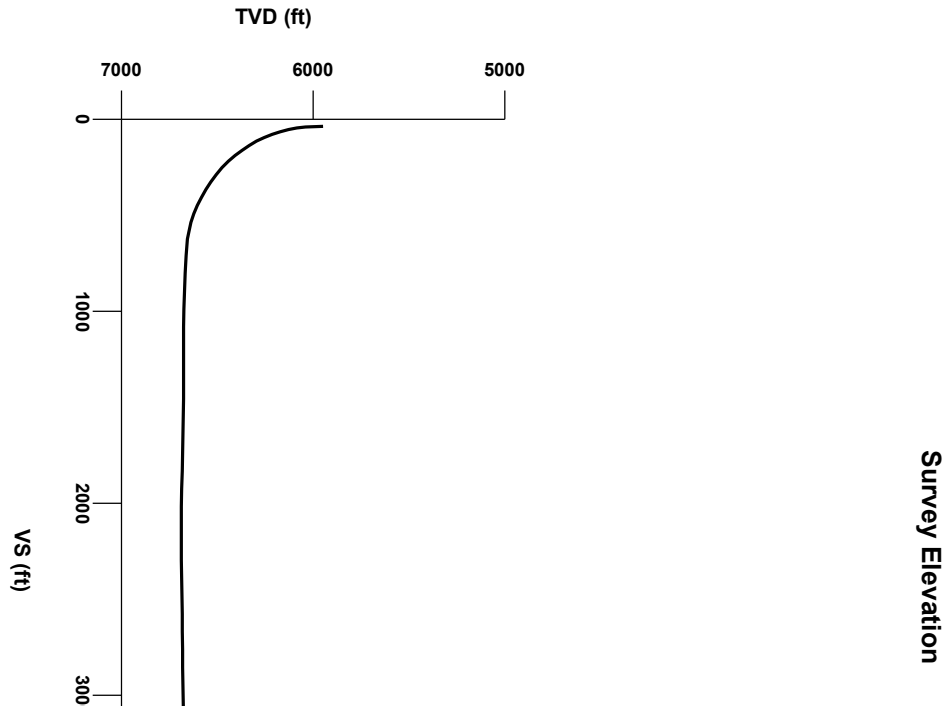
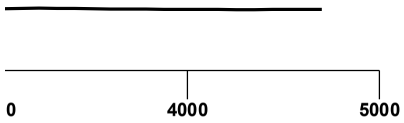
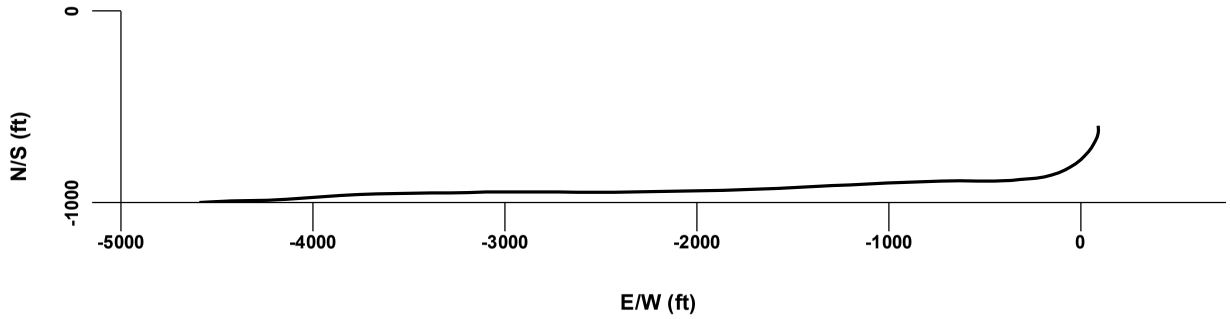
OPERATOR:	**NOBLE ENERGY INC.**
WELL:	**SLW RANCH B01-66-1HN**
LOCATION:	**SEC 1 T5N R64W**
COUNTY:	**WELD**
STATE:	**COLORADO**
SPOT:	**1,420' FNL; 199' FEL**
ELEVATION:	**4,612' GL; 4,636' KB**
FIELD:	**WATTENBERG**
SPUD DATE:	**01/14/2013**
TD DATE:	**01/20/2013**
DATES LOGGED:	**01/17/2013 - 01/20/2013 (HORIZONTAL)**
DEPTHS LOGGED:	**5,978' - 11,201' (HORIZONTAL)**
LOGGERS:	**CHRIS COOK; CHRIS SCAHEL**
DRILLING FLUID:	**LSND**
DRILLING RIG:	**H&P 315**
API:	**05-123-36318**
LOG TYPE:	**HORIZONTAL**
SCALE:	**1:240 (5 inches per 100 feet)**
REMARKS:	**SEE CORRESPONDING VERTICAL LOG SLW RANCH B01-66-1HN VERT. LAT/LON 40.431850/-104.489460 Wellsite Geological Services Provided by Columbine Logging Inc.**





Survey Plan



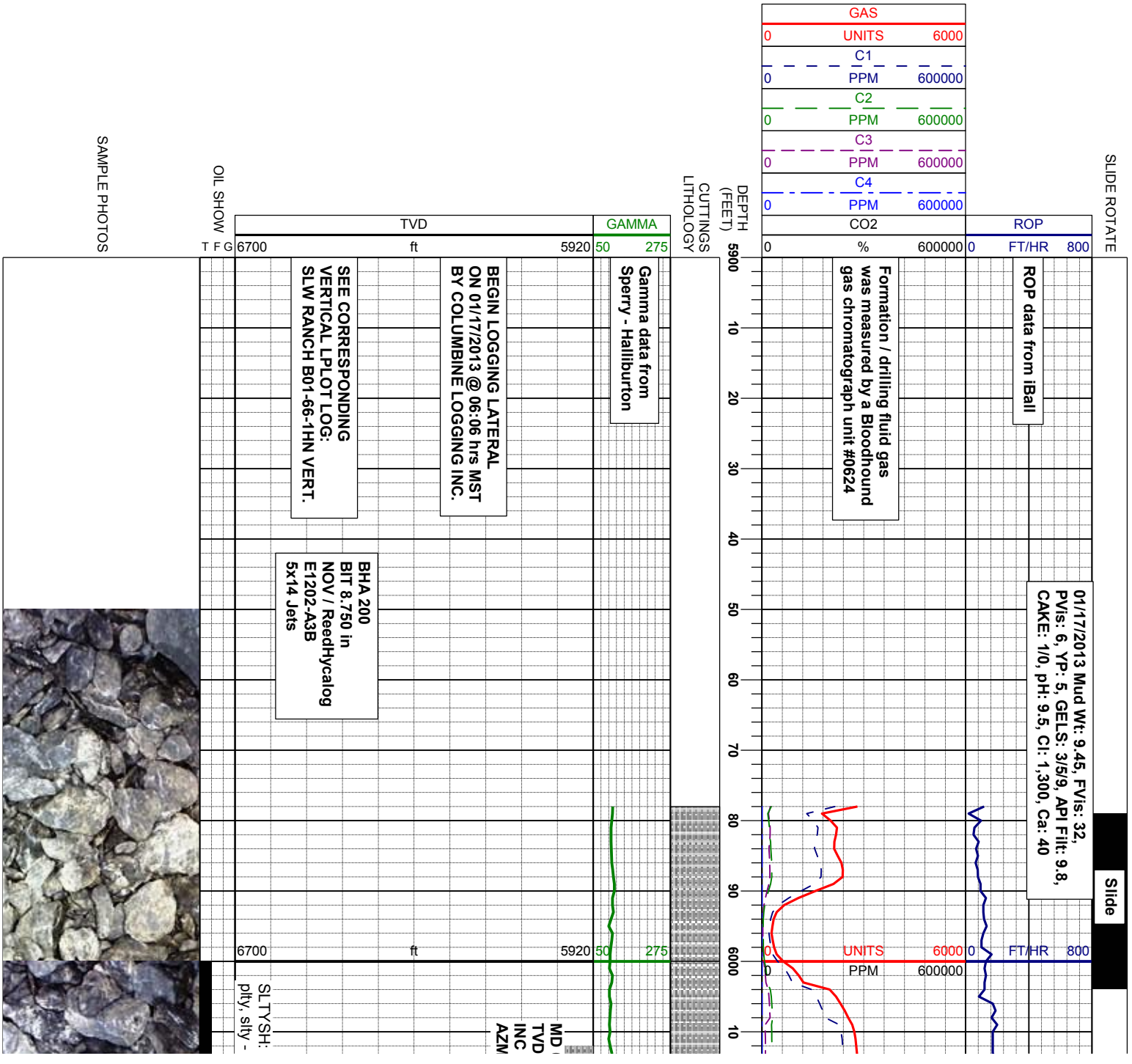
1000

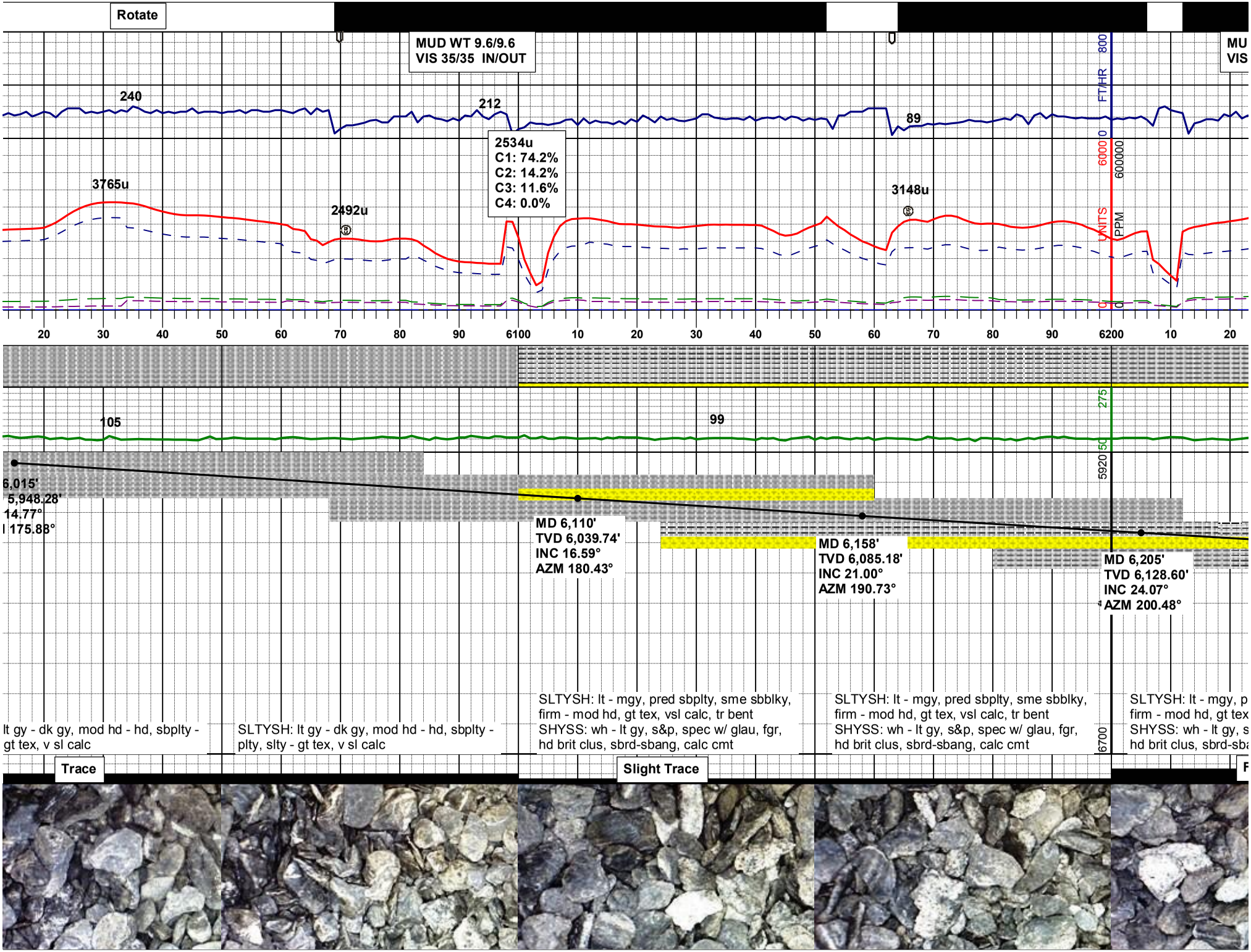
LITHOLOGIES

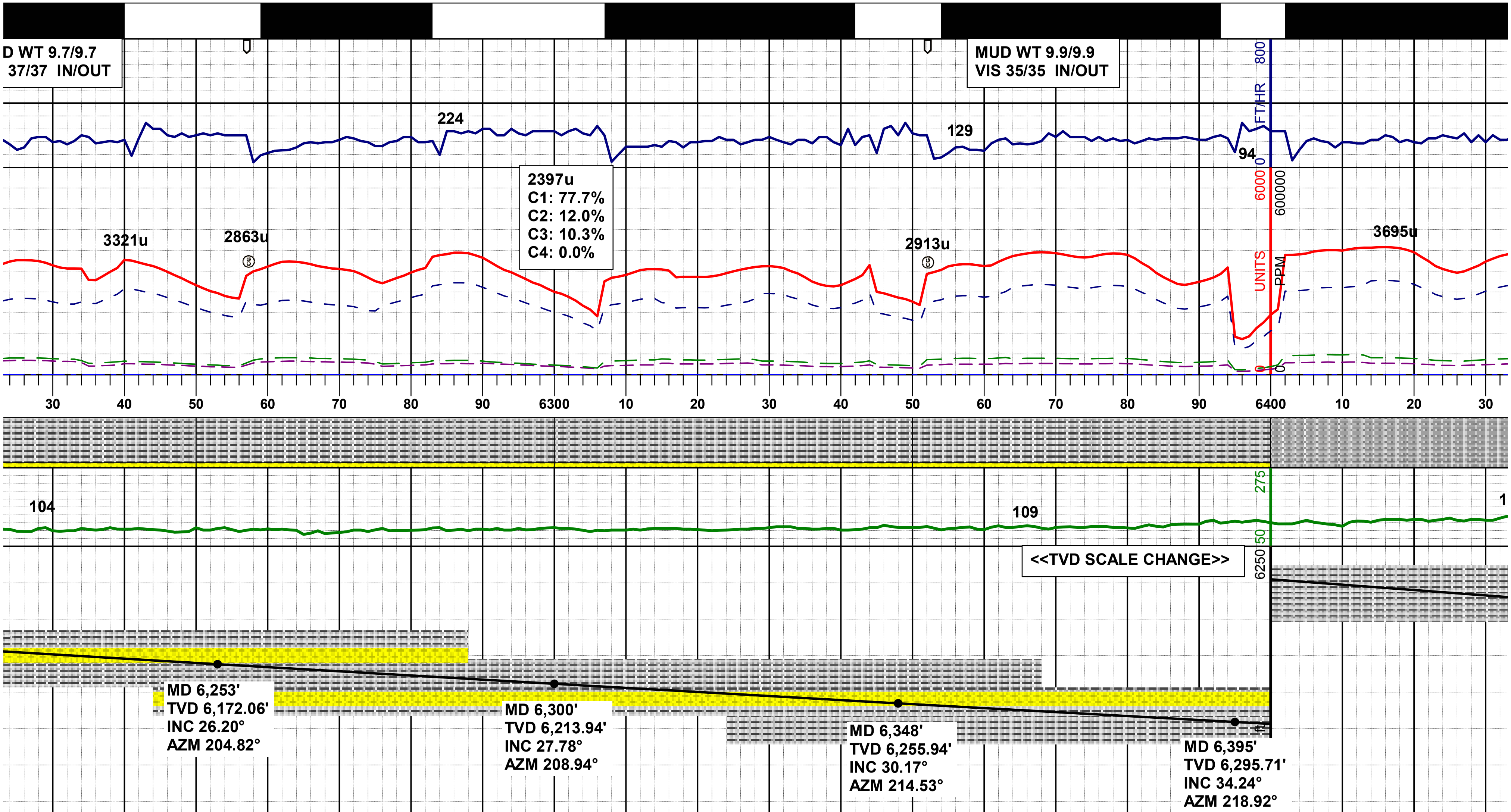
Chalk | Marl | Shaly Sandstone | Silty Shale

ENGINEERING SYMBOLS

Connection | Connection Gas | Midnight Depth




Rotate
MUD WT 9.6/9.6
VIS 35/35 IN/OUT
MU
VIS
240
212
89
2534u
C1: 74.2%
C2: 14.2%
C3: 11.6%
C4: 0.0%
3765u
2492u
3148u
FT/HR
800
0
6000
600000
UNITS
PPM
0
0
20
30
40
50
60
70
80
90
6100
10
20
30
40
50
60
70
80
90
6200
10
20
105
99
275
50
5920
6,015'
5,948.28'
14.77°
175.88°
MD 6,110'
TVD 6,039.74'
INC 16.59°
AZM 180.43°
MD 6,158'
TVD 6,085.18'
INC 21.00°
AZM 190.73°
MD 6,205'
TVD 6,128.60'
INC 24.07°
AZM 200.48°
6700
lt gy - dk gy, mod hd - hd, sbplty - gt tex, v sl calc
SLTYSH: lt gy - dk gy, mod hd - hd, sbplty - plty, slty - gt tex, v sl calc
SLTYSH: lt - mgy, pred sbplty, sme sbblky, firm - mod hd, gt tex, vsl calc, tr bent
SHYSS: wh - lt gy, s&p, spec w/ glau, fgr, hd brit clus, sbrd-sbang, calc cmt
SLTYSH: lt - mgy, pred sbplty, sme sbblky, firm - mod hd, gt tex, vsl calc, tr bent
SHYSS: wh - lt gy, s&p, spec w/ glau, fgr, hd brit clus, sbrd-sbang, calc cmt
SLTYSH: lt - mgy, p
firm - mod hd, gt tex
SHYSS: wh - lt gy, s
hd brit clus, sbrd-sba
Trace
Slight Trace



red sbplty, sme sbblky,
, vsl calc, tr bent
&p, spec w/ glau, fgr,
ang, calc cmt

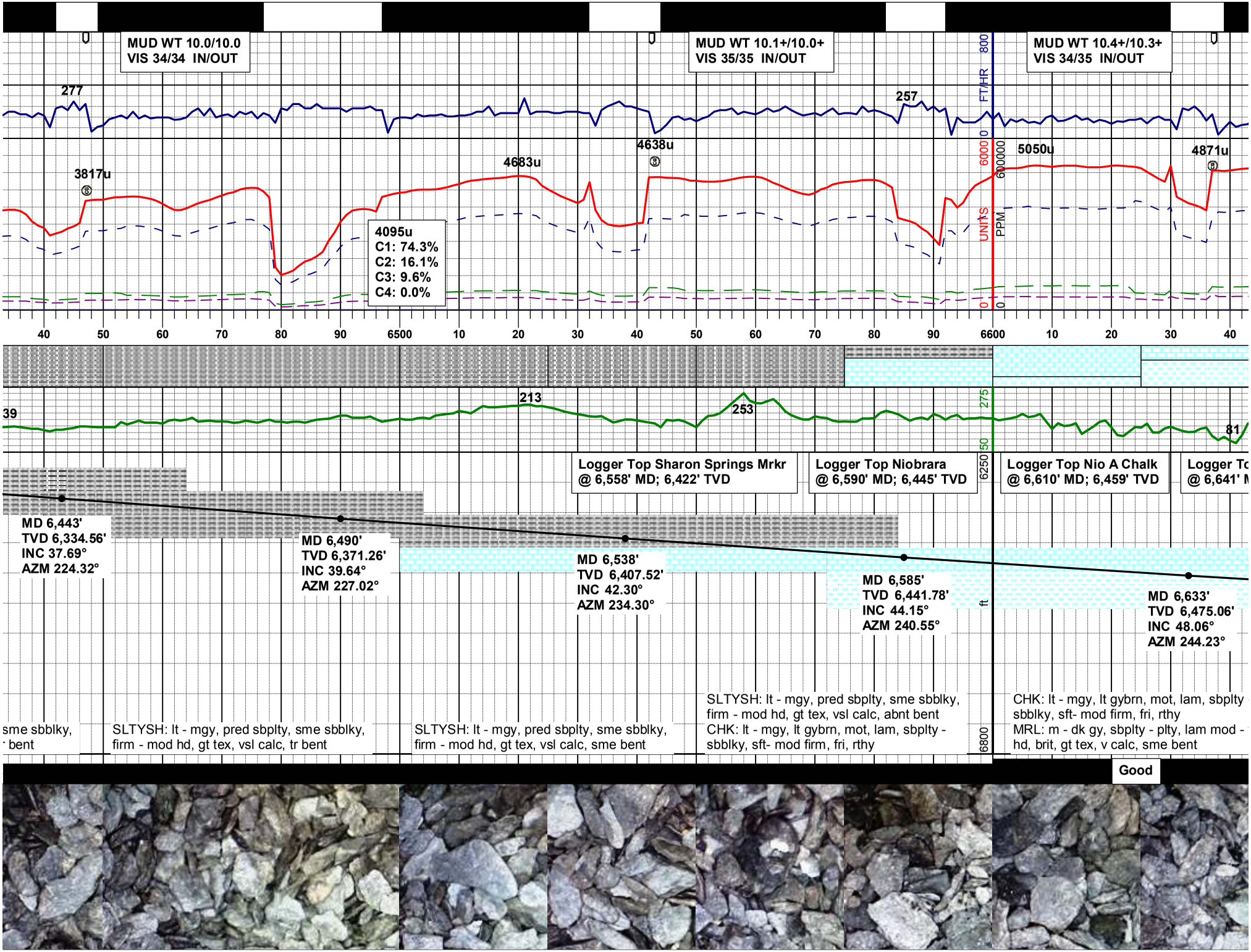
SLTYSH: lt - mgy, pred sbplty, sme sbblky,
firm - mod hd, gt tex, vsl calc, tr bent
SHYSS: wh - lt gy, s&p, spec w/ glau, fgr,
hd brit clus, sbrd-sbang, calc cmt

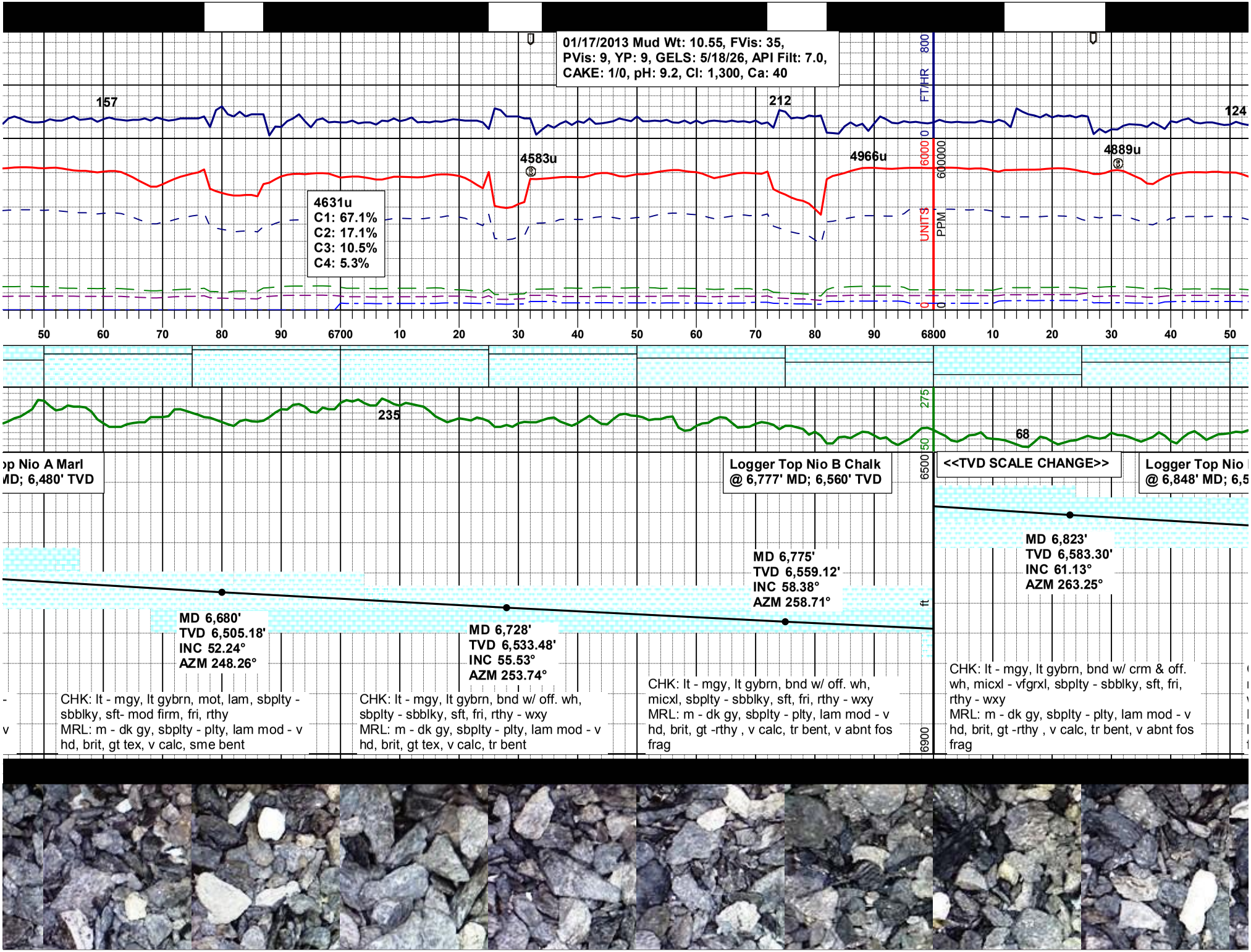
SLTYSH: lt - mgy, pred sbplty, sme sbblky,
firm - mod hd, gt tex, vsl calc, tr bent
SHYSS: wh - lt gy, s&p, spec w/ glau, fgr,
hd brit clus, sbrd-sbang, calc cmt

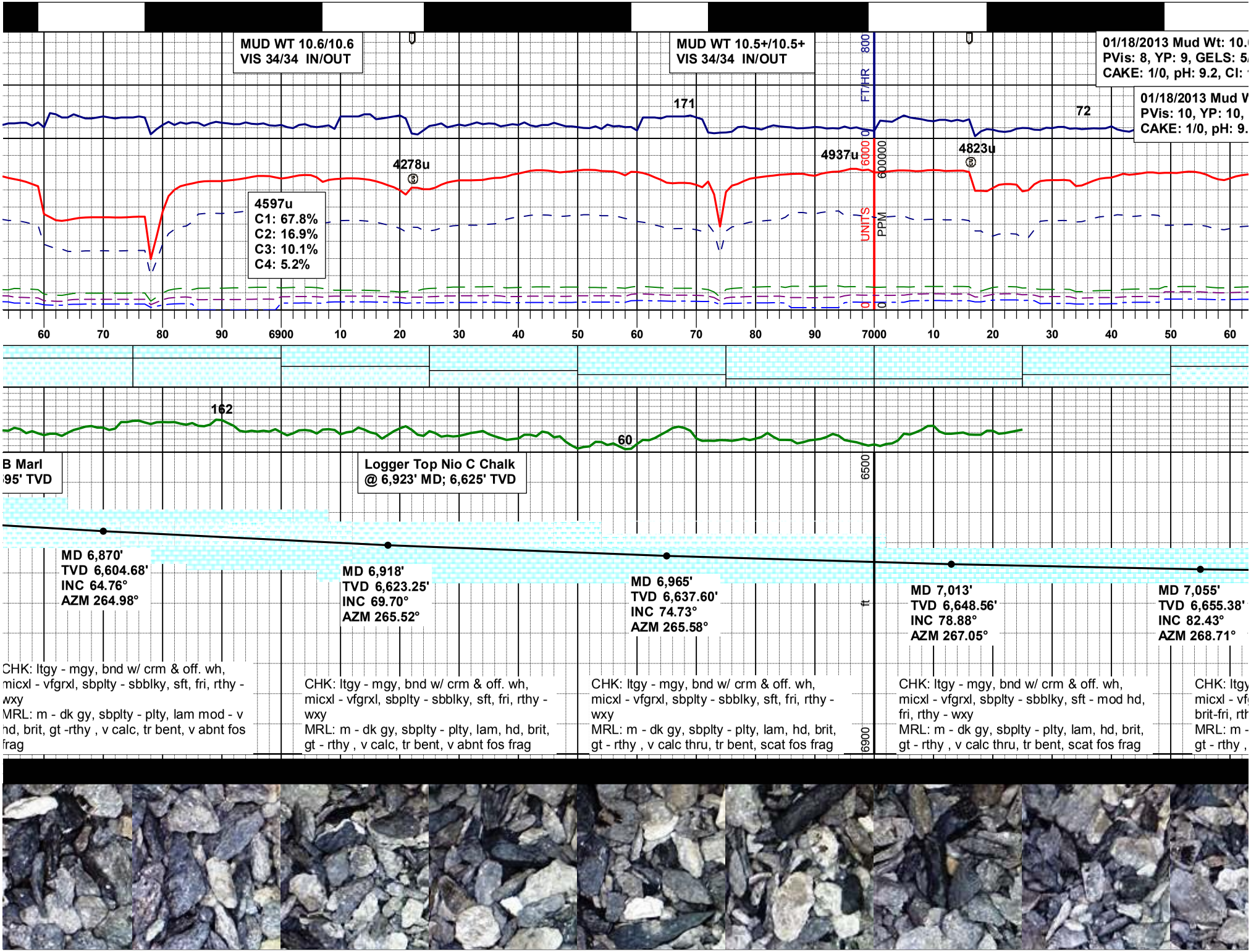
SLTYSH: lt - mgy, pred sbplty, sme sbblky,
firm - mod hd, gt tex, vsl calc, tr bent
SHYSS: wh - lt gy, s&p, spec w/ glau, fgr,
hd brit clus, sbrd-sbang, calc cmt

SLTYSH: lt - mgy, pred sbplty,
firm - mod hd, gt tex, vsl calc, tr

Fair | Trace | Moderate


MUD WT 10.0/10.0
VIS 34/34 IN/OUT
MUD WT 10.1+/10.0+
VIS 35/35 IN/OUT
MUD WT 10.4+/10.3+
VIS 34/35 IN/OUT
277
257
FT/HR
800
0
3817u
4683u
4638u
5050u
4871u
6000
600000
UNITS
PPM
0
4095u
C1: 74.3%
C2: 16.1%
C3: 9.6%
C4: 0.0%
40 50 60 70 80 90 6500 10 20 30 40 50 60 70 80 90 6600 10 20 30 40
39
213
253
81
275
50
Logger Top Sharon Springs Mrkr
@ 6,558' MD; 6,422' TVD
Logger Top Niobrara
@ 6,590' MD; 6,445' TVD
Logger Top Nio A Chalk
@ 6,610' MD; 6,459' TVD
Logger To
@ 6,641' M
6250
MD 6,443'
TVD 6,334.56'
INC 37.69°
AZM 224.32°
MD 6,490'
TVD 6,371.26'
INC 39.64°
AZM 227.02°
MD 6,538'
TVD 6,407.52'
INC 42.30°
AZM 234.30°
MD 6,585'
TVD 6,441.78'
INC 44.15°
AZM 240.55°
MD 6,633'
TVD 6,475.06'
INC 48.06°
AZM 244.23°
ft
sme sbblky,
bent
SLTYSH: lt - mgy, pred sbplty, sme sbblky, firm - mod hd, gt tex, vsl calc, tr bent
SLTYSH: lt - mgy, pred sbplty, sme sbblky, firm - mod hd, gt tex, vsl calc, sme bent
SLTYSH: lt - mgy, pred sbplty, sme sbblky, firm - mod hd, gt tex, vsl calc, abnt bent
CHK: lt - mgy, lt gybrn, mot, lam, sbplty - sbblky, sft- mod firm, fri, rthy
CHK: lt - mgy, lt gybrn, mot, lam, sbplty
sbblky, sft- mod firm, fri, rthy
MRL: m - dk gy, sbplty - plty, lam mod -
hd, brit, gt tex, v calc, sme bent
6800
Good


01/17/2013 Mud Wt: 10.55, FVis: 35,
PVis: 9, YP: 9, GELS: 5/18/26, API Filt: 7.0,
CAKE: 1/0, pH: 9.2, Cl: 1,300, Ca: 40
157
212
124
FT/HR
800
0
4583u
4966u
4889u
6000
0
600000
0
4631u
C1: 67.1%
C2: 17.1%
C3: 10.5%
C4: 5.3%
UNITS
PPM
50
60
70
80
90
6700
10
20
30
40
50
60
70
80
90
6800
10
20
30
40
50
235
68
275
50
op Nio A Marl
MD; 6,480' TVD
Logger Top Nio B Chalk
@ 6,777' MD; 6,560' TVD
<<TVD SCALE CHANGE>>
Logger Top Nio
@ 6,848' MD; 6,5
6500
MD 6,823'
TVD 6,583.30'
INC 61.13°
AZM 263.25°
MD 6,775'
TVD 6,559.12'
INC 58.38°
AZM 258.71°
ft
MD 6,680'
TVD 6,505.18'
INC 52.24°
AZM 248.26°
MD 6,728'
TVD 6,533.48'
INC 55.53°
AZM 253.74°
CHK: lt - mgy, lt gybrn, mot, lam, sbplty - sbblky, sft- mod firm, fri, rthy
MRL: m - dk gy, sbplty - plty, lam mod - v hd, brit, gt tex, v calc, sme bent
CHK: lt - mgy, lt gybrn, bnd w/ off. wh, sbplty - sbblky, sft, fri, rthy - wxy
MRL: m - dk gy, sbplty - plty, lam mod - v hd, brit, gt tex, v calc, tr bent
CHK: lt - mgy, lt gybrn, bnd w/ off. wh, micxl, sbplty - sbblky, sft, fri, rthy - wxy
MRL: m - dk gy, sbplty - plty, lam mod - v hd, brit, gt -rthy , v calc, tr bent, v abnt fos frag
CHK: lt - mgy, lt gybrn, bnd w/ crm & off. wh, micxl - vfgrxl, sbplty - sbblky, sft, fri, rthy - wxy
MRL: m - dk gy, sbplty - plty, lam mod - v hd, brit, gt -rthy , v calc, tr bent, v abnt fos frag
6900


MUD WT 10.6/10.6
VIS 34/34 IN/OUT
MUD WT 10.5+/10.5+
VIS 34/34 IN/OUT
01/18/2013 Mud Wt: 10.
PVis: 8, YP: 9, GELS: 5
CAKE: 1/0, pH: 9.2, Cl:
01/18/2013 Mud W
PVis: 10, YP: 10,
CAKE: 1/0, pH: 9.
171
72
FT/HR
800
0
4278u
4937u
4823u
4597u
C1: 67.8%
C2: 16.9%
C3: 10.1%
C4: 5.2%
6000
0
600000
0
UNITS
PPM
60
70
80
90
6900
10
20
30
40
50
60
70
80
90
7000
10
20
30
40
50
60
162
60
B Marl
95' TVD
Logger Top Nio C Chalk
@ 6,923' MD; 6,625' TVD
6500
ft
6900
MD 6,870'
TVD 6,604.68'
INC 64.76°
AZM 264.98°
MD 6,918'
TVD 6,623.25'
INC 69.70°
AZM 265.52°
MD 6,965'
TVD 6,637.60'
INC 74.73°
AZM 265.58°
MD 7,013'
TVD 6,648.56'
INC 78.88°
AZM 267.05°
MD 7,055'
TVD 6,655.38'
INC 82.43°
AZM 268.71°
CHK: ltgy - mgy, bnd w/ crm & off. wh, micxl - vfgrxl, sbplty - sbblky, sft, fri, rthy - wxy
MRL: m - dk gy, sbplty - plty, lam mod - v hd, brit, gt -rthy , v calc, tr bent, v abnt fos frag
CHK: ltgy - mgy, bnd w/ crm & off. wh, micxl - vfgrxl, sbplty - sbblky, sft, fri, rthy - wxy
MRL: m - dk gy, sbplty - plty, lam, hd, brit, gt - rthy , v calc, tr bent, v abnt fos frag
CHK: ltgy - mgy, bnd w/ crm & off. wh, micxl - vfgrxl, sbplty - sbblky, sft, fri, rthy - wxy
MRL: m - dk gy, sbplty - plty, lam, hd, brit, gt - rthy , v calc thru, tr bent, scat fos frag
CHK: ltgy - mgy, bnd w/ crm & off. wh, micxl - vfgrxl, sbplty - sbblky, sft - mod hd, fri, rthy - wxy
MRL: m - dk gy, sbplty - plty, lam, hd, brit, gt - rthy , v calc thru, tr bent, scat fos frag
CHK: ltgy
micxl - vf
brit-fri, rth
MRL: m -
gt - rthy ,

[redacted]

60, FVis: 34,
/15/24, API Filt: 7.8,
1,300, Ca: 40

Vt: 10.70, FVis: 36,
GELS: 7/22/34, API Filt: 7.6,
1, Cl: 1,300, Ca: 40

01/17/2013

01/19/2013

MUD WT 9.4/9.8+
VIS 31/33 IN/OUT

01/19/2013 Mud Wt: 9.60, FV
PVis: 7, YP: 7, GELS: 4/8/13
CAKE: 1/0, pH: 10.8, Cl: 1,4

124

212

FT/HR

6000 0

600000

@ 4725u

@ 3758u

UNITS

RPM

4754u
C1: 65.6%
C2: 17.6%
C3: 11.0%
C4: 5.8%

0

70 80 90 7100 10 20 30 40 50 60 70 80 90 7200 10 20 30 40 50 60 70

No Gamma Inside Casing

108

275

6500

BUILD COMPLETED
@ 20:44 hrs MST
01/17/2013

TOOH @ 7,109' MD FOR
INTERMEDIATE CASING

BEGAN DRILLING LATERAL
ON 01/19/2013 @ 01:55 HRS MST

BHA 300
BIT 6.125 in
HDBS / FXD54
5x15 JETS

MD 7,143'
TVD 6,663.36'
INC 87.16°
AZM 272.00°

MD 7,238'
TVD 6,667.66'
INC 87.65°
AZM 269.68°

ft

6900

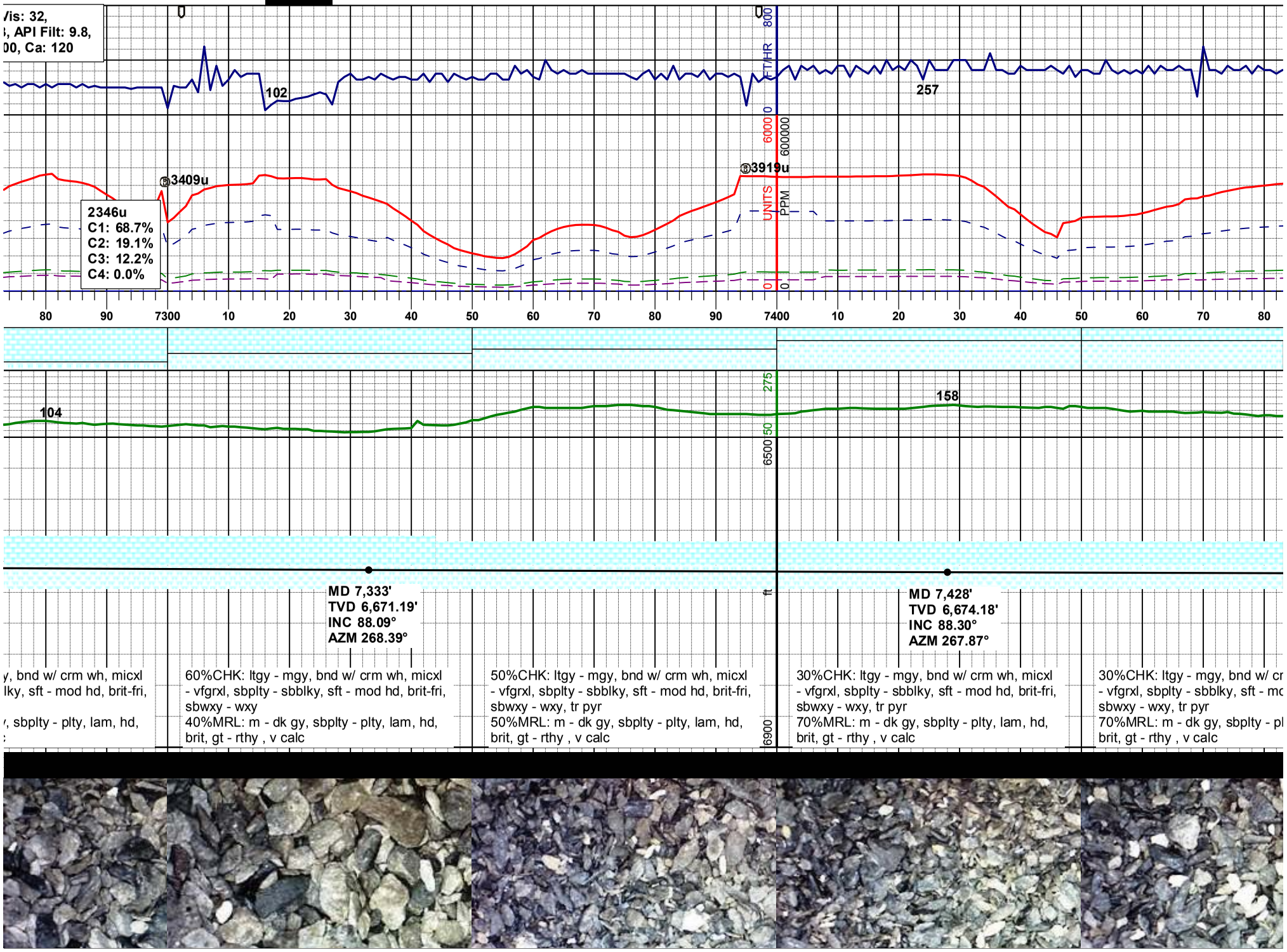
- mgy, bnd w/ crm & off. wh,
grxl, sbplty - sbblky, sft - mod hd,
ıy - wxy
dk gy, sbplty - plty, lam, hd, brit,
v calc thru, tr fos frag

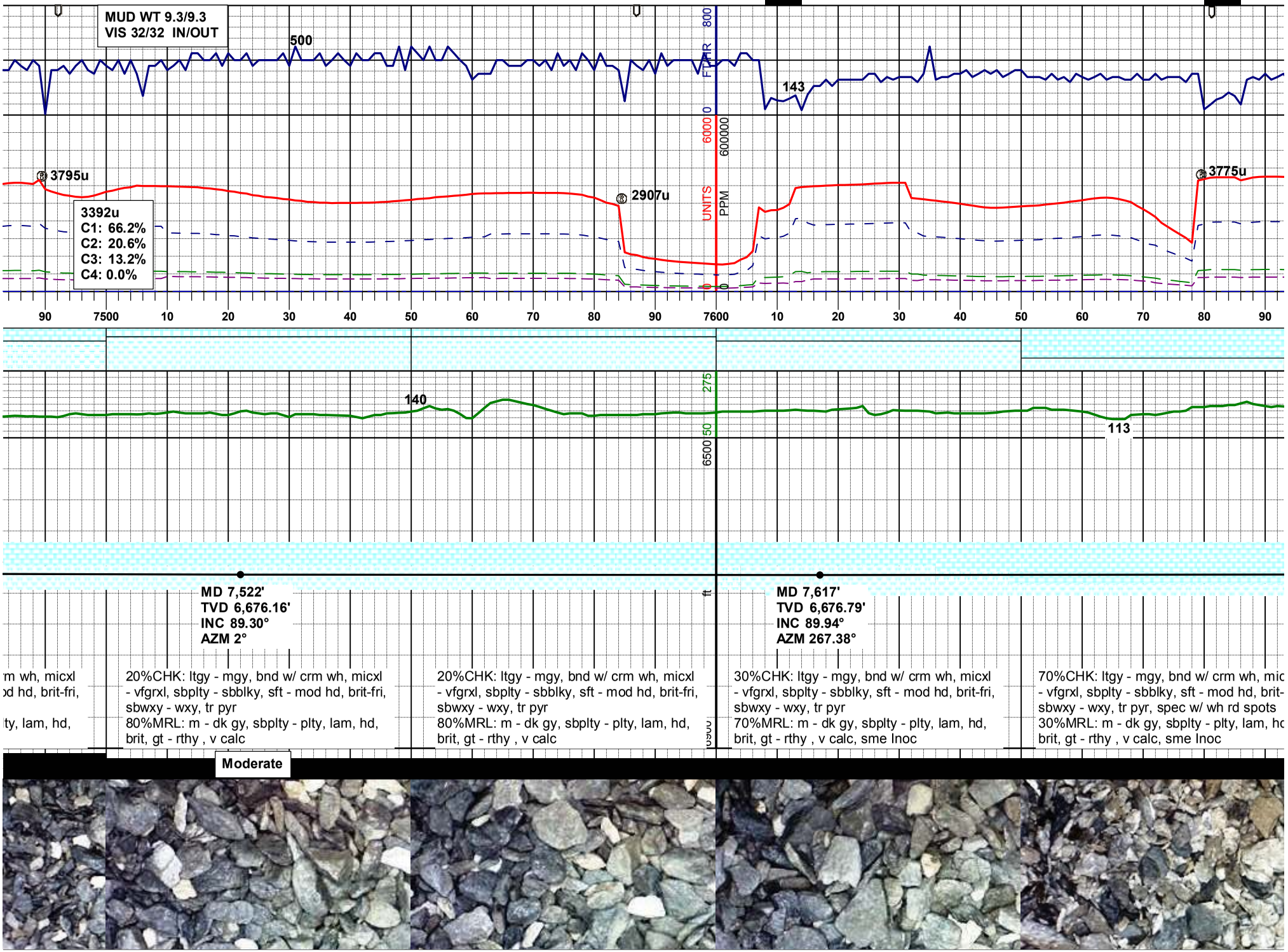
80% CHK: ltgy - mgy, bnd w/ crm wh, micxl
- vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri,
sbwxy - wxy
20% MRL: m - dk gy, sbplty - plty, lam, hd,
brit, gt - rthy , v calc thru, tr fos frag

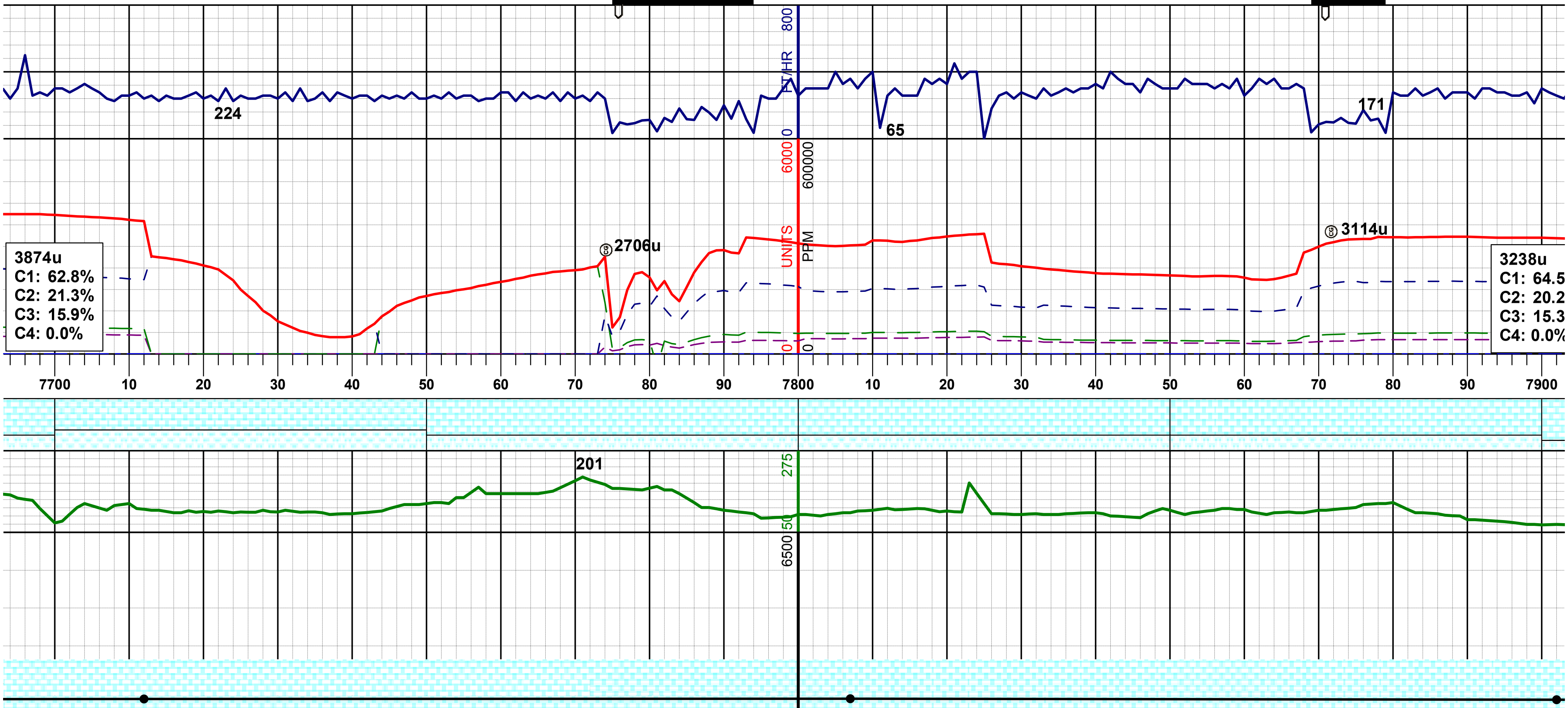
90% CHK: ltgy - mgy, bnd w/ crm wh, micxl
- vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri,
sbwxy - wxy
10% MRL: m - dk gy, sbplty - plty, lam, hd,
brit, gt - rthy , v calc thru,

80%CHK: ltgy - mgy, bnd w/ crm wh, micxl
- vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri,
sbwxy - wxy
20%MRL: m - dk gy, sbplty - plty, lam, hd,
brit, gt - rthy , v calc

80%CHK: ltgy - mgy
- vfgrxl, sbplty - sbb
sbwxy - wxy
20%MRL: m - dk gy
brit, gt - rthy , v calc


Vis: 32,
, API Filt: 9.8,
00, Ca: 120
102
257
FT/HR
800
0
6000
600000
3409u
3919u
UNITS
PPM
2346u
C1: 68.7%
C2: 19.1%
C3: 12.2%
C4: 0.0%
80
90
7300
10
20
30
40
50
60
70
80
90
7400
10
20
30
40
50
60
70
80
104
158
275
50
6500
MD 7,333'
TVD 6,671.19'
INC 88.09°
AZM 268.39°
MD 7,428'
TVD 6,674.18'
INC 88.30°
AZM 267.87°
ft
6900
y, bnd w/ crm wh, micxl
lky, sft - mod hd, brit-fri,
, sbplty - plty, lam, hd,
60%CHK: ltgy - mgy, bnd w/ crm wh, micxl
- vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri,
sbwxy - wxy
40%MRL: m - dk gy, sbplty - plty, lam, hd,
brit, gt - rthy , v calc
50%CHK: ltgy - mgy, bnd w/ crm wh, micxl
- vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri,
sbwxy - wxy, tr pyr
50%MRL: m - dk gy, sbplty - plty, lam, hd,
brit, gt - rthy , v calc
30%CHK: ltgy - mgy, bnd w/ crm wh, micxl
- vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri,
sbwxy - wxy, tr pyr
70%MRL: m - dk gy, sbplty - plty, lam, hd,
brit, gt - rthy , v calc
30%CHK: ltgy - mgy, bnd w/ cr
- vfgrxl, sbplty - sbblky, sft - mc
sbwxy - wxy, tr pyr
70%MRL: m - dk gy, sbplty - pl
brit, gt - rthy , v calc


MUD WT 9.3/9.3
VIS 32/32 IN/OUT
500
143
FLAIR
800
0
6000
600000
UNITS
PPM
3795u
3392u
C1: 66.2%
C2: 20.6%
C3: 13.2%
C4: 0.0%
2907u
3775u
90
7500
10
20
30
40
50
60
70
80
90
7600
10
20
30
40
50
60
70
80
90
140
275
50
6500
113
MD 7,522'
TVD 6,676.16'
INC 89.30°
AZM 2°
MD 7,617'
TVD 6,676.79'
INC 89.94°
AZM 267.38°
ft
m wh, micxl
od hd, brit-fri,
ty, lam, hd,
20%CHK: ltgy - mgy, bnd w/ crm wh, micxl - vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri, sbwxy - wxy, tr pyr
80%MRL: m - dk gy, sbplty - plty, lam, hd, brit, gt - rthy , v calc
20%CHK: ltgy - mgy, bnd w/ crm wh, micxl - vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri, sbwxy - wxy, tr pyr
80%MRL: m - dk gy, sbplty - plty, lam, hd, brit, gt - rthy , v calc
30%CHK: ltgy - mgy, bnd w/ crm wh, micxl - vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri, sbwxy - wxy, tr pyr
70%MRL: m - dk gy, sbplty - plty, lam, hd, brit, gt - rthy , v calc, sme lnoc
70%CHK: ltgy - mgy, bnd w/ crm wh, mic
- vfgrxl, sbplty - sbblky, sft - mod hd, brit-
sbwxy - wxy, tr pyr, spec w/ wh rd spots
30%MRL: m - dk gy, sbplty - plty, lam, hc
brit, gt - rthy , v calc, sme lnoc
Moderate



MD 7,712'
TVD 6,676.04'
INC 90.95°
AZM 267.19°

MD 7,807'
TVD 6,675.63'
INC 89.54°
AZM 267.49°

MD 7,9
TVD 6,6
INC 89.
AZM 26

xl
fri,
d,

60%CHK: ltgy - mgy, bnd w/ crm wh, micxl - vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri, sbwxy - wxy, tr pyr, spec w/ wh rd spots
40%MRL: m - dk gy, sbplty - plty, lam, hd, brit, gt - rthy , v calc, sme lnoc

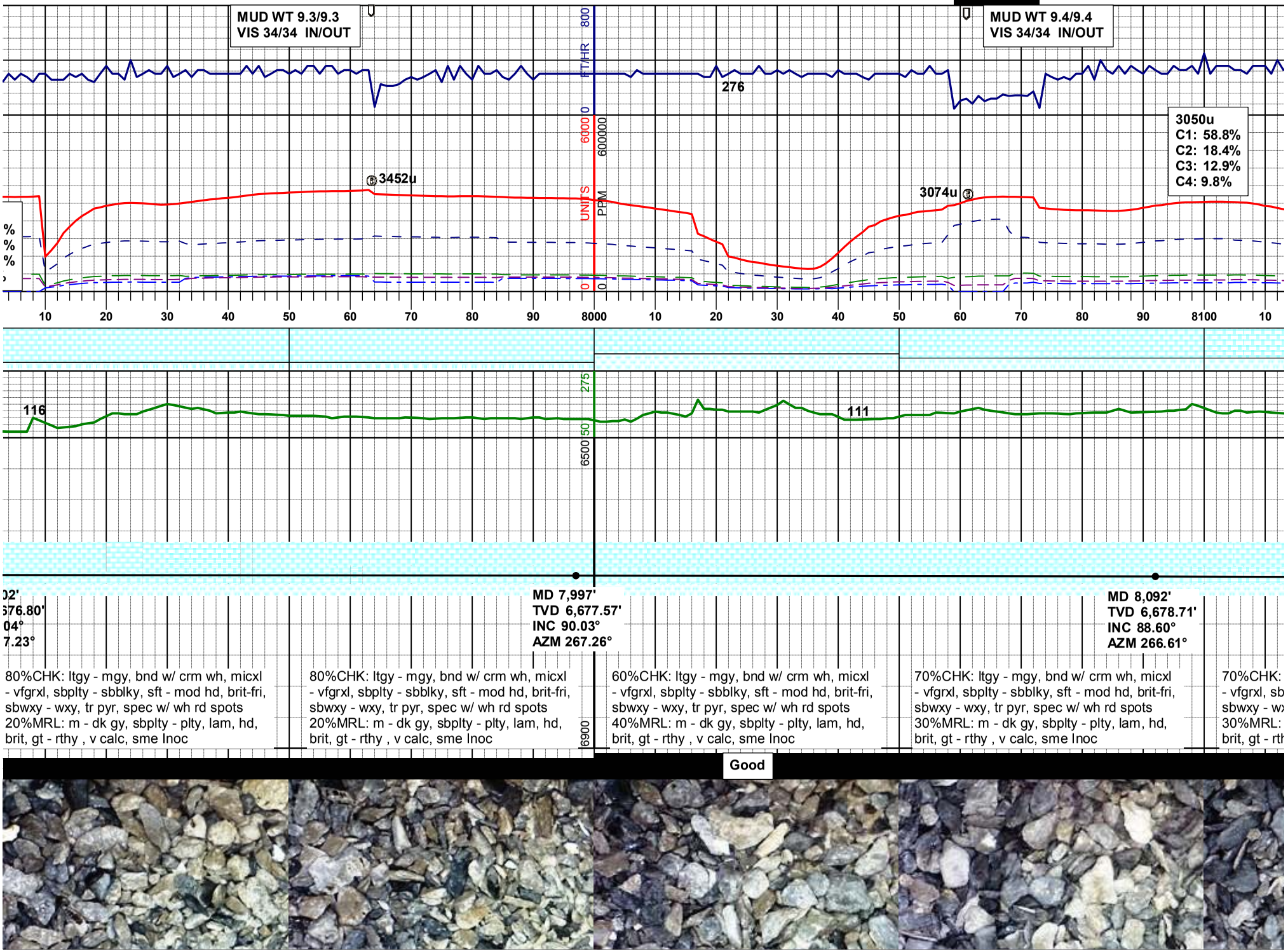
70%CHK: ltgy - mgy, bnd w/ crm wh, micxl - vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri, sbwxy - wxy, tr pyr, spec w/ wh rd spots
30%MRL: m - dk gy, sbplty - plty, lam, hd, brit, gt - rthy , v calc, sme lnoc

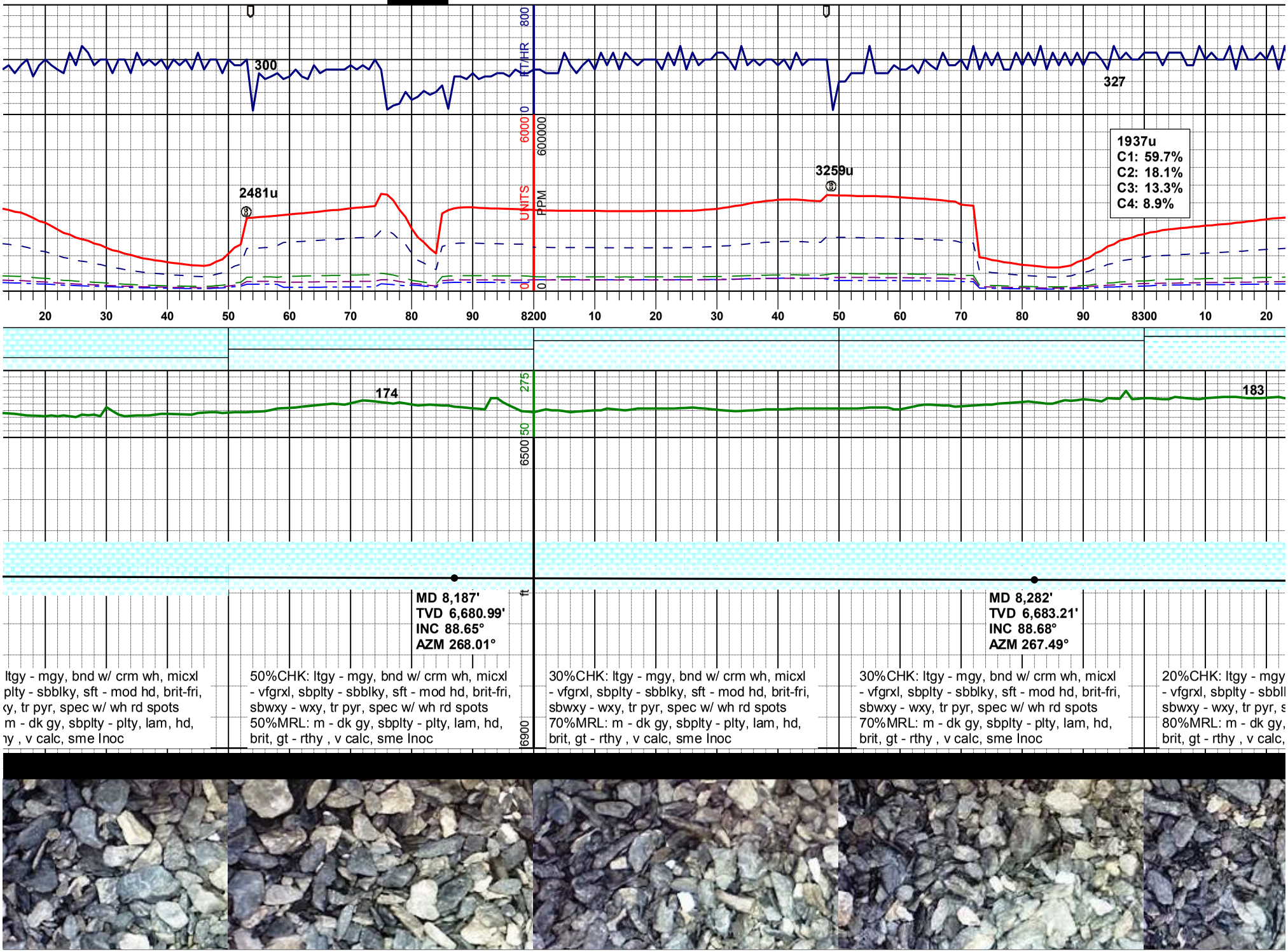
70%CHK: ltgy - mgy, bnd w/ crm wh, micxl - vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri, sbwxy - wxy, tr pyr, spec w/ wh rd spots
30%MRL: m - dk gy, sbplty - plty, lam, hd, brit, gt - rthy , v calc, sme lnoc

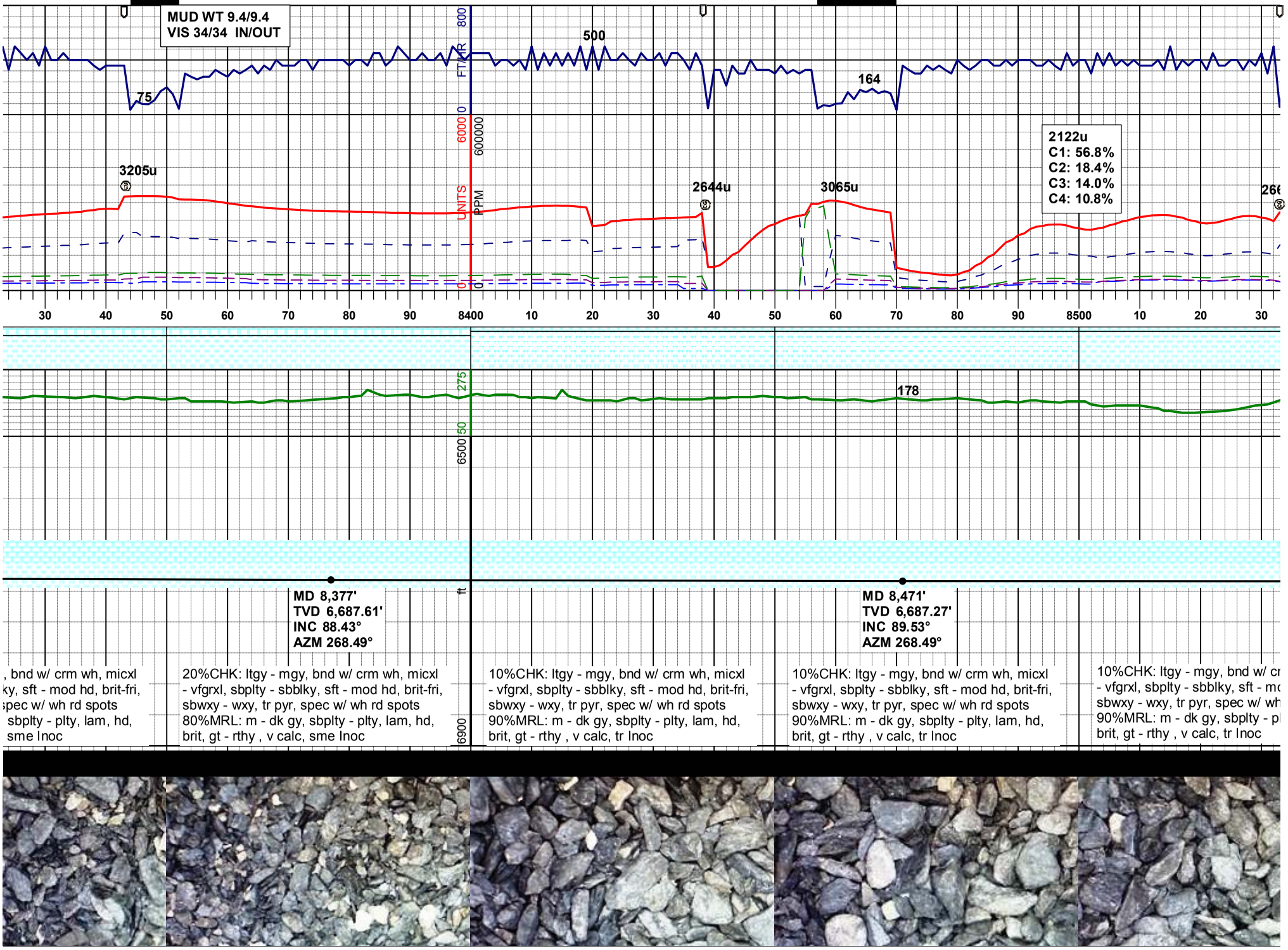
70%CHK: ltgy - mgy, bnd w/ crm wh, micxl - vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri, sbwxy - wxy, tr pyr, spec w/ wh rd spots
30%MRL: m - dk gy, sbplty - plty, lam, hd, brit, gt - rthy , v calc, sme lnoc

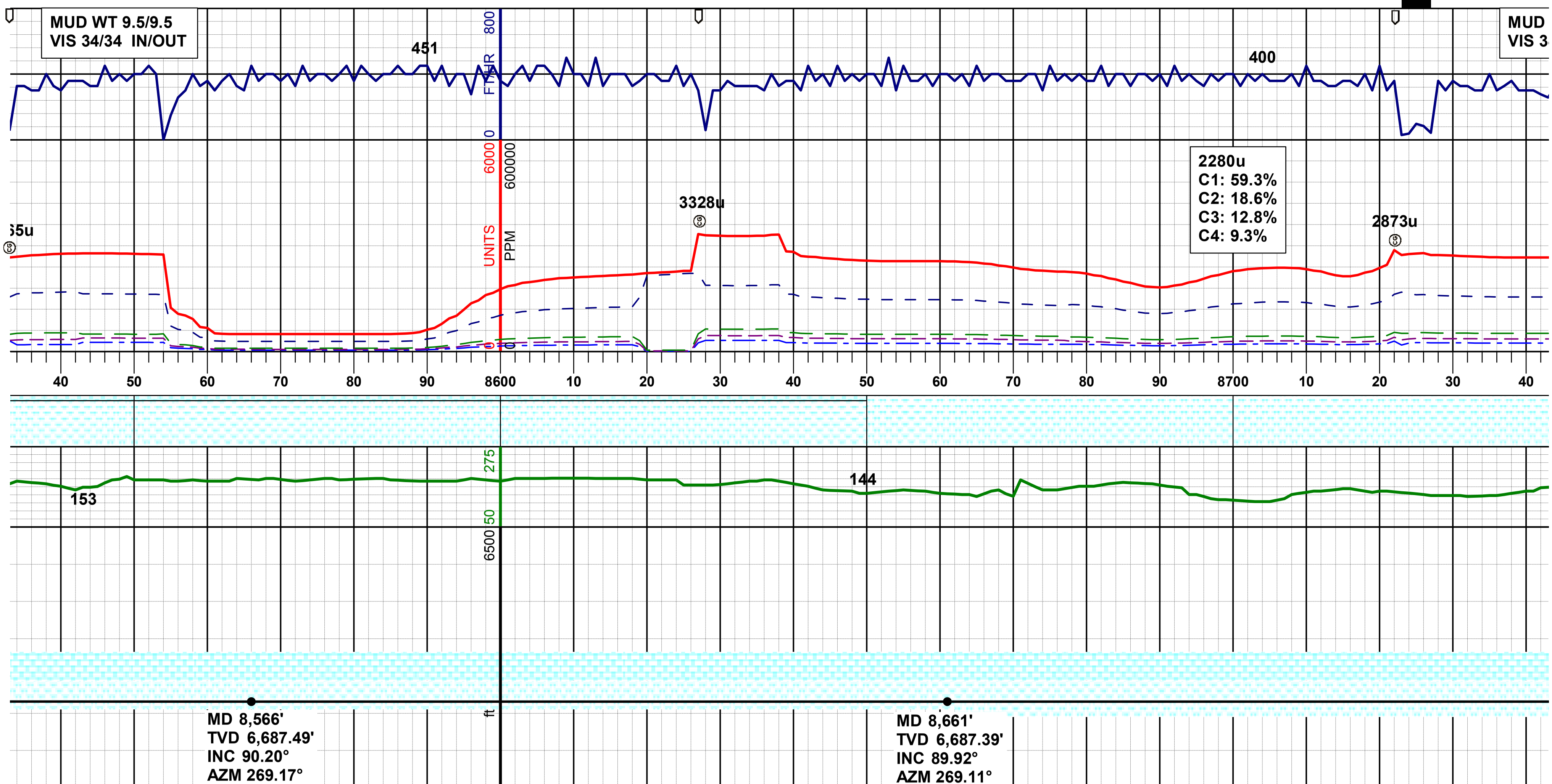
Good

Moderate


MUD WT 9.3/9.3
VIS 34/34 IN/OUT
MUD WT 9.4/9.4
VIS 34/34 IN/OUT
FT/HR
800
0
276
6000
0
600000
UNITS
PPM
3452u
3074u
3050u
C1: 58.8%
C2: 18.4%
C3: 12.9%
C4: 9.8%
10
20
30
40
50
60
70
80
90
8000
8100
116
111
275
50
6500
MD 7,997'
TVD 6,677.57'
INC 90.03°
AZM 267.26°
MD 8,092'
TVD 6,678.71'
INC 88.60°
AZM 266.61°
80%CHK: ltgy - mgy, bnd w/ crm wh, micxl - vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri, sbwxy - wxy, tr pyr, spec w/ wh rd spots 20%MRL: m - dk gy, sbplty - plty, lam, hd, brit, gt - rthy , v calc, sme lnoc
80%CHK: ltgy - mgy, bnd w/ crm wh, micxl - vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri, sbwxy - wxy, tr pyr, spec w/ wh rd spots 20%MRL: m - dk gy, sbplty - plty, lam, hd, brit, gt - rthy , v calc, sme lnoc
60%CHK: ltgy - mgy, bnd w/ crm wh, micxl - vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri, sbwxy - wxy, tr pyr, spec w/ wh rd spots 40%MRL: m - dk gy, sbplty - plty, lam, hd, brit, gt - rthy , v calc, sme lnoc
70%CHK: ltgy - mgy, bnd w/ crm wh, micxl - vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri, sbwxy - wxy, tr pyr, spec w/ wh rd spots 30%MRL: m - dk gy, sbplty - plty, lam, hd, brit, gt - rthy , v calc, sme lnoc
6900
Good


300
327
800
RT/HR
0
6000
600000
UNITS
PPM
0
0
2481u
3259u
1937u
C1: 59.7%
C2: 18.1%
C3: 13.3%
C4: 8.9%
20
30
40
50
60
70
80
90
8200
10
20
30
40
50
60
70
80
90
8300
10
20
174
183
275
50
6500
ft
MD 8,187'
TVD 6,680.99'
INC 88.65°
AZM 268.01°
MD 8,282'
TVD 6,683.21'
INC 88.68°
AZM 267.49°
ltgy - mgy, bnd w/ crm wh, micxl
plty - sbblky, sft - mod hd, brit-fri,
ky, tr pyr, spec w/ wh rd spots
m - dk gy, sbplty - plty, lam, hd,
ny , v calc, sme lnoc
50%CHK: ltgy - mgy, bnd w/ crm wh, micxl
- vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri,
sbwxy - wxy, tr pyr, spec w/ wh rd spots
50%MRL: m - dk gy, sbplty - plty, lam, hd,
brit, gt - rthy , v calc, sme lnoc
6900
30%CHK: ltgy - mgy, bnd w/ crm wh, micxl
- vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri,
sbwxy - wxy, tr pyr, spec w/ wh rd spots
70%MRL: m - dk gy, sbplty - plty, lam, hd,
brit, gt - rthy , v calc, sme lnoc
30%CHK: ltgy - mgy, bnd w/ crm wh, micxl
- vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri,
sbwxy - wxy, tr pyr, spec w/ wh rd spots
70%MRL: m - dk gy, sbplty - plty, lam, hd,
brit, gt - rthy , v calc, sme lnoc
20%CHK: ltgy - mgy
- vfgrxl, sbplty - sbbl
sbwxy - wxy, tr pyr, s
80%MRL: m - dk gy,
brit, gt - rthy , v calc,


MUD WT 9.4/9.4
VIS 34/34 IN/OUT
75
500
164
FT/HR
800
0
6000
0
600000
UNITS
PPM
0
3205u
2644u
3065u
2122u
C1: 56.8%
C2: 18.4%
C3: 14.0%
C4: 10.8%
30
40
50
60
70
80
90
8400
10
20
30
40
50
60
70
80
90
8500
10
20
30
275
50
6500
178
MD 8,377'
TVD 6,687.61'
INC 88.43°
AZM 268.49°
MD 8,471'
TVD 6,687.27'
INC 89.53°
AZM 268.49°
ft
6900
, bnd w/ crm wh, micxl
ky, sft - mod hd, brit-fri,
spec w/ wh rd spots
sbplty - plty, lam, hd,
sme Inoc
20%CHK: ltgy - mgy, bnd w/ crm wh, micxl
- vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri,
sbwxy - wxy, tr pyr, spec w/ wh rd spots
80%MRL: m - dk gy, sbplty - plty, lam, hd,
brit, gt - rthy , v calc, sme Inoc
10%CHK: ltgy - mgy, bnd w/ crm wh, micxl
- vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri,
sbwxy - wxy, tr pyr, spec w/ wh rd spots
90%MRL: m - dk gy, sbplty - plty, lam, hd,
brit, gt - rthy , v calc, tr Inoc
10%CHK: ltgy - mgy, bnd w/ crm wh, micxl
- vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri,
sbwxy - wxy, tr pyr, spec w/ wh rd spots
90%MRL: m - dk gy, sbplty - plty, lam, hd,
brit, gt - rthy , v calc, tr Inoc
10%CHK: ltgy - mgy, bnd w/ cr
- vfgrxl, sbplty - sbblky, sft - mo
sbwxy - wxy, tr pyr, spec w/ wh
90%MRL: m - dk gy, sbplty - pl
brit, gt - rthy , v calc, tr Inoc



...rm wh, micxl
...od hd, brit-fri,
... rd spots
...lty, lam, hd,

10%CHK: ltgy - mgy, bnd w/ crm wh, micxl - vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri, sbwxy - wxy, tr pyr, spec w/ wh rd spots
90%MRL: m - dk gy, sbplty - plty, lam, hd, brit, gt - rthy , v calc, tr Inoc

10%CHK: ltgy - mgy, bnd w/ crm wh, micxl - vfgrxl, sbplty - sbblky, sft - mod hd, brit-fri, sbwxy - wxy,
90%MRL: m - dk gy, sbplty - plty, lam, hd, brit, gt - rthy , v calc, tr Inoc

100%MRL: m - dk gy, sbplty - plty, lam, hd, brit, gt - rthy , v calc, tr Inoc

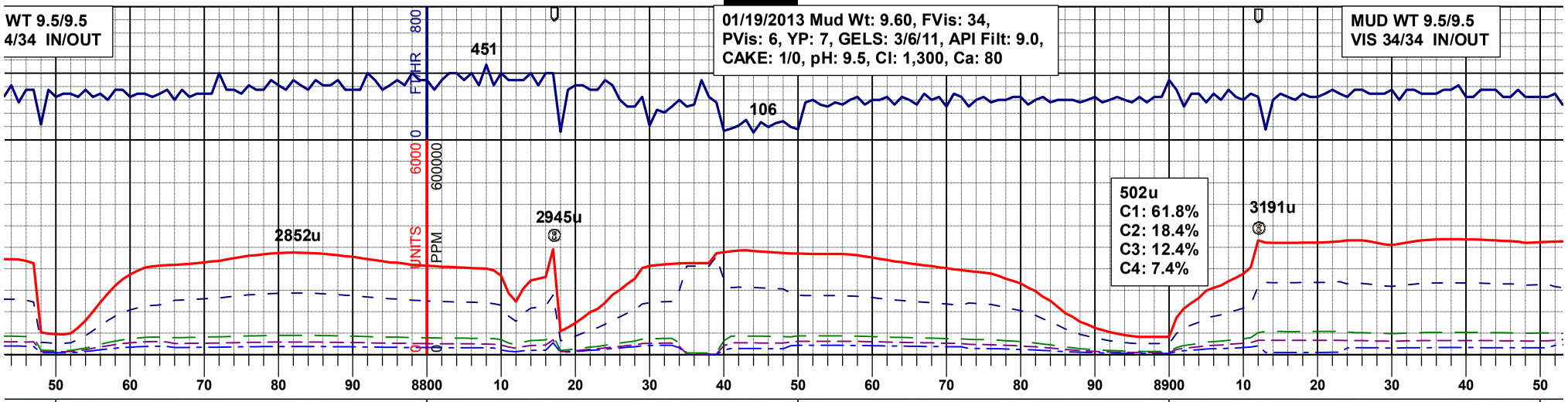
100%MRL: mgy - dkgy, sbplty - plty, lar... hd, brit, gt - rthy , v calc, tr bent, tr Inoc

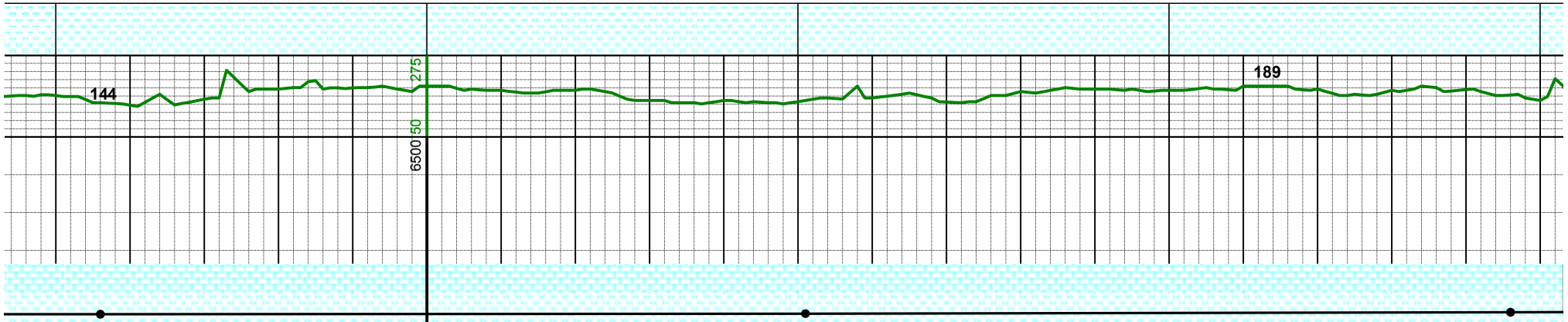
[redacted]

WT 9.5/9.5
4/34 IN/OUT

01/19/2013 Mud Wt: 9.60, FVis: 34,
PVis: 6, YP: 7, GELS: 3/6/11, API Filt: 9.0,
CAKE: 1/0, pH: 9.5, Cl: 1,300, Ca: 80

MUD WT 9.5/9.5
VIS 34/34 IN/OUT





ft

MD 8,756'
TVD 6,687.45'
INC 90.00°
AZM 268.86°

MD 8,851'
TVD 6,686.86'
INC 90.71°
AZM 269.08°

MD 8,946'
TVD 6,685.31
INC 91.16°
AZM 268.91°

n,

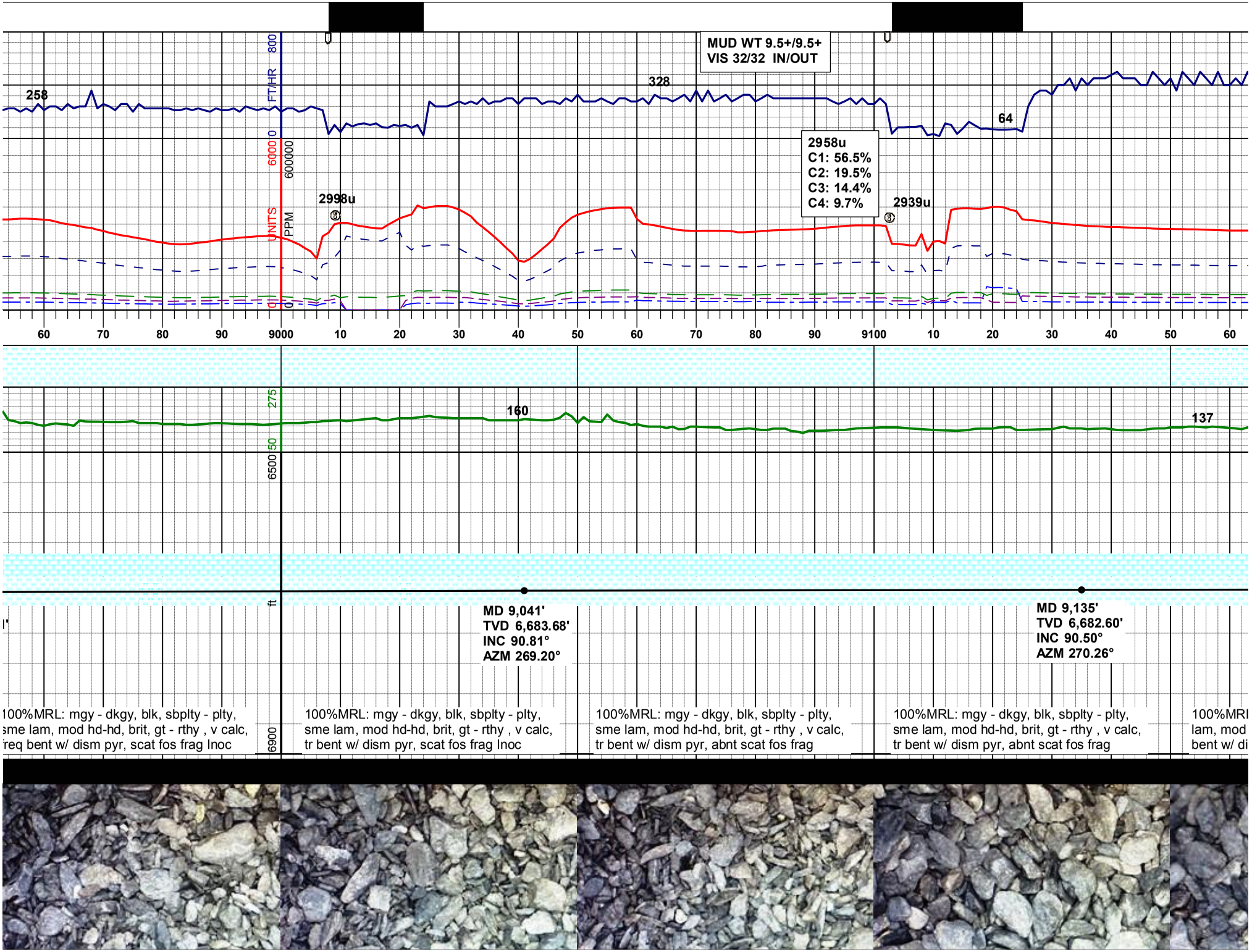
100%MRL: mgy - dkgy, sbplty - plty, lam, hd, brit, gt - rthy , v calc, tr bent, scat fos frag Inoc

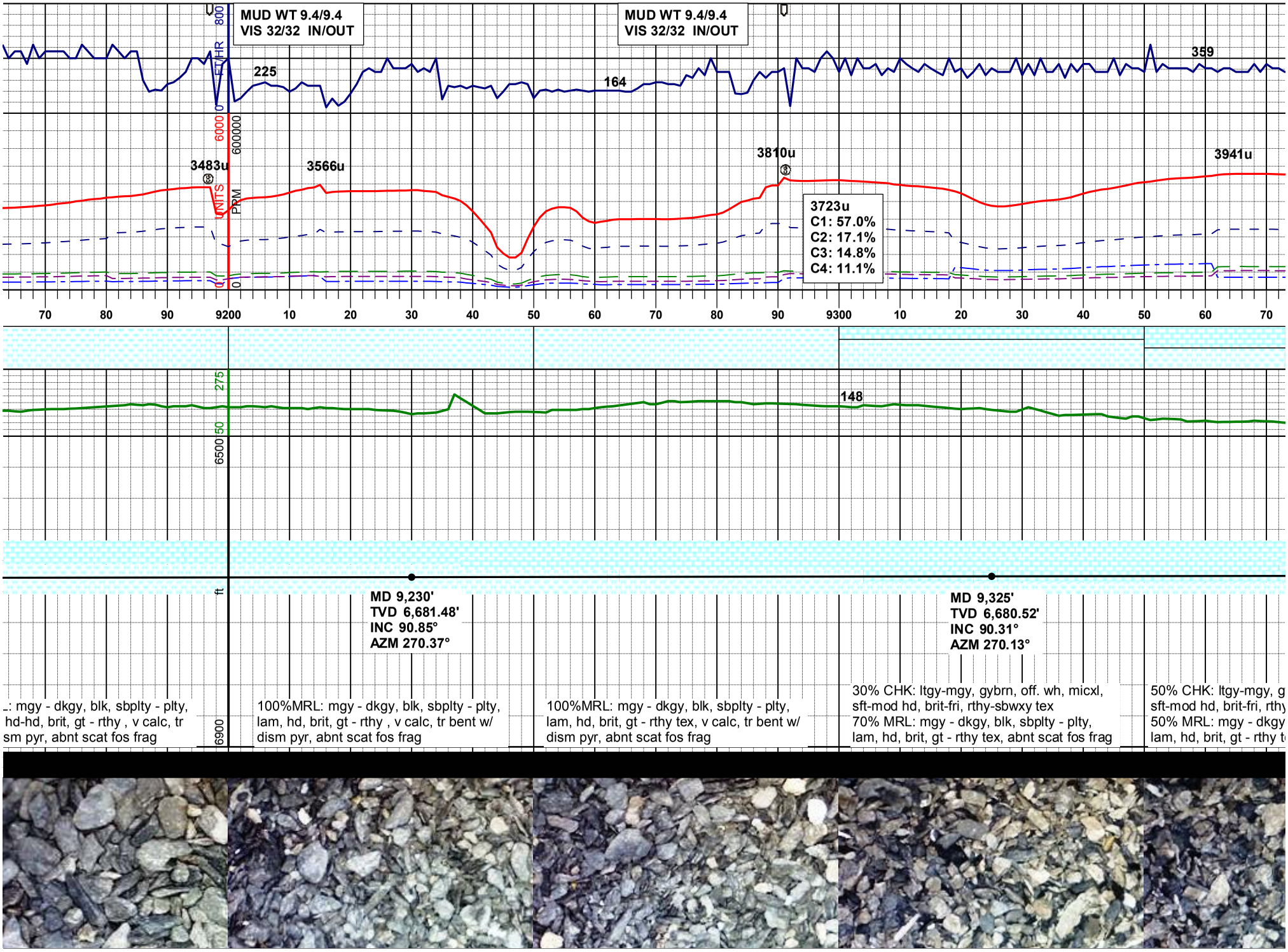
100%MRL: mgy - dkgy, sbplty - plty, lam, hd, brit, gt - rthy , v calc, freq bent w/ dism pyr, scat fos frag Inoc

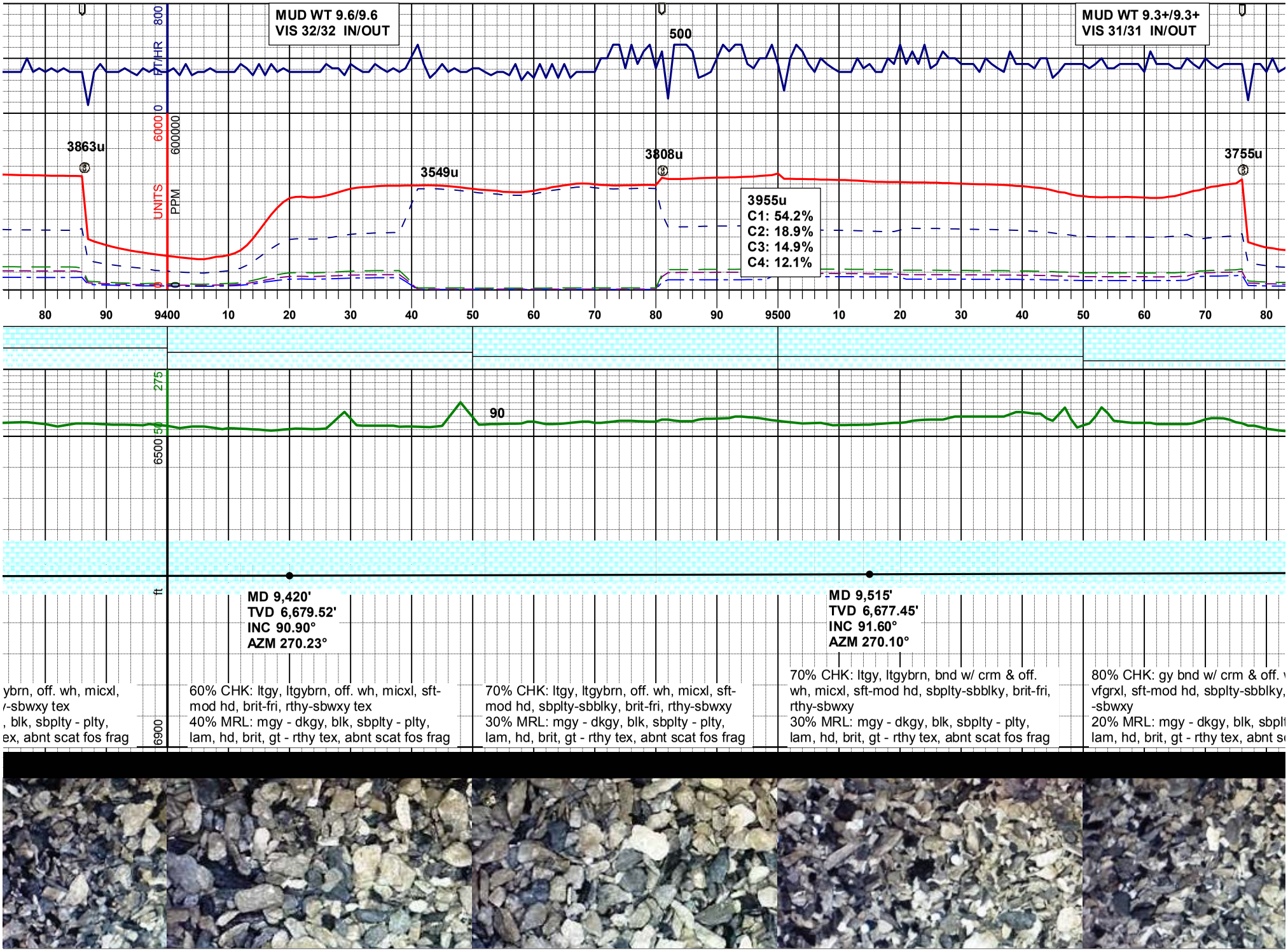
100%MRL: mgy - dkgy, blk, sbplty - plty, lam, hd, brit, gt - rthy , v calc, freq bent w/ dism pyr, scat fos frag Inoc

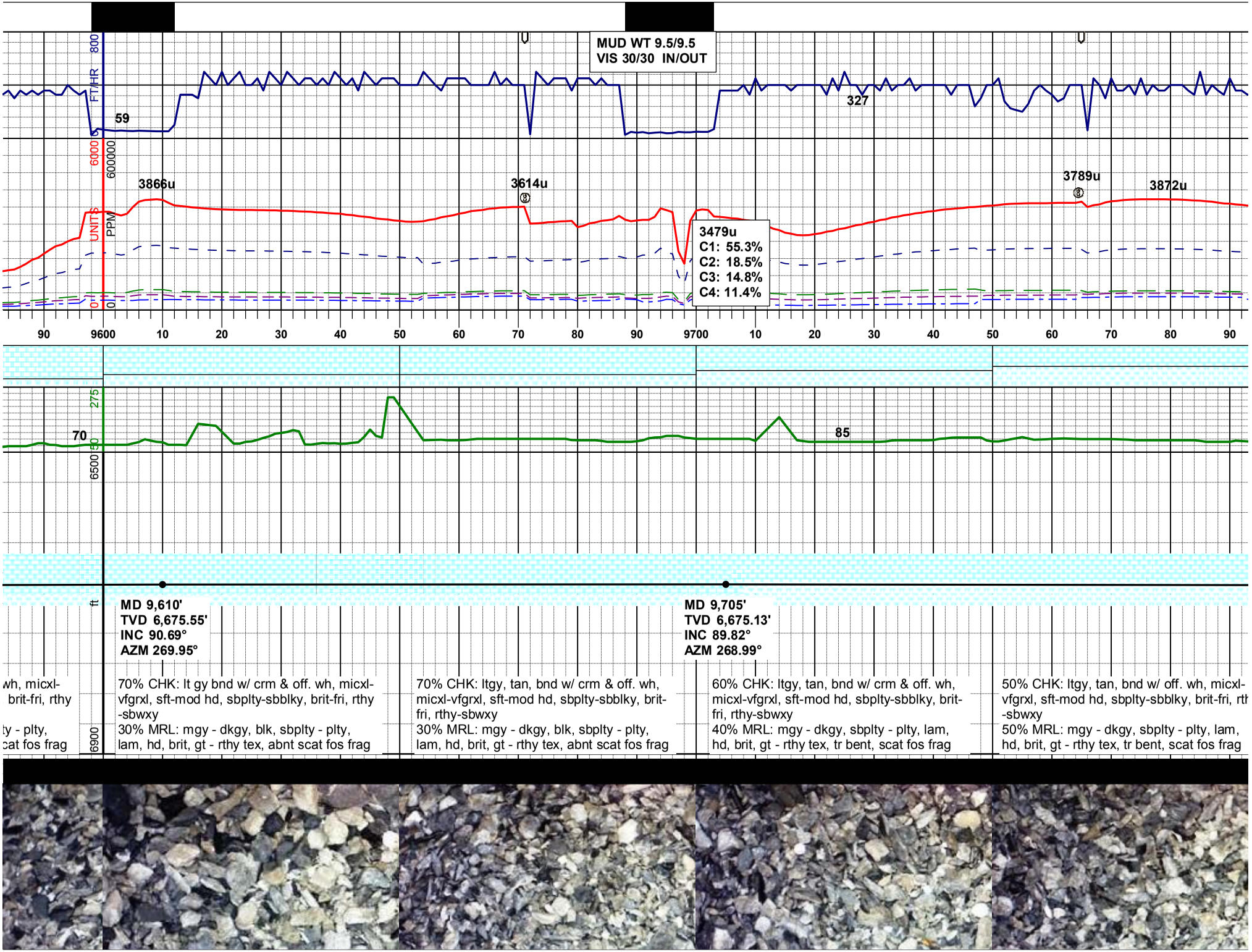
100%MRL: mgy - dkgy, blk, sbplty - plty, sme lam, hd, brit, gt - rthy , v calc, freq bent w/ dism pyr, scat fos frag Inoc

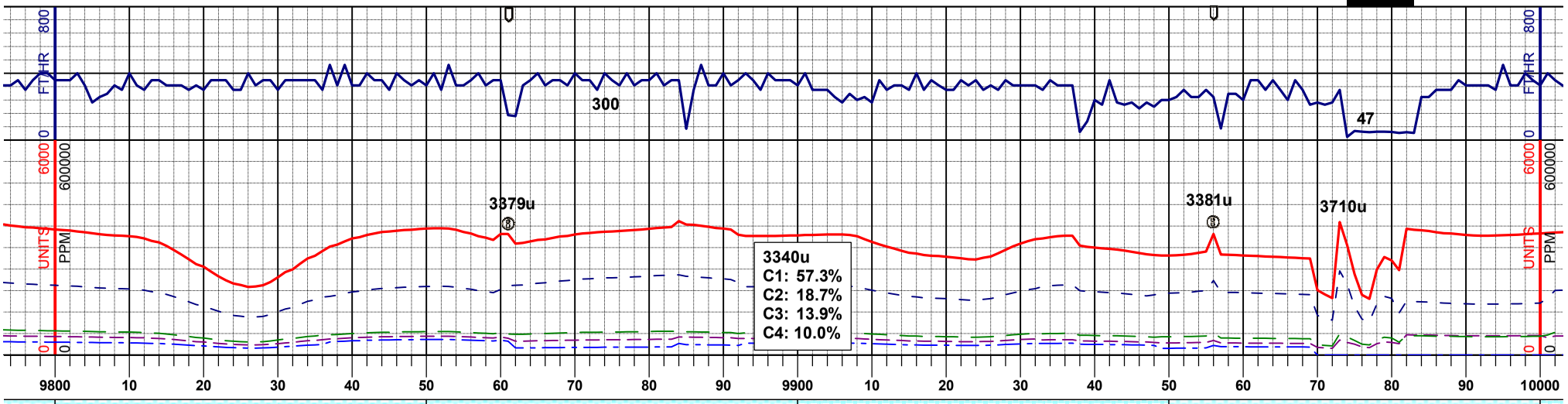
6900

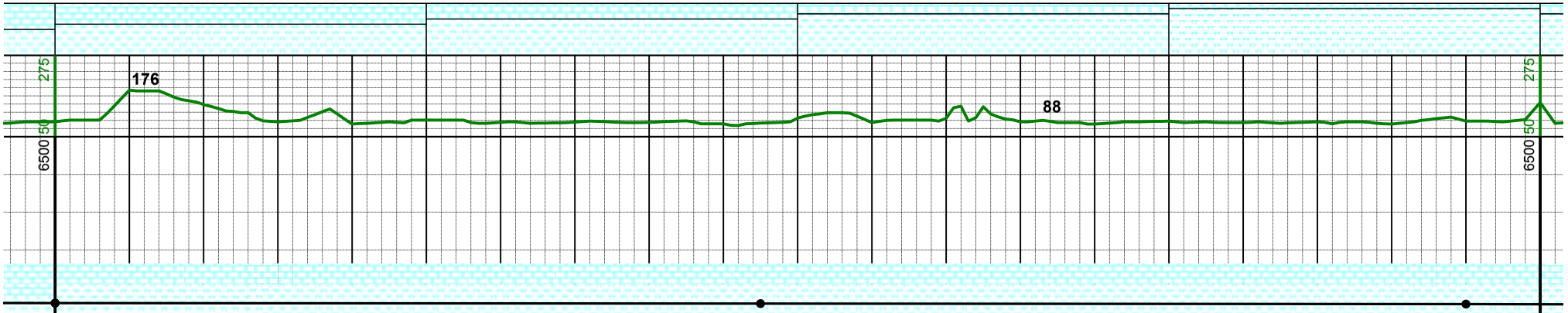

MUD WT 9.5+/9.5+
VIS 32/32 IN/OUT
258
328
64
FT/HR
800
0
6000
0
600000
UNITS
PPM
gu
0
2998u
2939u
2958u
C1: 56.5%
C2: 19.5%
C3: 14.4%
C4: 9.7%
60
70
80
90
9000
10
20
30
40
50
60
70
80
90
9100
10
20
30
40
50
60
275
50
6500
160
137
ft
MD 9,041'
TVD 6,683.68'
INC 90.81°
AZM 269.20°
MD 9,135'
TVD 6,682.60'
INC 90.50°
AZM 270.26°
6900
100%MRL: mgy - dkgy, blk, sbplty - plty, sme lam, mod hd-hd, brit, gt - rthy , v calc, freq bent w/ dism pyr, scat fos frag Inoc
100%MRL: mgy - dkgy, blk, sbplty - plty, sme lam, mod hd-hd, brit, gt - rthy , v calc, tr bent w/ dism pyr, scat fos frag Inoc
100%MRL: mgy - dkgy, blk, sbplty - plty, sme lam, mod hd-hd, brit, gt - rthy , v calc, tr bent w/ dism pyr, abnt scat fos frag
100%MRL: mgy - dkgy, blk, sbplty - plty, sme lam, mod hd-hd, brit, gt - rthy , v calc, tr bent w/ dism pyr, abnt scat fos frag
100%MRL lam, mod bent w/ di


MUD WT 9.4/9.4
VIS 32/32 IN/OUT
MUD WT 9.4/9.4
VIS 32/32 IN/OUT
FT/HR
800
0
225
164
359
6000
0
600000
UNITS
PRM
0
3483u
3566u
3810u
3941u
3723u
C1: 57.0%
C2: 17.1%
C3: 14.8%
C4: 11.1%
70
80
90
9200
10
20
30
40
50
60
70
80
90
9300
10
20
30
40
50
60
70
275
50
6500
148
ft
MD 9,230'
TVD 6,681.48'
INC 90.85°
AZM 270.37°
MD 9,325'
TVD 6,680.52'
INC 90.31°
AZM 270.13°
6900
_: mgy - dkgy, blk, sbplty - plty,
hd-hd, brit, gt - rthy , v calc, tr
sm pyr, abnt scat fos frag
100%MRL: mgy - dkgy, blk, sbplty - plty,
lam, hd, brit, gt - rthy , v calc, tr bent w/
dism pyr, abnt scat fos frag
100%MRL: mgy - dkgy, blk, sbplty - plty,
lam, hd, brit, gt - rthy tex, v calc, tr bent w/
dism pyr, abnt scat fos frag
30% CHK: ltgy-mgy, gybrn, off. wh, micxl,
sft-mod hd, brit-fri, rthy-sbwxy tex
70% MRL: mgy - dkgy, blk, sbplty - plty,
lam, hd, brit, gt - rthy tex, abnt scat fos frag
50% CHK: ltgy-mgy, g
sft-mod hd, brit-fri, rthy
50% MRL: mgy - dkgy
lam, hd, brit, gt - rthy t


MUD WT 9.6/9.6
VIS 32/32 IN/OUT
MUD WT 9.3+/9.3+
VIS 31/31 IN/OUT
FT/HR
800
0
500
UNITS
6000
0
600000
PPM
3863u
3549u
3808u
3755u
3955u
C1: 54.2%
C2: 18.9%
C3: 14.9%
C4: 12.1%
80
90
9400
10
20
30
40
50
60
70
80
90
9500
10
20
30
40
50
60
70
80
275
90
6500
50
ft
6900
MD 9,420'
TVD 6,679.52'
INC 90.90°
AZM 270.23°
MD 9,515'
TVD 6,677.45'
INC 91.60°
AZM 270.10°
ybrn, off. wh, micxl,
/-sbwxy tex
, blk, sbplty - plty,
ex, abnt scat fos frag
60% CHK: ltgy, ltgybrn, off. wh, micxl, sft-mod hd, brit-fri, rthy-sbwxy tex
40% MRL: mgy - dkgy, blk, sbplty - plty, lam, hd, brit, gt - rthy tex, abnt scat fos frag
70% CHK: ltgy, ltgybrn, off. wh, micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy-sbwxy
30% MRL: mgy - dkgy, blk, sbplty - plty, lam, hd, brit, gt - rthy tex, abnt scat fos frag
70% CHK: ltgy, ltgybrn, bnd w/ crm & off. wh, micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy-sbwxy
30% MRL: mgy - dkgy, blk, sbplty - plty, lam, hd, brit, gt - rthy tex, abnt scat fos frag
80% CHK: gy bnd w/ crm & off.
vfgrxl, sft-mod hd, sbplty-sbblky,
-sbwxy
20% MRL: mgy - dkgy, blk, sbplt
lam, hd, brit, gt - rthy tex, abnt s


MUD WT 9.5/9.5
VIS 30/30 IN/OUT
FT/HR
800
0
59
327
6000
600000
UNITS
PPM
0
0
3866u
3614u
3789u
3872u
3479u
C1: 55.3%
C2: 18.5%
C3: 14.8%
C4: 11.4%
90
9600
10
20
30
40
50
60
70
80
90
9700
10
20
30
40
50
60
70
80
90
275
70
0
85
6500
ft
6900
MD 9,610'
TVD 6,675.55'
INC 90.69°
AZM 269.95°
MD 9,705'
TVD 6,675.13'
INC 89.82°
AZM 268.99°
wh, micxl-
brit-fri, rthy
y - plty,
cat fos frag
70% CHK: lt gy bnd w/ crm & off. wh, micxl-vfgrxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy -sbwxy
30% MRL: mgy - dkgy, blk, sbplty - plty, lam, hd, brit, gt - rthy tex, abnt scat fos frag
70% CHK: ltgy, tan, bnd w/ crm & off. wh, micxl-vfgrxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy-sbwxy
30% MRL: mgy - dkgy, blk, sbplty - plty, lam, hd, brit, gt - rthy tex, abnt scat fos frag
60% CHK: ltgy, tan, bnd w/ crm & off. wh, micxl-vfgrxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy-sbwxy
40% MRL: mgy - dkgy, sbplty - plty, lam, hd, brit, gt - rthy tex, tr bent, scat fos frag
50% CHK: ltgy, tan, bnd w/ off. wh, micxl-vfgrxl, sft-mod hd, sbplty-sbblky, brit-fri, rth -sbwxy
50% MRL: mgy - dkgy, sbplty - plty, lam, hd, brit, gt - rthy tex, tr bent, scat fos frag





MD 9,800'
TVD 6,676.29'
INC 88.78°
AZM 268.41°

MD 9,895'
TVD 6,676.83'
INC 90.56°
AZM 269.63°

MD 9,990'
TVD 6,677.36'
INC 88.81°
AZM 269.02°

6900

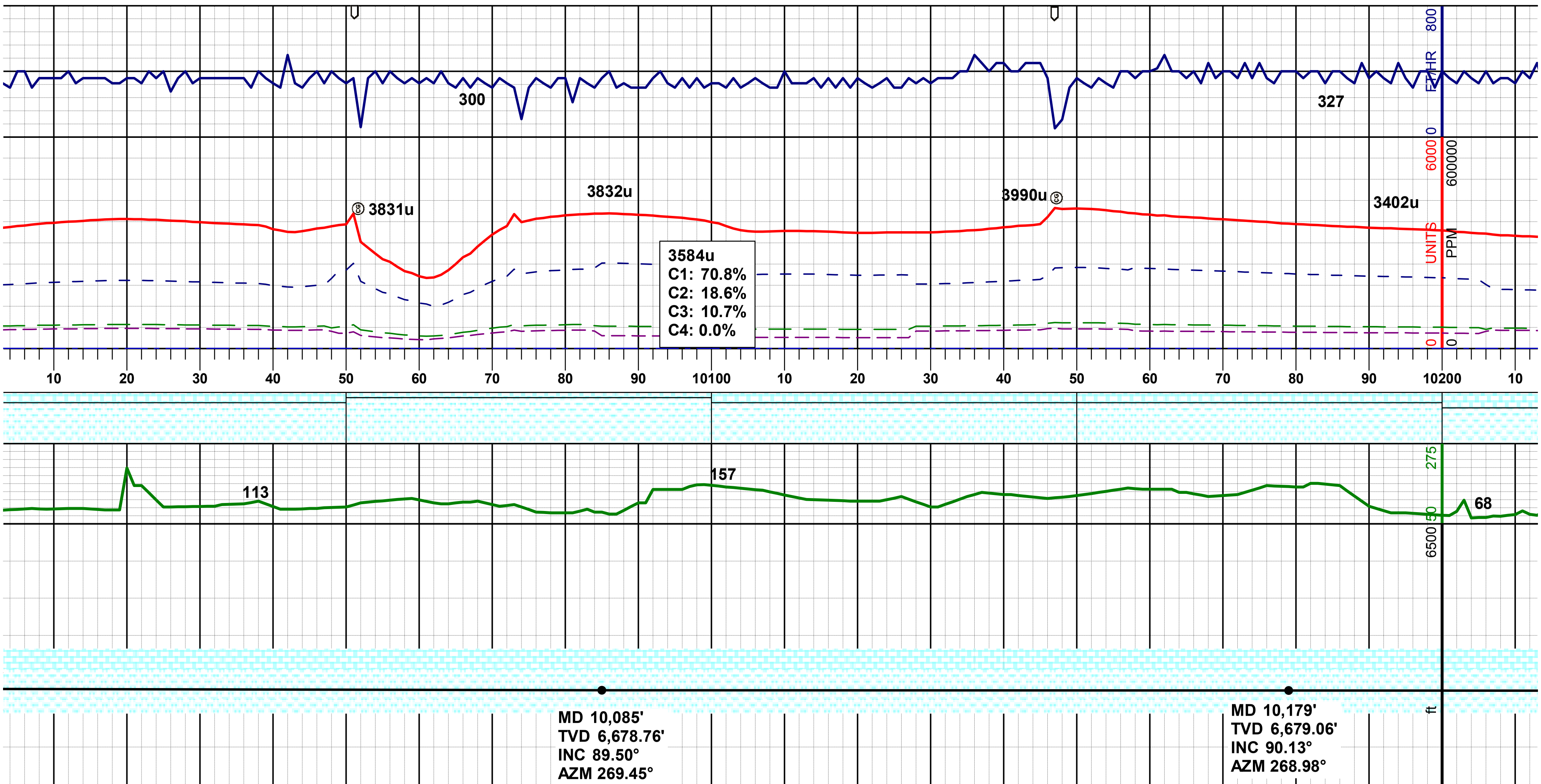
40% CHK: ltgy-mgy, tan, bnd w/ off. wh, micxl-vfgrxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy-sbwxy
60% MRL: mgy - dkgy, sbplty - plty, lam, hd, brit, gt - rthy tex, tr bent, scat fos frag

30% CHK: ltgy-mgy, tan, bnd w/ off. wh, micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy-sbwxy
70% MRL: mgy - dkgy, sbplty - plty, lam, hd, brit, gt - rthy tex, tr bent, scat fos frag

20% CHK: ltgy-mgy, tan, bnd w/ off. wh, micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy-sbwxy
80% MRL: mgy - dkgy, blk, sbplty - plty, lam, hd, brit, gt - rthy tex, tr bent, scat fos frag

10% CHK: ltgy-mgy, tan, bnd w/ off. wh, micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy-sbwxy
90% MRL: mgy - dkgy, blk, sbplty - plty, lam, hd, brit, gt - rthy tex, tr bent, tr fos frag

Moderate



20% CHK: ltgy-mgy, gybrn, bnd w/ off. wh, micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy -sbwxy
80% MRL: mgy - dkgy, blk, sbplty - plty, lam, hd, brit, gt - rthy tex, tr bent, tr fos frag

10% CHK: ltgy-mgy, gybrn, bnd w/ off. wh, micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy -sbwxy
90% MRL: mgy - dkgy, blk, sbplty - plty, lam, hd, brit, gt - rthy tex, tr bent, tr fos frag

20% CHK: ltgy-mgy, tan, bnd w/ off. wh, micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy -sbwxy
80% MRL: mgy - dkgy, blk, sbplty - plty, lam, hd, brit, gt - rthy tex, tr bent, tr fos frag

20% CHK: ltgy-mgy, tan, bnd w/ off. wh, micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy -sbwxy
80% MRL: mgy - dkgy, blk, sbplty - plty, lam, hd, brit, gt - rthy tex, tr bent, tr fos frag

30% CHK:
micxl, sft-r
-sbwxy
70% MRL:
lam, hd, br

Good

[redacted]

01/20/2013 Mud Wt: 9.50, FVis: 32,
PVis: 6, YP: 6, GELS: 3/6/9, API Filt: 9.2,
CAKE: 1/0, pH: 9.4, Cl: 1,300, Ca: 40

40

224

3598u

3772u

3859u

3439u
C1: 45.4%
C2: 17.6%
C3: 37.0%
C4: 0.0%

FT/HR 800 0
6000 600000
UNITS PPM
0 0

20 30 40 50 60 70 80 90 10300 10 20 30 40 50 60 70 80 90 10400 10 20

91

178

275 50
6500

MD 10,274'
TVD 6,679.66'
INC 89.15°
AZM 268.77°

MD 10,369'
TVD 6,681.05'
INC 89.17°
AZM 267.28°

ft
6900

ltgy-mgy, tan, bnd w/ off. wh,
nod hd, sbplty-sbblky, brit-fri, rthy

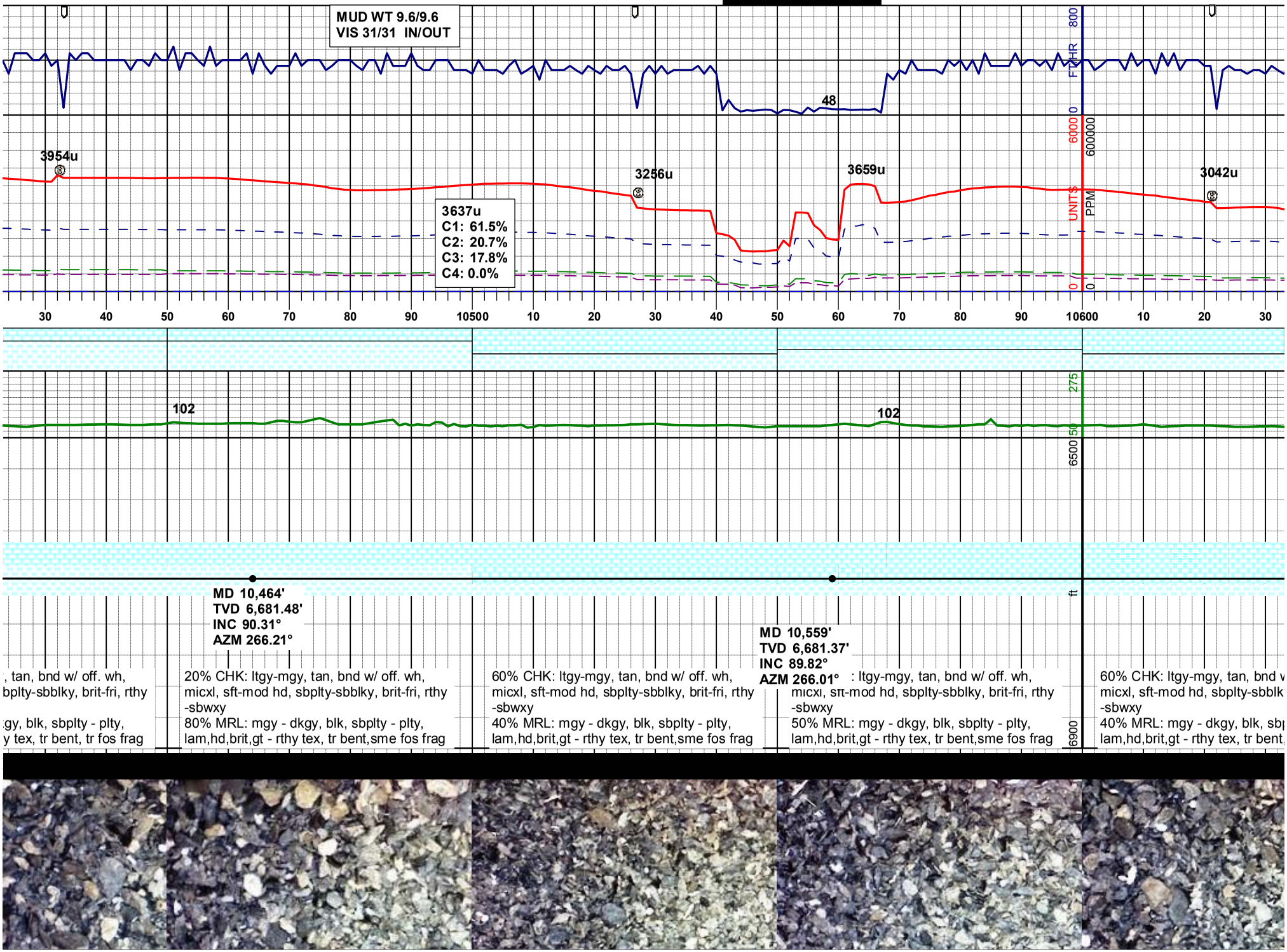
mgy - dkgy, blk, sbplty - plty,
rit, gt - rthy tex, tr bent, tr fos frag

30% CHK: ltgy-mgy, tan, bnd w/ off. wh,
micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy
-sbwxy
70% MRL: mgy - dkgy, blk, sbplty - plty,
lam, hd, brit, gt - rthy tex, tr bent, tr fos frag

20% CHK: ltgy-mgy, tan, bnd w/ off. wh,
micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy
-sbwxy
80% MRL: mgy - dkgy, blk, sbplty - plty,
lam,hd,brit,gt - rthy tex, tr bent,tr fos frag

30% CHK: ltgy-mgy, tan, bnd w/ off. wh,
micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy
-sbwxy
70% MRL: mgy - dkgy, blk, sbplty - plty,
lam, hd, brit, gt - rthy tex, tr bent, tr fos frag

30% CHK: ltgy-mgy
micxl, sft-mod hd, s
-sbwxy
70% MRL: mgy - dk
lam, hd, brit, gt - rth


MUD WT 9.6/9.6
VIS 31/31 IN/OUT
48
3954u
3256u
3659u
3042u
3637u
C1: 61.5%
C2: 20.7%
C3: 17.8%
C4: 0.0%
FT/HR
UNITS
PPM
102
102
MD 10,464'
TVD 6,681.48'
INC 90.31°
AZM 266.21°
MD 10,559'
TVD 6,681.37'
INC 89.82°
AZM 266.01°
, tan, bnd w/ off. wh,
bplty-sbblky, brit-fri, rthy
gy, blk, sbplty - plty,
y tex, tr bent, tr fos frag
20% CHK: ltgy-mgy, tan, bnd w/ off. wh,
micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy
-sbwxy
80% MRL: mgy - dkgy, blk, sbplty - plty,
lam,hd,brit,gt - rthy tex, tr bent,sme fos frag
60% CHK: ltgy-mgy, tan, bnd w/ off. wh,
micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy
-sbwxy
40% MRL: mgy - dkgy, blk, sbplty - plty,
lam,hd,brit,gt - rthy tex, tr bent,sme fos frag
: ltgy-mgy, tan, bnd w/ off. wh,
micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy
-sbwxy
50% MRL: mgy - dkgy, blk, sbplty - plty,
lam,hd,brit,gt - rthy tex, tr bent,sme fos frag
60% CHK: ltgy-mgy, tan, bnd w
micxl, sft-mod hd, sbplty-sbblk
-sbwxy
40% MRL: mgy - dkgy, blk, sb
lam,hd,brit,gt - rthy tex, tr bent,
ft

[redacted] [redacted]

MUD WT 9.6/9.6
VIS 32/32 IN/OUT

35

3728u
3583u
3503u
3493u

3308u
C1: 54.9%
C2: 19.3%
C3: 15.3%
C4: 10.6%

FT/HR 800 0
UNITS 6000 0
PPM 600000 0

40 50 60 70 80 90 10700 10 20 30 40 50 60 70 80 90 10800 10 20 30 40

88 90

275 50
6500

MD 10,654'
TVD 6681.70'
INC 89.78°
AZM 265.96°

MD 10,749'
TVD 6,682.28'
INC 89.26°
AZM 266.60°

ft
6900

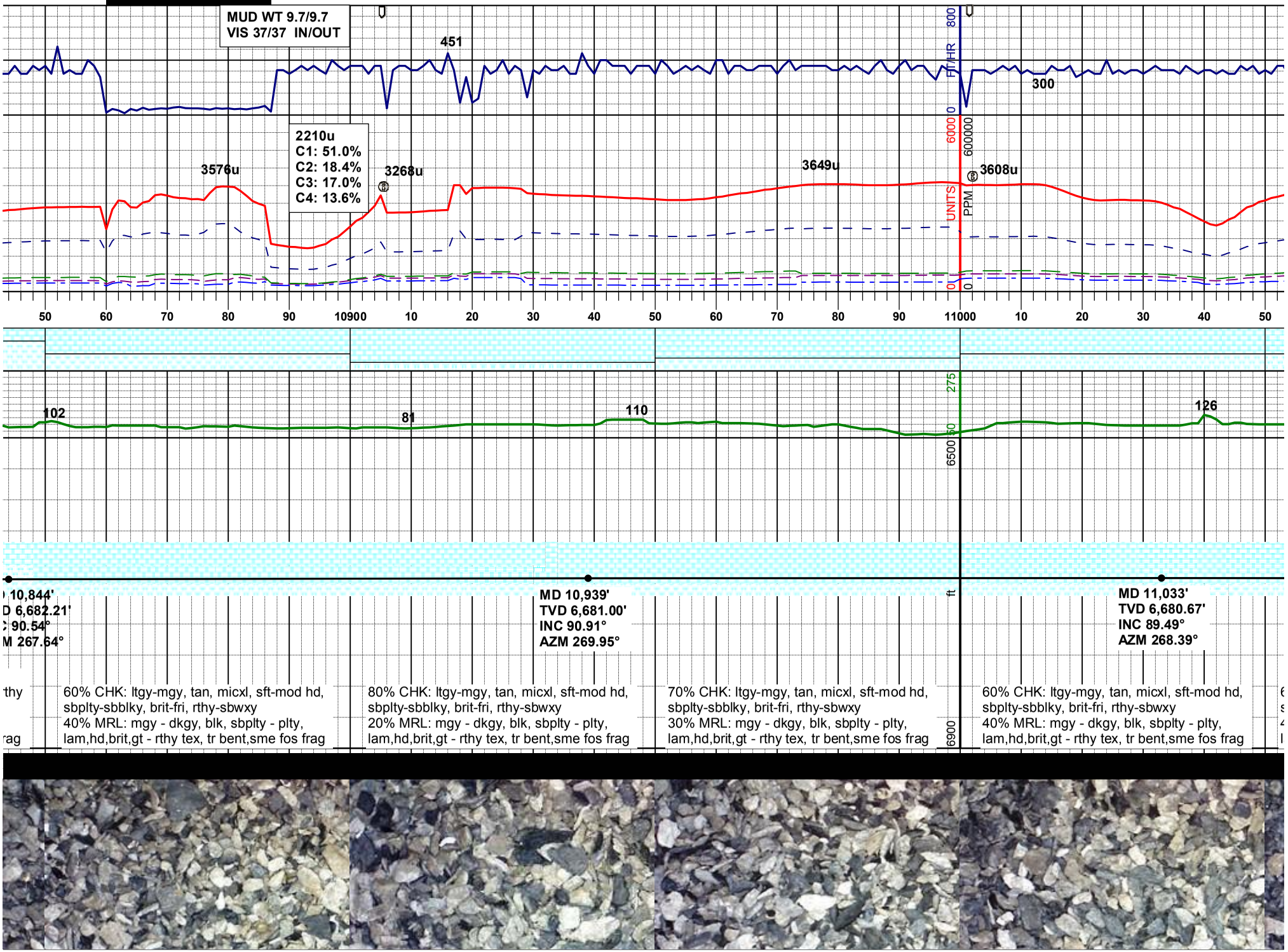
v/ off. wh,
y, brit-fri, rthy
olty - plty,
sme fos frag

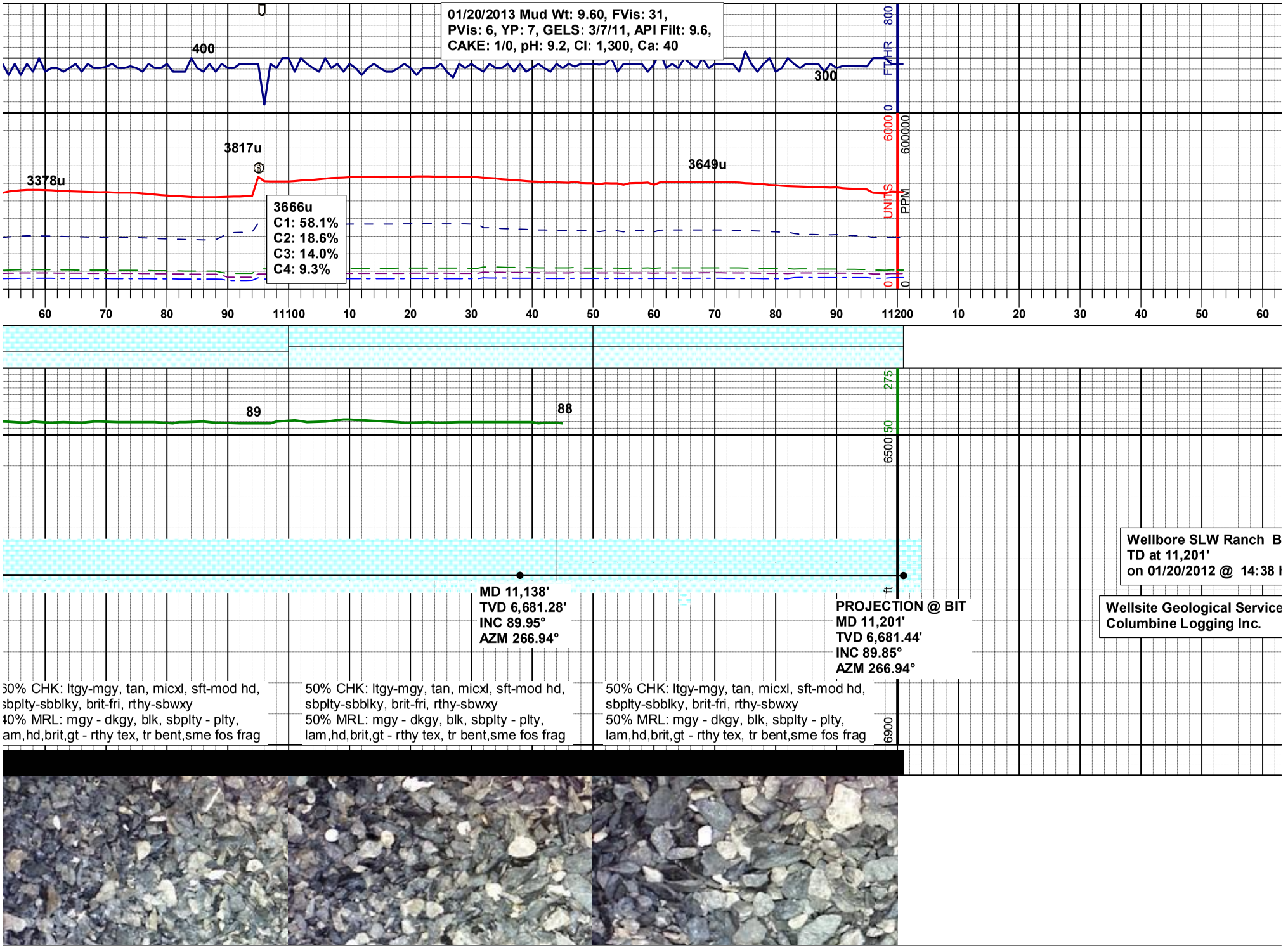
50% CHK: ltgy-mgy, tan, bnd w/ off. wh, micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy -sbwxy
50% MRL: mgy - dkgy, blk, sbplty - plty, lam,hd,brit,gt - rthy tex, tr bent,sme fos frag

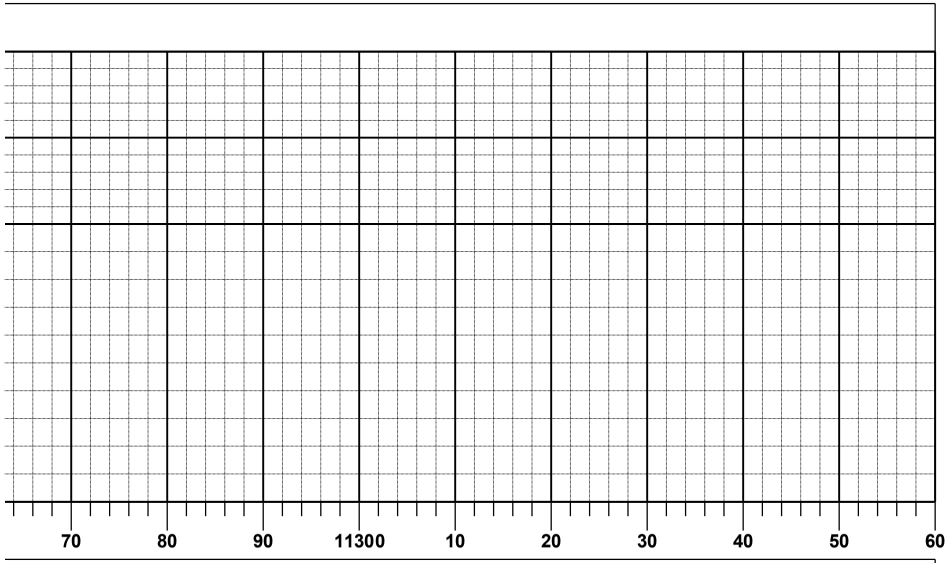
30% CHK: ltgy-mgy, tan, bnd w/ off. wh, micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy -sbwxy
70% MRL: mgy - dkgy, blk, sbplty - plty, lam,hd,brit,gt - rthy tex, tr bent,sme fos frag

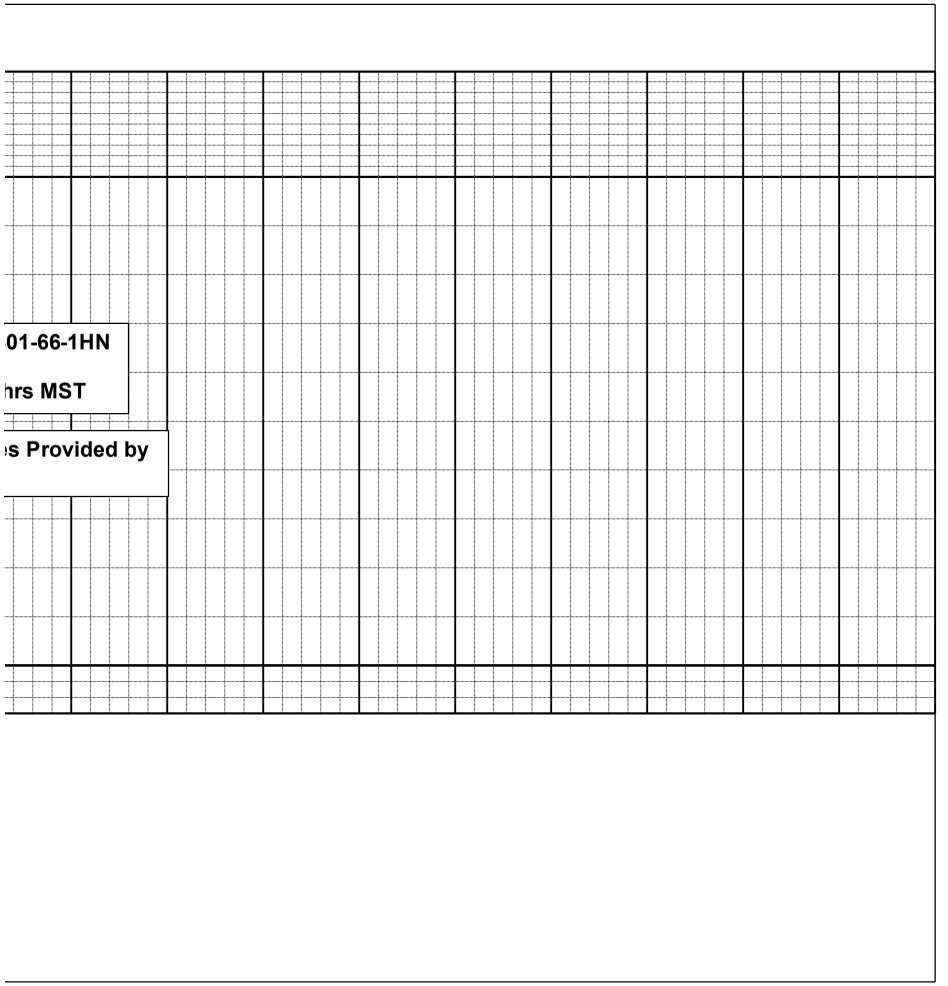
30% CHK: ltgy-mgy, tan, bnd w/ off. wh, micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy -sbwxy
70% MRL: mgy - dkgy, blk, sbplty - plty, lam,hd,brit,gt - rthy tex, tr bent,sme fos frag

30% CHK: ltgy-mgy, tan, bnd w/ off. wh, micxl, sft-mod hd, sbplty-sbblky, brit-fri, r -sbwxy
70% MRL: mgy - dkgy, blk, sbplty - plty, lam,hd,brit,gt - rthy tex, tr bent,sme fos fr


MUD WT 9.7/9.7
VIS 37/37 IN/OUT
451
300
FT/HR
800
0
2210u
C1: 51.0%
C2: 18.4%
C3: 17.0%
C4: 13.6%
3576u
3268u
3649u
3608u
6000
600000
UNITS
PPM
50
60
70
80
90
10900
10
20
30
40
50
60
70
80
90
11000
10
20
30
40
50
102
81
110
126
275
6500
MD 10,939'
TVD 6,681.00'
INC 90.91°
AZM 269.95°
MD 11,033'
TVD 6,680.67'
INC 89.49°
AZM 268.39°
ft
60% CHK: ltgy-mgy, tan, micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy-sbwxy
40% MRL: mgy - dkgy, blk, sbplty - plty, lam,hd,brit,gt - rthy tex, tr bent,sme fos frag
80% CHK: ltgy-mgy, tan, micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy-sbwxy
20% MRL: mgy - dkgy, blk, sbplty - plty, lam,hd,brit,gt - rthy tex, tr bent,sme fos frag
70% CHK: ltgy-mgy, tan, micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy-sbwxy
30% MRL: mgy - dkgy, blk, sbplty - plty, lam,hd,brit,gt - rthy tex, tr bent,sme fos frag
60% CHK: ltgy-mgy, tan, micxl, sft-mod hd, sbplty-sbblky, brit-fri, rthy-sbwxy
40% MRL: mgy - dkgy, blk, sbplty - plty, lam,hd,brit,gt - rthy tex, tr bent,sme fos frag
6900


01/20/2013 Mud Wt: 9.60, FVis: 31,
PVis: 6, YP: 7, GELS: 3/7/11, API Filt: 9.6,
CAKE: 1/0, pH: 9.2, Cl: 1,300, Ca: 40
400
300
FT/HR
800
0
3817u
3649u
3378u
3666u
C1: 58.1%
C2: 18.6%
C3: 14.0%
C4: 9.3%
6000
0
600000
UNITS
PPM
60 70 80 90 11100 10 20 30 40 50 60 70 80 90 11200 10 20 30 40 50 60
89
88
275
50
6500
MD 11,138'
TVD 6,681.28'
INC 89.95°
AZM 266.94°
PROJECTION @ BIT
MD 11,201'
TVD 6,681.44'
INC 89.85°
AZM 266.94°
ft
6900
Wellbore SLW Ranch B
TD at 11,201'
on 01/20/2012 @ 14:38 I
Wellsite Geological Service
Columbine Logging Inc.
50% CHK: ltgy-mgy, tan, micxl, sft-mod hd,
sbplty-sbblky, brit-fri, rthy-sbwxy
40% MRL: mgy - dkgy, blk, sbplty - plty,
lam,hd,brit,gt - rthy tex, tr bent,sme fos frag
50% CHK: ltgy-mgy, tan, micxl, sft-mod hd,
sbplty-sbblky, brit-fri, rthy-sbwxy
50% MRL: mgy - dkgy, blk, sbplty - plty,
lam,hd,brit,gt - rthy tex, tr bent,sme fos frag
50% CHK: ltgy-mgy, tan, micxl, sft-mod hd,
sbplty-sbblky, brit-fri, rthy-sbwxy
50% MRL: mgy - dkgy, blk, sbplty - plty,
lam,hd,brit,gt - rthy tex, tr bent,sme fos frag


70
80
90
11300
10
20
30
40
50
60


01-66-1HN
hrs MST
s Provided by