

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name TRISHA LC29-78HNB

Location SWSW SEC 29 T9N R59W

State COLORADO

County WELD

Country UNITED STATES

Rig Number H&P 273

API Number 05-123-38622

AFE # 140709

Region DJ BASIN

Field WILDCAT

Spud Date 3/20/2014

Drilling Completed 3/22/2014

Surface Coordinates 340' FSL; 955' FWL

Bottom Hole Coordinates 675' FNL; 675' FWL

Ground Elevation 4882'

K.B. Elevation 4906'

Logged Interval 640' To 5465'

Total Depth 5465'

Formation NIOBRARA

Type of Drilling Fluid LSND

Operator

Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Geologist

Name SARAH COMPTON

Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Other

Rock Types

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

Accessories

Fossils

ALGAE
AMPHIPORA
BELEMNITE
BIOCLASTIC
BRACHIOIPOD
BRYOZOA
CEPHALOPOD
CORAL
CRINOID
ECHINOID
FISH
FORAMINIFERA

Fossils

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

Minerals

Minerals

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

Minerals

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

Minerals

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

Stringer

Other Symbols

Oil Show

DEAD
EVEN
QUESTIONABLE
SPOTTED STAINING

Porosity

EARTHY
FENESTRAL
FRACTURE
INTERCRYSTALLINE
INTEROOLITIC

Oil Show

MOLDIC
ORGANIC
PINPOINT
VUGGY

Engineering

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

Other Symbols

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

Other Symbols

WIRELINE TESTED - LEFT

WIRELINE TESTED - RT

Rounding

ANGULAR
ROUNDED
SUBANG
SUBRND

Textures

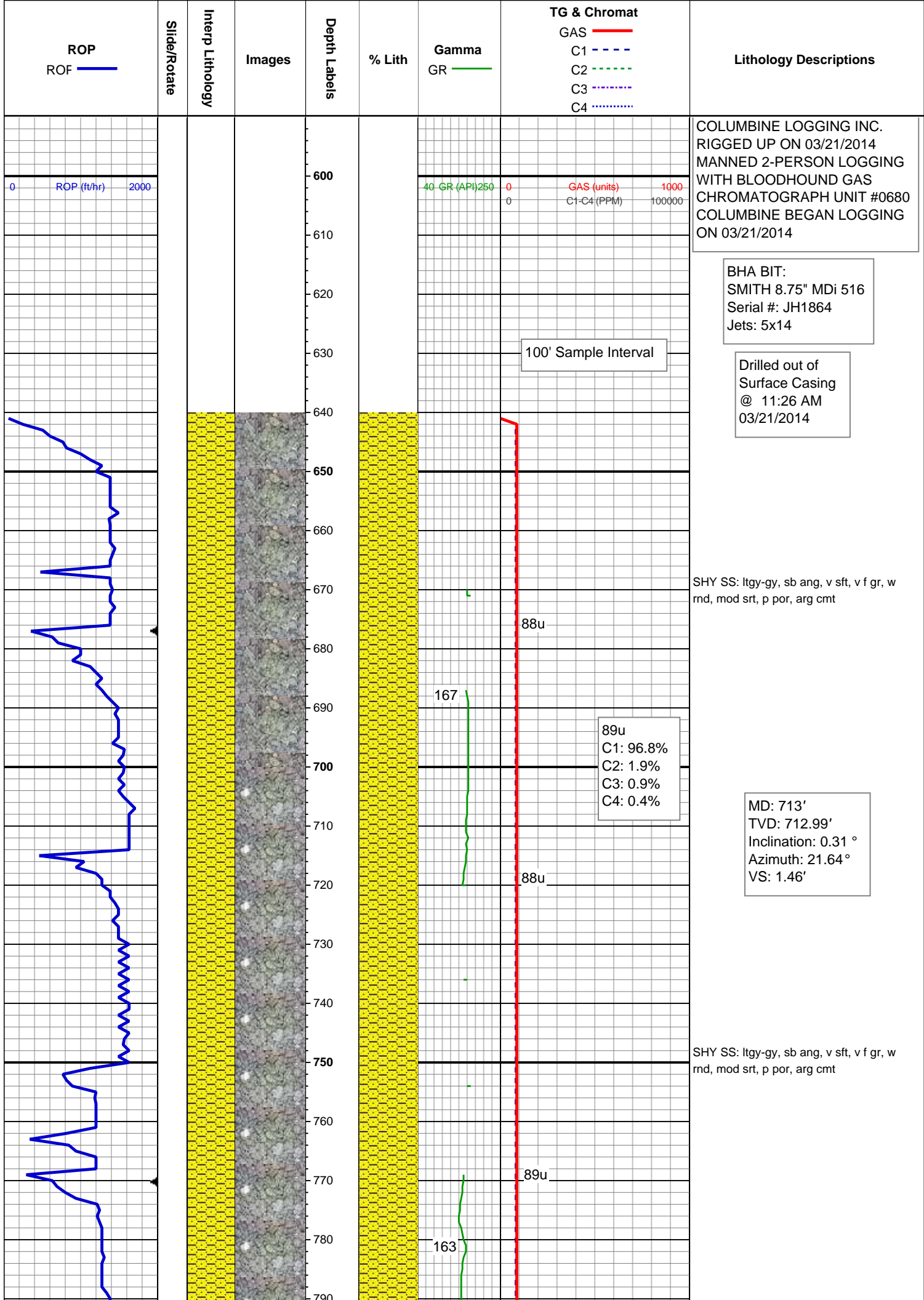
BOUNDSTONE
CHALKY
CRYPTOXLN

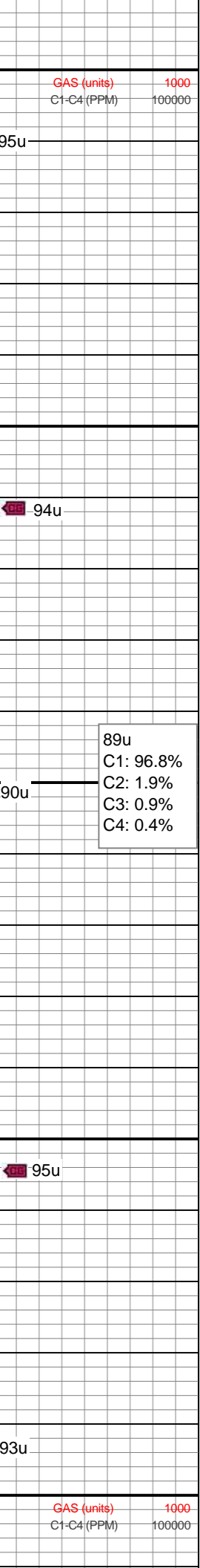
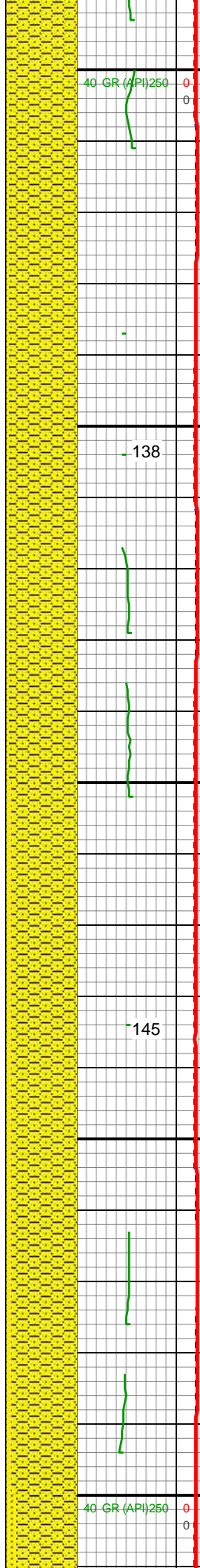
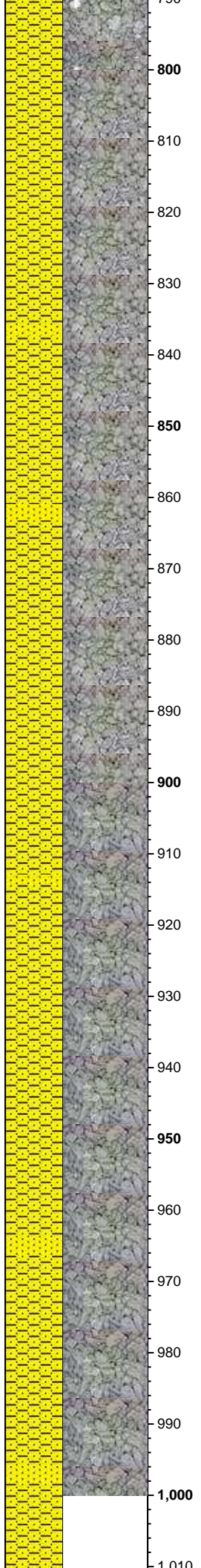
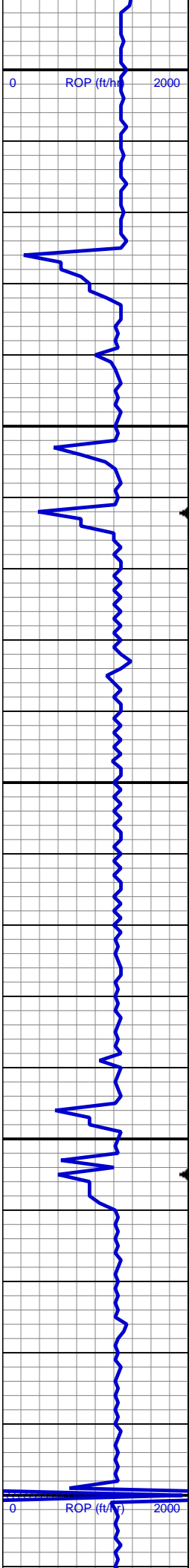
Other Symbols

EARTHY
FINELYXLN
GRAINSTONE
LITHOGRAPHIC
MICROXLN
MUDSTONE
PACKSTONE
WACKESTONE

Sorting

MODERATE
POOR
WELL





MD: 806'
TVD: 805.99'
Inclination: 0.26 °
Azimuth: 20.84 °
VS: 1.89'

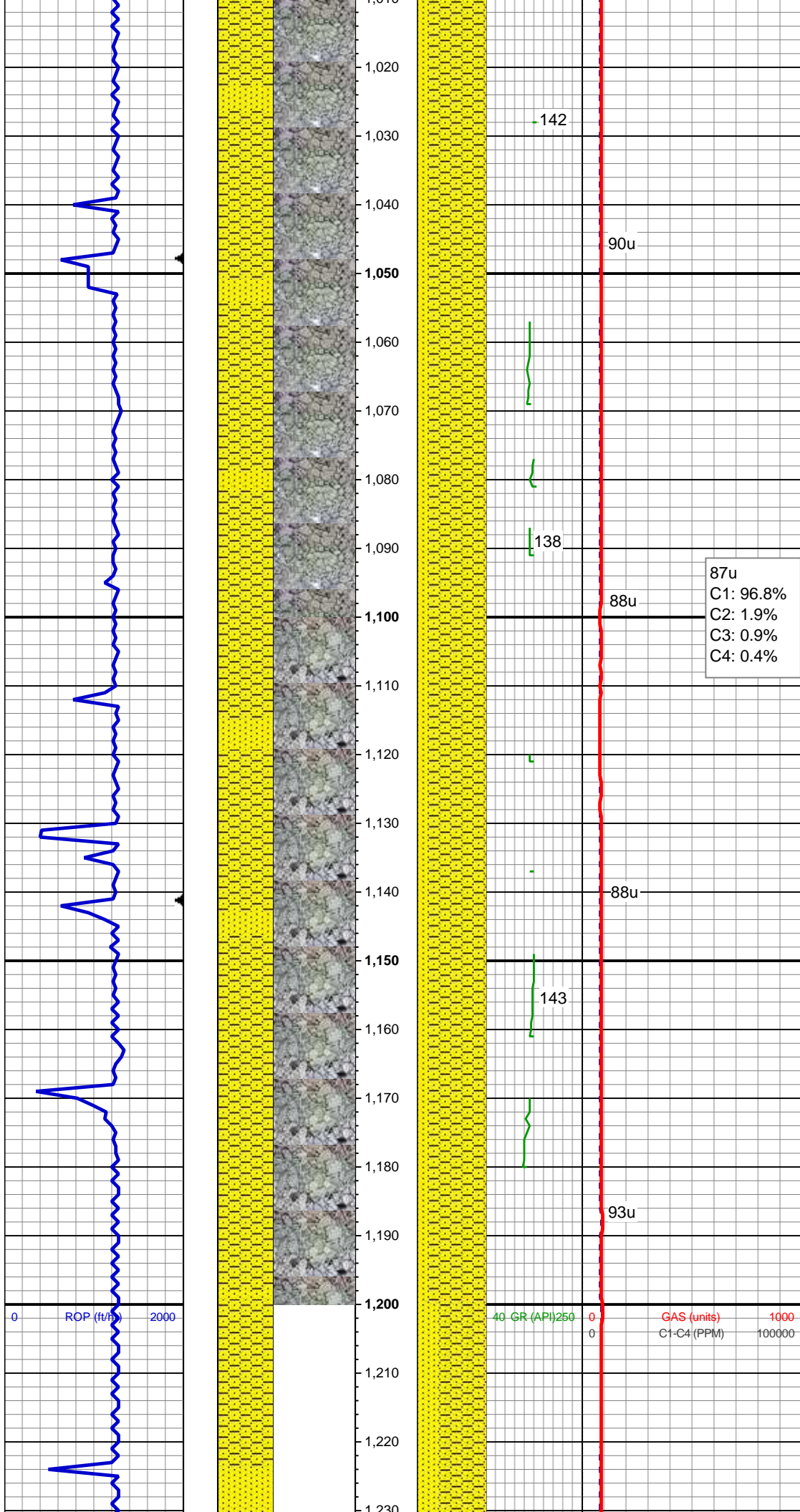
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt

89u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

MD: 899'
TVD: 898.99'
Inclination: 0.28 °
Azimuth: 73.39 °
VS: 2.13'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, sb ang, v fri, f gr - v f gr,
mod rnd, p srt, p por, arg cmt, occ glau,
tr lith frag

MD: 992'
TVD: 991.99'
Inclination: 0.31 °
Azimuth: 72.43 °
VS: 2.25'



SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, sb ang, v fri, f gr - v f gr,
mod rnd, p srt, p por, arg cmt, occ glau,
tr lith frag

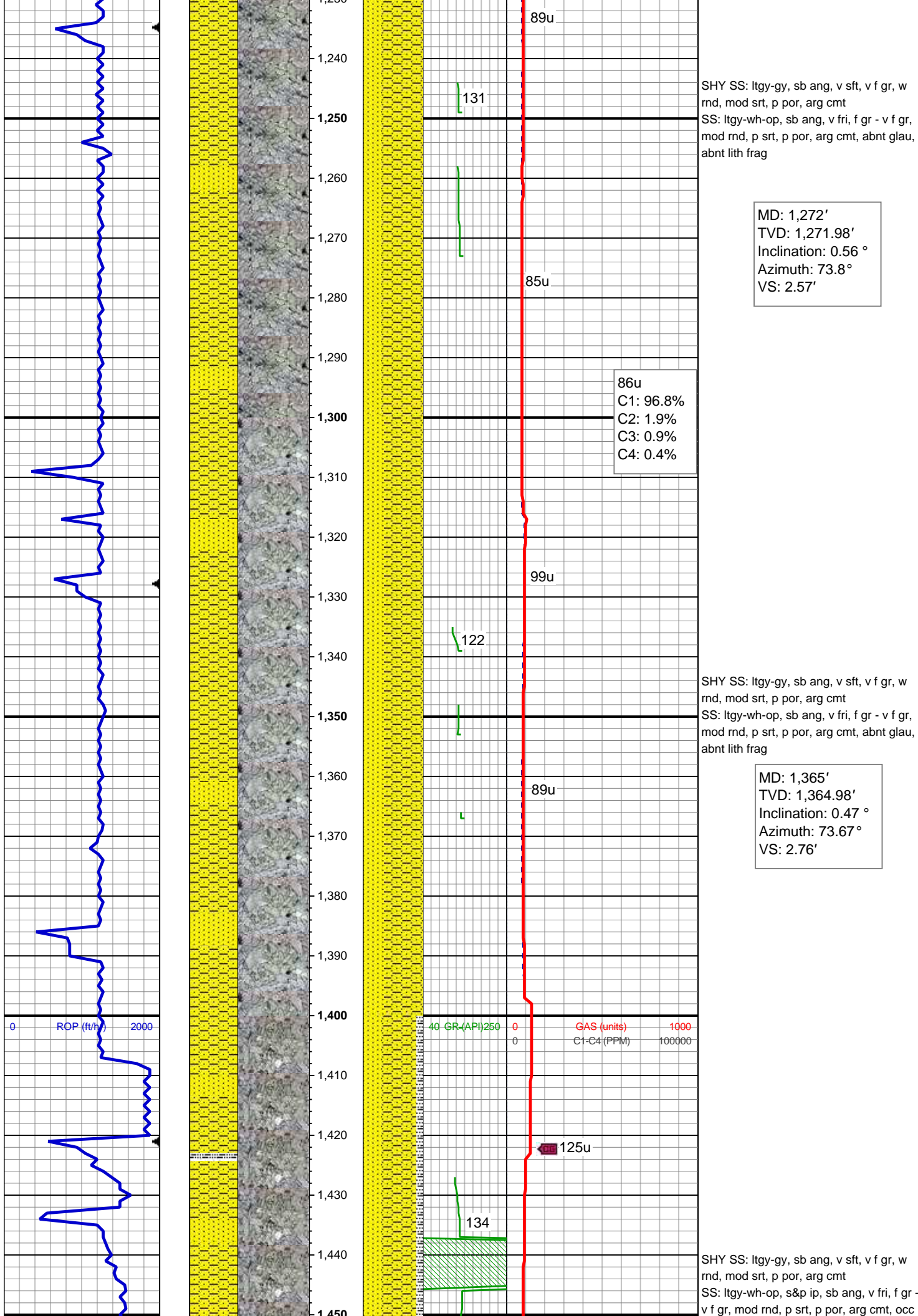
87u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, sb ang, v fri, f gr - v f gr,
mod rnd, p srt, p por, arg cmt, abnt glau,
abnt lith frag

MD: 1,179'
TVD: 1,178.99'
Inclination: 0.47 °
Azimuth: 83.07 °
VS: 2.44'

WT IN 8.40/ OUT 8.40
VIS IN 27/ OUT 27

40 GR (API) 250 0 1000
0 0 GAS (units) 100000
C1-C4 (PPM)



SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, sb ang, v fri, f gr - v f gr,
mod rnd, p srt, p por, arg cmt, abnt glau,
abnt lith frag

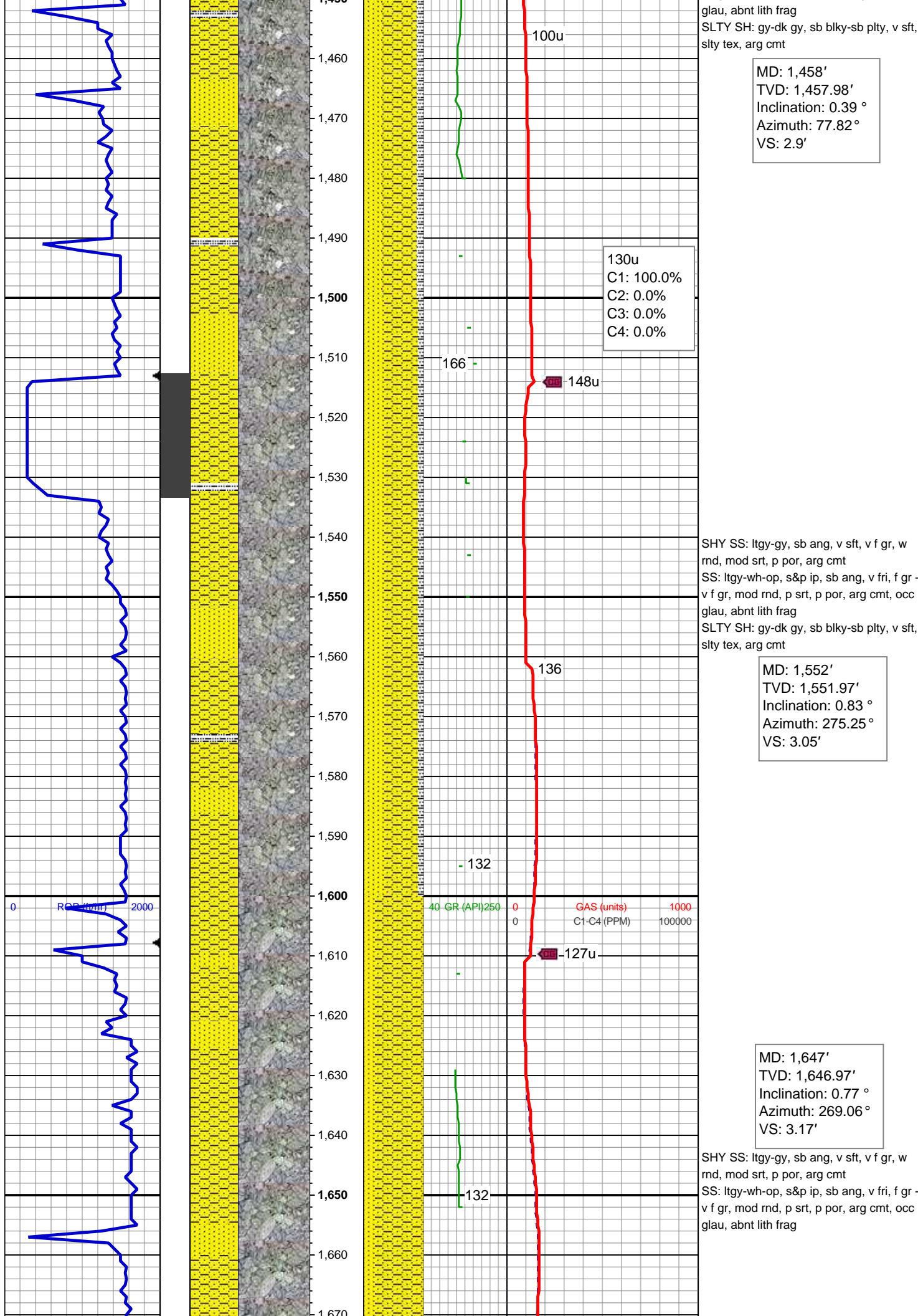
MD: 1,272'
TVD: 1,271.98'
Inclination: 0.56 °
Azimuth: 73.8 °
VS: 2.57'

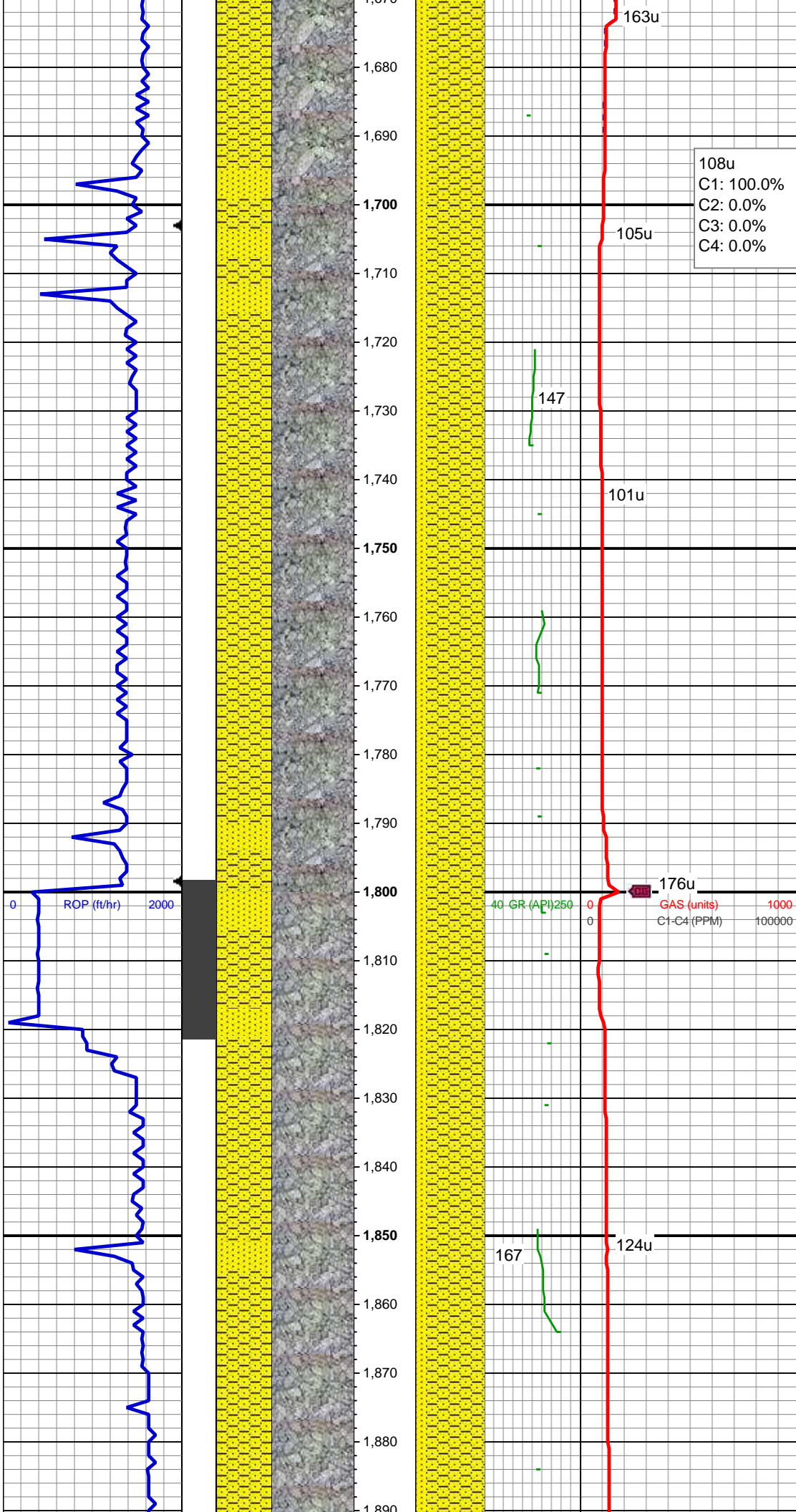
86u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, sb ang, v fri, f gr - v f gr,
mod rnd, p srt, p por, arg cmt, abnt glau,
abnt lith frag

MD: 1,365'
TVD: 1,364.98'
Inclination: 0.47 °
Azimuth: 73.67 °
VS: 2.76'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, occ





108u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

WT IN 8.40/ OUT 8.40
VIS IN 27/ OUT 27

MD: 1,742'
TVD: 1,741.96'
Inclination: 0.77 °
Azimuth: 265.17 °
VS: 3.17'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, occ
glau, abnt lith frag

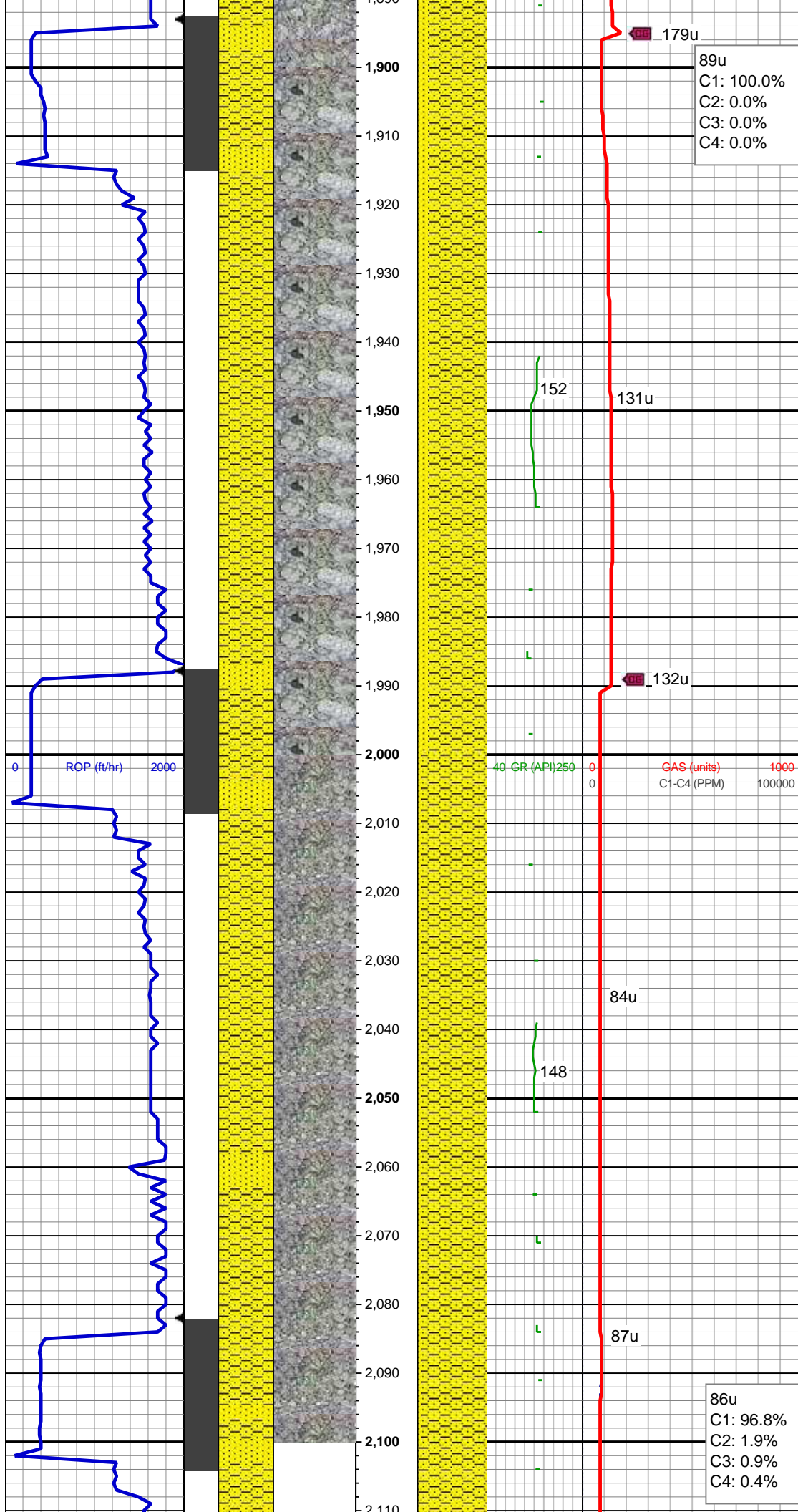
0 ROP (ft/hr) 2000

40 GR (API) 250 0 GAS (units) 1000
0 C1-C4 (PPM) 100000

MD: 1,837'
TVD: 1,836.92'
Inclination: 2.16 °
Azimuth: 272.4 °
VS: 3.31'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt, abnt glau
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, abnt
glau, abnt lith frag

167 124u



89u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

MD: 1,932'
TVD: 1,931.79'
Inclination: 3.77 °
Azimuth: 275.45 °
VS: 3.92'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt, abnt glau
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, abnt
glau, abnt lith frag

179u

152

131u

132u

WT IN 8.45/ OUT 8.45
VIS IN 27/ OUT 27

MD: 2,026'
TVD: 2,025.52'
Inclination: 4.88 °
Azimuth: 266.88 °
VS: 4.35'

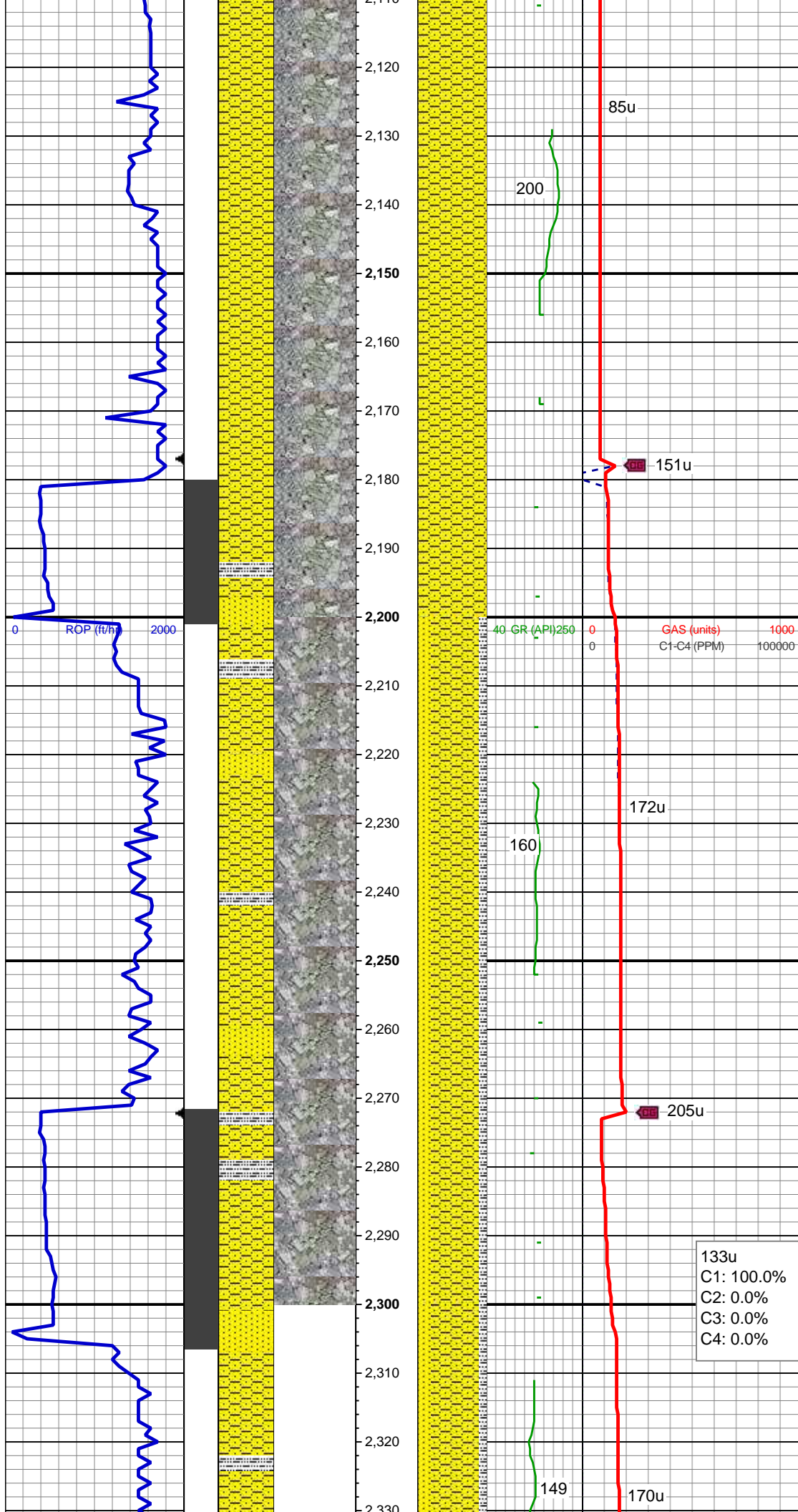
84u

148

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt, abnt glau
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, abnt
glau, abnt lith frag

87u

86u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%



MD: 2,121'
TVD: 2,120.12'
Inclination: 5.7 °
Azimuth: 256.74 °
VS: 3.47'

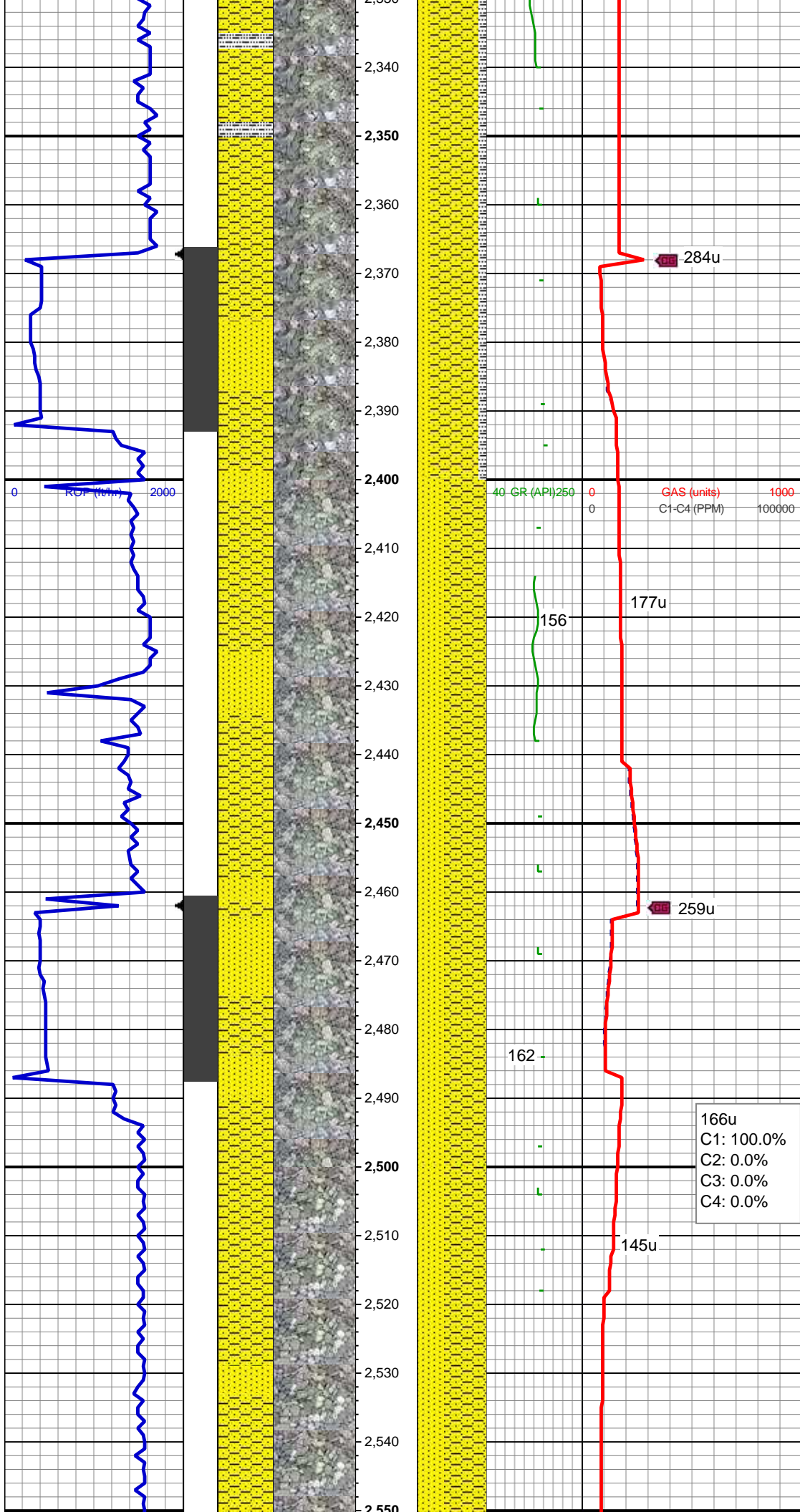
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt, abnt glau,
occ lith frag

MD: 2,216'
TVD: 2,214.53'
Inclination: 7.11 °
Azimuth: 254.81 °
VS: 1.36'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, occ
glau, occ lith frag
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
silty tex, arg cmt

133u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

MD: 2,311'
TVD: 2,308.51'
Inclination: 9.59 °
Azimuth: 257.45 °
VS: -1.24'



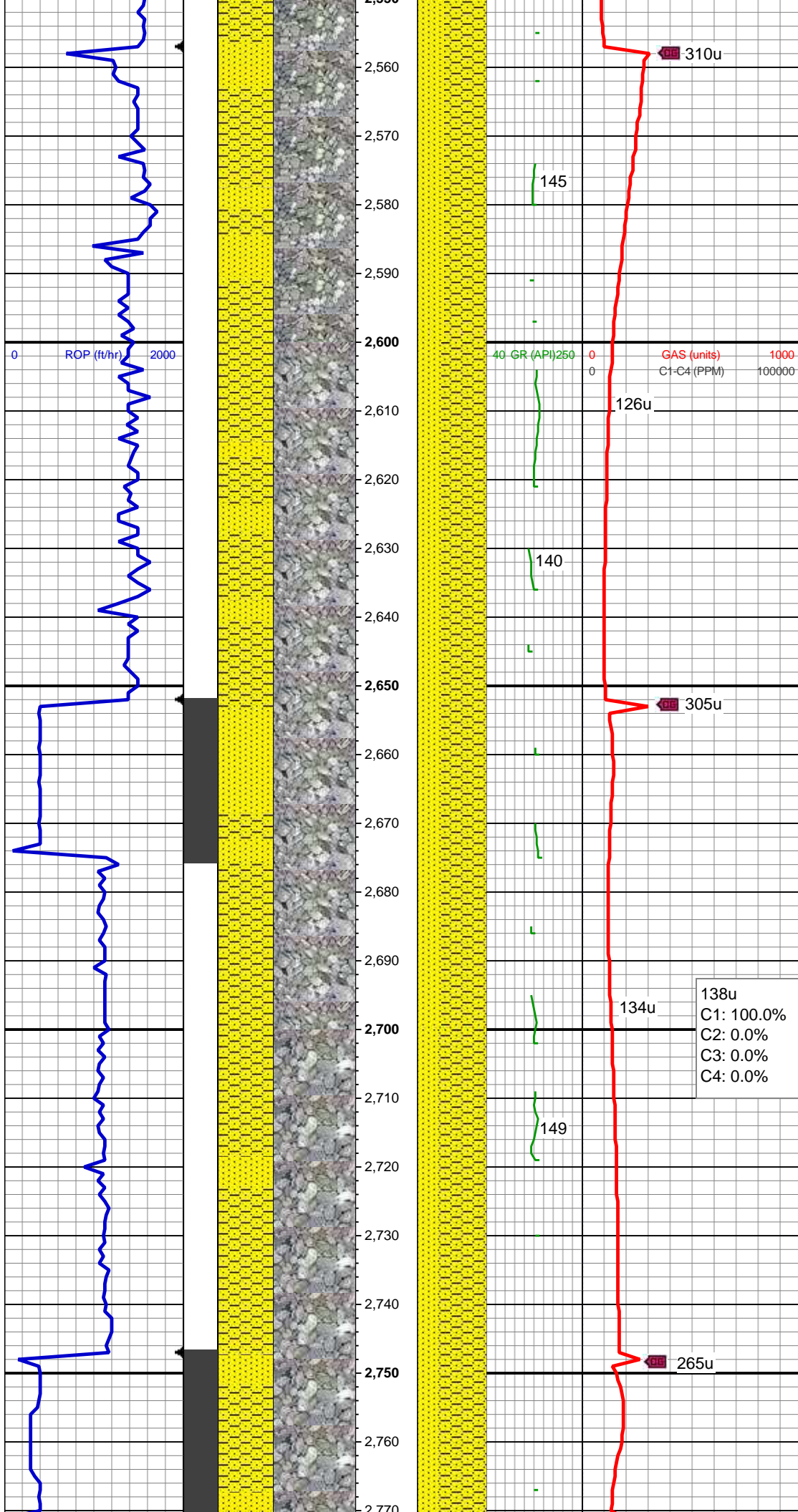
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, occ
glau, occ lith frag
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sfty tex, arg cmt

MD: 2,406'
TVD: 2,402.13'
Inclination: 10.01 °
Azimuth: 249.53 °
VS: -5.07'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, occ
glau, occ lith frag

MD: 2,501'
TVD: 2,495.51'
Inclination: 11.18 °
Azimuth: 252.15 °
VS: -9.96'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -



v f gr, mod rnd, p srt, p por, arg cmt, occ glau, occ lith frag

MD: 2,596'
TVD: 2,588.81'
Inclination: 10.5 °
Azimuth: 252.49 °
VS: -14.54'

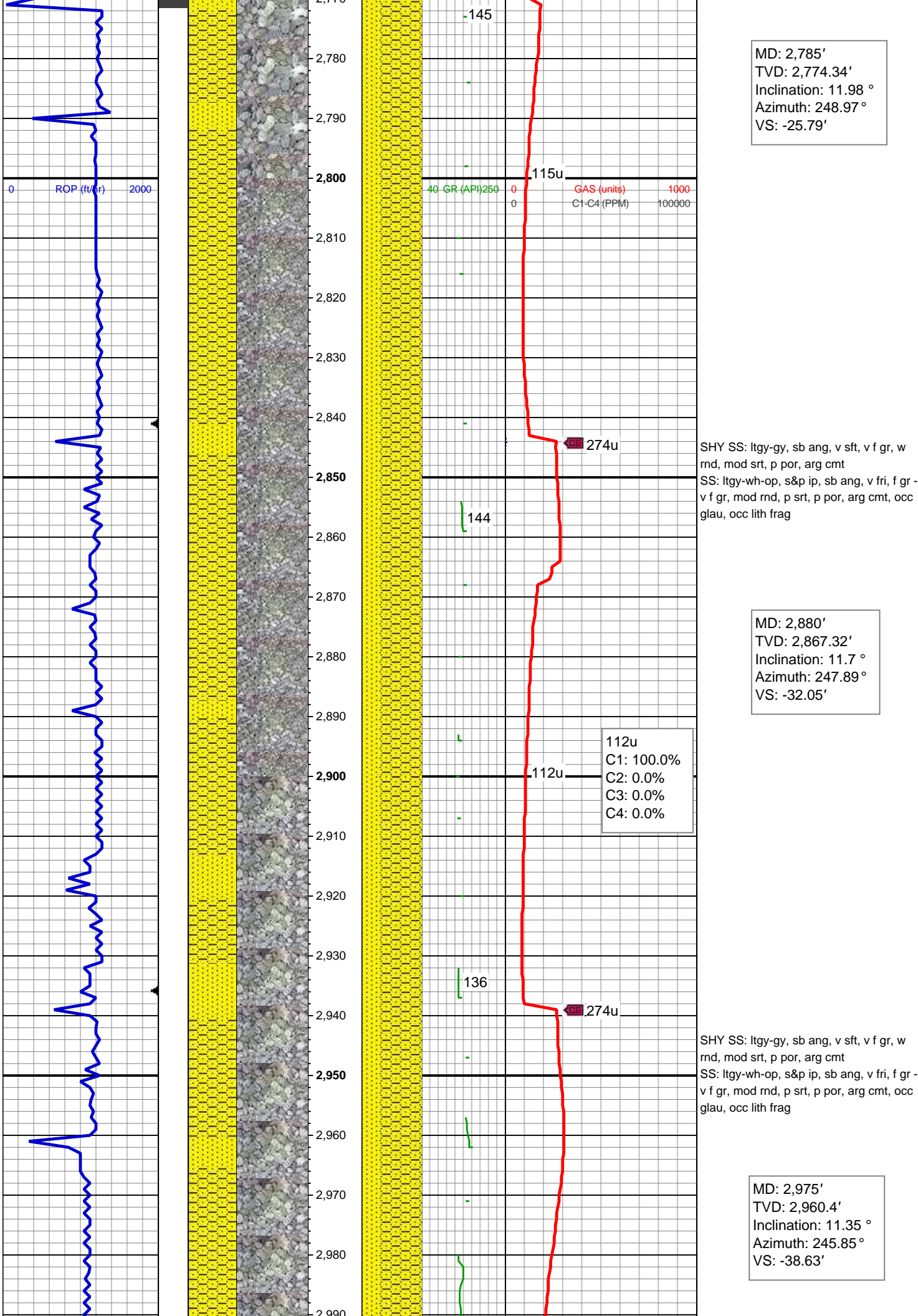
WT IN 8.40/ OUT 8.40
VIS IN 27/ OUT 27

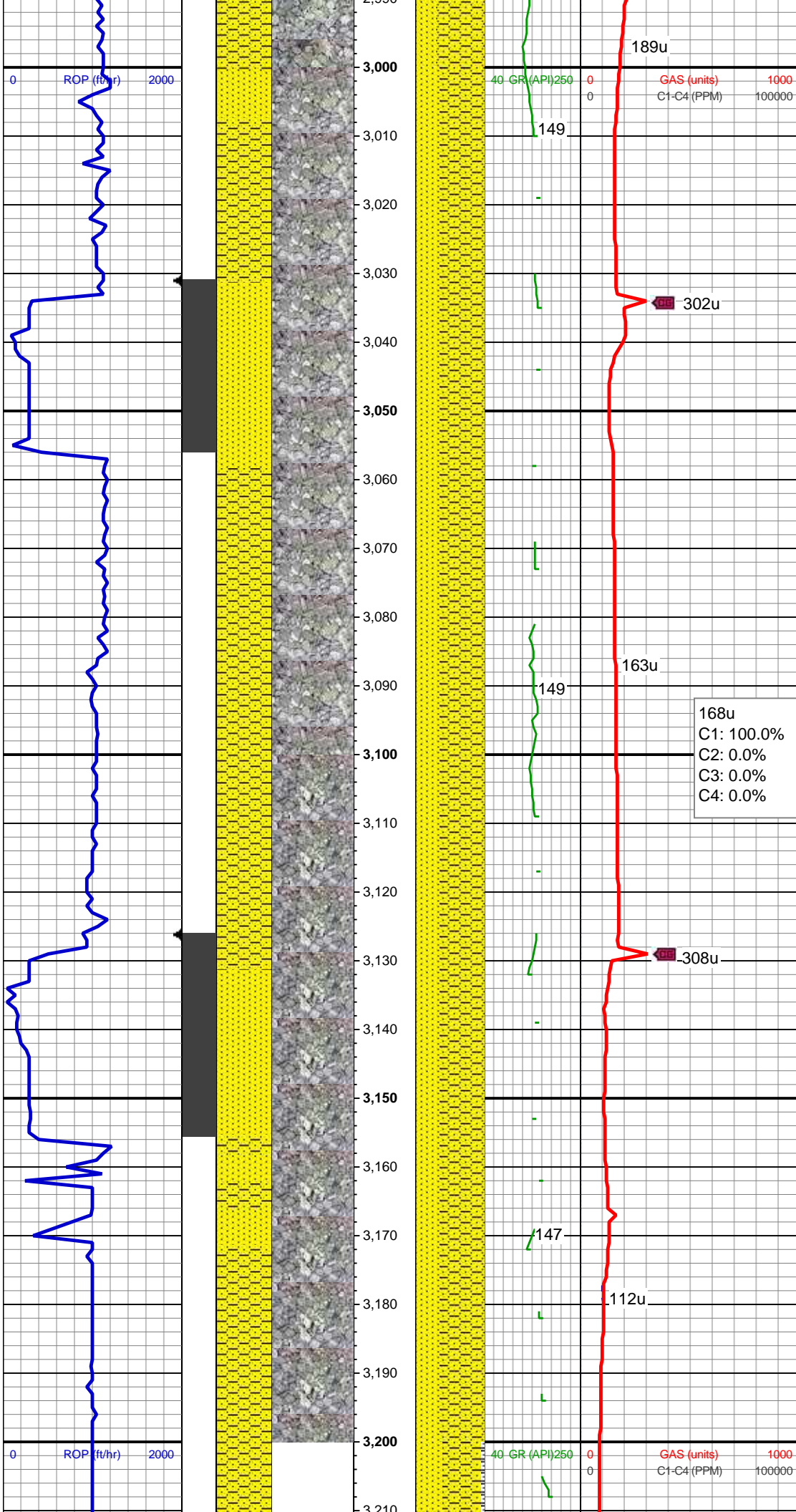
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr - v f gr, mod rnd, p srt, p por, arg cmt, occ glau, occ lith frag

MD: 2,690'
TVD: 2,681.2'
Inclination: 10.75 °
Azimuth: 247.27 °
VS: -19.7'

138u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr - v f gr, mod rnd, p srt, p por, arg cmt, occ glau, occ lith frag





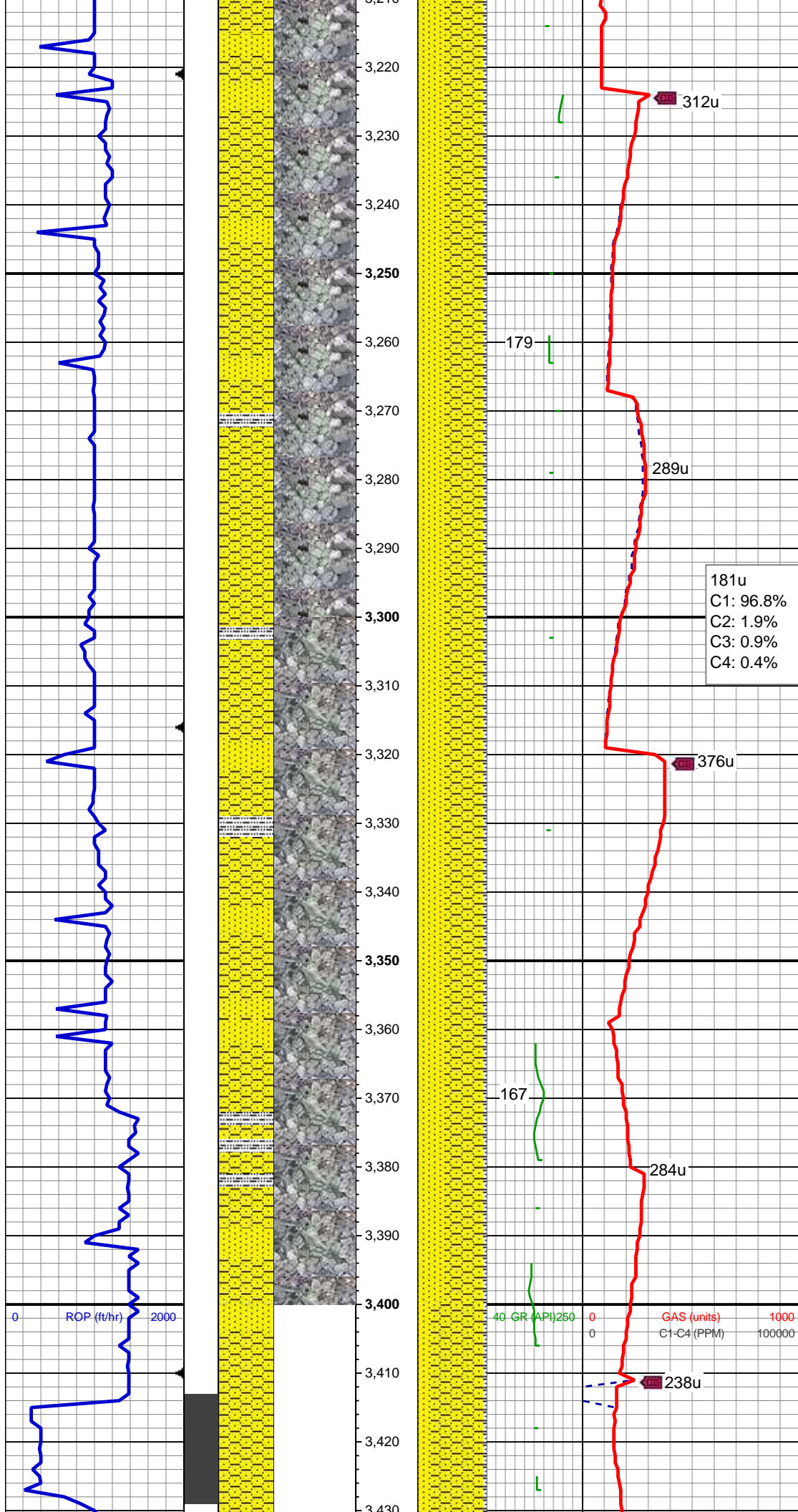
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, occ
glau, occ lith frag

MD: 3,070'
TVD: 3,053.69'
Inclination: 10.47 °
Azimuth: 253.16 °
VS: -44.12'

168u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, occ
glau, occ lith frag

MD: 3,165'
TVD: 3,147.03'
Inclination: 10.99 °
Azimuth: 255.4 °
VS: -48.06'



SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, occ
glau, occ lith frag
SLTY SH: gy-dk gy, sb blk-y-sb plty, v sft,
sly tex, arg cmt; tr pyr

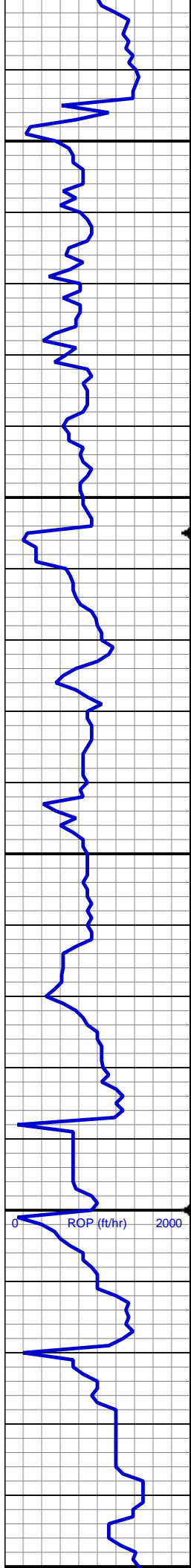
MD: 3,260'
TVD: 3,240.54'
Inclination: 9.3 °
Azimuth: 250.51 °
VS: -52.11'

181u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

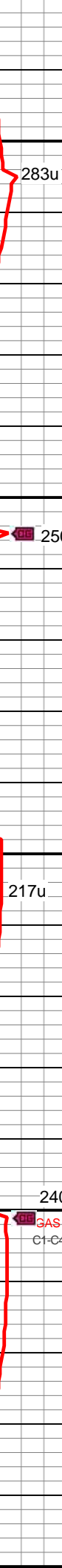
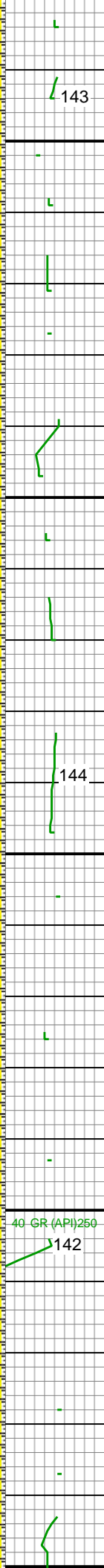
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, occ
glau, occ lith frag
SLTY SH: gy-dk gy, sb blk-y-sb plty, v sft,
sly tex, arg cmt; tr pyr

MD: 3,354'
TVD: 3,333.35'
Inclination: 8.97 °
Azimuth: 250.77 °
VS: -56.35'

MD: 3,449'
TVD: 3,426.99'
Inclination: 10.43 °



3,430
3,440
3,450
3,460
3,470
3,480
3,490
3,500
3,510
3,520
3,530
3,540
3,550
3,560
3,570
3,580
3,590
3,600
3,610
3,620
3,630
3,640
3,650



98u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

Azimuth: 255.77 °
VS: -60.14'

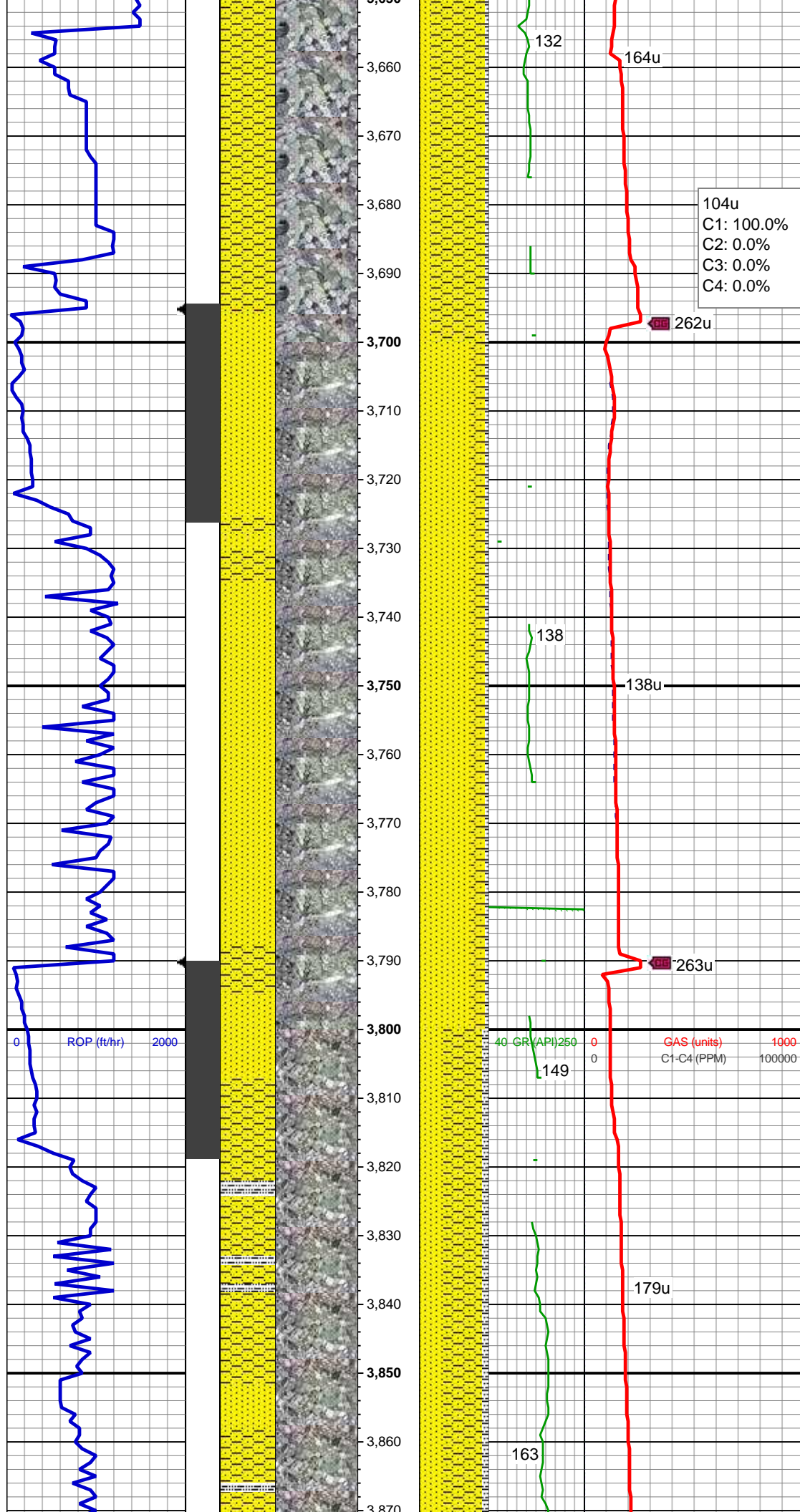
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, occ
glau, occ lith frag
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sly tex, arg cmt; tr pyr

MD: 3,544'
TVD: 3,520.29'
Inclination: 11.25 °
Azimuth: 255.94 °
VS: -63.65'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, occ
glau, occ lith frag
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sly tex, arg cmt; tr pyr

MD: 3,639'
TVD: 3,613.46'
Inclination: 11.31 °
Azimuth: 255.34 °
VS: -67.36'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, occ



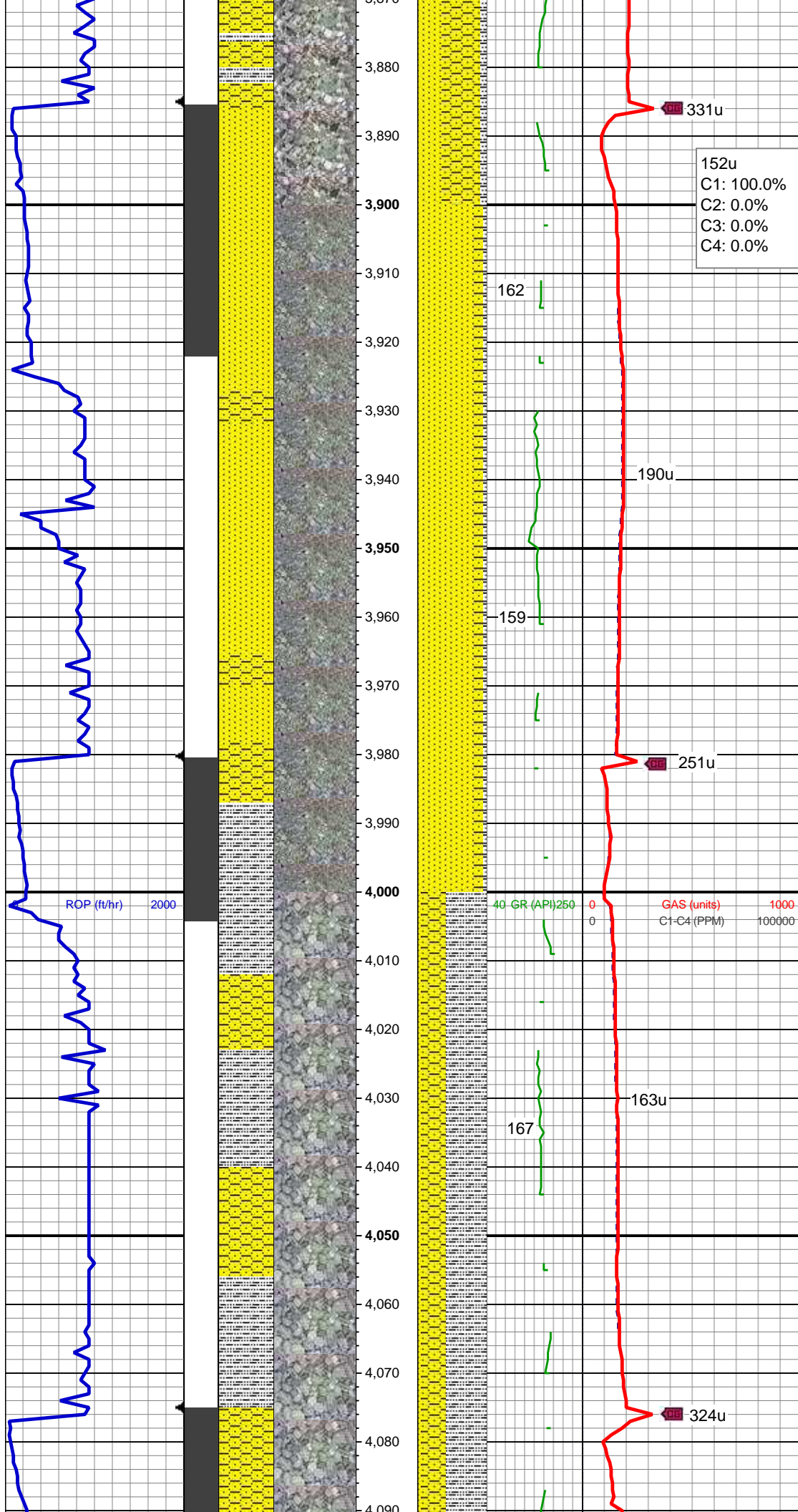
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, occ
glau, occ lith frag
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sfty tex, arg cmt; tr pyr

MD: 3,734'
TVD: 3,706.83'
Inclination: 9.91 °
Azimuth: 252.76 °
VS: -71.31'

SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, occ
glau, occ lith frag
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sfty tex, arg cmt; occ pyr

MD: 3,829'
TVD: 3,800.68'
Inclination: 7.91 °
Azimuth: 253.2 °
VS: -74.92'

SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, occ
glau, occ lith frag
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sfty tex, arg cmt; occ pyr

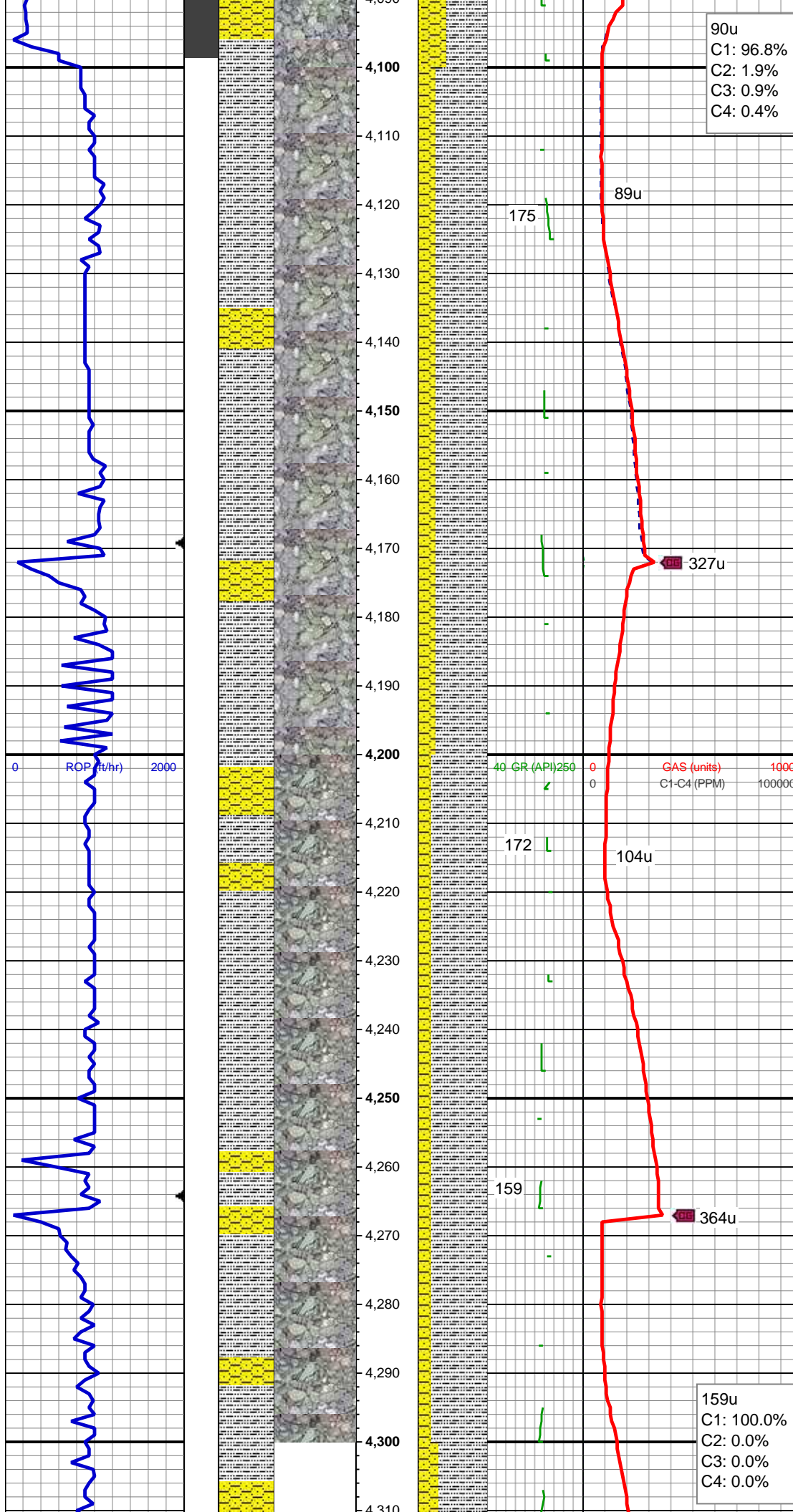


MD: 3,924'
TVD: 3,895.12'
Inclination: 4.41 °
Azimuth: 262.19 °
VS: -76.82'

SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, occ
glau, occ lith frag
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sfty tex, arg cmt; occ pyr

MD: 4,019'
TVD: 3,989.97'
Inclination: 1.88 °
Azimuth: 241.35 °
VS: -77.81'

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sfty tex, arg cmt
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt
SS: ltgy-wh-op, s&p ip, sb ang, v fri, f gr -
v f gr, mod rnd, p srt, p por, arg cmt, occ
glau, occ lith frag; occ pyr



WT IN 9.0/ OUT 8.80+
VIS IN 29/ OUT 28

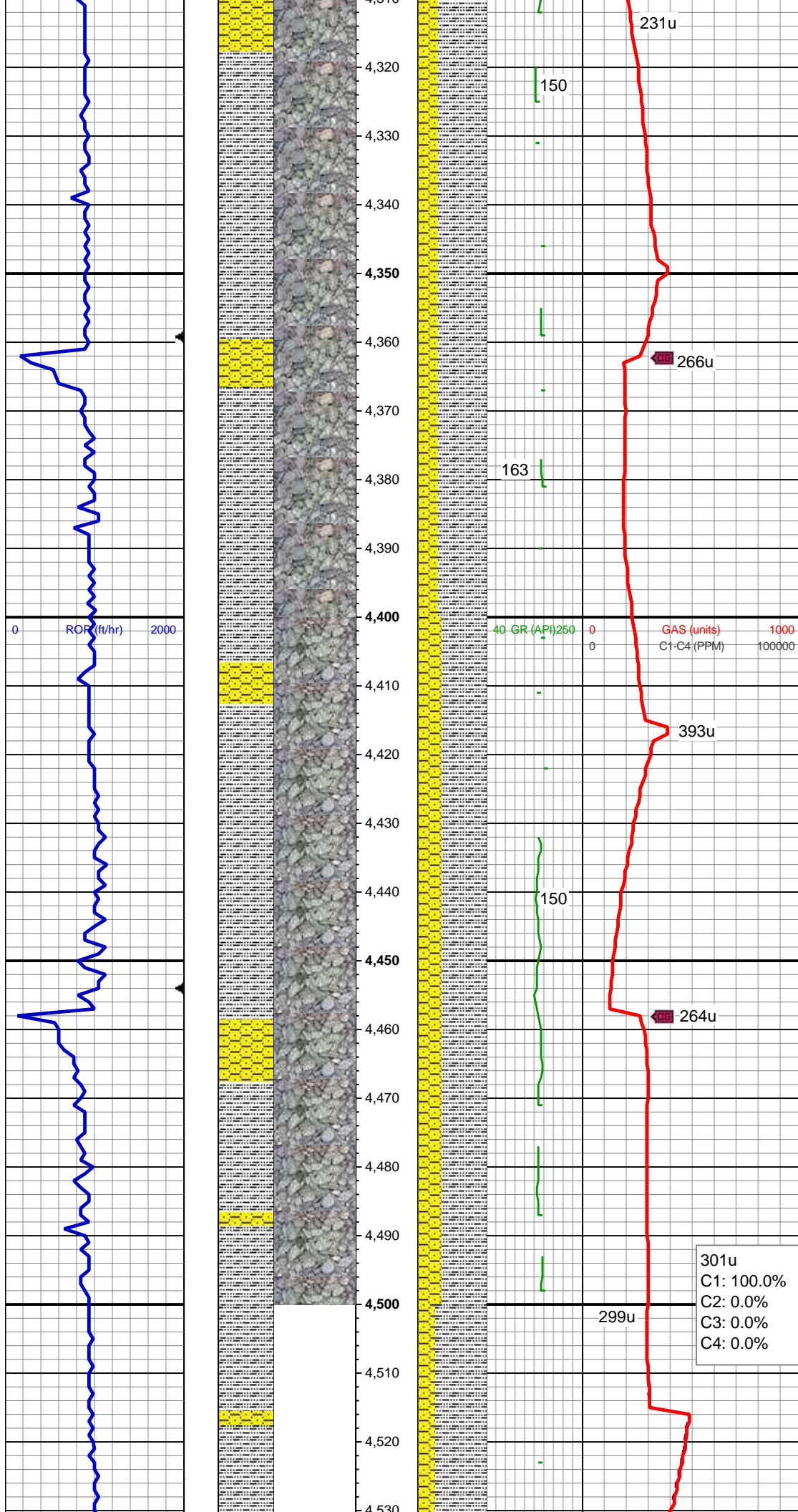
MD: 4,113'
TVD: 4,083.95'
Inclination: 1.27 °
Azimuth: 126.21 °
VS: -79.14'

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sfty tex, arg cmt
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt; tr pyr, tr foss
frags

MD: 4,208'
TVD: 4,178.93'
Inclination: 1.11 °
Azimuth: 93.13 °
VS: -79.9'

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sfty tex, arg cmt
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt; tr pyr

MD: 4,303'
TVD: 4,273.92'
Inclination: 0.87 °
Azimuth: 96.27 °
VS: -80.11'



SLTY SH: gy-dk gy, sb blkly-sb plty, v sft, slty tex, arg cmt
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w rnd, mod srt, p por, arg cmt

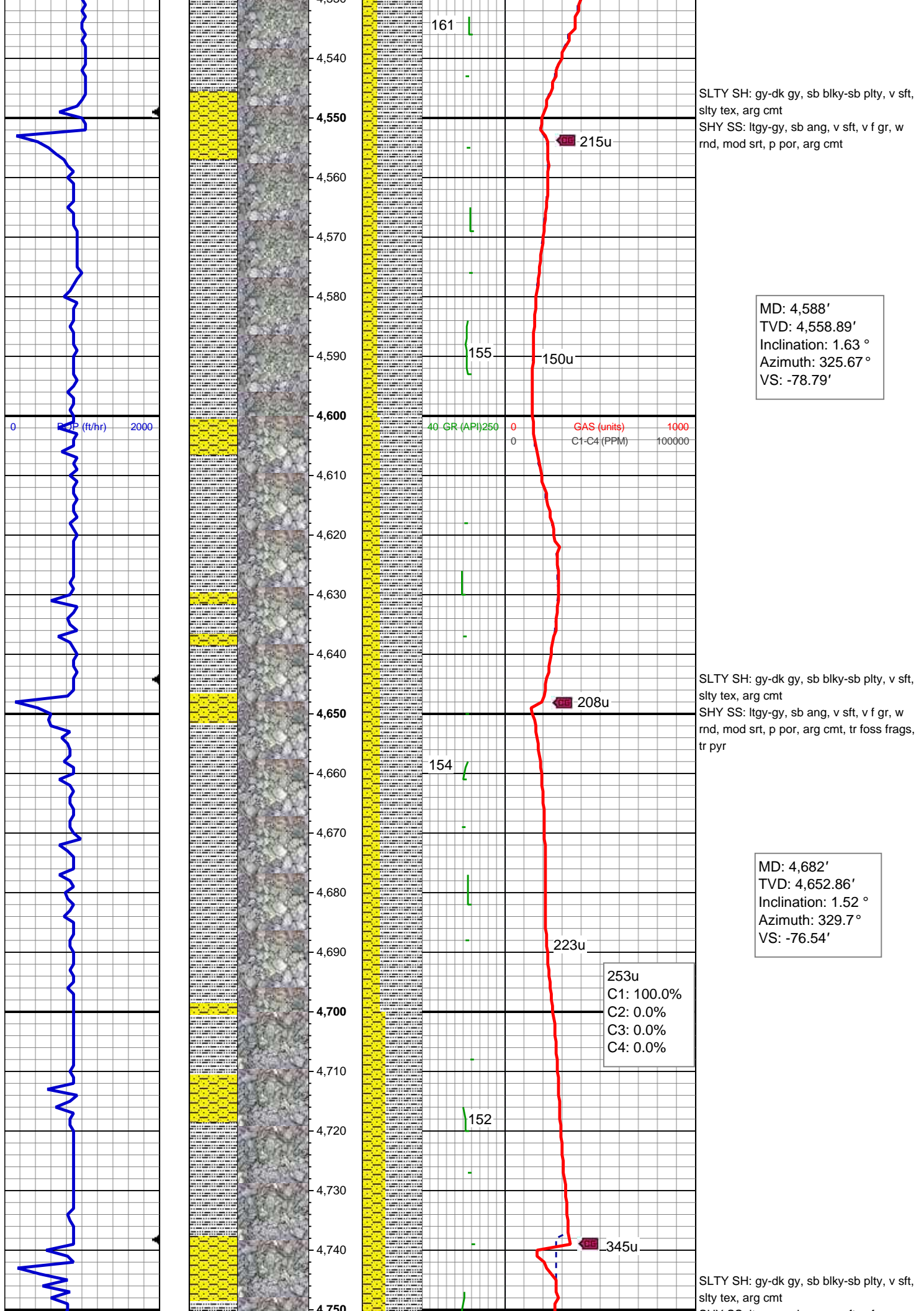
MD: 4,398'
TVD: 4,368.91'
Inclination: 0.58 °
Azimuth: 87.68 °
VS: -80.23'

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft, slty tex, arg cmt
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w rnd, mod srt, p por, arg cmt

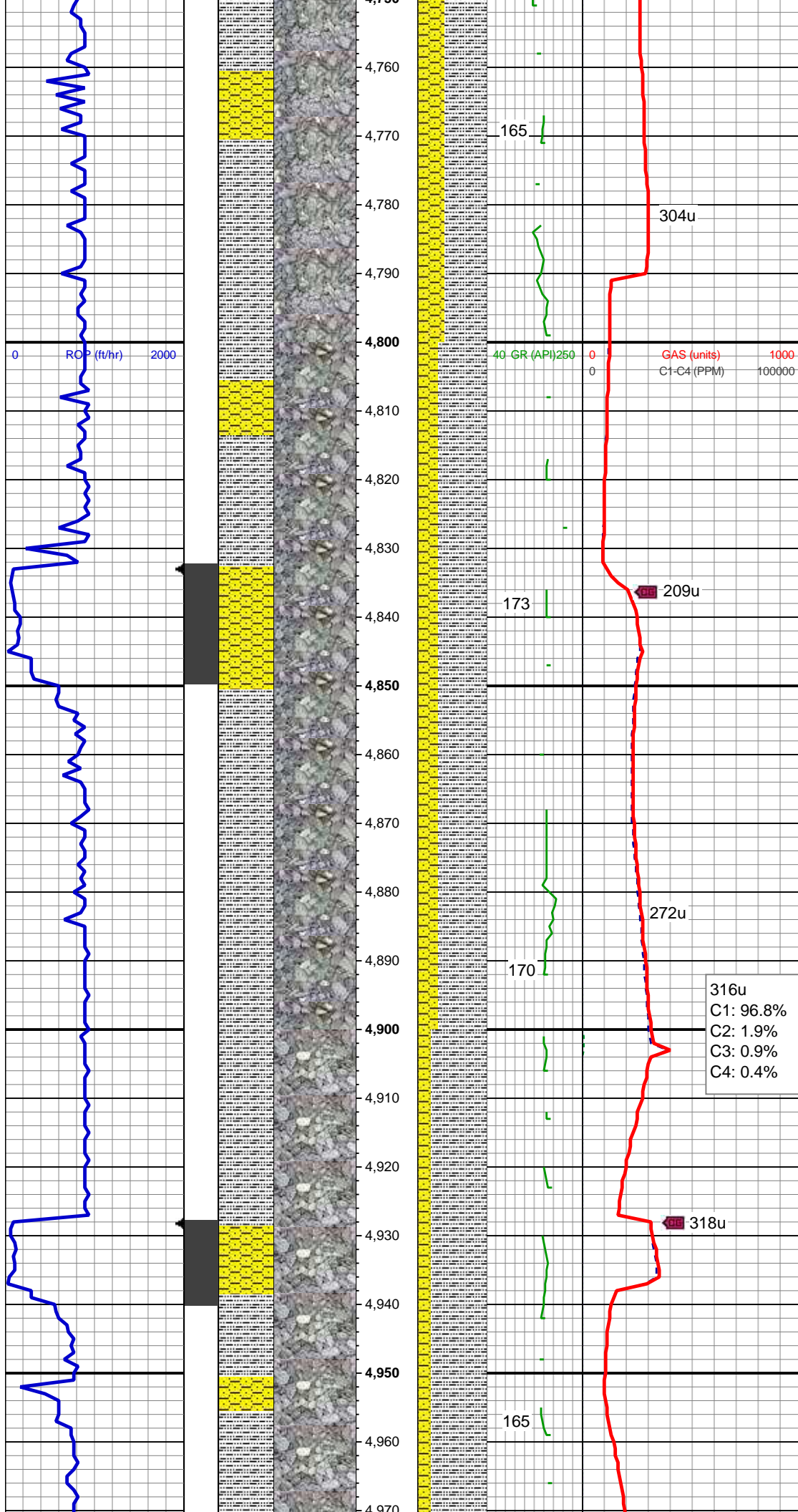
WT IN 9.20/ OUT 9.50
VIS IN 31/ OUT 33

MD: 4,493'
TVD: 4,463.91'
Inclination: 0.78 °
Azimuth: 74.11 °
VS: -80.09'

301u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%



SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt



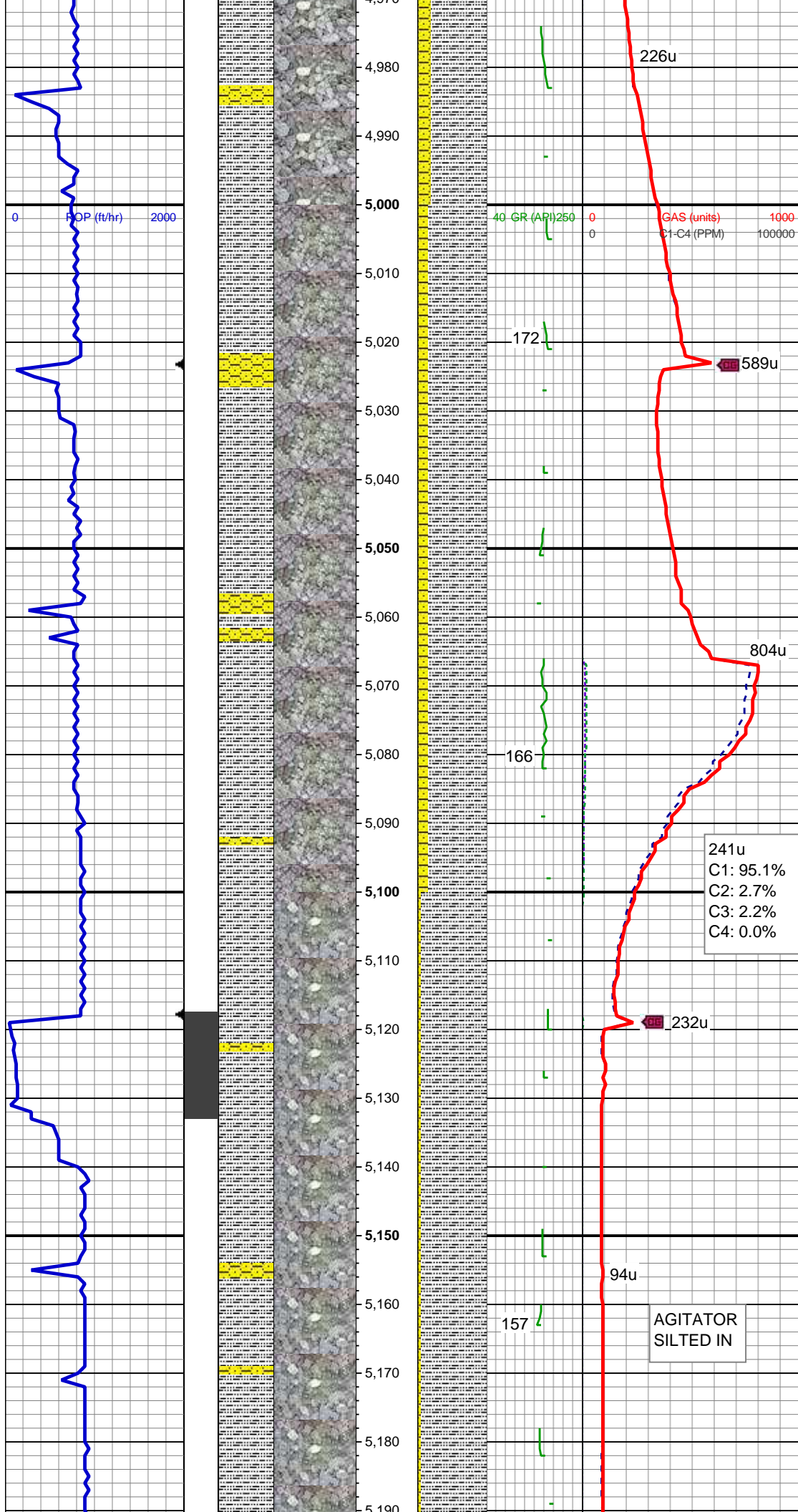
MD: 4,777'
TVD: 4,747.83'
Inclination: 0.99 °
Azimuth: 329.86 °
VS: -74.69'

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
silty tex, arg cmt
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt; tr pyr

MD: 4,872'
TVD: 4,842.83'
Inclination: 0.51 °
Azimuth: 71.09 °
VS: -73.85'

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
silty tex, arg cmt
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w
rnd, mod srt, p por, arg cmt; tr pyr, tr foss
frags

MD: 4,967'
TVD: 4,937.82'
Inclination: 0.82 °
Azimuth: 95.38 °



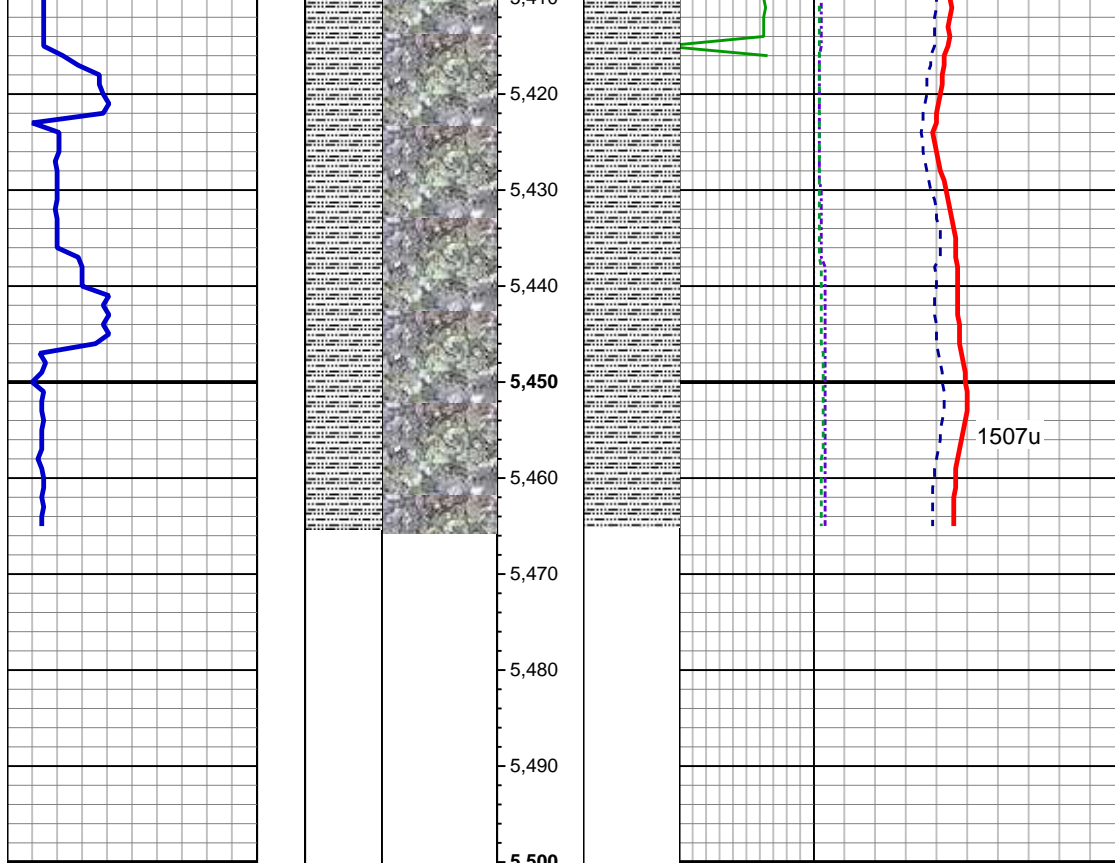
Azimuth: 95.50
VS: -73.83'

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft, slty tex, arg cmt
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w rnd, mod srt, p por, arg cmt; tr pyr

MD: 5,062'
TVD: 5,032.81'
Inclination: 0.5 °
Azimuth: 116.26 °
VS: -74.13'

SLTY SH: gy-dk gy, sb blkly-sb plty, v sft, slty tex, arg cmt
SHY SS: ltgy-gy, sb ang, v sft, v f gr, w rnd, mod srt, p por, arg cmt; occ pyr

MD: 5,156'
TVD: 5,126.8'
Inclination: 1.61 °
Azimuth: 95.27 °
VS: -74.51'



SLTY SH: gy-dk gy, sb blkly-sb plty, v sft,
sly tex, arg cmt

TD @ 5465' MD
03/22/2014 @ 12:26 AM

LOG CONTINUES ON MPlot
"TRISHA LC29-78HNB
HORZ"