

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Steadfast E27-63-1HN

Location SEC26 T6N R65W

State COLORADO

County WELD

Country USA

Rig Number PRECISION 828

API Number 05-123-38159

AFE # 139769

Region DENVER-JULESBURG BASIN

Field WATTENBERG

Spud Date 5/5/2014

Drilling Completed 5/13/2014

Surface Coordinates 395' FSL, 280' FEL

LAT/LONG: 40.45077/-104.62175

Ground Elevation 4676'

K.B. Elevation 4692'

Logged Interval 600' To 6320'

Total Depth 13528'

Formation FOX HILLS, PIERRE, PARKMAN, SUSSEX, SHANNON, TEEPEE BUTTES

Type of Drilling Fl... FRESH WATER, LSND

Operator

Company NOBLE ENERGY INC.

Address 1625 Broadway
Denver, CO 80202

Geologist

Name EVAN HOWELL

Company NOBLE ENERGY INC.

Address 1625 Broadway
Denver, CO 80202

Other

Wellsite Geologists: GARY MYERS, GABE RUBIO, JEREMY LOFTNESS

Rock Types



Other Symbols

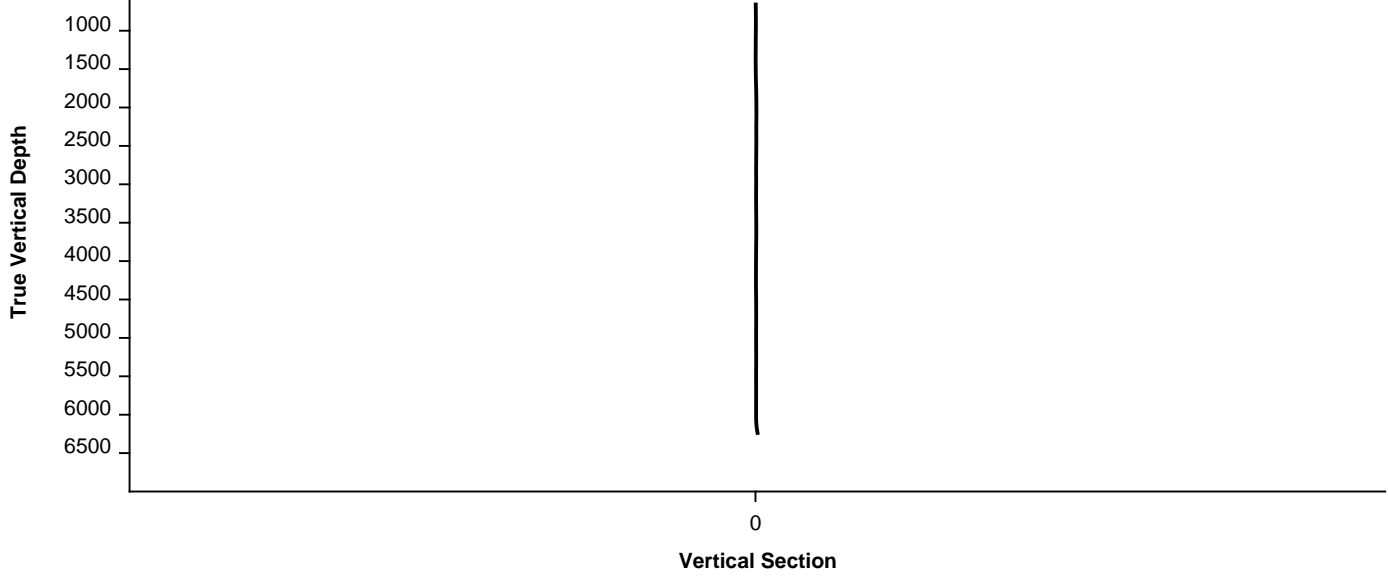


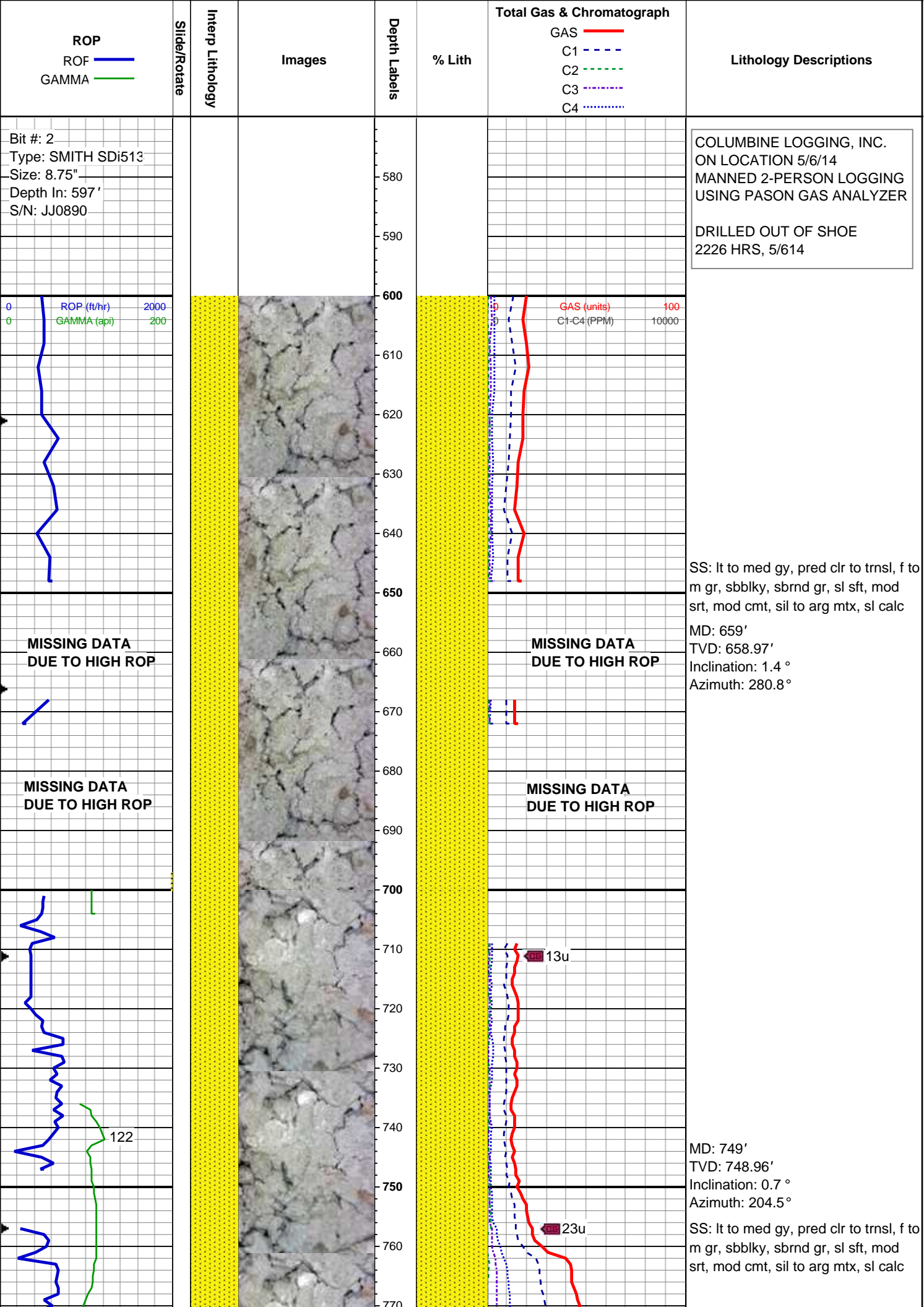
Survey Plan

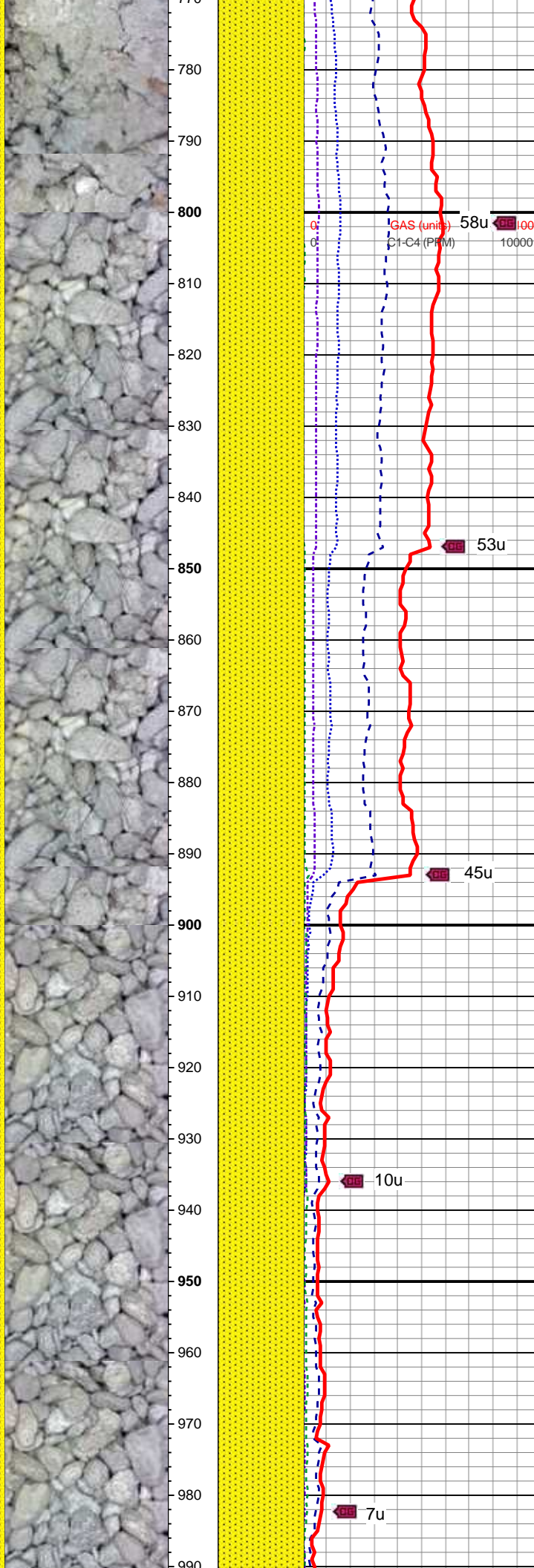
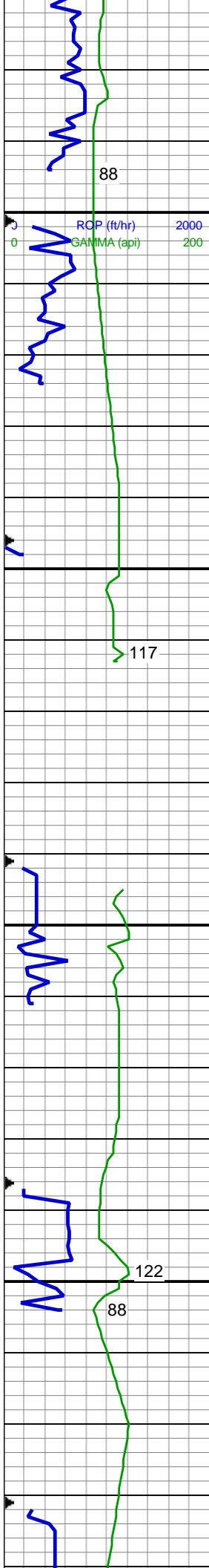


Survey Elevation



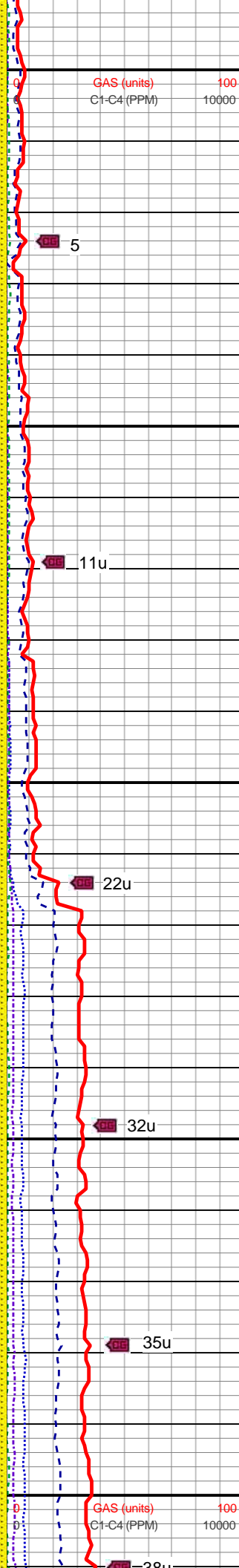
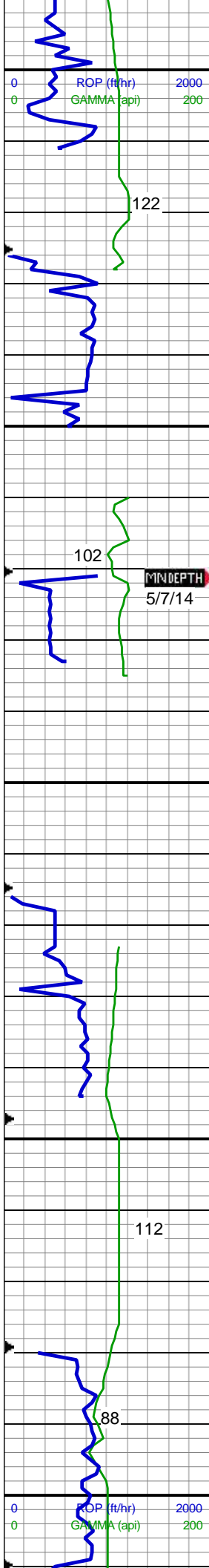






MD: 839'
TVD: 838.95'
Inclination: 0.8 °
Azimuth: 215°
SS: lt to med gy, pred clr to trnsf, f to m gr, sbbly, sbrnd gr, sl sft, mod srt, mod cmt, sil to arg mtx, sl calc

MD: 929'
TVD: 928.95'
Inclination: 1.1 °
Azimuth: 7.1°
SS: lt to med gy, pred clr to trnsf, f to m gr, sbbly, sbrnd gr, sl sft, mod srt, mod cmt, sil to arg mtx, sl calc



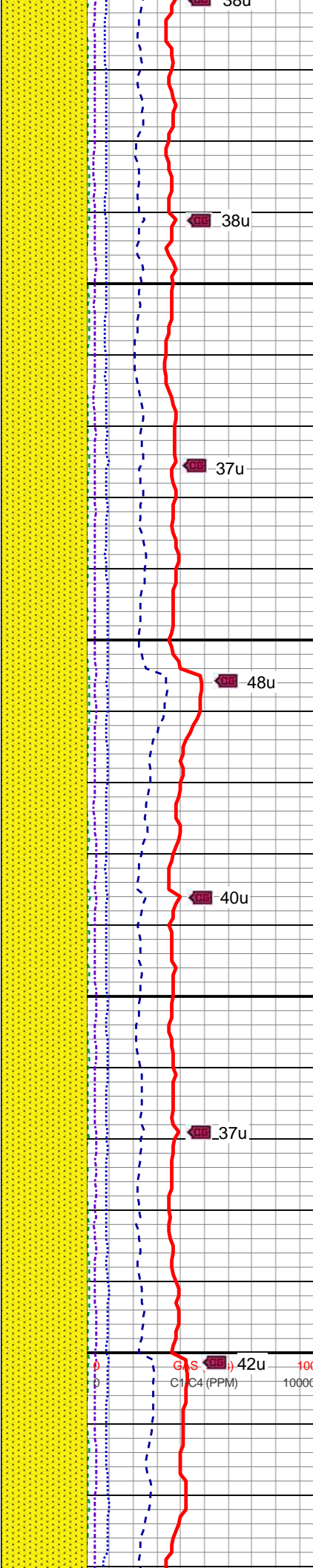
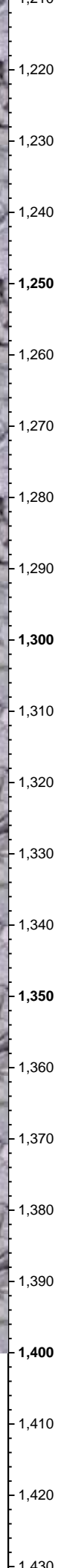
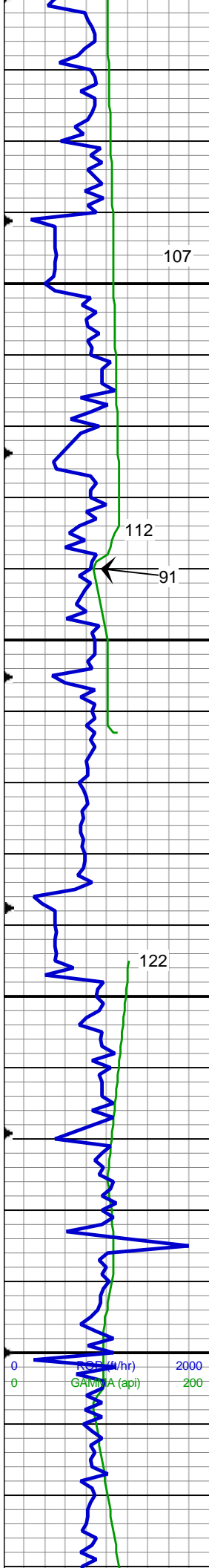
MD: 1,018'
TVD: 1,017.89'
Inclination: 3 °
Azimuth: 21.3°

SS: lt to med gy, pred clr to trnsl, f to m gr, sbbly, sbrnd gr, sl sft, mod srt, mod cmt, sil to arg mtx, sl calc

MD: 1,095'
TVD: 1,094.74'
Inclination: 4.1 °
Azimuth: 9.7°

SS: lt to med gy, pred clr to trnsl, f to m gr, sbbly, sbrnd gr, sl sft, mod srt, mod cmt, sil to arg mtx, sl calc

MD: 1,190'
TVD: 1,189.43'
Inclination: 5.1 °
Azimuth: 7.3°

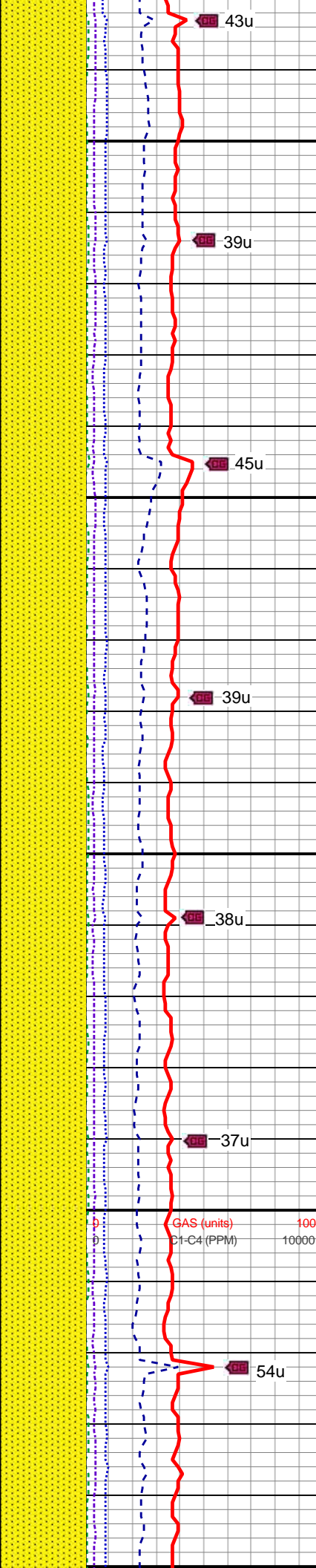
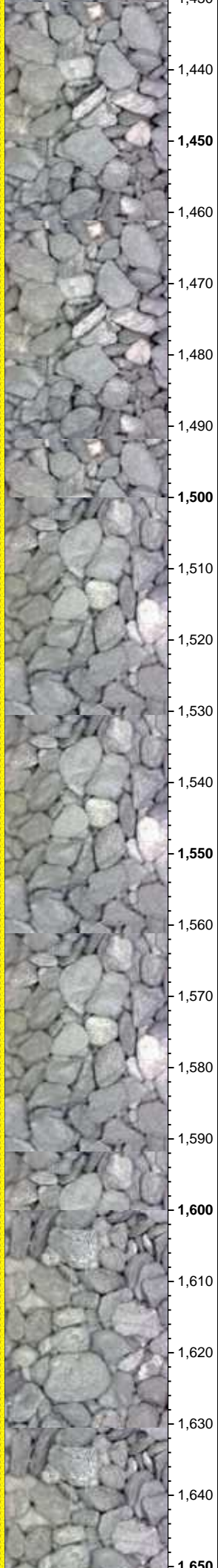
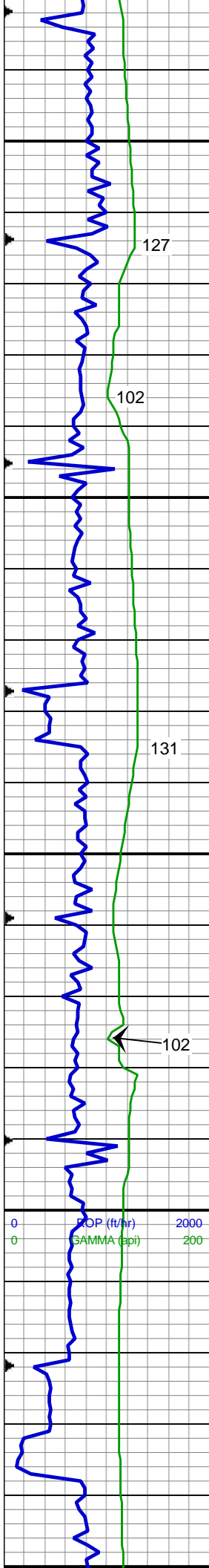


SS: lt to med gy, pred clr to trns, f to
m gr, sbbly, sbrnd gr, sl sft, mod
srt, mod cmt, sil to arg mtx, sl calc

MD: 1,285'
TVD: 1,283.93'
Inclination: 6.7 °
Azimuth: 9.5°

SS: lt to med gy, pred clr to trns, f to
m gr, sbbly, sbrnd gr, sl sft, mod
srt, mod cmt, sil to arg mtx, sl calc,
tr pyr

MD: 1,380'
TVD: 1,378.11'
Inclination: 8.3 °
Azimuth: 3.2°



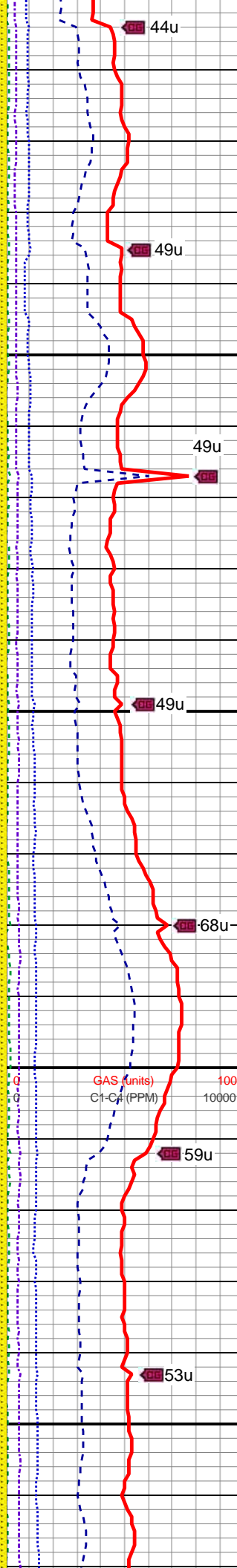
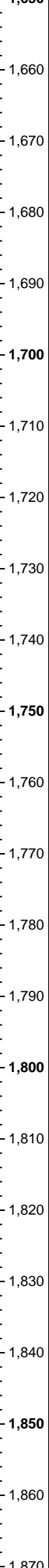
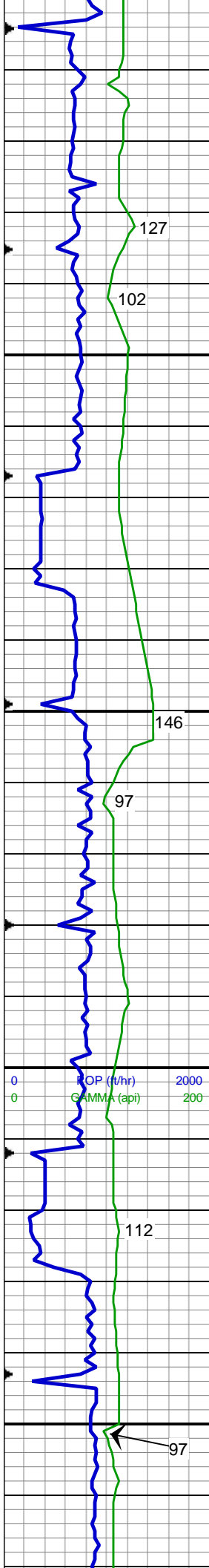
SS: v lt to mgy, s&p ip, pred clr to trnsl, f to m gr, sbbiky, sbrnd gr, sl sft to firm, mod srt, mod cmt, sil to arg mtx, sl calc

MD: 1,475'
TVD: 1,472.21'
Inclination: 7.5 °
Azimuth: 359.1 °

SS: v lt to mgy, s&p ip, pred clr to trnsl, f to m gr, sbbiky, sbrnd gr, sl sft to firm, mod srt, mod cmt, sil to arg mtx, sl calc

MD: 1,570'
TVD: 1,566.42'
Inclination: 7.3 °
Azimuth: 357.6 °

SS: v lt to mgy, s&p ip, pred clr to trnsl, f to m gr, sbbiky, sbrnd gr, sl



sft to firm, mod srt, mod cmt, sil to arg mtx, sl calc

MD: 1,665'
TVD: 1,660.58'
Inclination: 8 °
Azimuth: 353.7°

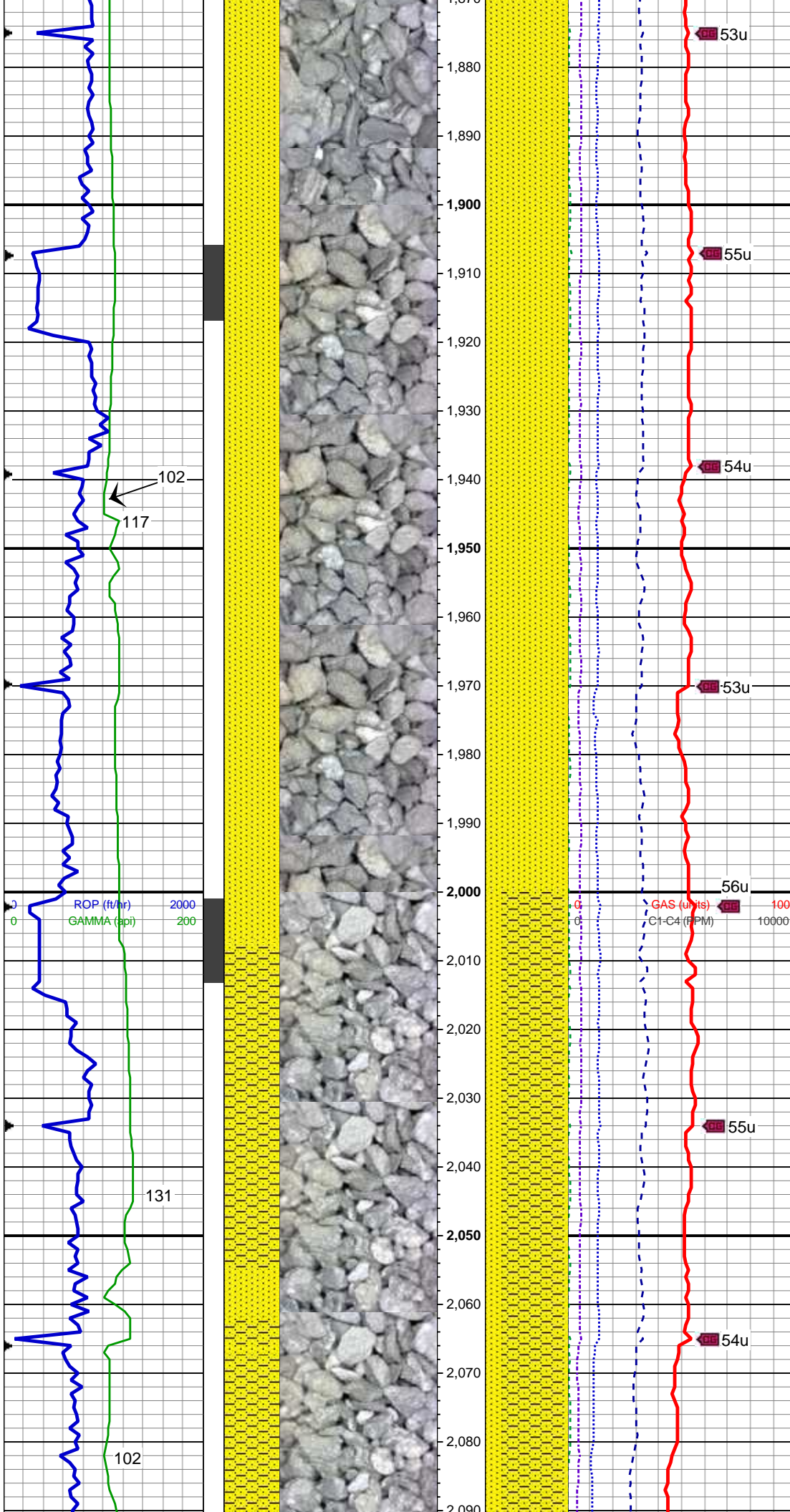
SS to SHYSS: v lt to mgy, s&p ip, pred clr to trnsf, f to m gr, grdg to vf gr, sbbiky, sbrnd gr, sl sft to firm, mod srt, mod cmt, sil to arg mtx, shy ip wi sh cls lamn, sl calc

MD: 1,760'
TVD: 1,754.52'
Inclination: 9.1 °
Azimuth: 355.6°

WT 8.4 / VIS 25

SS to SHYSS: v lt to mgy, s&p ip, pred clr to trnsf, f to m gr, grdg to vf gr, sbbiky, sbrnd gr, sl sft to firm, mod srt, mod cmt, sil to arg mtx, shy ip wi sh cls lamn, sl calc

MD: 1,855'
TVD: 1,848.31'
Inclination: 9.2 °
Azimuth: 359.5°

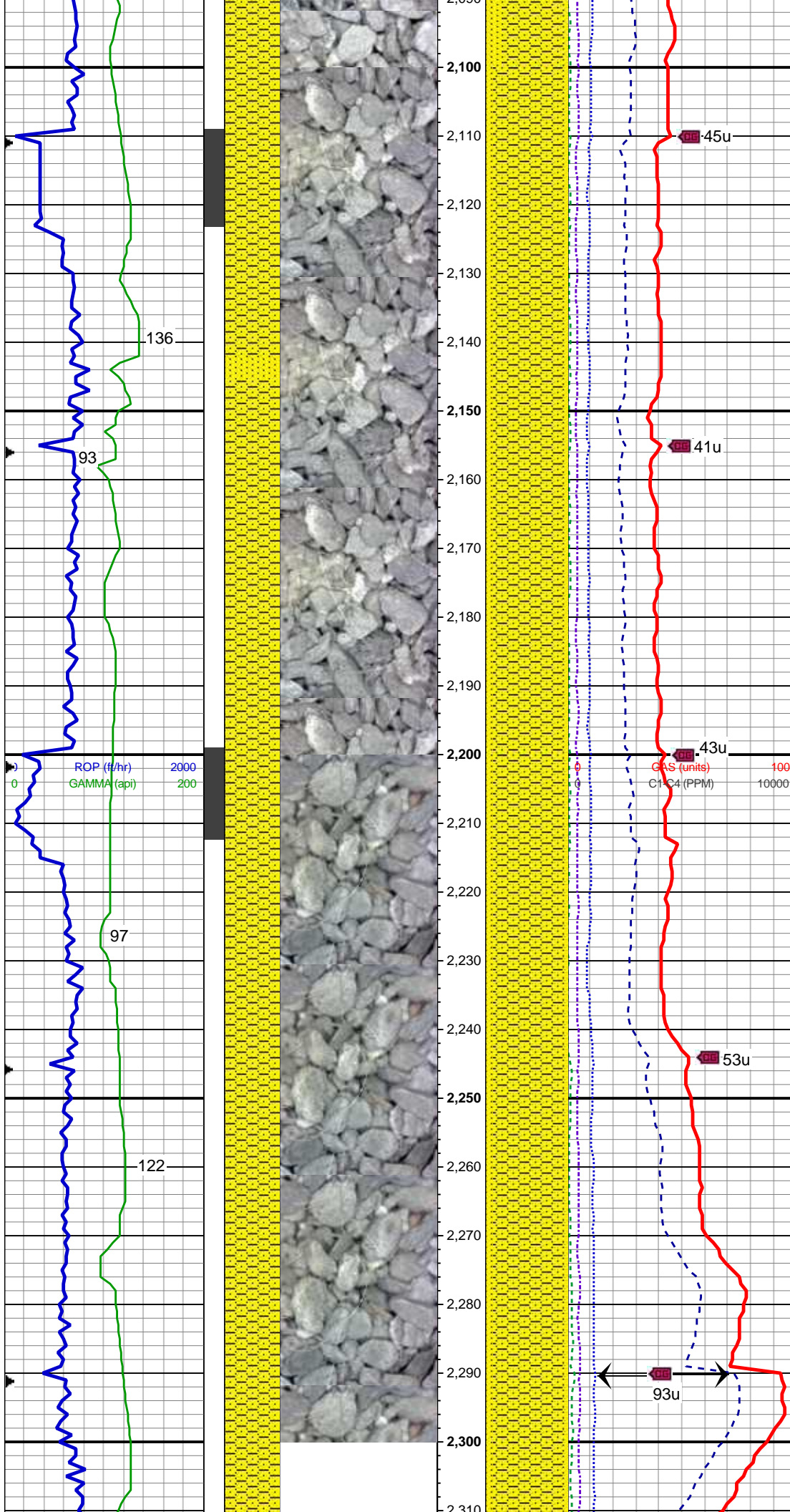


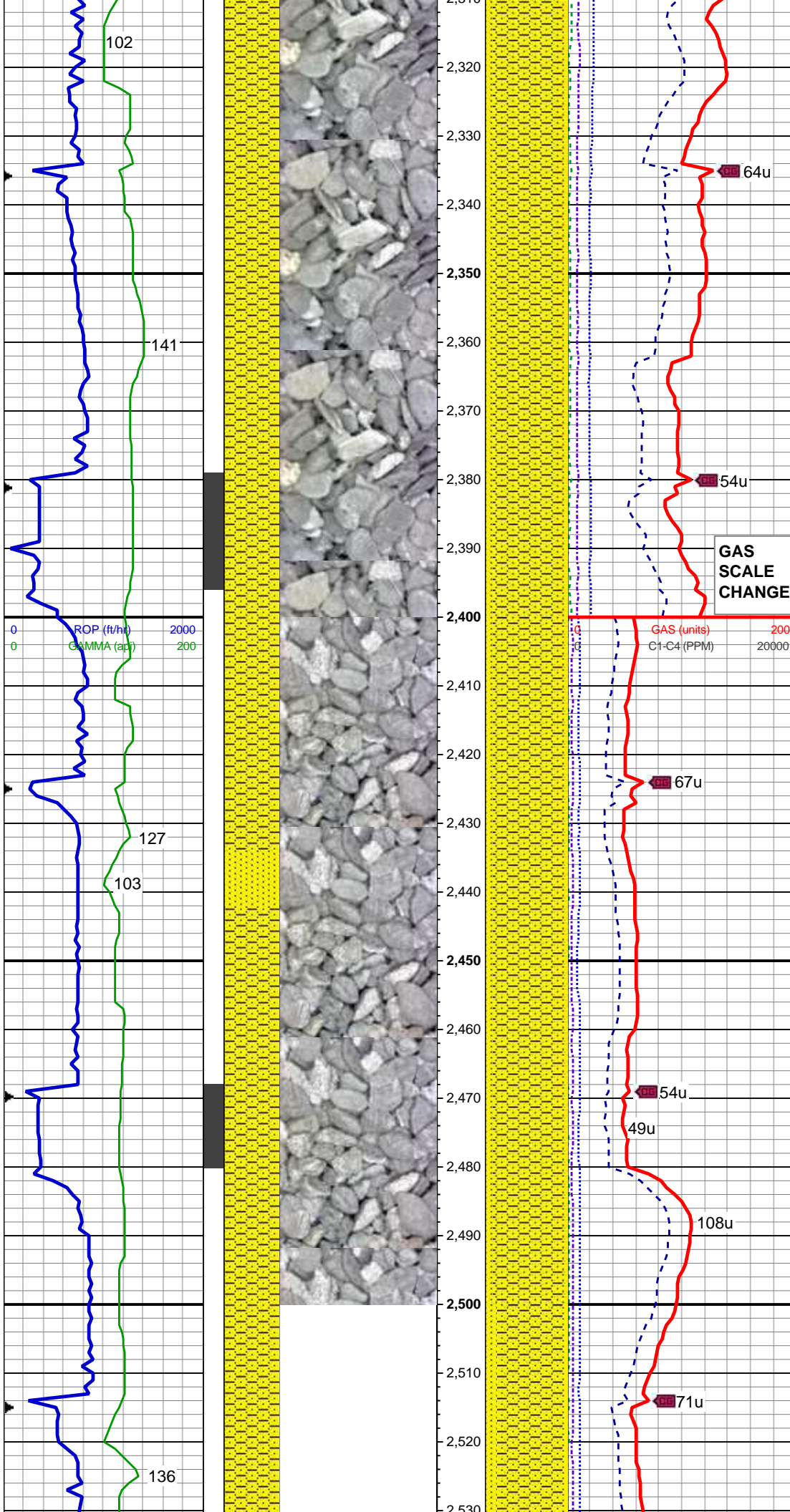
Depth: 1906'
WT 8.4
VIS 28
YP 1
pH 9.2
Cl- 800
Ca++ 40

MD: 1,950'
TVD: 1,942.13'
Inclination: 8.9 °
Azimuth: 1.3°
SS to SHYSS: v lt to mgy, s&p ip, pred clr to trns, f to m gr, grdg to vf gr, sbbly, sbrnd gr, sl sft to firm, mod srt, mod cmt, sil to arg mtx, shy ip wi sh cls lamn, sl calc

SHY SS: mgy, trns to op, vf to f gr, sbbly, sbrnd to sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, slty, grdg to shy sltst
SS: wh to mgy, clr to trns, f to mgr, sbbly, pred sbang gr, sl frm, mod srt, p to mod cmt, sil to arg mtx, sl calc

MD: 2,059'
TVD: 2,049.74'
Inclination: 9.4 °
Azimuth: 1.6°





MD: 2,329'
TVD: 2,316.44'
Inclination: 8 °
Azimuth: 2.7°

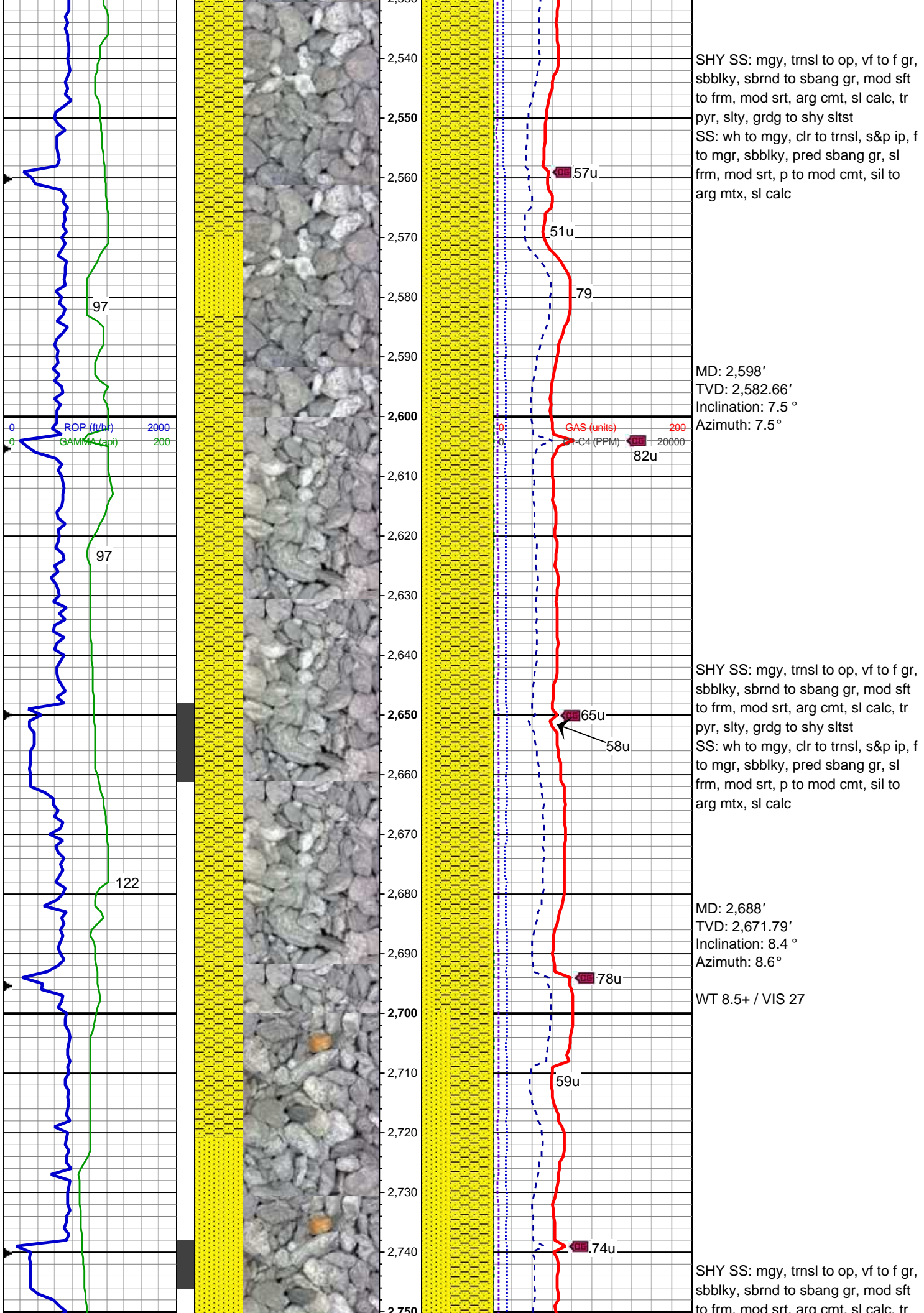
SHY SS: mgy, trnsl to op, vf to f gr, sbblky, sbrnd to sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, slty, grdg to shy sltst
SS: wh to mgy, clr to trnsl, s&p ip, f to mgr, sbblky, pred sbang gr, sl frm, mod srt, p to mod cmt, sil to arg mtx, sl calc

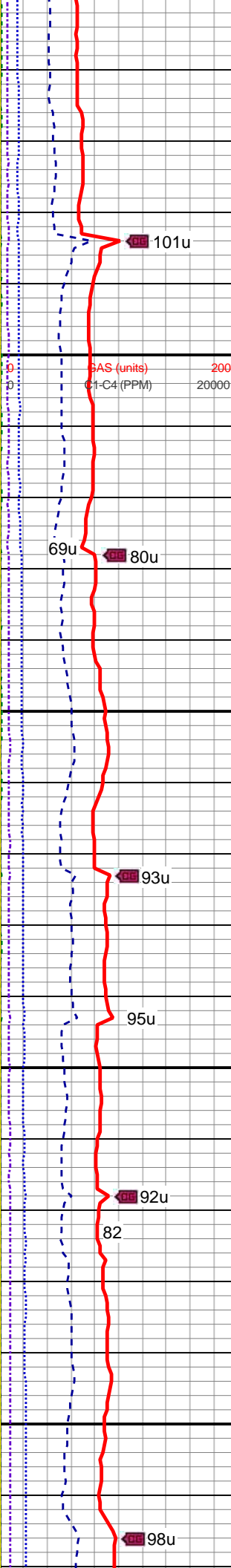
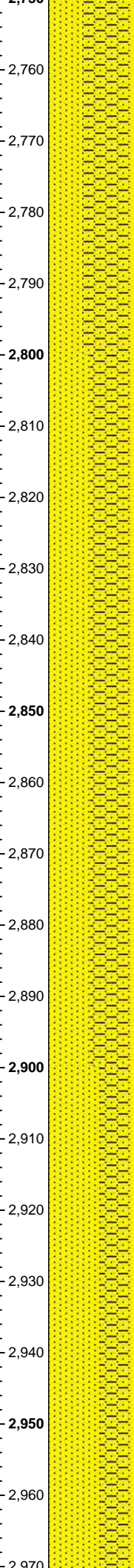
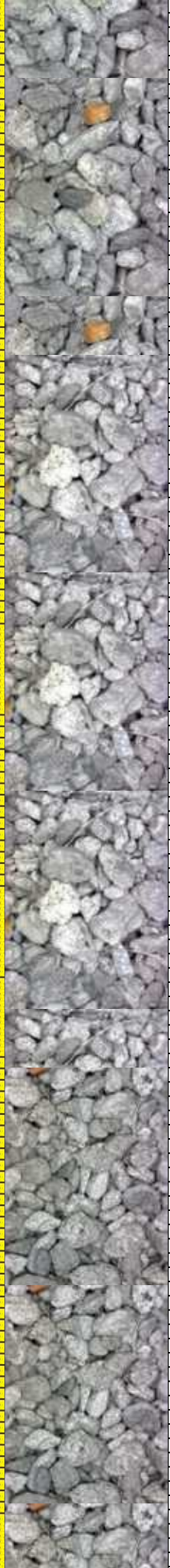
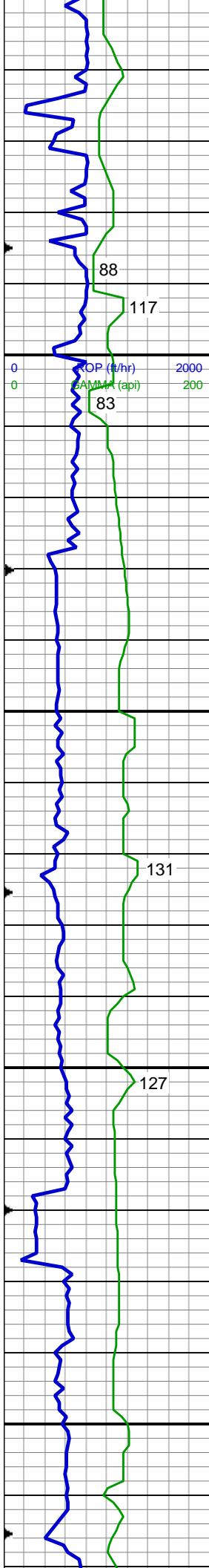
MD: 2,418'
TVD: 2,404.53'
Inclination: 8.4 °
Azimuth: 2.9°

WT 8.4+ / VIS 26

SHY SS: mgy, trnsl to op, vf to f gr, sbblky, sbrnd to sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, tr pyr, slty, grdg to shy sltst
SS: wh to mgy, clr to trnsl, s&p ip, f to mgr, sbblky, pred sbang gr, sl frm, mod srt, p to mod cmt, sil to arg mtx, sl calc

MD: 2,508'
TVD: 2,493.54'
Inclination: 8.6 °
Azimuth: 8.1°





pyr, slty, grdg to shy sltst
SS: wh to mgy, clr to trnsi, s&p ip,
mics ip, f to mgr, sbblky, pred
sbang gr, sl frm, mod srt, p to mod
cmt, sil to arg mtx, sl calc

MD: 2,778'
TVD: 2,760.66'
Inclination: 9.8 °
Azimuth: 6.5°

101u

69u 80u

SHY SS: mgy, trnsi to op, vf to f gr,
sbblky, sbrnd to sbang gr, mod sft
to frm, mod srt, arg cmt, sl calc, tr
pyr, slty, grdg to shy sltst
SS: wh to mgy, clr to trnsi, s&p ip,
mics ip, f to mgr, sbblky, pred
sbang gr, sl frm, mod srt, p to mod
cmt, sil to arg mtx, sl calc

MD: 2,868'
TVD: 2,849.34'
Inclination: 9.8 °
Azimuth: 2.8°

93u

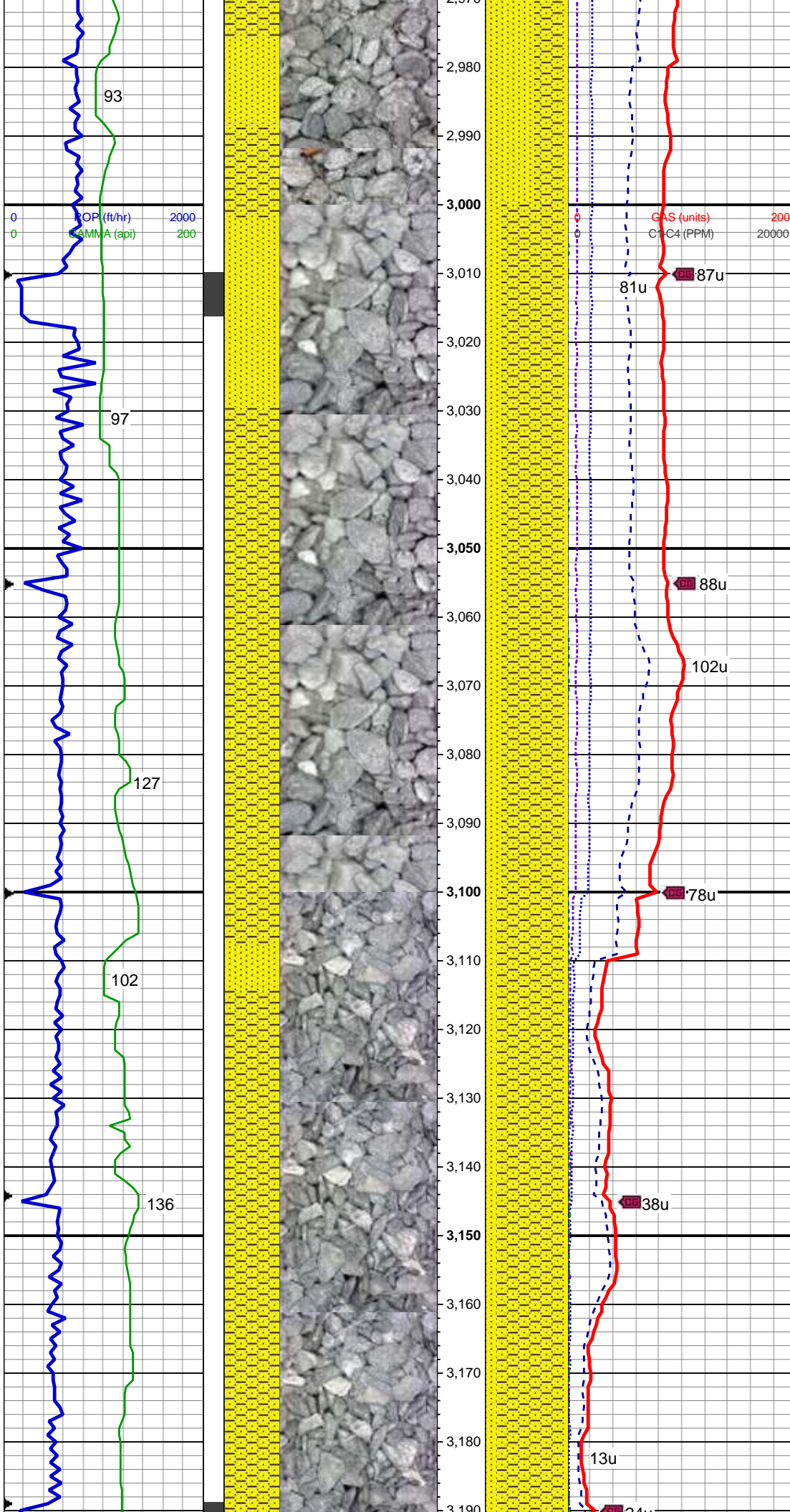
95u

82 92u

SS: wh to mgy, clr to trnsi, s&p ip,
mics ip, f to mgr, sbblky, pred
sbang gr, sl frm, mod srt, p to mod
cmt, sil to arg mtx, sl calc
SHY SS: mgy, trnsi to op, vf to f gr,
sbblky, sbrnd to sbang gr, mod sft
to frm, mod srt, arg cmt, sl calc, tr
pyr, slty, grdg to shy sltst

MD: 2,958'
TVD: 2,937.95'
Inclination: 10.4 °
Azimuth: 2.8°

98u

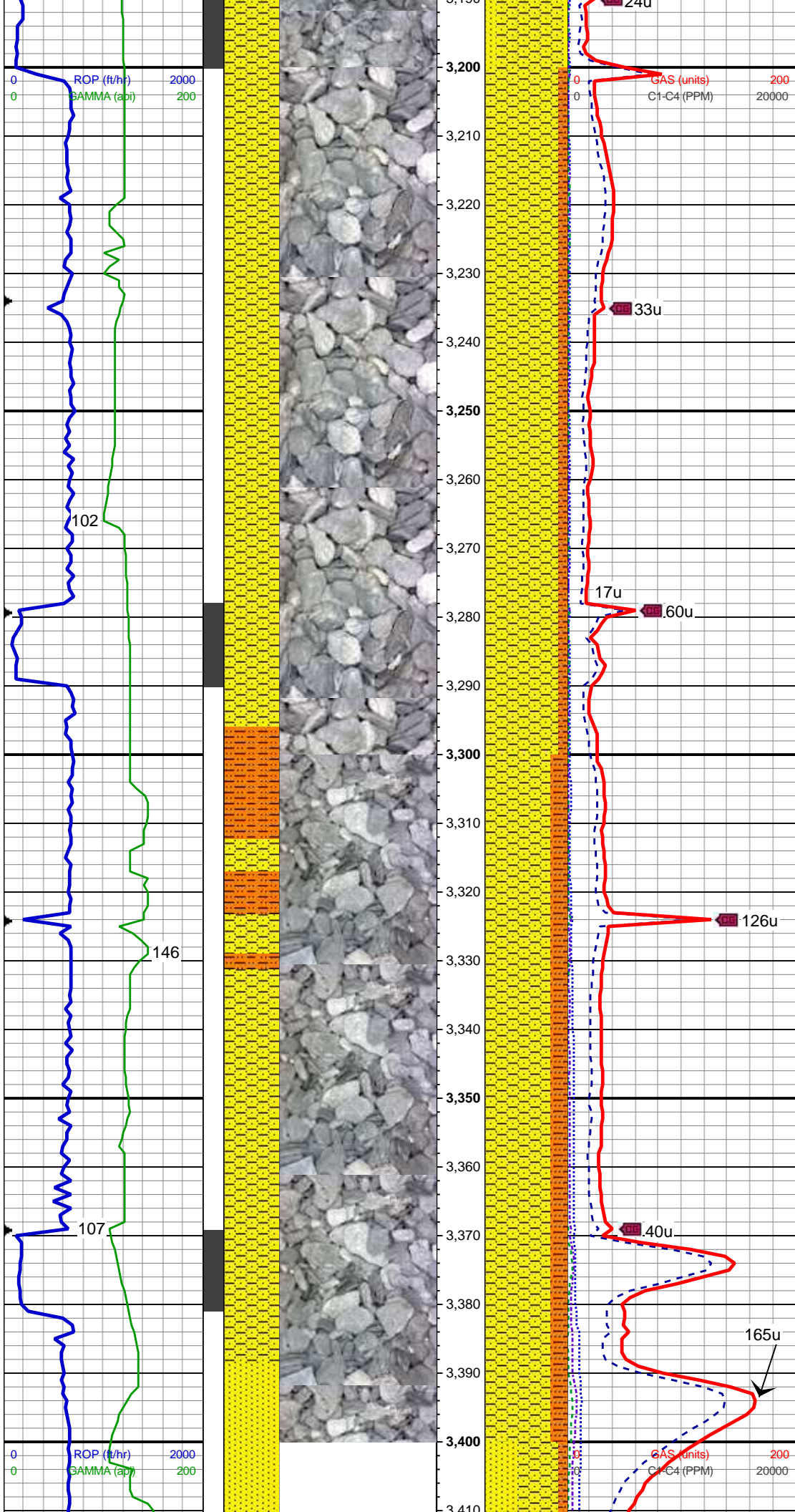


MD: 3,048'
TVD: 3,026.58'
Inclination: 9.6 °
Azimuth: 8.6 °

SHY SS: mgy, trnsi to op, vf to f gr, sbblky, lam ip, sbrnd to sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, tr pyr, slty, grdg to shy sltst SS: wh to mgy, clr to trnsi, s&p ip, mics ip, f to mgr, sbblky, pred sbang gr, sl frm, mod srt, p to mod cmt, sil to arg mtz, sl calc

MD: 3,137'
TVD: 3,114.58'
Inclination: 7.6 °
Azimuth: 4.9 °

SHY SS: mgy, trnsi to op, vf to f gr, sbblky, lam ip, sbrnd to sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, tr pyr, slty, grdg to shy sltst SS: wh to mgy, clr to trnsi, s&p ip, mics ip, f to mgr, sbblky, pred sbang gr, sl frm, mod srt, p to mod cmt, sil to arg mtz, sl calc



MD: 3,227'
TVD: 3,203.77'
Inclination: 7.8 °
Azimuth: 2.5°

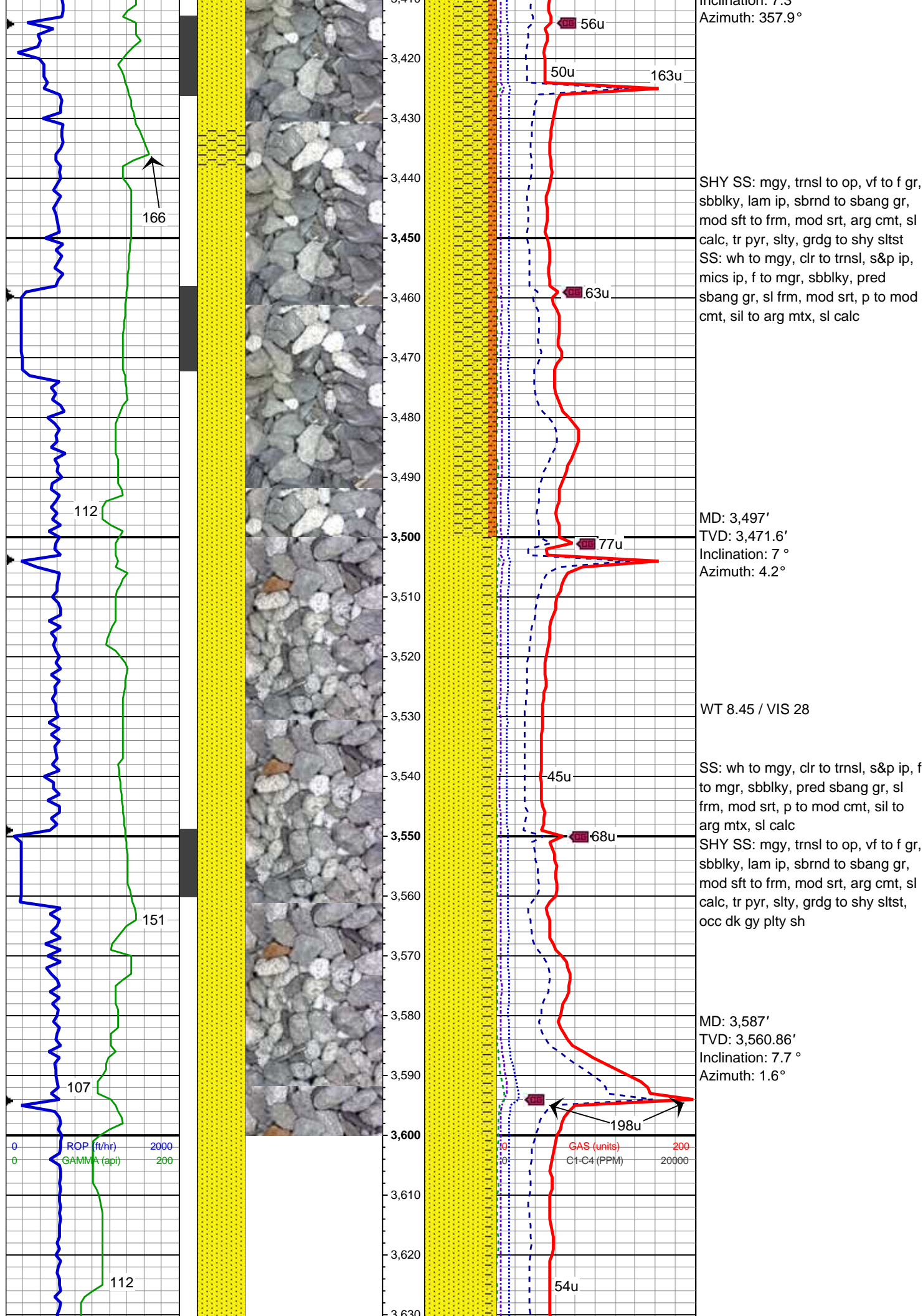
SHY SS: mgy, trnsf to op, vf to f gr,
sbbiky to sbply, lam ip, sbrnd to
sbang gr, mod sft to frm, mod srt,
arg cmt, sl calc, tr pyr, slty, grdg to
shy sltst

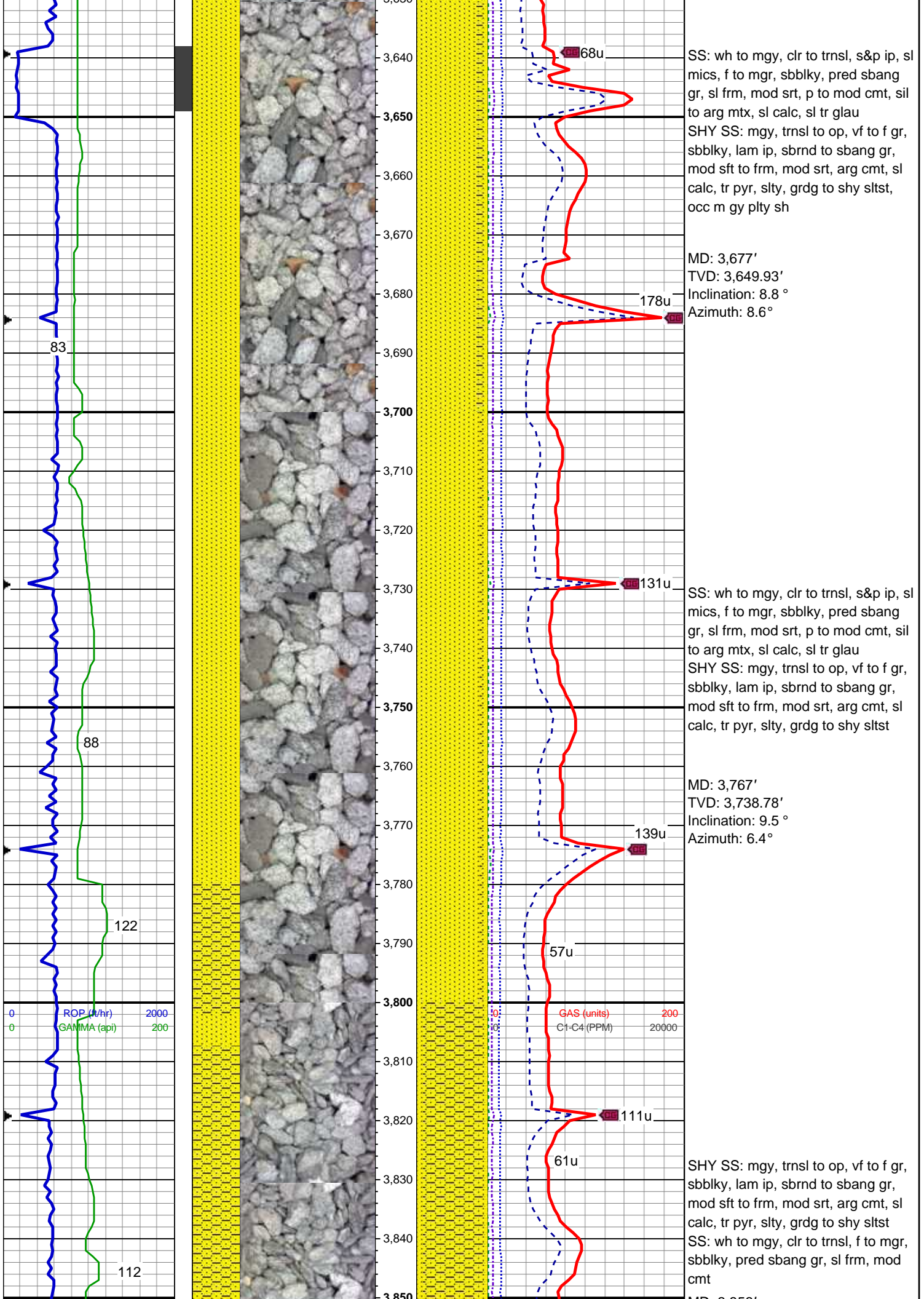
MD: 3,317'
TVD: 3,293.01'
Inclination: 7.1 °
Azimuth: 1.5°

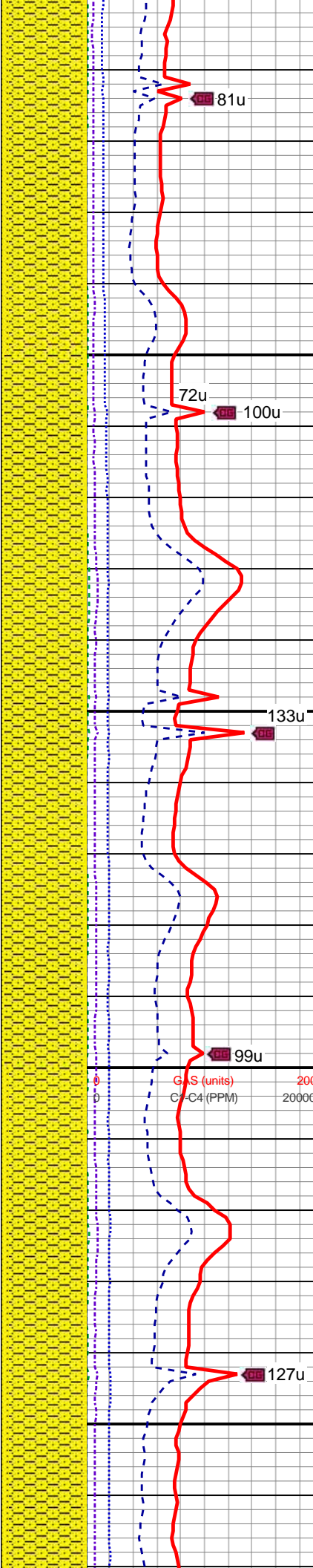
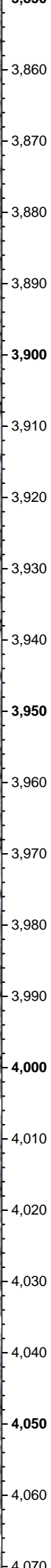
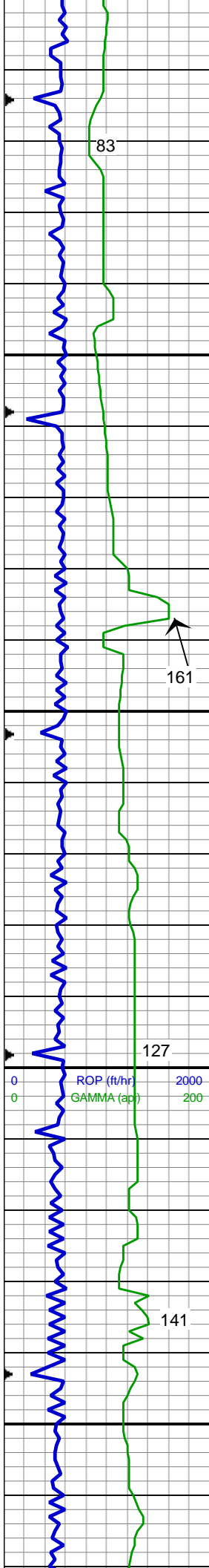
SHY SS: mgy, trnsf to op, vf to f gr,
sbbiky to sbply, lam ip, sbrnd to
sbang gr, mod sft to frm, mod srt,
arg cmt, sl calc, tr pyr, slty, grdg to
shy sltst

WT 8.4 / VIS 29

MD: 3,407'
TVD: 3,382.3'
Inclination: 7.2 °







MD: 3,856'
TVD: 3,826.54'
Inclination: 9.7 °
Azimuth: 8 °

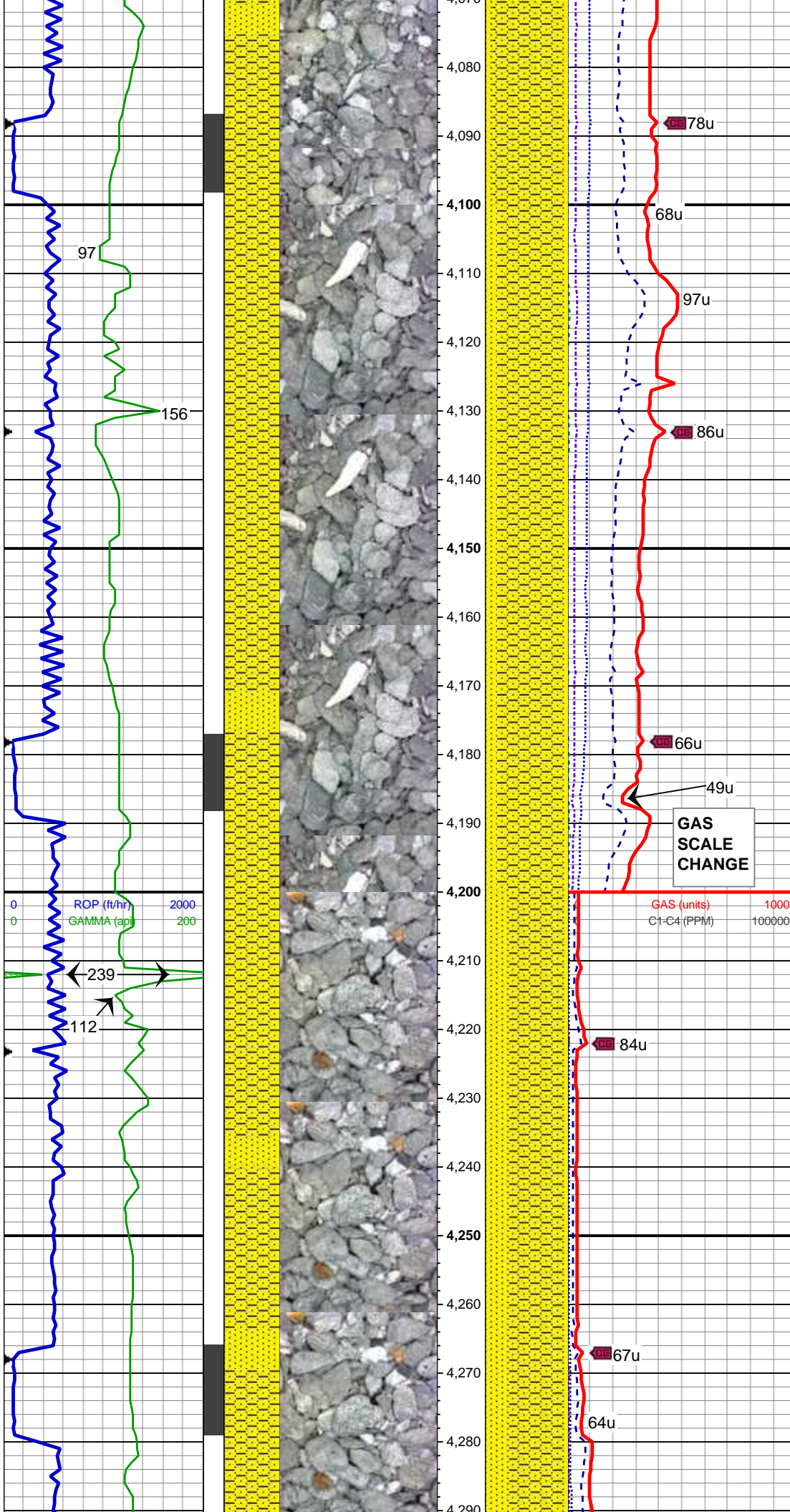
WT 8.35 / VIS 29

MD: 3,946'
TVD: 3,915.28'
Inclination: 9.5 °
Azimuth: 6.4 °

SHY SS: mgy, trnsl to op, vf to f gr, sbblky, lam ip, sbrnd to sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, tr pyr, slty, grdg to shy sltst
SS: wh to mgy, clr to trnsl, f to mgr, sbblky, pred sbang gr, sl frm, mod cmt

MD: 4,036'
TVD: 4,004.16'
Inclination: 8.6 °
Azimuth: 7.1 °

SHY SS: mgy, trnsl to op, vf to f gr, sbblky to sbplty, sbrnd to sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, slty, grdg to slty sh
SS: wh to mgy, clr to trnsl, f to mgr, sbblky, pred sbang gr, sl frm, mod cmt, occ bent



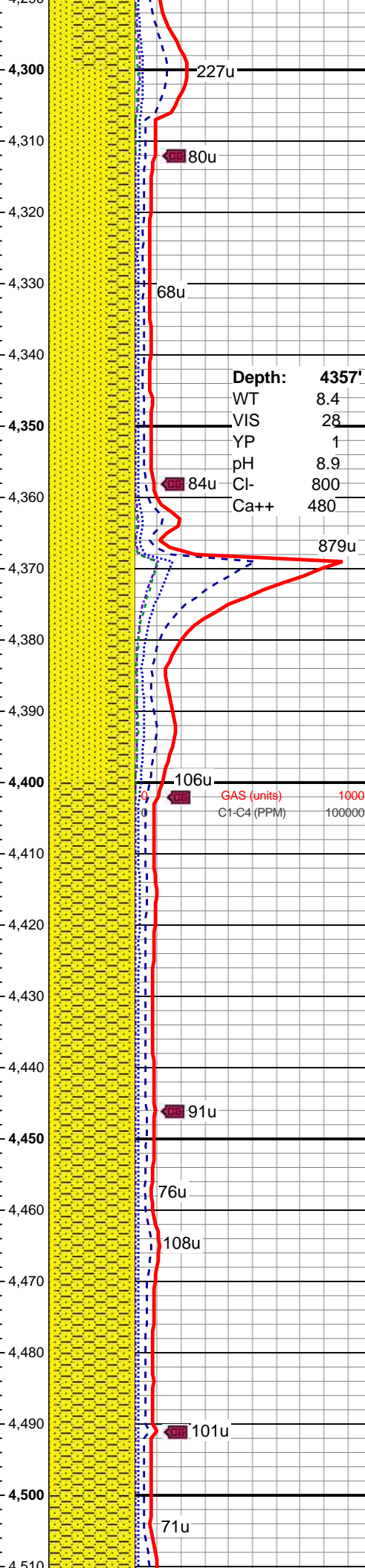
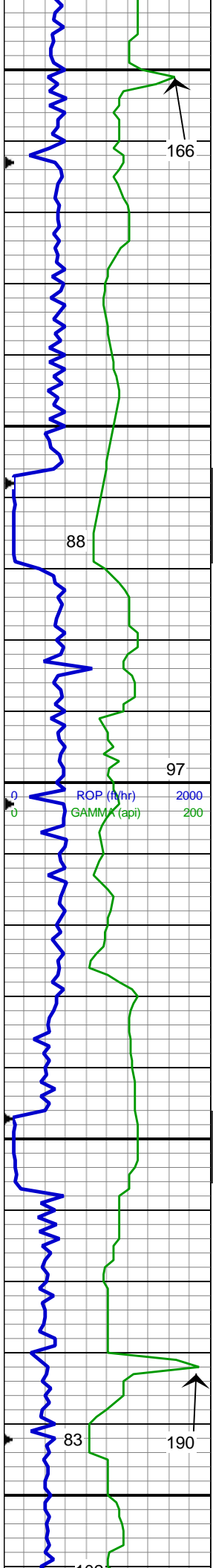
MD: 4,126'
TVD: 4,093.18'
Inclination: 8.3 °
Azimuth: 2.1 °

SHY SS: mgy, trnsf to op, vf to f gr,
sbbfky to sbpfty, sbrnd to sbang gr,
mod sft to frm, mod srt, arg cmt, sl
calc, slty, grdg to slty sh
SS: wh to mgy, clr to trnsf, f to mgr,
sbbfky, pred sbang gr, sl frm, mod
cmt, occ bent

MD: 4,216'
TVD: 4,182.19'
Inclination: 8.7 °
Azimuth: 8.7 °

WT 8.35 / VIS 29

SHY SS: mgy, trnsf to op, vf to f gr,
sbbfky to sbpfty, sbrnd to sbang gr,
mod sft to frm, mod srt, arg cmt, sl
calc, slty, grdg to slty sh
SS: wh to mgy, clr to trnsf, f to mgr,
sbbfky, pred sbang gr, sl frm, mod
cmt, tr bent



MD: 4,306'
TVD: 4,271.12'
Inclination: 9 °
Azimuth: 3.8°

Depth:	4357'
WT	8.4
VIS	28
YP	1
pH	8.9
Cl-	800
Ca++	480

SS: wh to mgy, clr to trnsl, s&p, f to mgr, sbblky, pred sbang gr, sl frm to brit, mod cmt, occ glau, occ bent
SHY SS: mgy, trnsl to op, vf to f gr, sbblky to sbply, sbrnd to sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, slty, grdg to slty sh

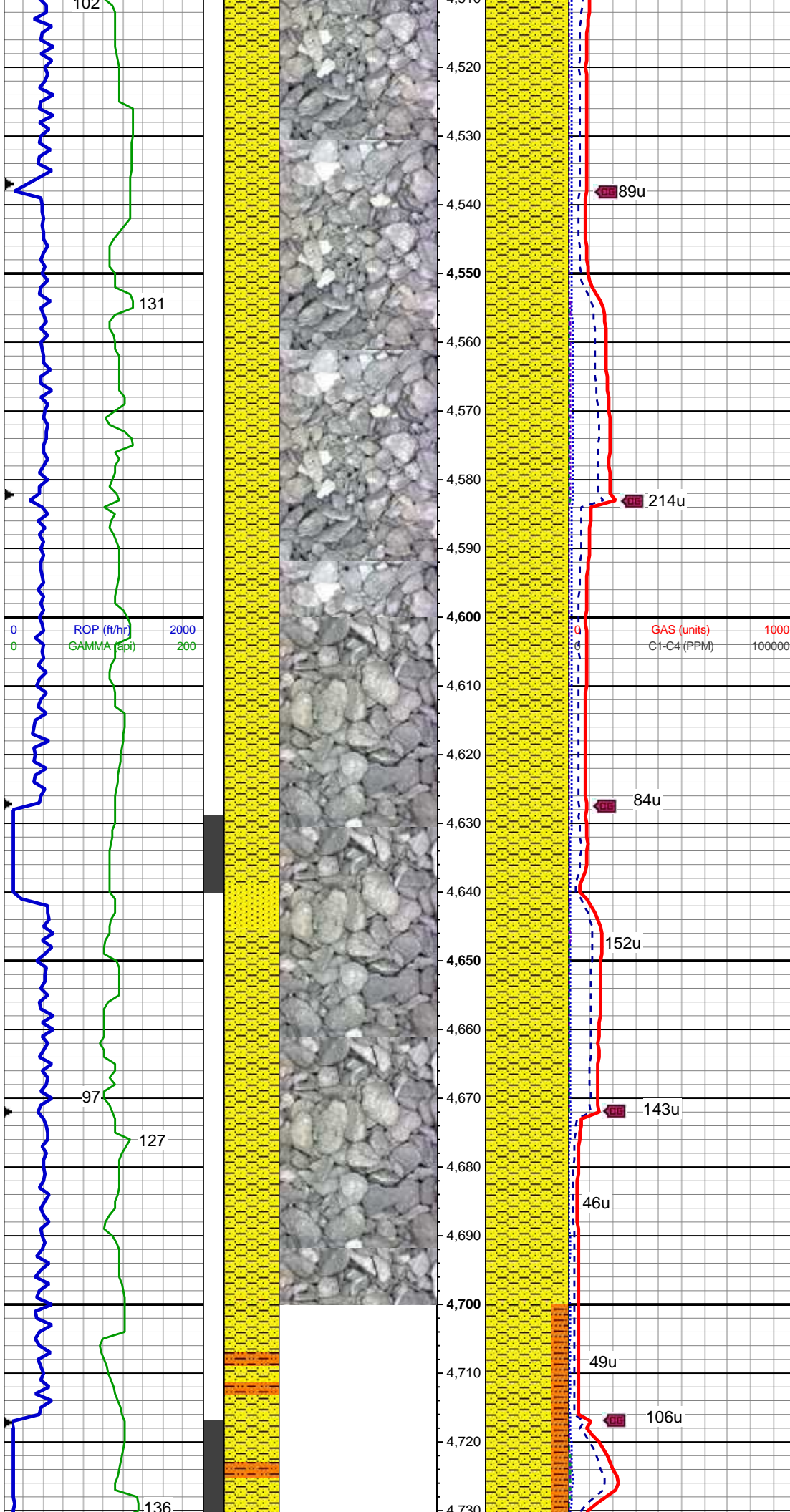
MD: 4,395'
TVD: 4,358.99'
Inclination: 9.3 °
Azimuth: 358.8°

GAS (units)	1000
C1-C4 (PPM)	100000

SHY SS: mgy, trnsl to op, vf to f gr, sbblky to sbply, sbrnd to sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, slty, grdg to slty sh
SS: wh to mgy, clr to trnsl, s&p, f to mgr, sbblky, pred sbang gr, sl frm to brit, mod cmt, occ bent

MD: 4,485'
TVD: 4,447.7'
Inclination: 10.1 °
Azimuth: 3.1°

WT 8.4 / VIS 28



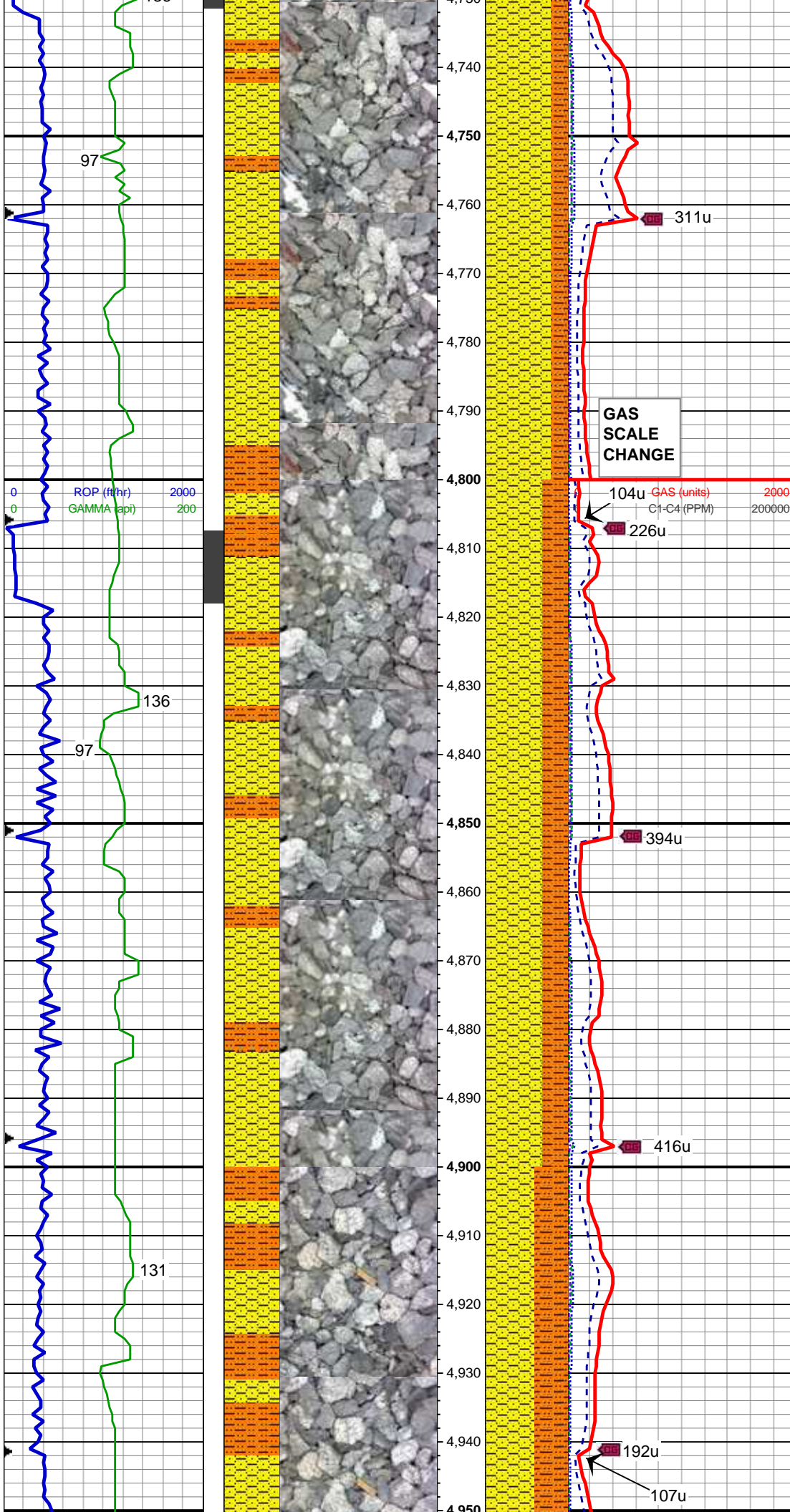
SHY SS: mgy, trnsI to op, vf to f gr, sbblky to sbply, sbrnd to sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, slty, grdg to slty sh
SS: wh to mgy, clr to trnsI, s&p, f to mgr, sbblky, pred sbang gr, sl frm to brit, mod cmt, occ bent

MD: 4,575'
TVD: 4,536.56'
Inclination: 8.2 °
Azimuth: 0.2 °

SHY SS: mgy, trnsI to op, vf to f gr, sbblky to sbply, sbrnd to sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, slty, grdg to slty sh
SS: wh to mgy, clr to trnsI, s&p, f to mgr, sbblky, pred sbang gr, sl frm to brit, mod cmt, occ bent

MD: 4,665'
TVD: 4,625.66'
Inclination: 8 °
Azimuth: 2.7 °

WT 8.4 / VIS 28



SHY SS: m to dk gy, trnsl to op, vf to f gr, sbblky to sbplty clus, sbang to sbrnd, mod srt, p to mod cmt, pred arg mtx, mod calc, tr glau, slty ip, grdg to shy sltst
SHY SLTST: m gy to gy brn, sft, sbblky to sbplty clus, shy tex, sl to mod calc

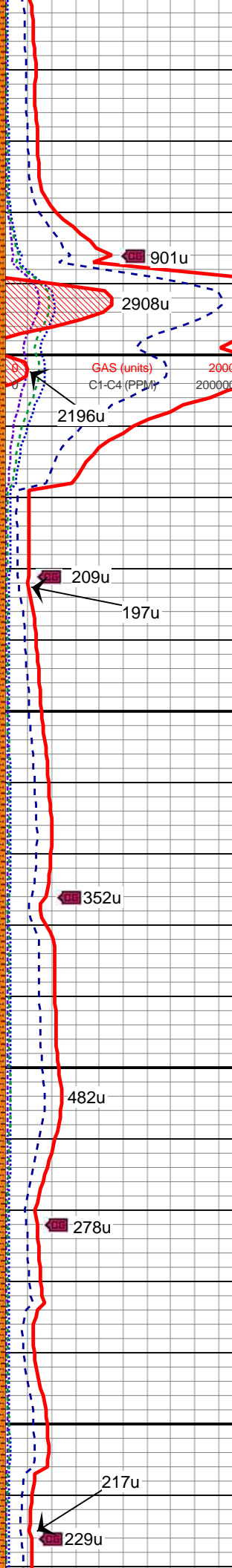
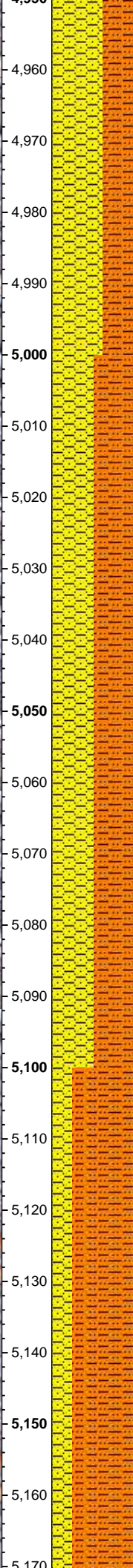
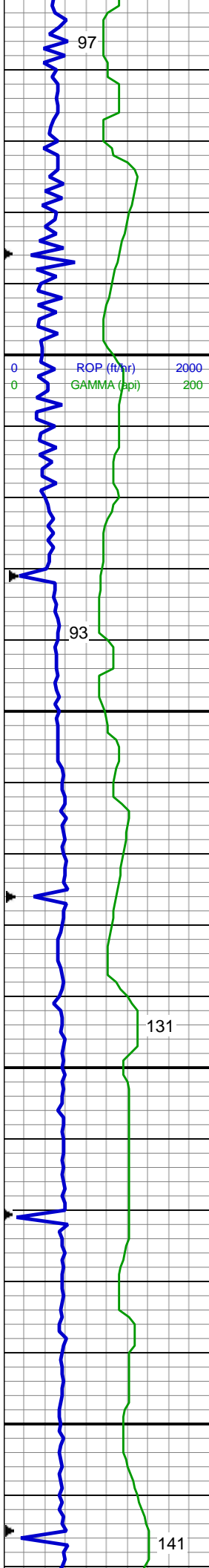
MD: 4,754'
TVD: 4,713.7'
Inclination: 8.8 °
Azimuth: 4.2 °

SHY SS: m to dk gy, trnsl to op, vf to f gr, sbblky to sbplty clus, sbang to sbrnd, mod srt, p to mod cmt, pred arg mtx, mod calc, tr glau, slty ip, grdg to shy sltst
SHY SLTST: m gy to gy brn, sft, sbblky to sbplty clus, shy tex, sl to mod calc

MD: 4,844'
TVD: 4,802.64'
Inclination: 8.8 °
Azimuth: 7.9 °

WT 8.5 / VIS 28

SHY SS: m to dk gy, trnsl to op, vf to f gr, sbblky to sbplty clus, sbang to sbrnd, p to mod srt, p to mod cmt, arg mtx, mod calc, tr pyr, tr bent, slty



ip, grdg to slty ss
SHY SLTST: m gy to gy brn, sft,
sbbiky to sbply clus, shy tex, sl to
mod calc, grdg to shy ss

MD: 4,934'
TVD: 4,891.76'
Inclination: 7.3 °
Azimuth: 5.5°

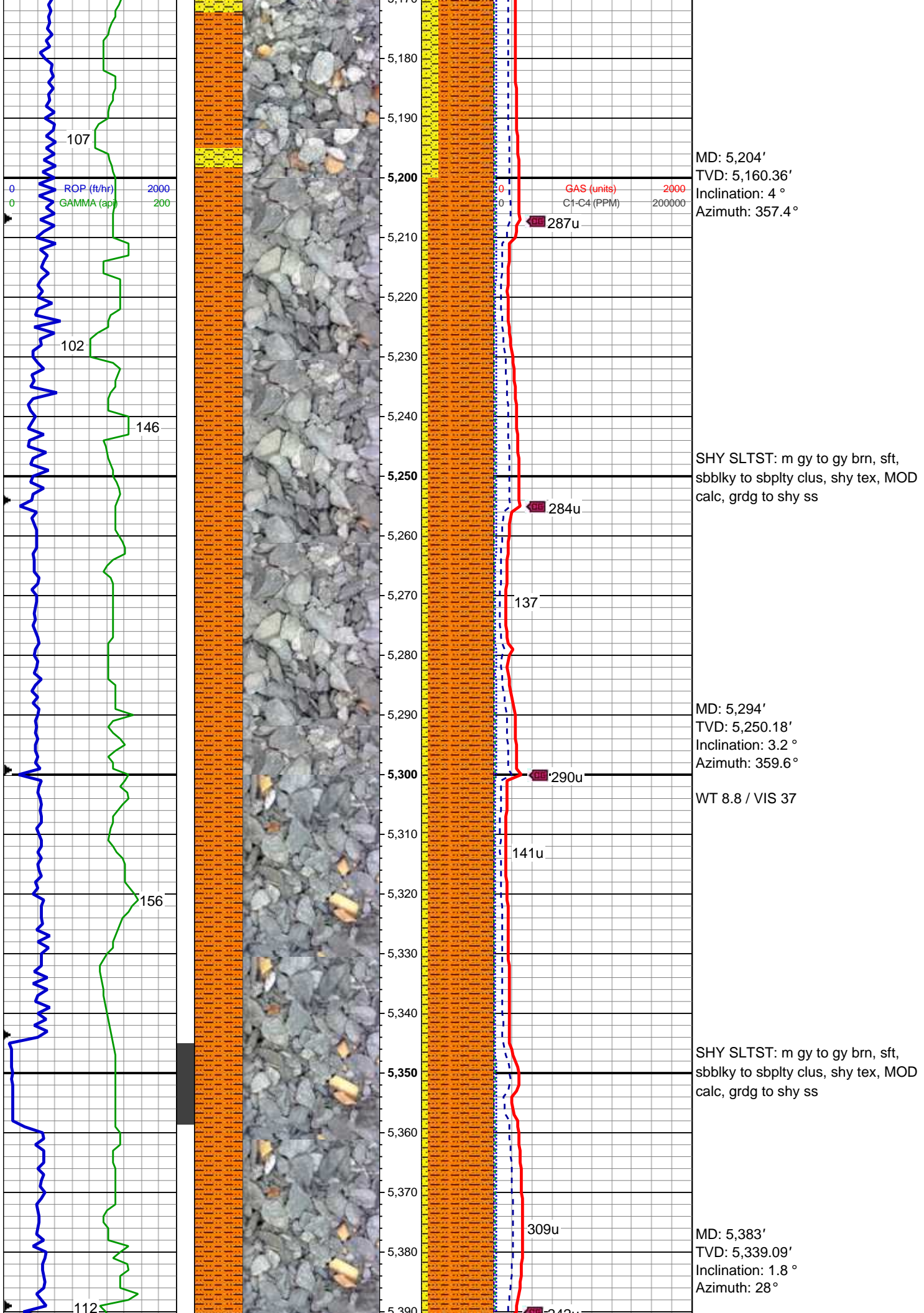
MD: 5,024'
TVD: 4,981.1'
Inclination: 6.5 °
Azimuth: 5°

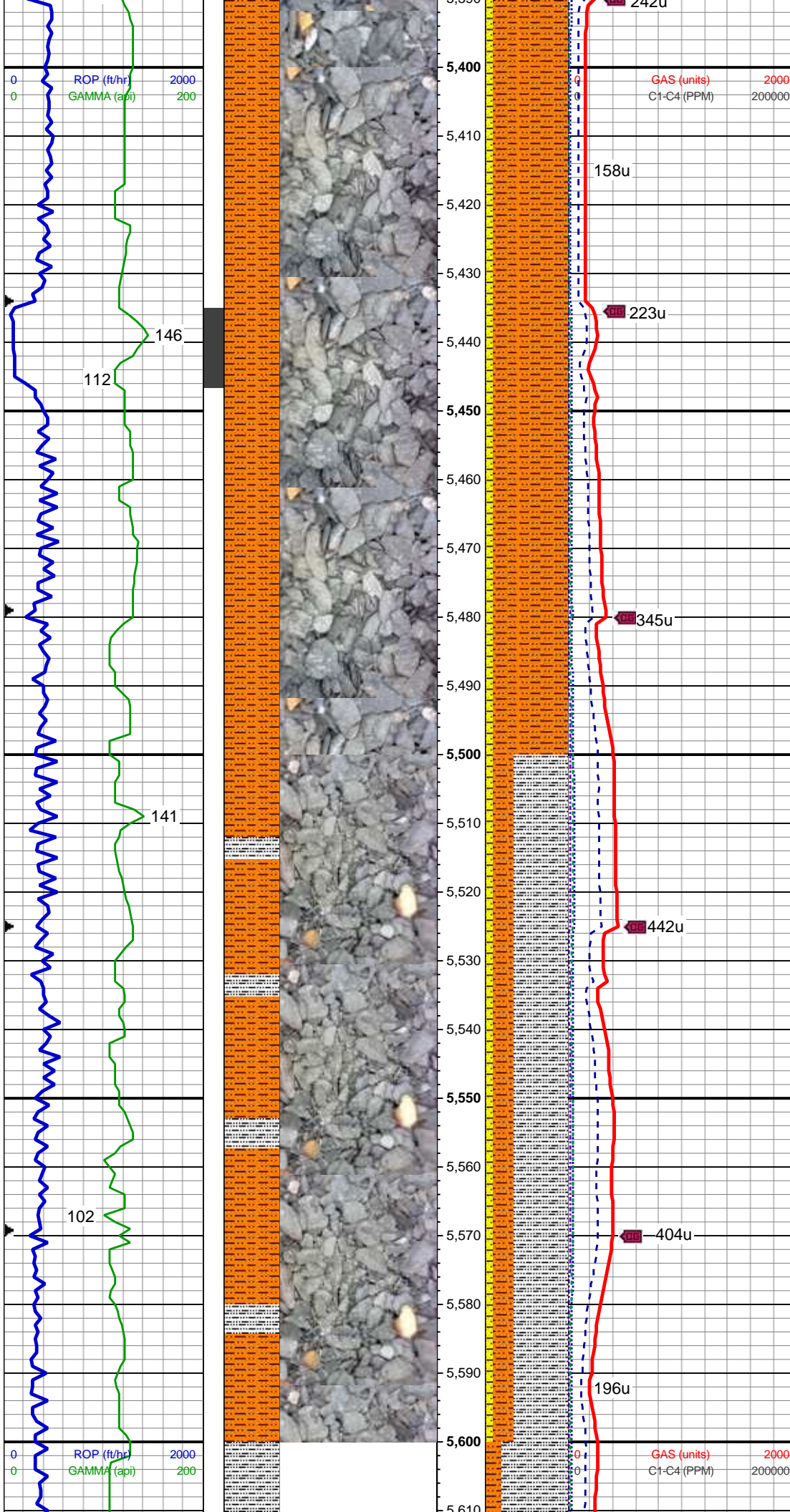
SHY SS: m to dk gy, trnsl to op, vf to
f gr, sbbiky to sbply clus, sbang to
sbrnd, p to mod srt, p to mod cmt,
arg mtx, mod calc, tr pyr, tr bent, slty
ip, grdg to slty ss
SHY SLTST: m gy to gy brn, sft,
sbbiky to sbply clus, shy tex, sl to
mod calc, grdg to shy ss

WT 8.4 / VIS 28

MD: 5,114'
TVD: 5,070.64'
Inclination: 5.1 °
Azimuth: 3.4°

SHY SS: m to dk gy, trnsl to op, vf to
f gr, sbbiky to sbply clus, sbang to
sbrnd, p to mod srt, p to mod cmt,
arg mtx, mod calc, tr pyr, tr bent, slty
ip, grdg to slty ss
SHY SLTST: m gy to gy brn, sft,
sbbiky to sbply clus, shy tex, sl to
mod calc, grdg to shy ss





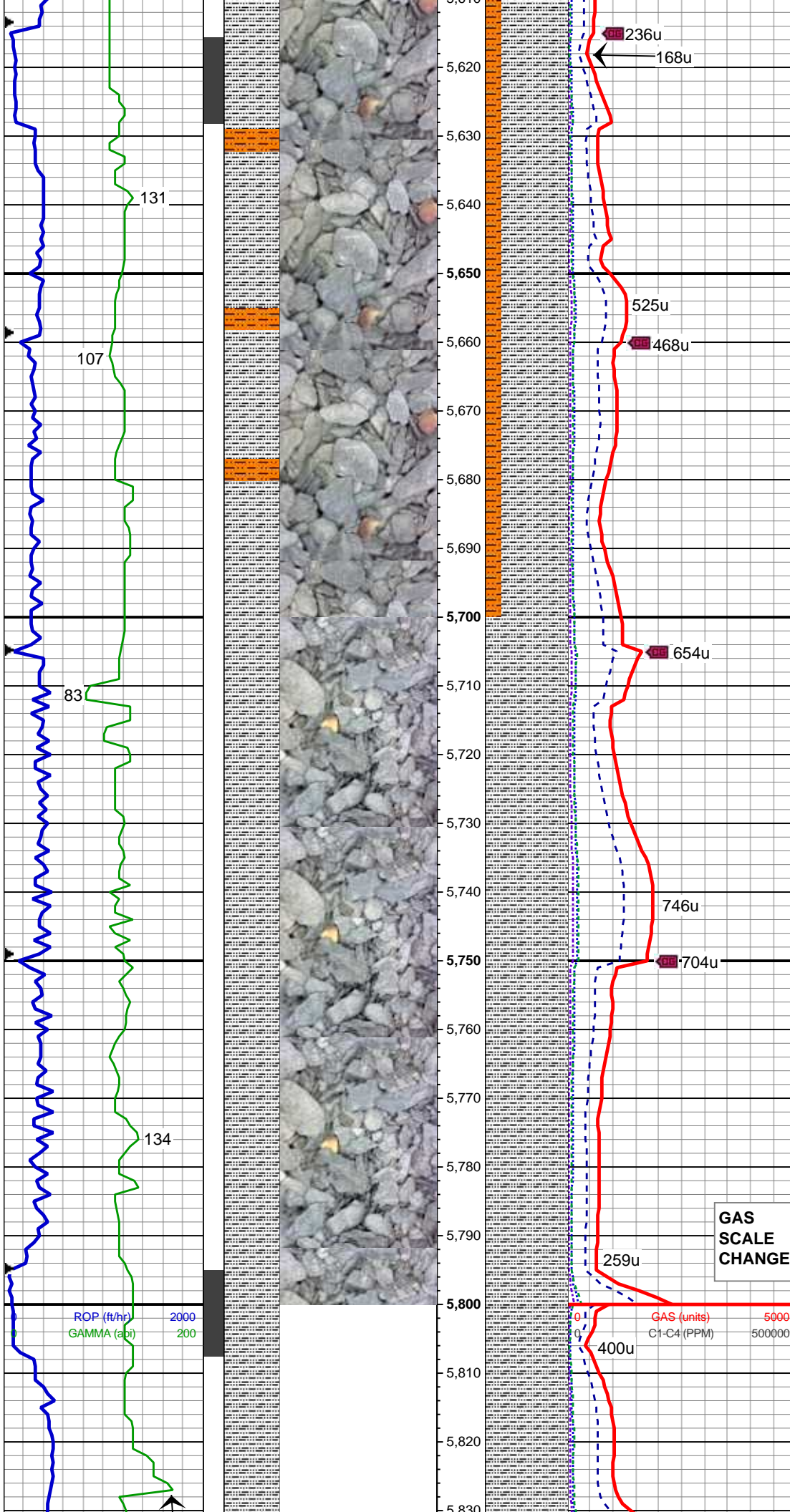
SHY SLTST: m gy to gy brn, sft,
sbbly to sbply clus, shy tex, MOD
calc, grdg to shy ss

MD: 5,473'
TVD: 5,429.07'
Inclination: 0.5 °
Azimuth: 41.9°

WT 8.8 / VIS 37

SLTY SH: med to dk gy, gy brn, sb
bly to sb ply, occ ply, sft to sl frm,
arg, sl, mod calc ip, sdy ip, tr pyr,
grdg to shy sltst
SHY SLTST: m gy to gy brn, sft,
sbbly to sbply, sl calc, mod calc
ip, grdg to shy ss

MD: 5,563'
TVD: 5,519.07'
Inclination: 0.6 °
Azimuth: 358.3°



SLTY SH: med to dk gy, gy brn, sb
blky to sb plty, occ plty, sft to sl frm,
arg, sl , mod calc ip, sdy ip, grdg to
shy sltst

SHY SLTST: m gy to gy brn, sft,
sbbkly to sbplty, sl calc, mod calc
ip, grdg to shy ss

MD: 5,653'
TVD: 5,609.07'
Inclination: 0.6 °
Azimuth: 207.7°

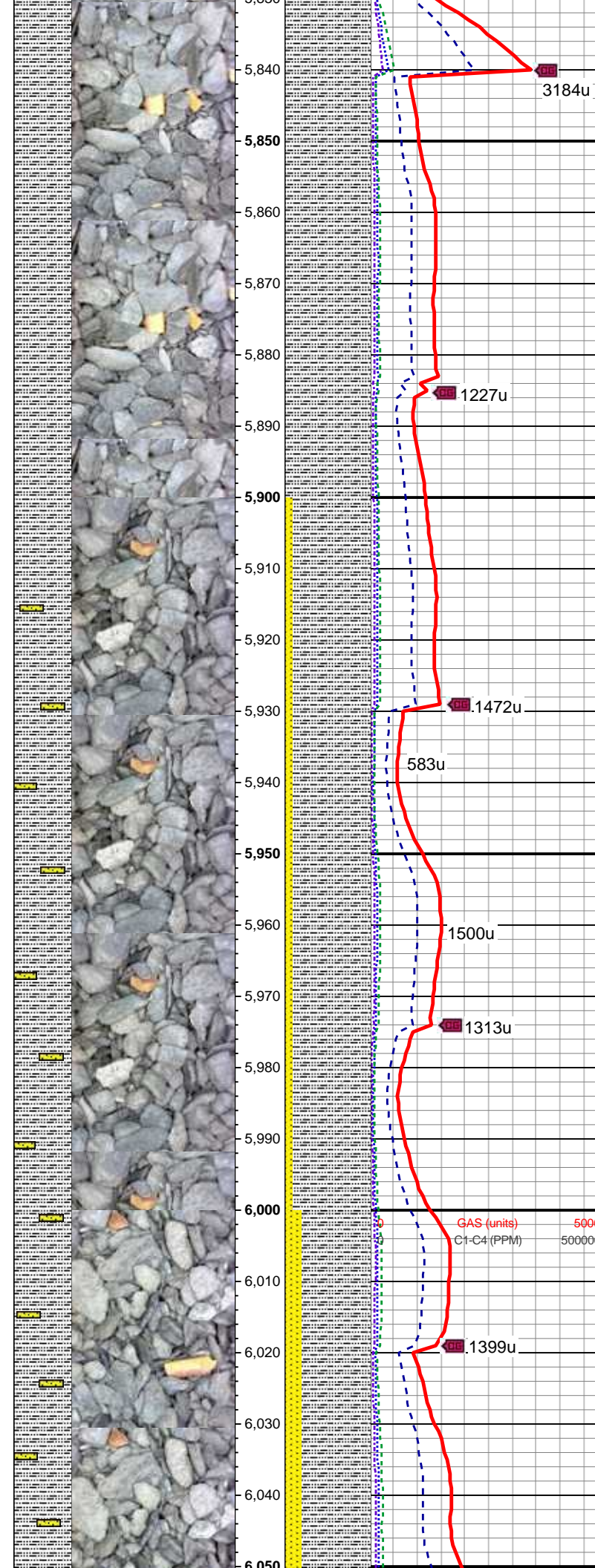
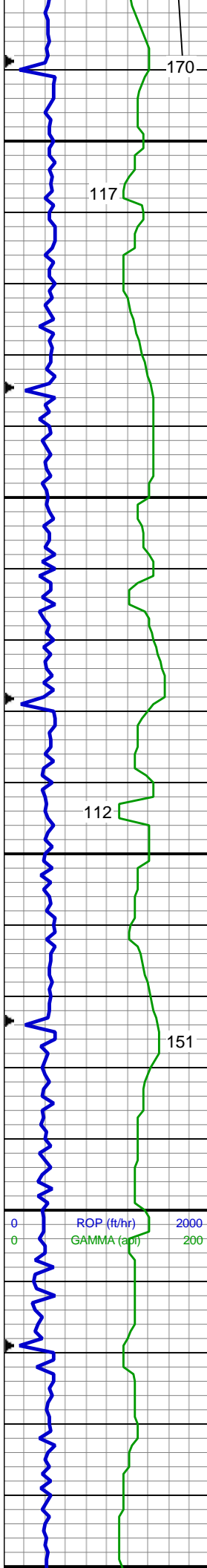
WT 9.0 / VIS 38

MD: 5,743'
TVD: 5,699.06'
Inclination: 0.9 °
Azimuth: 202.1°

SLTY SH: med to sl dk gy, gy brn,
sb blky to sb plty, occ plty, sft to sl
frm, arg, sl calc ip, sdy ip, grdg shy
ss

GAS
SCALE
CHANGE

MD: 5,833'
TVD: 5,789.04'
Inclination: 1.5 °



Azimuth: 162.9°

3184u

1227u

WT 9.2 / VIS 38

MD: 5,922'
TVD: 5,878.02'
Inclination: 1.1°
Azimuth: 180.3°

583u

1472u

1500u

1313u

MD: 6,012'
TVD: 5,968.01'
Inclination: 0.8°
Azimuth: 192.2°

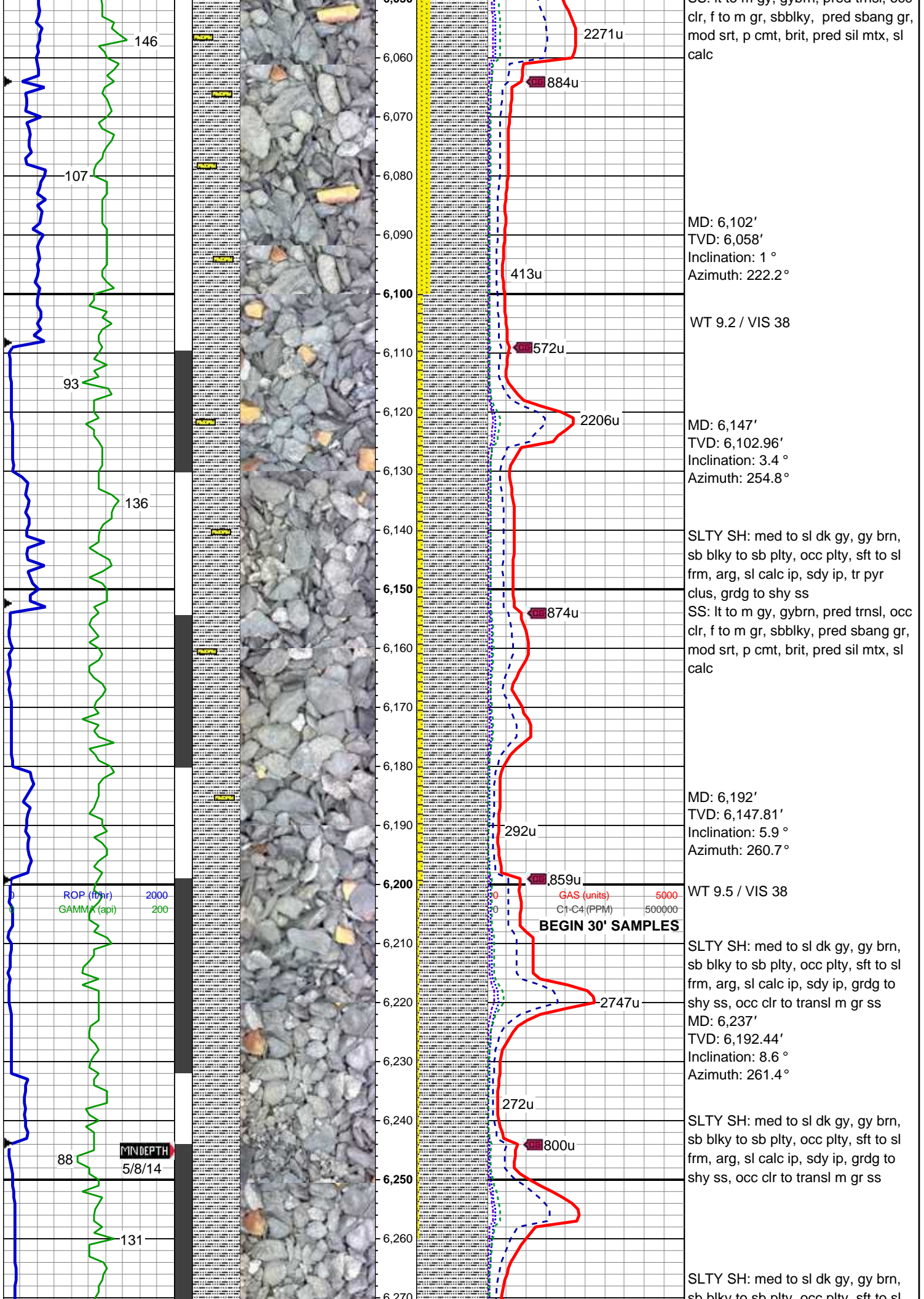
1399u

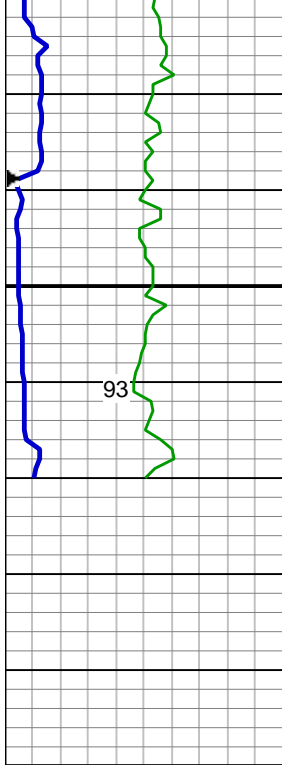
SLTY SH: med to sl dk gy, gy brn, sb blkly to sb plty, occ plty, sft to sl frm, arg, sl calc ip, sdy ip, grdg shy ss

SS: lt to m gy, gybrn, pred trnsl, occ clr, f to m gr, sbbkly, pred sbang gr, mod srt, p cmt, brit, pred sil mtx, sl calc

SLTY SH: med to sl dk gy, gy brn, sb blkly to sb plty, occ plty, sft to sl frm, arg, sl calc ip, sdy ip

SS: lt to m gy, gybrn, pred trnsl, occ

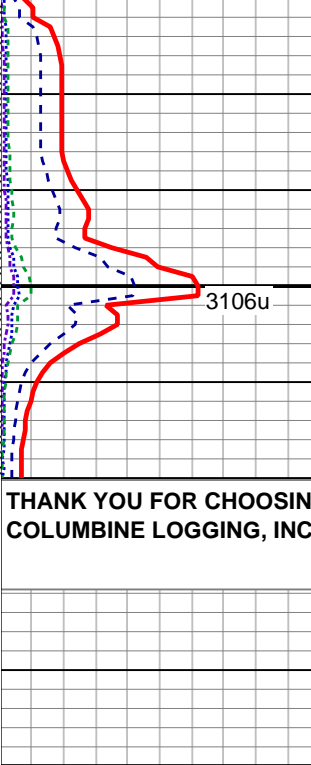




93



6,280
6,290
6,300
6,310
6,320
6,330
6,340
6,350



3106u

SLTY SH: med to sl dk gy, gy brn, sb blk to sb plty, occ plty, sft to sl frm, arg, sl calc ip, sdy ip, grdg to shy ss, tr clr to transl m gr ss

LOG CONTINUES ON FILE:
Steadfast E27-63-1HN Horiz.mplot

THANK YOU FOR CHOOSING
COLUMBINE LOGGING, INC.

MD: 6,282'
TVD: 6,236.77'
Inclination: 11.2 °
Azimuth: 262.3°