

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Oscar Y10-75-1HC VERT

Location SEC 10 T2N R64W

State COLORADO

County WELD

Country USA

Rig Number H&P 315

API Number 05-123-38202

AFE # 200202

Region DJ BASIN

Field WATTENBERG

Spud Date 10/11/2014

Drilling Completed 10/13/2014

Surface Coordinates NWSE SEC 10 T2N R64W
2,380' FSL; 2,098' FEL

LAT/LON: 40.15223/-104.53561

Bottom Hole Coordinates NWNE SEC 3 T2N R64W
75' FNL; 2,475' FEL

Ground Elevation 4,924'

K.B. Elevation 4,948'

Logged Interval 2,000' To 6,215'

Total Depth 14,440'

Formation NIOBRARA B CHALK

Type of Drilling Fluid LSND

Other Symbols

Oil Show

- DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

Porosity

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

- ORGANIC
- PINPOINT
- VUGGY

Engineering

- BIT
- CONNECTION (LEFT)
- CONNECTION (RIGHT)
- CONNECTION GAS
- CONNECTION GAS DOWN...
- CONNECTION GAS DOWN
- CORE - LOST
- CORE - RECOVERED
- DST INTERVAL

- FAULT
- FORMATION TOP
- GAS SHOW
- MN DEPTH
- NORMAL FAULT
- OIL SHOW
- OVERTURNED STRATA
- REVERSE FAULT
- SIDEWALL CORE (LEFT)
- SIDEWALL CORE (RIGHT)
- SLIDE
- SURVEY
- TRIP GAS
- WIRELINE TESTED - LEFT

- WIRELINE TESTED - RT

Rounding

- ANGULAR
- ROUNDED
- SUBANG
- SUBRND

Textures

- BOUNDSTONE
- CHALKY
- CRYPTOXLN
- E EARTHY
- FINELYXLN

- GRAINSTONE
- L LITHOGRAPHIC
- MIX MICROXLN
- MS MUDSTONE
- PS PACKSTONE
- WS WACKSTONE

Sorting

- M MODERATE
- P POOR
- W WELL

Accessories

Fossils

- ALGAE
- AMPHIPORA
- BELEMNITE
- BIOCLASTIC
- BRACHIOPOD
- BRYOZOA
- CEPHALOPOD
- CORAL
- CRINOID
- ECHINOID
- FISH
- FORAMINIFERA

F FOSSIL

- GASTROPOD
- INOCERAMUS
- OOLITE
- OSTRACOD
- PELECYPOD
- PELLET
- PISOLITE
- PLANT REMAINS
- PLANT SPORES
- SCAPHOPOD
- STROMATOPOROID

Minerals

// ANHYDRITIC

- ARGILLACEOUS
- ARGILLITE GRAIN
- BENTONITE
- BITUMENOUS SUBSTANCE
- BRECCIA FRAGMENTS
- CALCAREOUS
- CARBONACEOUS FLAKES
- CHTDK
- CHTLT
- COAL - THIN BEDS
- DOLOMITIC
- FELDSPAR
- FERRUGINOUS PELLET

^ FERRUGINOUS

- GLAUCONITE
- GYPSIFEROUS
- HEAVY MINERAL
- KAOLIN
- MARLSTONE
- MINERAL CRYSTALS
- NODULES
- PHOSPHATE PELLETS
- PYRITE
- SALT CAST
- SANDY
- SILICEOUS
- SILTY

^ TUFFACEOUS

Stringer

- ANHYDRITE STRINGER
- BENTONITE STRINGER
- COAL STRINGER
- DOLOMITE STRINGER
- GYPSUM STRINGER
- LIMESTONE STRINGER
- MARLSTONE (CALC) STRG
- MARLSTONE (DOL) STRG
- SANDSTONE STRINGER
- SHALE STRINGER
- SILTSTONE STRINGER

Rock Types

- SHALY SILTSTONE
- SHALY SANDSTONE
- SANDSTONE
- SILTY SHALE
- LIMESTONE
- CHALK
- MARLSTONE
- UNKNOWN
- ANHYDRITE

- BENTONITE
- BRECCIA
- CEMENT
- CHERT
- CLAY CHOKE SAND
- CLAYSTONE
- COAL
- CONGLOMERATE
- DOLOMITE

- GRANITE
- GYPSUM
- IGNEOUS
- SIDERITE or LIMONITE
- METAMORPHIC
- NO SAMPLE
- SALT
- SALT- PEPPER SAND
- SHALE

- SHALE COLORED
- SHALE GRAY
- SILTSTONE
- TILL
- TUFF
- WELDED TUFF

Operator

Company Noble Energy Inc

Address 1625 BROADWAY SUITE 2200
DENVER, CO 80202

Geologist

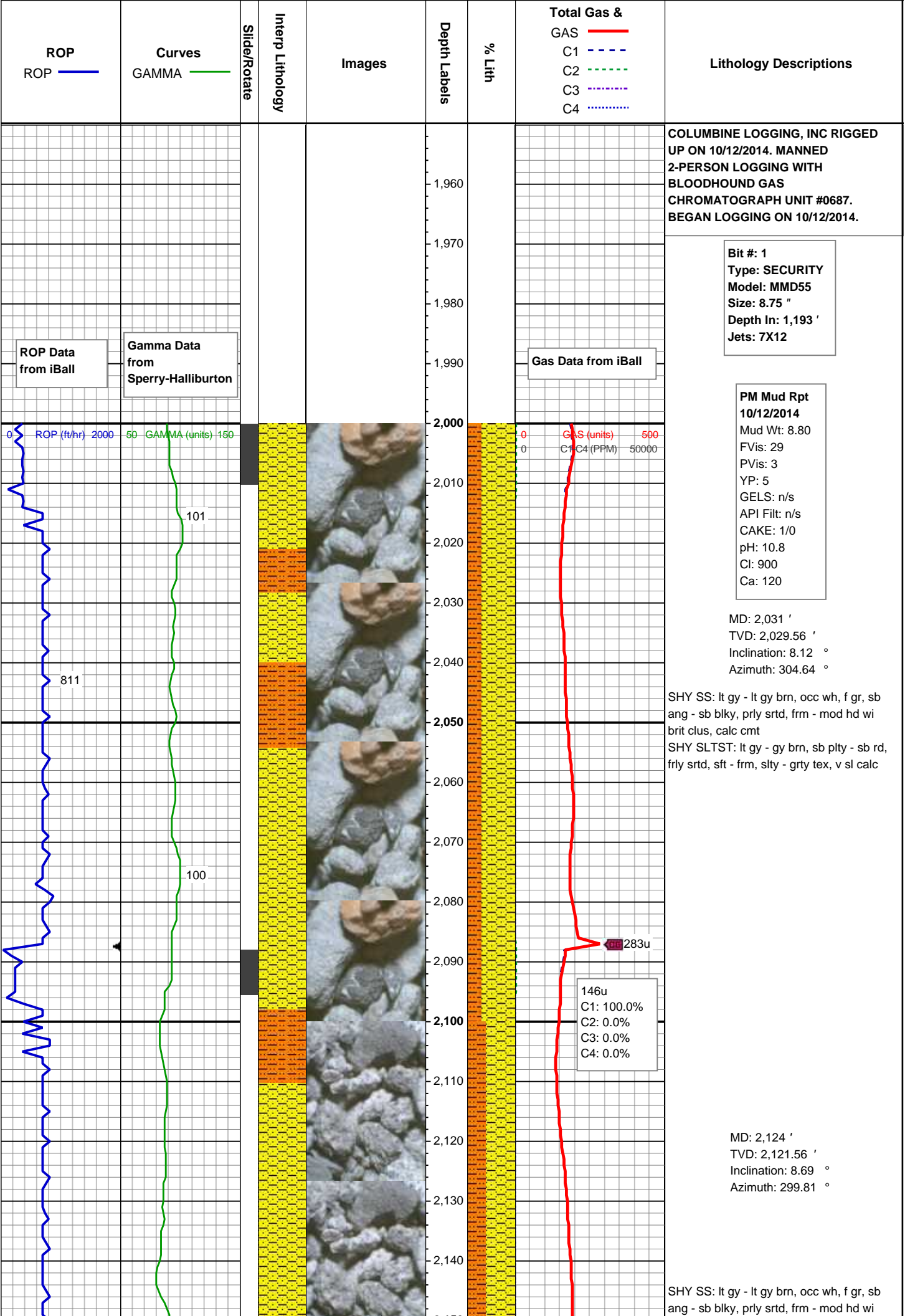
Name MARK COLE; ZACH UBER

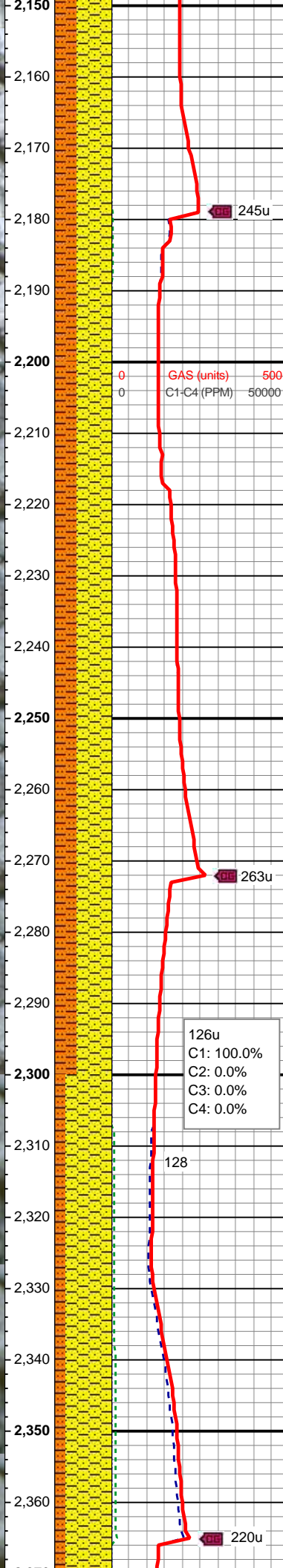
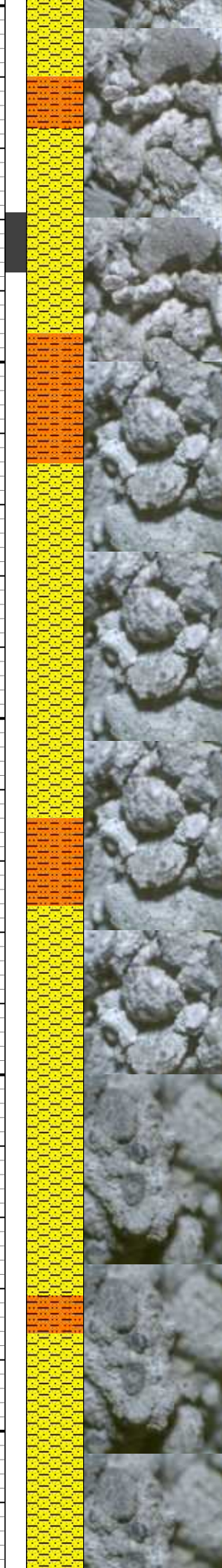
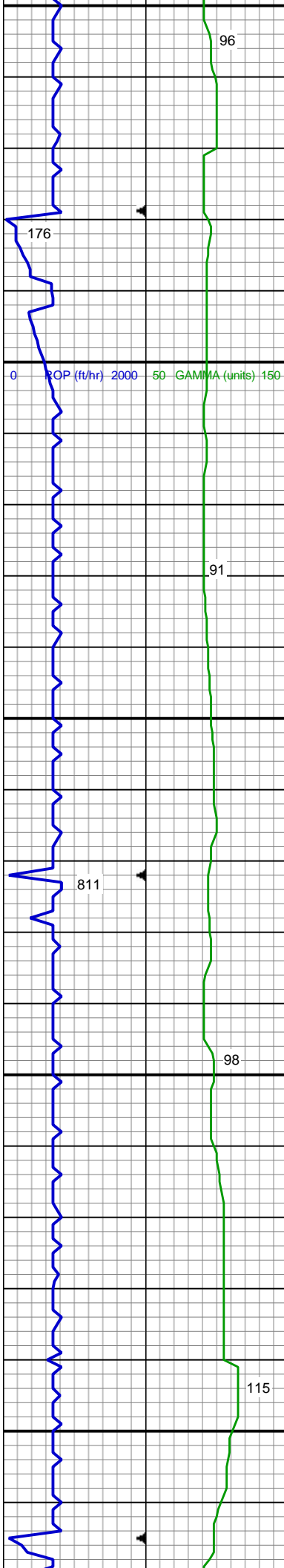
Company COLUMBINE LOGGING, INC

Address 2385 S LIPAN ST
DENVER, CO 80223

Zone Color Coding

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





brit clus, calc cmt
SHY SLTST: lt gy - gy brn, sb plty - sb rd,
frly srtld, sft - frm, slty - grty tex, v sl calc

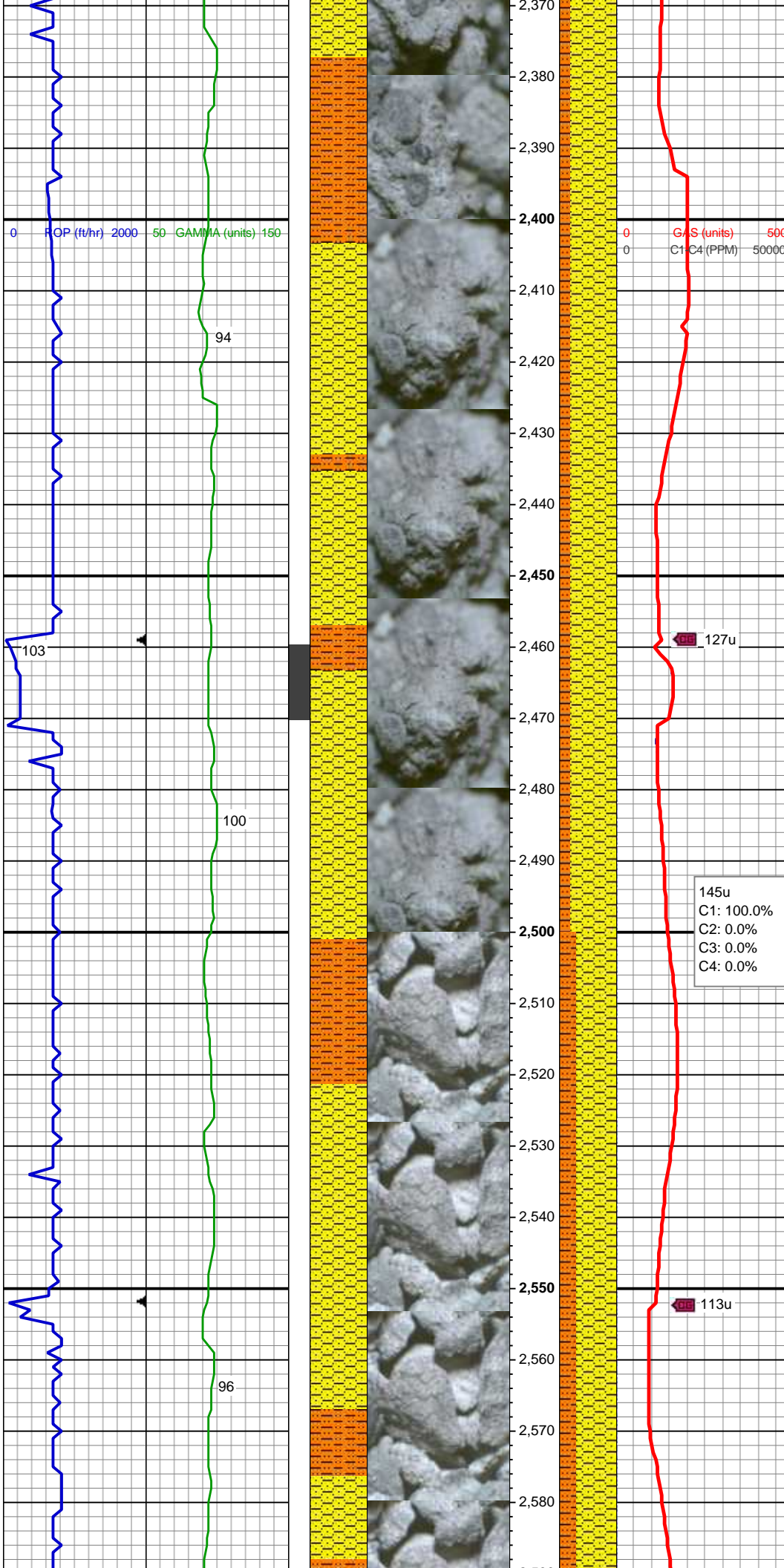
MUD WT: 8.90/8.80
VIS: 29/28 IN/OUT

MD: 2,216 '
TVD: 2,212.42 '
Inclination: 9.38 °
Azimuth: 296.81 °

SHY SS: lt gy - lt gy brn, occ wh, f gr, sb
ang - sb blkly, prly srtld, frm - mod hd wi
brit clus, calc cmt
SHY SLTST: lt gy - gy brn, sb plty - sb rd,
frly srtld, sft - frm, slty - grty tex, v sl calc

MD: 2,309 '
TVD: 2,304.26 '
Inclination: 8.72 °
Azimuth: 293.15 °

SHY SS: lt gy - lt gy brn, occ wh, f gr, sb
ang - sb blkly, prly srtld, frm - mod hd wi
brit clus, calc cmt
SHY SLTST: lt gy - gy brn, sb plty - sb rd,
frly srtld, sft - frm, slty - grty tex, v sl calc



MD: 2,402 '
TVD: 2,396.29 '
Inclination: 7.82 °
Azimuth: 292.5 °

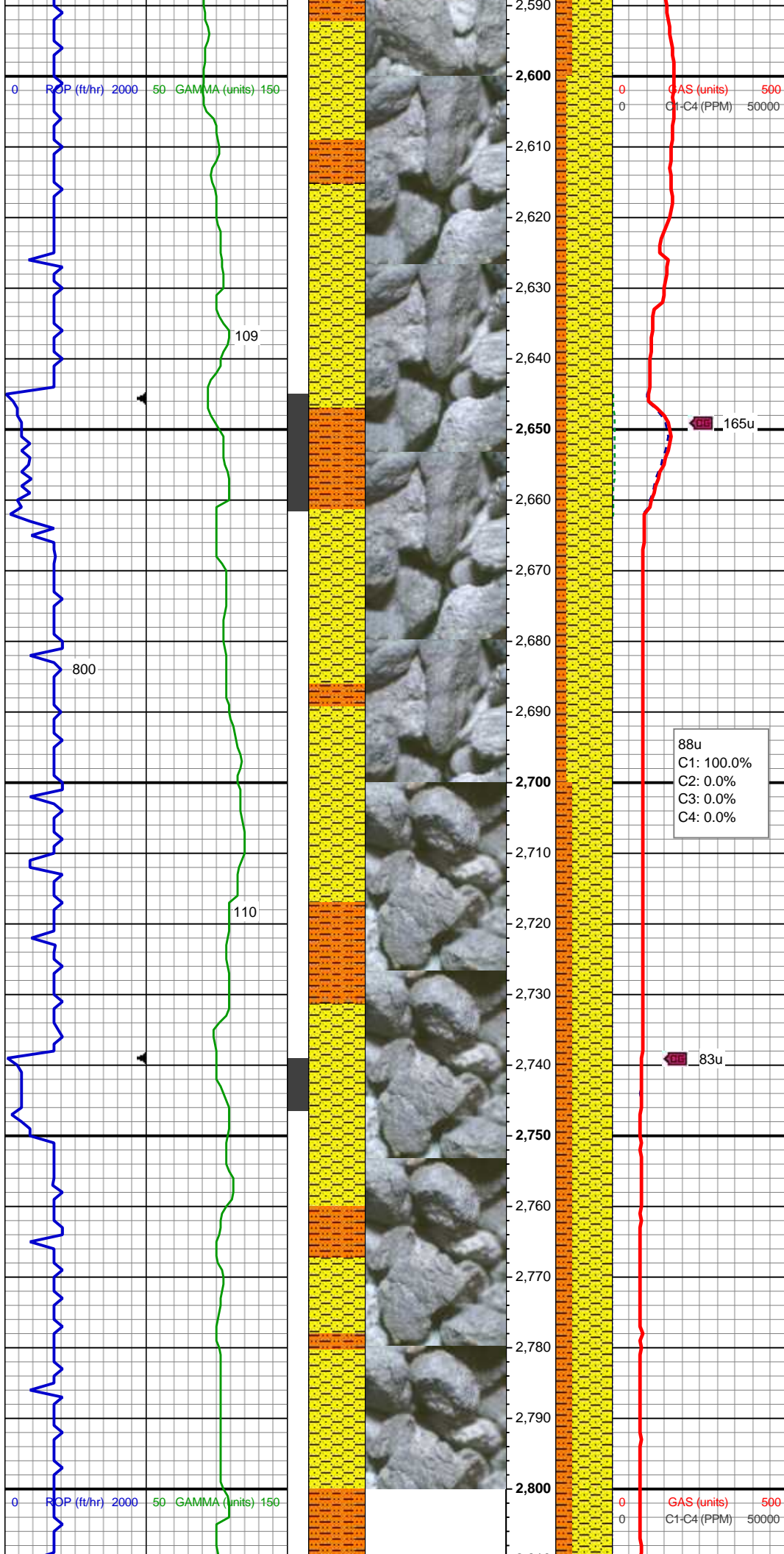
SHY SS: lt gy - lt gy brn, occ wh, f gr, sb
ang - sb blk, prly srt, frm - mod hd wi
brit clus, calc cmt
SHY SLTST: lt gy - gy brn, sb plty - sb rd,
fryl srt, sft - frm, slty - grty tex, v sl calc

MUD WT: 8.80/8.70
VIS: 31/30 IN/OUT

MD: 2,495 '
TVD: 2,488.33 '
Inclination: 8.63 °
Azimuth: 297.5 °

SHY SS: lt gy - lt gy brn, occ wh, f gr, sb
ang - sb blk, prly srt, frm - mod hd, calc
cmt
SHY SLTST: lt gy - gy brn, sb plty - sb rd,
fryl srt, sft - frm, slty - grty tex, v sl calc

MD: 2,589 '
TVD: 2,581.38 '



Minclination: 7.73 °
VAzimuth: 296.66 °

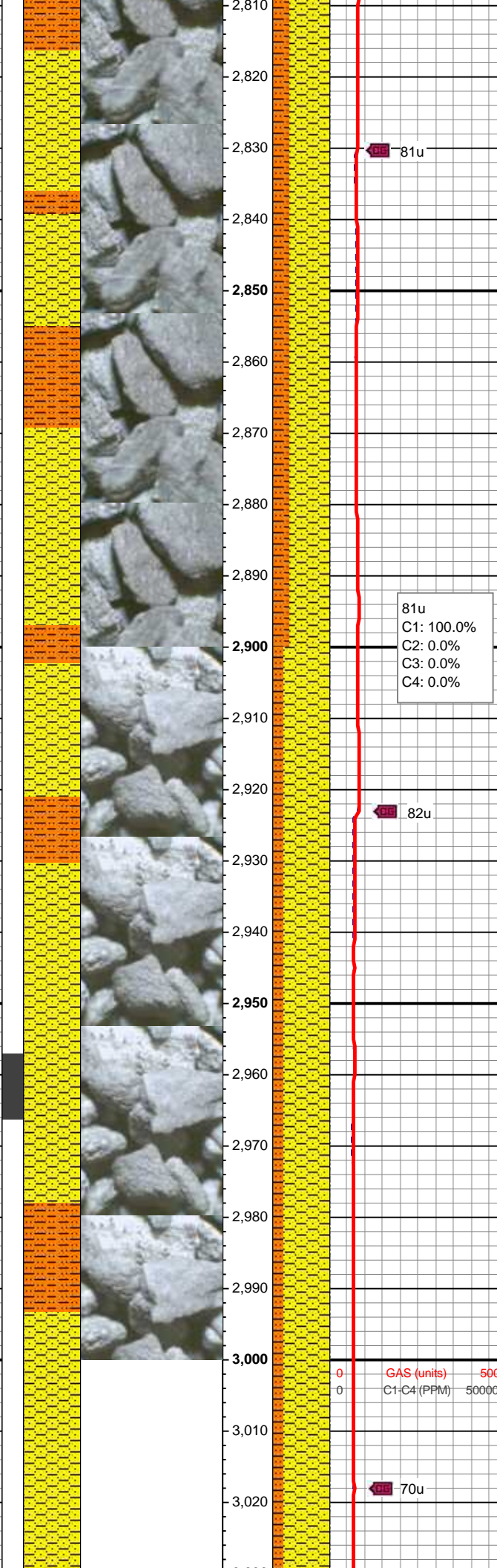
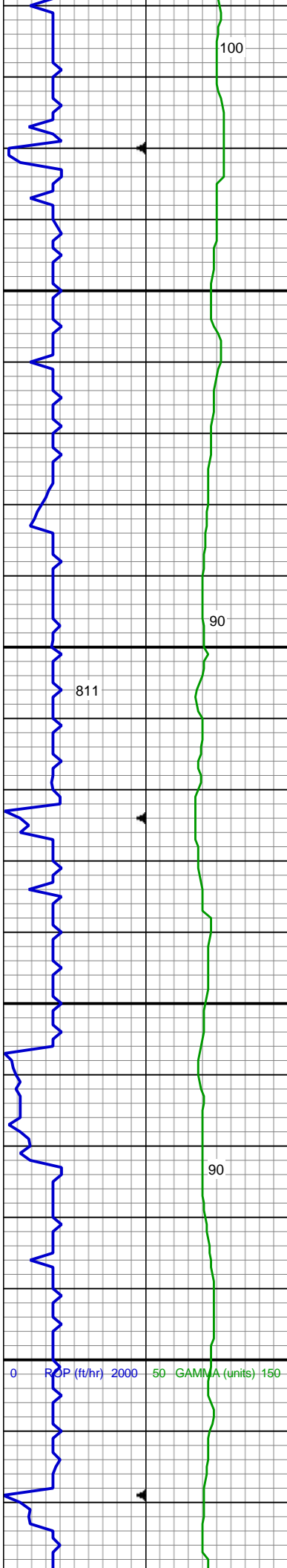
SHY SS: lt gy - lt gy brn, occ wh, f gr, sb
ang - sb blk, prly srt, frm - mod hd wi
brit clus, calc cmt
SHY SLTST: lt gy - gy brn, sb plty - sb rd,
frly srt, sft - frm, slty - grty tex, v sl calc

MD: 2,681 '
TVD: 2,672.48 '
Inclination: 8.34 °
Azimuth: 307.03 °

MUD WT: 8.90/8.70
VIS: 31/30 IN/OUT

SHY SS: lt gy - lt gy brn, occ wh, f gr, sb
ang - sb blk, prly srt, frm - mod hd wi
brit clus, calc cmt
SHY SLTST: lt gy - gy brn, sb plty - sb rd,
frly srt, sft - frm, slty - grty tex, v sl calc

MD: 2,774 '
TVD: 2,764.41 '
Inclination: 9.05 °
Azimuth: 307.87 °



SHY SS: lt gy - lt gy brn, occ wh, f gr, sb
ang - sb blk, prly srt, frm - mod hd, calc
cmt

SHY SLTST: lt gy - gy brn, sb plty - sb rd,
fry srt, sft - frm, slty - grty tex, v sl calc

MD: 2,866 '
TVD: 2,855.36 '
Inclination: 8.23 °
Azimuth: 306.4 °

81u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

MUD WT: 8.90/8.70
VIS: 31/30 IN/OUT

SHY SS: lt gy - lt gy brn, occ wh, f gr, sb
ang - sb blk, prly srt, frm - mod hd wi,
calc cmt

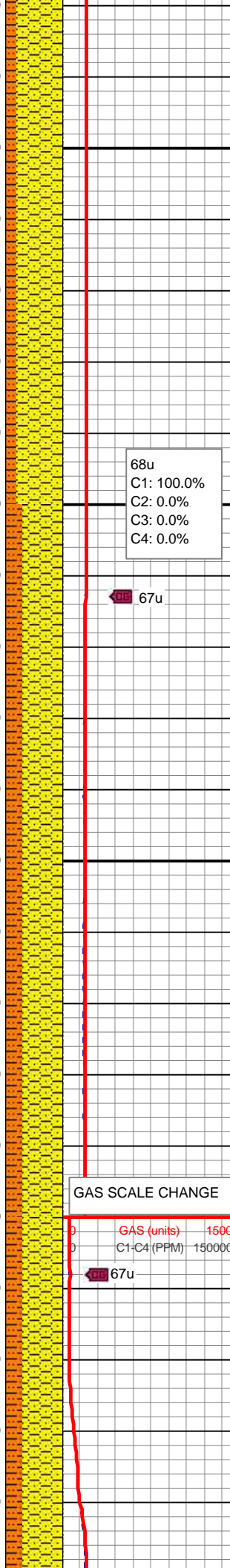
SHY SLTST: lt gy - gy brn, sb plty - sb rd,
fry srt, sft - frm, slty - grty tex, v sl calc

MD: 2,960 '
TVD: 2,948.31 '
Inclination: 8.97 °
Azimuth: 305.92 °

0 GAS (units) 500
0 C1-C4 (PPM) 50000



3,030
3,040
3,050
3,060
3,070
3,080
3,090
3,100
3,110
3,120
3,130
3,140
3,150
3,160
3,170
3,180
3,190
3,200
3,210
3,220
3,230
3,240



SHY SS: lt gy - lt gy brn, occ wh, f gr, sb
ang - sb blk, prly srt, frm - mod hd, calc
cmt
SHY SLTST: lt gy - gy brn, sb plty - sb rd,
frly srt, sft - frm, slty - grty tex, v sl calc

MD: 3,055 '
TVD: 3,042.14 '
Inclination: 9.02 °
Azimuth: 303.16 °

68u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

67u

MUD WT: 8.80/8.70
VIS: 32/29 IN/OUT

SHY SS: lt gy - lt gy brn, occ wh, f gr, sb
ang - sb blk, prly srt, frm - mod hd, calc
cmt
SHY SLTST: lt gy - gy brn, sb plty - sb rd,
frly srt, sft - frm, slty - grty tex, v sl calc

MD: 3,150 '
TVD: 3,136.05 '
Inclination: 8.33 °
Azimuth: 302.08 °

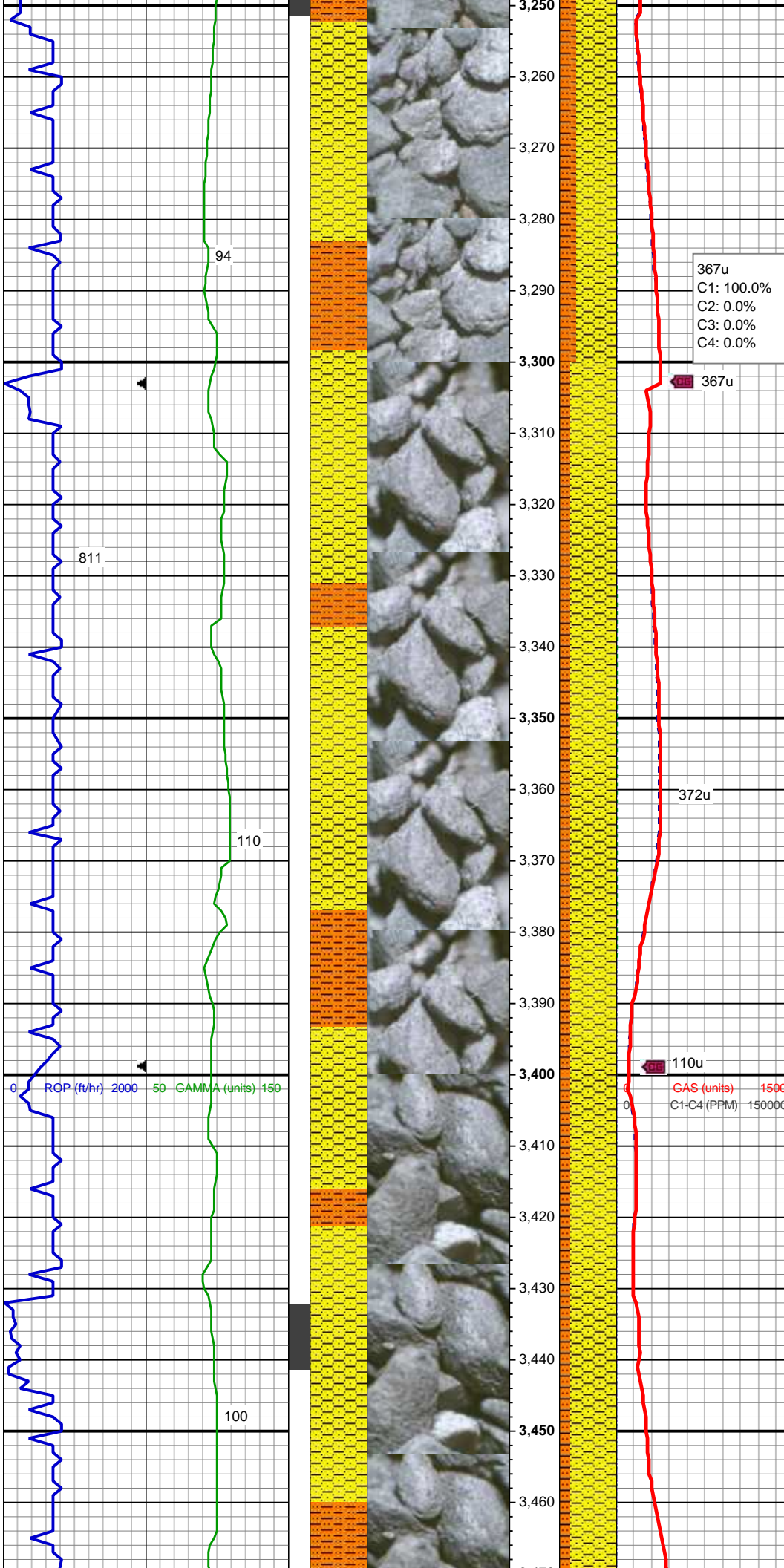
GAS SCALE CHANGE

GAS (units) 1500
C1-C4 (PPM) 150000

67u

MD: 3,245 '
TVD: 3,230.06 '
Inclination: 8.21 °
Azimuth: 298.25 °

SHY SS: lt gy - lt gy brn, occ wh, f gr, sb
ang - sb blk, prly srt, frm - mod hd wi



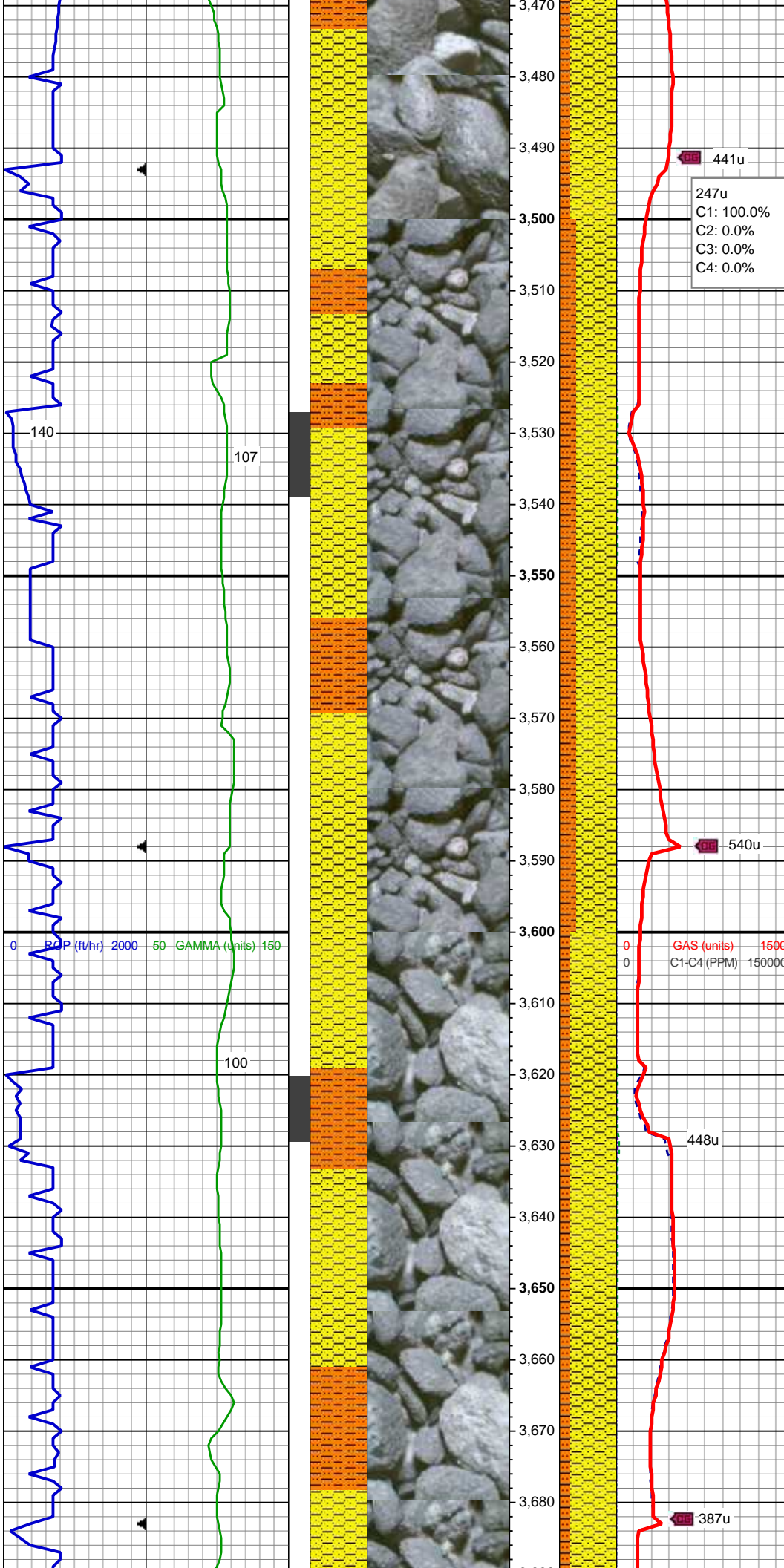
brit clus, calc cmt
SHY SLTST: lt gy - gy brn, sb plty - sb rd,
frly srted, sft - frm, slty - grty tex, v sl calc

MD: 3,340 '
TVD: 3,324.11 '
Inclination: 8.09 °
Azimuth: 295.44 °

SHY SS: lt gy - lt gy brn, occ wh, f gr, sb
ang - sb blk, prly srted, frm - mod hd wi
brit clus, calc cmt
SHY SLTST: lt gy - gy brn, sb plty - sb rd,
frly srted, sft - frm, slty - grty tex, v sl calc

MD: 3,435 '
TVD: 3,418.19 '
Inclination: 7.82 °
Azimuth: 293.63 °

SHY SS: lt gy - lt gy brn, occ wh, f gr, sb
ang - sb blk, prly srted, frm - mod hd wi
brit clus, calc cmt
SHY SLTST: lt gy - gy brn, sb plty - sb rd,
frly srted, sft - frm, slty - grty tex, v sl calc



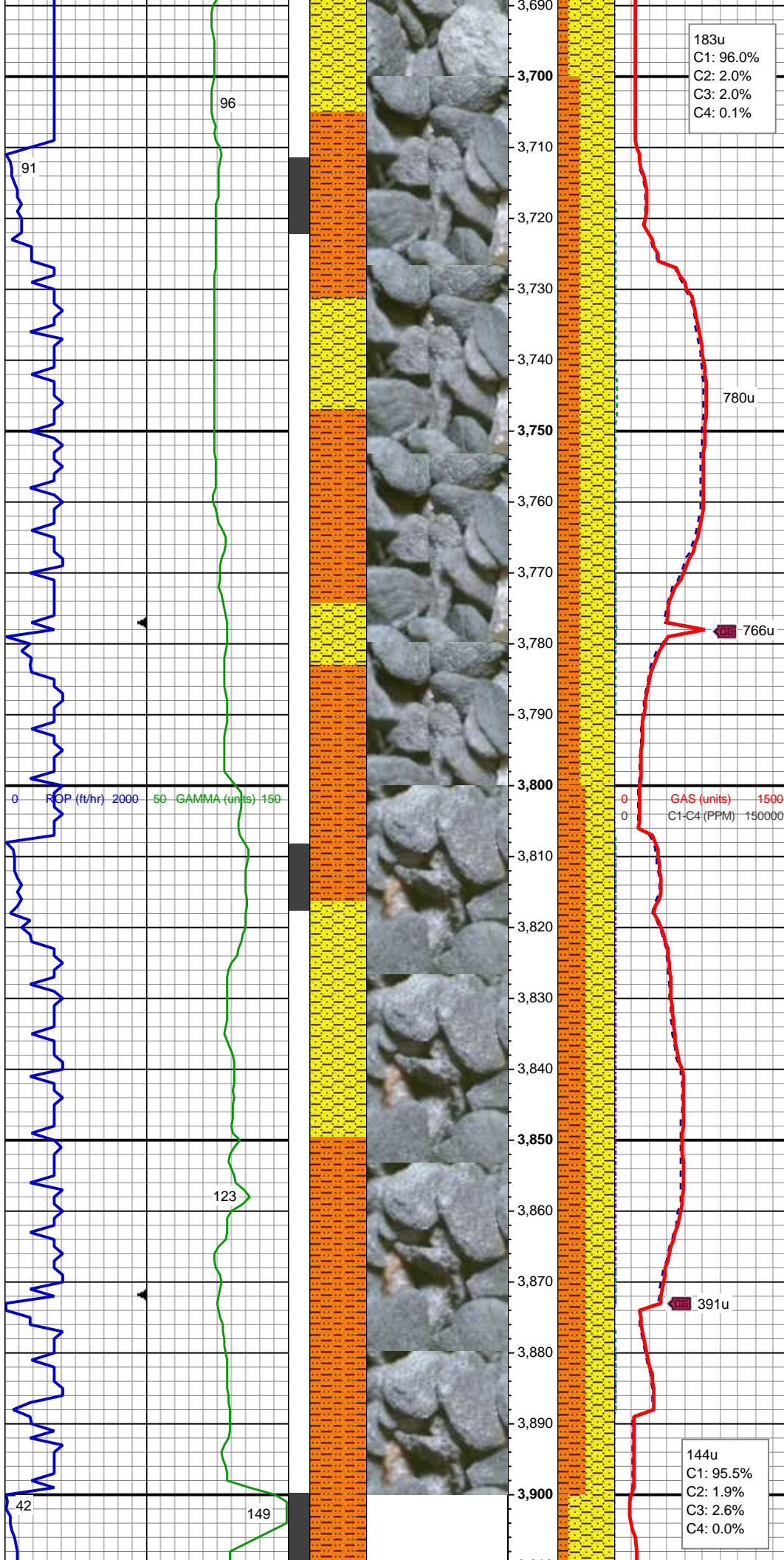
MUD WT: 8.80/8.70
VIS: 32/30 IN/OUT

MD: 3,530 '
TVD: 3,512.29 '
Inclination: 8.01 °
Azimuth: 290.24 °

SHY SS: lt gy - lt gy brn, occ wh, f gr, sb
ang - sb blk, prly srt, frm - mod hd wi
brit clus, calc cmt
SHY SLTST: lt gy - gy brn, sb plty - sb rd,
frly srt, sft - frm, slty - grty tex, v sl calc

MD: 3,625 '
TVD: 3,606.43 '
Inclination: 7.37 °
Azimuth: 293.33 °

SHY SS: lt gy - lt gy brn, occ wh, f gr, sb
ang - sb blk, prly srt, frm - mod hd, calc
cmt
SHY SLTST: lt gy - gy brn, sb plty - sb rd,
frly srt, sft - frm, slty - grty tex, sl calc



MD: 3,719 '
TVD: 3,699.56 '
Inclination: 8.23 °
Azimuth: 293.46 °

MUD WT: 8.80/8.70
VIS: 32/31 IN/OUT

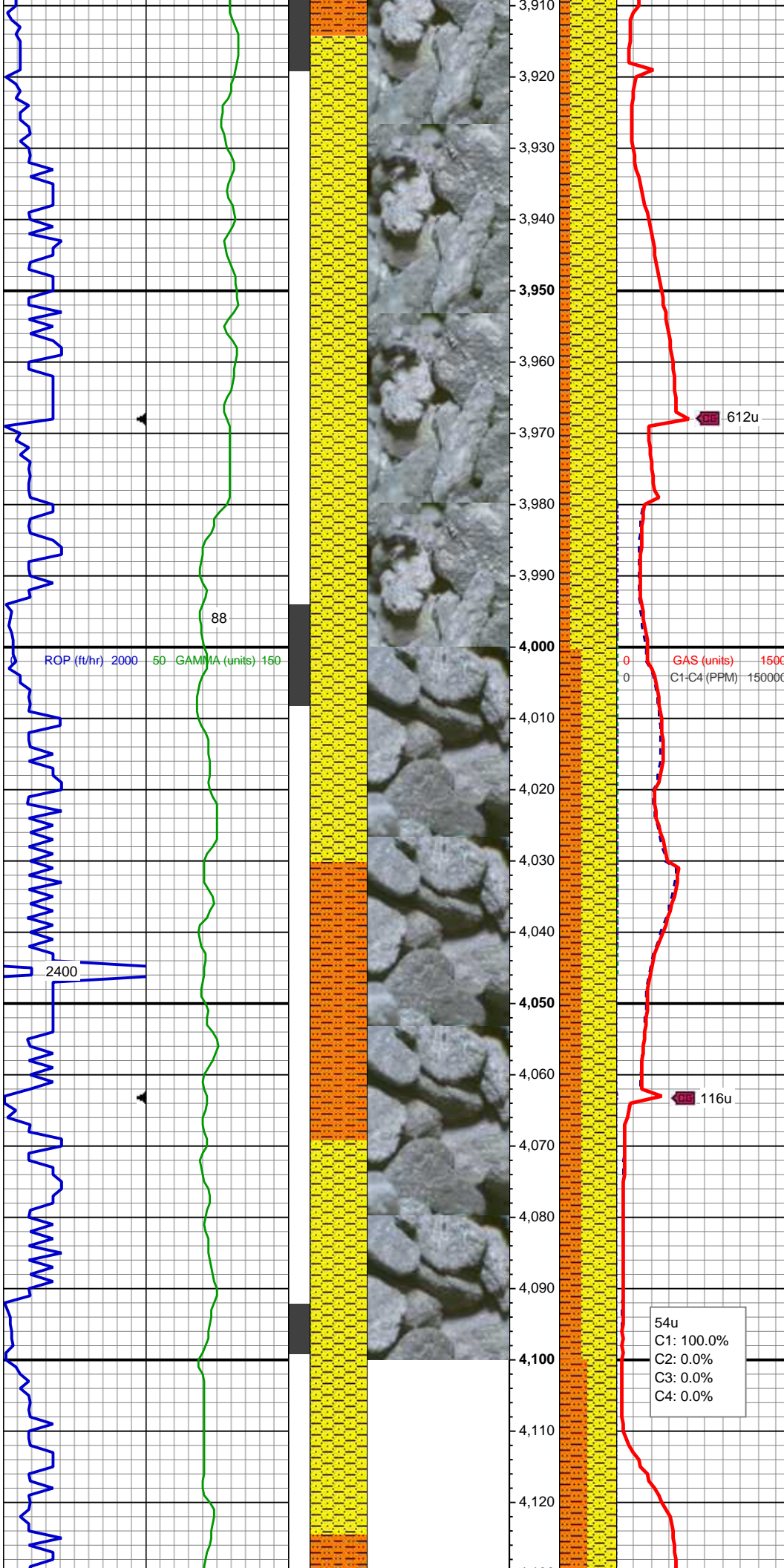
SHY SS: lt gy - lt gy brn, occ wh, f gr, sb
ang - sb blk, prly srt, frm - mod hd, calc
cmt
SHY SLTST: lt gy - gy brn, sb plty - sb rd,
fry srt, sft - frm, slty - grty tex, sl calc, tr
calcite

MD: 3,814 '
TVD: 3,793.63 '
Inclination: 7.87 °
Azimuth: 297.85 °

SHY SS: lt gy - lt gy brn, occ wh, f gr, sb
ang - sb blk, prly srt, frm - mod hd, calc
cmt
SHY SLTST: lt gy - gy brn, sb plty - sb rd,
fry srt, sft - frm, slty - grty tex, sl calc

AM Mud Rpt
10/13/2014
Mud Wt: 8.80
FVis: 30
PVis: 3
YP: 3
GELS: n/s
API Filt: n/s
CAKE: 1/0
pH: 9.0
Cl: 1,600
Ca: 80

MD: 3,909 '
TVD: 3,887.71 '
Inclination: 7.87 °
Azimuth: 297.85 °



TVD: 3,887.71'
Inclination: 8.03 °
Azimuth: 301.72 °

PARKMAN TOP @
3,914' MD; 3,893' TVD

SHY SLTST: lt - med gy - gy brn, sb plty -
sb rd, frly srted, sft - frm, slty - grty tex, sl
calc
SHY SS: lt gy - lt gy brn, rr wh, f gr, sb
ang - sb blkly, prly srted, frm - mod hd, calc
cmt

MD: 4,004 '
TVD: 3,981.77 '
Inclination: 8.12 °
Azimuth: 303.02 °

SHY SS: lt gy - lt gy brn, rr wh, f gr, sb
ang - sb blkly, prly srted, frm - mod hd, calc
cmt
SHY SLTST: lt - med gy - gy brn, sb plty -
sb rd, frly srted, sft - frm, slty - grty tex, sl
calc

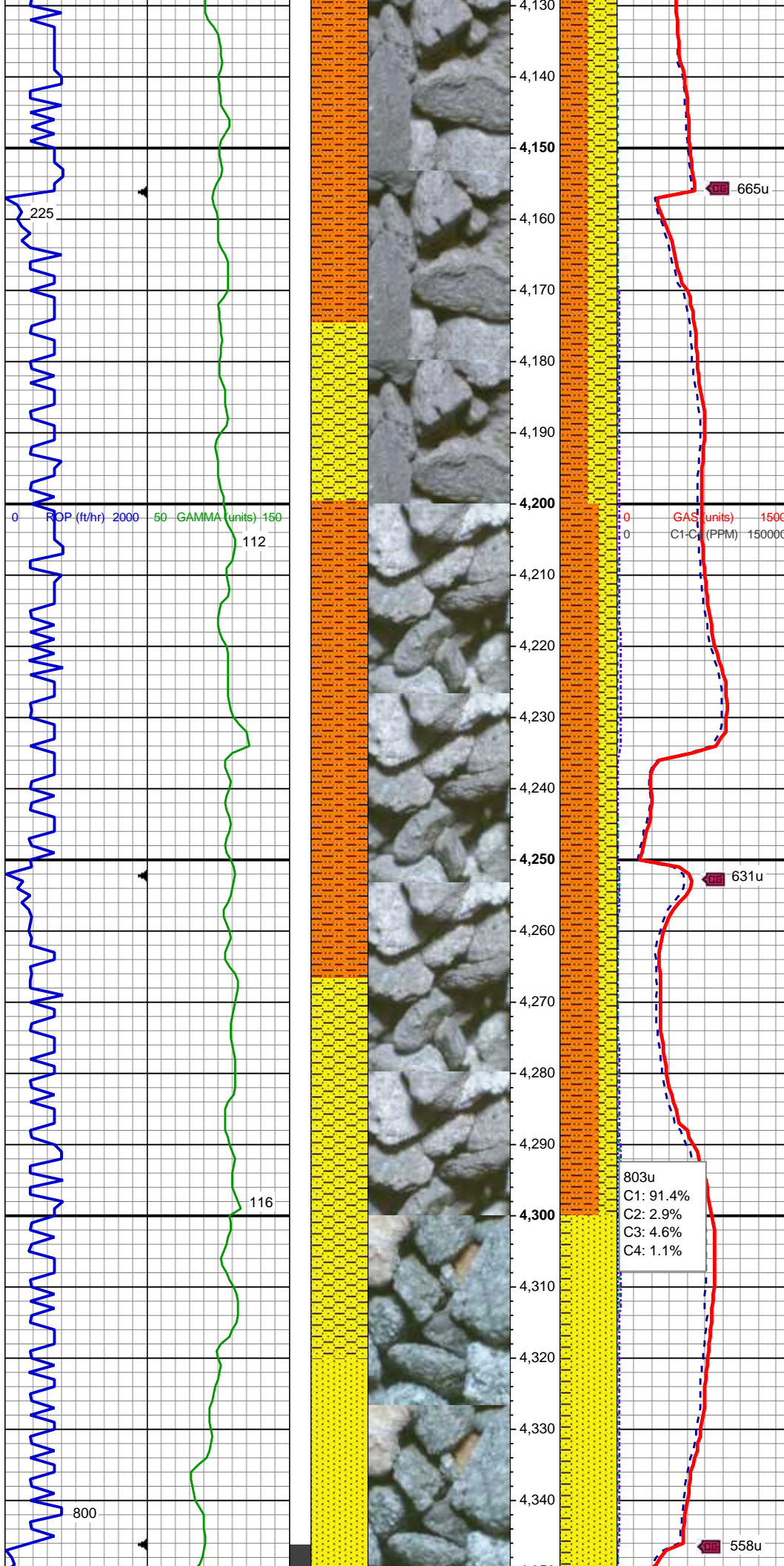
MD: 4,099 '
TVD: 4,075.71 '
Inclination: 9.04 °
Azimuth: 306.73 °

54u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

612u

116u

0 GAS (units) 1500
0 C1-C4 (PPM) 150000



SHY SS: lt gy - lt gy brn wi brit clus, rr wh, f gr, sb ang - sb blkly, prly srted, frm - mod hd, calc cmt
SHY SLTST: lt - med gy - gy brn, sb plty - sb rd, frly srted, sft - frm, slty - grty tex, sl calc

MD: 4,194 '
TVD: 4,169.54 '
Inclination: 8.93 °
Azimuth: 304.63 °

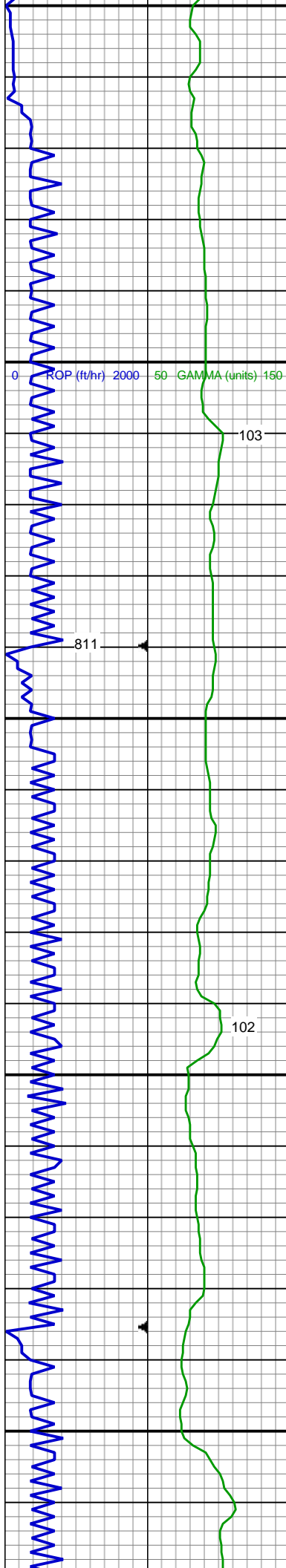
SHY SS: lt gy - lt gy brn wi brit clus, rr wh, f gr, sb ang - sb blkly, prly srted, frm - mod hd, calc cmt
SHY SLTST: lt - med gy - gy brn, sb plty - sb rd, frly srted, sft - frm, slty - grty tex, sl calc

SUSSEX TOP @
4,267' MD; 4,243' TVD

MD: 4,289 '
TVD: 4,263.54 '
Inclination: 7.71 °
Azimuth: 300.87 °

803u
C1: 91.4%
C2: 2.9%
C3: 4.6%
C4: 1.1%

SS: wh - v lt gy, s&p, brit clus, pred sb ang, sme sb blkly, prly srted, mod hd - hd, v calc cmt



4,350
4,360
4,370
4,380
4,390
4,400
4,410
4,420
4,430
4,440
4,450
4,460
4,470
4,480
4,490
4,500
4,510
4,520
4,530
4,540
4,550
4,560

GAS SCALE CHANGE

GAS (units) 2500
C1-C4 (PPM) 250000

654u

467u
C1: 94.0%
C2: 1.6%
C3: 3.8%
C4: 0.7%

1933u

SHY SS: lt gy - lt gy brn wi brit clus, rr wh, f gr, sb ang - sb blkly, prly srted, frm - mod hd, calc cmt

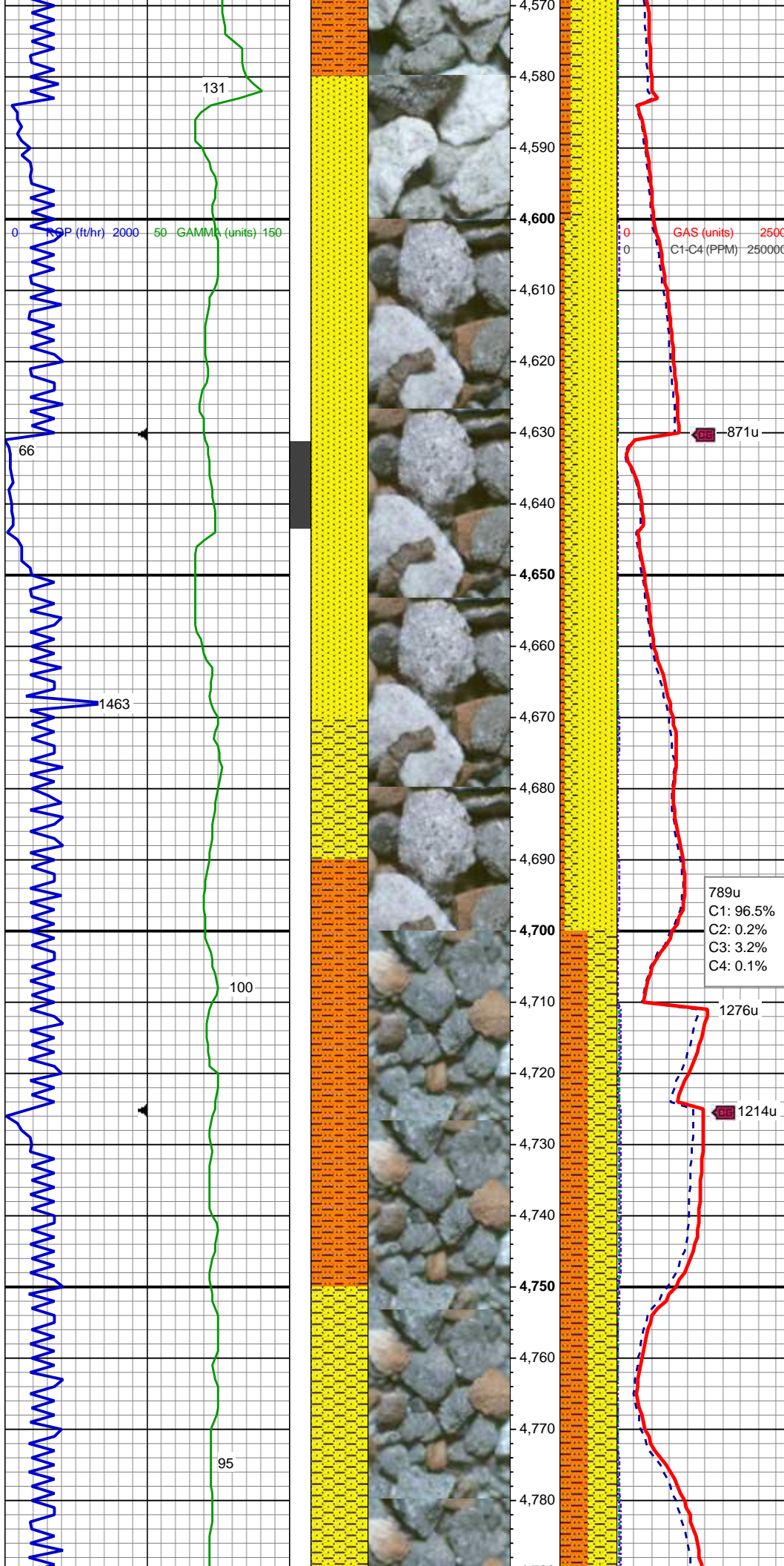
MD: 4,384 '
TVD: 4,357.54 '
Inclination: 8.94 °
Azimuth: 300.7 °

SS: wh - v lt gy, s&p, brit clus, pred sb ang, sme sb blkly, prly srted, mod hd - hd, v calc cmt
SHY SS: lt gy - lt gy brn wi brit clus, rr wh, f gr, sb ang - sb blkly, prly srted, frm - mod hd, calc cmt

MD: 4,478 '
TVD: 4,450.42 '
Inclination: 8.8 °
Azimuth: 297.84 °

SS: wh - v lt gy, s&p, brit clus wi wh clay mtx, pred sb ang, sme sb blkly, prly srted, mod hd - hd, v calc cmt
SHY SS: lt gy - lt gy brn wi brit clus, rr wh, f gr, sb ang - sb blkly, prly srted, frm - mod hd, calc cmt
SHY SLTST: lt gy, sb plty - sb rd, frly srted, sft - frm, slty - grty tex, sl calc

MD: 4,573 '



TVD: 4,544.29 '
Inclination: 8.83 °
Azimuth: 297.51 °

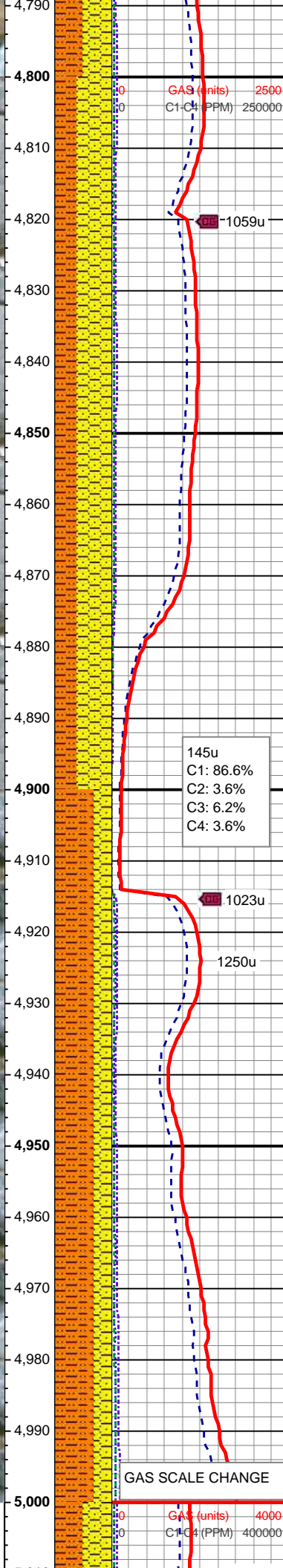
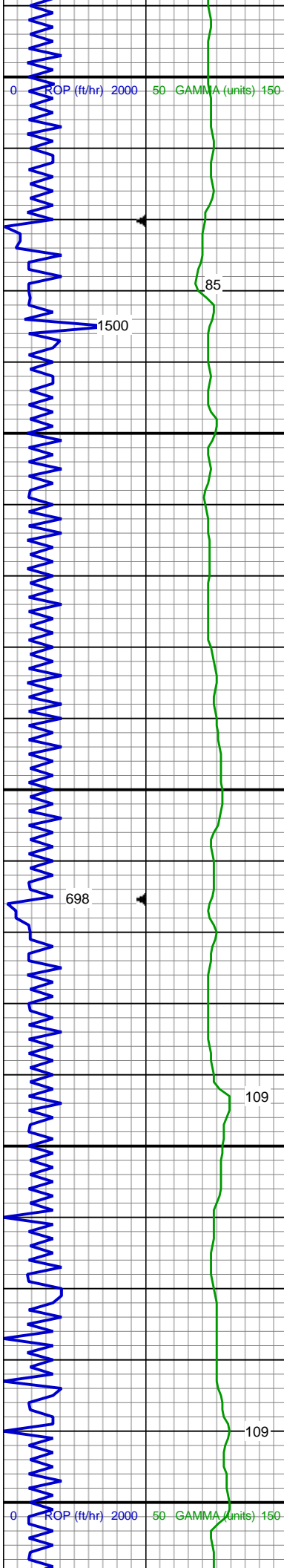
SS: wh - v lt gy, s&p, brit clus, pred sb ang, sme sb blkly, prly srted, mod hd - hd, v calc cmt
SHY SS: lt gy - lt gy brn wi brit clus, rr wh, f gr, sb ang - sb blkly, prly srted, frm - mod hd, calc cmt
SHY SLTST: lt gy, sb plty - sb rd, frly srted, sft - frm, slty - grty tex, sl calc

MD: 4,668 '
TVD: 4,638.12 '
Inclination: 9.22 °
Azimuth: 304.51 °

789u
C1: 96.5%
C2: 0.2%
C3: 3.2%
C4: 0.1%

SHY SS: lt gy - lt gy brn wi brit clus, rr wh, f gr, sb ang - sb blkly, prly srted, frm - mod hd, calc cmt
SHY SLTST: lt gy, sb plty - sb rd, frly srted, sft - frm, slty - grty tex, sl calc

MD: 4,763 '
TVD: 4,732.1 '
Inclination: 7.6 °
Azimuth: 302.19 °

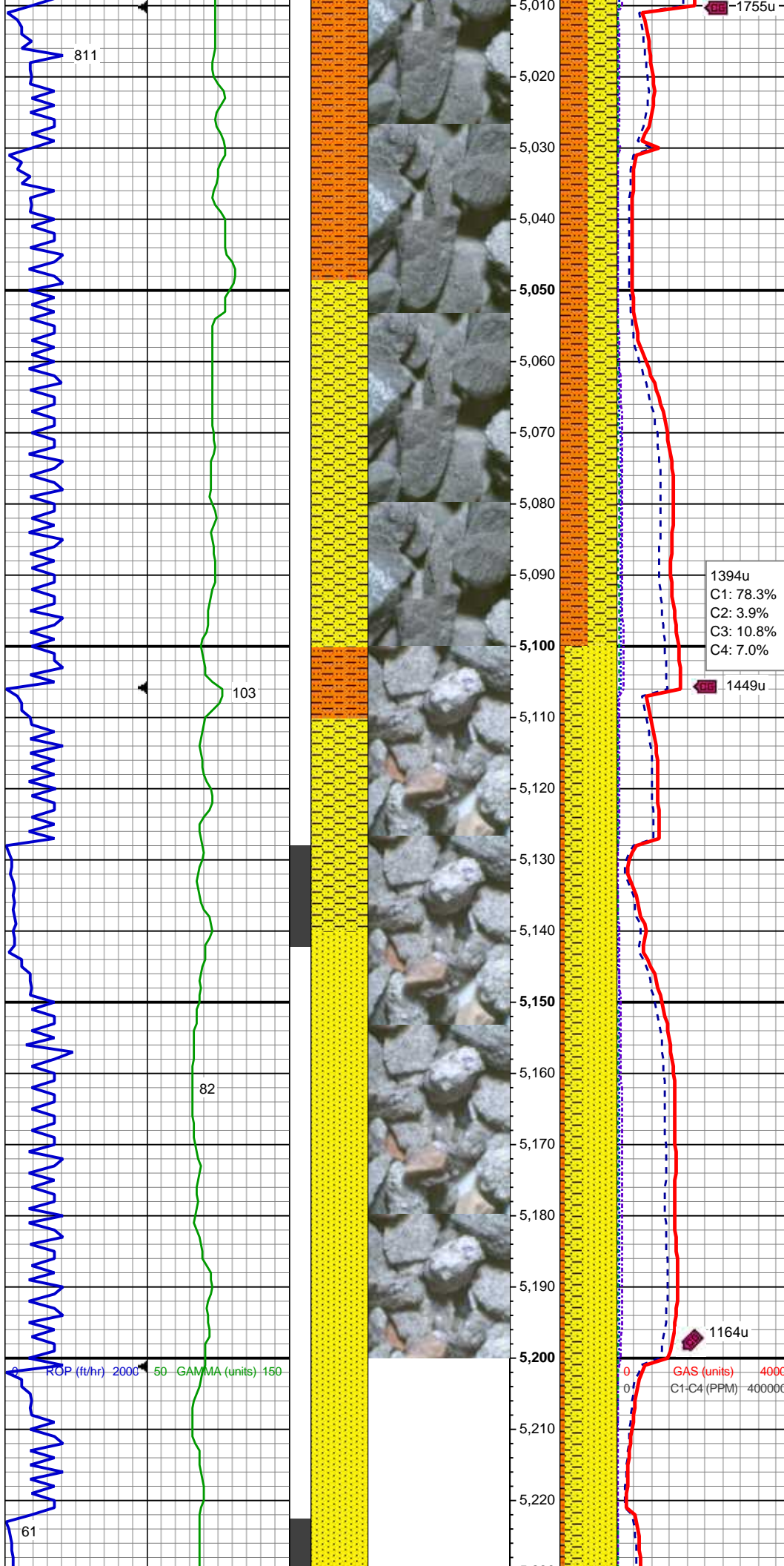


SHY SS: lt gy - lt gy brn wi brit clus, rr wh, f gr, sb ang - sb blkly, prly srted, frm - mod hd, calc cmt
SHY SLTST: lt gy, sb plty - sb rd, frly srted, sft - frm, slty - grty tex, sl calc

MD: 4,858 '
TVD: 4,826.34 '
Inclination: 6.83 °
Azimuth: 299.86 °

SHY SLTST: lt gy, sb plty - sb rd, frly srted, sft - frm, slty - grty tex, sl calc
SHY SS: lt gy - lt gy brn wi brit clus, rr wh, f gr, sb ang - sb blkly, prly srted, frm - mod hd, calc cmt

MD: 4,953 '
TVD: 4,920.7 '
Inclination: 6.5 °
Azimuth: 294.87 °



MD: 5,048 '
TVD: 5,015.18 '
Inclination: 5.5 °
Azimuth: 296.15 °

SHY SLTST: lt gy, sb plty - sb rd, frly srted,
sft - frm, slty - grty tex, sl calc
SHY SS: lt gy - lt gy brn wi brit clus, rr
wh, f gr, sb ang - sb blkly, prly srted, frm -
mod hd, calc cmt

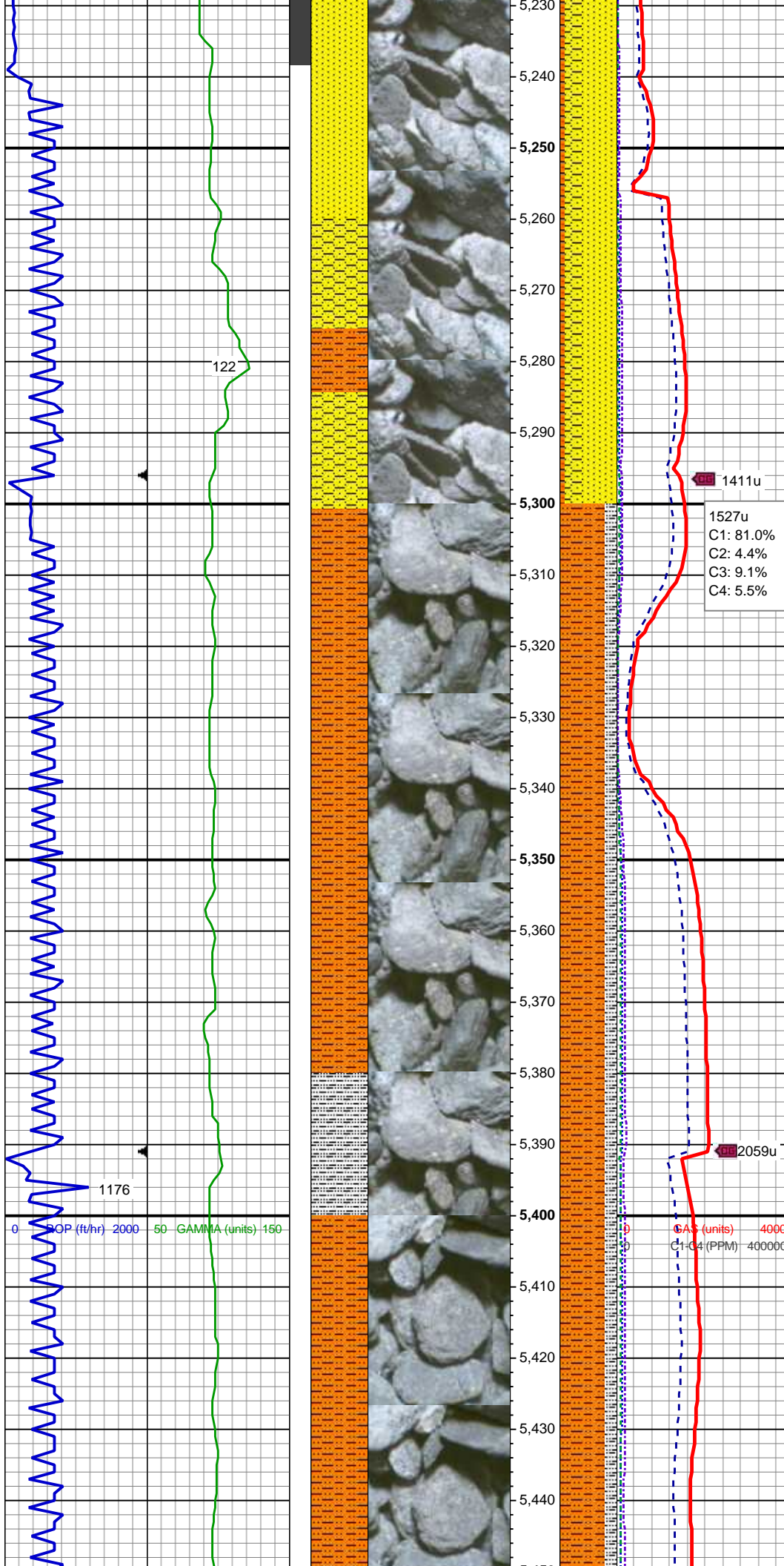
SHANNON TOP @
5,048' MD; 5,015' TVD

1394u
C1: 78.3%
C2: 3.9%
C3: 10.8%
C4: 7.0%

MD: 5,143 '
TVD: 5,109.84 '
Inclination: 4.13 °
Azimuth: 292.15 °

SS: wh - v lt gy, s&p, brit clus, pred sb
ang, sme sb blkly, prly srted, mod hd - hd, v
calc cmt
SHY SS: lt gy - lt gy brn wi brit clus, rr
wh, f gr, sb ang - sb blkly, prly srted, frm -
mod hd, calc cmt
SHY SLTST: lt gy, sb plty - sb rd, frly srted,
sft - frm, slty - grty tex, sl calc

MD: 5,238 '
TVD: 5,204.7 '



Inclination: 2.02 °
Azimuth: 296.75 °

SS: wh - v lt gy, s&p, brit clus, pred sb
ang, sme sb blkly, prly srted, mod hd - hd, v
calc cmt
SHY SS: lt gy - lt gy brn wi brit clus, rr
wh, f gr, sb ang - sb blkly, prly srted, frm -
mod hd, calc cmt
SHY SLTST: lt gy, sb plty - sb rd, frly srted,
sft - frm, slty - grty tex, sl calc

1411u

1527u
C1: 81.0%
C2: 4.4%
C3: 9.1%
C4: 5.5%

MD: 5,333 '
TVD: 5,299.66 '
Inclination: 1.34 °
Azimuth: 291.13 °

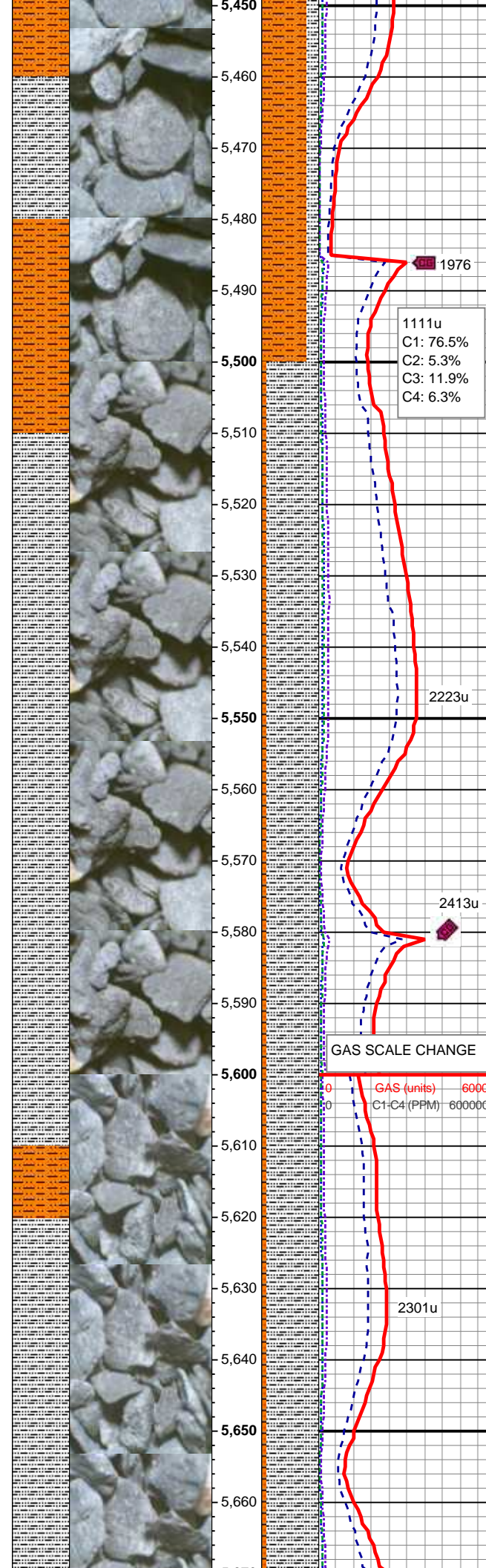
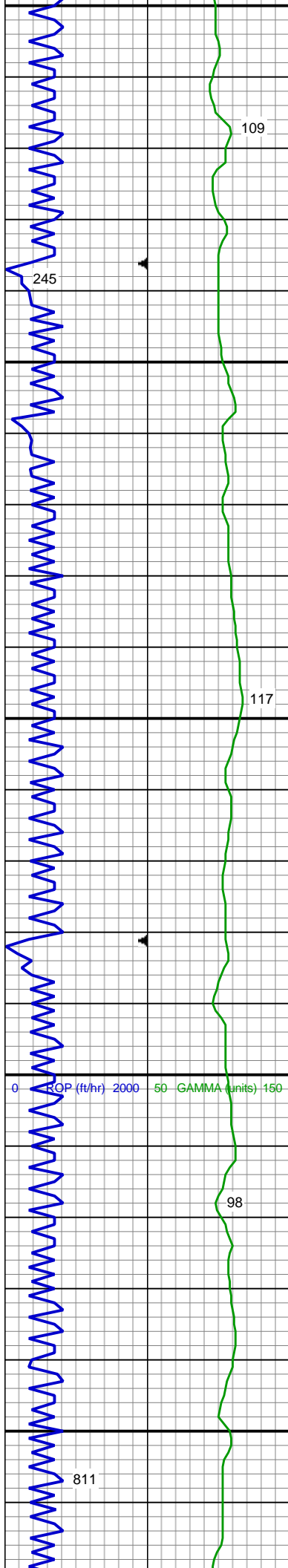
SHY SLTST: lt gy, sb plty - sb rd, frly srted,
sft - frm, slty - grty tex, sl calc
SLTY SH: lt - med gy, frm, plty - sb plty,
occ sb blkly, slty - grty tex, v sl calc

2059u

CAS (units) 4000
C1-C4 (PPM) 400000

MD: 5,428 '
TVD: 5,394.63 '
Inclination: 1.33 °
Azimuth: 283.78 °

SHY SLTST: lt gy, sb plty - sb rd, frly srted,
sft - frm, slty - grty tex, sl calc



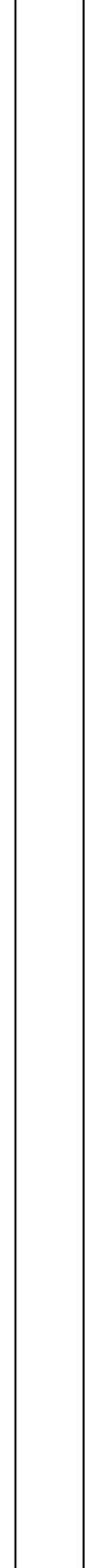
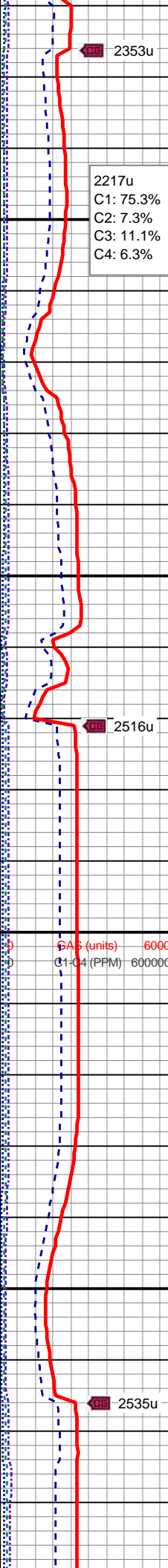
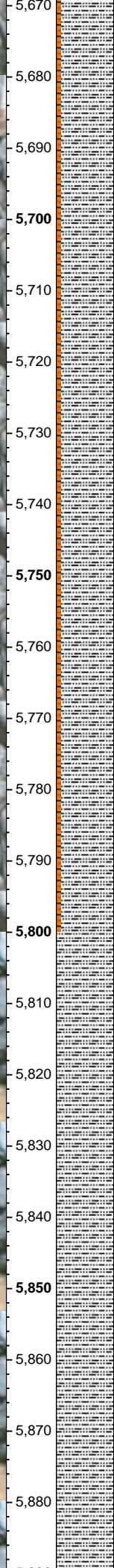
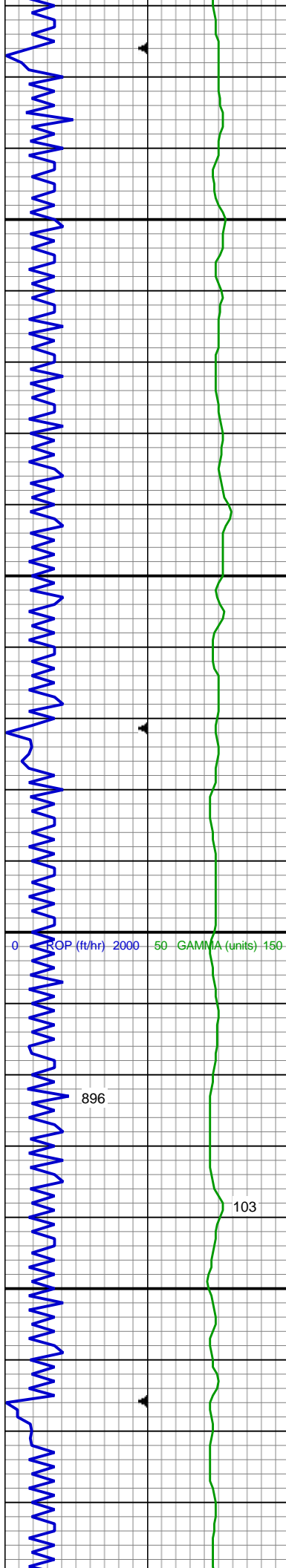
SLTY SH: lt - med gy, frm, plty - sb plty,
occ sb blkly, slty - grty tex, v sl calc

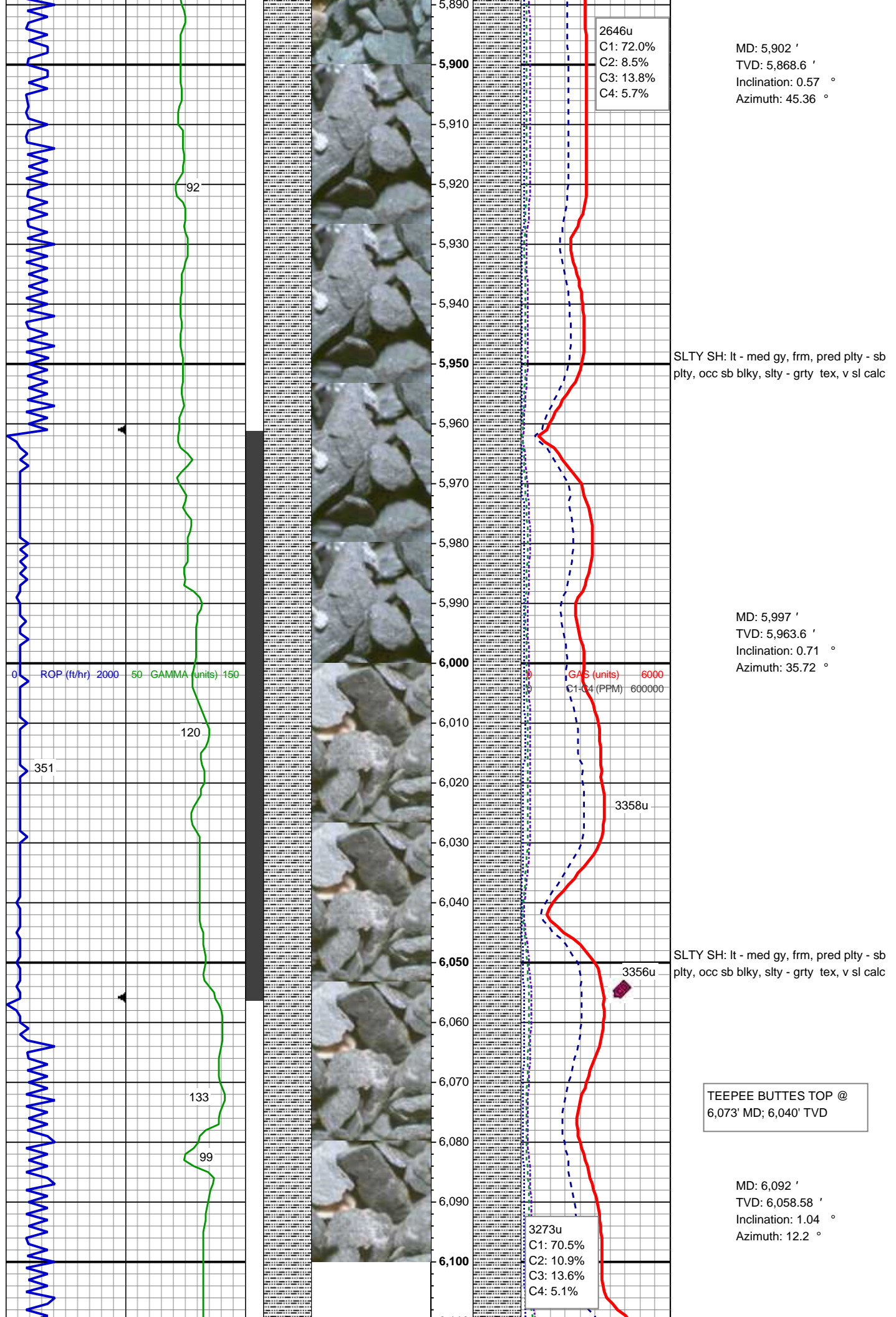
MD: 5,523 '
TVD: 5,489.62 '
Inclination: 0.79 °
Azimuth: 288.78 °

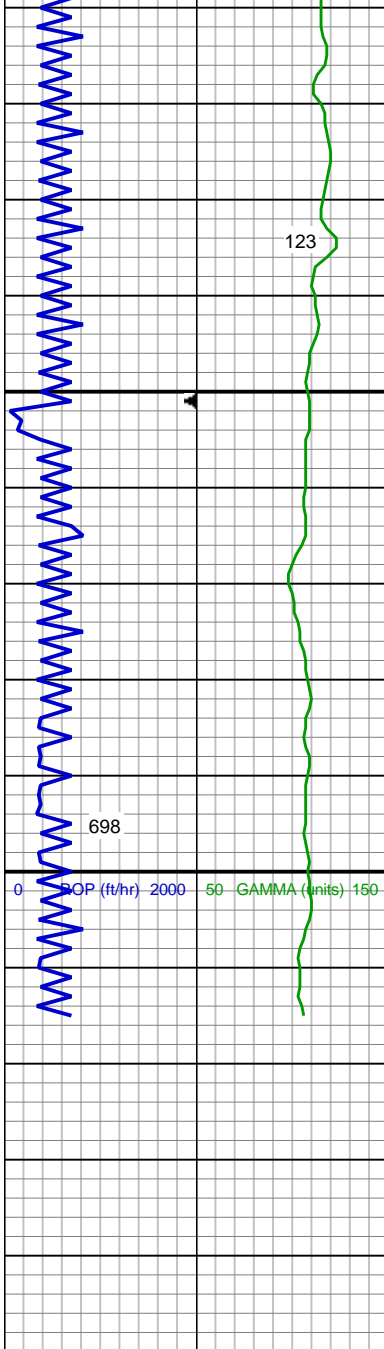
SLTY SH: lt - med gy, frm, pred plty - sb
plty, occ sb blkly, slty - grty tex, v sl calc
SHY SLTST: lt gy, sb plty - sb rd, frly srtd,
sft - frm, slty - grty tex, sl calc

MD: 5,617 '
TVD: 5,583.61 '
Inclination: 0.69 °
Azimuth: 306.21 °

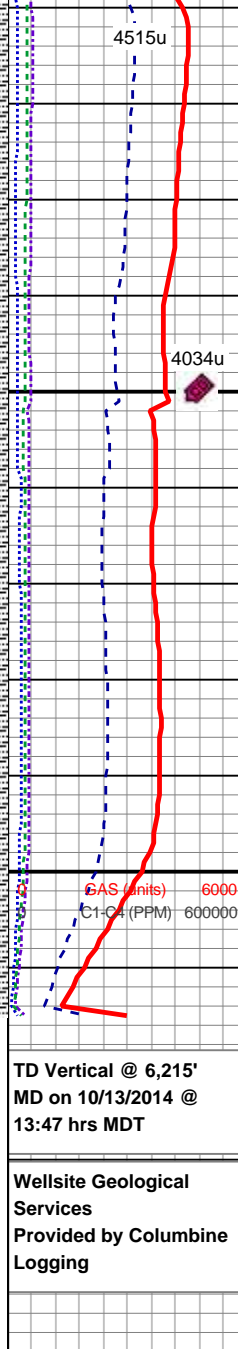
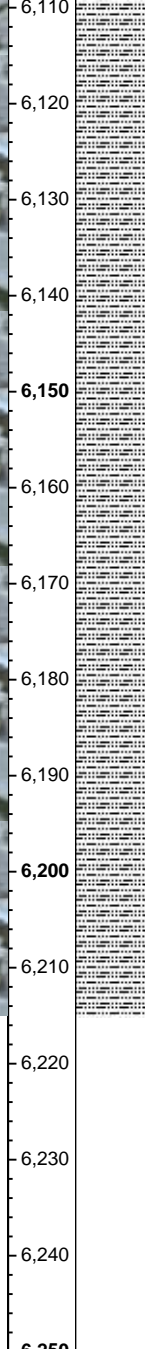
SLTY SH: lt - med gy, frm, pred plty - sb
plty, occ sb blkly, slty - grty tex, v sl calc
SHY SLTST: lt gy, sb plty - sb rd, frly srtd,
sft - frm, slty - grty tex, sl calc







6,110
6,120
6,130
6,140
6,150
6,160
6,170
6,180
6,190
6,200
6,210
6,220
6,230
6,240
6,250



SLTY SH: lt - med gy, frm, pred plty - sb
plty, occ sb blkly, slty - grty tex, v sl calc

SLTY SH: lt - med gy, frm, pred plty - sb
plty, occ sb blkly, slty - grty tex, v sl calc

TD Vertical @ 6,215'
MD on 10/13/2014 @
13:47 hrs MDT

Wellsite Geological
Services
Provided by Columbine
Logging

See Corresponding Horizontal Log
Oscar Y10-75-1HC HORZ