



Scale: 5" / 100'
Measured Depth Log

Well Name 05123368090000_HOWARD_28C_21HZ_MUD

Location SESW: SEC 21 T 1N R 67W

State COLORADO

Country U.S.A.

API Number 05-123-36809-0000

Region DJ BASIN

Spud Date 6/7/2013

Surface Coordinates 281' FSL, 1519' FWL

Bottom Hole Coordinates 460' FNL, 2350' FWL

County WELD

Rig Number XTREME 6

AFE # 2077268.DRL

Field WATTENBERG

Drilling Completed 11/20/2013

Ground Elevation 5025'

K.B. Elevation 5041'

Logged Interval 7200' To 12217'

Total Depth 12217'

Formation CODELL

Type of Drilling Fluid LSND

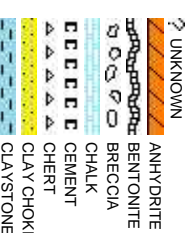
Company Anadarko

Address 1099 18th St #1
Denver, CO 80202

Name ISAAC SMITH & SONS

Company COLUMBINE LOGGING

Address 2385 S. LIPAN
DENVER, CO 80216



Operator

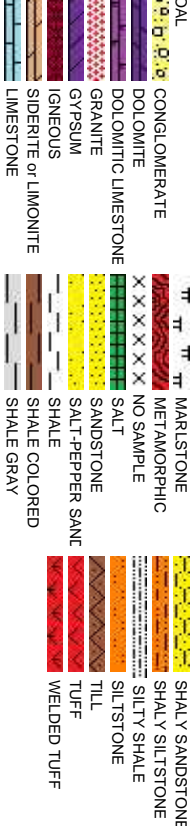
800
202

Geologist

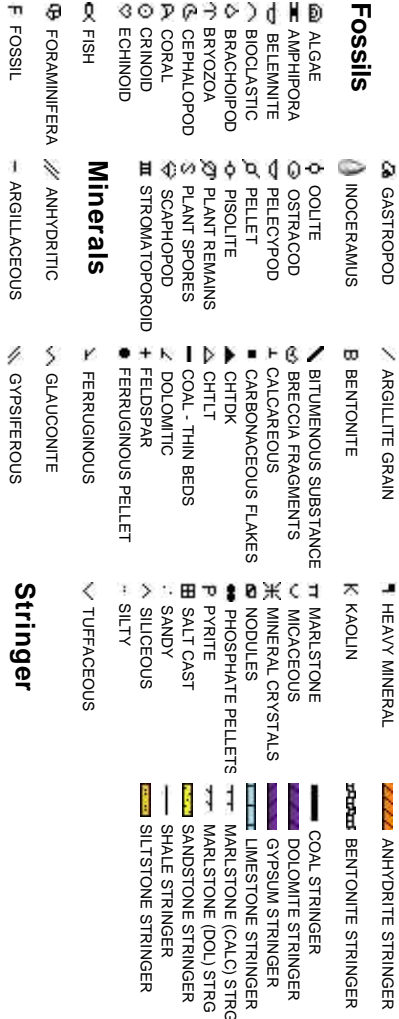
& JASON BEACH
OGGING INC.

STREET
00223

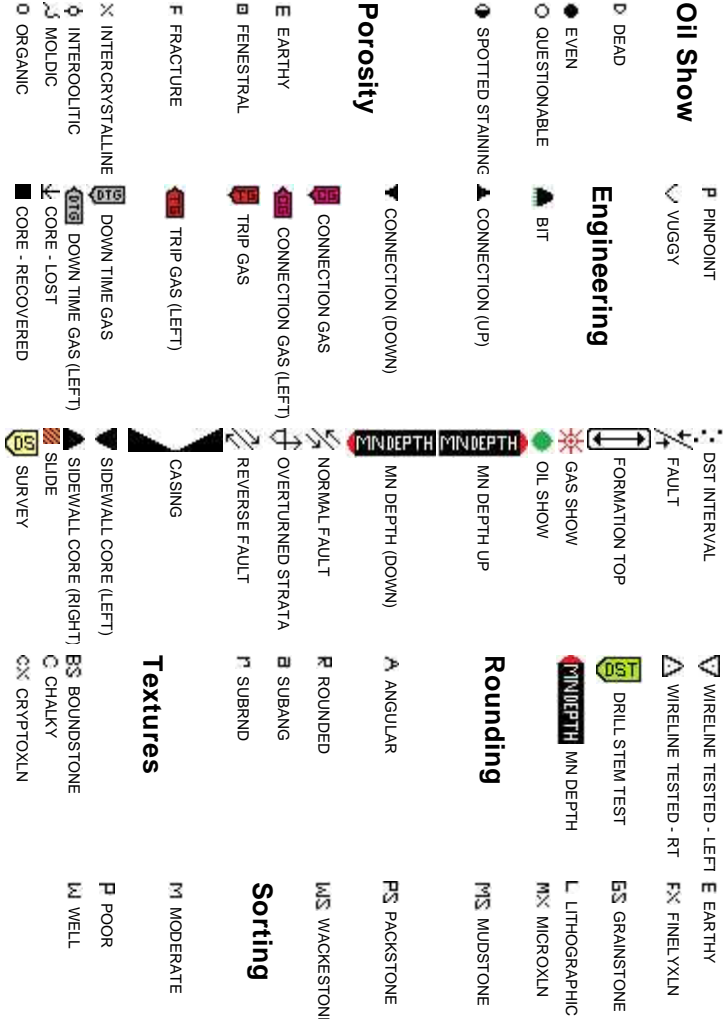
Rock Types



Accessories



Other Symbols



Slide/Rotate

ROP
ROF
GAMMA

GAS
C1
C2
C3
C4

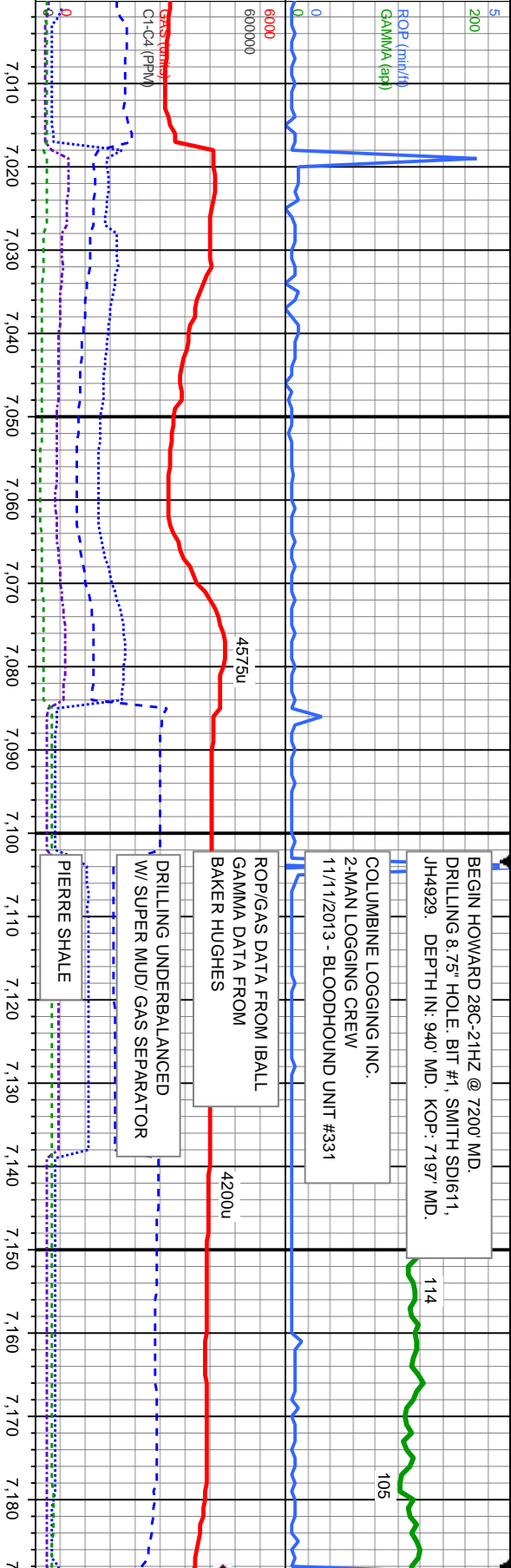
Depth Labels

% Lith

Well Bore
TVD

Oil Show

Images



MD: 7,055
TVD: 6,978.14
Inclination: 0.98
Azimuth: 345.39
VS: -226.41

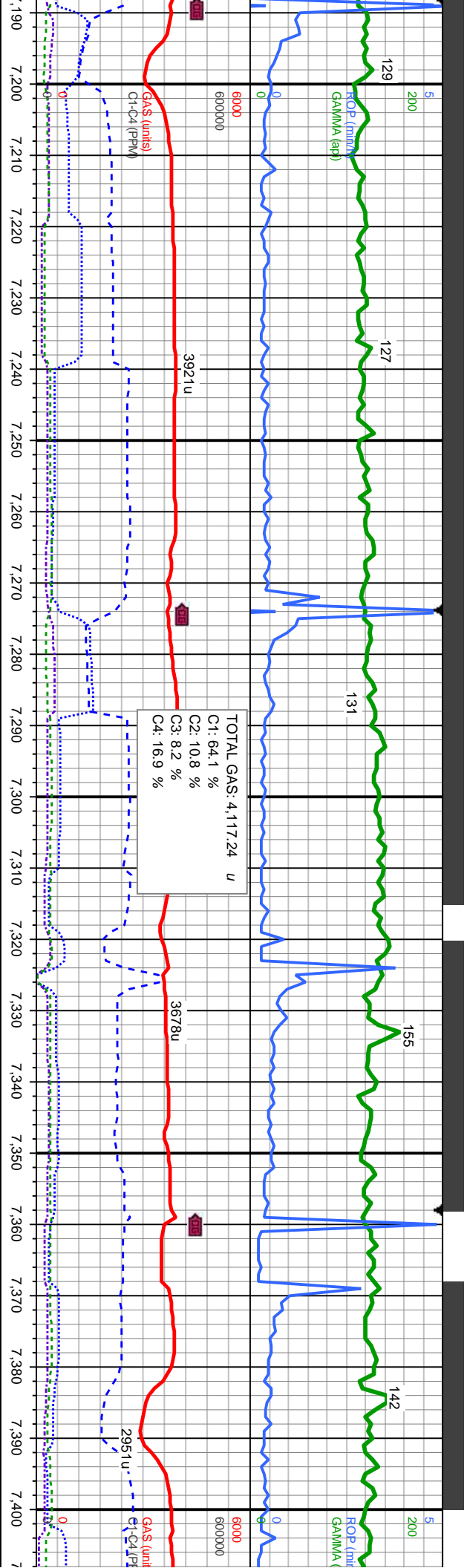
MD: 7,140
TVD: 7,063.12
Inclination: 1.11
Azimuth: 313.46
VS: -225.14

MD: 7,182
TVD: 7,105.11
Inclination: 1.62
Azimuth: 324.92
VS: -224.37

50' SAMPLE INTERVALS
50' SAMPLE DESCRIPTIONS

SLTY SH: med gy-dk gy, pty-sb blk, frm-sft, sb mnd-sb ang, mod fri, sl calc, sl tr bent, no o





WT IN 9.7/ OUT 9.7
VIS IN 39/ OUT 39

MD: 7,225
TVD: 7,148.01
Inclination: 5.86
Azimuth: 347.21
VS: -221.73

MD: 7,267
TVD: 7,189.49
Inclination: 11.83
Azimuth: 354.44
VS: -215.34

MD: 7,310
TVD: 7,231.04
Inclination: 17.89
Azimuth: 359.23
VS: -204.34

MD: 7,353
TVD: 7,271.33
Inclination: 22.87
Azimuth: 359.32
VS: -189.37

WT IN 10.0/ OUT 10.0
VIS IN 40/ OUT 40

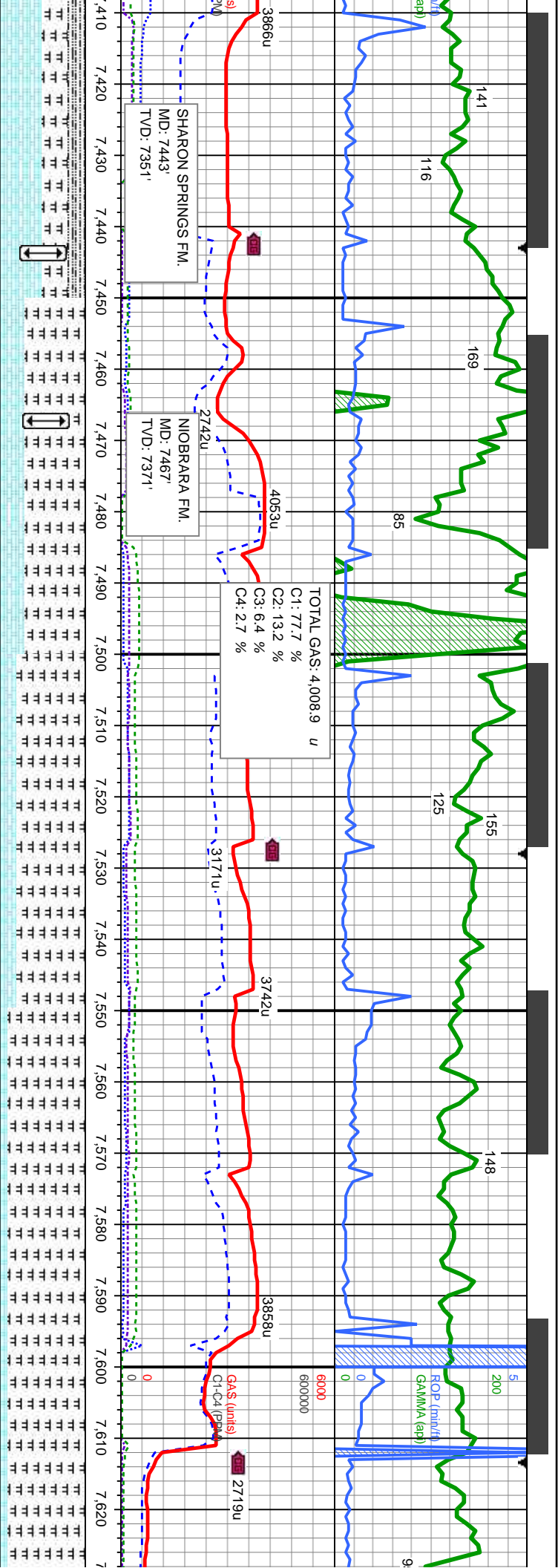
MD: 7,395
TVD: 7,309.33
Inclination: 27.47
Azimuth: 359.15
VS: -171.51

SLTY SH: med gy-dk gy, pily-sb blk, frm-sft, sb rnd-sb ang.
mod fri, sl calc, sl tr bent, no o

SLTY SH: med gy-dk gy, pily-sb blk, frm-sft, sb rnd-sb
ang, mod fri, sl calc, sl tr bent, no o



TVD (ft)
CHK: It-I
sft-sl frm
MRLST:
sft-frm, s
pily-sb b
calc: v f
thk bri b

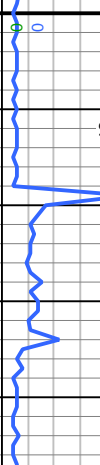
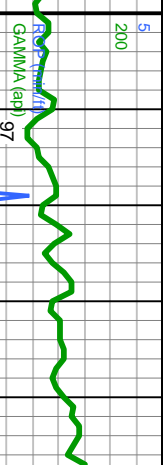


med gy,lt-med brn, mot, sb blk-y-sb ply, blk-y-sb wxy, v calc, tr bent; med-dk gy-gy brn, mod ply-blky, mod arg-sily, calc; SLTY SH: med gy-dk gy, blk-y, firm-sft, sb md-sb ang, mod fri, sl fast; multi sting bri bl-wh mky cut; mod -wht-sl green res ring	CHK: lt-med gy,lt-med brn, mot, sb blk-y-sb ply, sft-sl frm, fri, chky-sb wxy, v calc, tr bent; MRLST: med-dk gy-gy brn, sb ply-blky, mod sft-frm, sb arg-sily, calc, v fast; multi sting bri bl-wh mky cut; mod thk bri bl-wht-sl green res ring	CHK: lt-med gy,lt-med brn, mot, sb blk-y-sb ply, sft-sl frm, fri, chky-sb wxy, v calc, tr bent; MRLST: med-dk gy-gy brn, sb ply-blky, mod sft-frm, sb arg-sily, calc, v fast; multi sting bri bl-wh mky cut; mod thk bri bl-wht-sl green res ring	CHK: lt-med gy,lt-med brn, mot, sb blk-y-sb ply, sft-sl frm, fri, chky-sb wxy, v calc; MRLST: med-dk gy-gy brn, sb ply-blky, mod sft-frm, sb arg-sily, calc, v fast; multi sting bri bl-wh mky cut; mod thk bri bl-wht-sl green res ring	CHK: lt-med gy,lt-med brn, mot, sb blk-y-sb ply, sft-sl frm, fri, chky-sb wxy, v calc; MRLST: med-dk gy-gy brn, sb ply-blky, mod sft-frm, sb arg-sily, calc, v fast; multi sting bri bl-wh mky cut; mod thk bri bl-wht-sl green res ring
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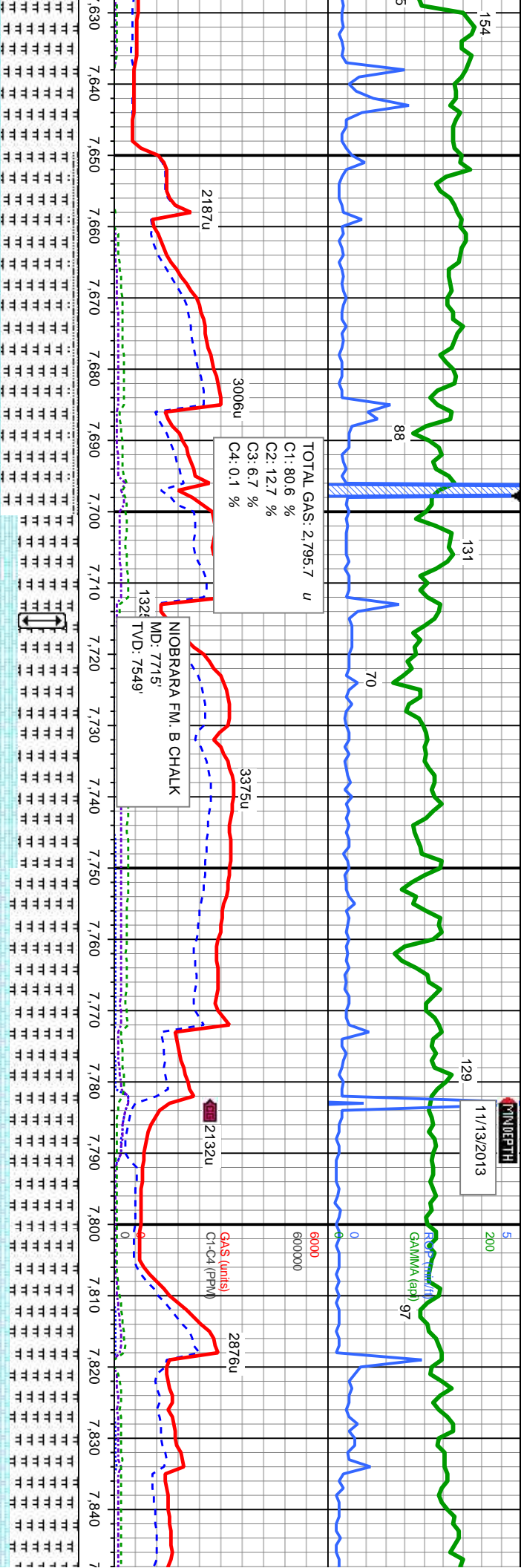
MINIDEPTH

11/13/2013



TOTAL GAS: 2,795.7 u
C1: 80.6 %
C2: 12.7 %
C3: 6.7 %
C4: 0.1 %

NOBRARA FM. B CHALK
MD: 7.715
TVD: 7549'



MD: 7.650
TVD: 7.506.26
Inclination: 47.61
Azimuth: 357.97
VS: -11.69

MD: 7.693
TVD: 7.534.78
Inclination: 49.29
Azimuth: 357.04
VS: 20.46

MD: 7.735
TVD: 7.560.91
Inclination: 53.72
Azimuth: 357.21
VS: 53.29

MD: 7.778
TVD: 7.584.59
Inclination: 59.43
Azimuth: 357.62
VS: 89.13

MD: 7.820
TVD: 7.605.2
Inclination: 61.79
Azimuth: 357.56
VS: 125.7

WT IN 10.1/ OUT 10.1
VIS IN 41/ OUT 41

WT IN 10.2/ OUT 10.2
VIS IN 41/ OUT 41

TVD SCALE
CHANGE

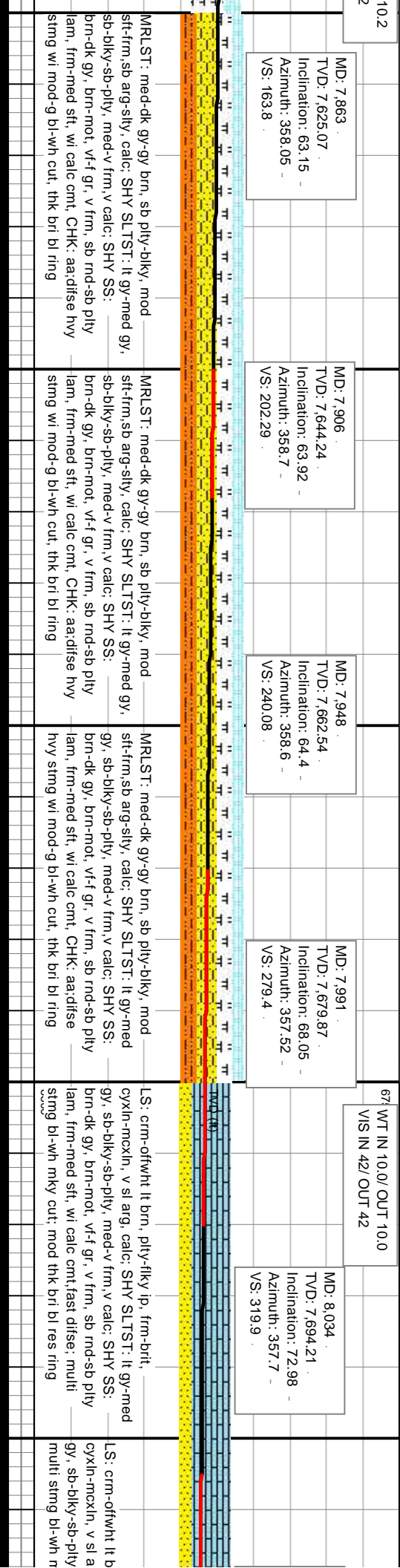
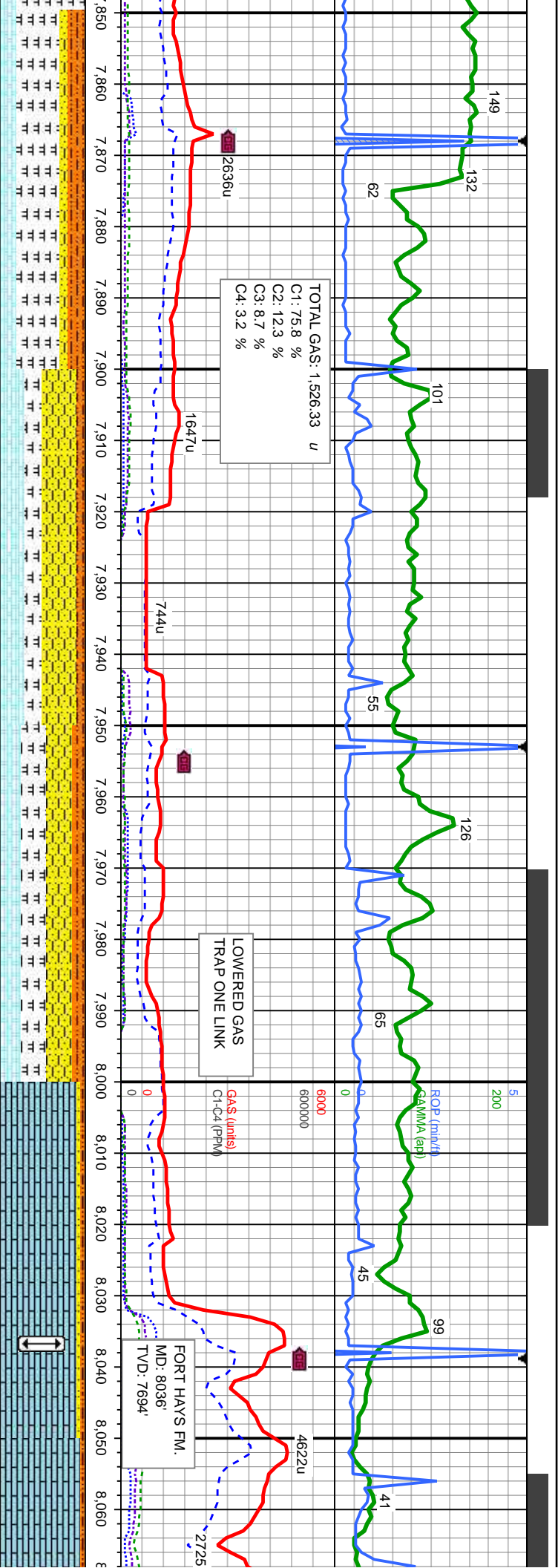
WT IN 10.2/ OUT 4
VIS IN 42/ OUT 4

CHK: lt-med gy,lt-med brn, mot, sb blk-y-sb pily, sft-sl
frm, fri, chky-sb wxy,v calc; MRLST: med-dk gy-gy
brn, sb pily-blky, mod sft-frm,sb arg-sily, calc; SLTY
SH: med gy-dk gy, pily-sb blk-y, frm-sft, sb rnd-sb
ang, mod fri, sl calc, v fast; multi string bri bl-wh
mky cut, mod thk bri bl-wh-sl green res ring

CHK: lt-med gy,lt-med brn, mot, sb blk-y-sb
pily, sft-sl frm, fri, chky-sb wxy,v calc;
MRLST: med-dk gy-gy brn, sb pily-blky, mod
sft-frm,sb arg-sily, calc, rr cal frags,difse hvy
string wi mod-g bl-wh cut, thk bri bl ring

CHK: lt-med gy,lt-med brn, mot, sb blk-y-sb pily,
sft-sl frm, fri, chky-sb wxy,v calc; MRLST:
med-dk gy-gy brn, sb pily-blky, mod sft-frm,sb
arg-sily, calc, rr bent, rr cal frags,difse hvy
string wi mod-g bl-wh cut, thk bri bl ring

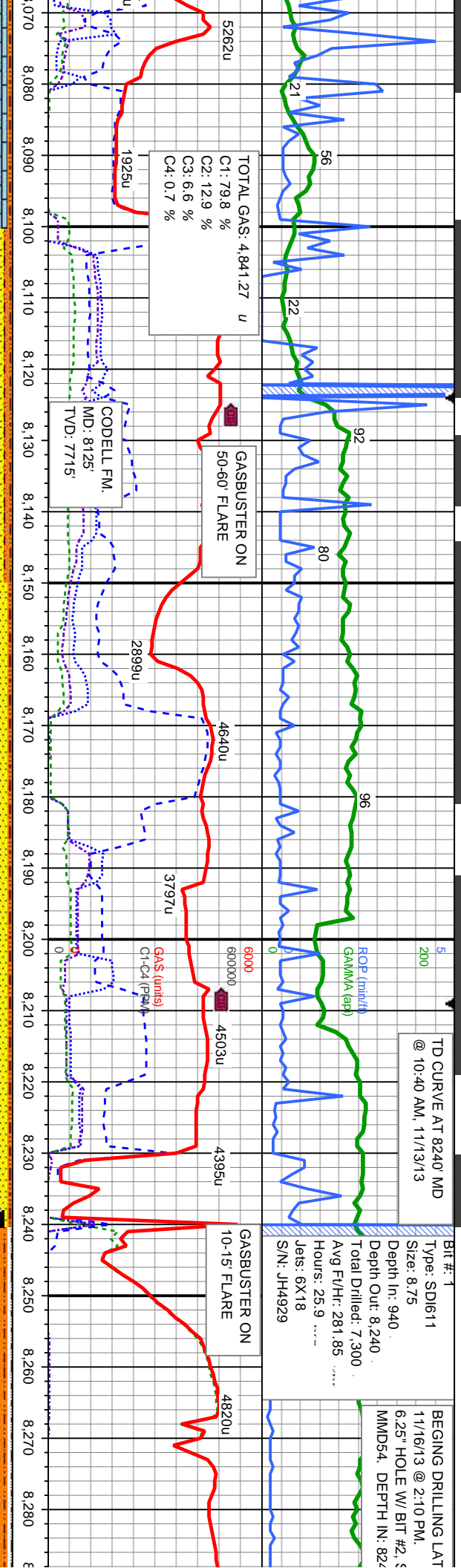




TD CURVE AT 8240' MD
@ 10:40 AM, 11/13/13

Bit #: 1
Type: SD1611
Size: 8.75
Depth In: 940
Depth Out: 8,240
Total Drilled: 7,300
Avg FV/Hr: 281.85
Hours: 25.9
Jets: 6X18
S/N: JH4929

BEGINNING DRILLING LAT
11/16/13 @ 2:10 PM.
6.25" HOLE W/ BIT #2, S
MMD54. DEPTH IN: 8240



TOTAL GAS: 4,841.27 u
C1: 79.8 %
C2: 12.9 %
C3: 6.6 %
C4: 0.7 %

CODILL FM.
MD: 8125'
TVD: 7715'

GASBUSTER ON
10-15 FLARE

MD: 8,076 TVD: 7,705.64 Inclination: 75.43 Azimuth: 358.25 VS: 360.29	WT IN 10.3/ OUT 10.2 VIS IN 45/ OUT 45	MD: 8,119 TVD: 7,715.01 Inclination: 79.4 Azimuth: 359.25 VS: 402.24	MD: 8,162 TVD: 7,721.71 Inclination: 82.68 Azimuth: 0.19 VS: 444.71	MD: 8,192 TVD: 7,724.66 Inclination: 86.02 Azimuth: 0.49 VS: 474.56	MD: 8,240 TVD: 7,726.74 Inclination: 89.01 Azimuth: 0.49 VS: 522.51	MD: 8,274 TVD: 7,727.27 Inclination: 89.2 Azimuth: 0.49 VS: 556.5
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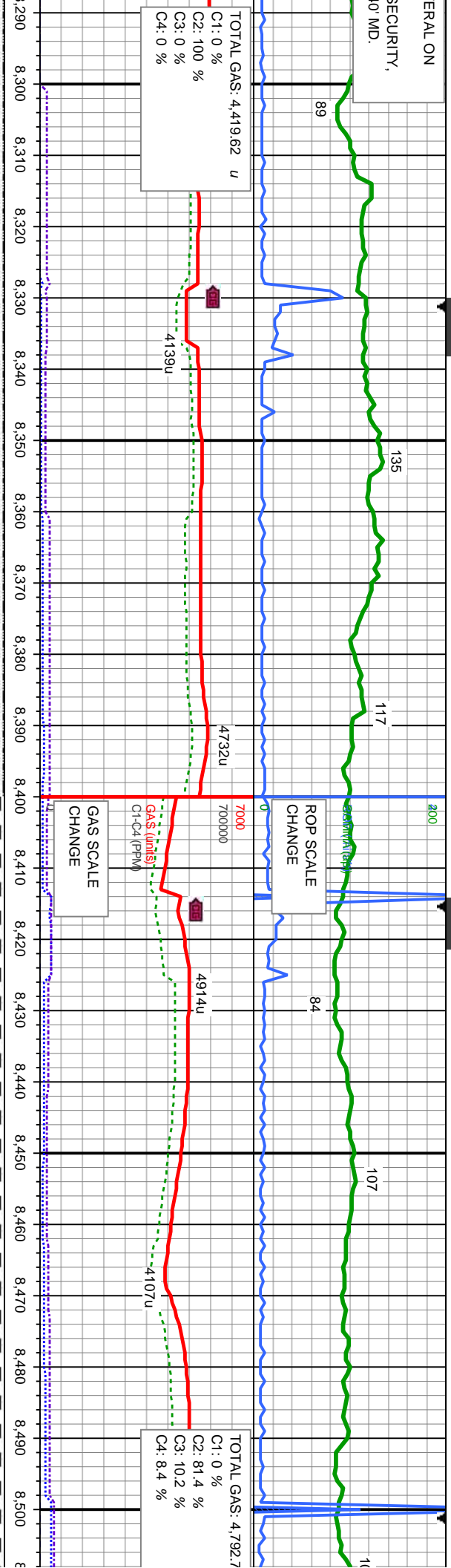
LS: crm-offwht lt brn, pily-fiky ip, frm-brit, cyxln-mcxln, v sl arg, calc; SHY SLTST: lt gy-med gy, sb-biky-sb-pily, med-v frm,v calc; SS: lt brn-dk,med-gry, brn-mot, v-f gr, med-v frm, sb-rnd-rnd, med-w strd, p-mod cons w/ v calc cmt's; multi stmg bl-wh mky cut; thk bri bl-wh res ring	LS: crm-offwht lt brn, pily-fiky ip, frm-brit, cyxln-mcxln, v sl arg, calc; SHY SLTST: lt gy-med gy, sb-biky-sb-pily, med-v frm,v calc; SS: lt brn-dk,med-gry, brn-mot, v-f gr, med-v frm, sb-rnd-rnd, med-w strd, p-mod cons w/ v calc cmt's; multi stmg bl-wh mky cut; thk bri bl-wh res ring	LS: crm-offwht lt brn, pily-fiky ip, frm-brit, cyxln-mcxln, v sl arg, calc; SHY SLTST: lt gy-med gy, sb-biky-sb-pily, med-v frm,v calc; SS: lt brn-dk,med-gry, brn-mot, v-f gr, med-v frm, sb-rnd-rnd, med-w strd, p-mod cons w/ v calc cmt's; multi stmg bl-wh mky cut; thk bri bl-wh res ring	SS: lt brn-dk,med-gry, brn-mot, v-f gr, sb-rnd-rnd, med-w strd, p-mod cons w/ cmt; SHY SLTST: lt gy-med gy, sb-biky-med-v frm,v calc; SLTY SH: med gy-dk biky, frm-sft, sb rnd-sb ang, mod fri, sl multi stmg bl-wh mky cut; thk bri bl-wh
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ERLAL ON

SECURITY,

10 MD.



WT IN 9.3/ OUT 9.3
VIS IN 40/ OUT 40

100' SAMPLE INTERVALS
100' SAMPLE DESCRIPTIONS

MD: 8,359
TVD: 7,727.55
Inclination: 90.43
Azimuth: 0.78
VS: 641.49

WT IN 9.3/ OUT 9.3
VIS IN 40/ OUT 40

6750

MD: 8,444
TVD: 7,726.73
Inclination: 90.67
Azimuth: 1.94
VS: 726.45

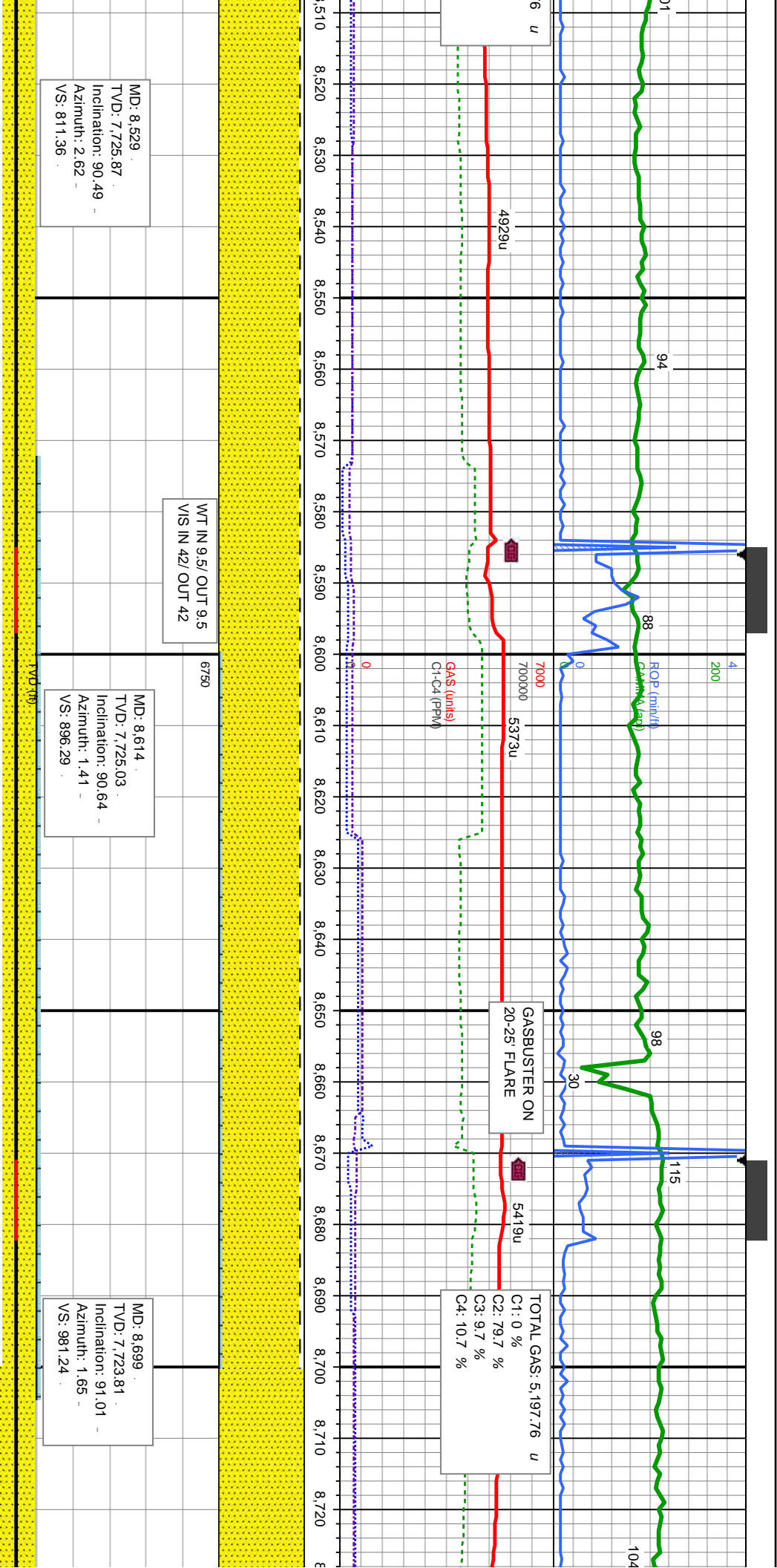
WT IN 9.2/ OUT 9.2
VIS IN 40/ OUT 40

med-v frm,
v calc
sb-plty,
gy, pty-sb
res ring

SS: lt brn-dk, med-gry, brn-mot, vf-f gr, med-v frm, sb-rnd-rnd, med-w strd, p-mod cons w/ v
calc cnt; LS: crm-offwh lt brn, pty-flky ip, frm-brit, cyxln-mckln, v sl arg, calc: SHY SLTST:
lt gy-med gy, sb-biky-sb-plty, med-v frm, v calc: SLTY SH: med gy-dk gy, pty-sb blk, frm-sft,
sb-rnd-sb ang, mod fri, sl calc: sl multi string bl-wh mky cut; thk bri bl-wh res ring

8500

SS: lt brn-dk, med-gry, brn-mot, vf-f gr, med-v frm, sb-rnd-rnd, med-w strd,
p-mod cons w/ v calc cnt; SH: med gy-dk gy, pty-sb blk, frm-sft, sb-rnd-sb
ang, mod fri, sl calc: sl multi string bl-wh mky cut; thk bri bl-wh res ring



MD: 8.529
TVD: 7.725.87
Inclination: 90.49
Azimuth: 2.62
VS: 811.36

WT IN 9.5/ OUT 9.5
VIS IN 42/ OUT 42

MD: 8.614
TVD: 7.725.03
Inclination: 90.64
Azimuth: 1.41
VS: 896.29

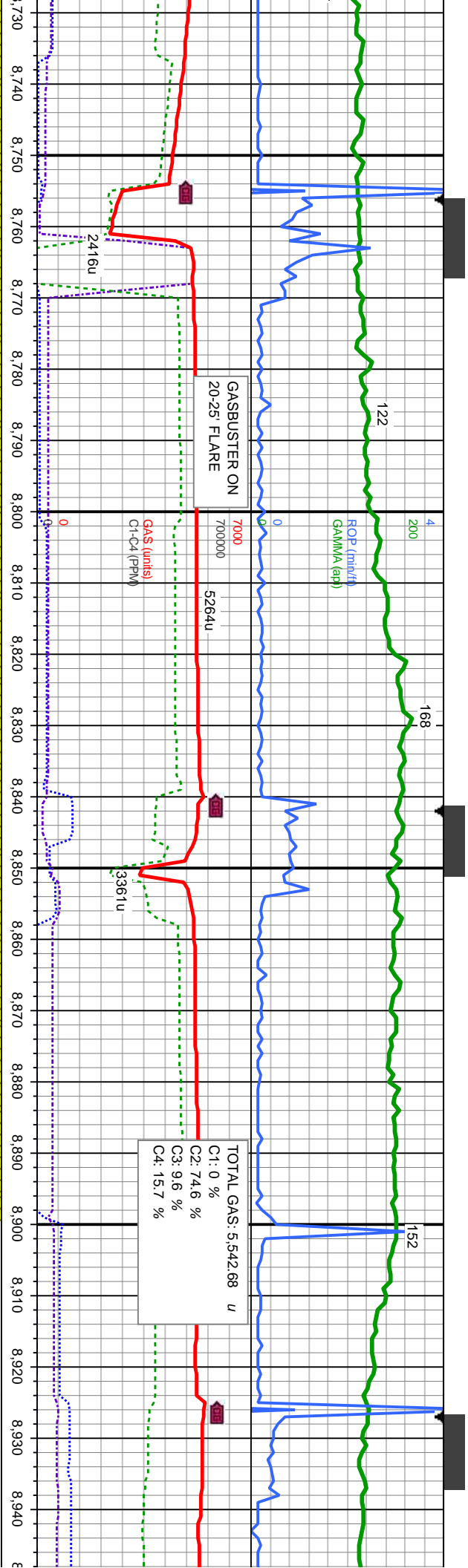
TOTAL GAS: 5,197.76 u
C1: 0 %
C2: 79.7 %
C3: 9.7 %
C4: 10.7 %

SS: lt brn-dk, med-gry, brn-mot, vf-f gr, med-v frm, sb-rnd-rnd, med-w strd,
p-mod cons w/ v calc cnt; SH: med gy-dk gy, ply-sb blk, frm-sft, sb rnd-sb
ang, mod fri, sl calc; tr LS; no difse; no sting cut; sl thk bri bl-sl green res ring

SS: lt brn-dk, med-gry, brn-mot, vf-f gr, med-v frm, sb-rnd-rnd, med-w strd,
p-mod cons w/ v calc cnt; SH: med gy-dk gy, ply-sb blk, frm-sft, sb rnd-sb
ang, mod fri, sl calc, LS: crm-offwht lt brn, ply-fly ip, frm-brt, cyxln-mcxln,
v sl arg, calc; tr LS; no difse; no sting cut; sl thk bri bl-sl green res ring

SS: lt brn-dk, med-
sb-rnd-rnd, med-w
LS; no difse; no s





WT IN 9.2/ OUT 9.2
VIS IN 46/ OUT 46

MD: 8.785
TVD: 7,721.9
Inclination: 91.54
Azimuth: 1.16
VS: 1,067.19

6750

TVD (ft)

WT IN 9.2/ OUT 9.2
VIS IN 42/ OUT 42

MD: 8.870
TVD: 7,719.46
Inclination: 91.75
Azimuth: 0.58
VS: 1,152.14

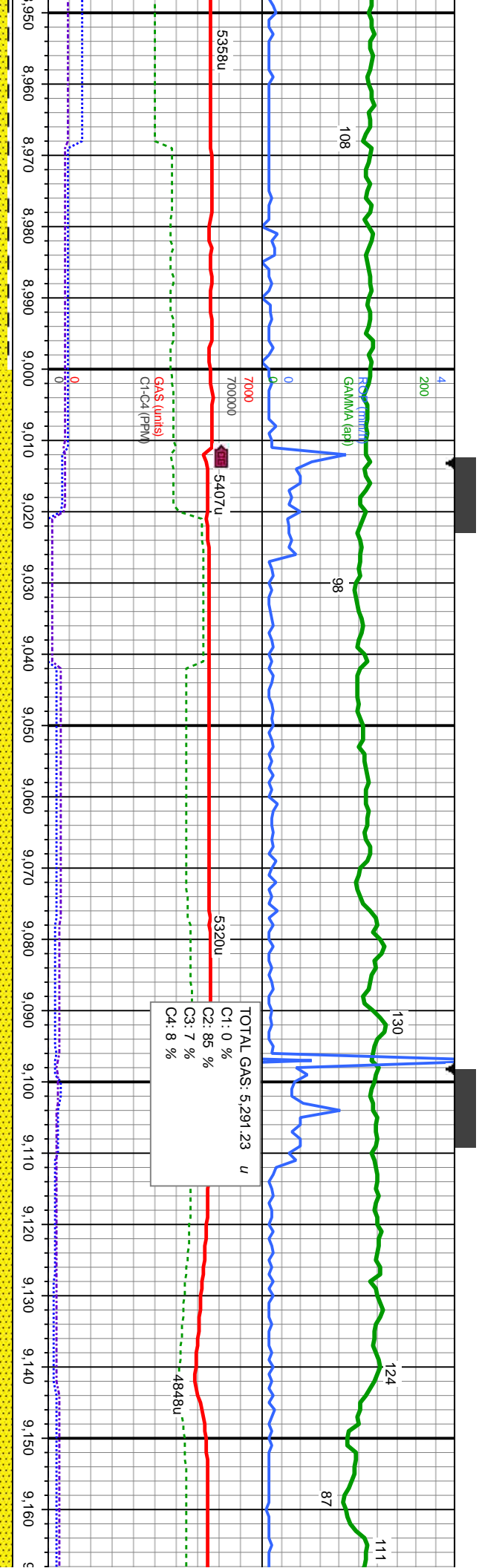
TOTAL GAS: 5,542.68 u
C1: 0 %
C2: 74.6 %
C3: 9.6 %
C4: 15.7 %

gry, brn-mot, vf-f gr, med-v frm,
strd, p-mod cons w/ v calc cnt; tr
ring cut; sl thk bri bl-sl green res ring

SS: lt brn-dk,med-gry, brn-mot, vf-f gr, med-v frm,
sb-rnd-rnd, med-w strd, p-mod cons w/ v calc cnt; tr
LS; no difse; no sting cut; sl thk bri bl-sl green res ring

SS: lt brn-dk,med-gry, brn-mot, vf-f gr,
w/ v calc cnt; SH: med gy-dk gy, ply-s
stmg/ strgs, lt bl flor wi g bl-wh cut, bri





MD: 8.956
V/D: 7.716.92
Inclination: 91.63
Azimuth: 0.6
S: 1,238.09

MD: 9.041
TVD: 7.713.98
Inclination: 92.33
Azimuth: 359.77
VS: 1,323.04

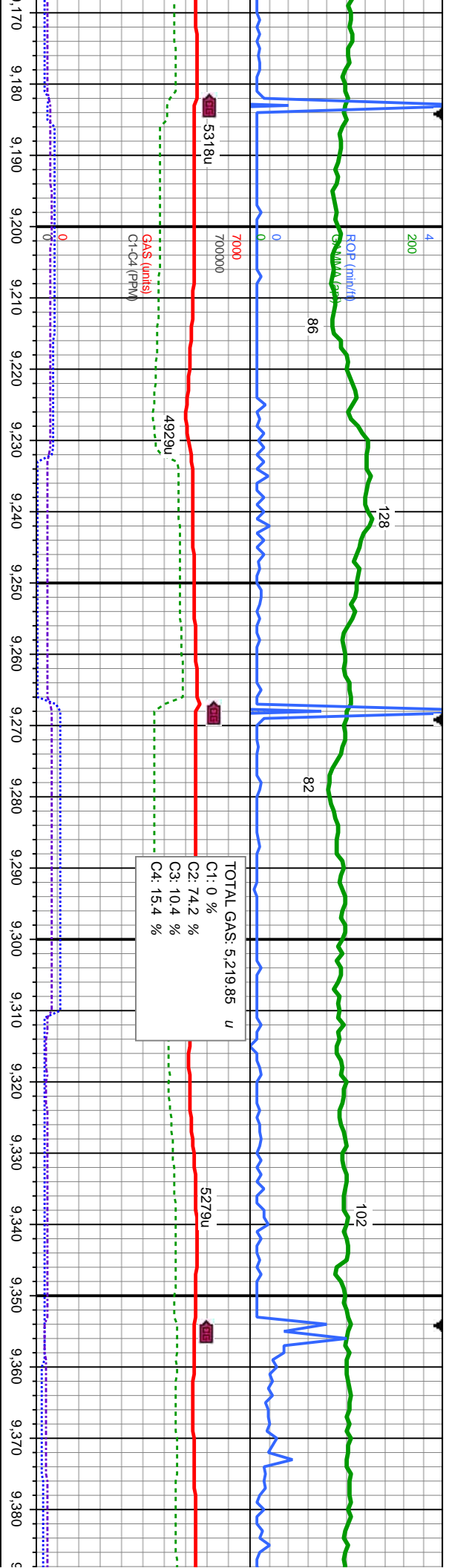
MD: 9.127
TVD: 7.710.48
Inclination: 92.34
Azimuth: 358.62
VS: 1,408.96

med-v frm, sb-rnd-rnd, med-w strd, p-mod cons
b blk, frm-sft, sb rnd-sb ang, mod fri, sl calc;
bl resdl ring

SS: lt brn-dk, med-gr, brn-mot, vf-f gr, med-v frm,
sb-rnd-rnd, med-w strd, p-mod cons w/ v calc cm; stmg/
strgs, lt bl flr wi g bl-wh dlse cut, bri bl resdl ring

SS: lt brn-dk, med-gr, brn-mot, vf-f gr, med-v frm,
sb-rnd-rnd, med-w strd, p-mod cons w/ v calc cm; stmg/
strgs, lt bl flr wi g bl-wh dlse cut, bri bl resdl ring





TOTAL GAS: 5,219.85 u
C1: 0 %
C2: 74.2 %
C3: 10.4 %
C4: 15.4 %

MD: 9,212
TVD: 7,706.96
Inclination: 92.4
Azimuth: 358.5
VS: 1,493.87

MD: 9,297
TVD: 7,703.29
Inclination: 92.55
Azimuth: 359.21
VS: 1,578.78

MD: 9,363
TVD: 7,700.37
Inclination: 91.1
Azimuth: 358.7
VS: 1,664.72

WT IN 10.2/ OUT 10.2
VIS IN 41/ OUT 41

SS: lt brn-dk, med-gr, brn-mot, vf-f gr, med-v frm, sb-rnd-rnd, med-w strd, p-mod cons wi v calc cmt; stmg/ strgs. lt bl flr wi g bl-wh difse cut, bri bl resd ring

SS: lt brn-dk, med-gr, brn-mot, vf-f gr, med-v frm, sb-rnd-rnd, med-w strd, p-mod cons wi v calc cmt; stmg/ strgs. lt bl flr wi g bl-wh difse cut, bri bl resd ring



DATE: 11/17/13

4
200

4
200

97

91

99

113

ROP (ft)
GAMMA (api)

78

5348u

5398u

7000
700000

TOTAL GAS: 5,226.38 u
C1: 0 %
C2: 89.6 %
C3: 7.7 %
C4: 2.7 %

GAS (units)
C1-C4 (PPM)

GAS (units)
C1-C4 (PPM)

0

0

9,390 9,400 9,410 9,420 9,430 9,440 9,450 9,460 9,470 9,480 9,490 9,500 9,510 9,520 9,530 9,540 9,550 9,560 9,570 9,580 9,590 9,600

6750

6750

WT IN 9.2/ OUT 9.2
VIS IN 42/ OUT 42

MD: 9.468
TVD: 7.699.21
Inclination: 90.21
Azimuth: 358.6
VS: 1,749.69

MD: 9.554
TVD: 7.698.62
Inclination: 90.58
Azimuth: 357.66
VS: 1,835.65

TVD (ft)

TVD (ft)

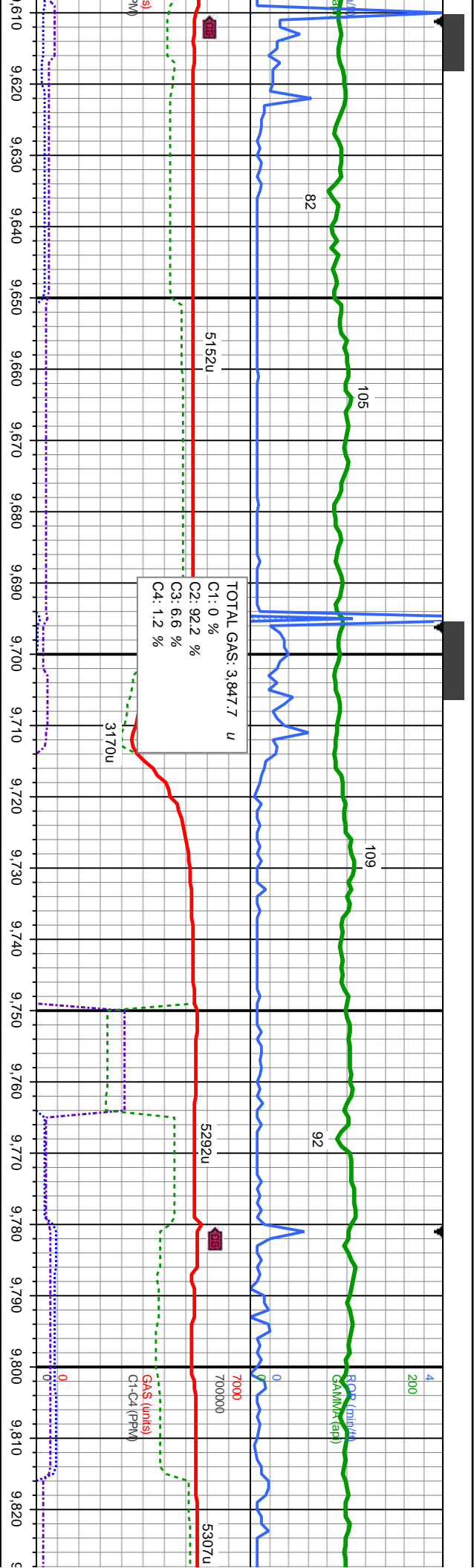
SS: lt brn-dk, med-gry, brn-mot, vf-f gr, med-v frm,
sb-rnd-rnd, med-w strd, p-mod cons wi v calc crnt; stmg/
strgs. lt bl flr wi g bl-wh dlse cut, brl bl resdl ring

SS: lt brn-dk, med-gry, brn-mot, vf-f gr, med-v frm,
sb-rnd-rnd, med-w strd, p-mod cons wi v calc crnt; stmg/
strgs. lt bl flr wi g bl-wh dlse cut, brl bl resdl ring

8500

8500





MD: 9.639
TVD: 7.698.35
Inclination: 89.78
Azimuth: 357.33
VS: 1.920.58

MD: 9.724
TVD: 7.698.36
Inclination: 90.21
Azimuth: 359.44
VS: 2.005.55

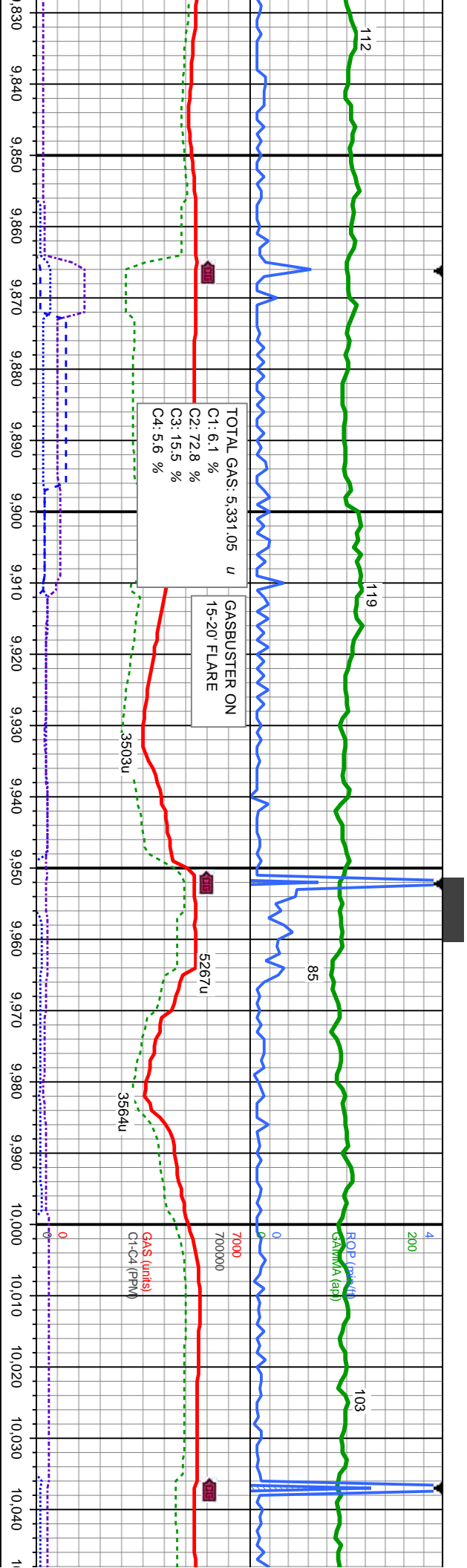
MD: 9.809
TVD: 7.697.82
Inclination: 90.52
Azimuth: 359.77
VS: 2.090.55

SS: lt brn-dk, med-gr, brn-mot, vf-f gr, med-v frm,
sb-rnd-rnd, med-w strd, p-mod cons w/ v calc cnt; stmg/
strgs, lt bl flr w/ g bl-wh dfse cut, brl bl resdl ring

SS: lt brn-dk, med-gr, brn-mot, vf-f gr, med-v frm,
sb-rnd-rnd, med-w strd, p-mod cons w/ v calc cnt; stmg/
strgs, lt bl flr w/ g bl-wh dfse cut, brl bl resdl ring

SS: lt brn-dk, med-gr, brn-mot, vf-f gr, med-v frm,
sb-rnd-rnd, med-w strd, p-mod cons w/ v calc cnt; stmg/
strgs, lt bl flr w/ g bl-wh dfse cut, brl bl resdl ring





TOTAL GAS: 5.331.05 u
C1: 6.1 %
C2: 72.8 %
C3: 15.5 %
C4: 5.6 %

GASBUSTER ON
15-20' FLARE

ROP (ft/min)
Gamma Ray (API)

Gas (units)
C1-C4 (PPM)

WT IN 9.2/ OUT 9.2
VIS IN 42/ OUT 42

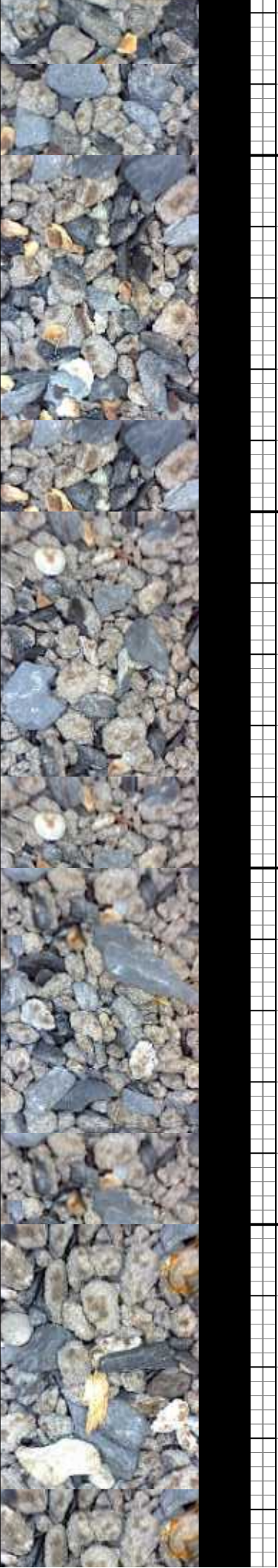
MD: 9.895
TVD: 7.696.74
Inclination: 90.92
Azimuth: 0.32
VS: 2.176.54

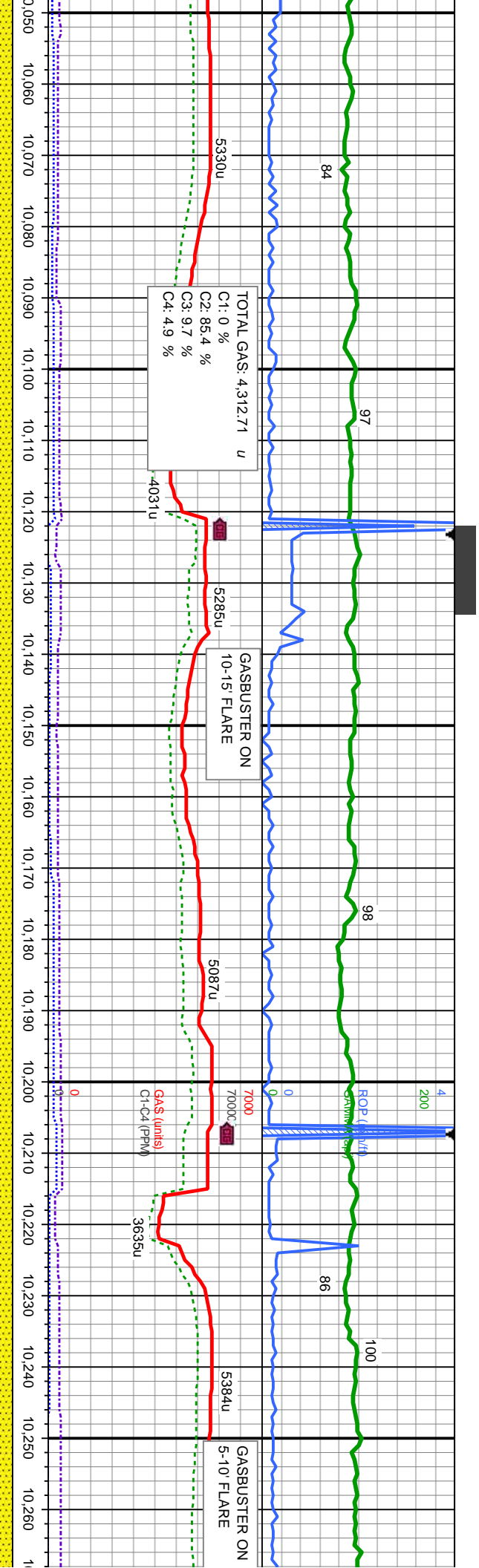
MD: 9.980
TVD: 7.695.48
Inclination: 90.77
Azimuth: 0.22
VS: 2.261.53

gry, brn-mot, vf-f gr, med-v frm, sb-rnd-rnd, med-w strd, p-mod cons w/ v calc cmt; stmg/ strgs. lt bl flr w/ g bl-wh difse cut, bri bl resdl ring

SS: lt brn-dk,med-gry, brn-mot, vf-f gr, med-v frm, sb-rnd-rnd, med-w strd, p-mod cons, calc cmt; stmg/ strgs. lt bl flr w/ g bl-wh difse cut, bri bl resdl ring

SS: lt brn-dk,med-gry, brn-mot, vf-f gr, sb-rnd-rnd, med-w strd, p-mod cons, calc cmt; stmg/ strgs. lt bl flr w/ g bl-wh difse cut, bri bl resdl ring





MD: 10,066
TVD: 7,693.98
Inclination: 91.23
Azimuth: 0.6
VS: 2,347.51

MD: 10,151
TVD: 7,693.14
Inclination: 89.9
Azimuth: 0.48
VS: 2,432.5

MD: 10,236
TVD: 7,692.88
Inclination: 90.46
Azimuth: 0.01
VS: 2,517.49

WT IN 9.2/ OUT 9.2
VIS IN 44/ OUT 44

med-v, frm,	
stic cnt/stmg/	
bl resdl ring	
SS: lt brn-dk, med-gry, brn-mot, vf-f gr, med-v frm,	
sb-rnd-rnd, med-w strd, p-mod cons w/ v calc cnt; stmg/	
strgs. lt bl flor w/ g bl-wh dfse cut, brt bl resdl ring	
8500	
SS: lt brn-dk, med-gry, brn-mot, vf-f gr, med-v frm,	
sb-rnd-rnd, med-w strd, p-mod cons w/ v calc cnt; stmg/	
strgs. lt bl flor w/ g bl-wh dfse cut, brt bl resdl ring	



TOOH FOR NEW BHA @ 10446 MD,
11/17/13 - NO FLOW & PRESSURE
SPIKES - WARRIOR WIRELINE
CALLED IN TO PERFORATE DRILL
PIPE ABOVE BHA AT THE KOP TO
REESTABLISH FLOW/ CIRCULATION
IN ORDER TO KILL WELL.

Bit #: 2
Type: MMD54
Size: 6.12
Depth In: 8,240
Depth Out: 10,446
Total Drilled: 2,206
Avg Ft/Hr: 227.4
Hours: 9.7
Jets: 3X12 2X12
S/N: 12325538

TOOH @ 10446 MD
FOR NEW BHA

TOTAL GAS: 4,822.73 u
C1: 6.6 %
C2: 74.3 %
C3: 15.3 %
C4: 3.9 %

MD: 10,322
TVD: 7,691.63
Inclination: 91.2
Azimuth: 1.41
VS: 2,603.47

WT IN 9.2/ OUT 9.2
VIS IN 44/ OUT 44

MD: 10,413
TVD: 7,690.49
Inclination: 90.24
Azimuth: 0.89
VS: 2,694.44

6750

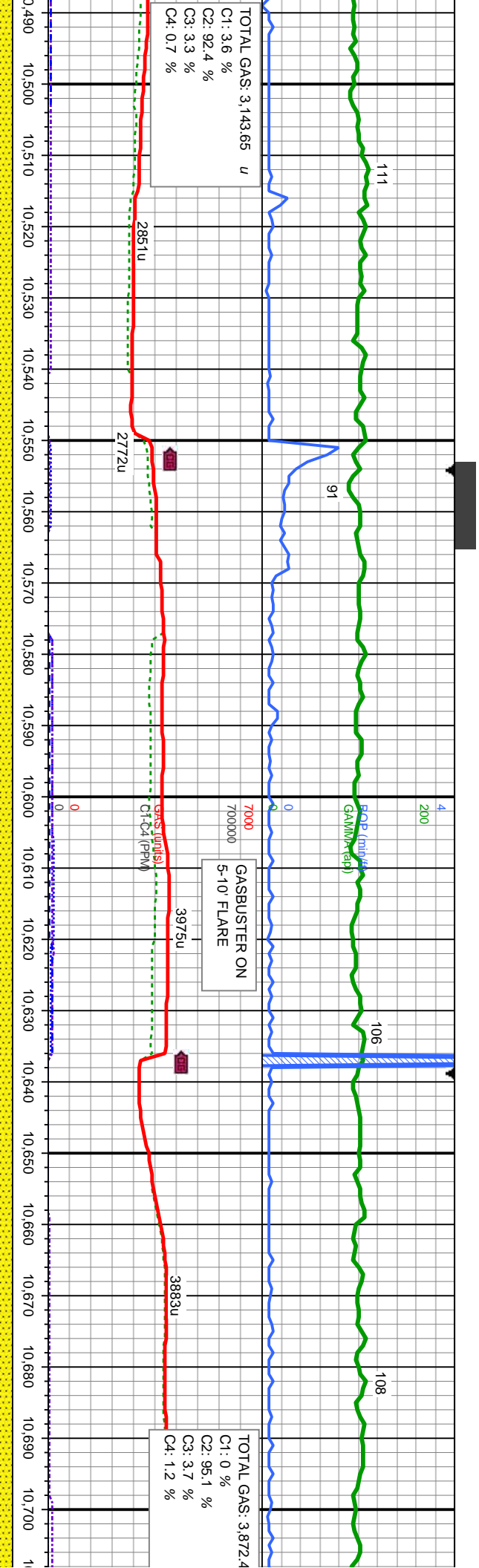
WT IN 10.6/ OUT 10.4
VIS IN 39/ OUT 42

SS: lt brn-dk,med-gry, brn-mot, vf-f gr, med-v frm,
sb-rnd-rnd, med-w strd, p-mod cons w/ v calc cmf; stimg/
strgs. lt bl flor w/ g bl-wh dfse cut, brn bl resdl ring

SS: lt brn-dk,med-gry, brn-mot, vf-f gr, med-v frm,
sb-rnd-rnd, med-w strd, p-mod cons w/ v calc cmf; stimg/
strgs. lt bl flor w/ g bl-wh dfse cut, brn bl resdl ring

8500





MD: 10,498
TVD: 7,689.76
Inclination: 90.74
Azimuth: 0.5
VS: 2,779.42

WT IN 10.5/OUT 10.5
VIS IN 40/OUT 42

MD: 10,583
TVD: 7,689.65
Inclination: 89.41
Azimuth: 0.43
VS: 2,864.41

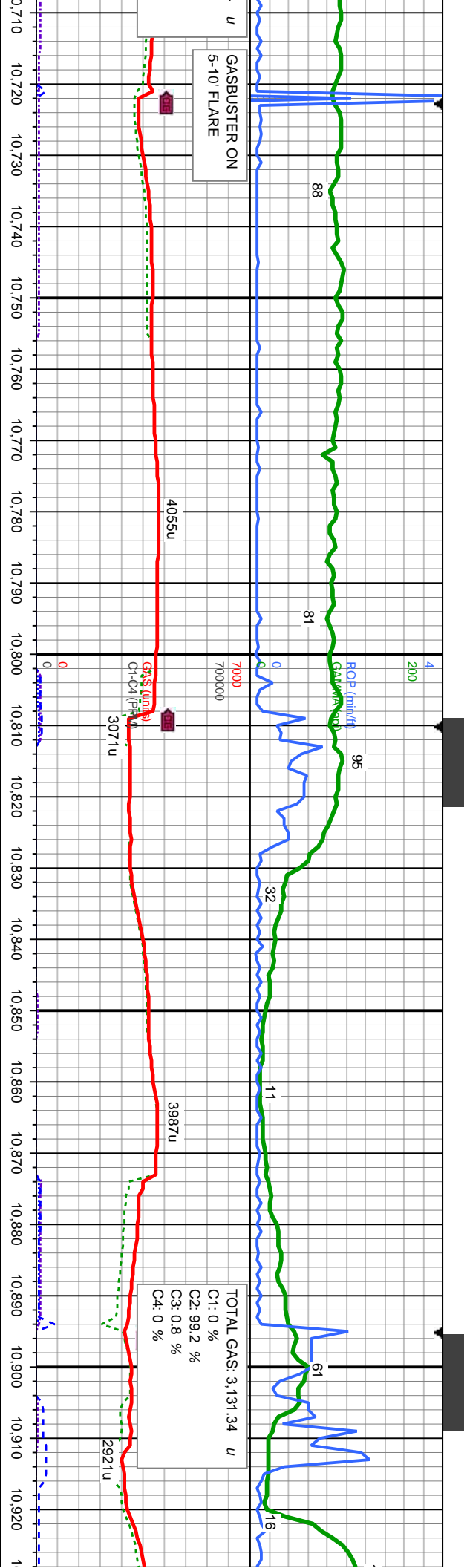
TVD (ft)

MD: 10,668
TVD: 7,690.73
Inclination: 89.13
Azimuth: 359.89
VS: 2,949.41

SS: lt brn-dk, med-gr, brn-mot, vf-f gr, med-v frm,
sb-rnd-rnd, med-w strd, p-mod cons wi v calc cm; stmg/
strgs, lt bl flr wi g bl-wh dfse cut, brl bl resd ring

SS: lt brn-dk, med-gr, brn-mot, vf-f gr, med-v frm,
sb-rnd-rnd, med-w strd, p-mod cons wi v calc cm; stmg/
strgs, lt bl flr wi g bl-wh dfse cut, brl bl resd ring





WT IN 10.6/ OUT 10.6
VIS IN 42/ OUT 42

MD: 10.754
TVD: 7.692.17
Inclination: 88.95
Azimuth: 0.41
VS: 3.035.39

WT IN 10.6/ OUT 10.6
VIS IN 42/ OUT 42

MD: 10.839
TVD: 7.693.43
Inclination: 89.35
Azimuth: 359.77
VS: 3.120.38

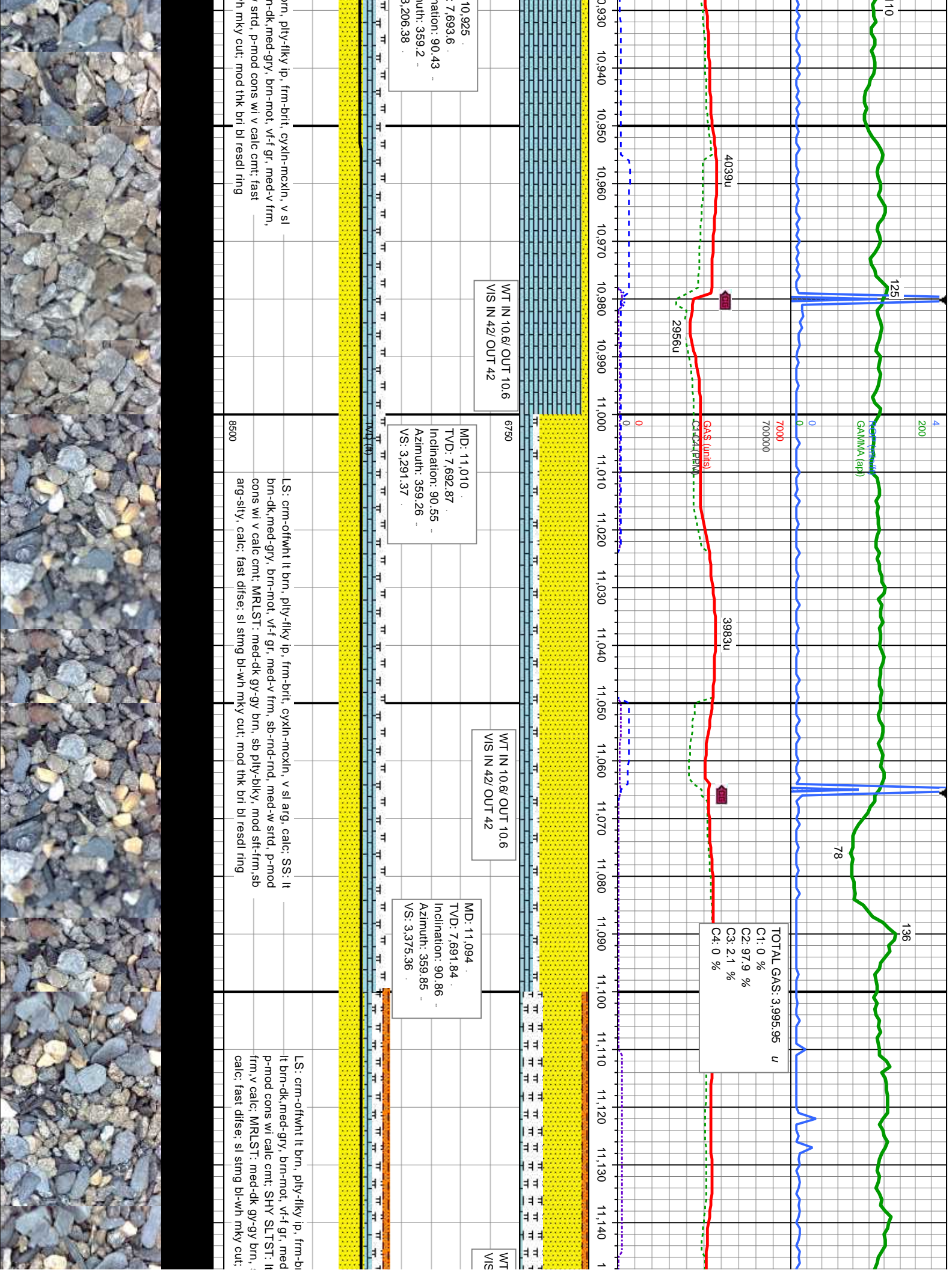
FAULT 1 OF 3
MD: 10920'
TVD: 7691'
Azir
VS: :
40' DOWNWARD THROW

SS: lt brn-dk,med-gr, brn-mot, vf-f gr, med-v frm,
sb-rnd-rnd, med-w strd, p-mod cons wi v calc cm; sting/
strgs. lt bl flor wi g bl-wh difse cut, brl bl resdl ring

LS: crm-offwht lt brn, plty-fiky ip, frm-brt, cyxln-mckln, v sl arg, calc: SS:
lt brn-dk,med-gr, brn-mot, vf-f gr, med-v frm, sb-rnd-rnd, med-w strd,
p-mod cons wi v calc cm; SHY SL.TST: lt gy-med gy, sb-biky-sb-plty,
med-v frm,fast difse; sl sting bl-wh mky cut; mod thk bri bl resdl ring

LS: crm-offwht lt t
arg, calc: SS: lt br
sb-rnd-rnd, med-w
difse; sl sting bl-w





10,925
7,693.6
ation: 90.43
uth: 359.2
3,206.38

WT IN 10.6/ OUT 10.6
VIS IN 42/ OUT 42

MD: 11,010
TVD: 7,692.87
Inclination: 90.55
Azimuth: 359.26
VS: 3,291.37

WT IN 10.6/ OUT 10.6
VIS IN 42/ OUT 42

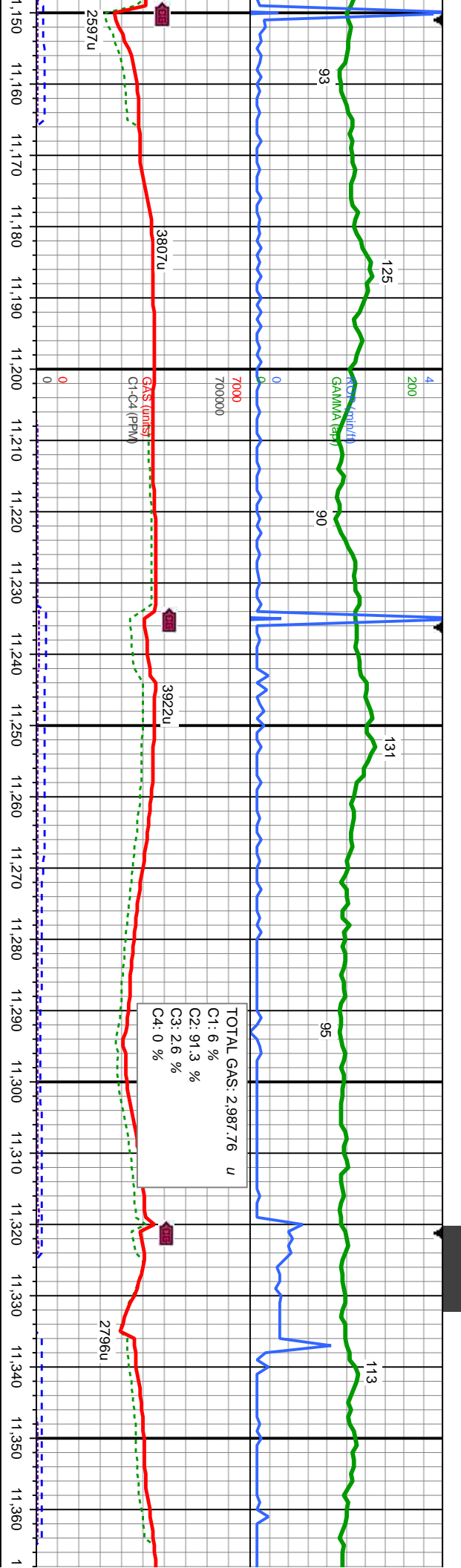
MD: 11,094
TVD: 7,691.84
Inclination: 90.86
Azimuth: 359.85
VS: 3,375.36

TOTAL GAS: 3,995.95 u
C1: 0 %
C2: 97.9 %
C3: 2.1 %
C4: 0 %

brn, pty-rlky ip, frm-brt, cyxn-mcxn, v sl
n-dk,med-gr, brn-mot, vf-f gr, med-v frm,
srd, p-mod cons wi v calc cnt; fast
h mky cut; mod thk bri bl resd ring

LS: crm-offwht lt brn, pty-rlky ip, frm-brt, cyxn-mcxn, v sl arg, calc; SS: lt
brn-dk,med-gr, brn-mot, vf-f gr, med-v frm, sb-rnd-rnd, med-w srd, p-mod
cons wi v calc cnt; MRLST: med-dk gy-gy brn, sb pty-blky, mod sft-frm, sb
arg-sly, calc; fast dfse; sl string bl-wh mky cut; mod thk bri bl resd ring

LS: crm-offwht lt brn, pty-rlky ip, frm-br
lt brn-dk,med-gr, brn-mot, vf-f gr, med
p-mod cons wi calc cnt; SHY SLTST: lt
frm, v calc; MRLST: med-dk gy-gy brn, ;
calc; fast dfse; sl string bl-wh mky cut;



IN 10.6/ OUT 10.6
IN 43/ OUT 43

MD: 11,180
TVD: 7,690.5
Inclination: 90.92
Azimuth: 359.79
VS: 3,461.35

6750

MD: 11,265
TVD: 7,688.91
Inclination: 91.23
Azimuth: 0.66
VS: 3,546.33

WT IN 10.6/ OUT 10.6
VIS IN 43/ OUT 43

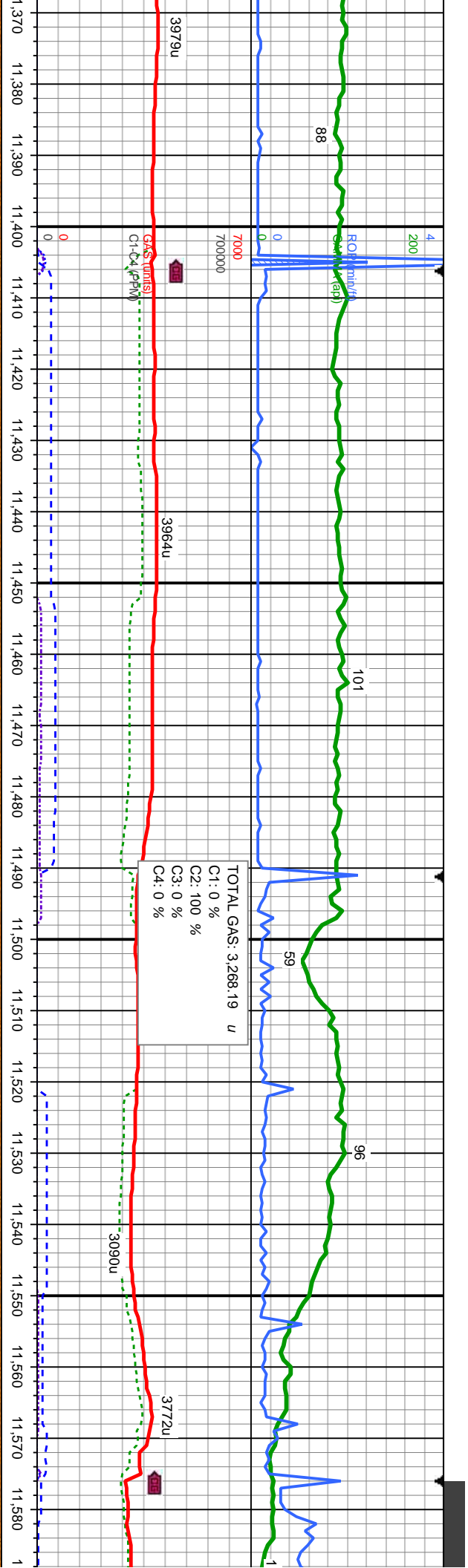
MD: 11,350
TVD: 7,687.79
Inclination: 90.27
Azimuth: 359.83
VS: 3,631.32

lt, cyxln-mcxl, v sl arg, calc; SS:
v frm, sb-rnd-rnd, med-w strd,
gy-med gy, sb-bkly-sb-ply, med-v
sb ply-bkly, mod sft-frm, sb arg-sily,
mod thk bri bl resd ring

LS: crm-offwht lt brn, ply-rlky ip, frm-brit, cyxln-mcxl, v sl arg, calc; SS: lt brn-dk, med-gry,
brn-mot, vt-f gr, med-v frm, sb-rnd-rnd, med-w strd, p-rnd cons wi calc cnt; SHY SLTST: lt
gy-med gy, sb-bkly-sb-ply, med-v frm, v calc; MRLST: med-dk gy-gy brn, sb ply-bkly, mod
sft-frm, sb arg-sily, calc; fast disse; sl string bl-wh mky cut; mod thk bri bl resd ring

SS: lt brn-dk, med-gry, brn-mot, vt-f gr, med-v frm, sb-rnd-rnd,
p-rnd cons wi calc cnt; SHY SLTST: lt gy-med gy, sb-bkly-sb-ply,
frm, v calc; TR LS: MRLST: med-dk gy-gy brn, sb ply-bkly, n
arg-sily, calc; fast disse; sl string bl-wh mky cut; mod thk bri





MD: 11,435
TVD: 7,687.53
Inclination: 90.09
Azimuth: 359.94
VS: 3,716.32

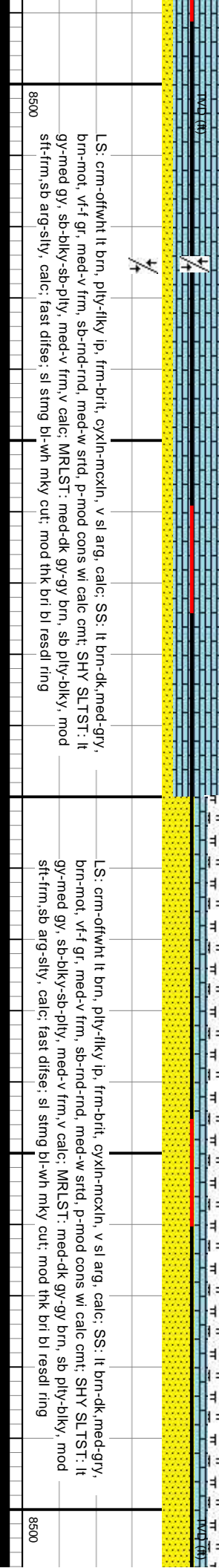
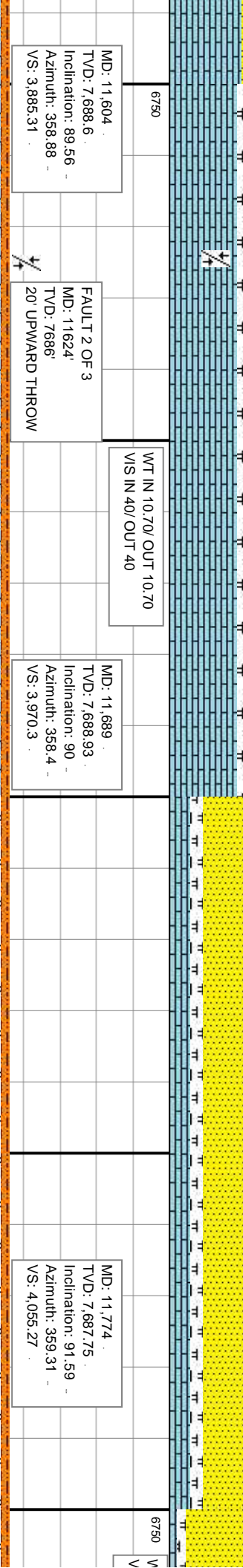
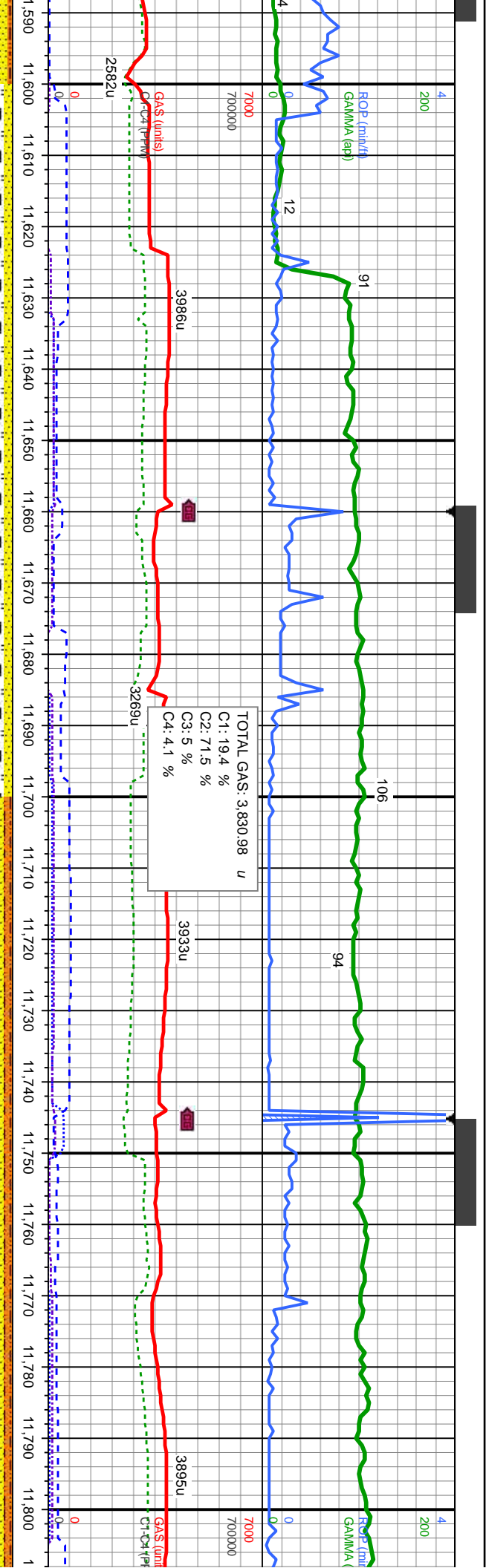
WT IN 10.70/ OUT 10.70
VIS IN 38/ OUT 38

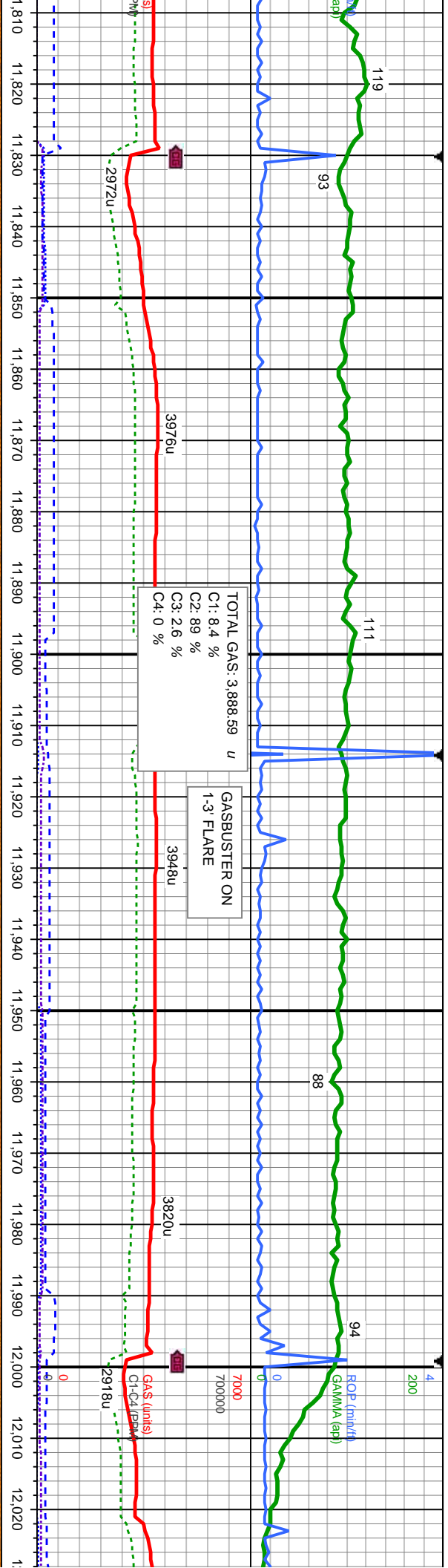
MD: 11,521
TVD: 7,687.88
Inclination: 89.44
Azimuth: 359.83
VS: 3,802.32

SS: lt brn-dk, med-gry, brn-mot, vf-f gr, med-v frm, sb-rnd-rnd, med-w strd, p-mod cons wi calc cnt; SHY SLTST: lt gy-med gy, sb-bkly-sb-pty, med-v frm, v calc; LS: crm-offwht lt brn, pty-fkly ip, frm-brit, cyxln-mcxln, v sl arg, calc; MRLST: med-dk gy-gy brn, sb pty-bkly, mod st-frm, sb arg-sily, calc; fast difse; sl stmg bl-wh mky cut; mod thk bri bl resdl ring

LS: crm-offwht lt brn, pty-fkly ip, frm-brit, cyxln-mcxln, v sl arg, calc; SS: lt brn-dk, med-gry, brn-mot, vf-f gr, med-v frm, sb-rnd-rnd, med-w strd, p-mod cons wi v calc cnt; SHY SLTST: lt gy-med gy, sb-bkly-sb-pty, med-v frm, v calc; fast difse; sl stmg bl-wh mky cut; mod thk bri bl resdl ring







IS IN 10.70/ OUT 10.70

MD: 11,858
TVD: 7,685.44
Inclination: 91.57
Azimuth: 359.02
VS: 4,139.24

MD: 11,943
TVD: 7,683.06
Inclination: 91.63
Azimuth: 359.91
VS: 4,224.2

WT IN 10.70/ OUT 10.70
VIS IN 39/ OUT 39

MD: 12,000
TVD: 7,680
Inclination: 91.63
Azimuth: 359.91
VS: 4,300

LS: crm-offwht lt brn, ply-fiky ip, frm-brt, cyxn-mcxln, v sl arg, calc; SS: lt brn-dk,med-gry, brn-mot, vf-f gr, med-v frm, sb-rnd-rnd, med-w srtid, p-mod cons wi calc cmt; SHY SLTST: lt gy-med gy, sb-biky-sb-ply, med-v frm, v calc; MRLST: med-dk gy-gy brn, sb ply-biky, mod sft-frm, sb arg-sily, calc; fast difse; sl stmg bl-wh mky cut; mod thk bri bl resdl ring

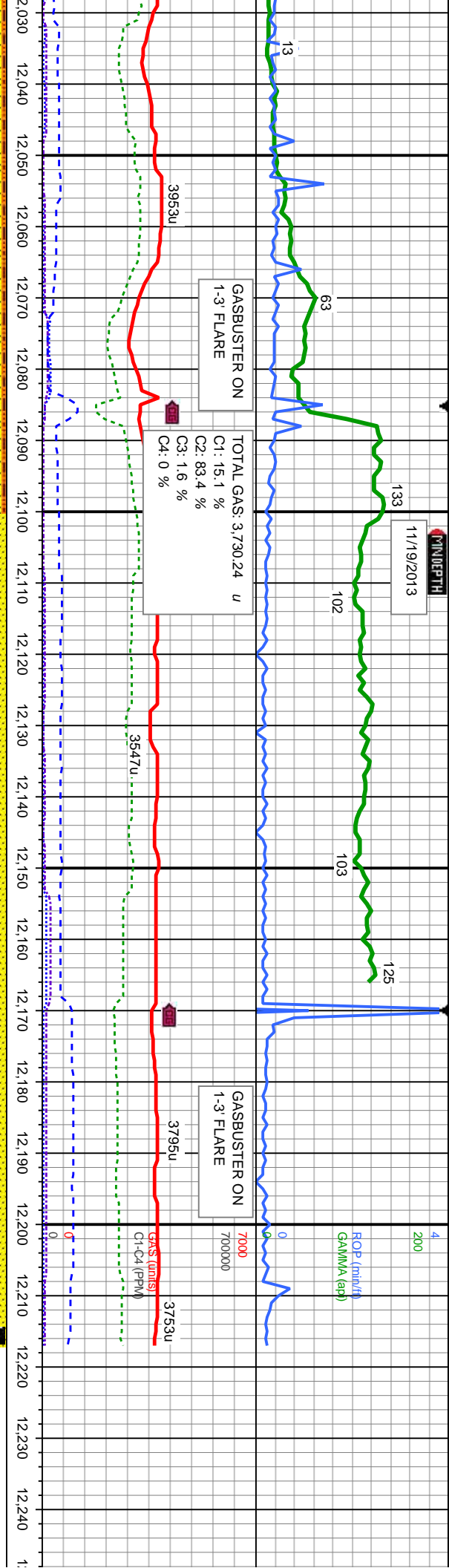
LS: crm-offwht lt brn, ply-fiky ip, frm-brt, cyxn-mcxln, v sl arg, calc; SS: lt brn-dk,med-gry, brn-mot, vf-f gr, med-v frm, sb-rnd-rnd, med-w srtid, p-mod cons wi calc cmt; SHY SLTST: lt gy-med gy, sb-biky-sb-ply, med-v frm, calc; MRLST: med-dk gy-gy brn, sb ply-biky, mod sft-frm, sb arg-sily, calc; CHK: lt-med gy,lt-med brn, mot, sb biky-sb ply, sft-sl frm, fri, chky-sb wxy, v calc; fast difse; sl stmg bl-wh mky cut; mod thk bri bl resdl ring

LS: crm-offwht lt brn, ply-fiky ip, frm-brt, cyxn-mcxln, v sl arg, calc; SS: lt brn-dk,med-gry, brn-mot, vf-f gr, med-v frm, sb-rnd-rnd, med-w srtid, p-mod cons wi calc cmt; SHY SLTST: lt gy-med gy, sb-biky-sb-ply, med-v frm, calc; MRLST: med-dk gy-gy brn, sb ply-biky, mod sft-frm, sb arg-sily, calc; wxy, v calc; fast difse; sl



MINDEPTH
11/19/2013

ROP (min/h)
GAMMA (api)



229
380.96
on: 91.17
: 359.62
0.17

FAULT 3 OF 3
MD: 12084'
TVD: 7678'
23 DOWNWARD THROW

MD: 12,114
TVD: 7,679.43
Inclination: 90.89
Azimuth: 359.73
VS: 4,395.16

WT IN 10.7/ OUT 10.7
VIS IN 39/ OUT 39

MD: 12,161
TVD: 7,678.79
Inclination: 90.67
Azimuth: 359.63
VS: 4,442.16

MD: 12,217
TVD: 7,678.14
Inclination: 90.67
Azimuth: 359.63
VS: 508.58

6750 PROJECTION TO BIT

LS: crm-offwht lt brn, ply-flky ip, frm-brt, cyxln-mcxln, v sl arg, calc; SS: lt brn-dk,med-gr, brn-dk,med-gr, brn-mot, vt-f gr, med-v frm, sb-rnd-rnd, med-w strd, p-mod cons wi calc cnt; MRLST: med-dk gy-gy brn, sb ply-blky, mod stf-frm, sb arg-slt, calc;CHK: lt-med gy,lt-med brn, mot, sb blky-sb ply, stf-sl frm, fri, chky-sb string bl-wh mky cut; mod thk bri bl resd ring

LS: crm-offwht lt brn, ply-flky ip, frm-brt, cyxln-mcxln, v sl arg, calc; SS: lt brn-dk,med-gr, brn-mot, vt-f gr, med-v frm, sb-rnd-rnd, med-w strd, p-mod cons wi calc cnt; MRLST: med-dk gy-gy brn, sb ply-blky, mod stf-frm, sb arg-slt, calc;CHK: lt-med gy,lt-med brn, mot, sb blky-sb ply, stf-sl frm, fri, chky-sb string bl-wh mky cut; mod thk bri bl resd ring

8500



Bit #: 3
Type: MMD54
Size: 6.12
Depth In: 10,446
Depth Out: 12,217
Total Drilled: 1,771
Avg Ft/Hr: 215.97
Hours: 8.2
Jets: 3X12 2X12
S/N: 12301812

TDD WELL @ 12217 MD
@ 12:40 AM ON 11/20/2013

12,250 12,260 12,270 12,280 12,290 12,300

THANK YOU FOR USING
COLUMBINE LOGGING INC.