

LOG created using LPLLOT VH Version 3.0, June 21, 2012, Copyright (C) 1999-2009 Pason Systems Corp.

**OPERATOR:** NOBLE ENERGY INC.  
**WELL:** WELLS RANCH AA14-63-1HN  
**LOCATION:** SWSW SEC. 14-6N-63W  
**COUNTY:** WELD  
**STATE:** COLORADO  
**SPOT:** 1,192' FSL 295' FWL  
**ELEVATION:** 4,735' GL 4,759' KB  
**FIELD:** WATTENBERG  
**SPUD DATE:** 6/13/2012  
**TD DATE:** 6/15/2012  
**DATES LOGGED:** 6/14/2012 - 6/15/2012 (VERTICAL)  
**DEPTHS LOGGED:** 2,000' - 5,800' (VERTICAL)  
**LOGGERS:** CHRIS COOK; MARK COLE  
**DRILLING FLUID:** LSND  
**DRILLING RIG:** H&P 315  
**API:** 05-123-35524  
**LOG TYPE:** VERTICAL  
**SCALE:** 1:240 (5 inches per 100 feet)  
**REMARKS:** See corresponding horizontal log: WELLS RANCH AA14-63-1HN HORZ.  
 Latitude: 40.482590; Longitude -104.412141

### LITHOLOGIES



Sandstone



Shaly Sandstone



Shaly Siltstone



Silty Shale

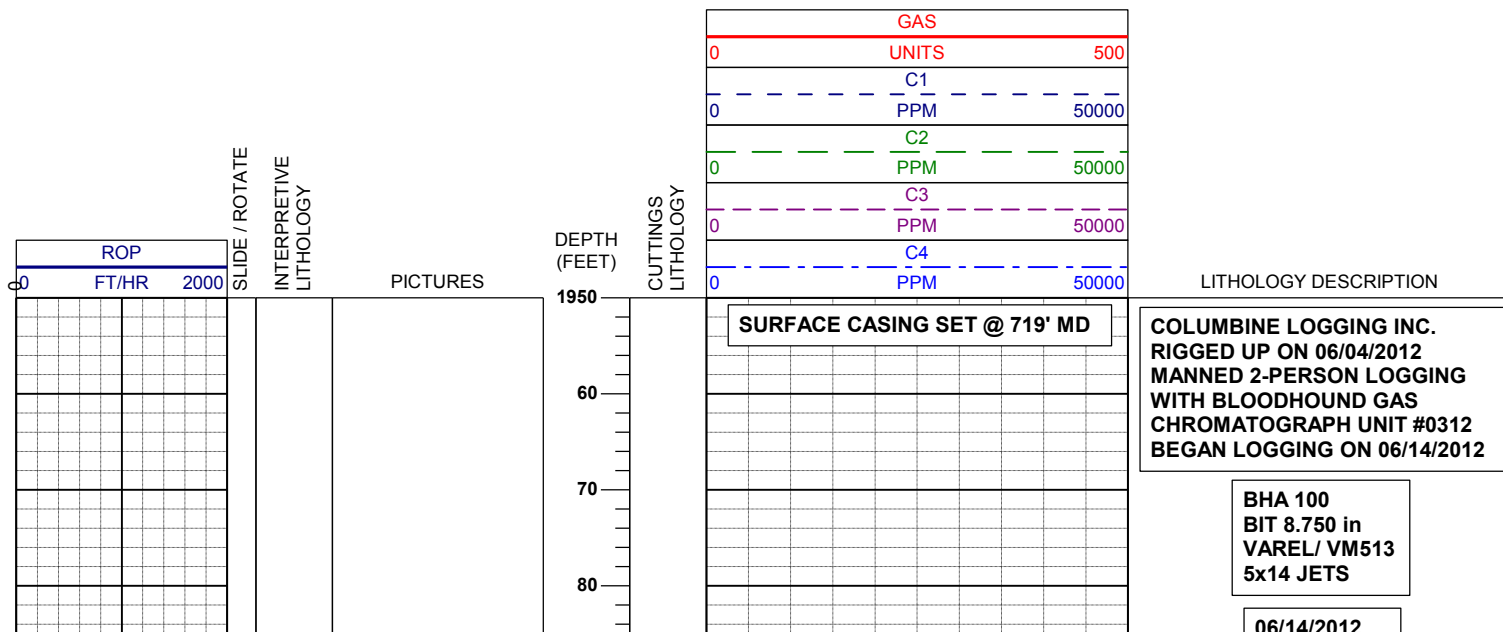
### ENGINEERING SYMBOLS

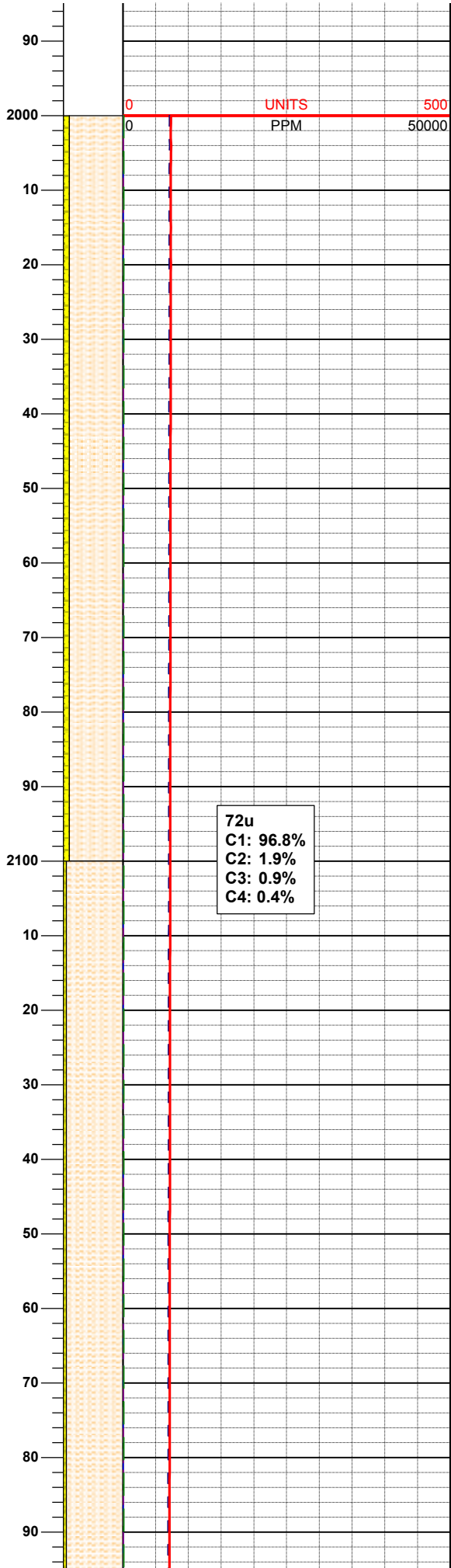
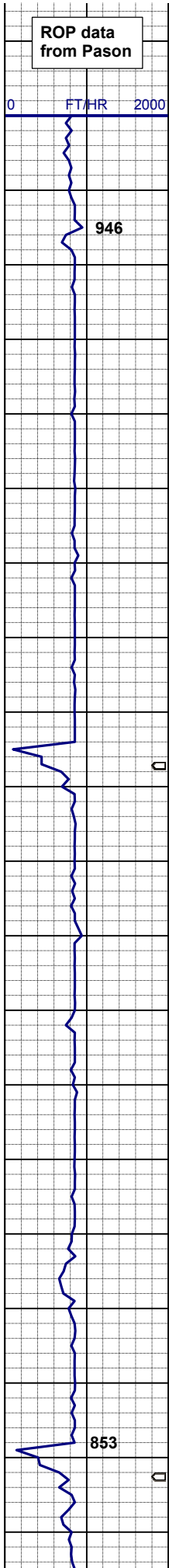


Connection



Midnight Depth



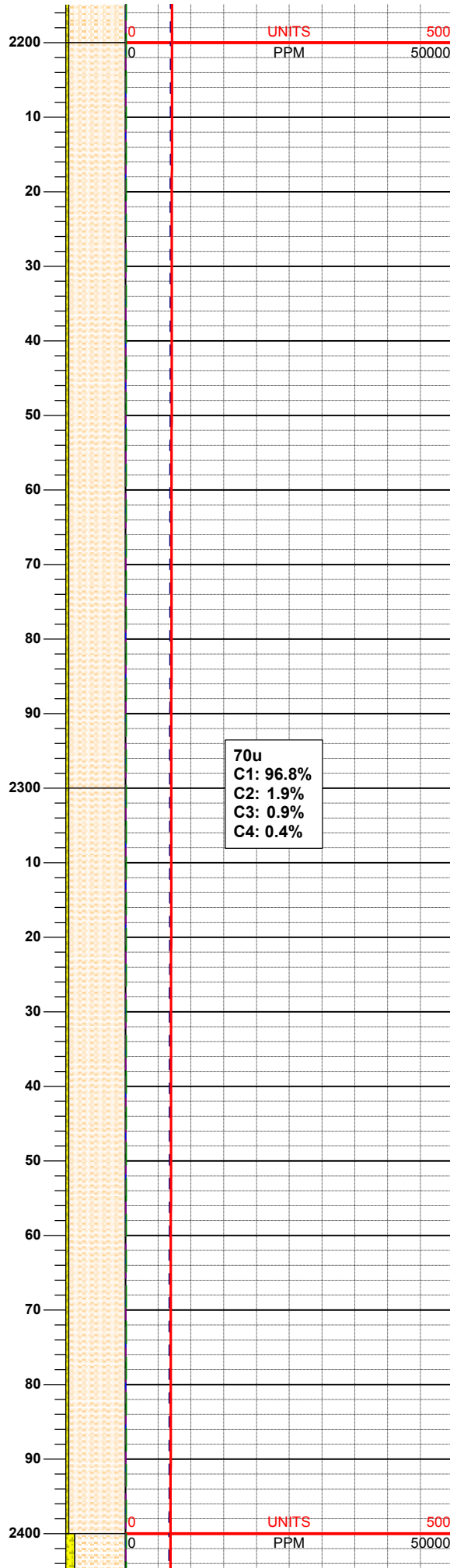
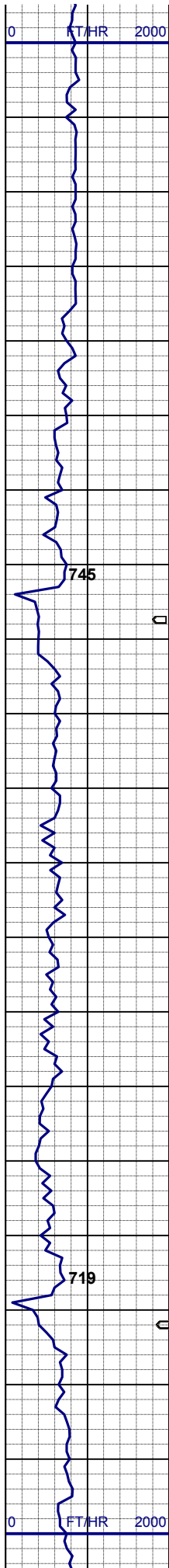


Mud Wt: 9.05  
FVis: 34  
PVis: 5  
YP: 4  
GELS: 1/2/4  
API Filt: ns  
CAKE: 1/0  
pH: 8.6  
Cl: 1,300  
Ca: 120

SD 2,029'  
INC 0.34°  
AZM 286.16°

SHLY SLTST: pred lt gy, sme crm,  
slty, p por, v arg cmt  
SHY SS: wh-ltgy, s&p, vfgr, sbang-  
sbrd, mod srt, fria, p por, arg cmt, occ  
glau & carb incl, calc

SHLY SLTST: pred lt gy, sme crm,  
slty, p por, v arg cmt  
SHY SS: wh-ltgy, s&p, vfgr, sbang-  
sbrd, mod srt, fria, p por, arg cmt, occ  
glau & carb incl, calc



glau & carb incl, calc

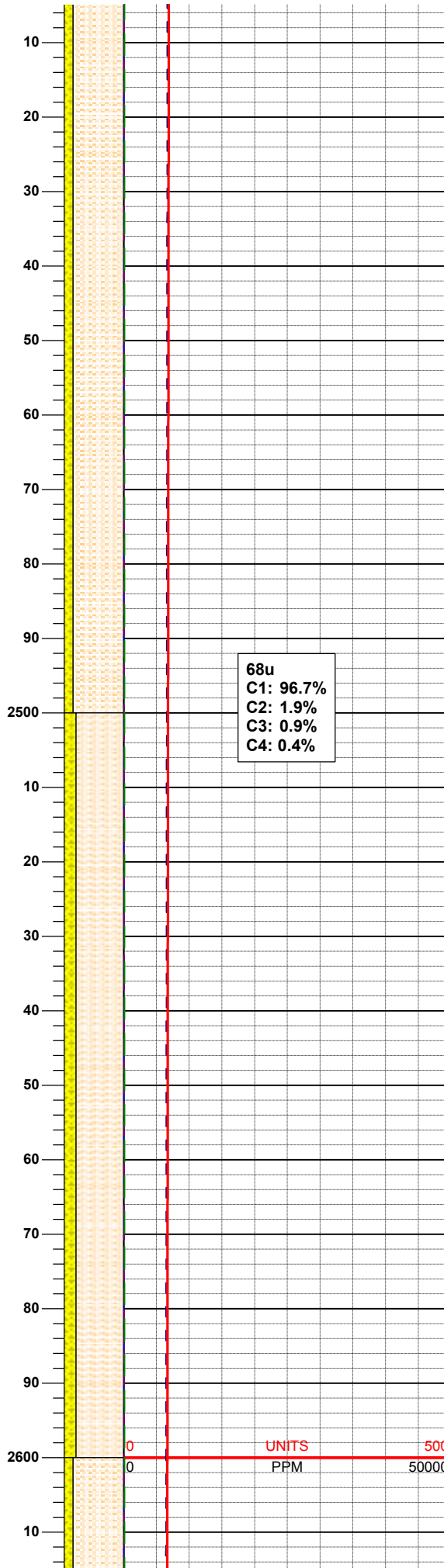
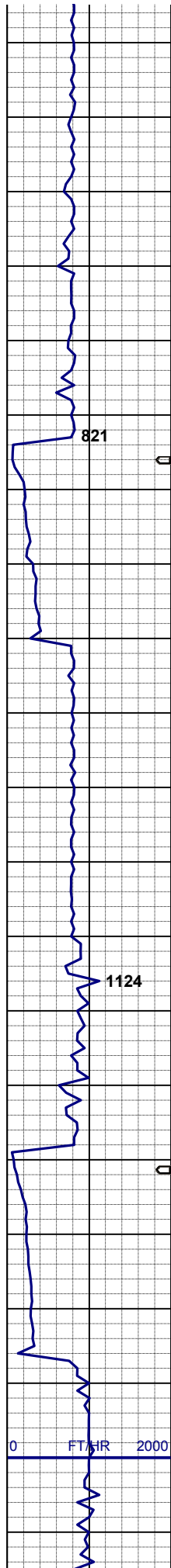
SHLY SLTST: pred lt gy, sme crm,  
slty, p por, v arg cmt  
SHY SS: wh-ltgy, s&p, vfgr, sbang-  
sbrd, mod srt, fria, p por, arg cmt, occ  
glau & carb incl, calc

SD 2,314'  
INC 0.56°  
AZM 204.16°

SHLY SLTST: pred lt gy, sme crm,  
slty, p por, v arg cmt  
SHY SS: wh-ltgy, s&p, vfgr, sbang-  
sbrd, mod srt, fria, p por, arg cmt, occ  
glau & carb incl, calc

SD 2,314'





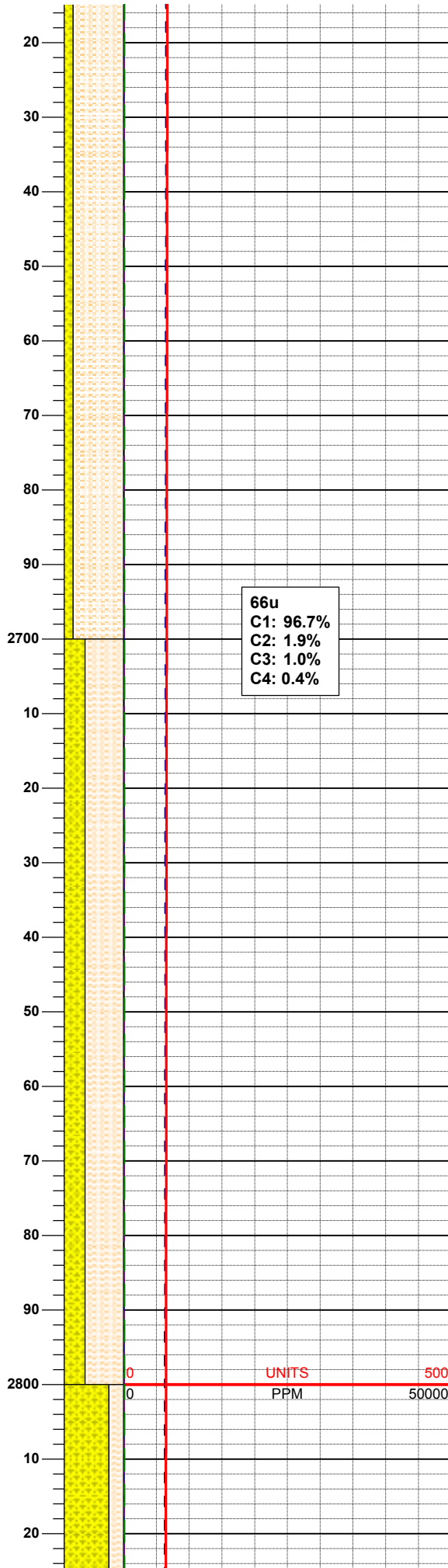
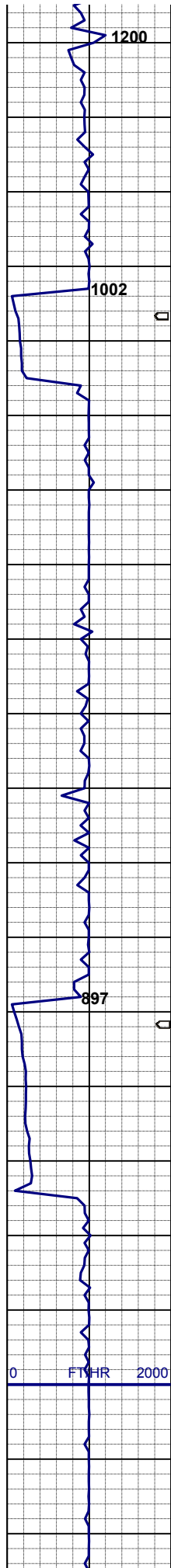
SD 2,409  
TVD 2,408.92'  
INC 0.62°  
AZM 185.77°

SHLY SLTST: pred lt gy, sme crm,  
slty, p por, v arg cmt  
SHY SS: wh-ltgy, s&p, vfgr, sbang-  
sbrd, mod srt, fria, p por, arg cmt, occ  
glau & carb incl, calc

SD 2,504'  
TVD 2,503.88'  
INC 2.68°  
AZM 207.67°

SHLY SLTST: pred lt gy, sme crm,  
slty, p por, v arg cmt  
SHY SS: wh-ltgy, s&p, vfgr, sbang-  
sbrd, mod srt, fria, p por, arg cmt, occ  
glau & carb incl, calc

SD 2,599'  
TVD 2,598.68'  
INC 4.72°  
AZM 234.23°



66u  
C1: 96.7%  
C2: 1.9%  
C3: 1.0%  
C4: 0.4%

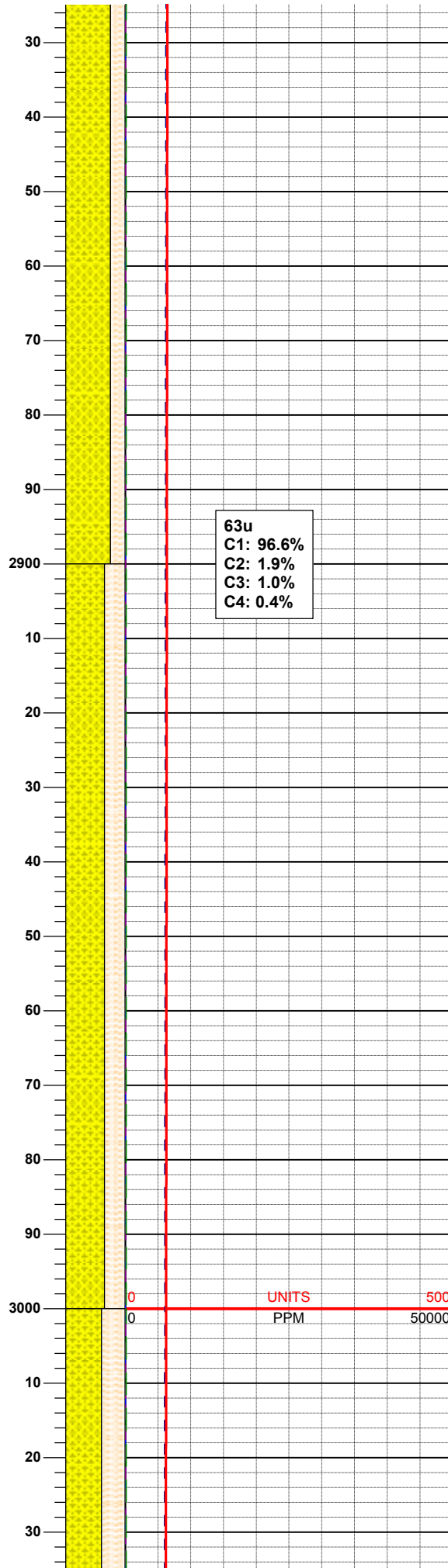
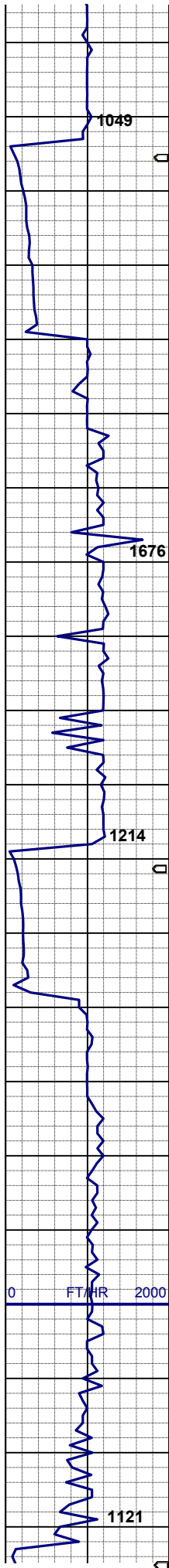
SD 2,694'  
TVD 2,693.33'  
INC 5.16°  
AZM 234.24°

SHLY SLTST: pred lt gy, sme crm,  
slty, p por, v arg cmt  
SHY SS: wh-ltgy, s&p, vfgr, sbang-  
sbrd, mod srt, fria, p por, arg cmt, occ  
glau & carb incl, calc

SD 2,788'  
TVD 2,786.85'  
INC 6.40°  
AZM 233.14°

SHLY SLTST: pred lt gy, sme crm,  
slty, p por, v arg cmt  
SHY SS: wh-ltgy, s&p, vfgr, sbang-  
sbrd, mod srt, fria, p por, arg cmt, occ  
glau & carb incl, calc





**SD 2,883'**  
**TVD 2,881.12'**  
**INC 7.75°**  
**AZM 224.78°**

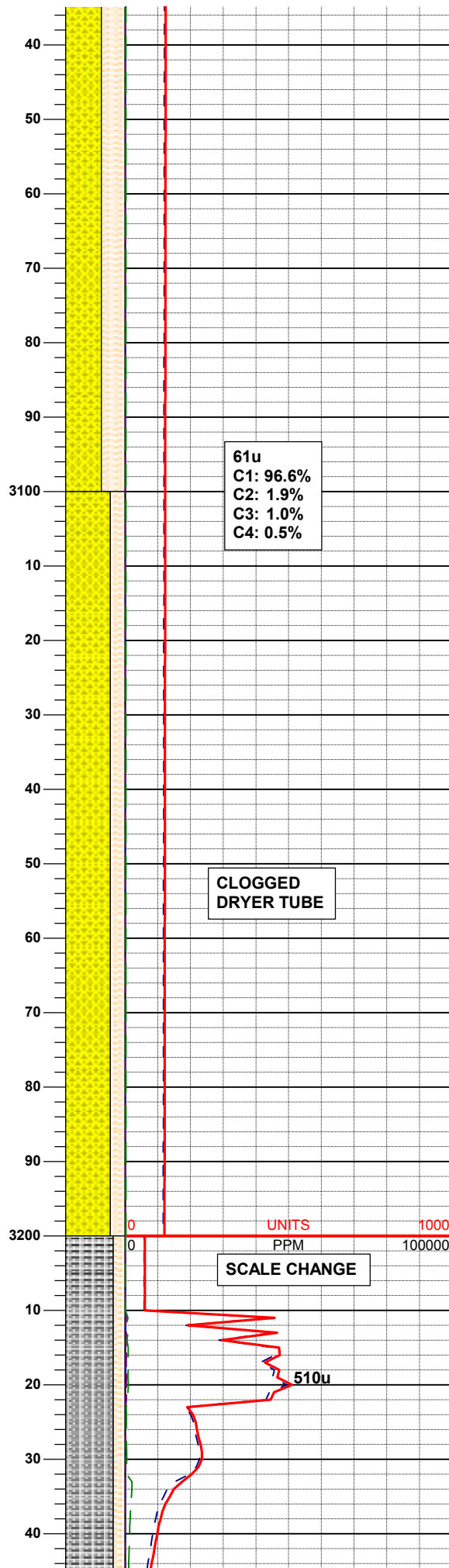
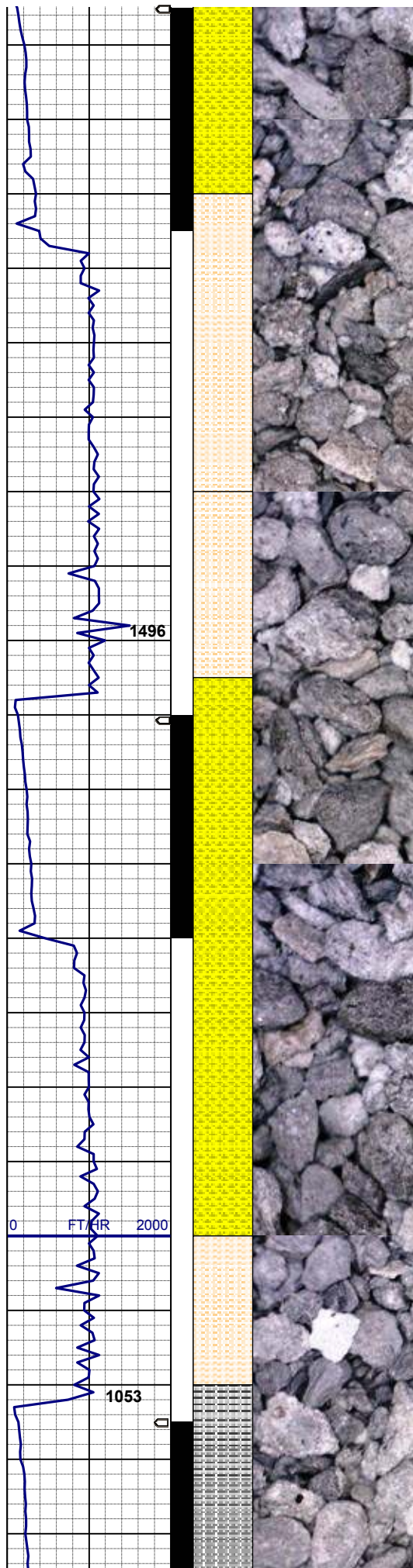
SHY SS: wh-ltgy, s&p, vfgr, sbang-sbrd, mod srt, fria, p por, arg cmt, occ glau & carb incl, calc  
SHLY SLTST: pred lt gy, sme crm, slty, p por, v arg cmt

**63u**  
**C1: 96.6%**  
**C2: 1.9%**  
**C3: 1.0%**  
**C4: 0.4%**

**SD 2,978'**  
**TVD 2,975.13'**  
**INC 8.82°**  
**AZM 225.85°**

SHY SS: wh-ltgy, s&p, vfgr, sbang-sbrd, mod srt, fria, p por, arg cmt, occ glau & carb incl, calc  
SHLY SLTST: pred lt gy, sme crm, slty, p por, v arg cmt

**MUD WT 8.9/8.9**  
**VIS 29/29 IN/OUT**



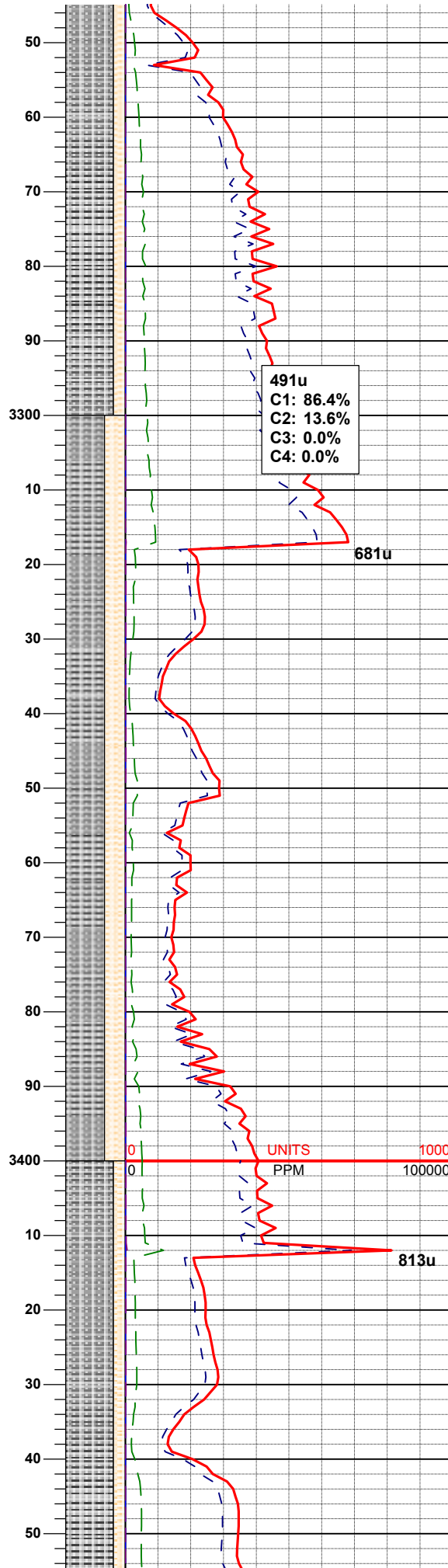
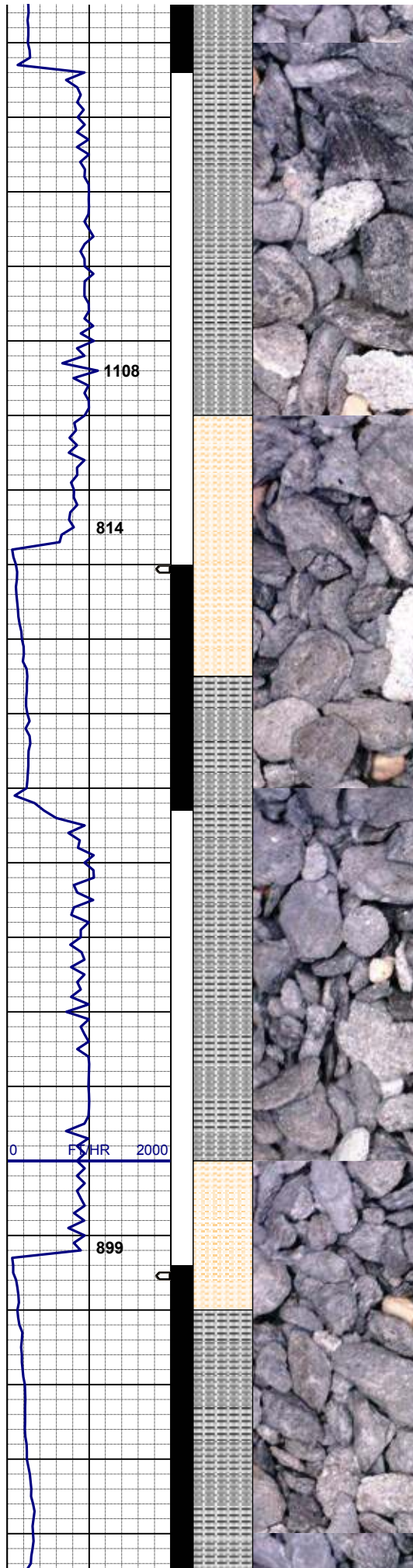
SD 3,073'  
TVD 3,068.92'  
INC 9.51°  
AZM 229.93°

SHY SS: wh-ltgy, s&p, vfgr, sbang-sbrd, mod srt, fria, p por, arg cmt, occ glau & carb incl, calc  
SHLY SLTST: pred lt gy, sme crm, slty, p por, v arg cmt

SD 3,168'  
TVD 3,162.39'  
INC 11.06°  
AZM 228.00°

SHY SS: wh-ltgy, s&p, vfgr, sbang-sbrd, mod srt, fria, p por, arg cmt, occ glau & carb incl, calc  
SHLY SLTST: pred lt gy, sme crm, slty, p por, v arg cmt





SD 3,263'  
TVD 3,255.52'  
INC 11.69°  
AZM 229.96°

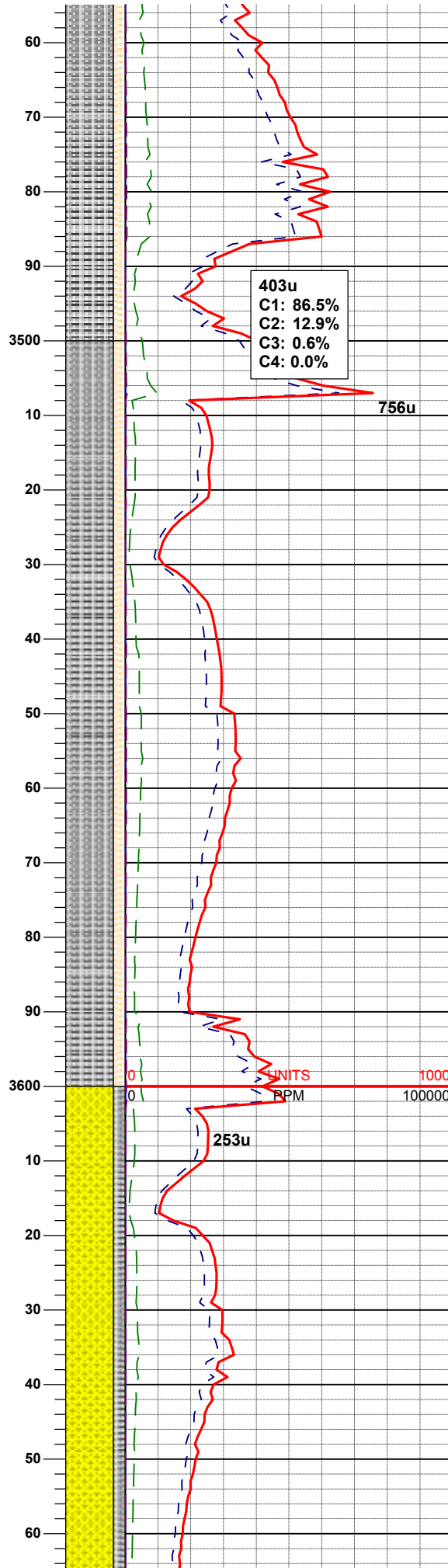
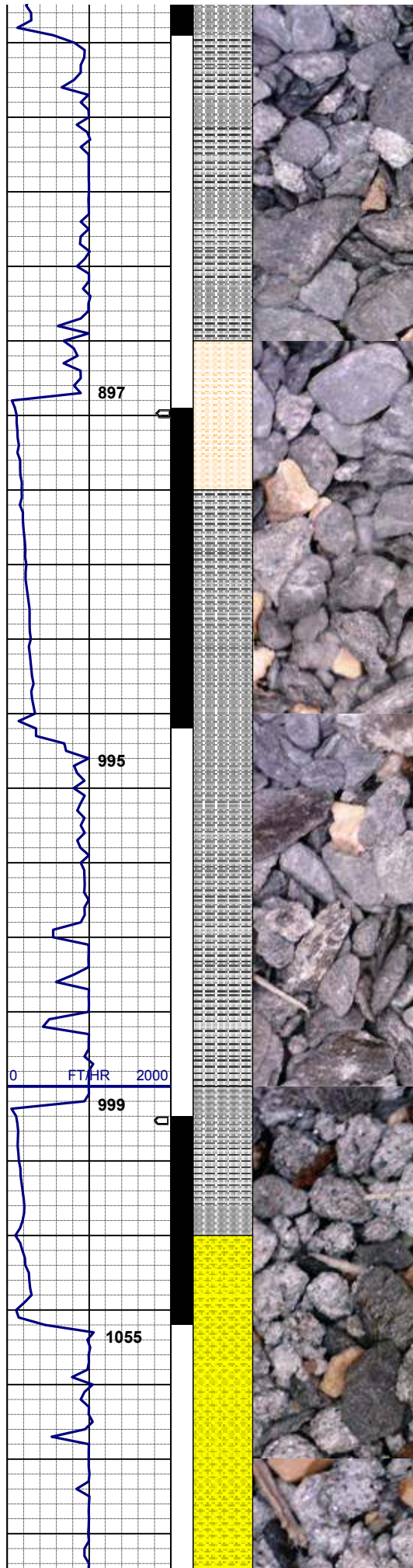
SLTY SH: lt - m gy, sbply - sbbly,  
firm, gt mtx, arg - slty  
SHLY SLTST: pred lt gy, sme crm,  
slty, p por, v arg cmt, sl calc

SD 3,357'  
TVD 3,347.69'  
INC 10.93°  
AZM 231.65°

SLTY SH: lt - m gy, sbply - sbbly,  
firm, gt mtx, arg - slty  
SHLY SLTST: pred lt gy, sme crm,  
slty, p por, v arg cmt, sl calc

SD 3,452'  
TVD 3,440.78'  
INC 12.09°





AZM 233.69°

SLTY SH: lt - m gy, sbply - sbblky,  
firm, gt mtx, arg - slty  
SHLY SLTST: pred lt gy, sme crm,  
sly, p por, v arg cmt, sl calc

403u  
C1: 86.5%  
C2: 12.9%  
C3: 0.6%  
C4: 0.0%

756u

SD 3,547'  
TVD 3,533.54'  
INC 12.85°  
AZM 230.60°

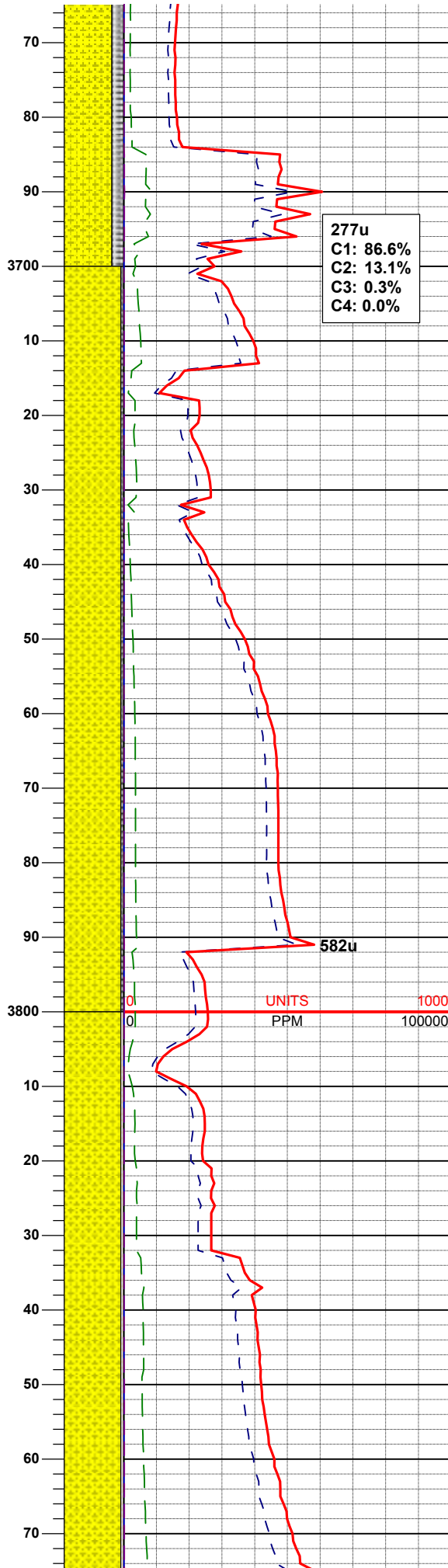
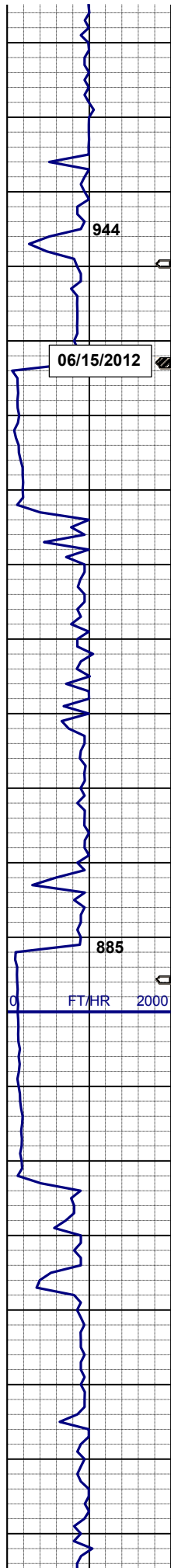
SLTY SH: m gy - dk gy, firm-sft,  
sbply - sbblky, gt mtx; arg - slty  
SHLY SLTST: pred lt gy, sme crm,  
sly, p por, v arg cmt, sl calc

INITS 1000  
RPM 100000

253u

LOGGER TOP OF  
PARKMAN SS  
MD 3,620' TVD 3,615'

SD 3,630'  
TVD 3,625.77'  
INC 14.87°  
AZM 227.08°



277u  
C1: 86.6%  
C2: 13.1%  
C3: 0.3%  
C4: 0.0%

SHLY SS: wh-ltgy-gy, s&p, m hd, f-m  
gr, sbrd-sbang, p srt, m por, calc &  
arg cmt, occ glau, occ carb incl  
SLTY SH: m gy - dk gy, firm-sft,  
sbply - sbblky, gt mtx; arg - slty

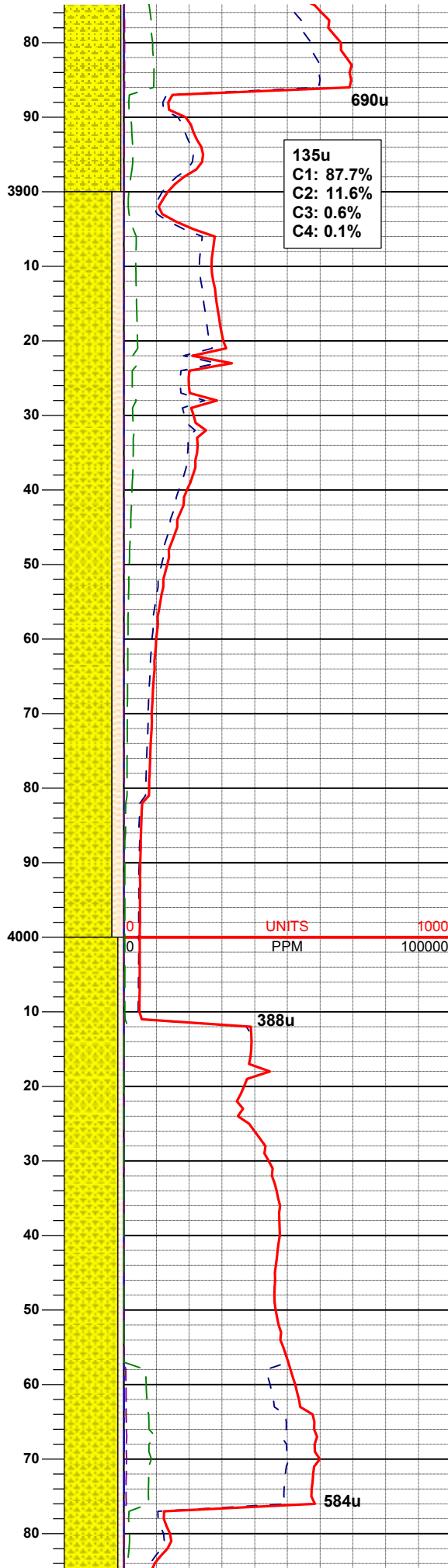
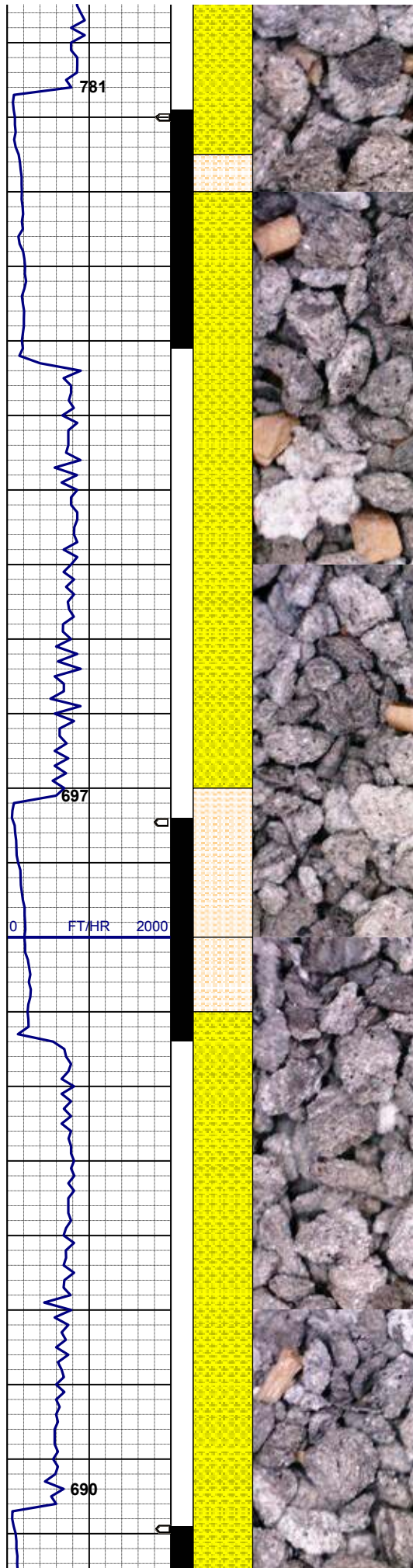
MUD WT 8.8/8.95  
VIS 28/28 IN/OUT

SD 3,737'  
TVD 3,717.56'  
INC 15.03°  
AZM 223.68°

SHLY SS: wh-ltgy-gy, s&p, m hd, f-m  
gr, sbrd-sbang, p srt, m por, calc &  
arg cmt, occ glau, occ carb incl  
SLTY SH: m gy - dk gy, firm-sft,  
sbply - sbblky, gt mtx; arg - slty

SD 3,832'  
TVD 3,809.61'  
INC 13.59°  
AZM 222.78°





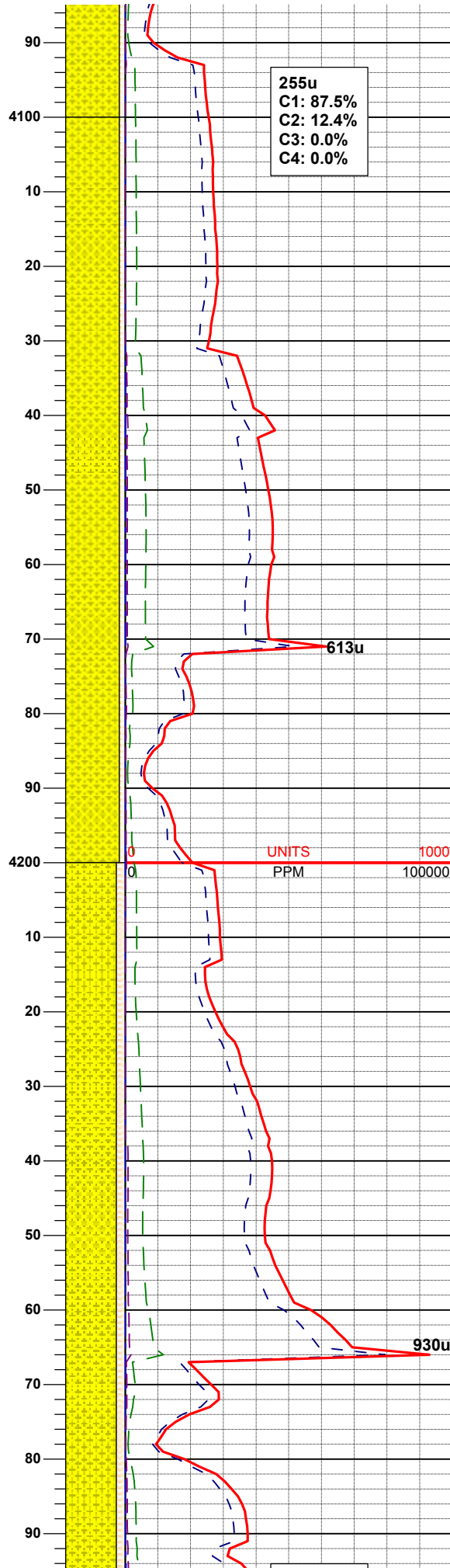
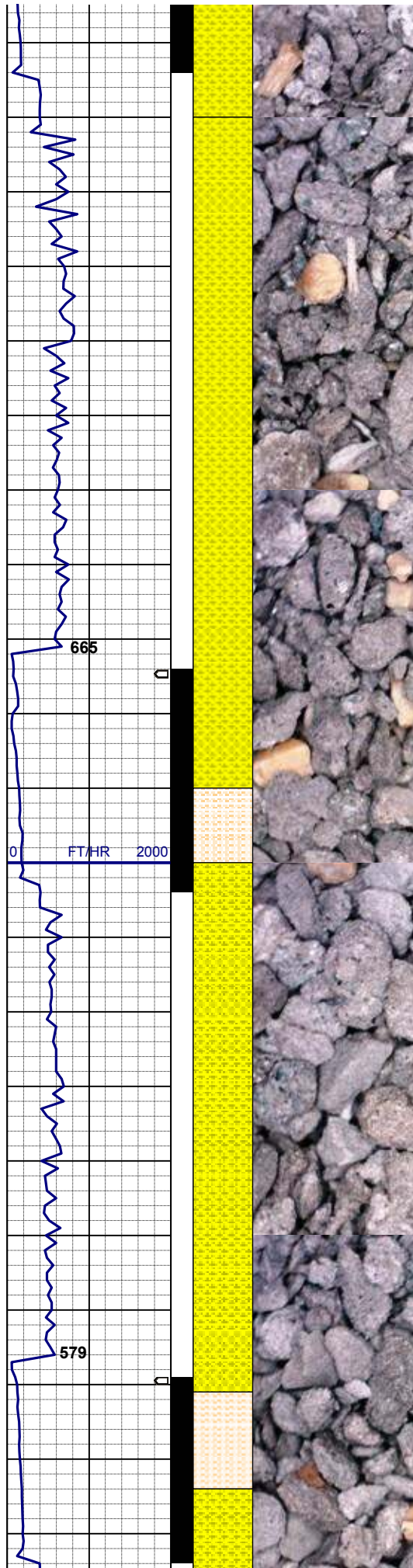
SHLY SS: wh-ltgy-gy, s&p, m hd, f-m  
gr, sbrd-sbang, p srt, m por, calc &  
arg cmt, occ glau, occ carb incl  
SHLY SLTST: pred lt gy, sme crm,  
silty, p por, v arg cmt, calc

SD 3,927'  
TVD 3,902.27'  
INC 11.87°  
AZM 222.00°

SHLY SS: wh-ltgy-gy, s&p, m hd, f-m  
gr, sbrd-sbang, p srt, m por, calc &  
arg cmt, occ glau, occ carb incl  
SHLY SLTST: pred lt gy, sme crm,  
silty, p por, v arg cmt, calc

SD 4,022'  
TVD 3,995.66'  
INC 9.21°  
AZM 224.65°

SHLY SS: wh-ltgy-gy, s&p, m hd, f-m



gr, sbrd-sbang, p srt, m por, calc & arg cmt, occ glau, occ carb incl  
SHLY SLTST: pred lt gy, sme crm, slty, p por, v arg cmt, calc

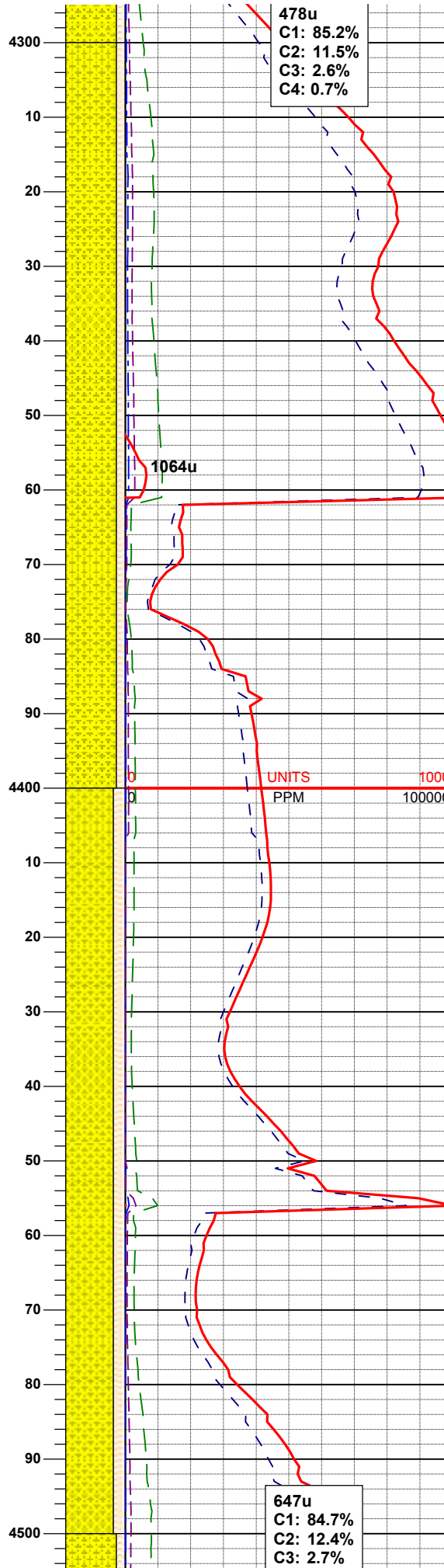
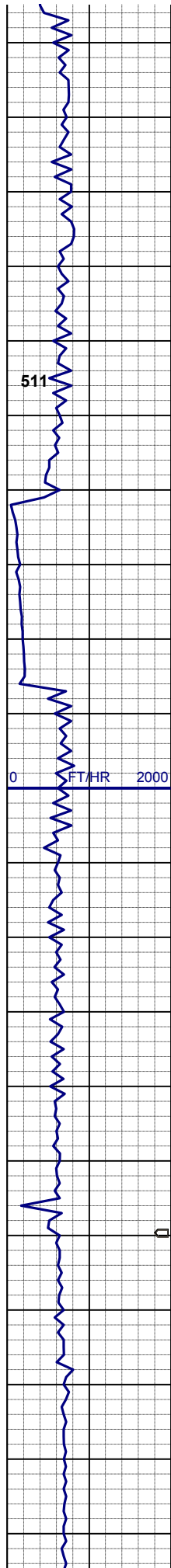
SD 4,117'  
TVD 4,089.75'  
INC 6.58°  
AZM 219.00°

SHLY SS: ltgy, s&p, m hd, f gr, sbrd-sbang, p srt, p por, calc & arg cmt, occ glau, occ carb incl grdg -  
SHLY SLTST: pred lt gy, sme crm, slty, p por, v arg cmt, calc

SD 4,212'  
TVD 4,184.32'  
INC 4.34°  
AZM 226.96°

SHLY SS: ltgy, s&p, m hd, f gr, sbrd-sbang, p srt, p por, calc & arg cmt, occ glau, occ carb incl grdg -  
SHLY SLTST: pred lt gy, sme crm, slty, p por, v arg cmt, calc





SD 4,307'  
TVD 4,279.16'  
INC 2.27°  
AZM 220.02°

LOGGER TOP OF  
SUSSEX (TERRY) SS  
MD 4,362' TVD 4,330'

SHLY SS: ltgy, s&p, m hd, f gr, sbdr-  
sbang, p srt, p por, calc & arg cmt,  
occ glau, occ carb incl grdg -  
SHLY SLTST: pred lt gy, sme crm,  
silty, p por, v arg cmt, calc

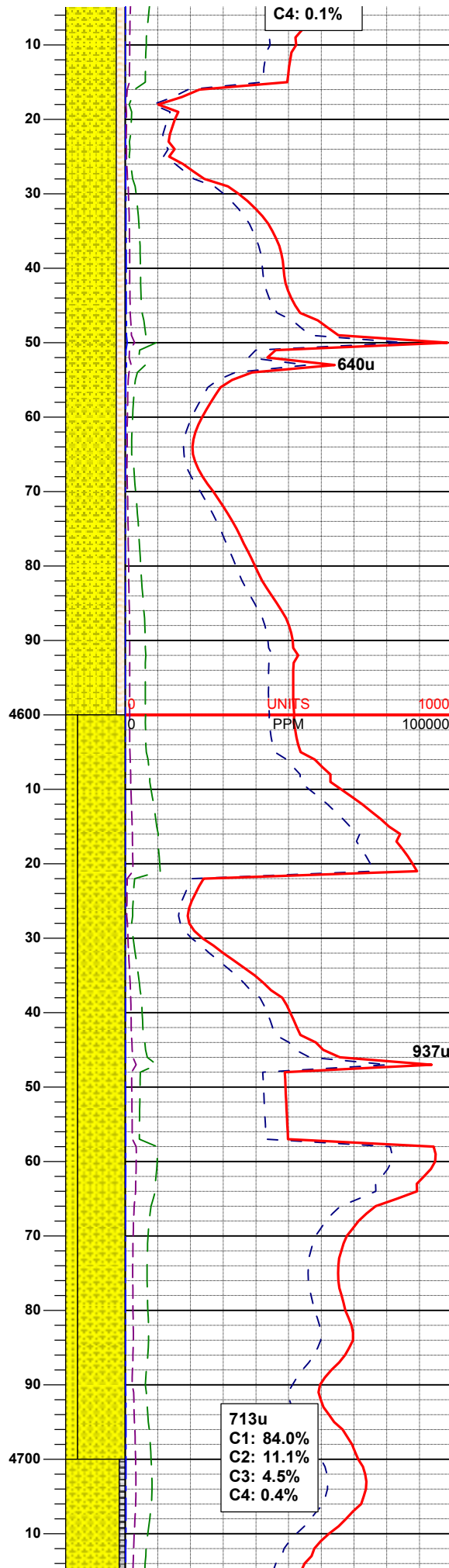
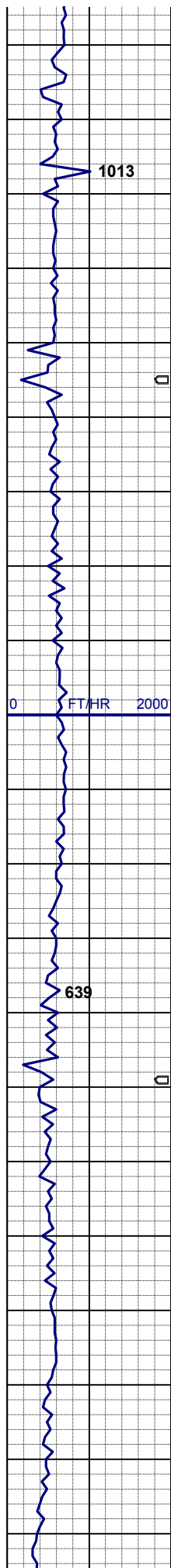
SD 4,402'  
TVD 4,374.12'  
INC 0.76°  
AZM 196.63°

06/15/2012  
Mud Wt: 8.8  
FVis: 29  
PVis: 2  
YP: 3  
GELS:ns  
API Filt: ns  
CAKE: 1/0  
pH: 9.3  
Cl: 1,000  
Ca: 80

MUD WT 8.7/8.75  
VIS 27/27 IN/OUT

SHLY SS: ltgy, s&p, m hd, f gr, sbdr-  
sbang, p srt, p por, calc & arg cmt,  
occ glau, occ carb incl grdg -  
SHLY SLTST: pred lt gy, sme crm,  
silty, p por, v arg cmt, calc

SD 4,497'  
TVD 4,469.11'  
INC 0.74°  
AZM 196.63°

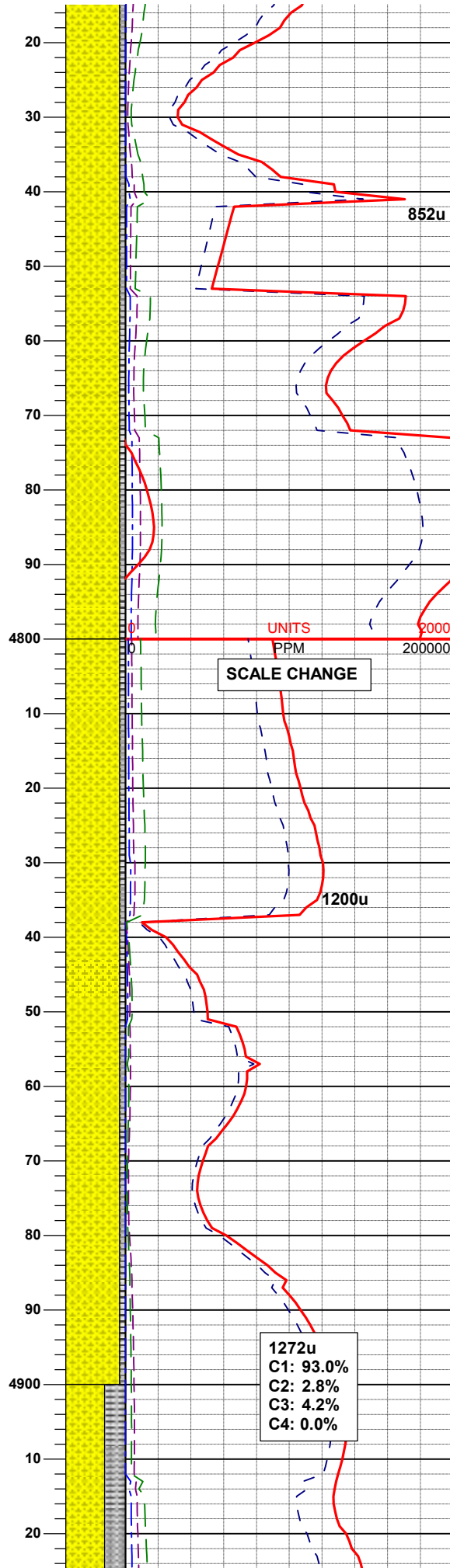
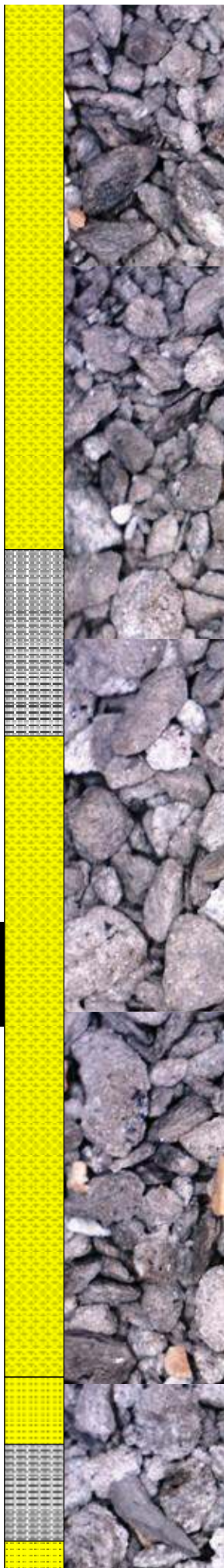
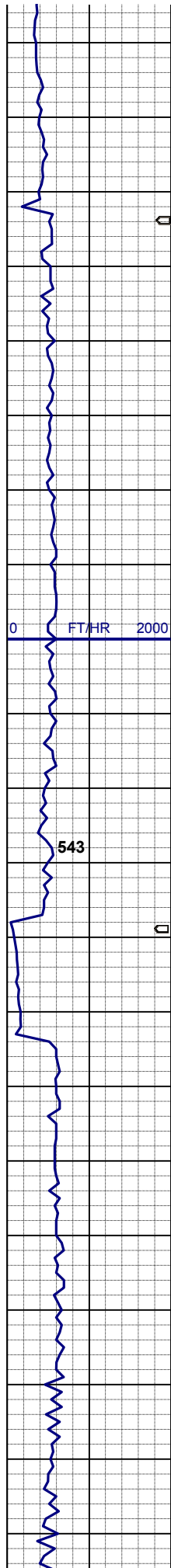


INC 0.74  
AZM 184.41°

SHLY SS: ltgy, s&p, m hd, f gr, sbrd-sbang, p srt, p por, calc & arg cmt, occ glau, occ carb incl grdg - SHLY SLTST: pred lt gy, sme crm, slty, p por, v arg cmt, calc

SHLY SS: ltgy, s&p, m hd, f gr, sbrd-sbang, p srt, p por, calc & arg cmt, occ glau, occ carb incl, SS: wh - gy, s&p, hd - firm, f - vf gr, sbrd - sbang, sme glau & carb incl,



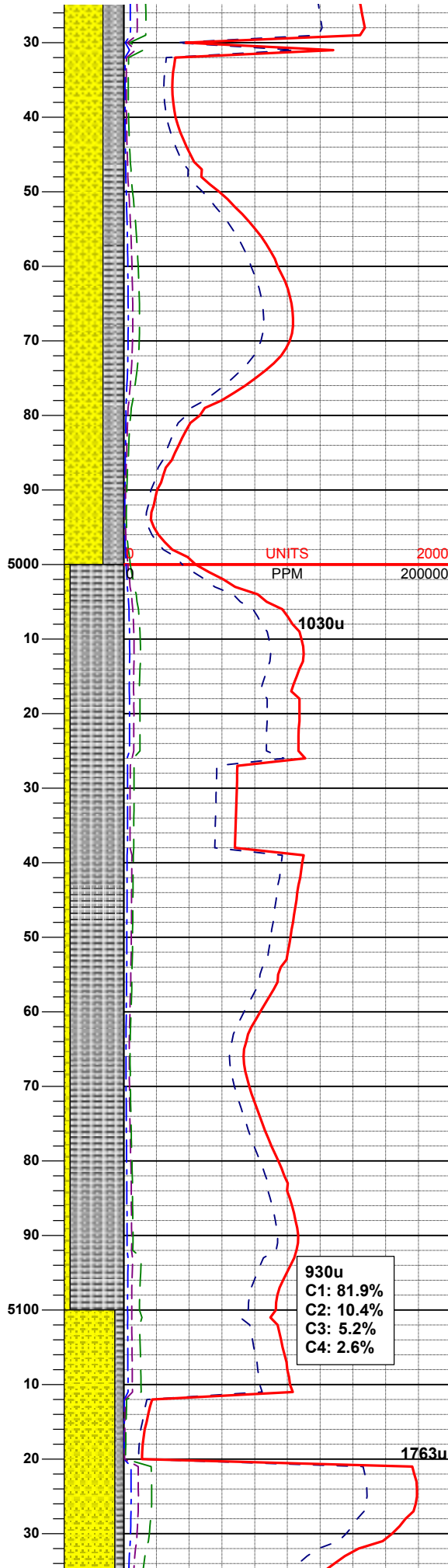
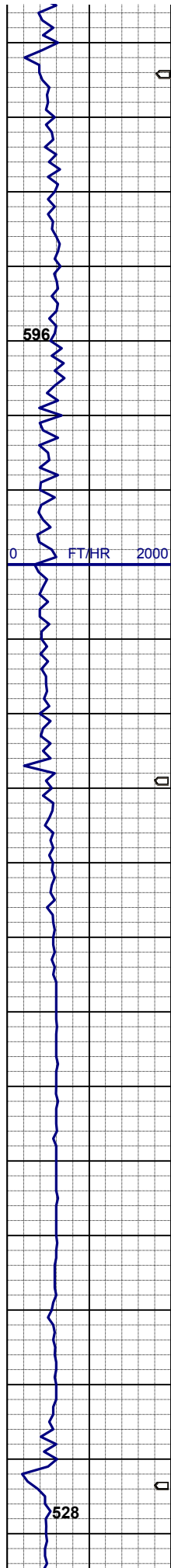


SD 4,781'  
TVD 4,753.06'  
INC 1.54°  
AZM 141.03°

SHLY SS: ltgy, s&p, m hd, f gr, sbdr-  
sbang, p srt, p por, calc & arg cmt,  
occ glau, occ carb incl,  
SLTY SH: ltgy-mgy, firm, sbplty-plty,  
silty tex, calc

LOGGER TOP OF  
SHANNON (HYGIENE) SS  
MD 4,837' TVD 4,805'

SHLY SS: ltgy, s&p, m hd, f gr, sbdr-  
sbang, p srt, p por, calc & arg cmt,  
occ glau, occ carb incl,  
SLTY SH: ltgy-mgy, firm, sbplty-plty,  
silty tex, calc



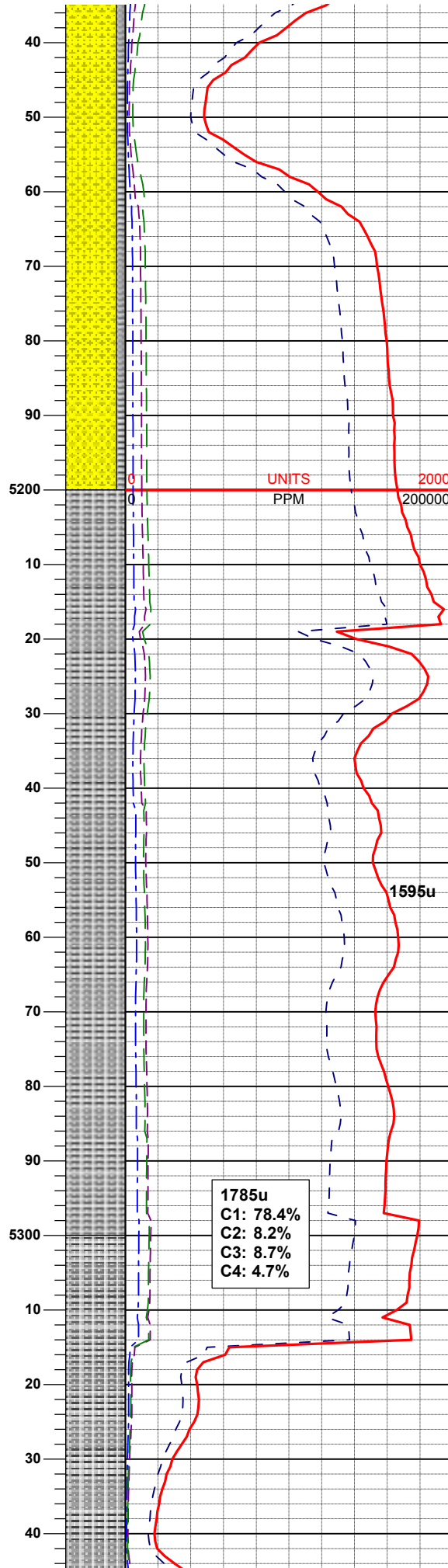
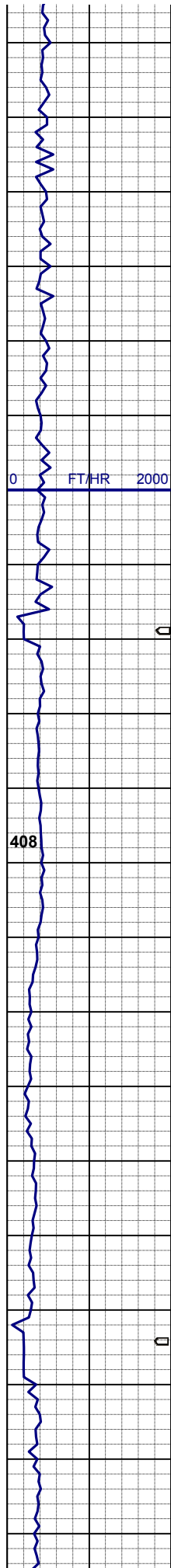
MUD WT 8.75/8.9  
VIS 27/27 IN/OUT

SHLY SS: ltgy, s&p, m hd, f gr, sbdr-sbang, p srt, p por, calc & arg cmt, occ glau, occ carb incl, SLTY SH: ltgy-mgy, firm, sbplty-plty, slty tex, calc

SD 5,066'  
TVD 5,038.02'  
INC 0.90°  
AZM 35.42°

SLTY SH: ltgy-mgy, firm, sbplty-plty, slty tex, calc  
SHLY SS: wh-ltgy-gy, s&p, m hd, f-m gr, sbdr-sbang, p srt, m por, calc & arg cmt, abnt glau, sme carb incl, sme LS, tr bent



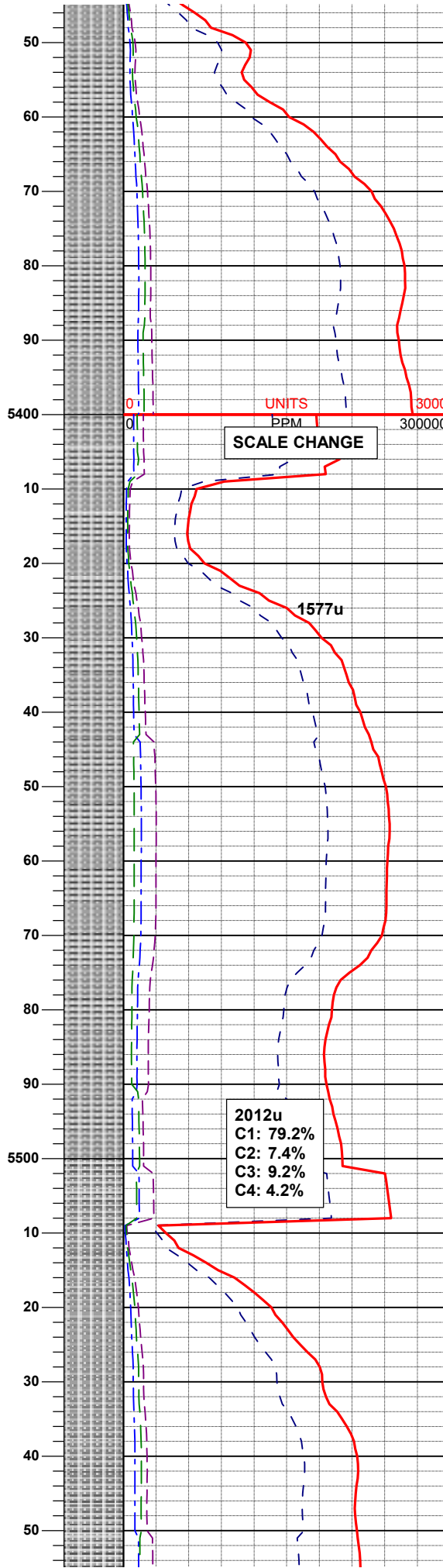
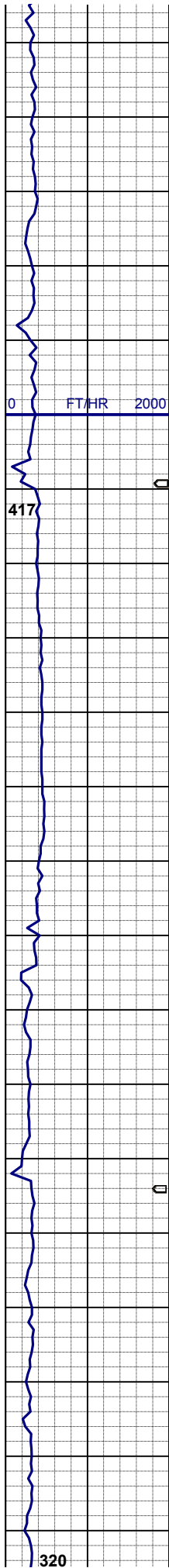


SLTY SH: ltgy-mgy, firm, sbplty-plty,  
slty tex, calc  
SHLY SS: wh-ltgy-gy, s&p, m hd, f-m  
gr, sbrd-sbang, p srt, m por, calc &  
arg cmt, abnt glau, sme carb incl, sme  
LS, tr bent

1785u  
C1: 78.4%  
C2: 8.2%  
C3: 8.7%  
C4: 4.7%

SLTY SH: ltgy-mgy, firm, sbplty-plty,  
slty tex, calc

MUD WT 9.15/9.2  
VIS 30/30 IN/OUT

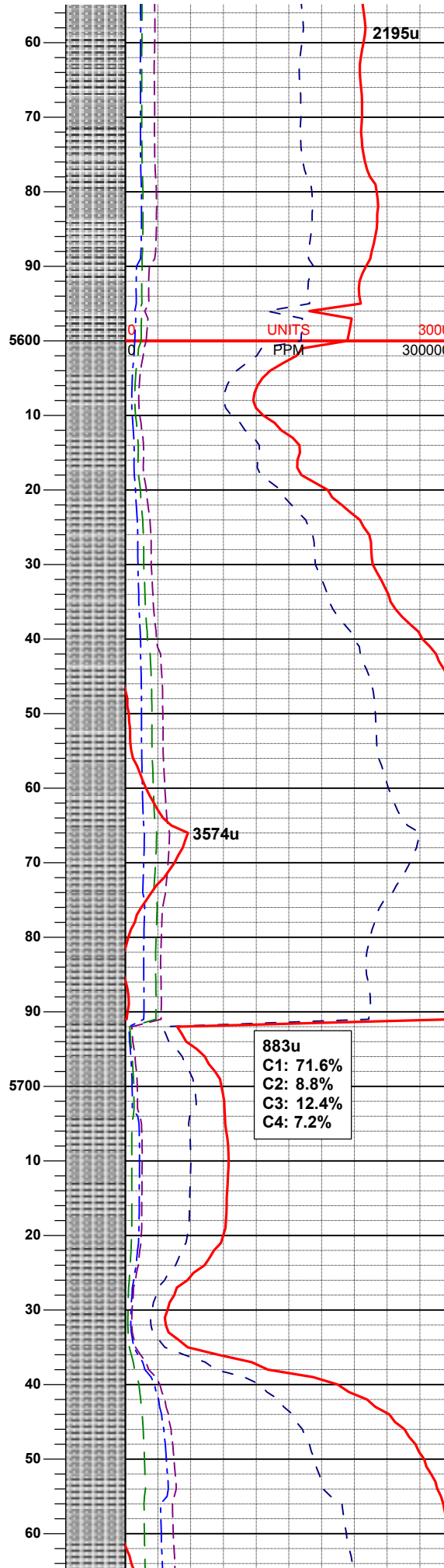
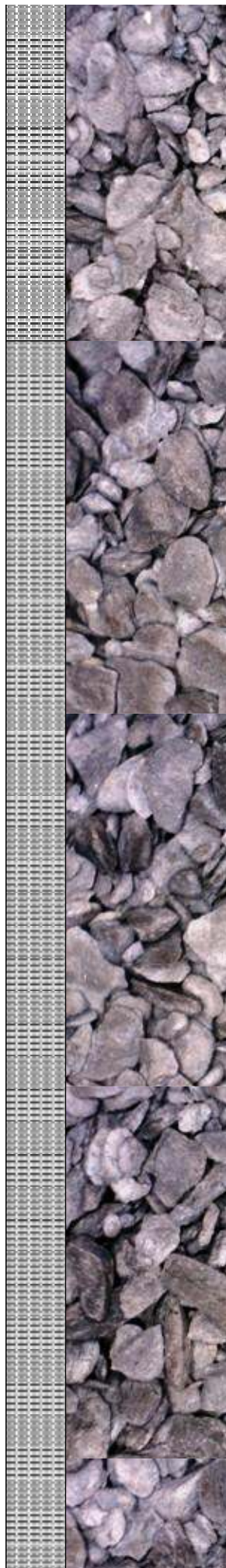
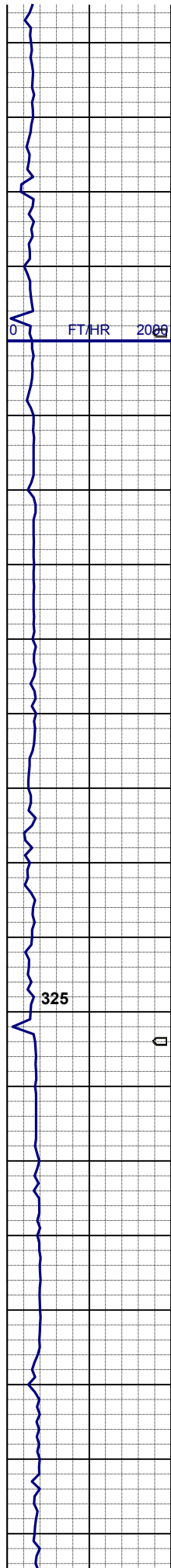


SD 5,351'  
TVD 5,322.96'  
INC 1.34°  
AZM 51.22°

SLTY SH: ltgy-mgy, firm, sbplty-plty,  
silty tex, calc

SLTY SH: ltgy-mgy, firm, sbplty-plty,  
silty tex, calc





SLTY SH: ltgy-mgy, firm, sbplty-plty, slty tex, calc

MUD WT 9.25/9.2  
VIS 31/31 IN/OUT

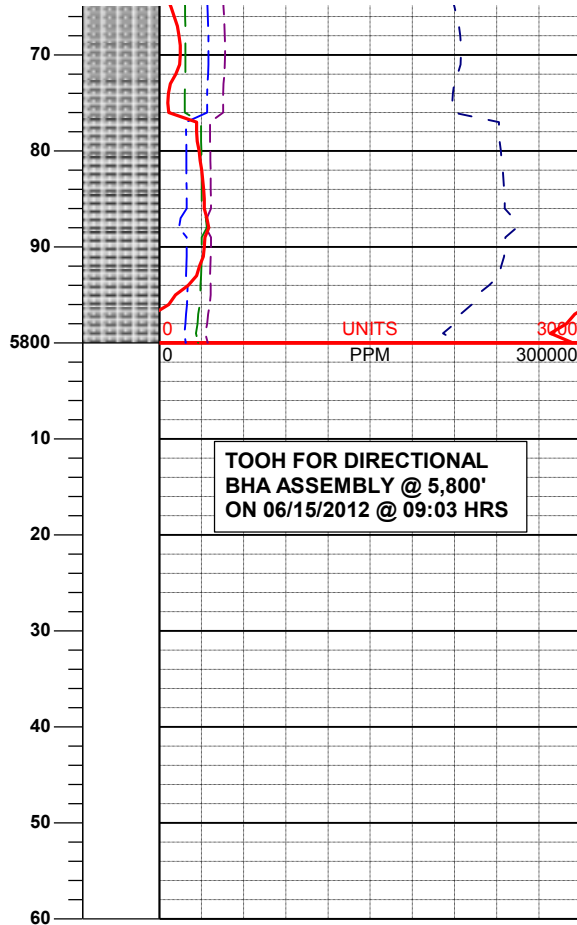
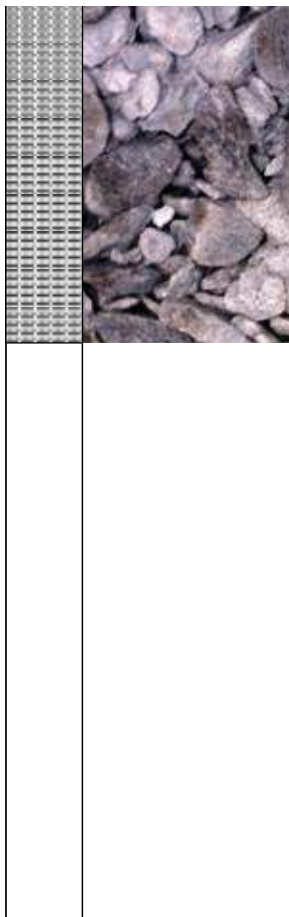
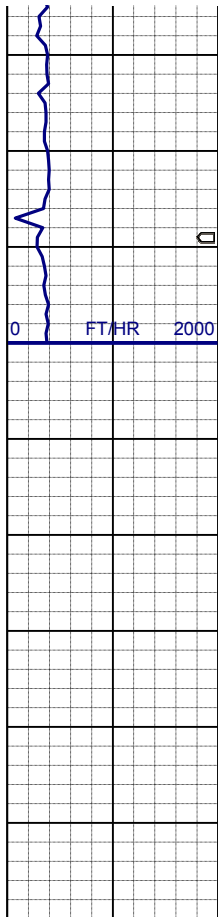
SD 5,636'  
TVD 5,607.90'  
INC 0.98°  
AZM 54.35°

LOGGER TOP OF  
TEEPEE BUTTES  
MD 5,666' TVD 5,635'

SLTY SH: ltgy-mgy, firm, sbplty-plty, slty tex, calc

883u  
C1: 71.6%  
C2: 8.8%  
C3: 12.4%  
C4: 7.2%

SD 5,743'  
TVD 5,714.89'  
INC 0.86°  
AZM 28.14°



SLTY SH: ltgy-mgy, firm, sbplty-plty,  
slty tex, calc

LOG CONTINUES ON  
HORIZONTAL L PLOT LOG  
WELLS RANCH  
AA14-63-1HN  
HORIZONTAL

Thank You for Using  
Columbine Logging Inc.