



Scale: 5" / 100'  
Measured Depth Log

Well Name Spurling 13C-34HZ

Location NWNW: SEC 34, TWP 2N 67W 6 PM

State COLORADO

County WELD

Country U.S.A.

Rig Number XTREME 6

API Number 05123389490000

AFE # 2085756.DRL

Region D-J BASIN

Field WATTENBERG

Spud Date 5/22/2014

Drilling Completed 5/28/2014

Surface Coordinates 377' FNL, 1058' FWL

Bottom Hole Coordinates 460' FFSSL, 610' FFWLL

Ground Elevation 5,015'

K.B. Elevation 5,035'

Logged Interval 7,100' To 12,219'

Total Depth 12,219'

Formation CODELL

Type of Drilling Fluid LSND/ PHPA

## Operator

Company Anadarko

Address Granite Tower  
1099 18th St. #1800  
Denver, CO 80202  
(JG)

## Geologist

Name ISAAC SMITH & BRIAN SPITZMILLER (LATERAL)

Company COLUMBINE LOGGING INC.

Address 2385 S. Lipan Street  
Denver, CO 80223  
Phone: 303-289-7764

## Zone Color Coding

Oil  
Note  
Error

Condensate  
Core  
Water

G  
Pl  
S

Rock Types

UNKNOWN	COAL	MARLSTONE	SHALY SANDSTONE
ANHYDRITE	CONGLOMERATE	METAMORPHIC	SHALY SILTSTONE
BENTONITE	DOLOMITE	NO SAMPLE	SILTY SHALE
BRECCIA	DOLOMITIC LIMESTONE	SALT	SILTSTONE
CHALK	GRANITE	SANDSTONE	TILL
CEMENT	GYPSUM	SALT-PEPPER SAND	TUFF
CHERT	IGNEOUS	SHALE	WELDED TUFF
CLAY CHOKE SAND	SIDERITE or LIMONITE	SHALE COLORED	
CLAYSTONE	LIMESTONE	SHALE GRAY	

Accessories

GASTROPOD	ARGILLITE GRAIN	HEAVY MINERAL	
INOCERAMUS	B BENTONITE	K KAOLIN	
ALGAE	BITUMENOUS SUBSTANCE	M MARCASITE	ANHYDRITE STRINGER
AMPHIPORA	BRECCIA FRAGMENTS	M MARLSTONE	BENTONITE STRINGER
BELEMNITE	PELCOYPOD	M MICACEOUS	COAL STRINGER
BIOCLASTIC	PELLET	MINERAL CRYSTALS	DOLOMITE STRINGER
BRACHIOPOD	PISOLITE	N NODULES	GYPSUM STRINGER
BRYOZOA	PLANT REMAINS	PHOSPHATE PELLETS	LIMESTONE STRINGER
CEPHALOPOD	PLANT SPORES	COAL - THIN BEDS	MARLSTONE (CALC) STRG
CORAL	SCAPHOPOD	D DOLOMITIC	MARLSTONE (DOL) STRG
CRINOID	STROMATOPOROID	F FELDSPAR	SANDSTONE STRINGER
ECHINOID		S SIDERITE	SHALE STRINGER
FISH		F FERRUGINOUS PELLET	
FORAMINIFERA	ANHYDRITIC	F FERRUGINOUS	SILTCEOUS
F FOSSIL	ARGILLACEOUS	GLAUCONITE	SILTY
		GYPSIFEROUS	TUFFACEOUS

Oil Show

P PINPOINT
V VUGGY

Engineering

D DEAD
E EVEN
Q QUESTIONABLE
B BIT
S SPOTTED STAINING
C CONNECTION (UP)

Porosity

C CONNECTION (DOWN)
E EARTHY
F FENESTRAL
T TRIP GAS
F FRACTURE
T TRIP GAS (LEFT)
I INTERCRYSTALLINE
D DOWN TIME GAS
I INTEROOLITIC
D DOWN TIME GAS
M MOLDIC
C CORE - LOST
O ORGANIC
C CORE - RECOVER

Other Symbols

 DST INTERVAL       WIRELINE TESTED - LEFT       E EARTHY

 FAULT       WIRELINE TESTED - RT       FX FINELYXLN

 FORMATION TOP       DRILL STEM TEST       GS GRAINSTONE



 GAS SHOW       MINDEPTH MN DEPTH       L LITHOGRAPHIC



 OIL SHOW       MINDEPTH MN DEPTH       MX MICROXLN

 MINDEPTH MN DEPTH UP      **Rounding**       MS MUDSTONE

 MINDEPTH MN DEPTH (DOWN)       A ANGULAR       PS PACKSTONE

 NORMAL FAULT       R ROUNDED       WS WACKSTONE


 OVERTURNED STRATA       B SUBANG




 REVERSE FAULT       N SUBRND

Sorting

 CASING       M MODERATE

Textures

 SIDEWALL CORE (LEFT)       P POOR

 SIDEWALL CORE (RIGHT)       BS BOUNDSTONE       W WELL

 SLIDE       C CHALKY

 SURVEY       CX CRYPTOXLN

Slide/Rotate

ROP  
ROF  
GAMMA

BEGIN SPURLING 13C-34HZ AT 7,100' MD.  
DRILLING 8.75" HOLE. BIT #1, SMITH, SD1613.  
DEPTH IN: 1.075 MD. KOP: 7,117 MD.

ROP & GAS DATA PROVIDED BY BALL  
BLOODHOUND UNIT #0787 - GAMMA & SURVEY  
DATA PROVIDED BY BAKER HUGHES

BEGIN COLUMBINE LOGGING INC.,  
1-MAN LOGGING 5/23/2014.

Total Gas & Chromatograph  
GAS  
C1  
C2  
C3  
C4

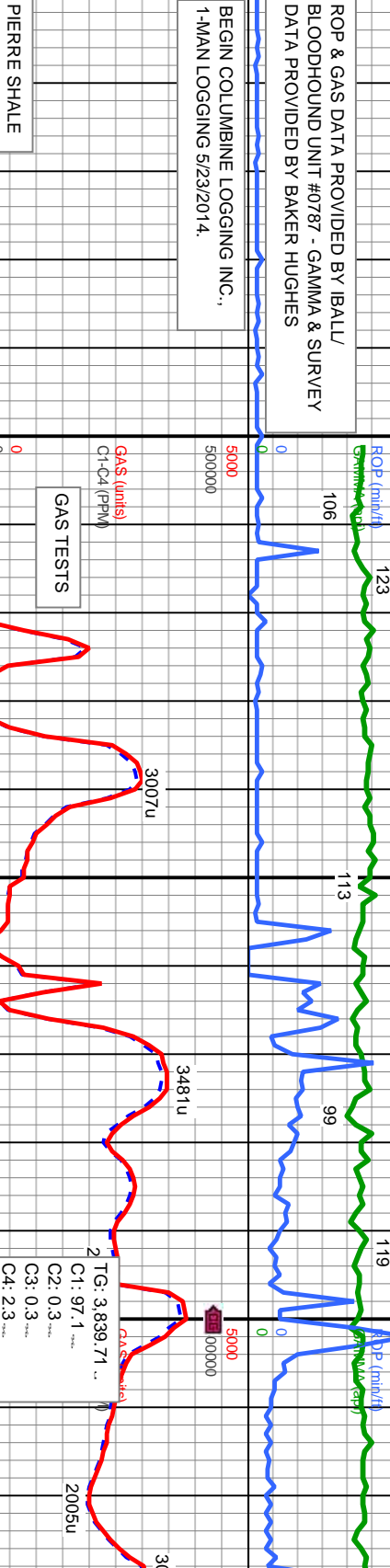
Depth Labels

% Lith

Well Bore  
TVD

Oil Show

Images



THE IDEALIZED INTERPRETATION OF THE  
WELLBORE LITHOLOGY IS NOT TO SCALE.

SCAVENGER TANK IN OPERATION  
WITH FOUR TOTAL SHAKERS.

USING 'BLACK FURY'  
(GILSONITE) MUD ADDITIVE

ACETONE WAS USED AS THE CUTTING AGENT  
WITH THE DIMPLE FILLED TO THE RIM. THE  
RATINGS ARE BASED ON 7 DESCRIPTORS:  
NONE, SLIGHT TRACE, TRACE, FAIR,  
MODERATE, GOOD, AND EXCELLENT. THE  
DESCRIPTOR USED IS BASED ON THE  
LOGGERS OBSERVATIONS AND BEST  
JUDGMENT OF BRILLIANCE, COLOR AND  
LONGEVITY OF THE CUT.

100' SAMPLE INTERVAL  
100' SAMPLE DESCRIPTION

MD: 7.049.  
TVD: 7,002.95  
Incl.: 0.33 -  
Azim.: 342.46 -  
VS: -343.89

WT IN 10.5/ OUT 10.5  
VIS IN 45/ OUT 45

MD: 7.092.  
TVD: 7,045.94  
Incl.: 2.44 -  
Azim.: 172.41 -  
VS: -343.1

SLTY SH: med-dk gy-blk, sb blk-ly-sb ply - ply, frm- mod frm,  
sl fri, slty, sl gt; difse stmg dul bl cut, thn dul bl resdl ring

SLTY SH: med-dk  
slty, sl gt; difse str

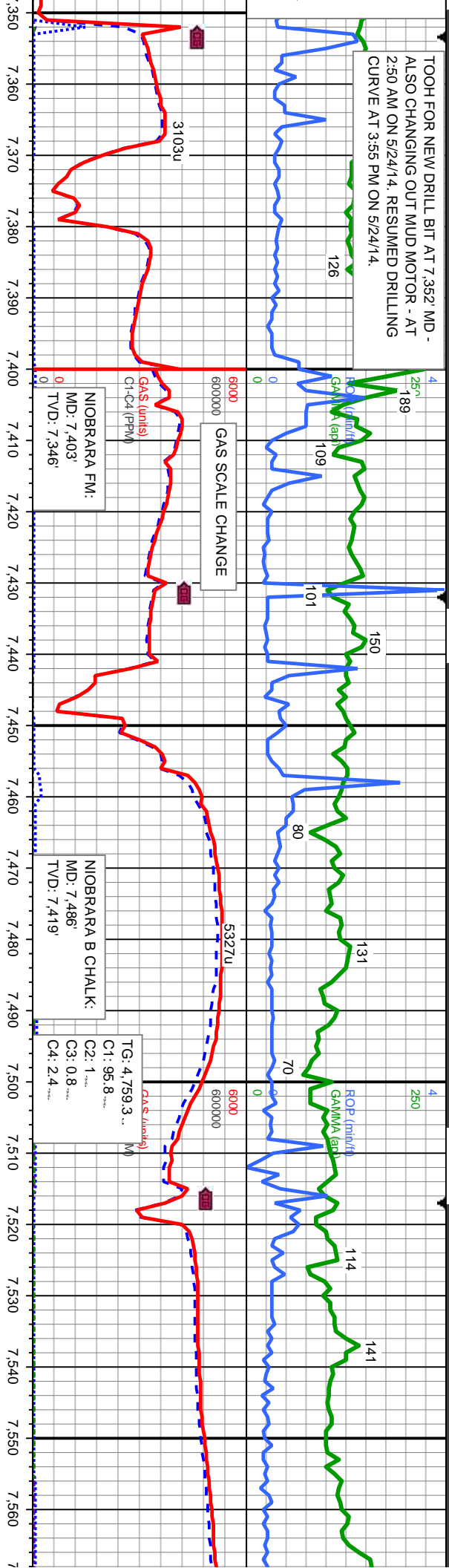








TOOH FOR NEW DRILL BIT AT 7.352' MD -  
ALSO CHANGING OUT MUD MOTOR - AT  
2:50 AM ON 5/24/14. RESUMED DRILLING  
CURVE AT 3:55 PM ON 5/24/14.



WT IN 10.5/ OUT 10.5  
VIS IN 43/ OUT 43

MD: 7.390  
TVD: 7.334.5  
Incl.: 24.78 -  
Azim.: 184.47 -  
VS: -275.54

SLTY SH: aa: CHK: med gy-lt gy, sl mot tex,  
sb biky-sb ply, sft-sl frm, arg, v calc;  
MRLST: med-dk gy, sb biky-sb ply, frm,  
arg-sl sily, sl mot, v calc, tr bent; difse  
sting dul bl cut, thn dul bl resdl ring

WT IN 10.5/ OUT 10.5  
VIS IN 45/ OUT 45

MD: 7.432  
TVD: 7.372.06  
Incl.: 28.42 -  
Azim.: 180.11 -  
VS: -256.76

CHK: med gy-lt gy, sl mot tex, sb biky-sb ply,  
sft-sl frm, arg, v calc; MRLST: med-dk gy, sb  
biky-sb ply, frm, arg-sl sily, sl mot, v calc, tr  
bent; sting wi occ strgs, lt bl flwr wi g bri  
bl-wh difse cut, thn bri bl resdl ring

MD: 7.475  
TVD: 7.409.31  
Incl.: 31.46 -  
Azim.: 177.57 -  
VS: -235.31

CHK: med gy-lt gy, sl mot tex, sb biky-sb ply,  
sft-sl frm, arg, v calc; MRLST: med-dk gy, sb  
biky-sb ply, frm, arg-sl sily, sl mot, v calc,  
tr bent; sting wi occ strgs, lt bl flwr wi g bri  
bl-wh difse cut, thn bri bl resdl ring

MD: 7.518  
TVD: 7.445.08  
Incl.: 35.95 -  
Azim.: 177.11 -  
VS: -211.49

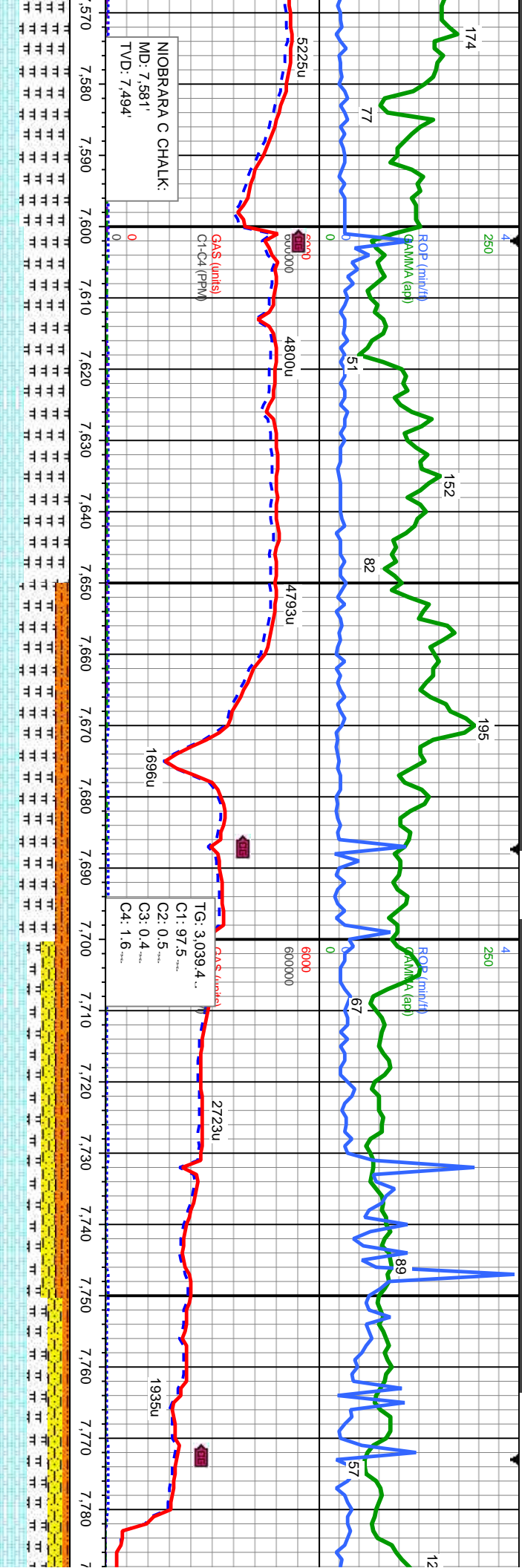
CHK: med gy-lt gy, sl mot tex, sb biky-sb ply,  
sft-sl frm, arg, v calc; MRLST: med-dk gy, sb  
biky-sb ply, frm, arg-sl sily, sl mot, v calc,  
tr bent; sting wi occ strgs, lt bl flwr wi g bri  
bl-wh difse cut, thn bri bl resdl ring

MD: 7.560  
TVD: 7.478.04  
Incl.: 40.61 -  
Azim.: 178.4 -  
VS: -185.5

CHK: med gy-lt gy  
ply, sft-sl frm, arg  
gy, sb biky-sb ply  
v calc; sting wi oc  
bl-wh difse cut, th







MD: 7.603  
TVD: 7.509.1  
Incl.: 46.84  
Azim.: 179.67  
VS: -155.8

MD: 7.646  
TVD: 7.536.89  
Incl.: 52.58  
Azim.: 180.31  
VS: -123.02

MD: 7.688  
TVD: 7.560.8  
Incl.: 58.01  
Azim.: 181.64  
VS: -88.5

MD: 7.731  
TVD: 7.581.7  
Incl.: 63.8  
Azim.: 181.74  
VS: -50.96

MD: 7.773  
TVD: 7.598.81  
Incl.: 68.1  
Azim.: 181.15  
VS: -12.62

, sl mot tex, sb blkly-sb		CHK: med gy-lt gy, sl mot tex, sb blkly-sb
, v calc; MR.LST: med-dk		ply, sft-sl frm, arg, v calc; MR.LST: med-dk
, frm, arg-si silty, sl mot,		gy, sb blkly-sb ply, frm, arg-si silty, sl mot, v
c strgs, lt bl flwr wi g bri		calc, tr bent; string wi occ strgs, lt bl flwr wi
n bri bl resd ring		g bri bl-wh dse cut, thn bri bl resd ring
		MR.LST: aa, CHK: aa, SHY SLTST: lt gy-med gy,
		sb-blkly-sb-ply, med-v frm, silty-tr sdy; mod
		string bl-wh mky cut; thn bri bl-wh resd ring
		MR.LST: aa,CHK:aa: SHY SLTST: lt gy-med gy,
		sb-blkly-sb-ply, med-v frm, silty-tr sdy; SHY SS:
		gy-dk-gry, sl brn, grnl, med-c gr, mod-v frm,
		sb-rnd-rnd, mod strd, mod cons, sl calc crnt; mod
		string bl-wh mky cut; thn bri bl-wh resd ring
		MR.LST: aa, CHK: aa: SHY SLTST: lt gy
		sb-blkly-sb-ply, med-v frm, silty-tr sdy; 5
		gy-dk-gry, sl brn, grnl, med-c gr, mod-v frm,
		sb-rnd-rnd, mod strd, mod cons, sl calc
		string bl-wh mky cut, thn bri bl-wh resd







BEGIN DRILLING LATERAL ON 5/26/14 AT 8:49 PM. 6.125" HOLE WITH BIT #3, VAREL, VS513D. DEPTH IN: 8029' MD.

ROP (min/ft)

GAMMA (ap)

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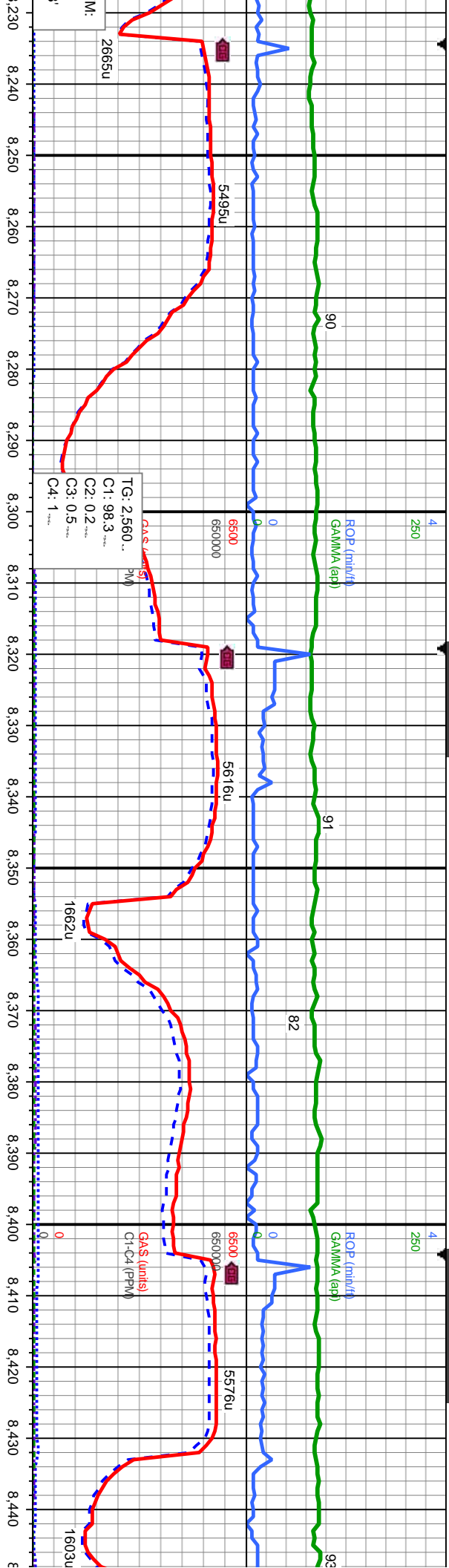
1



10

1





T: 9.2 @ 92F  
I: 37  
V: 11  
D: 10  
K: 1/  
H / Temp: 9.7 @ 92F  
MD: 8,266  
TVD: 7,643.69  
Incl.: 90.24  
Azim.: 357.2  
VS: 474.85  
TVD (ft)  
6500  
8200

WT IN 9.2/ OUT 9.2  
VIS IN 36/ OUT 36  
TVD (ft)  
6500  
8200

med-gr, mot, med-gr-c gr, mod-v frm, sb-rnd-rnd, mod-w strd,  
LS: crm-offwh-lt brn, sb ply-ply, frm-hd, cyln-mcxl, sl  
lt bl flr wi g bri bl-wh difse cut, bri bl resd sl gn ring  
SS: lt-med brn,lt gry-med-gr, mot, med-gr-c gr, mod-v frm, sb-rnd-rnd, mod-w strd,  
mod cons, sl calc cnt; mod sting lt bl flr wi bri bl-wh difse cut, thn bri bl resd ring  
TVD (ft)  
6500  
8200





DATE: 5/27/14

250

ROP (min/f)  
GAMMA (api)

89

83

ROP (min/f)  
GAMMA (api)

92

84

GA S (mole)

TG: 5.391.52 ..

C1: 97.5 .....

C2: 0.4 .....

C3: 0.5 .....

C4: 1.6 .....

GA S (mole)

TG: 5.391.52 ..

C1: 97.5 .....

C2: 0.4 .....

C3: 0.5 .....

C4: 1.6 .....

WT IN 9.2/ OUT 9.2  
VIS IN 41/ OUT 41

MD: 8.605  
TVD: 7.649.37  
Incl.: 90.03 -  
Azim.: 179.63 -  
VS: 813.4.

TVD (ft)

gr-c gr, mod-v frm, sb-rnd-rnd, mod-w strd,  
or wi bl-wh disse cut, thn bri bl resd ring

SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w strd,  
mod cons, sl calc cnt; mod stmg lt bl flor wi bri bl-wh disse cut, thn bri bl resd ring

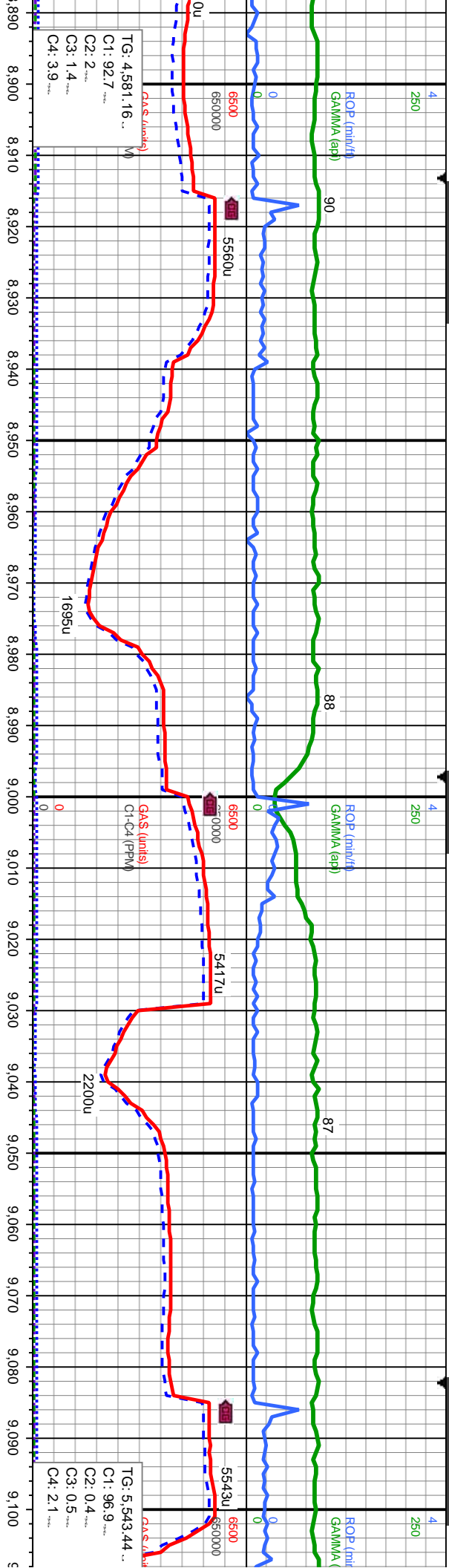
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w strd,  
mod cons, sl calc cnt; mod stmg lt bl flor wi bri bl-wh disse cut, thn bri bl resd ring

SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w strd,  
mod cons, sl calc cnt; mod stmg lt bl flor wi bri bl-wh disse cut, thn bri bl resd ring









TG: 4.581.16 ..  
C1: 92.7 ..  
C2: 2 ..  
C3: 1.4 ..  
C4: 3.9 ..

GRS (units)  
C1-C4 (PPM)

TG: 5.543.44 ..  
C1: 96.9 ..  
C2: 0.4 ..  
C3: 0.5 ..  
C4: 2.1 ..

WT IN 9.2/ OUT 9.2  
VIS IN 39/ OUT 39

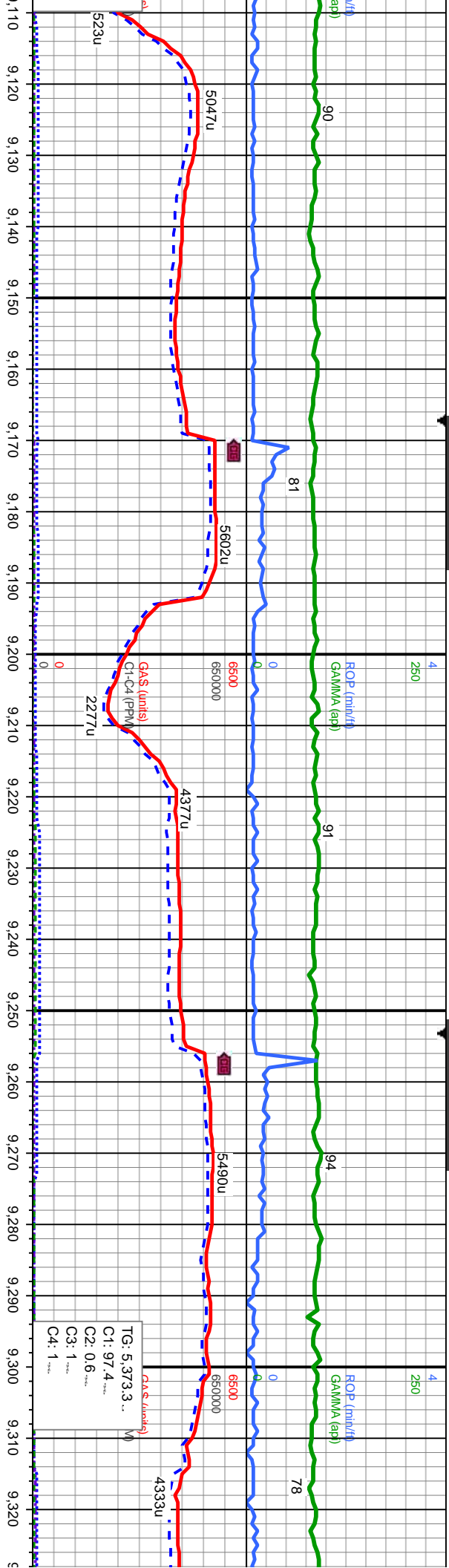
MD: 8.944  
TVD: 7.650.58  
Incl.: 90.15  
Azim.: 180.35  
VS: 1.152.39

M  
TV  
In  
Az  
VS

SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w strd, mod cons, sl calc cnt; mod stmg lt bl flr wr bri bl-wh difse cut, thn bri bl resd ring







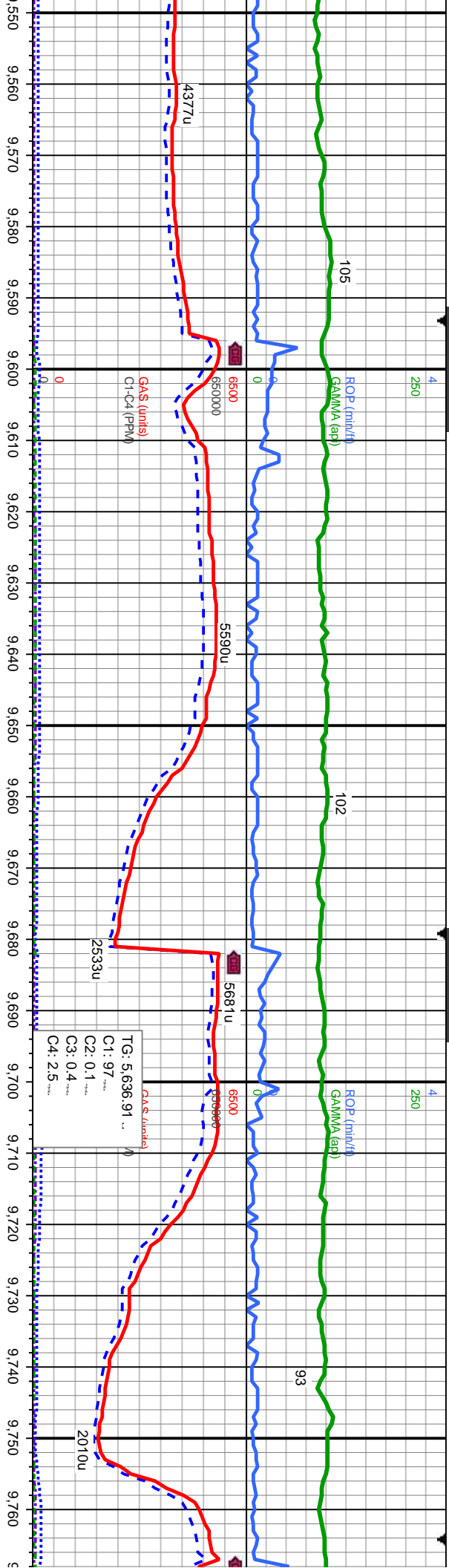
D: 9,114. /D: 7,650.31 cl.: 90.03 - rim.: 180.28 - S: 1,322.39 .		MD: 9,285. TVD: 7,649.17. Incl.: 90.74 . Azim.: 181.49 - VS: 1,493.37 .	
TVD (ft)		TVD (ft)	
6500		6500	

SS: lt-med brn, lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w strd, mod cons, sl calc cnt; mod stmg lt bl flr wr bri bl-wh difse cut, thn bri bl resd ring		SS: lt-med brn, lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w strd, mod cons, sl calc cnt; mod stmg lt bl flr wr bri bl-wh difse cut, thn bri bl resd ring	
8200		8200	







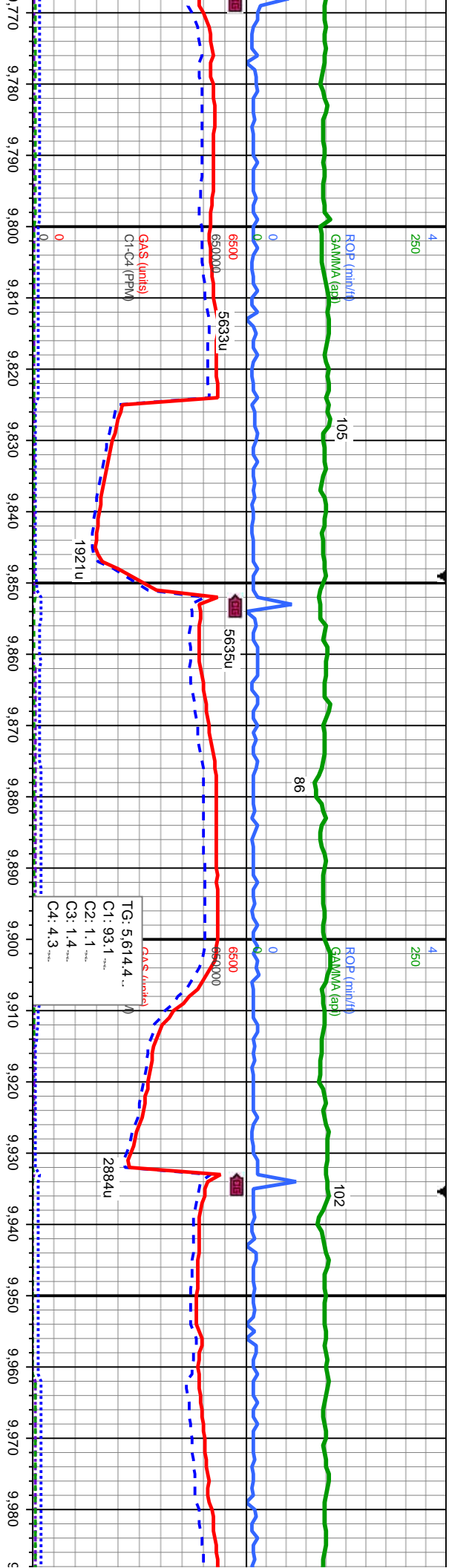


6500	MD: 9,626. TVD: 7,646.56 Incl.: 90.09 - Azim.: 181.61 - VS: 1,834.33 .
8200	TVD (ft)

gr-c gr, mod-v frm, sb-rnd-rnd, mod-w wi g bl-wh cut, thn bri bl-wh resdl ring	SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srt'd, mod cons, sl calc cnt; disse stmg wi g bl-wh cut, thn bri bl-wh resdl ring
8200	8200







MD: 9.796  
TVD: 7.645.2  
Incl.: 90.83 -  
Azim.: 182.12 -  
VS: 2.004.25

TVD (ft)

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

TVD (ft)

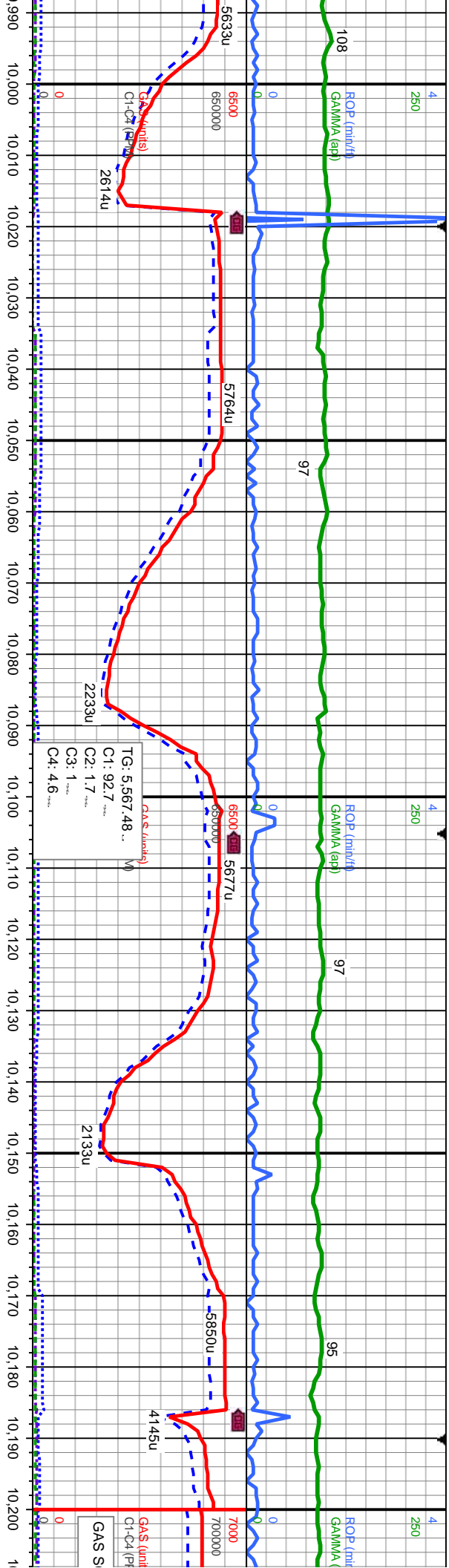
MD: 9.967  
TVD: 7.643.78  
Incl.: 90.12 -  
Azim.: 182.09 -  
VS: 2.175.15

TVD (ft)

b-rnd-rnd, mod-w  
bl-wh resdl ring  
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w  
strd, mod cons, sl calc cnt; difse stng w/ g bl-wh cut, thn bri bl-wh resdl ring







6500	8200	8200	6500	8200	8200
TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)
WT IN 9.4/ OUT 9.4 VIS IN 39/ OUT 39					
MD: 10.137 TVD: 7.644.06 Incl.: 89.69 - Azim.: 181.48 - VS: 2.345.08					

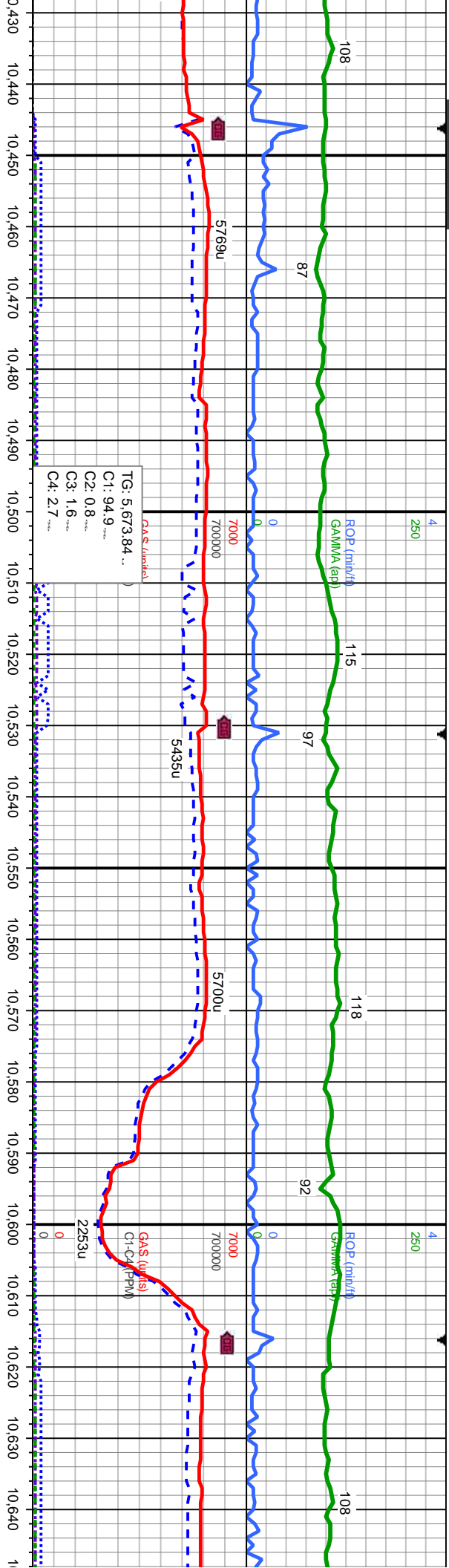
SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srt'd, mod cons, sl calc cmt; dfse string w/ g bl-wh cut, thn bri bl-wh resd ring

SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srt'd, mod cons, sl calc cmt; dfse string w/ g bl-wh cut, thn bri bl-wh resd ring









MD: 10,478.  
TVD: 7,648.26  
Incl.: 89.53 -  
Azim.: 2.41 -  
VS: 2.686.

WT IN 9.4/ OUT 9.4  
VIS IN 40/ OUT 40

TVD (ft)

TVD (ft)

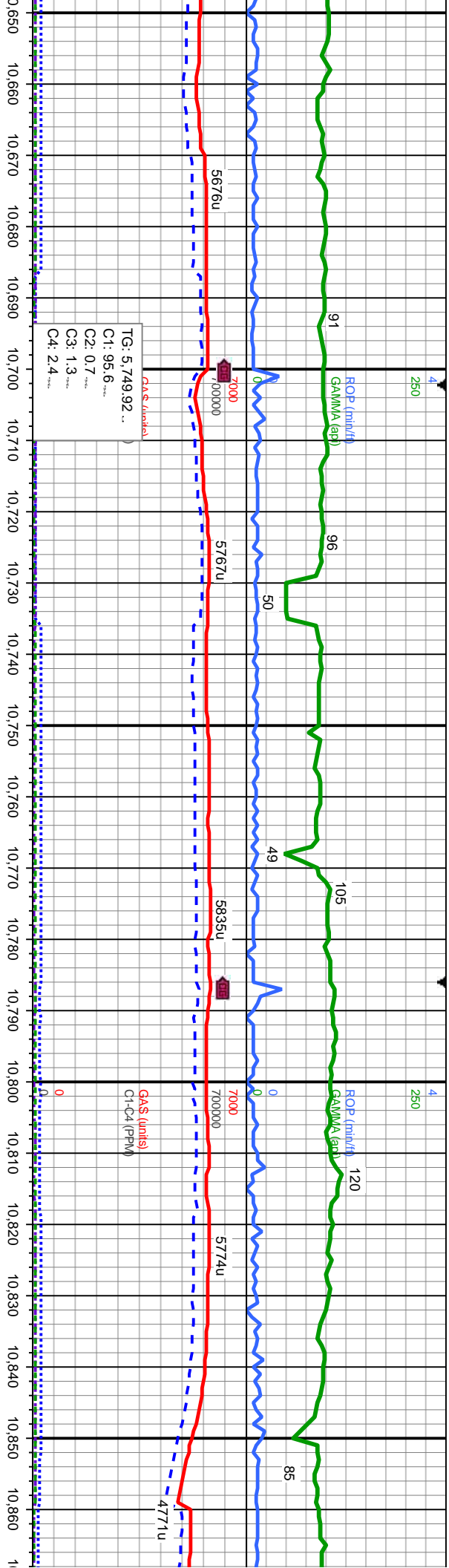
lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w  
s, sl calc cnt; disse stng w/ g bl-wh cut, thn bri bl-wh resd ring

SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w  
strd, mod cons, sl calc cnt; disse stng w/ g bl-wh cut, thn bri bl-wh resd ring

SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w  
strd, mod cons, sl calc cnt; disse stng





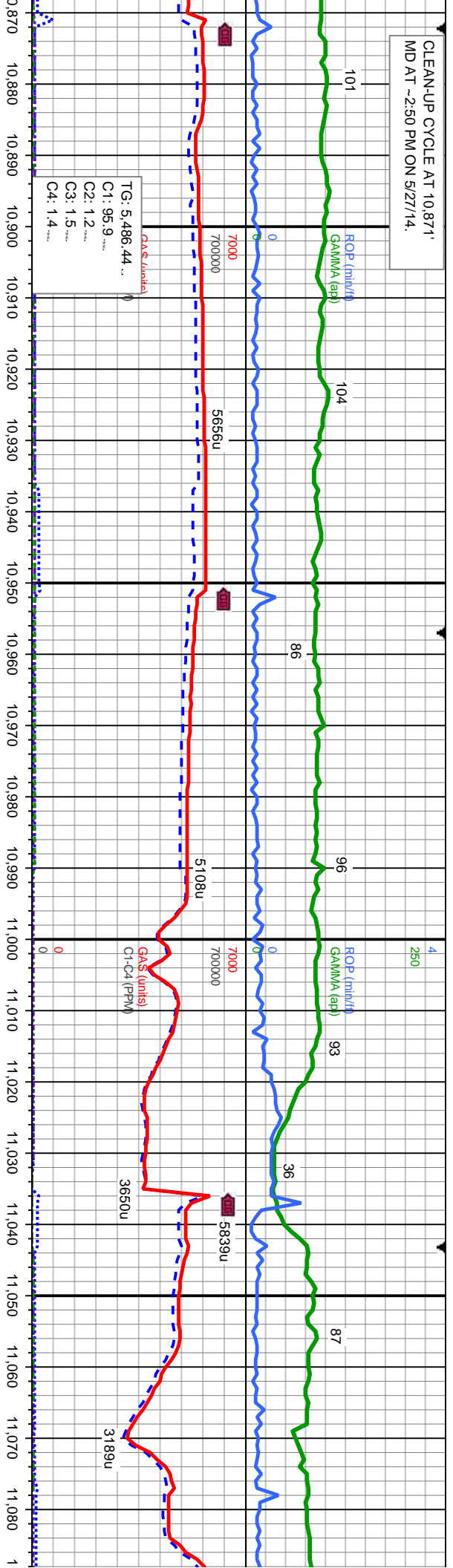


0.649 7.650,26 89.75 2.05 856.96	6500	8200
TV D (ft)	WT IN 9.4/ OUT 9.4 VIS IN 40/ OUT 40	MD: 10.819 TVD: 7.651.33 Incl.: 89.35 Azim.: 2.41 VS: 3.026.91

gr-c gr, mod-v frm, sb-rnd-rnd, mod-w wi g bl-wh cut, thn bri bl-wh resd ring	SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w strd, mod cons, sl calc cnt, rr pyr; difse string wi g bl-wh cut, thn bri bl-wh resd ring
8200	8200



CLEAN-UP CYCLE AT 10,871  
MD AT ~2:50 PM ON 5/27/14.



TG: 5,486.44  
C1: 95.9  
C2: 1.2  
C3: 1.5  
C4: 1.4

TVD (ft)

MD: 10,990 .  
TVD: 7,651.3 .  
Incl.: 89.75 -  
Azim.: 2.13 -  
VS: 3,197.85

TV D (ft)

- mod-w srted, mod-w resd ring

SS: lt-med brn, lt gry-med-gry occ wh, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w strd, mod cons, sl calc cmt; difse slow stmg wi gl-bl-wh cut, thk bri bl-wh resd ring

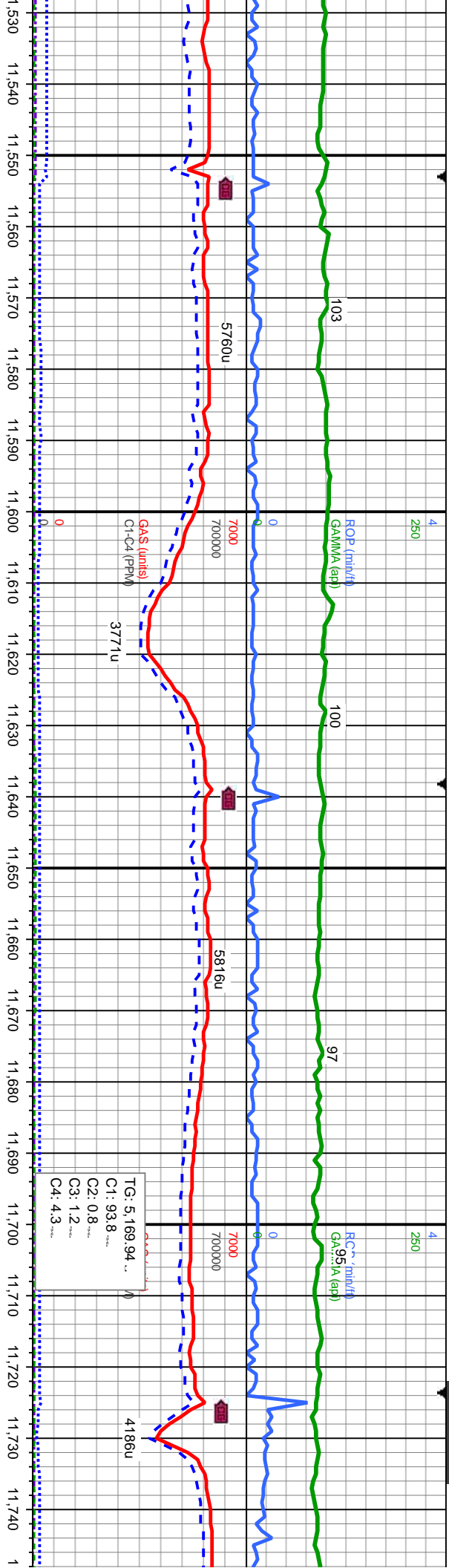
SS: lt-med brn, lt gry-med gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srit  
mod cons, sl calc cnt; LS: crm-off-wh-lt brn, sb ply-ply, frm-hd, cyxln-mcxln, sl  
dole-dole, calc; stmg, bl-wh flwr wr mod bri bl-wh disse cut, bri bl resdl sl gn ring











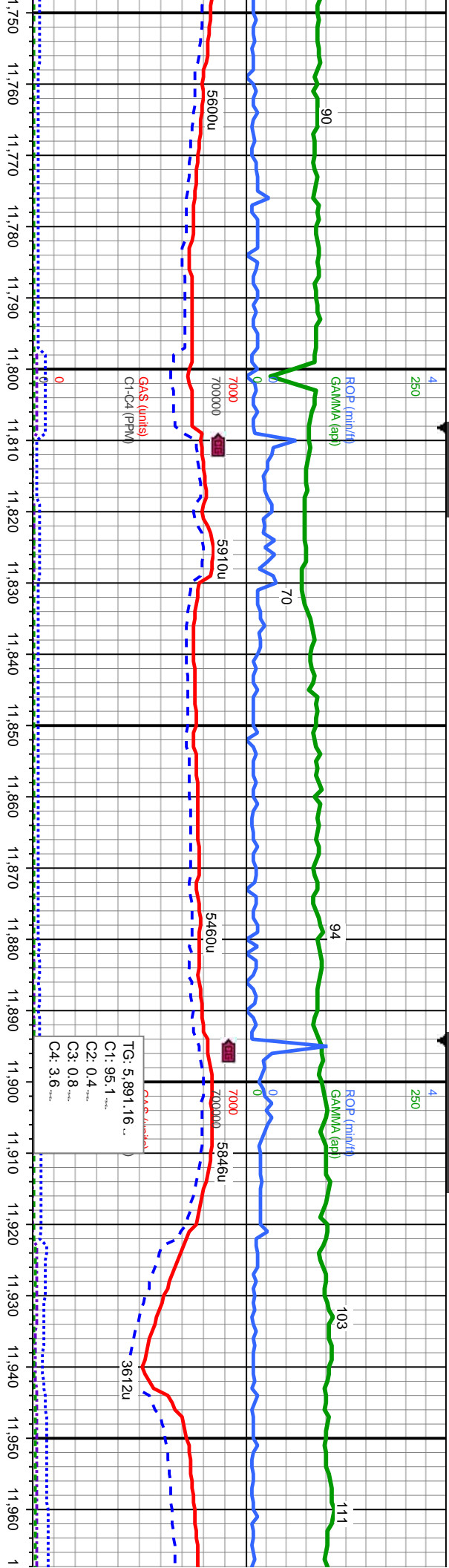
WT: 9.4 @ 112F  
FV: 44  
PV: 13  
YP: 11  
CK: 1/  
Sol: 6.5  
pH / Temp: 9.5 @ 112F  
Chl: 1,000

MD: 11,671  
TVD: 7,651.93  
Incl.: 88.91  
Azim.: 1.69  
VS: 3,878.55

TG: 5,169.94  
C1: 93.8  
C2: 0.8  
C3: 1.2  
C4: 4.3

Y-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w	8200	SS: lt-med brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w	8200
calc cnt; difse stng w/ mod bl-wh cut, thn bri bl-wh resd ring		strd, mod cons, sl calc cnt; difse stng w/ mod bl-wh cut, thn bri bl-wh resd ring	





6500  
TVD (ft)

MD: 11,841  
TVD: 7,652.82  
Incl.: 88.91  
Azim.: 1.69  
VS: 4,048.38

6500  
TVD (ft)

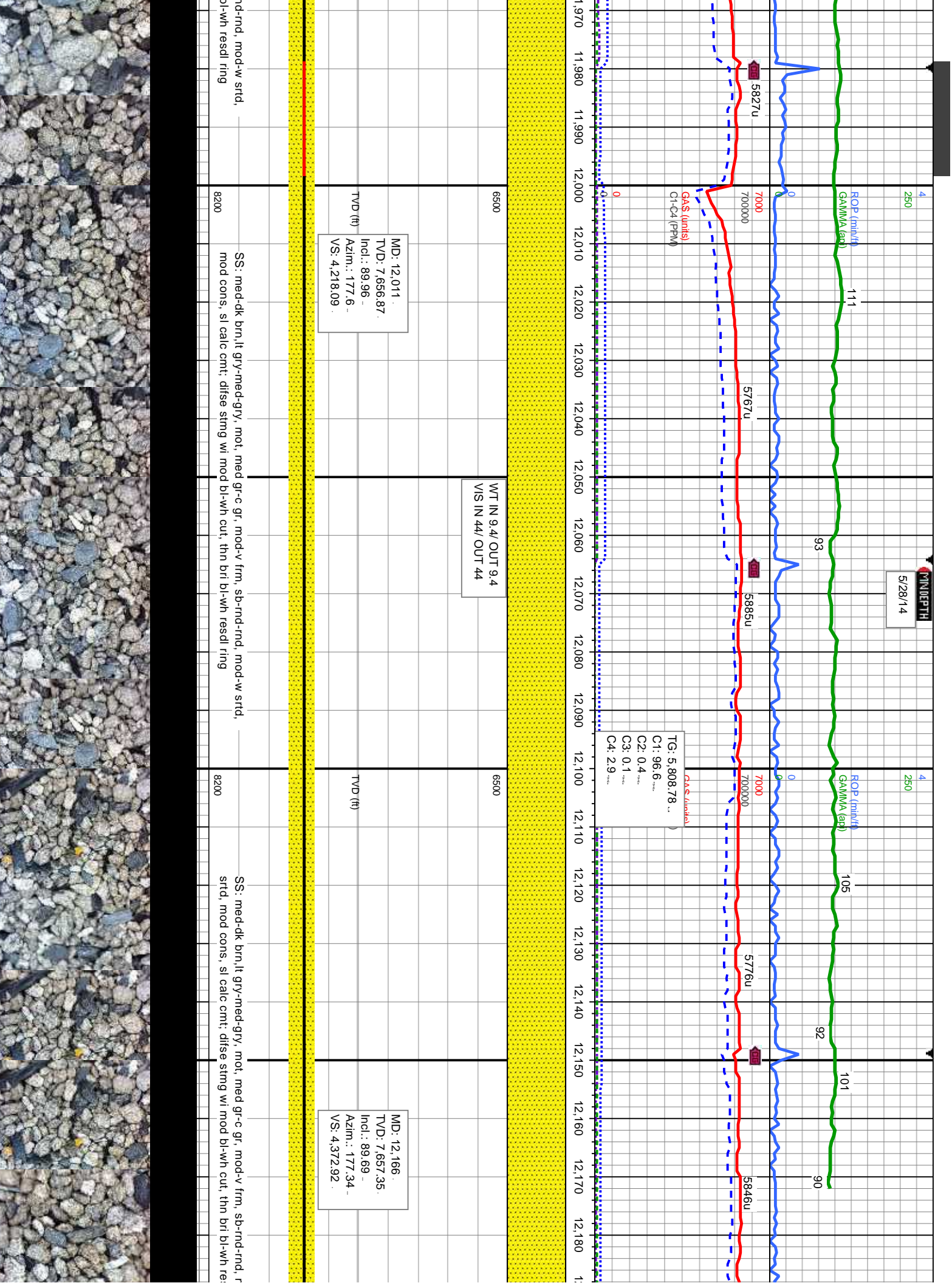
gr-c gr, mod frm, sb-rnd-rnd, mod-w srt, -  
nd bl-wh cut, thn bri bl-wh resd ring

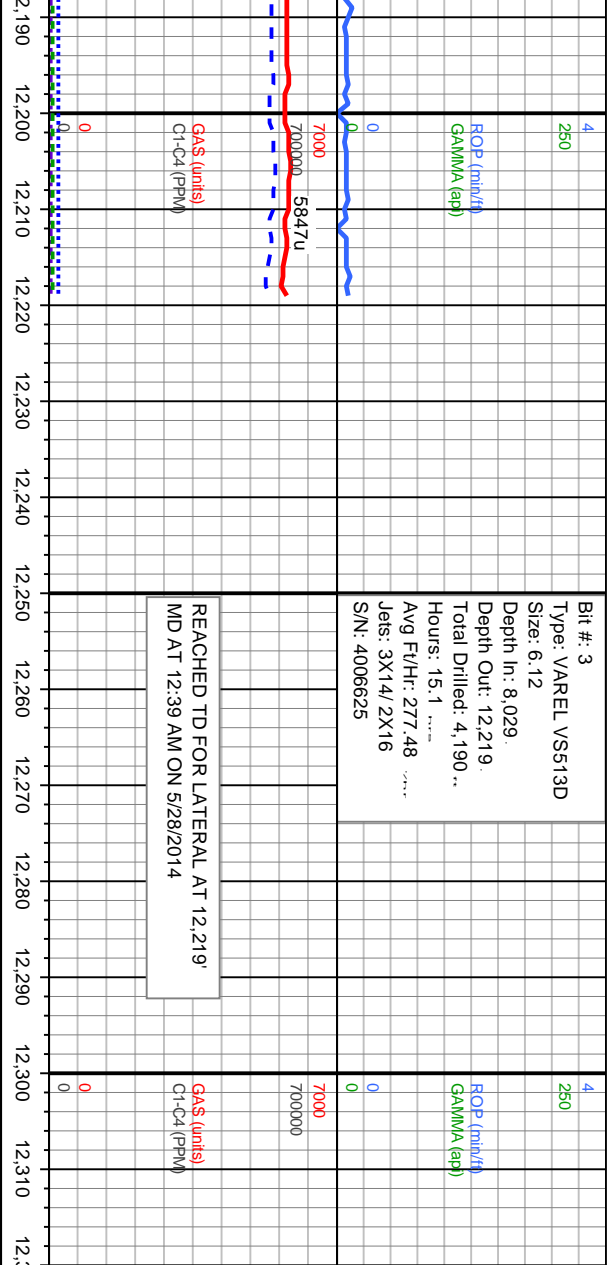
SS: lt-dk brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srt, -  
mod cons, sl calc cnt; disse string wi mod bl-wh cut, thn bri bl-wh resd ring

SS: dk brn,lt gry-med-gry, mot, med gr-c gr, mod-v frm, sb-rnd-rnd, mod-w srt, -  
mod cons, sl calc cnt; disse string wi mod bl-wh cut, thn bri bl-wh resd ring









6500										6500									
PROJECTED TO BIT										THANK YOU FOR USING COLUMBINE LOGGING INC.!									
MD: 12,219. TVD: 7,657.63. Incl.: 89.69. Azim.: 89.69. VS: 4,425.85.										WT: 9.4 @ 112F FV: 44 PV: 13 YP: 11 CK: 1/ Sol: 6 pH / Temp: 9.5 @ 112F Chl: 1,000									
TVD (ft)										TVD (ft)									
8200										8200									
nod-w sdl ring																			

