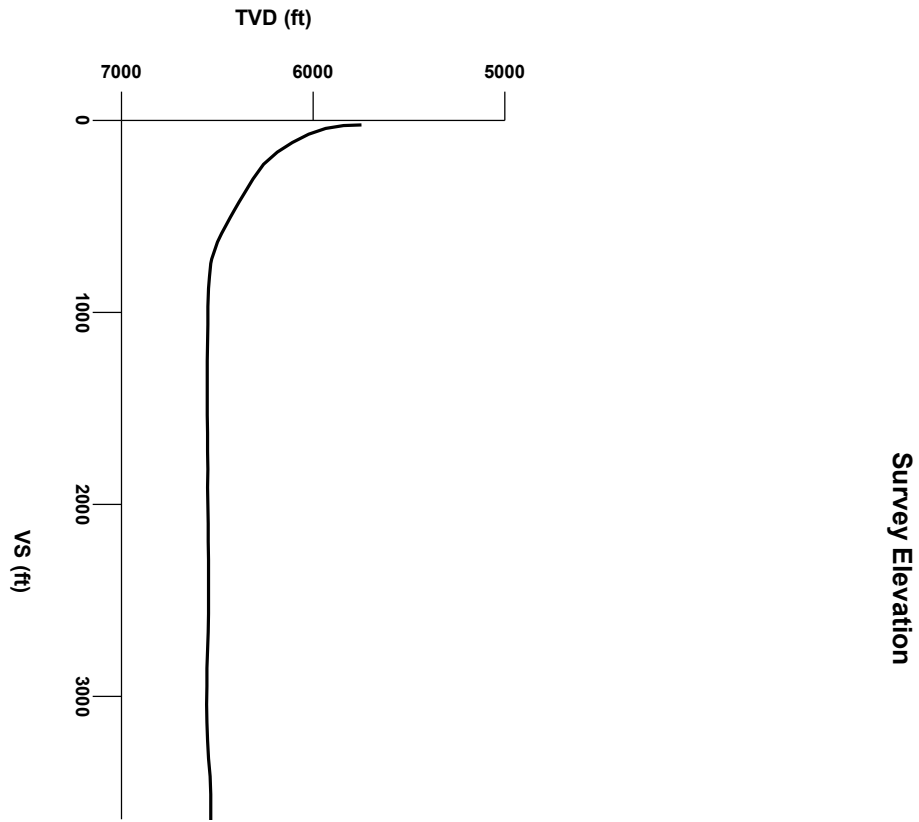
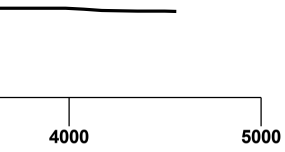
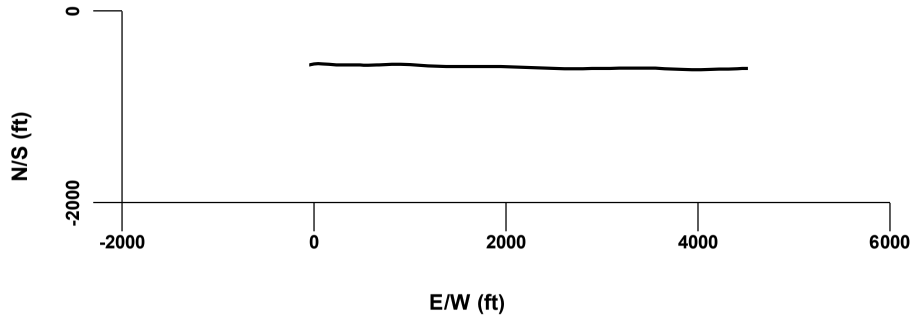
LOG created using LPLOT VH Version 3.0, May 01, 2013, Copyright (C) 1999-2009 Pason Systems Corp.

OPERATOR:	**NOBLE ENERGY INC.**
WELL:	**SLW RANCH STATE B13-69HN**
LOCATION:	**SWSW SEC 12, T5N, R64W**
COUNTY:	**WELD**
STATE:	**COLORADO**
SPOT:	**625' FSL, 246' FWL**
ELEVATION:	**GR 4,595', KB 4,625'**
FIELD:	**WILDCAT**
SPUD DATE:	**04/24/2013**
TD DATE:	**04/30/2013**
DATES LOGGED:	**04/26/2013 - 04/30/2013**
DEPTHS LOGGED:	**5835' MD - 10833' MD**
LOGGERS:	**ANDREA ZUIDEMA, SHANA SWIRIN**
DRILLING FLUID:	**LSND**
DRILLING RIG:	**H&P 326**
API:	**05-123-36496**
LOG TYPE:	**HORIZONTAL**
SCALE:	**1:240 (5 inches per 100 feet)**
REMARKS:	**WELLSITE GEOLOGICAL SERVICES PROVIDED BY COLUMBINE LOGGING INC.**

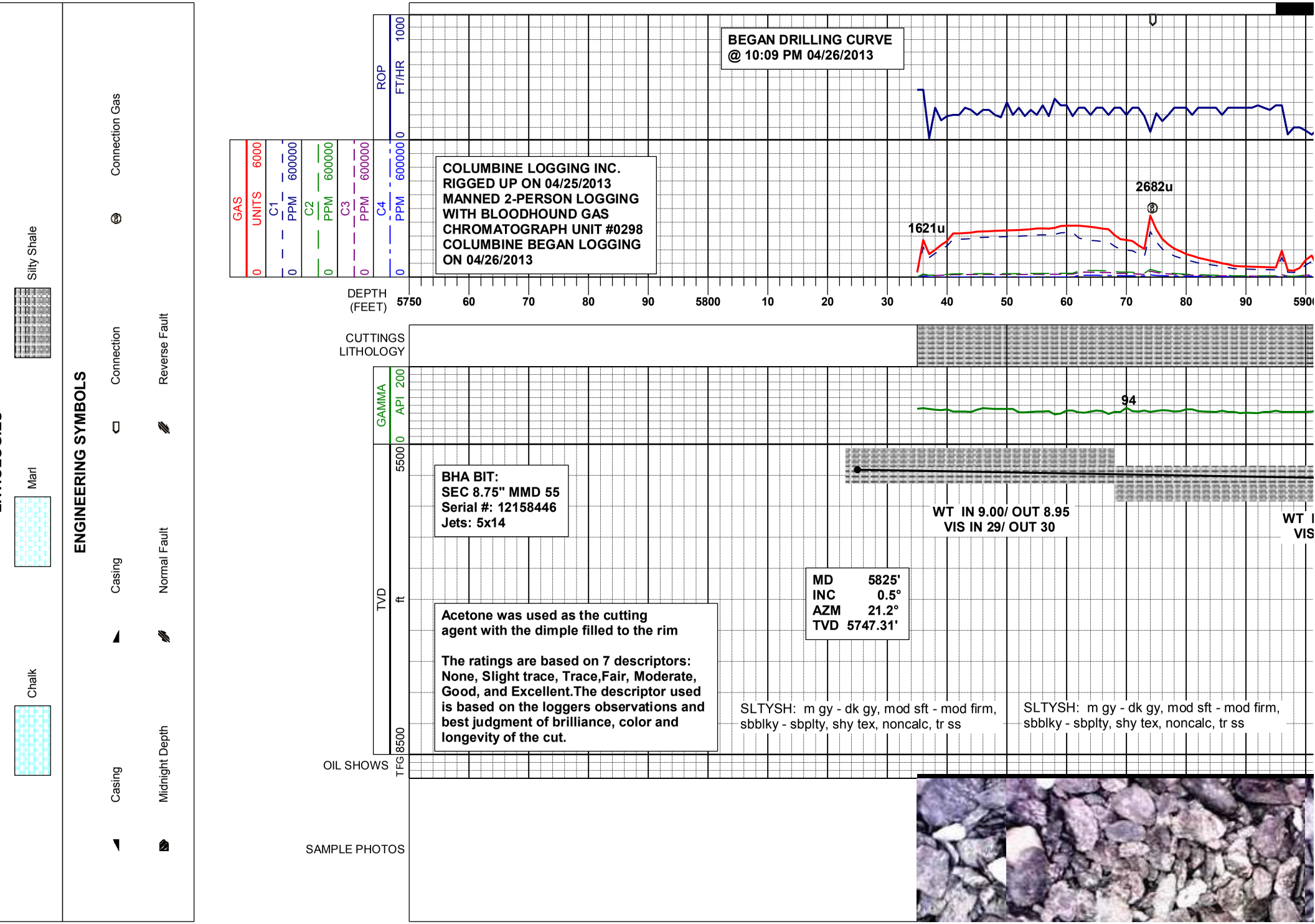


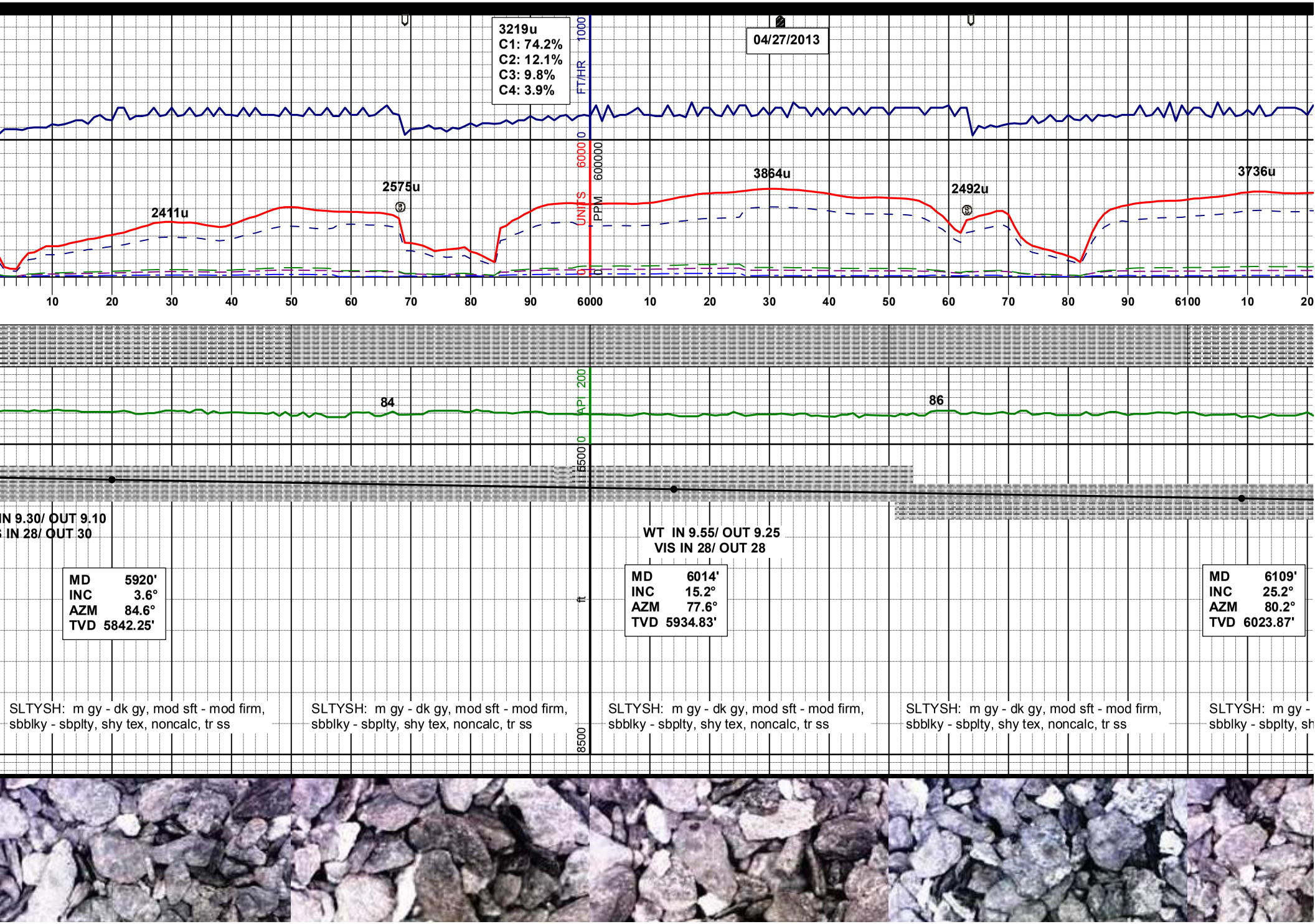


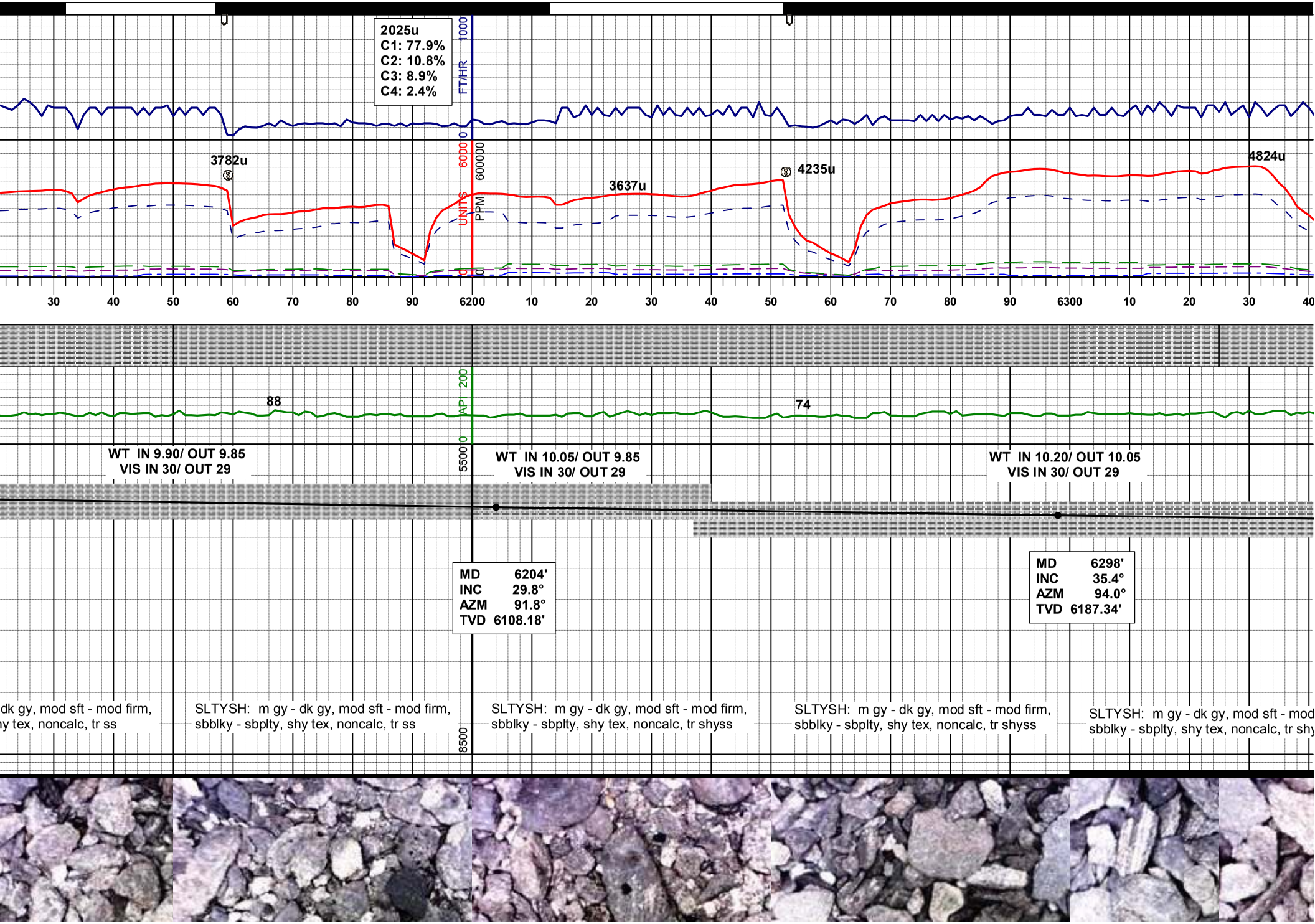
Survey Plan

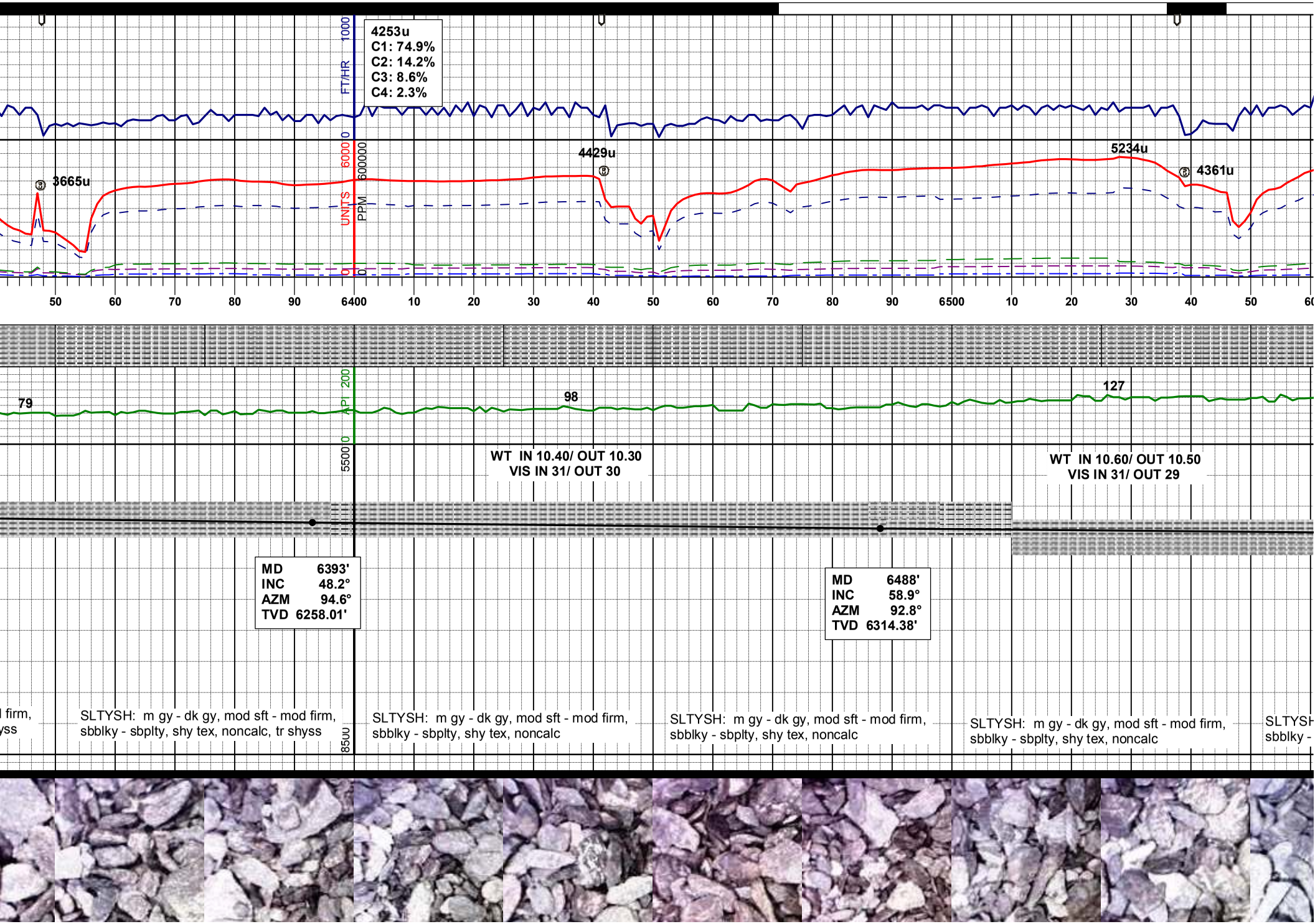


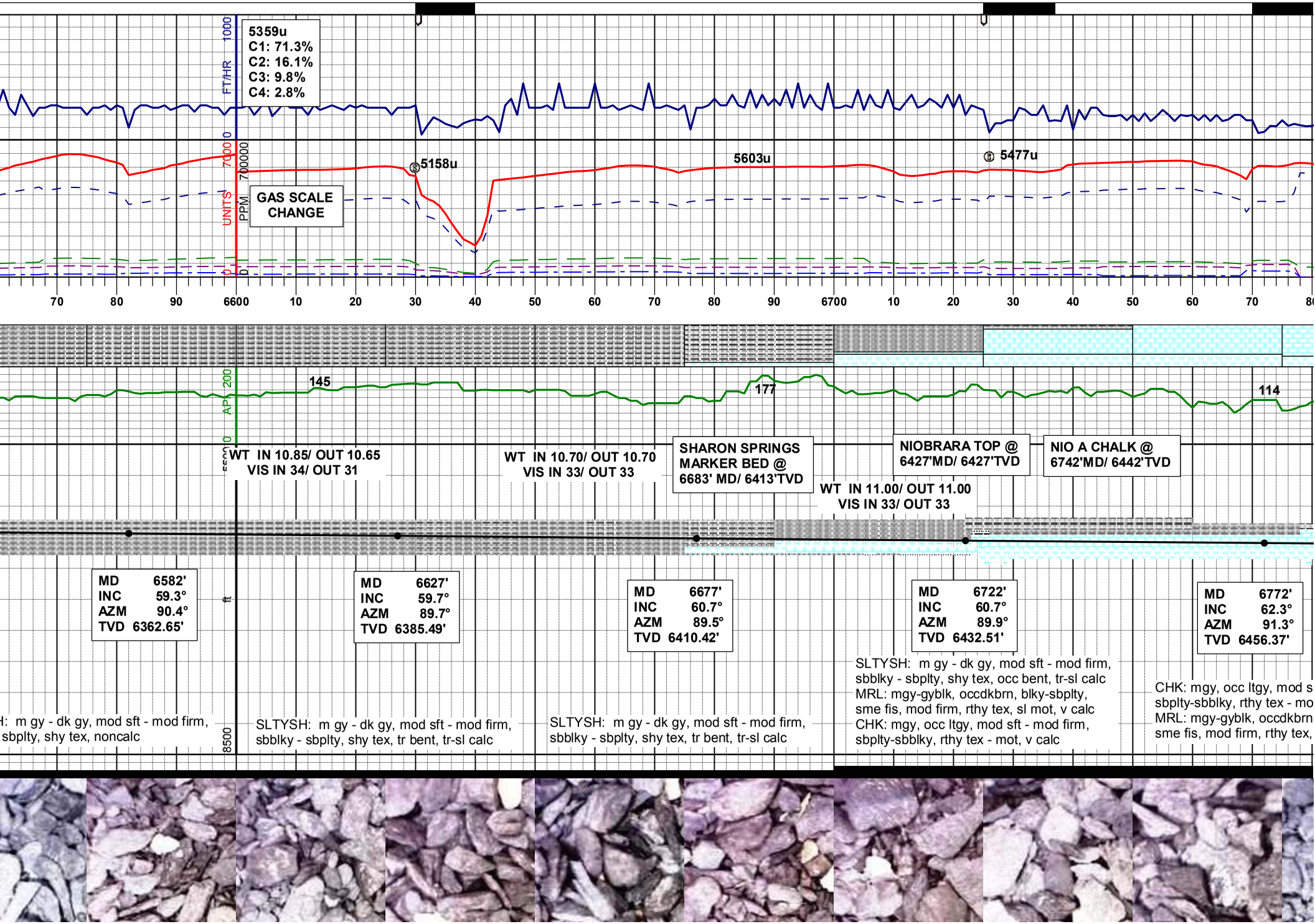
LITHOLOGIES

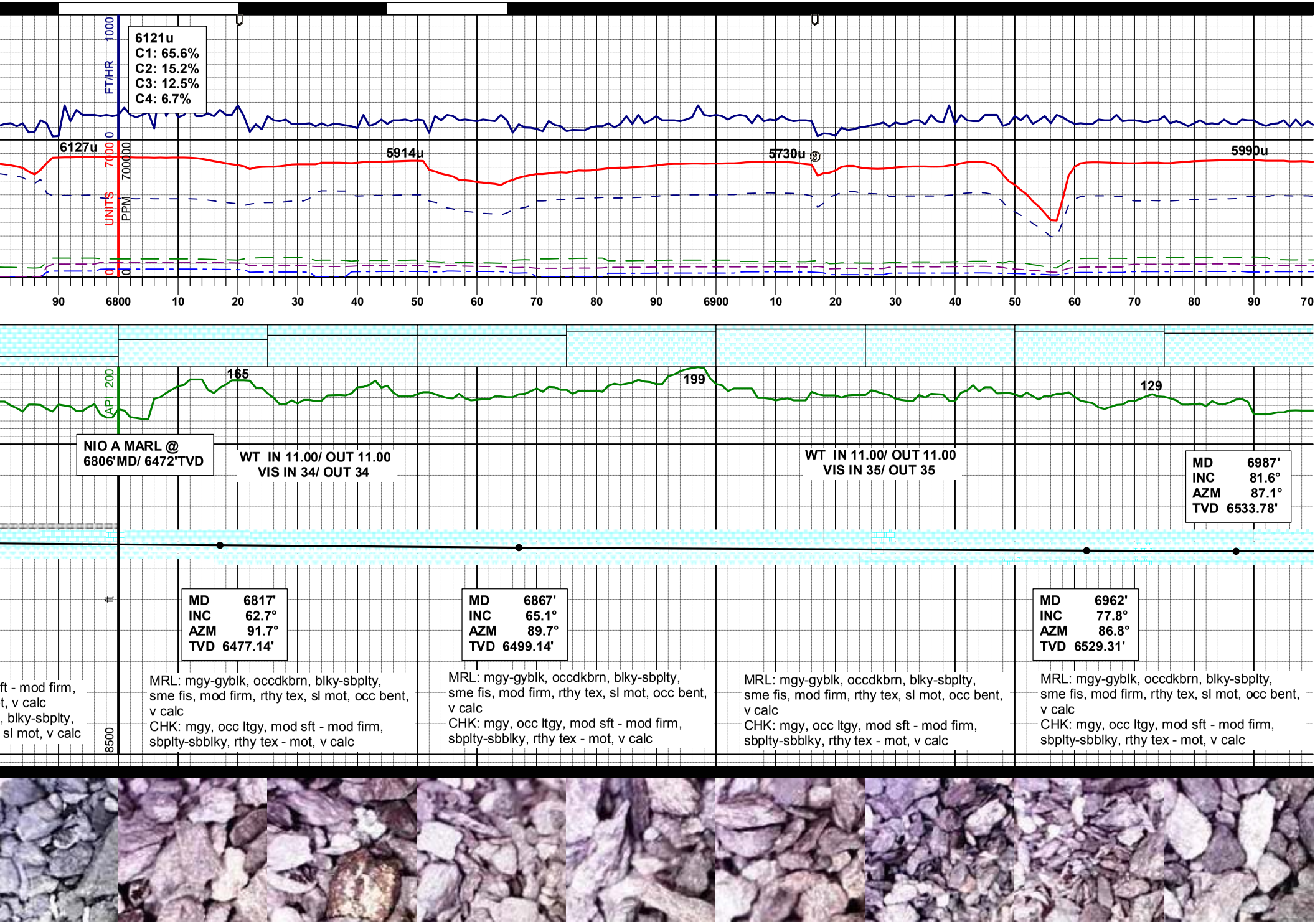

BEGAN DRILLING CURVE
@ 10:09 PM 04/26/2013
COLUMBINE LOGGING INC.
RIGGED UP ON 04/25/2013
MANNED 2-PERSON LOGGING
WITH BLOODHOUND GAS
CHROMATOGRAPH UNIT #0298
COLUMBINE BEGAN LOGGING
ON 04/26/2013
ROP FT/HR 1000 0
GAS UNITS 6000 0
C1 PPM 600000 0
C2 PPM 600000 0
C3 PPM 600000 0
C4 PPM 600000 0
2682u
1621u
DEPTH (FEET)
5750 60 70 80 90 5800 10 20 30 40 50 60 70 80 90 590
CUTTINGS LITHOLOGY
GAMMA API 200 0
94
TVD ft 5500 8500
BHA BIT:
SEC 8.75" MMD 55
Serial #: 12158446
Jets: 5x14
WT IN 9.00/ OUT 8.95
VIS IN 29/ OUT 30
MD 5825'
INC 0.5°
AZM 21.2°
TVD 5747.31'
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.
SLTYSH: m gy - dk gy, mod sft - mod firm, sbblky - sbplty, shy tex, noncalc, tr ss
SLTYSH: m gy - dk gy, mod sft - mod firm, sbblky - sbplty, shy tex, noncalc, tr ss
OIL SHOWS TFG
SAMPLE PHOTOS
ENGINEERING SYMBOLS
Connection Gas
Connection
Reverse Fault
Casing
Normal Fault
Casing
Midnight Depth
Silty Shale
Marl
Chalk

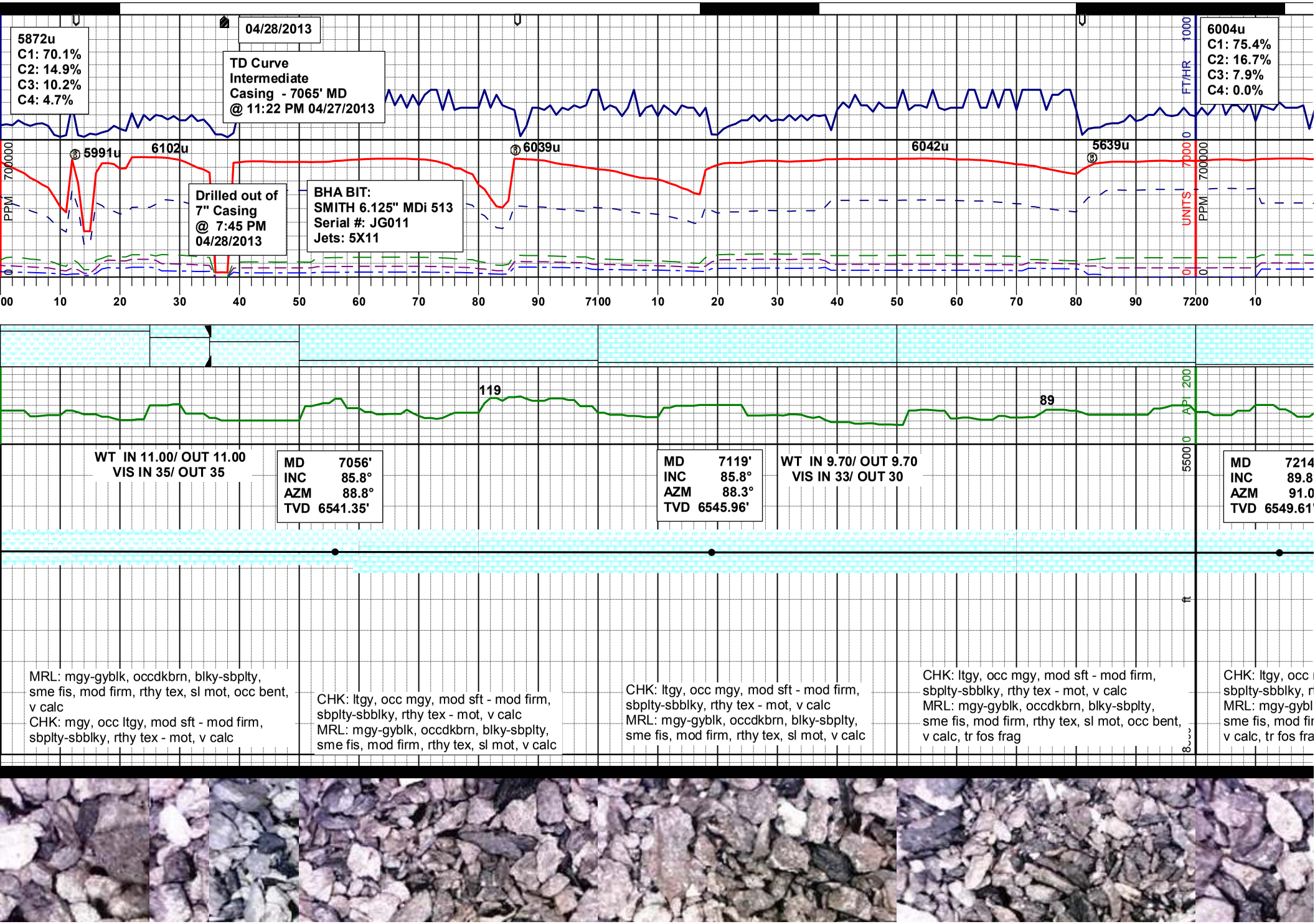

3219u
C1: 74.2%
C2: 12.1%
C3: 9.8%
C4: 3.9%
04/27/2013
FT/HR
1000
0
6000
UNITS
600000
PPM
0
2411u
2575u
3864u
2492u
3736u
10
20
30
40
50
60
70
80
90
6000
10
20
30
40
50
60
70
80
90
6100
10
20
84
86
API
200
0
8500
ft
IN 9.30/ OUT 9.10
IN 28/ OUT 30
MD 5920'
INC 3.6°
AZM 84.6°
TVD 5842.25'
WT IN 9.55/ OUT 9.25
VIS IN 28/ OUT 28
MD 6014'
INC 15.2°
AZM 77.6°
TVD 5934.83'
MD 6109'
INC 25.2°
AZM 80.2°
TVD 6023.87'
SLTYSH: m gy - dk gy, mod sft - mod firm, sbblky - sbplty, shy tex, noncalc, tr ss
SLTYSH: m gy - dk gy, mod sft - mod firm, sbblky - sbplty, shy tex, noncalc, tr ss
SLTYSH: m gy - dk gy, mod sft - mod firm, sbblky - sbplty, shy tex, noncalc, tr ss
SLTYSH: m gy - dk gy, mod sft - mod firm, sbblky - sbplty, shy tex, noncalc, tr ss
SLTYSH: m gy - sbblky - sbplty, sh

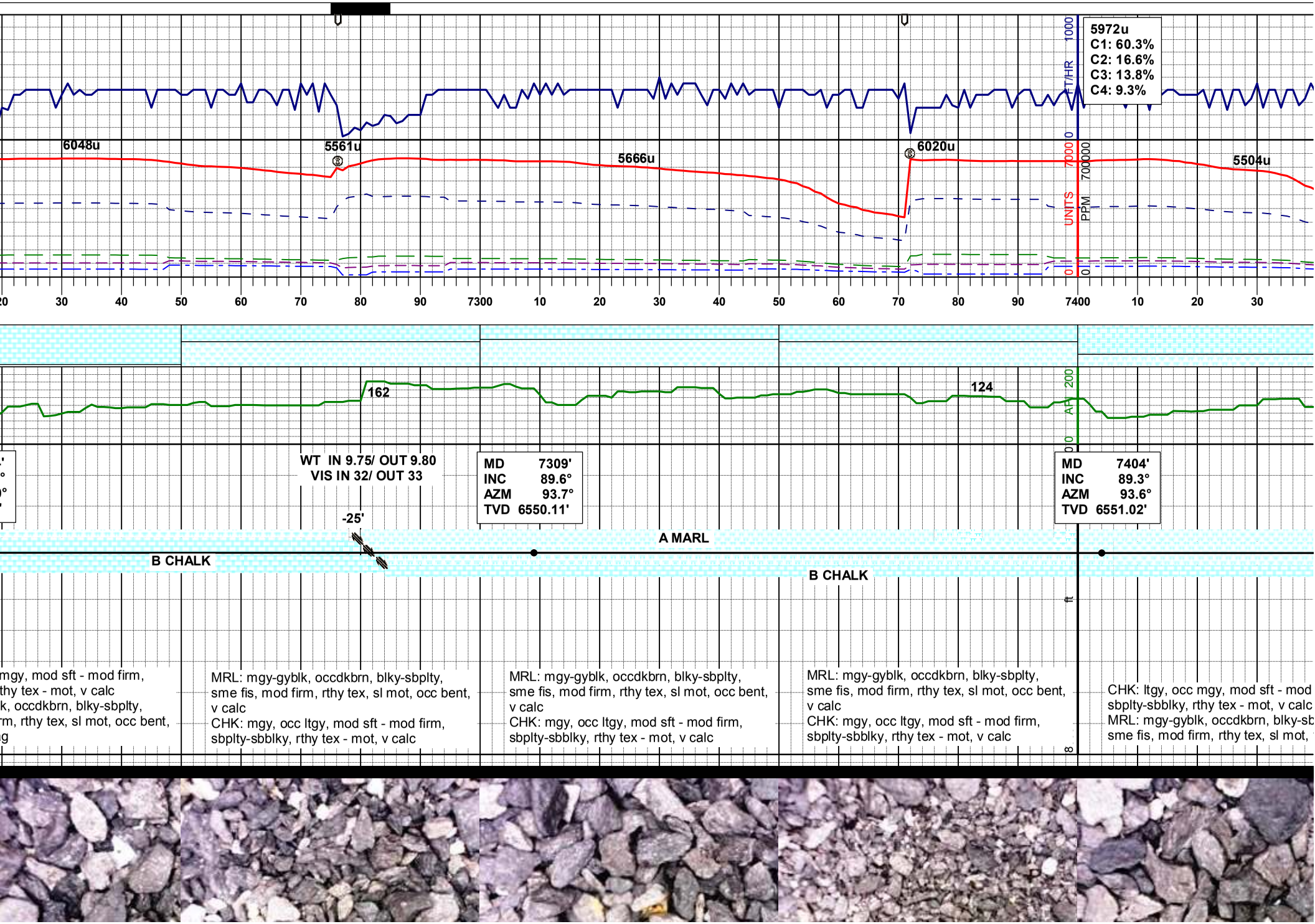

2025u
C1: 77.9%
C2: 10.8%
C3: 8.9%
C4: 2.4%
FT/HR
1000
0
6000
0
600000
UNITS
PPM
3782u
3637u
4235u
4824u
30
40
50
60
70
80
90
6200
10
20
30
40
50
60
70
80
90
6300
10
20
30
40
API
200
0
88
74
5500
WT IN 9.90/ OUT 9.85
VIS IN 30/ OUT 29
WT IN 10.05/ OUT 9.85
VIS IN 30/ OUT 29
WT IN 10.20/ OUT 10.05
VIS IN 30/ OUT 29
MD 6204'
INC 29.8°
AZM 91.8°
TVD 6108.18'
MD 6298'
INC 35.4°
AZM 94.0°
TVD 6187.34'
dk gy, mod sft - mod firm,
y tex, noncalc, tr ss
SLTYSH: m gy - dk gy, mod sft - mod firm,
sbblky - sbplty, shy tex, noncalc, tr ss
SLTYSH: m gy - dk gy, mod sft - mod firm,
sbblky - sbplty, shy tex, noncalc, tr shyss
SLTYSH: m gy - dk gy, mod sft - mod firm,
sbblky - sbplty, shy tex, noncalc, tr shyss
SLTYSH: m gy - dk gy, mod sft - mod
sbblky - sbplty, shy tex, noncalc, tr shy
8500

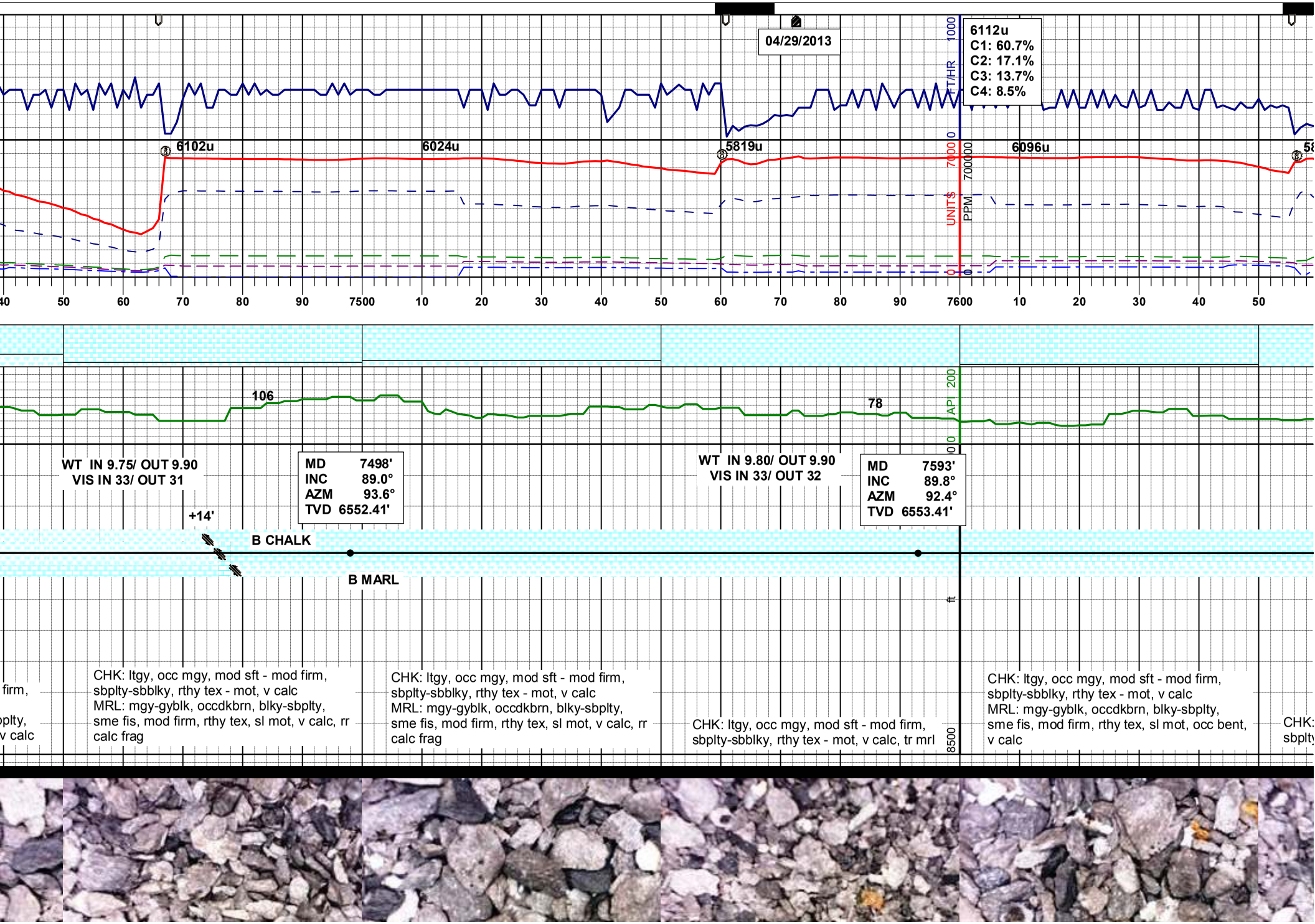

4253u
C1: 74.9%
C2: 14.2%
C3: 8.6%
C4: 2.3%
FT/HR
UNITS
PPM
3665u
4429u
5234u
4361u
50
60
70
80
90
6400
10
20
30
40
50
60
70
80
90
6500
10
20
30
40
50
API
79
98
127
WT IN 10.40/ OUT 10.30
VIS IN 31/ OUT 30
WT IN 10.60/ OUT 10.50
VIS IN 31/ OUT 29
MD 6393'
INC 48.2°
AZM 94.6°
TVD 6258.01'
MD 6488'
INC 58.9°
AZM 92.8°
TVD 6314.38'
SLTYSH: m gy - dk gy, mod sft - mod firm, sbblky - sbplty, shy tex, noncalc, tr shyss
SLTYSH: m gy - dk gy, mod sft - mod firm, sbblky - sbplty, shy tex, noncalc
SLTYSH: m gy - dk gy, mod sft - mod firm, sbblky - sbplty, shy tex, noncalc
SLTYSH: m gy - dk gy, mod sft - mod firm, sbblky - sbplty, shy tex, noncalc

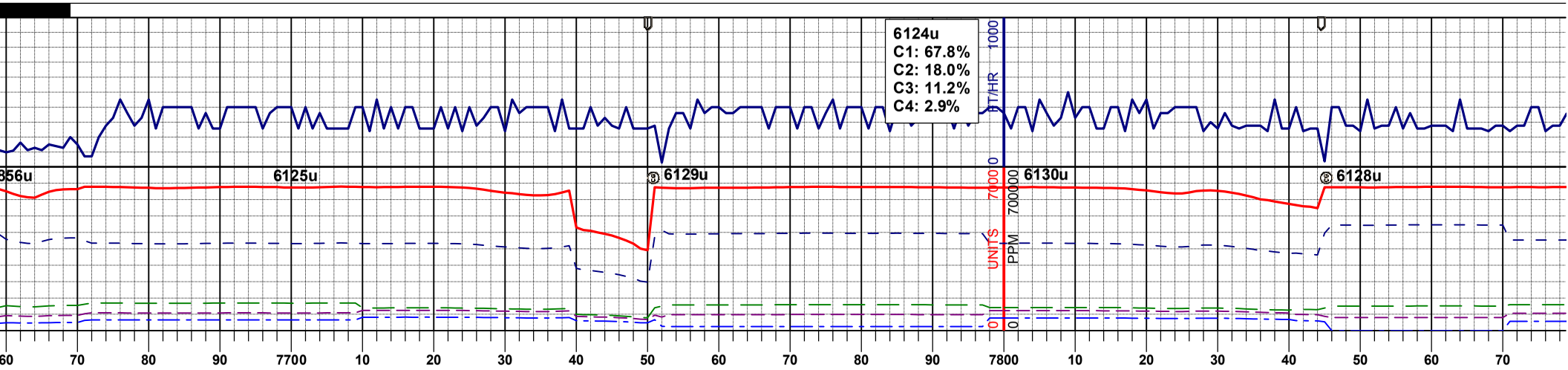

5359u
C1: 71.3%
C2: 16.1%
C3: 9.8%
C4: 2.8%
FT/HR
1000
0
UNITS
7000
0
PPM
700000
0
GAS SCALE CHANGE
5158u
5603u
5477u
70
80
90
6600
10
20
30
40
50
60
70
80
90
6700
10
20
30
40
50
60
70
APT
200
0
145
177
114
WT IN 10.85/ OUT 10.65
VIS IN 34/ OUT 31
WT IN 10.70/ OUT 10.70
VIS IN 33/ OUT 33
SHARON SPRINGS
MARKER BED @
6683' MD/ 6413'TVD
NIOBRARA TOP @
6427'MD/ 6427'TVD
NIO A CHALK @
6742'MD/ 6442'TVD
WT IN 11.00/ OUT 11.00
VIS IN 33/ OUT 33
MD 6582'
INC 59.3°
AZM 90.4°
TVD 6362.65'
MD 6627'
INC 59.7°
AZM 89.7°
TVD 6385.49'
MD 6677'
INC 60.7°
AZM 89.5°
TVD 6410.42'
MD 6722'
INC 60.7°
AZM 89.9°
TVD 6432.51'
MD 6772'
INC 62.3°
AZM 91.3°
TVD 6456.37'
ft
8500
H: m gy - dk gy, mod sft - mod firm,
sbplty, shy tex, noncalc
SLTYSH: m gy - dk gy, mod sft - mod firm,
sbblky - sbplty, shy tex, tr bent, tr-sl calc
SLTYSH: m gy - dk gy, mod sft - mod firm,
sbblky - sbplty, shy tex, tr bent, tr-sl calc
SLTYSH: m gy - dk gy, mod sft - mod firm,
sbblky - sbplty, shy tex, occ bent, tr-sl calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty,
sme fis, mod firm, rthy tex, sl mot, v calc
CHK: mgy, occ ltgy, mod sft - mod firm,
sbplty-sbblky, rthy tex - mot, v calc
CHK: mgy, occ ltgy, mod s
sbplty-sbblky, rthy tex - mo
MRL: mgy-gyblk, occdkbrn
sme fis, mod firm, rthy tex,

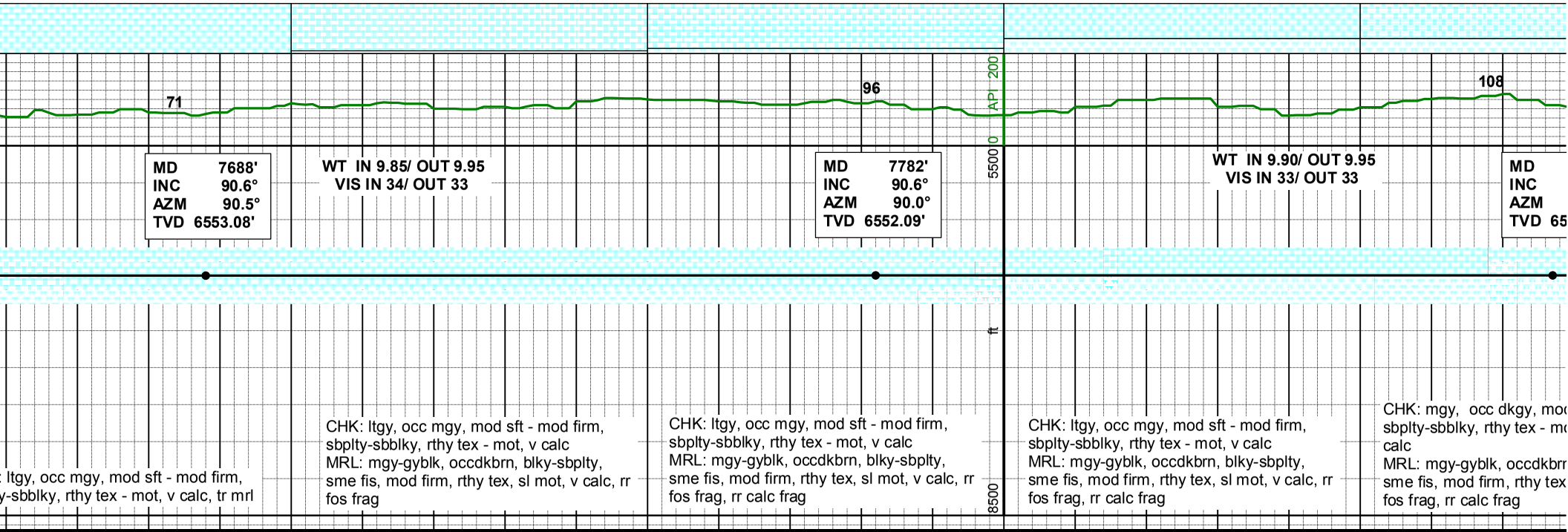

6121u
C1: 65.6%
C2: 15.2%
C3: 12.5%
C4: 6.7%
FT/HR
1000
0
6127u
5914u
5730u
5990u
UNITS
PPM
700000
0
90
6800
10
20
30
40
50
60
70
80
90
6900
10
20
30
40
50
60
70
80
90
70
API
200
165
199
129
NIO A MARL @
6806'MD/ 6472'TVD
WT IN 11.00/ OUT 11.00
VIS IN 34/ OUT 34
WT IN 11.00/ OUT 11.00
VIS IN 35/ OUT 35
MD 6987'
INC 81.6°
AZM 87.1°
TVD 6533.78'
ft
8500
MD 6817'
INC 62.7°
AZM 91.7°
TVD 6477.14'
MD 6867'
INC 65.1°
AZM 89.7°
TVD 6499.14'
MD 6962'
INC 77.8°
AZM 86.8°
TVD 6529.31'
ft - mod firm,
t, v calc
, blky-sbplty,
sl mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, rthy tex, sl mot, occ bent, v calc
CHK: mgy, occ ltgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, rthy tex, sl mot, occ bent, v calc
CHK: mgy, occ ltgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, rthy tex, sl mot, occ bent, v calc
CHK: mgy, occ ltgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, rthy tex, sl mot, occ bent, v calc
CHK: mgy, occ ltgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc

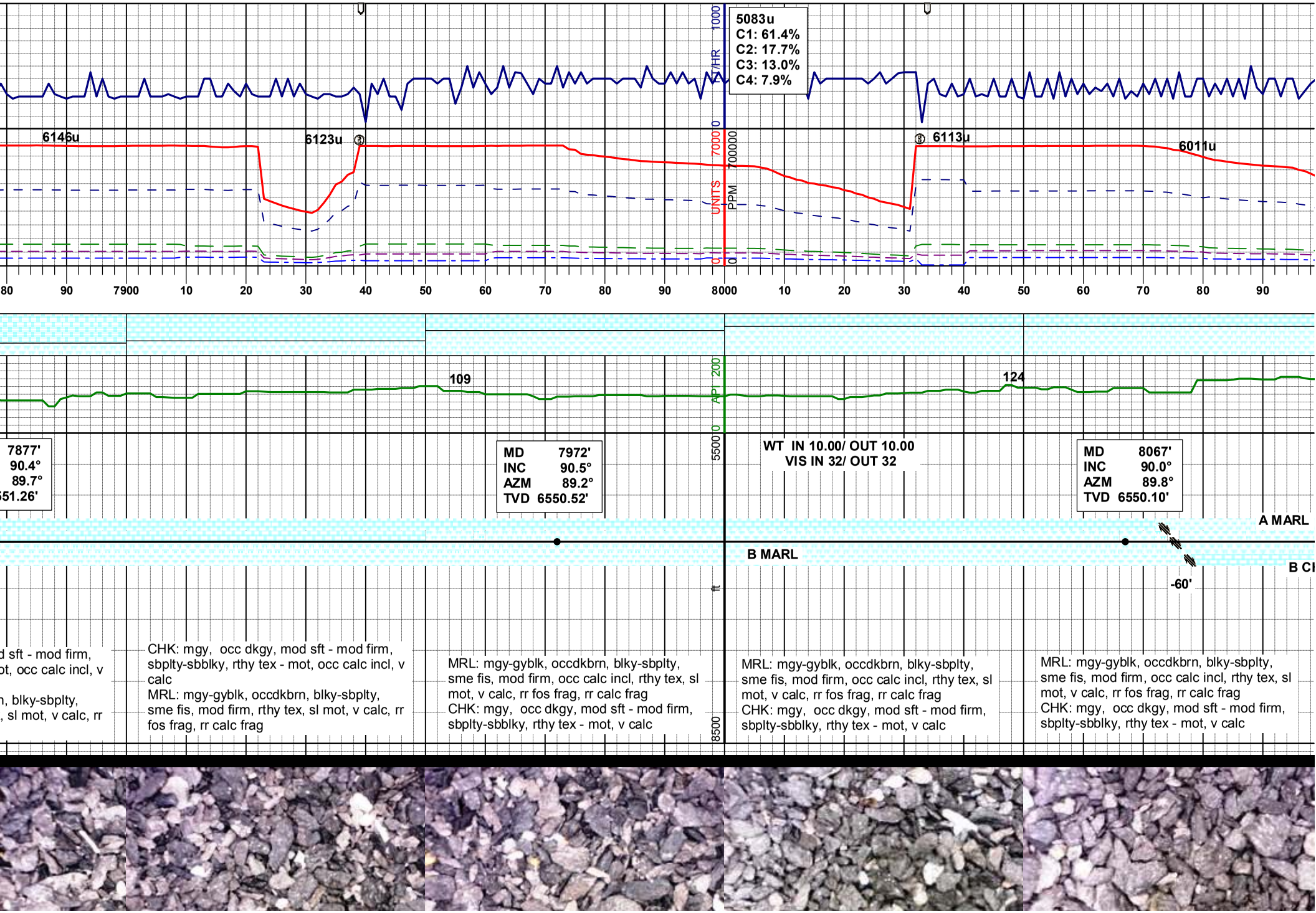

5872u
C1: 70.1%
C2: 14.9%
C3: 10.2%
C4: 4.7%
04/28/2013
TD Curve
Intermediate
Casing - 7065' MD
@ 11:22 PM 04/27/2013
6004u
C1: 75.4%
C2: 16.7%
C3: 7.9%
C4: 0.0%
FT/HR
1000
0
5991u
6102u
6039u
6042u
5639u
Drilled out of
7" Casing
@ 7:45 PM
04/28/2013
BHA BIT:
SMITH 6.125" MDi 513
Serial #: JG011
Jets: 5X11
PPM
700000
0
UNITS
7000
0
00
10
20
30
40
50
60
70
80
90
7100
7200
119
89
API
200
0
5500
WT IN 11.00/ OUT 11.00
VIS IN 35/ OUT 35
MD 7056'
INC 85.8°
AZM 88.8°
TVD 6541.35'
MD 7119'
INC 85.8°
AZM 88.3°
TVD 6545.96'
WT IN 9.70/ OUT 9.70
VIS IN 33/ OUT 30
MD 7214
INC 89.8
AZM 91.0
TVD 6549.61
ft
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, rthy tex, sl mot, occ bent, v calc
CHK: mgy, occ ltgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
CHK: ltgy, occ mgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, rthy tex, sl mot, occ bent, v calc
CHK: ltgy, occ mgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, rthy tex, sl mot, v calc
CHK: ltgy, occ mgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, rthy tex, sl mot, occ bent, v calc, tr fos frag
CHK: ltgy, occ
sbplty-sbblky, r
MRL: mgy-gybl
sme fis, mod fi
v calc, tr fos fra

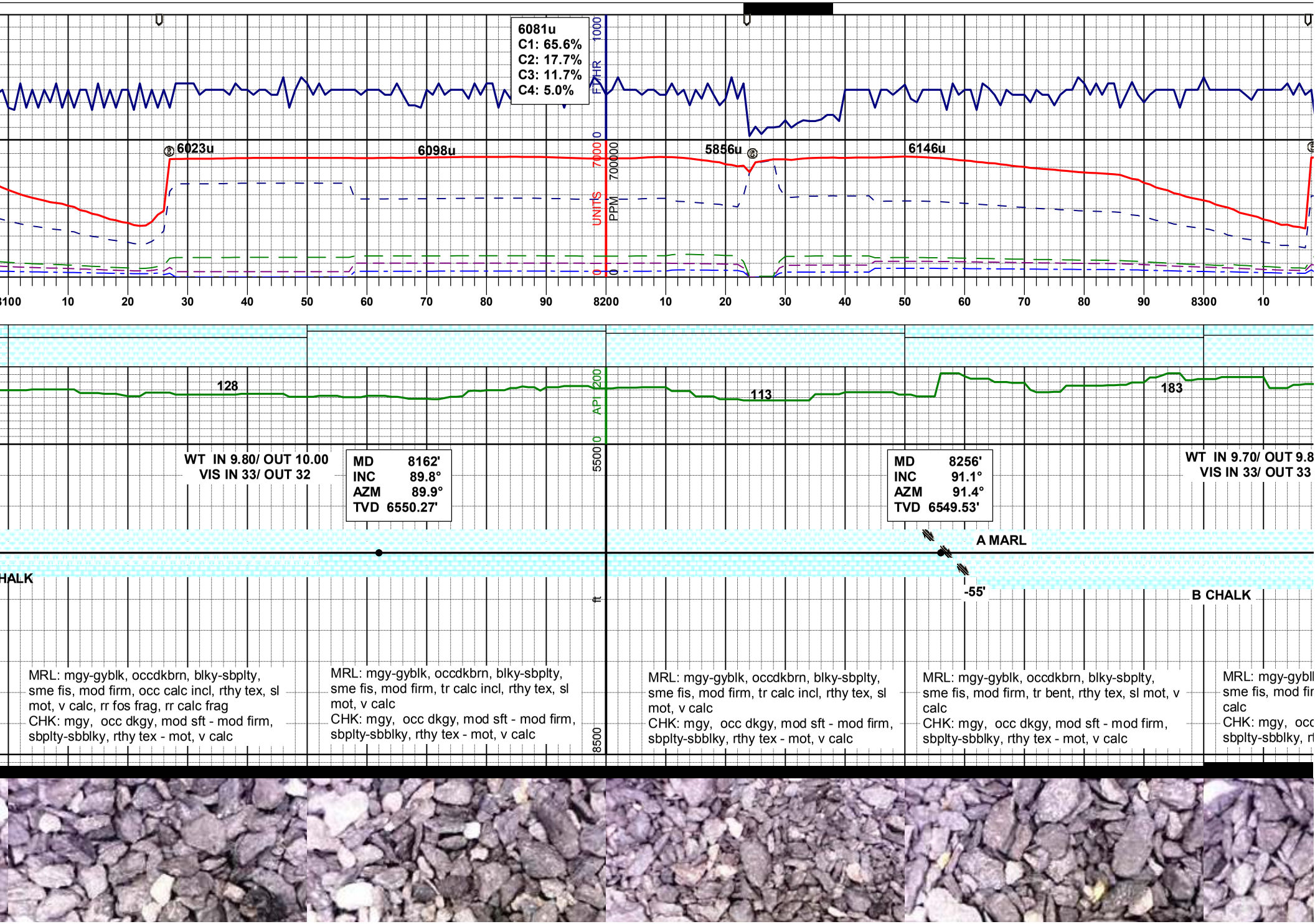

6048u
5561u
5666u
6020u
5504u
5972u
C1: 60.3%
C2: 16.6%
C3: 13.8%
C4: 9.3%
UNITS
PPM
162
124
WT IN 9.75/ OUT 9.80
VIS IN 32/ OUT 33
MD 7309'
INC 89.6°
AZM 93.7°
TVD 6550.11'
MD 7404'
INC 89.3°
AZM 93.6°
TVD 6551.02'
-25'
A MARL
B CHALK
B CHALK
mgy, mod sft - mod firm,
thy tex - mot, v calc
k, occdkbrn, blky-sbplty,
rm, rthy tex, sl mot, occ bent,
g
MRL: mgy-gyblk, occdkbrn, blky-sbplty,
sme fis, mod firm, rthy tex, sl mot, occ bent,
v calc
CHK: mgy, occ ltgy, mod sft - mod firm,
sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty,
sme fis, mod firm, rthy tex, sl mot, occ bent,
v calc
CHK: mgy, occ ltgy, mod sft - mod firm,
sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty,
sme fis, mod firm, rthy tex, sl mot, occ bent,
v calc
CHK: mgy, occ ltgy, mod sft - mod firm,
sbplty-sbblky, rthy tex - mot, v calc
CHK: ltgy, occ mgy, mod sft - mod
sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sb
sme fis, mod firm, rthy tex, sl mot,

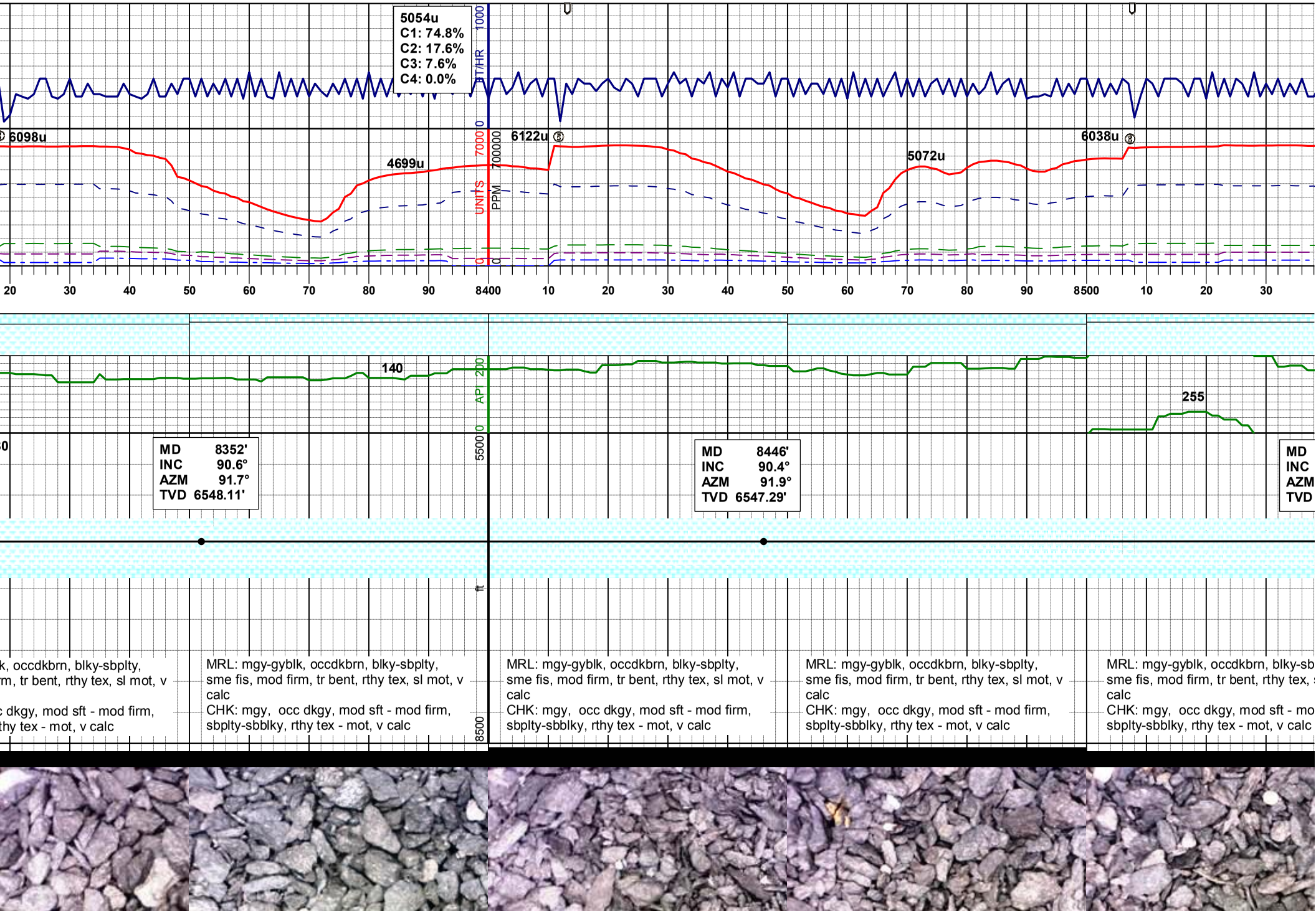

04/29/2013
6112u
C1: 60.7%
C2: 17.1%
C3: 13.7%
C4: 8.5%
FT/HR
1000
0
6102u
6024u
5819u
6096u
UNITS
7000
0
PPM
700000
0
40
50
60
70
80
90
7500
10
20
30
40
50
60
70
80
90
7600
10
20
30
40
50
106
78
API
200
0
WT IN 9.75/ OUT 9.90
VIS IN 33/ OUT 31
MD 7498'
INC 89.0°
AZM 93.6°
TVD 6552.41'
WT IN 9.80/ OUT 9.90
VIS IN 33/ OUT 32
MD 7593'
INC 89.8°
AZM 92.4°
TVD 6553.41'
+14'
B CHALK
B MARL
ft
8500
firm,
pplty,
v calc
CHK: ltgy, occ mgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, rthy tex, sl mot, v calc, rr calc frag
CHK: ltgy, occ mgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, rthy tex, sl mot, v calc, rr calc frag
CHK: ltgy, occ mgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc, tr mrl
CHK: ltgy, occ mgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, rthy tex, sl mot, occ bent, v calc
CHK:
sbplty

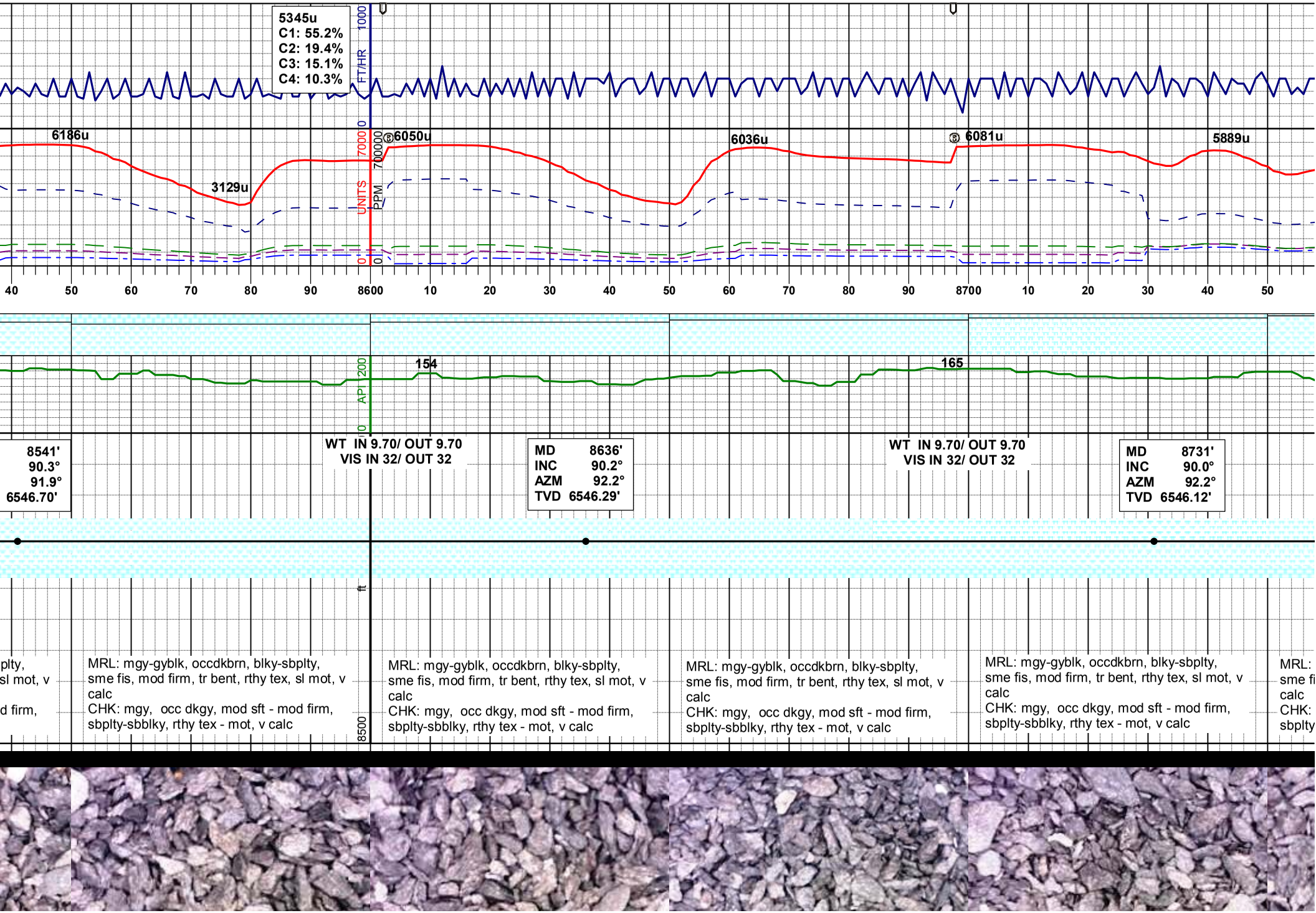

6124u
C1: 67.8%
C2: 18.0%
C3: 11.2%
C4: 2.9%
BT/HR
1000
0
UNITS
7000
0
PPM
700000
0
856u
6125u
6129u
6130u
6128u
60
70
80
90
7700
10
20
30
40
50
60
70
80
90
7800
10
20
30
40
50
60
70

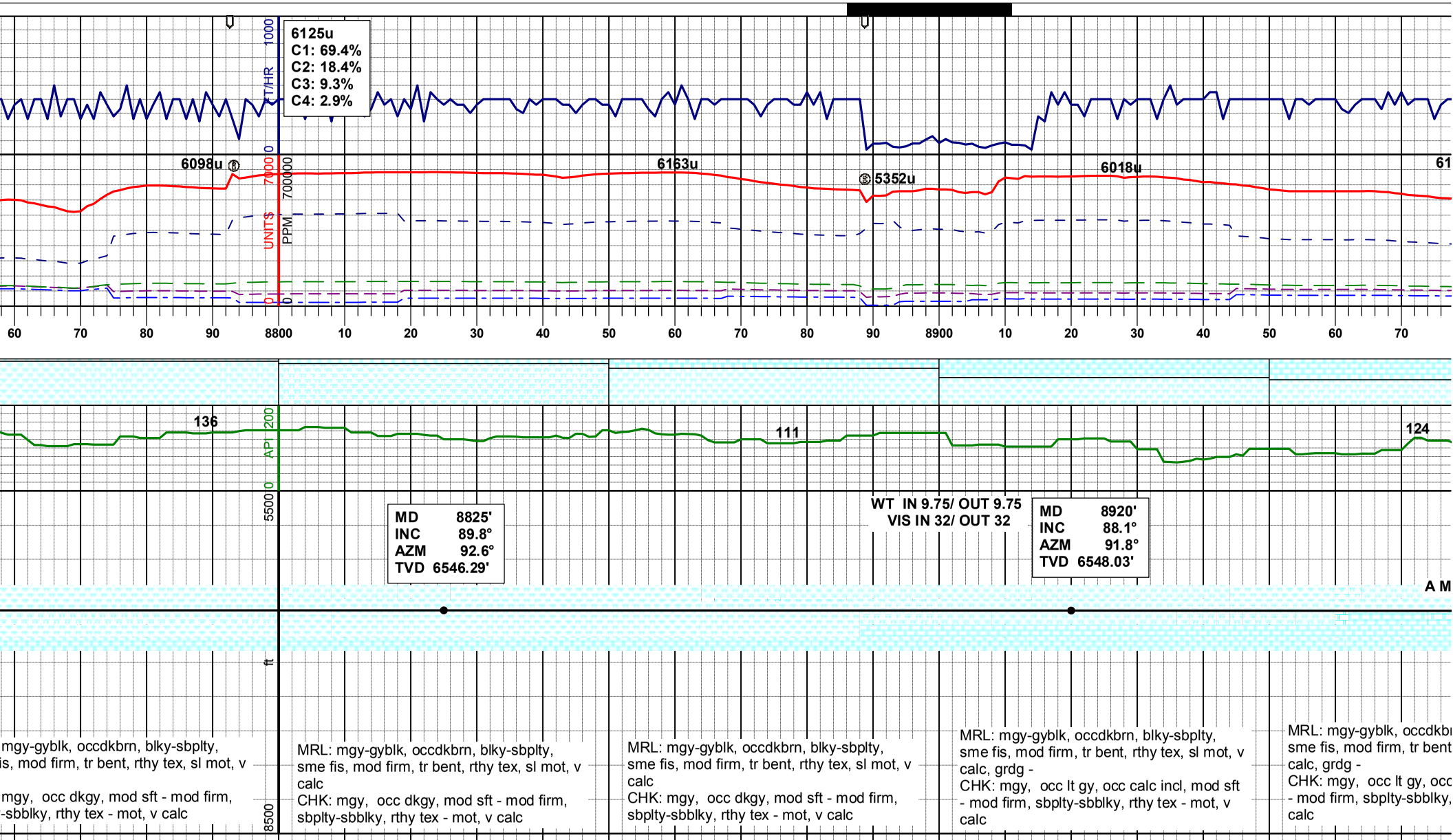

71
96
108
API
200
0
5500
8500
ft
MD 7688'
INC 90.6°
AZM 90.5°
TVD 6553.08'
WT IN 9.85/ OUT 9.95
VIS IN 34/ OUT 33
MD 7782'
INC 90.6°
AZM 90.0°
TVD 6552.09'
WT IN 9.90/ OUT 9.95
VIS IN 33/ OUT 33
MD
INC
AZM
TVD 65
ltgy, occ mgy, mod sft - mod firm,
y-sbblky, rthy tex - mot, v calc, tr mrl
CHK: ltgy, occ mgy, mod sft - mod firm,
sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty,
sme fis, mod firm, rthy tex, sl mot, v calc, rr
fos frag
CHK: ltgy, occ mgy, mod sft - mod firm,
sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty,
sme fis, mod firm, rthy tex, sl mot, v calc, rr
fos frag, rr calc frag
CHK: ltgy, occ mgy, mod sft - mod firm,
sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty,
sme fis, mod firm, rthy tex, sl mot, v calc, rr
fos frag, rr calc frag
CHK: mgy, occ dkgy, mod
sbplty-sbblky, rthy tex - mo
calc
MRL: mgy-gyblk, occdkbrn
sme fis, mod firm, rthy tex
fos frag, rr calc frag

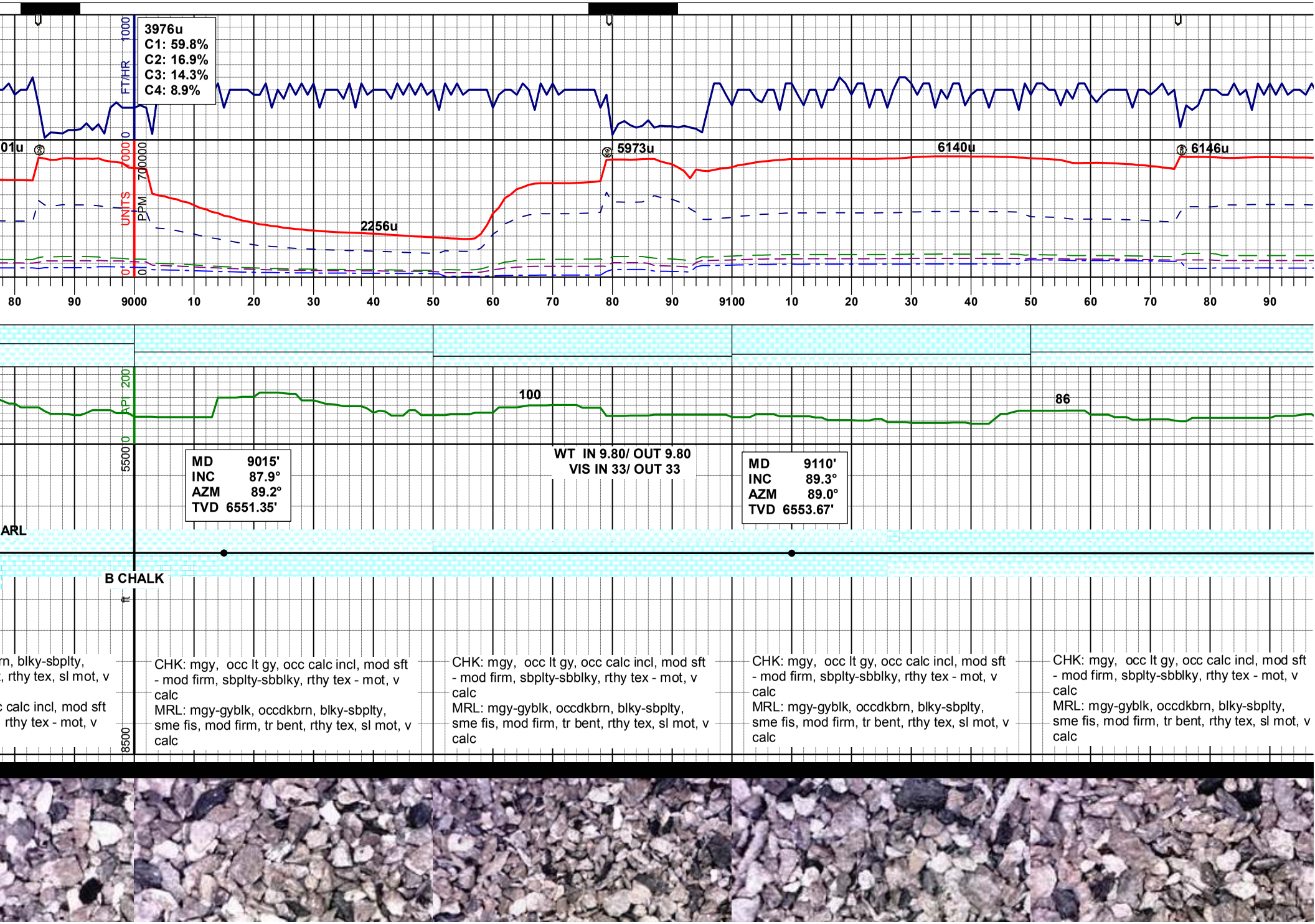

5083u
C1: 61.4%
C2: 17.7%
C3: 13.0%
C4: 7.9%
6146u
6123u
6113u
6011u
UNITS
PPM
700000
7000
0
1000
API
200
109
124
MD 7972'
INC 90.5°
AZM 89.2°
TVD 6550.52'
WT IN 10.00/ OUT 10.00
VIS IN 32/ OUT 32
MD 8067'
INC 90.0°
AZM 89.8°
TVD 6550.10'
A MARL
B MARL
-60'
ft
5500
8500
7877'
90.4°
89.7°
551.26'
d sft - mod firm,
ot, occ calc incl, v
n, blky-sbplty,
, sl mot, v calc, rr
CHK: mgy, occ dkgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, occ calc incl, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, rthy tex, sl mot, v calc, rr fos frag, rr calc frag
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl mot, v calc, rr fos frag, rr calc frag
CHK: mgy, occ dkgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl mot, v calc, rr fos frag, rr calc frag
CHK: mgy, occ dkgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl mot, v calc, rr fos frag, rr calc frag
CHK: mgy, occ dkgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc

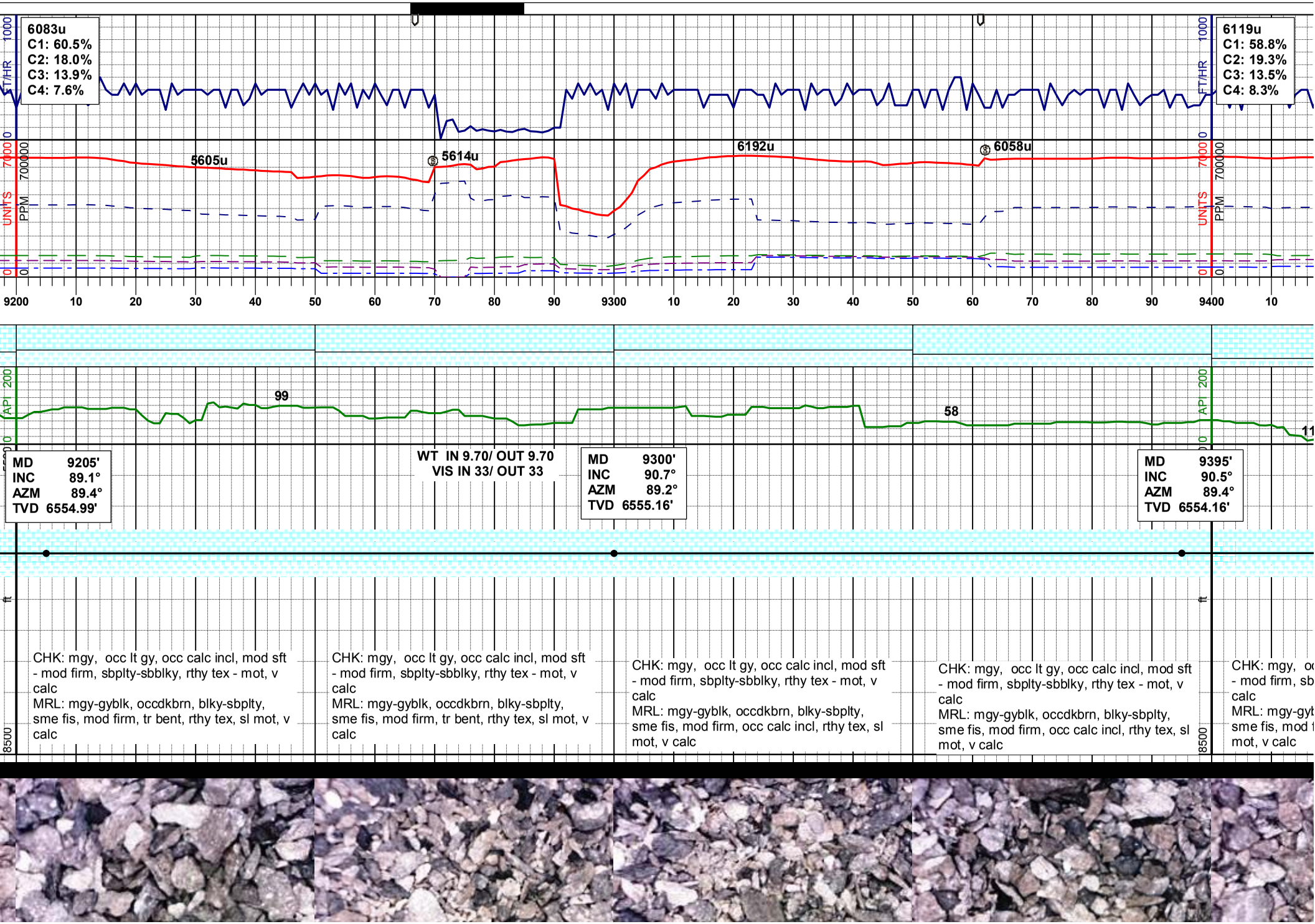

6081u
C1: 65.6%
C2: 17.7%
C3: 11.7%
C4: 5.0%
FTHR
1000
0
UNITS
PPM
700000
0
6023u
6098u
5856u
6146u
8100
10
20
30
40
50
60
70
80
90
8200
10
20
30
40
50
60
70
80
90
8300
10
API
200
0
5500
8500
ft
128
113
183
WT IN 9.80/ OUT 10.00
VIS IN 33/ OUT 32
MD 8162'
INC 89.8°
AZM 89.9°
TVD 6550.27'
MD 8256'
INC 91.1°
AZM 91.4°
TVD 6549.53'
WT IN 9.70/ OUT 9.8
VIS IN 33/ OUT 33
A MARL
-55'
B CHALK
HALK
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl mot, v calc, rr fos frag, rr calc frag
CHK: mgy, occ dkgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, tr calc incl, rthy tex, sl mot, v calc
CHK: mgy, occ dkgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, tr calc incl, rthy tex, sl mot, v calc
CHK: mgy, occ dkgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, tr bent, rthy tex, sl mot, v calc
CHK: mgy, occ dkgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gybl
sme fis, mod fir
calc
CHK: mgy, occ
sbplty-sbblky, rt

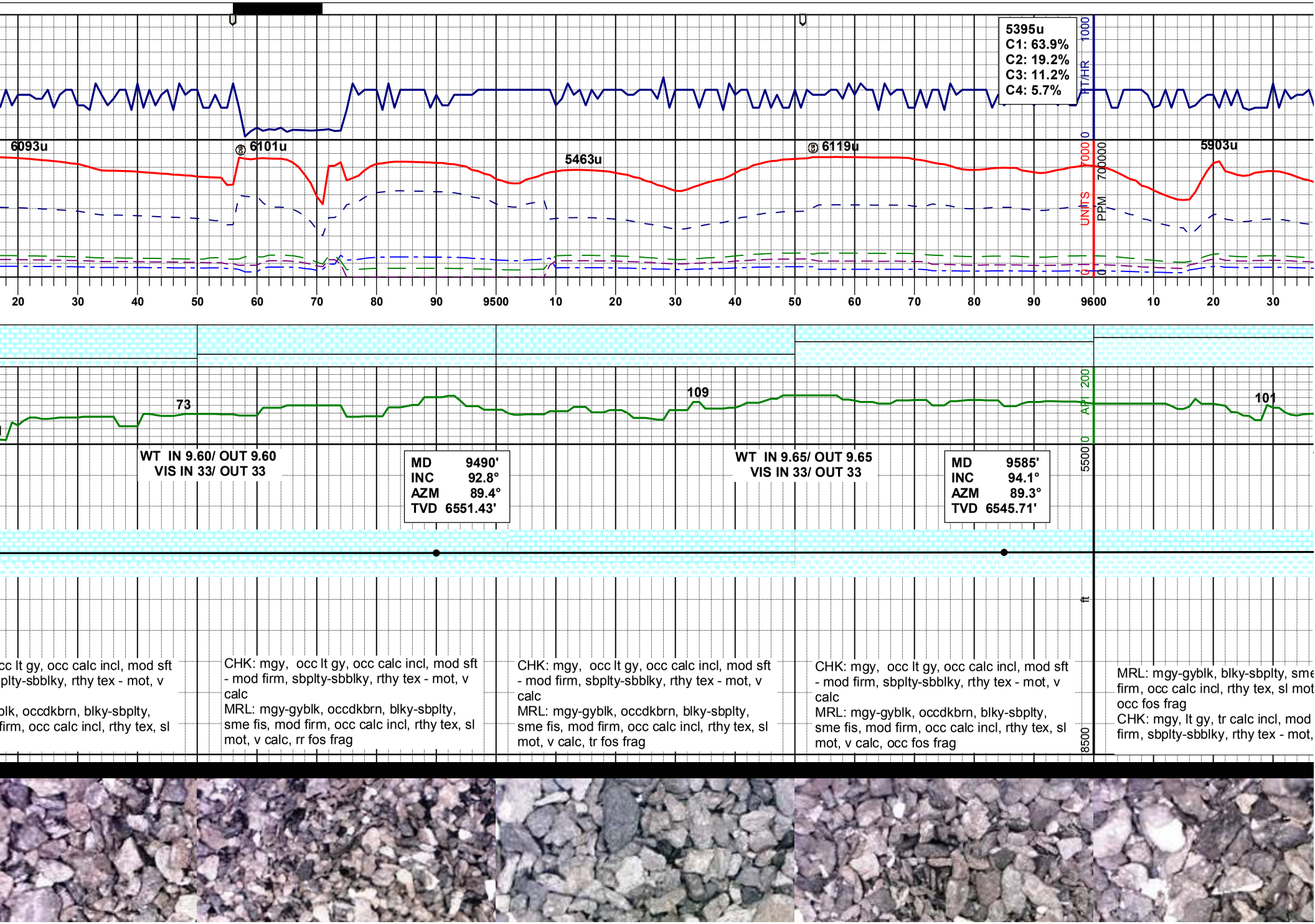

5054u
C1: 74.8%
C2: 17.6%
C3: 7.6%
C4: 0.0%
1000
0
FT/HR
6098u
4699u
6122u
5072u
6038u
7000
0
UNITS
700000
0
PPM
20
30
40
50
60
70
80
90
8400
10
20
30
40
50
60
70
80
90
8500
10
20
30
140
200
0
API
255
5500
MD 8352'
INC 90.6°
AZM 91.7°
TVD 6548.11'
MD 8446'
INC 90.4°
AZM 91.9°
TVD 6547.29'
MD
INC
AZM
TVD
ft
8500
k, occdkbrn, blky-sbplty,
rm, tr bent, rthy tex, sl mot, v
c dkgy, mod sft - mod firm,
thy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty,
sme fis, mod firm, tr bent, rthy tex, sl mot, v
calc
CHK: mgy, occ dkgy, mod sft - mod firm,
sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty,
sme fis, mod firm, tr bent, rthy tex, sl mot, v
calc
CHK: mgy, occ dkgy, mod sft - mod firm,
sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty,
sme fis, mod firm, tr bent, rthy tex, sl mot, v
calc
CHK: mgy, occ dkgy, mod sft - mod firm,
sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sb
sme fis, mod firm, tr bent, rthy tex,
calc
CHK: mgy, occ dkgy, mod sft - mo
sbplty-sbblky, rthy tex - mot, v calc

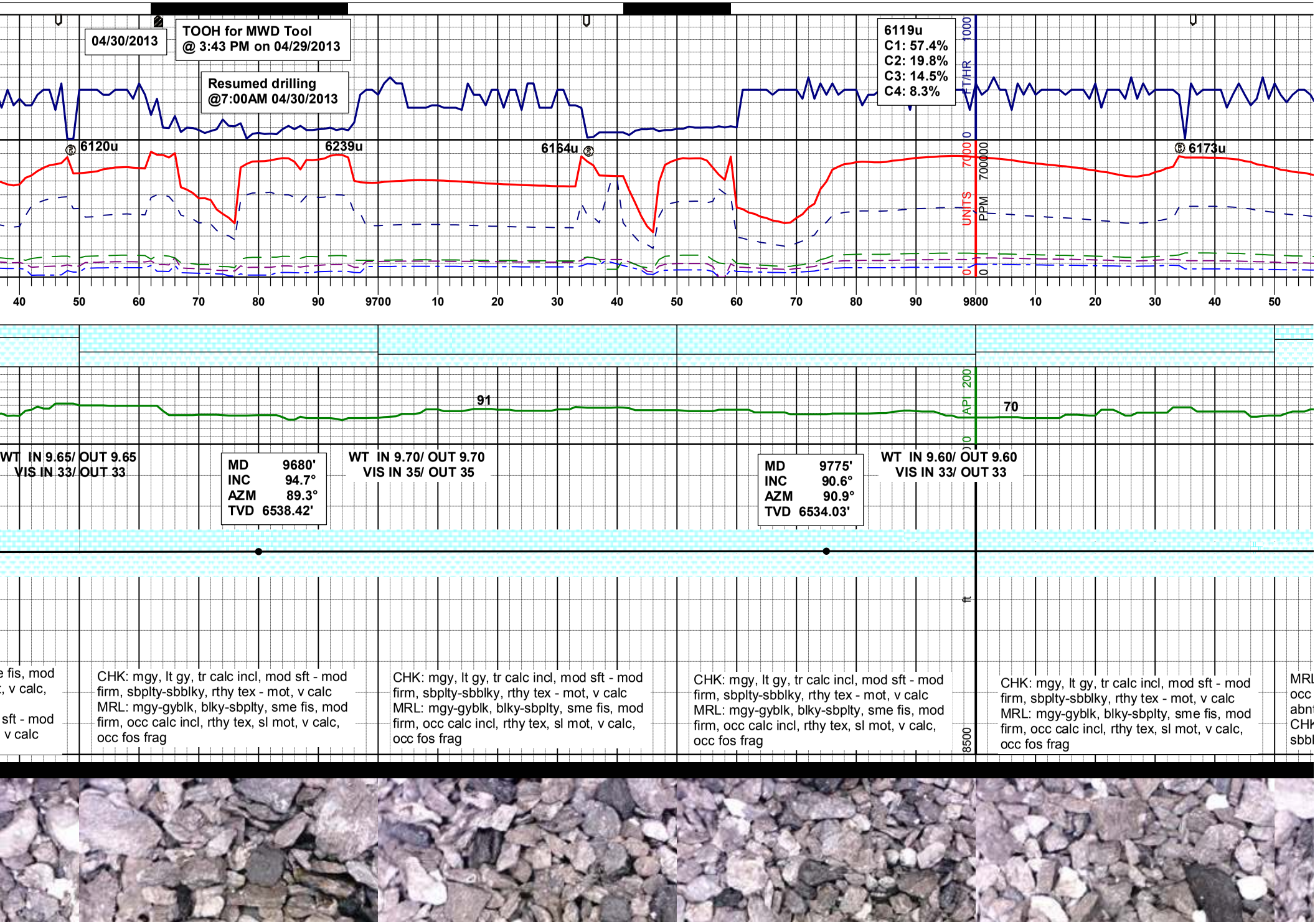

5345u
C1: 55.2%
C2: 19.4%
C3: 15.1%
C4: 10.3%
FT/HR
1000
0
6186u
3129u
6050u
6036u
6081u
5889u
UNITS
PPM
70000
0
40
50
60
70
80
90
8600
10
20
30
40
50
60
70
80
90
8700
10
20
30
40
50
API
200
0
154
165
8541'
90.3°
91.9°
6546.70'
WT IN 9.70/ OUT 9.70
VIS IN 32/ OUT 32
MD 8636'
INC 90.2°
AZM 92.2°
TVD 6546.29'
WT IN 9.70/ OUT 9.70
VIS IN 32/ OUT 32
MD 8731'
INC 90.0°
AZM 92.2°
TVD 6546.12'
ft
8500
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, tr bent, rthy tex, sl mot, v calc
CHK: mgy, occ dkgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, tr bent, rthy tex, sl mot, v calc
CHK: mgy, occ dkgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, tr bent, rthy tex, sl mot, v calc
CHK: mgy, occ dkgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, tr bent, rthy tex, sl mot, v calc
CHK: mgy, occ dkgy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc

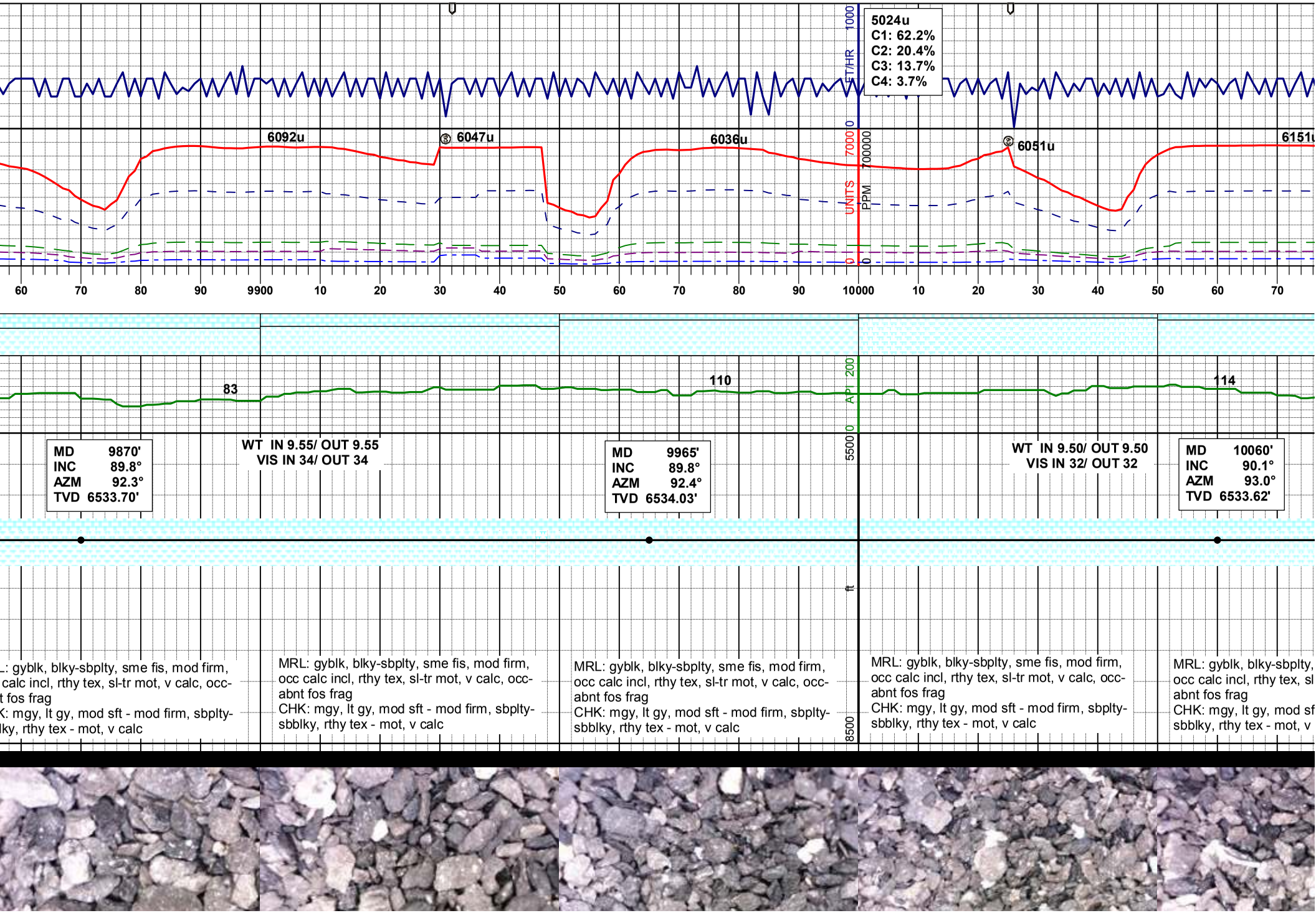

6125u
C1: 69.4%
C2: 18.4%
C3: 9.3%
C4: 2.9%
FT/HR
UNITS
PPM
6098u
6163u
5352u
6018u
8800
8900
136
111
124
API
MD 8825'
INC 89.8°
AZM 92.6°
TVD 6546.29'
WT IN 9.75/ OUT 9.75
VIS IN 32/ OUT 32
MD 8920'
INC 88.1°
AZM 91.8°
TVD 6548.03'
ft
8500
mgy-gyblk, occdkbrn, blky-sbplty,
is, mod firm, tr bent, rthy tex, sl mot, v
mgy, occ dkgy, mod sft - mod firm,
-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty,
sme fis, mod firm, tr bent, rthy tex, sl mot, v
calc
CHK: mgy, occ dkgy, mod sft - mod firm,
sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty,
sme fis, mod firm, tr bent, rthy tex, sl mot, v
calc
CHK: mgy, occ dkgy, mod sft - mod firm,
sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty,
sme fis, mod firm, tr bent, rthy tex, sl mot, v
calc, grdg -
CHK: mgy, occ lt gy, occ calc incl, mod sft
- mod firm, sbplty-sbblky, rthy tex - mot, v
calc
MRL: mgy-gyblk, occdkbr
sme fis, mod firm, tr bent
calc, grdg -
CHK: mgy, occ lt gy, occ
- mod firm, sbplty-sbblky,
calc

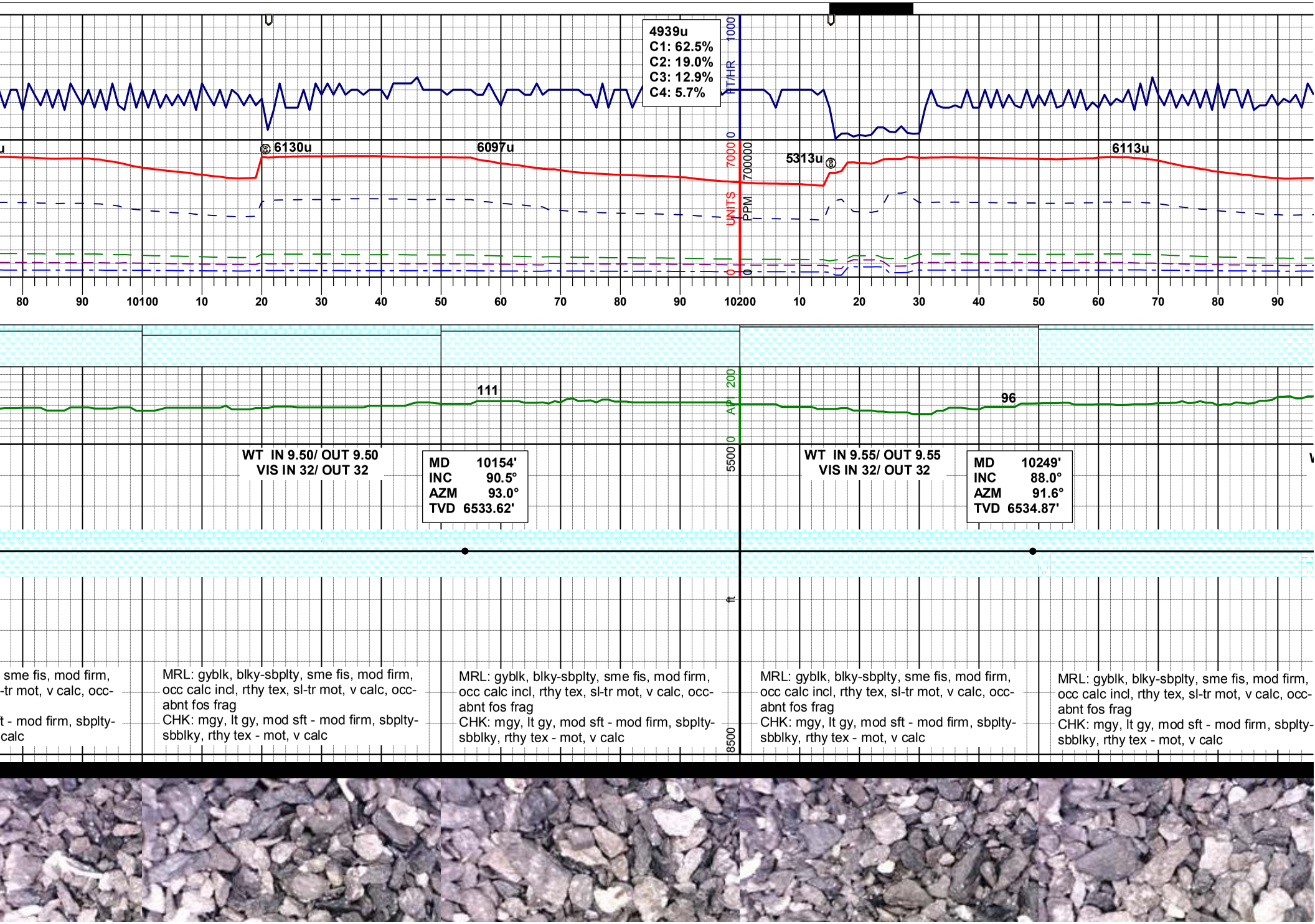

3976u
C1: 59.8%
C2: 16.9%
C3: 14.3%
C4: 8.9%
FT/HR
1000
0
UNITS
2000
0
PPM
700000
0
01u
2256u
5973u
6140u
6146u
80
90
9000
10
20
30
40
50
60
70
80
90
9100
10
20
30
40
50
60
70
80
90
API
200
0
100
86
5500
MD 9015'
INC 87.9°
AZM 89.2°
TVD 6551.35'
WT IN 9.80/ OUT 9.80
VIS IN 33/ OUT 33
MD 9110'
INC 89.3°
AZM 89.0°
TVD 6553.67'
ARL
B CHALK
ft
8500
rn, blky-sbplty,
, rthy tex, sl mot, v
c calc incl, mod sft
rthy tex - mot, v
CHK: mgy, occ lt gy, occ calc incl, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, tr bent, rthy tex, sl mot, v calc
CHK: mgy, occ lt gy, occ calc incl, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, tr bent, rthy tex, sl mot, v calc
CHK: mgy, occ lt gy, occ calc incl, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, tr bent, rthy tex, sl mot, v calc
CHK: mgy, occ lt gy, occ calc incl, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, tr bent, rthy tex, sl mot, v calc

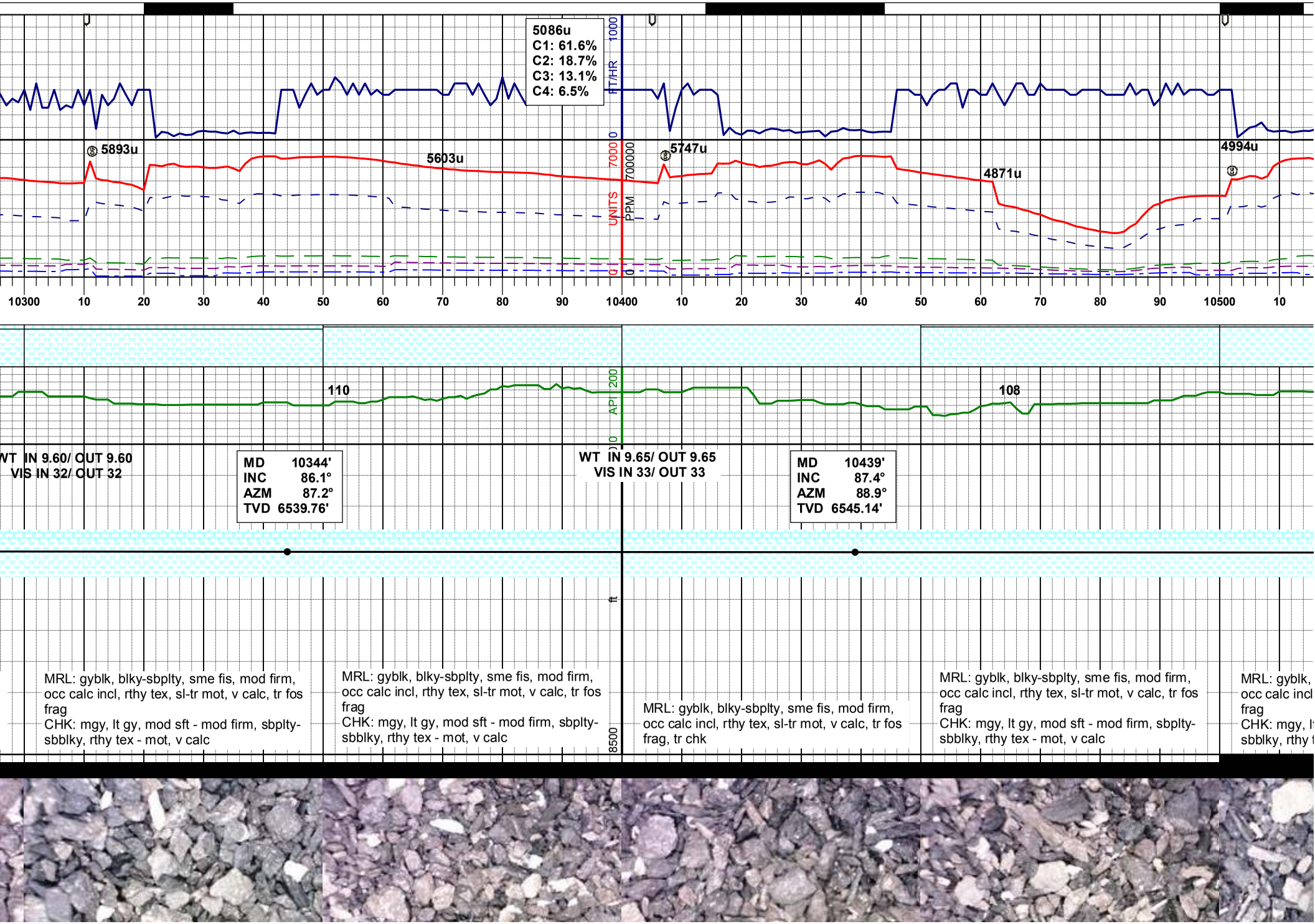

6083u
C1: 60.5%
C2: 18.0%
C3: 13.9%
C4: 7.6%
6119u
C1: 58.8%
C2: 19.3%
C3: 13.5%
C4: 8.3%
FT/HR
UNITS
PPM
5605u
5614u
6192u
6058u
9200
10
20
30
40
50
60
70
80
90
9300
9400
API
99
58
MD 9205'
INC 89.1°
AZM 89.4°
TVD 6554.99'
WT IN 9.70/ OUT 9.70
VIS IN 33/ OUT 33
MD 9300'
INC 90.7°
AZM 89.2°
TVD 6555.16'
MD 9395'
INC 90.5°
AZM 89.4°
TVD 6554.16'
ft
8500
CHK: mgy, occ lt gy, occ calc incl, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, tr bent, rthy tex, sl mot, v calc
CHK: mgy, occ lt gy, occ calc incl, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, tr bent, rthy tex, sl mot, v calc
CHK: mgy, occ lt gy, occ calc incl, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl mot, v calc
CHK: mgy, occ lt gy, occ calc incl, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl mot, v calc

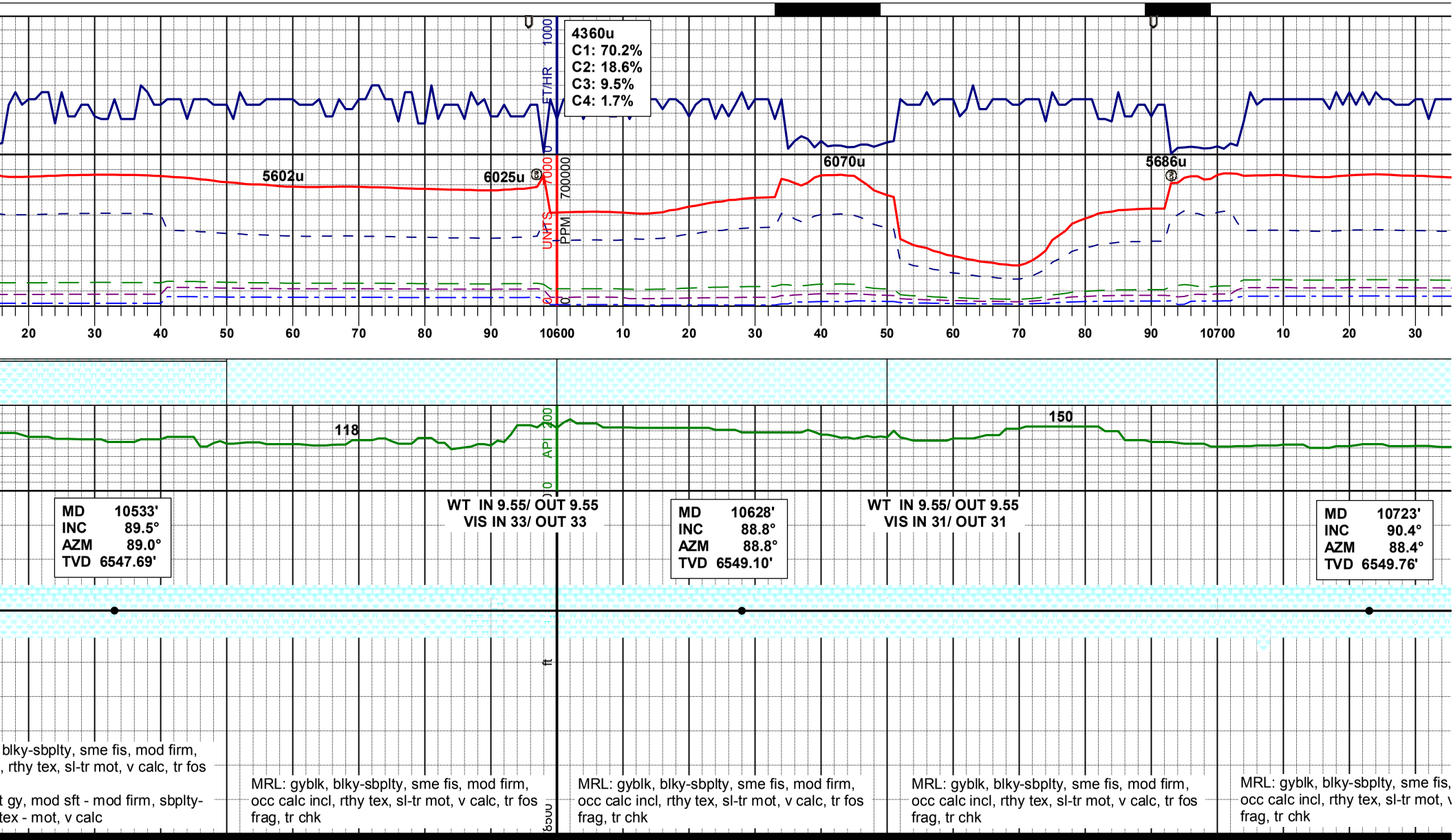

5395u
C1: 63.9%
C2: 19.2%
C3: 11.2%
C4: 5.7%
HT/HR
1000
0
6093u
6101u
5463u
6119u
5903u
UNITS
7000
0
PPM
700000
0
20
30
40
50
60
70
80
90
9500
10
20
30
40
50
60
70
80
90
9600
10
20
30
API
200
0
73
109
101
WT IN 9.60/ OUT 9.60
VIS IN 33/ OUT 33
MD 9490'
INC 92.8°
AZM 89.4°
TVD 6551.43'
WT IN 9.65/ OUT 9.65
VIS IN 33/ OUT 33
MD 9585'
INC 94.1°
AZM 89.3°
TVD 6545.71'
5500
ft
8500
cc lt gy, occ calc incl, mod sft
plty-sbblky, rthy tex - mot, v
blk, occdkbrn, blky-sbplty,
firm, occ calc incl, rthy tex, sl
CHK: mgy, occ lt gy, occ calc incl, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl mot, v calc, rr fos frag
CHK: mgy, occ lt gy, occ calc incl, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl mot, v calc, tr fos frag
CHK: mgy, occ lt gy, occ calc incl, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, occdkbrn, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl mot, v calc, occ fos frag
MRL: mgy-gyblk, blky-sbplty, sme
firm, occ calc incl, rthy tex, sl mot
occ fos frag
CHK: mgy, lt gy, tr calc incl, mod
firm, sbplty-sbblky, rthy tex - mot,

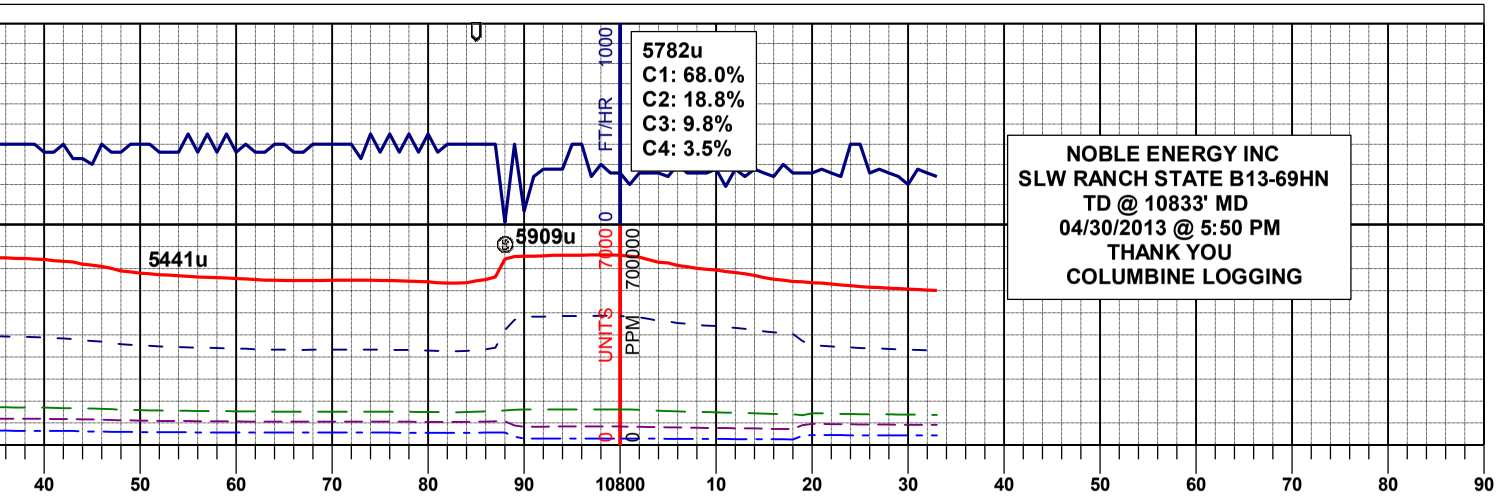

04/30/2013
TOOH for MWD Tool
@ 3:43 PM on 04/29/2013
Resumed drilling
@7:00AM 04/30/2013
6119u
C1: 57.4%
C2: 19.8%
C3: 14.5%
C4: 8.3%
FT/HR
1000
0
6120u
6239u
6164u
6173u
UNITS
PPM
700000
0
40
50
60
70
80
90
9700
10
20
30
40
50
60
70
80
90
9800
10
20
30
40
50
API
200
0
91
70
WT IN 9.65/ OUT 9.65
VIS IN 33/ OUT 33
MD 9680'
INC 94.7°
AZM 89.3°
TVD 6538.42'
WT IN 9.70/ OUT 9.70
VIS IN 35/ OUT 35
MD 9775'
INC 90.6°
AZM 90.9°
TVD 6534.03'
WT IN 9.60/ OUT 9.60
VIS IN 33/ OUT 33
ft
8500
e fis, mod
, v calc,
sft - mod
v calc
CHK: mgy, lt gy, tr calc incl, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl mot, v calc, occ fos frag
CHK: mgy, lt gy, tr calc incl, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl mot, v calc, occ fos frag
CHK: mgy, lt gy, tr calc incl, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl mot, v calc, occ fos frag
CHK: mgy, lt gy, tr calc incl, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: mgy-gyblk, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl mot, v calc, occ fos frag

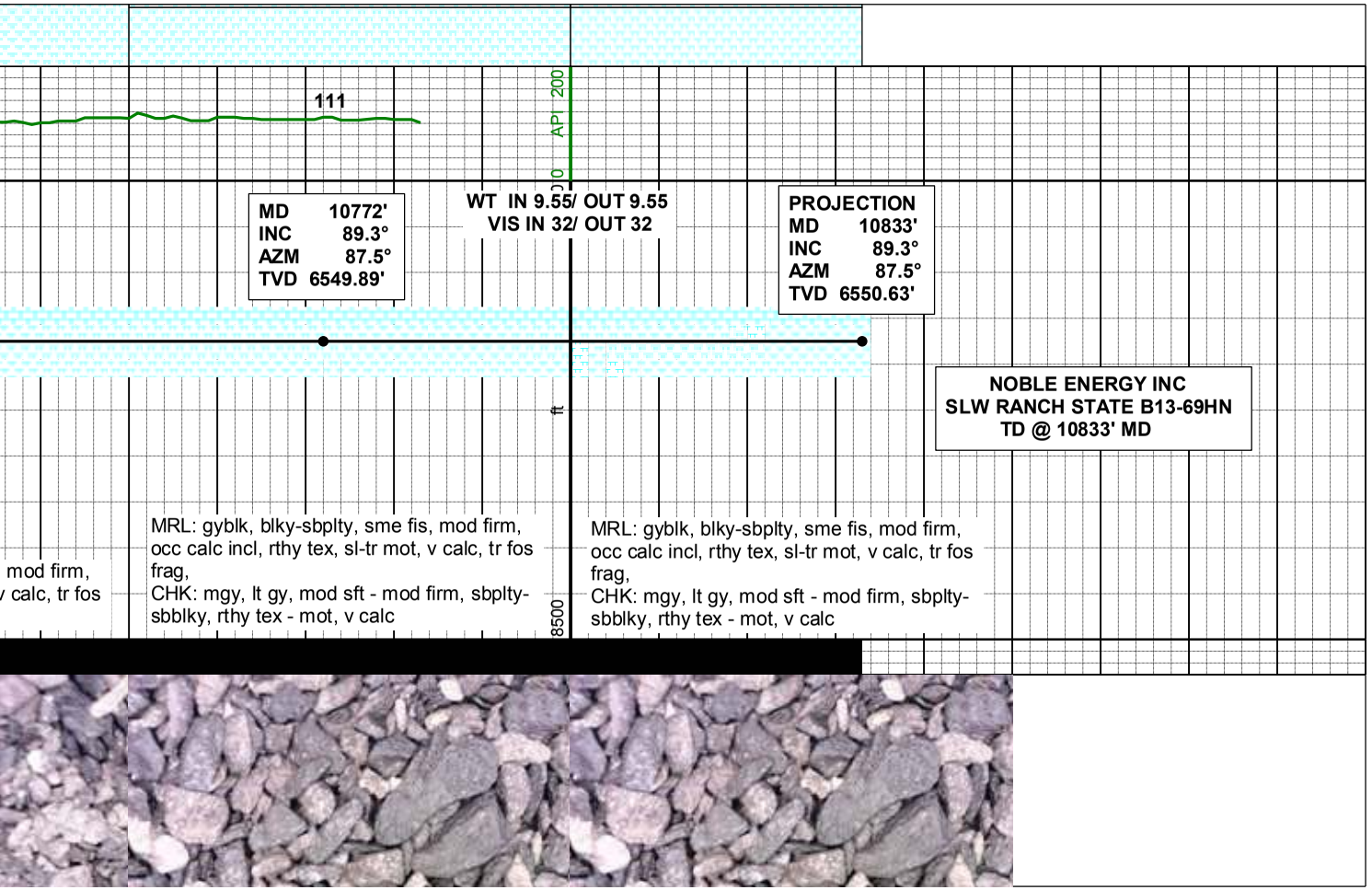

5024u
C1: 62.2%
C2: 20.4%
C3: 13.7%
C4: 3.7%
FT/HR
1000
0
6092u
6047u
6036u
6051u
6151u
700000
UNITS
PPM
0
60
70
80
90
9900
10
20
30
40
50
60
70
80
90
10000
10
20
30
40
50
60
70
83
110
114
API
200
0
MD 9870'
INC 89.8°
AZM 92.3°
TVD 6533.70'
WT IN 9.55/ OUT 9.55
VIS IN 34/ OUT 34
MD 9965'
INC 89.8°
AZM 92.4°
TVD 6534.03'
WT IN 9.50/ OUT 9.50
VIS IN 32/ OUT 32
MD 10060'
INC 90.1°
AZM 93.0°
TVD 6533.62'
5500
ft
8500
L: gyblk, blky-sbplty, sme fis, mod firm,
calc incl, rthy tex, sl-tr mot, v calc, occ-
t fos frag
K: mgy, lt gy, mod sft - mod firm, sbplty-
lky, rthy tex - mot, v calc
MRL: gyblk, blky-sbplty, sme fis, mod firm,
occ calc incl, rthy tex, sl-tr mot, v calc, occ-
abnt fos frag
CHK: mgy, lt gy, mod sft - mod firm, sbplty-
sbblky, rthy tex - mot, v calc
MRL: gyblk, blky-sbplty, sme fis, mod firm,
occ calc incl, rthy tex, sl-tr mot, v calc, occ-
abnt fos frag
CHK: mgy, lt gy, mod sft - mod firm, sbplty-
sbblky, rthy tex - mot, v calc
MRL: gyblk, blky-sbplty, sme fis, mod firm,
occ calc incl, rthy tex, sl-tr mot, v calc, occ-
abnt fos frag
CHK: mgy, lt gy, mod sft - mod firm, sbplty-
sbblky, rthy tex - mot, v calc
MRL: gyblk, blky-sbplty,
occ calc incl, rthy tex, sl
abnt fos frag
CHK: mgy, lt gy, mod sf
sbblky, rthy tex - mot, v


4939u
C1: 62.5%
C2: 19.0%
C3: 12.9%
C4: 5.7%
6130u
6097u
5313u
6113u
111
96
WT IN 9.50/ OUT 9.50
VIS IN 32/ OUT 32
MD 10154'
INC 90.5°
AZM 93.0°
TVD 6533.62'
WT IN 9.55/ OUT 9.55
VIS IN 32/ OUT 32
MD 10249'
INC 88.0°
AZM 91.6°
TVD 6534.87'
MRL: gyblk, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl-tr mot, v calc, occ-abnt fos frag
CHK: mgy, lt gy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: gyblk, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl-tr mot, v calc, occ-abnt fos frag
CHK: mgy, lt gy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: gyblk, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl-tr mot, v calc, occ-abnt fos frag
CHK: mgy, lt gy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: gyblk, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl-tr mot, v calc, occ-abnt fos frag
CHK: mgy, lt gy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
HT/HR
UNITS
PPM
API
ft


5086u
C1: 61.6%
C2: 18.7%
C3: 13.1%
C4: 6.5%
HT/HR
1000
0
5893u
5603u
5747u
4871u
4994u
UNITS
PPM
700000
0
10300
10
20
30
40
50
60
70
80
90
10400
10
20
30
40
50
60
70
80
90
10500
10
API
200
0
110
108
WT IN 9.60/ OUT 9.60
VIS IN 32/ OUT 32
MD 10344'
INC 86.1°
AZM 87.2°
TVD 6539.76'
WT IN 9.65/ OUT 9.65
VIS IN 33/ OUT 33
MD 10439'
INC 87.4°
AZM 88.9°
TVD 6545.14'
ft
8500
MRL: gyblk, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl-tr mot, v calc, tr fos frag
CHK: mgy, lt gy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: gyblk, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl-tr mot, v calc, tr fos frag
CHK: mgy, lt gy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: gyblk, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl-tr mot, v calc, tr fos frag, tr chk
MRL: gyblk, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl-tr mot, v calc, tr fos frag
CHK: mgy, lt gy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: gyblk,
occ calc incl
frag
CHK: mgy,
sbblky, rthy


4360u
C1: 70.2%
C2: 18.6%
C3: 9.5%
C4: 1.7%
5602u
6025u
6070u
5686u
ET/HR
UNITS
PPM
1000
0
7000
700000
20
30
40
50
60
70
80
90
10600
10
20
30
40
50
60
70
80
90
10700
10
20
30
118
150
API
200
0
MD 10533'
INC 89.5°
AZM 89.0°
TVD 6547.69'
WT IN 9.55/ OUT 9.55
VIS IN 33/ OUT 33
MD 10628'
INC 88.8°
AZM 88.8°
TVD 6549.10'
WT IN 9.55/ OUT 9.55
VIS IN 31/ OUT 31
MD 10723'
INC 90.4°
AZM 88.4°
TVD 6549.76'
ft
blky-sbplty, sme fis, mod firm,
, rthy tex, sl-tr mot, v calc, tr fos
t gy, mod sft - mod firm, sbplty-
tex - mot, v calc
MRL: gyblk, blky-sbplty, sme fis, mod firm,
occ calc incl, rthy tex, sl-tr mot, v calc, tr fos
frag, tr chk
MRL: gyblk, blky-sbplty, sme fis, mod firm,
occ calc incl, rthy tex, sl-tr mot, v calc, tr fos
frag, tr chk
MRL: gyblk, blky-sbplty, sme fis, mod firm,
occ calc incl, rthy tex, sl-tr mot, v calc, tr fos
frag, tr chk
MRL: gyblk, blky-sbplty, sme fis,
occ calc incl, rthy tex, sl-tr mot, v
frag, tr chk


5782u
C1: 68.0%
C2: 18.8%
C3: 9.8%
C4: 3.5%
5909u
5441u
FT/HR
UNITS
PPM
1000
0
700000
NOBLE ENERGY INC
SLW RANCH STATE B13-69HN
TD @ 10833' MD
04/30/2013 @ 5:50 PM
THANK YOU
COLUMBINE LOGGING
40
50
60
70
80
90
10800
10
20
30
40
50
60
70
80
90


111
API
200
0
MD 10772'
INC 89.3°
AZM 87.5°
TVD 6549.89'
WT IN 9.55/ OUT 9.55
VIS IN 32/ OUT 32
PROJECTION
MD 10833'
INC 89.3°
AZM 87.5°
TVD 6550.63'
NOBLE ENERGY INC
SLW RANCH STATE B13-69HN
TD @ 10833' MD
ft
8500
mod firm,
v calc, tr fos
MRL: gyblk, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl-tr mot, v calc, tr fos frag,
CHK: mgy, lt gy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc
MRL: gyblk, blky-sbplty, sme fis, mod firm, occ calc incl, rthy tex, sl-tr mot, v calc, tr fos frag,
CHK: mgy, lt gy, mod sft - mod firm, sbplty-sbblky, rthy tex - mot, v calc