

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name SEYLER B10-63-1HN VERT

Location SEC 10 T5N R64W

State COLORADO

County WELD

Country USA

Rig Number H&P 315

API Number 05-123-37698

AFE # 136850

Region DJ BASIN

Field WATTENBERG

Spud Date 12/14/2013

Drilling Completed 12/17/2013

Surface Coordinates SWSW SEC 10 T5N R64W
1,198' FSL; 245' FWL

LAT/LON 40.409870/-104.544730

Bottom Hole Coordinates SESE SEC 10 T5N R64W
990' FSL; 700' FEL

Ground Elevation 4,582'

K.B. Elevation 4,606'

Logged Interval 2,000' **To** 5,930'

Total Depth 5,930'

Formation NIOBRARA B CHALK

Type of Drilling Fluid LSND

Operator

Company Noble Energy Inc

Address 1625 BROADWAY SUITE 2200
DENVER, CO 80202

Geologist

Name MARK COLE, NATHAN MURPHY

Company COLUMBINE LOGGING, INC

Address 2385 S LIPAN ST
DENVER, CO 80223

Rock Types

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

Accessories

Fossils

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

Fossil

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

Minerals

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

Ferruginous

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

Tuffaceous

Stringer

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

Other Symbols

Oil Show

DEAD
 EVEN
 QUESTIONABLE
 SPOTTED STAINING

Porosity

EARTHY
 FENESTRAL
 FRACTURE
 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
 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

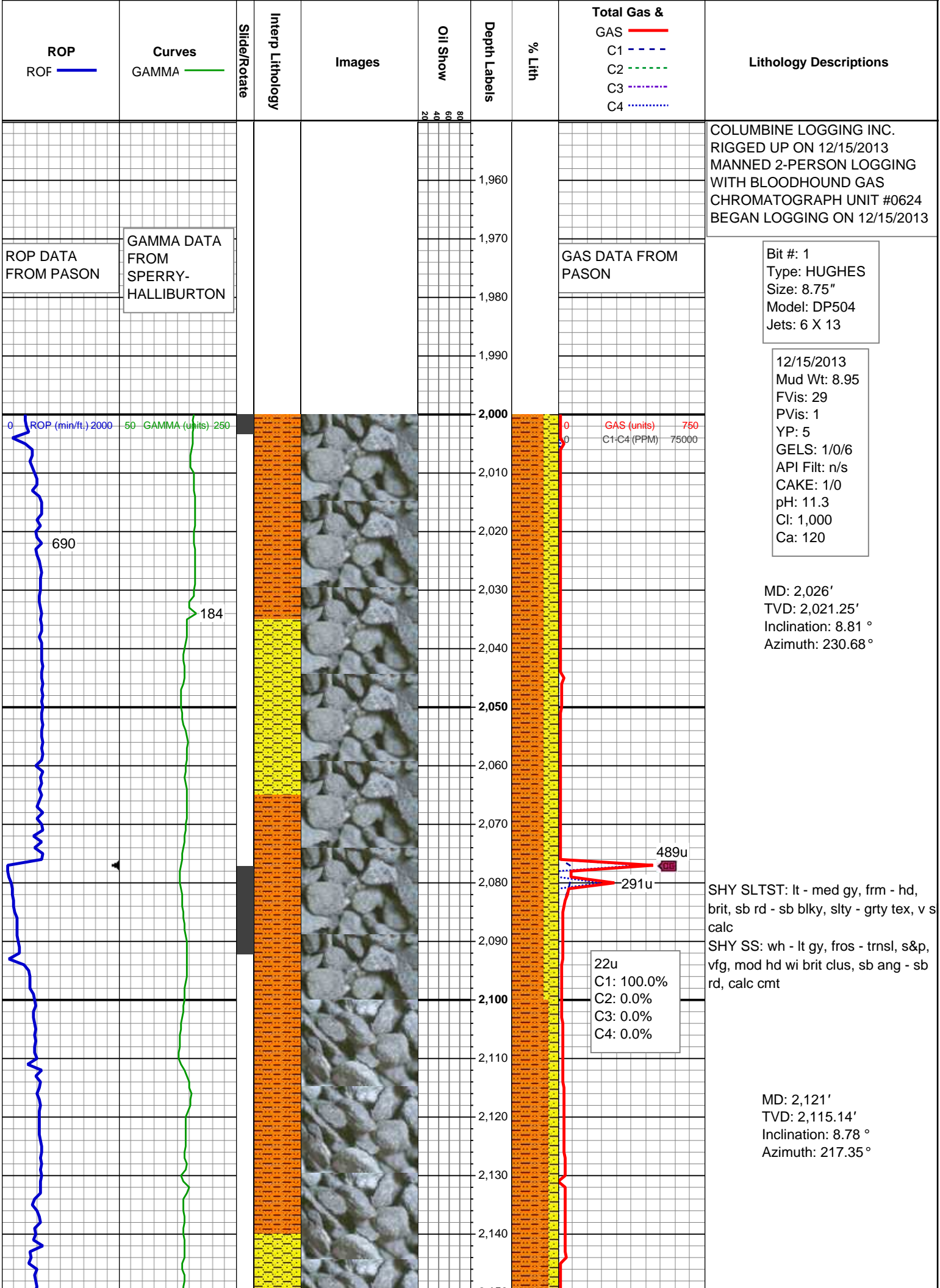
BOUNDSTONE
 CHALKY
 CRYPTOXLN

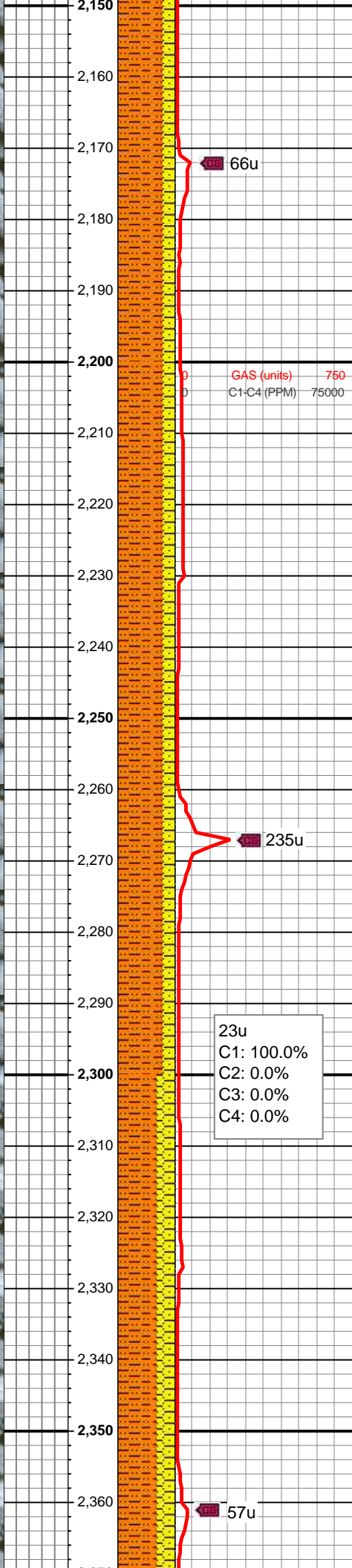
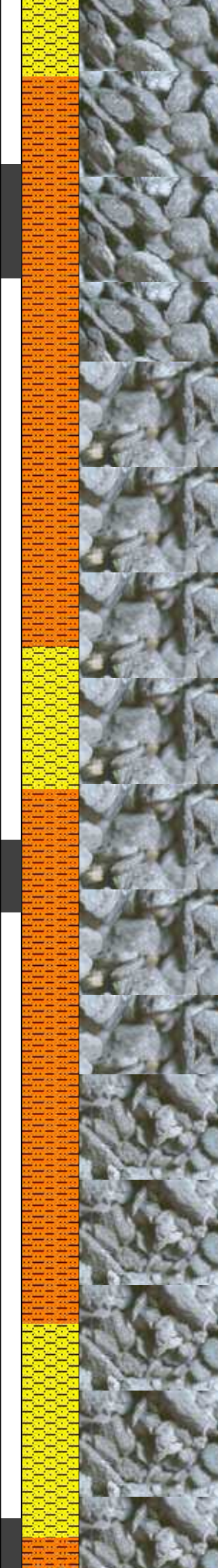
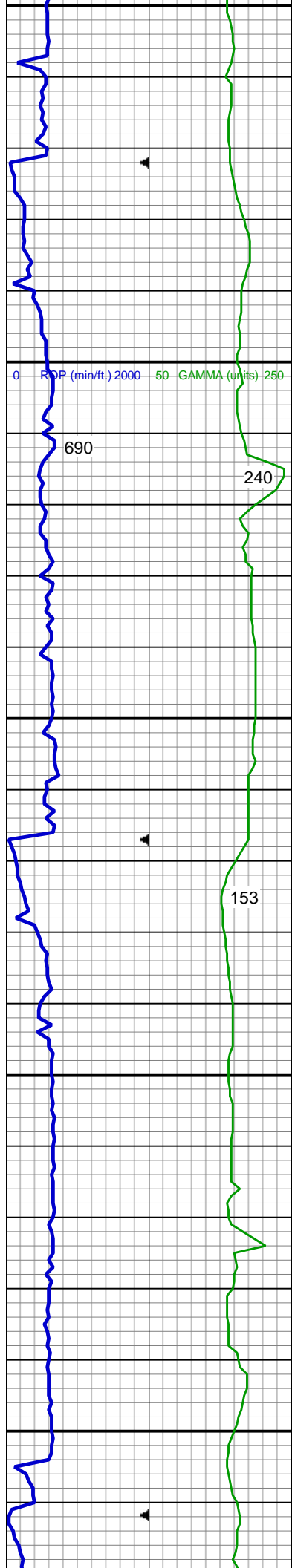
Earthy

FINELYXLN
 GRAINSTONE
 LITHOGRAPHIC
 MICROXLN
 MUDSTONE
 PACKSTONE
 WACKESTONE

Sorting

MODERATE
 POOR
 WELL





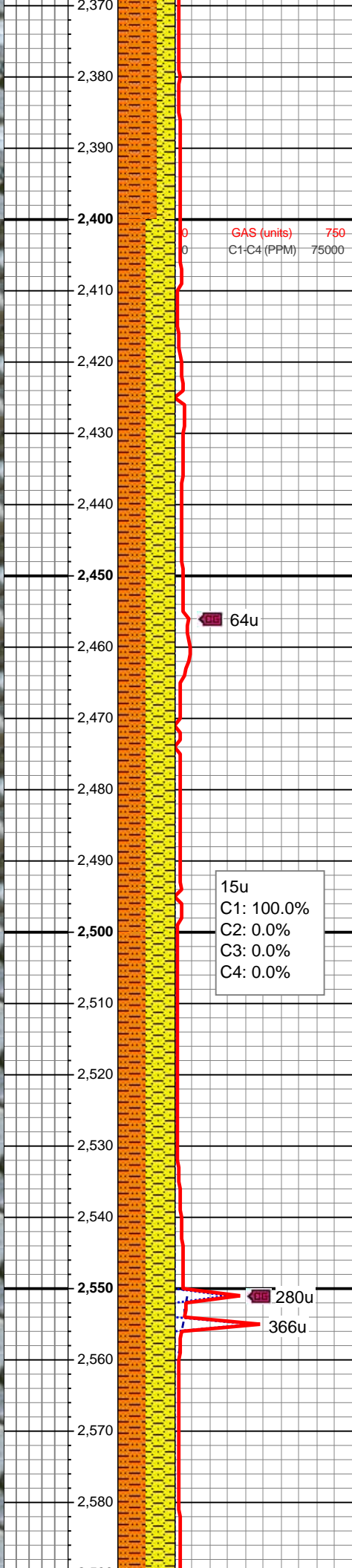
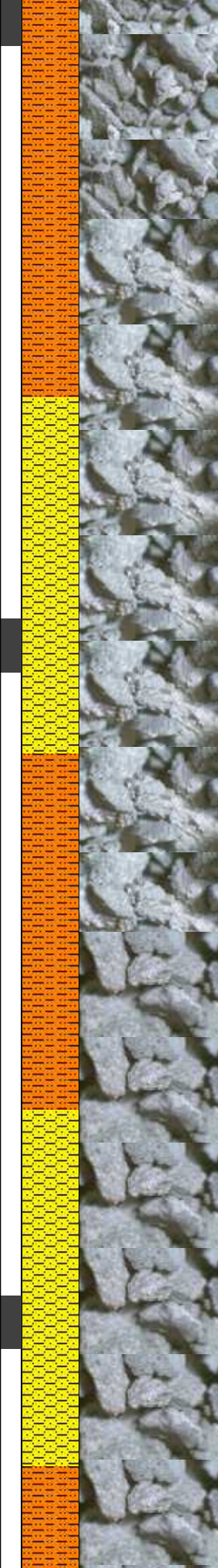
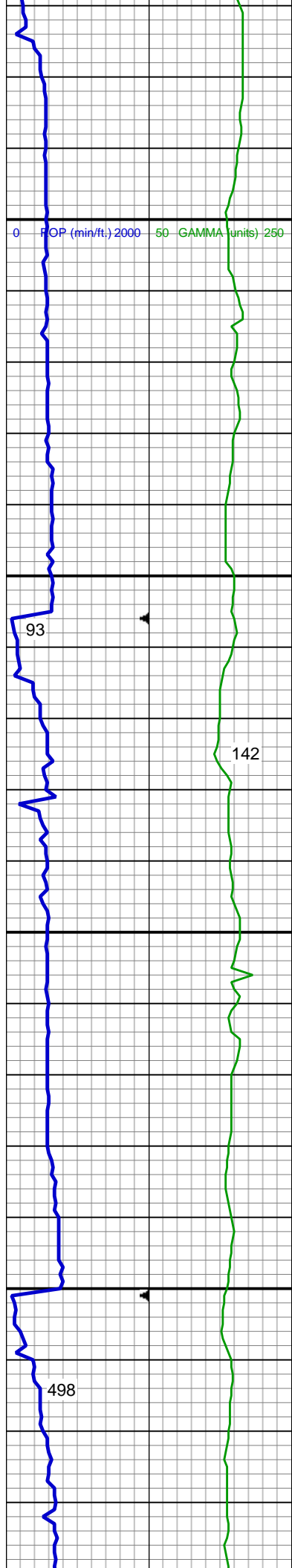
SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc
SHY SS: wh - lt gy, fros - trnsl, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt

MD: 2,216'
TVD: 2,208.87'
Inclination: 9.99 °
Azimuth: 216.2 °

SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc
SHY SS: wh - lt gy, fros - trnsl, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt

MD: 2,311'
TVD: 2,302.49'
Inclination: 9.61 °
Azimuth: 209 °

MUD WT: 9.0/9.1
VIS: 32/32 IN/OUT



SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc

SHY SS: wh - lt gy, fros - trns, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt

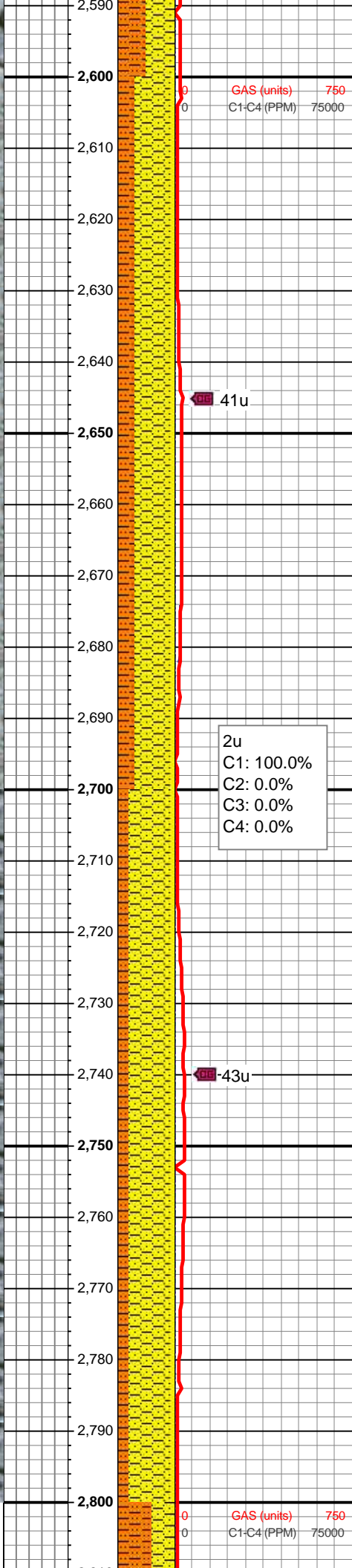
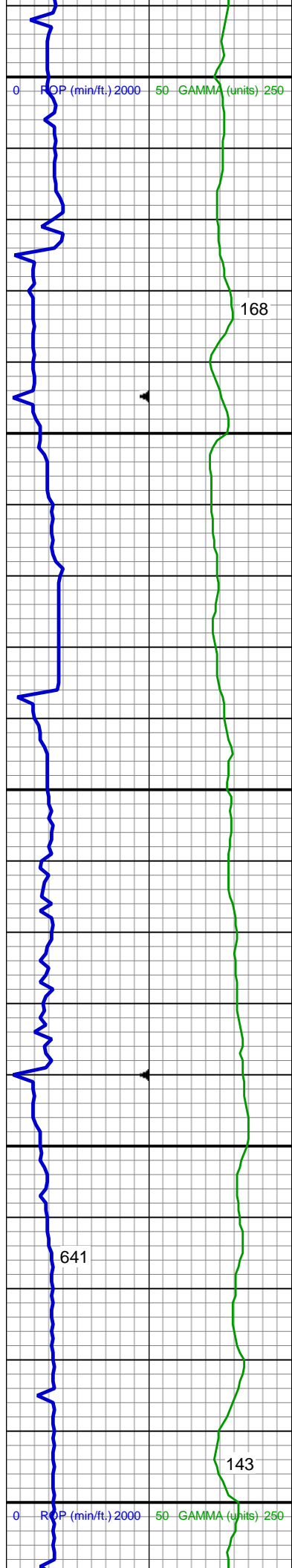
MD: 2,405'
TVD: 2,395.09'
Inclination: 10.16 °
Azimuth: 212.92 °

SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc

SHY SS: wh - lt gy, fros - trns, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt

MD: 2,500'
TVD: 2,488.63'
Inclination: 10.01 °
Azimuth: 214.59 °

SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc



SHY SS: wh - lt gy, fros - trns, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt

MD: 2,595'
TVD: 2,582.12'
Inclination: 10.46 °
Azimuth: 212.84 °

SHY SS: wh - lt gy, fros - trns, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt

SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc

SS: wh - lt gy, fros - trns, speckl wi mica, f gr, hd brit clus, ang - sb ang, v calc cmt

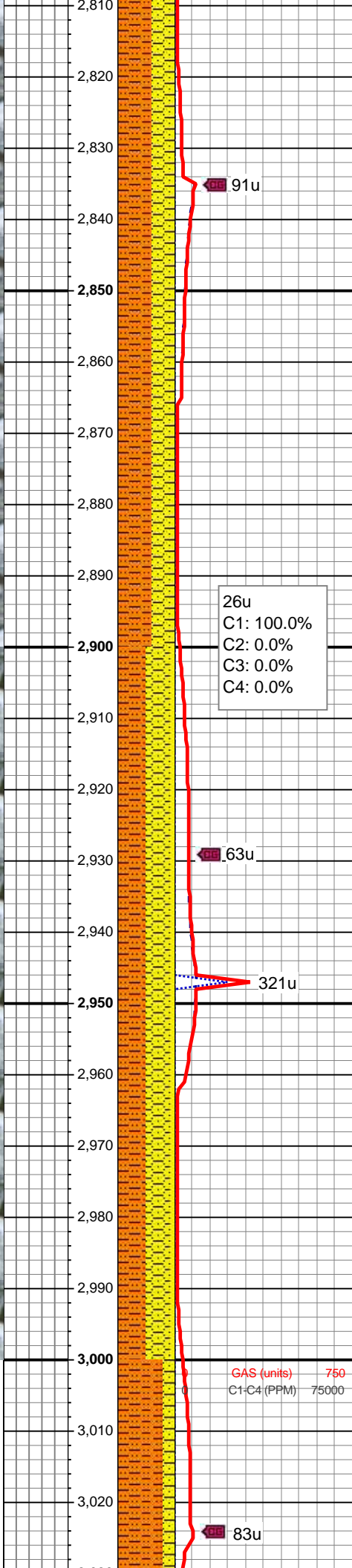
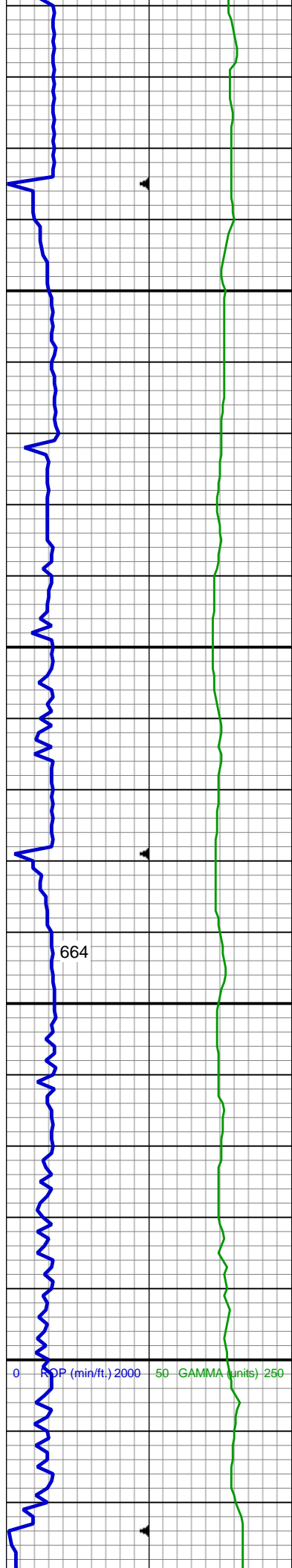
MD: 2,690'
TVD: 2,675.5'
Inclination: 10.71 °
Azimuth: 211.88 °

SHY SS: wh - lt gy, fros - trns, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt

SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc

SS: wh - lt gy, fros - trns, speckl wi mica, f gr, hd brit clus, ang - sb ang, v calc cmt

MD: 2,785'
TVD: 2,768.99'
Inclination: 9.73 °



Inclination: 9.73°
Azimuth: 212.07°

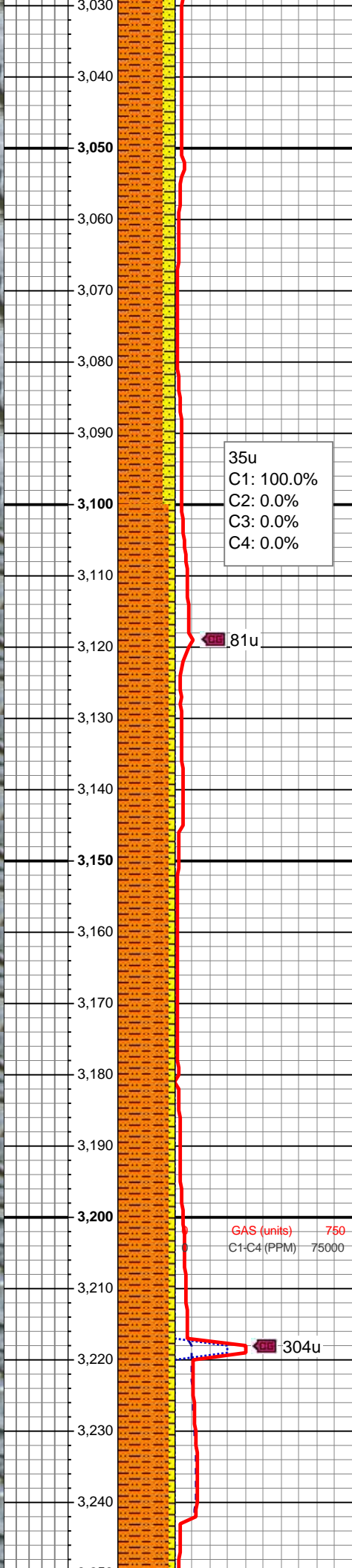
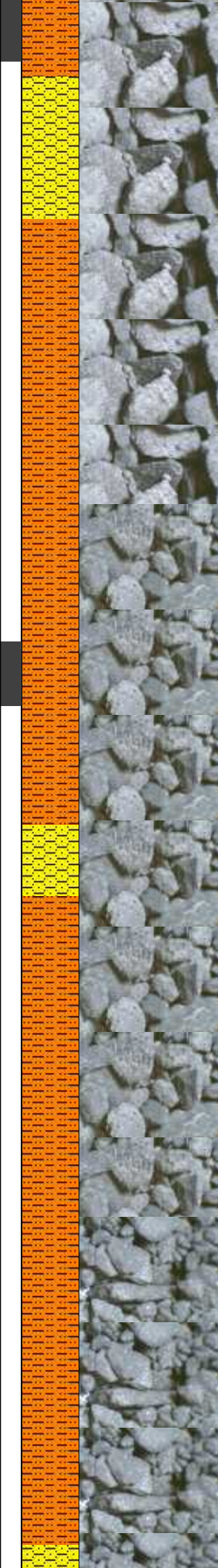
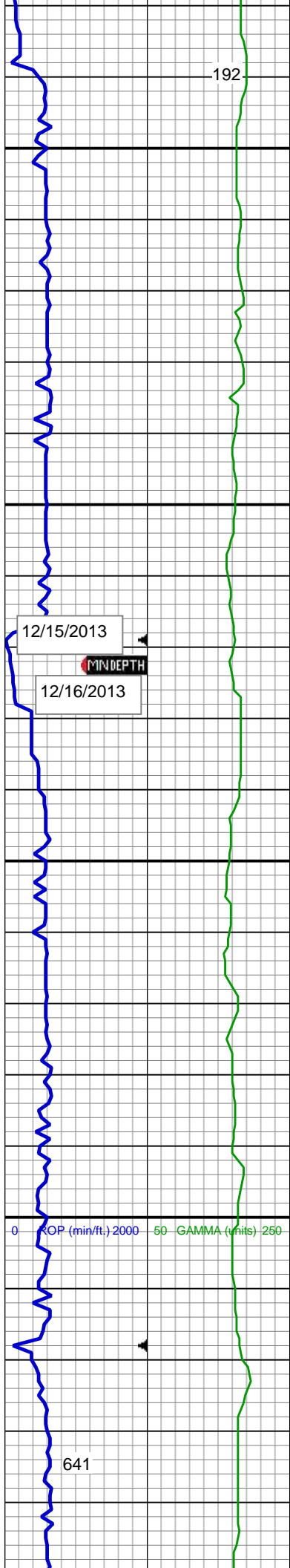
MUD WT: 9.1/9.2
VIS: 34/36 IN/OUT

MD: 2,880'
TVD: 2,862.66'
Inclination: 9.47°
Azimuth: 210.03°

SHY SLTST: lt - med gy, frm - hd,
brit, sb rd - sb blk, slty - grty tex, v s
calc
SHY SS: wh - lt gy, fros - trns, s&p,
vfg, mod hd wi brit clus, sb ang - sb
rd, calc cmt

MD: 2,974'
TVD: 2,955.48'
Inclination: 8.72°
Azimuth: 211.04°

SHY SLTST: lt - med gy, frm - hd,
brit, sb rd - sb blk, slty - grty tex, v s
calc
SHY SS: wh - lt gy, fros - trns, s&p,
vfg, mod hd wi brit clus, sb ang - sb
rd, calc cmt
SS: wh - lt gy, fros - trns, speckl wi
mica, f gr, hd brit clus, ang - sb ang,
v calc cmt



MD: 3,069'

TVD: 3,049.37'

Inclination: 8.81 °

Azimuth: 209.52 °

SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc

SHY SS: wh - lt gy, fros - trns, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt

MD: 3,164'

TVD: 3,143.25'

Inclination: 8.82 °

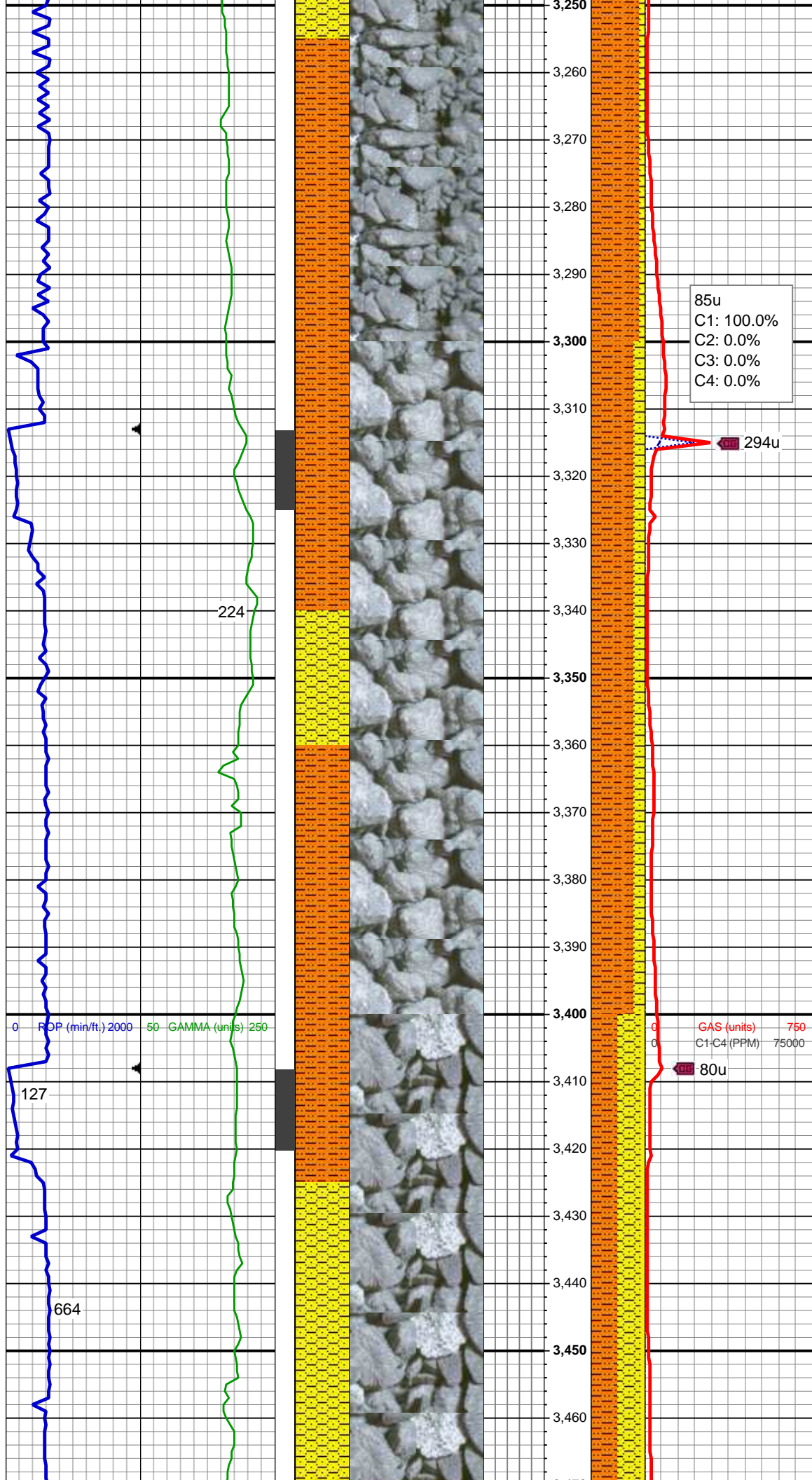
Azimuth: 214.14 °

SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc

SHY SS: wh - lt gy, fros - trns, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt

MUD WT: 9.15/9.25

VIS: 34/34 IN/OUT



MD: 3,259'
TVD: 3,237.29'
Inclination: 7.44 °
Azimuth: 215.01 °

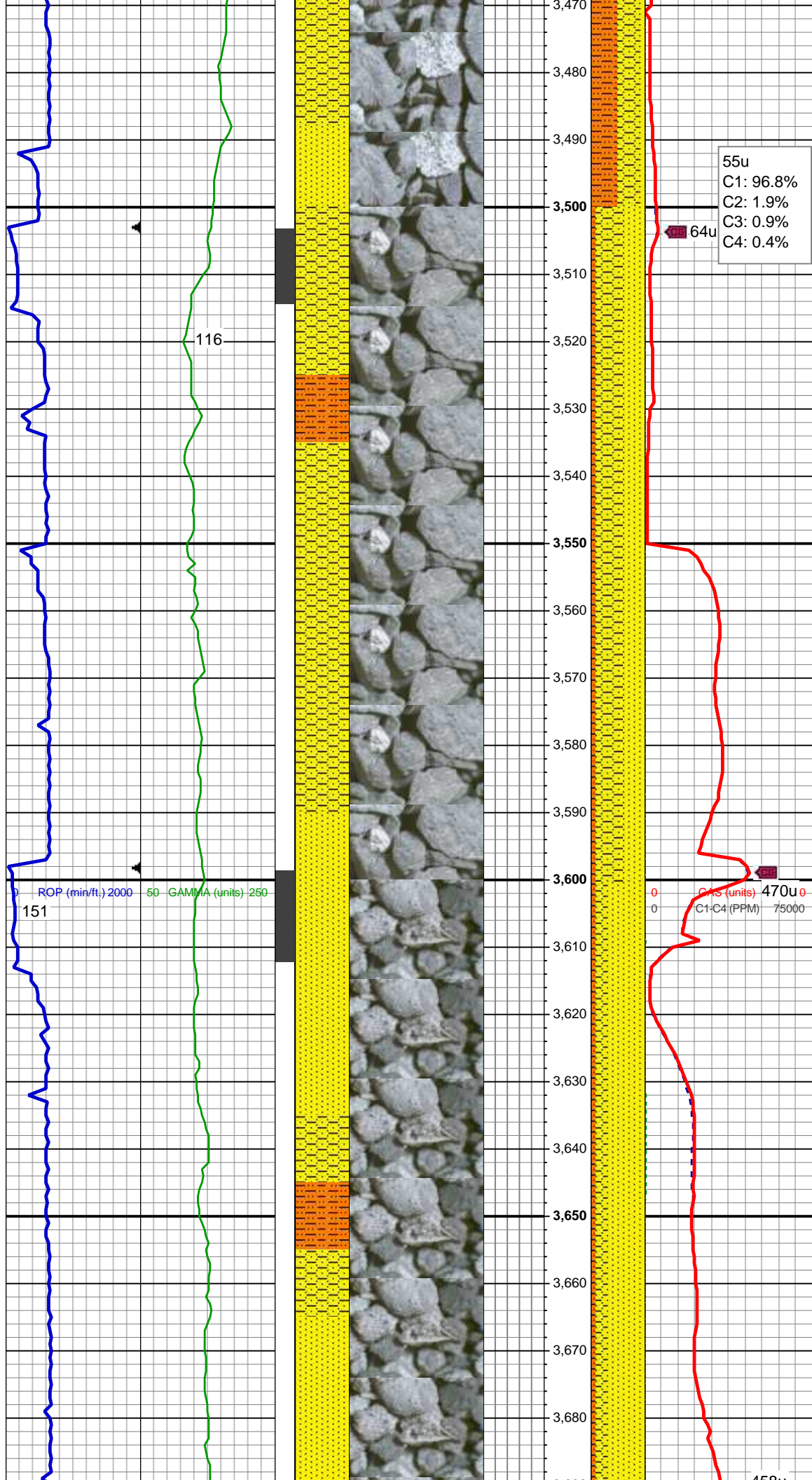
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brit, sb rd - sb blk, slty - grty tex, v s
calc
SHY SS: wh - lt gy, fros - trns, s&p,
vfg, mod hd wi brit clus, sb ang - sb
rd, calc cmt

MD: 3,353'
TVD: 3,330.73'
Inclination: 5.08 °
Azimuth: 216.93 °

SHY SLTST: lt - med gy, frm - hd,
brit, sb rd - sb blk, slty - grty tex, v s
calc
SHY SS: wh - lt gy, fros - trns, s&p,
vfg, mod hd wi brit clus, sb ang - sb
rd, calc cmt

MD: 3,448'
TVD: 3,425.47'
Inclination: 3.35 °
Azimuth: 207.86 °

Parkman Top @
3,488' MD; 3,466' TVD



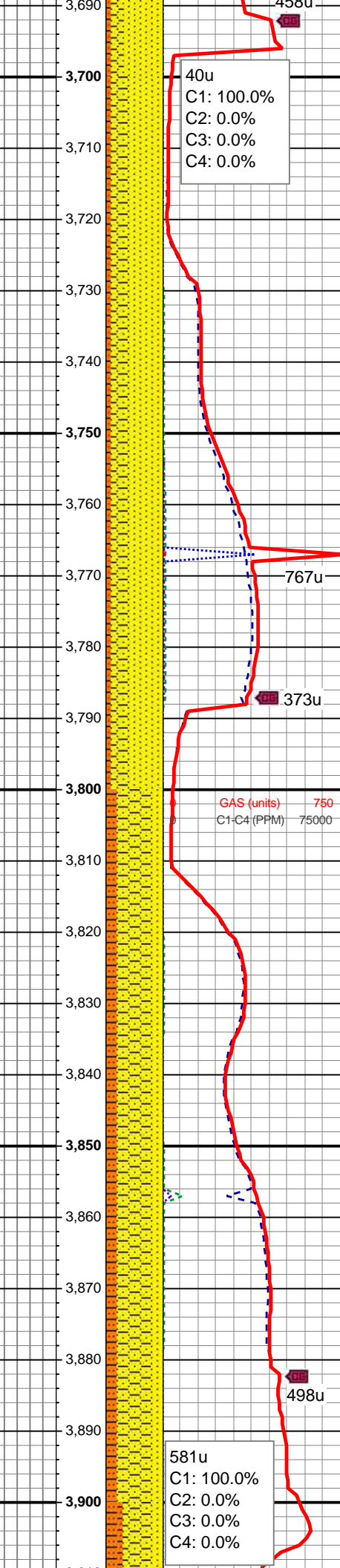
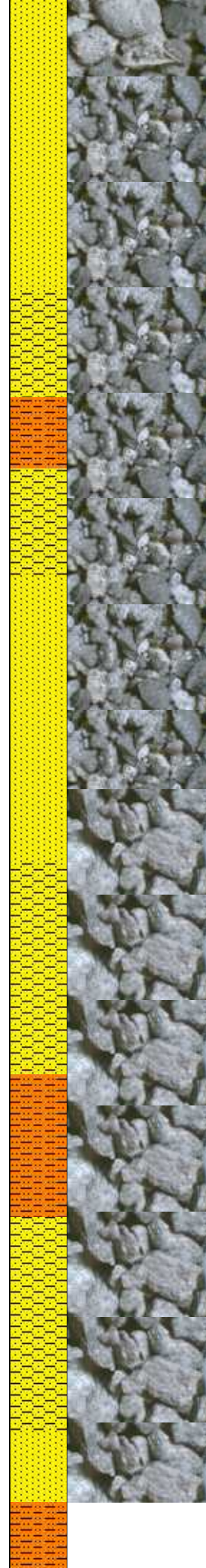
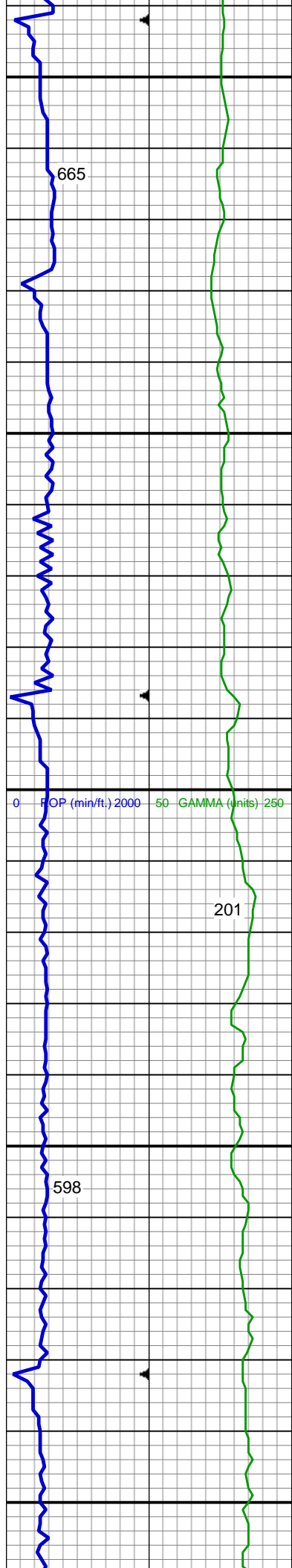
SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc
SHY SS: wh - lt gy, fros - trns, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt
SS: wh - lt gy, fros - trns, speckl wi mica, f gr, hd brit clus, ang - sb ang, v calc cmt

MD: 3,543'
TVD: 3,520.36'
Inclination: 2.04 °
Azimuth: 214.42 °

SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc
SHY SS: wh - lt gy, fros - trns, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt
SS: wh - lt gy, fros - trns, speckl wi mica, f gr, hd brit clus, ang - sb ang, v calc cmt

MD: 3,638'
TVD: 3,615.33'
Inclination: 0.85 °
Azimuth: 207.19 °

SS: wh - lt gy, fros - trns, speckl wi mica, f gr, hd brit clus, ang - sb ang, v calc cmt
SHY SS: wh - lt gy, fros - trns, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt



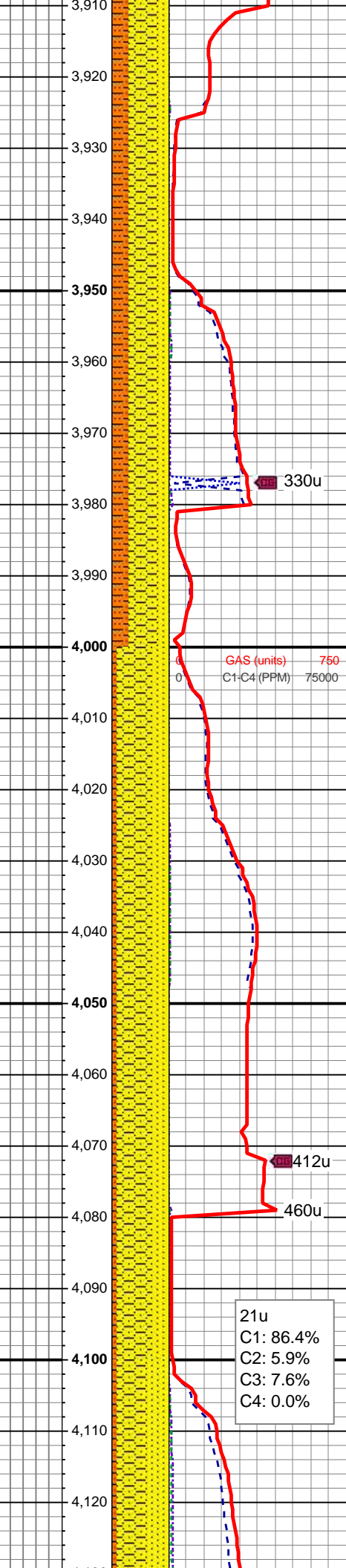
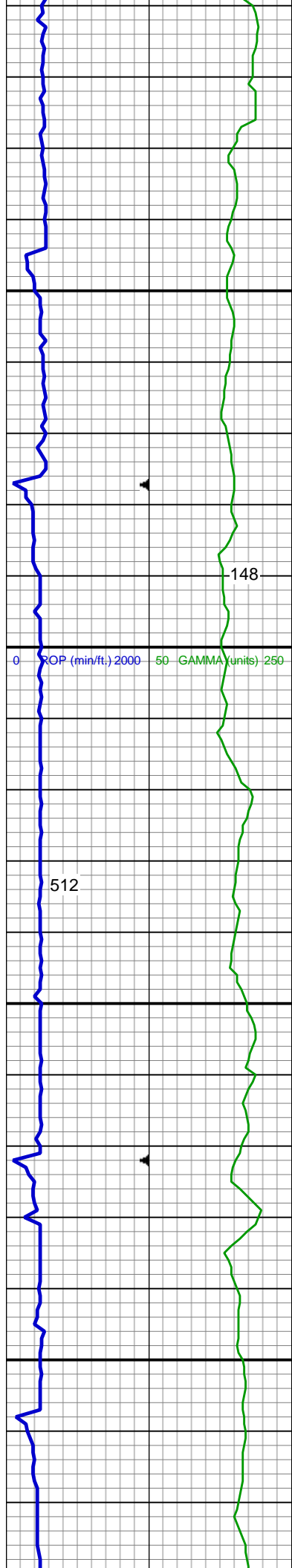
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SS: wh - lt gy, fros - trns, speckl wi mica, f gr, hd brit clus, ang - sb ang, v calc cmt

SHY SS: wh - lt gy, fros - trns, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt

SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc

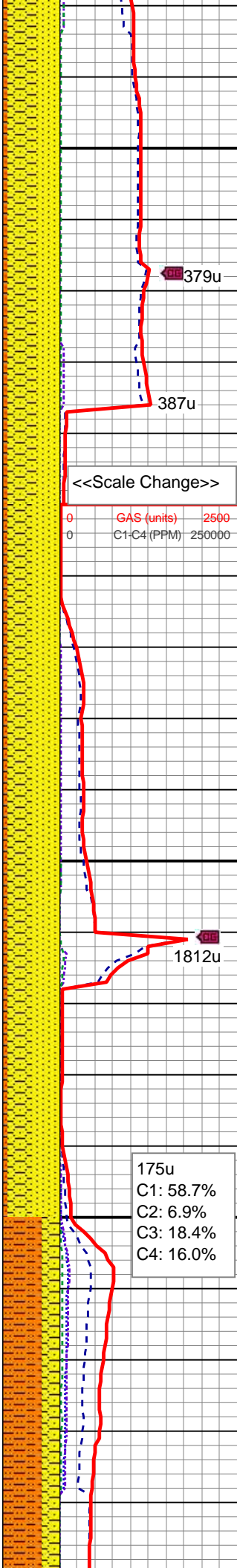
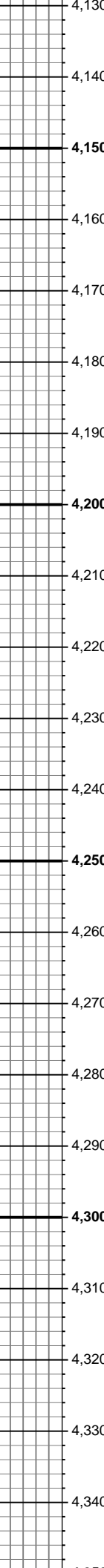
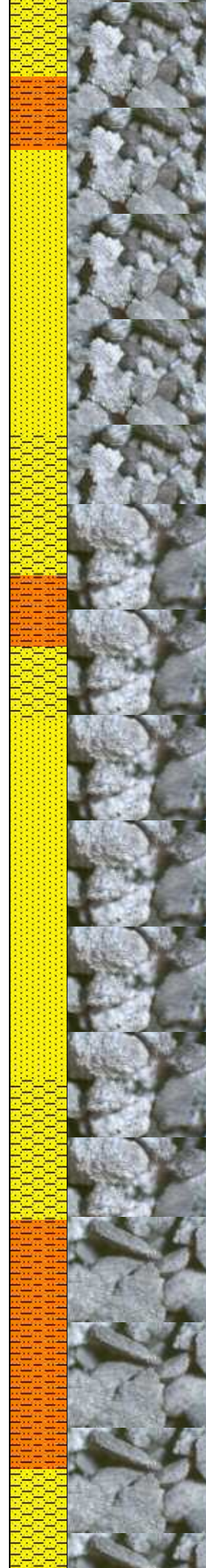
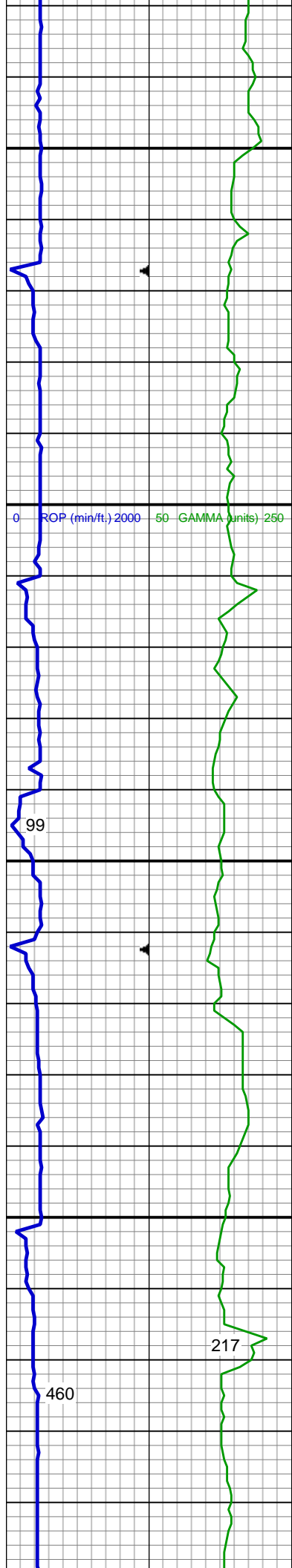
SS: wh - lt gy, fros - trns, speckl wi mica, f gr, hd brit clus, ang - sb ang, v calc cmt



MD: 3,923'
TVD: 3,900.32'
Inclination: 0.22 °
Azimuth: 78.87 °

SHY SS: wh - lt gy, fros - trns, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt
SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc
SS: wh - lt gy, fros - trns, speckl wi mica, f gr, hd brit clus, ang - sb ang, v calc cmt

SHY SS: lt gy, fros - trns, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt, grdg to
SS: wh, speckl wi mica, fros - trns, f gr, hd brit clus, ang - sb ang, calc cmt
SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc

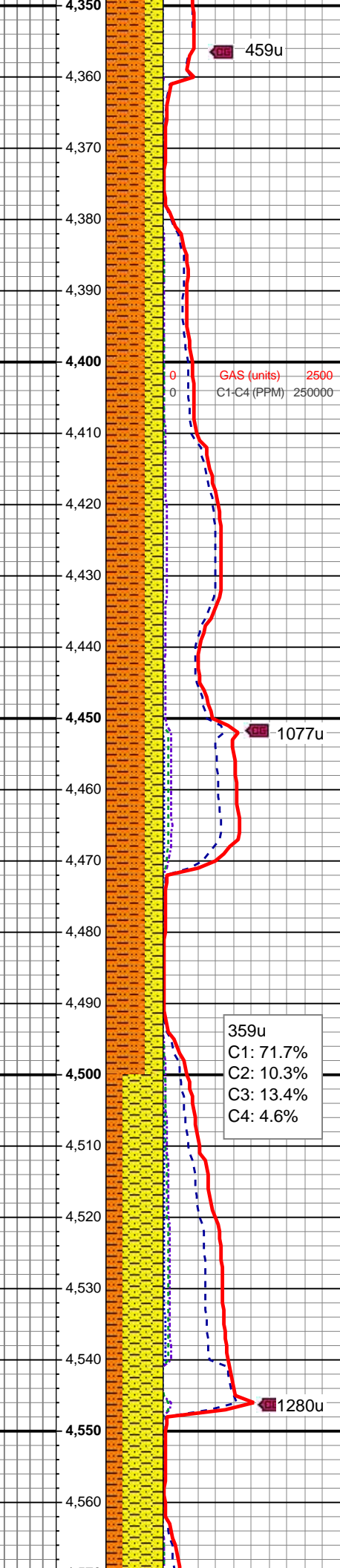
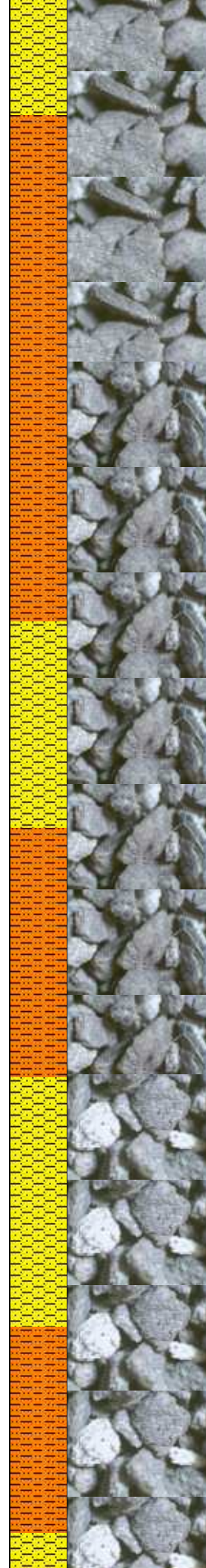
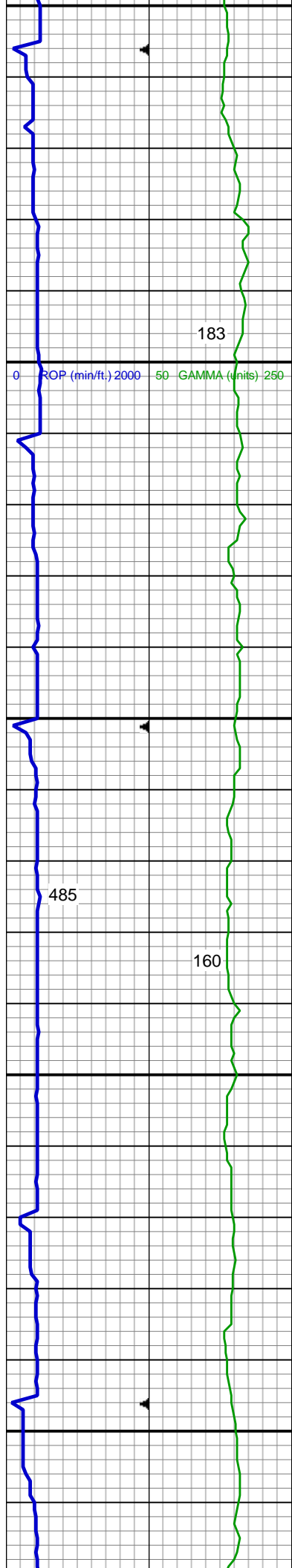


Sussex Top @
4,149' MD; 4,126' TVD

SHY SS: lt gy, fros - trnsl, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt, grdg to
SS: wh, speckl wi mica, fros - trnsl, f gr, hd brit clus, ang - sb ang, calc cmt
SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc

MD: 4,207'
TVD: 4,184.29'
Inclination: 1.19 °
Azimuth: 67.4 °

SS: wh, speckl wi mica, fros - trnsl, f gr, hd brit clus, ang - sb ang, calc cmt
SHY SS: lt gy, fros - trnsl, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt
SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc

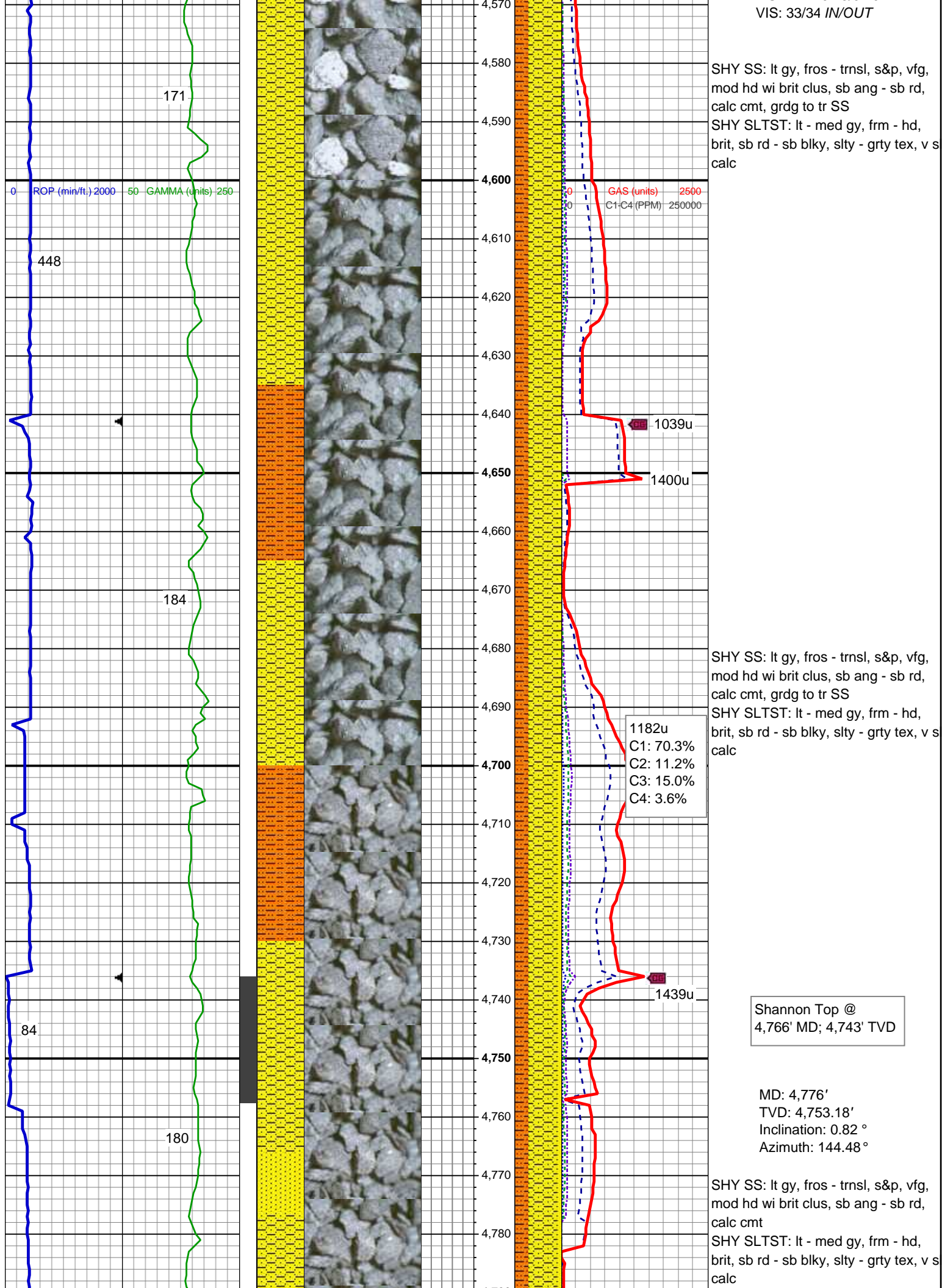


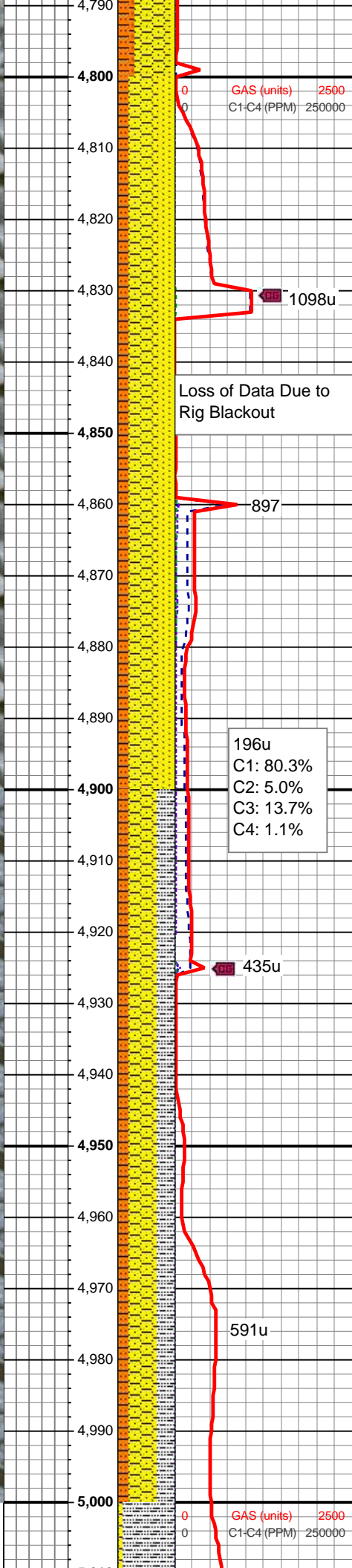
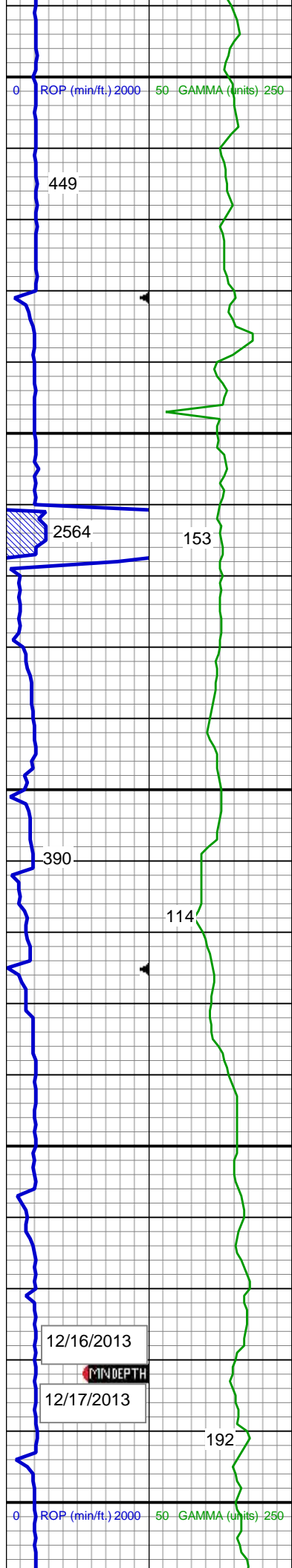
SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc
SHY SS: lt gy, fros - trnsl, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt, grdg to tr SS

SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v s calc
SHY SS: lt gy, fros - trnsl, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt, grdg to tr SS

MD: 4,492'
TVD: 4,469.22'
Inclination: 1.37 °
Azimuth: 66.26 °

MUD WT: 9.25/9.40





SS: wh, speckl wi mica, fros - trnsl, f gr, hd brit clus, ang - sb ang, calc cmt

MUD WT: 9.10/9.15
VIS: 29/29 IN/OUT

SHY SS: lt gy, fros - trnsl, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt

SS: wh, speckl wi mica, fros - trnsl, f gr, hd brit clus, ang - sb ang, calc cmt

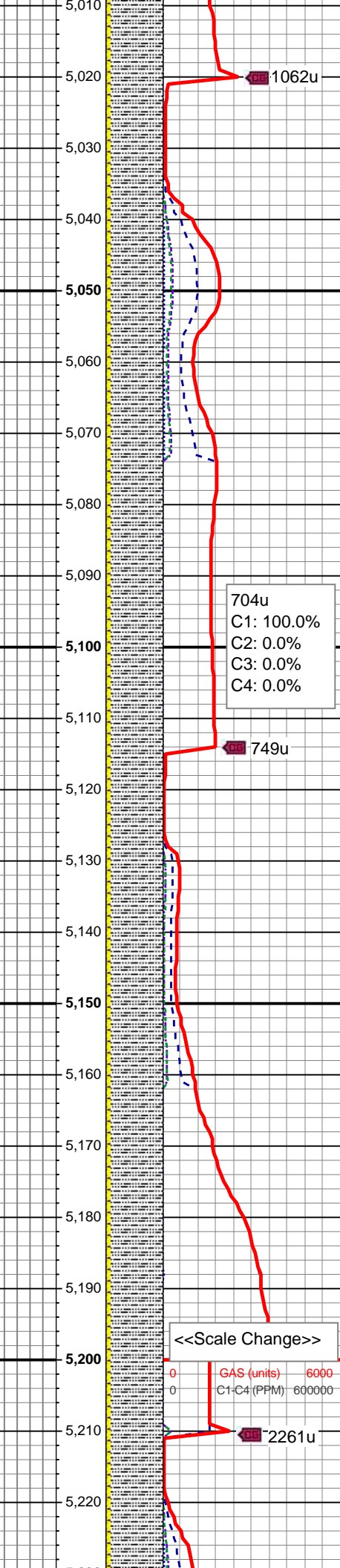
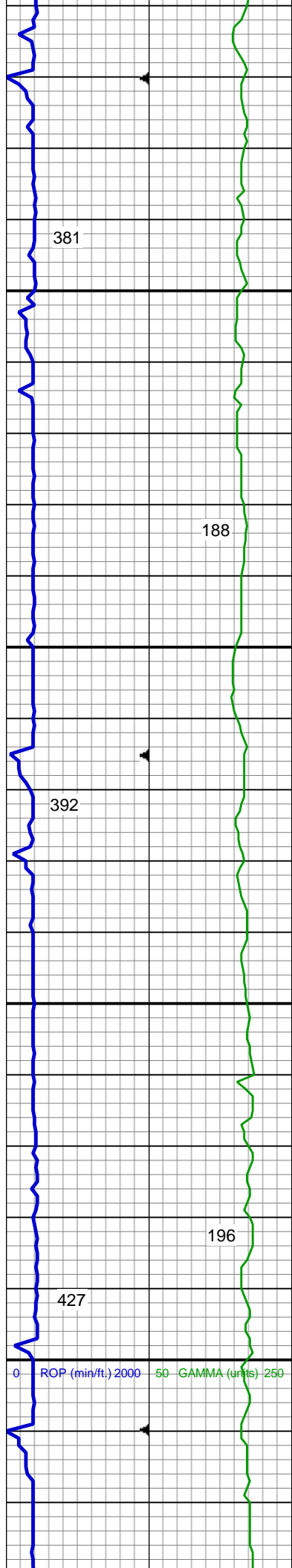
SHY SLTST: lt - med gy, frm - hd, brit, sb rd - sb blk, slty - grty tex, v sl calc

12/16/2013
Mud Wt: 9.00
FVis: 30
PVis: 2
YP: 5
GELS: 2/5/7
API Filt: n/s
CAKE: 1/0
pH: 9.0
Cl: 600
Ca: 80

SHY SS: lt gy, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt

SLTY SH: lt - med gy, occ dk gy, frm - hd, plty - sb plty - sb blk, slty - grty tex, v sl calc

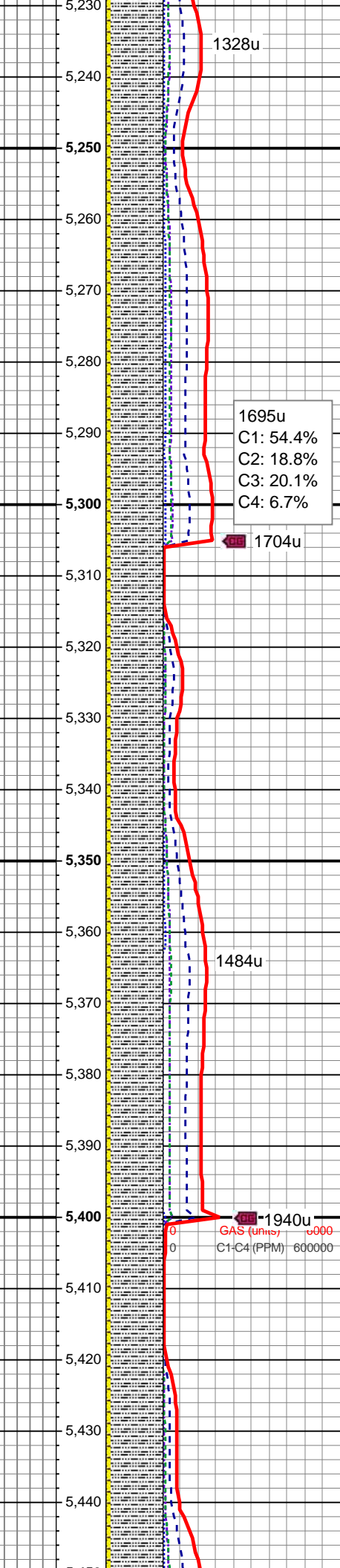
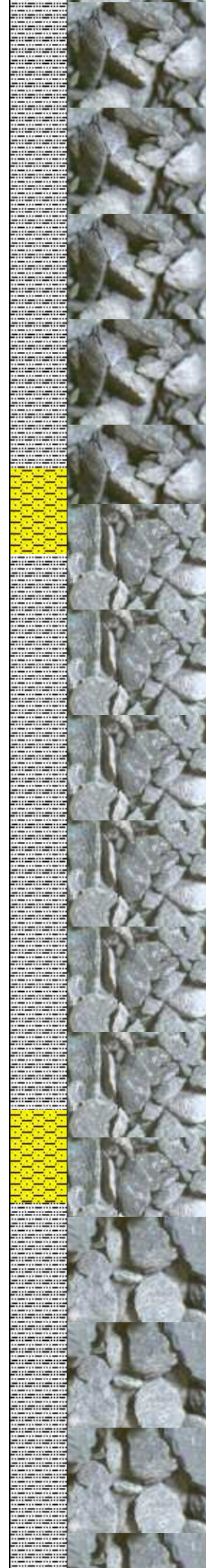
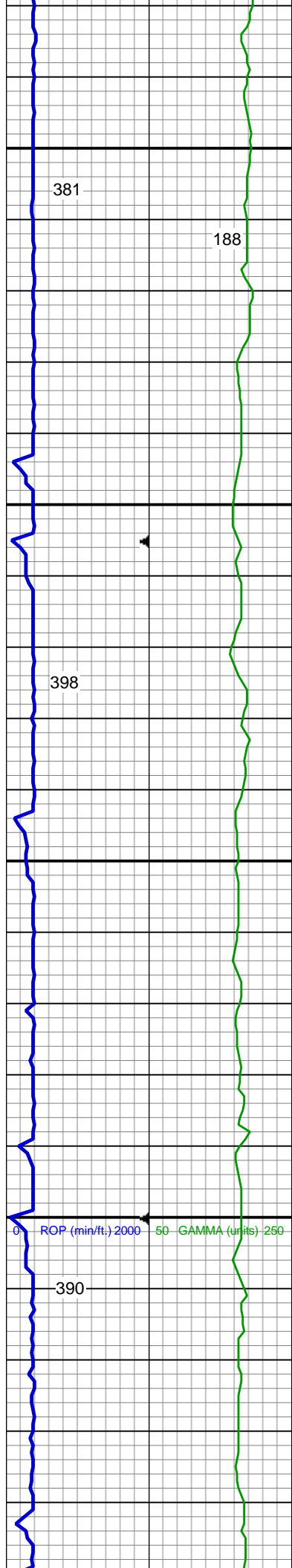
SHY SLTST: lt - med gy, frm - hd, sb rd - sb blk, slty - grty tex, v sl calc



MD: 5,061'
TVD: 5,038.16'
Inclination: 0.73 °
Azimuth: 167.66 °

SLTY SH: lt - med gy, occ dk gy, frm
- hd, plty - sb plty - sb blkly, slty - grty
tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi
brit clus, sb ang - sb rd, calc cmt

SLTY SH: lt - med gy, occ dk gy, frm
- hd, plty - sb plty - sb blkly, slty - grty
tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi
brit clus, sb ang - sb rd, calc cmt



1328u

1695u
C1: 54.4%
C2: 18.8%
C3: 20.1%
C4: 6.7%

1704u

1484u

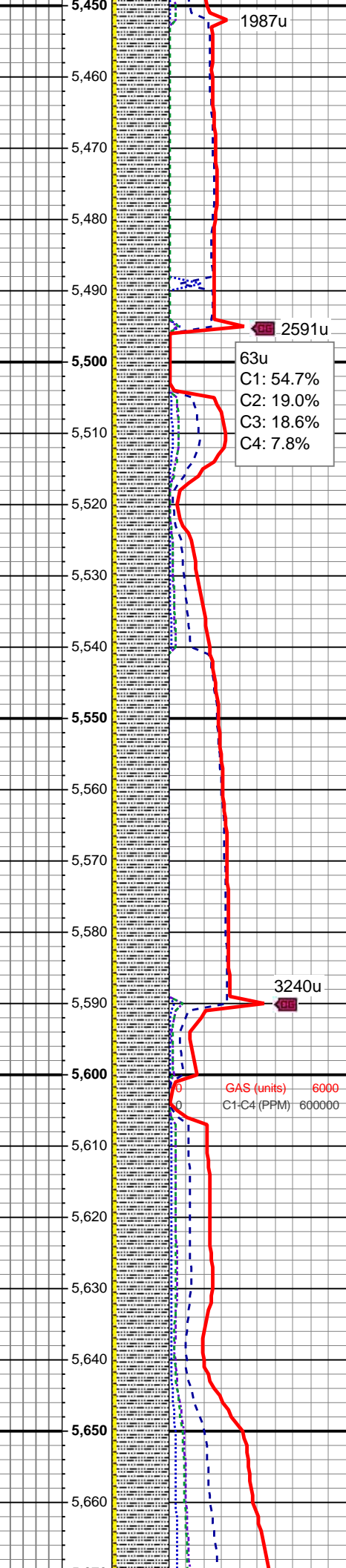
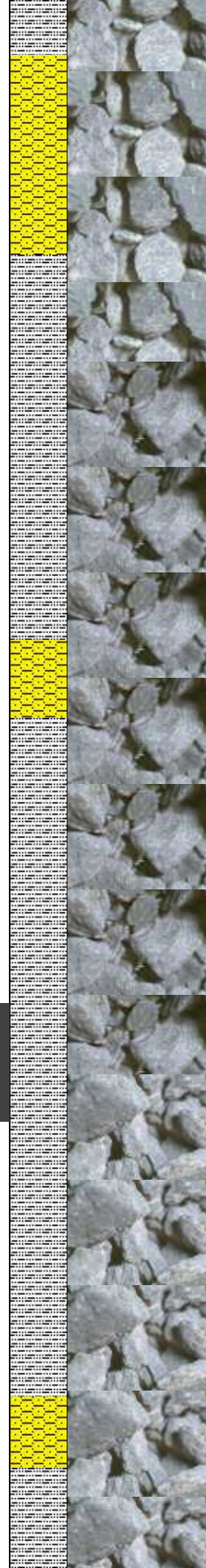
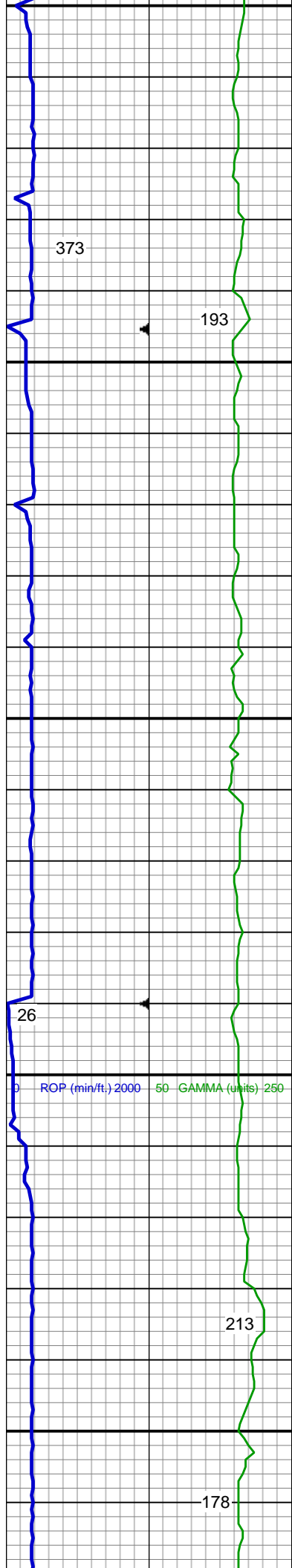
1940u
GAS (units) 60000
C1-C4 (PPM) 600000

MUD WT: 9.4/9.3
VIS: 35/35 IN/OUT

SLTY SH: lt - med gy, occ dk gy, frm
- hd, plty - sb plty - sb blkly, slty - grty
tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi
brit clus, sb ang - sb rd, calc cmt

MD: 5,346'
TVD: 5,323.13'
Inclination: 1.03 °
Azimuth: 135.55 °

SLTY SH: lt - med gy, occ dk gy, frm
- hd, plty - sb plty - sb blkly, slty - grty
tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi
brit clus, sb ang - sb rd, calc cmt



1987u

2591u

63u

C1: 54.7%

C2: 19.0%

C3: 18.6%

C4: 7.8%

SLTY SH: lt - med gy, occ dk gy, frm
- hd, plty - sb plty - sb blk, slty - grty
tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi
brit clus, sb ang - sb rd, calc cmt

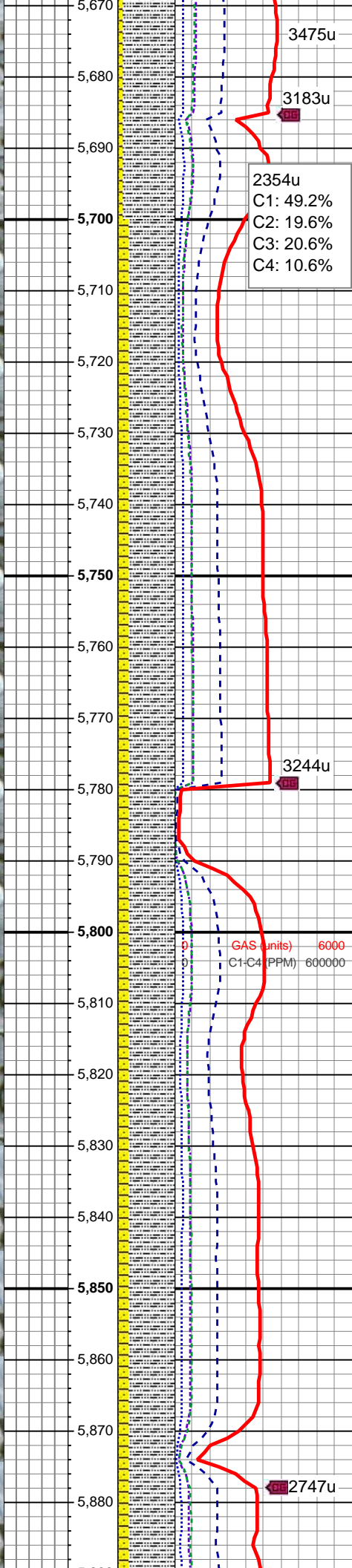
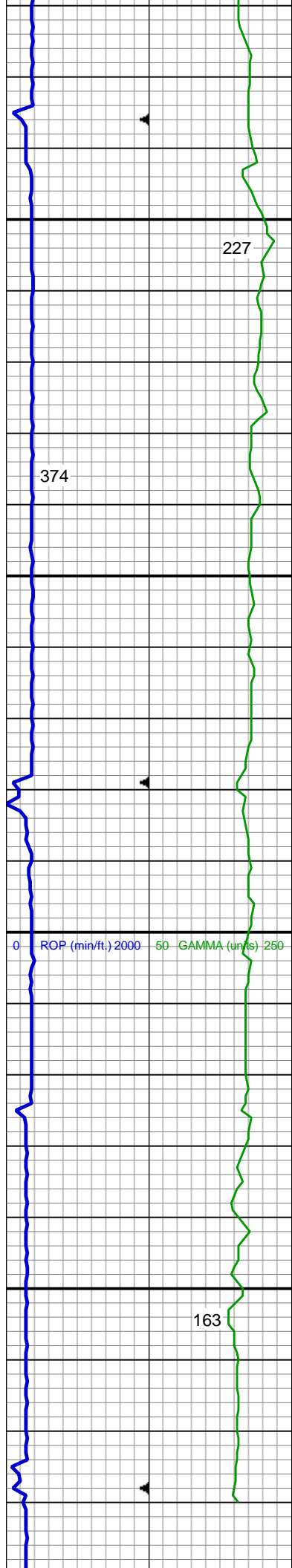
MUD WT: 9.8/9.7
VIS: 35/35 IN/OUT

3240u

SLTY SH: lt - med gy, occ dk gy, frm
- hd, plty - sb plty - sb blk, slty - grty
tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi
brit clus, sb ang - sb rd, calc cmt

GAS (units) 6000
C1-C4 (PPM) 600000

MD: 5,631'
TVD: 5,608.11'
Inclination: 0.73 °
Azimuth: 242.57 °



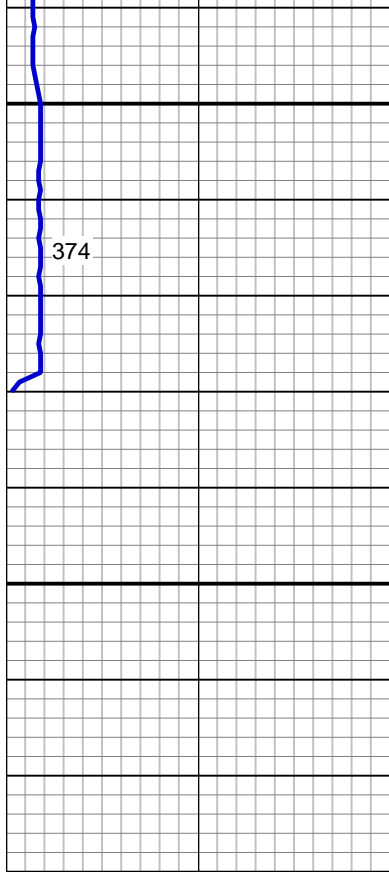
SLTY SH: lt - med gy brn, occ dk gy, frm - hd, plty - sb plty - sb blk, slty - grty tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt

SLTY SH: lt - med gy brn, occ dk gy, frm - hd, plty - sb plty - sb blk, slty - grty tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi brit clus, sb ang - sb rd, calc cmt

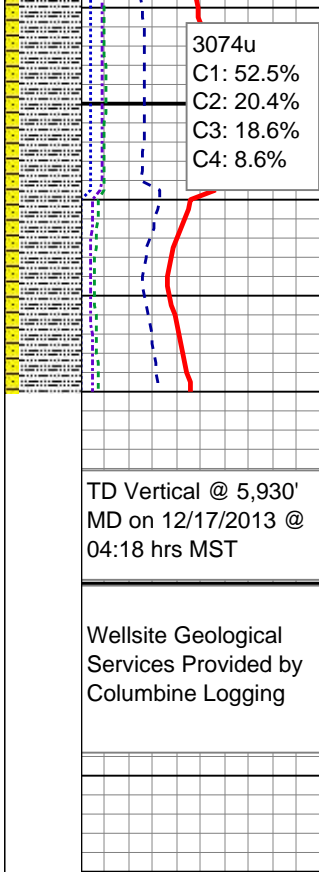
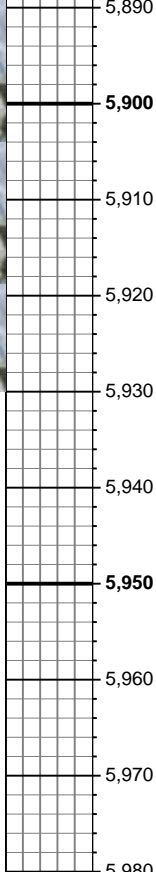
Teepee Buttes Top @
5,805' MD; 5,782' TVD

MD: 5,874'
TVD: 5,851.09'
Inclination: 0.42 °
Azimuth: 201.96 °

SLTY SH: lt - med gy brn, occ dk gy, frm - hd, plty - sb plty - sb blk, slty -



5,890
5,900
5,910
5,920
5,930
5,940
5,950
5,960
5,970
5,980



grty tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi
brit clus, sb ang - sb rd, calc cmt

3074u
C1: 52.5%
C2: 20.4%
C3: 18.6%
C4: 8.6%

SLTY SH: lt - med gy brn, occ dk gy,
frm - hd, plty - sb plty - sb blk, slty -
grty tex, v sl calc
SHY SS: lt gy, s&p, vfg, mod hd wi
brit clus, sb ang - sb rd, calc cmt

TD Vertical @ 5,930'
MD on 12/17/2013 @
04:18 hrs MST

Wellsite Geological
Services Provided by
Columbine Logging

See Corresponding Horizontal Log
Seyler B10-63-1HN HORZ