



Scale: 5" / 100'
Measured Depth Log

Well Name Shook 3-10-2CDH Vertical

Location SWSE SEC 3, T1S, R67W

State COLORADO

County ADAMS

Country USA

Rig Number ENSIGN 145

API Number 05-001-09973

AFE # 1700006

Geographic Region DJ BASIN

Field WATTENBERG

Spud Date 4/11/2017

Drilling Completed 6/7/2017

Surface Coordinates SWSE SEC 3, T1S, R67W
2058' FSL x 2244' FEL

Bottom Hole Coordinates SEC 10, T1S, R67W
460' FNL x 1338' FWL

Ground Elevation 5098'

K.B. Elevation 5111'

Logged Interval 1804' **To** 8652'

Total Depth 6848'

Formation SURFACE - CODELL SS

Type of Drilling Fluid OBM - OIL BASED MUD

Operator

Company PetroShare

Address 7200 S Alton Way
Englewood, CO 80112



Geologist

Zone Color Coding

Name WEDGE HOWLAND, SAGE BETTS

Company TERRA GUIDANCE

Address 1298 O Road
Loma CO 81524
(970) 260-5408

Oil

Note

Error

Condensate

Core

Water

Gas

Pressure

Seal

Rock Types

UNKNOWN

ANHYDRITE
GYPSUM
SALT
SIDERITE or LIMONITE
LIMESTONE
DOLOMITE

CHERT

COAL
MARLSTONE
CLAYSTONE
SHALE
SHALE GRAY
SHALE COLORED

SILTSTONE
SANDSTONE
CONGLOMERATE
BRECCIA
TILL
BENTONITE
TUFF

IGNEOUS
METAMORPHIC
CEMENT
SHALY SILTSTONE
SILTY SHALE
CHALK
SHALY SANDSTONE

Accessories

Fossils

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

FOSSIL

GASTROPOD
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
CASING
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

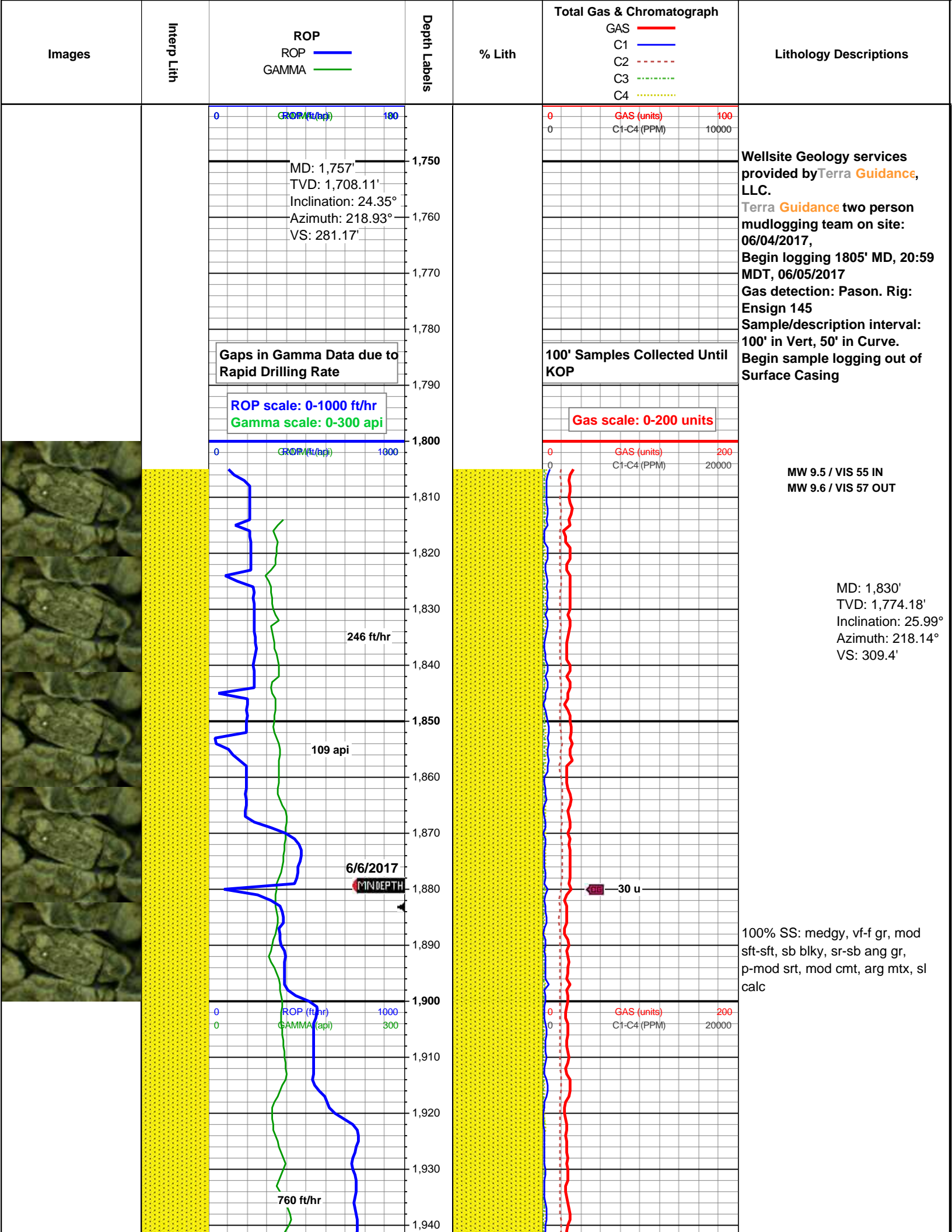
LITHOGRAPHIC

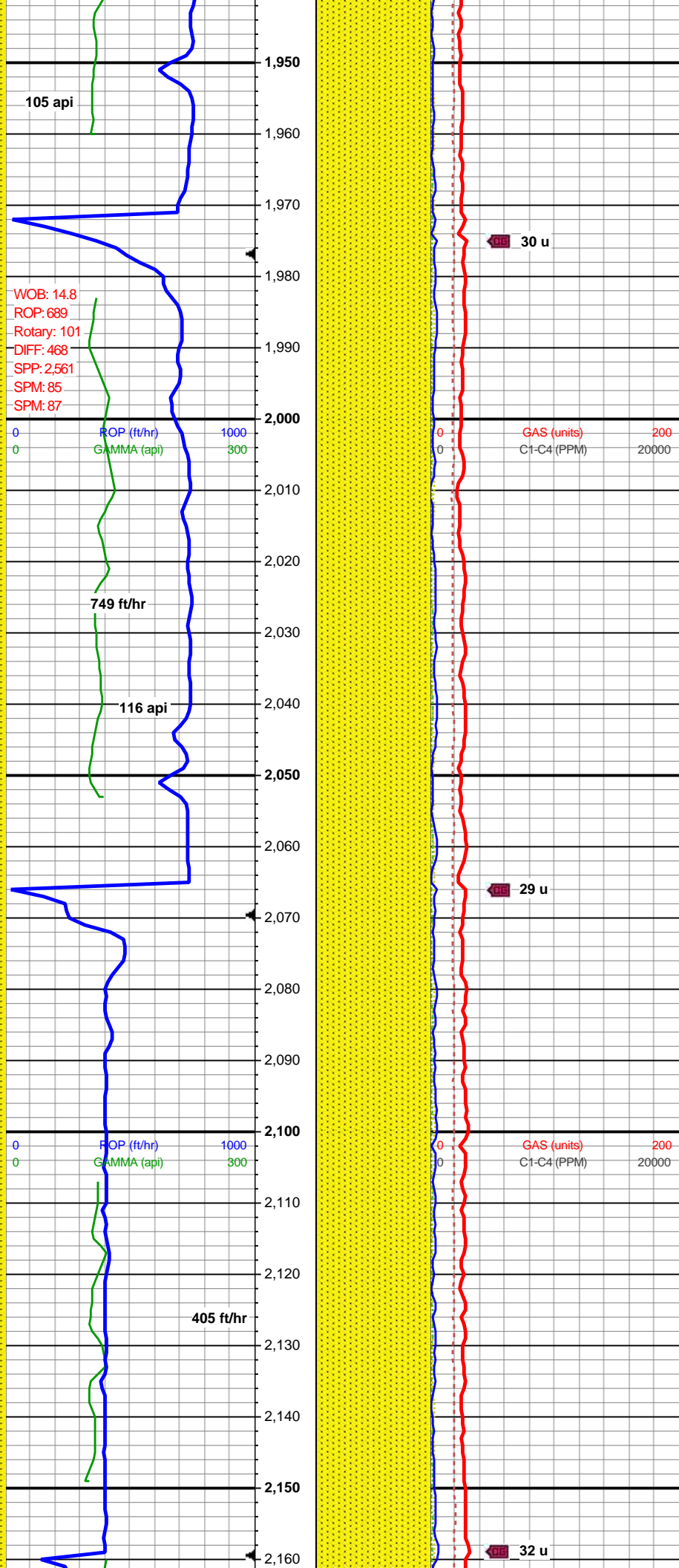
MICROXLN
MUDSTONE
PACKSTONE
WACKESTONE

Sorting

MODERATE
POOR
WELL

SHALY SILTSTONE





MD: 1,953'
TVD: 1,886.25'
Inclination: 22.67°
Azimuth: 212.18°
VS: 356.51'

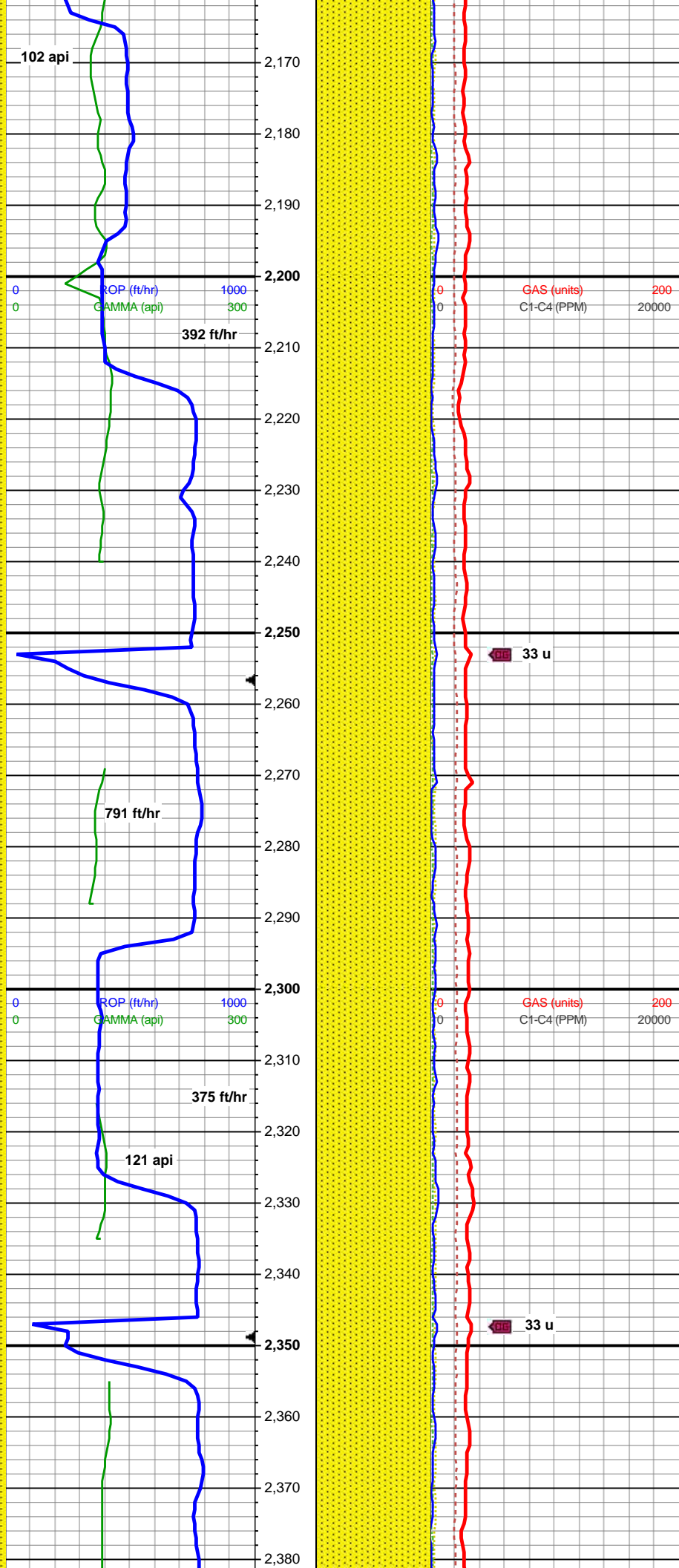
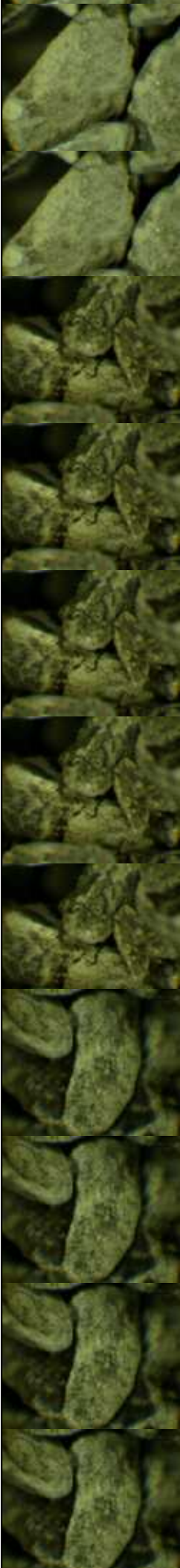
100% SS: medgy, vf-f gr, mod
sft-sft, sb blkly, sr-sb ang gr,
p-mod srt, mod cmt, arg mtx, sl
calc

MW 9.5 / VIS 55 IN
MW 9.6 / VIS 57 OUT

MD: 2,046'
TVD: 1,972.4'
Inclination: 21.61°
Azimuth: 207.92°
VS: 390.15'

100% SS: medgy, vf-f gr, mod
sft-sft, sb blkly, sr-sb ang gr,
p-mod srt, mod cmt, arg mtx, sl
calc

MD: 2,139'
TVD: 2,058.87'
Inclination: 21.6°
Azimuth: 206.24°
VS: 423.49'



100% SS: medgy, vf-f gr, mod
sft-sft, sb blkly, sr-sb ang gr,
p-mod srt, mod cmt, arg mtx, sl
calc

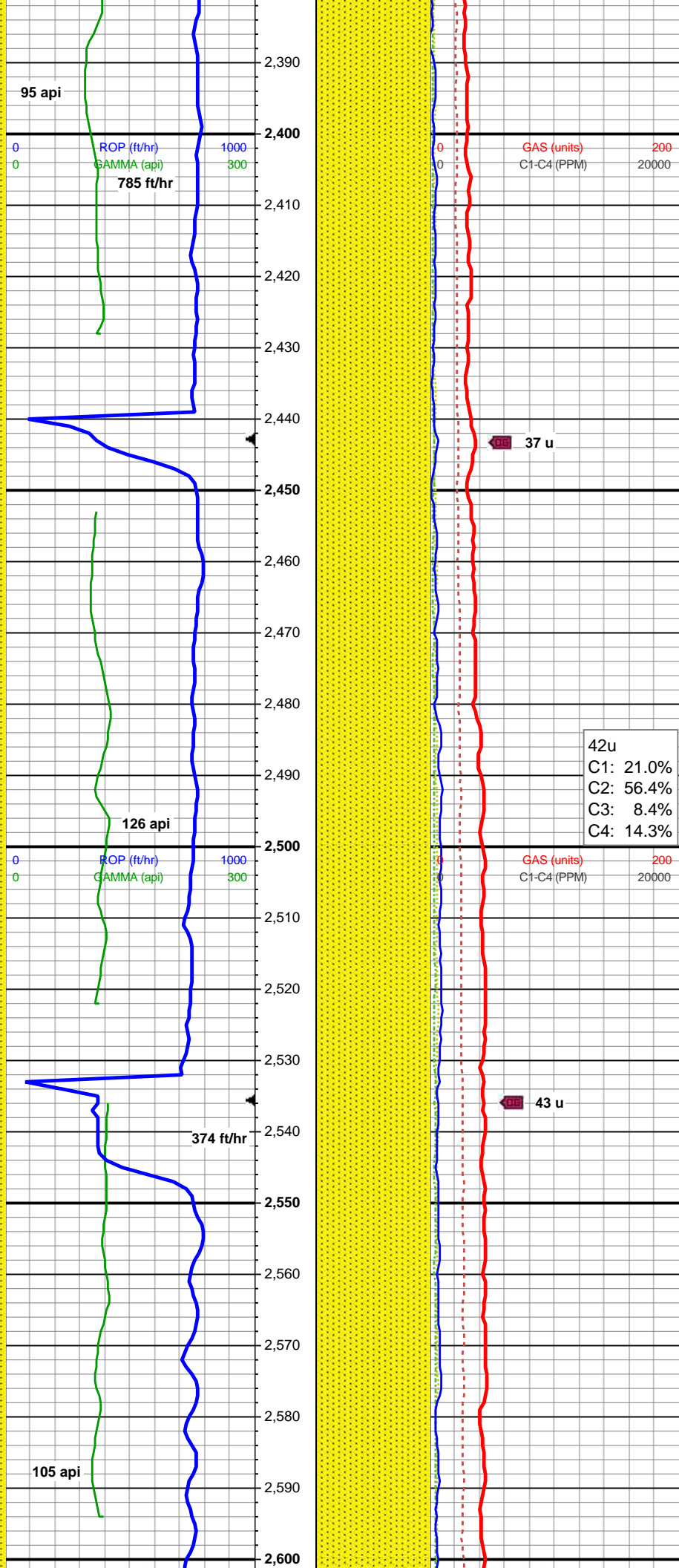
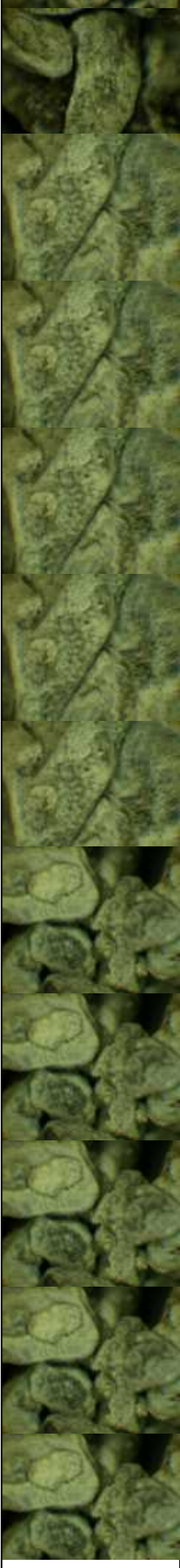
MW 9.5 / VIS 55 IN
MW 9.6 / VIS 57 OUT

MD: 2,232'
TVD: 2,145.44'
Inclination: 21.26°
Azimuth: 206.39°
VS: 456.67'

100% SS: medgy, vf-f gr, mod
sft-sft, sb blkly, sr-sb ang gr,
p-mod srt, mod cmt, arg mtx, sl
calc

MW 9.5 / VIS 52 IN
MW 9.5 / VIS 53 OUT

MD: 2,325'
TVD: 2,232.04'
Inclination: 21.49°
Azimuth: 208.22°
VS: 489.64'



100% SS: medgy, vf-f gr, mod
sft-sft, sb blk, sr-sb ang gr,
p-mod srt, mod cmt, arg mtx

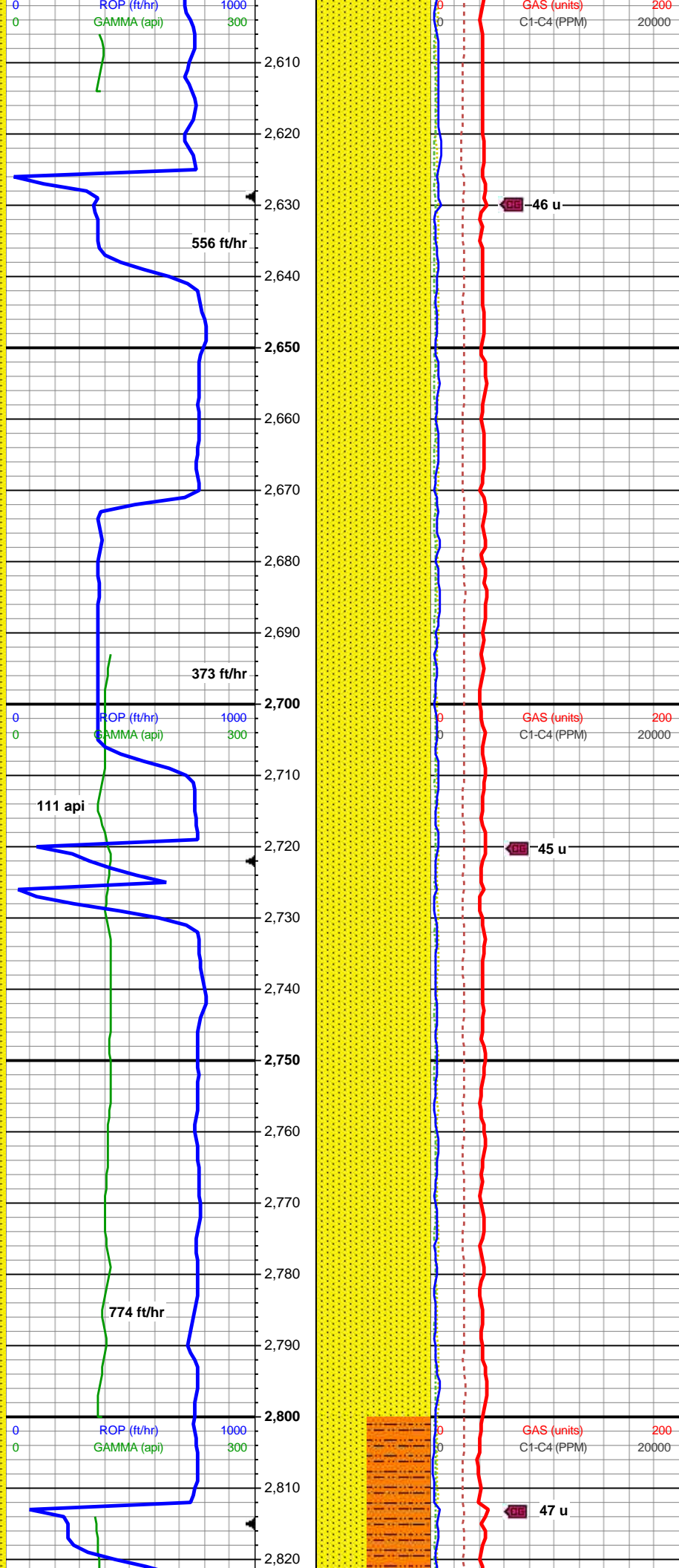
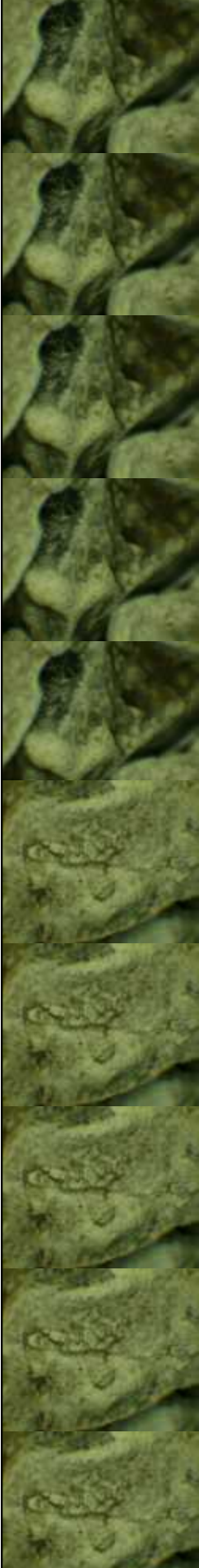
MW 9.5 / VIS 55 IN
MW 9.6 / VIS 57 OUT

MD: 2,419'
TVD: 2,319.53'
Inclination: 21.44°
Azimuth: 211.67°
VS: 522.69'

100% SS: medgy, vf-f gr, mod
sft-sft, sb blk, sr-sb ang gr,
p-mod srt, mod cmt, arg mtx

MD: 2,512'
TVD: 2,406.11'
Inclination: 21.41°
Azimuth: 216.52°
VS: 554.55'

100% SS: medgy, vf-f gr, mod
sft-sft, sb blk, sr-sb ang gr,
p-mod srt, mod cmt, arg mtx



MW 9.5 / VIS 55 IN
MW 9.6 / VIS 57 OUT

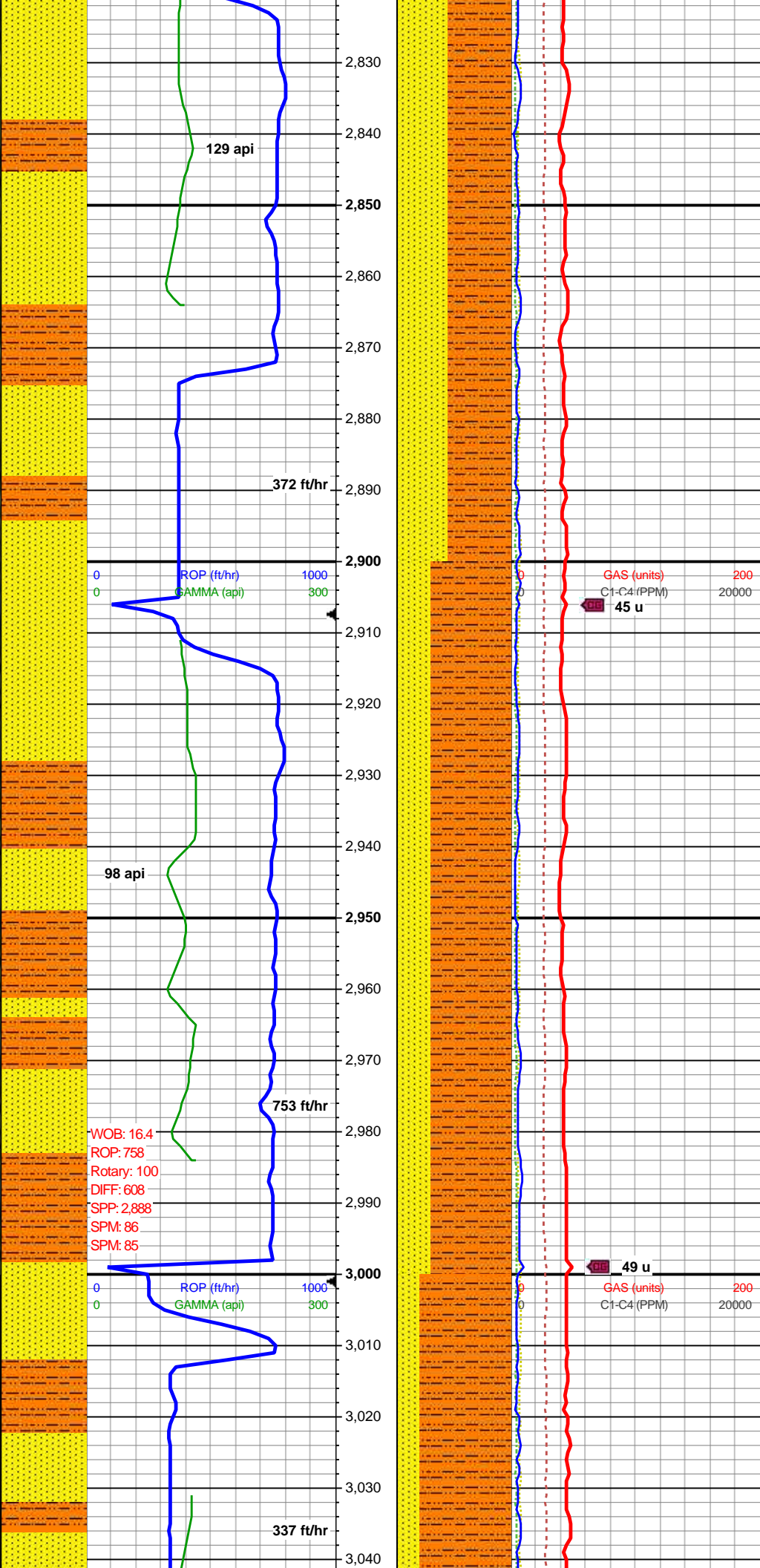
MD: 2,698'
TVD: 2,579.28'
Inclination: 21.5°
Azimuth: 226.72°
VS: 614.55'

100% SS: medgy, vf-f gr, mod
sft-sft, sb blkly, sr-sb ang gr,
p-mod srt, mod cmt, arg mtx

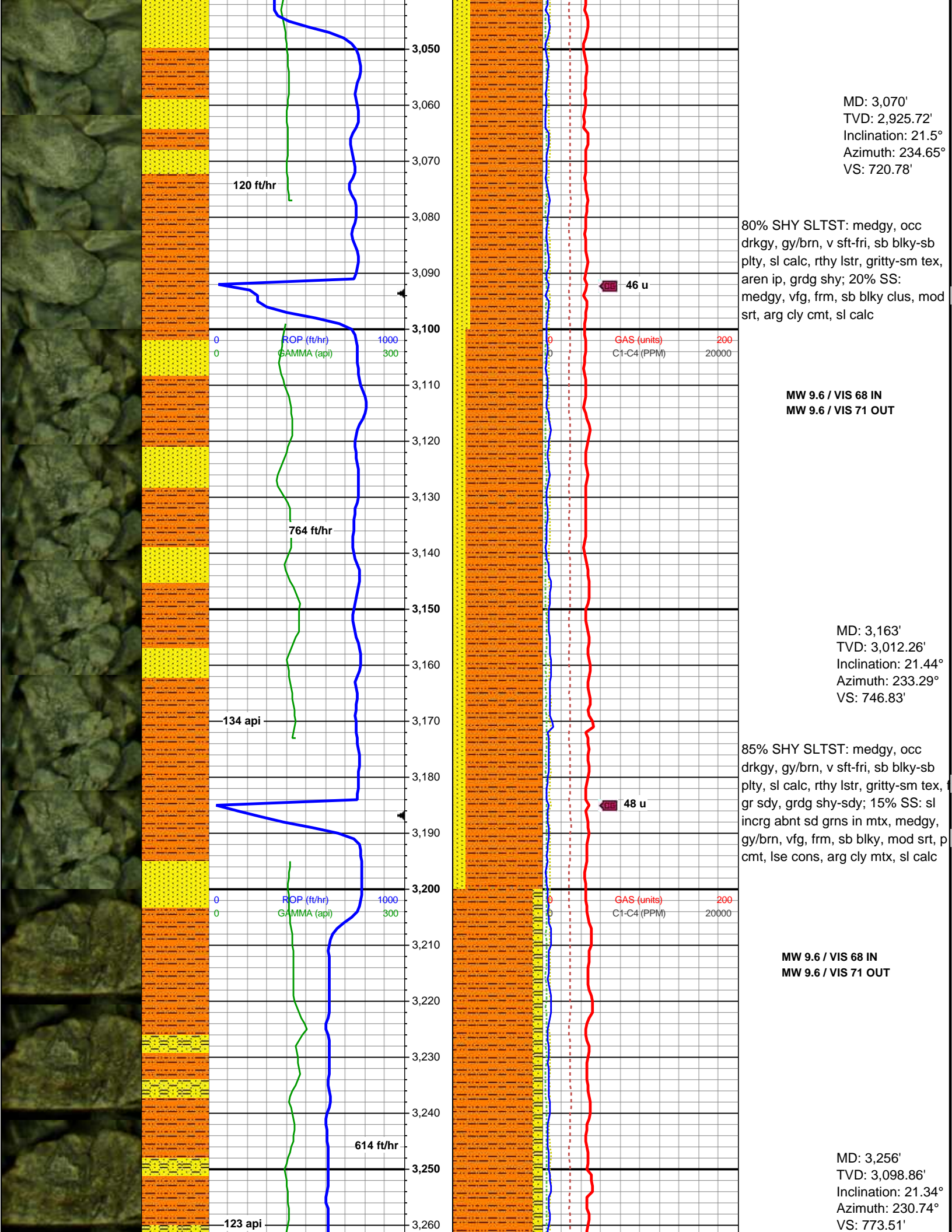
MD: 2,791'
TVD: 2,665.84'
Inclination: 21.41°
Azimuth: 229.88°
VS: 642.62'

100% SS: medgy, vf-f gr, mod
sft-sft, sb blkly, sr-sb ang gr,
p-mod srt, mod cmt, arg mtx, sl
calc

MW 9.5 / VIS 55 IN
MW 9.6 / VIS 57 OUT



MW 9.5 / VIS 55 IN
MW 9.6 / VIS 57 OUT



MD: 3,070'
TVD: 2,925.72'
Inclination: 21.5°
Azimuth: 234.65°
VS: 720.78'

80% SHY SLTST: medgy, occ drkgy, gy/brn, v sft-fri, sb blkly-sb plty, sl calc, rthy lstr, gritty-sm tex, aren ip, grdg shy; 20% SS: medgy, vfg, frm, sb blkly clus, mod srt, arg cly cmt, sl calc

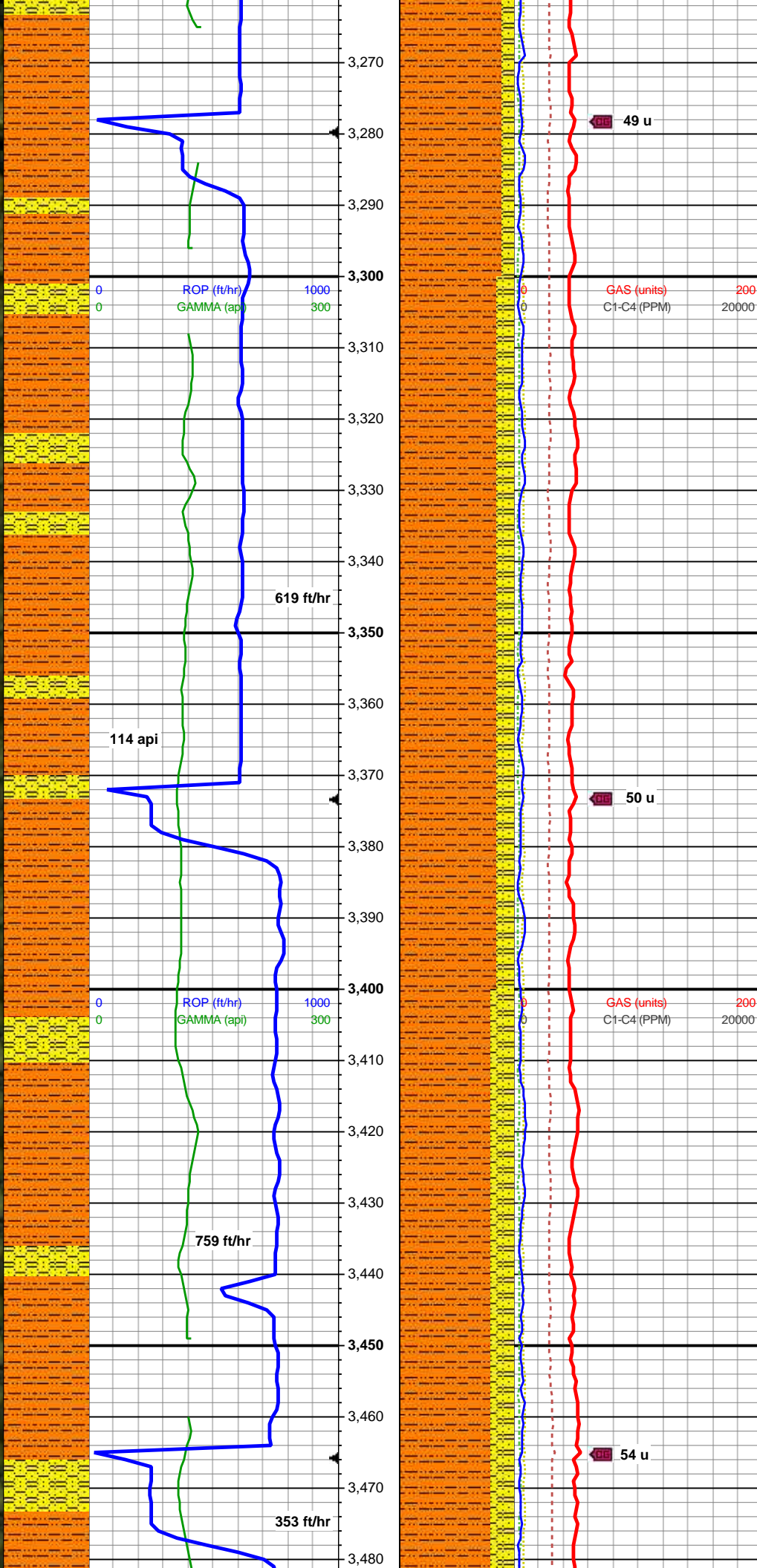
MW 9.6 / VIS 68 IN
MW 9.6 / VIS 71 OUT

MD: 3,163'
TVD: 3,012.26'
Inclination: 21.44°
Azimuth: 233.29°
VS: 746.83'

85% SHY SLTST: medgy, occ drkgy, gy/brn, v sft-fri, sb blkly-sb plty, sl calc, rthy lstr, gritty-sm tex, gr sdy, grdg shy-sdy; 15% SS: sl incrg abnt sd grns in mtx, medgy, gy/brn, vfg, frm, sb blkly, mod srt, p cmt, lse cons, arg cly mtx, sl calc

MW 9.6 / VIS 68 IN
MW 9.6 / VIS 71 OUT

MD: 3,256'
TVD: 3,098.86'
Inclination: 21.34°
Azimuth: 230.74°
VS: 773.51'



90% SHY SLTST: medgy, occ drkgy, gy/brn, v sft-fri, sb blkly-sb plty, sl calc, rthy lstr, gritty-sm tex, gr sdy, grdg shy-sdy; 10% SHY SS: sl incrg abnt sd grns in mtz, medgy, gy/brn, vfg, frm, sb blkly, mod srt, p cmt, lse cons, arg cly mtz, sl calc

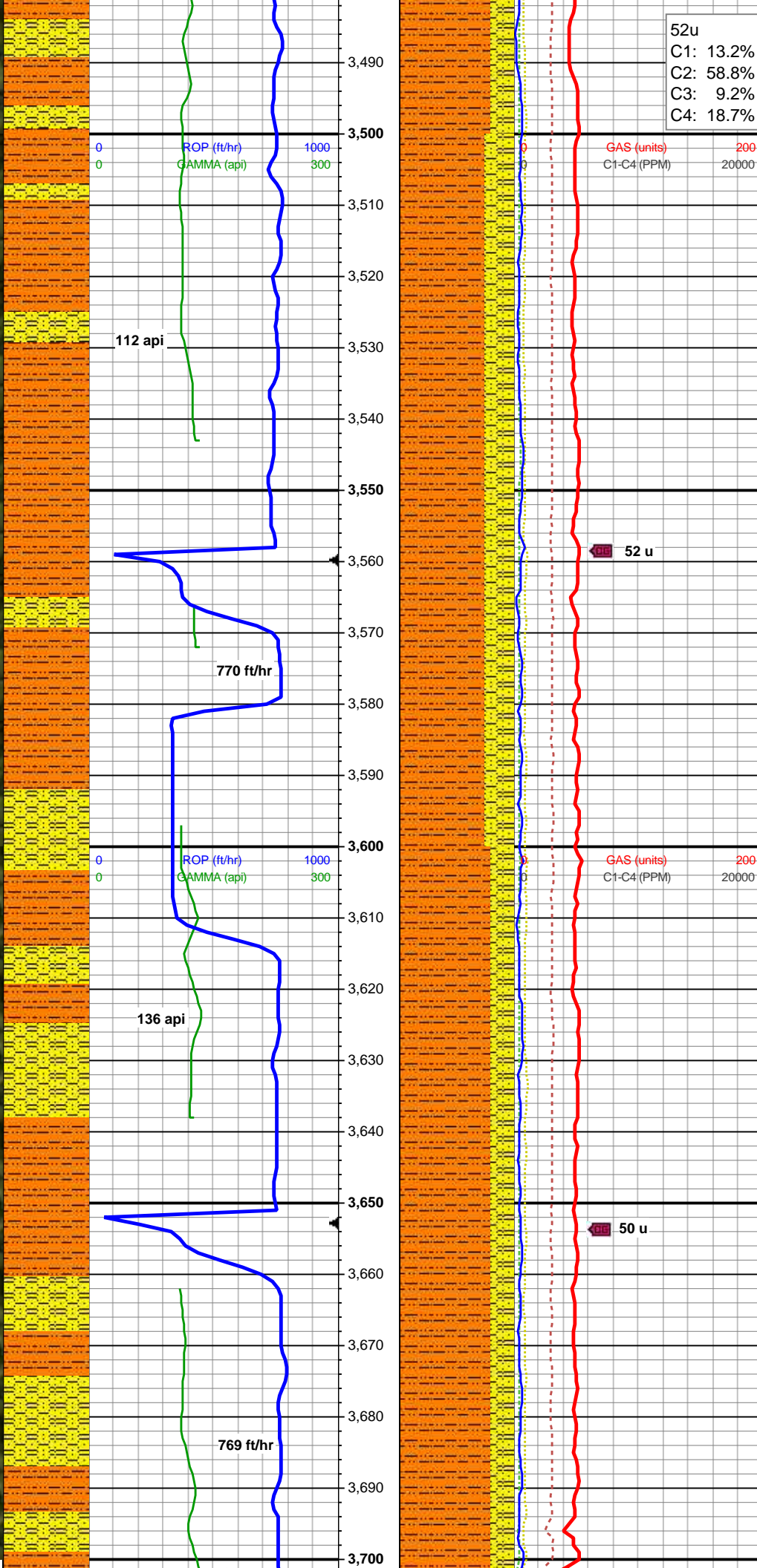
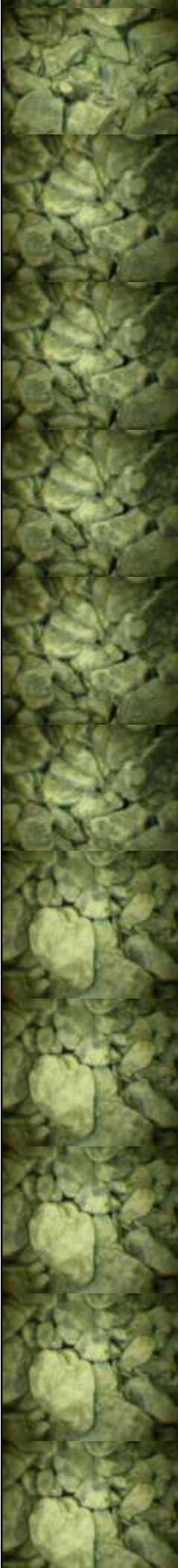
MD: 3,349'
TVD: 3,185.41'
Inclination: 21.59°
Azimuth: 227.29°
VS: 801.35'

85% SHY SLTST: medgy, occ drkgy, gy/brn, v sft-fri, sb blkly-sb plty, sl calc, rthy lstr, gritty-sm tex, gr sdy, grdg shy-sdy; 15% SHY SS: sl incrg abnt sd grns in mtz, medgy, gy/brn, vfg, frm, sb blkly, mod srt, p cmt, lse cons, arg cly mtz, sl calc

MW 9.6 / VIS 68 IN
MW 9.6 / VIS 71 OUT

MD: 3,442'
TVD: 3,271.96'
Inclination: 21.34°
Azimuth: 223.76°
VS: 830.31'

80% SHY SLTST: medgy, occ drkgy, gy/brn, v sft-fri, sb blkly-sb plty, sl calc, rthy lstr, gritty-sm tex, gr sdy, grdg shy-sdy; 20% SHY SS: sl incrg abnt sd grns in mtz, medgy, gy/brn, vfg, frm, sb blkly, mod srt, p cmt, lse cons, arg cly mtz, sl calc



plty, sl calc, rthy lstr, gritty-sm tex,
gr sdy, grdg shy-sdy; 20% SHY
SS: sl incrg abnt sd grns in mtx,
medgy, gy/brn, vfg, frm, sb blkly,
mod srt, p cmt, lse cons, arg cly
mtx, sl calc

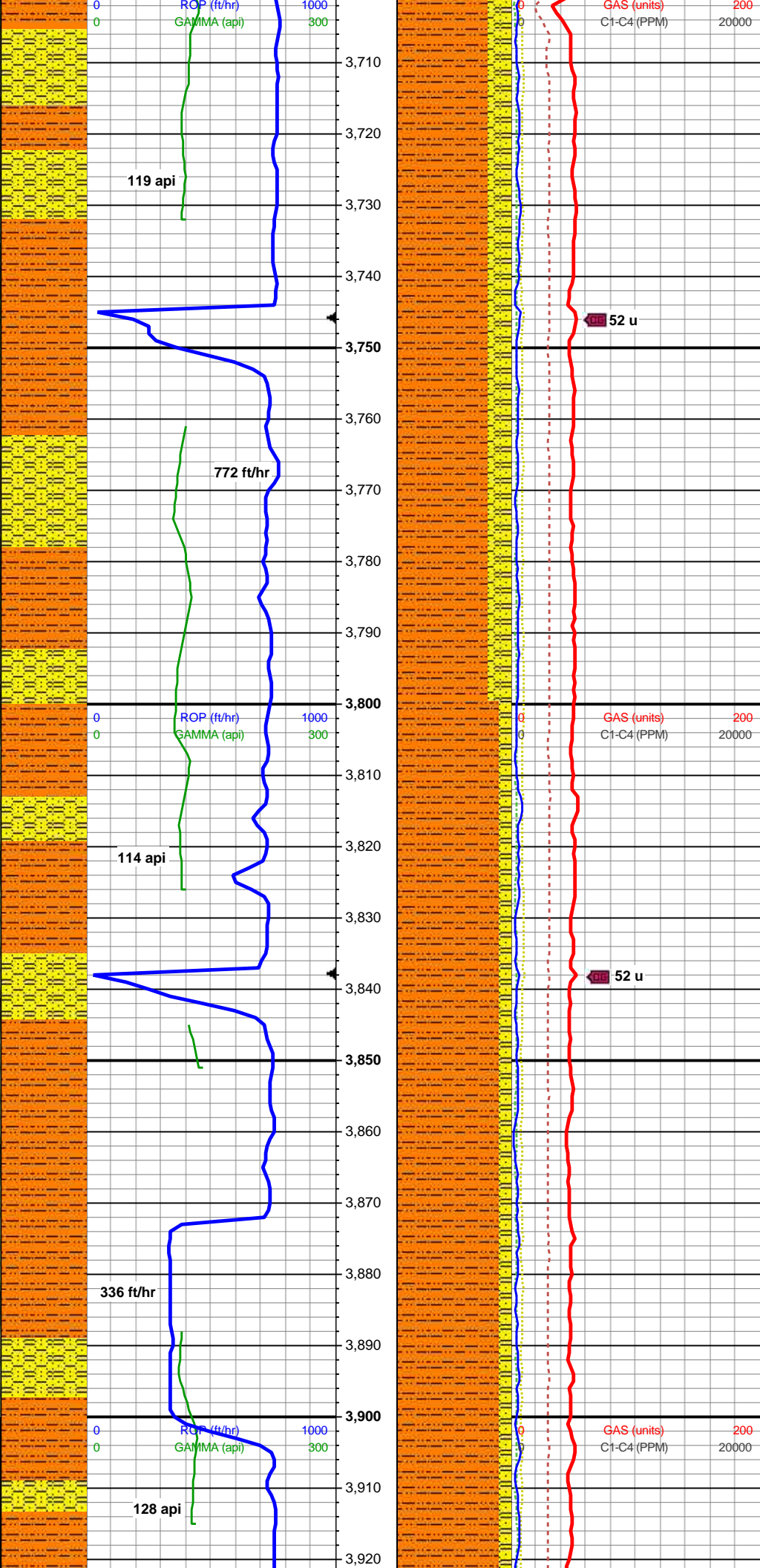
MW 9.6 / VIS 69 IN
MW 9.6 / VIS 71 OUT

MD: 3,535'
TVD: 3,358.58'
Inclination: 21.39°
Azimuth: 219.44°
VS: 860.29'

75% SHY SLTST: medgy, occ
drkgy, gy/brn, v sft-fri, sb blkly-sb
plty, sl calc, rthy lstr, gritty-sm tex,
gr sdy, grdg shy-sdy; 25% SHY
SS: sl incrg abnt sd grns in mtx,
medgy, gy/brn, vfg, frm, sb blkly,
mod srt, p cmt, lse cons, arg cly
mtx, sl calc

MD: 3,628'
TVD: 3,445.19'
Inclination: 21.33°
Azimuth: 216.17°
VS: 891.25'

80% SHY SLTST: med gy-dk gy,
gy/brn, hrd, sb blkly-sb plty, sl calc,
rthy, slty tex, f gr sd, grdg shy-sdy;
20% SHY SS: gy brn, vfg, frm, sb
blkly, mod srt, arg cly mtx, sl calc



MW 9.6 / VIS 69 IN
MW 9.6 / VIS 71 OUT

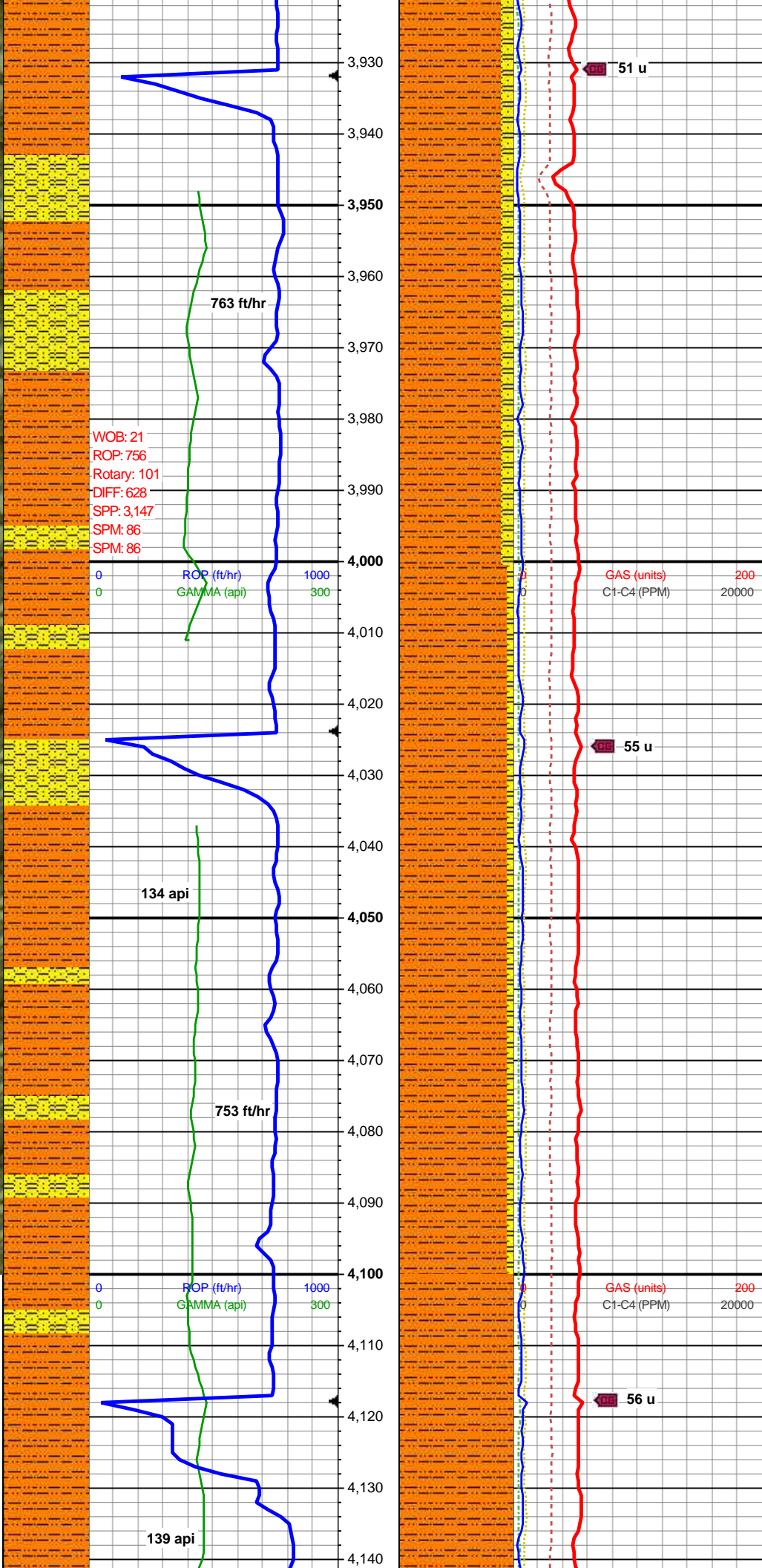
MD: 3,721'
TVD: 3,531.79'
Inclination: 21.44°
Azimuth: 217.36°
VS: 922.5'

80% SHY SLTST: med gy-dk gy
brn, mot, hrd, sb blkly-sb plty,
variably calc, rthy, slty tex, f gr sd,
grdg shy-sdy; 20% SHY SS: gy
brn, vfg, frm, sb blkly, mod srt, arg
cly mtx

MD: 3,814'
TVD: 3,618.36'
Inclination: 21.42°
Azimuth: 218.17°
VS: 953.57'

90% SHY SLTST: med gy-dk gy
brn, mot, hrd, sb blkly-sb plty,
variably calc, rthy, slty tex, f gr sd,
grdg shy-sdy; 10% SHY SS: lt gy
brn, vfg, frm, sb blkly, mod srt, arg
cly mtx

MD: 3,907'
TVD: 3,704.96'
Inclination: 21.34°
Azimuth: 215.9°
VS: 984.75'

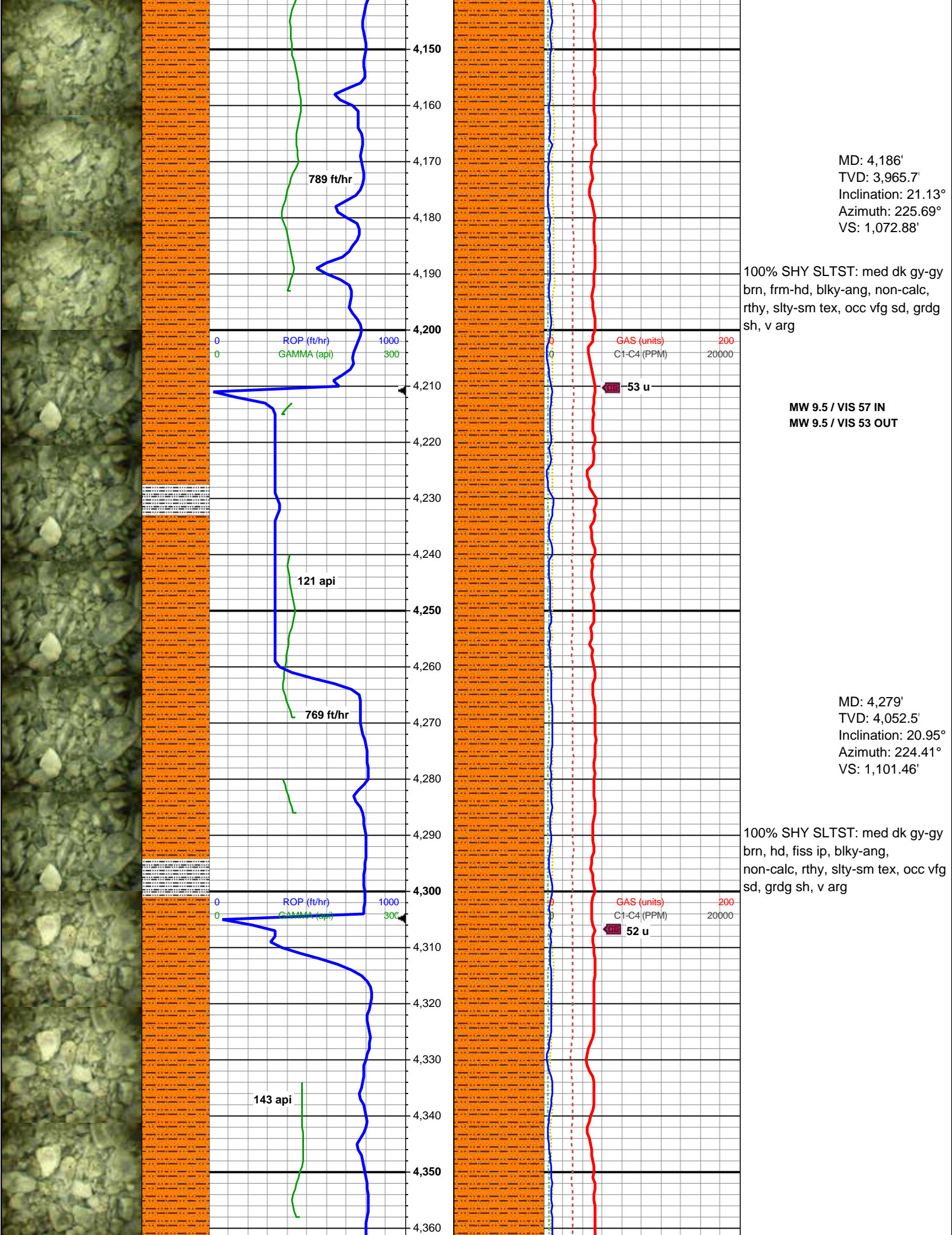


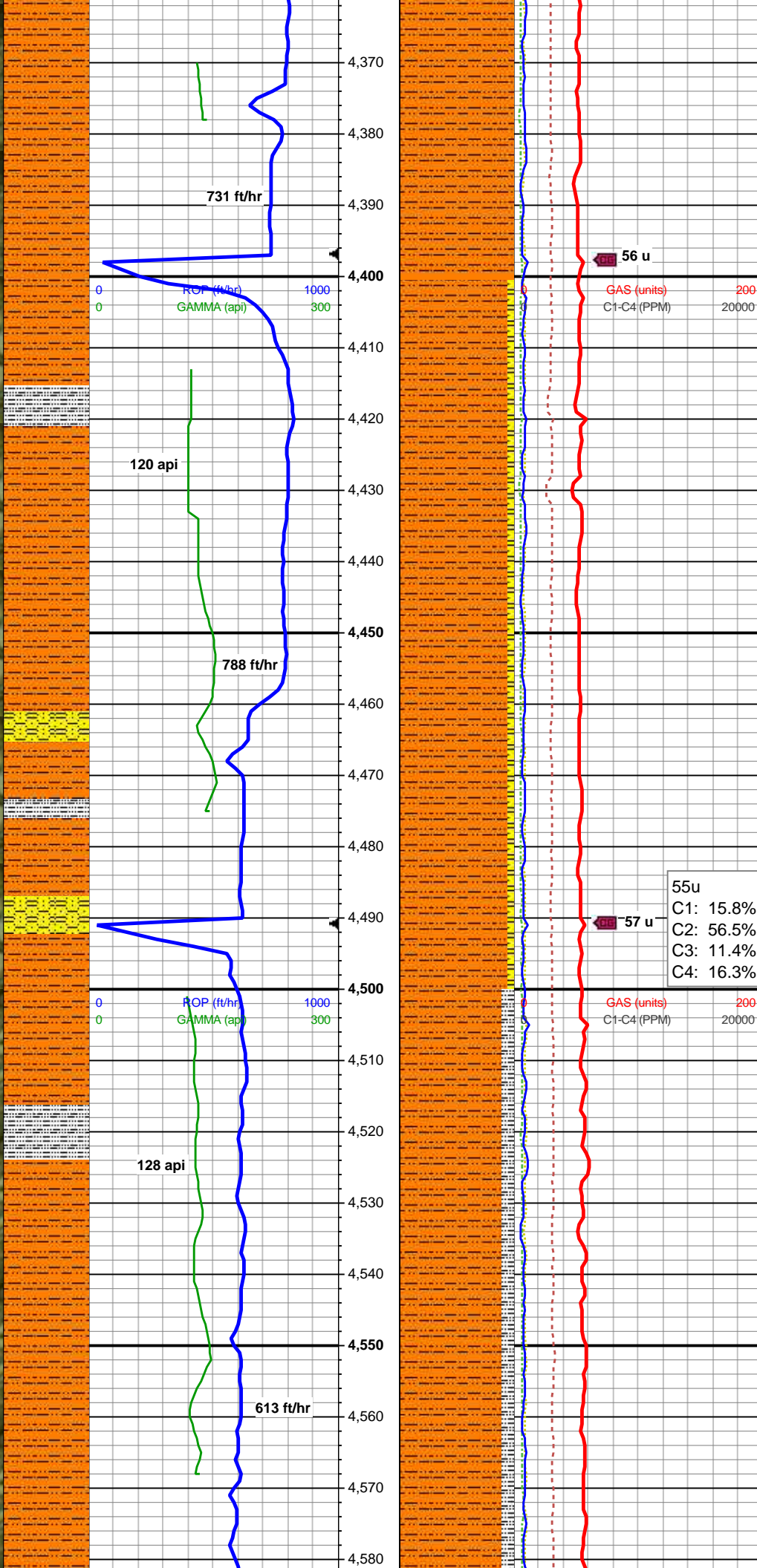
90% SHY SLTST: med gy-dk gy
brn, mot-stri, hrd, blk- plty, non
calc, rthy, slty tex, f gr sd, grdg
shy-sdy; 10% SHY SS: lt gy brn,
vfg, frm, sb blk, mod srt, arg cly
mtx

MD: 4,000'
TVD: 3,791.83'
Inclination: 20.52°
Azimuth: 219.35°
VS: 1,015.16'

MD: 4,093'
TVD: 3,878.85'
Inclination: 20.8°
Azimuth: 223.37°
VS: 1,044.26'

95% SHY SLTST: med gy-dk gy
brn, mot-stri, hrd, blk- plty, non
calc, rthy, slty tex, f gr sd; 5% SHY
SS: lt gy brn, vfg, frm, sb blk-ang,
mod srt, arg cly mtx





MD: 4,372'
TVD: 4,139.48'
Inclination: 20.52°
Azimuth: 226.82°
VS: 1,129.47'

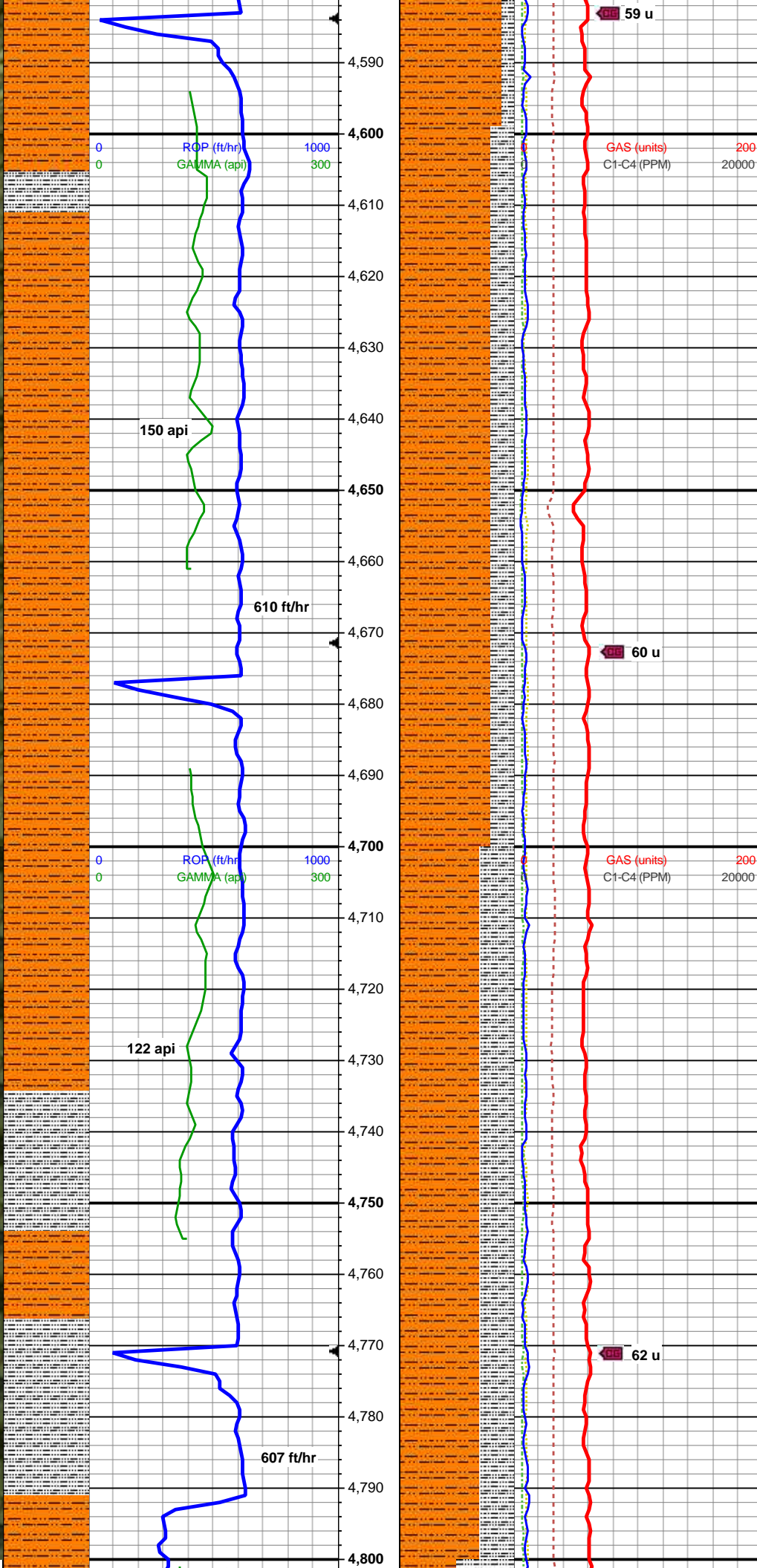
100% SHY SLTST: med dk gy-gy
brn, frm-hd, fiss ip, sb blk-ang,
non-calc, rthy, slty-sm tex, occ vfg
sd, grdg sh, v arg, intbdd wi
rr-mnr shy ss

MD: 4,465'
TVD: 4,226.7'
Inclination: 20.08°
Azimuth: 229.19°
VS: 1,156.19'

95% SHY SLTST: med gy-dk gy
brn, mot-stri, hrd, blk- plty, non
calc, rthy, slty tex, f gr sd; 5% SHY
SS: lt gy brn, vfg, frm, sb blk-ang,
mod srt, arg cly mtx, tr pyr nod

MW 9.5 / VIS 51 IN
MW 9.5 / VIS 49 OUT

MD: 4,558'
TVD: 4,313.77'
Inclination: 21.08°
Azimuth: 228.59°
VS: 1,182.97'



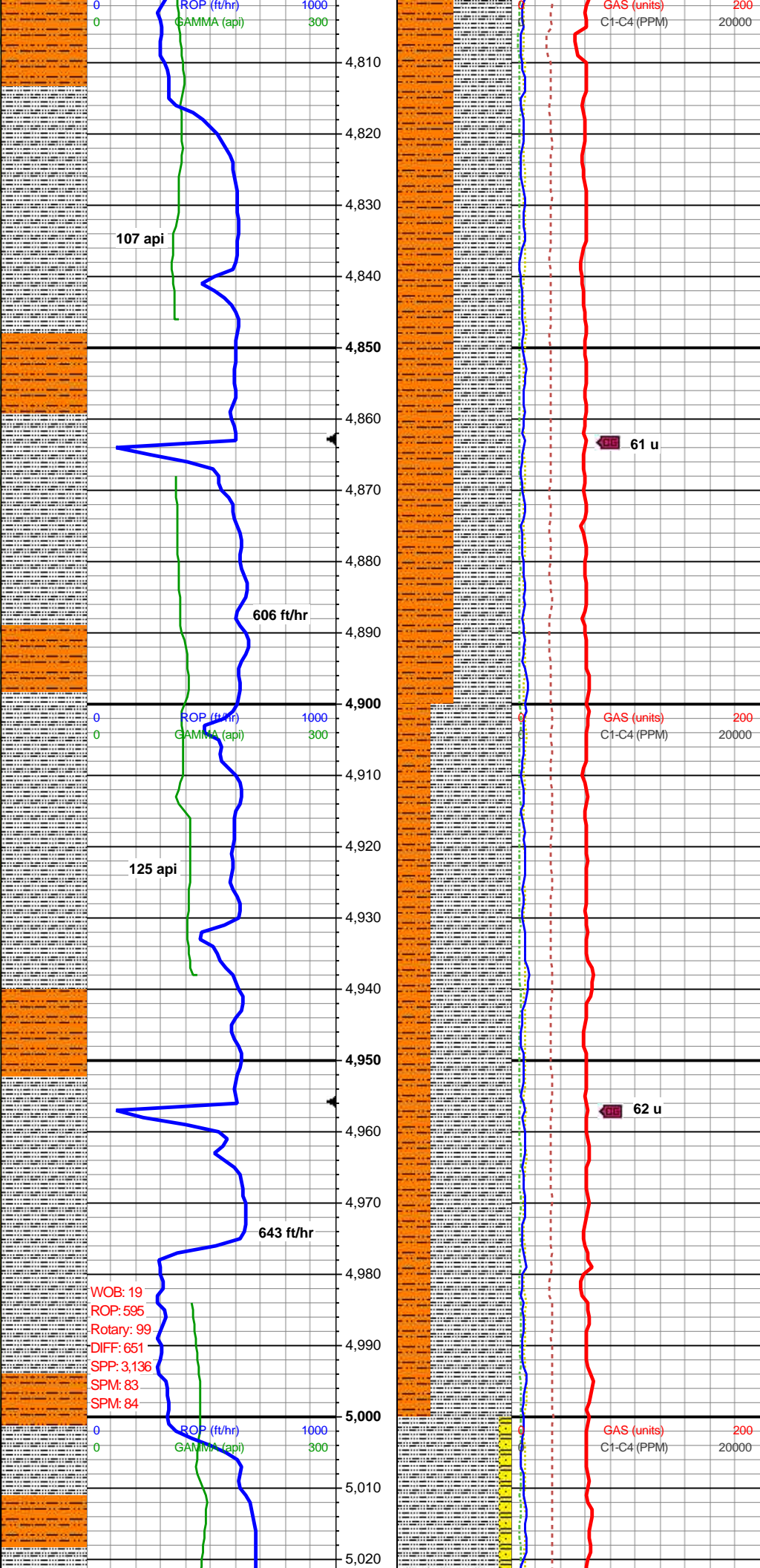
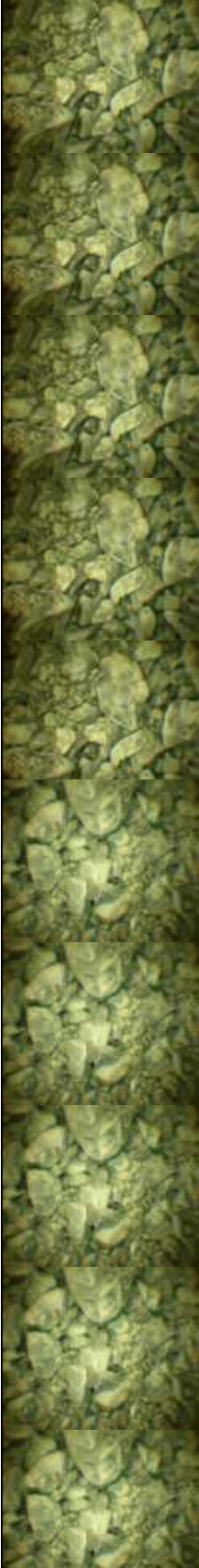
90% SHY SLTST: med gy-dk gy
brn, mot-stri, hrd, blk- plty, non
calc, rthy, slty tex, mn- f gr sd;
10% SLTY SH: dk gy brn, vfg, frm,
sb blk-ang, mod srt, arg mtx

MD: 4,651'
TVD: 4,400.43
Inclination: 21.46°
Azimuth: 226.78°
VS: 1,211.02'

80% SHY SLTST: med gy-dk gy
brn, mot-stri, frm-hrd, blk- plty,
non calc, rthy, slty tex; 20% SLTY
SH: dk gy brn, vfg, frm, sb
blk-ang, mod srt, arg mtx

MD: 4,744'
TVD: 4,487.02'
Inclination: 21.34°
Azimuth: 225.48°
VS: 1,239.72'

70% SHY SLTST: med-dk gy brn,
stri, frm-hrd, rnd-plty, mod calc,
rthy, slty tex; 30% SLTY SH: dk gy
brn, vfg, frm, sb blk-ang, mod srt,
arg mtx, mod calc



MW 9.5 / VIS 59 IN
MW 9.5 / VIS 51 OUT

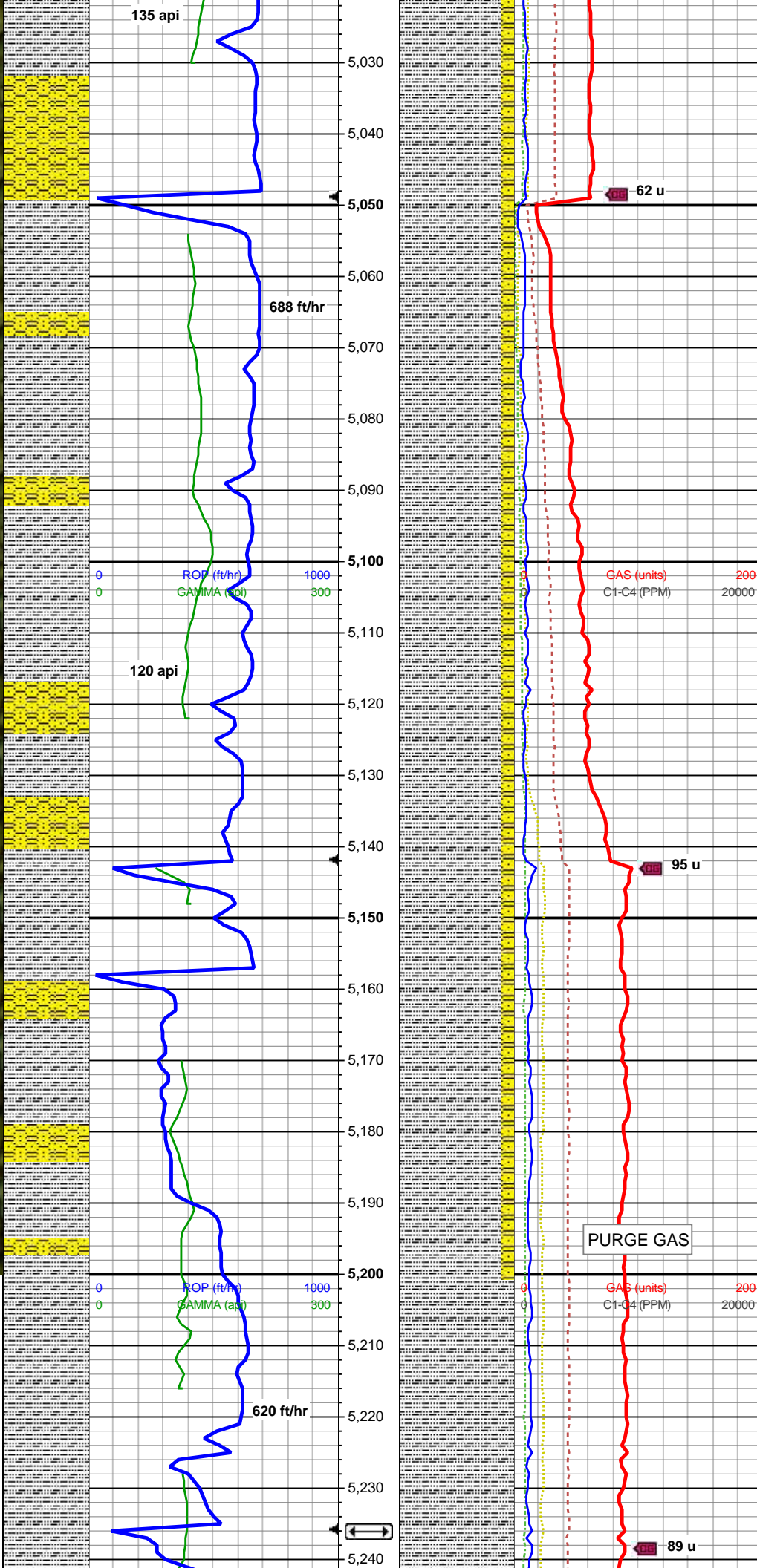
MD: 4,837'
TVD: 4,573.62'
Inclination: 21.46°
Azimuth: 220.27°
VS: 1,269.39'

50% SLTY SH: dk gy brn, vfg, frm,
sb blkgy-sb rnd, mod srt, arg mtx,
non-calc; 50% SHY SLTST:
med-dk gy brn, stri, frm-hrd, blkgy,
mod calc, rthy, slty tex

MD: 4,930'
TVD: 4,660.26'
Inclination: 21.21°
Azimuth: 212.71°
VS: 1,300.56'

70% SLTY SH: dk gy brn, vfg,
frm-hrd, sb blkgy-sb rnd, mod srt,
arg mtx, non-calc; 30% SHY
SLTST: med-dk gy brn, stri-mot,
hrd, blkgy, non-calc, rthy, slty tex

MD: 5,023'



TVD: 4,747'
Inclination: 21.09°
Azimuth: 208.87°
VS: 1,332.65'

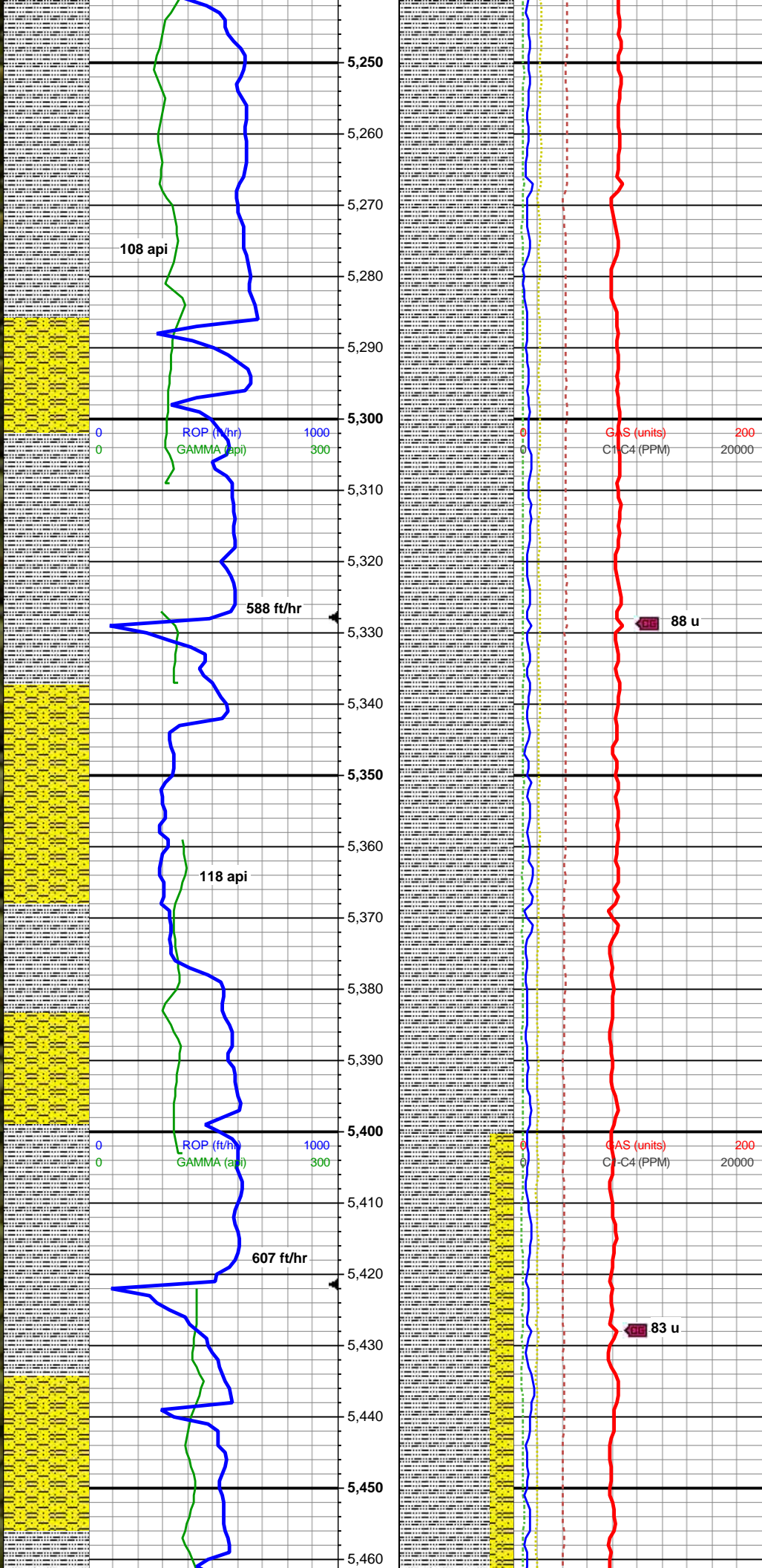
90% SLTY SH: dk gy brn, vfg,
frm-hrd, sb blk-y-rnd, mod srt, arg
mtx, non-calc; 10% SHY SS:
lt-med gy brn, stri, sft-frm, blk-y,
non-calc, rthy, slty tex

MD: 5,116'
TVD: 4,833.98'
Inclination: 20.35°
Azimuth: 211.07°
VS: 1,364.27'

90% SLTY SH: dk gy brn, vfg, frm,
sb blk-y-rnd, mod srt, arg mtx,
non-calc; 10% SHY SS: lt-med gy
brn, stri, sft-frm, blk-y, non-calc,
rthy, slty tex

MD: 5,208'
TVD: 4,920.05'
Inclination: 21.04°
Azimuth: 209.44°
VS: 1,395.47'

Sussex/Shannon Top
5236' MD / 4946' TVD



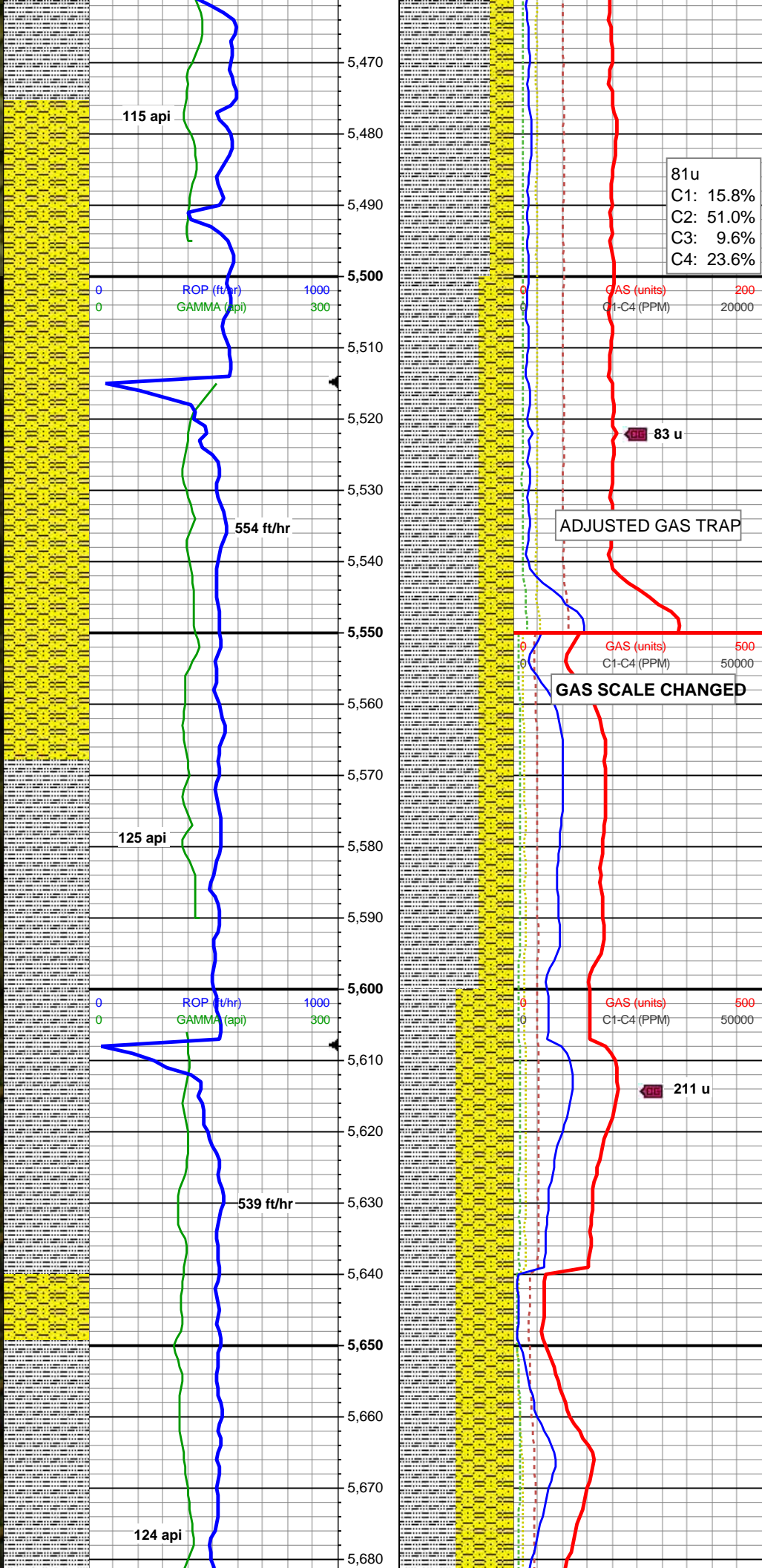
100% SLTY SH: dk gy brn, vfg, frm, sb blk-y-rnd, mod srt, arg mtx, mod calc, intbdd wi rr lt gy brn shy ss

MD: 5,301'
TVD: 5,006.7'
Inclination: 21.57°
Azimuth: 204.26°
VS: 1,428.37'

MW 9.5 / VIS 68 IN
MW 9.5 / VIS 72 OUT

100% SLTY SH: dk gy brn, vfg, frm-sl hrd, sb blk-y-rnd, rr sb ang, mod srt, arg mtx, mod calc, intbdd wi mnrr lt gy brn shy ss

MD: 5,394'
TVD: 5,093.19'
Inclination: 21.56°
Azimuth: 200.43°
VS: 1,462.17'



81u
C1: 15.8%
C2: 51.0%
C3: 9.6%
C4: 23.6%

80% SLTY SH: dk gy brn, vfg,
frm-sl hrd, sb blk-y-rnd, rr sb ang,
mod srt, arg mtx, mod calc, intbdd
wi lt gy brn shy ss; 20% SHY SS:
lt gr brn-offwht, frm, blk-y-ang, arg
mtx, non-calc

MD: 5,487'
TVD: 5,179.77'
Inclination: 21.29°
Azimuth: 201.45°
VS: 1,495.88'

ADJUSTED GAS TRAP

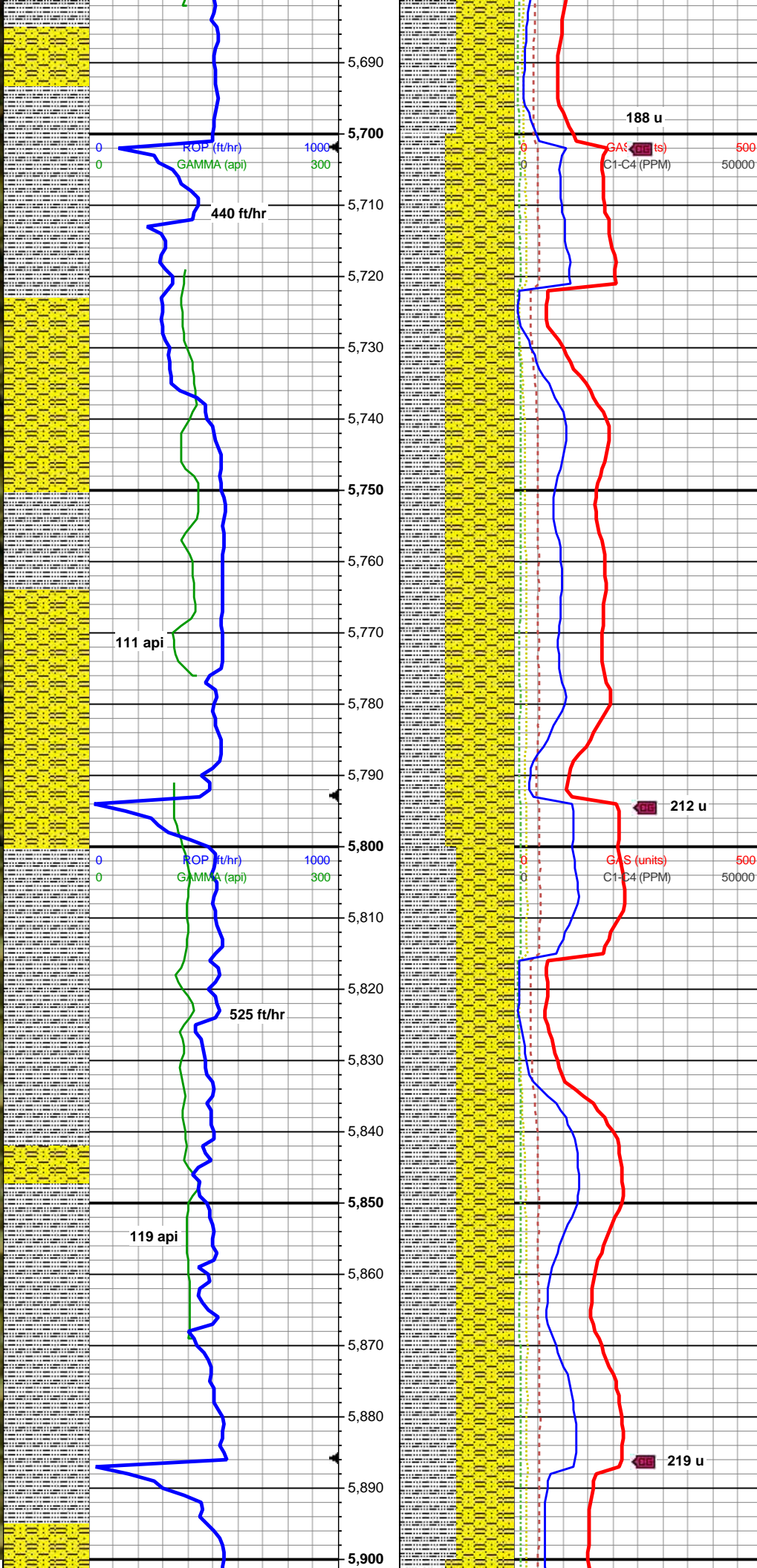
GAS SCALE CHANGED

MD: 5,580'
TVD: 5,266.47'
Inclination: 21.14°
Azimuth: 202.3°
VS: 1,529.21'

70% SLTY SH: dk gy brn, vfg,
frm-sl hrd, sb blk-y-rnd, rr sb ang,
mod srt, arg mtx, mod calc, intbdd
wi lt gy brn shy ss; 30% SHY SS:
lt gr, sft, uncons, rnd- sb blk-y, arg
mtx, sl calc

MW 9.5 / VIS 54 IN
MW 9.5 / VIS 51 OUT

MD: 5,673'
TVD: 5,353.17'
Inclination: 21.28°
Azimuth: 201.65°
VS: 1,562.52'



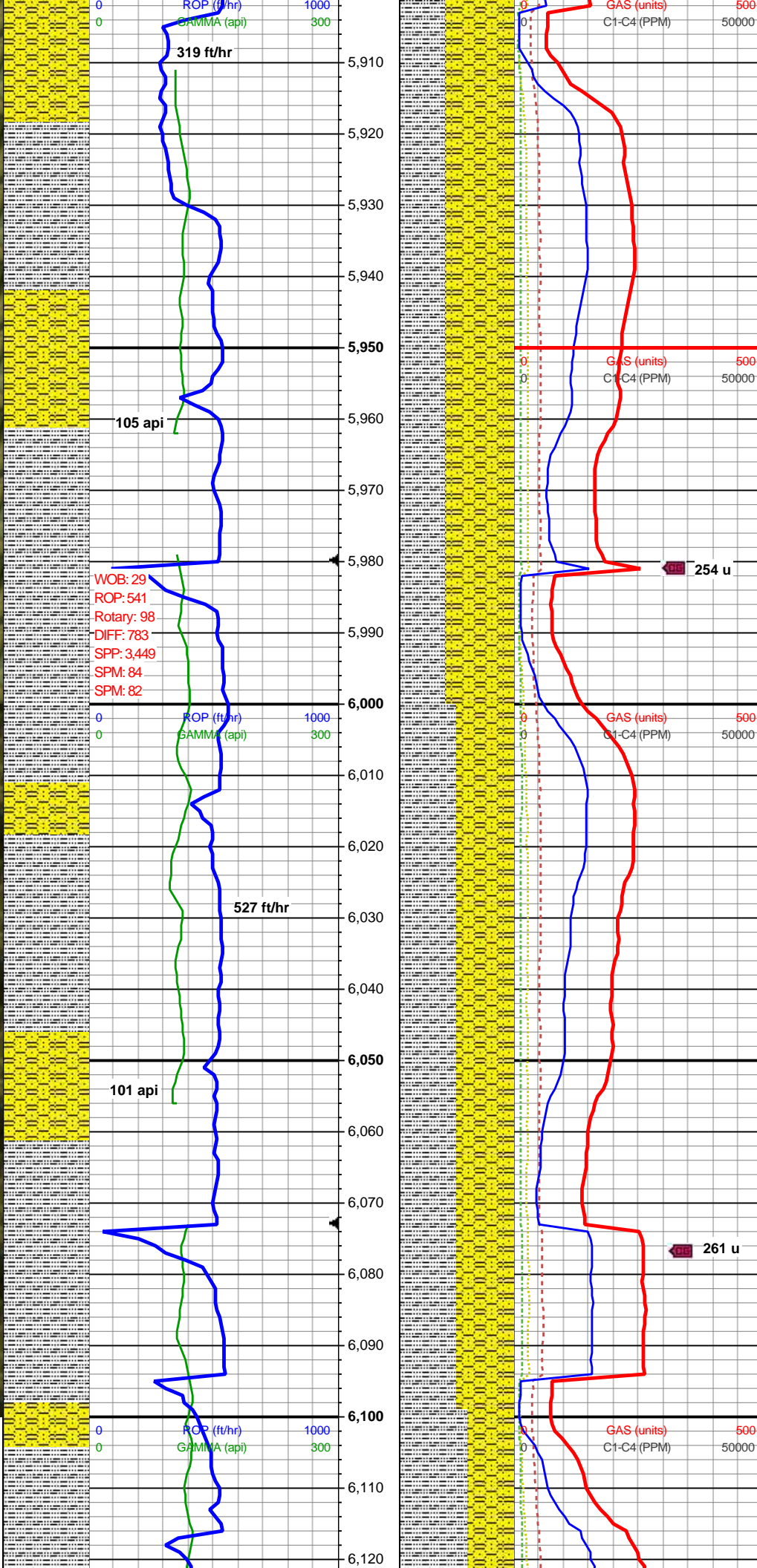
50% SLTY SH: dk gy brn, vfg, frm-sl hrd, sb blk-yrnd, rr sb ang, mod srt, arg mtx, mod calc; 50% SHY SS: lt gr, sft, uncons, rnd- sb blk-yr, arg mtx, sl calc

MD: 5,766'
TVD: 5,439.87'
Inclination: 21.12°
Azimuth: 203.87°
VS: 1,595.75'

60% SHY SS: lt-med gr, sft-uncons, rnd-sb blk-yr, arg mtx, calc; 40% SLTY SH: dk gy brn, vfg, frm-sl hrd, sb blk-yrnd, mnr ang, mod srt, arg mtx, mod calc

MD: 5,859'
TVD: 5,526.57'
Inclination: 21.34°
Azimuth: 207.7°
VS: 1,628.69'

50% SHY SS: lt-med gr, sft-uncons, rnd-sb blk-yr, arg mtx, calc-sl calc; 50% SLTY SH: dk gy brn, vfg, frm-hrd, sb blk-yrnd, mnr ang-plty, mod srt, arg mtx, non calc



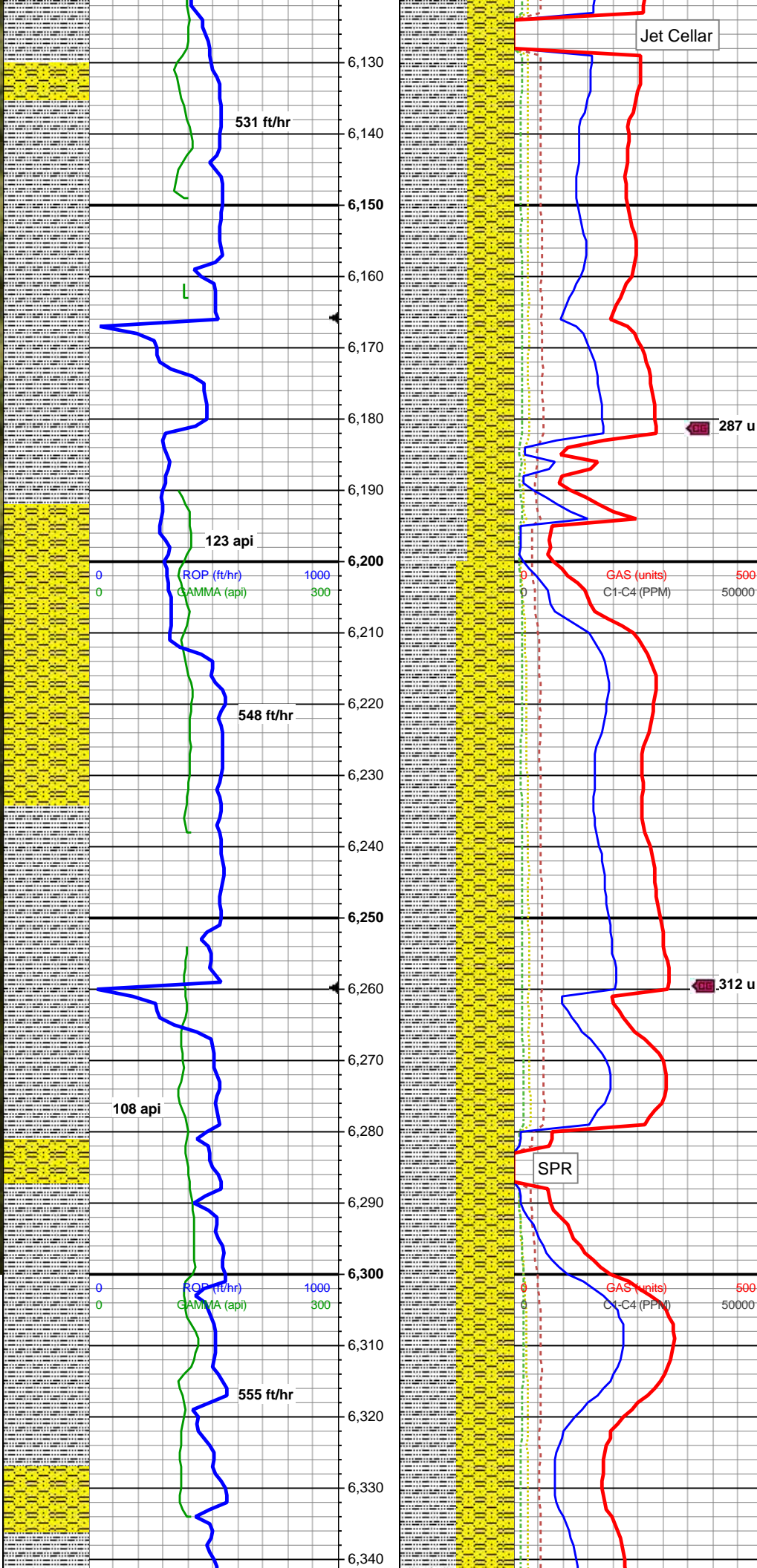
MD: 5,952'
TVD: 5,613.21'
Inclination: 21.27°
Azimuth: 210.5°
VS: 1,661.29'

60% SHY SS: lt-med gr,
sft-uncons, rnd-sb blk, arg mtx,
calc; 40% SLTY SH: dk gy brn, vfg,
frm-sl hrd, sb blk-rnd, mnr ang,
mod srt, arg mtx, mod calc

MW 9.6 / VIS 51 IN
MW 9.5 / VIS 50 OUT

MD: 6,046'
TVD: 5,700.83'
Inclination: 21.22°
Azimuth: 213.02°
VS: 1,693.7'

50% SHY SS: lt-med gr,
sft-uncons, rnd-sb blk, arg mtx,
calc-sl calc; 50% SLTY SH: dk gy
brn, vfg, frm-hrd, sb blk-rnd, mnr
ang-plty, mod srt, arg mtx, non
calc



MD: 6,139'
TVD: 5,787.55'
Inclination: 21.13°
Azimuth: 214.52°
VS: 1,725.3'

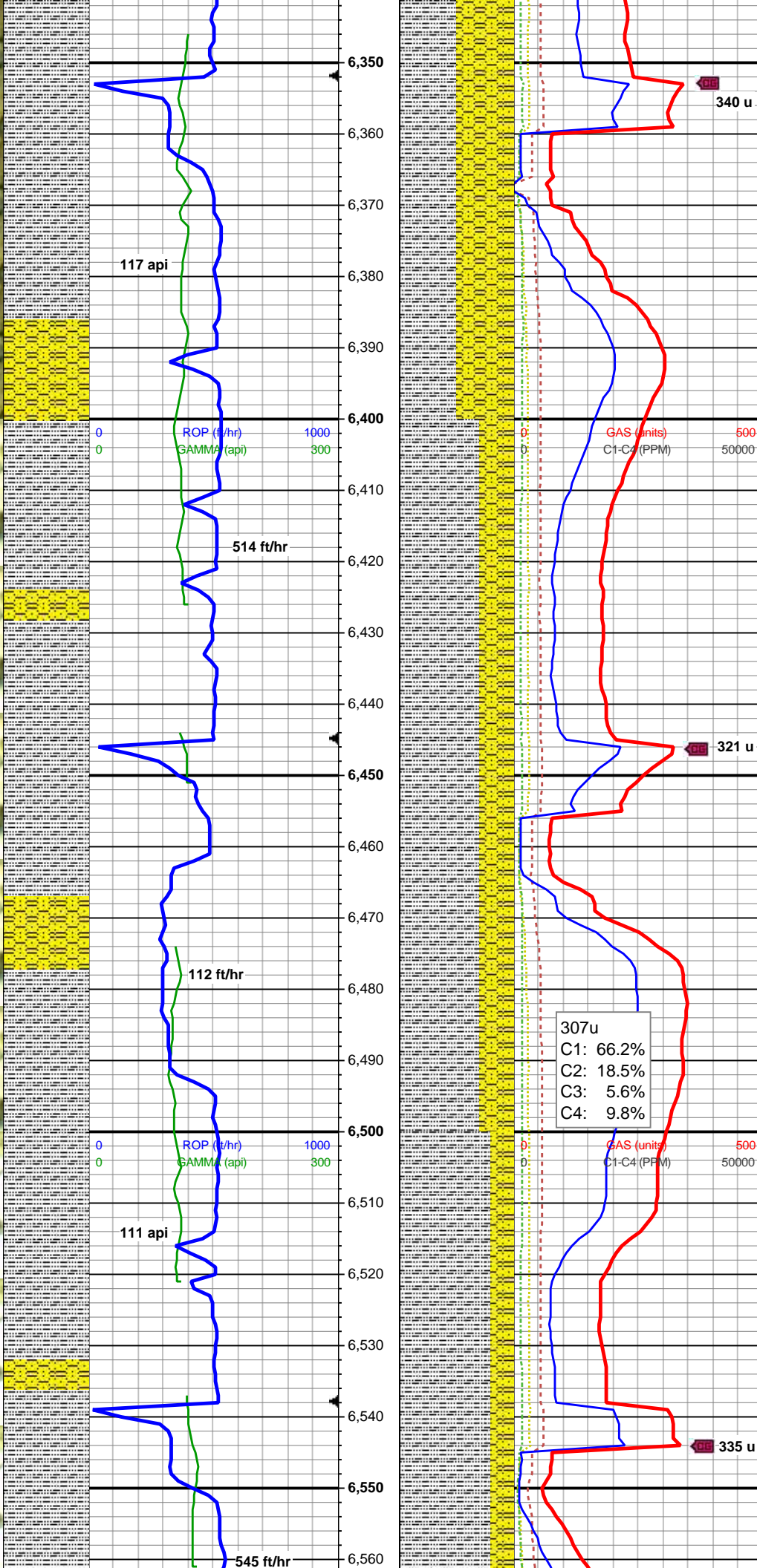
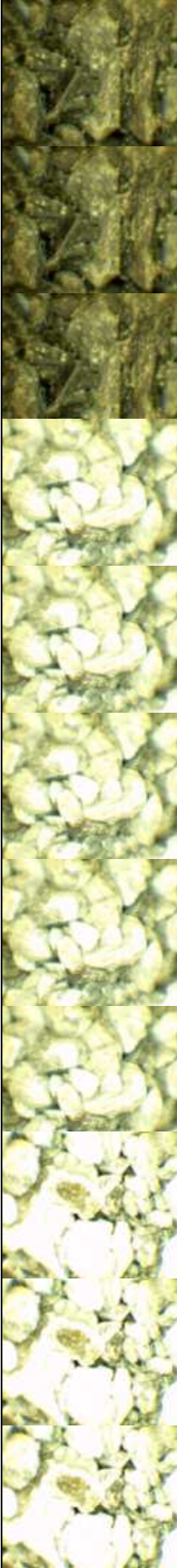
MW 9.6 / VIS 51 IN
MW 9.6 / VIS 50 OUT

60% SLTY SH: dk gy brn, vfg, frm, sb blk-y-rnd, mnr ang, mod srt, arg mtz, calc ip; 40% SHY SS: lt-med gr, sft-uncons, rnd-sb blk-y, arg mtz, non-calc

MD: 6,232'
TVD: 5,874.16'
Inclination: 21.59°
Azimuth: 216.76°
VS: 1,756.75'

50% SHY SS: lt-med gr, sft-uncons, rnd-sb blk-y, arg mtz, calc-sl calc; 50% SLTY SH: dk gy brn, vfg, frm-hrd, sb blk-y-rnd, mnr ang-plty, mod srt, arg mtz, non calc

MD: 6,325'
TVD: 5,960.64'
Inclination: 21.6°
Azimuth: 219.93°
VS: 1,787.91'



50% SHY SS: lt-med gr,
sft-uncons, rnd-sb blkly, arg mtx,
calc ip; 50% SLTY SH: dk gy brn,
vfg, frm-hrd, sb blkly-rnd, mnr
ang-plty, mod srt, arg mtx,
non-calc

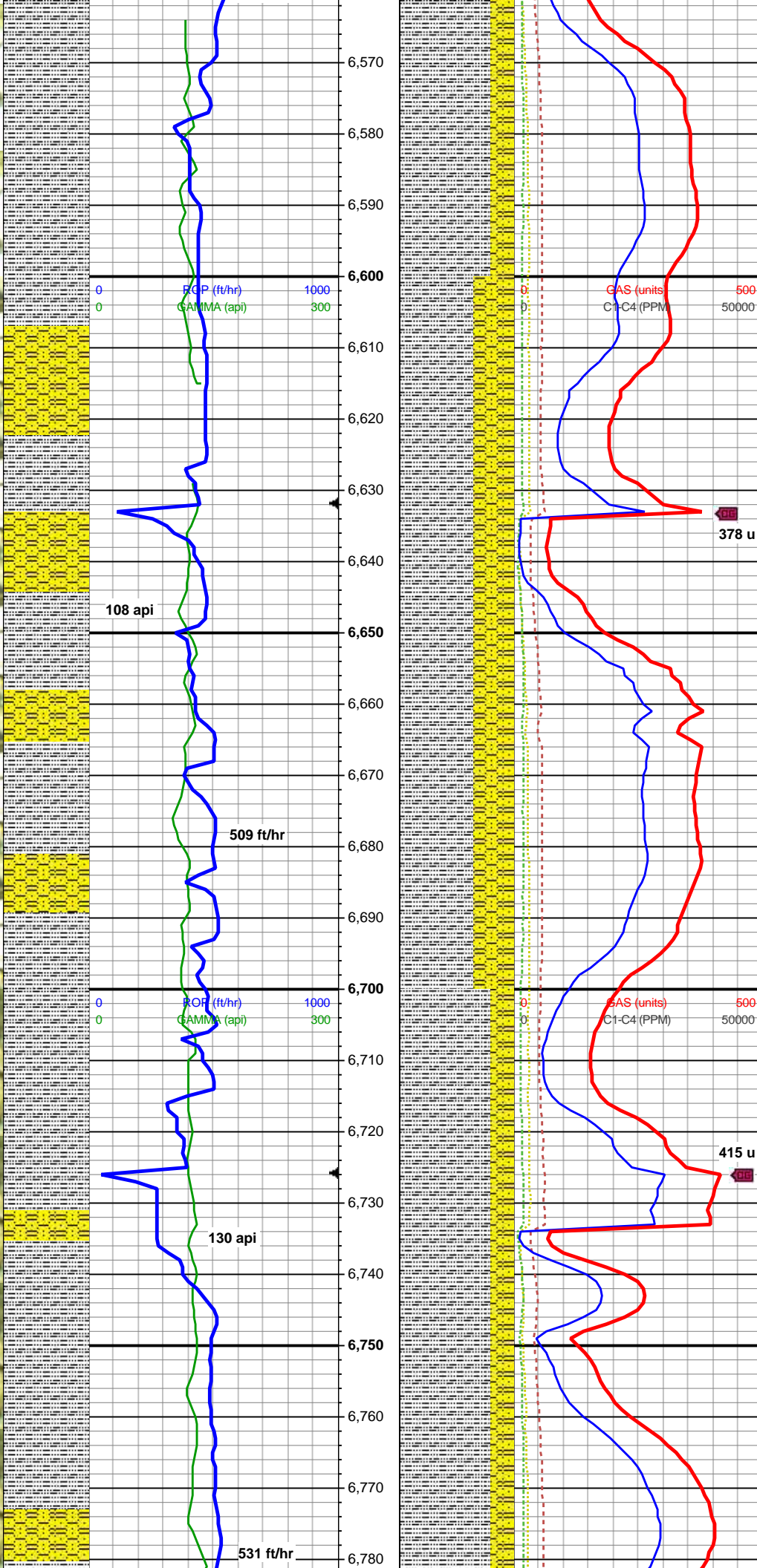
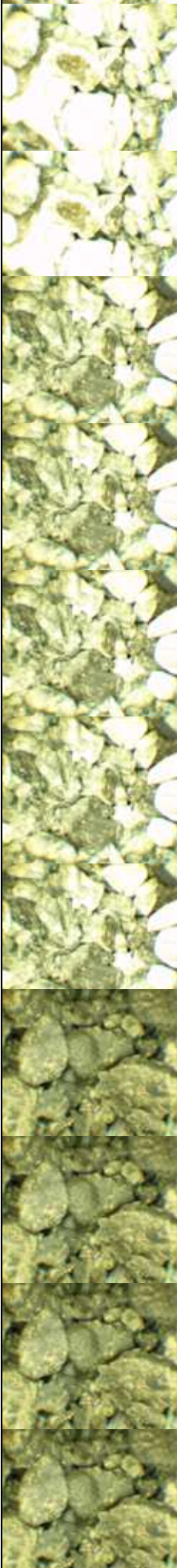
MD: 6,419'
TVD: 6,048.05'
Inclination: 21.55°
Azimuth: 222.38°
VS: 1,818.63'

70% SLTY SH: dk gy brn, vfg,
frm-occ hrd, sb blkly-rnd, mnr ang,
mod srt, arg mtx, calc ip; 30%
SHY SS: lt-med gy-gy brn,
sft-uncons, rnd-sb blkly, arg mtx,
non-calc

MW 9.6 / VIS 51 IN
MW 9.6 / VIS 48 OUT

MD: 6,512'
TVD: 6,134.57'
Inclination: 21.5°
Azimuth: 224.13°
VS: 1,848.37'

307u
C1: 66.2%
C2: 18.5%
C3: 5.6%
C4: 9.8%



80% SLTY SH: dk gy brn, f-vfg, frm-occ hrd, sb blk-y-rnd, mn-r plty, mod srt, arg mt-x, calc ip; 20% SHY SS: lt-med gy-gy brn, sft-uncons, rnd, arg mt-x, non-calc

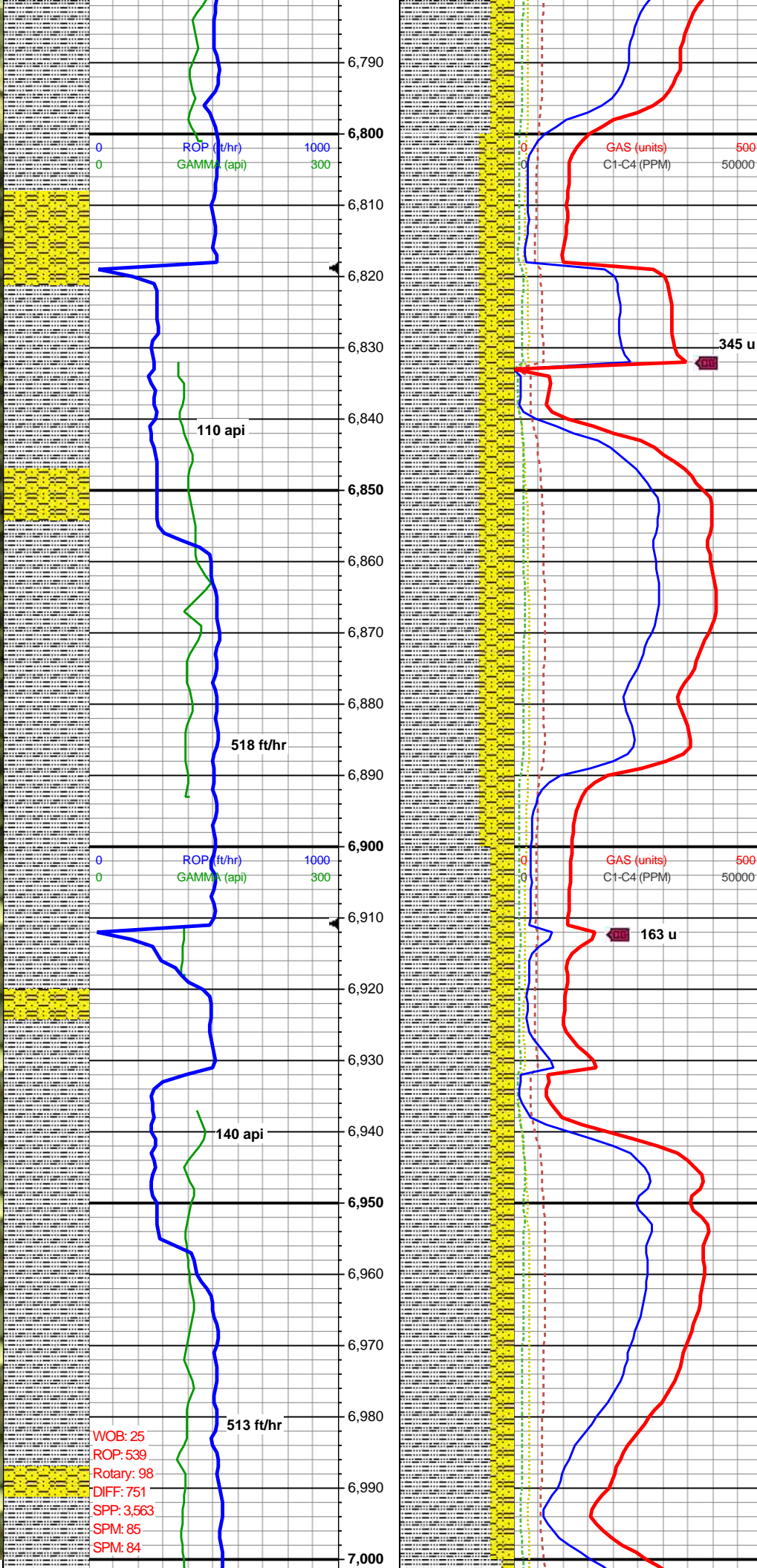
MD: 6,605'
TVD: 6,221.05'
Inclination: 21.64°
Azimuth: 225.26°
VS: 1,877.74'

MD: 6,698'
TVD: 6,307.45'
Inclination: 21.8°
Azimuth: 226.39°
VS: 1,906.95'

65% SLTY SH: dk gy brn-dk gy, vf-f gr, frm-occ hrd, sb blk-y-rnd, mn-r plty, mod srt, arg mt-x, calc ip; 35% SHY SS: lt-med gy-gy brn, sft-uncons, rnd-sb blk-y, arg mt-x, non-calc

MW 9.6 / VIS 54 IN
MW 9.6 / VIS 50 OUT

MD: 6,791'
TVD: 6,393.92'
Inclination: 21.42°
Azimuth: 229.31°
VS: 1,935.36'



80% SLTY SH: dk gy brn, f-vfg, frm-occ hrd, sb blk-y-rnd, mn-r plty, mod srt, arg mtx, calc ip; 20% SHY SS: lt-med gy-gy brn, sft-uncons, rnd, arg mtx, non-calc

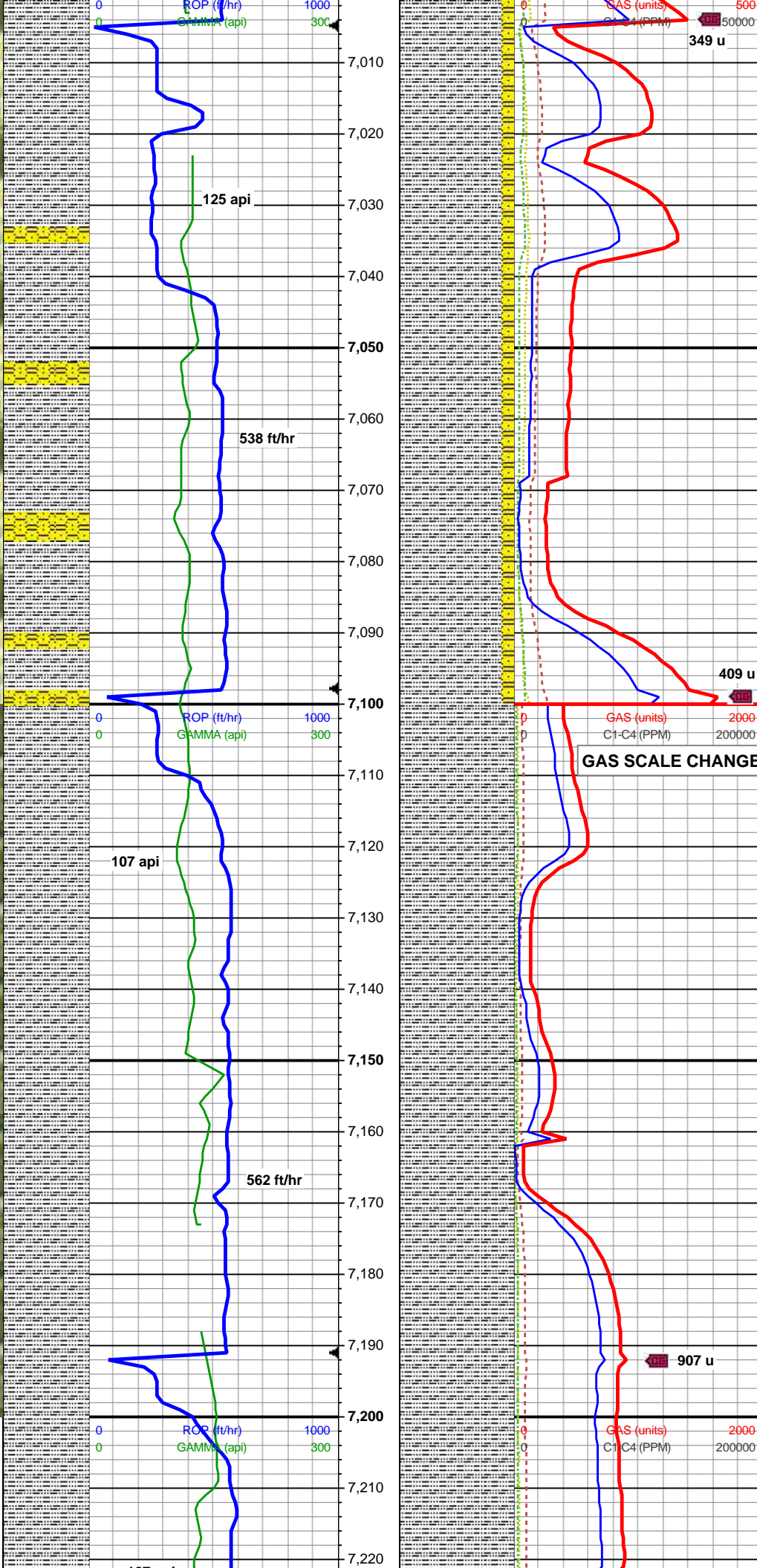
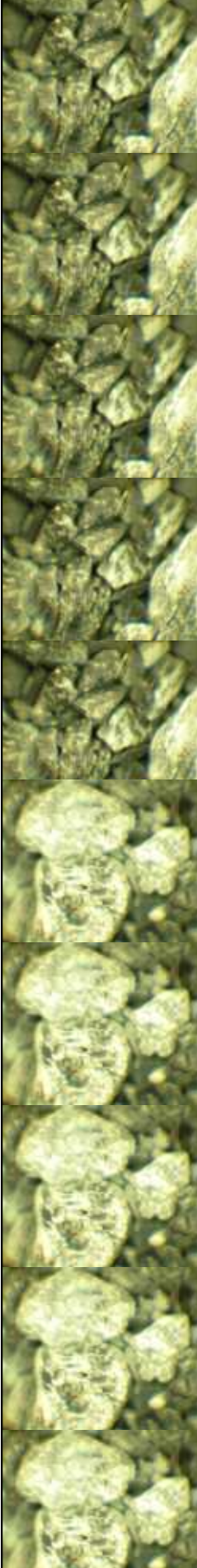
MD: 6,885'
TVD: 6,481.32'
Inclination: 21.78°
Azimuth: 234.09°
VS: 1,962.68'

70% SLTY SH: dk gy brn-dk gy, vf-f gr, frm-occ hrd, sb blk-y-rnd, mn-r plty, mod srt, arg mtx, calc ip; 30% SHY SS: lt-med gy-gy brn, sft-uncons, rnd-sb blk-y, arg mtx, non-calc

MD: 6,978'
TVD: 6,567.68'
Inclination: 21.85°
Azimuth: 226.53°
VS: 1,990.45'

80% SLTY SH: dk gy brn-dk gy, vf gr, frm-hrd, plty-ang, mod srt, arg mtx, non-calc; 20% SHY SS: lt-med gy-gy brn, sft-uncons, rnd-sb blk-y, arg mtx, non-calc

WOB: 25
ROP: 539
Rotary: 98
DIFF: 751
SPM: 3,563
SPM: 85
SPM: 84



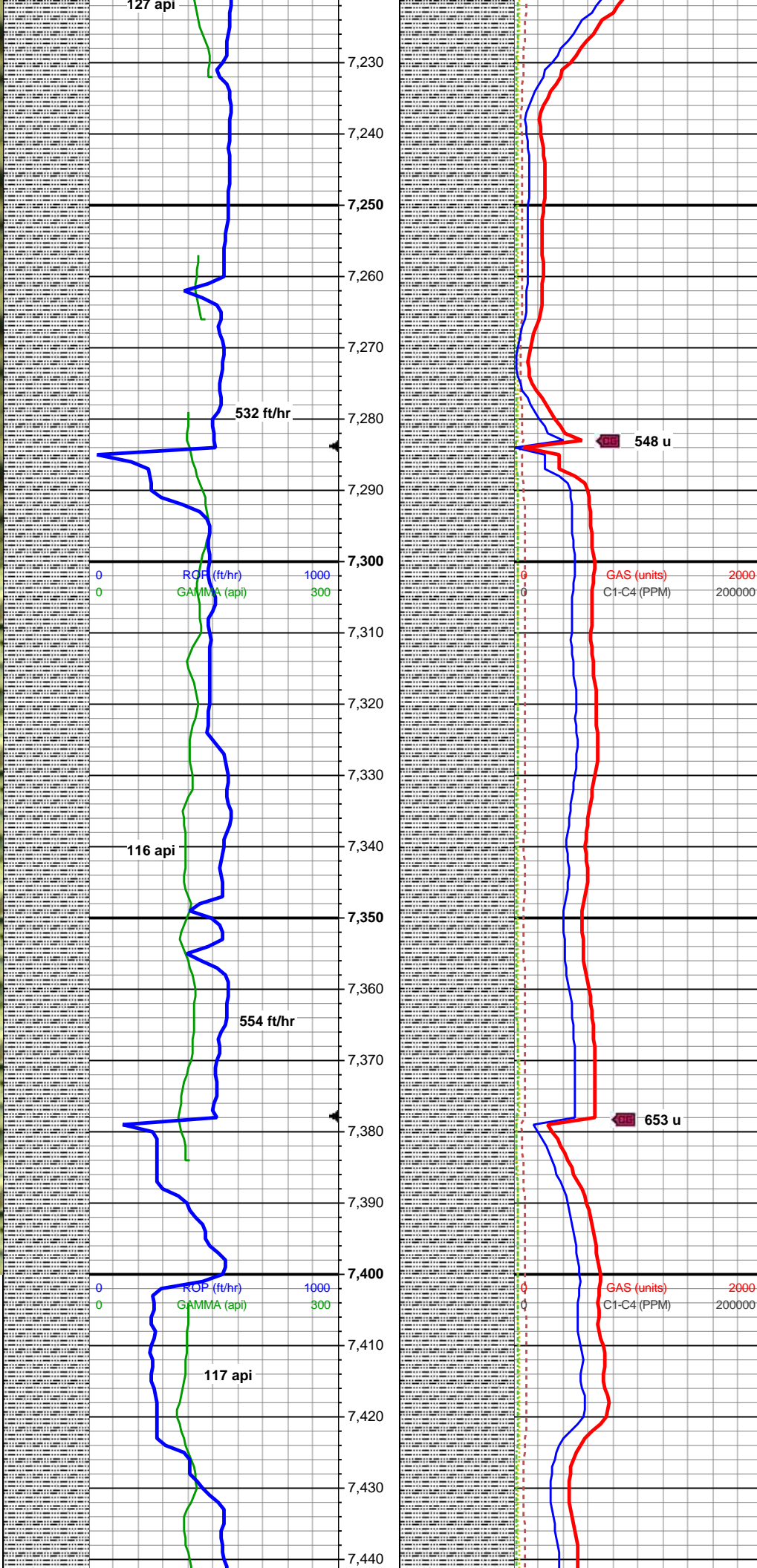
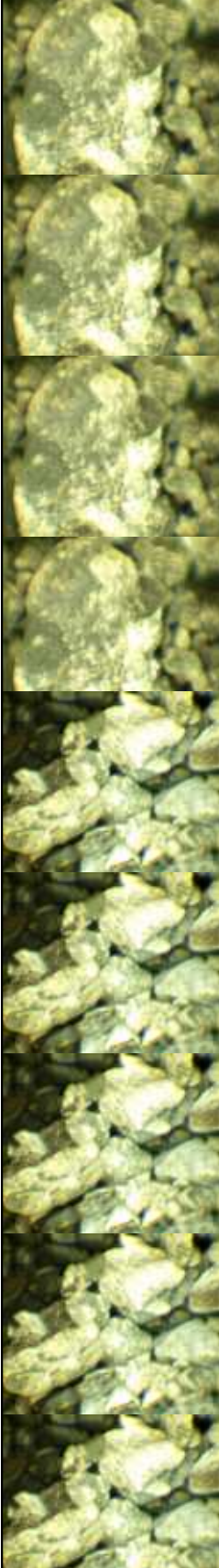
MW 9.6 / VIS 51 IN
MW 9.6 / VIS 49 OUT

MD: 7,071'
TVD: 6,654.01'
Inclination: 21.82°
Azimuth: 224.43°
VS: 2,019.91'

90% SLTY SH: dk gy brn-dk gy, vf gr, frm-hrd, plty-sb blk, mod srt, arg mtx, non-calc; 10% SHY SS: lt-med gy-gy brn, frm-hrd, sb blk-ang, arg mtx, non-calc

MD: 7,164'
TVD: 6,740.48'
Inclination: 21.39°
Azimuth: 225.87°
VS: 2,049.19'

100% SLTY SH: dk gy brn-dk gy, vf gr, frm-hrd, plty-sb blk, mod srt, arg mtx, non-calc, rr shy ss frags



MD: 7,257'
TVD: 6,827.19'
Inclination: 20.99°
Azimuth: 228.88°
VS: 2,077.23'

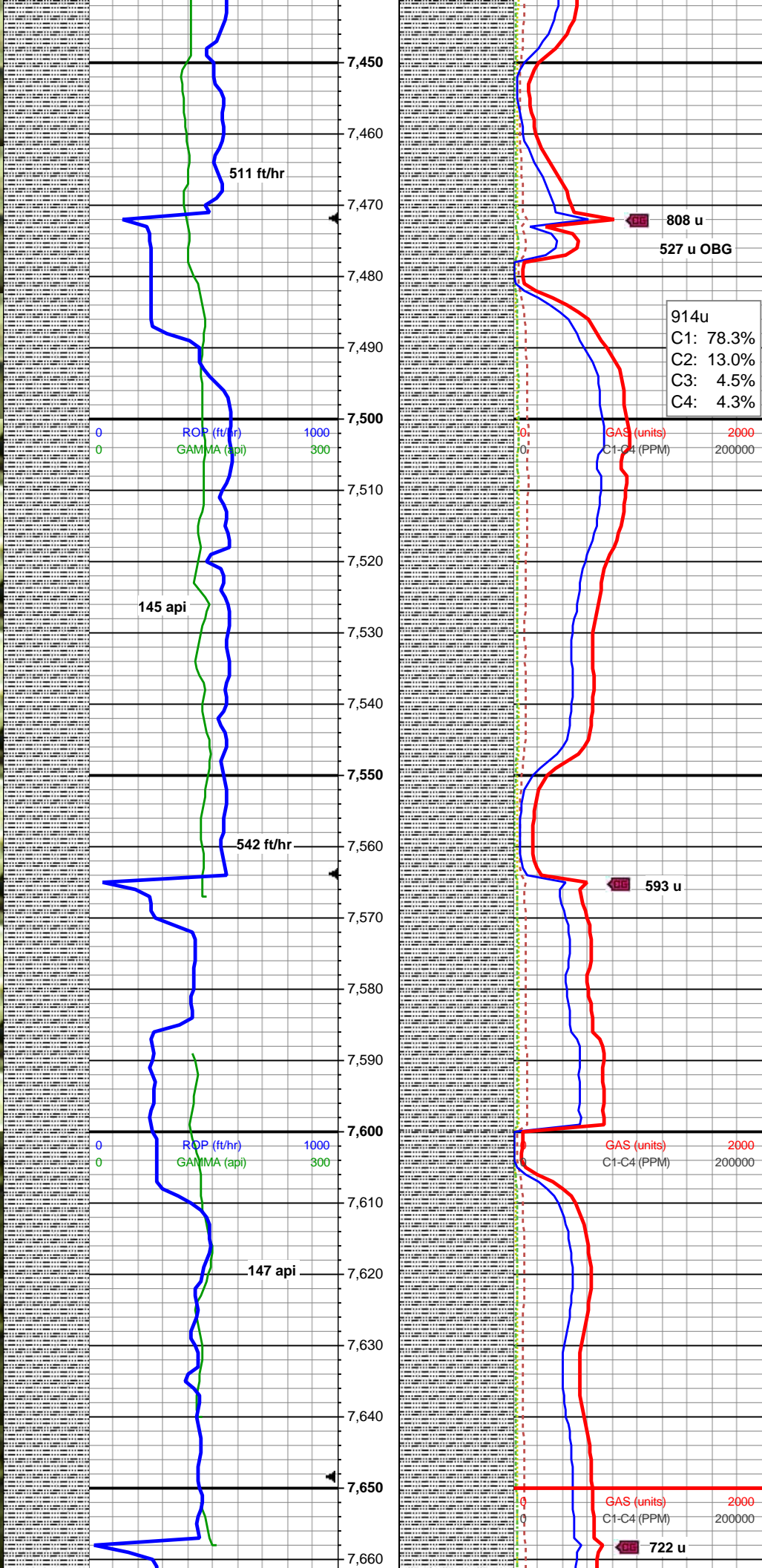
100% SLTY SH: med dk gy-dk gy,
blky-sb plty, hd-frm, arg, slty tex,
rthy, sl calc

MD: 7,350'
TVD: 6,914.03'
Inclination: 20.95°
Azimuth: 231.7°
VS: 2,104.02'

100% SLTY SH: med dk gy-dk gy,
blky-sb plty, hd-frm, arg, slty tex,
rthy, sl calc

MW 9.6 / VIS 40 IN
MW 9.6 / VIS 51 OUT

MD: 7,443'
TVD: 7,000.67'



TVD: 7,000.07'
Inclination: 21.7°
Azimuth: 231.94°
VS: 2,130.7'

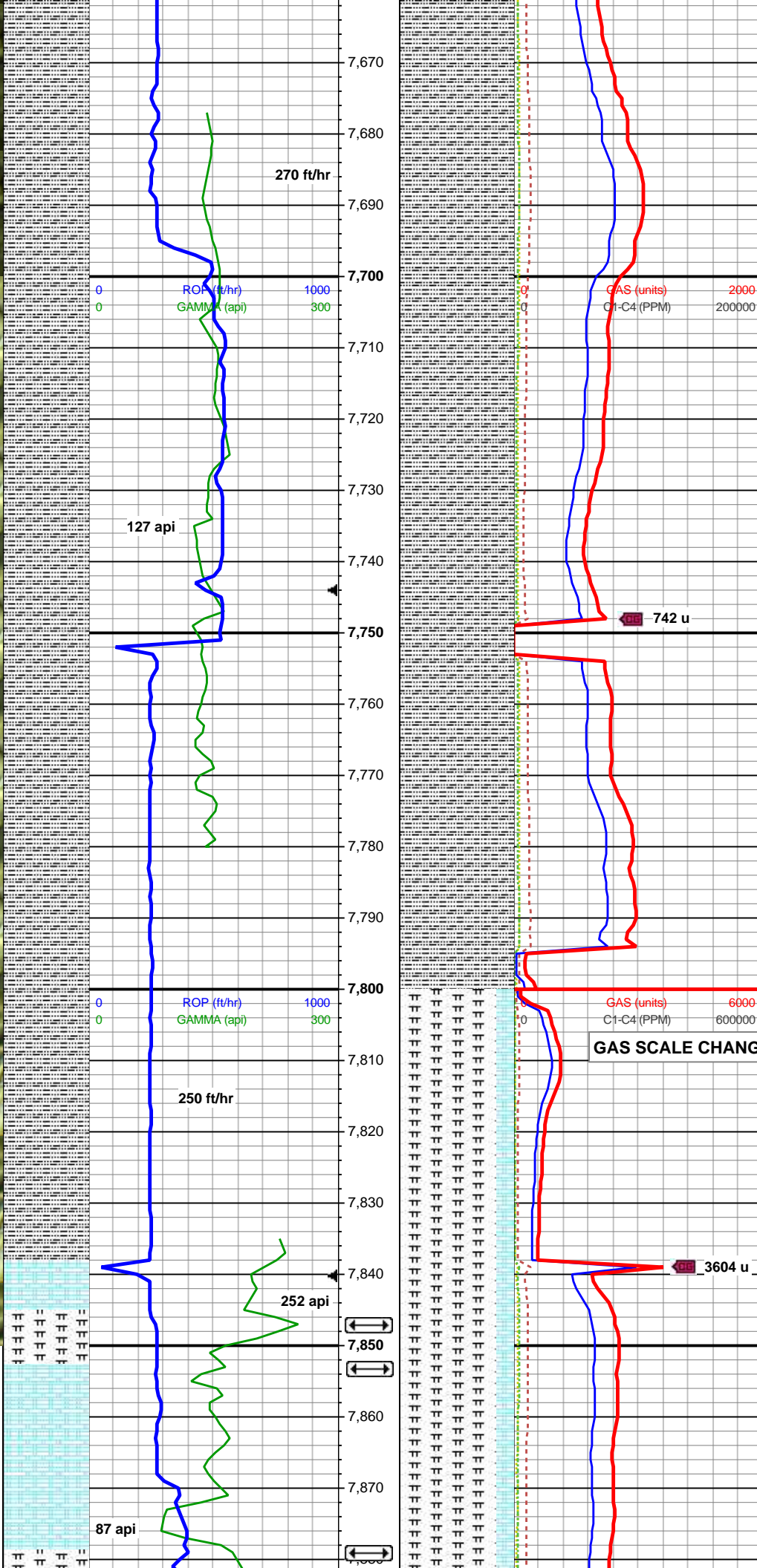
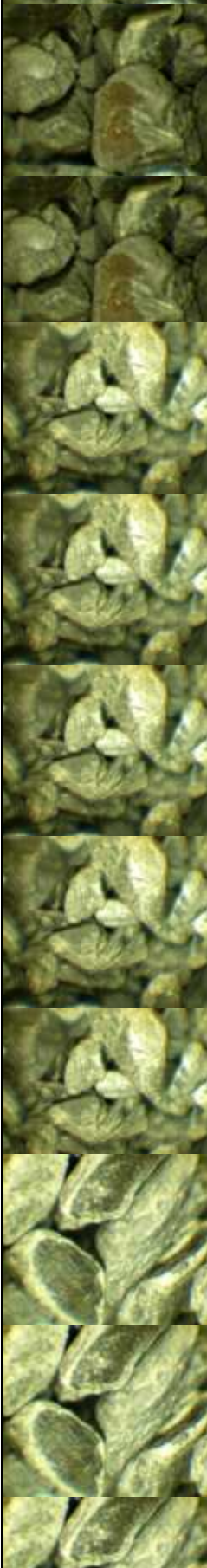
100% SLTY SH: med dk gy-dk gy,
blky-sb plty, hd-frn, arg, slty tex,
rthy, sl calc

MD: 7,537'
TVD: 7,088.21'
Inclination: 21.02°
Azimuth: 232.11°
VS: 2,157.64'

100% SLTY SH: med dk gy-dk gy,
blky-sb plty, hd-frn, arg, slty tex,
rthy, sl calc

MD: 7,630'
TVD: 7,174.89'
Inclination: 21.55°
Azimuth: 223.22°
VS: 2,185.65'

MW 9.6 / VIS 50 IN
MW 9.6 / VIS 51 OUT



100% SLTY SH: med dk gy-dk gy
brn, sb blkly-sb rnd, hd-frm, arg,
slty tex, rthy, sl calc

MD: 7,724'
TVD: 7,262.49'
Inclination: 21.15°
Azimuth: 209.54°
VS: 2,217.05'

100% SLTY SH: dk gy, blkly-sb
ppty, frm-hd, arg, sl gritty tex, rthy,
rr bent, sl calc

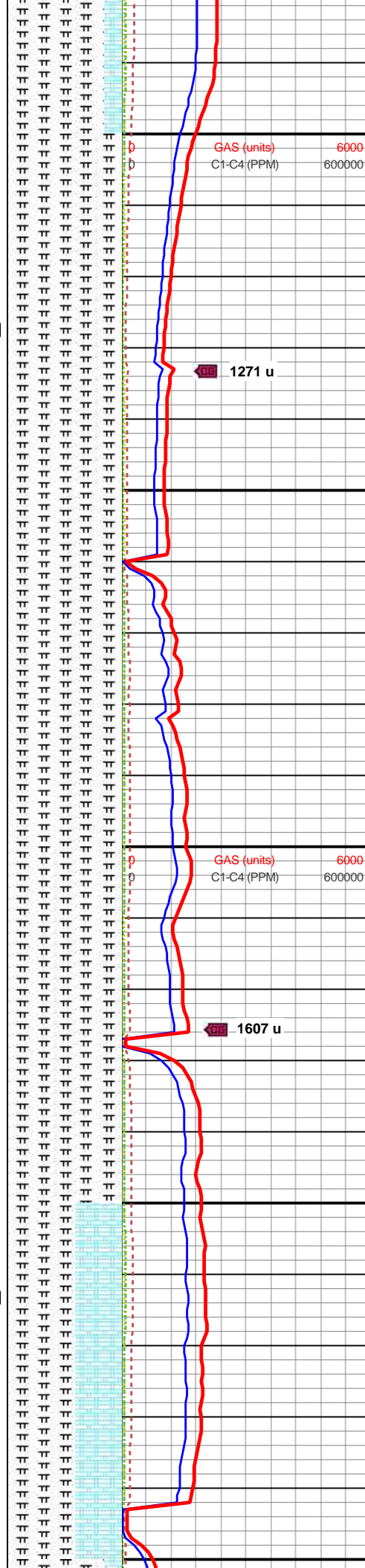
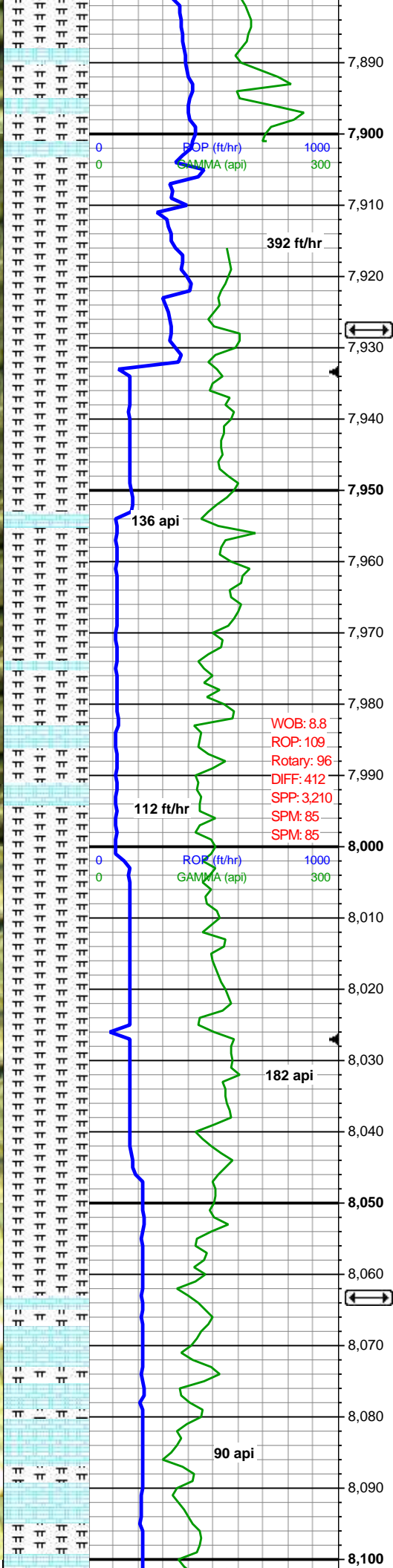
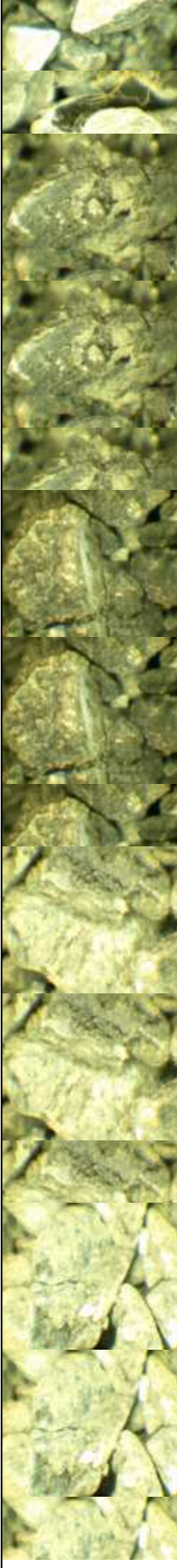
MD: 7,816'
TVD: 7,348.09'
Inclination: 21.91°
Azimuth: 202.26°
VS: 2,250.02'

MW 9.6 / VIS 52 IN
MW 9.6 / VIS 51 OUT

Niobrara Top
7847' MD / 7377' TVD

Niobrara A Chalk Top
7853' MD / 7382' TVD

Niobrara A Marl Top
7879' MD / 7407' TVD



85% MRLST: med-dk gy, frm, sb
blky-sb plty, slty, mot-stri tex v
calc; 15% CHK: medgy, pred sft,
sb blky, wxy-rthy-sl stri tex, slty, rr
bent

MD: 7,909'
TVD: 7,434.67'
Inclination: 20.94°
Azimuth: 196.38°
VS: 2,283.8'

KOP Reached 7932' MD
Begin 50' Sample Collection

100% MRLST: med-dk gy, frm, sb
blky-sb plty, slty, mot-stri tex, sl tr
calc, rr bent

MW 9.6 / VIS 51 IN
MW 9.6 / VIS 52 OUT

100% MRLST: med-dk gy, frm, sb
blky-sb plty, slty, mot-stri tex, v sl
calc, rr bent, sl tr fos frag

MD: 8,003'
TVD: 7,520.03'
Inclination: 28.4°
Azimuth: 194.7°
VS: 2,322.99'

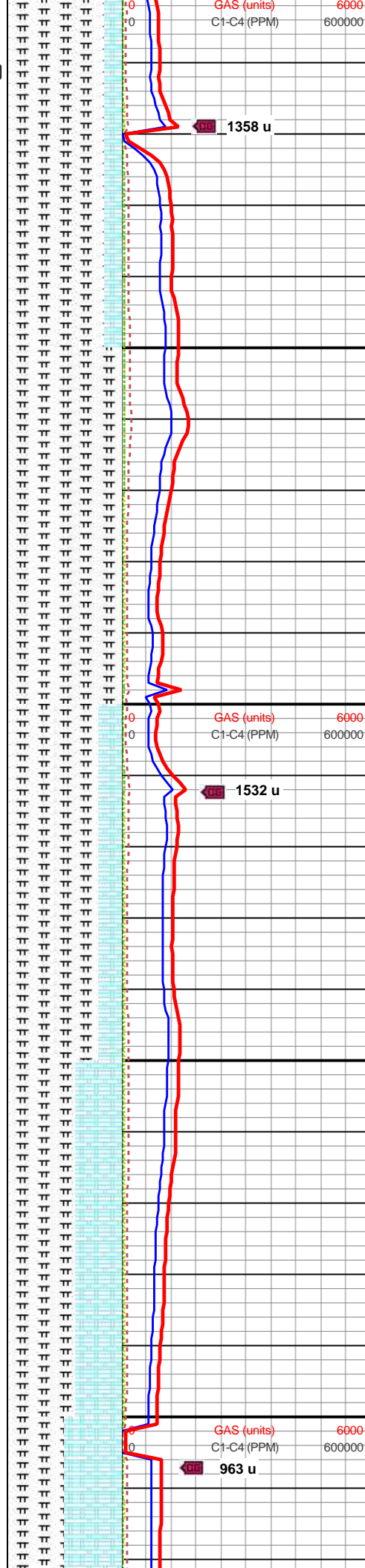
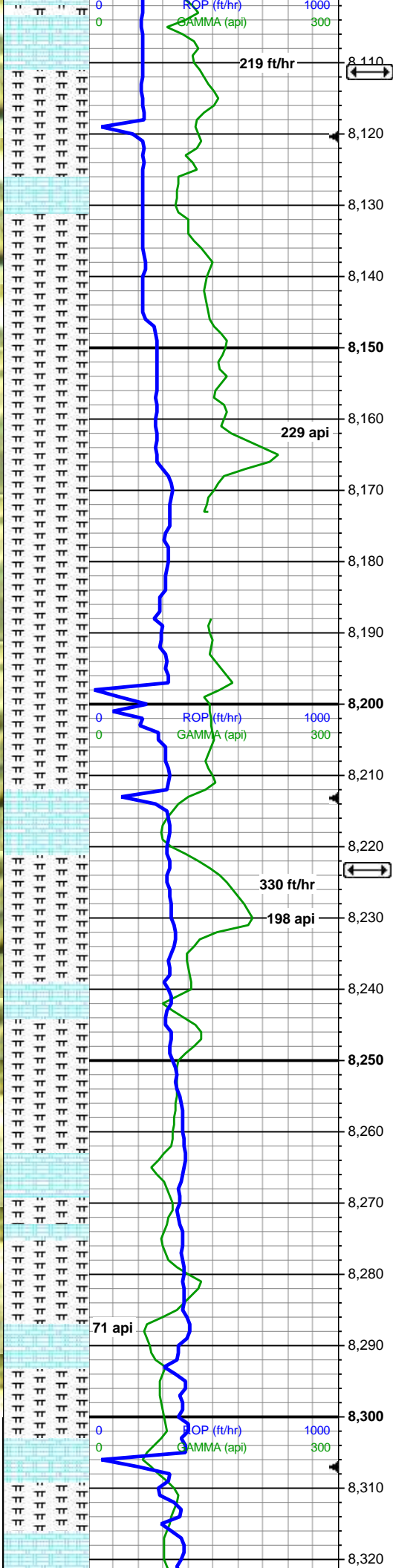
100% MRLST: med-dk gy, frm, sb
blky-sb plty, slty, mot-stri tex, v sl
calc, rr bent

MW 9.75 / VIS 52 IN
MW 9.6 / VIS 51 OUT

Niobrara B Chalk Top
8063' MD / 7571' TVD

60% MRLST: med-dk gy, frm, sb
blky-sb plty, slty, mot-stri tex, v sl
calc; v rr bent; 40% CHK: medgy,
pred sft, sb blky, wxy-rthy-sl stri
tex, slty

MD: 8,096'
TVD: 7,527.99'



TVD: 7,597.96'
Inclination: 37.57°
Azimuth: 193.01°
VS: 2,373.56'

Niobrara B Marl Top
8111' MD / 7610' TVD

85% MRLST: med-dk gy, frm, sb
blky-sb plty, slty, mot-stri tex, sl tr
calc; 15% CHK: medgy, pred sft,
sb blky, wxy-rthy-sl stri tex, slty, v r
bent

MD: 8,190'
TVD: 7,667.26'
Inclination: 47.28°
Azimuth: 191.98°
VS: 2,436.88'

100% MRLST: med-dk gy, frm, sb
blky-sb plty, slty, mot-stri tex, v sl
calc

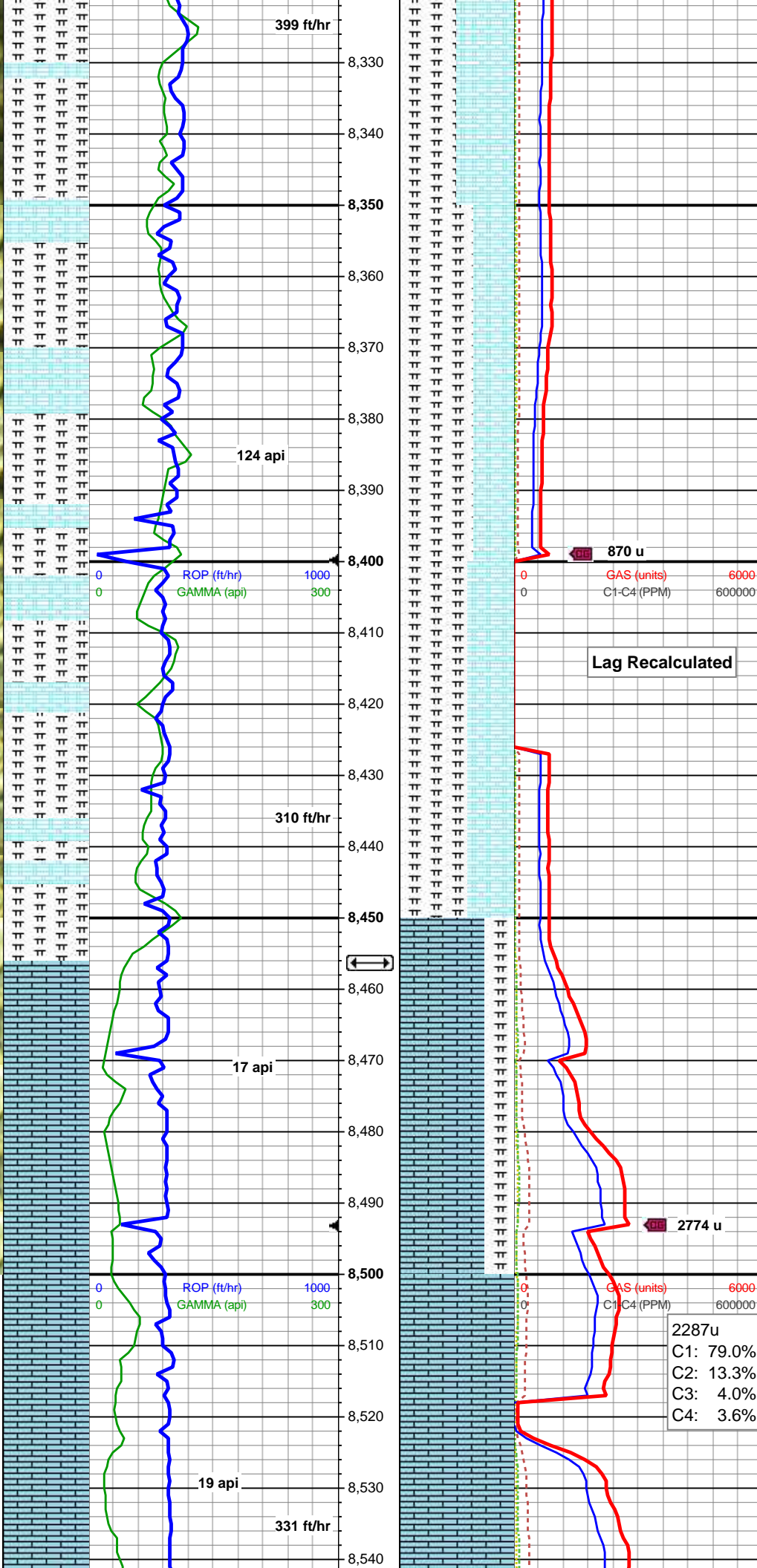
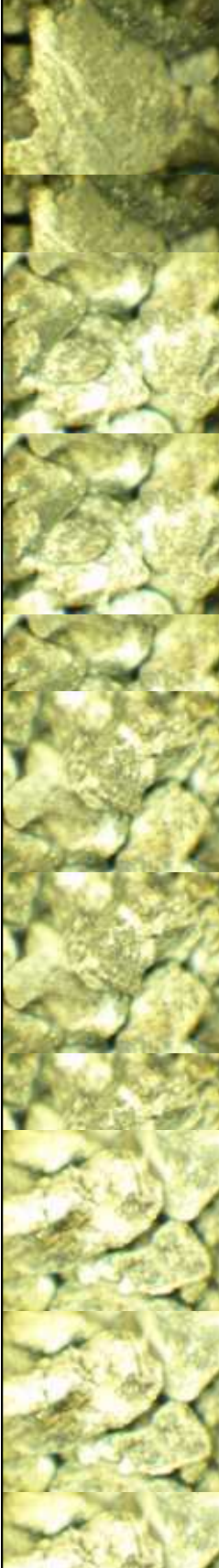
MW 9.75 / VIS 52 IN
MW 9.6 / VIS 51 OUT

Niobrara C Marl Top
8223' MD / 7689' TVD

80% MRLST: med-dk gy, frm, sb
blky-sb plty, slty, mot-stri tex v
calc; 20% CHK: medgy, pred sft,
sb blky, wxy-rthy-sl stri tex, slty, v r
bent

MD: 8,283'
TVD: 7,725.45'
Inclination: 55.18°
Azimuth: 190.7°
VS: 2,509.25'

60% MRLST: med-dk gy, frm, sb
blky-sb plty, slty, mot-stri tex, v sl
calc; 40% CHK: lt gy-medgy, pred
sft, sb blky, wxy-rthy-sl stri tex, slty



50% MRLST: med-dk gy, frm, sb
blky-sb plty, slty, mot-stri tex, v sl
calc; 50% CHK: lt gy-medgy, pred
sft, sb blky, wxy-rthy-sl stri tex, slty

MD: 8,376'
TVD: 7,772.13'
Inclination: 64.51°
Azimuth: 188.35°
VS: 2,589.33'

65% MRLST: med-dk gy, frm, sb
blky-sb plty, slty, mot-stri tex, v sl
calc; 35% CHK: lt gy-medgy, pred
sft, sb blky, wxy-rthy-sl stri tex, slty

MW 9.75 / VIS 51 IN
MW 9.75 / VIS 52 OUT

60% MRLST: med-dk gy, frm, sb
blky-sb plty, slty, mot-stri tex, v sl
calc; 40% CHK: medgy, pred sft,
sb blky, wxy-rthy-sl stri tex, slty

Fort Hayes Top
8456' MD / 7803' TVD

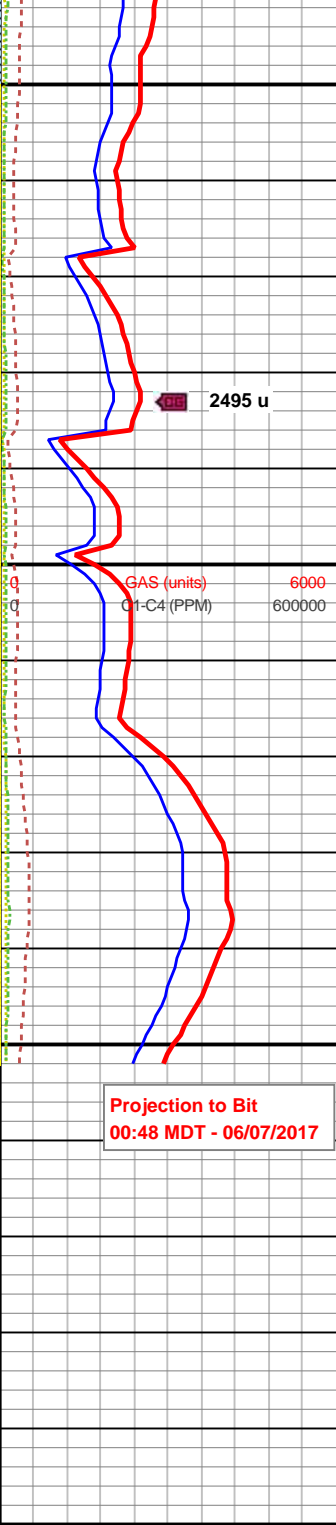
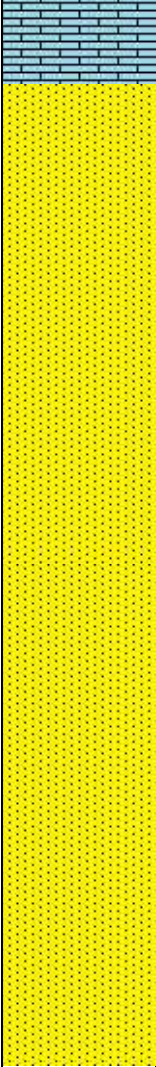
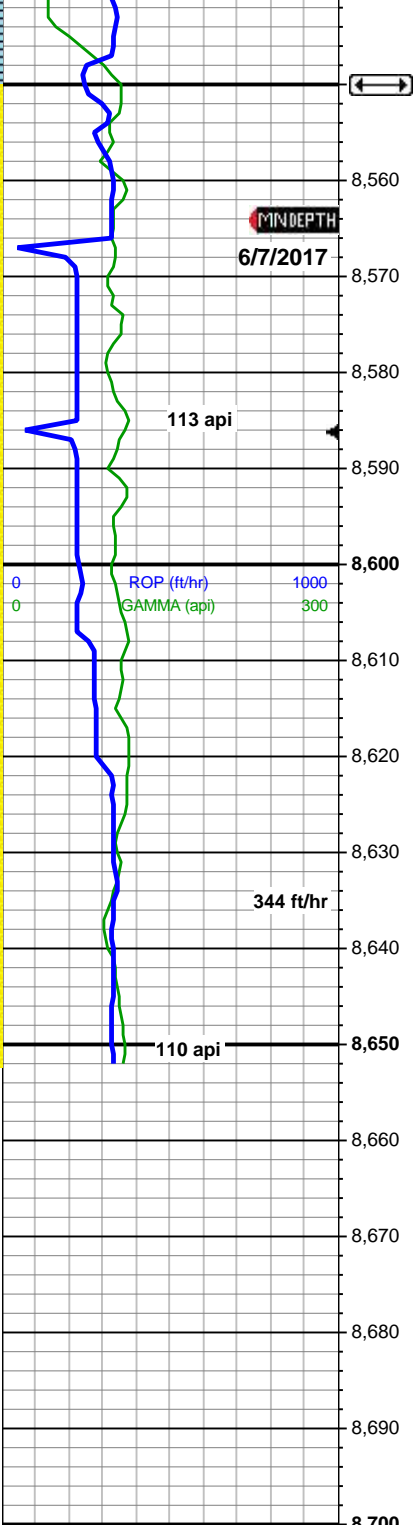
MD: 8,469'
TVD: 7,806.8'
Inclination: 71.68°
Azimuth: 186.59°
VS: 2,675'

75% LS: beige-crm-tn-bf, mod
sft-occ frm, brit, sb plty-sb blky,
occ plty-fis, sm tex, occ sl gritty
xlam slt, micxln, v calc; 25%
MRLST: med-dk gy, frm, sb
blky-sb plty, slty, mot-stri tex, v sl
calc

MW 9.8 / VIS 50 IN
MW 9.75 / VIS 51 OUT

2287u
C1: 79.0%
C2: 13.3%
C3: 4.0%
C4: 3.6%

100% LS: beige-crm-tn-bf, mod
sft-occ frm, brit, sb plty-sb blky,



slt-occ thin, bnt, sb plty-sb blk, occ plty-fis, sm tex, occ sl gritty xlam slt, micxln, v calc

Codell Top
8550' MD / 7827' TVD

MD: 8,562'
TVD: 7,829.6'
Inclination: 79.91°
Azimuth: 185.71°
VS: 2,764.26'

100% SS: gy-dk gy, sft-mod hd, v f gr, sb plty-sb blk, fr srt, fr por, calc cmt, tr slty incl ip

MW 9.9 / VIS 50 IN
MW 9.8 / VIS 50 OUT

100% SS: gy-dk gy, sft-mod hd, v f gr, sb plty-sb blk, fr srt, fr por, calc cmt, v sl tr slty incl ip

Projection to Bit
00:48 MDT - 06/07/2017

MD: 8,652'
TVD: 7,837.37'
Inclination: 90.18°
Azimuth: 184.58°
VS: 2,852.75'

Thank you for using Terra Guidance LLC.