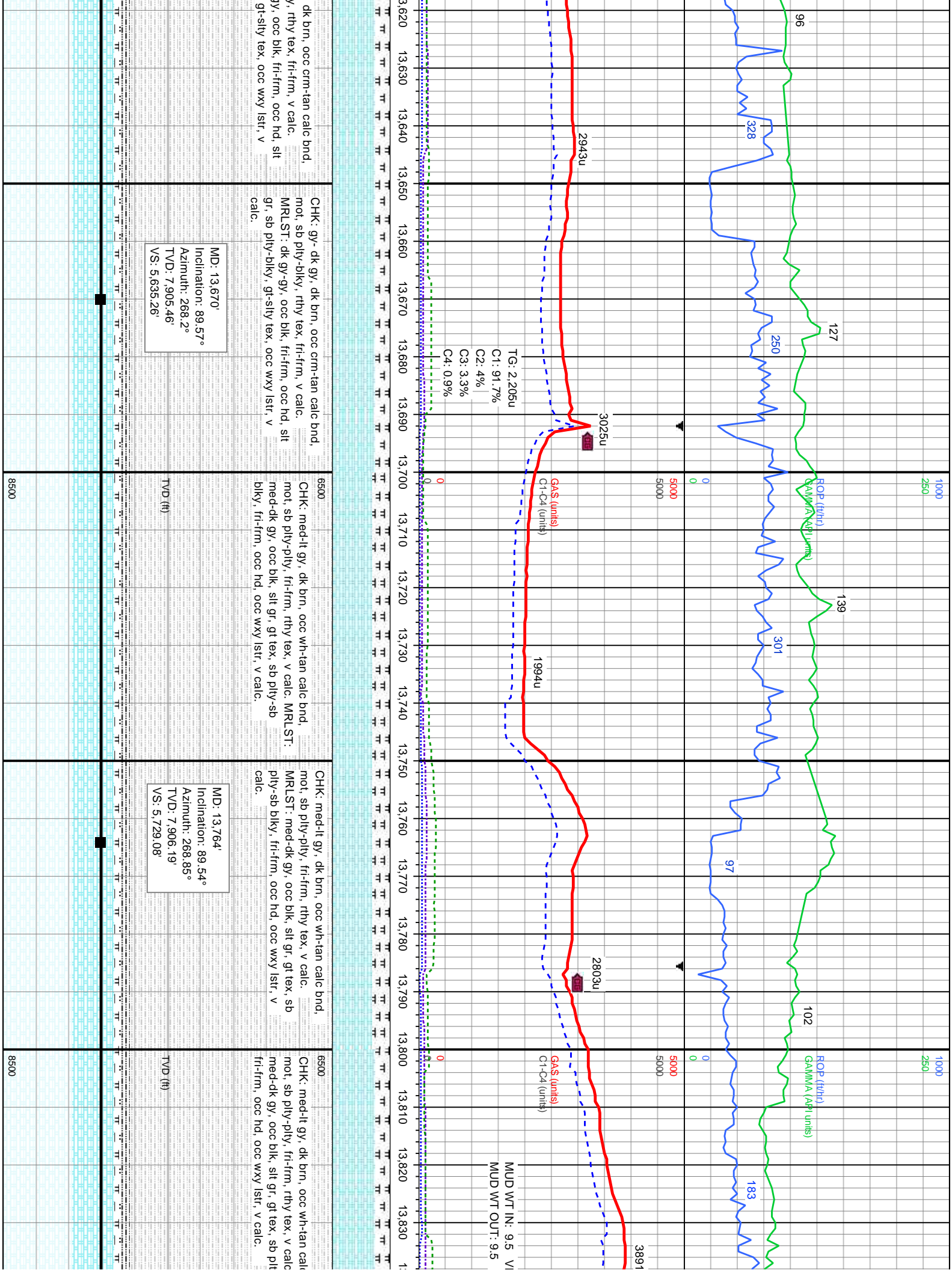
MD: 13,575'
Inclination: 89.32°
Azimuth: 264.87°
TVD: 7,904.54'
VS: 5,540.71'

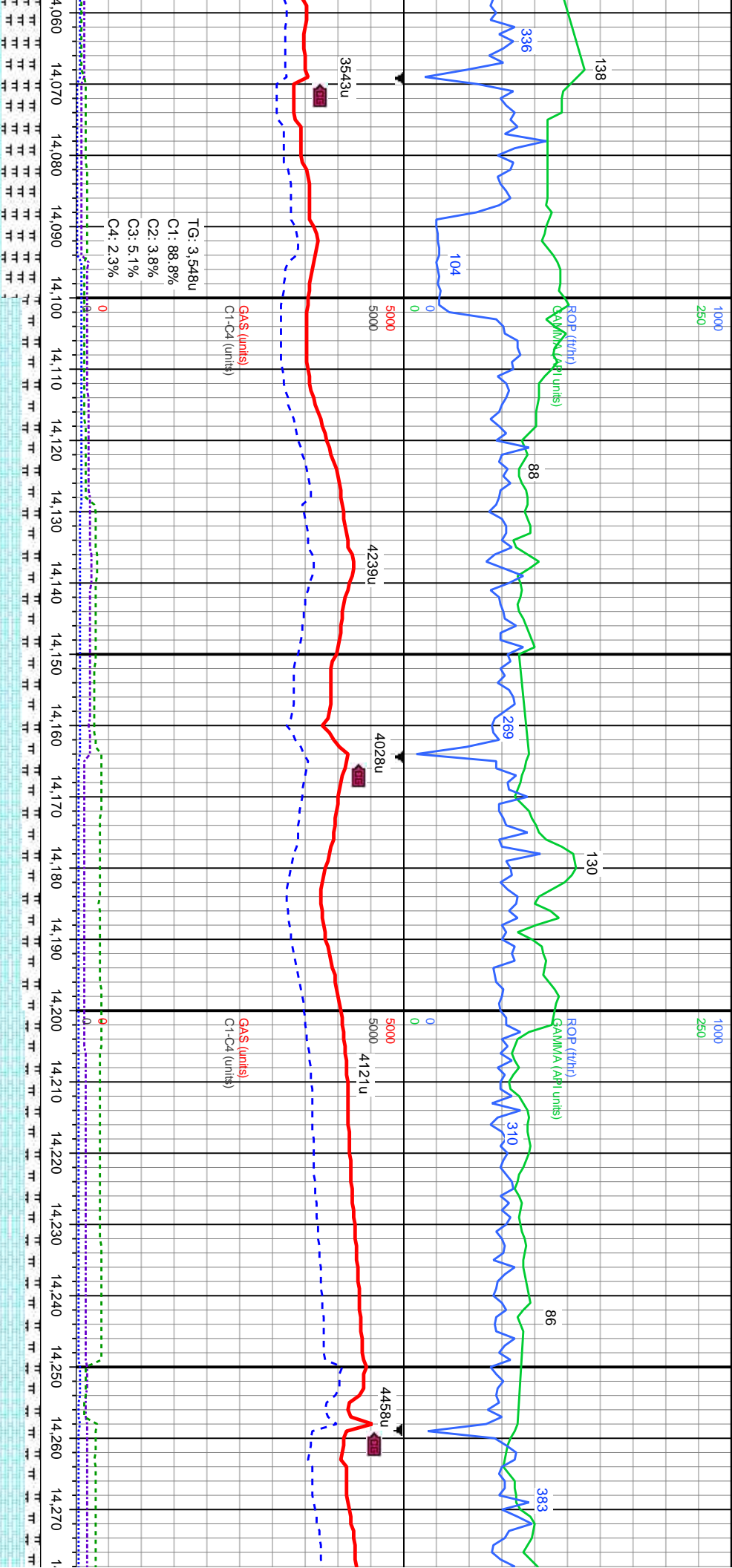
6500
CHK: gy- dk gy,
mot, sb pily-blk
MRLST: dk gy-
gr, sb pily-blky,
calc.

MUD WT IN: 9.4 VS: 51
MUD WT OUT: 9.4 VS: 51

TG: 1,993u
C1: 85.8%
C2: 7.5%
C3: 4.2%
C4: 2.6%

ROP: 157 ft/hr
RPM: 110
SPP: 3720 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 8.58 kips





ST: dk gy-gy, occ blk, slt gr, fri-frm, occ
ply-biky, gt-sily tex, occ wxy lstr, v
CHK: med-dk gy, dk brn, occ crm-wh
and, mot, sb ply-biky, fri-frm, rthy tex, v
w/BENT strg.

6500
CHK: gy- dk gy, dk brn, occ crm-tan calc bnd,
mot, sb ply-biky, rthy tex, fri-frm, v calc. MRLST:
dk gy-gy, occ blk, fri-frm, occ hd, slt gr, sb
ply-biky, gt-sily tex, occ wxy lstr, v calc.

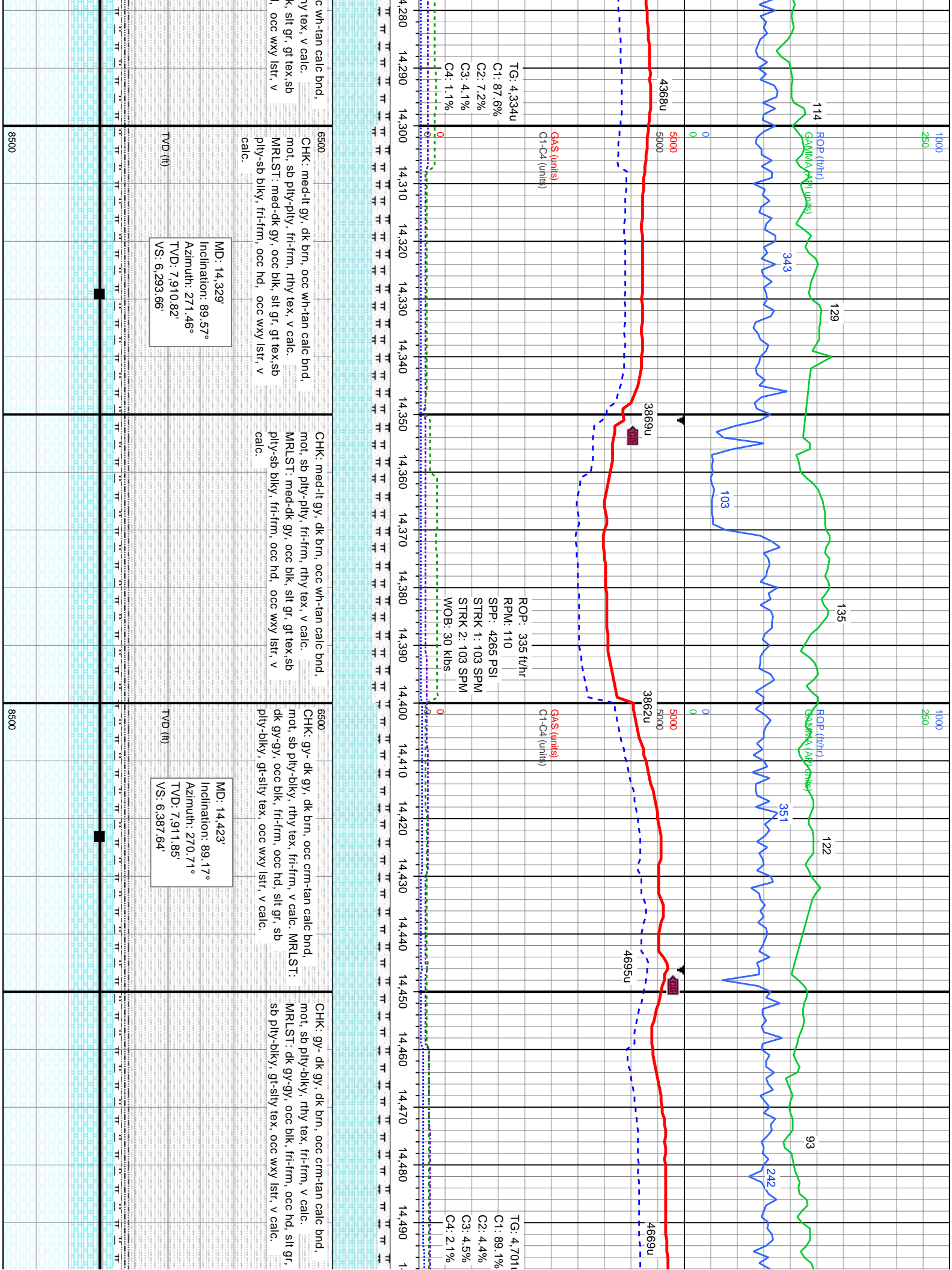
MD: 14,141'
Inclination: 89.45°
Azimuth: 274.82°
TVD: 7,909.41'
VS: 6,105.72'

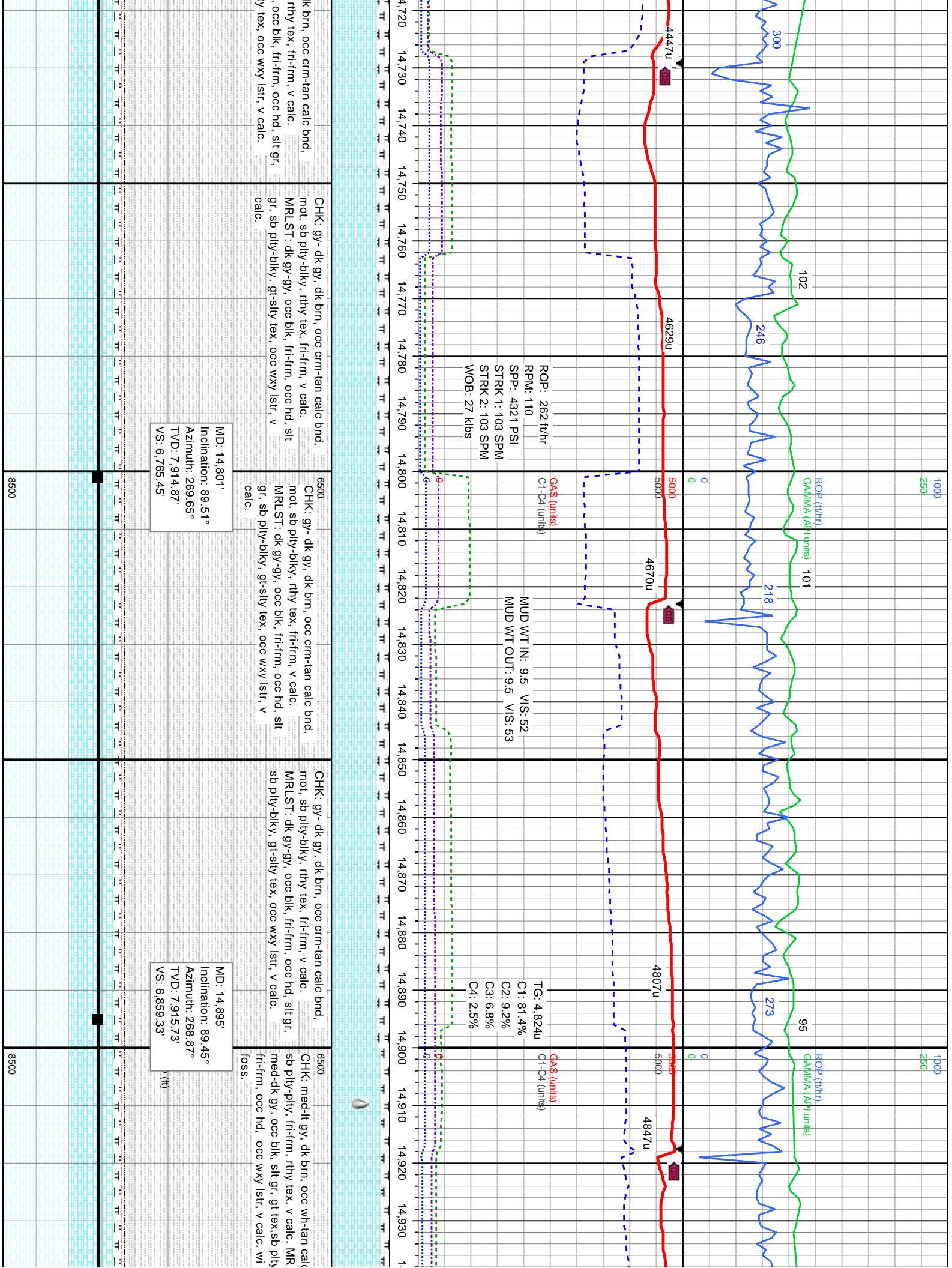
6500
CHK: gy- dk gy, dk brn, occ crm-tan calc bnd,
mot, sb ply-biky, rthy tex, fri-frm, v calc. MRLST:
dk gy-gy, occ blk, fri-frm, occ hd, slt gr, sb
ply-biky, gt-sily tex, occ wxy lstr, v
calc.

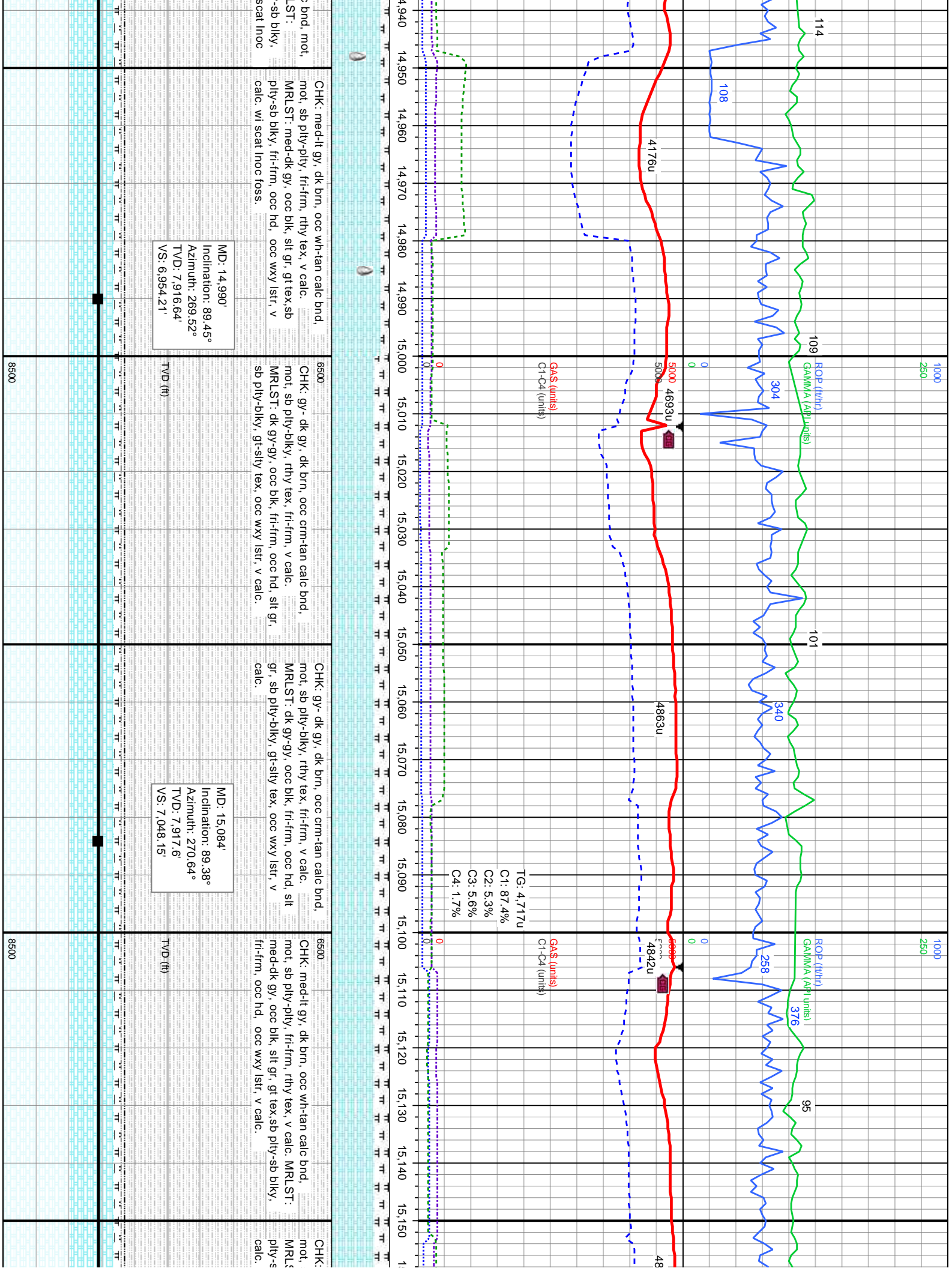
6500
CHK: med-lt gy, dk brn, occ wh-tan calc bnd,
mot, sb ply-pily, fri-frm, rthy tex, v calc. MRLST:
med-dk gy, occ blk, slt gr, gt tex, sb
ply-sb biky, fri-frm, occ hd, occ wxy lstr, v
calc.

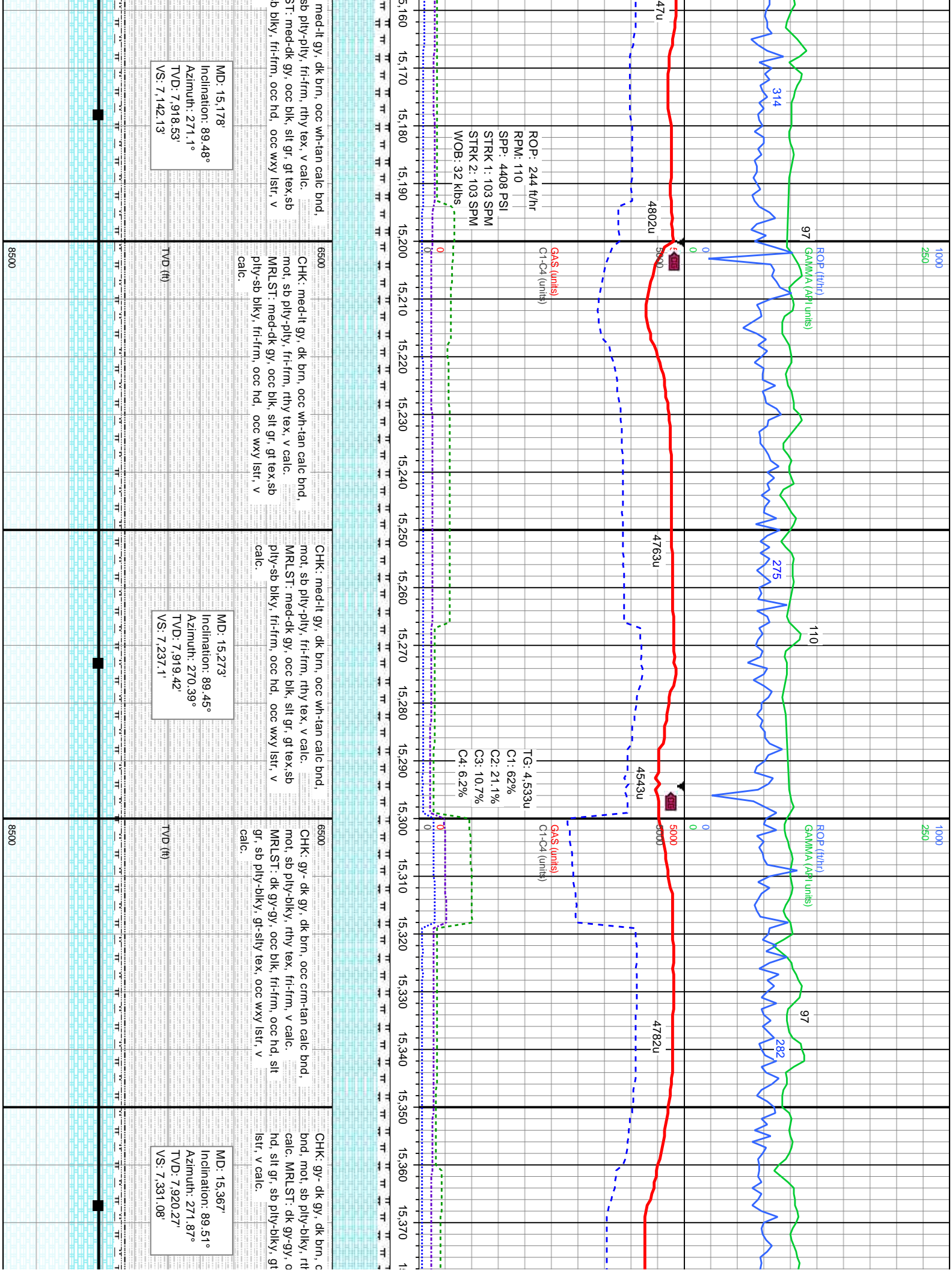
MD: 14,236'
Inclination: 89.63°
Azimuth: 273.04°
TVD: 7,910.17'
VS: 6,200.67'

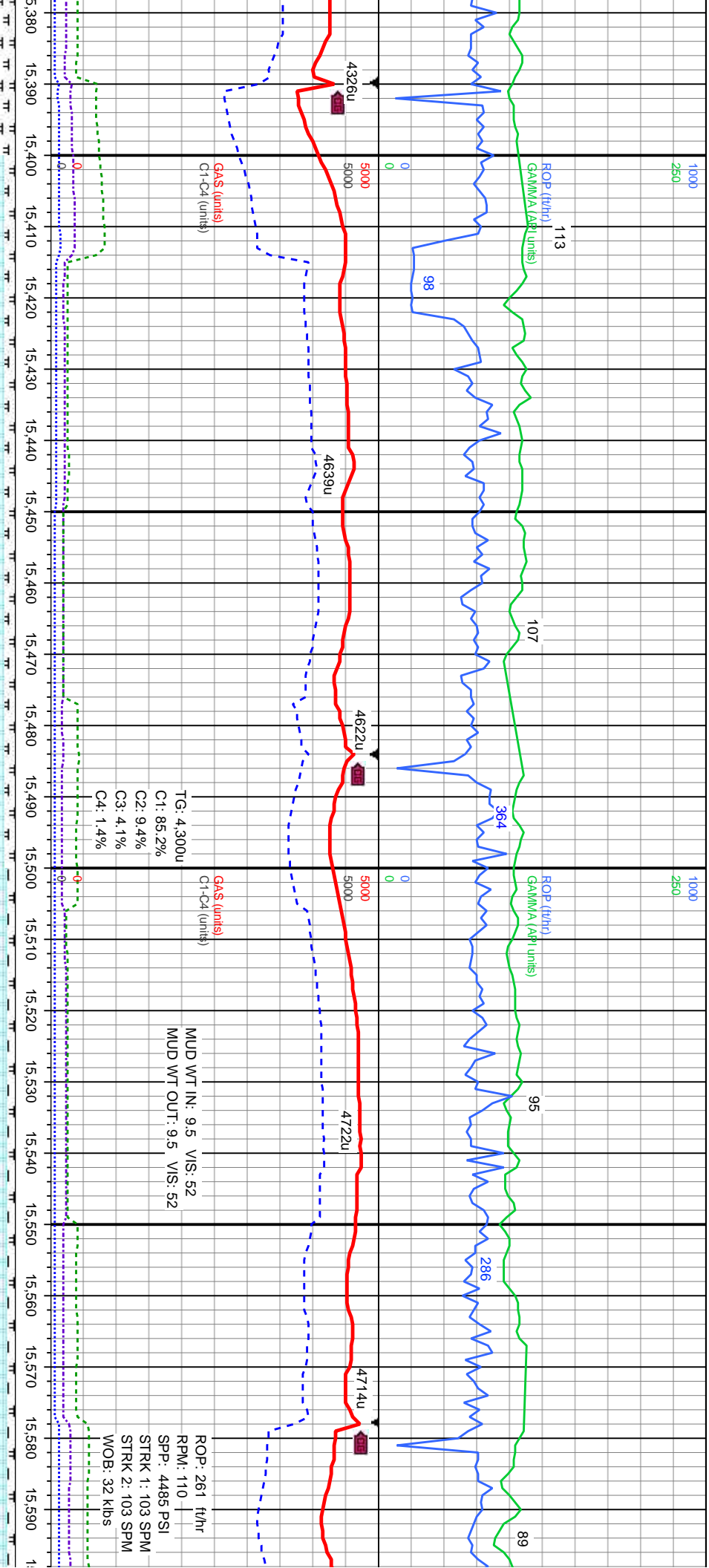
CHK: med-lt gy, dk brn, oc
mot, sb ply-pily, fri-frm, rth
MRLST: med-dk gy, occ bl
ply-sb biky, fri-frm, occ hc
calc.









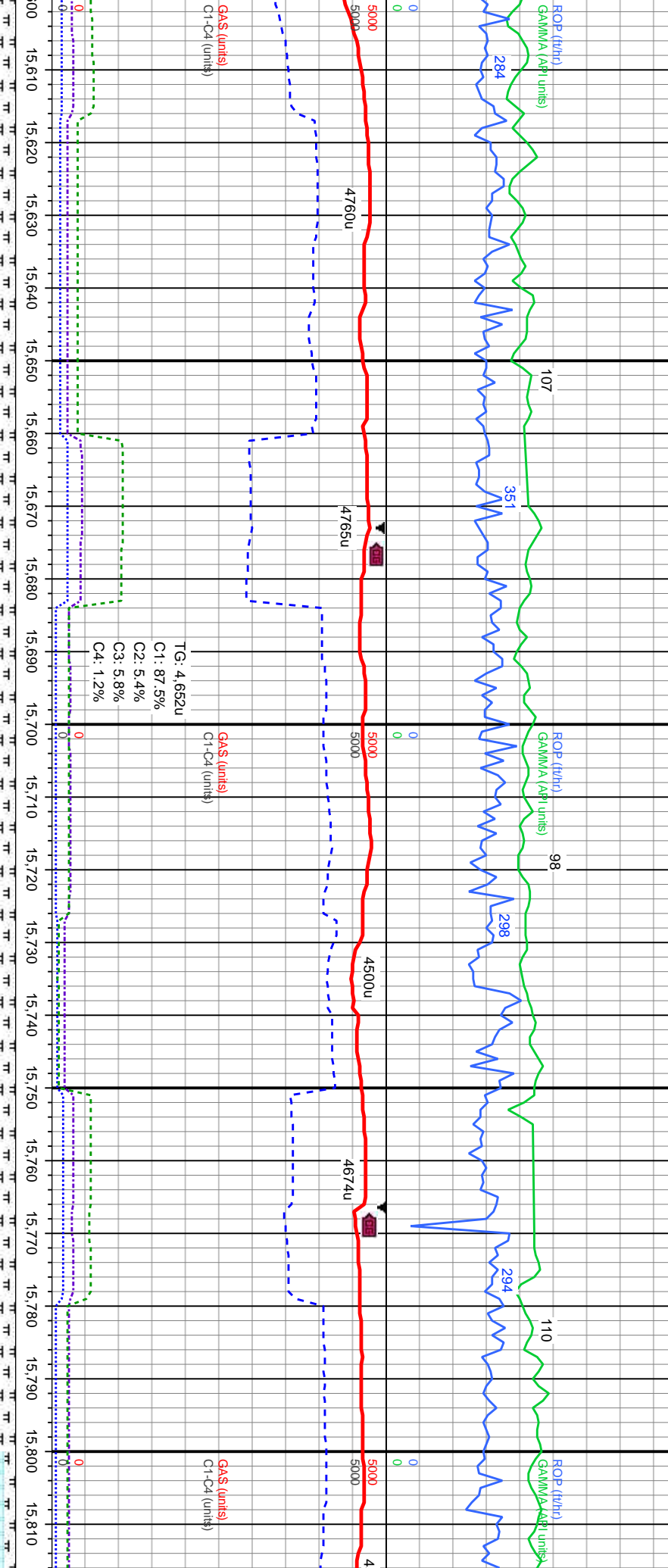
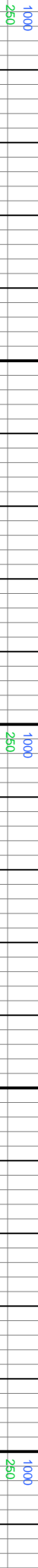


occ crm-tan calc y tex, fri-frm, v cc blk, fri-frm, occ sly tex, occ wxy	6500 CHK: gy-dk gy, dk brn, occ crm-tan calc bnd, mot, sb ply-blky, rthy tex, fri-frm, v calc. MRLST: dk gy-gy, occ blk, fri-frm, occ hd, sit gr, sb ply-blky, gt-sly tex, occ wxy lstr, v calc.	MD: 15,462' Inclination: 89.63° Azimuth: 273.59° TVD: 7,920.99' VS: 7,426.07'	TVD (ft)
occ crm-tan calc y tex, fri-frm, v cc blk, fri-frm, occ sly tex, occ wxy	6500 CHK: med-lt gy, dk brn, occ wh-tan calc bnd, mot, sb ply-ply, fri-frm, rthy tex, v calc. MRLST: med-dk gy, occ blk, sit gr, gt tex, sb ply-sb blk, fri-frm, occ hd, occ wxy lstr, v calc.	MD: 15,556' Inclination: 89.51° Azimuth: 273.86° TVD: 7,921.69' VS: 7,520.02'	TVD (ft)
occ crm-tan calc y tex, fri-frm, v cc blk, fri-frm, occ sly tex, occ wxy	6500 CHK: gy-dk gy, dk brn, occ crm-tan calc bnd, mot, sb ply-blky, rthy tex, fri-frm, v calc. MRLST: dk gy-gy, occ blk, fri-frm, occ hd, sit gr, sb ply-blky, gt-sly tex, occ wxy lstr, v calc.	MD: 15,462' Inclination: 89.63° Azimuth: 273.59° TVD: 7,920.99' VS: 7,426.07'	TVD (ft)
occ crm-tan calc y tex, fri-frm, v cc blk, fri-frm, occ sly tex, occ wxy	6500 CHK: med-lt gy, dk brn, occ wh-tan calc bnd, mot, sb ply-ply, fri-frm, rthy tex, v calc. MRLST: med-dk gy, occ blk, sit gr, gt tex, sb ply-sb blk, fri-frm, occ hd, occ wxy lstr, v calc.	MD: 15,556' Inclination: 89.51° Azimuth: 273.86° TVD: 7,921.69' VS: 7,520.02'	TVD (ft)

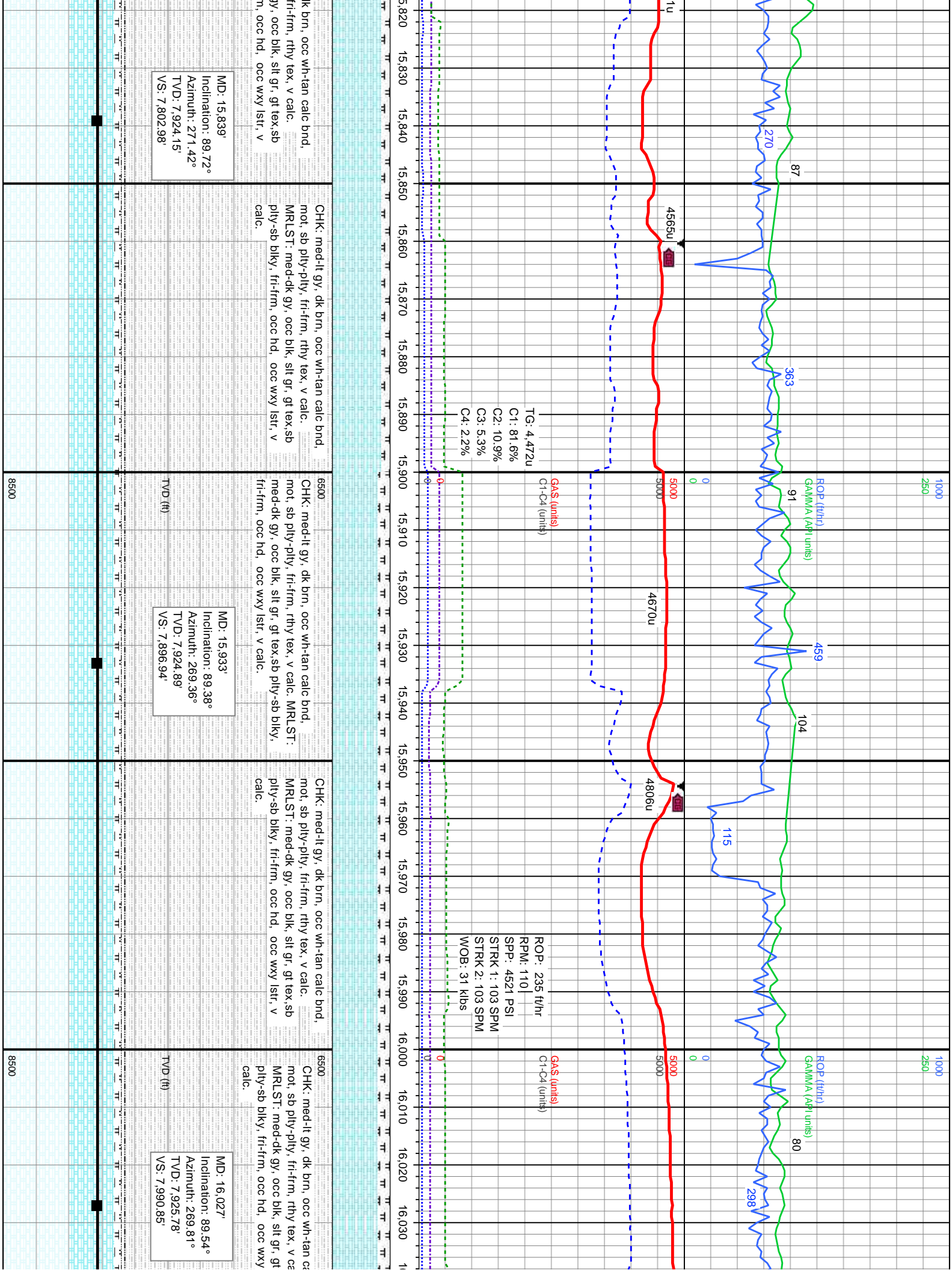
TG: 4,300u
C1: 85.2%
C2: 9.4%
C3: 4.1%
C4: 1.4%

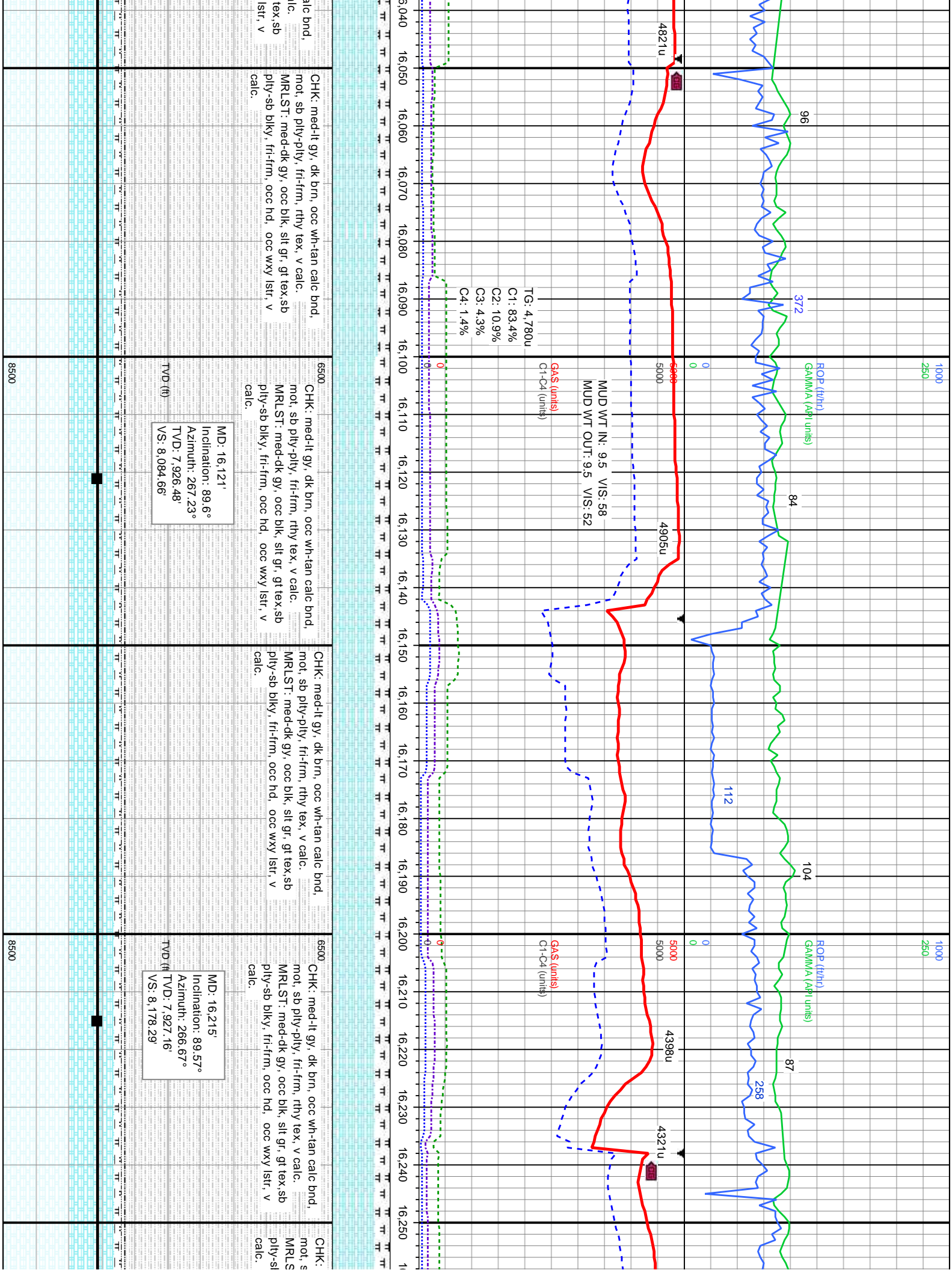
MUD WT IN: 9.5 V/S: 52
MUD WT OUT: 9.5 V/S: 52

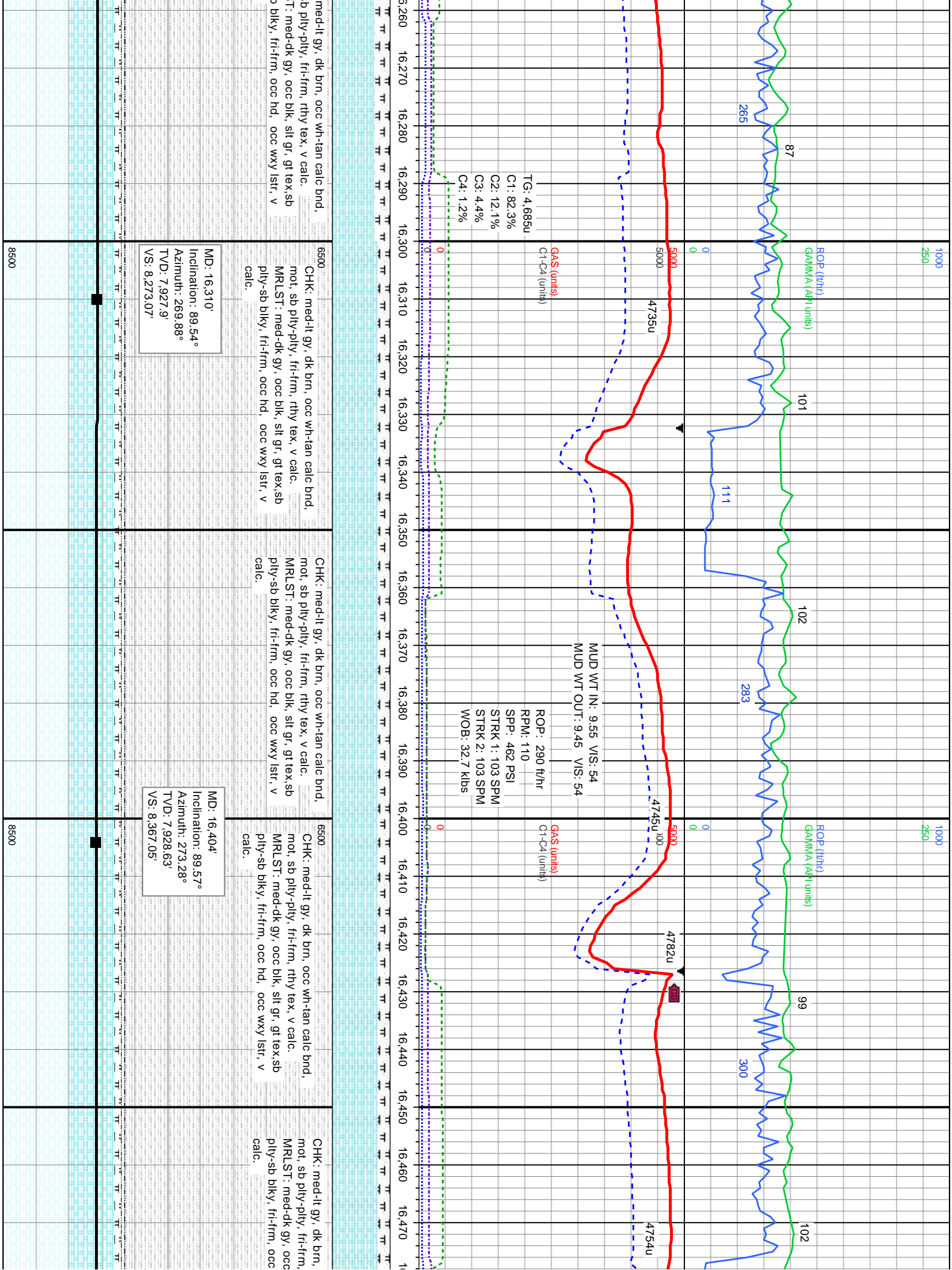
ROP: 261 ft/hr
RPM: 110
SPP: 4485 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 32 klbs

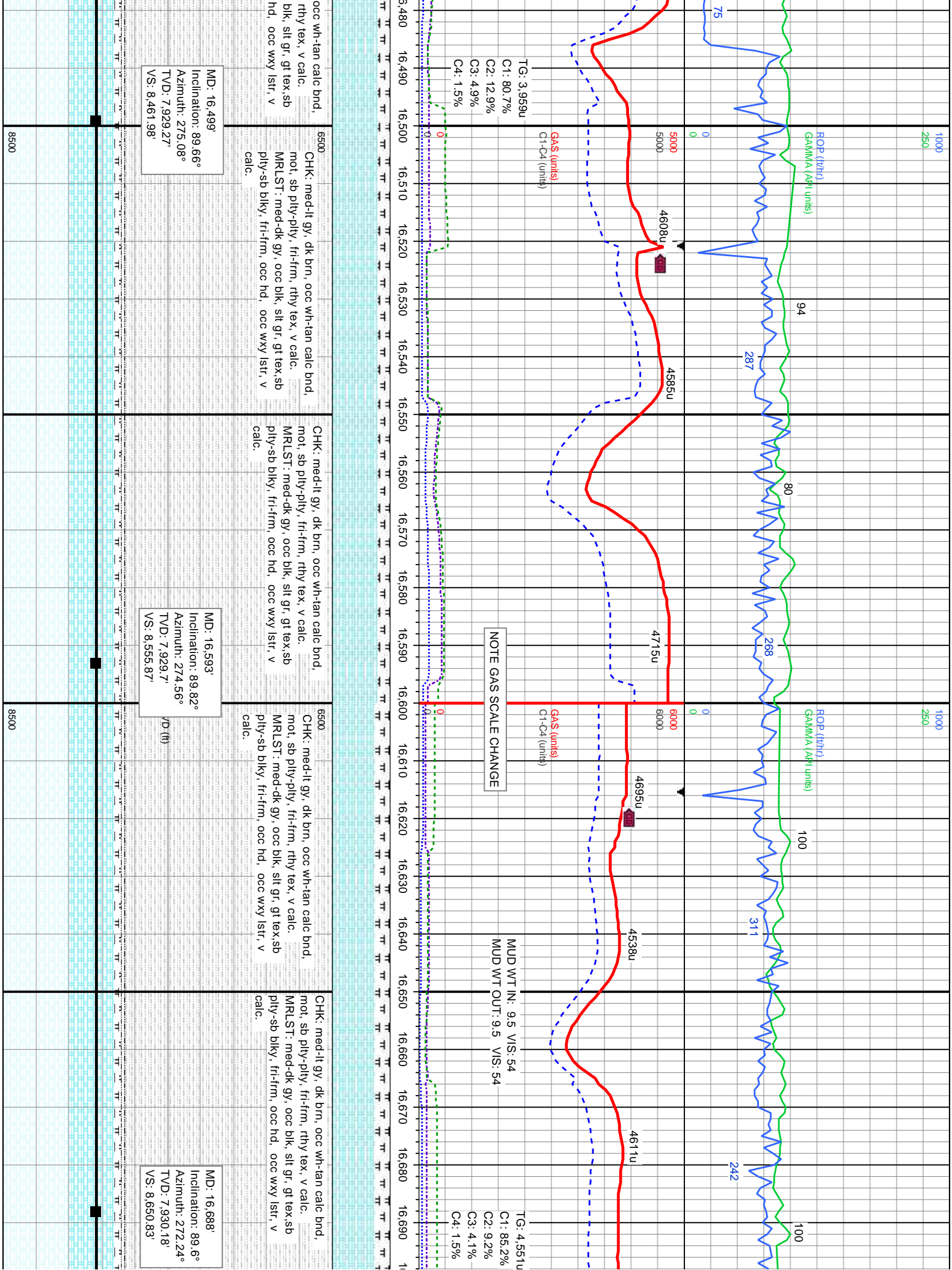


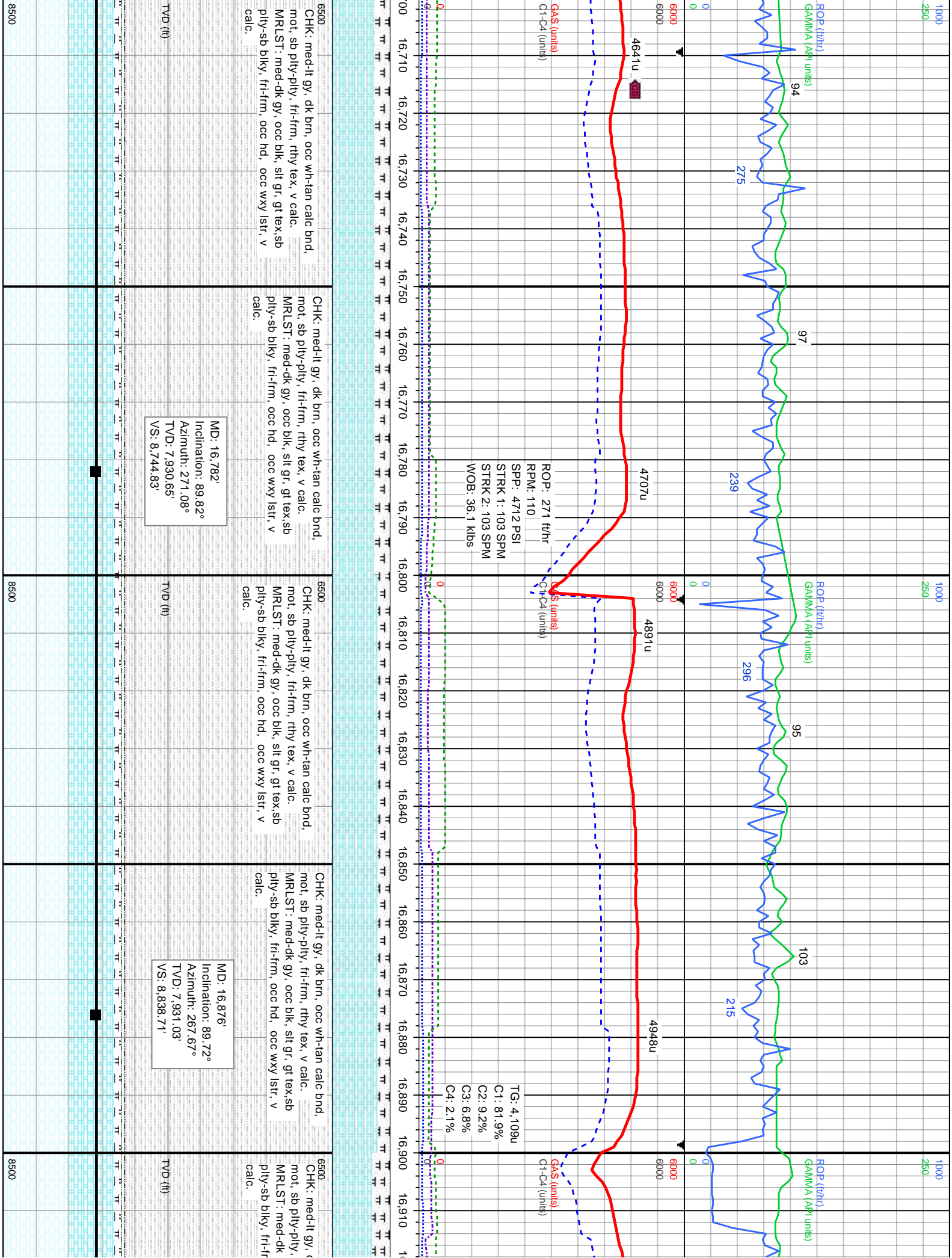
<div>6500</div> <div>CHK: gy- dk gy, dk brn, occ crm-tan calc bnd, mot, sb pily-biky, rthy tex, fri-frm, v calc, MRLST: dk gy-gy, occ blk, fri-frm, occ hd, slt gr, sb pily-biky, gt-sily tex, occ wxy lstr, v calc.</div>	<div>6500</div> <div>CHK: gy- dk gy, dk brn, occ crm-tan calc bnd, mot, sb pily-biky, rthy tex, fri-frm, v calc, MRLST: dk gy-gy, occ blk, fri-frm, occ hd, slt gr, sb pily-biky, gt-sily tex, occ wxy lstr, v calc.</div>	<div>6500</div> <div>CHK: med-lt gy, dk brn, occ wh-tan calc bnd, mot, sb pily-pily, fri-frm, rthy tex, v calc, MRLST: med-dk gy, occ blk, slt gr, gt tex, sb pily-sb biky, fri-frm, occ hd, occ wxy lstr, v calc.</div>	<div>6500</div> <div>CHK: med-lt gy, dk brn, occ wh-tan calc bnd, mot, sb pily-pily, fri-frm, rthy tex, v calc, MRLST: med-dk gy, occ blk, slt gr, gt tex, sb pily-sb biky, fri-frm, occ hd, occ wxy lstr, v calc.</div>	<div>6500</div> <div>CHK: med-lt gy, c mot, sb pily-pily, MRLST: med-dk gy, pily-sb biky, fri-fr</div>	<div>TVD (ft)</div> <div>MD: 15,650' Inclination: 89.51° Azimuth: 272.29° TVD: 7,922.5' VS: 7.614'</div>	<div>TVD (ft)</div> <div>MD: 15,744' Inclination: 89.38° Azimuth: 271.12° TVD: 7,923.41' VS: 7.707.99'</div>	<div>TVD (ft)</div>	<div>TVD (ft)</div>	<div>TVD (ft)</div>
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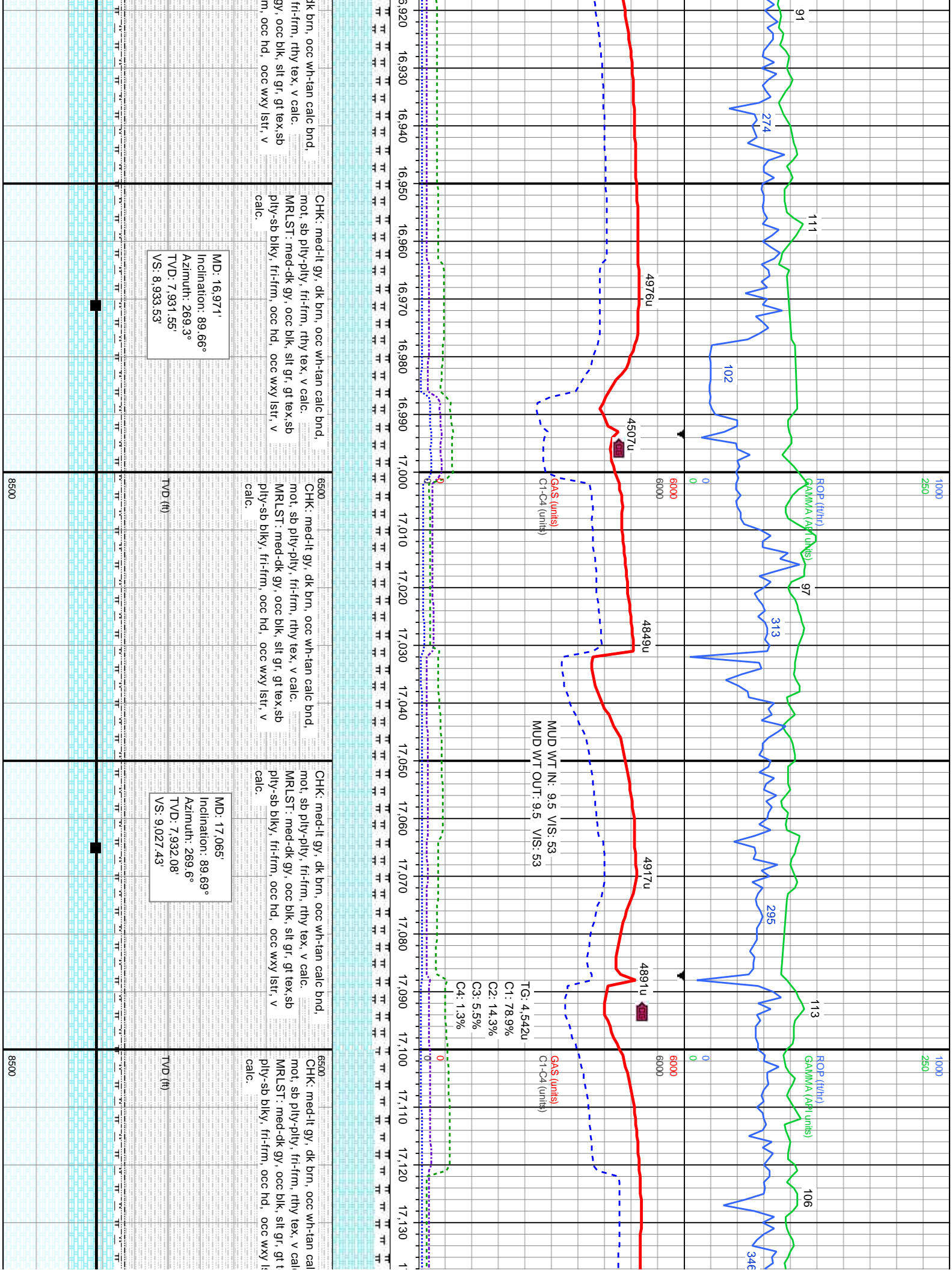


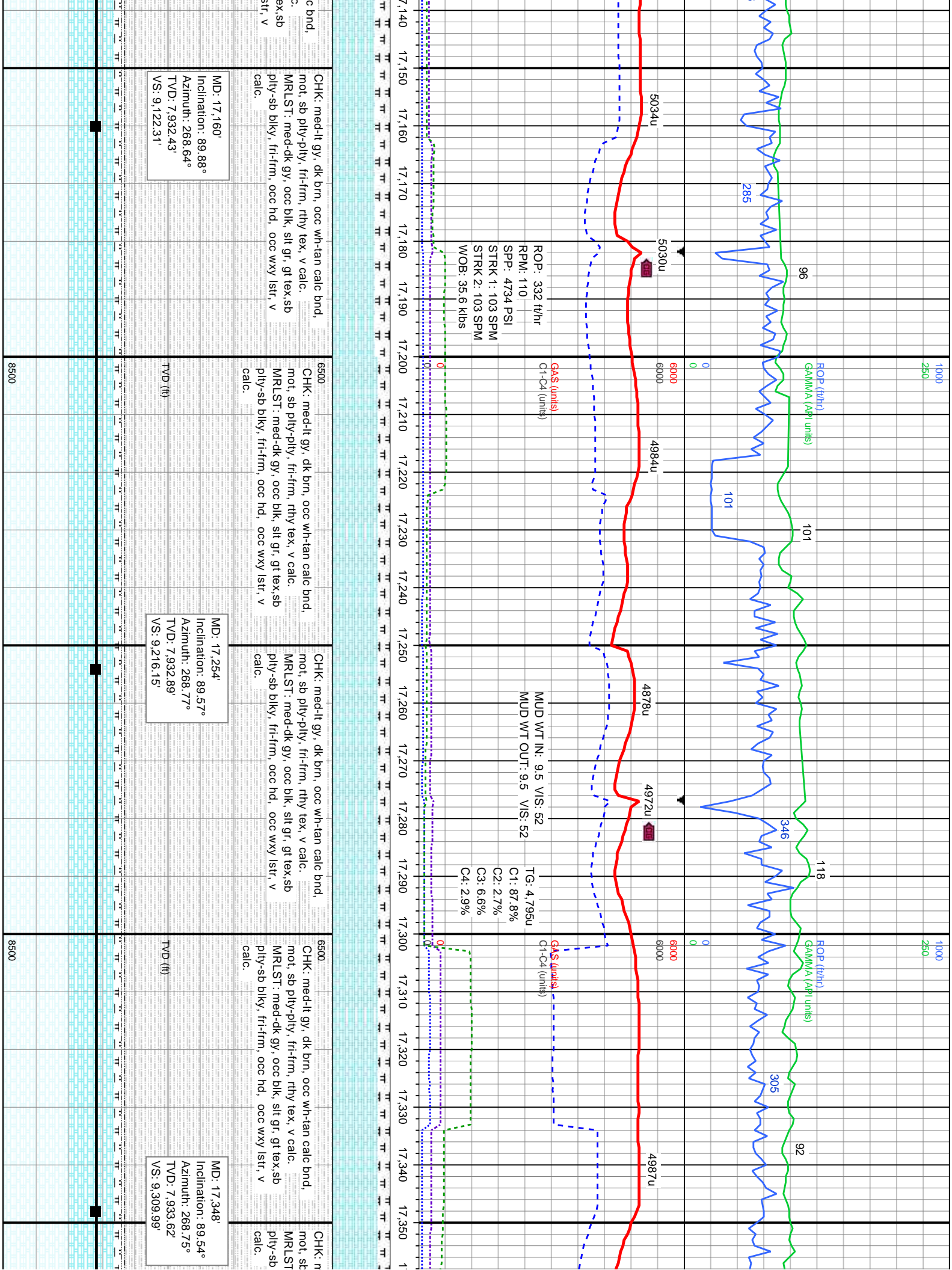


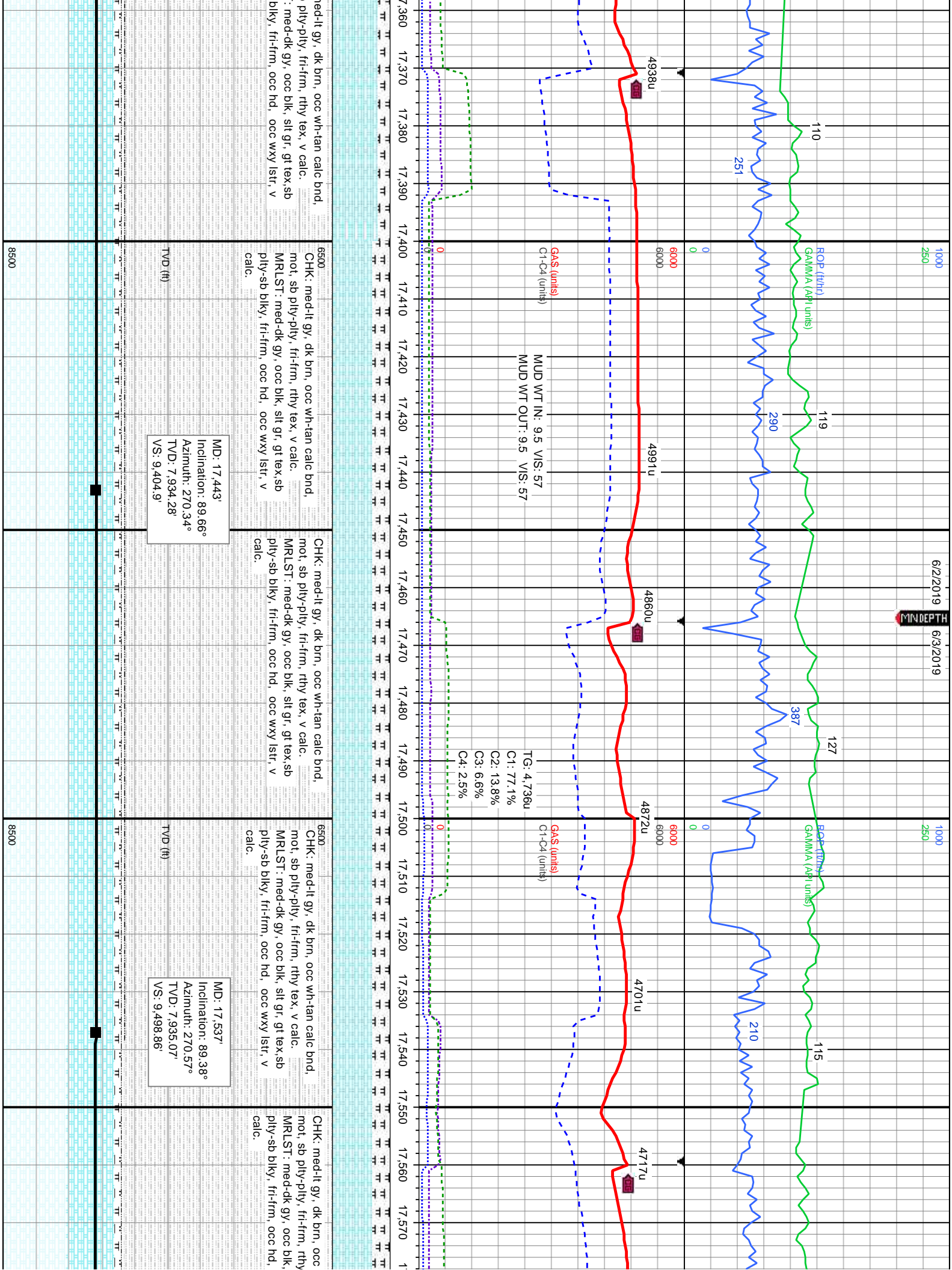


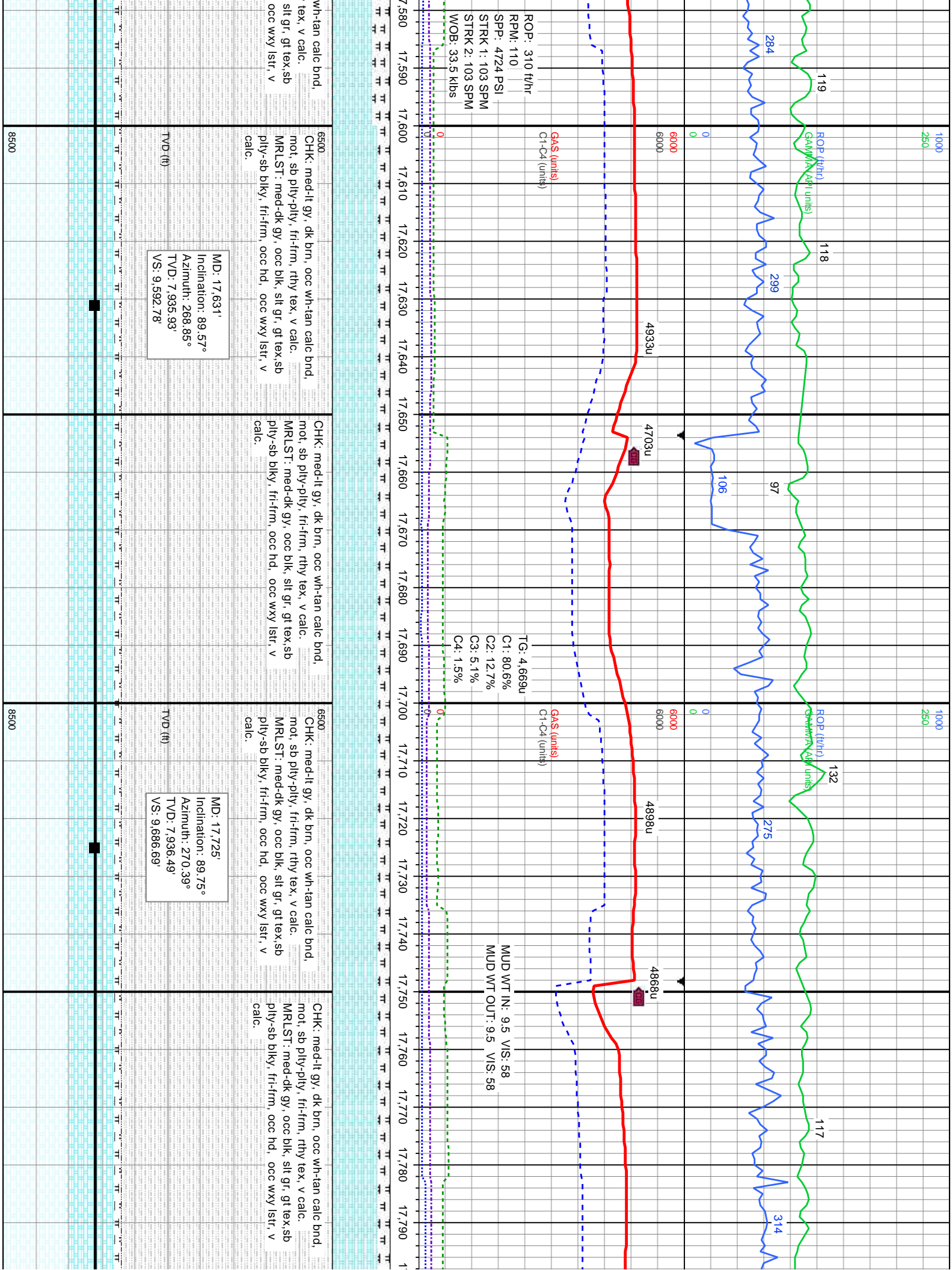












1000
250

1000
250

ROP (ft/hr)
GAMMA (API units)

121

254

Reached TD at 2:22 AM
MDT on 6/3/2019 at
17,867' Drillers Depth.

0
6000

0
6000

4684u

6000
6000

GAS (units)
C1-C4 (units)

GAS (units)
C1-C4 (units)

0
0

0
0

17,800 17,810 17,820 17,830 17,840 17,850 17,860 17,870 17,880 17,890 17,900 17,910 17,920 17,930 17,940 17,950

6500

CHK: med-lt gy, dk brn, occ wh-tan calc bnd,
mot, sb ply-ply, fri-firm, rthy tex, v calc.
MRLST: med-dk gy, occ blk, slit gr, gt tex, sb
ply-sb blk, fri-firm, occ hd, occ wxy lst, v
calc.

6500

MD: 17.819°
Inclination: 89.54°
Azimuth: 271.79°
TVD: 7,937.07'
VS: 9,780.67'

TVD (ft)

Projection to Bit Survey.

8500

8500