



Scale: 5" / 100'
Measured Depth Log

Well Name Rohn State LD09-68HN(HORZ)

Location NENE SEC 9, T9N, R58W

State COLORADO

Country USA

API Number 05-123-37545

Region DJ BASIN

Spud Date 9/17/2013

Surface Coordinates 898' FNL, 480' FEL

Bottom Hole Coordinates 60' FSL, 65' FEL

County WELD

Rig Number H&P 326

Field WILDCAT

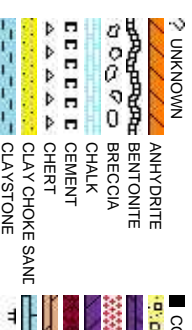
Drilling Completed 9/22/2013

Ground Elevation	4740'	K.B. Elevation	4770'
Logged Interval	4983'	To	9716'
Formation	NIOBRARA B CHALK		
Type of Drilling Fluid	LSND		
		Total Depth	9716'

Company NOBLE ENERGY
Address 1625 Broadway
Denver, CO 80202

Name EVAN HOWELL
Company NOBLE ENERGY
Address 1625 Broadway
Denver, CO 80202

ANDREA ZUIDEMA
MATTHEW HOPKINS



Operator

BY INC.

Suite 2200
202

Geologist

BY INC.

Suite 2200
202

Other

Rock Types

CONGLOMERATE

DOLOMITE

GRANITE

GYPSUM

IGNEOUS

SIDERITE or LIMONITE

LIMESTONE

MARLSTONE

METAMORPHIC

NO SAMPLE

SALT SANDSTONE

SALT-PEPPER SALT

SHALE

SHALE COLORED

SHALE GRAY

SHALY SANDSTONE

SHALY SILTSTONE

SILTY SHALE

SILTSTONE

TILL

TUFF

WELDED TUFF

Accessories

F FOSSIL

GASTROPOD

OOLITE

AMPHIROA

BELEMITE

BIOCLASTIC

BRACHIOPOD

BRYOZOA

CEPHALOPOD

CORAL

CRINOID

ECHINOID

FISH

FORAMINIFERA

ARGILLACEOUS

ARGILLITE GRAIN

B BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

CALCAREOUS

CARBONACEOUS FLAKES

CHTDK

CHTLT

COAL - THIN BEDS

DOLOMITIC

FELDSPAR

FERRUGINOUS PELLET

FERRUGINOUS

FERRUGINOUS

GLAUCONITE

GYPSEFEROUS

HEAVY MINERAL

INOCERAMUS

KAOLIN

MARLSTONE

MINERAL CRYSTALS

NODULES

PHOSPHATE PELLET:

PYRITE

SALT CAST

SANDY

SILICEOUS

SILT

SILTSTONE STRINGER

TUFFACEOUS

ANHYDRITE STRINGER

BENTONITE STRINGER

COAL STRINGER

DOLOMITE STRINGER

GYPSUM STRINGER

LIMESTONE STRINGER

MARLSTONE (CALC) STRG

MARLSTONE (DOL) STRG

SANDSTONE STRINGER

SHALE STRINGER

Other Symbols

MOLDIC

ORGANIC

DEAD

EVEN

QUESTIONABLE

SPOTTED STAINING

FAULT

FORMATION TOP

GAS SHOW

MINDEPTH MN DEPTH

NORMAL FAULT

OIL SHOW

OVERTURNED STRATA

REVERSE FAULT

SIDEWALL CORE (LEFT)

SIDEWALL CORE (RIGHT)

WIRELINE TESTED - LEFT

WIRELINE TESTED - RT

ANGULAR

ROUNDED

SUBANG

SUBRND

BOUNDSTONE

CHALKY

CRYPTOXLN

E EARTHY

FINELYXLN

GRAINSTONE

L LITHOGRAPHIC

MX MICROXLN

MIS MUDSTONE

PS PACKSTONE

WIS WACKSTONE

Oil Show

Porosity

Engineering

Textures

Sorting

FRACTURE

INTERCRYSTALLINE

INTEROOLITIC

CONNECTION (LEFT)

CONNECTION (RIGHT)

CONNECTION GAS

CORE - LOST

CORE - RECOVERED

DST INTERVAL

BIT

SLIDE

SURVEY

TRIP GAS

SLIDE

TRIP GAS

Slide/Rotate

BEGAN DRILLING CURVE
@ 11:47 PM 09/19/2013

ROP
ROP (ft/hr)
0
3000
3000000

Total Gas & Chromatograph

GAS
C1
C2
C3
C4

COLUMBINE LOGGING INC.
RIGGED UP ON 09/18/2013
MANNED 2-PERSON LOGGING
WITH BLOODHOUND GAS
CHROMATOGRAPH UNIT #0298
COLUMBINE BEGAN LOGGING
ON 09/18/2013

50' Sample Interval

1051u
C1: 85.0%
C2: 6.7%
C3: 5.7%
C4: 2.7%

1462u

Depth Labels

% Lith

Gamma

GAMMA

Well Bore
TV D

TV D (ft)

TV D (ft)

MD: 4,966 '
TV D: 4,928.24 '
Inclination: 0.5 °
Azimuth: 263.1 °
VS: -157.13 '

MD: 5,061 '
TV D: 5,023.2 '
Inclination: 2.5 °
Azimuth: 289.7 °
VS: -154.75 '

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.

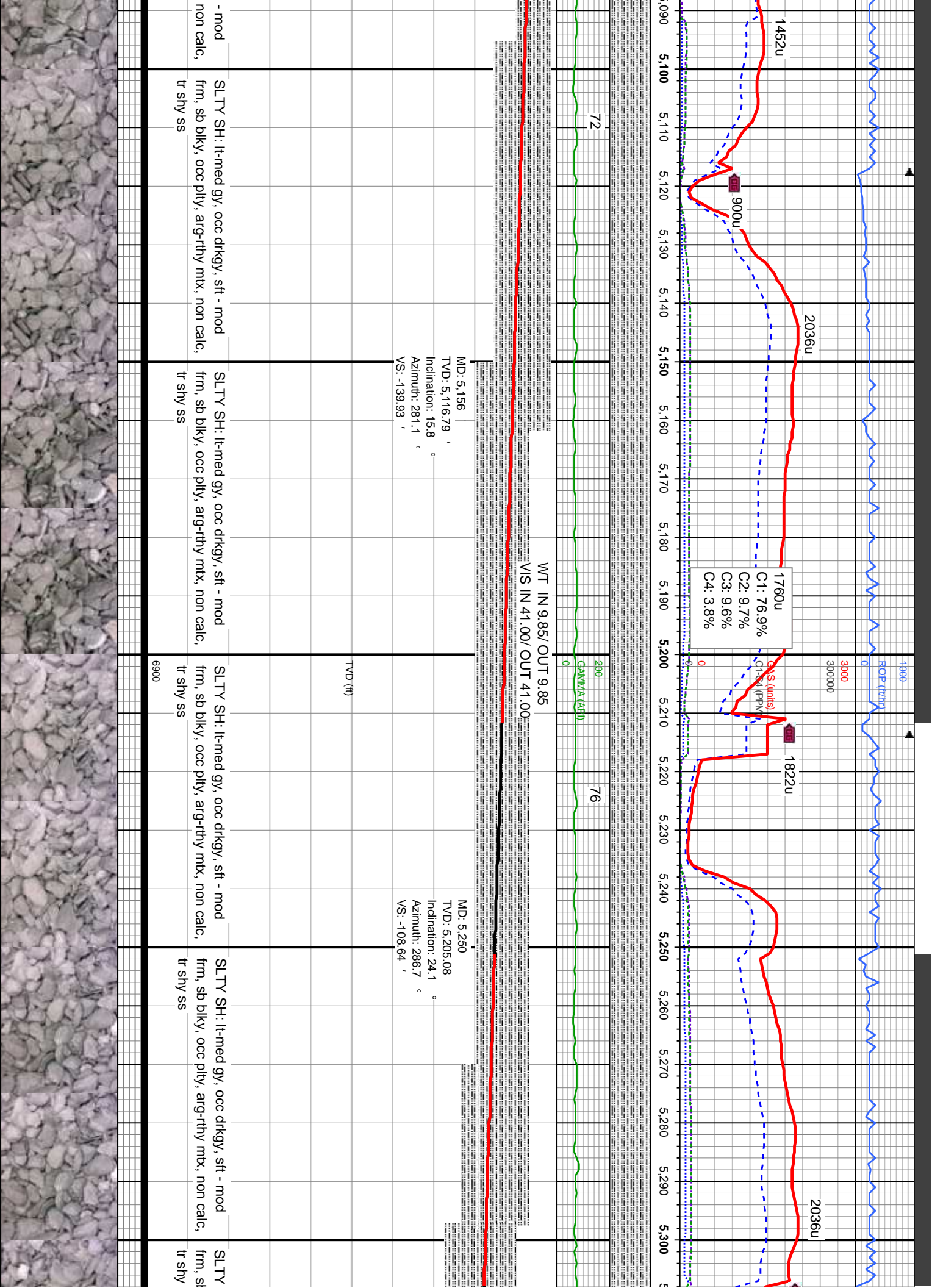
SLTY SH: lt-med gy, occ drkg, sft - mod
frm, sb blk, occ ply, arg-rthy mtx, non calc,
tr shy ss

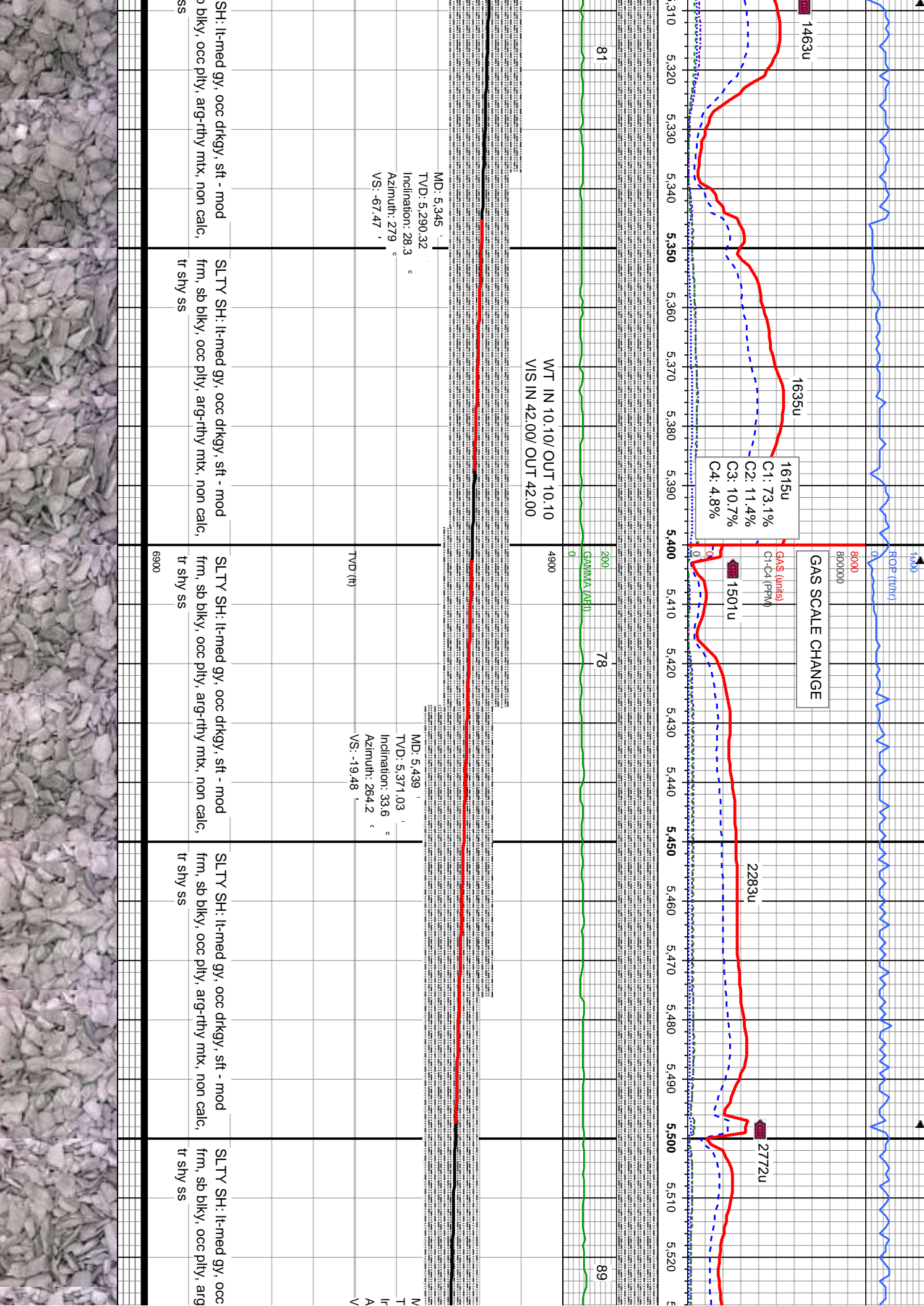
SLTY SH: lt-med gy, occ drkg, sft
frm, sb blk, occ ply, arg-rthy mtx,
tr shy ss

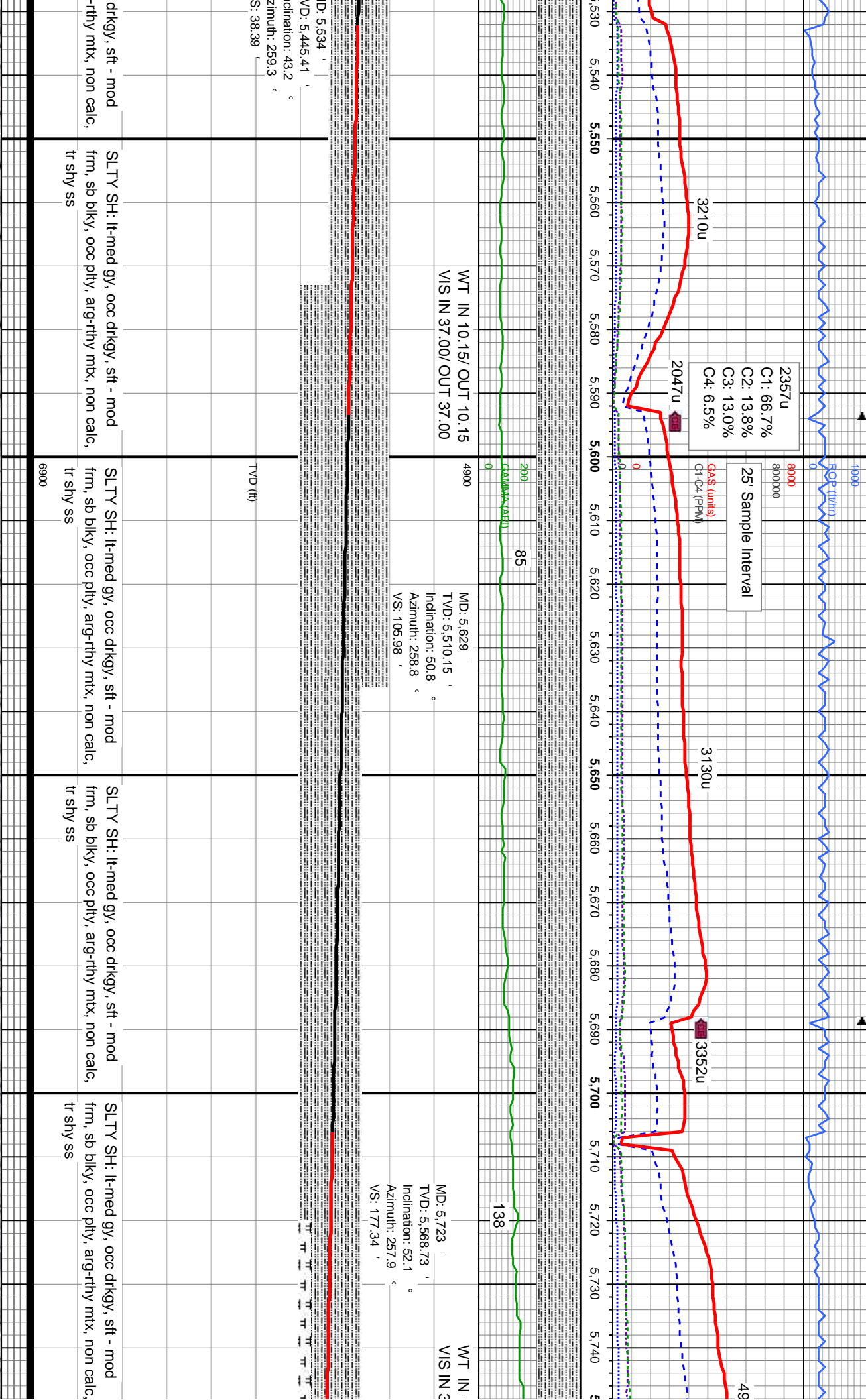
Oil Show

Images









2357u

C1: 66.7%
C2: 13.8%
C3: 13.0%
C4: 6.5%

25' Sample Interval

GAS (units)
C1-C4 (PPM)

3130u

3352u

WT IN 10.15/ OUT 10.15
VIS IN 37.00/ OUT 37.00

MD: 5.629
TVD: 5.510.15
Inclination: 50.8
Azimuth: 258.8
VS: 105.98

WT IN
VIS IN 3

MD: 5.723
TVD: 5.568.73
Inclination: 52.1
Azimuth: 257.9
VS: 177.34

ID: 5.534
VD: 5.445.41
Inclination: 43.2
Azimuth: 259.3
VS: 38.39

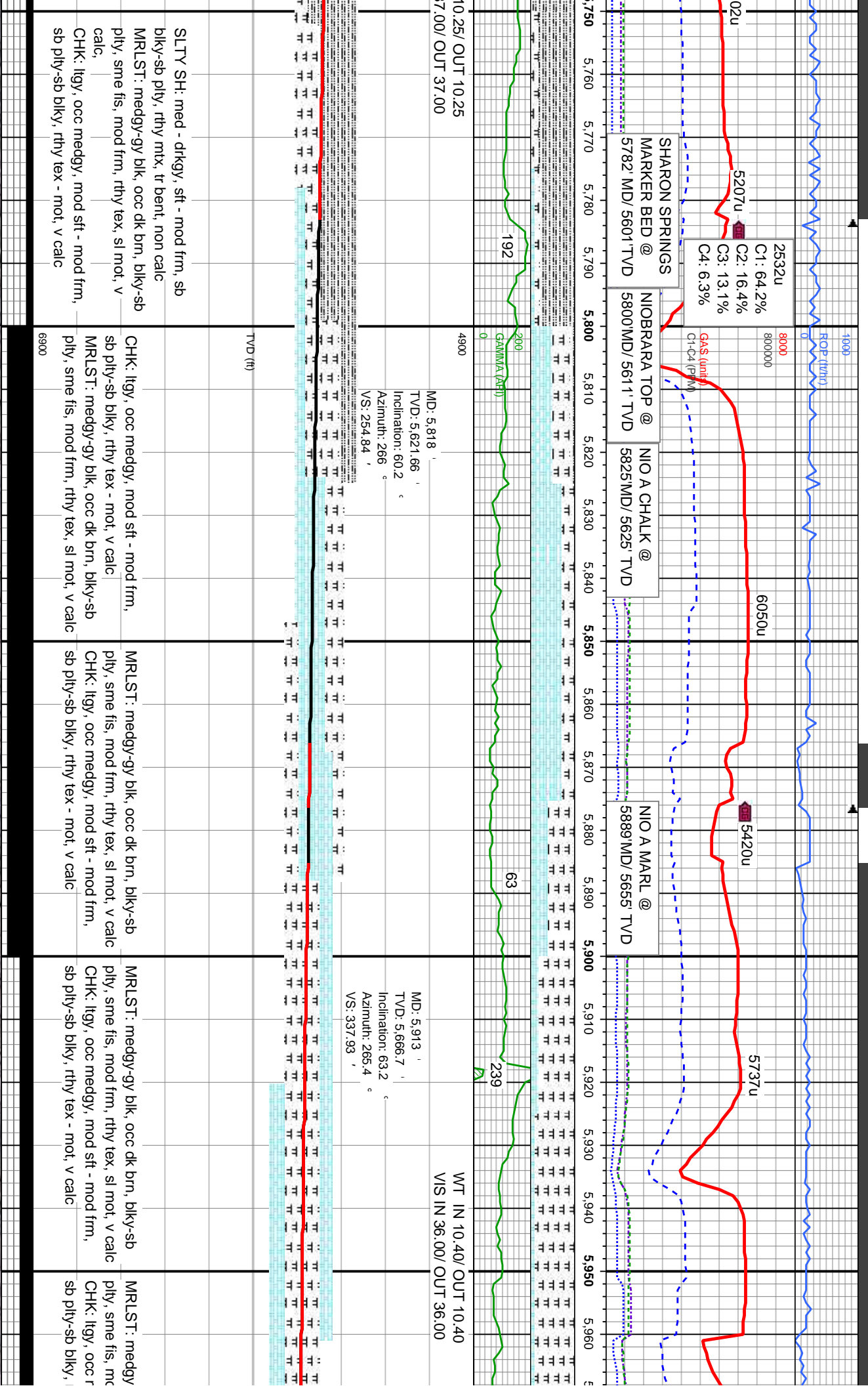
TVD (ft)

SLTY SH: lt-med gy, occ drkg, sft - mod
frm, sb blk, occ pty, arg-rthy mt, non calc,
tr shy ss

SLTY SH: lt-med gy, occ drkg, sft - mod
frm, sb blk, occ pty, arg-rthy mt, non calc,
tr shy ss

SLTY SH: lt-med gy, occ drkg, sft - mod
frm, sb blk, occ pty, arg-rthy mt, non calc,
tr shy ss

SLTY SH: lt-med gy, occ drkg, sft - mod
frm, sb blk, occ pty, arg-rthy mt, non calc,
tr shy ss



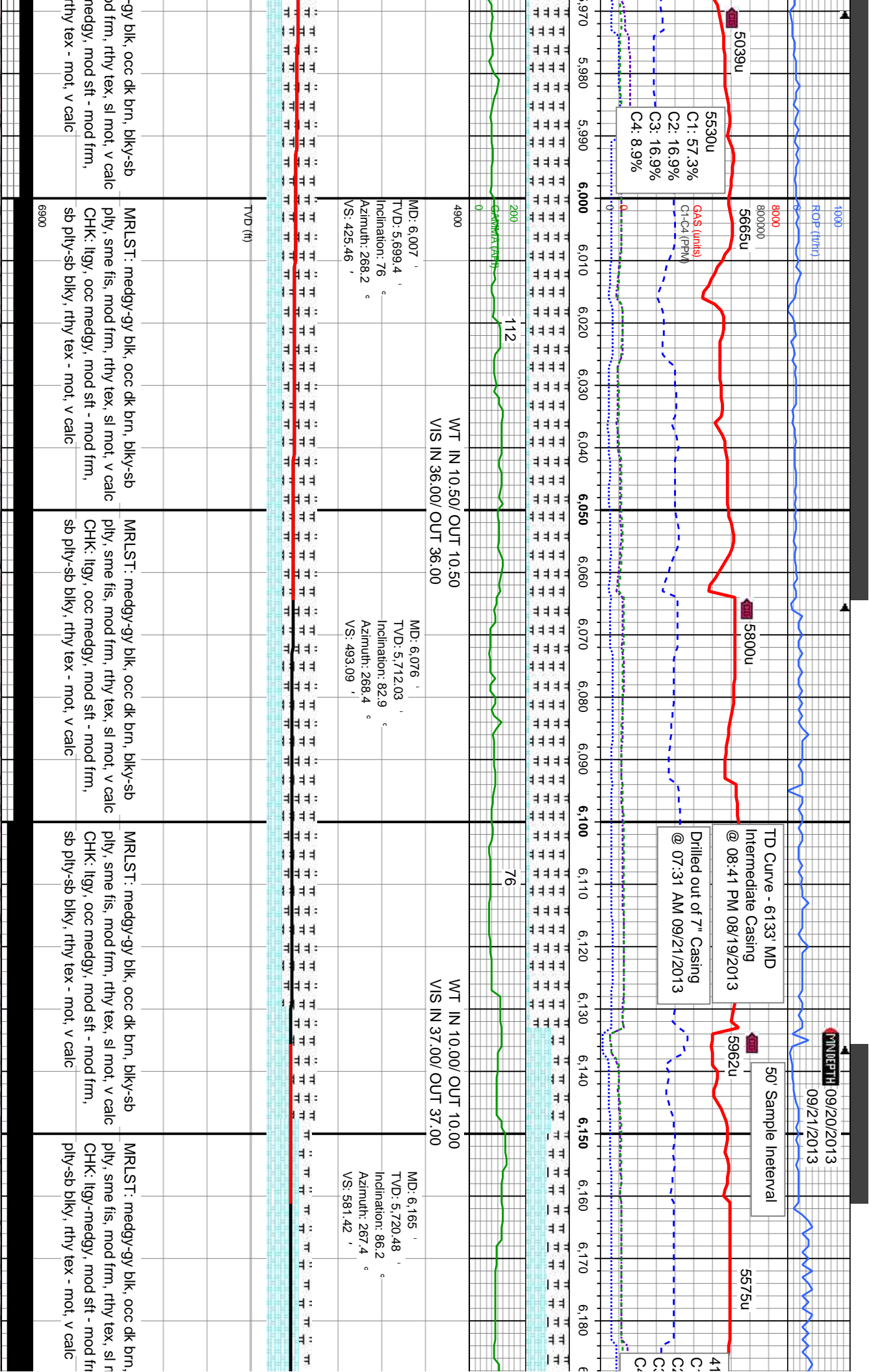
SLTY SH: med - drkgy, sft - mod frm, sb
biky-sb ply, rthy mtx, tr bent, non calc
MRLST: medgy-gy blk, occ dk brn, biky-sb
ply, sme fis, mod frm, rthy tex, sl mot, v
calc,
CHK: lgy, occ medgy, mod sft - mod frm,
sb ply-sb biky, rthy tex - mot, v calc

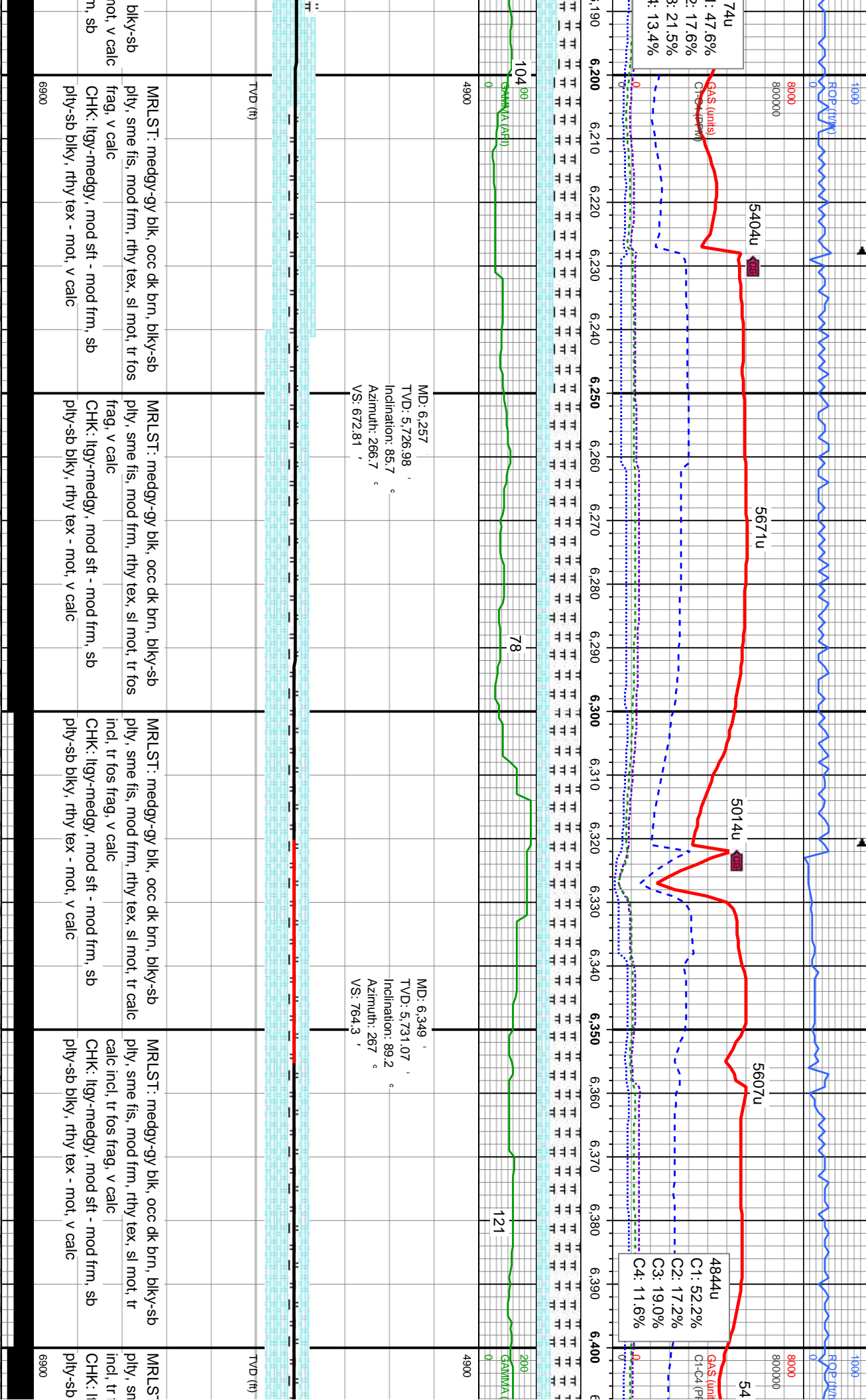
CHK: lgy, occ medgy, mod sft - mod frm,
sb ply-sb biky, rthy tex - mot, v calc
MRLST: medgy-gy blk, occ dk brn, biky-sb
ply, sme fis, mod frm, rthy tex, sl mot, v calc
CHK: lgy, occ medgy, mod sft - mod frm,
sb ply-sb biky, rthy tex - mot, v calc

MRLST: medgy-gy blk, occ dk brn, biky-sb
ply, sme fis, mod frm, rthy tex, sl mot, v calc
CHK: lgy, occ medgy, mod sft - mod frm,
sb ply-sb biky, rthy tex - mot, v calc

MRLST: medgy-gy blk, occ dk brn, biky-sb
ply, sme fis, mod frm, rthy tex, sl mot, v calc
CHK: lgy, occ medgy, mod sft - mod frm,
sb ply-sb biky, rthy tex - mot, v calc

MRLST: medgy
ply, sme fis, mc
CHK: lgy, occ r
sb ply-sb biky,





74u
: 47.6%
2: 17.6%
3: 21.5%
4: 13.4%

GAS (units)
C1-C4 (ppm)

ROP (ft)

5404u

5671u

5014u

5607u

4844u

GAS (units)
C1-C4 (ppm)

C1: 52.2%
C2: 17.2%
C3: 19.0%
C4: 11.6%

104 90
GAMA (API)

78

121

200
GAMA (API)

MD: 6.257
TVD: 5,726.98
Inclination: 85.7 °
Azimuth: 266.7 °
VS: 672.81

MD: 6.349
TVD: 5,731.07
Inclination: 89.2 °
Azimuth: 267 °
VS: 764.3

TVD (ft)

TVD (ft)

MRLST: medgy-gy blk, occ dk brn, blk-y-sb
ply, sme fis, mod frm, rthy tex, sl mot, tr fos
frag, v calc
CHK: llyg-medgy, mod sft - mod frm, sb
ply-sb blk, rthy tex - mot, v calc

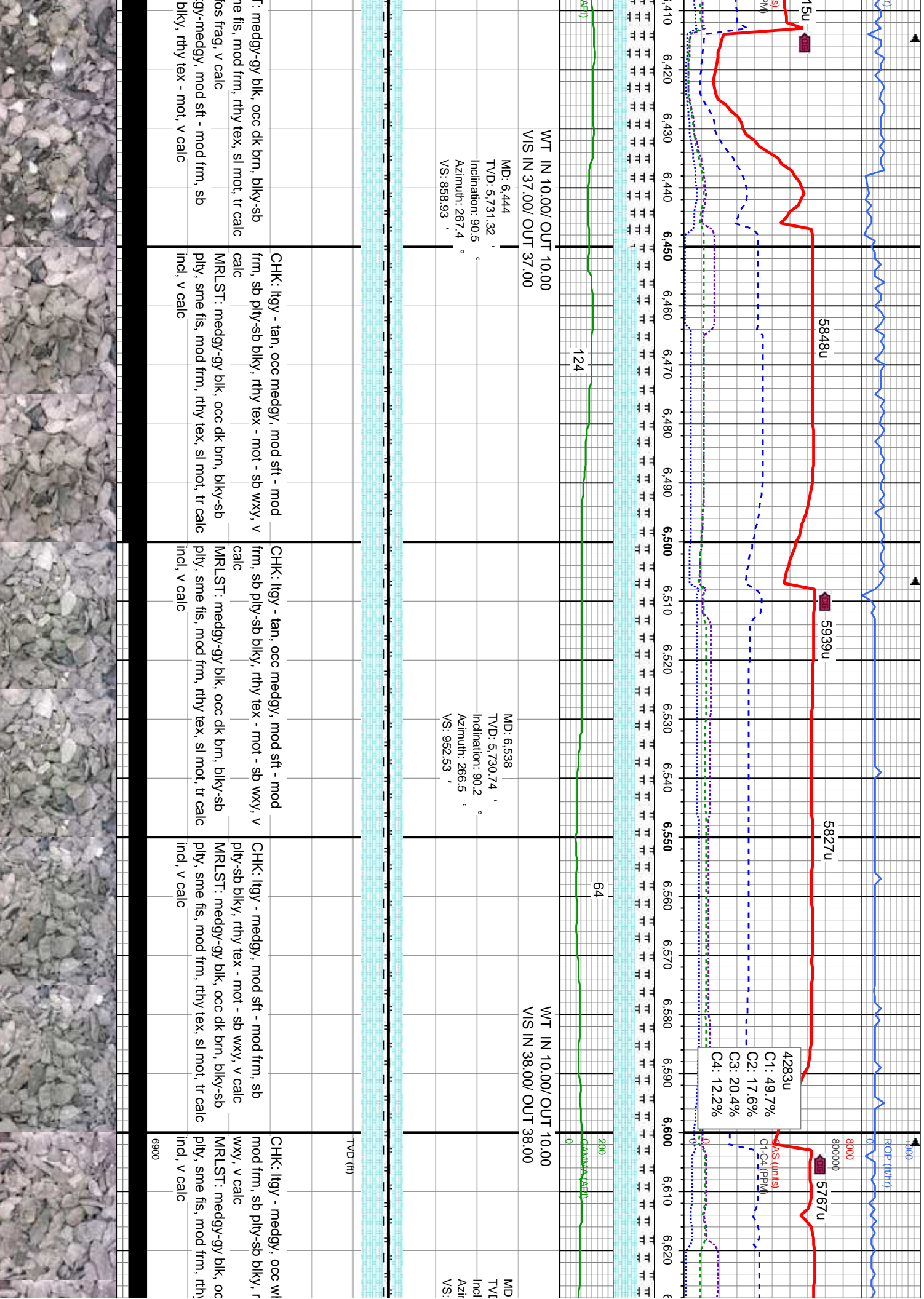
MRLST: medgy-gy blk, occ dk brn, blk-y-sb
ply, sme fis, mod frm, rthy tex, sl mot, tr fos
frag, v calc
CHK: llyg-medgy, mod sft - mod frm, sb
ply-sb blk, rthy tex - mot, v calc

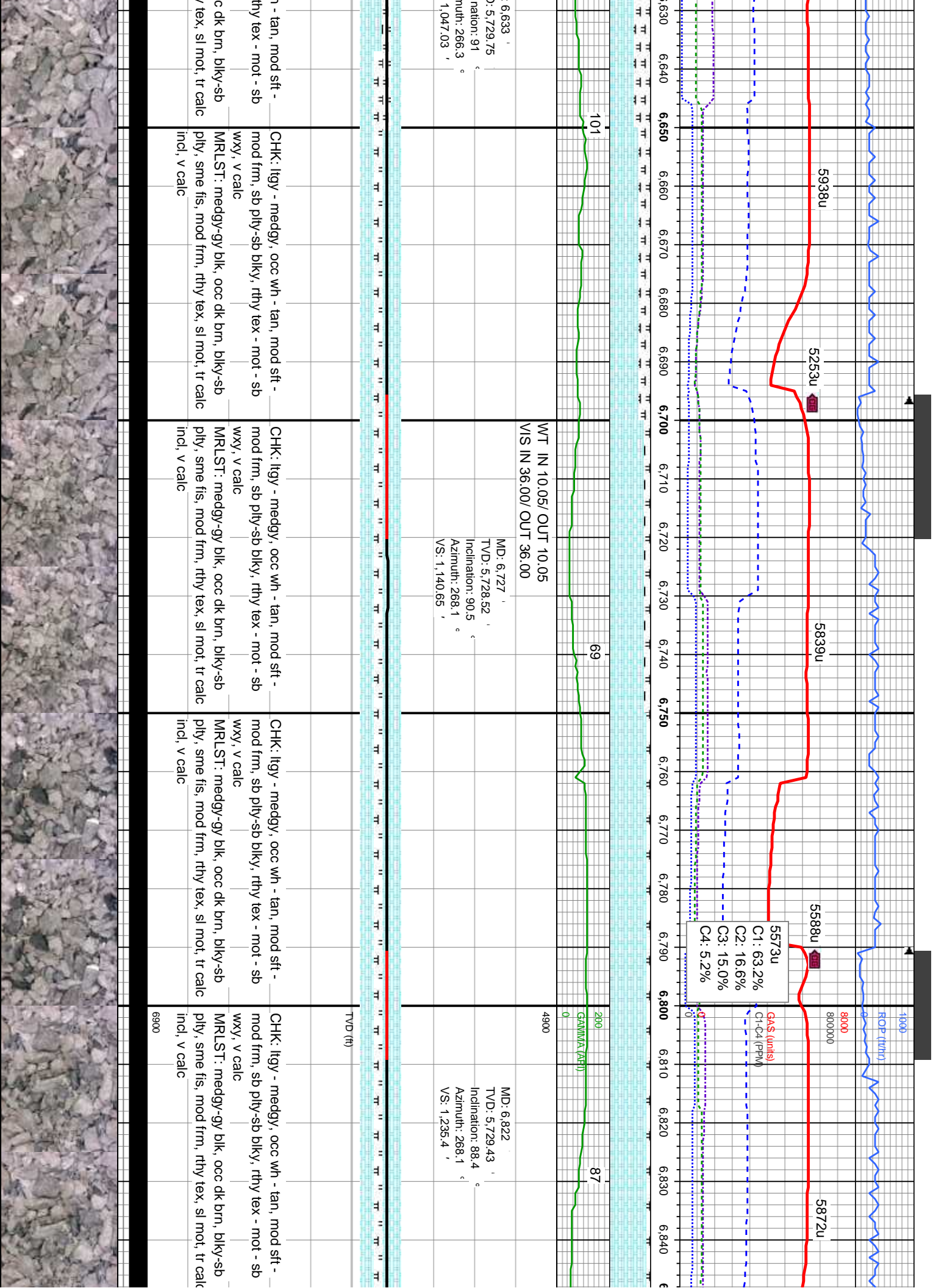
MRLST: medgy-gy blk, occ dk brn, blk-y-sb
ply, sme fis, mod frm, rthy tex, sl mot, tr calc
incl, tr fos frag, v calc
CHK: llyg-medgy, mod sft - mod frm, sb
ply-sb blk, rthy tex - mot, v calc

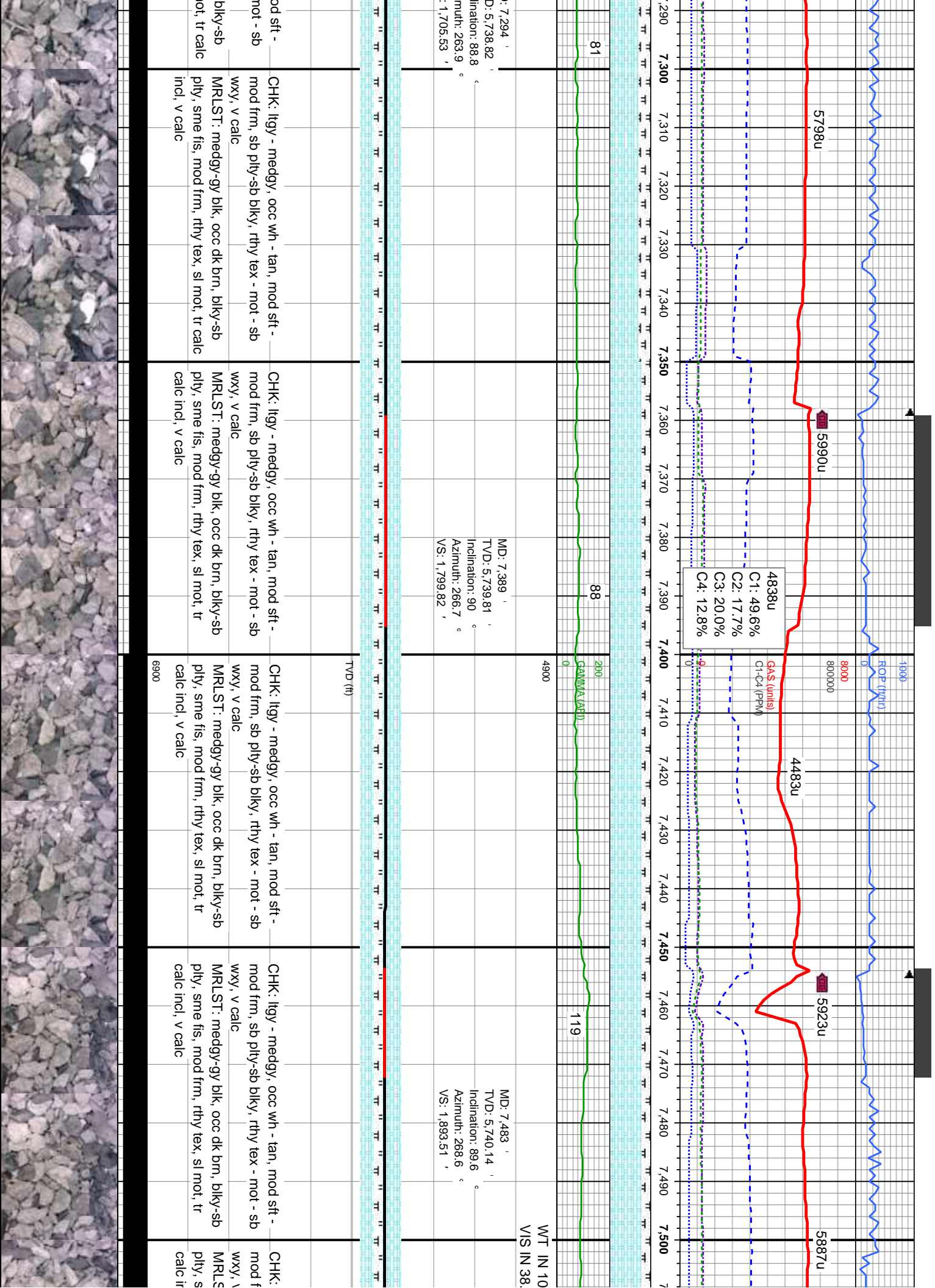
MRLST: medgy-gy blk, occ dk brn, blk-y-sb
ply, sme fis, mod frm, rthy tex, sl mot, tr
calc incl, tr fos frag, v calc
CHK: llyg-medgy, mod sft - mod frm, sb
ply-sb blk, rthy tex - mot, v calc

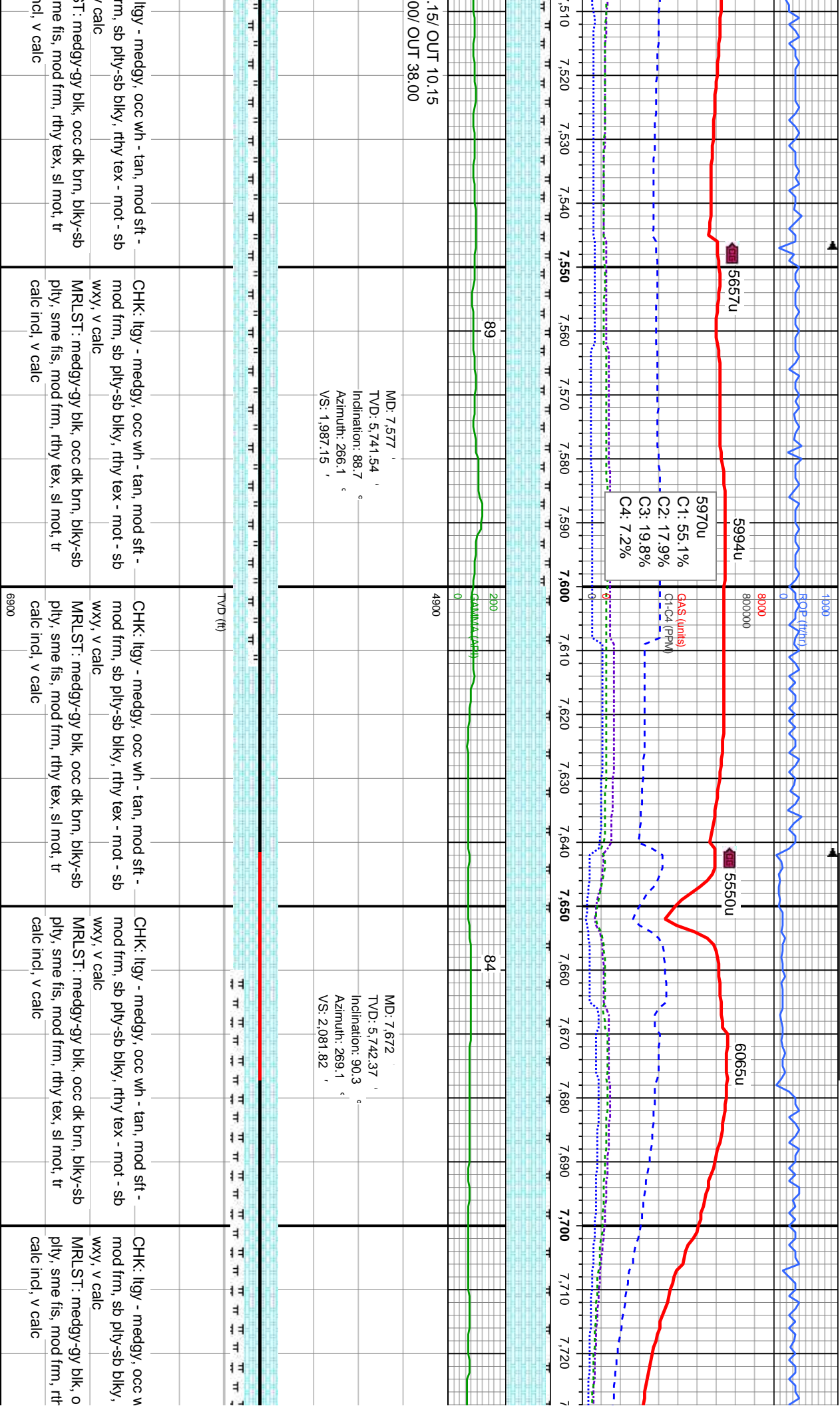
MRLST: medgy-gy blk, occ dk brn, blk-y-sb
ply, sme fis, mod frm, rthy tex, sl mot, tr
calc incl, tr fos frag, v calc
CHK: llyg-medgy, mod sft - mod frm, sb
ply-sb blk, rthy tex - mot, v calc

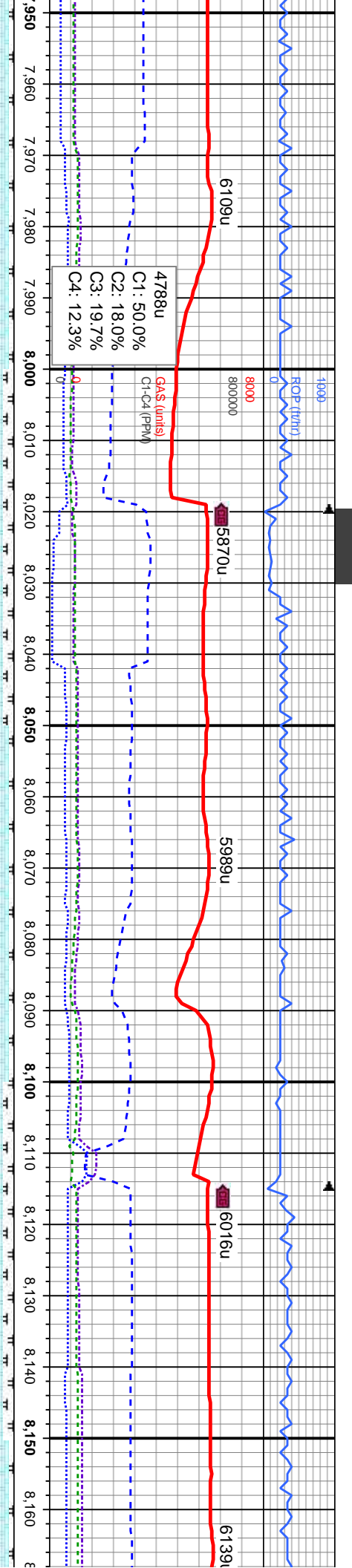
6900







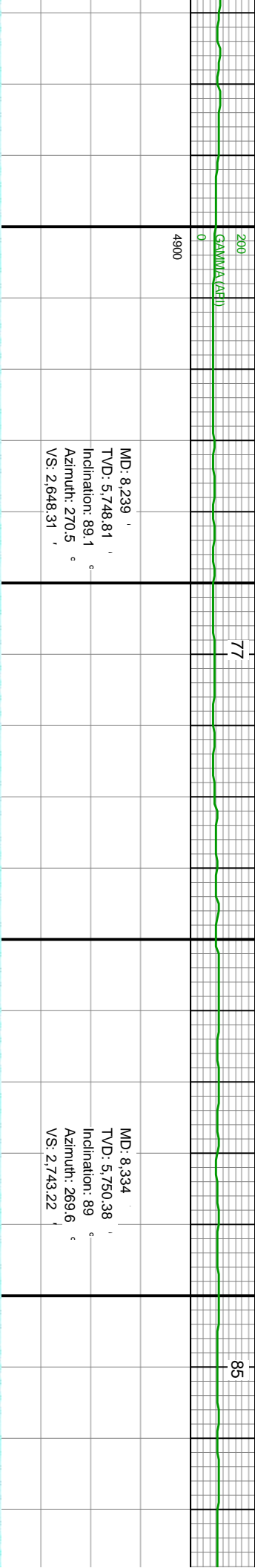
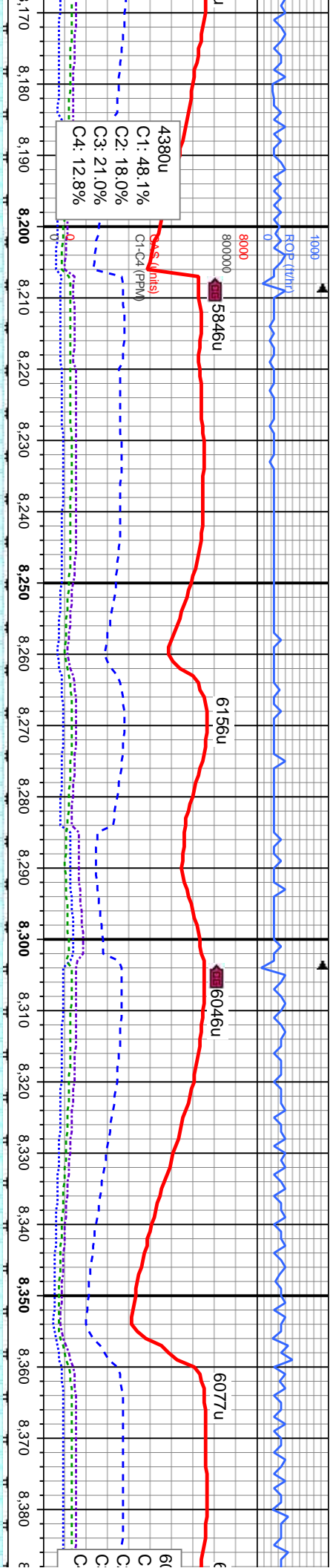




85	200	84	121
Gamma-ray			
	4900		
ID: 7.965 ' VD: 5.742.94 ' Inclination: 89.4 ° azimuth: 271.2 ° S: 2.364.45 ' MD: 8.050 TVD: 5.744.77 ' Inclination: 86.4 ° Azimuth: 270.9 ° VS: 2.459.41 ' MD: 8.145 TVD: 5.747.09 ' Inclination: 88.8 ° Azimuth: 271 ° VS: 2.554.35 ' WT IN 10.15/ OUT 10.15 VIS IN 38.00/ OUT 38.00			

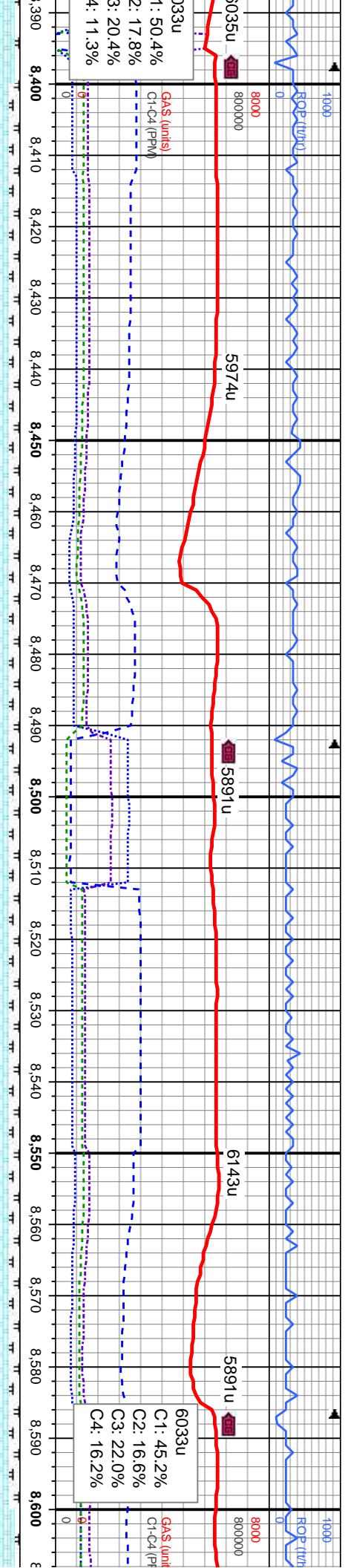
CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb pty-sb blk, rthy tex - mot - sb wxy, v calc	CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb pty-sb blk, rthy tex - mot - sb wxy, v calc	CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb pty-sb blk, rthy tex - mot - sb wxy, v calc	CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb pty-sb blk, rthy tex - mot - sb wxy, v calc
MRLST: medgy-gy blk, occ dk brn, blk, sb pty, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc	MRLST: medgy-gy blk, occ dk brn, blk, sb pty, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc	MRLST: medgy-gy blk, occ dk brn, blk, sb pty, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc	MRLST: medgy-gy blk, occ dk brn, blk, sb pty, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc
6900			





occ wh - tan, mod sft - y-sb blk, rthy tex - mot - sb	CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb pty-sb blk, rthy tex - mot - sb wxy, v calc	MD: 8,239 TVD: 5,748.81 Inclination: 89.1 Azimuth: 270.5 VS: 2,648.31
occ dk brn, blk, rthy tex, sl mot, tr	CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb pty-sb blk, rthy tex - mot - sb wxy, v calc	MD: 8,334 TVD: 5,750.38 Inclination: 89 Azimuth: 269.6 VS: 2,743.22

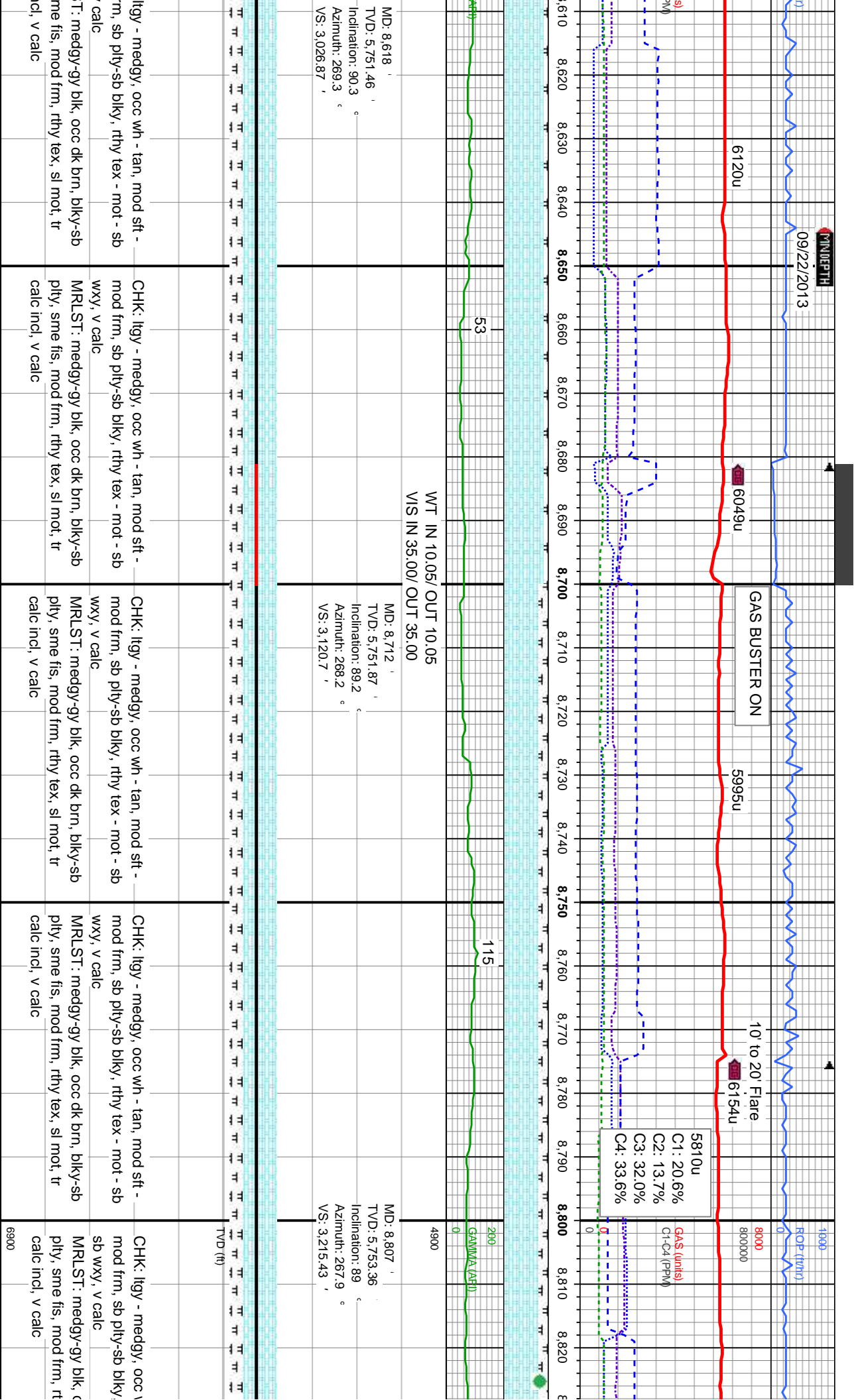


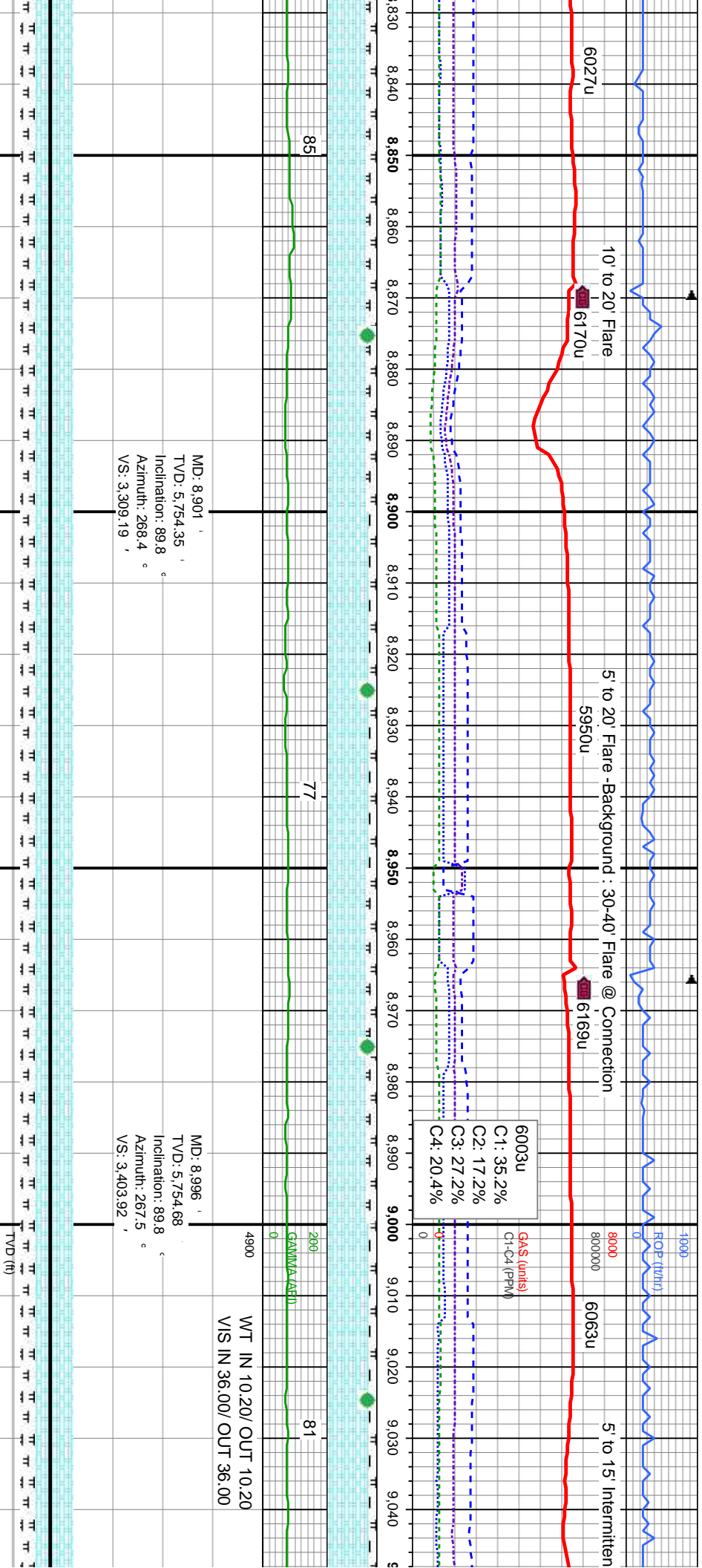


200	76	89	200
GAMMA (API)	GAMMA (API)	GAMMA (API)	GAMMA (API)
0	0	0	0
4900			4900
MD: 8.429 ' , TVD: 5.751.63 ' , Inclination: 89.5 ° , Azimuth: 269.1 ° , VS: 2.838.09 ' ,			
WT IN 10.20/ OUT 10.20 VIS IN 36.00/ OUT 36.00			
MD: 8.523 ' , TVD: 5.751.87 ' , Inclination: 90.2 ° , Azimuth: 269.8 ° , VS: 2.931.98 ' ,			

mod sft - mot - sb	CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb plty-sb blk, rthy tex - mot - sb wxy, v calc	CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb plty-sb blk, rthy tex - mot - sb wxy, v calc	CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb plty-sb blk, rthy tex - mot - sb wxy, v calc	CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb plty-sb blk, rthy tex - mot - sb wxy, v calc
mod sft - mot - sb	MRSLT: medgy-gy blk, occ dk brn, blk-sb plty, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc	MRSLT: medgy-gy blk, occ dk brn, blk-sb plty, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc	MRSLT: medgy-gy blk, occ dk brn, blk-sb plty, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc	MRSLT: medgy-gy blk, occ dk brn, blk-sb plty, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc
6900				6900

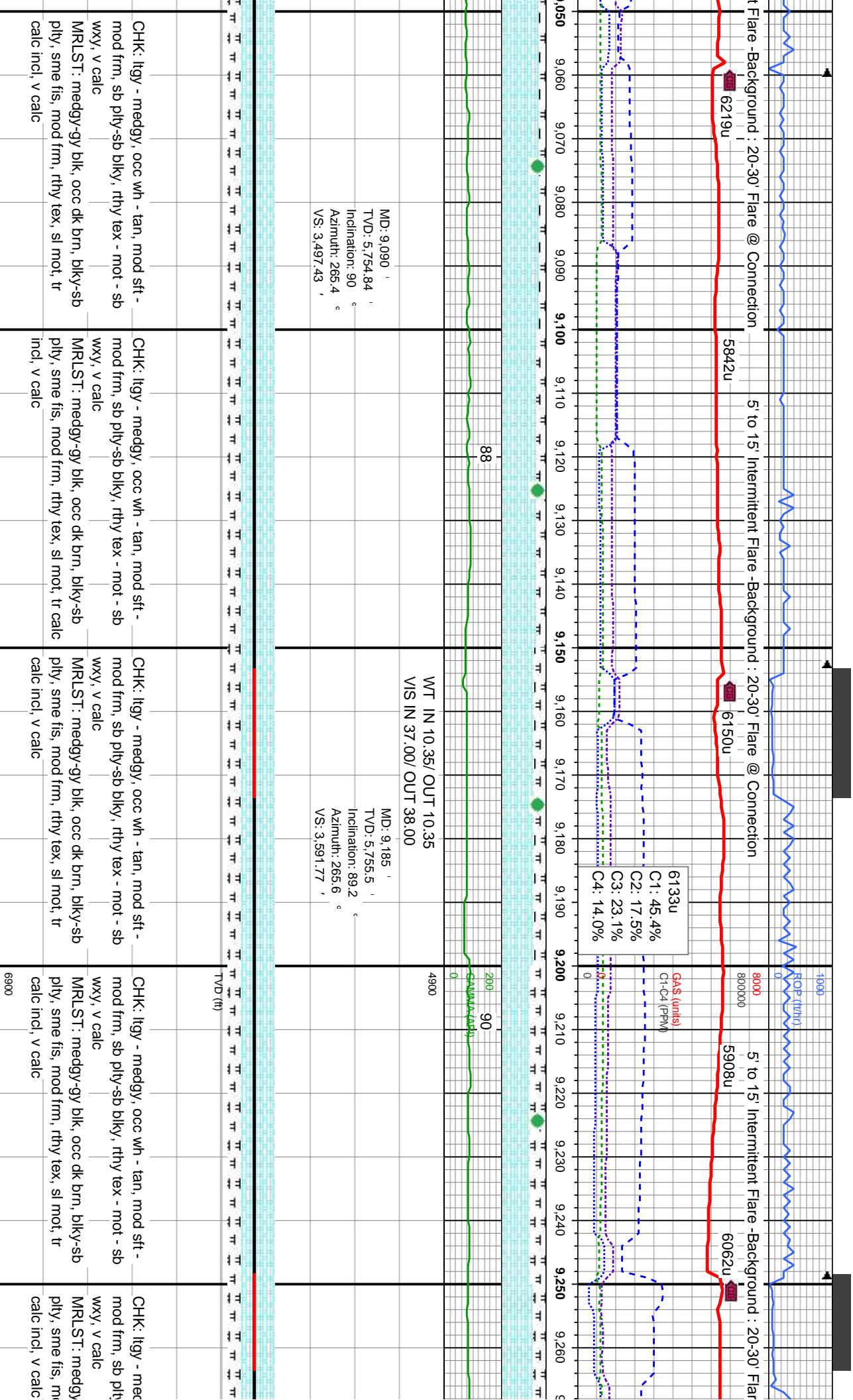






wh - tan, mod sft - rthy tex - mot -	CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb pty-sb blk, rthy tex - mot - sb wxy, v calc	CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb pty-sb blk, rthy tex - mot - sb wxy, v calc	CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb pty-sb blk, rthy tex - mot - sb wxy, v calc	CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb pty-sb blk, rthy tex - mot - sb wxy, v calc
occ dk brn, blk, sb rthy tex, sl mot, tr	MRLST: medgy-gy blk, occ dk brn, blk, sb pty, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc	MRLST: medgy-gy blk, occ dk brn, blk, sb pty, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc	MRLST: medgy-gy blk, occ dk brn, blk, sb pty, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc	MRLST: medgy-gy blk, occ dk brn, blk, sb pty, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc





MD: 9,090 '
TVD: 5,754.84 '
Inclination: 90 °
Azimuth: 265.4 °
VS: 3,497.43 '

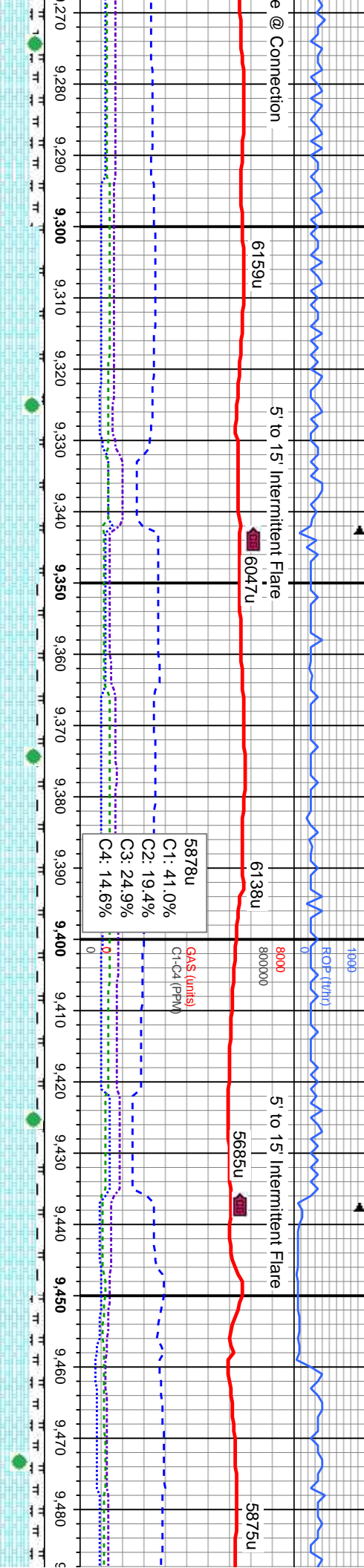
WT IN 10.35/ OUT 10.35
V/S IN 37.00/ OUT 38.00

MD: 9,185 '
TVD: 5,755.5 '
Inclination: 89.2 °
Azimuth: 265.6 °
VS: 3,591.77 '

6133u
C1: 45.4%
C2: 17.5%
C3: 23.1%
C4: 14.0%

GAS (units)
C1-C4 (PPM)

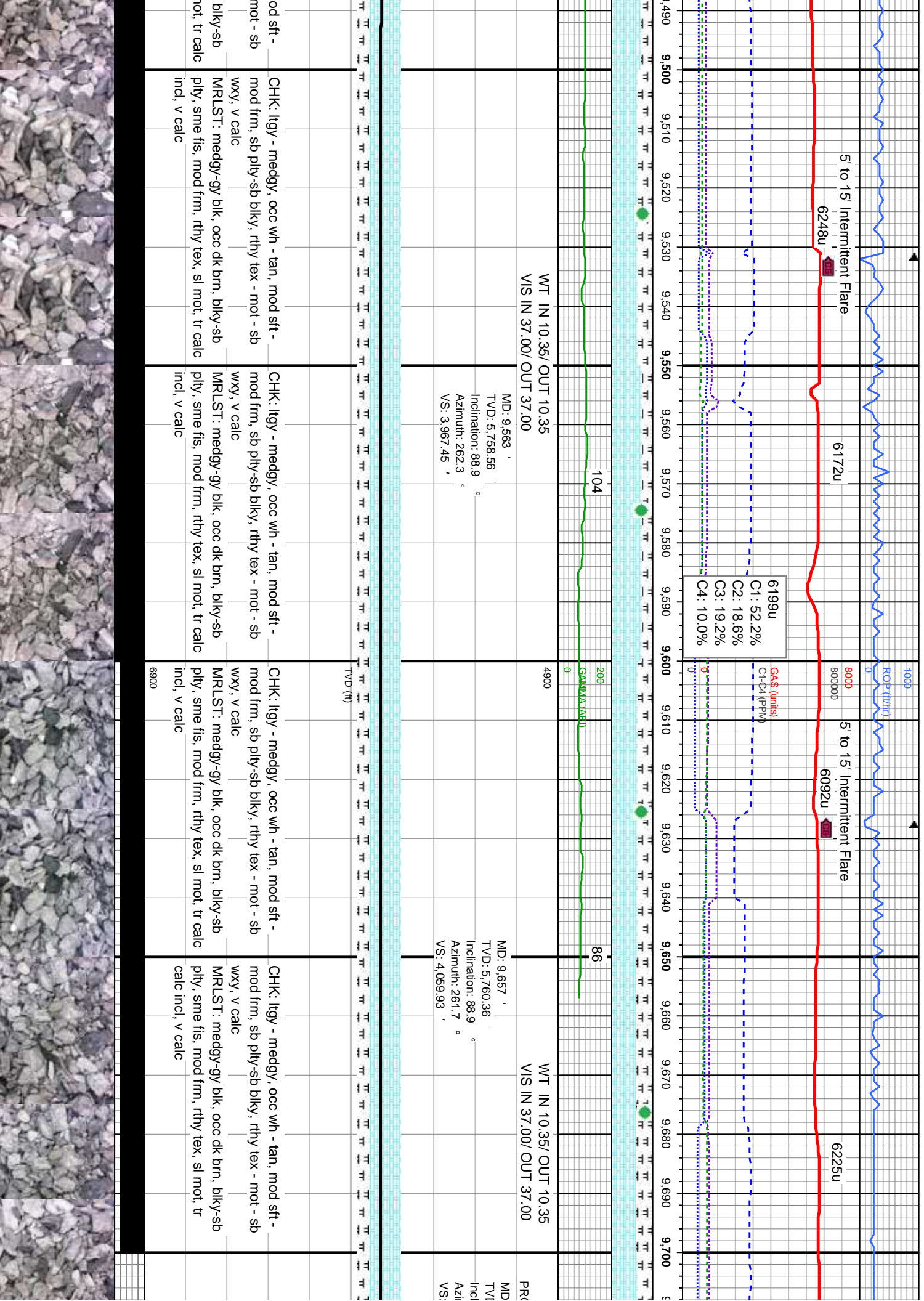
TVD (ft)



MD: 9.279 ' TVD: 5.756.33 ' Inclination: 89.8 ° Azimuth: 267.4 ° VS: 3.685.29 '	75	WT IN 10.30/ OUT 10.30 VIS IN 37.00/ OUT 37.00	MD: 9.374 ' TVD: 5.756.08 ' Inclination: 90.5 ° Azimuth: 268.1 ° VS: 3.780 '	75	WT IN 10.35/ OUT 10.35 VIS IN 38.00/ OUT 38.00	MD: 9.468 ' TVD: 5.756.65 ' Inclination: 88.8 ° Azimuth: 265.1 ° VS: 3.873.53 '
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lgy, occ wh - tan, mod sft - -sb blk, rthy tex - mot - sb	CHK: lgy - medgy, occ wh - tan, mod sft - mod frm, sb pty-sb blk, rthy tex - mot - sb wxy, v calc	CHK: lgy - medgy, occ wh - tan, mod sft - mod frm, sb pty-sb blk, rthy tex - mot - sb wxy, v calc	CHK: lgy - medgy, occ wh - tan, mod sft - mod frm, sb pty-sb blk, rthy tex - mot - sb wxy, v calc
-gy blk, occ dk brn, blk-sb mod frm, rthy tex, sl mot, tr	MRLST: medgy-gy blk, occ dk brn, blk-sb pty, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc	MRLST: medgy-gy blk, occ dk brn, blk-sb pty, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc	MRLST: medgy-gy blk, occ dk brn, pty, sme fis, mod frm, rthy tex, sl n incl, v calc





NOBLE ENERGY INC.
ROHN STATE LD09-68HN
TD @ 9716' MD
09/22/2013 @ 08:55 AM
THANK YOU
COLUMBINE LOGGING

