



Scale: 5" / 100'
Measured Depth Log

Well Name	Mahalo State AA09-72-1BHN		
Location	SESE SEC4 T6N R63W		
State	CO	County	WELD
Country	USA	Rig Number	PRECESION 828
API Number	05-123-39018	AFE #	200341
Region	DENVER-JULESBURG BASIN	Field	WATTENBERG
Spud Date	12/28/2014	Drilling Completed	1/5/2015
Surface Coordinates	325' FSL, 1215' FEL Lat/Long: 40.50952/-104.43654		
Ground Elevation	4700'	K.B. Elevation	4716'
Logged Interval	6100'	To	12036'
		Total Depth	12036'
Formation	PIERRE (TEEPEE BUTTES, SHARON SPRINGS), NIOBRARA (SMOKY HILLS A,B, AND C SUBMEMBERS)		
Type of Drilling Fluid	LSND		

Company NOBLE ENERGY INC
Address 1625 Broadway
Denver, CO 80202

Name JAMES TALOR
Company NOBLE ENERGY INC
Address 1625 Broadway
Denver, CO 80202

WELLSITE GEOLOGICAL

Operator

NC.

Geologist

NC.

Other

Geologists: GARY L. MYERS
C.S. METZ

LOG CONTINUES FROM FILE: Mahalo State AA09-72-1BHNC Ver1.mpl
GEOLOGICAL SERVICES PROVIDED BY COLUMBINE LOGGING, INC.

Rock Types

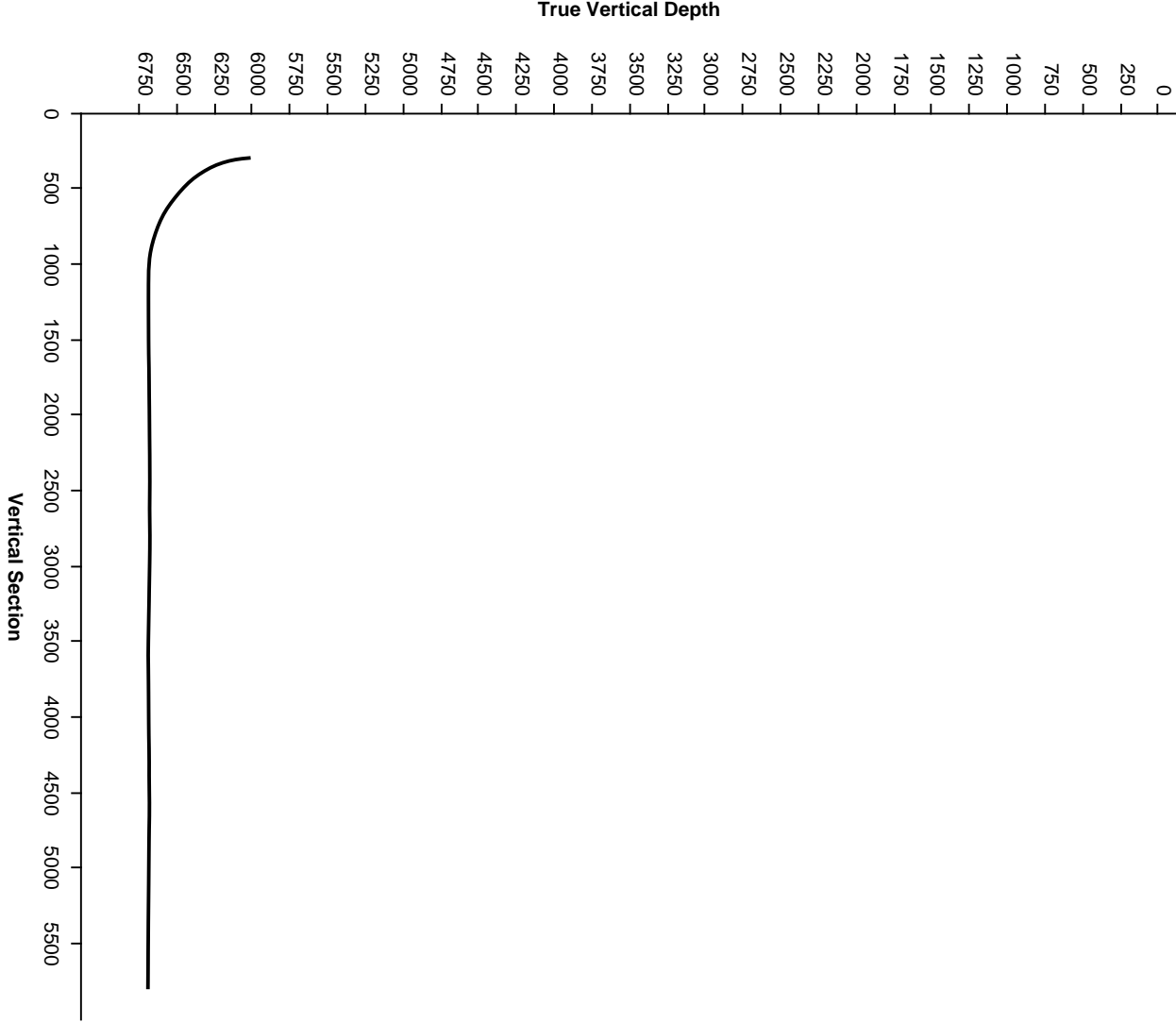
UNKNOWN	BRECCIA	GRANITE
CHALK	CEMENT	GYPSUM
MARLSTONE	CHERT	IGNEOUS
SANDSTONE	CLAY CHOKE SAND	SIDERITE or LIMONITE
SHALY SANDSTONE	CLAYSTONE	LIMESTONE
SILTY SHALE	COAL	METAMORPHIC
SHALY SILTSTONE	CONGLOMERATE	NO SAMPLE
ANHYDRITE	DOLomite	SALT
BENTONITE	DOLOMITIC LIMESTONE	SALT-PEPPER SAND

Accessories

GASTROPOD	ARGILLITE GRAIN	HEAVY MINERAL	ANHYDRITE
INOCERAMUS	BENTONITE	KAOLIN	BENTONITE
ALGAE	BITUMENOUS SUBSTANCE	MARLSTONE	COAL STRIP
AMPHIPORA	BRECCIA FRAGMENTS	MICACEOUS	DOLomite
BELEMNITE	PELECYPOD	CALCAREOUS	GYPSUM SAND
BIOTASTIC	PELLET	CARBONACEOUS FLAKES	MINERAL CRYSTALS
BRACHIOPOD	PISOLITE	CHTDK	PHOSPHATE PELLETS
BRYOZOA	PLANT REMAINS	CHTLT	PYRITE
CEPHALOPOD	PLANT SPORES	COAL - THIN BEDS	SALT CAST
CORAL	SCAPHOPOD	DOLOMITIC	SANDY
CRINOID	STROMATOPOROID	FELDSPAR	SILICEOUS
ECHINOID	FERRUGINOUS PELLET	SILTY	
FISH	FERRUGINOUS	TUFFACEOUS	
FORAMINIFERA	ANHYDRITIC	GLAUCONITE	
FOSSIL	ARGILLACEOUS	GYPSIFEROUS	

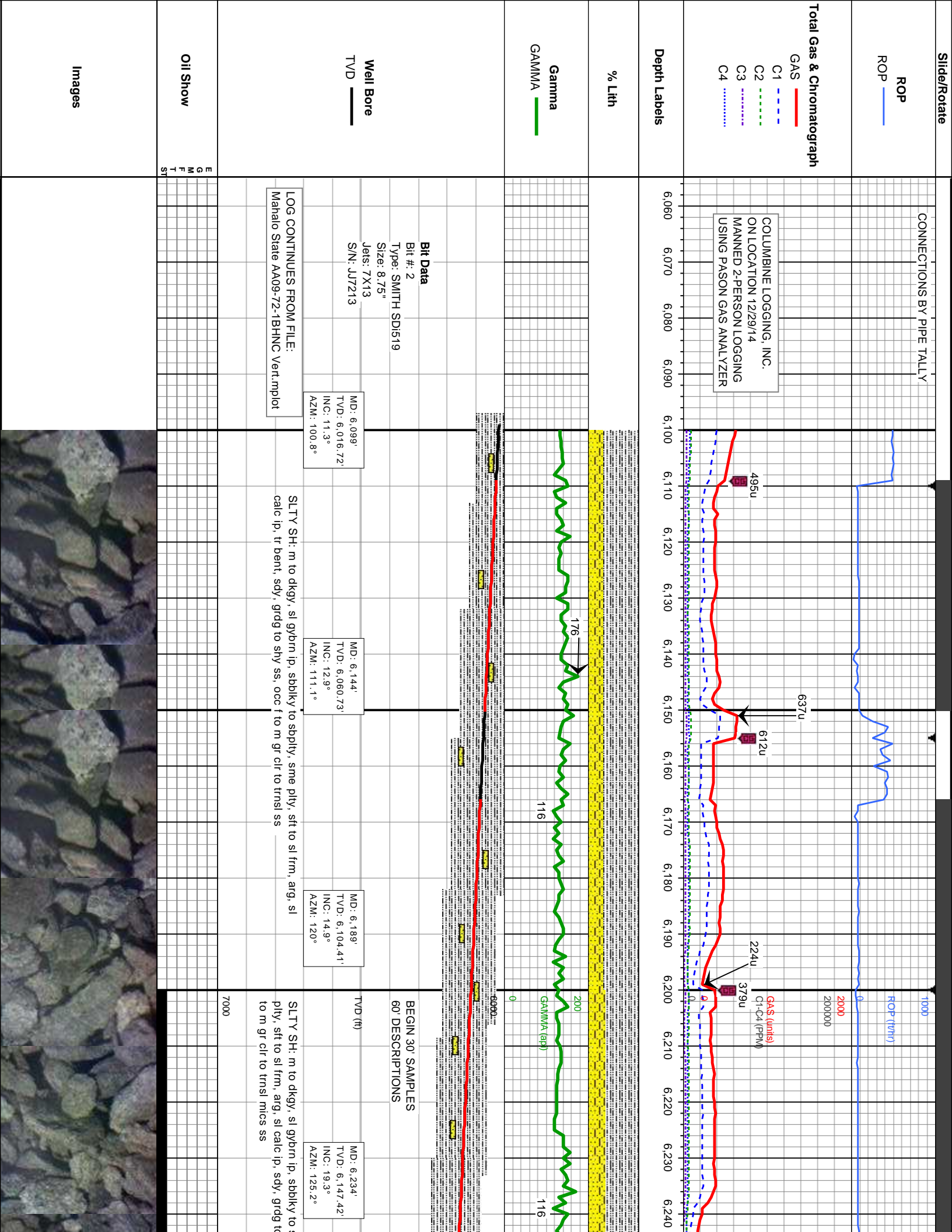
Stringer

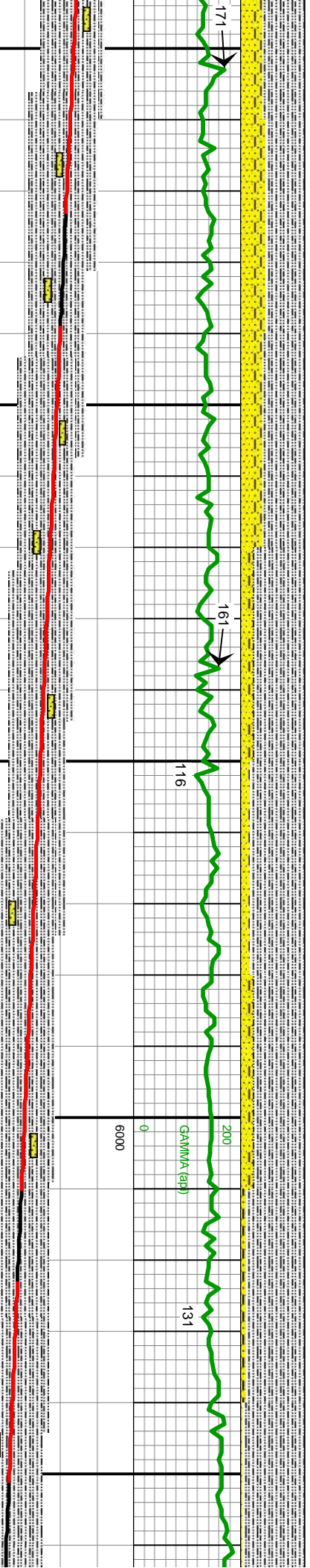
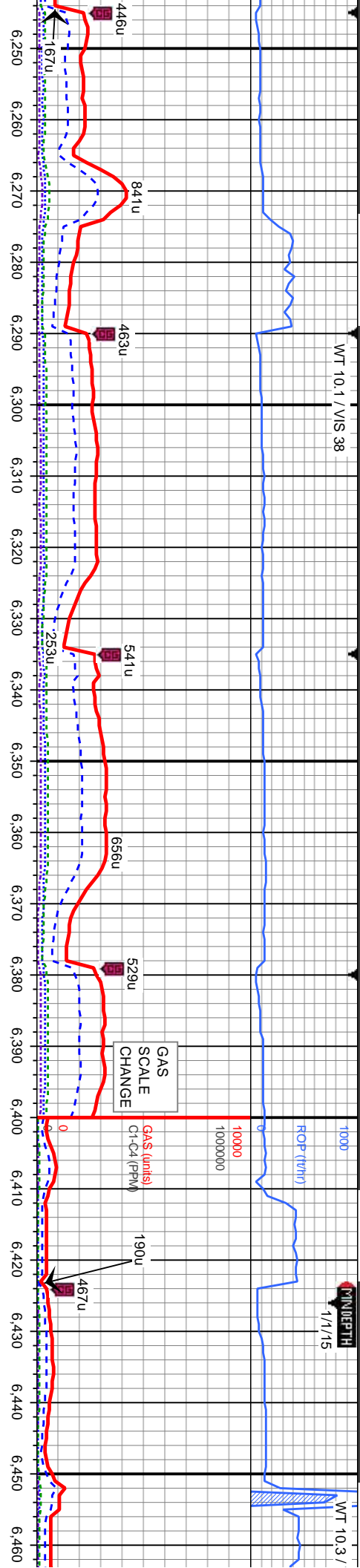
Survey Elevation



Plan

ing





MD: 6.279'
TVD: 6.189.41'
INC: 22.8°
AZM: 129.2°

MD: 6.324'
TVD: 6.230.36'
INC: 26.2°
AZM: 135.6°

MD: 6.370'
TVD: 6.271.04'
INC: 29.5°
AZM: 144.6°

TVD (ft)
MD: 6.415'
TVD: 6.309.53'
INC: 32.9°
AZM: 147.2°

MD: 6.460'
TVD: 6.346'
INC: 36.1°
AZM: 147.8°

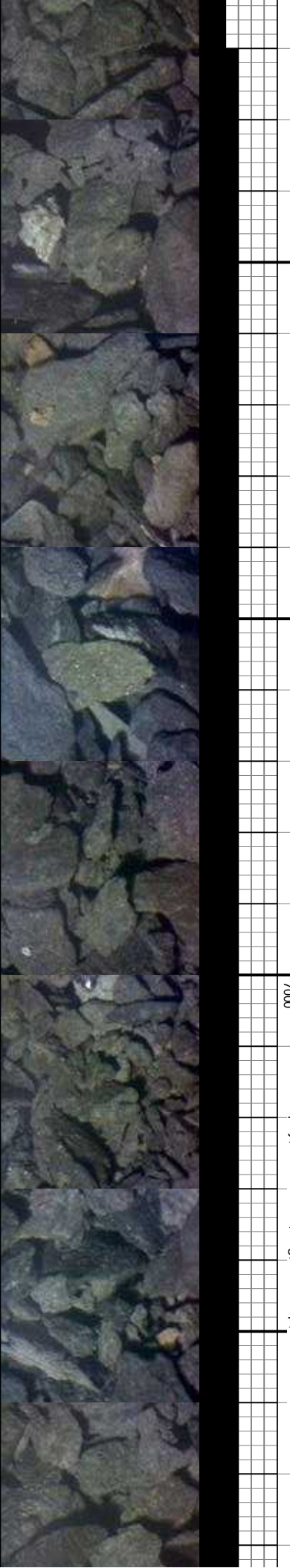
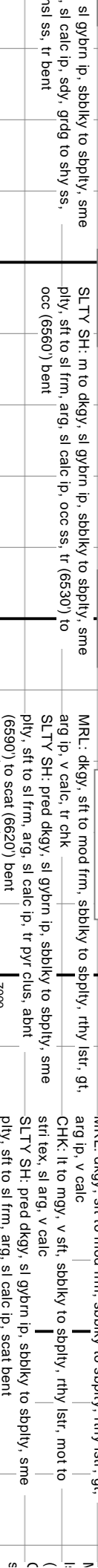
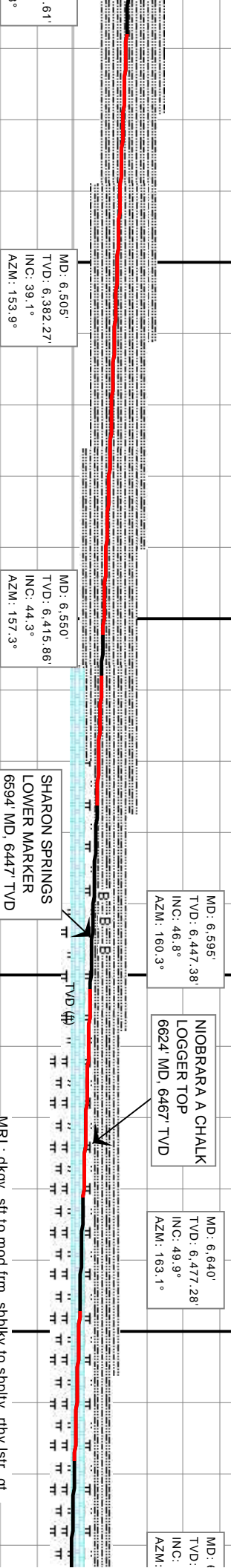
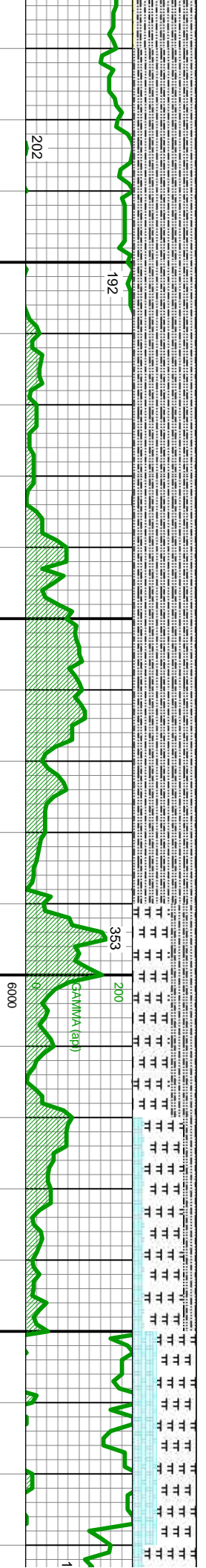
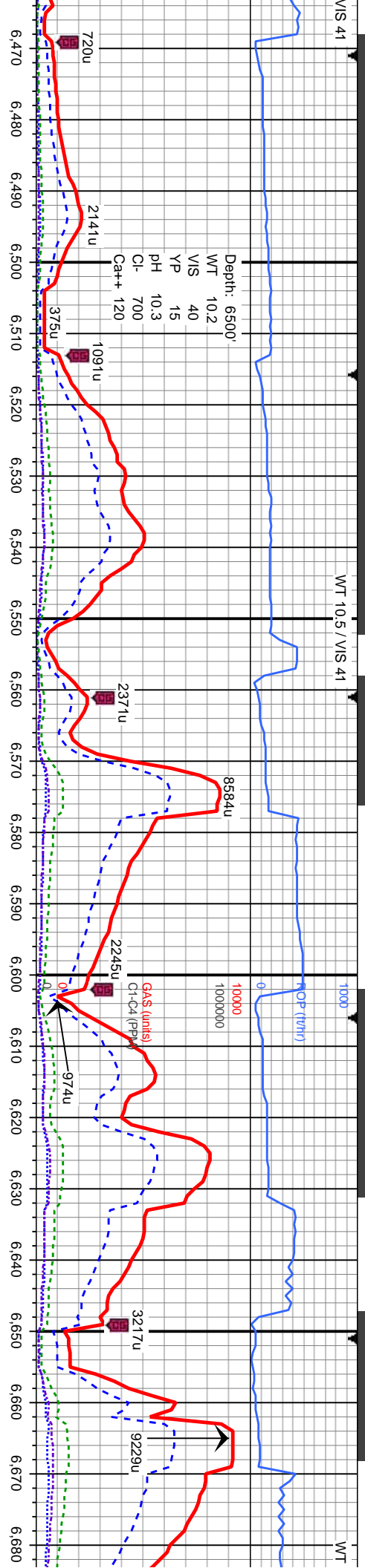
SLTY SH: m to dkgy, sl gybrn ip, sbblky to sbply, sme
ply, sft to sl frm, arg, sl calc ip, sdy, grdg to shy ss,
occ f to m gr clr to trnsi ss

SLTY SH: m to dkgy, sl gybrn ip, sbblky to sbply, sme
ply, sft to sl frm, arg, sl calc ip, sdy, grdg to shy ss,
occ f to m gr clr to trnsi ss

SLTY SH: m to dkgy, sl gybrn ip, sbblky to sbply, sme
ply, sft to sl frm, arg, sl calc ip, sdy, grdg to shy ss,
occ f to m gr clr to trnsi ss

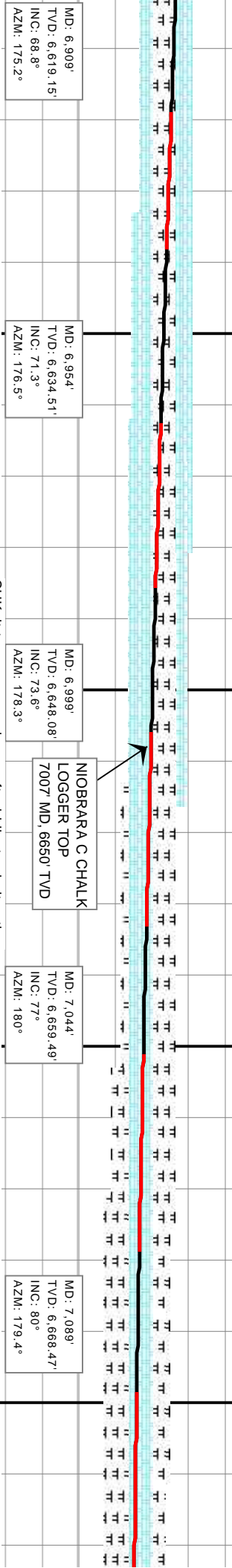
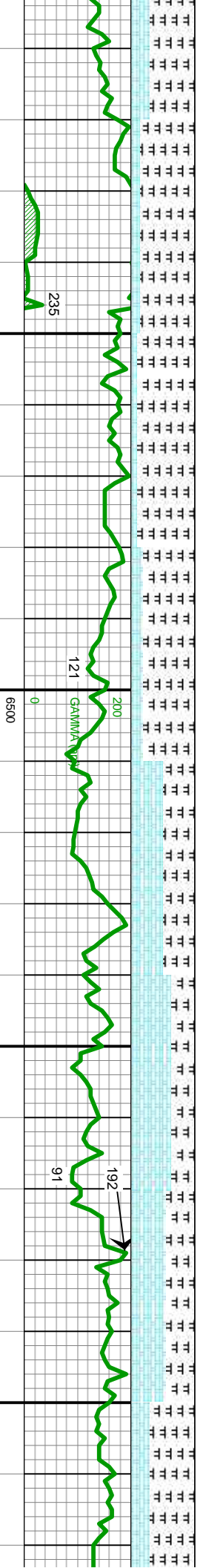
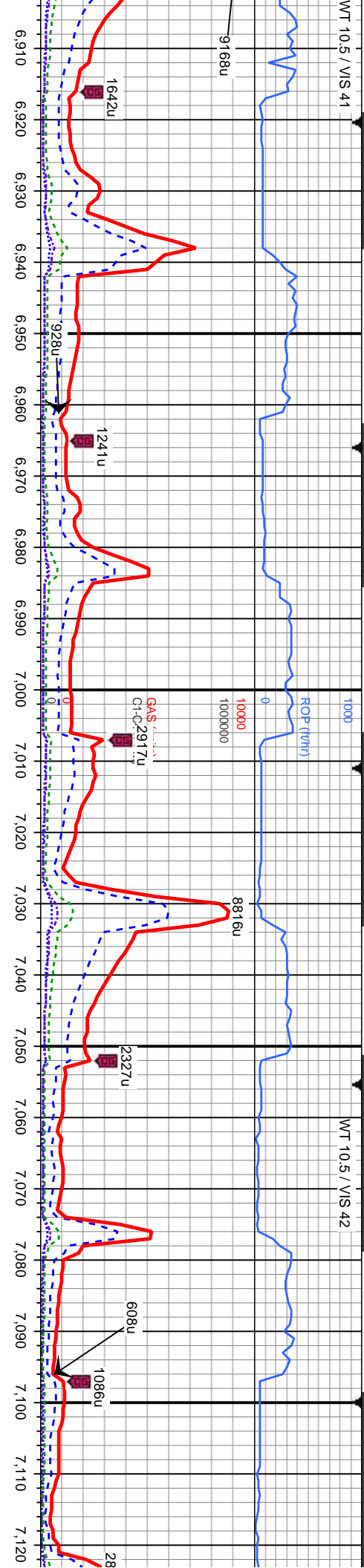
SLTY SH: m to dkgy,
ply, sft to sl frm, arg
occ f to m gr clr to tr





WT 10.5 / VIS 41

WT 10.5 / VIS 42



MD: 6,909' TVD: 6,619.15' INC: 68.8° AZM: 175.2°

MD: 6,954' TVD: 6,634.51' INC: 71.3° AZM: 176.5°

MD: 6,999' TVD: 6,648.08' INC: 73.6° AZM: 178.3°

MD: 7,044' TVD: 6,659.49' INC: 77° AZM: 180°

MD: 7,089' TVD: 6,668.47' INC: 80° AZM: 179.4°

ISIR: mot to sbply, rthy lsir, gt, arg ip, v calc, occ fos frag, tr bent (6980)

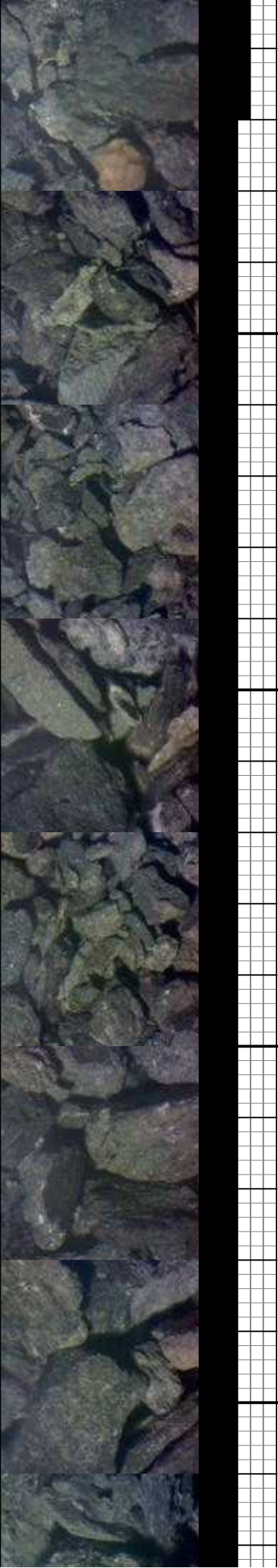
CHK: It to mgy, v sft, sbply to sbply, rthy lsir, mot to sbply, rthy lsir, gt, arg ip, v calc, occ inoc frag, tr (7010) to occ (7040) bent

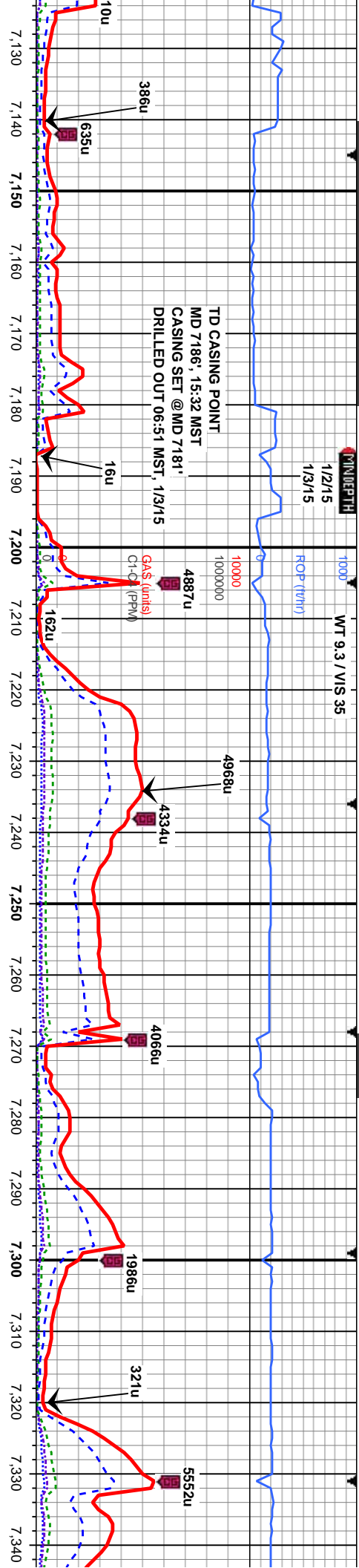
CHK: It to mgy, occ gybrn, v sft, sbply to sbply, rthy to wxy lsir, mot to str tex, v calc, rr cal incl

MRL: m to dkgy, sme v dkgy, sft to mod frm, sbply to sbply, rthy lsir, gt, arg ip, v calc, occ inoc frag, tr (7070) to occ (7100) bent

MRL: m to dkgy ip, v calc, occ in

CHK: It to mgy, tex, v calc, rr ca





GAMMA TOOL IN CASING

TVD
SCALE
CHANGE

Bit Data
Bit #: 3
Type: SMITH SD1516
Size: 6.125"
Depth In: 7.186'
Jets: 5X14
S/N: J9162

MD: 7.303'
TVD: 6.681.22'
INC: 89.9°
AZM: 179.8°

MD: 7.130'
TVD: 6.674.35'
INC: 83.5°
AZM: 179.3°

Bit Data
Depth In: 844'
Depth Out: 7.186'
Hours: 26.5 hrs
Avg F/Hr: 239.3 /hr

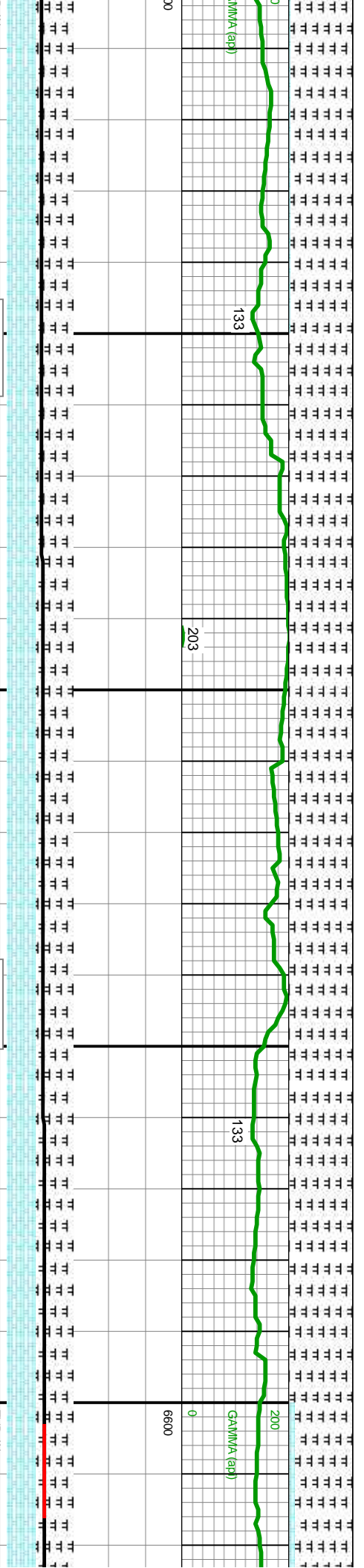
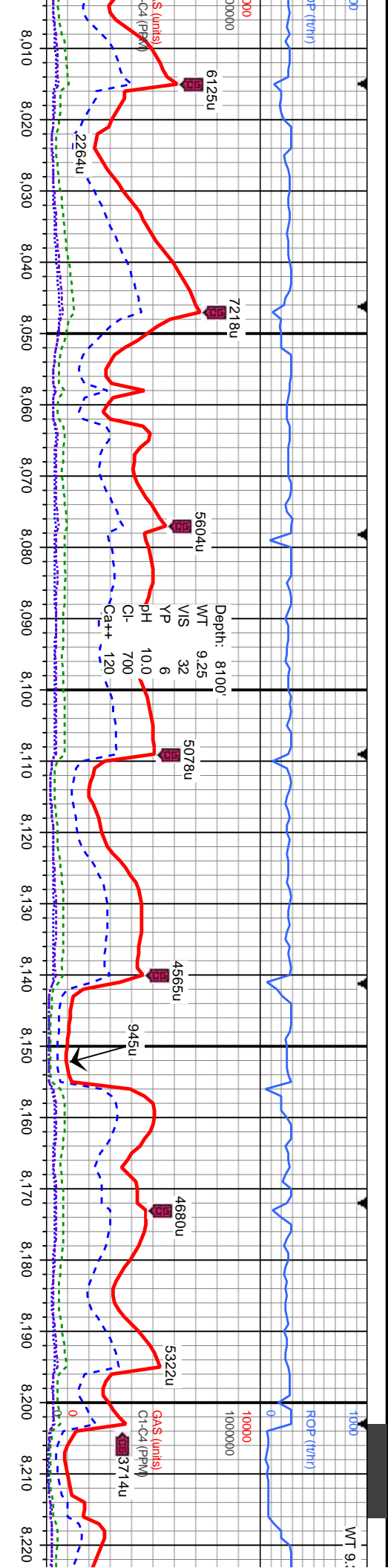
same v dkgy, sft to mod frm, sbblky to sbply, rthy lstr, gt, arg
oc frag
mooc gybm, v sft, sbblky to sbply, rthy to wxy lstr, mot to stri
incl

MRL: pred dkgy, sft to mod frm, sbblky to sbply, rthy lstr, gt,
arg lp, v calc, tr los frag
CHK: It to mgy, v to mod sft, sbblky to sbply, rthy lstr, mot to
stri tex, v calc

MRL: pred dkgy, sft to mod frm, sbblky to sbply,
rthy lstr, gt, arg lp, v calc, tr los frag, tr bent
CHK: It to mgy, v to mod sft, sbblky to sbply,
rthy lstr, mot to stri tex, v calc

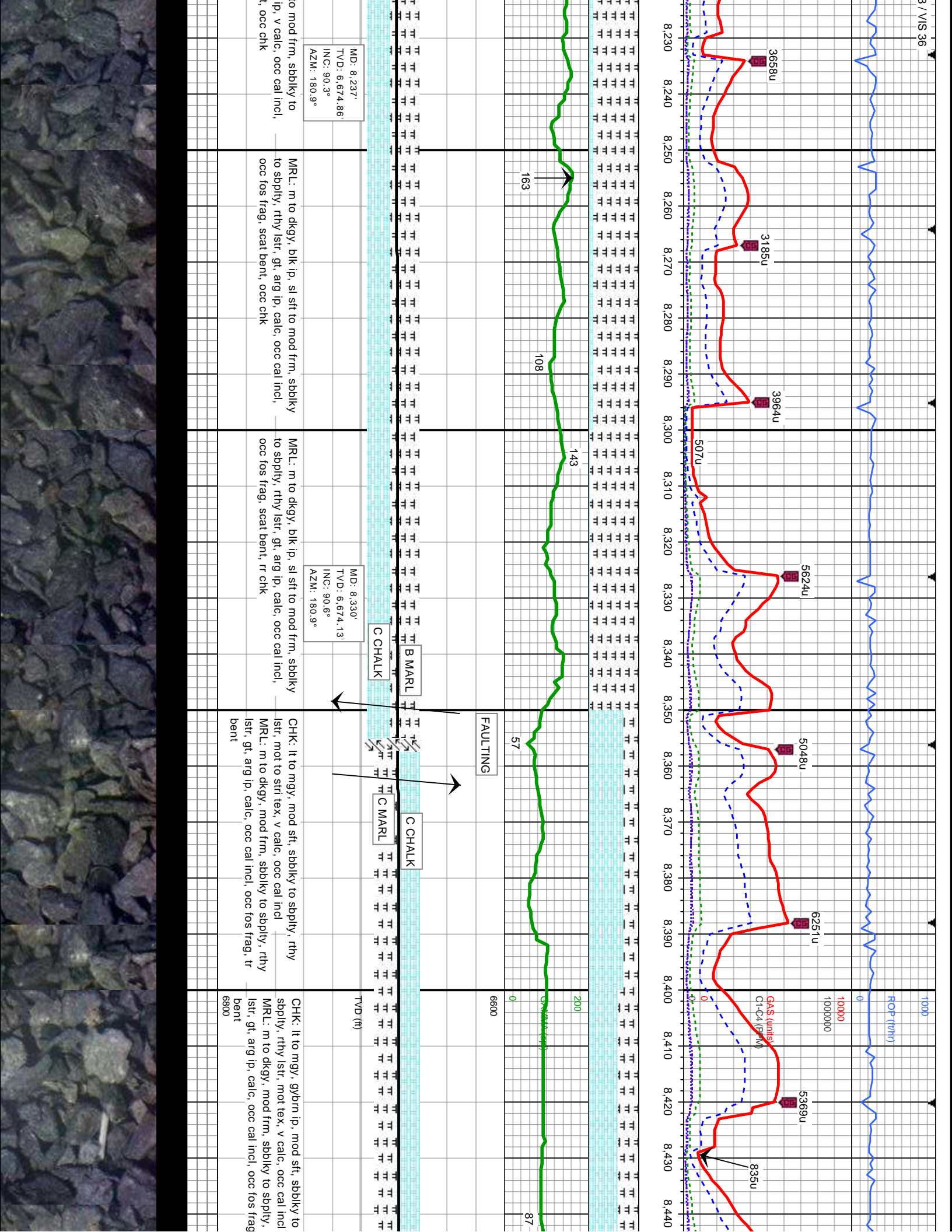
CHK: It to mgy, v to mod sft, sbblky to sbply,
rthy lstr, mot to stri tex, v calc, tr cal incl
MRL: m to dkgy, sl sft to mod frm, sbblky to
sbply, rthy lstr, gt, arg lp, v calc, tr los frag,
bent

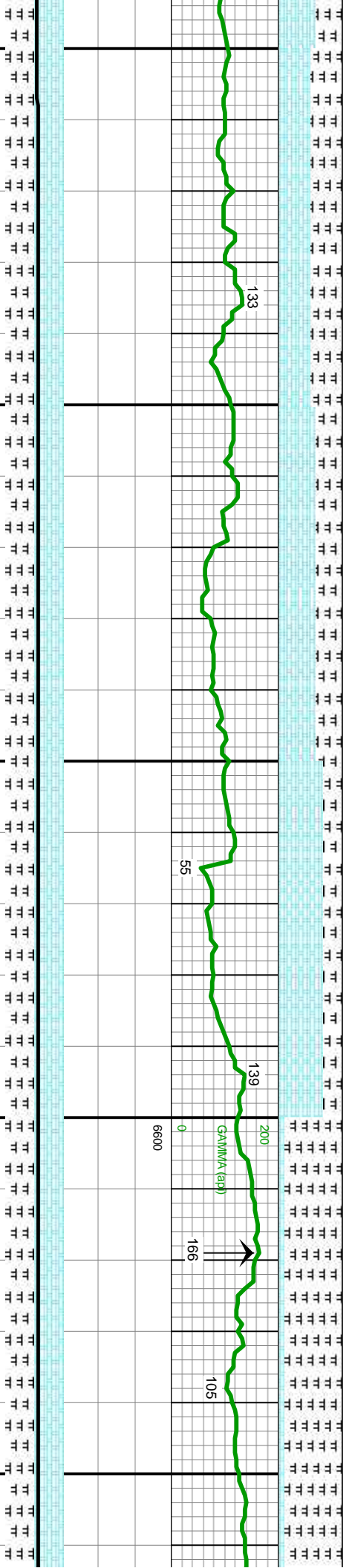
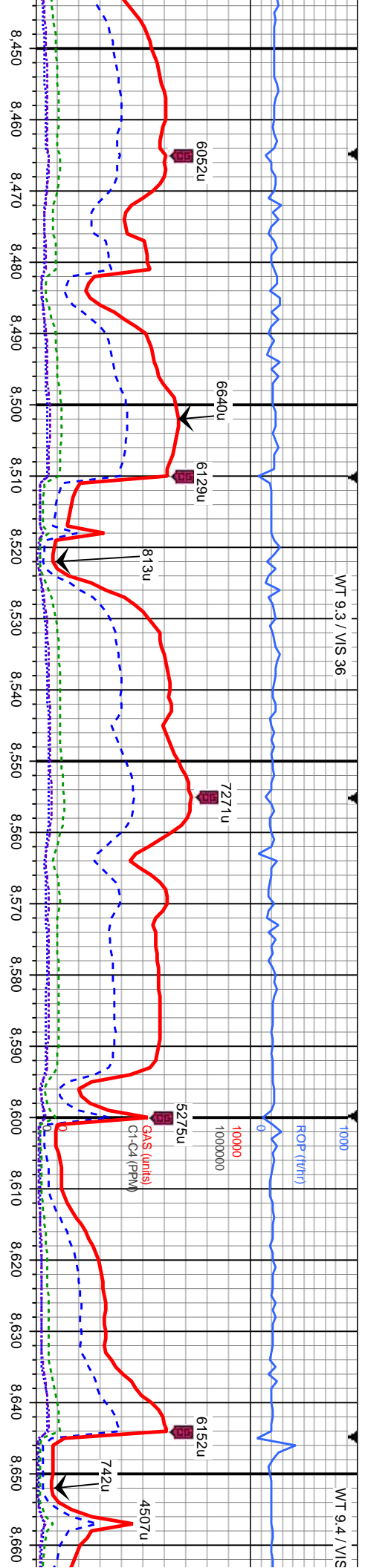




D (ft)	M.D.: 8.051' T.V.D.: 6.676.49' INC.: 90.7° AZM.: 180.1°	MRL: m to dkgy, sl sft to mod frm, sbbiky to sbbply, rthy lstf, gt, arg ip, v calc, occ cal incl, abtnt fos frag, scat bent, tr chk
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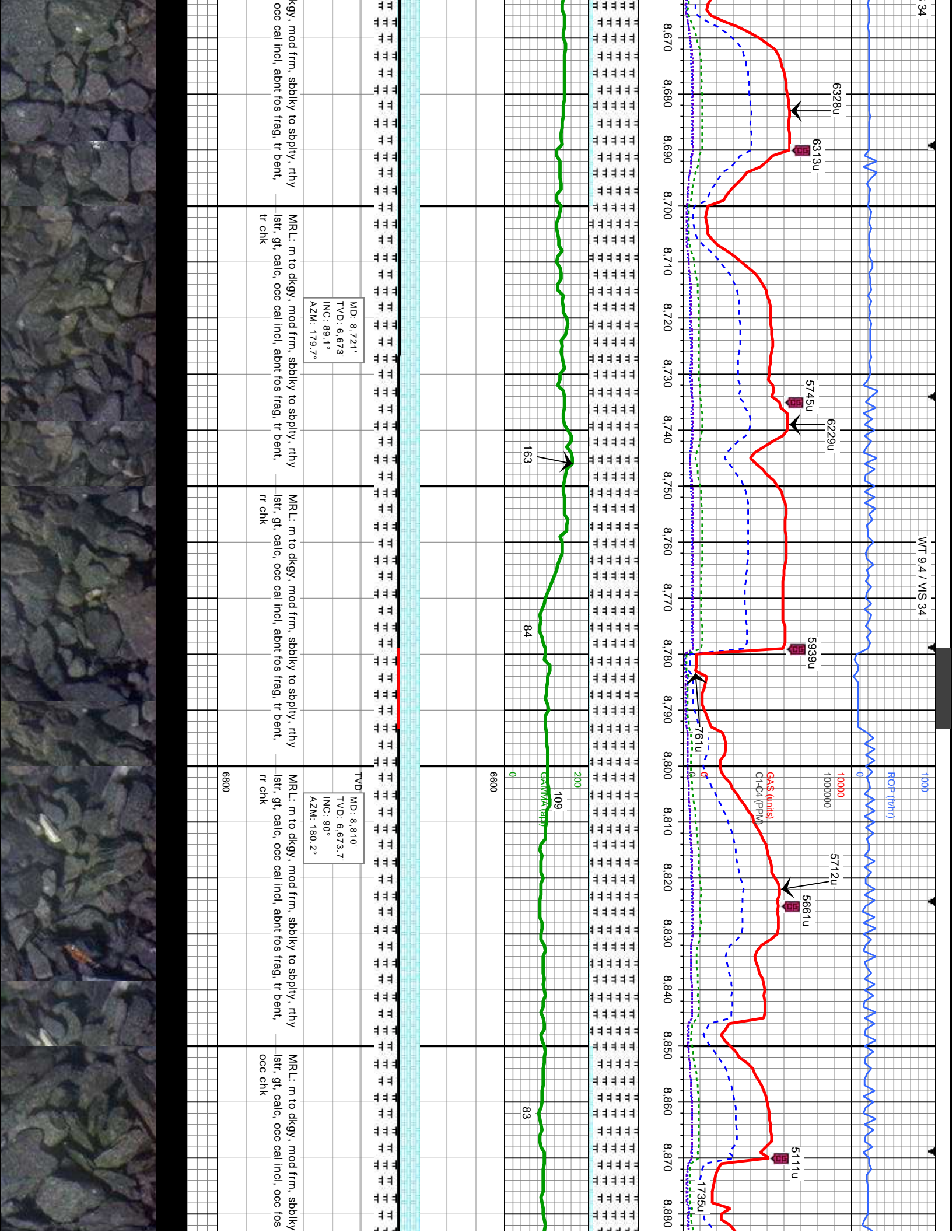


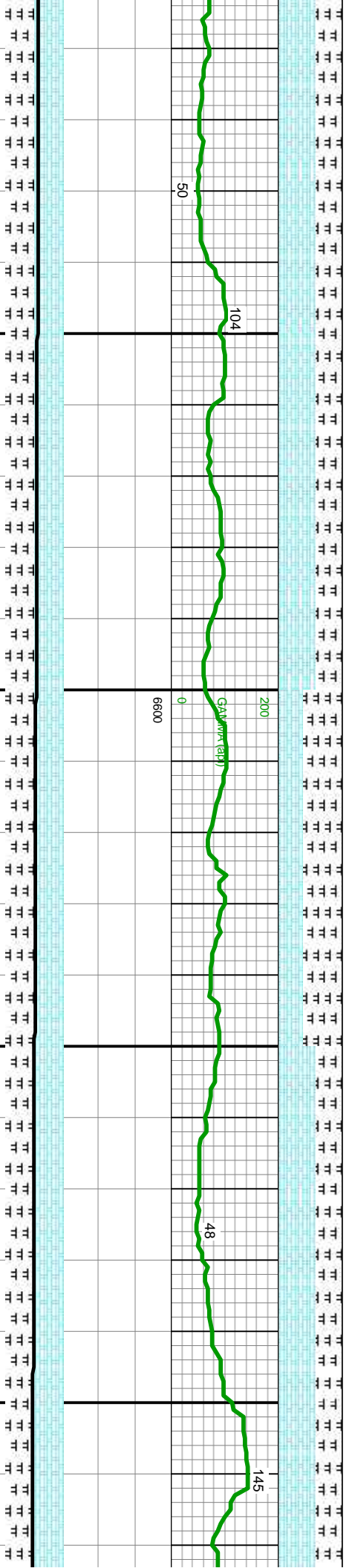
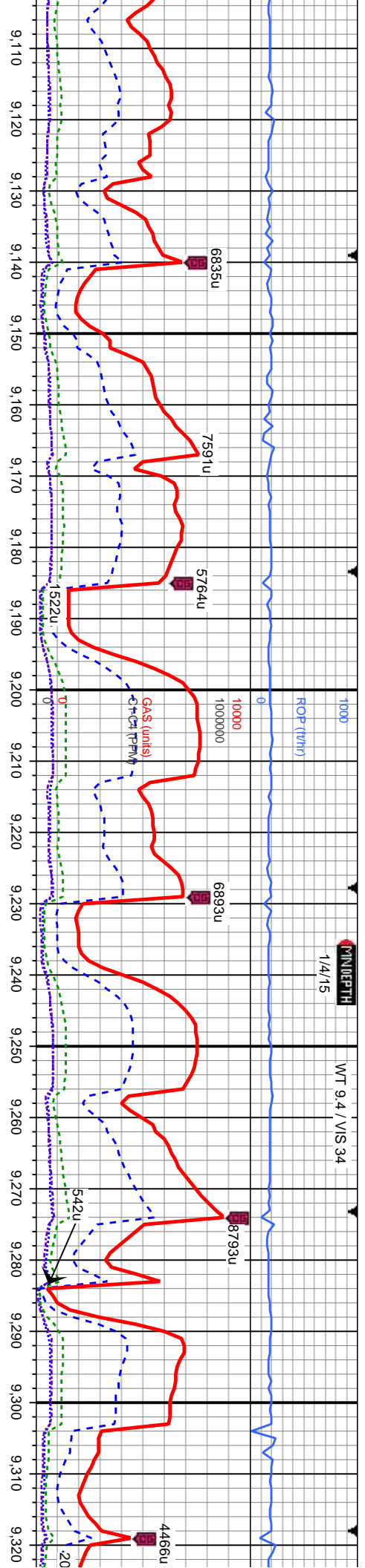
MD: 8.451'	MD: 8.541'	MD: 8.631'
TVD: 6.673.08'	TVD: 6.672.6'	TVD: 6.672.37'
INC: 90.4°	INC: 90.2°	INC: 90.1°
AZM: 180.6°	AZM: 180.5°	AZM: 180.2°

CHK: lt to mgy, mod sft, sbbkly to sbply, rthy lsfr, mot to str tex, v calc, occ cal incl	CHK: vit to mgy, mod sft to sl frm, sbbkly to sbply, rthy lsfr, mot tex, v calc, occ cal incl	CHK: vit to mgy, mod sft to sl frm, sbbkly to sbply, rthy lsfr, mot tex, v calc, occ cal incl	MRL: m to dkgy, mod frm, sbbkly to sbply, rthy lsfr, gt, calc, occ cal incl, abnt fos frag, tr bent,	MRL: m to dkgy, mod frm, sbbkly to sbply, rthy lsfr, gt, calc, occ cal incl, abnt fos frag, tr bent,	MRL: m to dkgy, mod frm, sbbkly to sbply, rthy lsfr, gt, calc, occ cal incl, abnt fos frag, tr bent,
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TVD (ft)

6800





CHK: lt to mgy, sl gybrn, mod sft to sl frm, sbblky sbbply, rthy lstr, mot tex, v calc, occ cal incl MRL: m to dkgy, mod frm, sbblky to sbbply, rthy lstr, gt, calc, occ cal incl, tr fos frag, tr bent	MD: 9.170' TVD: 6.673.3' INC: 89.1° AZM: 181.6°	CHK: lt to mgy, sl gybrn, mod sft to sl frm, sbblky to sbbply, rthy lstr, mot tex, v calc, occ cal incl MRL: m to dkgy, mod frm, sbblky to sbbply, rthy lstr, gt, calc, occ cal incl, tr fos frag, tr bent
	TVD (ft)	CHK: lt to mgy, sl gybrn, mod sft to sl frm, sbblky to sbbply, rthy lstr, mot tex, v calc, occ cal incl MRL: m to dkgy, mod frm, sbblky to sbbply, rthy lstr, gt, calc, occ cal incl, tr fos frag, tr bent
	6800	CHK: lt to mgy, sl gybrn, mod sft to sl frm, sbblky sbbply, rthy lstr, mot tex, v calc, occ cal incl MRL: m to dkgy, mod frm, sbblky to sbbply, rthy lstr, gt, calc, occ cal incl, tr fos frag, tr bent

WT 9.6 / VIS 39

ROP (ft/hr)

1000

10000

1000000

GA\$ (units)

C1-C4 (PPM)

427u

3962u

2275u

5058u

847u

4610u

771



200

0

6600

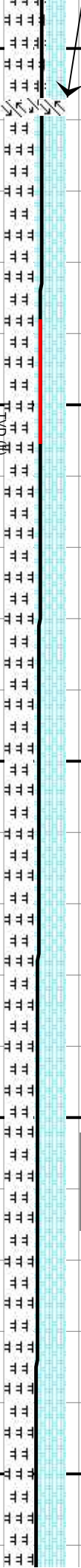
54

185

81

MD: 9.709'
TVD: 6,682.16'
INC: 89.5°
AZM: 181.1°

TVD (ft)



MRL: m to dkgy, mod frm, sbbkly to sbply, rthy

lstr, gt, arg lp, calc, tr fos frag, tr bent

CHK: lt to mgy, mod sft to sl frm, sbbkly to

sbply, rthy lstr, mot tex, v calc

CHK: lt to mgy, mod sft to sl frm, sbbkly to sbply,

rthy lstr, mot tex, v calc

MRL: m to dkgy, mod frm, sbbkly to sbply, rthy

lstr, gt, arg lp, calc, rr cal incl, tr fos frag, tr bent

CHK: lt to mgy, mod sft to sl frm, sbbkly to sbply,

rthy lstr, mot tex, v calc

MRL: m to dkgy, mod frm, sbbkly to sbply, rthy

lstr, gt, arg lp, calc, rr cal incl, tr fos frag, tr bent

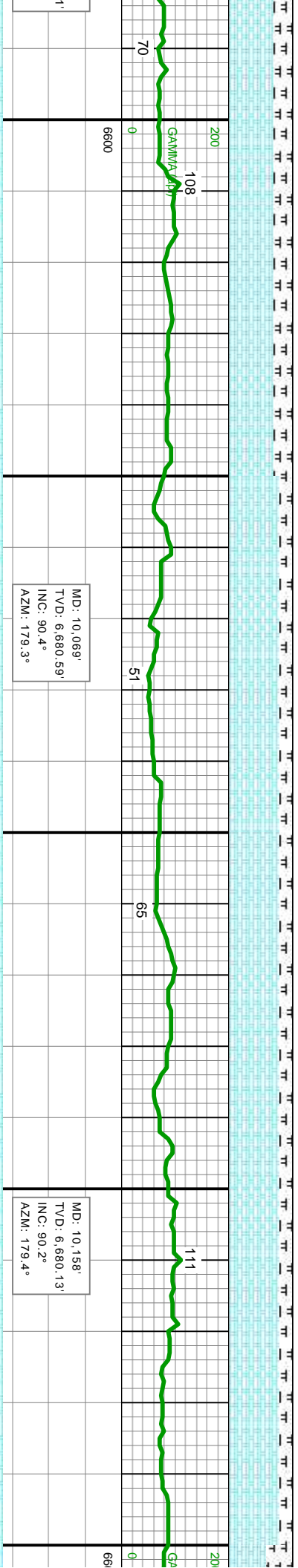
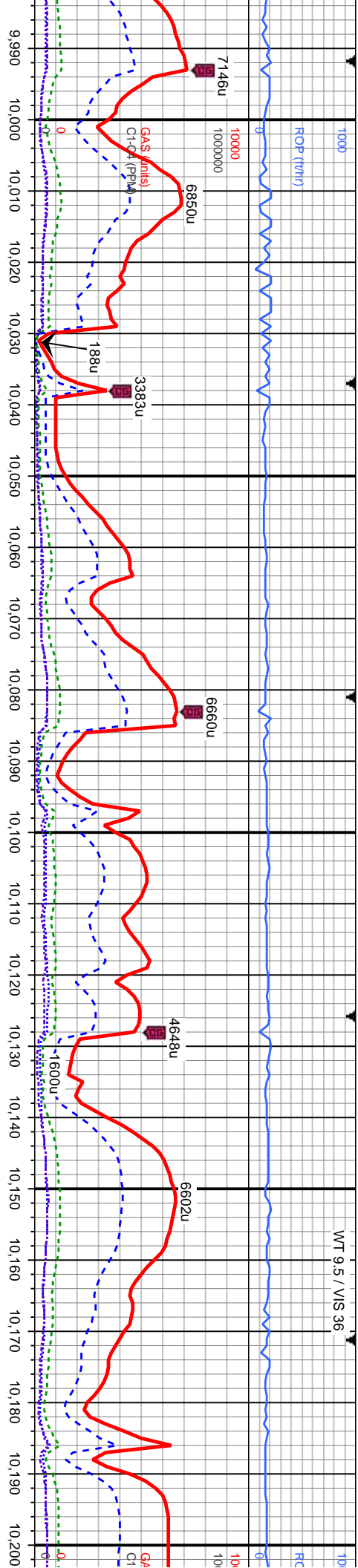
CHK: lt to mgy, mod sft to sl frm, sbbkly to sbply,

rthy lstr, mot tex, v calc

MRL: m to dkgy, mod frm, sbbkly to sbply, rthy

lstr, gt, arg lp, calc, rr cal incl, tr fos frag, tr bent

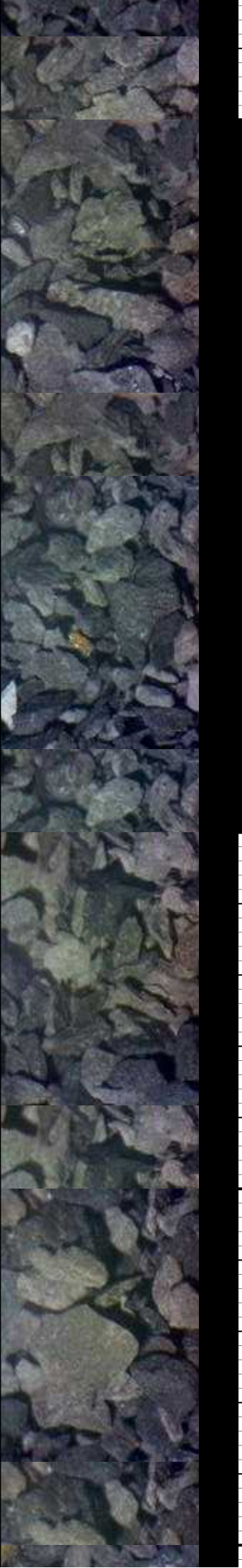


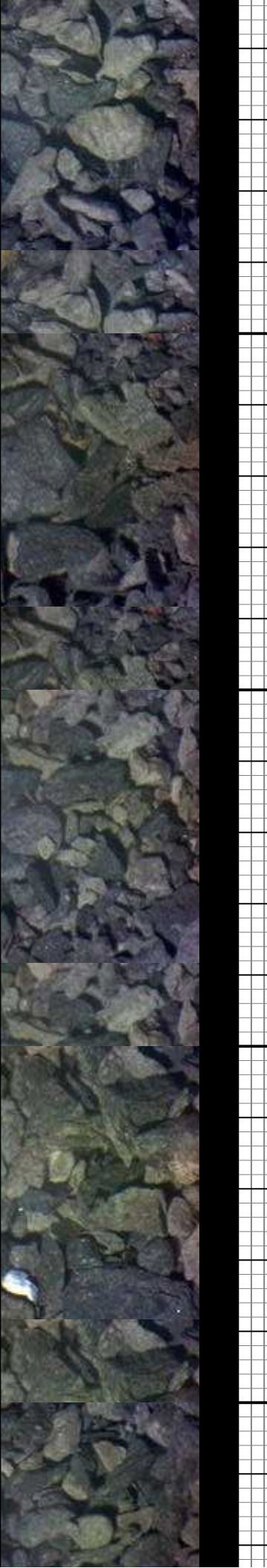
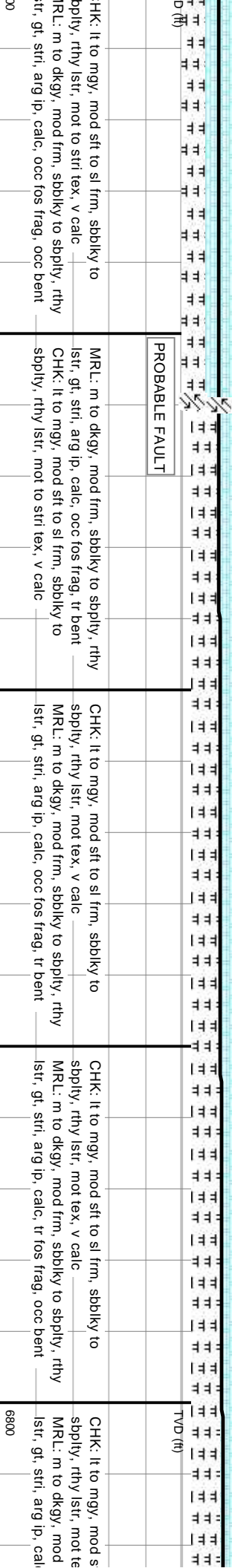
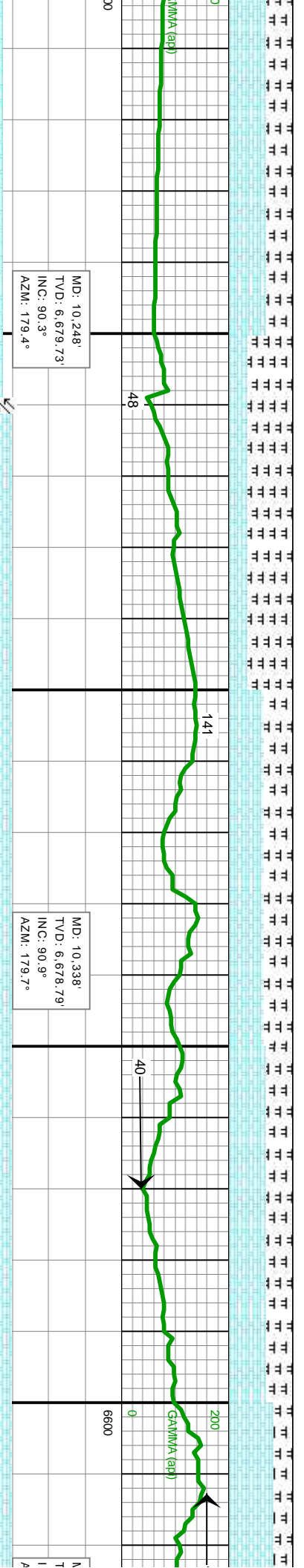
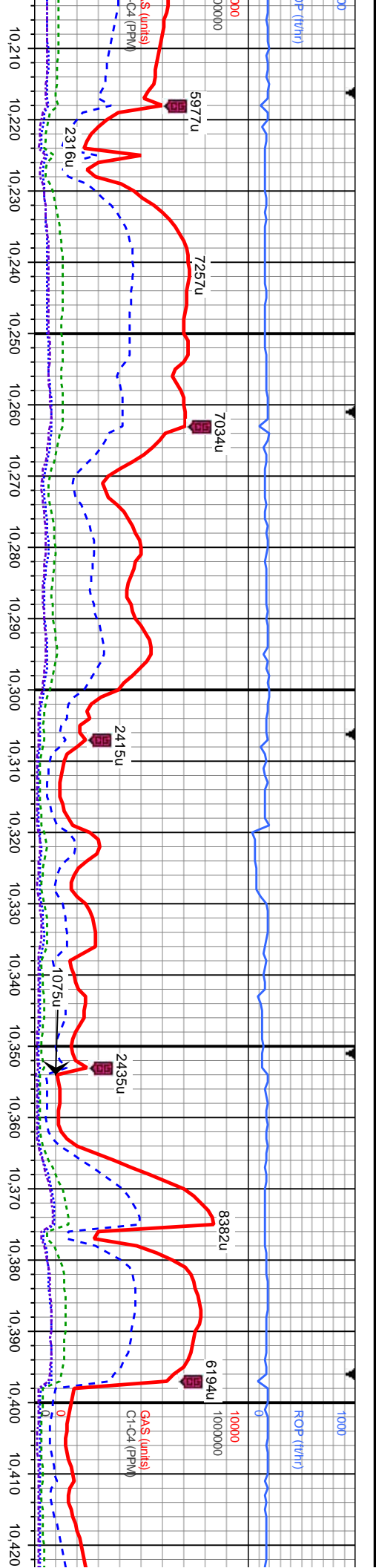


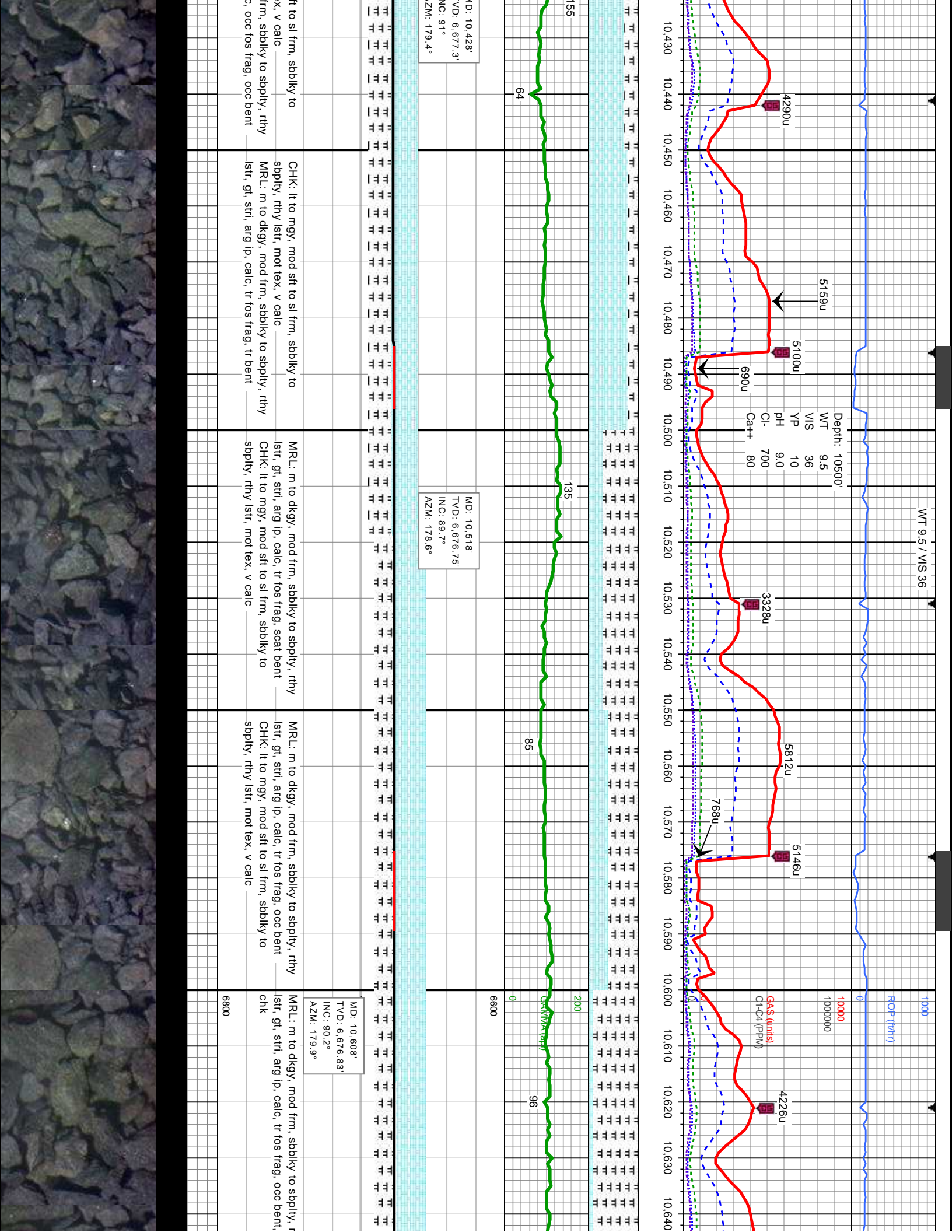
MD: 10.069'
TVD: 6,680.59'
INC: 90.4°
AZM: 179.3°

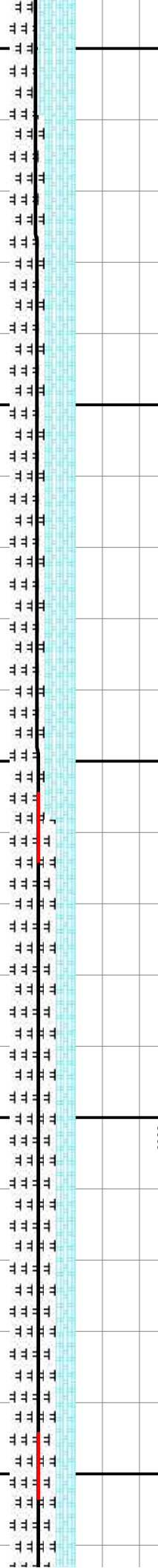
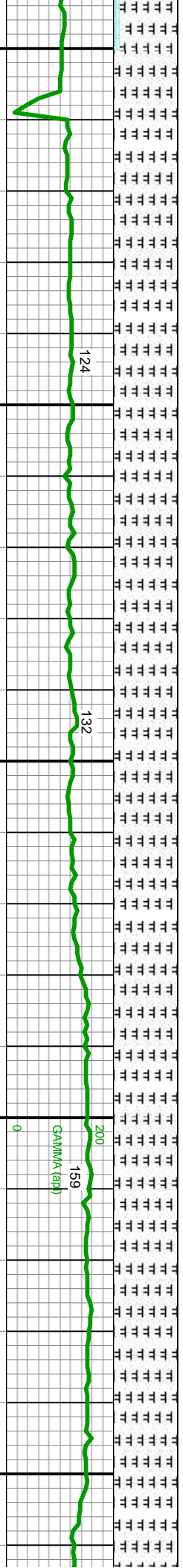
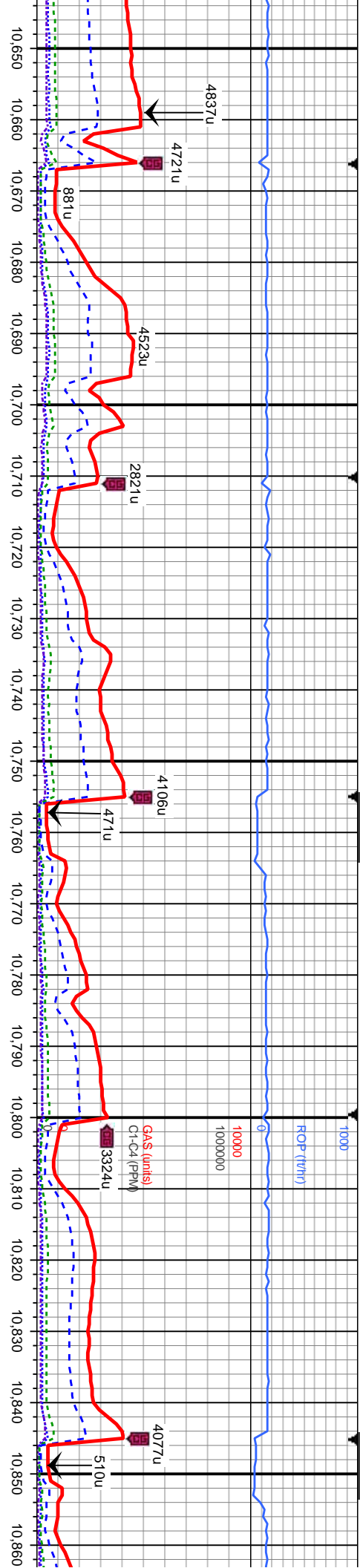
MD: 10.158'
TVD: 6,680.13'
INC: 90.2°
AZM: 179.4°

SB	CH	CH	CH
sbblky to rr cal incl	CHK: It to mgy, mod sft to sl frm, sbblky to sbply, rthy lstr, mot tex, v calc, rr cal incl	CHK: It to mgy, mod sft to sl frm, sbblky to sbply, rthy lstr, mot to str tex, v calc	CHK: It to mgy, mod sft to sl frm, sbblky to sbply, rthy lstr, mot to str tex, v calc
to sbply, rthy	MRL: m to dkgy, mod frm, sbblky to sbply, rthy	MRL: m to dkgy, mod frm, sbblky to sbply, rthy	MRL: m to dkgy, mod frm, sbblky to sbply, rthy
rr cal incl,	lstr, gt, arg ip, calc, occ fos frag, rr cal incl,	lstr, gt, strl, arg ip, calc, occ fos frag, occ bent	lstr, gt, strl, arg ip, calc, occ fos frag, occ bent
6800	occ bent		







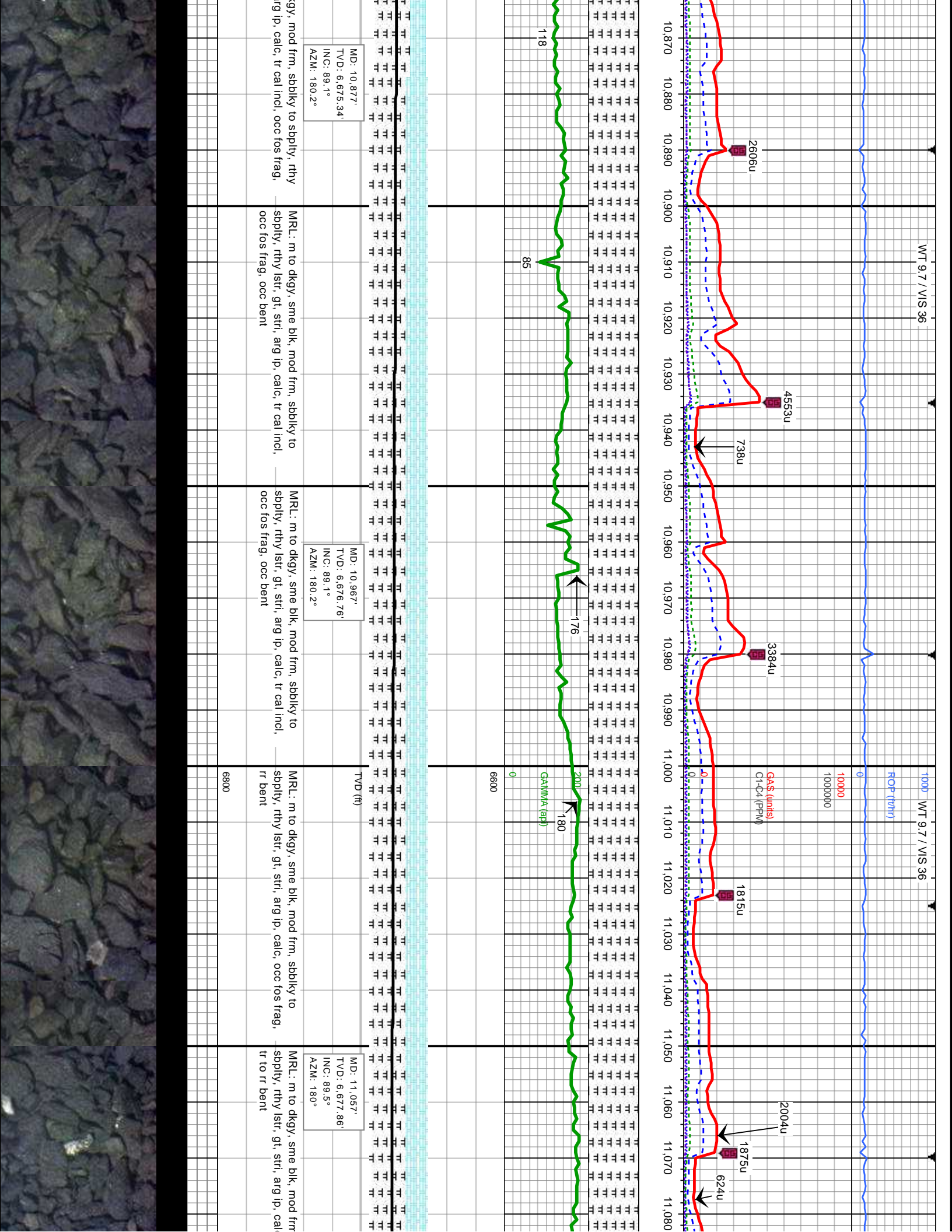


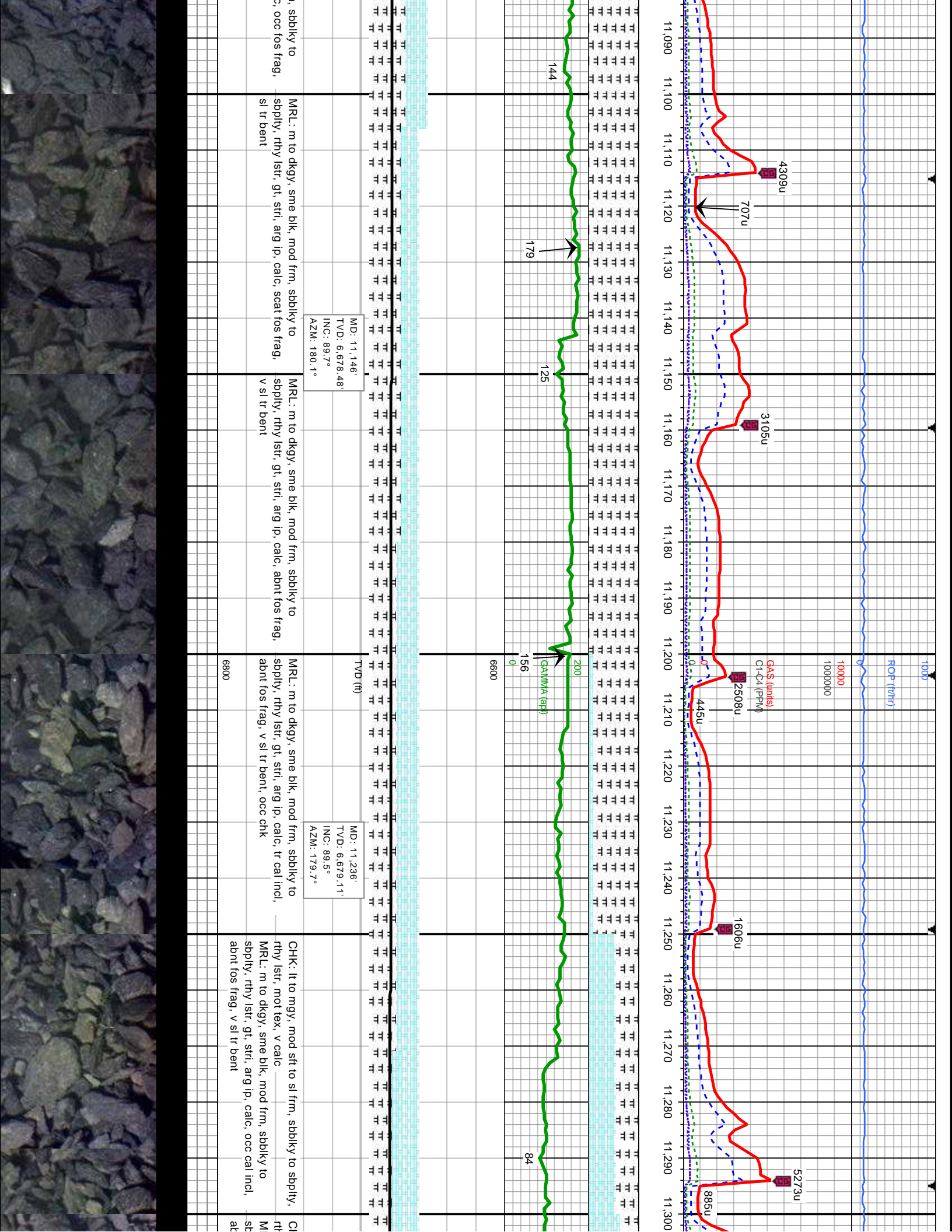
MD: 10.697'
TVD: 6,675.97'
INC: 90.9°
AZM: 180.2°

MD: 10.787'
TVD: 6,674.95'
INC: 90.4°
AZM: 179.8°

MR: m to dkg, mod frm, sbbky to sply, rhy
lstr, gt, stri, arg ip, calc, tr fos frag, occ bent, tr
chk

MR: m to dkg, mod frm, sbbky to sply, rhy
lstr, gt, stri, arg ip, calc, tr fos frag, occ bent, tr
sl tr bent

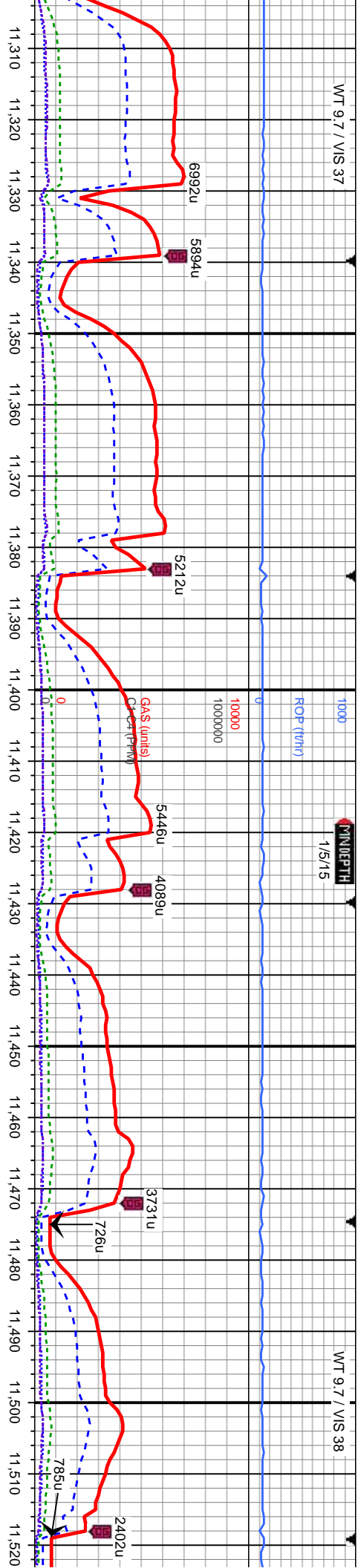




WT 9.7 / VIS 37

1000
ROP (ft/hr)
1/5/15

WT 9.7 / VIS 38



94

112

94

94

MD: 11,326'
TVD: 6,679.81'
INC: 89.6°
AZM: 179.6°

MD: 11,416'
TVD: 6,680.6'
INC: 89.4°
AZM: 179.5°

MD: 11,506'
TVD: 6,681.54'
INC: 89.4°
AZM: 179.1°

CHK: It to mgy, mod sft to sl frm, sbbkly to sbply,
rthy lstr, mot tex, v calc
MR: m to dkg, sme blk, mod frm, sbbkly to
sbply, rthy lstr, gt, stri, arg ip, calc, occ cal incl,
nt fos frag, tr bent

CHK: It to mgy, mod sft to sl frm, sbbkly to sbply,
rthy lstr, mot tex, v calc
MR: m to dkg, sme blk, mod frm, sbbkly to
sbply, rthy lstr, gt, stri, arg ip, calc, occ cal incl,
abt fos frag, sl tr bent

MR: m to dkg, sme blk, mod frm, sbbkly to
sbply, rthy lstr, gt, stri, mot ip, arg ip, calc, tr cal
incl, occ fos frag, tr bent, occ chk

MR: m to dkg, sme blk, mod frm, sbbkly to
sbply, rthy lstr, gt, stri, mot ip, arg ip, calc, rr cal
incl, occ fos frag, tr bent, occ chk

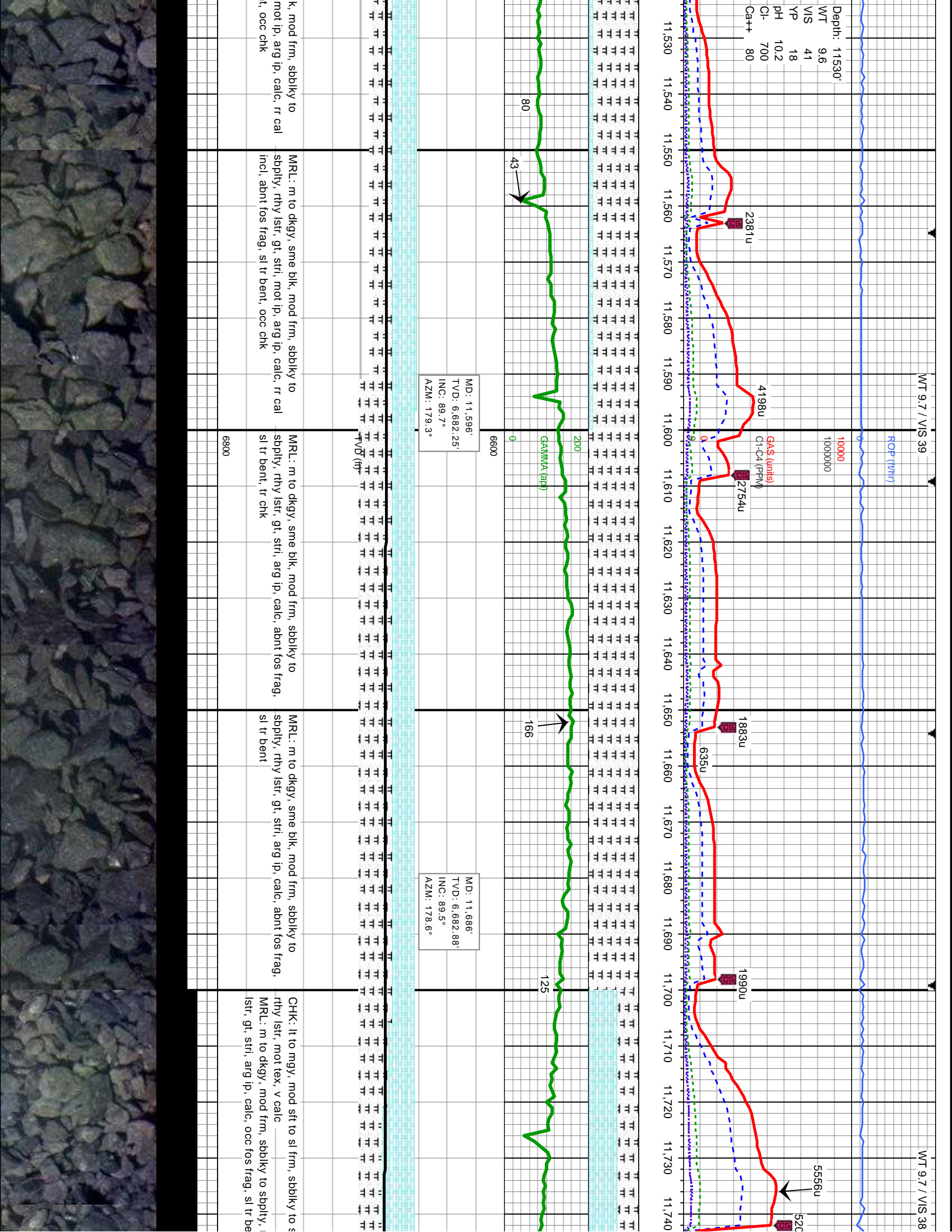
MR: m to dkg, sme b
sbply, rthy lstr, gt, stri,
incl, occ fos frag, tr bent

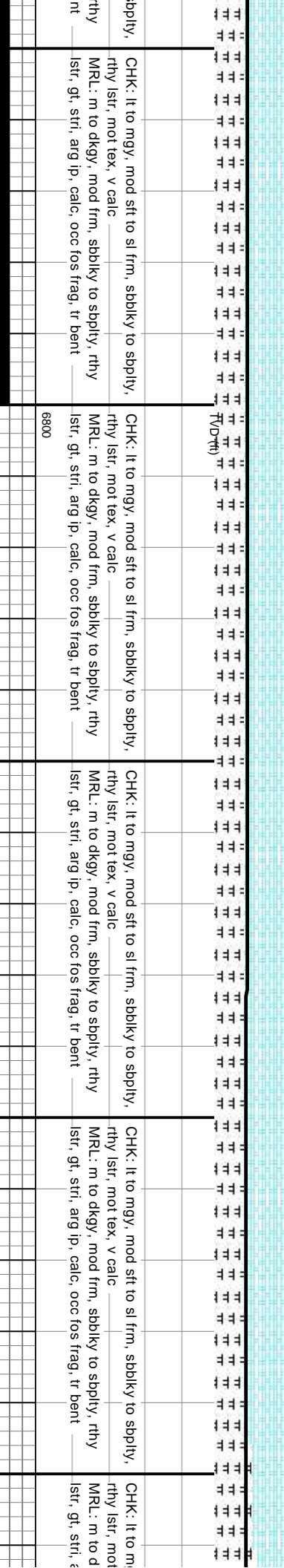
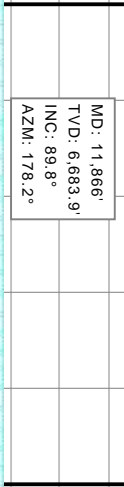
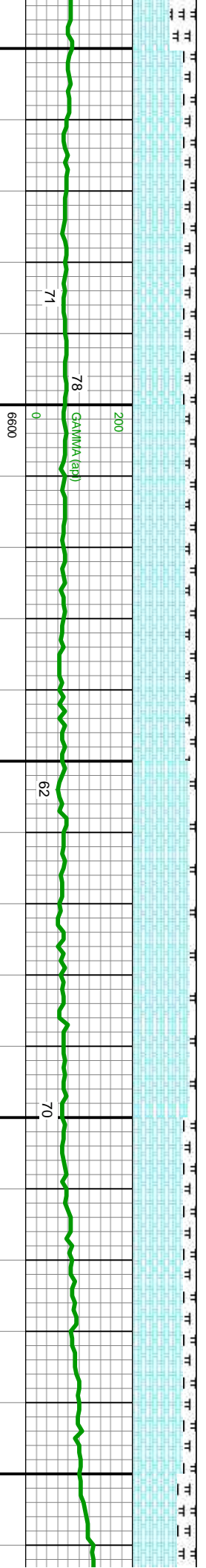
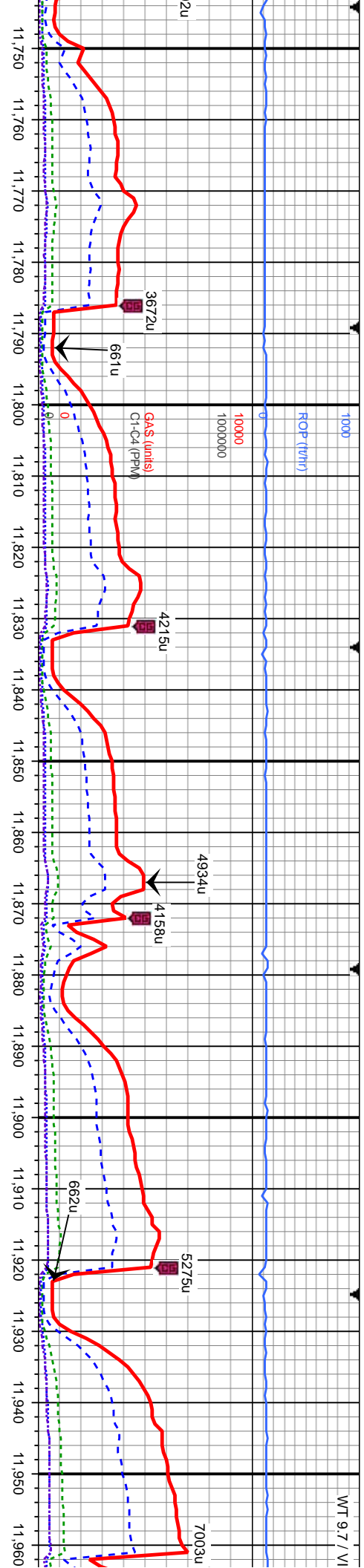
TVD (ft)

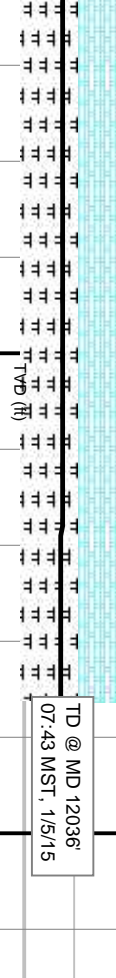
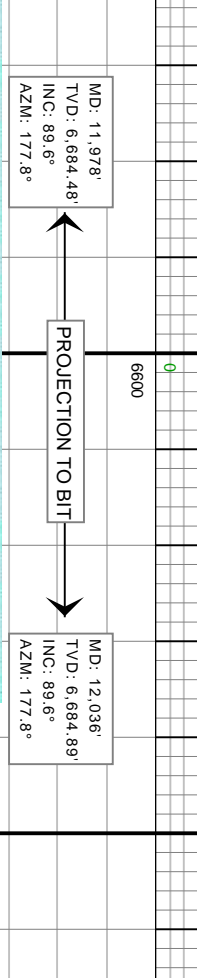
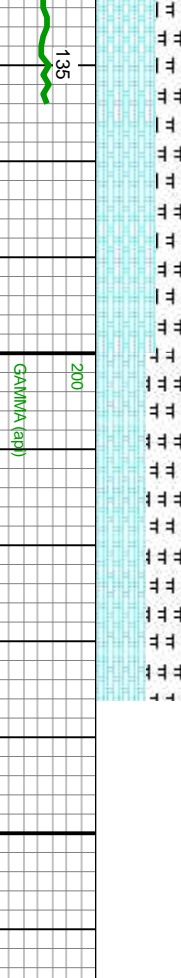
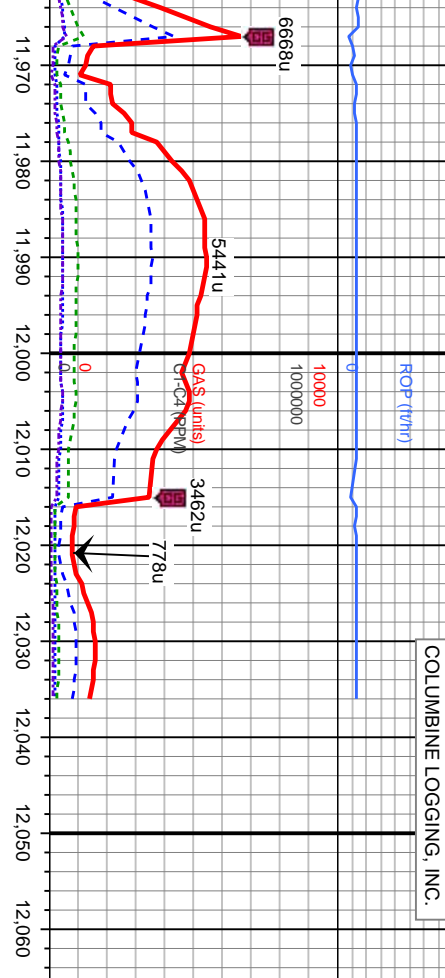
6800

6600









Bit Data	
Bit #: 3	
CHK: It to mgy, mod sft to sl frm, sbblky to sbply, rthy	CHK: It to mgy, mod sft to sl frm, sbblky to sbply, rthy
tex, v calc	sbblky to sbply, rthy lstr, mot tex, v calc
MD: 11,978'	MRL: m to dkgly, mod frm, sbblky to sbply, rthy lstr, gt, stri, arg ip, calc, tr fos frag, tr bent
TV D: 6,684.48'	
INC: 89.6°	
AZM: 177.8°	
TD @ MD 12036'	
07:43 MST, 1/5/15	

