

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Pappenheim 6-62-27-0108BH

Location SEC 27-T6N-R62W

State COLORADO

Country USA

API Number 05-123-37220

Region DENVER-JULESBURG BASIN

Spud Date 5/14/2013

Surface Coordinates 1302' FNL 205' FWL

Bottom Hole Coordinates NENE SEC 27-T6N-R62W
650' FNL 620' FEL

County WELD

Rig Number CADE 24

Field NE WATTENBERG

Drilling Completed 5/26/2013

Ground Elevation 4750

K. B. Elevation 4765

Logged Interval 4000 **To** 10918

Total Depth 10918

Formation NIOBRARA B2

Type of Drilling Fluid SPUD

Company BILL BARRETT
Address 1099 18th Street
Denver, CO 80

Name Jason Brand
Company Bill Barrett Corp
Address 1099 18th Street
Denver, CO 80

DATES LOGGED

UNKNOWN
ANHYDRITE
BENTONITE
BRECCIA
CHALK
CEMENT
CHERT
CLAY CHOKE SAND
CLAYSTONE

CC
TT

Operator

CORPORATION

202
t, Suite 2300

Geologist

oration
t, Suite 2300
202

Other

5/16/2013 - 5/26/2013

Rock Types

	METAMORPHIC		SHALY SILTSTONE
	NO SAMPLE		SILTY SHALE
	SALT		TILL
	SANDSTONE		TUFF
	SALT-PEPPER SANDSTONE		WELDED TUFF
	SHALE		
	SHALE COLORED		
	SHALE GRAY		
	MARLSTONE		
	SHALY SANDSTONE		

Accessories

	F FOSSIL		ARGILLACEOUS		GLAUCONITE		TUFFACEOUS
	GASTROPOD		ARGILLITE GRAIN		GYPSEIFEROUS		
	OOLITE		B BENTONITE		HEAVY MINERAL		
	OSTRACOD		BITUMENOUS SUBSTANCE		INOCERAMUS		
	PELECYPOD		BRECCIA FRAGMENTS		KAOLIN		
	BIOCLASTIC		CALCAREOUS		MARLSTONE		
	BRACHIOPOD		CARBONACEOUS FLAKES		MINERAL CRYSTALS		
	PISOLITE		CHTDK		NODULES		
	PLANT REMAINS		COAL - THIN BEDS		PHOSPHATE PELLETS		
	CEPHALOPOD		CHTLT		PYRITE		
	CORAL		DOLOMITIC		SALT CAST		
	CRINOID		FELDSPAR		SANDY		
	ECHINOID						
	FISH						
	FORAMINIFERA		ANHYDRITIC		FERRUGINOUS PELLETS		SILTACEOUS
			FERRUGINOUS		SILTY		
							SILTSTONE STRINGER

Other Symbols

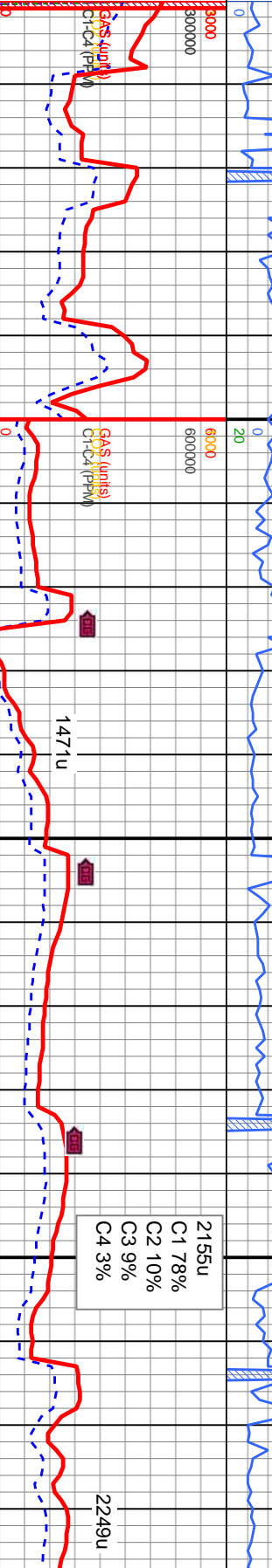
	MOLDIC		FAULT		WIRELINE TESTED - LEFT		E EARTHY
	ORGANIC		FORMATION TOP		WIRELINE TESTED - RT		FX FINELY SILTY
	PINPOINT		GAS SHOW		GRAINSTONE		L LITHOGRAPHIC
	VUGGY		MINERAL DEPTH				
	QUESTIONABLE						
	SPOTTED STAINING						
	Engineering		NORMAL FAULT		ANGULAR		MX MICROXLN
	BIT		OIL SHOW		R ROUNDED		MS MUDSTONE
	CONNECTION (LEFT)		OVERTURNED STRATA		SUBANG		PS PACKSTONE
	CONNECTION (RIGHT)		REVERSE FAULT		SUBRND		WS WACKESTONE
	CONNECTION GAS		SIDEWALL CORE (LEFT)				
	FENESTRAL		SIDEWALL CORE (RIGHT)				
	FRACTURE		SLIDE		BOUNDSTONE		M MODERATE
	INTERCRYSTALLINE		SURVEY		CHALKY		P POOR
	INTEROOLITIC		TRIP GAS		CRYPTOXLN		W WELL

COLUMBINE LOGGING INC.
 RIGGED UP ON 5/16/13
 MANNED 2-PERSON LOGGING
 WITH BLOODHOUND GAS
 CHROMATOGRAPH UNIT #0550

IN WT 10.0 VIS 41/OUT WT 10.0+ VIS 50

IN WT 10.0 VIS 41/OUT WT 10.0+ VIS 50

- ROP —
- ROF —
- GAMMA —

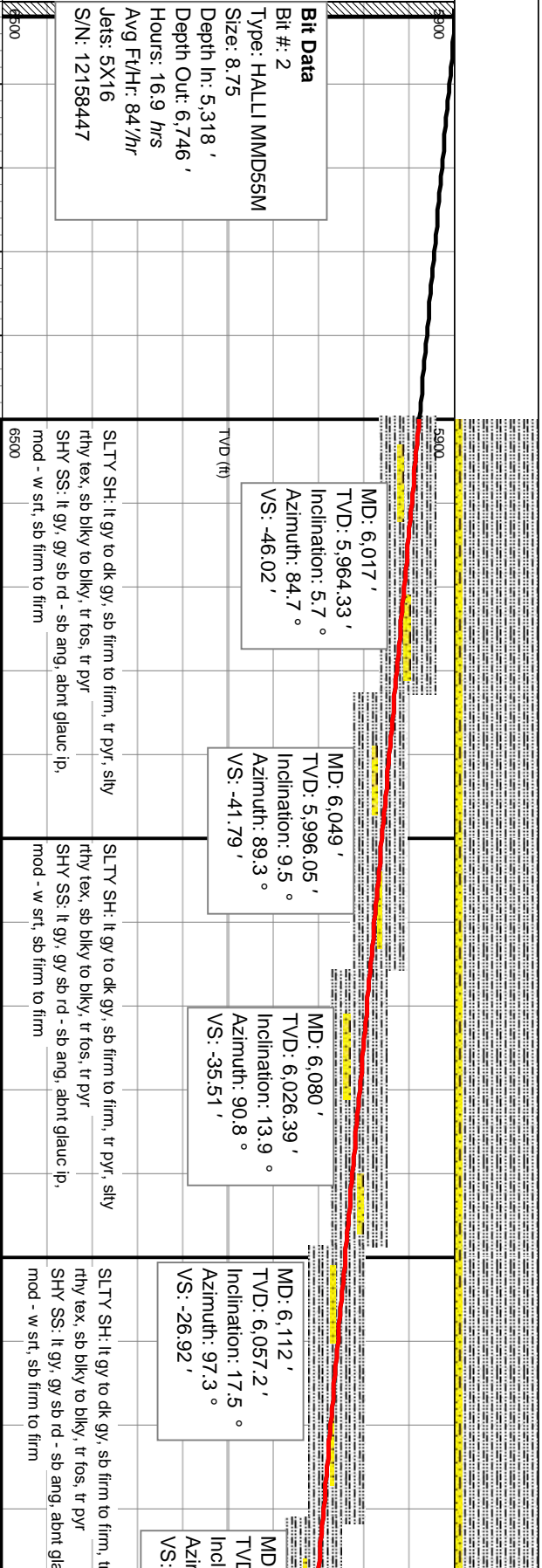


Total Gas & Chromatograph

- GAS —
- C1 —
- C2 —
- C3 —
- C4 —
- CO2 —

Depth Labels

% Lith



Well Bore

TVD —

Bit #: 2
 Type: HALLI MMD55M
 Size: 8.75
 Depth In: 5,318 '
 Depth Out: 6,746 '
 Hours: 16.9 hrs
 Avg Ft/Hr: 84'/hr
 Jets: 5X16
 S/N: 12158447

Bit Data

MD: 6,017 '
 TVD: 5,964.33 '
 Inclination: 5.7 °
 Azimuth: 84.7 °
 VS: -46.02 '

MD: 6,049 '
 TVD: 5,996.05 '
 Inclination: 9.5 °
 Azimuth: 89.3 °
 VS: -41.79 '

MD: 6,080 '
 TVD: 6,026.39 '
 Inclination: 13.9 °
 Azimuth: 90.8 °
 VS: -35.51 '

MD: 6,112 '
 TVD: 6,057.2 '
 Inclination: 17.5 °
 Azimuth: 97.3 °
 VS: -26.92 '

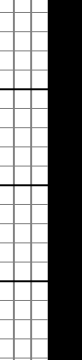
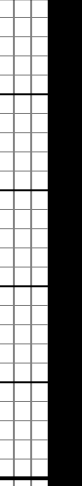
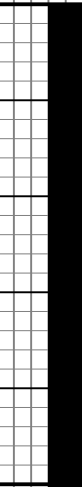
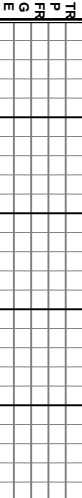
MD:
 TVD:
 Incln:
 Azim:
 VS:

SLTY SH: It gy to dk gy, sb firm to firm, tr pyr, silty
 rthy tex, sb blkly to blkly, tr fos, tr pyr
 SHY SS: It gy, gy sb rd - sb ang, abnt glauc ip,
 mod - w srt, sb firm to firm

SLTY SH: It gy to dk gy, sb firm to firm, tr pyr, silty
 rthy tex, sb blkly to blkly, tr fos, tr pyr
 SHY SS: It gy, gy sb rd - sb ang, abnt glauc ip,
 mod - w srt, sb firm to firm

SLTY SH: It gy to dk gy, sb firm to firm, tr
 rthy tex, sb blkly to blkly, tr fos, tr pyr
 SHY SS: It gy, gy sb rd - sb ang, abnt glauc
 mod - w srt, sb firm to firm

Oil Show



Images

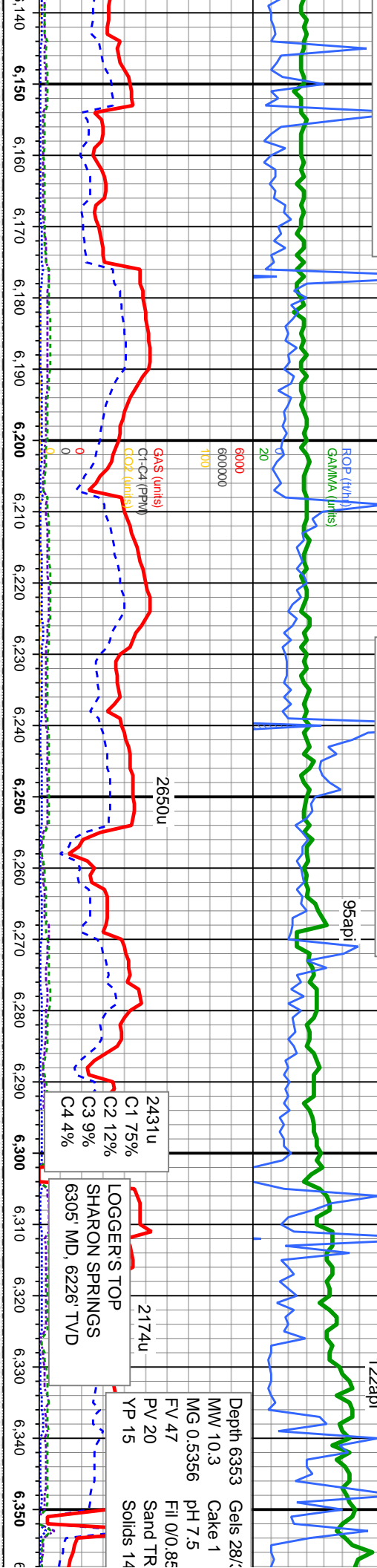


10.0+ VIS 42/OUT WT 10.1 VIS 45

IN WT 10.1 VIS 41/OUT WT 10.1 VIS 44

122api

5/19/20



6,143' MD: 6,143' TVD: 6,086.55' Inclination: 20.0° Azimuth: 103.9° VS: -17.21'

MD: 6,175' TVD: 6,116.47' Inclination: 21.6° Azimuth: 99.3° VS: -6.17'

MD: 6,206' TVD: 6,144.83' Inclination: 26.0° Azimuth: 94.5° VS: 6.19'

MD: 6,238' TVD: 6,172.87' Inclination: 31.5° Azimuth: 92.9° VS: 21.5'

MD: 6,269' TVD: 6,198.52' Inclination: 36.8° Azimuth: 92.0° VS: 38.85'

MD: 6,305' TVD: 6,226.37' Inclination: 41.8° Azimuth: 90.4° VS: 61.61'

MD: 6,336' TVD: 6,249.08' Inclination: 44.0° Azimuth: 88.5° VS: 82.7'

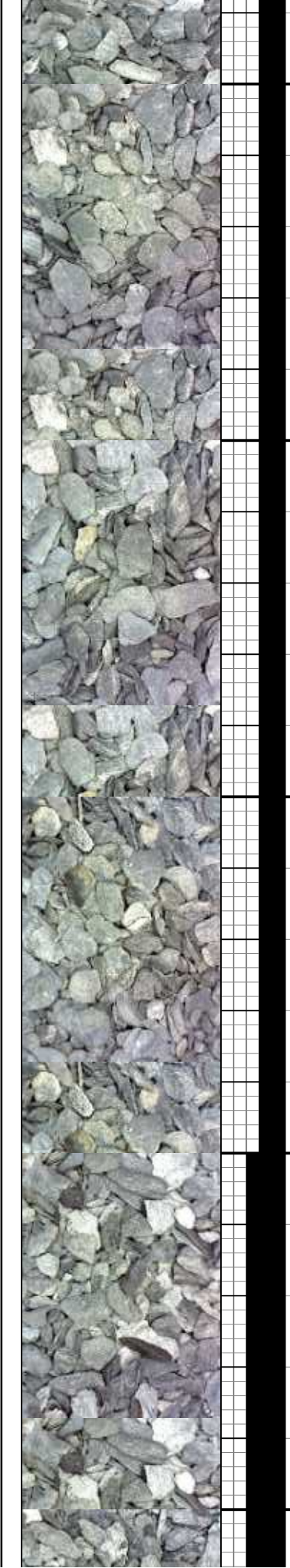
SLTY SH: lt gy to dk gy, sb firm to firm, tr pyr, silty
rthy tex, sb blkly to blkly, tr fos, tr pyr
SHY SS: lt gy, gy sb rd - sb ang, abnt glauc ip,
mod - w srt, sb firm to firm

SLTY SH: lt gy to dk gy, sb firm to firm, tr pyr, silty
rthy tex, sb blkly to blkly, tr fos, tr pyr
SHY SS: lt gy, gy sb rd - sb ang, abnt glauc ip,
mod - w srt, sb firm to firm

SLTY SH: lt gy to dk gy, sb firm to firm, tr pyr, silty
rthy tex, sb blkly to blkly, tr fos, tr pyr
SHY SS: lt gy, gy sb rd - sb ang, abnt glauc ip,
mod - w srt, sb firm to firm

SLTY SH: lt gy to dk gy, sb firm to firm, tr pyr, silty
rthy tex, sb blkly to blkly, tr fos, tr pyr
SHY SS: lt gy, gy sb rd - sb ang, abnt glauc ip,
mod - w srt, sb firm to firm

SLTY p-moc
CHK: sbply



IN WT 10.2+ VIS 52/OUT WT 10.1 VIS 61

201api

92api

IN WT 10.3 VIS 43/OUT WT 9.6 VIS 51

118api

201api

92api

Water 84
Oil 0
Hard 40
MBT 50
Ch 300
LCM 0

LOGGERS TOP
NIOBRARA
6389' MD, 6287' TVD

C1 72%
C2 13%
C3 10%
C4 4%

LOGGERS TOP
NIOBRARA B2
6527' MD, 6373' TVD

Depth 6765
IMW 9.35
MG 0.4862
FV 31
PV 8
YP 2
Gels 3/1
Cake 1
pH 10.5
Fill 0.2/1
Sand TR
Solids 7

6360 6370 6380 6390 6400 6410 6420 6430 6440 6450 6460 6470 6480 6490 6500 6510 6520 6530 6540 6550 6560 6570

MD: 6,367'
TVD: 6,271.34'
Inclination: 44.2°
Azimuth: 88.4°
VS: 104.27'

MD: 6,399'
TVD: 6,293.85'
Inclination: 46.4°
Azimuth: 89.5°
VS: 127.02'

MD: 6,430'
TVD: 6,314.91'
Inclination: 48°
Azimuth: 91.8°
VS: 149.73'

MD: 6,462'
TVD: 6,335.86'
Inclination: 50.2°
Azimuth: 91.3°
VS: 173.88'

MD: 6,493'
TVD: 6,354.69'
Inclination: 55°
Azimuth: 92.5°
VS: 198.44'

MD: 6,525'
TVD: 6,371.8'
Inclination: 60.3°
Azimuth: 94.7°
VS: 225.34'

MD: 6,556'
TVD: 6,386.11'
Inclination: 64.7°
Azimuth: 96.2°
VS: 252.6'

CHK: It-med gy, sme brn-red, lam, mot, vsft-sft, sbply-dlky, v calc, cpxl, intbd w/rnl, v tr bent, MRL: It-dk gy, stri, sft-v sft, sbply-ply, fr- brit, sil, vf grn, rr vf dism pyr

CHK: It-med gy, sme brn-red, lam, mot, vsft-sft, sbply-dlky, v calc, cpxl, intbd w/rnl, v tr bent, MRL: It-dk gy, stri, sft-v sft, sbply-ply, fr- brit, sil, vf grn

CHK: It-med gy, sme brn-red, lam, mot, vsft-sft, sbply-dlky, v calc, cpxl, intbd w/rnl, v tr bent, MRL: It-dk gy, stri, sft-v sft, sbply-ply, fr- brit, sil, vf grn

CHK: It-med gy, sme brn-red, sbply-dlky, v calc, cpxl, intbd bent, tr tos MRL: It-dk gy, stri, sft-v sft, sbply-ply, fr- brit, sil, vf grn

Sht: dk gy- blk, sme brn-gy, sft-mod sft, ind, fri-brit, fis, sme sl band, sbply-ply It-med gy, sme brn-red, lam, mot, vsft-sft, blk, v calc, cpxl, intbd w/rnl, v tr bent

6500



IN WT 10.2 VIS 44/OUT WT 9.9 VIS 51

IN WT 10.2 VIS 48/OUT WT 10.1 VIS 58

5/20/2013
5/21/2013

MINDEPTH

ROI (ft/hr)
GAMMA (um79api)

1.5api

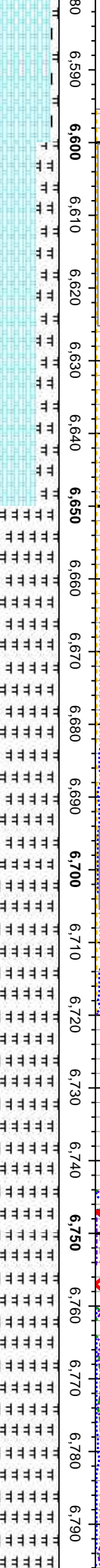
97api

Water 93
Oil 0
Hard 120
MBT 35
Ch 300
LCM 0

LOGGERS TOP
BASE NIOBRARA B2
6600 MD, 6404' TVD

3609u
C1 74%
C2 13%
C3 10%
C4 3%

2061u



5CHK: lt-med gy, sme brn-red, lam, mot, vsft-sft, sbply-dlky, v calc, cpxl, intbd w/mrl, v tr bent, tr fos
MRL: lt-dk gy, stri, sft-v sft, sbply-ply, fri- brit, sil, v/ grn, abnt fos

CHK: lt-med gy, sme brn-red, lam, mot, vsft-sft, sbply-dlky, v calc, cpxl, intbd w/mrl, v tr bent, tr fos
MRL: lt-dk gy, stri, sft-v sft, sbply-ply, fri- brit, sil, v/ grn, abnt fos

CHK: lt-med gy, sme brn-red, lam, mot, vsft-sft, sbply-dlky, v calc, cpxl, intbd w/mrl, v tr bent, tr fos
MRL: lt-dk gy, stri, sft-v sft, sbply-ply, fri- brit, sil, v/ grn, abnt fos

MRL: lt-dk gy, stri, sft-v sft, sbply-ply, fri- brit, sil, v/ grn, abnt fos
CHK: lt-med gy, sme brn-red, lam, mot, vsft-sft, sbply-dlky, v calc, cpxl, intbd w/mrl, v tr bent, tr fos

MD: 6,588 '
TVD: 6,399.15 '
Inclination: 67.2 °
Azimuth: 96.4 °
VS: 281.52 '

MD: 6,619 '
TVD: 6,410.41 '
Inclination: 70.2 °
Azimuth: 96.5 °
VS: 310.1 '

MD: 6,651 '
TVD: 6,420.01 '
Inclination: 74.9 °
Azimuth: 97.7 °
VS: 340.24 '

MD: 6,682 '
TVD: 6,427.03 '
Inclination: 78.9 °
Azimuth: 97.7 °
VS: 370 '

Bit Data
Bit #: 4
Type: HALIBURTON FXD54
Size: 6.12
Depth In: 6.745 '
Depth Out: 9.614 '
Hours: 25.4 hrs
Avg Ft/Hr: 113'/hr
Jets: 5X16
S/N: 12066928

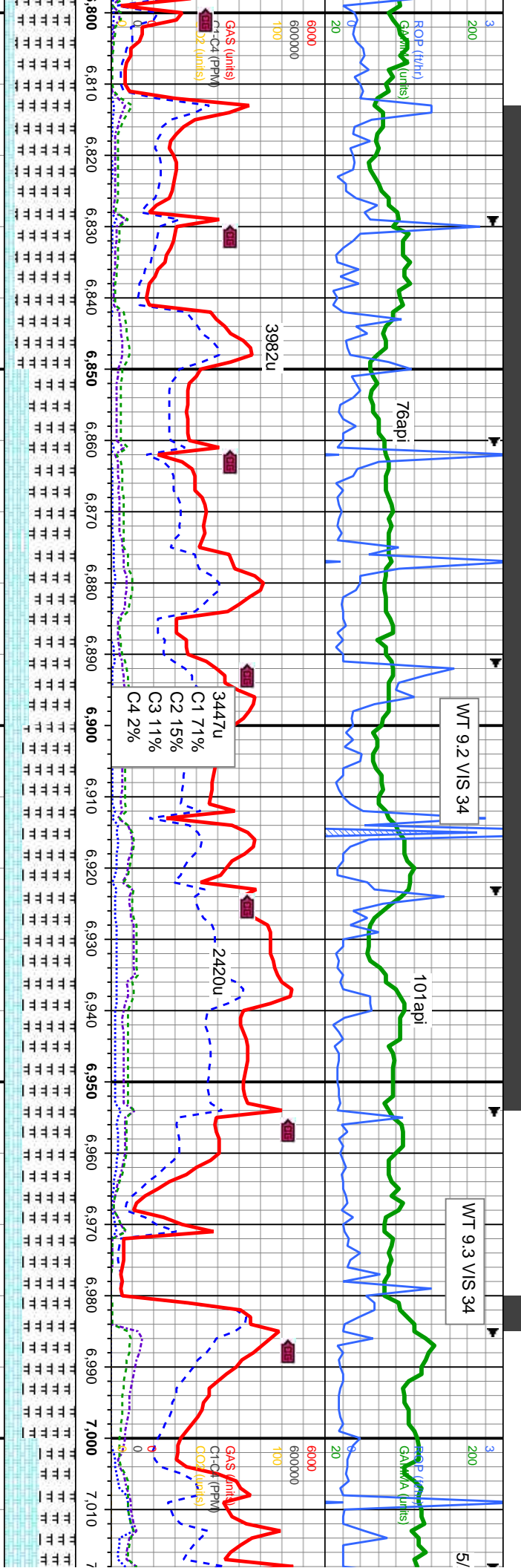
SCALE CHANGE
1 White Block On
TVD Scale = 10'

MD: 6,763 '
TVD: 6,438.37 '
Inclination: 85 °
Azimuth: 97.4 °
VS: 449.08 '

6500

6450





63' MR.L: lt-dk gy, stri, sft-v-sft, sbply-pily, fri- brt, sil, vf grn, abnt fos
 CHK: lt-med gy, sme brn-red, lam, mot, vsft-sft, sbply-dily, v calc, crpxl, intbd w/mrl, v tr bent, tr fos

MR.L: lt-dk gy, stri, sft-v-sft, sbply-pily, fri- brt, sil, vf grn, abnt fos
 CHK: lt-med gy, sme brn-red, lam, mot, vsft-sft, sbply-dily, v calc, crpxl, intbd w/mrl, v tr bent, tr fos

MR.L: lt-dk gy, stri, sft-v-sft, sbply-pily, fri- brt, sil, vf grn, abnt fos
 CHK: lt-med gy, sme brn-red, lam, mot, vsft-sft, sbply-dily, v calc, crpxl, intbd w/mrl, v tr bent, tr fos

MR.L: lt-dk gy, stri, sft-v-sft, sbply-pily, fri- brt, sil, vf grn, abnt fos
 CHK: lt-med gy, sme brn-red, lam, mot, vsft-sft, sbply-dily, v calc, crpxl, intbd w/mrl, v tr bent, tr fos

6' MR.L: lt-dk gy, stri, sil, vf grn, abnt fos
 CHK: lt-med gy, str sbply-dily, v calc, bent, tr fos

MD: 6,826' TVD: 6,444' Inclination: 85.3° Azimuth: 96.6° VS: 511.03'

MD: 6,857' TVD: 6,446.05' Inclination: 87.1° Azimuth: 97.1° VS: 541.6'

MD: 6,880' TVD: 6,446.47' Inclination: 90.8° Azimuth: 94.5° VS: 564.39'

MD: 6,920' TVD: 6,444.72' Inclination: 96° Azimuth: 92.4° VS: 604.1'

MD: 7,014' TVD: 6,430.5' Inclination: 100° Azimuth: 92.1° VS: 696.75'

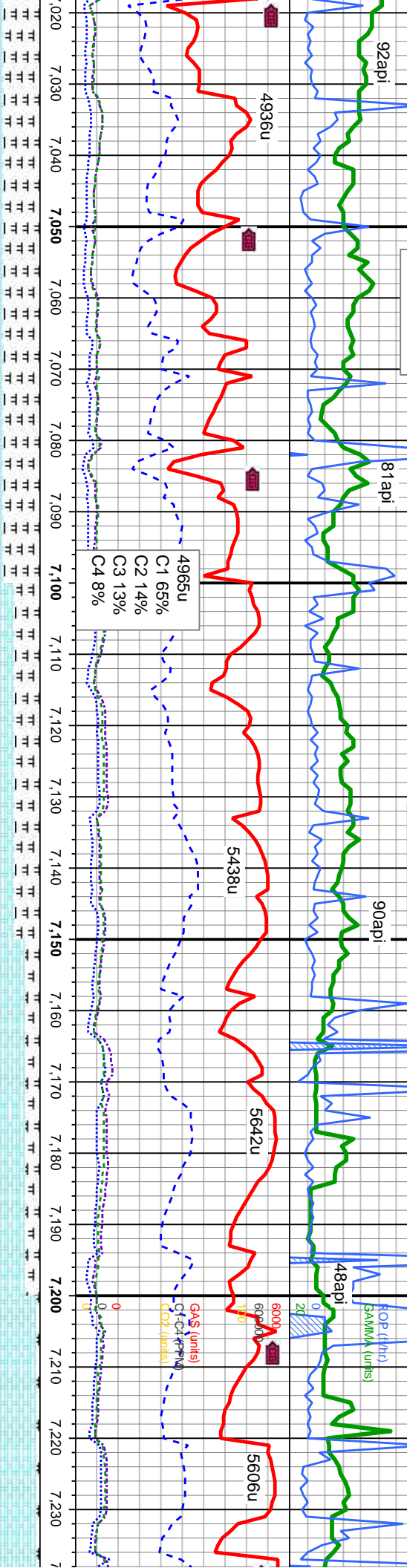


DEPTH
22/2013

WT 9.3 VIS 34

WT 9.3 VIS 35

WT 9.3+ VIS 35



MRL: lt-dk gy, stri, sft-v sft, sbply-ply, fri- brt, sil, vf grn, abnt fos
CHK: lt-med gy, sme brn-red, lam, mot, vsft-sft, sbply-dlky, v calc, cpxl, intbd w/mrl, v tr bent, tr fos

CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb ply-dlky, v calc, intbd w/marl, v tr bent, abnt fos
MARL: lt-dk gy, stri, sft-v sft, sb ply-ply, fri- brt, sil, vf grn, abnt fos

CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb ply-dlky, v calc, intbd w/marl, v tr bent, abnt fos
MARL: lt-dk gy, stri, sft-v sft, sb ply-ply, fri- brt, sil, vf grn, abnt fos

CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb ply-dlky, v calc, intbd w/marl, v bent, abnt fos
MARL: lt-dk gy, stri, sft-v sft, sb ply-ply, fri- brt, sil, vf grn, abnt fos

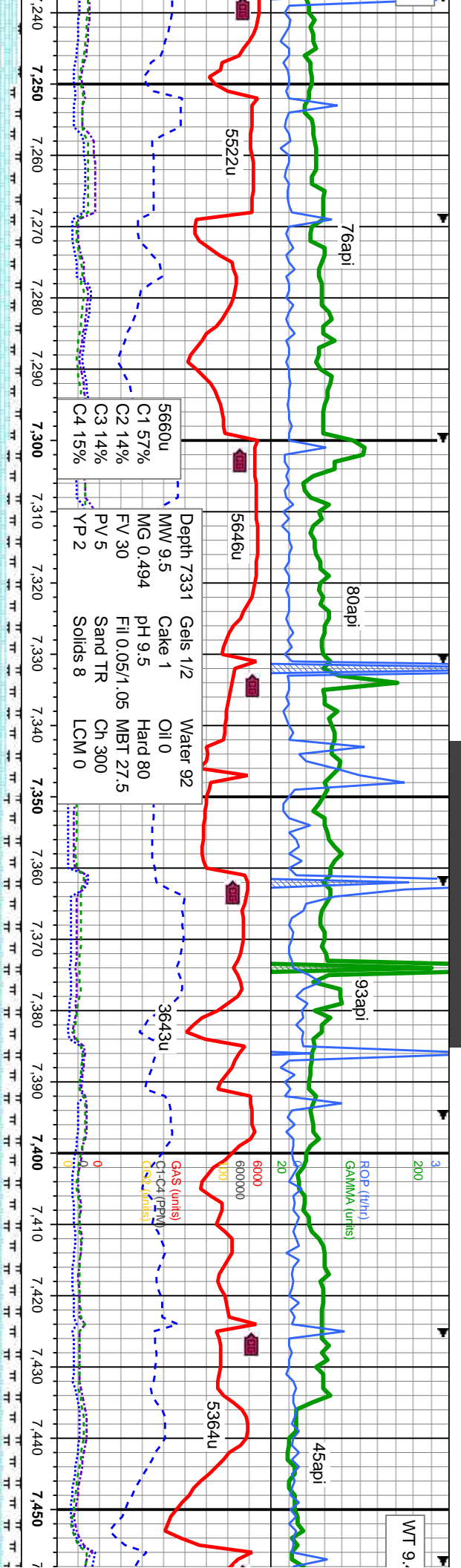
MD: 7.077 '
TVD: 6,419.84 '
Inclination: 98.1 °
Azimuth: 90.1 °
VS: 758.74 '

MD: 7.171 '
TVD: 6,409.2 '
Inclination: 94.9 °
Azimuth: 86.7 °
VS: 852.11 '

6450



WT 9.



CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-blky, v calc. Intbd w/marl, v tr bent, abnt fos
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pty, fri- brit, sil, v/ grn, abnt fos

CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-blky, v calc. Intbd w/marl, v tr bent, abnt fos
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pty, fri- brit, sil, v/ grn, abnt fos

CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-blky, v calc. Intbd w/marl, v tr bent, abnt fos
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pty, fri- brit, sil, v/ grn, abnt fos

6CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-blky, v calc. Intbd w/marl, v tr bent, abnt fos
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pty, fri- brit, sil, v/ grn, abnt fos

CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-blky, v calc. Intbd w/marl, v tr bent, abnt fos
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pty, fri- brit, sil, v/ grn, abnt fos

MD: 7,265 '
 TVD: 6,405.59 '
 Inclination: 89.5 °
 Azimuth: 84.4 °
 VS: 945.9'

MD: 7,360 '
 TVD: 6,404.26 '
 Inclination: 92.1 °
 Azimuth: 86.9 °
 VS: 1,040.79'

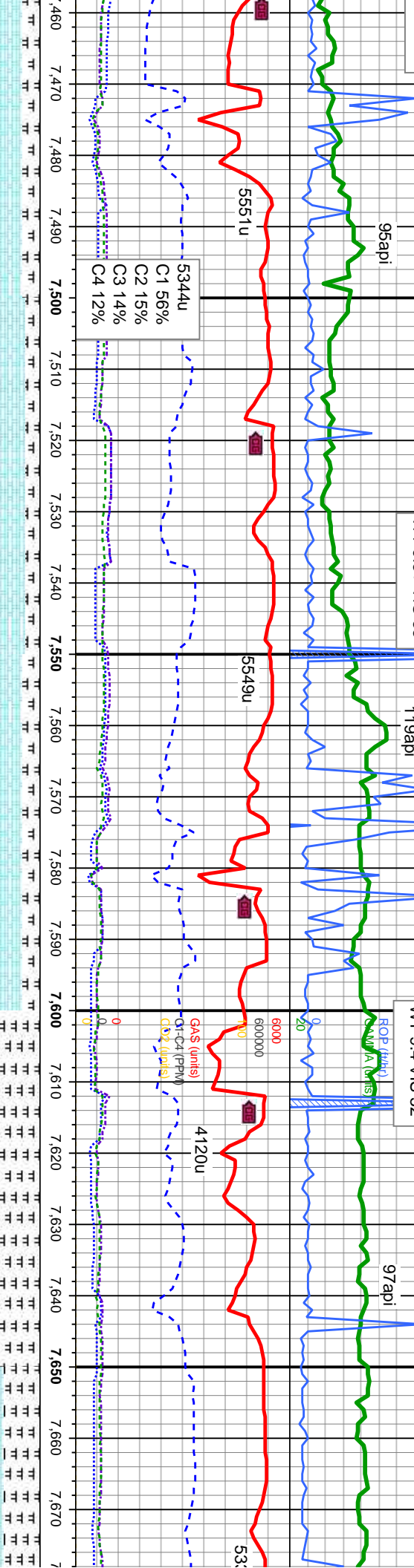
MD: 7,454 '
 TVD: 6,398.8 '
 Inclination: 88.5 °
 Azimuth: 88.5 °
 VS: 1,134.6'



4 VIS 34

WT 9.3+ VIS 33

WT 9.4 VIS 32



med gy, some brn-red, lam, mot, v
 b ply-blky, v calc, intbd w/marl, v tr
 nt fos

CHK: lt-med gy, some brn-red, lam, mot, v
 sft-sft, sb ply-blky, v calc, intbd w/marl, v tr
 bent, abnt fos

MARL: lt-dk gy, stri, sft-v sft, sb ply-ply, fri- brit,
 n, abnt fos

CHK: lt-med gy, some brn-red, lam, mot, v
 sft-sft, sb ply-blky, v calc, intbd w/marl, v tr
 bent, abnt fos

MARL: lt-dk gy, stri, sft-v sft, sb ply-ply, fri- brit,
 sil, v/ grn, abnt fos

6350
 MARL: lt-dk gy, stri, sft-v sft, sb ply-ply, fri- brit,
 sil, v/ grn

CHK: lt-med gy, some brn-red, lam, mot, v
 sft-sft, sb ply-blky, v calc, intbd w/marl, v tr
 bent

MARL: lt-dk gy, stri, sft-v sft, sb ply-ply, fri- brit,
 sil, v/ grn

CHK: lt-med gy, some brn-red, lam, mot, v
 sft-sft, sb ply-blky, v calc, intbd w/marl, v tr
 bent

444'	7.548'	MD: 7.548'	6450	MD: 7.643'
55° 7'	6.391.72'	TVD: 6.391.72'		TVD: 6.389.07'
	Inclination: 93.2°	Inclination: 93.2°		Inclination: 90°
	Azimuth: 88.1°	Azimuth: 88.1°		Azimuth: 88.2°
	VS: 1,228.35'	VS: 1,228.35'		VS: 1,323.3'



WT 9.3+ VIS 32

106api

RCE (ft/hr)
GAM (ppm)
GAS (units)C1 (ppm)
C2 (ppm)
C3 (ppm)
C4 (ppm)

118api

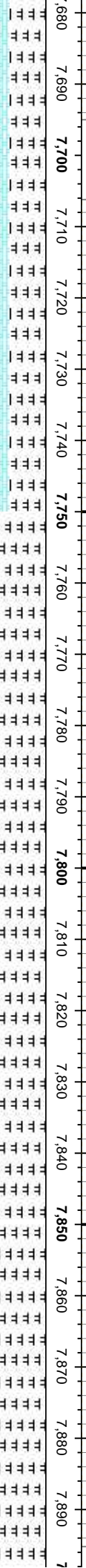
5391u

5344u

8u

4467u
C1 49%
C2 16%
C3 19%
C4 16%

55
C1
C2
C3
C4



sil, vf grn	MARL: lt-dk gy, stri, sft-v sft, sb pty-pty, fri- brit,	sil, vf grn	MARL: lt-dk gy, stri, sft-v sft, sb pty-pty, fri- brit,	sil, vf grn	MARL: lt-dk gy, stri, sft-v sft, sb pty-pty, fri- brit,	sil, vf grn	MARL: lt-dk gy, stri, sft-v sft, sb pty-pty, fri- brit,
sft-sft, sb pty-bly, v calc, intbd w/marl, v tr bent		sft-sft, sb pty-bly, v calc, intbd w/marl, v tr bent		sft-sft, sb pty-bly, v calc, intbd w/marl, v tr bent		sft-sft, sb pty-bly, v calc, intbd w/marl, v tr bent	

MD: 7,737 '
TVD: 6,388.25 '
Inclination: 91.0 °
Azimuth: 87.5 °
VS: 1,417.29 '

MD: 7,831 '
TVD: 6,387.59 '
Inclination: 89.8 °
Azimuth: 85.8 °
VS: 1,511.26 '

6460

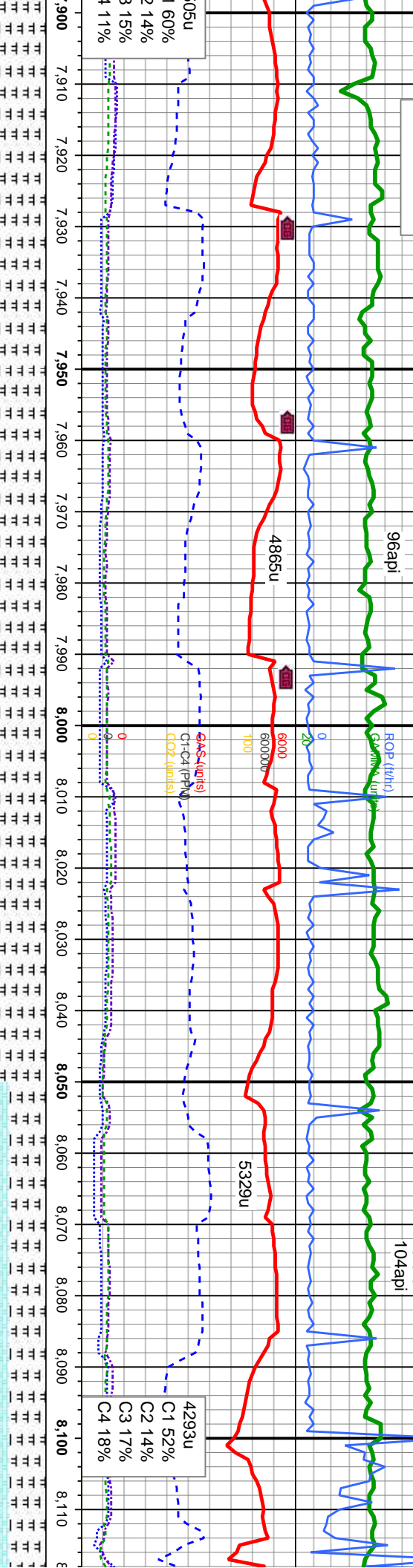
TVD (ft)



WT 9.4+ VIS 32

96api

104api



MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, vf grn
 CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-diky, v calc, intbd w/marl, v tr bent

MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, vf grn
 CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-diky, v calc, intbd w/marl, v tr bent

63MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, vf grn
 CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-diky, v calc, intbd w/marl, v tr bent

MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, vf grn
 CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-diky, v calc, intbd w/marl, v tr bent

MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, vf grn
 CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-diky, v calc, intbd w/marl, v tr bent

MD: 7,926 '
 TVD: 6,387.43 '
 Inclination: 90.4 °
 Azimuth: 88.4 °
 VS: 1,606.23 '

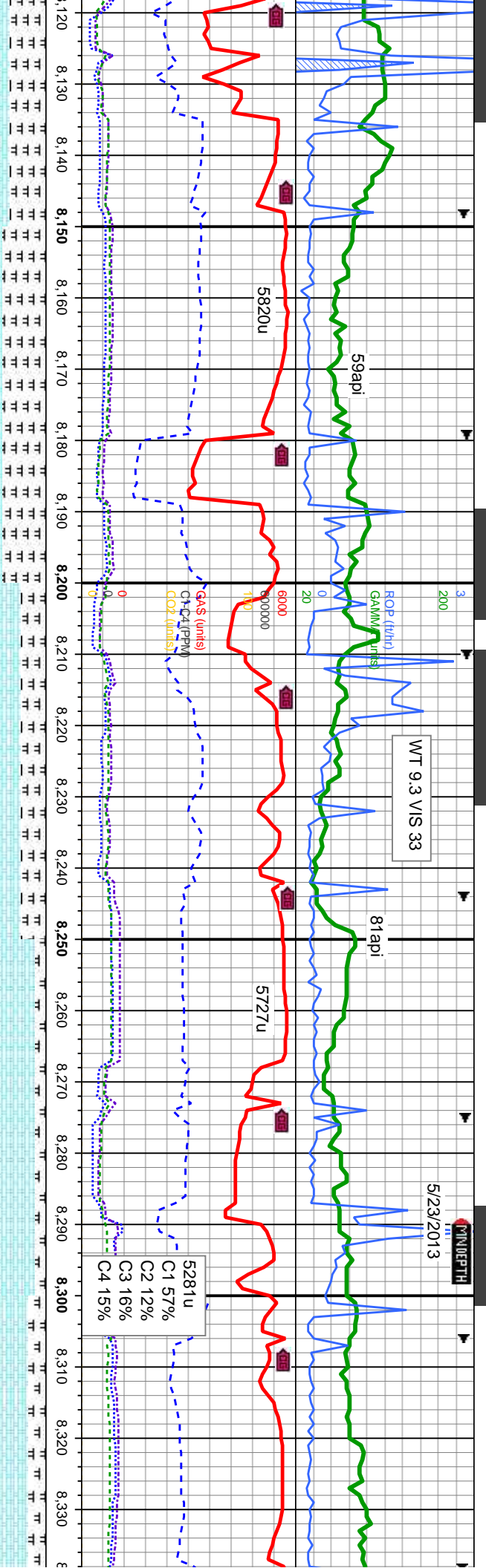
MD: 8,020 '
 TVD: 6,387.02 '
 Inclination: 90.1 °
 Azimuth: 91.7 °
 VS: 1,700.17 '

MD: 8,115 '
 TVD: 6,386.5 '
 Inclination: 91.1 °
 Azimuth: 91.1 °
 VS: 1,794.97 '

6460

TVD (ft)





MD: 8,303 '
 TVD: 6,397.02 '
 Inclination: 86.7 °
 Azimuth: 87 °
 VS: 1,982.57 '

63^{sec}
 CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-blky, v calc, intbd w/marl, v bent
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pty, fri- brit, sil, vf grn

MARL: lt-dk gy, stri, sft-v sft, sb pily-pty, fri- brit, sil, vf grn
 CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-blky, v calc, intbd w/marl, v bent

CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-blky, v calc, intbd w/marl, bent
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pty, fri- brit, sil, vf grn

CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-blky, v calc, intbd w/marl, v bent
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pty, fri- brit, sil, vf grn

MD: 8,209 '
 TVD: 6,390.62 '
 Inclination: 85.5 °
 Azimuth: 88.9 °
 VS: 1,888.79 '

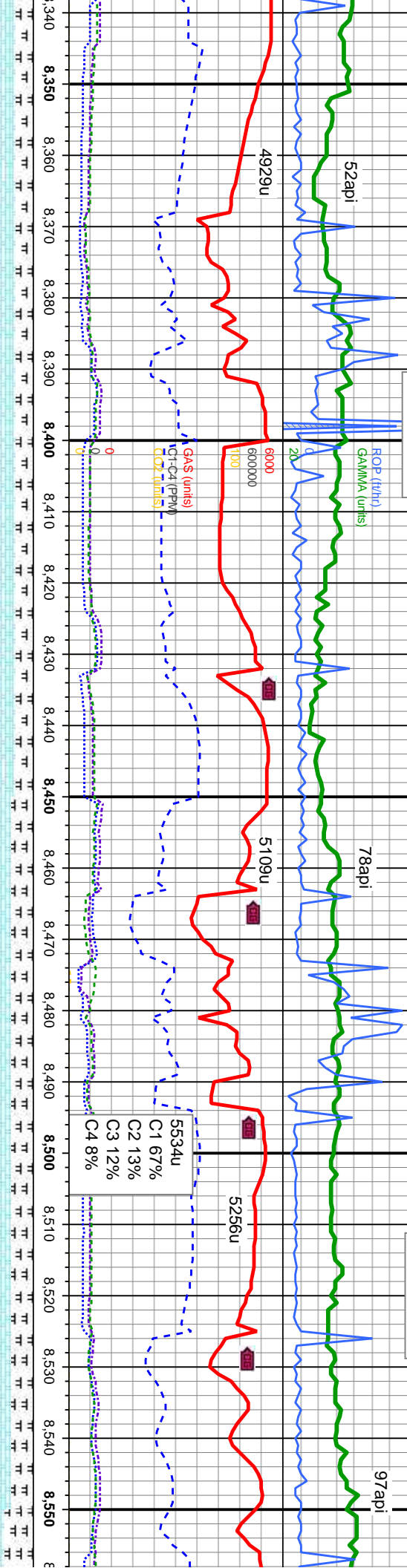
MARL: lt-dk gy, stri, sft-v sft, sb pily-pty, fri- brit, sil, vf grn
 CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-blky, v calc, intbd w/marl, v bent



8 °
 0 °
 33 '

WT 9.2 VIS 34

WT 9.3 VIS 31



MD: 8,397 '
 TVD: 6,400.71 '
 Inclination: 88.8 °
 Azimuth: 86.1 °
 VS: 2,076.46 '

MD: 8,491 '
 TVD: 6,401.28 '
 Inclination: 90.5 °
 Azimuth: 85.4 °
 VS: 2,170.37 '

5534u
 C1 67%
 C2 13%
 C3 12%
 C4 8%

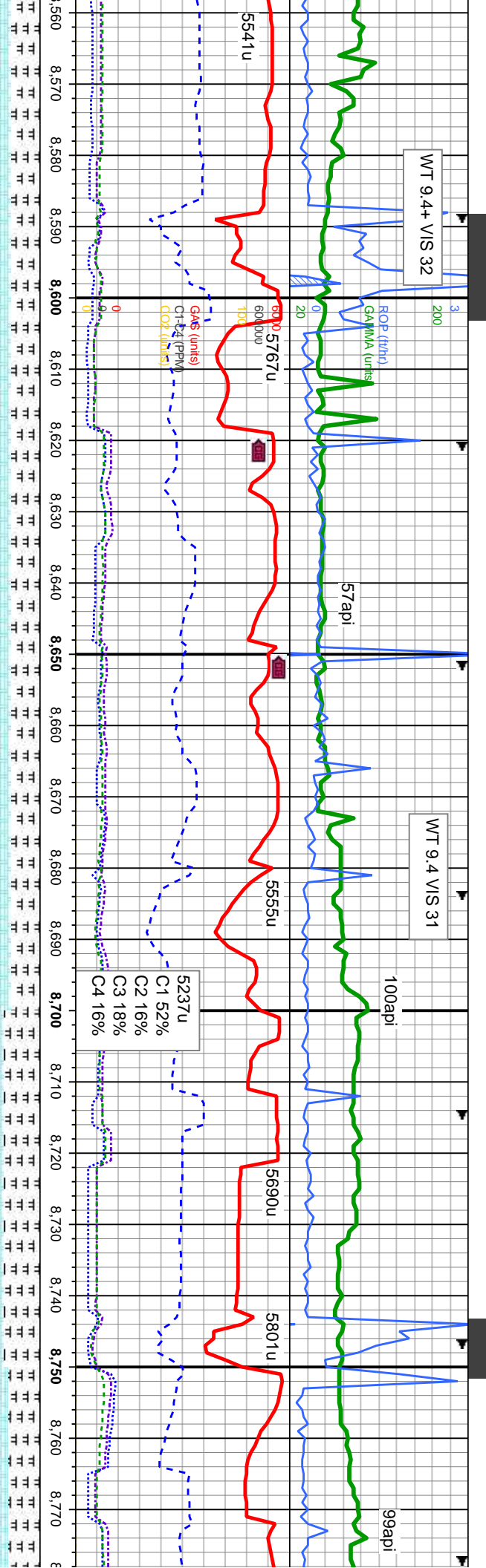
CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-biky, v calc, intbd w/marl, v tr bent
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, vt grn

CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-biky, v calc, intbd w/marl, v tr bent
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, vt grn

CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-biky, v calc, intbd w/marl, v tr bent
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, vt grn

CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-biky, v calc, intbd w/marl, v tr bent
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, vt grn





WT 9.4+ VIS 32

WT 9.4 VIS 31

MD: 8,586 '
 TVD: 6,401.53 '
 Inclination: 89.2 °
 Azimuth: 84.2 °
 VS: 2,265.21 '

MD: 8,680 '
 TVD: 6,401.2 '
 Inclination: 91.2 °
 Azimuth: 82.9 °
 VS: 2,358.9 '

MD: 8,775 '
 TVD: 6,400 '
 Inclination: 89.2 °
 Azimuth: 84.2 °
 VS: 2,453.3 '

CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-biky, v calc, intbd w/marl, v tr bent
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, vf grn, tr fos

CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-biky, v calc, intbd w/marl, v tr bent
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, vf grn, tr fos

CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-biky, v calc, intbd w/marl, v tr bent
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, vf grn, tr fos

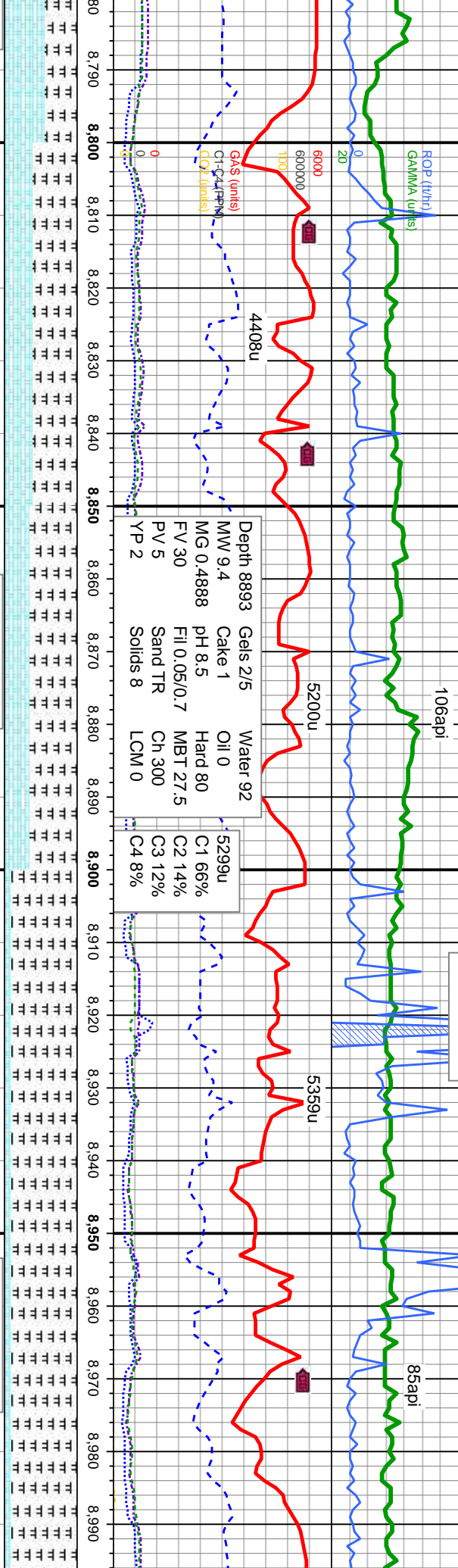
CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-biky, v calc, intbd w/marl, v tr bent
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, vf grn, tr fos



WT 9.4 VIS 31

WT 9.4 VIS 31

WT 9.4 VIS 31



MD: 8,710'
TVD: 6,402.51'
Inclination: 89.4°
Azimuth: 83.5°
VS: 2,548.26'

MD: 8,870'
TVD: 6,402.51'
Inclination: 88.5°
Azimuth: 88.5°
VS: 2,548.26'

MD: 8,964'
TVD: 6,403.9'
Inclination: 89.8°
Azimuth: 84.3°
VS: 2,642.18'

lam, mot, v
d w/marl, v tr

CHK: ll-med gy, some brn-red, lam, mot, v
sft-sft, sb pily-blky, v calc, inbtd w/marl, v tr
bent

MARL: ll-dk gy, stri, sft-v sft, sb pily-pily, fri-
brit, sil, vf grn, tr fos

CHK: ll-med gy, some brn-red, lam, mot, v
sft-sft, sb pily-blky, v calc, inbtd w/marl, v tr
bent

MARL: ll-dk gy, stri, sft-v sft, sb pily-pily, fri-
brit, sil, vf grn, tr fos

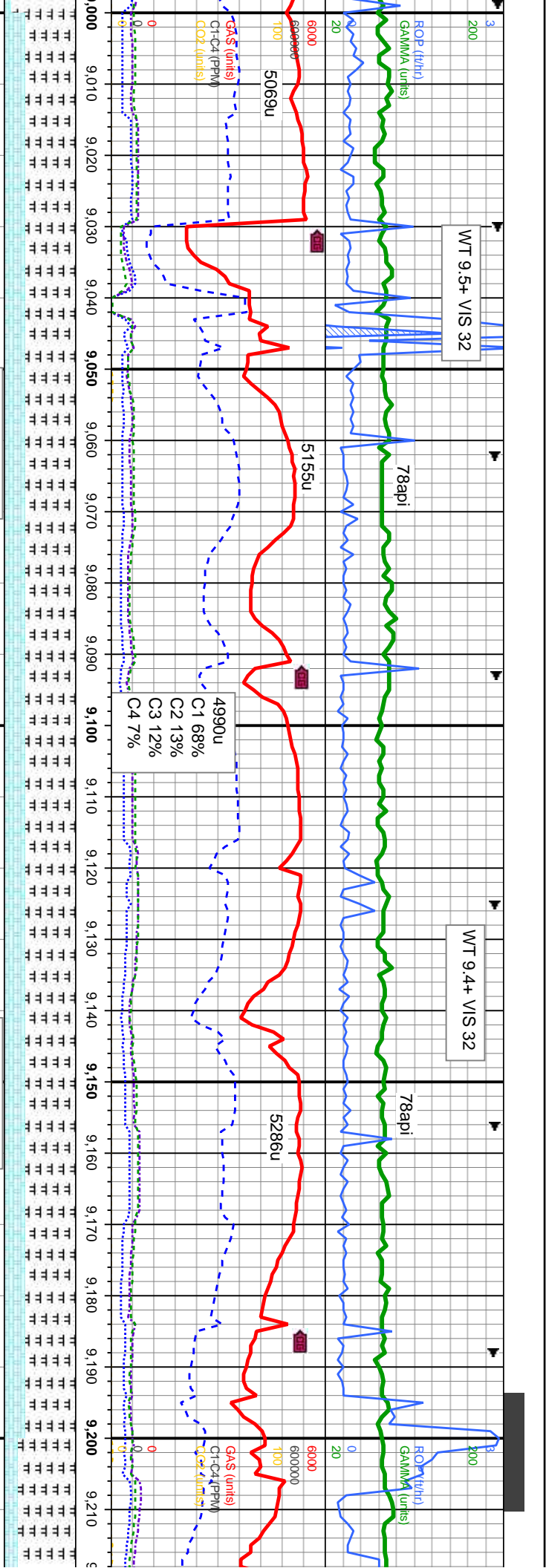
CHK: ll-med gy, some brn-red, lam, mot, v
sft-sft, sb pily-blky, v calc, inbtd w/marl, v tr
bent

MARL: ll-dk gy, stri, sft-v sft, sb pily-pily, fri-
brit, sil, vf grn, tr fos

CHK: ll-med gy, some brn-red, lam, mot, v
sft-sft, sb pily-blky, v calc, inbtd w/marl, v tr
bent

MARL: ll-dk gy, stri, sft-v sft, sb pily-pily, fri-
brit, sil, vf grn, tr fos



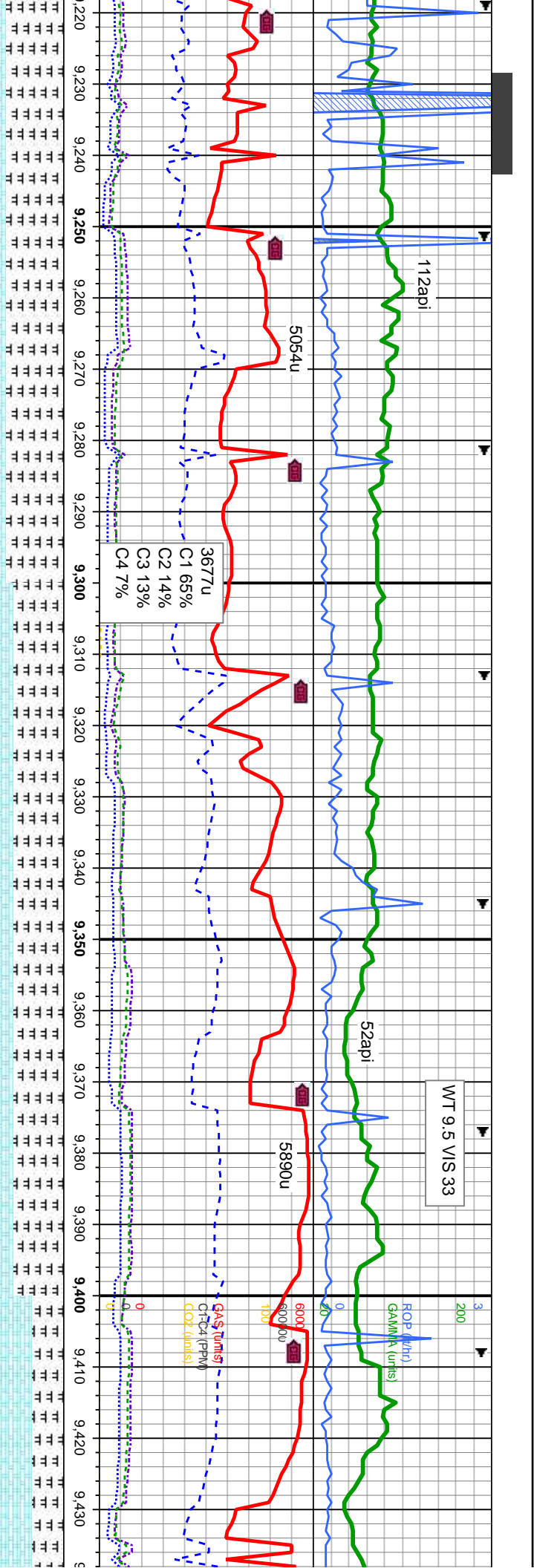


MD: 9,059 '
 TVD: 6,403.65 '
 Inclination: 90.5 °
 Azimuth: 84.1 °
 VS: 2,736.96 '

MD: 9,153 '
 TVD: 6,402.92 '
 Inclination: 90.4 °
 Azimuth: 85.4 °
 VS: 2,830.8 '

TVD (ft)	6350	6350	6350
MARL: lt-dk gy, stri, sft-v sft, sb pily-pty, fri- brit, sil, vt grn, tr fos	MARL: lt-dk gy, stri, sft-v sft, sb pily-pty, fri- brit, sil, vt grn, tr fos	MARL: lt-dk gy, stri, sft-v sft, sb pily-pty, fri- brit, sil, vt grn, tr fos	MARL: lt-dk gy, stri, sft-v sft, sb pily-pty, fri- brit, sil, vt grn, tr fos
CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-biky, v calc, intbd w/marl, v tr bent	CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-biky, v calc, intbd w/marl, v tr bent	CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-biky, v calc, intbd w/marl, v tr bent	CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-biky, v calc, intbd w/marl, v tr bent





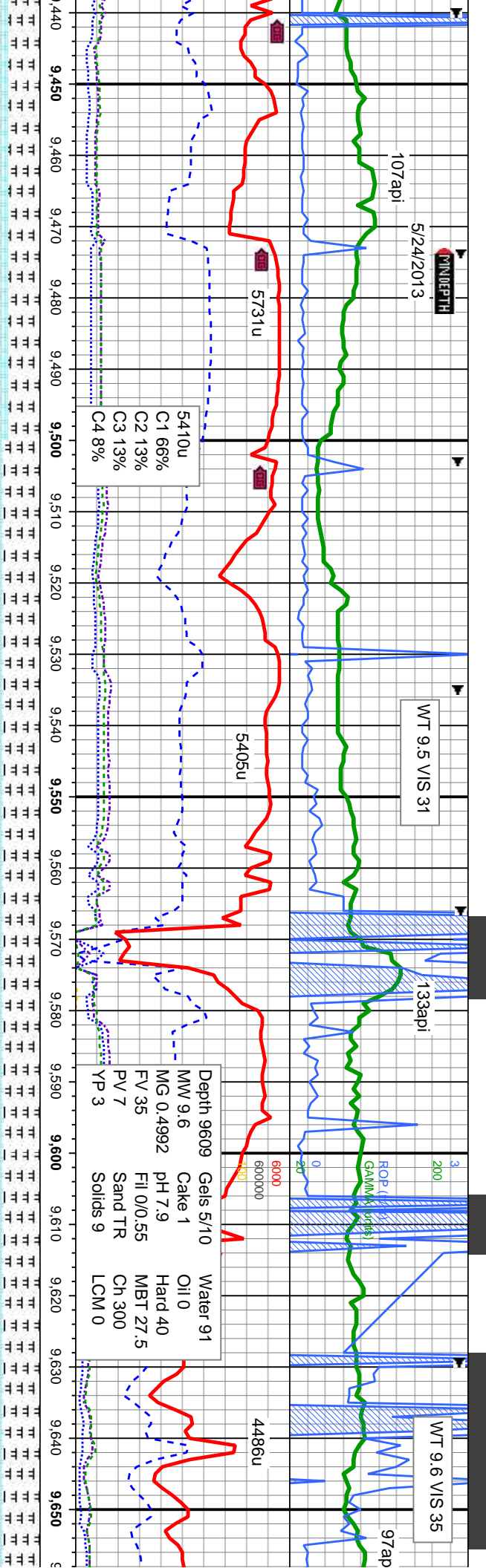
MD: 9,248 '
 TVD: 6,401.76 '
 Inclination: 91 °
 Azimuth: 86.7 °
 VS: 2,925.72 '

MD: 9,342 '
 TVD: 6,400.12 '
 Inclination: 91 °
 Azimuth: 86.9 °
 VS: 3,019.69 '

MD: 9,43 '
 TVD: 6,3 '
 Inclination: '
 Azimuth: '
 VS: 3,114 '

sft-v sft, sb pily-pily, fri- brit.	MARL.: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit.	MARL.: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit.	MARL.: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit.
the brn-red, lam, mot, v	sil, vf grn, tr fos	CHK: lt-med gy, some brn-red, lam, mot, v	CHK: lt-med gy, some brn-red, lam, mot, v
calc, inbnd w/marl, v tr bent	sft-sft, sb pily-biky, v calc, inbnd w/marl, v tr bent	sft-sft, sb pily-biky, v calc, inbnd w/marl, v tr bent	sft-sft, sb pily-biky, v calc, inbnd w/marl, v tr bent





MD: 9.532'
 TVD: 6,399.87'
 Inclination: 89.3°
 Azimuth: 86.1°
 VS: 3,209.58'

MD: 9.622'
 TVD: 6,402.54'
 Inclination: 87.3°
 Azimuth: 85°
 VS: 3,299.45'

Bit Data
 Bit #: 5
 Type: SMITH MD1513
 Size: 6.12
 Depth In: 9,614'
 Depth Out: 10,918'
 Hours: 17.3 hrs
 Avg FV/Hr: 73.4 V/hr
 Jets: 5X16
 S/N: JG6229

Depth 9609	Gels 5/10	Water 91
MW 9.6	Cake 1	Oil 0
MG 0.4992	pH 7.9	Hard 40
FV 35	Fill 0/0.55	MBT 27.5
PV 7	Sand TR	Ch 300
YP 3	Solids 9	LCM 0

fri- brit,
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit,
 sill, v' grn, tr fos
 CHK: lt-med gy, some brn-red, lam, mot, v
 sft-sft, sb pily-blky, v calc, inbd w/mari, v tr
 bent

MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit,
 sill, v' grn, tr fos
 CHK: lt-med gy, some brn-red, lam, mot, v
 sft-sft, sb pily-blky, v calc, inbd w/mari, v tr
 bent

MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit,
 sill, v' grn, tr fos
 CHK: lt-med gy, some brn-red, lam, mot, v
 sft-sft, sb pily-blky, v calc, inbd w/mari, v tr
 bent

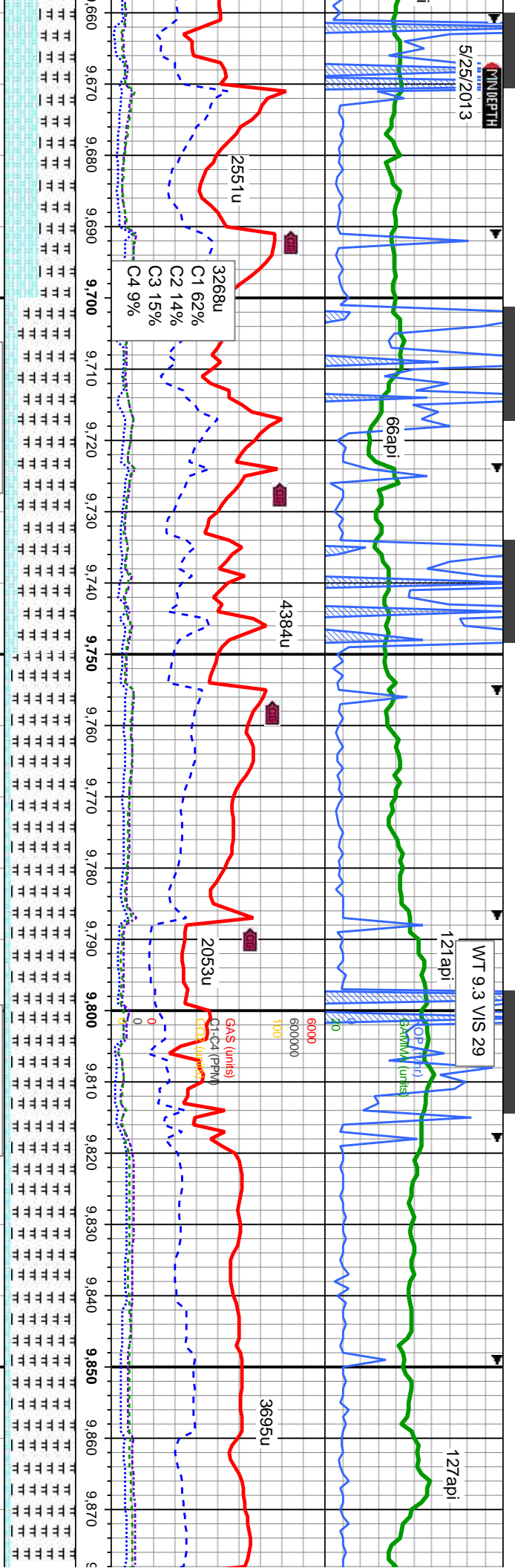
MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit,
 sill, v' grn, tr fos
 CHK: lt-med gy, some brn-red, lam, mot, v
 sft-sft, sb pily-blky, v calc, inbd w/mari, v tr
 bent

MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit,
 sill, v' grn, tr fos
 CHK: lt-med gy, some brn-red, lam, mot, v
 sft-sft, sb pily-blky, v calc, inbd w/mari, v tr
 bent



5/25/2013

MINIDEPTH



WT 9.3 VIS 29

121api

127api

MD: 9,717 '
 TVD: 6,406.68 '
 Inclination: 87.7 °
 Azimuth: 87.2 °
 VS: 3,394.29 '

MD: 9,811 '
 TVD: 6,409.8 '
 Inclination: 88.5 °
 Azimuth: 88.5 °
 VS: 3,488.24 '

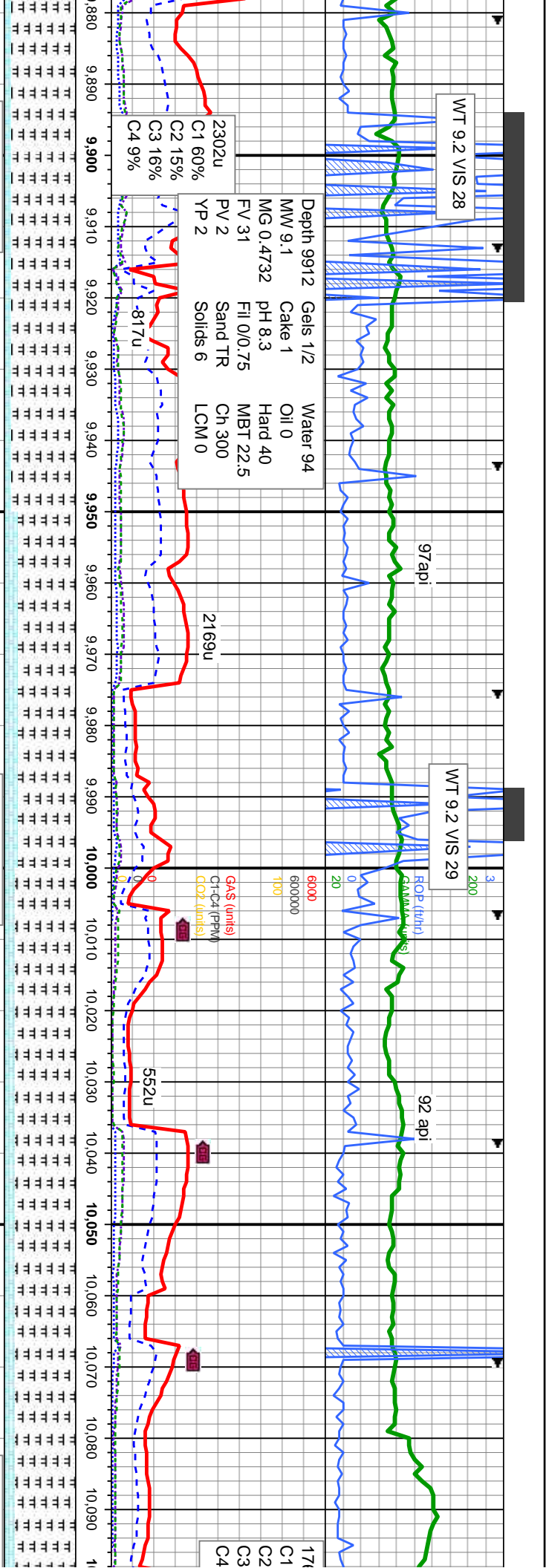
l-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, v! grn, tr fos
 MARL: l-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, v! grn, tr fos
 CHK: l-med gy, some brn-red, lam, mot, v sft-sft, sb pily-biky, v calc, inbnd w/marl, v tr bent

l-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, v! grn, tr fos
 MARL: l-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, v! grn, tr fos
 CHK: l-med gy, some brn-red, lam, mot, v sft-sft, sb pily-biky, v calc, inbnd w/marl, v tr bent

l-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, v! grn, tr fos
 MARL: l-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, v! grn, tr fos
 CHK: l-med gy, some brn-red, lam, mot, v sft-sft, sb pily-biky, v calc, inbnd w/marl, v tr bent

l-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, v! grn, tr fos
 MARL: l-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, v! grn, tr fos
 CHK: l-med gy, some brn-red, lam, mot, v sft-sft, sb pily-biky, v calc, inbnd w/marl, v tr bent





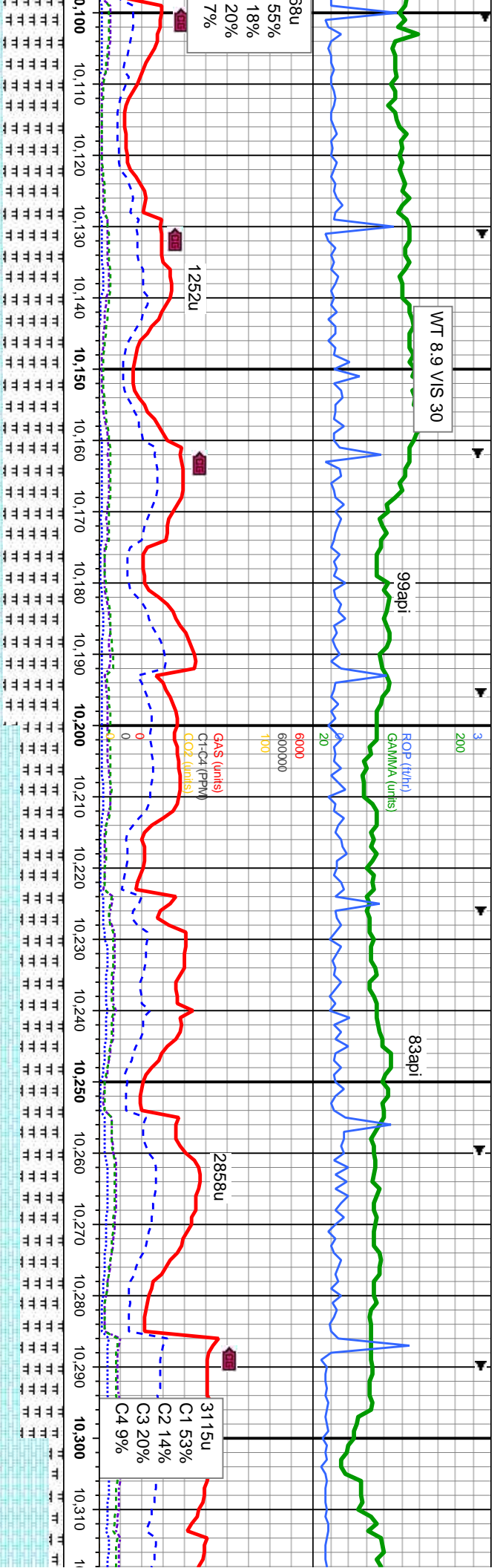
MD: 9,905 '
 TVD: 6,412.01 '
 Inclination: 88.8 °
 Azimuth: 89 °
 VS: 3,582.2 '

MD: 10,000 '
 TVD: 6,412.51 '
 Inclination: 90.6 °
 Azimuth: 88.5 °
 VS: 3,677.19 '

MD: 10,094 '
 TVD: 6,410.54 '
 Inclination: 91 °
 Azimuth: 88.2 °
 VS: 3,771.17 '

p ply-pty, fri- brit,	MARL: lt-dk gy, stri, sft-v sft, sb ply-pty, fri- brit, sil, vf grn, tr fos	TVD (ft)	MARL: lt-dk gy, stri, sft-v sft, sb ply-pty, fri- brit, sil, vf grn, tr fos
lam, mot, v w/marl, v tr	CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb ply-blky, v calc, inbd w/marl, v tr bent		CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb ply-blky, v calc, inbd w/marl, v tr bent





MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, v/ grn, tr fos
 CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-blky, v calc, intbd w/marl, v tr bent

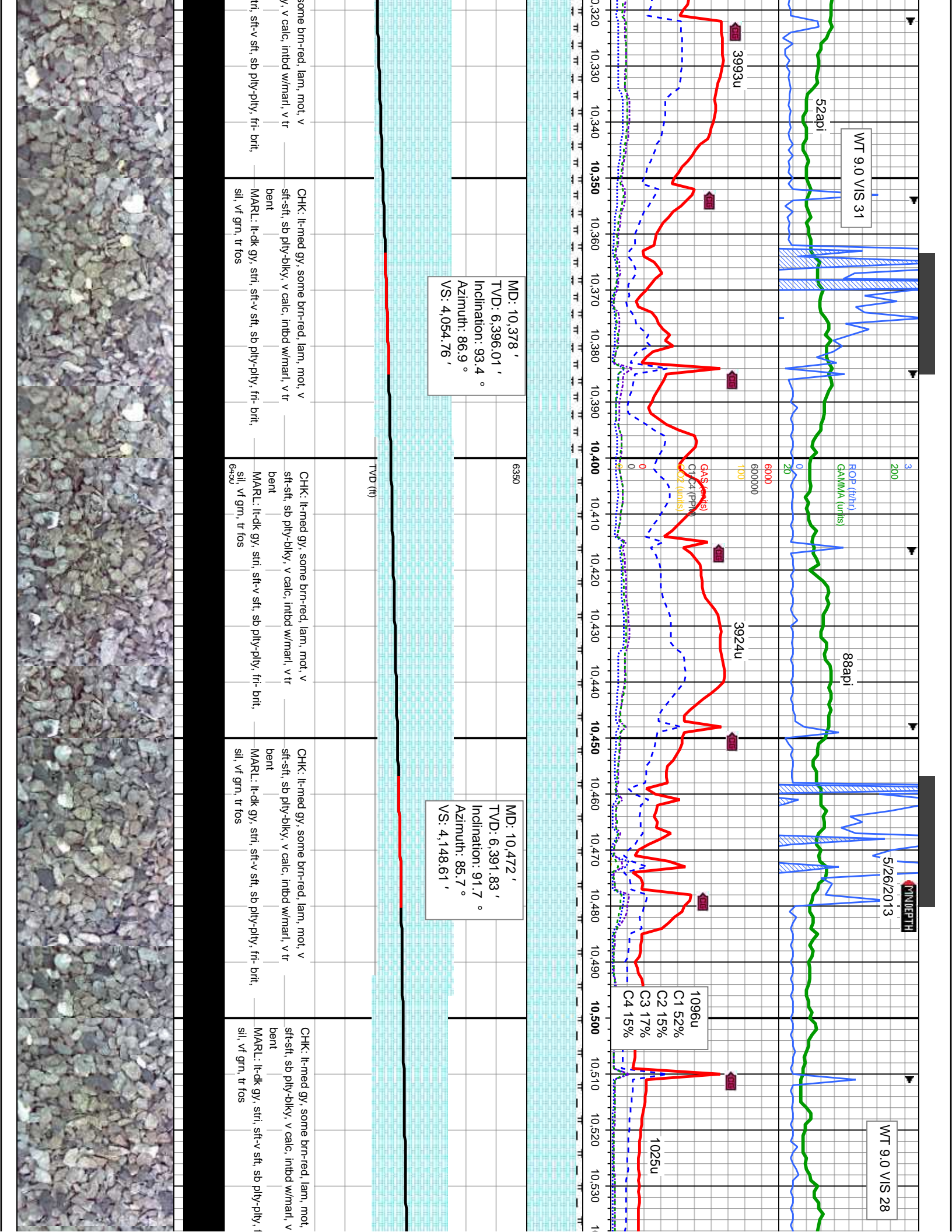
MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, v/ grn, tr fos
 CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-blky, v calc, intbd w/marl, v tr bent

MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, v/ grn, tr fos
 CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-blky, v calc, intbd w/marl, v tr bent

MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit, sil, v/ grn, tr fos
 CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pily-blky, v calc, intbd w/marl, v tr bent

CHK: lt-med gy, sft-sft, sb pily-blk bent
 MARL: lt-dk gy, s sil, v/ grn, tr fos





WT 9.0 VIS 31

WT 9.0 VIS 28

ROP (ft/hr)
GAMMA (units)

52api

88api

1096u

1025u

3993u

3924u

C1 52%
C2 15%
C3 17%
C4 15%

MD: 10,378 '
TVD: 6,396.01 '
Inclination: 93.4 °
Azimuth: 86.9 °
VS: 4,054.76 '

MD: 10,472 '
TVD: 6,391.83 '
Inclination: 91.7 °
Azimuth: 85.7 °
VS: 4,148.61 '

some brn-red, lam, mot, v sft-sft, v calc, intbd w/marl, v tr
CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pty-blky, v calc, intbd w/marl, v tr bent
MARL: lt-dk gy, stri, sft-v sft, sb pty-pty, fri- brit, sil, vf grn, tr fos

CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pty-blky, v calc, intbd w/marl, v tr bent
MARL: lt-dk gy, stri, sft-v sft, sb pty-pty, fri- brit, sil, vf grn, tr fos

CHK: lt-med gy, some brn-red, lam, mot, v sft-sft, sb pty-blky, v calc, intbd w/marl, v tr bent
MARL: lt-dk gy, stri, sft-v sft, sb pty-pty, fri- brit, sil, vf grn, tr fos

CHK: lt-med gy, some brn-red, lam, mot, sft-sft, sb pty-blky, v calc, intbd w/marl, v bent
MARL: lt-dk gy, stri, sft-v sft, sb pty-pty, sil, vf grn, tr fos

TVD (ft)

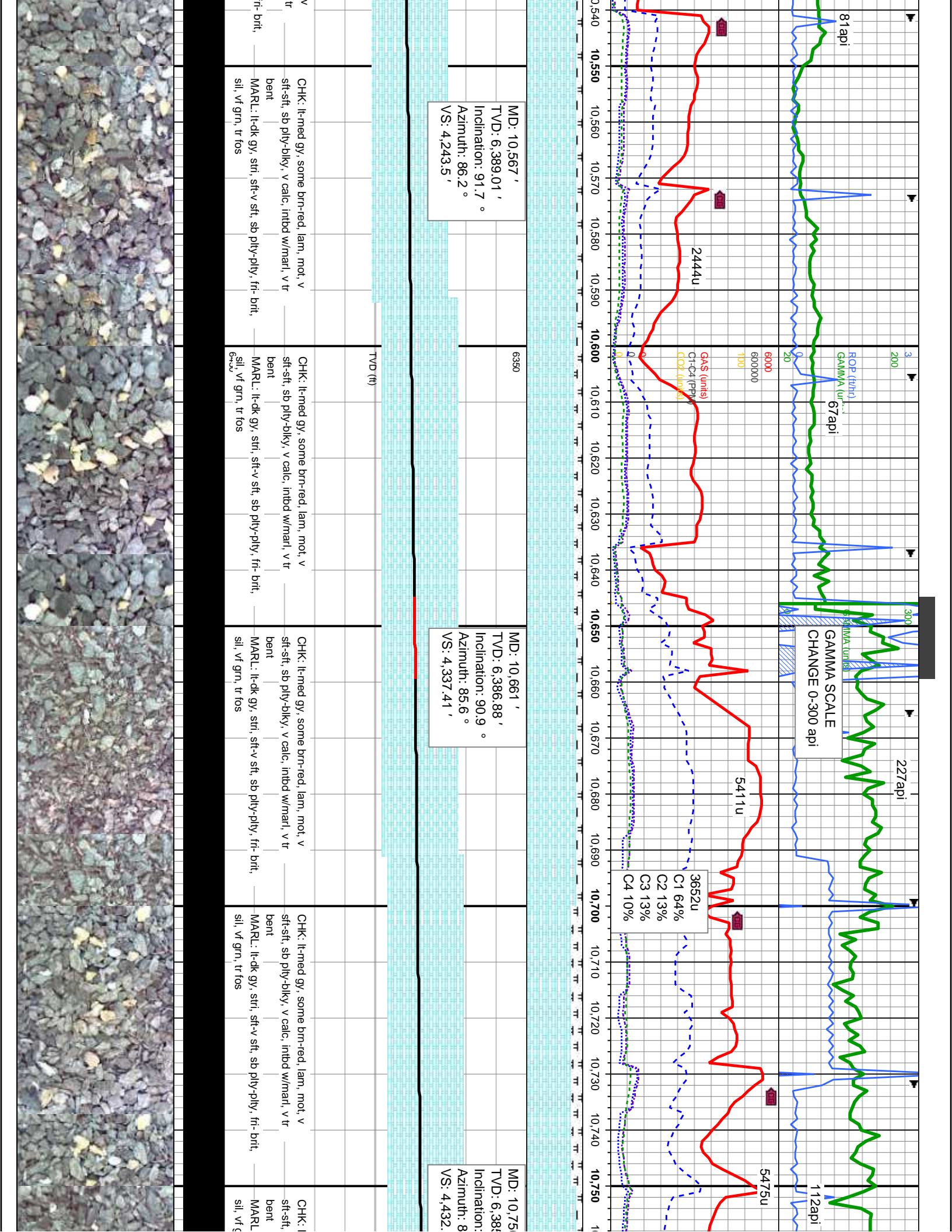
6350

6450

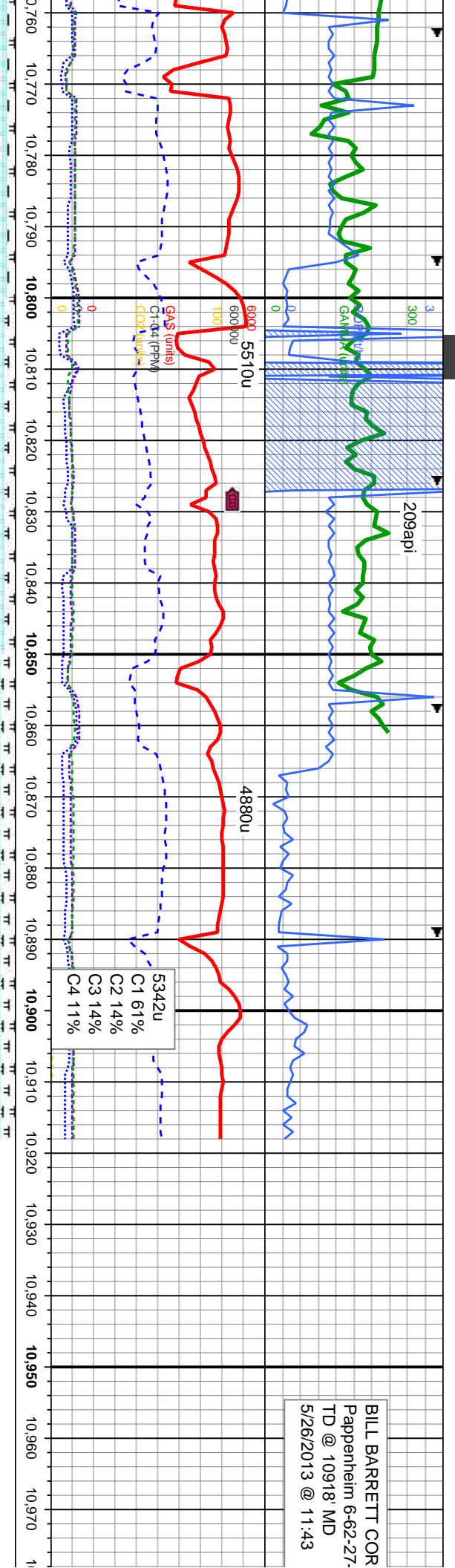
5/26/2013

10,530

10,320 10,330 10,340 10,350 10,360 10,370 10,380 10,390 10,400 10,410 10,420 10,430 10,440 10,450 10,460 10,470 10,480 10,490 10,500 10,510 10,520 10,530



BILL BARRETT COR
 Pappenheim 6-62-27-
 TD @ 10918' MD
 5/26/2013 @ 11:43



6' 5.14'
 91.2°
 5.5°
 3'

MD: 10,848'
 TVD: 6,383.29'
 Inclination: 91.1°
 Azimuth: 85.5°
 VS: 4.524, .18'

THANK YOU FOR U
 COLUMBINE LOGG

lt-med gy, some brn-red, lam, mot, v
 sb pily-blky, v calc, intbd w/marl, v tr
 brnt
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit,
 sil, vf grn, tr fos

CHK: lt-med gy, some brn-red, lam, mot, v
 sft-sft, sb pily-blky, v calc, intbd w/marl, v tr
 bent
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit,
 sil, vf grn, tr fos

CHK: lt-med gy, some brn-red, lam, mot, v
 sft-sft, sb pily-blky, v calc, intbd w/marl, v tr
 bent
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit,
 sil, vf grn, tr fos

CHK: lt-med gy, some brn-red, lam, mot, v
 sft-sft, sb pily-blky, v calc, intbd w/marl, v tr
 bent
 MARL: lt-dk gy, stri, sft-v sft, sb pily-pily, fri- brit,
 sil, vf grn, tr fos



