COLUMBINE LOGGING

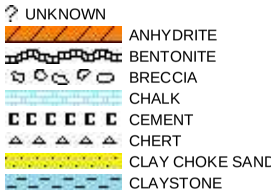
Scale: 5" / 100'
Measured Depth Log

Well Name	LOCHBUIE 30C-13HZ		
Location	SEC 13, T1N, R66W		
State	COLORADO	**County**	WELD
Country	USA	**Rig Number**	ENSIGN 132
API Number	05-123-38177	**AFE #**	2079331
Region	DJ BASIN	**Field**	WATTENBERG
Spud Date	2/7/2014	**Drilling Completed**	2/17/2014
Surface Coordinates	572' FSL & 582' FWL 40.045570 -104.732877		
Bottom Hole Coordinates	460' FNL & 330' FWL 40.057428 -104.733731		
Ground Elevation	5078'	**K.B. Elevation**	5091'
Logged Interval	6994' **To** 11854'	**Total Depth**	4860'
Formation	CODELL		
Type of Drilling Fluid	FSNL		

Company ANADARKO PE
Address 1099 18th St, S
Denver , CO 80

Name JAKE STUART
Company ANADARKO PE
Address 1099 18th St, S
Denver , CO 80

Columbine Loggers



Operator

ETROLEUM INC.

uite 1800
202

Geologist

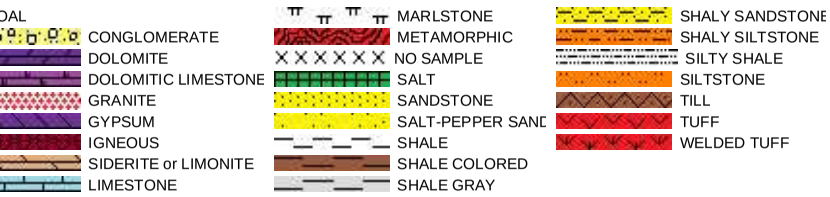
ETROLEUM INC.

uite 1800
202

Other

SHANA SWIRIN, CAMERON NAKOS

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
- MARLSTONE
- MICACEOUS
- 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

- D DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING
- P PINPOINT
- VUGGY

Engineering

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

Porosity

- E EARTHY
- FENESTRAL
- F FRACTURE
- INTERCRYSTALLINE
- INTEROOLITIC
- MOLDIC
- O ORGANIC

Rounding

- A ANGULAR
- R ROUNDED
- SUBANG
- SUBRND

Textures

- BS BOUNDSTONE
- C CHALKY
- CX CRYPTOXLN
- E EARTHY
- FX FINELYXLN
- GS GRAINSTONE
- L LITHOGRAPHIC
- MX MICROXLN
- MS MUDSTONE
- PS PACKSTONE
- WS WACKESTONE

Sorting

- M MODERATE
- P POOR
- W WELL

Slide/Rotate

ROP
ROF
GAMMA

Columbine Logging Two Person
Rigged Up 2300hrs 02/06/2014
With Bloodhound Unit # 0313

Logging Started @
1220hrs 02/09/2014
at 6994' MD

5
350
Problems with Gamma
ROP (min/ft)
GAMMA (api)
111
120
0
0

2689u
C1: 68.1%
C2: 18.8%
C3: 13.1%
C4: 0.0%

Total Gas & Chromatograph
GAS
C1
C2
C3
C4

7000
700000
7000
700000
3970u
WT 9.7/ VIS 41
WT 9.9+/ VIS 41
3743u
3236u
3327u
GAS (units)
C1-C4 (PPM)
0
0

Bit Data
Bit #: 02
Type: SMITH SDi611
Size: 8.75
Depth In: 1,268
Depth Out: 7,908
Jets: 6x16
S/N: JH9146

Depth Labels
7,000
7,050
7,100

% Lith

Well Bore
TVD

Begin in Sussex Formation
6850
MD: 6,979
TVD: 6,932.23
Inclination: 1.92
Azimuth: 302.78
VS: -517.12
MD: 7,027
TVD: 6,980.1
Inclination: 6.66
Azimuth: 357.46
VS: -513.9
MD: 7,074
TVD: 7,026.42
Inclination: 12.52
Azimuth: 359.39
VS: -506.08
MD: 7,122
TVD: 7,072.65
Inclination: 18.52
Azimuth: 0.12
VS: -493.24
TVD (ft)
TVD (ft)

Acetone was used as the cutting agent with the dimple filled to the rim
The ratings are based on 7 descriptors: None, Slight trace, Trace,Fair, Moderate, Good, and Excellent.The descriptor used is based on the loggers observations and best judgement of brilliance, color and longevity of the cut.

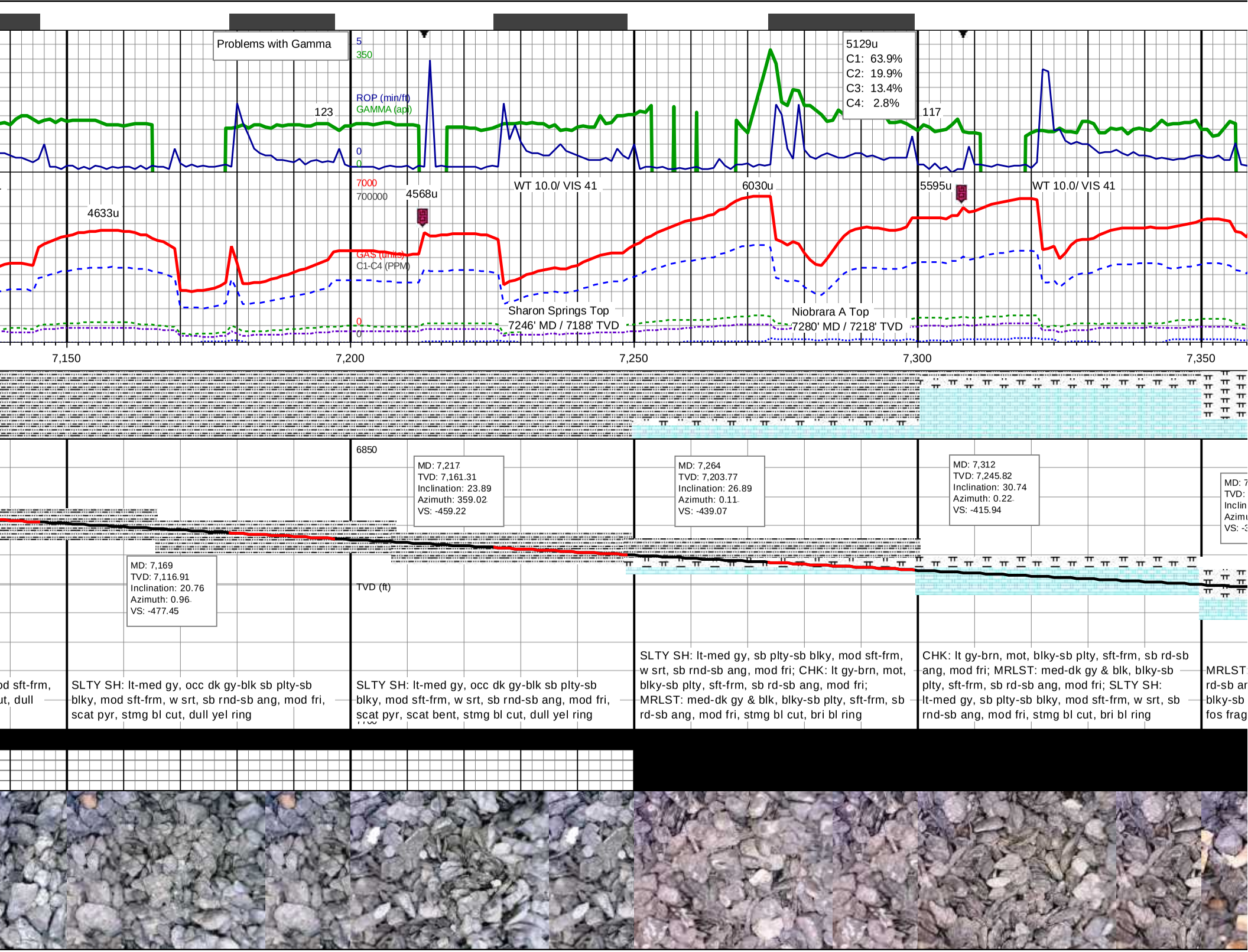
SLTY SH: lt-med gy, sb plty-sb blky, mod sft-frm, w srt, sb rnd-sb ang, mod fri, stmg bl cut, dull yel ring

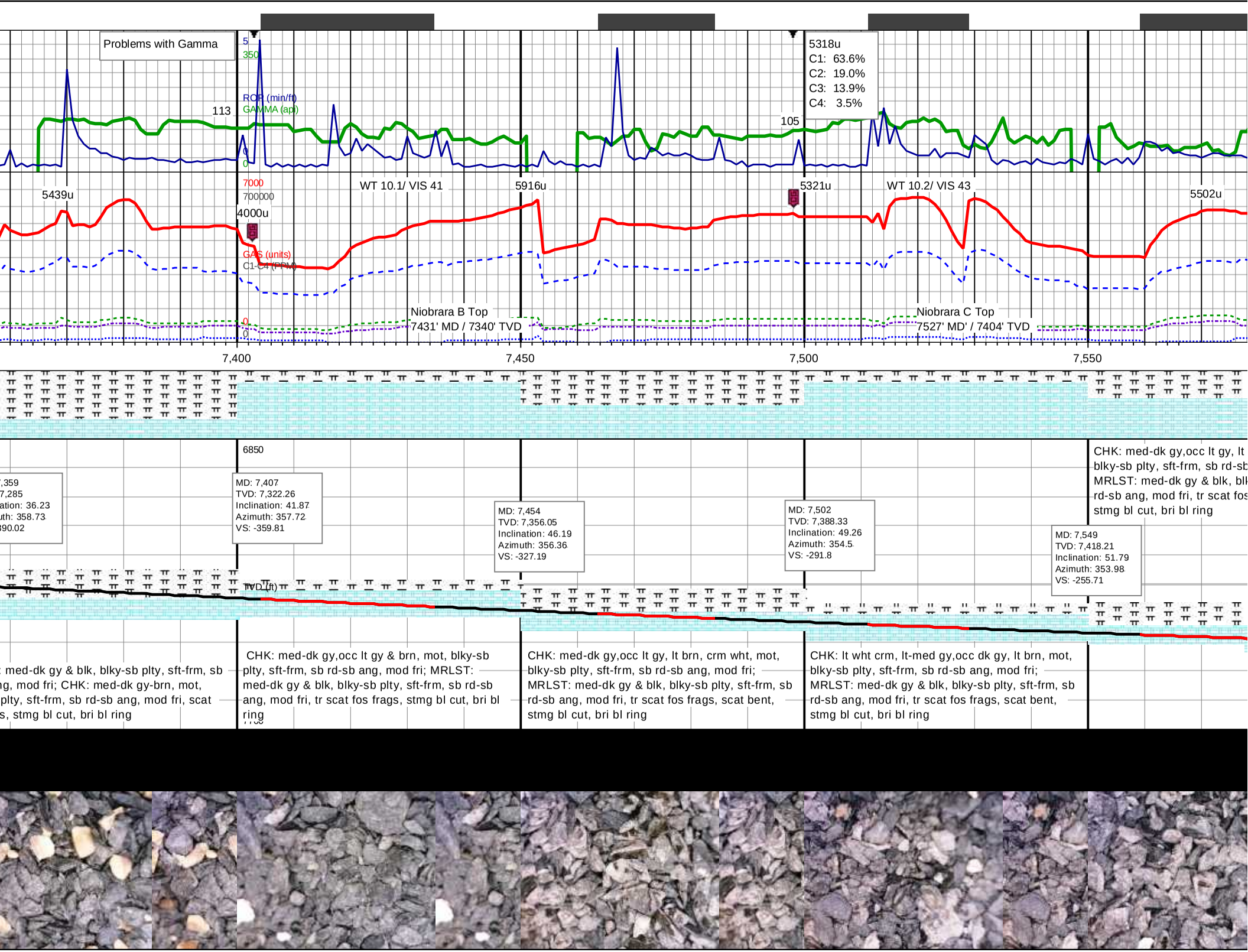
SLTY SH: lt-med gy, sb plty-sb blky, mod sft-frm, w srt, sb rnd-sb ang, mod fri, stmg bl cut, dull yel ring

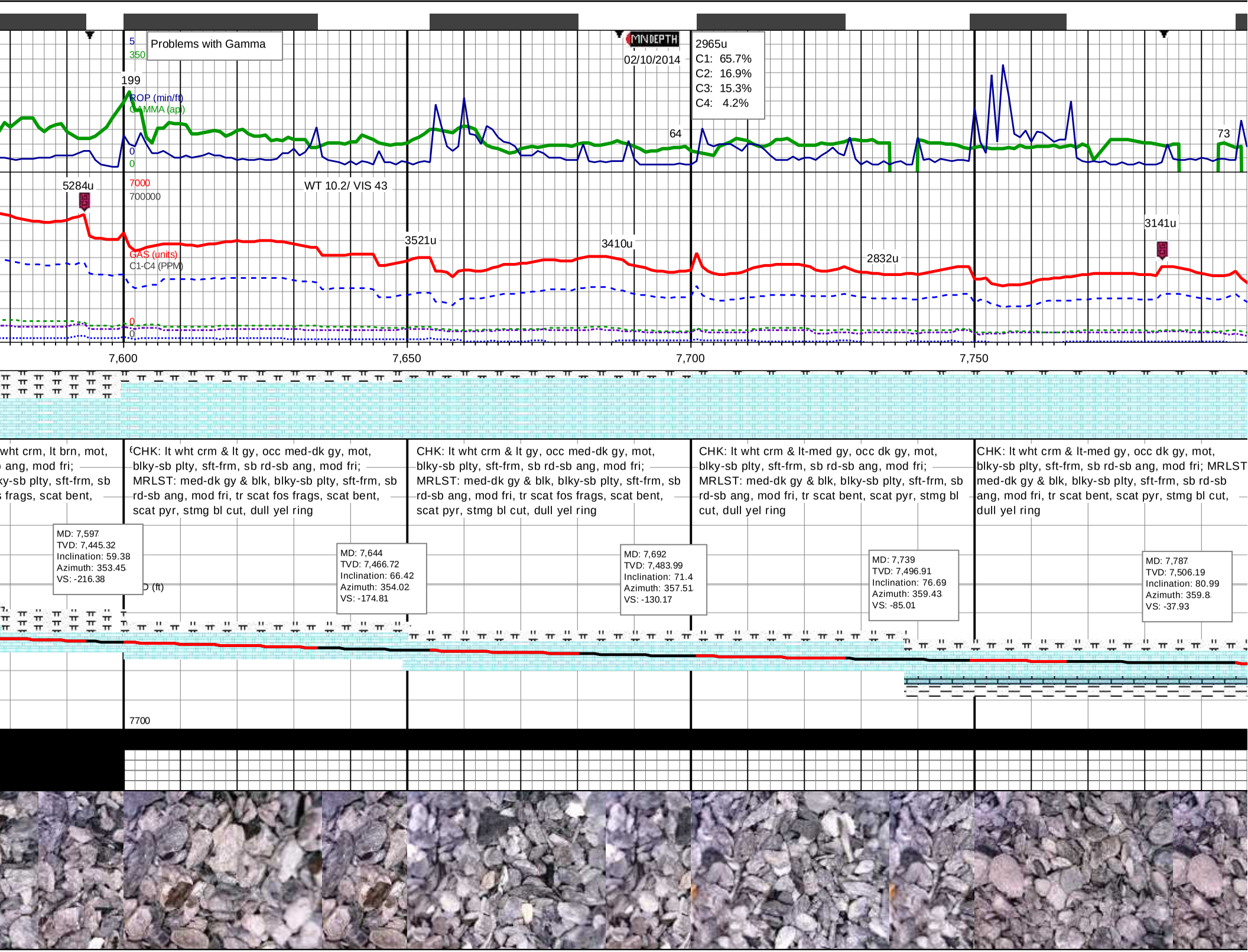
SLTY SH: lt-med gy, sb plty-sb blky, mo
w srt, sb rnd-sb ang, mod fri, stmg bl cu
yel ring

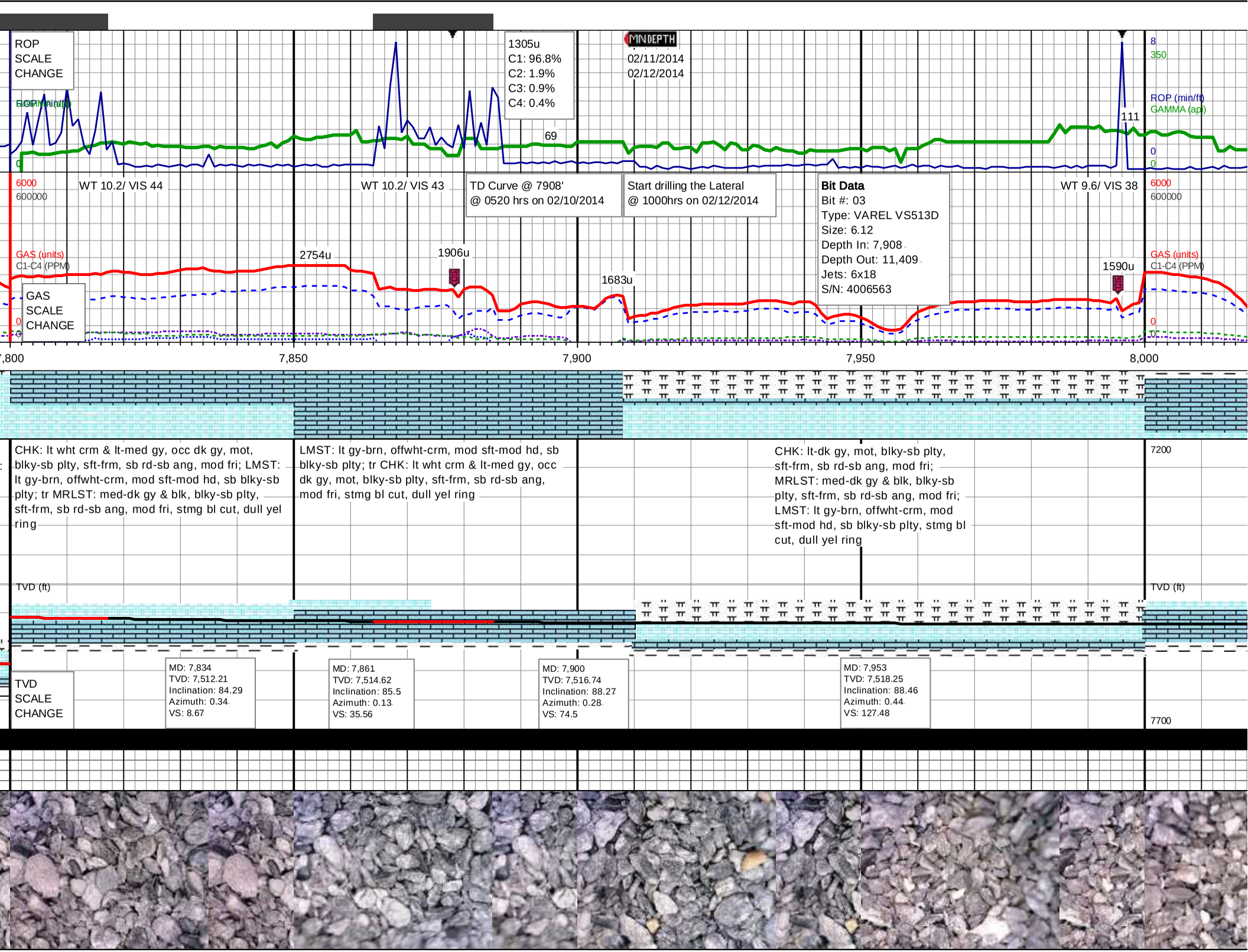
Oil Show
ST
T
F
M
G
E

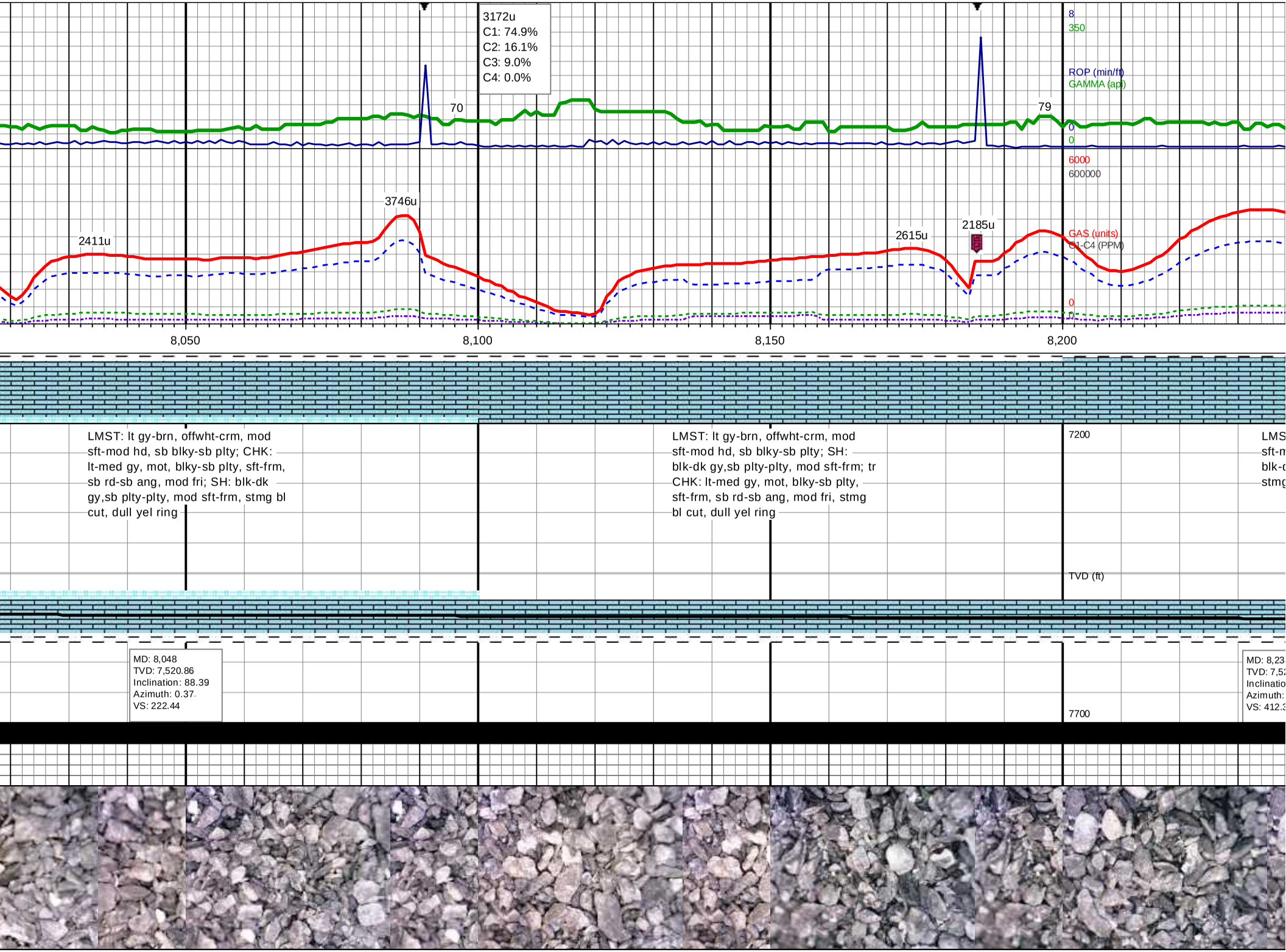
Images

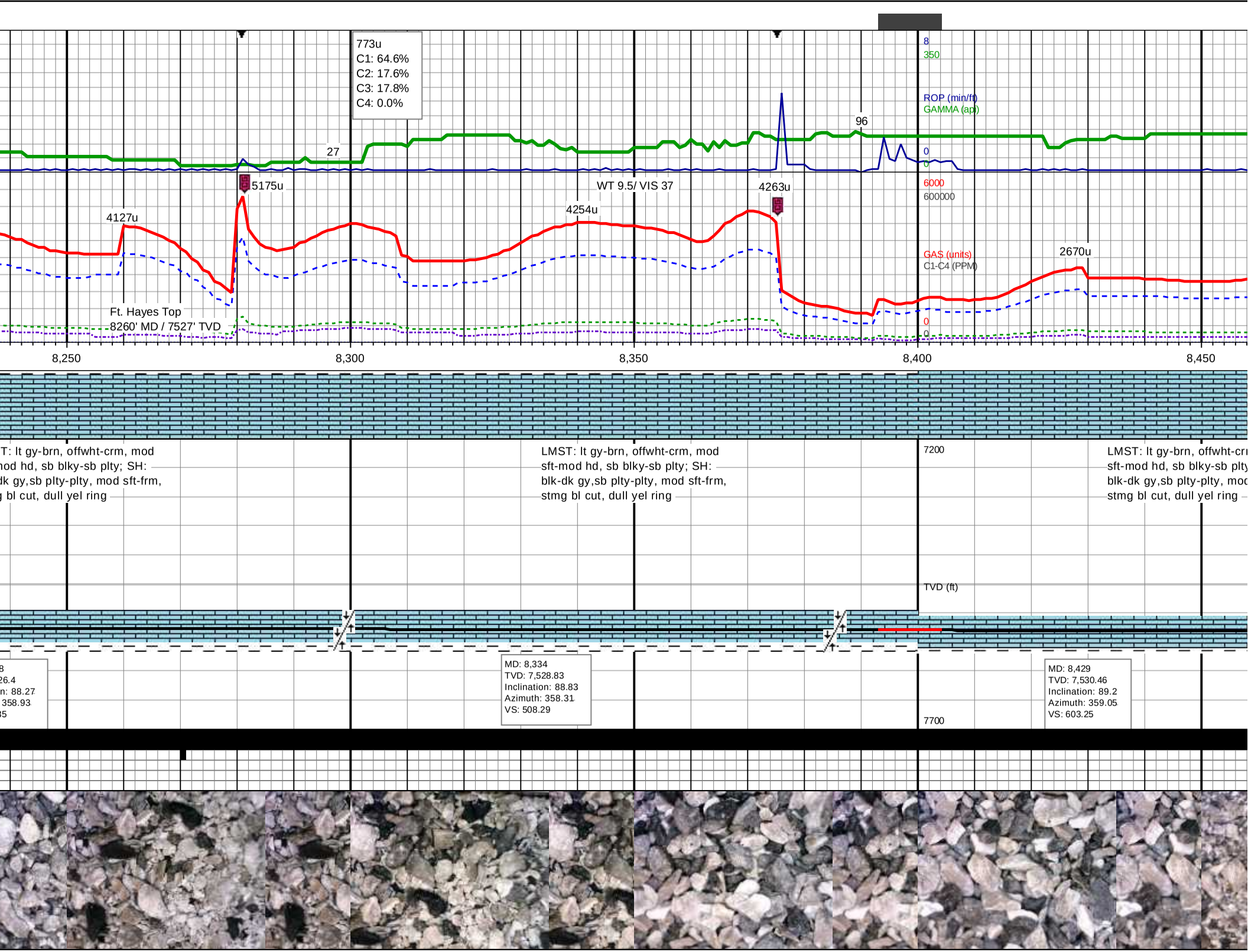

Problems with Gamma
5
350
ROP (min/ft)
GAMMA (api)
0
0
123
117
5129u
C1: 63.9%
C2: 19.9%
C3: 13.4%
C4: 2.8%
7000
700000
4633u
4568u
WT 10.0/ VIS 41
6030u
5595u
WT 10.0/ VIS 41
GAS (units)
C1-C4 (PPM)
0
0
Sharon Springs Top
7246' MD / 7188' TVD
Niobrara A Top
7280' MD / 7218' TVD
7,150
7,200
7,250
7,300
7,350
6850
MD: 7,217
TVD: 7,161.31
Inclination: 23.89
Azimuth: 359.02
VS: -459.22
MD: 7,264
TVD: 7,203.77
Inclination: 26.89
Azimuth: 0.11
VS: -439.07
MD: 7,312
TVD: 7,245.82
Inclination: 30.74
Azimuth: 0.22
VS: -415.94
MD: 7,169
TVD: 7,116.91
Inclination: 20.76
Azimuth: 0.96
VS: -477.45
TVD (ft)
od sft-frm,
ut, dull
SLTY SH: lt-med gy, occ dk gy-blk sb plty-sb blky, mod sft-frm, w srt, sb rnd-sb ang, mod fri, scat pyr, stmg bl cut, dull yel ring
SLTY SH: lt-med gy, occ dk gy-blk sb plty-sb blky, mod sft-frm, w srt, sb rnd-sb ang, mod fri, scat pyr, scat bent, stmg bl cut, dull yel ring
SLTY SH: lt-med gy, sb plty-sb blky, mod sft-frm, w srt, sb rnd-sb ang, mod fri; CHK: lt gy-brn, mot, blky-sb plty, sft-frm, sb rd-sb ang, mod fri; MRLST: med-dk gy & blk, blky-sb plty, sft-frm, sb rd-sb ang, mod fri, stmg bl cut, bri bl ring
CHK: lt gy-brn, mot, blky-sb plty, sft-frm, sb rd-sb ang, mod fri; MRLST: med-dk gy & blk, blky-sb plty, sft-frm, sb rd-sb ang, mod fri; SLTY SH: lt-med gy, sb plty-sb blky, mod sft-frm, w srt, sb rnd-sb ang, mod fri, stmg bl cut, bri bl ring
MRLST
rd-sb ar
blky-sb
fos frag

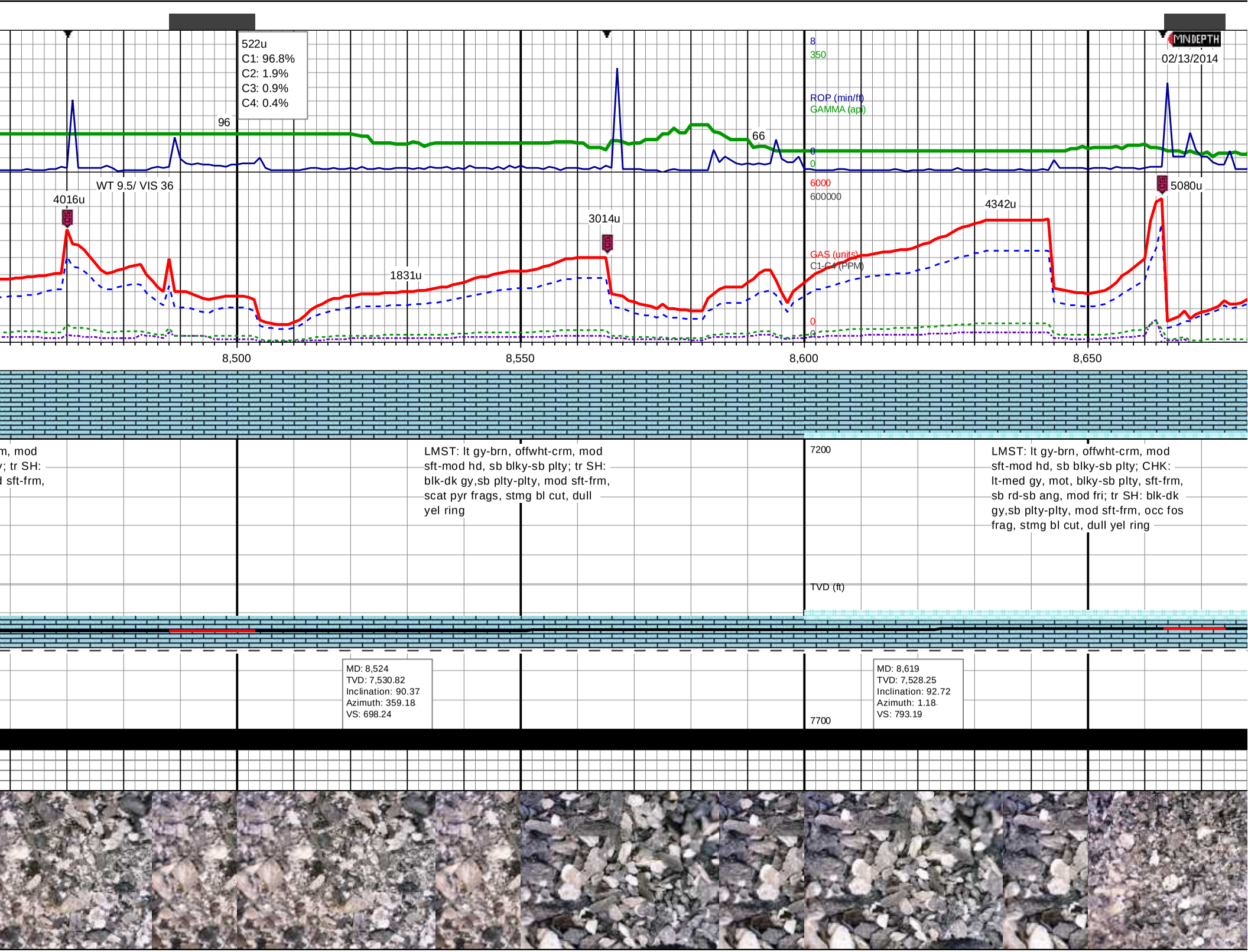

Problems with Gamma
5
350
ROP (min/ft)
GAMMA (api)
113
0
0
5318u
C1: 63.6%
C2: 19.0%
C3: 13.9%
C4: 3.5%
105
7000
700000
5439u
WT 10.1/ VIS 41
5916u
5321u
WT 10.2/ VIS 43
5502u
4000u
GAS (units)
C1-C4 (PPM)
0
0
Niobrara B Top
7431' MD / 7340' TVD
Niobrara C Top
7527' MD' / 7404' TVD
7,400
7,450
7,500
7,550
6850
MD: 7,407
TVD: 7,322.26
Inclination: 41.87
Azimuth: 357.72
VS: -359.81
MD: 7,454
TVD: 7,356.05
Inclination: 46.19
Azimuth: 356.36
VS: -327.19
MD: 7,502
TVD: 7,388.33
Inclination: 49.26
Azimuth: 354.5
VS: -291.8
MD: 7,549
TVD: 7,418.21
Inclination: 51.79
Azimuth: 353.98
VS: -255.71
TVD (ft)
CHK: med-dk gy,occ lt gy, lt
blky-sb plty, sft-frm, sb rd-sb
MRLST: med-dk gy & blk, blk
rd-sb ang, mod fri, tr scat fos
stmg bl cut, bri bl ring
med-dk gy & blk, blky-sb plty, sft-frm, sb
ng, mod fri; CHK: med-dk gy-brn, mot,
plty, sft-frm, sb rd-sb ang, mod fri, scat
s, stmg bl cut, bri bl ring
CHK: med-dk gy,occ lt gy & brn, mot, blky-sb plty, sft-frm, sb rd-sb ang, mod fri; MRLST: med-dk gy & blk, blky-sb plty, sft-frm, sb rd-sb ang, mod fri, tr scat fos frags, stmg bl cut, bri bl ring
CHK: med-dk gy,occ lt gy, lt brn, crm wht, mot, blky-sb plty, sft-frm, sb rd-sb ang, mod fri; MRLST: med-dk gy & blk, blky-sb plty, sft-frm, sb rd-sb ang, mod fri, tr scat fos frags, scat bent, stmg bl cut, bri bl ring
CHK: lt wht crm, lt-med gy,occ dk gy, lt brn, mot, blky-sb plty, sft-frm, sb rd-sb ang, mod fri; MRLST: med-dk gy & blk, blky-sb plty, sft-frm, sb rd-sb ang, mod fri, tr scat fos frags, scat bent, stmg bl cut, bri bl ring

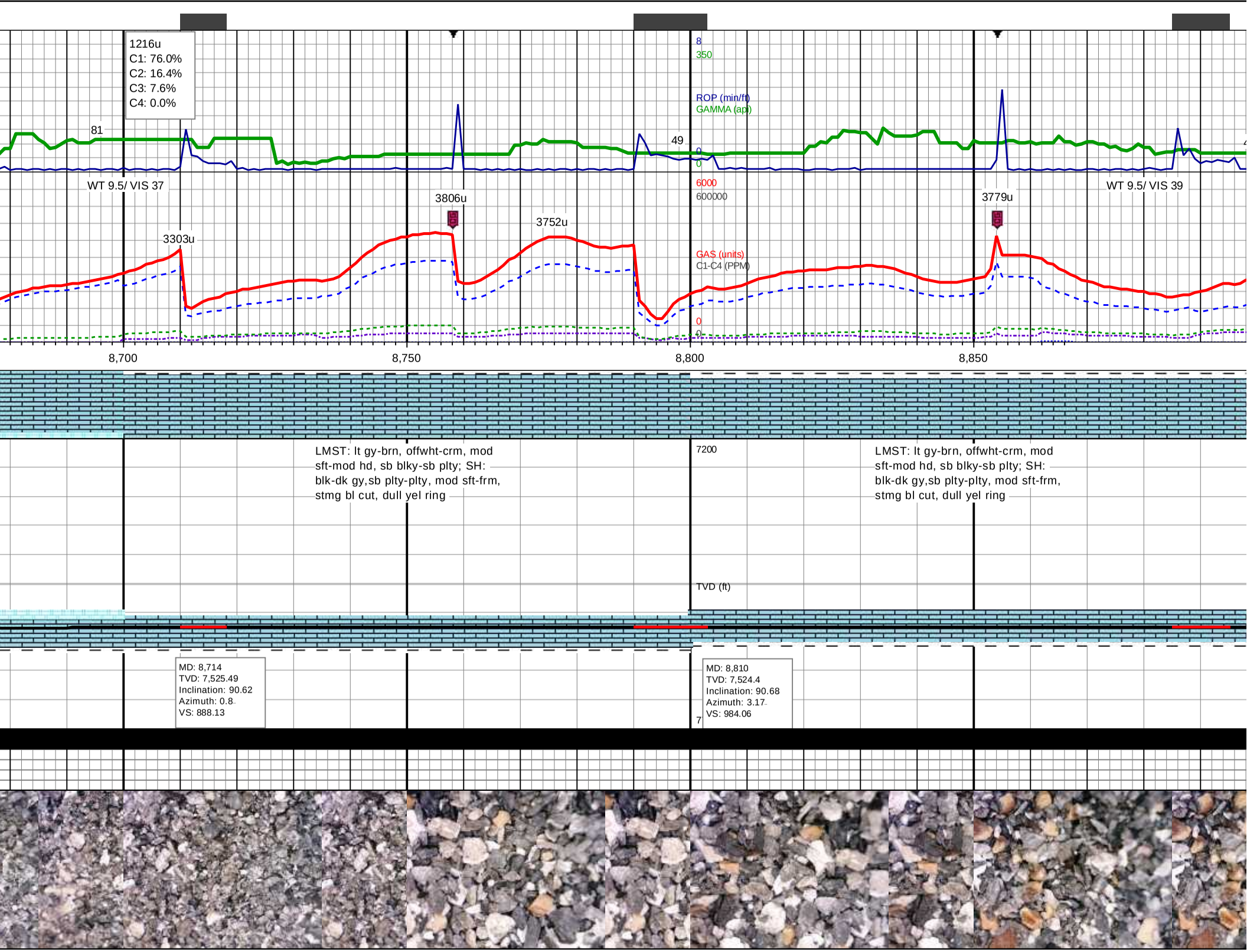

Problems with Gamma
5
350
199
ROP (min/ft)
GAMMA (api)
0
0
7000
700000
GAS (units)
C1-C4 (PPM)
0
0
MNDEPTH
02/10/2014
2965u
C1: 65.7%
C2: 16.9%
C3: 15.3%
C4: 4.2%
64
73
5284u
WT 10.2/ VIS 43
3521u
3410u
2832u
3141u
7,600
7,650
7,700
7,750
wht crm, lt brn, mot,
ang, mod fri;
ky-sb plty, sft-frm, sb
frags, scat bent,
CHK: lt wht crm & lt gy, occ med-dk gy, mot, blky-sb plty, sft-frm, sb rd-sb ang, mod fri; MRLST: med-dk gy & blk, blky-sb plty, sft-frm, sb rd-sb ang, mod fri, tr scat fos frags, scat bent, scat pyr, stmg bl cut, dull yel ring
CHK: lt wht crm & lt gy, occ med-dk gy, mot, blky-sb plty, sft-frm, sb rd-sb ang, mod fri; MRLST: med-dk gy & blk, blky-sb plty, sft-frm, sb rd-sb ang, mod fri, tr scat fos frags, scat bent, scat pyr, stmg bl cut, dull yel ring
CHK: lt wht crm & lt-med gy, occ dk gy, mot, blky-sb plty, sft-frm, sb rd-sb ang, mod fri; MRLST: med-dk gy & blk, blky-sb plty, sft-frm, sb rd-sb ang, mod fri, tr scat bent, scat pyr, stmg bl cut, dull yel ring
CHK: lt wht crm & lt-med gy, occ dk gy, mot, blky-sb plty, sft-frm, sb rd-sb ang, mod fri; MRLST med-dk gy & blk, blky-sb plty, sft-frm, sb rd-sb ang, mod fri, tr scat bent, scat pyr, stmg bl cut, dull yel ring
MD: 7,597
TVD: 7,445.32
Inclination: 59.38
Azimuth: 353.45
VS: -216.38
MD: 7,644
TVD: 7,466.72
Inclination: 66.42
Azimuth: 354.02
VS: -174.81
MD: 7,692
TVD: 7,483.99
Inclination: 71.4
Azimuth: 357.51
VS: -130.17
MD: 7,739
TVD: 7,496.91
Inclination: 76.69
Azimuth: 359.43
VS: -85.01
MD: 7,787
TVD: 7,506.19
Inclination: 80.99
Azimuth: 359.8
VS: -37.93
7700

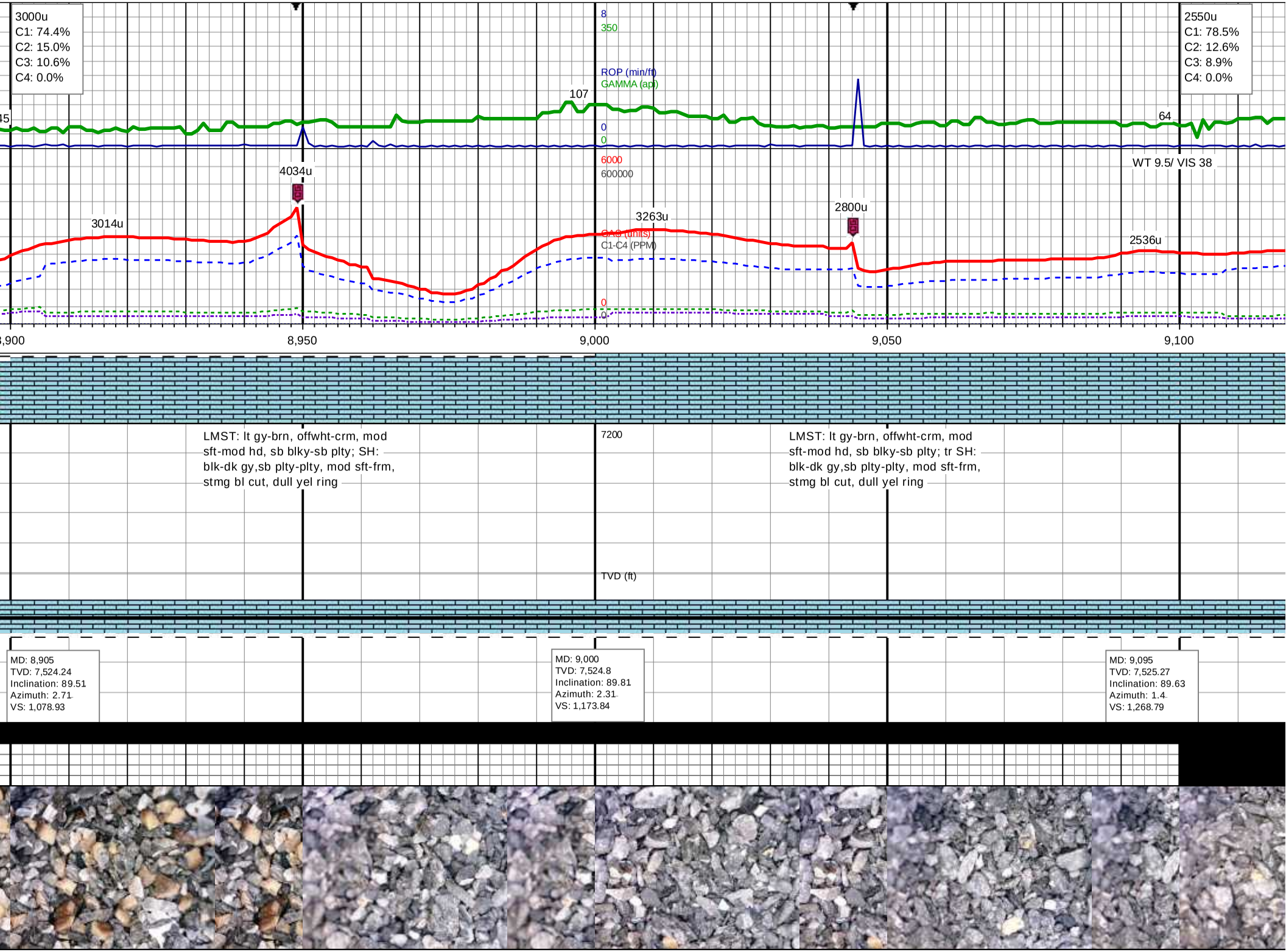

ROP
SCALE
CHANGE
GAMMA (api)
1305u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%
MNDEPTH
02/11/2014
02/12/2014
8
350
ROP (min/ft)
GAMMA (api)
111
69
0
0
6000
600000
WT 10.2/ VIS 44
WT 10.2/ VIS 43
TD Curve @ 7908'
@ 0520 hrs on 02/10/2014
Start drilling the Lateral
@ 1000hrs on 02/12/2014
Bit Data
Bit #: 03
Type: VAREL VS513D
Size: 6.12
Depth In: 7,908
Depth Out: 11,409
Jets: 6x18
S/N: 4006563
WT 9.6/ VIS 38
6000
600000
GAS (units)
C1-C4 (PPM)
2754u
1906u
1683u
1590u
GAS (units)
C1-C4 (PPM)
GAS
SCALE
CHANGE
0
0
7,800
7,850
7,900
7,950
8,000
CHK: lt wht crm & lt-med gy, occ dk gy, mot, blky-sb plty, sft-frm, sb rd-sb ang, mod fri; LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; tr MRLST: med-dk gy & blk, blky-sb plty, sft-frm, sb rd-sb ang, mod fri, stmg bl cut, dull yel ring
LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; tr CHK: lt wht crm & lt-med gy, occ dk gy, mot, blky-sb plty, sft-frm, sb rd-sb ang, mod fri, stmg bl cut, dull yel ring
CHK: lt-dk gy, mot, blky-sb plty, sft-frm, sb rd-sb ang, mod fri; MRLST: med-dk gy & blk, blky-sb plty, sft-frm, sb rd-sb ang, mod fri; LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty, stmg bl cut, dull yel ring
7200
TVD (ft)
TVD (ft)
TVD
SCALE
CHANGE
MD: 7,834
TVD: 7,512.21
Inclination: 84.29
Azimuth: 0.34
VS: 8.67
MD: 7,861
TVD: 7,514.62
Inclination: 85.5
Azimuth: 0.13
VS: 35.56
MD: 7,900
TVD: 7,516.74
Inclination: 88.27
Azimuth: 0.28
VS: 74.5
MD: 7,953
TVD: 7,518.25
Inclination: 88.46
Azimuth: 0.44
VS: 127.48
7700

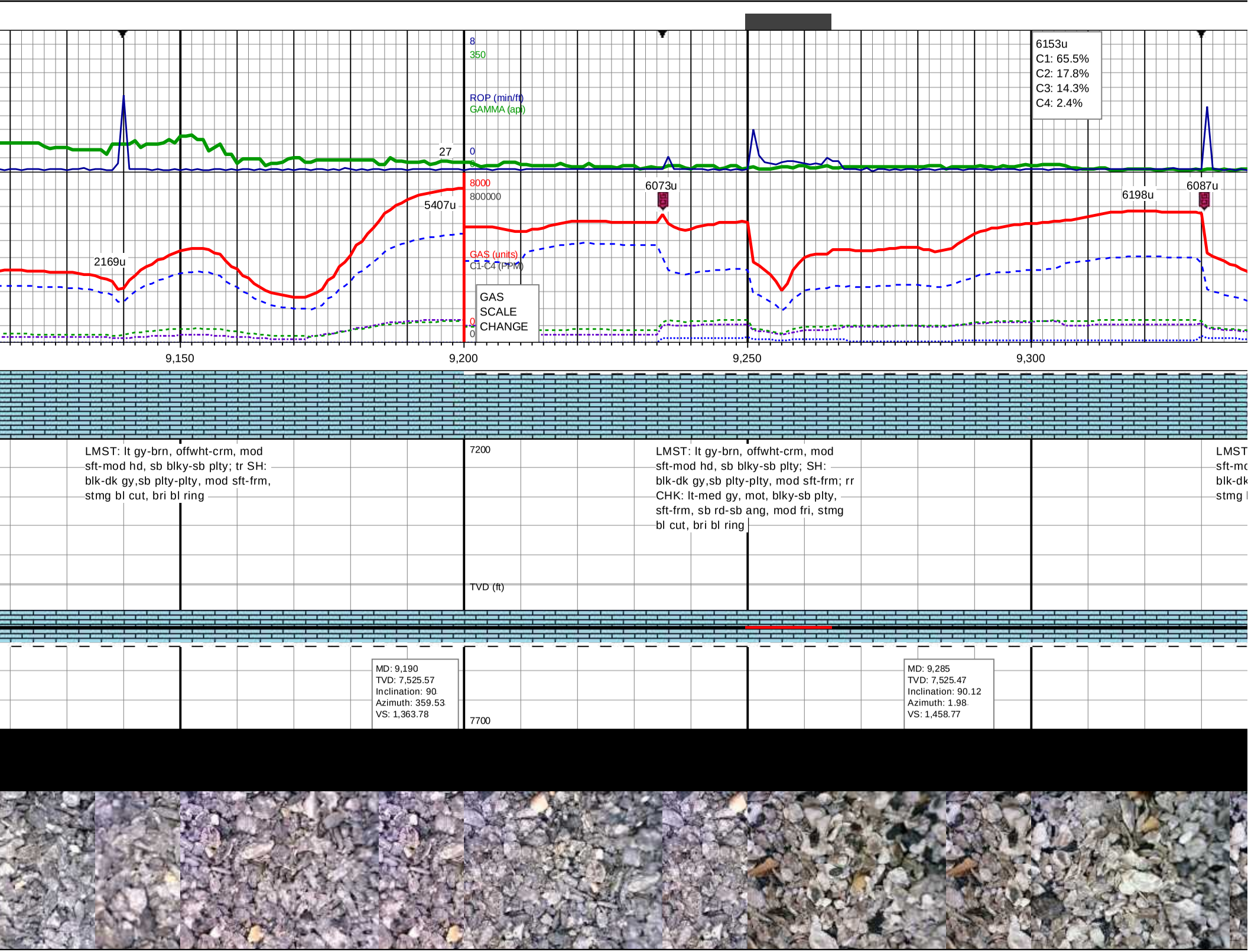

3172u
C1: 74.9%
C2: 16.1%
C3: 9.0%
C4: 0.0%
70
79
8
350
ROP (min/ft)
GAMMA (api)
0
0
6000
600000
3746u
2411u
2615u
2185u
GAS (units)
C1-C4 (PPM)
0
0
8,050
8,100
8,150
8,200
LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; CHK: lt-med gy, mot, blky-sb plty, sft-frm, sb rd-sb ang, mod fri; SH: blk-dk gy,sb plty-plty, mod sft-frm, stmg bl cut, dull yel ring
LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; SH: blk-dk gy,sb plty-plty, mod sft-frm; tr CHK: lt-med gy, mot, blky-sb plty, sft-frm, sb rd-sb ang, mod fri, stmg bl cut, dull yel ring
7200
TVD (ft)
7700
MD: 8,048
TVD: 7,520.86
Inclination: 88.39
Azimuth: 0.37
VS: 222.44

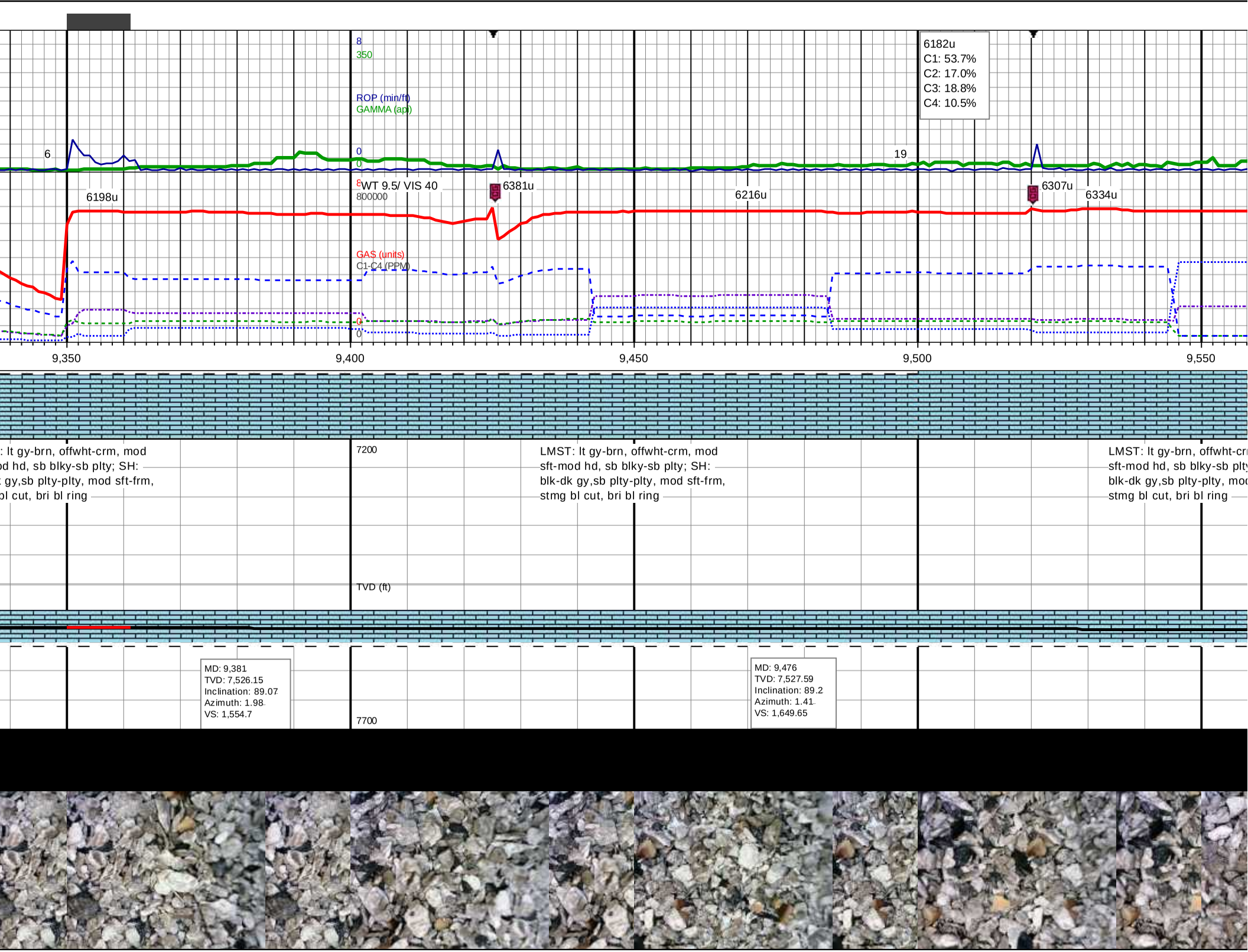

773u
C1: 64.6%
C2: 17.6%
C3: 17.8%
C4: 0.0%
8
350
ROP (min/ft)
GAMMA (api)
0
0
6000
600000
GAS (units)
C1-C4 (PPM)
0
0
27
96
5175u
4263u
WT 9.5/ VIS 37
4254u
4127u
2670u
Ft. Hayes Top
8260' MD / 7527' TVD
8,250
8,300
8,350
8,400
8,450
T: lt gy-brn, offwht-crm, mod
od hd, sb blky-sb plty; SH:
dk gy,sb plty-plty, mod sft-frm,
bl cut, dull yel ring
LMST: lt gy-brn, offwht-crm, mod
sft-mod hd, sb blky-sb plty; SH:
blk-dk gy,sb plty-plty, mod sft-frm,
stmg bl cut, dull yel ring
LMST: lt gy-brn, offwht-cr
sft-mod hd, sb blky-sb plty
blk-dk gy,sb plty-plty, mod
stmg bl cut, dull yel ring
7200
TVD (ft)
7700
MD: 8,334
TVD: 7,528.83
Inclination: 88.83
Azimuth: 358.31
VS: 508.29
MD: 8,429
TVD: 7,530.46
Inclination: 89.2
Azimuth: 359.05
VS: 603.25

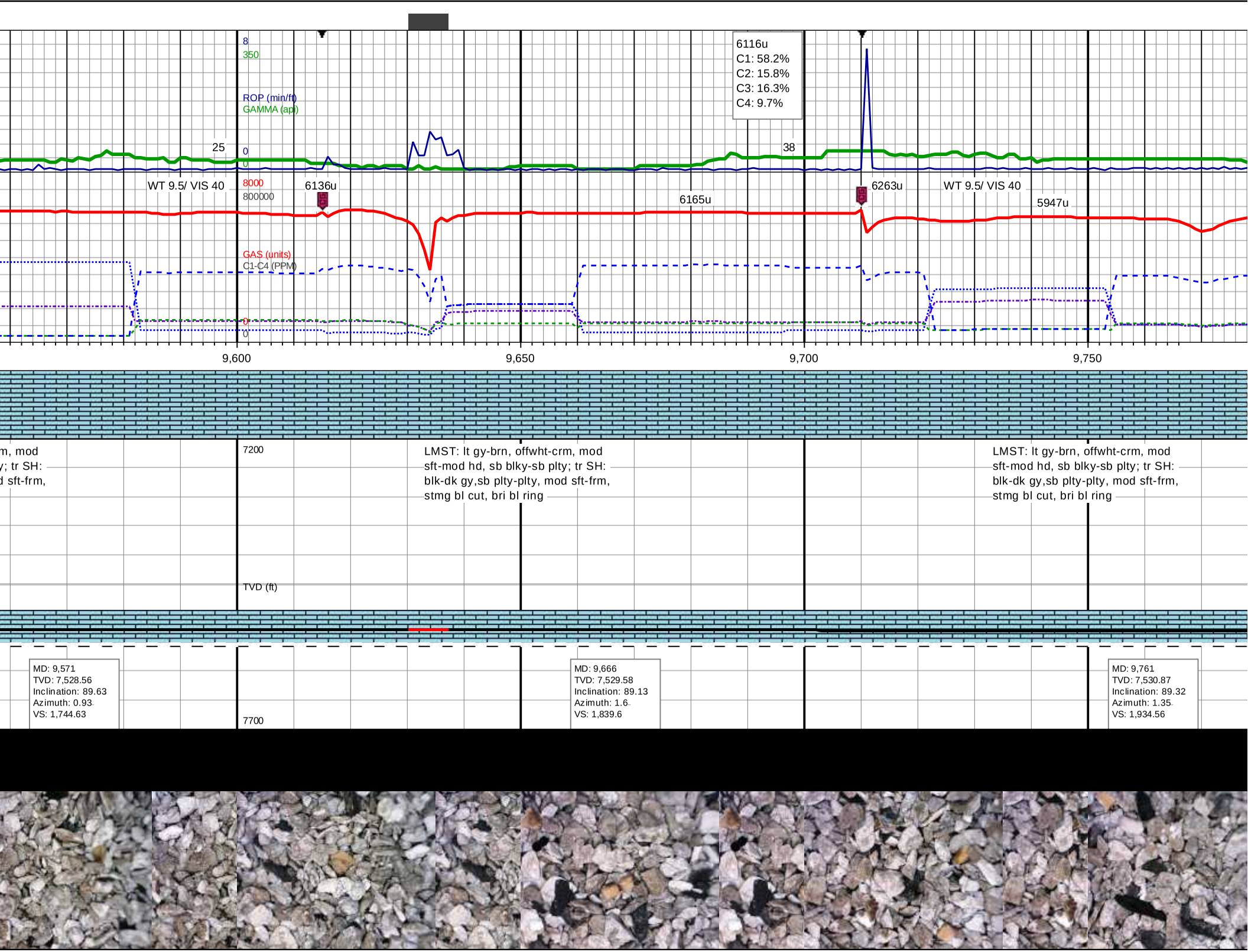

522u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%
MNDEPTH
02/13/2014
8
350
ROP (min/ft)
GAMMA (api)
96
66
0
0
6000
600000
WT 9.5/ VIS 36
4016u
3014u
1831u
4342u
5080u
GAS (units)
C1-C4 (PPM)
0
0
8,500
8,550
8,600
8,650
LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; tr SH: blk-dk gy,sb plty-plty, mod sft-frm, scat pyr frags, stmg bl cut, dull yel ring
LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; CHK: lt-med gy, mot, blky-sb plty, sft-frm, sb rd-sb ang, mod fri; tr SH: blk-dk gy,sb plty-plty, mod sft-frm, occ fos frag, stmg bl cut, dull yel ring
7200
TVD (ft)
MD: 8,524
TVD: 7,530.82
Inclination: 90.37
Azimuth: 359.18
VS: 698.24
MD: 8,619
TVD: 7,528.25
Inclination: 92.72
Azimuth: 1.18
VS: 793.19
7700

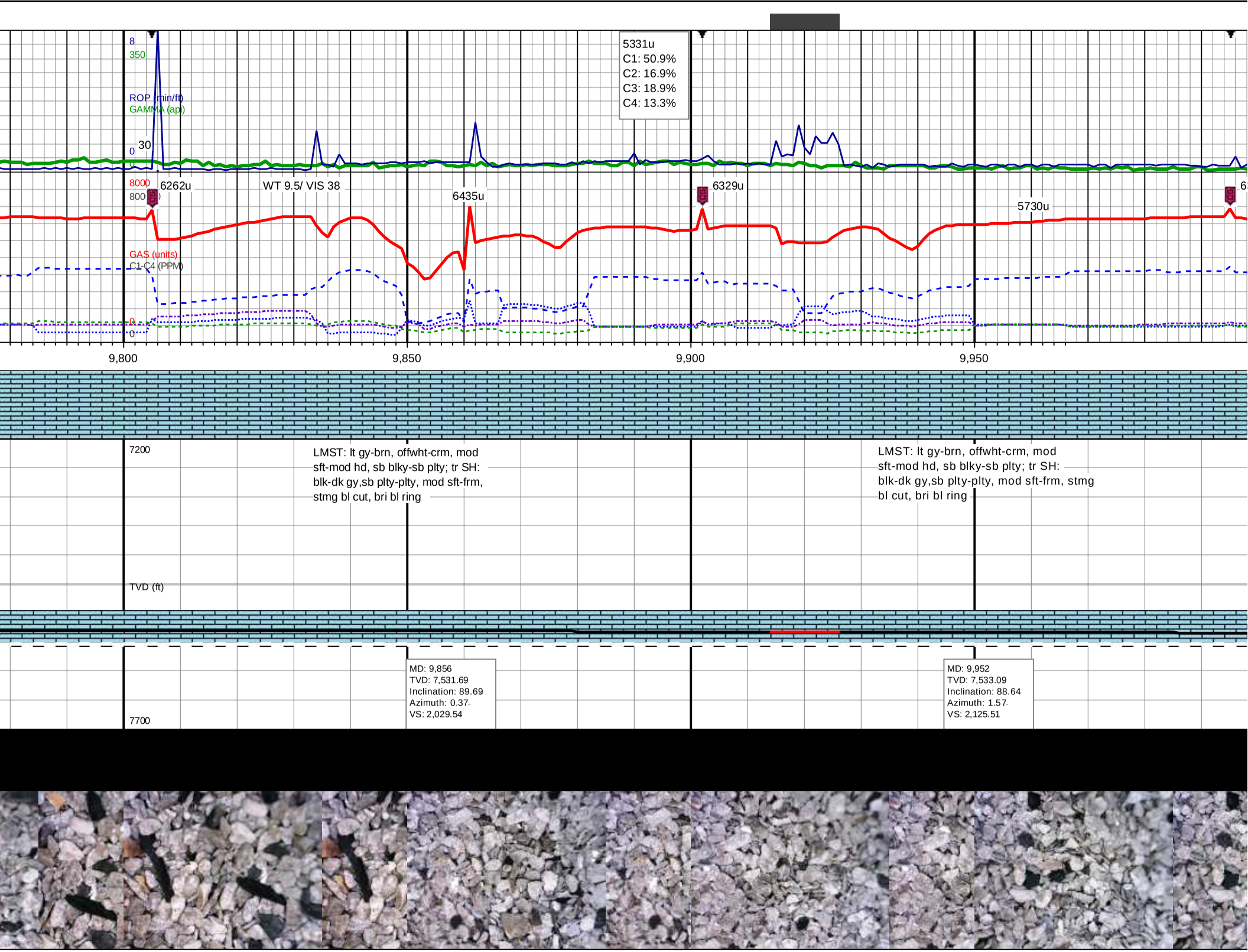

1216u
C1: 76.0%
C2: 16.4%
C3: 7.6%
C4: 0.0%
81
49
8
350
ROP (min/ft)
GAMMA (api)
0
0
WT 9.5/ VIS 37
WT 9.5/ VIS 39
3303u
3806u
3752u
3779u
6000
600000
GAS (units)
C1-C4 (PPM)
0
0
8,700
8,750
8,800
8,850
LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; SH: blk-dk gy,sb plty-plty, mod sft-frm, stmg bl cut, dull yel ring
LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; SH: blk-dk gy,sb plty-plty, mod sft-frm, stmg bl cut, dull yel ring
7200
TVD (ft)
MD: 8,714
TVD: 7,525.49
Inclination: 90.62
Azimuth: 0.8
VS: 888.13
MD: 8,810
TVD: 7,524.4
Inclination: 90.68
Azimuth: 3.17
VS: 984.06
7

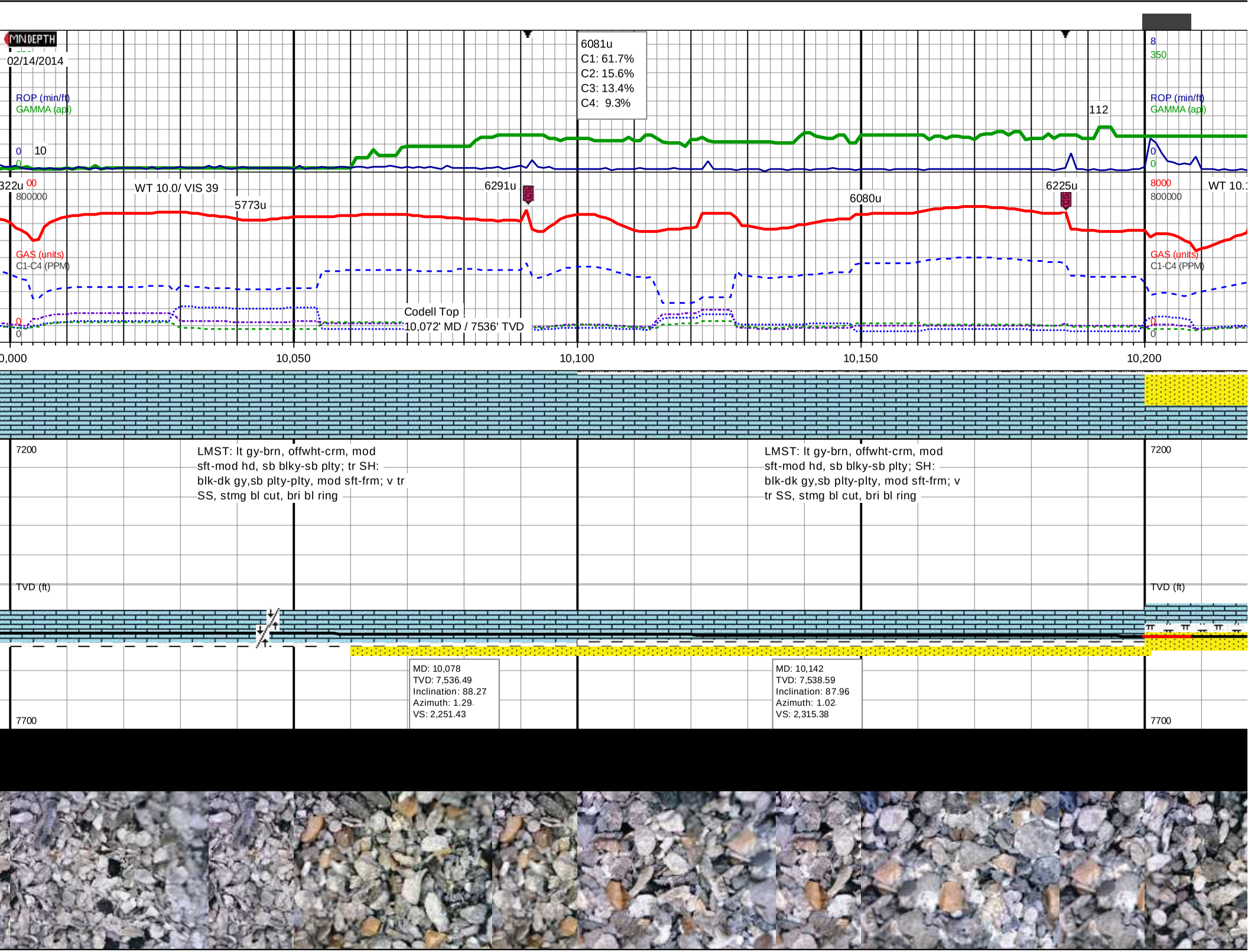

3000u
C1: 74.4%
C2: 15.0%
C3: 10.6%
C4: 0.0%
2550u
C1: 78.5%
C2: 12.6%
C3: 8.9%
C4: 0.0%
8
350
ROP (min/ft)
GAMMA (api)
107
64
0
0
6000
600000
WT 9.5/ VIS 38
4034u
3014u
3263u
2800u
2536u
GAS (units)
C1-C4 (PPM)
0
0
8,900
8,950
9,000
9,050
9,100
LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; SH: blk-dk gy,sb plty-plty, mod sft-frm, stmg bl cut, dull yel ring
7200
LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; tr SH: blk-dk gy,sb plty-plty, mod sft-frm, stmg bl cut, dull yel ring
TVD (ft)
MD: 8,905
TVD: 7,524.24
Inclination: 89.51
Azimuth: 2.71
VS: 1,078.93
MD: 9,000
TVD: 7,524.8
Inclination: 89.81
Azimuth: 2.31
VS: 1,173.84
MD: 9,095
TVD: 7,525.27
Inclination: 89.63
Azimuth: 1.4
VS: 1,268.79

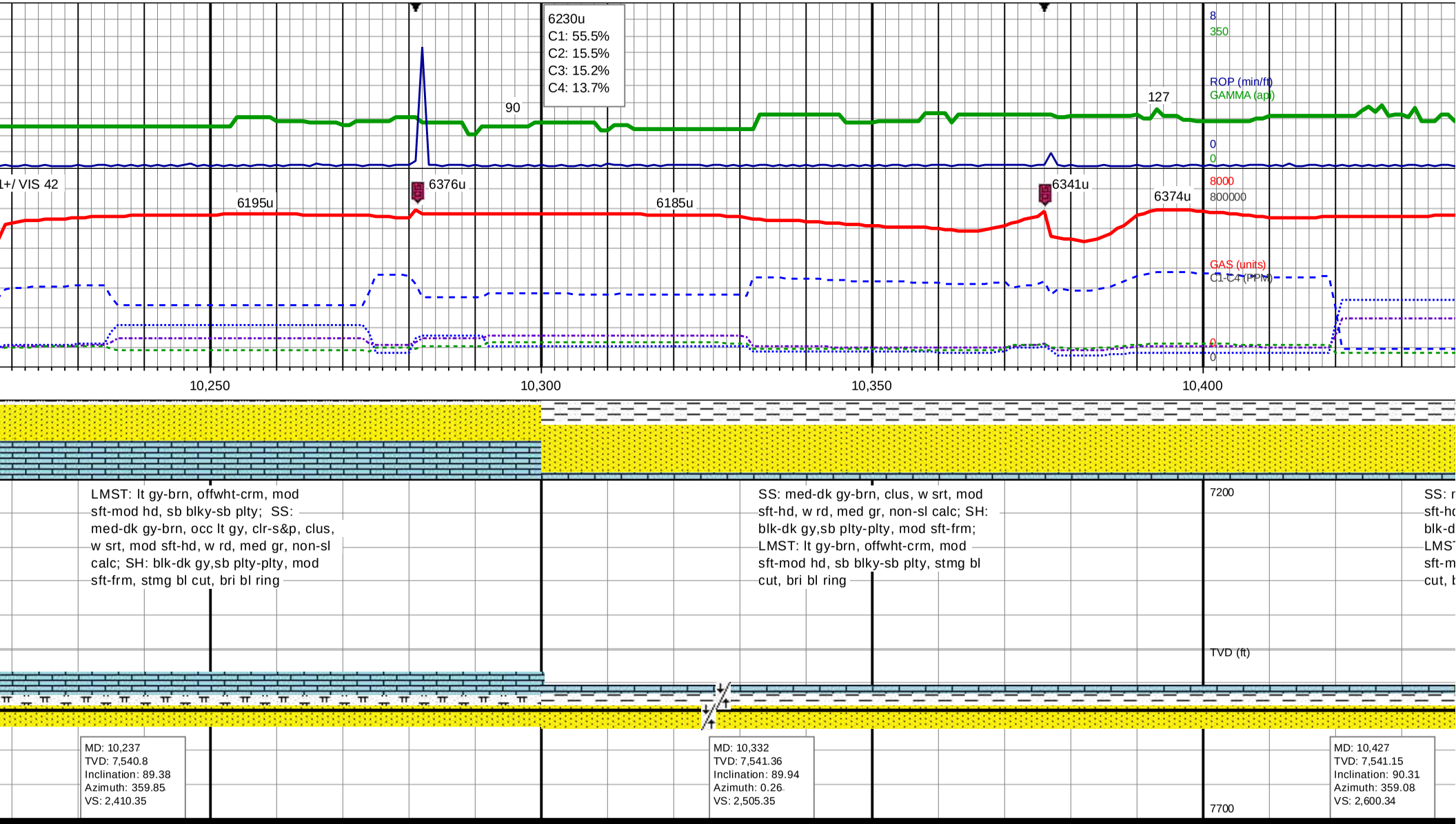

8
350
ROP (min/ft)
GAMMA (api)
27
0
8000
800000
GAS (units)
C1-C4 (PPM)
0
0
GAS
SCALE
CHANGE
6153u
C1: 65.5%
C2: 17.8%
C3: 14.3%
C4: 2.4%
2169u
5407u
6073u
6198u
6087u
9,150
9,200
9,250
9,300
LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; tr SH: blk-dk gy,sb plty-plty, mod sft-frm, stmg bl cut, bri bl ring
LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; SH: blk-dk gy,sb plty-plty, mod sft-frm; rr CHK: lt-med gy, mot, blky-sb plty, sft-frm, sb rd-sb ang, mod fri, stmg bl cut, bri bl ring
7200
TVD (ft)
7700
MD: 9,190
TVD: 7,525.57
Inclination: 90
Azimuth: 359.53
VS: 1,363.78
MD: 9,285
TVD: 7,525.47
Inclination: 90.12
Azimuth: 1.98
VS: 1,458.77

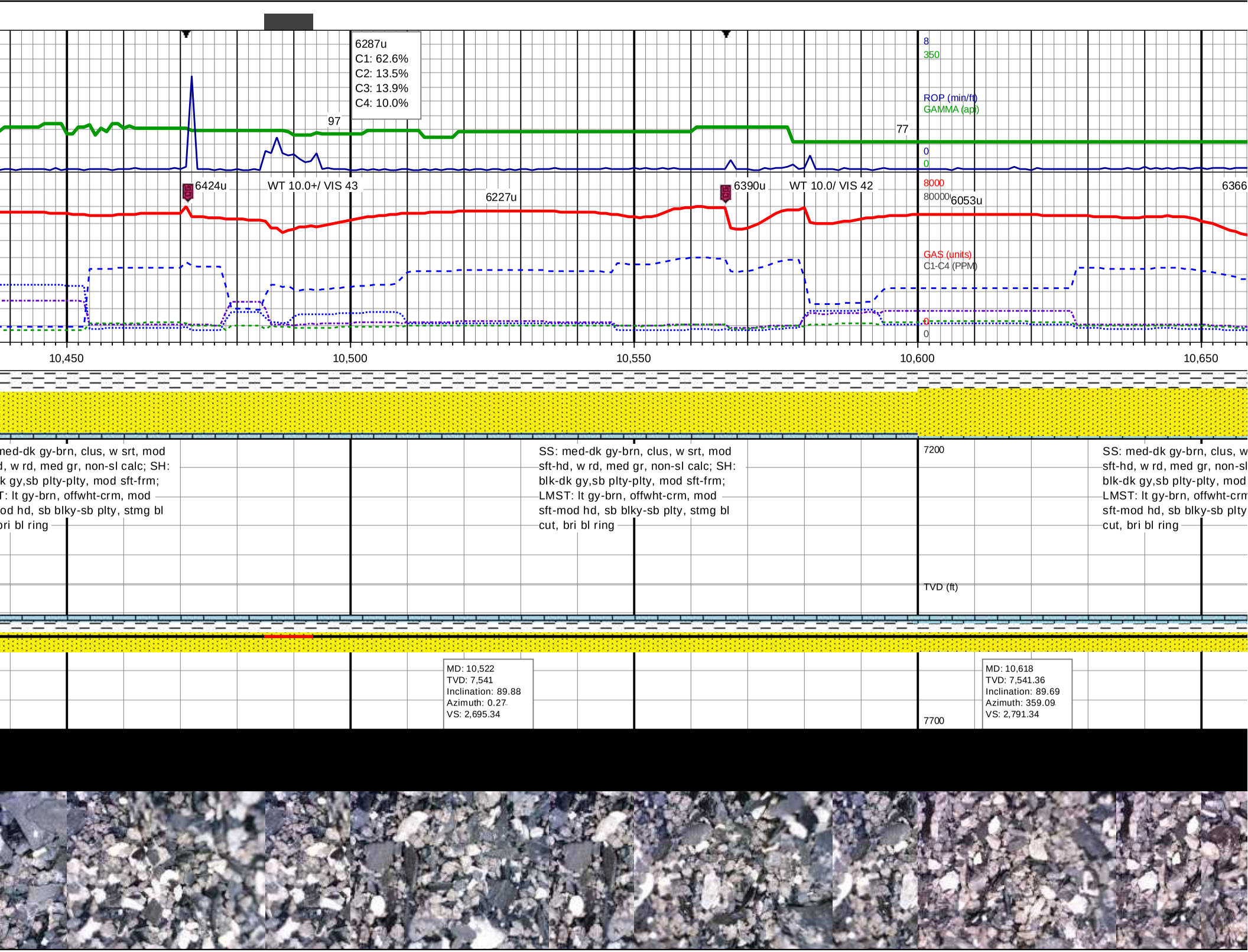

8
350
ROP (min/ft)
GAMMA (api)
0
0
6
19
6182u
C1: 53.7%
C2: 17.0%
C3: 18.8%
C4: 10.5%
6198u
WT 9.5/ VIS 40
800000
6381u
6216u
6307u
6334u
GAS (units)
C1-C4 (PPM)
0
0
9,350
9,400
9,450
9,500
9,550
: lt gy-brn, offwht-crm, mod
od hd, sb blky-sb plty; SH:
gy,sb plty-plty, mod sft-frm,
bl cut, bri bl ring
7200
LMST: lt gy-brn, offwht-crm, mod
sft-mod hd, sb blky-sb plty; SH:
blk-dk gy,sb plty-plty, mod sft-frm,
stmg bl cut, bri bl ring
LMST: lt gy-brn, offwht-cr
sft-mod hd, sb blky-sb plt
blk-dk gy,sb plty-plty, mo
stmg bl cut, bri bl ring
TVD (ft)
MD: 9,381
TVD: 7,526.15
Inclination: 89.07
Azimuth: 1.98
VS: 1,554.7
7700
MD: 9,476
TVD: 7,527.59
Inclination: 89.2
Azimuth: 1.41
VS: 1,649.65

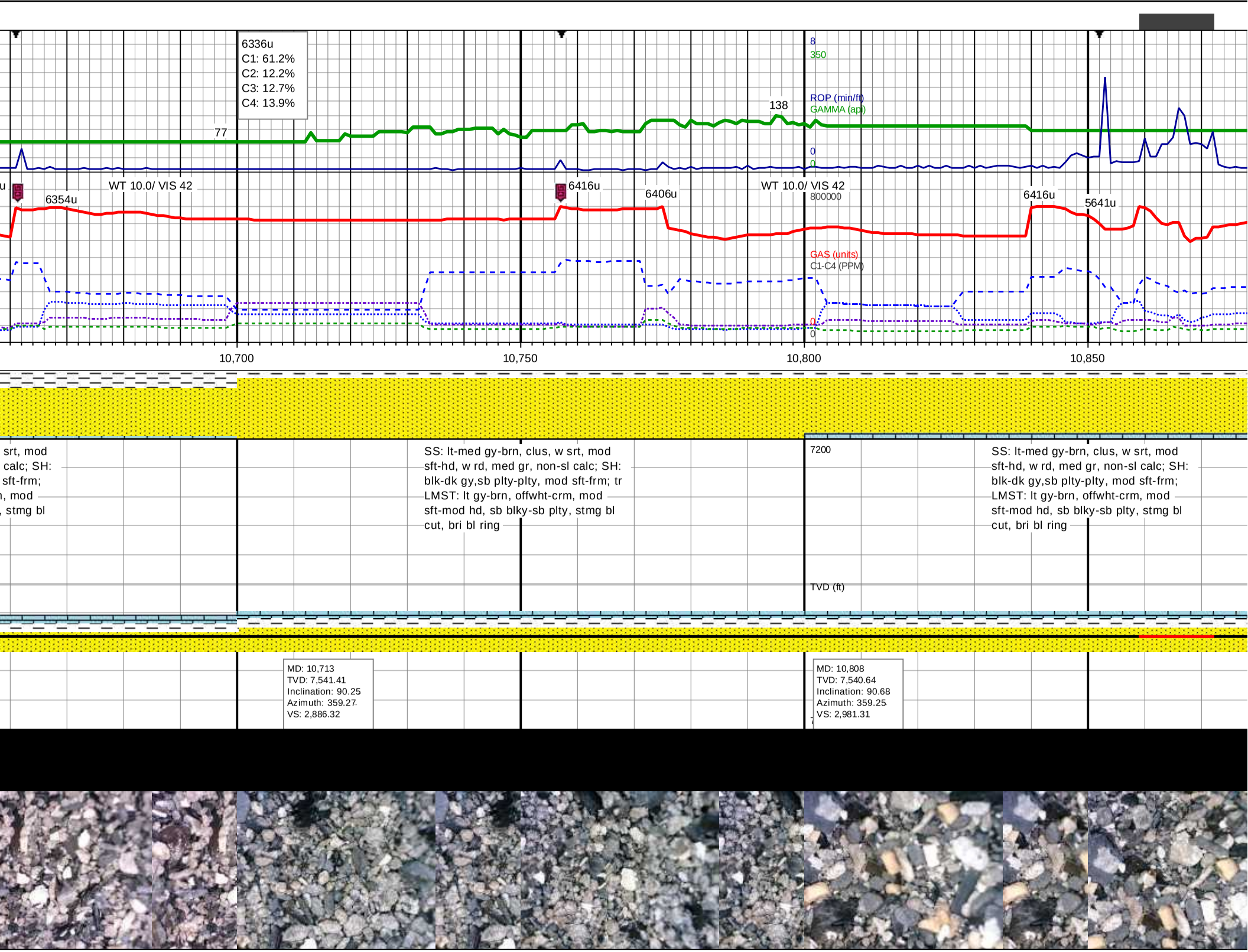

8
350
ROP (min/ft)
GAMMA (api)
25
0
0
6116u
C1: 58.2%
C2: 15.8%
C3: 16.3%
C4: 9.7%
38
WT 9.5/ VIS 40
8000
800000
6136u
6165u
6263u
WT 9.5/ VIS 40
5947u
GAS (units)
C1-C4 (PPM)
0
0
9,600
9,650
9,700
9,750
m, mod
y; tr SH:
d sft-frm,
7200
LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; tr SH: blk-dk gy,sb plty-plty, mod sft-frm, stmg bl cut, bri bl ring
LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; tr SH: blk-dk gy,sb plty-plty, mod sft-frm, stmg bl cut, bri bl ring
TVD (ft)
MD: 9,571
TVD: 7,528.56
Inclination: 89.63
Azimuth: 0.93
VS: 1,744.63
MD: 9,666
TVD: 7,529.58
Inclination: 89.13
Azimuth: 1.6
VS: 1,839.6
MD: 9,761
TVD: 7,530.87
Inclination: 89.32
Azimuth: 1.35
VS: 1,934.56
7700

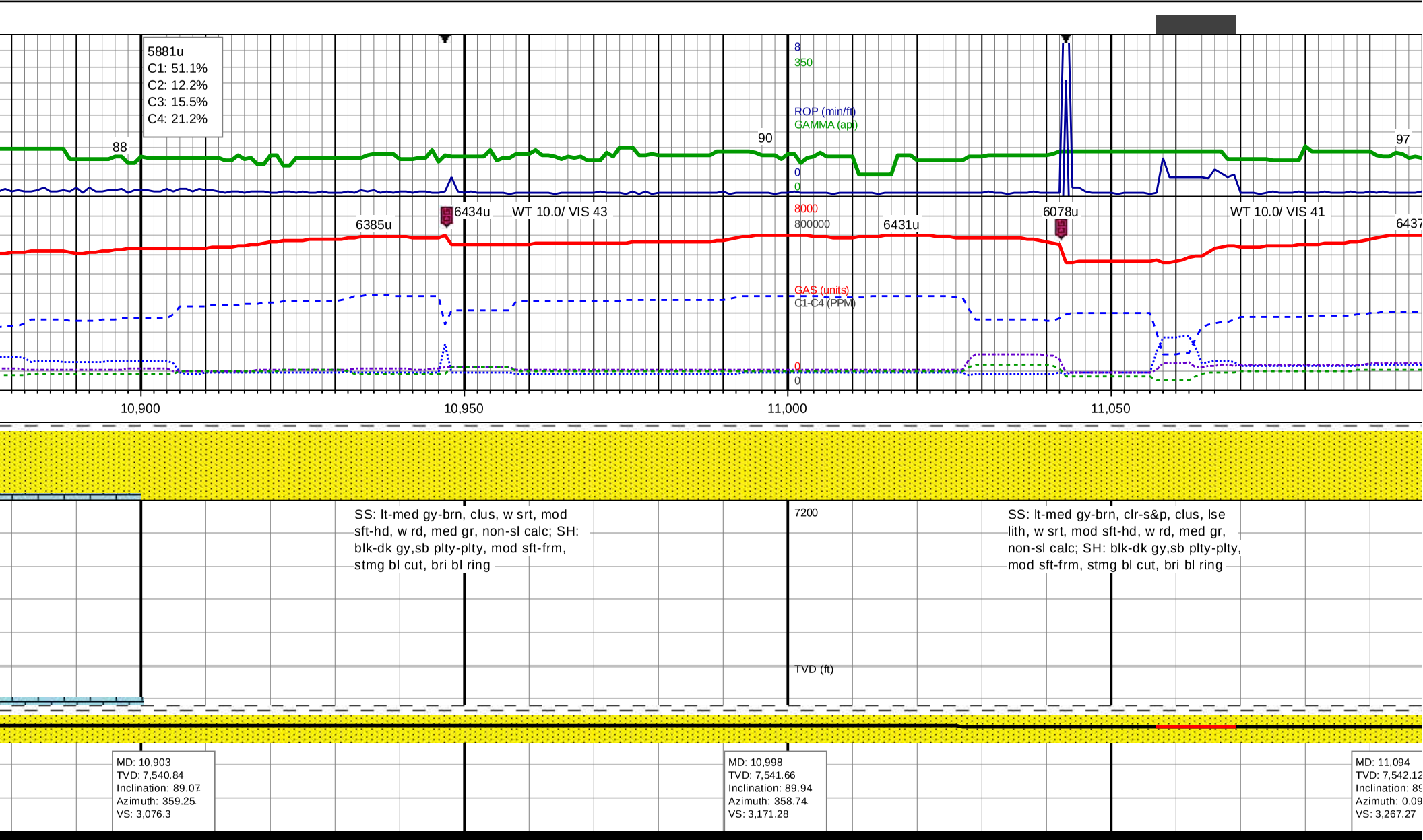

8
350
ROP (min/ft)
GAMMA (api)
0
30
5331u
C1: 50.9%
C2: 16.9%
C3: 18.9%
C4: 13.3%
8000
800
6262u
WT 9.5/ VIS 38
6435u
6329u
5730u
GAS (units)
C1-C4 (PPM)
0
0
9,800
9,850
9,900
9,950
7200
LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; tr SH: blk-dk gy,sb plty-plty, mod sft-frm, stmg bl cut, bri bl ring
LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; tr SH: blk-dk gy,sb plty-plty, mod sft-frm, stmg bl cut, bri bl ring
TVD (ft)
MD: 9,856
TVD: 7,531.69
Inclination: 89.69
Azimuth: 0.37
VS: 2,029.54
MD: 9,952
TVD: 7,533.09
Inclination: 88.64
Azimuth: 1.57
VS: 2,125.51
7700


MNDEPTH
02/14/2014
ROP (min/ft)
GAMMA (api)
0
10
6081u
C1: 61.7%
C2: 15.6%
C3: 13.4%
C4: 9.3%
112
8
350
322u
WT 10.0/ VIS 39
5773u
6291u
6080u
6225u
800000
GAS (units)
C1-C4 (PPM)
Codell Top
10,072' MD / 7536' TVD
10,000
10,050
10,100
10,150
10,200
LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; tr SH: blk-dk gy,sb plty-plty, mod sft-frm; v tr SS, stmg bl cut, bri bl ring
7200
TVD (ft)
7700
MD: 10,078
TVD: 7,536.49
Inclination: 88.27
Azimuth: 1.29
VS: 2,251.43
MD: 10,142
TVD: 7,538.59
Inclination: 87.96
Azimuth: 1.02
VS: 2,315.38

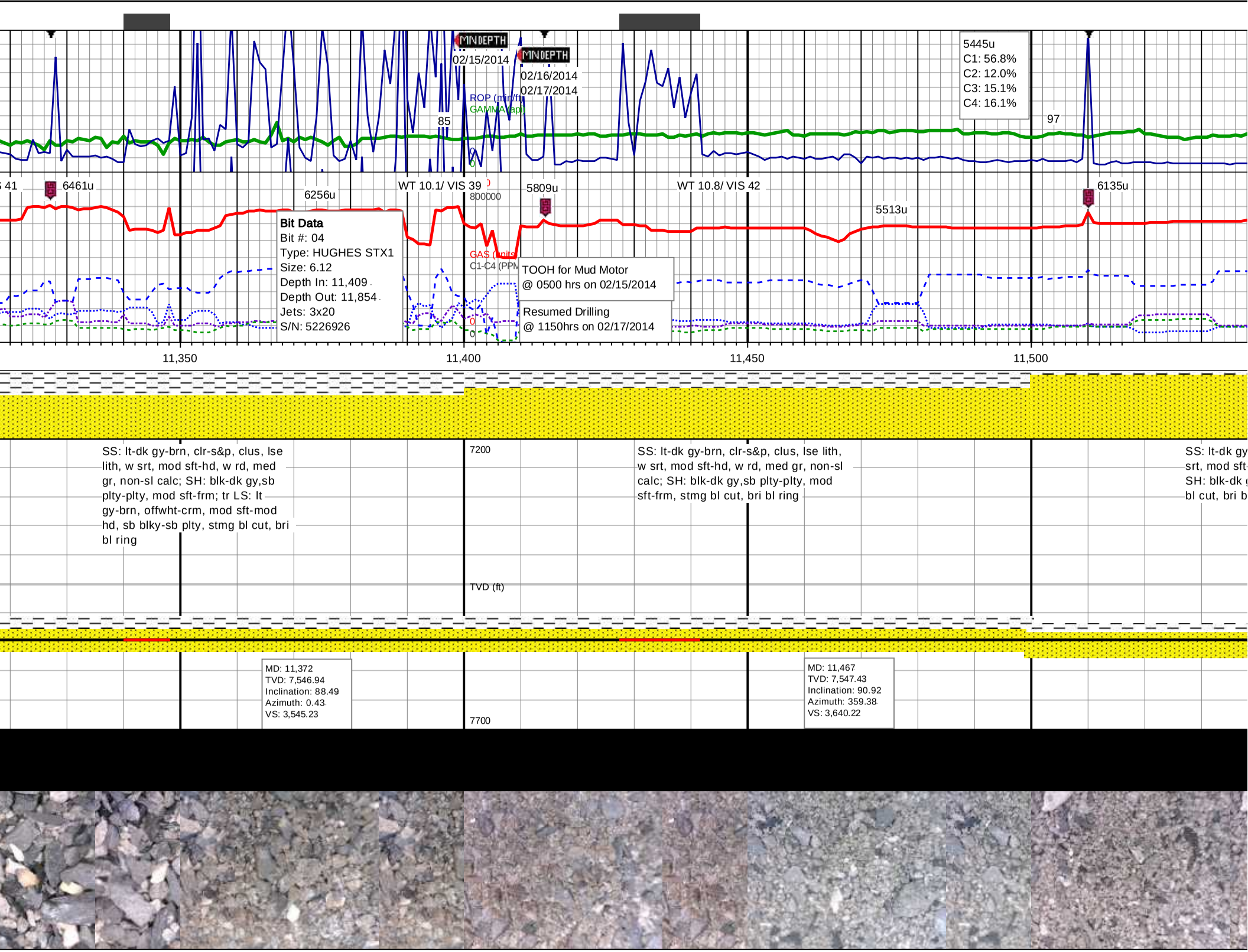

6230u
C1: 55.5%
C2: 15.5%
C3: 15.2%
C4: 13.7%
90
127
8
350
ROP (min/ft)
GAMMA (api)
0
0
1+/ VIS 42
6195u
6376u
6185u
6341u
6374u
8000
800000
GAS (units)
C1-C4 (PPM)
0
0
10,250
10,300
10,350
10,400
LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty; SS: med-dk gy-brn, occ lt gy, clr-s&p, clus, w srt, mod sft-hd, w rd, med gr, non-sl calc; SH: blk-dk gy,sb plty-plty, mod sft-frm, stmg bl cut, bri bl ring
SS: med-dk gy-brn, clus, w srt, mod sft-hd, w rd, med gr, non-sl calc; SH: blk-dk gy,sb plty-plty, mod sft-frm; LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty, stmg bl cut, bri bl ring
7200
TVD (ft)
7700
MD: 10,237
TVD: 7,540.8
Inclination: 89.38
Azimuth: 359.85
VS: 2,410.35
MD: 10,332
TVD: 7,541.36
Inclination: 89.94
Azimuth: 0.26
VS: 2,505.35
MD: 10,427
TVD: 7,541.15
Inclination: 90.31
Azimuth: 359.08
VS: 2,600.34

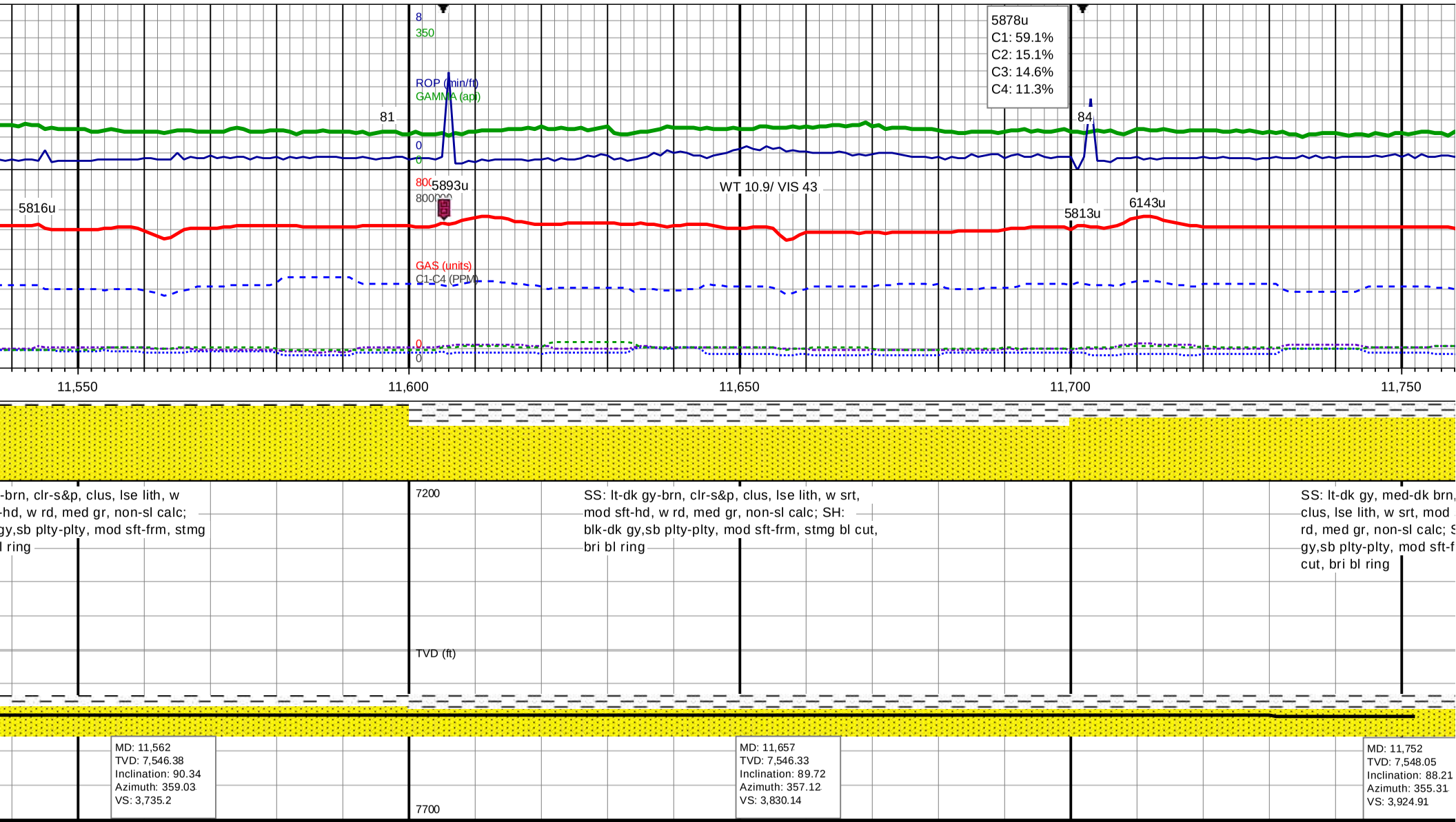

6287u
C1: 62.6%
C2: 13.5%
C3: 13.9%
C4: 10.0%
97
77
8
350
ROP (min/ft)
GAMMA (api)
0
0
6424u
WT 10.0+/ VIS 43
6227u
6390u
WT 10.0/ VIS 42
8000
80000
6053u
6366
GAS (units)
C1-C4 (PPM)
0
0
10,450
10,500
10,550
10,600
10,650
med-dk gy-brn, clus, w srt, mod
d, w rd, med gr, non-sl calc; SH:
k gy,sb plty-plty, mod sft-frm;
T: lt gy-brn, offwht-crm, mod
od hd, sb blky-sb plty, stmg bl
bri bl ring
SS: med-dk gy-brn, clus, w srt, mod
sft-hd, w rd, med gr, non-sl calc; SH:
blk-dk gy,sb plty-plty, mod sft-frm;
LMST: lt gy-brn, offwht-crm, mod
sft-mod hd, sb blky-sb plty, stmg bl
cut, bri bl ring
7200
TVD (ft)
SS: med-dk gy-brn, clus, w
sft-hd, w rd, med gr, non-sl
blk-dk gy,sb plty-plty, mod
LMST: lt gy-brn, offwht-crm
sft-mod hd, sb blky-sb plty
cut, bri bl ring
MD: 10,522
TVD: 7,541
Inclination: 89.88
Azimuth: 0.27
VS: 2,695.34
7700
MD: 10,618
TVD: 7,541.36
Inclination: 89.69
Azimuth: 359.09
VS: 2,791.34

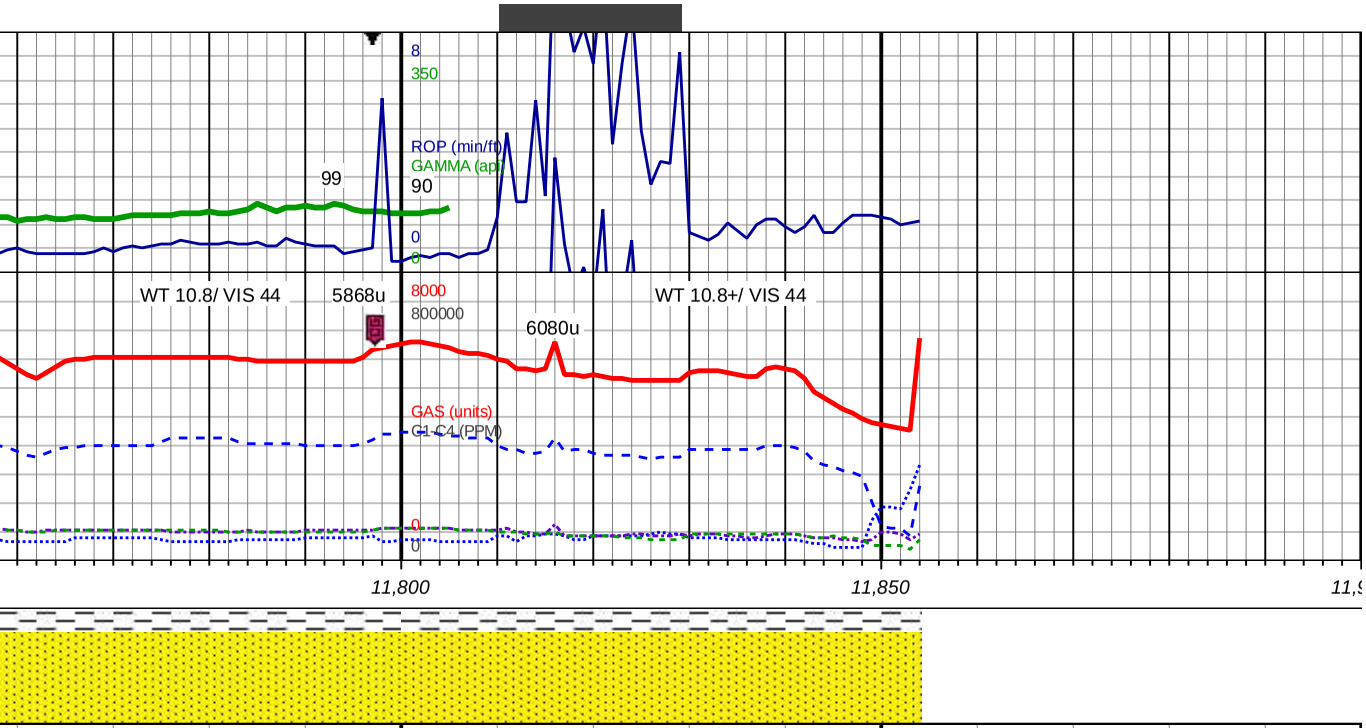

6336u
C1: 61.2%
C2: 12.2%
C3: 12.7%
C4: 13.9%
77
138
8
350
ROP (min/ft)
GAMMA (api)
0
0
WT 10.0/ VIS 42
6354u
6416u
6406u
WT 10.0/ VIS 42
800000
6416u
5641u
GAS (units)
C1-C4 (PPM)
0
0
10,700
10,750
10,800
10,850
srt, mod
calc; SH:
sft-frm;
, mod
, stmg bl
SS: lt-med gy-brn, clus, w srt, mod sft-hd, w rd, med gr, non-sl calc; SH: blk-dk gy,sb plty-plty, mod sft-frm; tr LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty, stmg bl cut, bri bl ring
7200
SS: lt-med gy-brn, clus, w srt, mod sft-hd, w rd, med gr, non-sl calc; SH: blk-dk gy,sb plty-plty, mod sft-frm; LMST: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty, stmg bl cut, bri bl ring
TVD (ft)
MD: 10,713
TVD: 7,541.41
Inclination: 90.25
Azimuth: 359.27
VS: 2,886.32
MD: 10,808
TVD: 7,540.64
Inclination: 90.68
Azimuth: 359.25
VS: 2,981.31

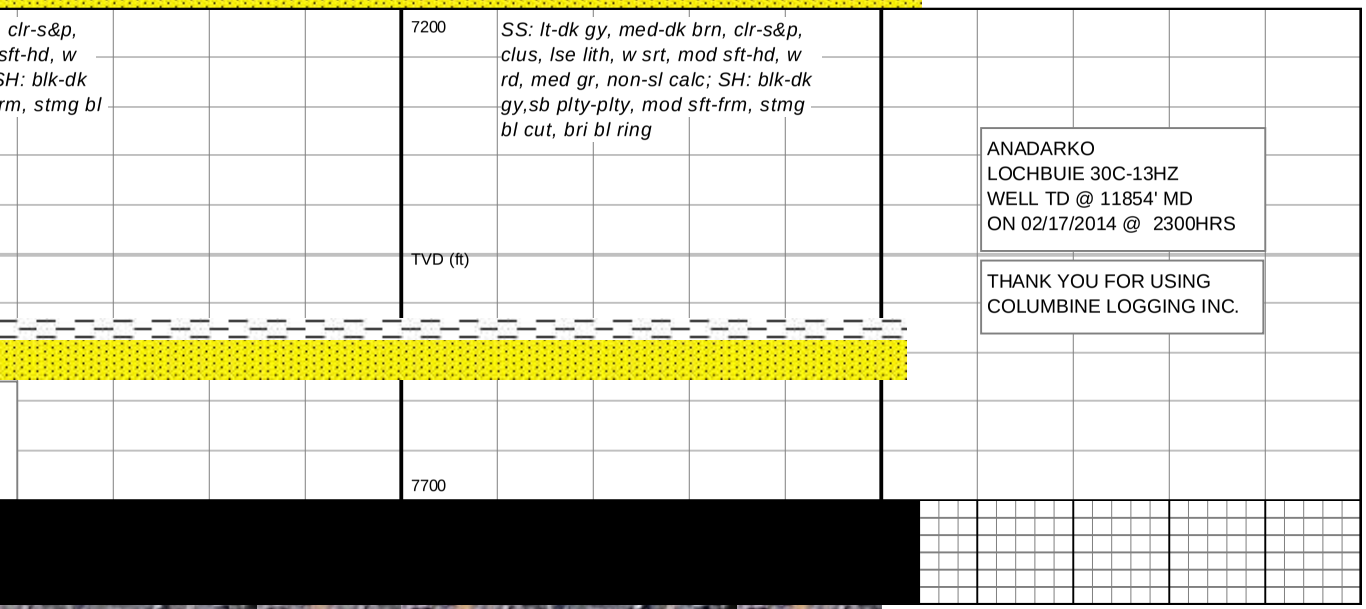

5881u
C1: 51.1%
C2: 12.2%
C3: 15.5%
C4: 21.2%
88
90
97
8
350
ROP (min/ft)
GAMMA (api)
0
0
8000
800000
6385u
6434u
WT 10.0/ VIS 43
6431u
6078u
WT 10.0/ VIS 41
6437
GAS (units)
C1-C4 (PPM)
0
0
10,900
10,950
11,000
11,050
7200
SS: lt-med gy-brn, clus, w srt, mod sft-hd, w rd, med gr, non-sl calc; SH: blk-dk gy,sb plty-plty, mod sft-frm, stmg bl cut, bri bl ring
SS: lt-med gy-brn, clr-s&p, clus, lse lith, w srt, mod sft-hd, w rd, med gr, non-sl calc; SH: blk-dk gy,sb plty-plty, mod sft-frm, stmg bl cut, bri bl ring
TVD (ft)
MD: 10,903
TVD: 7,540.84
Inclination: 89.07
Azimuth: 359.25
VS: 3,076.3
MD: 10,998
TVD: 7,541.66
Inclination: 89.94
Azimuth: 358.74
VS: 3,171.28
MD: 11,094
TVD: 7,542.12
Inclination: 89
Azimuth: 0.09
VS: 3,267.27


6437u
C1: 53.9%
C2: 13.8%
C3: 16.5%
C4: 15.8%
8
350
ROP (min/ft)
GAMMA (api)
92
0
0
6096u
C1: 33.5%
C2: 13.5%
C3: 23.7%
C4: 29.2%
105
5974u
WT 10.0/ VIS 41
6369u
8000
800000
6078u
6085u
WT 10.0/ VIS
GAS (units)
C1:C4 (PPM)
0
0
11,100
11,150
11,200
11,250
11,300
SS: lt-med gy-brn, clr-s&p, clus, lse lith, w srt, mod sft-hd, w rd, med gr, non-sl calc; SH: blk-dk gy,sb plty-plty, mod sft-frm, stmg bl cut, bri bl ring
7200
SS: lt-med gy-brn, clr-s&p, clus, lse lith, w srt, mod sft-hd, w rd, med gr, non-sl calc; SH: blk-dk gy,sb plty-plty, mod sft-frm, stmg bl cut, bri bl ring
TVD (ft)
MD: 11,189
TVD: 7,543.71
Inclination: 88.58°
Azimuth: 0.48°
VS: 3,362.26
7700
MD: 11,284
TVD: 7,545.35
Inclination: 89.44°
Azimuth: 0.15°
VS: 3,457.24


MNDEPTH
02/15/2014
MNDEPTH
02/16/2014
02/17/2014
ROP (min/ft)
GAMMA (api)
85
0
5445u
C1: 56.8%
C2: 12.0%
C3: 15.1%
C4: 16.1%
97
6461u
6256u
WT 10.1/ VIS 39
800000
5809u
WT 10.8/ VIS 42
6135u
5513u
Bit Data
Bit #: 04
Type: HUGHES STX1
Size: 6.12
Depth In: 11,409
Depth Out: 11,854
Jets: 3x20
S/N: 5226926
GAS (units)
C1-C4 (PPM)
TOOH for Mud Motor
@ 0500 hrs on 02/15/2014
Resumed Drilling
@ 1150hrs on 02/17/2014
11,350
11,400
11,450
11,500
SS: lt-dk gy-brn, clr-s&p, clus, lse lith, w srt, mod sft-hd, w rd, med gr, non-sl calc; SH: blk-dk gy,sb plty-plty, mod sft-frm; tr LS: lt gy-brn, offwht-crm, mod sft-mod hd, sb blky-sb plty, stmg bl cut, bri bl ring
7200
SS: lt-dk gy-brn, clr-s&p, clus, lse lith, w srt, mod sft-hd, w rd, med gr, non-sl calc; SH: blk-dk gy,sb plty-plty, mod sft-frm, stmg bl cut, bri bl ring
TVD (ft)
MD: 11,372
TVD: 7,546.94
Inclination: 88.49
Azimuth: 0.43
VS: 3,545.23
7700
MD: 11,467
TVD: 7,547.43
Inclination: 90.92
Azimuth: 359.38
VS: 3,640.22


8
350
ROP (min/ft)
GAMMA (api)
0
0
81
84
5878u
C1: 59.1%
C2: 15.1%
C3: 14.6%
C4: 11.3%
800
800000
5893u
5816u
WT 10.9/ VIS 43
5813u
6143u
GAS (units)
C1-C4 (PPM)
0
0
11,550
11,600
11,650
11,700
11,750
-brn, clr-s&p, clus, lse lith, w
-hd, w rd, med gr, non-sl calc;
gy,sb plty-plty, mod sft-frm, stmg
l ring
7200
SS: lt-dk gy-brn, clr-s&p, clus, lse lith, w srt,
mod sft-hd, w rd, med gr, non-sl calc; SH:
blk-dk gy,sb plty-plty, mod sft-frm, stmg bl cut,
bri bl ring
SS: lt-dk gy, med-dk brn,
clus, lse lith, w srt, mod
rd, med gr, non-sl calc; S
gy,sb plty-plty, mod sft-f
cut, bri bl ring
TVD (ft)
MD: 11,562
TVD: 7,546.38
Inclination: 90.34
Azimuth: 359.03
VS: 3,735.2
7700
MD: 11,657
TVD: 7,546.33
Inclination: 89.72
Azimuth: 357.12
VS: 3,830.14
MD: 11,752
TVD: 7,548.05
Inclination: 88.21
Azimuth: 355.31
VS: 3,924.91





ANADARKO
LOCHBUIE 30C-13HZ
WELL TD @ 11854' MD
ON 02/17/2014 @ 2300HRS

THANK YOU FOR USING
COLUMBINE LOGGING INC.