



Scale: 5" / 100'
Measured Depth Log

Well Name Qualls 3C-28H Horizontal Final

Location S28 T3N R68W

State COLORADO

Country USA

API Number 05-123-37047

Region DJ BASIN

Spud Date 7/6/2013

Surface Coordinates 802' FSL, 281' FWL

Bottom Hole Coordinates 1486' FSL, 460' FEL

County WELD

Rig Number H&P 278

AFE # 13174483

Field WATTENBERG

Drilling Completed 8/12/2013

Ground Elevation 4957

K.B. Elevation 4982

Logged Interval 5000 **To** 11540

Total Depth 6540

Formation CODELL SANDSTONE

Type of Drilling Fluid H2O, LSND

Company Encana Oil & G
Address 370 17th Street
Denver, CO 80

Name Stacy Tincher &
Company Encana Oil & G
Address 370 17th Street
Denver, CO 80

Columbine Logging, Inc.
Wellsite Geologists

Operator

as (USA), Inc.
Suite 1700
202

Geologist

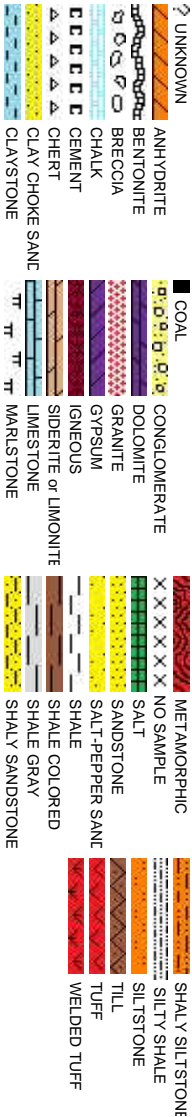
Jeffrey Schroeder
as (USA), Inc.
Suite 1700
202

Other

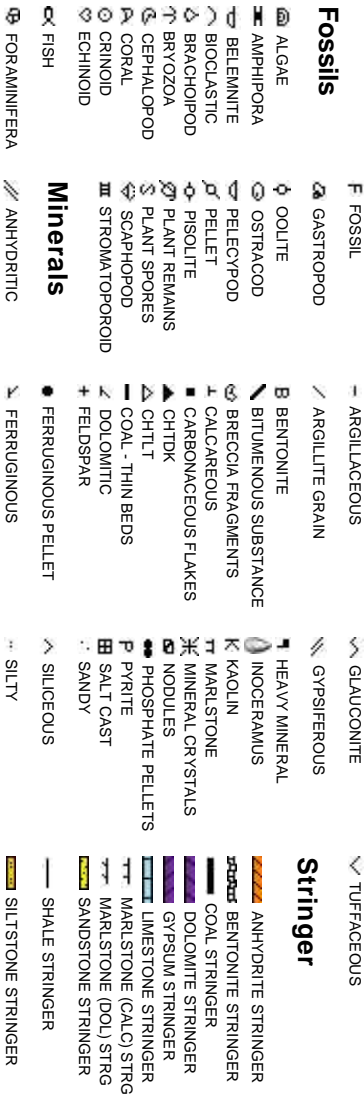
2385 S. Lipan St.
Denver, CO 80223

Elizabeth Storey
Robert Davis
Joey Luce
Daniel Meidel
Eric Bernardo

Rock Types











Accessories























Other Symbols














Oil Show

-  MOLDIC
-  ORGANIC
-  PINPOINT
-  VUGGY
-  DEAD
-  EVEN
-  QUESTIONABLE
-  SPOTTED STAINING









Engineering

-  FAULT
-  FORMATION TOP
-  GAS SHOW
-  MINDEPTH MN DEPTH
-  NORMAL FAULT
-  OIL SHOW
-  OVERTURNED STRATA
-  REVERSE FAULT
-  SIDEWALL CORE (LEFT)
-  SIDEWALL CORE (RIGHT)
-  CONNECTION GAS
-  CONNECTION (LEFT)
-  CONNECTION (RIGHT)
-  BIT
-  SPOTTED STAINING
-  QUESTIONABLE
-  EVEN
-  PINPOINT
-  ORGANIC
-  MOLDIC




Rounding

-  WIRELINE TESTED - LEFT
-  WIRELINE TESTED - RT
-  FINELYXLN
-  GRAINSTONE
-  L LITHOGRAPHIC
-  MICROXLN
-  MUDSTONE
-  PACKSTONE
-  WACKESTONE
-  SUBANG
-  SUBRND
-  ANGULAR
-  ROUNDED

Porosity

-  EARTHY
-  FENESTRAL
-  FRACTURE
-  INTERCRYSTALLINE
-  INTEROOLITIC
-  CORE - LOST
-  CORE - RECOVERED
-  DST INTERVAL

Textures

-  BOUNDSTONE
-  CHALKY
-  CRYPTOXLN

Sorting

-  MODERATE
-  POOR
-  WELL

ROP
ROF
GAMMA

Gamma from Cathedral
ROP from Pason

212

800
200
ROP (ft/hr)
GAMMA (units)

REFER TO QUALLS 3C-28H
VERTICAL FOR INC <23.8

IN 11.50/44 OUT 11.40/44

IN 11.10/48 OUT 11.10/43

IN 11.20/45 OUT 11.10/51

Total Gas & Chromatograph

GAS
C1
C2
C3
C4

549u
C1 62.9%
C2 9.9%
C3 6.4%
C4 20.8%

50' Overlap from Vertical

Depth Labels

6.660 6.670 6.680 6.690 6.700 6.710 6.720 6.730 6.740 6.750 6.760 6.770 6.780 6.790 6.800 6.810 6.820 6.830 6

% Lith

30' Samples

6500

Well Bore
TVD

Logging of the curve/horizontal by
Columbine Logging, Inc.

MD: 6,658'
TVD: 6,573.13'
Inclination: 23.8 °
Azimuth: 90.5 °
VS: -141.53'

MD: 6,690'
TVD: 6,602.04'
Inclination: 27 °
Azimuth: 88.6 °
VS: -127.81'

MD: 6,721'
TVD: 6,629.53'
Inclination: 28 °
Azimuth: 89 °
VS: -113.5'

MD: 6,753'
TVD: 6,657.38'
Inclination: 31 °
Azimuth: 91.3 °
VS: -97.75'

MD: 6,785'
TVD: 6,684.44'
Inclination: 33.5 °
Azimuth: 93.9 °
VS: -80.70'

MD: 6,816'
TVD: 6,709.98'
Inclination: 35.6 °
Azimuth: 95.2 °
TVD (ft) VS: -63.17'

TRACE

SLTY SH: dk - med gy, sft - mod hd, sb
ply, occ ply, silty - sl rthy tex, sl sdy ip, tr
bent, sl calc, grdg to slst ip, mod
diffuse, mod-fast stmg cut, bri, mod
yel-gn ring, sl tr sin

SLTY SH: dk - med gy, sft - mod hd, sb
ply, occ ply, silty - sl rthy tex, sl sdy ip,
bent, sl calc, grdg-slst ip, mod diffuse,
fast stmg cut, bri, mod yel-gn ring, sl tr
sin

SLTY SH: dk - med gy, sft - mod
ply, occ ply, silty - sl rthy tex, sl s
bent, sl calc, grdg to slst ip, mod
fast stmg cut, bri, mod yel-gn ring
sin

7700

Oil Show

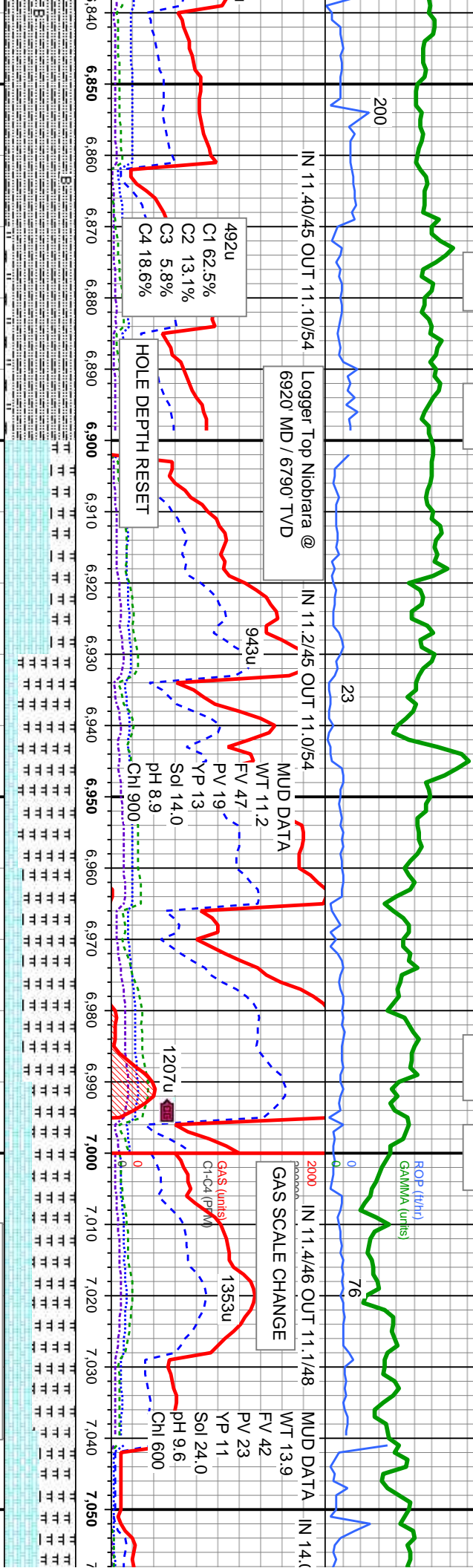
E
G
M
FR
TR

Images



8/2/13 MINDEPTH 8/3/13

8/3/13 8/5/13



492u
C1 62.5%
C2 13.1%
C3 5.8%
C4 18.6%

IN 11.40/45 OUT 11.10/54
Logger Top Niobrara @
6920' MD / 6790' TVD

IN 11.2/45 OUT 11.0/54
MUD DATA
WT 11.2
FV 47
PV 19
YP 13
Sol 14.0
pH 8.9
Chl 900

IN 11.4/46 OUT 11.1/48
GAS SCALE CHANGE
WT 13.9
FV 42
PV 23
YP 11
Sol 24.0
pH 9.6
Chl 600

MD: 6,848

TTVD: 6,735.65'
Inclination: 37.7°
Azimuth: 93.6°
VS: -44.13'

MD: 6,879
TVD: 6,789.76'
Inclination: 40.2°
Azimuth: 91.5°
VS: -24.66'

MD: 6,911
TVD: 6,783.63'
Inclination: 43.3°
Azimuth: 88.7°
VS: -3.36'

MD: 6,974
TVD: 6,827.41'
Inclination: 47.5°
Azimuth: 87.5°
VS: 41.88'

MD: 6,986
TVD: 6,835.49'
Inclination: 47.8°
Azimuth: 88°
VS: 50.75'

sd, sb
hd, sb
diffuse,
silty ip,
silty
TRACE

SLTY SH: dk - med gy, sft - mod hd, sb pty,
occ pty, silty - sl rthy tex, sl sdy ip, bent, sl
calc, grdg to silst ip, MRLST: med gy - dk gy,
sft - hd, sb blkly - blkly, microxln, sl mot, silty
tex, calc, mod-fast diffuse, fast stmg cut, bri,
mod-thk grn-wh ring, sl tr stn

MRLST: med gy - dk gy, sft - hd, sb blkly - sb
pty, microxln, sl mot, silty tex, calc, CHK: lt gy
brn - med gy, mot dk gy, sft, brt ip, sb blkly -
blkly, rthy tex, arg calc mtx, tr dissn pyr, tr
bent, mod-fast diffuse, fast stmg cut, bri,
mod-thk grn-wh ring, sl tr stn

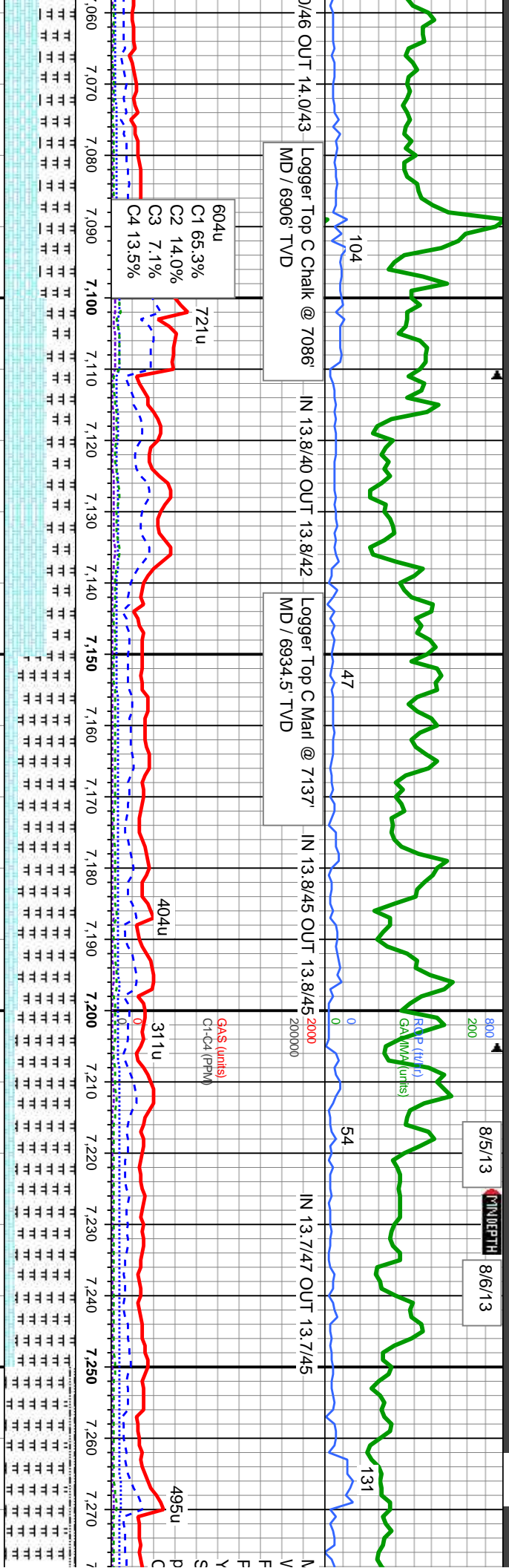
MRLST: med gy - dk gy, sft - hd, sb blkly - sb
pty, microxln, sl mot, silty tex, calc, CHK: lt gy
gy brn, mot, sft, sb blkly, rthy tex, arg calc
mtx, tr pyr, rr fos, no mnrl flr, fast diffuse,
fast stmg, bri bl wh cut, no stn or od

MRLST: med gy - dk gy, sft - hd, sb blkly - sb
pty, microxln, sl mot, silty tex, calc, CHK: gy -
gy brn, mot, sft, sb blkly, rthy tex, arg calc mtx,
com pyr, com fos, tr dull yel mnrl flr, fast
diffuse, mod fast stmg, bri bl wh cut, tr brn
stmg, no od

6500
Curve landed at 7039 MD
@ 0642hrs on 8/3/13
Resumed drilling @ 15:00hrs on 8/5/13

MD: 7,039
TVD: 6,848
Inclination: 37.7°
Azimuth: 93.6°
VS: 102'





Logger Top C Chalk @ 7086'
MD / 6906' TVD

Logger Top C Marl @ 7137'
MD / 6934.5' TVD

66	MD: 7,087'	MD: 7,119'	MD: 7,151'	MD: 7,182'	6500	MD: 7,214'	MD: 7,245'	MD: 7,270'
582.51'	TVD: 6,903.41'	TVD: 6,924.93'	TVD: 6,945.56'	TVD: 6,964.04'		TVD: 6,981.54'	TVD: 6,996.78'	TVD: 7,011.92'
47.8 °	Inclination: 47.4 °	Inclination: 48.1 °	Inclination: 51.6 °	Inclination: 55.2 °		Inclination: 58.5 °	Inclination: 62.6 °	Inclination: 66.7 °
89.2 °	Azimuth: 88.9 °	Azimuth: 89.2 °	Azimuth: 89.6 °	Azimuth: 89.6 °		Azimuth: 90.4 °	Azimuth: 90.4 °	Azimuth: 90.4 °
VS: 125.47'	VS: 149.16'	VS: 173.61'	VS: 198.49'	VS: 225.27'		VS: 252.27'	VS: 277.54'	VS: 302.81'

50' Samples	CHK: It gy - med gy, brn, mot dk gy, v sft - hd, brit ip, sb blkly - blkly, sb wxy tex, arg calc mtz, MRLST: med gy - dk gy, sft - hd, sb blkly - blkly, microxln, sl mot, silty tex, calc, tr dissim pyr, rr bent, no mnrl flr, fast diffuse, slow mod slow stmg, bri bl wh cut, frt brn stm, no od	MRLST: med gy - dk gy, sft - frm, blkly, microxln, sl mot, silty tex, calc, intbd w CHK: It gy, med gy - gy brn, sft - frm, brit ip, sb blkly - blkly, rthy tex, arg calc mtz, tr dissim pyr, abnt sec calcite, rr bent, no mnrl flr, fast diffuse, fast stmg, bri bl wh cut, rr brn stm, no od	MRLST: med gy - dk gy, sft - hd, sb blkly - blkly, microxln, sl mot, silty tex, calc, intbd w CHK: It gy, med gy - gy brn, sft - frm, brit ip, sb blkly - blkly, rthy tex, arg calc mtz, tr dissim pyr, abnt sec calcite, rr bent, no mnrl flr, fast diffuse, fast stmg, bri bl wh cut, rr brn stm, no od	MRLST: med gy - dk gy, sft - hd, sb blkly - blkly, microxln, sl mot, silty tex, calc, intbd w CHK: It gy, med gy - gy brn, sft - frm, brit ip, sb blkly - blkly, rthy tex, arg calc mtz, tr dissim pyr, abnt sec calcite, rr bent, no mnrl flr, fast diffuse, fast stmg, bri bl wh cut, rr brn stm, no od
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Logger Top Ft. Hayes
MD 7305' / TVD 7021'

8/6/13

8/7/13

Logger Top Codell
MD 7430' / TVD 7055'

GAMMA SACLE CHANGE

ROP (ft/hr)
GAMMA (units)

MUD DATA

IN 13.6/44 OUT 13.6/44

IN 13.7/44 OUT 13.6/43

TOOH for Mud Motor MD 7391'
8/6/13 @ 1044 MST

MUD DATA

WT 13.7
FV 44
PV 21
YP 11
Sol 23.0
pH 9.1
Chl 800

VT 13.7

V 44
V 23
P 10
C1 47.3%
C2 10.8%
C3 6.6%
C4 36.4%

Drilling Resumed
8/7/13 @ 234 MST

GAS SCALE
CHANGE

WT 13.7
FV 44
PV 21
YP 11
Sol 23.0
pH 9.1
Chl 800

108

C1
C2
C3
C4

240u

240u

537u

469u

194u

844u

1594u

64

6000

6000000

GAS (units)
C1-C4 (PPM)

MD: 7,308

TVD: 7,022.82

Inclination: 69 °

Azimuth: 89.3 °

VS: 728.68'

MD: 7,340

TVD: 7,033.31

Inclination: 72.7 °

Azimuth: 87.6 °

VS: 339.81'

MD: 7,372

TVD: 7,042.21

Inclination: 75 °

Azimuth: 87.1 °

VS: 370.51'

MD: 7,403

TVD: 7,049.76

Inclination: 76.8 °

Azimuth: 87.9 °

VS: 400.55'

MD: 7,435

TVD: 7,056.53

Inclination: 78.8 °

Azimuth: 89 °

VS: 431.81'

MD: 7,467

TVD: 7,061.75

Inclination: 82.4 °

Azimuth: 89.8 °

VS: 463.38'

MD: 7,499

TVD: 7,067.06

Inclination: 82.4 °

Azimuth: 89.8 °

VS: 494.2'

VS: 400.55'

VS: 431.81'

VS: 463.38'

LS: offwht, crm, bf-gy brn, wxy-soapy, mcnln, v sft-occ mod frm, sb pily, ireg-sb blkly, mtnx, calc MRLST: med gy-dk gy, blk ip, sft-hd, sb blkly-bkly, sl mot, rthy lstr, slty tex, calc, tr dull ong-brn mnrl flr, fast diffuse, mod slow stmg, dull bl wh cut, no stn or od

LS: offwht, crm, bf-gy brn, wxy-soapy, mcnln, v sft-occ mod frm, sb pily, ireg-sb blkly, mtnx, calc MRLST: med gy-dk gy, blk ip, sft-hd, sb blkly-bkly, sl mot, rthy lstr, slty tex, calc, tr dull ong-brn mnrl flr, fast diffuse, mod slow stmg, dull bl wh cut, no stn or od

LS: offwht, crm-it-brn, bf-gy brn, wxy-soapy, mcnln, mod frm-hd, sb pily, ireg-sb blkly, mtnx, calc SS: crm-it brn, lt gy-gy brn, trnsl - clr gr, vt - l f gr, sb rnd - ang, mod sft - hd, brit, mod srt, mod - w cons, tt clus, sl calc ip, glau incl, tr dull ong-brn mnrl flr, fast diffuse, mod slow stmg, dull bl wh cut, no stn or od

SS: gy brn, lt gy- med gy, trnsl - clr gr, vt - l f gr, sb rnd - sb ang, mod sft - hd, brit, mod srt, mod - w cons, tt clus, sl calc ip LS: offwht, crm-it-brn, wxy-soapy, mcnln, mod frm-hd, sb pily, ireg-sb blkly, mtnx, calc, dull ong-brn mnrl flr, slow diffuse, mod slow stmg, dull bl wh cut, no stn or od

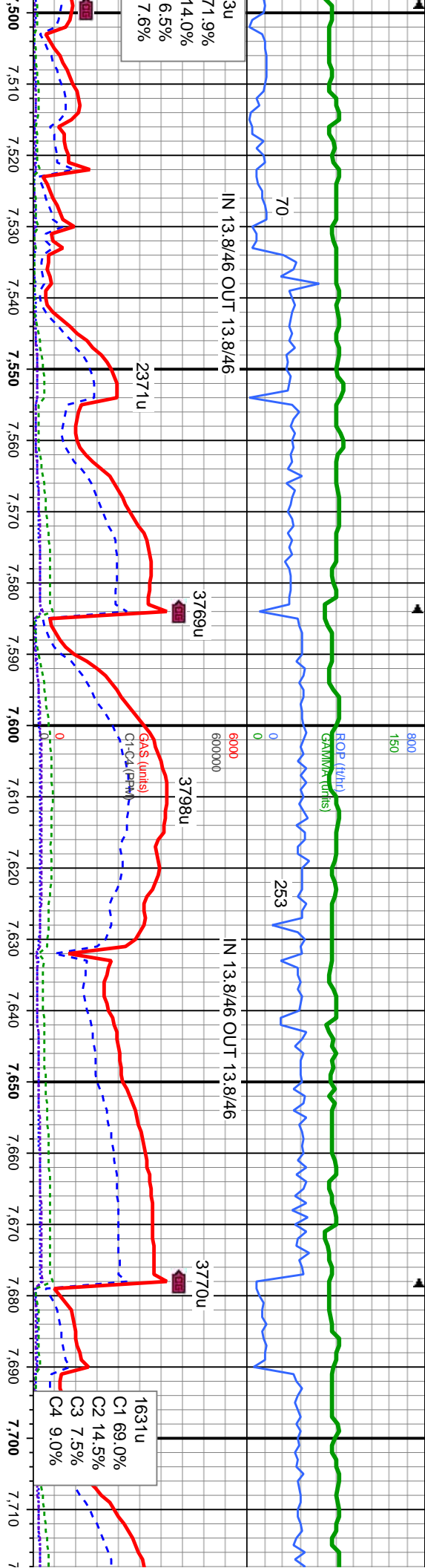
ft - hd, sb blkly - tex, calc SLTY SH: blkly-sb pily, nom, r pyr, v rr chk frags, i bl wh cut, no stn

ft - hd, sb blkly - tex, calc SLTY SH: blkly-sb pily, nom, r pyr, v rr chk frags, i bl wh cut, no stn

ft - hd, sb blkly - tex, calc SLTY SH: blkly-sb pily, nom, r pyr, v rr chk frags, i bl wh cut, no stn

ft - hd, sb blkly - tex, calc SLTY SH: blkly-sb pily, nom, r pyr, v rr chk frags, i bl wh cut, no stn

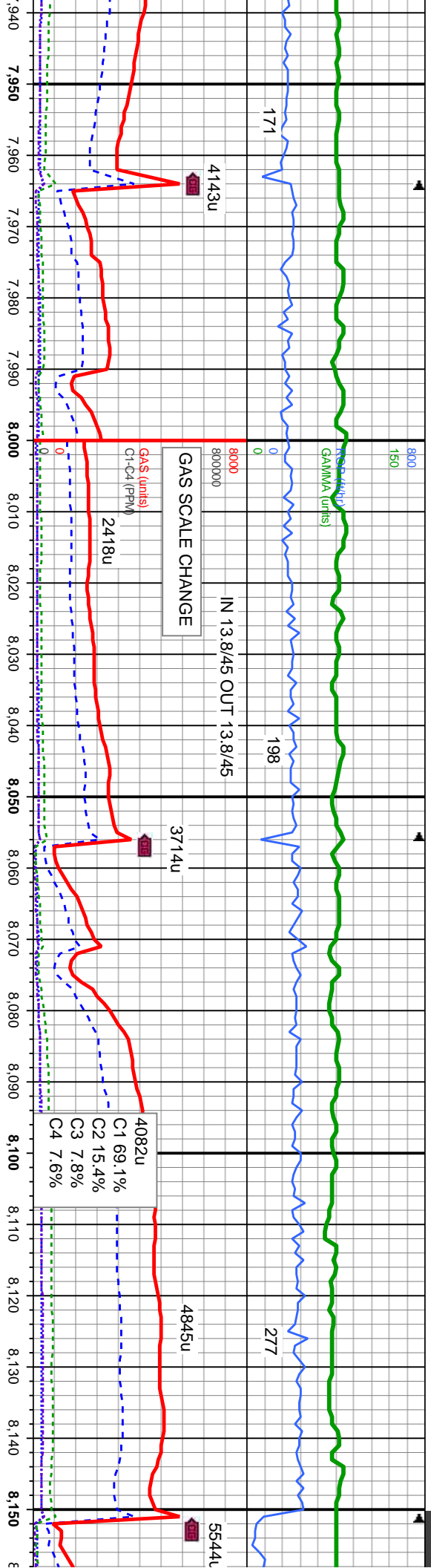




MD: 7.530 ' TVD: 7.066.75 ' Inclination: 87.9 ° Azimuth: 92.6 ° VS: 526.13 '	MD: 7.624 ' TVD: 7.070.2 ' Inclination: 87.9 ° Azimuth: 92.5 ° VS: 619.97 '	MD: 7.710 ' TVD: 7.100.0 ' Inclination: 87.9 ° Azimuth: 92.5 ° VS: 619.97 '
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SS: gy brn, lt gy- med gy, trnsf - clr gr, vf - lf gr, sb rnd - sb ang, mod sft - hd, brit, mod srt, mod - w cons, tt clus, silty mtx, sl calc ip, tr ls, dull org-brn mnrl flr, slow diffuse, mod slow string, dull bl wh cut, no stn or od	SS: gy brn, lt gy- med gy, trnsf - clr gr, vf - lf gr, sb rnd - sb ang, mod sft - hd, brit, mod srt, mod - w cons, tt clus, silty mtx, sl calc ip, tr ls, tr dull org-gn mnrl flr, mod slow diffuse, mod string, dull bl wh cut, no stn or od	SS: gy brn, lt gy- med gy, trnsf - clr gr, vf - lf gr, sb rnd - sb ang, mod sft - hd, brit, mod srt, mod - w cons, tt clus, silty mtx, sl calc ip, tr ls, tr dull org-gn mnrl flr, mod slow diffuse, mod string, dull bl wh cut, no stn or od	SS: gy brn, occ lf gr, sb rnd - sb mod - w cons, tt glau, tr ls, no mn fast string, dull bl
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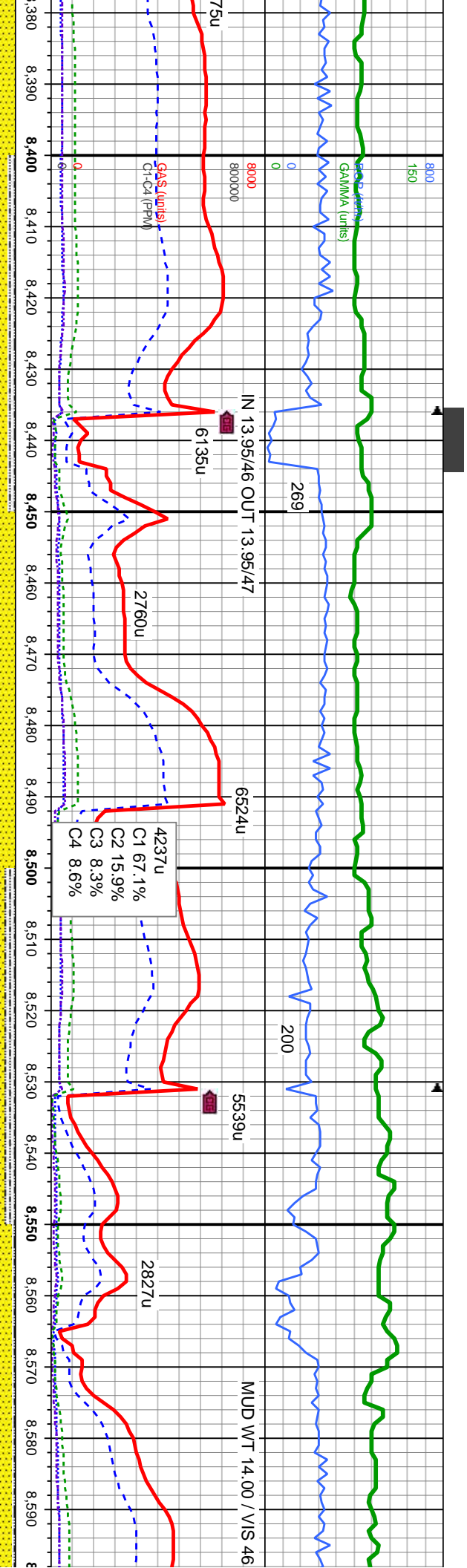


MD: 8,003 '
TVD: 7,084.01 '
Inclination: 87 °
Azimuth: 88.3 °
VS: 998.64 '

MD: 8,097 '
TVD: 7,089.42 '
Inclination: 86.4 °
Azimuth: 87.9 °
VS: 1,092.44 '

- clt gr, vf - sft, brit, mtx, sl	SS: gy brn, occ lt gy- med gy, trnsf - clt gr, vf - lt gr, occ c gr, sb rnd - sb ang, mod sft, brit, mod srt, mod - w cons, tt clus, silty mtx, sl	SS: gy brn, occ lt gy- med gy, trnsf - clt gr, vf - lt gr, occ c gr, sb rnd - sb ang, mod sft, brit, mod srt, mod - w cons, tt clus, silty mtx, sl	SS: gy brn, occ lt gy- med gy, trnsf - clt gr, vf - lt gr, occ c gr, sb rnd - sb ang, mod sft, brit, mod srt, mod - w cons, tt clus, silty mtx, sl	SS: gy brn, occ lt gy- med gy, trnsf - clt gr, vf - lt gr, occ c gr, sb rnd - sb ang, mod sft, brit, mod srt, mod - w cons, tt clus, silty mtx, sl	SS: gy brn, occ lt gy- med gy, trnsf - clt gr, vf - lt gr, occ c gr, sb rnd - sb ang, mod sft, brit, mod srt, mod - w cons, tt clus, silty mtx, sl
calc ip, tr glau ip, tr ls, no mnrl flor, mod fast diffuse, mod fast stmng, bl wh cut, no stn or od	calc ip, tr glau ip, tr ls, no mnrl flor, mod fast diffuse, mod fast stmng, bl wh cut, no stn or od	calc ip, tr glau ip, tr ls, no mnrl flor, mod fast diffuse, mod fast stmng, bl wh cut, no stn or od	calc ip, tr glau ip, tr ls, no mnrl flor, mod fast diffuse, mod fast stmng, bl wh cut, no stn or od	calc ip, tr glau ip, tr ls, no mnrl flor, mod fast diffuse, mod fast stmng, bl wh cut, no stn or od	calc ip, tr glau ip, tr ls, no mnrl flor, mod fast diffuse, mod fast stmng, bl wh cut, no stn or od





8,381'	MD: 8,476'	MD: 8,570'
7,104.77'	TVD: 7,109.83'	TVD: 7,114.26'
Inclination: 86.6°	Inclination: 87.3°	Inclination: 87.3°
uth: 87.5°	Azimuth: 88.1°	Azimuth: 88.2°
,375.9'	VS: 1,470.69'	VS: 1,564.54'

DEPTH SCALE CHANGE

SS: gy brn, occ lt gy- med gy, trnsf - clr gr, vf - lf gr, sb rnd - sb ang, mod sft-firm, brit, mod srt, mod - w cons, tt clus, sl calc ip, glau ip, SLTY SH: med gy - dk gy, sft - mod firm, sb ply - ply, no mnrl flr, mod slow diffuse, tr slow stmg, dull bl wh cut, no stn or od	SS: gy brn, occ lt gy- med gy, trnsf - clr gr, vf - lf gr, sb rnd - sb ang, mod sft-firm, brit, mod srt, mod - w cons, tt clus, slty mltx, sl calc ip, glau ip, tr bent, tr slty sh and ls, no mnrl flr, mod diffuse, mod stmg, bri bl wh cut, no stn or od	SS: gy brn, occ lt gy- med gy, trnsf - clr gr, vf - lf gr, sb rnd - sb ang, mod sft-firm, brit, mod srt, mod - w cons, tt clus, sl calc ip, glau ip, SLTY SH: med gy - dk gy, sft - mod firm, sb ply - ply, no mnrl flr, slow diffuse, tr slow stmg, dull bl wh cut, no stn or od	SS: gy brn, occ lt gy- med gy, trnsf - clr gr, vf - lf gr, sb rnd - sb ang, mod sft-firm, brit, mod srt, mod - w cons, tt clus, slty mltx, sl calc ip, glau ip, tr bent, tr slty sh and ls, no mnrl flr, slow diffuse, slow stmg, bri bl wh cut, no stn or od
7700			



8/7/13

DEPTH

8/8/13

800
125

ROP (ft/hr)
GAMMA (units)

-25
4000
400000

MUD WT 14.00 / VIS 43

MUD WT 13.90 / VIS 42

2001u

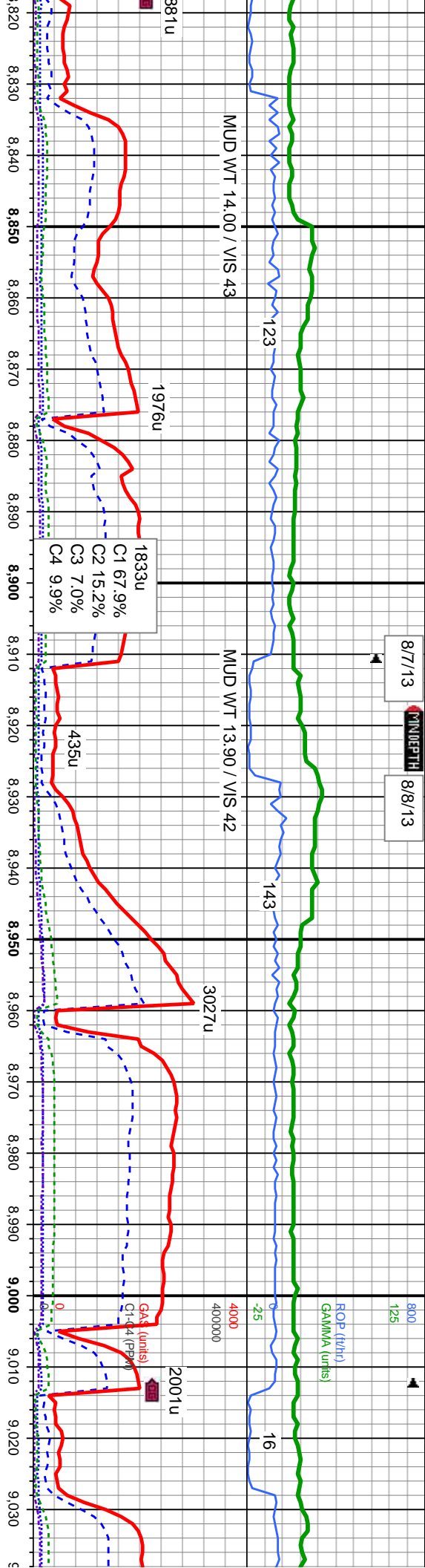
GAS (units)
C1-C4 (PPHM)

1833u
C1 67.9%
C2 15.2%
C3 7.0%
C4 9.9%

1976u

435u

3027u



MD: 8,854'

TVD: 7,127.07'

Inclination: 88.4 °

Azimuth: 88.5 °

VS: 1,848.02'

MD: 8,949'

TVD: 7,129.22'

Inclination: 89 °

Azimuth: 91 °

VS: 1,942.99'

6800

MD:

TVD:

Incl:

Azir:

VS:

t brn, wxy-soapy, mcxln,
pity, ireg-sb blkly, mtx, v
s, mod diffuse, mod stmg,
ut, no stn or od

LS: offwht, crm-lt brn, wxy-soapy, mcxln,
mod frm-hd, sb pity, ireg-sb blkly, mtx, v
calc, no mnrl flr, mod slow diffuse, mod
slow stmg, dull bl wh mky cut, no stn or od

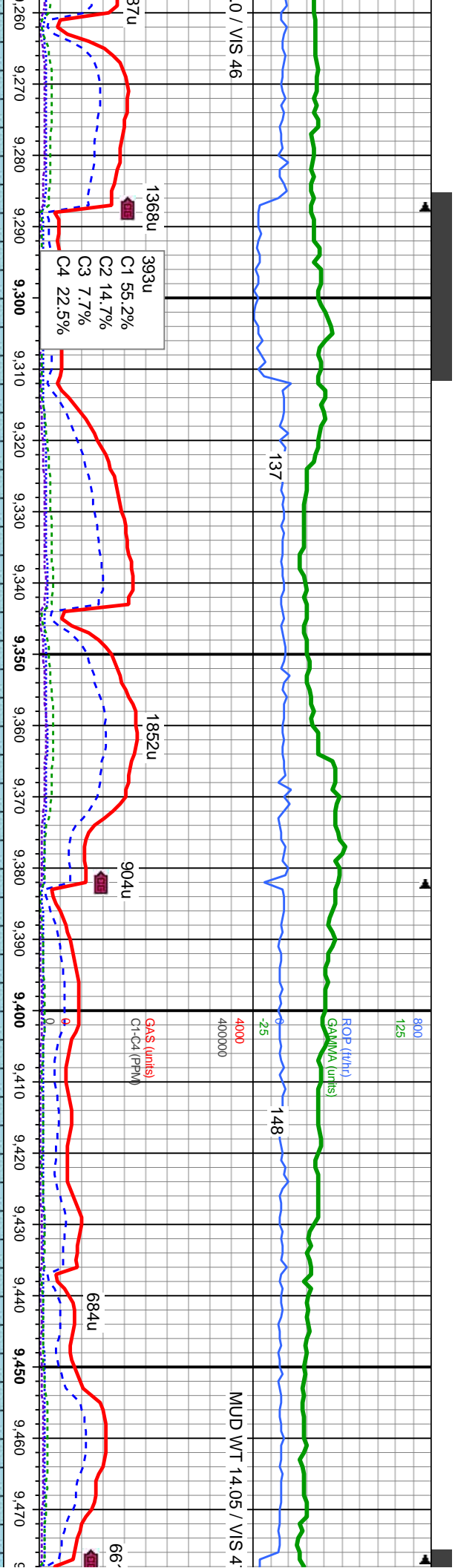
LS: offwht, crm-lt brn, wxy-soapy, mcxln,
mod frm-hd, sb pity, ireg-sb blkly, mtx, v calc,
tr shy slst and ss, no mnrl flr, mod slow
diffuse, mod slow stmg, dull bl wh cut, no
stn or od

LS: offwht, crm-lt brn, wxy-soapy, mcxln,
mod frm-hd, sb pity, ireg-sb blkly, mtx, v calc,
tr shy slst and ss, no mnrl flr, mod slow
diffuse, mod slow stmg, dull bl wh cut, no
stn or od

LS: offwht, crm-lt brn, wxy-soapy, m
frm-hd, sb pity, ireg-sb blkly, mtx, v c
slst, no mnrl flr, mod slow diffuse,
slow stmg, dull bl wh cut, no stn or c

TVD (ft)



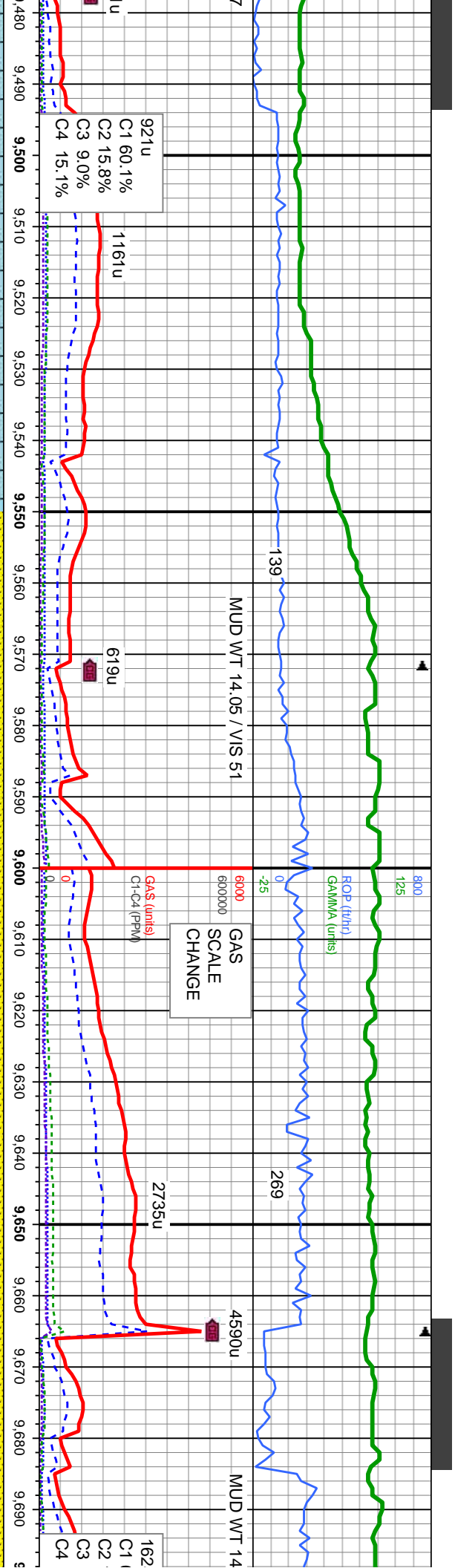


MD: 9,328'
TVD: 7,143.37'
Inclination: 85.3°
Azimuth: 90.6°
VS: 2,321.47'

MD: 9,422'
TVD: 7,150.5'
Inclination: 86°
Azimuth: 90.9°
VS: 2,415.19'

Depth (ft)	Description
9,260 - 9,290	offwht, crm-lt brn, wxy-soapy, mckln, mod firm-hd, sb plty, ireg-sb blkly, mtx, v calc, tr slty sh, no mnrl flr, mod slow diffuse, slow blng, dull bl wh cut, no str or od
9,290 - 9,330	offwht, crm-lt brn, wxy-soapy, mckln, mod firm-hd, sb plty, ireg-sb blkly, mtx, v calc, tr slty sh, no mnrl flr, mod slow diffuse, slow blng, dull bl wh cut, no str or od
9,330 - 9,370	offwht, crm-lt brn, wxy-soapy, mckln, mod firm-hd, sb plty, ireg-sb blkly, mtx, v calc, tr slty sh, no mnrl flr, mod slow diffuse, slow blng, dull bl wh cut, no str or od
9,370 - 9,410	offwht, crm-lt brn, wxy-soapy, mckln, mod firm-hd, sb plty, ireg-sb blkly, mtx, v calc, tr slty sh, no mnrl flr, mod slow diffuse, slow blng, dull bl wh cut, no str or od
9,410 - 9,450	offwht, crm-lt brn, wxy-soapy, mckln, mod firm-hd, sb plty, ireg-sb blkly, mtx, v calc, tr slty sh, no mnrl flr, mod slow diffuse, slow blng, dull bl wh cut, no str or od
9,450 - 9,470	offwht, crm-lt brn, wxy-soapy, mckln, mod firm-hd, sb plty, ireg-sb blkly, mtx, v calc, tr slty sh, no mnrl flr, mod slow diffuse, slow blng, dull bl wh cut, no str or od





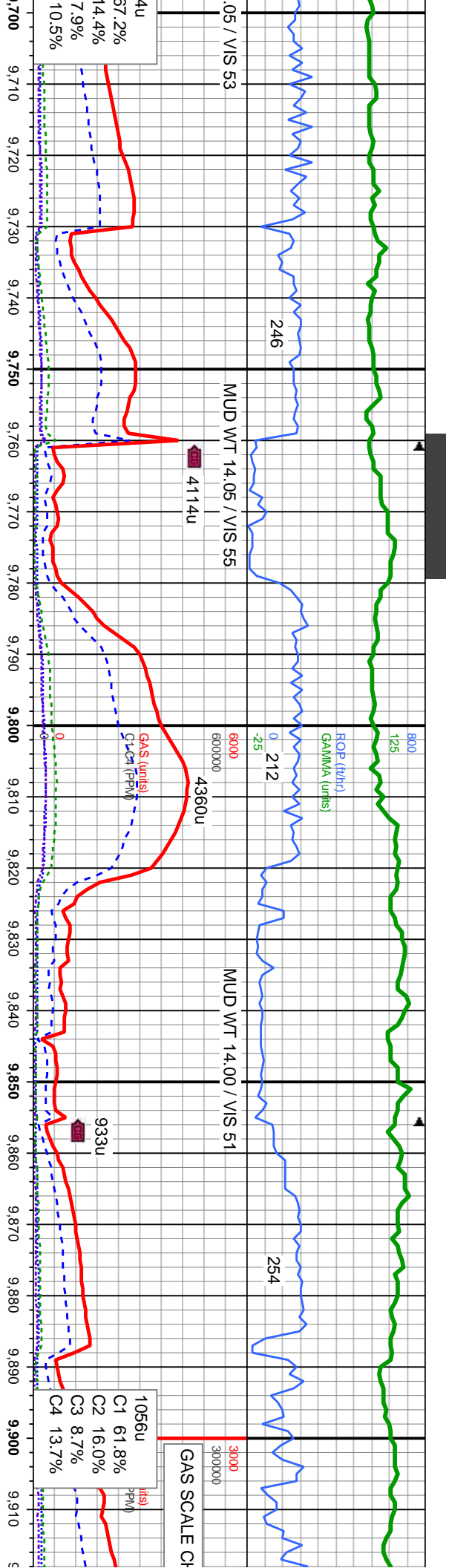
MD: 9,517'
TVD: 7,158.03'
Inclination: 84.9°
Azimuth: 91°
VS: 2,509.88'

soapy, mckln, mod y, mtx, v calc, tr stly diffuse, slow n or od	LS: offwht, crm-lt brn, wxy-soapy, mckln, mod frm-hd, sb pily, ireg-sb blkly, mtx, v calc, tr stly sh, no mnrl flr, mod slow diffuse, slow blng, dull bl wh cut, no stn or od	SS: gy brn, lt gy- med gy, trnsf - clr gr, vf - l f gr, sb rnd - sb ang, mod sft - hd, brit, mod srt, mod - w cons, tt clus, sl calc ip, LS: offwht, crm-lt brn, wxy-soapy, mckln, mod frm-hd, sb pily, ireg-sb blkly, mtx, v calc, dull yel mnrl flr, mod slow diffuse, slow stmg, dull bl wh cut, no stn or od	SS: gy brn, lt gy- med gy, trnsf - clr gr, vf - l f gr, sb rnd - sb ang, mod sft - hd, brit, mod srt, mod - w cons, tt clus, sl calc ip, LS: offwht, crm-lt brn, wxy-soapy, mckln, mod frm-hd, sb pily, ireg-sb blkly, mtx, v calc, dull yel mnrl flr, mod diffuse, mod slow stmg, dull bl wh cut, no stn or od	SS: gy brn, lt gy- med gy, trnsf - clr gr, vf - l f gr, sb rnd - sb ang, mod sft - hd, brit, mod srt, mod - w cons, tt clus, sl calc ip, LS: offwht, crm-lt brn, wxy-soapy, mckln, mod frm-hd, sb pily, ireg-sb blkly, mtx, v calc, dull yel mnrl flr, mod slow diffuse, slow stmg, dull bl wh cut, no stn or od
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MD: 9,612'
TVD: 7,167.8'
Inclination: 83.3°
Azimuth: 89.7°
VS: 2,604.37'

TVD (ft)

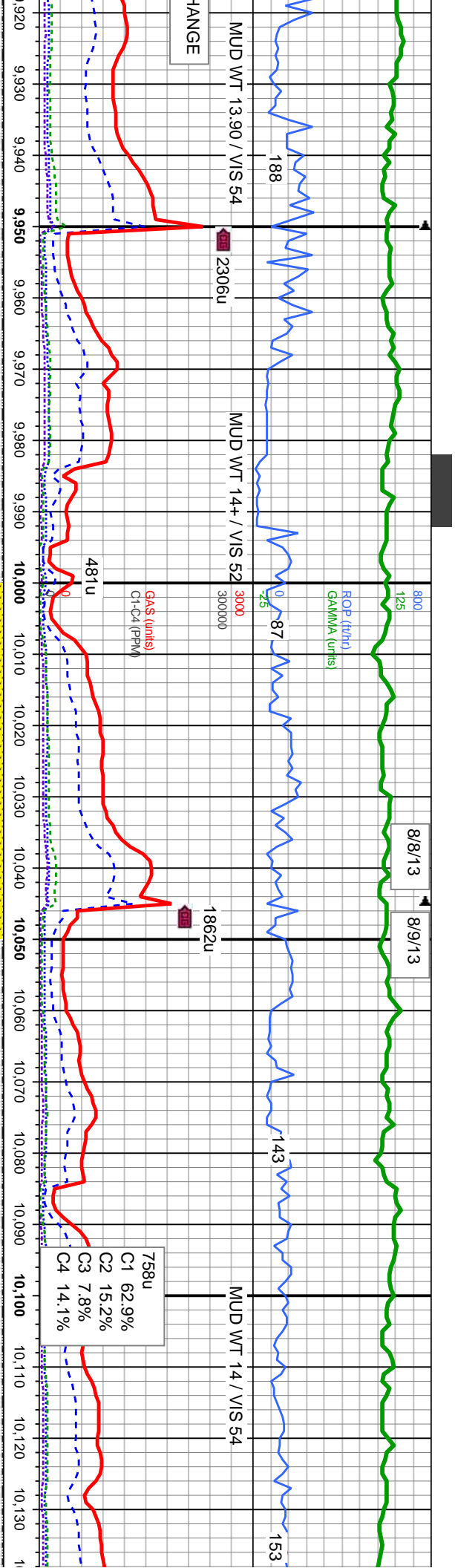




MD: 9,706 TVD: 7,177.54 Inclination: 84.8 ° Azimuth: 90.4 ° VS: 2,697.86 '	MD: 9,801 TVD: 7,184.75 Inclination: 86.5 ° Azimuth: 90.4 ° VS: 2,792.58 '	MD: 9,895 TVD: 7,190.32 Inclination: 86.7 ° Azimuth: 90 ° VS: 2,886.41 '
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SS: gy brn, lt gy- med gy, trnsl - clr gr, vf - lf gr, sb md - sb ang, mod sft - hd, brit, mod srt, mod - w cons, tt clus, sl calc ip, LS: offwht, crm-lt brn, wxy-soapy, mcxln, mod frm-hd, sb ply, ireg-sb blkly, mtx, v calc, dull yel mnrl flr, slow diffuse, mod slow stmg, dull bl wh cut, no stn or od	SS: gy brn, lt gy- med gy, trnsl - clr gr, vf - lf gr, sb md - sb ang, mod sft - hd, brit, mod srt, mod - w cons, tt clus, sl calc ip, LS: offwht, crm-lt brn, wxy-soapy, mcxln, mod frm-hd, sb ply, ireg-sb blkly, mtx, v calc, tr silty sh, dull yel mnrl flr, mod slow diffuse, mod slow stmg, dull bl wh cut, no stn or od	SS: gy brn, lt gy- med gy, trnsl - clr gr, vf - lf gr, sb md - sb ang, mod sft - hd, brit, mod srt, mod - w cons, tt clus, sl calc ip, LS: offwht, crm-lt brn, wxy-soapy, mcxln, mod frm-hd, sb ply, ireg-sb blkly, mtx, v calc, tr silty sh, dull yel mnrl flr, mod slow diffuse, mod slow stmg, dull bl wh cut, no stn or od	SS: gy brn, lt gy gr, sb md - sb a srt, mod - w cor sh, dull yel mnrl stmg, dull bl mk
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MD: 9,990'
TVD: 7,195.38'
Inclination: 87.2°
Azimuth: 89.9°
VS: 2,981.28'

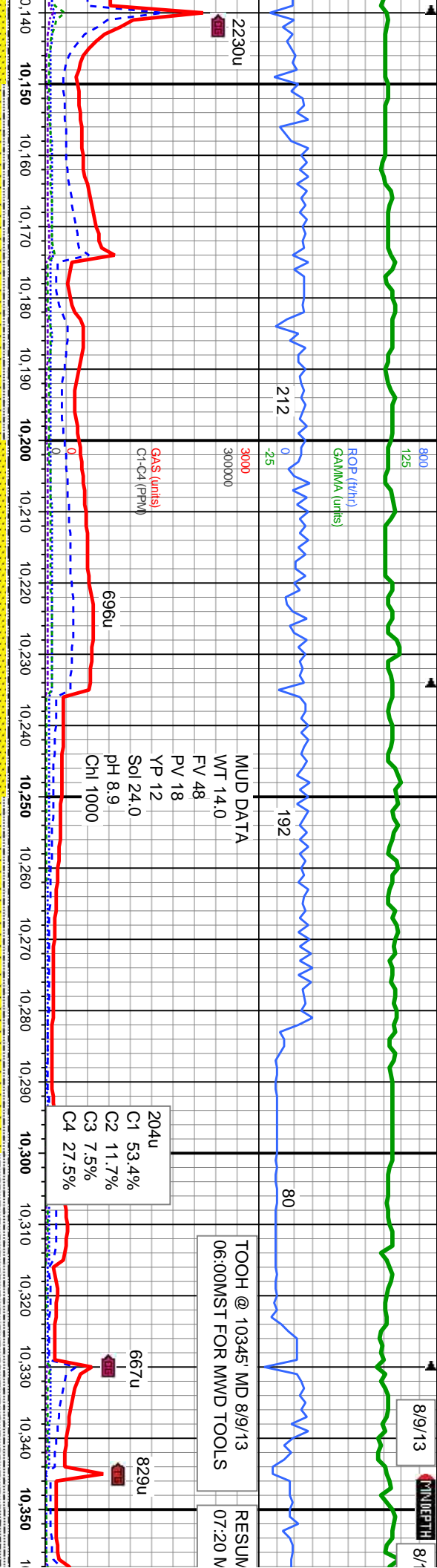
SCALE CHANGE

MD: 10,085'
TVD: 7,199.36'
Inclination: 88°
Azimuth: 89.5°
VS: 3,076.19'

758u
C1 62.9%
C2 15.2%
C3 7.8%
C4 14.1%

- med gy, trns - clr gr, vf - l f ng, mod sft - hd, brit, mod s, it clus, sl calc ip, tr sily flor, mod diffuse, mod slow y wh cut, no sin or od	SS: gy brn, lt gy- med gy, trns - clr gr, vf - l f gr, sb rnd - sb ang, mod sft - hd, brit, mod srt, mod - w cons, it clus, sl calc ip, tr sily sh, dull yel mnrl flor, mod fast diffuse, fast stmg, bri bl mky wh cut, no sin or od	SS: gy brn, lt gy- med gy, trns - clr gr, vf - l f gr, sb rnd - sb ang, mod sft - hd, brit, mod srt, mod - w cons, it clus, sl calc ip, tr ls and sily sh, dull yel mnrl flor, slow diffuse, slow stmg, bri bl mky wh cut, no sin or od	SS: gy brn, lt gy- med gy, trns - clr gr, vf - l f gr, sb rnd - sb ang, mod sft - hd, brit, mod srt, mod - w cons, it clus, sl calc ip, tr ls and sily sh, dull yel mnrl flor, slow diffuse, slow stmg, bri bl mky wh cut, no sin or od
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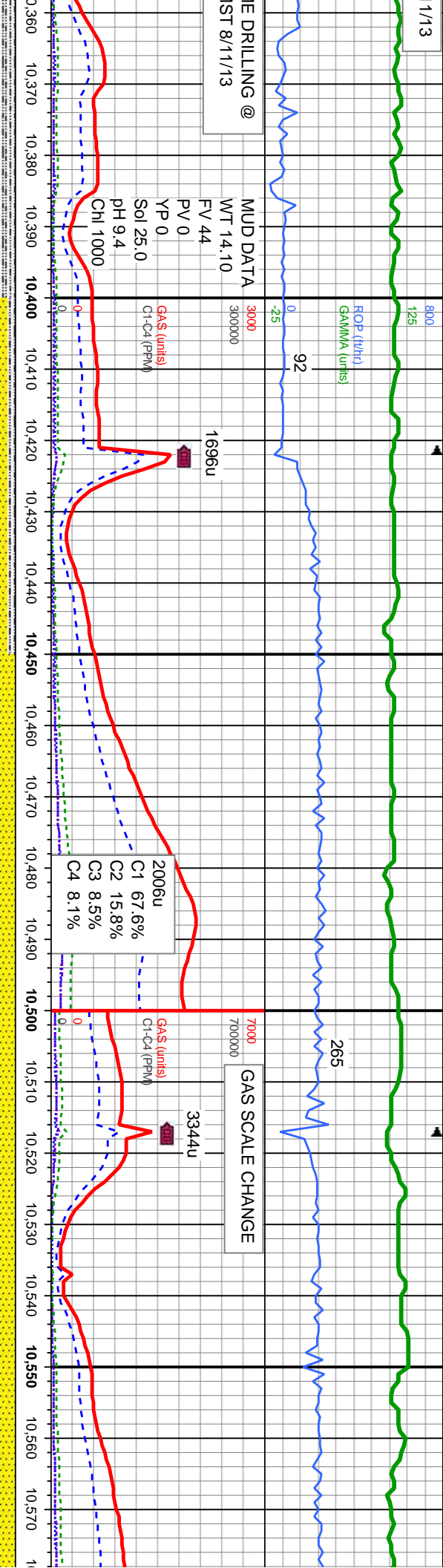


MD: 10,179 '
TVD: 7,202.56 '
Inclination: 88.1 °
Azimuth: 89 °
VS: 3,170.13 '

MD: 10,278 '
TVD: 7,205.23 '
Inclination: 88.8 °
Azimuth: 89.4 °
VS: 3,269.08 '

gr, vf - l f it, mod tr ls and diffuse, n or od	SS: gy brn, lt gy- med gy, trns l - clr gr, vf - l f gr, sb rnd - sb ang, mod sft - hd, brit, mod srt, mod - w cons, tt clus, sl calc ip, tr ls and sily sh, dull yel mnrl flor, mod fast diffuse, slow stmg, dull bl mky wh cut, no stn or od	SS: gy brn, lt gy- med gy, trns l - clr gr, vf - l f gr, sb rnd - sb ang, mod sft - hd, brit, mod srt, mod - w cons, tt clus, sl calc ip, tr ls and sily sh, dull yel mnrl flor, fast diffuse, slow stmg, dull bl mky wh cut, no stn or od	SS: gy brn, lt gy- med gy, trns l - clr gr, vf - l f gr, sb rnd - sb ang, mod sft - hd, brit, mod srt, mod - w cons, tt clus, sl calc SLTY SH: med gy, occ dk gy, firm- brit, pily, sm tex, mod fast diffuse, slow stmg, dull bl wh cut, no stn or od	SS: gy gr, sb r srt, mo med gy mod fa
	TVD (ft)			

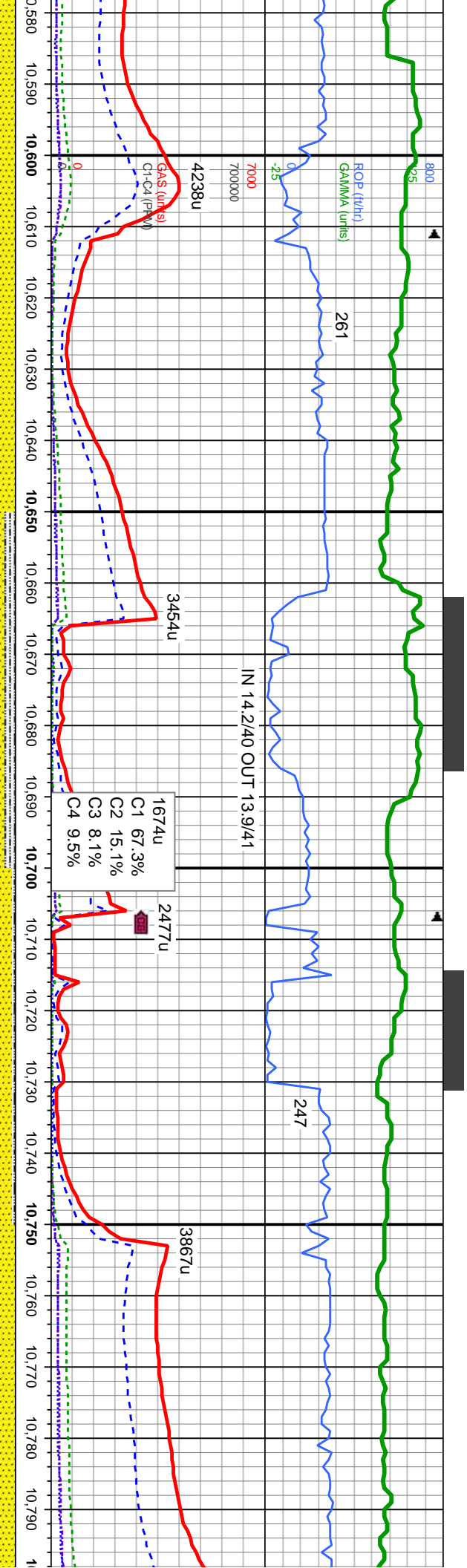




MD: 10,372' TVD: 7,206.79' Inclination: 89.3° Azimuth: 89.4° VS: 3,363.06'	7000	MD: 10,467' TVD: 7,207.29' Inclination: 90.1° Azimuth: 89.5° VS: 3,458.06'	MD: 10,561' TVD: 7,207.04' Inclination: 90.2° Azimuth: 89.6° VS: 3,562.05'
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brn, lt gy- med gy, trnsl - clr gr, vf - lf	SS: gy brn, lt gy- med gy, trnsl - clr gr, vf - lf	SS: gy brn, lt gy- med gy, trnsl - clr gr, vf - lf	SS: gy brn, lt gy- med gy, trnsl - clr gr, vf - lf
gr, sb rnd - sb ang, mod sft - hd, brit, mod	gr, sb rnd - sb ang, mod sft - hd, brit, mod	gr, sb rnd - sb ang, mod sft - hd, brit, mod	gr, sb rnd - sb ang, mod sft - hd, brit, mod
sd - w cons, tt clus, sl calc SLTY SH:	srt, mod - w cons, tt clus, sl calc SLTY SH:	srt, mod - w cons, tt clus, sl calc, tr stly sh,	srt, mod - w cons, tt clus, sl calc, tr stly sh,
occ dk gy, firm- brit, ply, sm tex,	med gy, occ dk gy, firm- brit, ply, sm tex,	mod slow diffuse, mod slow blmg, bl wh	stly sh, mod slow diffuse,
fast diffuse, slow sting, dull bl wh cut,	fast diffuse, mod fast sting, bl wh cut, no	cut, no stn or od	bl wh cut, no stn or od
or od	stn or od		





MD: 10,656'
TVD: 7,205.88'
Inclination: 91.2°
Azimuth: 89.6°
VS: 3,647.04'

MD: 10,751'
TVD: 7,204.14'
Inclination: 90.9°
Azimuth: 90.1°
VS: 3,742.03'

TVD (ft)	SS: gy brn, lt gy- med gy, trnsl - clr gr, vf - lf gr, sb rnd - sb ang, mod sft - hd, brt, mod srt, mod - w cons, tt clus, sug tex, sl calc, tr sily sh, mod slow diffuse, mod slow blmg, bl wh cut, no stn or od	SS: gy brn, lt gy- med gy, trnsl - clr gr, vf - lf gr, sb rnd - sb ang, mod sft - hd, brt, mod srt, mod - w cons, tt clus, sug tex, sl calc, SLTY SH: med gy, occ dk gy, firm- brt, ply, sm tex, mod slow diffuse, mod slow blmg, bl wh cut, no stn or od	SS: gy brn, lt gy- med gy, trnsl - clr gr, vf - lf gr, sb rnd - sb ang, mod sft - hd, brt, mod srt, mod - w cons, tt clus, sug tex, sl calc, SLTY SH: med gy, occ dk gy, firm- brt, ply, sm tex, mod slow diffuse, mod slow blmg, dull bl wh cut, no stn or od	SS: gy brn, lt gy- med gy, trnsl - clr gr, vf - lf gr, sb rnd - sb ang, mod sft - hd, brt, mod srt, mod - w cons, tt clus, sug tex, sl calc, tr sily sh, mod slow diffuse, mod slow blmg, bl wh cut, no stn or od
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8/11/13

MINDEPTH

8/12/13

800
125

ROP (ft/hr)
GAMMA (units)

13.60 / VIS 38

98

3156u

1088u

791u
C1 65.3%
C2 14.4%
C3 7.2%
C4 13.0%

MUD WT 13.60 / VIS 40

140

1423u

GAS (units)
C1-C4 (PPM)
2192u

11,020 11,030 11,040 11,050 11,060 11,070 11,080 11,090 11,100 11,110 11,120 11,130 11,140 11,150 11,160 11,170 11,180 11,190 11,200 11,210 11,220 11,230 1

MD: 11,035

TVD: 7,203.74

Inclination: 89.8 °

Azimuth: 89.3 °

VS: 4,026.01

MD: 11,129

TVD: 7,205.38

Inclination: 88.2 °

Azimuth: 86.7 °

VS: 4,119.93

7000

MD: 11,223

TVD: 7,208.25

Inclination: 88.3 °

Azimuth: 87.4 °

VS: 4,213.76

TVD (ft)

- med gy, trnsI - clr gr, vf - lf
ng, mod sft - hd, brit, mod
s, tt clus, sug tex, sl calc,
gy, occ dk gy, firm- brit, ply,
w diffuse, mod slow blmg,
o stn or od

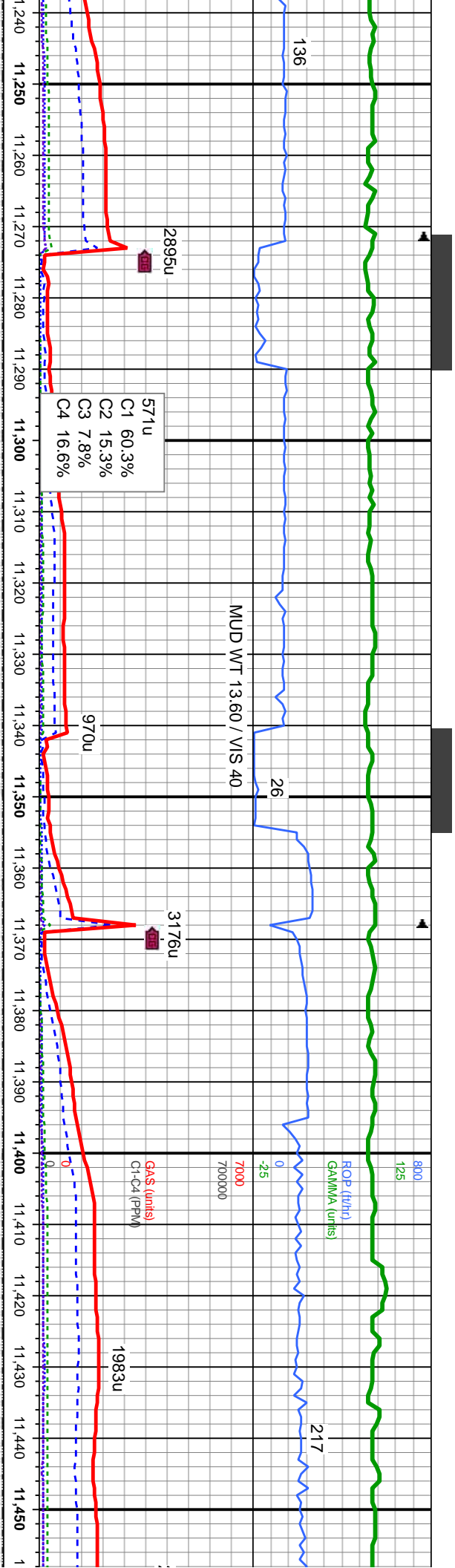
SS: gy brn, lt gy- med gy, trnsI - clr gr, vf - lf
gr, sb rnd - sb ang, mod sft - hd, brit, mod
srt, mod - w cons, tt clus, sug tex, sl calc,
SLTY SH: med gy, occ dk gy, firm- brit, ply,
sm tex, mod slow diffuse, mod slow blmg,
dull bl wh cut, no stn or od

SS: gy brn, lt gy- med gy, trnsI - clr gr, vf - lf
gr, sb rnd - sb ang, mod sft - hd, brit, mod
srt, mod - w cons, tt clus, sug tex, sl calc,
SLTY SH: med gy, occ dk gy, firm- brit, ply,
sm tex, mod slow diffuse, mod slow blmg,
dull bl wh cut, no stn or od

SS: gy brn, lt gy- med gy, trnsI - clr gr, vf - lf
gr, sb rnd - sb ang, mod sft - hd, brit, mod
srt, mod - w cons, tt clus, sug tex, sl calc,
SLTY SH: med gy, occ dk gy, firm- brit, ply,
sm tex, slow diffuse, slow blmg, dull bl wh
cut, no stn or od

SS: gy brn, lt gy- med gy, trnsI - clr
gr, sb rnd - sb ang, mod sft - hd, brit
srt, mod - w cons, tt clus, sug tex, s
SLTY SH: med gy, occ dk gy, firm-
sm tex, slow diffuse, slow blmg, dull
cut, no stn or od



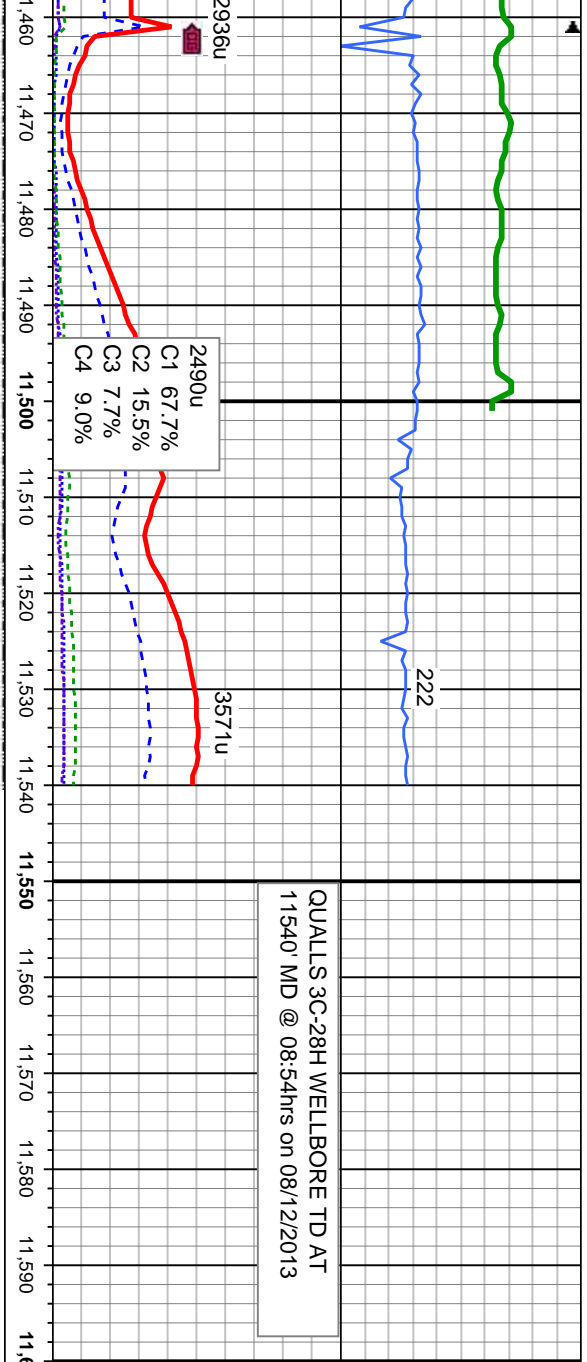


MD: 11,318
TVD: 7,210.4
Inclination: 89.1 °
Azimuth: 88.2 °
VS: 4,308.66'

7000
MD: 11,413
TVD: 7,211.4
Inclination: 89.7 °
Azimuth: 87.9 °
VS: 4,403.6'

gr, vf - lf	SS: gy brn, lt gy- med gy, trnsl - clr gr, vf - lf	SS: gy brn, lt gy- med gy, trnsl - clr gr, vf - lf	SS: gy brn, lt gy- med gy, trnsl - clr gr, vf - lf	SS: gy brn, lt gy- med gy, trnsl - clr gr, vf - lf
t, mod	gr, sb rnd - sb ang, mod sft - hd, brit, mod	gr, sb rnd - sb ang, mod sft - hd, brit, mod	gr, sb rnd - sb ang, mod sft - hd, brit, mod	gr, sb rnd - sb ang, mod sft - hd, brit, mod
l calc,	srt, mod - w cons, tt clus, sug tex, sl calc,	srt, mod - w cons, tt clus, sug tex, sl calc,	srt, mod - w cons, tt clus, sug tex, sl calc,	srt, mod - w cons, tt clus, sug tex, sl calc,
brit, plty,	SLTY SH: med gy, occ dk gy, firm- brit, plty,	SLTY SH: med gy, occ dk gy, firm- brit, plty,	SLTY SH: med gy, occ dk gy, firm- brit, plty,	SLTY SH: med gy, occ dk gy, firm- brit, plty,
l bl wh	sm tex, slow diffuse, slow blng, dull bl wh	sm tex, slow diffuse, slow blng, dull bl wh	sm tex, slow diffuse, slow blng, dull bl wh	sm tex, slow diffuse, slow blng, dull bl wh
cut, no sin or od	cut, no sin or od	cut, no sin or od	cut, no sin or od	cut, no sin or od





MD: 11,490'
TVD: 7,212'
Inclination: 89.4°
Azimuth: 88°
VS: 4,480.55'

Thank you for using
Columbine Logging, Inc.

brn, lt gy- med gy, trns - clr gr, vf - lf
nd - sb ang, mod sft - hd, brit, mod
d - w cons, tt clus, sug tex, sl calc,
SH: med gy, occ dk gy, firm- brit, pily,
slow diffuse, slow blng, dull bl wh
stn or od

SS: gy brn, lt gy- med gy, trns - clr gr, vf - lf
gr, sb rnd - sb ang, mod sft - hd, brit, mod
srt, mod - w cons, tt clus, sug tex, sl calc,
SLTY SH: med gy, occ dk gy, firm- brit, pily,
sm tex, slow diffuse, slow blng, dull bl wh
cut, no stn or od

