



Scale: 5" / 100'
Measured Depth Log

Well Name Switchman 1647-17-11-H_HORZ

Location SWSW Sec17, T16S, R47W

State COLORADO

Country USA

API Number 0501707777

Region LAS ANIMAS ARCH

Spud Date 1/6/2014

Surface Coordinates 350' FSL / 600' FWL

Bottom Hole Coordinates 650' FSL / 700'FWL

County CHEYENNE

Rig Number PIONEER 54

AFE # 2085288

Field WILDCAT

Drilling Completed 1/23/2014

Ground Elevation 4185'

K.B. Elevation 4204'

Logged Interval 5040' **To** 9230'

Total Depth 9230'

Formation SPERGEN

Type of Drilling Fluid FRESH WATER

Company Anadarko Petro
Address 1099 18th St. S
Denver, CO 802

Name Mark Lehrer
Company Anadarko Petro
Address 1099 18th St. S
Denver, CO 802

Wellsite Geologist

Operator

leum

uite 1800
202

Geologist

leum

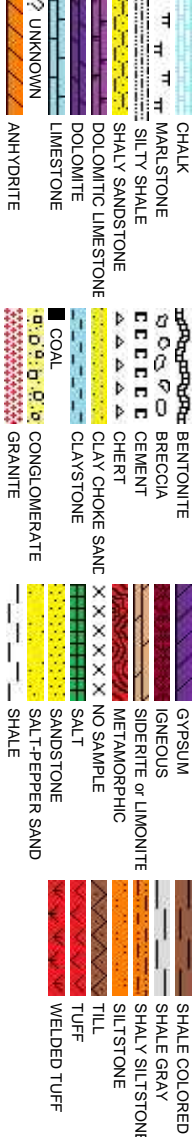
uite 1800
202

Other

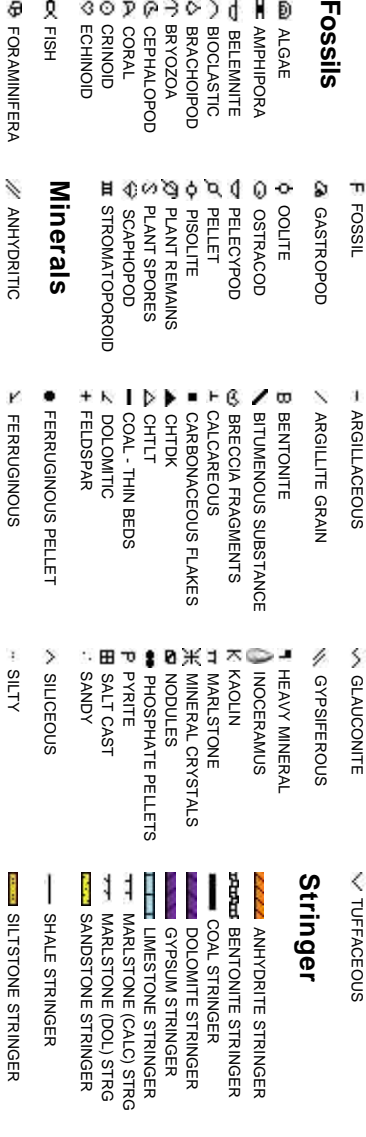
Jason Lubniewski
Ryan Sullivan
John Winerth

Columbine Logging Inc.
2385 S. Lipan St.
Denver, CO 80223






















































Rock Types



Accessories



Other Symbols

Oil Show	 ORGANIC	 FORMATION TOP	Rounding	 L LITHOGRAPHIC
 PINPOINT		 GAS SHOW		 M _X MICROXIN
 DEAD	 VUGGY	 MN DEPTH	 A ANGULAR	 M _S MUDDSTONE
 EVEN	 QUESTIONABLE	 NORMAL FAULT	 R ROUNDED	 P _S PACKSTONE
 SPOTTED STAINING	 BIT	 OIL SHOW	 B SUBANG	 M _S WACKESTONE
	 OVERTURNED STRATA	 REVERSE FAULT	 P SUBRND	
Porosity	 CONNECTION (DOWN)	 SIDEWALL CORE (LEFT)	Textures	Sorting
 CONNECTION (LEFT)	 CONNECTION (RIGHT)	 SIDEWALL CORE (RIGHT)	 B _S BOUNDSTONE	 M MODERATE
 E EARTHY	 FENESTRAL	 SLIDE	 C CHALKY	 P POOR
 F FRACTURE	 CORE - LOST	 SURVEY	 C _X CRYPTOXIN	 W WELL
 INTERCRYSTALLINE	 CORE - RECOVERED	 TRIP GAS	 E EARTHY	
 INTEROOLITIC	 DST INTERVAL	 WIRELINE TESTED - LEFT	 F _X FINELYXIN	
 MOLDIC	 FAULT	 WIRELINE TESTED - RT	 B _S GRAINSTONE	

Slide/Rotate

ROP

ROP

Total Gas & Chromatograph

GAS

C1

C2

C3

C4

Depth Labels

% Lith

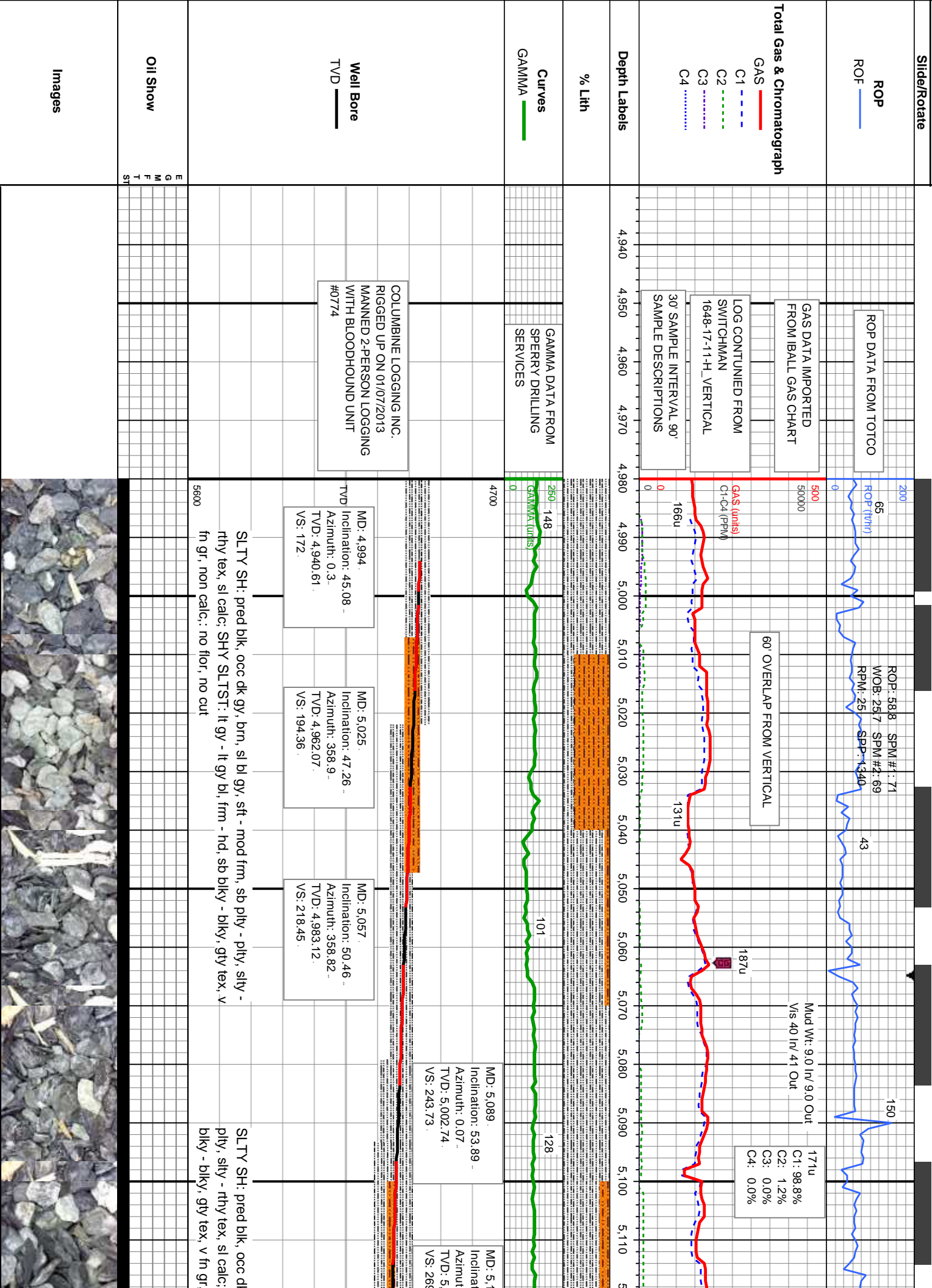
Curves

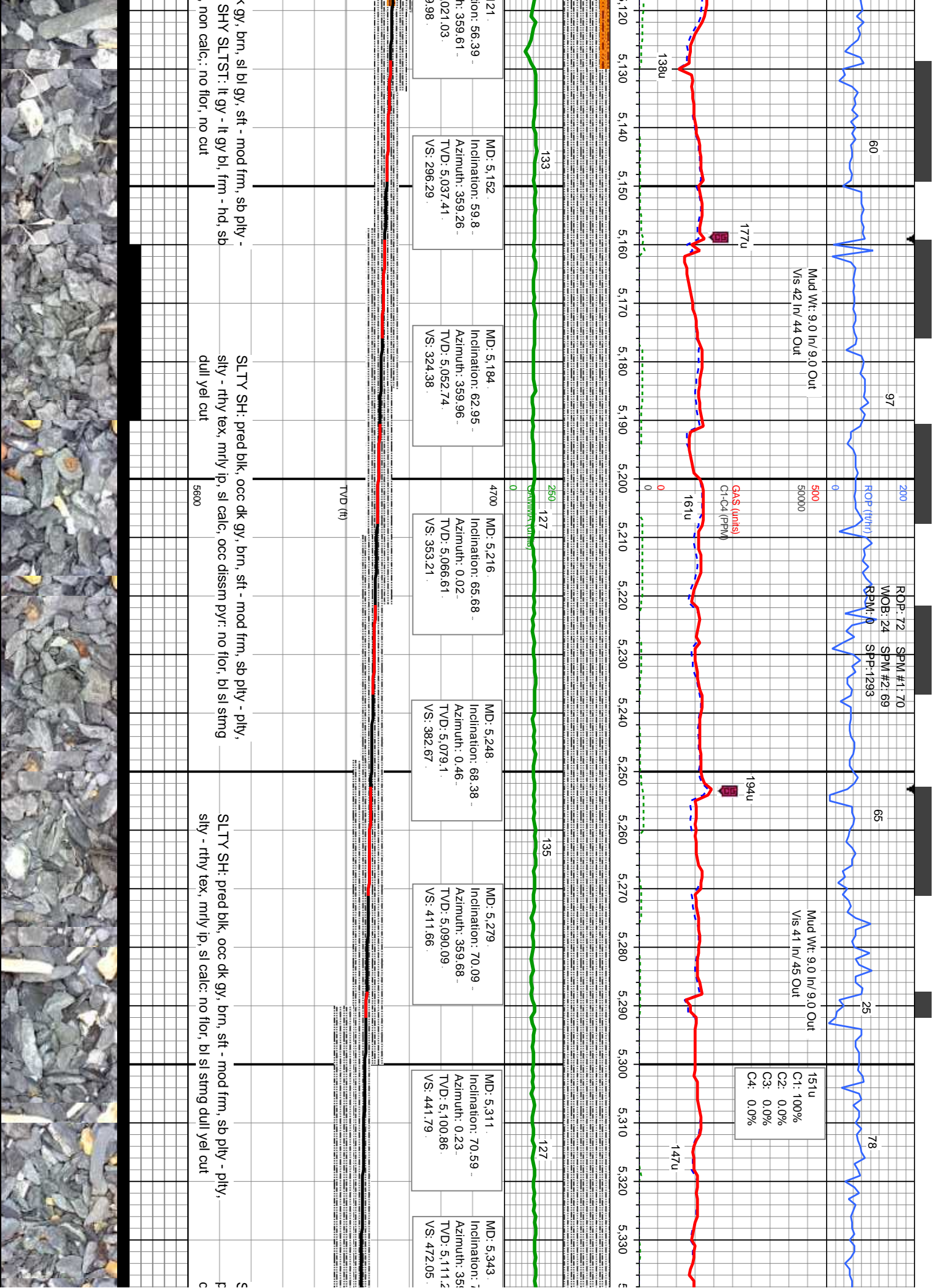
GAMMA

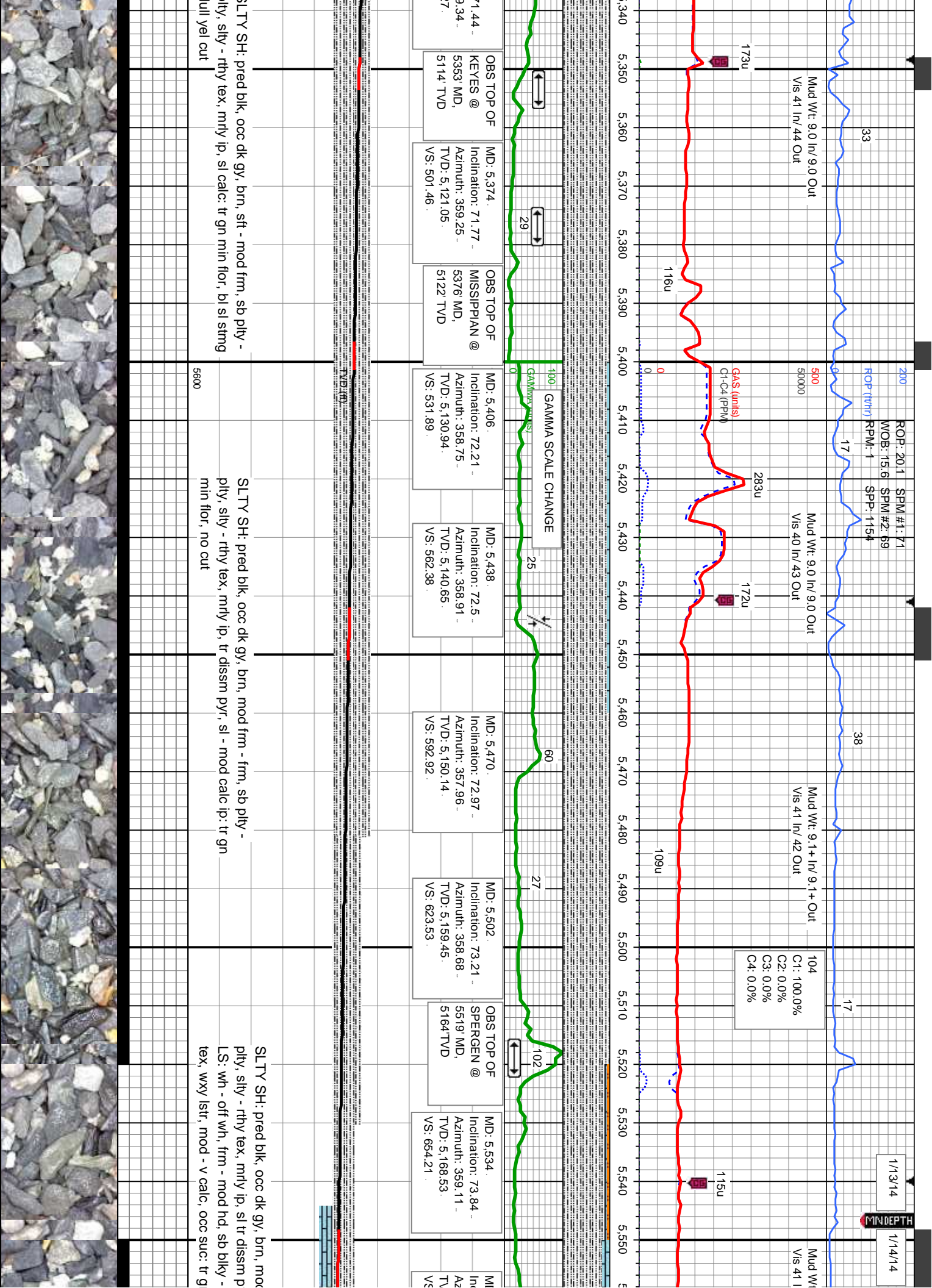
Well Bore
TVD

Oil Show

Images







200 ROP: 20.3 SFM #1: 7.1
WOB: 25.1 SFM #2: 69
ROP (RPM): 26 SP: 1264
1/14/14 1/16/14
MINDEPTH
1/16/14 1/17/14

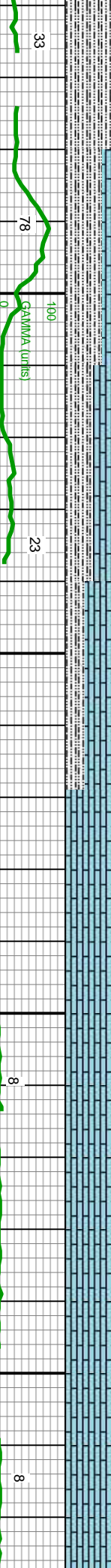
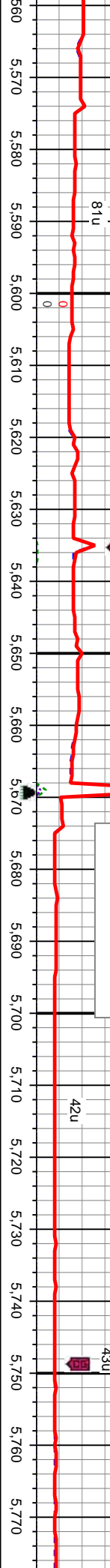
9.1 in/ 9.1+ Out
MUD DATA (5574)
MW 9.1 / EV 42
PV 12 / YP 11
API FL N/A
Sand 0.5%
pH 8.7
Cl- 2300 / Ca++ 440

TD CURVE @ 5669 MD
1/14/2013 @ 11:44MST
RESUME DRILLING @
12:10 MST ON 1/16/14

TOOH FOR
DIRECTIONAL
TOOLS @
5684 MD
43u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

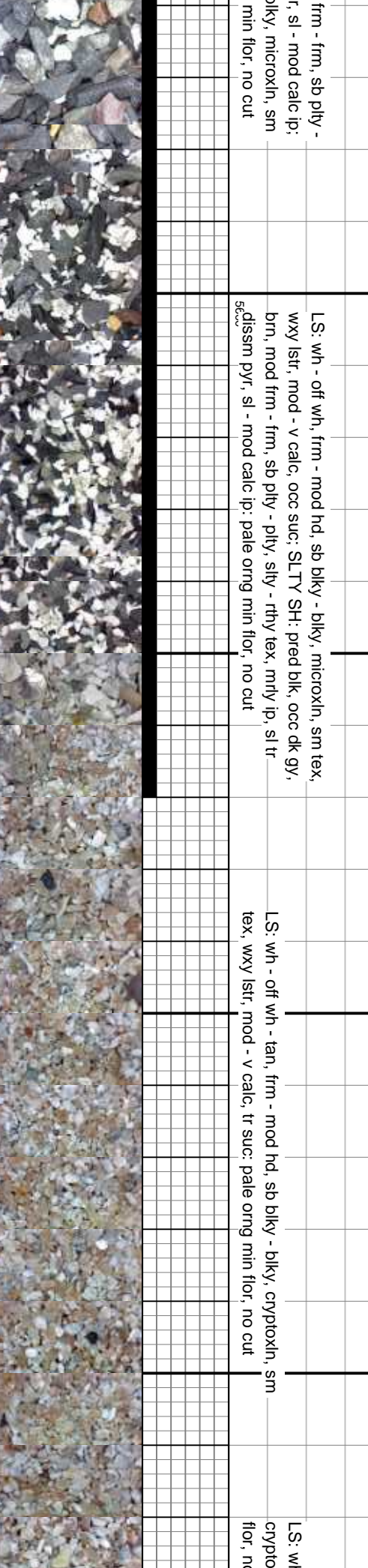
Mud Wt: 8.7+ in/ 8.8 Out
Vis 43 in/ 42 Out
MUD DATA (5754)
MW 8.75 / EV 40
PV 10 / YP 10
API FL N/A
Sand 0.5%
pH 10.5
Cl- 1800 / Ca++ 380

Mud Wt: 8.7+ in/ 8.8 Out
Vis 42 in/ 43 Out



33 78 23 29 31 20 8
D: 5.565
Inclination: 76.88 -
Azimuth: 359.81 -
TVD: 5.176.36
VS: 684.19
MD: 5.597
Inclination: 79.77 -
Azimuth: 0.25 -
TVD: 5.182.83
VS: 715.53
MD: 5.629
Inclination: 82.7 -
Azimuth: 0.84 -
TVD: 5.187.71
VS: 747.15
Bit Data
Bit #: 3
Type: SDI513
Size: 6.12"
Depth In: 5.669'
S/N: JH3197
MD: 5.714
Inclination: 85.98 -
Azimuth: 0.29 -
TVD: 5.196.09
VS: 120.91
MD: 5.745
Inclination: 86.54 -
Azimuth: 0.32 -
TVD: 5.198.11
VS: 121.08
MD: 5.776
Inclination: 88 -
Azimuth: 0.5 -
TVD: 5.199.58
VS: 121.29

42Ca/20Mg 50Ca/30Mg 67Ca/20Mg 64Ca/23Mg
Casing Set AT 5667 MD
L.S: wh - off wh, frm - mod hd, sb blk - blk, microxln, sm tex, wxy lstr, mod - v calc, occ suc; SLTY SH: pried blk, occ dk gy, brn, mod frm - frm, sb ply - ply, slty - tthy tex, mnty ip, sl tr
L.S: wh - off wh - tan, frm - mod hd, sb blk - blk, cryptoxln, sm tex, wxy lstr, mod - v calc, tr suc: pale orng min flr, no cut
L.S: wh - frm, sb ply - wxy, sl - mod calc ip, blk, microxln, sm - mod calc ip, pale orng min flr, no cut



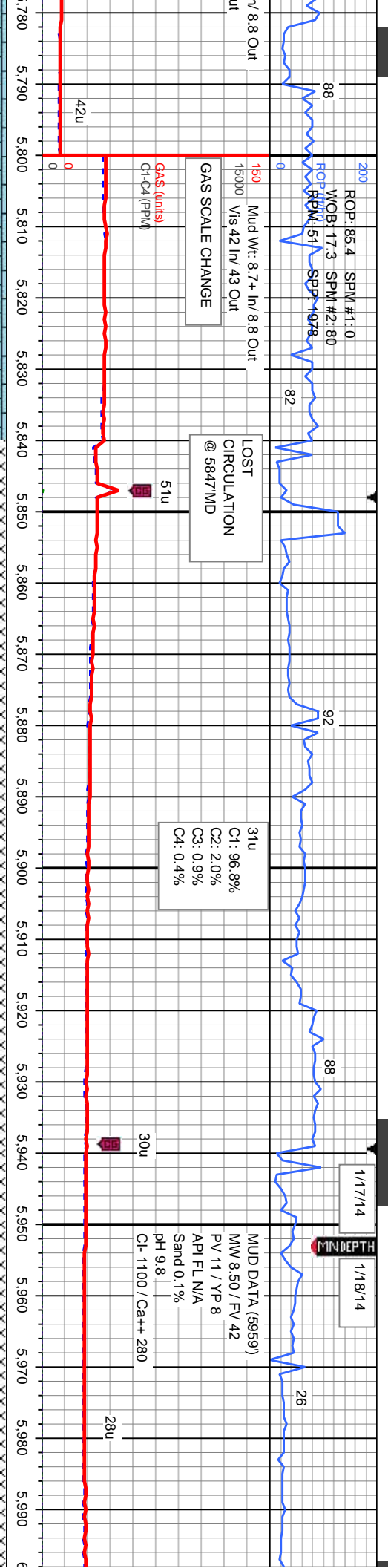
ROP: 85.4 SPM #1:0
MOB: 17.3 SPM #2: 80
ROP: 110.51 SPM #3: 1978

GAS SCALE CHANGE
Mud Wt: 8.7+ In/ 8.8 Out
Vis 42 In/ 43 Out

LOST
CIRCULATION
@ 5847 MD

31u
C1: 96.8%
C2: 2.0%
C3: 0.9%
C4: 0.4%

MUD DATA (5959)
MW 8.50 / FV 42
PV 11 / YP 8
API FL N/A
Sand 0.1%
pH 9.8
Cl- 1100 / Ca++ 280



GAS (units)
C1-C4 (PPM)

MD: 5,806
Inclination: 89.14
Azimuth: 0.11
TVD: 5,200.32
VS: 121.45

MD: 5,837
Inclination: 89.75
Azimuth: 0.23
TVD: 5,200.62
VS: 121.54

MD: 5,868
Inclination: 90.19
Azimuth: 359.53
TVD: 5,200.64
VS: 121.48

MD: 5,898
Inclination: 90.74
Azimuth: 359.63
TVD: 5,200.4
VS: 121.26

MD: 5,929
Inclination: 91.11
Azimuth: 358.88
TVD: 5,199.9
VS: 120.86

MD: 5,959
Inclination: 91.11
Azimuth: 358.75
TVD: 5,199.31
VS: 120.24

MD: 5,989
Inclination: 91.54
Azimuth: 358.48
TVD: 5,198.62
VS: 119.51

70Ca/14Mg

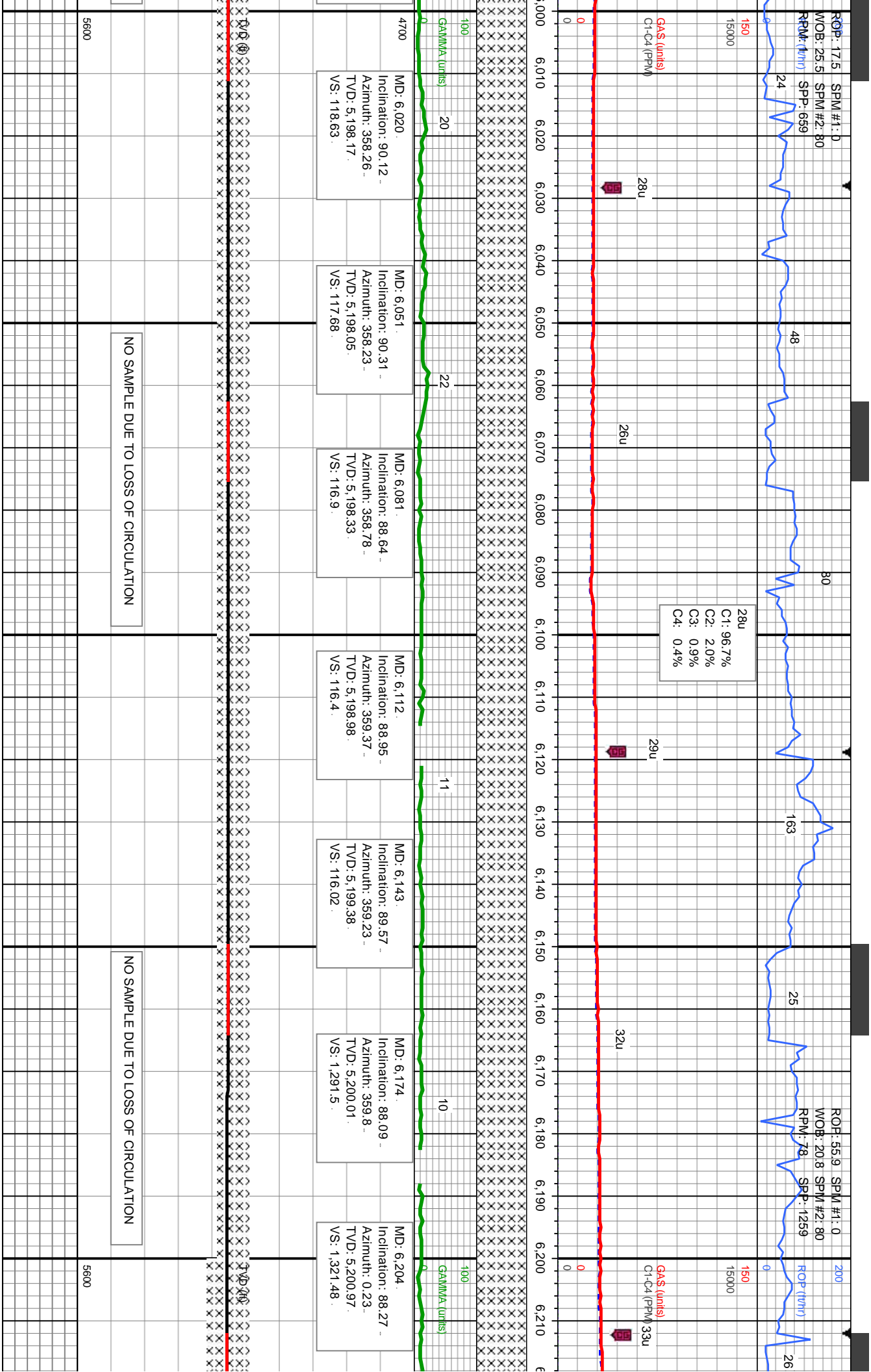
55Ca/27Mg

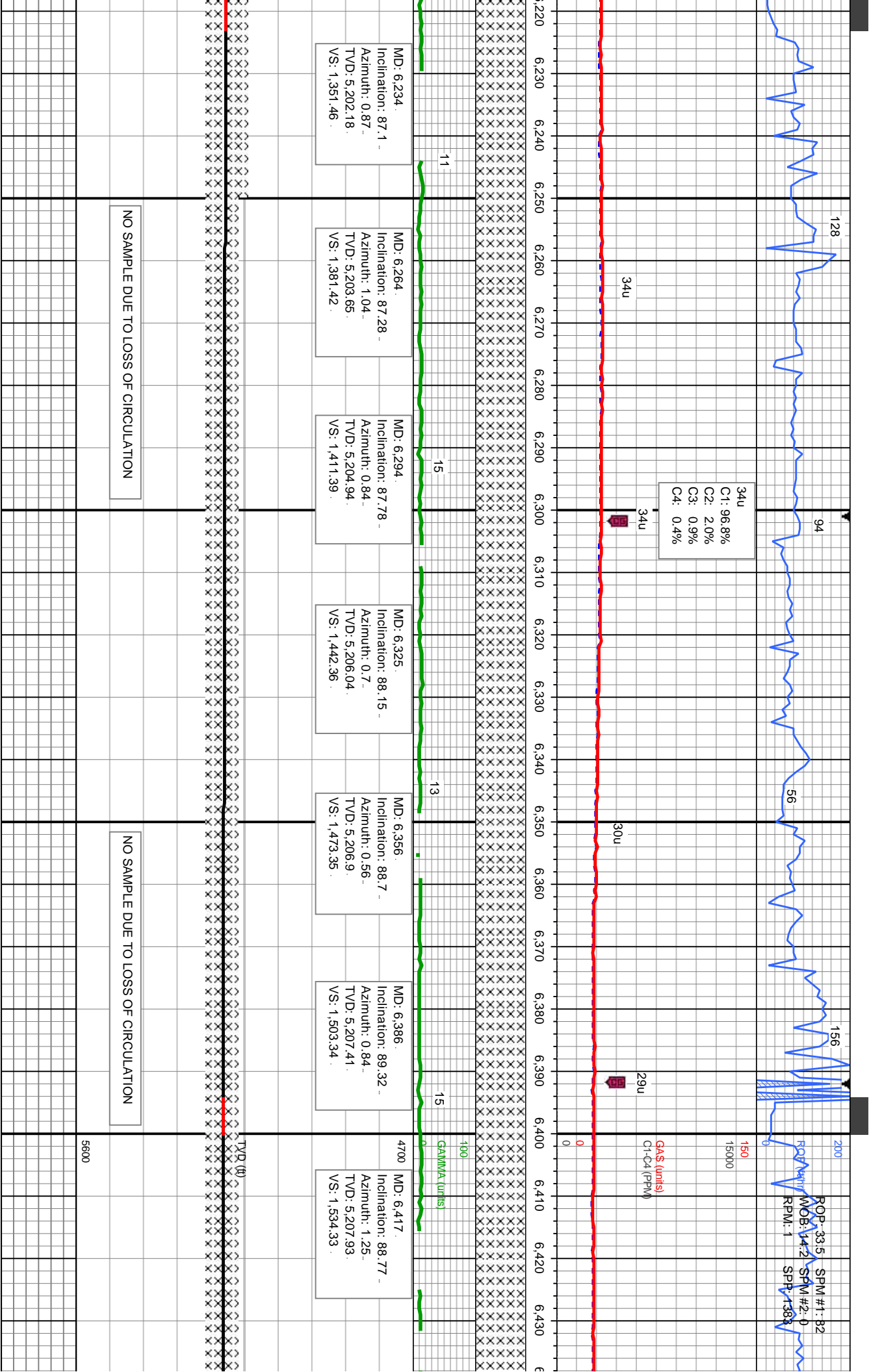
- off wh - tan, occ pnk, frm - mod hd, sb blk - blk, sm tex, wxy lsir, mod - v calc, tr suc: pale org min cut

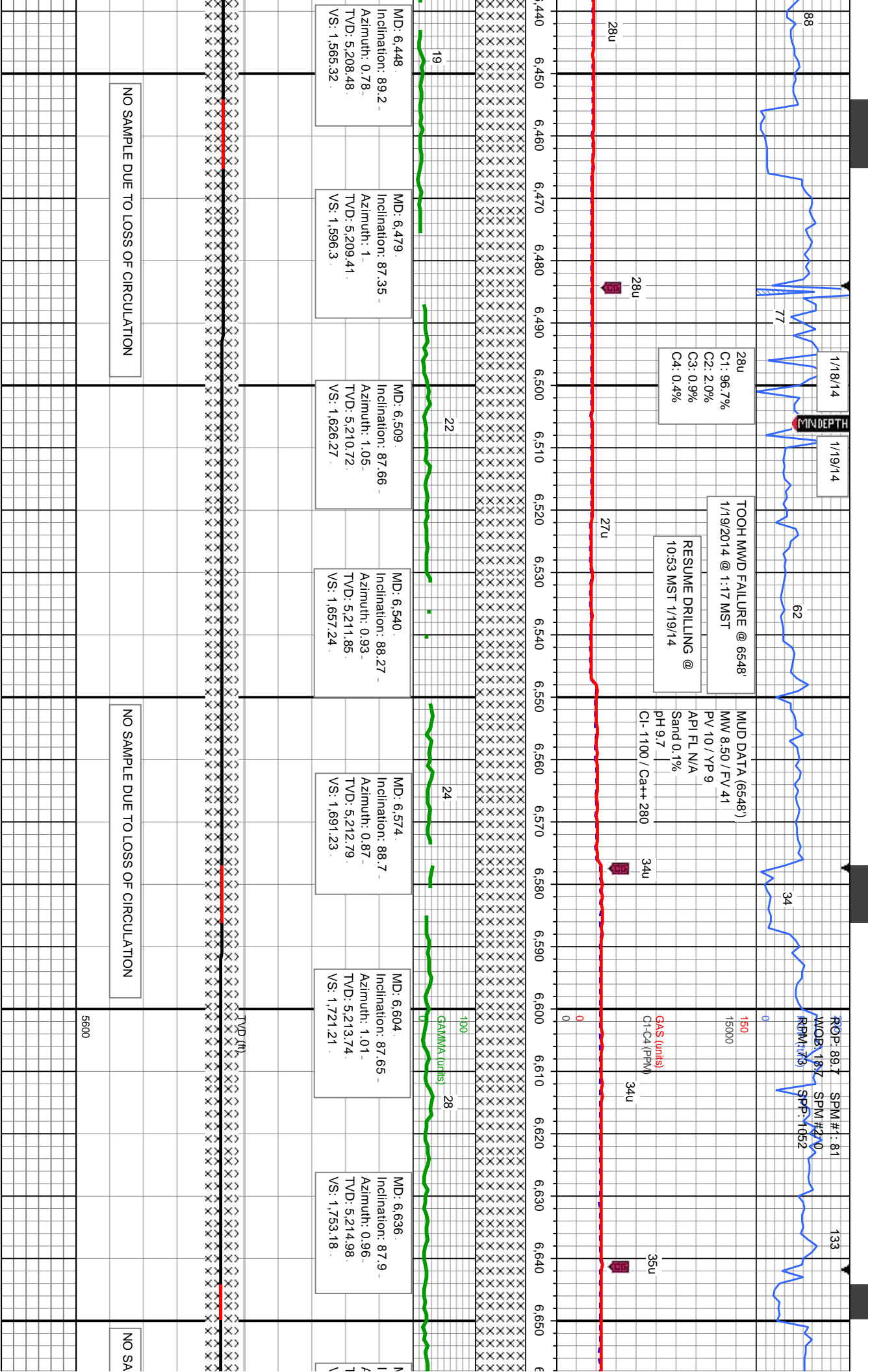
NO SAMPLE DUE TO LOSS OF CIRCULATION

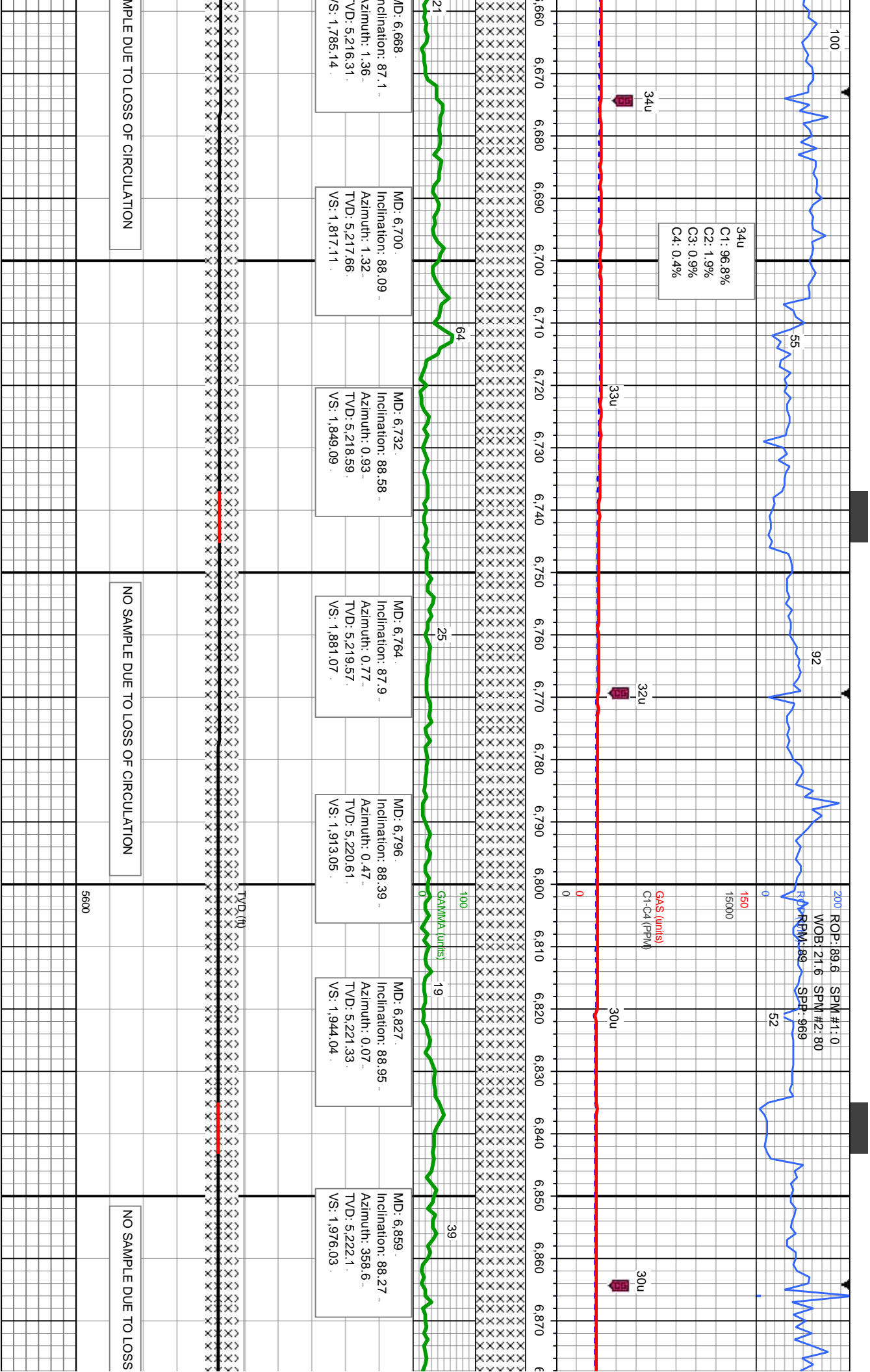
NO SAMPLE DUE TO LOSS OF CIRCULATION











200 ROP: 89.6 SPM #1: 0
WOB: 21.6 SPM #2: 80
RPM: 89 SPM: 969

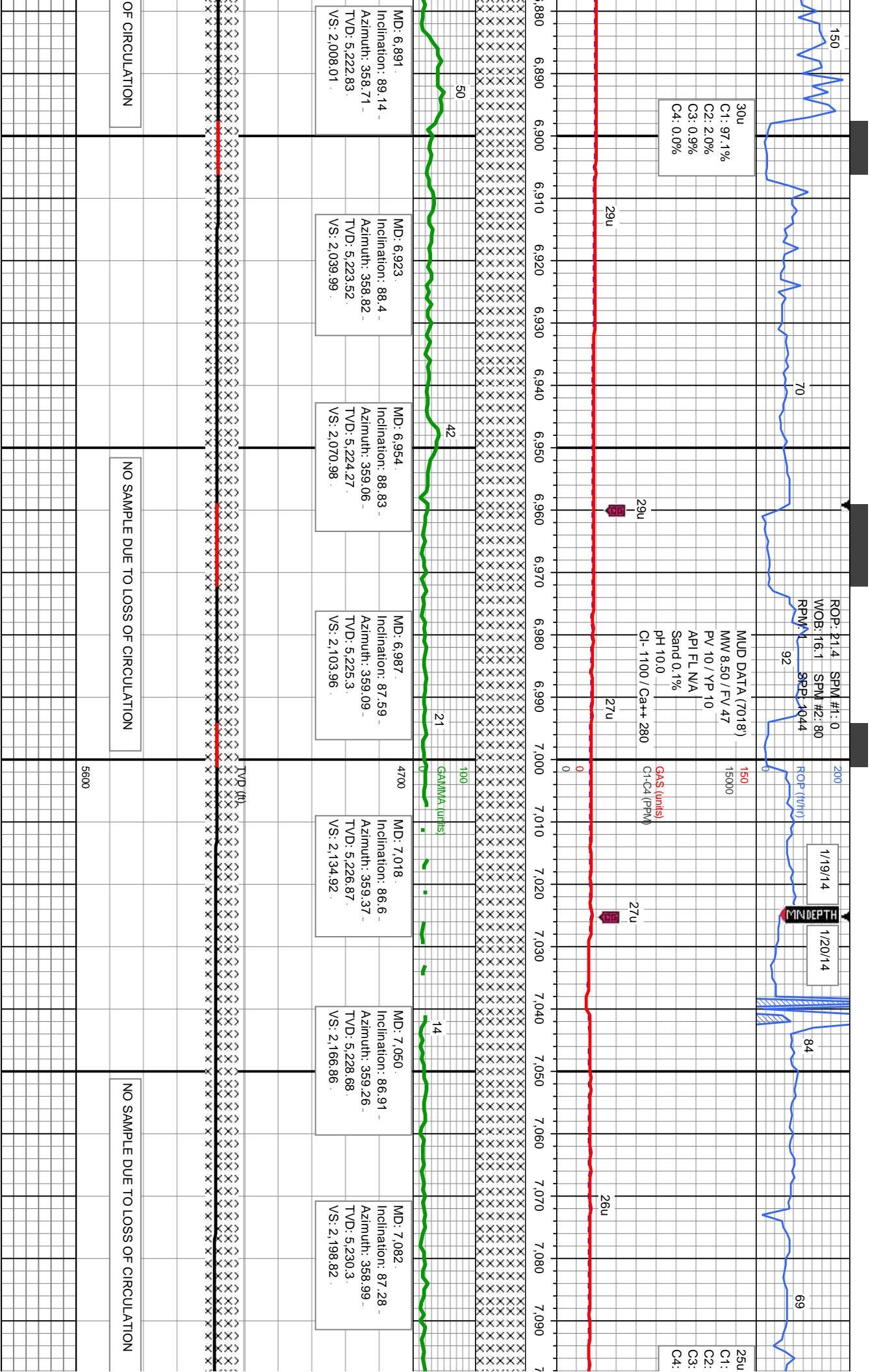
34u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

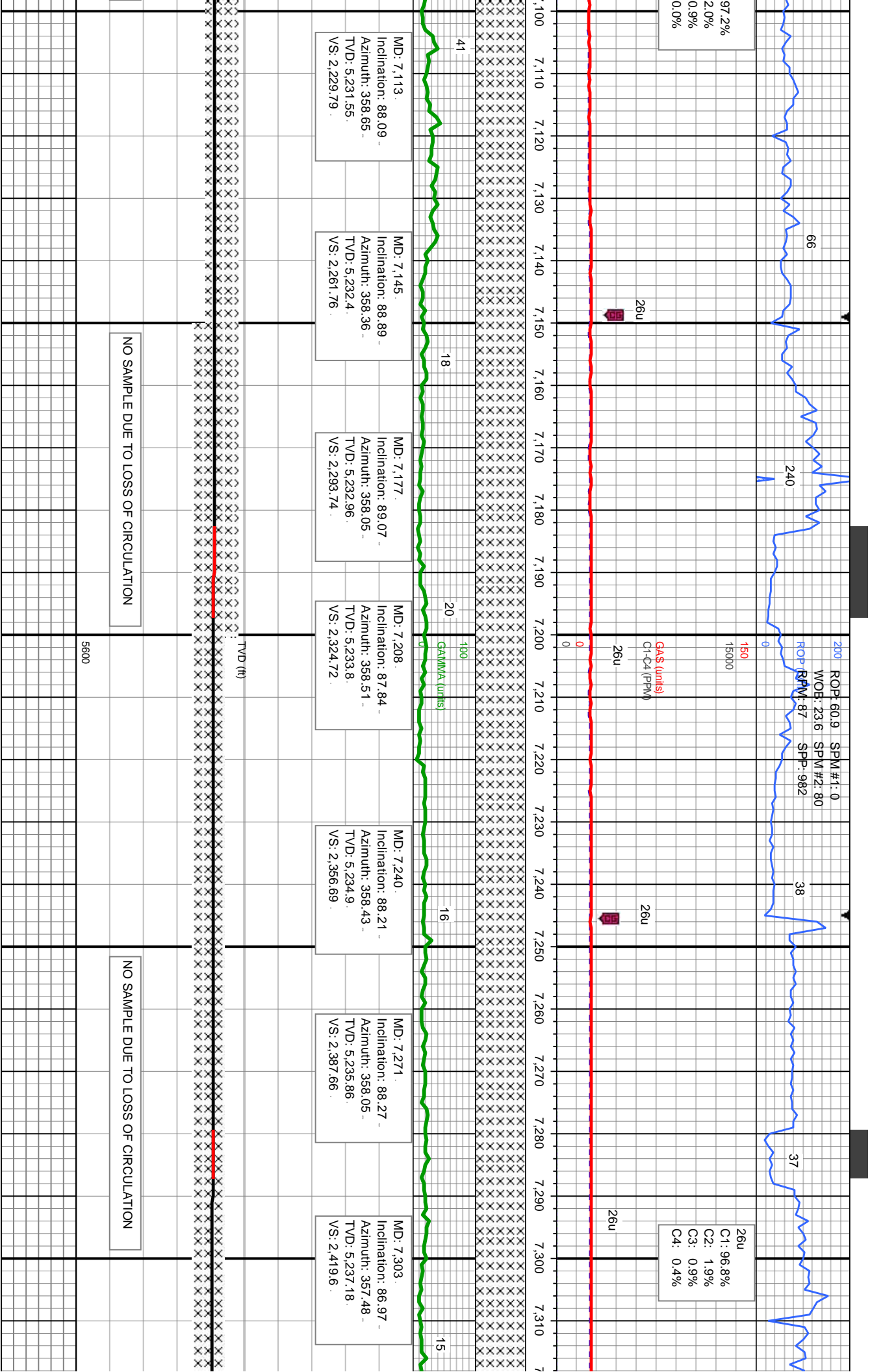
Gas (units)
C1-C4 (PPM)

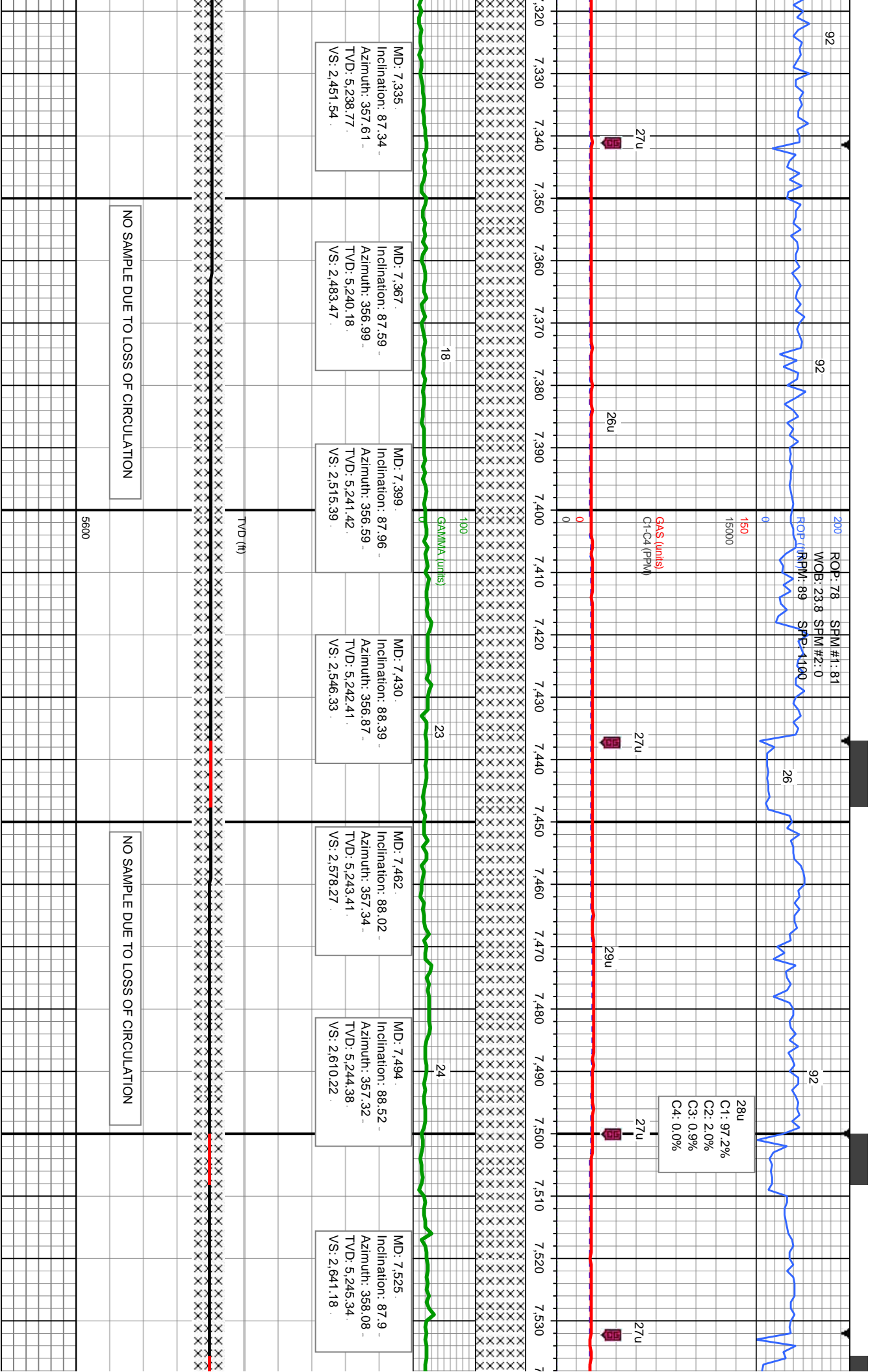
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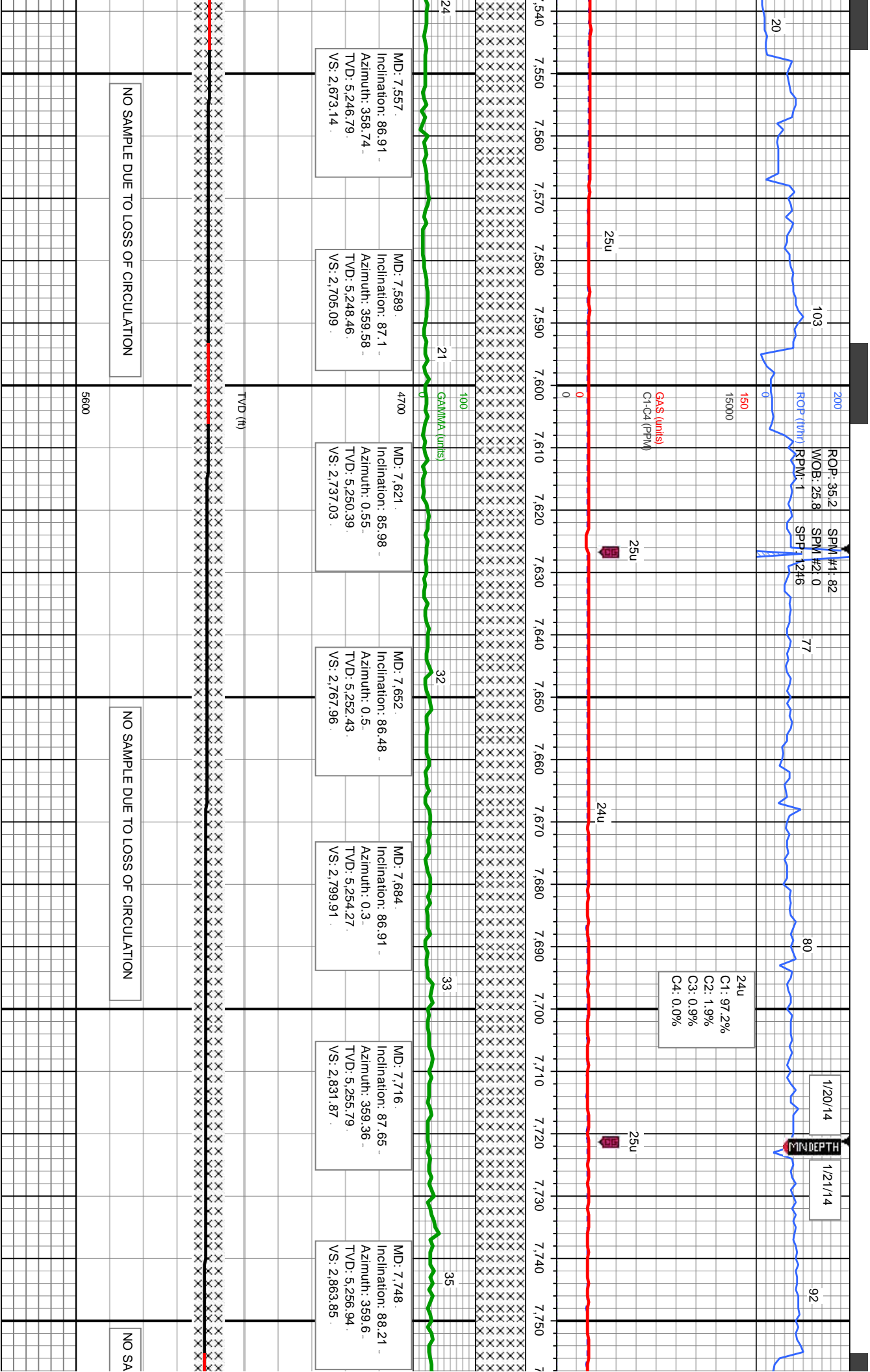
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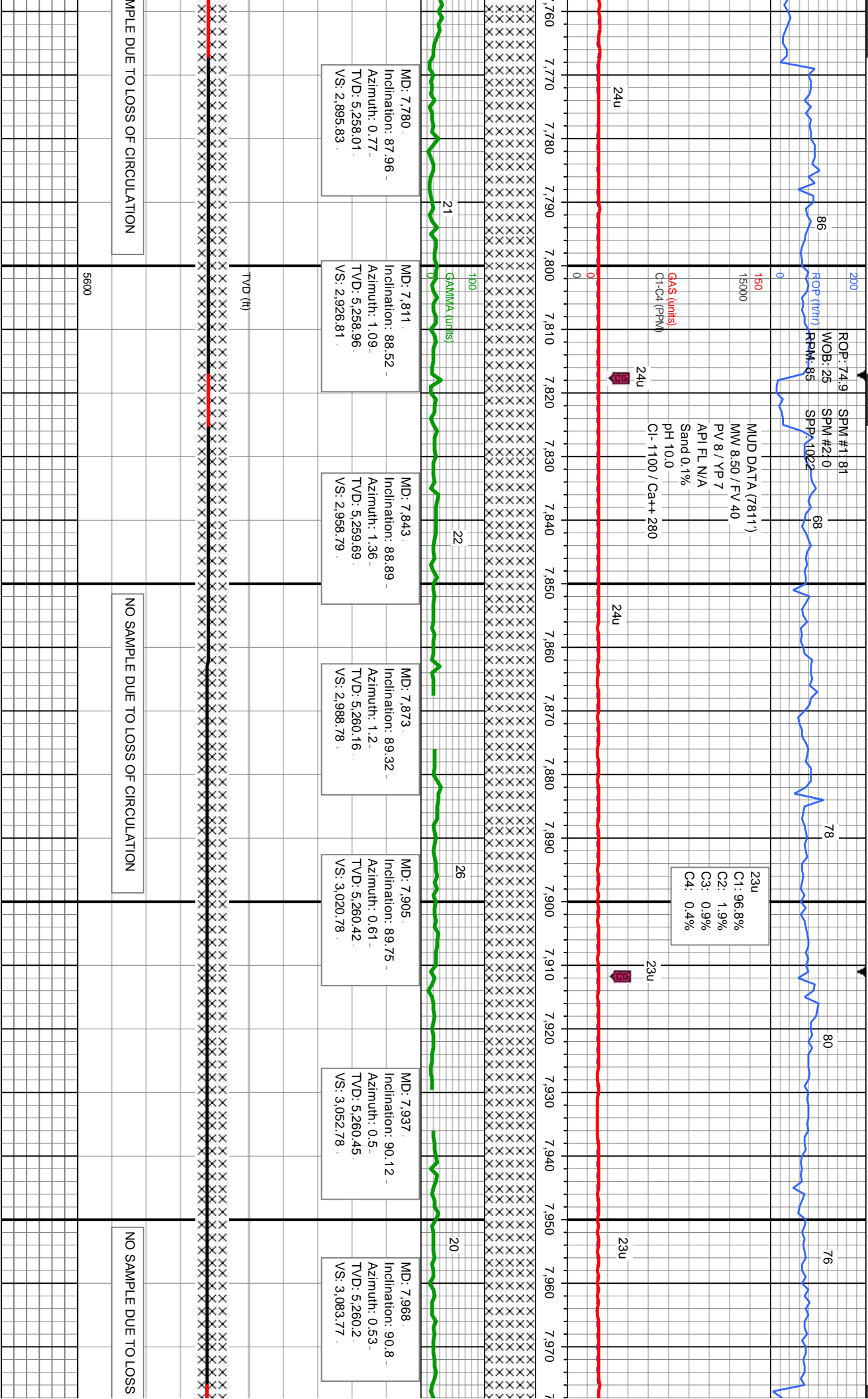
NO SAMPLE DUE TO LOSS

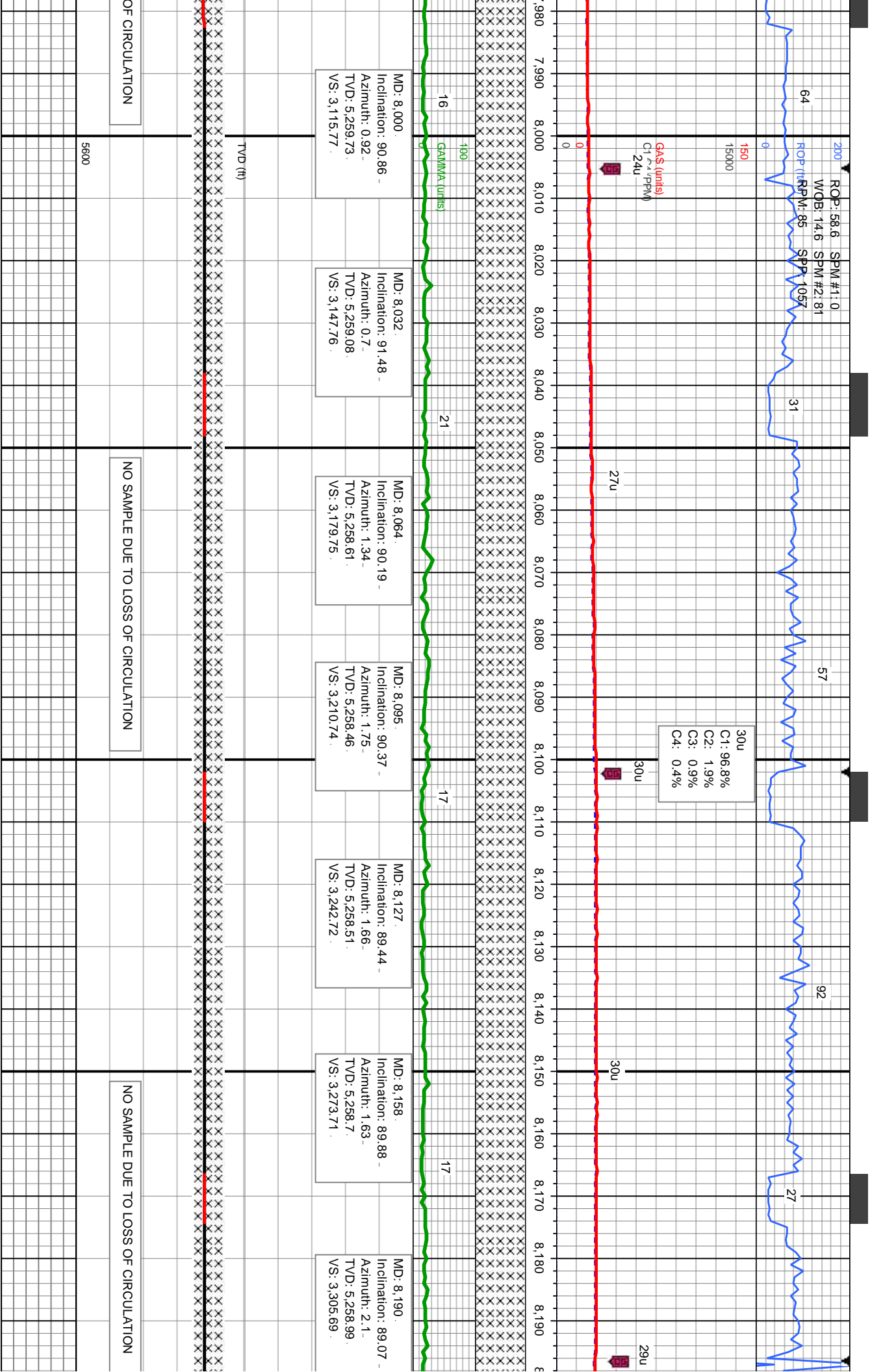


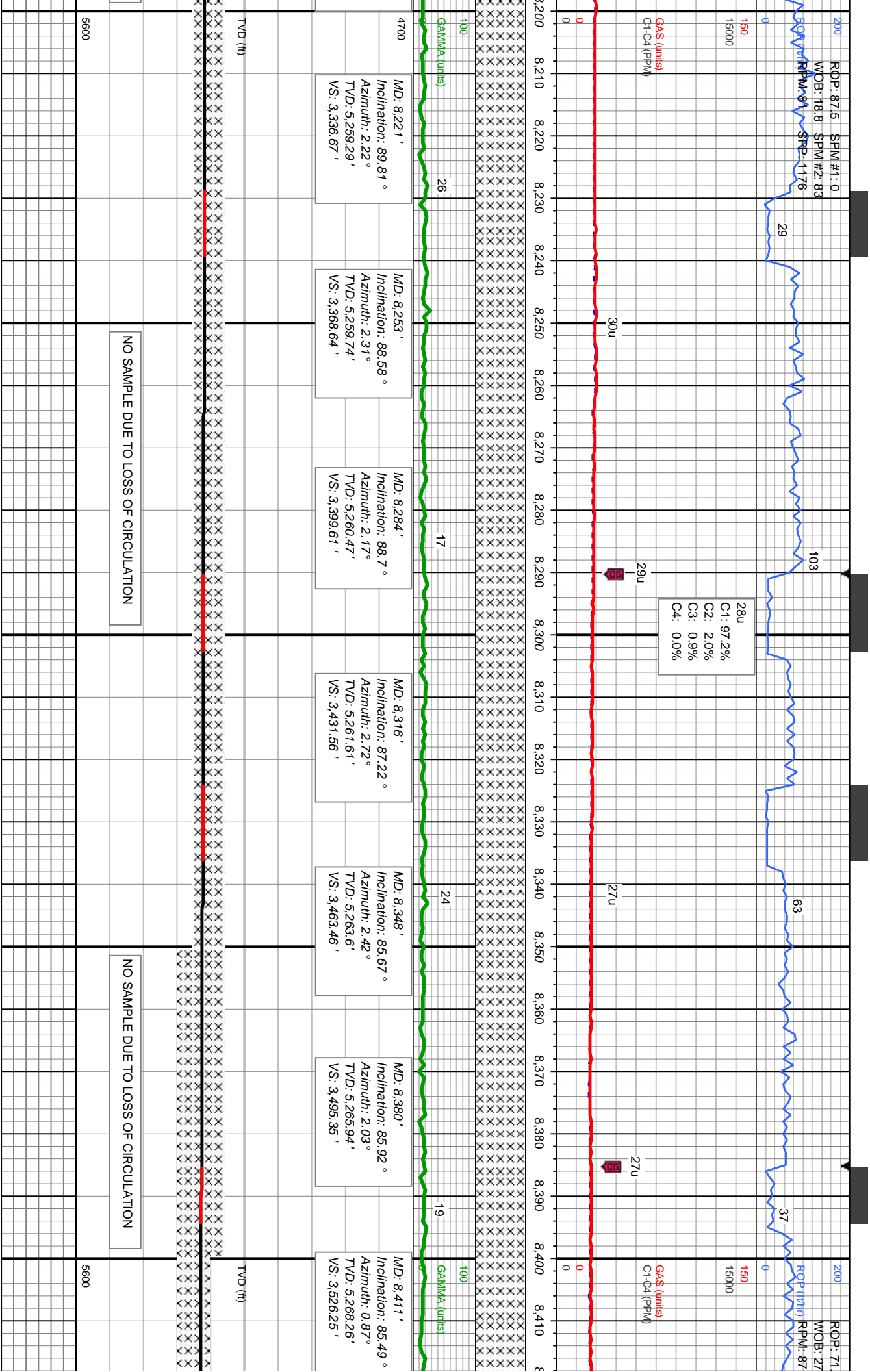


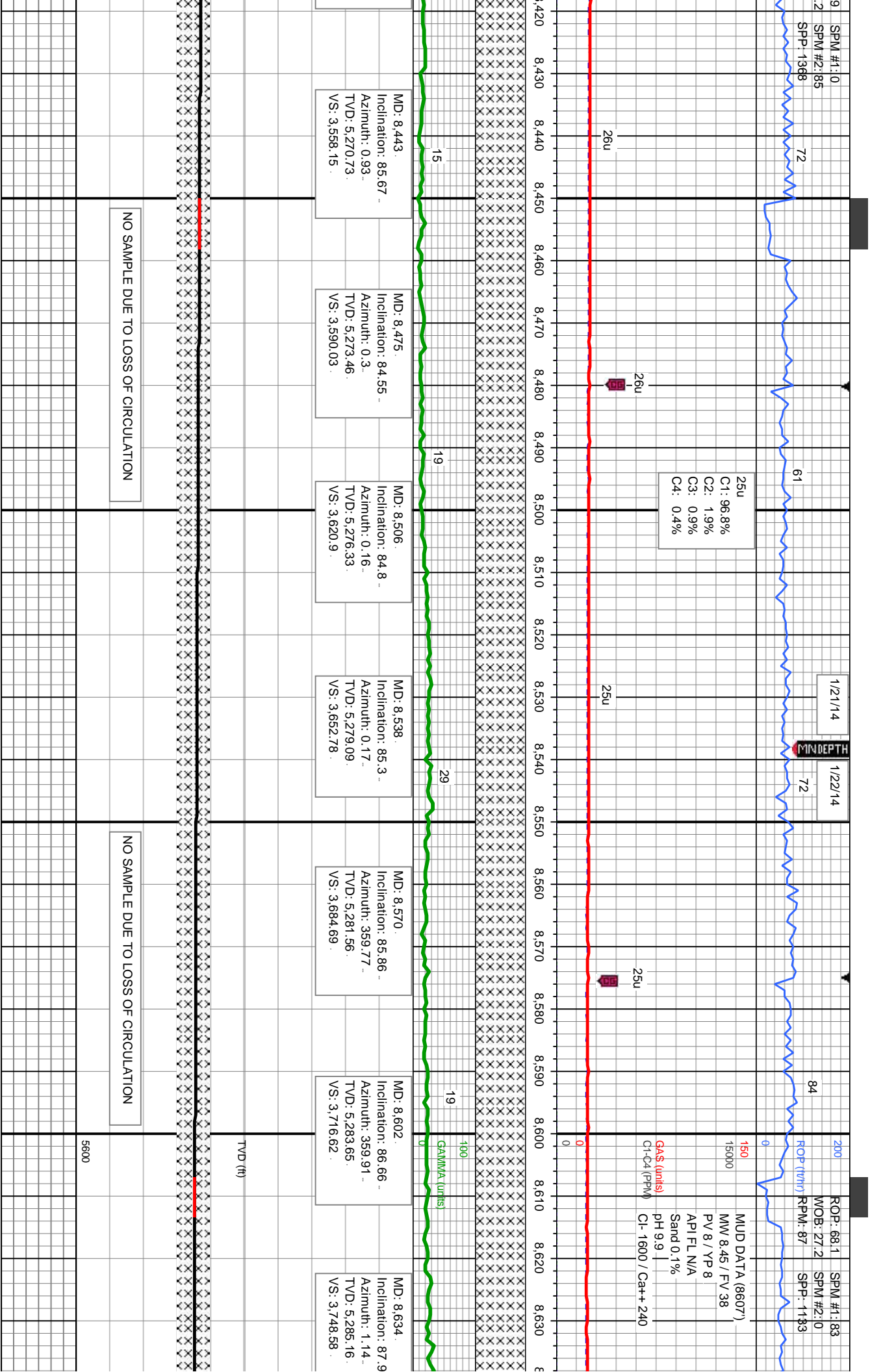












SPM #1:0
SPM #2:85
SPP: 1368

72

61

72

84

ROP (ft/hr)

MWD (ft)

MWD (ft)

MD: 8,443
Inclination: 85.67
Azimuth: 0.93
TVD: 5,270.73
VS: 3,558.15

MD: 8,475
Inclination: 84.55
Azimuth: 0.3
TVD: 5,273.46
VS: 3,590.03

MD: 8,506
Inclination: 84.8
Azimuth: 0.16
TVD: 5,276.33
VS: 3,620.9

MD: 8,538
Inclination: 85.3
Azimuth: 0.17
TVD: 5,279.09
VS: 3,652.78

MD: 8,570
Inclination: 85.86
Azimuth: 359.77
TVD: 5,281.56
VS: 3,684.69

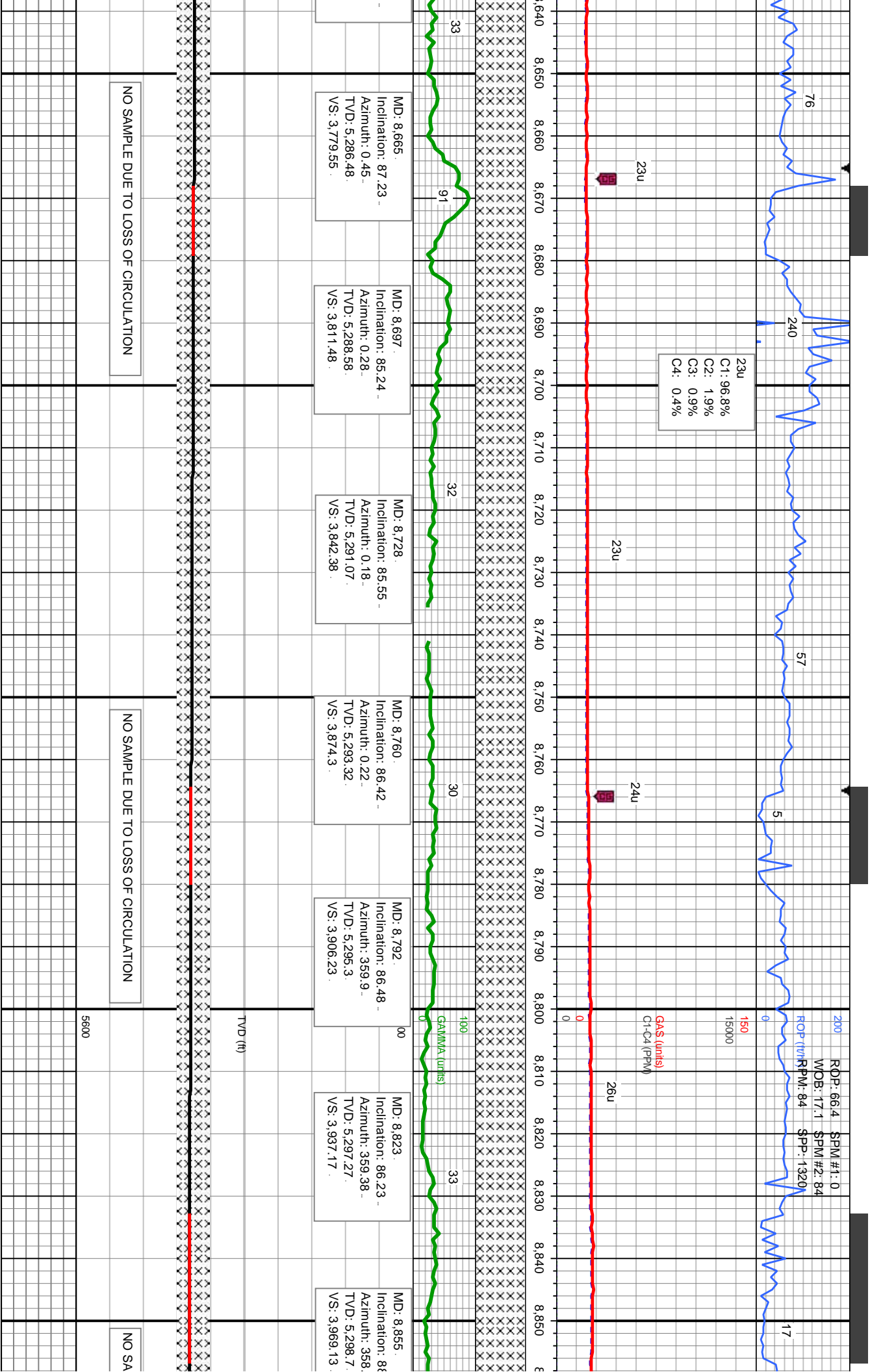
MD: 8,602
Inclination: 86.66
Azimuth: 359.91
TVD: 5,283.65
VS: 3,716.62

MD: 8,634
Inclination: 87.9
Azimuth: 1.14
TVD: 5,285.16
VS: 3,748.58

NO SAMPLE DUE TO LOSS OF CIRCULATION

TVD (ft)

5600



200 ROP: 66.4 SPM #1: 0
WOB: 17.1 SPM #2: 84
ROP (ft/hr): 84 SPP: 1320

150

0
GAS (units)
C1-C4 (PPM)

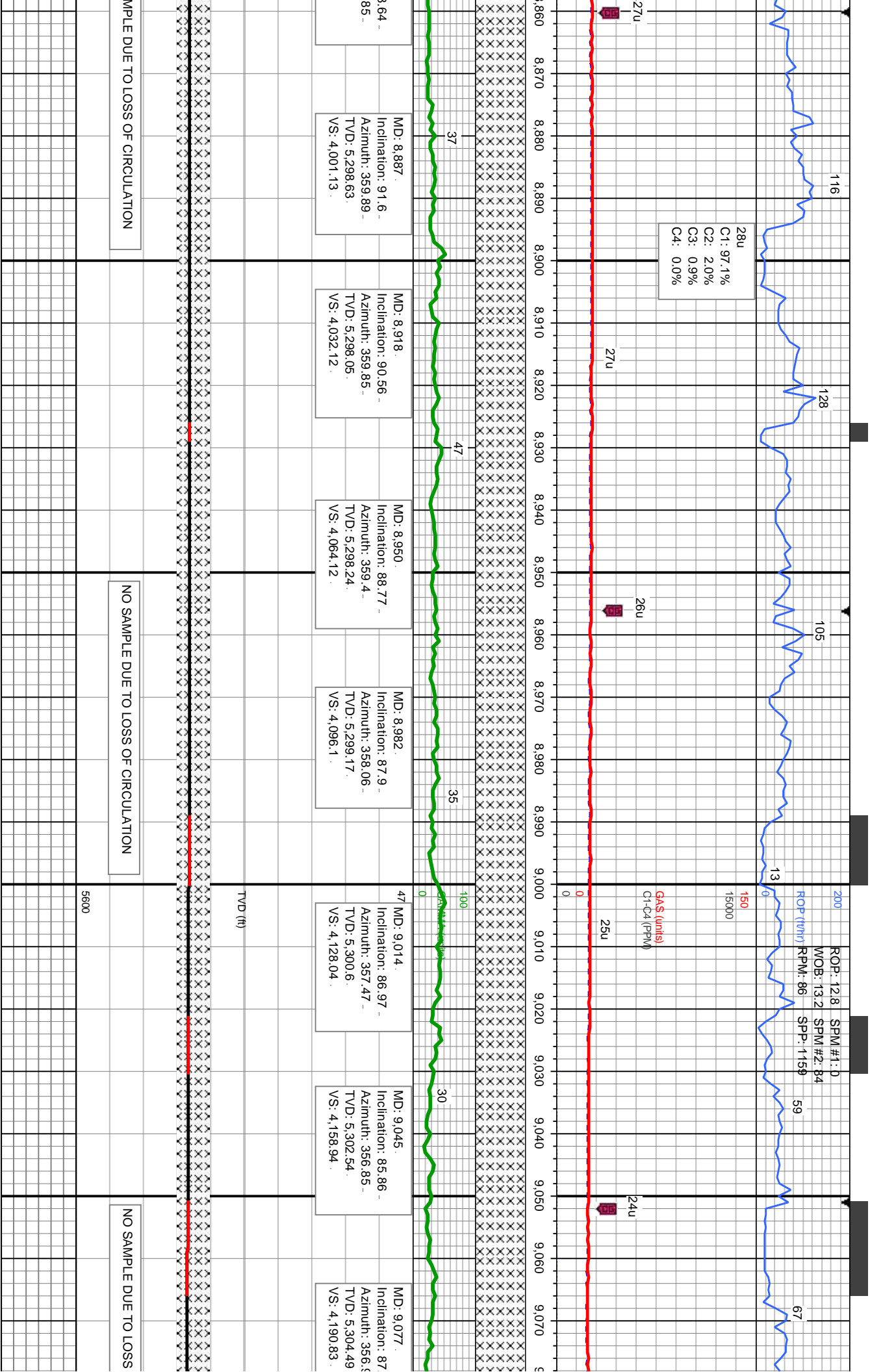
100
GAMMA (units)

00

TVD (ft)

5600

NO SA



28u
C1: 97.1%
C2: 2.0%
C3: 0.9%
C4: 0.0%

GA\$ (units)
C1-C4 (PPM)

MD: 8,887.
Inclination: 91.6
Azimuth: 359.89
TVD: 5,298.63
VS: 4,001.13

MD: 8,918.
Inclination: 90.56
Azimuth: 359.85
TVD: 5,298.05
VS: 4,032.12

MD: 8,950.
Inclination: 88.77
Azimuth: 359.4
TVD: 5,298.24
VS: 4,064.12

MD: 8,982.
Inclination: 87.9
Azimuth: 358.06
TVD: 5,299.17
VS: 4,096.1

MD: 9,014.
Inclination: 86.97
Azimuth: 357.47
TVD: 5,300.6
VS: 4,128.04

MD: 9,045.
Inclination: 85.86
Azimuth: 356.85
TVD: 5,302.54
VS: 4,158.94

MD: 9,077.
Inclination: 87
Azimuth: 356.5
TVD: 5,304.49
VS: 4,190.83

NO SAMPLE DUE TO LOSS OF CIRCULATION

NO SAMPLE DUE TO LOSS OF CIRCULATION

NO SAMPLE DUE TO LOSS

1/22/14 1/23/14

MINDEPTH

24u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

24u

24u

MUD DATA (9177)
MW 8.45 / FV 38
PV 9 / YP 7
API FL N/A
Sand 0.1%
pH 9.8
Cl- 1500 / Ca++ 280

GAS (units)
C1-C4 (PPM)

200 ROP: 45.9 SPM #1: 0
ROF (ft/hr) MOB: 24.2 SPM #2: 85
RPM: 86 SPP: 1289

9,080 9,090 9,100 9,110 9,120 9,130 9,140 9,150 9,160 9,170 9,180 9,190 9,200 9,210 9,220 9,230 9,240 9,250 9,260 9,270 9,280 9,290

100
GAMMA (units)

0

MD: 9,108.
Inclination: 90.87
Azimuth: 358.74
TVD: 5,305.02
VS: 4,221.8

MD: 9,140.
Inclination: 93.58
Azimuth: 359.1
TVD: 5,303.78
VS: 4,253.77

MD: 9,193.
Inclination: 92.35
Azimuth: 357.88
TVD: 5,301.04
VS: 4,306.68

MD: 9,230.
Inclination: 91.5
Azimuth: 358.
TVD: 5,299.8
VS: 4,343.63

Projection To Bit

TD SWITCHMAN
1647-11-11-H@ 9230 MD
03:47 MST on 1/23/14

THANK YOU FOR
USING COLUMBINE
LOGGING INC.

OF CIRCULATION

NO SAMPLE DUE TO LOSS OF CIRCULATION

TVD (ft)

5600

