

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Upchurch State LD02-76-1AHN

Location SESW SEC2, T9N, R58W, 6PM

State COLORADO

County WELD

Country USA

Rig Number H&P 326

API Number 05-123-39814

Field WILDCAT

Region DJ BASIN

Drilling Completed 12/27/2014

Spud Date 12/22/2014

Surface Coordinates 615' FSL, 1604' FWL
40.77498/-103.83521

Bottom Hole Coordinates (PROJ)
330' FFNLL, 2200' FFWLL

Ground Elevation 4742'

K.B. Elevation 4772'

Logged Interval 1227' To 4973'

Total Depth 9758'

Formation NIOBRARA A-CHALK

Type of Drilling Fluid LSND

Other Symbols

Oil Show

- DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

Porosity

- E EARTHY
- F FENESTRAL
- F FRACTURE
- X INTERCRYSTALLINE
- ◇ INTEROOLITIC

MOLDIC

ORGANIC

PINPOINT

VUGGY

Engineering

BIT

CONNECTION (LEFT)

CONNECTION (RIGHT)

CONNECTION GAS

CORE - LOST

CORE - RECOVERED

DST INTERVAL

FAULT

FORMATION TOP

GAS SHOW

MINDEPTH 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

MX MICROXLN

MS MUDSTONE

PS PACKSTONE

WS WACKESTONE

Sorting

M MODERATE

P POOR

W WELL

Zone Color Coding

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

Accessories

Fossils

- ALGAE
- AMPHIPORA

F FOSSIL

GASTROPOD

INOCERAMUS

OOLITE

ANHYDRITIC

ARGILLACEOUS

ARGILLITE GRAIN

B BENTONITE

FERRUGINOUS

GLAUCONITE

GYPSIFEROUS

HEAVY MINERAL

TUFFACEOUS

Stringer

ANHYDRITE STRINGER

BELEMNITE
BIOCLASTIC
BRACHIOPOD
BRYOZOA
CEPHALOPOD
CORAL
CRINOID
ECHINOID
FISH
FORAMINIFERA

OSTRACOD
PELECYPOD
PELLET
PISOLITE
PLANT REMAINS
PLANT SPORES
SCAPHOPOD
STROMATOPOROID

Minerals

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

KAOLIN
MARLSTONE
MINERAL CRYSTALS
NODULES
PHOSPHATE PELLETS
PYRITE
SALT CAST
SANDY
SILICEOUS
SILTY

BENTONITE STRINGER
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
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

Geologist

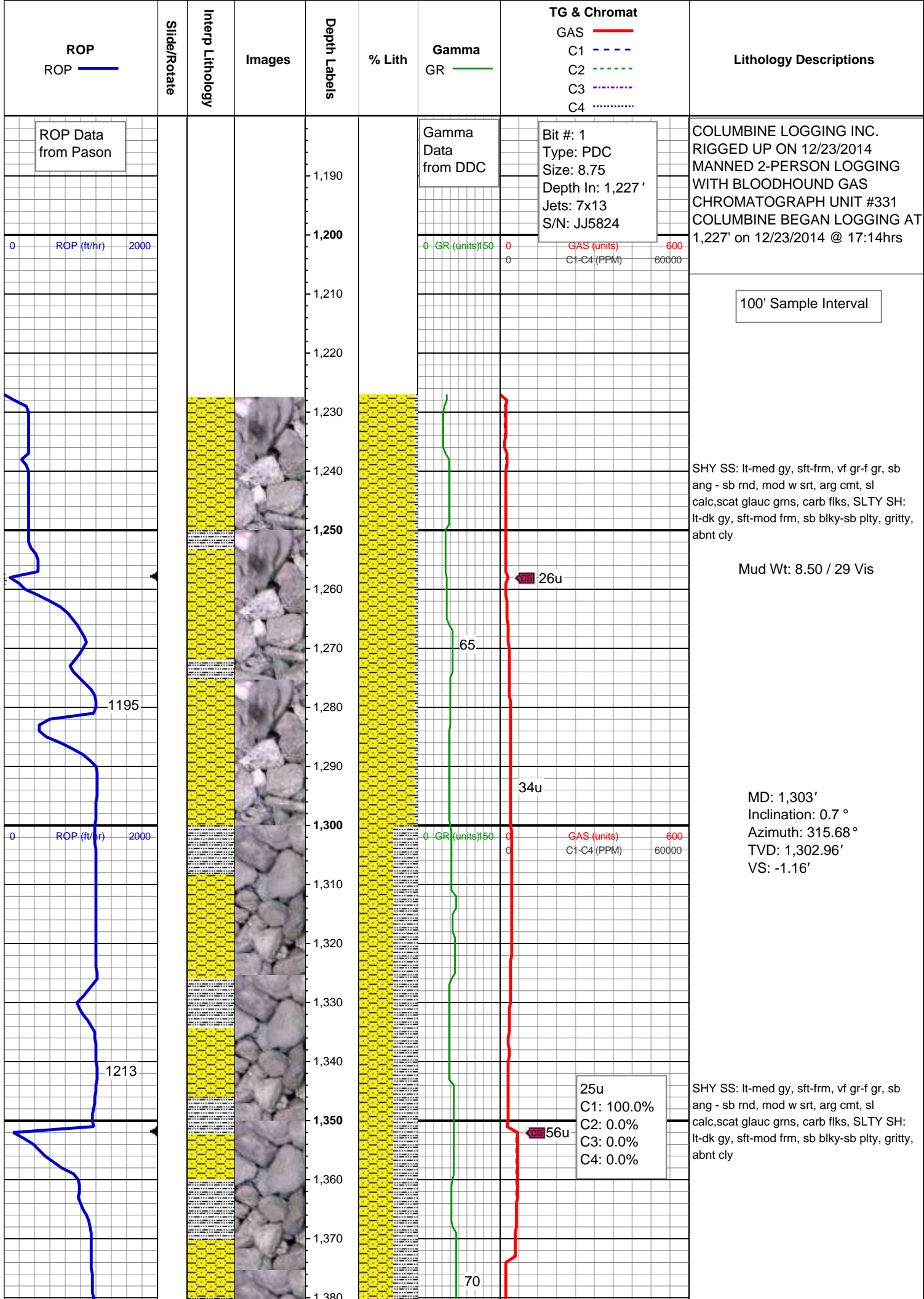
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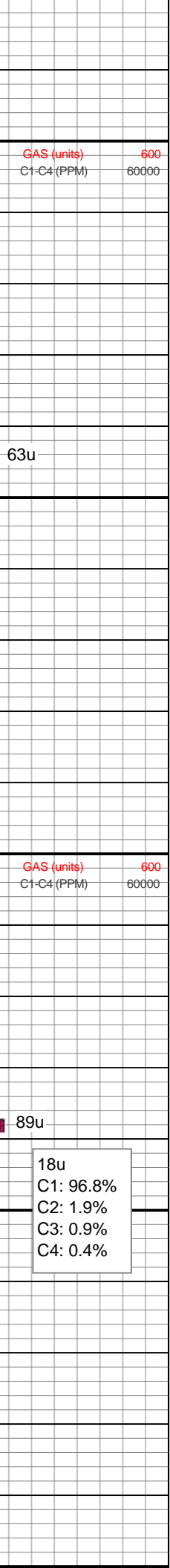
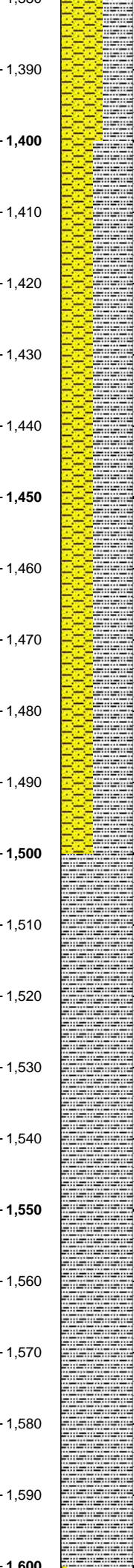
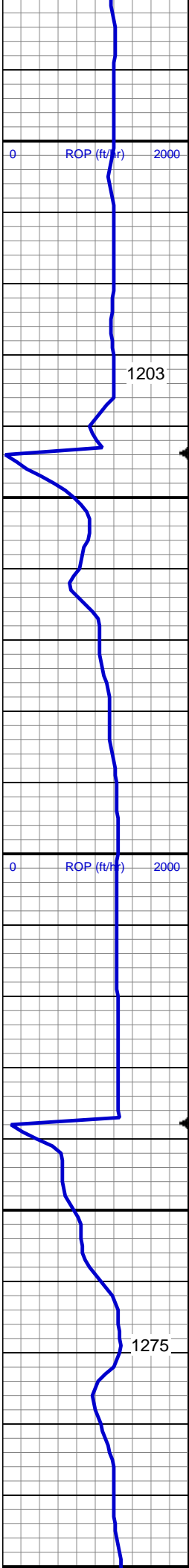
Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Other

COLUMBINE LOGGING MATT HOPKINS
ANDREW MARTENS





MD: 1,395'
Inclination: 0.44 °
Azimuth: 311.46 °
TVD: 1,394.96'
VS: -0.6'

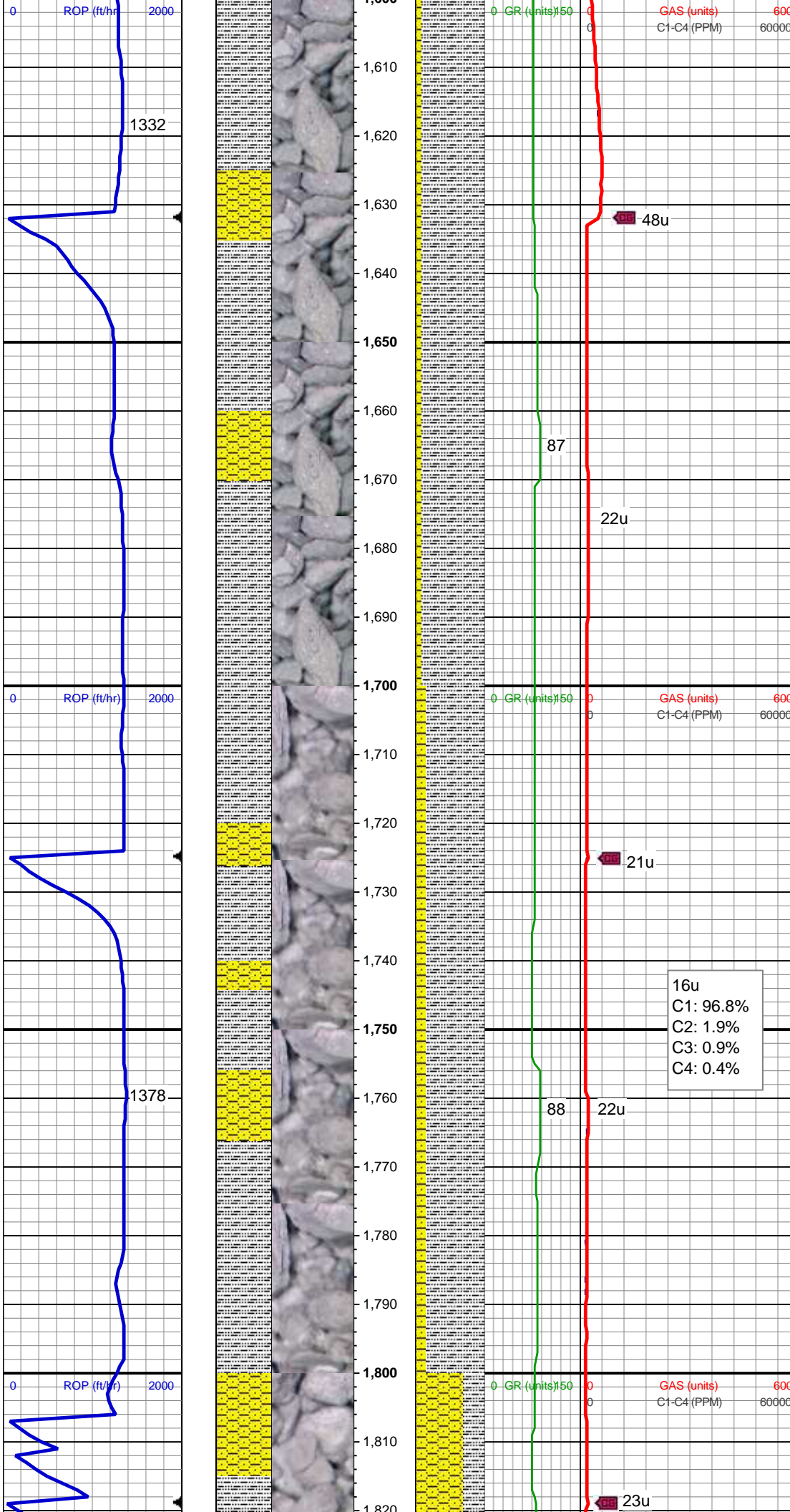
SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb plty, gritty, cly, SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb md, mod w srt, arg cmt, sl calc, scat glauc grns, carb flks

MD: 1,488'
Inclination: 0.53 °
Azimuth: 263.12 °
TVD: 1,487.96'
VS: -0.49'

18u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb plty, gritty, abnt cly

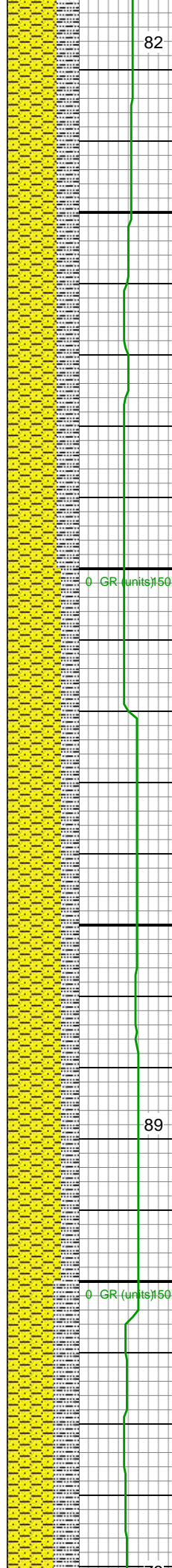
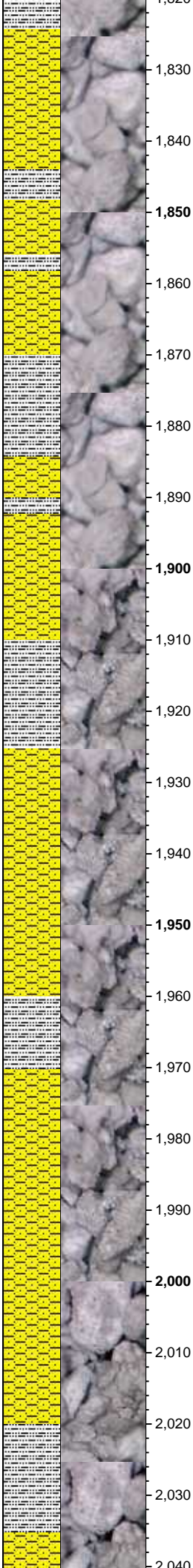
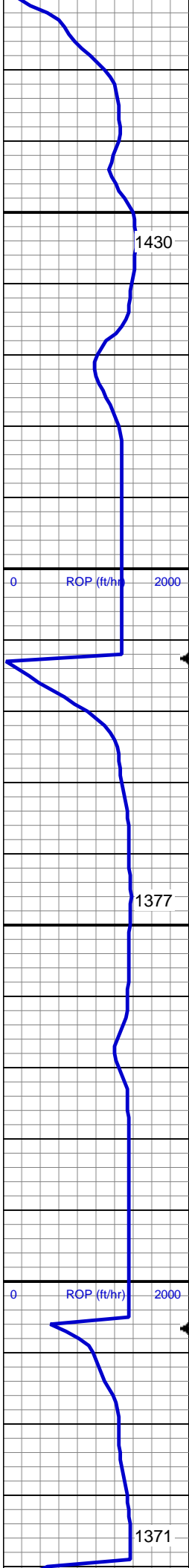
MD: 1,582'
Inclination: 0.35 °
Azimuth: 250.64 °
TVD: 1,581.95'
VS: -0.71'



SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb
plty, grtty, abnt cly, SHY SS: lt-med gy,
sft-frm, vf gr-f gr, sb ang - ang, mod w srt,
arg cmt, sl calc, scat glauc grns, carb flks

SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb
plty, grtty, abnt cly, SHY SS: lt-med gy,
sft-frm, vf gr-f gr, sb ang - sb rnd, mod w
srt, arg cmt, sl calc, scat glauc grns, carb
flks

MD: 1,768'
Inclination: 0.26 °
Azimuth: 232.18 °
TVD: 1,767.95'
VS: -1.24'



SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb
ang - sb rnd, mod w srt, arg cmt, sl
calc,scat glauc grns, carb flks, SLTY SH:
lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty,
abnt cly

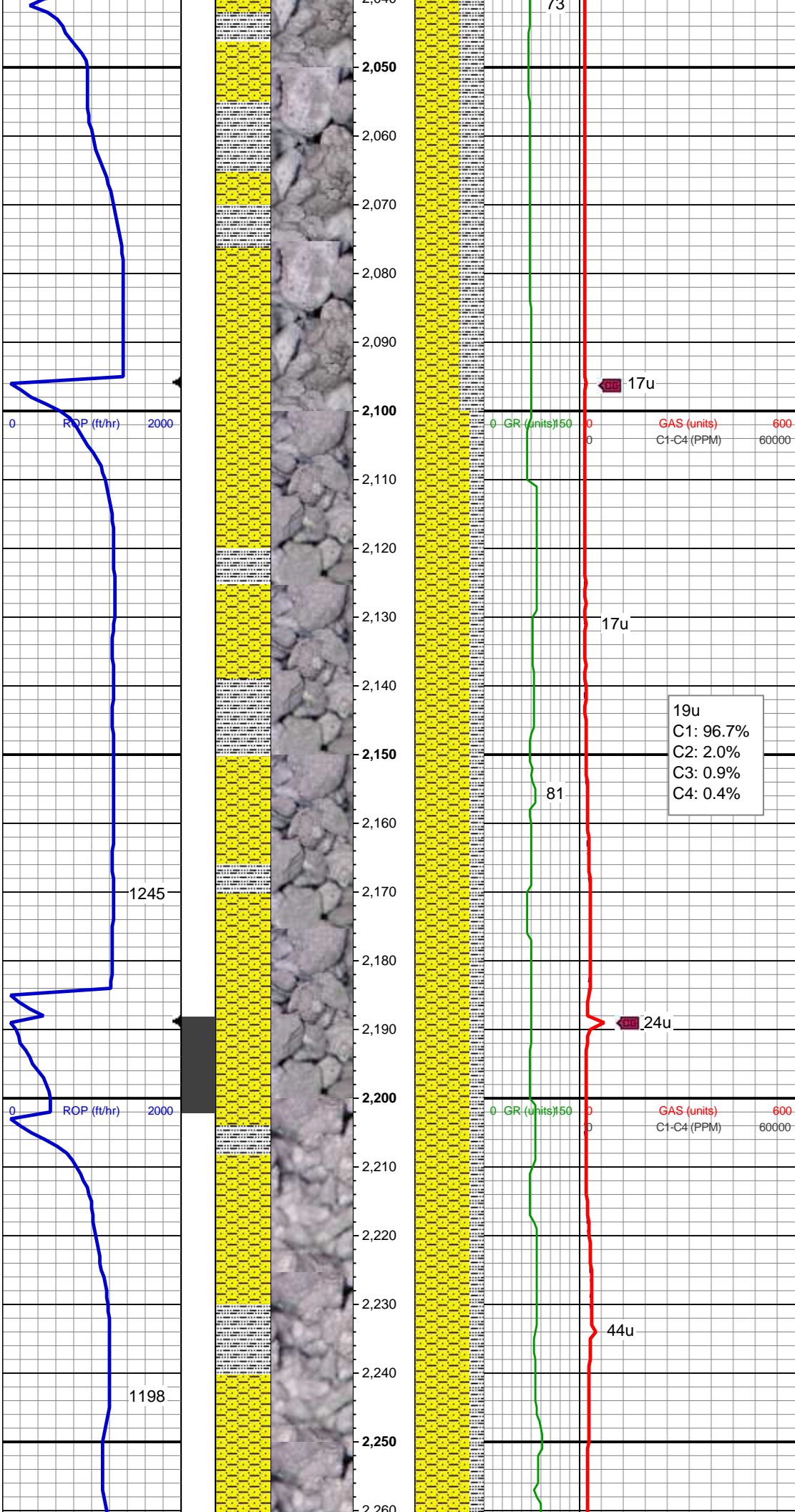
MD: 1,862'
Inclination: 0.26 °
Azimuth: 29.86 °
TVD: 1,861.95'
VS: -1.2'

SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb
ang - sb rnd, mod w srt, arg cmt, sl
calc,scat glauc grns, carb flks, SLTY SH:
lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty,
abnt cly

MD: 1,954'
Inclination: 0.35 °
Azimuth: 46.2 °
TVD: 1,953.95'
VS: -0.79'

SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb
ang - sb rnd, mod w srt, arg cmt, sl
calc,scat glauc grns, carb flks, SLTY SH:
lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty,
cly

MD: 2,042'



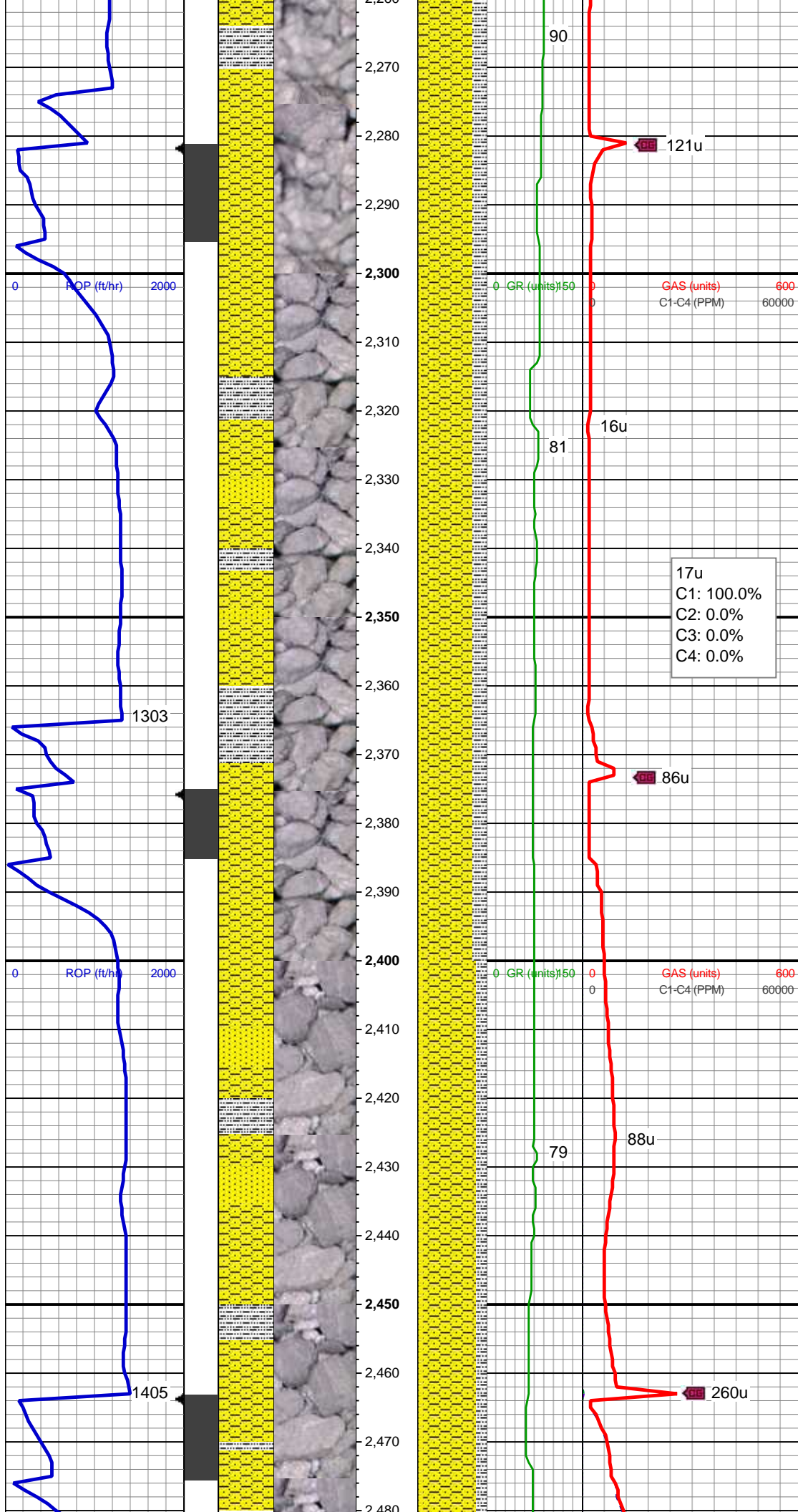
MD: 2,048'
Inclination: 0.35 °
Azimuth: 66.6 °
TVD: 2,047.95'
VS: -0.43'

MD: 2,138'
Inclination: 0.62 °
Azimuth: 36.19 °
TVD: 2,137.94'
VS: 0.13'

SHY SS: lt-med gy, sft frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc, scat glauc grns, carb flks, SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty, abnt cly

MD: 2,230'
Inclination: 2.2 °
Azimuth: 69.76 °
TVD: 2,229.91'
VS: 1.34'

SHY SS: lt-med gy, sft frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc, scat glauc grns, carb flks, SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty, abnt cly

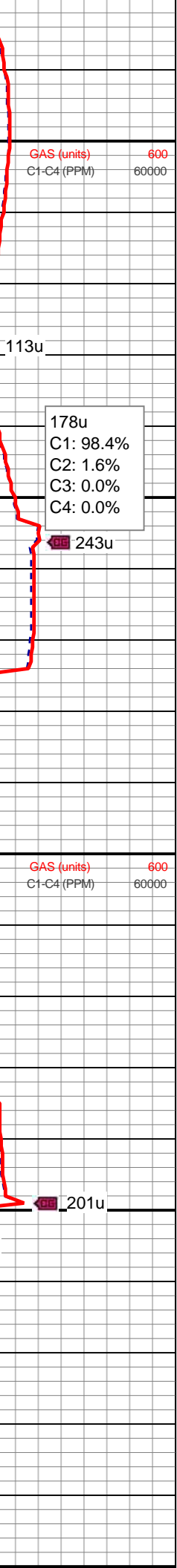
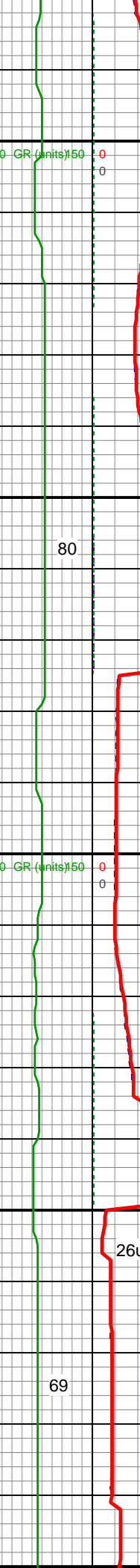
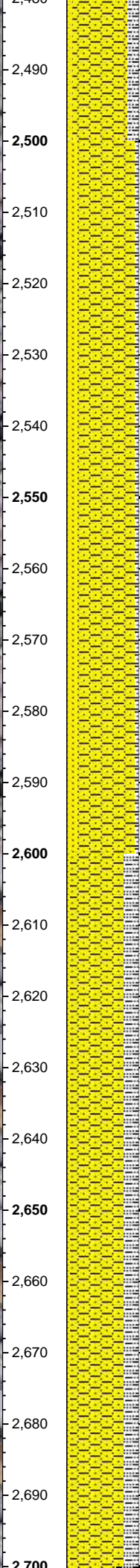
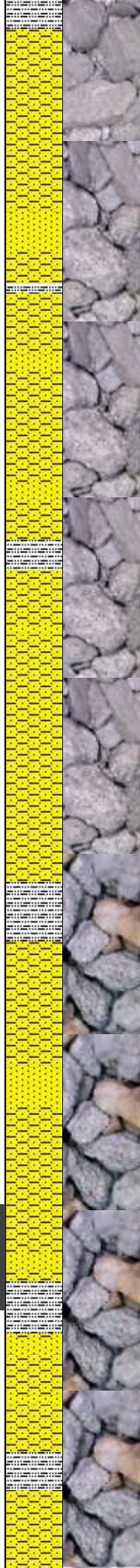
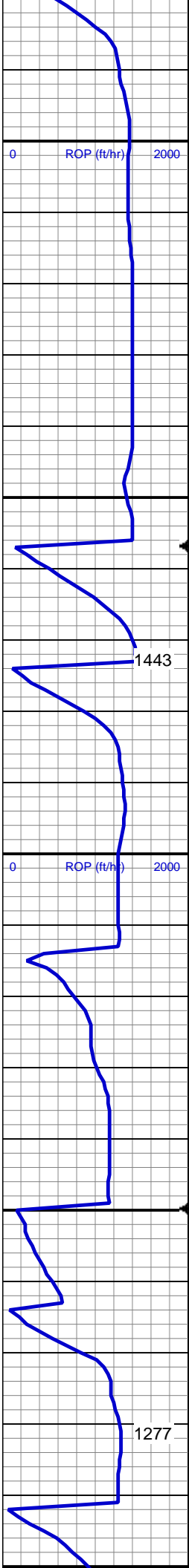


MD: 2,323'
Inclination: 3.87 °
Azimuth: 89.45 °
TVD: 2,322.78'
VS: 2.49'

SHY SS: lt-med gy, sft frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc, scat glauc grns, carb flks, SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty, abnt cly, SS: med - lt gy, s&P ip, uncons, speckl wi glau, f gr, hd brit clus, ang - sb ang, calc cmt, tr slty sh

MD: 2,415'
Inclination: 5.8 °
Azimuth: 97.18 °
TVD: 2,414.45'
VS: 2.75'

SHY SS: lt-med gy, sft frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc, scat glauc grns, carb flks, SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty, abnt cly, SS: med - lt gy, s&P ip, uncons, speckl wi glau, f gr, hd brit clus, sb rnd - sb ang, calc cmt, tr slty sh



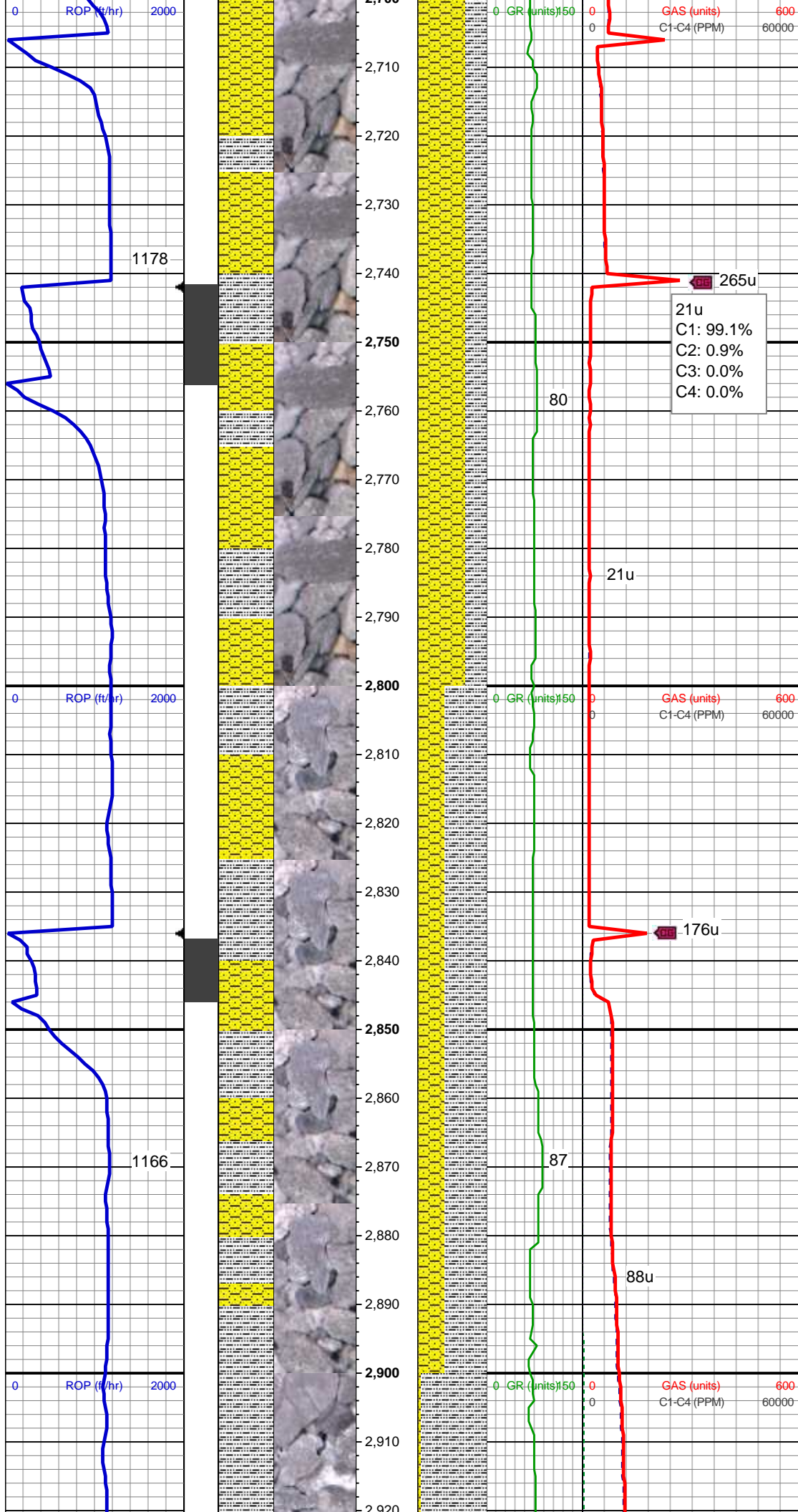
MD: 2,508'
Inclination: 7.65 °
Azimuth: 104.92 °
TVD: 2,506.81'
VS: 1.69'

SHY SS: lt-med gy, sft frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc, scat glauc grns, carb flks, SS: med - lt gy, s&P ip, uncon, speckl wi glau, f gr, hd brit clus, ang - sb ang, calc cmt, tr slty sh, SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty, abnt cly

MD: 2,601'
Inclination: 7.83 °
Azimuth: 101.75 °
TVD: 2,598.96'
VS: 0.1'

SHY SS: lt-med gy, sft frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc, scat glauc grns, carb flks, SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty, abnt cly, SS: med - lt gy, s&P ip, uncon, speckl wi glau, f gr, hd brit clus, ang - sb ang, calc cmt, tr slty sh

MD: 2,692'
Inclination: 8.27 °
Azimuth: 114.41 °
TVD: 2,689.07'
VS: -2.59'



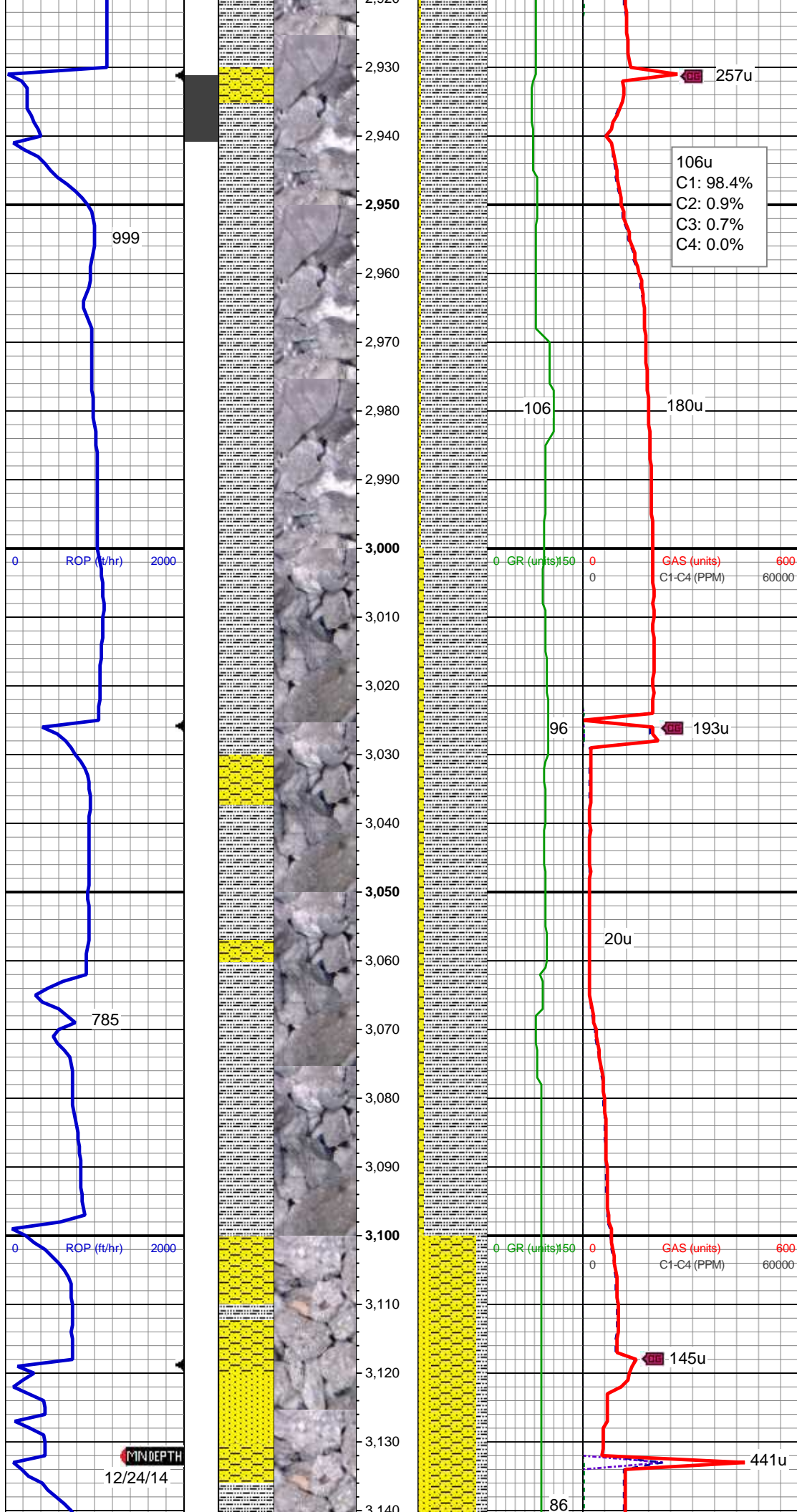
21u
C1: 99.1%
C2: 0.9%
C3: 0.0%
C4: 0.0%

SHY SS: lt-med gy, sft frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc, scat glauc grns, carb flks, SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty, abnt cly

MD: 2,786'
Inclination: 10.29 °
Azimuth: 108.43 °
TVD: 2,781.84'
VS: -6.53'

SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty, abnt cly, SHY SS: lt-med gy, sft frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc, scat glauc grns, carb flks

MD: 2,881'
Inclination: 10.99 °
Azimuth: 100.7 °
TVD: 2,875.21'
VS: -9.09'

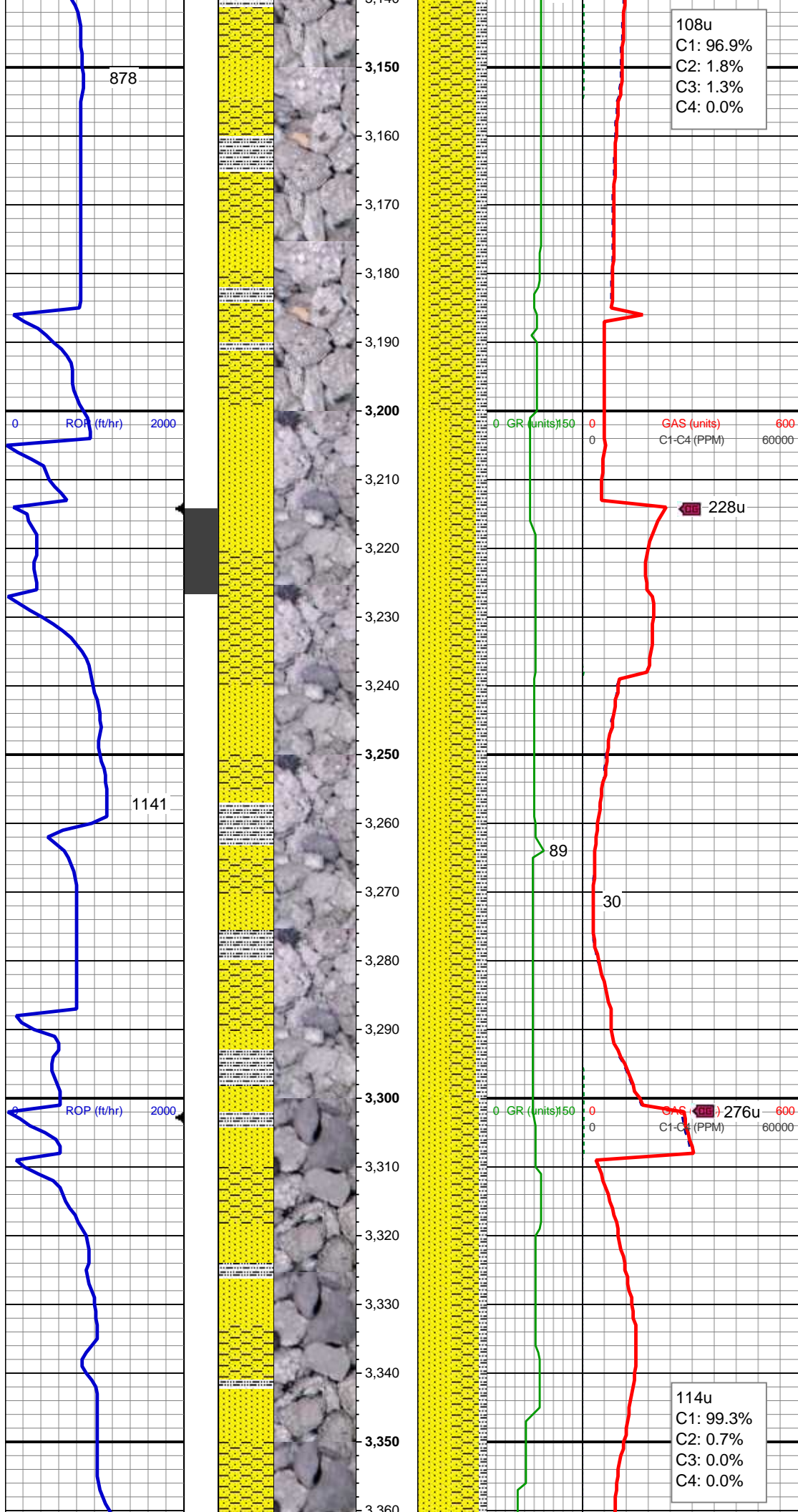


SLTY SH: lt-dk gy, sft-mod frm, plty-sb
plty, gritty, abnt cly, SHY SS: lt-med gy,
sft-frm, vf gr-f gr, sb ang - sb rnd, mod w
srt, arg cmt, sl calc, scat glauc grns, carb
flks

MD: 2,975'
Inclination: 10.29 °
Azimuth: 92.96 °
TVD: 2,967.6'
VS: -9.38'

SLTY SH: lt-dk gy, sft-mod frm, plty-sb
plty, gritty, abnt cly, SHY SS: lt-med gy,
sft-frm, vf gr-f gr, sb ang - sb rnd, mod w
srt, arg cmt, sl calc, scat glauc grns, carb
flks

Mud Wt: 8.80 / 28 Vis
SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb
ang - sb rnd, mod w srt, arg cmt, sl calc
SC: mod lt-med gy, sft-frm, vf gr-f gr, sb
ang - sb rnd, mod w srt, arg cmt, sl calc



SS: med - lt gy, s&P ip, uncon, speckl wi
mica & glau, f gr, hd brit clus, ang - sb
ang, calc cmt SLTY SH: lt-dk gy, sft-mod
frm, sb blkly-sb plty, gritty

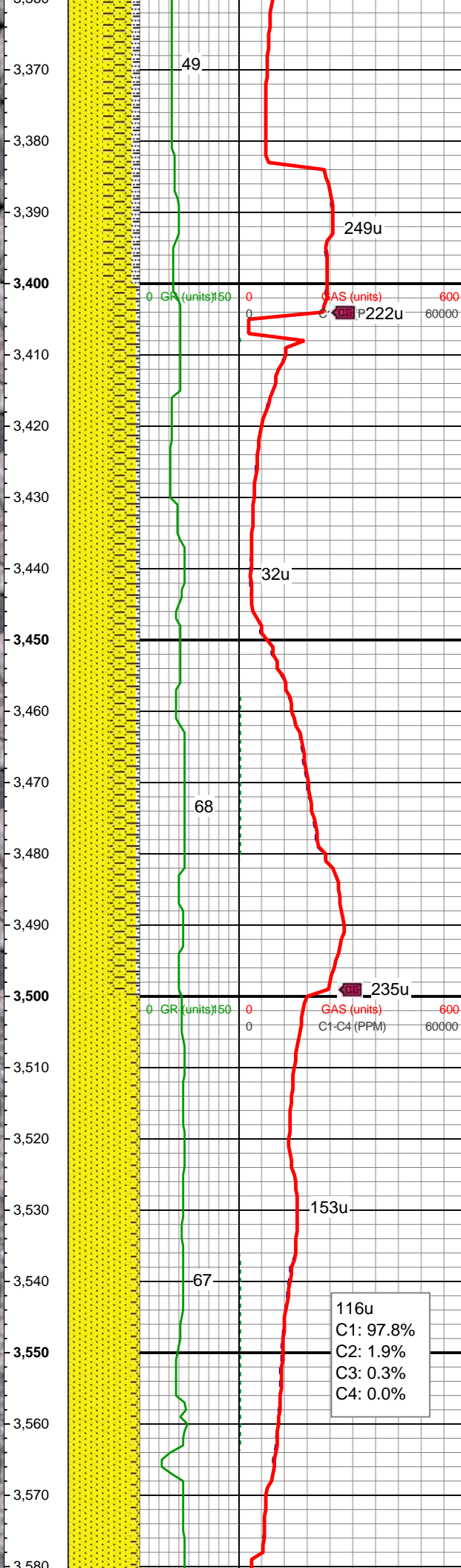
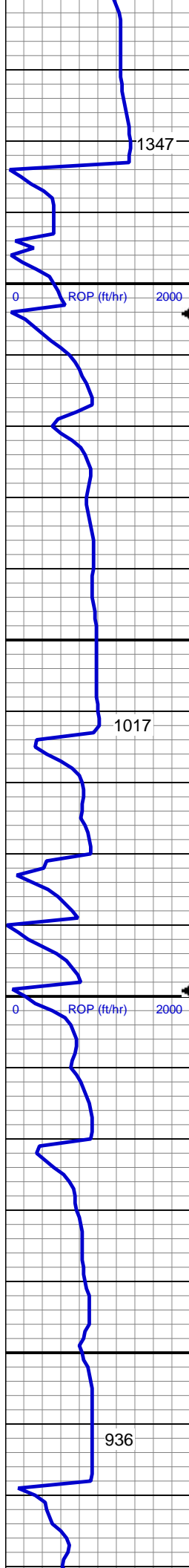
MD: 3,164'
Inclination: 9.85 °
Azimuth: 93.31 °
TVD: 3,153.69'
VS: -7.72'

SS: med - lt gy, s&P ip, uncon, speckl wi
mica & glau, f gr, hd brit clus, ang - sb
ang, calc cmt, SHY SS: lt-med gy,
sft-frm, vf gr-f gr, sb ang - sb rnd, mod w
srt, arg cmt, sl calc, SLTY SH: lt-dk gy,
sft-mod frm, sb blkly-sb plty, gritty

Mud Wt: 8.70 / 28 Vis

SS: med - lt gy, s&P ip, uncon, speckl wi
glau, f gr, hd brit clus, ang - sb ang, calc
cmt, SHY SS: lt-med gy, sft-frm, vf gr-f gr,
sb ang - sb rnd, mod w srt, arg cmt, sl
calc, SLTY SH: lt-dk gy, sft-mod frm, sb
blkly-sb plty, gritty

MD: 3,354'
Inclination: 11.08 °
Azimuth: 83.47 °
TVD: 3,340.69'
VS: -3.03'

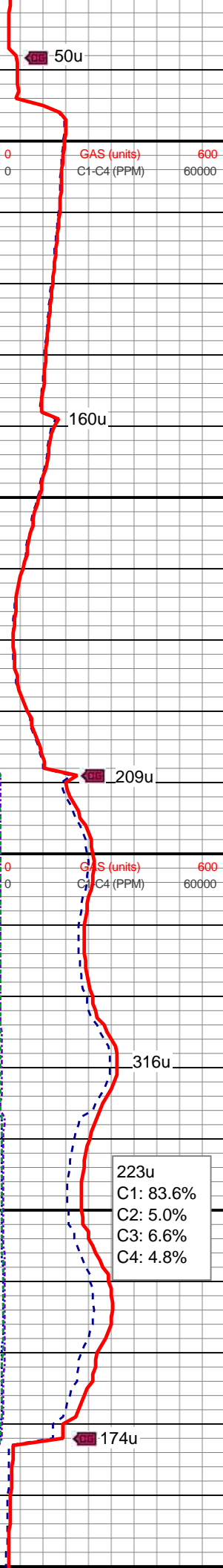
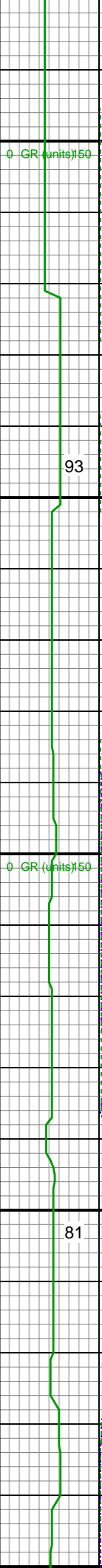
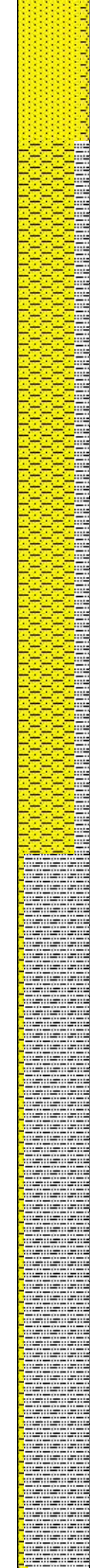
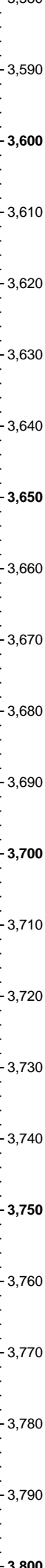
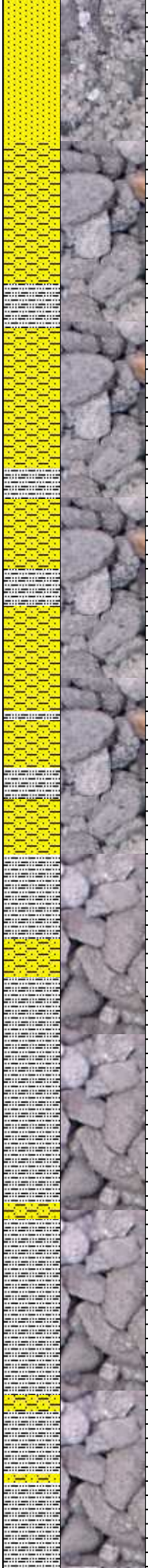
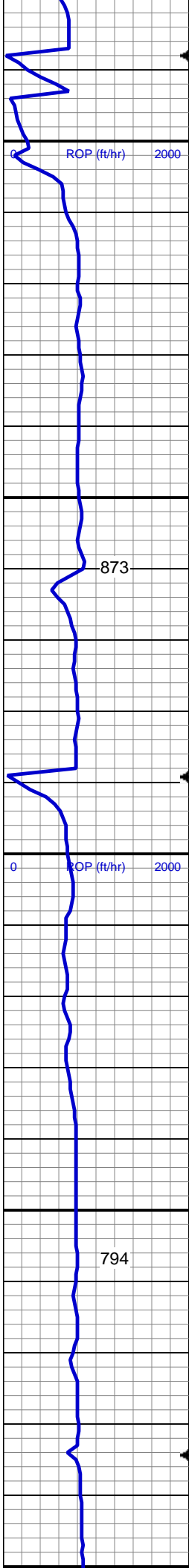


MD: 3,448'
Inclination: 11.34 °
Azimuth: 84.7 °
TVD: 3,432.9'
VS: 0.74'

SS: med - lt gy, s&P ip, uncon, speckl wi glau, f gr, hd brit clus, ang - sb ang, calc cmt, SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc, SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty

MD: 3,542'
Inclination: 11.61 °
Azimuth: 82.77 °
TVD: 3,525.02'
VS: 4.72'

SS: med - lt gy, s&P ip, uncon, speckl wi glau, f gr, hd brit clus, ang - sb ang, calc cmt, SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc



MD: 3,637'
Inclination: 11.52 °
Azimuth: 88.04 °
TVD: 3,618.1'
VS: 8.23'

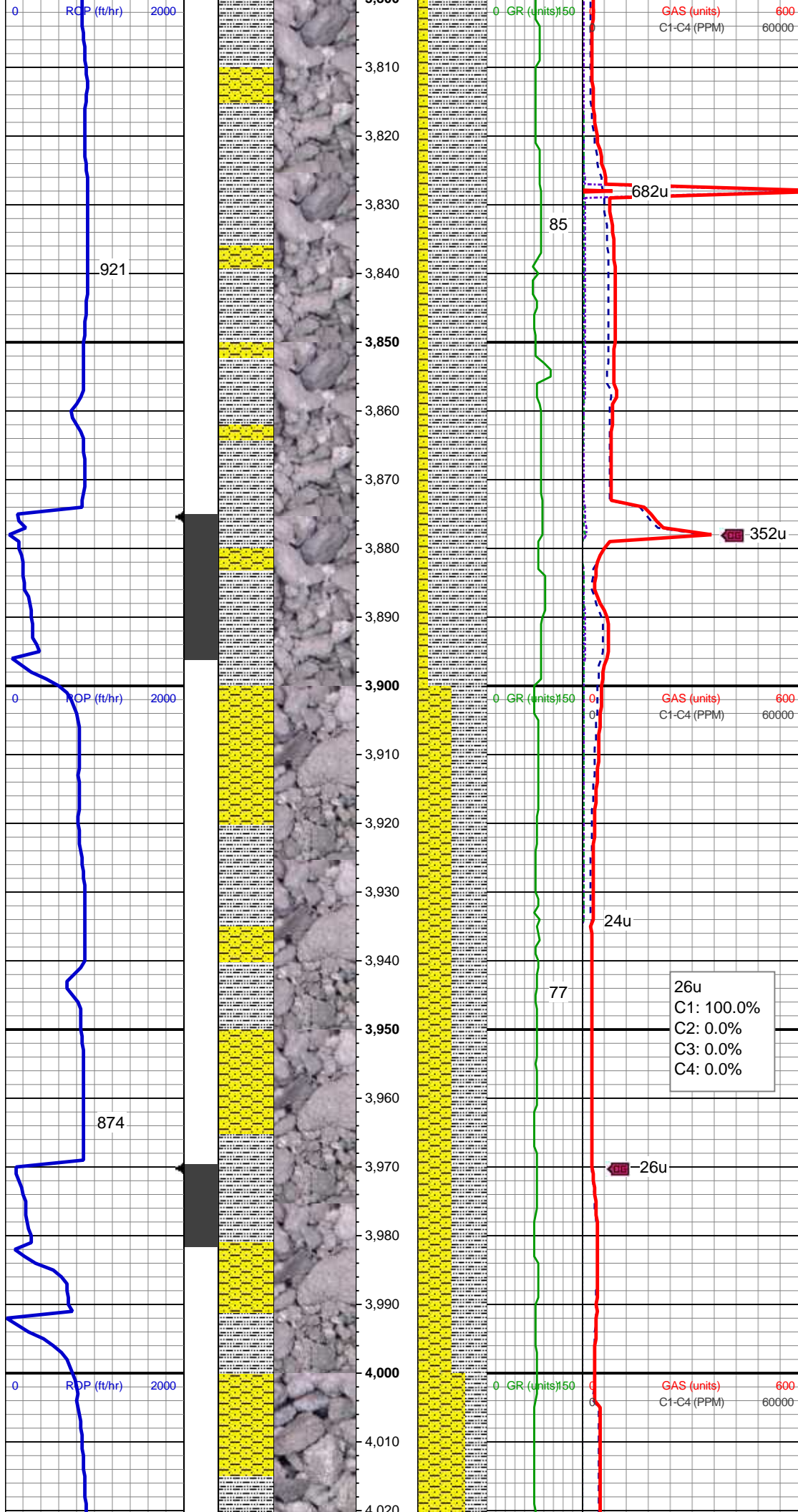
SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc,
SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb pty, gritty

Mud Wt: 8.70 / 28 Vis

MD: 3,731'
Inclination: 10.73 °
Azimuth: 86.99 °
TVD: 3,710.33'
VS: 10.9'

SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb pty, gritty, SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc

223u
C1: 83.6%
C2: 5.0%
C3: 6.6%
C4: 4.8%



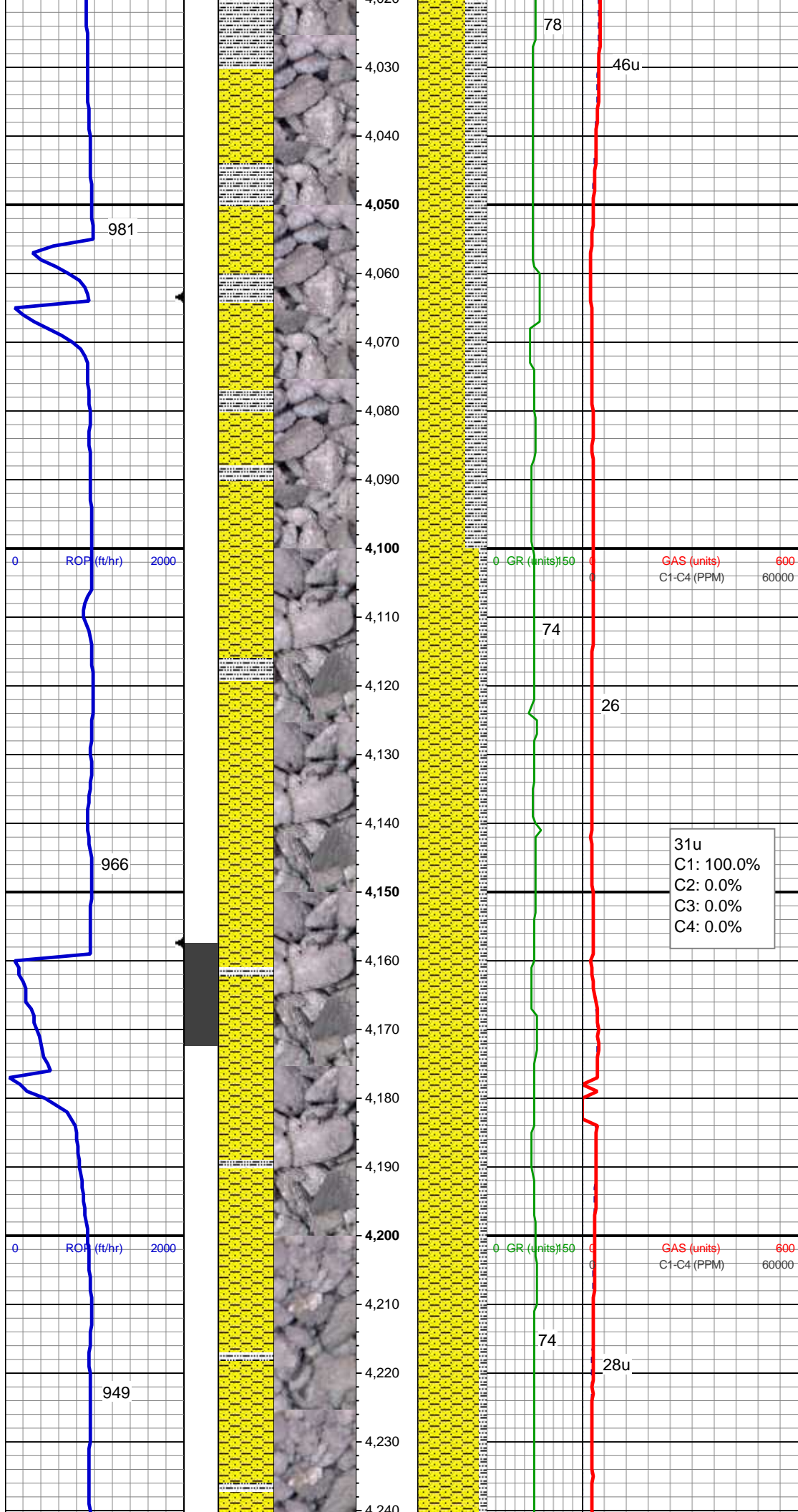
MD: 3,826'
Inclination: 9.85 °
Azimuth: 85.93 °
TVD: 3,803.8'
VS: 13.71'

SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb
ply, gritty, SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc

MD: 3,920'
Inclination: 10.9 °
Azimuth: 94.72 °
TVD: 3,896.27'
VS: 15.32'

SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb
ang - sb rnd, mod w srt, arg cmt, sl calc,
SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb
ply, gritty

MD: 4,015'
Inclination: 12.13 °
Azimuth: 96.65 °
TVD: 3,989.35'

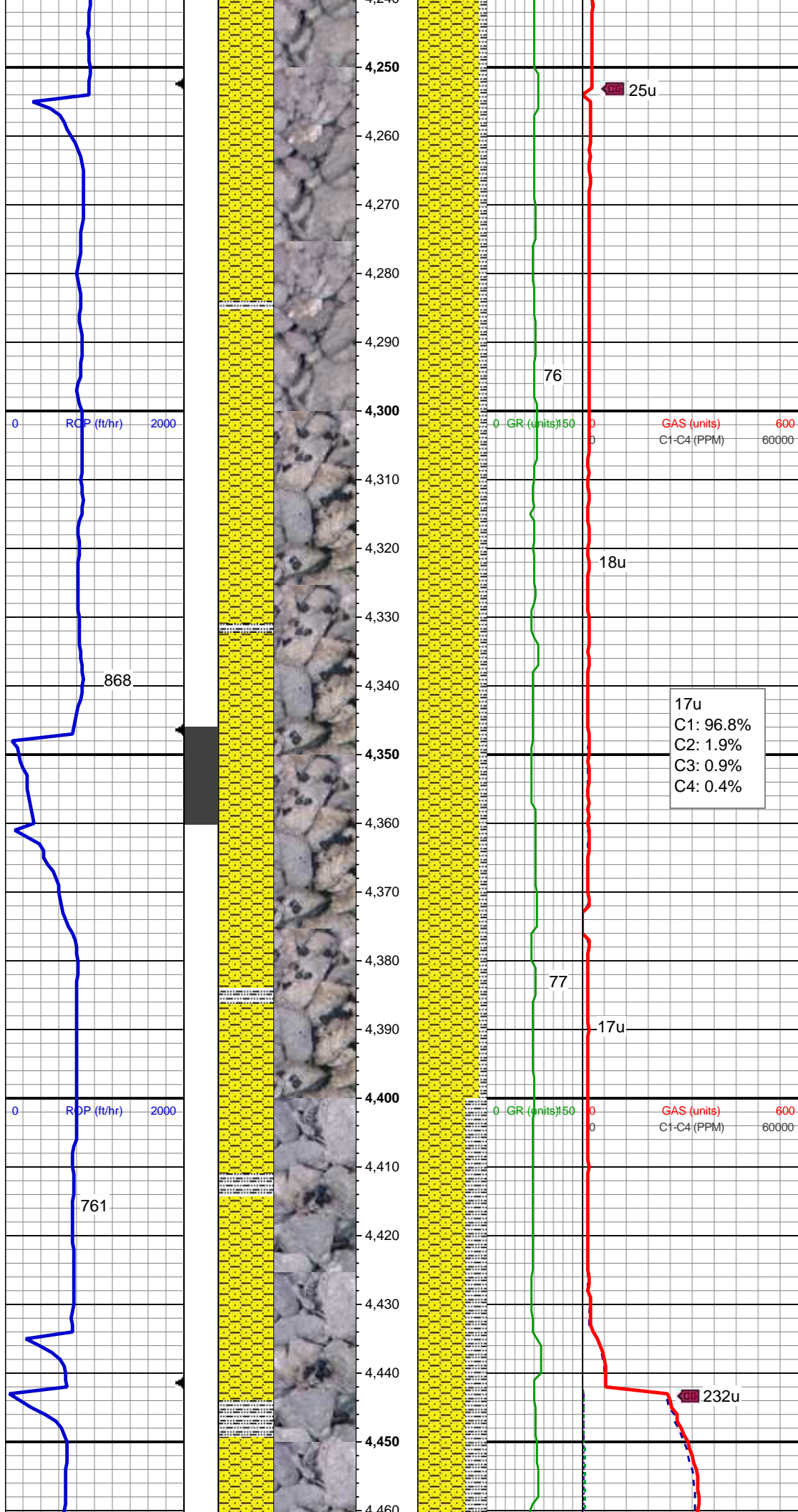


SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb
ang - sb rnd, mod w srt, arg cmt, sl calc,
SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb
pity, gritty

MD: 4,109'
Inclination: 10.9 °
Azimuth: 94.72 °
TVD: 4,081.46'
VS: 15.5'

SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb
ang - sb rnd, mod w srt, arg cmt, sl calc,
SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb
pity, gritty

MD: 4,204'
Inclination: 13.01 °
Azimuth: 97.71 °
TVD: 4,174.4'
VS: 15.38'



SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb
ang - sb rnd, mod w srt, arg cmt, sl calc,
SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb
ppty, gritty

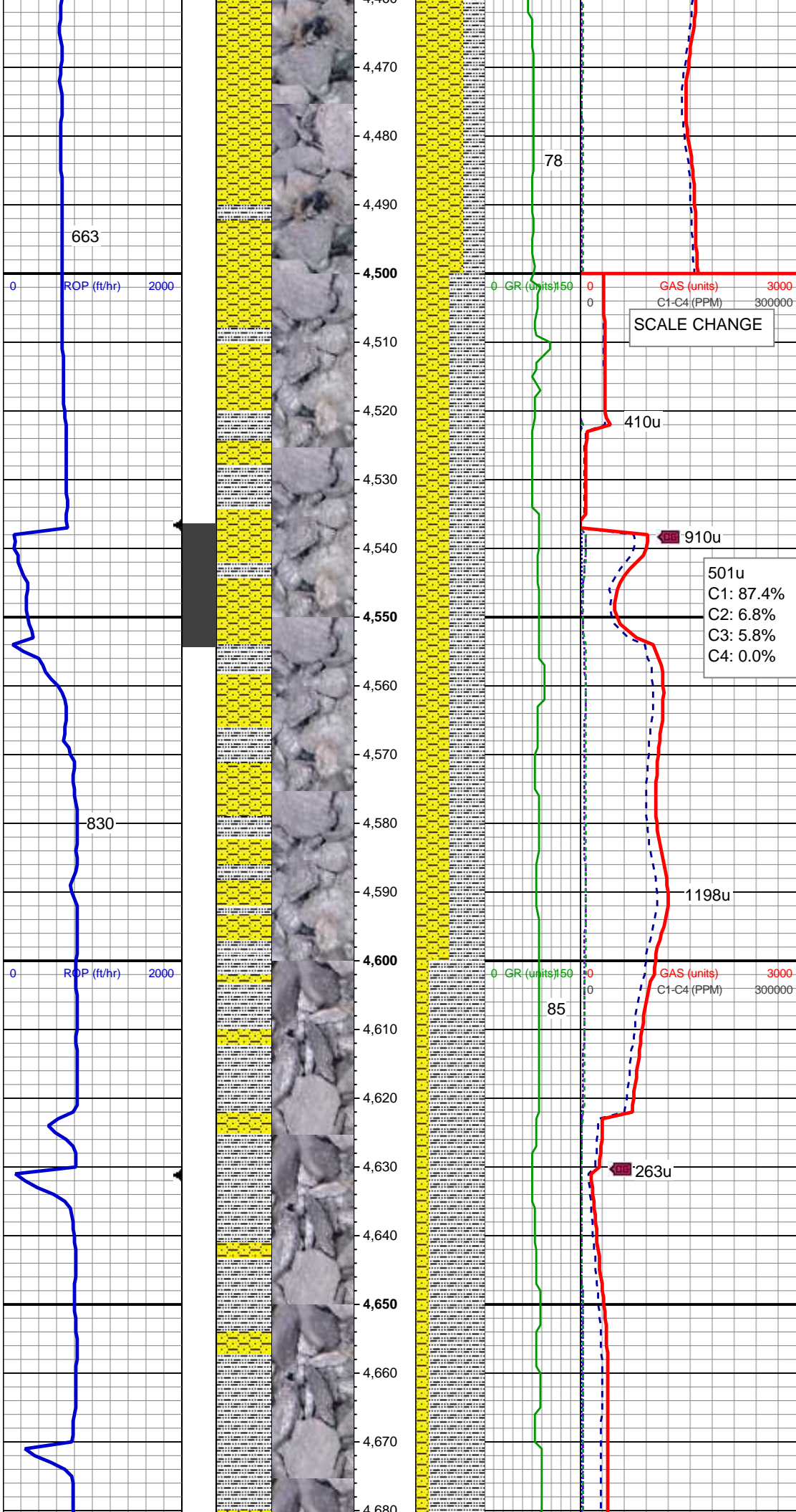
MD: 4,298'
Inclination: 11.34 °
Azimuth: 97.88 °
TVD: 4,266.28'
VS: 14.77'

Mud Wt: 8.85 / 33 Vis

SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb
ang - sb rnd, mod w srt, arg cmt, sl calc,
SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb
ppty, gritty

MD: 4,393'
Inclination: 11.87 °
Azimuth: 91.73 °
TVD: 4,359.34'
VS: 15.19'

SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb
ang - sb rnd, mod w srt, arg cmt, sl calc,
SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb
ppty, gritty



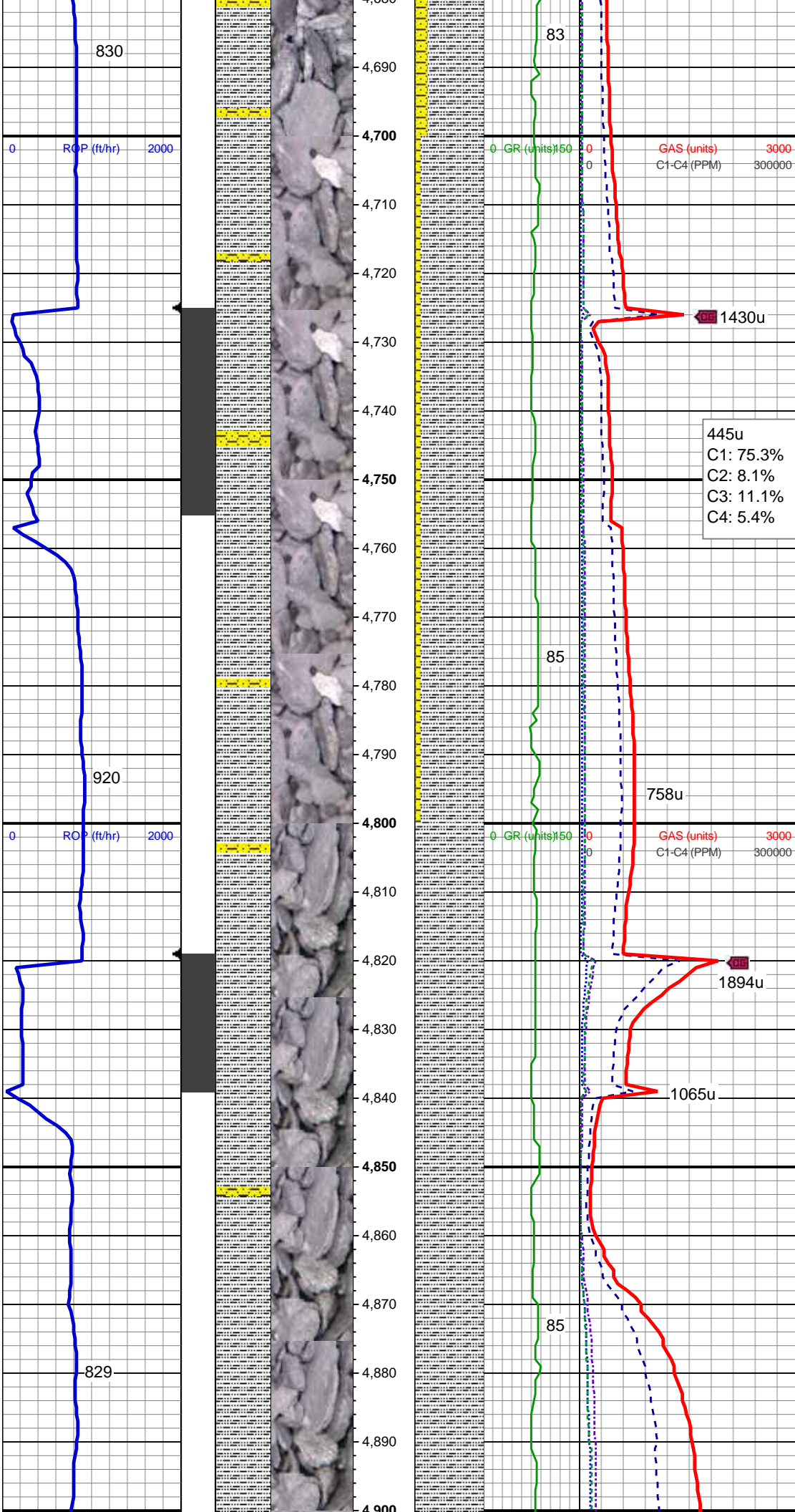
MD: 4,487'
Inclination: 10.02 °
Azimuth: 92.96 °
TVD: 4,451.63'
VS: 16.35'

Mud Wt: 9.10 / 38 Vis
SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc, SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty

MD: 4,582'
Inclination: 10.46 °
Azimuth: 86.28 °
TVD: 4,545.12'
VS: 18.24'

SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc

MD: 4,677'
Inclination: 8.71 °
Azimuth: 82.06 °
TVD: 4,638.79'



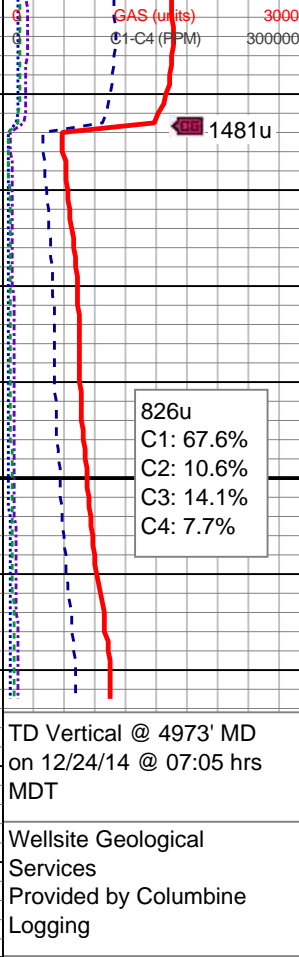
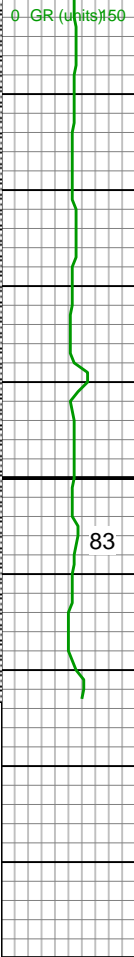
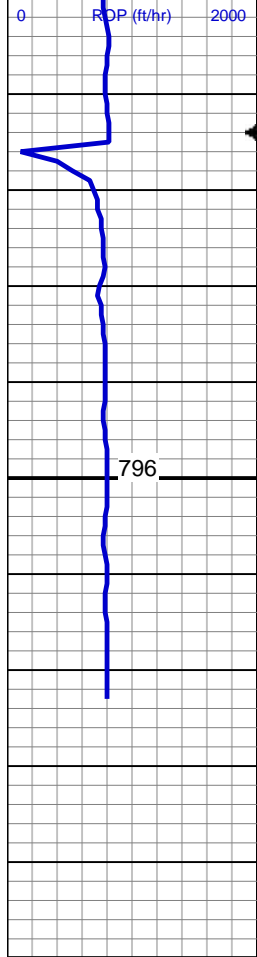
TVD: 4,688.70'
VS: 21.44'

SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb
ply, gritty SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc

MD: 4,771'
Inclination: 10.11 °
Azimuth: 93.31 °
TVD: 4,731.53'
VS: 23.54'

SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb
ply, gritty, tr shly ss

MD: 4,865'
Inclination: 10.73 °
Azimuth: 88.92 °
TVD: 4,823.98'
VS: 25.01'



Mud Wt: 9.10 / 43 Vis

SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb plty, gritty, tr shly ss

MD: 4,961'
Inclination: 8.71 °
Azimuth: 85.23 °
TVD: 4,918.6'
VS: 27.47'

See Corresponding Horizontal Log Upchurch LD02-76-1AHN(HORZ)

TD Vertical @ 4973' MD on 12/24/14 @ 07:05 hrs MDT

Wellsite Geological Services Provided by Columbine Logging