

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Mecklenburg State LD01-73HN

Location SESE SEC 1, T9N, ROW 58W, 6 PM

State COLORADO

County WELD

Country USA

Rig Number H&P 326

API Number 05-123-39699

Field WILDCAT

Region DJ BASIN

Drilling Completed 11/22/2014

Spud Date 11/15/2014

Surface Coordinates 400' FSL, 1265' FEL
40.77427/-103.8069

Bottom Hole Coordinates (PROJ)
810' FFNLL, 1320' FFELL

Ground Elevation 4651'

K.B. Elevation 4681'

Logged Interval 1222' To 4812'

Total Depth 14,710'

Formation NIOBRARA B CHALK

Type of Drilling Fluid LSND

Other Symbols

Oil Show

- DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

Porosity

- E EARTHY
- F FENESTRAL
- F FRACTURE
- 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
- 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

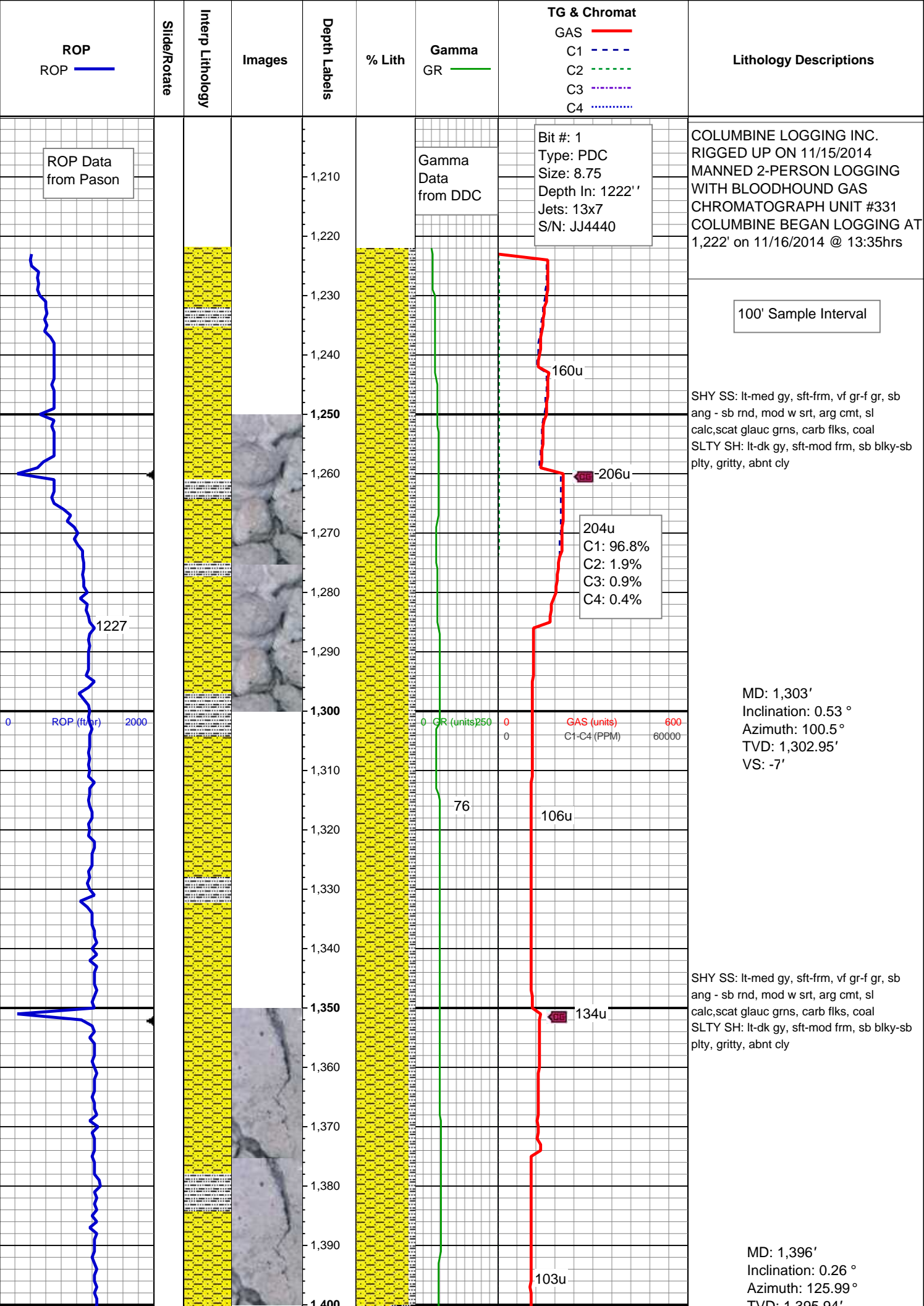
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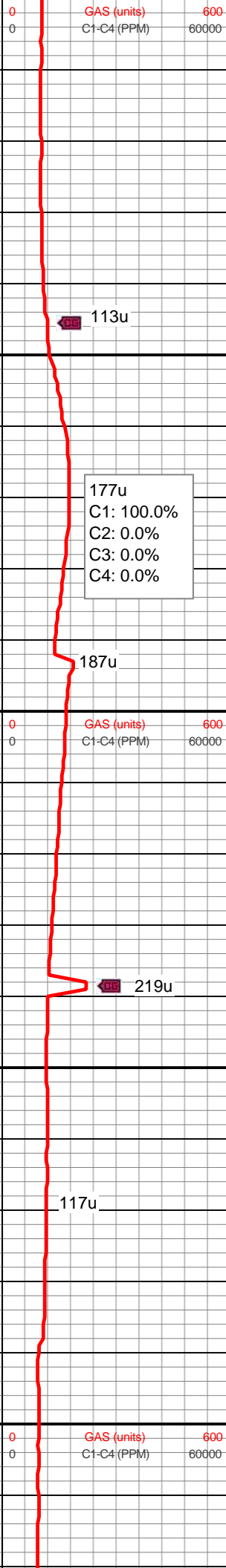
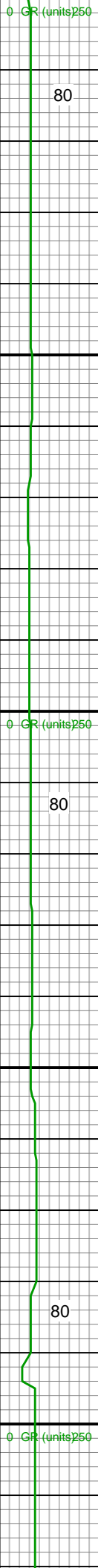
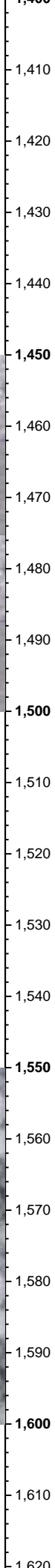
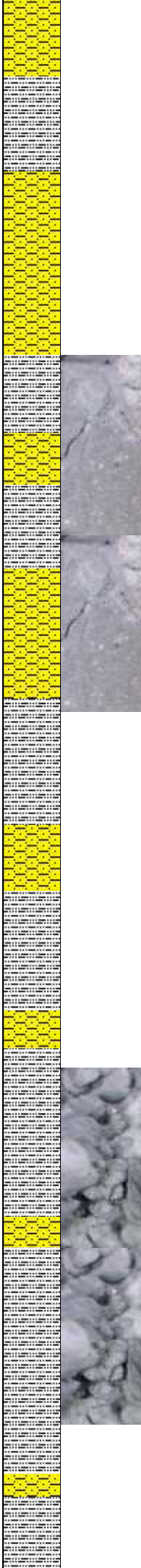
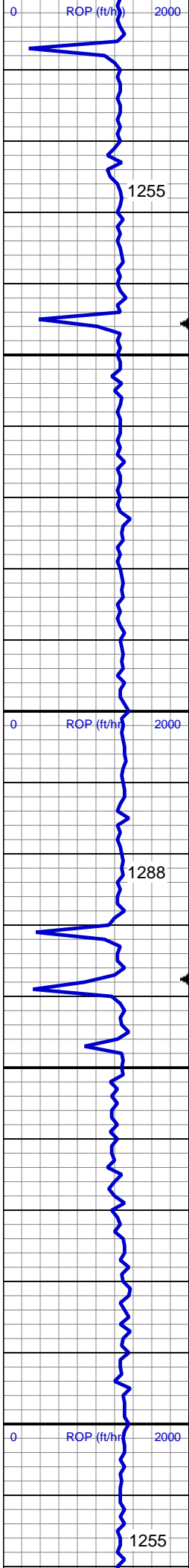
Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Other

COLUMBINE LOGGING MATT HOPKINS
MIKE KERSCHEN





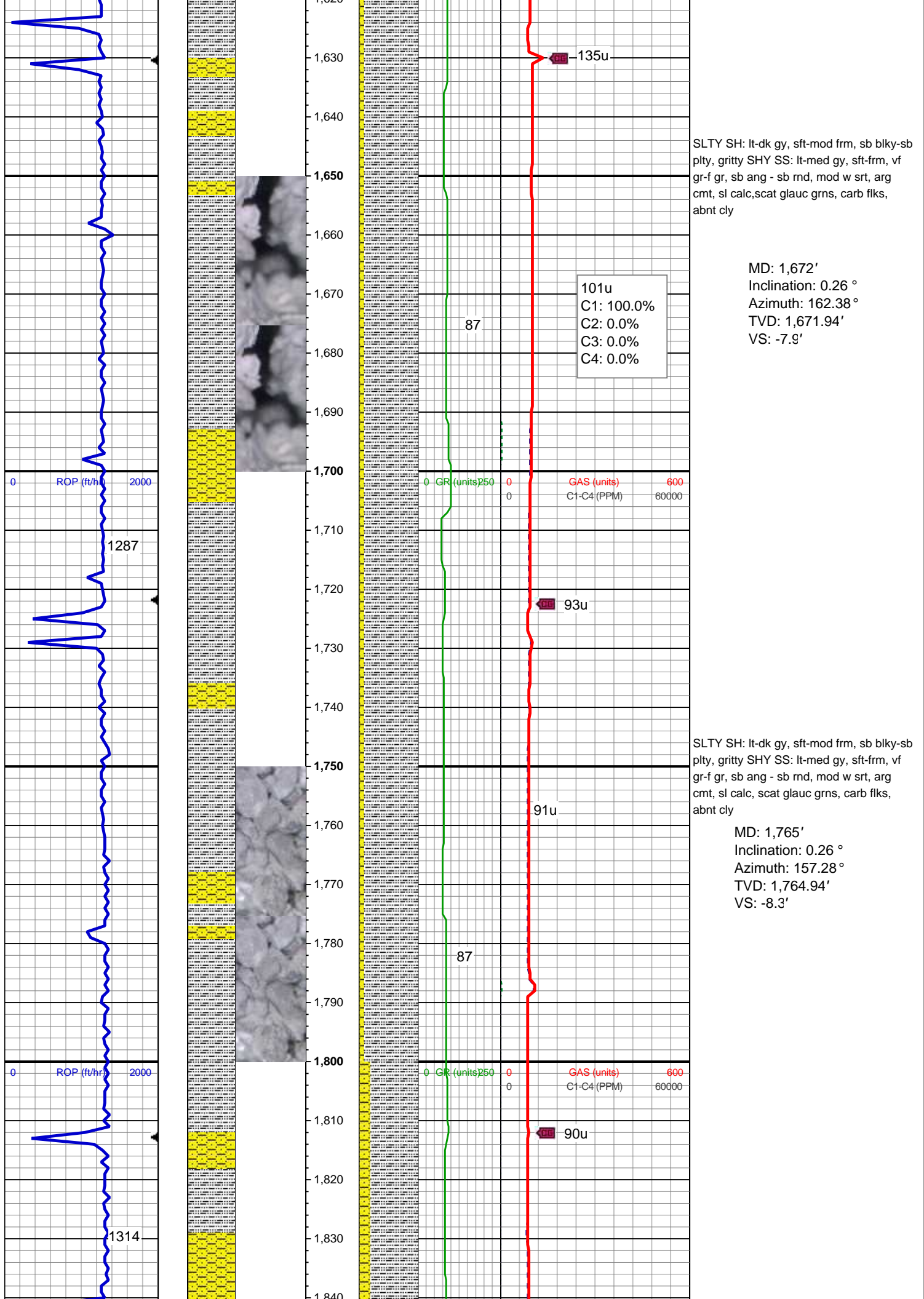
VS: -7.23'

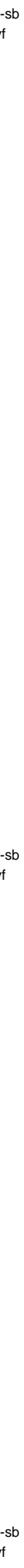
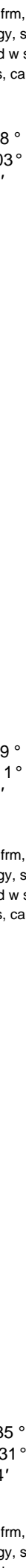
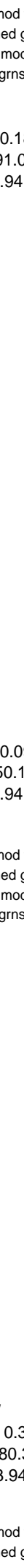
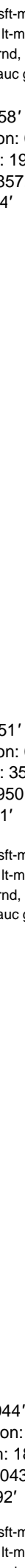
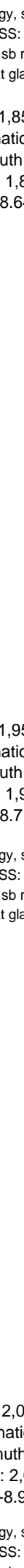
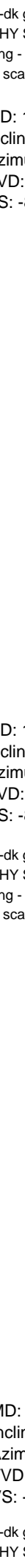
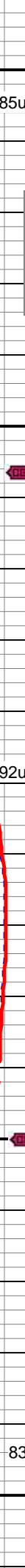
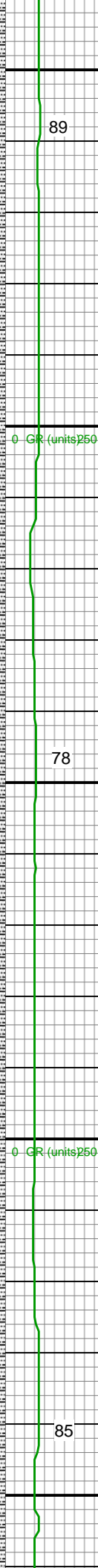
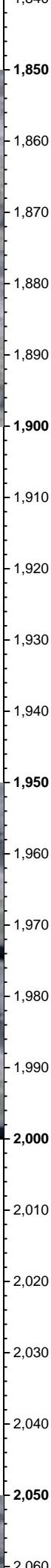
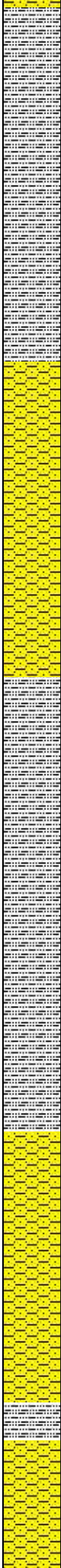
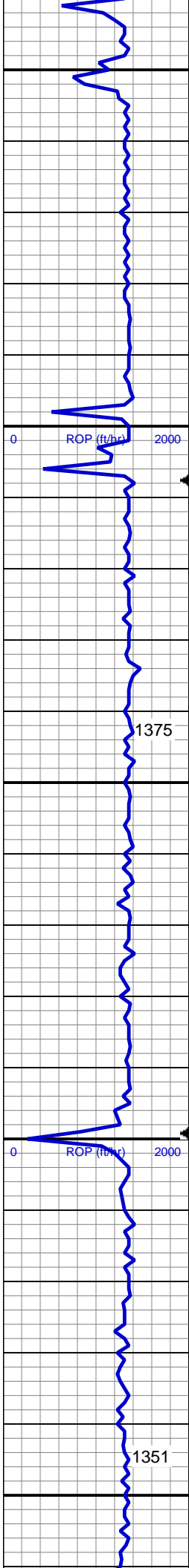
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MD: 1,489'
Inclination: 0.35 °
Azimuth: 208.61 °
TVD: 1,488.94'
VS: -7.61'

SLTY SH: lt-dk gy, sft-mod frm, sb blkly-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, scat glauc grns, carb flks, abnt cly

MD: 1,581'
Inclination: 0.53 °
Azimuth: 277.51 °
TVD: 1,580.94'
VS: -7.77'





SLTY SH: lt-dk gy, sft-mod frm, sb blkly-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, scat glauc grns, carb flks,
abnt cly

MD: 1,858'
Inclination: 0.18 °
Azimuth: 191.03 °
TVD: 1,857.94'
VS: -8.64'

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

GR (units)

GAS (units)

C1-C4 (PPM)

96u

MD: 1,951'
Inclination: 0.09 °
Azimuth: 350.11 °
TVD: 1,950.94'
VS: -8.71'

SLTY SH: lt-dk gy, sft-mod frm, sb blkly-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, scat glauc grns, carb flks,
abnt cly

GR (units)

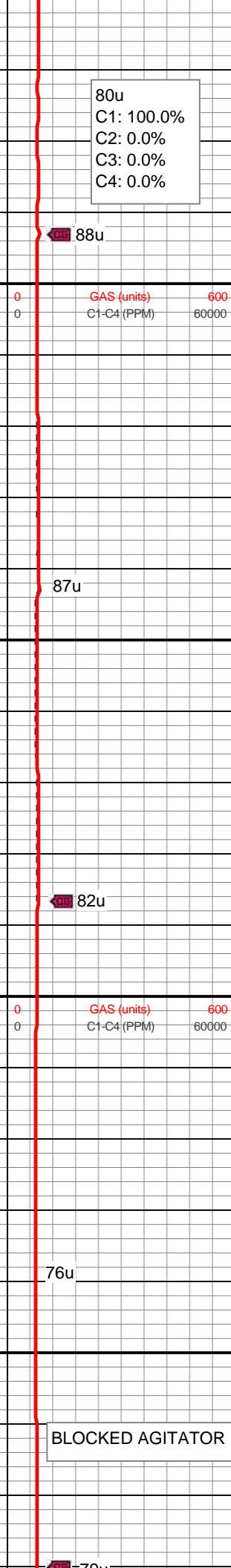
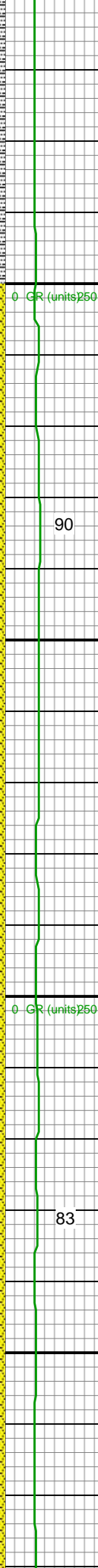
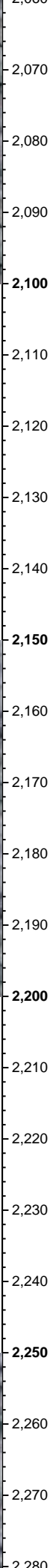
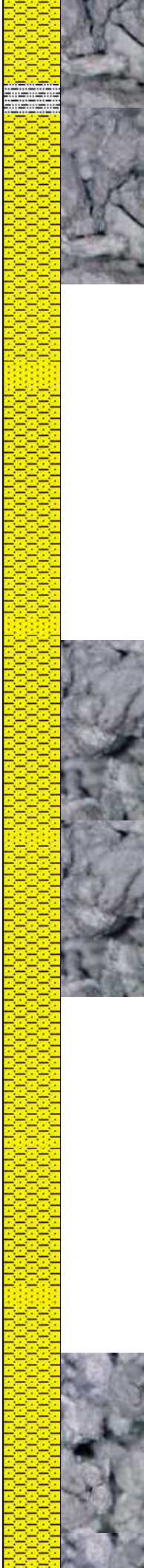
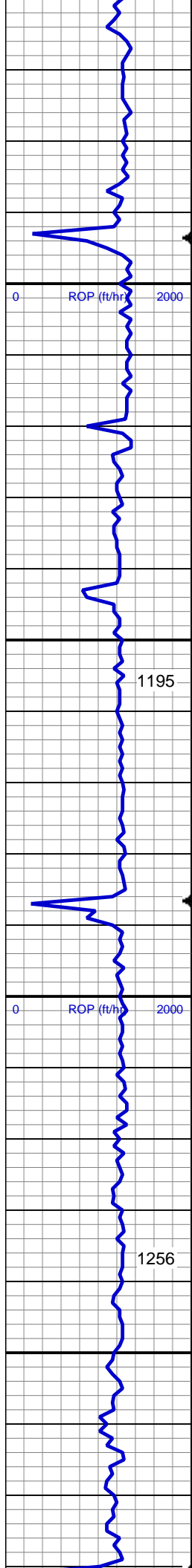
GAS (units)

C1-C4 (PPM)

96u

MD: 2,044'
Inclination: 0.35 °
Azimuth: 180.31 °
TVD: 2,043.94'
VS: -8.92'

SLTY SH: lt-dk gy, sft-mod frm, sb blkly-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, scat glauc grns, carb flks, abnt cly

80u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

88u

MD: 2,137'
Inclination: 0.53 °
Azimuth: 192.96 °
TVD: 2,136.94'
VS: -9.62'

SHY SS: 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, uncons, speckl wi glau, f gr, hd brit clus, ang - sb ang, calc cmt, tr slty sh

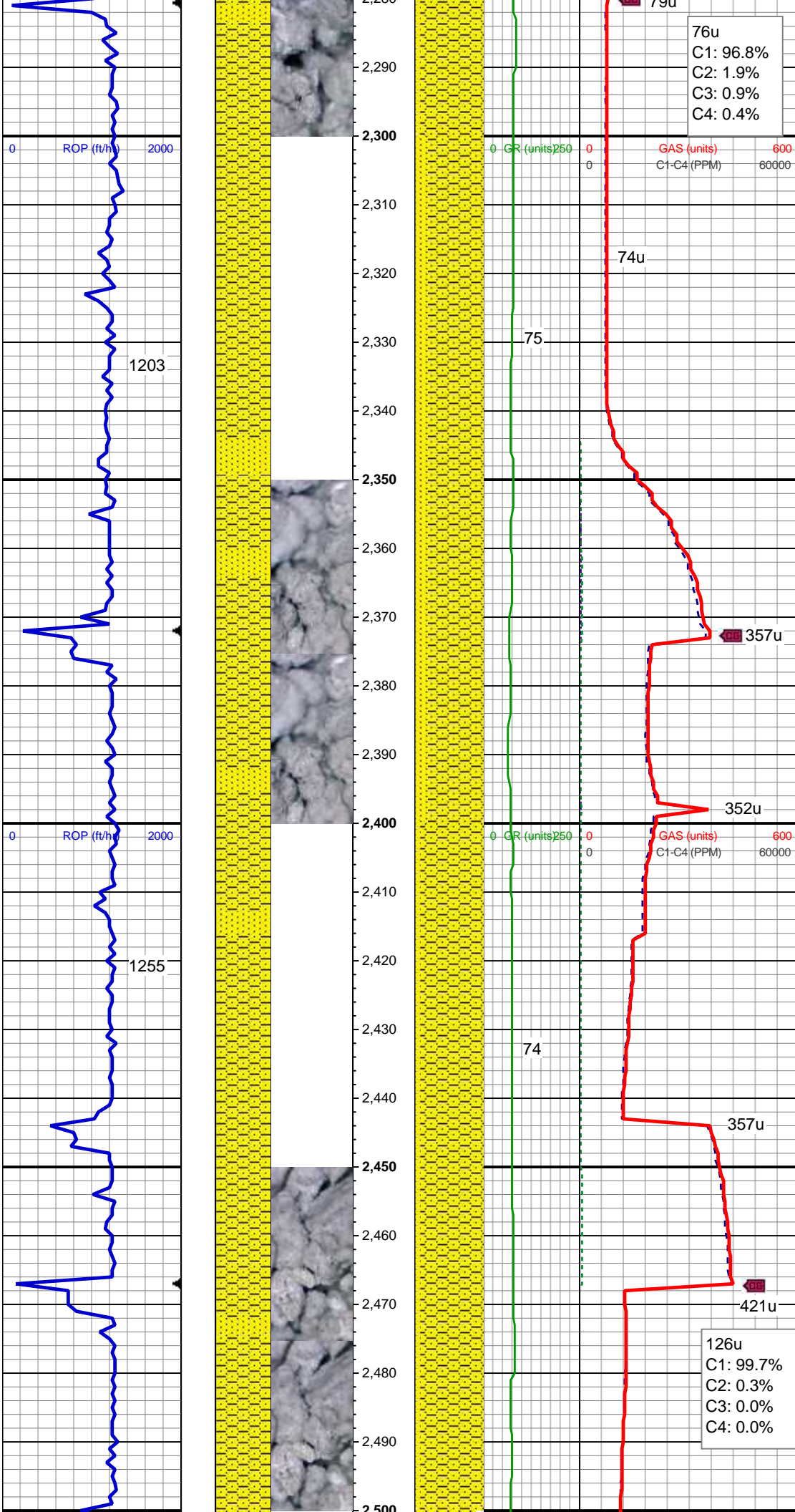
82u

MD: 2,231'
Inclination: 0.53 °
Azimuth: 171.69 °
TVD: 2,230.93'
VS: -10.47'

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

BLOCKED AGITATOR

Mud Wt: 8.90 / 35 Vis



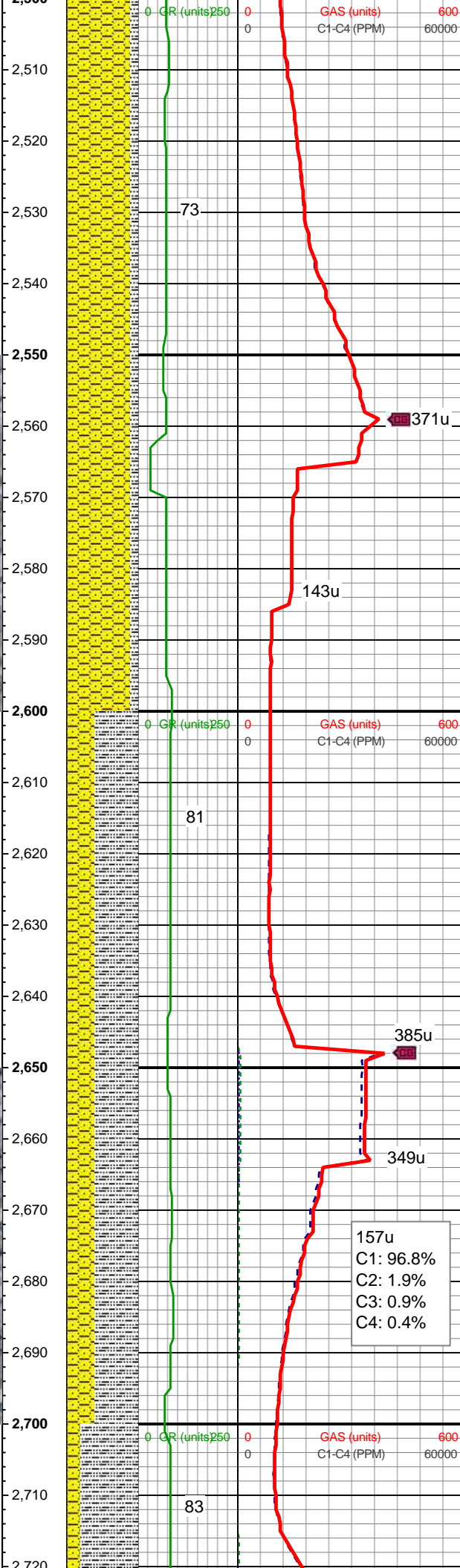
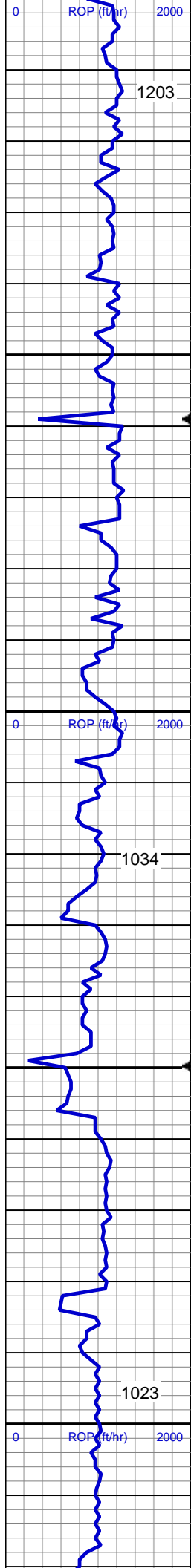
MD: 2,323'
Inclination: 0.53 °
Azimuth: 178.37 °
TVD: 2,322.93'
VS: -11.32'

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

MD: 2,417'
Inclination: 0.53 °
Azimuth: 152.53 °
TVD: 2,416.92'
VS: -12.15'

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

126u
C1: 99.7%
C2: 0.3%
C3: 0.0%
C4: 0.0%



MD: 2,509'
Inclination: 0.35 °
Azimuth: 172.57 °
TVD: 2,508.92'
VS: -12.81'

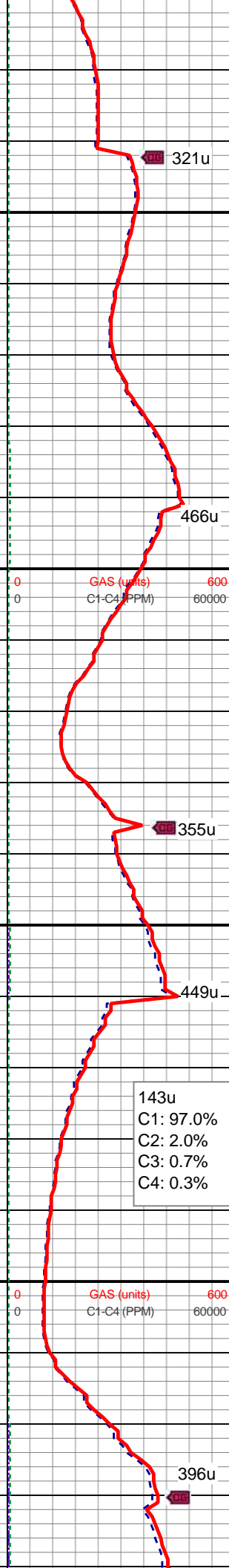
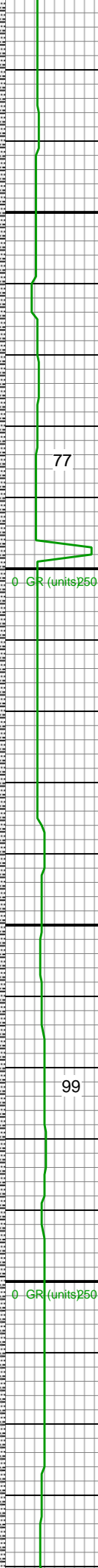
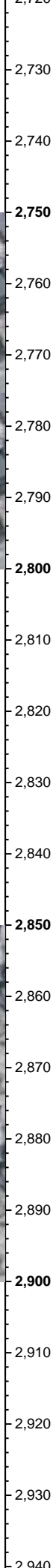
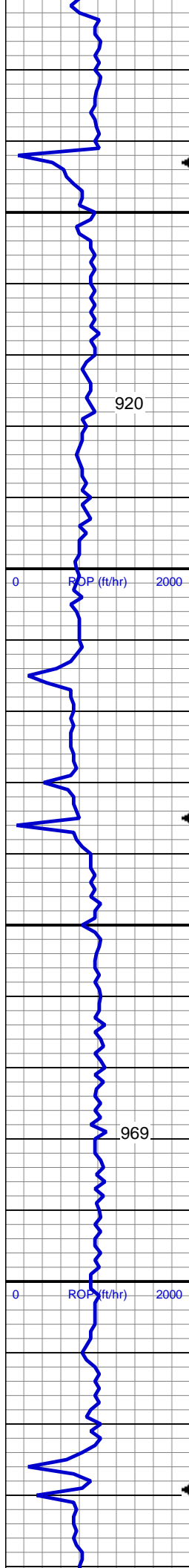
SHY SS: lt-med gy, s&p ip, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc, carb flks, SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty

MD: 2,602'
Inclination: 0.44 °
Azimuth: 104.54 °
TVD: 2,601.92'
VS: -13.2'

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

MD: 2,695'
Inclination: 0.62 °
Azimuth: 129.68 °
TVD: 2,694.92'
VS: -13.65'

Mud Wt: 8.90 / 37 Vis

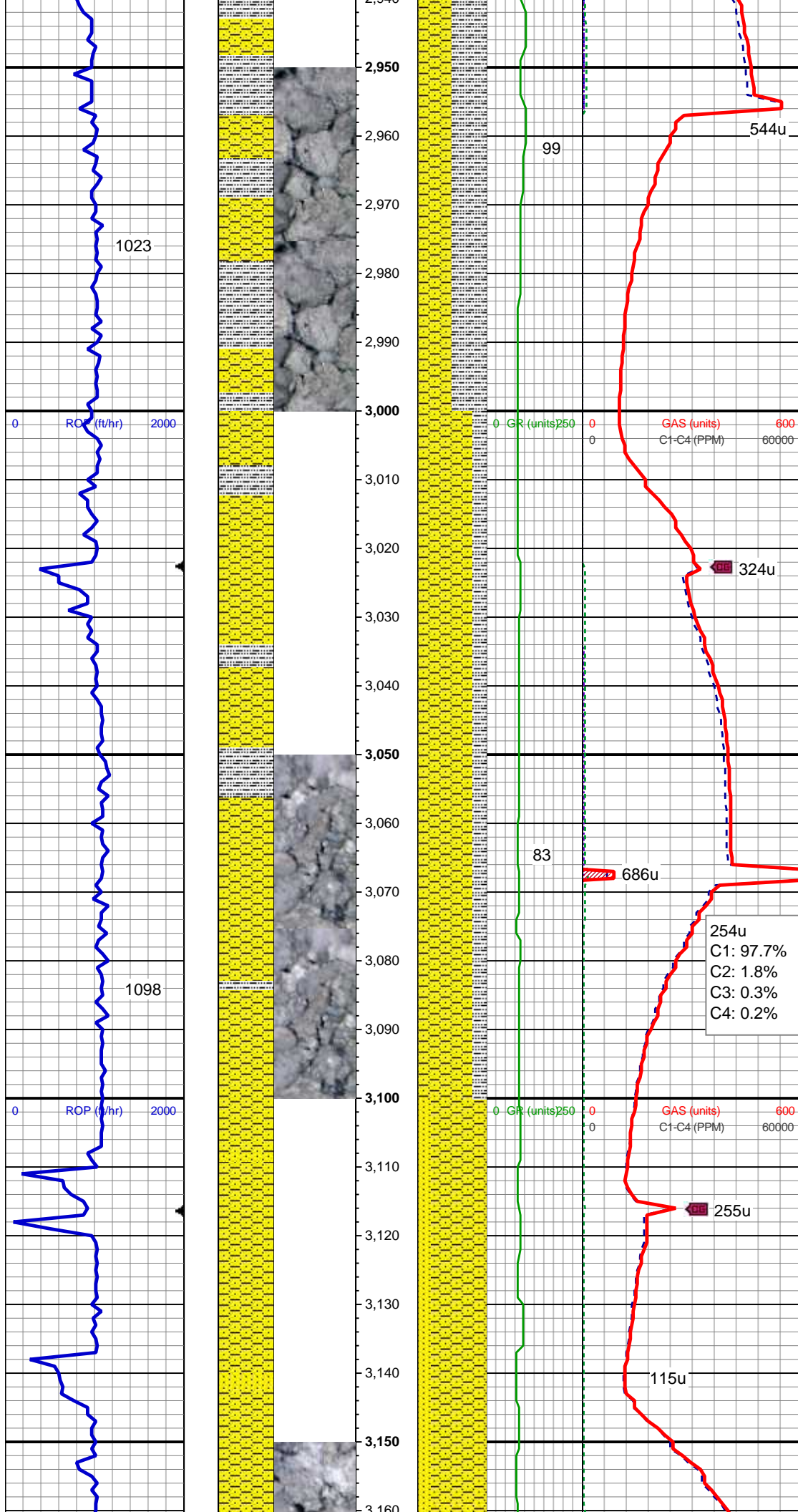


SHY SS: lt-med gy, sft frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc, carb flks, SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty

MD: 2,786'
Inclination: 0.35 °
Azimuth: 146.03 °
TVD: 2,785.91'
VS: -14.22'

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

MD: 2,880'
Inclination: 0.44 °
Azimuth: 238.49 °
TVD: 2,879.91'
VS: -14.63'



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

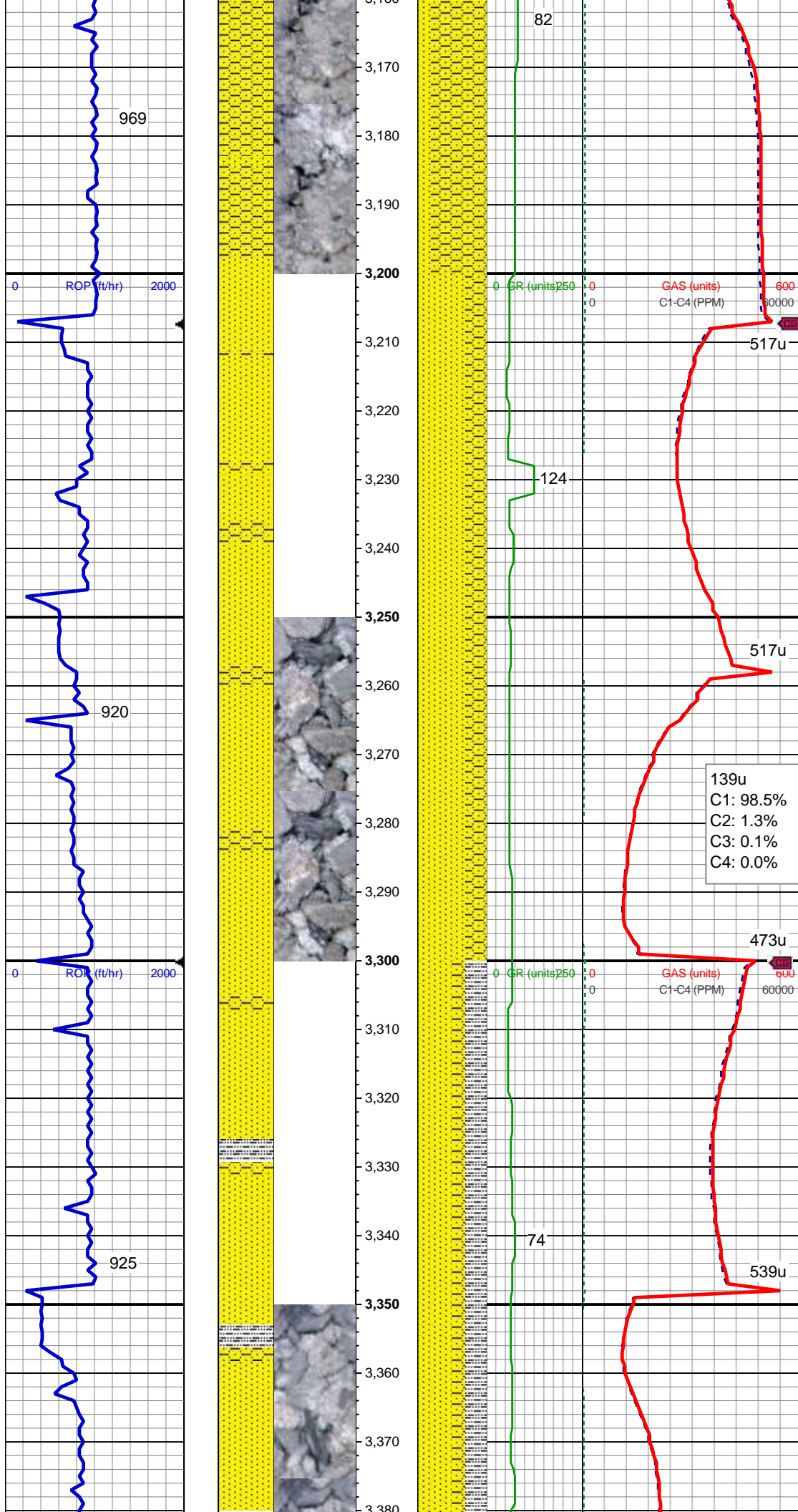
MD: 2,973'
Inclination: 0.7 °
Azimuth: 242.53 °
TVD: 2,972.91'
VS: -15.05'

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: 3,066'
Inclination: 0.7 °
Azimuth: 239.19 °
TVD: 3,065.9'
VS: -15.55'

SHY SS: 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

MD: 3,159'
Inclination: 0.52 °



Inclination: 0.53°
Azimuth: 242.53°
TVD: 3,158.89'
VS: -16'

Mud Wt: 9.05 / 48 Vis

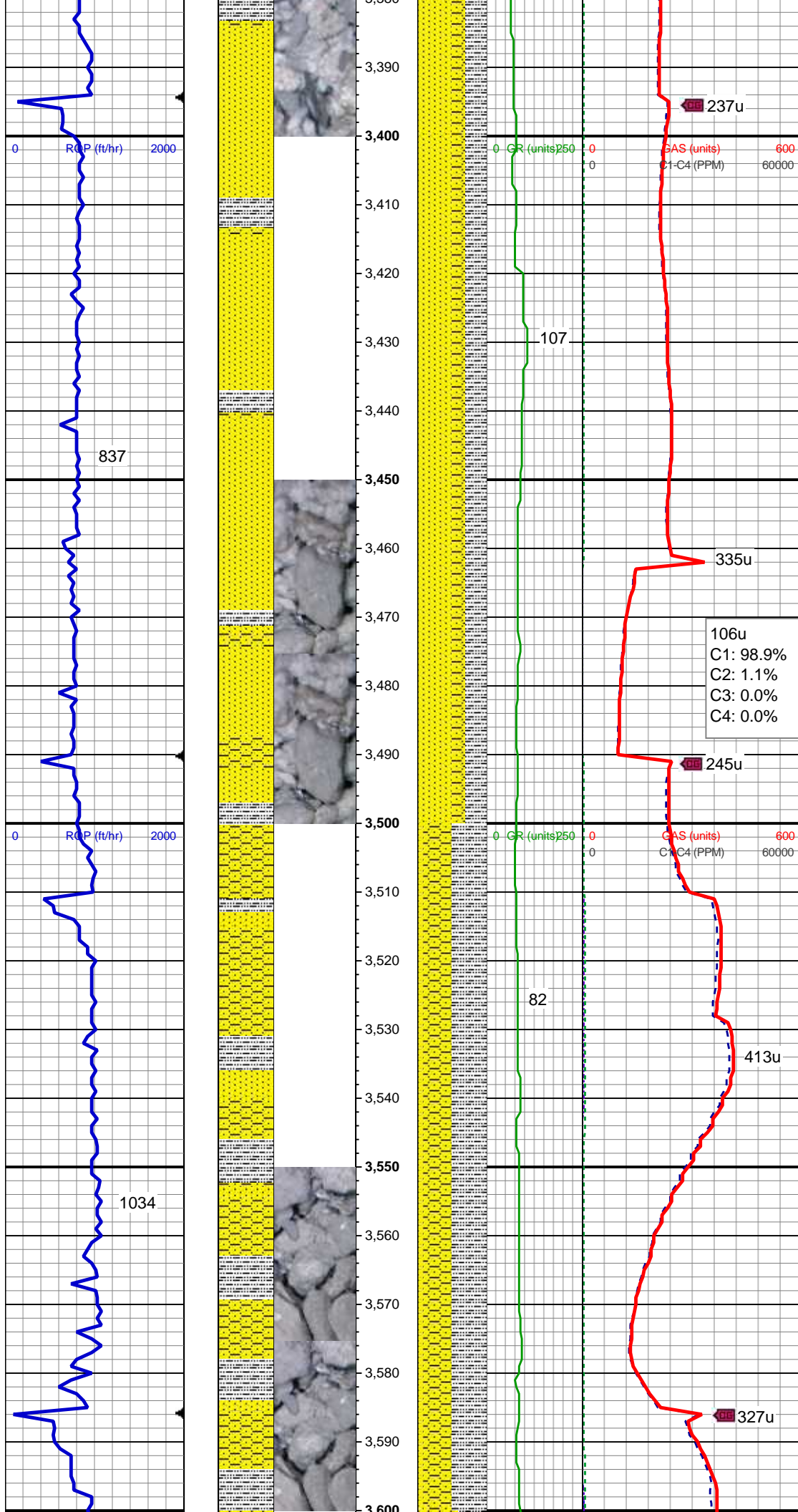
SS: med - lt gy, trnsl, s&p ip, speckl wi mica & glau, f gr, hd brit clus, ang - sb ang, ply cmtd SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc

MD: 3,251'
Inclination: 0.62°
Azimuth: 247.1°
TVD: 3,250.89'
VS: -16.35'

139u
C1: 98.5%
C2: 1.3%
C3: 0.1%
C4: 0.0%

MD: 3,346'
Inclination: 0.7°
Azimuth: 229.52°
TVD: 3,345.88'
VS: -16.88'

SS: med - lt gy, trnsl, s&p ip, f gr, lith clus, ang - sb ang, ply cmtd 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

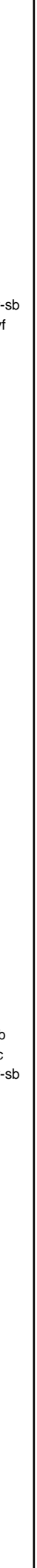
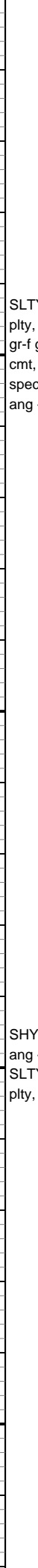
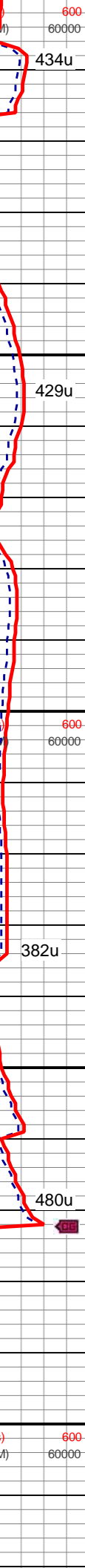
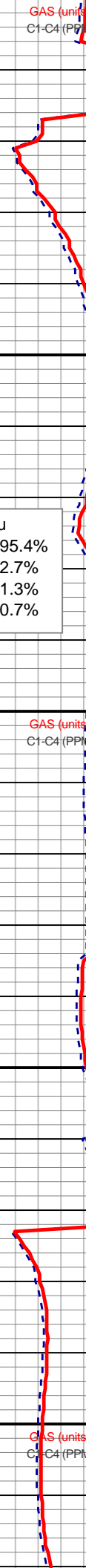
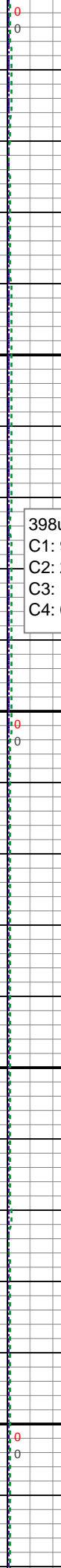
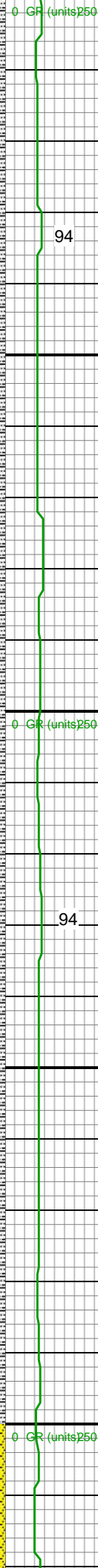
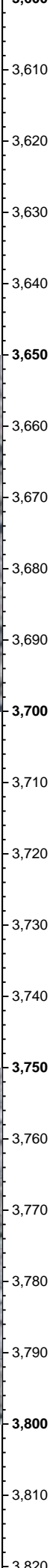
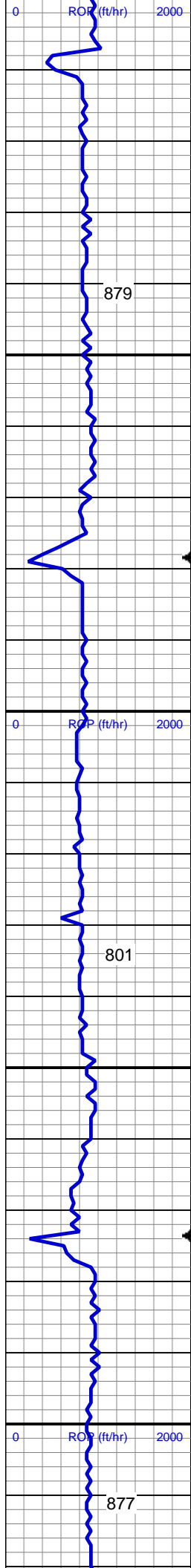


MD: 3,440'
Inclination: 0.97 °
Azimuth: 236.38 °
TVD: 3,439.87'
VS: -17.65'

SS: med - lt gy, trnsl, s&p ip, f gr, lith
clus, ang - sb ang, ply cmtd 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: 3,535'
Inclination: 1.06 °
Azimuth: 230.23 °
TVD: 3,534.86'
VS: -18.59'

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 SS: med - lt gy, s&p ip,
speckl wi mica & glau, f gr, hd brit clus,
ang - sb ang, calc cmt



MD: 3,630'
Inclination: 1.14 °
Azimuth: 238.14 °
TVD: 3,629.84'
VS: -19.58'

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 SS: med - lt gy, s&p ip,
speckl wi mica & glau, f gr, hd brit clus,
ang - sb ang, calc cmt

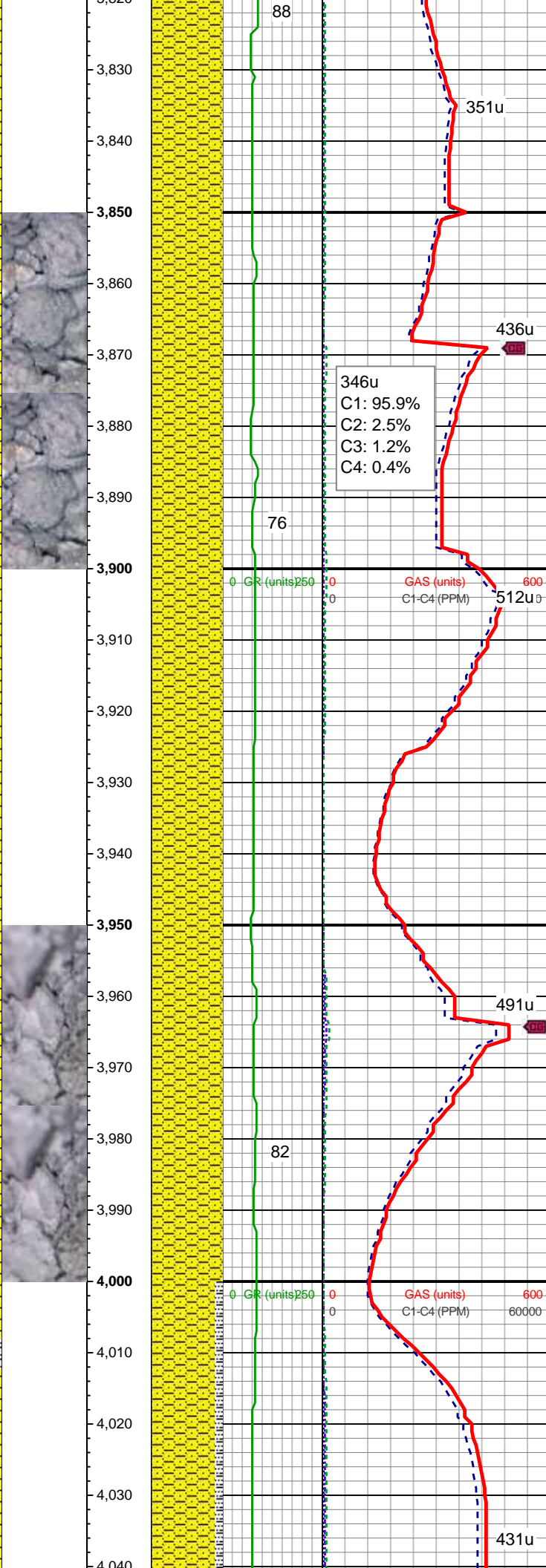
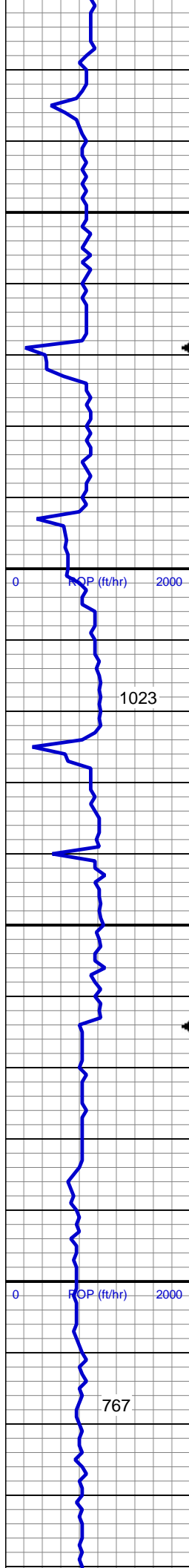
Mud Wt: 9.10 / 48 Vis

MD: 3,724'
Inclination: 1.32 °
Azimuth: 228.65 °
TVD: 3,723.82'
VS: -20.71'

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: 3,819'
Inclination: 1.41 °
Azimuth: 218.1 °
TVD: 3,818.79'

398u
C1: 95.4%
C2: 2.7%
C3: 1.3%
C4: 0.7%



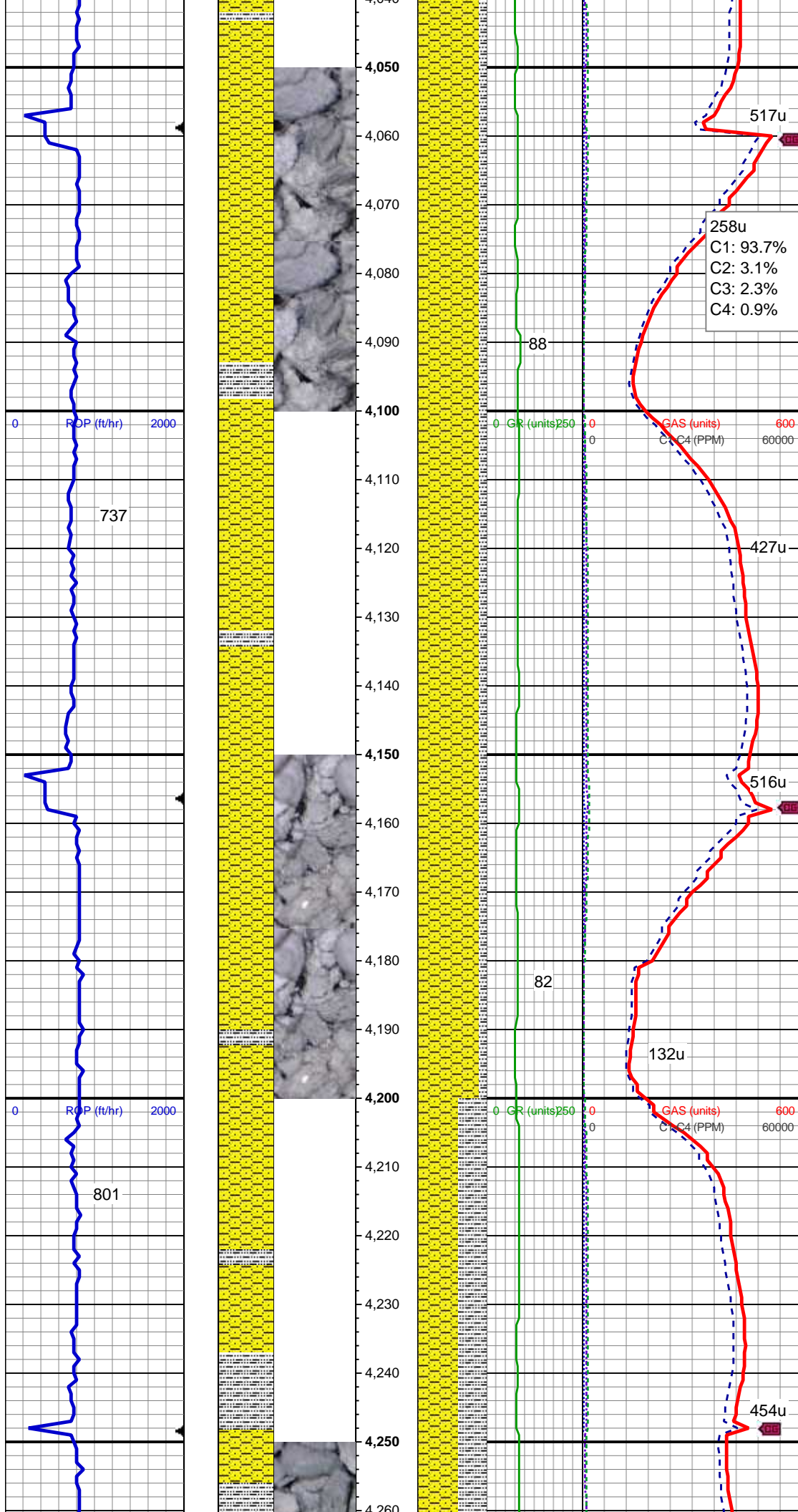
VS: -22.28'

SHY SS: lt-med gy, sft-firm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc, tr slty sh

MD: 3,913'
Inclination: 1.32 °
Azimuth: 208.08 °
TVD: 3,912.77'
VS: -24.09'

SHY SS: lt-med gy, sft-firm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc, tr slty sh

MD: 4,008'
Inclination: 1.41 °
Azimuth: 203.86 °
TVD: 4,007.74'
VS: -26.07'



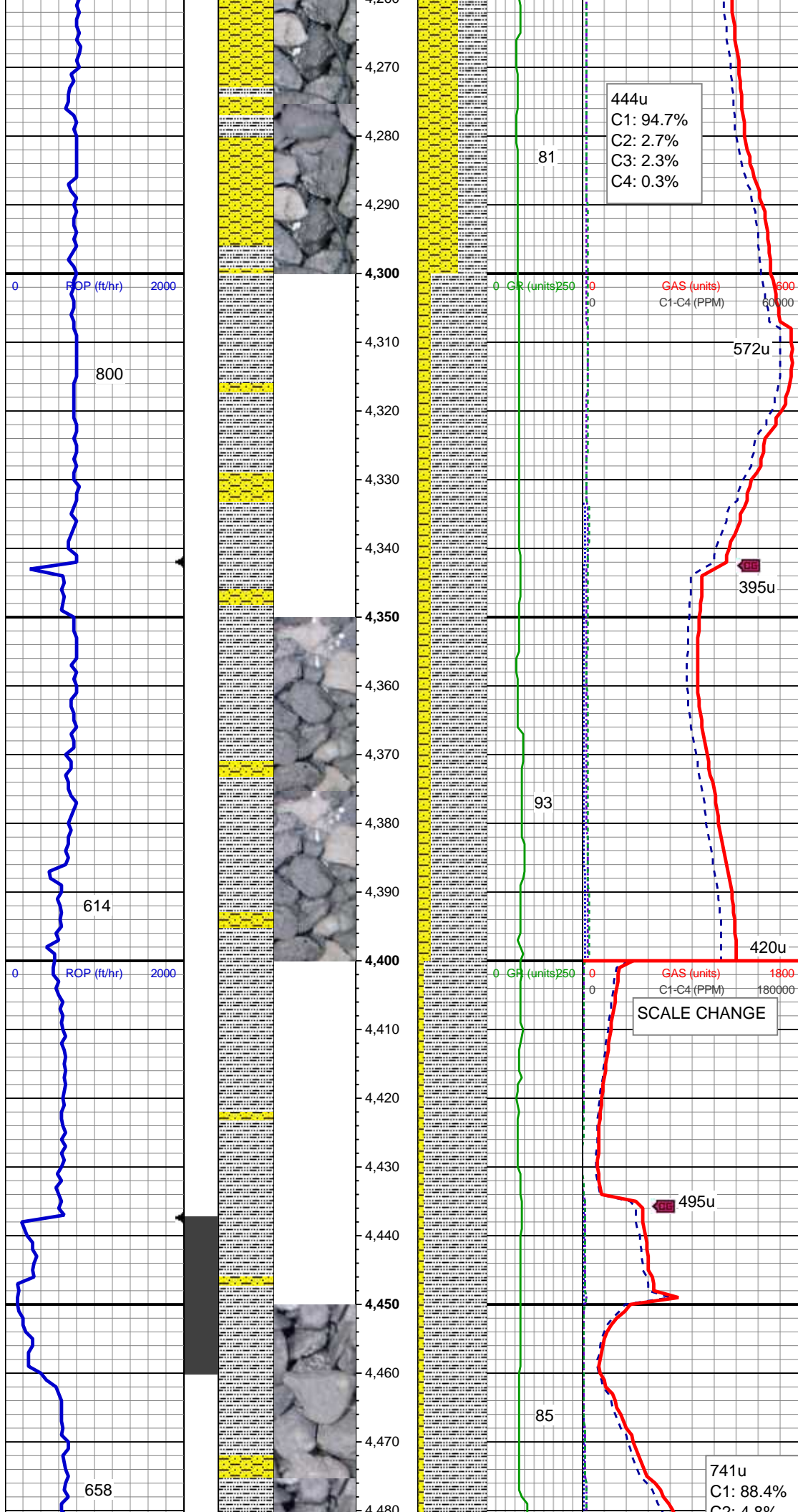
SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb
ang - sb rnd, mod w srt, arg cmt, sl calc
SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb
ppty, gritty

MD: 4,103'
Inclination: 1.49 °
Azimuth: 201.05 °
TVD: 4,102.71'
VS: -28.25'

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: 4,197'
Inclination: 1.58 °
Azimuth: 186.46 °
TVD: 4,196.67'
VS: -30.65'

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



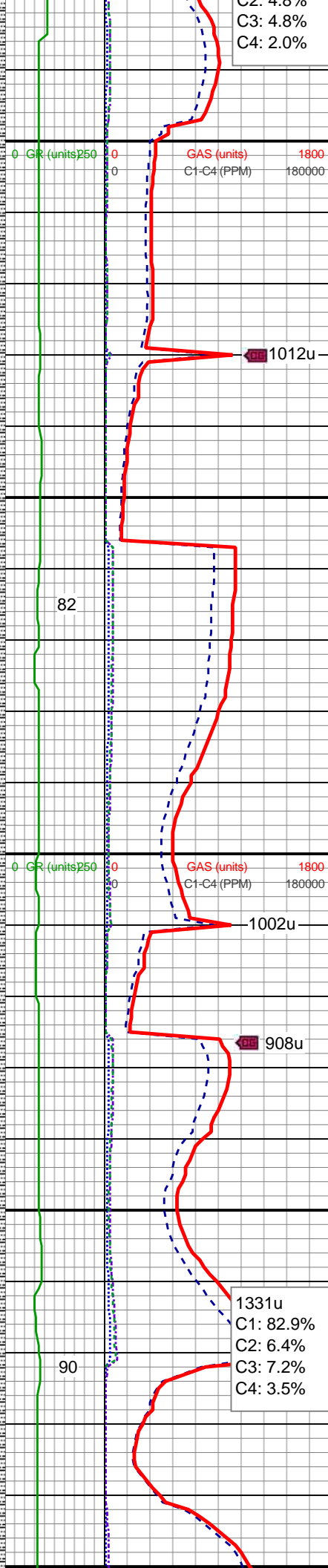
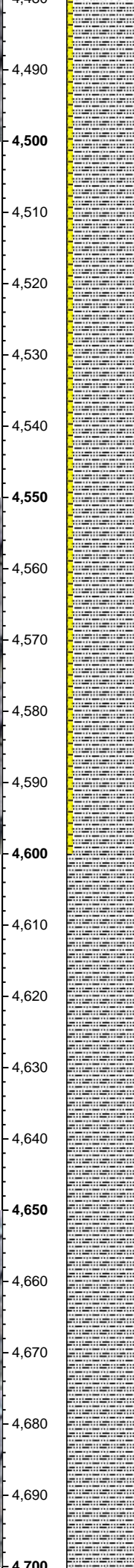
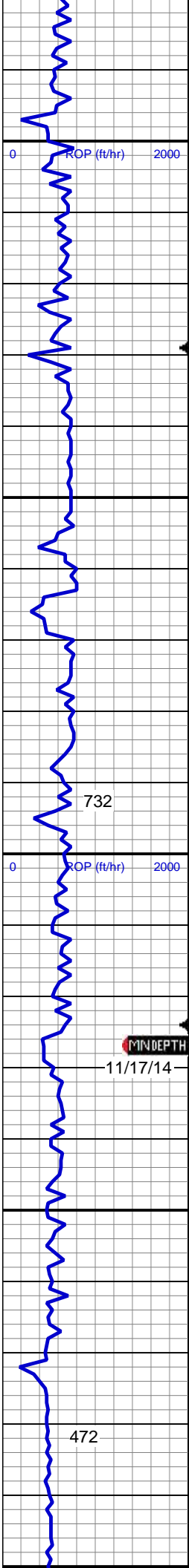
MD: 4,292'
Inclination: 1.93 °
Azimuth: 185.4 °
TVD: 4,291.63'
VS: -33.53'

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: 4,386'
Inclination: 1.76 °
Azimuth: 204.74 °
TVD: 4,385.58'
VS: -36.37'

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: 4,481'
Inclination: 2.02 °



Azimuth: 37.4°
TVD: 4,480.56'
VS: -36.39'

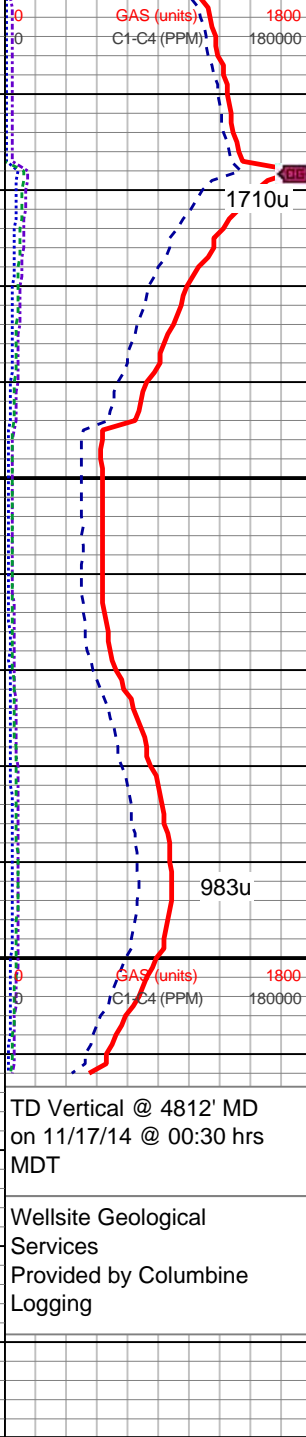
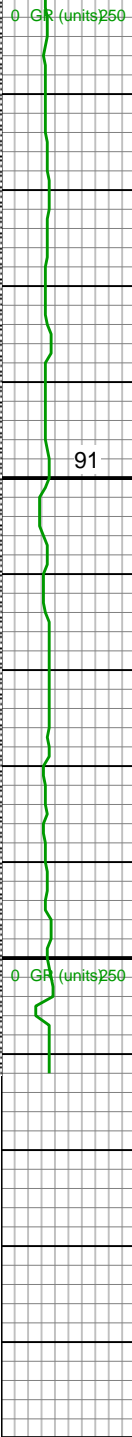
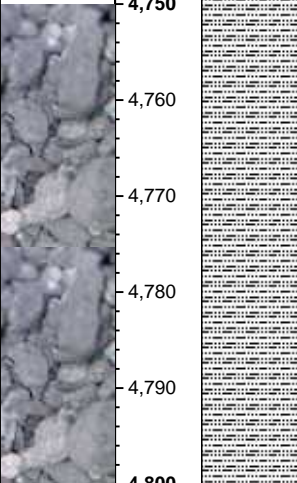
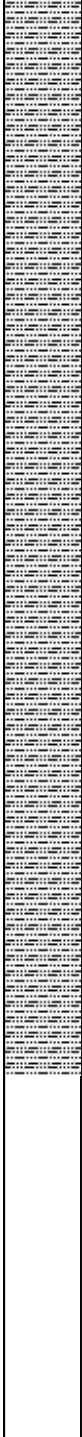
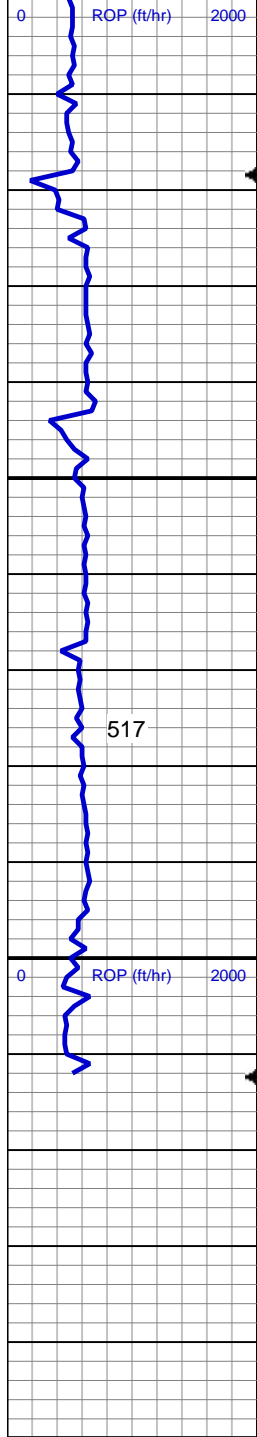
Mud Wt: 9.50 / 49 Vis

SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-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

MD: 4,575'
Inclination: 1.41°
Azimuth: 35.46°
TVD: 4,574.52'
VS: -34.21'

SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb pty, gritty, tr shy ss

MD: 4,670'
Inclination: 1.23°
Azimuth: 18.59°
TVD: 4,669.5'
VS: -32.34'



SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb pty, gritty, tr shy ss	
MD: 4,764' Inclination: 0.97 ° Azimuth: 5.23 ° TVD: 4,763.48' VS: -30.61'	
TD Vertical @ 4812' MD on 11/17/14 @ 00:30 hrs MDT	See Corresponding Horizontal Log Mecklenburg State LD01-73HN(HORZ)
Wellsite Geological Services Provided by Columbine Logging	