



Scale: 5" / 100'
Measured Depth Log

Well Name CUTTHROAT LC28079NHB HORZ

Location SEC 28 T9N R59W

State COLORADO

County WELD

Country USA

Rig Number HP 326

API Number 05-123-38855

AFE # 140726

Region DJ BASIN

Field DJ BASIN

Spud Date 8/5/2014

Drilling Completed 8/11/2014

Surface Coordinates 40° 42' 52.295 N
103° 58' 58.302 W

Ground Elevation 4854

K.B. Elevation 4892'

Logged Interval 644' To 10325'

Total Depth 10325'

Formation NIOBRARA B MARL

Type of Drilling Fluid LSND

Company Noble Energy Inc

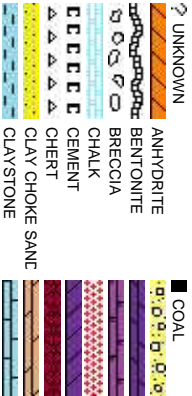
Address 1625 Broadway Suite 2200
Denver, CO 80202

Name EVAN HOWELL

Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Columbine Logging Inc.

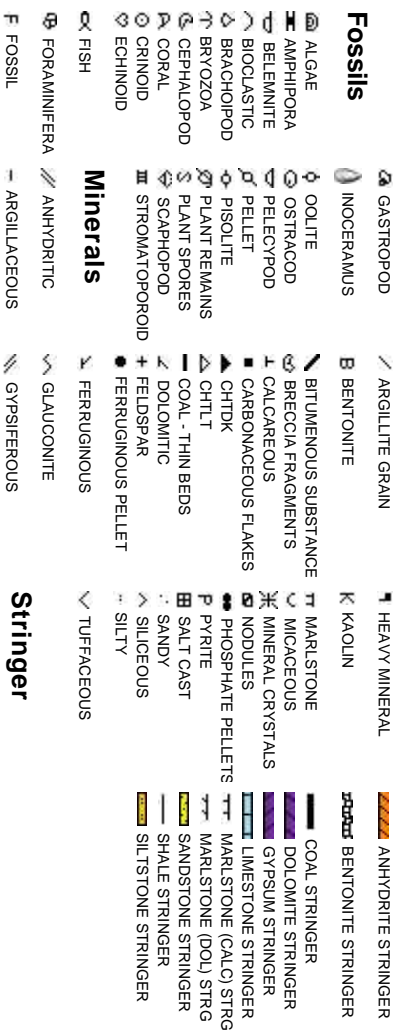


Operator

200

Accessories

Fossils



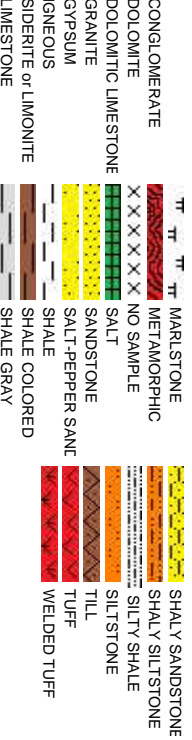
Geologist

200

Other

Kevin Donahue
Collin Metz

Rock Types



Other Symbols

Oil Show

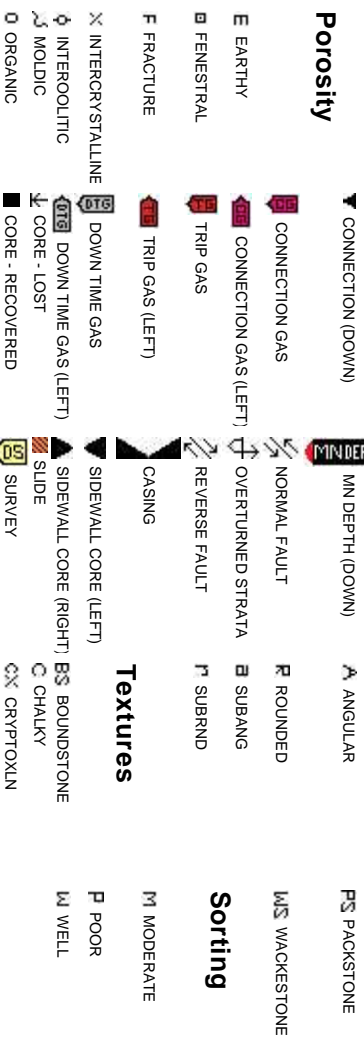


Engineering

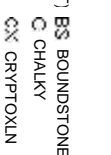


SPOTTED STAINING CONNECTION (UP)

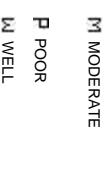
Porosity



Textures



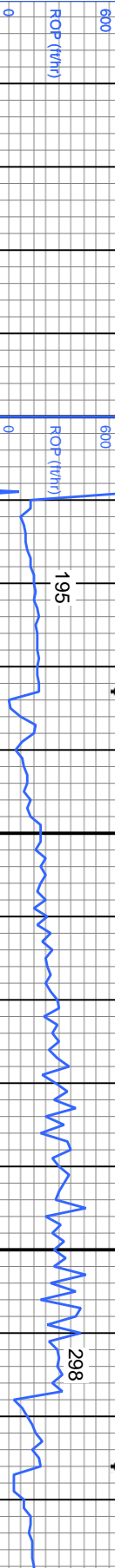
Sorting



Slide/Rotate

ROP

ROP (ft/hr)



Total Gas & Chromatograph

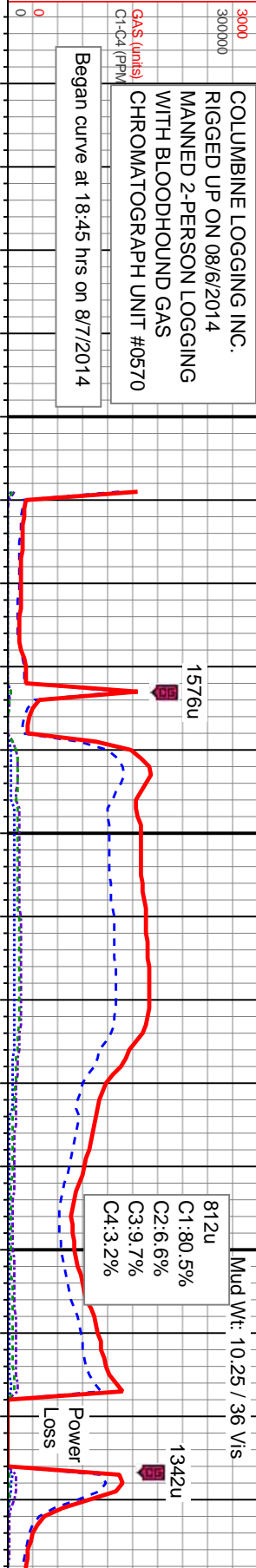
GAS

C1

C2

C3

C4

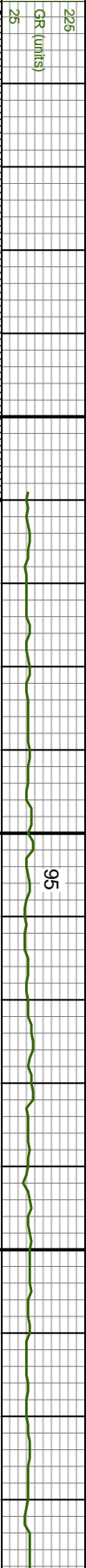


Depth Labels

% Lith

GAMMA

GR



50" Sample Intervals

SLTY SH: med-dk gy, sft-firm, sb pily - sb blk, silty rthy tex, non calc

SLTY SH: med-dk gy, sft-firm, sb pily - sb blk, silty rthy tex, non calc

SLTY SH: med-dk gy, sft-mod firm - sb blk, silty rthy tex, non calc

Well Bore
TVD

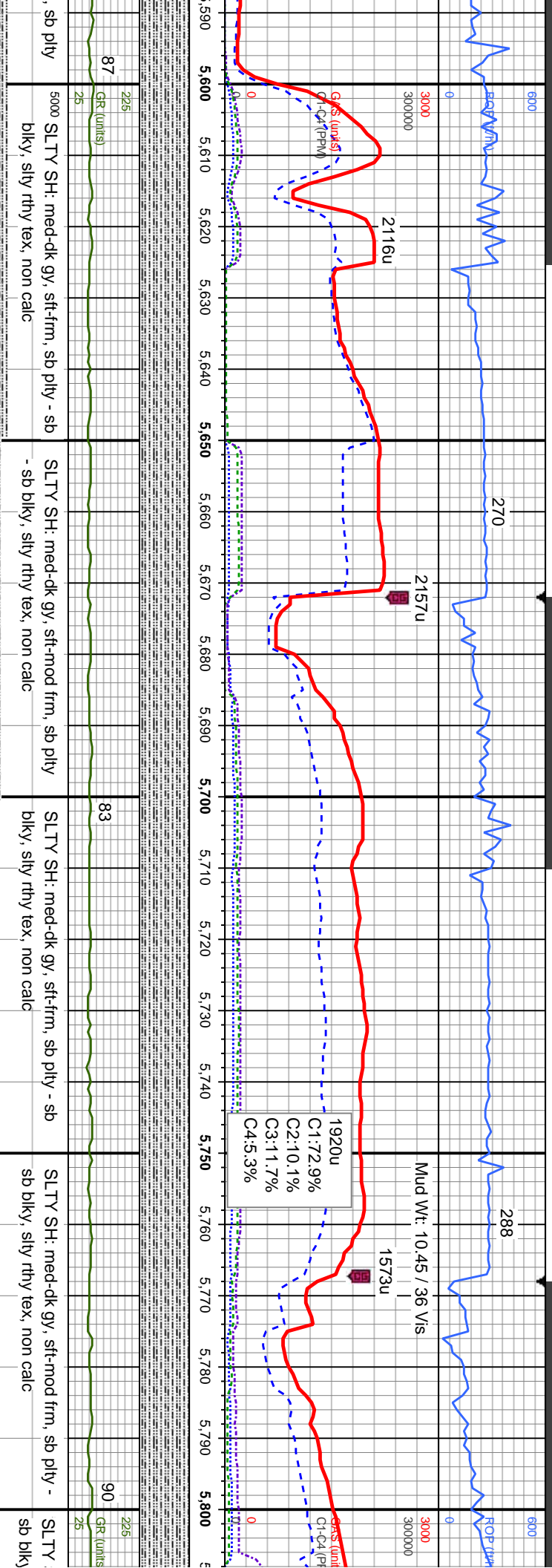
MD: 5,531'
TVD: 5,445.94'
Inclination: 16.36 °
Azimuth: 292 °
VS: 214.38'

Oil Show

Oil Show

Images



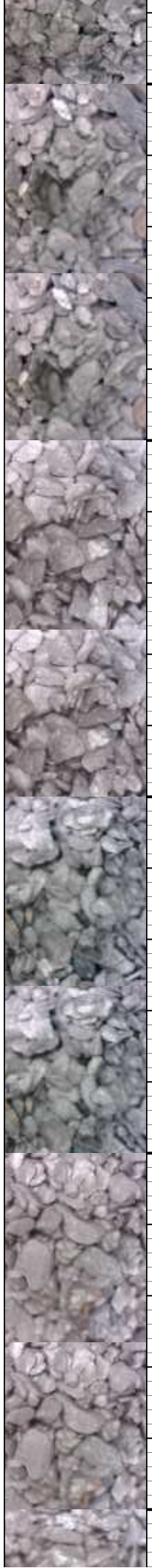


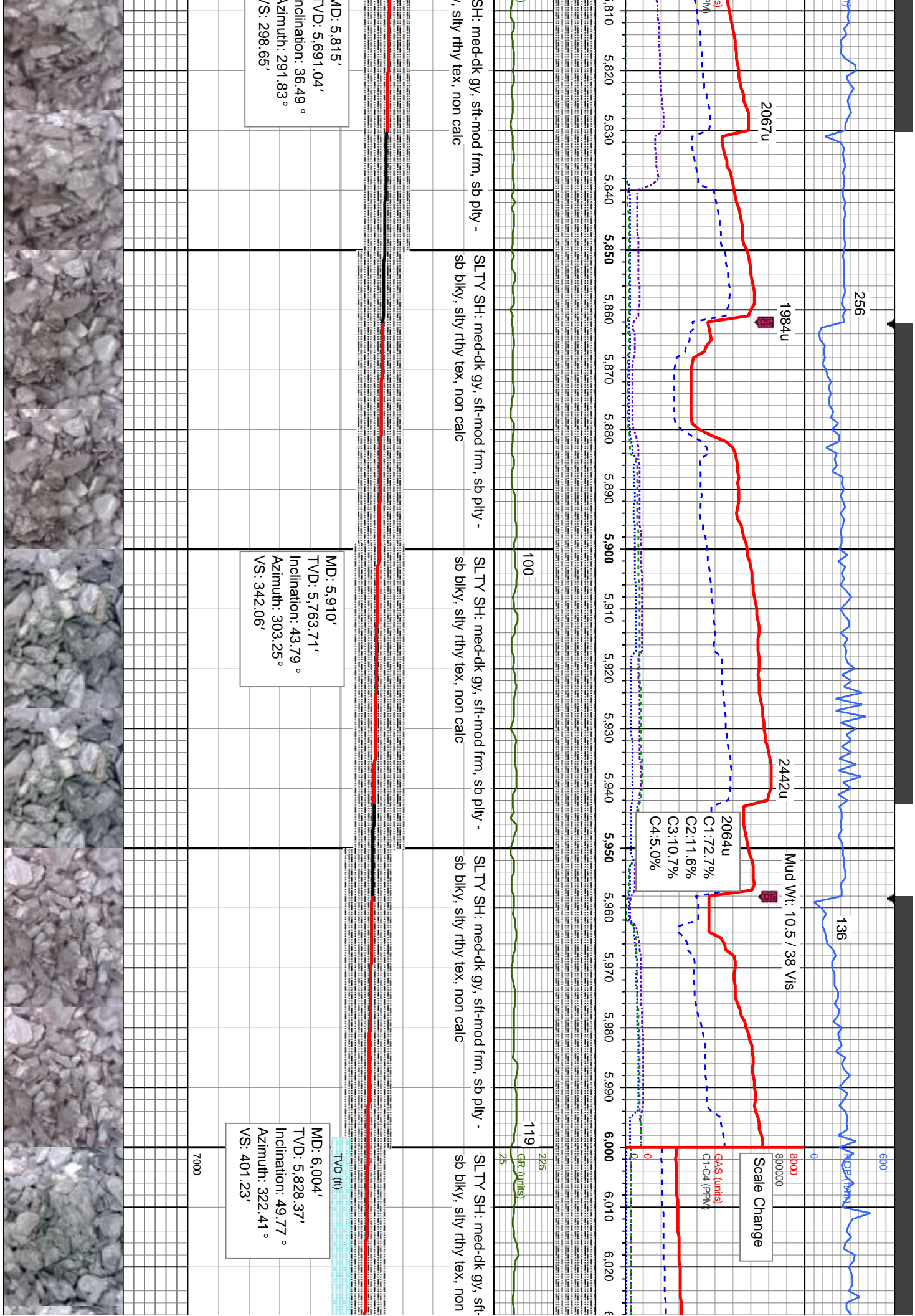
MD: 5,626'
TVD: 5,533.02'
Inclination: 30.16 °
Azimuth: 287.26 °
VS: 236.56'

MD: 5,721'
TVD: 5,613.88'
Inclination: 33.15 °
Azimuth: 289.19 °
VS: 265.63'

7000

7000





MD: 5,815'
TVD: 5,691.04'
Inclination: 36.49°
Azimuth: 291.83°
VS: 298.65'

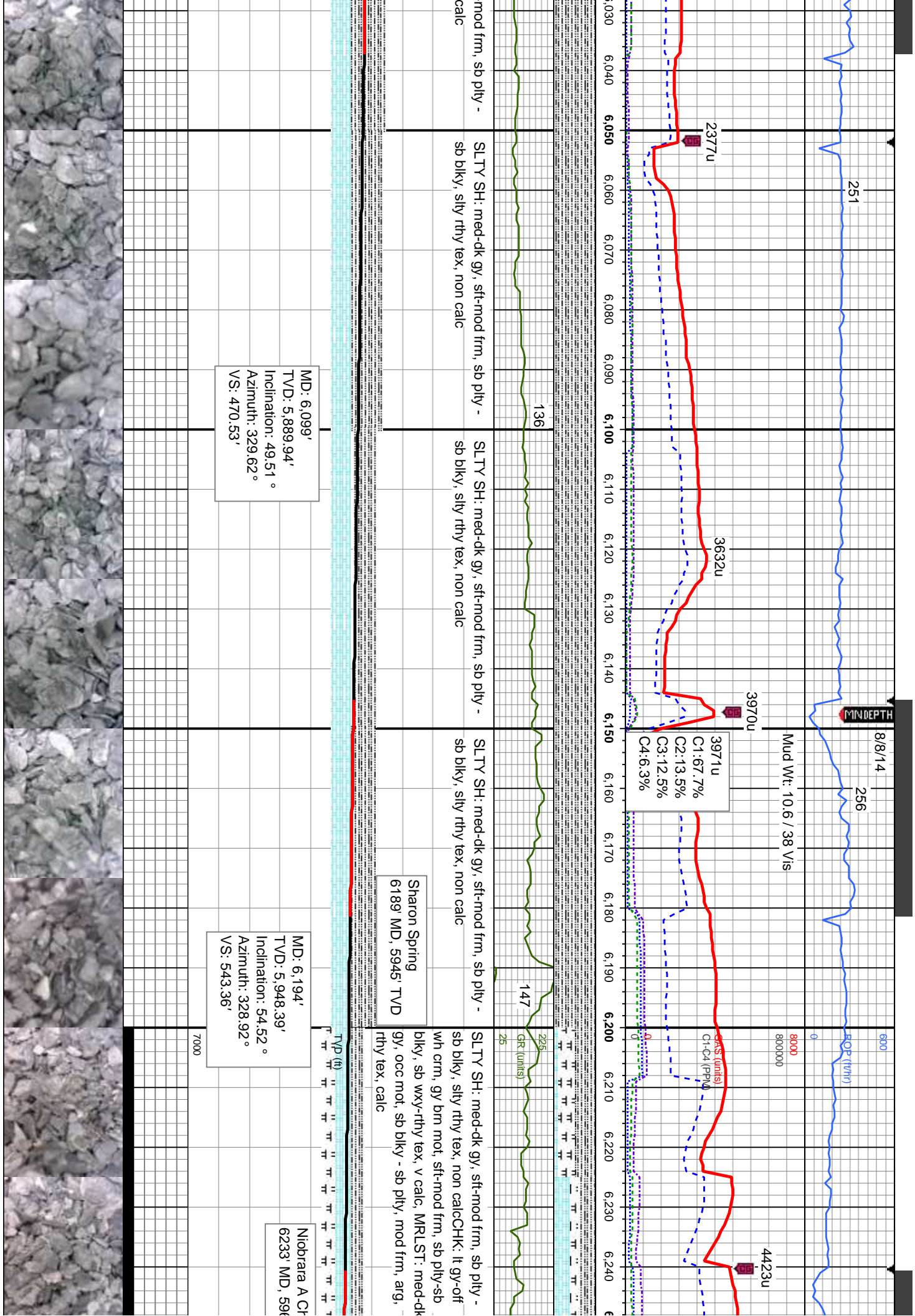
MD: 5,910'
TVD: 5,763.71'
Inclination: 43.79°
Azimuth: 303.25°
VS: 342.06'

MD: 6,004'
TVD: 5,828.37'
Inclination: 49.77°
Azimuth: 322.41°
VS: 401.23'

Scale Change

2064u
C1:72.7%
C2:11.6%
C3:10.7%
C4:5.0%

Mud Wt: 10.5 / 38 Vis

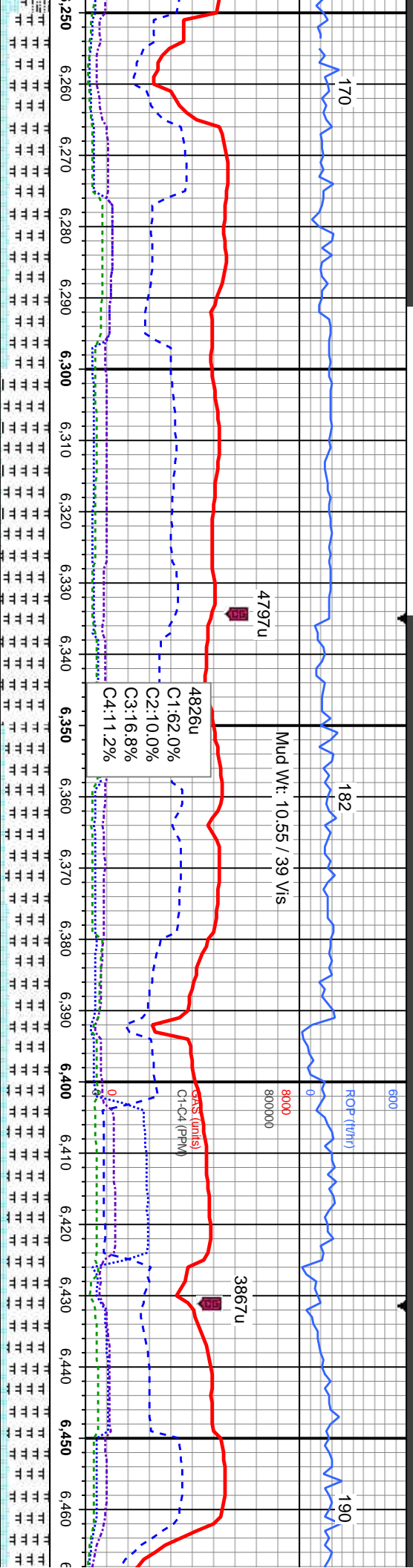


MD: 6,099'
TVD: 5,889.94'
Inclination: 49.51 °
Azimuth: 329.62 °
VS: 470.53'

Sharon Spring
6189' MD, 5945' TVD

MD: 6,194'
TVD: 5,948.39'
Inclination: 54.52 °
Azimuth: 328.92 °
VS: 543.36'

Niobrara A Ch
6233' MD, 596



6,250 6,260 6,270 6,280 6,290 6,300 6,310 6,320 6,330 6,340 6,350 6,360 6,370 6,380 6,390 6,400 6,410 6,420 6,430 6,440 6,450 6,460 6,470

ROP (ft/hr)

Mud Wt: 10.55 / 39 Vis

4797u

4826u

C1:62.0%
C2:10.0%
C3:16.8%
C4:11.2%

3867u

C1-C4 (PPM)

170

182

190

6,250 6,260 6,270 6,280 6,290 6,300 6,310 6,320 6,330 6,340 6,350 6,360 6,370 6,380 6,390 6,400 6,410 6,420 6,430 6,440 6,450 6,460 6,470

146

102

225

25

5000

MRLST: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc CHK: lt gy-off wh crm, gy brn mot, sft-mod frm, sb ply-sb blkly, sb wxy-rthy tex, v calc

MRLST: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc CHK: lt gy-off wh crm, gy brn mot, sft-mod frm, sb ply-sb blkly, sb wxy-rthy tex, v calc

MRLST: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc CHK: lt gy-off wh crm, gy brn mot, sft-mod frm, sb ply-sb blkly, sb wxy-rthy tex, v calc

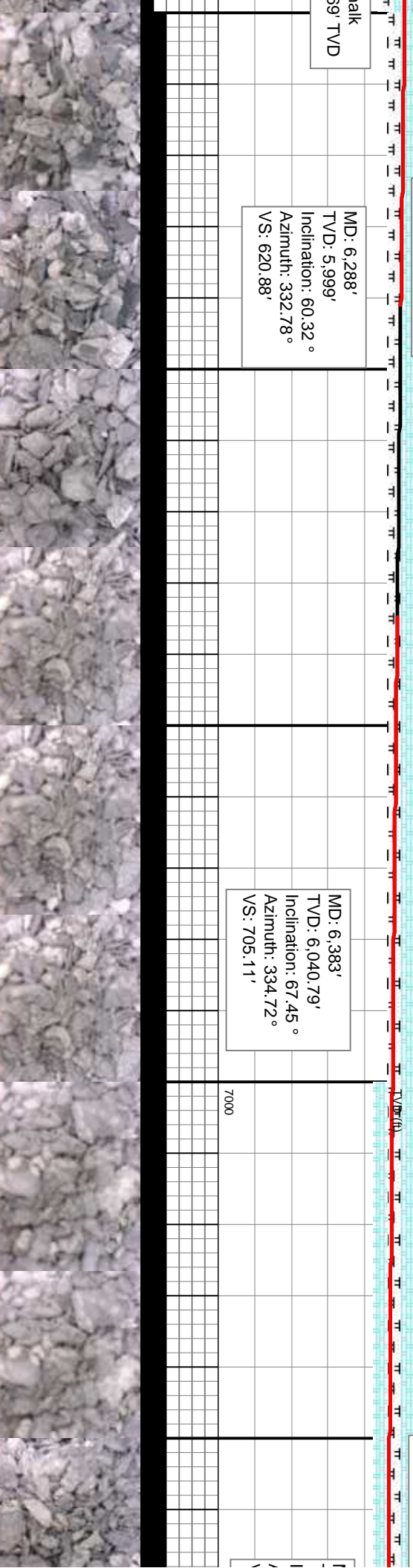
MRLST: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc CHK: lt gy-off wh crm, gy brn mot, sft-mod frm, sb ply-sb blkly, sb wxy-rthy tex, v calc

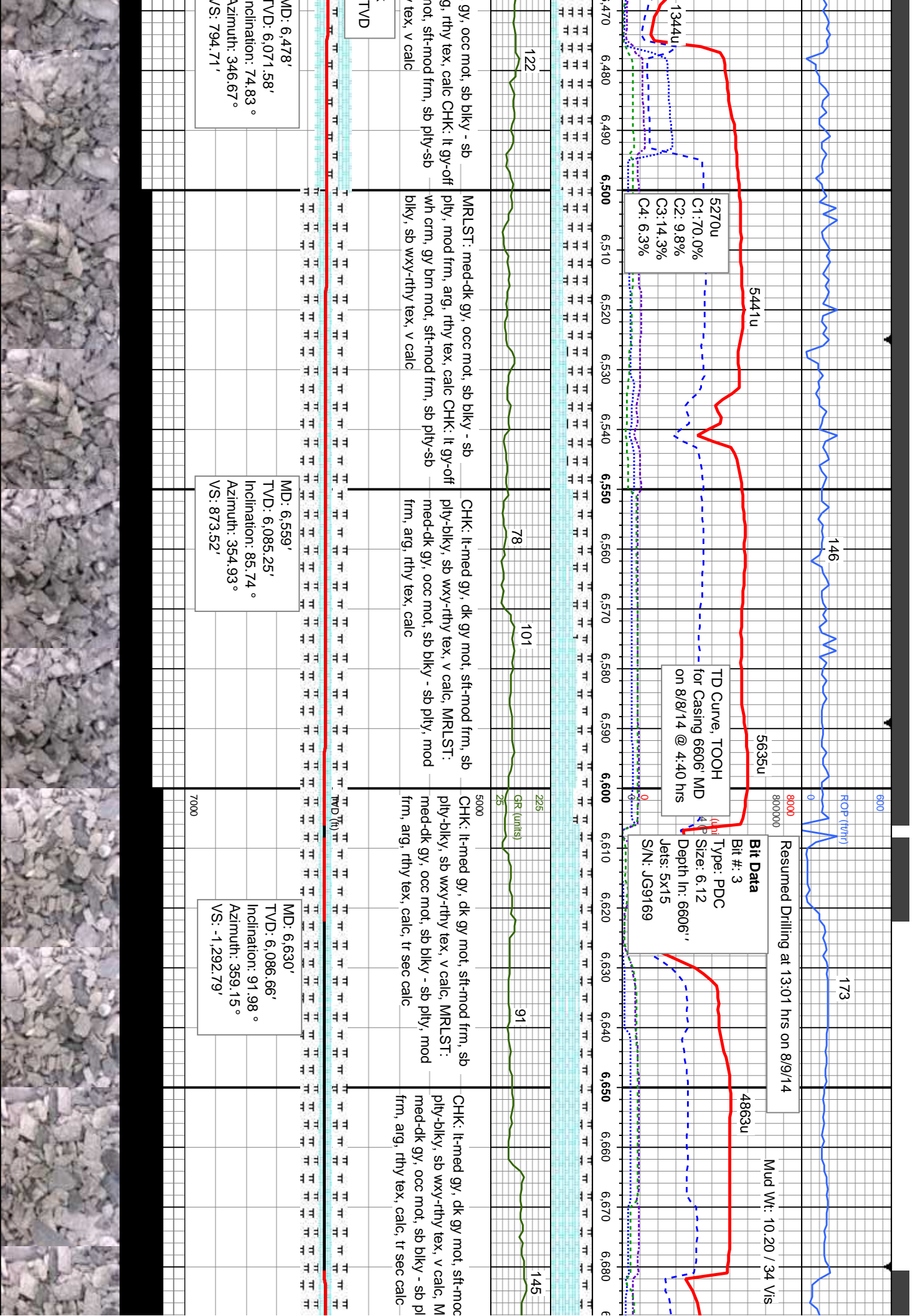
Niobrara A Marl
6279' MD, 5994' TVD

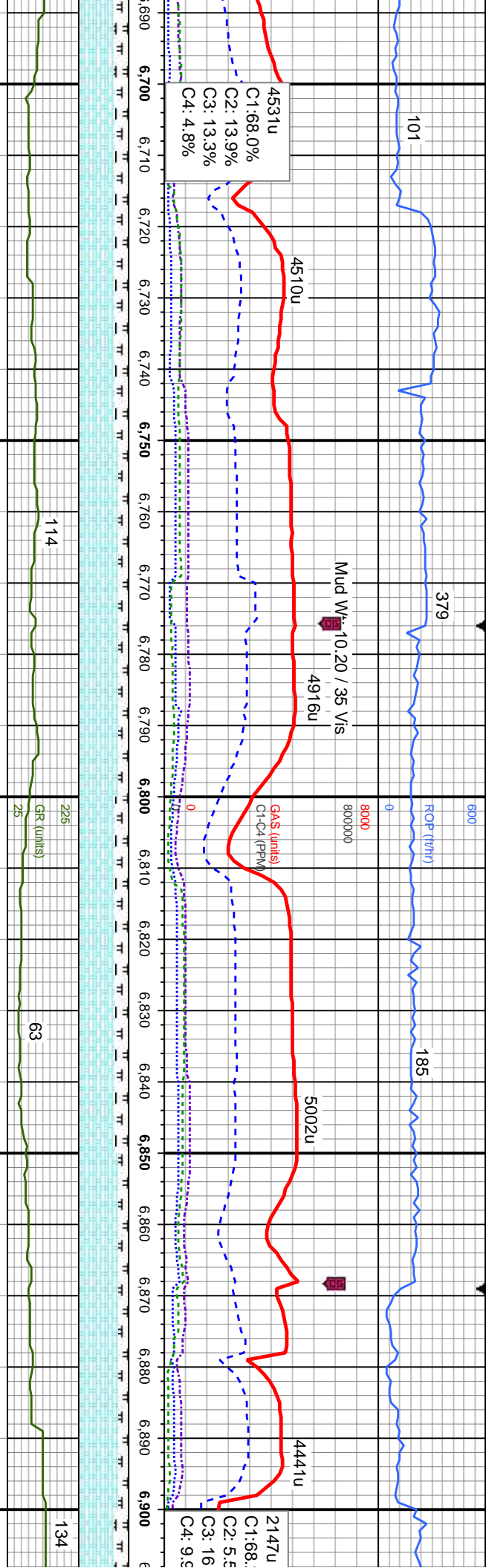
MD: 6,288'
TVD: 5,999'
Inclination: 60.32 °
Azimuth: 332.78 °
VS: 620.88'

MD: 6,383'
TVD: 6,040.79'
Inclination: 67.45 °
Azimuth: 334.72 °
VS: 705.11'

Niobrara B Chalk
6458' MD, 6065' TVD







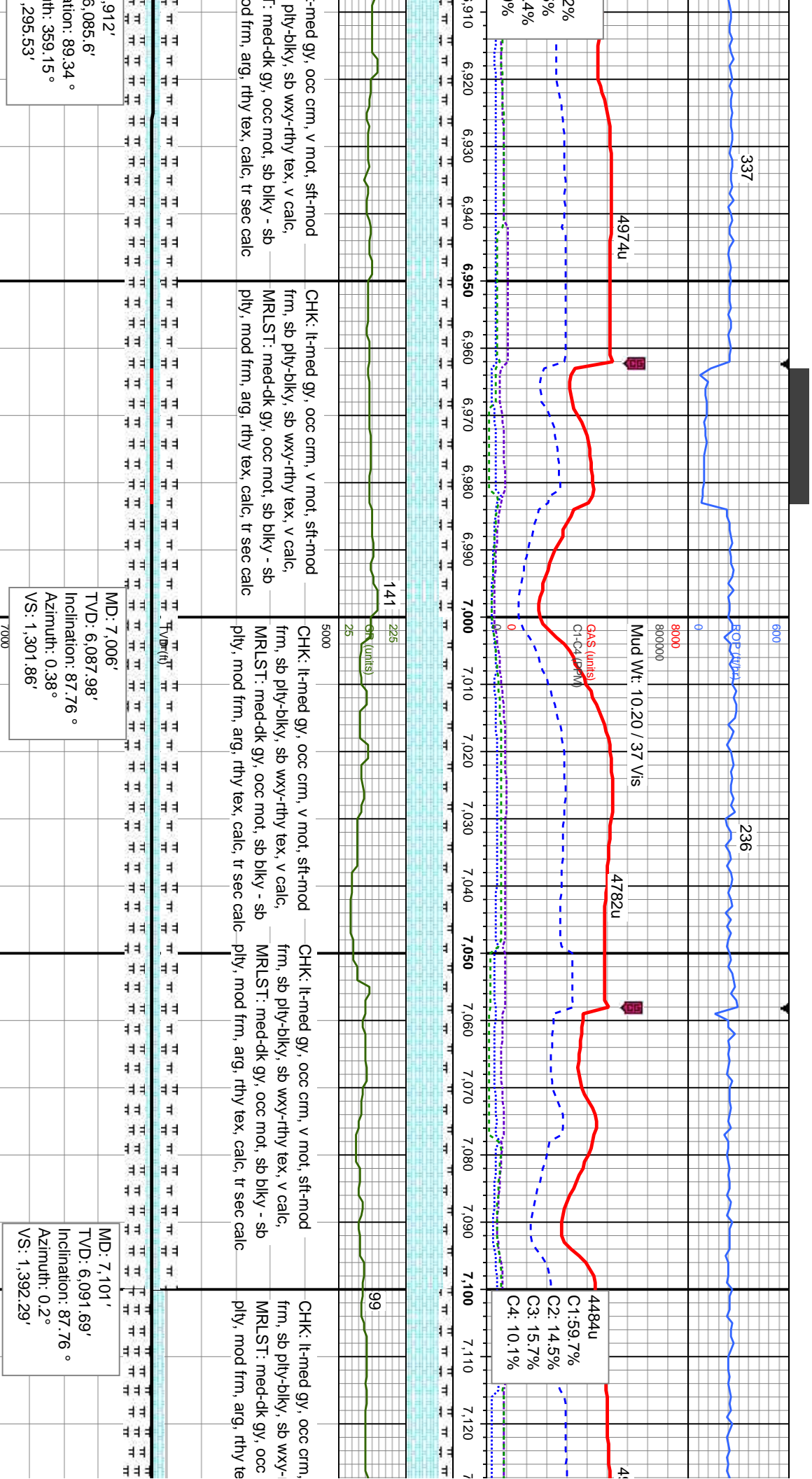
frm, sb RST: y, mod	CHK: lt-med gy, dk gy mot, sft-mod frm, sb ply-bkly, sb wxy-rthy tex, v calc, MRLST: med-dk gy, occ mot, sb bkly - sb ply, mod frm, arg, rthy tex, calc, tr sec calc	CHK: lt-med gy, dk gy mot, sft-mod frm, sb ply-bkly, sb wxy-rthy tex, v calc, MRLST: med-dk gy, occ mot, sb bkly - sb ply, mod frm, arg, rthy tex, calc, tr sec calc	CHK: lt-med gy, dk gy mot, sft-mod frm, sb ply-bkly, sb wxy-rthy tex, v calc, MRLST: med-dk gy, occ mot, sb bkly - sb ply, mod frm, arg, rthy tex, calc, tr sec calc	CHK: lt-med gy, dk gy mot, sft-mod frm, sb ply-bkly, sb wxy-rthy tex, v calc, MRLST: med-dk gy, occ mot, sb bkly - sb ply, mod frm, arg, rthy tex, calc, tr sec calc	CHK: lt-med gy, dk gy mot, sft-mod frm, sb MRLST: med-dk gy, occ mot, sb bkly - sb ply, mod
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MD: 6,723'
TVD: 6,085.38'
Inclination: 89.6 °
Azimuth: 359.85 °
VS: -1,293.6'

MD: 6,817'
TVD: 6,085.38'
Inclination: 90.4 °
Azimuth: 359.33 °
VS: -1,294.27'

MD: 6
TVD: 6
Inclination: 90.4 °
Azimuth: 359.33 °
VS: -1,294.27'

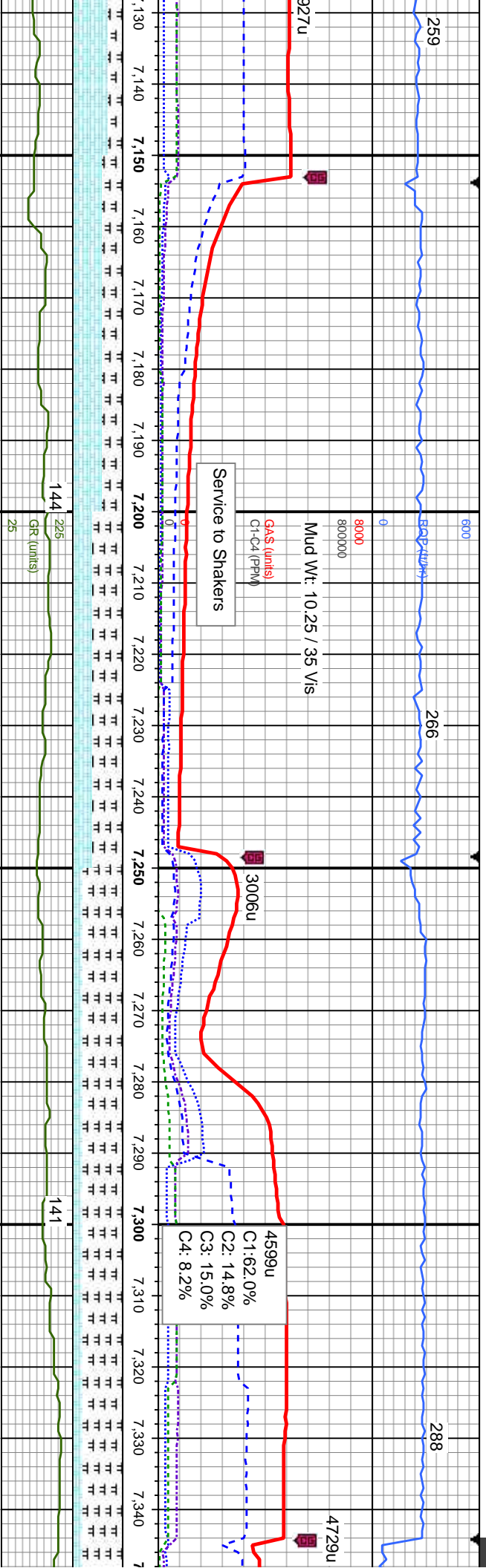




MD: 7.006'
TVD: 6,087.98'
Inclination: 87.76 °
Azimuth: 0.38 °
VS: 1,301.86'

MD: 7.101'
TVD: 6,091.69'
Inclination: 87.76 °
Azimuth: 0.2 °
VS: 1,392.29'



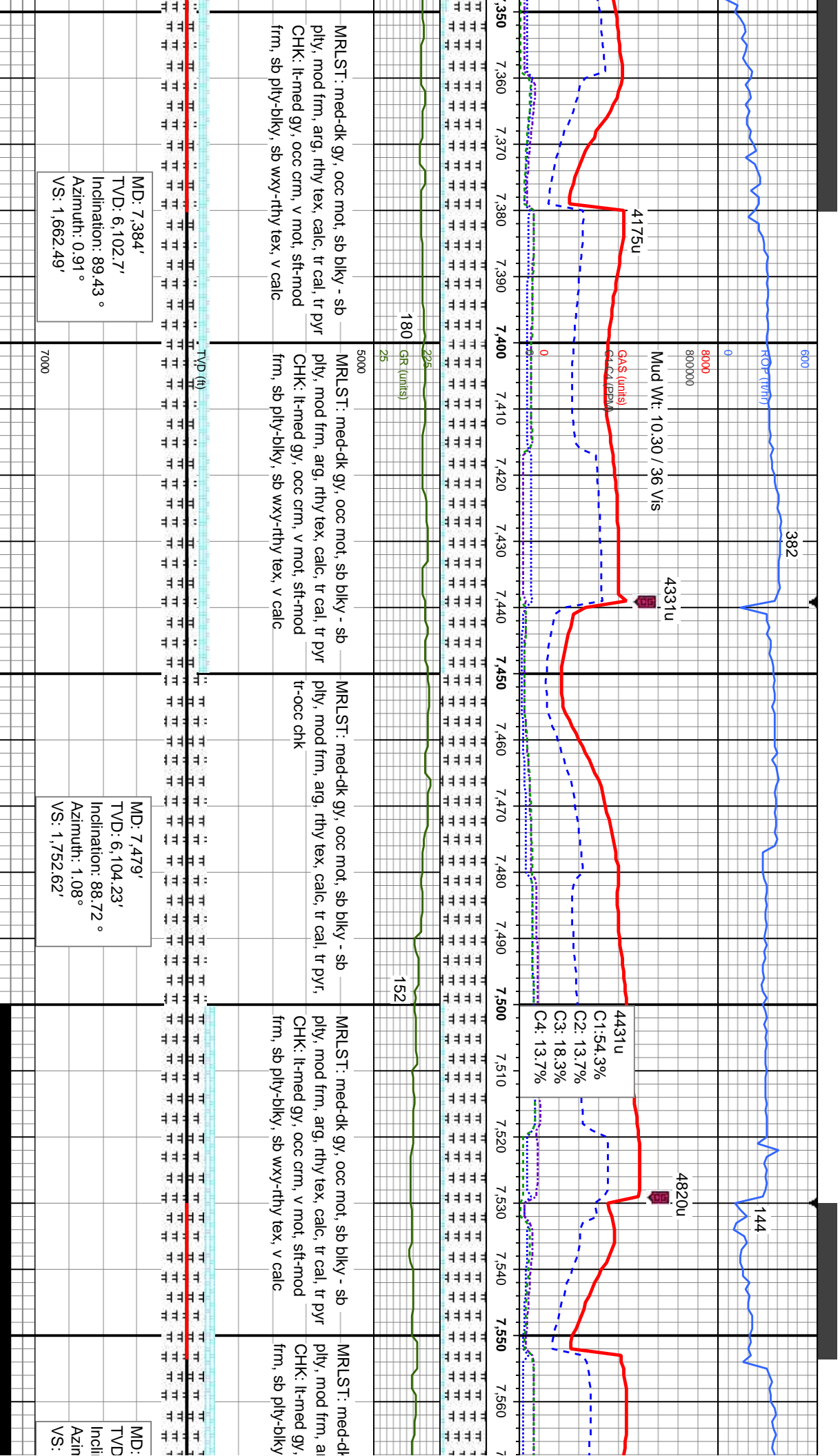


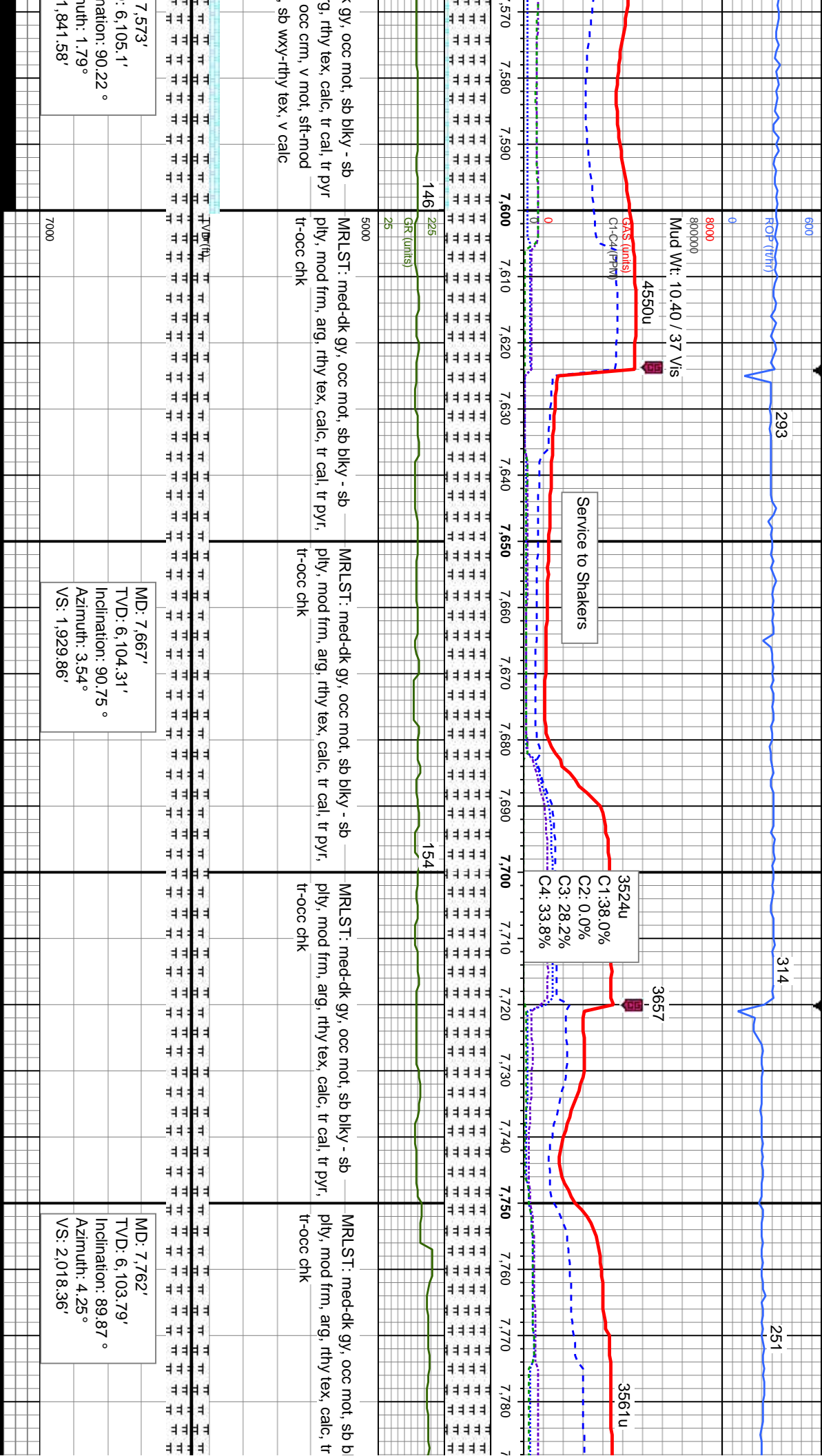
v mot, sft-mod rthy tex, v calc, mot, sb blkly - sb x, calc, tr sec calc	CHK: lt-med gy, occ crm, v mot, sft-mod frm, sb ply-blky, sb wxy-rthy tex, v calc, MRLST: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc, tr sec calc	MRLST: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc, tr cal, tr pyr CHK: lt-med gy, occ crm, v mot, sft-mod frm, sb ply-blky, sb wxy-rthy tex, v calc	MRLST: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc, tr cal, tr pyr CHK: lt-med gy, occ crm, v mot, sft-mod frm, sb ply-blky, sb wxy-rthy tex, v calc
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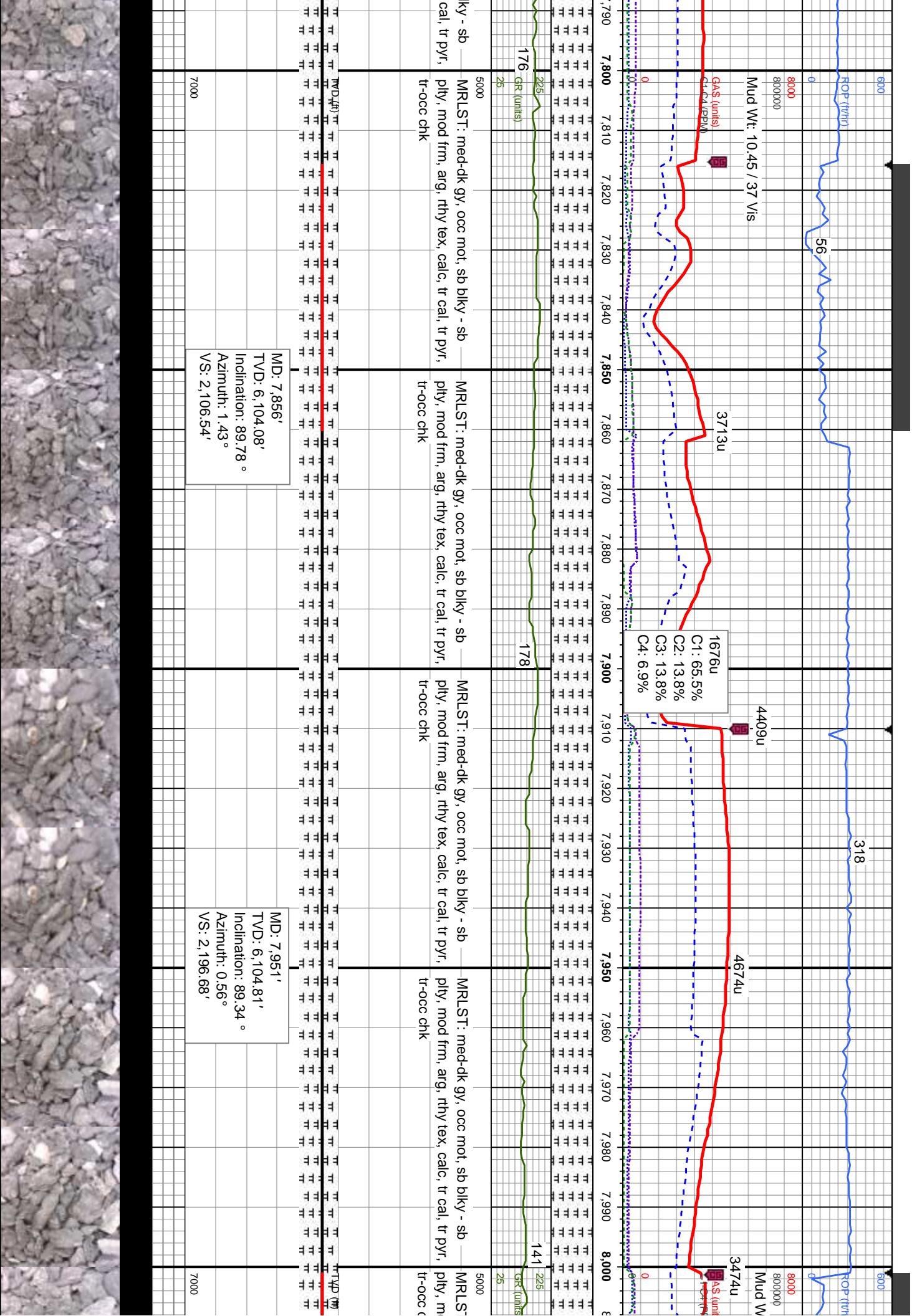
MD: 7,195'
TVD: 6,095.58'
Inclination: 87.49 °
Azimuth: 359.5°
VS: 1,481.98'

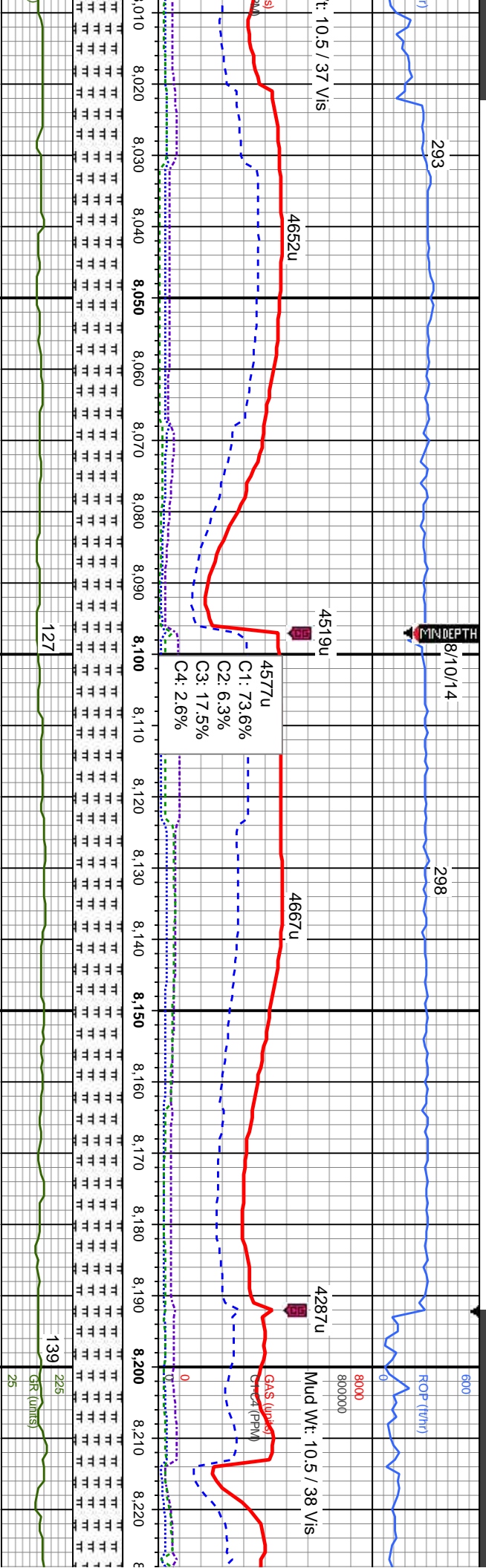
MD: 7,290'
TVD: 6,099.96'
Inclination: 87.23 °
Azimuth: 359.15°
VS: 1,572.86'









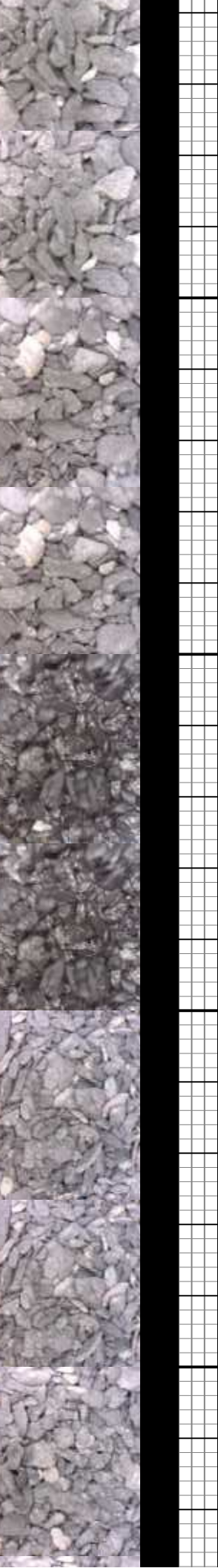


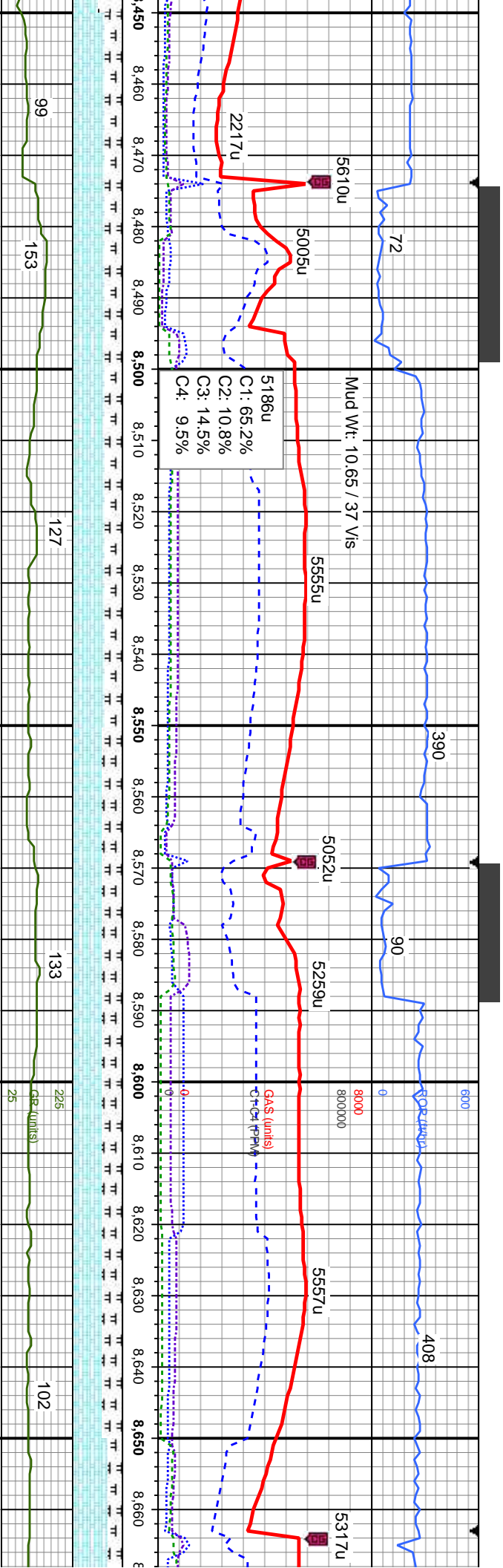
med-dk gy, occ mot, sb blk y - sb	MRLST: med-dk gy, occ mot, sb blk y - sb	MRLST: med-dk gy, occ mot, sb blk y - sb	MRLST: med-dk gy, occ mot, sb blk y - sb	MRLST: med-dk gy, occ mot, sb blk y - sb
ply, mod frm, arg, rthy tex, calc, tr cal, tr pyr,	ply, mod frm, arg, rthy tex, calc, tr cal, tr pyr,	ply, mod frm, arg, rthy tex, calc, tr cal, tr pyr,	ply, mod frm, arg, rthy tex, calc, tr cal, tr pyr,	ply, mod frm, arg, rthy tex, calc, tr cal, tr pyr,
tr-occ chk	tr-occ chk	tr-occ chk	tr-occ chk	tr-occ chk

MD: 8,045'
TVD: 6,105.1'
Inclination: 90.31 °
Azimuth: 1.26 °
VS: 2,285.91'

MD: 8,140'
TVD: 6,105.24'
Inclination: 89.52 °
Azimuth: 0.2 °
VS: 2,376.19'

MD: 8,140'
TVD: 6,105.24'
Inclination: 89.52 °
Azimuth: 0.2 °
VS: 2,376.19'





CHK: lt-med gy, occ crm, v mot, sft-mod
frm, sb pty-blky, sb wxy-rthy tex, v calc
MRLST: med-dk gy, occ mot, sb blky - sb
pty, mod frm, arg, rthy tex, calc, tr cal, tr fus
fos

CHK: lt-med gy, occ crm, v mot, sft-mod
frm, sb pty-blky, sb wxy-rthy tex, v calc
MRLST: med-dk gy, occ mot, sb blky - sb
pty, mod frm, arg, rthy tex, calc, tr cal, tr fus
fos

CHK: lt-med gy, occ crm, v mot, sft-mod
frm, sb pty-blky, sb wxy-rthy tex, v calc
MRLST: med-dk gy, occ mot, sb blky - sb
pty, mod frm, arg, rthy tex, calc, tr cal, occ
fus fos

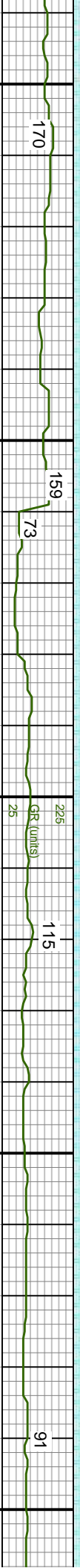
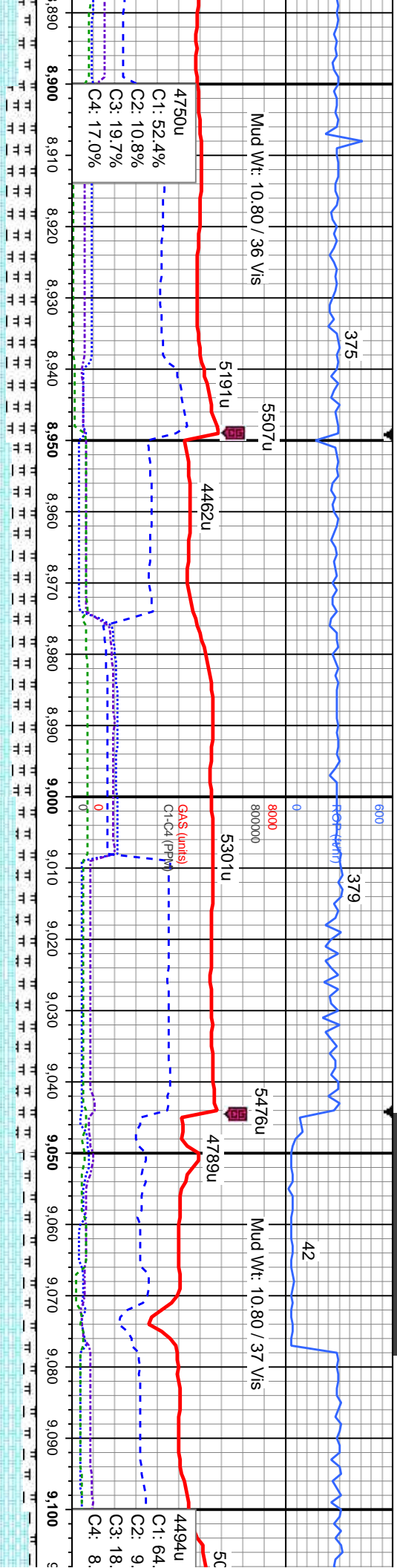
CHK: lt-med gy, occ crm, v mot, sft-mod
frm, sb pty-blky, sb wxy-rthy tex, v calc
MRLST: med-dk gy, occ mot, sb blky - sb
pty, mod frm, arg, rthy tex, calc, tr cal, occ
fus fos

CHK: lt-med gy, occ crm, v mot, sft-mod
frm, sb pty-blky, sb wxy-rthy tex, v calc
MRLST: med-dk gy, occ mot, sb blky - sb
pty, mod frm, arg, rthy tex, calc, tr cal, occ
fus fos

MD: 8,517'
TVD: 6,096.56'
Inclination: 91.1°
Azimuth: 357.74°
VS: -1,280.24'

MD: 8,611'
TVD: 6,095.99'
Inclination: 89.6°
Azimuth: 358.1°
VS: -1,283.65'





mod	MRST: med- <u>dk</u> gy, <u>occ</u> mot, sb <u>biky</u> - sb
calc	ply, mod frm, arg, rthy tex, calc, tr cal, <u>occ</u>
xy - sb	fus fos: CHK: lt-med gy, <u>occ</u> crm, v mot,
cal, <u>occ</u>	sft-mod frm, sb ply-biky, sb wxy-rthy tex, v
cal	calc

MRLST: med-dk gy, occ mot, sb bily - sb
ply, mod frm, arg, rthy tex, calc, tr cal, occ
fus tos; CHK: lt-med gy, occ crm, v mot,
sft-mod frm, sb ply-bily, sb wxy-rthy tex, v
calc, abnt sec calcite

CHK: l-med gy, occ crm, v mot, sft-mod
frm, sb ply-blyk, sb wxy-fty tex, v calc
MRST: med-dk gy, occ mot, sb blyk - sb
ply, mod frm, aig, fty tex, calc, tr cal, occ
fus fos, abnt sec calcite

CHK: lt-med gy, occ crm, v mot, stf-mod
frm, sb ply-bkly, sb wxy-rthy tex, v calc
MRLST: med-dk gy, occ mot, sb blkly - sb
ply, mod frm, arg, rthy tex, calc, tr cal, occ
fus fos, abnt sec calcie

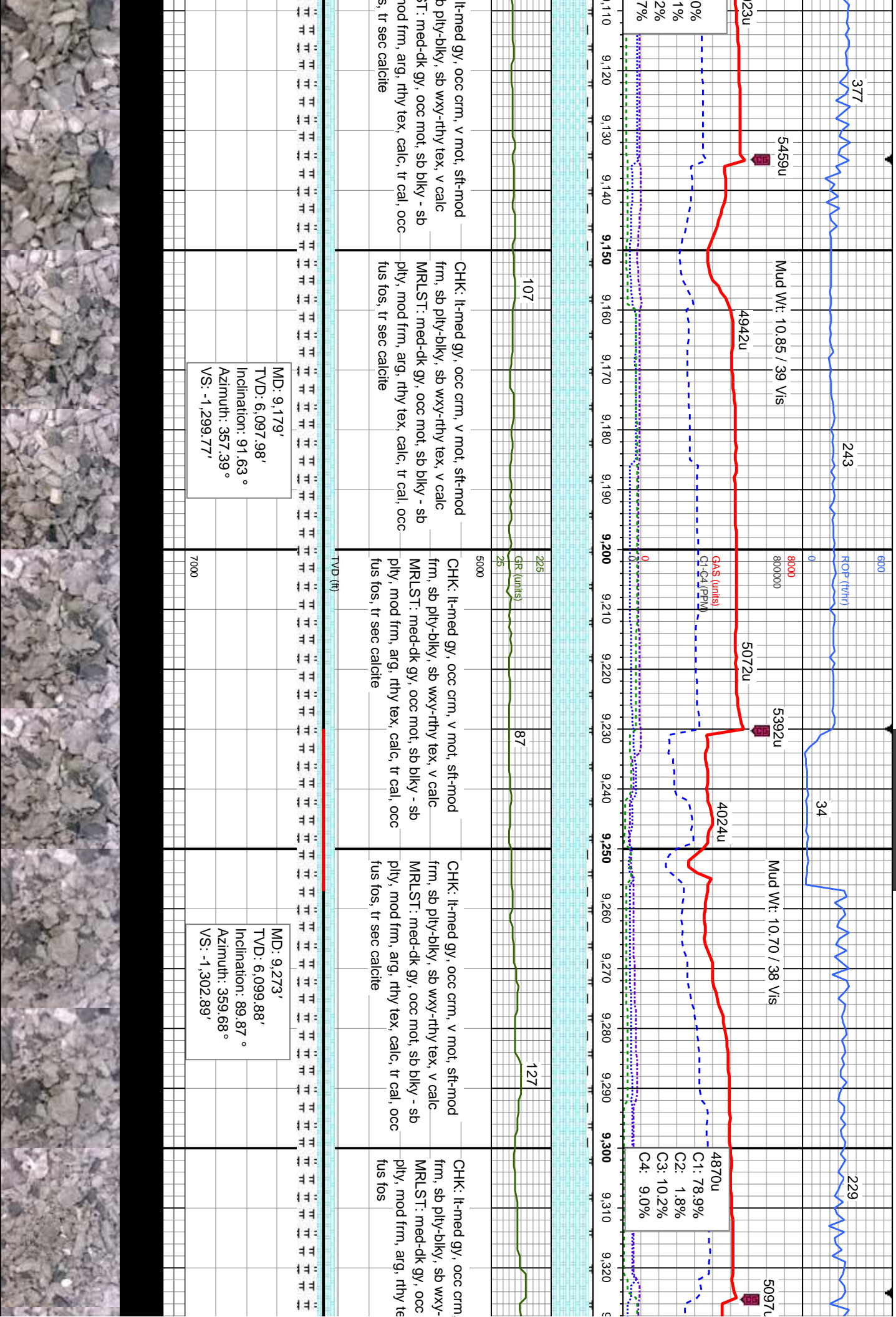
CHK:
frm, s
MRLS
ply, n
fus fo



D: 6,098.72'
Elevation: 88.11°
Muth: 358.62°
E: -1,290.63'

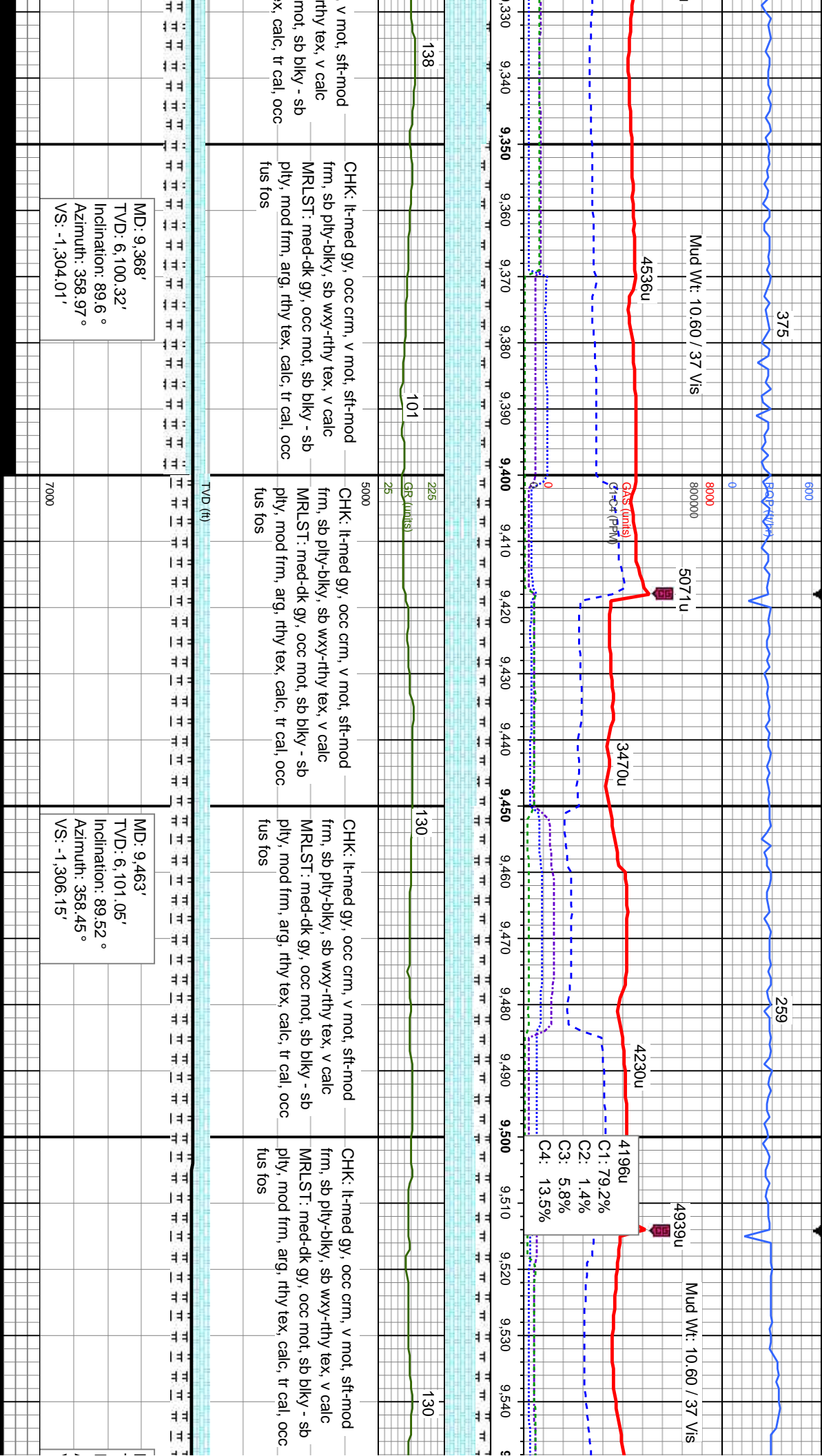
MD: 8,990'
TVD: 6,102.21'
Inclination: 87.67°
Azimuth: 357.92°
VS: -1,293.49'

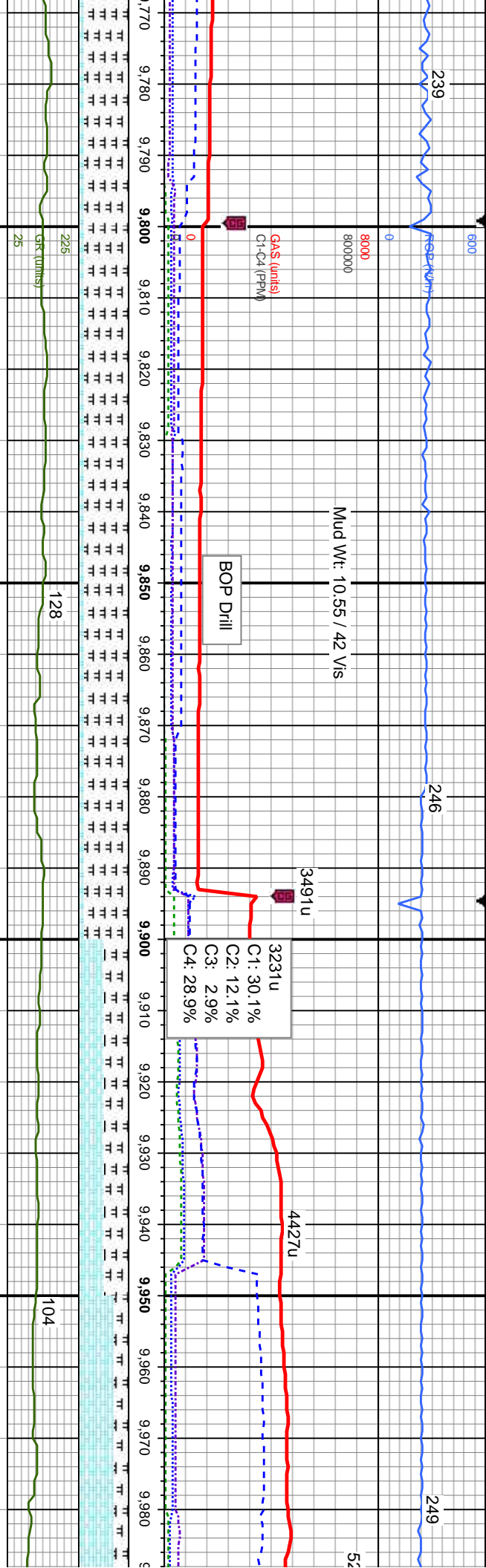
MD: 9,084'
TVD: 6,100.17'
Inclination: 91.01 °
Azimuth: 358.1 °
VS: -1,296.03'



MD: 9,179'
TVD: 6,097.98'
Inclination: 91.63 °
Azimuth: 357.39 °
VS: -1,299.77'

MD: 9,273'
TVD: 6,099.88'
Inclination: 89.87 °
Azimuth: 359.68 °
VS: -1,302.89'

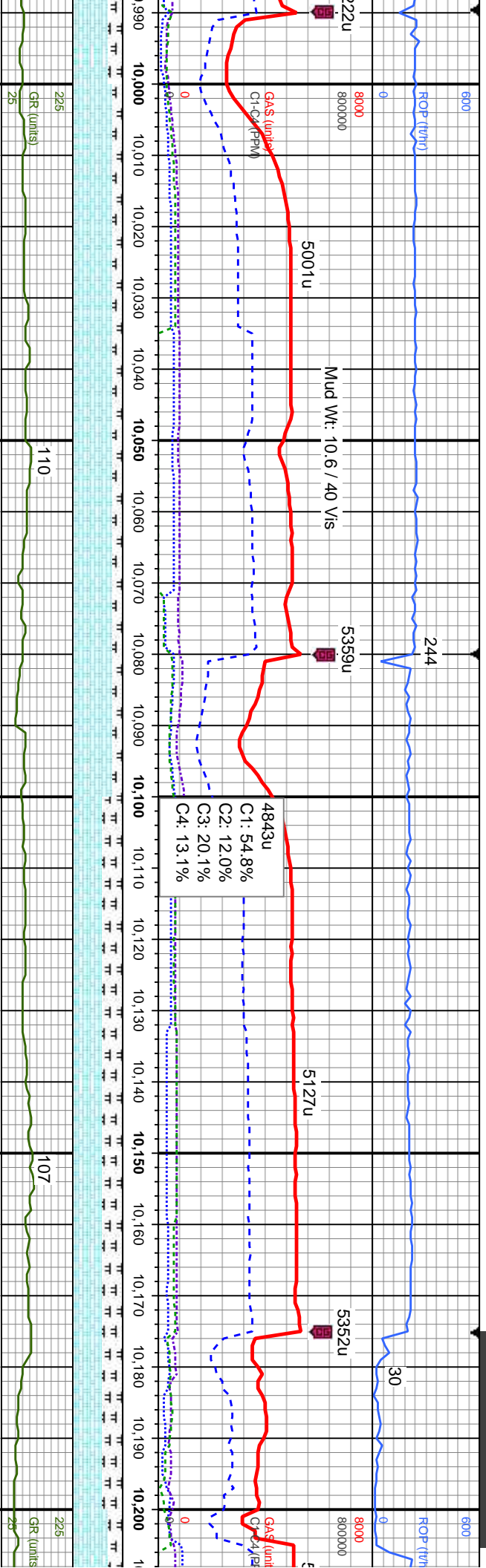




gy, occ mot, sb blkly - sb g, rthy tex, calc, tr cal, occ med gy, occ crm, v mot, ply-blky, sb wxy-rthy tex, v	MRLST: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc, tr cal, tr pyr, occ fus fos, CHK: lt-med gy, occ crm, v mot, sft-mod frm, sb ply-blky, sb wxy-rthy tex, v calc	MRLST: med-dk gy, occ mot, sb blkly - sb ply, frm, arg, rthy tex, calc, tr cal, occ fus fos, CHK: lt-med gy, occ crm, v mot, sft-mod frm, sb ply-blky, sb wxy-rthy tex, v calc	MRLST: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc, tr cal, occ fus fos, CHK: lt-med gy, occ crm, v mot, sft-mod frm, sb ply-blky, sb wxy-rthy tex, v calc	CHK: lt-med gy, occ crm, v mot, sft frm, sb ply-blky, sb wxy-rthy tex, v MRLST: med-dk gy, occ mot, sb bl ply, mod frm, arg, rthy tex, calc, tr fus fos
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MD: 9,841' TVD: 6,101.17' Inclination: 90.22 ° Azimuth: 357.22° VS: 4,012.61'	MD: 9,936' TVD: 6,100.44' Inclination: 90.66 ° Azimuth: 355.99° VS: 4,104.77'
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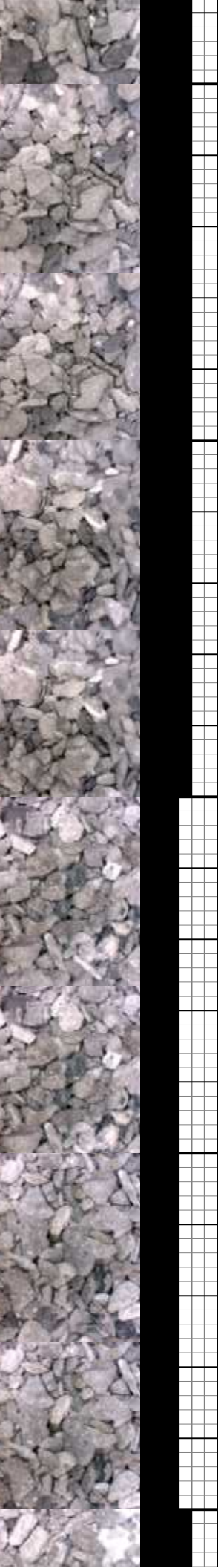


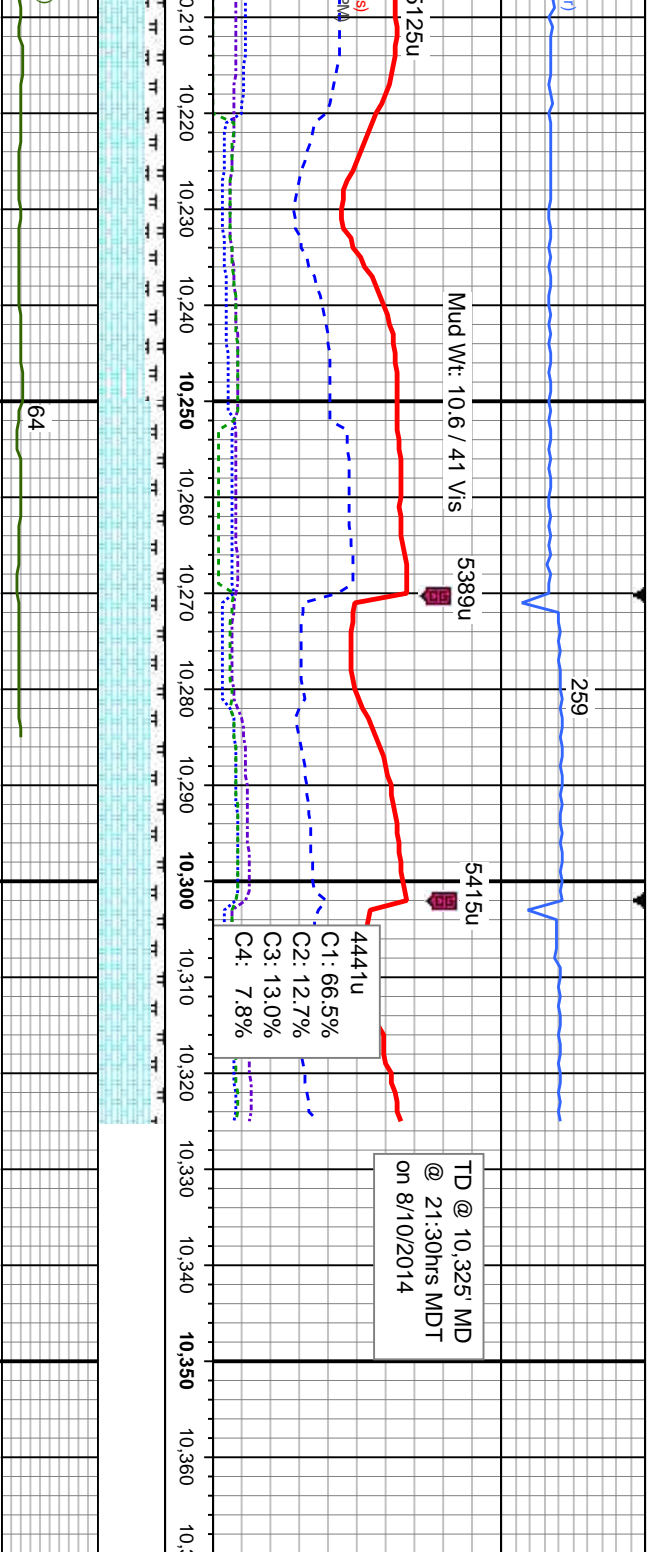


5000	CHK: lt-med gy, occ crm, v mot, sft-mod frm, sb ply-blky, sb wxy-rthy tex, v calc MRLST: med-dk gy, occ mot, sb blkly - sb ply, frm, arg, rthy tex, calc, tr cal, occ fus fos	5000	CHK: lt-med gy, occ crm, v mot, sft-mod frm, sb ply-blky, sb wxy-rthy tex, v calc MRLST: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc, tr cal, tr pyr, occ fus fos	5000	CHK: lt-med gy, occ crm, v mot, sft-mod frm, sb ply-blky, sb wxy-rthy tex, v calc MRLST: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc, tr cal, occ fus fos	5000	CHK: lt-med gy, occ crm, v mot, sft-mod frm, sb ply-blky, sb wxy-rthy tex, v calc MRLST: med-dk gy, occ mot, sb blkly - sb ply, mod frm, arg, rthy tex, calc, tr cal, occ fus fos
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MD: 10,030'
TVD: 6,099.07'
Inclination: 91.01 °
Azimuth: 355.46 °
VS: 4,196.3'

MD: 10,125'
TVD: 6,096.96'
Inclination: 91.54 °
Azimuth: 354.93 °
VS: 4,288.99'





med gy, occ crm, v mot, sft-mod
ply-blky, sb wxy-rthy tex, v calc
mod frm, arg, rthy tex, calc, tr cal, occ

CHK: lt-med gy, occ crm, v mot, sft-mod
frm, sb ply-blky, sb wxy-rthy tex, v calc
MRLST: med-dk gy, occ mot, sb blky - sb
ply, frm, arg, rthy tex, calc, tr cal, tr pyr, occ
fus fos

Wellsite Geological Services
Provided By Columbine
Logging, Thank You!

MD: 10,219'
TVD: 6,096.6'
Inclination: 88.9°
Azimuth: 355.28°
VS: 4,380.75'

MD: 10,274'
TVD: 6,097.49'
Inclination: 89.25°
Azimuth: 354.93°
VS: 4,434.43'

MD: 10,325'
TVD: 6,098.15'
Inclination: 89.25°
Azimuth: 354.93°
VS: 4,484.25'

