

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Mackinaw A19-79HNA HORZ

Location SEC 24 T6N R65W

State COLORADO

Country USA

API Number 05-123-38147

Region DJ BASIN

Spud Date 7/5/2014

Surface Coordinates NENE SEC 24 T6N R65W
330' FNL; 1,077' FEL

LAT/LON: 40.47782/-104.60574

Bottom Hole Coordinates SWSW SEC 19 T6N R64W
535' FSL; 240' FWL

Ground Elevation 4,684'

Logged Interval 6,069' **To** 11,144

Formation NIOBRARA A MARL

Type of Drilling Fluid LSND

K.B. Elevation 4,708'

Total Depth 11,144'

County WELD

Rig Number H&P 315

AFE # 139587



















Field WATTENBERG

Drilling Completed 7/10/2014

Company Noble Energy Inc
Address 1625 BROADWAY
DENVER, CO 80202

Name MARK COLE; JH
Company COLUMBINE LOGGING
Address 2385 S LIPAN ST
DENVER, CO 80224

 Oil
 Note
 Error

 CHALK
 MARLSTONE
 SILTY SHALE
 SHALY SANDSTONE
 UNKNOWN
 ANHYDRITE
 BENTONITE
 BRECCIA
 CEMENT
 CHALK
 MARLSTONE
 SILTY SHALE
 SHALY SANDSTONE
 UNKNOWN
 ANHYDRITE
 BENTONITE
 BRECCIA
 CEMENT

Operator

AY SUITE 2200
2202

Geologist

ACK WEINERTH
OGGING, INC

2223

Zone Color Coding

 Condensate

 Gas









 Core

 Pressure









 Water

 Seal









Rock Types

CHERT
CLAY CHOKE SAND
CLAYSTONE
CONGLOMERATE
DOLOMITE
GRANITE
GYPSUM
IGNEOUS


SIDERITE or LIMONITE
LIMESTONE
METAMORPHIC
NO SAMPLE
SALT
SANDSTONE
SALT-PEPPER SAND
SHALE
SHALE COLORED


       


SHALE GRAY
SHALY SILTSTONE
SILTSTONE
TILL
TUFF
WELDED TUFF


Accessories


Fossils


 F FOSSIL


 GASTROPOD


 OOLITE


 AMPHIPORA


 BELEMNITE


 BIOCLASTIC


 BRACHIOPOD


 PISOLITE


 PLANT REMAINS


 CEPHALOPOD

 CORAL


 CRINOID


 ECHINOID


 FISH


 FORAMINIFERA


Minerals


 ARGILLACEOUS


 ARGILLITE GRAIN


 B BENTONITE


 BITUMENOUS SUBSTANCE


 BRECCIA FRAGMENTS


 CALCAREOUS


 CARBONACEOUS FLAKES


 CHERT


 CHERT


 COAL - THIN BEDS

 SCAPHOPOD


 STROMATOPOROID


 + FELDSPAR


 ● FERRUGINOUS PELLET


 ≡ FERRUGINOUS


Stringer


 TUFFACEOUS


 GYPSIFEROUS


 HEAVY MINERAL


 INOCERAMUS


 K KAOLIN


 MARLSTONE


 MINERAL CRYSTALS


 NODULES


 PHOSPHATE PELLETS


 P PYRITE


 SALT CAST

 : SANDY

 > SILICEOUS


 . SILTY


 SHALE STRINGER


 SILTSTONE STRINGER


Other Symbols


Oil Show

 ORGANIC


 PINPOINT


 VUGGY


 EVEN


 QUESTIONABLE


Engineering


 SPOTTED STAINING


 BIT


 CONNECTION (DOWN)


 CONNECTION (LEFT)


 CONNECTION (RIGHT)

 FENESTRAL


 F FRACTURE


 INTERCRYSTALLINE


 INTERCRYSTALLINE


 MOLDIC


Textures


 NORMAL FAULT


 OIL SHOW


 OVERTURNED STRATA


 REVERSE FAULT

 SIDEWALL CORE (LEFT)


 SIDEWALL CORE (RIGHT)


 SLIDE


 SURVEY


 CRYPTOXLN


Sorting


 E EARTHY


 F FINE XLN


 G GRAINSTONE


 L LITHOGRAPHIC


 M MICROXLN


 A ANGULAR


 M MUDSTONE

 P PACKSTONE


 W WACKESTONE


 M MODERATE


 P POOR


 W WELL


Rounding


 CORE - RECOVERED


 TRIP GAS


 WIRELINE TESTED - LEFT


 WIRELINE TESTED - RT


 FORMATION TOP


 GAS SHOW


 DST INTERVAL


 FAULT


 MIN DEPTH

 NORMAL FAULT

 SUBANG

 SUBRND

 R ROUNDED

 SUBANG

Slide/Rotate

ROP

ROP (ft/hr)

Curves
GAMMA

Total Gas & Chromatograph

GAS

C1

C2

C3

C4

Depth Labels

% Lith

Well Bore

TVD

Oil Show

Images

ROP Data from iBall

7/7/2014 PM, Mud Wt: 9.70, FV/s: 42
PV/s: 10, YP: 10, GELS: 4/15/26, API Filt: 9.5
CAKE: 2/0, pH: 10.5, Cl: 1,600, Ca: 120

Gamma Data from Sperry - Halliburton

Gas Data from iBall

1571u
C1: 44.9%
C2: 14.6%
C3: 27.7%
C4: 12.8%
nls
PTM

1110u

Columbine Logging began logging with
BloodHound unit 0687 on 07/07/2014

50' Sample Interval @ 6,100' MD

MD: 6,055'
TVD: 5,947.5'
Inclination: 11.18 °
Azimuth: 87.25 °
VS: 99.59'

Bit Data

Bit #: 2

Type: Security

Model: MMMD55M

Size: 8.75"

Depth In: 6,069'

Depth Out: 7,227'

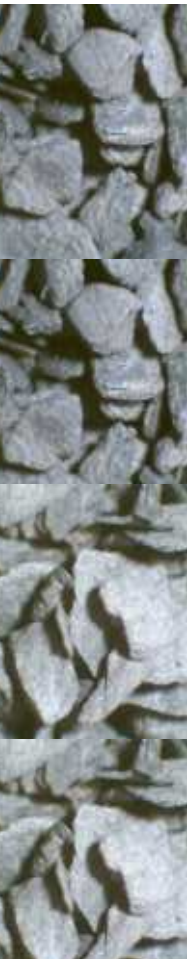
Jets: 4x16, 1x18

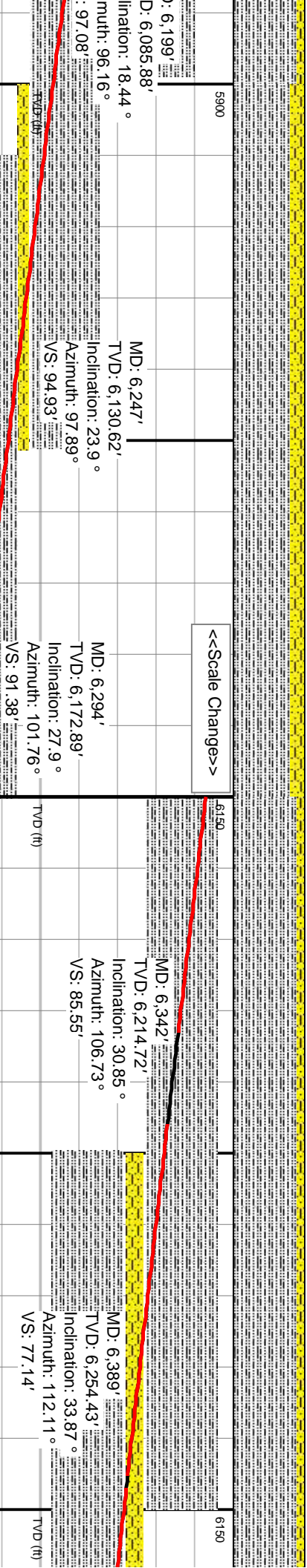
SLTY SH: lt gy, occ med - dk gy, frm - mod
hd, pily - sb pily, occ sb blkly, silty - grty tex, v
sl calc
SHY SS: lt - medgy, f gr, sb ang - sb rd, py
srt, brit clus, p por, calc cmt, sme glau

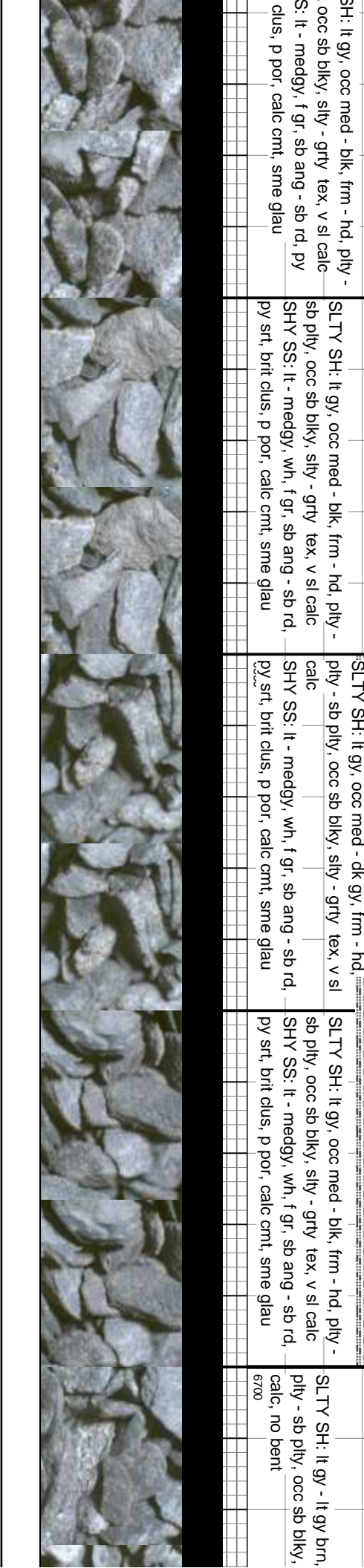
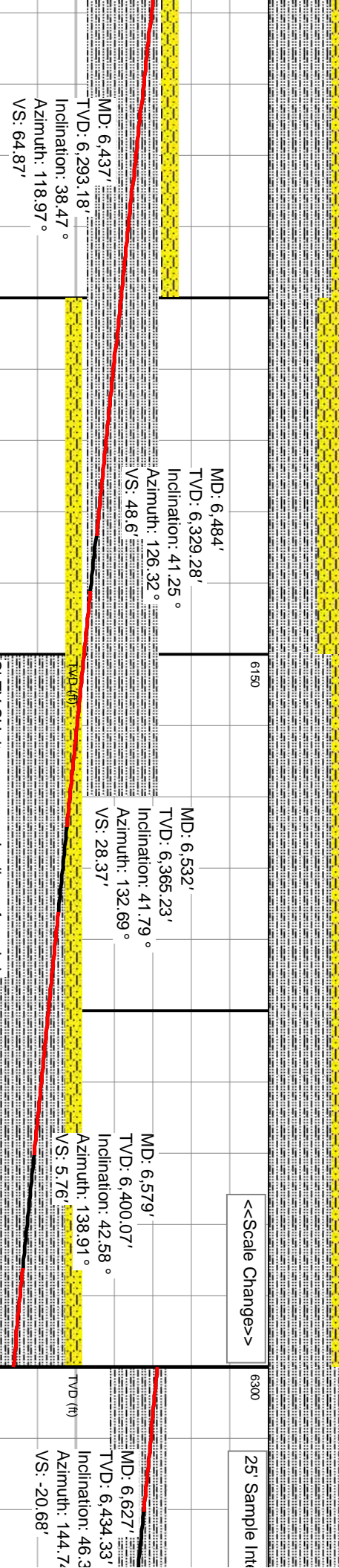
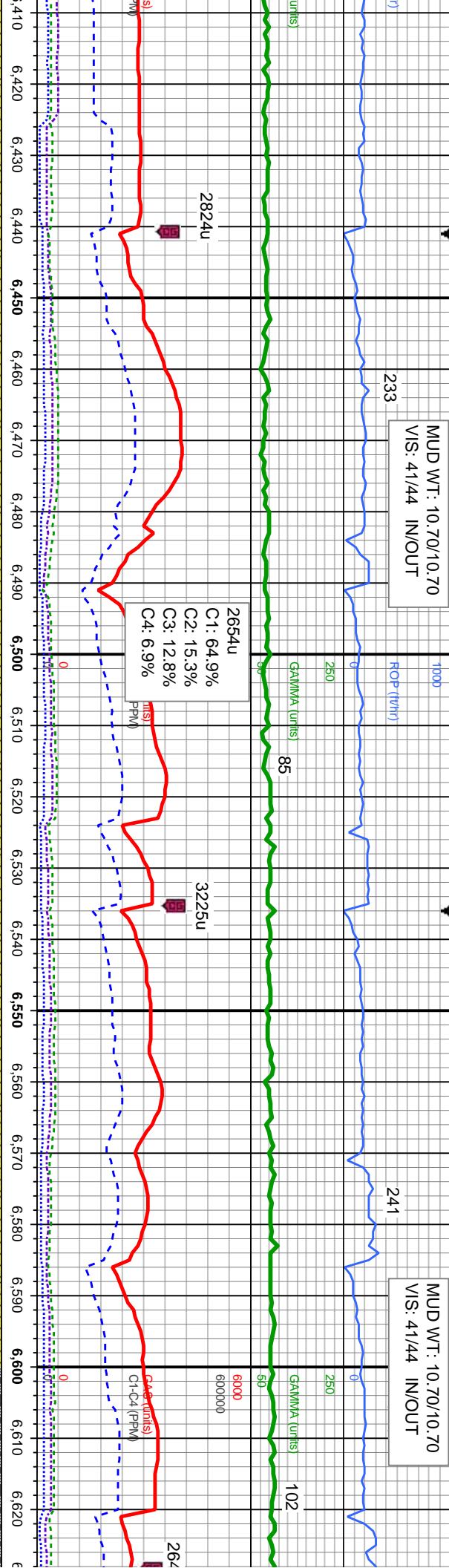
SLTY SH: lt gy, occ med - dk gy, frm - mod
hd, pily - sb pily, occ sb blkly, silty - grty tex, v
sl calc
SHY SS: lt - medgy, f gr, sb ang - sb rd, py
srt, brit clus, p por, calc cmt, sme glau

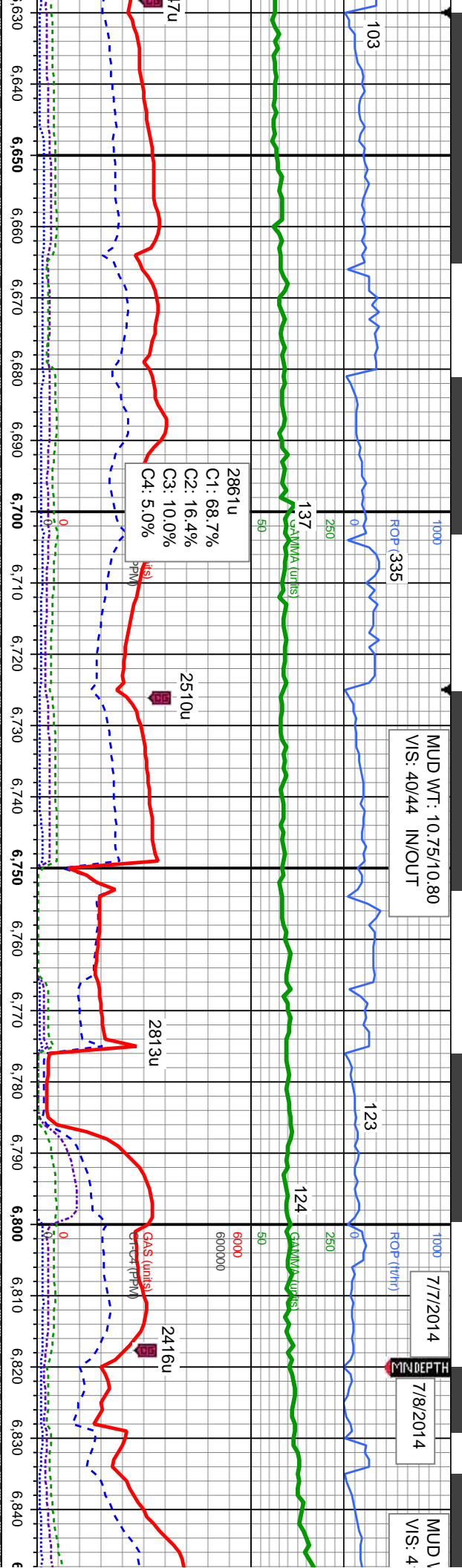
SLTY SH: lt gy, occ med - dk gy, frm - mod
hd, pily - sb pily, occ sb blkly, silty - grty tex, v
sl calc
SHY SS: lt - medgy, f gr, sb ang - sb rd, py
srt, brit clus, p por, calc cmt, sme glau

E
G
M
F
T
S









penval @ 6.650' MD

MD: 6.674'
TVD: 6.465.51'
Inclination: 50.52 °
Azimuth: 147.7 °
VS: -49.92'

6300

MD: 6.722'
TVD: 6.495.33'
Inclination: 52.66 °
Azimuth: 151.4 °
VS: -82.34'

6300

MD: 6.769'
TVD: 6.523.8'
Inclination: 52.83 °
Azimuth: 156.32 °
VS: -115.91'

6300

MD: 6.817'
TVD: 6.552.13'
Inclination: 54.84 °
Azimuth: 160.01 °
VS: -151.87'

6700

<<Scale Change>>

blk, frm - mod hd,
silty - grfy tex, v sl

SLTY SH: lt gy - lt gy brn, blk, frm - mod hd,
pily - sb pily, occ sb blkly, silty - grfy tex, v sl
calc, no bent

SLTY SH: lt gy - lt gy brn, blk, frm - mod hd,
pily - sb pily, occ sb blkly, silty - grfy tex, v sl
calc, no bent

SLTY SH: lt gy - lt gy brn, blk, frm - mod hd,
pily - sb pily, occ sb blkly, silty - grfy tex, v sl
calc, v rr bent

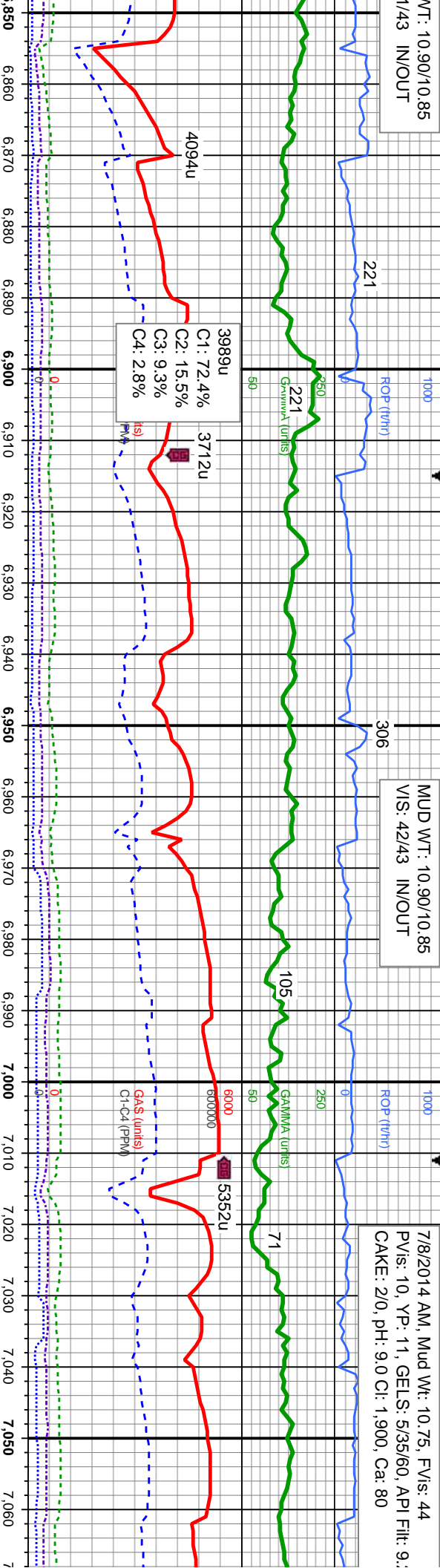
SLTY SH: lt gy - lt gy brn, blk, frm - mod hd,
pily - sb pily, occ sb blkly, silty - grfy tex, v sl
calc, v rr bent



WT: 10.90/10.85
1/43 IN/OUT

MUD WT: 10.90/10.85
VIS: 42/43 IN/OUT

7/8/2014 AM, Mud Wt: 10.75, FVIs: 44
PVIs: 10, YP: 11, GELS: 5/35/60, API Filt: 9.1
CAKE: 2/0, pH: 9.0 Cl: 1,900, Ca: 80



Sharon Springs Top @
6,899 MD: 6,596' TVD

Niobrara Top @
6,924 MD: 6,608' TVD

Nio A Chalk Top @
6,968 MD: 6,628' TVD

Nio A Marl Top @
7,030' MD: 6,650' TVD

MD: 6,864'
TVD: 6,578.55'
Inclination: 56.76°
Azimuth: 162.66°
VS: -188.7'

MD: 6,912'
TVD: 6,603.18'
Inclination: 61.49°
Azimuth: 165.84°
VS: -228.34'

MD: 6,959'
TVD: 6,624.75'
Inclination: 66.47°
Azimuth: 167.27°
VS: -635.03'

MD: 7,007'
TVD: 6,642.26'
Inclination: 70.73°
Azimuth: 169.22°
VS: -679.52'

SLTY SH: lt gy - lt gy brn, blk, frm - mod hd,
pily - sb pily, occ sb blkly, silty - grty tex, v sl
calc, abnt bent

SLTY SH: lt gy - lt gy brn, blk, frm - mod hd,
pily - sb pily, occ sb blkly, silty - grty tex, v sl
calc

CHK: tan - ltgy, mot, lam, v sft - frm, sb pily -
sb blkly, rthy tex, v calc, tr bent
MRL: lt - med gy, rr blk, sft - frm, sme mod
hd, sb pily - pily, silty - grty tex

CHK: lt - medgy brn, mot, lam, v sft - frm, sb
pily - sb blkly, rthy tex, v calc, sme bent
MRL: lt - med gy, rr blk, sft - frm, sme mod
hd, sb pily - pily, silty - grty tex

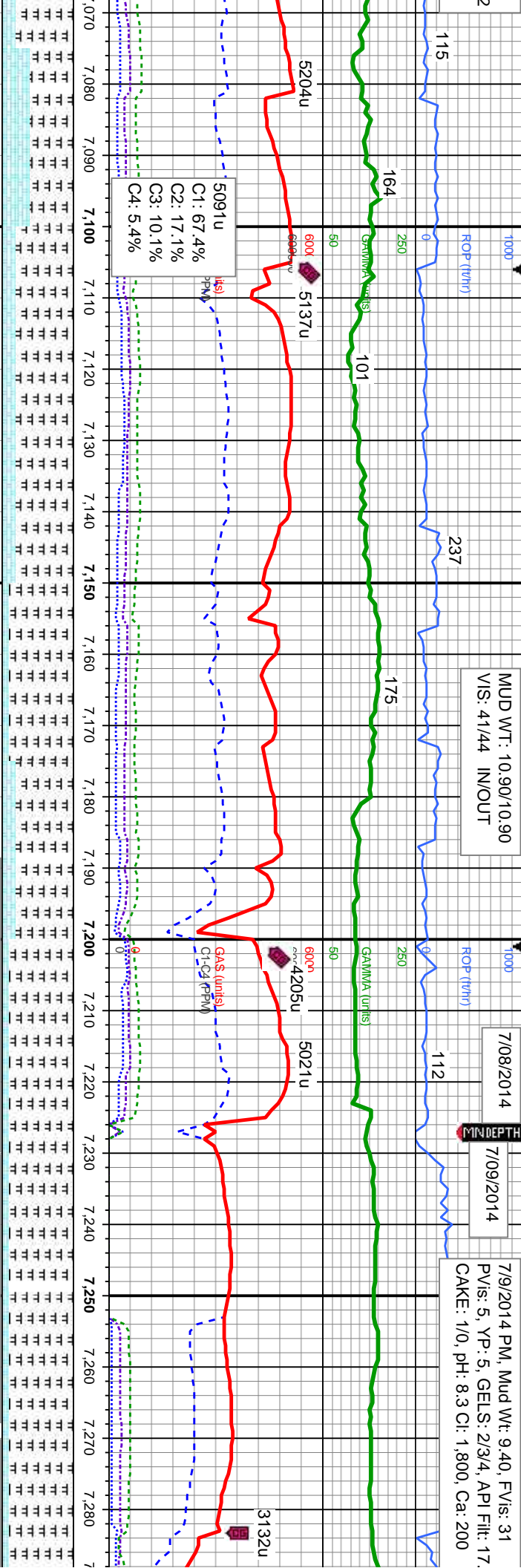
MRL: lt - med gy
hd, sb pily - pily,
CHK: lt - medgy
pily - sb blkly, rth
frag



MUD WT: 10.90/10.90
VIS: 41/44 IN/OUT

7/08/2014
7/09/2014

7/9/2014 PM, Mud Wt: 9.40, FVis: 31
PVIS: 5, YP: 5, GELS: 2/3/4, API Fil: 17
CAKE: 1/0, pH: 8.3 Cl: 1.800, Ca: 200



MD: 7,102'
TVD: 6,668.99'
Inclination: 76.59°
Azimuth: 174.98°
VS: 769.46'

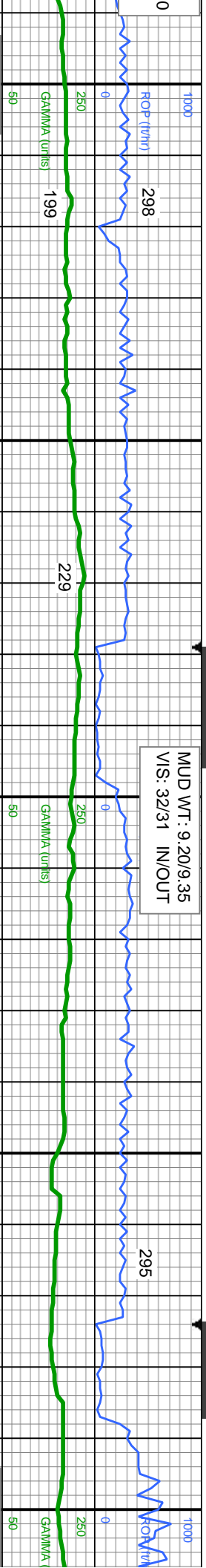
MD: 7,174'
TVD: 6,681.65'
Inclination: 83.13°
Azimuth: 176.13°
VS: 838.61'

TOOH @ 7,227' MD to run 7" casing
50 Sample Interval @ 7,250' MD

Bit #: 3
Type: Reed
Model: Hycalog
Size: 6.12"
Depth In: 7,227'
Jets: 5x14

6,656.65'	6,656.65'	MD: 7,102'	MD: 7,174'	MD: 7,260'
ation: 73.62°	ation: 73.62°	TVD: 6,668.99'	TVD: 6,681.65'	TVD: 6,688.65'
uth: 172.08°	uth: 172.08°	Inclination: 76.59°	Inclination: 83.13°	Inclination: 87.53°
23.86'	23.86'	Azimuth: 174.98°	Azimuth: 176.13°	Azimuth: 180.02°
VS: 769.46'	VS: 769.46'	VS: 838.61'	VS: 838.61'	VS: -558.68'
frb, sft - frm, sme mod	frb, sft - frm, sme mod	frb, sft - frm, sme mod	frb, sft - frm, sme mod	frb, sft - frm, sme mod
stly - grty tex	stly - grty tex	stly - grty tex	stly - grty tex	stly - grty tex
brn, mot, lam, v sft - frm, sb	brn, mot, lam, v sft - frm, sb	brn, mot, lam, v sft - frm, sb	brn, mot, lam, v sft - frm, sb	brn, mot, lam, v sft - frm, sb
ty tex, v calc, sme bent, tr fos	ty tex, v calc, sme bent, tr fos	ty tex, v calc, sme bent, tr fos	ty tex, v calc, sme bent, tr fos	ty tex, v calc, sme bent, tr fos
MRL: It - med gy, r blk, sft - frm, sme mod	MRL: It - med gy, r blk, sft - frm, sme mod	MRL: It - med gy, r blk, sft - frm, sme mod	MRL: It - med gy, r blk, sft - frm, sme mod	MRL: It - med gy, r blk, sft - frm, sme mod
hd, sb ply - ply, stly - grty tex	hd, sb ply - ply, stly - grty tex	hd, sb ply - ply, stly - grty tex	hd, sb ply - ply, stly - grty tex	hd, sb ply - ply, stly - grty tex
CHK: It - medgy brn, mot, lam, v sft - frm, sb	CHK: It - medgy brn, mot, lam, v sft - frm, sb	CHK: It - medgy brn, mot, lam, v sft - frm, sb	CHK: It - medgy brn, mot, lam, v sft - frm, sb	CHK: It - medgy brn, mot, lam, v sft - frm, sb
ply - sb blk, rthy tex, v calc, sme bent, tr fos	ply - sb blk, rthy tex, v calc, sme bent, tr fos	ply - sb blk, rthy tex, v calc, sme bent, tr fos	ply - sb blk, rthy tex, v calc, sme bent, tr fos	ply - sb blk, rthy tex, v calc, sme bent, tr fos
frag	frag	frag	frag	frag
10% CHK: It - medgy brn, mot, lam, v sft -	10% CHK: It - medgy brn, mot, lam, v sft -	10% CHK: It - medgy brn, mot, lam, v sft -	10% CHK: It - medgy brn, mot, lam, v sft -	10% CHK: It - medgy brn, mot, lam, v sft -
frn, sb ply - sb blk, rthy tex, v calc	frn, sb ply - sb blk, rthy tex, v calc	frn, sb ply - sb blk, rthy tex, v calc	frn, sb ply - sb blk, rthy tex, v calc	frn, sb ply - sb blk, rthy tex, v calc
90% MRL: It - med gy, r blk, sft - frm, sme	90% MRL: It - med gy, r blk, sft - frm, sme	90% MRL: It - med gy, r blk, sft - frm, sme	90% MRL: It - med gy, r blk, sft - frm, sme	90% MRL: It - med gy, r blk, sft - frm, sme
mod hd, sb ply - ply, stly - grty tex, r bent,	mod hd, sb ply - ply, stly - grty tex, r bent,	mod hd, sb ply - ply, stly - grty tex, r bent,	mod hd, sb ply - ply, stly - grty tex, r bent,	mod hd, sb ply - ply, stly - grty tex, r bent,
no fos frag	no fos frag	no fos frag	no fos frag	no fos frag
6900	6900	6900	6900	6900



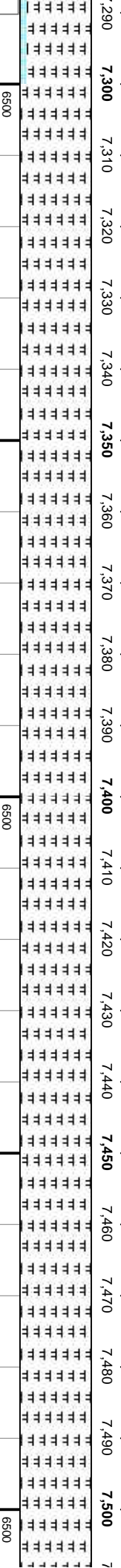


C1: 58.7%
C2: 19.4%
C3: 13.1%
C4: 8.7%

GAS (units)
C1 C4 (PPM)

C1: 78.4%
C2: 2.1%
C3: 13.1%
C4: 6.4%

MUD WT: 9.20/9.35
VIS: 32/31 IN/OUT



MD: 7,320'
TVD: 6,691.57'
Inclination: 86.88°
Azimuth: 179.39°

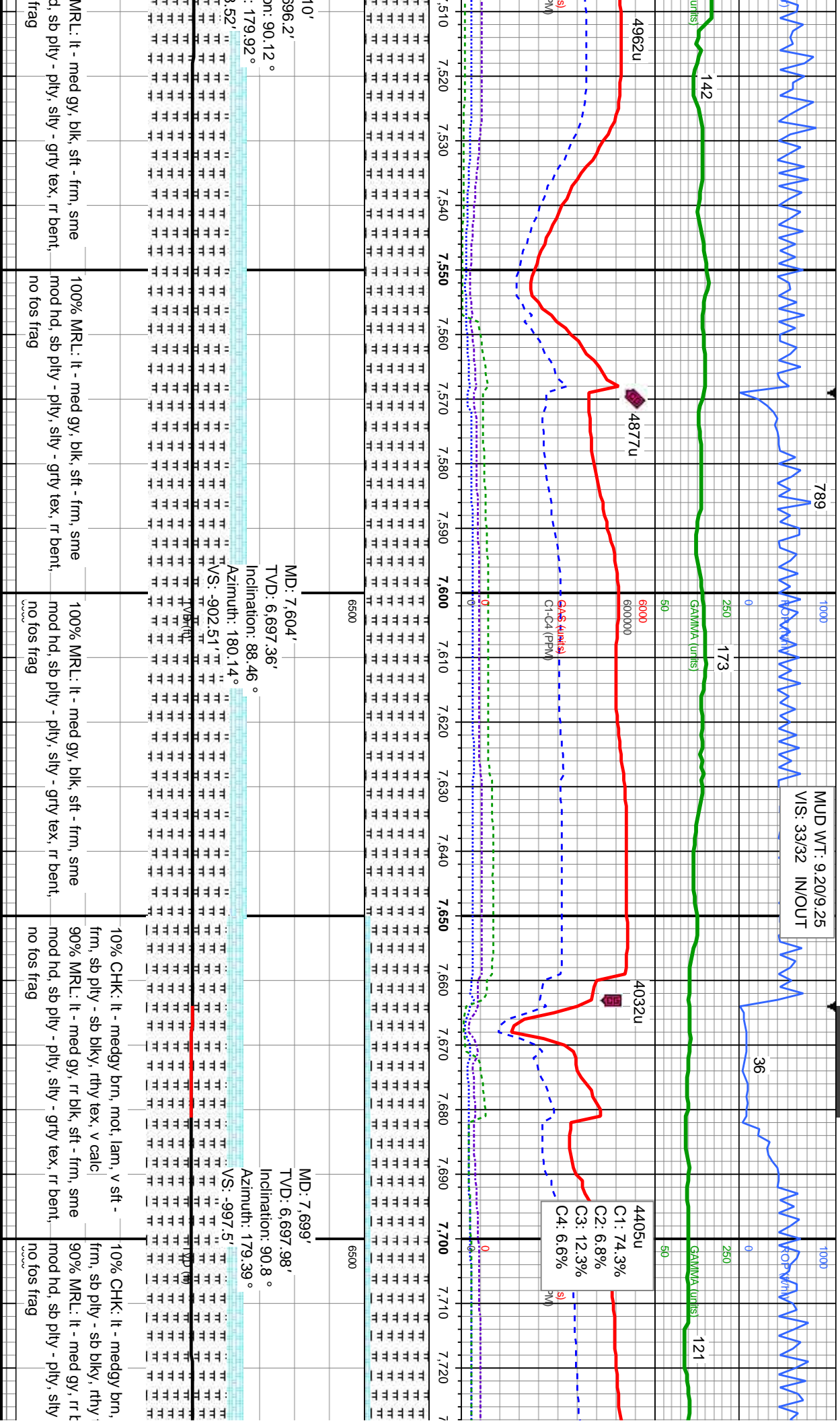
MD: 7,415'
TVD: 6,695.23'
Inclination: 88.71°
Azimuth: 179.51°

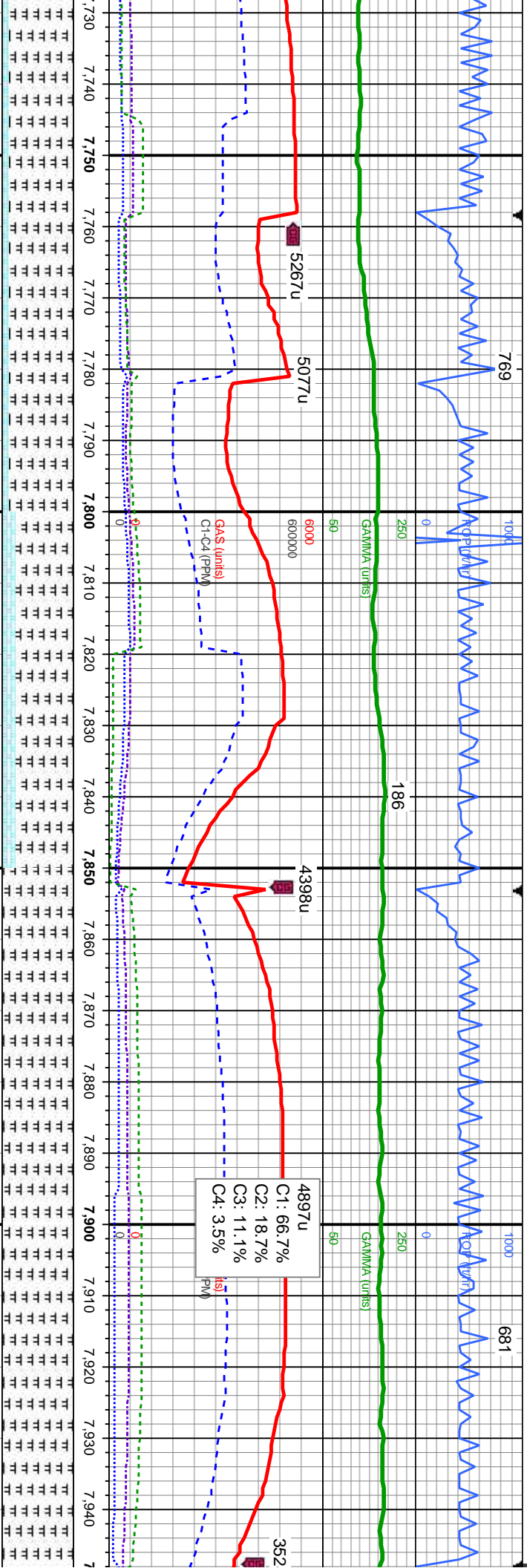
MD: 7.5
TVD: 6.6
Inclination: 88.71°
Azimuth: 179.51°



100% MRL: It - med gy, blk, sft - frm, sme mod hcd, sb plty - plty, silty - grty tex, rr bent, no fos frag	100% MRL: It - med gy, blk, sft - frm, sme mod hcd, sb plty - plty, silty - grty tex, rr bent, no fos frag	100% MRL: It - med gy, blk, sft - frm, sme mod hcd, sb plty - plty, silty - grty tex, rr bent, no fos frag	100% MRL: It - med gy, blk, sft - frm, sme mod hcd, sb plty - plty, silty - grty tex, rr bent, no fos frag
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MD: 7.794'
TVD: 6,696.98'
Inclination: 90.4°
Azimuth: 179.12°

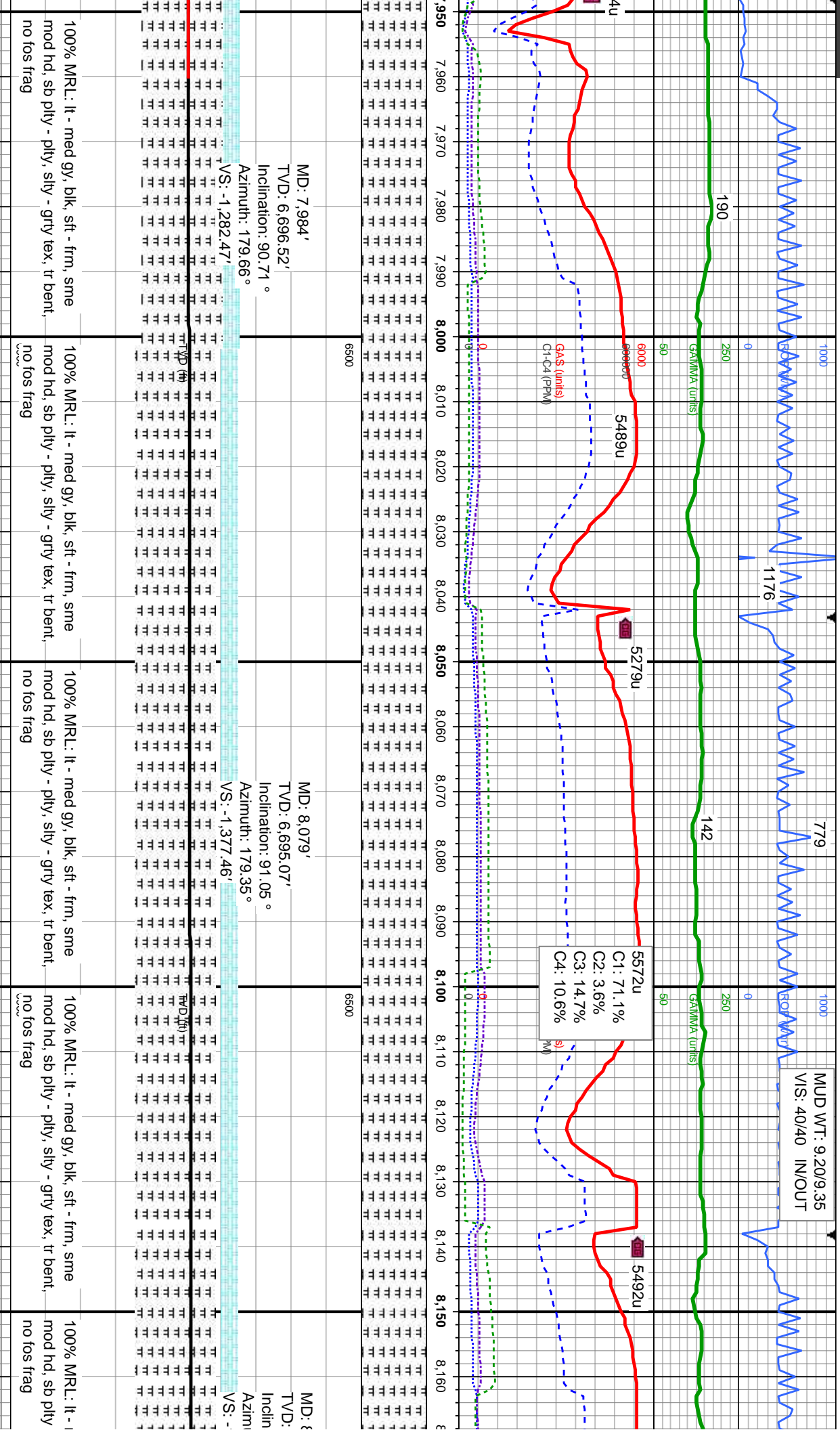
VS: -1,092.48'

MD: 7.889'
TVD: 6,696.88'
Inclination: 89.72°
Azimuth: 179.57°

VS: -1,187.48'

mot, lam, v sft -	10% CHK: lt - medgy brn, mot, lam, v sft -	20% CHK: lt - medgy brn, mot, lam, v sft -	100% MRL: lt - medgy, blk, sft - frm, sme	100% MRL: lt - medgy, blk, sft - frm, sme
tex, v calc	frm, sb ply - sb blk, rthy tex, v calc	frm, sb ply - sb blk, rthy tex, v calc	mod hcd, sb ply - ply, silty - grty tex, tr bent, no fos frag	mod hcd, sb ply - ply, silty - grty tex, tr bent, no fos frag
blk, sft - frm, sme	90% MRL: lt - med gy, rr blk, sft - frm, sme	80% MRL: lt - med gy, rr blk, sft - frm, sme	mod hcd, sb ply - ply, silty - grty tex, tr bent, no fos frag	mod hcd, sb ply - ply, silty - grty tex, tr bent, no fos frag
- grty tex, rr bent,	no fos frag	fos frag	no fos frag	no fos frag





560

7/9/2014

7/10/2014

MOEDPTH

MOEDPTH

MOEDPTH

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MD: 8,268'
TVD: 6,692.63'
Inclination: 89.57°
Azimuth: 178.62°
VS: -1,566.41'

MD: 8,363'
TVD: 6,692.96'
Inclination: 90.03°
Azimuth: 177.84°
VS: -1,661.36'

MD: 8,173'
TVD: 6,693.25'
Inclination: 91.17°
Azimuth: 179.12°
VS: -1,471.43'

MD: 8,173'
TVD: 6,693.25'
Inclination: 91.17°
Azimuth: 179.12°
VS: -1,471.43'

MD: 8,173'
TVD: 6,693.25'
Inclination: 91.17°
Azimuth: 179.12°
VS: -1,471.43'

MD: 8,173'
TVD: 6,693.25'
Inclination: 91.17°
Azimuth: 179.12°
VS: -1,471.43'

MD: 8,173'
TVD: 6,693.25'
Inclination: 91.17°
Azimuth: 179.12°
VS: -1,471.43'

MD: 8,173'
TVD: 6,693.25'
Inclination: 91.17°
Azimuth: 179.12°
VS: -1,471.43'

MD: 8,173'
TVD: 6,693.25'
Inclination: 91.17°
Azimuth: 179.12°
VS: -1,471.43'

MD: 8,173'
TVD: 6,693.25'
Inclination: 91.17°
Azimuth: 179.12°
VS: -1,471.43'

MD: 8,173'
TVD: 6,693.25'
Inclination: 91.17°
Azimuth: 179.12°
VS: -1,471.43'

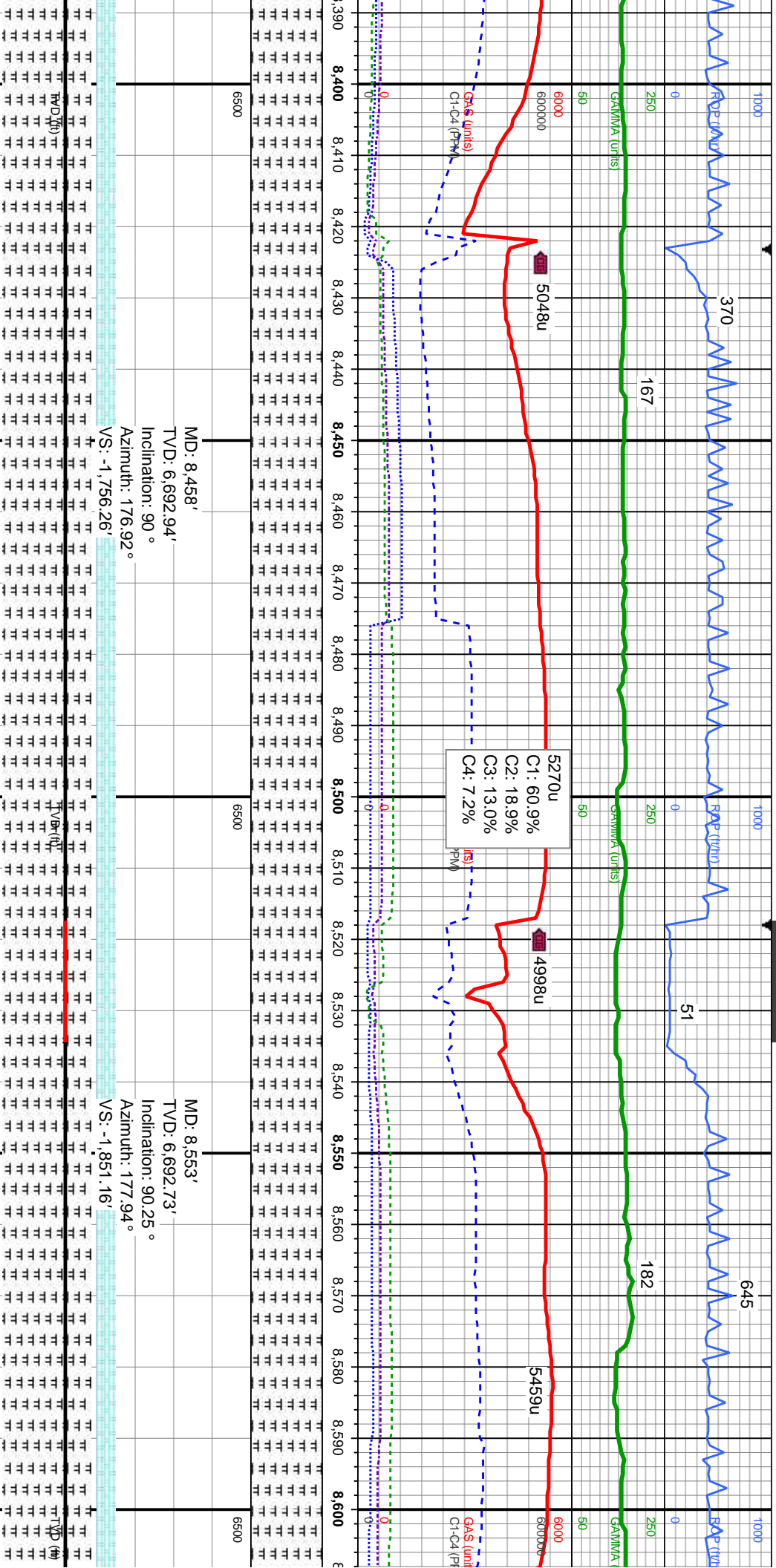
med gy, blk, sft - frm, sme
- pily, silty - grty tex, tr bent,
mod hcd, sb pily - pily, silty - grty tex, mod
bent, no fos frag

100% MRL: It - med gy, blk, sft - frm, sme
mod hcd, sb pily - pily, silty - grty tex, tr bent,
no fos frag

100% MRL: It - med gy, blk, sft - frm, sme
mod hcd, sb pily - pily, silty - grty tex, tr bent,
no fos frag

100% MRL: It - med gy, blk, sft - frm
mod hcd, sb pily - pily, silty - grty tex
no fos frag

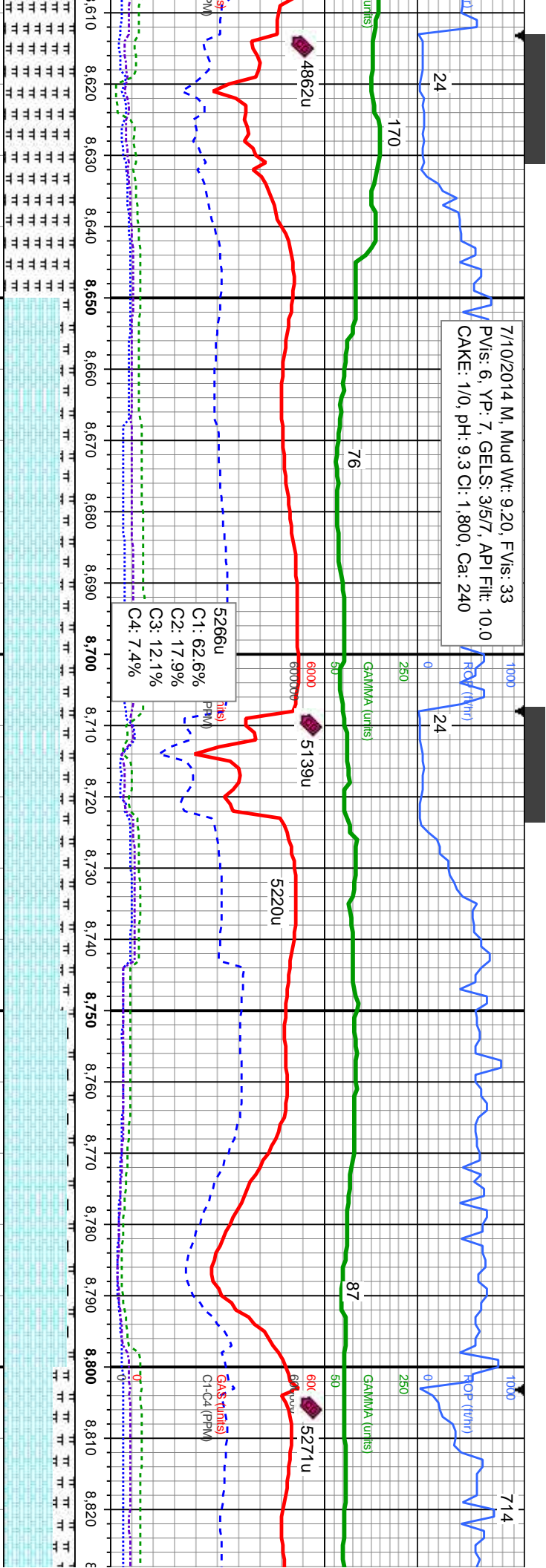




6500	MD: 8,458'	VS: -1,756.26'
6500	TVD: 6,692.94'	
6500	Inclination: 90.°	
6500	Azimuth: 176.92°	
6500	MD: 8,553'	VS: -1,851.16'
6500	TVD: 6,692.73'	
6500	Inclination: 90.25°	
6500	Azimuth: 177.94°	
6500	MD: 8,553'	VS: -1,851.16'
6500	TVD: 6,692.73'	
6500	Inclination: 90.25°	
6500	Azimuth: 177.94°	

100% MRL: It - med gy, blk, sft - frm, sme	100% MRL: It - med gy, blk, sft - frm, sme	100% MRL: It - med gy, blk, sft - frm, sme	100% MRL: It - med gy, blk, sft - frm, sme
mod hcd, sb plty - plty, silty - grty tex, tr bent,	mod hcd, sb plty - plty, silty - grty tex, tr bent,	mod hcd, sb plty - plty, silty - grty tex, tr bent,	mod hcd, sb plty - plty, silty - grty tex, tr bent,
no fos frag	no fos frag	no fos frag	no fos frag

7/10/2014 M. Mud Wt: 9.20, FV/s: 33
PV/s: 6, YP: 7, GELS: 3/5/7, API Filtr: 10.0
CAKE: 1/0, pH: 9.3 Cl: 1,800, Ca: 240



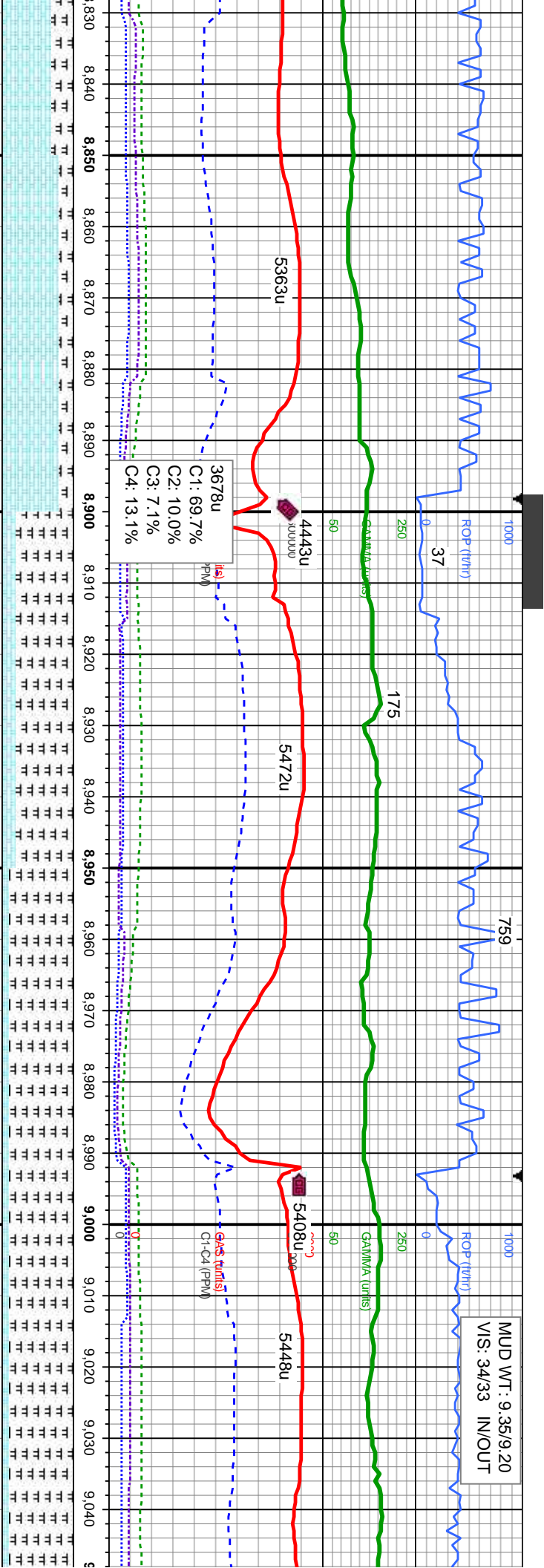
MD: 8,647'
TVD: 6,692.23'
Inclination: 90.37°
Azimuth: 179.27°
VS: -1,945.13'

MD: 8,742'
TVD: 6,692.1'
Inclination: 89.78°
Azimuth: 180.44°
VS: 2,345.01'

MD:
TVD:
Incl:
Azir:
VS:

A Chalk		80% CHK: lt - medgy, blk, sft - frm, sme	80% CHK: tan speckl wi wh, mot, lam, v sft	90% CHK: tan speckl wi wh, mot, lam, v sft	70% CHK: tan speckl wi
A Marl		20% MRL: lt - med gy, r blk, sft - frm, sme	20% MRL: lt - med gy, r blk, sft - frm, sme	10% MRL: lt - med gy, r blk, sft - frm, sme	30% MRL: lt - med gy, r
A Chalk		mod hd, sb pily - pily, silty - grty tex, tr bent,	mod hd, sb pily - pily, silty - grty tex, tr bent,	mod hd, sb pily - pily, silty - grty tex, tr bent,	mod hd, sb pily - pily, silty
A Chalk		no fos frag	no fos frag	no fos frag	no fos frag





8,837'
: 6,691.85'
nation: 90.52 °
uth: 179.39 °
2,435.91'

MD: 8,932'
TVD: 6,691.8'
Inclination: 89.54 °
Azimuth: 180.75 °
VS: 2,526.74'

A Chalk

MD: 9,027'
TVD: 6,693.2'
Inclination: 88.77 °
Azimuth: 180.98 °
VS: 2,617.16'

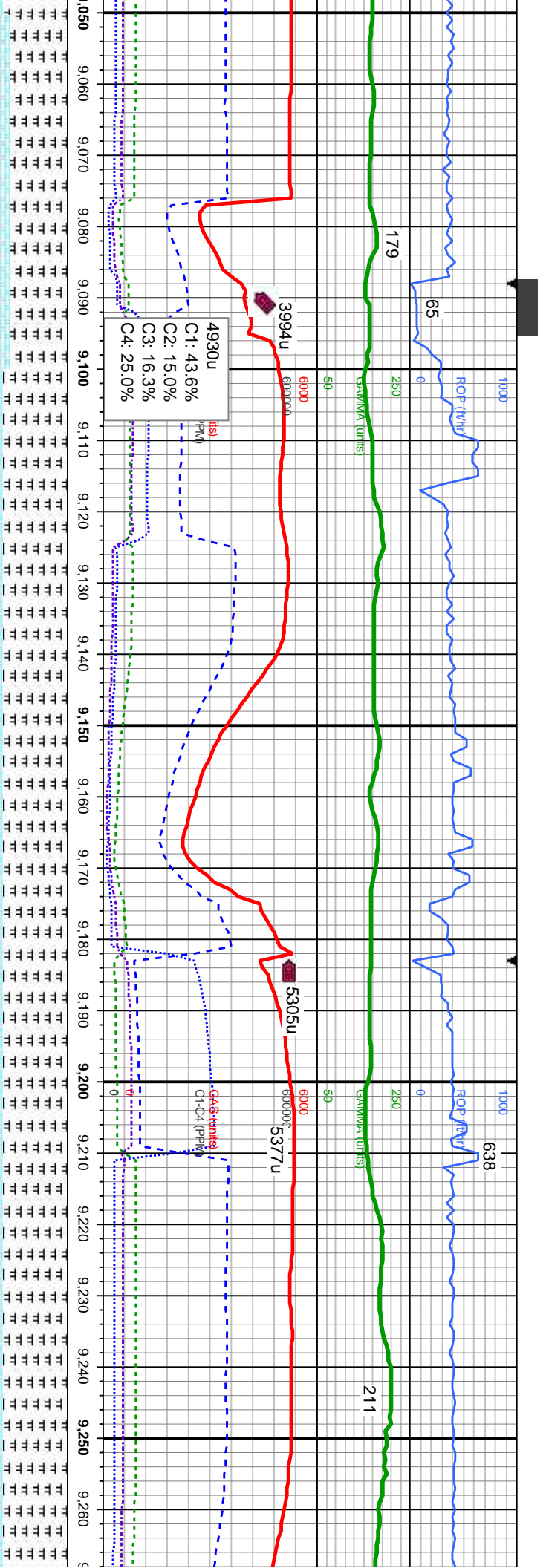
80% CHK: tan speckl wi wh, mot, lam, v sft
- frm, sb pily - sb blk, rthy tex, v calc
20% MRL: lt - med gy, rr blk, sft - frm, sme
mod hd, sb pily - pily, silty - grty tex, sme
bent, no fos frag

20% CHK: tan speckl wi wh, mot, lam, v sft
- frm, sb pily - sb blk, rthy tex, v calc
80% MRL: lt - med gy, rr blk, sft - frm, sme
mod hd, sb pily - pily, silty - grty tex, sme
bent, no fos frag

10% CHK: tan speckl wi wh, mot, lam, v sft
- frm, sb pily - sb blk, rthy tex, v calc
90% MRL: lt - med gy, rr blk, sft - frm, sme
mod hd, sb pily - pily, silty - grty tex, sme
bent, no fos frag

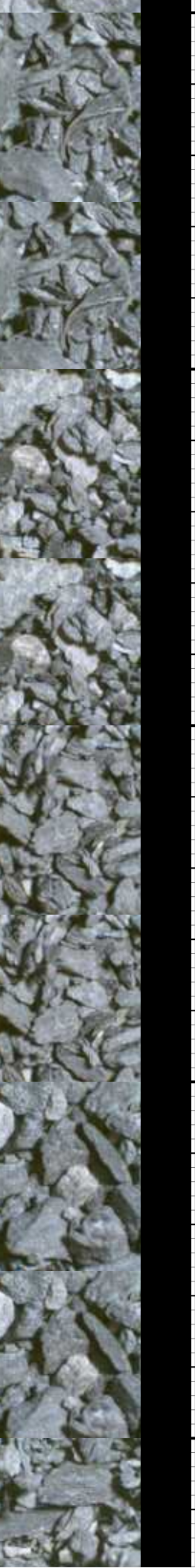
10% CHK: tan speckl wi wh, mot, lam, v sft
- frm, sb pily - sb blk, rthy tex, v calc
90% MRL: lt - med gy, rr blk, sft - frm, sme
mod hd, sb pily - pily, silty - grty tex, sme
bent, no fos frag

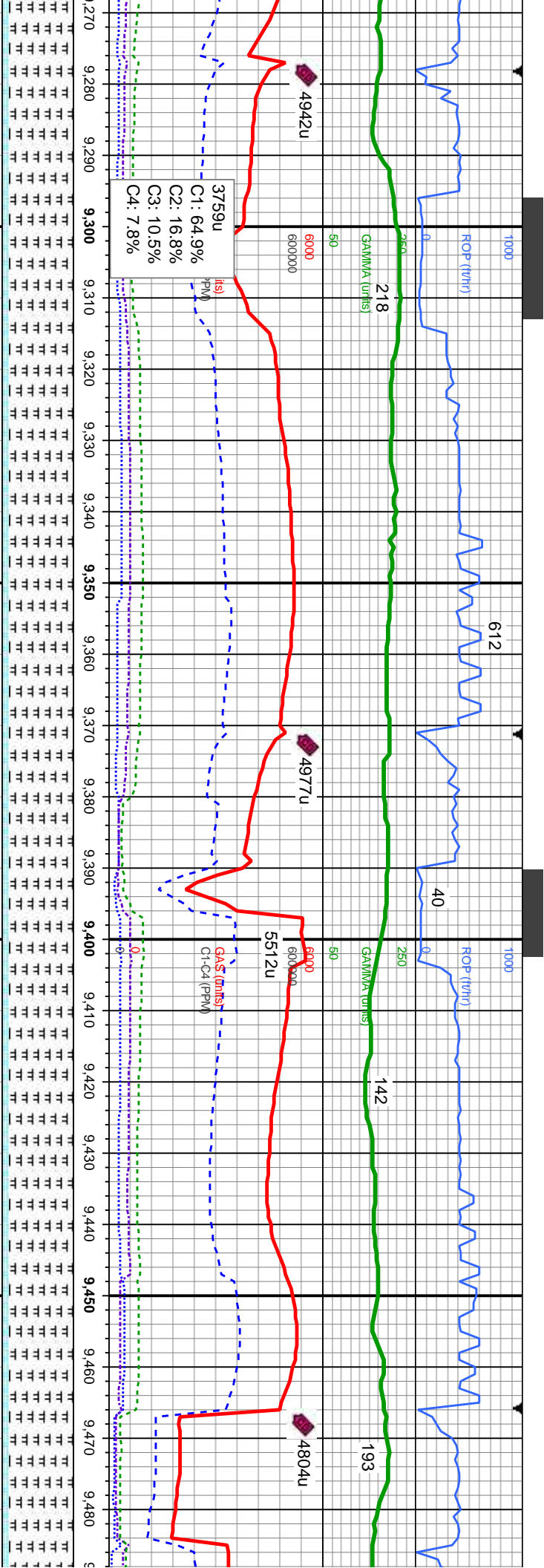




6500	MD: 9.122' TVD: 6,694.69' Inclination: 89.44 ° Azimuth: 180.89 ° VS: 2,707.55'	6500	MD: 9.217' TVD: 6,696.7' Inclination: 88.12 ° Azimuth: 180.62 ° VS: 2,798.02'	6500	MD: 9.217' TVD: 6,696.7' Inclination: 88.12 ° Azimuth: 180.62 ° VS: 2,798.02'
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20% CHK: tan speckl wi wh, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc 80% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb ply - ply, silty - grty tex, abnt bent, no fos frag	10% CHK: tan speckl wi wh, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc 90% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb ply - ply, silty - grty tex, abnt bent, sme fos frag	10% CHK: tan speckl wi wh, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc 90% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb ply - ply, silty - grty tex, abnt bent, sme fos frag	10% CHK: tan speckl wi wh, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc 90% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb ply - ply, silty - grty tex, abnt bent, sme fos frag	10% CHK: tan speckl wi wh, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc 90% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb ply - ply, silty - grty tex, abnt bent, sme fos frag
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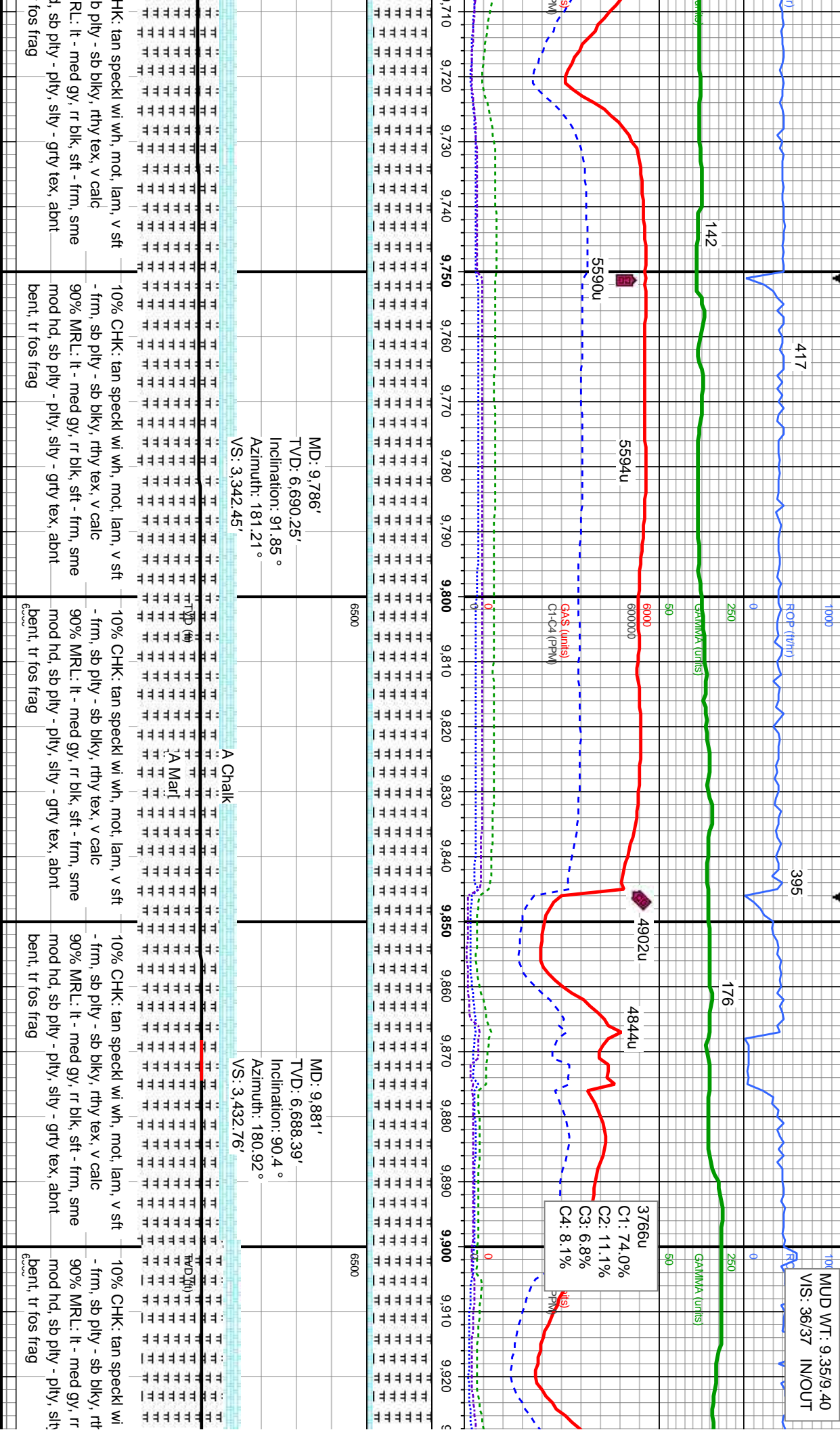


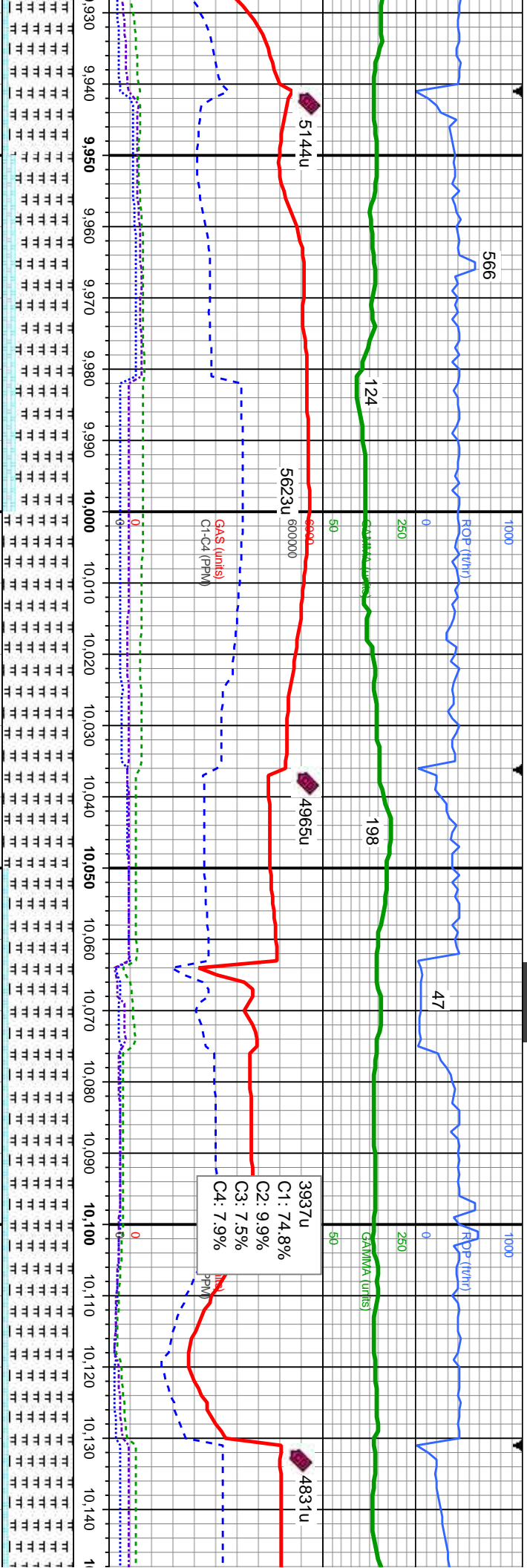
MD: 9,312'
TVD: 6,698.77'
Inclination: 89.38 °
Azimuth: 179.43 °
VS: 2,888.85'

MD: 9,407'
TVD: 6,698.8'
Inclination: 90.59 °
Azimuth: 178.93 °
VS: 2,980.09'

speckl wi wh, mot, lam, v sft	10% CHK: tan speckl wi wh, mot, lam, v sft	10% CHK: tan speckl wi wh, mot, lam, v sft	10% CHK: tan speckl wi wh, mot, lam, v sft
blky, rthy tex, v calc	- frm, sb ply - sb blky, rthy tex, v calc	- frm, sb ply - sb blky, rthy tex, v calc	- frm, sb ply - sb blky, rthy tex, v calc
ed gy, rr blk, sft - frm, sme	90% MRL: lt - med gy, rr blk, sft - frm, sme	90% MRL: lt - med gy, rr blk, sft - frm, sme	90% MRL: lt - med gy, rr blk, sft - frm, sme
ply, sily - grty tex, abnt	mod hd, sb ply - ply, sily - grty tex, abnt	mod hd, sb ply - ply, sily - grty tex, abnt	mod hd, sb ply - ply, sily - grty tex, abnt
g	bent, sme fos frag	bent, sme fos frag	bent, sme fos frag







MD: 9,975'
TVD: 6,688.36'
Inclination: 89.63 °
Azimuth: 181.25 °
VS: 3,522.13'

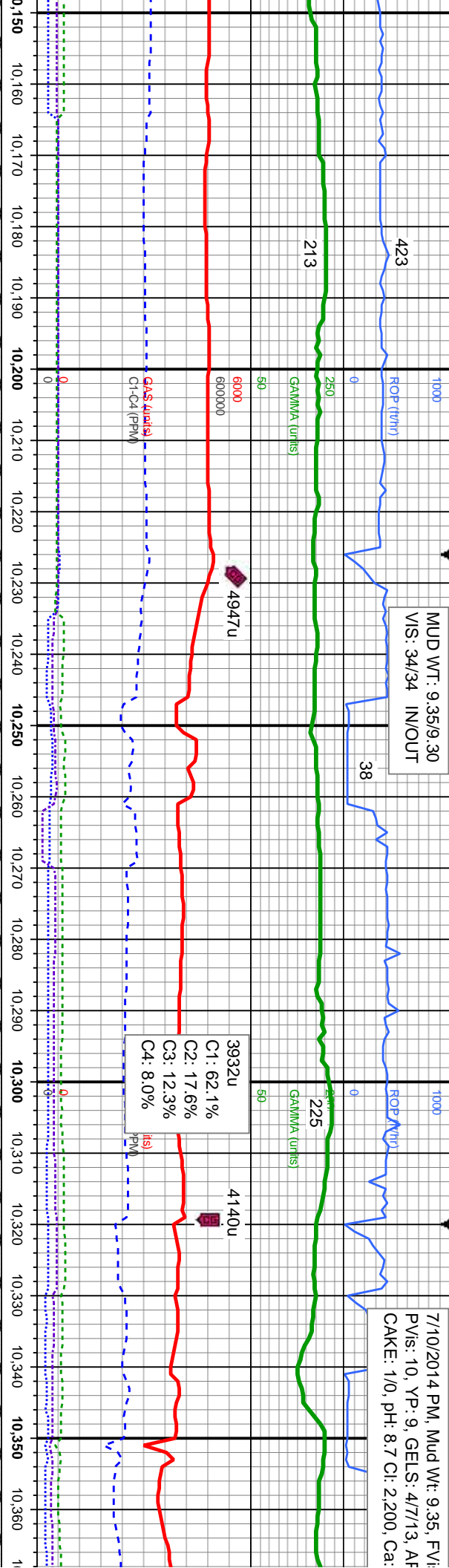
MD: 10,070'
TVD: 6,688.95'
Inclination: 89.66 °
Azimuth: 180.76 °
VS: 3,612.49'

wh, mot, lam, v sft -frm, sb ply - sb blk, rthy tex, v calc 80% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb ply - ply, silty - grty tex, abnt bent, tr fos frag	20% CHK: tan speckl wi wh, mot, lam, v sft -frm, sb ply - sb blk, rthy tex, v calc 80% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb ply - ply, silty - grty tex, abnt bent, tr fos frag	100% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb ply - ply, silty - grty tex, abnt bent, tr fos frag	10% CHK: tan speckl wi wh, mot, lam, v sft -frm, sb ply - sb blk, rthy tex, v calc 90% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb ply - ply, silty - grty tex, abnt bent, tr fos frag	10% CHK: tan speckl wi wh, mot, lam, v sft -frm, sb ply - sb blk, rthy tex, v calc 90% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb ply - ply, silty - grty tex, abnt bent, tr fos frag



MUD WT: 9.35/9.30
VIS: 34/34 IN/OUT

7/10/2014 PM, Mud Wt: 9.35, FV/
PVls: 10, YP: 9, GELS: 47/13, AF
CAKE: 1/0, pH: 8.7 Cl: 2.200, Ca:



MD: 10,165'
TVD: 6,689.9'
Inclination: 89.2 °
Azimuth: 180.67 °
VS: 3,703'

MD: 10,260'
TVD: 6,691.61'
Inclination: 88.74 °
Azimuth: 179.51 °
VS: 3,793.8'

MD: 10,355'
TVD: 6,692.48'
Inclination: 90.22 °
Azimuth: 179.02 °
VS: -3,652.71'

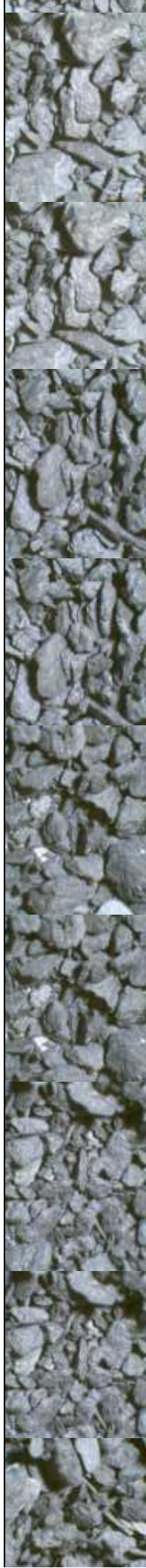
100% MRL: lt - med gy, rr blk, sft - frm, sme
mod hd, sb pily - pily, silty - grty tex, sme
bent, tr fos frag

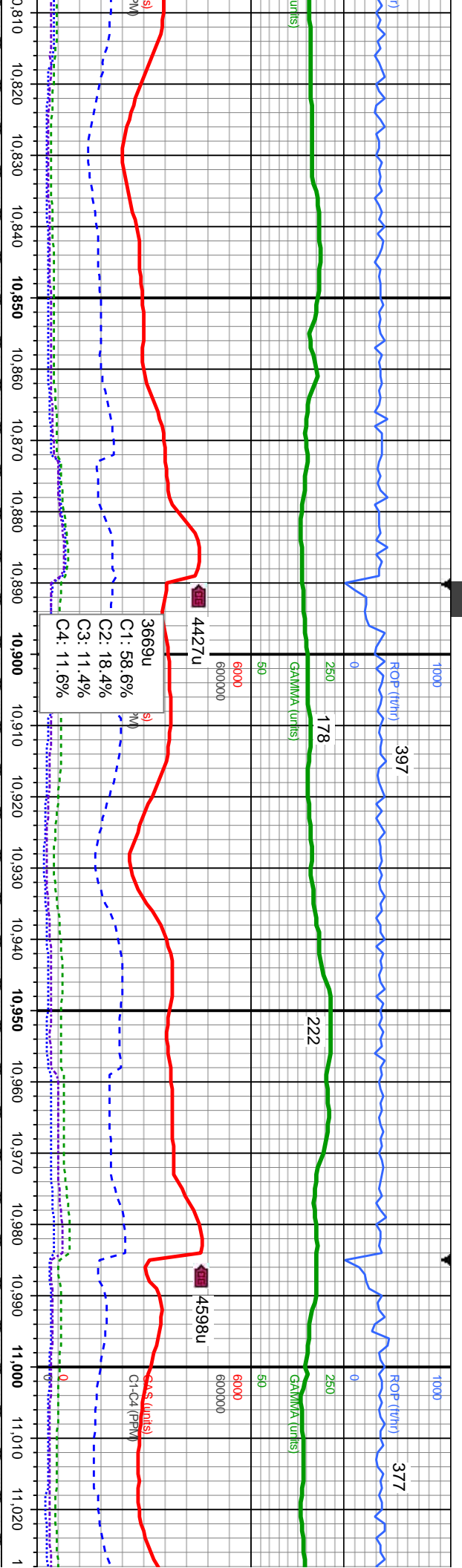
100% MRL: lt - med gy, rr blk, sft - frm, sme
mod hd, sb pily - pily, silty - grty tex, sme
bent, tr fos frag

100% MRL: lt - med gy, rr blk, sft - frm, sme
mod hd, sb pily - pily, silty - grty tex, abnt
bent, tr fos frag

100% MRL: lt - med gy, rr blk, sft - frm, sme
mod hd, sb pily - pily, silty - grty tex, abnt
bent, tr fos frag

100% MRL: lt - med gy, rr blk, sft - frm, sme
mod hd, sb pily
bent, tr fos frag





MD: 10,829'
TVD: 6,691.02'
Inclination: 89.75 °
Azimuth: 174.39°

MD: 10,924'
TVD: 6,691.48'
Inclination: 89.69 °
Azimuth: 173.89°

MD: 11,019'
TVD: 6,692.09'
Inclination: 89.57 °
Azimuth: 173.42°

VS: -4,125.85'	VS: -4,220.36'	VS: -4,314.77'
100% MRL: It - med gy, rr blk, sft - frm, sme mod hd, sb ply - pily, silty - grty tex, abnt bent, no fos frag	100% MRL: It - med gy, rr blk, sft - frm, sme mod hd, sb ply - pily, silty - grty tex, abnt bent, no fos frag	100% MRL: It - med gy, rr blk, sft - frm, sme mod hd, sb ply - pily, silty - grty tex, abnt bent, no fos frag



