

LOG created using L PLOT VH Version 3.0, May 13, 2013, Copyright (C) 1999-2009 Pason Systems Corp.

**OPERATOR:** NOBLE ENERGY INC.  
**WELL:** SAUER F33-77-1HC  
**LOCATION:** SESW SEC 33 T5N R65W  
**COUNTY:** WELD  
**STATE:** COLORADO  
**SPOT:** 237' FSL, 1,609' FWL  
**ELEVATION:** 4,670' GL, 4,684' KB  
**FIELD:** WATTENBERG  
**SPUD DATE:** 05/04/2013  
**TD DATE:** 05/12/2013  
**DATES LOGGED:** 05/05/2013 - 05/12/2013  
**DEPTHS LOGGED:** 630' - 11,241'  
**LOGGERS:** KYLE KNIGHT, NATHAN MURPHY  
**DRILLING FLUID:** FW, LSND  
**DRILLING RIG:** ENSIGN 121  
**API:** 05-123-36444  
**LOG TYPE:** VERTICAL  
**SCALE:** 1:240 (5 inches per 100 feet)  
**REMARKS:** Wellsite Geological Services Provided By Columbine Logging Inc.  
 LAT, LONG: 40.34913/-104.67208

### LITHOLOGIES



No Sample



Sandstone



Shaly Sandstone



Shaly Siltstone



Silty Shale

### ENGINEERING SYMBOLS



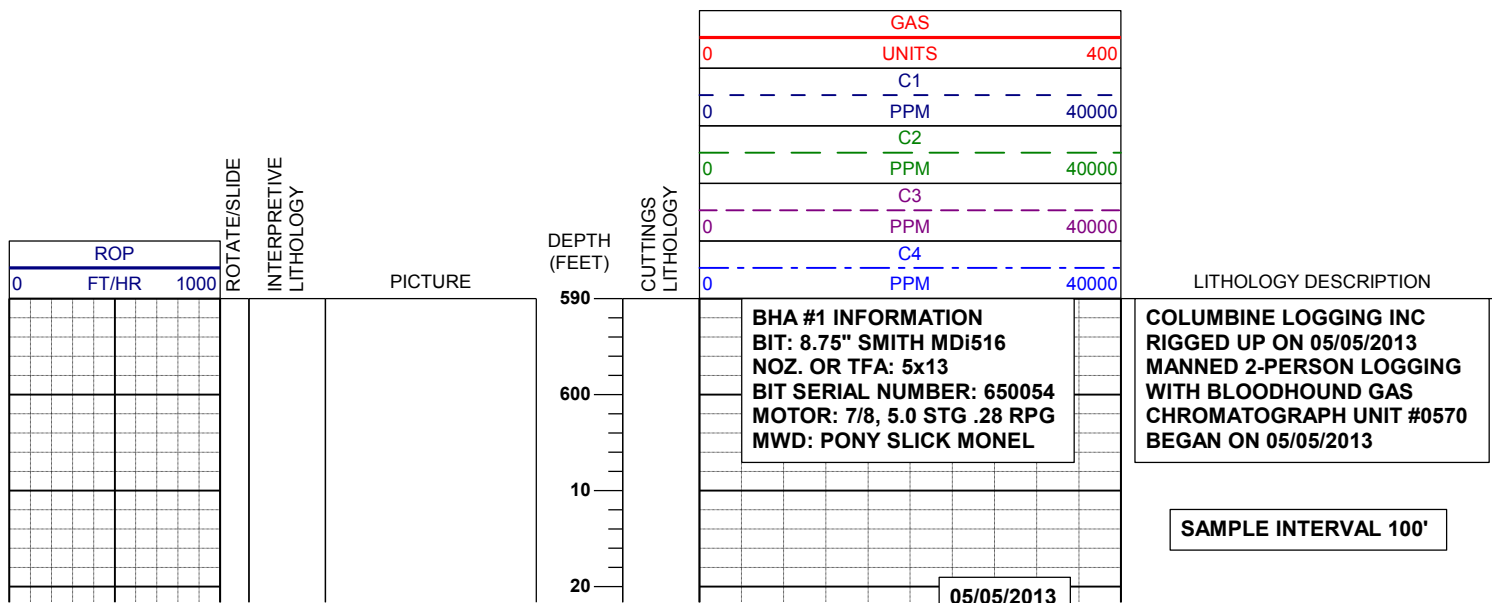
Connection



Connection Gas



Midnight Depth



05/05/2013

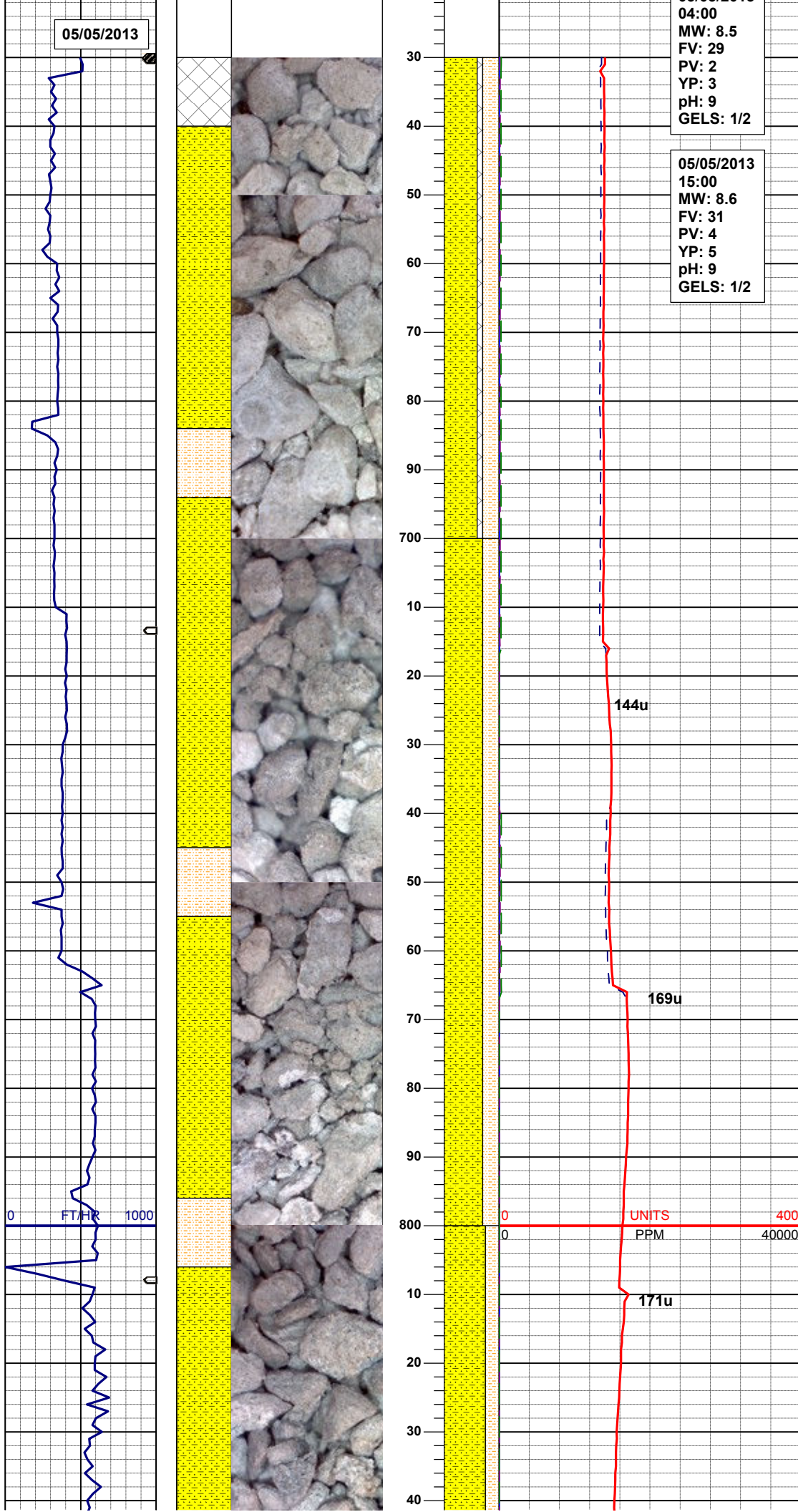
04:00  
MW: 8.5  
FV: 29  
PV: 2  
YP: 3  
pH: 9  
GELS: 1/2

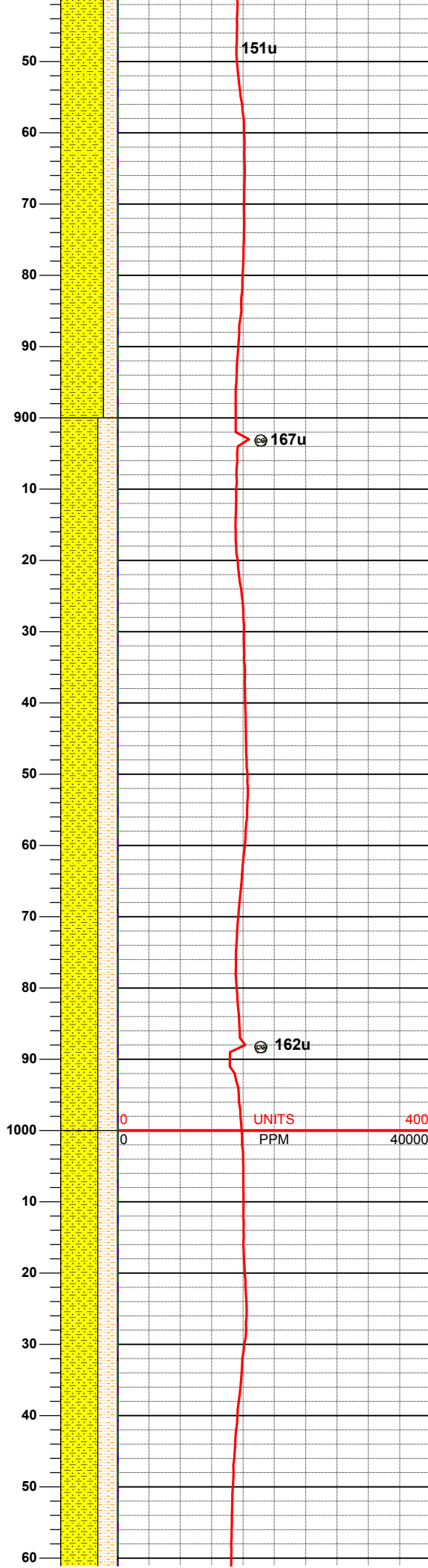
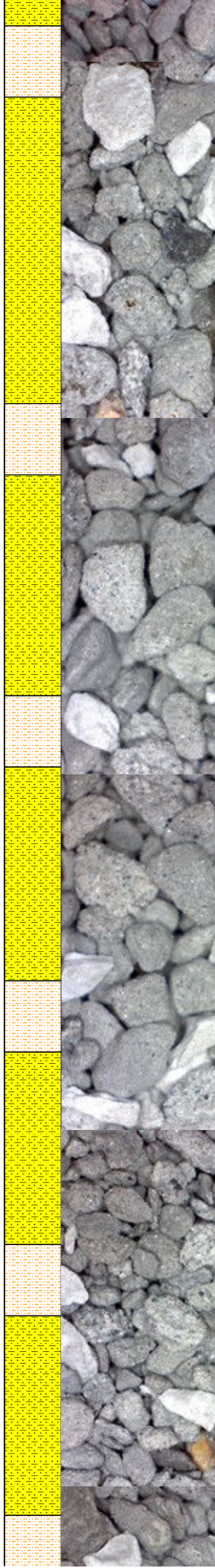
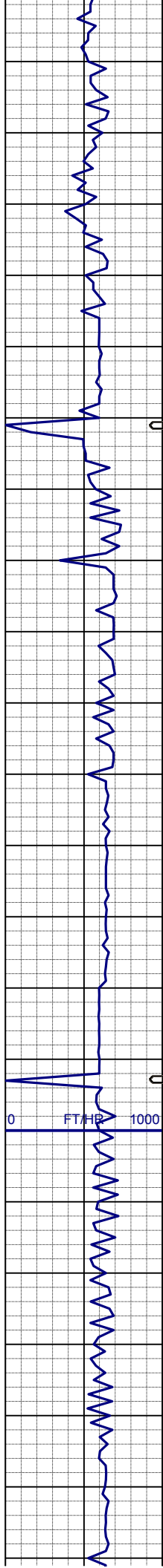
05/05/2013  
15:00  
MW: 8.6  
FV: 31  
PV: 4  
YP: 5  
pH: 9  
GELS: 1/2

CMT:  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmt, slcalc,  
phlog  
SHYSLTST: lt-mgy, occ dk gy, f-vfgr,  
sbrd-sbang, mod srt, arg mtx

**SURVEY**  
**MD 663'**  
**INC 0.4°**  
**AZI 305.3°**  
**TVD 662.97'**

SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmt, slcalc,  
phlog  
SHYSLTST: lt-mgy, occ dk gy, f-vfgr,  
sbrd-sbang, mod srt, arg mtx





SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmt, slcalc,  
phlog  
SHYSLTST: lt-mgy, occ dk gy, f-vfgr,  
sbrd-sbang, mod srt, arg mtx

**SURVEY**  
**MD 853'**  
**INC 1.2°**  
**AZI 44.6°**  
**TVD 852.96'**

**MUD WT: 8.4 VIS: 28 IN**  
**MUD WT: 8.4 VIS: 28 OUT**

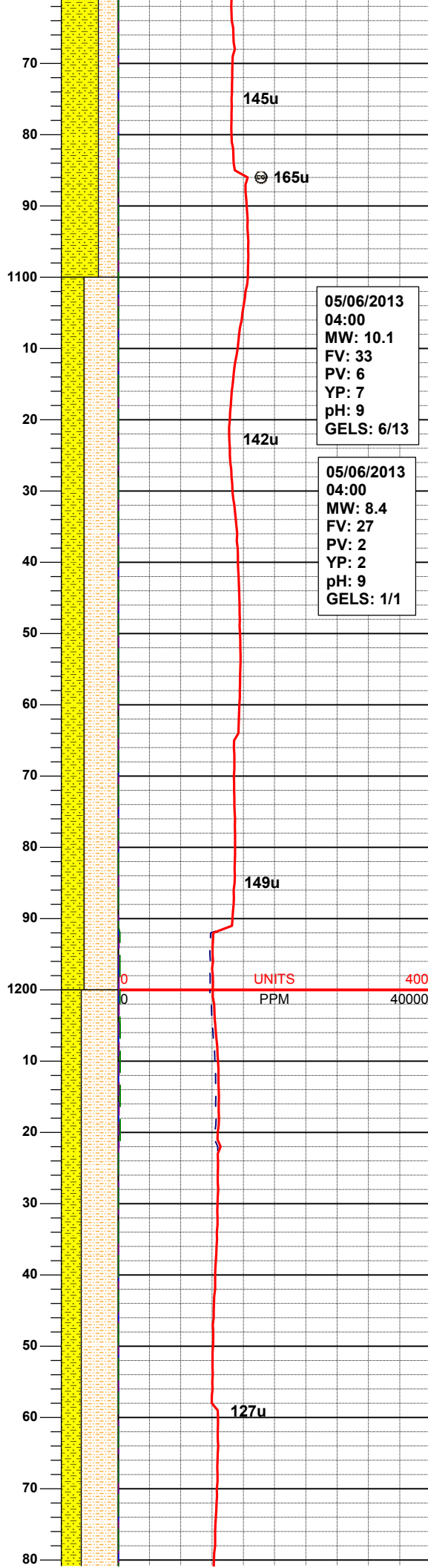
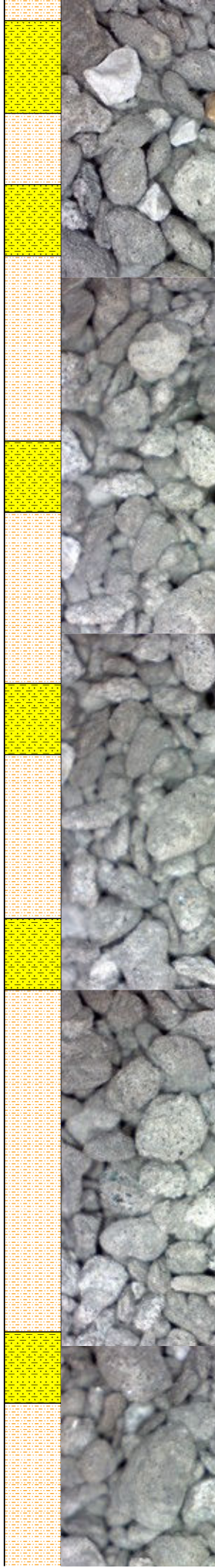
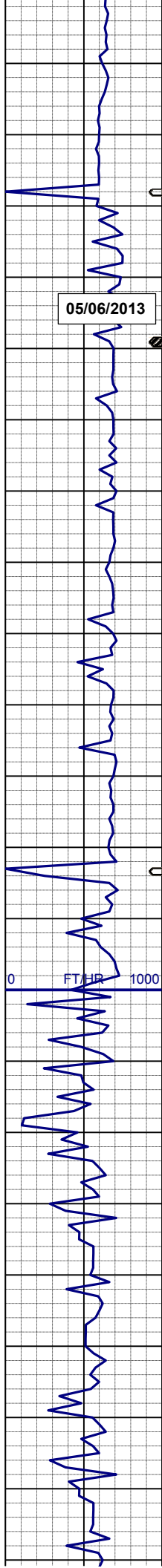
**SURVEY**  
**MD 948'**  
**INC 1.3°**  
**AZI 25.6°**  
**TVD 947.94'**

SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmt, slcalc,  
phlog  
SHYSLTST: lt-mgy, occ dk gy, f-vfgr,  
sbrd-sbang, mod srt, arg mtx

**SURVEY**  
**MD 1043'**  
**INC 1.5°**  
**AZI 104.9°**  
**TVD 1042.92'**

SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmt, slcalc,  
phlog  
SHYSLTST: lt-mgy, occ dk gy, f-vfgr,  
sbrd-sbang, mod srt, arg mtx





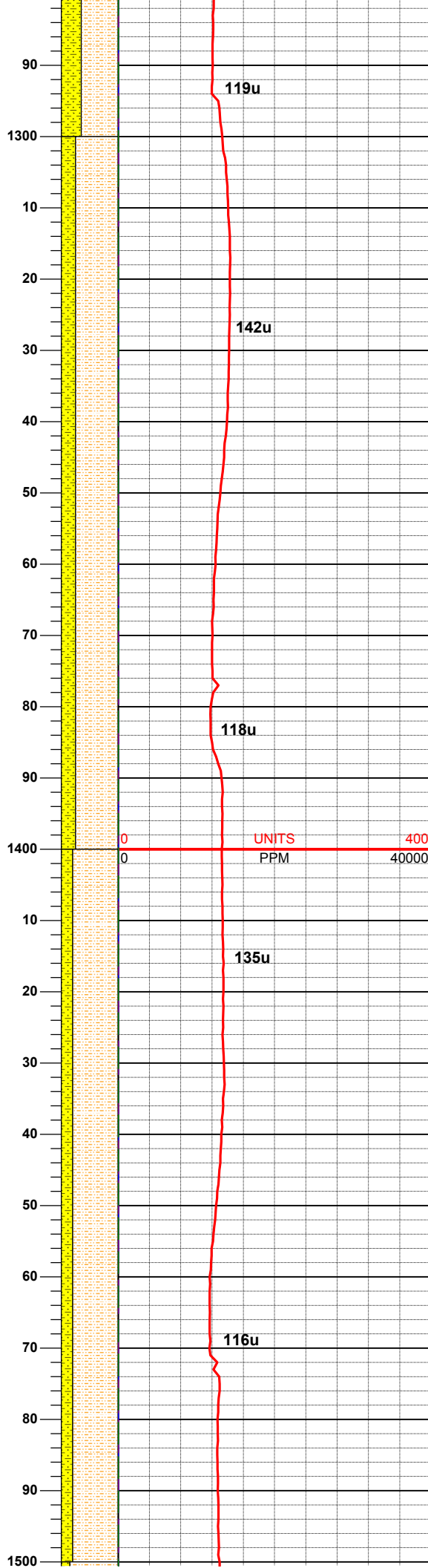
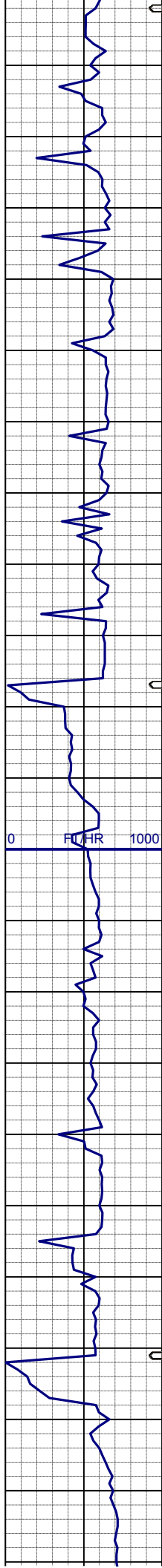
**SURVEY**  
**MD 1137'**  
**INC 1.1°**  
**AZI 100.5°**  
**TVD 1136.89'**

SHYSLTST: lt-mgy, occ dk gy, f-vfgr, sbrd-sbang, mod srt, arg mtz, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog, tr ss

**SURVEY**  
**MD 1232'**  
**INC 1.6°**  
**AZI 90.3°**  
**TVD 1231.87'**

SHYSLTST: lt-mgy, occ dk gy, f-vfgr, sbrd-sbang, mod srt, arg mtz, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog, tr ss



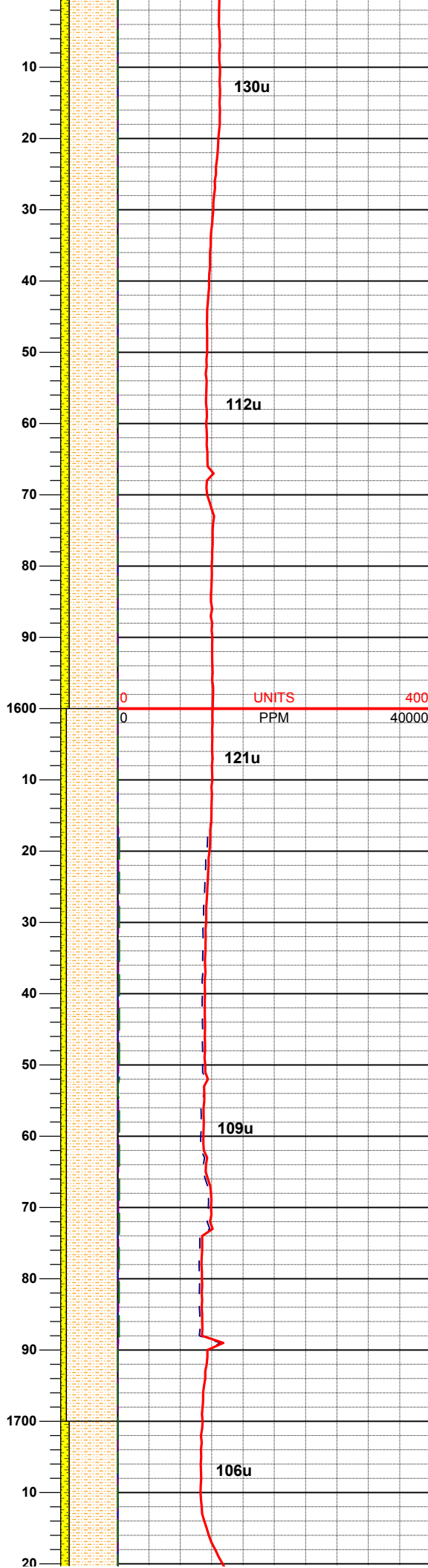
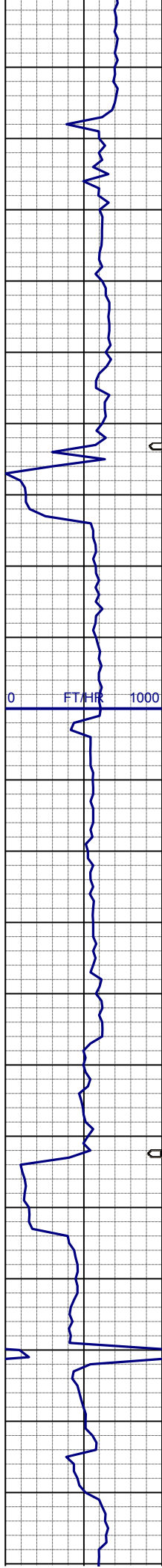


**SURVEY**  
**MD 1326'**  
**INC 1.7°**  
**AZI 134.2°**  
**TVD 1325.83'**

SHYSLTST: lt-mgy, occ dk gy, f-vfgr,  
sbrd-sbang, mod srt, arg mtz, grd to  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmt, sicalc,  
phlog, tr ss

**SURVEY**  
**MD 1422'**  
**INC 1.9°**  
**AZI 149°**  
**TVD 1416.77'**

SHYSLTST: lt-mgy, occ dk gy, f-vfgr,  
sbrd-sbang, mod srt, arg mtz, grd to  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmt, sicalc,  
phlog, tr ss



**SURVEY**  
**MD 1517'**  
**INC 2.0°**  
**AZI 168.7°**  
**TVD 1516.77'**

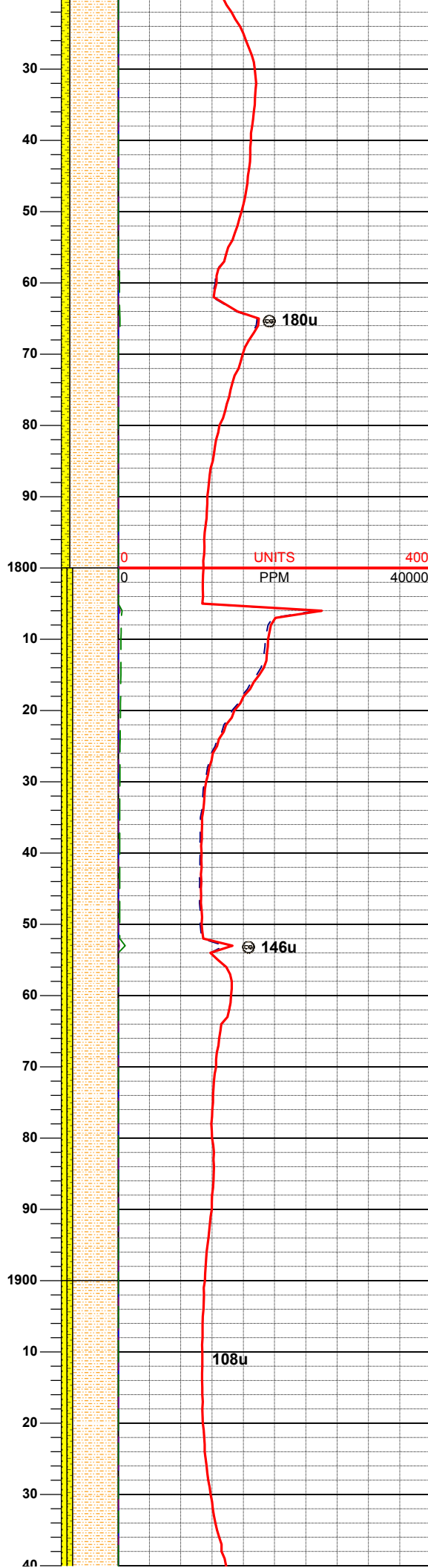
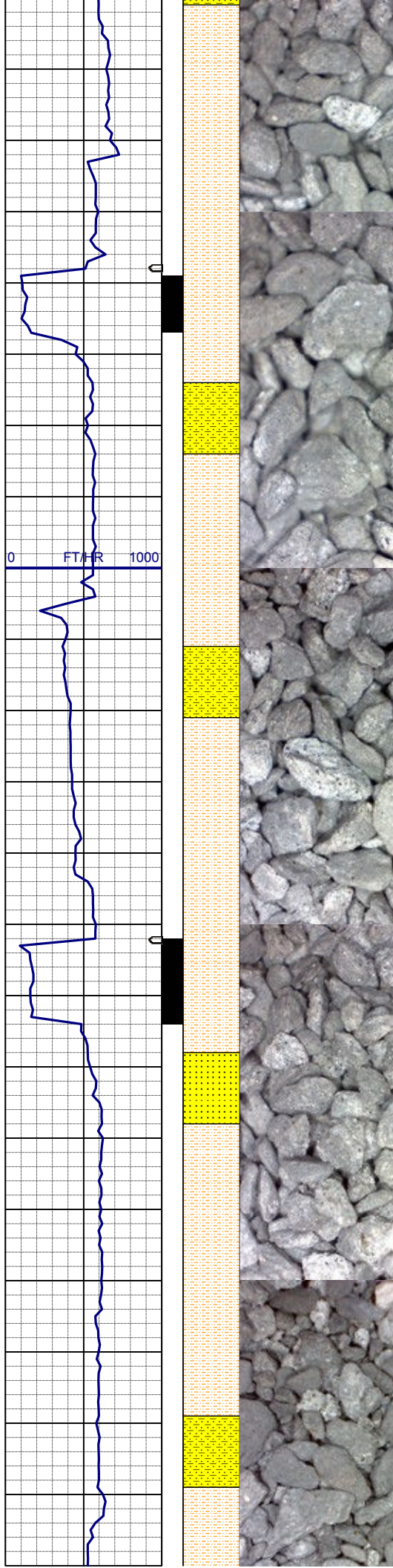
SHYSLTST: lt-mgy, occ dk gy, f-vfgr,  
sbrd-sbang, mod srt, arg mtx, grd to  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmt, slcalc,  
phlog, tr ss

**SURVEY**  
**MD 1612'**  
**INC 2.4°**  
**AZI 175.9°**  
**TVD 1611.66'**

SHYSLTST: lt-mgy, occ dk gy, f-vfgr,  
sbrd-sbang, mod srt, arg mtx, grd to  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmt, slcalc,  
phlog, tr ss

**SURVEY**  
**MD 1707'**  
**INC 4.6°**  
**AZI 176.4°**  
**TVD 1706.48'**



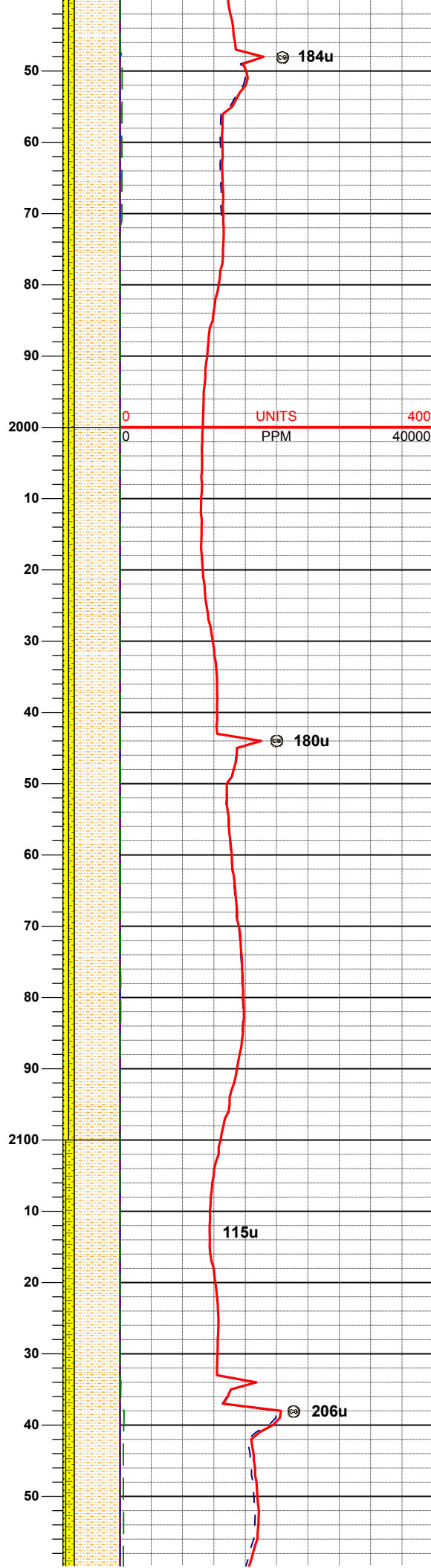
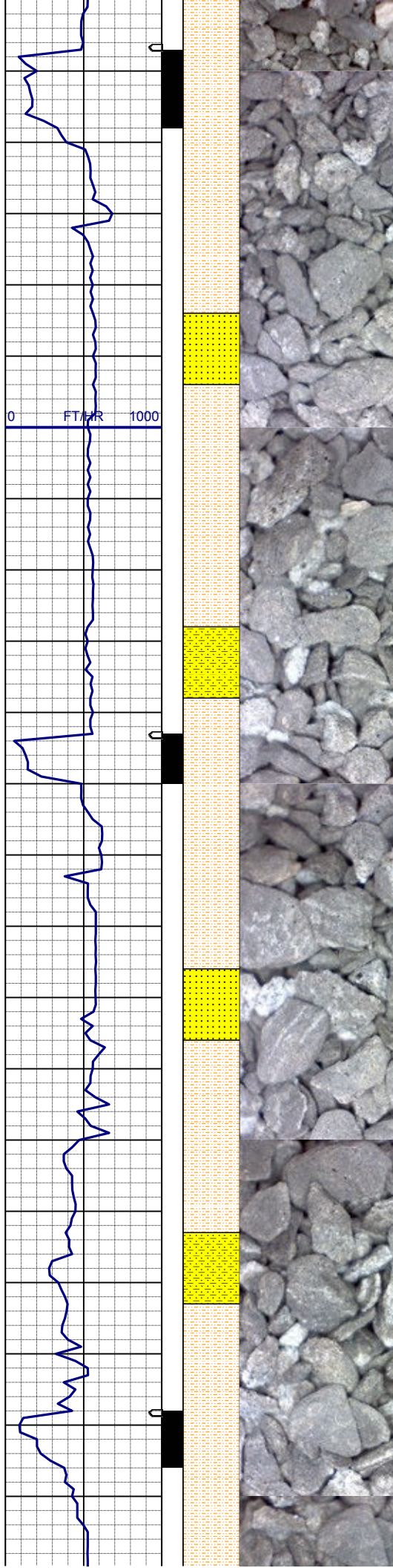


SHYSLTST: lt-mgy, occ dk gy, f-vfgr, sbrd-sbang, mod srt, arg mtx, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog, tr ss

**SURVEY**  
**MD 1802'**  
**INC 5.6°**  
**AZI 178.0°**  
**TVD 1801.10'**

SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtx, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau

**SURVEY**  
**MD 1897'**  
**INC 7.2°**  
**AZI 173.6°**  
**TVD 1895.50'**



SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtz, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau

**SURVEY**  
**MD 1992'**  
**INC 8.3°**  
**AZI 175.4°**  
**TVD 1989.64'**

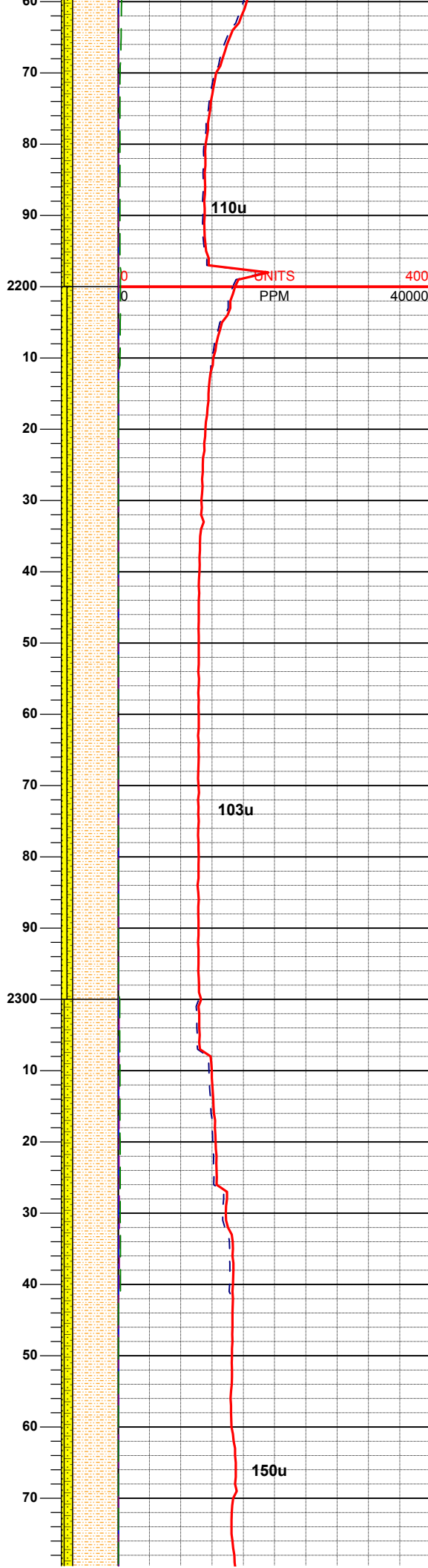
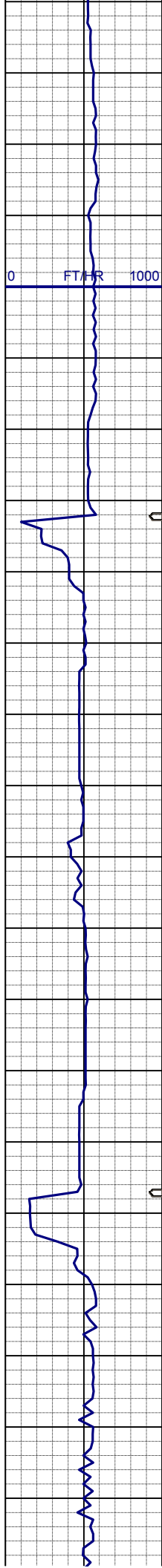
**MUD WT: 8.4 VIS: 27 IN**  
**MUD WT: 8.4 VIS: 27 OUT**

SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtz, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau

**SURVEY**  
**MD 2087'**  
**INC 8.7°**  
**AZI 171.5°**  
**TVD 2083.59'**

SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtz, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau





**SURVEY**  
**MD 2182'**  
**INC 9.1°**  
**AZI 163.9°**  
**TVD 2177.45'**

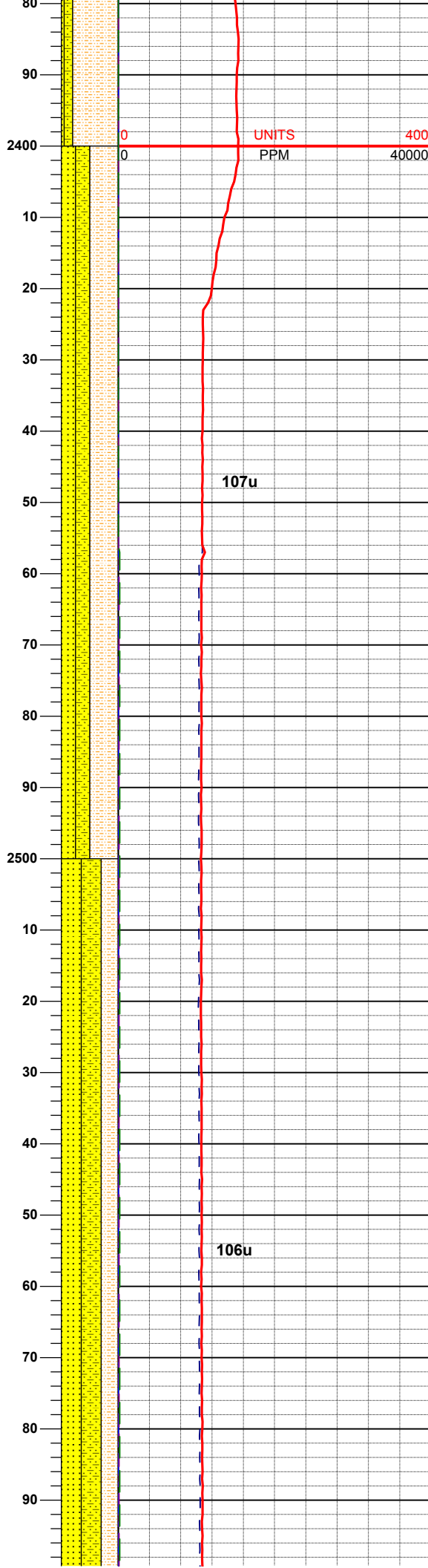
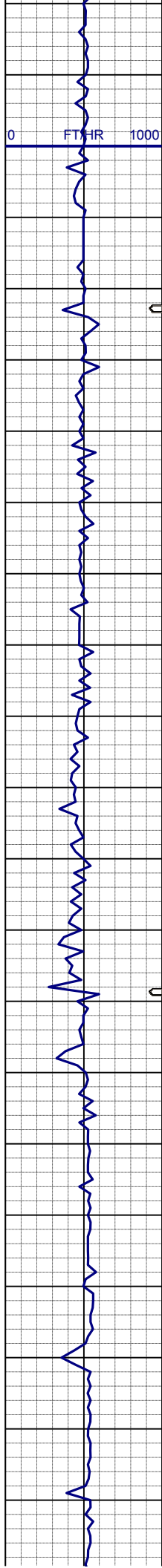
SHYSLTST: lt-mgy, occ tan, f-vfgr,  
sbrd-sbang, mod srt, arg mtx, grd to  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmt, slcalc,  
phlog  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-  
wsrt, ppor, argcmt, slcalc, phlog, tr  
glau

**SURVEY**  
**MD 2276'**  
**INC 8.2°**  
**AZI 162.9°**  
**TVD 2270.38'**

**MUD WT: 8.4 VIS: 27 IN**  
**MUD WT: 8.4 VIS: 28 OUT**

SHYSLTST: lt-mgy, occ tan, f-vfgr,  
sbrd-sbang, mod srt, arg mtx, grd to  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmt, slcalc,  
phlog  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-  
wsrt, ppor, argcmt, slcalc, phlog, tr  
glau

**SURVEY**  
**MD 2371'**  
**INC 8.4°**  
**AZI 162.5°**  
**TVD 2364.39'**



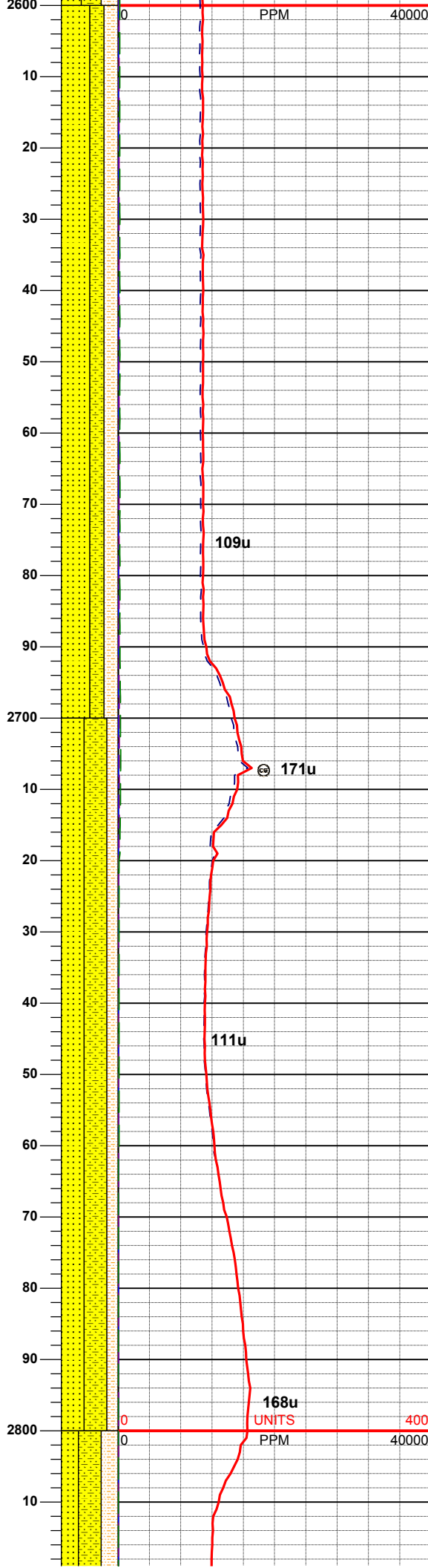
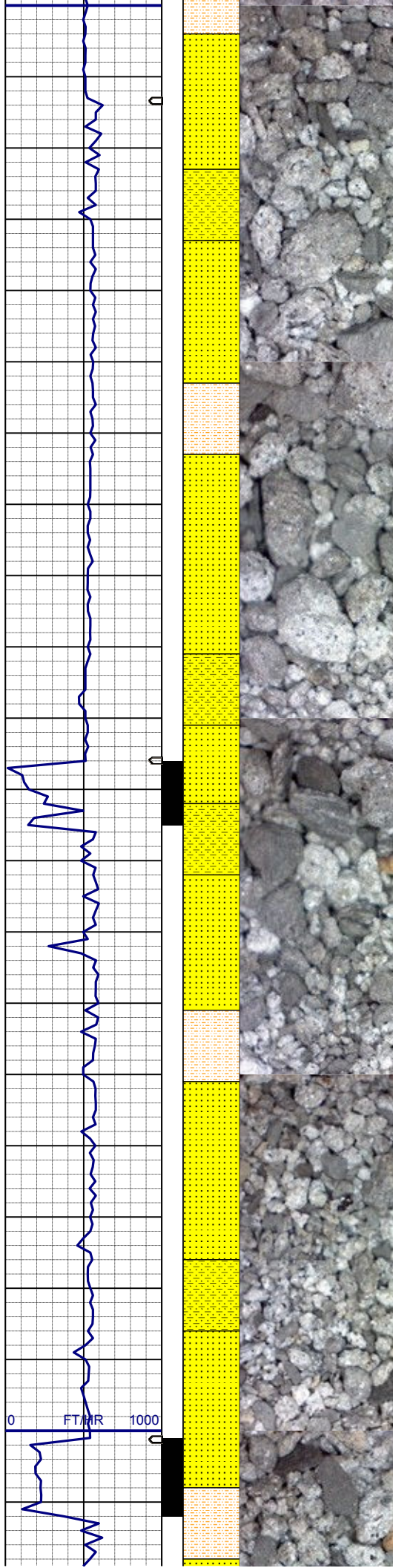
SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtx, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau

**SURVEY**  
**MD 2466'**  
**INC 7.9°**  
**AZI 161.7°**  
**TVD 2458.43'**

SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtx

**SURVEY**  
**MD 2561'**  
**INC 8.1°**  
**AZI 158.3°**  
**TVD 2552.50'**



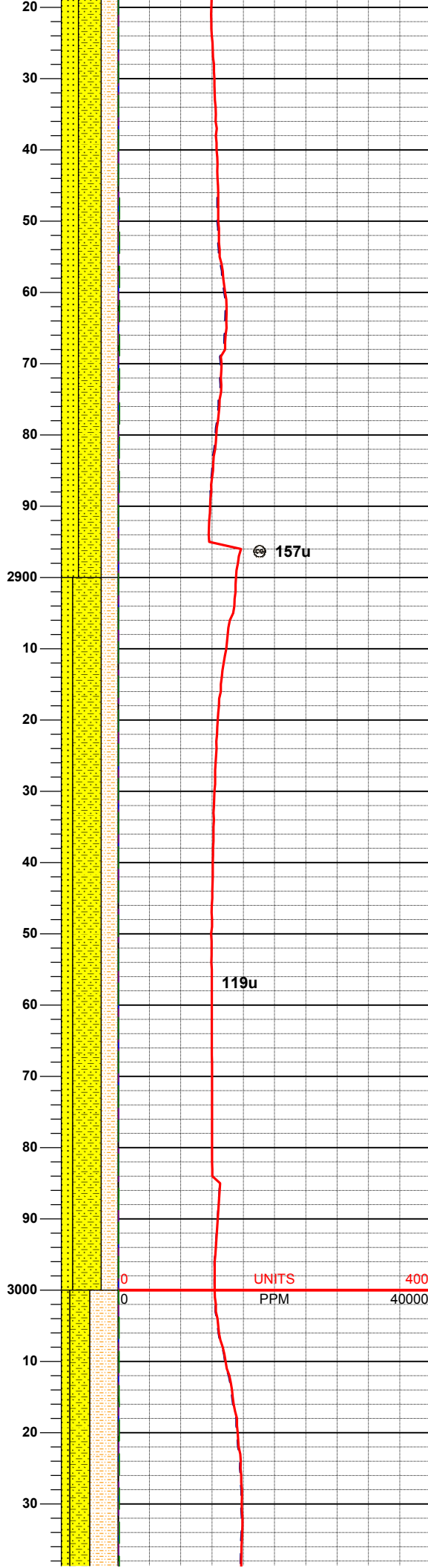
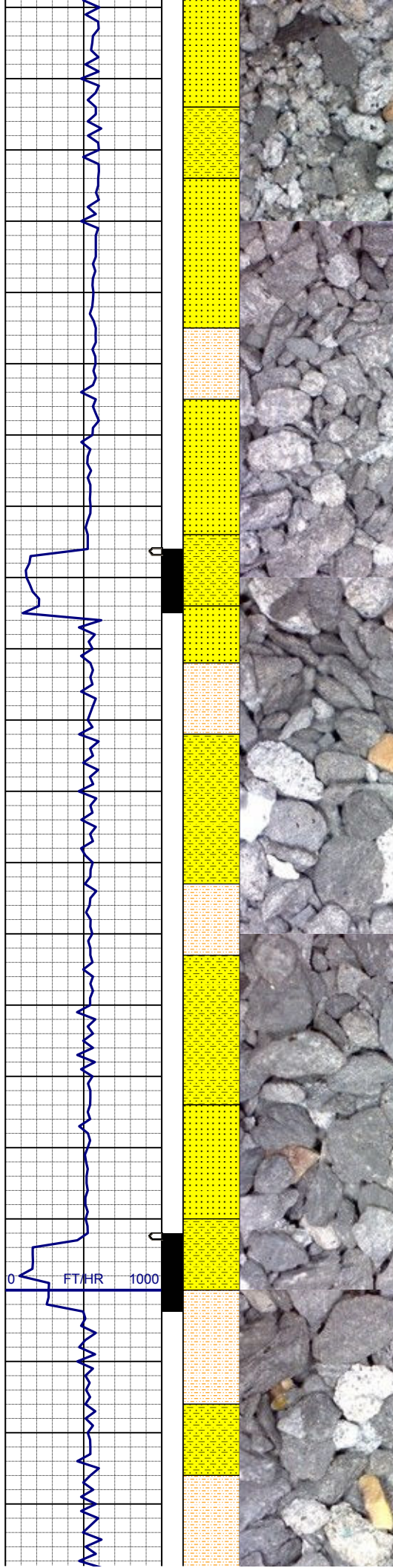


SS: w-ltgy, s&p, mf-c gr, sbrd, mod-  
wsrt, ppor, argcmt, slcalc, phlog, tr  
glau, grd to  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmt, slcalc,  
phlog  
SHYSLTST: lt-mgy, occ tan, f-vfgr,  
sbrd-sbang, mod srt, arg mtz

**SURVEY**  
**MD 2656'**  
**INC 8.2°**  
**AZI 154.8°**  
**TVD 2646.54'**

SS: w-ltgy, s&p, mf-c gr, sbrd, mod-  
wsrt, ppor, argcmt, slcalc, phlog, tr  
glau, grd to  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmt, slcalc,  
phlog  
SHYSLTST: lt-mgy, occ tan, f-vfgr,  
sbrd-sbang, mod srt, arg mtz

**SURVEY**  
**MD 2750'**  
**INC 7.9°**  
**AZI 142.0°**  
**TVD 2739.63'**



**SURVEY**  
**MD 2845'**  
**INC 6.5°**  
**AZI 150.4°**  
**TVD 2833.88'**

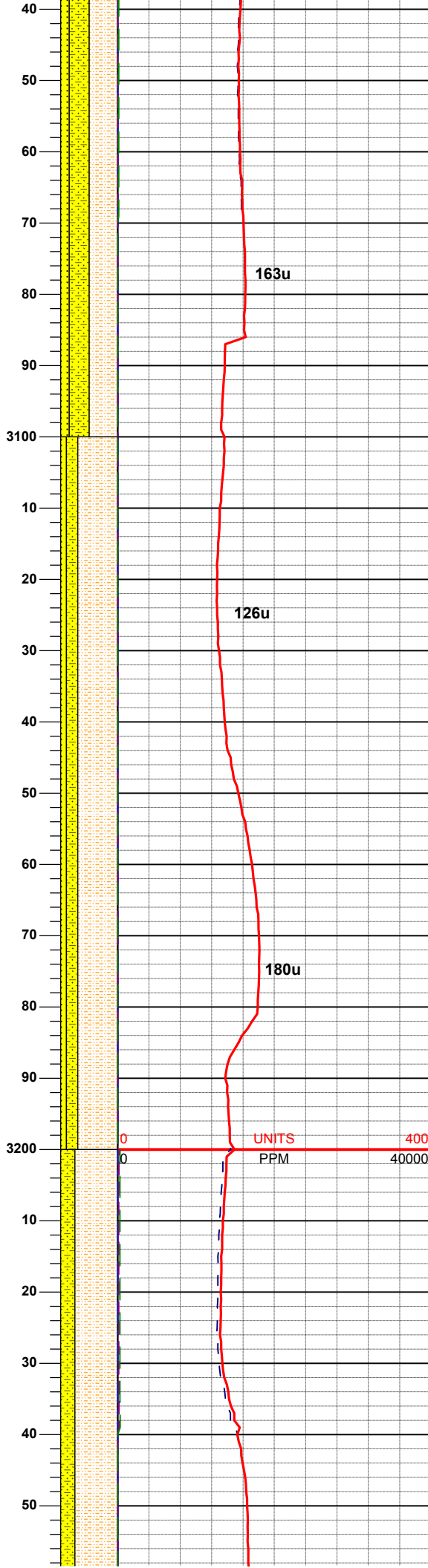
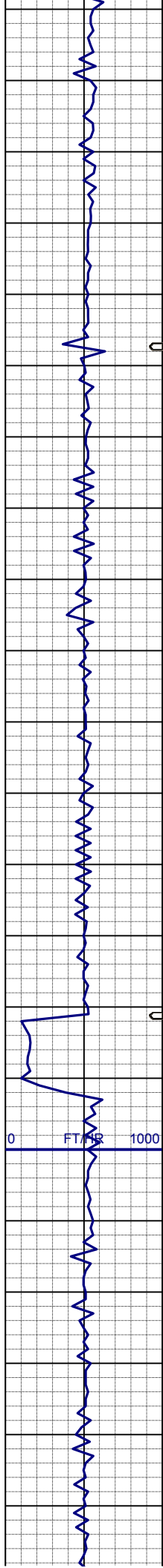
SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog, grd to  
SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtx, SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau

**SURVEY**  
**MD 2940'**  
**INC 4.9°**  
**AZI 163.1°**  
**TVD 2928.41'**

SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog, grd to  
SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtx, SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau

**SURVEY**  
**MD 3035'**  
**INC 2.7°**  
**AZI 169.0°**





**TVD 3023.19'**

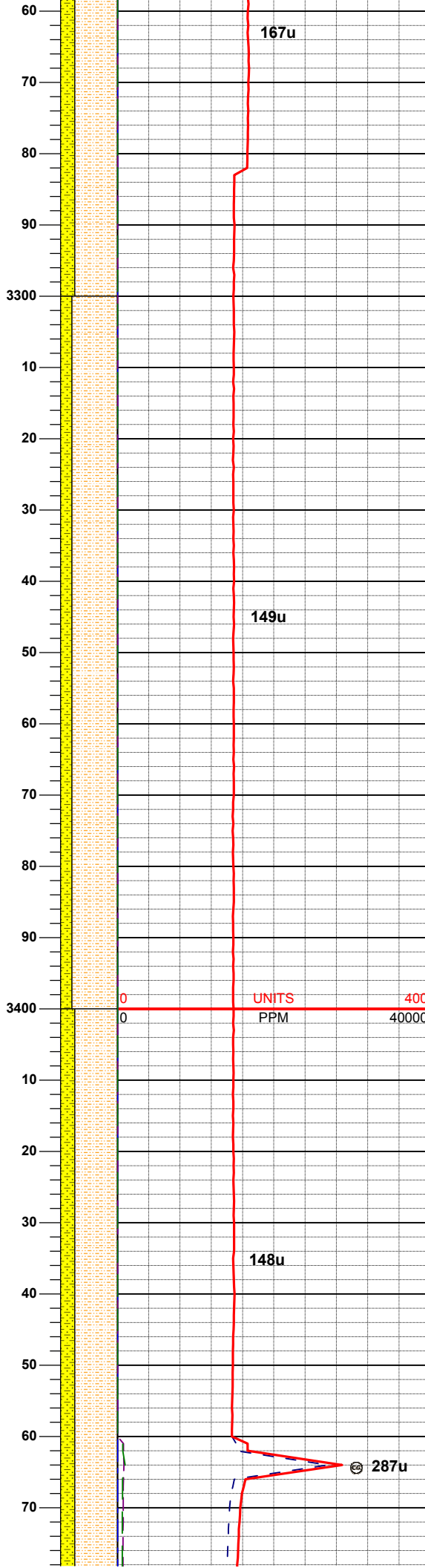
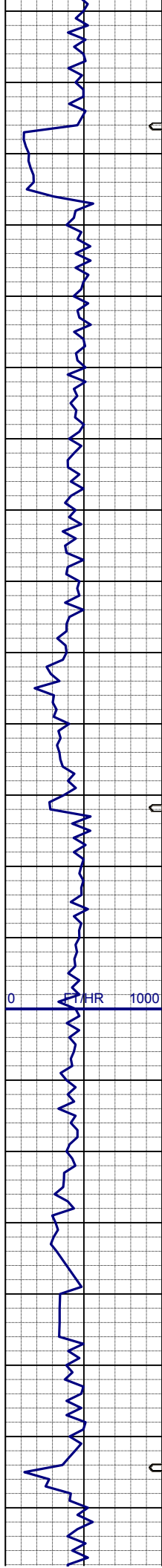
SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog, grd to SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtz, SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau

**SURVEY**  
**MD 3130'**  
**INC 2.6°**  
**AZI 172.2°**  
**TVD 3118.09'**

SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog, grd to SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtz, SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau

**SURVEY**  
**MD 3225'**  
**INC 1.1°**  
**AZI 147.4°**  
**TVD 3213.04'**

SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtz, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog, sme ss



**SURVEY**  
**MD 3319'**  
**INC 0.4°**  
**AZI 10.7°**  
**TVD 3307.04'**

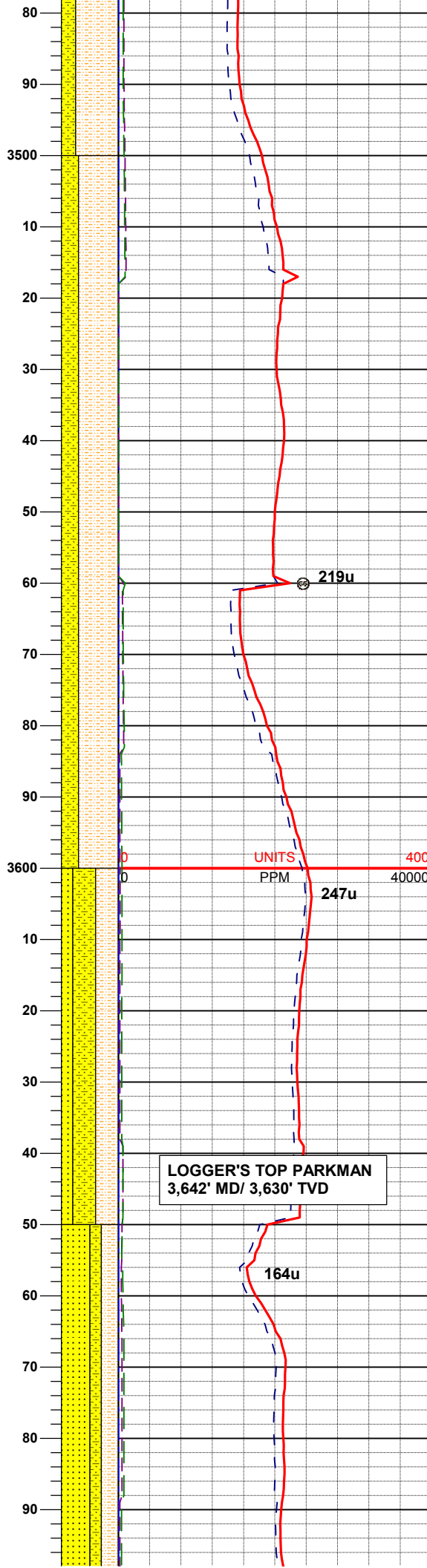
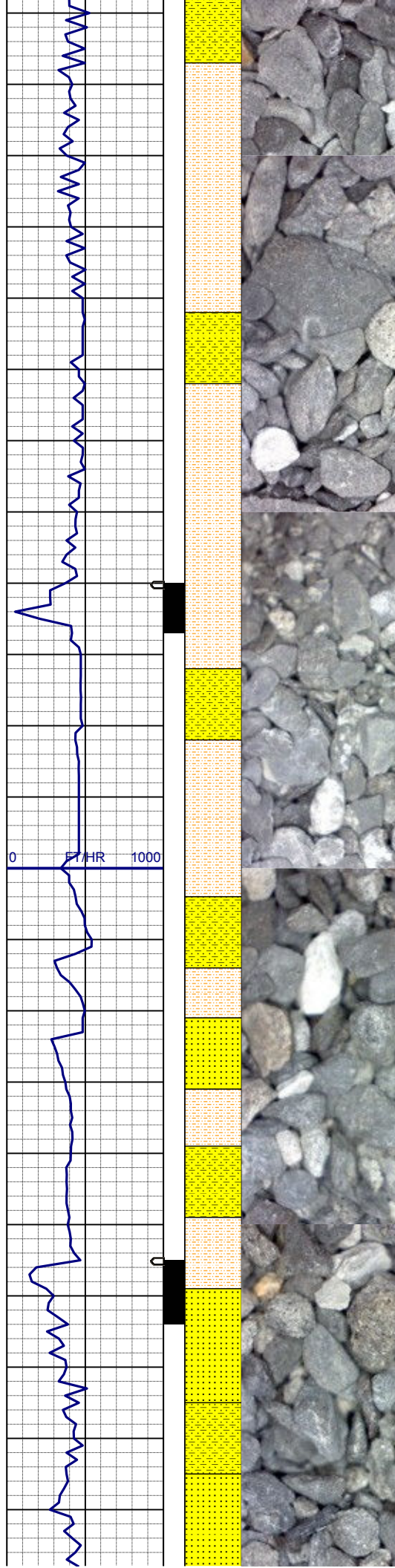
SHYSLTST: lt-mgy, occ tan, f-vfgr,  
sbrd-sbang, mod srt, arg mtX, grd to  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmnt, slcalc,  
phlog, sme ss

**SURVEY**  
**MD 3414'**  
**INC 0.4°**  
**AZI 73.1°**  
**TVD 3402.03'**

**MUD WT: 8.4+ VIS: 28 IN**  
**MUD WT: 8.4 VIS: 27 OUT**

SHYSLTST: lt-mgy, occ tan, f-vfgr,  
sbrd-sbang, mod srt, arg mtX, grd to  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmnt, slcalc,  
phlog, sme ss





**SURVEY**  
**MD 3509'**  
**INC 0.4°**  
**AZI 18.7°**  
**TVD 3497.03'**

SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtx, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog, sme ss

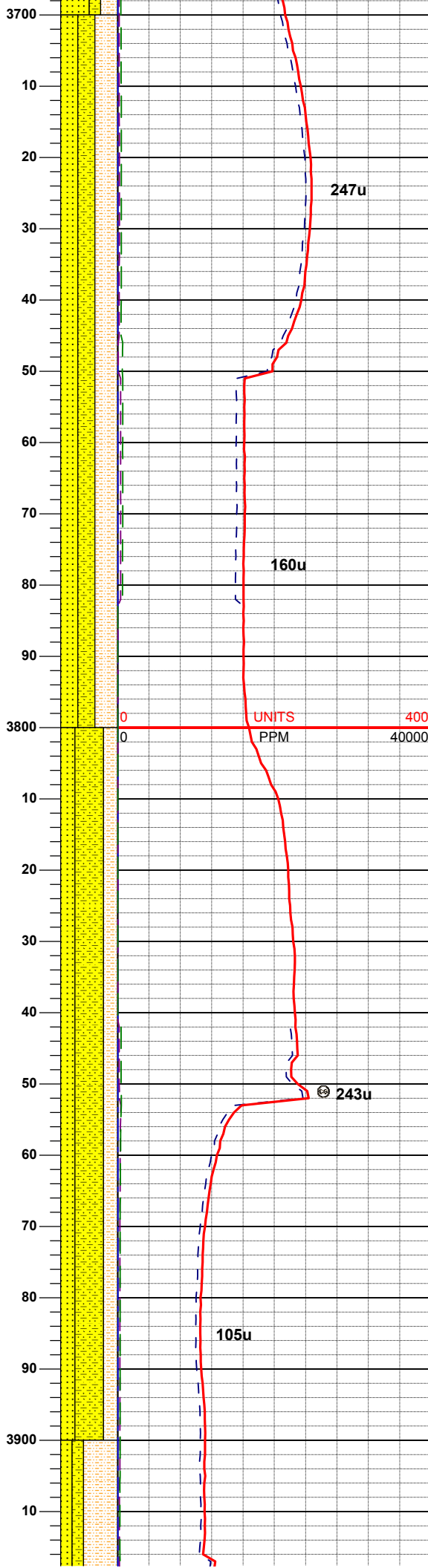
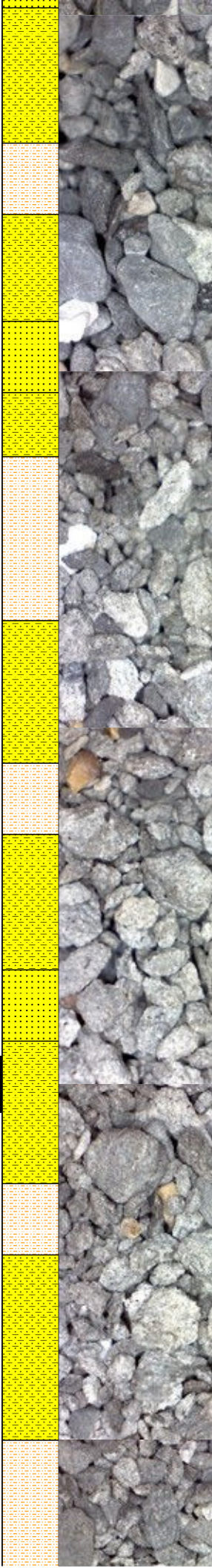
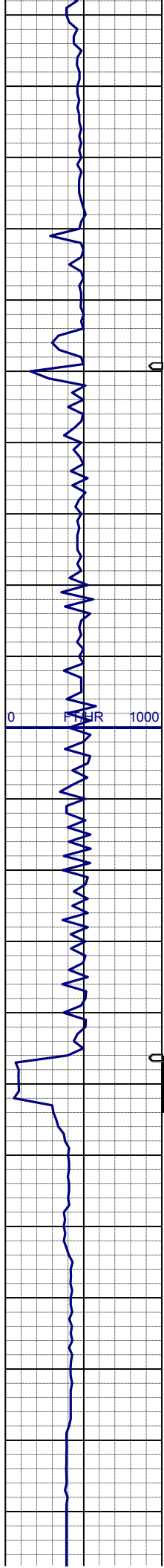
**SURVEY**  
**MD 3604'**  
**INC 0.3°**  
**AZI 343.2°**  
**TVD 3592.03'**

SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtx, grd to SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog

**LOGGER'S TOP PARKMAN**  
**3,642' MD/ 3,630' TVD**

SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau, grd to SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtx, SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog

**SURVEY**



MD 3699'  
INC 0.6°  
AZI 79.2°  
TVD 3687.03'

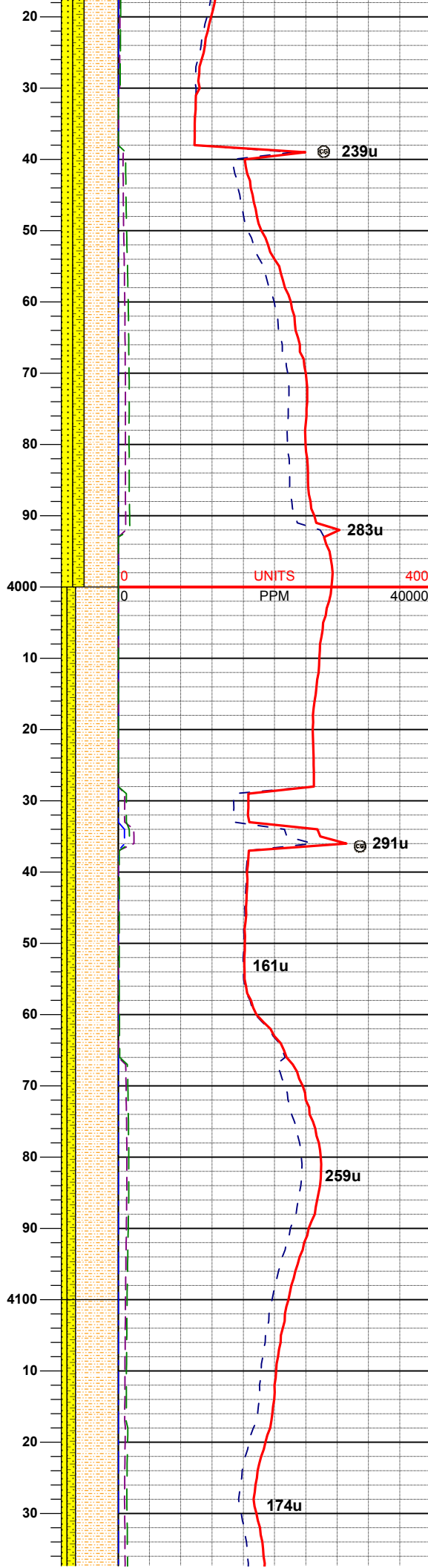
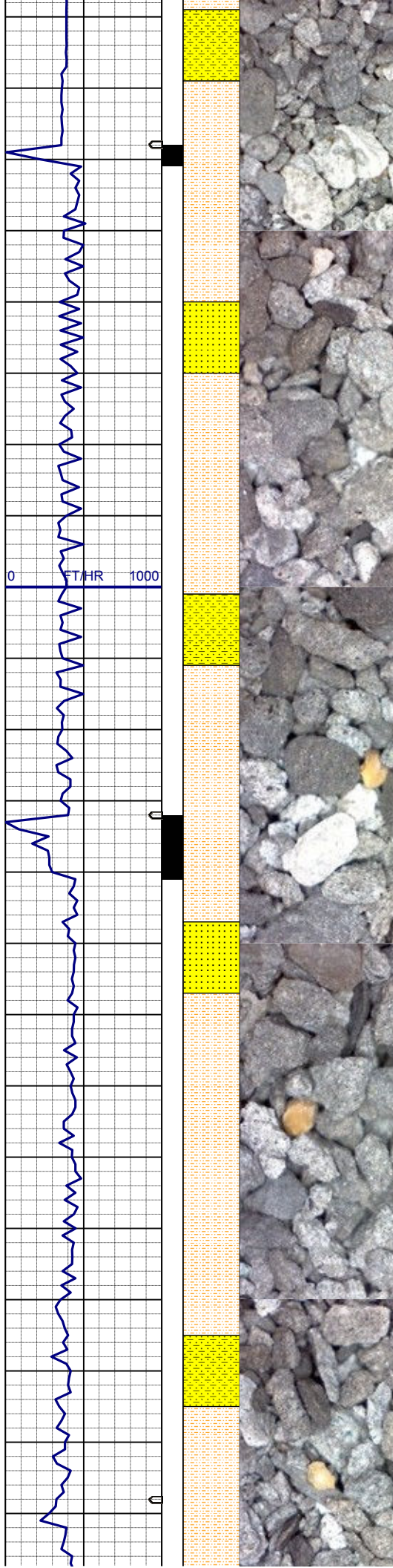
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-  
wsrt, ppor, argcmt, slcalc, phlog, tr  
glau, grd to  
SHYSLTST: lt-mgy, occ tan, f-vfgr,  
sbrd-sbang, mod srt, arg mtz,  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmt, slcalc, tr  
phlog

SURVEY  
MD 3793'  
INC 0.6°  
AZI 93.4°  
TVD 3781.02'

SHYSLTST: lt-mgy, occ tan, f-vfgr,  
sbrd-sbang, mod srt, arg mtz, grd to  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-  
wsrt, ppor, argcmt, slcalc, phlog, tr  
glau,  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmt, slcalc, tr  
phlog

SURVEY  
MD 3888'  
INC 0.3°  
AZI 77.3°  
TVD 3876.02'



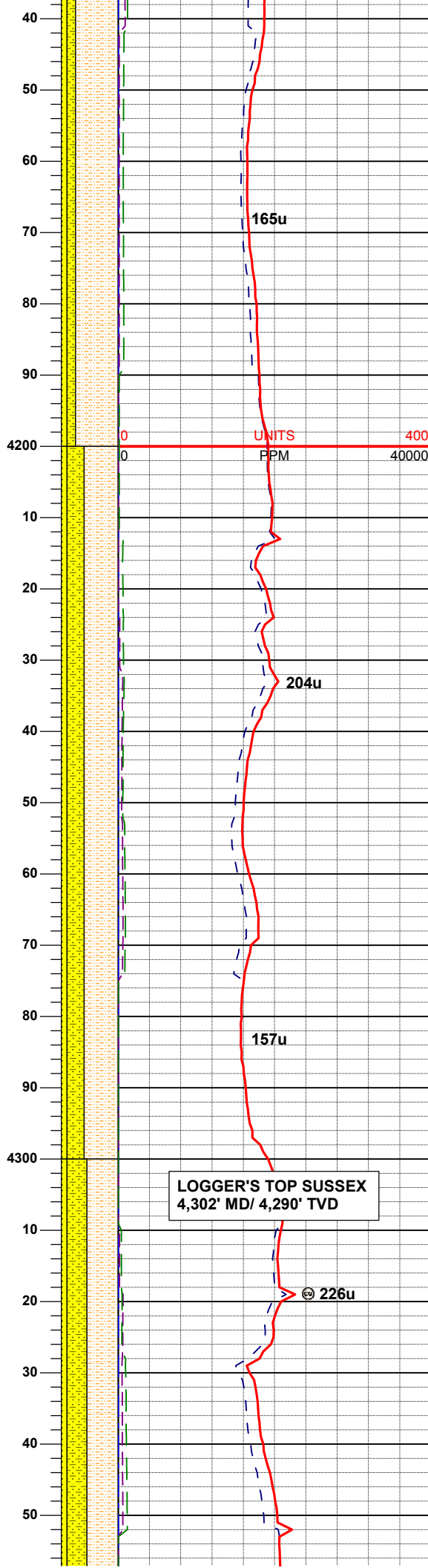
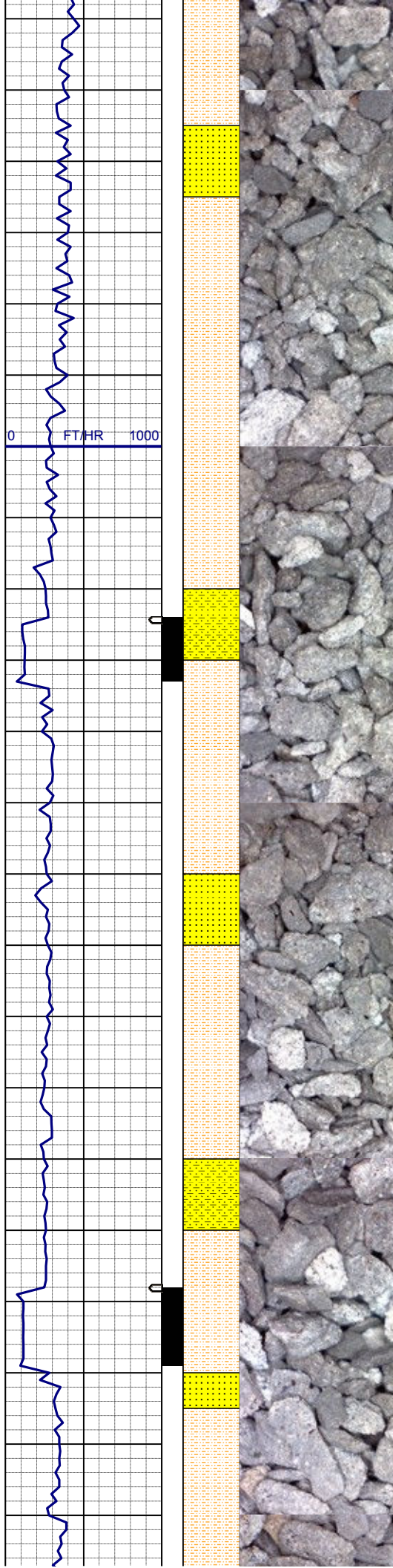


SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtx, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau

**SURVEY**  
**MD 3983'**  
**INC 0.4°**  
**AZI 98.4°**  
**TVD 3971.02'**

SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtx, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau

**SURVEY**  
**MD 4078'**  
**INC 0.7°**  
**AZI 121.2°**  
**TVD 4066.01'**



SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtx, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau

**SURVEY**  
**MD 4173'**  
**INC 0.9°**  
**AZI 140.0°**  
**TVD 4161.00'**

**MUD WT: 8.5 VIS: 27 IN**  
**MUD WT: 8.5 VIS: 28 OUT**

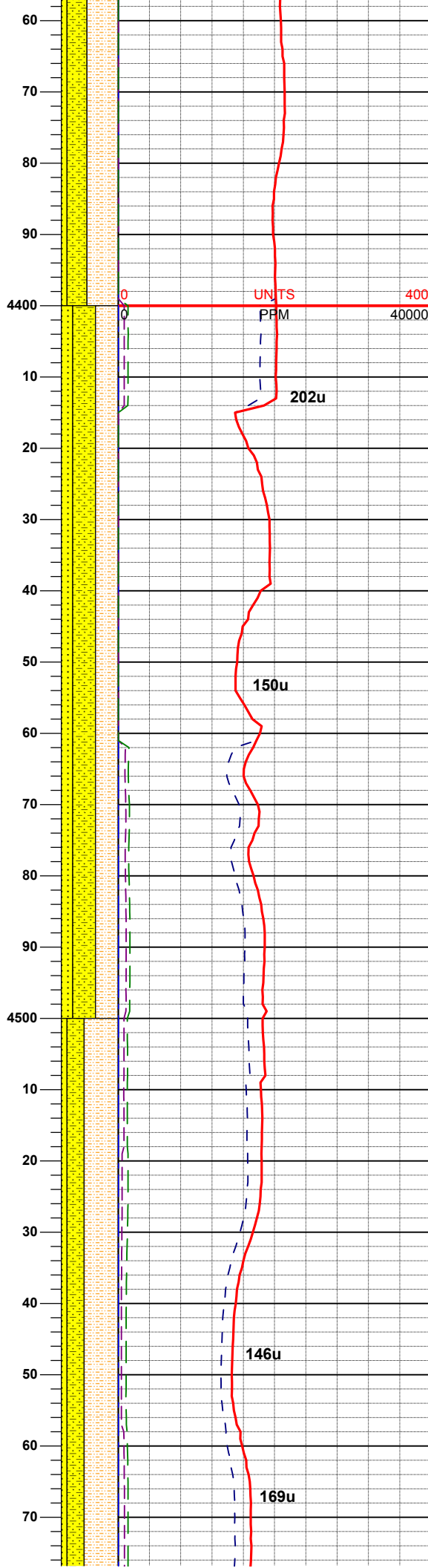
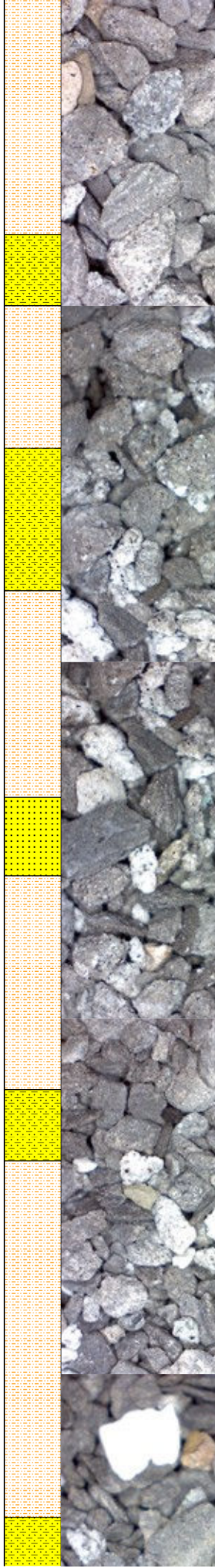
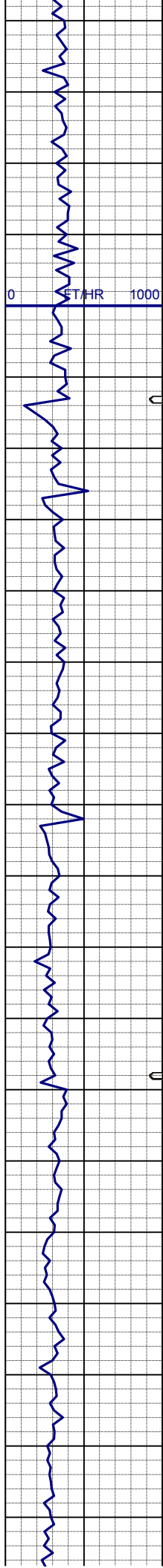
SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtx, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau

**SURVEY**  
**MD 4268'**  
**INC 0.2°**  
**AZI 69.2°**  
**TVD 4256.0'**

**LOGGER'S TOP SUSSEX**  
**4,302' MD/ 4,290' TVD**

SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtx, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau





glau

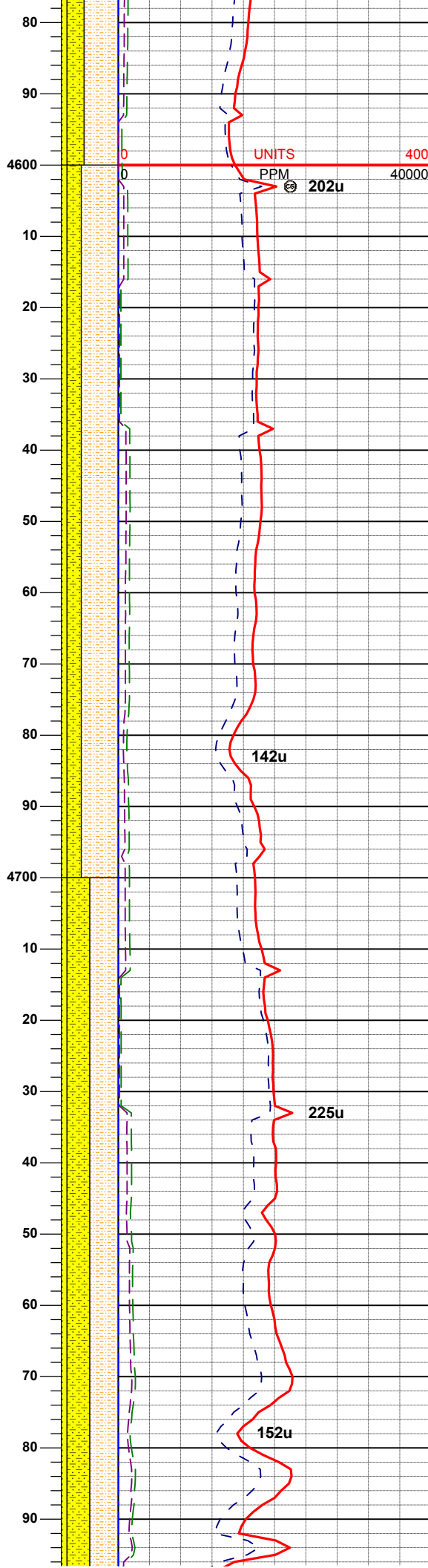
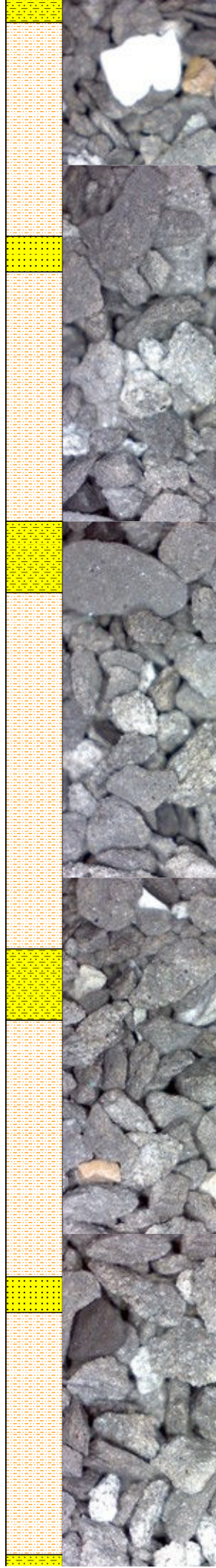
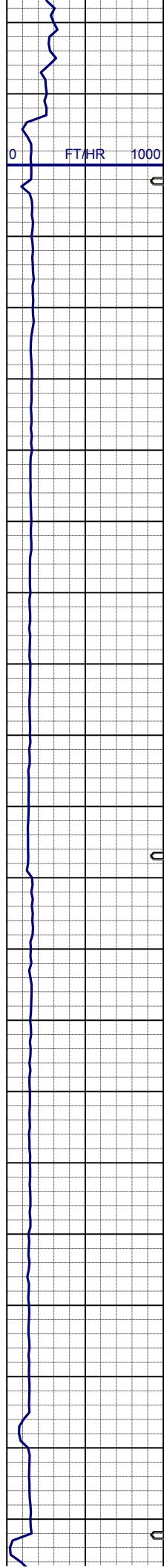
**SURVEY**  
**MD 4363'**  
**INC 1.3°**  
**AZI 267.5°**  
**TVD 4350.99'**

SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtx, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau

**SURVEY**  
**MD 4457'**  
**INC 1.7°**  
**AZI 253.9°**  
**TVD 4444.96'**

SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtx, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau

**SURVEY**  
**MD 4552'**  
**INC 1.8°**  
**AZI 251.7°**  
**TVD 4539.92'**



MUD WT: 8.8 VIS: 28 IN  
MUD WT: 8.8 VIS: 28 OUT

SURVEY  
MD 4647'  
INC 1.5°  
AZI 246.4°  
TVD 4634.88'

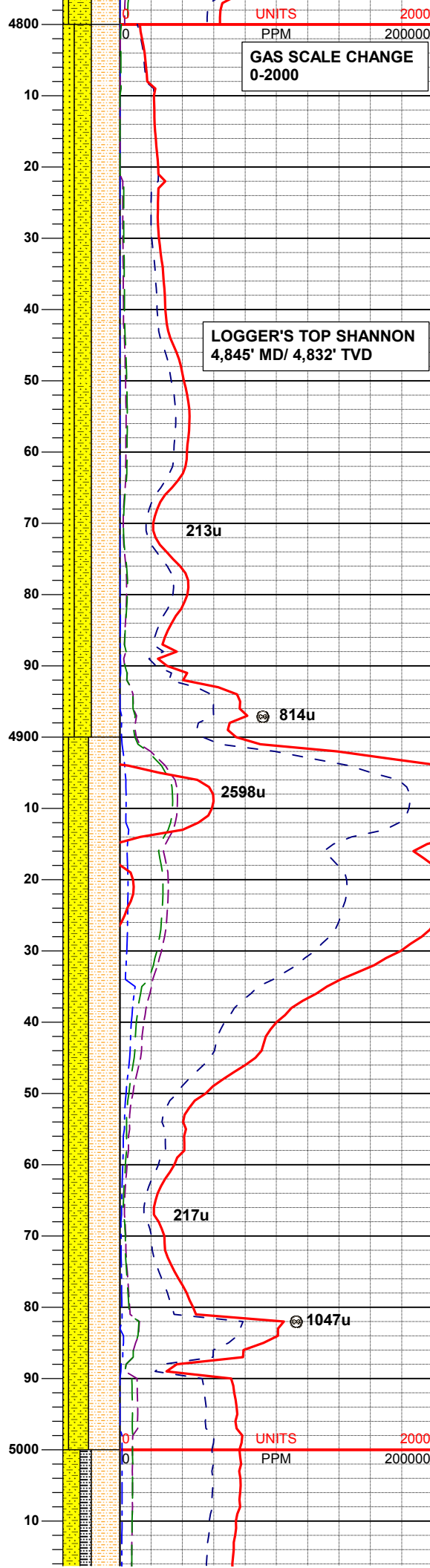
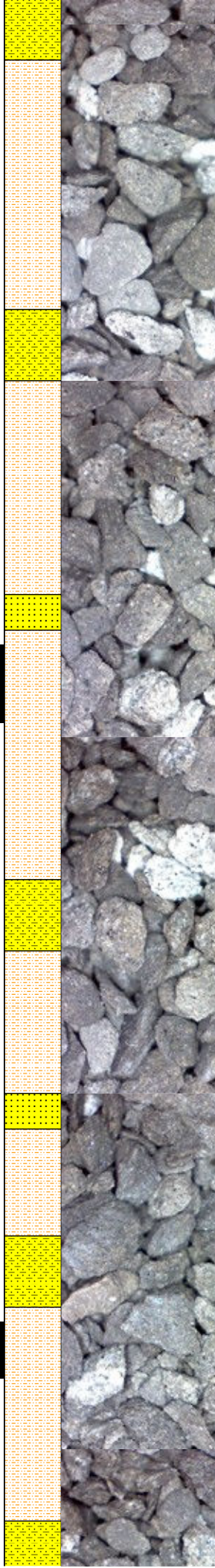
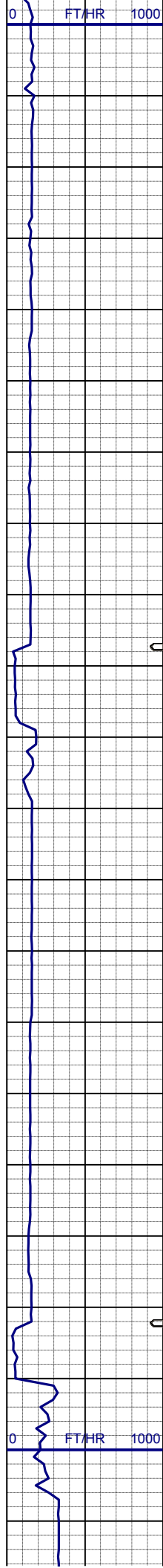
SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtx, grd to  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau

MUD WT: 8.8 VIS: 28 IN  
MUD WT: 8.8 VIS: 28 OUT

SURVEY  
MD 4742'  
INC 1.7°  
AZI 225.8°  
TVD 4729.84'

SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtx, grd to  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau





MUD WT: 9.0 VIS: 29 IN  
MUD WT: 8.9 VIS: 29 OUT

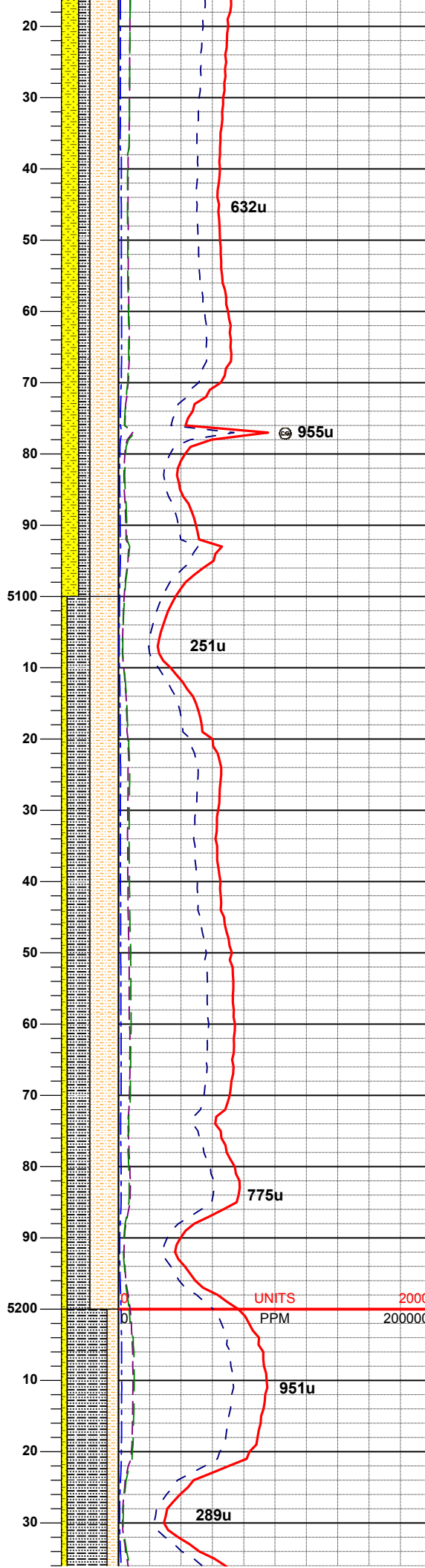
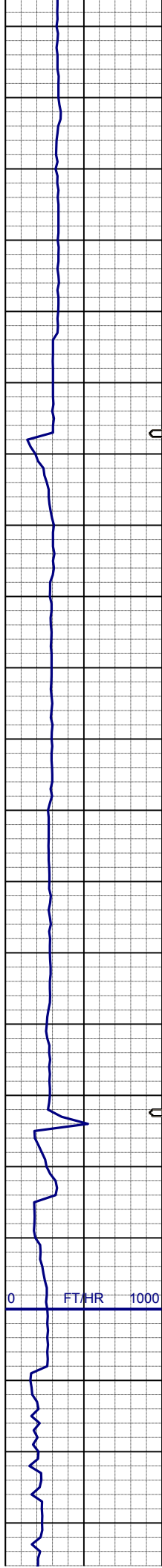
**SURVEY**  
MD 4837'  
INC 2.2°  
AZI 221.6°  
TVD 4824.79'

SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtz, grd to  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau

MUD WT: 9.1 VIS: 29 IN  
MUD WT: 9.0 VIS: 29 OUT

**SURVEY**  
MD 4931'  
INC 1.0°  
AZI 261.7°  
TVD 4918.75'

SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtz, grd to  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau



**SURVEY**  
**MD 5026'**  
**INC 1.4°**  
**AZI 325.1°**  
**TVD 5013.73'**

SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtz, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
SLTYSH: lt - mgy, dk gy, occ tan, v f gr, fri-brit, sbplty-sbbiky, sl calc, tr pyr ctd, tr cln ss

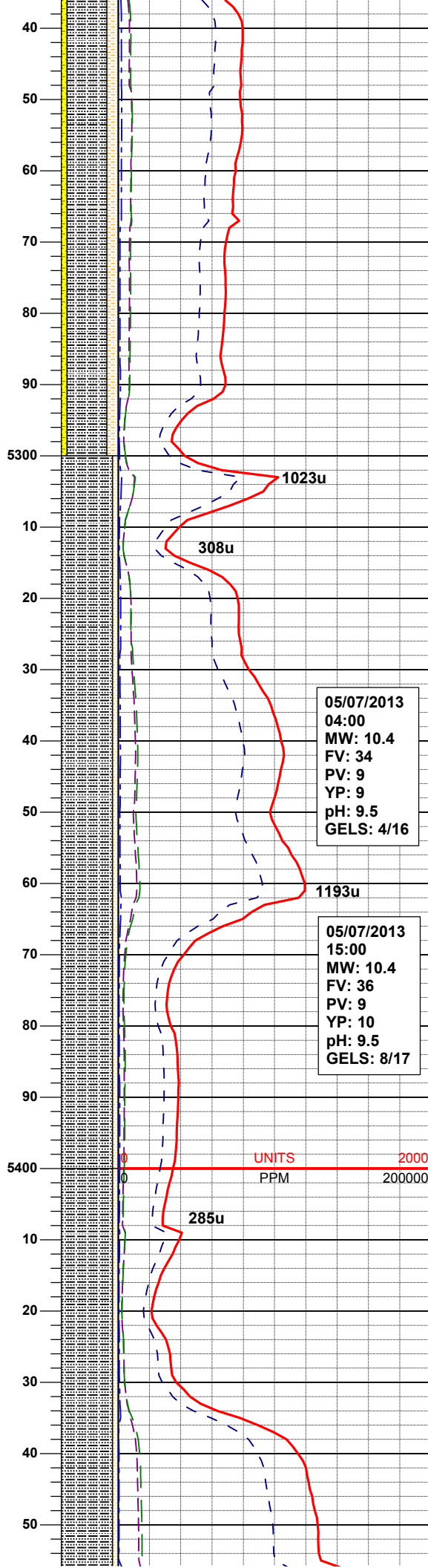
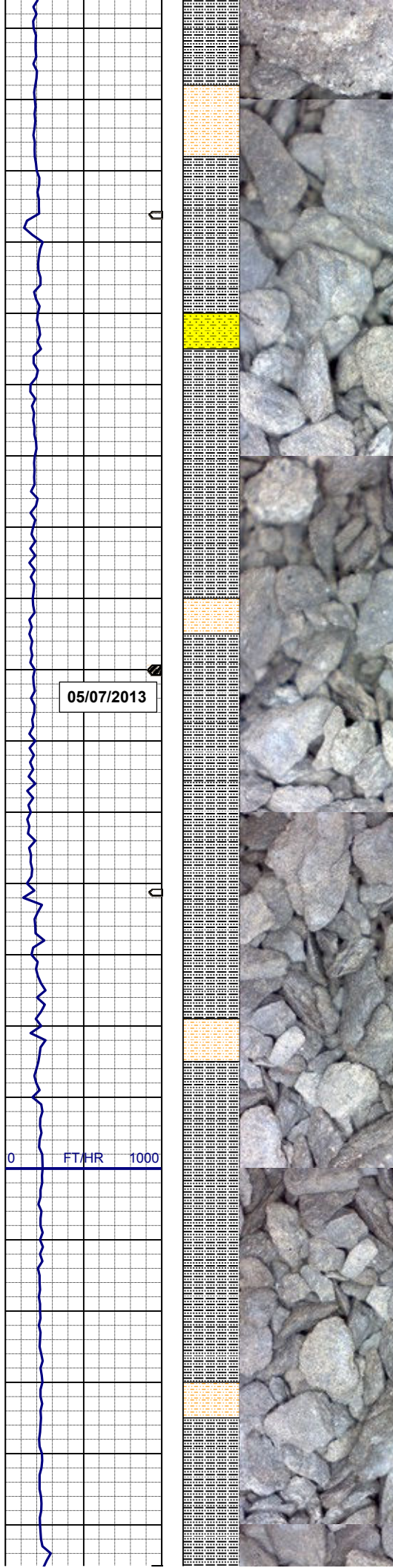
**SURVEY**  
**MD 5121'**  
**INC 1.1°**  
**AZI 320.2°**  
**TVD 5108.71'**

SHYSLTST: lt-mgy, occ tan, f-vfgr, sbrd-sbang, mod srt, arg mtz, SLTYSH: lt - mgy, dk gy, occ tan, v f gr, fri-brit, sbplty-sbbiky, sl calc, grd to SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog, trss, tr pyr ctd

**MUD WT: 9.6 VIS: 30 IN**  
**MUD WT: 9.6 VIS: 30 OUT**

**SURVEY**  
**MD 5216'**  
**INC 1.2°**  
**AZI 326.0°**  
**TVD 5203.69'**





SLTYSH: lt - mgy, dk gy, occ tan, v f  
gr, fri-brit, sbplty-sbbiky, sl calc, grd to  
SHYSLTST: lt-mgy, occ tan, f-vfgr,  
sbrd-sbang, mod srt, arg mtz,  
SHYSS: lt-mgy, f-mfgr, sbrd-sbang,  
mod-psrt, sft, ppor, argcmf, slcalc,  
phlog, trss, tr pyr ctd

**SURVEY**  
**MD 5311'**  
**INC 1.1°**  
**AZI 308.4°**  
**TVD 5298.67'**

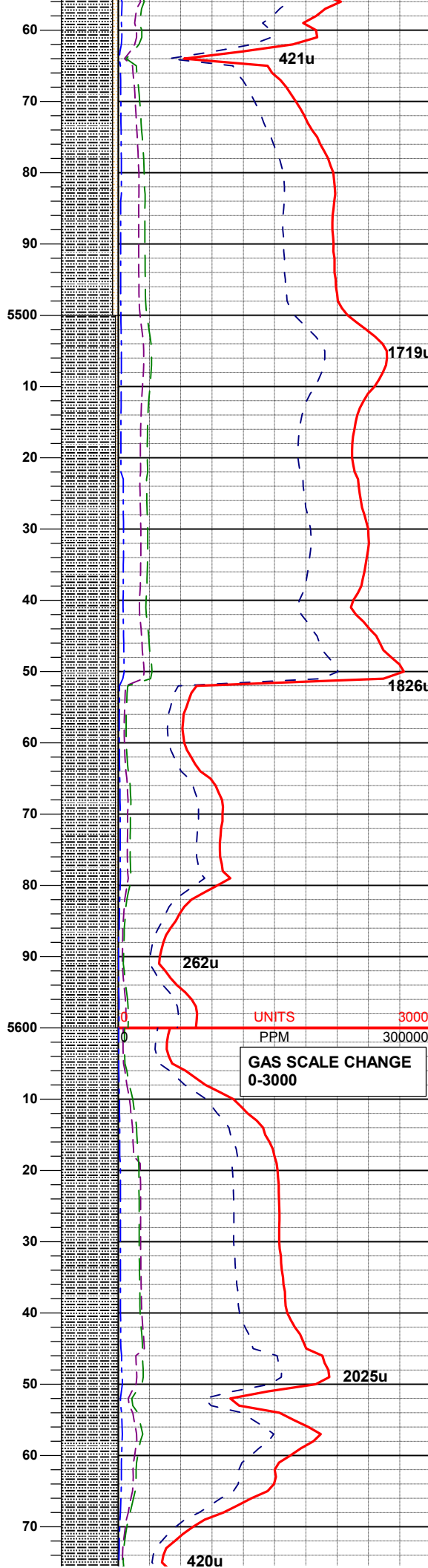
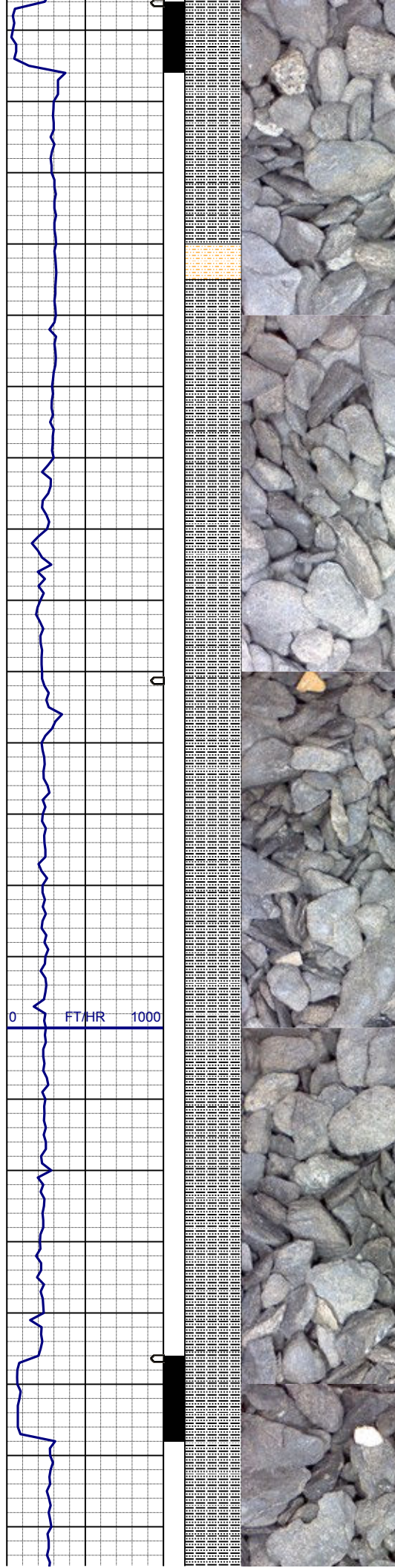
**MUD WT: 9.8 VIS: 32 IN**  
**MUD WT: 9.8 VIS: 32 OUT**

SLTYSH: lt - mgy, dk gy, occ tan, v f  
gr, fri-brit, sbplty-sbbiky, sl calc, grd to  
SHYSLTST: lt-mgy, occ tan, f-vfgr,  
sbrd-sbang, mod srt, arg mtz, sme  
shyss, trss, tr pyr ctd

**SURVEY**  
**MD 5405'**  
**INC 1.4°**  
**AZI 301.6°**  
**TVD 5392.65'**

SLTYSH: lt - mgy, dk gy, occ tan, v f  
gr, fri-brit, sbplty-sbbiky, sl calc, grd to  
SHYSLTST: lt-mgy, occ tan, f-vfgr,  
sbrd-sbang, mod srt, arg mtz, sme  
shyss, trss, tr pyr ctd





MUD WT: 9.8 VIS: 32 IN  
MUD WT: 9.8 VIS: 32 OUT

SURVEY  
MD 5500'  
INC 1.0°  
AZI 273.8°  
TVD 5487.63'

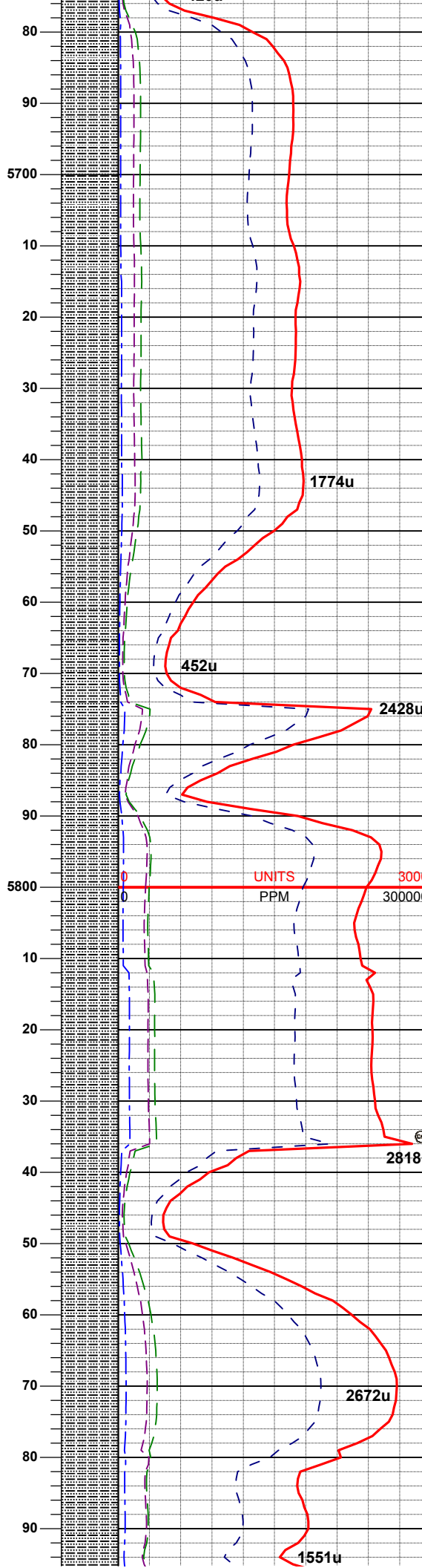
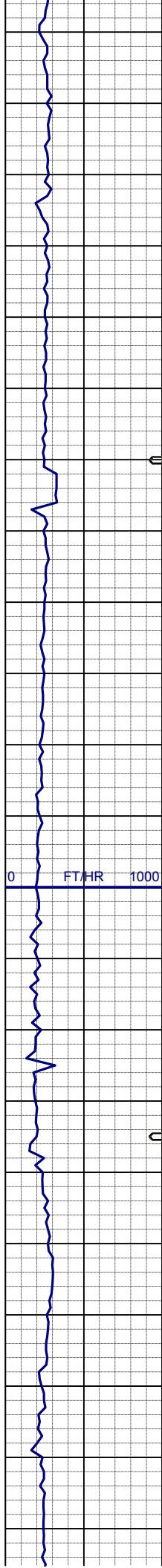
SLTYSH: lt - mgy, dk gy, occ tan, v f  
gr, fri-brit, sbplty-sbblky, sl calc, grd to  
SHYSLTST: lt-mgy, occ tan, f-vfgr,  
sbrd-sbang, mod srt, arg mtx, sme  
shyss, trss, tr pyr ctd

SURVEY  
MD 5595'  
INC 1.0°  
AZI 240.9°  
TVD 5582.62'

MUD WT: 9.8+ VIS: 32 IN  
MUD WT: 9.8 VIS: 32 OUT

SLTYSH: lt - mgy, dk gy, occ tan, v f  
gr, fri-brit, sbplty-sbblky, sl calc, tr  
shysltst, tr shyss, tr pyr ctd





**SURVEY**  
**MD 5690'**  
**INC 0.9°**  
**AZI 346.4°**  
**TVD 5677.61'**

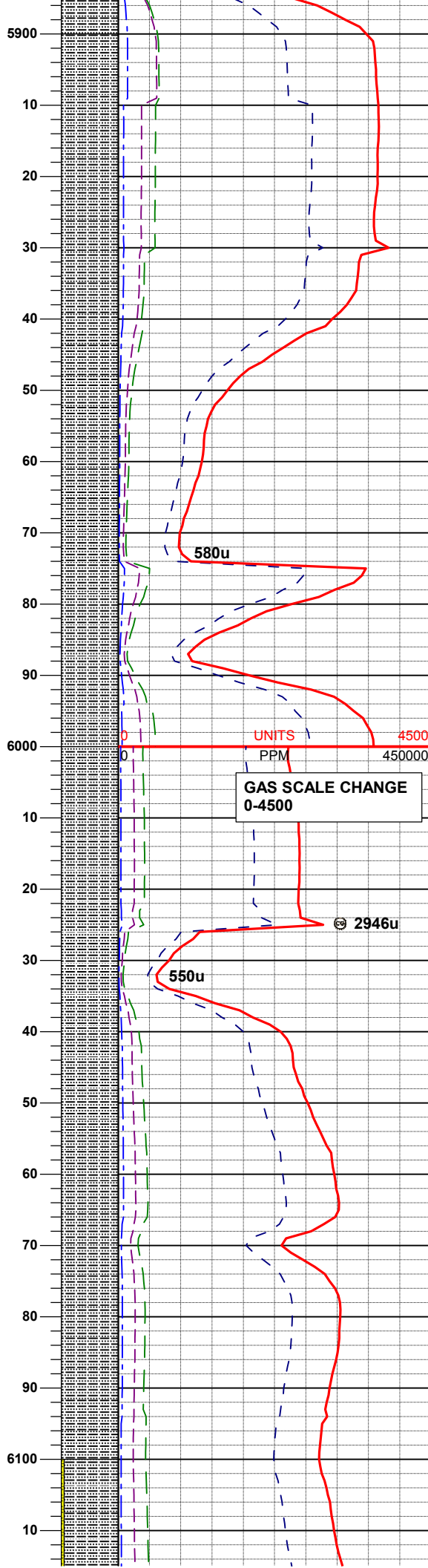
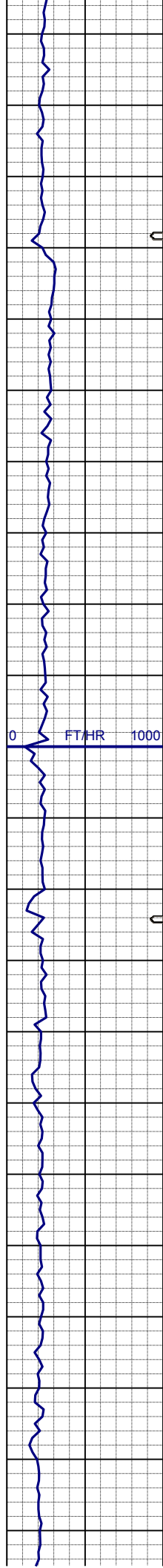
SLTYSH: lt - mgy, dk gy, occ tan, v f  
gr, fri-brit, sbplty-sbblky, sl calc, tr  
shysltst, tr shyss, tr pyr ctd

**SURVEY**  
**MD 5785'**  
**INC 0.5°**  
**AZI 339.0°**  
**TVD 5772.60'**

**MUD WT: 10 VIS: 33 IN**  
**MUD WT: 10 VIS: 32 OUT**

SLTYSH: lt - mgy, dk gy, occ tan, v f  
gr, fri-brit, sbplty-sbblky, sl calc, tr  
shysltst, tr shyss, tr pyr ctd

**SURVEY**  
**MD 5879'**  
**INC 1.0°**  
**AZI 302.8°**  
**TVD 5866.59'**



MUD WT: 10.2 VIS: 32 IN  
MUD WT: 10.2 VIS: 32 OUT

SLTYSH: lt - mgy, dk gy, occ tan, v f  
gr, fri-brit, sbplty-sbblky, sl calc, tr  
shysltst, tr shyss, tr pyr ctd

SURVEY  
MD 5974'  
INC 0.9°  
AZI 328.1°  
TVD 5961.58'

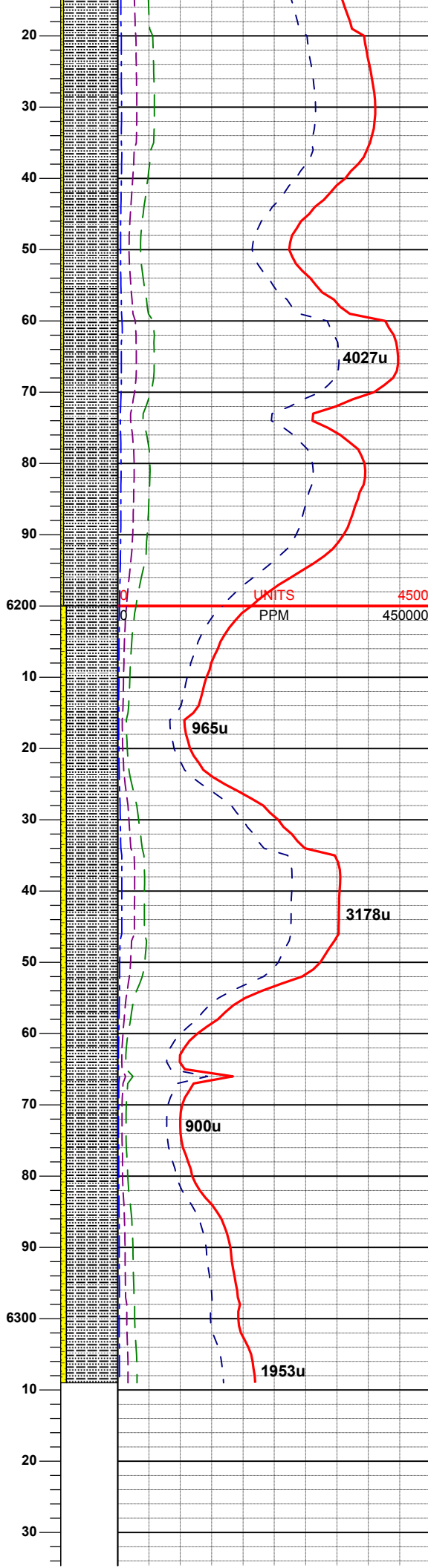
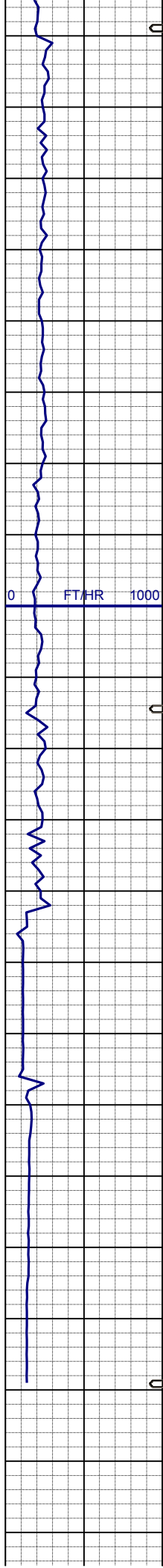
UNITS  
PPM  
GAS SCALE CHANGE  
0-4500

SLTYSH: lt - mgy, dk gy, occ tan, v f  
gr, fri-brit, sbplty-sbblky, sl calc, tr  
shysltst, tr shyss, tr pyr ctd

SURVEY  
MD 6069'  
INC 0.4°  
AZI 320.7°  
TVD 6056.57'

MUD WT: 10.2 VIS: 33 IN  
MUD WT: 10.2 VIS: 33 OUT





SLTYSH: lt - mgy, dk gy, occ tan, v f  
gr, fri-brit, sbplty-sbblky, sl calc, occ  
pyr ctd  
SHYSS: lt-mgy, f-mggr, sbrd-sbang,  
mod-psrt, ppor, argcmt

**SURVEY**  
**MD 6164'**  
**INC 0.4°**  
**AZI 255.2°**  
**TVD 6151.57'**

**MUD WT: 10.4 VIS: 36 IN**  
**MUD WT: 10.3 VIS: 36 OUT**

SLTYSH: lt - mgy, dk gy, occ tan, v f  
gr, fri-brit, sbplty-sbblky, sl calc, occ  
pyr ctd  
SHYSS: lt-mgy, f-mggr, sbrd-sbang,  
mod-psrt, ppor, argcmt

**SURVEY**  
**MD 6258'**  
**INC 0.7°**  
**AZI 290.9°**  
**TVD 6245.57'**

**TD VERTICAL @ 6,309' MD**  
**@ 06:58 MST 05/07/2013**

**LOG CONTINUES ON L PLOT**  
**SAUER F33-77-1HC HORIZONTAL**

**THANK YOU FOR USING**  
**COLUMBINE LOGGING INC.**

