



Scale: 5" / 100'
Measured Depth Log

Well Name Morning Fresh 13N-15HZ

Location NW Sec 15 T3N R66W

State COLORADO

County WELD

Country USA

Rig Number ENSIGN 138

API Number 05-123-37000

Field WATTENBERG

Region DJ BASIN

Drilling Completed 7/11/2014

Spud Date 7/7/2014

Surface Coordinates 460' FNL 235' FWL

Bottom Hole Coordinates 1' FSL 235' FWL

Ground Elevation 4851'

K.B. Elevation 4864'

Logged Interval 6850' To 12093'

Total Depth 12093'

Formation NIOBRARA B

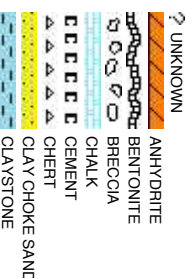
Type of Drilling Fluid LSND, H2O

Company Anadarko

Address Granite Tower
1099 18th St, S
Denver, CO 80202

Name CAMERON NA

Company COLUMBINE L
Address 2385 S Lipan S
Denver, CO 80202



Operator

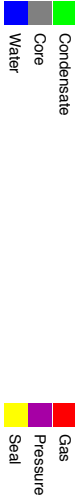
Unit #1800
202

Geologist

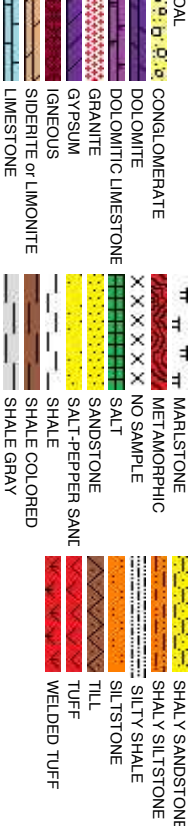
KOS & ADAM HARRIS
LOGGING, INC.

2223

Zone Color Coding



Rock Types



Accessories

Fossils		Minerals		Stringer	
	GASTROPOD		ARGILLITE GRAIN		HEAVY MINERAL
	INOCERAMUS		KAOLIN		ANHYDRITE STRINGER
	ALGAE		BENTONITE		BENTONITE STRINGER
	AMPHIPORA		MARCASITE		COAL STRINGER
	OSTRACOD		BRECCIA FRAGMENTS		DOLOMITE STRINGER
	BELEMNITE		CALCAREOUS		GYPSUM STRINGER
	BIOCLASTIC		CARBONACEOUS FLAKES		LIMESTONE STRINGER
	BRACHIOPOD		CHERT		MARLSTONE (CALC) STRG
	BRYOZOA		COAL - THIN BEDS		MARLSTONE (DOL) STRG
	CEPHALOPOD		DOLOMITIC		SANDSTONE STRINGER
	CORAL		FELDSPAR		
	CRINOID		FERRUGINOUS PELLET		
	ECHINOID		FERRUGINOUS		
	FISH		GLAUCONITE		
	FORAMINIFERA		GYPSIFEROUS		
	F. FOSSIL				
			SILTY		
			TUFFACEOUS		

Other Symbols

Oil Show		Engineering		Rounding		Textures		Sorting	
	DEAD		DST INTERVAL		WIRELINE TESTED - LEFT		E EARTHY		
	EVEN		VUGGY		FAULT		WIRELINE TESTED - RT		FINE XLYLN
	QUESTIONABLE		FORMATION TOP		GAS SHOW		DRILL STEM TEST		GS GRAINSTONE
	SPOTTED STAINING		BIT		OIL SHOW		MN DEPTH		L LITHOGRAPHIC
			CONNECTION (UP)		MN DEPTH UP		MX MICROXLN		
			CONNECTION (DOWN)		MN DEPTH (DOWN)		MS MUDSTONE		
			CONNECTION GAS		ANGULAR		PS PACKSTONE		
	E EARTHY		CONNECTION GAS (LEFT)		NORMAL FAULT		R ROUNDED		WS WACKESTONE
	F FENESTRAL		TRIP GAS		OVERTURNED STRATA		B SUBANG		
	F FRACTURE		TRIP GAS (LEFT)		REVERSE FAULT		R SUBRND		
	INTERCRYSTALLINE		CASING		SIDEWALL CORE (LEFT)				
	INTERCRYSTALLINE		DOWN TIME GAS		SIDEWALL CORE (RIGHT)				
	MOLDIC		DOWN TIME GAS (LEFT)		SLIDE				
	ORGANIC		CORE - LOST		SURVEY				
			CORE - RECOVERED						

Slide/Rotate

ROP SCALE:
0 - 750 FT/HR

ROP
ROF
GAMMA

GAMMA SCALE:
0 - 300 API

Total Gas & Chromatograph

GAS

C1
C2
C3
C4

Begin Logging on
8 July 2014 @
1831 MST

PASON TOTAL GAS
IN "GAS10000" UNITS

Depth Labels

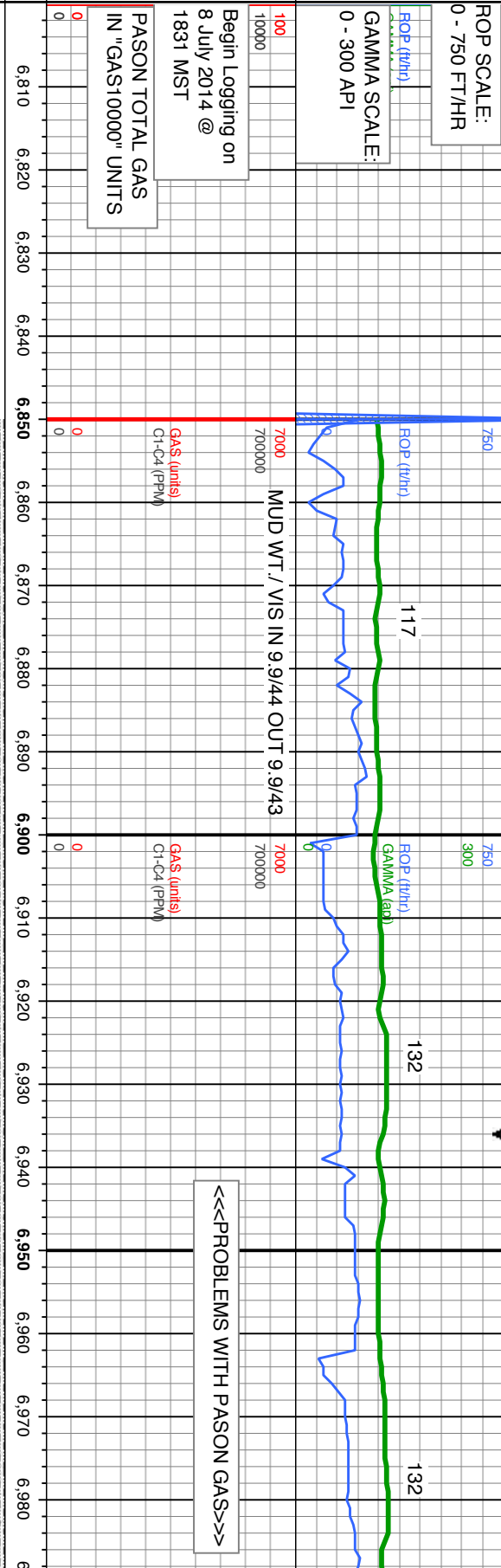
% Lith

Well Bore
TVD

Oil Show

Images

EGMFTST



100' Sample Intervals

Bit Data

Type: SMITH/SDI611

Size: 8.75

Jets: 3x16/3x18

TVD (ft)

TVD (ft)

TVD (ft)

TVD (ft)

MD: 6,889'

TVD: 6,839.52'

Inclination: 28.4 °

Azimuth: 172.29 °

VS: -141.04'

100' OIL SHOWS

7700

7700

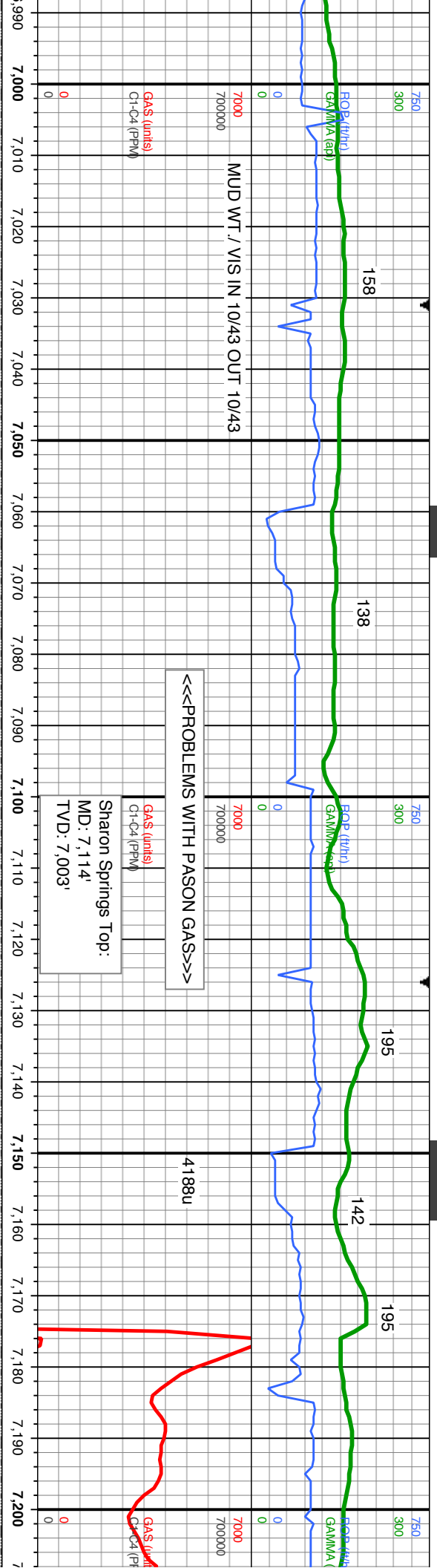
7700

7700

100% SLTY SH: lt-med gy brn, sme dk gy, mot ip, frm-hd, sb blk-y-sb pily, silty tex, sl calc, tr pyr, tr SS strg, tr bent, sl calc; v slw strn, v tr bl-wht cut, thin frt ylw-grn flor ring, no stn

100% SLTY SH: lt-med gy brn, sme dk gy, mot ip, frm-hd, sb blk-y-sb pily, silty tex, sl calc, tr pyr, tr SS strg, tr bent, sl calc; v slw strn, v tr bl-wht cut, thin frt ylw-grn flor ring, no stn



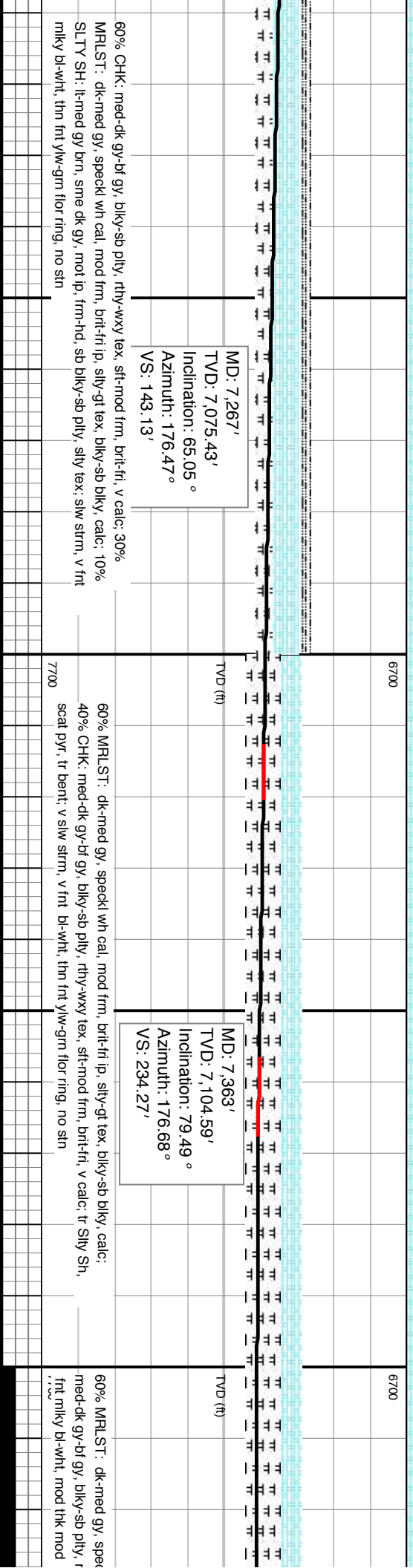
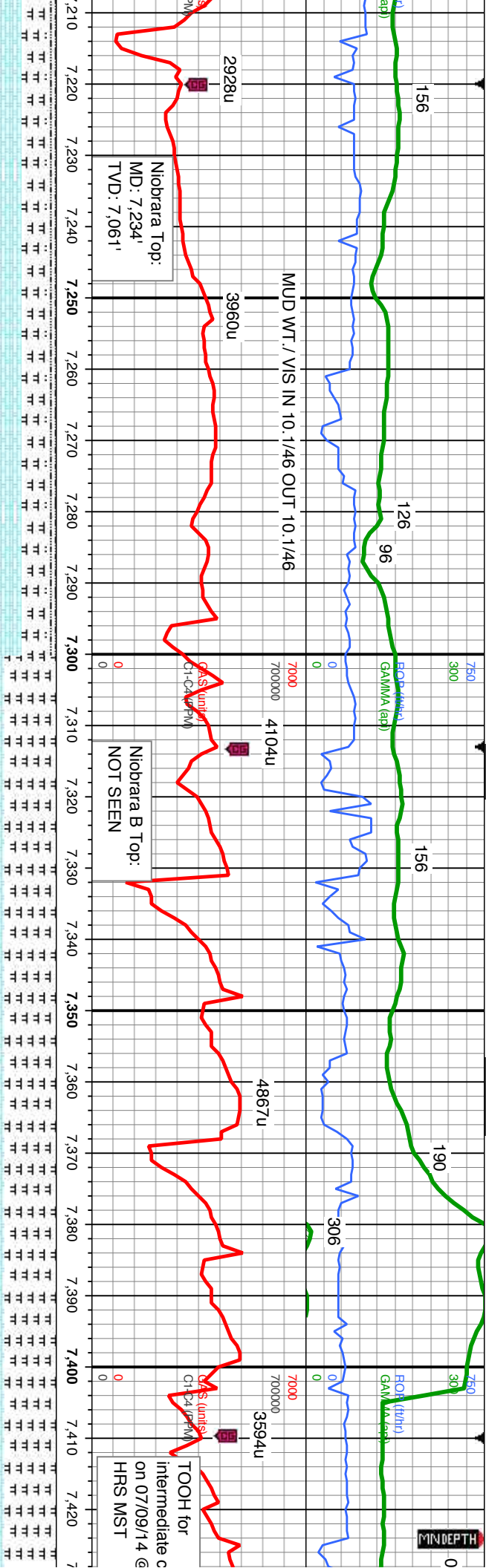


MD: 7,079'
TVD: 6,982.7'
Inclination: 53.57 °
Azimuth: 173.58 °
VS: -19.76'

100% SLTY SH: lt-med gy brn, sme dk gy, mot ip, frm-hd, sb blk-y-sb pily, silty tex, sl calc, tr pyr, tr bent, sl calc, v silw strn, v tr bl-wht cut, thin frt ylw-grn flr ring, no sln

MD: 7,173'
TVD: 7,033.14'
Inclination: 61.47 °
Azimuth: 175.68 °
VS: 59.28'

70% SLTY SH: lt-med gy brn, sme dk gy, mot ip, frm-hd, sb blk-y-sb pily, silty tex: 15% MRLST: dk-med gy, speck wh cal, mod frm, brt-frt ip, silty-gt tex, blk-y-sb blk-y, calc, 15% CHK: med-dk gy-bf gy, blk-y-sb pily, rthy-wxy tex, sft-mod frm, brt-frt, v calc;



7/09/2014 07/10/2014

169

RESUMED DRILLING
@ 15:48 HRS MST ON
07/10/14

TD Curve
(7450MD/7114'TVD)
@ 0019 MST on 9
July 2014

VIS IN 9.9/44 OUT 10.2/45

ROP (ft/hr)
GAMMA (api)

261

86

ROP (ft/hr)
GAMMA (api)

7000
700000

GAS (units)
Cl-C4 (PPM)

1841u

2652u

GAS (units)
Cl-C4 (PPM)

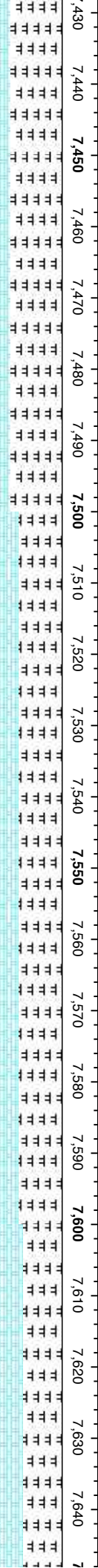
2570u

186

asing
p 0130

4068u

318u



Projection to Bit:
7450MD
88.00 INC
181.00 AZM

Bit Data
Bit #: 2
Type: VSS13D
Size: 6 1/8
Depth In: 7,450'
Jets: 5X18

6700

6700

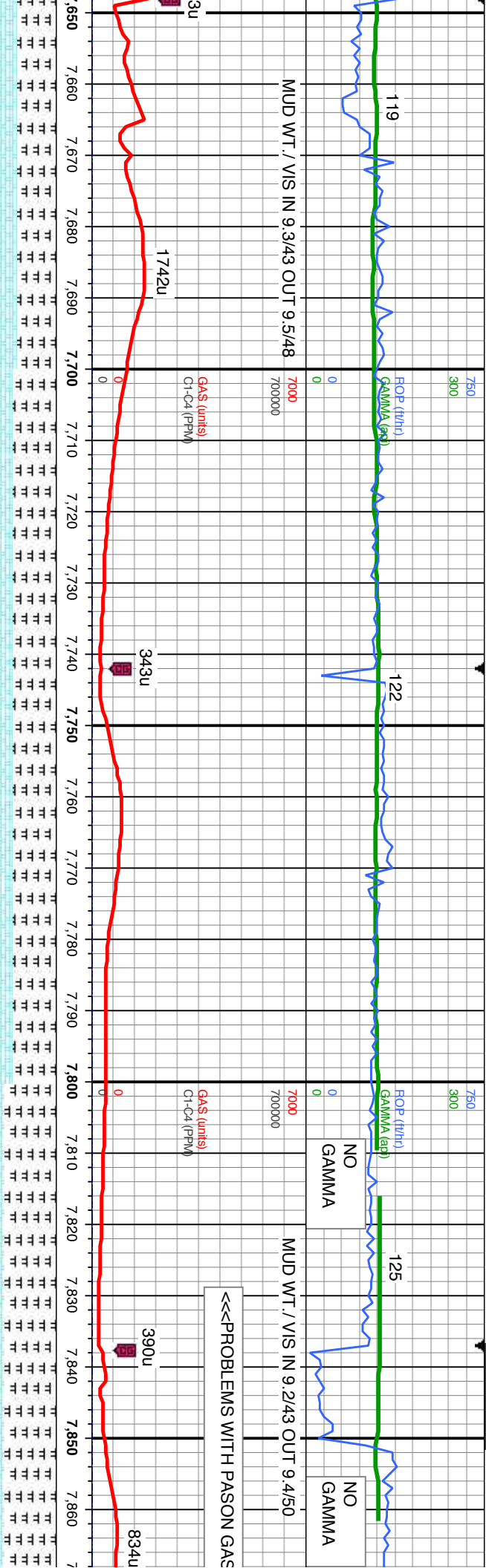
MD: 7,450'
TVD: 7,114.06'
Inclination: 88.0°
Azimuth: 181°
VS: 320.65'

MD: 7,512'
TVD: 7,117.74'
Inclination: 90.37°
Azimuth: 179.9°
VS: 382.44'

50% CHK: med-dk gy-bf gy, biky-sb pily, rthy-wxy tex, sft-mod frm, brit-frt, v calc 50% MRLST: dk-med gy, speckl wh cal, mod frm, brit-frt ip, sily-gt tex, biky-sb biky, calc: tr Sily Sh, scat pyr, occ calc frags: slw strn, v frt bl-wht, mod thk mod br bl flr ring, tr stn

55% CHK: med-dk gy-bf gy, sb biky-sb pily, rthy-wxy v gy, speckl wh cal, mod frm, brit-frt ip, sily-gt tex, biky-sb strn, frt mlky bl-wht, mod thk br bl flr ring, no stn



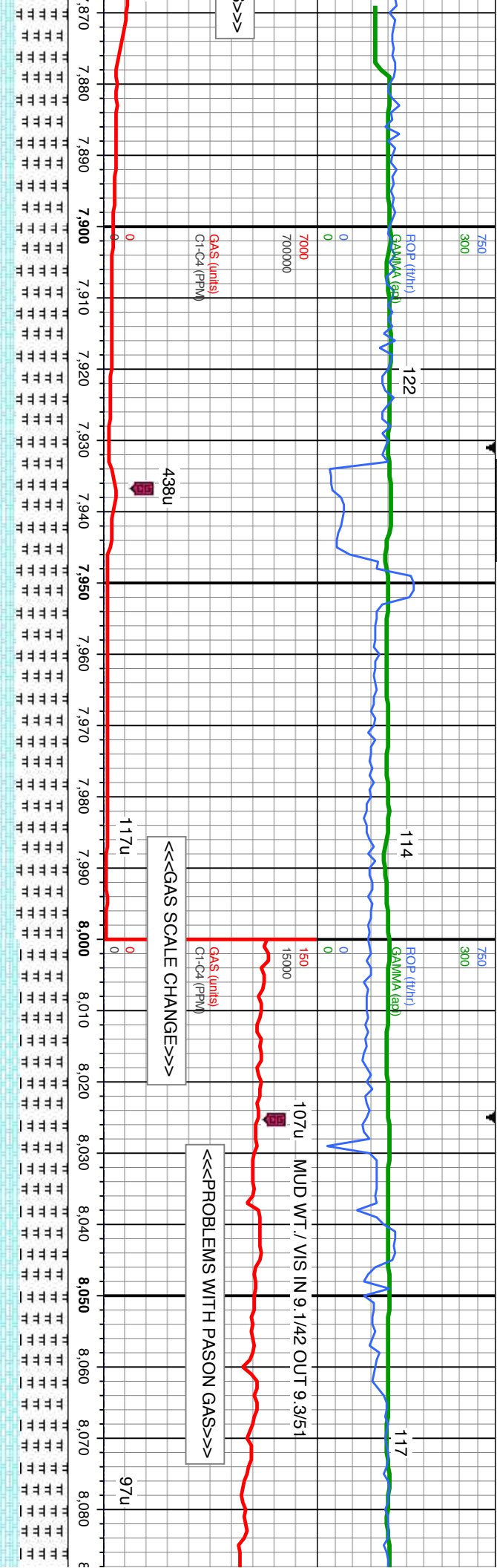


MD: 7,700'
TVD: 7,119.76'
Inclination: 88.4°
Azimuth: 179.62°
VS: 570.38'

MD: 7,795'
TVD: 7,122.59'
Inclination: 88.18°
Azimuth: 179.09°
VS: 665.33'

ex, sft-mod frm, brlt-frt, v calc 45% MRLST: dk-med	50% CHK: med-dk gy-bl gy, sb blk-y-sb ply, rthy-wxy tex, sft-mod frm, brlt-frt, v calc 50% MRLST: dk-med
blky, calc; tr los, scat pyr, occ calc frags; slw	gy, speckl wh cal, mod frm, brlt-frt ip, slty-gt tex, blk-y-sb blk-y, calc; tr los, scat pyr, scatt calc frags; slw
	strm, v frt bl-wht, thn frt bl flr ring, no sin





MD: 7,889'
TVD: 7,124.82'
Inclination: 89.11°
Azimuth: 178.51°
VS: 759.3'

TVD (ft)

v calc 40% MRLST: dk-med
gs: slw strm, fnt milky bl-wht,

60% MRLST: dk-med gy, mot cal, mod frm, silty-gt tex, blk-y-sb blk-y, calc 40% CHK: med-dk gy-rl gy, sb
blk-y-sb ply, rthy-wxy tex, sft-mod frm, brit-fr, v calc; tr dissim pyr, scatt calc frags; v slw strm, v fnt bl-wht,
mod thk mod br bl flr ring, tr stn

MD: 7,984'
TVD: 7,126.07'
Inclination: 89.38°
Azimuth: 179.56°
VS: 854.29'

TVD (ft)

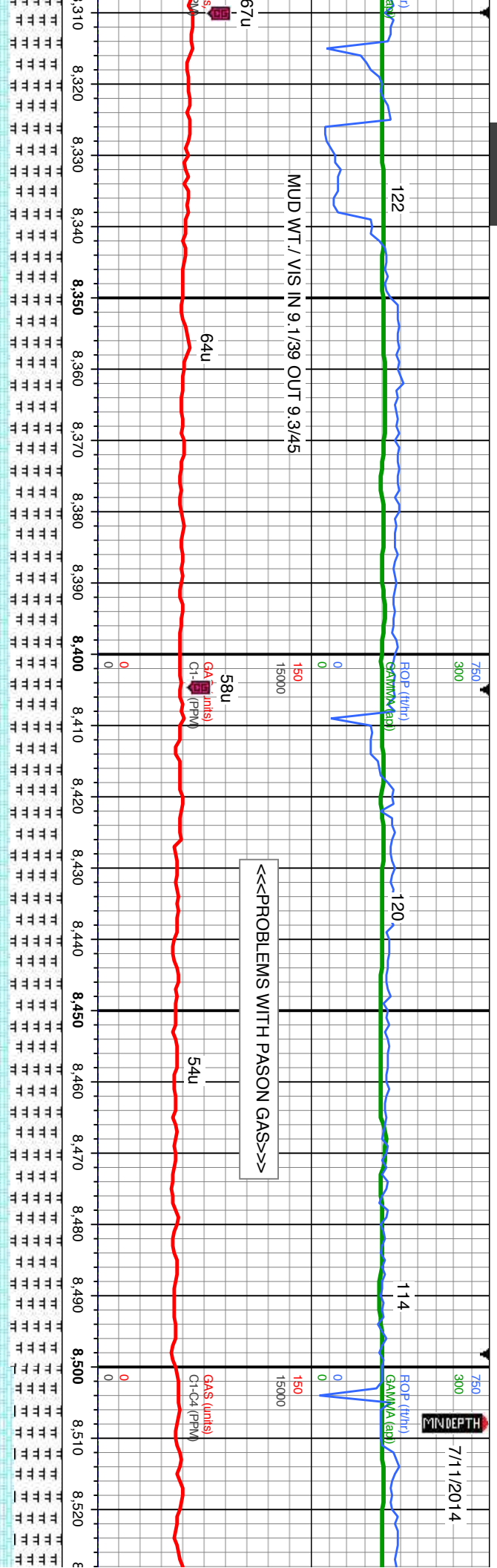
55% MRLST: dk-med gy, mot cal, mod frm, silty tex, blk-y-sb blk-y, calc, 45% CHK: med gy-rl gy, sb
blk-y-sb ply, occ ply, rthy-wxy tex, sft-mod frm, v calc; occ calc frags; slw strm, mod fnt milky bl-wht
thk dull bl flr ring, no stn

MD: 8,079'
TVD: 7,126.81'
Inclination: 89.72°
Azimuth: 179.5°
VS: 949.28'

TVD (ft)

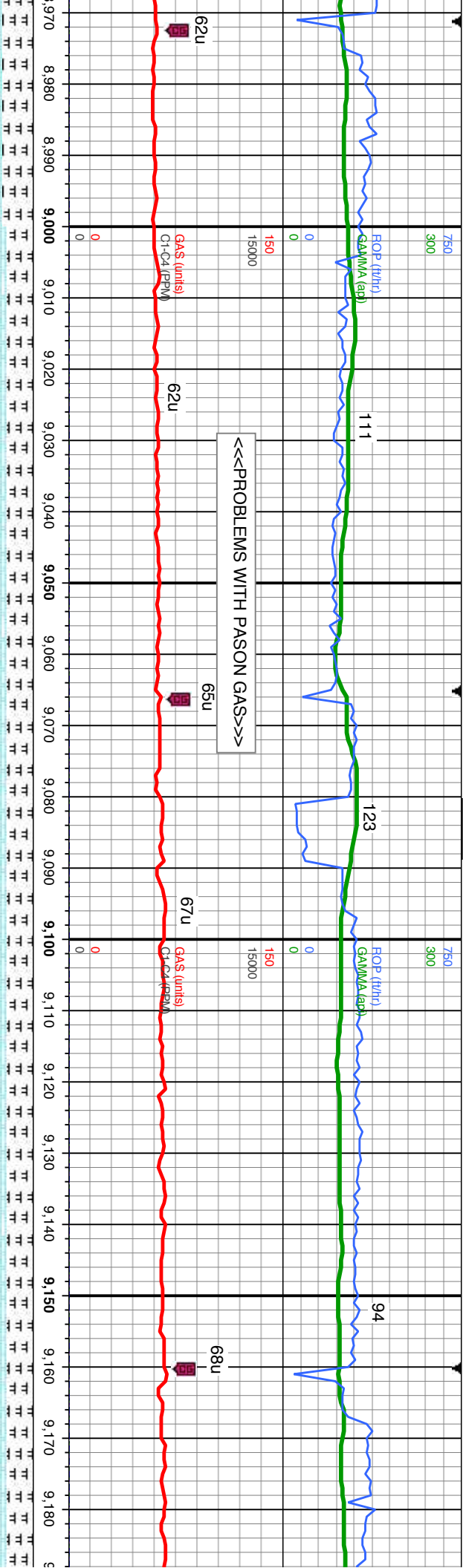


MINDEPTH



MD: 8.362' TVD: 7,127.98' Inclination: 89.72 ° Azimuth: 179.66 ° VS: 1,232.26'		MD: 8.456' TVD: 7,128.29' Inclination: 89.91 ° Azimuth: 180.76 ° VS: 1,326.22'		MD: 8.556' TVD: 7,128.29' Inclination: 89.91 ° Azimuth: 180.76 ° VS: 1,326.22'	
60% MFLST: dk-med gy, mot cal, mod frm, silty tex, biky-sb biky, calc, 40% CHK: med gy-ft gy, sb biky-sb ply, occ ply, rthy-wxy tex, sft-mod frm, v calc: scatt diss pyr, occ calc frags: silw strn, fnt b-wht, mod thk dull bl flr ring, no sin		60% MFLST: dk-med gy, mot cal, mod frm, silty tex, biky-sb biky, calc, 40% CHK: med gy-ft gy, sb biky-sb ply, occ ply, rthy-wxy tex, sft-mod frm, v calc: scatt diss pyr, occ calc frags: silw strn, fnt b-wht, mod thk dull bl flr ring, no sin		55% MFLST: dk-med gy, mot cal, mod frm, silty tex, biky-sb biky, calc, 40% CHK: med gy-ft gy, sb biky-sb ply, occ ply, rthy-wxy tex, sft-mod frm, v calc: scatt diss pyr, occ calc frags: silw strn, fnt b-wht, mod thk dull bl flr ring, no sin	





6700

6700

TVD (ft)

TVD (ft)

MD: 9,023'
TVD: 7,120.15'
Inclination: 91.29 °
Azimuth: 178.26 °
VS: 1,892.94'

MD: 9,118'
TVD: 7,118.96'
Inclination: 90.15 °
Azimuth: 177.48 °
VS: 1,987.93'

70% CHK: med gy-ll gy, sb blk-y-sb ply, rthy-wxy tex, mod sft-mod frm, v calc, 30% MRLST: dk-med gy, mot wh cal, mod frm, silty-gt tex, blk-y-sb blk-y, calc; scatt dissim pyr, occ calc frags; v slw strm, v fnt bl-wht, mod thk mod br bl flr ring; no sin

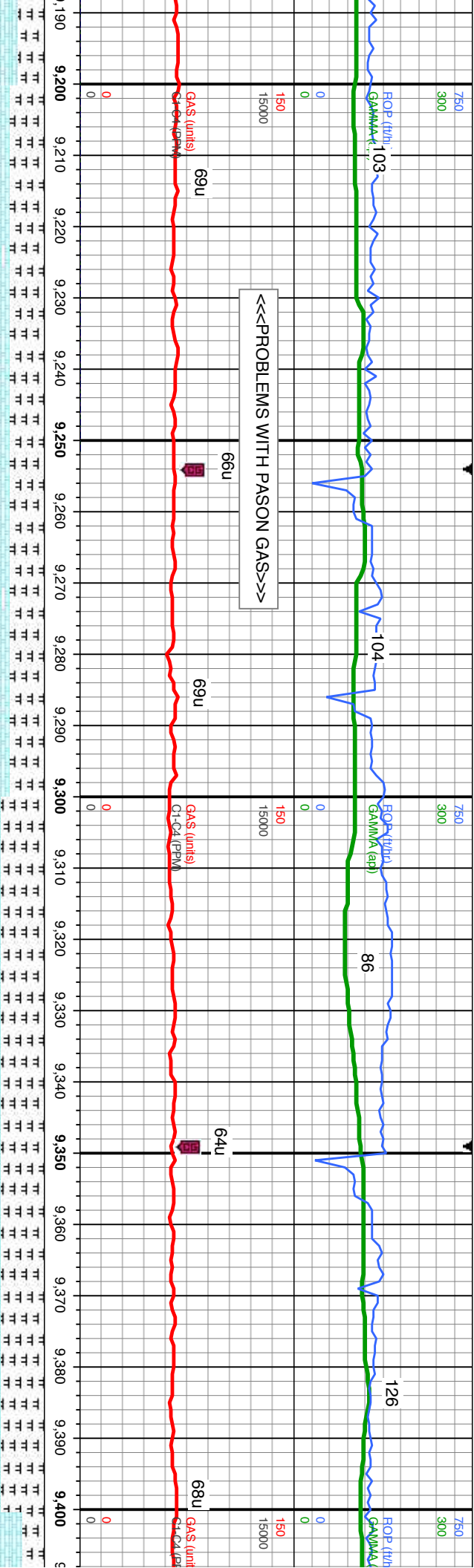
70% CHK: med-dk gy, occ ll gy, sb blk-y-sb ply, rthy-wxy tex, mod sft-mod frm, v calc, 30% MRLST: med-dk gy & blk, mot wh cal, mod frm, silty-gt tex, blk-y-sb blk-y, calc; slw strm, fnt bl-wht, thn mod br bl flr ring; no sin

7700

calc, 35% MRLST: dk-med calc frags; slw strm, fnt mlky

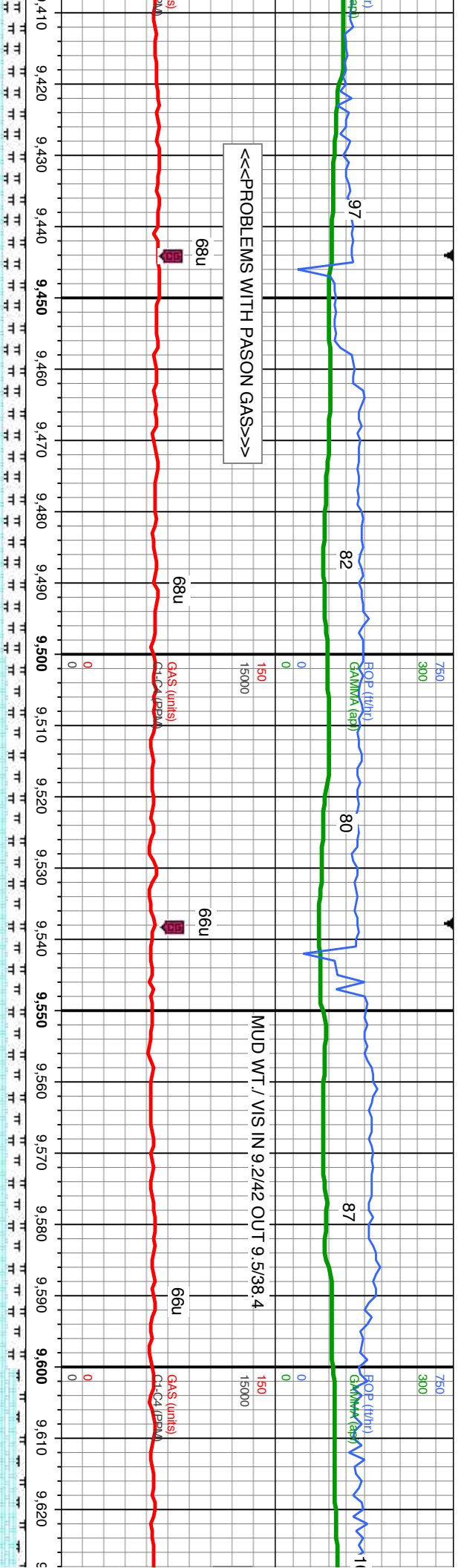
MRLST: med-dk gy & blk, mot wh cal, mod frm, silty-gt tex, blk-y-sb blk-y, calc; slw strm, fnt bl-wht, thn mod br bl flr ring; no sin





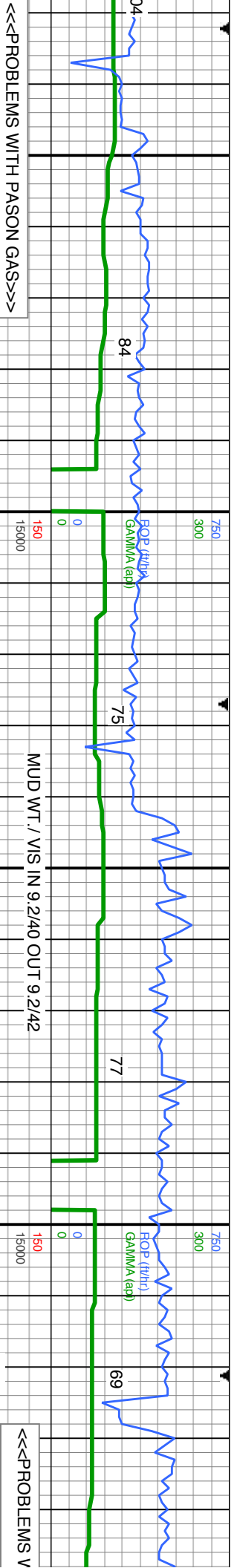
6700		6700		6700	
TV MD: 9,212'		MD: 9,307'		MD: 9,402'	
TVD: 7,118.58'		TVD: 7,117.99'		TVD: 7,117.17'	
Inclination: 90.31 °		Inclination: 90.4 °		Inclination: 90.0 °	
Azimuth: 177.75 °		Azimuth: 177.54 °		Azimuth: 177.4 °	
VS: 2,081.91'		VS: 2,176.89'		VS: 2,271.87'	
60% CHK: med-dk gy, occ lt gy, sb blk-y-sb ply, rthy-wxy tex, mod sft-mod frm, v calc, 40% MRLST: med-dk gy & blk, mot wh cal, mod frm, silty-gt tex, blk-y-sb blk-y, calc, tr pyr, v slw strn, v fnt bl-wrt, tm mod dull bl flor ring, no stn		50% CHK: med-dk gy, occ lt gy, sb blk-y-sb ply, rthy-wxy tex, mod sft-mod frm, v calc, 50% MRLST: med-dk gy & blk, mot wh cal, mod frm, silty-gt tex, blk-y-sb blk-y, calc, scat pyr frags, v tr bent, mod fst, mod fnt mlky bl-wrt, mod thk br bl flor ring, no stn			
7700		7700		7700	





6700		6700	
MD: 9,496'		MD: 9,590'	
TVD: 7,116.1'		TVD: 7,114.61'	
Inclination: 90.71 °		Inclination: 91.11 °	
Azimuth: 177.39 °		Azimuth: 177.72 °	
VS: 2,365.85'		VS: 2,459.83'	
55% CHK: med gy gy, occ lt&dk gy, sb blk-y-sb ply, rthy-wxy tex, mod sft-mod frm, v calc, 25% MRLST: med-dk gy & blk, mot wh cal, mod frm, silty-gt tex, blk-y-sb blk-y, calc, slw strfm, v frt		80% CHK: med gy gy, occ lt&dk gy, sb blk-y-sb ply, rthy-wxy tex, mod sft-mod frm, v calc, 20% MRLST: med-dk gy & blk, mot wh cal, mod frm, silty-gt tex, blk-y-sb blk-y, calc, slw strfm, frt bl-wht, mod thn mod br bl flr ring, no str	
7700		7700	





MD: 9,685'
TVD: 7,112.72'
Inclination: 91.17°
Azimuth: 177.05°
VS: 2,554.78'

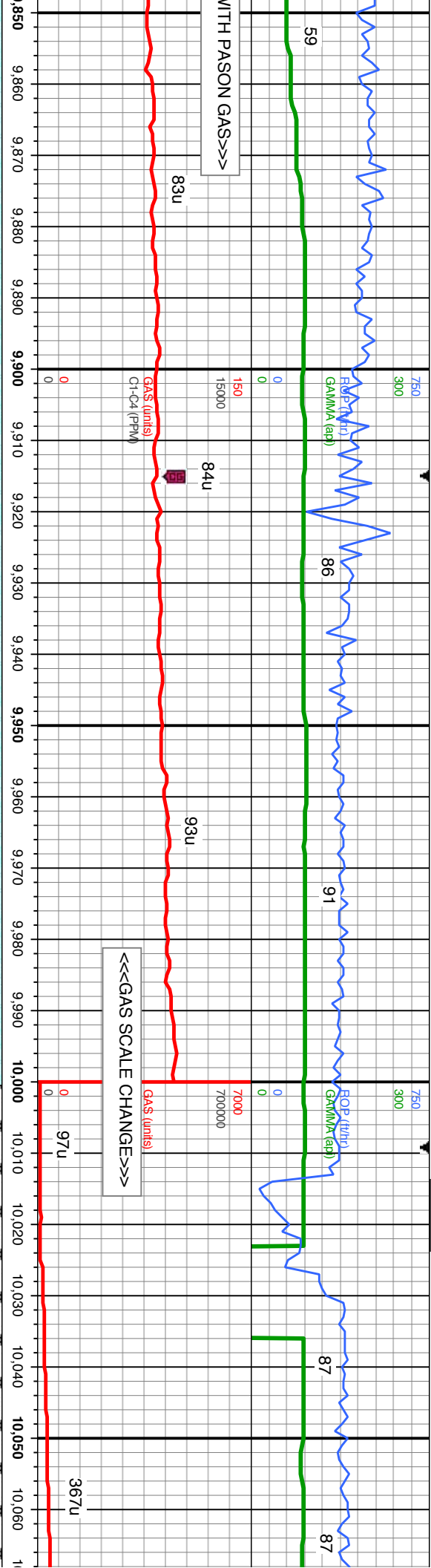
MD: 9,779'
TVD: 7,110.62'
Inclination: 91.39°
Azimuth: 176.53°
VS: 2,648.71'

gy, occ dk gy, sb blk-y-sb ply, rthy-wxy tex, mod sft-mod frm, v calc, & blk, mot wh cal, mod frm, sily-gt tex, blk-y-sb blk-y, calc, slw strn, fnt & dull bl flr ring, no stn

85% CHK: lt-med gy gy, occ dk gy, sb blk-y-sb ply, rthy-wxy tex, mod sft-mod frm, v calc, 15% MRLST: dk gy & blk, mot wh cal, mod frm, sily-gt tex, blk-y-sb blk-y, calc, tr tos frags, slw strn, fnt bl-wht, thn dull bl flr ring, no stn

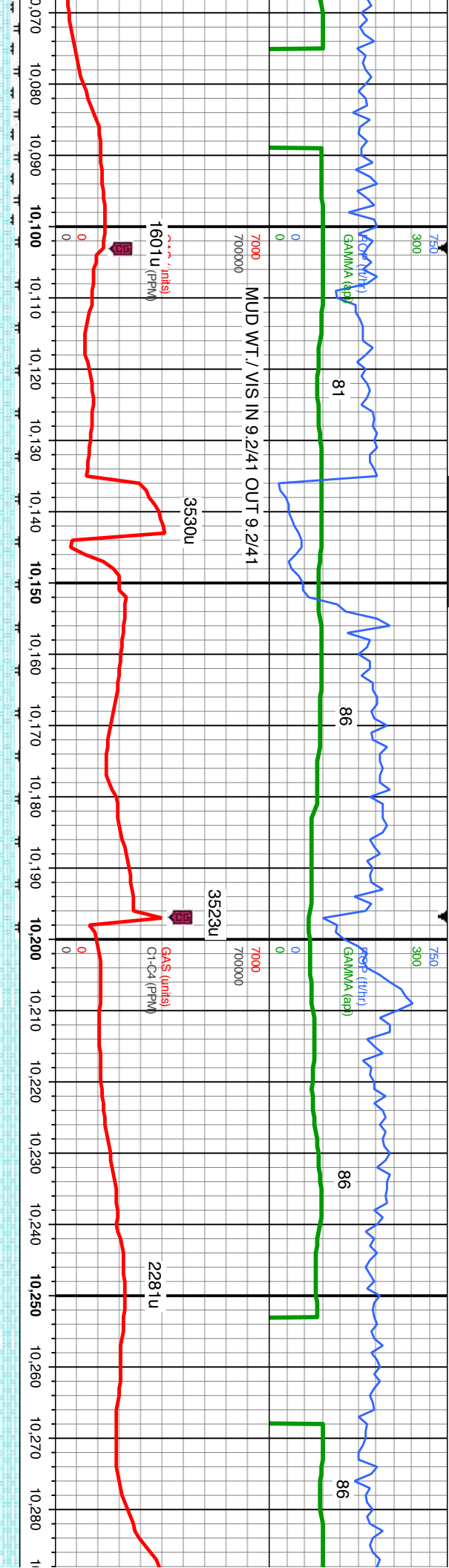
100% CHK: lt-med gy gy, occ dk gy, sb blk-y-sb tr MRLST: dk gy & blk, mot wh cal, mod frm, sl blk-y bl-wht, mod thk br bl flr ring, no stn





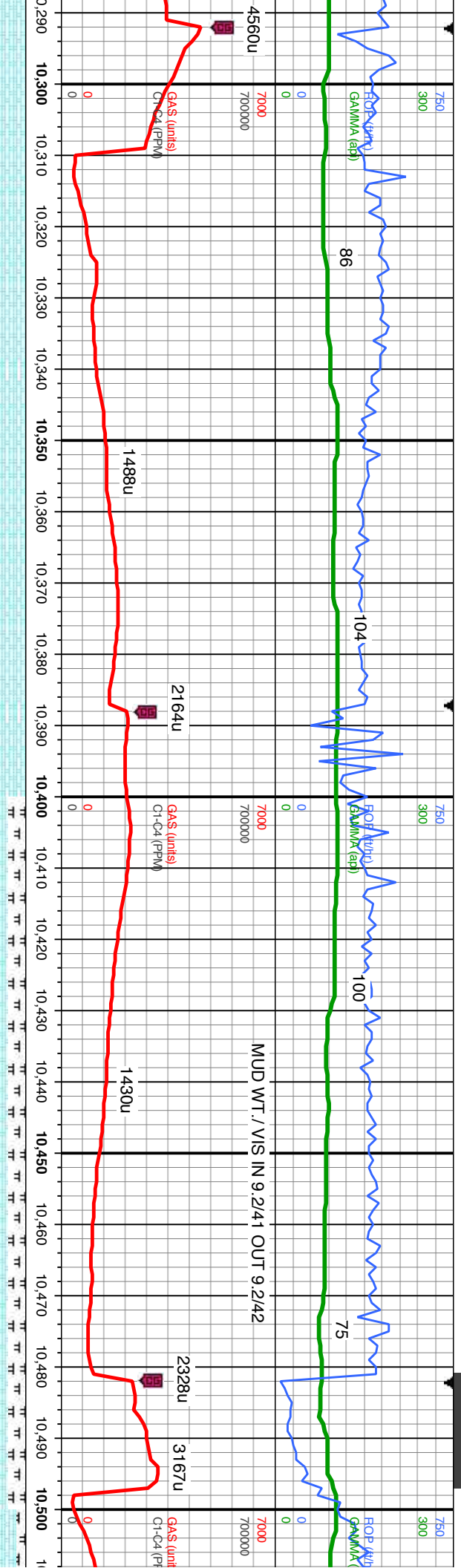
MD: 9,873'		MD: 9,967'		MD: 10,061'	
TVD: 7,107.99'		TVD: 7,104.77'		TVD: 7,101.66'	
Inclination: 91.82 °		Inclination: 92.1 °		Inclination: 91.1 °	
Azimuth: 175.9 °		Azimuth: 176.73 °		Azimuth: 176.4 °	
VS: 2,742.59'		VS: 2,836.46'		VS: 2,930.35'	
ply, rthy-wxy tex, mod sft-mod frm, v calc, rly-gt tex, blkly-sb blkly, calc, mod fst strfm, frt		100% CHK: lt-med gy gy, occ dk gy, sb blkly-sb ply, rthy-wxy tex, mod sft-mod frm, v calc, tr MRLST: dk gy & blk, mot wh cal, mod frm, silty-gt tex, blkly-sb blkly, calc, slw strfm, frt mlky bl-whit, mod thn dull bl flr ring, no str		90% CHK: lt-med gy gy, occ dk gy, sb blkly-sb ply, rthy-wxy tex, mod sft-mod frm, v calc, tr MRLST: dk gy & blk, mot wh cal, mod frm, silty-gt tex, blkly-sb blkly, calc, bl-whit, thk mod br bl flr ring, no str	
TVD (ft)		TVD (ft)		TVD (ft)	
6700		6700		7700	





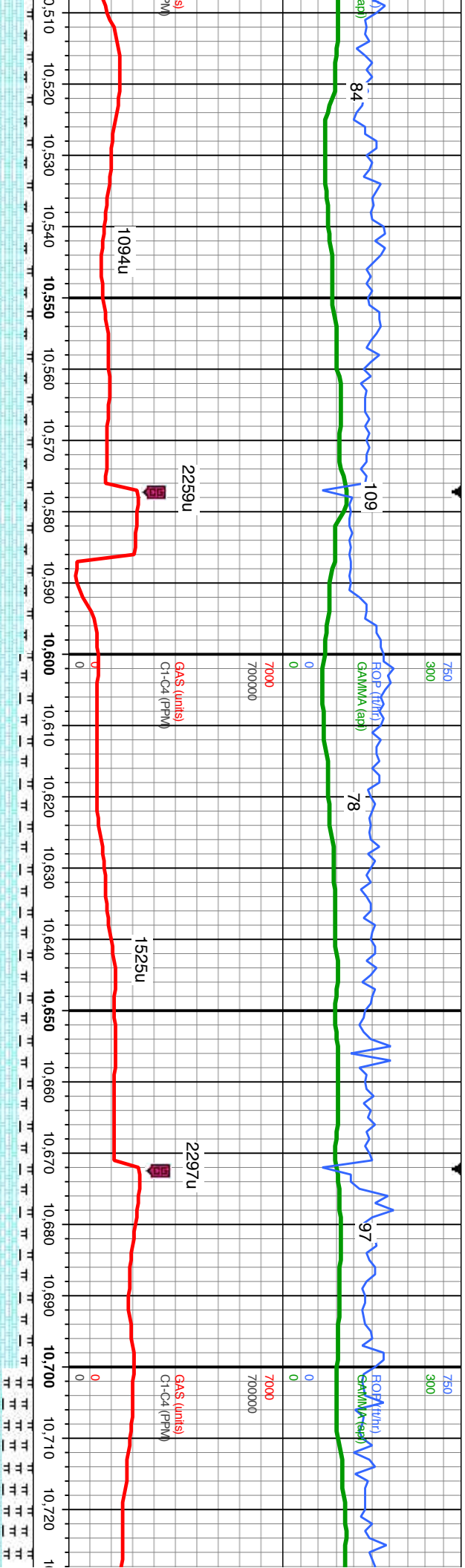
6700		6700	
TVD (ft)		TVD (ft)	
MD: 10,156'		MD: 10,250'	
TVD: 7,100.58'		TVD: 7,101.46'	
Inclination: 89.6°		Inclination: 89.32°	
Azimuth: 178.82°		Azimuth: 178.21°	
VS: 3,025.32'		VS: 3,119.32'	
95% CHK: lt-med gy gy, occ dk gy, sb blk-y-sb ply, rthy-wxy tex, mod sft-mod frm, v calc, 5% MRLST: dk gy & blk, mot wh cal, mod frm, silty-gt tex, blk-y-sb blk-y, calc, mod slw strn, frt		100% CHK: lt-med gy gy, occ dk gy, sb blk-y-sb ply, rthy-wxy tex, mod sft-mod frm, v calc, tr MRLST: dk gy & blk, mot wh cal, mod frm, silty-gt tex, blk-y-sb blk-y, calc, slw strn, mod frt bl-whit, mod thn dull bl flr ring, no stn	
7700		7700	





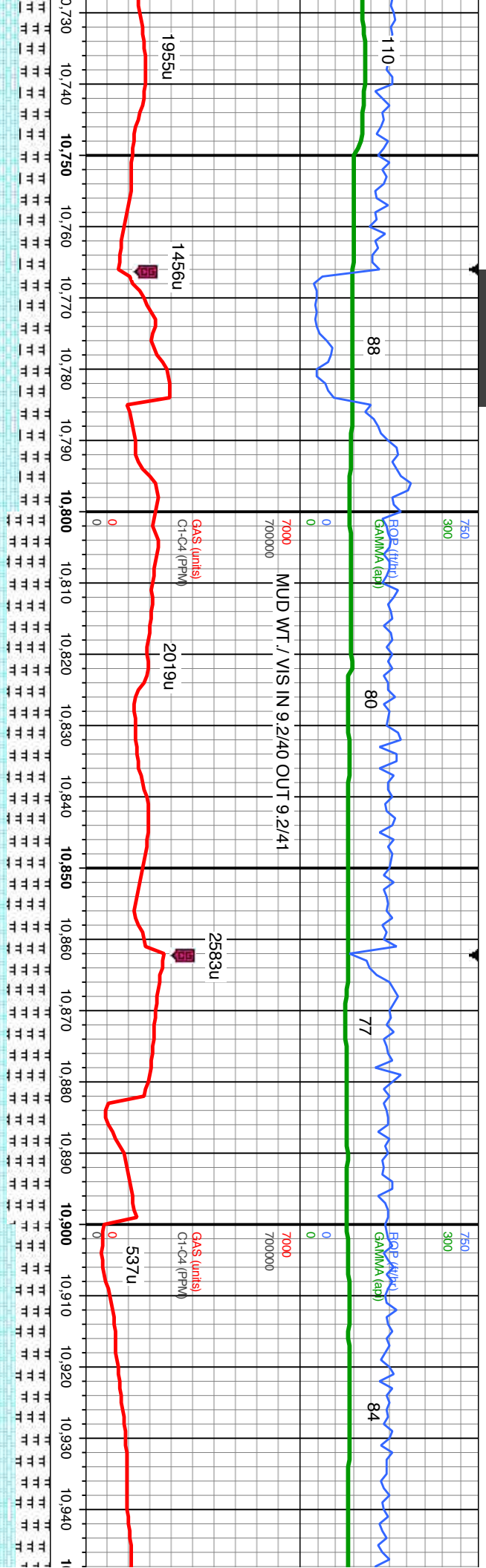
6700		6700		6700	
TVD (ft)		TVD (ft)		TVD (ft)	
MD: 10,345'		MD: 10,440'		TVD (ft)	
TVD: 7,102.48'		TVD: 7,103.43'			
Inclination: 89.45 °		Inclination: 89.41 °			
Azimuth: 178.1°		Azimuth: 177.82°			
VS: 3,214.31'		VS: 3,309.3'			
100% CHK: med gy gy, occ dk gy, sb blk-y-sb ply, rthy-wxy tex, mod sft-mod frm, v calc, tr		80% CHK: med-dk gy gy, occ lt gy, sb blk-y-sb ply, rthy-wxy tex, mod sft-mod frm, v calc: 20%			
MRLST: blk, mot wh cal, mod frm, silty-gt tex, blk-y-sb blk, calc; slw strn, frt bl-wht, mod		MRLST: dk gy-blk, mot wh cal, mod frm, silty-gt tex, blk-y-sb blk, calc; slw strn, frt milky			
thn mod dull bl flr ring, no stn		bl-wht, thn mod dull bl flr ring, no sin			
7700		7700		7700	





6700		6700	
MD: 10,535'		MD: 10,630'	
TVD: 7,104.74'		TVD: 7,106.38'	
Inclination: 89.01 °		Inclination: 89.01 °	
Azimuth: 179.1°		Azimuth: 178.65°	
VS: 3,404.29'		VS: 3,499.27'	
90% CHK: med-dk gy gy, occ lt gy, sb bky-sb ply, rthy-wxy tex, mod sft-mod frm, v calc, 10% MRLST: dk gy-blk, mot wh cal, mod frm, silty-gt tex, bky-sb bky, calc, scat fos frags, slw strn, frt bl-wht, thkmod br bl flr ring, no stn		85% CHK: med-dk gy gy, occ lt gy, sb bky-sb ply, rthy-wxy tex, mod sft-mod frm, v calc, 15% MRLST: dk gy-blk, mot wh cal, mod frm, silty-gt tex, bky-sb bky, calc, scat fos frags, slw strn, mod frt bl-wht, mod thn mod dull bl flr ring, no stn	
TVD (ft)		TVD (ft)	
7700		7700	
65% CHK: med-dk gy gy MRLST: dk gy-blk, mot frt mlky bl-wht, mod th		65% CHK: med-dk gy gy MRLST: dk gy-blk, mot frt mlky bl-wht, mod th	
MD: 10,724'		MD: 10,724'	
TVD: 7,108.3'		TVD: 7,108.3'	
Inclination: 8°		Inclination: 8°	
Azimuth: 177°		Azimuth: 177°	
VS: 3,593.25'		VS: 3,593.25'	



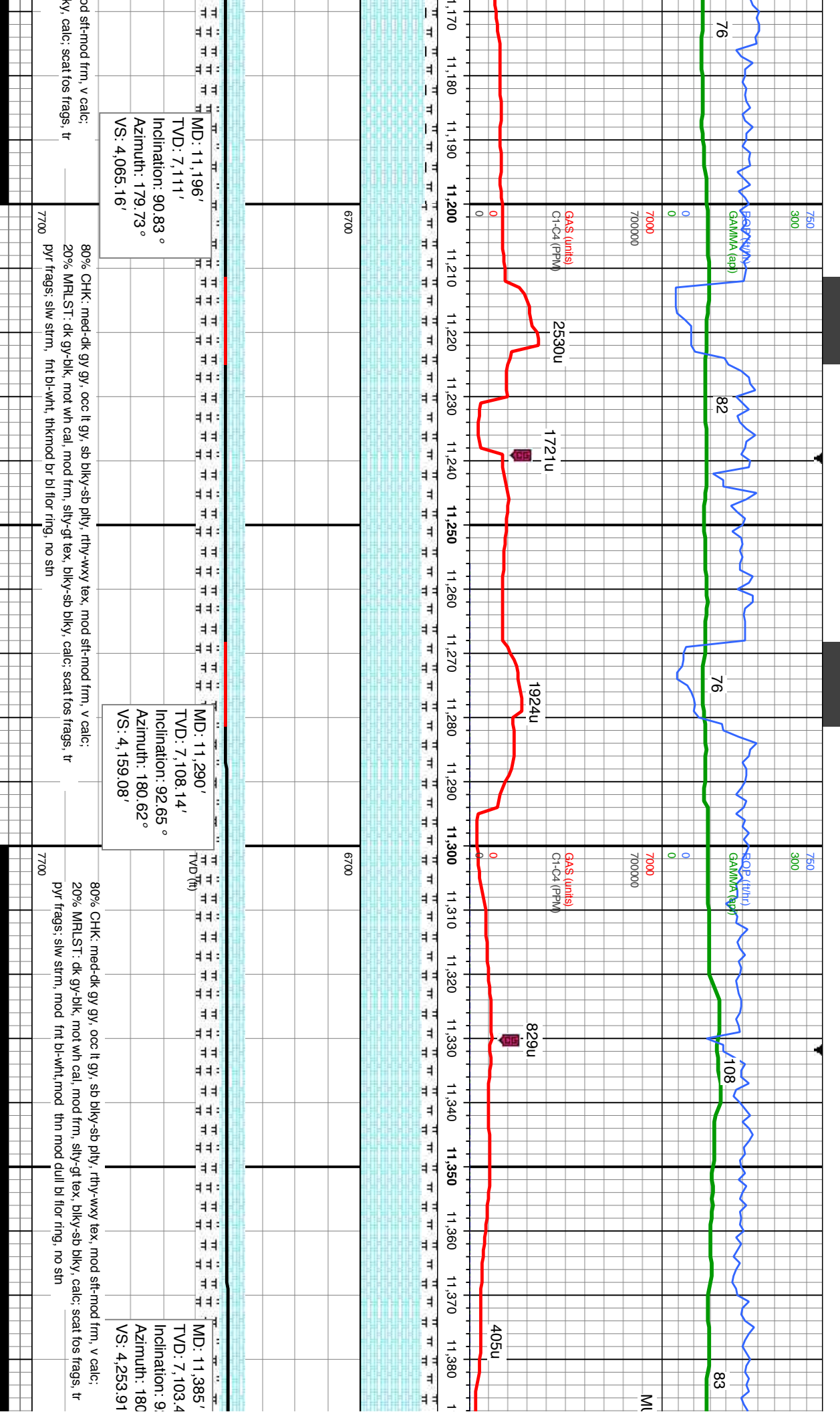


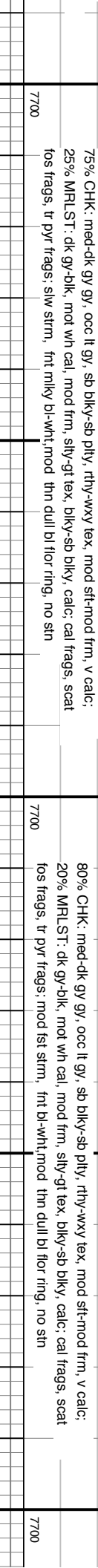
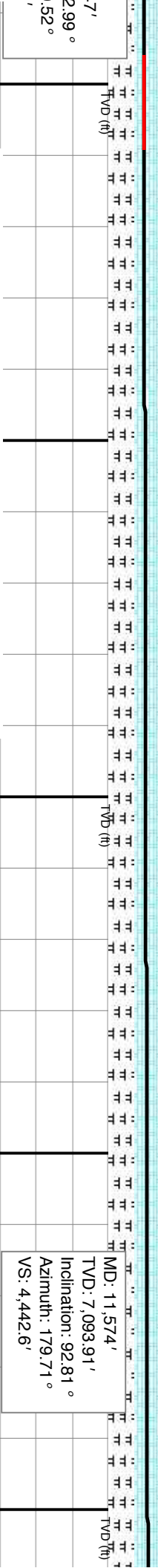
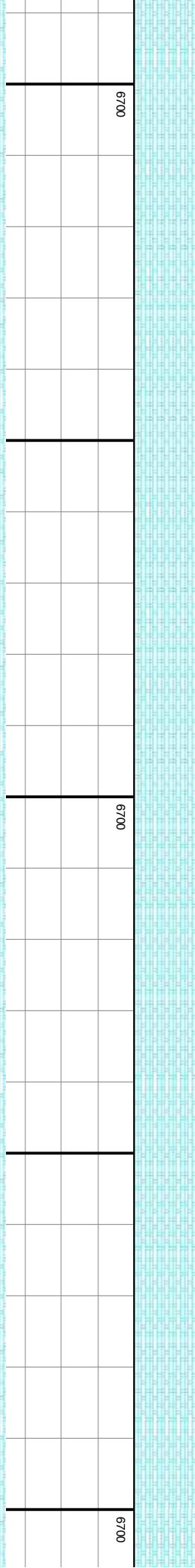
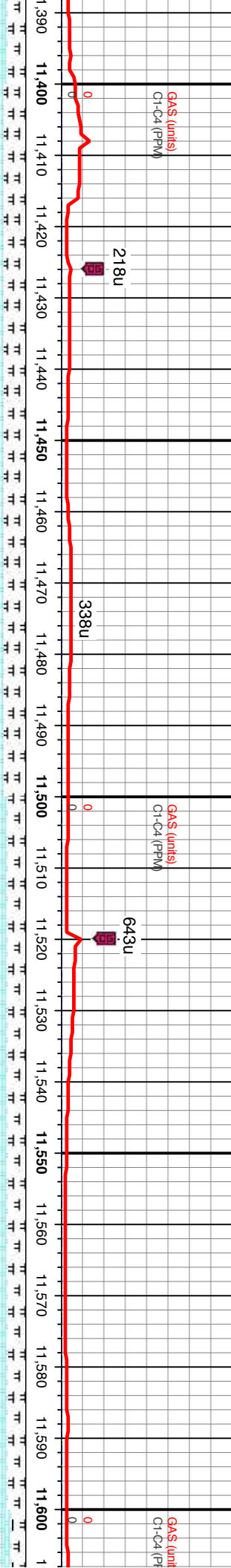
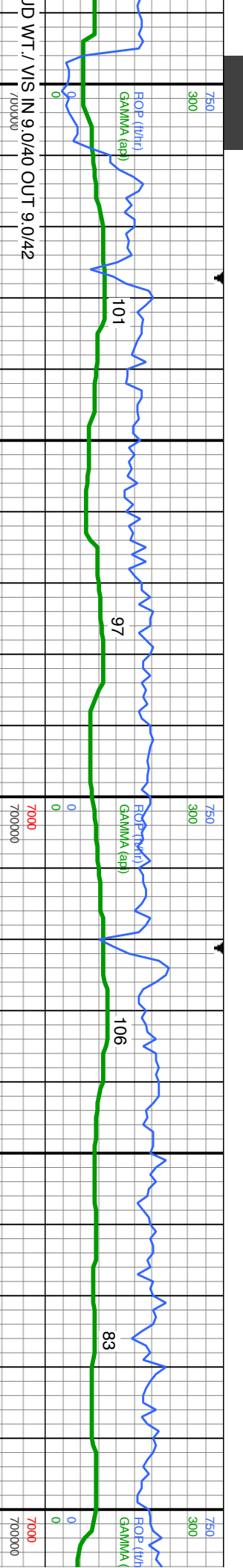
6700		6700	
5'		5'	
8.83 °		8.83 °	
.99 °		.99 °	
occ lt gy, sb blk-y-sb ply, rthy-wxy tex, mod sft-mod frm, v calc; 25% wh cal, mod frm, silty-gt tex, blk-y-sb blk-y, calc; scat fos frags; silw strn, n dull bl flr ring; no stn		50% CHK: dk gy gy, occ med gy, sb blk-y-sb ply, rthy-wxy tex, mod sft-mod frm, v calc; 50% MRLST: blk, mot wh cal, mod frm, silty-gt tex, blk-y-sb blk-y, calc; abnt scat fos frags, scat pyr frags; v silw strn, v fnt bl-whl, thn mod dull bl flr ring; no stn	
7700		7700	

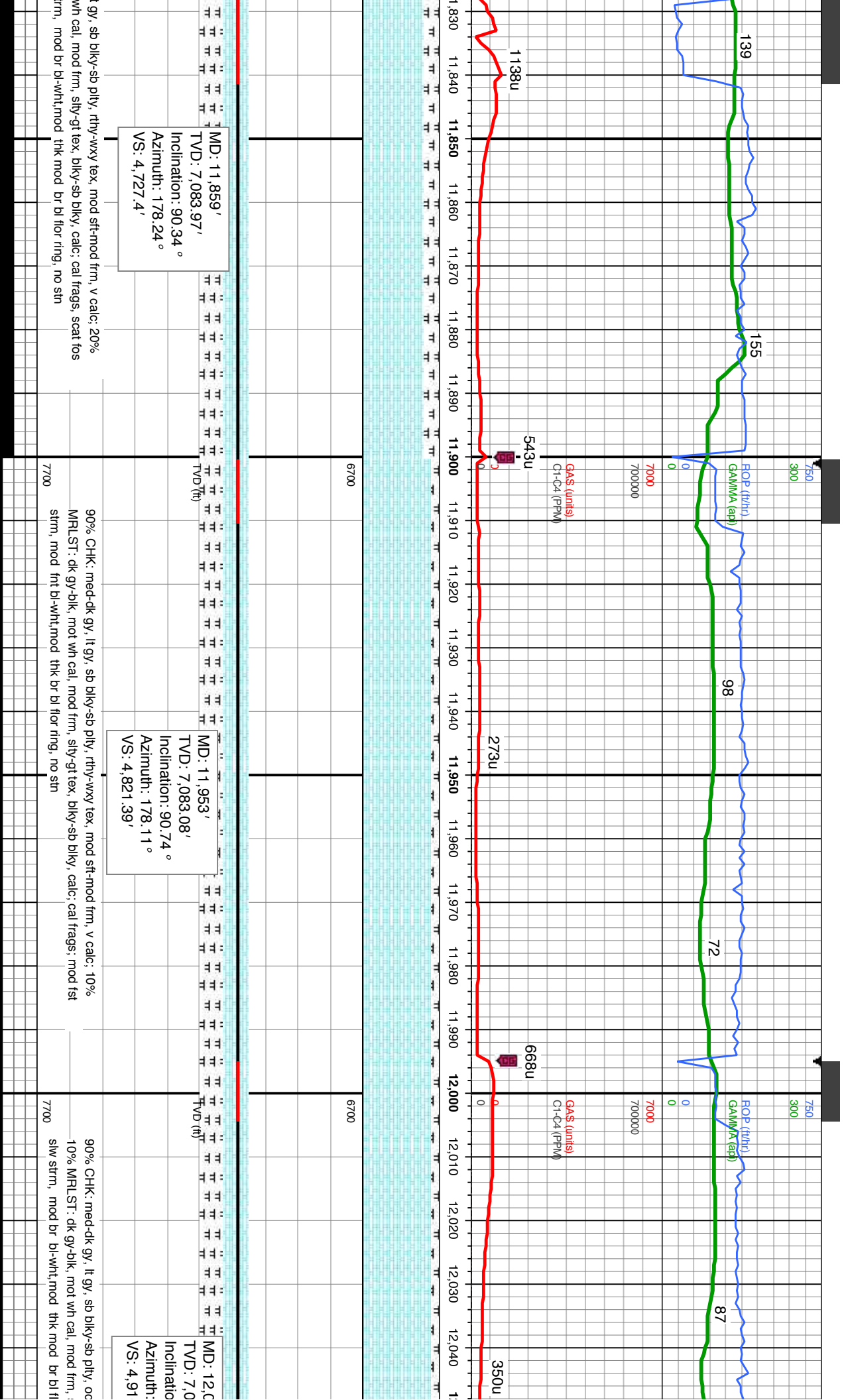
MD: 10,818'
TVD: 7,109.34'
Inclination: 89.72 °
Azimuth: 179.12 °
VS: 3,687.24'

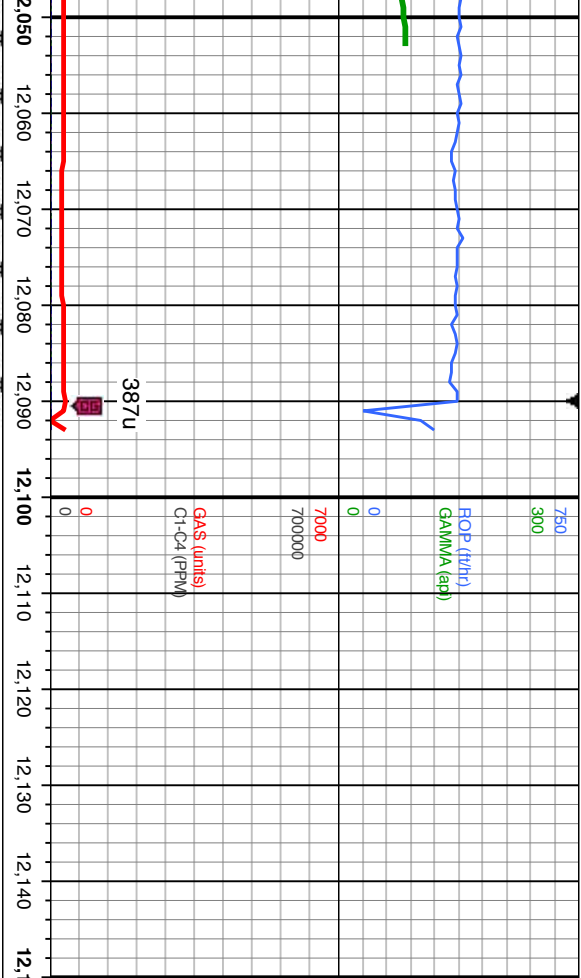
MD: 10,912'
TVD: 7,109.95'
Inclination: 89.54 °
Azimuth: 179.22 °
VS: 3,781.24'











6700

TD'd @ 12093' MD on
07/11/2014 at 19:53
HRS MST

Thank you for using
Columbine Logging, Inc.

PROJECTION TO BIT

MD: 12,093'
TVD: 7,080.44'
Inclination: 91.26°
Azimuth: 178.01°
VS: 4,961.36'

c blkly, rthy-wxy tex, mod sft-mod frm, v calc;
sl silty-gt tex, blkly-sb blkly, calc; occ cal frags;
or ring, no stn

7700

