

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Wells Ranch State A36-686 Vert

Location SEC31, T6N, R63W

State Colorado

County Weld

Country United States

Rig Number H&P 326

API Number 05-123-41510

Field Wattenberg

Region DJ Basin

Drilling Completed 7/19/2015

Spud Date 7/6/2015

Surface Coordinates SEC31, T6N, R63W
Lat/Long: 40.44809/-104.47164

Bottom Hole Coordinates Planned Location
SEC36, T6N, R64W

Ground Elevation 4656'

K.B. Elevation 4686'

Logged Interval 814' To 16483'

Total Depth 16483'

Formation Pierre, Niobrara, Carlile

Type of Drilling Fluid Water/LSND

Other Symbols

Oil Show

- DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

Porosity

- E EARTHY
- F FENESTRAL
- F FRACTURE
- X INTERCRYSTALLINE
- Q INTEROOLITIC
- M MOLDIC

ORGANIC

P PINPOINT

V VUGGY

Engineering

- BIT CHANGE
- CONNECTION (LEFT)
- CONNECTION (RIGHT)
- CONNECTION GAS
- TRIP GAS
- DOWN TIME GAS
- CORE - LOST
- CORE - RECOVERED
- DST INTERVAL

FAULT

FORMATION TOP

GAS SHOW

OIL SHOW

MN DEPTH MN DEPTH

MN DEPTH MN DEPTH (RIGHT)

NORMAL FAULT

OVERTURNED STRATA

REVERSE FAULT

CASING

SIDEWALL CORE (LEFT)

SIDEWALL CORE (RIGHT)

SLIDE

SURVEY

DRILL STEM TEST

WIRELINE TESTED - LEFT

WIRELINE TESTED - RT

Rounding

- ANGULAR
- ROUNDED
- SUBANG
- SUBRND

Textures

- BOUNDSTONE
- CHALKY
- CRYPTOXLN

E EARTHY

FX FINELYXLN

GS GRAINSTONE

L LITHOGRAPHIC

MX MICROXLN

MS MUDSTONE

PS PACKSTONE

WS WACKESTONE

Sorting

- M MODERATE
- P POOR
- W WELL

Accessories

Fossils

- ALGAE
- AMPHIPORA

GASTROPOD

INOCERAMUS

OOLITE

OSTRACOD

ARGILLITE GRAIN

B BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

HEAVY MINERAL

K KAOLIN

M MARCASITE

TT MARLSTONE

Stringer

- ANHYDRITE STRINGER
- BENTONITE STRINGER

BELEMNITE
BIOCLASTIC
BRACHIOPOD
BRYOZOA
CEPHALOPOD
CORAL
CRINOID
ECHINOID
FISH
FORAMINIFERA
FOSSIL

PELECYPOD
PELLET
PISOLITE
PLANT REMAINS
PLANT SPORES
SCAPHOPOD
STROMATOPOROID

Minerals

ANHYDRITIC
ARGILLACEOUS

CALCAREOUS
CARBONACEOUS FLAKES
CHTDK
CHTLT
COAL - THIN BEDS
DOLOMITIC
FELDSPAR
FERRUGINOUS PELLET
FERRUGINOUS
GLAUCONITE
GYPSIFEROUS

MICACEOUS
MINERAL CRYSTALS
NODULES
PHOSPHATE PELLETS
PYRITE
SALT CAST
SANDY
SIDERITE
SILICEOUS
SILTY
TUFACEOUS

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

Rock Types

UNKNOWN
ANHYDRITE
BENTONITE
BRECCIA
CEMENT
CHALK
CHERT
CLAY CHOKE SAND
CLAYSTONE

COAL
CONGLOMERATE
DOLOMITE
DOLOMITIC LIMESTONE
GRANITE
GYPSUM
IGNEOUS
LIMESTONE
SIDERITE or LIMONITE

MARLSTONE
METAMORPHIC
NO SAMPLE
SALT
SALT- PEPPER SAND
SANDSTONE
SHALE
SHALE COLORED
SHALE GRAY

SHALY SANDSTONE
SHALY SILTSTONE
SILTSTONE
SILTY SHALE
TILL
TUFF
WELDED TUFF

Operator

Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Other

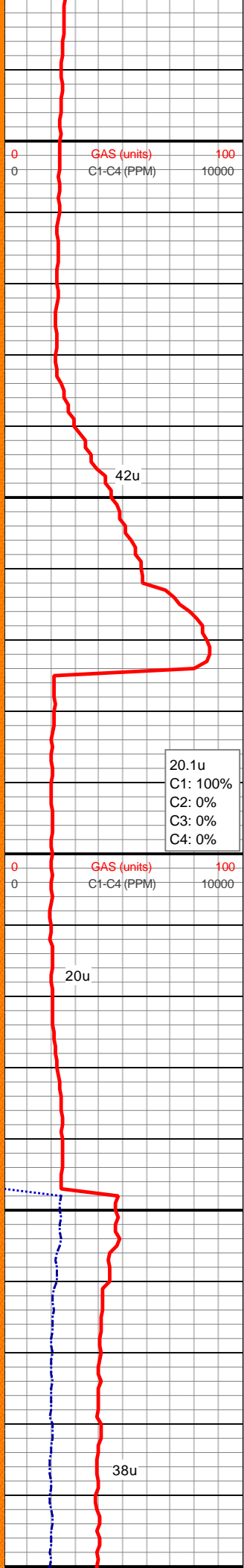
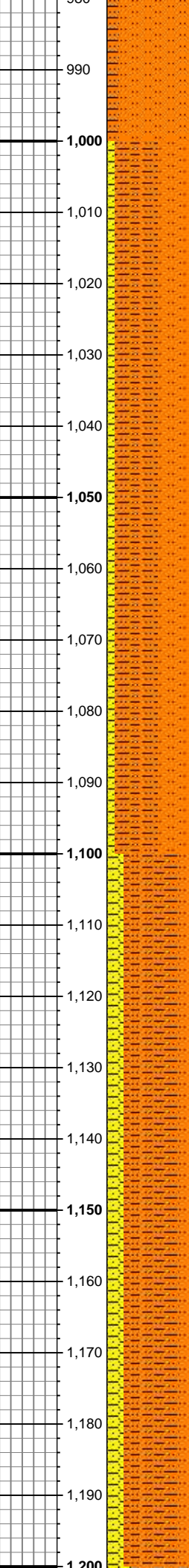
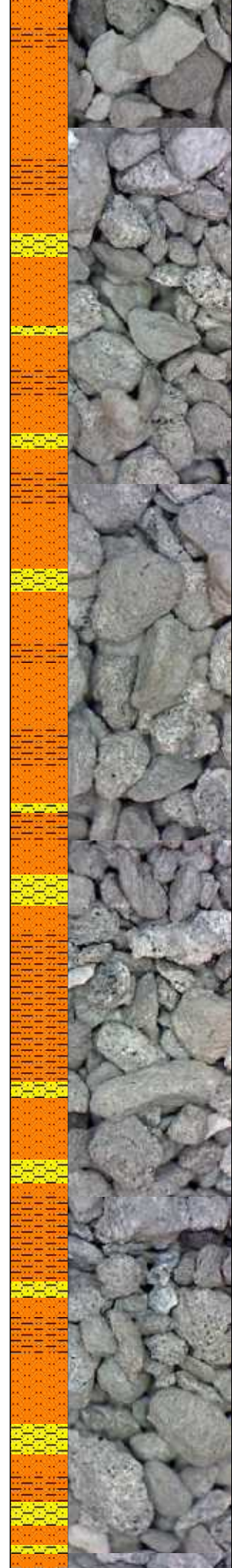
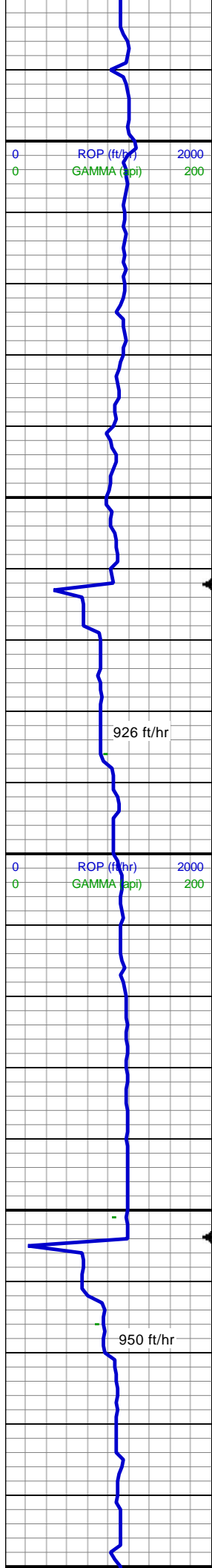
Mud Logging Company Columbine Logging Inc.
Well Site Geologist (Days) Brad Wilson
Well Site Geologist (Nights) Shanna Gilbert

Zone Color Coding

Oil
Note
Error
Condensate
Core
Water
Gas
Pressure
Seal

Geologist

Name James Taylor
Company NOBLE ENERGY INC.
Address 1625 Broadway Suite 2200
Denver, CO 80202



MUD WT 8.4 VIS 26

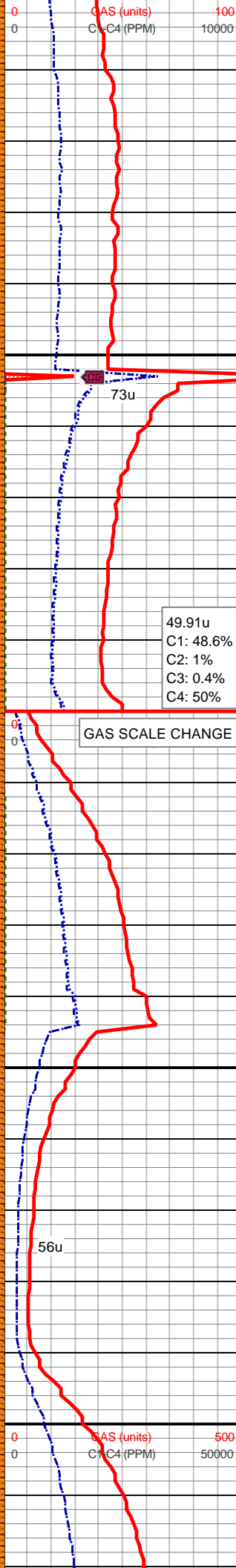
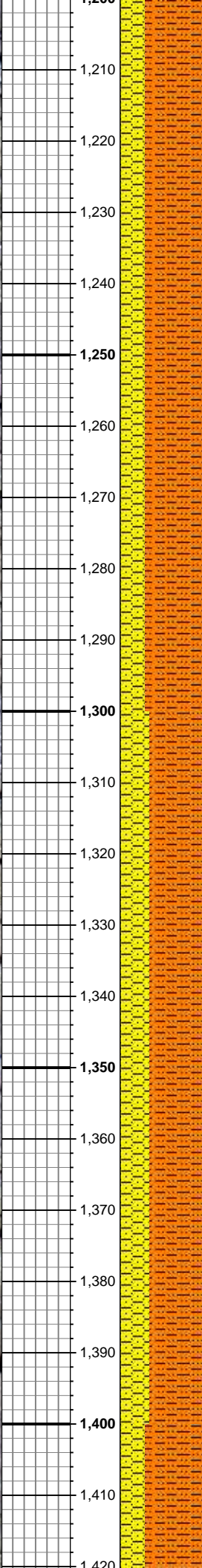
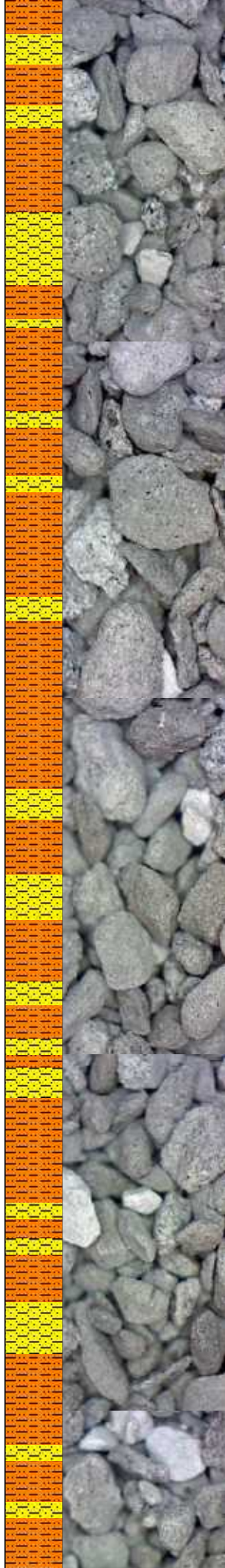
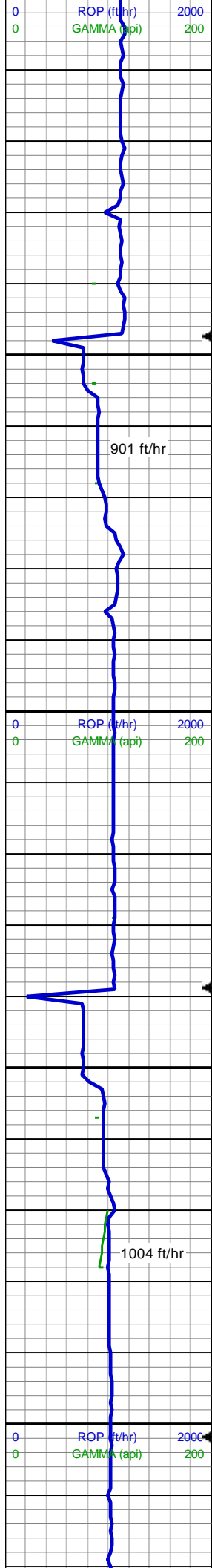
MD: 1,013'
TVD: 1,012.98'
Inclination: 0.7°
Azimuth: 79.2°
VS: -4.89'

SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn, arg, sl rthy, ply srt,
occ blk org cl
SLTST: lt gy, sft -v sft, sb blky-sb plty, sl
gt, v arg, sl rthy,grdg - slty clyst
SHY SS: ltgy-wh, sft-sl frm, f-v f gr,sb
ang-sb rnd, gr sup mtx, sl arg, v sl calc

MD: 1,106'
TVD: 1,105.97'
Inclination: 0.9°
Azimuth: 84.3°
VS: -6.16'

SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn occ f grn, arg, sl
rthy, ply srt, occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr,sb
ang-sb rnd, gr sup mtx, sl arg, v sl calc
SLTST: lt gy, sft -v sft, sb blky-sb plty, sl
gt, v arg, sl rthy

MD: 1,201'



TVD: 1,200.96'
Inclination: 1.3°
Azimuth: 61.9°
VS: -7.83'

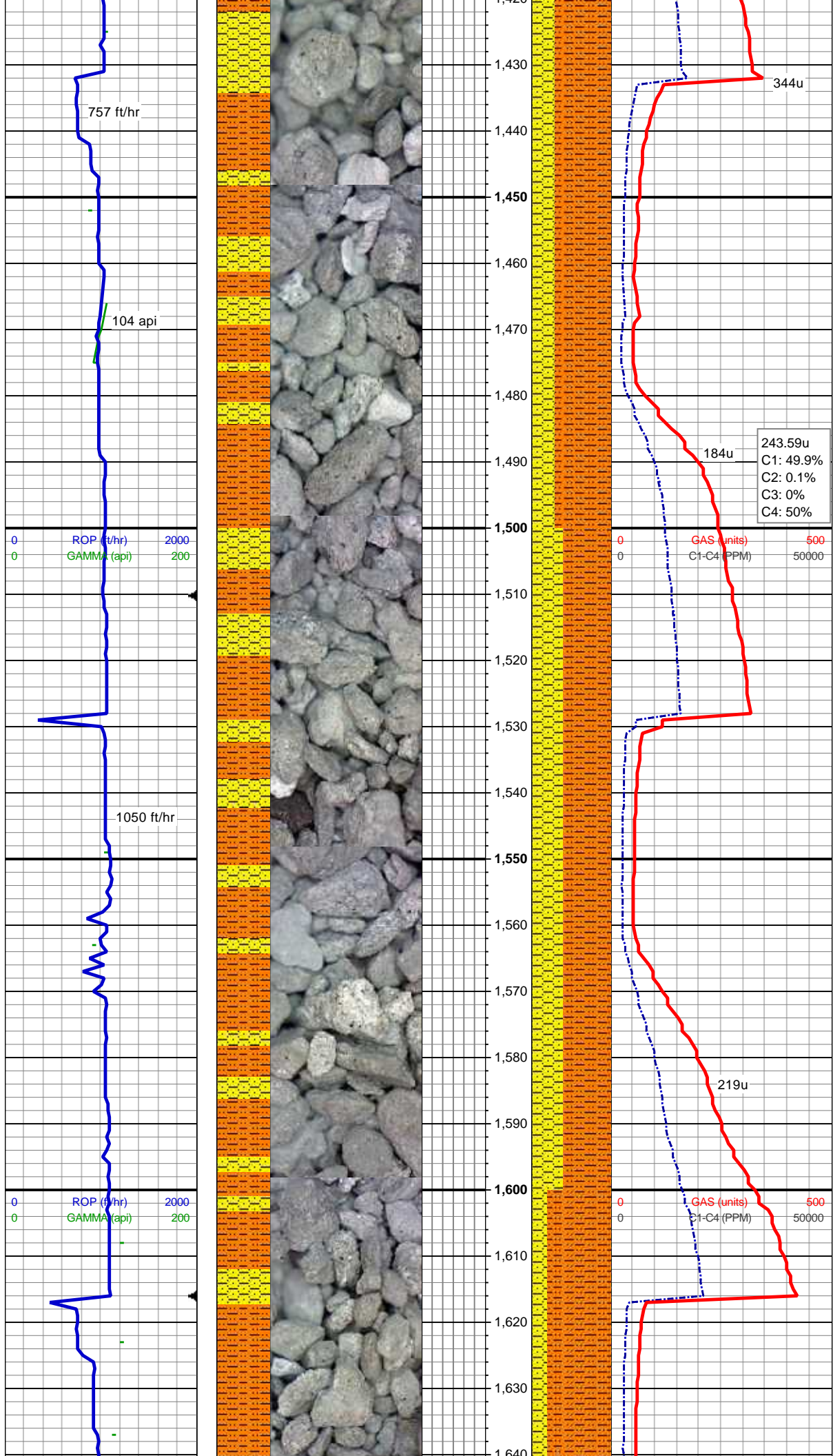
MUD WT 8.6 VIS 26

SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn occ f grn, arg, sl
rthy, ply srt, occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr, sb
ang-sb rnd, gr sup mtx, sl arg, v sl calc,
occ speckl blk org incl

MD: 1,293'
TVD: 1,292.94'
Inclination: 0.8°
Azimuth: 70.8°
VS: -9.33'

SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn occ f grn, arg, sl
rthy, ply srt, occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr, sb
ang-sb rnd, gr sup mtx, sl arg, v sl calc,
occ speckl blk org incl

MD: 1,386'
TVD: 1,385.93'
Inclination: 0.6°
Azimuth: 110.2°
VS: -10.4'

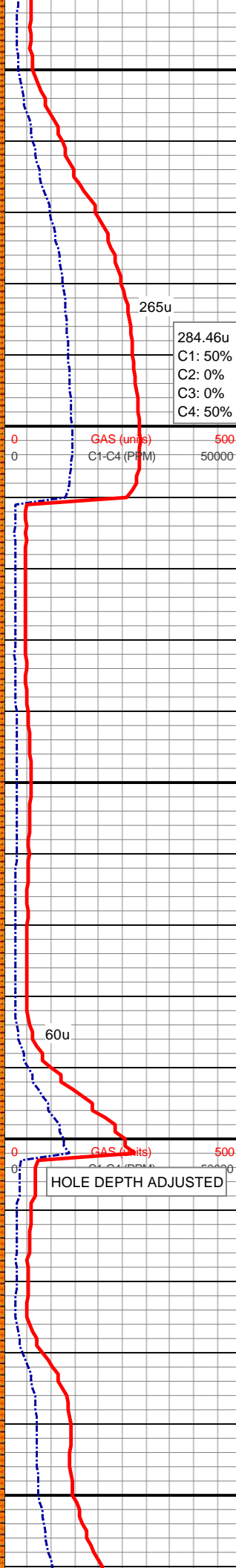
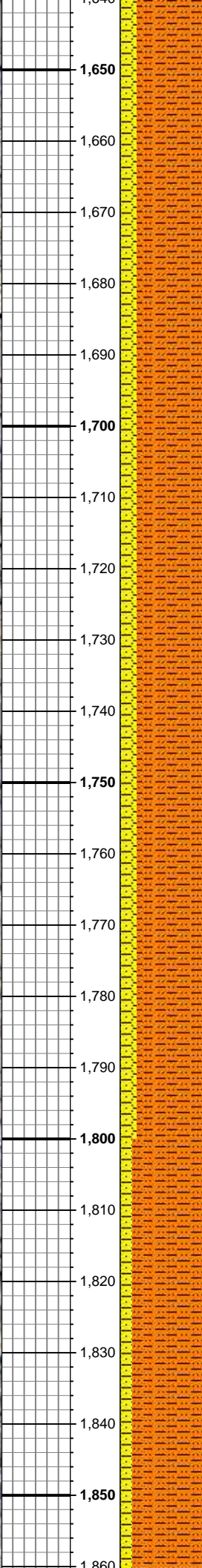
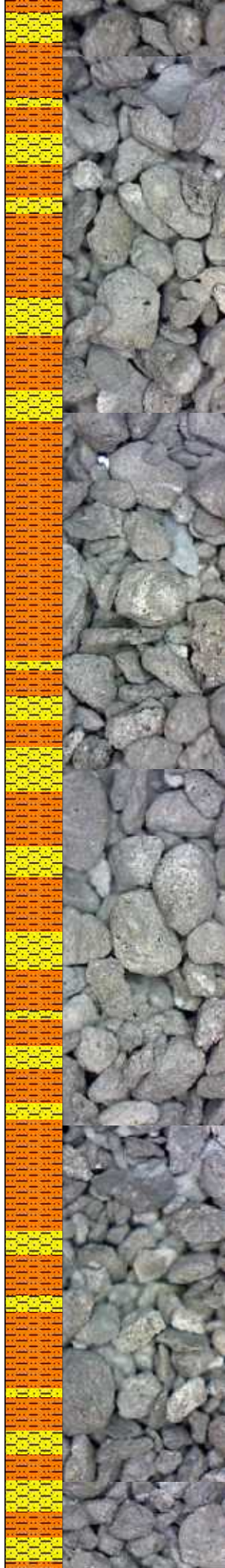
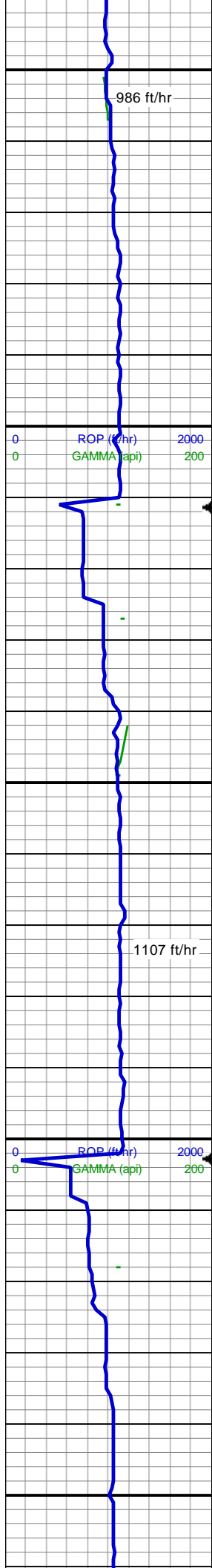


SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn occ f grn, arg, sl
rthy, ply srt, occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr, sb
ang-sb rnd, gr sup mtx, sl arg, v sl calc,
occ speckl blk org incl

MD: 1,478'
TVD: 1,477.93'
Inclination: 0.26°
Azimuth: 93.85°
VS: -11.07'

SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn occ f grn, arg, sl
rthy, ply srt, occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr, sb
ang-sb rnd, gr sup mtx, sl arg, v sl calc,
occ speckl blk org incl

MD: 1,570'
TVD: 1,569.93'
Inclination: 0.08°
Azimuth: 80.05°
VS: -11.34'



SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn occ f grn, arg, sl
rthy, ply srt, occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr,sb
ang-sb rnd, gr sup mtx, sl arg, v sl calc,
occ speckl blk org incl

MD: 1,663'
TVD: 1,662.93'
Inclination: 0.26°
Azimuth: 140.6°
VS: -11.54'

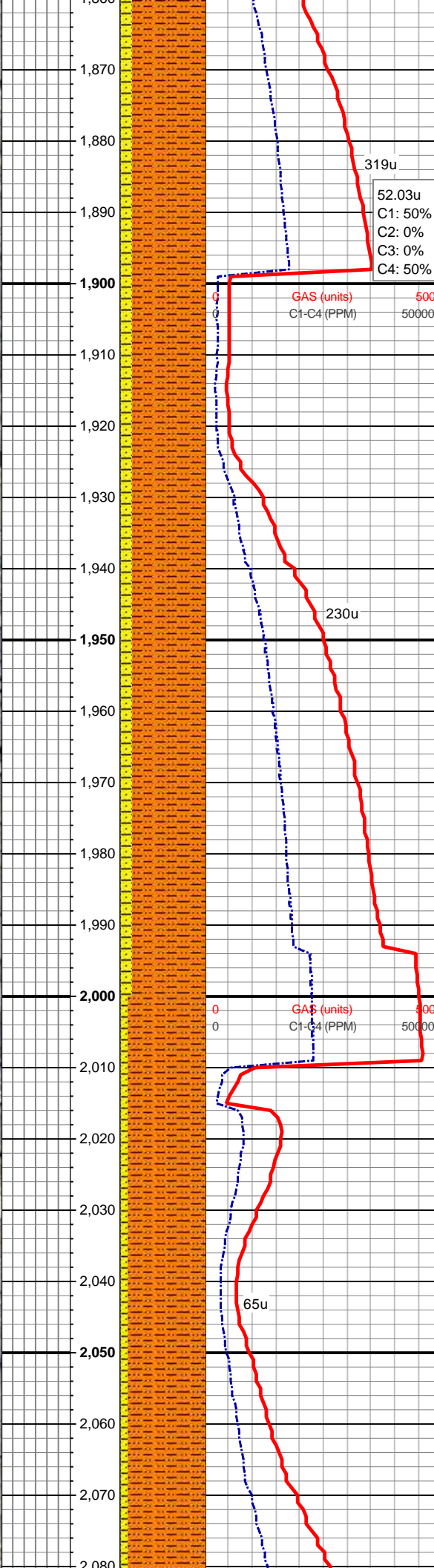
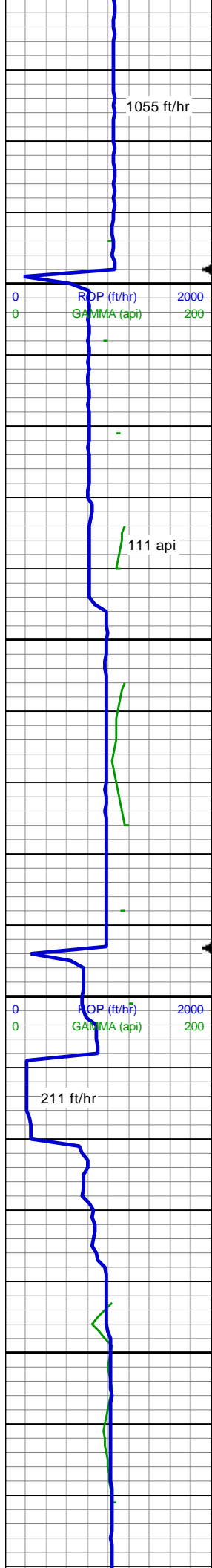
265u
284.46u
C1: 50%
C2: 0%
C3: 0%
C4: 50%

SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn occ f grn, arg, sl
rthy, ply srt, occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr,sb
ang-sb rnd, gr sup mtx, sl arg, v sl calc,
occ speckl blk org incl

MD: 1,757'
TVD: 1,756.93'
Inclination: 0.53°
Azimuth: 176.91°
VS: -11.72'

HOLE DEPTH ADJUSTED

SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn occ f grn, arg, sl
rthy, ply srt, occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr,sb
ang-sb rnd, gr sup mtx, sl arg, v sl calc,
occ speckl blk org incl



MD: 1,850'
TVD: 1,849.93'
Inclination: 0.43°
Azimuth: 174.79°
VS: -11.81'

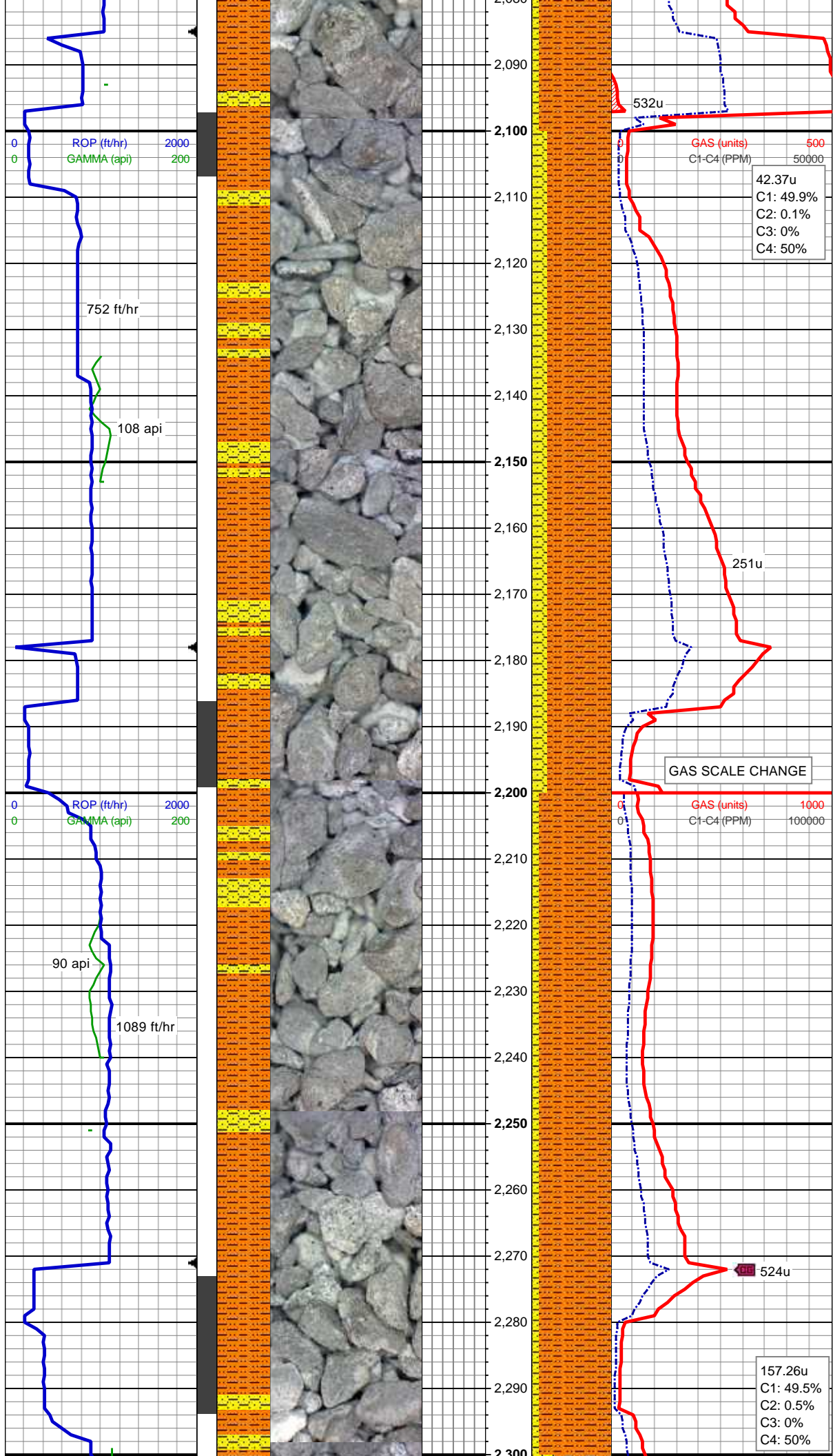
SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f gm occ f gm, arg, sl
rthy, ply srt, occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr, sb
ang-sb rnd, gr sup mtx, sl arg, v sl calc,
occ speckl blk org incl

MD: 1,944'
TVD: 1,943.92'
Inclination: 0.26°
Azimuth: 176.99°
VS: -11.87'

MUD WT 8.6 VIS 26

MD: 2,037'
TVD: 2,036.91'
Inclination: 1.97°
Azimuth: 33.29°
VS: -12.72'

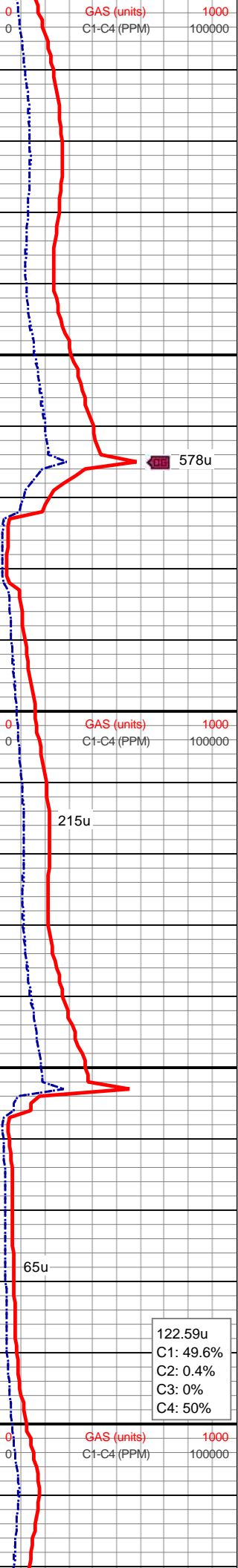
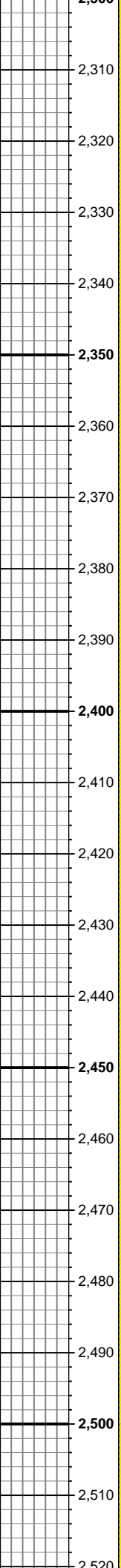
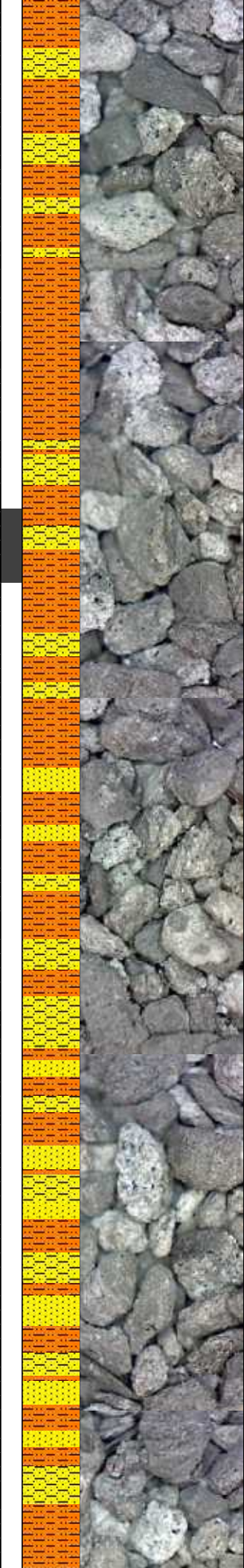
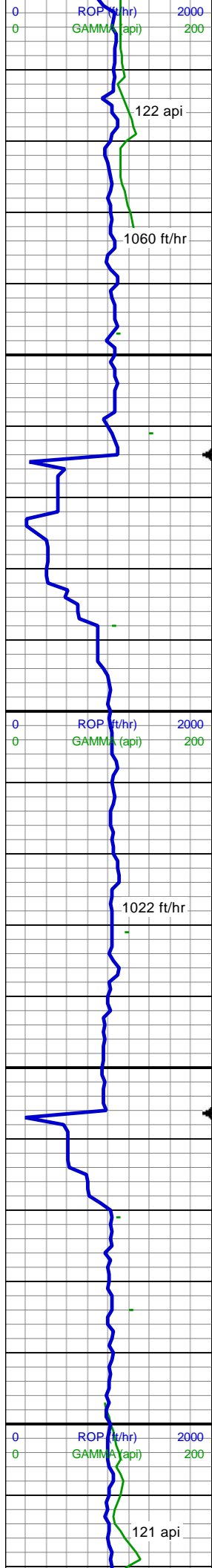
SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f gm occ f gm, arg, sl
rthy, ply srt, occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr, sb
ang-sb rnd, gr sup mtx, sl arg, v sl calc,
occ speckl blk org incl



MD: 2,130'
TVD: 2,129.78'
Inclination: 3.82°
Azimuth: 26.53°
VS: -14.82'

SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn occ f grn, arg, sl
rthy, ply srt, occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr, sb
ang-sb rnd, gr sup mtx, sl arg, ply srt, v sl
calc, occ speckl blk org incl

SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn occ f grn, arg, sl
rthy, ply srt, occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr, sb
ang-sb rnd, gr sup mtx, sl arg, ply srt, v sl
calc, occ speckl blk org incl



MD: 2,315'
TVD: 2,313.9'
Inclination: 7.25°
Azimuth: 34°
VS: -23.49'

SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn occ f grn, arg, sl
rthy, ply srt, occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr,sb
ang-sb rnd, gr sup mtx, sl arg, ply srt, v sl
calc, occ speckl blk org incl
SS: lt gy - wh, S&P, frm - brit, sb rnd, f gr,
mod srt, sl arg cmt, mod calc, occ glau

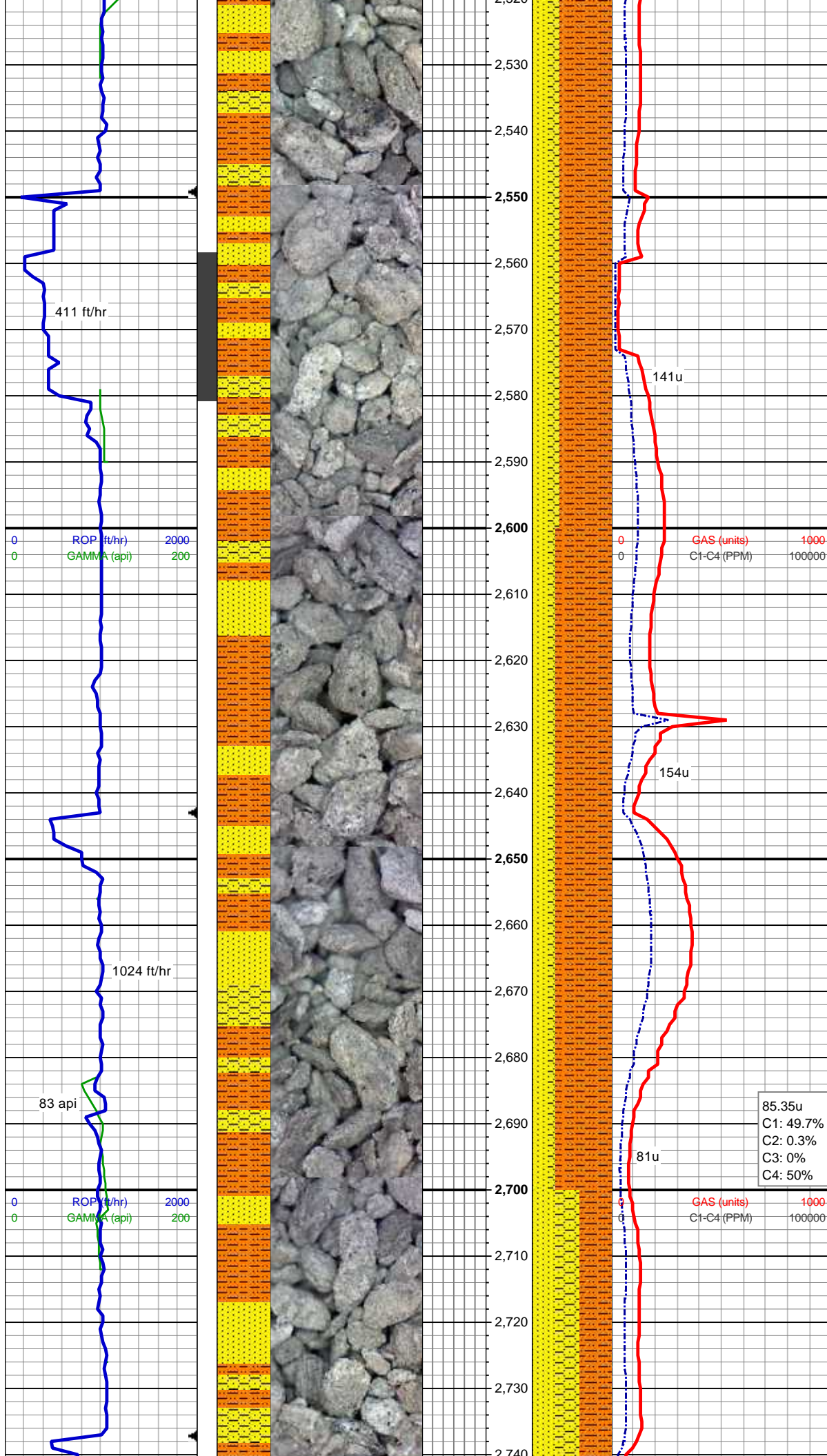
MD: 2,409'
TVD: 2,407.06'
Inclination: 8.09°
Azimuth: 38.48°
VS: -30.53'

SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn occ f grn, arg, sl
rthy, ply srt, occ blk org cl
SS: lt gy - wh, S&P, frm - brit, sb rnd, f gr,
mod srt, sl arg cmt, mod calc, occ glau
SHY SS: ltgy-wh, sft-sl frm, f-v f gr,sb
ang-sb rnd, gr sup mtx, sl arg, ply srt, v sl
calc, occ speckl blk org incl

MUD WT 8.6 VIS 26

122.59u
C1: 49.6%
C2: 0.4%
C3: 0%
C4: 50%

MD: 2,501'
TVD: 2,498.17'
Inclination: 7.87°
Azimuth: 33.47°
VS: -37.62'



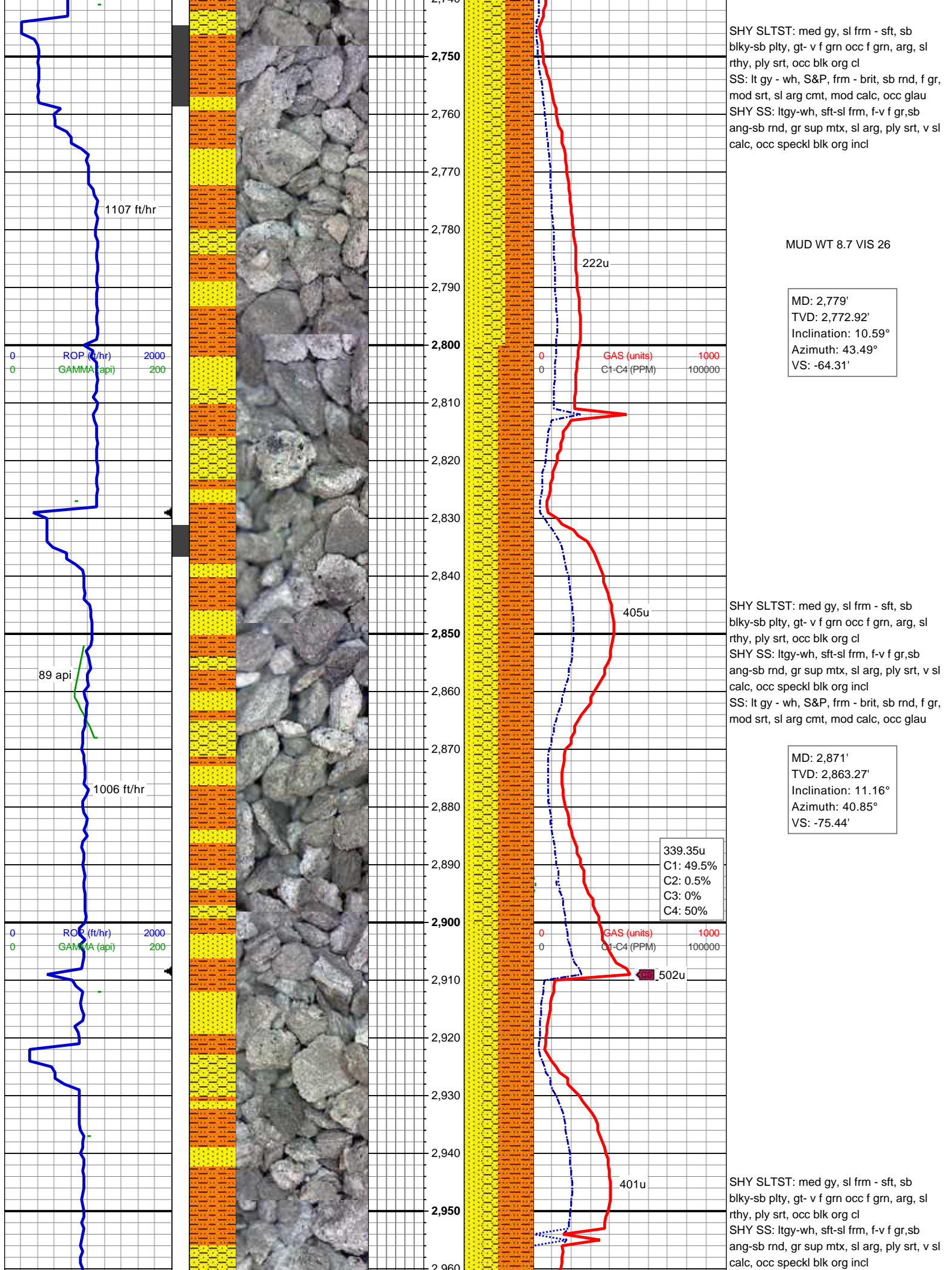
SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn occ f grn, arg, sl
rthy, ply srt, occ blk org cl
SS: lt gy - wh, S&P, frm - brit, sb rnd, f gr,
mod srt, sl arg cmt, mod calc, occ glau
SHY SS: ltgy-wh, sft-sl frm, f-v f gr,sb
ang-sb rnd, gr sup mtx, sl arg, ply srt, v sl
calc, occ speckl blk org incl

MD: 2,594'
TVD: 2,590.2'
Inclination: 8.66°
Azimuth: 41.82°
VS: -45.38'

SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn occ f grn, arg, sl
rthy, ply srt, occ blk org cl
SS: lt gy - wh, S&P, frm - brit, sb rnd, f gr,
mod srt, sl arg cmt, mod calc, occ glau
SHY SS: ltgy-wh, sft-sl frm, f-v f gr,sb
ang-sb rnd, gr sup mtx, sl arg, ply srt, v sl
calc, occ speckl blk org incl

85.35u
C1: 49.7%
C2: 0.3%
C3: 0%
C4: 50%

MD: 2,686'
TVD: 2,681.19'
Inclination: 8.35°
Azimuth: 43.67°
VS: -54.21'



SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn occ f grn, arg, sl
rthy, ply srt, occ blk org cl
SS: lt gy - wh, S&P, frm - brit, sb rnd, f gr,
mod srt, sl arg cmt, mod calc, occ glau
SHY SS: ltgy-wh, sft-sl frm, f-v f gr,sb
ang-sb rnd, gr sup mtx, sl arg, ply srt, v sl
calc, occ speckl blk org incl

MUD WT 8.7 VIS 26

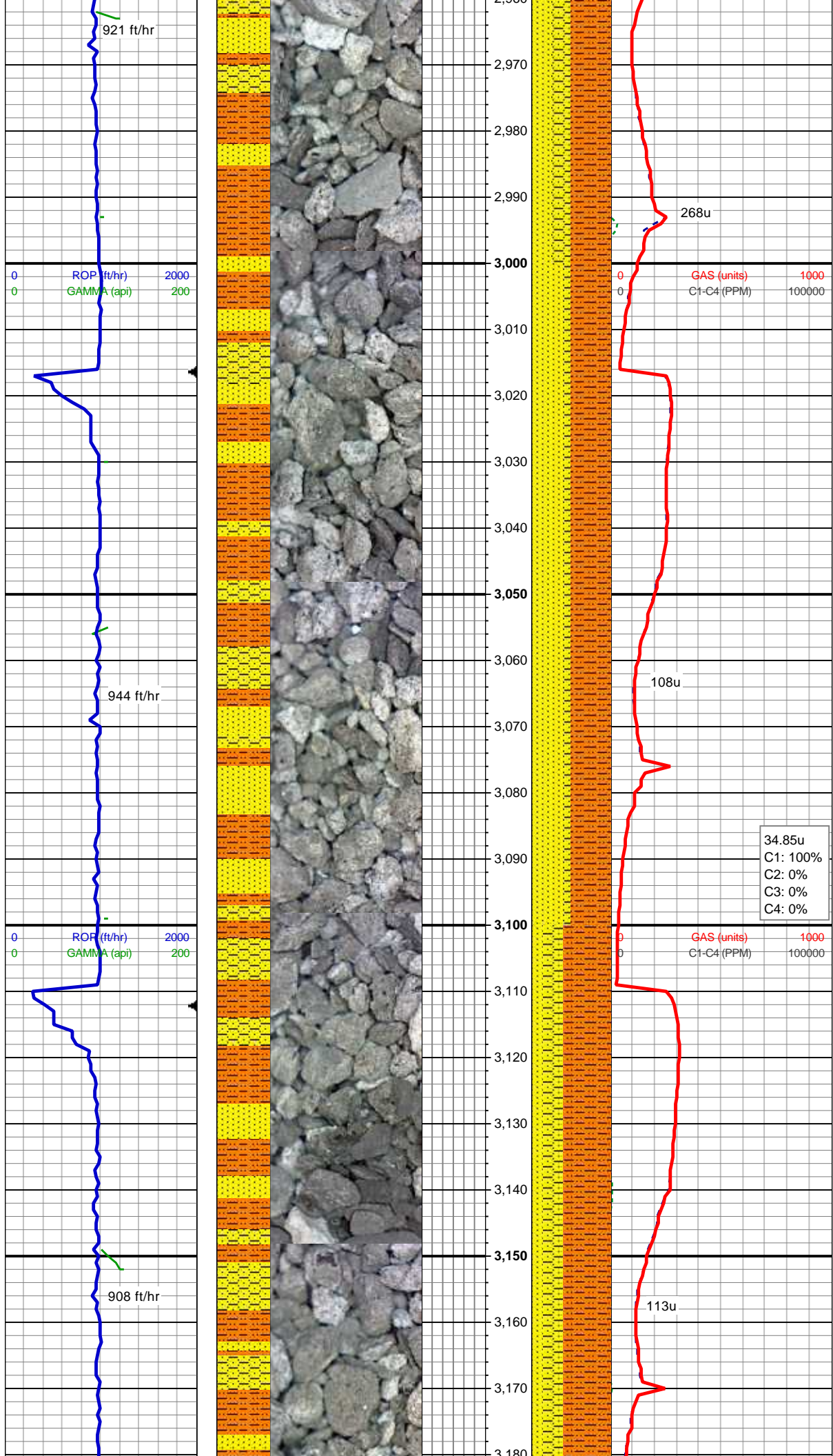
MD: 2,779'
TVD: 2,772.92'
Inclination: 10.59°
Azimuth: 43.49°
VS: -64.31'

SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn occ f grn, arg, sl
rthy, ply srt, occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr,sb
ang-sb rnd, gr sup mtx, sl arg, ply srt, v sl
calc, occ speckl blk org incl
SS: lt gy - wh, S&P, frm - brit, sb rnd, f gr,
mod srt, sl arg cmt, mod calc, occ glau

MD: 2,871'
TVD: 2,863.27'
Inclination: 11.16°
Azimuth: 40.85°
VS: -75.44'

339.35u
C1: 49.5%
C2: 0.5%
C3: 0%
C4: 50%

SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, gt- v f grn occ f grn, arg, sl
rthy, ply srt, occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr,sb
ang-sb rnd, gr sup mtx, sl arg, ply srt, v sl
calc, occ speckl blk org incl



SS: lt gy - wh, S&P, frm - brit, sb rnd, f gr, mod srt, sl arg cmt, mod calc, occ glau

MD: 2,966'
TVD: 2,956.56'
Inclination: 10.59°
Azimuth: 39.27°
VS: -86.43'

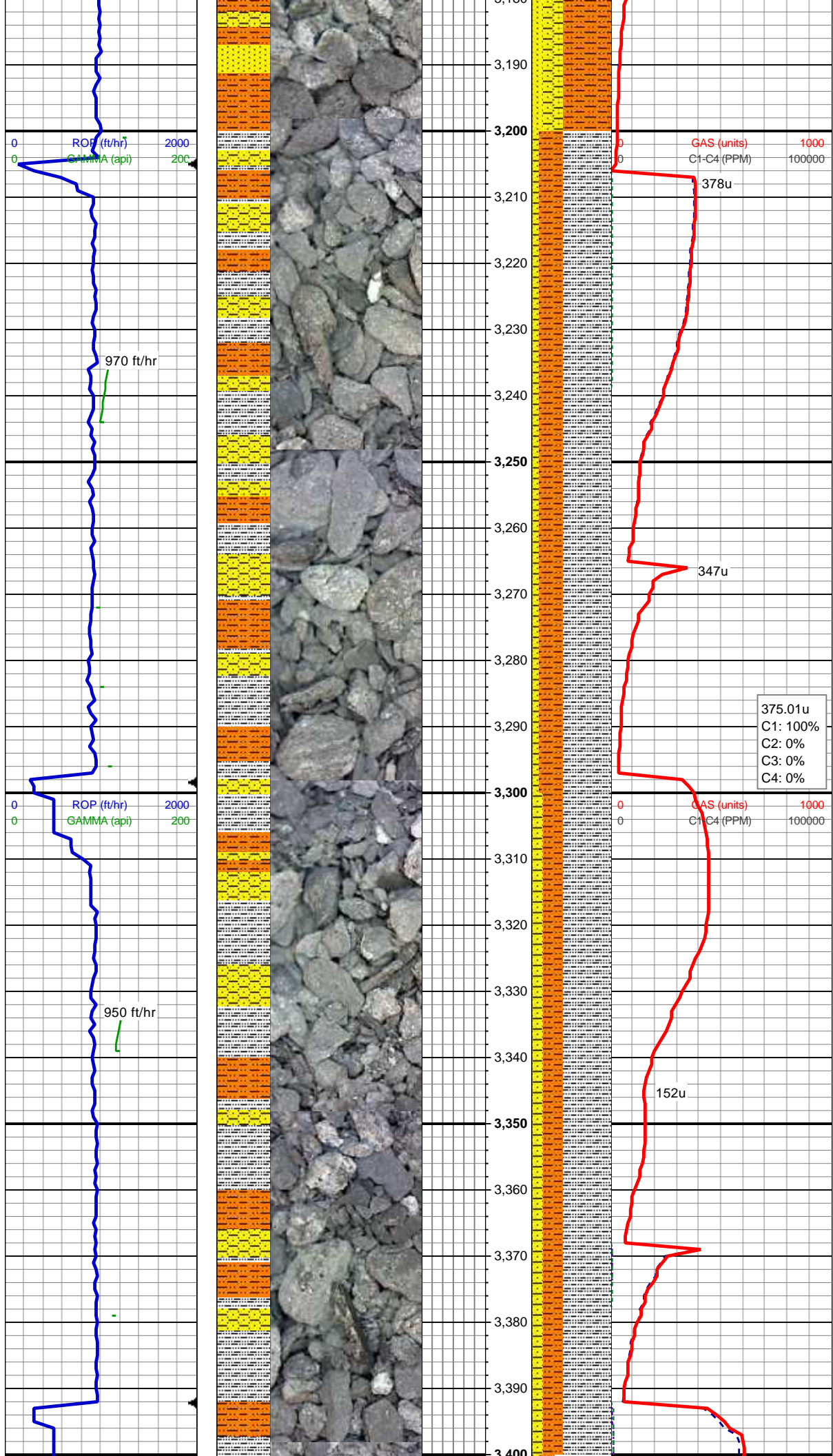
SHY SLTST: lt-med gy, sl frm - sft, sb blk-sb plty, sl gt tex, sl arg, sl rthy, ply srt, occ blk org cl
SS: lt gy - wh, S&P, frm - brit, sb rnd, f gr, mod srt, sl arg cmt, mod calc, occ glau
SHY SS: ltgy-wh, sft-sl frm, f-v f gr,sb ang-sb rnd, gr sup mtx, sl arg, ply srt, v sl calc, occ speckl blk org incl

MD: 3,060'
TVD: 3,048.98'
Inclination: 10.46°
Azimuth: 37.34°
VS: -96.54'

34.85u
C1: 100%
C2: 0%
C3: 0%
C4: 0%

SHY SLTST: med gy, sl frm - sft, sb blk-sb plty, sl gt tex, sl arg, sl rthy, ply srt, occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr,sb ang-sb rnd, gr sup mtx, sl arg, ply srt, v sl calc, occ speckl blk org incl
SS: lt gy - wh, S&P, frm - brit, sb rnd, f gr, mod srt, sl arg cmt, mod calc, occ glau

MD: 3,154'
TVD: 3,141.54'
Inclination: 9.58°
Azimuth: 36.19°



VS: -105.81'

MUD WT 8.47 VIS 26

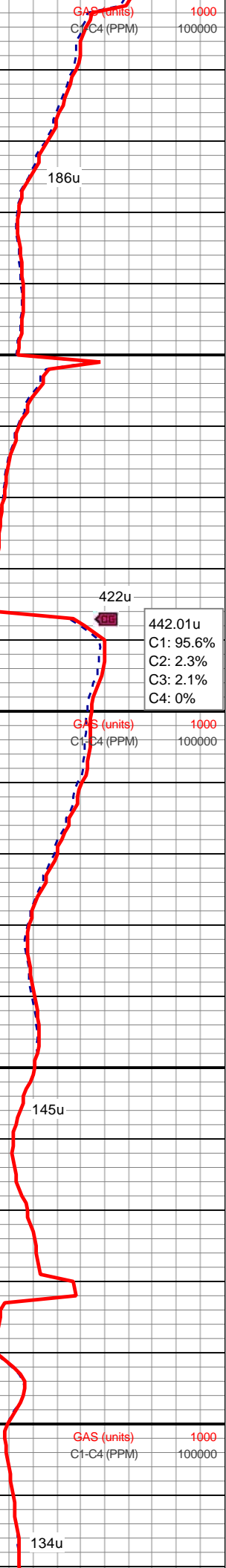
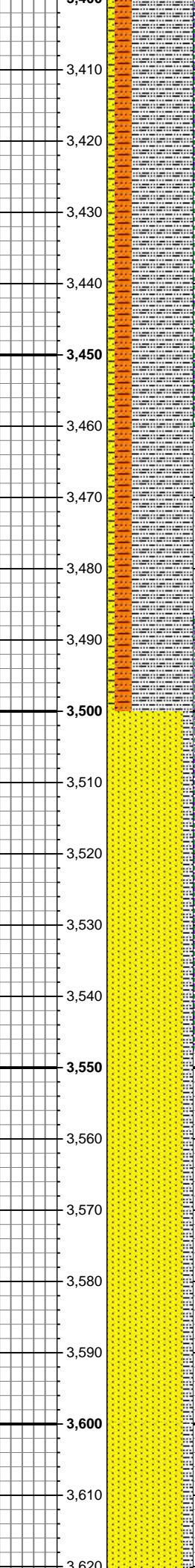
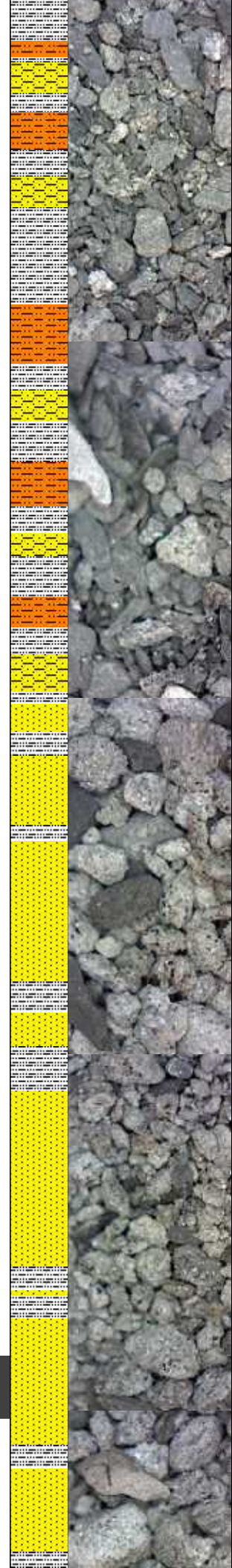
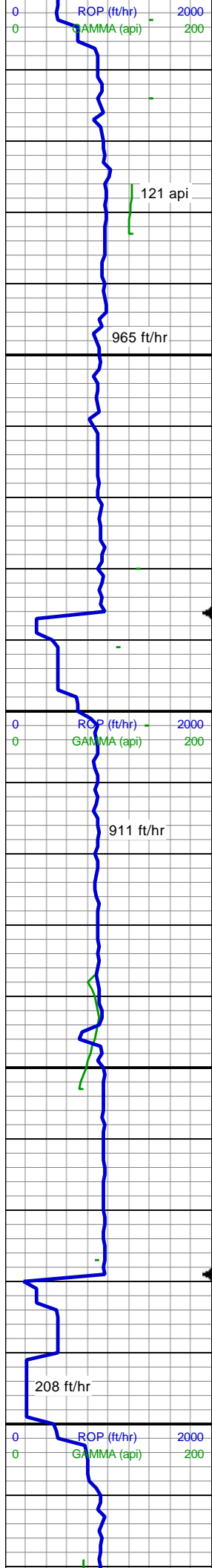
SLTY SH: med gy-lt gy, sb plty-plty, sft- sl
frm, slt tex, sl rthy lstr, sl sdy ip, non calc
SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, sl gt tex, sl arg, sl rthy, ply srt,
occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr,sb
ang-sb rnd, gr sup mtx, sl arg, ply srt, v sl
calc

MD: 3,248'
TVD: 3,234.43'
Inclination: 8.09°
Azimuth: 33.29°
VS: -113.59'

375.01u
C1: 100%
C2: 0%
C3: 0%
C4: 0%

SLTY SH: med gy-lt gy, sb plty-plty, sft- sl
frm, slt tex, sl rthy lstr, sl sdy ip, non calc
SHY SLTST: med gy, sl frm - sft, sb
blky-sb plty, sl gt tex, sl arg, sl rthy, ply srt,
occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr,sb
ang-sb rnd, gr sup mtx, sl arg, ply srt, v sl
calc

MD: 3,342'
TVD: 3,327.63'
Inclination: 6.86°
Azimuth: 34.35°
VS: -119.98'

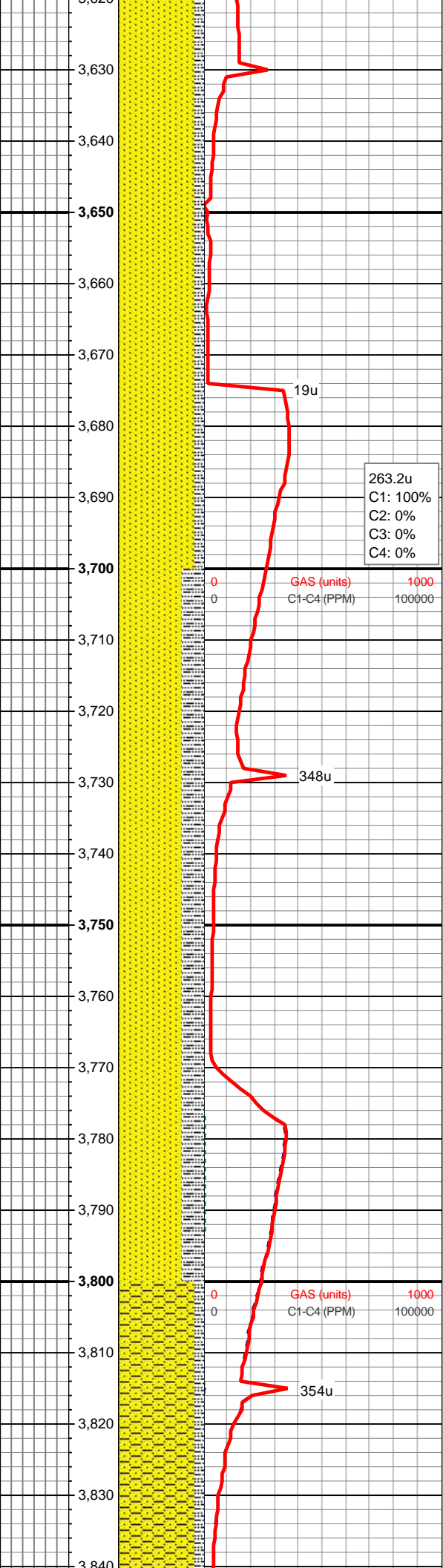
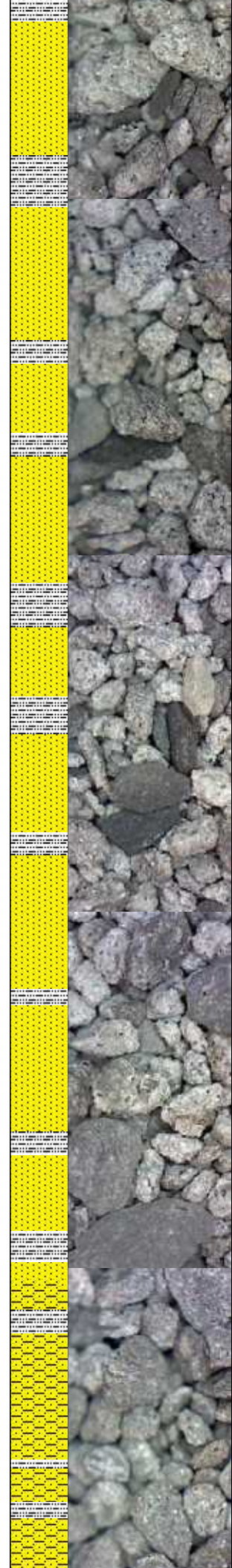
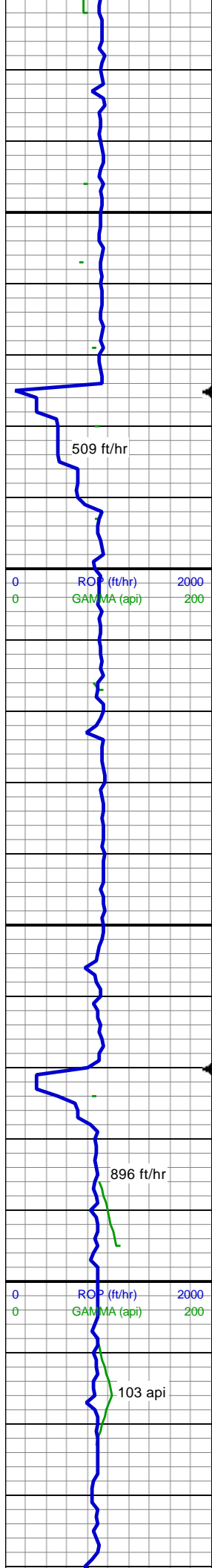


MD: 3,436'
TVD: 3,421.04'
Inclination: 5.93°
Azimuth: 28.11°
VS: -125.08'

SLTY SH: med gy-lt gy, sb plty-plty, sft-sl frm, slt tex, sl rthy lstr, sl sdy ip, non calc
SHY SLTST: med gy, sl frm - sft, sb blk-ly-sb plty, sl gt tex, sl arg, sl rthy, ply srt, occ blk org cl
SHY SS: ltgy-wh, sft-sl frm, f-v f gr, sb ang-sb rnd, gr sup mtx, sl arg, ply srt, v sl calc

MD: 3,530'
TVD: 3,514.56'
Inclination: 5.63°
Azimuth: 27.67°
VS: -129.18'

SS: lt gy - wh, S&P, frm - brit, sb rnd, f gr, mod srt, sl arg cmt, mod calc, occ glau
SLTY SH: med gy-lt gy, sb plty-plty, sft-sl frm, slt tex, sl rthy lstr, sl sdy ip, non calc, occ fos frags



MD: 3,625'

TVD: 3,609.03'

Inclination: 6.51°

Azimuth: 27.23°

VS: -133.45'

MD: 3,719'

TVD: 3,702.39'

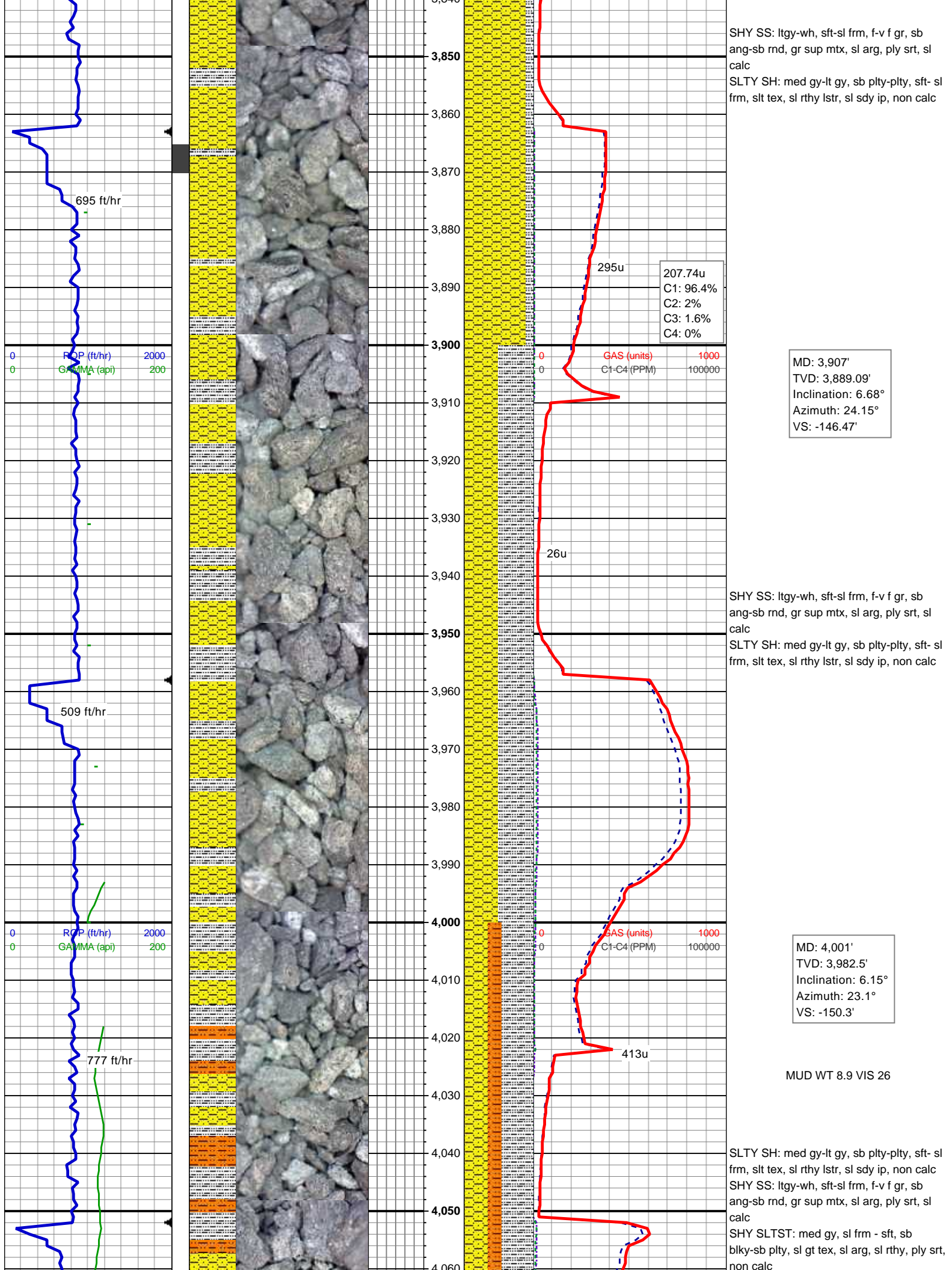
Inclination: 6.81°

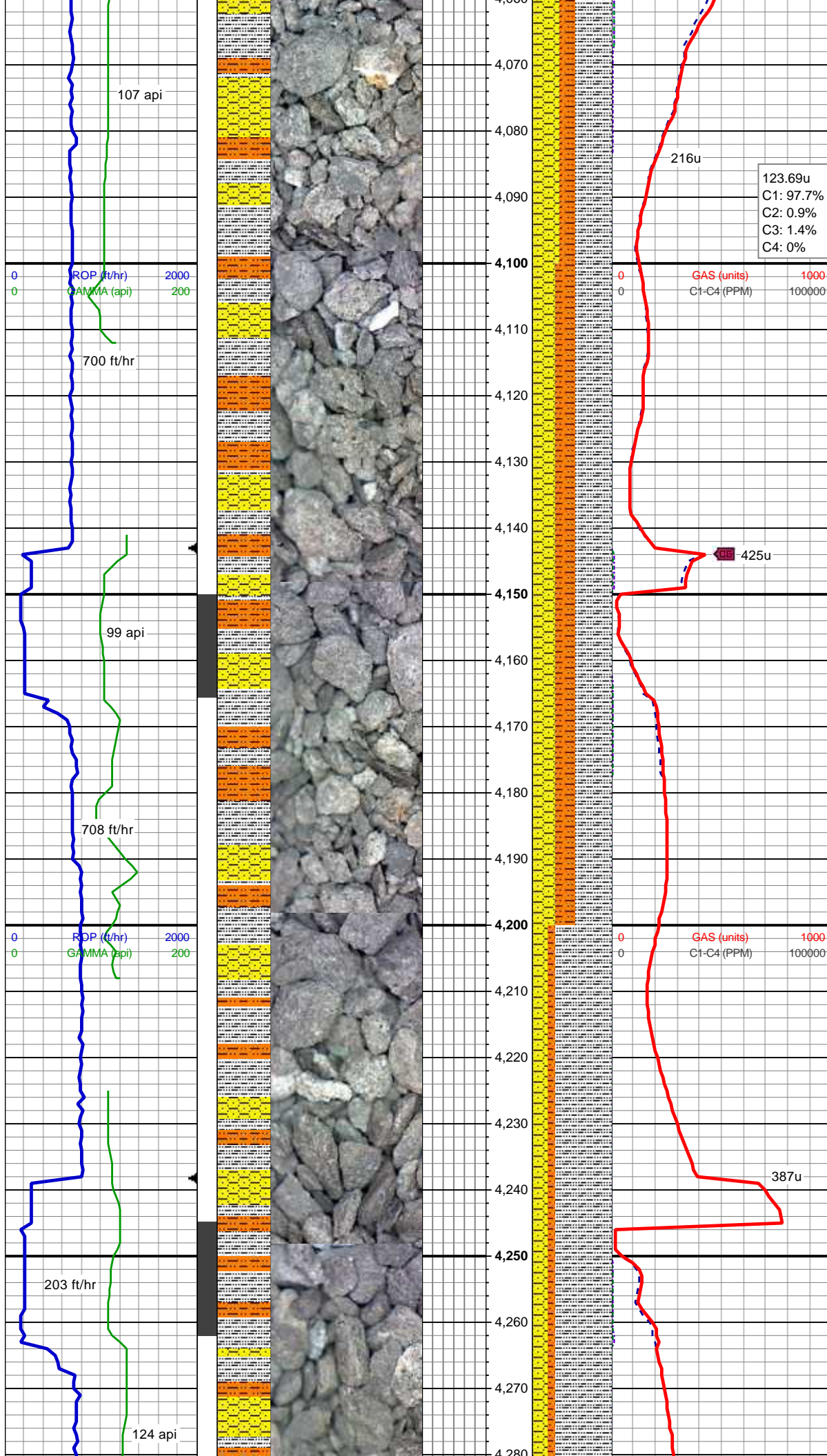
Azimuth: 25.82°

VS: -137.93'

SS: lt gy - wh, S&P, frm - brit, sb rnd, f gr, mod srt, sl arg cmt, mod calc, occ glau

SLTY SH: med gy-lt gy, sb plty-plty, sft-sl frm, slt tex, sl rthy lstr, sl sdy ip, non calc, occ fos frags





MD: 4,095'
TVD: 4,076'
Inclination: 5.71°
Azimuth: 23.8°
VS: -153.81'

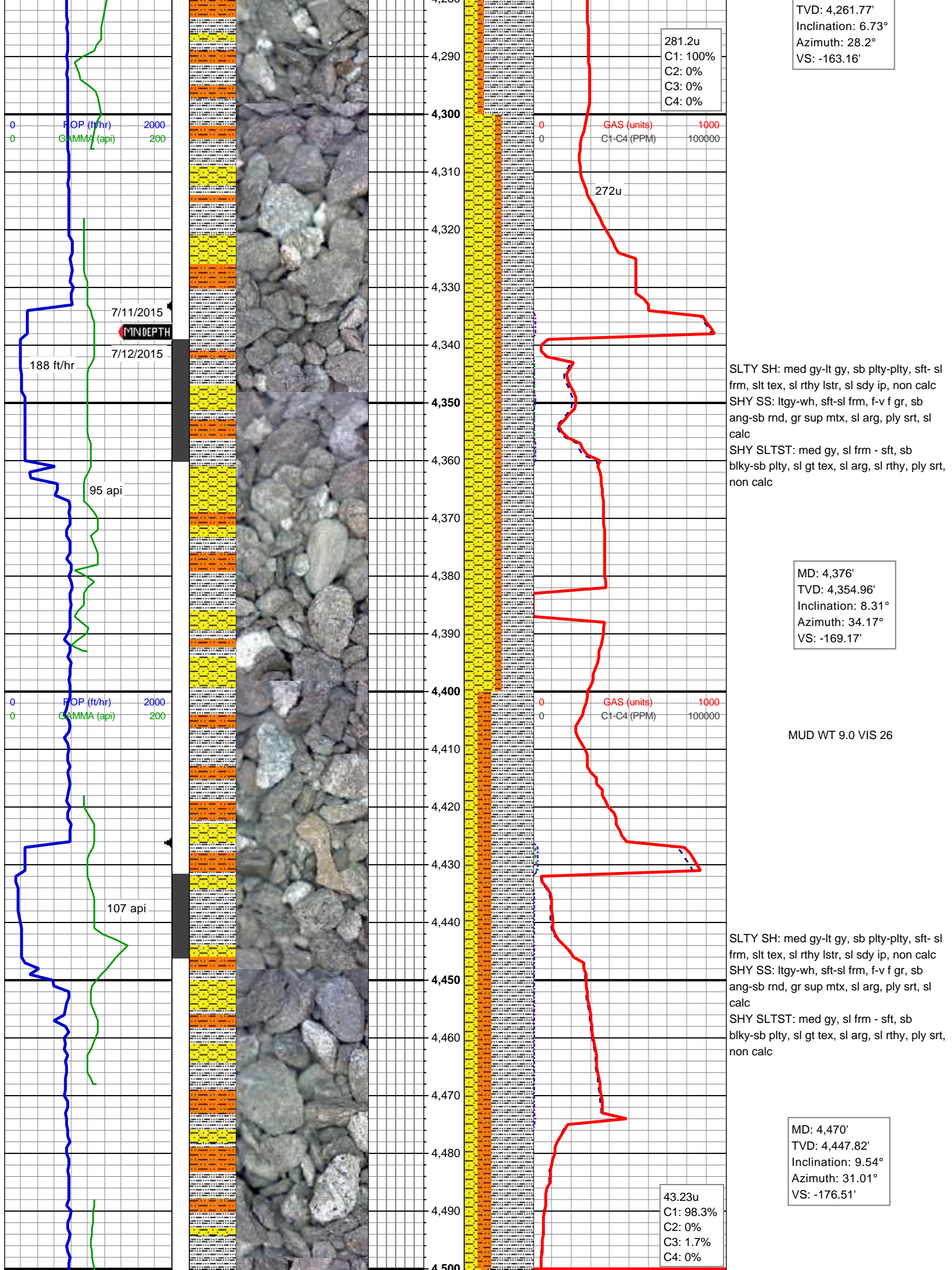
SLTY SH: med gy-lt gy, sb plty-plty, sft-sl frm, slt tex, sl rthy lstr, sl sdy ip, non calc
SHY SS: ltgy-wh, sft-sl frm, f-v f gr, sb ang-sb rnd, gr sup mtx, sl arg, ply srt, sl calc
SHY SLTST: med gy, sl frm - sft, sb blk-sb plty, sl gt tex, sl arg, sl rthy, ply srt, non calc

MD: 4,188'
TVD: 4,168.43'
Inclination: 6.95°
Azimuth: 29.87°
VS: -158.12'

MUD WT 9.0 VIS 26

SLTY SH: med gy-lt gy, sb plty-plty, sft-sl frm, slt tex, sl rthy lstr, sl sdy ip, non calc
SHY SS: ltgy-wh, sft-sl frm, f-v f gr, sb ang-sb rnd, gr sup mtx, sl arg, ply srt, sl calc
SHY SLTST: med gy, sl frm - sft, sb blk-sb plty, sl gt tex, sl arg, sl rthy, ply srt, non calc

MD: 4,282'



TVD: 4,261.77'
Inclination: 6.73°
Azimuth: 28.2°
VS: -163.16'

281.2u
C1: 100%
C2: 0%
C3: 0%
C4: 0%

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

272u

SLTY SH: med gy-lt gy, sb plty-plty, sft-sl frm, slt tex, sl rthy lstr, sl sdy ip, non calc
SHY SS: ltgy-wh, sft-sl frm, f-v f gr, sb ang-sb rnd, gr sup mtx, sl arg, ply srt, sl calc
SHY SLTST: med gy, sl frm - sft, sb blk-sb plty, sl gt tex, sl arg, sl rthy, ply srt, non calc

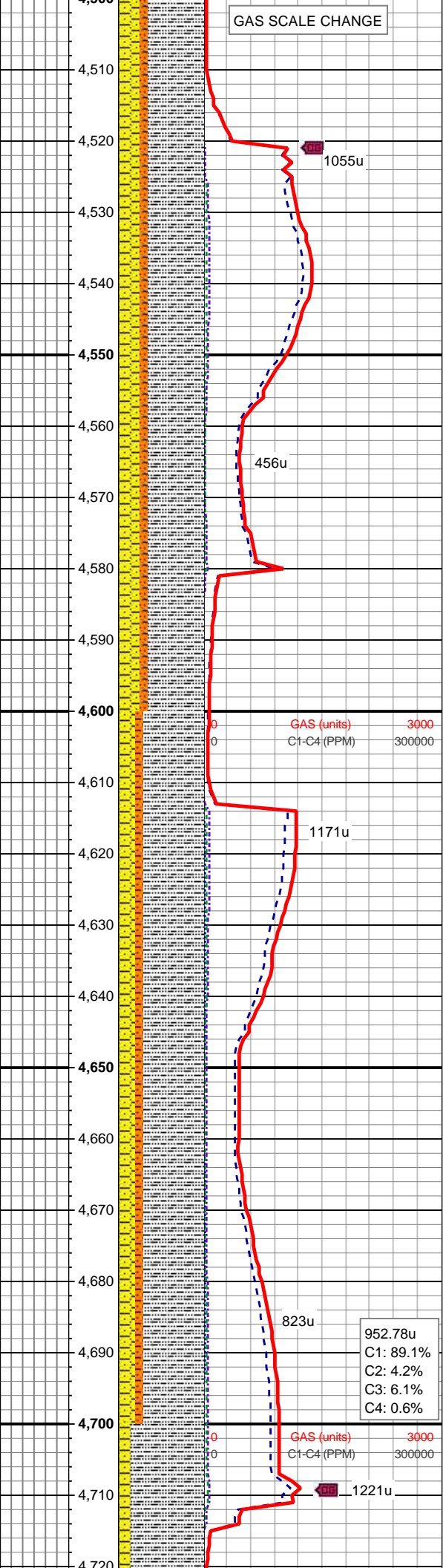
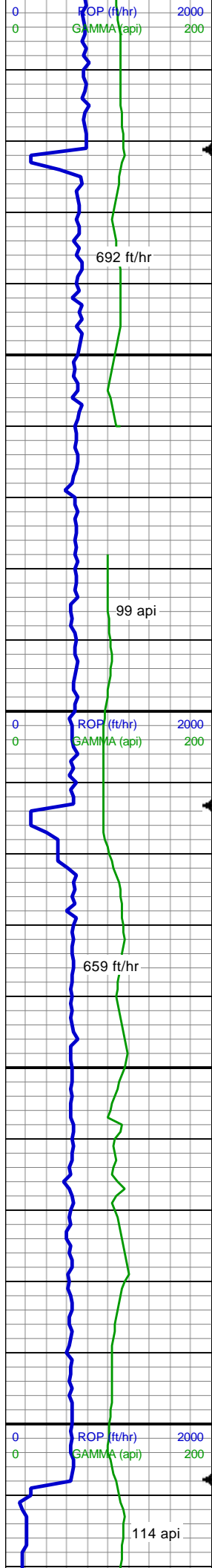
MD: 4,376'
TVD: 4,354.96'
Inclination: 8.31°
Azimuth: 34.17°
VS: -169.17'

MUD WT 9.0 VIS 26

SLTY SH: med gy-lt gy, sb plty-plty, sft-sl frm, slt tex, sl rthy lstr, sl sdy ip, non calc
SHY SS: ltgy-wh, sft-sl frm, f-v f gr, sb ang-sb rnd, gr sup mtx, sl arg, ply srt, sl calc
SHY SLTST: med gy, sl frm - sft, sb blk-sb plty, sl gt tex, sl arg, sl rthy, ply srt, non calc

MD: 4,470'
TVD: 4,447.82'
Inclination: 9.54°
Azimuth: 31.01°
VS: -176.51'

43.23u
C1: 98.3%
C2: 0%
C3: 1.7%
C4: 0%



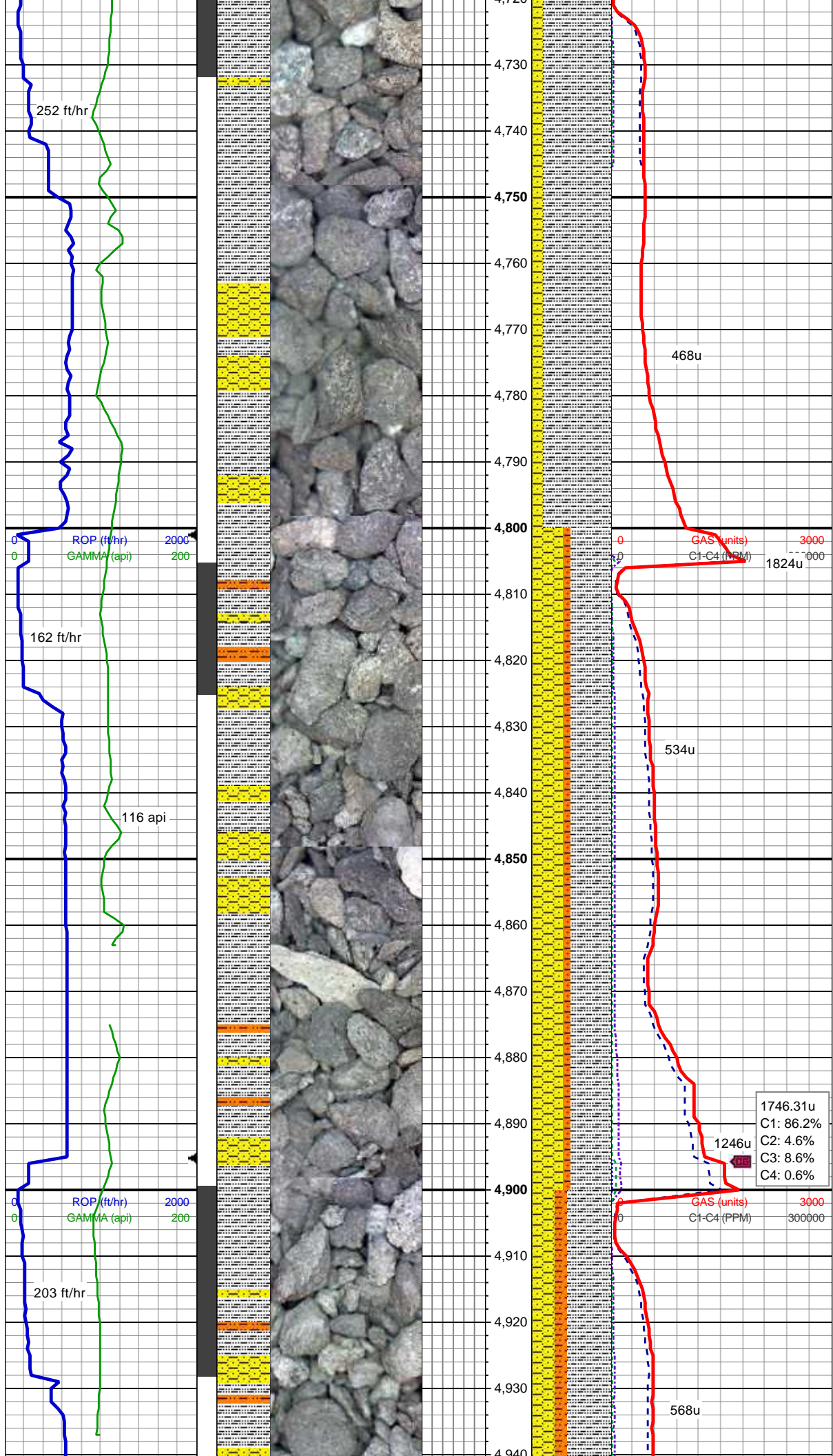
SLTY SH: med gy-lt gy, sb plty-plty, sft-sl frm, slt tex, sl rthy lstr, sl sdy ip, non calc
SHY SS: ltgy-wh, sft-sl frm, f-v f gr, sb ang-sb rnd, gr sup mtx, sl arg, ply srt, sl calc
SHY SLTST: med gy, sl frm - sft, sb blk-sb plty, sl gt tex, sl arg, sl rthy, ply srt, non calc

MD: 4,564'
TVD: 4,540.74'
Inclination: 7.78°
Azimuth: 27.93°
VS: -183.01'

SLTY SH: med gy-lt gy, sb plty-plty, sft-sl frm, slt tex, sl rthy lstr, sl sdy ip, non calc
SHY SS: ltgy-wh crm, sft-sl frm, f-v f gr, sb ang-sb rnd, gr sup mtx, sl arg, ply srt, sl calc
SHY SLTST: med gy, sl frm - sft, sb blk-sb plty, sl gt tex, sl arg, sl rthy, ply srt, non calc, rr bent

MD: 4,657'
TVD: 4,633'
Inclination: 6.68°
Azimuth: 29.08°
VS: -188.18'

952.78u
C1: 89.1%
C2: 4.2%
C3: 6.1%
C4: 0.6%



SLTY SH: med gy-lt gy, sb plty-plty, sft- sl frm, slt tex, sl rthy lstr, sl sdy ip, non calc
SHY SS: ltgy-wh crm, sft-sl frm, f-v f gr, sb ang-sb rnd, gr sup mtx, sl arg, ply srt, sl calc, rr bent

MD: 4,751'
TVD: 4,726.32'
Inclination: 7.12°
Azimuth: 28.2°
VS: -193.2'

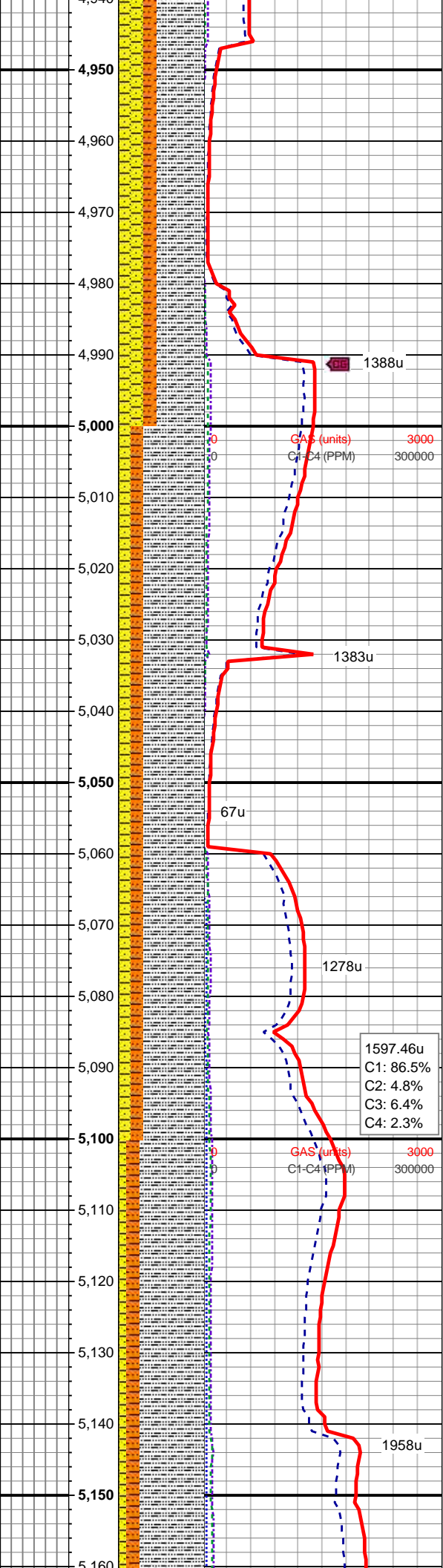
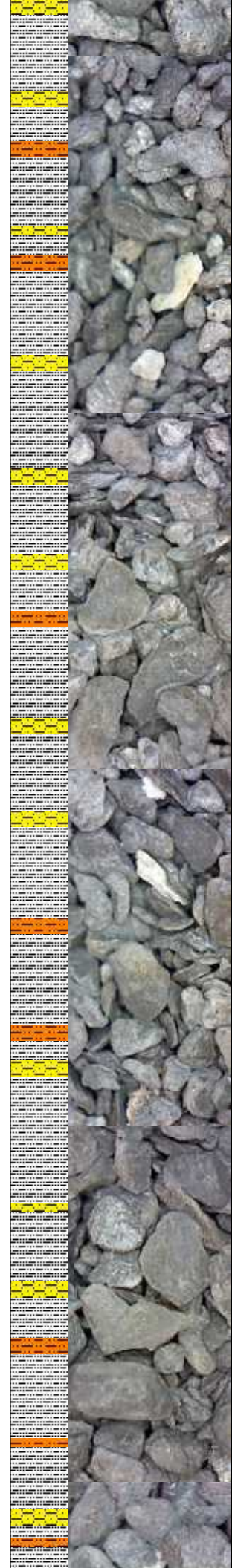
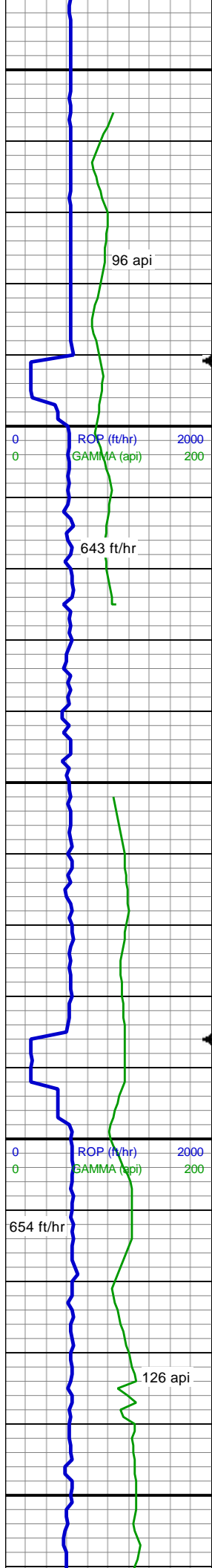
MUD WT 9.1 VIS 35

MD: 4,845'
TVD: 4,819.5'
Inclination: 8.04°
Azimuth: 34.26°
VS: -199.23'

SLTY SH: med gy-lt gy, sb plty-plty, sft- sl frm, slt tex, sl rthy lstr, sl sdy ip, non calc
SHY SS: ltgy-wh crm, sft-sl frm, f-v f gr, sb ang-sb rnd, gr sup mtx, sl arg, ply srt, sl calc
SHY SLTST: med-dk gy, sl frm - sft, sb blkly-sb plty, sl gt tex, sl arg, sl rthy, ply srt, blk incl, non calc, tr bent, occ fos frags

1746.31u
C1: 86.2%
C2: 4.6%
C3: 8.6%
C4: 0.6%

MD: 4,940'
TVD: 4,913.21'
Inclination: 10.77°
Azimuth: 39.62°
VS: -208.14'



SLTY SH: med gy-lt gy, sb plty-plty, sft- sl frm, slt tex, sl rthy lstr, sl sdy ip, non calc
SHY SS: ltgy-wh crm, sft-sl frm, f-v f gr, sb ang-sb rnd, gr sup mtx, sl arg, ply srt, sl calc
SHY SLTST: med-dk gy, sl frm - sft, sb blk-sb plty, sl gt tex, sl arg, sl rthy, ply srt, blk incl, non calc, tr bent, occ fos frags, tr glau

1388u

GAS (units) 3000
C1-C4 (PPM) 300000

MD: 5,033'
TVD: 5,004.67'
Inclination: 10.15°
Azimuth: 37.69°
VS: -218.17'

1383u

67u

1278u

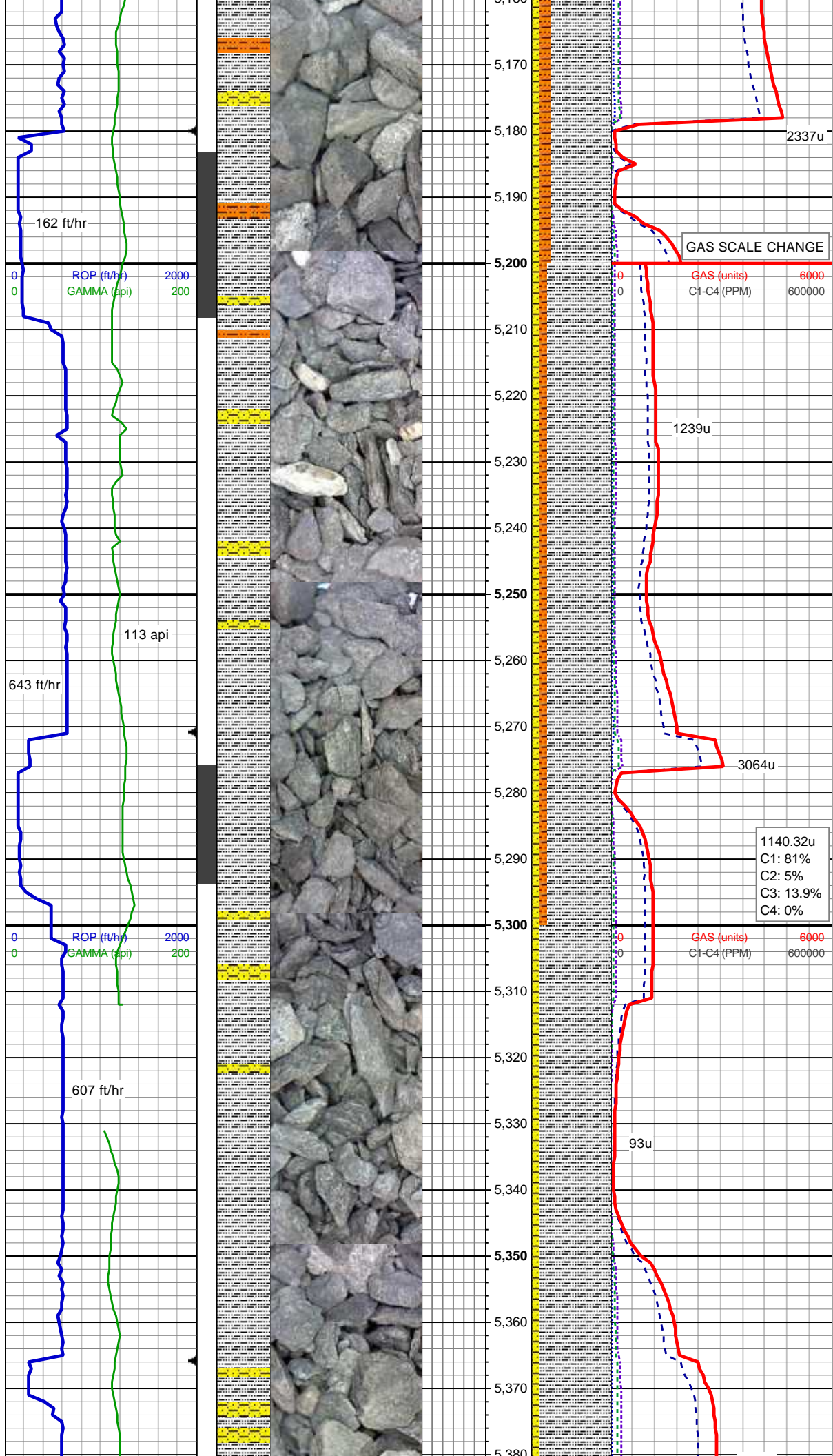
1597.46u
C1: 86.5%
C2: 4.8%
C3: 6.4%
C4: 2.3%

GAS (units) 3000
C1-C4 (PPM) 300000

MD: 5,128'
TVD: 5,098.45'
Inclination: 8.18°
Azimuth: 32.24°
VS: -226.4'

1958u

SLTY SH: med - dk gy, sb blk-sb plty, sl sft-sl frm, slt tex, rthy lstr, sl arg, non calc
SHY SLTST: med-dk gy, sl frm - sft, sb blk-sb plty, gt tex, arg
SHY SS: ltgy - offwht, sft - brit occ frm, sb rnd, f-v f gr, mod srt, arg cmt; tr wh ss, rr



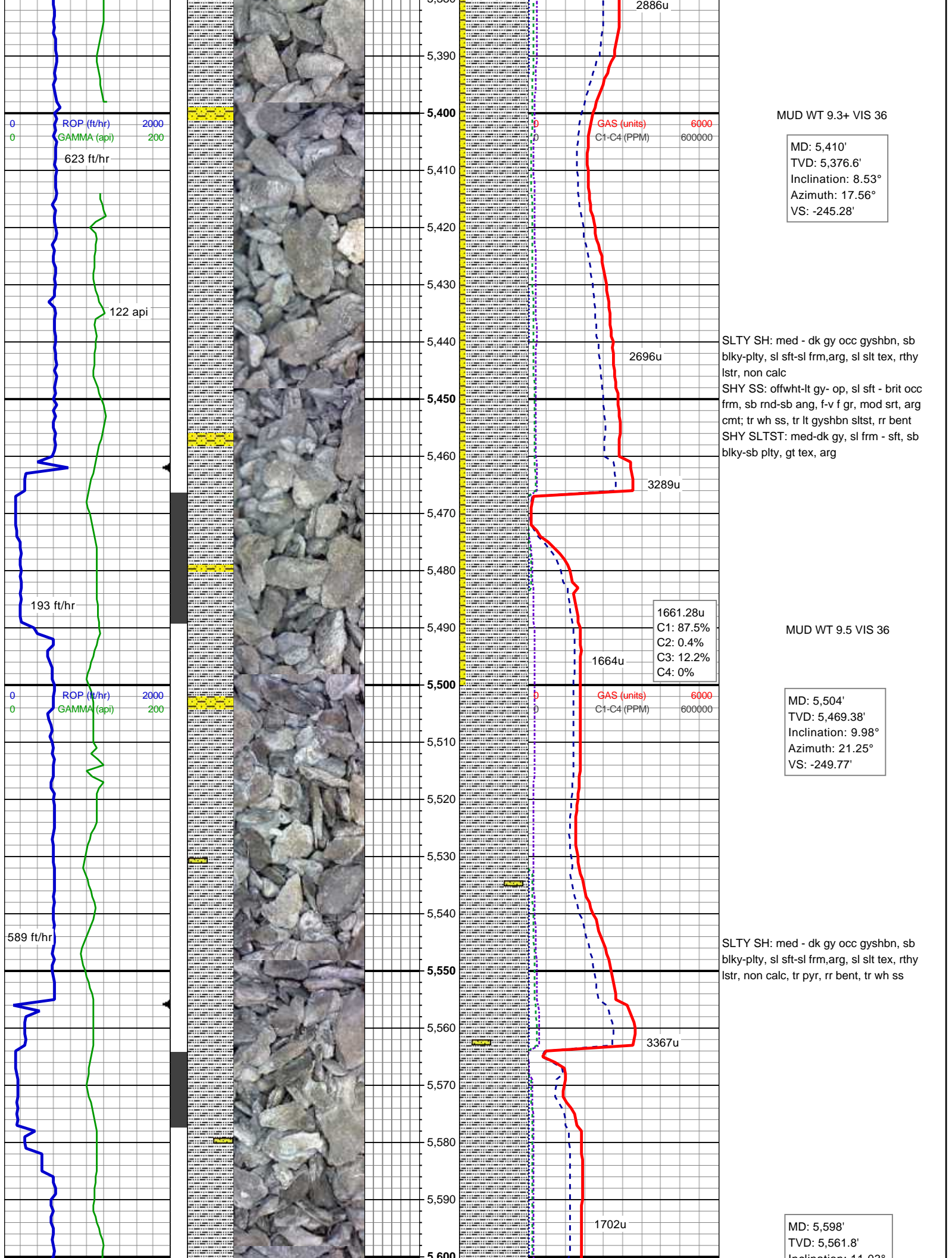
MD: 5,222'
TVD: 5,191.34'
Inclination: 9.49°
Azimuth: 27.32°
VS: -233.03'

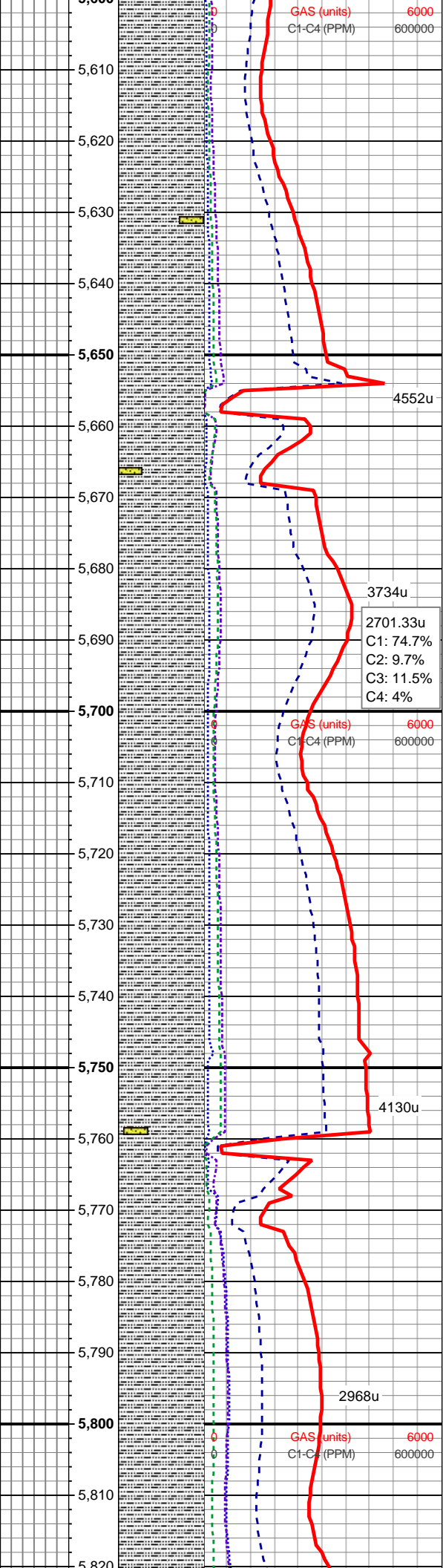
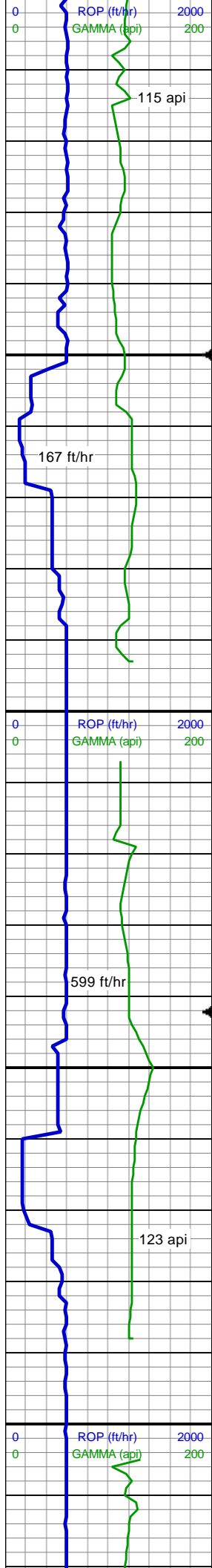
SLTY SH: med - dk gy occ gyshbn, sb
blky-plty, sl sft-sl frm, arg, sl slt tex, rthy
lstr, non calc
SHY SS: offwht-lt gy- op, sl sft - brit occ
frm, sb rnd-sb ang, f-v f gr, mod srt, arg
cmt; tr wh ss, tr lt gysbhn sltst, rr bent

1140.32u
C1: 81%
C2: 5%
C3: 13.9%
C4: 0%

MD: 5,316'
TVD: 5,283.9'
Inclination: 10.55°
Azimuth: 26.7°
VS: -239.87'

SLTY SH: med - dk gy occ gyshbn, sb
blky-plty, sl sft-sl frm, arg, sl slt tex, rthy
lstr, non calc
SHY SS: offwht-lt gy- op, sl sft - brit occ
frm, sb rnd-sb ang, f-v f gr, mod srt, arg
cmt; tr wh ss, tr lt gysbhn sltst, rr bent
SHY SLTST: med-dk gy, sl frm - sft, sb
blky-sb plty, gt tex, arg





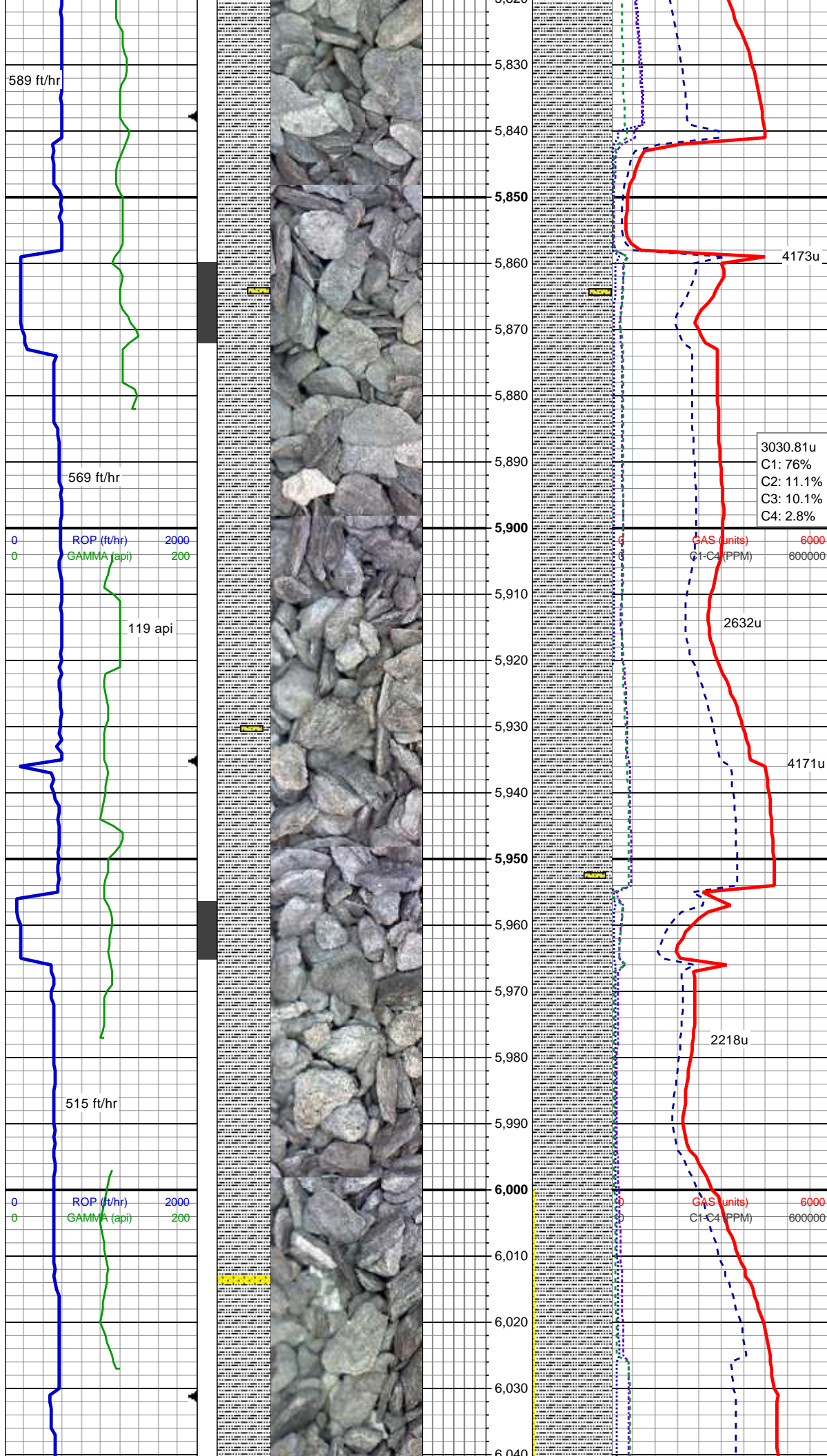
Inclination: 11.03°
Azimuth: 20.81°
VS: -255.28'

SLTY SH: med - dk gy occ gyshbn, sb blkly-sb plty occ plty, sl sft-sl frm, arg, sl slt tex, rthy lstr, non calc, tr pyr, rr bent, tr wh ss

MD: 5,692'
TVD: 5,654.11'
Inclination: 10.76°
Azimuth: 18.79°
VS: -260.64'

SLTY SH: med - dk gy occ gyshbn, sb blkly-sb plty occ plty, sl sft-sl frm, arg, sl slt tex, rthy lstr, non calc, tr pyr, rr bent, tr wh ss

MD: 5,786'
TVD: 5,746.47'
Inclination: 10.63°
Azimuth: 16.42°
VS: -265.26'



SLTY SH: med - dk gy occ gyshbn, sb
blky-sb plty occ plty, sl sft-sl frm,arg, sl slt
tex, rthy lstr, non calc, tr pyr, rr bent, tr wh
ss

MD: 5,881'
TVD: 5,839.87'
Inclination: 10.46°
Azimuth: 13.87°
VS: -269.15'

MUD WT 9.6 VIS 35

SLTY SH: med - dk gy occ gyshbn, sb
blky-sb plty occ plty, sl sft-sl frm,arg, sl slt
tex, rthy lstr, non calc, tr pyr, no bent, tr
wh ss

MD: 5,975'
TVD: 5,932.3'
Inclination: 10.51°
Azimuth: 16.24°
VS: -272.94'

