

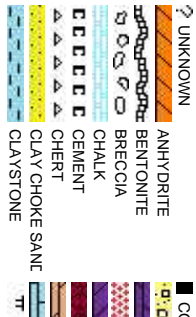


Scale: 5" / 100'
Measured Depth Log

Well Name	Waste Management 2Q-401		
Location	SESW SEC 2, 2N, 64W, 6TH		
State	COLORADO	County	WELD
Country	USA	Rig Number	ENSIGN 14
API Number	05-123-36959-0000		
Region	DJ BASIN	Field	WATTENBERG
Spud Date	8/5/2013	Drilling Completed	8/14/2013
Surface Coordinates	FSL 230' x 2140' FWL		
Bottom Hole Coordinates	FNL 485' x 2493' FWL		
Ground Elevation	4932'	K.B. Elevation	4947'
Logged Interval	6258'	To	11502'
		Total Depth	11502'
Formation	SHANNON SAND - CODELL SAND		
Type of Drilling Fluid	LSND - WATER POLY MUD		

Company PDC ENERGY
Address 1775 Sherman
Denver, CO. 80

Name STEVE SERAD
Company PDC ENERGY
Address 1775 Sherman
Denver, CO. 80



Operator

INC.

Street, Suite 3000
203

Geologist

A
INC.

Street, Suite 3000
203

Rock Types

Unit	Symbol	Unit	Symbol	Unit	Symbol	Unit	Symbol
DAL.		SHALY SILTSTONE		SHALY SANDSTONE		SHALY SILTSTONE	
CONGLOMERATE		X X X X X	NO SAMPLE			SILTY SHALE	
DOLOMITE			SALT			SILTSTONE	
GRANITE			SANDSTONE			TILL	
GYPSEUM			SALT-PEPPER SAND			TUFF	
IGNEOUS			SHALE			WEDDED TUFF	
SIDERITE or LIMONITE			SHALE COLORED				
LIMESTONE			SHALE GRAY				
MARLSTONE							
CLAY							

Accessories

Fossils

[illegible]

Other Symbols

Oil Show

Oil Show

☒ MOLDIC
☐ ORGANIC
☐ PINPOINT
☒ VUGGY
☒ DEAD
☒ EVEN

☒ FAULT
☒ FORMATION TOP
☒ GAS SHOW
☒ MN DEPTH
☒ MN DEPTH

☒ WIRELINE TESTED - LEFT
☒ WIRELINE TESTED - RT
☒ E EARTHY
☒ Fx FINELYXXLN
☒ GS GRAINSTONE
☒ L LITHOGRAPHIC

Rounding

Engineering

QUESTIONABLE

SPOTTED STAINING

Engineering

BIT

CONNECTION (LEFT)

CONNECTION (RIGHT)

FENESTRAL

FRACTURE

INTERCRYSTALLINE

INTEROOLITIC

NORMAL FAULT

OIL SHOW

OVERTURNED STRATA

REVERSE FAULT

SIDEWALL CORE (LEFT)

SIDEWALL CORE (RIGHT)

SLIDE

SURVEY

TRIP GAS

Textures

BOUNDSTONE

CHALKY

CRYPTOXLN

Sorting

MODERATE

POOR

WELL













MICROLYN

MUDSTONE

PACKSTONE

WACKSTONE

Porosity

	E EARTHY		CONNECTION (LEFT)		REVERSE FAULT		SUBRAND		MS WACKSTONE
	F FENESTRAL		CONNECTION (RIGHT)		SIDEWALL CORE (LEFT)				
	F FRACTURE		CONNECTION GAS		SIDEWALL CORE (RIGHT)				
	F FRACTURE		CORE - LOST		SLIDE		B3 BOUNDSTONE		M MODERATE
	X INTERCRYSTALLINE		CORE - RECOVERED		OS SURVEY		C CHALKY		P POOR
	Q INTERCOLLITIC		DST INTERVAL		TRIP GAS		C CRYPTOXLN		W WELL

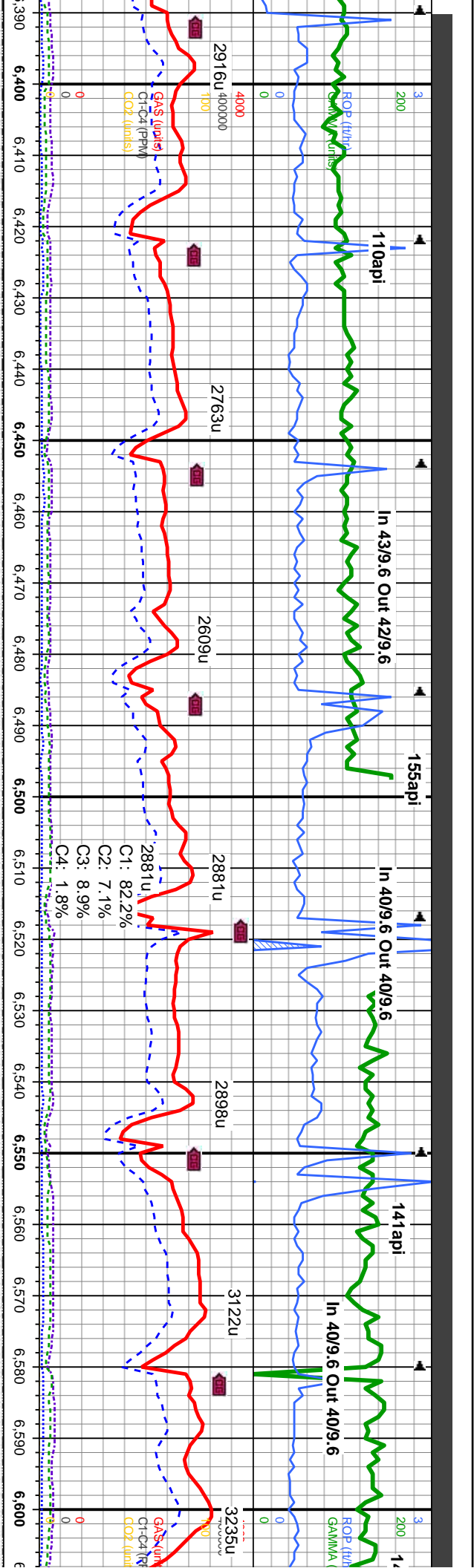
Textures

BS BOUNDSTONE **M** MODERATE
C CHALKY **P** POOR
CX CRYPTOXLN **W** WELL

Sorting

M MODERATE
P POOR
W WELL

Slide/Rotate		ROP		ROF		GAMMA		Total Gas & Chromatograph		Depth Labels		% Lith		Well Bore		Oil Show		Images													
		200		0		0		GAS (units) C1 (ppm) C2 (ppm) C3 (ppm) C4 (ppm) CO2 (ppm)		6,210 6,220 6,230 6,240 6,250 6,260 6,270 6,280 6,290 6,300 6,310 6,320 6,330 6,340 6,350 6,360 6,370 6,380		6100		MD: 6,247' TVD: 6,227.06' Inclination: 0.1° Azimuth: 335.7° VS: -167.81'		MD: 6,277' TVD: 6,257.06' Inclination: 1° Azimuth: 13.7° VS: -167.53'		MD: 6,309' TVD: 6,289.05' Inclination: 2.4° Azimuth: 11.9° VS: -166.59'		MD: 6,341' TVD: 6,321' Inclination: 4° Azimuth: 10.9° VS: -164.82'		MD: 6,373' TVD: 6,352.89' Inclination: 5.3° Azimuth: 2.5° VS: -162.23'		SLTY SH: It-m gy, sft, sb ply, rthy-grty tex, sl calc, w/ occ carb lams, grdg to SHLY SLTST: It gy, sft, sb ply, rthy, silty sl calc, SHLY SS: Itgy, s&p, vfg, ang-sb rd, w srt, m consol, sl calc cmt, n vis por n ffor, fnt tr lt yel cut, n sin		SLTY SH: It-m gy, sft, sb ply, rthy-grty tex, sl calc, w/ occ carb lams, grdg to SHLY SLTST: It gy, sft, sb ply, rthy, silty sl calc, SHLY SS: Itgy, s&p, vfg, ang-sb rd, w srt, m consol, sl calc cmt, n vis por n ffor, fnt tr lt yel cut, n sin		SLTY SH: It-m gy, sft, sb ply, rthy-grty tex, sl calc, w/ occ carb lams, grdg to SHLY SLTST: It gy, sft, sb ply, rthy, silty sl calc, SHLY SS: Itgy, s&p, vfg, ang-sb rd, w srt, m consol, sl calc cmt, n vis por n ffor, fnt tr lt yel cut, n sin		SLTY SH: It-m gy, sft, sb ply, rthy-grty tex, sl calc, w/ occ carb lams, grdg to SHLY SLTST: It gy, sft, sb ply, rthy, silty sl calc, SHLY SS: Itgy, s&p, vfg, ang-sb rd, w srt, m consol, sl calc cmt, n vis por n ffor, fnt tr lt yel cut, n sin	
		Columbine Logging 2-Manned Geosteering Operational 8/8/2013 Bloodhound # 707						Bit Data Bit #: 2 Type: E1202 Size: 8.75 Depth In: 936' Jets: 5x16 S/N: A174687																							
		110api		In 43/9.5 Out 42/9.5		103api																									
		3514u		3187u		3495u		3025u																							
		C1: 82.8%		C2: 5.7%		C3: 9.1%		C4: 2.4%																							

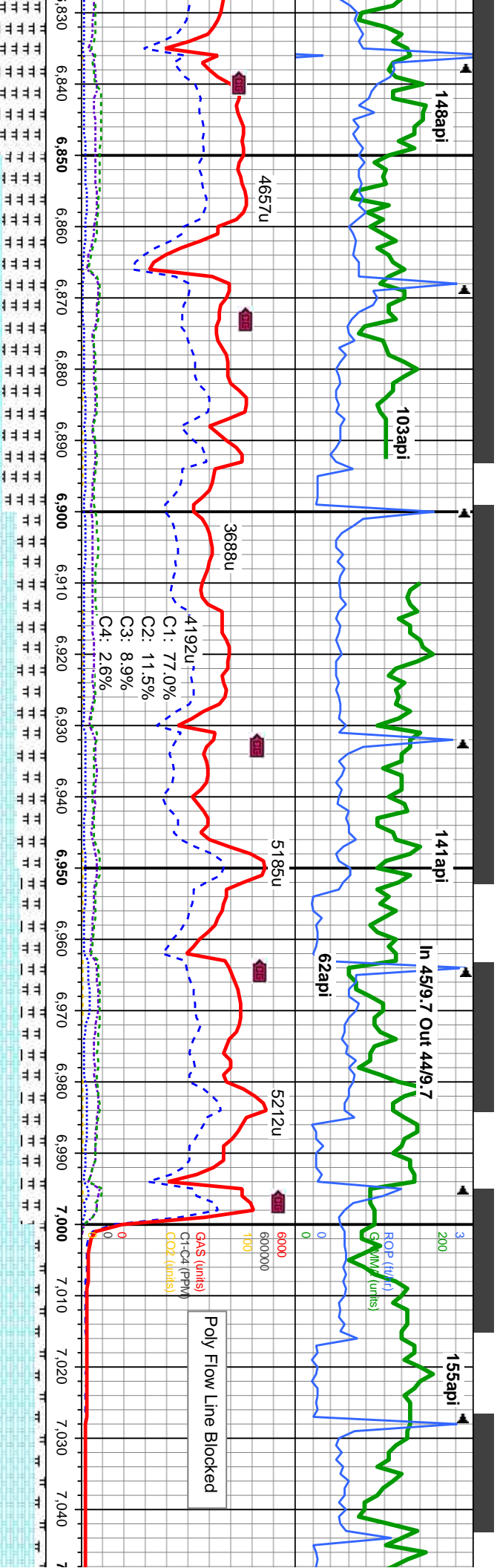


MD: 6.404 TVD: 6.383.71 Inclination: 6.9 ° Azimuth: 2.6 ° VS: -158.94	MD: 6.436 TVD: 6.415.41 Inclination: 9 ° Azimuth: 5.4 ° VS: -154.52	MD: 6.468 TVD: 6.446.93 Inclination: 10.8 ° Azimuth: 7.4 ° VS: -149.02	MD: 6.500 TVD: 6.478.26 Inclination: 12.6 ° Azimuth: 9 ° VS: -142.54	MD: 6.531 TVD: 6.508.41 Inclination: 14.3 ° Azimuth: 8.6 ° VS: -135.35	MD: 6.563 TVD: 6.539.29 Inclination: 16.1 ° Azimuth: 8.1 ° VS: -126.98	MD: 6.595 TVD: 6.569.92 Inclination: 17.6 ° Azimuth: 9.1 ° VS: -117.72
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SLTY SH: lt-m gy, sft, sb ply, rthy-grty tex, sl calc, w/ occ carb lams, grdg to SHLY SLTST: lt gy, sft, sb ply, rthy, silty sl calc, SHLY SS: ltgy, s&p, vgr, ang-sb rd, w strd, m consol, sl calc cmt, n vis por n flor, frt tr lt yel cut, n stn	SLTY SH: lt-m gy, sft, sb ply, rthy-grty tex, sl calc, w/ occ carb lams, grdg to SHLY SLTST: lt gy, sft, sb ply, rthy, silty sl calc, SHLY SS: ltgy, s&p, vgr, ang-sb rd, w strd, m consol, sl calc cmt, n vis por n flor, frt tr lt yel cut, n stn	SLTY SH: lt-m gy, sft, sb ply, rthy-grty tex, sl calc, w/ occ carb lams, grdg to SHLY SLTST: lt gy, sft, sb ply, rthy, silty sl calc, n vis por n flor, frt tr lt yel cut, n stn	SLTY SH: lt-m gy, sft, sb ply, rthy-grty tex, sl calc, w/ occ carb lams, grdg to SH, SH SLTST: lt gy, sft, sb ply, rthy, silty sl calc, n vis por n flor, frt tr lt yel cut, n stn
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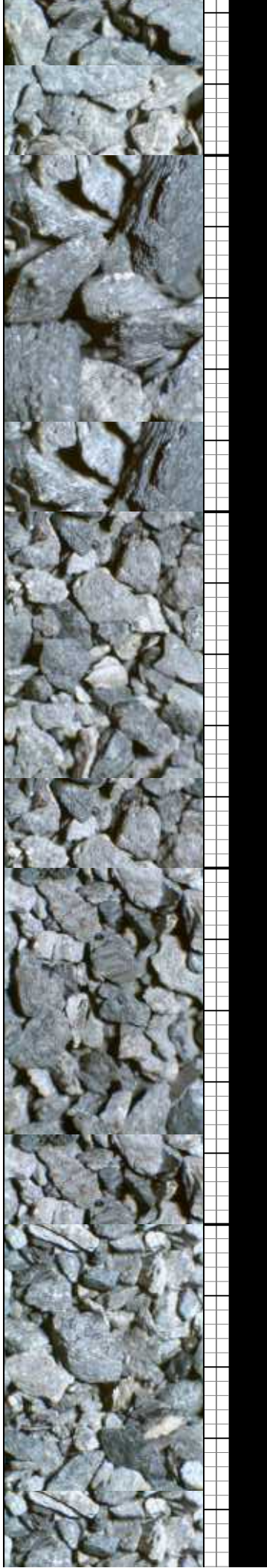


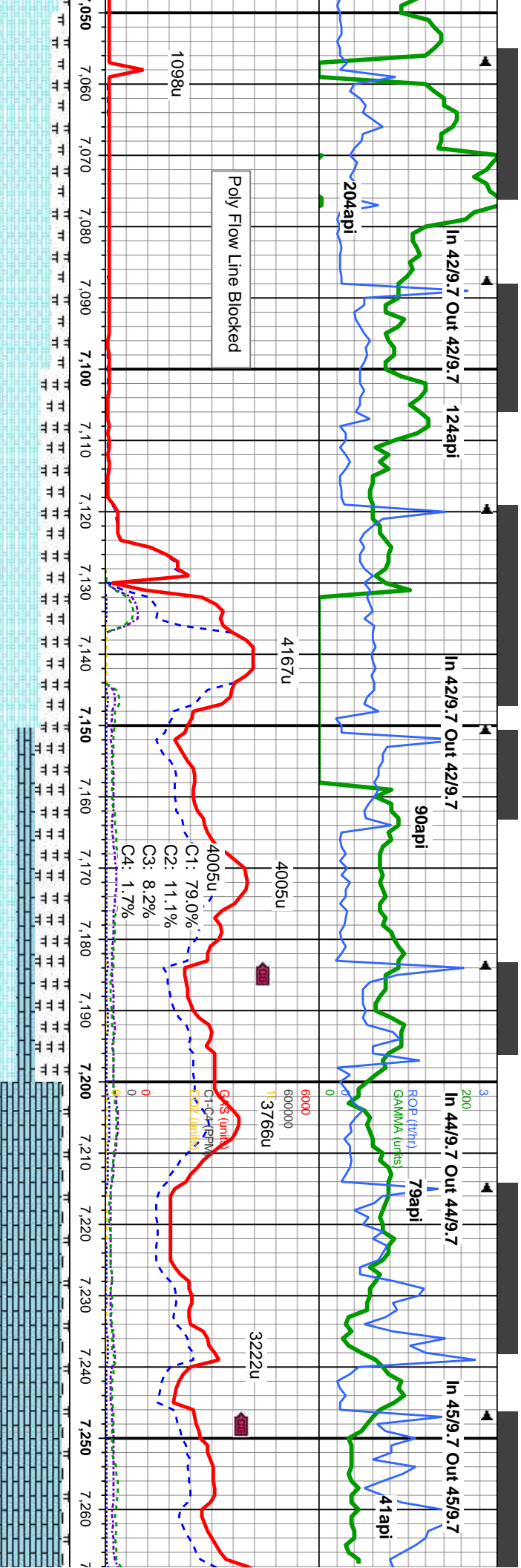


MD: 6,849	MD: 6,880	MD: 6,912	MD: 6,944	MD: 6,976	MD: 7,007
TVD: 6,796.96	TVD: 6,822.75	TVD: 6,845.74	TVD: 6,867.09	TVD: 6,886.79	TVD: 6,904.48
Inclination: 37.5 °	Inclination: 42.2 °	Inclination: 45.9 °	Inclination: 50.4 °	Inclination: 53.6 °	Inclination: 56.8 °
Azimuth: 8.1 °	Azimuth: 7 °	Azimuth: 5.8 °	Azimuth: 4.2 °	Azimuth: 3.5 °	Azimuth: 3.3 °
VS: -11.43	VS: 8.4	VS: 30.63	VS: 54.46	VS: 79.67	VS: 105.12

CHK: lt-m gy, lt brn ip, sft, sb pty & blk, rthy-sb wxy lstr, mot & lam tex, v calc, r fosMRL: m-dk gy, sft, sb blk, rthy lstr, mot tex v calc w/ org mat, n flor, stmg bri yel cut, lt yel sh.

Niobrara B
6850' MD/ 6800' TVD





CHK: lt-m gy, lt brn ip, sft, sb pily & blk, rthy-sb wxy lstr, mot & lam tex, v calc, r fosMR.L: m-dk gy, sft, sb blk, rthy lstr, mot tex v calc w/ org mat, n flor, sting bri yel cut, lt yel sin.

CHK: lt-m gy, lt brn ip, sft, sb pily & blk, rthy-sb wxy lstr, mot & lam tex, v calc, r fosMR.L: m-dk gy, sft, sb blk, rthy lstr, mot tex v calc w/ org mat, n flor, sting bri yel cut, lt yel sin.

Niobrara C
7080' MD/ 6941' TVD

MD: 7.071
TVD: 6.936.93
Inclination: 61.5
Azimuth: 4
VS: 160.25

MD: 7.102
TVD: 6.951
Inclination: 64.5
Azimuth: 3.7
VS: 187.86

MD: 7.134
TVD: 6.963.99
Inclination: 67.6
Azimuth: 2.5
VS: 217.09

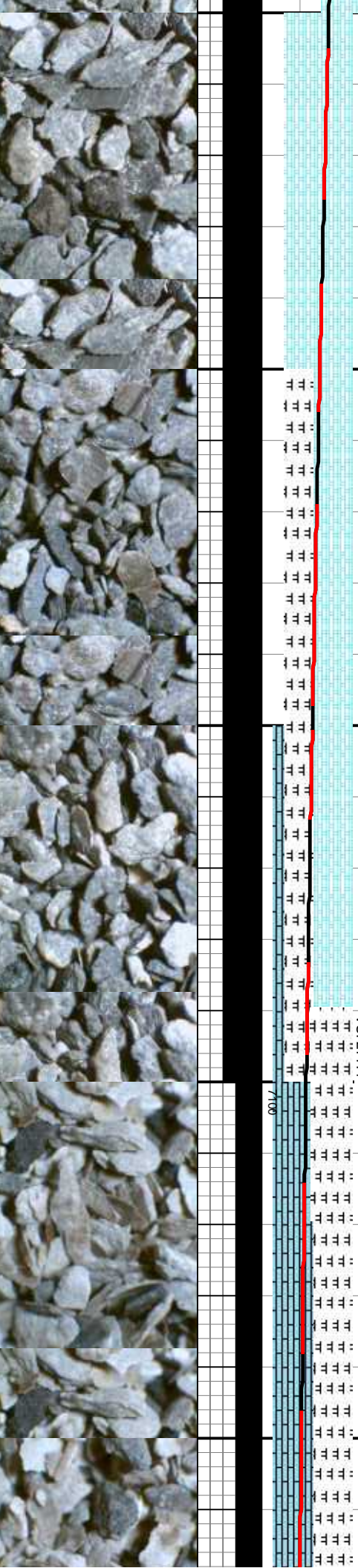
CHK: lt-m gy, lt brn ip, sft, sb pily & blk, rthy-sb wxy lstr, mot & lam tex, v calc, r fosMR.L: m-dk gy, sft, sb blk, rthy lstr, mot tex v calc w/ org mat, LS: tan, crm and buff wh, sft-m frm, sb pily & blk, dull -semi sulluster, mic xl tex, v calc, n flor, sting bri yel cut, lt yel sin.

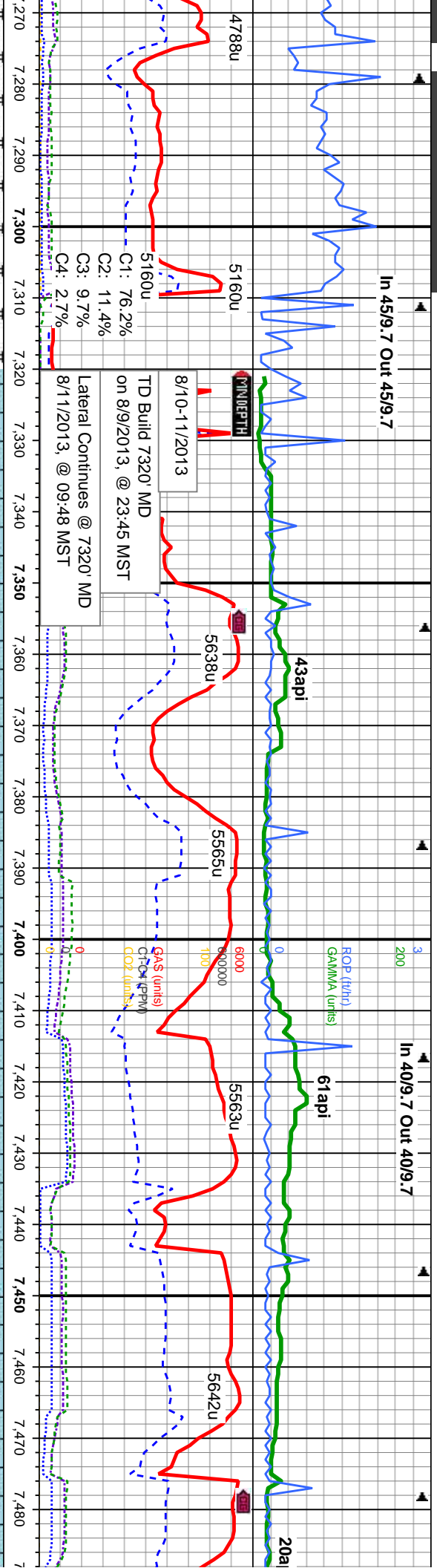
LS: tan, crm and buff wh, sft-m frm, sb pily & blk, dull -semi sulluster, mic xl tex, v calc, MR.L: m-dk gy, sft, sb blk, rthy lstr, mot tex v calc w/ org mat, n flor, sting bri yel cut, lt yel sin.

Fort Hayes
7199' MD/ 7199' TVD

MD: 7.166
TVD: 6.975.27
Inclination: 71.1
Azimuth: 1.8
VS: 247

MD: 7.229
TVD: 6.993.49
Inclination: 75.3
Azimuth: 1
VS: 307.17





LS: tan, crm and buff wh, sft-m frm, sb ply & blk, dull -semi sull luster, mic xl tex, v calc, MRL: m-dk gy, sft, sb blk, rthy lstr, mot tex v calc w/ org mat, n flor, stmg bri yel cut, lt yel stn.

LS: wh, tan, crm, sft-m gfrm, sb ply rthy-smth lstr, mic xl-fos tex, v calc, tr sltys, tr ss, n flor, tr stmg yel cut, n stn

LS: wh, tan, crm, sft-m gfrm, sb ply rthy-smth lstr, mic xl-fos tex, v calc, tr sltys, tr dism pyr, n flor, tr stmg yel cut, n stn, vtr ss, tr sh

LS: wh, tan, crm, sft-m gfrm, sb ply rthy-smth lstr, mic xl-fos tex, v calc sltys, tr dism pyr, n flor, tr stmg y stn, vtr ss, tr sh

MD: 7.272
D: 7.002.47
Inclination: 80.6
muth: 1.8
VS: 349.14

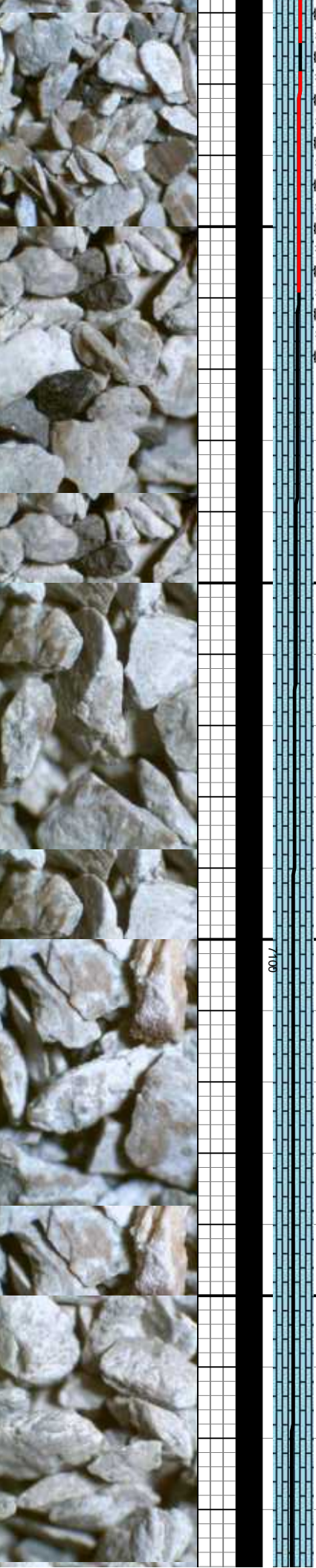
MD: 7.320
TVD: 7.008.48
Inclination: 85
Azimuth: 1.8
VS: 396.69

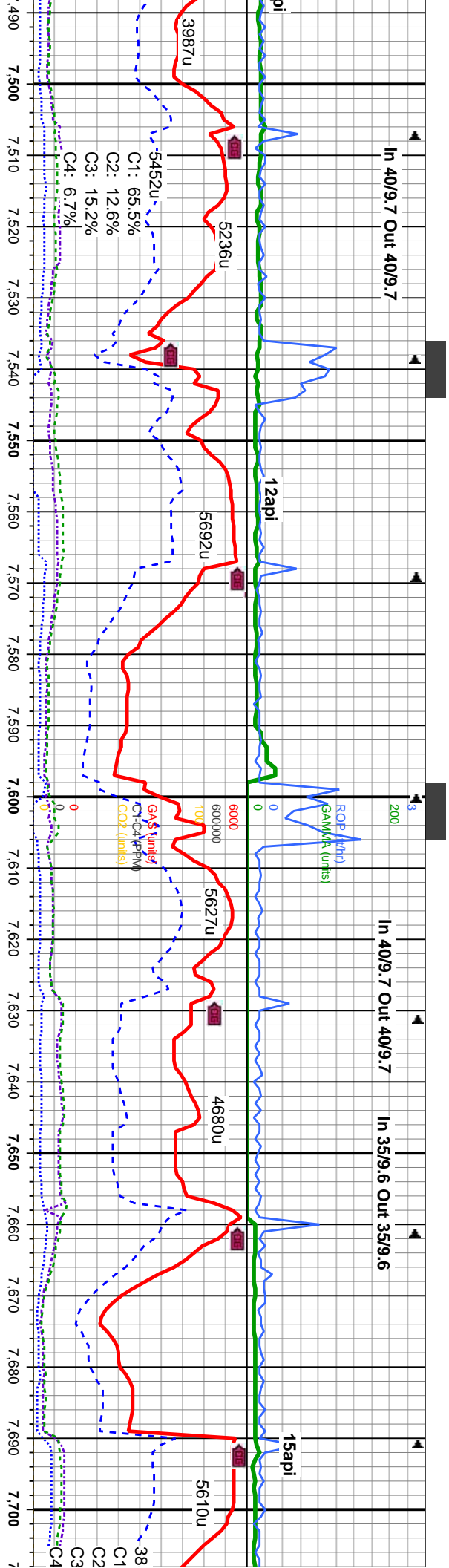
MD: 7.389
TVD: 7.018.41
Inclination: 86.6
Azimuth: 0.2
VS: 464.73

MD: 7.419
TVD: 7.020.06
Inclination: 87.1
Azimuth: 0.2
VS: 494.59

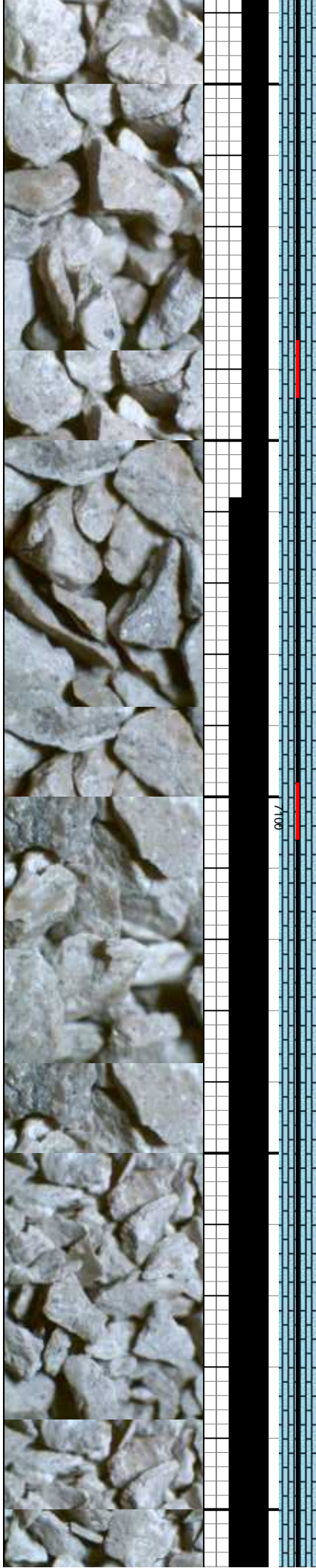
MD: 7.450
TVD: 7.021.55
Inclination: 87.4
Azimuth: 0.7
VS: 525.47

MD: 7.480
TVD: 7.022.67
Inclination: 88.3
Azimuth: 0.5
VS: 555.37





LS: wh, tan, crm, sft-m gfrm, sb pily rthy-smth lstr, mic xl-fos tex, v calc, tr siltyshly, tr dism pyr, n flor, tr stmg yel cut, n stn, vtr ss, tr sh		MD: 7,511 TVD: 7,023.46 Inclination: 88.8 Azimuth: 2.1 VS: 586.3	MD: 7,542 TVD: 7,023.97 Inclination: 89.3 Azimuth: 359.5 VS: 617.22	MD: 7,572 TVD: 7,024.31 Inclination: 89.4 Azimuth: 3.3 VS: 647.16	MD: 7,602 TVD: 7,024.55 Inclination: 89.7 Azimuth: 358.6 VS: 677.09	MD: 7,633 TVD: 7,024.71 Inclination: 89.7 Azimuth: 359.1 VS: 707.93	MD: 7,664 TVD: 7,024.76 Inclination: 90.1 Azimuth: 358.4 VS: 738.76	MD: 7,695 TVD: 7,024.52 Inclination: 90.8 Azimuth: 358.1 VS: 769.56
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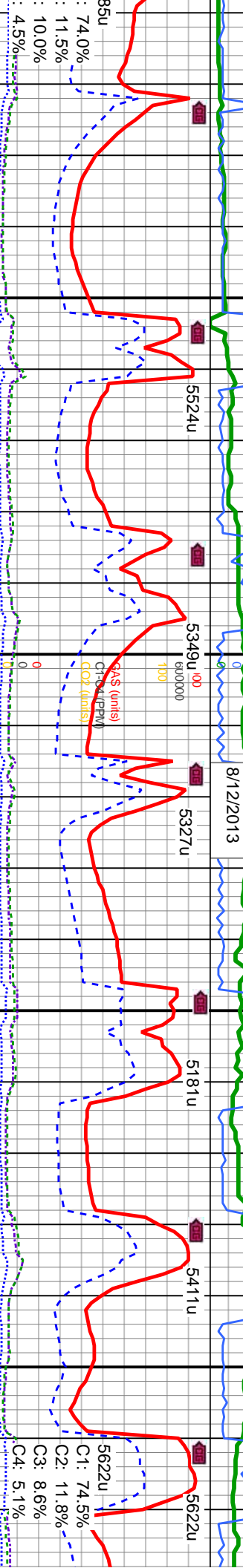
In 44/9.6 Out 44/9.6

ROP (ft/hr)
GAMMA (units)
41 api

8/12/2013

52api

30api



tan, crm, sft-m gfrm, sb pily
rthy-smth lst, mic xl-fos tex, v calc, tr dism
pyr, n flor, tr smng yel cut, n stn

LS: wh, tan, crm, sft-m gfrm, sb pily
rthy-smth lst, mic xl-fos tex, v calc, tr dism
pyr, n flor, tr smng yel cut, n stn
TVD Scale Change
6,070' - 7,070'

LS: wh, tan, crm, sft-m gfrm, sb pily
rthy-smth lst, mic xl-fos tex, v calc, vstr dism
pyr, SLTY SH: lt-m gy, sft, sb pily, rthy-grly
tex, sl calc, w/ occ carb lams, grdg to SH, n
flor, tr smng yel cut, n stn

LS: wh, tan, crm, sft-m gfrm, sb pily
rthy-smth lst, mic xl-fos tex, v calc, vstr dism
pyr, SLTY SH: lt-m gy, sft, sb pily, rthy-grly
tex, sl calc, w/ occ carb lams, grdg to SH, n
flor, tr smng yel cut, n stn

LS: wh, tan, crm, sft-m gfrm
rthy-smth lst, mic xl-fos t
pyr, SLTY SH: lt-m gy, sft
tex, sl calc, w/ occ carb la
flor, tr smng yel cut, n stn

MD: 7,727
TVD: 7,023.88
Inclination: 91.5 °
Azimuth: 358.4 °
VS: 801.35

MD: 7,759
TVD: 7,023.01
Inclination: 91.6 °
Azimuth: 357.5 °
VS: 833.11

Represents 16' Target Zone

MD: 7,822
TVD: 7,021.42
Inclination: 91 °
Azimuth: 358.1 °
VS: 895.61

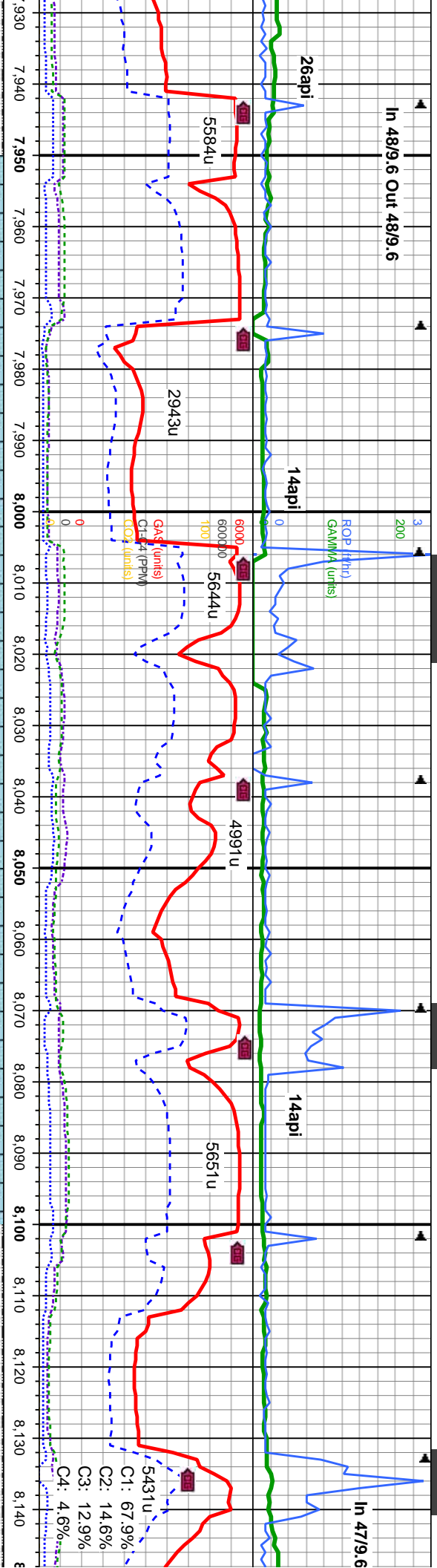
MD: 7,854
TVD: 7,021.14
Inclination: 90 °
Azimuth: 357.2 °
VS: 927.36

MD: 7,886
TVD: 7,021.64
Inclination: 88.2 °
Azimuth: 357.7 °
VS: 959.1

MD: 7,917
TVD: 7,022.69
Inclination: 87.9 °
Azimuth: 357.2 °
VS: 989.83



In 48/9.6 Out 48/9.6



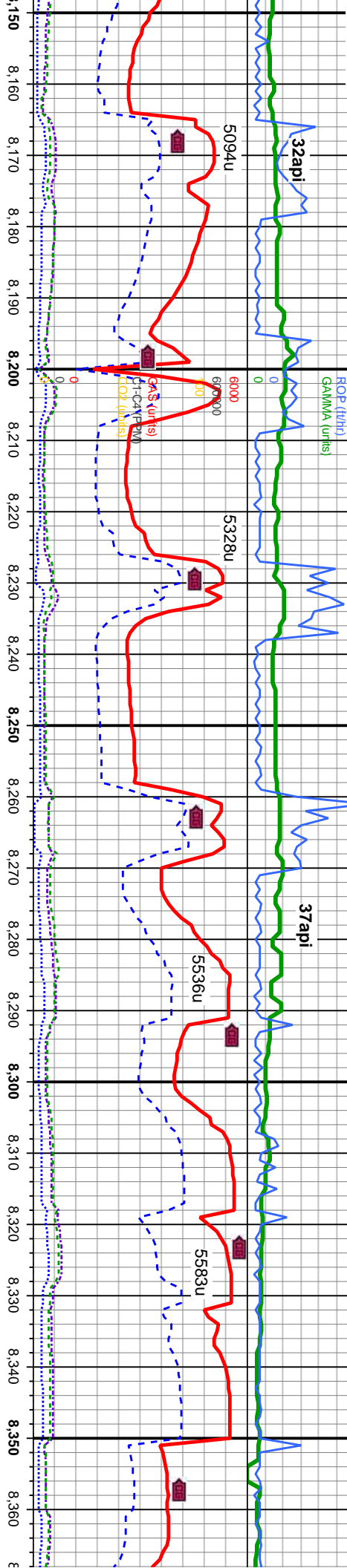
In 47/9.6

LS: wh, tan, crm, sft-m grfm, sb pily rthy-smth lst, mic x-fos tex, v calc, tr sltysh, n flor, tr stmg yel cut, n stn	LS: wh, tan, crm, sft-m grfm, sb pily rthy-smth lst, mic x-fos tex, v calc, tr sltysh, n flor, tr stmg yel cut, n stn	LS: wh, tan, crm, sft-m grfm, sb pily rthy-smth lst, mic x-fos tex, v calc, tr sltysh, n flor, tr stmg yel cut, n stn	LS: wh, tan, crm, sft-m grfm, sb pily rthy-smth lst, mic x-fos tex, v calc, tr sltysh, n flor, tr stmg yel cut, n stn
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MD: 7.949 TVD: 7.023.89 Inclination: 87.8 Azimuth: 356.8 VS: 1.021.52	MD: 7.981 TVD: 7.024.93 Inclination: 88.5 Azimuth: 356.7 VS: 1.053.19	MD: 8.013 TVD: 7.025.88 Inclination: 88.1 Azimuth: 357 VS: 1.084.88	MD: 8.044 TVD: 7.026.63 Inclination: 89.1 Azimuth: 357 VS: 1.115.59	MD: 8.076 TVD: 7.026.89 Inclination: 90 Azimuth: 357.2 VS: 1.147.3	MD: 8.108 TVD: 7.026.63 Inclination: 90.9 Azimuth: 357.9 VS: 1.179.05	MD: 8.139 TVD: 7.026.12 Inclination: 91 Azimuth: 357.5 VS: 1.209.82
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Out 47/9.6



LS: wh, tan, crm, sft-m gfrm, sb pily
rthy-smth lstr, mic xl-fos tex, v calc, vstr dism
pyr, SLTY SH: lt-m gy, sft, sb pily, rthy-grty
tex, sl calc, w/ occ carb lams, grdg to SH, n
flor, tr sting yel cut, n stn

LS: wh, tan, crm, sft-m gfrm, sb pily
rthy-smth lstr, mic xl-fos tex, v calc, vstr dism
pyr, SLTY SH: lt-m gy, sft, sb pily, rthy-grty
tex, sl calc, w/ occ carb lams, grdg to SH, n
flor, tr sting yel cut, n stn

LS: wh, tan, crm, sft-m gfrm, sb pily
rthy-smth lstr, mic xl-fos tex, v calc, vstr dism
pyr, SLTY SH: lt-m gy, sft, sb pily, rthy-grty
tex, sl calc, w/ occ carb lams, grdg to SH, n
flor, tr sting yel cut, n stn

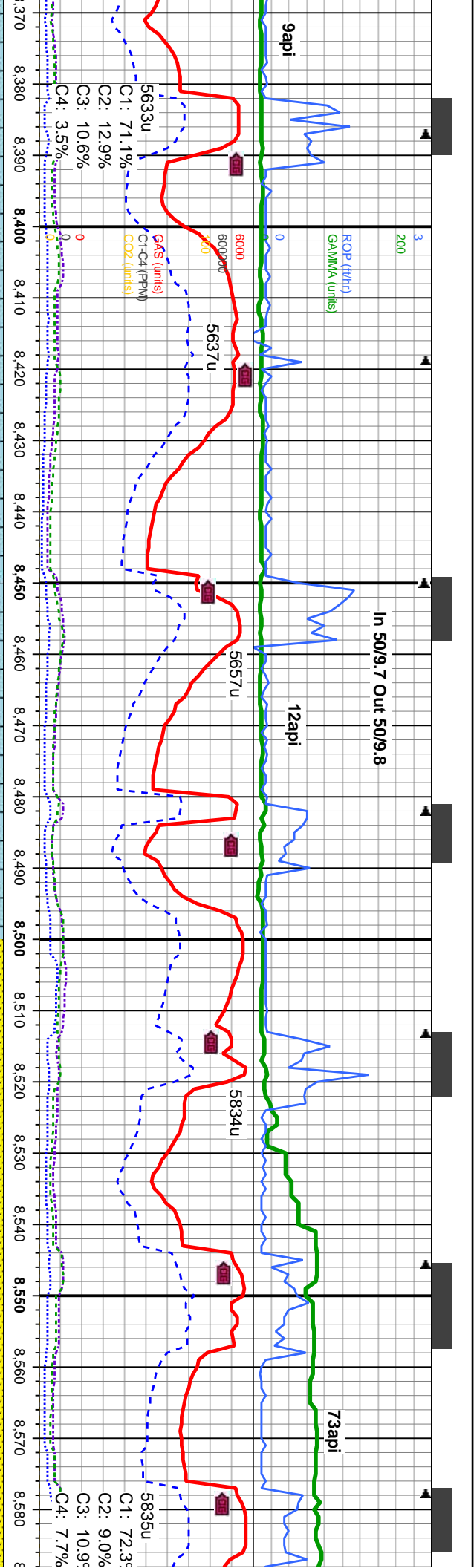
LS: wh, tan, crm, sft-m gfrm, sb pily
rthy-smth lstr, mic xl-fos tex, v calc, vstr dism
pyr, SLTY SH: lt-m gy, sft, sb pily, rthy-grty
tex, sl calc, w/ occ carb lams, grdg to SH, n
flor, tr sting yel cut, n stn

LS: wh, tan, crm, sft-m gfrm, sb pily
rthy-smth lstr, mic xl-fos tex, v calc, vstr dism
pyr, SLTY SH: lt-m gy, sft, sb pily, rthy-grty
tex, sl calc, w/ occ carb lams, grdg to SH, n
flor, tr sting yel cut, n stn

<< Top of Target Zone >>

MD: 8,171 TVD: 7,020.41 Inclination: 91.1 Azimuth: 357.7 VS: 1,241.98	MD: 8,202 TVD: 7,019.92 Inclination: 90.7 Azimuth: 358.8 VS: 1,272.78	MD: 8,234 TVD: 7,020.17 Inclination: 88.4 Azimuth: 358.8 VS: 1,304.6	MD: 8,298 TVD: 7,023.04 Inclination: 87.1 Azimuth: 358.2 VS: 1,368.12	MD: 8,330 TVD: 7,024.4 Inclination: 88 Azimuth: 358.1 VS: 1,399.88	MD: 8,362 TVD: 7,025.38 Inclination: 88.5 Azimuth: 357.7 VS: 1,431.64
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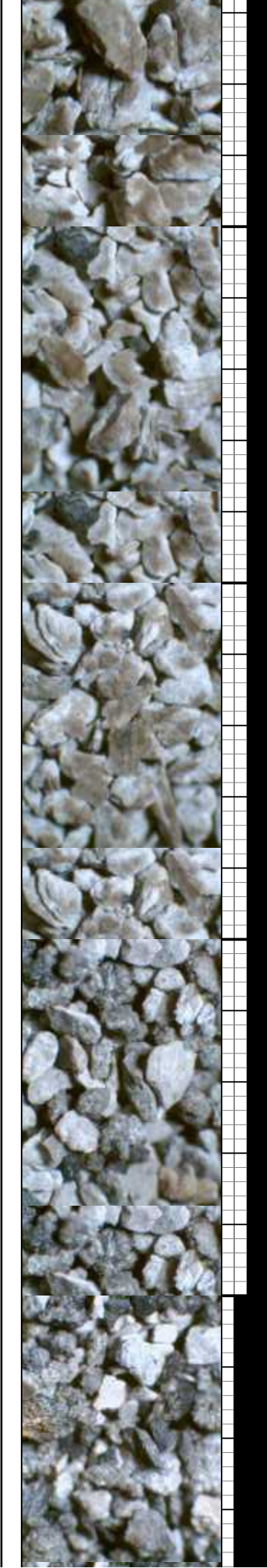
LS: wh, tan, crm, sft-m grfm, sb ply
rthy-smth lstr, mic xl-fos tex, v calc, tr stlysh,
n flor, tr sting yel cut, n stn

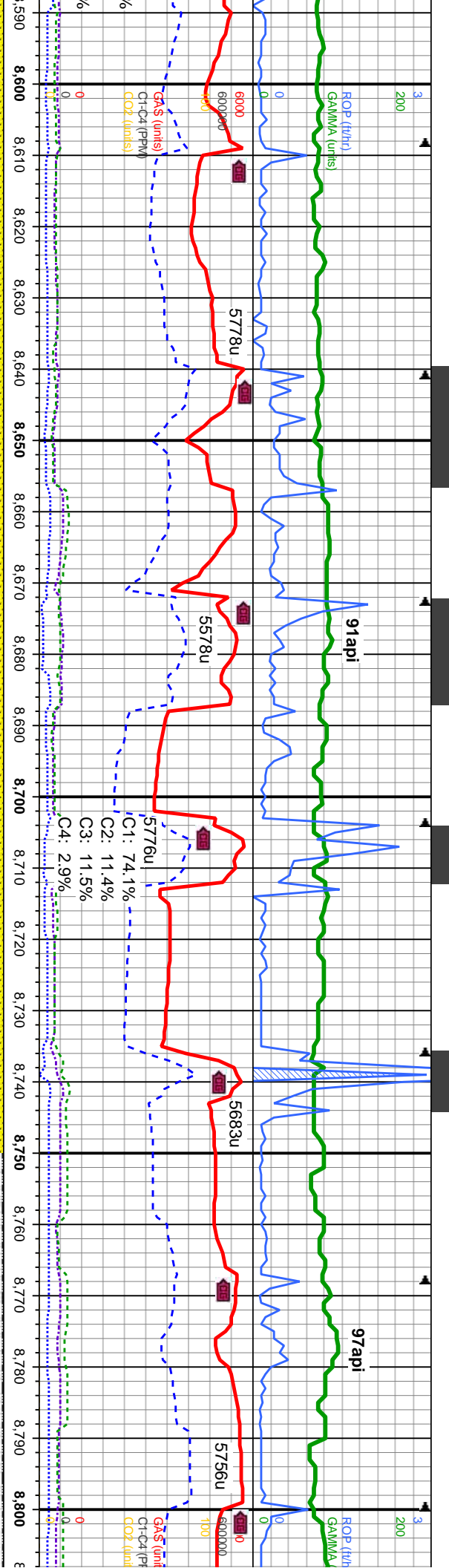
LS: wh, tan, crm, sft-m grfm, sb ply
rthy-smth lstr, mic xl-fos tex, v calc, tr stlysh,
MD,n flor, tr sting yel cut, n stn

SS: lt-m gy brn, trns, lrg transp qtz grn,
clusters, m-f gr, ang-sb rd, m-w strd, n calc,
tr - mod vis por; LS: wh, tan, crm, sft-m grfm,
sb ply rthy-smth lstr, mic xl-fos tex, v calc, tr
stlysh, tr diss pyr, n flor, tr sting yel cut, n
stin, vtr ss

SS: lt-med gy brn, trns, lrg tmsp qtz
clus, med-f gr, ang-sb rd, med-w str
mod por; LS: wh, tan, crm, sb ply, l
tex, v calc, tr stly sh, tr diss pyr, n
sting yel cut, no stn

MD: 8,393 TVD: 7,026.17 Inclination: 88.6 Azimuth: 357.7 VS: 1,462.4	MD: 8,425 TVD: 7,026.81 Inclination: 89.1 Azimuth: 357.2 VS: 1,494.14	MD: 8,488 TVD: 7,027.09 Inclination: 90.3 Azimuth: 358.1 VS: 1,556.66	MD: 8,520 TVD: 7,026.98 Inclination: 90.1 Azimuth: 358.1 VS: 1,568.44	MD: 8,552 TVD: 7,027.23 Inclination: 89 Azimuth: 358.9 VS: 1,620.25	MD: 8,584 TVD: 7,027.9 Inclination: 8 Azimuth: 358 VS: 1,652.07
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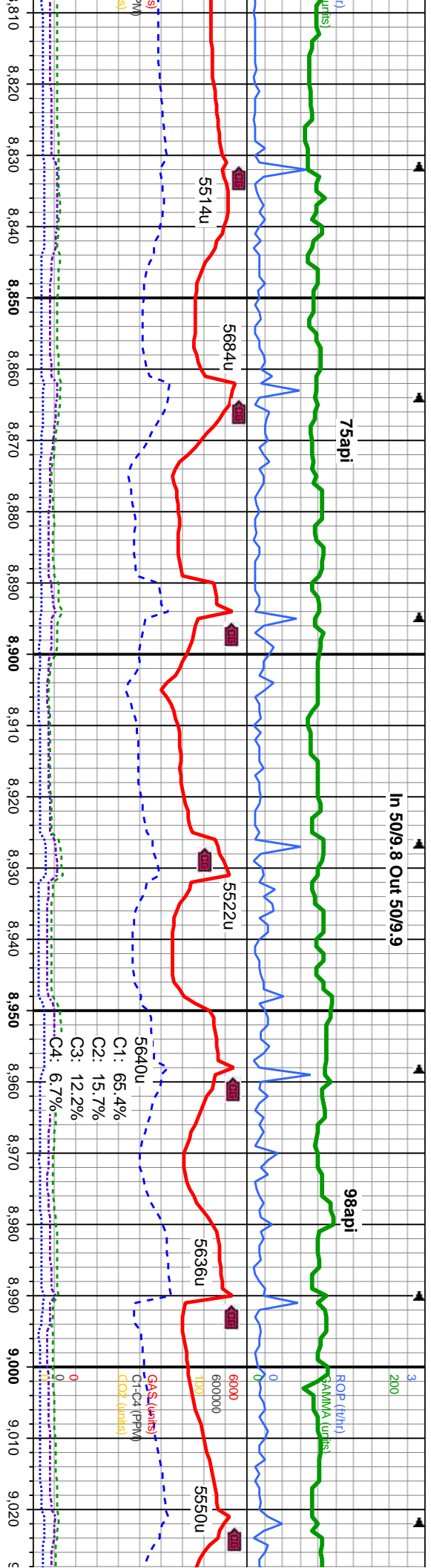




SS: lt-med gy brn, trns, lrg trns qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por. LS: wh, tan, crm, sb pily, mic xl-fos tex, v calc, tr silty sh, tr diss pyr, nTVD: 7.029.77, v calc, tr silty sh, tr diss pyr, no flor, tr sting yel cut, no sin	SS: lt-med gy brn, trns, lrg trns qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por. LS: wh, tan, crm, sb pily, mic xl-fos tex, v calc, tr silty sh, tr diss pyr, no flor, tr sting yel cut, no sin	SS: lt-med gy brn, trns, lrg trns qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por. SLTY SH: m-dkgy sft-fm, sbply-sbdkly, rthy & aren tex, occ lam, bioturb in part, tr pyr, sl calc; tr - mod vis por, g sting cut, mod brn sin.	SS: lt-med gy brn, trns, lrg trns qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por. SLTY SH: med-dk gy sft-fm, sb ply-sb blkly, rthy & aren tex, occ lam, bioturb in part, tr pyr, sl calc; tr - mod por, g sting cut, mod brn sin.	SS: lt-med gy brn, trns, lrg trns qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por. SLTY SH: med-dk gy sft-fm, sb ply-sb blkly, rthy & aren tex, occ lam, bioturb in part, tr pyr, sl calc; tr - mod por, g sting cut, mod brn sin.
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MD: 8.616 TVD: 7.028.87 Inclination: 88.3 Azimuth: 358.4 VS: 1.683.86	MD: 8.679 TVD: 7.030.74 Inclination: 88.1 Azimuth: 0.9 VS: 1.746.55	MD: 8.711 TVD: 7.031.61 Inclination: 88.8 Azimuth: 1.8 VS: 1.778.49	MD: 8.743 TVD: 7.032.17 Inclination: 89.2 Azimuth: 2.1 VS: 1.810.44	MD: 8.774 TVD: 7.032.57 Inclination: 89.3 Azimuth: 2.3 VS: 1.841.41	MD: 8.80 TVD: 7.033.00 Inclination: 89.3 Azimuth: 2.3 VS: 1.872.00
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med gy brn, trns, lrg tmsp qtz gm, med-f gr, ang-sb rd, med-w strd, tr - mod por; SLTY SH: med-dk gy sft-fim, sb biky, rthy & aren tex, occ lam, bioturb in part, tr pyr, sl calc; tr - mod por, g string cut, mod brn str.

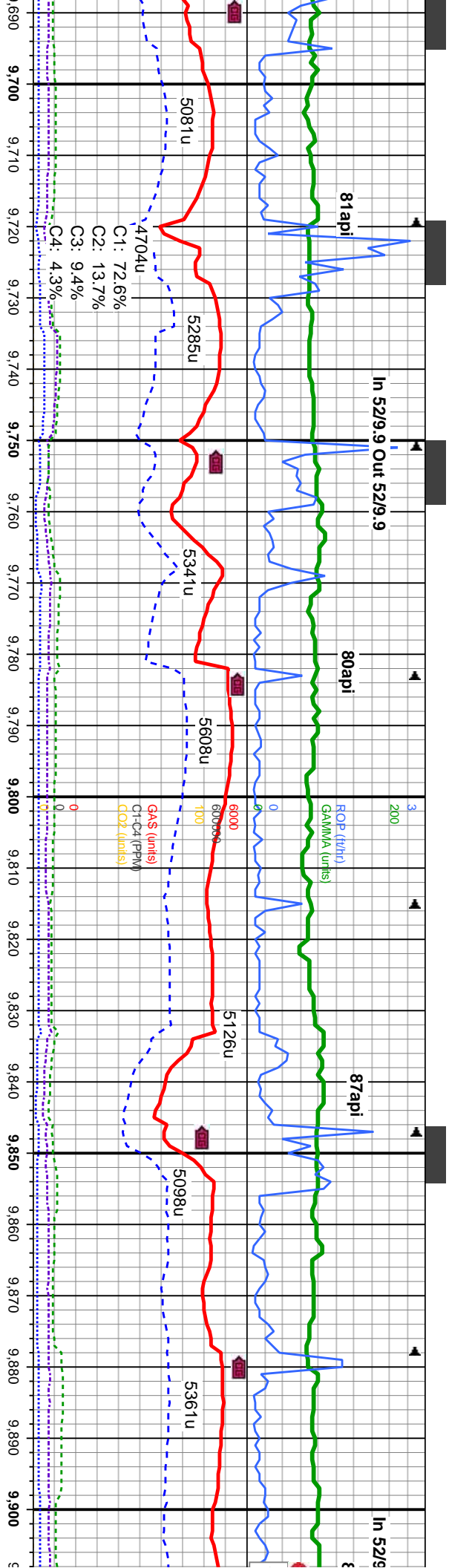
SS: lt-med gy brn, trns, lrg tmsp qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por; SLTY SH: med-dk gy sft-fim, sb pty-sb biky, rthy & aren tex, occ lam, bioturb in part, tr pyr, sl calc; tr - mod por, g string cut, mod brn str.

SS: lt-med gy brn, trns, lrg tmsp qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por; SLTY SH: med-dk gy sft-fim, sb pty-sb biky, rthy & aren tex, occ lam, bioturb in part, tr pyr, sl calc; tr - mod por, g string cut, mod brn str.

SS: lt-med gy brn, trns, lrg tmsp qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por; SLTY SH: med-dk gy sft-fim, sb pty-sb biky, rthy & aren tex, occ lam, bioturb in part, tr pyr, sl calc; tr - mod por, g string cut, mod brn str.

MD: 8,838 TVD: 7,033.24 Inclination: 89.3 Azimuth: 0.9 VS: 1,905.32	MD: 8,870 TVD: 7,033.64 Inclination: 89.3 Azimuth: 0.9 VS: 1,937.25	MD: 8,901 TVD: 7,033.93 Inclination: 89.6 Azimuth: 1 VS: 1,968.18	MD: 8,933 TVD: 7,034.1 Inclination: 89.8 Azimuth: 1.2 VS: 2,000.11	MD: 8,965 TVD: 7,034.16 Inclination: 90 Azimuth: 1.2 VS: 2,032.05	MD: 8,996 TVD: 7,034.18 Inclination: 89.9 Azimuth: 1.4 VS: 2,063	MD: 9,024 TVD: 7,034.18 Inclination: 89.9 Azimuth: 1.4 VS: 2,094
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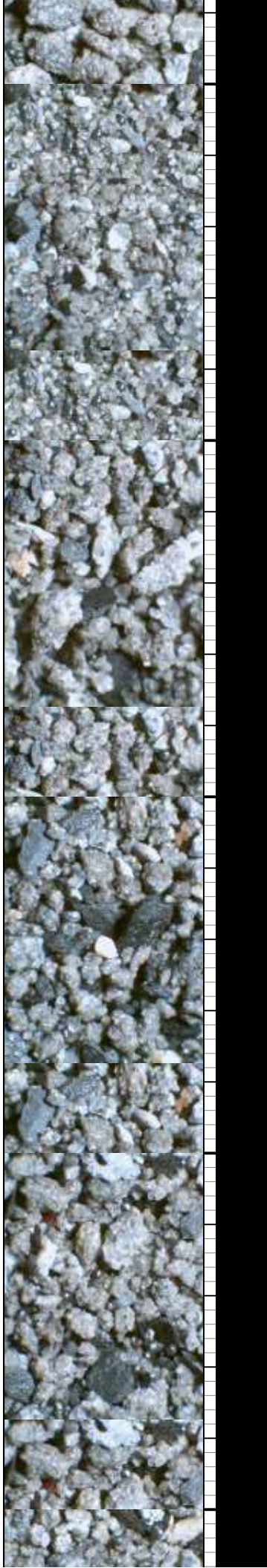
SS: lt-med gy brn, trns, lrg trns qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por, occ siltysh, g stng cut, mod brn stn.

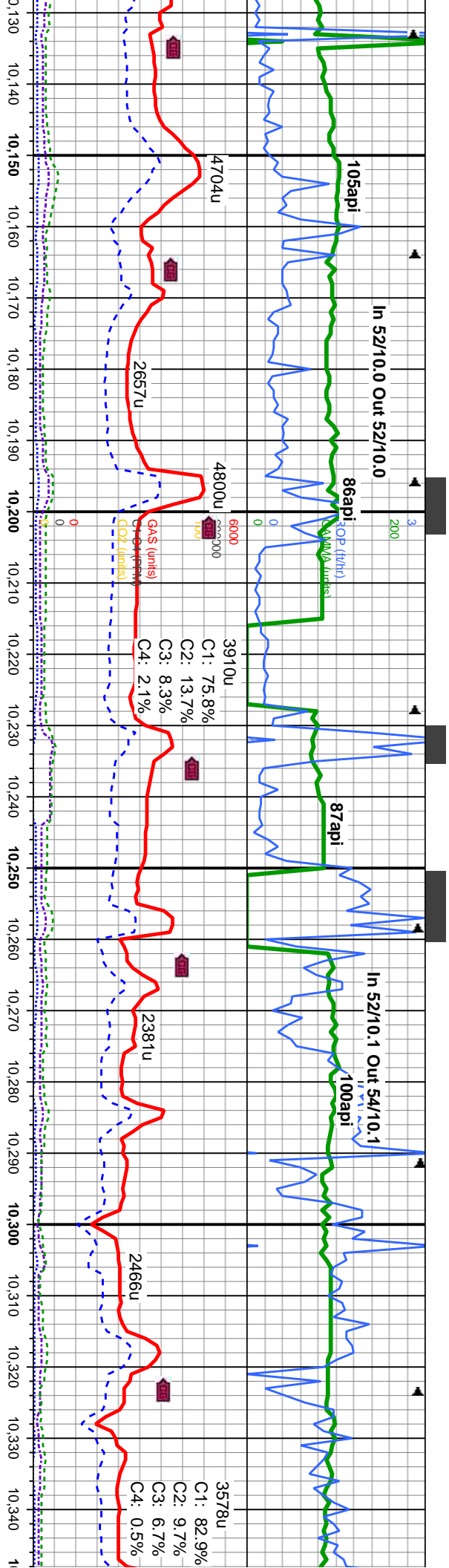
SS: lt-med gy brn, trns, lrg trns qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por, occ siltysh, g stng cut, mod brn stn.

SS: lt-med gy brn, trns, lrg trns qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por, occ siltysh, g stng cut, mod brn stn.

SS: lt-med gy brn, trns, lrg trns qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por, occ siltysh, g stng cut, mod brn stn.

MD: 9.694 TVD: 7.032.54 Inclination: 90 Azimuth: 0.2 VS: 2.759.83	MD: 9.726 TVD: 7.032.74 Inclination: 89.3 Azimuth: 0.9 VS: 2.791.74	MD: 9.758 TVD: 7.033.35 Inclination: 88.5 Azimuth: 0.9 VS: 2.823.67	MD: 9.790 TVD: 7.034.25 Inclination: 88.3 Azimuth: 1 VS: 2.865.58	MD: 9.821 TVD: 7.035.17 Inclination: 88.3 Azimuth: 0.5 VS: 2.886.5	MD: 9.853 TVD: 7.035.92 Inclination: 89 Azimuth: 1.2 VS: 2.918.41	MD: 9.885 TVD: 7.036.39 Inclination: 89.3 Azimuth: 1.6 VS: 2.950.36
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g trnsf qtz gm,
med-w strd, tr -
g cut, mod brn

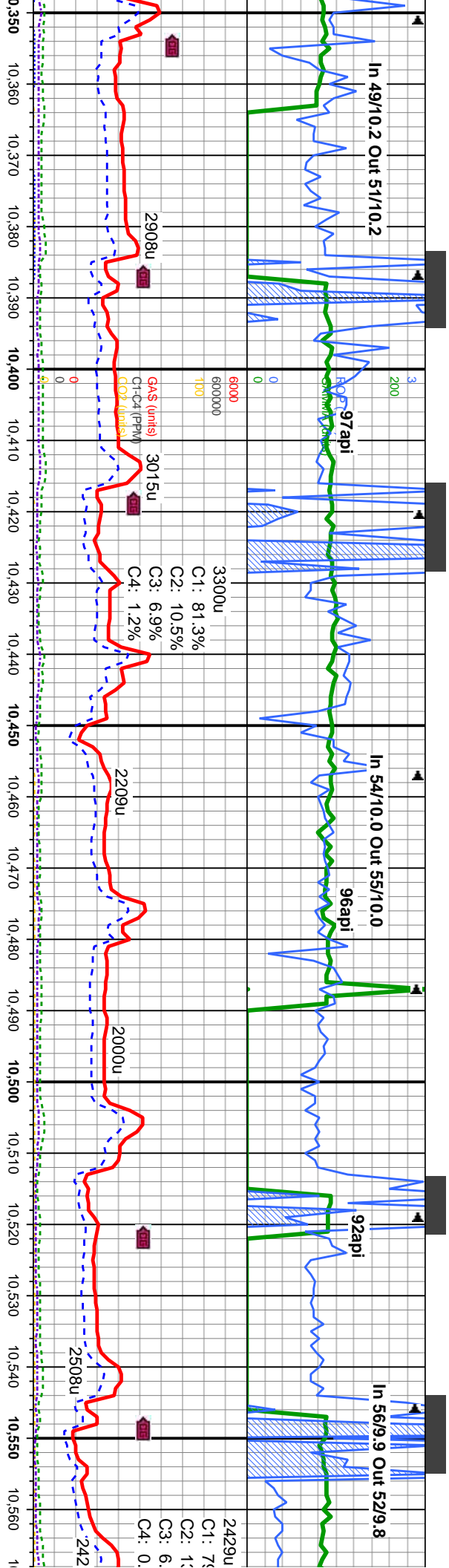
SS: lt-med gy brn, trnsf, lrg trnsf qtz gm,
clus, med-f gr, ang-sb rd, med-w strd, tr -
mod por, occ sltsh, g string cut, mod brn
stn.

SS: lt-med gy brn, trnsf, lrg trnsf qtz gm,
clus, med-f gr, ang-sb rd, med-w strd, tr -
mod por; SLTY SH: med-dk gy sft-firm, sb
ply-sb blkky, rthy & v aren tex, occ lam, g
string cut, mod brn stn.

SS: lt-med gy brn, trnsf, lrg trnsf qtz gm,
clus, med-f gr, ang-sb rd, med-w strd, tr -
mod por; SLTY SH: med-dk gy sft-firm, sb
ply-sb blkky, rthy & v aren tex, occ lam, g
string cut, mod brn stn.

MD: 10.139 TVD: 7.038.38 Inclination: 90.7 Azimuth: 1.4 VS: 3.203.98	MD: 10.170 TVD: 7.038 Inclination: 90.7 Azimuth: 1.2 VS: 3.234.92	MD: 10.202 TVD: 7.037.66 Inclination: 90.5 Azimuth: 1 VS: 3.266.85	MD: 10.234 TVD: 7.037.66 Inclination: 89.5 Azimuth: 0.7 VS: 3.298.78	MD: 10.265 TVD: 7.038.07 Inclination: 89 Azimuth: 0.7 VS: 3.329.7	MD: 10.297 TVD: 7.038.65 Inclination: 88.9 Azimuth: 0.3 VS: 3.361.61	MD: 10.329 TVD: 7.039.16 Inclination: 89.3 Azimuth: 0.9 VS: 3.393.52
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SS: lt-med gy brn, trns, lrg trns qtz grn, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por; SLTY SH: med-dk gy sft-frm, sb ply-sb blk, rthy & v aren tex, occ lam, g sting cut, mod brn stn.

SS: lt-med gy brn, trns, lrg trns qtz grn, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por; SLTY SH: med-dk gy sft-frm, sb ply-sb blk, rthy & v aren tex, occ lam, g sting cut, mod brn stn.

SS: lt-med gy brn, trns, lrg trns qtz grn, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por; SLTY SH: med-dk gy sft-frm, sb ply-sb blk, rthy & v aren tex, occ lam, g sting cut, mod brn stn.

SS: lt-med gy brn, trns, lrg trns qtz grn, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por; SLTY SH: med-dk gy sft-frm, sb ply-sb blk, rthy & v aren tex, occ lam, g sting cut, mod brn stn.

SS: lt-med gy brn, trns, lrg trns qtz grn, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por; SLTY SH: med-dk gy sft-frm, sb ply-sb blk, rthy & v aren tex, occ lam, g sting cut, mod brn stn.

MD: 10.361
TVD: 7.039.49
Inclination: 89.5
Azimuth: 1.2
VS: 3.425.45

MD: 10.383
TVD: 7.039.63
Inclination: 90
Azimuth: 0.9
VS: 3.457.39

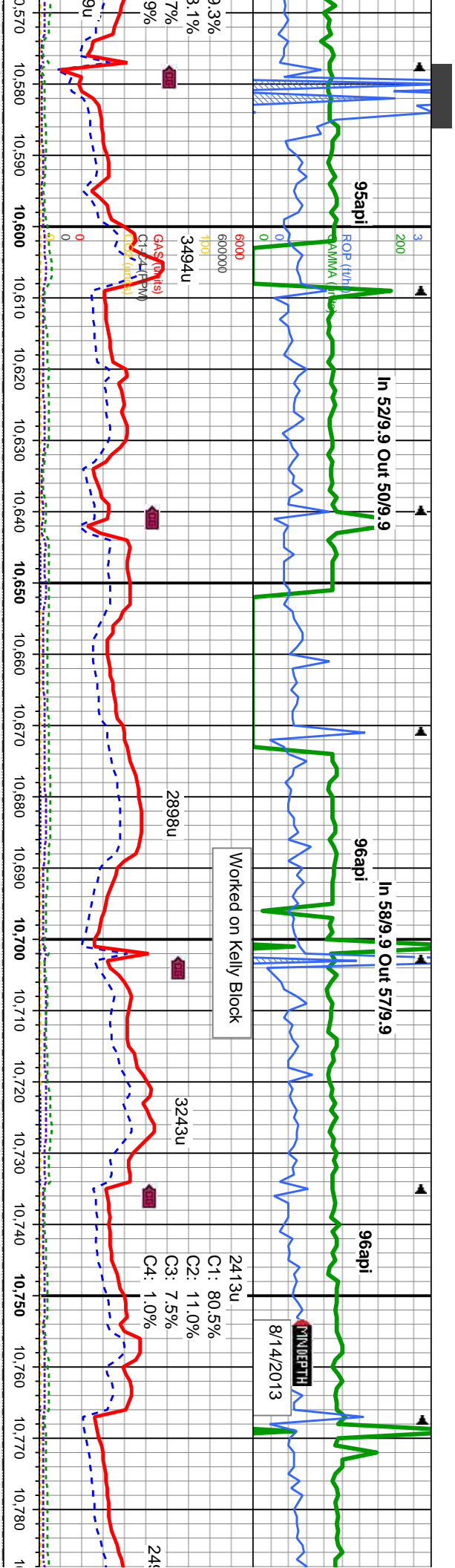
MD: 10.424
TVD: 7.039.44
Inclination: 90.7
Azimuth: 0.3
VS: 3.488.31

MD: 10.488
TVD: 7.037.94
Inclination: 91.9
Azimuth: 359.6
VS: 3.552.06

MD: 10.520
TVD: 7.036.93
Inclination: 91.7
Azimuth: 359.5
VS: 3.583.91

MD: 10.551
TVD: 7.036.15
Inclination: 91.2
Azimuth: 359.8
VS: 3.614.78





6970

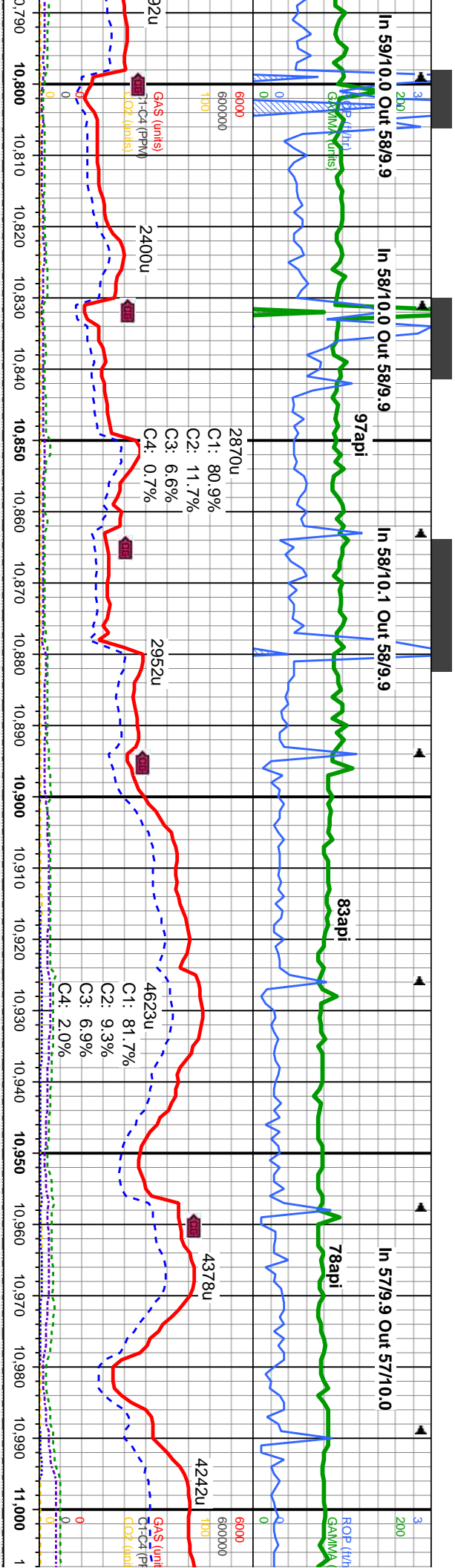
SS: lt-med gy brn, trns, lrg trns qtz grn, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por, SLTY SH: med-dk gy sft-frm, sb ply-sb blk, rthy & v aren tex, occ lam, g string cut, mod brn stn.

SS: lt-med gy brn, trns, lrg trns qtz grn, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por, SLTY SH: med-dk gy sft-frm, sb ply-sb blk, rthy & v aren tex, occ lam, g string cut, mod brn stn.

SS: lt-med gy brn, trns, lrg trns qtz grn, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por, SLTY SH: med-dk gy sft-frm, sb ply-sb blk, rthy & v aren tex, occ lam, g string cut, mod brn stn.

MD: 10.583 TVD: 7.035.67 Inclination: 90.5 Azimuth: 358.8 VS: 3.646.63	MD: 10.615 TVD: 7.035.34 Inclination: 90.7 Azimuth: 358.6 VS: 3.678.46	MD: 10.647 TVD: 7.034.94 Inclination: 90.7 Azimuth: 358.4 VS: 3.710.26	MD: 10.678 TVD: 7.034.73 Inclination: 90.1 Azimuth: 357.9 VS: 3.741.06	MD: 10.710 TVD: 7.034.7 Inclination: 90 Azimuth: 358.4 VS: 3.772.85	MD: 10.742 TVD: 7.034.7 Inclination: 90 Azimuth: 358.1 VS: 3.804.65	MD: 10.774 TVD: 7.034.7 Inclination: 90 Azimuth: 357.7 VS: 3.836.42
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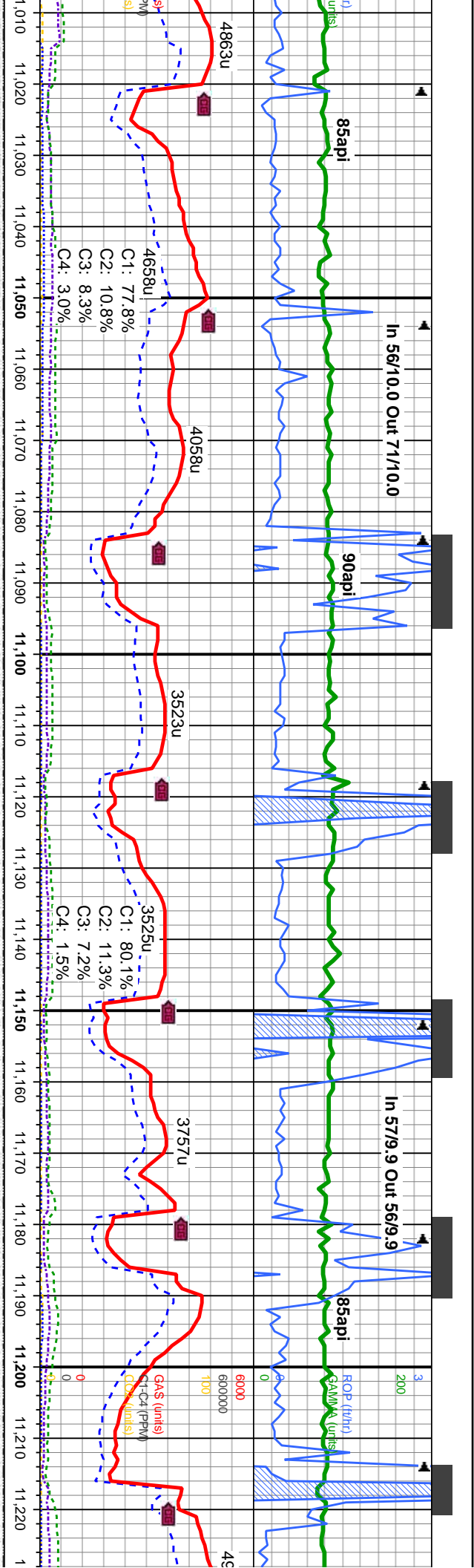
6970
SS: lt-med gy brn, trns, lrg tmsp qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr-mod por; SLTY SH: med-dk gy sft-firm, sb ply-sb blkly, rthy & v aren tex, occ lam, g stmg cut, mod brn str.

6970
SS: lt-med gy brn, trns, lrg tmsp qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr-mod por; SLTY SH: med-dk gy sft-firm, sb ply-sb blkly, rthy & v aren tex, occ lam, g stmg cut, mod brn str.

6970
SS: lt-med gy brn, trns, lrg tmsp qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr-mod por; SLTY SH: med-dk gy sft-firm, sb ply-sb blkly, rthy & v aren tex, occ lam, g stmg cut, mod brn str.

<<< Base of Target Zone >>>			
MD: 10.805 TVD: 7.034.56 Inclination: 90.5 Azimuth: 358.4 VS: 3.867.21	MD: 10.837 TVD: 7.034.15 Inclination: 91 Azimuth: 358.6 VS: 3.899.02	MD: 10.869 TVD: 7.032.86 Inclination: 91.2 Azimuth: 359.1 VS: 3.962.68	MD: 10.932 TVD: 7.032.16 Inclination: 91.4 Azimuth: 359.1 VS: 3.993.53
MD: 10.964 TVD: 7.031.35 Inclination: 91.5 Azimuth: 359.1 VS: 4.025.36	MD: 10.996 TVD: 7.030.51 Inclination: 91.5 Azimuth: 358.8 VS: 4.057.19		





med gy brn, trns, lrg trns qtz grn, med-f gr, ang-sb rd, med-w strd, tr - mod por; SLTY SH: med-dk gy sft-frm, sb ply-sb blk, rthy & v aren tex, occ lam, g stng cut, mod brn sin.

SS: lt-med gy brn, trns, lrg trns qtz grn, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por; SLTY SH: med-dk gy sft-frm, sb ply-sb blk, rthy & v aren tex, occ lam, g stng cut, mod brn sin.

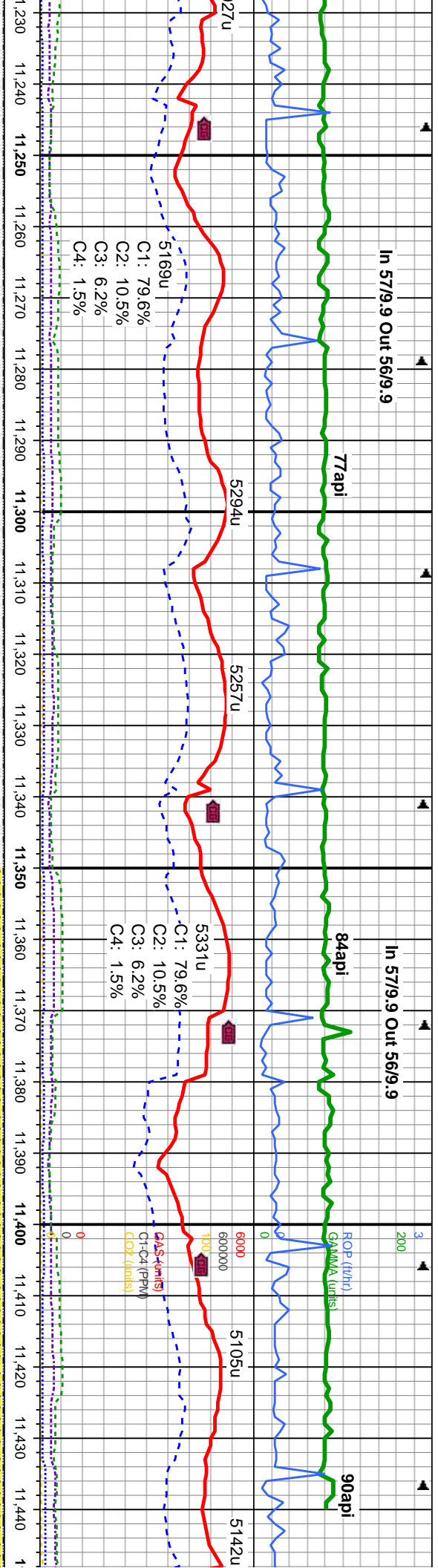
SS: lt-med gy brn, trns, lrg trns qtz grn, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por; SLTY SH: med-dk gy sft-frm, sb ply-sb blk, rthy & v aren tex, occ lam, g stng cut, mod brn sin.

SS: lt-med gy brn, trns, lrg trns qtz grn, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por; SLTY SH: med-dk gy sft-frm, sb ply-sb blk, rthy & v aren tex, occ lam, g stng cut, mod brn sin.

SS: lt-med gy brn, trns, lrg trns qtz grn, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por; SLTY SH: med-dk gy sft-frm, sb ply-sb blk, rthy & v aren tex, occ lam, g stng cut, mod brn sin.

MD: 11.028 TVD: 7.029.67 Inclination: 91.5 Azimuth: 358.6 VS: 4.089	MD: 11.060 TVD: 7.028.89 Inclination: 91.3 Azimuth: 358.1 VS: 4.120.79	MD: 11.092 TVD: 7.028.17 Inclination: 91.3 Azimuth: 358.8 VS: 4.152.59	MD: 11.123 TVD: 7.027.68 Inclination: 90.5 Azimuth: 359.3 VS: 4.183.44	MD: 11.155 TVD: 7.027.57 Inclination: 89.9 Azimuth: 359.8 VS: 4.215.31	MD: 11.187 TVD: 7.027.62 Inclination: 89.9 Azimuth: 0.3 VS: 4.247.2	MD: 11.219 TVD: 7.027.79 Inclination: 89.5 Azimuth: 1.4 VS: 4.279.13
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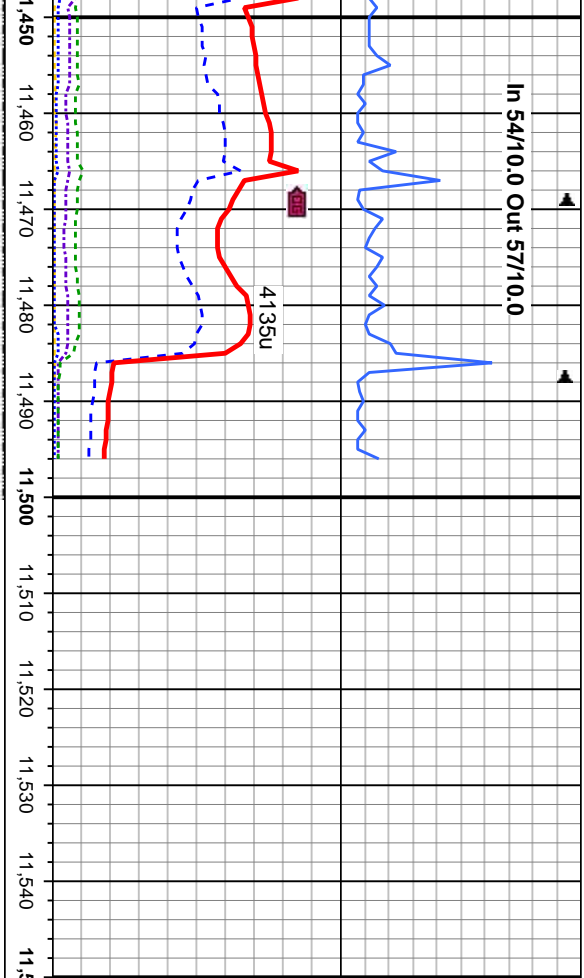
SS: lt-med gy brn, trns, lrg trns qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr-mod por; SLTY SH: med-dk gy sft-frm, sb ply-sb blkly, rthy & v aren tex, occ lam, g sting cut, mod brn stn.

SS: lt-med gy brn, trns, lrg trns qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr-mod por; SLTY SH: med-dk gy sft-frm, sb ply-sb blkly, rthy & v aren tex, occ lam, g sting cut, mod brn stn.

SS: lt-med gy brn, trns, lrg trns qtz gm, clus, med-f gr, ang-sb rd, med-w strd, tr-mod por; SLTY SH: med-dk gy sft-frm, sb ply-sb blkly, rthy & v aren tex, occ lam, g sting cut, mod brn stn.

MD: 11,251 TVD: 7,028.01 Inclination: 89.7 Azimuth: 1.2 VS: 4,311.07	MD: 11,283 TVD: 7,028.18 Inclination: 89.7 Azimuth: 1.2 VS: 4,343.01	MD: 11,314 TVD: 7,028.26 Inclination: 90 Azimuth: 1.4 VS: 4,373.95	MD: 11,346 TVD: 7,028.23 Inclination: 90.1 Azimuth: 1.4 VS: 4,405.9	MD: 11,378 TVD: 7,028.21 Inclination: 90 Azimuth: 1.4 VS: 4,437.85	MD: 11,409 TVD: 7,028.21 Inclination: 90 Azimuth: 1.2 VS: 4,468.79	MD: 11,440 TVD: 7,028.21 Inclination: 90 Azimuth: 1.2 VS: 4,505
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SS: lt-med gy brn, tmsl, lng trnsp qtz grn, clus, med-f gr, ang-sb rd, med-w strd, tr - mod por, SLTY SH: med-dk gy sft-fm, sb ply-sb blkly, rthy & v aren tex, occ lam, g string cut, mod brn str.

TD 11502' MD
@15:01 8/14/2013

Thank You For Using
Columbine Logging Inc.

Projection to Bit

MD: 11,502'
TVD: 7,028.08'
Inclination: 90.1°
Azimuth: 1.6°
VS: 4,561.65'

