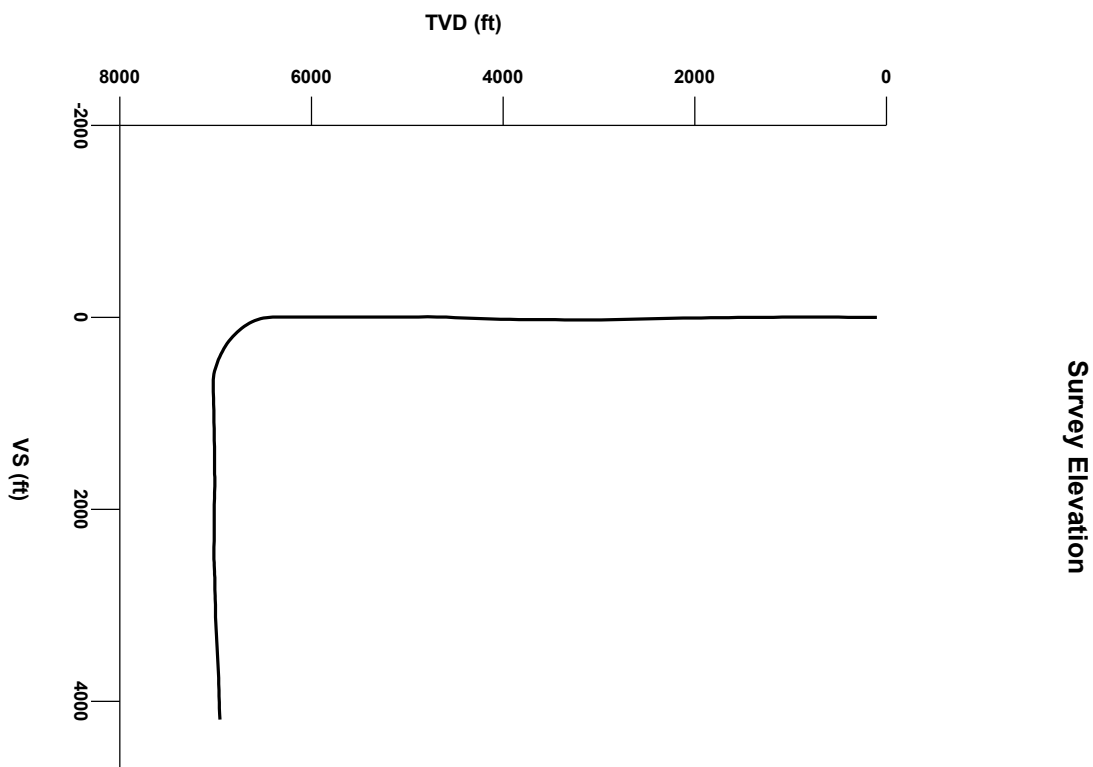
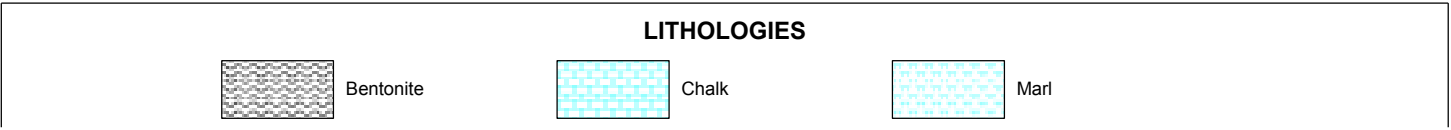
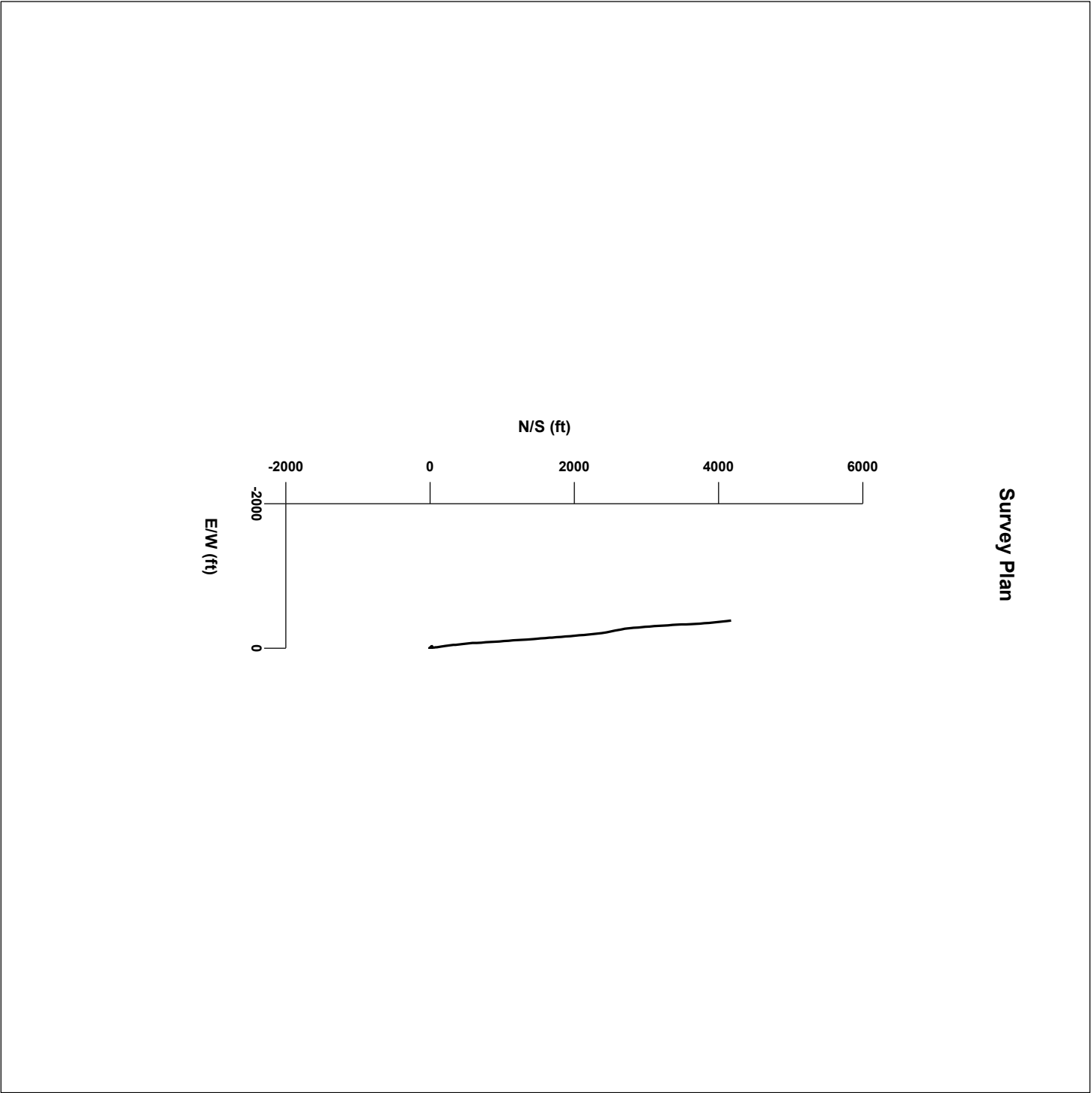
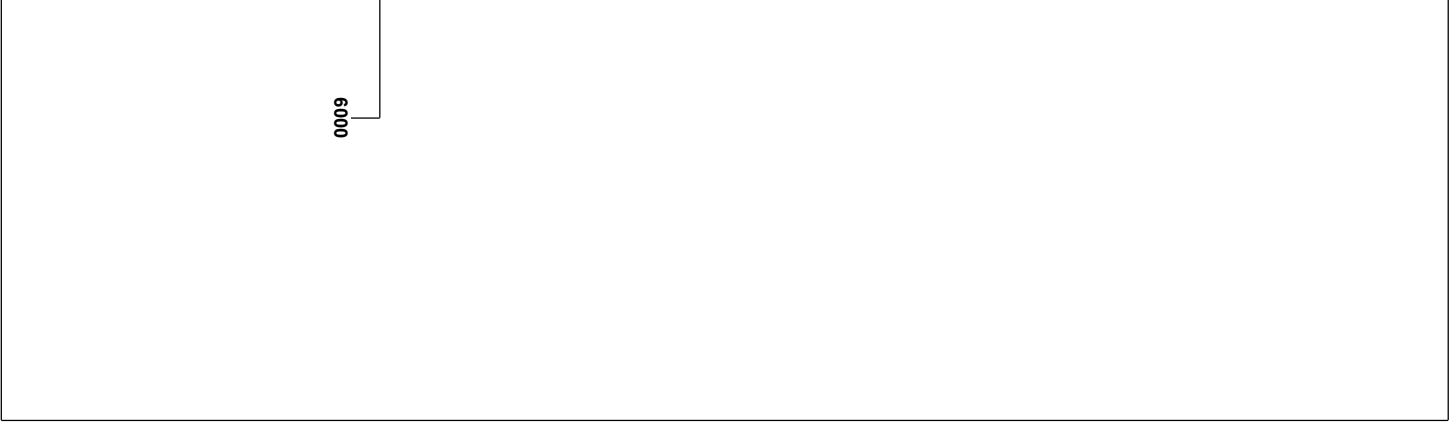


LOG created using LPLOT VH Version 3.0, March 10, 2012, Copyright (C) 1999-2009 Pason Systems Corp.

OPERATOR: ENCANA OIL & GAS (USA) INC.
WELL: GRATTAN 4A-30H
LOCATION: SESE S30 T2N-R64W
COUNTY: WELD
STATE: COLORADO
SPOT: 621' FSL, 461' FEL
ELEVATION: 4935' GL, 4948' KB
FIELD: WATTENBERG
SPUD DATE: 02/29/12 @ 0230 HRS
TD DATE: 03/10/12
DATES LOGGED: 03/04/12 - 03/10/12
DEPTHS LOGGED: 5000' - 10980'
LOGGERS: MICHAEL ANDERSON, SCOTT MANWARING
DRILLING FLUID: H2O, LSND
DRILLING RIG: ENSIGN #135
API: 05-123-34362
LOG TYPE: HORIZONTAL
SCALE: 1:240 (5 inches per 100 feet)
REMARKS: Continued from Grattan 4A-30H Vertical.







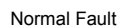
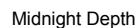
MODIFIERS

B Bentonite

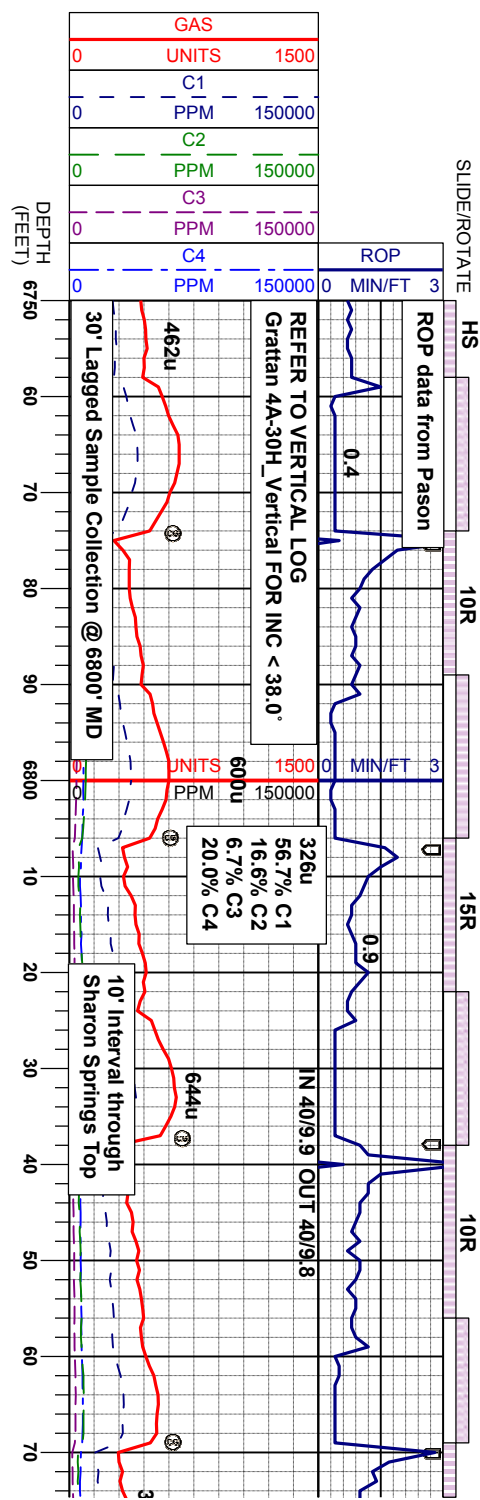
F Fossils

P Pyrite

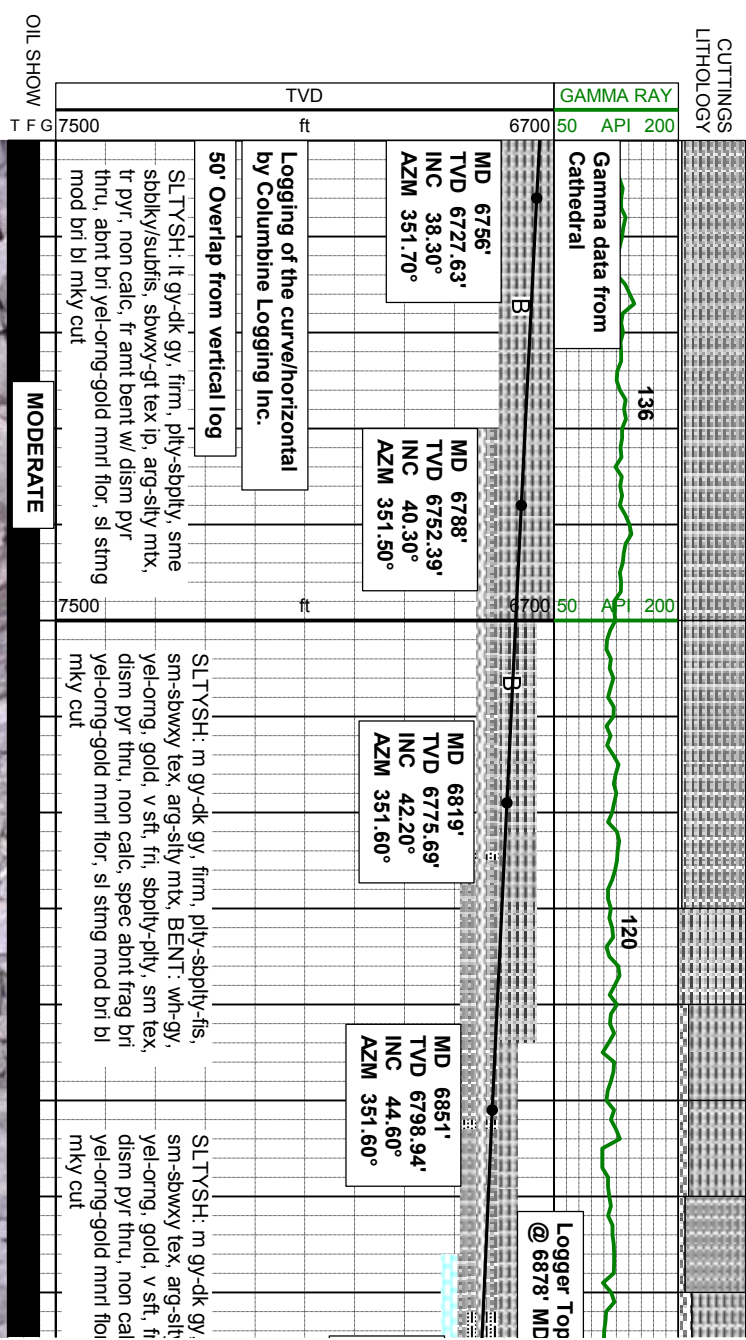
ENGINEERING SYMBOLS

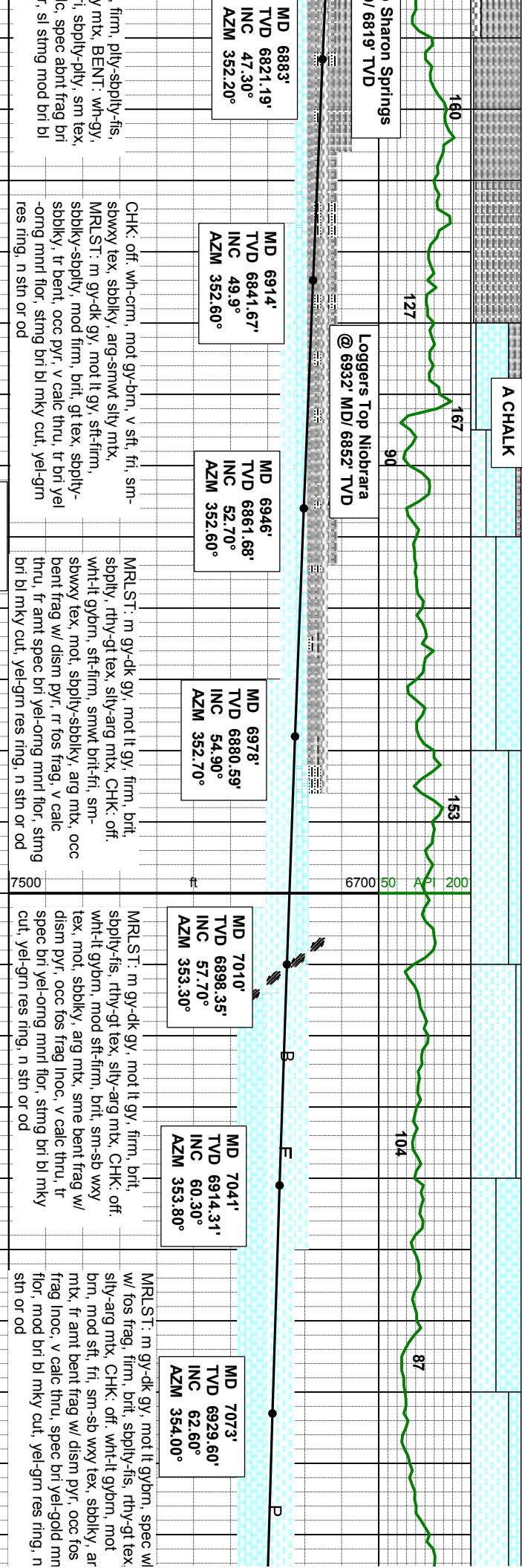
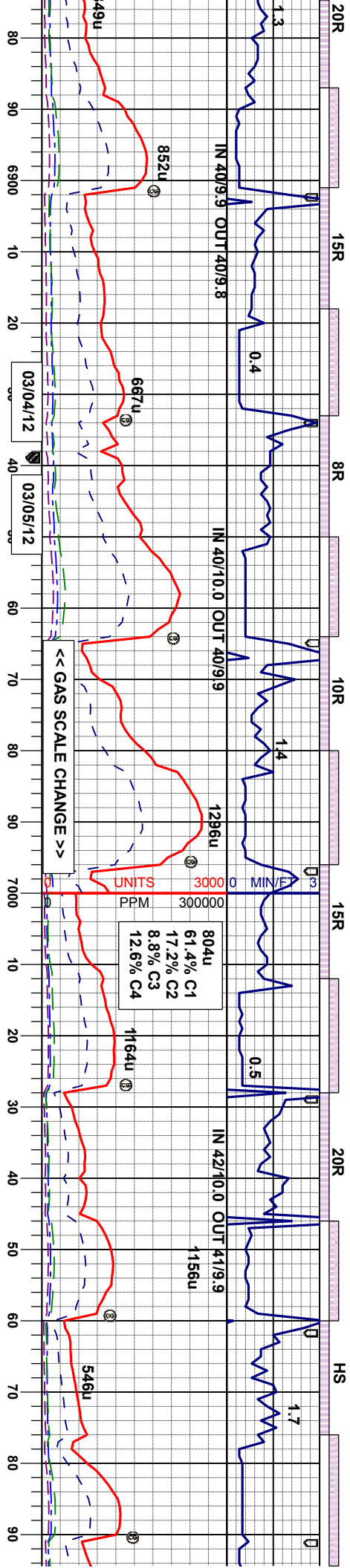


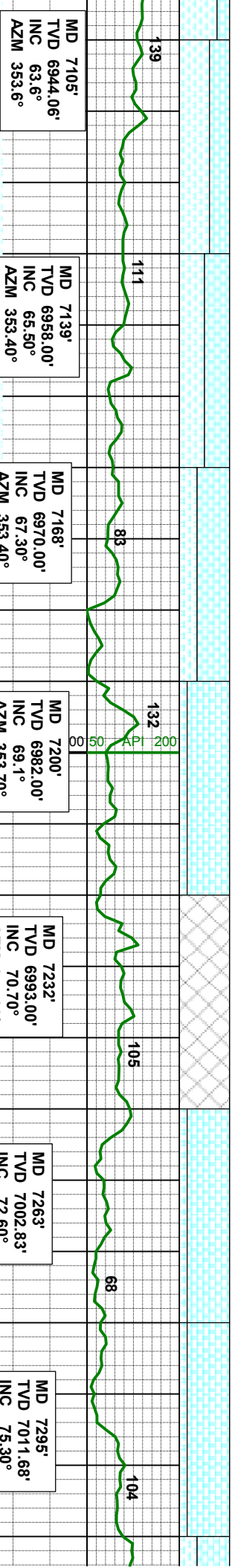
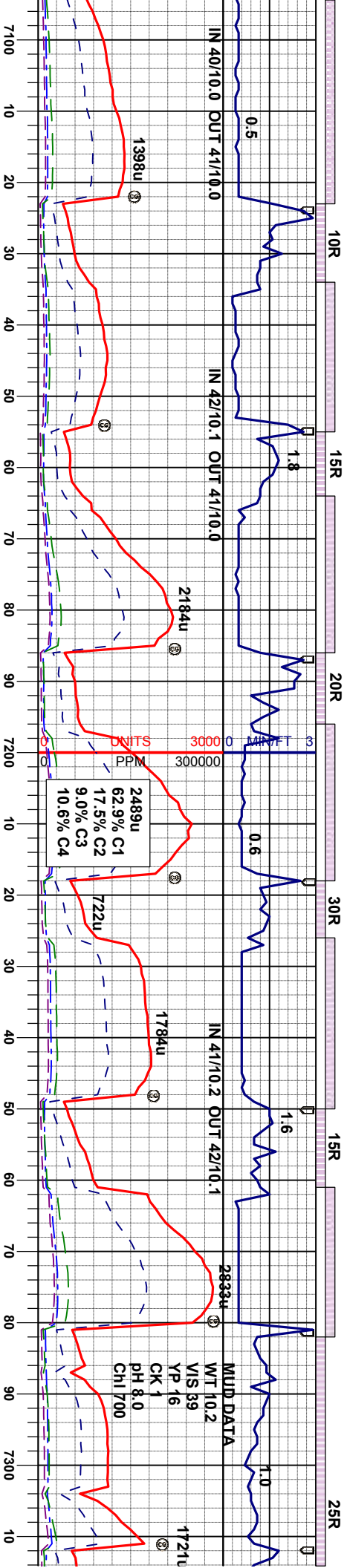
BAR SYMBOLS



SAMPLE PHOTOS







CHK: It brn-crm, mot wh, mod sft, fri, wxy tex, sbply-sbply, arg mt, MRLST: m gy-dk gy, firm, brit, sbply, gt tex, silty-arg mt, fr amt bent frag w/ dism pyr, occ fos frag Inoc, v calc thru, spec bri yel mnrl flr, mod bri bl mky cut, yel-gm res ring, n stn or od

CHK: v wh-brn, mot thru, mod sft-smwt firm, brit-fri, sm-v wxy tex, sbply-sbply, arg mt, MRLST: dk gy, v firm, brit, sbply-sbfts, gt tex, silty-arg mt, tr bent frag, tr fos frag, tr pyr, v calc thru, tr bri yel mnrl flr, mod bri bl mky cut, yel-gm res ring, n stn or od

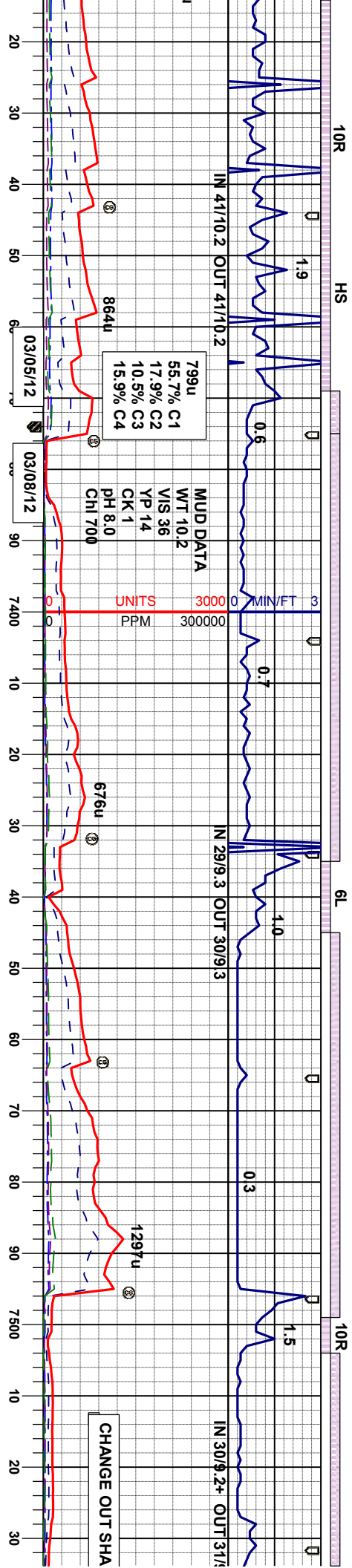
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CHK: wh-brn, mot, mod sft-firm, brit-fri, sm-wxy tex, sbply-sbply, arg mt, MRLST: dk gy, spec wh, firm, brit, sbply-sbfts, gt tex, silty-arg mt, tr bent frag, tr fos frag, v calc thru, spec du gold-orm mnrl flr, sl string bri bl mky cut, yel-gm res ring, n stn or od

CHK: wh-bl wxy tex, sb-dk gy, firm mt, tr bent thru, tr du string bri bl od, n stn

MODERATE





GAMMA PROBE IN CASING

@ 7375' MD: Perform 15 stand short trip;
TIH to bit; Run 7 in Intermediate Casing;
Pick up lateral BHA; drill out of casing shoe

MD 7325'
TVD 7017.92'
INC 80.70°
AZM 356.60°

MD 7385'
TVD 7023.87'
INC 87.9°
AZM 357.60°

MD 7449'
TVD 7025.10'
INC 89.90°
AZM 357.00°

MD 7512'
TVD 7024.71'
INC 90.80°
AZM 355.60°

<< TVD SCALE CHANGE >>

n, mot, pred sft-sl firm, fri, sm-
sbbly-sbrd, arg mtz, MRLST: m gy
, brt, sbbly-sbfrs, gt tex, silty-arg
frag, rr pyr, rr fos frag, v calc
gold-orm mnt flr, immediate
mky cut, yel-gm res ring, fnt o

MRLST: dk gy, occ blk, firm, brt, sbbly-
sbbly, gt tex, silty-arg mtz, CHK: wh-it brn,
mot, pred sft-sl firm, fri, sm-wxy tex, sbbly-
sbrd, arg mtz, tr bent frag, occ pyr, fr ant
fos frag inoc, v calc thru, tr brt yel-gold mnt
flr, fast sting bri bl mky cut, v it gm res
ring, fnt o od, n stn

CHK: lt brn-brn, pred sft-sl firm, fri, sm-wxy
tex, sbbly-sbrd, arg mtz, MRLST: m-it gy,
occ blk and dk gy, firm, brt, sbbly-sbbly,
gt tex, arg-sily mtz, v calc thru, occ fos frag
inoc, tr pyr, n mnt flr, fast sting bri bl mky
cut, lt gm res ring, fnt o od, n stn

MRLST: m-it gy, occ dk gy, firm, brt, sbbly
-sbbly, gt-rthy tex, arg-sily mtz, CHK: wh-it
brngy, mot, pred sft-sl firm, fri, sm-wxy tex,
sbbly-sbrd, arg mtz, v calc thru, occ fos
frag inoc, rr pyr, n mnt flr, fast sting bri bl
mky cut, v fnt gm res ring, fnt o od, n stn

MRLST: m-it gy, occ dk gy, firm,
-sbbly, gt-rthy tex, arg-sily mtz,
lt brngy, mot, pred sft-sl firm, fri,
tex, sbbly-sbrd, arg mtz, v calc
fos frag inoc, rr pyr, n mnt flr,
bri bl mky cut, bri gn res ring, fnt

MODERATE





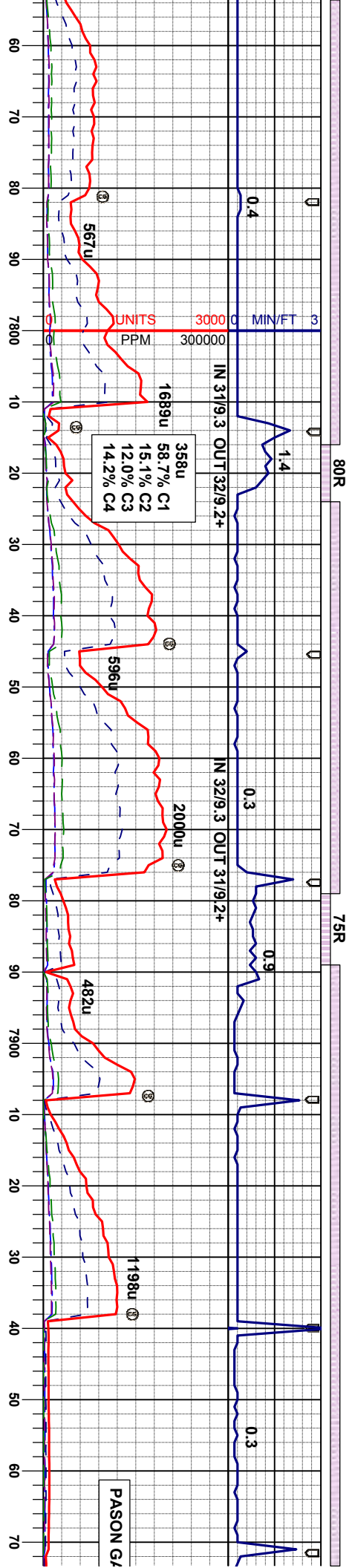
MD	7639'
TVD	7021.5'
INC	91.60°
AZM	356.20°

MD	7702'
TVD	7019.74'
INC	91.60°
AZM	355.80°

CHK: it gybm-gybm, offt wh mody sply-sli
firm, fri, sm-sb wxy tex, stl grt slt, sply-sb-
sbility, arg-smwt sily mt, MGR STR: m gy-dk
gy, spec wn ip, v firm, brit, spbly-sbky,
microhn, qf tex, arg-sly mtm, v calc thru,
occ fos frag inoc, t' bent w/ dism pyr, spec
bri gold mtl flwr, string mod bri bl mky cut,
bri yel-gn res ring, n sin or od

GOOD





MD 7766'
TVD 7018.12'
INC 91.30°
AZM 355.10°

MD 7829'
TVD 7016.96'
INC 90.80°
AZM 355.20°

MD 7893'
TVD 7015.96'
INC 91.00°
AZM 356.80°

MD 7956'
TVD 7014.91'
INC 90.90°
AZM 356.80°

CHK: It gybrn-gybrn, off, wh, mod sft-sl
firm, fri, sm-sb wxy tex, sl gt ip, sbply-
sbblky, arg-smwt sily mtz, MRLST: m gy-dk
sily, spec wh ip, v firm, brt, sbply-sbblky,
microxin, gt tex, arg-sily mtz, v calc thru,
occ fos frag inoc, it bent w/ dism pyr, spec
ori gold mnrt flor, sting mod bri bl mky cut,
bri yel-gn res ring, n stn or od

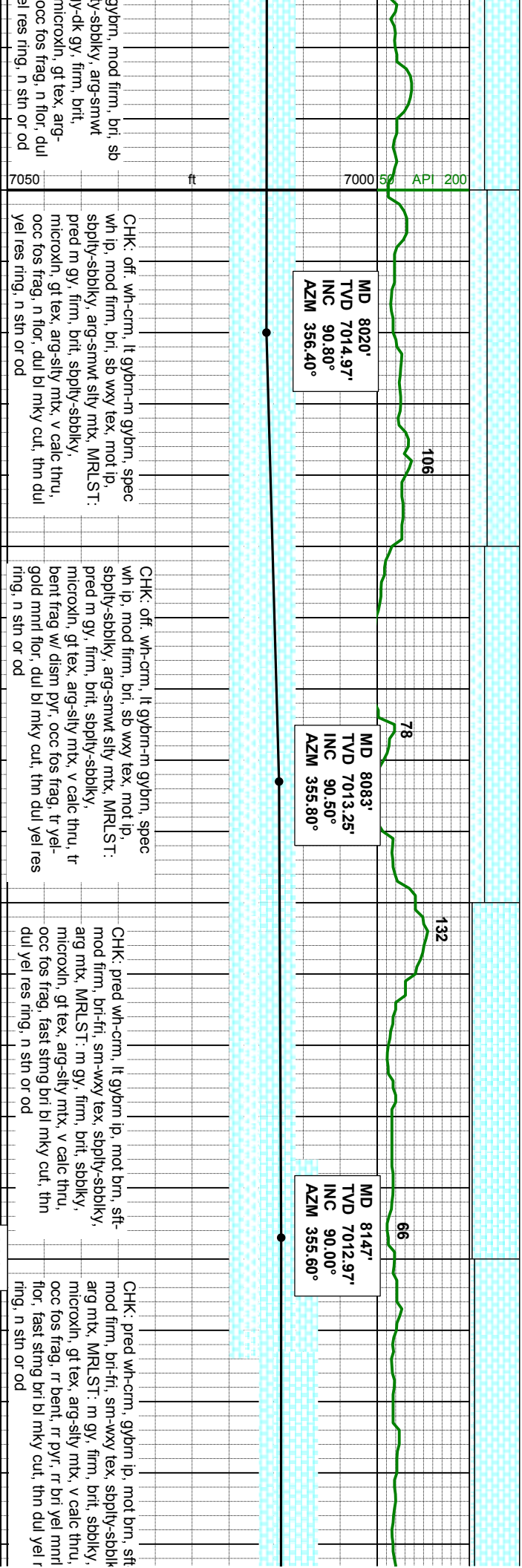
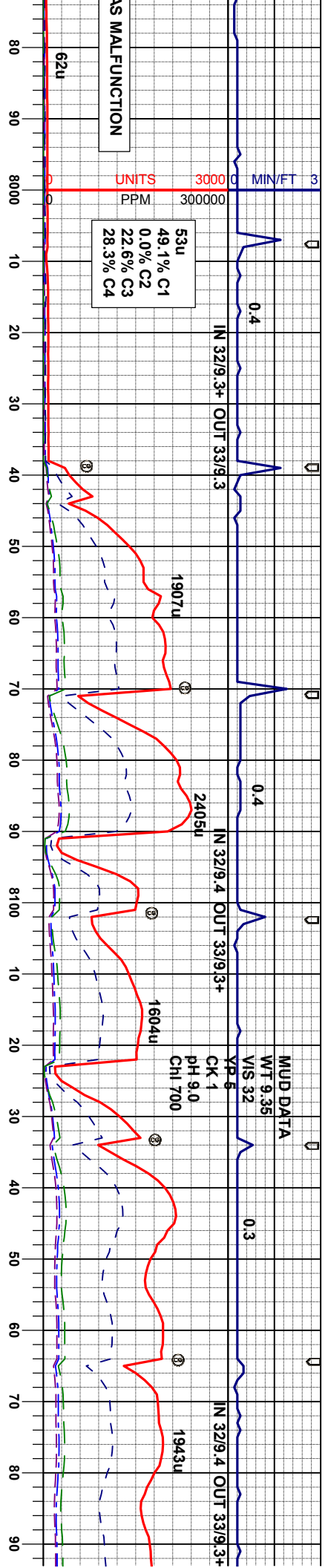
MRLST: smwt lt gy-dk gy, spec wh ip, v
firm, brt, sbply-sbblky, microxin, gt tex, arg
sily mtz, CHK: It gybrn-gybrn, off, wh, mod
sft-sl firm, fri, sm-sb wxy tex, sl gt ip, sbply-
sbblky, arg-smwt sily mtz, v calc thru, r fos
frag, n flor, sting mod bri bl-purp mky cut,
dul gn res ring, n stn or od

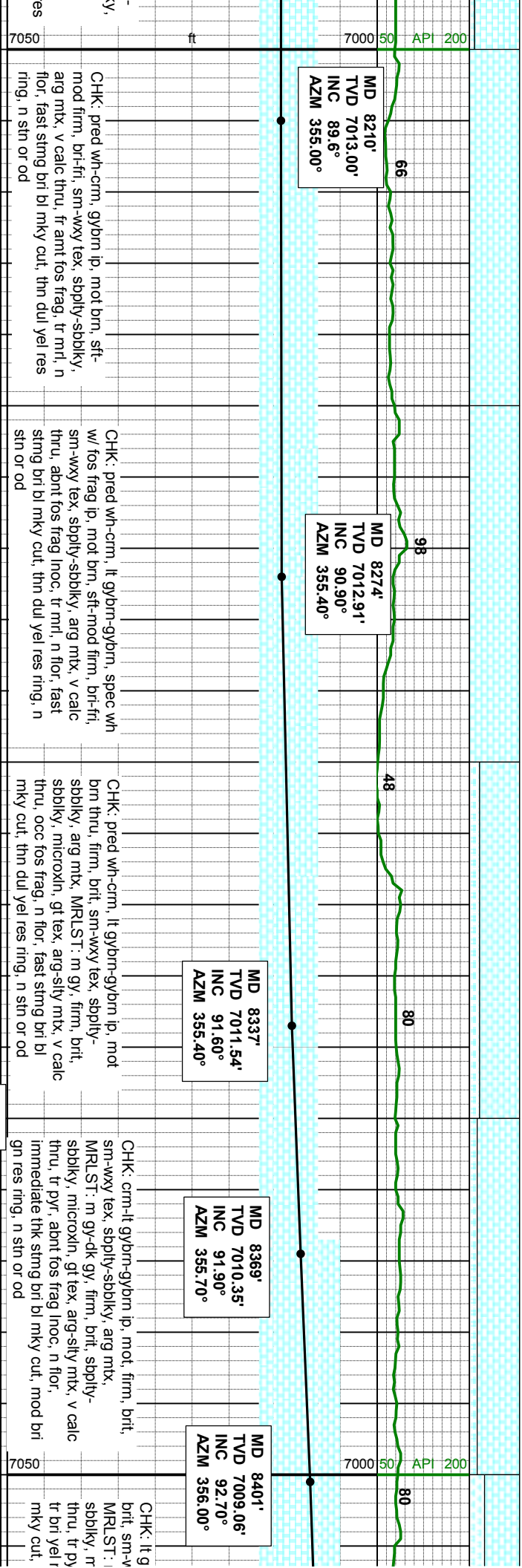
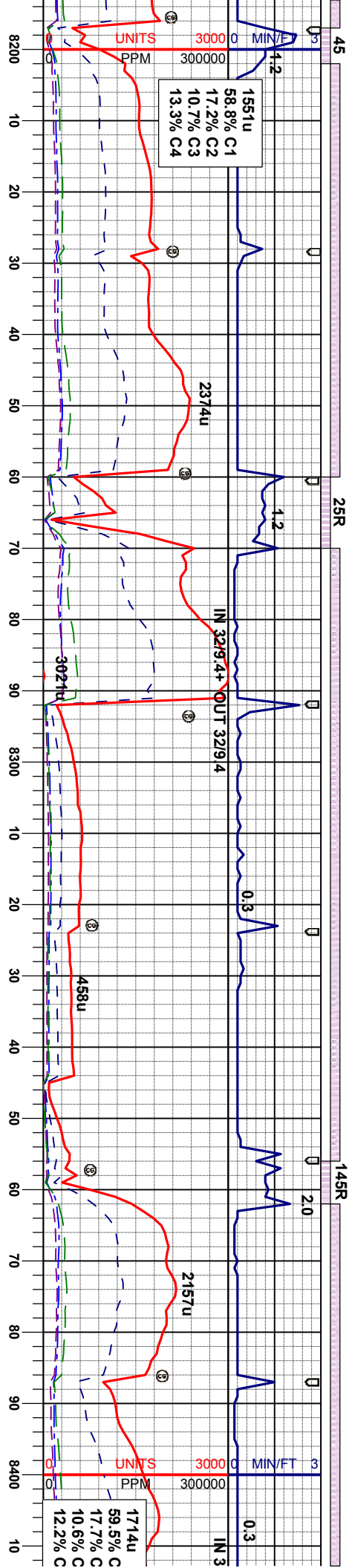
CHK: It gybrn-gybrn, mod firm, bri, sm-sb
wxy tex, sl gt ip, sbply-sbblky, arg-smwt
sily mtz, MRLST: It gy-dk gy, firm, brt,
sbply-sbblky, fis ip, microxin, gt tex, arg-
sily mtz, v calc thru, r bent, r pyr, r fos
frag, n flor, mod bri bl-purp mky cut, dul gn
res ring, n stn or od

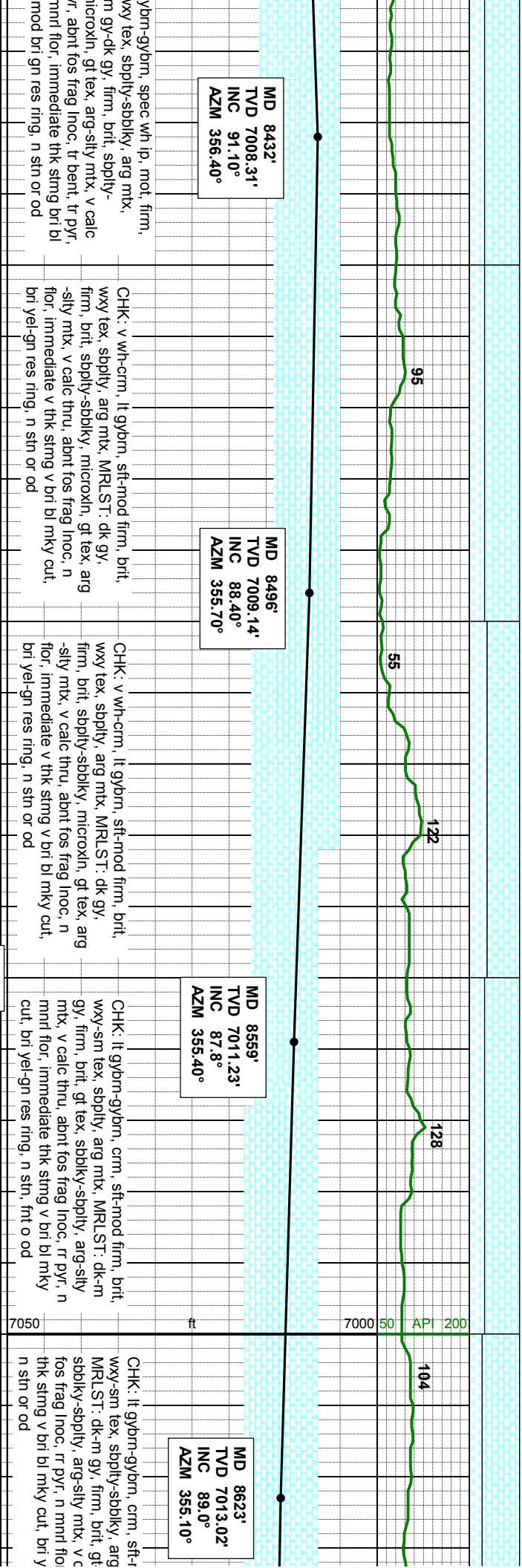
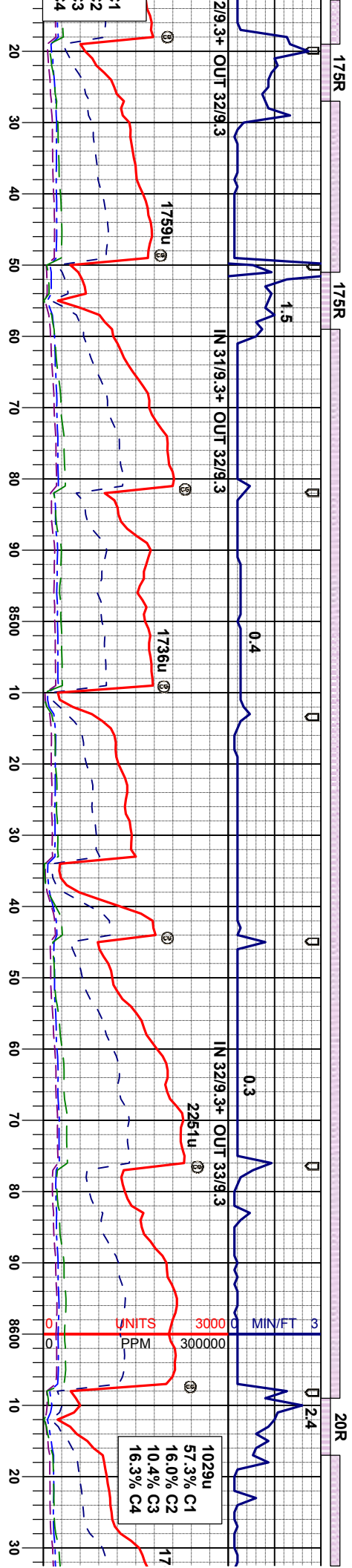
CHK: off, wh-crm, lt gybrn, mod firm, bri, sb
wxy tex, mot ip, sbply-sbblky, arg-smwt
sily mtz, MRLST: It gy-dk gy, firm, brt,
sbply-sbblky, fis ip, microxin, gt tex, arg-
sily mtz, v calc thru, occ fos frag, n flor, dul
bl mky cut, thin dul yel res ring, n stn or od

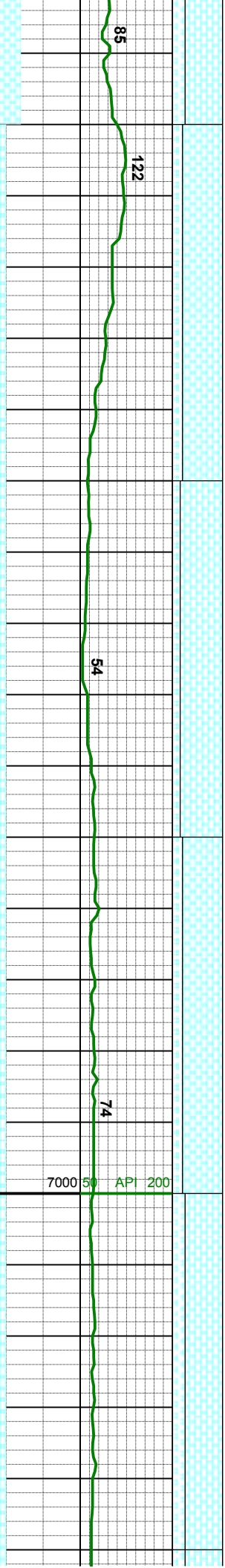
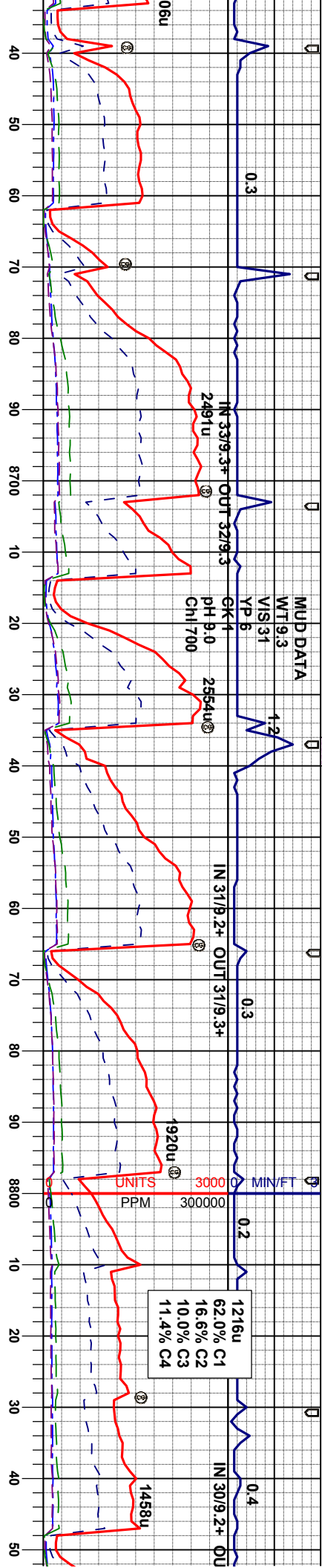
CHK: off, wh-crm, lt gybrn, mod firm, bri, sb
wxy tex, mot ip, sbply-
sily mtz, MRLST: It g
sbply-sbblky, fis ip, i
sily mtz, v calc thru,
bl mky cut, thin dul ye

GOOD









MD 8666'
TVD 7014.12'
INC 89.0°
AZM 354.90°

MD 8750'
TVD 7014.79'
INC 89.80°
AZM 354.70°

MD 8813'
TVD 7014.40'
INC 90.90°
AZM 354.90°

mod firm, brit, mtx.
rthy tex, calc thru, about immediate
n mnt flr, immediate thk sting v bri bl mky cut, bri gn-bl res ring, n stn or od

CHK: It gybrn-gybrn, crm, sft-mod firm, brit, wxy-sm tex, sbply-fis, arg mtx, MRLST: dk-m gy, firm, brit, gt-rthy tex, sbply-sbply, arg-sily mtx, v calc thru, about fos frag inoc, n mnt flr, immediate thk sting v bri bl mky cut, bri gn-bl res ring, n stn or od

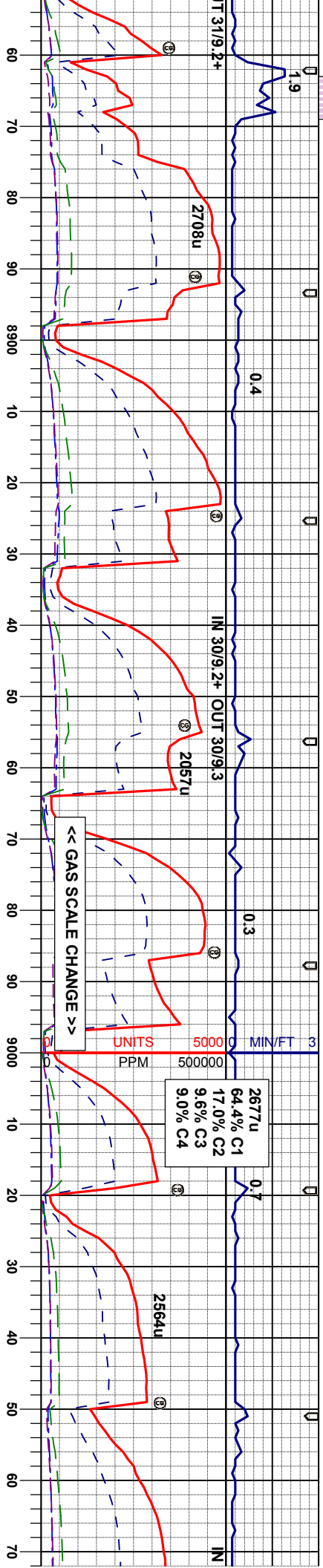
CHK: It gybrn-gybrn, off, crm, sft-mod firm, brit, wxy-sm tex, sbply-fis, arg mtx, MRLST: dk-m gy, firm, brit, gt-rthy tex, sbply-sbply, arg-sily mtx, v calc thru, about fos frag inoc, n mnt flr, immediate thk sting v bri bl mky cut, bri gn-bl res ring, n stn or od

CHK: It gybrn-gybrn, sft-mod firm, brit, wxy-sm tex, sbply-fis, arg mtx, MRLST: dk-m gy, firm, brit, gt-rthy tex, sbply-sbply, arg-sily mtx, v calc thru, about fos frag inoc, n mnt flr, immediate thk sting v bri bl mky cut, bri gn-bl res ring, n stn or od

CHK: It gybrn-gybrn, sft-mod firm, brit, wxy-sm tex, sbply-fis, arg mtx, MRLST: dk-m gy, firm, brit, gt-rthy tex, sbply-sbply, arg-sily mtx, v calc thru, about fos frag inoc, n mnt flr, immediate thk sting v bri bl mky cut, bri gn-bl res ring, n stn or od

GOOD





MD 8876'
TVD 7014.02'
INC 89.80°
AZM 356.20°

MRSLST: dk-m gy, firm, brit, gt-rthy tex, sbbkly-sbply, arg-sily mtz, CHK: lt gybrn-gybrn-dm, sft-mod firm, brit, wxy-sm tex, sbply-fis, arg mtz, v calc thru, abnt fos frag noc, r pyr, n mnt flr, immediate thk string v bri bl mky cut, bri gn-bl res ring, n stn or od

MD 8940'
TVD 7014.41'
INC 89.50°
AZM 354.40°

MRSLST: dk-m gy, occ blk, firm, brit, gt-rthy tex, sbbkly-sbply, arg-sily mtz, CHK: lt gybrn-gybrn-dm, sft-mod firm, brit, wxy-sm tex, sbply-fis, arg mtz, v calc thru, abnt fos frag inoc, n mnt flr, mod fast sl string v bri bl mky cut, bri gn res ring, n stn or od

MD 9003'
TVD 7014.69'
INC 90.00°
AZM 354.90°

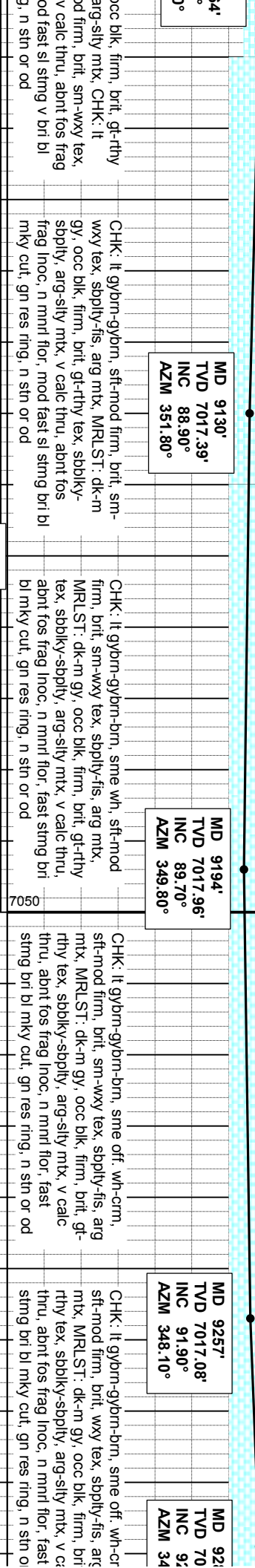
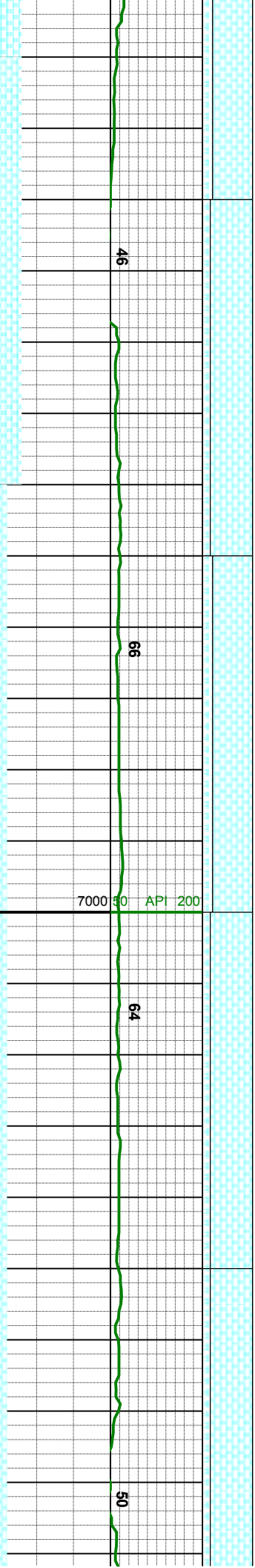
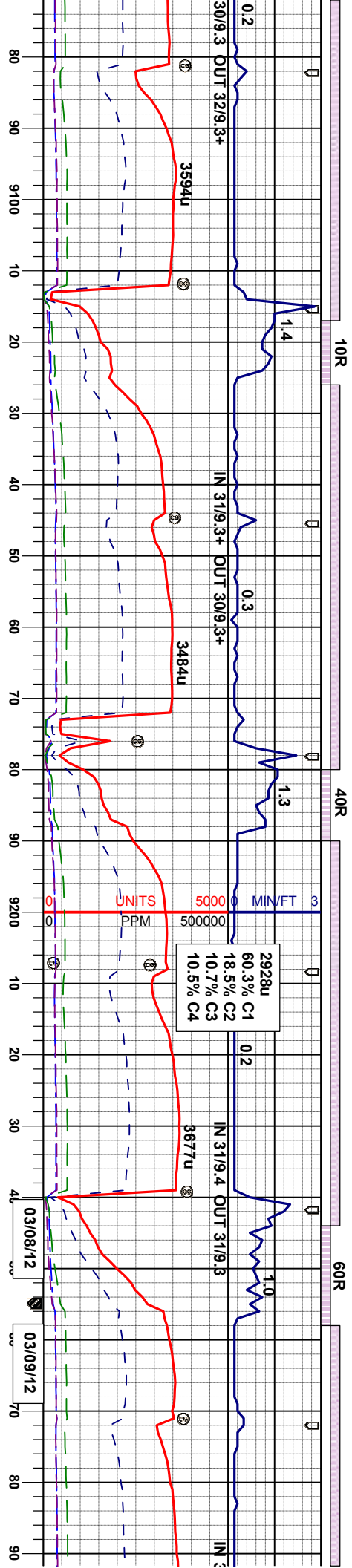
MRSLST: dk-m gy, occ blk, firm, brit, gt-rthy tex, sbbkly-sbply, arg-sily mtz, CHK: lt gybrn-gybrn, sft-mod firm, brit, sm-wxy tex, sbply-fis, arg mtz, v calc thru, abnt fos frag inoc, n mnt flr, mod fast sl string v bri bl mky cut, gn res ring, n stn or od

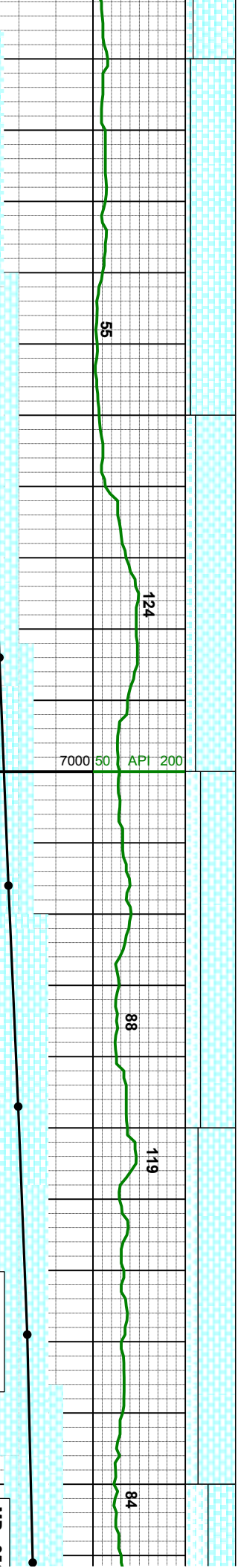
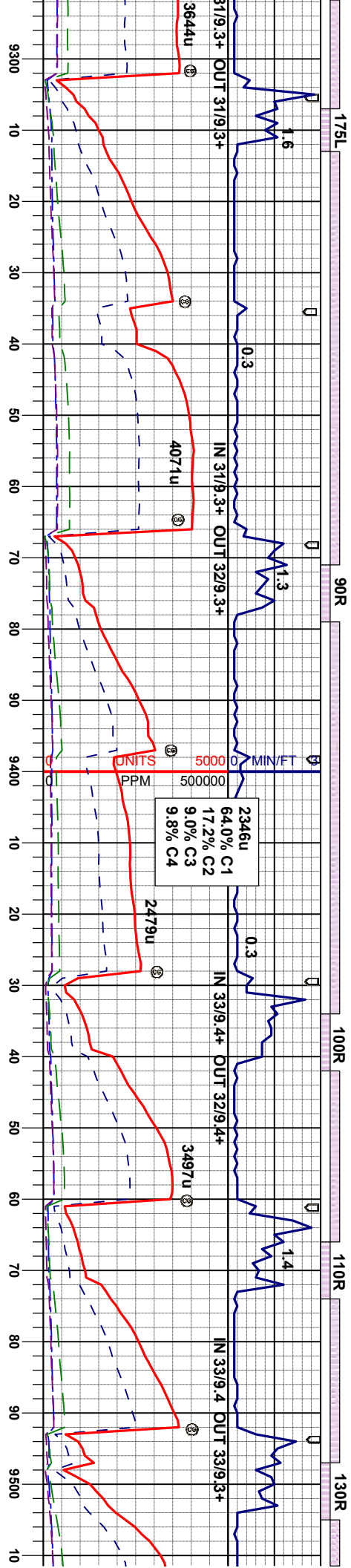
MD 9067'
TVD 7015.6'
INC 88.30°
AZM 353.8°

MRSLST: dk-m gy, occ blk, firm, brit, gt-rthy tex, sbbkly-sbply, arg-sily mtz, CHK: lt gybrn-gybrn, sft-mod firm, brit, sm-wxy tex, sbply-fis, arg mtz, v calc thru, abnt fos frag inoc, n mnt flr, mod fast sl string v bri bl mky cut, gn res ring, n stn or od

GOOD







89'
15.90'
2.30°
17.70°

MD 9321'
TVD 7014.68'
INC 92.10°
AZM 349.30°

TVD	7012.84'
INC	92.00°
AZM	349.40°

MD 9416'
TVD 7011.41'
INC 92.40°
AZM 349.80°

MD	9447'
TVD	7009.8
INC	92.50°
AZM	351.20

MD	9479'
TVD	7008.64'
INC	91.90°
AZM	353.30°

MD	951
TVD	700
INC	900
AZM	350

CHK: it gybm-gybm-bm, sme of, wh-cm,
sft-mod firm, brt, wxy tex, sbply-fs, arg
mtx, MRST: pcedon dk-m, r, blk, firm
brt, g-ftty tex, sbblky-sbply, arg-sily mtx
v calc thru, abt fos freg lnc, n mnr flr,
fast string brt bl mky cut, gn res ring, n str
or od

CHK, n gyvrm-gyvrm-om, sme otr. wh-cmm
stf-mod firm, brit, wxy tex, sbply, arg mtx
MLRST: pxdom dk-n gy, r blk, firm, v
gr-ty tex, sbply-sbply, arg-sly mtx, v
calc thru, abnt fos frag inoc, n mmf flr, s
fast sting bri bl mky cut, gn tes ring, n str
or od

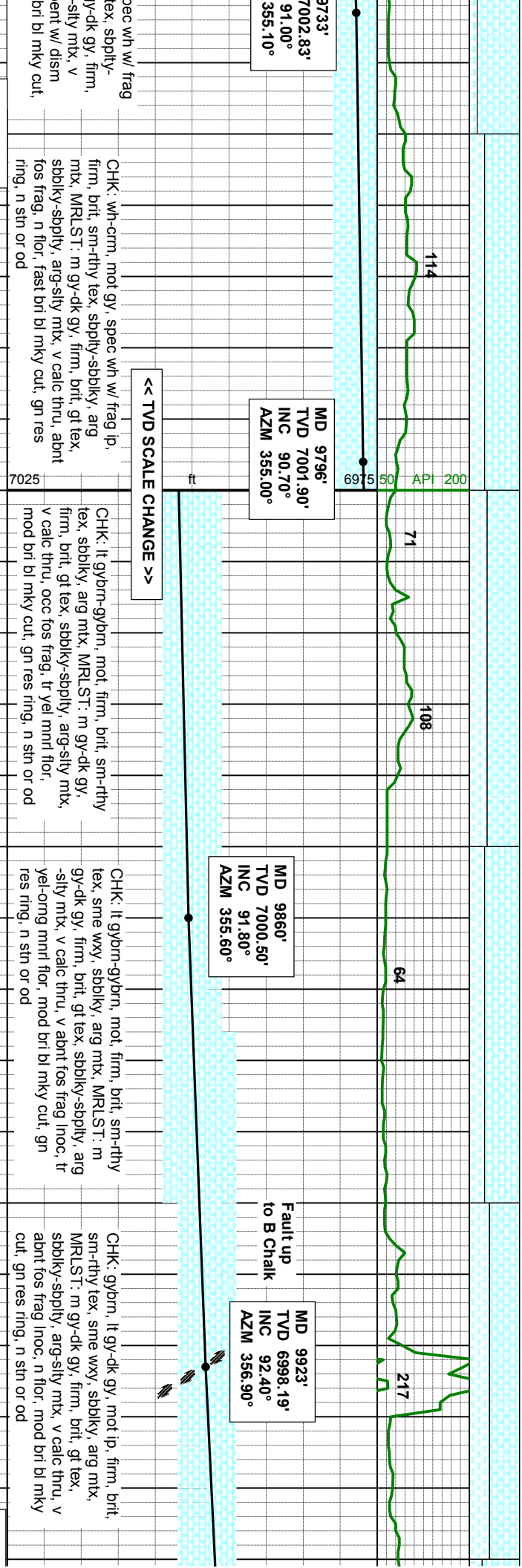
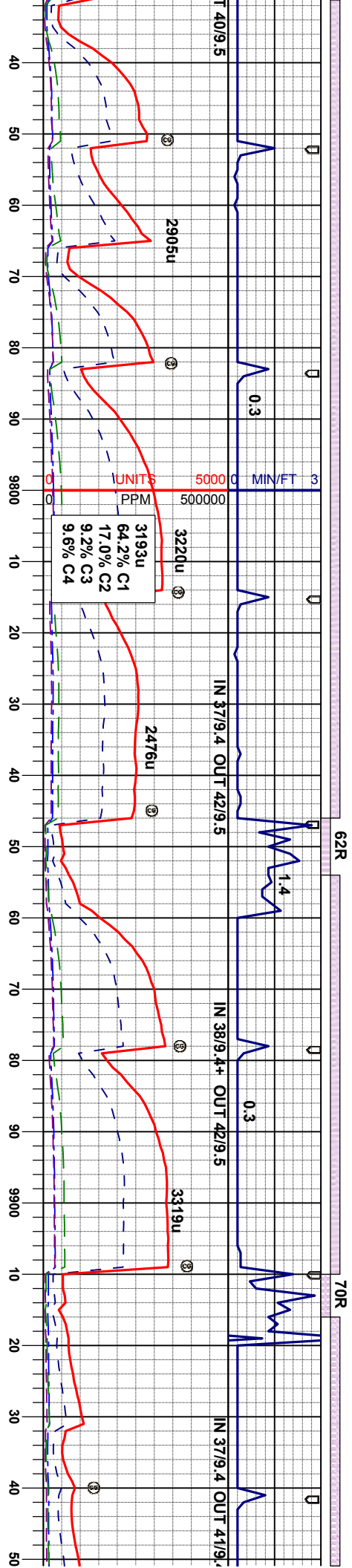
CHK: It gybm-gybm-brn, wh-crm, frm, brttxy tex, sbply-sbdky, ang mx, MRLST: n, dk gy, frm, brt, gr-thy tex, sbkly-sbply, ang-sly mx, v calc thr, abnt fss frng inoc, r bent, r gold mflr, fast stng brt bl m cut, gn res ring, n sh or od

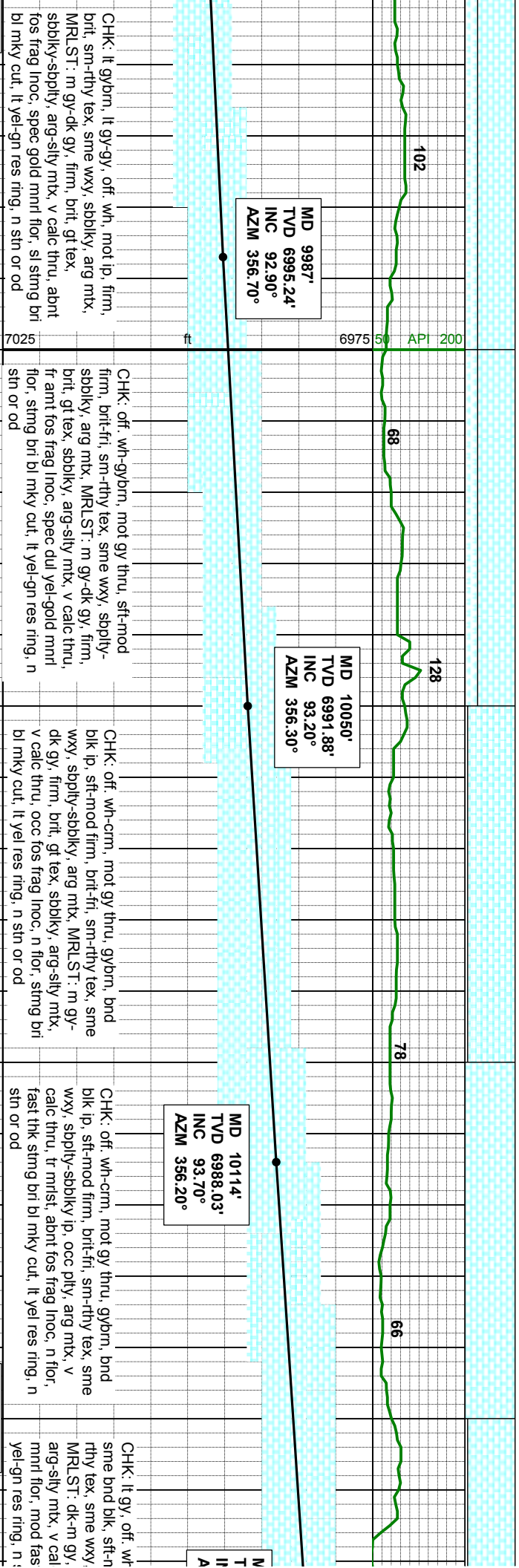
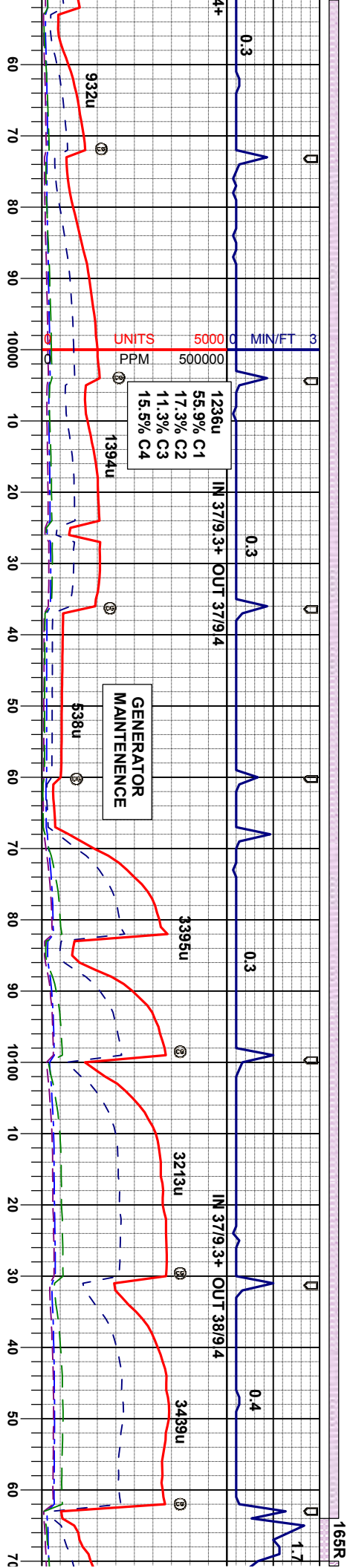
CHK: It gyðen-gyðm, off. wh-cm, firm, brit
way tex, sbply sbply, aig mtk, MRLST: n
dk gy, firm, brit, gthly tex, sbply-sbply,
arg-sfly mtk, v caic thru, ooc fos frag inoç,
n bent, spec bri,yel-dui omg mnd flor, fasti
sl stimg bri bi mky cut, gn res ring, n stn o
od

CHK: It g
wxy tex,
dk gy, fir
arg-slty r
r bent, s
sl sting k
od

MODERATE

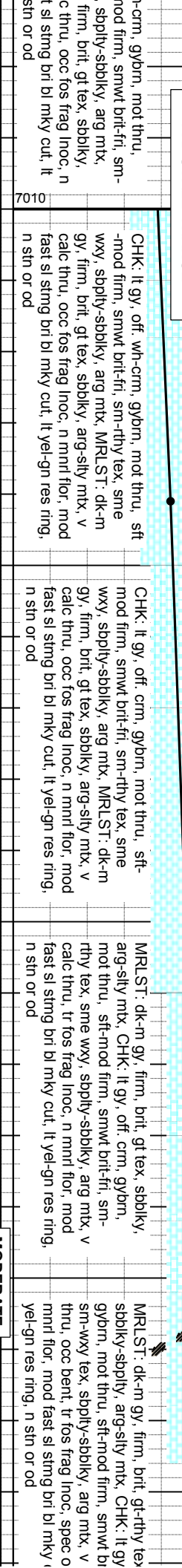
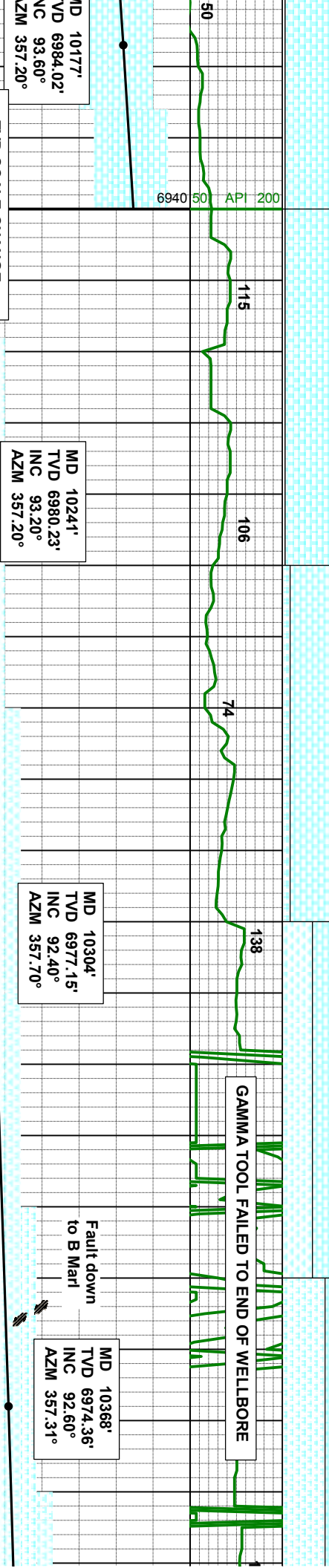
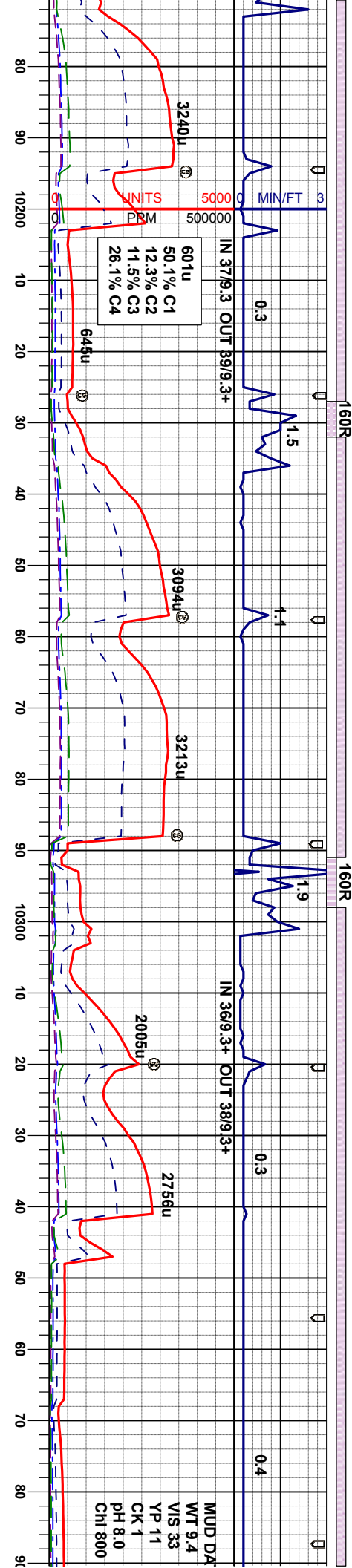


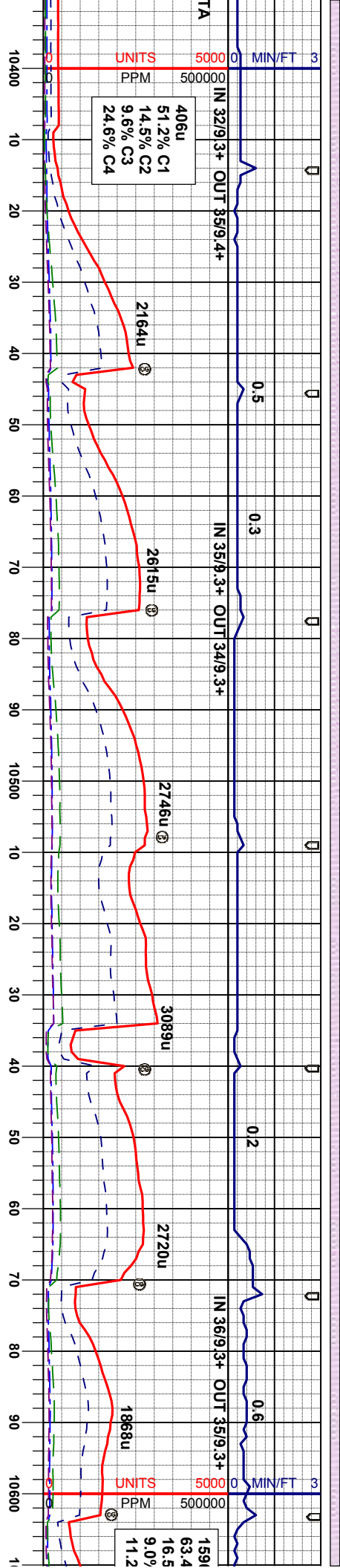




RATE

MODERATE





MD 10431'
TVD 6971.83'
INC 92.00°
AZM 356.80°

MD 10495'
TVD 6969.82'
INC 91.60°
AZM 355.70°

MD 10558'
TVD 6968.17'
INC 91.40°
AZM 355.60°

MRLST: dk-m gy, firm, brit, gt-rthy tex, sbbkly-sbply, arg-sily mtz, CHK: lt gy, gybrn, mot thru, sft-mod firm, smwt brit-fri, sm-wxy tex, sbply-sbply, arg mtz, v calc thru, tr bent, tr fos frag inoc, r omg mnrl flr, mod fast sl sting bri bl mky cut, lt gn res ring, n stn or od

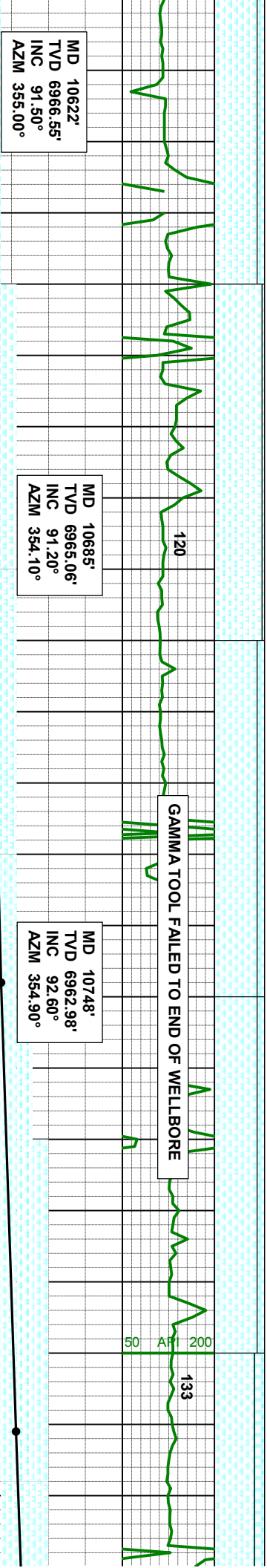
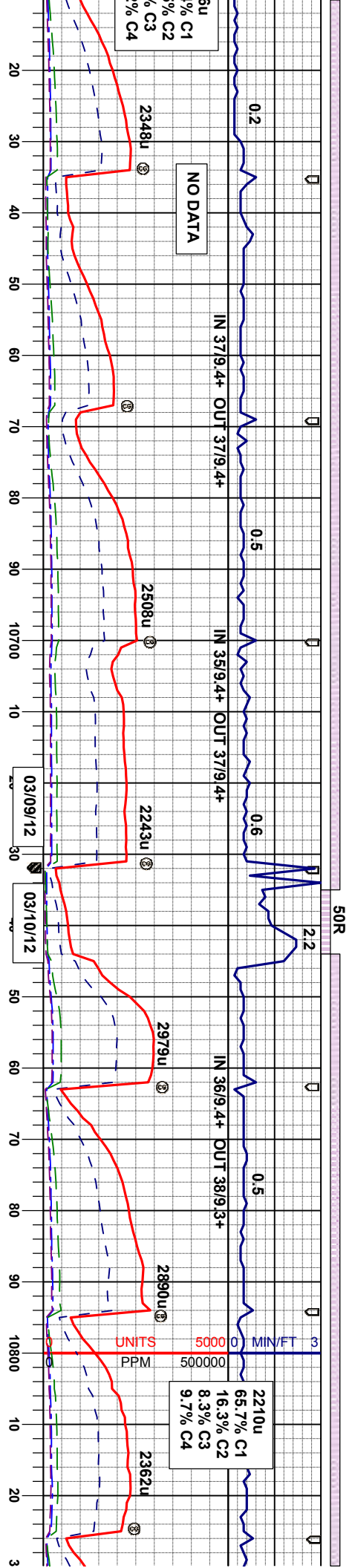
MRLST: dk-m gy, firm, brit, gt-rthy tex, sbbkly-sbply, arg-sily mtz, CHK: lt gy, gybrn, mot thru, sft-mod firm, smwt brit-fri, sm-wxy tex, sbply-sbply, arg mtz, v calc thru, tr fos frag inoc, n mnrl flr, mod fast sl sting bri bl mky cut, lt gn res ring, n stn or od

MRLST: dk-m gy, firm, brit, gt-rthy tex, sbbkly-sbply, arg-sily mtz, CHK: m gy, gybrn, mot thru, sft-mod firm, smwt brit-fri, sm-wxy tex, sbply-sbply, arg mtz, v calc thru, occ bent, tr fos frag inoc, spec omg mnrl flr, mod fast sl sting bri bl mky cut, lt gn res ring, n stn or od

MRLST: dk-m gy, firm, brit, gt-rthy tex, sbbkly-sbply, arg-sily mtz, CHK: m gy, gybrn, mot thru, sft-mod firm, smwt brit-fri, sm-wxy tex, sbply-sbply, arg mtz, v calc thru, tr bent, tr fos frag inoc, spec omg mnrl flr, mod fast sl sting bri bl mky cut, lt gn res ring, n stn or od

MRLST: dk-m gy, firm, brit, gt-rthy tex, sbbkly-sbply, arg-sily mtz, CHK: m gy, gybrn, mot thru, sft-mod firm, smwt brit-fri, sm-wxy tex, sbply-sbply, arg mtz, v calc thru, tr bent, tr fos frag inoc, spec omg mnrl flr, mod fast sl sting bri bl mky cut, lt gn res ring, n stn or od

GOOD



MD 10622' TVD 6966.55' INC 91.50° AZM 355.00°

MD 10685' TVD 6965.06' INC 91.20° AZM 354.10°

MD 10748' TVD 6962.98' INC 92.60° AZM 354.90°

MD 10811' TVD 6960.12' INC 92.60° AZM 354.20°

MRSLT: dk-m gy, firm, brit, gt-rthy tex, sbbiky, arg-sily mtz, CHK: m gy, gybrn, mot, sft-mod firm, brit-smwfrt, sm-wxy tex, sbbiky-sbbly-fis, arg mtz, v calc thru, tr fos frag inoc, tr pyr, n mnrl flr, mod fast sl sting bri bl mky cut, lt gn res ring, n stn or od

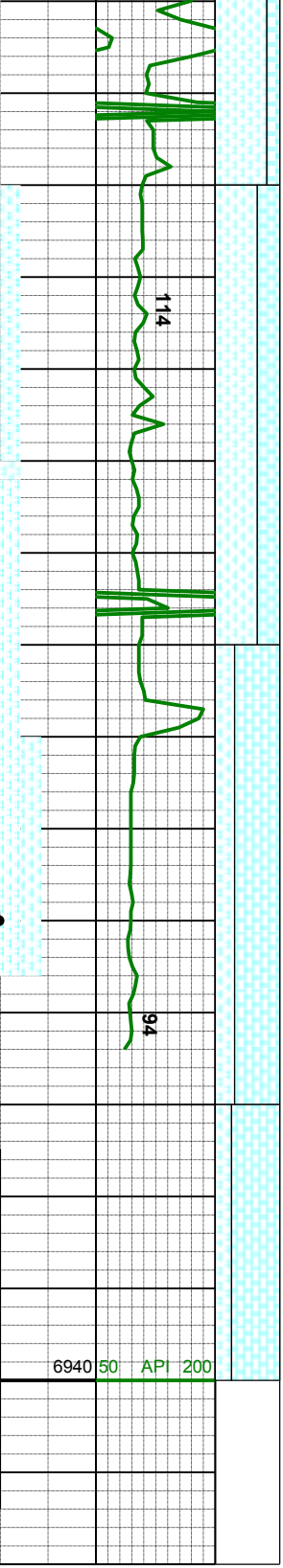
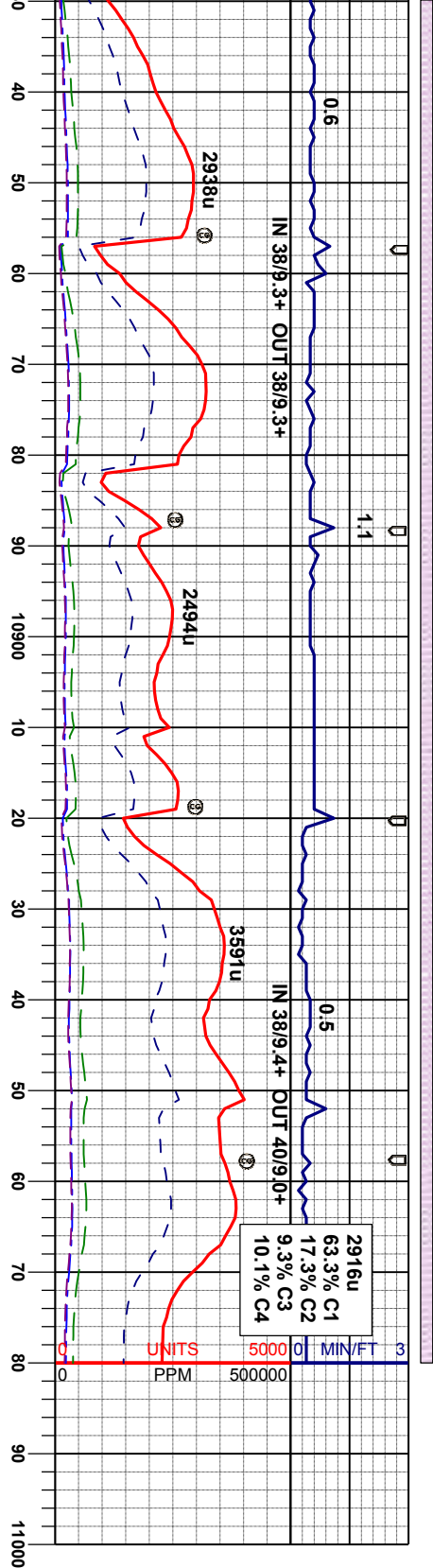
MRSLT: dk-m gy, firm, brit, gt-rthy tex, sbbiky, arg-sily mtz, CHK: m gy, gybrn, mot, sft-mod firm, brit-smwfrt, sm-wxy tex, sbbiky-sbbly-fis, arg mtz, v calc thru, tr fos frag inoc, tr pyr, spec ong mnrl flr, mod fast sl sting bri bl mky cut, bri lt bl-gn res ring, n stn or od

MRSLT: dk-m gy, ooc blk, firm, brit, gt-rthy tex, sbbiky, arg-sily mtz, CHK: m gy, gybrn, mot, sft-mod firm, brit-smwfrt, sm-wxy tex, sbbiky-sbbly-fis, arg mtz, v calc thru, abrt fos frag inoc, tr bent, spec ong mnrl flr, mod fast sl sting bri bl mky cut, bri lt bl-gn res ring, n stn or od

MRSLT: predom dk-m gy, c gt-rthy tex, sbbiky, arg-sily r gybrn, mot, blk brd ip, sft-r smwfrt, sm-wxy tex, sbbiky mtz, v calc thru, abrt fos fra spec ong mnrl flr, mod fast mky cut, bri lt bl-gn res ring

GOOD





MD 10875'
TVD 6957.10'
INC 92.80°
AZM 353.90°

MD 10930'
TVD 6954.22'
INC 93.20°
AZM 353.60°

Grattan 4A-30H Wellbore TD @
10,980' MD @ 0345hrs on 03/10/12

Thank You for Using
Columbine Logging, Inc.

occ blk, firm, brit, mty, CHK: n gy, mod firm, brit-sbply-fis, arg g inoc, tr bent, st sl string bri bl n stn or od

MRLST: dk-m gy, firm, brit, gt-rthy tex, sbply-sbply, arg-sly mty, CHK: dk-m gy, lt gybm-gybm, mot, sft-mod firm, brit-smwfrt, sm-wxy tex, sbply-sbply-fis, arg mty, v calc thru, abnt fos frag inoc, n mnt flr, mod fast sl string bri bl mky cut, bri lt bl-gn res ring, n stn or od

CHK: pred off, wh, mot gy, sft-mod firm, brit, fr, sbwxy tex, sbply-sbply, arg mty, MRLST: dk-m gy, firm, brit, gt-rthy tex, sbply-sbply, arg-sly mty, v calc thru, fr amt fos frag inoc, abnt bent w/ disn pyr, abnt bri gold mnt flr, mod fast sl string bri bl mky cut, bri lt bl-gn res ring, n stn or od

GOOD

7010

ft

6940 50 API 200