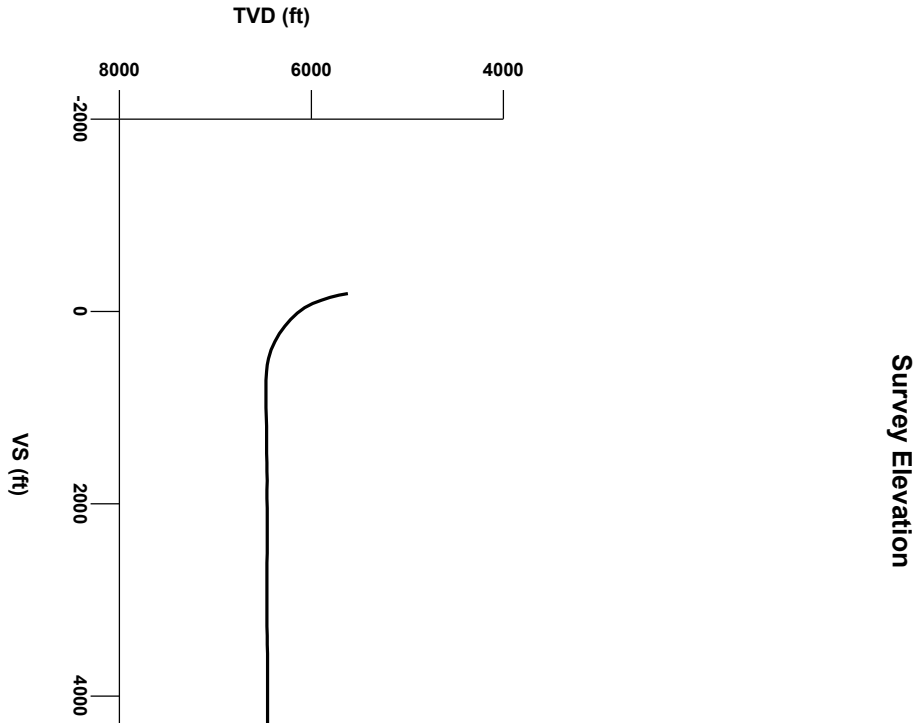
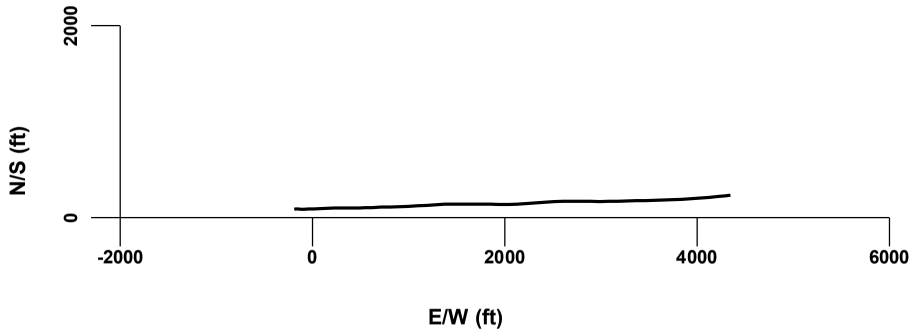
OPERATOR:	**NOBLE ENERGY INC.**
WELL:	**KUMMER PC LE 23-65-1HN**
LOCATION:	**SEC 23 T8N R61W**
COUNTY:	**WELD**
STATE:	**COLORADO**
SPOT:	**2235' FSL; 255' FWL**
ELEVATION:	**4982' GL; 5006' KB**
FIELD:	**WILDCAT**
SPUD DATE:	**04/06/2013**
TD DATE:	**04/18/2013**
DATES LOGGED:	**04/14/2013 - 04/18/2013**
DEPTHS LOGGED:	**5600' - 10645' MD**
LOGGERS:	**LAURA KELLOGG; CONOR PESICKA**
DRILLING FLUID:	**LSND**
DRILLING RIG:	**H&P 273**
API:	**05-123-36684**
LOG TYPE:	**HORIZONTAL**
SCALE:	**1:240 (5 inches per 100 feet)**
REMARKS:	**WELLSITE GEOLOGICAL SERVICES PROVIDED BY COLUMBINE LOGGING INC.**

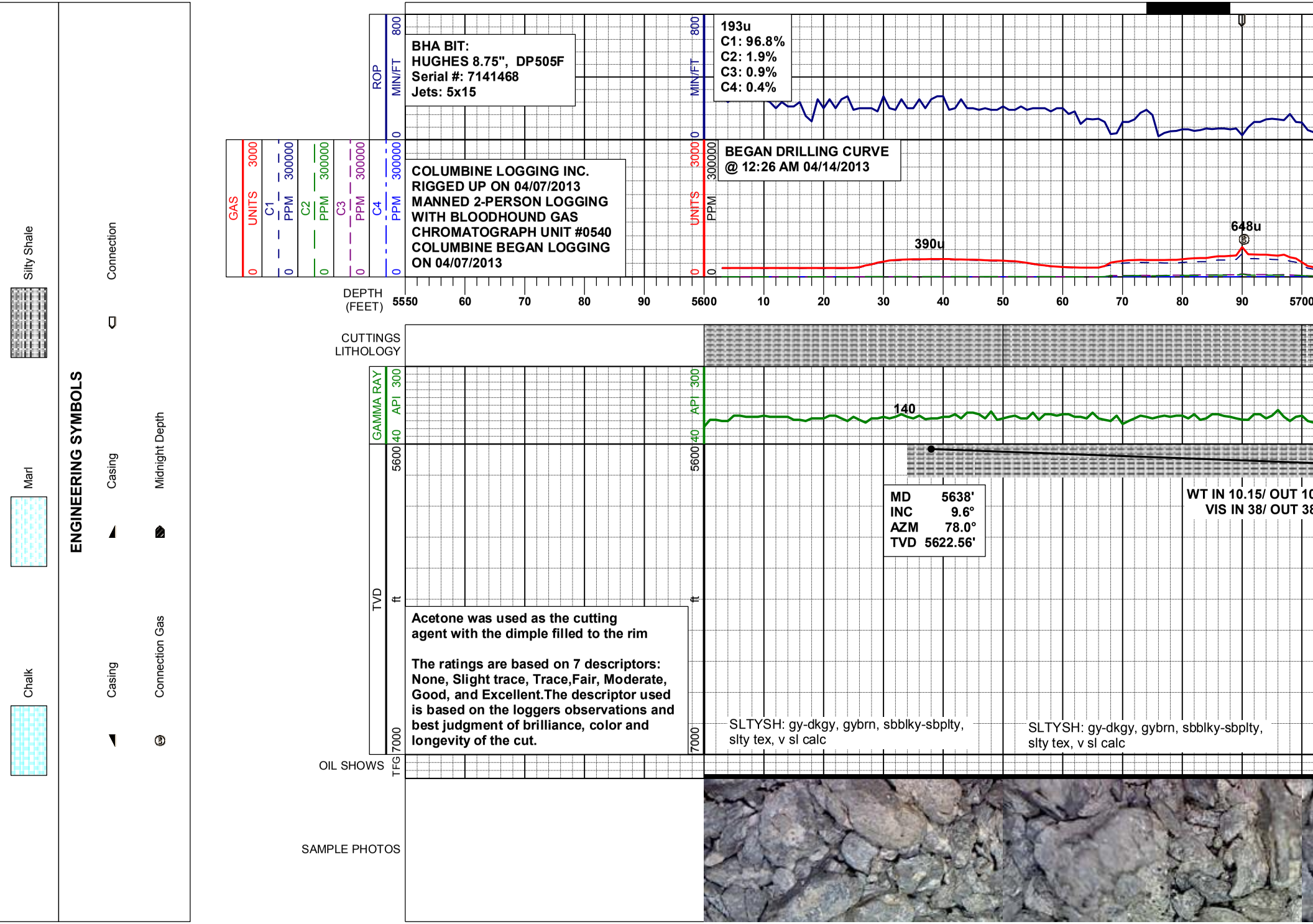


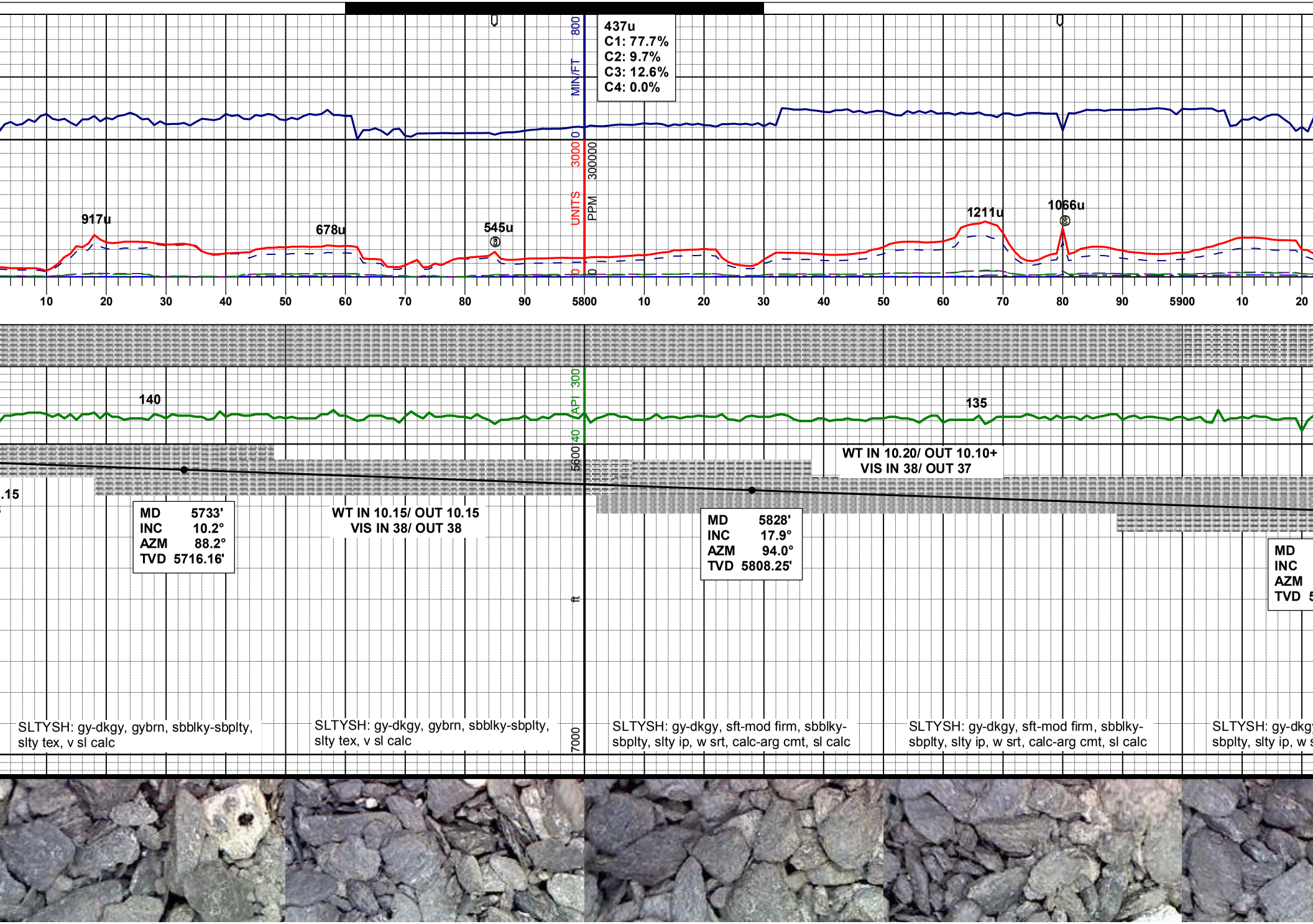
6000

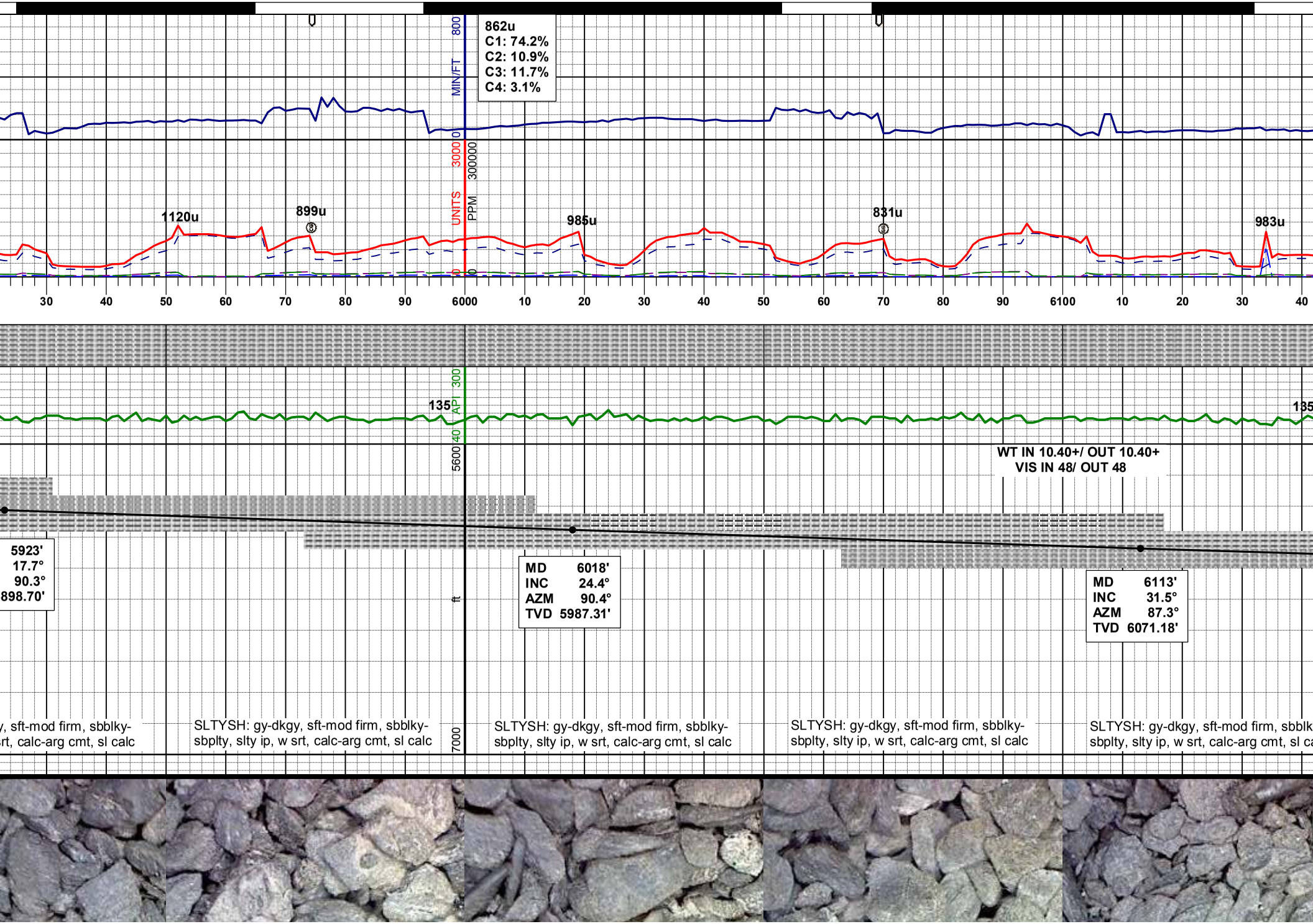
Survey Plan

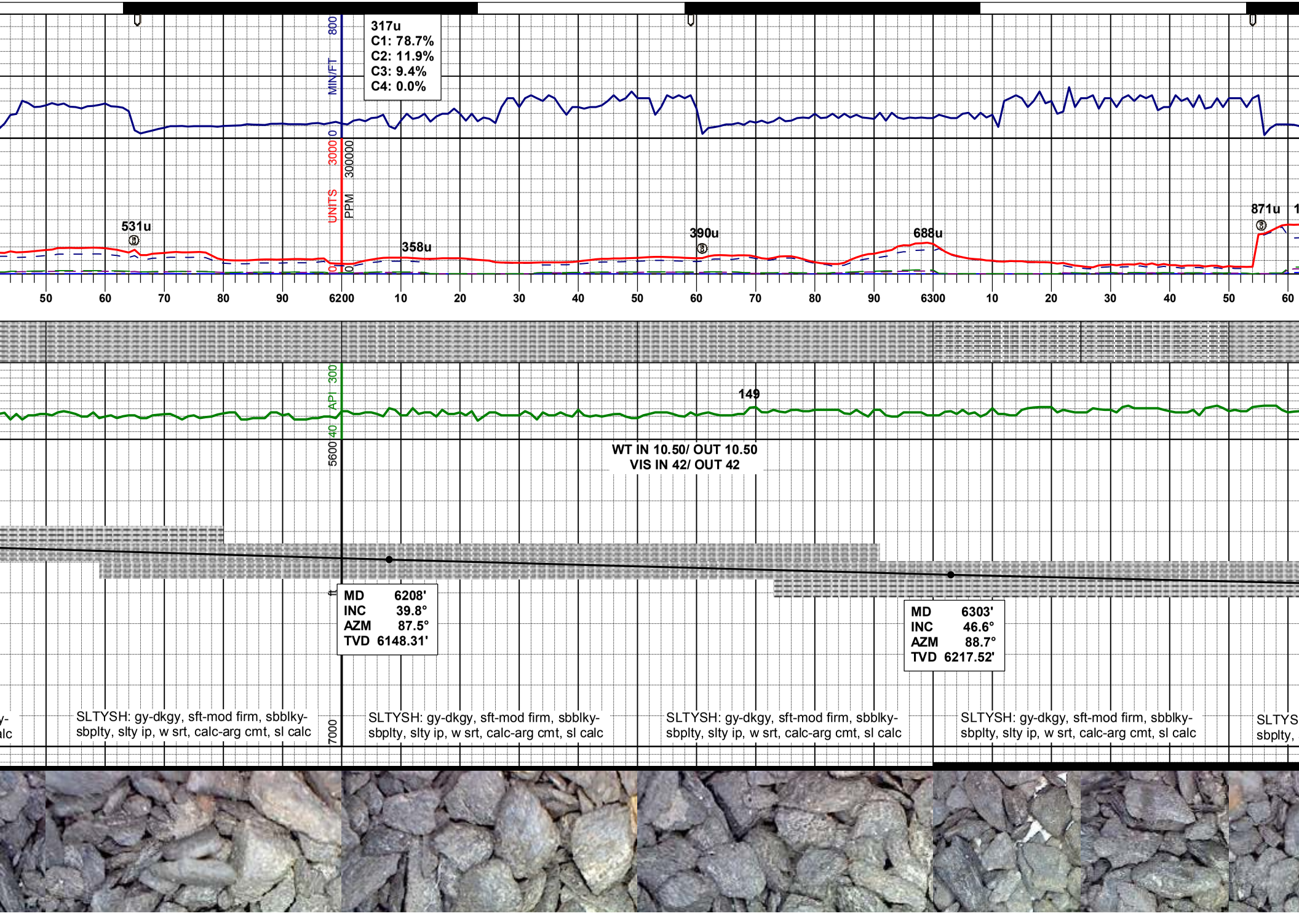


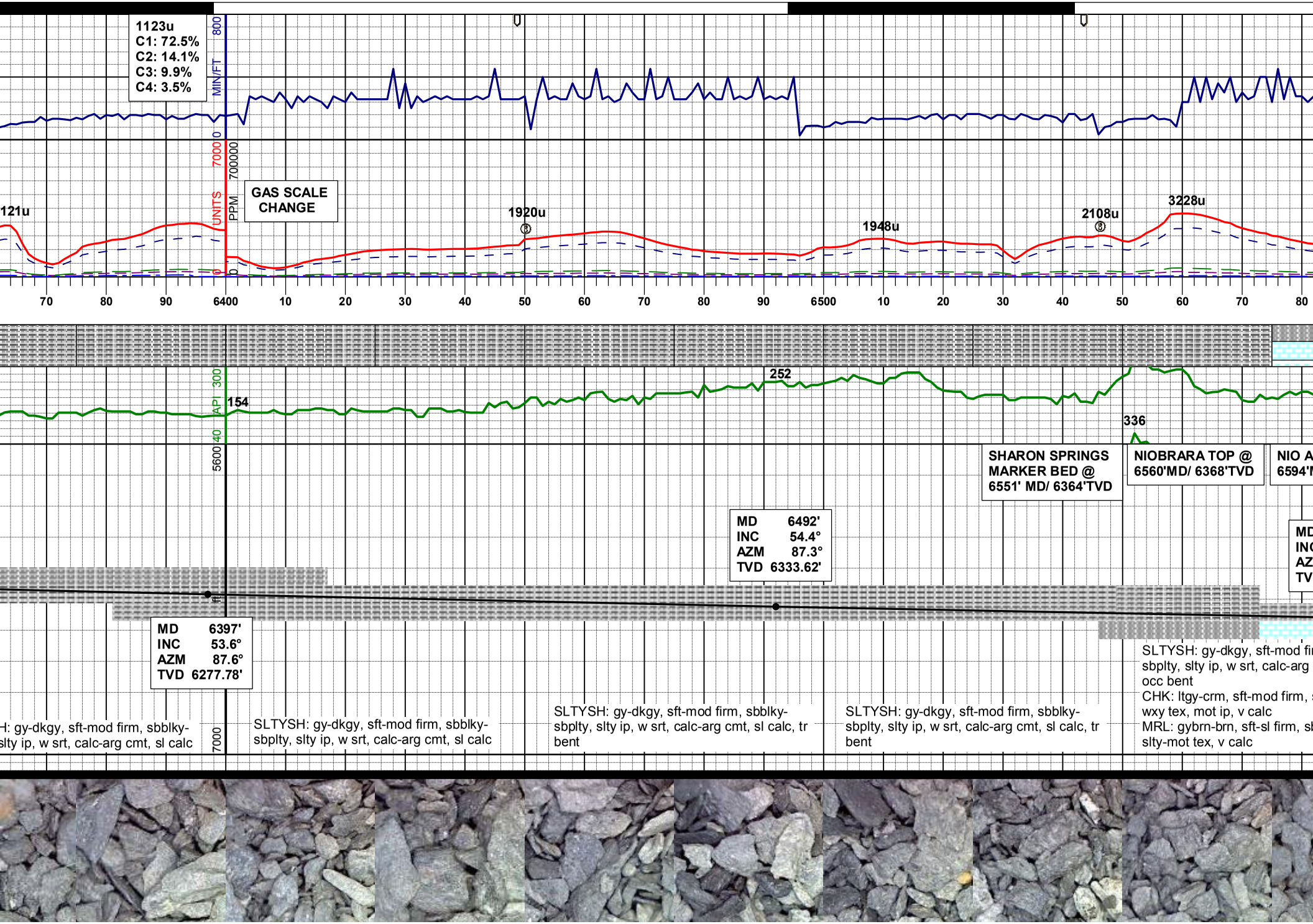
LITHOLOGIES

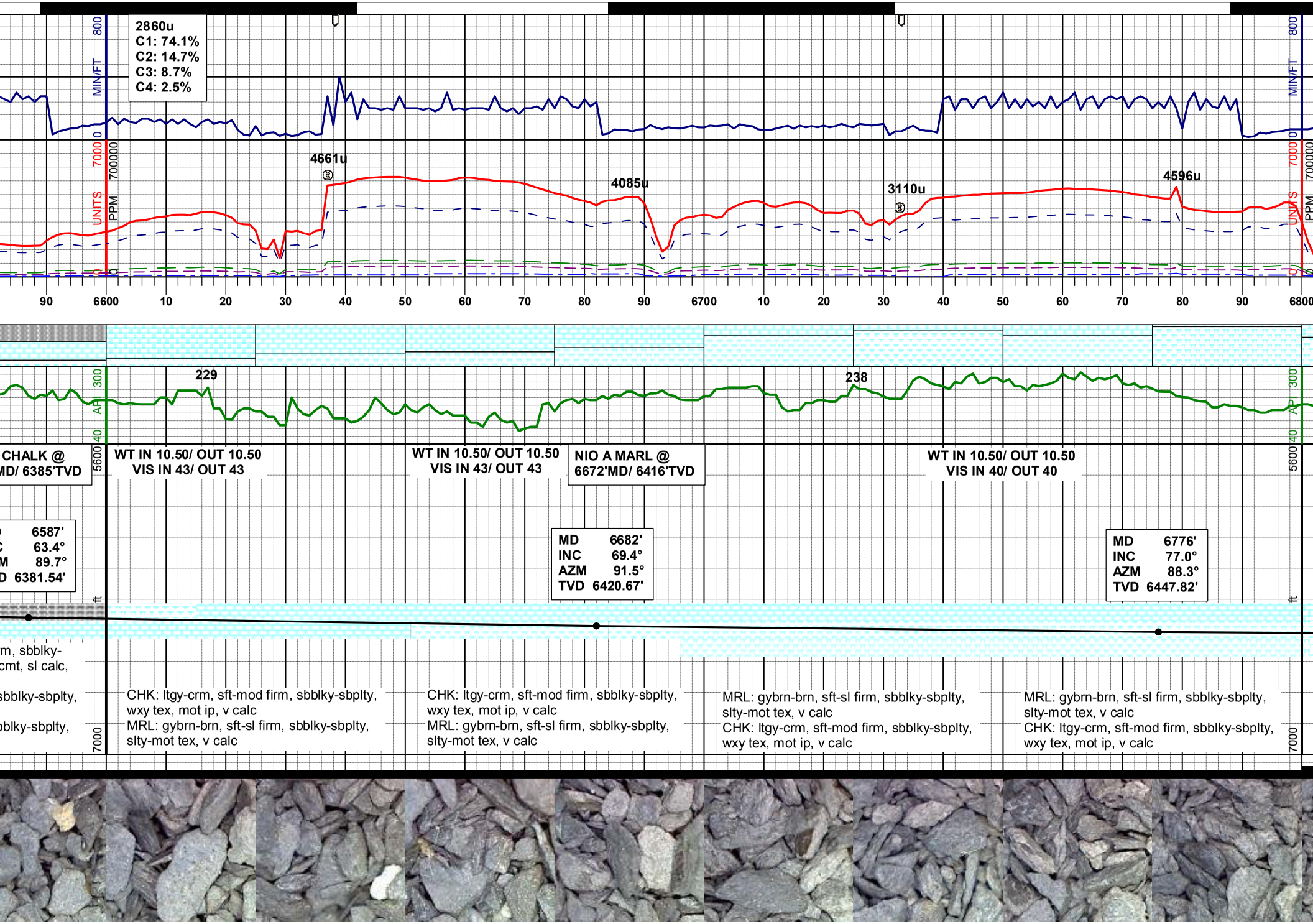

ENGINEERING SYMBOLS
Silty Shale
Marl
Chalk
Connection
Casing
Midnight Depth
Casing
Connection Gas
BHA BIT:
HUGHES 8.75", DP505F
Serial #: 7141468
Jets: 5x15
193u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%
BEGAN DRILLING CURVE
@ 12:26 AM 04/14/2013
COLUMBINE LOGGING INC.
RIGGED UP ON 04/07/2013
MANNED 2-PERSON LOGGING
WITH BLOODHOUND GAS
CHROMATOGRAPH UNIT #0540
COLUMBINE BEGAN LOGGING
ON 04/07/2013
390u
648u
GAS
UNITS
C1
C2
C3
C4
PPM
ROP
MIN/FT
DEPTH
(FEET)
CUTTINGS
LITHOLOGY
GAMMA RAY
API
140
TVD
ft
MD 5638'
INC 9.6°
AZM 78.0°
TVD 5622.56'
WT IN 10.15/ OUT 10
VIS IN 38/ OUT 38
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: gy-dkgy, gybrn, sbblky-sbplty,
slty tex, v sl calc
SLTYSH: gy-dkgy, gybrn, sbblky-sbplty,
slty tex, v sl calc
OIL SHOWS
TFG
SAMPLE PHOTOS

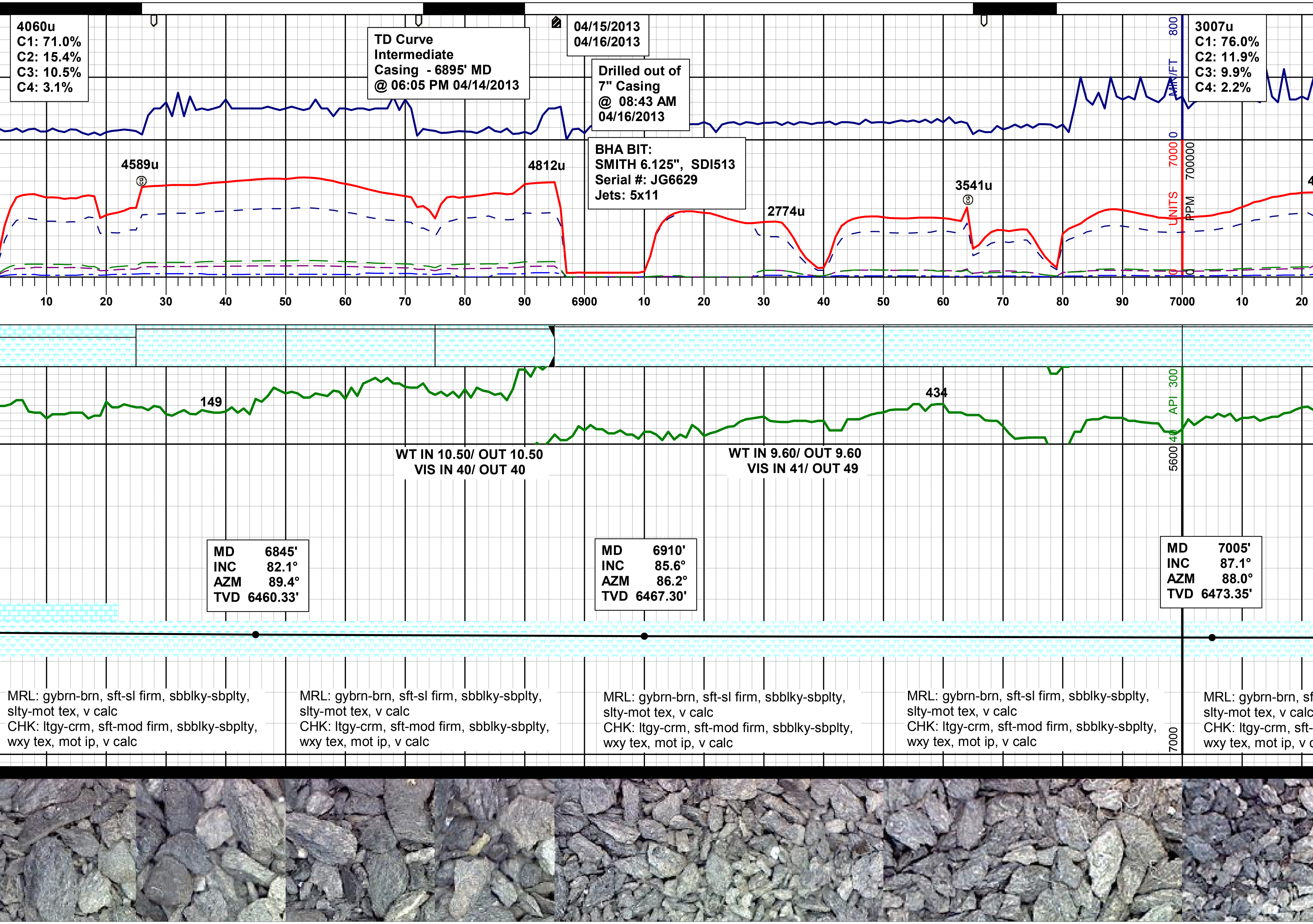

437u
C1: 77.7%
C2: 9.7%
C3: 12.6%
C4: 0.0%
MIN/FT
800
0
UNITS
3000
0
PPM
300000
0
917u
678u
545u
1211u
1066u
10
20
30
40
50
60
70
80
90
5800
10
20
30
40
50
60
70
80
90
5900
10
20
140
135
API
300
40
5600
ft
7000
WT IN 10.20/ OUT 10.10+
VIS IN 38/ OUT 37
MD 5733'
INC 10.2°
AZM 88.2°
TVD 5716.16'
WT IN 10.15/ OUT 10.15
VIS IN 38/ OUT 38
MD 5828'
INC 17.9°
AZM 94.0°
TVD 5808.25'
SLTYSH: gy-dkgy, gybrn, sbblky-sbplty, slty tex, v sl calc
SLTYSH: gy-dkgy, gybrn, sbblky-sbplty, slty tex, v sl calc
SLTYSH: gy-dkgy, sft-mod firm, sbblky-sbplty, slty ip, w srt, calc-arg cmt, sl calc
SLTYSH: gy-dkgy, sft-mod firm, sbblky-sbplty, slty ip, w srt, calc-arg cmt, sl calc

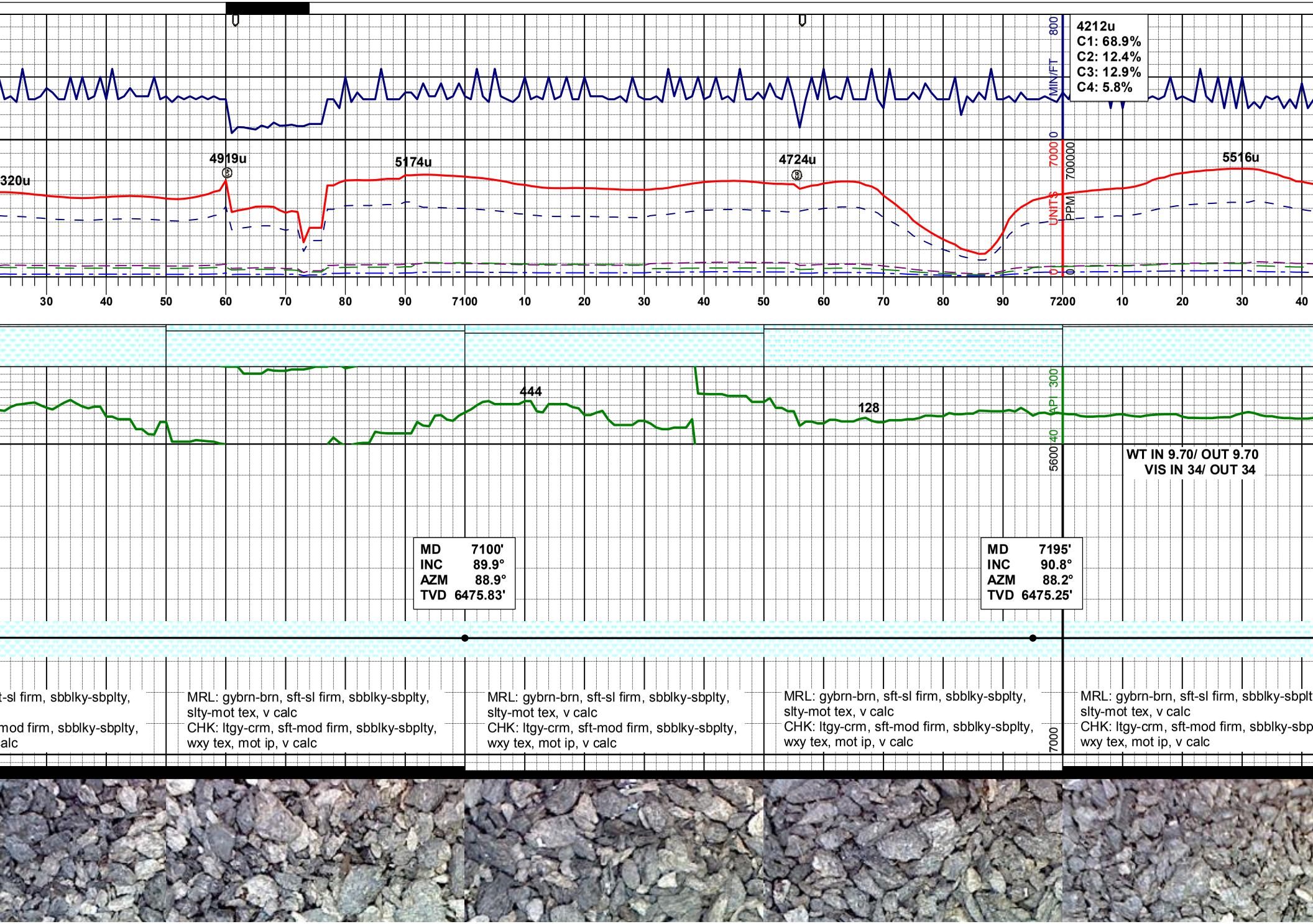

862u
C1: 74.2%
C2: 10.9%
C3: 11.7%
C4: 3.1%
MIN/FT
800
0
UNITS
3000
0
PPM
300000
0
1120u
899u
985u
831u
983u
30
40
50
60
70
80
90
6000
10
20
30
40
50
60
70
80
90
6100
10
20
30
40
API
300
40
135
135
5600
ft
7000
WT IN 10.40+/ OUT 10.40+
VIS IN 48/ OUT 48
5923'
17.7°
90.3°
898.70'
MD 6018'
INC 24.4°
AZM 90.4°
TVD 5987.31'
MD 6113'
INC 31.5°
AZM 87.3°
TVD 6071.18'
, sft-mod firm, sbblky-
rt, calc-arg cmt, sl calc
SLTYSH: gy-dkgy, sft-mod firm, sbblky-
sbplty, slty ip, w srt, calc-arg cmt, sl calc
SLTYSH: gy-dkgy, sft-mod firm, sbblky-
sbplty, slty ip, w srt, calc-arg cmt, sl calc
SLTYSH: gy-dkgy, sft-mod firm, sbblky-
sbplty, slty ip, w srt, calc-arg cmt, sl calc
SLTYSH: gy-dkgy, sft-mod firm, sbblk
sbplty, slty ip, w srt, calc-arg cmt, sl ca

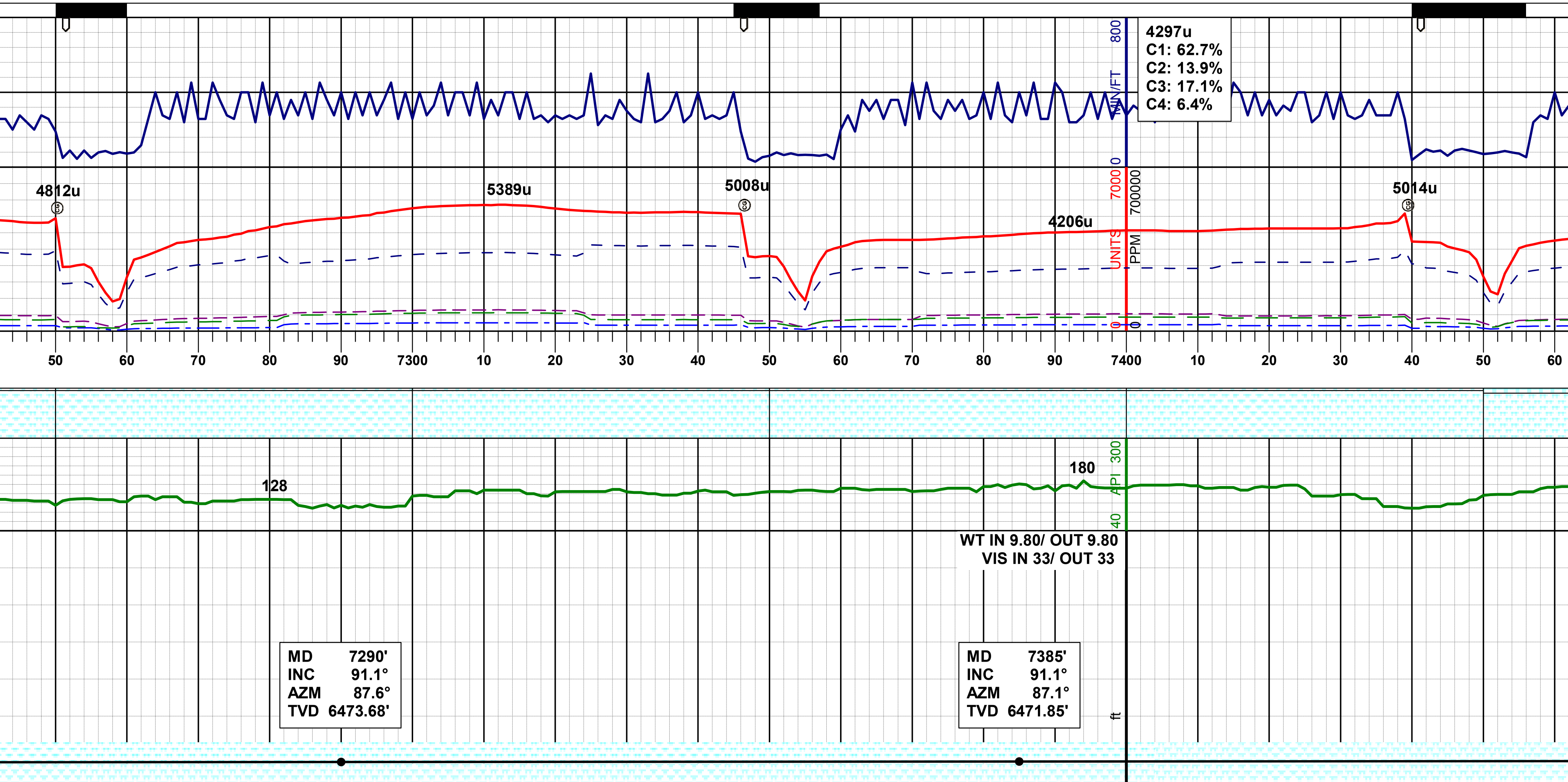

317u
C1: 78.7%
C2: 11.9%
C3: 9.4%
C4: 0.0%
MIN/FT
800
0
UNITS
3000
0
PPM
300000
0
531u
358u
390u
688u
871u
50
60
70
80
90
6200
10
20
30
40
50
60
70
80
90
6300
10
20
30
40
50
60
API
300
40
5600
149
WT IN 10.50/ OUT 10.50
VIS IN 42/ OUT 42
ft
7000
MD 6208'
INC 39.8°
AZM 87.5°
TVD 6148.31'
MD 6303'
INC 46.6°
AZM 88.7°
TVD 6217.52'
SLTYSH: gy-dkgy, sft-mod firm, sbblky-sbplty, slty ip, w srt, calc-arg cmt, sl calc
SLTYSH: gy-dkgy, sft-mod firm, sbblky-sbplty, slty ip, w srt, calc-arg cmt, sl calc
SLTYSH: gy-dkgy, sft-mod firm, sbblky-sbplty, slty ip, w srt, calc-arg cmt, sl calc
SLTYSH: gy-dkgy, sft-mod firm, sbblky-sbplty, slty ip, w srt, calc-arg cmt, sl calc


1123u
C1: 72.5%
C2: 14.1%
C3: 9.9%
C4: 3.5%
800
MIN/FT
0
7000
700000
UNITS
PPM
GAS SCALE CHANGE
121u
1920u
1948u
2108u
3228u
70
80
90
6400
10
20
30
40
50
60
70
80
90
6500
10
20
30
40
50
60
70
80
300
API
40
5600
154
252
336
SHARON SPRINGS MARKER BED @ 6551' MD/ 6364'TVD
NIOBRARA TOP @ 6560'MD/ 6368'TVD
MD 6492'
INC 54.4°
AZM 87.3°
TVD 6333.62'
MD 6397'
INC 53.6°
AZM 87.6°
TVD 6277.78'
ft
7000
H: gy-dkgy, sft-mod firm, sbblky-
slty ip, w srt, calc-arg cmt, sl calc
SLTYSH: gy-dkgy, sft-mod firm, sbblky-
sbplty, slty ip, w srt, calc-arg cmt, sl calc
SLTYSH: gy-dkgy, sft-mod firm, sbblky-
sbplty, slty ip, w srt, calc-arg cmt, sl calc, tr
bent
SLTYSH: gy-dkgy, sft-mod firm, sbblky-
sbplty, slty ip, w srt, calc-arg cmt, sl calc, tr
bent
SLTYSH: gy-dkgy, sft-mod fi
sbplty, slty ip, w srt, calc-arg
occ bent
CHK: ltgy-crm, sft-mod firm,
wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sl
slty-mot tex, v calc


2860u
C1: 74.1%
C2: 14.7%
C3: 8.7%
C4: 2.5%
MIN/FT
UNITS
PPM
4661u
4085u
3110u
4596u
90 6600 10 20 30 40 50 60 70 80 90 6700 10 20 30 40 50 60 70 80 90 6800
API
229
238
CHALK @
MD/ 6385'TVD
WT IN 10.50/ OUT 10.50
VIS IN 43/ OUT 43
WT IN 10.50/ OUT 10.50
VIS IN 43/ OUT 43
NIO A MARL @
6672'MD/ 6416'TVD
WT IN 10.50/ OUT 10.50
VIS IN 40/ OUT 40
6587'
63.4°
89.7°
6381.54'
MD 6682'
INC 69.4°
AZM 91.5°
TVD 6420.67'
MD 6776'
INC 77.0°
AZM 88.3°
TVD 6447.82'
ft
m, sbblky-
cmt, sl calc,
sbblky-sbplty,
bblky-sbplty,
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc


4060u
C1: 71.0%
C2: 15.4%
C3: 10.5%
C4: 3.1%
TD Curve
Intermediate
Casing - 6895' MD
@ 06:05 PM 04/14/2013
04/15/2013
04/16/2013
Drilled out of
7" Casing
@ 08:43 AM
04/16/2013
BHA BIT:
SMITH 6.125", SDI513
Serial #: JG6629
Jets: 5x11
3007u
C1: 76.0%
C2: 11.9%
C3: 9.9%
C4: 2.2%
0 MIN/FT 800
0 UNITS 7000
0 PPM 700000
4589u
4812u
2774u
3541u
10 20 30 40 50 60 70 80 90 6900 10 20 30 40 50 60 70 80 90 7000 10 20
149
434
40 API 300
5600
WT IN 10.50/ OUT 10.50
VIS IN 40/ OUT 40
WT IN 9.60/ OUT 9.60
VIS IN 41/ OUT 49
MD 6845'
INC 82.1°
AZM 89.4°
TVD 6460.33'
MD 6910'
INC 85.6°
AZM 86.2°
TVD 6467.30'
MD 7005'
INC 87.1°
AZM 88.0°
TVD 6473.35'
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
7000


4212u
C1: 68.9%
C2: 12.4%
C3: 12.9%
C4: 5.8%
MIN/FT
800
0
7000
0
UNITS
700000
PPM
0
4919u
5174u
4724u
5516u
320u
30
40
50
60
70
80
90
7100
10
20
30
40
50
60
70
80
90
7200
10
20
30
40
444
128
API
300
40
5600
7000
WT IN 9.70/ OUT 9.70
VIS IN 34/ OUT 34
MD 7100'
INC 89.9°
AZM 88.9°
TVD 6475.83'
MD 7195'
INC 90.8°
AZM 88.2°
TVD 6475.25'
t-sl firm, sbblky-sbplty,
mod firm, sbblky-sbplty,
alc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplt
slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbp
wxy tex, mot ip, v calc

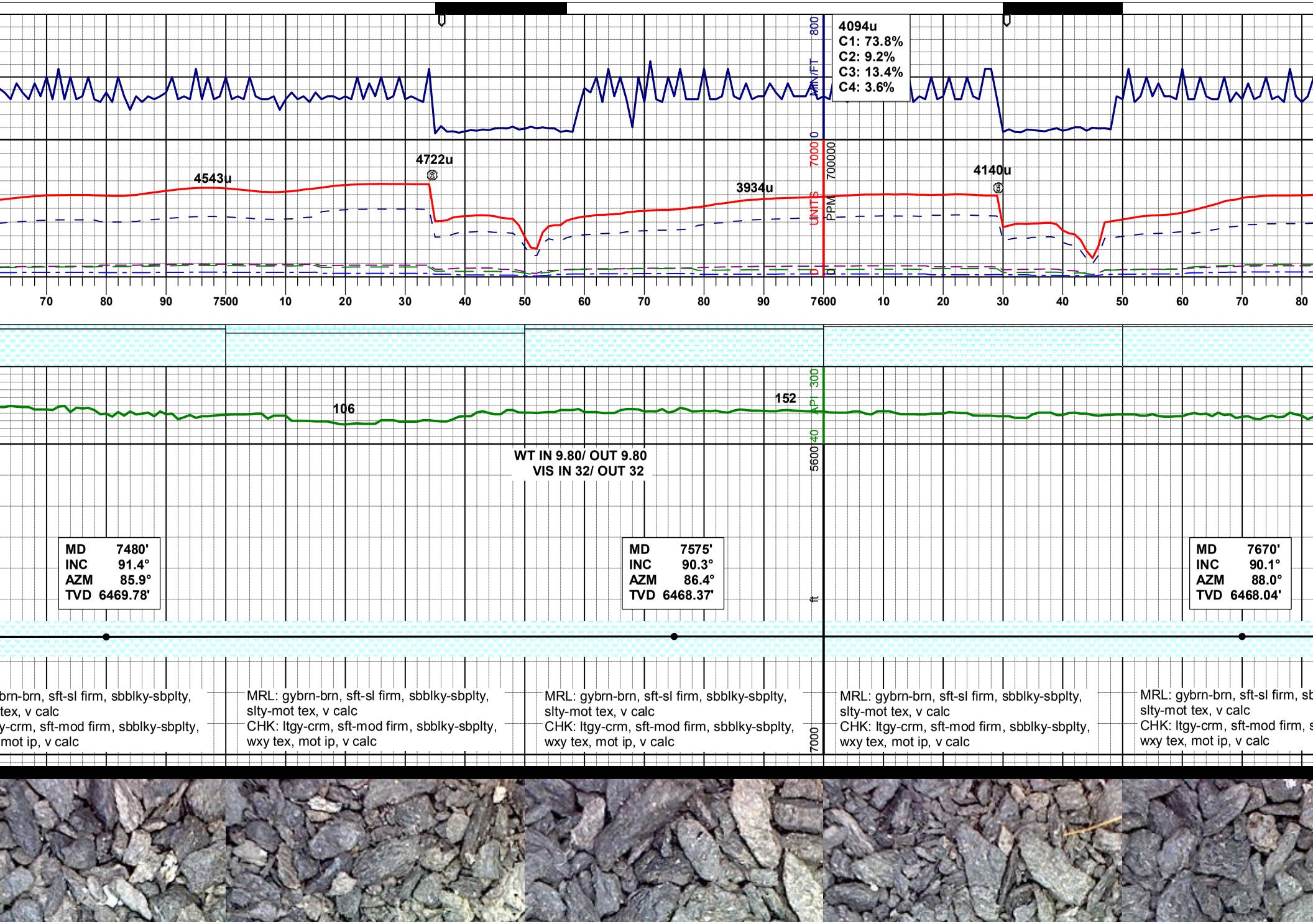


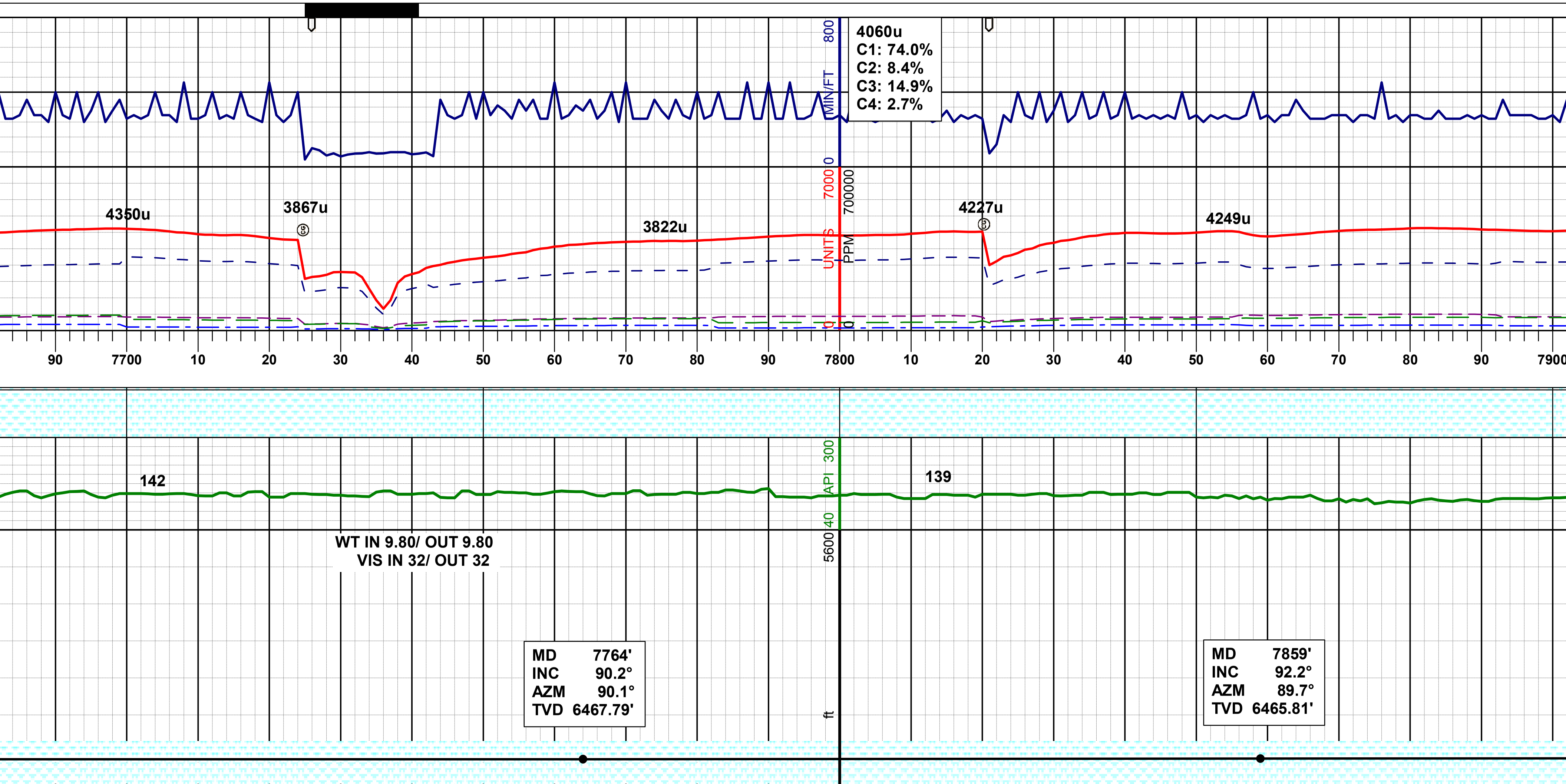
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc

MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc

MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc

MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc


4094u
C1: 73.8%
C2: 9.2%
C3: 13.4%
C4: 3.6%
4543u
4722u
3934u
4140u
800
0
UNITS
700000
PPM
70
80
90
7500
10
20
30
40
50
60
70
80
90
7600
10
20
30
40
50
60
70
80
106
152
300
API
40
5600
WT IN 9.80/ OUT 9.80
VIS IN 32/ OUT 32
MD 7480'
INC 91.4°
AZM 85.9°
TVD 6469.78'
MD 7575'
INC 90.3°
AZM 86.4°
TVD 6468.37'
MD 7670'
INC 90.1°
AZM 88.0°
TVD 6468.04'
ft
7000
brn-brn, sft-sl firm, sbblky-sbplty,
tex, v calc
y-crm, sft-mod firm, sbblky-sbplty,
mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty,
slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty,
wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty,
slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty,
wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty,
slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty,
wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sb
slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, s
wxy tex, mot ip, v calc



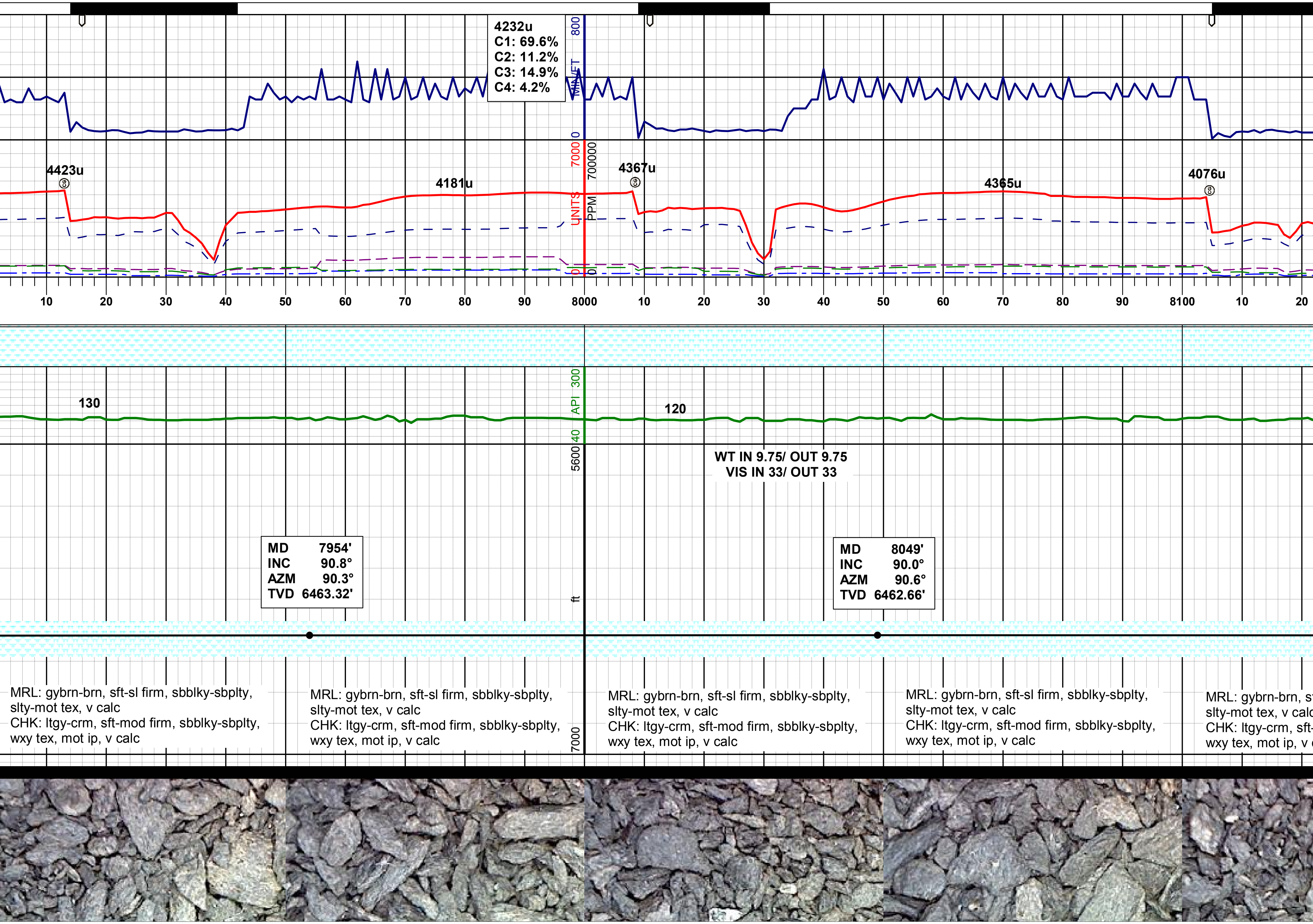
...blky-sbplty,
...bblky-sbplty,

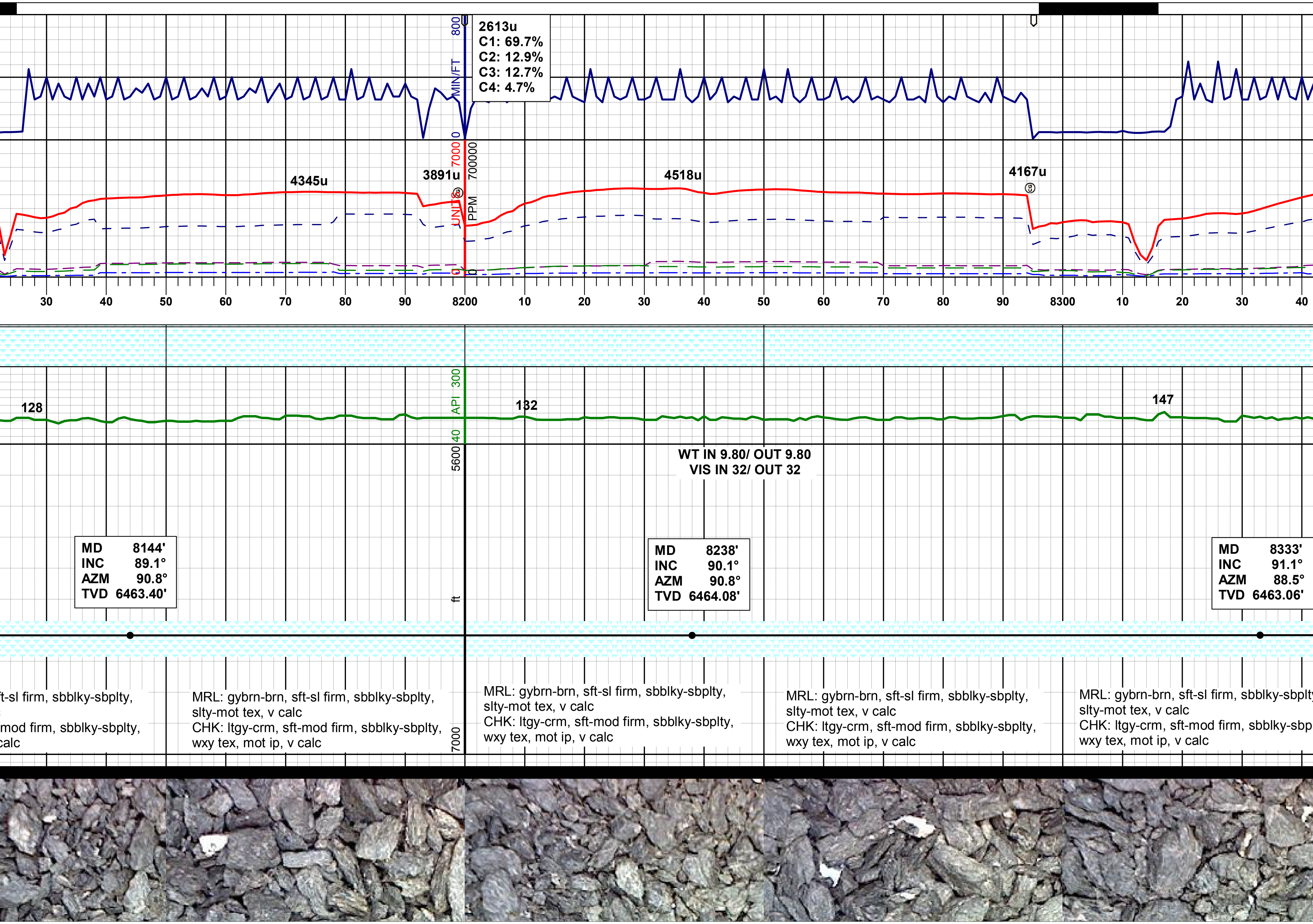
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc

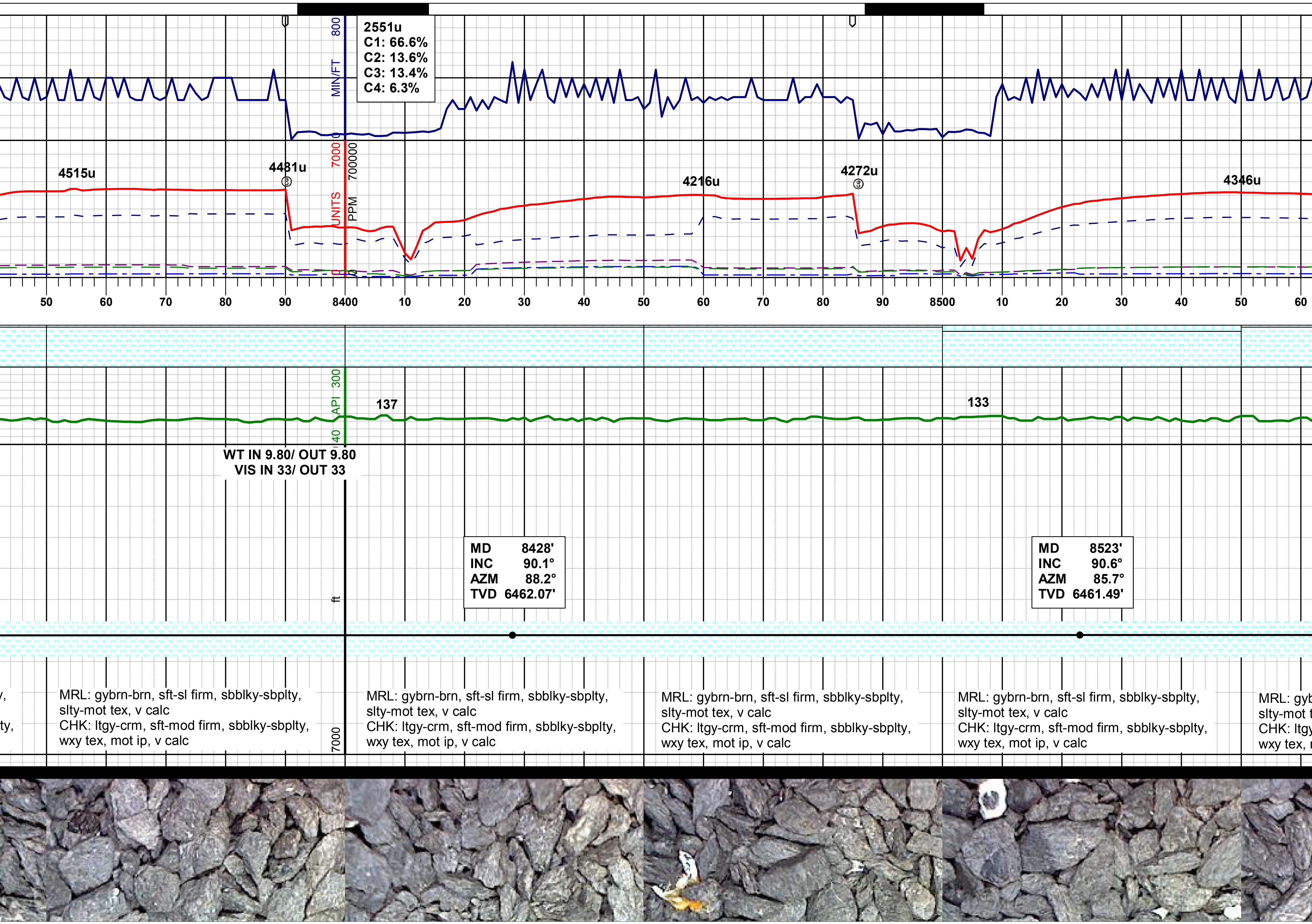
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc

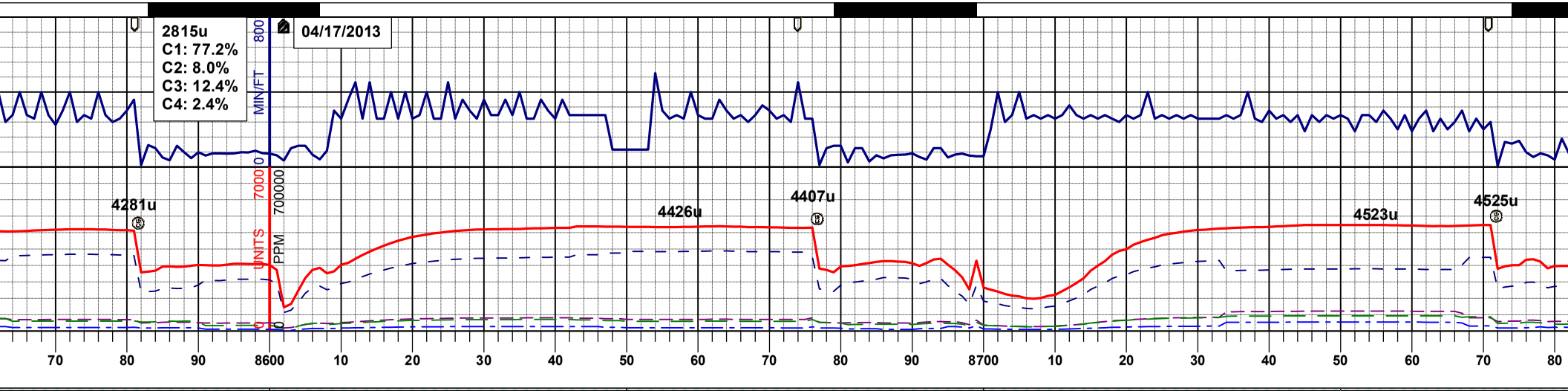
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc

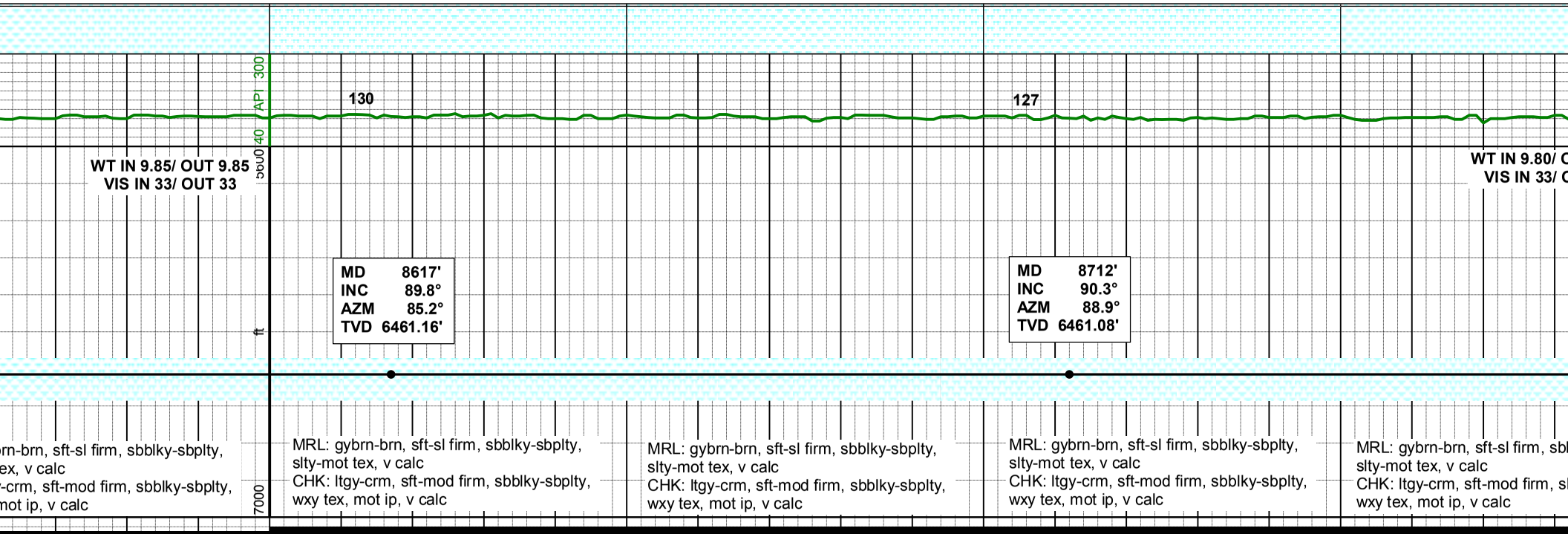
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc

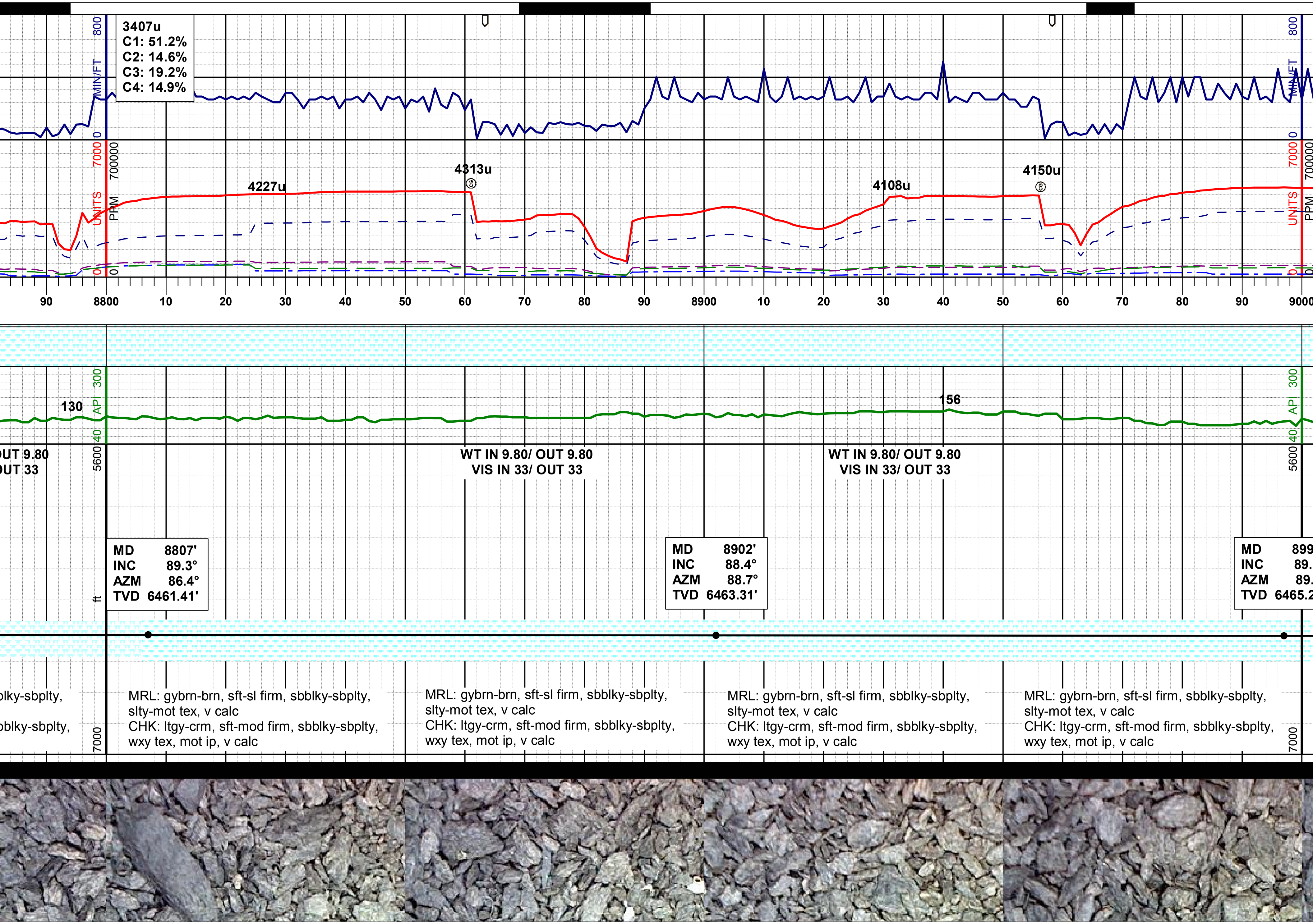

4232u
C1: 69.6%
C2: 11.2%
C3: 14.9%
C4: 4.2%
0 MIN/FT 800
0 UNITS 7000
0 PPM 700000
4423u
4181u
4367u
4365u
4076u
10 20 30 40 50 60 70 80 90 8000 10 20 30 40 50 60 70 80 90 8100 10 20
40 API 300
130
120
5600 ft 7000
WT IN 9.75/ OUT 9.75
VIS IN 33/ OUT 33
MD 7954'
INC 90.8°
AZM 90.3°
TVD 6463.32'
MD 8049'
INC 90.0°
AZM 90.6°
TVD 6462.66'
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc

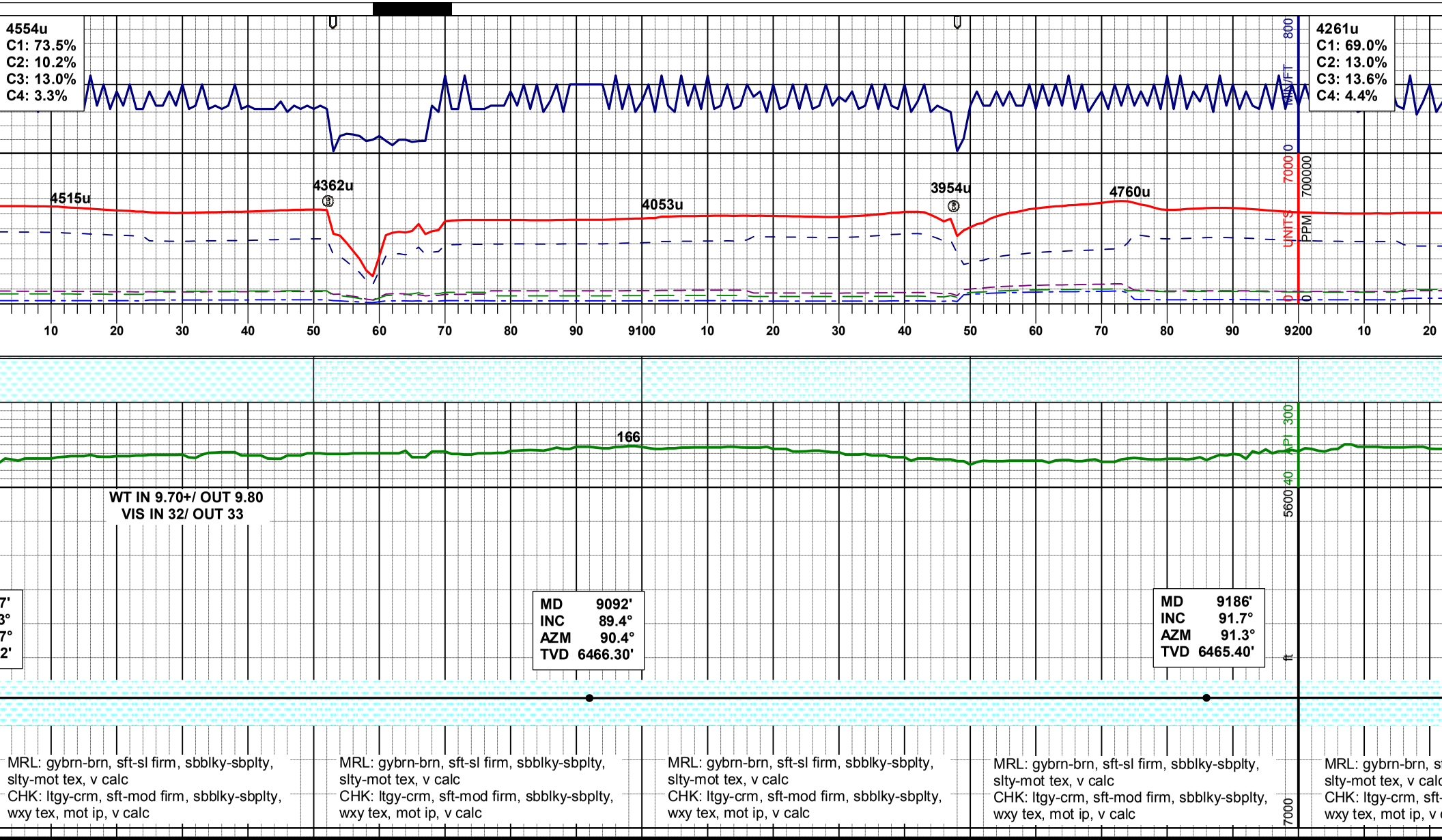

2613u
C1: 69.7%
C2: 12.9%
C3: 12.7%
C4: 4.7%
0 MIN/FT 800
0 UNITS 7000
0 PPM 700000
4345u
3891u
4518u
4167u
30 40 50 60 70 80 90 8200 10 20 30 40 50 60 70 80 90 8300 10 20 30 40
40 API 300
128
132
147
5600 ft 7000
WT IN 9.80/ OUT 9.80
VIS IN 32/ OUT 32
MD 8144'
INC 89.1°
AZM 90.8°
TVD 6463.40'
MD 8238'
INC 90.1°
AZM 90.8°
TVD 6464.08'
MD 8333'
INC 91.1°
AZM 88.5°
TVD 6463.06'
t-sl firm, sbblky-sbplty,
mod firm, sbblky-sbplty,
calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplt
slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbp
wxy tex, mot ip, v calc

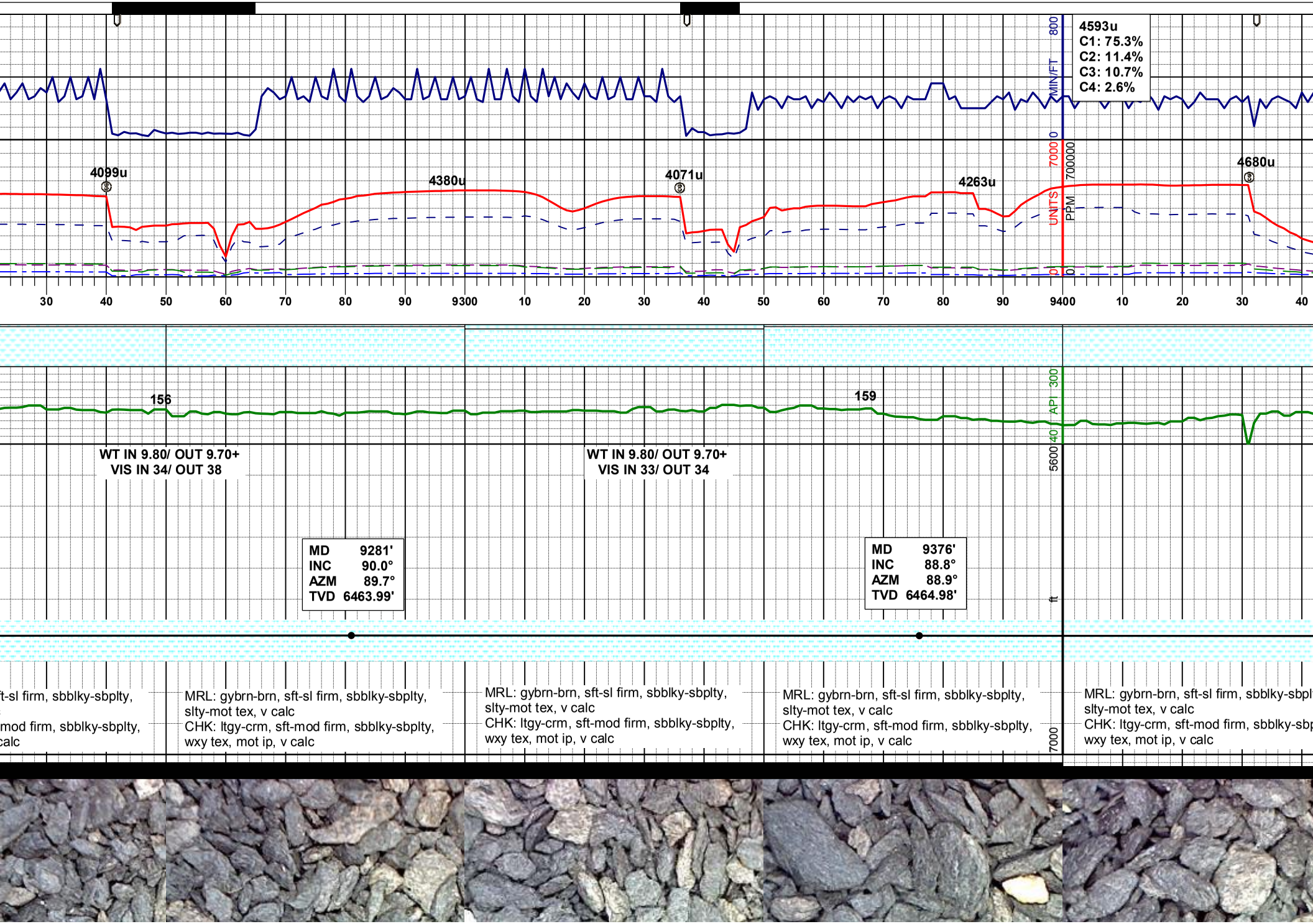

2551u
C1: 66.6%
C2: 13.6%
C3: 13.4%
C4: 6.3%
MIN/FT 0 800
UNITS 0 7000
PPM 0 700000
4515u
4481u
4216u
4272u
4346u
50 60 70 80 90 8400 10 20 30 40 50 60 70 80 90 8500 10 20 30 40 50 60
API 40 300
137
133
WT IN 9.80/ OUT 9.80
VIS IN 33/ OUT 33
MD 8428'
INC 90.1°
AZM 88.2°
TVD 6462.07'
MD 8523'
INC 90.6°
AZM 85.7°
TVD 6461.49'
ft
7000
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc

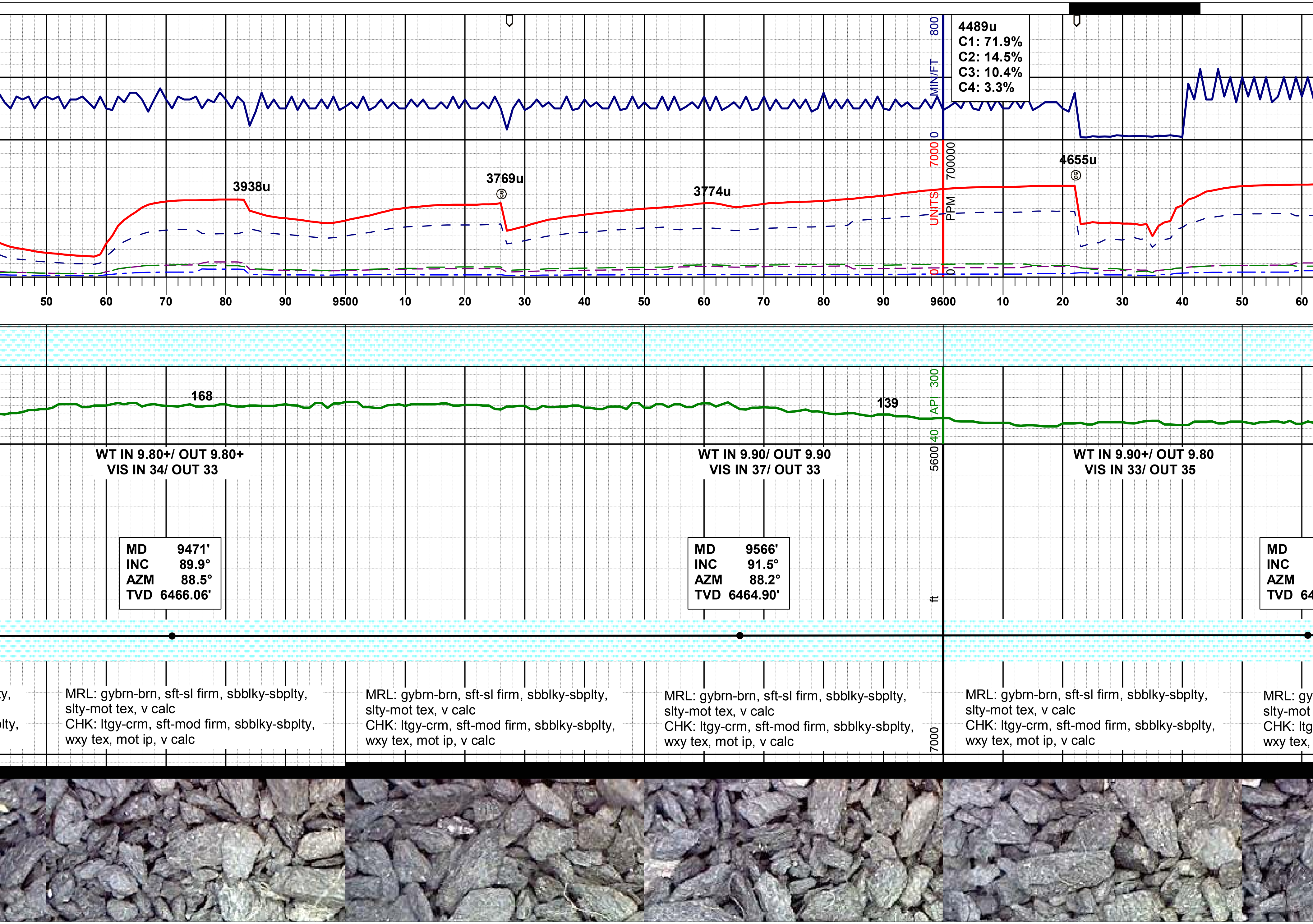

2815u
C1: 77.2%
C2: 8.0%
C3: 12.4%
C4: 2.4%
04/17/2013
MIN/FT
800
0
UNITS
7000
0
PPM
700000
0
4281u
4426u
4407u
4523u
4525u
70
80
90
8600
10
20
30
40
50
60
70
80
90
8700
10
20
30
40
50
60
70
80

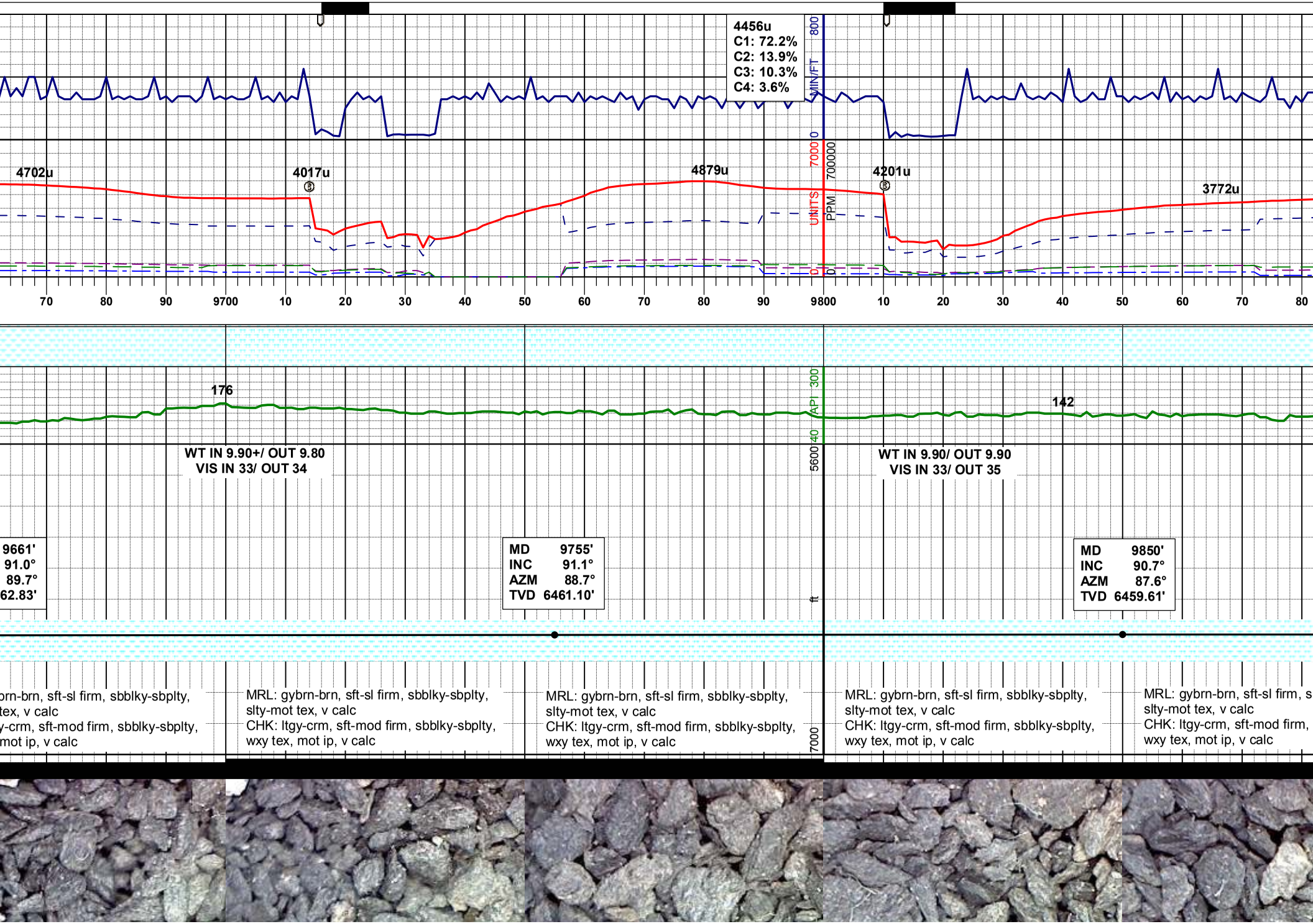

API
300
40
130
127
WT IN 9.85/ OUT 9.85
VIS IN 33/ OUT 33
WT IN 9.80/ O
VIS IN 33/ O
MD 8617'
INC 89.8°
AZM 85.2°
TVD 6461.16'
MD 8712'
INC 90.3°
AZM 88.9°
TVD 6461.08'
ft
7000
rn-brn, sft-sl firm, sbblky-sbplty,
ex, v calc
-crm, sft-mod firm, sbblky-sbplty,
ot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty,
slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty,
wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty,
slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty,
wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty,
slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty,
wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbl
slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sl
wxy tex, mot ip, v calc

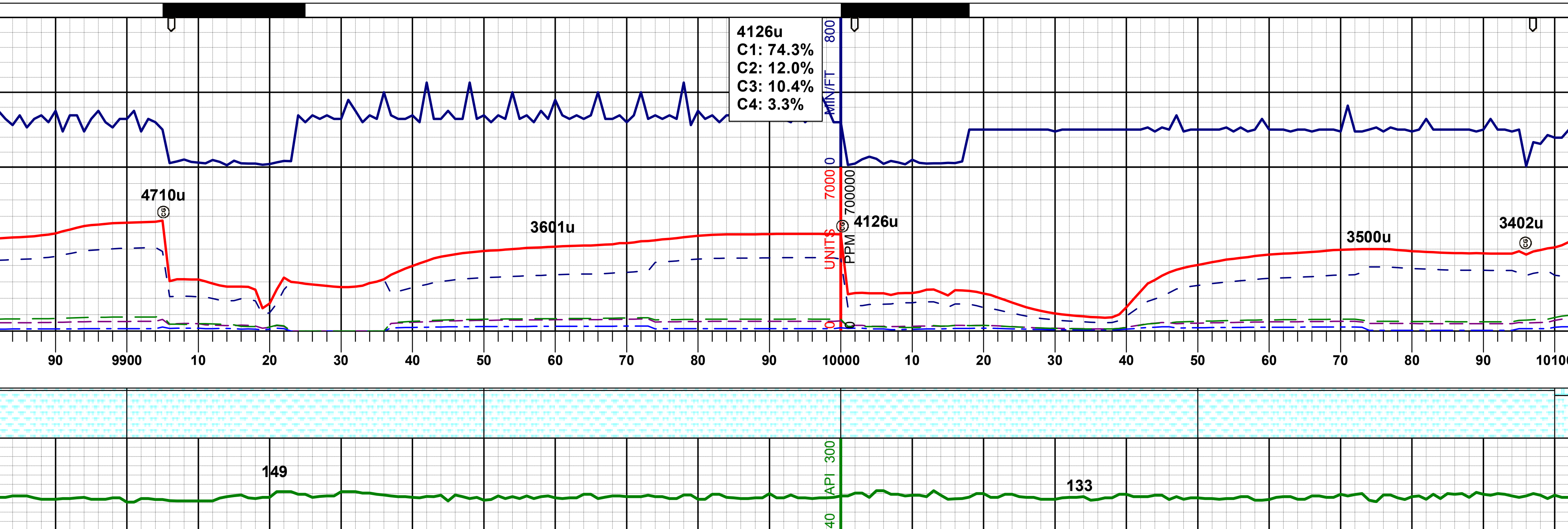

3407u
C1: 51.2%
C2: 14.6%
C3: 19.2%
C4: 14.9%
0 MIN/FT 800
0 UNITS 7000
0 PPM 700000
4227u
4313u
4108u
4150u
90
8800
10
20
30
40
50
60
70
80
90
8900
10
20
30
40
50
60
70
80
90
9000
40 API 300
130
156
5600 ft 7000
OUT 9.80
OUT 33
WT IN 9.80/ OUT 9.80
VIS IN 33/ OUT 33
WT IN 9.80/ OUT 9.80
VIS IN 33/ OUT 33
MD 8807'
INC 89.3°
AZM 86.4°
TVD 6461.41'
MD 8902'
INC 88.4°
AZM 88.7°
TVD 6463.31'
MD 899
INC 89.
AZM 89.
TVD 6465.2
blky-sbplty,
blky-sbplty,
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc


4554u
C1: 73.5%
C2: 10.2%
C3: 13.0%
C4: 3.3%
4261u
C1: 69.0%
C2: 13.0%
C3: 13.6%
C4: 4.4%
4515u
4362u
4053u
3954u
4760u
800
0
700000
0
UNITS
PPM
10
20
30
40
50
60
70
80
90
9100
9200
166
API
300
40
5600
WT IN 9.70+/ OUT 9.80
VIS IN 32/ OUT 33
MD 9092'
INC 89.4°
AZM 90.4°
TVD 6466.30'
MD 9186'
INC 91.7°
AZM 91.3°
TVD 6465.40'
ft
7000
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc


4593u
C1: 75.3%
C2: 11.4%
C3: 10.7%
C4: 2.6%
MIN/FT
800
0
7000
0
UNITS
PPM
700000
0
4099u
4380u
4071u
4263u
4680u
30
40
50
60
70
80
90
9300
10
20
30
40
50
60
70
80
90
9400
10
20
30
40
156
159
API
300
40
5600
ft
WT IN 9.80/ OUT 9.70+
VIS IN 34/ OUT 38
WT IN 9.80/ OUT 9.70+
VIS IN 33/ OUT 34
MD 9281'
INC 90.0°
AZM 89.7°
TVD 6463.99'
MD 9376'
INC 88.8°
AZM 88.9°
TVD 6464.98'
ft-sl firm, sbblky-sbplty,
mod firm, sbblky-sbplty,
calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbpl
slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbp
wxy tex, mot ip, v calc
7000


4489u
C1: 71.9%
C2: 14.5%
C3: 10.4%
C4: 3.3%
0 MIN/FT 800
0 UNITS 7000
0 PPM 700000
3938u
3769u
3774u
4655u
50 60 70 80 90 9500 10 20 30 40 50 60 70 80 90 9600 10 20 30 40 50 60
40 API 300
168
139
5600 ft 7000
WT IN 9.80+/ OUT 9.80+
VIS IN 34/ OUT 33
WT IN 9.90/ OUT 9.90
VIS IN 37/ OUT 33
WT IN 9.90+/ OUT 9.80
VIS IN 33/ OUT 35
MD 9471'
INC 89.9°
AZM 88.5°
TVD 6466.06'
MD 9566'
INC 91.5°
AZM 88.2°
TVD 6464.90'
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc


4456u
C1: 72.2%
C2: 13.9%
C3: 10.3%
C4: 3.6%
800
MIN/FT
0
7000
0
700000
UNITS
PPM
C
C
4702u
4017u
4879u
4201u
3772u
70
80
90
9700
10
20
30
40
50
60
70
80
90
9800
10
20
30
40
50
60
70
80
176
142
300
API
40
5600
ft
7000
WT IN 9.90+/ OUT 9.80
VIS IN 33/ OUT 34
WT IN 9.90/ OUT 9.90
VIS IN 33/ OUT 35
9661'
91.0°
89.7°
62.83'
MD 9755'
INC 91.1°
AZM 88.7°
TVD 6461.10'
MD 9850'
INC 90.7°
AZM 87.6°
TVD 6459.61'
brn-brn, sft-sl firm, sbblky-sbplty,
tex, v calc
y-crm, sft-mod firm, sbblky-sbplty,
mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty,
slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty,
wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty,
slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty,
wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty,
slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty,
wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, s
slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm,
wxy tex, mot ip, v calc



WT IN 9.80+/ OUT 9.80+
VIS IN 33/ OUT 34

WT IN 9.80+/ OUT 9.80+
VIS IN 34/ OUT 34

WT IN 9.90/ OUT 9.
VIS IN 33/ OUT 35

5600 ft 7000

MD	9945'
INC	89.5°
AZM	87.6°
TVD	6459.45'

MD	10040'
INC	90.2°
AZM	88.7°
TVD	6459.70'

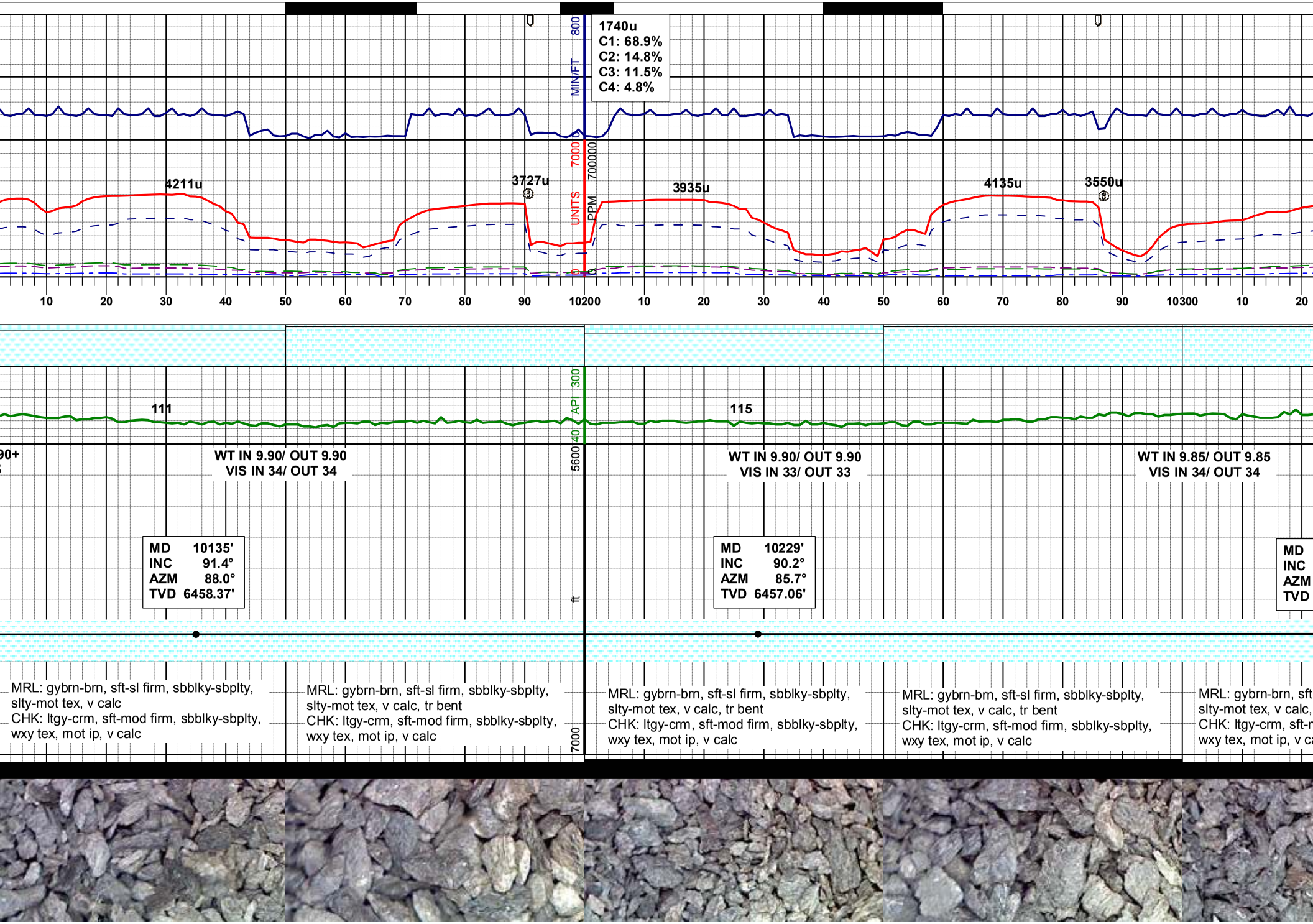
sbblky-sbplty,
sbblky-sbplty,

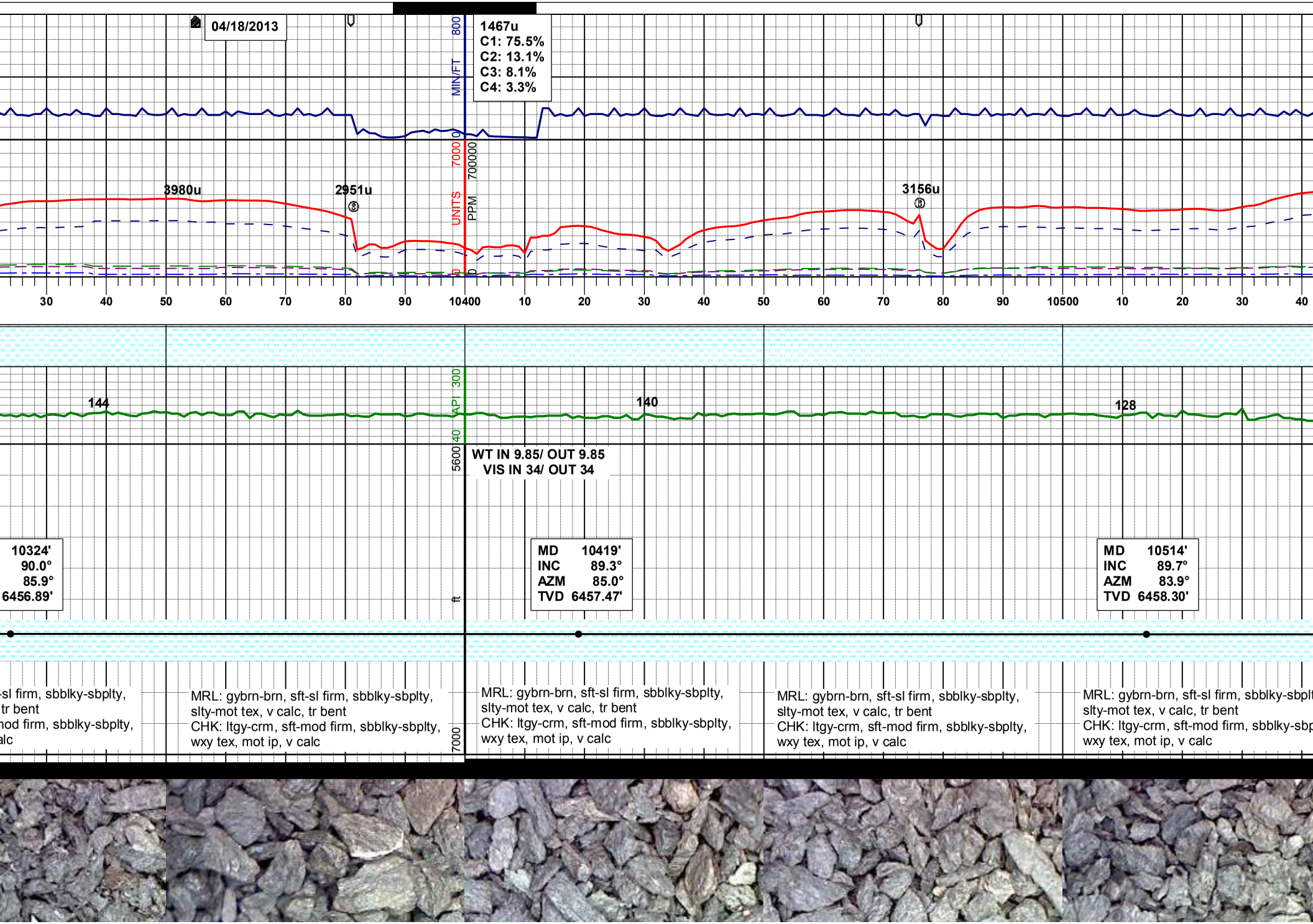
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc

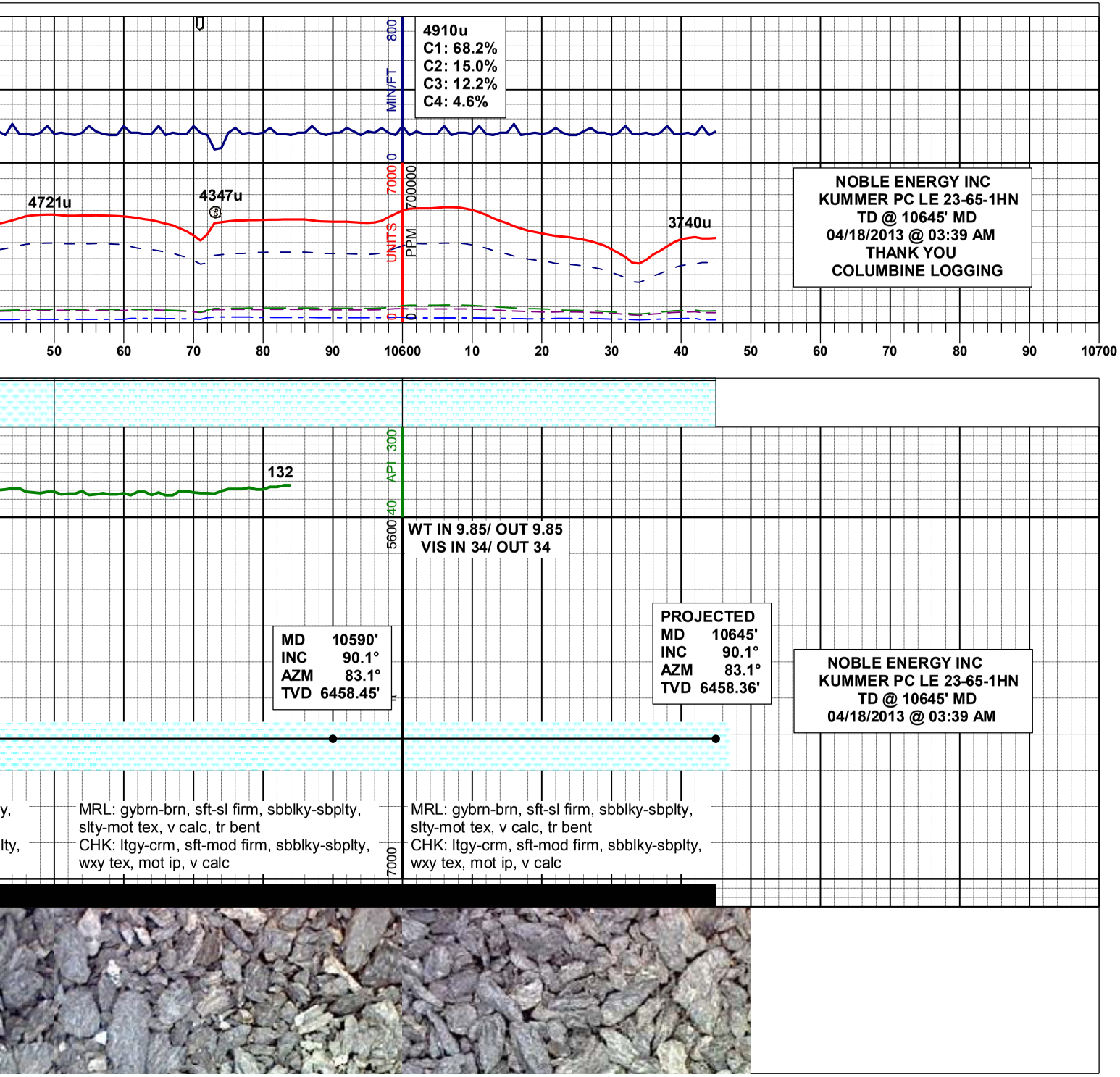
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc

MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc

MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc


1740u
C1: 68.9%
C2: 14.8%
C3: 11.5%
C4: 4.8%
MIN/FT
800
7000
UNITS
PPM
700000
0
4211u
3727u
3935u
4135u
3550u
10
20
30
40
50
60
70
80
90
10200
10300
API
300
40
5600
ft
111
115
WT IN 9.90/ OUT 9.90
VIS IN 34/ OUT 34
WT IN 9.90/ OUT 9.90
VIS IN 33/ OUT 33
WT IN 9.85/ OUT 9.85
VIS IN 34/ OUT 34
MD 10135'
INC 91.4°
AZM 88.0°
TVD 6458.37'
MD 10229'
INC 90.2°
AZM 85.7°
TVD 6457.06'
MD
INC
AZM
TVD
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc, tr bent
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
7000
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc, tr bent
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc, tr bent
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft
slty-mot tex, v calc,
CHK: ltgy-crm, sft-m
wxy tex, mot ip, v ca


04/18/2013
1467u
C1: 75.5%
C2: 13.1%
C3: 8.1%
C4: 3.3%
MIN/FT
800
0
UNITS
7000
0
PPM
700000
0
3980u
2951u
3156u
30
40
50
60
70
80
90
10400
10
20
30
40
50
60
70
80
90
10500
10
20
30
40
144
140
128
API
300
40
5600
WT IN 9.85/ OUT 9.85
VIS IN 34/ OUT 34
ft
7000
10324'
90.0°
85.9°
6456.89'
MD 10419'
INC 89.3°
AZM 85.0°
TVD 6457.47'
MD 10514'
INC 89.7°
AZM 83.9°
TVD 6458.30'
-sl firm, sbblky-sbplty,
tr bent
nod firm, sbblky-sbplty,
alc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc, tr bent
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc, tr bent
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc, tr bent
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbpl
slty-mot tex, v calc, tr bent
CHK: ltgy-crm, sft-mod firm, sbblky-sbp
wxy tex, mot ip, v calc


4910u
C1: 68.2%
C2: 15.0%
C3: 12.2%
C4: 4.6%
MIN/FT
800
0
UNITS
7000
0
PPM
700000
0
4721u
4347u
3740u
NOBLE ENERGY INC
KUMMER PC LE 23-65-1HN
TD @ 10645' MD
04/18/2013 @ 03:39 AM
THANK YOU
COLUMBINE LOGGING
50
60
70
80
90
10600
10
20
30
40
50
60
70
80
90
10700
132
API
300
40
5600
WT IN 9.85/ OUT 9.85
VIS IN 34/ OUT 34
MD 10590'
INC 90.1°
AZM 83.1°
TVD 6458.45'
PROJECTED
MD 10645'
INC 90.1°
AZM 83.1°
TVD 6458.36'
NOBLE ENERGY INC
KUMMER PC LE 23-65-1HN
TD @ 10645' MD
04/18/2013 @ 03:39 AM
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc, tr bent
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
MRL: gybrn-brn, sft-sl firm, sbblky-sbplty, slty-mot tex, v calc, tr bent
CHK: ltgy-crm, sft-mod firm, sbblky-sbplty, wxy tex, mot ip, v calc
7000