



COMPANY University of Utah
WELL NAME 78B-32
FIELD FORGE UTAH
COUNTY Beaver
STATE Utah
WELL HEAD COORDINATES 38.500, -112.882
 Northing: 4263043 m
 Easting: 335450 m
ELEVATION 5536'
RIG START DATE 6/26/2021
TD DATE 7/29/2021
TOTAL DEPTH 9500'
TRUE VERTICAL DEPTH 9497.27'
TD LOCATION 33.1'S, 70.8'W of wellhead
DRILLING CONTRACTOR Frontier Drilling Rig #16
COMPANY REPRESENTATIVES V. Welch
 Brian Gresham

LOG INTERVAL
DATE LOGGED 6/27/21 TO 7/29/21
DEPTH LOGGED 140' TO 9500'
MUD DRILLING 140' TO 9500'
LOG SCALE 1:600
UNIT NO. C23
LOGGING GEOLOGISTS
 Brennan Williams-Mieding(bwm), Austin
 Mellema(am), Patrick Bradshaw(pb), Andrew
 Schepflin(as), Tim Dooley(td)

HOLE

24.5" TO 128'
 22" TO 422'
 14 3/4" TO 3009'
 10 5/8" TO 8545'
 5 3/4" TO 9500'

CASING

23.5" FROM 0' TO 128'
 16" FROM 0' TO 421'
 11.75" FROM 0' TO 2989'
 7" FROM 0' TO 8508

ABBREVIATIONS

NB New Bit **BHT** Bottom Hole Temp
RRB Re-run Bit **c** Carbide Test
CB Core Bit **NR** No Returns
WOB Weight on Bit **LAT** Logged After Trip
SPM Strokes per Minute **CFM** Cubic Feet per Min
PP Pump Pressure **BUT** Bottoms Up Temp
RPM Revolutions per Min

SYMBOLS

Wireline Log Casing Shoe
 Steam/Water Entry Flow Test
 Deviation Survey Cored Interval No Recovery

REMARKS

All depths from rotary table = 30.5'

LITHOLOGY

	Clay		Diorite
	Silt		Syenite
	Sand		Quartz Monzonite
	Gravel		Quartz Latite
	Alluvium		Quartzite
	Basalt		Gneiss
	Rhyolite		Felsic Dike
	Tuff		Altered Zone
	Granite		
	Granodiorite		

DRILL BREAKS

3226'
 4294'
 4711'
 5609'
 5859'
 5950'

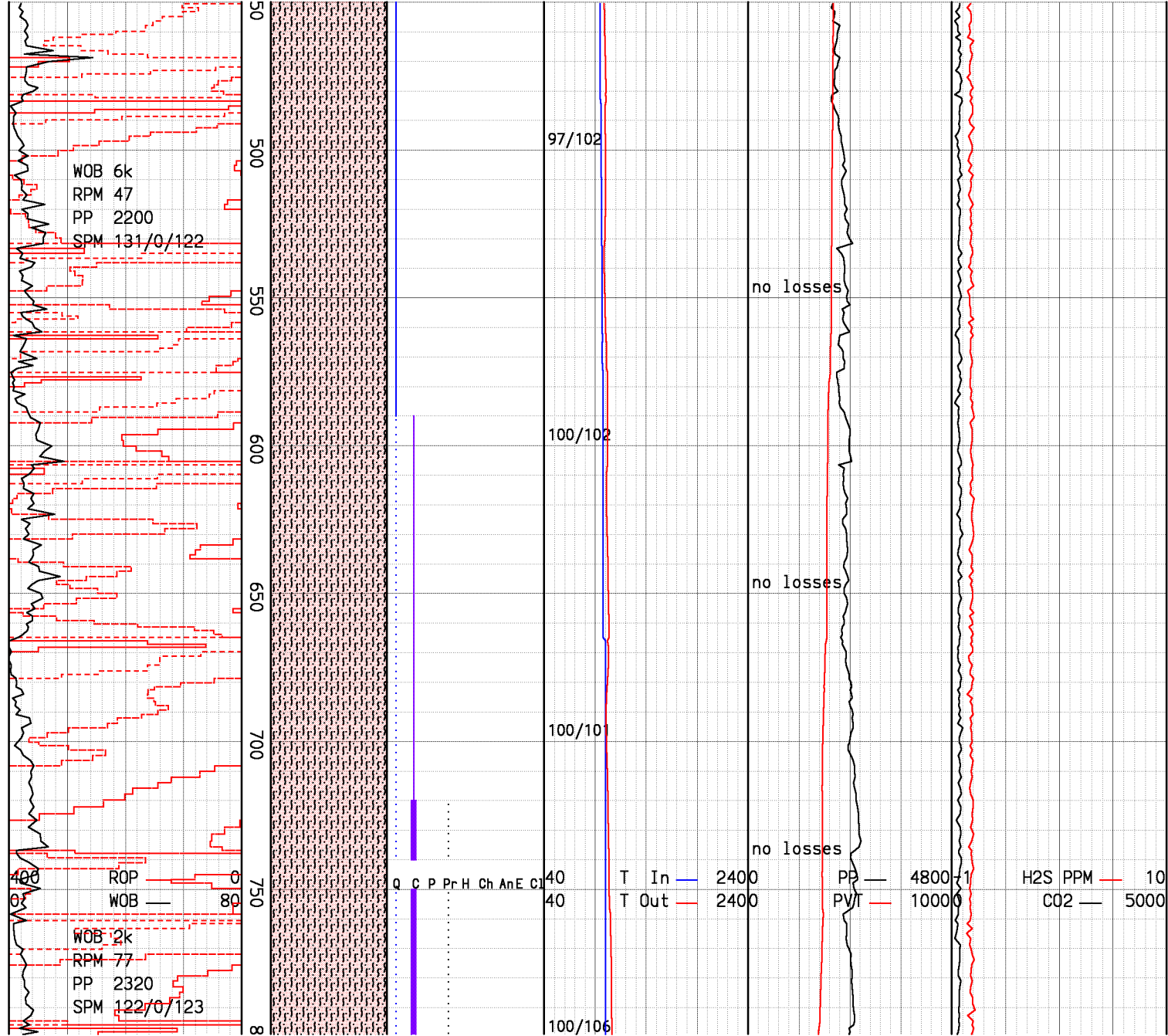
WATER ENTRIES

SECONDARY MINERALS

Q = Quartz Rare << 1%
 C = Calcite Trace < 1%
 P = Pyrite Minor 1% to 4%
 Z = Zeolite Common 4% to 7%
 H = Hematite Abundant 7% to 10%
 Ch = Chlorite Abundant > 10%
 An = Anhydrite
 E = Epidote
 Cl = Clay

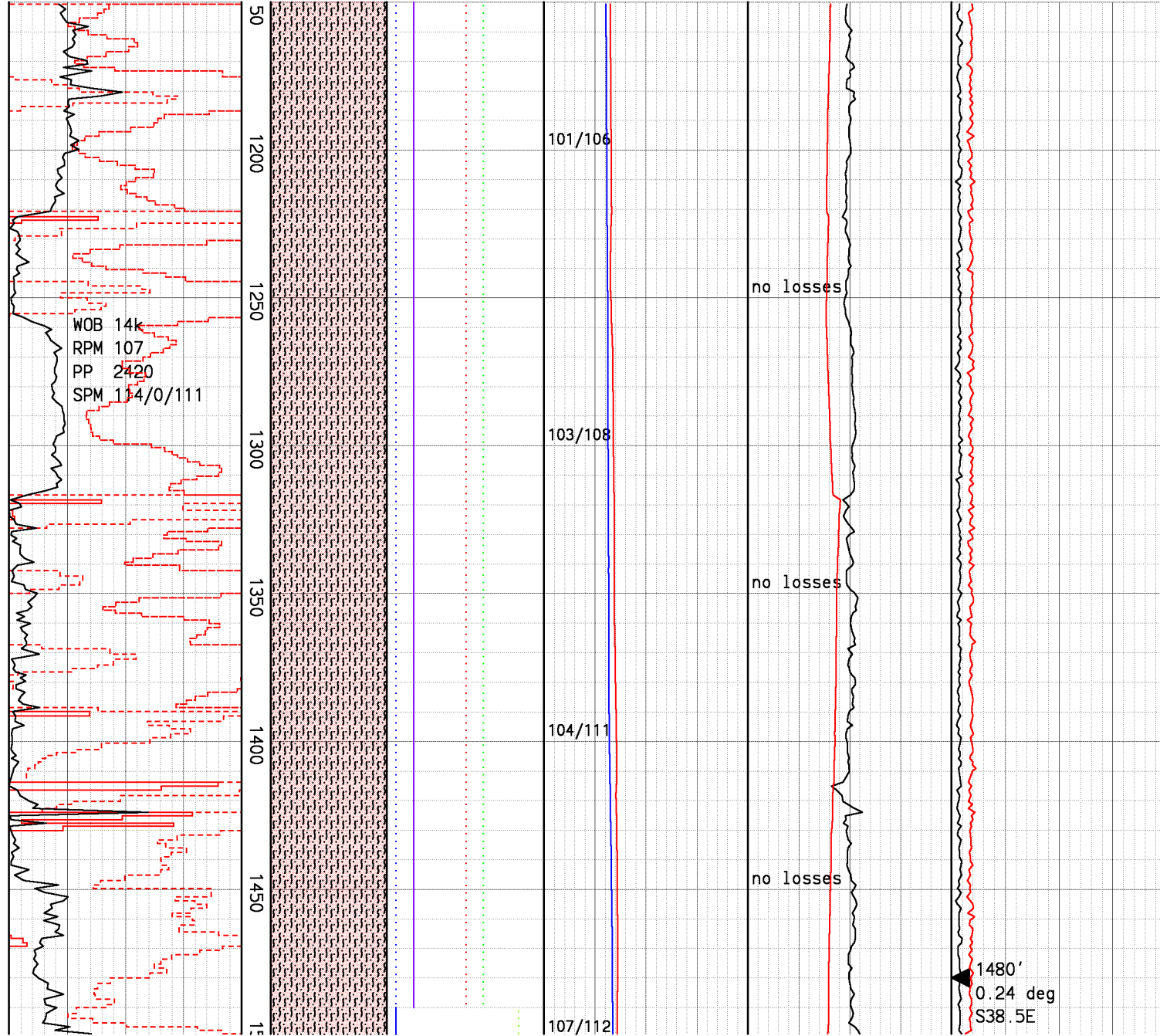
Scale 1: 600

Drilling Data			Lithology	Minerals	Temperatures		Circulation		Gas Analysis		Descriptions			
ROP					Temperature In		Pit Total		H2S					
400	ft/hr	0			40	deg F	240	0	bbbls	1000		1	ppm	10
Weight on Bit					Temperature Out		Pump Pressure		CO2					
0	k lbs	80	40	deg F	240	0	psi	4800	0	ppm	5000			
			Depth (ft)		Clay Epidote Anhydrite Chlorite Hematite Sericite Pyrite Calcite Quartz									
SPUD on 6/27/2021			00									<div>23.5" conductor set at 128' KB. SPUD FORGE Utah 78B-32 on 6/27/21. Drill ahead w/ 22" bit.</div> <div>Alluvium:predom wht-tan, beige,clr,r orng,unconsol, prly srtd,predom gravel & med-v crs gr sand avg 1mm occ up to 10mm,predom granitic,subang-subrndd,com milky-translu subhed qtz, tr plag w/visible striations,det euhed hornblende,tr-com tan-blk biotite,r epid (occ bright pistachio grn),occ hematization/oxidation of grs,r pnk agg calc.</div> <div>Alluvium:wht,transluc-transpar,unconsol,predom det qtz & plag w/gravel and fn-v coarse gr sand,prly srtd,predom granitic,subang-rndd,r agg magn,occ hematite & det euhed horn, tr-com biotite.</div> <div>Drill 22" hole t/422'. Run 9 jts of 16", 86# J-55 Buttress casing to 421'.</div> <div>Drill 11' perform FIT test. Drill ahead w/14.75" bit & mud motor.</div>		
NB#1 Smith XRTC bwm 6/28			150											
WOB 2k RPM 70 PP 560 SPM 106/97			200			85/na								
			250				no losses							
			300			87/na								
			350				no losses			337' 1.04 deg N1.51W				
293' /3.5hrs			400			90/na								
NB#2 Reed TKC66 6/29 bwm														
NB#3 Baker Hughes 6/30 bwm			4				no losses							



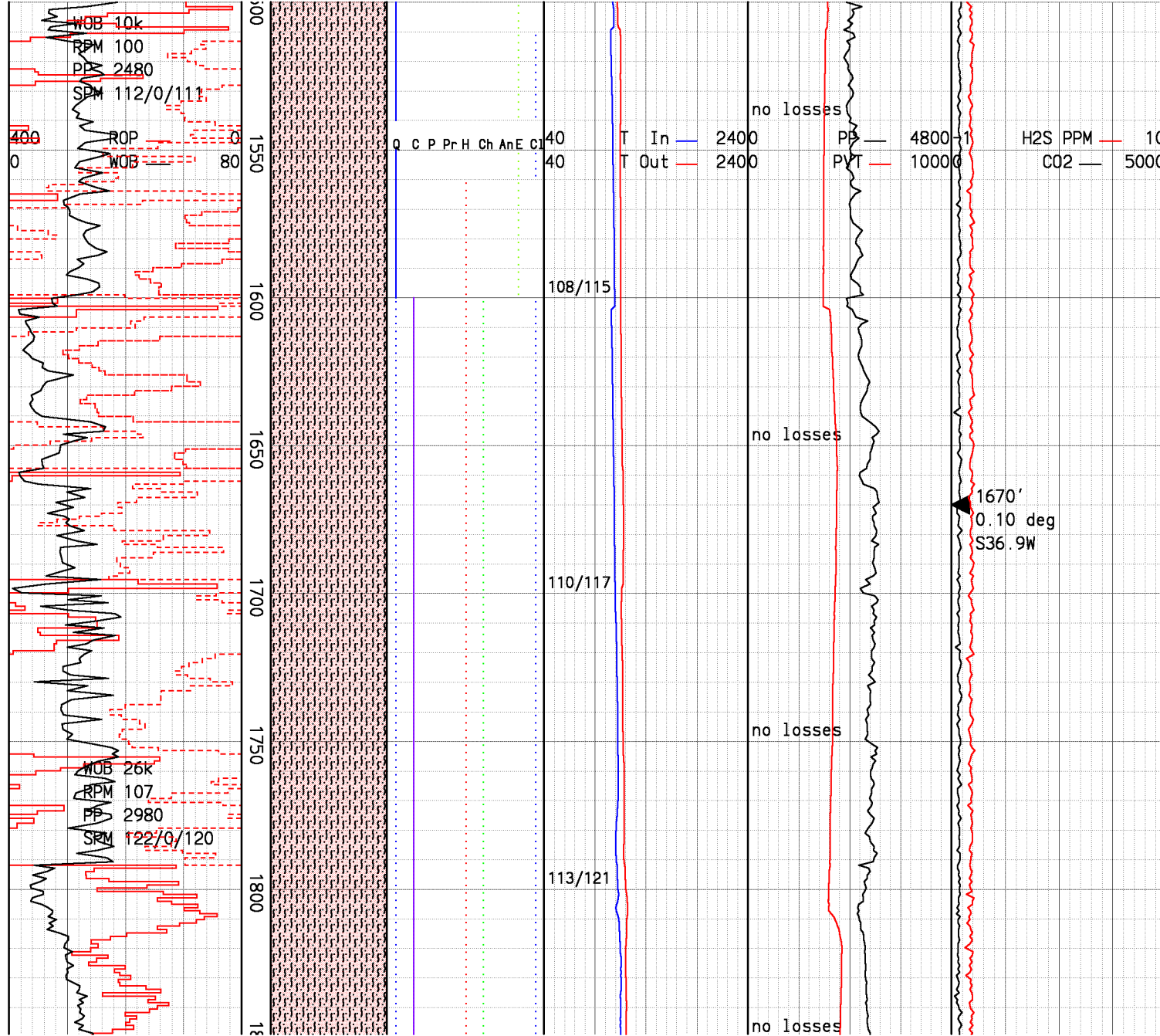
Alluvium:wht-tan/org,translu-
transpar qtz,unconsol,grs
~2mm & up to 15mm,predom det
qtz & plag w/gravel and crs-
v coarse gr sand,prly srtd,
predom granitic,subang
-subrddd,r agg magn,occ
hematite,tr brn-blk biotite.

Alluvium:wht-tan/org,translu-
transpar qtz,unconsol,grs
~2mm & up to 10mm,predom det
qtz & plag w/gravel and crs-
v coarse gr sand,mod-prly
srtd,predom granitic,ang
-subrddd,occ hematite,r brn-
blk biotite.



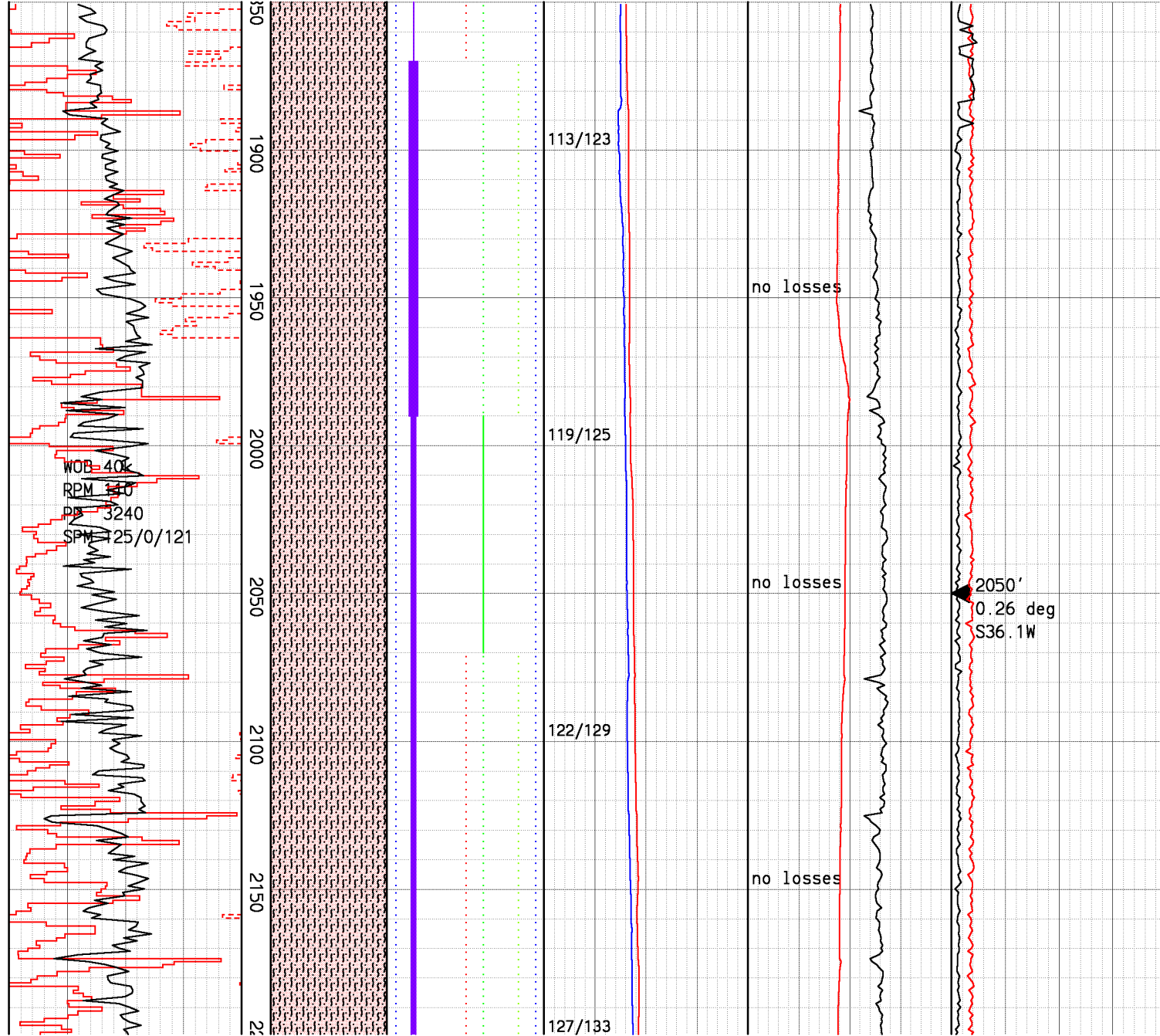
Alluvium:wht-tan/org,translu-
transpar qtz,unconsol,grs
~2mm & up to 20mm,predom det
qtz & plag w/gravel and crs-
v crs gr sand,prly srted,
predom granitic,ang-subrddd,
tr disem calc,r det horn,r
chlor,occ hematite,r brn-blk
biotite.

Alluvium:wht-tan/org,translu-
transpar qtz,unconsol,grs
~2mm & up to 20mm,predom det
qtz & plag w/gravel and crs-
v crs gr sand,prly srted,
predom granitic,ang-subrddd,
tr disem calc,r det horn,r
chlor,occ hematite,r brn-blk
biotite.

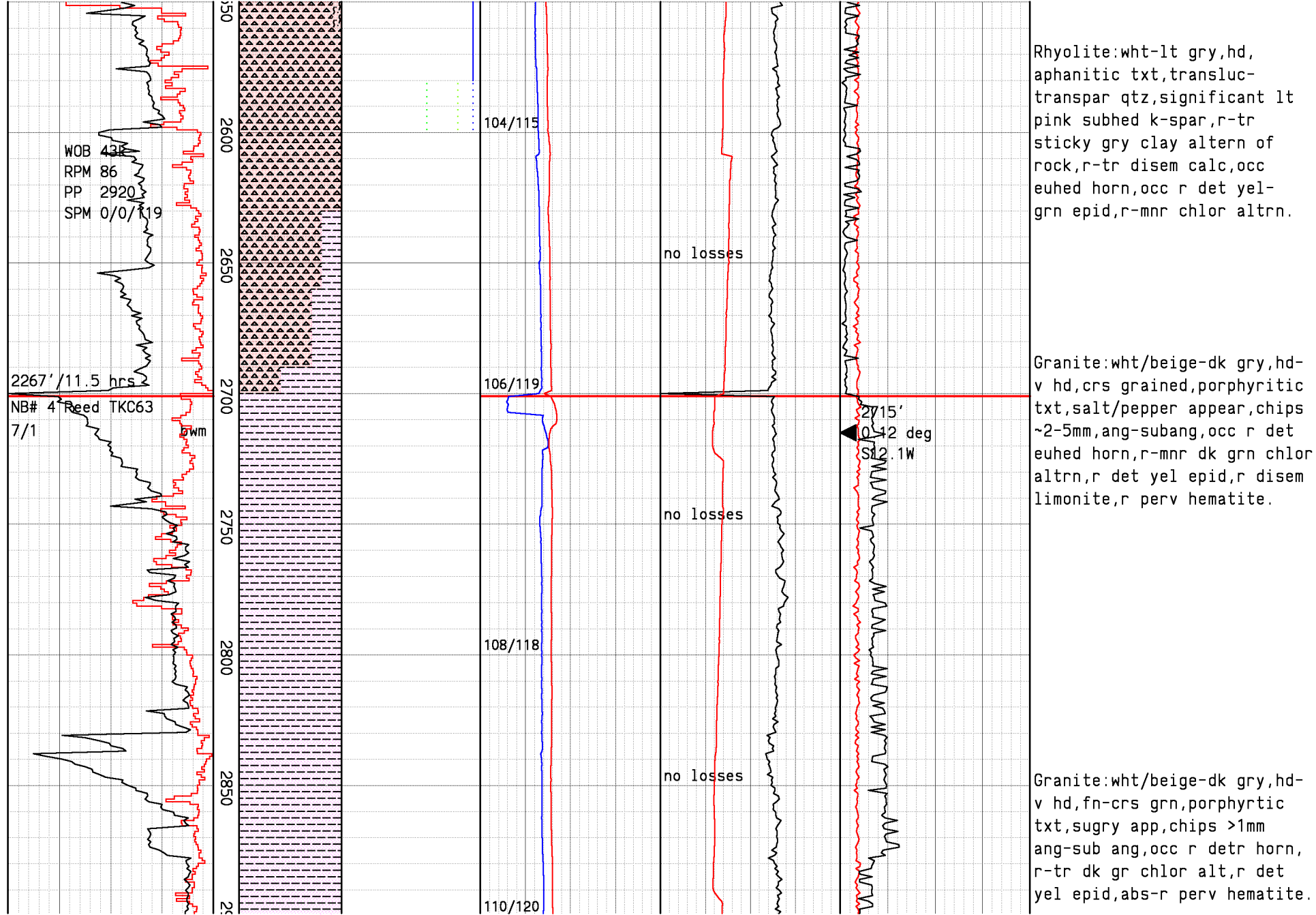


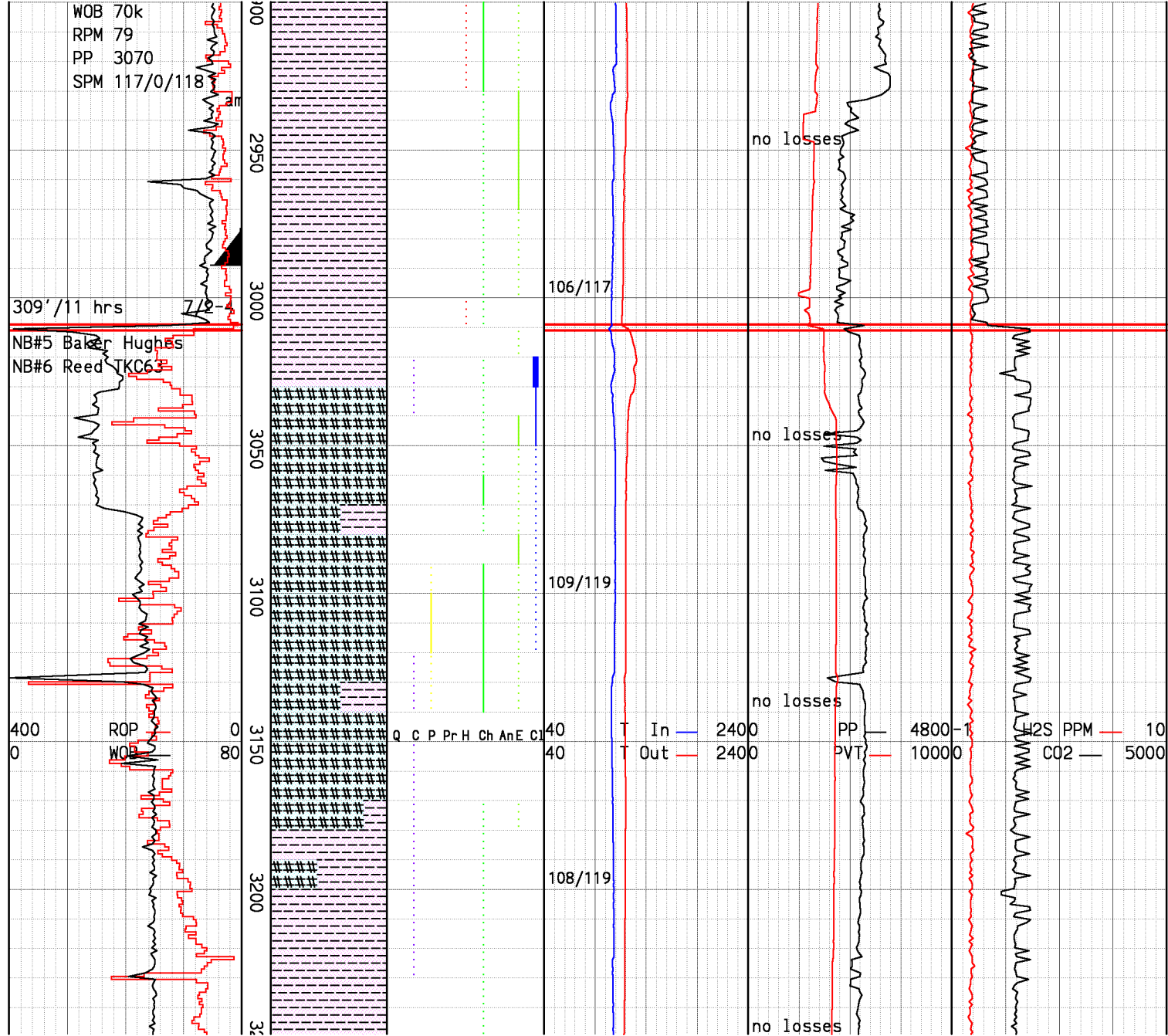
Alluvium:wht-tan/org,translu-
transpar qtz,occ sugary txt,
unconsol,much smaller grs ~2-
5mm,predom det occ vitreous
qtz & plag w/gravel and crs-
v crs gr sand,well srtd,
predom granitic,ang,tr disem
calc,r det horn,r chlor,occ
hematite,r brn-blk biotite.

Alluvium:wht-gry/tan,translu-
transpar occ rexln qtz,occ
sugary txt,unconsol,smaller
grs ~2-5mm,predom det occ
vitreous qtz & plag w/gravel
and crs-v crs gr sand,wl
srtd,predom granitic,ang,tr
disem calc,r det horn,r
chlor,occ hematite,r sticky
gry clay,r gold-brn occ blk
biotite.



Alluvium:wht/gry-tan,translu-
transpar occ rexln qtz,occ
sugary txt,unconsol,smaller
grs ~2-5mm,predom det occ
vitreous qtz & plag w/gravel
and crs-v coarse gr sand,wl
srted,predom granitic,ang,tr
disem calc,r det horn,r
chlor,occ hematite,r sticky
gry clay,r gold-brn occ blk
biotite.



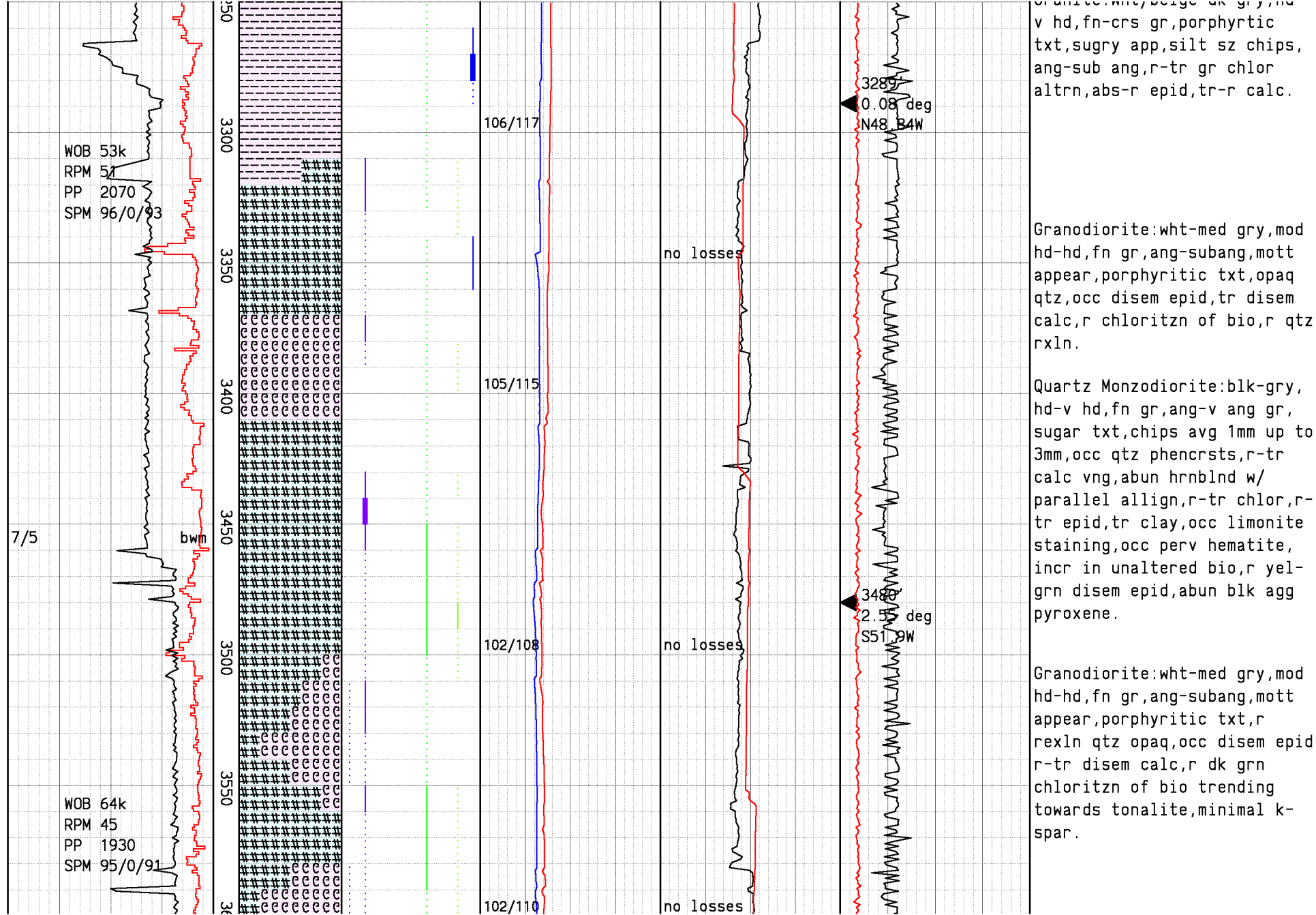


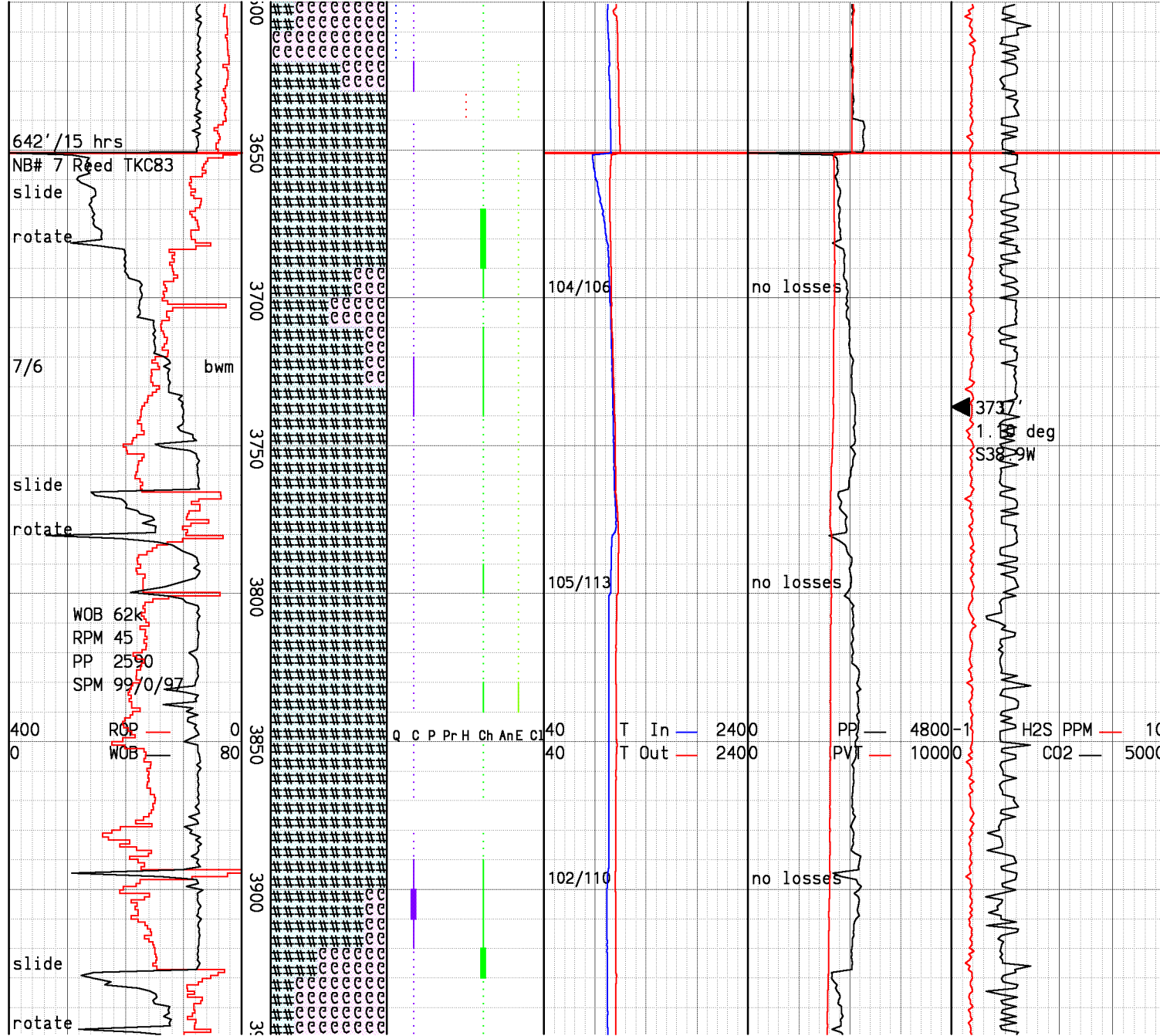
Drill 14.75" hole t/3009'.
Run 73 jnts of 11.75", 54#
J-55 BTC casing to 2989'.

Drill 2', perform FIT test.
Drill ahead w/10.625" bit
& mud motor.

Quartz Monzodiorite: blk-gry,
hd-v hd, fn gr, ang-v ang gr,
sugary txt, occ qtz phenocrsts,
abun hrnblnd, r-tr chlor, r-tr
epid, tr clay.

Drill Break F/3226' T/3231'
ROP F/ 64'/hr to 224'/hr,
WOB F/50-34k lbs.



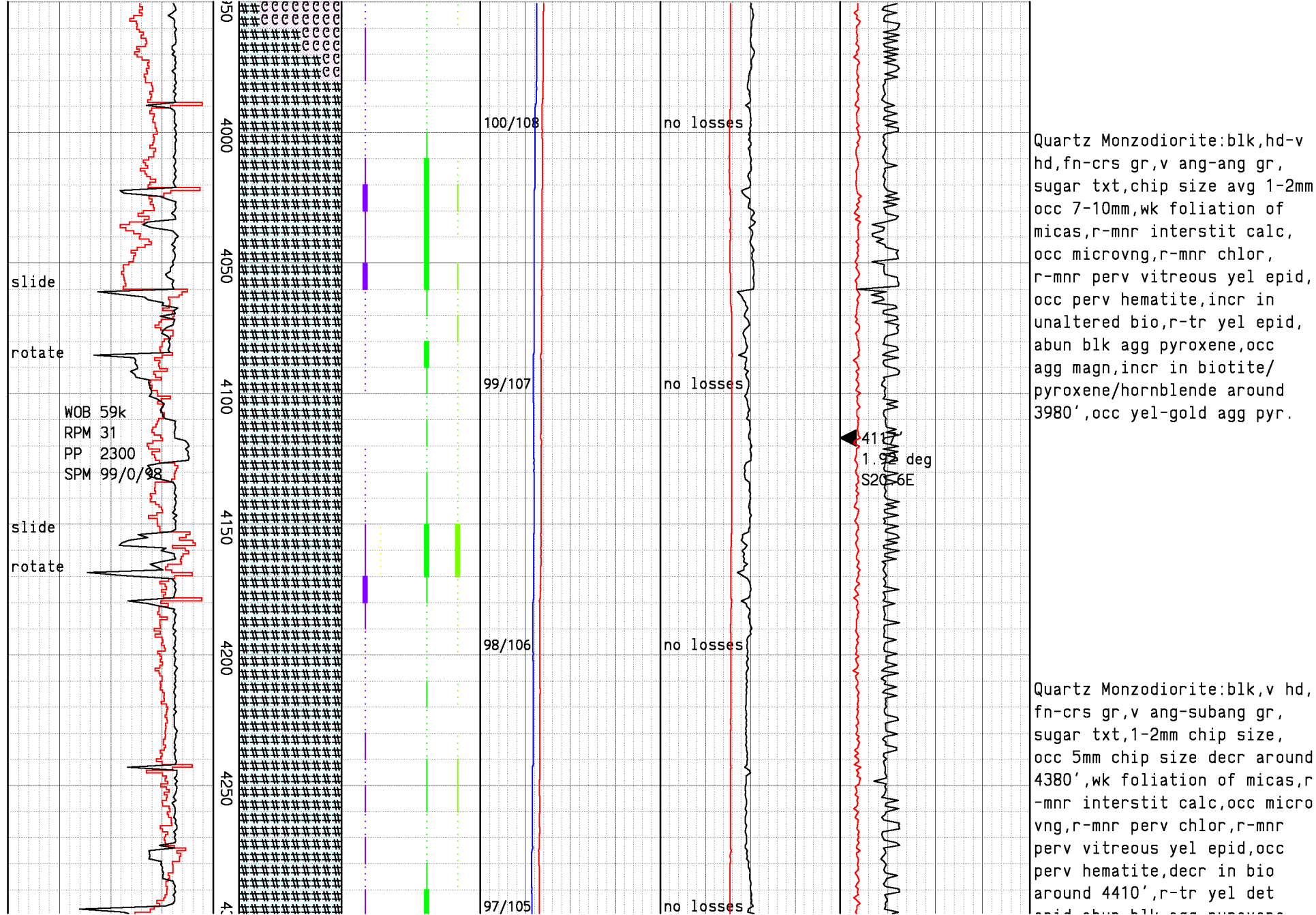


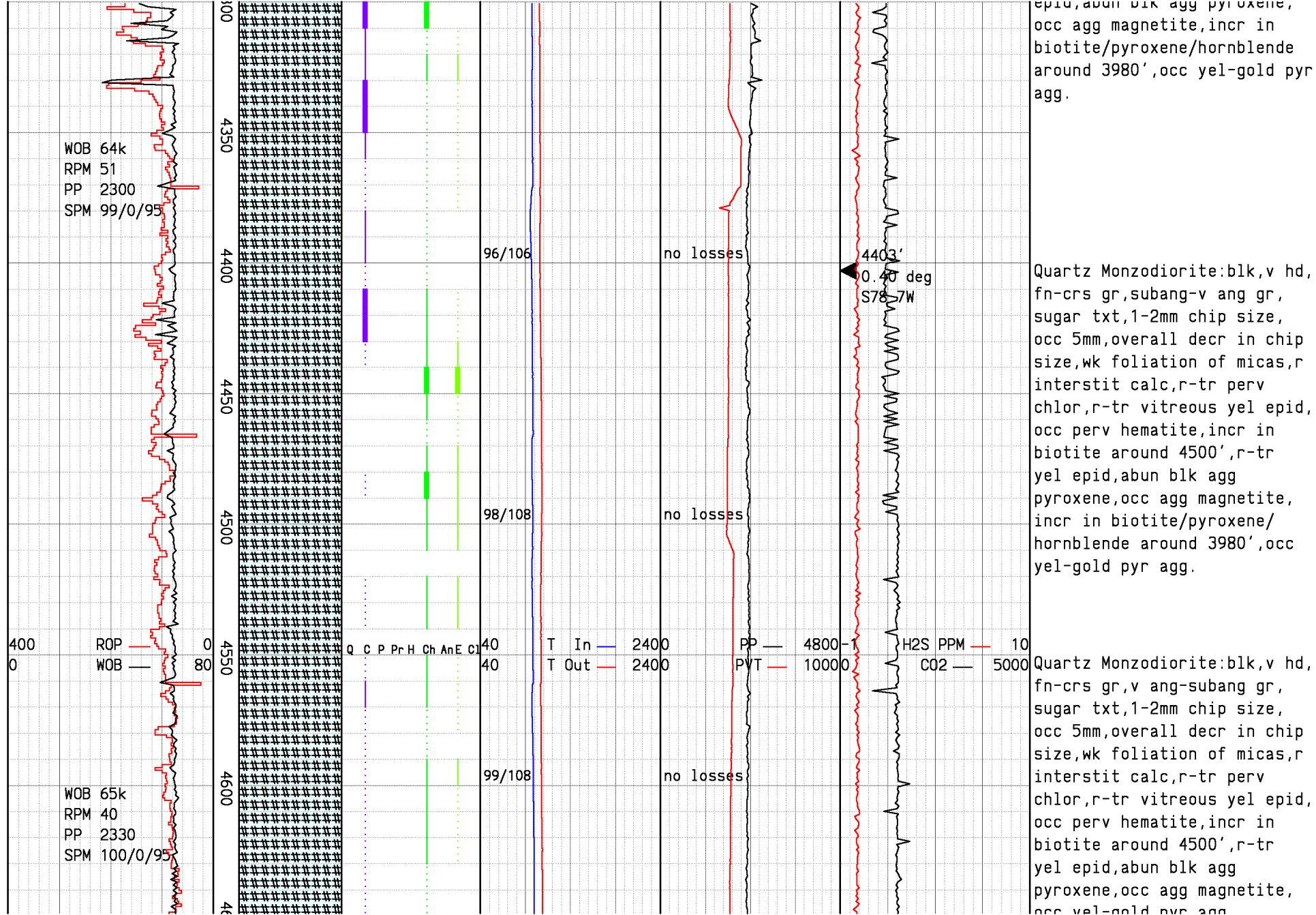
Switch from drilling on mud to drilling on clean water.

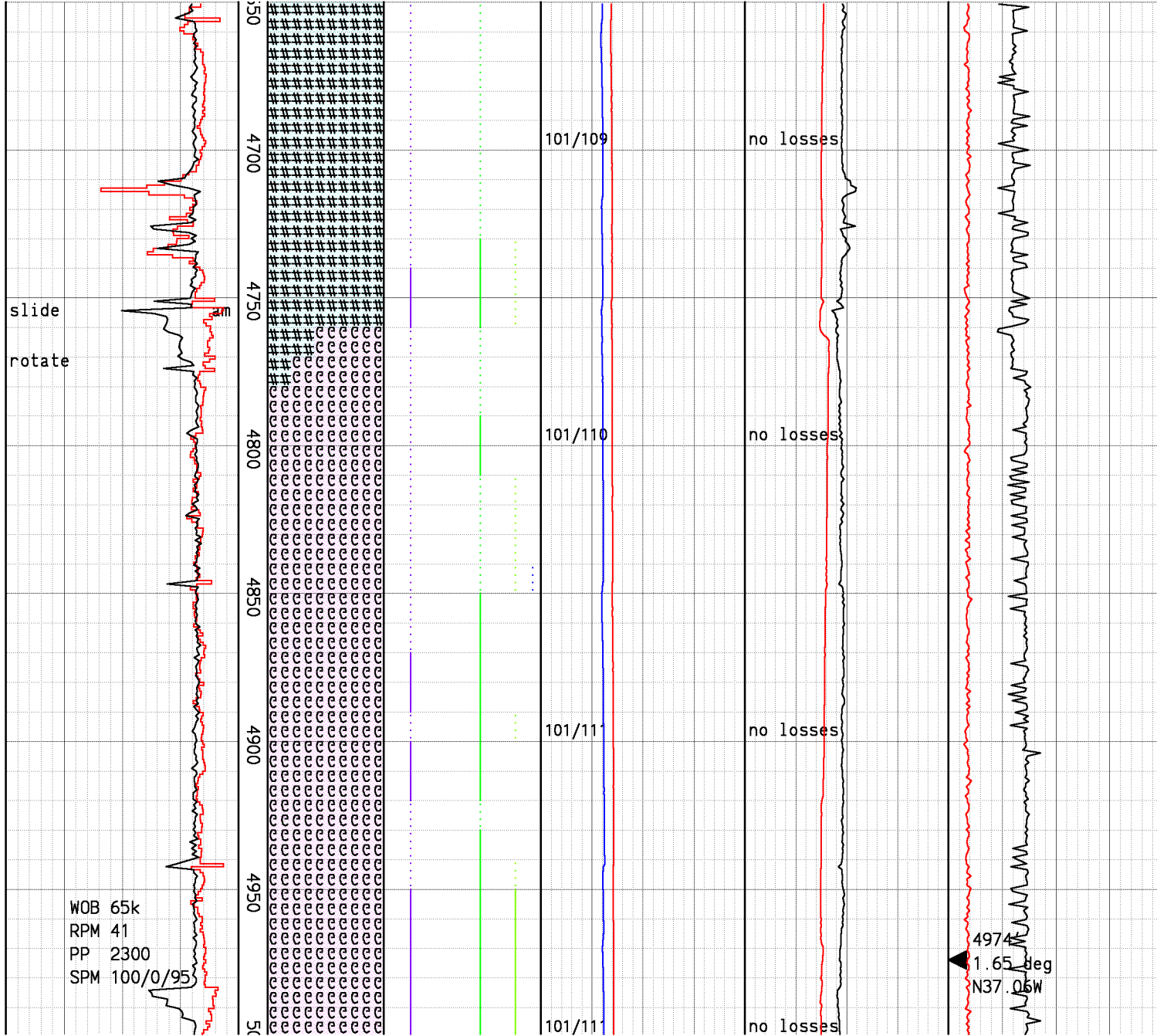
Quartz Monzodiorite: blk-gry, hd-v hd, fn gr, ang-v ang gr, sugar txt, chips avg 1mm up to 3mm, occ qtz phenocrsts, r-tr calc vng, abund hrnblnd w/ parallel align, r-tr chlor, r-tr epid, tr clay, occ limonite staining, occ perv hematite, incr in unaltered bio, r yel-grn disem epid, prom blk agg pyroxene.

Granodiorite: wht-med gry, mod hd-hd, fn gr, ang-subang, mott appear, porphyritic txt, r yel-grn euhed & perv epid, r-tr disem calc, r-tr dk grn chloritzn of bio, minimal k-spar, high percentage of biotite lenses.

Quartz Monzodiorite: gry-blk, hd-v hd, fn-crs gr, ang-v ang gr, sugar txt, chip size avg 1-2mm, occ 5m-10mm incrng around ~3900', wk fol of micas, r-mnr disem calc microvng, tr-r perv chlor, occ r-tr yel epid, occ perv hematite, incr in unalt bio, occ yel det epid, prom blk agg pyroxene, occ agg mag, incr in biotite/pyroxene/hornblende around 3980'.

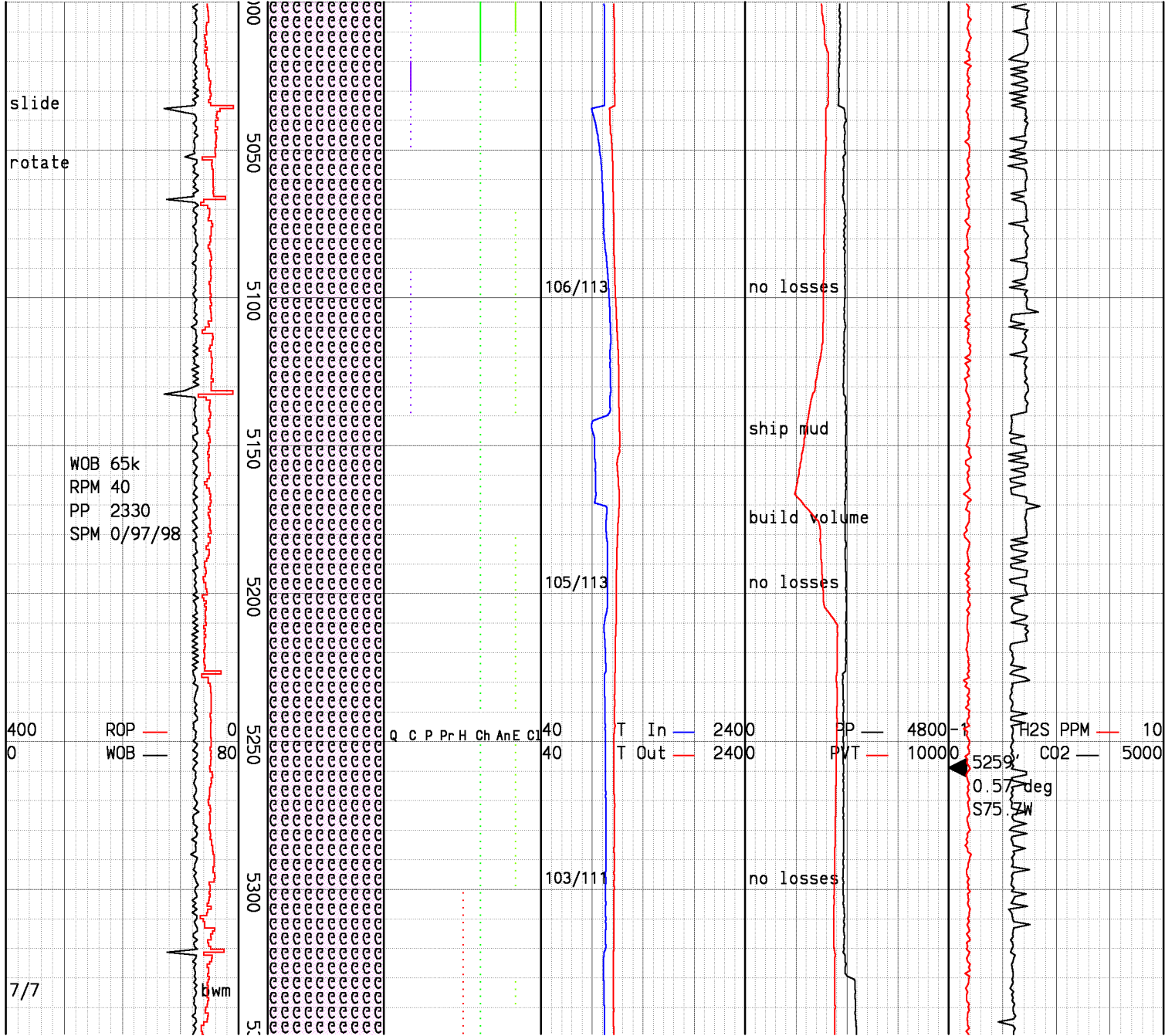






Quartz Monzodiorite:lt-md gry,fn gr,subang-v ang,sugary txt,chip size >1mm,wk fol of micas,r-tr calc,r-tr perv chlor,abs-r yel epid,abs hem, significant decr in biotite.

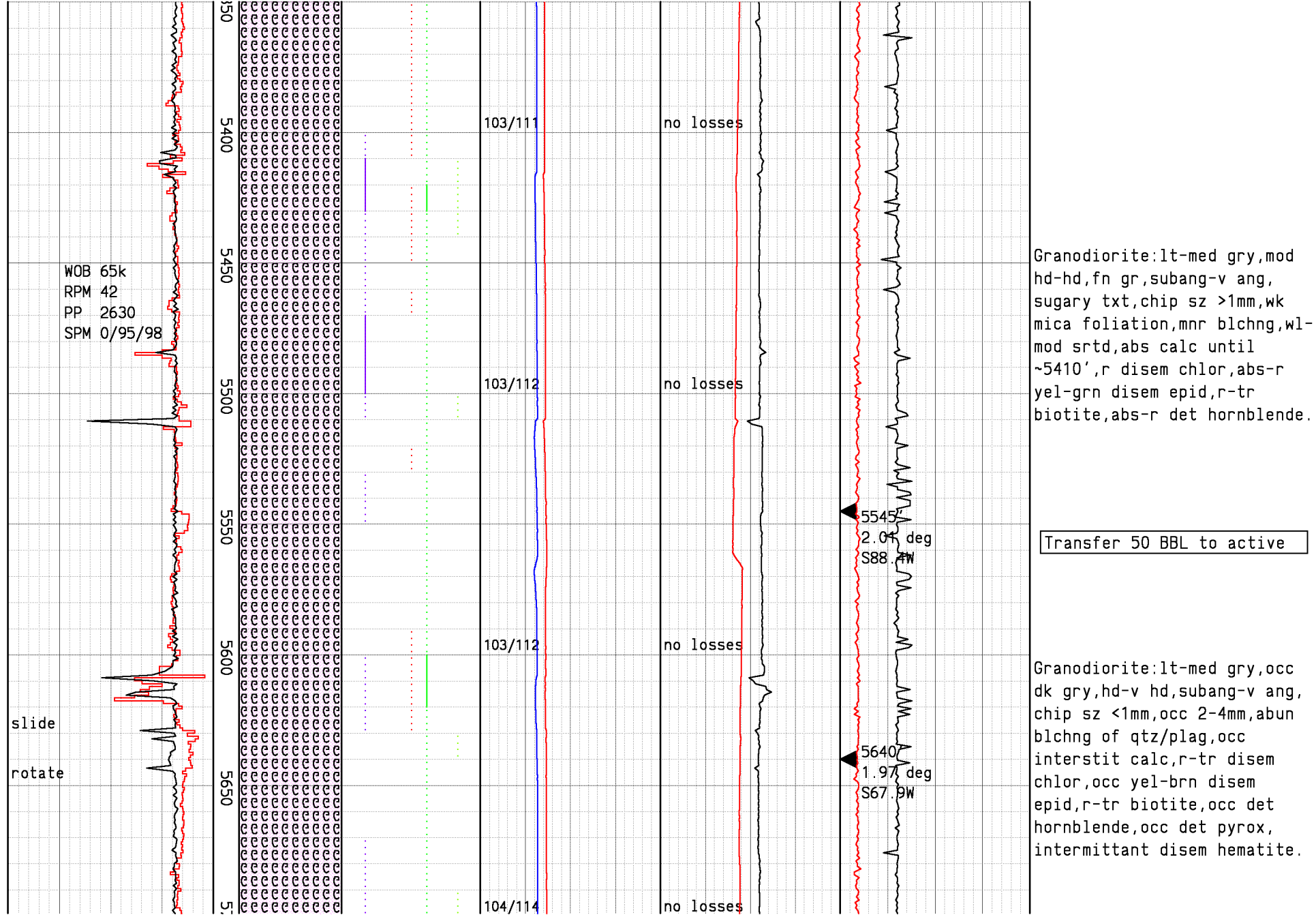
Granodiorite:lt-med gry, subang-v ang,sugary txt,chip sz >1mm,wk mica foliation,mnr blobs abs-to interstit calc



blchng,abs r interstit calc,
r-tr chlor,r-yr yel epid,abs
clay,tr biotite.

Granodiorite:lt-med gry,mod
hd-hd,fn gr,subang-v ang,
sugary txt,chip sz >1mm,wk
mica foliation,mnr blchng,
abs-r interstit calc,r disem
chlor,abs-r yel epid,abs
clay,tr biotite,tr nodule
of unknown orng/brn min.

Granodiorite:lt-med gry,mod
hd-hd,fn gr,subang-v ang,
sugary txt,chip sz >1mm,wk
mica foliation,mnr blchng,wl-
mod srtd,abs calc,r disem
chlor,abs-r yel-grn disem
epid,r-tr biotite,abs-r det
hornblende.



slide WOB 65k
RPM 41
PP 2780
rotate SPM 0/98/100

2051' / 29.5 hrs 7/8-10

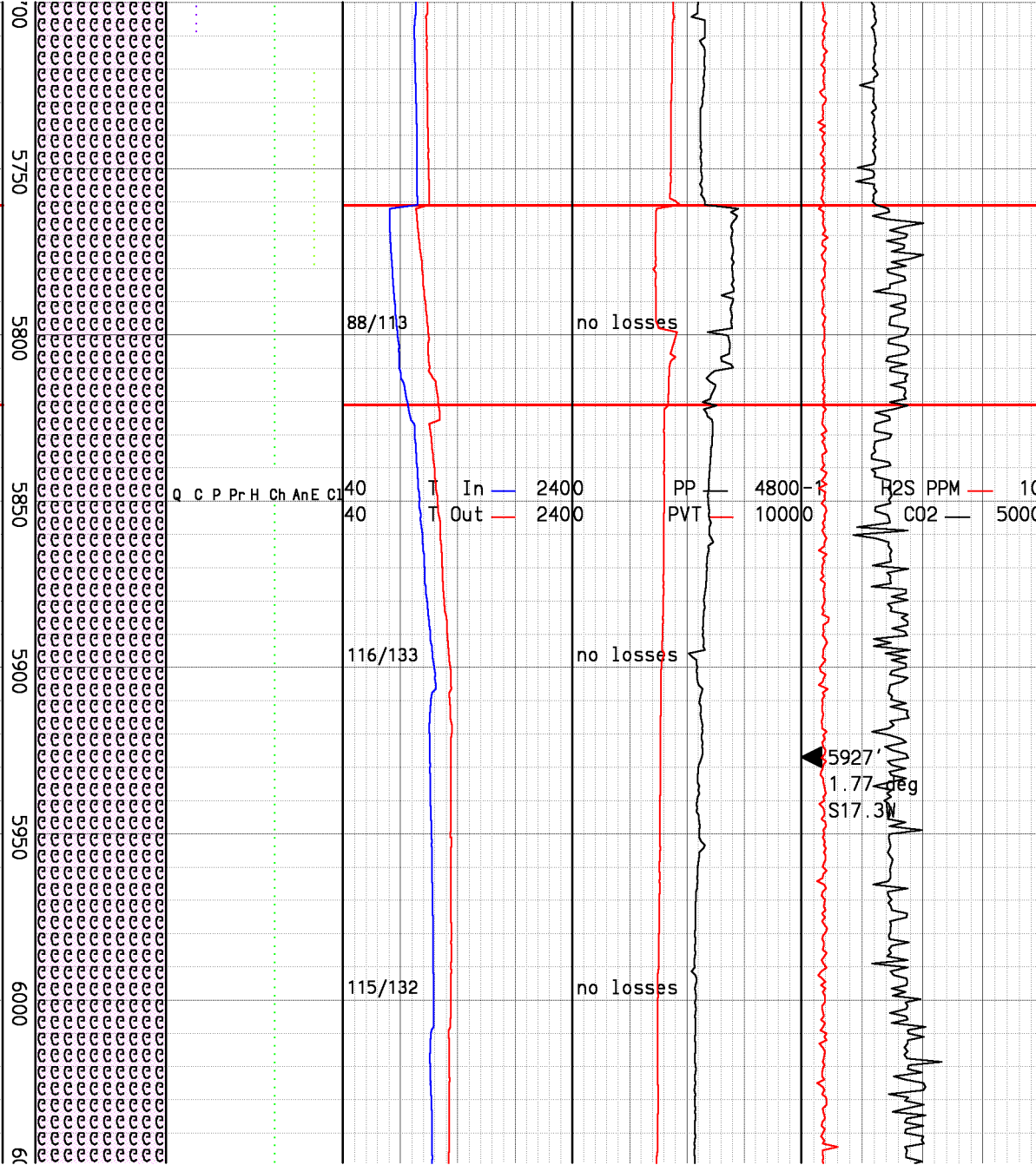
NB#9 Reed TKC83 pb

60' / 1 hr

NB#10 Reed TKC83
7/11 bwm

400 ROP 0
0 WOB 80

WOB 69k
RPM 50
PP 2610
SPM 0/97/97



Granodiorite:lt-med gry,occ
dk gry,hd-v hd,subang-v ang,
chip sz <1mm,abun blchnng of
qtz/plag,occ interstit calc,r
disem chlor,occ yel-brn disem
epid,occ biotite.

Drill Break F/5859' T/5869'
ROP F/ 159'/hr to 308'/hr,
WOB F/67-51k lbs.

Granodiorite:lt-med gry,occ
dk gry,hd-v hd,chip sz <1mm,
minimal altrn,occ transpar
interstit qtz,r disem chlor,
occ yel-brn disem epid,occ
euhed biotite.

Drill Break F/5950' T/5957'
ROP F/ 123'/hr to 264'/hr,
WOB F/71-67k lbs.

Granodiorite:lt-med gry,occ
dk gry,hd-v hd,chip sz <1mm,
minimal altrn,occ interstit
qtz,occ euhed biotite.

rotate

WOB 65k
RPM 50
PP 2540
SPM 0/96/97

115/128

no losses
build volume

110/125

no losses

110/124

no losses

110/124

no losses

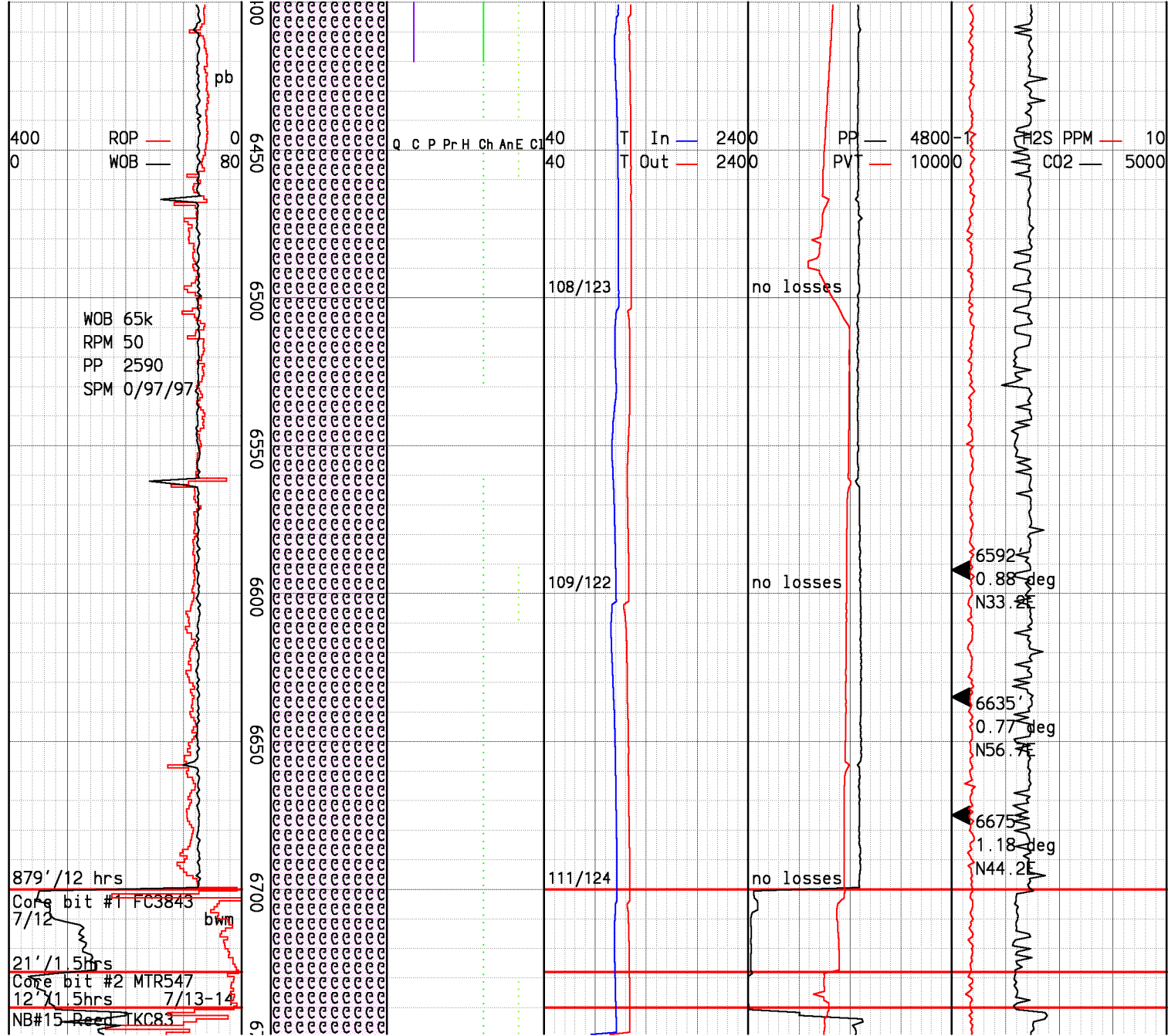
6307
1.06 deg
S47.5E

Fill pits to 500 BBLS

Granodiorite:lt-med gry,occ
dk gry,mod hd-hd,incr in chip
size,avg ~1mm,minimal altrn,
occ transpar interstit qtz,r
euhed biotite,signif incr in
biotite,calc,& chlor for ~20'
f/6180'-6200'.

Dump water out of pits
for dust control.

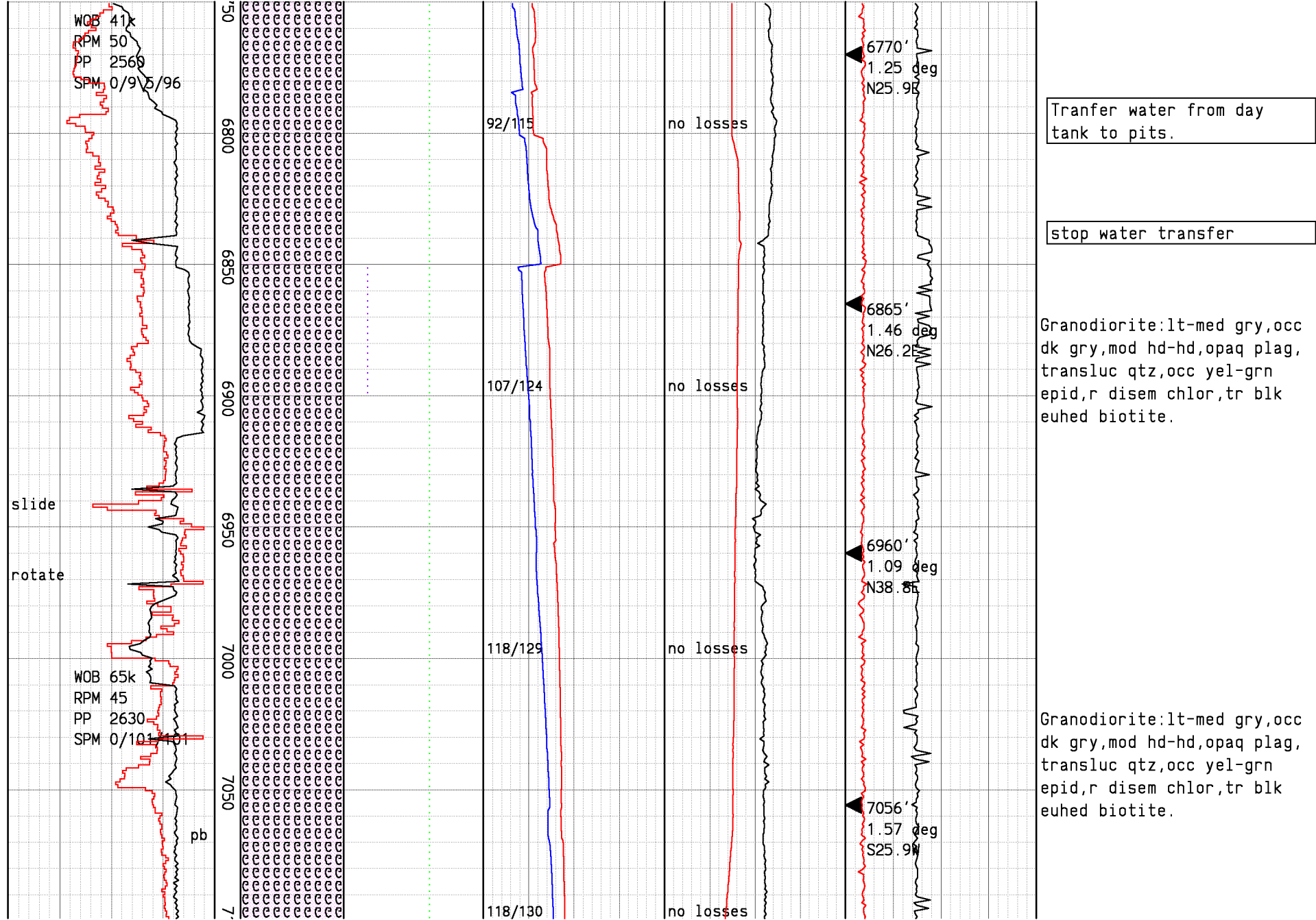
Granodiorite:lt-med gry,occ
dk gry,mod hd-hd,decr in chip
size,avg <1mm,minimal altrn,
occ transpar interstit qtz,r
euhed biotite.

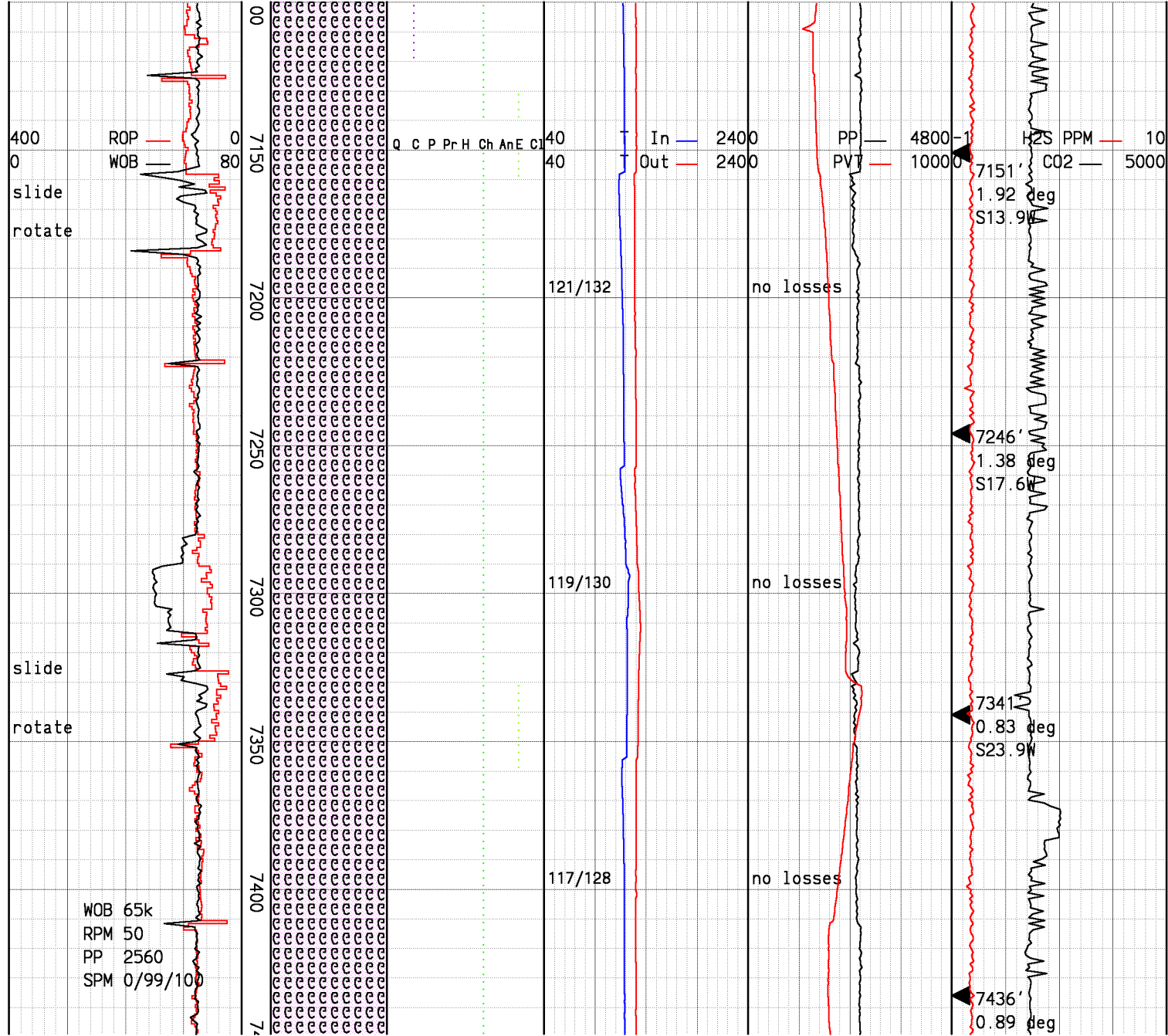


Granodiorite:lt-med gry,occ dk gry,hd,subang-v ang,chip sz <1mm,tr disem chlor,r yel disem epid,tr interstit calc, intermittent disem hematite, r euhed biotite,signif incr in biotite,calc,& chlor for ~20' f/6410'-6430'.

Granodiorite:lt-med gry,occ dk gry,mod hd-hd,ang-sub ang, sugary txt,chip sz avg <1mm, r blchnng of plag/qtz,occ yel-brn epid,r disem chlor,occ euhed biotite.

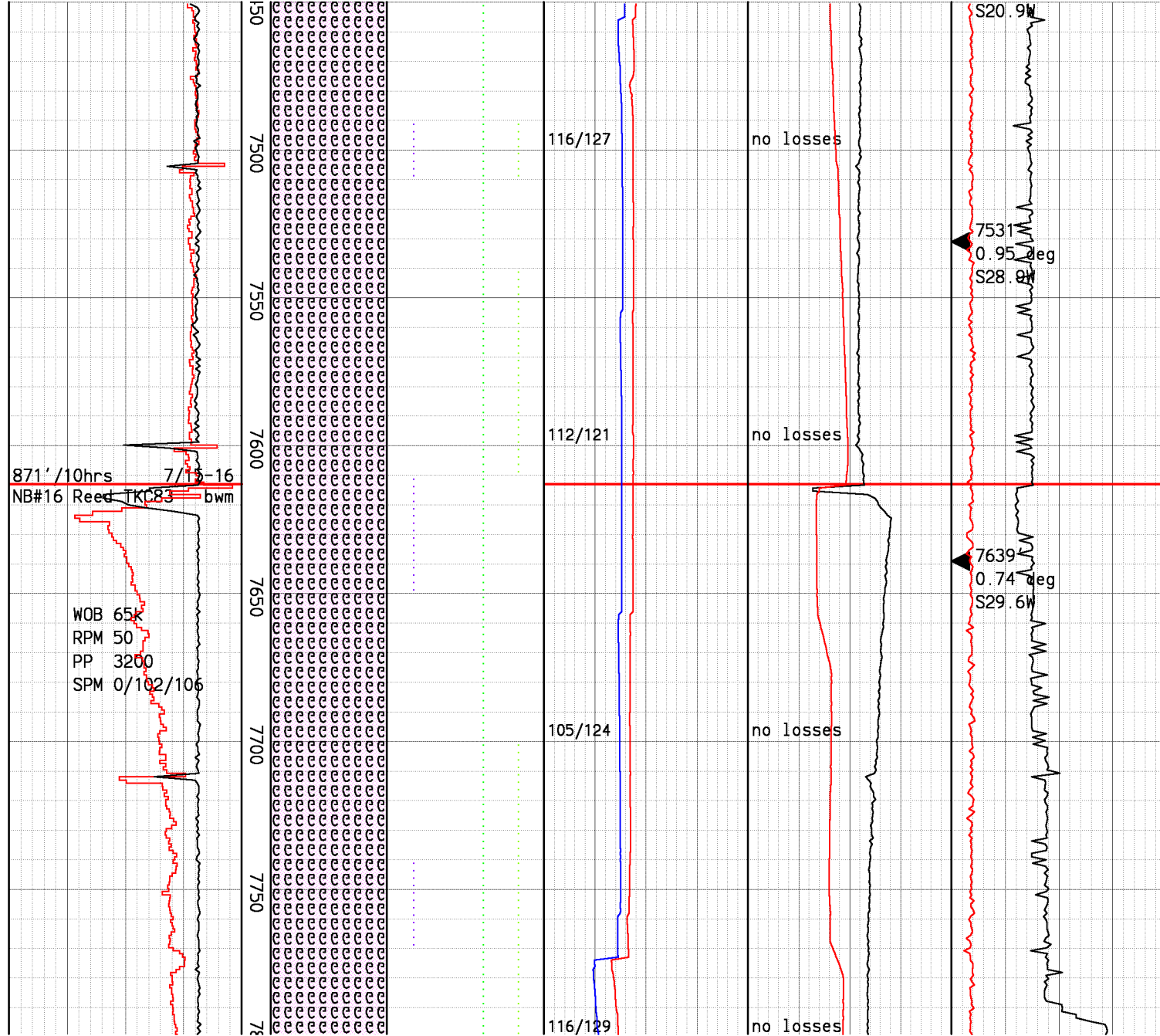
Drill to 6700'. Core #1 f/ 6700-6728'. Pull 28' of core out. RIH and Core #2 f/6728-6740'. Pull 12' of core out. RIH to ream, then POH to make up directional tools & drill ahead f/6740'.





Granodiorite:lt-med gry,r dk gry,mod hd-hd,ang-sub ang, chip sz avg <1mm,occ ~1-2mm, opaq plag,transluc qtz,abs epid,r disem chlor,tr blk euhed biotite.

Granodiorite:lt-med gry,occ dk gry,mod hd-hd,subang-ang chip sz avg <1mm,opaq plag,altrn of plag,transluc qtz,r qtz vng,occ disem calc,occ yel epid,r disem chlor,tr blk euhed biotite.



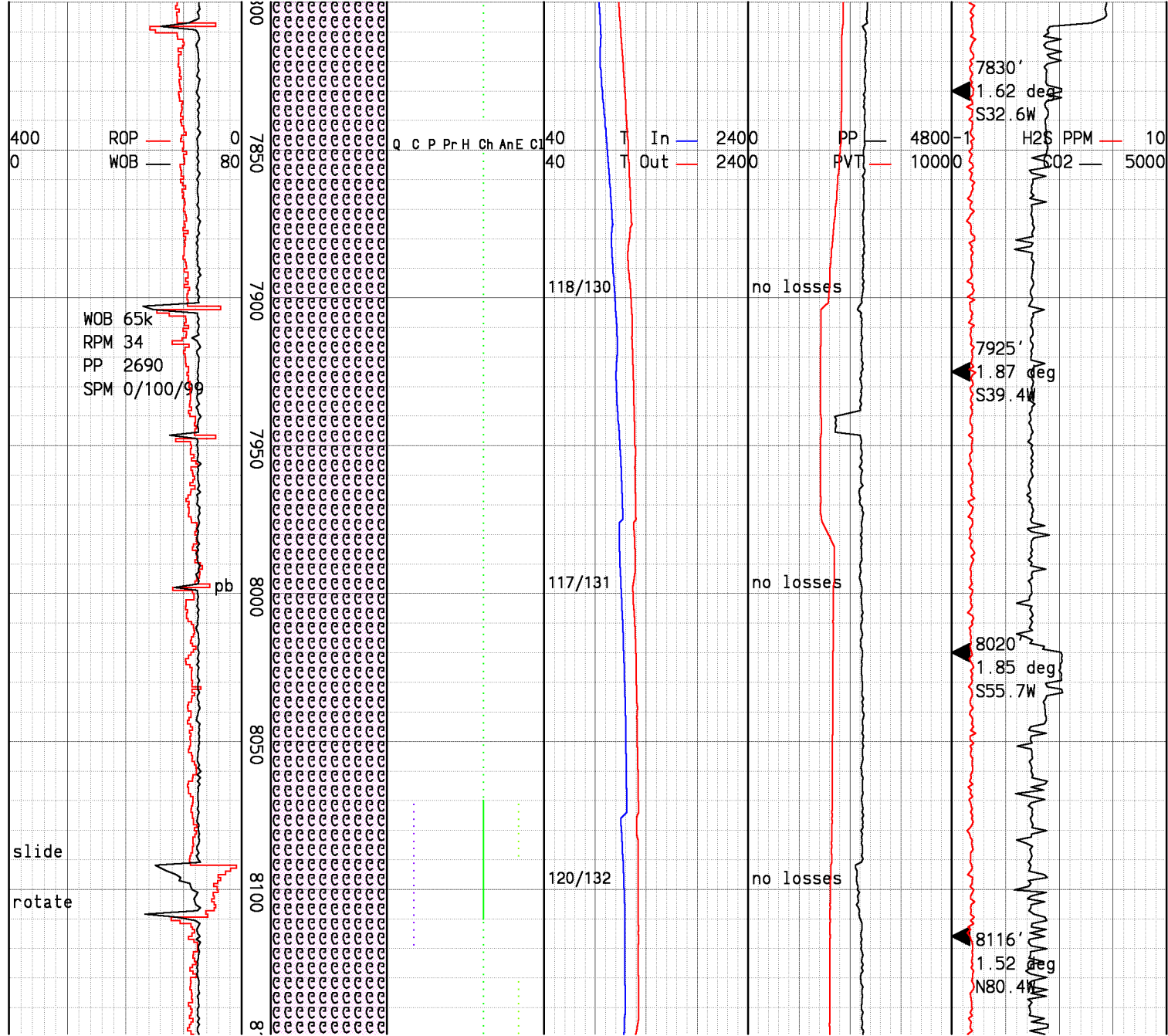
Granodiorite:lt-med gry,occ
dk gry,mod hd-hd,chip
sz avg <1mm,opaq plag,com
altrn of plag,transluc qtz,r
qtz vng,occ disem calc,r yel
epid,occ disem pyr,r disem
chlor,occ pyrox,r blk euhed
biotite,occ biotite vng.

Transfer to pill fresh
water for sweep.

Send fresh water sweep.

transfer fresh water to
pill

Granodiorite:lt-med gry,occ
dk gry,mod hd-hd,opaq plag,
com altrn of plag,com



transluc qtz, occ disem calc,
r yel epid, r disem chlor, r
blk euhed biotite, occ
biotite vng.

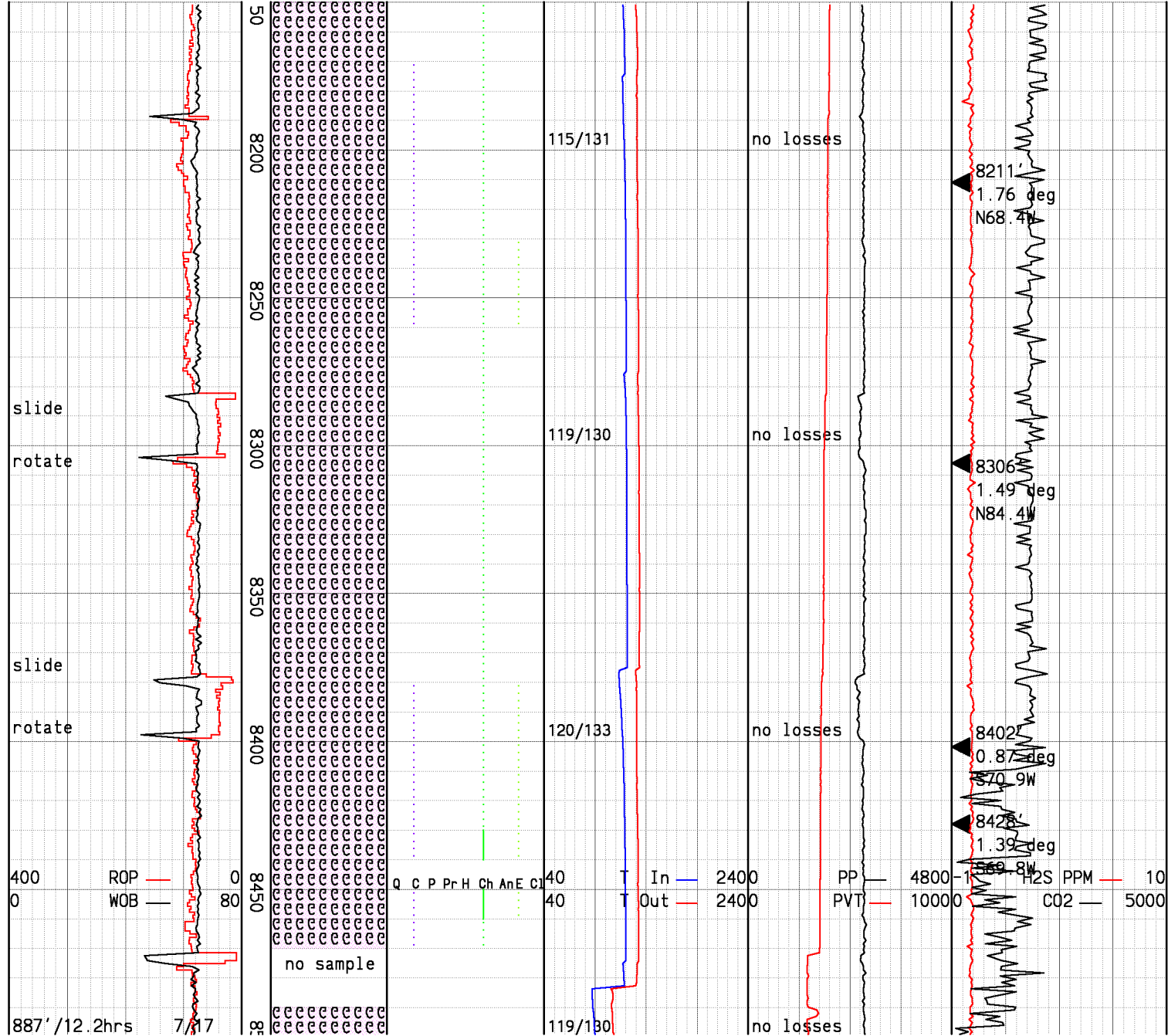
transfer out of pits to
reserve pit

RPM Step Test

Pump 70 BBL fresh water
sweep

Granodiorite: lt-med gry, occ
dk gry, mod hd-hd, opa q plag, r
altrn of plag, occ transluc
qtz, occ disem calc, abs epid, r
disem chlor, tr blk euhed
biotite.

Granodiorite: lt-med gry, occ
dk gry, mod hd-hd, transluc
plag, occ altrn of plag, occ
transluc qtz, occ disem calc, r



translucent, r disem calc, r
yel epid, r disem chlor, r blk
euhed biotite, perv incr in
biotite, calc, & chlor f/8040'-
8100'.

Granodiorite: lt-med gry, occ
dk gry, mod hd-hd, transluc
plag, r altn of plag, com
transluc qtz, occ disem calc,
occ yel epid, r disem chlor, r
blk euhed biotite, decr in
biot, calc, & chlor f/8300'-
8370'.

Granodiorite Core: blk/white,
lt gry, lt brn, hd-v hd, com
augen txt w/10mm by 15mm com
size, fn gr dikes typically
dk gry occ felsic, com flow
pattern of mafics dom biotite

[8 75" core f/8500-8530'

NB#17 HC3843

7/18

40' 75hrs 7/19-27

7/28

NB#18 Reed C55 td

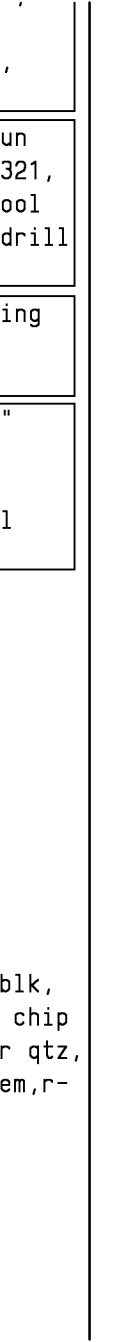
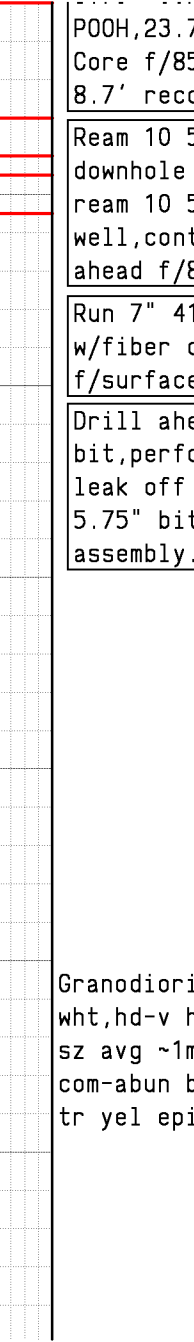
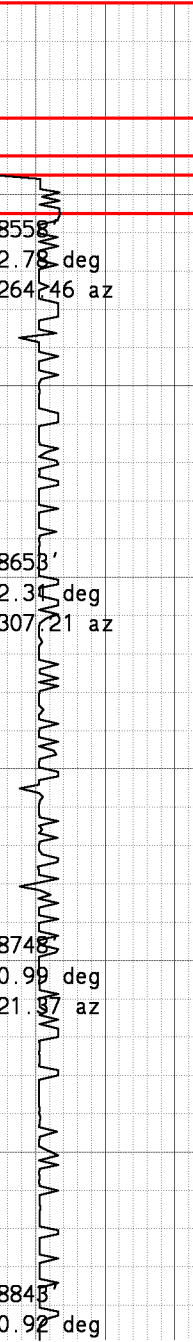
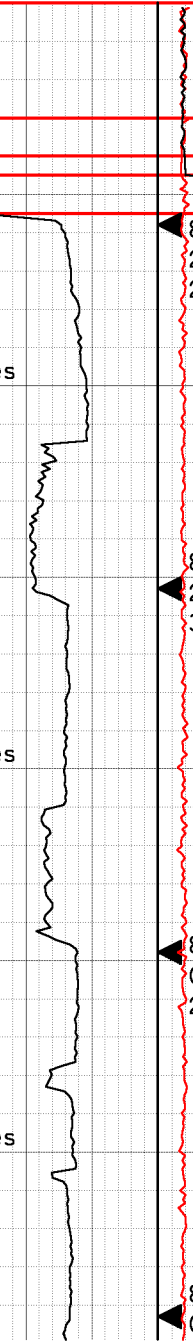
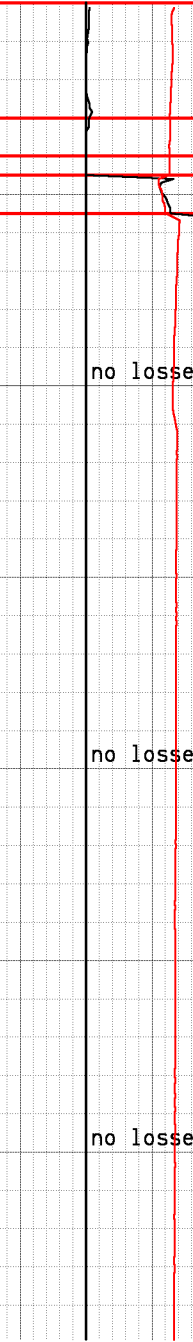
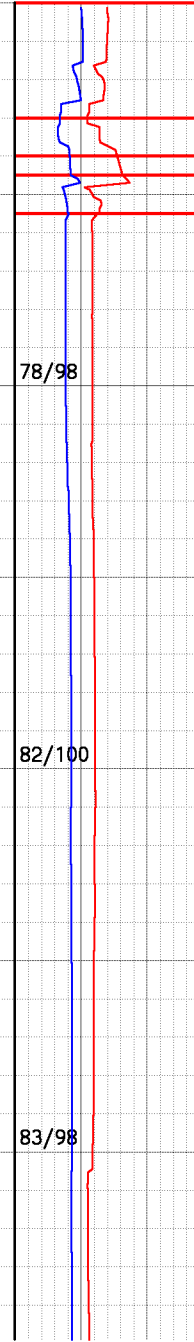
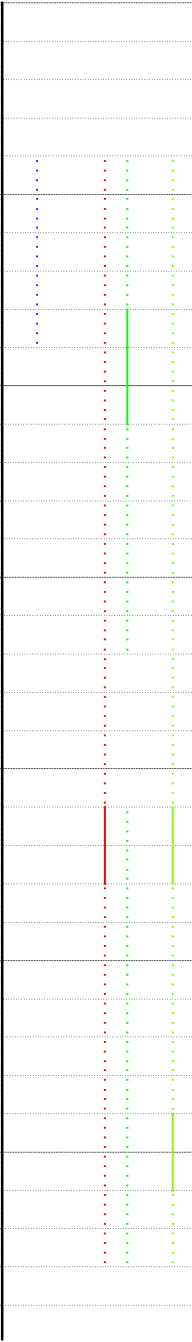
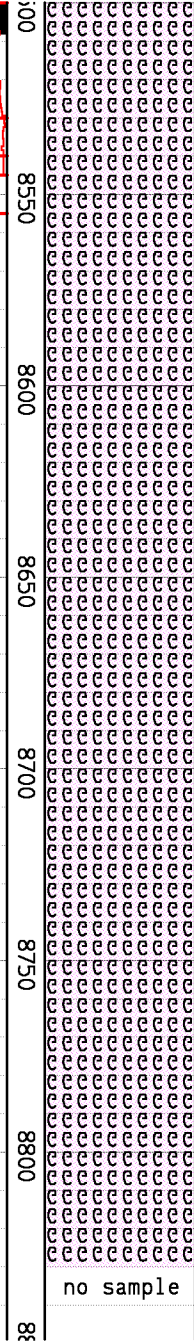
rotate

slide

rotate

slide

rotate



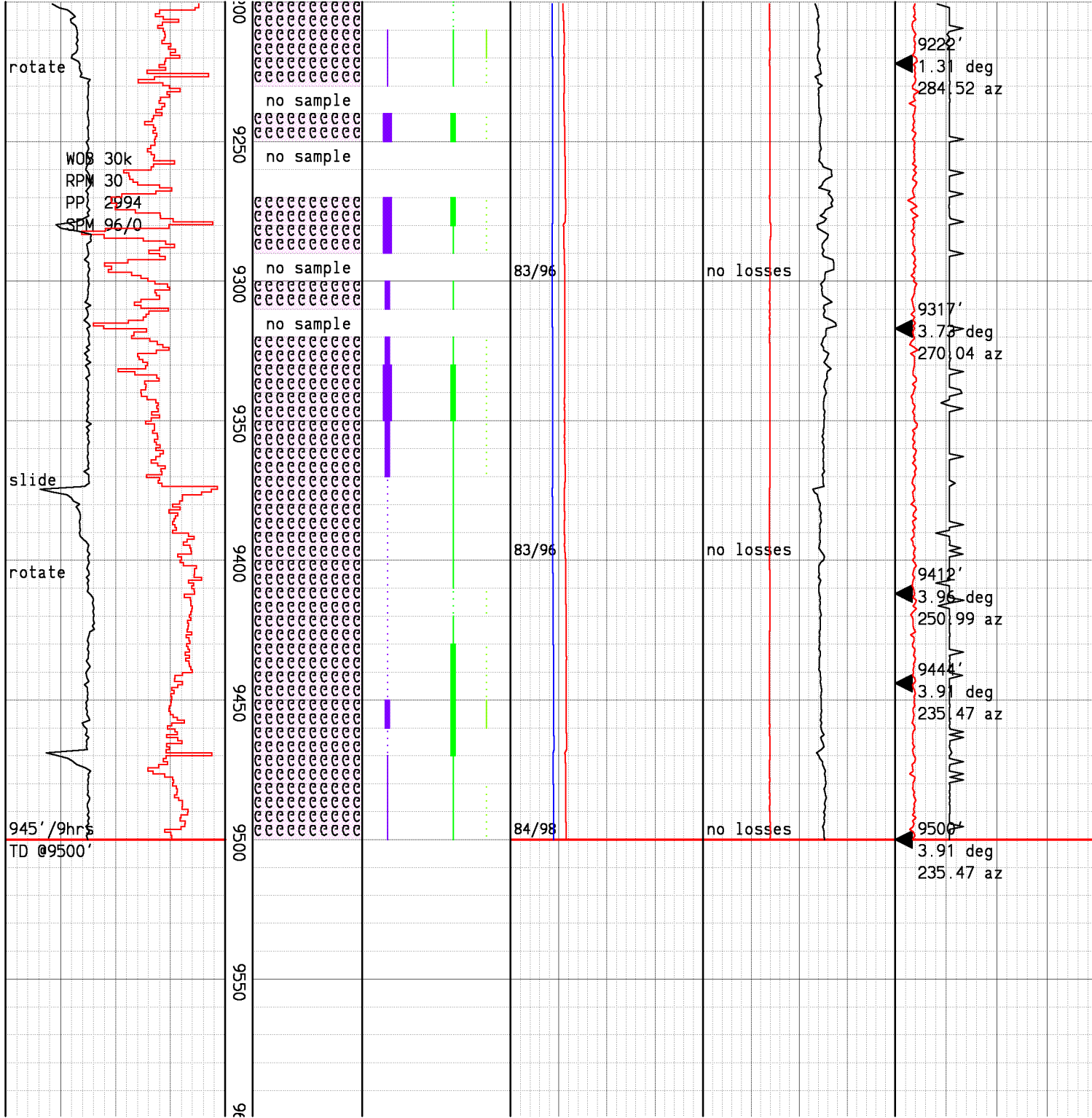
P00H,23.7' recovered,
Core f/8530-8540',P00H,
8.7' recovered.

Ream 10 5/8" t/8514',run
downhole logging:temp 321,
ream 10 5/8" t/8540',cool
well,continue logging,drill
ahead f/8540'-8544'.

Run 7" 41# TN110SS casing
w/fiber optic cable
f/surface t/8508'.

Drill ahead 10' w/5.75"
bit,perform extended
leak off test,P00H for
5.75" bit & directional
assembly.

Granodiorite:lt-md gry,blk,
wht,hd-v hd,ang-sub ang chip
sz avg ~1mm,com-abun clr qtz,
com-abun biotite,r-tr hem,r-
tr yel epid,r chlor.



Granodiorite:lt-md gry,blk,
wht,hd-v hd,subang-ang chip
sz avg ~1mm,occ 2-5mm,com-
abun clr qtz,com-abun
biotite,tr-com calc vng,r-mnr
chlor,r-tr yel epid,loc mnr
red/brn mica.

Granodiorite:lt-md gry,blk,
wht,hd-v hd,ang-sub ang chip
sz avg ~1mm,com-abun clr qtz,
com-abun biotite,tr-mnr
chlor,r calc vng,r-tr yel
epid.

T.D. University of Utah
FORGE 78B-32 at 9500' on
7/29/21.Leave hole open
below 7" shoe.

9222'
1.31 deg
284.52 az

9317'
3.73 deg
270.04 az

9412'
3.95 deg
250.99 az

9444'
3.91 deg
235.47 az

9500'
3.91 deg
235.47 az