

LOG created using LPLOT VH Version 3.0, January 10, 2012, Copyright (C) 1999-2009 Pason Systems Corp.

**OPERATOR:** CHESAPEAKE OPERATING INC.  
**WELL:** STATE 8-60-16-2H  
**LOCATION:** NW NW 280' FNL & 660' FWL  
**COUNTY:** WELD  
**STATE:** COLORADO  
**SPOT:** NWNW SEC 16, T8N, R60W  
**ELEVATION:** GL 4918', KB 4940'  
**FIELD:** WILDCAT  
**SPUD DATE:** 1/2/2012  
**TD DATE:**  
**DATES LOGGED:** 1/5/2012  
**DEPTHS LOGGED:** 1111'-  
**LOGGERS:** MARK RAIMO, KYLE KNIGHT  
**DRILLING FLUID:** LSND  
**DRILLING RIG:** SST 53  
**API:** 05-123-34824  
**LOG TYPE:** VERTICAL  
**SCALE:** 1:240 (5 inches per 100 feet)  
**REMARKS:**

### LITHOLOGIES



Sandstone



Shaly Sandstone



Shaly Siltstone



Siltstone



Silty Shale

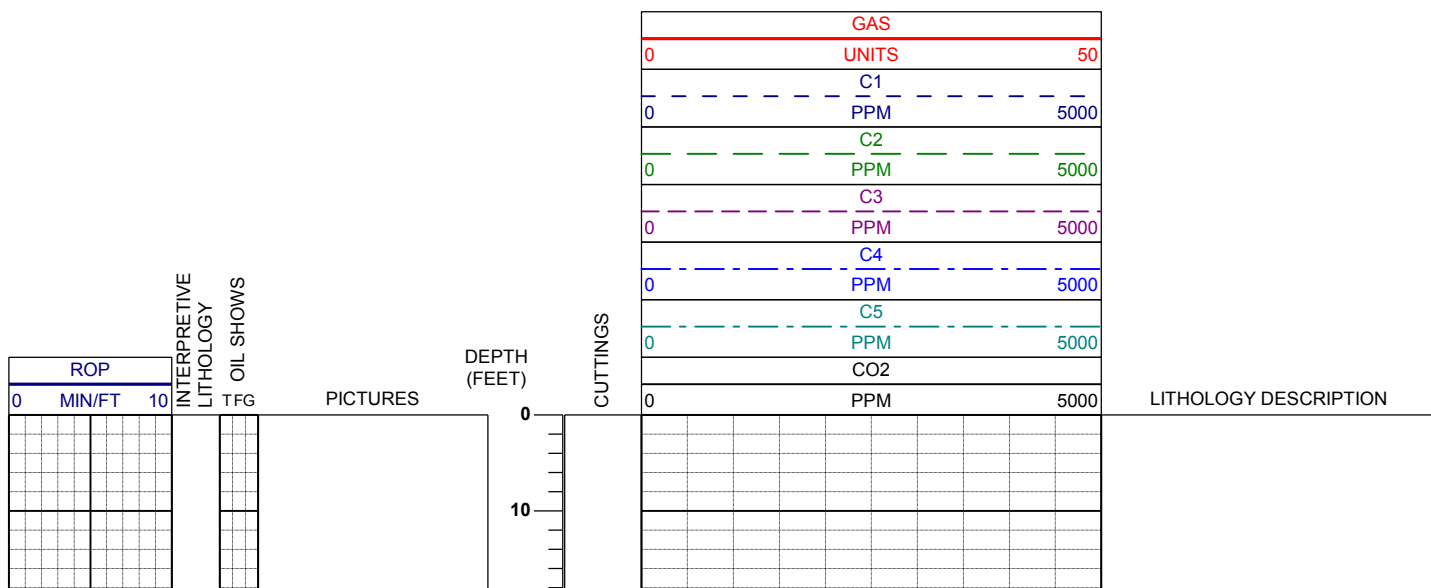
### ENGINEERING SYMBOLS



Connection



Midnight Depth





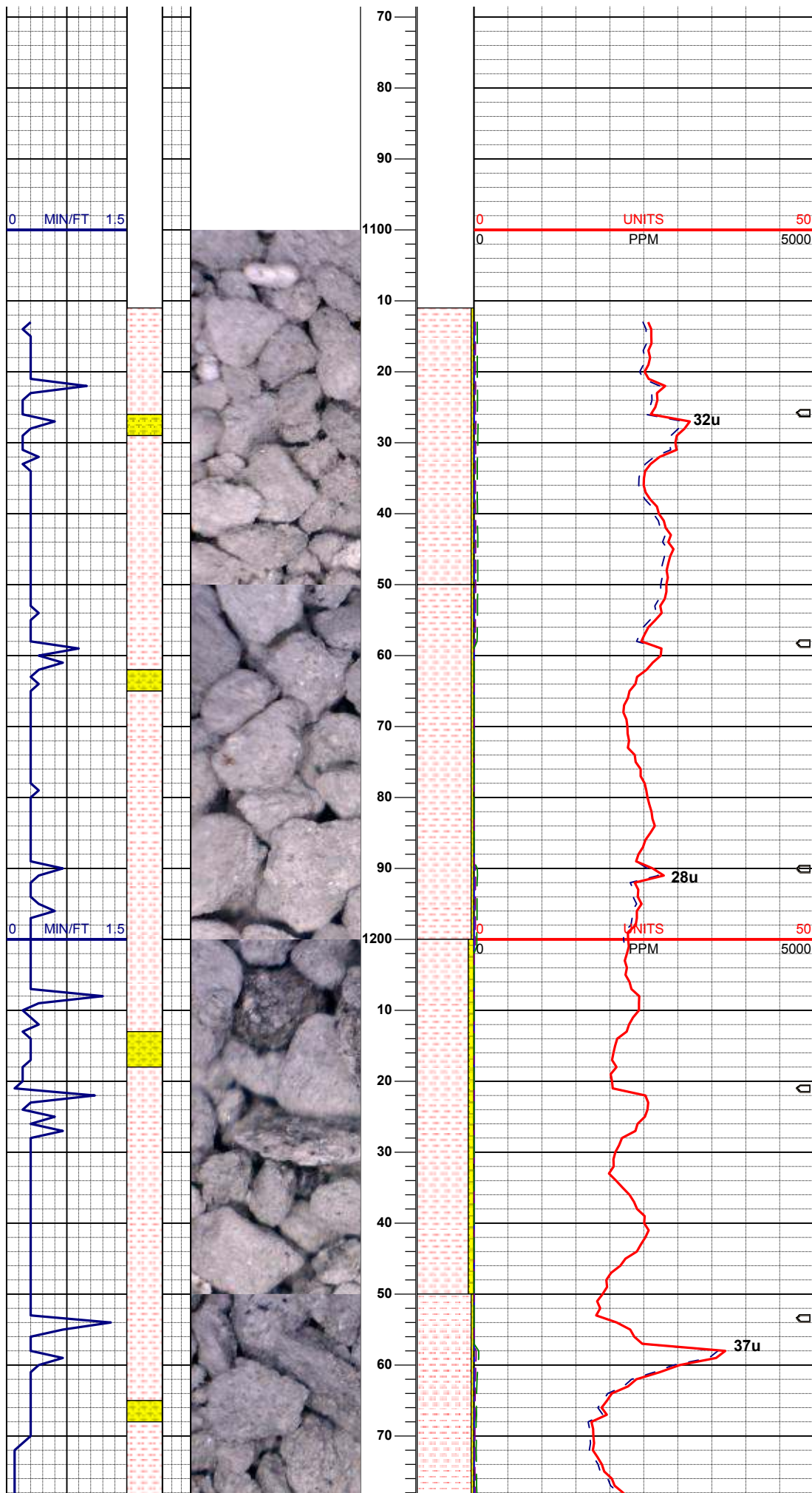




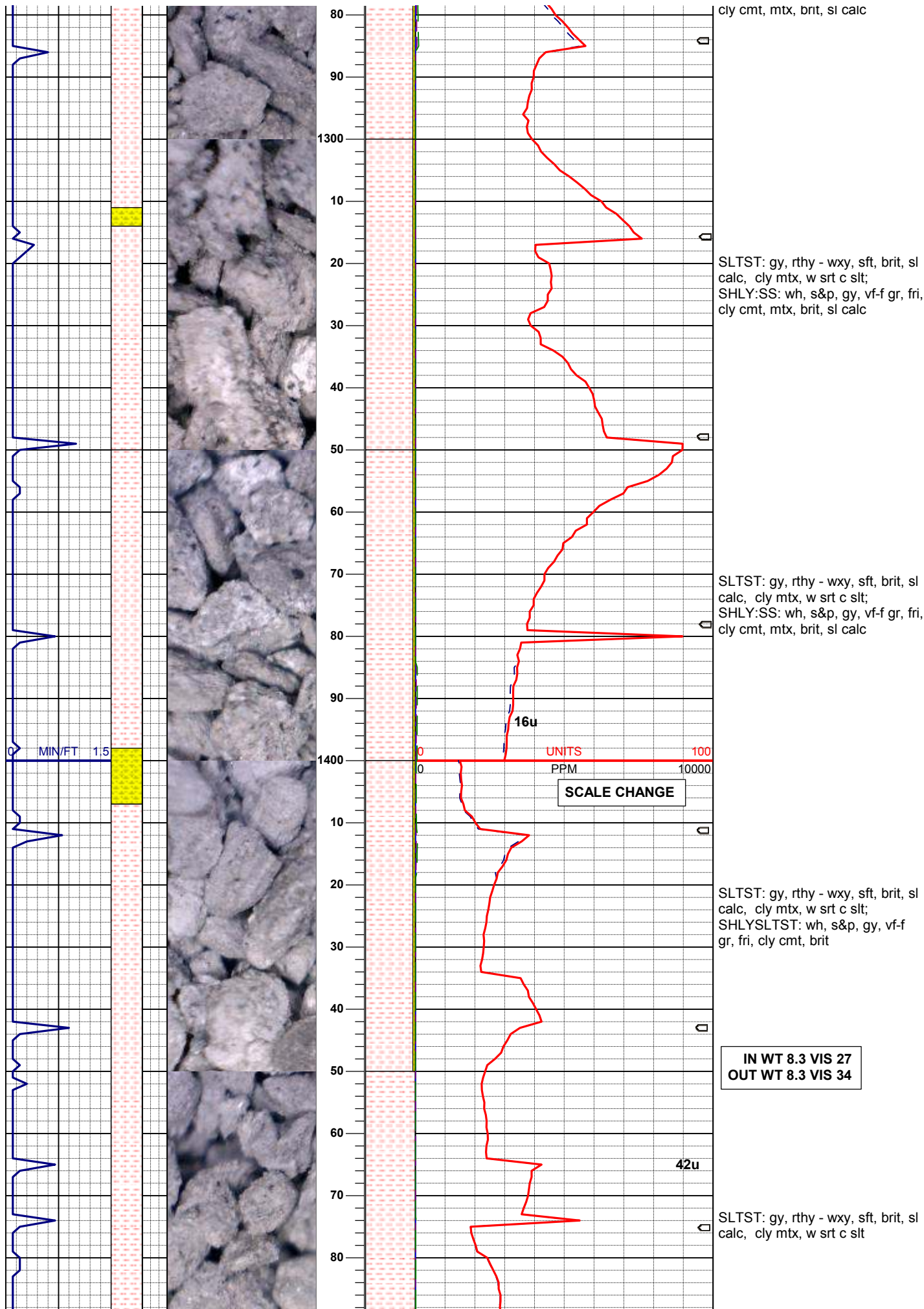




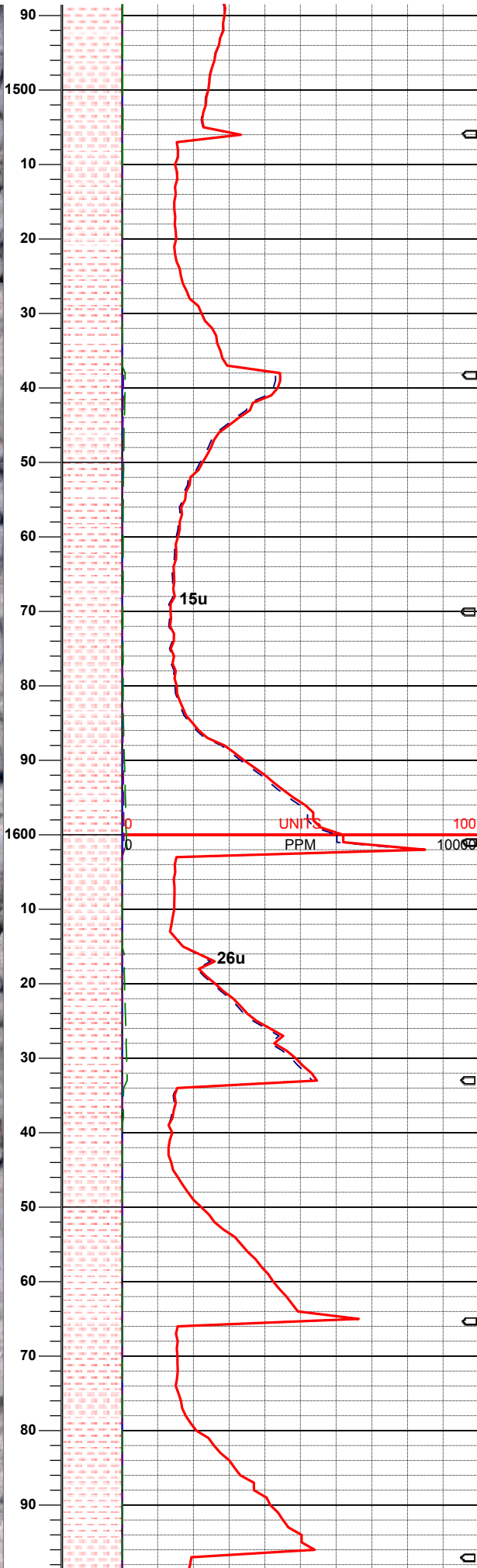
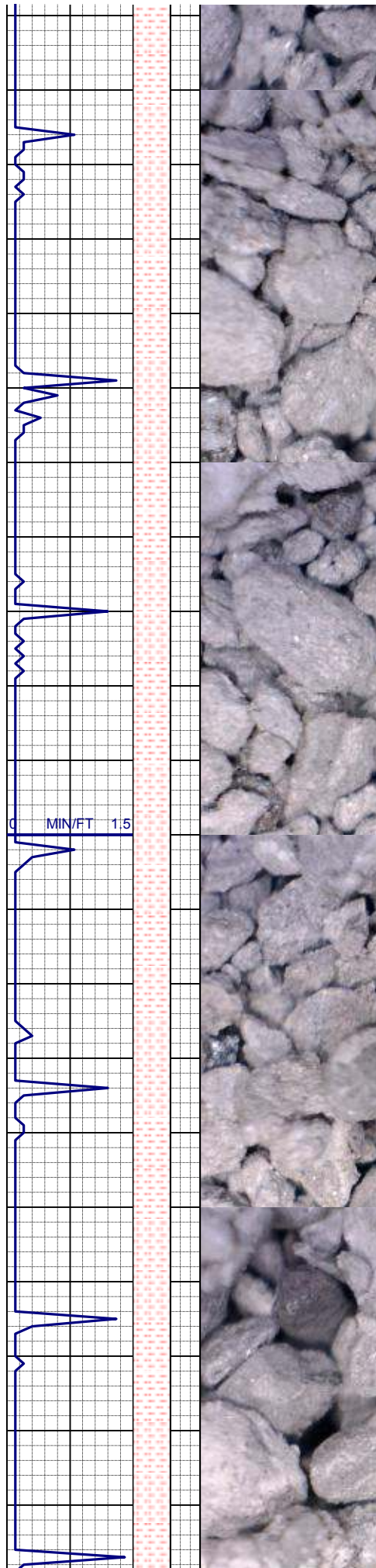
**COLUMBINE LOGGING  
RIGGED UP ON 01/04/12  
MANNED 2-PERSON  
LOGGING WITH  
BLOODHOUND GAS  
CHROMATOGRAPH  
UNIT #569**











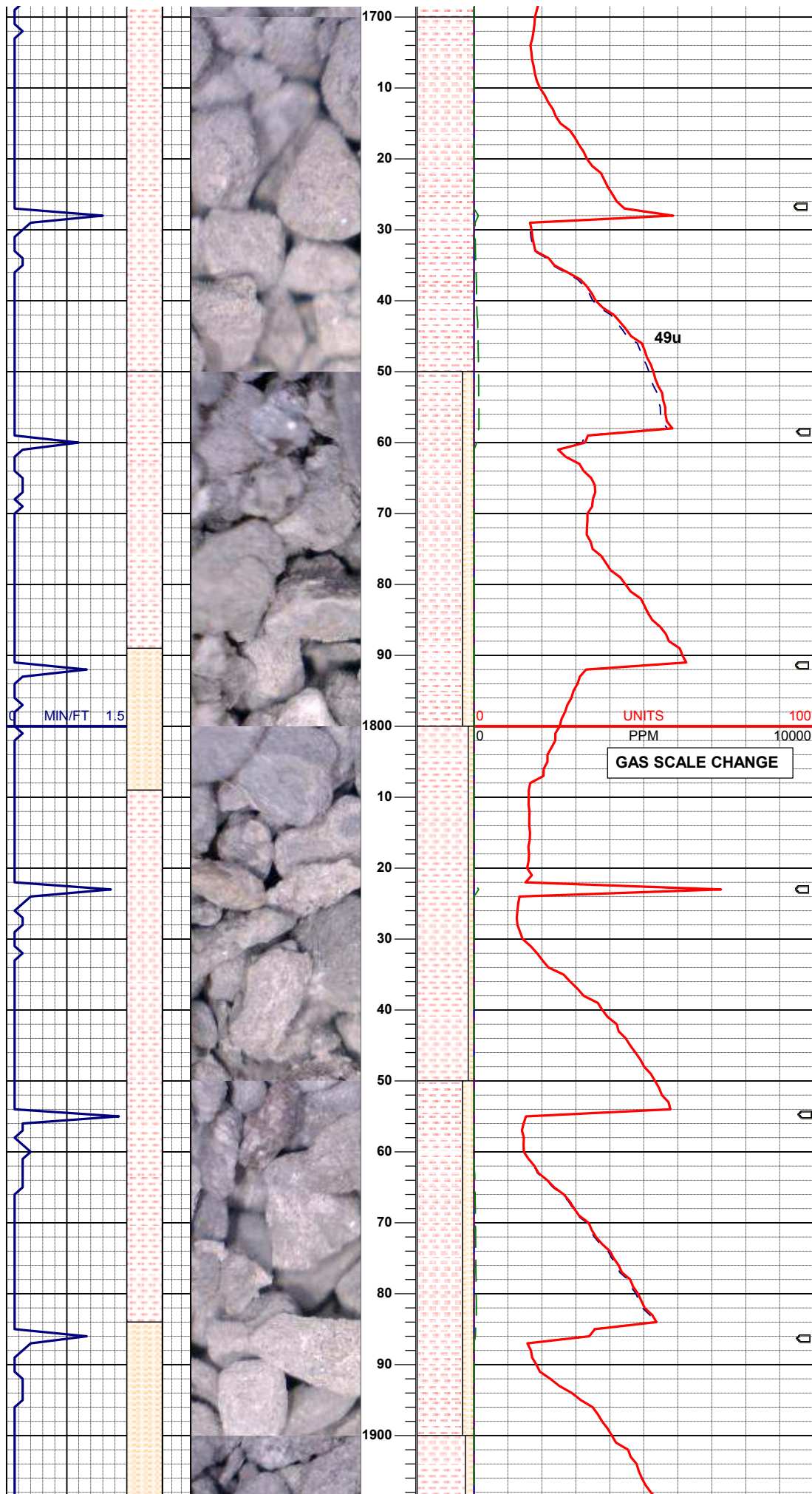
SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt

**SURVEY**  
**MD 1569'**  
**INC 0.2°**  
**AZM 252°**

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt, abnt  
clay

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt, abnt  
clay

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt, abnt  
clay



SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt, abnt  
clay

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit, tr bent, abnt  
clay

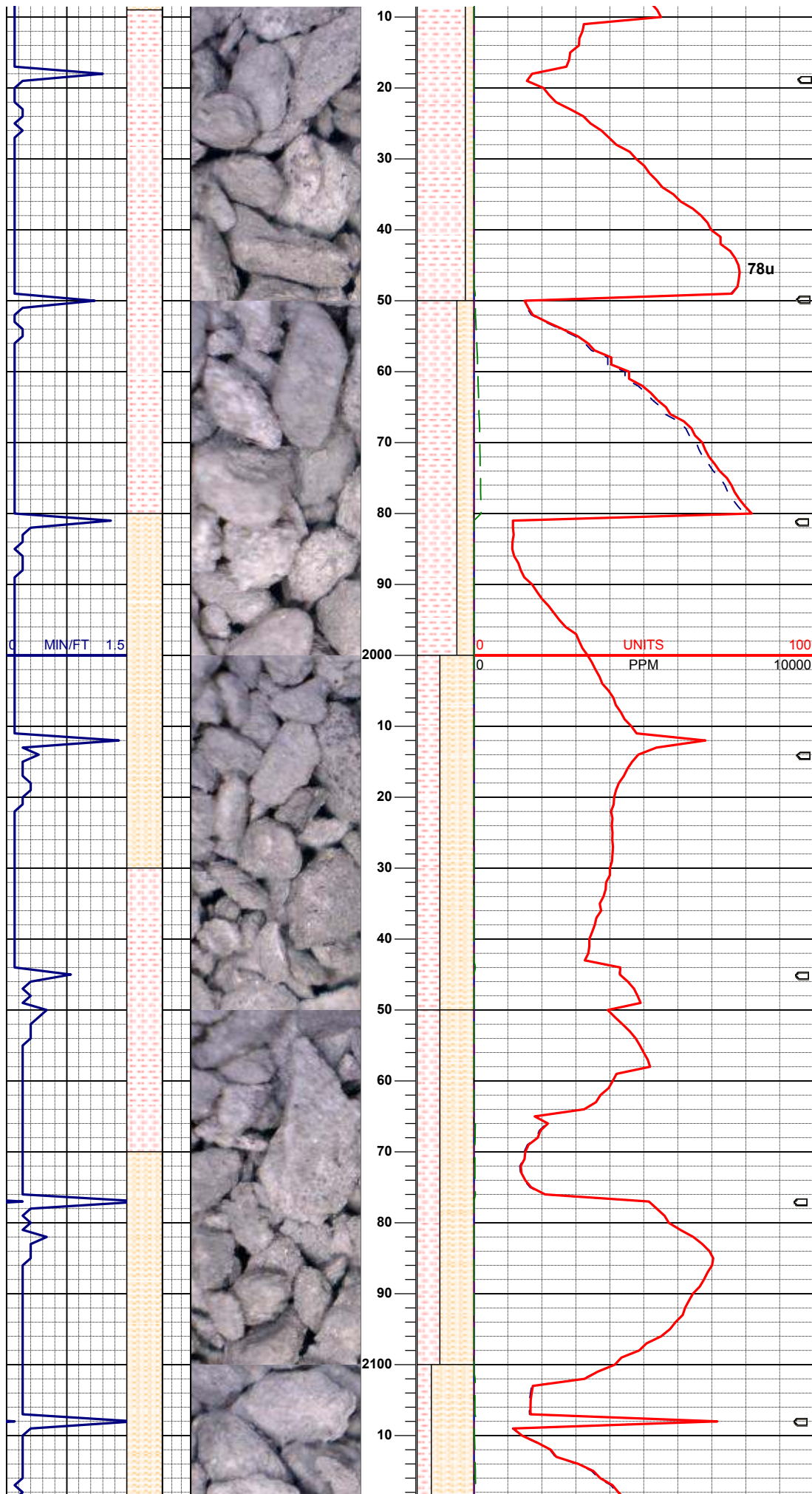
IN WT 8.3 VIS 29  
OUT WT 8.3 VIS 32

SURVEY  
MD 1822'  
INC 0.3°  
AZM 270°

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit, tr bent, abnt  
clay

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit, tr bent, abnt  
clay





IN WT 8.3 VIS 29  
OUT WT 8.3 VIS 32

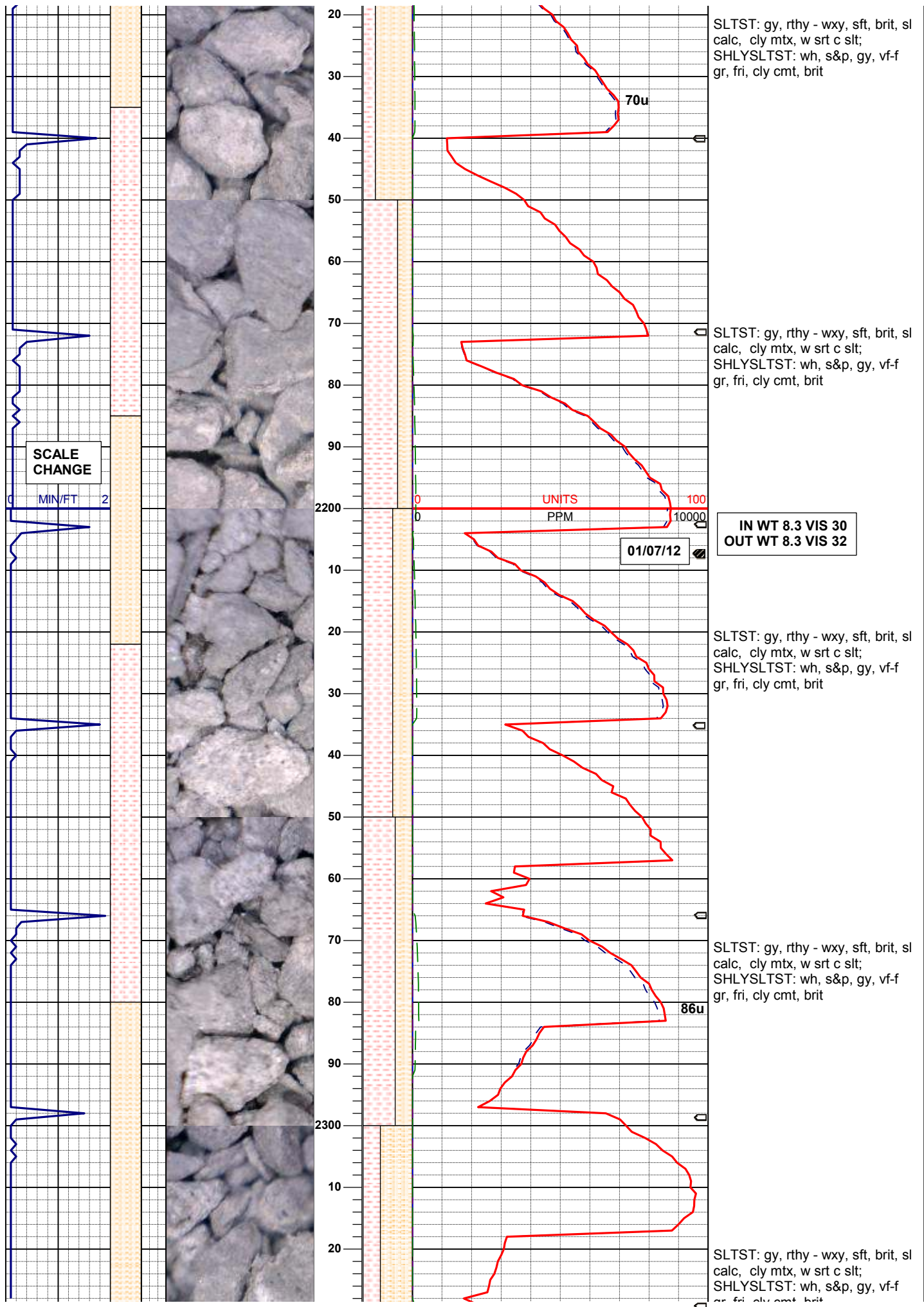
SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit, abnt clay

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit, abnt clay

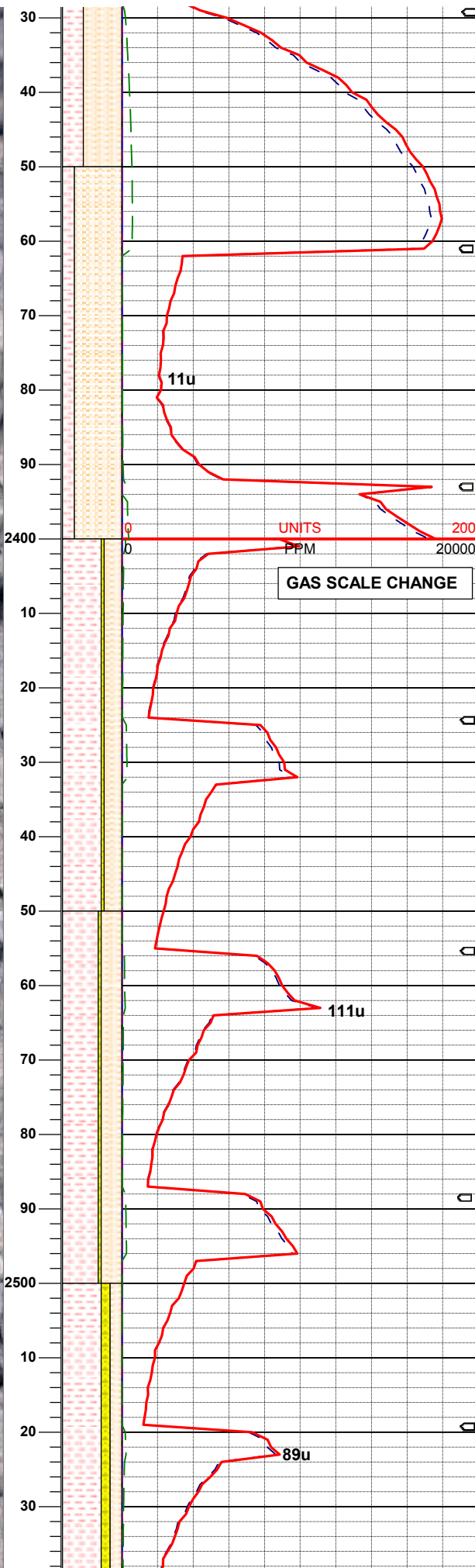
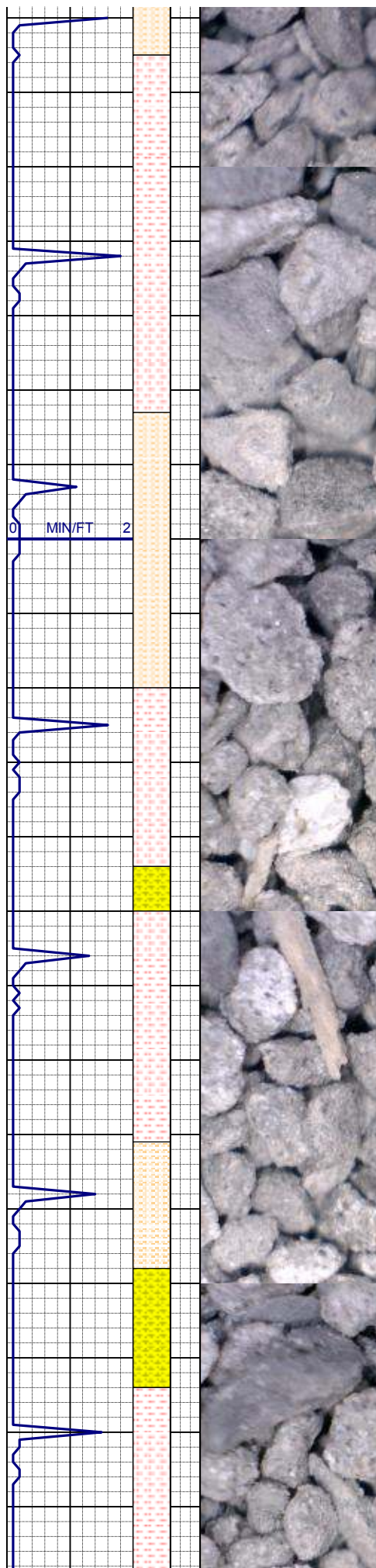
SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit, abnt clay

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit, abnt clay

SURVEY  
MD 2108'  
INC 0.2°  
AZM 198°







gr, m, cly cmt, brit

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit

**SURVEY**  
**MD 2392'**  
**INC 0.1°**  
**AZM 326°**

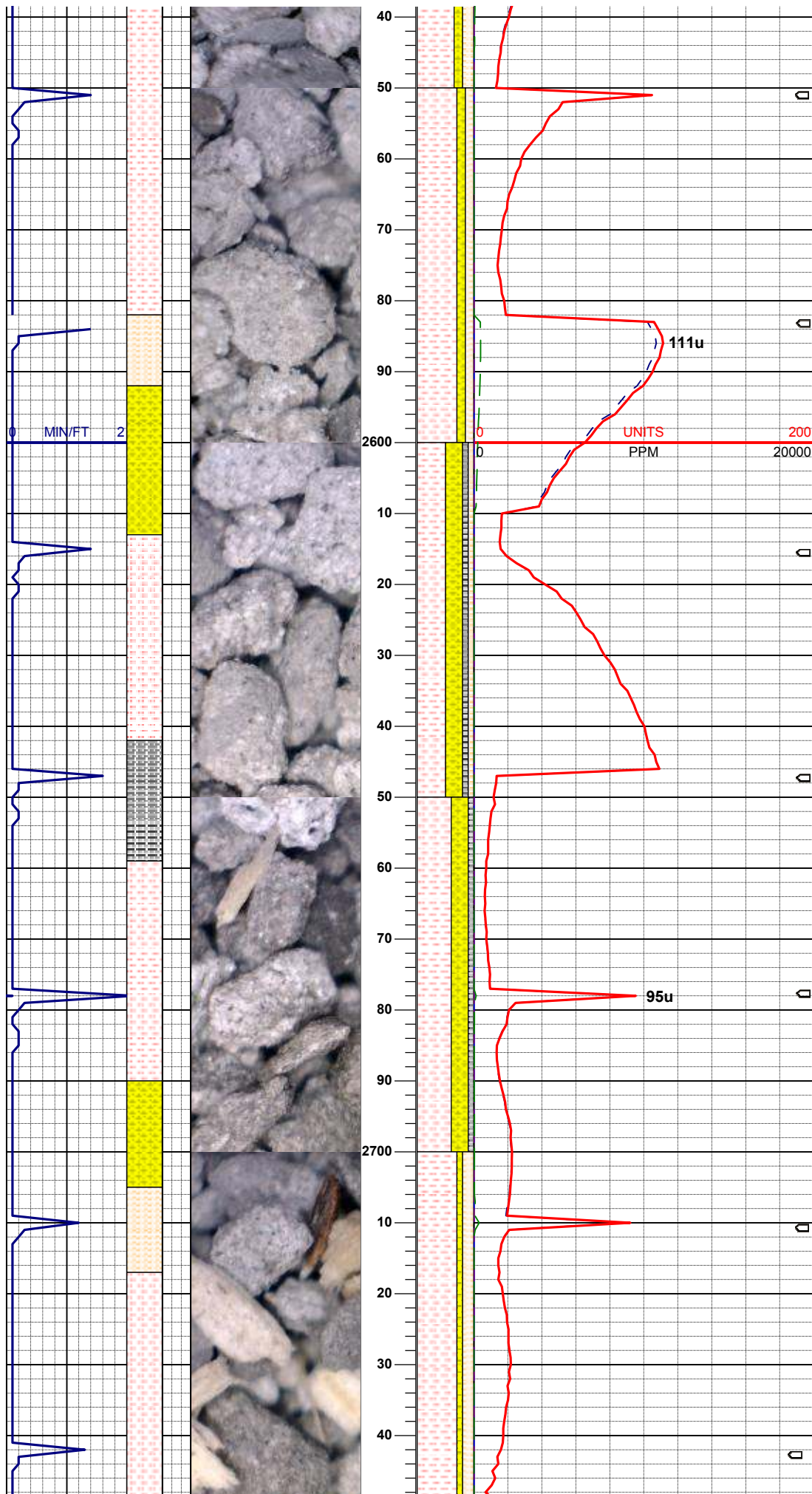
UNITS  
PPM  
2400 0 20000  
200

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit; SHLY:SS:  
wh, s&p, gy, vf-f gr, fri, cly cmt,  
mtx, brit, sl calc

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit; SHLY:SS:  
wh, s&p, gy, vf-f gr, fri, cly cmt,  
mtx, brit, sl calc

**IN WT 8.3 VIS 30**  
**OUT WT 8.3 VIS 30**

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit; SHLY:SS:  
wh, s&p, gy, vf-f gr, fri, cly cmt,  
mtx, brit, sl calc



SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit; SHLY:SS:  
wh, s&p, gy, vf-f gr, fri, cly cmt,  
mtx, brit, sl calc

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit; SHLY:SS:  
wh, s&p, gy, vf-f gr, fri, cly cmt,  
mtx, brit, sl calc; SLTY:SH: lt gy -  
dk gy, sft-hd, gd slty - aren, hom,  
brit, sbply - sbrd

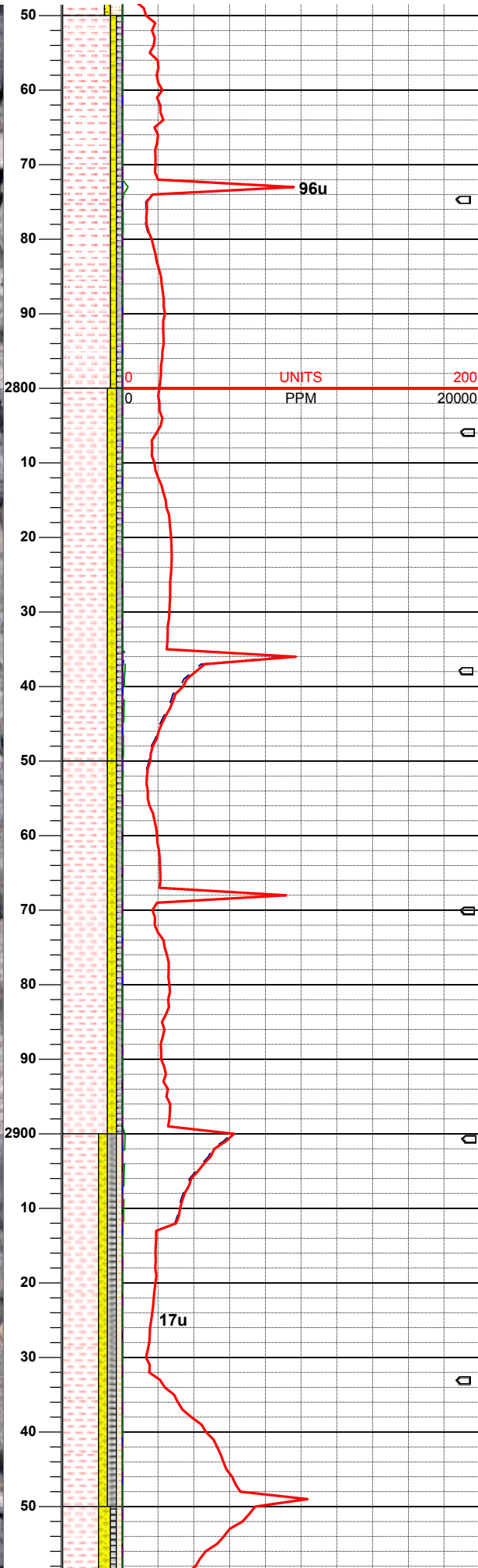
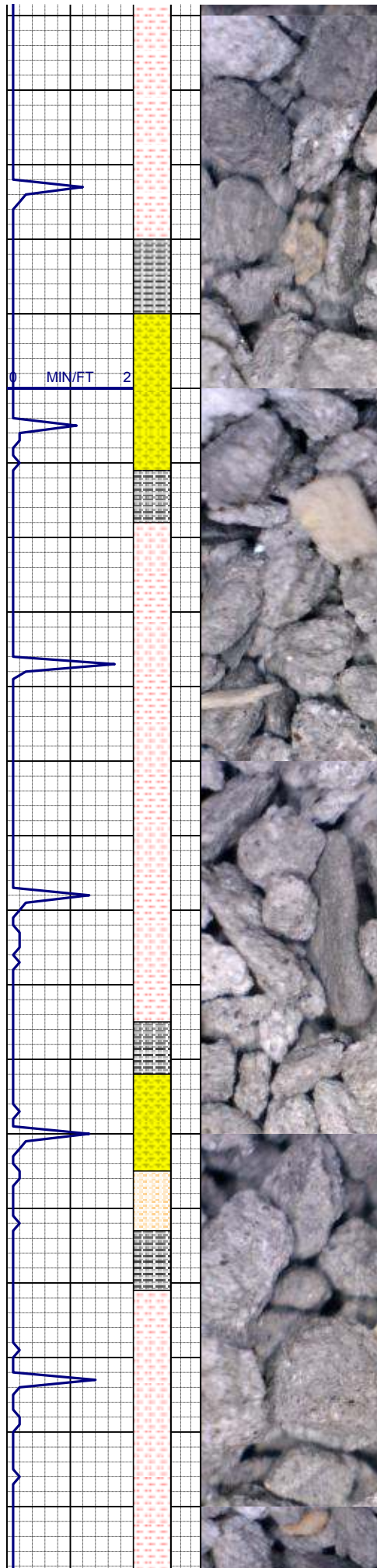
SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLY:SS: wh, s&p, gy, vf-f gr, fri,  
cly cmt, mtx, brit, sl calc;  
SLTY:SH: lt gy - dk gy, sft-hd, gd  
slty - aren, hom, brit, sbply -  
sbrd

**SURVEY**  
**MD 2678°**  
**INC 0.1°**  
**AZM 204°**

**IN WT 8.3 VIS 30**  
**OUT WT 8.3 VIS 30**

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit; SHLY:SS:  
wh, s&p, gy, vf-f gr, fri, cly cmt,  
mtx, brit, sl calc





SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLY:SS: wh, s&p, gy, vf-f gr, fri,  
cly cmt, mtx, brit, sl calc:  
SLTY:SH: lt gy - dk gy, sft-hd, gd  
sly - aren, hom, brit, sbply -  
sbrd

IN WT 8.3 VIS 32  
OUT WT 8.3+ VIS 30

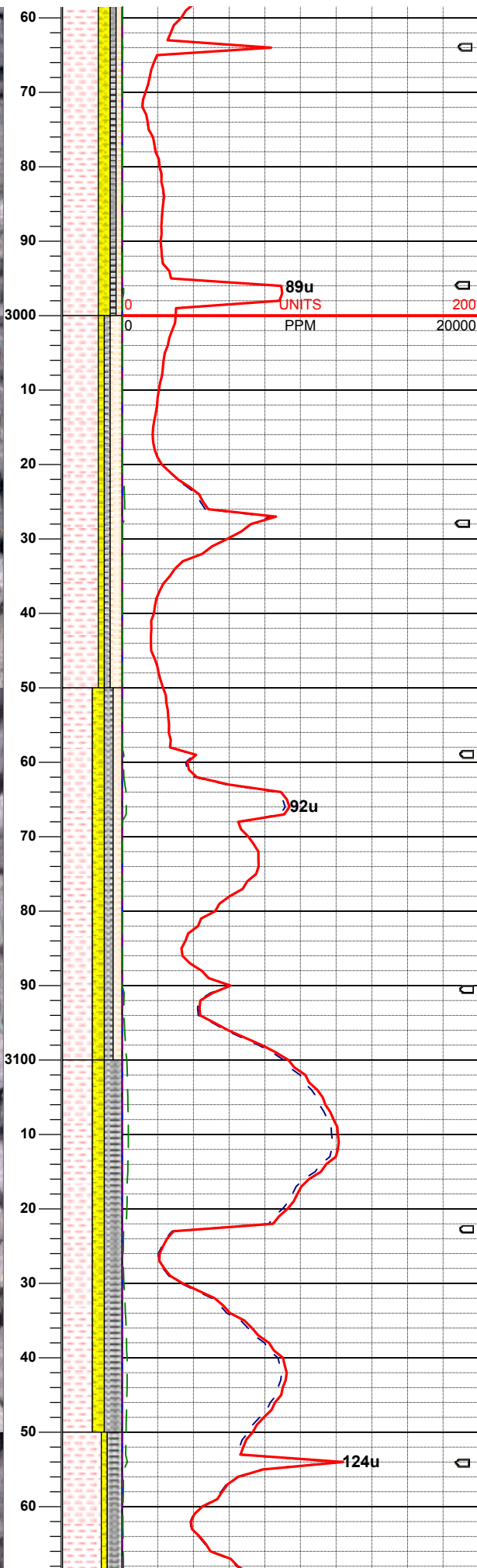
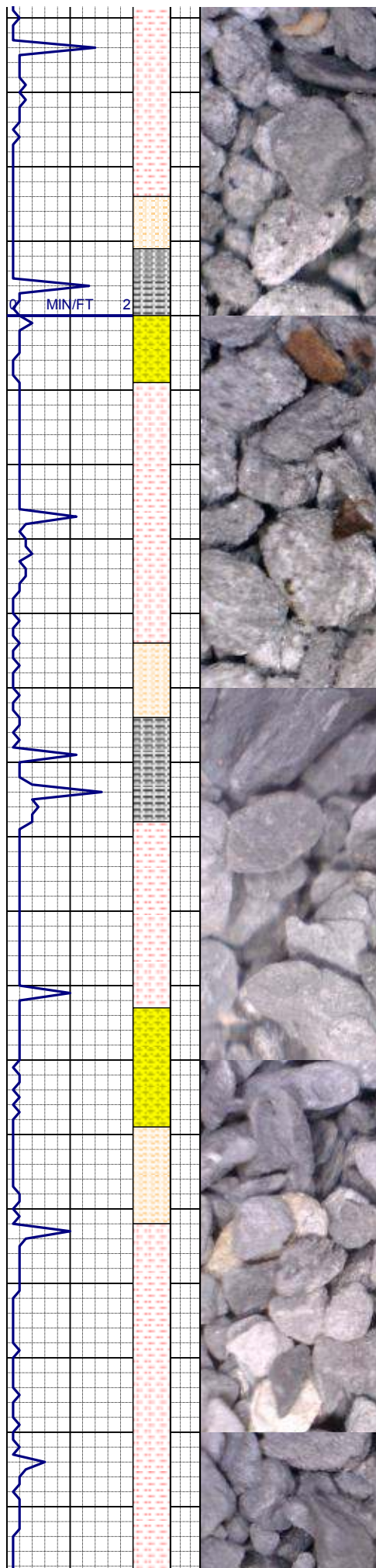
SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLY:SS: wh, s&p, gy, vf-f gr, fri,  
cly cmt, mtx, brit, sl calc:  
SLTY:SH: lt gy - dk gy, sft-hd, gd  
sly - aren, hom, brit, sbply -  
sbrd

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLY:SS: wh, s&p, gy, vf-f gr, fri,  
cly cmt, mtx, brit, sl calc:  
SLTY:SH: lt gy - dk gy, sft-hd, gd  
sly - aren, hom, brit, sbply -  
sbrd

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit; SHLY:SS:  
wh, s&p, gy, vf-f gr, fri, cly cmt,  
mtx, brit, sl calc: SLTY:SH: lt gy -  
dk gy, sft-hd, gd sly - aren, hom,  
brit, sbply - sbrd

SURVEY  
MD 2963'  
INC 0.3°





IN WT 8.4+ VIS 31  
OUT WT 8.4+ VIS 30

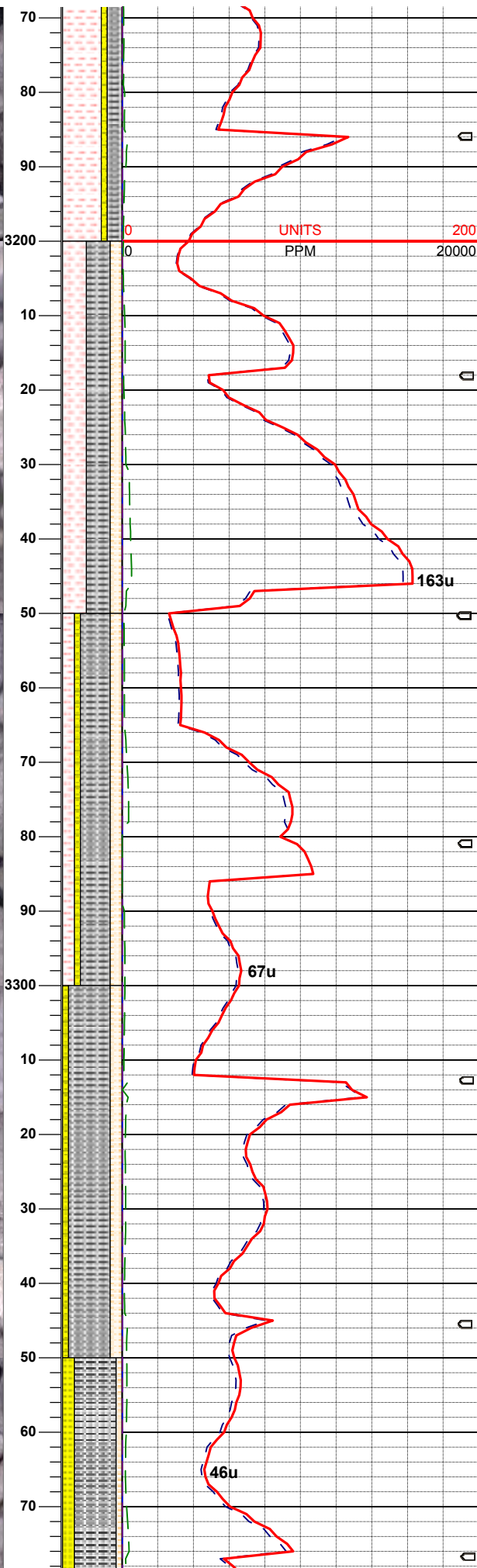
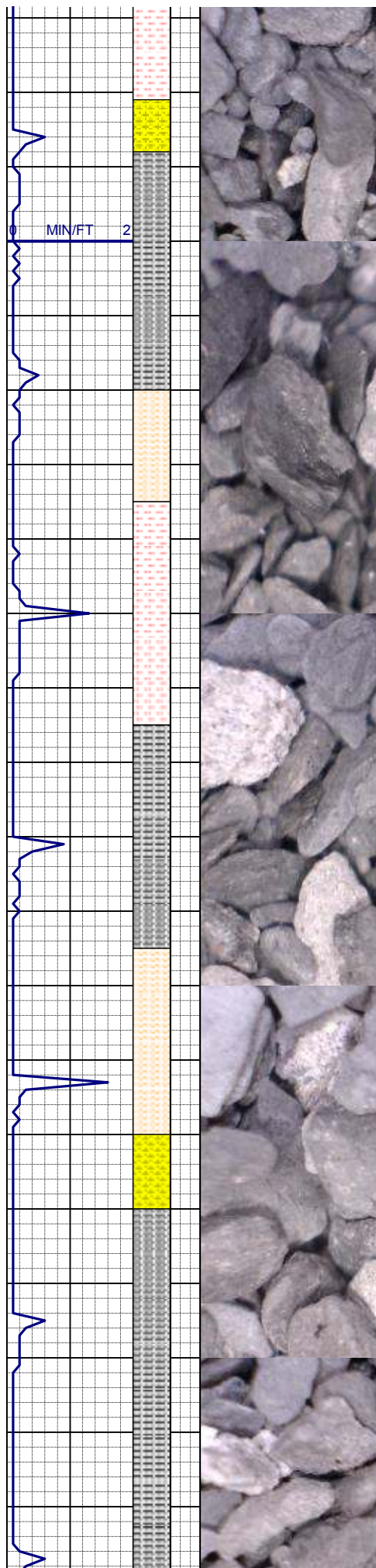
SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit; SHLY:SS:  
wh, s&p, gy, vf-f gr, fri, cly cmt,  
mtx, brit, sl calc: SLTY:SH: lt gy -  
dk gy, sft-hd, gd slty - aren, hom,  
brit, sbply - sbrd

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLY:SS: wh, s&p, gy, vf-f gr, fri,  
cly cmt, mtx, brit, sl calc:  
SLTY:SH: lt gy - dk gy, sft-hd, gd  
slty - aren, hom, brit, sbply -  
sbrd

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit; SHLY:SS:  
wh, s&p, gy, vf-f gr, fri, cly cmt,  
mtx, brit, sl calc: SLTY:SH: lt gy -  
dk gy, sft-hd, gd slty - aren, hom,  
brit, sbply - sbrd

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLY:SS: wh, s&p, gy, vf-f gr, fri,  
cly cmt, mtx, brit, sl calc:  
SLTY:SH: lt gy - dk gy, sft-hd, gd  
slty - aren, hom, brit, sbply -  
sbrd

SLTST: gy, rthy - wxy, sft, brit, sl  
calc, cly mtx, w srt c slt;  
SHLY:SS: wh, s&p, gy, vf-f gr, fri,  
cly cmt, mtx, brit, sl calc:



SHLY:SS: wh, s&p, gy, vf-f gr, fri, cly cmt, mtx, brit, sl calc: SLTY:SH: lt gy - dk gy, sft-hd, gd slty - aren, hom, brit, sbply - sbrd

IN WT 8.8 VIS 29  
OUT WT 8.6 VIS 31

SLTST: gy, rthy - wxy, sft, brit, sl calc, cly mtx, w srt c slt; SHLYSLTST: wh, s&p, gy, vf-f gr, fri, cly cmt, brit; grd to SLTY:SH: lt gy - dk gy, sft-hd, gd slty - aren, hom, brit, sbply - sbrd

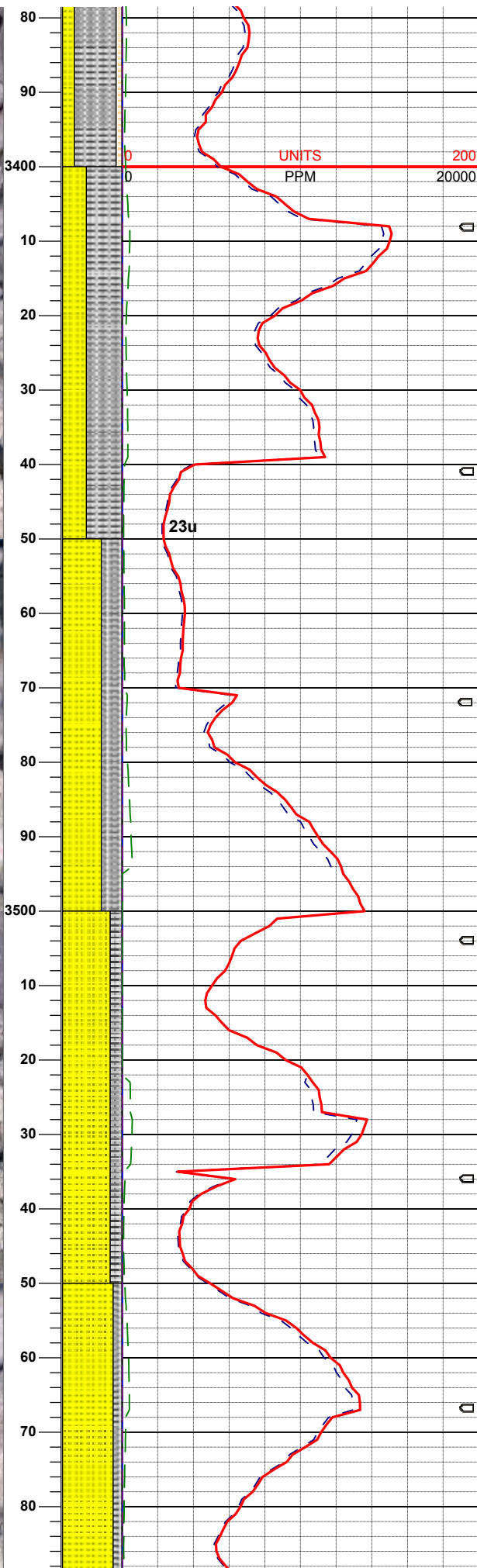
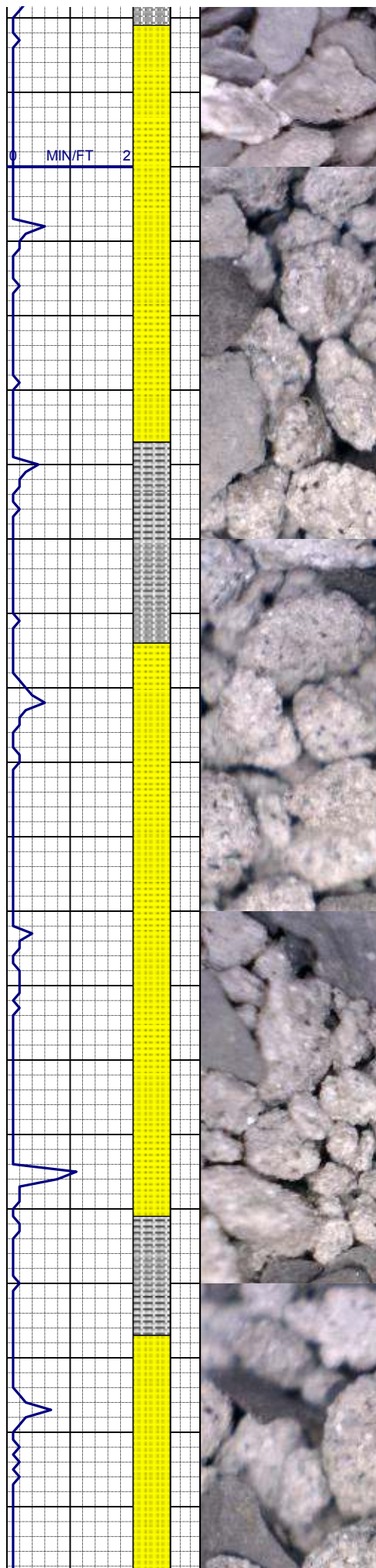
SLTST: gy, rthy - wxy, sft, brit, sl calc, cly mtx, w srt c slt; SHLYSLTST: wh, s&p, gy, vf-f gr, fri, cly cmt, brit; SHLY:SS: wh, s&p, gy, vf-f gr, fri, cly cmt, mtx, brit, sl calc: SLTY:SH: lt gy - dk gy, sft-hd, gd slty - aren, hom, brit, sbply - sbrd

SURVEY  
MD 3279'  
INC 0.3°  
AZM 133.2°

SLTY:SH: lt gy - dk gy, sft-hd, gd slty - aren, hom, brit, sbply - sbrd; SHLYSLTST: wh, s&p, gy, vf-f gr, fri, cly cmt, brit; SHLY:SS: wh, s&p, gy, vf-f gr, fri, cly cmt, mtx, brit, sl calc:

SS: clr, wh, trns, occ s&p, f -m gr, sbrnd - sbang, sme rnd, brit - fri, sme lse, sme tgt clus, m - w





srt, mtx: arg, sl calc, occ carb  
SLTY:SH: lt gy - dk gy, hd - sft,  
gd slty - aren, hom, brit, suply -  
sbrd SHLYSLTST: wh, s&p, gy,  
vf-f gr, fri, cly cmt, brits

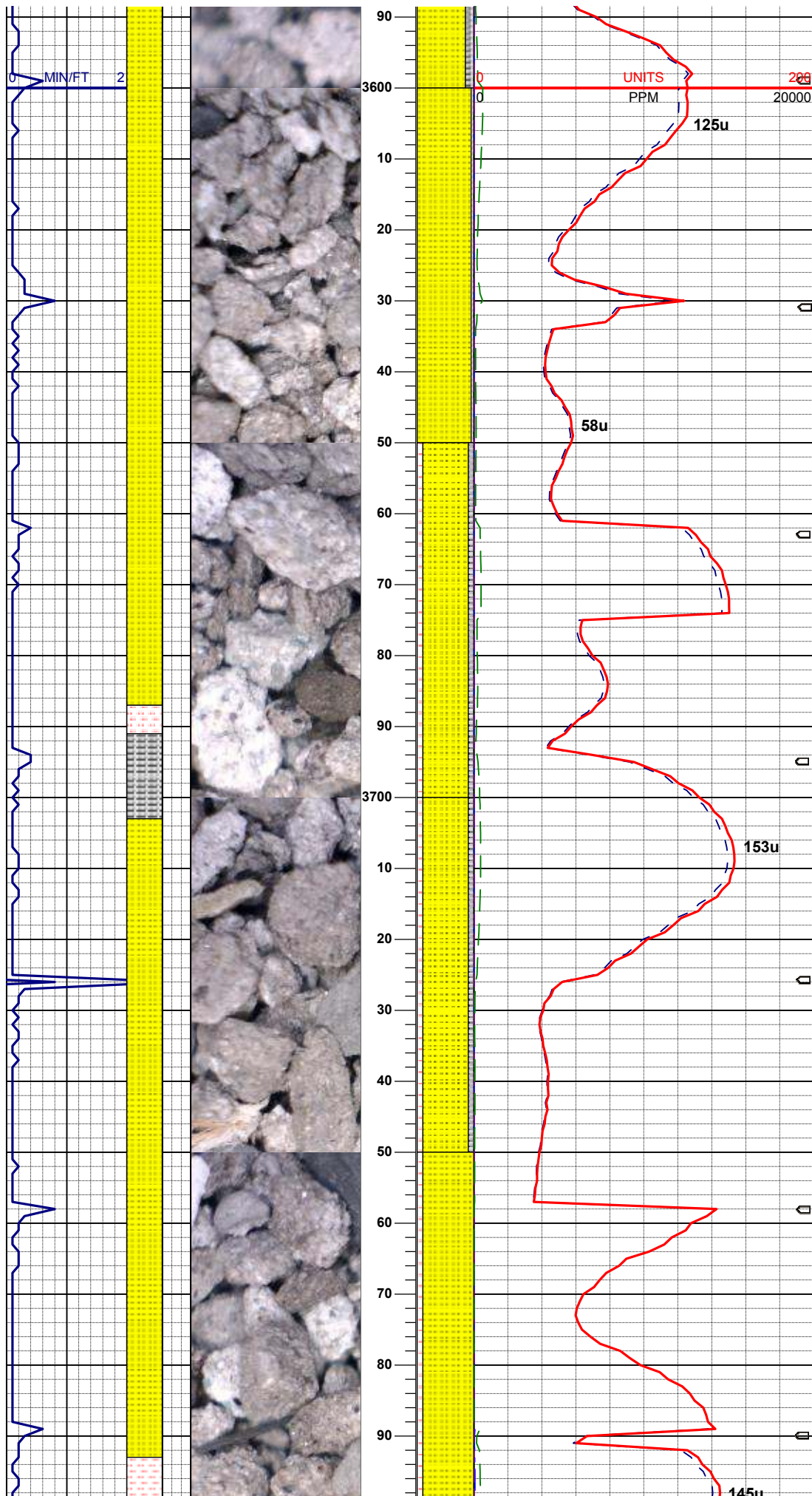
SS: clr, wh, trns, occ s&p, f -m  
gr, sbrnd - sbang, sme rnd, brit -  
fri, sme lse, sme tgt clus, m - w  
srt, mtx: arg, sl calc, occ carb  
SLTY:SH: lt gy - dk gy, hd - sft,  
gd slty - aren, hom, brit, suply -  
sbrd

SS: clr, wh, trns, occ s&p, f -m  
gr, sbrnd - sbang, sme rnd, brit -  
fri, sme lse, sme tgt clus, m - w  
srt, mtx: arg, sl calc, occ carb  
SLTY:SH: lt gy - dk gy, hd - sft,  
gd slty - aren, hom, brit, suply -  
sbrd

**SURVEY**  
**MD 3501'**  
**INC 1.5°**  
**AZM 131.2°**

SS: clr, wh, trns, occ s&p, f -m  
gr, sbrnd - sbang, sme rnd, brit -  
fri, sme lse, sme tgt clus, m - w  
srt, mtx: arg, sl calc, occ carb  
SLTY:SH: lt gy - dk gy, hd - sft,  
gd slty - aren, hom, brit, suply -  
sbrd

SS: clr, wh, trns, occ s&p, f -m  
gr, sbrnd - sbang, sme rnd, brit -  
fri, sme lse, sme tgt clus, m - w  
srt, mtx: arg, sl calc, occ carb  
SLTY:SH: lt gy - dk gy, hd - sft,  
gd slty - aren, hom, brit, suply -  
sbrd



IN WT 8.7 VIS 32  
OUT WT 8.8 VIS 32

SS: clr, wh, trns, occ s&p, f -m gr, sbrnd - sbang, sme rnd, brit - fri, sme lse, sme tgt clus, m - w srt, mtx: arg, sl calc, tr glauc  
SLTY:SH: lt gy - dk gy, hd - sft, gd slty - aren, hom, brit, suply - sbrd

SS: gy-dk gy, clr, wh, trns, occ s&p, f -m gr, sbrnd - sbang, sme rnd, brit - fri, sme lse, sme tgt clus, m - w srt, mtx: arg, sl calc  
SLTY:SH: lt gy - dk gy, hd - sft, gd slty - aren, hom, brit, suply - sbrd; SLTST: gy, rthy - wxy, sft, brit, sl calc, cly mtx, w srt c slt;

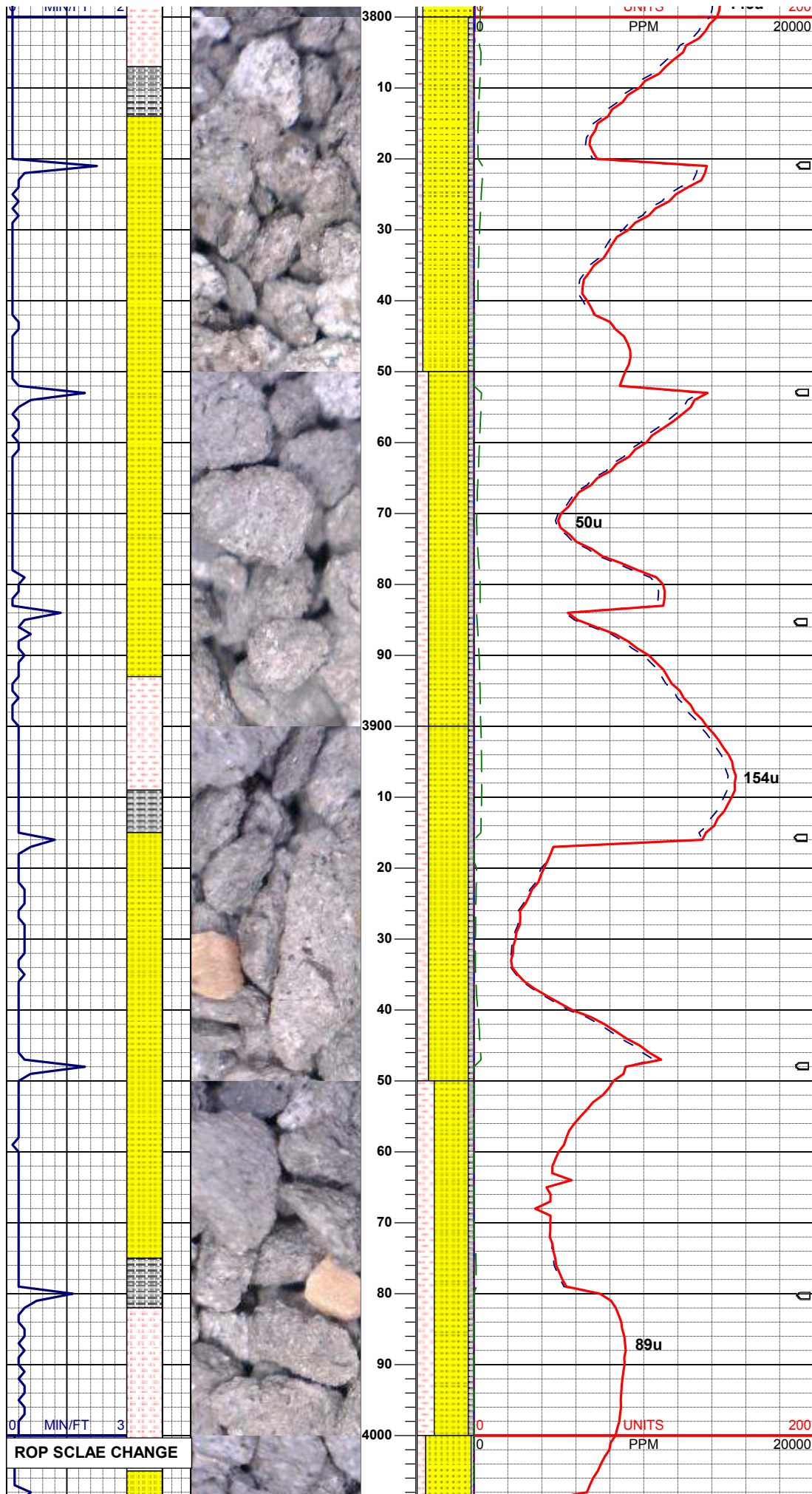
SS: gy-dk gy, clr, wh, trns, occ s&p, f -m gr, sbrnd - sbang, sme rnd, brit - fri, sme lse, sme tgt clus, m - w srt, mtx: arg, sl calc  
SLTY:SH: lt gy - dk gy, hd - sft, gd slty - aren, hom, brit, suply - sbrd; SLTST: gy, rthy - wxy, sft, brit, sl calc, cly mtx, w srt c slt;

IN WT 8.7 VIS 38  
OUT WT 8.9 VIS 32

SS: gy-dk gy, clr, s&p, sme gn, f -m gr, sbrnd - sbang, sme rnd, brit - fri, sme lse, sme tgt clus, w srt, mtx: arg, sl calc; SLTST:lt gy-gy, clr, s&p, vf-f gr, rthy - wxy, sft, brit, sl calc, cly mtx, w srt

SURVEY  
MD 3787'  
INC 2.2°  
AZM 148.2°





SS: gy-dk gy, clr, s&p, sme gn, f  
-m gr, sbrnd - sbang, sme rnd,  
brit - fri, sme lse, sme tgt clus, w  
srt, mtx: arg, sl calc SLTY:SH: lt  
gy - dk gy, hd - sft, gd slty - aren,  
hom, brit, suplty - sbrd; SLTST:lt  
gy- gy, clr, s&p, vf-f gr, rthy -  
wxy, sft, brit, sl calc, cly mtx, w  
srt

SS: gy-dk gy, clr, s&p, sme gn, f  
-m gr, sbrnd - sbang, sme rnd,  
brit - fri, sme lse, sme tgt clus, w  
srt, mtx: arg, sl calc SLTY:SH: lt  
gy - dk gy, hd - sft, gd slty - aren,  
hom, brit, suplty - sbrd; SLTST:lt  
gy- gy, clr, s&p, vf-f gr, rthy -  
wxy, sft, brit, sl calc, cly mtx, w  
srt

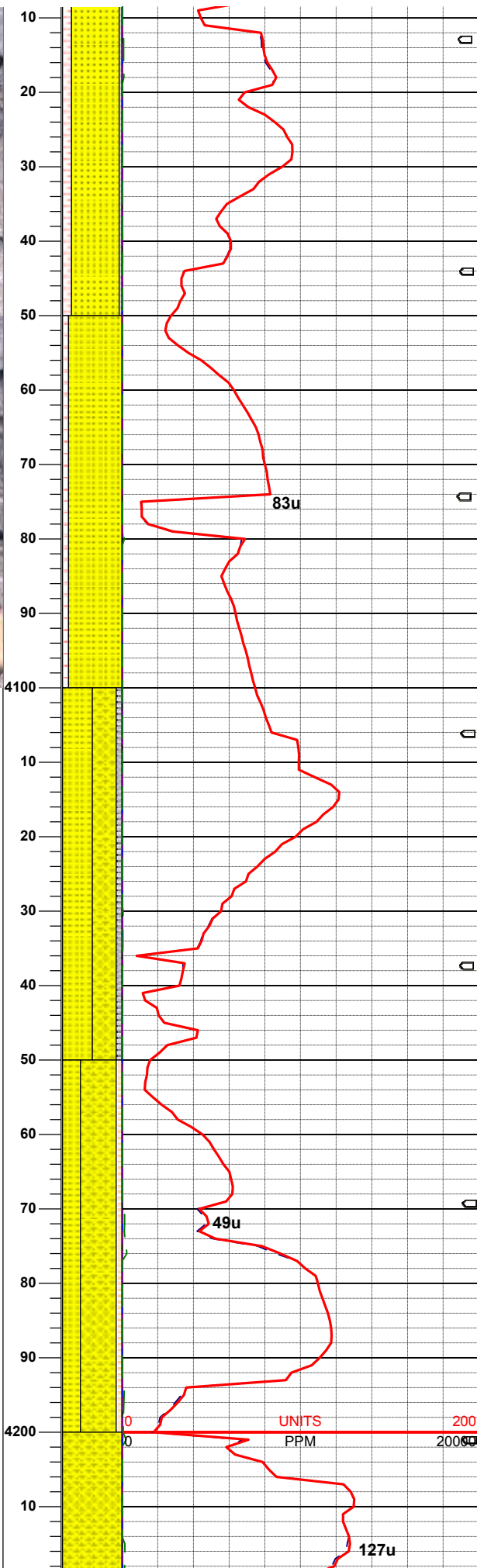
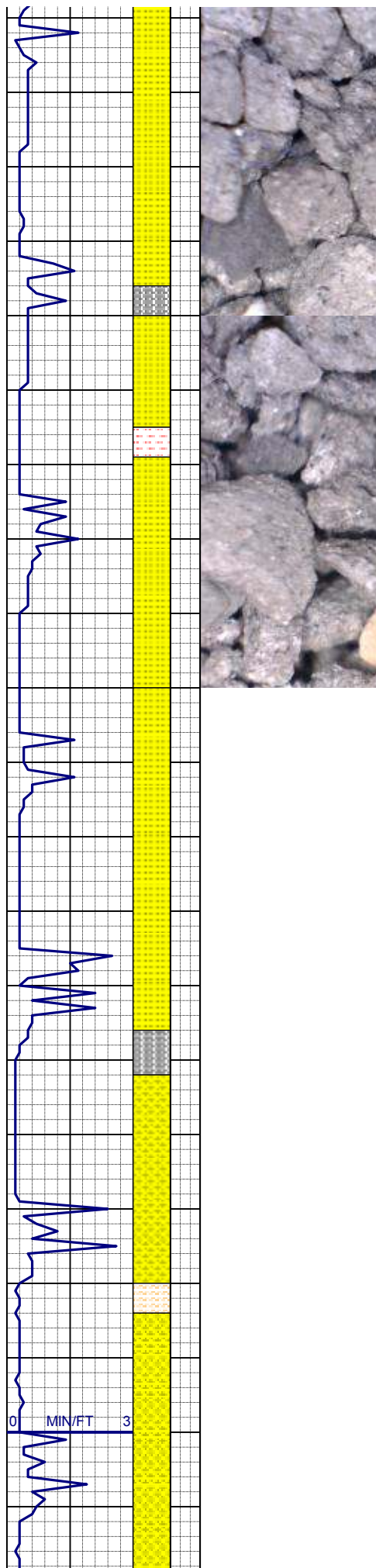
IN WT 8.7 VIS 31  
OUT WT 8.9 VIS 31

SS: gy-dk gy, clr, s&p, sme gn, f  
-m gr, sbrnd - sbang, sme rnd,  
brit - fri, sme lse, sme tgt clus, w  
srt, mtx: arg, sl calc SLTY:SH: lt  
gy - dk gy, hd - sft, gd slty - aren,  
hom, brit, suplty - sbrd; SLTST:lt  
gy- gy, clr, s&p, vf-f gr, rthy -  
wxy, sft, brit, sl calc, cly mtx, w  
srt

SS: gy-dk gy, clr, wh, trnsl, occ  
s&p, sme gn, f -m gr, sbrnd -  
sbang, sme rnd, brit - fri, sme  
lse, sme tgt clus, m - w srt, mtx:  
arg, sl calc SLTY:SH: lt gy - dk  
gy, hd - sft, gd slty - aren, hom,  
brit, suplty - sbrd; SLTST: gy,  
rthy - wxy, sft, brit, sl calc, cly  
mtx, w srt

SURVEY  
MD 3979'  
INC 2.9°  
AZM 151.2°

IN WT 8.7 VIS 35  
OUT WT 8.9 VIS 32



SS: gy-dk gy, clr, wh, trnsl, occ s&p, sme gn, f -m gr, sbrnd - sbang, sme rnd, brit - fri, sme lse, sme tgt clus, m - w srt, mtx: arg, sl calc SLTY:SH: lt gy - dk gy, hd - sft, gd slty - aren, hom, brit, suplty - sbrd; SLTST: gy, rthy - wxy, sft, brit, sl calc, cly mtx, w srt

SS: lt gy-dk gy, clr, wh, occ s&p, sme gn, f -m gr, sbrnd - sbang, sme rnd, brit - fri, sme lse, sme tgt clus, m - w srt, mtx: arg, sl calc; SLTST: gy, rthy - wxy, sft, brit, sl calc, cly mtx, w srt

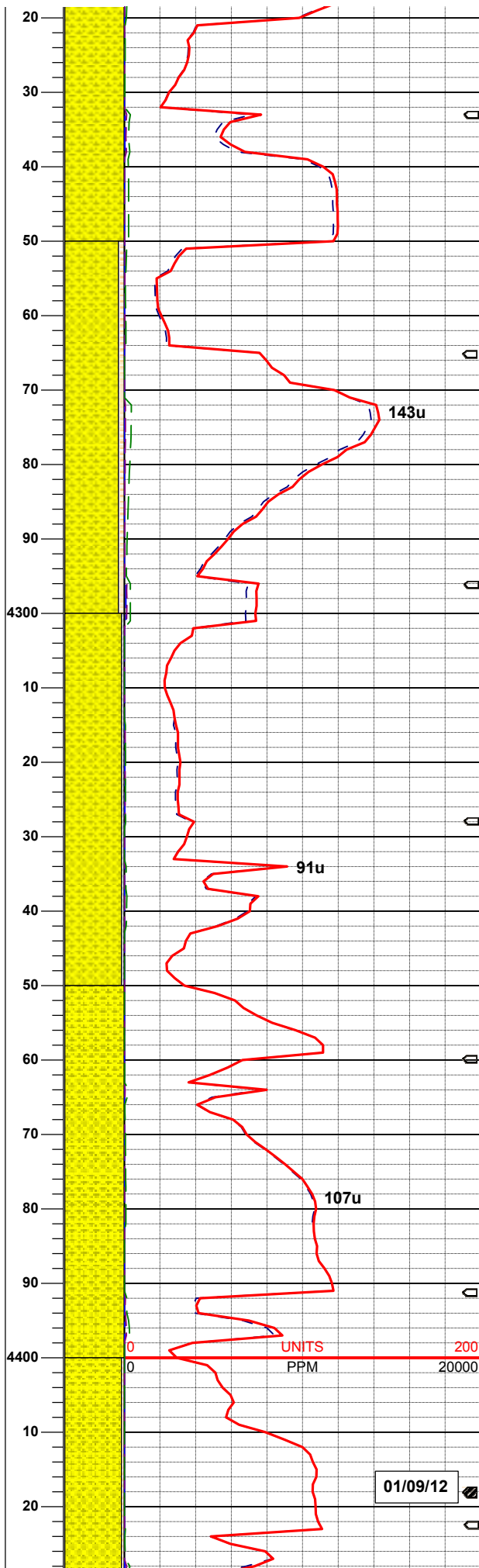
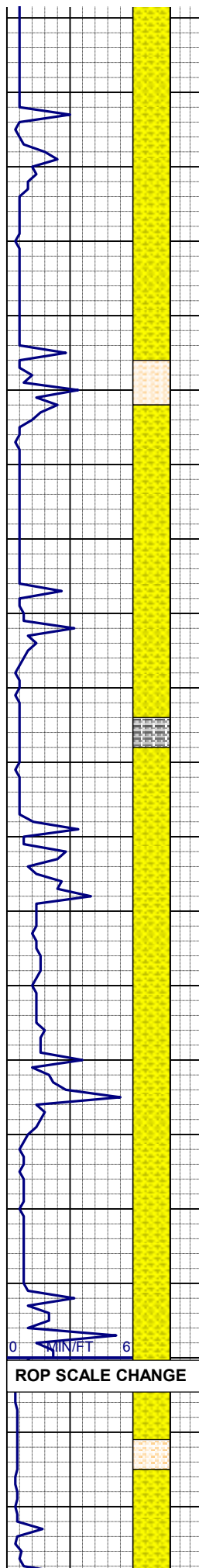
SHLY:SS: lt gy- gy, wh, s&p, vf-f gr, fri, cly cmt, brit, sl calc; SLTY:SH: lt gy - dk gy, sft-hd, gd slty - aren, hom, brit, sbply - sbrd

**SURVEY**  
**MD 4137'**  
**INC 2.7°**  
**AZM 158°**

**VISIBLE OIL**

SHLY:SS: wh, s&p, gy, vf-f gr, fri, cly cmt, brit, v sl calc; SLTY:SH: lt gy - dk gy, sft-hd, gd slty - aren, hom, brit, sbply - sbrd; SHLYSLTST: wh, s&p, gy, vf-f gr, fri, cly cmt, brit

**IN WT 8.3 VIS 28**  
**OUT WT 8.3 VIS 28**



SHLY:SS: lt gy- gy, wh, s&p, , vf-  
f gr, fri, cly cmt, brit, v sl calc

SHLY:SS: lt gy- gy, wh, s&p, , vf-  
f gr, fri, cly cmt, brit, v sl calc;  
SHLYSLTST: wh, s&p, gy, vf-f  
gr, fri, cly cmt, brit

SHLY:SS: wh, s&p, gy, vf-f gr, fri,  
cly cmt, mtz, brit, v sl calc;  
SLTY:SH: lt gy - dk gy, sft-hd, gd  
silty - aren, hom, brit, sbply -  
sbrd

**SURVEY**  
**MD 4328'**  
**INC 3.1°**  
**AZM 152°**  
**TVD 4296**

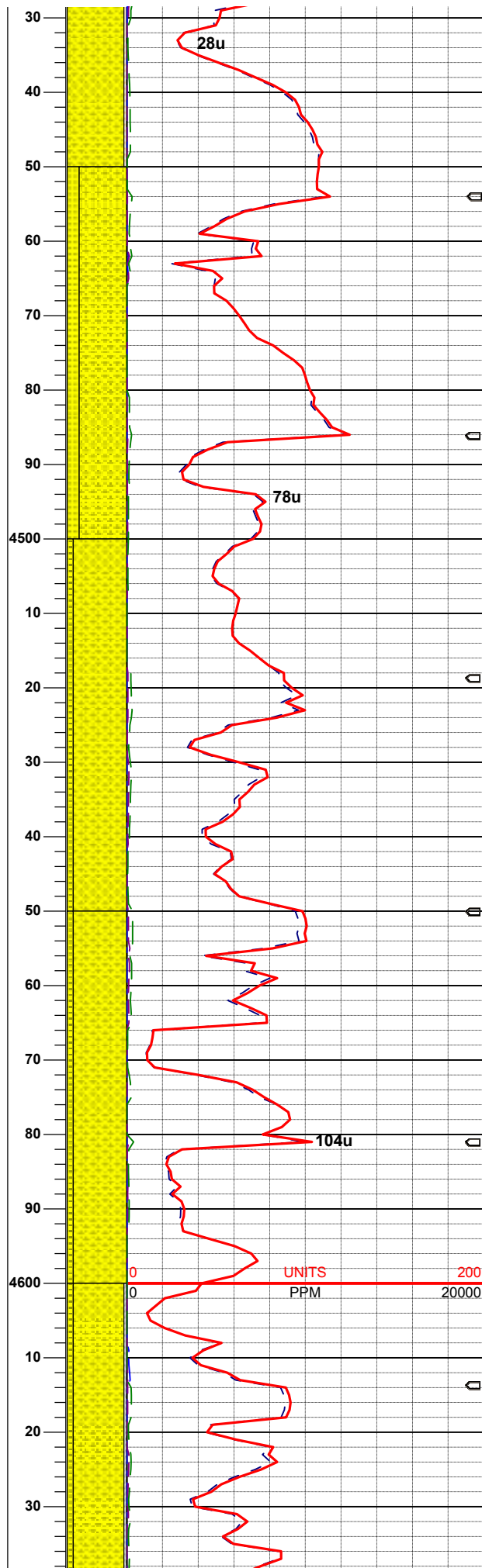
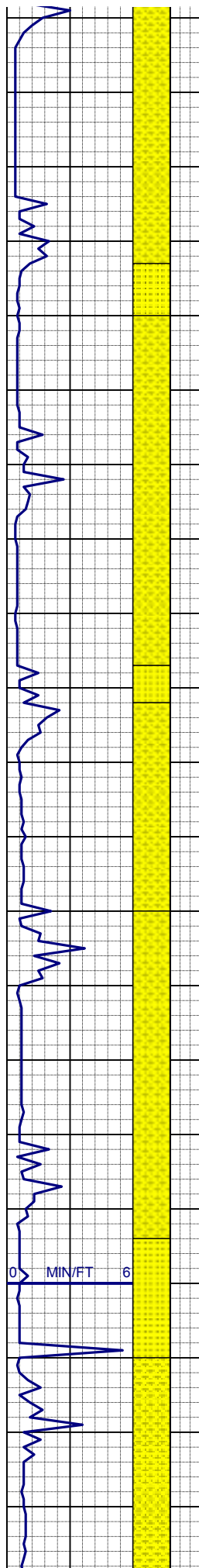
SHLY:SS: lt gy- gy, wh, s&p, , vf-  
f gr, fri, cly cmt, brit,w srt, v sl  
calc

**IN WT 8.4 VIS 29**  
**OUT WT 8.4 VIS 29**

**01/09/12**

SHLY:SS: lt gy- gy, wh, s&p, , vf-  
f gr, fri, cly cmt, brit,w srt, v sl  
calc; SHLYSLTST: wh, s&p, gy,  
vf-f gr, fri, cly cmt, brit





vi-i gr, m, cly cmt, brit

**VISIBLE OIL**

**IN WT 8.5 VIS 28  
OUT WT 8.6 VIS 28**

SHLY:SS: lt gy- gy, wh, s&p, , vf-  
f gr, fri, cly cmt, brit,w srt, v sl  
calc; SS: clr, gy, wh, s&p, f -m gr,  
sbrnd - sbang, sme rnd, brit - fri,  
lse- tgt clus, m - w srt, mtx: arg,  
sl calc

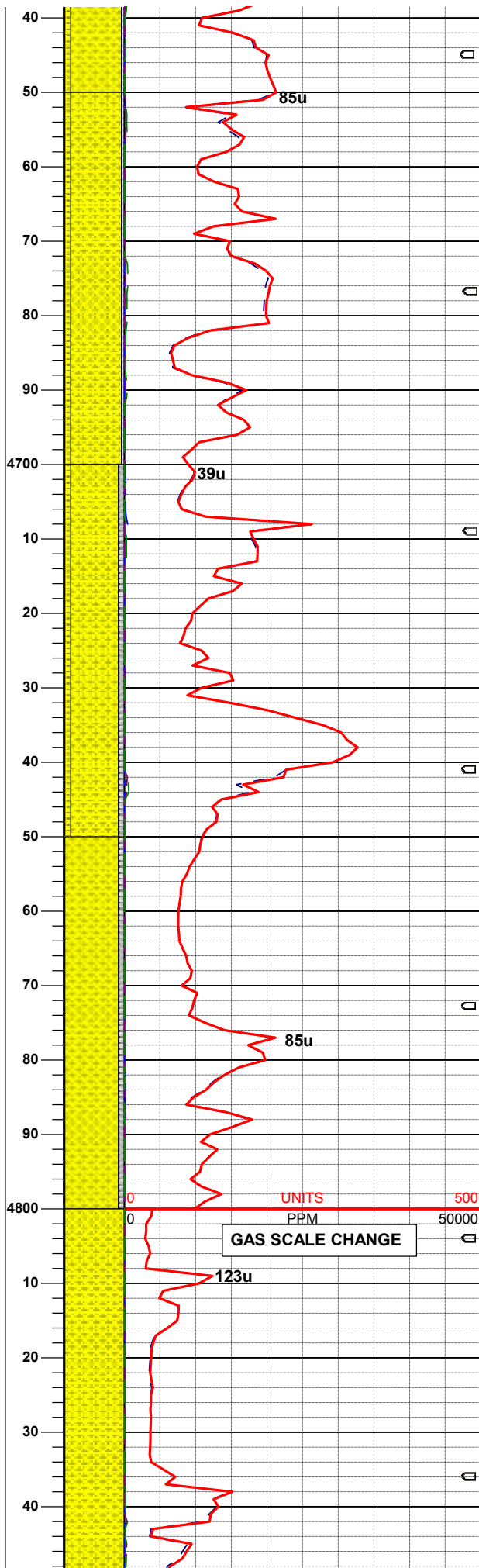
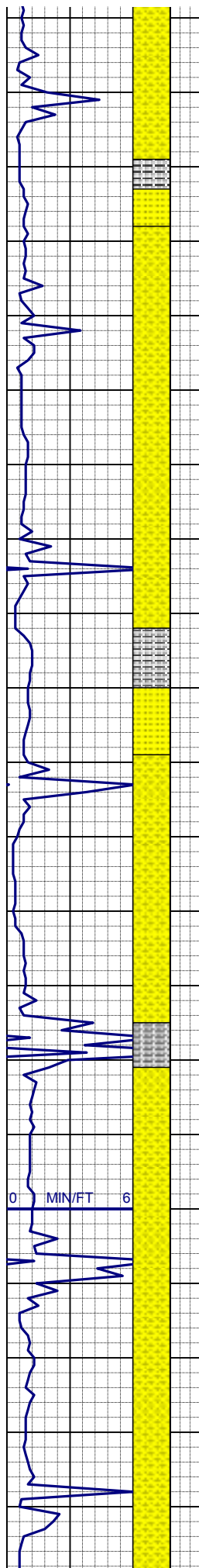
**SURVEY  
MD 4517'  
INC 3.2°  
AZM 147°  
TVD 4485'**

SHLY:SS: lt gy- gy, wh, s&p, , vf-  
f gr, fri, cly cmt, w srt, brit, v sl  
calc; SS: clr, gy, wh, s&p, f -m gr,  
sbrnd - sbang, sme rnd, brit - fri,  
lse- tgt clus, m - w srt, mtx: arg,  
sl calc

**IN WT 8.6 VIS 28  
OUT WT 8.6 VIS 28**

SHLY:SS: lt gy- gy, wh, s&p, , vf-  
f gr, fri, cly cmt, w srt, brit, v sl  
calc; SS: clr, gy, wh, s&p, f -m gr,  
sbrnd - sbang, sme rnd, brit - fri,  
lse- tgt clus, m - w srt, mtx: arg,  
sl calc

SHLY:SS: lt gy- gy, wh, s&p, , vf-  
f gr, fri, cly cmt, w srt, brit, v sl  
calc; SS: clr, gy, wh, s&p, f -m gr,  
sbrnd - sbang, sme rnd, brit - fri,  
lse- tgt clus, m - w srt, mtx: arg,  
sl calc



IN WT 8.6 VIS 30  
OUT WT 8.6 VIS 28+

SHLY:SS: lt gy- gy, wh, s&p, , vf-  
f gr, fri, cly cmt, w srt, brit, v sl  
calc; SS: clr, gy, wh, s&p, f -m gr,  
sbrnd - sbang, sme rnd, brit - fri,  
lse- tgt clus, m - w srt, mt: arg,  
sl calc; SLTY:SH: lt gy - dkgy, hd  
- sft, hom, brit, suply - sbbiky,  
sly - aren

SURVEY  
MD 4708'  
INC 3.0°  
AZM 153°  
TVD 4676'

SHLY:SS: lt gy- gy, wh, s&p, , vf-  
f gr, fri, cly cmt, w srt, brit, v sl  
calc; SS: clr, gy, wh, s&p, f -m gr,  
sbrnd - sbang, sme rnd, brit - fri,  
lse- tgt clus, m - w srt, mt: arg,  
sl calc; SLTY:SH: lt gy - dk gy,  
hd - sft, gd sly - aren, hom, brit,  
suply - sbbiky

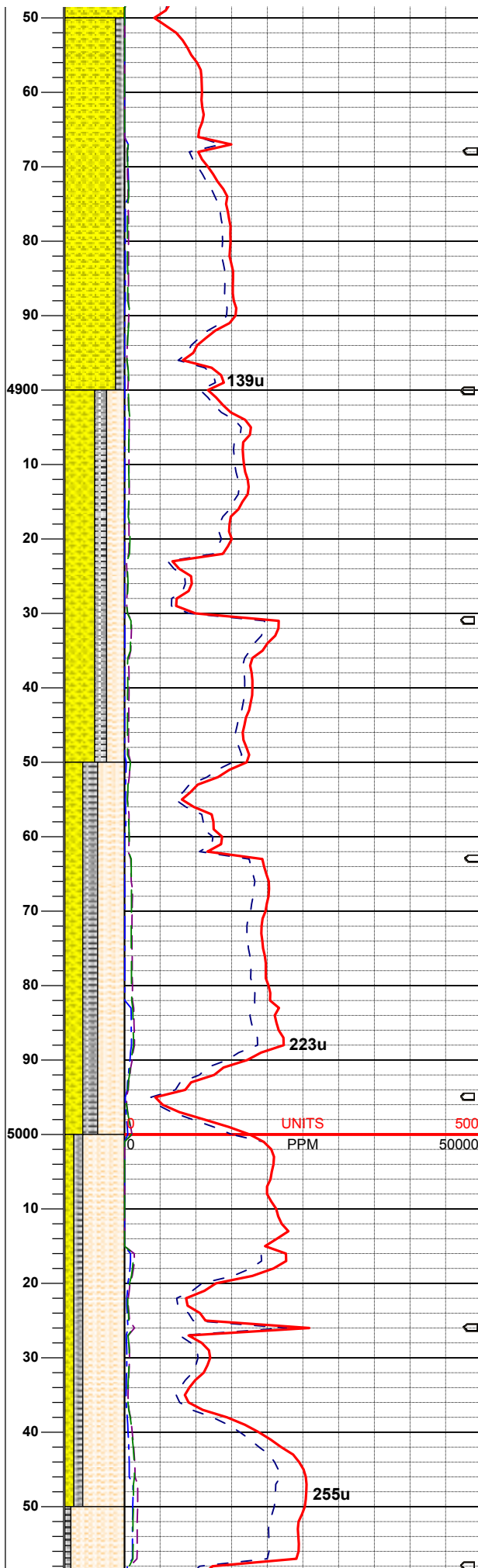
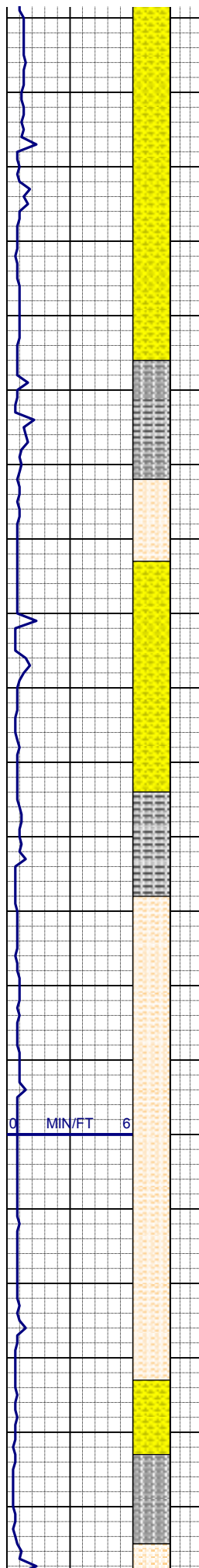
IN WT 8.6 VIS 27  
OUT WT 8.6 VIS 28

SHLY:SS: lt gy- gy, wh, s&p, , vf-  
f gr, fri, brit, w srt, v sl calc, cly  
cmt; SLTY:SH: lt gy - dk gy, hd -  
sft, gd sly - aren, hom, brit,  
suply - sbbiky

UNITS 0 500  
PPM 0 50000  
GAS SCALE CHANGE

SHLY:SS: lt gy- gy, wh, s&p, , vf-  
f gr, fri, brit, w srt, v sl calc, cly  
cmt

IN WT 8.5 VIS 27  
OUT WT 8.6 VIS 27



**SURVEY  
MD 4832'  
INC 2.6°  
AZM 156.2°**

SHLY:SS: lt gy- gy, wh, s&p, vf-f  
gr, sft, fri, , w srt, v sl calc, cly  
cmt; SLTY:SH: lt gy - gy, m sft -  
sft, slty - aren, brit, suply -  
sbbiky

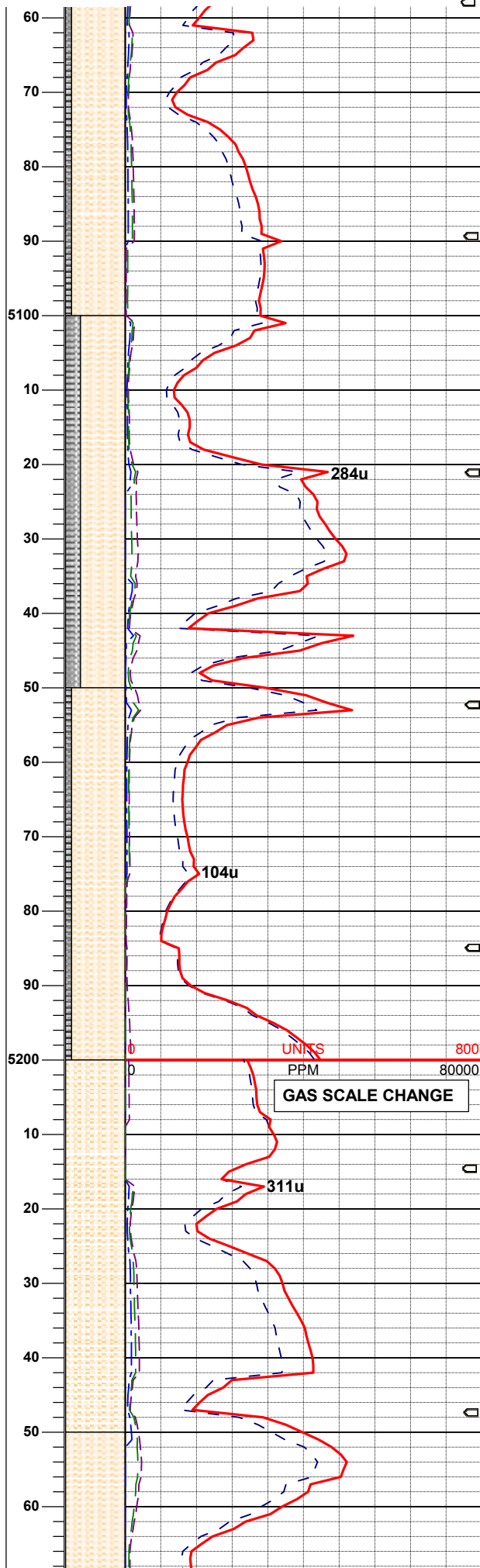
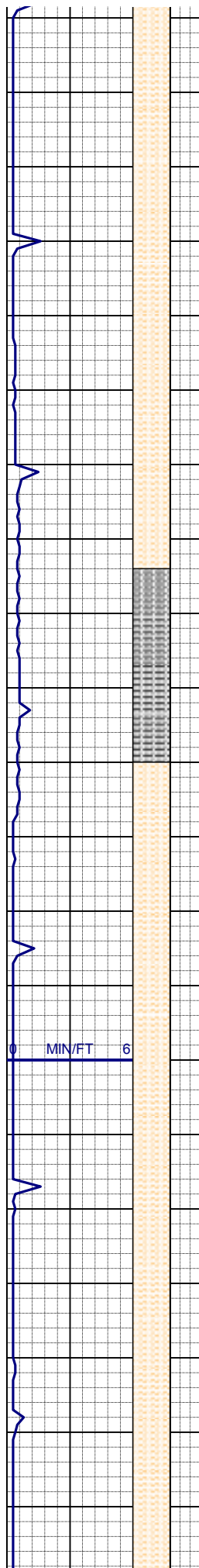
SHLY:SS: lt gy- gy, wh, s&p, , vf-  
f gr, fri, sft, w srt, v sl calc, cly  
cmt; SHLYSLTST: lt gy- gy,  
s&p, vf-f gr, fri, w srt, cly cmt,  
brit; grdg to SLTY:SH: lt gy - gy,  
hd - sft, slty - aren, brit, suply -  
sbbiky

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt.; grdg to  
SLTY:SH: lt gy - gy, m sft - sft,  
fri, slty - aren, suply - sbbiky;  
SHLY:SS: clr, s&p, gy, wh, f-m  
gr, fri, sft, w srt, v sl calc, cly cmt

**SURVEY  
MD 4990'  
INC 2.1°  
AZM 155.2°**

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt.; grdg to  
SLTY:SH: lt gy - gy, m sft - sft,  
fri, slty - aren, suply - sbbiky;  
SHLY:SS: clr, s&p, gy, wh, f-m  
gr, fri, sft, w srt, v sl calc, cly cmt

**IN WT 8.5 VIS 27  
OUT WT 8.6 VIS 28**



SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt.; grdg to  
SLTY:SH: lt gy - gy, m sft - sft,  
fri, slty - aren, suply - sbblky,  
sme bent; wh, bri

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt.; grdg to  
SLTY:SH: lt gy - gy, m sft - sft,  
fri, slty - aren, suply - sbblky,  
sme bent; wh, bri

IN WT 8.5 VIS 26  
OUT WT 8.7 VIS 29

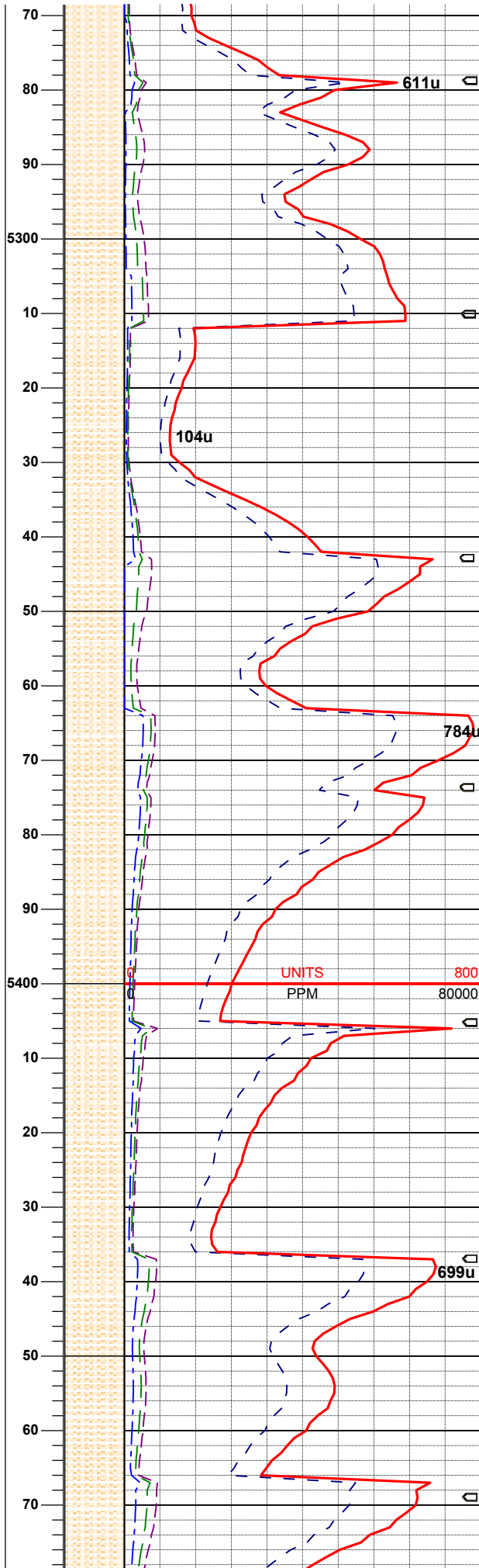
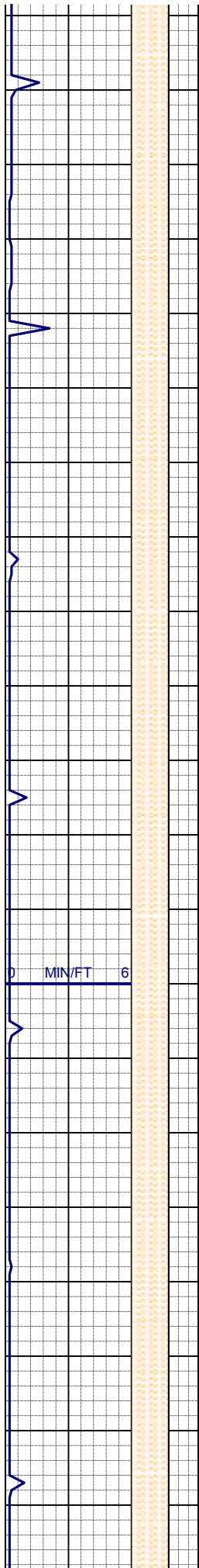
SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt.; grdg to  
SLTY:SH: lt gy - gy, m sft - sft,  
fri, slty - aren, suply - sbblky,  
sme bent; wh, bri

SURVEY  
MD 5181'  
INC 1.9°  
AZM 87.2°

UNITS  
PPM  
800  
80000  
GAS SCALE CHANGE

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt





SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt

611u

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt

104u

**SURVEY**  
**MD 5372'**  
**INC 1.6°**  
**AZM 174.2°**

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt

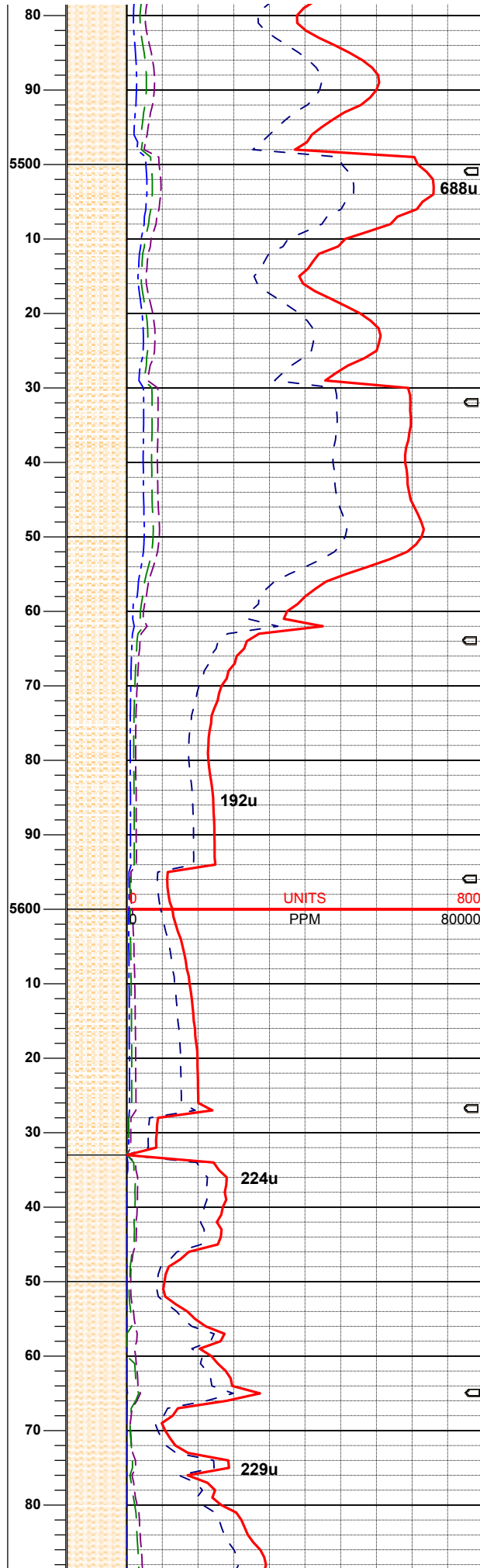
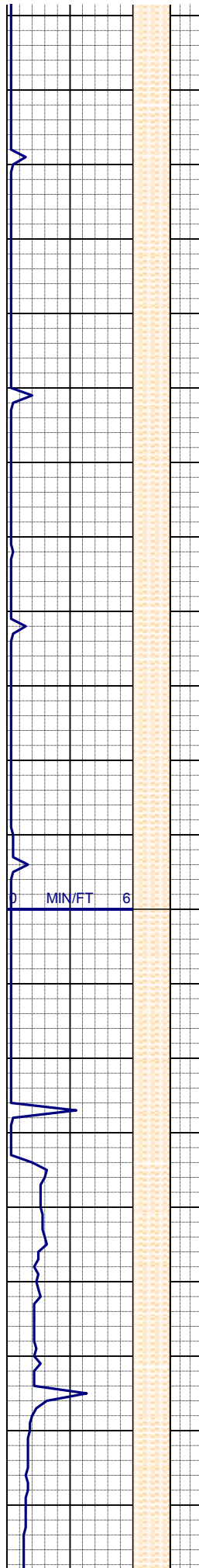
**IN WT 8.5 VIS 38**  
**OUT WT 8.7 VIS 31**

UNITS  
PPM

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt

699u

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt



SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt

**SURVEY**  
**MD 5599'**  
**INC 0.9°**  
**AZM 191.2°**

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt, tr bent

**SURVEY**  
**MD 5622'**  
**INC 1.5°**  
**AZM 176.2°**  
**TVD 5620.12'**

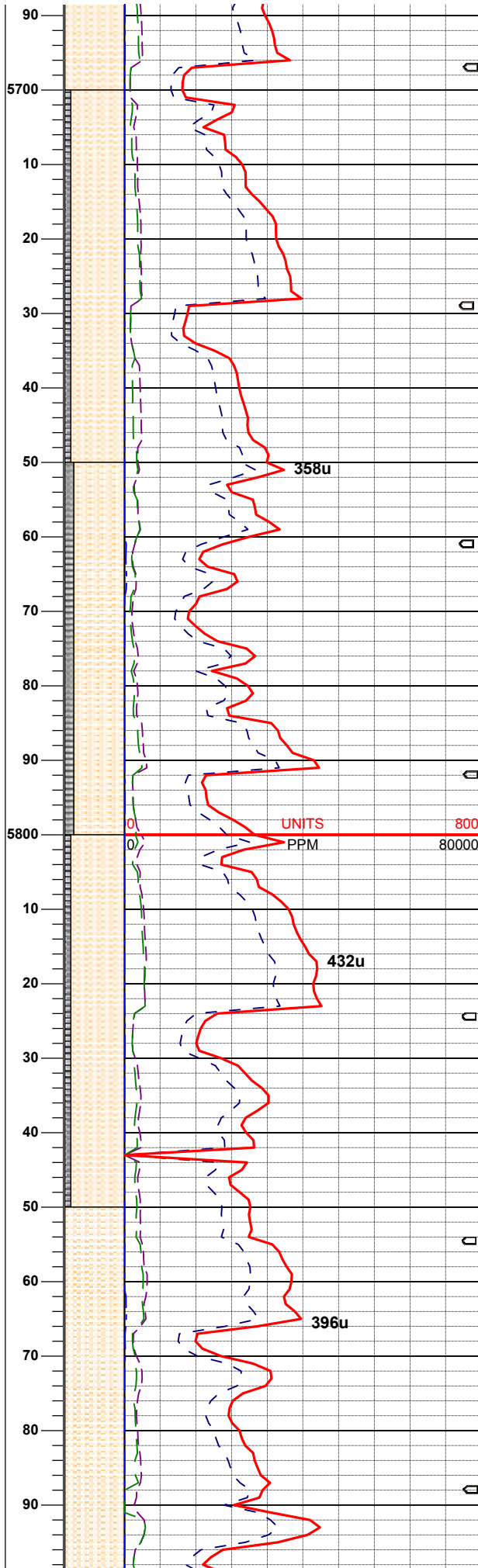
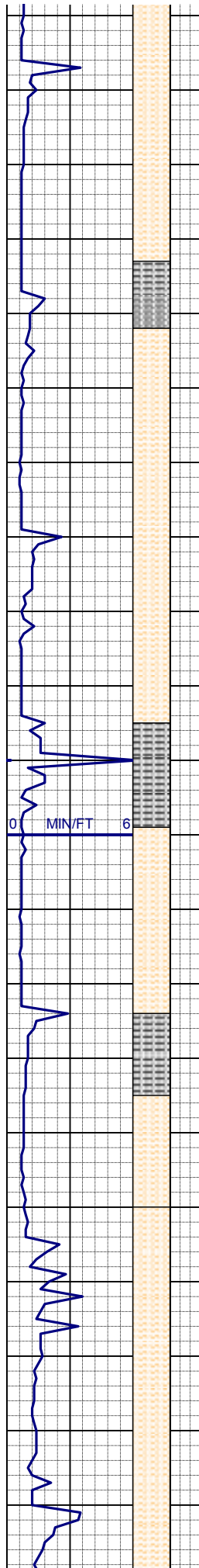
**KOP, TOO H @ 5633' MD**  
**FOR DIRECTIONAL TOOLS**  
**1900 HRS ON 1/09/12**

**RESUME DRILLING ON**  
**1/10/12 @ 0800 HRS**

**IN WT 8.8 VIS 39**  
**OUT WT 8.9+ VIS 35**

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt, tr bent  
grdg to sltysh

**SURVEY**  
**MD 5685'**  
**INC 6.9°**  
**AZM 172.3°**  
**TVD 5682.93'**



**SURVEY**  
**MD 5717'**  
**INC 9.9°**  
**AZM 180.1°**  
**TVD 5714.58'**

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt.; grdg to  
SLTY:SH: lt gy - gy, m sft - sft,  
fri, slty - aren, suply - sbbkly, tr  
bent

**SURVEY**  
**MD 5749'**  
**INC 12.9°**  
**AZM 184.7°**  
**TVD 5745.94'**

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt.; grdg to  
SLTY:SH: lt gy - gy, m sft - sft,  
fri, slty - aren, suply - sbbkly, tr  
bent

**IN WT 8.8 VIS 37**  
**OUT WT 8.8 VIS 36**

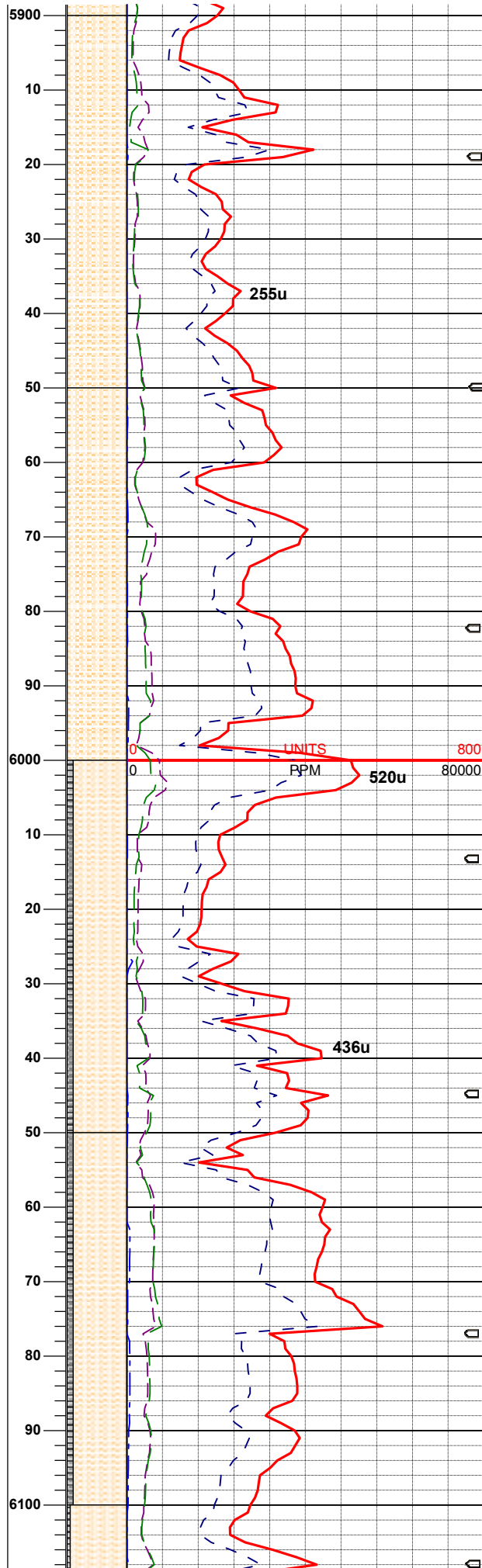
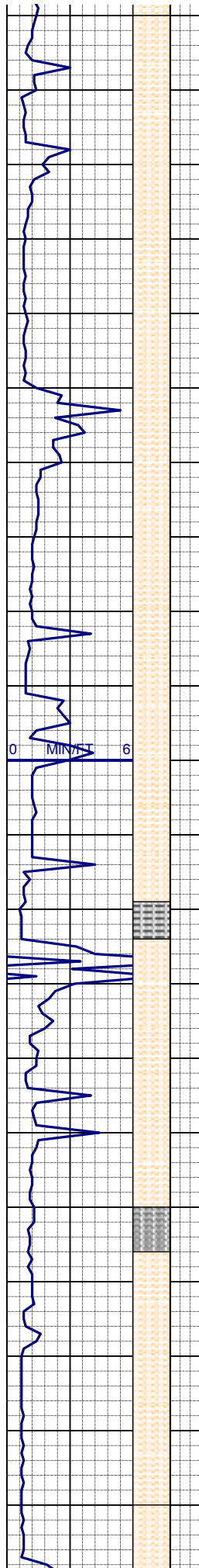
**SURVEY**  
**MD 5812'**  
**INC 17.5°**  
**AZM 184.4°**  
**TVD 5806.72'**

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt.; grdg to  
SLTY:SH: lt gy - gy, m sft - sft,  
fri, slty - aren, suply - sbbkly

**IN WT 8.9+ VIS 37**  
**OUT WT 8.9 VIS 37**

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt, sl calc





**SURVEY**  
**MD 5908'**  
**INC 25.2°**  
**AZM 180°**  
**TVD 5896'**

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt, sl calc

**IN WT 9.0+ VIS 37**  
**OUT WT 9.1 VIS 37**

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt, sl calc

**SURVEY**  
**MD 6002'**  
**INC 33.6°**  
**AZM 178°**  
**TVD 5978'**

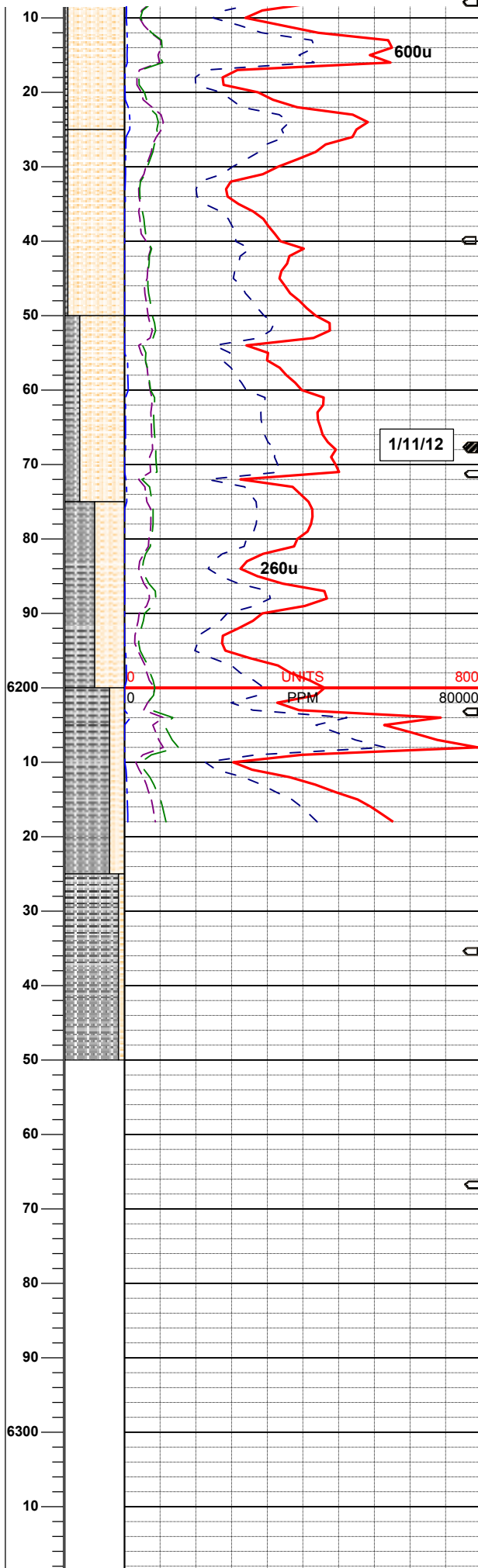
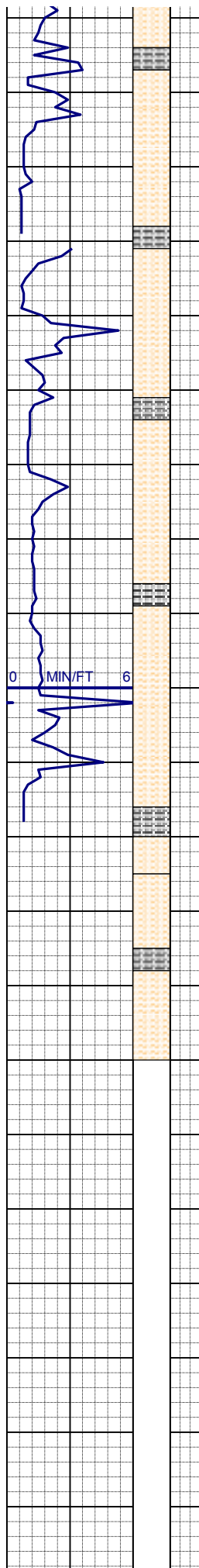
SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt, sl calc ;  
grdg to SLTY:SH: lt gy - gy, m sft  
- sft, fri, slty - aren, suply -  
sbbiky

**IN WT 9.0+ VIS 37**  
**OUT WT 9.0 VIS 37**

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt, sl calc ;  
grdg to SLTY:SH: lt gy - gy, m sft  
- sft, fri, slty - aren, suply -  
sbbiky, tr pyr

**SURVEY**  
**MD 6098'**  
**INC 40.8°**  
**AZM 180°**  
**TVD 6055'**

SHLYSLTST: lt gy- gy, s&p, vf-f



gr, sft, fri, w srt, cly cmt, sl calc ;  
grdg to SLTY:SH: lt gy - gy, m sft  
- sft, fri, slty - aren, suply -  
sbbiky

**IN WT 9.0+ VIS 39**  
**OUT WT 9.0 VIS 39**

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, cly cmt, sl calc ;  
grdg to SLTY:SH: lt gy - gy, m sft  
- sft, fri, slty - aren, suply -  
sbbiky

**SURVEY**  
**MD 6161'**  
**INC 45.2°**  
**AZM 176°**  
**TVD 6101'**

SHLYSLTST: lt gy- gy, s&p, vf-f  
gr, sft, fri, w srt, gri, cly cmt, sl  
calc ; grdg to SLTY:SH: lt gy -  
gy, m sft - sft, fri, slty - aren,  
suply - sbbiky

1/11/12

SLTY:SH: lt gy - gy, m sft - sft,  
fri, slty - aren, suply - sbbiky,  
mtx: arg; SHLYSLTST: lt gy- gy,  
s&p, vf-f gr, sft, fri, w srt, gri, cly  
cmt, sl calc, bent

**IN WT 9.0+ VIS 39**  
**OUT WT 9.0 VIS 39**

SLTY:SH: lt gy - gy, m sft - sft,  
fri, slty - aren, suply - sbbiky,  
mtx: arg; SHLYSLTST: lt gy- gy,  
s&p, vf-f gr, sft, fri, w srt, gri, cly  
cmt, sl calc, bent

**SURVEY**  
**MD 6225'**  
**INC 51.3°**  
**AZM 178°**  
**TVD 6143'**

SLTY:SH: lt gy - gy, m sft - hrd,  
fri, slty - aren, suply - sbbiky,  
mtx: arg; SHLYSLTST: lt gy- gy,  
s&p, vf-f gr, sft, fri, w srt, gri, cly  
cmt, sl calc, bent

**IN WT 9.0+ VIS 39**  
**OUT WT 9.0 VIS 39**

