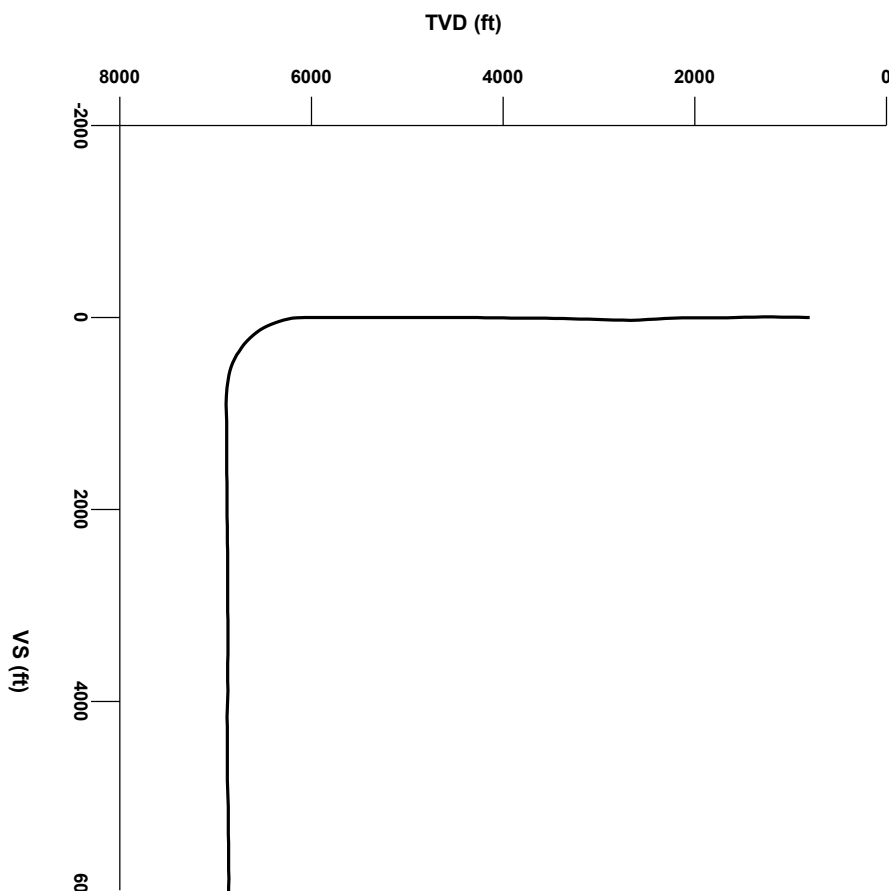


LOG created using LPLLOT VH Version 3.0, June 05, 2013, Copyright (C) 1999-2009 Pason Systems Corp.

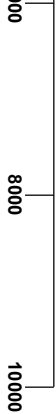
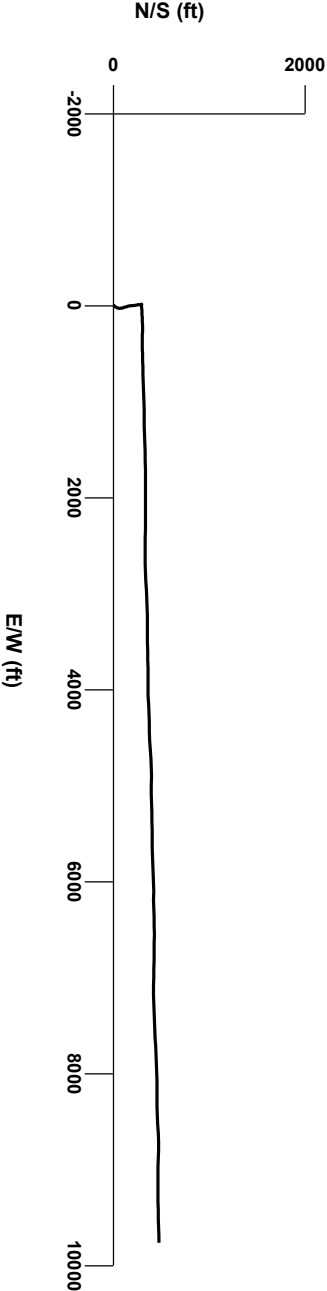
OPERATOR: NOBLE ENERGY INC
WELL: SHABLE USX PC AB11-63-1HNL
LOCATION: SEC11 T7N R64W
COUNTY: WELD
STATE: COLORADO
SPOT: 698' FSL, 250' FWL
ELEVATION: 4818'GL, 4834'KB
FIELD: WATTENBERG
SPUD DATE: 5/20/13
TD DATE: 6/2/13
DATES LOGGED: 5/21/13 - 6/2/13
DEPTHS LOGGED: 802'- 16399'
GEOLOGISTS: G MYERS, T STOCKWELL, C WARREN
DRILLING FLUID: LSND
DRILLING RIG: PRECISION 828
API: 05-123-36701
LOG TYPE: HORIZONTAL
SCALE: 1:240 (5 inches per 100 feet)
REMARKS: WELLSITE GEOLOGICAL SERVICES PROVIDED BY COLUMBINE LOGGING, INC.

LOG CONTINUES FROM FILE: Shable USX PC AB11-63-1HNL Vert.lplot



Survey Elevation

Survey Plan



LITHOLOGIES

Chalk

Marl

Sandstone

Shaly Sandstone

Silty Shale

ENGINEERING SYMBOLS

Bit Change

Connection Gas

Reverse Fault

Casing

Arrow

Arrow

Casing

Midnight Depth

Connection

Normal Fault

DEPTH (FEET)

6040

50

60

70

80

90

6100

10

20

30

362u

30

40

50

6

GAS

0

UNITS

2000

C1

0

PPM

200000

C2

0

PPM

200000

C3

0

PPM

200000

C4

0

PPM

200000

ROP

0

MIN/FT

5

SLIDE/ROTATE

BIT #2

SMITH

SDI, 8.75"

SER# JG9983

IN @ MD 792'

WOB 16

RPM 35

PP 2370

SPM 140

COLUMBINE LOGGING, INC.

RIGGED UP AND READY

ON 5/20/13

MANNED 2-PERSON LOGGING

WITH BLOODHOUND GAS

CHROMATOGRAPH UNIT #0331

LOG CONTINUES FROM FILE:

Shable USX PC AB11-63-1HNL Vert/plot

OIL SHOW

T F G

7000

ft

6000

GAMMA RAY

0

API

200

CUTTINGS

LITHOLOGY

MD 6085'

INC 0.8°

AZI 116.3°

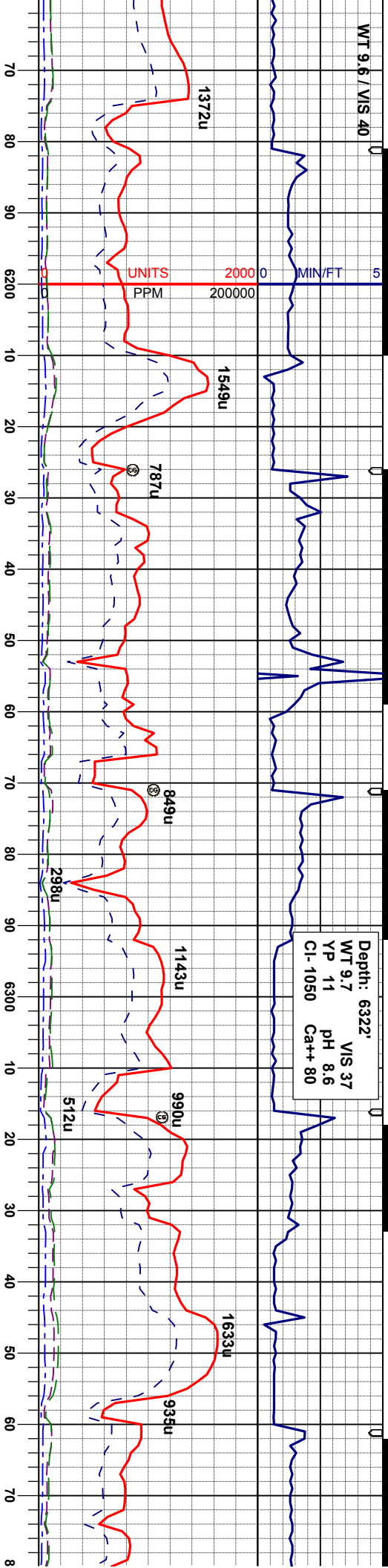
TVD 6067.1'

SLTYSH: lt-mgy- gybrn, occ sbbiky, tr ply, sft- mfirm, gt calc, grdg- shyss, occ wh- lty

SAMPLE PHOTOS

WT 9.6 / VIS 40

Depth: 6322'
WT 9.7 VIS 37
YP 11 pH 8.6
Cl- 1050 Ca++ 80



BEGIN 30' SAMPLES
60' DESCRIPTIONS

MD 6175'
INC 4.4°
AZI 81.0°
TVD 6157.0'

MD 6220'
INC 8.3°
AZI 77.3°
TVD 6201.8'

MD 6265'
INC 12.5°
AZI 82.0°
TVD 6246.0'

MD 6310'
INC 15.8°
AZI 79.8°
TVD 6289.6'

MD 6355'
INC 17.5°
AZI 82.2°
TVD 6332.8'

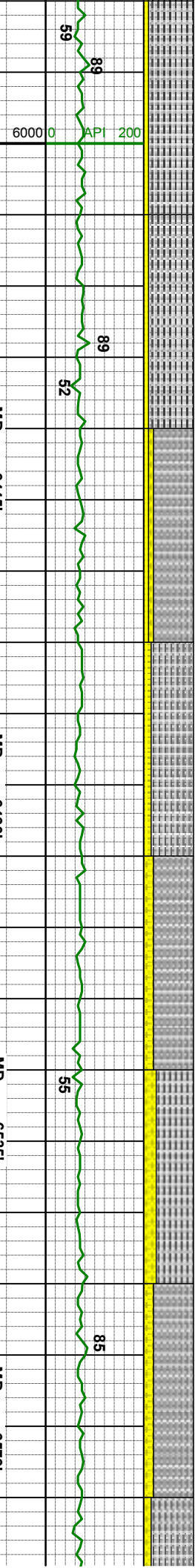
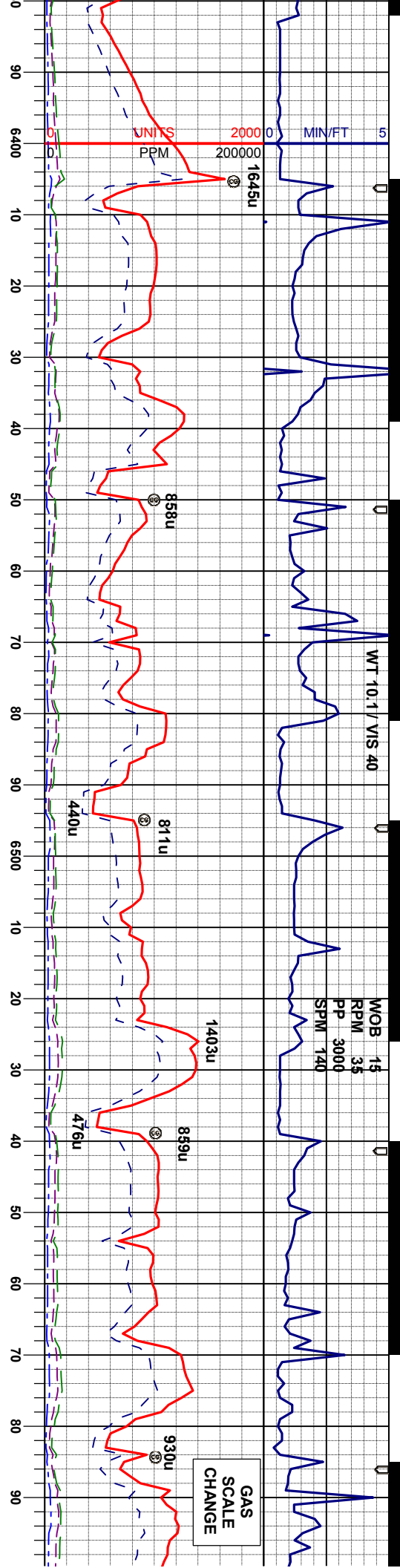
dk gy sbply-
bck, tr sdy ip, sl
gy s&p tgr ss

SLTYSH: lt-mgy- gybrn, occ dk gy sbply-
sbdky, tr pily, sft- mfirm, gt txt, tr sdy ip, sl
calc, grdg- shyss, occ wh- llyy s&p tgr ss

SLTYSH: lt-mgy- gybrn, occ dk gy sbply-
sbdky, tr pily, sft- mfirm, gt txt, tr sdy ip, sl
calc, grdg- shyss, occ wh- llyy s&p tgr ss

SLTYSH: lt-mgy- gybrn, occ dk gy sbply-
sbdky, tr pily, sft- mfirm, gt txt, tr sdy ip, sl
calc, grdg- shyss, occ wh- llyy tgr ss





MD 6445'
INC 21.8°
AZI 88.4°
TVD 6417.9'

MD 6490'
INC 25.3°
AZI 87.1°
TVD 6459.1'

MD 6535'
INC 29.7°
AZI 87.3°
TVD 6499.0'

MD 6579'
INC 33.4°
AZI 88.6°
TVD 6536.5'

TVD SCALE CHANGE

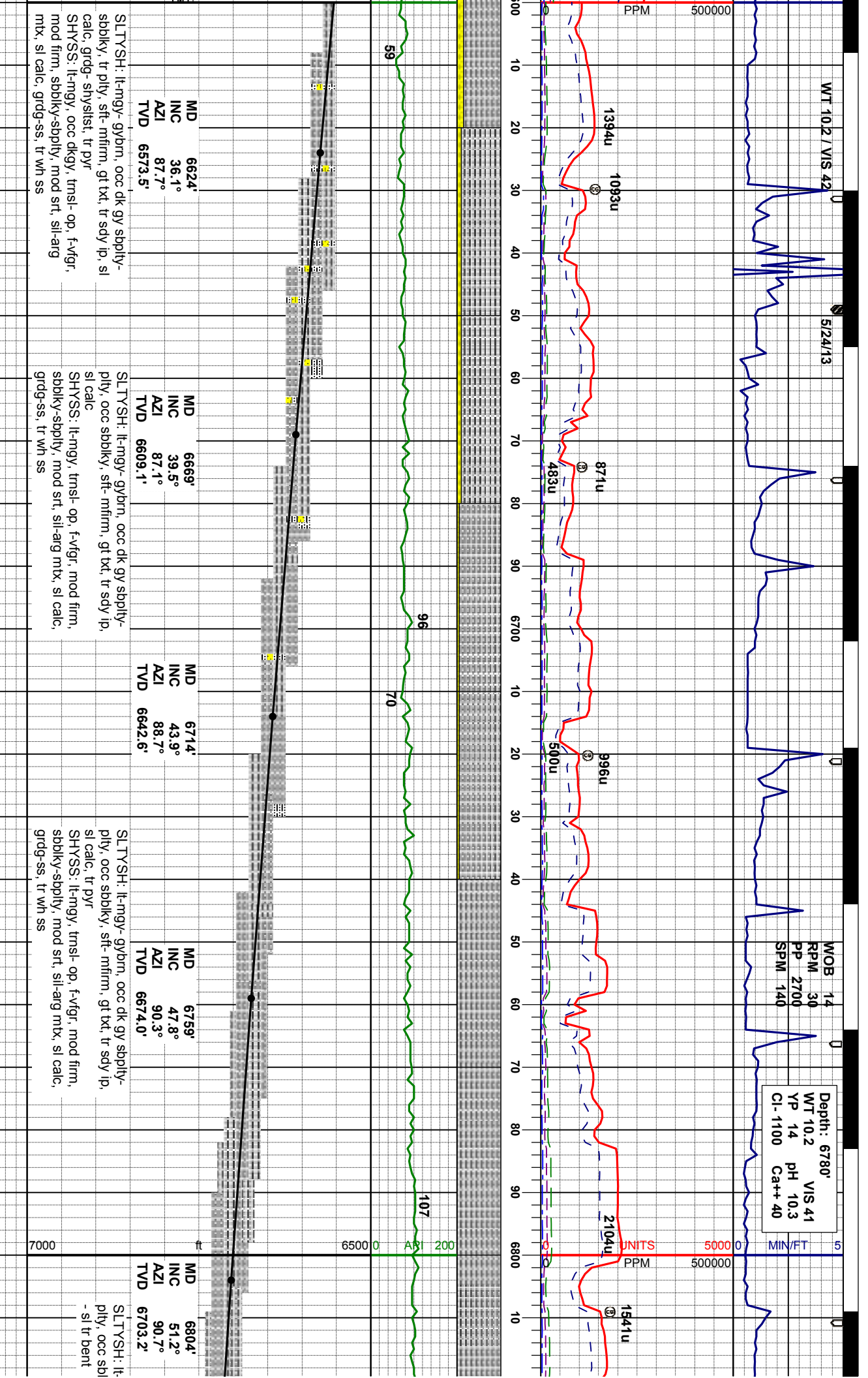
MD 6400'
INC 18.1°
AZI 87.5°
TVD 6375.6'

SLTYSH: lt-mgy- gybrn, occ dk gy sbply-
sblky, tr ply, sft- mfirm, gt txt, tr sdy ip, sl
calc, grdg- shyss, occ wh- lgy fgr ss, tr pyr

SLTYSH: lt-mgy- gybrn, occ dk gy sbply-
sblky, tr ply, sft- mfirm, gt txt, tr sdy ip, sl
calc, grdg- shyslst, tr pyr
SHYSS: lt-mgy, occ dkgy, tmsl- op, f-vfgr,
mod firm, sblky-sbply, mod srt, sil-arg
mtx, sl calc, grdg-ss, tr wh ss

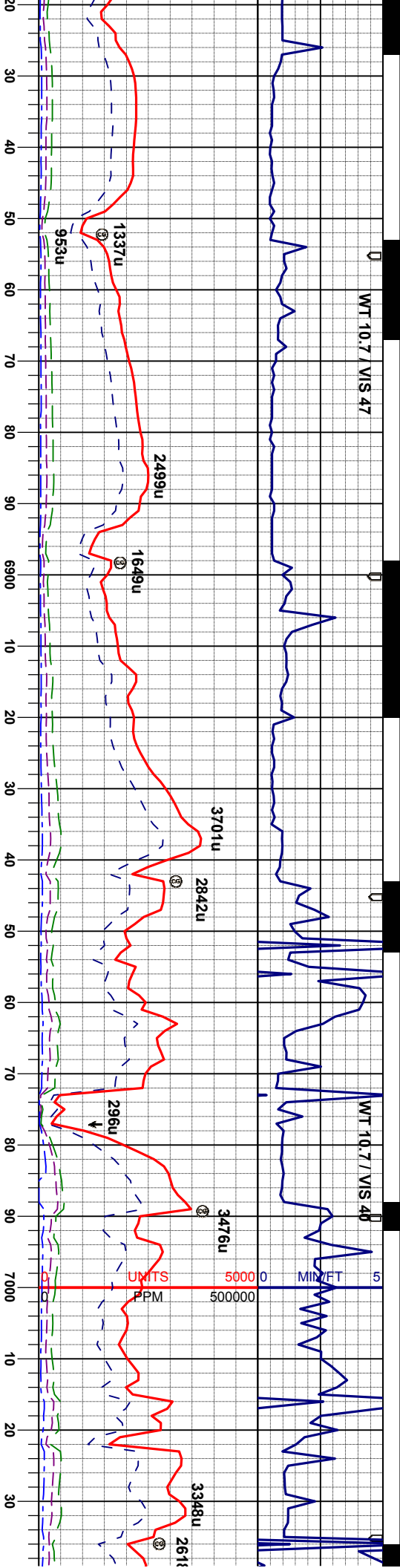
SLTYSH: lt-mgy- gybrn, occ dk gy sbply-
sblky, tr ply, sft- mfirm, gt txt, tr sdy ip, sl
calc, grdg- shyslst, tr pyr
SHYSS: lt-mgy, occ dkgy, tmsl- op, f-vfgr,
mod firm, sblky-sbply, mod srt, sil-arg
mtx, sl calc, grdg-ss, tr wh ss





WT 10.7 / VIS 47

WT 10.7 / VIS 48



MD 6849'
INC 54.2°
AZI 90.5°
TVD 6730.5'

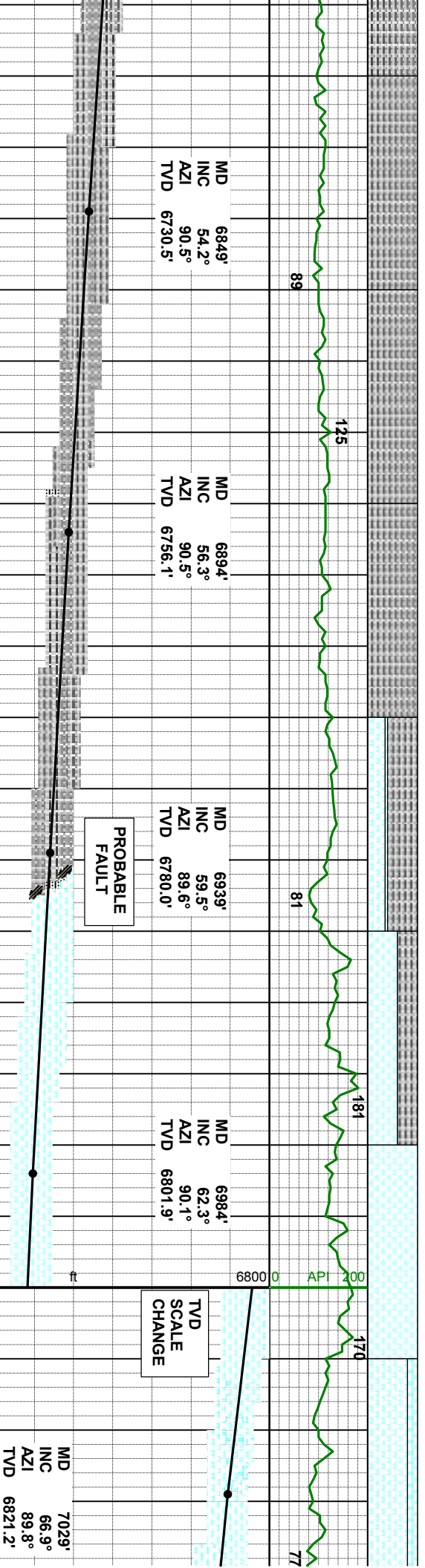
MD 6894'
INC 56.3°
AZI 90.5°
TVD 6756.1'

MD 6939'
INC 59.5°
AZI 89.6°
TVD 6780.0'

MD 6984'
INC 62.3°
AZI 90.1°
TVD 6801.9'

PROBABLE
FAULT

TVD
SCALE
CHANGE

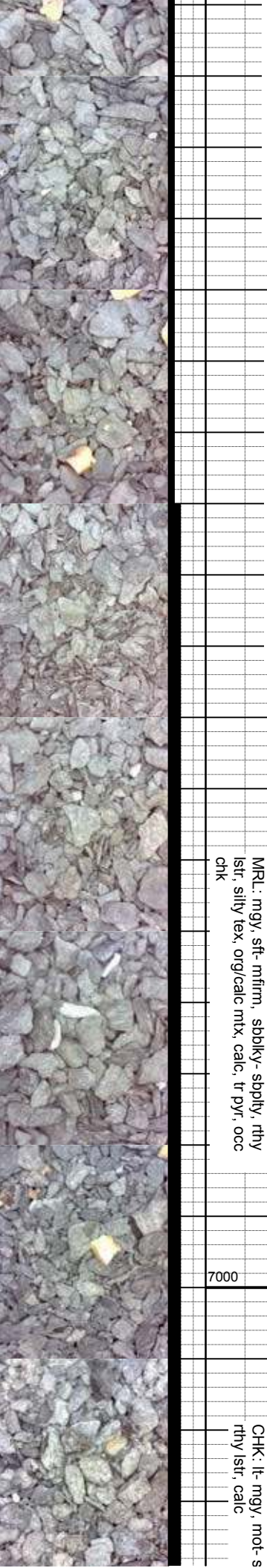


SLTYSH: lt-mgy- gybrn, occ dk gy sbply-
ply, occ sbkly, sft- mfirm, gt txt, vsi calc, tr
bent

SLTYSH: lt-mgy- gybrn, occ dk gy sbply-
ply, occ sbkly, sft- mfirm, gt txt, vsi calc, tr
bent
MRL: mgy, sft- mfirm, sbkly- sbply, rthy
lstr, silty tex, org/calc mt, calc, tr pyr, occ
chk

MD 7029'
INC 66.9°
AZI 89.8°
TVD 6821.2'

MRL: m- dkgy, sft- n
rthy lstr, silty tex, org
bent
CHK: lt-mgy, mot-s
rthy lstr, calc



MOB 14
RPM 30
PP 2700
SPM 140

WT 10.5 / VIS 44

MOB 15
RPM 35
PP 3180
SPM 140

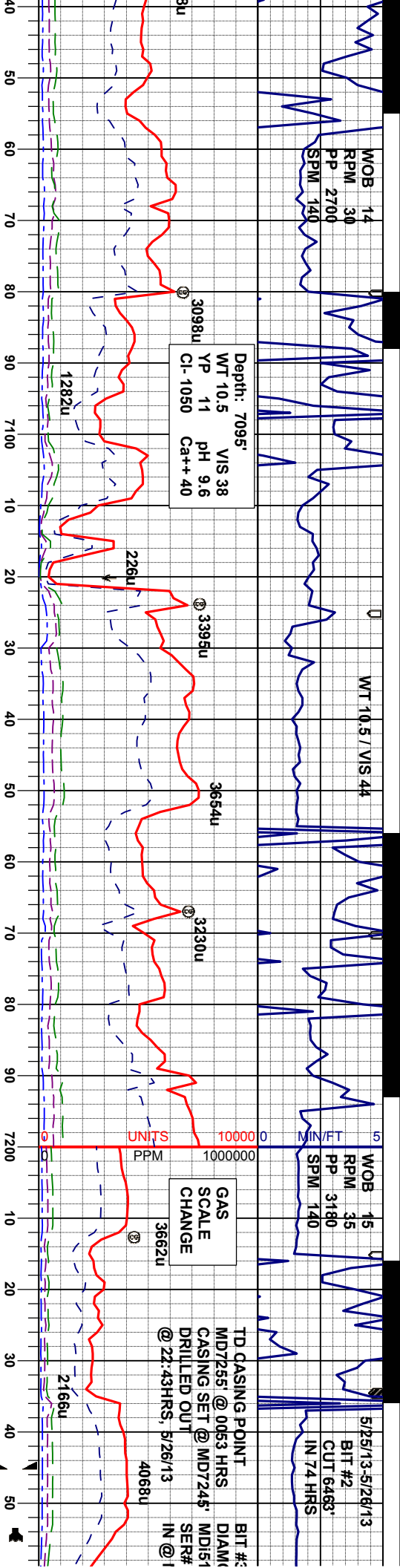
5/25/13-5/26/13
BIT #2
CUT 6463"
IN 74 HRS

Depth: 7095'
WT 10.5 VIS 38
YP 11 pH 9.6
CI-1050 Ca++ 40

GAS
SCALE
CHANGE

TD CASING POINT
MD7255' @ 0053 HRS
CASING SET @ MD7245'
DRILLED OUT
@ 22:43HRS, 5/26/13

BIT #3
DIAM
SER#
IN @ 1



NIOBRARA B CHALK
LOGGER TOP
7149' MD, 6858' TVD

MD 7074'
INC 70.9°
AZI 88.4°
TVD 6837.4'

MD 7119'
INC 74.6°
AZI 88.0°
TVD 6850.8'

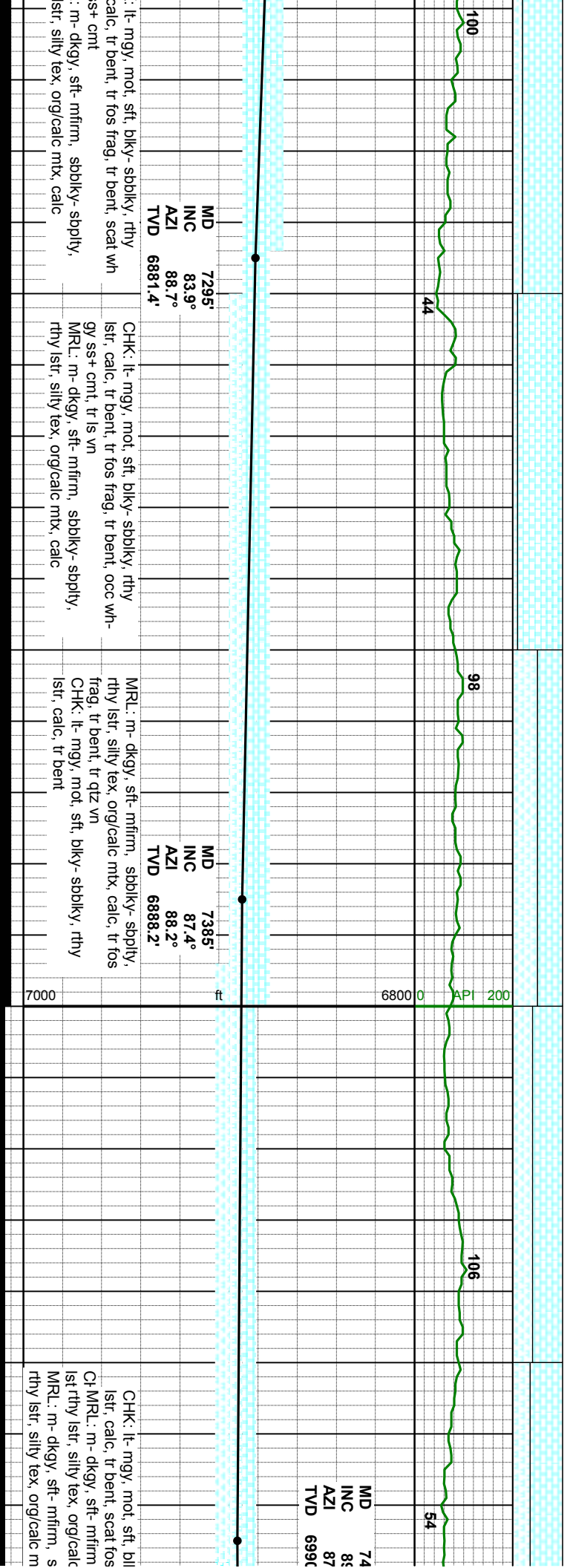
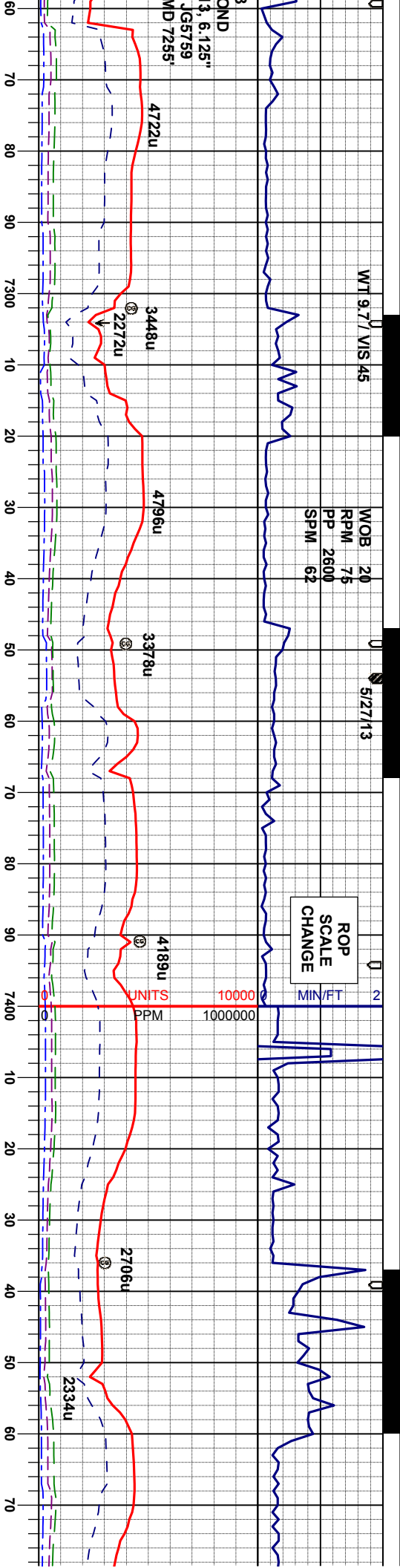
MD 7164'
INC 77.0°
AZI 87.9°
TVD 6861.8'

MD 7204'
INC 81.0°
AZI 88.9°
TVD 6869.4'

firm, sbblky- sbply,
g/calc mtx, calc, sl tr
tri, sft, blkly- sbblky,
MRL: m- dkgy, sft- mfirm, sbblky- sbply,
rthy lstr, silty tex, org/calc mtx, calc, tr bent
CHK: lt- mgy, mot, sft, blkly- sbblky, rthy
lstr, calc, tr bent, tr fos frag
MRL: m- dkgy, sft- mfirm, sbblky- sbply,
rthy lstr, silty tex, org/calc mtx, calc
CHK: lt- mgy, mot, sft, blkly- sbblky, rthy
lstr, calc, tr bent, tr fos frag
MRL: m- dkgy, sft- mfirm, sbblky- sbply,
rthy lstr, silty tex, org/calc mtx, calc
CHK: lt- mgy, mot, sft, blkly- sbblky, rthy
lstr, calc, tr bent, tr fos frag
MRL: m- dkgy, sft- mfirm, sbblky- sbply,
rthy lstr, silty tex, org/calc mtx, calc

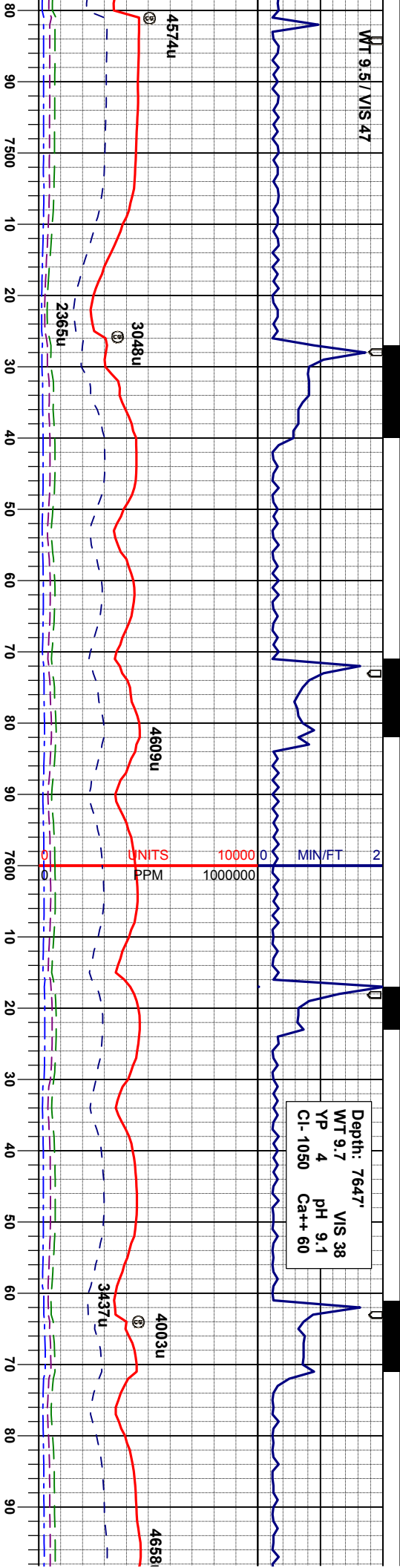
7000





WT 9.5 / VIS 47

Depth: 7647'
WT 9.7
YP 4
Cl- 1050
pH 9.1
Ca++ 60
VIS 38



MD 7565'
INC 92.2°
AZI 88.9°
TVD 6889.3'

MD 7655'
INC 91.5°
AZI 88.7°
TVD 6886.4'

MRL: m- dkgy, sft- mfirm, sbblky- sbply, rthy lstr, silty tex, org/calc mtz, calc, tr bent, scat fos frag
CHK: lt- mgy, mot, sft, blk- sbblky, rthy lstr, calc

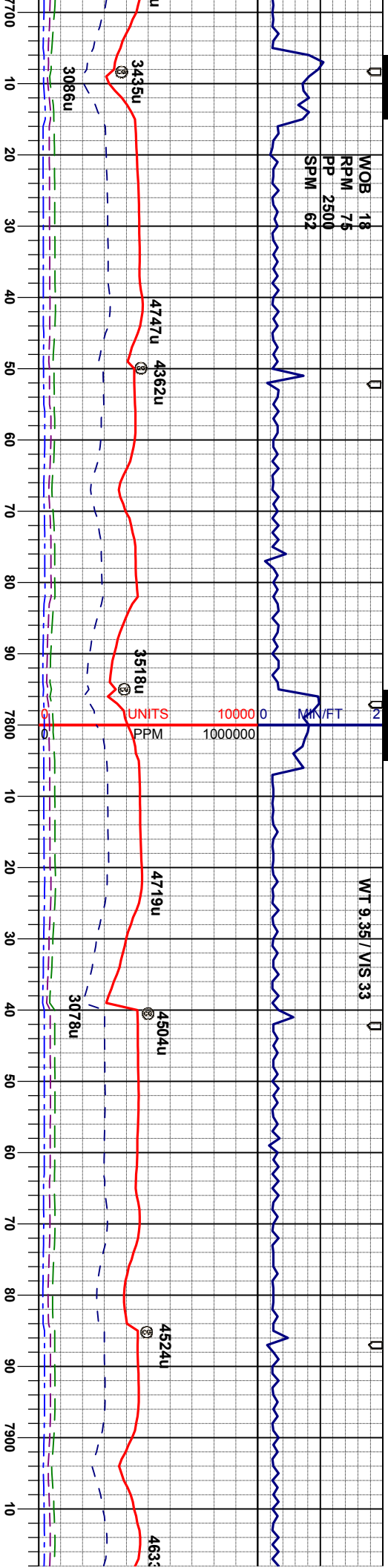
MRL: m- dkgy, sft- mfirm, sbblky- sbply, rthy lstr, silty tex, org/calc mtz, calc, tr bent, scat fos frag
CHK: lt- mgy, mot, sft, blk- sbblky, rthy lstr, calc

MRL: m- dkgy, sft- mfirm, sbblky- sbply, rthy lstr, silty tex, org/calc mtz, calc, occ bent, tr fos frag
CHK: lt- mgy, mot, sft, blk- sbblky, rthy lstr, calc



MOB 18
RPM 75
PP 2500
SPM 62

WT 9.35 / VIS 33



MD 7744'
INC 90.5°
AZI 89.4°
TVD 6884.8'

MD 7834'
INC 89.8°
AZI 89.3°
TVD 6884.6'

MD 7834'
INC 89.8°
AZI 89.3°
TVD 6884.6'

CHK: lt- mgy, mot, sft, blk- sbblky, rthy
lstr, calc
MRL: m- dkgy, sft- mfirm, sbblky- sbply,
rthy lstr, silty tex, orgcalc mt, calc, occ
bent, tr fos frag

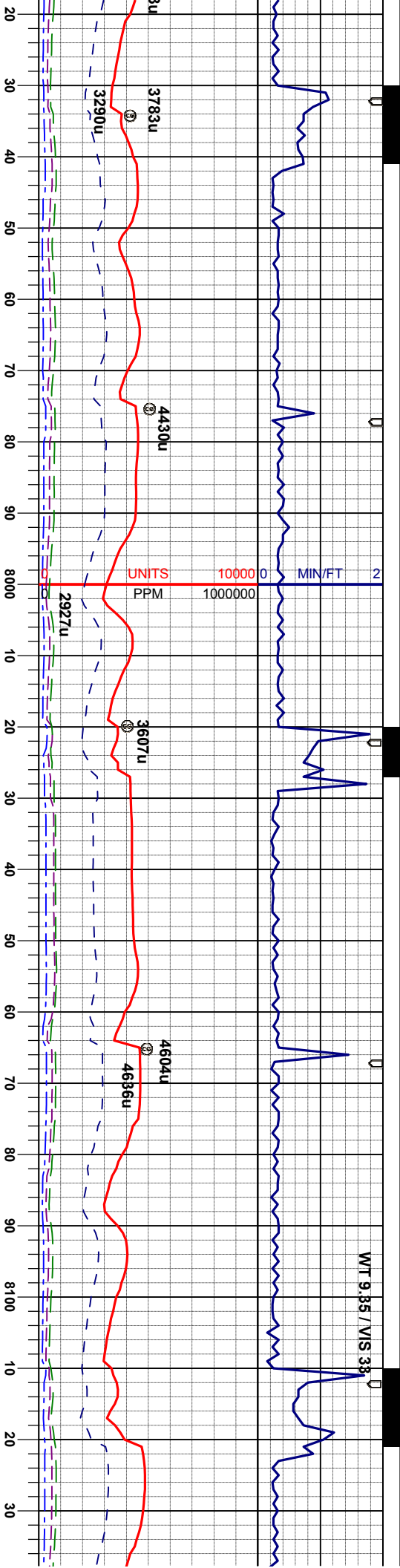
CHK: lt- mgy, mot, sft, blk- sbblky, rthy
lstr, calc
MRL: m- dkgy, sft- mfirm, sbblky- sbply,
rthy lstr, silty tex, orgcalc mt, calc, occ
bent, tr fos frag

MRL: m- dkgy, sft- mfirm, sbblky- sbply,
rthy lstr, silty tex, orgcalc mt, calc, scat
bent, tr fos frag
CHK: lt- mgy, mot, sft, blk- sbblky, rthy
lstr, calc

MRL: m- dkgy, sft- mfirm, sbblky- sbply,
rthy lstr, silty tex, orgcalc mt, calc, scat
bent, tr fos frag
CHK: lt- mgy, mot, sft, blk- sbblky, rthy
lstr, calc

MRL: m- dkgy, sft- mfirm, sbblky- sbply,
rthy lstr, silty tex, orgcalc mt, calc, scat
bent, tr fos frag
CHK: lt- mgy, mot, sft, blk- sbblky, rthy
lstr, calc

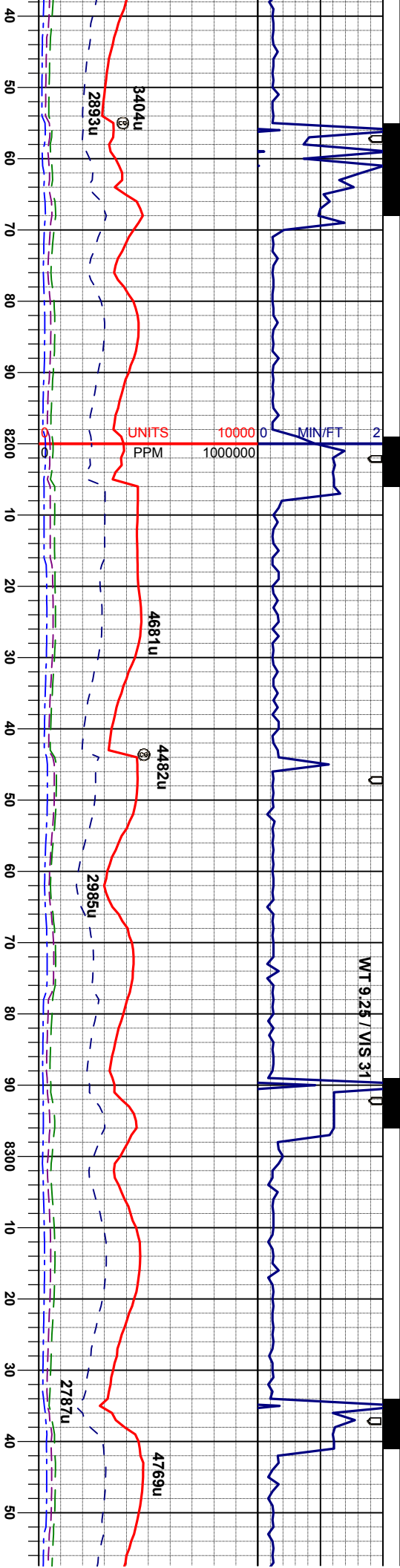




7924'		8014'		8104'	
90.7°		89.7°		90.2°	
88.4°		88.2°		87.7°	
6884.2'		6883.9'		6884.0'	

75		108		56		12	
6800		6800		6800		6800	
API		API		API		API	
200		200		200		200	
7000		7000		7000		7000	
ft		ft		ft		ft	
, sft- mfirm, sbblky- sbply,		MR.L: m- dkgy, sft- mfirm, sbblky- sbply,		MR.L: m- dkgy, sft- mfirm, sbblky- sbply,		CHK: lt- mgy, mot- str, sft, bly- sbi	
ex, org/calc mt, calc, scat		rthy lst, silty tex, org/calc mt, calc, occ		rthy lst, silty tex, org/calc mt, calc, occ		rthy lst, calc	
9		bent, tr fos frag		bent, occ fos frag		MR.L: m- dkgy, sft- mfirm, sbblky- s	
mot, sft, bly- sbblky, rthy		CHK: lt- mgy, mot, sft, bly- sbblky, rthy		CHK: lt- mgy, mot, sft, bly- sbblky, rthy		rthy lst, silty tex, org/calc mt, calc,	
lstr, calc		lstr, calc		lstr, calc		occ fos frag	





MD 8194'
INC 90.5°
AZI 89.4°
TVD 6883.4'

CHK: lt-mgy, mot-stri, sft, blk- sbbly,
rthy lstr, calc
MRL: m-dkgy, sft- mfirm, sbbly- sbbly,
rthy lstr, silty tex, org/calc mtx, calc, tr bent,
occ fos frag

MD 8284'
INC 90.9°
AZI 88.7°
TVD 6882.3'

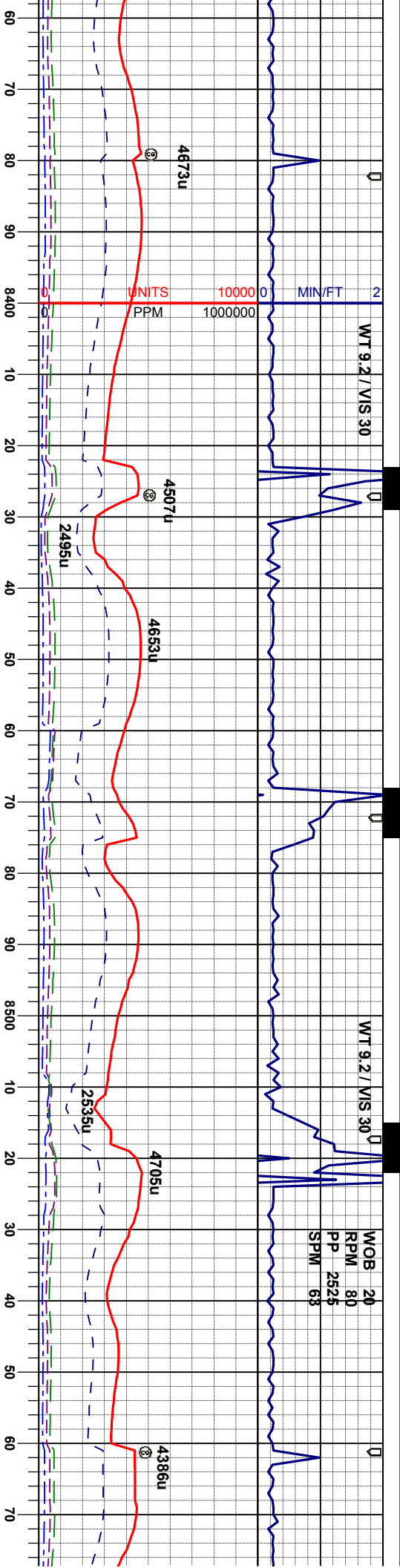
CHK: lt-mgy, mot-stri, sft, blk- sbbly,
rthy lstr, calc
MRL: m-dkgy, sft- mfirm, sbbly- sbbly,
rthy lstr, silty tex, org/calc mtx, calc, tr bent,
occ fos frag

CHK: lt-mgy, mot-stri, sft, blk- sbbly,
rthy lstr, calc
MRL: m-dkgy, sft- mfirm, sbbly- sbbly,
rthy lstr, silty tex, org/calc mtx, calc, tr bent,
occ fos frag

MRL: m-dkgy, sft- mfirm, sbbly- sbbly,
rthy lstr, silty tex, org/calc mtx, calc, occ
bent, abnt fos frag
CHK: lt-mgy, mot, sft, blk- sbbly, rthy
lstr, calc

MR
rthy
ber
CH
lstr





MD 8374'
INC 90.8°
AZI 89.6°
TVD 6881.0'

MD 8463'
INC 90.4°
AZI 90.0°
TVD 6880.1'

MD 8553'
INC 88.9°
AZI 89.3°
TVD 6880.6'

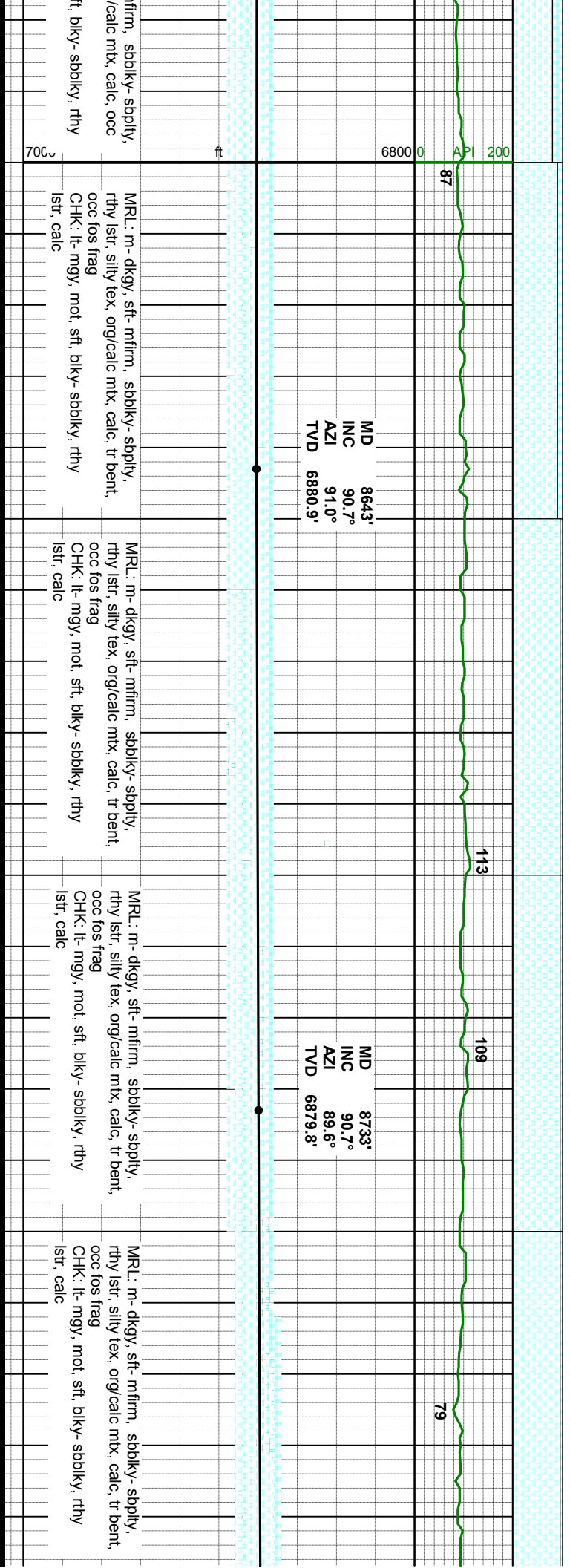
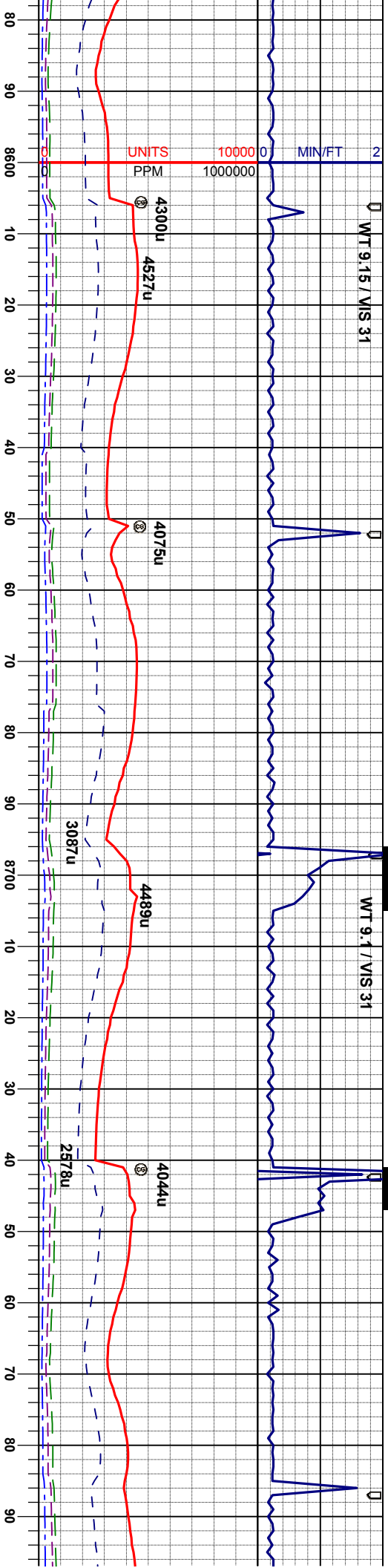
L: m- dkgy, sft- mfirm, sbblky- sbply,
/str, silty tex, org/calc mtx, calc, occ
it, occ fos frag
CHK: lt- mgy, mot, sft, blk- sbblky, rthy
calc

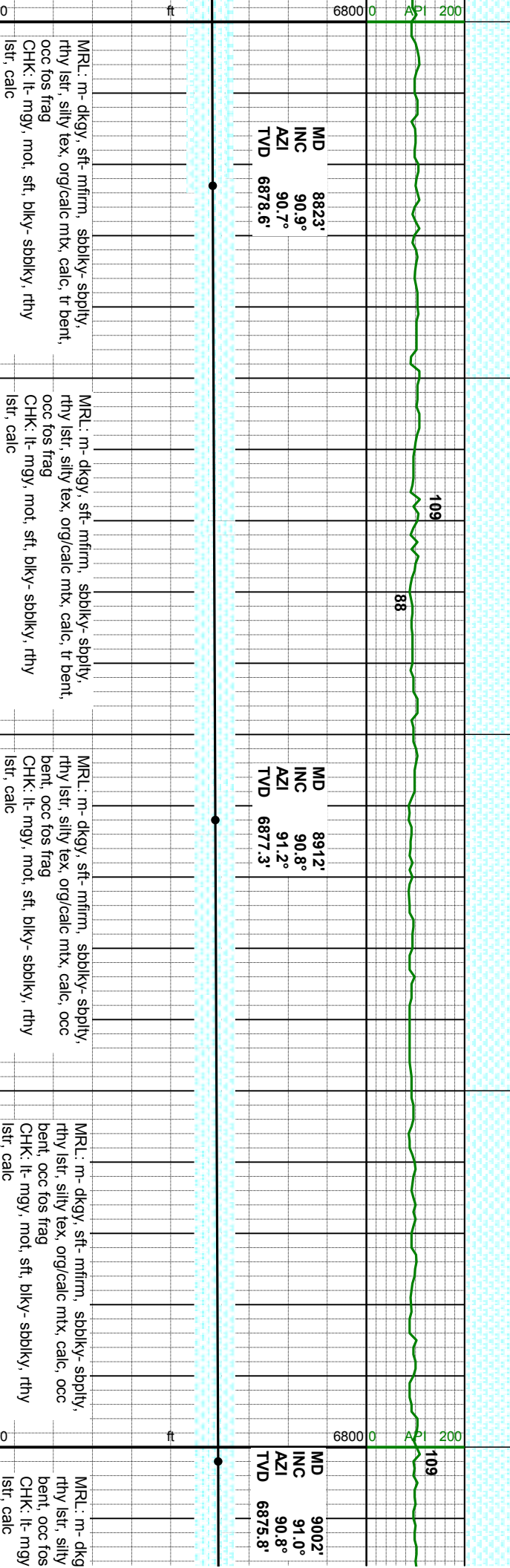
MRL: m- dkgy, sft- mfirm, sbblky- sbply,
rthy lstr, silty tex, org/calc mtx, calc, occ
bent, occ fos frag
CHK: lt- mgy, mot, sft, blk- sbblky, rthy
lstr, calc

MRL: m- dkgy, sft- mfirm, sbblky- sbply,
rthy lstr, silty tex, org/calc mtx, calc, tr bent,
occ fos frag
CHK: lt- mgy, mot, sft, blk- sbblky, rthy
lstr, calc

MRL: m- dkgy, sft- mfirm, sbblky- sbply,
rthy lstr, silty tex, org/calc mtx, calc, it bent,
occ fos frag
CHK: lt- mgy, mot, sft, blk- sbblky, rthy
lstr, calc

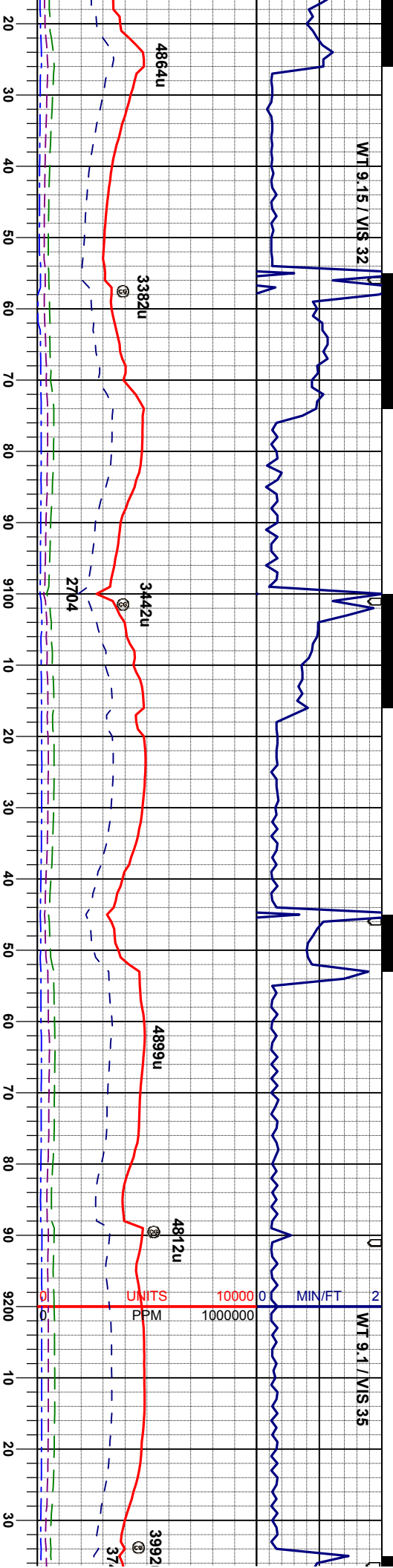






WT 9.15 / VIS 32

WT 9.1 / VIS 35



MD 9092'
INC 90.0°
AZI 91.2°
TVD 6875.1'

MD 9182'
INC 89.6°
AZI 89.4°
TVD 6875.4'

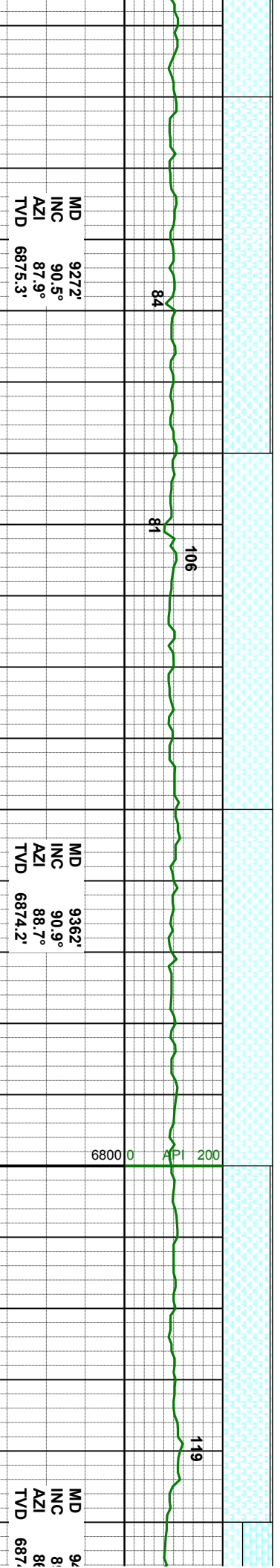
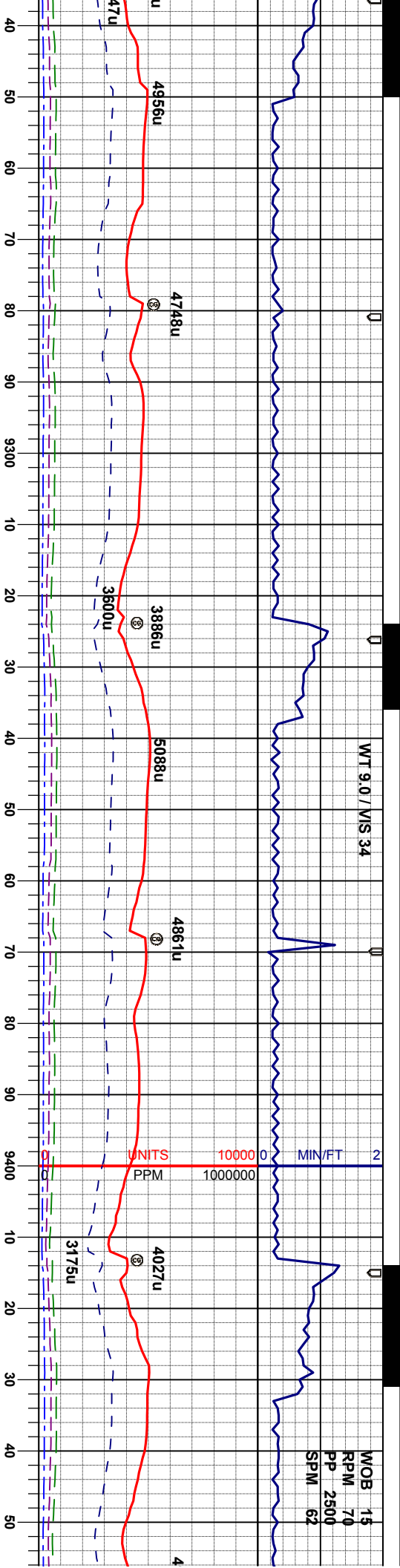
MRL: m- dkgy, sft- mfirm, sbbiky- sbply,
rthy lstr, silty tex, org/calc mt, calc, occ
bent, abd tos frag
CHK: lt- mgy, mot, sft, biky- sbbiky, rthy
lstr, calc

MRL: m- dkgy, sft- mfirm, sbbiky- sbply,
rthy lstr, silty tex, org/calc mt, calc, occ
bent, scat tos frag
CHK: lt- mgy, mot, sft, biky- sbbiky, rthy
lstr, calc

MRL: m- dkgy, sft- mfirm, sbbiky- sbply,
rthy lstr, silty tex, org/calc mt, calc, occ
bent, scat tos frag
CHK: lt- mgy, mot, sft, biky- sbbiky, rthy
lstr, calc

MRL: m- dkgy, sft- mfirm, sbbiky- sbply,
rthy lstr, silty tex, org/calc mt, calc, occ
bent, scat tos frag
CHK: lt- mgy, mot, sft, biky- sbbiky, rthy
lstr, calc





MRL: m- dkgy, sft- mfirm, sbblky- sbply, rthy lstr, silty tex, org/calc mtx, calc, occ bent, scat fos frag

MRL: m- dkgy, sft- mfirm, sbblky- sbply, rthy lstr, silty tex, org/calc mtx, calc, occ bent, occ fos frag, occ chk

MRL: m- dkgy, sft- mfirm, sbblky- sbply, rthy lstr, silty tex, org/calc mtx, calc, occ bent, occ fos frag, occ chk

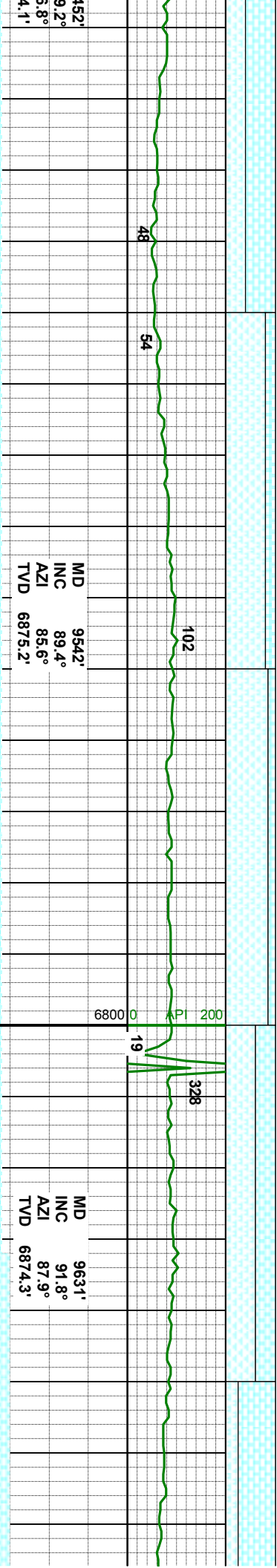
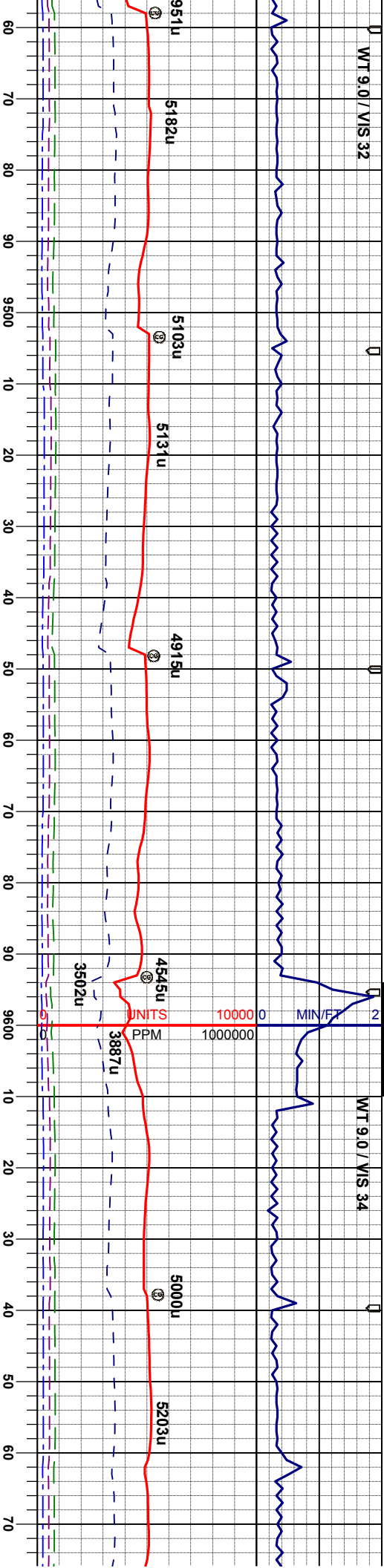
MRL: m- dkgy, sft- mfirm, sbblky- sbply, rthy lstr, silty tex, org/calc mtx, calc, occ bent, occ fos frag

CHK: lt- mgy, mot, sft, blk- sbblky, rthy lstr, calc



WT 9.0 / VIS 32

WT 9.0 / VIS 34



MD 9542'
INC 89.4°
AZI 85.6°
TVD 6875.2'

MD 9631'
INC 91.8°
AZI 87.9°
TVD 6874.3'

CHK: lt-mgy, mot, sft, blk- sbbkly, rthy
ist, calc, occ bent, occ fos frag
R.L: m-dkgy, sft- mfirm, sbbkly- sbspky,
any lstr, silty tex, org/calc mtx, calc

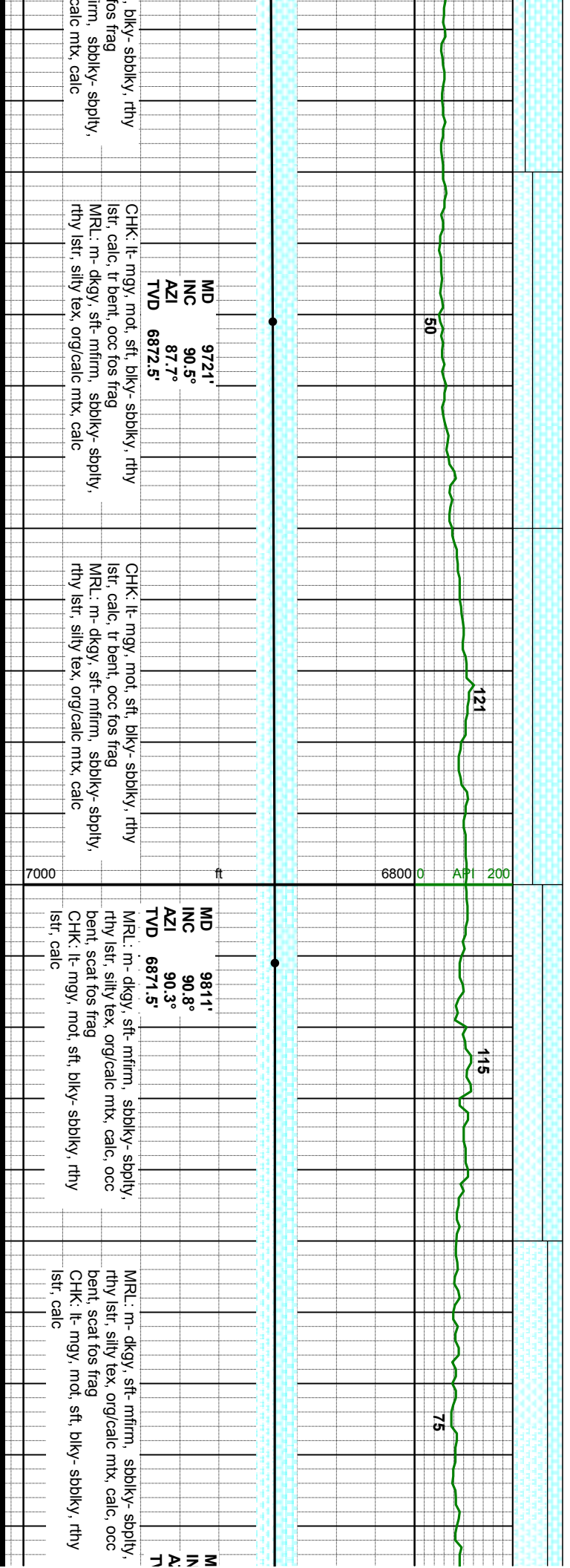
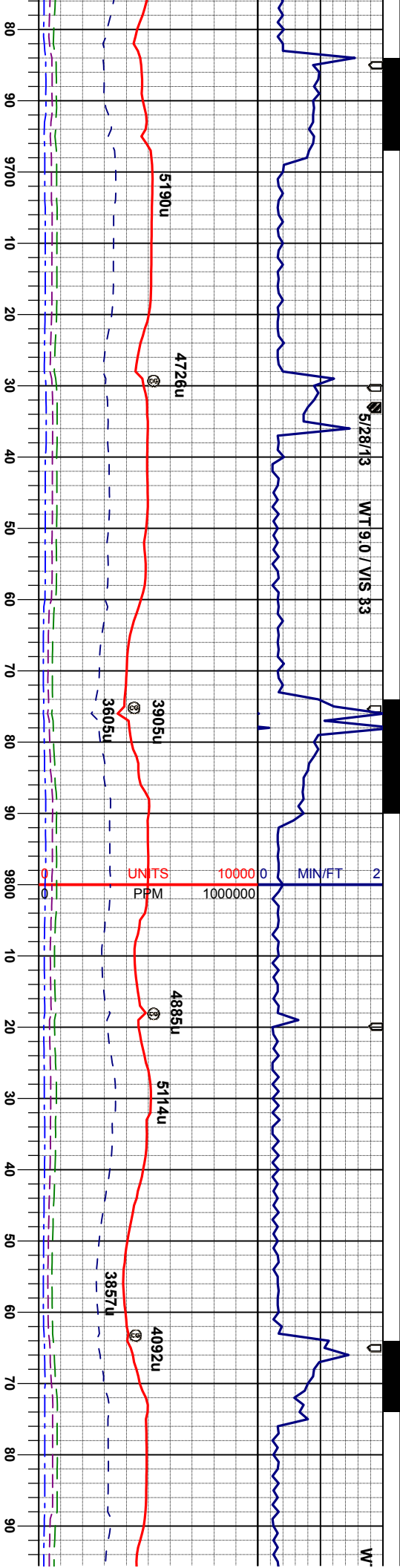
MR.L: m-dkgy, sft- mfirm, sbbkly- sbspky,
rthy lstr, silty tex, org/calc mtx, calc, occ
bent, occ fos frag
CHK: lt-mgy, mot, sft, blk- sbbkly, rthy
lstr, calc

MR.L: m-dkgy, sft- mfirm, sbbkly- sbspky,
rthy lstr, silty tex, org/calc mtx, calc, occ
bent, occ fos frag
CHK: lt-mgy, mot, sft, blk- sbbkly, rthy
lstr, calc

MR.L: m-dkgy, sft- mfirm, sbbkly- sbspky,
rthy lstr, silty tex, org/calc mtx, calc, occ
bent, occ fos frag
CHK: lt-mgy, mot, sft, blk- sbbkly, rthy
lstr, calc

CHK: lt-mgy, mot, sft
lstr, calc, tr bent, occ
MR.L: m-dkgy, sft- mfirm
rthy lstr, silty tex, org/calc





T 9.1 / VIS 34

0

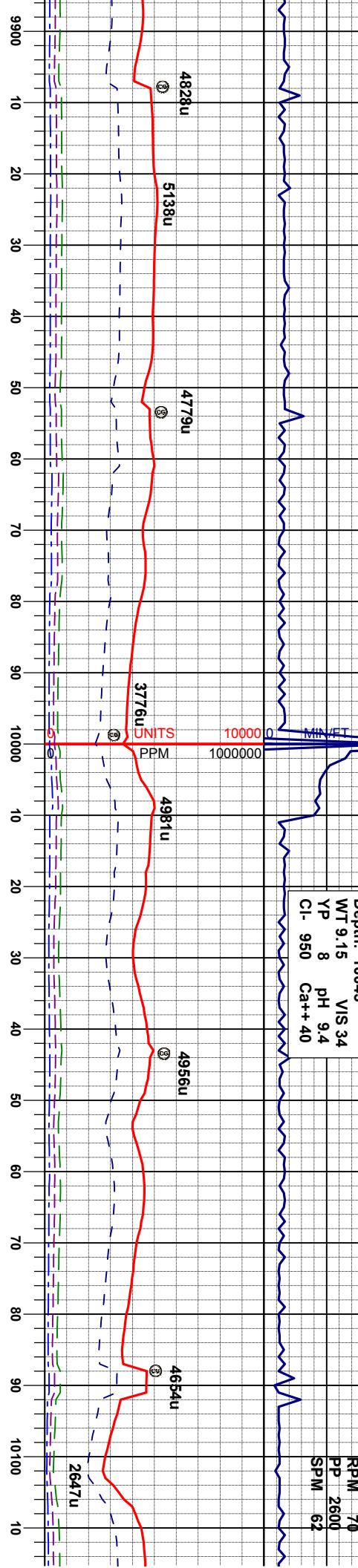
2

0

0

Depth: 10043'
WT 9.15 VIS 34
YP 8 pH 9.4
Cl- 950 Ca++ 40

WOB 15
RPM 70
PP 2600
SPM 62



D 9901'
C 89.1°
ZI 89.3°
VD 6871.5'

MD 9991'
INC 90.6°
AZI 89.8°
TVD 6871.8'

MD 10081'
INC 88.9°
AZI 89.4°
TVD 6872.2'

MRL: m- dkgy, sft- mfirm, sdbbly- sbply,
rthy lstr, silty tex, org/calc mtx, calc, occ
bent, scat fos frag
CHK: lt- mgy, mot, sft, blk- sbbly, rthy
lstr, calc

MRL: m- dkgy, sft- mfirm, sdbbly- sbply,
rthy lstr, silty tex, org/calc mtx, calc, occ
bent, scat fos frag
CHK: lt- mgy, mot, sft, blk- sbbly, rthy
lstr, calc

MRL: m- dkgy, sft- mfirm, sdbbly- sbply,
rthy lstr, silty tex, org/calc mtx, calc, occ
bent, scat fos frag
CHK: lt- mgy, mot, sft, blk- sbbly, rthy
lstr, calc

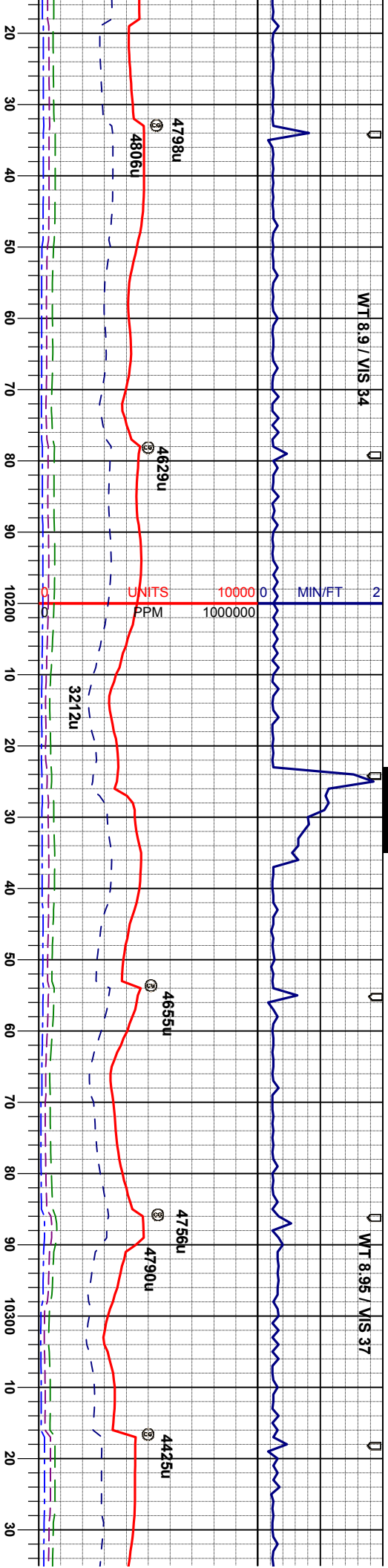
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rthy lstr, silty tex, org/calc mtx, calc, occ
bent, scat fos frag
CHK: lt- mgy, mot, sft, blk- sbbly, rthy
lstr, calc

MRL: m- d
rthy lstr, sil
bent, occ f
CHK: lt- m
lstr, calc



WT 8.9 / VIS 34

WT 8.95 / VIS 37



88

92

119

125

APL 200

6800

MD 10171'
INC 88.5°
AZI 89.3°
TVD 6874.2'

MD 10265'
INC 90.3°
AZI 88.2°
TVD 6875.2'

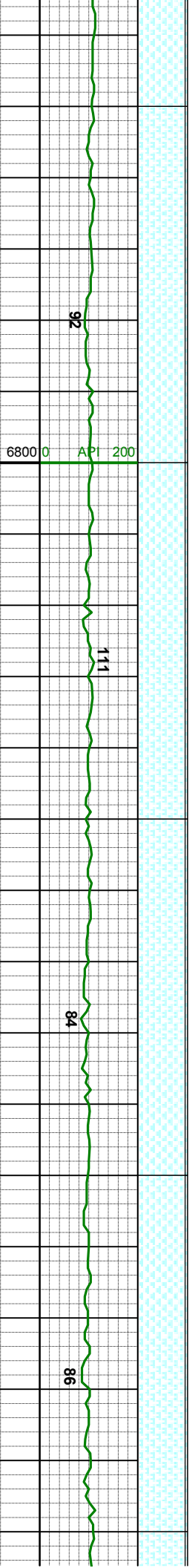
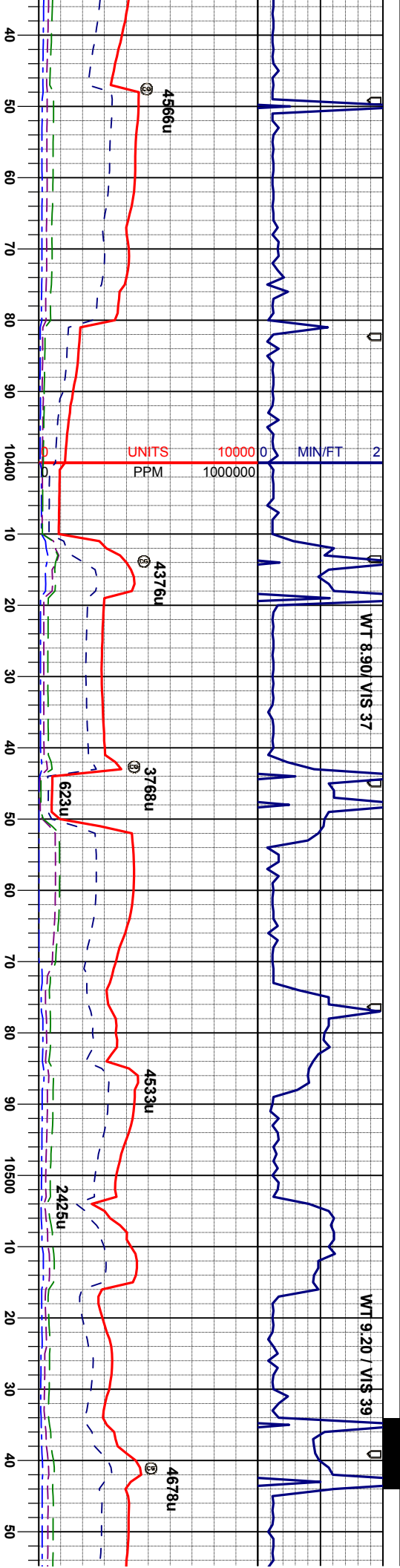
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bent, occ fos frag
CHK: lt - mgy, mot, sft, blk - sbbiky, rthy
lstr, calc

MRL: m - dkgy, sft - mfirm, sbbiky - sbply,
rthy lstr, silty tex, org/calc mt, calc, occ
bent, occ fos frag
CHK: lt - mgy, mot, sft, blk - sbbiky, rthy
lstr, calc

MRL: m - dkgy, sft - mfirm, sbbiky - sbply,
rthy lstr, silty tex, org/calc mt, calc, t bent,
occ fos frag
CHK: lt - mgy, mot, sft, blk - sbbiky, rthy
lstr, calc

MRL: m - dkgy, sft - mfirm, sbbiky - sbply,
rthy lstr, silty tex, org/calc mt, calc, t bent,
occ fos frag
CHK: lt - mgy, mot, sft, blk - sbbiky, rthy
lstr, calc

ky, sft - mfirm, sbbiky - sbply,
ly tex, org/calc mt, calc, occ
os frag
gy, mot, sft, blk - sbbiky, rthy



MD 10359'
INC 91.0°
AZI 88.6°
TVD 6874.1'

MRL: m-dkgy, sft-mfirm, sbbiky-sbply,
rthy lstr, silty tex, org/calc mtx, calc, occ
bent, occ fos frag
CHK: lt-mgy, mot, sft, blk- sbbiky, rthy
lstr, calc

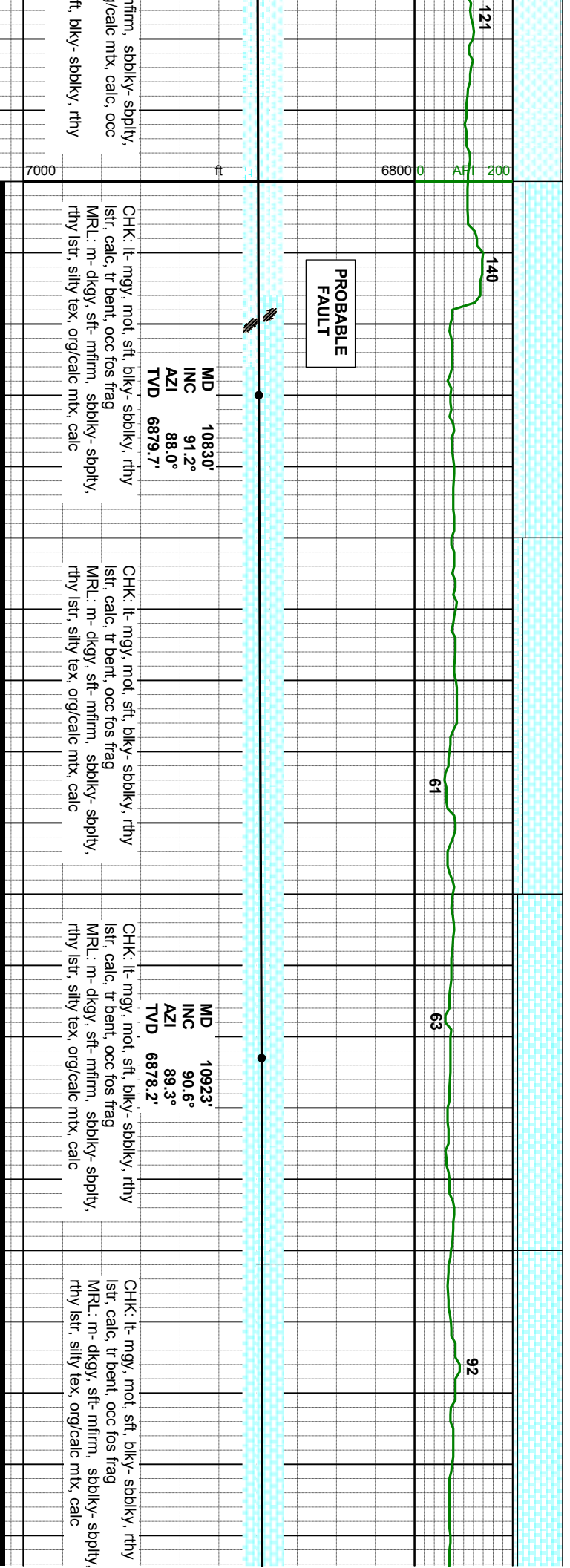
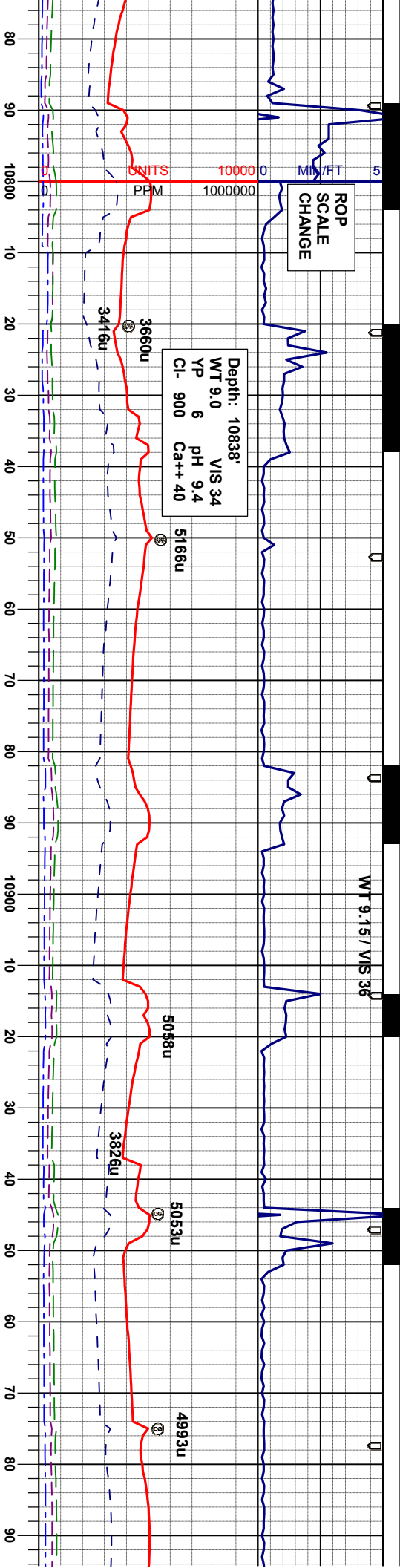
MD 10453'
INC 91.1°
AZI 91.7°
TVD 6872.4'

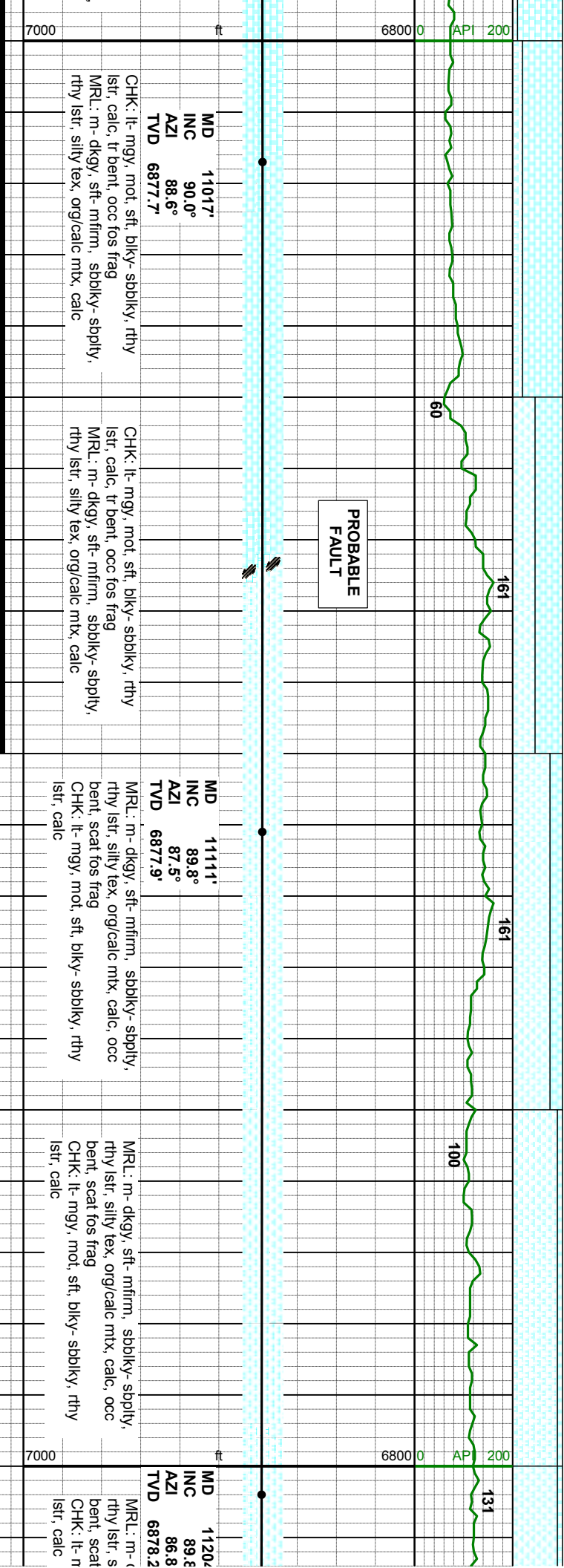
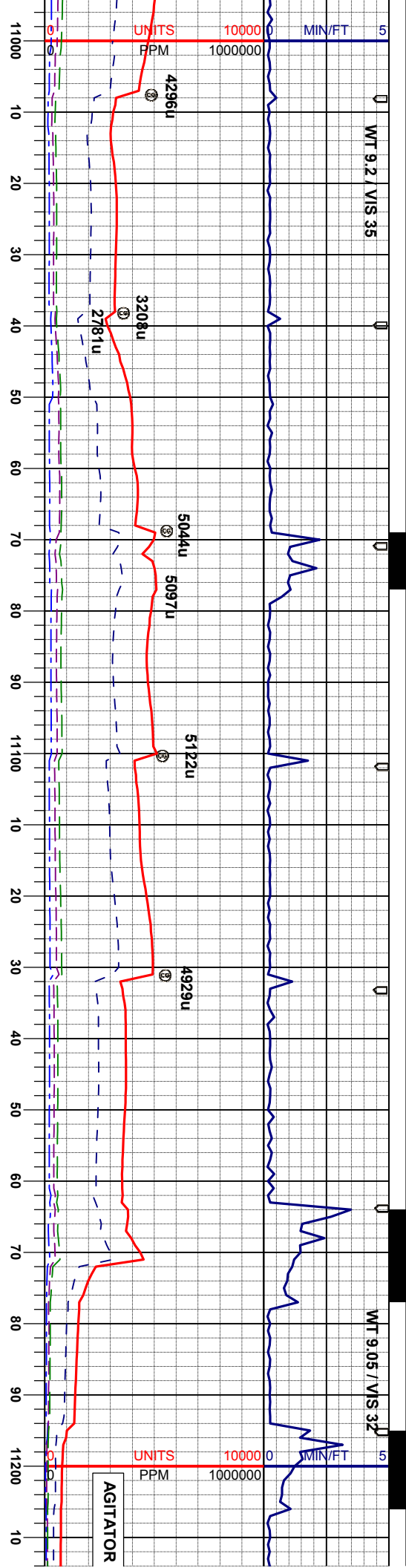
MRL: m-dkgy, sft-mfirm, sbbiky-sbply,
rthy lstr, silty tex, org/calc mtx, calc, occ
bent, occ fos frag
CHK: lt-mgy, mot, sft, blk- sbbiky, rthy
lstr, calc

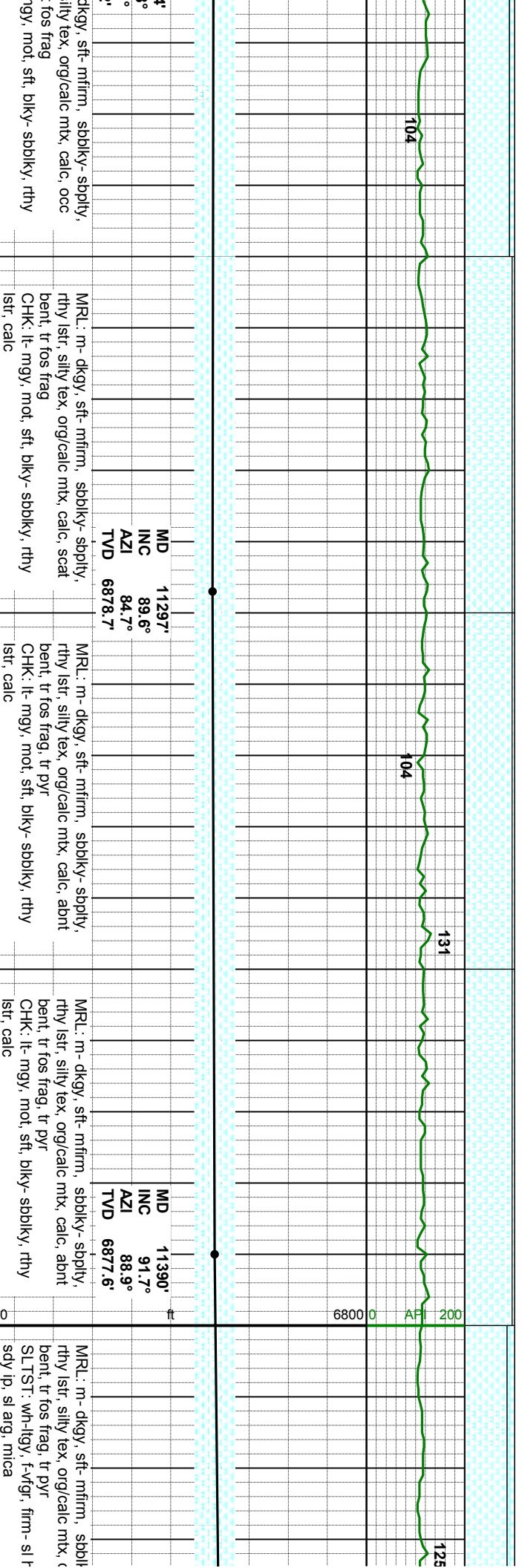
MD 10541'
INC 87.3°
AZI 90.0°
TVD 6873.7'

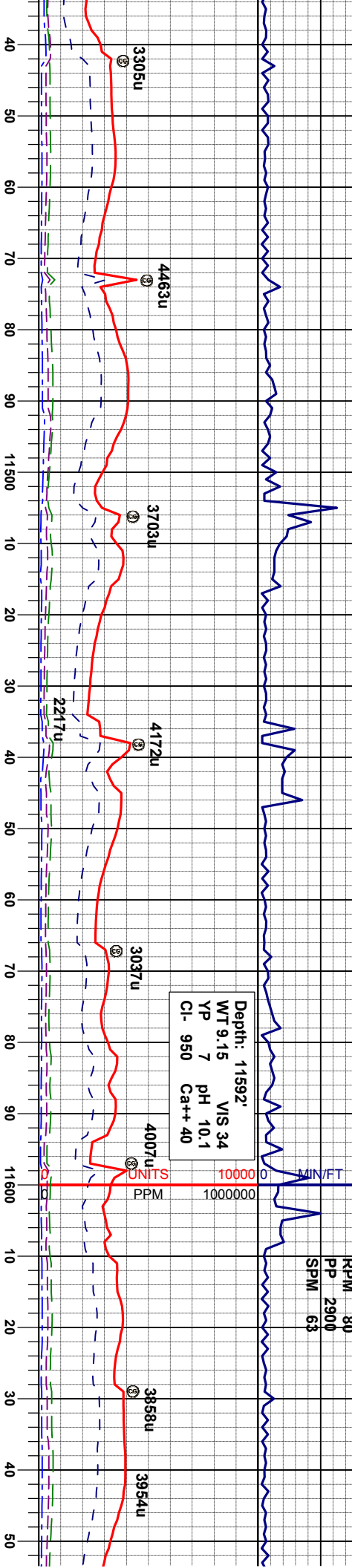
MRL: m-dkgy, sft-mfirm, sbbiky-sbply,
rthy lstr, silty tex, org/calc mtx, calc, scat
bent, occ fos frag
CHK: lt-mgy, mot, sft, blk- sbbiky, rthy
lstr, calc











MD 11485'
INC 92.9°
AZI 90.5°
TVD 6873.8'

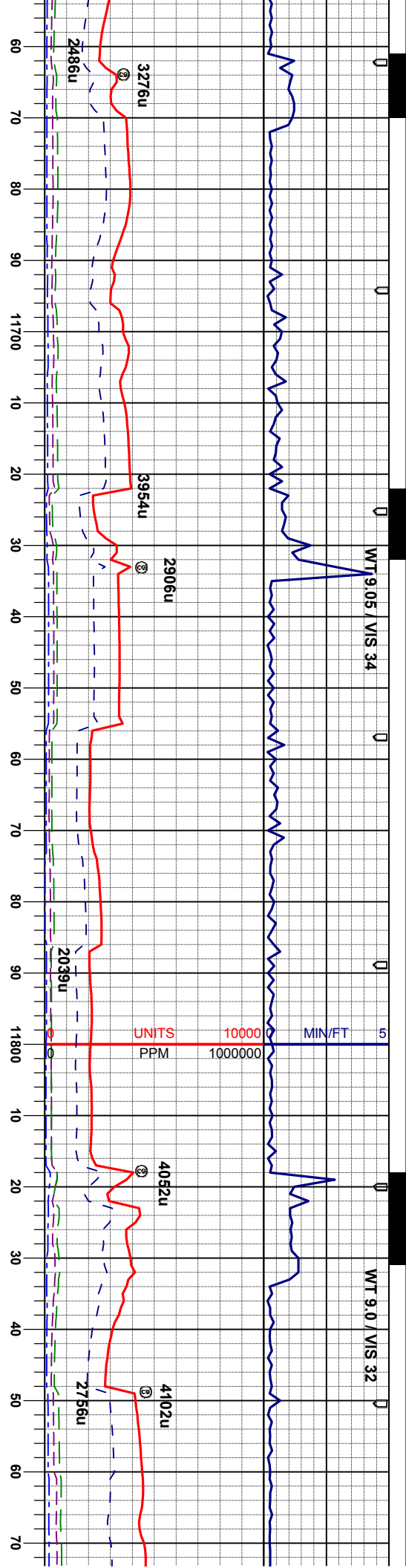
MRL: m-dkgy, sft-mfirm, sbbiky-sbply,
rthy lstr, silty tex, org/calc mtx, calc, abnt
bent, tr fos frag
CHK: lt-mgy, mot, sft, blkly-sbbiky, rthy
lstr, calc

MD 11578'
INC 91.2°
AZI 90.3°
TVD 6870.5'

MRL: m-dkgy, sft-mfirm, sbbiky-sbply,
rthy lstr, silty tex, org/calc mtx, calc, scat
bent, abnt fos frag
CHK: lt-mgy, mot, sft, blkly-sbbiky, rthy
lstr, calc

MRL: m-dkgy, sft-mfirm, sbbiky-sbply,
rthy lstr, silty tex, org/calc mtx, calc, scat
bent, abnt fos frag, tr pyr
CHK: lt-mgy, mot, sft, blkly-sbbiky, rthy
lstr, calc





MD 11672'
INC 90.2°
AZI 89.6°
TVD 6869.4'

MRL: m-dkgy, sft- mfirm, sbbiky- spbly, rthy istr, silty tex, org/calc mt, calc, abnt bent, occ fos frag, tr chnk

MD 11766'
INC 90.4°
AZI 88.4°
TVD 6868.9'

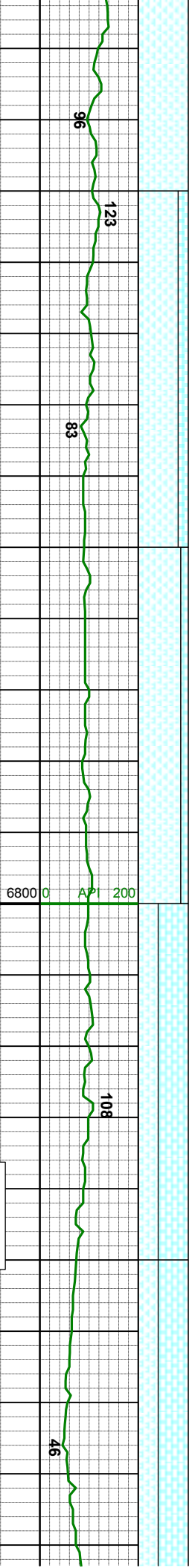
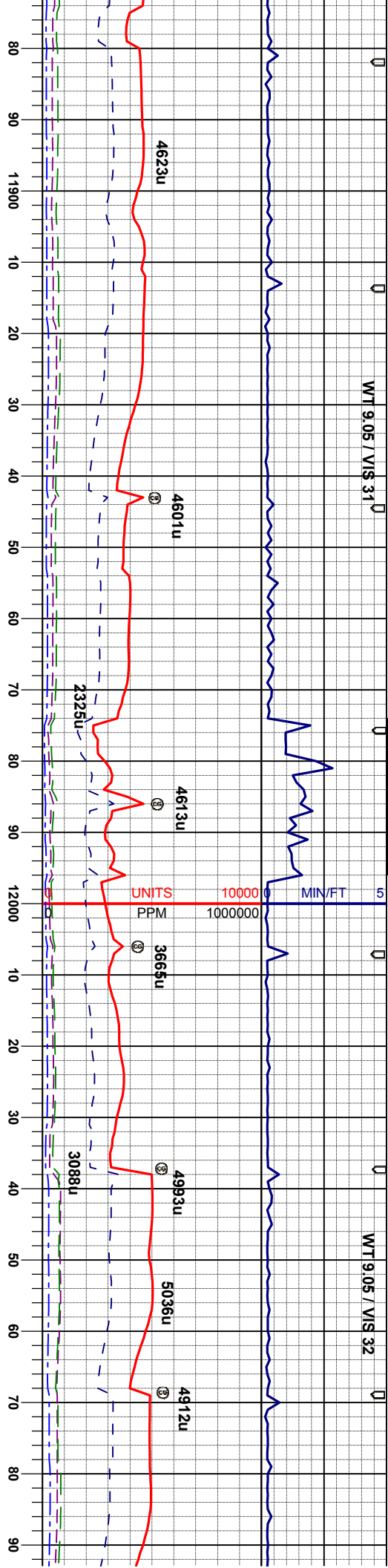
MRL: m-dkgy, sft- mfirm, sbbiky- spbly, rthy istr, silty tex, org/calc mt, calc, abnt bent, occ fos frag, tr chnk

MRL: m-dkgy, sft- mfirm, sbbiky- spbly, rthy istr, silty tex, org/calc mt, calc, abnt bent, occ fos frag, tr chnk

MD 11859'
INC 90.5°
AZI 89.1°
TVD 6868.1'

MRL: m-dkgy, sft- mfirm, sbbiky- spbly, rthy istr, silty tex, org/calc mt, calc, abnt bent, occ fos frag, tr chnk



**PROBABLE
FAULT**

MD	11953'
INC	91.0°
AZI	88.7°
TVD	6866.9'

MR.: m-dkgy, sft-mfirm, sbblky-sbply,
rthy lstr, silty tex, org/calc mtx, calc, scat
bent, occ fos frag
CHK: lt-mgy, mot, sft, blkly-sbblky, rthy
lstr, calc

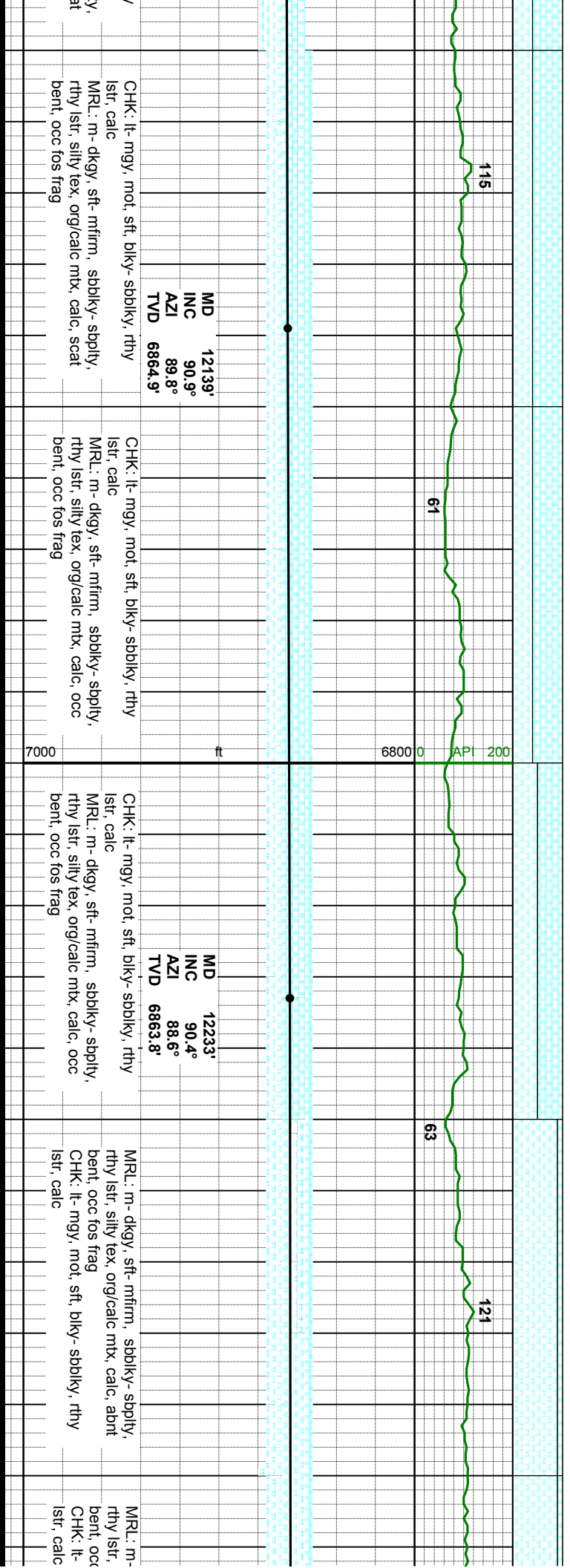
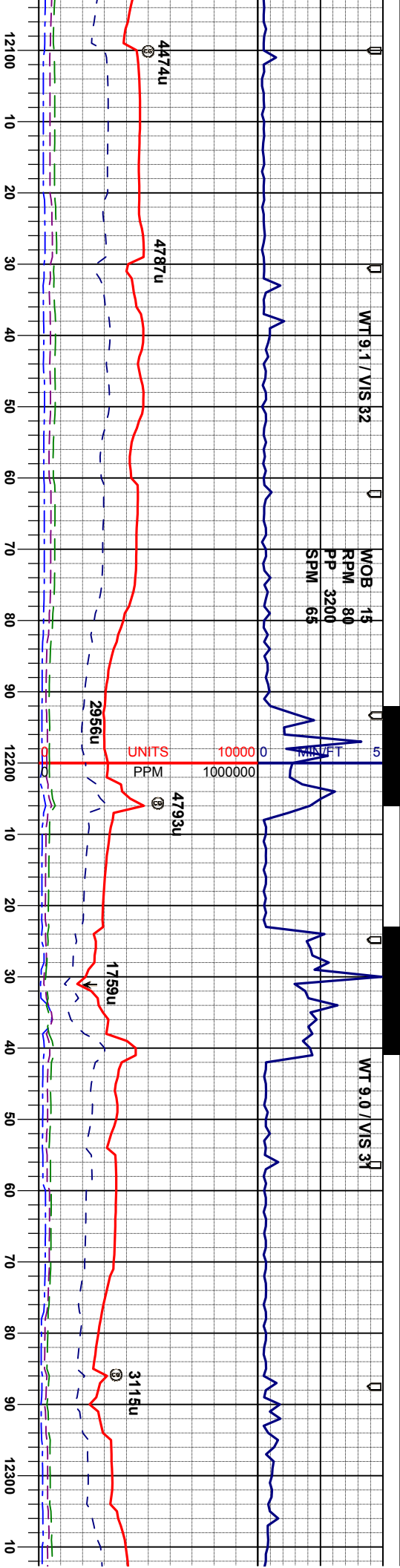
MRL: m-dkxy, sft- mfirm, sbblky- sbply,
rthy lstr, silty tex, org/calc mtx, calc, abnt
bent, occ fos frag
CHK: lt- mgy, mot, sft, blk- sbblky, rthy
lstr, calc

MD	12046
INC	90.3°
AZI	89.4°
TVD	6865.8'

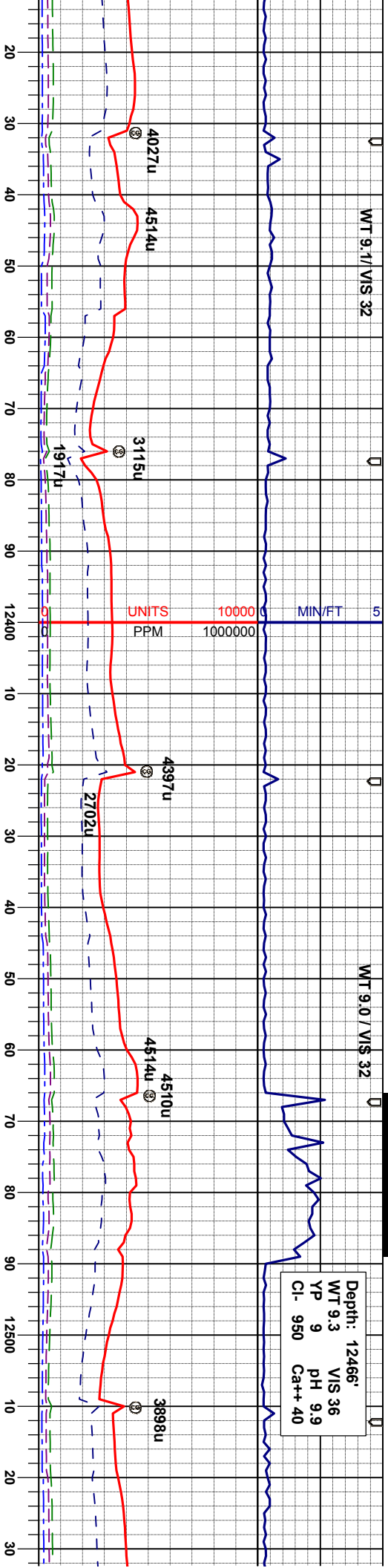
CHK- lt- mgy, mot, stf, bky- sbolky, rthy
lstr, calc
MRL: m- dkgy, sft- mfirm, sbolky- sbpty,
rthy lstr, silty tex, orgcalc mtx, calc, abnt
bent, occ fos frag

CHK: lt-mgy, mot, sft, blk-y-sbblky, rthy
ist, calc
MRL: m-dky, sft-mfirm, sbblky-sbplit
rthy ist, silty tex, org/calc mtx, calc, sce
bent, occ fos frag





Depth: 12466'
WT 9.3 VIS 36
YP 9 pH 9.9
Cl- 950 Ca++ 40



AR 200

68000

ft

MD 12323'
INC 90.2°
AZI 88.0°
TVD 6863.3'

MR: m- dkgy, sft- mfirm, sbblky- sbply,
rthy lstr, silty tex, org/calc mtx, calc, scat
bent, occ fos frag
CHK: lt- mgy, mot, sft, blk- sbblky, rthy
lstr, calc

MD 12413'
INC 90.0°
AZI 87.9°
TVD 6863.2'

MR: m- dkgy, sft- mfirm, sbblky- sbply,
rthy lstr, silty tex, org/calc mtx, calc, occ
bent, occ fos frag
CHK: lt- mgy, mot, sft, blk- sbblky, rthy
lstr, calc

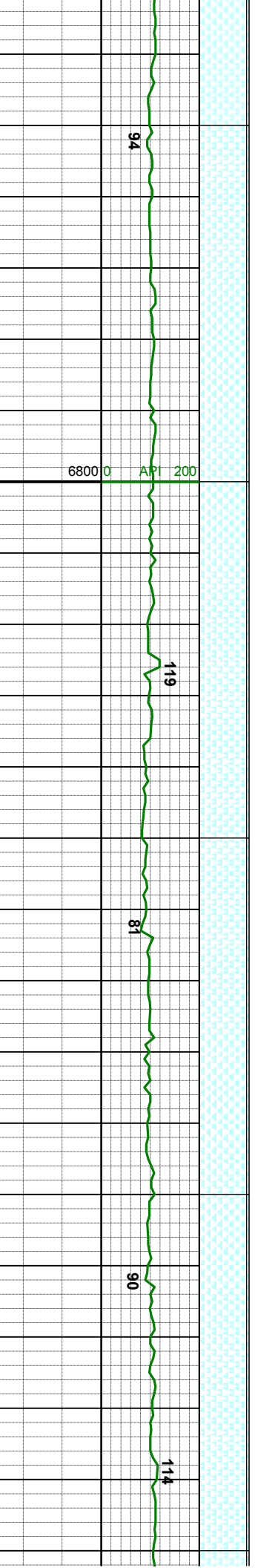
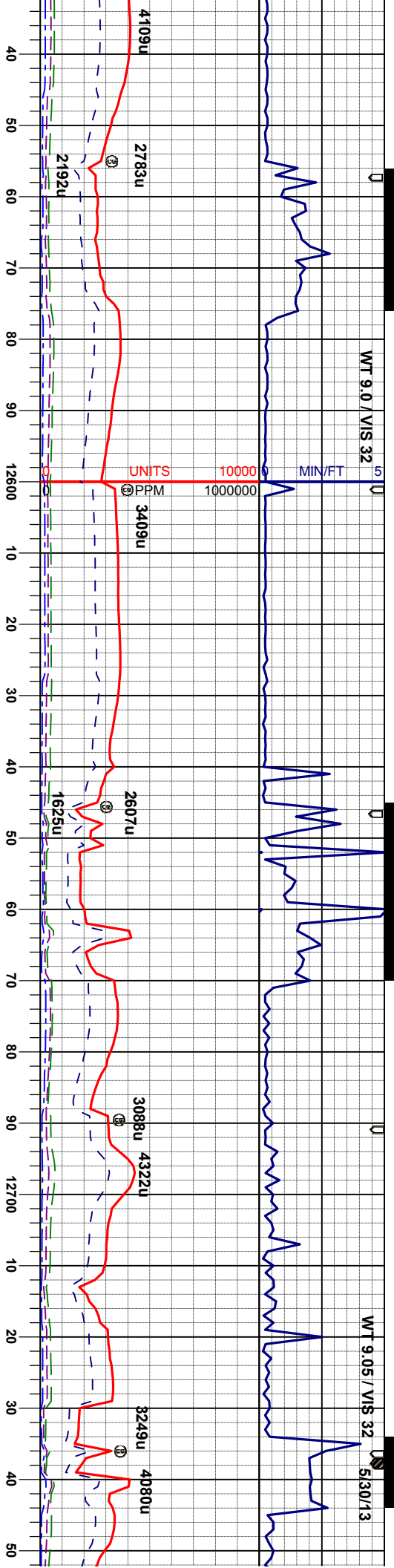
MD 12503'
INC 89.1°
AZI 87.1°
TVD 6863.9'

MR: m- dkgy, sft- mfirm, sbblky- sbply,
rthy lstr, silty tex, org/calc mtx, calc, abnt
bent, occ fos frag
CHK: lt- mgy, mot, sft, blk- sbblky, rthy
lstr, calc



WT 9.0 / VIS 32

WT 9.05 / VIS 32 5/30/13



MD 12593.1
INC 89.0°
AZI 88.4°
TVD 6865.4

MD 12682.1
INC 90.2°
AZI 89.8°
TVD 6866.0

MRL: m- dkgy, sft- mfirm, sdbkly- sbply,
rthy lstr, silty tex, org/calc mtx, calc, scat
bent, occ fos frag
CHK: lt- mgy, mot, sft, blkly- sbkly, rthy
lstr, calc

MRL: m- dkgy, sft- mfirm, sdbkly- sbply,
rthy lstr, silty tex, org/calc mtx, calc, occ
bent, tr fos frag
CHK: lt- mgy, mot, sft, blkly- sbkly, rthy
lstr, calc

MRL: m- dkgy, sft- mfirm, sdbkly- sbply,
rthy lstr, silty tex, org/calc mtx, calc, scat
bent, tr fos frag
CHK: lt- mgy, mot, sft, blkly- sbkly, rthy
lstr, calc

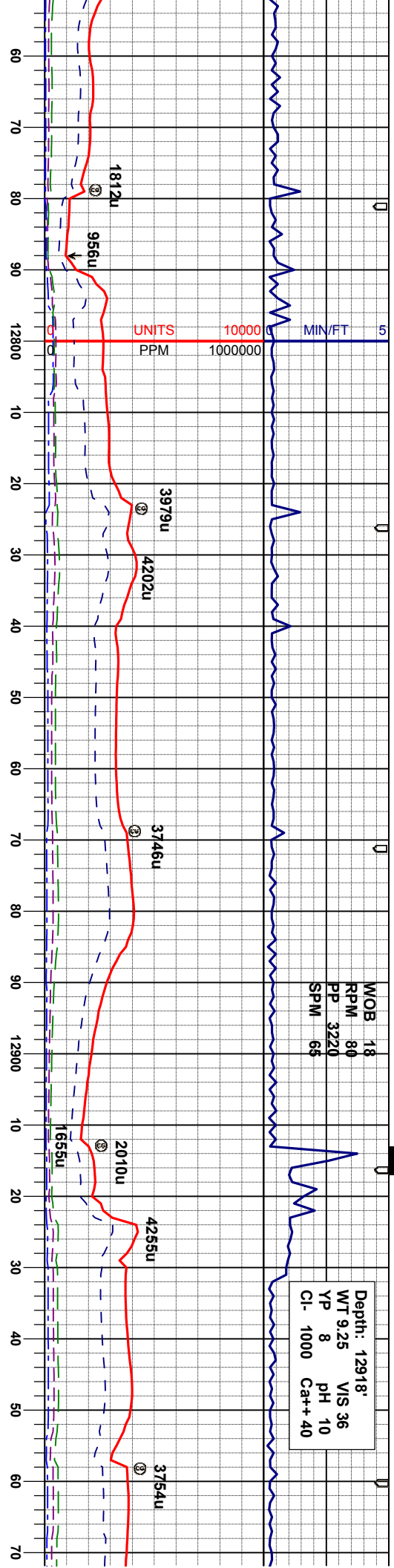
MRL: m- dkgy, sft- mfirm, sdbkly- sbply,
rthy lstr, silty tex, org/calc mtx, calc, scat
bent, tr fos frag
CHK: lt- mgy, mot, sft, blkly- sbkly, rthy
lstr, calc

7000

114

Depth: 12918'
WT 9.25 V/S 36
YP 8 pH 10
Cl- 1000 Ca++ 40

WOB 18
RPM 80
PP 3220
SPM 65



MD 12772'
INC 91.2°
AZI 90.5°
TVD 6864.9'

MRL: m- dkgy, sft- mfirm, sbdkly- sbply,
rthy lstr, silty tex, org/calc mtz, calc, occ
bent, tr fos frag
CHK: lt- mgy, mot, sft, blkly- sbdkly, rthy
lstr, calc

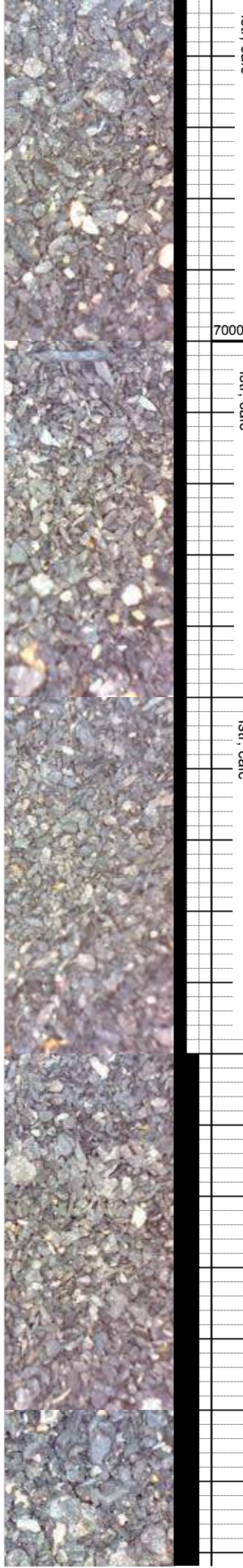
MD 12862'
INC 90.4°
AZI 87.5°
TVD 6863.6'

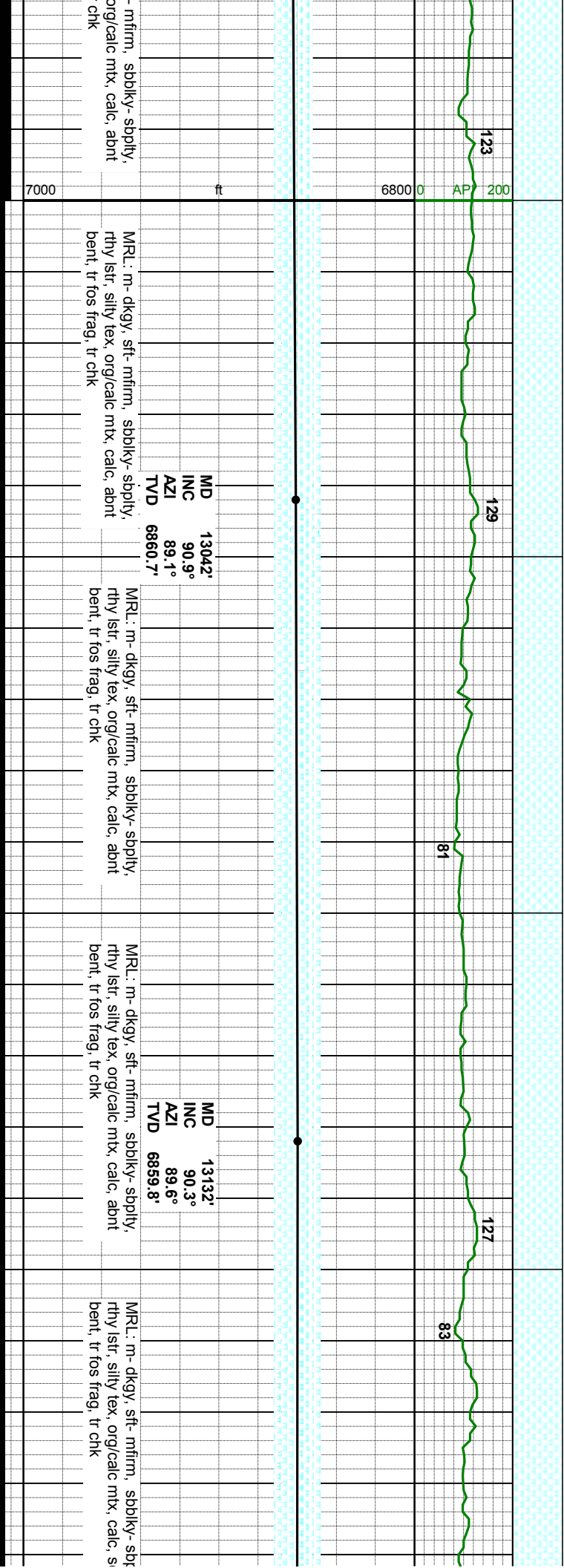
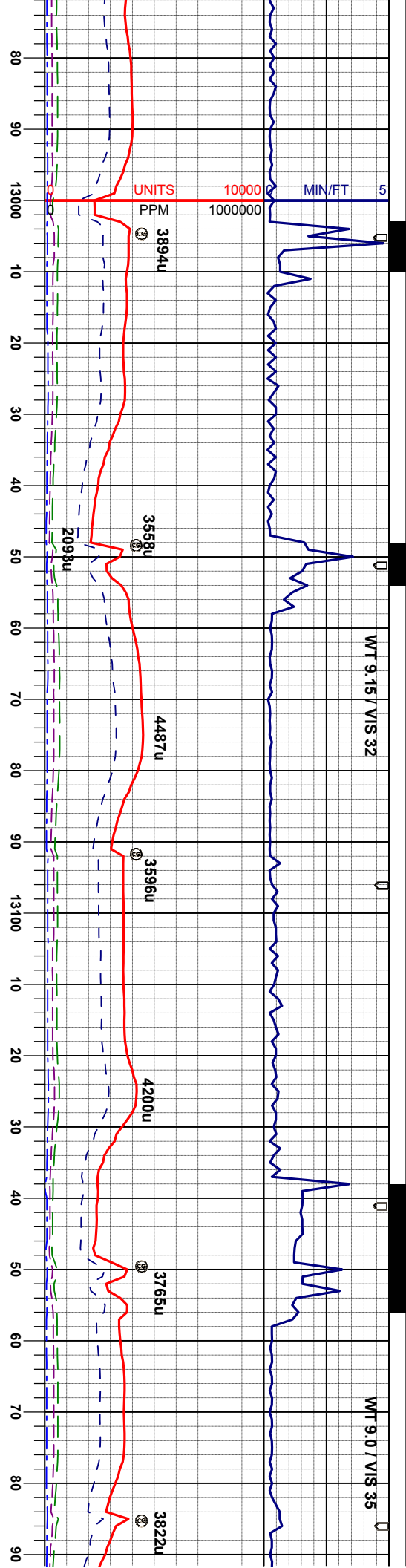
MRL: m- dkgy, sft- mfirm, sbdkly- sbply,
rthy lstr, silty tex, org/calc mtz, calc, occ
bent, tr fos frag
CHK: lt- mgy, mot, sft, blkly- sbdkly, rthy
lstr, calc

MD 12952'
INC 91.2°
AZI 88.9°
TVD 6862.4'

MRL: m- dkgy, sft- mfirm, sbdkly- sbply,
rthy lstr, silty tex, org/calc mtz, calc, abnt
bent, occ fos frag, tr chk

MRL: m- dkgy, sft- mfirm, sbdkly- sbply,
rthy lstr, silty tex, org/calc mtz, calc, abnt
bent, tr fos frag, tr chk





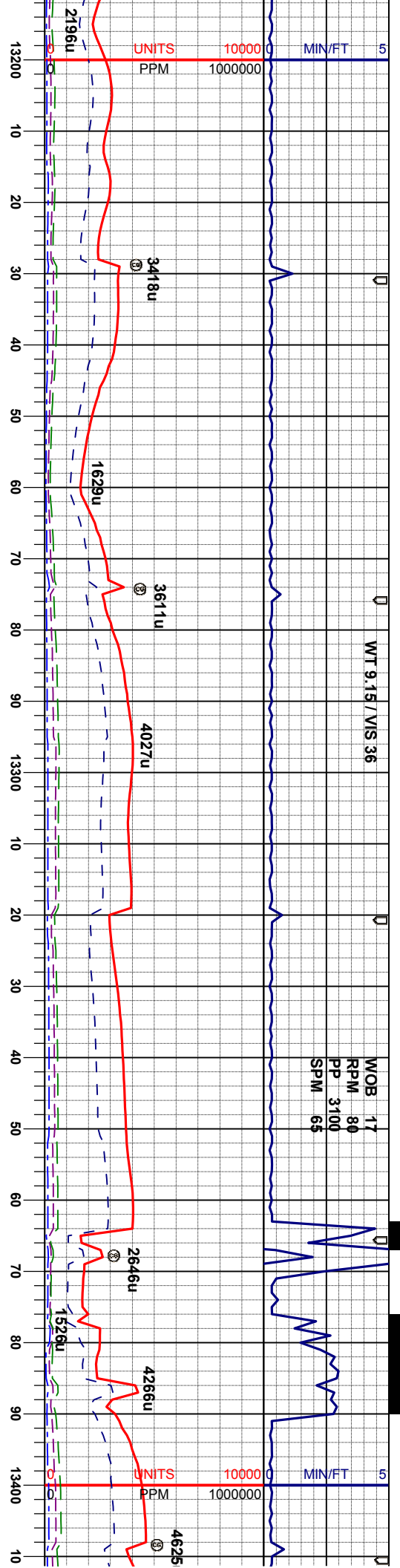
- mfirm, sbbiky- spbly,
org/calc mtz, calc, abnt
bent, tr fos frag, tr chk

MRL: m- dky, sft- mfirm, sbbiky- spbly,
rthy lst, silty tex, org/calc mtz, calc, abnt
bent, tr fos frag, tr chk

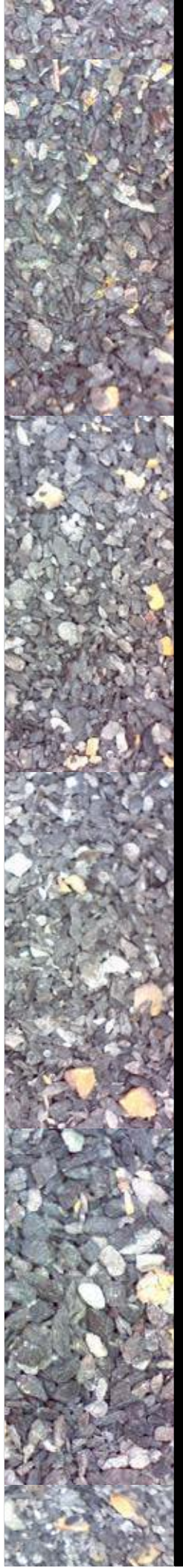
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rthy lst, silty tex, org/calc mtz, calc, abnt
bent, tr fos frag, tr chk

MRL: m- dky, sft- mfirm, sbbiky- spbly,
rthy lst, silty tex, org/calc mtz, calc, s
bent, tr fos frag, tr chk



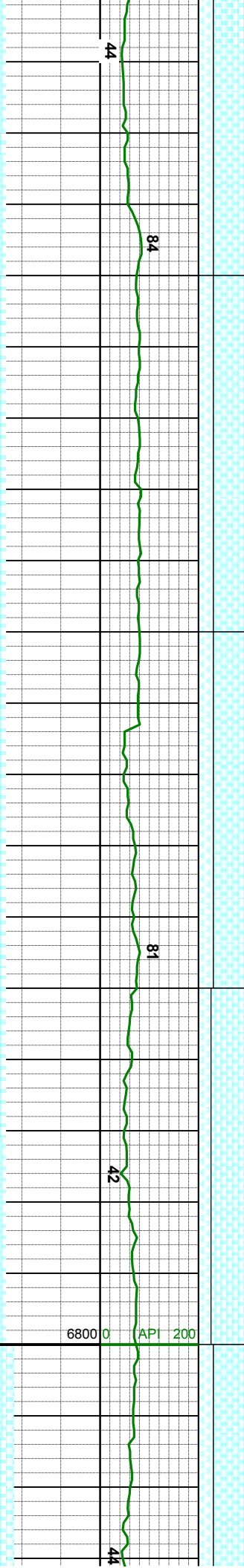
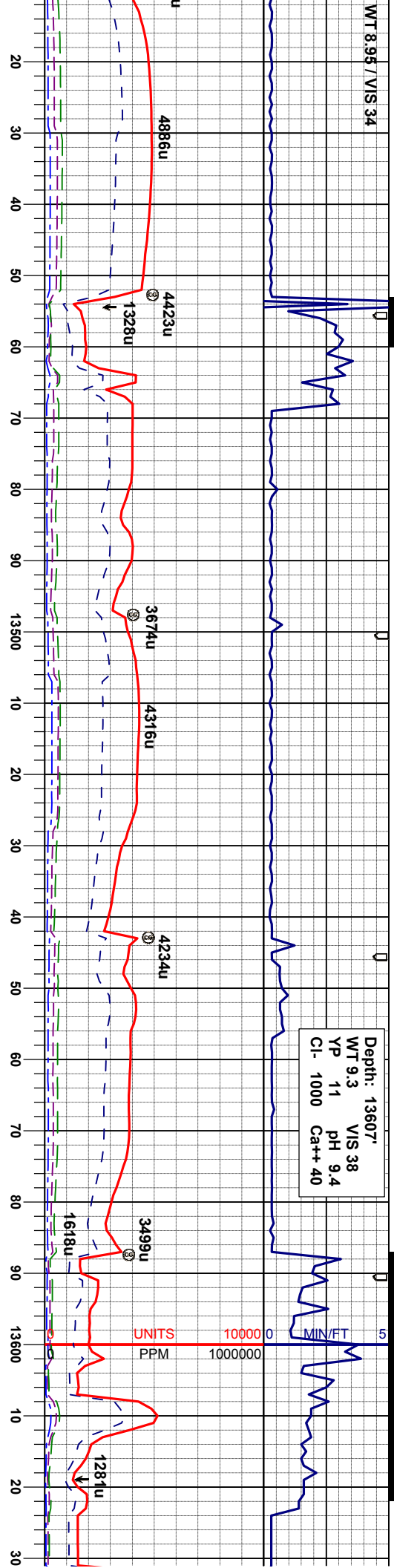


MD 13221'		MD 13311'		MD 1	
INC 89.2°		INC 89.1°		INC	
AZI 90.8°		AZI 90.5°		AZI	
TVD 6860.2'		TVD 6861.5'		TVD 68	
MRL: m-dkgy, sft-mfirm, sbbiky-sbply, rthy lstr, silty tex, org/calc mt, calc, scat bent, tr fos frag, tr chk		MRL: m-dkgy, sft-mfirm, sbbiky-sbply, rthy lstr, silty tex, org/calc mt, calc, occ bent, occ fos frag		MRL: m-dkgy, sft-mfirm, sbbiky-sbply, rthy lstr, cal	
		CHK: lt-mgy, mot, sft, biky-sbbiky, rthy lstr, calc		CHK: lt-mgy, mot, sft, biky-sbbiky, rthy lstr, cal	



WT 8.95 / VIS 34

Depth: 13607'
WT 9.3 VIS 38
YP 11 pH 9.4
Cl- 1000 Ca++ 40



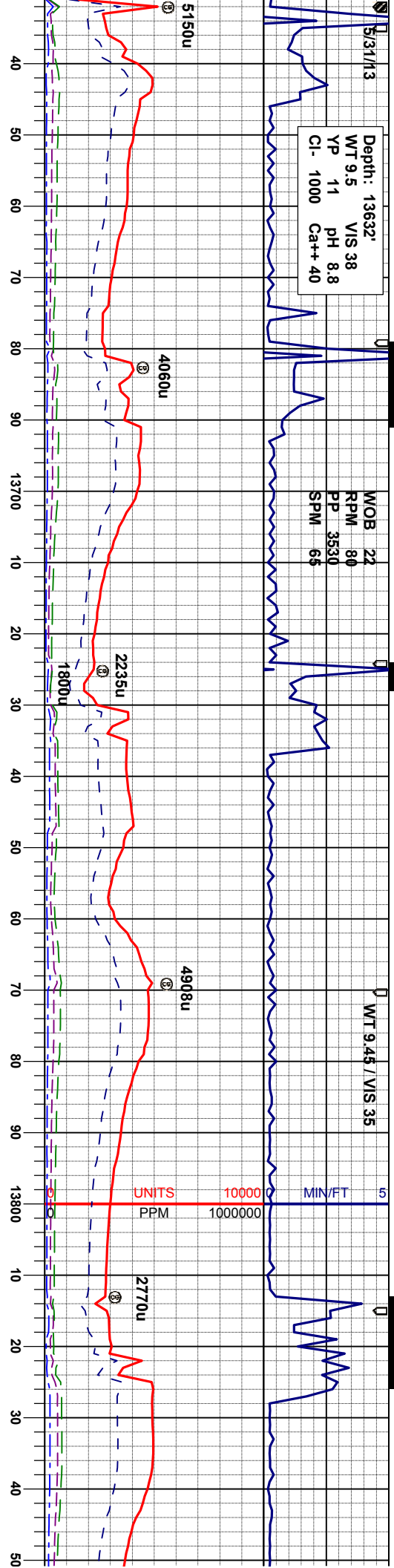
3401'	MD 1349.1'	INC 91.7°	AZI 91.4°	TVD 6862.0'	CHK: lt-mgy, mot, sft, blk- sbbiky, rthy lsr, calc MRL: m-dkgy, sft-mfirm, sbbiky-sbply, rthy lsr, silty tex, org/calc mt, calc, scat bent, occ fos frag
662.8'	MD 1358.1'	INC 93.7°	AZI 91.2°	TVD 6867.7'	CHK: lt-mgy, mot, sft, blk- sbbiky, rthy lsr, calc MRL: m-dkgy, sft-mfirm, sbbiky-sbply, rthy lsr, silty tex, org/calc mt, calc, occ bent, tr fos frag
	MD 1358.1'	INC 93.7°	AZI 91.2°	TVD 6867.7'	CHK: lt-mgy, mot, sft, blk- sbbiky, rthy lsr, calc MRL: m-dkgy, sft-mfirm, sbbiky-sbply, rthy lsr, silty tex, org/calc mt, calc, occ bent, tr fos frag



Depth: 13632'
WT 9.5 V/S 38
YP 11 pH 8.8
Cl- 1000 Ca++ 40

MOB 22
RPM 80
PP 3530
SPM 65

WT 9.45 / V/S 35



MD 13671'
INC 90.6°
AZI 90.5°
TVD 6854.4'

MD 13761'
INC 88.4°
AZI 89.6°
TVD 6855.2'

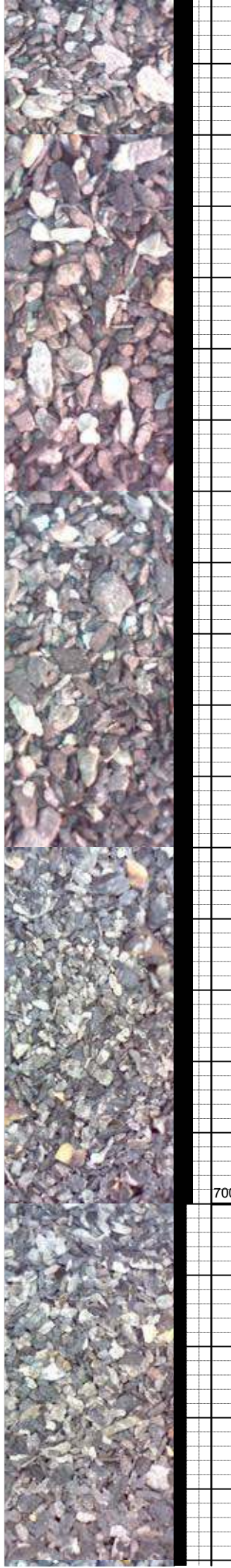
MD INC
AZI TVD

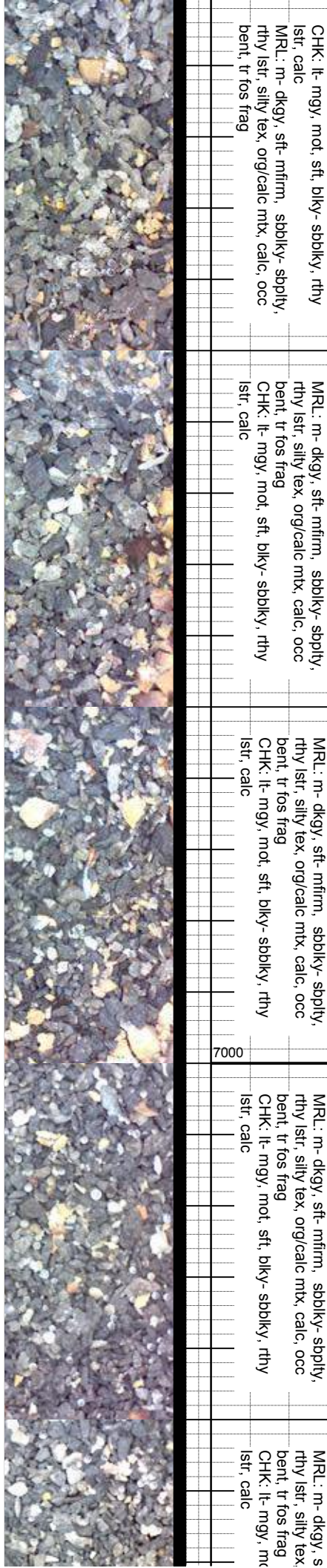
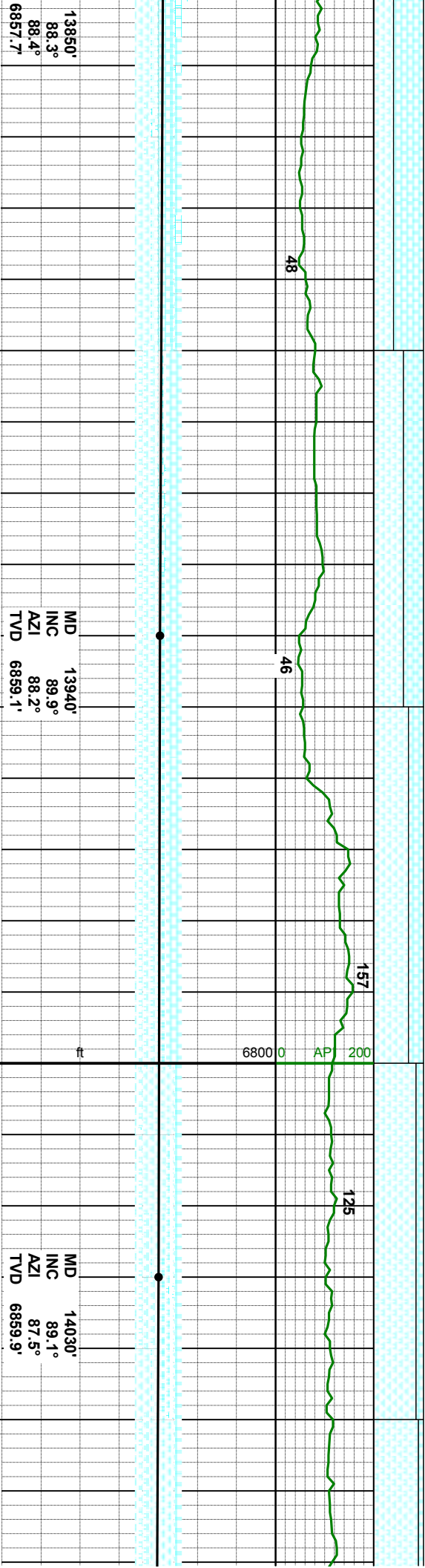
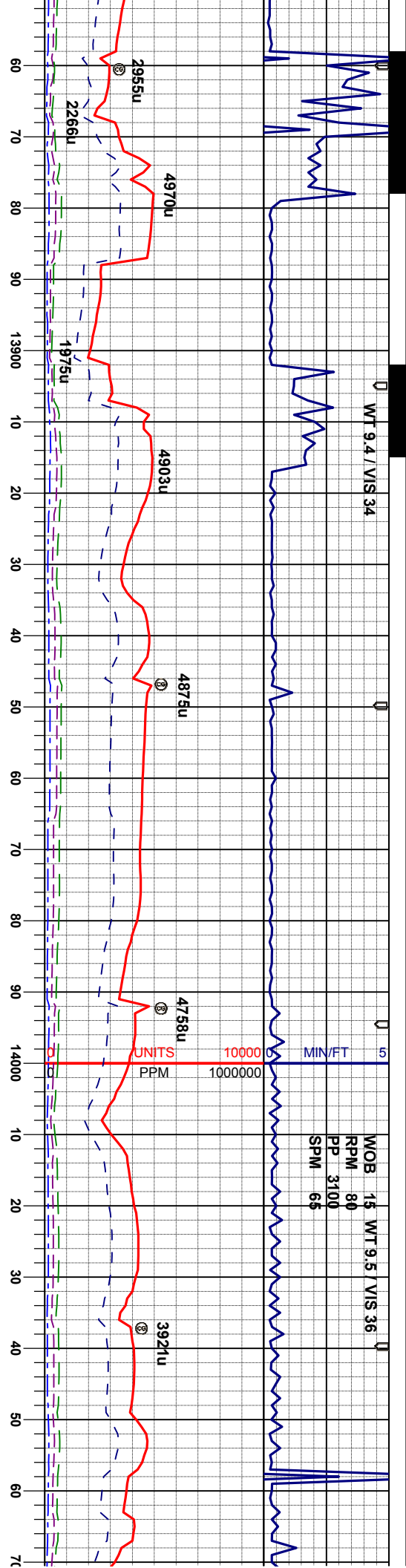
CHK: lt- mgy, mot, sft, blk- sbbky, rthy
lstr, calc
MR: m- dkgy, sft- mfirm, sbbky- sbply,
rthy lstr, silty tex, org/calc mtx, calc, abnt
bent, tr fos frag

CHK: lt- mgy, mot, sft, blk- sbbky, rthy
lstr, calc
MR: m- dkgy, sft- mfirm, sbbky- sbply,
rthy lstr, silty tex, org/calc mtx, calc, scat
bent, tr fos frag

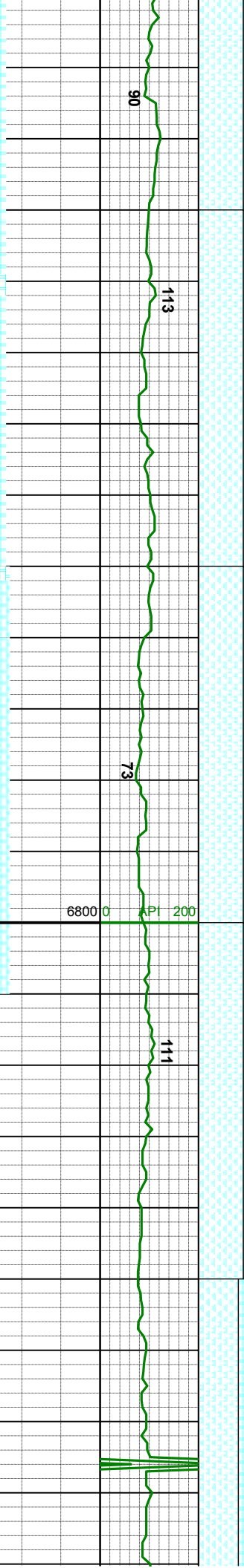
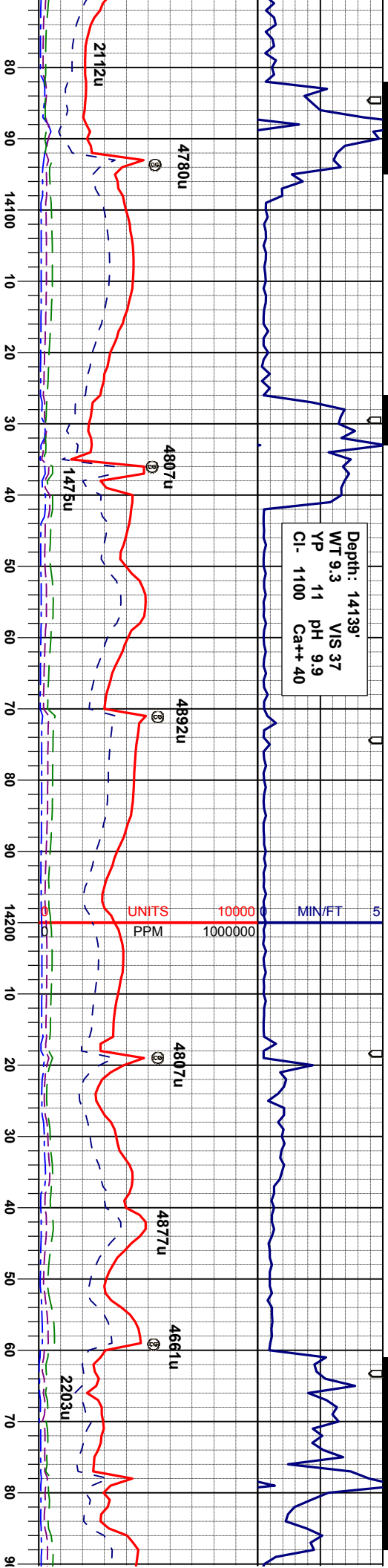
MR: m- dkgy, sft- mfirm, sbbky- sbply,
rthy lstr, silty tex, org/calc mtx, calc, occ
bent, tr fos frag
CHK: lt- mgy, mot, sft, blk- sbbky, rthy
lstr, calc

MR: m- dkgy, sft- mfirm, sbbky- sbply,
rthy lstr, silty tex, org/calc mtx, calc, occ
bent, tr fos frag
CHK: lt- mgy, mot, sft, blk- sbbky, rthy
lstr, calc





Depth: 14139'
WT 9.3
YP 11
CI- 1100
pH 9.9
Ca++ 40



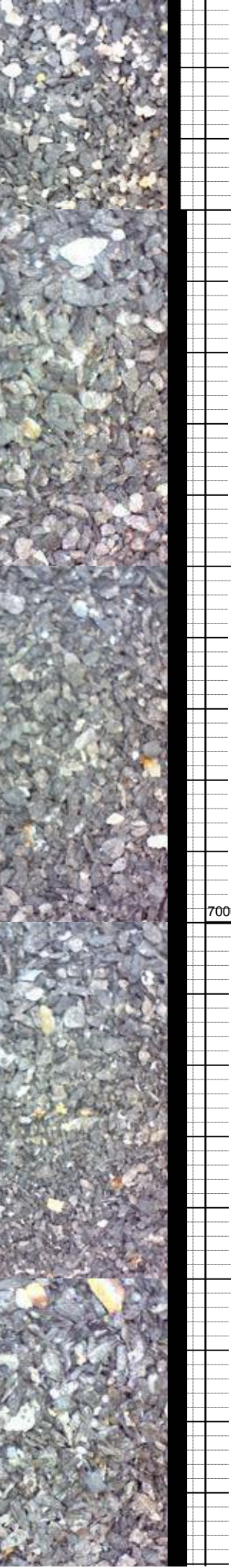
MD 14120'
INC 89.0°
AZI 87.0°
TVD 6861.4'

MRL: m- dkgy, sft- mfirm, sdbiky- sbply,
rthy istr, silty tex, org/calc mtx, calc, occ
bent, tr fos frag
CHK: lt- mgy, mot, sft, biky- sbply, rthy
istr, calc

MD 14210'
INC 89.7°
AZI 87.5°
TVD 6862.4'

MRL: m- dkgy, sft- mfirm, sdbiky- sbply,
rthy istr, silty tex, org/calc mtx, calc, tr bent,
tr fos frag
CHK: lt- mgy, mot, sft, biky- sbply, rthy
istr, calc

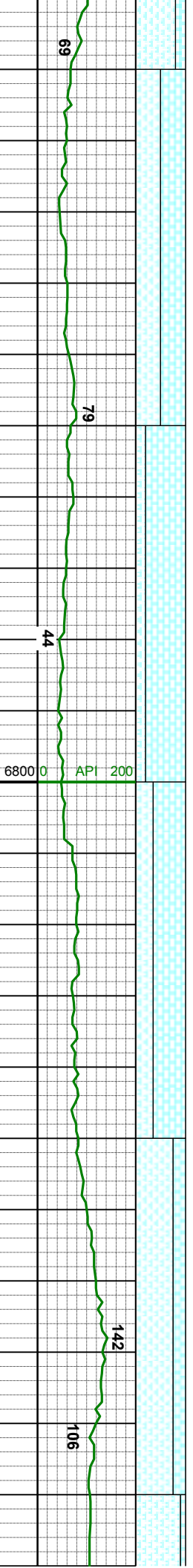
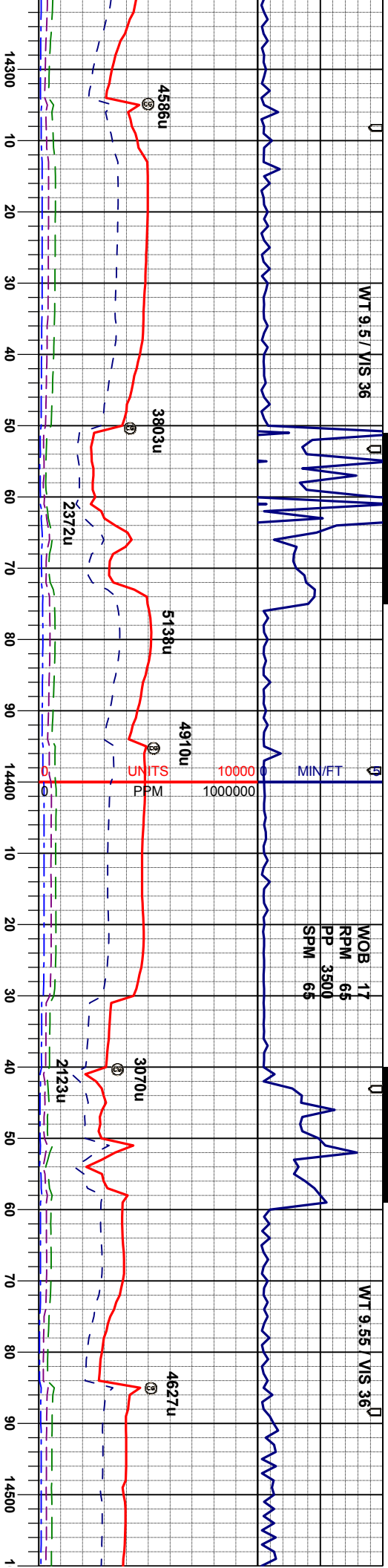
MRL: m- dkgy, sft- mfirm, sdbiky- sbply,
rthy istr, silty tex, org/calc mtx, calc, tr
tr fos frag
CHK: lt- mgy, mot, sft, biky- sbply, rthy
istr, calc



WT 9.5 / VIS 36

WOB 17
RPM 65
PP 3500
SPM 65

WT 9.55 / VIS 36



MD 14300'
INC 90.9°
AZI 86.3°
TVD 6862.0'

MD 14390'
INC 91.6°
AZI 87.9°
TVD 6860.0'

MD 14480'
INC 90.7°
AZI 87.9°
TVD 6858.2'

MRL: m-dkgy, sft-mfirm, sbblky-sbply,
rthy istr, silty tex, orgcalc mt, calc, tr bent,
tr fos frag
CHK: lt-mgy, mot, sft, blk- sbblky, rthy
istr, calc

CHK: lt-mgy, mot, sft, blk- sbblky, rthy
istr, calc, tr bent, tr fos frag
MRL: m-dkgy, sft-mfirm, sbblky-sbply,
rthy istr, silty tex, orgcalc mt, calc

MRL: m-dkgy, sft-mfirm, sbblky-sbply,
rthy istr, silty tex, orgcalc mt, calc, tr bent,
tr fos frag
CHK: lt-mgy, mot, sft, blk- sbblky, rthy
istr, calc

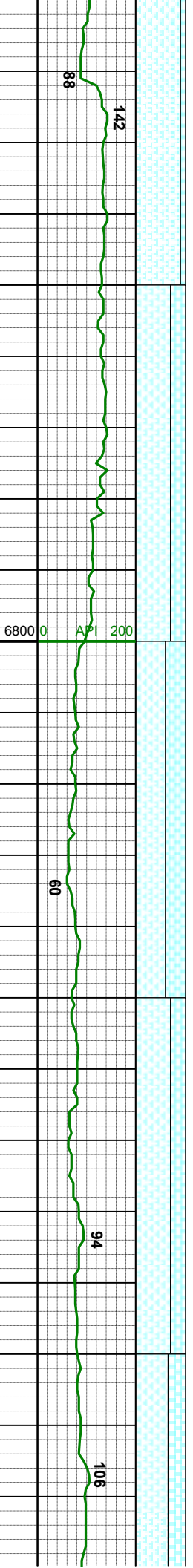
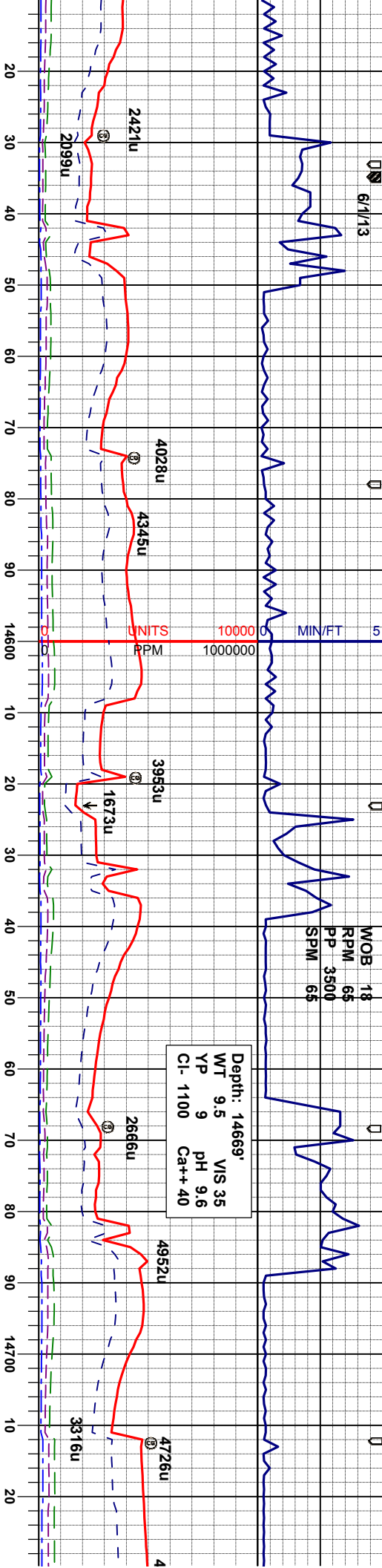
MRL: rthy is
bent, c
CHK: istr, ce



6/1/13

MOB 18
RPM 65
PP 3500
SPM 65

Depth: 14669'
WT 9.5 V/S 35
YP 9 pH 9.6
Cl- 1100 Ca++ 40



MD 14570'
INC 90.7°
AZI 88.0°
TVD 6857.1'

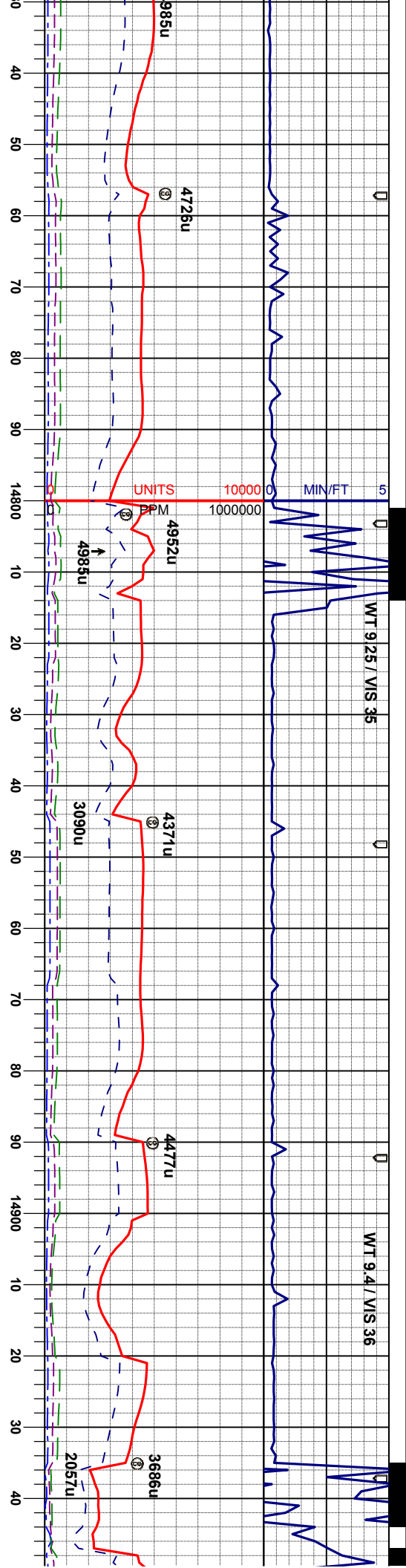
MR.L: m-dkgy, sft-mfirm, sbbiky-sbply,
rthy lstr, silty tex, org/calc mt, calc, tr bent,
occ fos frag
CHK: lt-mgy, mot, sft, blk- sbbiky, rthy
lstr, calc

MD 14659'
INC 91.0°
AZI 89.3°
TVD 6855.8'

MR.L: m-dkgy, sft-mfirm, sbbiky-sbply,
rthy lstr, silty tex, org/calc mt, calc, scat
bent, occ fos frag
CHK: lt-mgy, mot, sft, blk- sbbiky, rthy
lstr, calc

MR.L: m-dkgy, sft-mfirm, sbbiky-sbply,
rthy lstr, silty tex, org/calc
bent, occ fos frag
CHK: lt-mgy, mot, sft, blk
lstr, calc

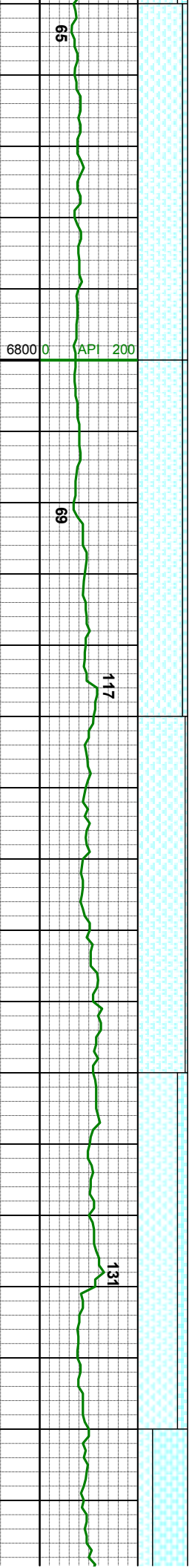
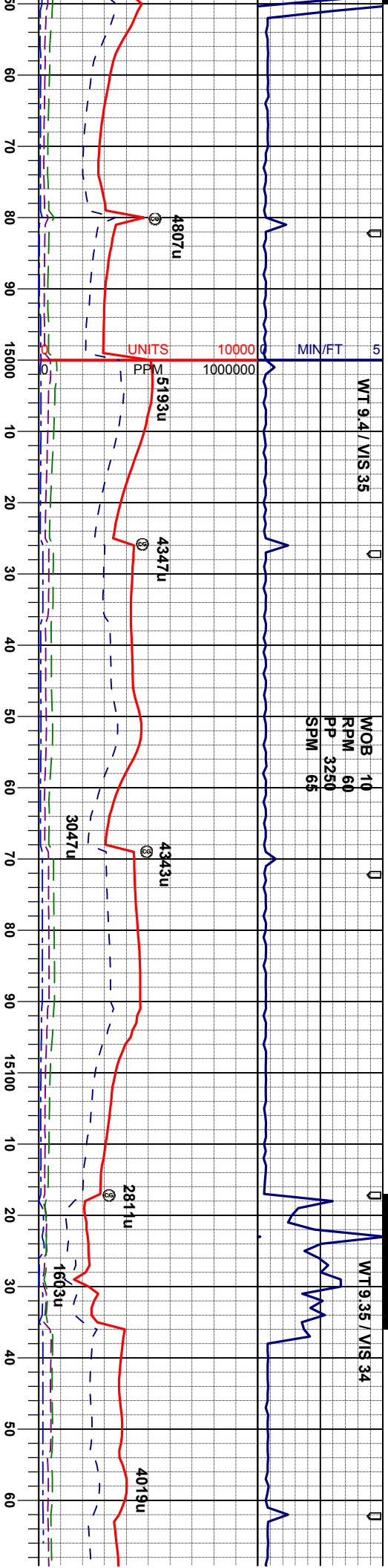




PROBABLE
FAULT

MD 14749'		MD 14839'		MD 14629'	
INC 90.7°		INC 91.4°		INC 91.7°	
AZI 89.3°		AZI 91.4°		AZI 89.1°	
TVD 6854.4'		TVD 6852.8'		TVD 6850.3'	
MRL: m- dkgy, sft- mfirm, sbblky- sbply, rthy lstr, silty tex, org/calc mt, calc, scat		MRL: m- dkgy, sft- mfirm, sbblky- sbply, rthy lstr, silty tex, org/calc mt, calc, tr bent, occ fos frag		MRL: m- dkgy, sft- mfirm, sbblky- sbply, rthy lstr, silty tex, org/calc mt, calc, tr bent, occ fos frag	
CHK: lt- mgy, mot, sft, biky- sbblky, rthy lstr, calc		CHK: lt- mgy, mot, sft, biky- sbblky, rthy lstr, calc		CHK: lt- mgy, mot, sft, biky- sbblky, rthy lstr, calc	





MR.: m-dkgy, sft-mfirm, sbblky-sbply,
rthy lstr, silty tex, org/calc mtx, calc, tr bent,
occ fos frag
CHK: lt-mgy, mot, sft, blk-y-sbblky, rthy
lstr, calc

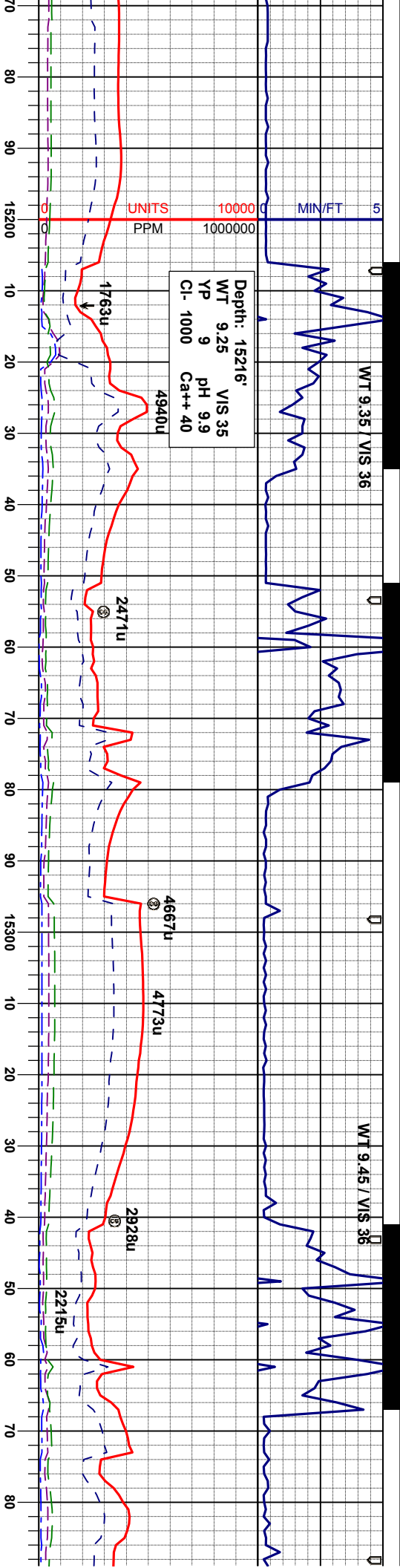
MR.: m-dkgy, sft-mfirm, sbbkly-sbply,
rthy lstr, silty tex, org/calc mtx, calc, occ
bent, occ fos frag
CHK.-lt-mgy, mot, sft, blkly-sbblkly, rthy
lstr, calc

MR.L: m-dkgy, sft-m firm, sbbkky-sbply,
rthy lstr, silyl tex, orgcalc mtz, calc, occ
bent, occ fos frag
CHK: ll-mgy, mot, sft, blyk-sbblky, rthy
lstr, calc

MR: m-dkgy, sft-m firm, sbblky-sbply,
rthy lstr, silty tex, org/calc mtx, calc, occ
bent, occ fos frag
CHK: lt-mgy, mot, sft, bkly-sbbkly, rthy
lstr, calc

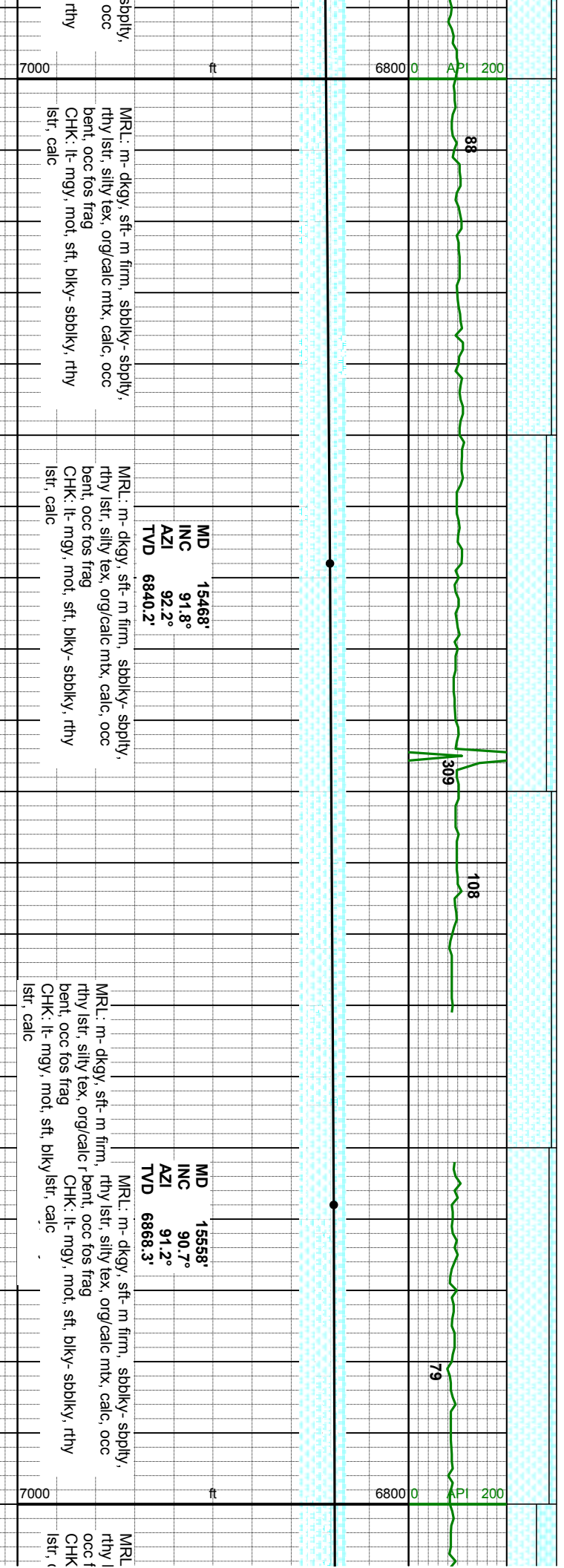
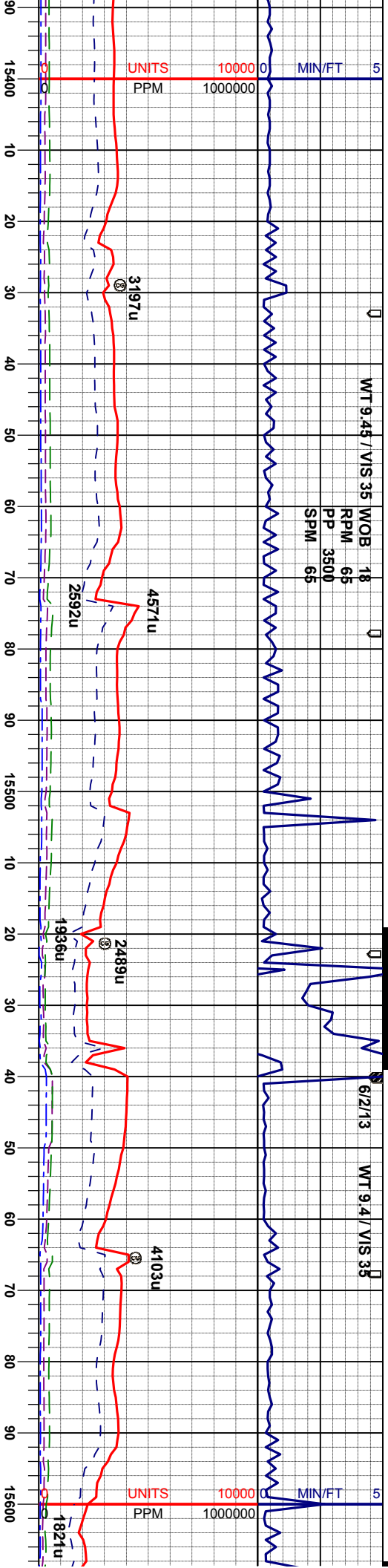
CHK: lt-mgy, r
lstr, calc
MRL: m-dkgy,
rthy lstr, silty te
bent, occ fos fr

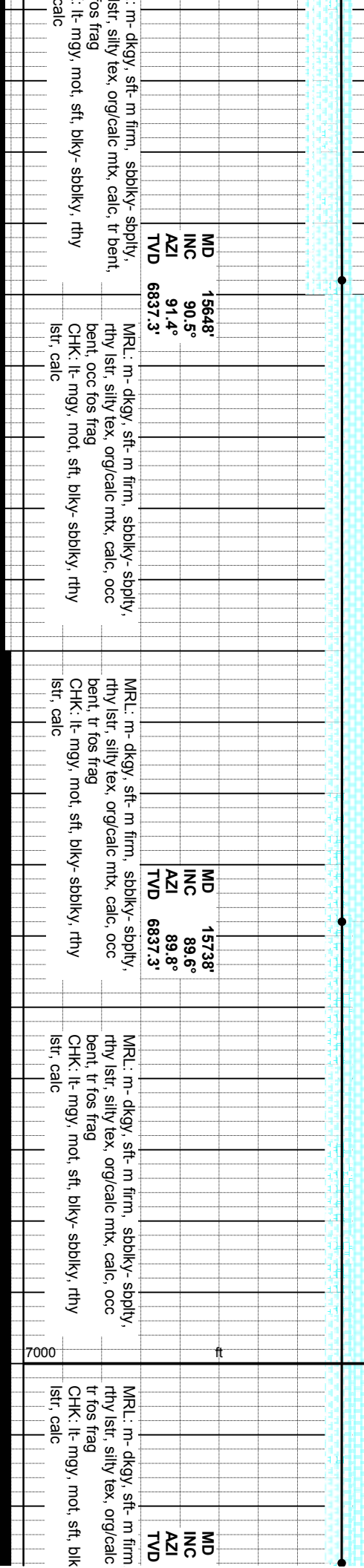
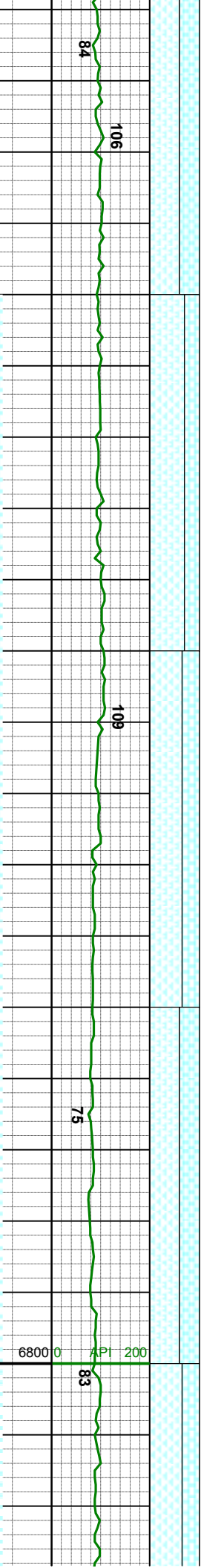
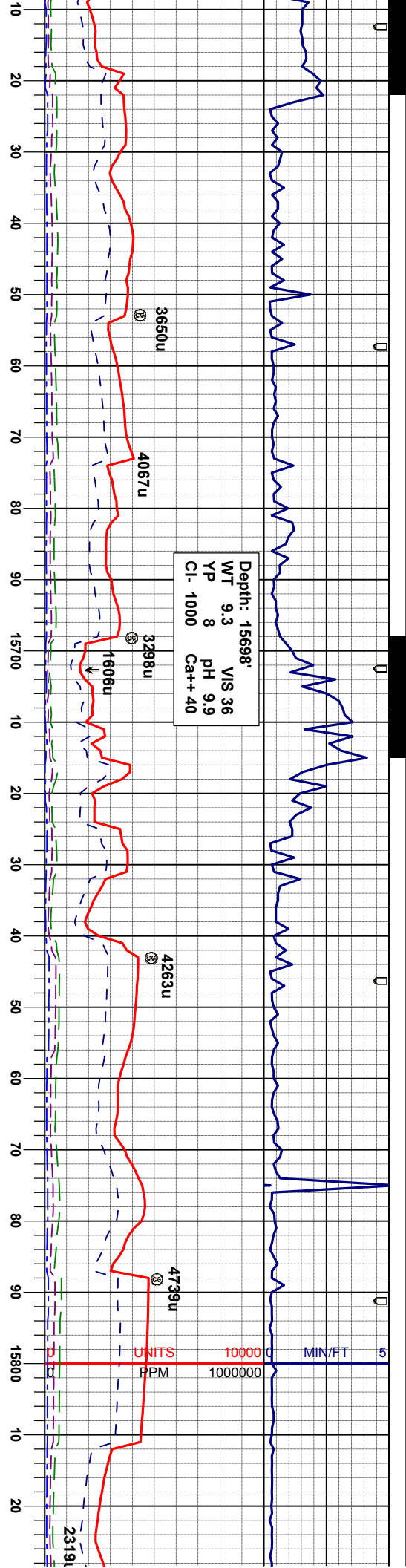


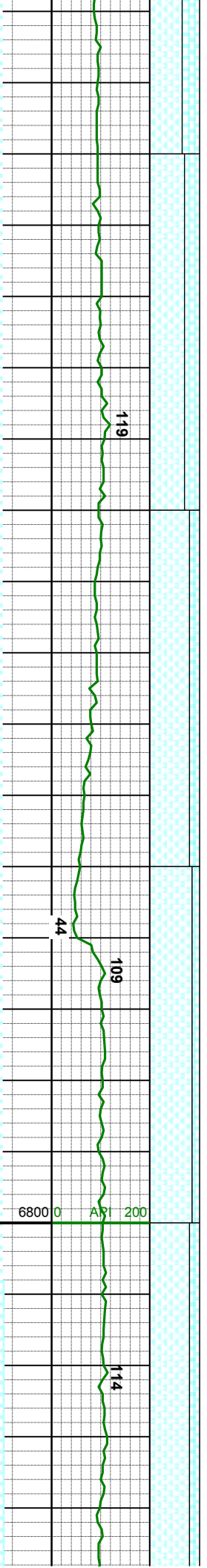
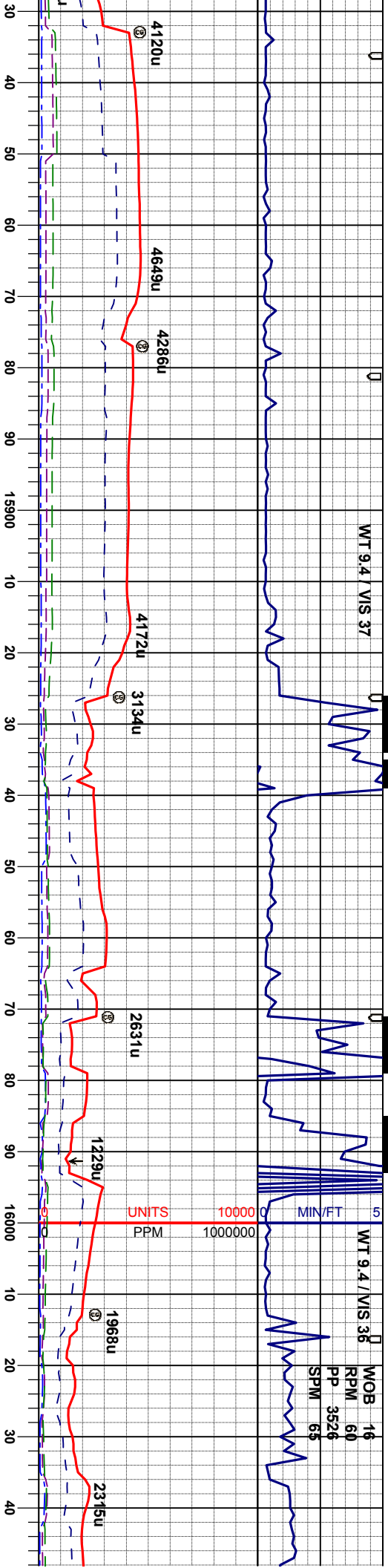


API 200		API 200		API 200	
56	42	113	54	125	
6800		6800		6800	
ft		ft		ft	
MD 15199'		MD 15289'		MD 15378'	
INC 90.8°		INC 91.9°		INC 91.6°	
AZI 86.1°		AZI 88.6°		AZI 91.5°	
TVD 6847.8'		TVD 6845.6'		TVD 6842.9'	
MRL: m- dkgy, sft- m firm, sbblky- sbply, rthy lstr, calc		MRL: m- dkgy, sft- m firm, sbblky- sbply, rthy lstr, silty tex, org/calc mtx, calc, occ bent, occ fos frag		MRL: m- dkgy, sft- m firm, sbblky- sbply, rthy lstr, silty tex, org/calc mtx, calc, occ bent, occ fos frag	
CHK: lt- mgy, mot, sft, blk- sbblky, rthy		CHK: lt- mgy, mot, sft, blk- sbblky, rthy		CHK: lt- mgy, mot, sft, blk- sbblky, rthy	
sft- m firm, sbblky- sbply, org/calc mtx, calc, occ		sft- m firm, sbblky- sbply, org/calc mtx, calc, occ		sft- m firm, sbblky- sbply, org/calc mtx, calc, occ	
mot, sft, blk- sbblky, rthy		mot, sft, blk- sbblky, rthy		mot, sft, blk- sbblky, rthy	
7000		7000		7000	









15828'	MD	15918'
90.2°	INC	90.9°
89.3°	AZI	88.6°
6837.4'	TVD	6836.6'

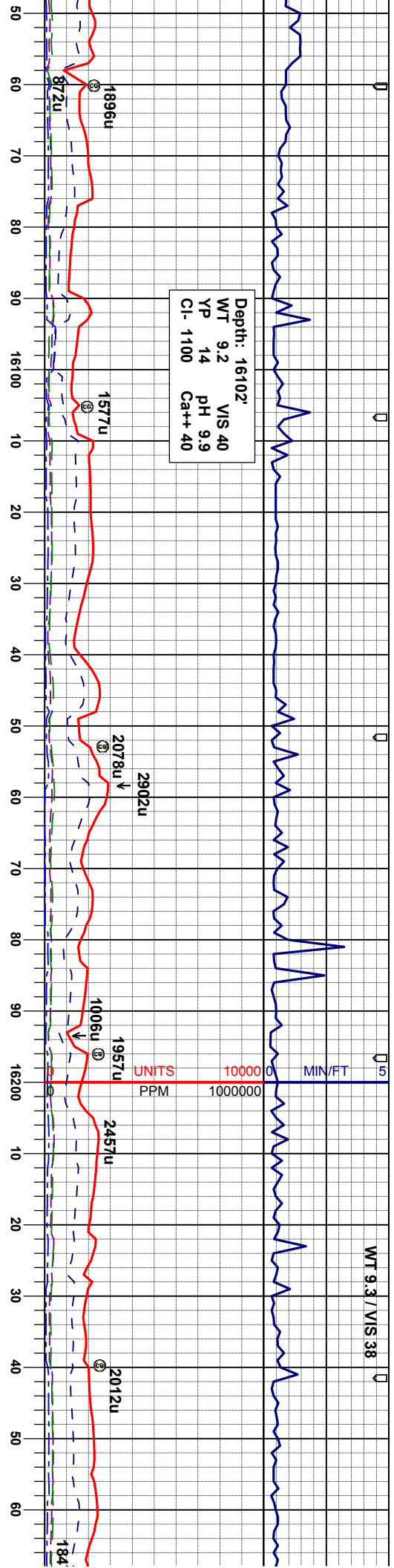
MR.L: m- dkgy, sft- m firm, sbdky- sbply, rthy lstr, silty tex, org/calc mtx, calc, tr bent, tr fos frag

MR.L: m- dkgy, sft- m firm, sbdky- sbply, rthy lstr, silty tex, org/calc mtx, calc, occ bent, occ fos frag

MR.L: m- dkgy, sft- m firm, sbdky- sbply, rthy lstr, silty tex, org/calc mtx, calc, tr bent, occ fos frag

CHK: lt- mgy, mot, sft, bky- sbdky, rthy lstr, calc





MD 16097'		MD 16187'			
INC 90.0°		INC 89.7°			
AZI 88.6°		AZI 88.4°			
TVD 6836.2'		TVD 6836.4'			
MRL: m- dkgy, sft- m firm, sbblky- sbply, rthy lstr, silty tex, org/calc mtx, calc, tr bent, tr fos frag		MRL: m- dkgy, sft- m firm, sbblky- sbply, rthy lstr, silty tex, org/calc mtx, calc, occ fos frag		MRL: m- dkgy, sft- m firm, sbblky- sbply, rthy lstr, silty tex, org/calc mtx, calc, abnt bent, scat fos frag	
CHK: lt- mgy, mot, sft, blk- sbblky, rthy lstr, calc		CHK: lt- mgy, mot, sft, blk- sbblky, rthy lstr, calc		CHK: lt- mgy, rthy lstr, calc	
				MRL: m- dkgy lstr, calc	
				MRL: m- dkgy rthy lstr, silty to bent, occ fos f	



