COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name	Booth J 26H
Location	NWNE S26 T7N R65W
State	COLORADO
County	WELD
Country	USA
Rig Number	FRONTIER 8
API Number	05-123-36087
Region	DJ BASIN
Field	WATTENBERG
Surface Coordinates	28' FNL & 2274' FEL
Bottom Hole Coordinates	PROJECTED: 465' FSL & 2064' FEL
Ground Elevation	4892'
K.B. Elevation	4915'
Logged Interval	6000'
Formation	NIOBRARA C CHALK
Type of Drilling Fluid	H2O, LSND

Company BAYSWATER E

Address 730 17th Street
Denver, CO 802

Company BAYSWATER E

Address 730 17th Street
Denver, CO 802

WELLSITE GEOLOGISTS

Operator

EXPLORATION AND PRODUCTION, LLC

, Suite 610
202

Geologist

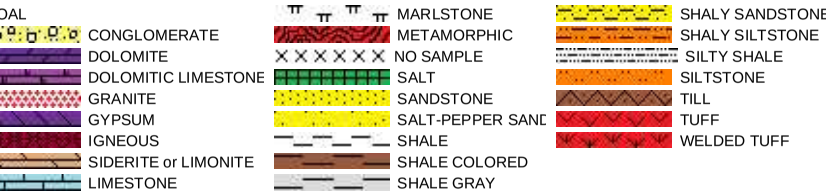
EXPLORATION AND PRODUCTION, LLC

, Suite 610
202

Other

ROBERT DAVIS
NICK BARBER

Rock Types



Accessories

Fossils

ALGAE
AMPHIPORA
BELEMNITE
BIOCLASTIC
BRACHOIPOD
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
MARCASITE
MARLSTONE
MICACEOUS
MINERAL CRYSTALS
NODULES
PHOSPHATE PELLETS
PYRITE
SALT CAST
SANDY
SIDERITE
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
PINPOINT
VUGGY

Engineering

BIT
CONNECTION (UP)
CONNECTION (DOWN)
CONNECTION GAS
CONNECTION GAS (LEFT)
TRIP GAS
TRIP GAS (LEFT)
DOWN TIME GAS
DOWN TIME GAS (LEFT)
CORE - LOST
CORE - RECOVERED
DST INTERVAL
FAULT
FORMATION TOP
GAS SHOW
OIL SHOW
MN DEPTH UP
MN DEPTH (DOWN)
NORMAL FAULT
OVERTURNED STRATA
REVERSE FAULT
CASING
SIDEWALL CORE (LEFT)
SIDEWALL CORE (RIGHT)
SLIDE
SURVEY
WIRELINE TESTED - LEFT
WIRELINE TESTED - RT
DRILL STEM TEST
MN DEPTH

Porosity

EARTHY
FENESTRAL
FRACTURE
INTERCRYSTALLINE
INTEROOLITIC
MOLDIC
ORGANIC

Rounding

ANGULAR
ROUNDED
SUBANG
SUBRND

Textures

BOUNDSTONE
CHALKY
CRYPTOXLN
EARTHY
FINELYXLN
GRAINSTONE
LITHOGRAPHIC
MICROXLN
MUDSTONE
PACKSTONE
WACKESTONE

Sorting

MODERATE
POOR
WELL

Slide/Rotate

ROP

ROP

Total Gas & Chromatograph

GAS

C1

C2

C3

C4

Depth Labels

% Lith

Gamma

GR

Well Bore

TVD

Oil Show

Images

400

ROP (ft/hr)

0

80

3000

300000

GAS (units)

C1-C4 (PPM)

0

0

MUD WT: 9.8 / MUD VIS: 49

MUD DATA

MW 9.1

FV 40

PV 14

YP 6

API FL 6.0

pH 9.7

Cl- 500

COLUMBINE LOGGING
RIGGED UP
ON 5/5/2014
MANNED 2-PERSON
LOGGING WITH
BLOODHOUND GAS
CHROMATOGRAPH #0298

1151u

C1: 79.8%

C2: 9.1%

C3: 10.0%

C4: 1.1%

1136u

BG

5,960 5,970 5,980 5,990 **6,000** 6,010 6,020 6,030 6,040 **6,050** 6,060 6,070 6,080 6,090 **6,100** 6,110 6,120 6,130

300

GR (API)

0

144

149

5900

50' Sample Interval

MD: 6,037′
TVD: 6,023.08′
Inclination: 5 °
Azimuth: 25°
VS: -293.58′

MD: 6,133′
TVD: 6,118
Inclination:
Azimuth: 28
VS: -301.16

BEGIN LOGGING F/ 6000' MD @ 22:11 HRS ON 5/5/14

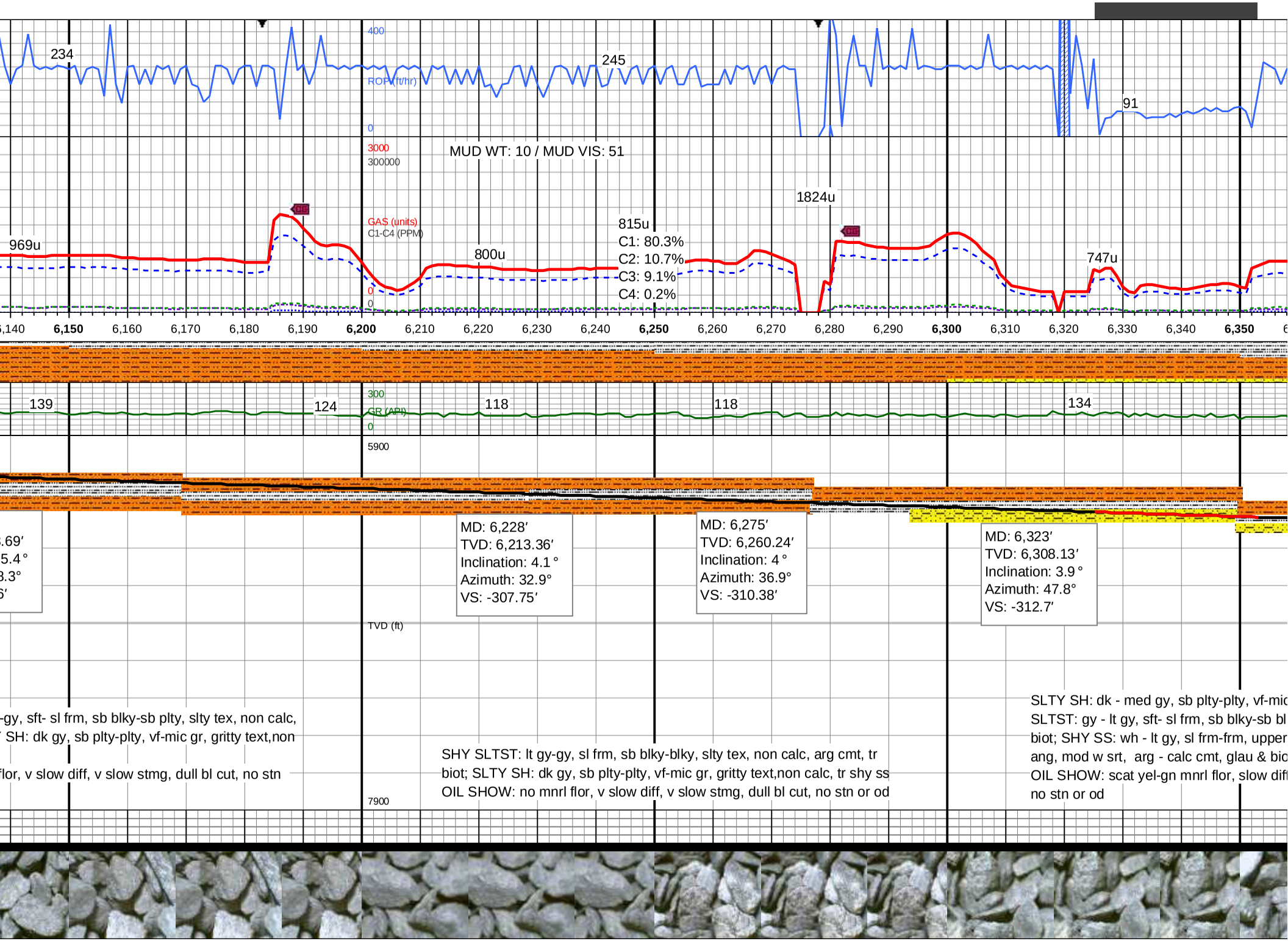
TVD (ft)

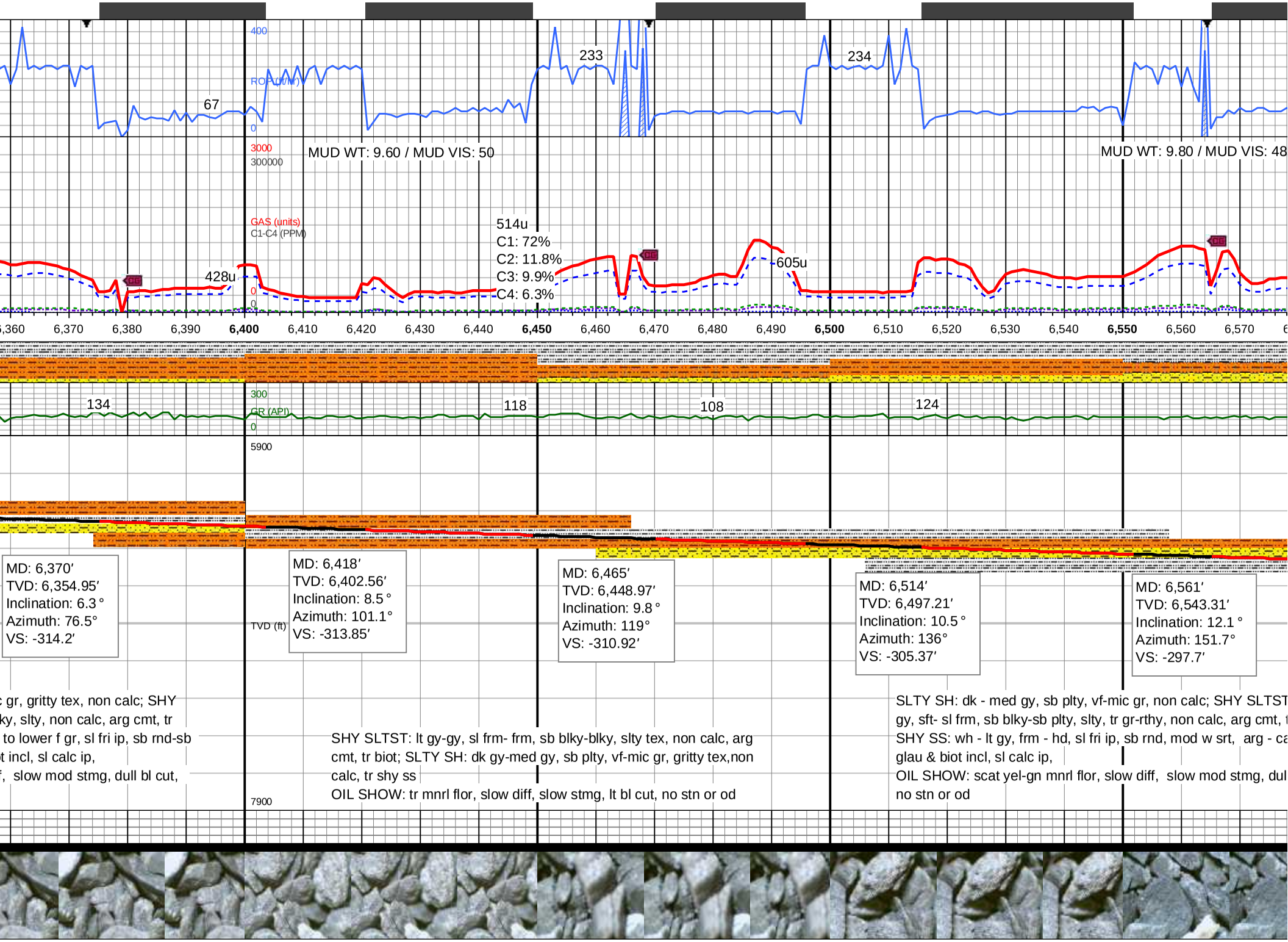
Bit #: 2
Type: SMITH SDI611
Size: 8.75
Depth In: 763′
Jets: 6x14
S/N: JH46556

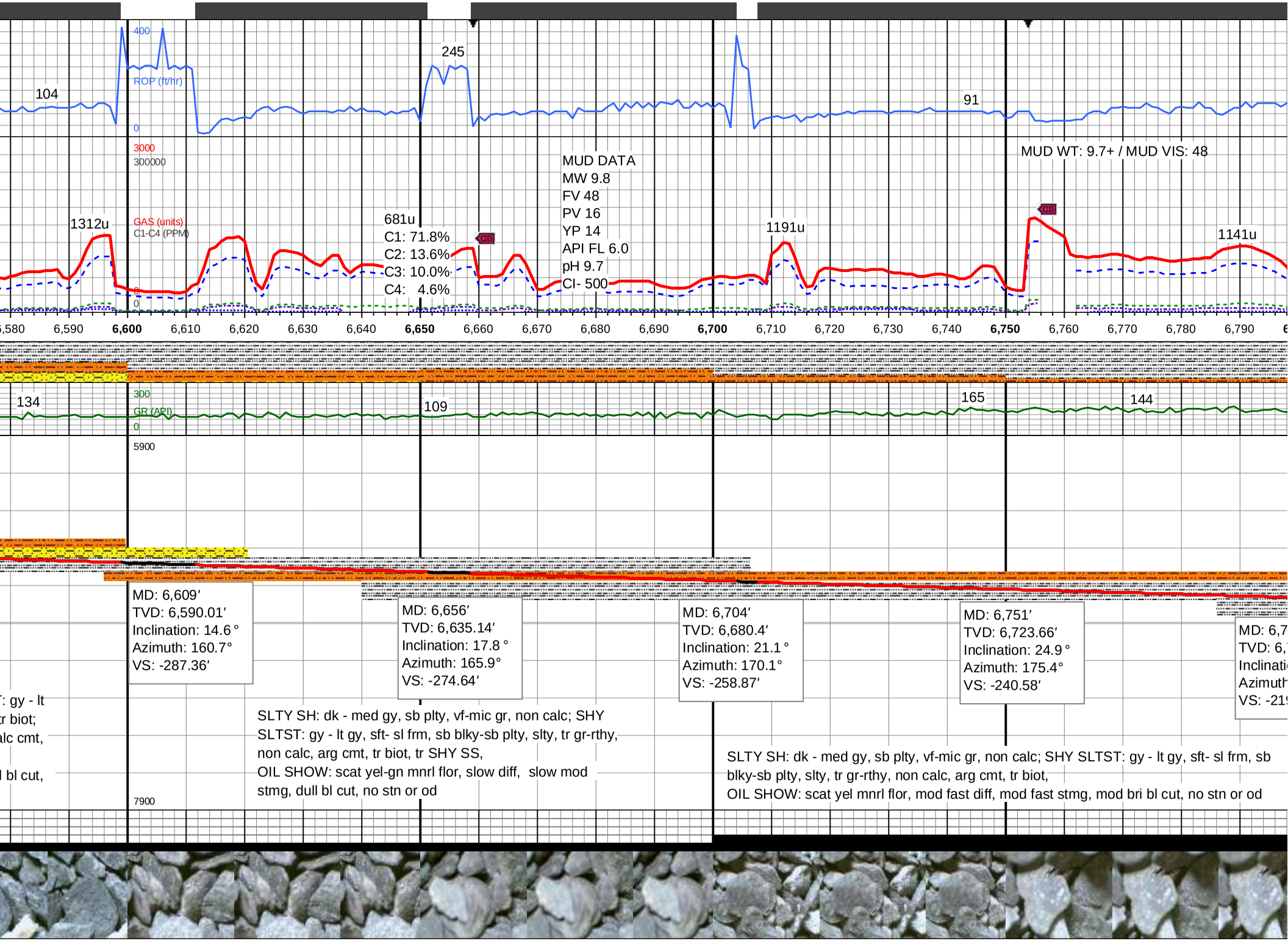
SHY SLTST: gy, occ lt gy - dk gy, sft- sl frm, sb blky-sb plty, slty, tr gr-rthy, non calc, arg cmt, tr biot; SLTY SH: dk gy, sb plty, vf-mic gr, non calc, tr shy ss
OIL SHOW: no mnrl flor, v slow diff, v slow stmg, dull bl cut, no stn or od

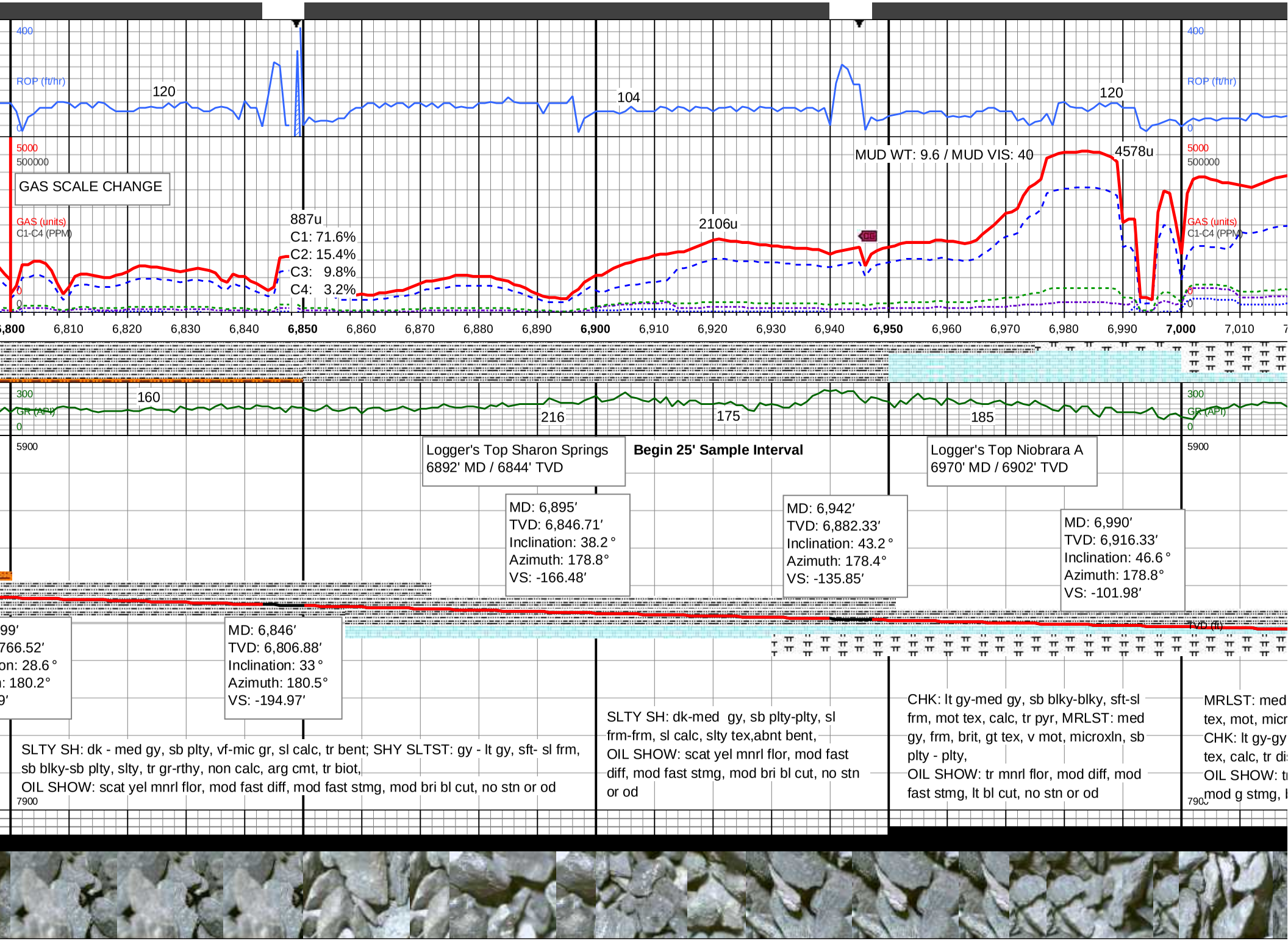
SHY SLTST: med gy
arg cmt, tr biot; SLTY
calc
OIL SHOW: no mnrl f
or od

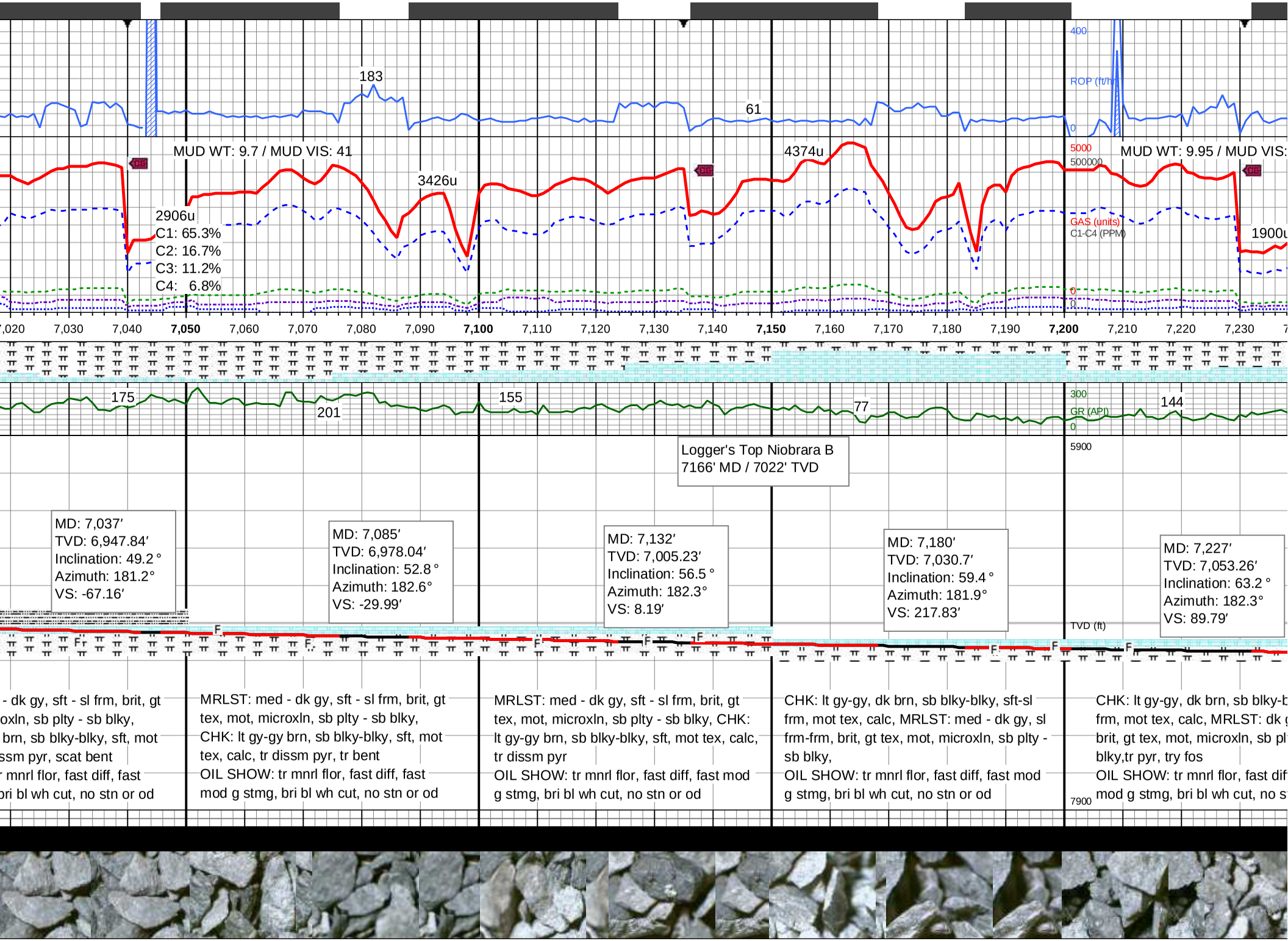
7900

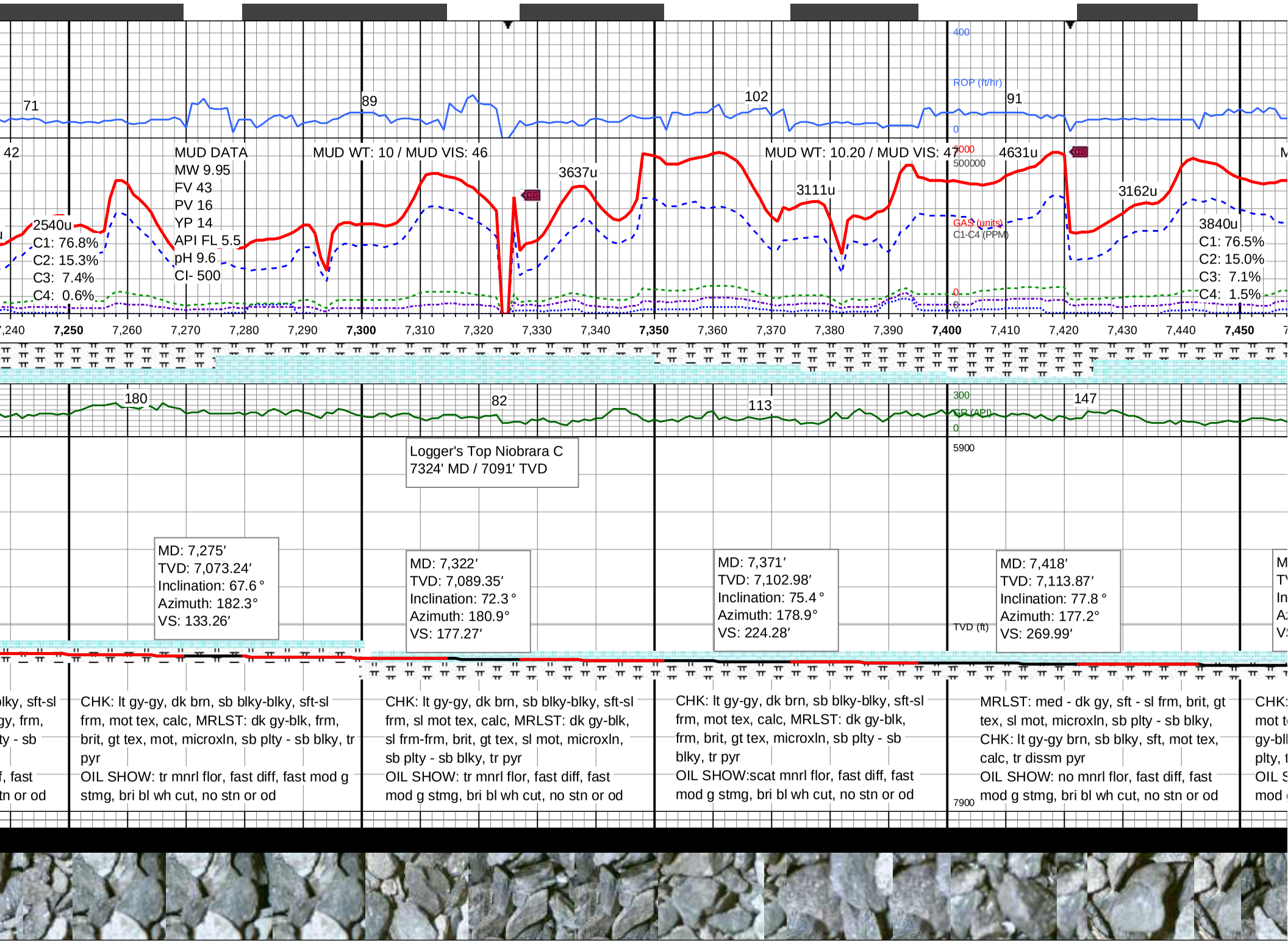

234
245
91
400
ROP (ft/hr)
0
3000
300000
MUD WT: 10 / MUD VIS: 51
GAS (units)
C1-C4 (PPM)
969u
800u
815u
C1: 80.3%
C2: 10.7%
C3: 9.1%
C4: 0.2%
1824u
747u
0
0
6,140
6,150
6,160
6,170
6,180
6,190
6,200
6,210
6,220
6,230
6,240
6,250
6,260
6,270
6,280
6,290
6,300
6,310
6,320
6,330
6,340
6,350
139
124
118
118
134
300
GR (API)
0
5900
MD: 6,228′
TVD: 6,213.36′
Inclination: 4.1 °
Azimuth: 32.9°
VS: -307.75′
MD: 6,275′
TVD: 6,260.24′
Inclination: 4 °
Azimuth: 36.9°
VS: -310.38′
MD: 6,323′
TVD: 6,308.13′
Inclination: 3.9 °
Azimuth: 47.8°
VS: -312.7′
TVD (ft)
7900
SHY SLTST: lt gy-gy, sl frm, sb blky-blky, slty tex, non calc, arg cmt, tr biot; SLTY SH: dk gy, sb plty-plty, vf-mic gr, gritty text,non calc, tr shy ss
OIL SHOW: no mnrl flor, v slow diff, v slow stmg, dull bl cut, no stn or od
SLTY SH: dk - med gy, sb plty-plty, vf-mic
SLTST: gy - lt gy, sft- sl frm, sb blky-sb bl
biot; SHY SS: wh - lt gy, sl frm-frm, upper
ang, mod w srt, arg - calc cmt, glau & bio
OIL SHOW: scat yel-gn mnrl flor, slow diff
no stn or od

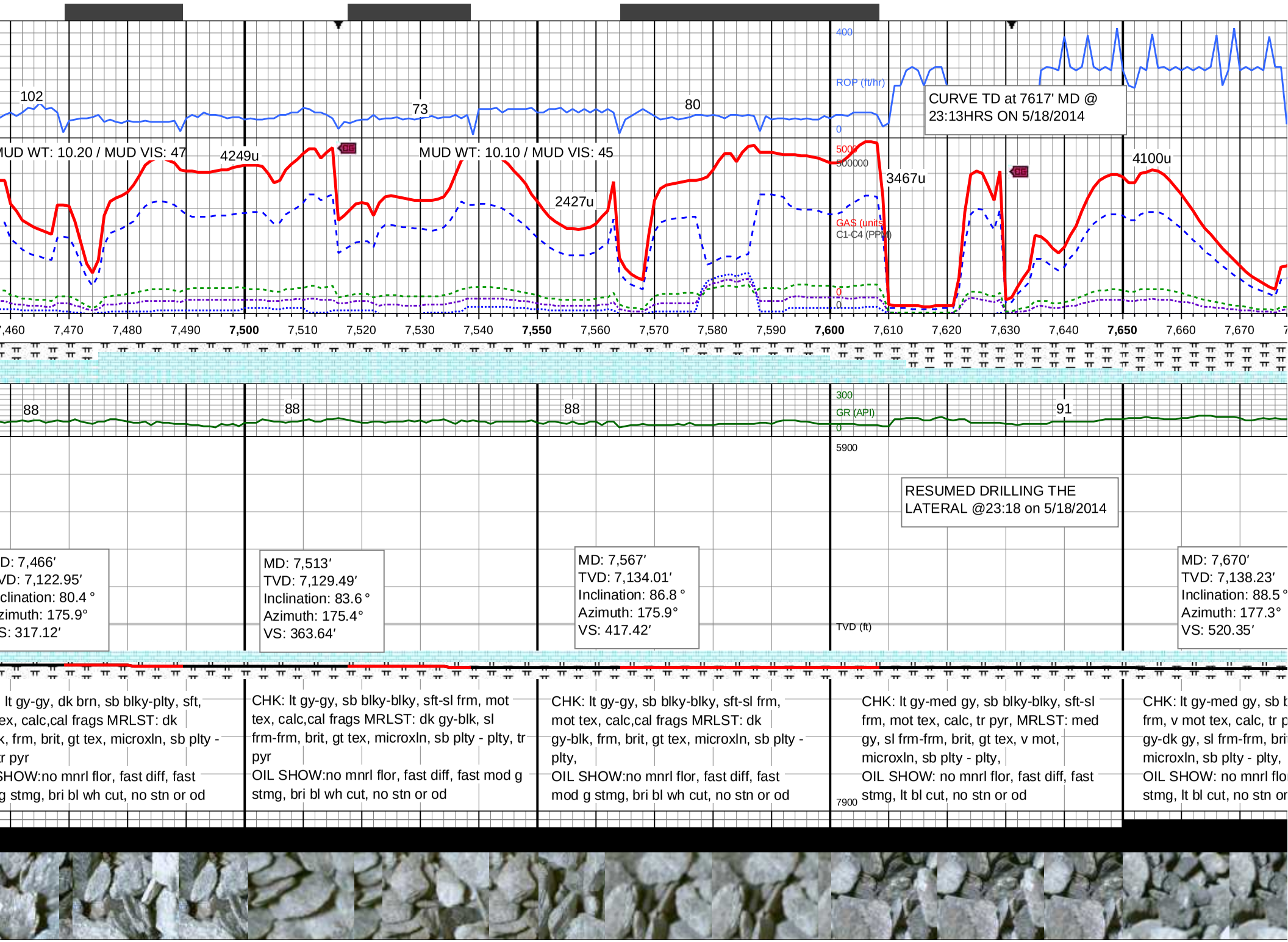

400
ROP (M/H)
0
67
233
234
3000
300000
MUD WT: 9.60 / MUD VIS: 50
MUD WT: 9.80 / MUD VIS: 48
GAS (units)
C1-C4 (PPM)
428u
514u
C1: 72%
C2: 11.8%
C3: 9.9%
C4: 6.3%
605u
0
6,360
6,370
6,380
6,390
6,400
6,410
6,420
6,430
6,440
6,450
6,460
6,470
6,480
6,490
6,500
6,510
6,520
6,530
6,540
6,550
6,560
6,570
134
118
108
124
300
GR (API)
0
5900
TVD (ft)
7900
MD: 6,370′
TVD: 6,354.95′
Inclination: 6.3 °
Azimuth: 76.5°
VS: -314.2′
MD: 6,418′
TVD: 6,402.56′
Inclination: 8.5 °
Azimuth: 101.1°
VS: -313.85′
MD: 6,465′
TVD: 6,448.97′
Inclination: 9.8 °
Azimuth: 119°
VS: -310.92′
MD: 6,514′
TVD: 6,497.21′
Inclination: 10.5 °
Azimuth: 136°
VS: -305.37′
MD: 6,561′
TVD: 6,543.31′
Inclination: 12.1 °
Azimuth: 151.7°
VS: -297.7′
c gr, gritty tex, non calc; SHY
ky, slty, non calc, arg cmt, tr
to lower f gr, sl fri ip, sb rnd-sb
t incl, sl calc ip,
f, slow mod stmg, dull bl cut,
SHY SLTST: lt gy-gy, sl frm- frm, sb blky-blky, slty tex, non calc, arg cmt, tr biot; SLTY SH: dk gy-med gy, sb plty, vf-mic gr, gritty tex,non calc, tr shy ss
OIL SHOW: tr mnrl flor, slow diff, slow stmg, lt bl cut, no stn or od
SLTY SH: dk - med gy, sb plty, vf-mic gr, non calc; SHY SLTST
gy, sft- sl frm, sb blky-sb plty, slty, tr gr-rthy, non calc, arg cmt,
SHY SS: wh - lt gy, frm - hd, sl fri ip, sb rnd, mod w srt, arg - ca
glau & biot incl, sl calc ip,
OIL SHOW: scat yel-gn mnrl flor, slow diff, slow mod stmg, dul
no stn or od

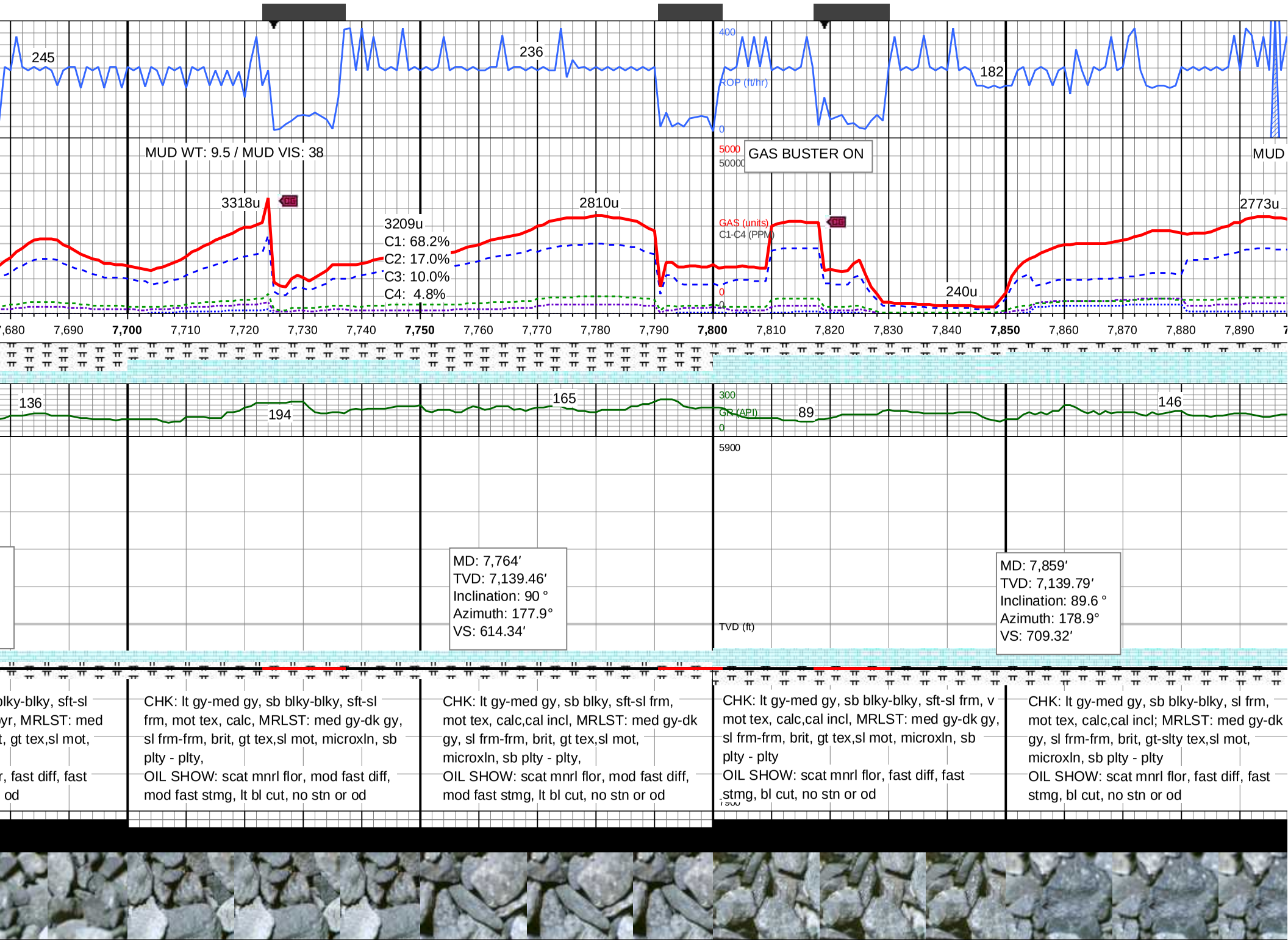

400
ROP (ft/hr)
0
104
245
91
3000
300000
MUD DATA
MW 9.8
FV 48
PV 16
YP 14
API FL 6.0
pH 9.7
Cl- 500
MUD WT: 9.7+ / MUD VIS: 48
1312u
GAS (units)
C1-C4 (PPM)
681u
C1: 71.8%
C2: 13.6%
C3: 10.0%
C4: 4.6%
1191u
1141u
0
6,580
6,590
6,600
6,610
6,620
6,630
6,640
6,650
6,660
6,670
6,680
6,690
6,700
6,710
6,720
6,730
6,740
6,750
6,760
6,770
6,780
6,790
134
300
GR (API)
0
109
165
144
5900
MD: 6,609′
TVD: 6,590.01′
Inclination: 14.6 °
Azimuth: 160.7°
VS: -287.36′
MD: 6,656′
TVD: 6,635.14′
Inclination: 17.8 °
Azimuth: 165.9°
VS: -274.64′
MD: 6,704′
TVD: 6,680.4′
Inclination: 21.1 °
Azimuth: 170.1°
VS: -258.87′
MD: 6,751′
TVD: 6,723.66′
Inclination: 24.9 °
Azimuth: 175.4°
VS: -240.58′
SLTY SH: dk - med gy, sb plty, vf-mic gr, non calc; SHY
SLTST: gy - lt gy, sft- sl frm, sb blky-sb plty, slty, tr gr-rthy,
non calc, arg cmt, tr biot, tr SHY SS,
OIL SHOW: scat yel-gn mnrl flor, slow diff, slow mod
stmg, dull bl cut, no stn or od
SLTY SH: dk - med gy, sb plty, vf-mic gr, non calc; SHY SLTST: gy - lt gy, sft- sl frm, sb
blky-sb plty, slty, tr gr-rthy, non calc, arg cmt, tr biot,
OIL SHOW: scat yel mnrl flor, mod fast diff, mod fast stmg, mod bri bl cut, no stn or od
7900

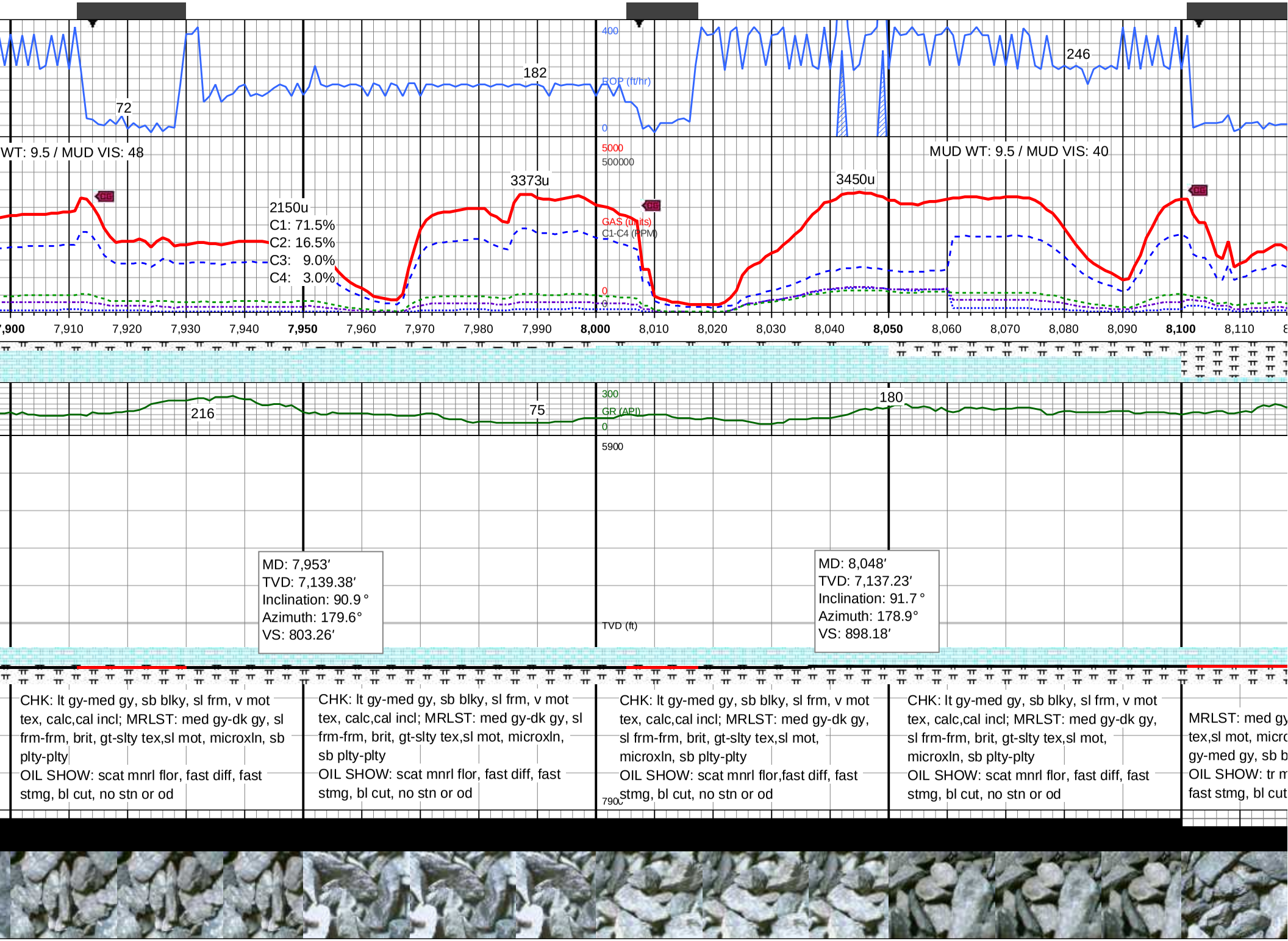

400
ROP (ft/hr)
120
104
120
0
5000
500000
GAS SCALE CHANGE
GAS (units)
C1-C4 (PPM)
887u
C1: 71.6%
C2: 15.4%
C3: 9.8%
C4: 3.2%
2106u
MUD WT: 9.6 / MUD VIS: 4578u
6,800
6,810
6,820
6,830
6,840
6,850
6,860
6,870
6,880
6,890
6,900
6,910
6,920
6,930
6,940
6,950
6,960
6,970
6,980
6,990
7,000
7,010
300
GR (API)
160
216
175
185
5900
Logger's Top Sharon Springs
6892' MD / 6844' TVD
Begin 25' Sample Interval
Logger's Top Niobrara A
6970' MD / 6902' TVD
MD: 6,895′
TVD: 6,846.71′
Inclination: 38.2 °
Azimuth: 178.8°
VS: -166.48′
MD: 6,942′
TVD: 6,882.33′
Inclination: 43.2 °
Azimuth: 178.4°
VS: -135.85′
MD: 6,990′
TVD: 6,916.33′
Inclination: 46.6 °
Azimuth: 178.8°
VS: -101.98′
99′
766.52′
on: 28.6 °
: 180.2°
9′
MD: 6,846′
TVD: 6,806.88′
Inclination: 33 °
Azimuth: 180.5°
VS: -194.97′
SLTY SH: dk - med gy, sb plty, vf-mic gr, sl calc, tr bent; SHY SLTST: gy - lt gy, sft- sl frm, sb blky-sb plty, slty, tr gr-rthy, non calc, arg cmt, tr biot,
OIL SHOW: scat yel mnrl flor, mod fast diff, mod fast stmg, mod bri bl cut, no stn or od
7900
SLTY SH: dk-med gy, sb plty-plty, sl frm-frm, sl calc, slty tex,abnt bent,
OIL SHOW: scat yel mnrl flor, mod fast diff, mod fast stmg, mod bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky-blky, sft-sl frm, mot tex, calc, tr pyr, MRLST: med gy, frm, brit, gt tex, v mot, microxln, sb plty - plty,
OIL SHOW: tr mnrl flor, mod diff, mod fast stmg, lt bl cut, no stn or od
MRLST: med
tex, mot, micr
CHK: lt gy-gy
tex, calc, tr di
OIL SHOW: t
mod g stmg, l

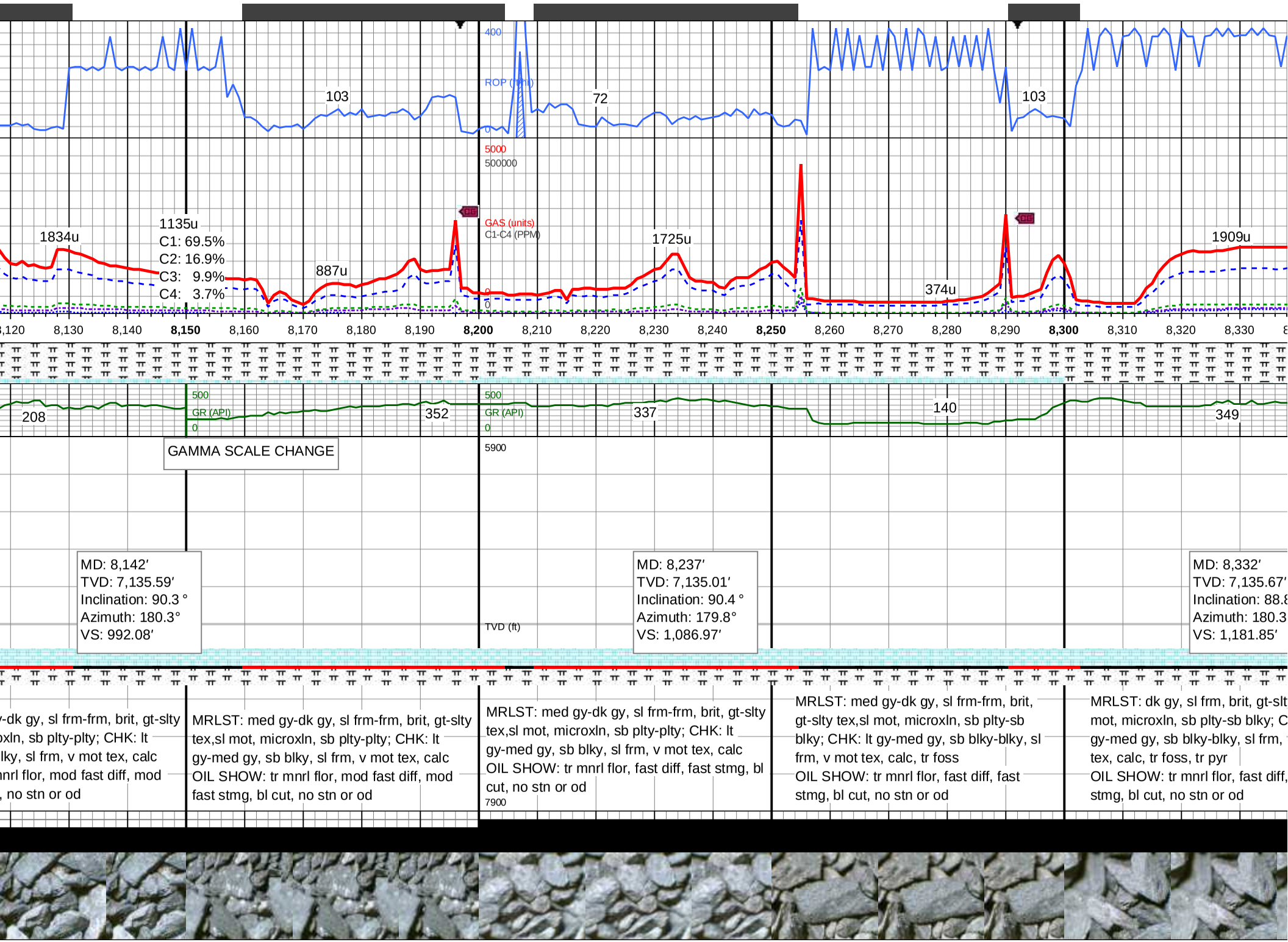

183
61
400
ROP (ft/hr)
0
MUD WT: 9.7 / MUD VIS: 41
3426u
4374u
MUD WT: 9.95 / MUD VIS:
2906u
C1: 65.3%
C2: 16.7%
C3: 11.2%
C4: 6.8%
5000
500000
GAS (units)
C1-C4 (PPM)
1900u
0
0
7,020
7,030
7,040
7,050
7,060
7,070
7,080
7,090
7,100
7,110
7,120
7,130
7,140
7,150
7,160
7,170
7,180
7,190
7,200
7,210
7,220
7,230
175
201
155
77
144
300
GR (API)
0
5900
Logger's Top Niobrara B
7166' MD / 7022' TVD
MD: 7,037′
TVD: 6,947.84′
Inclination: 49.2 °
Azimuth: 181.2°
VS: -67.16′
MD: 7,085′
TVD: 6,978.04′
Inclination: 52.8 °
Azimuth: 182.6°
VS: -29.99′
MD: 7,132′
TVD: 7,005.23′
Inclination: 56.5 °
Azimuth: 182.3°
VS: 8.19′
MD: 7,180′
TVD: 7,030.7′
Inclination: 59.4 °
Azimuth: 181.9°
VS: 217.83′
MD: 7,227′
TVD: 7,053.26′
Inclination: 63.2 °
Azimuth: 182.3°
VS: 89.79′
TVD (ft)
- dk gy, sft - sl frm, brit, gt
oxln, sb plty - sb blky,
brn, sb blky-blky, sft, mot
ssm pyr, scat bent
r mnrl flor, fast diff, fast
ri bl wh cut, no stn or od
MRLST: med - dk gy, sft - sl frm, brit, gt tex, mot, microxln, sb plty - sb blky, CHK: lt gy-gy brn, sb blky-blky, sft, mot tex, calc, tr dissm pyr, tr bent
OIL SHOW: tr mnrl flor, fast diff, fast mod g stmg, bri bl wh cut, no stn or od
MRLST: med - dk gy, sft - sl frm, brit, gt tex, mot, microxln, sb plty - sb blky, CHK: lt gy-gy brn, sb blky-blky, sft, mot tex, calc, tr dissm pyr
OIL SHOW: tr mnrl flor, fast diff, fast mod g stmg, bri bl wh cut, no stn or od
CHK: lt gy-gy, dk brn, sb blky-blky, sft-sl frm, mot tex, calc, MRLST: med - dk gy, sl frm-frm, brit, gt tex, mot, microxln, sb plty - sb blky,
OIL SHOW: tr mnrl flor, fast diff, fast mod g stmg, bri bl wh cut, no stn or od
CHK: lt gy-gy, dk brn, sb blky-b
frm, mot tex, calc, MRLST: dk
brit, gt tex, mot, microxln, sb pl
blky,tr pyr, try fos
OIL SHOW: tr mnrl flor, fast dif
mod g stmg, bri bl wh cut, no s
7900

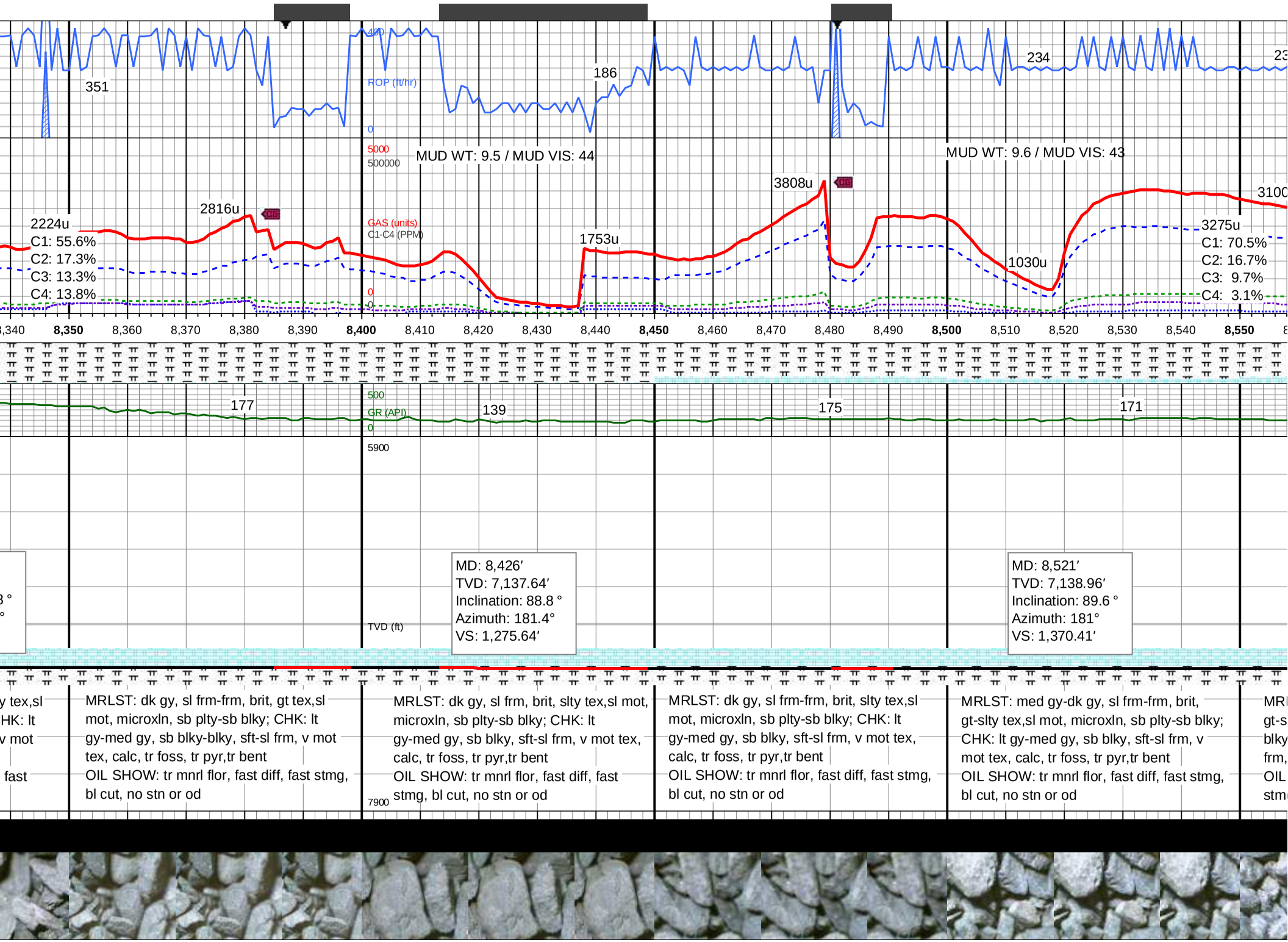

71
89
102
91
ROP (ft/hr)
400
0
42
MUD DATA
MW 9.95
FV 43
PV 16
YP 14
API FL 5.5
pH 9.6
CI- 500
MUD WT: 10 / MUD VIS: 46
MUD WT: 10.20 / MUD VIS: 47
2540u
C1: 76.8%
C2: 15.3%
C3: 7.4%
C4: 0.6%
3637u
3111u
4631u
3162u
3840u
C1: 76.5%
C2: 15.0%
C3: 7.1%
C4: 1.5%
GAS (units)
C1-C4 (PPM)
7000
500000
0
7,240
7,250
7,260
7,270
7,280
7,290
7,300
7,310
7,320
7,330
7,340
7,350
7,360
7,370
7,380
7,390
7,400
7,410
7,420
7,430
7,440
7,450
180
82
113
147
GR (API)
300
0
5900
Logger's Top Niobrara C
7324' MD / 7091' TVD
MD: 7,275'
TVD: 7,073.24'
Inclination: 67.6 °
Azimuth: 182.3°
VS: 133.26'
MD: 7,322'
TVD: 7,089.35'
Inclination: 72.3 °
Azimuth: 180.9°
VS: 177.27'
MD: 7,371'
TVD: 7,102.98'
Inclination: 75.4 °
Azimuth: 178.9°
VS: 224.28'
MD: 7,418'
TVD: 7,113.87'
Inclination: 77.8 °
Azimuth: 177.2°
VS: 269.99'
TVD (ft)
7900
lky, sft-sl
gy, frm,
ty - sb
f, fast
tn or od
CHK: lt gy-gy, dk brn, sb blky-blky, sft-sl frm, mot tex, calc, MRLST: dk gy-blk, frm, brit, gt tex, mot, microxln, sb plty - sb blky, tr pyr
OIL SHOW: tr mnrl flor, fast diff, fast mod g stmg, bri bl wh cut, no stn or od
CHK: lt gy-gy, dk brn, sb blky-blky, sft-sl frm, sl mot tex, calc, MRLST: dk gy-blk, sl frm-frm, brit, gt tex, sl mot, microxln, sb plty - sb blky, tr pyr
OIL SHOW: tr mnrl flor, fast diff, fast mod g stmg, bri bl wh cut, no stn or od
CHK: lt gy-gy, dk brn, sb blky-blky, sft-sl frm, mot tex, calc, MRLST: dk gy-blk, frm, brit, gt tex, microxln, sb plty - sb blky, tr pyr
OIL SHOW:scat mnrl flor, fast diff, fast mod g stmg, bri bl wh cut, no stn or od
MRLST: med - dk gy, sft - sl frm, brit, gt tex, sl mot, microxln, sb plty - sb blky,
CHK: lt gy-gy brn, sb blky, sft, mot tex, calc, tr dissm pyr
OIL SHOW: no mnrl flor, fast diff, fast mod g stmg, bri bl wh cut, no stn or od

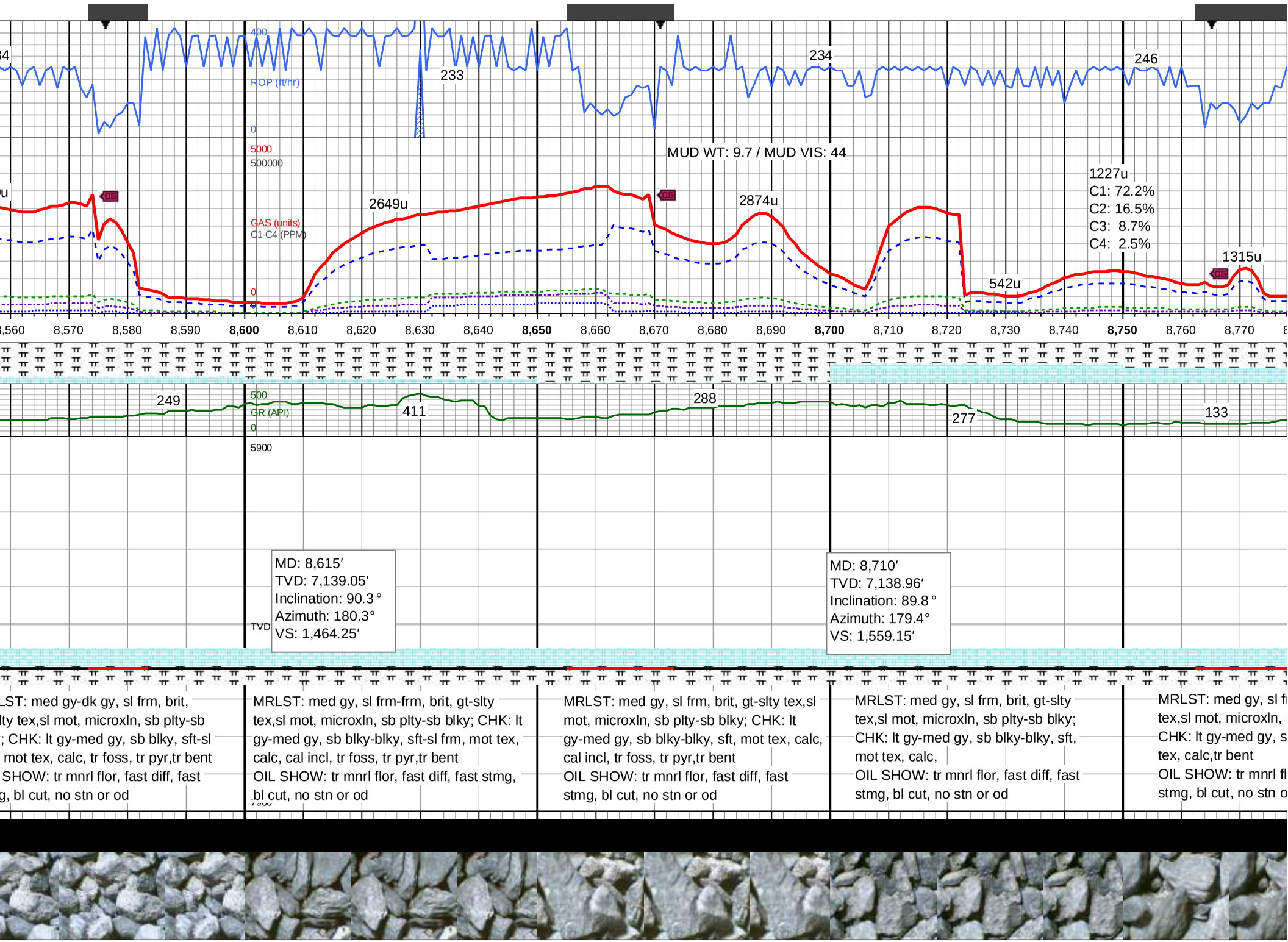

102
73
80
400
ROP (ft/hr)
0
CURVE TD at 7617' MD @
23:13HRS ON 5/18/2014
MUD WT: 10.20 / MUD VIS: 47
4249u
MUD WT: 10.10 / MUD VIS: 45
2427u
3467u
4100u
5000
500000
GAS (units)
C1-C4 (PPM)
0
0
7,460
7,470
7,480
7,490
7,500
7,510
7,520
7,530
7,540
7,550
7,560
7,570
7,580
7,590
7,600
7,610
7,620
7,630
7,640
7,650
7,660
7,670
88
88
88
91
300
GR (API)
0
5900
RESUMED DRILLING THE
LATERAL @23:18 on 5/18/2014
D: 7,466′
VD: 7,122.95′
clination: 80.4 °
zimuth: 175.9°
S: 317.12′
MD: 7,513′
TVD: 7,129.49′
Inclination: 83.6 °
Azimuth: 175.4°
VS: 363.64′
MD: 7,567′
TVD: 7,134.01′
Inclination: 86.8 °
Azimuth: 175.9°
VS: 417.42′
TVD (ft)
MD: 7,670′
TVD: 7,138.23′
Inclination: 88.5 °
Azimuth: 177.3°
VS: 520.35′
lt gy-gy, dk brn, sb blky-plty, sft,
ex, calc,cal frags MRLST: dk
k, frm, brit, gt tex, microxln, sb plty -
r pyr
HOW:no mnrl flor, fast diff, fast
g stmg, bri bl wh cut, no stn or od
CHK: lt gy-gy, sb blky-blky, sft-sl frm, mot
tex, calc,cal frags MRLST: dk gy-blk, sl
frm-frm, brit, gt tex, microxln, sb plty - plty, tr
pyr
OIL SHOW:no mnrl flor, fast diff, fast mod g
stmg, bri bl wh cut, no stn or od
CHK: lt gy-gy, sb blky-blky, sft-sl frm,
mot tex, calc,cal frags MRLST: dk
gy-blk, frm, brit, gt tex, microxln, sb plty -
plty,
OIL SHOW:no mnrl flor, fast diff, fast
mod g stmg, bri bl wh cut, no stn or od
CHK: lt gy-med gy, sb blky-blky, sft-sl
frm, mot tex, calc, tr pyr, MRLST: med
gy, sl frm-frm, brit, gt tex, v mot,
microxln, sb plty - plty,
OIL SHOW: no mnrl flor, fast diff, fast
stmg, lt bl cut, no stn or od
7900
CHK: lt gy-med gy, sb b
frm, v mot tex, calc, tr p
gy-dk gy, sl frm-frm, bri
microxln, sb plty - plty,
OIL SHOW: no mnrl flo
stmg, lt bl cut, no stn or


245
236
182
ROP (ft/hr)
400
0
MUD WT: 9.5 / MUD VIS: 38
5000
50000
GAS BUSTER ON
MUD
3318u
3209u
C1: 68.2%
C2: 17.0%
C3: 10.0%
C4: 4.8%
2810u
2773u
GAS (units)
C1-C4 (PPM)
240u
7,680
7,690
7,700
7,710
7,720
7,730
7,740
7,750
7,760
7,770
7,780
7,790
7,800
7,810
7,820
7,830
7,840
7,850
7,860
7,870
7,880
7,890
136
194
165
89
146
GR (API)
300
0
5900
MD: 7,764′
TVD: 7,139.46′
Inclination: 90 °
Azimuth: 177.9°
VS: 614.34′
MD: 7,859′
TVD: 7,139.79′
Inclination: 89.6 °
Azimuth: 178.9°
VS: 709.32′
TVD (ft)
lky-blky, sft-sl
yr, MRLST: med
t, gt tex,sl mot,
r, fast diff, fast
od
CHK: lt gy-med gy, sb blky-blky, sft-sl frm, mot tex, calc, MRLST: med gy-dk gy, sl frm-frm, brit, gt tex,sl mot, microxln, sb plty - plty,
OIL SHOW: scat mnrl flor, mod fast diff, mod fast stmg, lt bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc,cal incl, MRLST: med gy-dk gy, sl frm-frm, brit, gt tex,sl mot, microxln, sb plty - plty,
OIL SHOW: scat mnrl flor, mod fast diff, mod fast stmg, lt bl cut, no stn or od
CHK: lt gy-med gy, sb blky-blky, sft-sl frm, v mot tex, calc,cal incl, MRLST: med gy-dk gy, sl frm-frm, brit, gt tex,sl mot, microxln, sb plty - plty
OIL SHOW: scat mnrl flor, fast diff, fast stmg, bl cut, no stn or od
CHK: lt gy-med gy, sb blky-blky, sl frm, mot tex, calc,cal incl; MRLST: med gy-dk gy, sl frm-frm, brit, gt-slty tex,sl mot, microxln, sb plty - plty
OIL SHOW: scat mnrl flor, fast diff, fast stmg, bl cut, no stn or od


72
182
246
ROP (ft/hr)
400
0
WT: 9.5 / MUD VIS: 48
MUD WT: 9.5 / MUD VIS: 40
5000
500000
3373u
3450u
2150u
C1: 71.5%
C2: 16.5%
C3: 9.0%
C4: 3.0%
GAS (units)
C1-C4 (PPM)
0
0
7,900
7,910
7,920
7,930
7,940
7,950
7,960
7,970
7,980
7,990
8,000
8,010
8,020
8,030
8,040
8,050
8,060
8,070
8,080
8,090
8,100
8,110
216
75
180
300
GR (API)
0
5900
MD: 7,953′
TVD: 7,139.38′
Inclination: 90.9 °
Azimuth: 179.6°
VS: 803.26′
MD: 8,048′
TVD: 7,137.23′
Inclination: 91.7 °
Azimuth: 178.9°
VS: 898.18′
TVD (ft)
CHK: lt gy-med gy, sb blky, sl frm, v mot tex, calc,cal incl; MRLST: med gy-dk gy, sl frm-frm, brit, gt-slty tex,sl mot, microxln, sb plty-plty
OIL SHOW: scat mnrl flor, fast diff, fast stmg, bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sl frm, v mot tex, calc,cal incl; MRLST: med gy-dk gy, sl frm-frm, brit, gt-slty tex,sl mot, microxln, sb plty-plty
OIL SHOW: scat mnrl flor, fast diff, fast stmg, bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sl frm, v mot tex, calc,cal incl; MRLST: med gy-dk gy, sl frm-frm, brit, gt-slty tex,sl mot, microxln, sb plty-plty
OIL SHOW: scat mnrl flor,fast diff, fast stmg, bl cut, no stn or od
7900
CHK: lt gy-med gy, sb blky, sl frm, v mot tex, calc,cal incl; MRLST: med gy-dk gy, sl frm-frm, brit, gt-slty tex,sl mot, microxln, sb plty-plty
OIL SHOW: scat mnrl flor, fast diff, fast stmg, bl cut, no stn or od
MRLST: med gy
tex,sl mot, micro
gy-med gy, sb b
OIL SHOW: tr m
fast stmg, bl cut


400
ROP (MIN)
0
103
72
103
5000
500000
GAS (units)
C1-C4 (PPM)
0
0
1834u
1135u
C1: 69.5%
C2: 16.9%
C3: 9.9%
C4: 3.7%
887u
1725u
374u
1909u
8,120
8,130
8,140
8,150
8,160
8,170
8,180
8,190
8,200
8,210
8,220
8,230
8,240
8,250
8,260
8,270
8,280
8,290
8,300
8,310
8,320
8,330
500
GR (API)
0
208
352
337
140
349
500
GR (API)
0
5900
GAMMA SCALE CHANGE
MD: 8,142′
TVD: 7,135.59′
Inclination: 90.3 °
Azimuth: 180.3°
VS: 992.08′
MD: 8,237′
TVD: 7,135.01′
Inclination: 90.4 °
Azimuth: 179.8°
VS: 1,086.97′
MD: 8,332′
TVD: 7,135.67′
Inclination: 88.8
Azimuth: 180.3
VS: 1,181.85′
TVD (ft)
7900
-dk gy, sl frm-frm, brit, gt-slty
xln, sb plty-plty; CHK: lt
lky, sl frm, v mot tex, calc
nrl flor, mod fast diff, mod
, no stn or od
MRLST: med gy-dk gy, sl frm-frm, brit, gt-slty tex,sl mot, microxln, sb plty-plty; CHK: lt gy-med gy, sb blky, sl frm, v mot tex, calc
OIL SHOW: tr mnrl flor, mod fast diff, mod fast stmg, bl cut, no stn or od
MRLST: med gy-dk gy, sl frm-frm, brit, gt-slty tex,sl mot, microxln, sb plty-plty; CHK: lt gy-med gy, sb blky, sl frm, v mot tex, calc
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od
MRLST: med gy-dk gy, sl frm-frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky; CHK: lt gy-med gy, sb blky-blky, sl frm, v mot tex, calc, tr foss
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od
MRLST: dk gy, sl frm, brit, gt-slt
mot, microxln, sb plty-sb blky; C
gy-med gy, sb blky-blky, sl frm,
tex, calc, tr foss, tr pyr
OIL SHOW: tr mnrl flor, fast diff,
stmg, bl cut, no stn or od


351
ROP (ft/hr)
400
0
186
234
5000
500000
MUD WT: 9.5 / MUD VIS: 44
MUD WT: 9.6 / MUD VIS: 43
2224u
C1: 55.6%
C2: 17.3%
C3: 13.3%
C4: 13.8%
2816u
GAS (units)
C1-C4 (PPM)
1753u
3808u
1030u
3275u
C1: 70.5%
C2: 16.7%
C3: 9.7%
C4: 3.1%
8,340
8,350
8,360
8,370
8,380
8,390
8,400
8,410
8,420
8,430
8,440
8,450
8,460
8,470
8,480
8,490
8,500
8,510
8,520
8,530
8,540
8,550
177
GR (API)
500
0
139
175
171
5900
MD: 8,426′
TVD: 7,137.64′
Inclination: 88.8 °
Azimuth: 181.4°
VS: 1,275.64′
MD: 8,521′
TVD: 7,138.96′
Inclination: 89.6 °
Azimuth: 181°
VS: 1,370.41′
TVD (ft)
7900
MRLST: dk gy, sl frm-frm, brit, gt tex,sl mot, microxln, sb plty-sb blky; CHK: lt gy-med gy, sb blky-blky, sft-sl frm, v mot tex, calc, tr foss, tr pyr,tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od
MRLST: dk gy, sl frm, brit, slty tex,sl mot, microxln, sb plty-sb blky; CHK: lt gy-med gy, sb blky, sft-sl frm, v mot tex, calc, tr foss, tr pyr,tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od
MRLST: dk gy, sl frm-frm, brit, slty tex,sl mot, microxln, sb plty-sb blky; CHK: lt gy-med gy, sb blky, sft-sl frm, v mot tex, calc, tr foss, tr pyr,tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od
MRLST: med gy-dk gy, sl frm-frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky; CHK: lt gy-med gy, sb blky, sft-sl frm, v mot tex, calc, tr foss, tr pyr,tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od



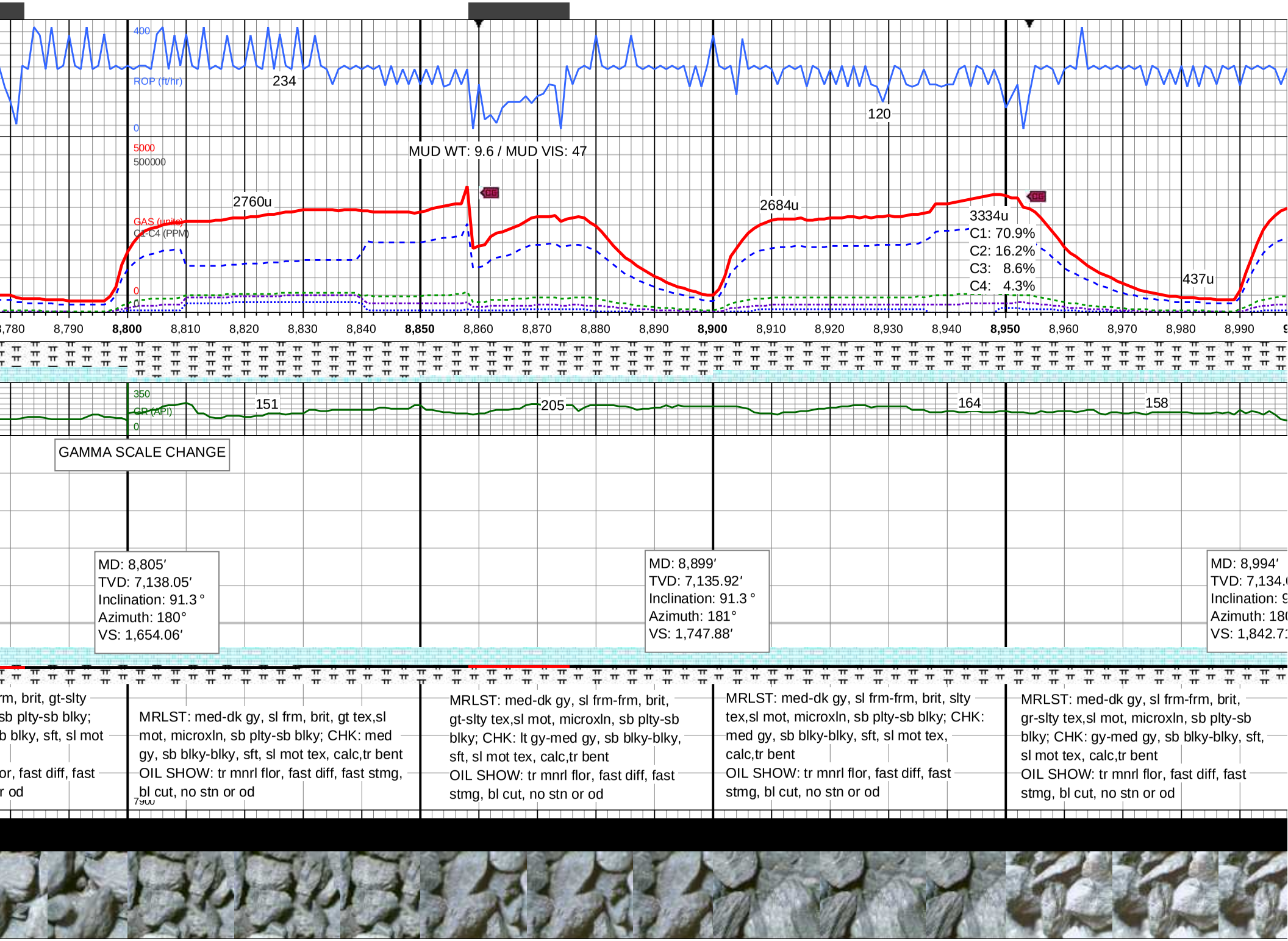
LST: med gy-dk gy, sl frm, brit,
lty tex,sl mot, microxln, sb plty-sb
; CHK: lt gy-med gy, sb blky, sft-sl
mot tex, calc, tr foss, tr pyr,tr bent
SHOW: tr mnrl flor, fast diff, fast
g, bl cut, no stn or od

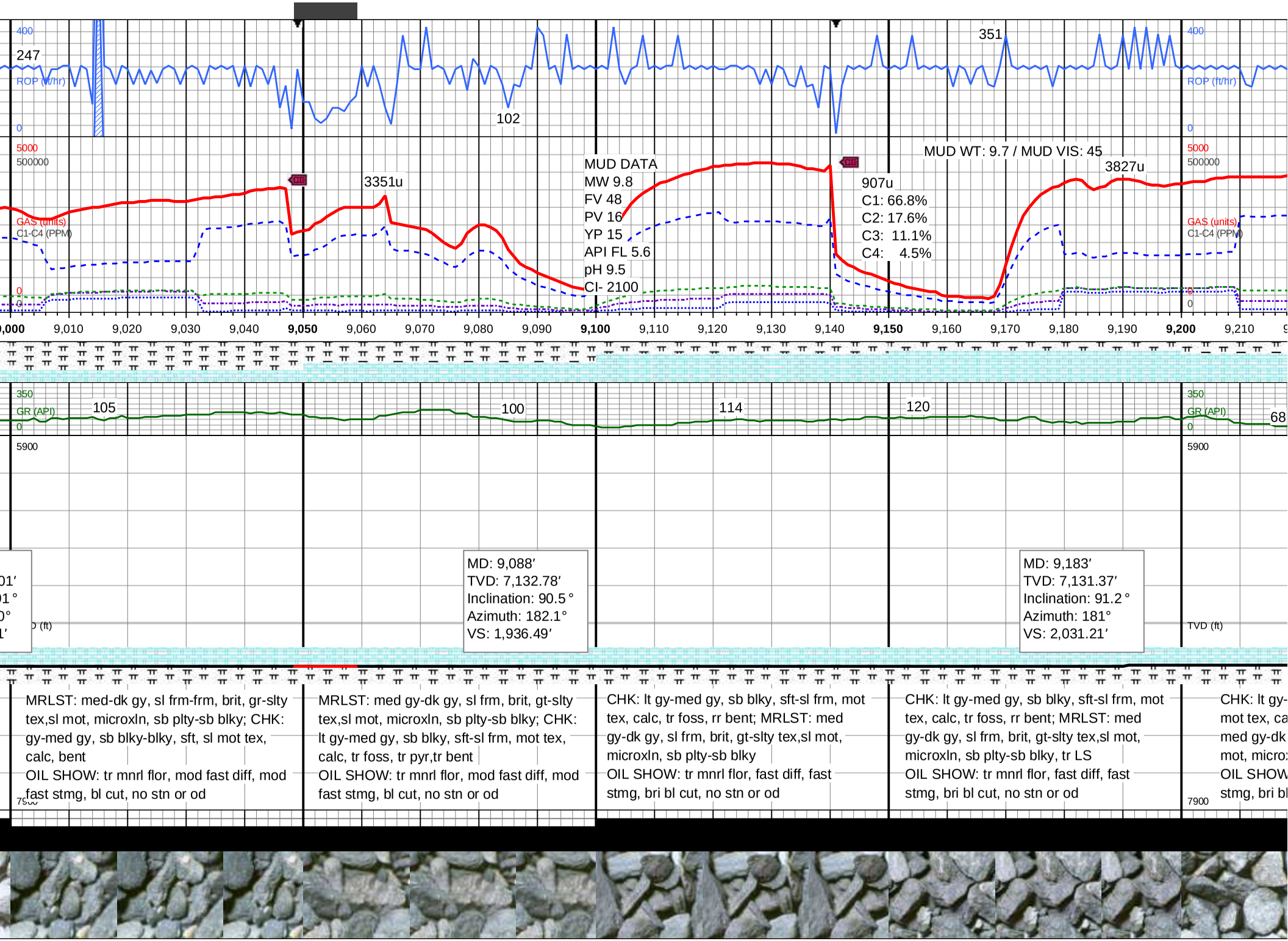
MRLST: med gy, sl frm-frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky; CHK: lt gy-med gy, sb blky-blky, sft-sl frm, mot tex, calc, cal incl, tr foss, tr pyr,tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od

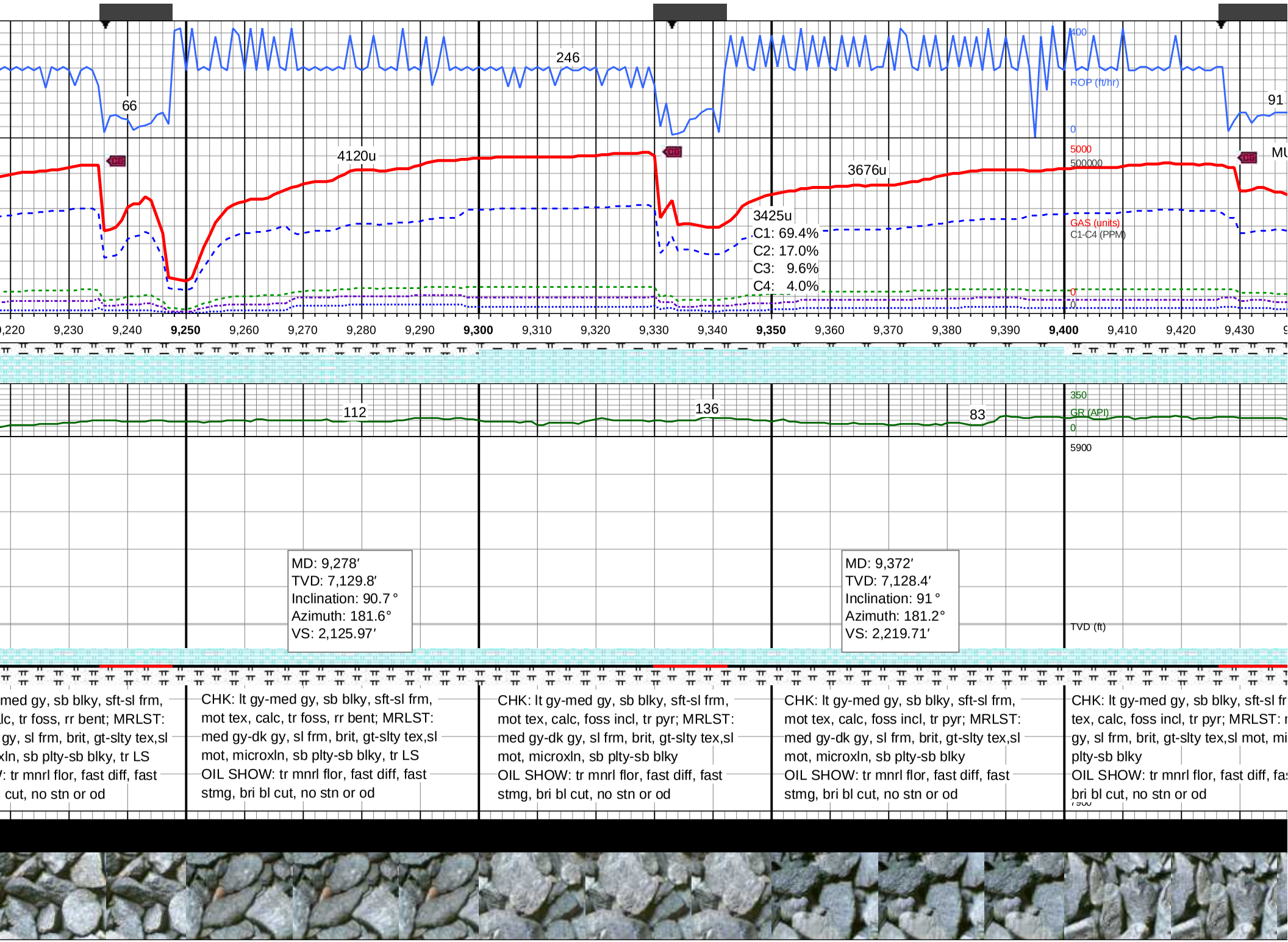
MRLST: med gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky; CHK: lt gy-med gy, sb blky-blky, sft, mot tex, calc, cal incl, tr foss, tr pyr,tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od

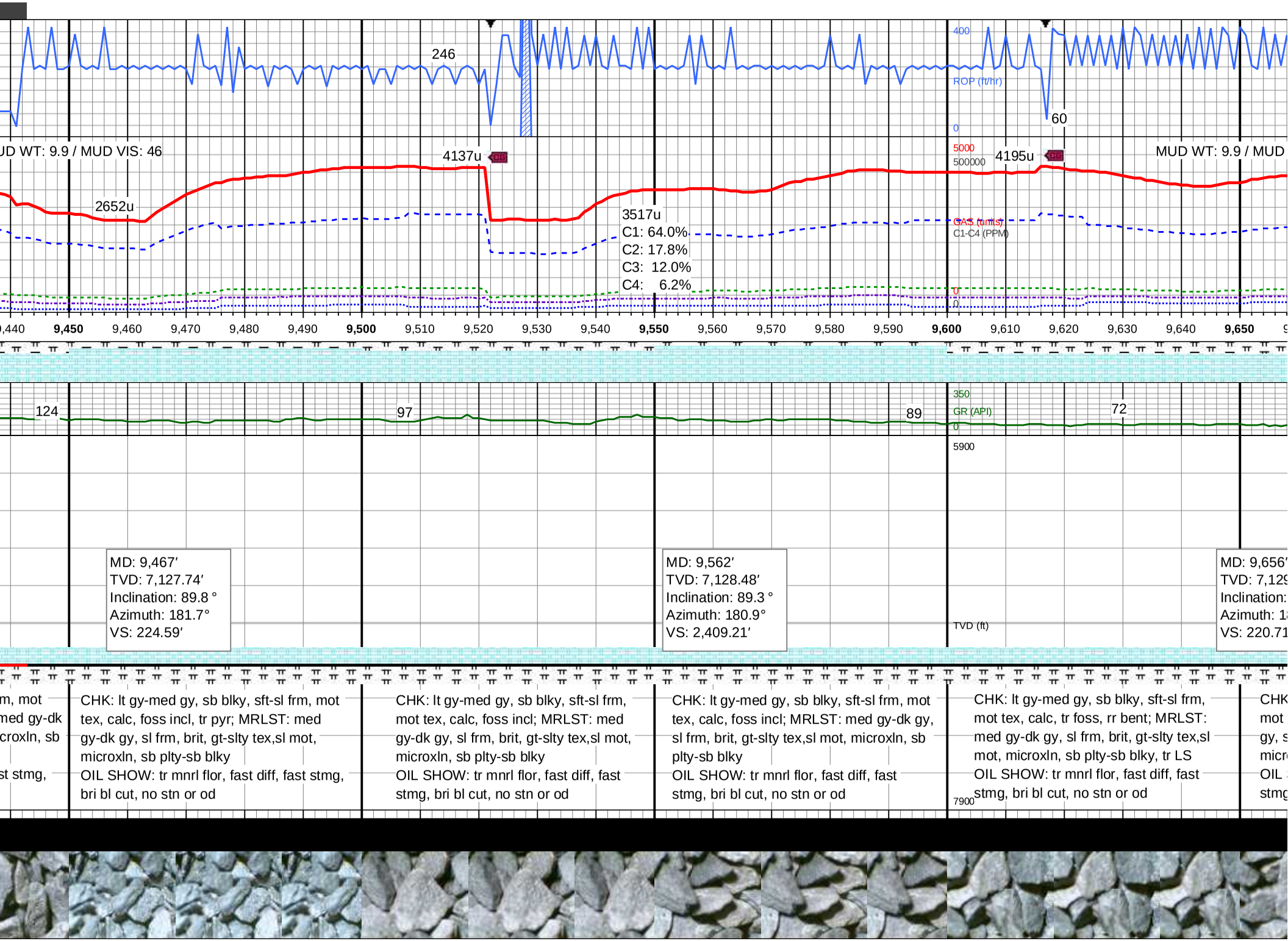
MRLST: med gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky; CHK: lt gy-med gy, sb blky-blky, sft, mot tex, calc,
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od

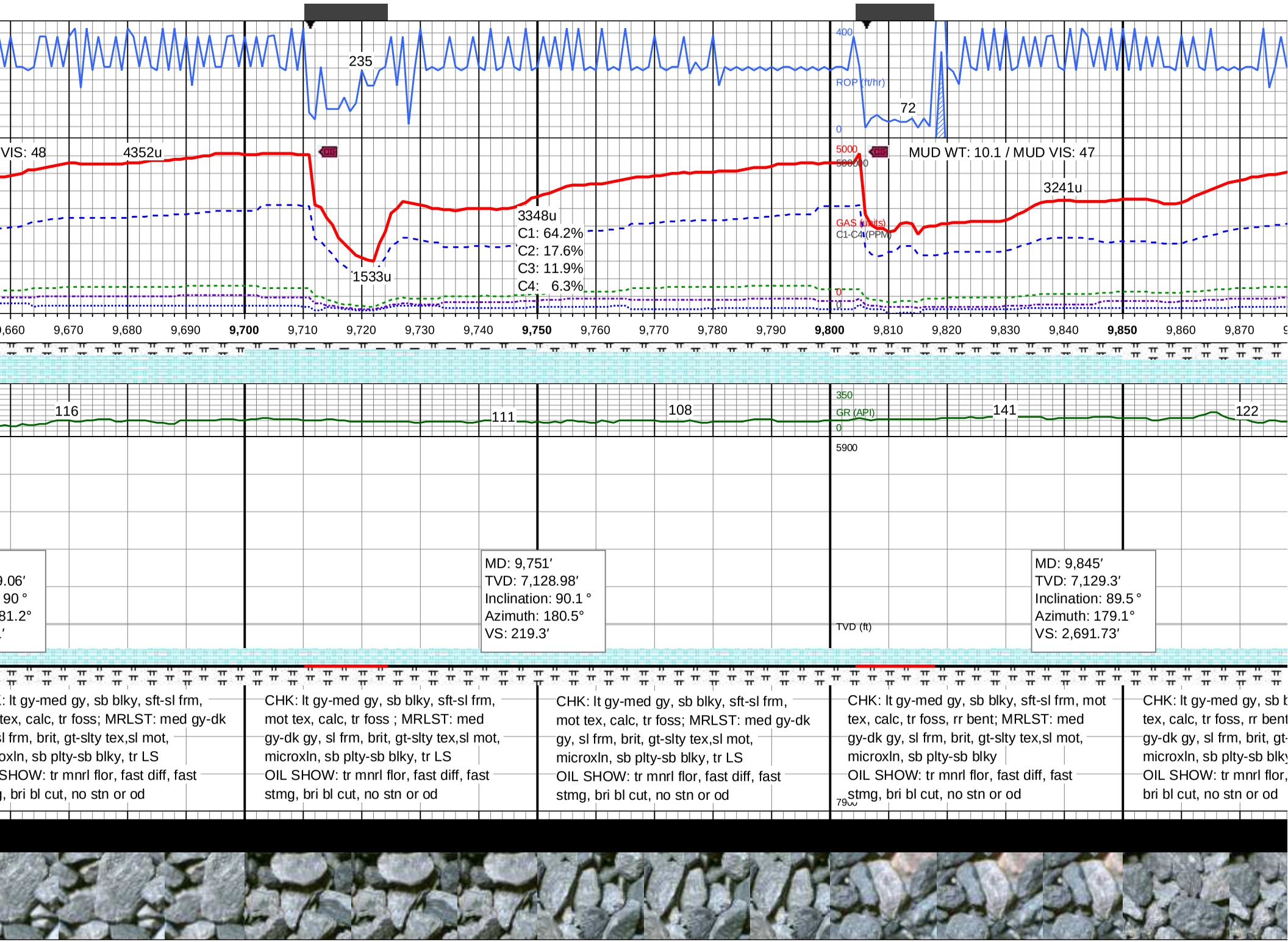
MRLST: med gy, sl fr
tex,sl mot, microxln,
CHK: lt gy-med gy, s
tex, calc,tr bent
OIL SHOW: tr mnrl fl
stmg, bl cut, no stn o

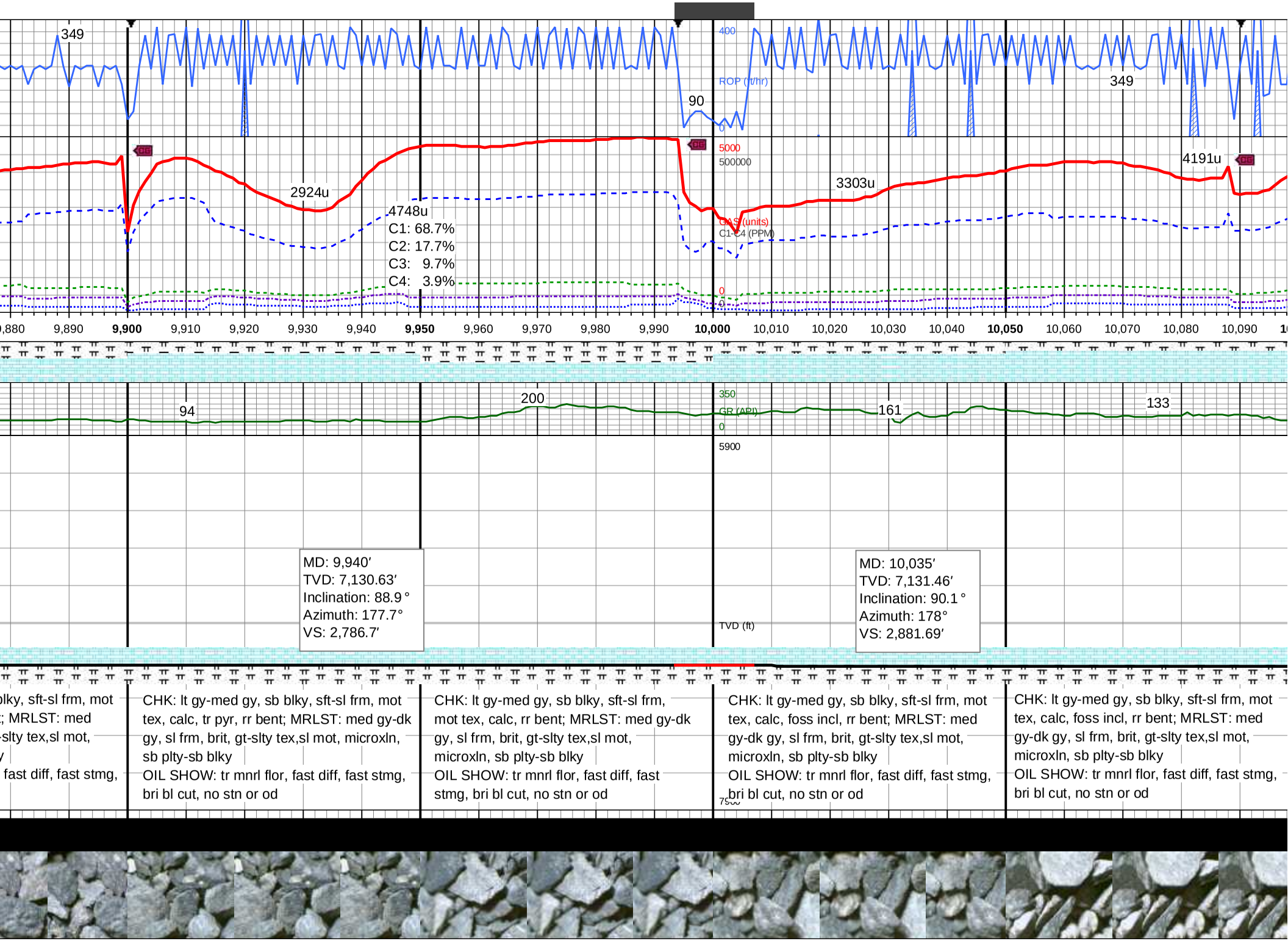

400
ROP (ft/hr)
234
0
120
5000
500000
MUD WT: 9.6 / MUD VIS: 47
2760u
GAS (units)
C1-C4 (PPM)
0
2684u
3334u
C1: 70.9%
C2: 16.2%
C3: 8.6%
C4: 4.3%
437u
8,780
8,790
8,800
8,810
8,820
8,830
8,840
8,850
8,860
8,870
8,880
8,890
8,900
8,910
8,920
8,930
8,940
8,950
8,960
8,970
8,980
8,990
350
GR (API)
0
151
205
164
158
GAMMA SCALE CHANGE
MD: 8,805′
TVD: 7,138.05′
Inclination: 91.3 °
Azimuth: 180°
VS: 1,654.06′
MD: 8,899′
TVD: 7,135.92′
Inclination: 91.3 °
Azimuth: 181°
VS: 1,747.88′
MD: 8,994′
TVD: 7,134.
Inclination: 9
Azimuth: 180
VS: 1,842.7
rm, brit, gt-slty
sb plty-sb blky;
b blky, sft, sl mot
or, fast diff, fast
r od
MRLST: med-dk gy, sl frm, brit, gt tex,sl mot, microxln, sb plty-sb blky; CHK: med gy, sb blky-blky, sft, sl mot tex, calc,tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od
7900
MRLST: med-dk gy, sl frm-frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky; CHK: lt gy-med gy, sb blky-blky, sft, sl mot tex, calc,tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od
MRLST: med-dk gy, sl frm-frm, brit, slty tex,sl mot, microxln, sb plty-sb blky; CHK: med gy, sb blky-blky, sft, sl mot tex, calc,tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od
MRLST: med-dk gy, sl frm-frm, brit, gr-slty tex,sl mot, microxln, sb plty-sb blky; CHK: gy-med gy, sb blky-blky, sft, sl mot tex, calc,tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od

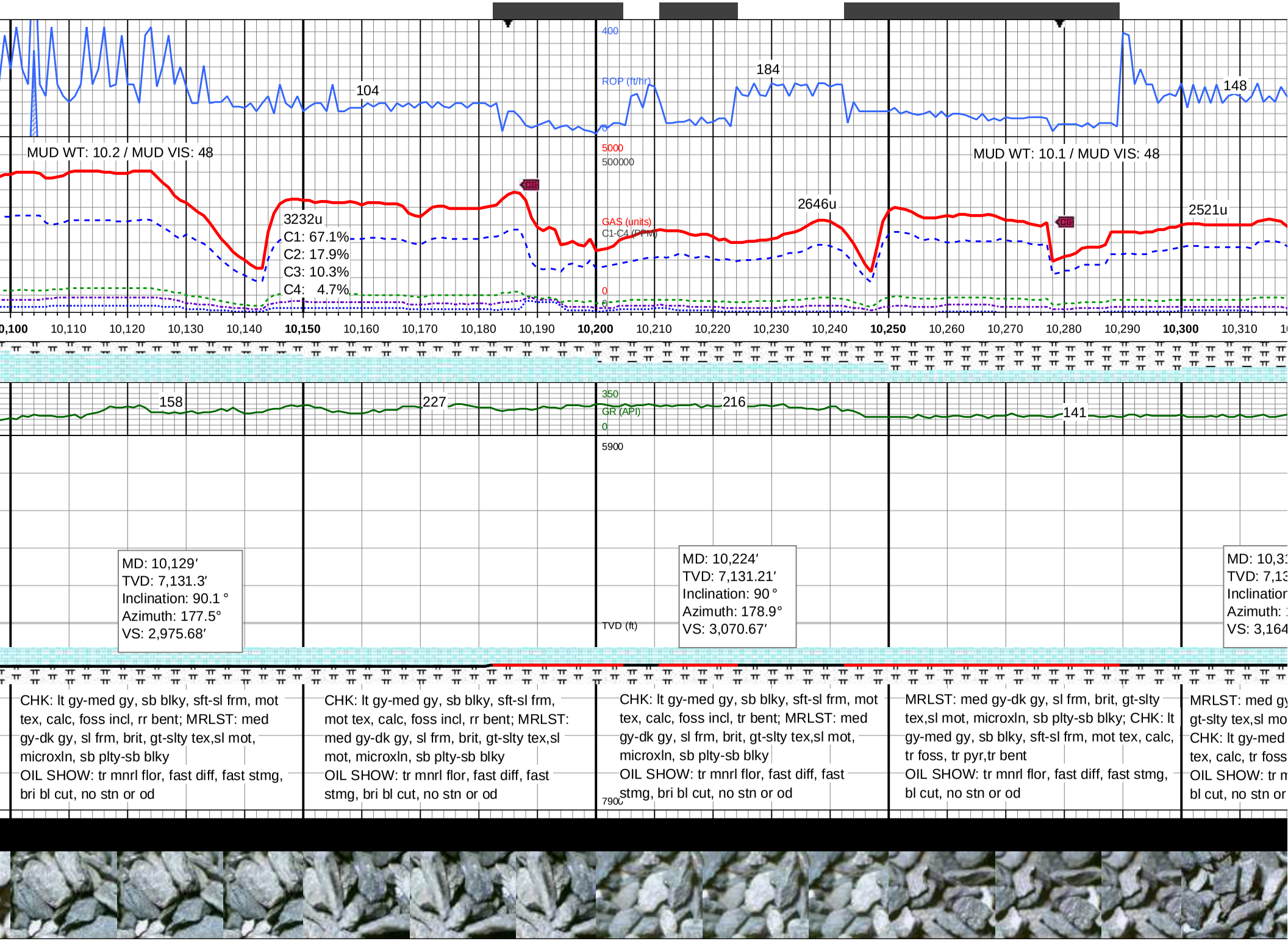

400
247
ROP (ft/hr)
0
102
351
400
ROP (ft/hr)
0
5000
500000
MUD DATA
MW 9.8
FV 48
PV 16
YP 15
API FL 5.6
pH 9.5
Cl- 2100
MUD WT: 9.7 / MUD VIS: 45
3351u
907u
3827u
C1: 66.8%
C2: 17.6%
C3: 11.1%
C4: 4.5%
GAS (units)
C1-C4 (PPM)
5000
500000
GAS (units)
C1-C4 (PPM)
0
0
9,000
9,010
9,020
9,030
9,040
9,050
9,060
9,070
9,080
9,090
9,100
9,110
9,120
9,130
9,140
9,150
9,160
9,170
9,180
9,190
9,200
9,210
350
GR (API)
105
100
114
120
350
GR (API)
68
0
5900
5900
MD: 9,088′
TVD: 7,132.78′
Inclination: 90.5 °
Azimuth: 182.1°
VS: 1,936.49′
MD: 9,183′
TVD: 7,131.37′
Inclination: 91.2 °
Azimuth: 181°
VS: 2,031.21′
TVD (ft)
MRLST: med-dk gy, sl frm-frm, brit, gr-slty tex,sl mot, microxln, sb plty-sb blky; CHK: gy-med gy, sb blky-blky, sft, sl mot tex, calc, bent
OIL SHOW: tr mnrl flor, mod fast diff, mod fast stmg, bl cut, no stn or od
MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky; CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, tr foss, tr pyr,tr bent
OIL SHOW: tr mnrl flor, mod fast diff, mod fast stmg, bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, tr foss, rr bent; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, tr foss, rr bent; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky, tr LS
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
7900
7900

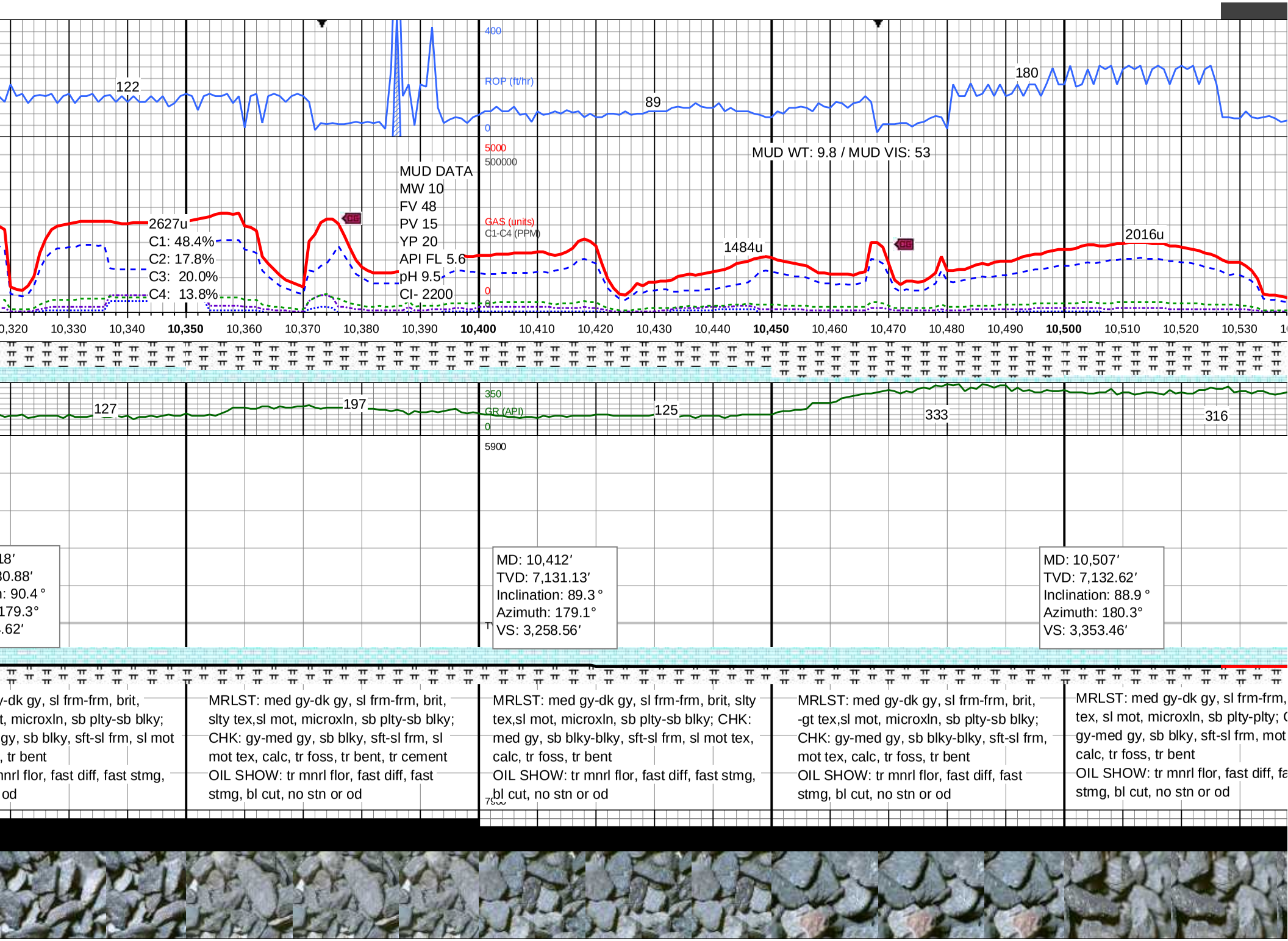

66
246
91
4120u
3676u
3425u
C1: 69.4%
C2: 17.0%
C3: 9.6%
C4: 4.0%
400
ROP (ft/hr)
0
5000
500000
GAS (units)
C1-C4 (PPM)
0
9,220
9,230
9,240
9,250
9,260
9,270
9,280
9,290
9,300
9,310
9,320
9,330
9,340
9,350
9,360
9,370
9,380
9,390
9,400
9,410
9,420
9,430
112
136
83
350
GR (API)
0
5900
MD: 9,278′
TVD: 7,129.8′
Inclination: 90.7 °
Azimuth: 181.6°
VS: 2,125.97′
MD: 9,372′
TVD: 7,128.4′
Inclination: 91 °
Azimuth: 181.2°
VS: 2,219.71′
TVD (ft)
med gy, sb blky, sft-sl frm,
lc, tr foss, rr bent; MRLST:
gy, sl frm, brit, gt-slty tex,sl
xln, sb plty-sb blky, tr LS
: tr mnrl flor, fast diff, fast
cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm,
mot tex, calc, tr foss, rr bent; MRLST:
med gy-dk gy, sl frm, brit, gt-slty tex,sl
mot, microxln, sb plty-sb blky, tr LS
OIL SHOW: tr mnrl flor, fast diff, fast
stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm,
mot tex, calc, foss incl, tr pyr; MRLST:
med gy-dk gy, sl frm, brit, gt-slty tex,sl
mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast
stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm,
mot tex, calc, foss incl, tr pyr; MRLST:
med gy-dk gy, sl frm, brit, gt-slty tex,sl
mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast
stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl fr
tex, calc, foss incl, tr pyr; MRLST:
gy, sl frm, brit, gt-slty tex,sl mot, mi
plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fas
bri bl cut, no stn or od

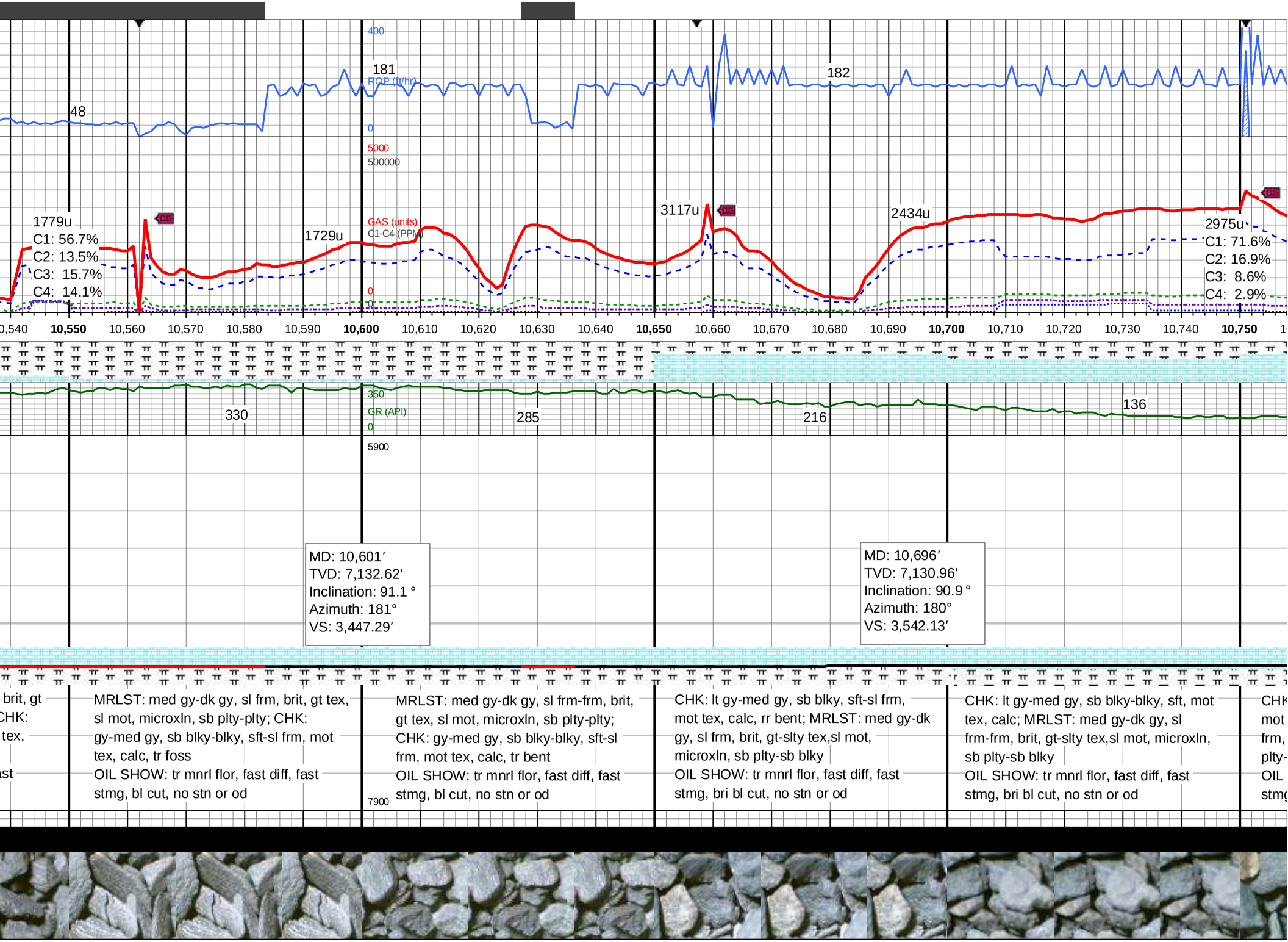

246
400
ROP (ft/hr)
60
0
UD WT: 9.9 / MUD VIS: 46
4137u
5000
500000
4195u
MUD WT: 9.9 / MUD
2652u
3517u
C1: 64.0%
C2: 17.8%
C3: 12.0%
C4: 6.2%
GAS (units)
C1-C4 (PPM)
0
0
9,440
9,450
9,460
9,470
9,480
9,490
9,500
9,510
9,520
9,530
9,540
9,550
9,560
9,570
9,580
9,590
9,600
9,610
9,620
9,630
9,640
9,650
124
97
89
72
350
GR (API)
0
5900
MD: 9,467′
TVD: 7,127.74′
Inclination: 89.8 °
Azimuth: 181.7°
VS: 224.59′
MD: 9,562′
TVD: 7,128.48′
Inclination: 89.3 °
Azimuth: 180.9°
VS: 2,409.21′
TVD (ft)
MD: 9,656′
TVD: 7,129
Inclination:
Azimuth: 1
VS: 220.71
m, mot
med gy-dk
croxln, sb
st stmg,
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, foss incl, tr pyr; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, foss incl; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, foss incl; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, tr foss, rr bent; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky, tr LS
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
7900
CHK
mot
gy, s
micr
OIL
stmg

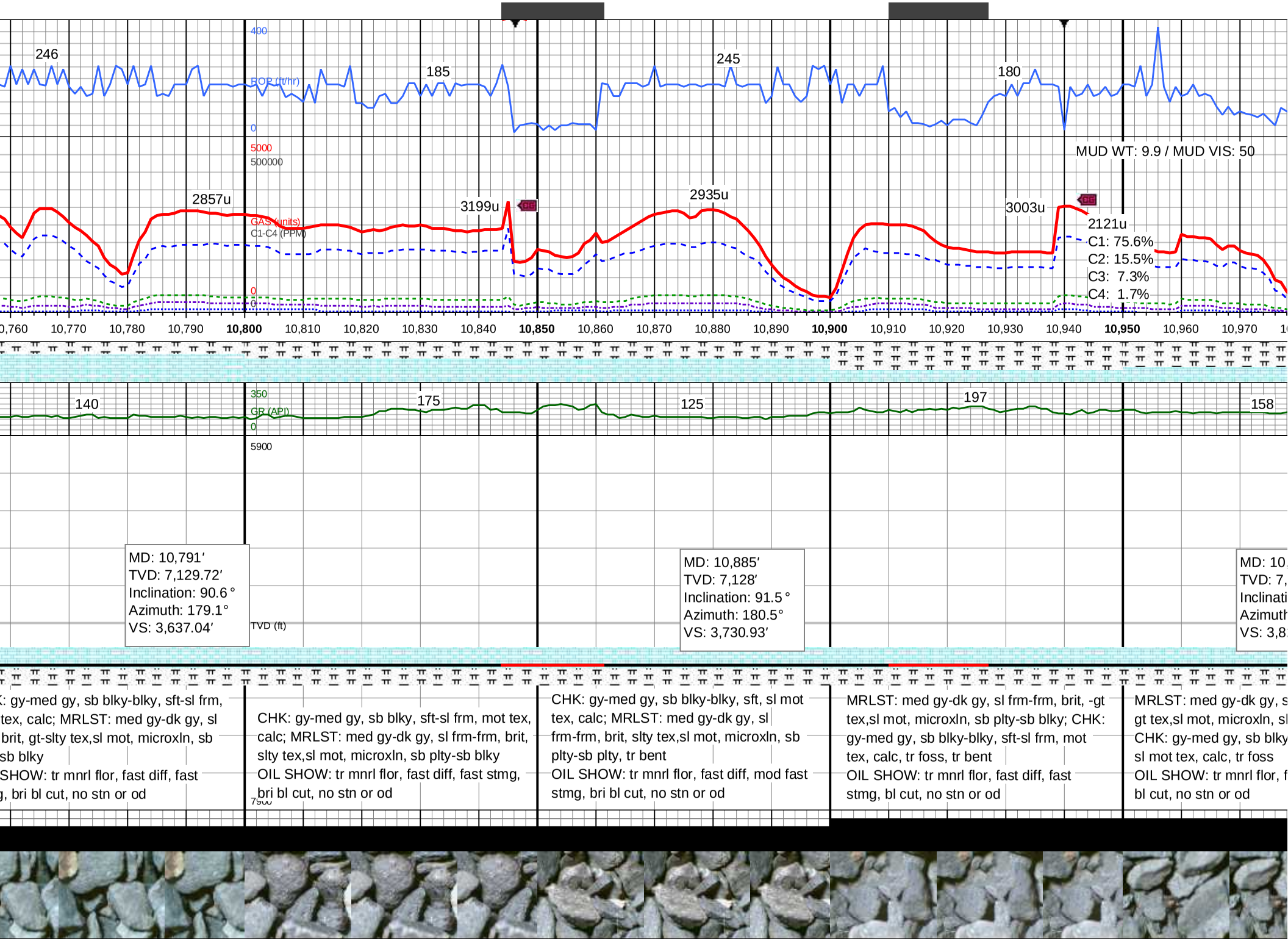

235
400
ROP (ft/hr)
72
0
VIS: 48
4352u
5000
500000
MUD WT: 10.1 / MUD VIS: 47
3241u
3348u
C1: 64.2%
C2: 17.6%
C3: 11.9%
C4: 6.3%
GAS (units)
C1-C4 (PPM)
1533u
0
0
9,660
9,670
9,680
9,690
9,700
9,710
9,720
9,730
9,740
9,750
9,760
9,770
9,780
9,790
9,800
9,810
9,820
9,830
9,840
9,850
9,860
9,870
116
111
108
350
GR (API)
0
141
122
5900
MD: 9,751′
TVD: 7,128.98′
Inclination: 90.1 °
Azimuth: 180.5°
VS: 219.3′
MD: 9,845′
TVD: 7,129.3′
Inclination: 89.5 °
Azimuth: 179.1°
VS: 2,691.73′
TVD (ft)
7900
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, tr foss; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky, tr LS
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, tr foss ; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky, tr LS
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, tr foss; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky, tr LS
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, tr foss, rr bent; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od

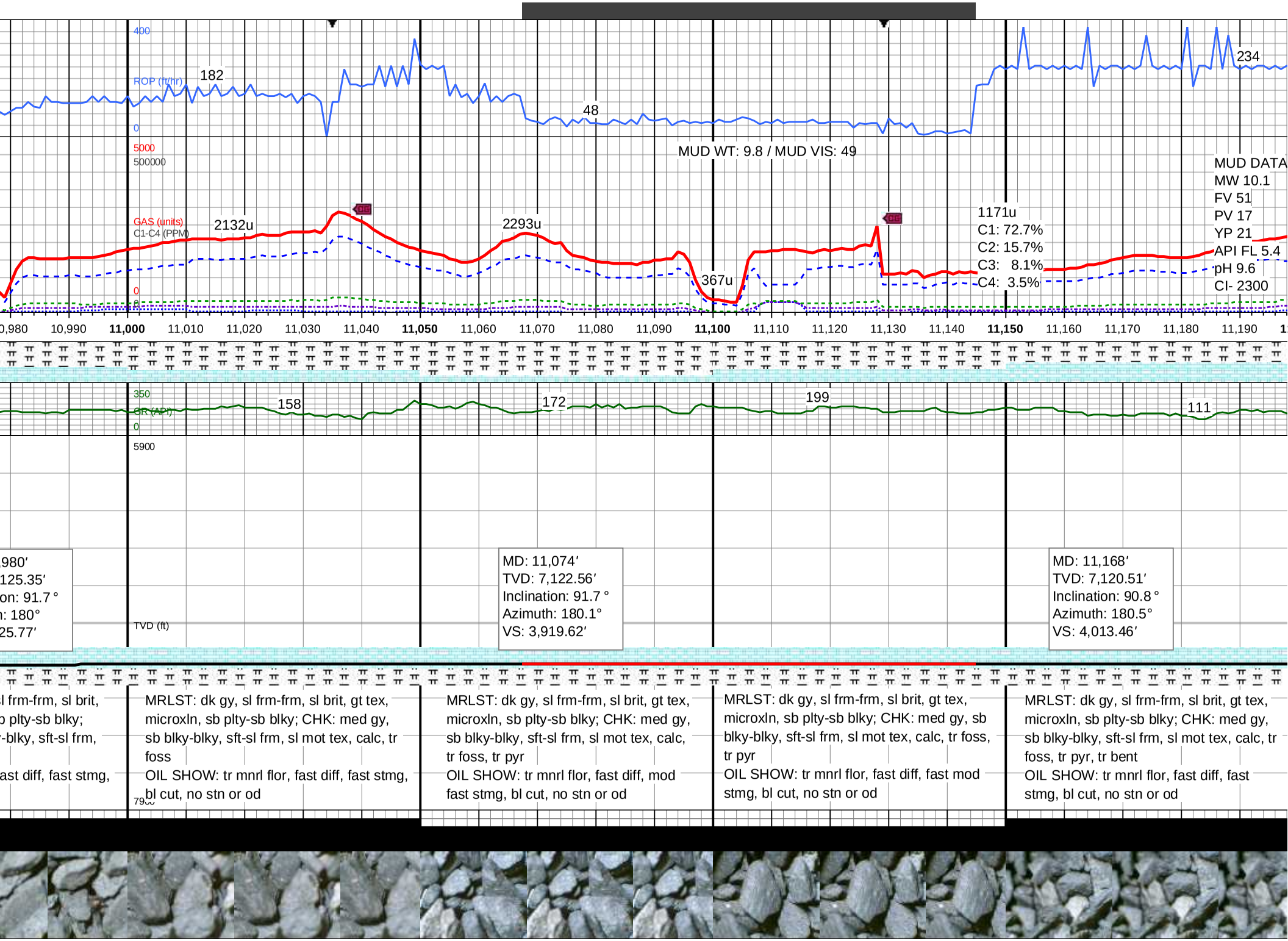

349
90
400
ROP (ft/hr)
0
5000
500000
GAS (units)
C1-C4 (PPM)
0
0
2924u
4748u
C1: 68.7%
C2: 17.7%
C3: 9.7%
C4: 3.9%
3303u
4191u
349
9,880
9,890
9,900
9,910
9,920
9,930
9,940
9,950
9,960
9,970
9,980
9,990
10,000
10,010
10,020
10,030
10,040
10,050
10,060
10,070
10,080
10,090
94
200
350
GR (API)
0
5900
161
133
MD: 9,940′
TVD: 7,130.63′
Inclination: 88.9 °
Azimuth: 177.7°
VS: 2,786.7′
MD: 10,035′
TVD: 7,131.46′
Inclination: 90.1 °
Azimuth: 178°
VS: 2,881.69′
TVD (ft)
lky, sft-sl frm, mot
; MRLST: med
-slty tex,sl mot,
y
fast diff, fast stmg,
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, tr pyr, rr bent; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, rr bent; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, foss incl, rr bent; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, foss incl, rr bent; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od

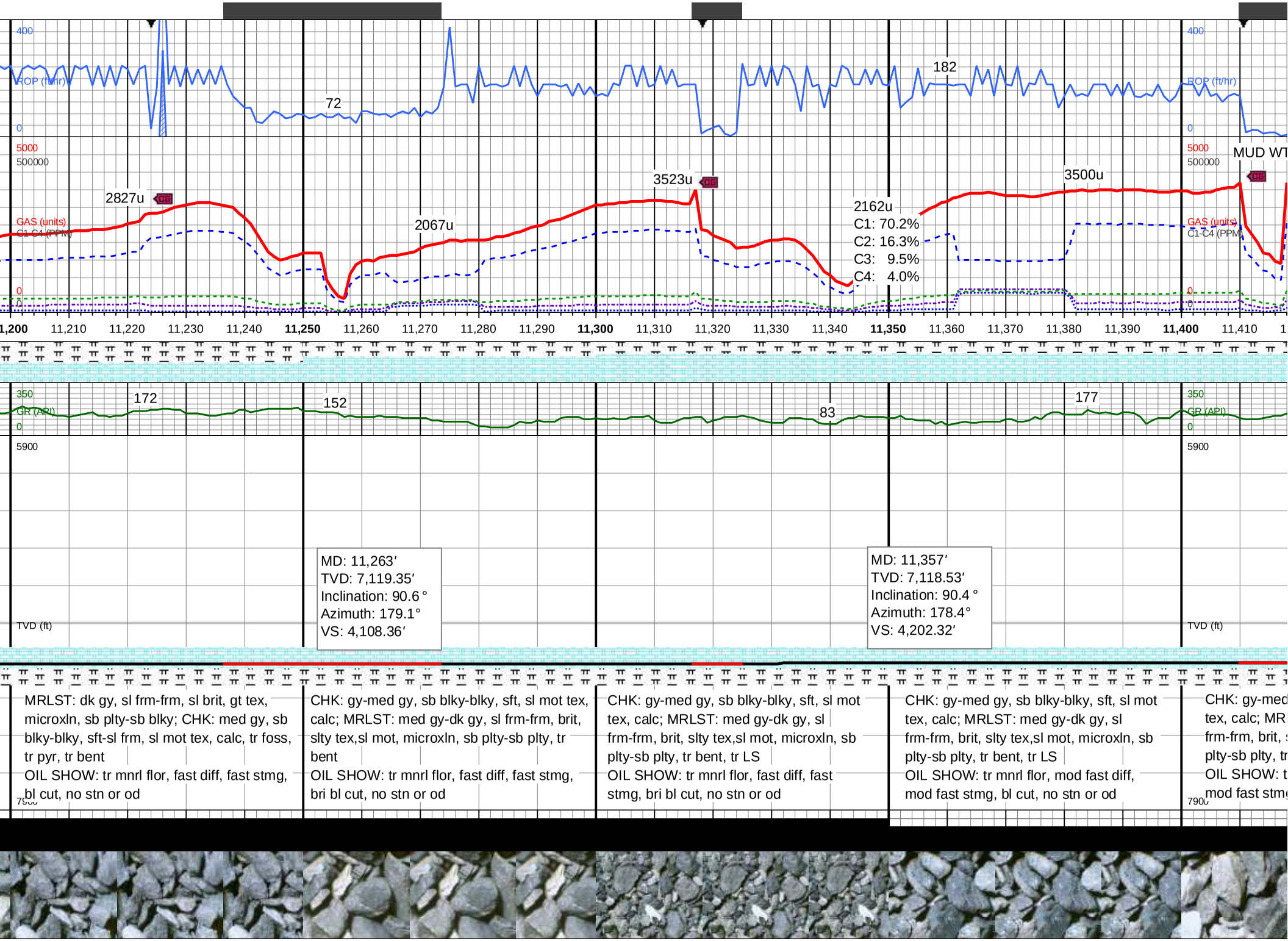

400
ROP (ft/hr)
0
104
184
148
MUD WT: 10.2 / MUD VIS: 48
MUD WT: 10.1 / MUD VIS: 48
5000
500000
GAS (units)
C1-C4 (PPM)
0
0
3232u
C1: 67.1%
C2: 17.9%
C3: 10.3%
C4: 4.7%
2646u
2521u
10,100
10,110
10,120
10,130
10,140
10,150
10,160
10,170
10,180
10,190
10,200
10,210
10,220
10,230
10,240
10,250
10,260
10,270
10,280
10,290
10,300
10,310
158
227
216
141
350
GR (API)
0
5900
MD: 10,129′
TVD: 7,131.3′
Inclination: 90.1 °
Azimuth: 177.5°
VS: 2,975.68′
MD: 10,224′
TVD: 7,131.21′
Inclination: 90 °
Azimuth: 178.9°
VS: 3,070.67′
TVD (ft)
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, foss incl, rr bent; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, foss incl, rr bent; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, foss incl, tr bent; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
7900
MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky; CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, tr foss, tr pyr,tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od

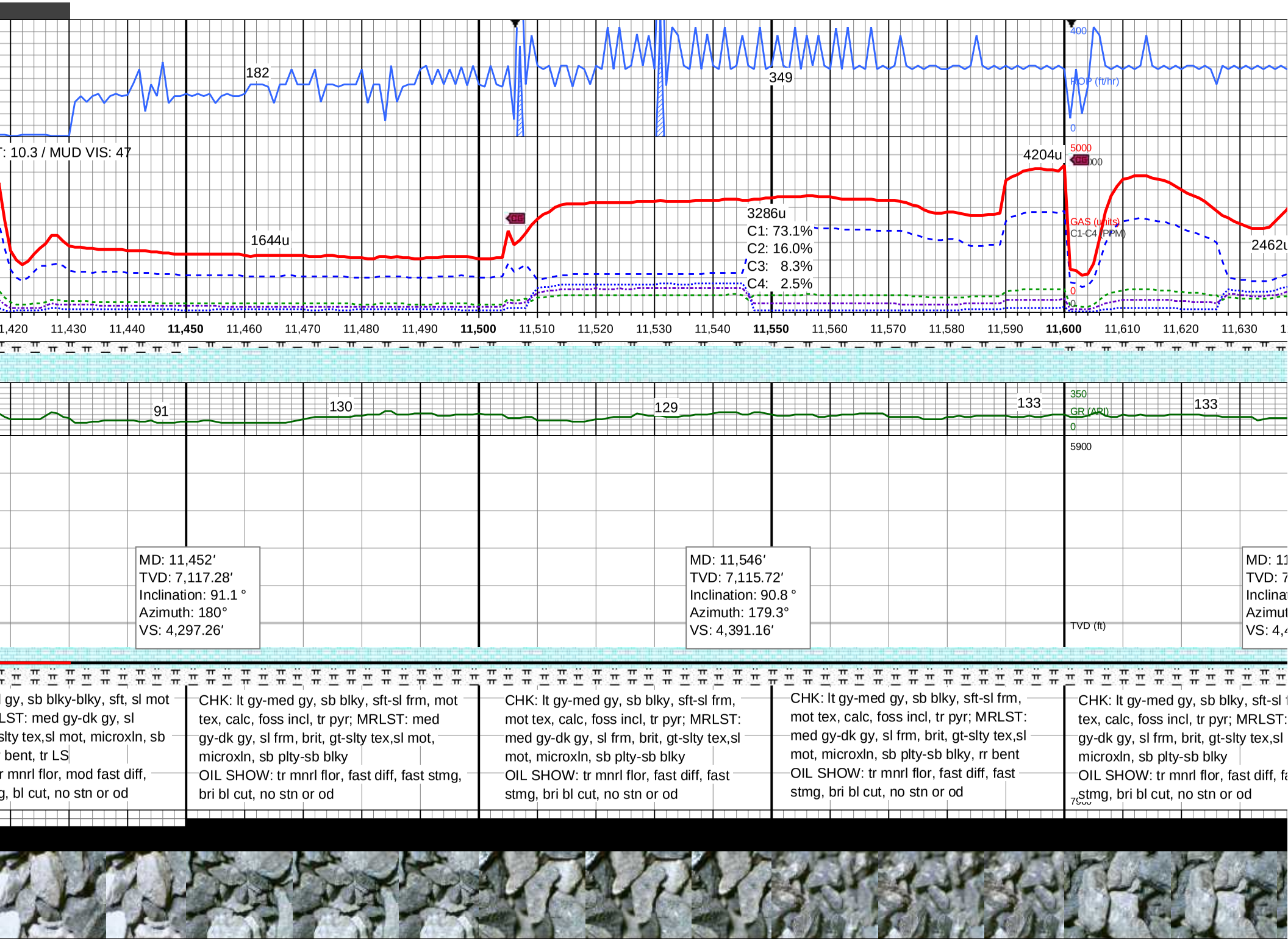

122
400
ROP (ft/hr)
0
89
180
5000
500000
MUD DATA
MW 10
FV 48
PV 15
YP 20
API FL 5.6
pH 9.5
Cl- 2200
MUD WT: 9.8 / MUD VIS: 53
GAS (units)
C1-C4 (PPM)
2627u
C1: 48.4%
C2: 17.8%
C3: 20.0%
C4: 13.8%
1484u
2016u
0
10,320
10,330
10,340
10,350
10,360
10,370
10,380
10,390
10,400
10,410
10,420
10,430
10,440
10,450
10,460
10,470
10,480
10,490
10,500
10,510
10,520
10,530
127
197
350
GR (API)
0
5900
125
333
316
MD: 10,412′
TVD: 7,131.13′
Inclination: 89.3 °
Azimuth: 179.1°
VS: 3,258.56′
MD: 10,507′
TVD: 7,132.62′
Inclination: 88.9 °
Azimuth: 180.3°
VS: 3,353.46′
MRLST: med gy-dk gy, sl frm-frm, brit, slty tex,sl mot, microxln, sb plty-sb blky; CHK: gy-med gy, sb blky, sft-sl frm, sl mot tex, calc, tr foss, tr bent, tr cement
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od
MRLST: med gy-dk gy, sl frm-frm, brit, slty tex,sl mot, microxln, sb plty-sb blky; CHK: med gy, sb blky-blky, sft-sl frm, sl mot tex, calc, tr foss, tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od
MRLST: med gy-dk gy, sl frm-frm, brit, -gt tex,sl mot, microxln, sb plty-sb blky; CHK: gy-med gy, sb blky-blky, sft-sl frm, mot tex, calc, tr foss, tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od

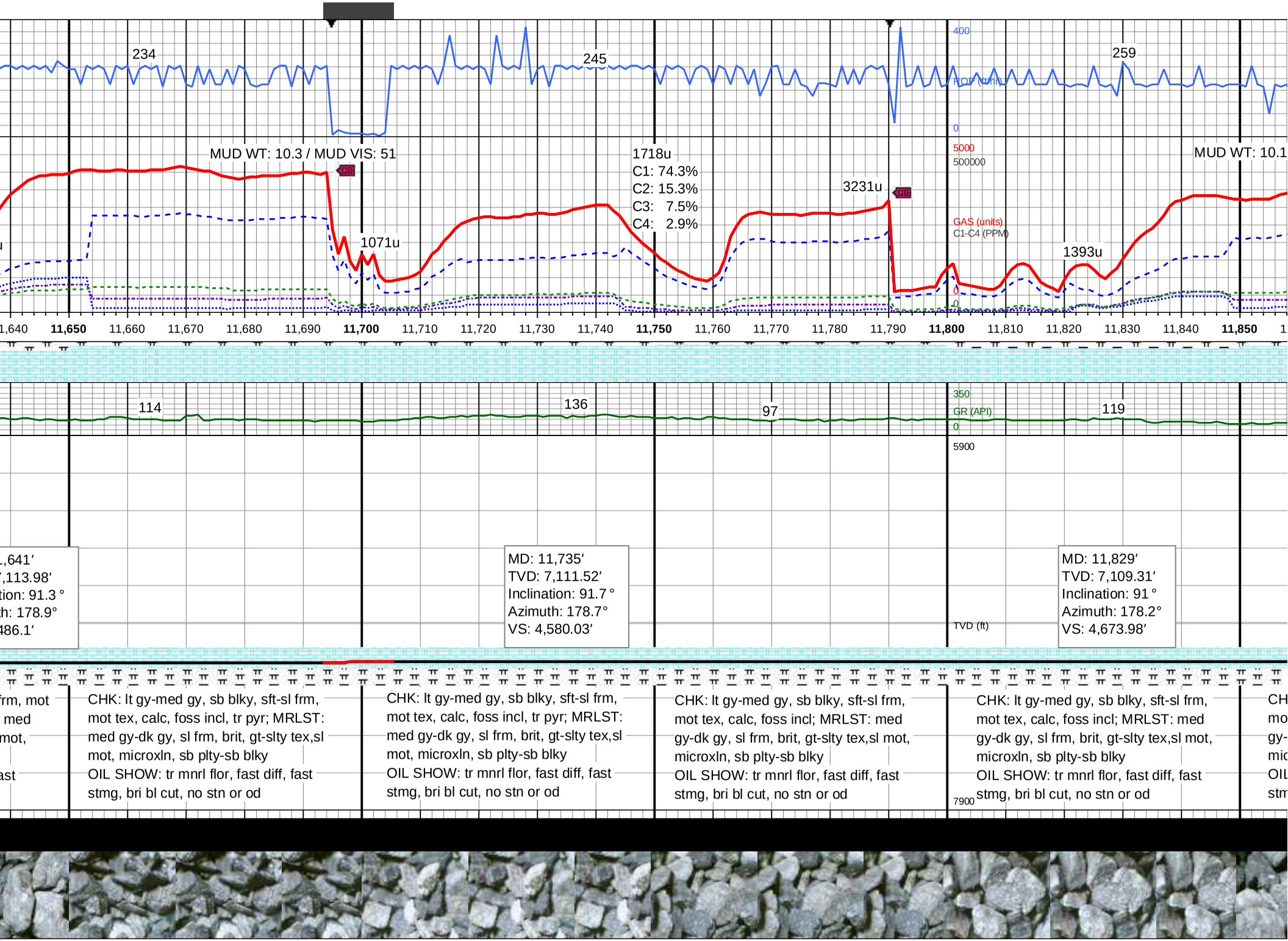

400
181
ROP (ft/hr)
0
48
182
5000
500000
1779u
C1: 56.7%
C2: 13.5%
C3: 15.7%
C4: 14.1%
1729u
GAS (units)
C1-C4 (PPM)
0
3117u
2434u
2975u
C1: 71.6%
C2: 16.9%
C3: 8.6%
C4: 2.9%
10,540
10,550
10,560
10,570
10,580
10,590
10,600
10,610
10,620
10,630
10,640
10,650
10,660
10,670
10,680
10,690
10,700
10,710
10,720
10,730
10,740
10,750
350
330
GR (API)
0
285
216
136
5900
MD: 10,601′
TVD: 7,132.62′
Inclination: 91.1 °
Azimuth: 181°
VS: 3,447.29′
MD: 10,696′
TVD: 7,130.96′
Inclination: 90.9 °
Azimuth: 180°
VS: 3,542.13′
brit, gt
CHK:
tex,
ast
MRLST: med gy-dk gy, sl frm, brit, gt tex, sl mot, microxln, sb plty-plty; CHK: gy-med gy, sb blky-blky, sft-sl frm, mot tex, calc, tr foss
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od
MRLST: med gy-dk gy, sl frm-frm, brit, gt tex, sl mot, microxln, sb plty-plty; CHK: gy-med gy, sb blky-blky, sft-sl frm, mot tex, calc, tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od
7900
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, rr bent; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky-blky, sft, mot tex, calc; MRLST: med gy-dk gy, sl frm-frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK
mot
frm,
plty-
OIL
stmg

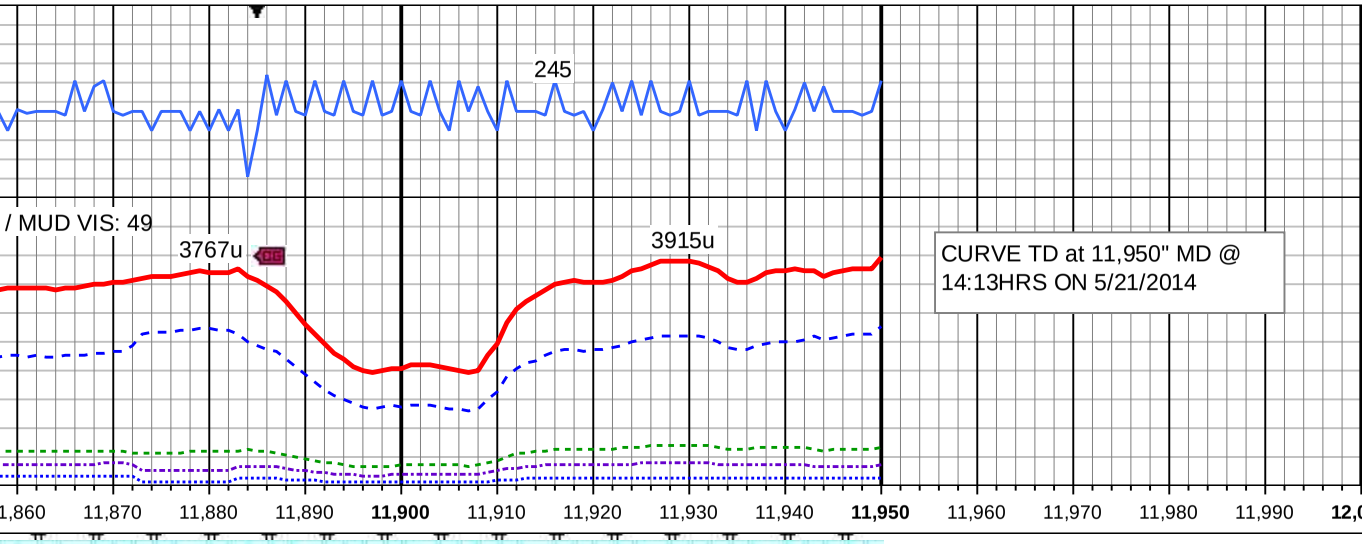

246
185
245
180
400
ROP (ft/hr)
0
5000
500000
MUD WT: 9.9 / MUD VIS: 50
2857u
3199u
2935u
3003u
2121u
C1: 75.6%
C2: 15.5%
C3: 7.3%
C4: 1.7%
GAS (units)
C1-C4 (PPM)
0
0
10,760
10,770
10,780
10,790
10,800
10,810
10,820
10,830
10,840
10,850
10,860
10,870
10,880
10,890
10,900
10,910
10,920
10,930
10,940
10,950
10,960
10,970
140
175
125
197
158
350
GR (API)
0
5900
MD: 10,791′
TVD: 7,129.72′
Inclination: 90.6 °
Azimuth: 179.1°
VS: 3,637.04′
MD: 10,885′
TVD: 7,128′
Inclination: 91.5 °
Azimuth: 180.5°
VS: 3,730.93′
TVD (ft)
: gy-med gy, sb blky-blky, sft-sl frm, tex, calc; MRLST: med gy-dk gy, sl brit, gt-slty tex,sl mot, microxln, sb sb blky
SHOW: tr mnrl flor, fast diff, fast , bri bl cut, no stn or od
CHK: gy-med gy, sb blky, sft-sl frm, mot tex, calc; MRLST: med gy-dk gy, sl frm-frm, brit, slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: gy-med gy, sb blky-blky, sft, sl mot tex, calc; MRLST: med gy-dk gy, sl frm-frm, brit, slty tex,sl mot, microxln, sb plty-sb plty, tr bent
OIL SHOW: tr mnrl flor, fast diff, mod fast stmg, bri bl cut, no stn or od
MRLST: med gy-dk gy, sl frm-frm, brit, -gt tex,sl mot, microxln, sb plty-sb blky; CHK: gy-med gy, sb blky-blky, sft-sl frm, mot tex, calc, tr foss, tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od
MRLST: med gy-dk gy, s
gt tex,sl mot, microxln, sl
CHK: gy-med gy, sb blky
sl mot tex, calc, tr foss
OIL SHOW: tr mnrl flor, f
bl cut, no stn or od

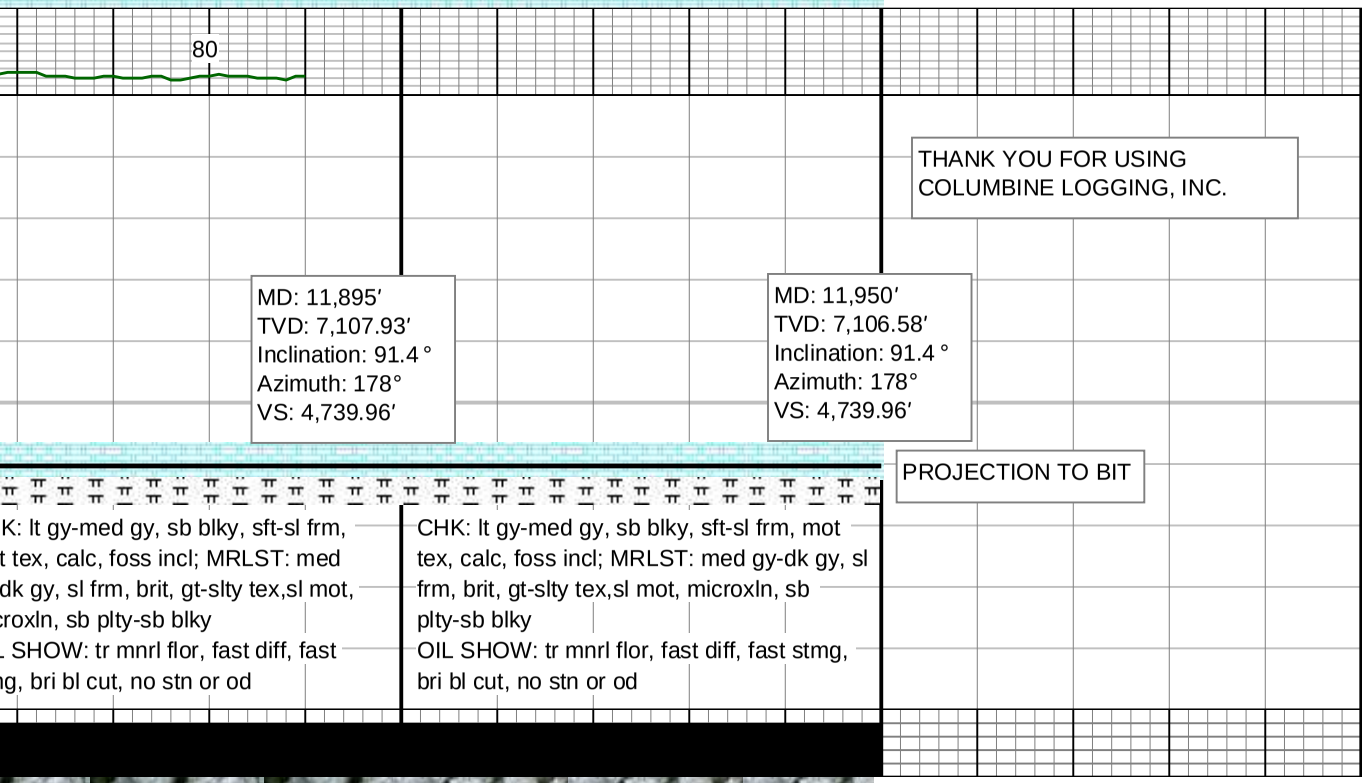

400
ROP (ft/hr)
182
48
234
0
5000
500000
MUD WT: 9.8 / MUD VIS: 49
MUD DATA
MW 10.1
FV 51
PV 17
YP 21
API FL 5.4
pH 9.6
CI- 2300
GAS (units)
C1-C4 (PPM)
2132u
2293u
367u
1171u
C1: 72.7%
C2: 15.7%
C3: 8.1%
C4: 3.5%
0
0
10,980
10,990
11,000
11,010
11,020
11,030
11,040
11,050
11,060
11,070
11,080
11,090
11,100
11,110
11,120
11,130
11,140
11,150
11,160
11,170
11,180
11,190
350
GR (API)
158
172
199
111
0
5900
TVD (ft)
980′
125.35′
on: 91.7 °
n: 180°
25.77′
MD: 11,074′
TVD: 7,122.56′
Inclination: 91.7 °
Azimuth: 180.1°
VS: 3,919.62′
MD: 11,168′
TVD: 7,120.51′
Inclination: 90.8 °
Azimuth: 180.5°
VS: 4,013.46′
l frm-frm, sl brit,
b plty-sb blky;
-blky, sft-sl frm,
ast diff, fast stmg,
MRLST: dk gy, sl frm-frm, sl brit, gt tex, microxln, sb plty-sb blky; CHK: med gy, sb blky-blky, sft-sl frm, sl mot tex, calc, tr foss
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od
MRLST: dk gy, sl frm-frm, sl brit, gt tex, microxln, sb plty-sb blky; CHK: med gy, sb blky-blky, sft-sl frm, sl mot tex, calc, tr foss, tr pyr
OIL SHOW: tr mnrl flor, fast diff, mod fast stmg, bl cut, no stn or od
MRLST: dk gy, sl frm-frm, sl brit, gt tex, microxln, sb plty-sb blky; CHK: med gy, sb blky-blky, sft-sl frm, sl mot tex, calc, tr foss, tr pyr
OIL SHOW: tr mnrl flor, fast diff, fast mod stmg, bl cut, no stn or od
MRLST: dk gy, sl frm-frm, sl brit, gt tex, microxln, sb plty-sb blky; CHK: med gy, sb blky-blky, sft-sl frm, sl mot tex, calc, tr foss, tr pyr, tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od


ROP (ft/hr)
400
0
72
182
5000
500000
GAS (units)
C1-C4 (PPM)
2827u
2067u
3523u
2162u
C1: 70.2%
C2: 16.3%
C3: 9.5%
C4: 4.0%
3500u
MUD WT
11,200
11,210
11,220
11,230
11,240
11,250
11,260
11,270
11,280
11,290
11,300
11,310
11,320
11,330
11,340
11,350
11,360
11,370
11,380
11,390
11,400
11,410
GR (API)
350
172
152
83
177
5900
TVD (ft)
MD: 11,263′
TVD: 7,119.35′
Inclination: 90.6 °
Azimuth: 179.1°
VS: 4,108.36′
MD: 11,357′
TVD: 7,118.53′
Inclination: 90.4 °
Azimuth: 178.4°
VS: 4,202.32′
MRLST: dk gy, sl frm-frm, sl brit, gt tex, microxln, sb plty-sb blky; CHK: med gy, sb blky-blky, sft-sl frm, sl mot tex, calc, tr foss, tr pyr, tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bl cut, no stn or od
CHK: gy-med gy, sb blky-blky, sft, sl mot tex, calc; MRLST: med gy-dk gy, sl frm-frm, brit, slty tex,sl mot, microxln, sb plty-sb plty, tr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: gy-med gy, sb blky-blky, sft, sl mot tex, calc; MRLST: med gy-dk gy, sl frm-frm, brit, slty tex,sl mot, microxln, sb plty-sb plty, tr bent, tr LS
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: gy-med gy, sb blky-blky, sft, sl mot tex, calc; MRLST: med gy-dk gy, sl frm-frm, brit, slty tex,sl mot, microxln, sb plty-sb plty, tr bent, tr LS
OIL SHOW: tr mnrl flor, mod fast diff, mod fast stmg, bl cut, no stn or od


182
349
400
ROP (ft/hr)
0
T: 10.3 / MUD VIS: 47
4204u
5000
GAS (units)
C1-C4 (PPM)
1644u
3286u
C1: 73.1%
C2: 16.0%
C3: 8.3%
C4: 2.5%
2462u
11,420
11,430
11,440
11,450
11,460
11,470
11,480
11,490
11,500
11,510
11,520
11,530
11,540
11,550
11,560
11,570
11,580
11,590
11,600
11,610
11,620
11,630
91
130
129
133
133
350
GR (API)
0
5900
MD: 11,452′
TVD: 7,117.28′
Inclination: 91.1 °
Azimuth: 180°
VS: 4,297.26′
MD: 11,546′
TVD: 7,115.72′
Inclination: 90.8 °
Azimuth: 179.3°
VS: 4,391.16′
TVD (ft)
l gy, sb blky-blky, sft, sl mot
LST: med gy-dk gy, sl
slty tex,sl mot, microxln, sb
bent, tr LS
r mnrl flor, mod fast diff,
g, bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, foss incl, tr pyr; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, foss incl, tr pyr; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, foss incl, tr pyr; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky, rr bent
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl
tex, calc, foss incl, tr pyr; MRLST:
gy-dk gy, sl frm, brit, gt-slty tex,sl
microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fa
stmg, bri bl cut, no stn or od


234
245
259
400
ROP (min/ft)
0
MUD WT: 10.3 / MUD VIS: 51
1718u
C1: 74.3%
C2: 15.3%
C3: 7.5%
C4: 2.9%
3231u
1071u
1393u
MUD WT: 10.1
5000
500000
GAS (units)
C1-C4 (PPM)
0
0
11,640
11,650
11,660
11,670
11,680
11,690
11,700
11,710
11,720
11,730
11,740
11,750
11,760
11,770
11,780
11,790
11,800
11,810
11,820
11,830
11,840
11,850
114
136
97
119
350
GR (API)
0
5900
TVD (ft)
7900
,641′
,113.98′
tion: 91.3 °
h: 178.9°
486.1′
MD: 11,735′
TVD: 7,111.52′
Inclination: 91.7 °
Azimuth: 178.7°
VS: 4,580.03′
MD: 11,829′
TVD: 7,109.31′
Inclination: 91 °
Azimuth: 178.2°
VS: 4,673.98′
rm, mot
med
mot,
ast
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, foss incl, tr pyr; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, foss incl, tr pyr; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, foss incl; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot tex, calc, foss incl; MRLST: med gy-dk gy, sl frm, brit, gt-slty tex,sl mot, microxln, sb plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg, bri bl cut, no stn or od


245
/ MUD VIS: 49
3767u
3915u
CURVE TD at 11,950" MD @
14:13HRS ON 5/21/2014
1,860
11,870
11,880
11,890
11,900
11,910
11,920
11,930
11,940
11,950
11,960
11,970
11,980
11,990


80
THANK YOU FOR USING
COLUMBINE LOGGING, INC.
MD: 11,895′
TVD: 7,107.93′
Inclination: 91.4 °
Azimuth: 178°
VS: 4,739.96′
MD: 11,950′
TVD: 7,106.58′
Inclination: 91.4 °
Azimuth: 178°
VS: 4,739.96′
PROJECTION TO BIT
K: lt gy-med gy, sb blky, sft-sl frm,
t tex, calc, foss incl; MRLST: med
dk gy, sl frm, brit, gt-slty tex,sl mot,
croxln, sb plty-sb blky
L SHOW: tr mnrl flor, fast diff, fast
ng, bri bl cut, no stn or od
CHK: lt gy-med gy, sb blky, sft-sl frm, mot
tex, calc, foss incl; MRLST: med gy-dk gy, sl
frm, brit, gt-slty tex,sl mot, microxln, sb
plty-sb blky
OIL SHOW: tr mnrl flor, fast diff, fast stmg,
bri bl cut, no stn or od