COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name	Spurling_35N_34HZ		
Location	NWNW: SEC 34, TWP 2N 67W 6 PM		
State	COLORADO	**County**	WELD
Country	U.S.A.	**Rig Number**	XTREME 6
API Number	05123389500000	**AFE #**	2085757.DRL
Region	D-J BASIN	**Field**	WATTENBERG
Spud Date	5/14/2014	**Drilling Completed**	5/20/2014
Surface Coordinates	377' FNL, 1088' FWL		
Bottom Hole Coordinates	460' FFSLL, 1070' FFWLL		
Ground Elevation	5,015'	**K.B. Elevation**	5,035'
Logged Interval	6,900' **To** 11,951'	**Total Depth**	11,951'
Formation	NIOBRARA		
Type of Drilling Fluid	LSND/ PHPA		

Operator

Company Anadarko

Address Granite Tower
1099 18th St. #1800
Denver, CO 80202
(JG)(JS)

Geologist

Name ISAAC SMITH & ADAM NEUMANN (LATERAL)

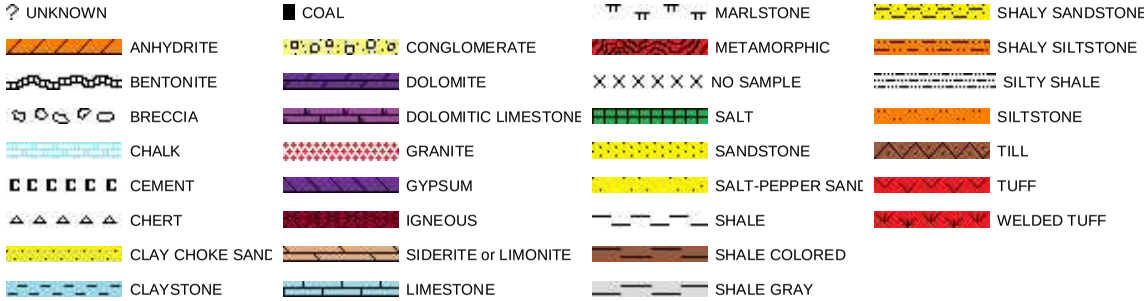
Company COLUMBINE LOGGING INC.

Address 2385 S. Lipan Street
Denver, CO 80223
Phone: 303-289-7764

Zone Color Coding

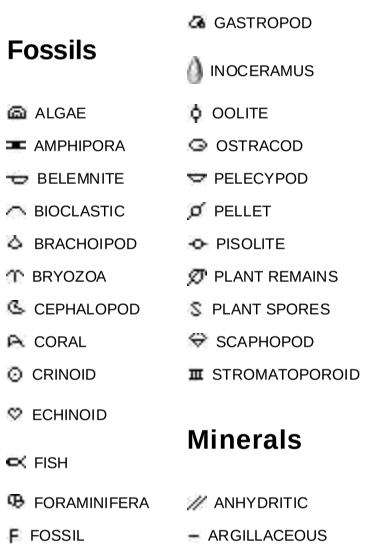
Oil	Condensate	G
Note	Core	Pr
Error	Water	Sc

Rock Types



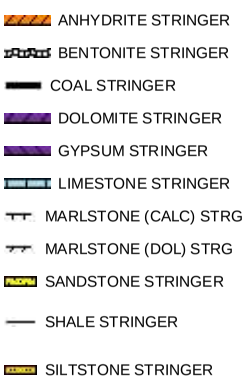
Accessories

Fossils

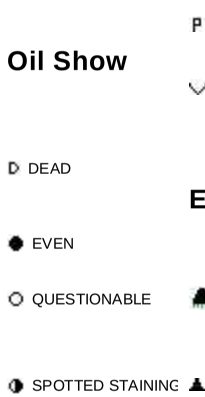


Minerals

Stringer

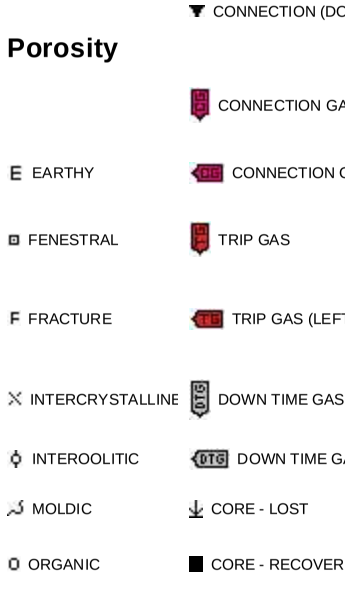


Oil Show



Engineering

Porosity



Other Symbols

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

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
GAMMA

BEGIN SPURLING 35N-34HZ AT 6,900' MD.
DRILLING 8.75" HOLE. BIT #1, SMITH, SDi611.
DEPTH IN: 1,076' MD. KOP: 6,893' MD.

ROP & GAS DATA PROVIDED BY IBALL/
BLOODHOUND UNIT #0787 - GAMMA & SURVEY
DATA PROVIDED BY BAKER HUGHES

5
250
ROP (min/ft)
GAMMA (api)
0
0
113
84

Total Gas & Chromatograph
GAS
C1
C2
C3
C4

BEGIN COLUMBINE LOGGING
INC., 1-MAN LOGGING 5/16/2014.

6000
600000
GAS (units)
C1-C4 (PPM)
85u
3527u
2095u
343u
1996u
3389u
2630u
PIERRE SHALE
TG: 2,329.21
C1: 96.6
C2: 0
C3: 0.6
C4: 2.8

Depth Labels
6,750 6,760 6,770 6,780 6,790 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

% Lith

Well Bore
TVD

THE IDEALIZED INTERPRETATION OF THE
WELLBORE LITHOLOGY IS NOT TO SCALE.

SCAVENGER TANK IN OPERATION
WITH FOUR TOTAL SHAKERS.

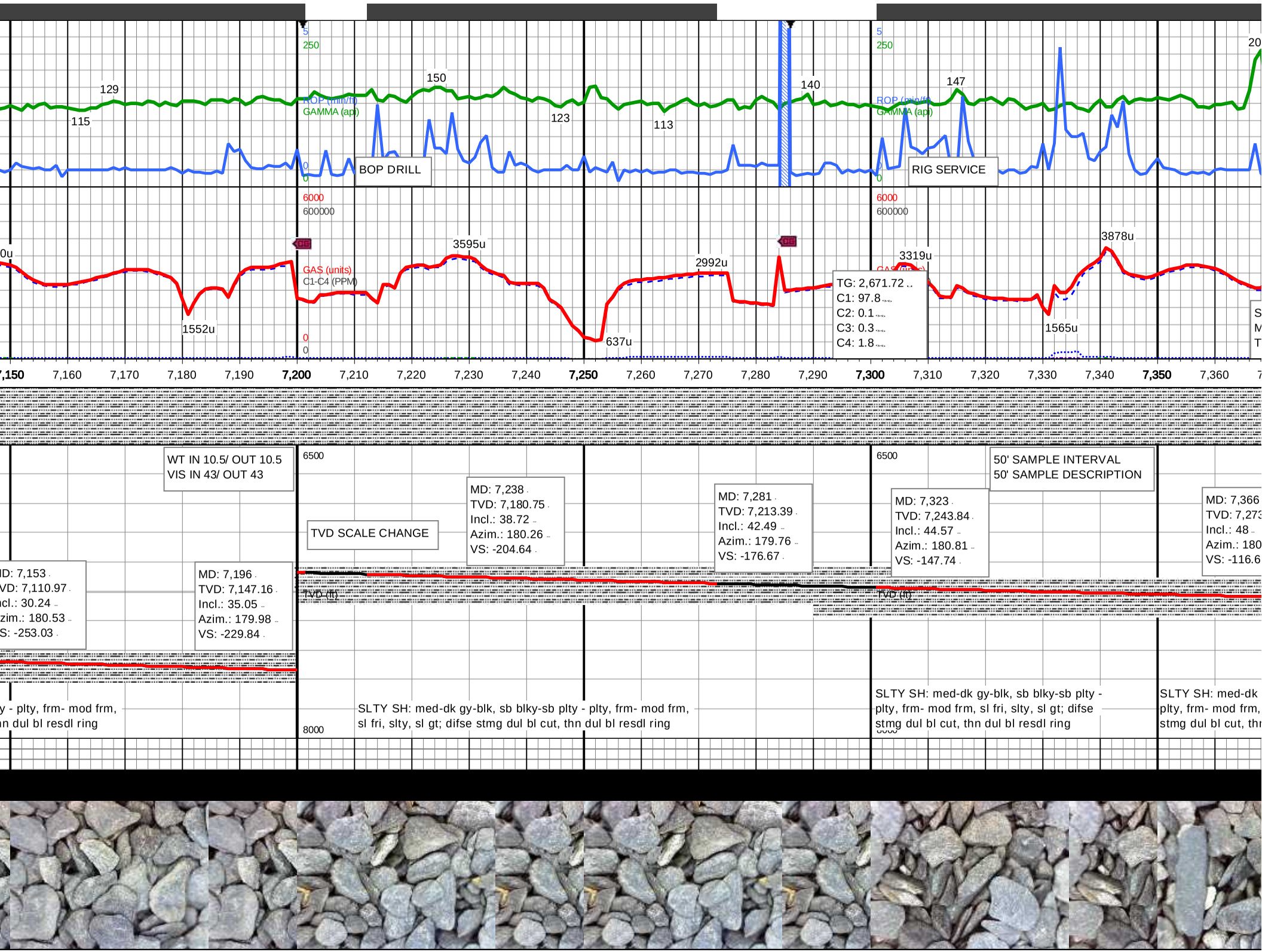
ACETONE WAS USED AS THE CUTTING
AGENT WITH THE DIMPLE FILLED TO THE
RIM. THE RATINGS ARE BASED ON 7
DESCRIPTORS: NONE, SLIGHT TRACE,
TRACE,FAIR, MODERATE, GOOD, AND
EXCELLENT.THE DESCRIPTOR USED IS
BASED ON THE LOGGERS OBSERVATIONS
AND BEST JUDGMENT OF BRILLIANCE,
COLOR AND LONGEVITY OF THE CUT.

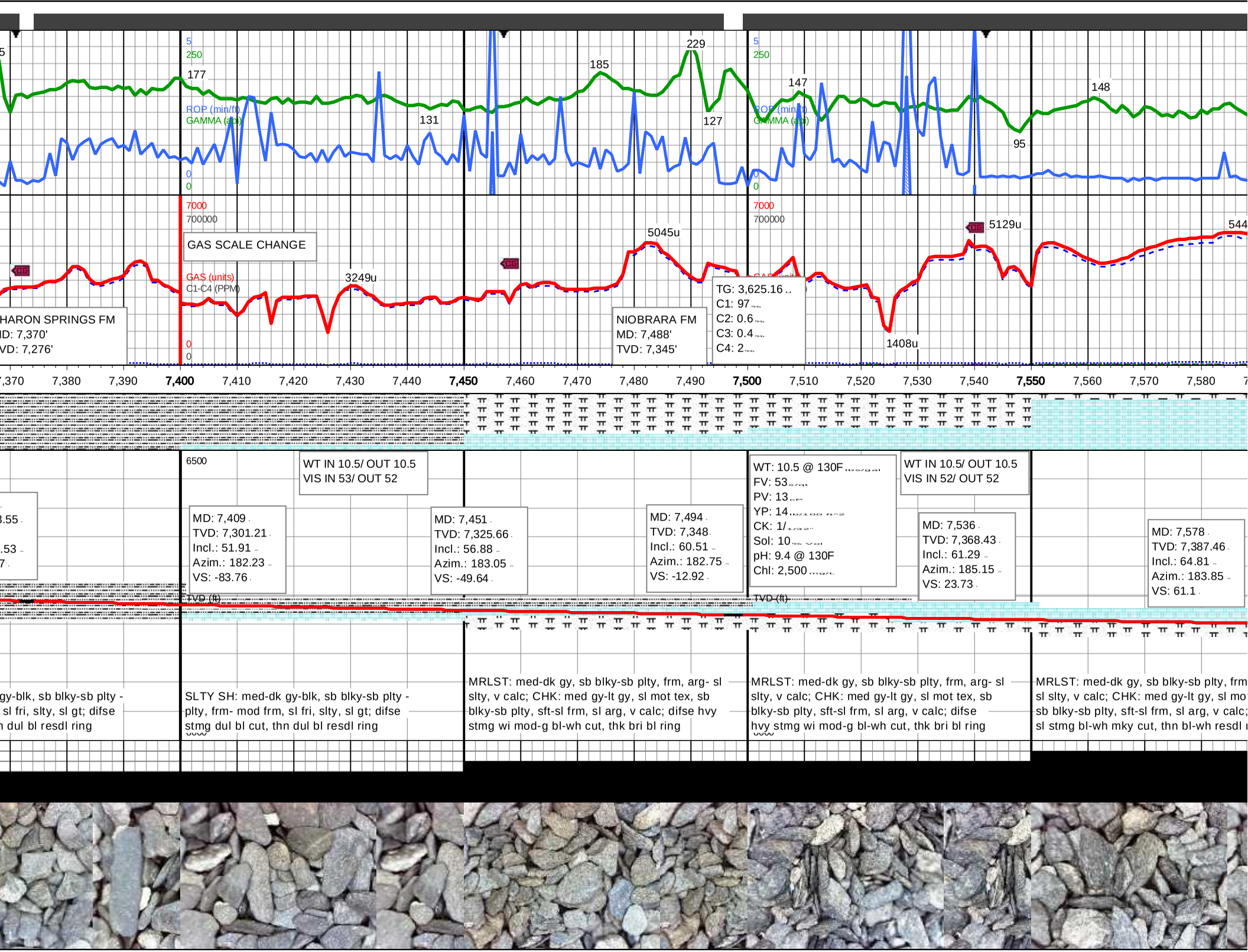
6000
100' SAMPLE INTERVAL
100' SAMPLE DESCRIPTION
WT IN 10.1/ OUT 10.1
VIS IN 40/ OUT 40
MD: 6,813
TVD: 6,786.14
Incl.: 0.9
Azim.: 139.51
VS: -336.52
MD: 6,855
TVD: 6,828.14
Incl.: 1.26
Azim.: 159.74
VS: -335.84
MD: 6,898
TVD: 6,871.05
Incl.: 5.42
Azim.: 170.01
VS: -333.41
TVD (ft)
7500
SLTY SH: med-dk gy-blk, sb blky-sb plty - plty, frm- mod frm,
sl fri, slty, sl gt; difse stmg dul bl cut, thn dul bl resdl ring

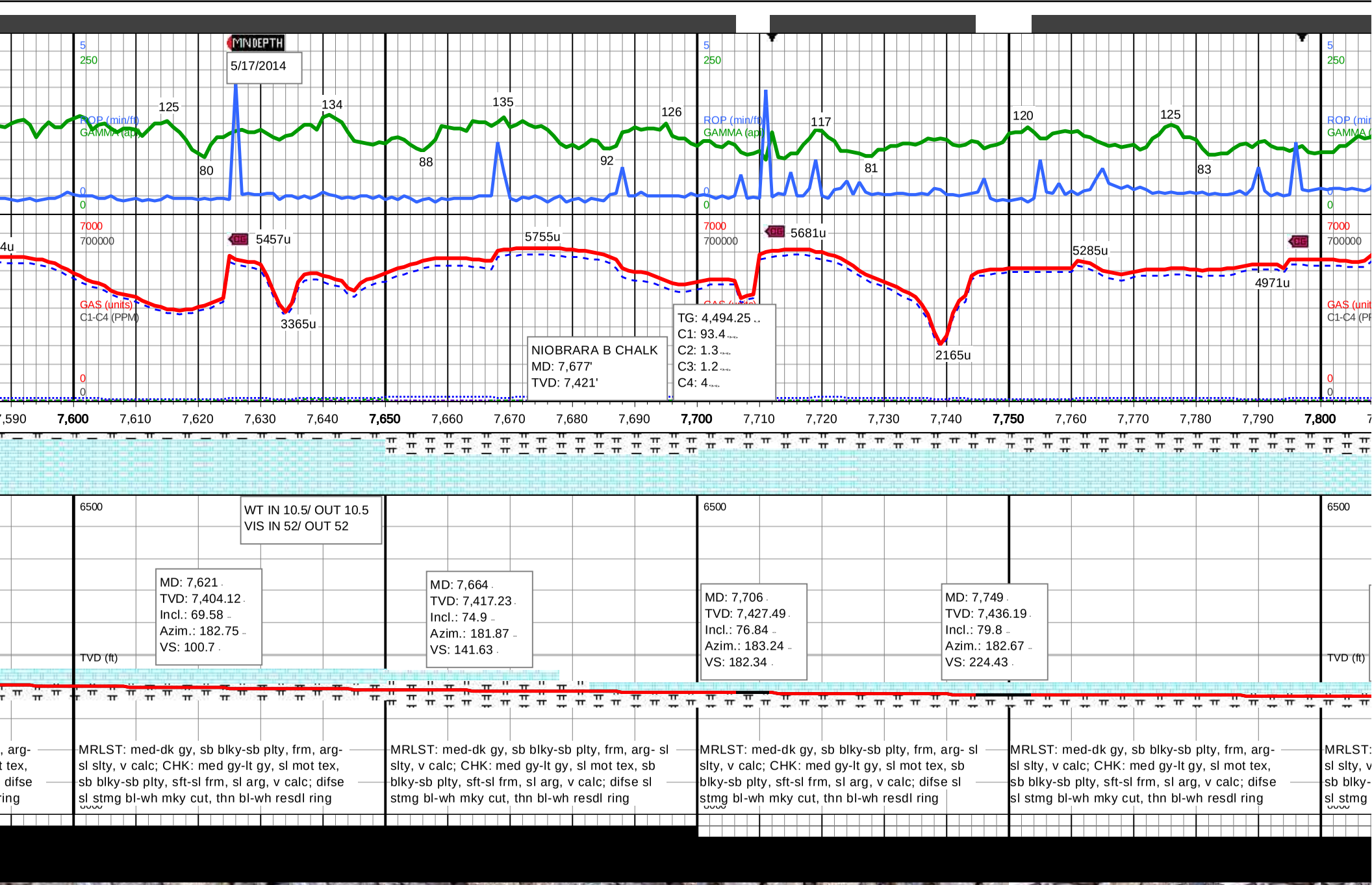
Oil Show
E
G
M
F
T
P

Images


118
109
129
117
119
120
ROP (min/ft)
GAMMA (api)
5
250
0
6000
600000
GAS (units)
C1-C4 (PPM)
1283u
2960u
2535u
3520u
778u
5098u
658u
TG: 2,785.98
C1: 98
C2: 0.3
C3: 0.3
C4: 1.4
6,930
6,940
6,950
6,960
6,970
6,980
6,990
7,000
7,010
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
0.5/ OUT 10.5
42/ OUT 42
WT: 10.5 @ 121F
FV: 43
PV: 11
YP: 13
CK: 1/
Sol: 10
pH: 9.5 @ 121F
Chl: 2,800
WT IN 10.5/ OUT 10.5
VIS IN 43/ OUT 43
MD: 6,940
TVD: 6,912.65
Incl.: 10.28
Azim.: 172.03
VS: -327.76
MD: 6,983
TVD: 6,954.56
Incl.: 15.34
Azim.: 173.63
VS: -318.33
MD: 7,025
TVD: 6,994.66
Incl.: 19.23
Azim.: 174.77
VS: -305.94
MD: 7,068
TVD: 7,034.79
Incl.: 22.86
Azim.: 176.95
VS: -290.57
MD: 7,111
TVD: 7,073.93
Incl.: 26
Azim.: 179.72
VS: -272.81
6000
TVD (ft)
7500
gy-blk, sb blky-sb plty - plty, frm- mod frm,
fse stmg dul bl cut, thn dul bl resdl ring
SLTY SH: med-dk gy-blk, sb blky-sb plty - plty, frm- mod frm,
sl fri, slty, sl gt; difse stmg dul bl cut, thn dul bl resdl ring
SLTY SH: med-dk gy-blk, sb blky-sb plt
sl fri, slty, sl gt; difse stmg dul bl cut, th


5
250
ROP (min/ft)
GAMMA (api)
0
0
6000
600000
129
115
150
123
140
113
147
BOP DRILL
RIG SERVICE
GAS (units)
C1-C4 (PPM)
3595u
2992u
3319u
3878u
1552u
637u
1565u
TG: 2,671.72 ..
C1: 97.8 ...
C2: 0.1 ...
C3: 0.3 ...
C4: 1.8 ...
7,150
7,160
7,170
7,180
7,190
7,200
7,210
7,220
7,230
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
WT IN 10.5/ OUT 10.5
VIS IN 43/ OUT 43
6500
TVD SCALE CHANGE
MD: 7,238
TVD: 7,180.75
Incl.: 38.72
Azim.: 180.26
VS: -204.64
MD: 7,281
TVD: 7,213.39
Incl.: 42.49
Azim.: 179.76
VS: -176.67
50' SAMPLE INTERVAL
50' SAMPLE DESCRIPTION
MD: 7,323
TVD: 7,243.84
Incl.: 44.57
Azim.: 180.81
VS: -147.74
MD: 7,366
TVD: 7,273
Incl.: 48
Azim.: 180
VS: -116.6
ID: 7,153
VD: 7,110.97
cl.: 30.24
zim.: 180.53
S: -253.03
MD: 7,196
TVD: 7,147.16
Incl.: 35.05
Azim.: 179.98
VS: -229.84
TVD (ft)
8000
y - plty, frm- mod frm,
n dul bl resdl ring
SLTY SH: med-dk gy-blk, sb blky-sb plty - plty, frm- mod frm, sl fri, slty, sl gt; difse stmg dul bl cut, thn dul bl resdl ring
SLTY SH: med-dk gy-blk, sb blky-sb plty - plty, frm- mod frm, sl fri, slty, sl gt; difse stmg dul bl cut, thn dul bl resdl ring
SLTY SH: med-dk
plty, frm- mod frm,
stmg dul bl cut, thn


5
250
177
ROP (min/ft)
GAMMA (api)
0
0
131
185
229
127
5
250
147
148
95
0
0
7000
700000
GAS SCALE CHANGE
GAS (units)
C1-C4 (PPM)
0
0
3249u
5045u
5129u
1408u
544
HARON SPRINGS FM
ID: 7,370'
VD: 7,276'
NIOBRARA FM
MD: 7,488'
TVD: 7,345'
TG: 3,625.16
C1: 97
C2: 0.6
C3: 0.4
C4: 2
7,370
7,380
7,390
7,400
7,410
7,420
7,430
7,440
7,450
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
6500
WT IN 10.5/ OUT 10.5
VIS IN 53/ OUT 52
MD: 7,409
TVD: 7,301.21
Incl.: 51.91
Azim.: 182.23
VS: -83.76
MD: 7,451
TVD: 7,325.66
Incl.: 56.88
Azim.: 183.05
VS: -49.64
MD: 7,494
TVD: 7,348
Incl.: 60.51
Azim.: 182.75
VS: -12.92
WT: 10.5 @ 130F
FV: 53
PV: 13
YP: 14
CK: 1/
Sol: 10
pH: 9.4 @ 130F
Chl: 2,500
WT IN 10.5/ OUT 10.5
VIS IN 52/ OUT 52
MD: 7,536
TVD: 7,368.43
Incl.: 61.29
Azim.: 185.15
VS: 23.73
MD: 7,578
TVD: 7,387.46
Incl.: 64.81
Azim.: 183.85
VS: 61.1
TVD (ft)
TVD (ft)
gy-blk, sb blky-sb plty -
sl fri, slty, sl gt; difse
n dul bl resdl ring
SLTY SH: med-dk gy-blk, sb blky-sb plty -
plty, frm- mod frm, sl fri, slty, sl gt; difse
stmg dul bl cut, thn dul bl resdl ring
MRLST: med-dk gy, sb blky-sb plty, frm, arg- sl
slty, v calc; CHK: med gy-lt gy, sl mot tex, sb
blky-sb plty, sft-sl frm, sl arg, v calc; difse hvy
stmg wi mod-g bl-wh cut, thk bri bl ring
MRLST: med-dk gy, sb blky-sb plty, frm, arg- sl
slty, v calc; CHK: med gy-lt gy, sl mot tex, sb
blky-sb plty, sft-sl frm, sl arg, v calc; difse
hvy stmg wi mod-g bl-wh cut, thk bri bl ring
MRLST: med-dk gy, sb blky-sb plty, frm
sl slty, v calc; CHK: med gy-lt gy, sl mo
sb blky-sb plty, sft-sl frm, sl arg, v calc;
sl stmg bl-wh mky cut, thn bl-wh resdl


MNDEPTH
5/17/2014
ROP (min/ft)
GAMMA (api)
GAS (units)
C1-C4 (PPM)
5457u
3365u
5755u
5681u
2165u
5285u
4971u
NIOBRARA B CHALK
MD: 7,677'
TVD: 7,421'
TG: 4,494.25
C1: 93.4
C2: 1.3
C3: 1.2
C4: 4
WT IN 10.5/ OUT 10.5
VIS IN 52/ OUT 52
MD: 7,621
TVD: 7,404.12
Incl.: 69.58
Azim.: 182.75
VS: 100.7
MD: 7,664
TVD: 7,417.23
Incl.: 74.9
Azim.: 181.87
VS: 141.63
MD: 7,706
TVD: 7,427.49
Incl.: 76.84
Azim.: 183.24
VS: 182.34
MD: 7,749
TVD: 7,436.19
Incl.: 79.8
Azim.: 182.67
VS: 224.43
TVD (ft)
MRLST: med-dk gy, sb blky-sb plty, frm, arg- sl slty, v calc; CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, sft-sl frm, sl arg, v calc; difse sl stmg bl-wh mky cut, thn bl-wh resdl ring

REACHED TD FOR THE CURVE AT
7860' MD @ 3:55 AM ON 5/17/2014.

Bit #: 1
Type: SDI611
Size: 8.75
Depth In: 1,076
Depth Out: 7,860
Total Drilled: 6,784
Hours: 29.2
Avg Ft/Hr: 232.32
Jets: 6X20
S/N: JH5428

BEGIN DRILLING LATERAL ON 5/18/14 AT 8:42 PM.
6.125" HOLE WITH BIT #2. DEPTH IN: 7860' MD.

ROP SCALE CHANGE

ROP (min/ft)
GAMMA (api)

GAS (units)
C1-C4 (PPM)

TG: 1,994.1
C1: 95.2
C2: 1.1
C3: 1
C4: 2.7

BEGIN 2-MAN LOGGING
5/18/2014.

PROJECTED TO BIT

FAULT 1 OF 6:
MD: 7,879'
TVD: 7,444'
VS: 354'
28' DOWNWARD THROW

100' SAMPLE INTERVAL
100' SAMPLE DESCRIPTION

MD: 7,812
TVD: 7,443.16
Incl.: 87.49
Azim.: 181.79
VS: 286.98

WT: 10.6 @ 92F
FV: 49
PV: 13
YP: 13
CK: 1/
Sol: 10
pH: 9.2 @ 92F
Chl: 2,300

MD: 7,860
TVD: 7,444.35
Incl.: 88.67
Azim.: 0
VS: 334.96

MD: 7,927
TVD: 7,444.97
Incl.: 89.23
Azim.: 359.85
VS: 401.95

WT: 9.4 @ 88F
FV: 39
PV: 11
YP: 12
CK: 1/
Sol: 6
pH: 9.3 @ 88F
Chl: 2,300

MD: 8,012
TVD: 7,446.62
Incl.: 89.87
Azim.: 358.81
VS: 486.93

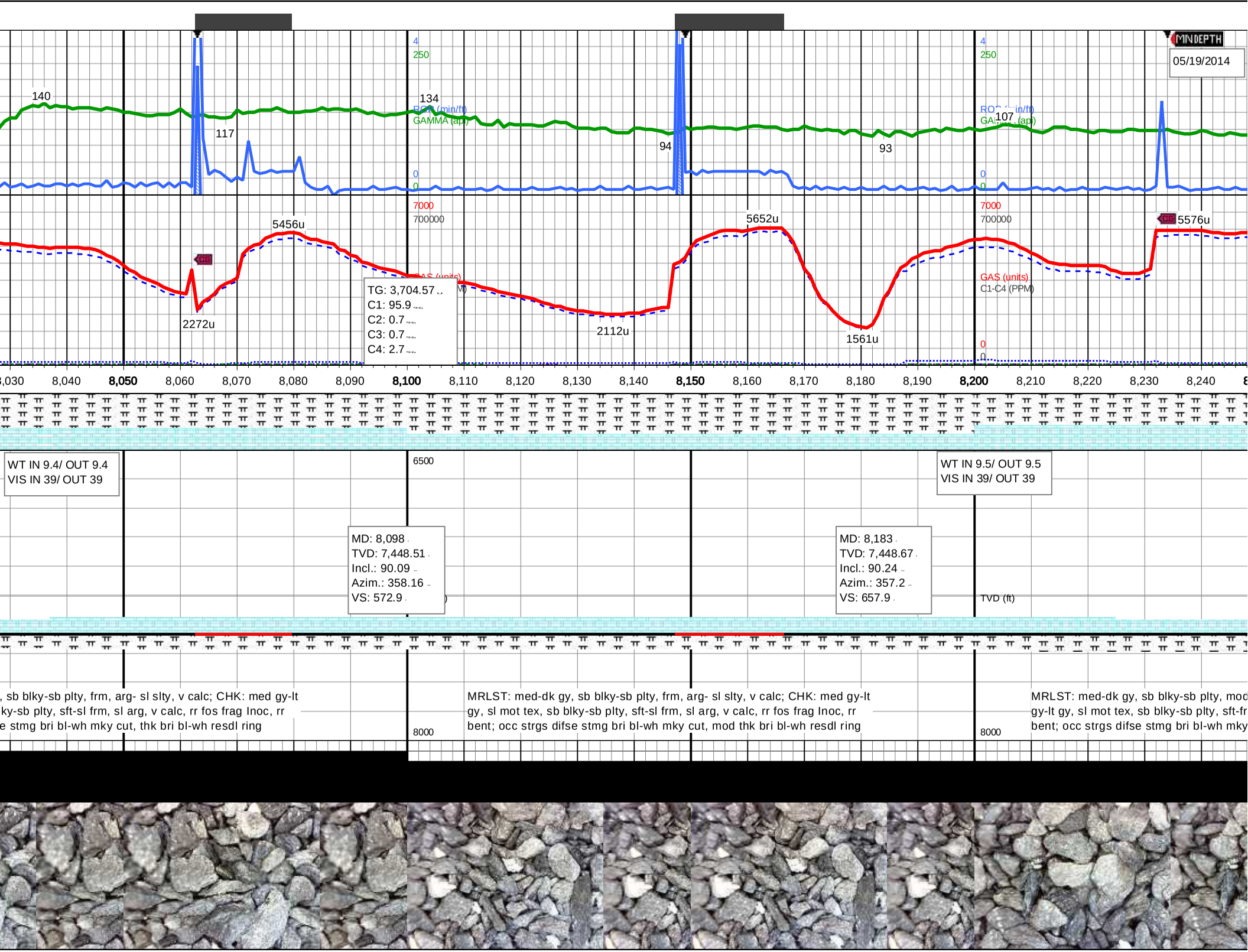
TVD (ft)

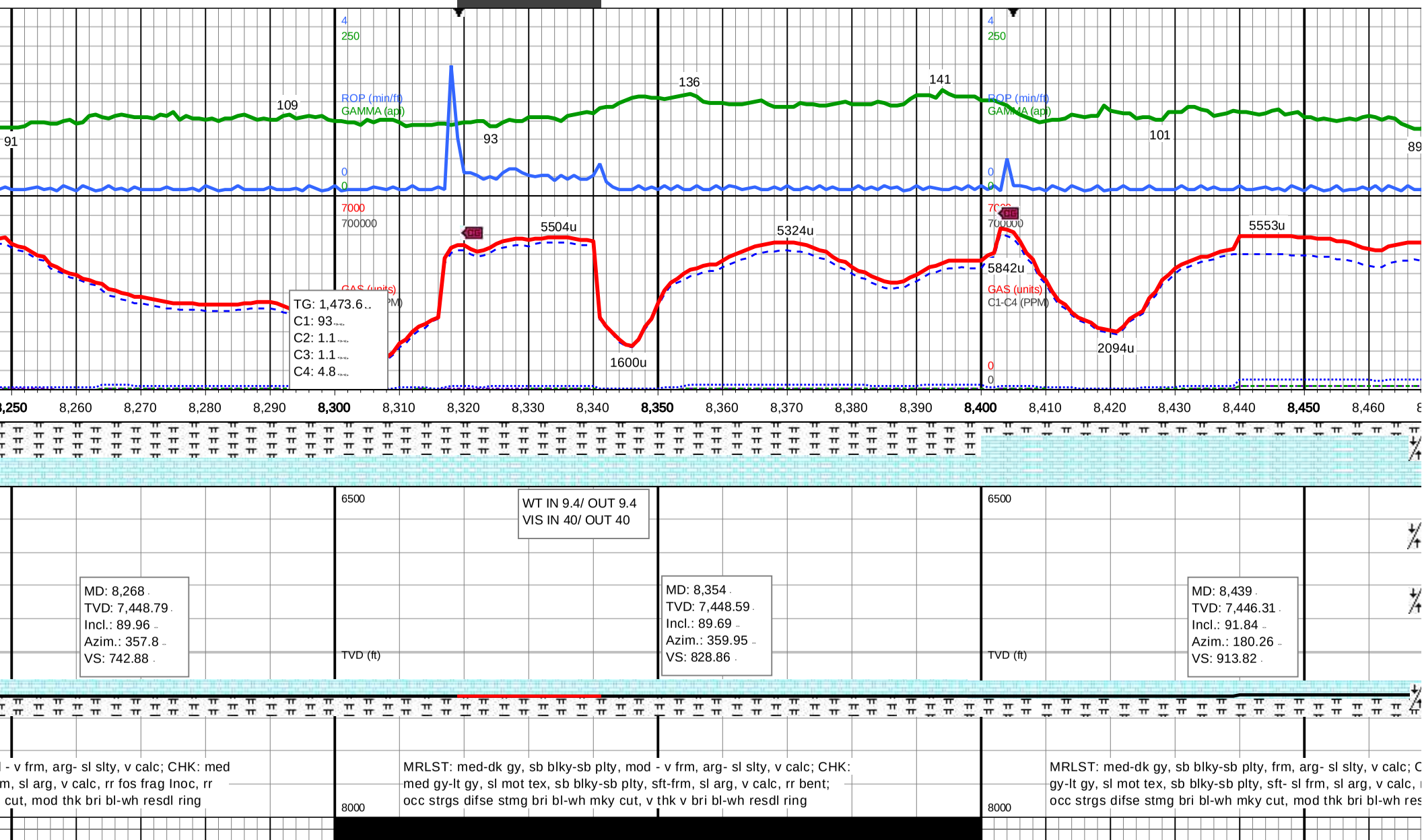
med-dk gy, sb blky-sb plty, frm, arg- calc; CHK: med gy-lt gy, sl mot tex, sb plty, sft-sl frm, sl arg, v calc; difse bl-wh mky cut, thn bl-wh resdl ring

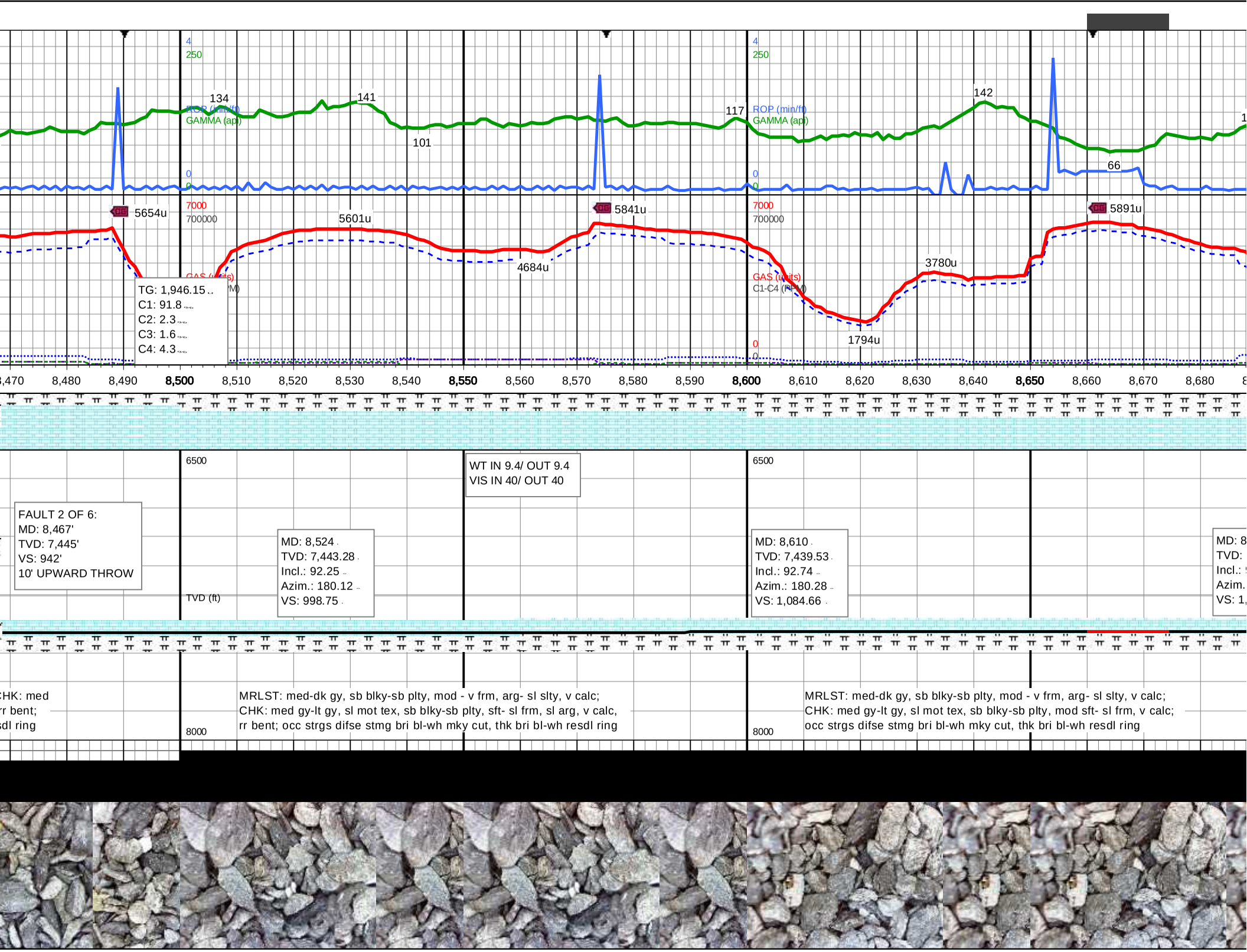
MRLST: med-dk gy, sb blky-sb plty, frm, arg- sl slty, v calc; CHK: med gy-lt gy, brn ip, sl mot tex, sb blky-sb plty, sft-sl frm, arg, v calc; occ strgs difse stmg bri bl-wh mky cut, mod thk bri bl-wh resdl ring

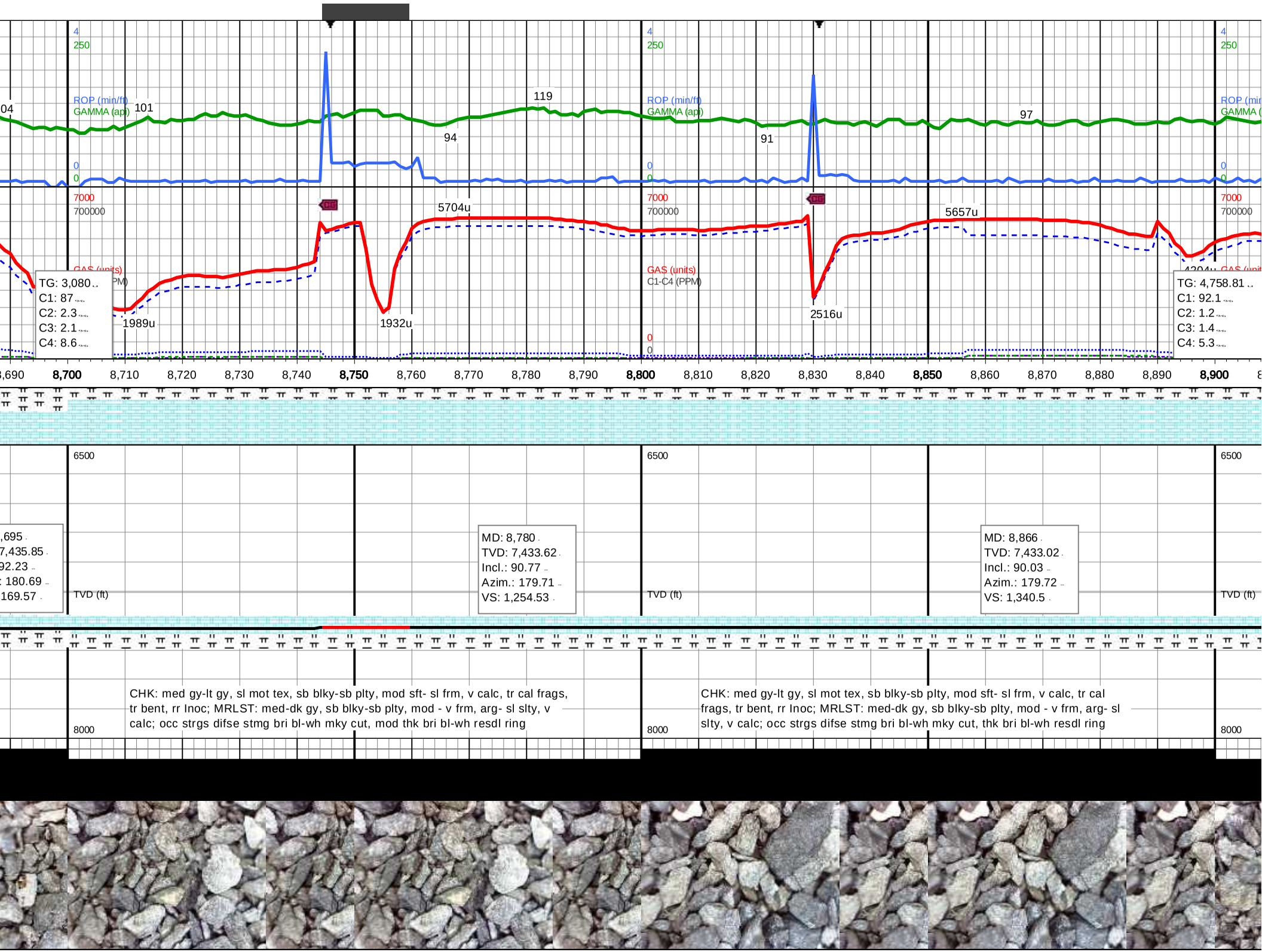
MRLST: med-dk gy, sb blky-sb plty, frm, arg- sl slty, v calc; CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, sft-sl frm, sl arg, v calc, rr fos frag Inoc; occ strgs difse stmg bri bl-wh mky cut, mod thk bri bl-wh resdl ring

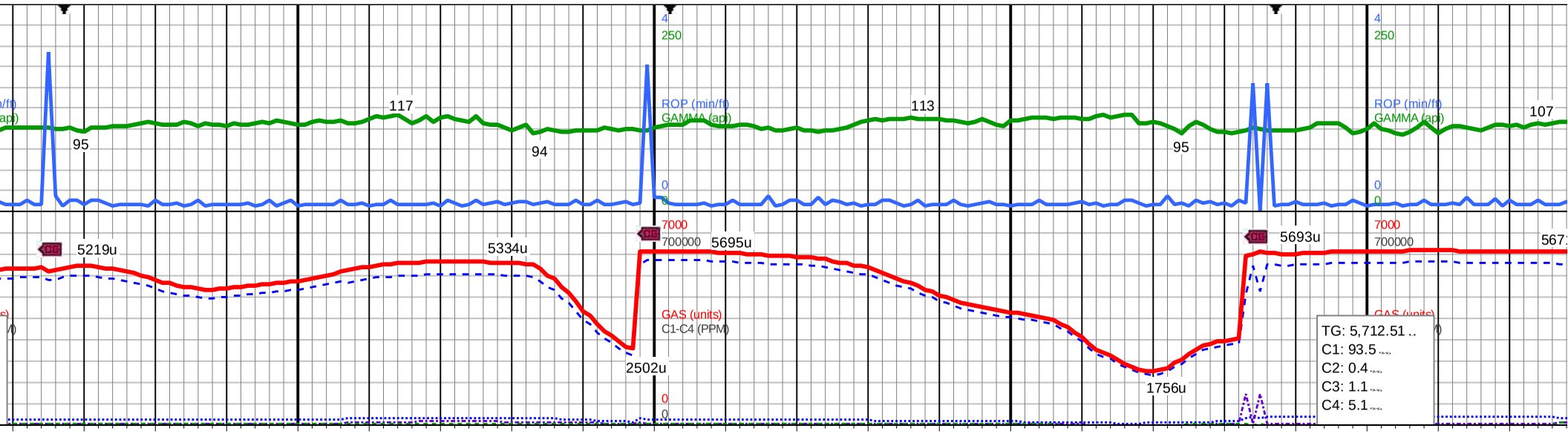
MRLST: med-dk gy
gy, sl mot tex, sb bl
bent; occ strgs difs


MNDEPTH
05/19/2014
140
117
134
94
93
107
4
250
0
7000
700000
5456u
2272u
5652u
2112u
1561u
5576u
GAS (units)
C1-C4 (PPM)
TG: 3,704.57
C1: 95.9
C2: 0.7
C3: 0.7
C4: 2.7
8,030
8,040
8,050
8,060
8,070
8,080
8,090
8,100
8,110
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
WT IN 9.4/ OUT 9.4
VIS IN 39/ OUT 39
6500
MD: 8,098
TVD: 7,448.51
Incl.: 90.09
Azim.: 358.16
VS: 572.9
WT IN 9.5/ OUT 9.5
VIS IN 39/ OUT 39
MD: 8,183
TVD: 7,448.67
Incl.: 90.24
Azim.: 357.2
VS: 657.9
TVD (ft)
, sb blky-sb plty, frm, arg- sl slty, v calc; CHK: med gy-lt
ky-sb plty, sft-sl frm, sl arg, v calc, rr fos frag Inoc, rr
e stmg bri bl-wh mky cut, thk bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty, frm, arg- sl slty, v calc; CHK: med gy-lt
gy, sl mot tex, sb blky-sb plty, sft-sl frm, sl arg, v calc, rr fos frag Inoc, rr
bent; occ strgs difse stmg bri bl-wh mky cut, mod thk bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty, mod
gy-lt gy, sl mot tex, sb blky-sb plty, sft-fr
bent; occ strgs difse stmg bri bl-wh mky
8000


4
250
ROP (min/ft)
GAMMA (api)
0
0
109
91
93
136
141
101
89
7000
700000
GAS (units)
C1-C4 (PPM)
TG: 1,473.6..
C1: 93....
C2: 1.1....
C3: 1.1....
C4: 4.8....
5504u
1600u
5324u
5842u
2094u
5553u
8,250
8,260
8,270
8,280
8,290
8,300
8,310
8,320
8,330
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
6500
WT IN 9.4/ OUT 9.4
VIS IN 40/ OUT 40
MD: 8,268
TVD: 7,448.79
Incl.: 89.96
Azim.: 357.8
VS: 742.88
MD: 8,354
TVD: 7,448.59
Incl.: 89.69
Azim.: 359.95
VS: 828.86
MD: 8,439
TVD: 7,446.31
Incl.: 91.84
Azim.: 180.26
VS: 913.82
TVD (ft)
8000
- v frm, arg- sl slty, v calc; CHK: med
m, sl arg, v calc, rr fos frag Inoc, rr
cut, mod thk bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; CHK:
med gy-lt gy, sl mot tex, sb blky-sb plty, sft-frm, sl arg, v calc, rr bent;
occ strgs difse stmg bri bl-wh mky cut, v thk v bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty, frm, arg- sl slty, v calc; C
gy-lt gy, sl mot tex, sb blky-sb plty, sft- sl frm, sl arg, v calc,
occ strgs difse stmg bri bl-wh mky cut, mod thk bri bl-wh res


4
250
134
ROP (min/ft)
GAMMA (api)
141
101
117
142
66
0
7000
700000
5654u
5601u
5841u
4684u
5891u
3780u
1794u
GAS (units)
C1-C4 (RPM)
TG: 1,946.15
C1: 91.8
C2: 2.3
C3: 1.6
C4: 4.3
8,470
8,480
8,490
8,500
8,510
8,520
8,530
8,540
8,550
8,560
8,570
8,580
8,590
8,600
8,610
8,620
8,630
8,640
8,650
8,660
8,670
8,680
6500
TVD (ft)
8000
WT IN 9.4/ OUT 9.4
VIS IN 40/ OUT 40
FAULT 2 OF 6:
MD: 8,467'
TVD: 7,445'
VS: 942'
10' UPWARD THROW
MD: 8,524
TVD: 7,443.28
Incl.: 92.25
Azim.: 180.12
VS: 998.75
MD: 8,610
TVD: 7,439.53
Incl.: 92.74
Azim.: 180.28
VS: 1,084.66
MD: 8
TVD:
Incl.:
Azim.
VS: 1,
CHK: med
rr bent;
sdl ring
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc;
CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, sft- sl frm, sl arg, v calc,
rr bent; occ strgs difse stmg bri bl-wh mky cut, thk bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc;
CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- sl frm, v calc;
occ strgs difse stmg bri bl-wh mky cut, thk bri bl-wh resdl ring


ROP (min/ft)
GAMMA (api)
GAS (units)
C1-C4 (PPM)
TVD (ft)
101
94
119
91
97
5704u
1989u
1932u
2516u
5657u
TG: 3,080
C1: 87
C2: 2.3
C3: 2.1
C4: 8.6
TG: 4,758.81
C1: 92.1
C2: 1.2
C3: 1.4
C4: 5.3
MD: 8,780
TVD: 7,433.62
Incl.: 90.77
Azim.: 179.71
VS: 1,254.53
MD: 8,866
TVD: 7,433.02
Incl.: 90.03
Azim.: 179.72
VS: 1,340.5
8,700
8,750
8,800
8,850
8,900
CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- sl frm, v calc, tr cal frags, tr bent, rr Inoc; MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; occ strgs difse stmg bri bl-wh mky cut, mod thk bri bl-wh resdl ring



WT IN 9.4/ OUT 9.4
VIS IN 41/ OUT 41

6500

MD: 8,951
TVD: 7,432.89
Incl.: 90.15
Azim.: 179.74
VS: 1,425.47

MD: 9,036
TVD: 7,432.64
Incl.: 90.18
Azim.: 179.31
VS: 1,510.43

MD: 9,122
TVD: 7,433.02
Incl.: 89.32
Azim.: 179.15
VS: 1,596.38

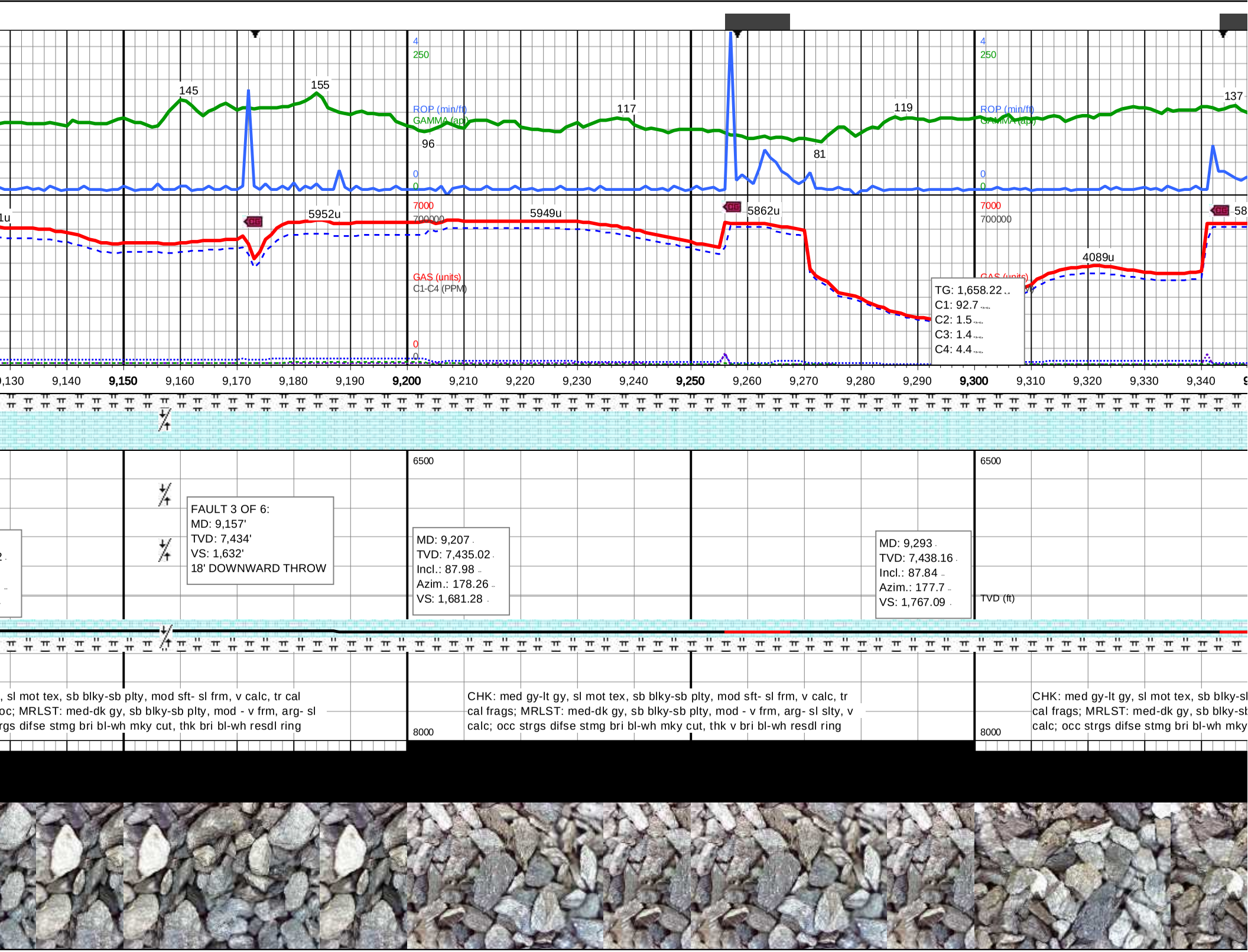
TVD (ft)

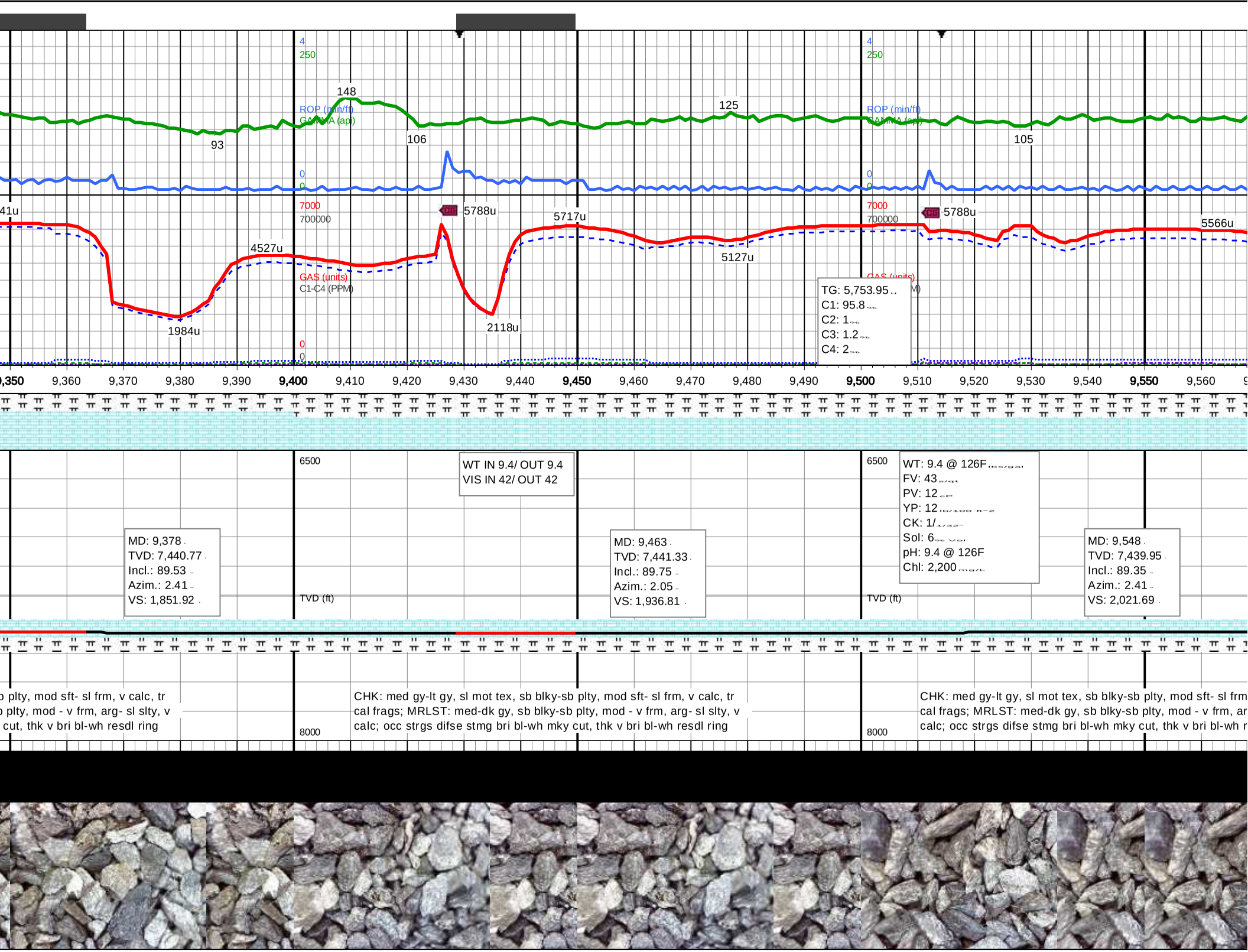
8000

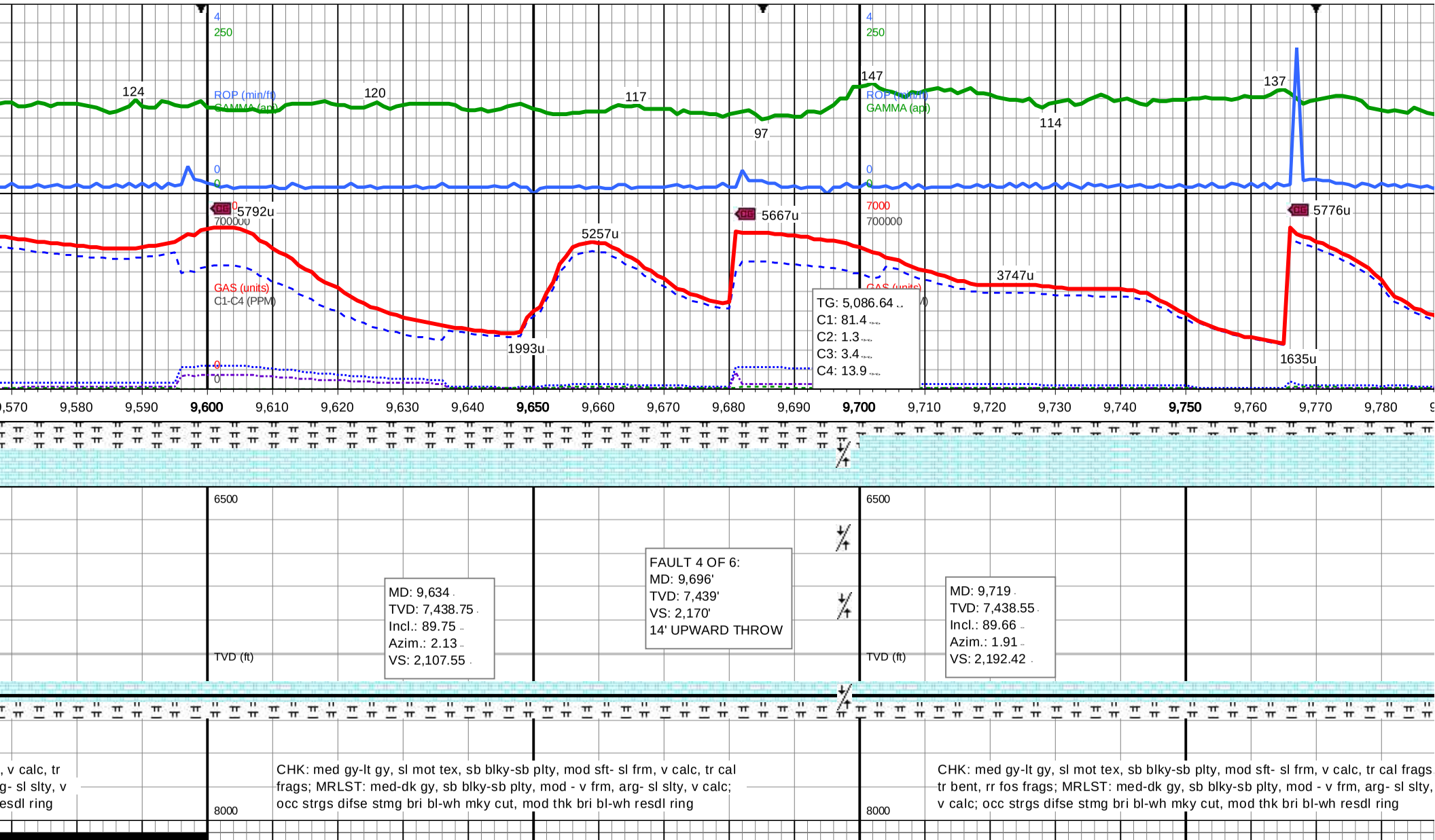
CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- sl frm, v calc, tr cal frags, tr bent, rr Inoc; MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; occ strgs difse stmg bri bl-wh mky cut, mod thk bri bl-wh resdl ring

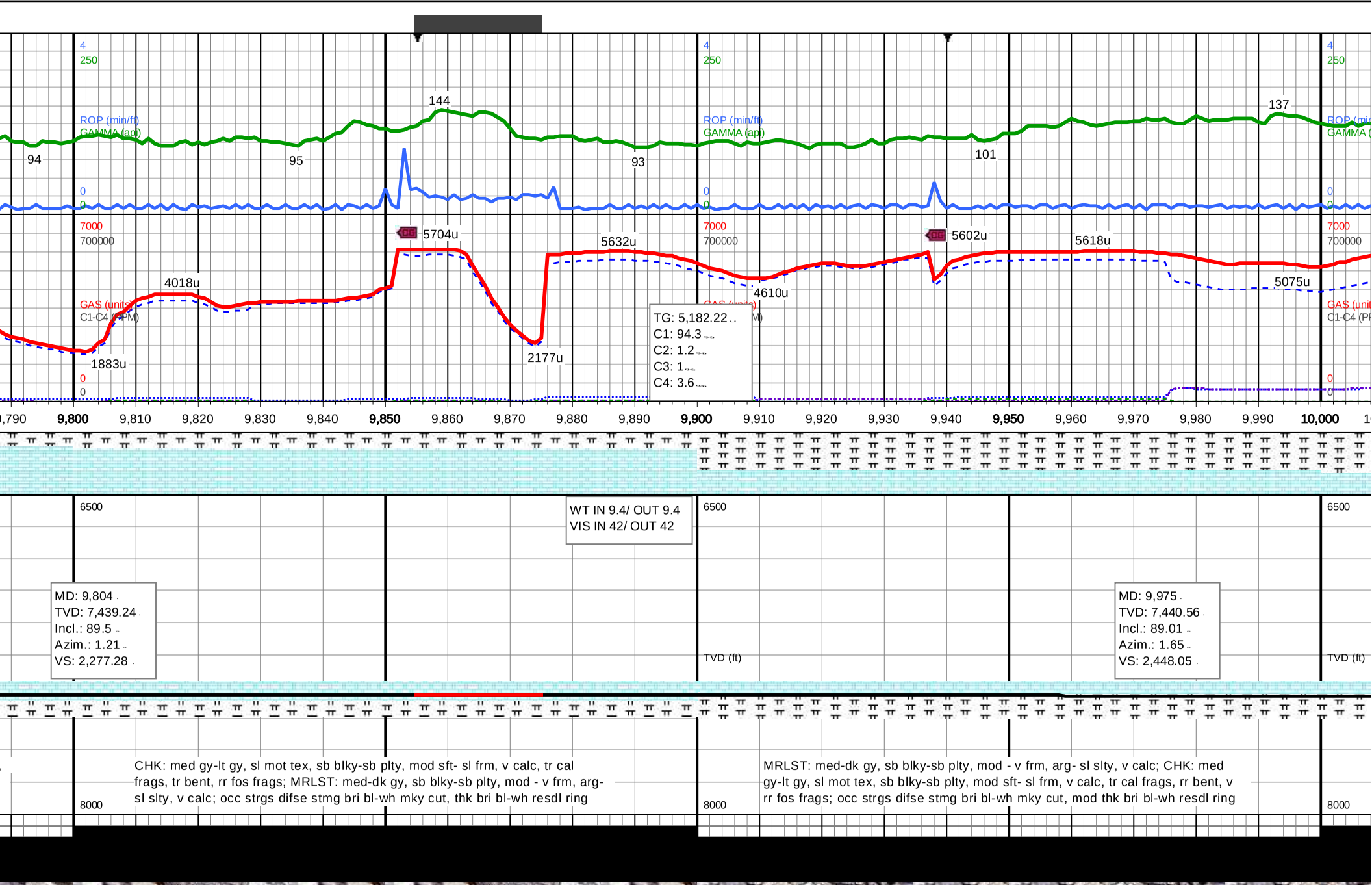
CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- sl frm, v calc, tr cal frags, tr bent, rr Inoc; MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; occ strgs difse stmg bri bl-wh mky cut, mod thk bri bl-wh resdl ring

CHK: med gy-lt gy
frags, tr bent, rr In
slty, v calc; occ st


145
155
117
119
81
137
96
4
250
ROP (min/ft)
GAMMA (api)
0
0
5952u
5949u
5862u
4089u
7000
700000
GAS (units)
C1-C4 (PPM)
TG: 1,658.22
C1: 92.7
C2: 1.5
C3: 1.4
C4: 4.4
9,130
9,140
9,150
9,160
9,170
9,180
9,190
9,200
9,210
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
6500
FAULT 3 OF 6:
MD: 9,157'
TVD: 7,434'
VS: 1,632'
18' DOWNWARD THROW
MD: 9,207
TVD: 7,435.02
Incl.: 87.98
Azim.: 178.26
VS: 1,681.28
MD: 9,293
TVD: 7,438.16
Incl.: 87.84
Azim.: 177.7
VS: 1,767.09
TVD (ft)
8000
, sl mot tex, sb blky-sb plty, mod sft- sl frm, v calc, tr cal
oc; MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl
rgs difse stmg bri bl-wh mky cut, thk bri bl-wh resdl ring
CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- sl frm, v calc, tr
cal frags; MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v
calc; occ strgs difse stmg bri bl-wh mky cut, thk v bri bl-wh resdl ring
CHK: med gy-lt gy, sl mot tex, sb blky-sl
cal frags; MRLST: med-dk gy, sb blky-sb
calc; occ strgs difse stmg bri bl-wh mky


4
250
148
ROP (min/ft)
GAMMA (api)
93
106
125
105
0
0
7000
700000
5788u
5717u
4527u
5127u
5566u
GAS (units)
C1-C4 (PPM)
1984u
2118u
TG: 5,753.95
C1: 95.8
C2: 1
C3: 1.2
C4: 2
9,350
9,360
9,370
9,380
9,390
9,400
9,410
9,420
9,430
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
6500
WT IN 9.4/ OUT 9.4
VIS IN 42/ OUT 42
WT: 9.4 @ 126F
FV: 43
PV: 12
YP: 12
CK: 1/
Sol: 6
pH: 9.4 @ 126F
Chl: 2,200
MD: 9,378
TVD: 7,440.77
Incl.: 89.53
Azim.: 2.41
VS: 1,851.92
MD: 9,463
TVD: 7,441.33
Incl.: 89.75
Azim.: 2.05
VS: 1,936.81
MD: 9,548
TVD: 7,439.95
Incl.: 89.35
Azim.: 2.41
VS: 2,021.69
TVD (ft)
8000
b plty, mod sft- sl frm, v calc, tr
b plty, mod - v frm, arg- sl slty, v
cut, thk v bri bl-wh resdl ring
CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- sl frm, v calc, tr
cal frags; MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v
calc; occ strgs difse stmg bri bl-wh mky cut, thk v bri bl-wh resdl ring
CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- sl frm
cal frags; MRLST: med-dk gy, sb blky-sb plty, mod - v frm, ar
calc; occ strgs difse stmg bri bl-wh mky cut, thk v bri bl-wh

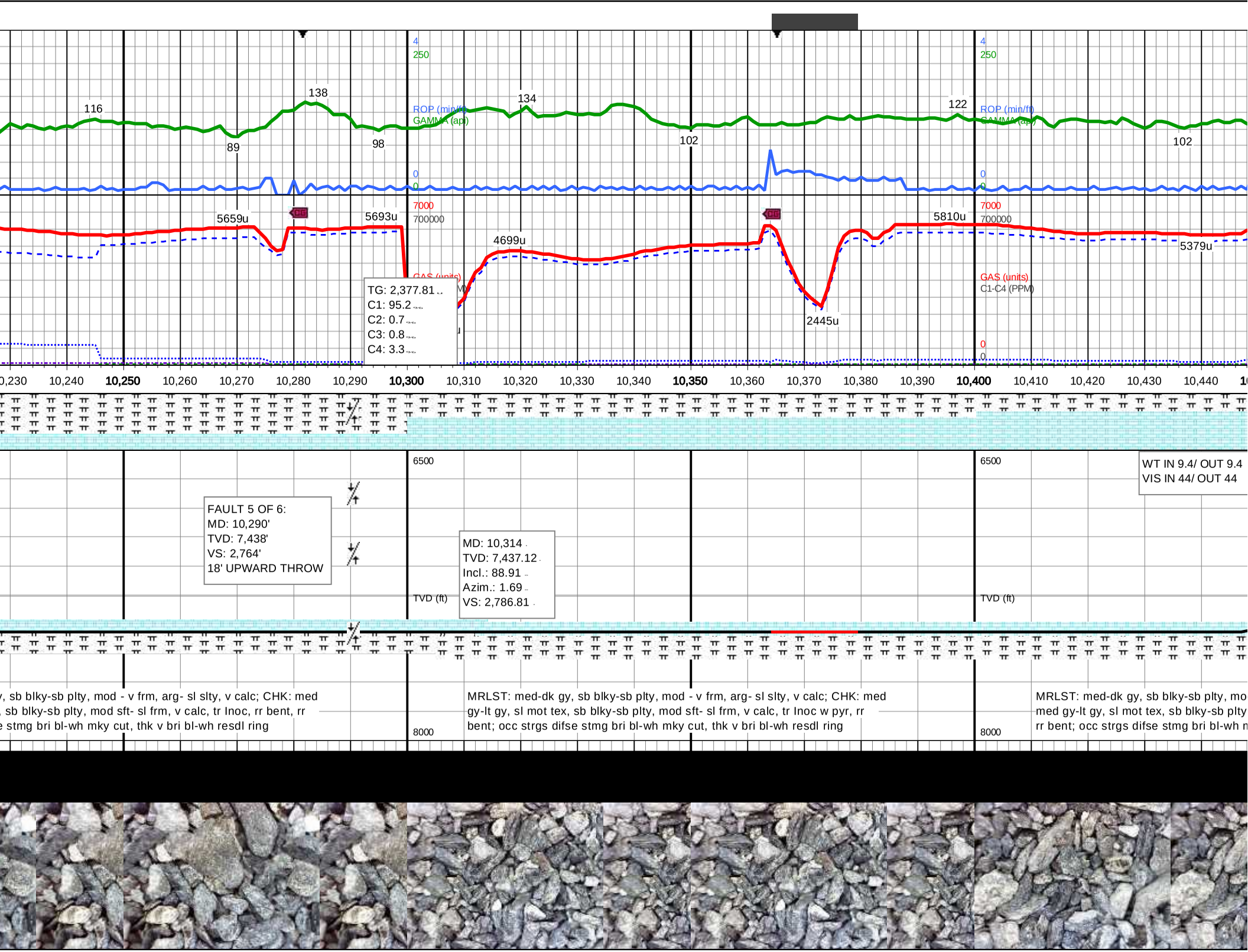

4
250
ROP (min/ft)
GAMMA (api)
0
124
120
117
97
147
114
137
5792u
5257u
5667u
1993u
3747u
5776u
1635u
GAS (units)
C1-C4 (PPM)
7000000
TG: 5,086.64
C1: 81.4
C2: 1.3
C3: 3.4
C4: 13.9
9,570
9,580
9,590
9,600
9,610
9,620
9,630
9,640
9,650
9,660
9,670
9,680
9,690
9,700
9,710
9,720
9,730
9,740
9,750
9,760
9,770
9,780
6500
TVD (ft)
MD: 9,634
TVD: 7,438.75
Incl.: 89.75
Azim.: 2.13
VS: 2,107.55
FAULT 4 OF 6:
MD: 9,696'
TVD: 7,439'
VS: 2,170'
14' UPWARD THROW
MD: 9,719
TVD: 7,438.55
Incl.: 89.66
Azim.: 1.91
VS: 2,192.42
8000
, v calc, tr
g- sl slty, v
esdl ring
CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- sl frm, v calc, tr cal frags; MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; occ strgs difse stmg bri bl-wh mky cut, mod thk bri bl-wh resdl ring
CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- sl frm, v calc, tr cal frags
tr bent, rr fos frags; MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty,
v calc; occ strgs difse stmg bri bl-wh mky cut, mod thk bri bl-wh resdl ring

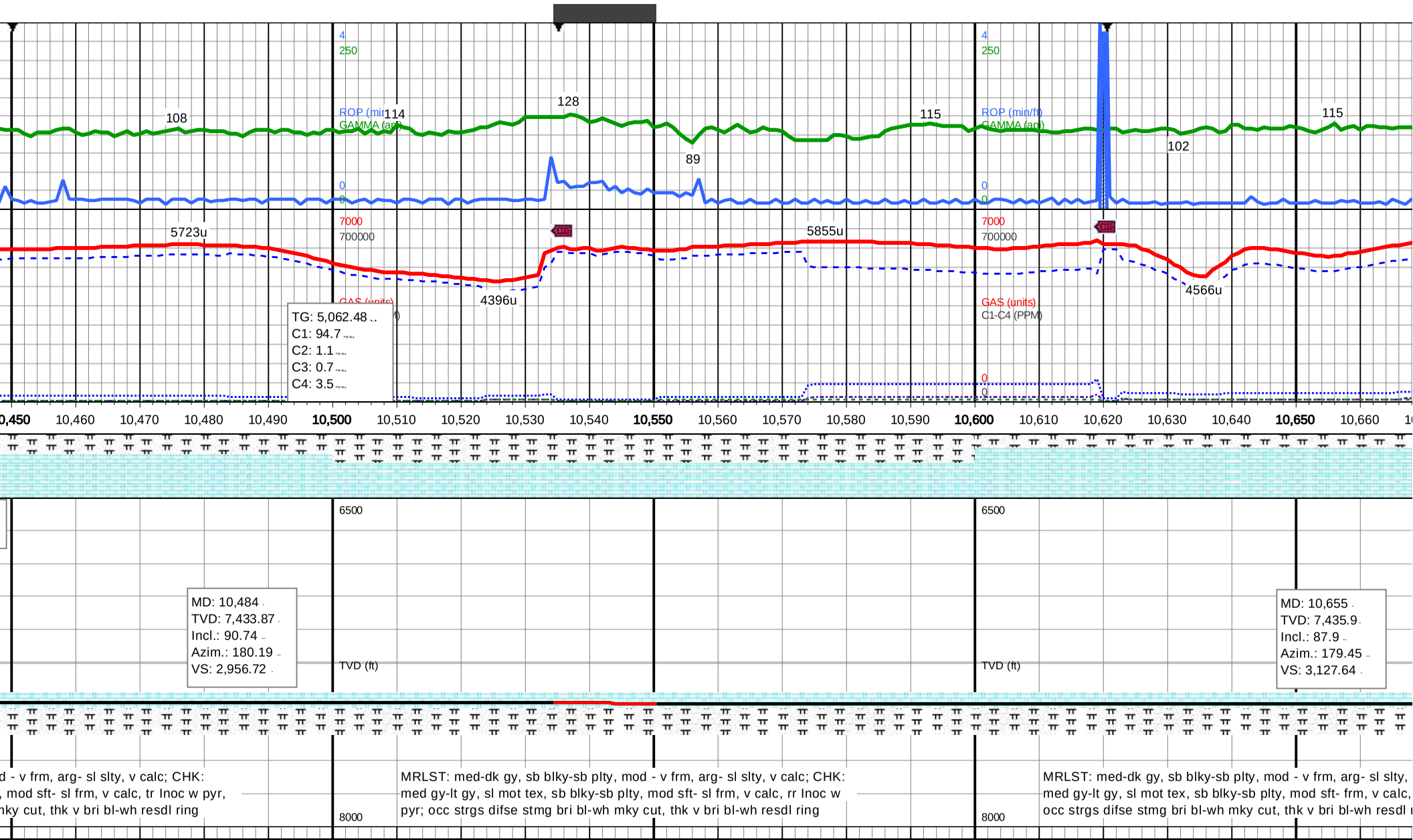

4
250
ROP (min/ft)
GAMMA (api)
0
0
144
94
95
93
137
101
7000
700000
GAS (units)
C1-C4 (PPM)
5704u
5632u
5602u
5618u
4018u
4610u
5075u
1883u
2177u
TG: 5,182.22
C1: 94.3
C2: 1.2
C3: 1
C4: 3.6
9,790
9,800
9,810
9,820
9,830
9,840
9,850
9,860
9,870
9,880
9,890
9,900
9,910
9,920
9,930
9,940
9,950
9,960
9,970
9,980
9,990
10,000
6500
WT IN 9.4/ OUT 9.4
VIS IN 42/ OUT 42
MD: 9,804
TVD: 7,439.24
Incl.: 89.5
Azim.: 1.21
VS: 2,277.28
MD: 9,975
TVD: 7,440.56
Incl.: 89.01
Azim.: 1.65
VS: 2,448.05
TVD (ft)
8000
CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- sl frm, v calc, tr cal frags, tr bent, rr fos frags; MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; occ strgs difse stmg bri bl-wh mky cut, thk bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- sl frm, v calc, tr cal frags, rr bent, v rr fos frags; occ strgs difse stmg bri bl-wh mky cut, mod thk bri bl-wh resdl ring

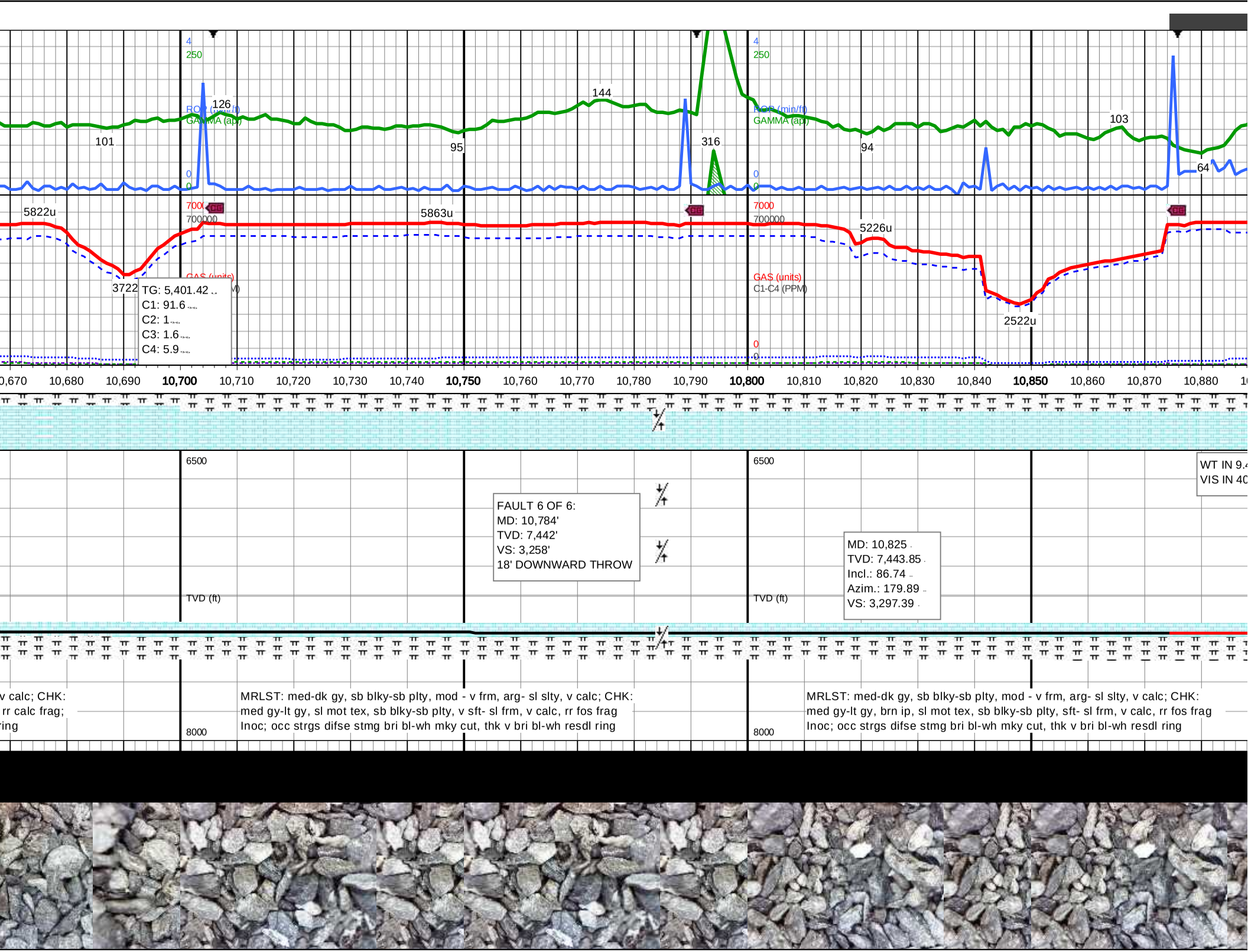
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- sl frm, v calc, tr cal frags, rr bent, v rr fos frags; occ strgs difse stmg bri bl-wh mky cut, thk bri bl-wh resdl ring

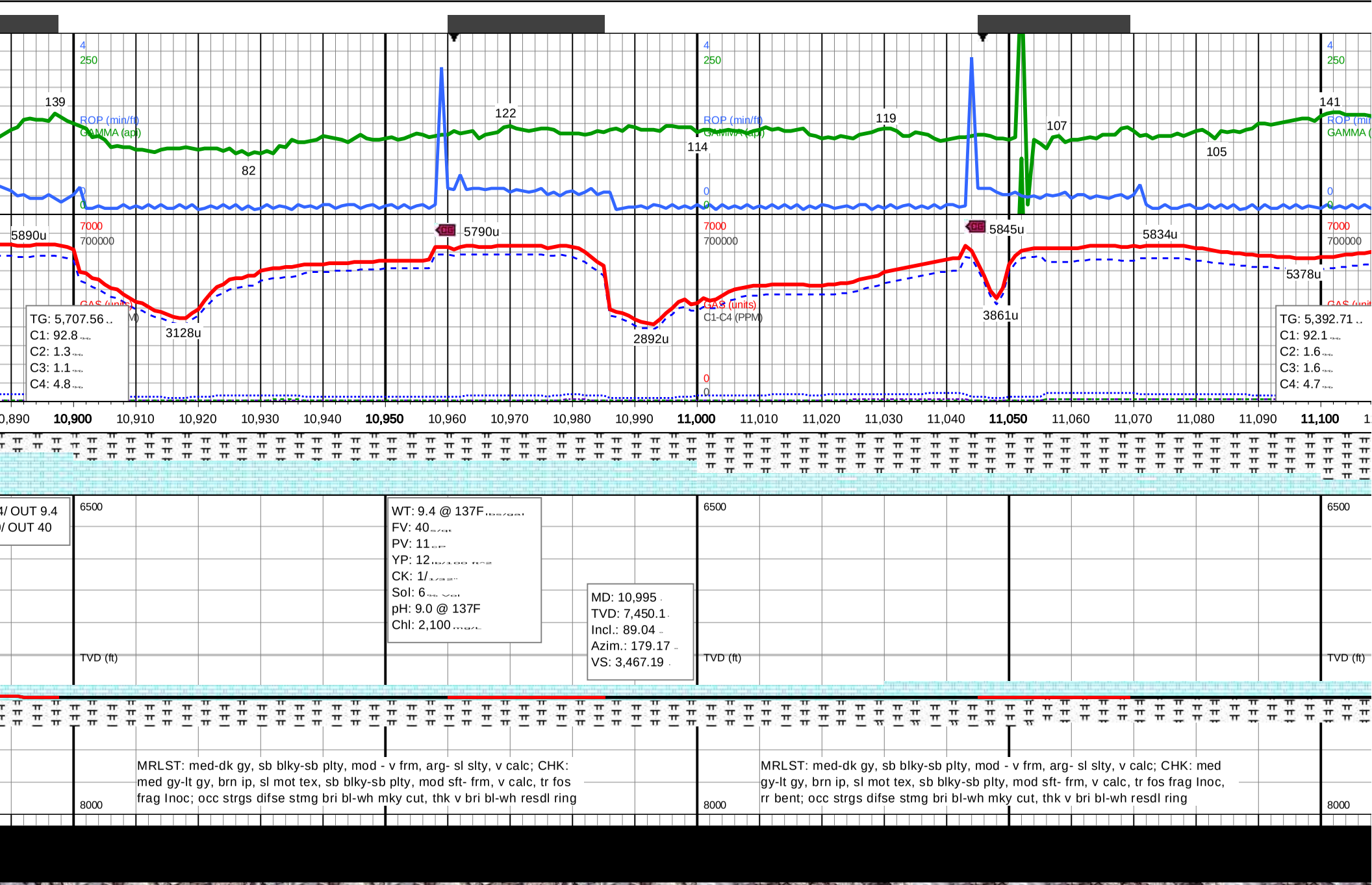
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- sl frm, v calc, tr cal frags; occ strgs difse stmg bri bl-wh mky cut, thk bri bl-wh resdl ring

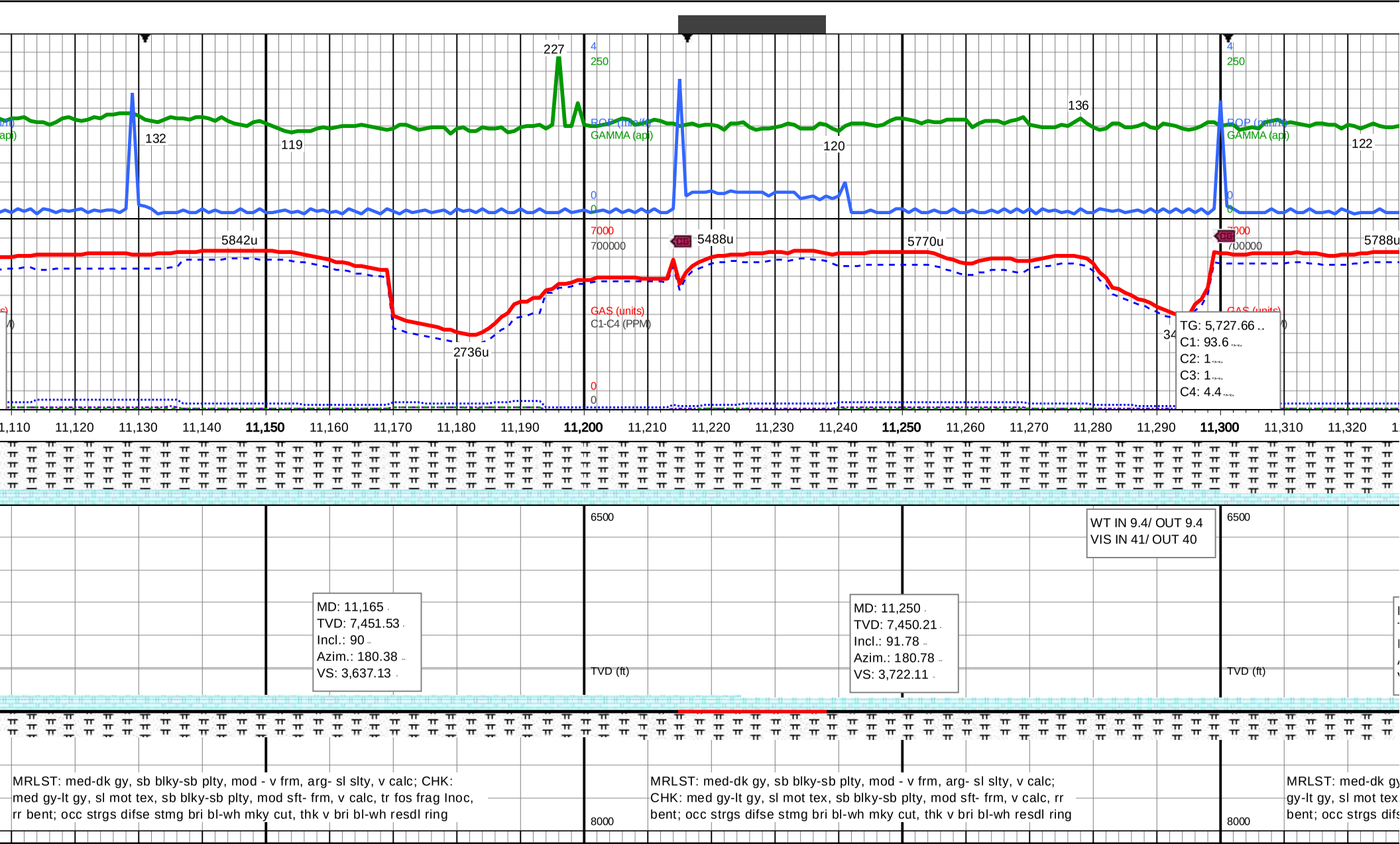
MRLST: med-dk gy
gy-lt gy, sl mot tex
pyr; occ strgs difse

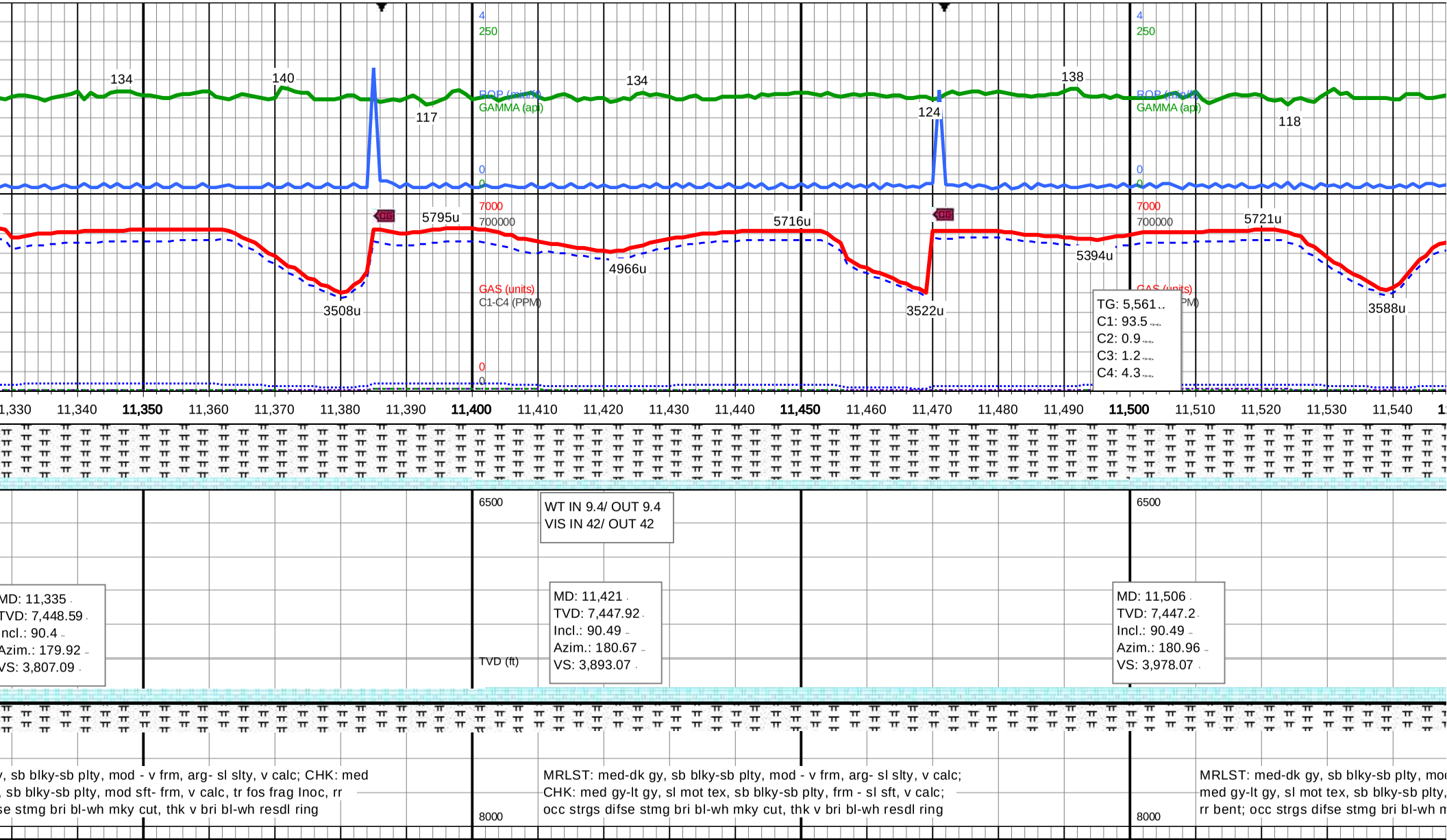

116
138
89
98
134
102
122
102
ROP (min/ft)
GAMMA (api)
4
250
0
0
5659u
5693u
4699u
5810u
2445u
5379u
7000
700000
GAS (units)
C1-C4 (PPM)
TG: 2,377.81
C1: 95.2
C2: 0.7
C3: 0.8
C4: 3.3
10,230
10,240
10,250
10,260
10,270
10,280
10,290
10,300
10,310
10,320
10,330
10,340
10,350
10,360
10,370
10,380
10,390
10,400
10,410
10,420
10,430
10,440
FAULT 5 OF 6:
MD: 10,290'
TVD: 7,438'
VS: 2,764'
18' UPWARD THROW
MD: 10,314
TVD: 7,437.12
Incl.: 88.91
Azim.: 1.69
VS: 2,786.81
6500
TVD (ft)
8000
WT IN 9.4/ OUT 9.4
VIS IN 44/ OUT 44
, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; CHK: med
sb blky-sb plty, mod sft- sl frm, v calc, tr Inoc, rr bent, rr
e stmg bri bl-wh mky cut, thk v bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- sl frm, v calc, tr Inoc w pyr, rr bent; occ strgs difse stmg bri bl-wh mky cut, thk v bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty, mo
med gy-lt gy, sl mot tex, sb blky-sb plty
rr bent; occ strgs difse stmg bri bl-wh

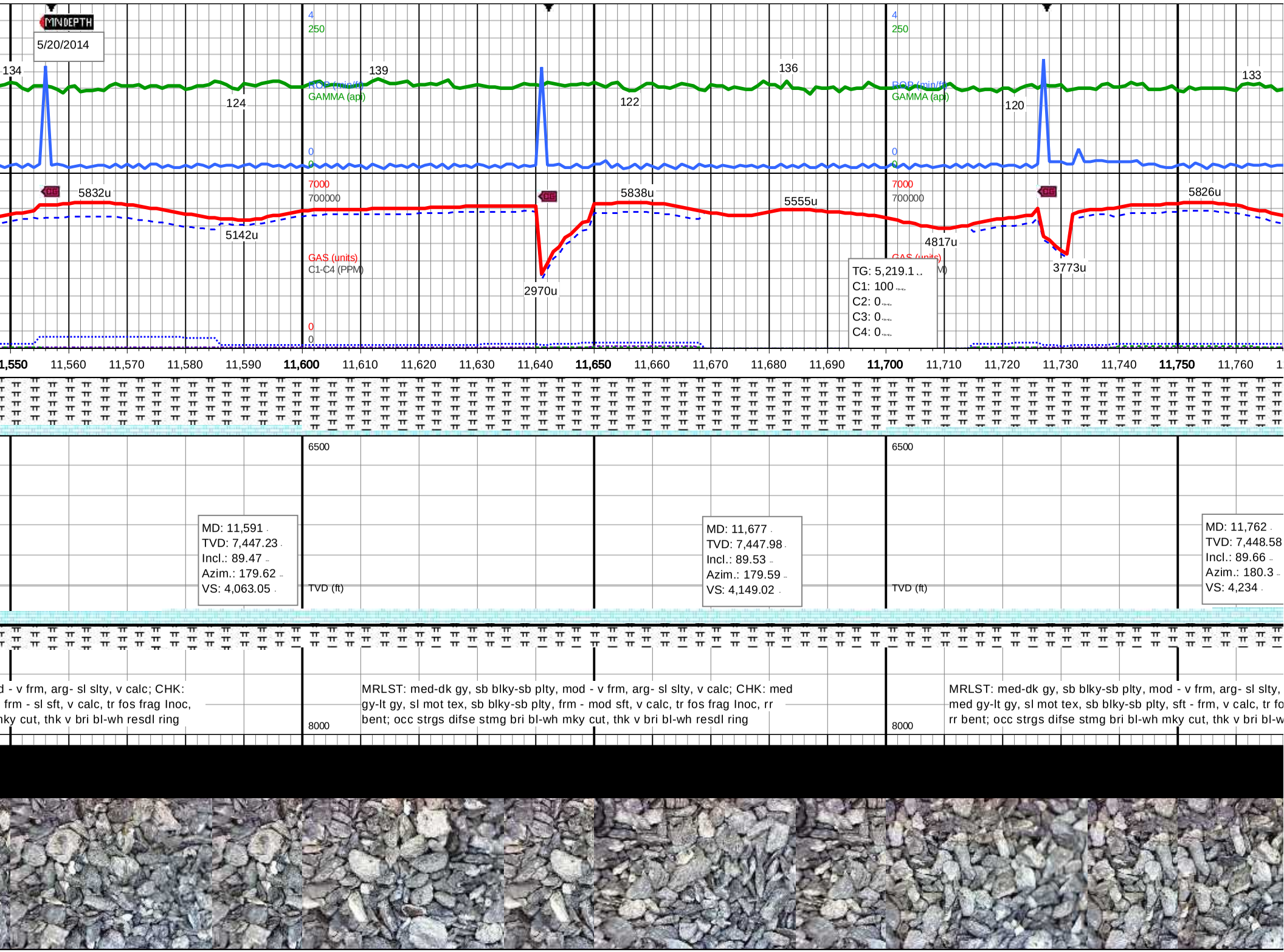

4
250
ROP (min/ft)
GAMMA (api)
0
0
108
114
128
89
115
102
115
7000
700000
5723u
4396u
5855u
4566u
GAS (units)
C1-C4 (PPM)
0
0
TG: 5,062.48
C1: 94.7
C2: 1.1
C3: 0.7
C4: 3.5
10,450
10,460
10,470
10,480
10,490
10,500
10,510
10,520
10,530
10,540
10,550
10,560
10,570
10,580
10,590
10,600
10,610
10,620
10,630
10,640
10,650
10,660
6500
TVD (ft)
8000
MD: 10,484
TVD: 7,433.87
Incl.: 90.74
Azim.: 180.19
VS: 2,956.72
MD: 10,655
TVD: 7,435.9
Incl.: 87.9
Azim.: 179.45
VS: 3,127.64
d - v frm, arg- sl slty, v calc; CHK:
, mod sft- sl frm, v calc, tr Inoc w pyr,
nky cut, thk v bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; CHK:
med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- sl frm, v calc, rr Inoc w
pyr; occ strgs difse stmg bri bl-wh mky cut, thk v bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty,
med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- frm, v calc,
occ strgs difse stmg bri bl-wh mky cut, thk v bri bl-wh resdl

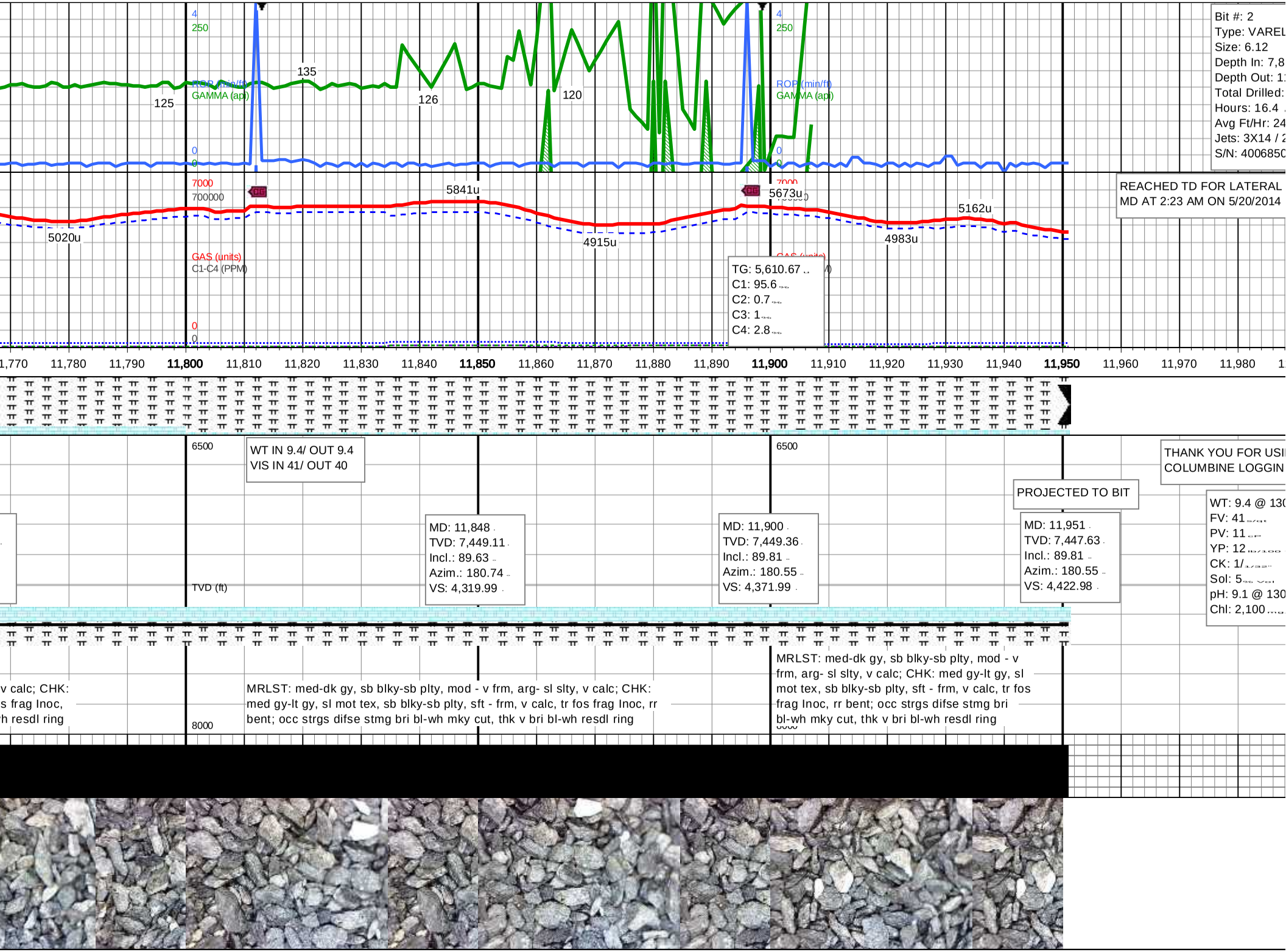

4
250
ROP (min/ft)
GAMMA (api)
0
101
126
95
144
316
94
103
64
5822u
3722
5863u
5226u
2522u
700
700000
GAS (units)
C1-C4 (PPM)
TG: 5,401.42
C1: 91.6
C2: 1
C3: 1.6
C4: 5.9
10,670
10,680
10,690
10,700
10,710
10,720
10,730
10,740
10,750
10,760
10,770
10,780
10,790
10,800
10,810
10,820
10,830
10,840
10,850
10,860
10,870
10,880
6500
TVD (ft)
FAULT 6 OF 6:
MD: 10,784'
TVD: 7,442'
VS: 3,258'
18' DOWNWARD THROW
MD: 10,825
TVD: 7,443.85
Incl.: 86.74
Azim.: 179.89
VS: 3,297.39
WT IN 9.4
VIS IN 40
v calc; CHK:
rr calc frag;
ring
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; CHK:
med gy-lt gy, sl mot tex, sb blky-sb plty, v sft- sl frm, v calc, rr fos frag
Inoc; occ strgs difse stmg bri bl-wh mky cut, thk v bri bl-wh resdl ring
8000

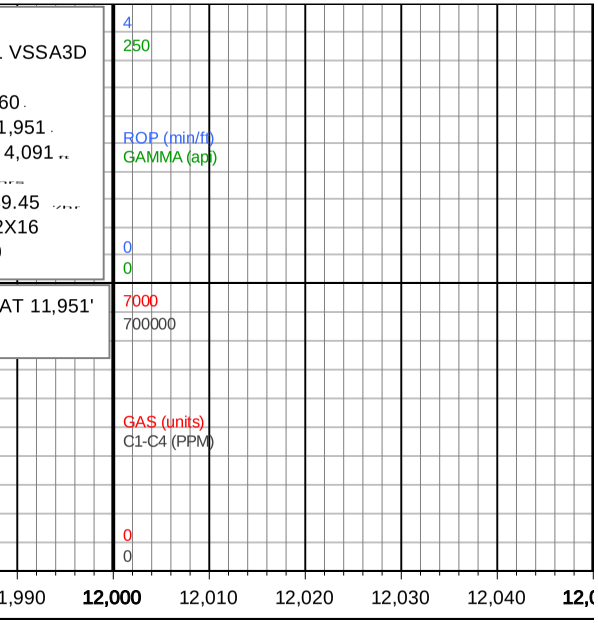

4
250
ROP (min/ft)
GAMMA (api)
0
139
82
122
114
119
107
105
141
7000
700000
GAS (units)
C1-C4 (PPM)
5890u
5790u
3128u
2892u
5845u
3861u
5834u
5378u
TG: 5,707.56
C1: 92.8
C2: 1.3
C3: 1.1
C4: 4.8
TG: 5,392.71
C1: 92.1
C2: 1.6
C3: 1.6
C4: 4.7
10,890
10,900
10,910
10,920
10,930
10,940
10,950
10,960
10,970
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
4/ OUT 9.4
/ OUT 40
6500
TVD (ft)
WT: 9.4 @ 137F
FV: 40
PV: 11
YP: 12
CK: 1/
Sol: 6
pH: 9.0 @ 137F
Chl: 2,100
MD: 10,995
TVD: 7,450.1
Incl.: 89.04
Azim.: 179.17
VS: 3,467.19
8000
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; CHK: med gy-lt gy, brn ip, sl mot tex, sb blky-sb plty, mod sft- frm, v calc, tr fos frag Inoc; occ strgs difse stmg bri bl-wh mky cut, thk v bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; CHK: med gy-lt gy, brn ip, sl mot tex, sb blky-sb plty, mod sft- frm, v calc, tr fos frag Inoc, rr bent; occ strgs difse stmg bri bl-wh mky cut, thk v bri bl-wh resdl ring

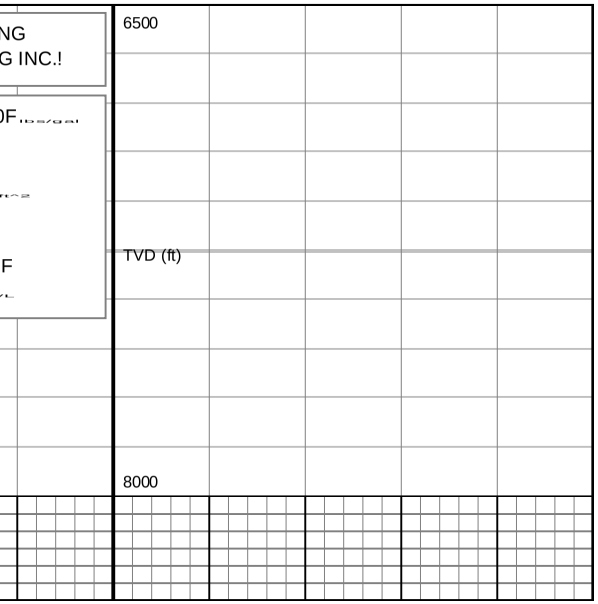

227
132
119
120
136
122
4
250
0
ROP (min/ft)
GAMMA (api)
5842u
5488u
5770u
5788u
2736u
7000
700000
GAS (units)
C1-C4 (PPM)
TG: 5,727.66 ..
C1: 93.6 ...
C2: 1 ...
C3: 1 ...
C4: 4.4 ...
11,110
11,120
11,130
11,140
11,150
11,160
11,170
11,180
11,190
11,200
11,210
11,220
11,230
11,240
11,250
11,260
11,270
11,280
11,290
11,300
11,310
11,320
6500
WT IN 9.4/ OUT 9.4
VIS IN 41/ OUT 40
MD: 11,165
TVD: 7,451.53
Incl.: 90
Azim.: 180.38
VS: 3,637.13
MD: 11,250
TVD: 7,450.21
Incl.: 91.78
Azim.: 180.78
VS: 3,722.11
TVD (ft)
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- frm, v calc, tr fos frag Inoc, rr bent; occ strgs difse stmg bri bl-wh mky cut, thk v bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, mod sft- frm, v calc, rr bent; occ strgs difse stmg bri bl-wh mky cut, thk v bri bl-wh resdl ring
8000


134
140
117
134
124
138
118
4
250
ROP (min/ft)
GAMMA (api)
0
0
7000
700000
GAS (units)
C1-C4 (PPM)
0
0
5795u
3508u
4966u
5716u
3522u
5394u
5721u
3588u
TG: 5,561..
C1: 93.5
C2: 0.9
C3: 1.2
C4: 4.3
11,330
11,340
11,350
11,360
11,370
11,380
11,390
11,400
11,410
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
6500
WT IN 9.4/ OUT 9.4
VIS IN 42/ OUT 42
MD: 11,335
TVD: 7,448.59
Incl.: 90.4
Azim.: 179.92
VS: 3,807.09
MD: 11,421
TVD: 7,447.92
Incl.: 90.49
Azim.: 180.67
VS: 3,893.07
MD: 11,506
TVD: 7,447.2
Incl.: 90.49
Azim.: 180.96
VS: 3,978.07
TVD (ft)
, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; CHK: med
sb blky-sb plty, mod sft- frm, v calc, tr fos frag Inoc, rr
se stmg bri bl-wh mky cut, thk v bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc;
CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, frm - sl sft, v calc;
occ strgs difse stmg bri bl-wh mky cut, thk v bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty, mod
med gy-lt gy, sl mot tex, sb blky-sb plty,
rr bent; occ strgs difse stmg bri bl-wh m
8000
8000


MNDEPTH
5/20/2014
134
124
139
122
136
120
133
4
250
ROP (min/ft)
GAMMA (api)
0
0
5832u
5142u
5838u
2970u
5555u
4817u
5826u
3773u
7000
700000
GAS (units)
C1-C4 (PPM)
0
0
TG: 5,219.1
C1: 100
C2: 0
C3: 0
C4: 0
11,550
11,560
11,570
11,580
11,590
11,600
11,610
11,620
11,630
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
6500
MD: 11,591
TVD: 7,447.23
Incl.: 89.47
Azim.: 179.62
VS: 4,063.05
TVD (ft)
MD: 11,677
TVD: 7,447.98
Incl.: 89.53
Azim.: 179.59
VS: 4,149.02
MD: 11,762
TVD: 7,448.58
Incl.: 89.66
Azim.: 180.3
VS: 4,234
d - v frm, arg- sl slty, v calc; CHK:
frm - sl sft, v calc, tr fos frag Inoc,
hky cut, thk v bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, frm - mod sft, v calc, tr fos frag Inoc, rr bent; occ strgs difse stmg bri bl-wh mky cut, thk v bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, med gy-lt gy, sl mot tex, sb blky-sb plty, sft - frm, v calc, tr fo rr bent; occ strgs difse stmg bri bl-wh mky cut, thk v bri bl-w
8000


Bit #: 2
Type: VAREL
Size: 6.12
Depth In: 7,8
Depth Out: 1
Total Drilled:
Hours: 16.4
Avg Ft/Hr: 24
Jets: 3X14 / 2
S/N: 400685
REACHED TD FOR LATERAL
MD AT 2:23 AM ON 5/20/2014
ROP (min/ft)
GAMMA (api)
GAS (units)
C1-C4 (PPM)
5020u
5841u
4915u
5673u
5162u
4983u
TG: 5,610.67
C1: 95.6
C2: 0.7
C3: 1
C4: 2.8
11,770
11,780
11,790
11,800
11,810
11,820
11,830
11,840
11,850
11,860
11,870
11,880
11,890
11,900
11,910
11,920
11,930
11,940
11,950
11,960
11,970
11,980
6500
WT IN 9.4/ OUT 9.4
VIS IN 41/ OUT 40
THANK YOU FOR USI
COLUMBINE LOGGIN
PROJECTED TO BIT
MD: 11,848
TVD: 7,449.11
Incl.: 89.63
Azim.: 180.74
VS: 4,319.99
MD: 11,900
TVD: 7,449.36
Incl.: 89.81
Azim.: 180.55
VS: 4,371.99
MD: 11,951
TVD: 7,447.63
Incl.: 89.81
Azim.: 180.55
VS: 4,422.98
WT: 9.4 @ 130
FV: 41
PV: 11
YP: 12
CK: 1/
Sol: 5
pH: 9.1 @ 130
Chl: 2,100
TVD (ft)
8000
v calc; CHK:
s frag Inoc,
h resdl ring
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, sft - frm, v calc, tr fos frag Inoc, rr bent; occ strgs difse stmg bri bl-wh mky cut, thk v bri bl-wh resdl ring
MRLST: med-dk gy, sb blky-sb plty, mod - v frm, arg- sl slty, v calc; CHK: med gy-lt gy, sl mot tex, sb blky-sb plty, sft - frm, v calc, tr fos frag Inoc, rr bent; occ strgs difse stmg bri bl-wh mky cut, thk v bri bl-wh resdl ring


VSSA3D
60
1,951
4,091
9.45
2X16
AT 11,951'
4
250
ROP (min/ft)
GAMMA (api)
0
0
7000
700000
GAS (units)
C1-C4 (PPM)
0
0
1,990
12,000
12,010
12,020
12,030
12,040


NG
G INC.!
F
6500
TVD (ft)
8000