

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Rohn State LD10-63-1HN

Location SESE SEC 9 T9N R58W

State COLORADO

County WELD

Country USA

Rig Number H&P 273

API Number 05-123-37623

Field WILDCAT

Region DJ BASIN

Drilling Completed 10/16/2014

Spud Date 10/15/2014

Surface Coordinates 848' FSL; 330' FEL

Bottom Hole Coordinates 990' FFSLL; 660' FFELL

Ground Elevation 4719'

K.B. Elevation 4743'

Logged Interval 1220' To 4880'

Total Depth 4880'

Formation NIOBRARA

Type of Drilling Fluid LSND

Other Symbols

Oil Show

- DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

Porosity

- E EARTHY
- F FENESTRAL
- F FRACTURE
- X INTERCRYSTALLINE
- Q 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

Rounding

- ANGULAR
- ROUNDED
- SUBANG
- SUBRND

Textures

- BOUNDSTONE
- CHALKY
- CRYPTOXLN

- WIRELINE TESTED - LEFT
- WIRELINE TESTED - RT
- 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
- BELEMNITE
- BIOCLASTIC
- BRACHIOPOD

F FOSSIL

- GASTROPOD
- INOCERAMUS
- OOLITE
- OSTRACOD
- PELECYPOD
- PELLET

ANHYDRITIC

- ARGILLACEOUS
- ARGILLITE GRAIN
- BENTONITE
- BITUMENOUS SUBSTANCE
- BRECCIA FRAGMENTS
- CAI CARFOUS

FERRUGINOUS

- GLAUCONITE
- GYPSIFEROUS
- HEAVY MINERAL
- KAOLIN
- MARLSTONE
- MINERAL CRYSTALS

TUFFACEOUS

Stringer

- ANHYDRITE STRINGER
- BENTONITE STRINGER
- COAL STRINGER
- DOLOMITE STRINGER

↑ BRYOZOA
🐙 CEPHALOPOD
🪸 CORAL
🪼 CRINOID
🐚 ECHINOID
🐟 FISH
🔍 FORAMINIFERA

🔍 PISOLITE
🌿 PLANT REMAINS
🍄 PLANT SPORES
🐚 SCAPHOPOD
🪸 STROMATOPOROID

Minerals

■ CARBONACEOUS FLAKES
▲ CHTDK
▲ CHTLT
— COAL - THIN BEDS
🔍 DOLOMITIC
+ FELDSPAR
● FERRUGINOUS PELLET

🔍 NODULES
● PHOSPHATE PELLETS
🔍 PYRITE
🔍 SALT CAST
· SANDY
🔍 SILICEOUS
· SILTY

🔍 GYPSUM STRINGER
🔍 LIMESTONE STRINGER
🔍 MARLSTONE (CALC) STRG
🔍 MARLSTONE (DOL) STRG
🔍 SANDSTONE STRINGER
— SHALE STRINGER
🔍 SILTSTONE STRINGER

Rock Types

🔍 UNKNOWN
🔍 CHALK
🔍 MARLSTONE
🔍 SANDSTONE
🔍 SHALY SANDSTONE
🔍 SILTY SHALE
🔍 ANHYDRITE
🔍 BENTONITE
🔍 BRECCIA

🔍 CEMENT
🔍 CHERT
🔍 CLAY CHOKE SAND
🔍 CLAYSTONE
🔍 COAL
🔍 CONGLOMERATE
🔍 DOLOMITE
🔍 GRANITE
🔍 GYPSUM

🔍 IGNEOUS
🔍 LIMESTONE
🔍 SIDERITE or LIMONITE
🔍 METAMORPHIC
X X X X X X NO SAMPLE
🔍 SALT
🔍 SALT- PEPPER SAND
🔍 SHALE
🔍 SHALE COLORED

🔍 SHALE GRAY
🔍 SHALY SILTSTONE
🔍 SILTSTONE
🔍 TILL
🔍 TUFF
🔍 WELDED TUFF

Operator

Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Other

Wellsite Geologist #1 Laura Kellogg

Wellsite Geologist #2 Nick Kopiasz

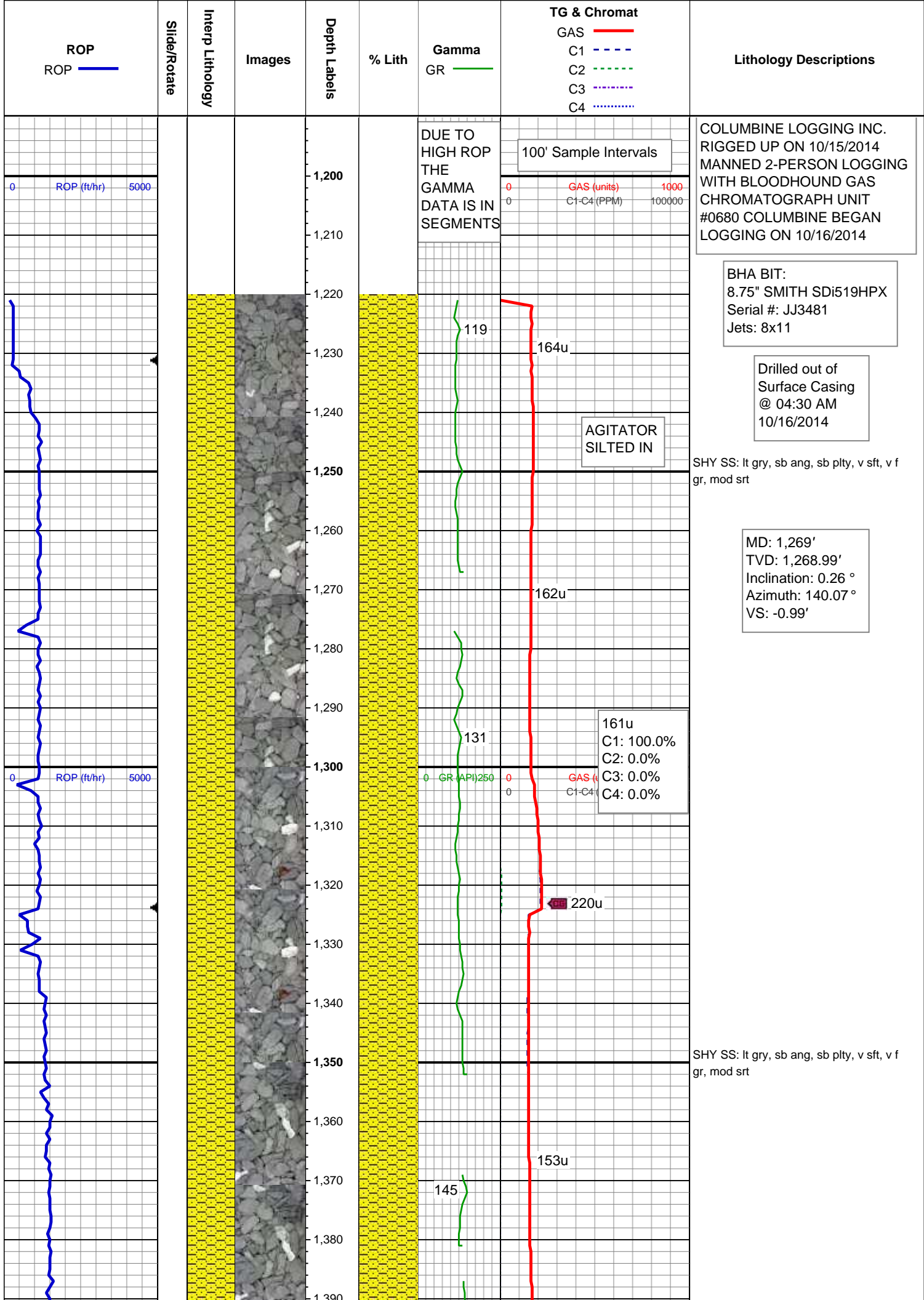
Wellsite Geological Services Provided By Columbine Logging Inc.

Geologist

Name RENEE CLACKER

Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202



DUE TO
HIGH ROP
THE
GAMMA
DATA IS IN
SEGMENTS

COLUMBINE LOGGING INC.
RIGGED UP ON 10/15/2014
MANNED 2-PERSON LOGGING
WITH BLOODHOUND GAS
CHROMATOGRAPH UNIT
#0680 COLUMBINE BEGAN
LOGGING ON 10/16/2014

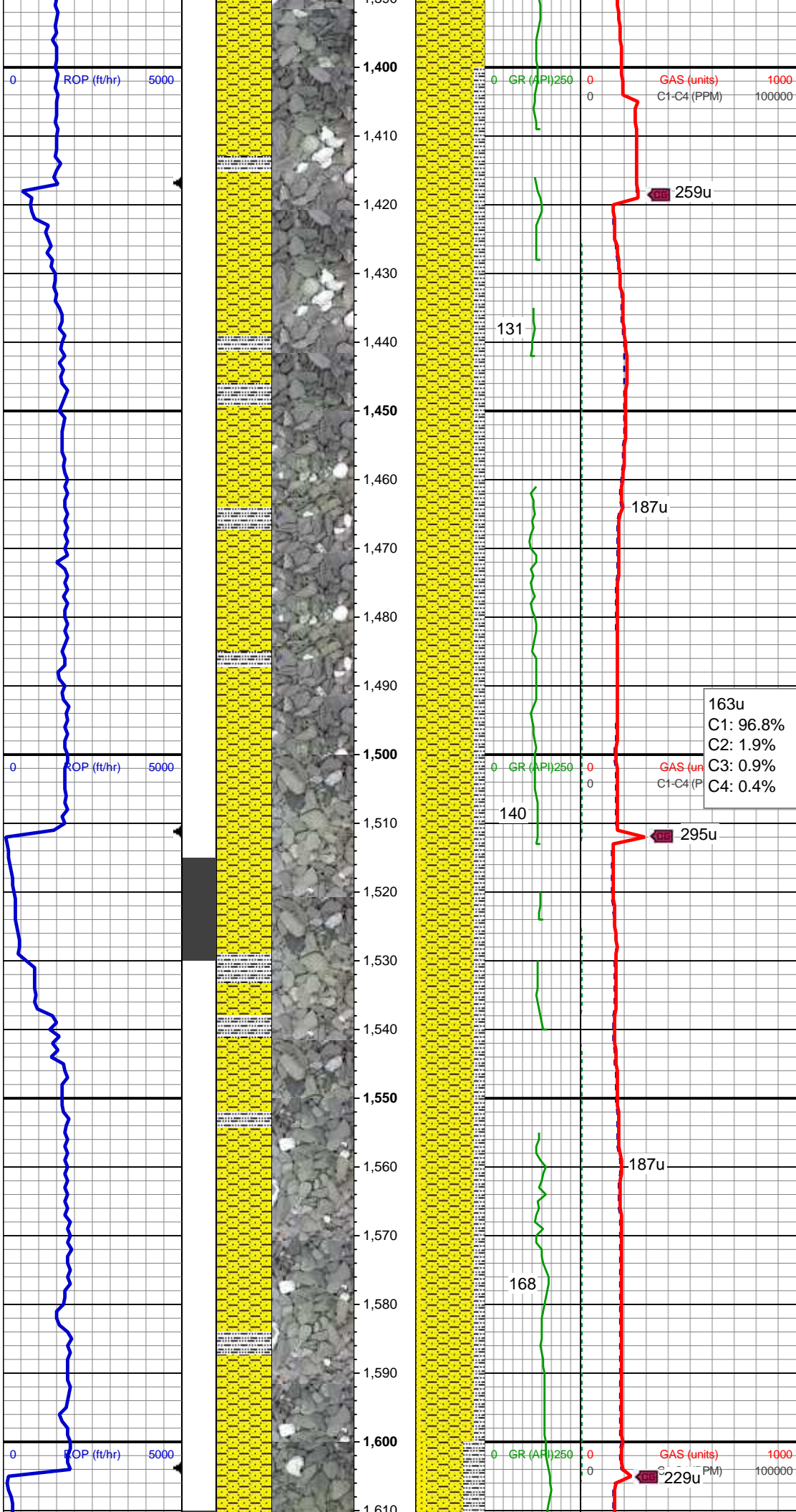
BHA BIT:
8.75" SMITH SDi519HPX
Serial #: JJ3481
Jets: 8x11

Drilled out of
Surface Casing
@ 04:30 AM
10/16/2014

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt

MD: 1,269'
TVD: 1,268.99'
Inclination: 0.26 °
Azimuth: 140.07 °
VS: -0.99'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt



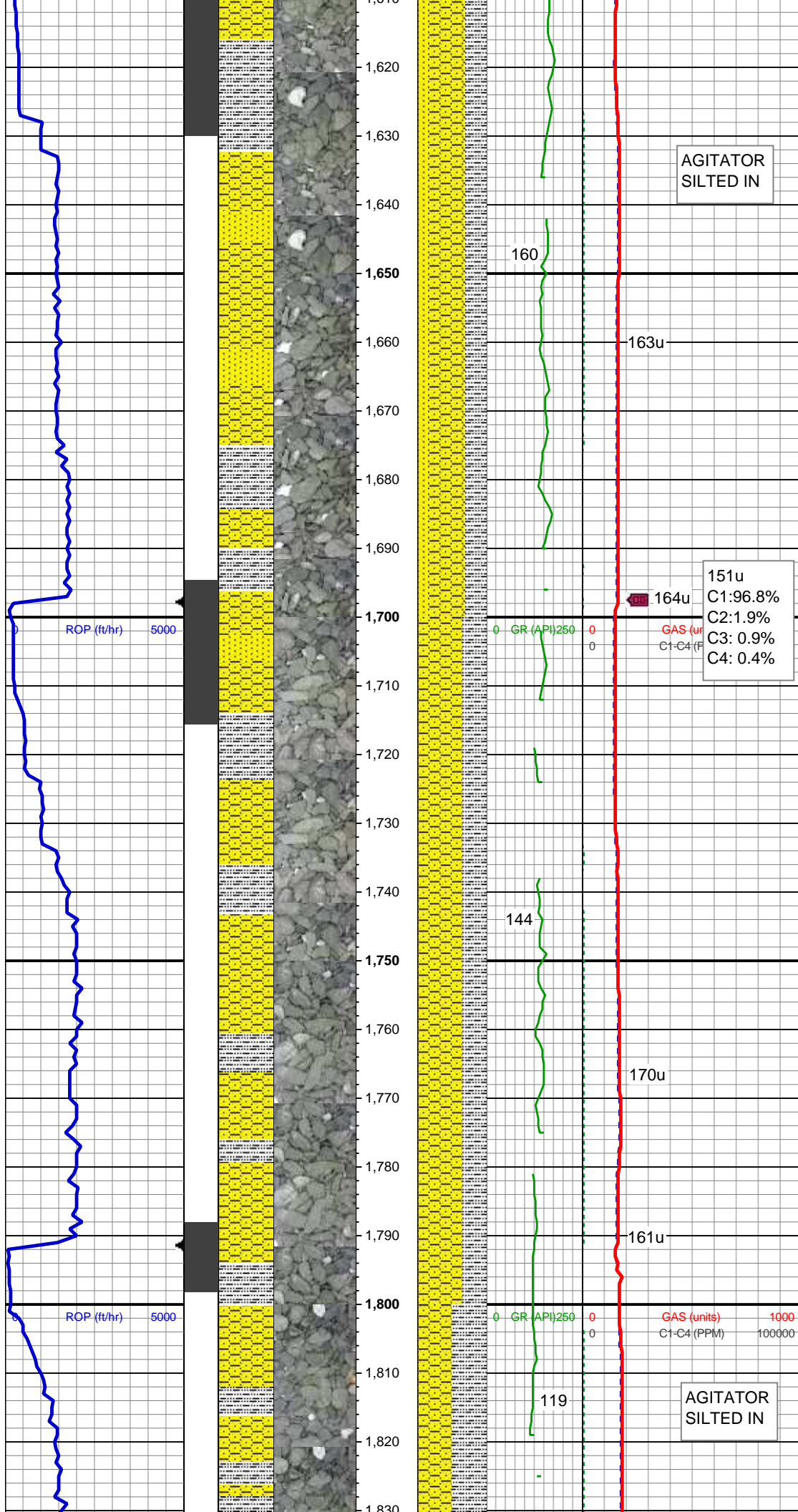
SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sfty tex

MD: 1,454'
TVD: 1,453.99'
Inclination: 0.22 °
Azimuth: 114.14 °
VS: -0.43'

163u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

MD: 1,547'
TVD: 1,546.97'
Inclination: 1.92 °
Azimuth: 56.16 °
VS: 1.07'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sfty tex
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frn, mod-w srt, sl calc cmt



MD: 1,639'
TVD: 1,638.84'
Inclination: 4.11 °
Azimuth: 45.23 °
VS: 4.86'

SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt
SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex
SS: clr, lt gry-wht, occ sap, sb rnd, f gr, hrd-frn, mod-w srt, sl calc cmt

WT IN 8.50/ OUT 8.50
VIS IN 29/ OUT 29

MD: 1,732'
TVD: 1,731.51'
Inclination: 5.55 °
Azimuth: 42.06 °
VS: 10.54'

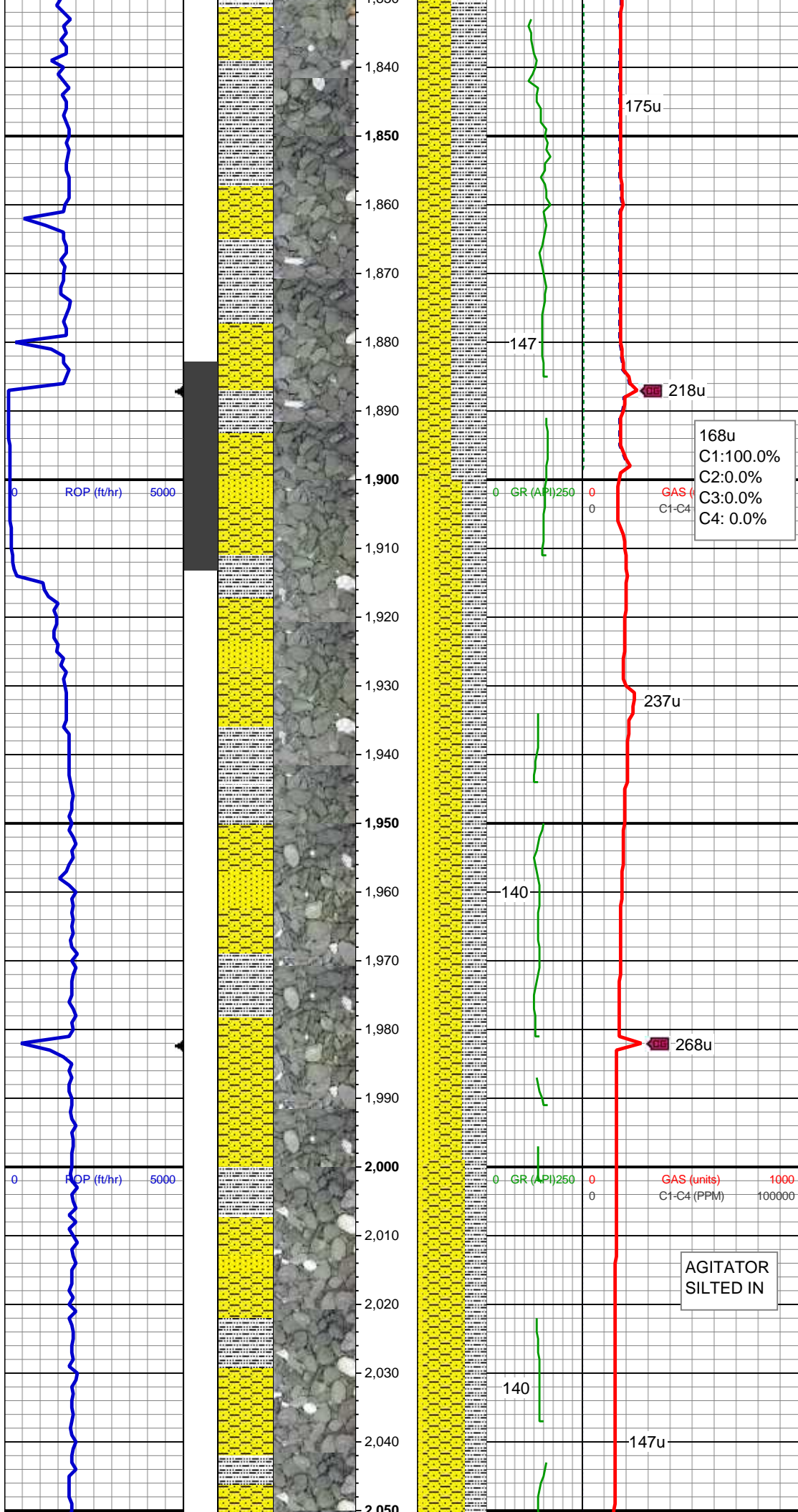
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt
SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex

MD: 1,827'
TVD: 1,826.04'
Inclination: 5.9 °
Azimuth: 49.29 °

AGITATOR
SILTED IN

151u
C1:96.8%
C2:1.9%
C3: 0.9%
C4: 0.4%

AGITATOR
SILTED IN



VS: 17.66'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sly tex

168u
C1:100.0%
C2:0.0%
C3:0.0%
C4: 0.0%

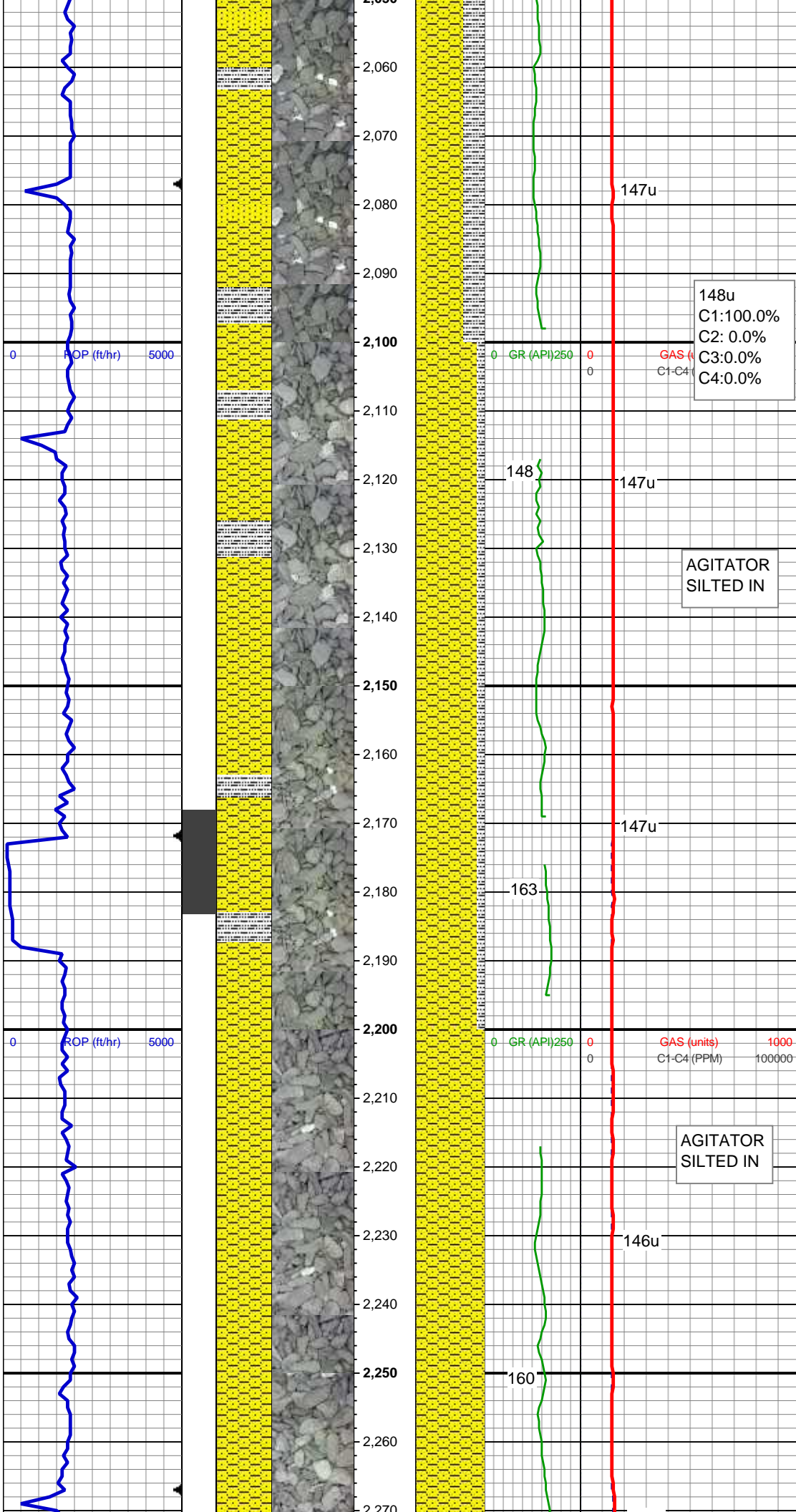
MD: 1,922'
TVD: 1,920.32'
Inclination: 8.16 °
Azimuth: 49.73 °
VS: 26.9'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sly tex
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frn, mod-w srt, sl calc cmt

AGITATOR
SILTED IN

MD: 2,017'
TVD: 2,014.39'
Inclination: 7.87 °
Azimuth: 49.47 °
VS: 37.44'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,

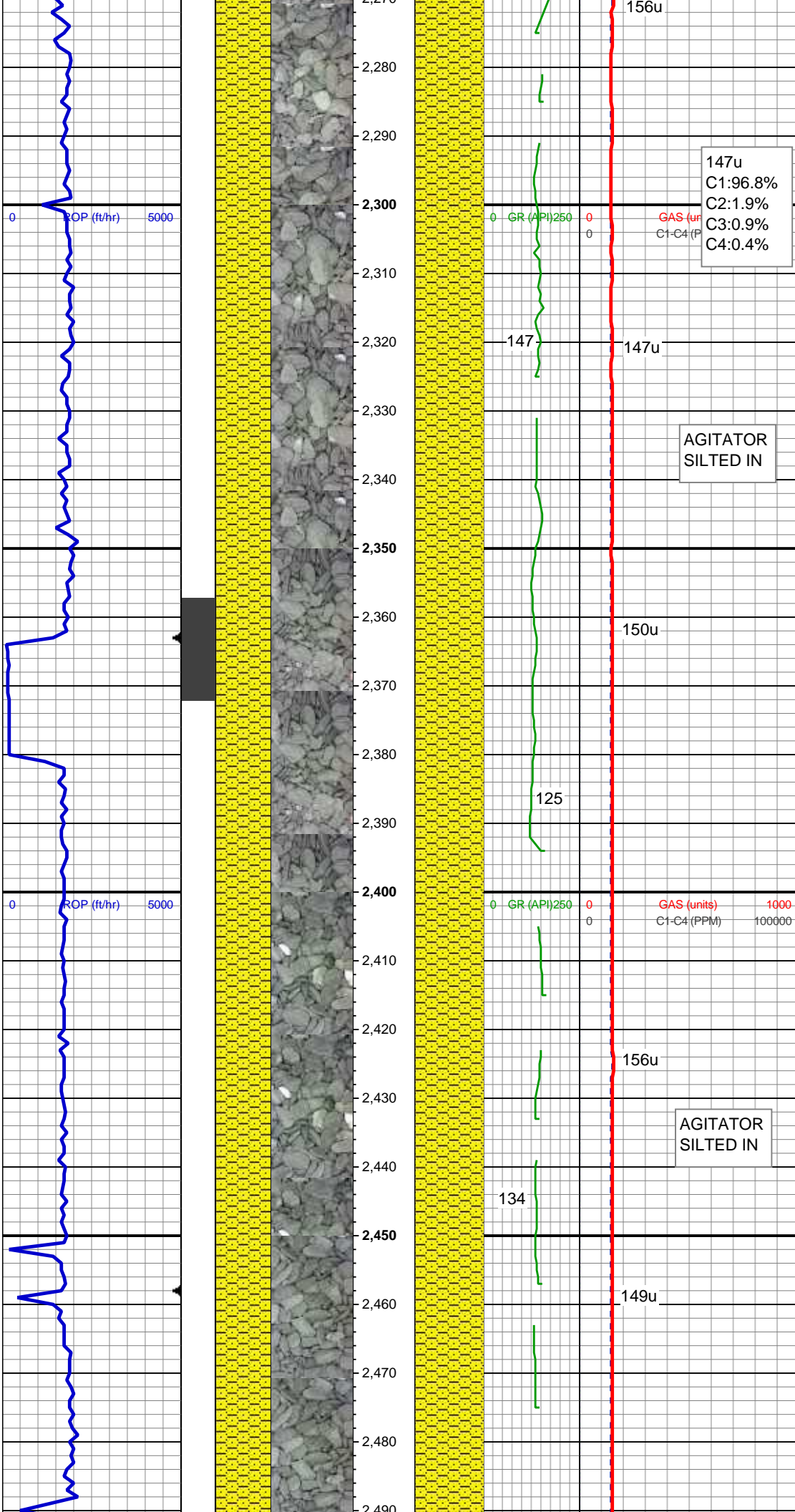


slty tex
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frn, mod-w srt, sl calc cmt

MD: 2,112'
TVD: 2,108.58'
Inclination: 7.16 °
Azimuth: 48.9°
VS: 47.27'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
slty tex
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frn, mod-w srt, sl calc cmt

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag



147u
C1:96.8%
C2:1.9%
C3:0.9%
C4:0.4%

MD: 2,301'
TVD: 2,296.04'
Inclination: 7.46 °
Azimuth: 49.29 °
VS: 66.27'

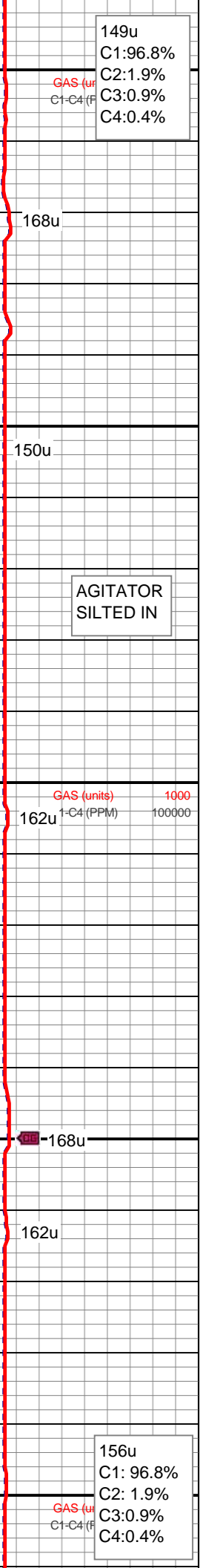
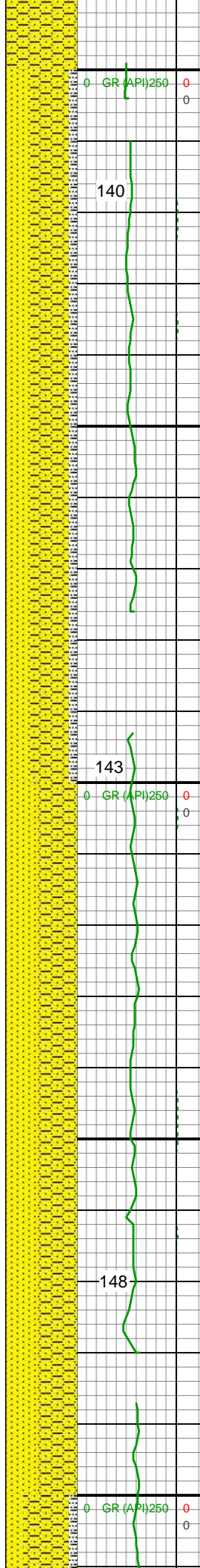
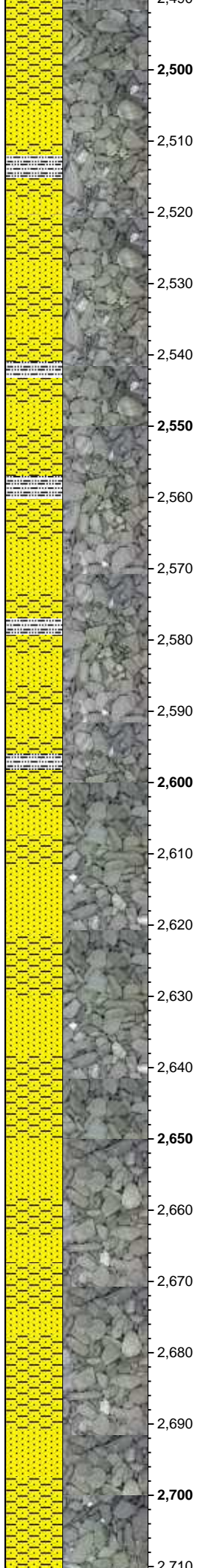
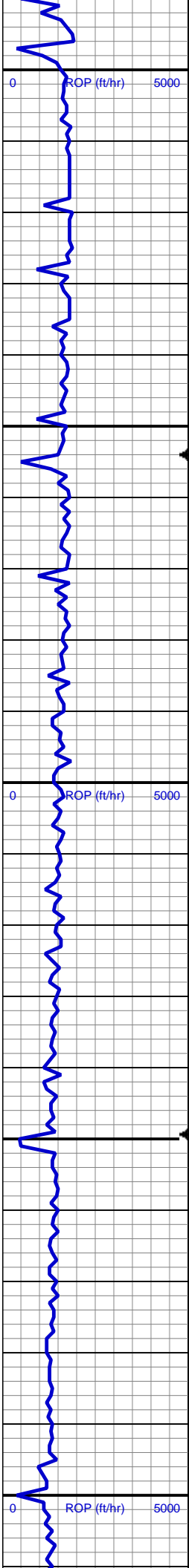
SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag

AGITATOR
SILTED IN

AGITATOR
SILTED IN

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag

MD: 2,491'
TVD: 2,484.88'



149u
C1:96.8%
C2:1.9%
C3:0.9%
C4:0.4%

168u

150u

AGITATOR
SILTED IN

143

162u

168u

162u

148

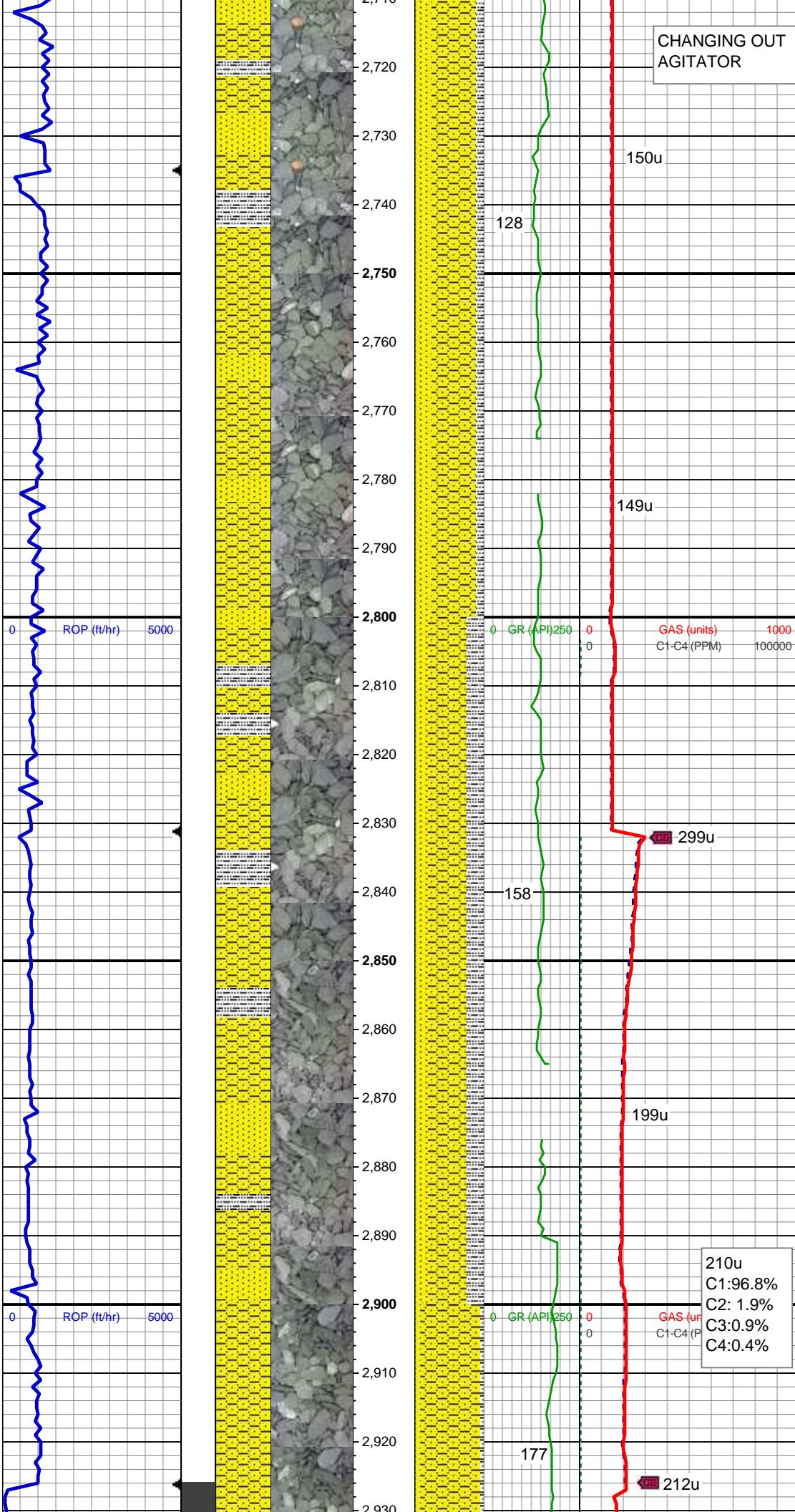
156u
C1: 96.8%
C2: 1.9%
C3:0.9%
C4:0.4%

MD: 2,586'
TVD: 2,578.22'
Inclination: 8.33 °
Azimuth: 45.49 °
VS: 96.96'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frn, mod-w srt, sl calc cmt
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sly tex

MD: 2,681'
TVD: 2,672.28'
Inclination: 7.87 °
Azimuth: 43.34 °
VS: 106.83'

WT IN 8.90/ OUT 8.90
VIS IN 28/ OUT 28



CHANGING OUT
AGITATOR

150u

128

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frn, mod-w srt, sl calc cmt
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sly tex

MD: 2,776'
TVD: 2,766.42'
Inclination: 7.52 °
Azimuth: 40.38 °
VS: 115.83'

149u

0 ROP (ft/hr) 5000

0 GR (API) 250

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

0 ROP (ft/hr) 5000

0 GR (API) 250

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

210u
C1:96.8%
C2: 1.9%
C3:0.9%
C4:0.4%

158

299u

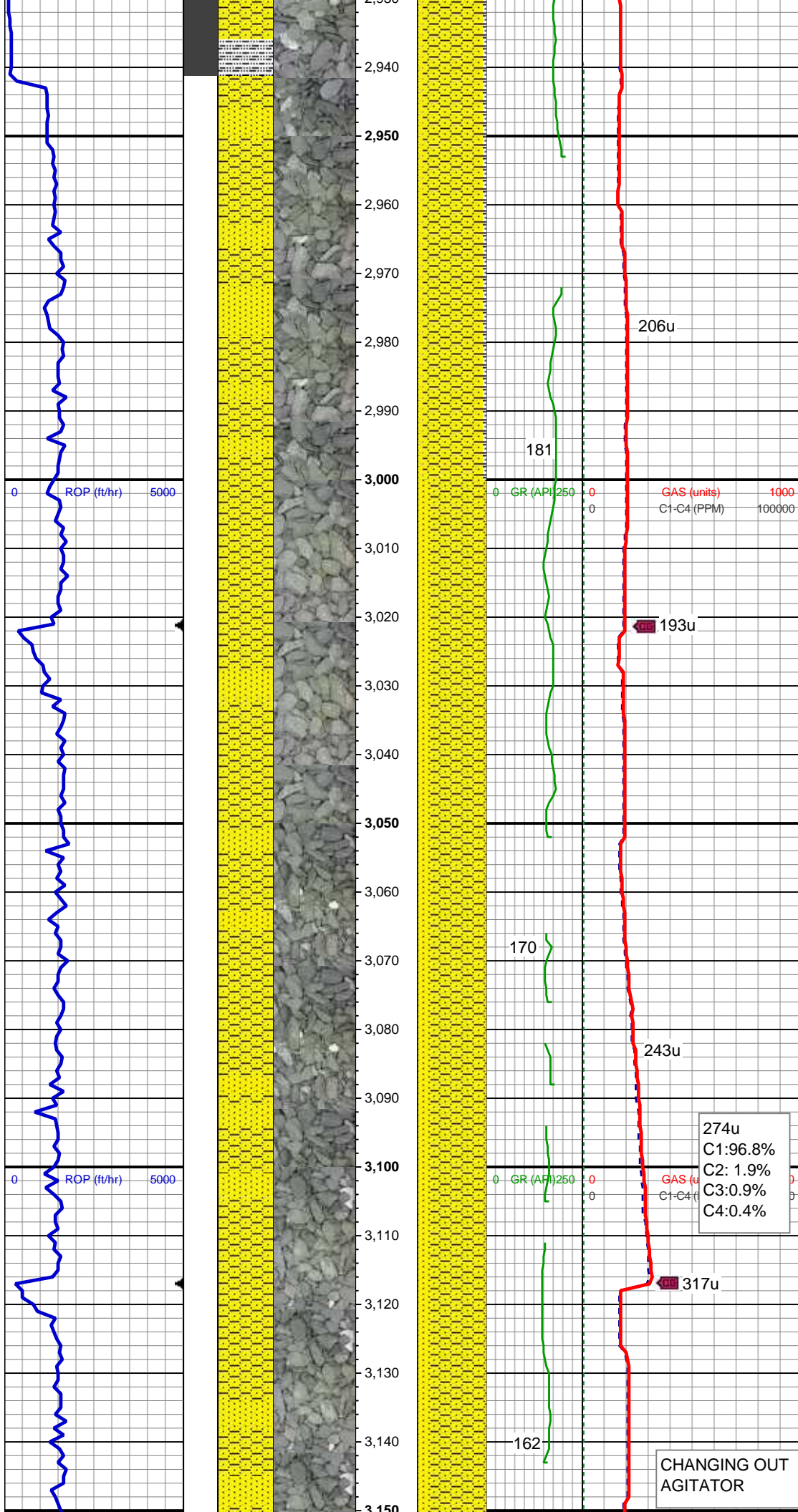
SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sly tex
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frn, mod-w srt, sl calc cmt

MD: 2,871'
TVD: 2,860.63'
Inclination: 7.23 °
Azimuth: 37.76 °
VS: 124.02'

199u

177

212u



SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd frm, mod-w srt, sl calc cmt
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sly tex

MD: 2,965'
TVD: 2,953.94'
Inclination: 6.78 °
Azimuth: 46.71 °
VS: 132.13'

WT IN 9.20/ OUT 9.20
VIS IN 33/ OUT 33

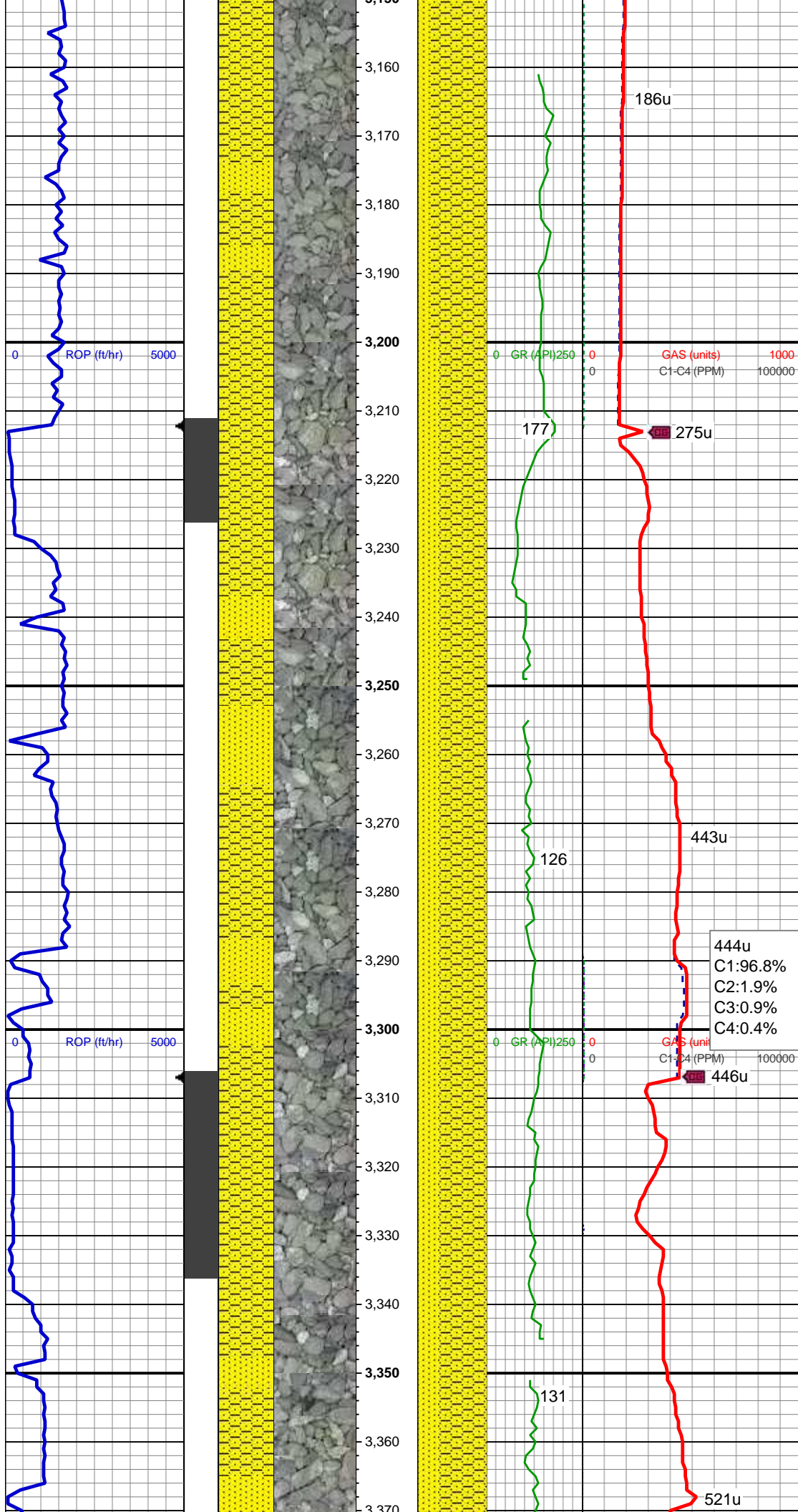
SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd frm, mod-w srt, sl calc cmt

MD: 3,060'
TVD: 3,048.33'
Inclination: 6.17 °
Azimuth: 42.28 °
VS: 140.05'

274u
C1:96.8%
C2: 1.9%
C3:0.9%
C4:0.4%

CHANGING OUT
AGITATOR

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt



SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frn, mod-w srt, sl calc cmt

MD: 3,155'
TVD: 3,142.78'
Inclination: 6.19 °
Azimuth: 40.53 °
VS: 147.23'

MD: 3,250'
TVD: 3,237.35'
Inclination: 4.7 °
Azimuth: 48.64 °
VS: 153.82'

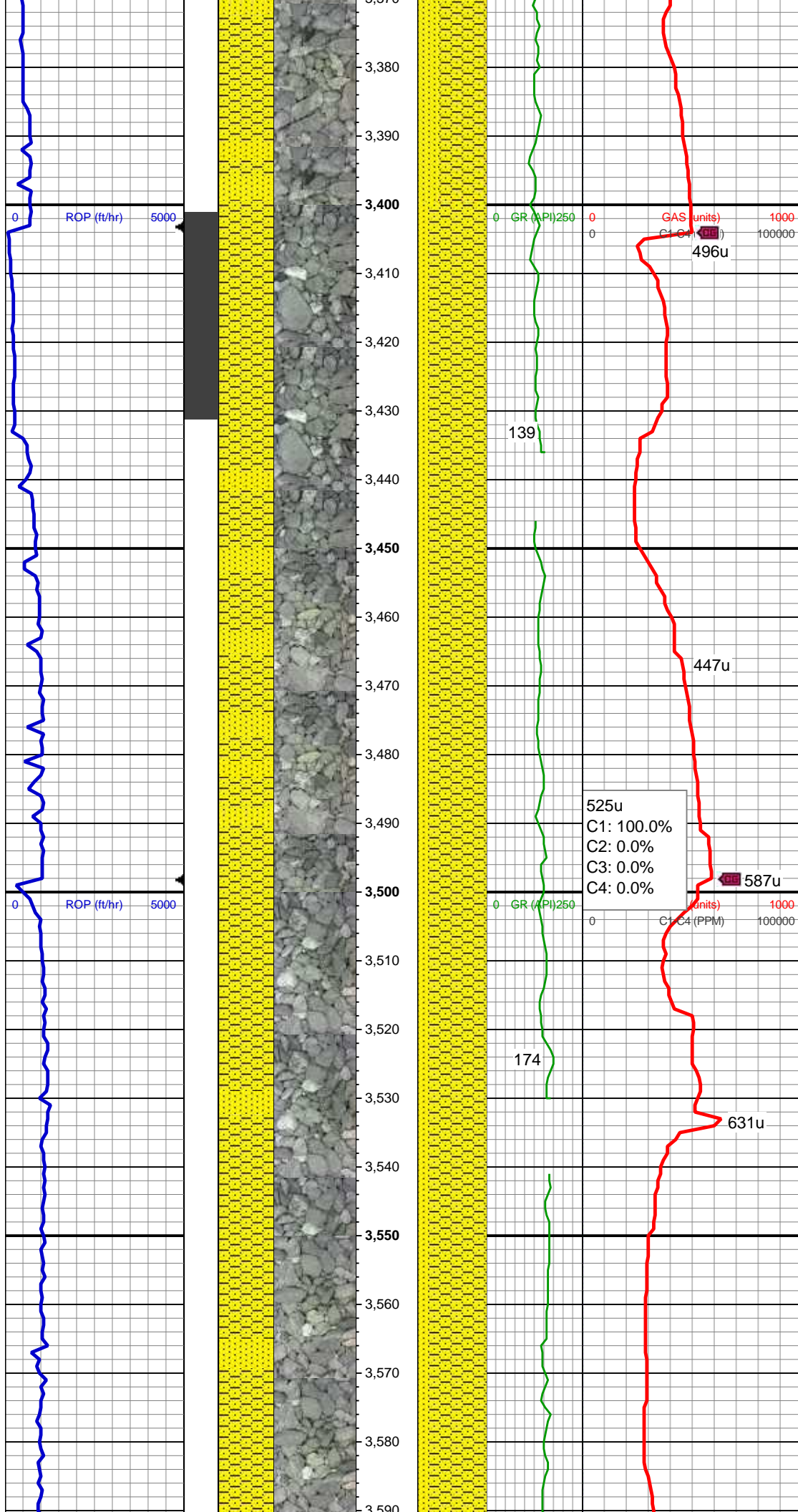
SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frn, mod-w srt, sl calc cmt, tr glauc

444u
C1:96.8%
C2:1.9%
C3:0.9%
C4:0.4%

MD: 3,345'
TVD: 3,332.14'
Inclination: 2.75 °
Azimuth: 45.09 °
VS: 158.57'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frn, mod-w srt, sl calc cmt, tr glauc

WT IN 9.30/ OUT 9.30
VIS IN 34/ OUT 34



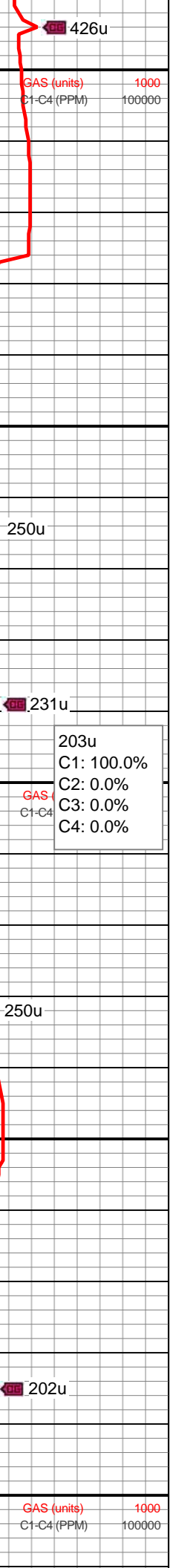
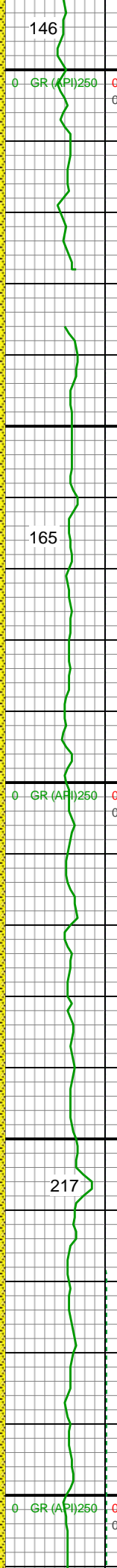
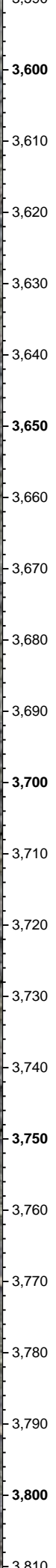
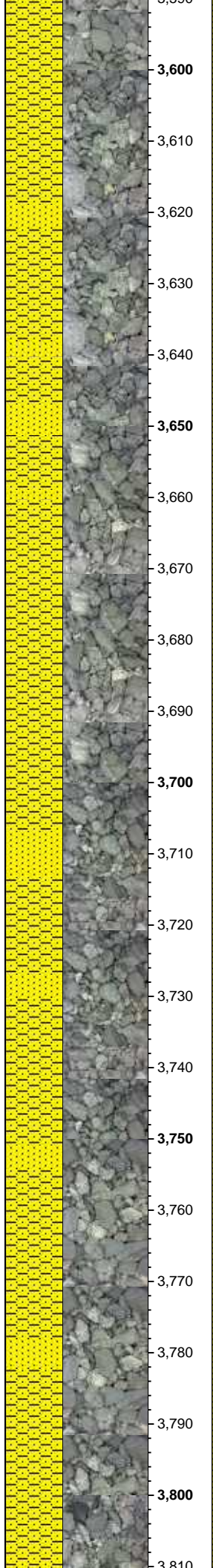
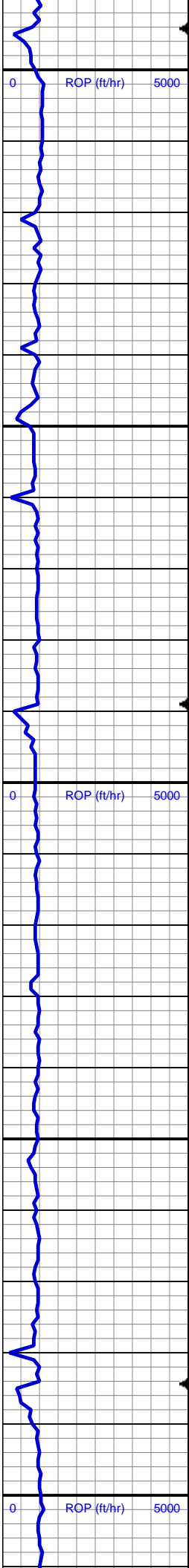
MD: 3,440'
TVD: 3,427.09'
Inclination: 0.96 °
Azimuth: 33.54 °
VS: 160.74'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frm, mod-w srt, sl calc cmt, tr glauc

525u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

MD: 3,534'
TVD: 3,521.07'
Inclination: 1.32 °
Azimuth: 26.66 °
VS: 161.75'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frm, mod-w srt, sl calc cmt, tr glauc



MD: 3,629'
TVD: 3,616.05'
Inclination: 1.25 °
Azimuth: 22.28 °
VS: 162.73'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frm, mod-w srt, sl calc cmt, tr glauc

203u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

MD: 3,724'
TVD: 3,711.04'
Inclination: 0.59 °
Azimuth: 8.67 °
VS: 163.28'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frm, mod-w srt, sl calc cmt, occ
glauc

146

426u

165

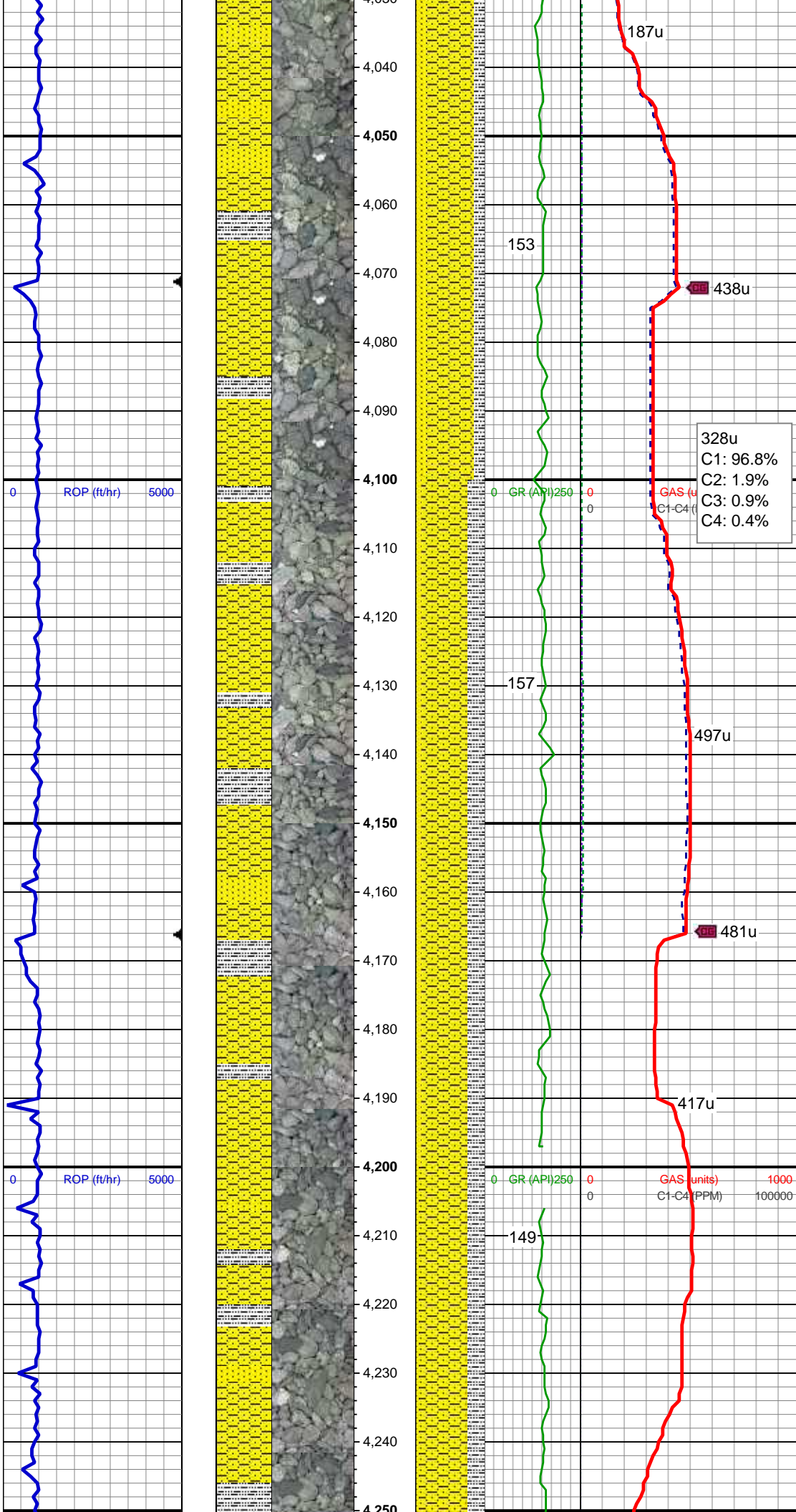
250u

231u

250u

217

202u



SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frn, mod-w srt, sl calc cmt
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
silty tex

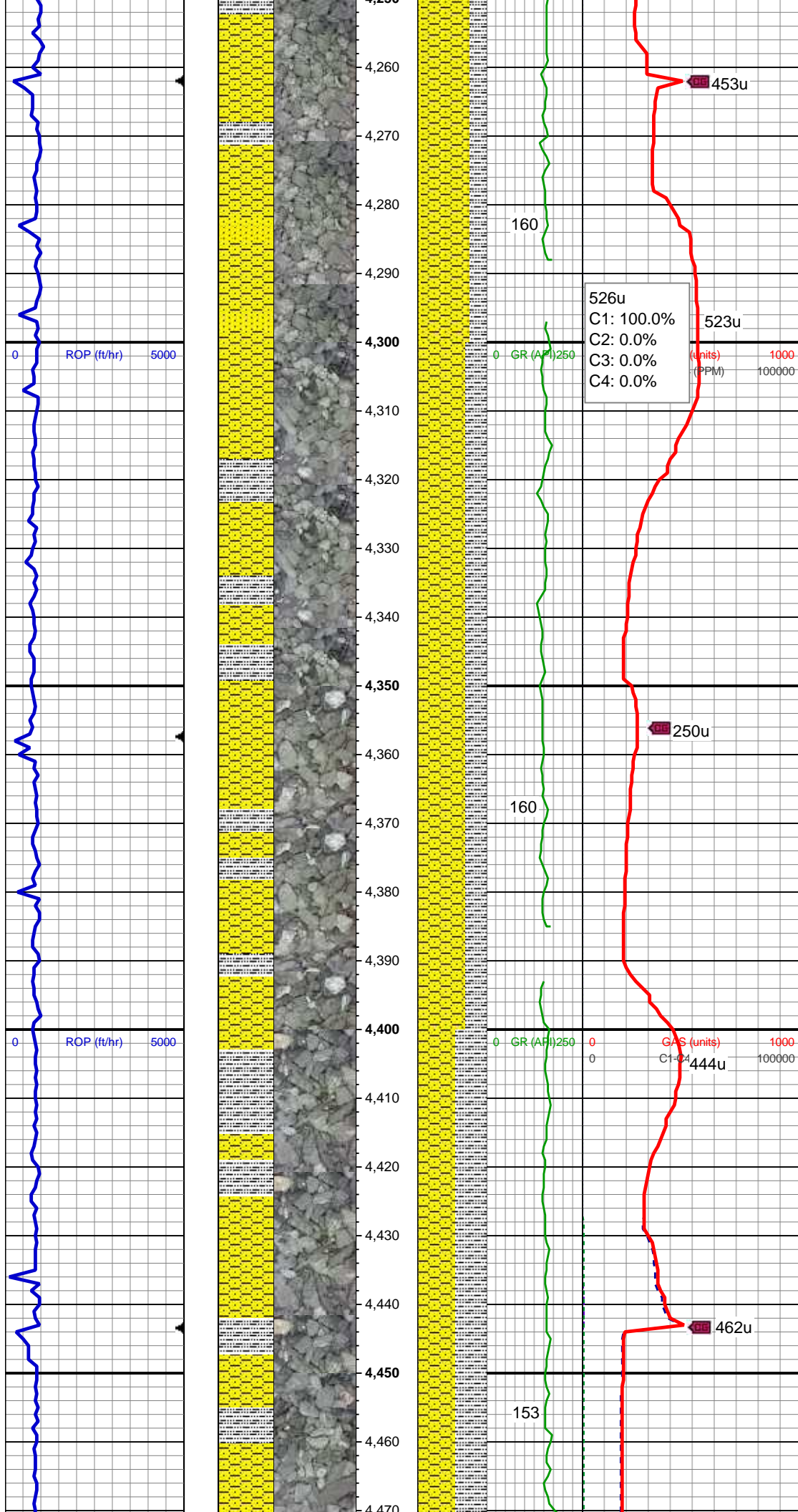
MD: 4,104'
TVD: 4,091.03'
Inclination: 0.28 °
Azimuth: 159.81 °
VS: 163.18'

WT IN 9.60/ OUT 9.60
VIS IN 34/ OUT 34

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
silty tex
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frn, mod-w srt, sl calc cmt

MD: 4,198'
TVD: 4,185.03'
Inclination: 0.29 °
Azimuth: 124.65 °
VS: 163.44'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,



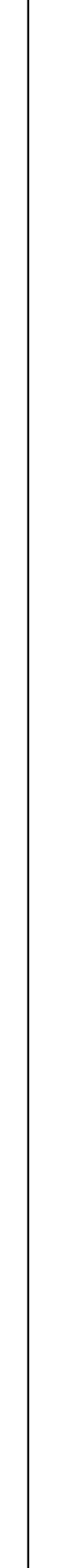
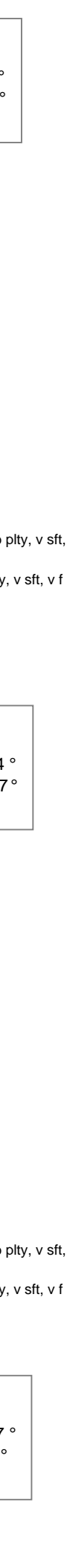
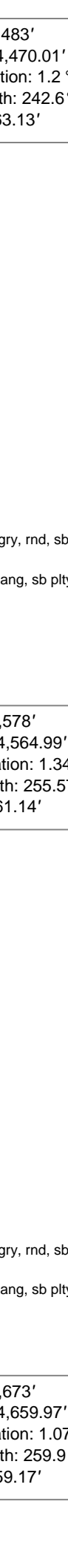
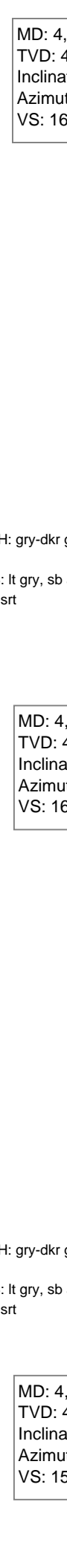
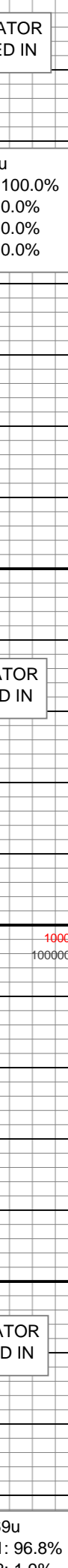
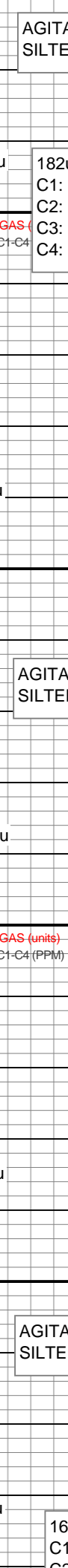
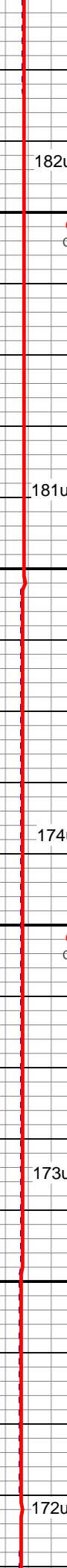
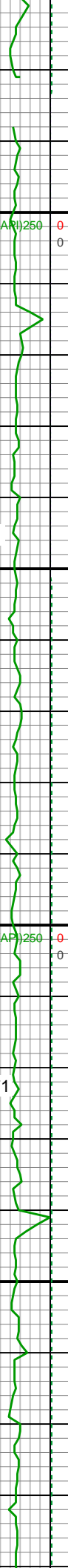
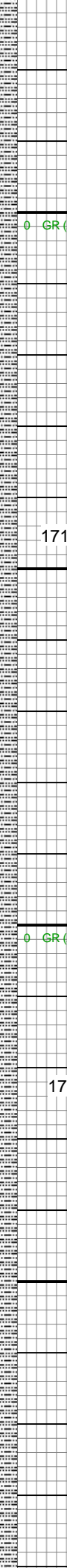
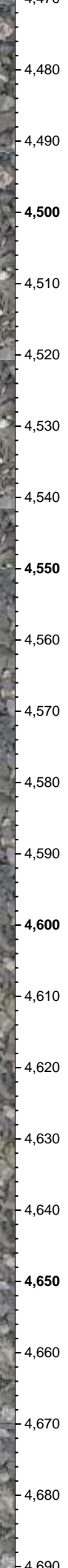
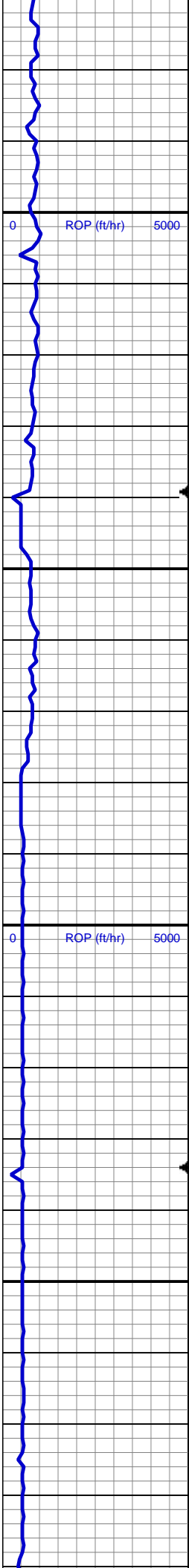
slty tex
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frm, mod-w srt, sl calc cmt

MD: 4,293'
TVD: 4,280.03'
Inclination: 0.39 °
Azimuth: 136.07 °
VS: 163.84'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
slty tex

MD: 4,388'
TVD: 4,375.02'
Inclination: 0.57 °
Azimuth: 177.42 °
VS: 164.04'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
slty tex



AGITATOR
SILTED IN

MD: 4,483'
TVD: 4,470.01'
Inclination: 1.2 °
Azimuth: 242.6 °
VS: 163.13'

182u

182u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

0 GR (API) 250

0

GAS (units)
C1-C4 (PPM)

0

181u

171

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt

AGITATOR
SILTED IN

MD: 4,578'
TVD: 4,564.99'
Inclination: 1.34 °
Azimuth: 255.57 °
VS: 161.14'

174u

0 GR (API) 250

0

GAS (units)
C1-C4 (PPM)

0

1000

100000

171

173u

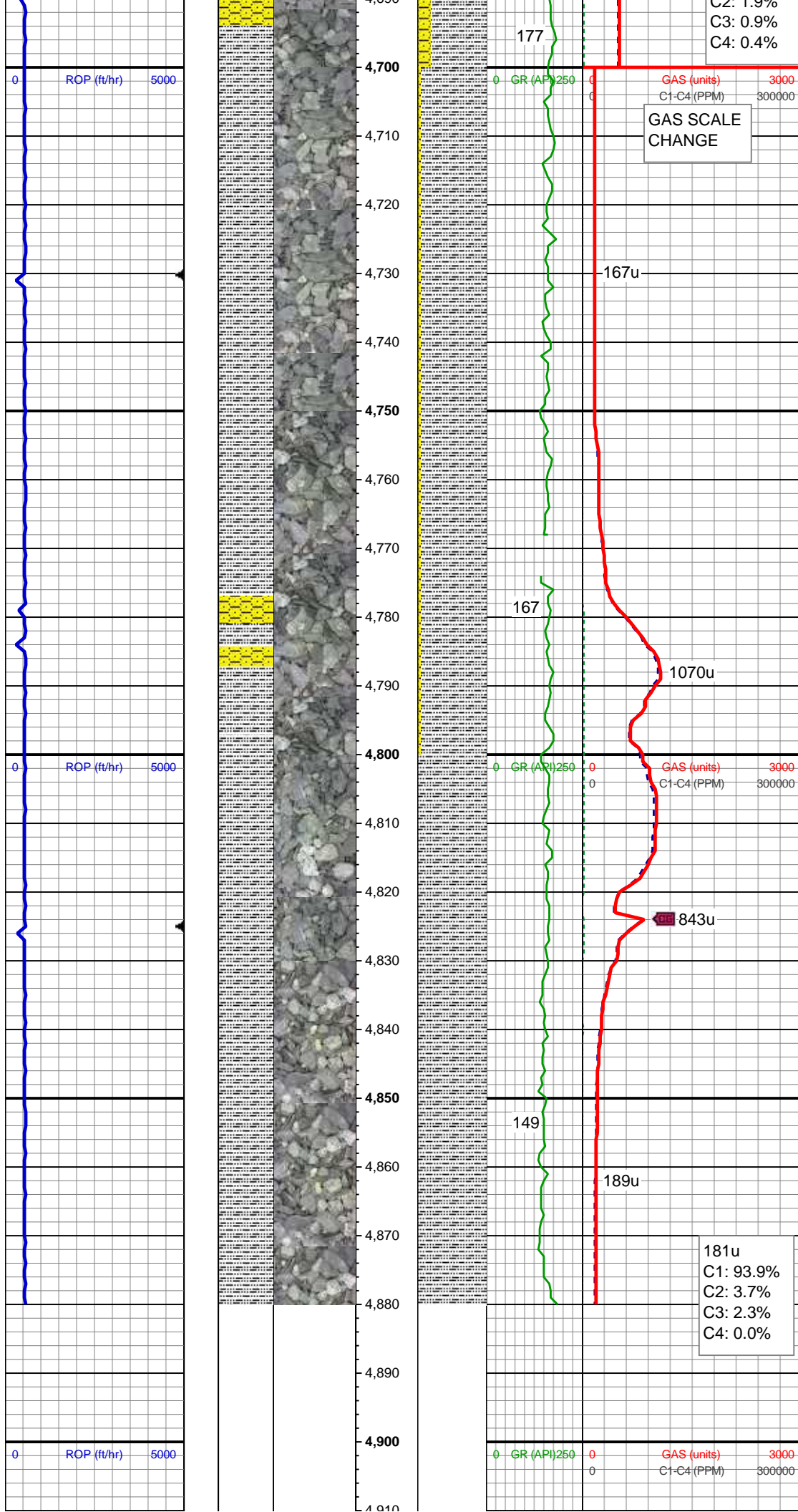
SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt

AGITATOR
SILTED IN

MD: 4,673'
TVD: 4,659.97'
Inclination: 1.07 °
Azimuth: 259.9 °
VS: 159.17'

172u

169u
C1: 96.8%
C2: 1.0%



SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt

MD: 4,767'
TVD: 4,753.96'
Inclination: 0.89 °
Azimuth: 279.04 °
VS: 157.58'

MD: 4,824'
TVD: 4,810.95'
Inclination: 0.55 °
Azimuth: 266.49 °
VS: 156.88'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex

MD: 4,880'
TVD: 4,866.95'
Inclination: 0.55 °
Azimuth: 266.49 °
VS: 156.34'

TD'd VERT @ 4880' MD
10/16/2014 @ 2:09 PM

LOG CONTINUES ON MPLOT
"ROHN STATE LD10-63-1HN
HORZ"