



Scale: 5" / 100'
Measured Depth Log

Well Name HOUSTON 12C-8HZ

Location SEC.8-T3N-R67W

State COLORADO

Country USA

API Number 05-123-3894600

Region DJ BASIN

Spud Date 3/18/2014

Surface Coordinates 1765' FSL 620' FEL

Bottom Hole Coordinates 2090' FSL 50' FWL

County WELD

Rig Number XTREME 8

AFE # 2091308

Field WATTENBERG

Drilling Completed 6/7/2014

Ground Elevation 4,807'

K.B. Elevation 4,824'

Logged Interval 6,950' To 11894'

Total Depth 11894'

Formation CODELL

Type of Drilling Fluid FW LSND

Company Anadarko

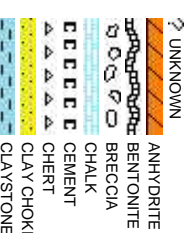
Address 1099 18TH, SU
DENVER, CO 8

Name SCOTT MANW

Company COLUMBINE L

Address 2385 S. LIPAN
DENVER, CO 8

Scott Manwaring



Operator

ITE 1800

0202

Geologist

ARING, THOMAS WRIGHT

OGGING INC

ST
0223

Other

Columbine Lead Wellsite Geologist

Columbine Wellsite Geologist

Rock Types

CONGLOMERATE	MARLSTONE	SHALY SANDSTONE
DOLomite	METAMORPHIC	SHALY SILTSTONE
DOLomite	NO SAMPLE	SILT SHALE
DOLomite Limestone	SALT	SILTSTONE
GRANITE	SANDSTONE	TILL
GYPSUM	SALT-PEPPER SAND	TUFF
IGNEOUS	SHALE	WELDED TUFF
SIDERITE or LIMONITE	SHALE COLORED	
LIMESTONE	SHALE GRAY	

Accessories

Fossils

GASTROPOD	ARGILLITE GRAIN
INOCERAMUS	BENTONITE
OOLITE	BITUMENOUS SUBSTANCE
OSTRACOD	BRECCIA FRAGMENTS
BELEMNITE	CALCAREOUS
BIOCLASTIC	CARBONACEOUS FLAKES
BRACHIOPOD	CHITDK
PISOLITE	CHTLT
PLANT REMAINS	COAL - THIN BEDS
CEPHALOPOD	DOLOMITIC
CORAL	SCAPHOPOD
CRINOID	STROMATOPOROID
ECHINOID	FERRUGINOUS PELLET

Minerals

FISH	FERRUGINOUS	SILICEOUS
FORAMINIFERA	ANHYDRITIC	SILTY
FOSSIL	ARGILLACEOUS	TUFFACEOUS
	GLAUCONITE	
	GYPSIFEROUS	

Stringer

ANHYDRITE STRINGER
BENTONITE STRINGER
COAL STRINGER
DOLomite STRINGER
GYPSUM STRINGER
LIMESTONE STRINGER
MARLSTONE (CALC) STRG
MARLSTONE (DOL) STRG
SANDSTONE STRINGER
SHALE STRINGER
SILTSTONE STRINGER

Other Symbols

Oil Show

PINPOINT	DST INTERVAL
VUGGY	FAULT
DEAD	FORMATION TOP
EVEN	GAS SHOW
QUESTIONABLE	OIL SHOW
BIT	
SPOTTED STAINING	CONNECTION (UP)

Engineering

CONNECTION (DOWN)	MN DEPTH (DOWN)	ANGULAR	PACKSTONE
CONNECTION GAS	NORMAL FAULT	ROUNDED	WACKSTONE
CONNECTION GAS (LEFT)	OVERTURNED STRATA	SUBANG	
TRIP GAS	REVERSE FAULT	SUBRAND	
TRIP GAS (LEFT)	CASING		
INTERCRYSTALLINE	SIDEWALL CORE (LEFT)		
INTEROOLITIC	DOWN TIME GAS		
MOLDIC	DOWN TIME GAS (LEFT)		
ORGANIC	CORE - LOST		
	CORE - RECOVERED		
	SURVEY		

Rounding

WIRELINE TESTED - LEFT	E EARTHY
WIRELINE TESTED - RT	FX FINELYXLN
DRILL STEM TEST	GS GRAINSTONE
MN DEPTH	L LITHOGRAPHIC
	MX MICROXLN
	MS MUDSTONE

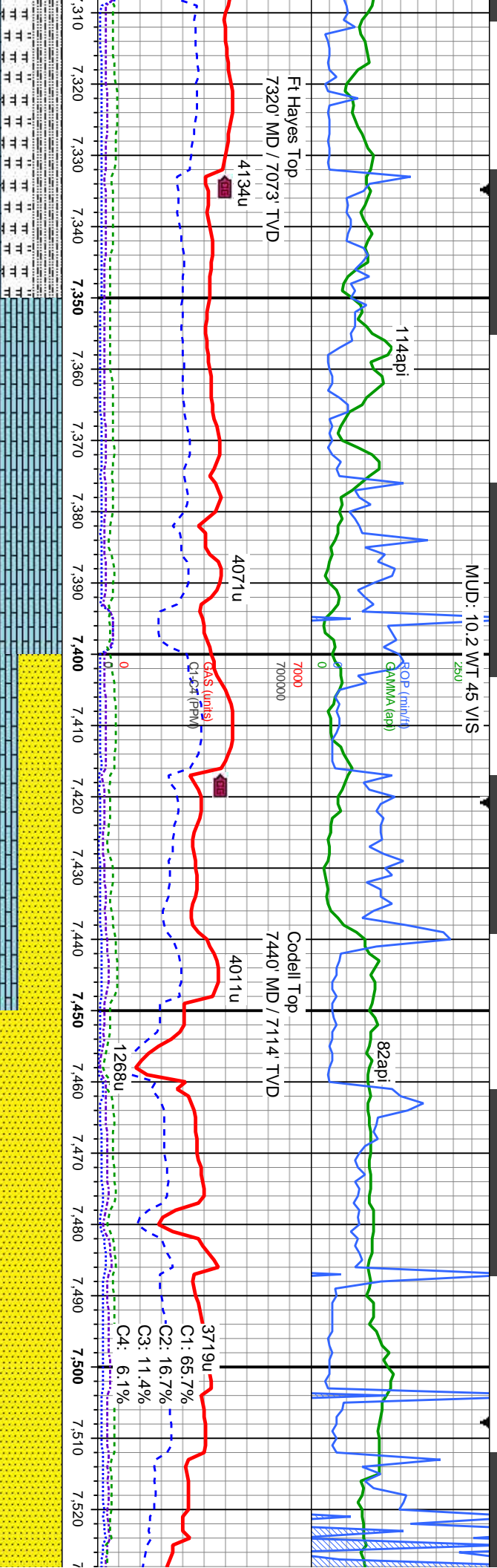
ANGULAR	PACKSTONE
ROUNDED	WACKSTONE

Sorting

Textures

POOR	M MODERATE
WELL	

MUD: 10.2 WT 45 VIS



dk-med gy, sb blk, med sft-fm, silty
TY SH: med-lt gy, sb blk, sft, wxy-rthy
off wh-wh crm, lt gy, mod sft-fm, xln, sb blk, occ blk, wxy tex, v calc, sting cut, bri bl ring

LS: off wh-wh crm, lt gy, mod sft-fm, xln, sb blk, sft, wxy-rthy
ply-sb blk, occ blk, wxy tex, v calc, tr silty sh, sting mky bri bl cut, bri bl ring

LS: off wh-wh crm, lt gy, mod sft-fm, xln, sb blk, sft, wxy-rthy
ply-sb blk, occ blk, wxy tex, v calc, tr silty sh, SS: dk-med gy-gy brn, s&p, occ clr gr, med hd-fm, sb rnd, f gr, mod fri, sl calc; sting mky bri bl cut, bri bl ring

SS: dk-med gy-gy brn, s&p, occ clr gr, med hd-fm, sb rnd, f gr, mod fri, sl calc; LS: off wh-wh crm, lt gy, mod sft-fm, xln, sb blk, occ blk, wxy tex, v calc, tr silty sh; sting mky bri bl cut, bri bl ring

SS: dk-med gy-gy brn, s&p, occ clr gr, med hd-fm, sb rnd, f gr, mod fri, sl calc; LS: off wh-wh crm, lt gy, mod sft-fm, xln, sb blk, occ blk, wxy tex, v calc, tr silty sh; sting mky bri bl cut, bri bl ring

D: 7,317'
VD: 7,071.6'
Inclination: 63.61 °
Azimuth: 270.93 °
VS: -99.28'

MD: 7,360'
TVD: 7,089.2'
Inclination: 68.05 °
Azimuth: 270.42 °
VS: -60.06'

MD: 7,403'
TVD: 7,103.69'
Inclination: 72.55 °
Azimuth: 271.71 °
VS: -19.59'

MD: 7,447'
TVD: 7,115.39'
Inclination: 76.59 °
Azimuth: 271.67 °
VS: 22.8'

MD: 7,504'
TVD: 7,126.58'
Inclination: 80.78 °
Azimuth: 272.16 °
VS: 78.66'



06/4-5/2014

MUD: 9.9 WT 40 VIS

06/6/2014

MINDEPTH

MINDEPTH

ROP SCALE
CHANGE

97api

121api

125api

Curve TD at 7,565' MD
06/04/2014 @ 00:55 hrs
Resume drilling 22:25
06/05/2014

7000

7000000

3822u

2535u

C1: 77.5%

C2: 14.7%

C3: 6.0%

C4: 1.7%

445u

1357u

474u

Gas (units)
C1-C4 (PPM)

2870u

TVD (ft)

MD: 7,565'
TVD: 7,131.71'
Inclination: 89.55 °
Azimuth: 271.67 °
VS: 139.36'

MD: 7,640'
TVD: 7,139.69'
Inclination: 88.15 °
Azimuth: 270.72 °
VS: 211.74'

MD: 7,725'
TVD: 7,140.92'
Inclination: 90.18 °
Azimuth: 270.72 °
VS: 298.9'

SS: dk-med gy-gy brn, s&p, occ clr gr,
med hd-frn, sb rnd, f gr, mod fri, sl calc;
stimg mky bl cut, bl ring

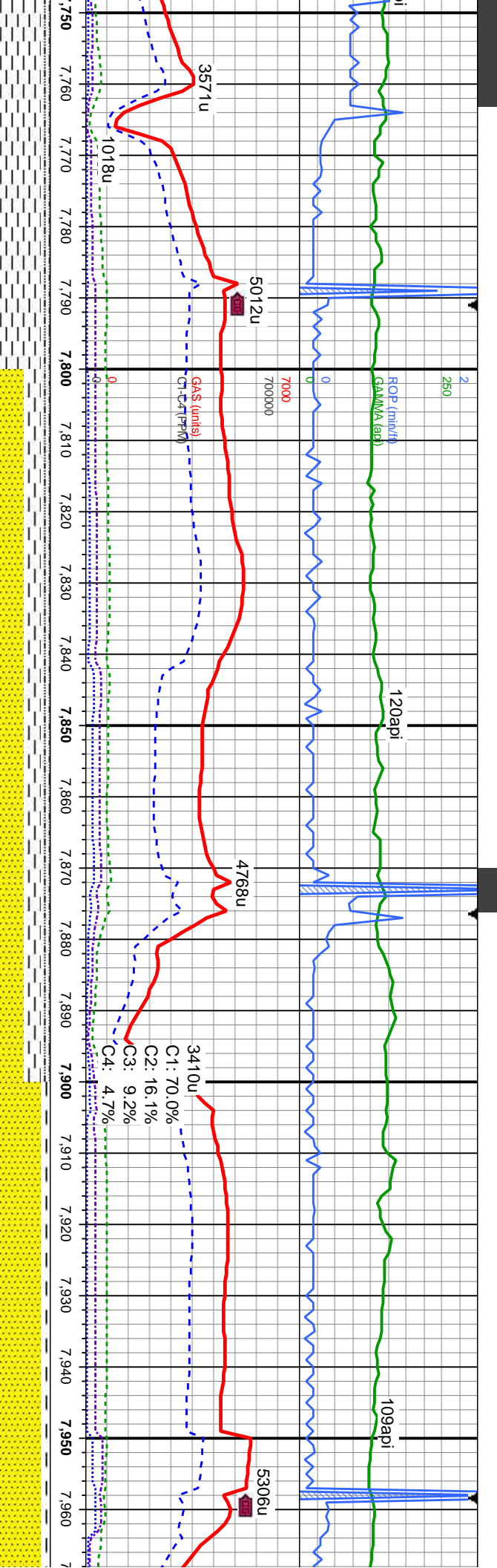
SH: med-dk gy, sme blk, ply-sb ply, fis, med hd-frn, fri, w srt
SLTY SH: med gy, s&p, sb blk-sb ply, frm, sl fis, f grn, w srt
SS: dk-med gy-gy brn, s&p, occ clr gr, med hd-frn, sb rnd, f
gr, mod fri, sl calc; stimg mky bl cut, dul bl ring

SH: med-dk gy, sme blk, ply-sb
SH: med gy, s&p, sb blk-sb ply
gy-gy brn, s&p, occ clr gr, med
stimg mky bl cut, bl ring

p, occ clr gr, med
fr, sl calc; stimg

7400





ply, fis, med hd-fm, fri, w sit SLTY
y, frm, sl fis, f grn, w sit SS: dk-med
hd-fm, sb rnd, f gr, mod fri, sl calc;

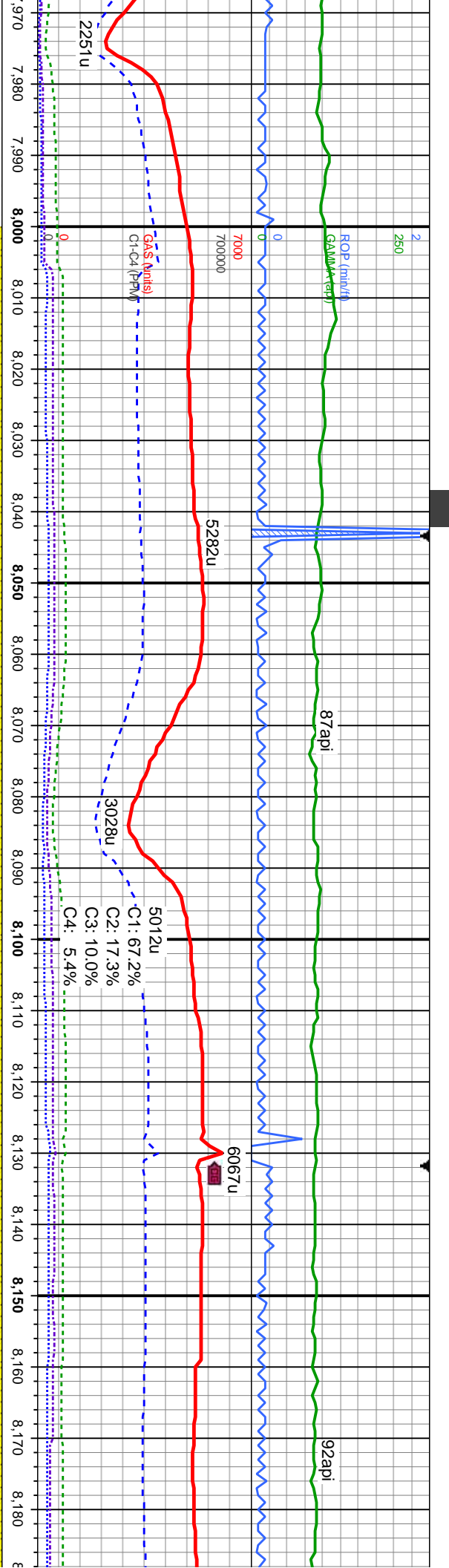
6800
SH: med-dk gy, sme blk, ply-sb ply, fis, med hd-fm, fri, w sit SLTY
SH: med gy, s&p, sb blk-y-sb ply, frm, sl fis, f grn, w sit SS: dk-med
gy-gy brn, s&p, occ clr gr, med hd-fm, sb rnd, f gr, mod fri, sl calc;
stmg mky bl cut, bl ring

SS: dk-med gy-gy brn, s&p, occ clr gr, med hd-fm
mod fri, sl calc; SH: dk-med gy, occ blk, ply-sb pl
hd-fm, fri; stmg mky bl cut, bl ring

MD: 7,811'
TVD: 7,139.64'
Inclination: 91.53 °
Azimuth: 270.49 °
VS: 384.89'

MD: 7,896'
TVD: 7,137.89'
Inclination: 90.83 °
Azimuth: 270.78 °
VS: 469.87'





1, sb md, f gr,
y, fis, med

SS: dk-med gy-gy brn, s&p, occ clr gr, occ med brn
mtx, med hd frm, sb md, f gr, mod fri, sl calc, tr stly
sh; string mky bl cut, bl ring

SS: dk-med gy-gy brn, s&p, occ clr gr, occ med brn
mtx, med hd frm, sb md, f gr, mod fri, sl calc, tr stly sh;
string mky bl cut, bl ring

MD: 7,981'
TVD: 7,136.61'
Inclination: 90.89 °
Azimuth: 271.3°
VS: 554.85'

MD: 8,066'
TVD: 7,135.18'
Inclination: 91.04 °
Azimuth: 271.35°
VS: 639.83'

MD: 8,152'
TVD: 7,133.64'
Inclination: 91.01 °
Azimuth: 271.14°
VS: 725.81'



MUD: 9.5 WT 41 VIS

25u

250

ROP (min/hr)
GAMMA (api)

91 api

99api

ROP (min/hr)
GAMMA (api)

7000

7000

5435u

5237u

GAS (units)
Cl-C4 (PPM)

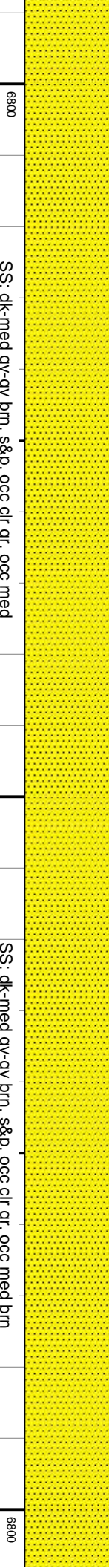
C1: 67.2%
C2: 16.8%
C3: 9.9%
C4: 6.2%

GAS (units)
Cl-C4 (PPM)

3632u

658u

8,190 8,200 8,210 8,220 8,230 8,240 8,250 8,260 8,270 8,280 8,290 8,300 8,310 8,320 8,330 8,340 8,350 8,360 8,370 8,380 8,390 8,400



6800

6800

SS: dk-med gy-gy brn, s&p, occ clr gr, occ med
brn mtx, med hd-firm, sb rnd, f gr, mod fri, sl calc, tr
sily sh; string mky bl cut, bl ring

SS: dk-med gy-gy brn, s&p, occ clr gr, occ med brn
mtx, med hd-firm, sb rnd, f gr, mod fri, sl calc, tr sily sh;
string mky bl cut, bl ring

TVD (ft)

TVD (ft)

MD: 8,237'
TVD: 7,132.26'
Inclination: 90.86 °
Azimuth: 270.87 °
VS: 810.79'

MD: 8,322'
TVD: 7,131.17'
Inclination: 90.61 °
Azimuth: 270.9 °
VS: 895.78'

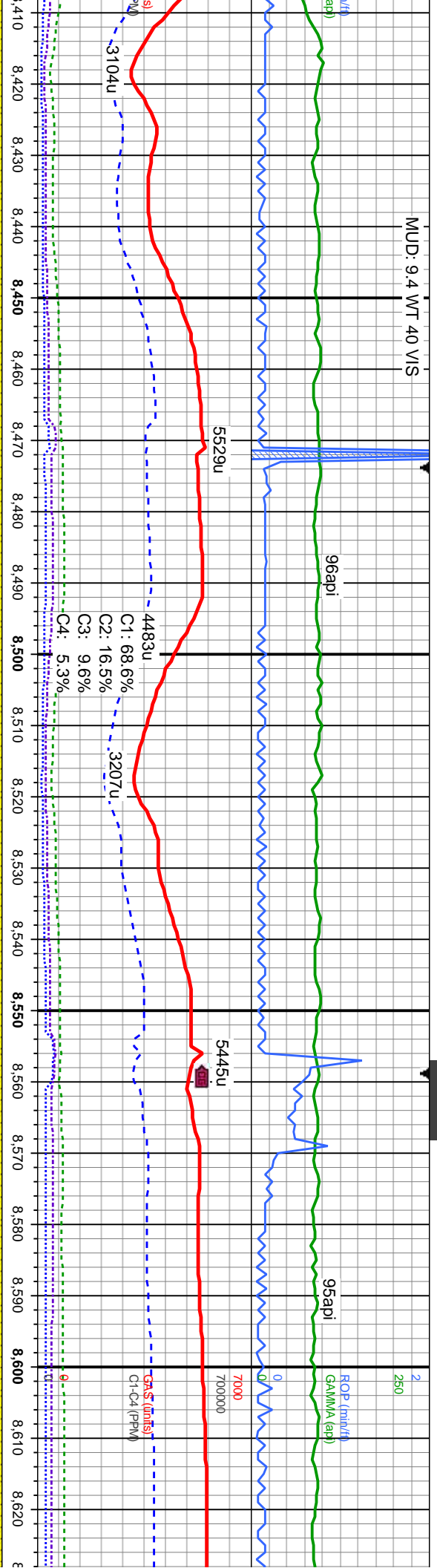
MD: 8,401'
TVD: 7,131.17'
Inclination: 90.61 °
Azimuth: 270.9 °
VS: 981.7'

7400

7400



MUD: 9.4 WT 40 VIS



SS: dk-med gy-gy brn, s&p, occ clr gr, occ med bmn mtx, med hd-frn, sb md, f gr, mod fri, sl calc, tr silty sh; string mky bl cut, bl ring

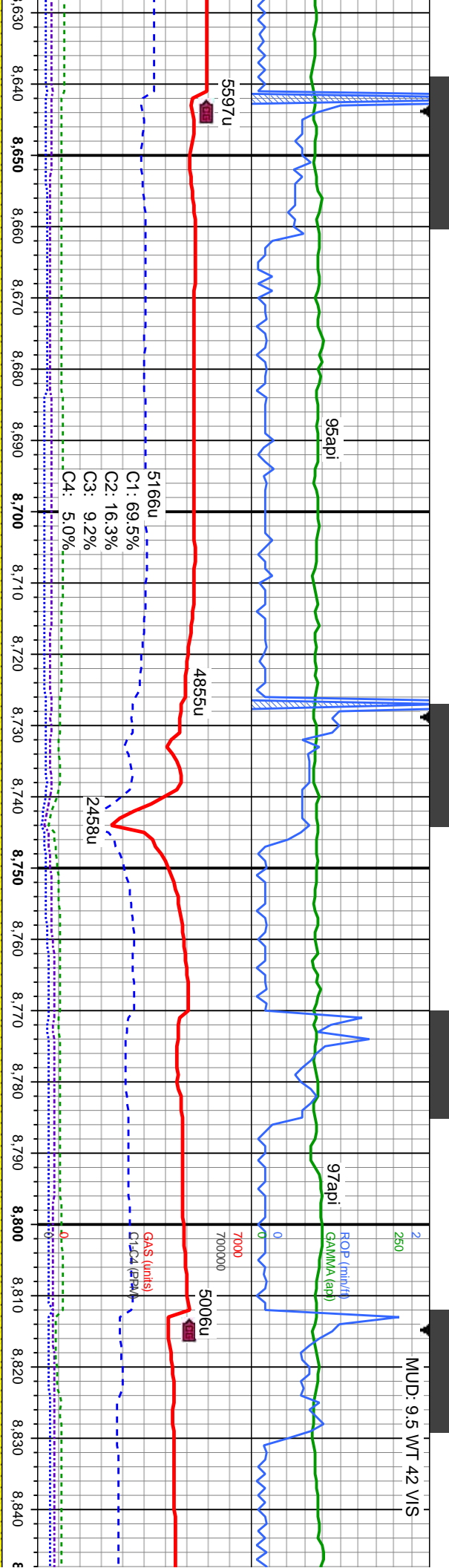
SS: dk-med gy-gy brn, s&p, occ clr gr, occ med bmn mtx, med hd-frn, sb md, f gr, mod fri, sl calc, tr silty sh; string mky bl cut, bl ring

MD: 8,493'
TVD: 7,131.69'
Inclination: 88.82 °
Azimuth: 269.04 °
VS: 1,066.76'

MD: 8,578'
TVD: 7,133.62'
Inclination: 88.58 °
Azimuth: 268.99 °
VS: 1,151.71'



MUD: 9.5 WT 42 VIS



dk-med gy-gy brn, s&p, occ clr gr, occ med
mtx, med hd-fm, sb md, f gr, mod fri, sl calc,
y sh; sting mky bl cut, bl ring

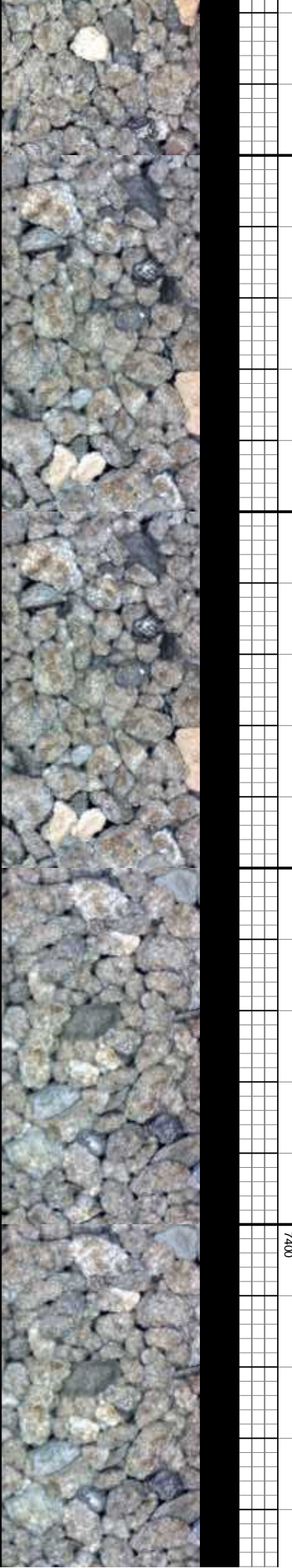
SS: dk-med gy-gy brn, s&p, occ clr gr, occ med
brn mtx, med hd-fm, sb rnd, f gr, mod fri, sl
calc, tr silty sh; sting mky bl cut, bl ring

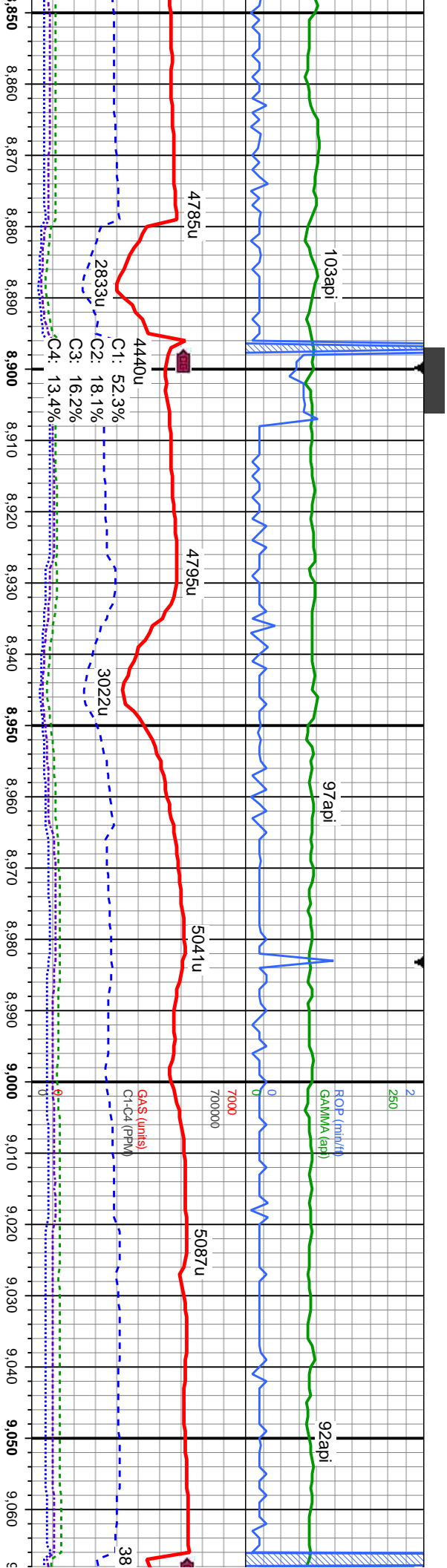
SS: dk-med gy-gy brn, s&p
rnd, f gr, mod fri, sl calc, tr
ring

MD: 8,663'
TVD: 7,135.34'
Inclination: 89.1 °
Azimuth: 268.54 °
VS: 1,236.66'

MD: 8,749'
TVD: 7,135.83'
Inclination: 90.24 °
Azimuth: 268.47 °
VS: 1,322.61'

MD: 8,834'
TVD: 7,134.93'
Inclination: 90.98 °
Azimuth: 270.56 °
VS: 1,407.59'





, occ cl gr, med hd frm, sb
sily sh; stmg mky bl cut, bl

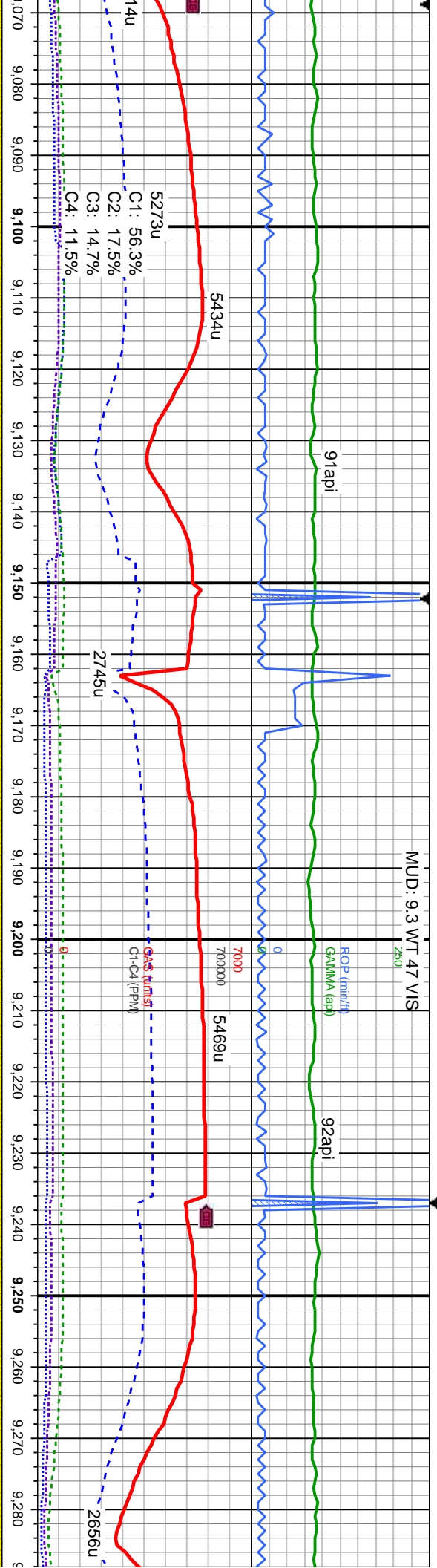
SS: dk-med gy-gy brn, s&p, occ clr gr, med hd frm,
sb md, f gr, mod fri, sl calc, tr sily sh; stmg mky bl cut,
bl ring

SS: dk-med gy-gy brn, s&p, occ clr gr, mec
sb md, f gr, mod fri, sl calc, tr sily sh; stmg
cut, bl ring

MD: 8,919'
TVD: 7,133.04'
Inclination: 91.57°
Azimuth: 270.99°
VS: 1,492.57'

MD: 9,004'
TVD: 7,130.8'
Inclination: 91.44°
Azimuth: 271.1°
VS: 1,577.53'





hd frm, mky bl

SS: dk-med gy-gy brn, s&p, occ cl gr, med hd frm, sb md, f gr, mod fri, sl calc, tr silty sh; sting mky bl cut, bl ring

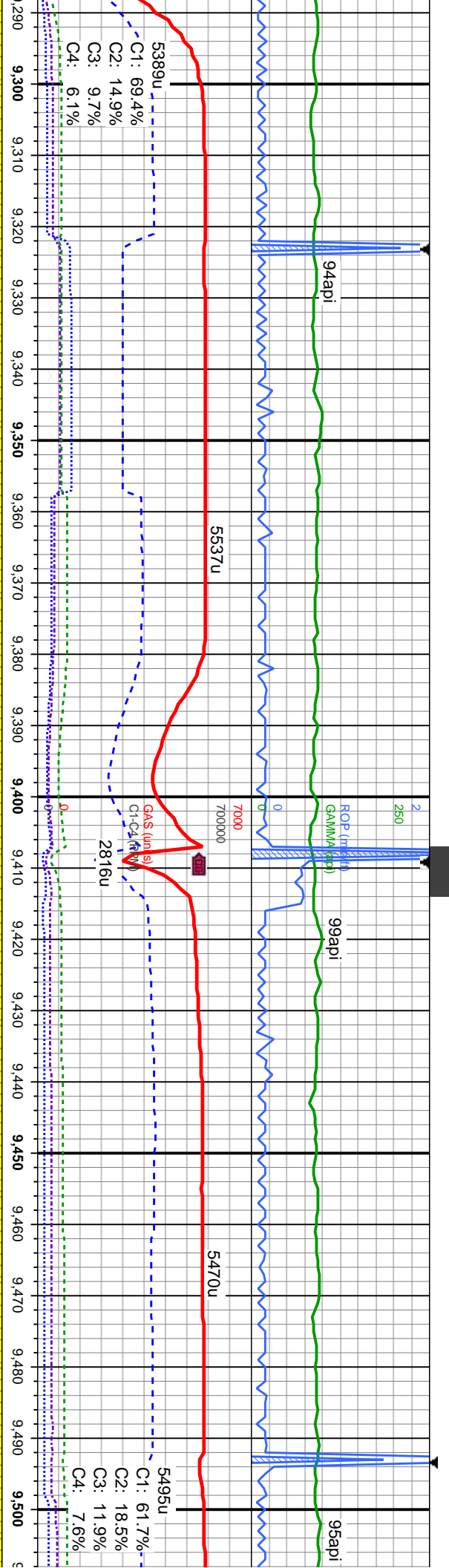
SS: dk-med gy-gy brn, s&p, occ cl gr, med sb md, f gr, mod fri, sl calc, tr silty sh; sting mky bl cut, bl ring

MD: 9,089'
TVD: 7,128.64'
Inclination: 91.48 °
Azimuth: 271.13 °
VS: 1,662.5'

MD: 9,174'
TVD: 7,126.95'
Inclination: 90.8 °
Azimuth: 270.6 °
VS: 1,747.48'

MD: 9,260'
TVD: 7,125.91'
Inclination: 90.58 °
Azimuth: 270.49 °
VS: 1,833.47'





SS: dk-med gy-gy brn, s&p, occ clr gr, med
hd-fm, sb rnd, f gr, mod fri, sl calc, tr silty sh;
stmg mky bl cut, bl ring

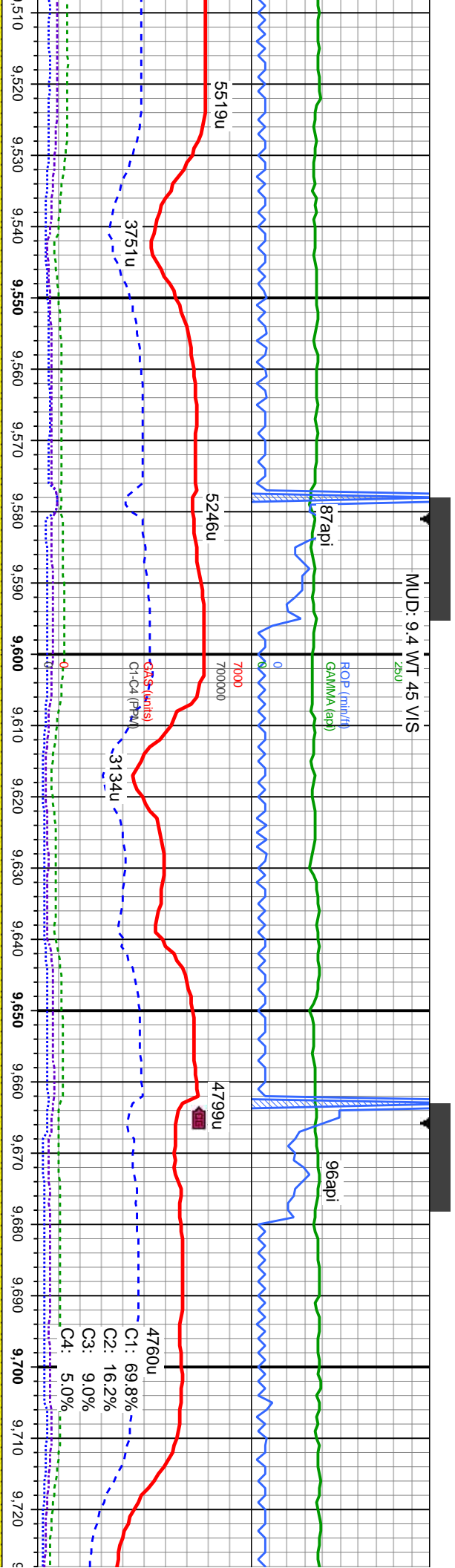
SS: dk-med gy-gy brn, s&p, occ clr gr, med
hd-fm, sb rnd, f gr, mod fri, sl calc, tr silty sh;
stmg mky bl cut, bl ring

MD: 9,345'
TVD: 7,125.37'
Inclination: 90.15 °
Azimuth: 270.37 °
VS: 1,918.47'

TVD (ft)

MD
TVD
Incl
Azil
VS





SS: dk-med gy-gy brn, s&p, occ clr gr, med
hd-firm, sb md, f gr, mod fri, sl calc, tr silty
sh: string mky bl cut, bl ring

SS: dk-med gy-gy brn, s&p, occ clr gr, med
hd-firm, sb md, f gr, mod fri, sl calc, tr silty sh:
string mky bl cut, bl ring

9,515'
D: 7,126.31'
Inclination: 89.22 °
Muth: 270.03 °
2,088.46'

MD: 9,600'
TVD: 7,126.96'
Inclination: 89.9 °
Azimuth: 269.17 °
VS: 2,173.45'

MD: 9,686'
TVD: 7,127.36'
Inclination: 89.56 °
Azimuth: 269.72 °
VS: 2,259.44'



MUD: 9.4 WT 45 VIS

2bu

94api

ROP (mbl/h)

92api

GAMMA (api)

5402u

7000

700000

5453 (units)

Cl-C4 (PPM)

2885u

4849u

4138u

C1: 68.7%

C2: 16.4%

C3: 9.5%

C4: 5.4%

9,730 9,740 9,750 9,760 9,770 9,780 9,790 9,800 9,810 9,820 9,830 9,840 9,850 9,860 9,870 9,880 9,890 9,900 9,910 9,920 9,930 9,940 9,950

dk-med gy-gy brn, s&p, occ clr gr, med
-frm, sb rnd, f gr, mod fri, sl calc, tr silty sh;
ng mky bl cut, bl ring

SS: dk-med gy-gy brn, s&p, occ clr gr, med
hd-frm, sb rnd, f gr, mod fri, sl calc, tr silty sh;
stmg mky bl cut, bl ring

SS: dk-med gy-gy brn
hd-frm, sb rnd, f gr, r
sh, stmg mky bl cut, k

MD: 9,771'

TVD: 7,127.65'

Inclination: 90.06 °

Azimuth: 270.22 °

VS: 2,344.43'

MD: 9,856'

TVD: 7,127.76'

Inclination: 89.78 °

Azimuth: 270.02 °

VS: 2,429.43'

MD: 9,942'

TVD: 7,128.46'

Inclination: 89.29 °

Azimuth: 268.48 °

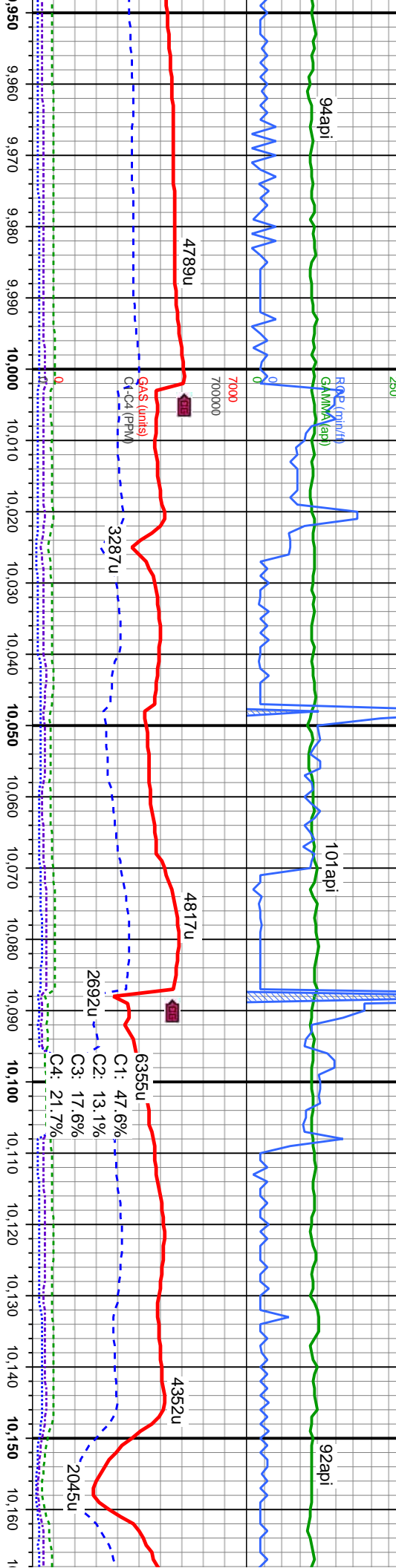
VS: 2,515.41'

7400

TVD (ft)

6800

MUD: 9.4 WT 45 VIS



1, s&p, occ clr gr, med
mod fri, sl calc, tr sily
bl ring

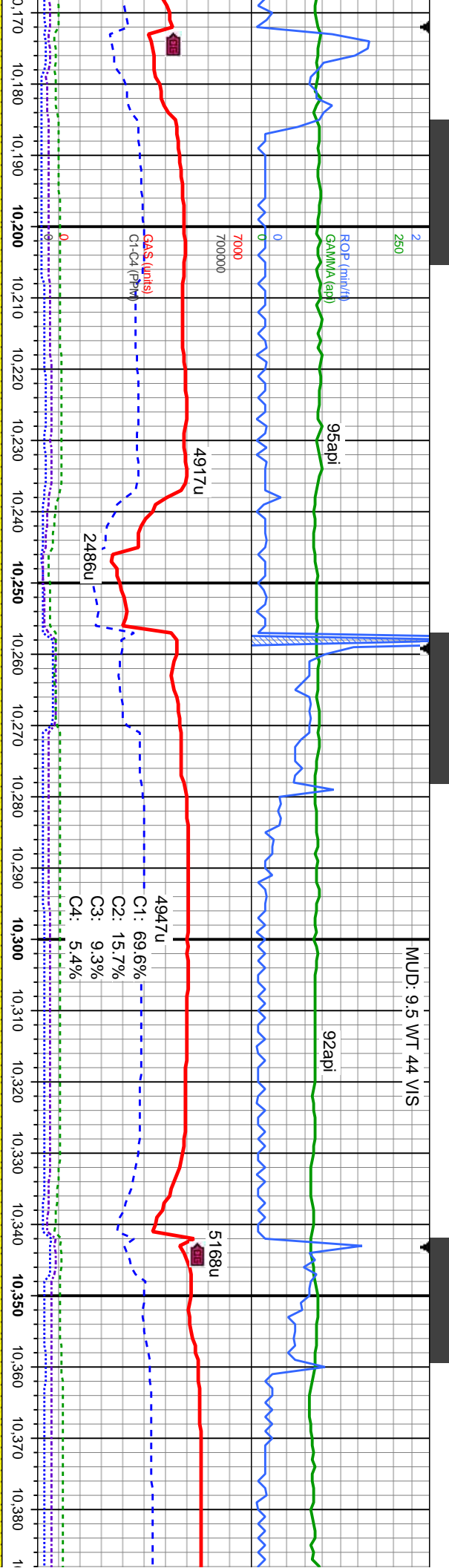
SS: dk-med gy-gy brn, s&p, occ clr gr, med
hd frm, sb md, f gr, mod fri, sl calc, tr sily sh;
stmg mky bl cut, bl ring

SS: dk-med gy-gy brn, s&p, occ clr gr, med
sb md, f gr, mod fri, sl calc, tr sily sh; stmg r
cut, bl ring

MD: 10,027'
TVD: 7,129.4'
Inclination: 89.44 °
Azimuth: 268.37°
VS: 2,600.35'

MD: 10,112'
TVD: 7,128.77'
Inclination: 91.41 °
Azimuth: 269.6°
VS: 2,685.32'





6800

SS: dk-med gy-gy brn, s&p, occ clr gr, med hd-firm, sb md, f gr, mod fri, sl calc, tr silty sh; string mky bl cut, bl ring

SS: dk-med gy-gy brn, s&p, occ clr gr, med hd-firm, sb md, f gr, mod fri, sl calc, tr silty sh; string mky bl cut, bl ring

MD: 10,198'
TVD: 7,127.9'
Inclination: 89.75 °
Azimuth: 269.72 °
VS: 2.771.3'

MD: 10,283'
TVD: 7,128.59'
Inclination: 89.32 °
Azimuth: 270.39 °
VS: 2.856.3'

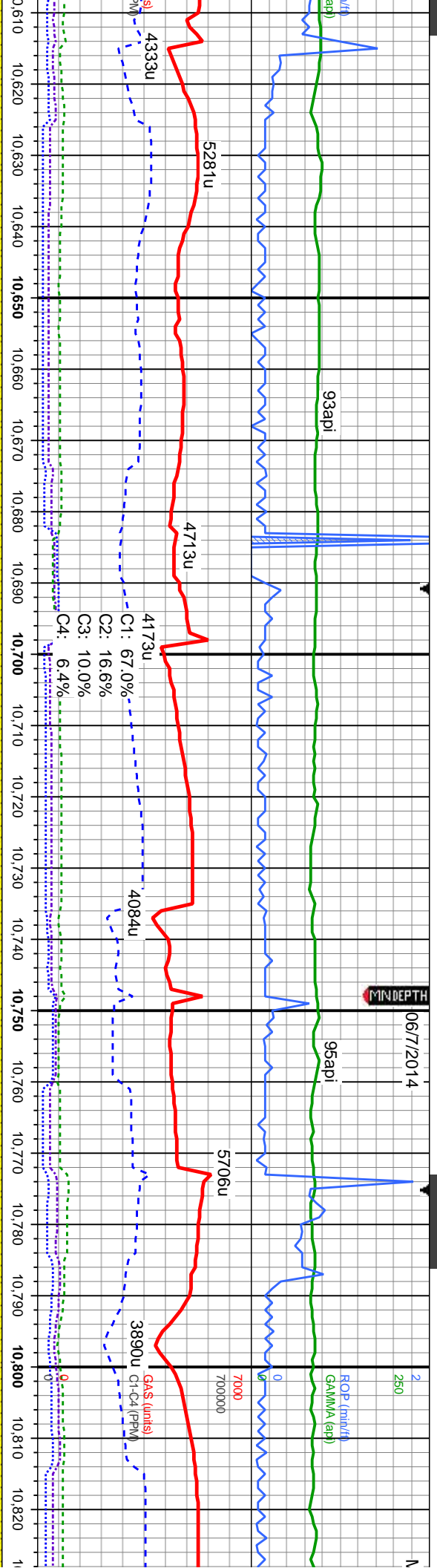
MD: 10,368'
TVD: 7,129.28'
Inclination: 89.75 °
Azimuth: 270.45 °
VS: 2.941.29'





06/7/2014

MINDEPTH



MD: 10,634'
TVD: 7,128.31'
Inclination: 89.81 °
Azimuth: 271.64 °
VS: 3,207.28'

MD: 10,709'
TVD: 7,128.91'
Inclination: 89.26 °
Azimuth: 271.62 °
VS: 3,282.26'

MD: 10,794'
TVD: 7,129.86'
Inclination: 89.47 °
Azimuth: 271.11 °
VS: 3,367.24'



MUD: 9.7 WT 44 VIS

91api

5813u

4925u

C1: 62.4%
C2: 18.4%
C3: 12.3%
C4: 7.0%

4454u

89api

5405u

GAS (units)
GAMMA (api)

3606u

dk-med gy-gy brn, s&p, occ clr gr, med
m, sb md, f gr, mod fri, sl calc, tr sily sh;
mky bl cut, bl ring

SS: dk-med gy-gy brn, s&p, occ clr gr, med hd frm,
sb md, w srt, f gr, mod fri, sl calc; string mky bl cut, bl
ring

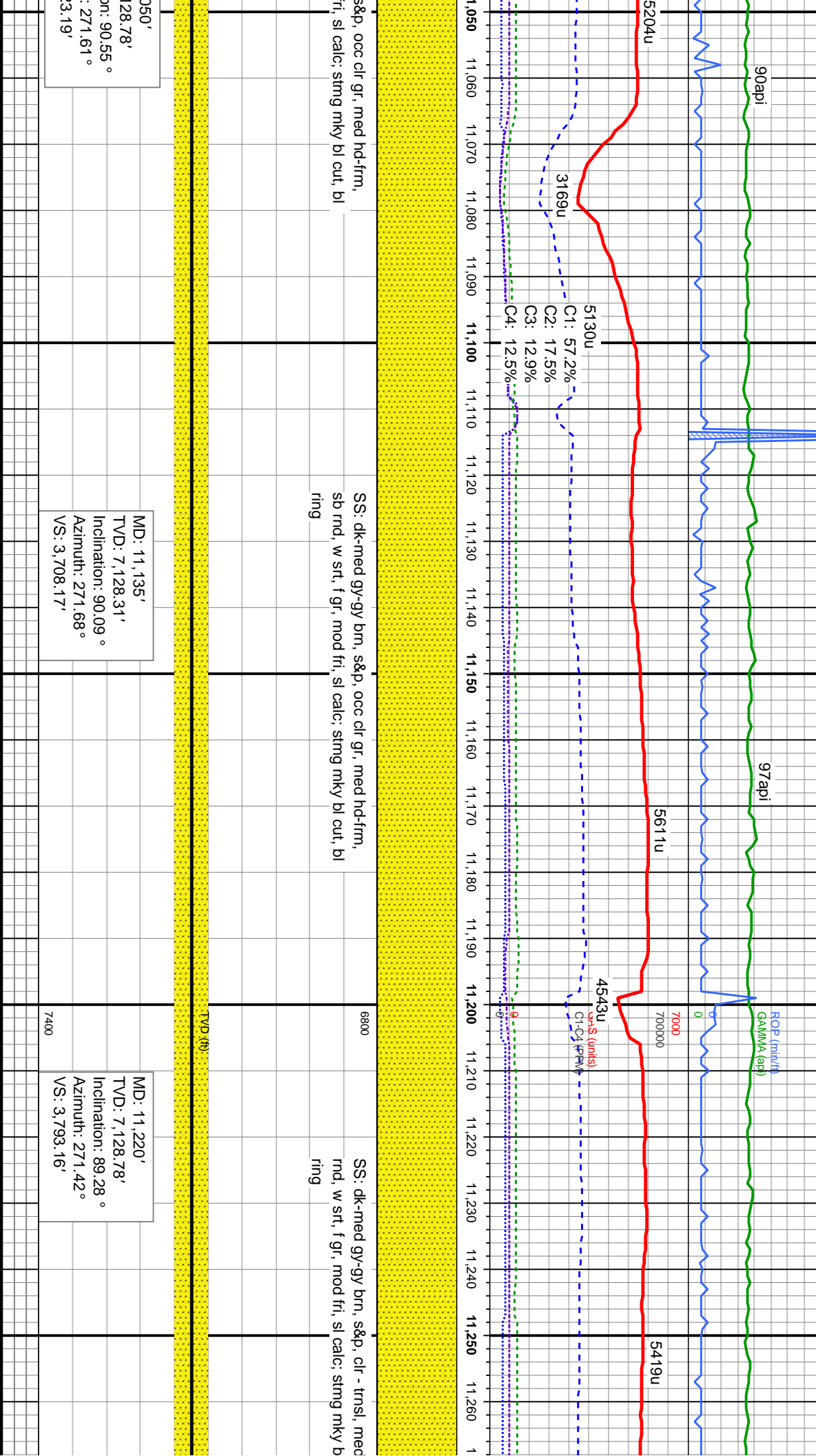
SS: dk-med gy-gy brn, s;
sb md, w srt, f gr, mod l
ring

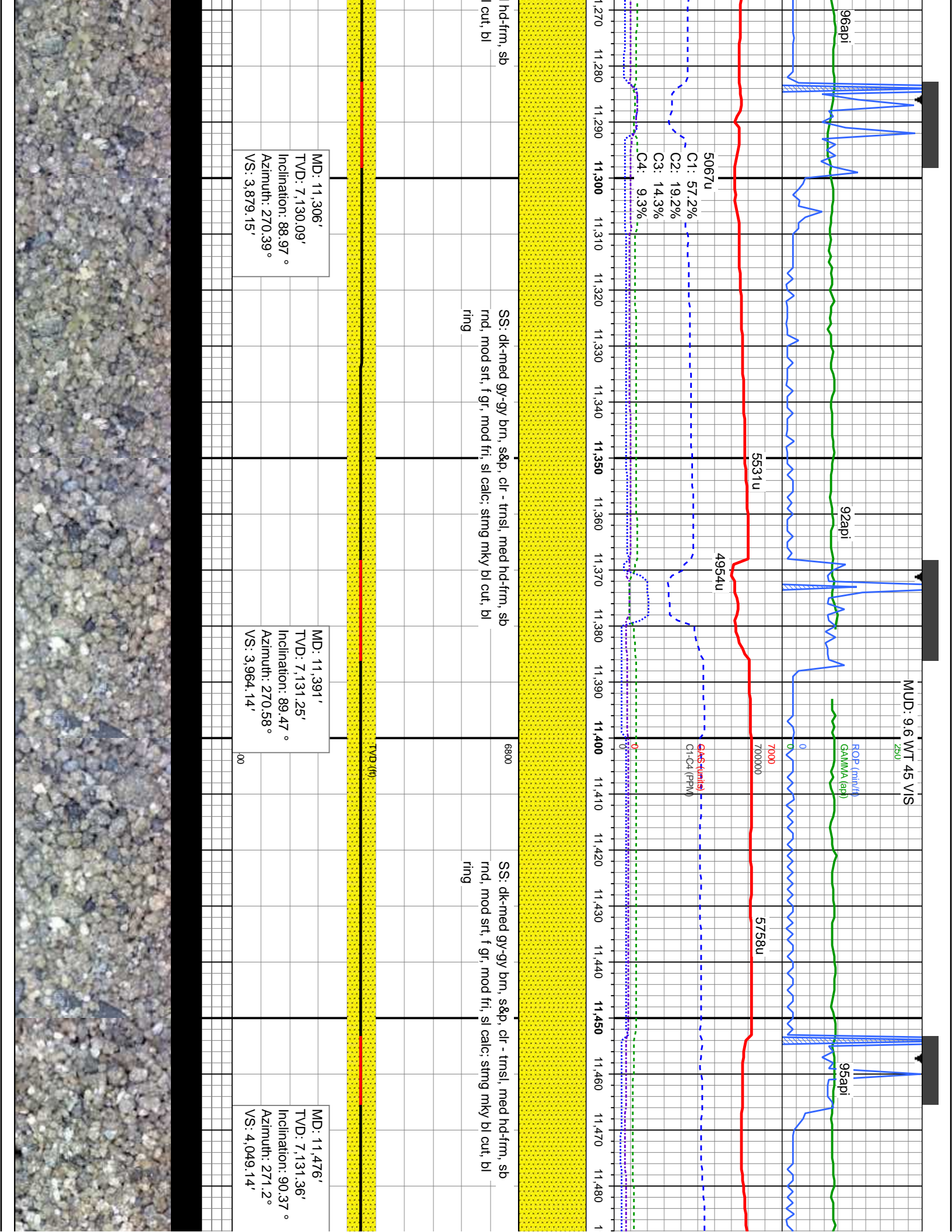
MD: 10,880'
TVD: 7,130.29'
Inclination: 89.96°
Azimuth: 271.48°
VS: 3,453.21'

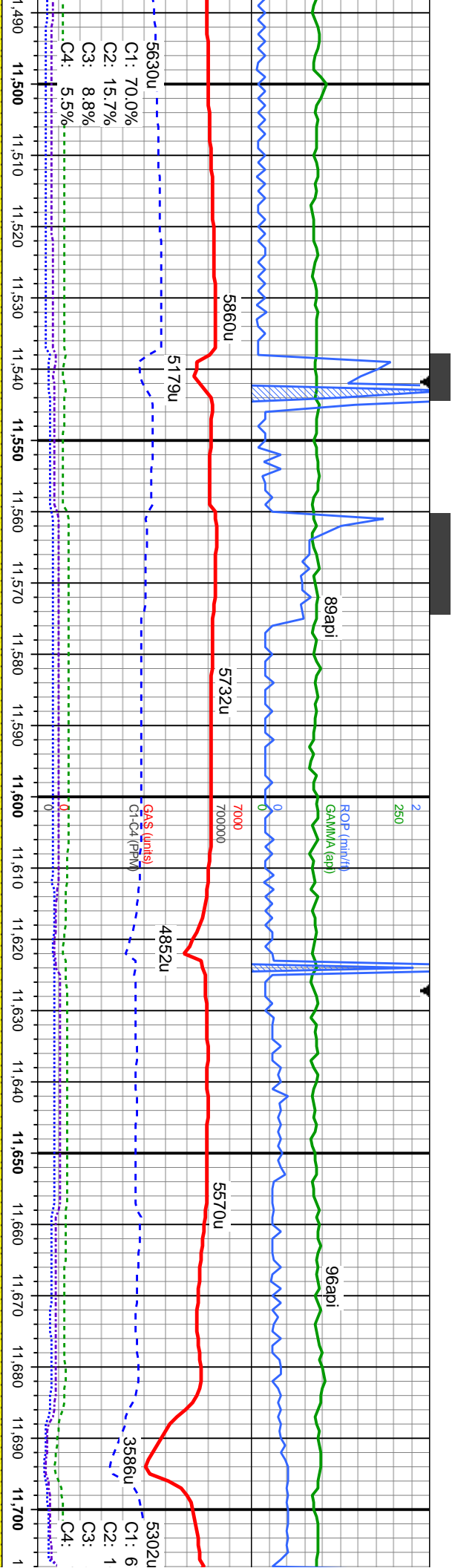
MD: 10,965'
TVD: 7,129.75'
Inclination: 90.76°
Azimuth: 271.64°
VS: 3,538.2'

MD: 11,110'
TVD: 7,129.75'
Inclination: 90.76°
Azimuth: 271.64°
VS: 3,623.21'







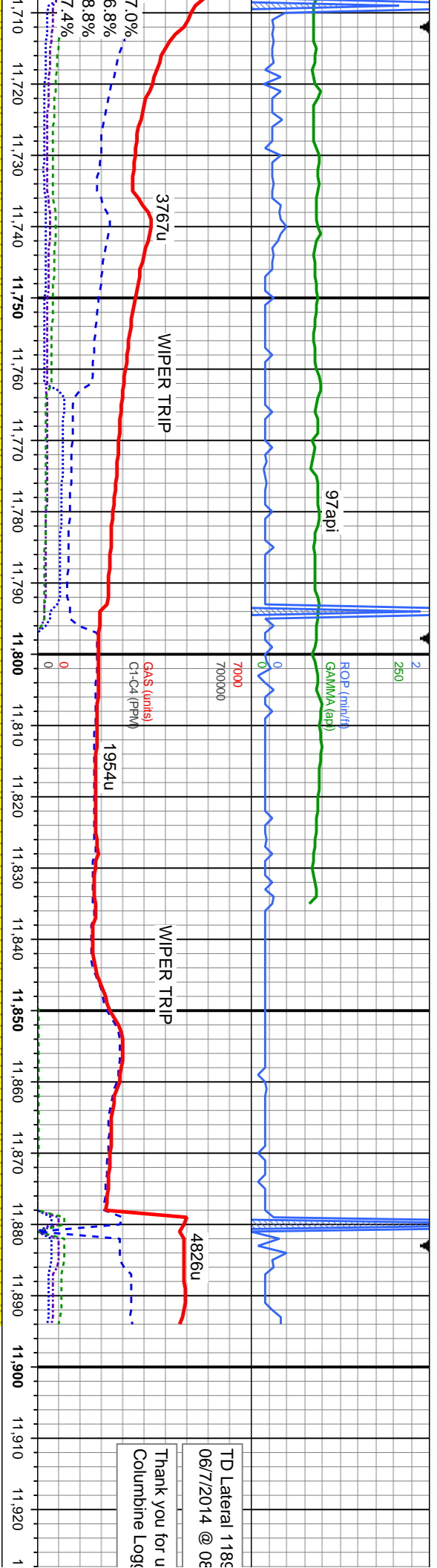


SS: dk-med gy-gy brn, s&p, clr - trns, med hd frm, sb
rnd, w srt, f gr, mod fri, sl calc; sting mky bl cut, bl
ring

SS: dk-med gy-gy brn, s&p, clr - trns, med hd frm, sb
md, w srt, f gr, mod fri, sl calc; sting mky bl cut, bl
ring

MD: 11,647'
TVD: 7,129.22'
Inclination: 91.07°
Azimuth: 272.13°
VS: 4,220.11'





TD Lateral 1185
06/7/2014 @ 08
Thank you for u
Columbine Log

SS: dk-med gy-gy brn, s&p, clr - trns, med hd-fm, sb
rnd, w srt, f gr, mod fri, sl calc; string mky bl cut, bl
ring

6800

SS: dk-med gy-gy brn, s&p, clr - trns, med hd-fm, sb
rnd, w srt, f gr, mod fri, sl calc; string mky bl cut, bl
ring

PROJECTION TO BIT

MD: 11,732'
TVD: 7,128.5'
Inclination: 89.9 °
Azimuth: 271.47 °
VS: 4,305.09'

MD: 11,828'
TVD: 7,130.14'
Inclination: 88.14 °
Azimuth: 270.9 °
VS: 4,401.07'

MD: 11,894'
TVD: 7,132.28'
Inclination: 88.14 °
Azimuth: 270.9 °
VS: 4,467.03'



