

Décollement Consulting Inc.



Scale: 5" / 100'
Measured Depth Log

Well Name State Crow 41-21-20XRLNB_Lateral

Location NE/NE Section 21, T7N - R61W

State CO

County Weld

Country USA

Rig Number Xtreme 22

API Number 05-123-41116

Field Wattenberg

Region D.J. Basin

Drilling Completed 7/22/2015

Spud Date 7/15/2015

Surface Coordinates 1293 FNL x 341 FEL (Lat: 40.563234, -104.318704)

Bottom Hole Coordinates 660 FNL x 610 FWL (Lat: 40.564101, -104.354110)

Ground Elevation 4,895'

K.B. Elevation 4,912'

Logged Interval 7,300

Formation Niobrara "B" Chalk

Type of Drilling Fluid Water Based Mud

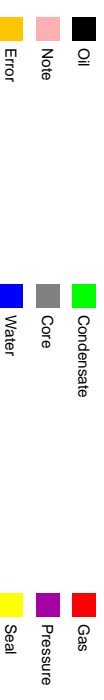
Operator

Address Bonanza Creek Energy, Inc.
410 17th Street, Suite 1500
Denver, Colorado 80202

Geologist

Name Brian Spitzmiller & Dan Kabala
Company Décollement Consulting Inc.
Address 13300 Braun Rd.
Golden, CO. 80401

Zone Color Coding



Rock Types

Blank



CHALK



CPF

CEMENT



MPF



SHALE S

LIMESTONE

SANDSTONE



SHALE SF

MARLSTONE

SHALE

Accessories

Fossils

- ALGAE
- AMPHIPORA
- BELEMNITE
- BIOCLASTIC
- BRACHIOPOD
- BRYOZOA
- CEPHALOPOD
- CORAL
- CRINOID
- ECHINOID
- FISH
- FORAMINIFERA

Minerals

ANHYDRITIC

F FOSSIL

GASTROPOD

OOLITE

OSTRACOD

PELECYPOD

PELLET

PISOLITE

PLANT REMAINS

PLANT SPORES

SCAPHOPOD

STROMATOPOROID

ARGILLACEOUS

ARGILLITE GRAIN

BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

CALCAREOUS

CARBONACEOUS FLAKES

CHTDK

CHTLT

COAL - THIN BEDS

DOLOMITIC

FELDSPAR

FERRUGINOUS PELLET

FERRUGINOUS

GLAUCONITE

GYPSIFEROUS

HEAVY MINERAL

K KOLIN

MARLSTONE

MINERAL CRYSTALS

NOODULES

PHOSPHATE PELLETS

PYRITE

SALT CAST

SANDY

SILICEOUS

SILTY

TUFFACEOUS

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

Oil S

DEAD

EVEN

QUEST

SPOT

Poros

E EART

FENES

F FRAC

INTER

INTER

MOLD

Other Symbols

ORGANIC FORMATION TOP L LITHOGRAPHIC

how **Rounding**

P PINPOINT GAS SHOW MX MICROXLN

V VUGGY MN DEPTH A ANGULAR MS MUDSTONE

NORMAL FAULT R ROUNDED PS PACKSTONE

Engineering OIL SHOW S SUBANG WS WACKESTONE

OVERTURNED STRATA SUBRND

Sorting

CASING REVERSE FAULT

Textures

CONNECTION (LEFT) SIDEWALL CORE (LEFT) M MODERATE

CONNECTION (RIGHT) SIDEWALL CORE (RIGHT) BS BOUNDSTONE P POOR

CONNECTION GAS SLIDE C CHALKY W WELL

CORE - LOST S SURVEY CX CRYPTOXLN

CORE - RECOVERED TRIP GAS E EARTHY

DST INTERVAL WIRELINE TESTED - LEFT FX FINELYXLN

FAULT WIRELINE TESTED - RT GS GRAINSTONE

Slide/Rotate

Depth



Total Gas & Chromatography

- GAS
- C1
- C2
- C3
- iC4
- nC4
- CO2

Total Gas Calibration
1% Methane = 100u

Black = Slide
White = Rotate

Gas Chromatograph Calibration
C1 = 1.0% Methane = 10,000ppm
C2 = 1.0% Ethane = 10,000ppm
C3 = 1.0% Propane = 10,000ppm
iC4 = 1.0% Iso-Butane = 10,000ppm
nC4 = 1.0% N-Butane = 10,000ppm

Reached ICPL @ 1456
hrs on 7/16/2015, pump
high vis sweeps,
condition hole, Run 7"
casing to 7,204' MD

Bit #: 3
Size: 6.125
Mfr.: VAREL
Type: VSS13DGU
Depth In: 7,236'

C1: na %
C2: na %
C3: na %
iC4: na %
nC4: na %

5185u

CO2: 0.2%

Gas (units)
C1-iC4 (PPM)
CO2 (percent)

Decollement
Consulting on
location and rigged
up on 7/15/2015.

WOB 21.3
RPM 45/45
SPP 3370
SPM 0/89

WT 9.0 VIS 40

166

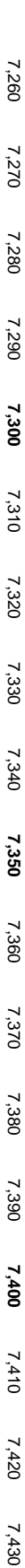
WOB 18.8
RPM 76/76
SPP 3305
SPM 0/90

WT 9.0 VIS 39

Curves
ROP
Gamma



Depth Labels



Interpretive Lithology



Well Bore
TVD

MD: 7,299'
TVD: 6,673.65'
Inclination: 88.21°
Azimuth: 269.32°
VS: 923.81'

MD: 7,384'
TVD: 6,677.24'
Inclination: 86.95°
Azimuth: 268.98°
VS: 1,008.43'

90% MARL: dk brn/gy, frm-sft, sb ply-sb blkly, rthy
gsy lst, grtty, abn motld carb mat, 10% CHK. lt
gy, motld wh, sft- mod frm, occ brt, sb ply-sb
blkly, rthy lst, v calc, sl brn/blk sn, mod fst good
y/lw whi blooming cut flour, gd whi resid ring.

90% MARL: dk brn/gy, frm-sft, sb ply-sb blkly, rthy
gsy lst, grtty, abn motld carb mat, 10% CHK. lt
gy, motld wh, sft- mod frm, occ brt, sb ply-sb
blkly, rthy lst, v calc, sl brn/blk sn, slw frt
y/lw-brwn blooming cut flour, frt whi resid ring.

frt brn-grn mnrl flor, cmnn SH.

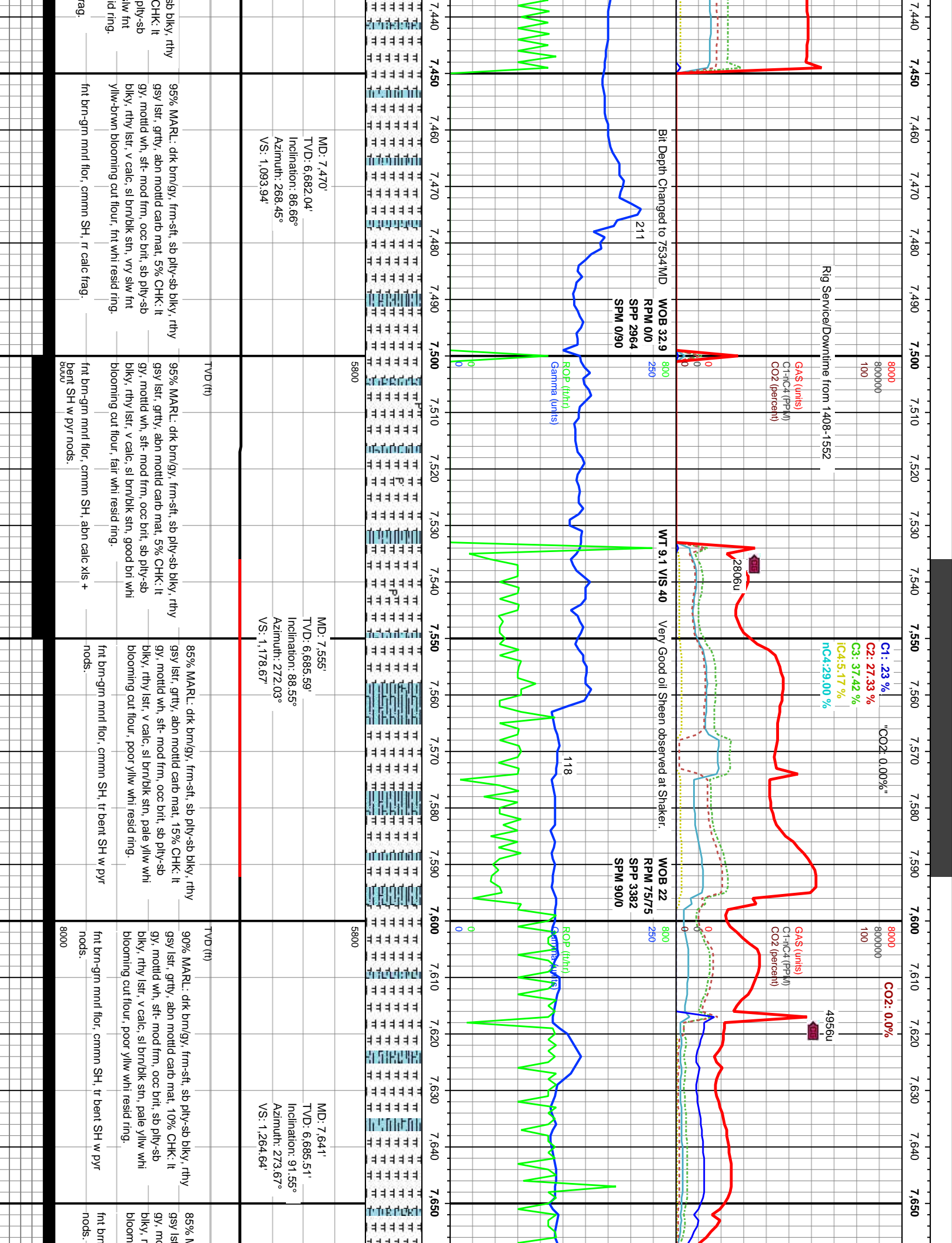
frt brn-grn mnrl flor, abn bent SH w pyr nod,
cmnn SH.

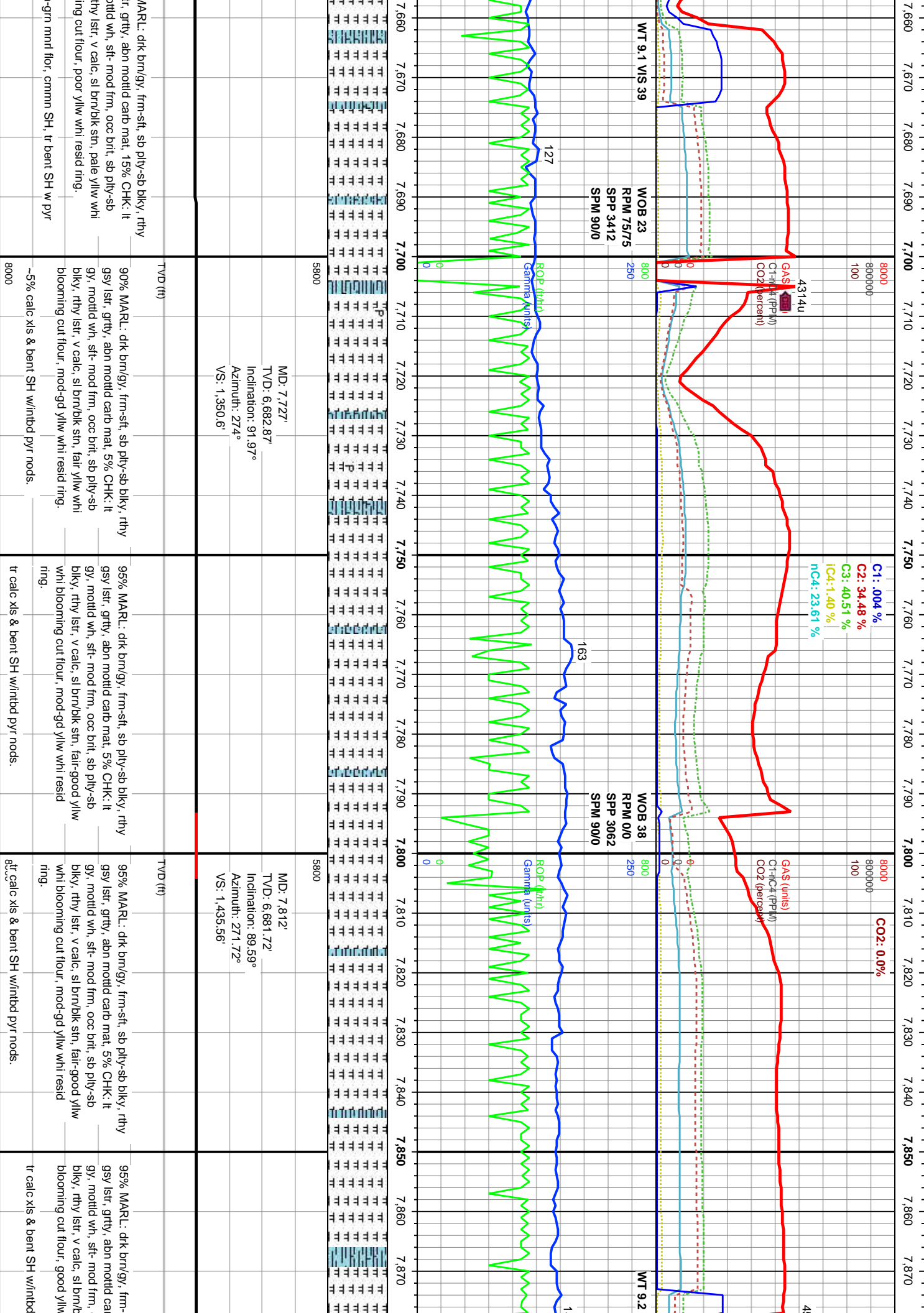
frt brn-grn mnrl flor, cmnn SH.

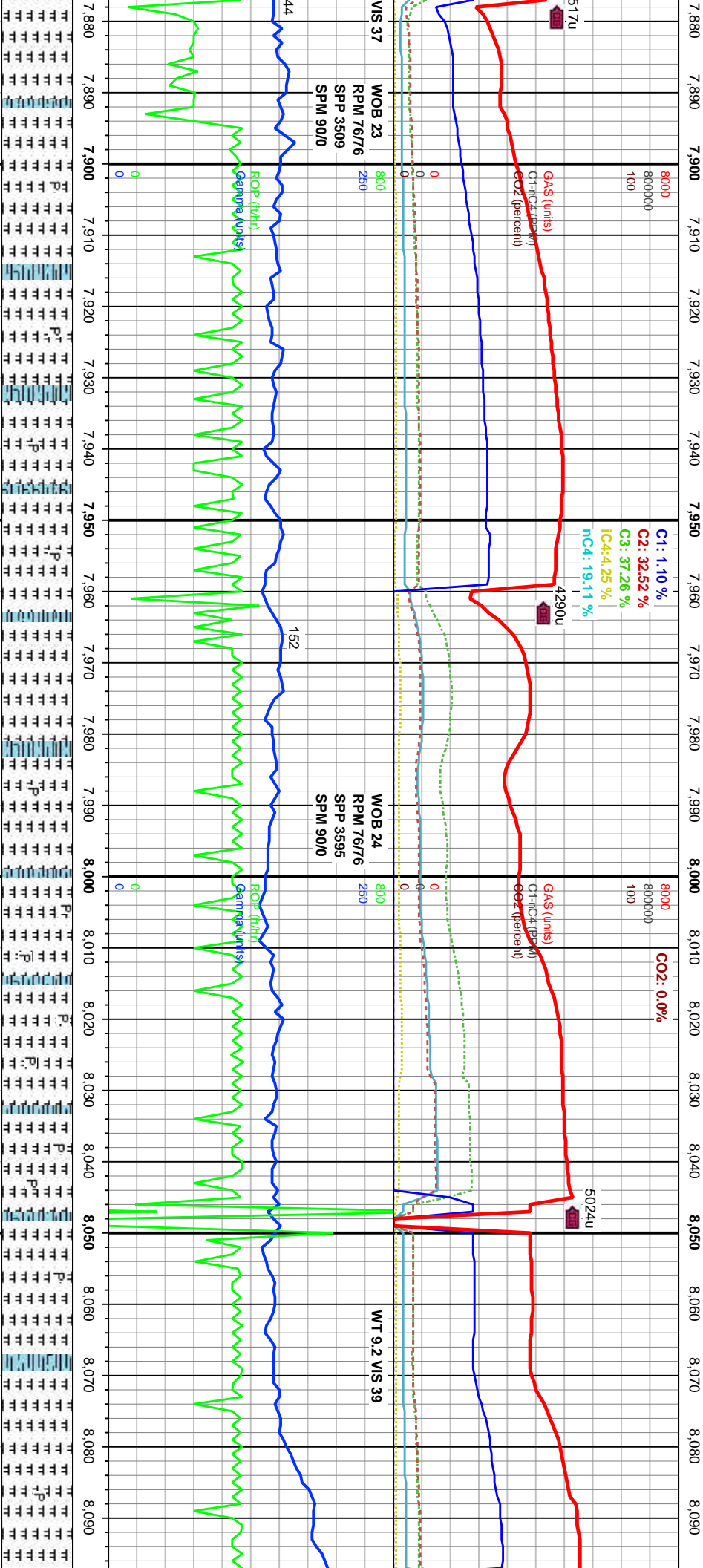
frt brn-grn mnrl flor, cmnn SH, r calc f

Oil Show

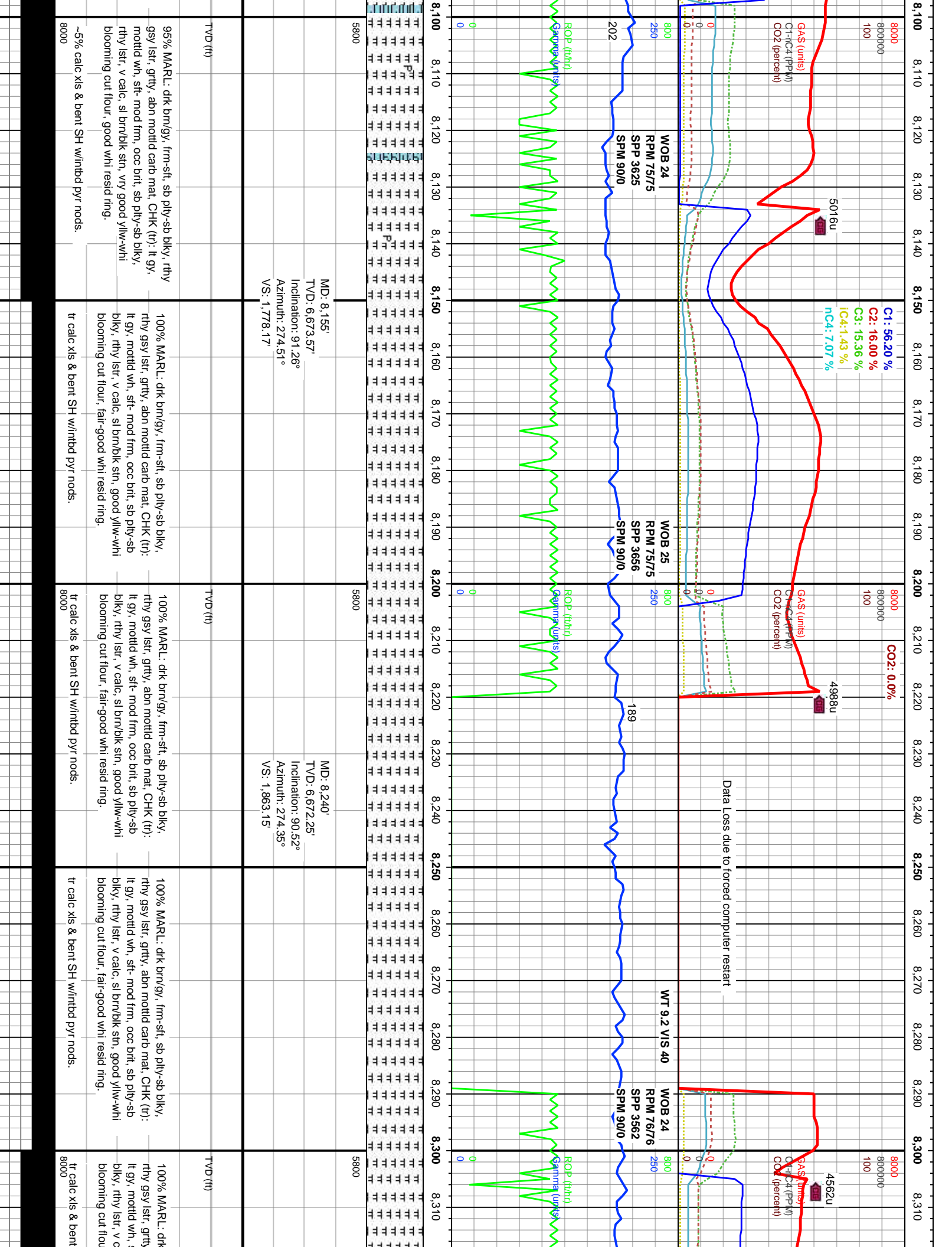
TR
P
FR
G
E

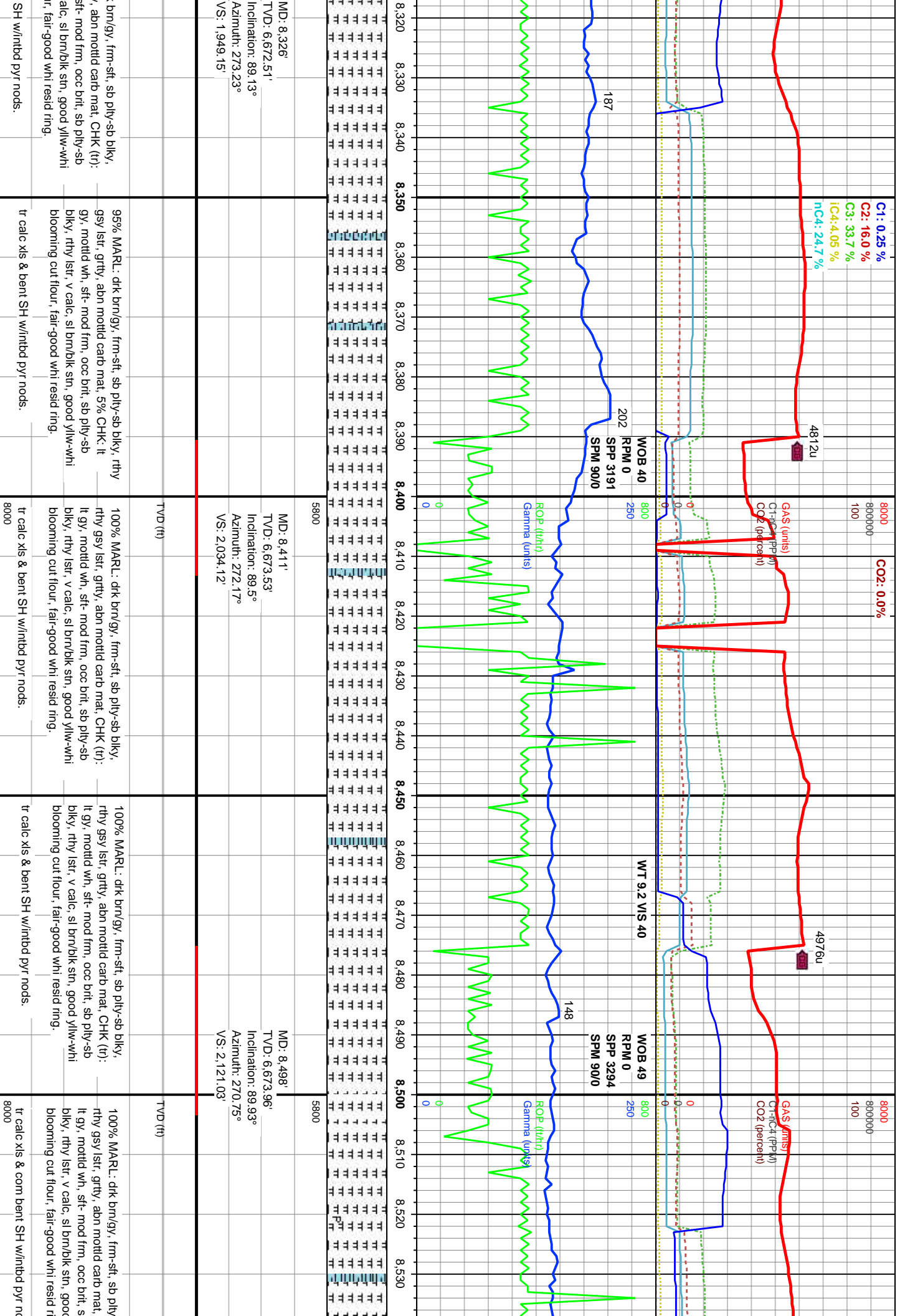






MD: 7.898' TVD: 6,680.66' Inclination: 91.82° Azimuth: 270.37° VS: 1,521.44'		MD: 7.983' TVD: 6,678.05' Inclination: 91.69° Azimuth: 274.87° VS: 1,606.35'		MD: 8.069' TVD: 6,675.65' Inclination: 91.51° Azimuth: 269.9° VS: 1,692.26'	
90% MARL: dk brn/gy, frm-sft, sb pily-sb blk, rthy gsy lst, grty, abn mottd carb mat, 5% CHK: lt gy, mottd wh, sft- mod frm, occ brt, sb pily-sb blk, rthy lst, v calc, sl brn/blk stn, good yllw whi blooming cut flour, fair-poor yllw resid ring.		90% MARL: dk brn/gy, frm-sft, sb pily-sb blk, rthy gsy lst, grty, abn mottd carb mat, 5% CHK: lt gy, mottd wh, sft- mod frm, occ brt, sb pily-sb blk, rthy lst, v calc, sl brn/blk stn, good yllw whi blooming cut flour, fair yllw-whi resid ring.		95% MARL: dk brn/gy, frm-sft, sb pily-sb blk, rthy gsy lst, grty, abn mottd carb mat, CHK (tr): lt gy, mottd wh, sft- mod frm, occ brt, sb pily-sb blk, rthy lst, v calc, sl brn/blk stn, vry good blue-whi blooming cut flour, good whi resid ring.	
pyr nods. -5% calc xls & bent SH w/inbtd pyr nods.		pyr nods. -5% calc xls & bent SH w/inbtd pyr nods.		pyr nods. -5% calc xls & bent SH w/inbtd pyr nods.	





MD: 8,326'
TVD: 6,672.51'
Inclination: 89.13°
Azimuth: 273.23°
VS: 1,949.15'

MD: 8,411'
TVD: 6,673.53'
Inclination: 89.5°
Azimuth: 272.17°
VS: 2,034.12'

MD: 8,498'
TVD: 6,673.96'
Inclination: 89.93°
Azimuth: 270.75°
VS: 2,121.03'

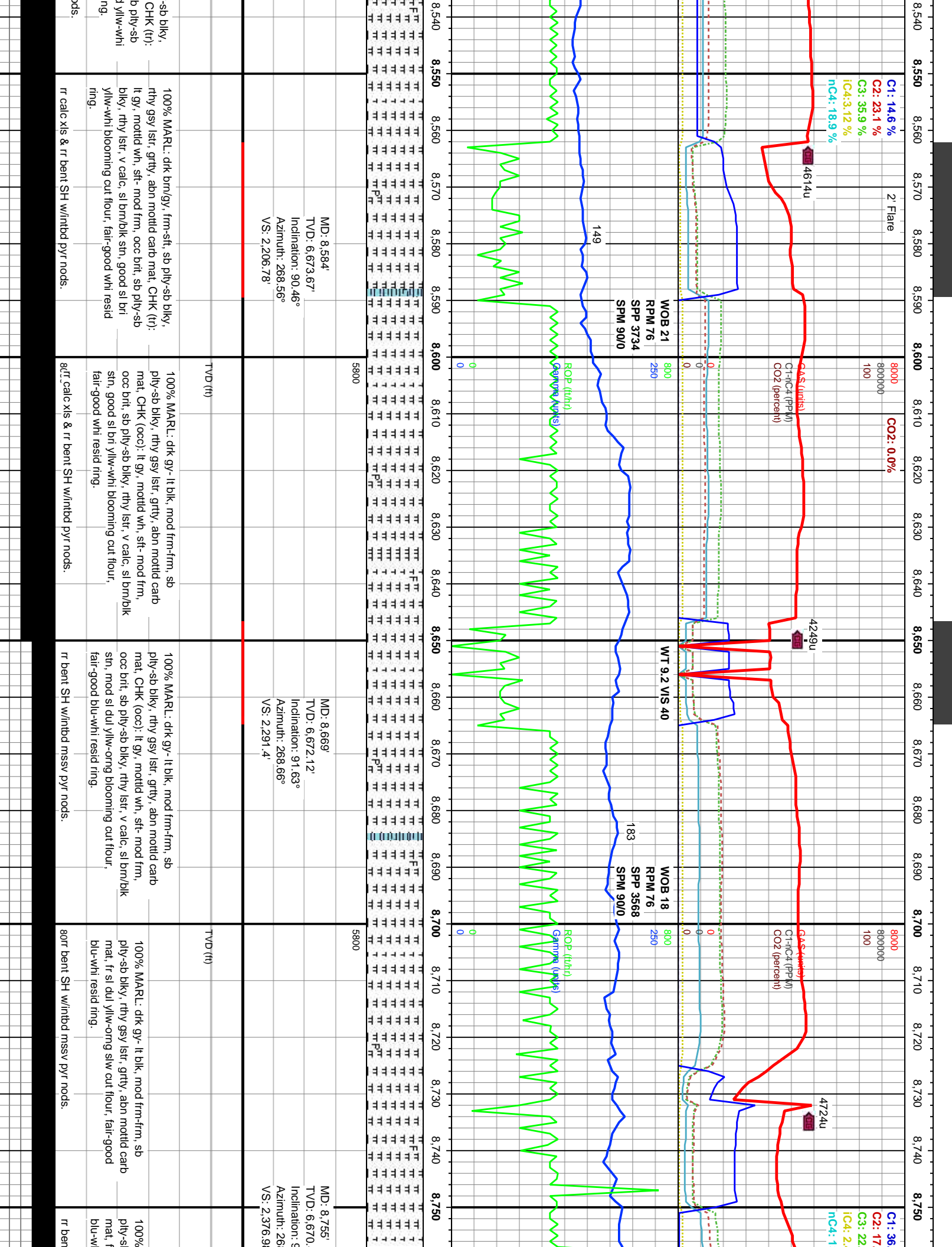
SH w/ntbd pyr nodes.

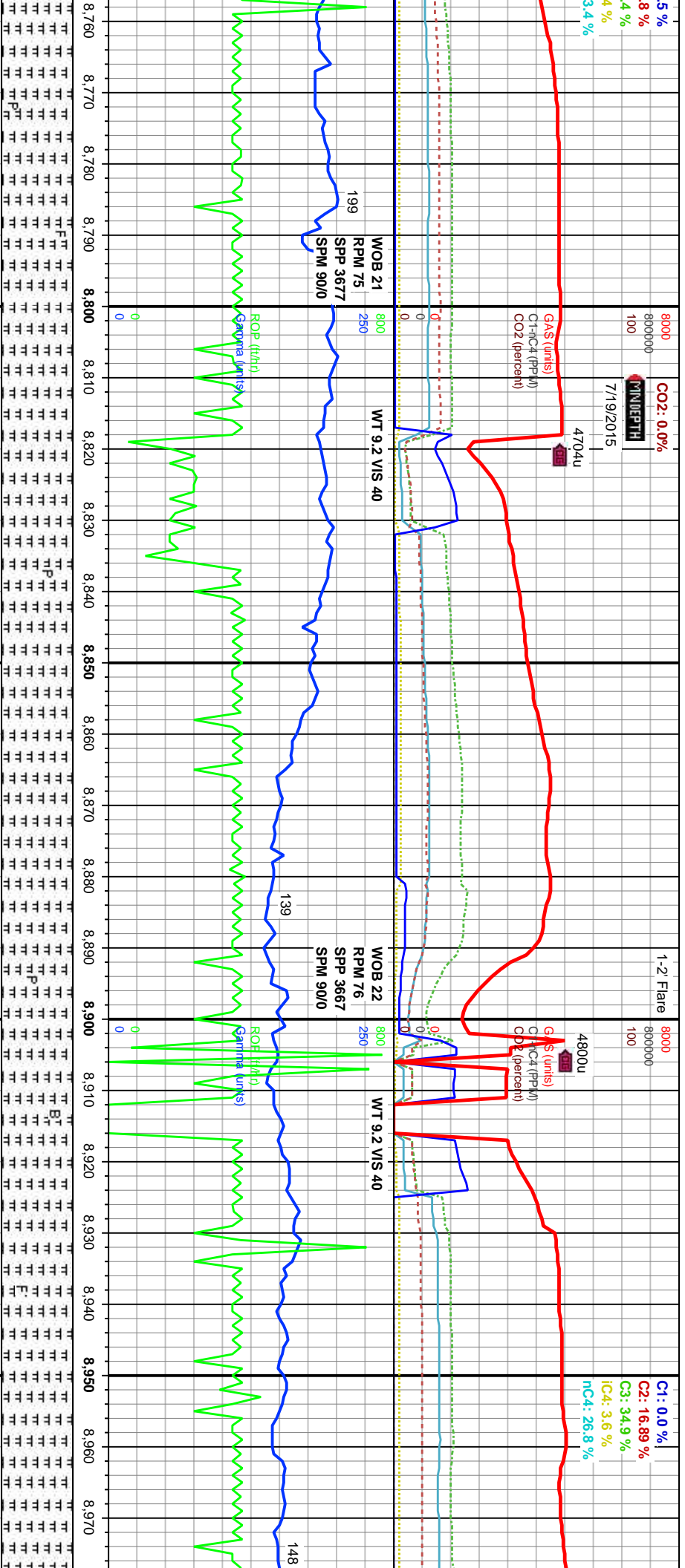
tr calc xls & bent SH w/ntbd pyr nodes.

tr calc xls & bent SH w/ntbd pyr nodes.

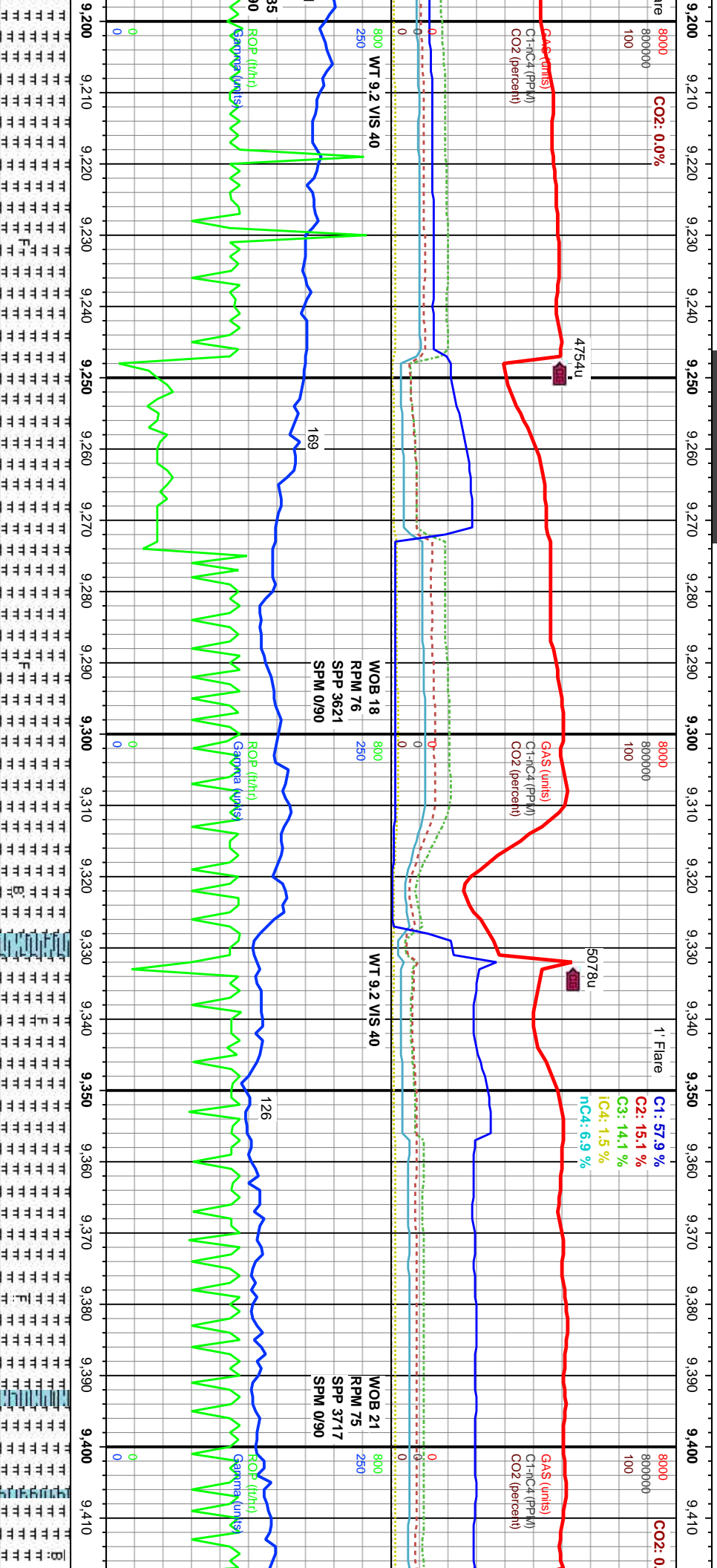
tr calc xls & bent SH w/ntbd pyr nodes.

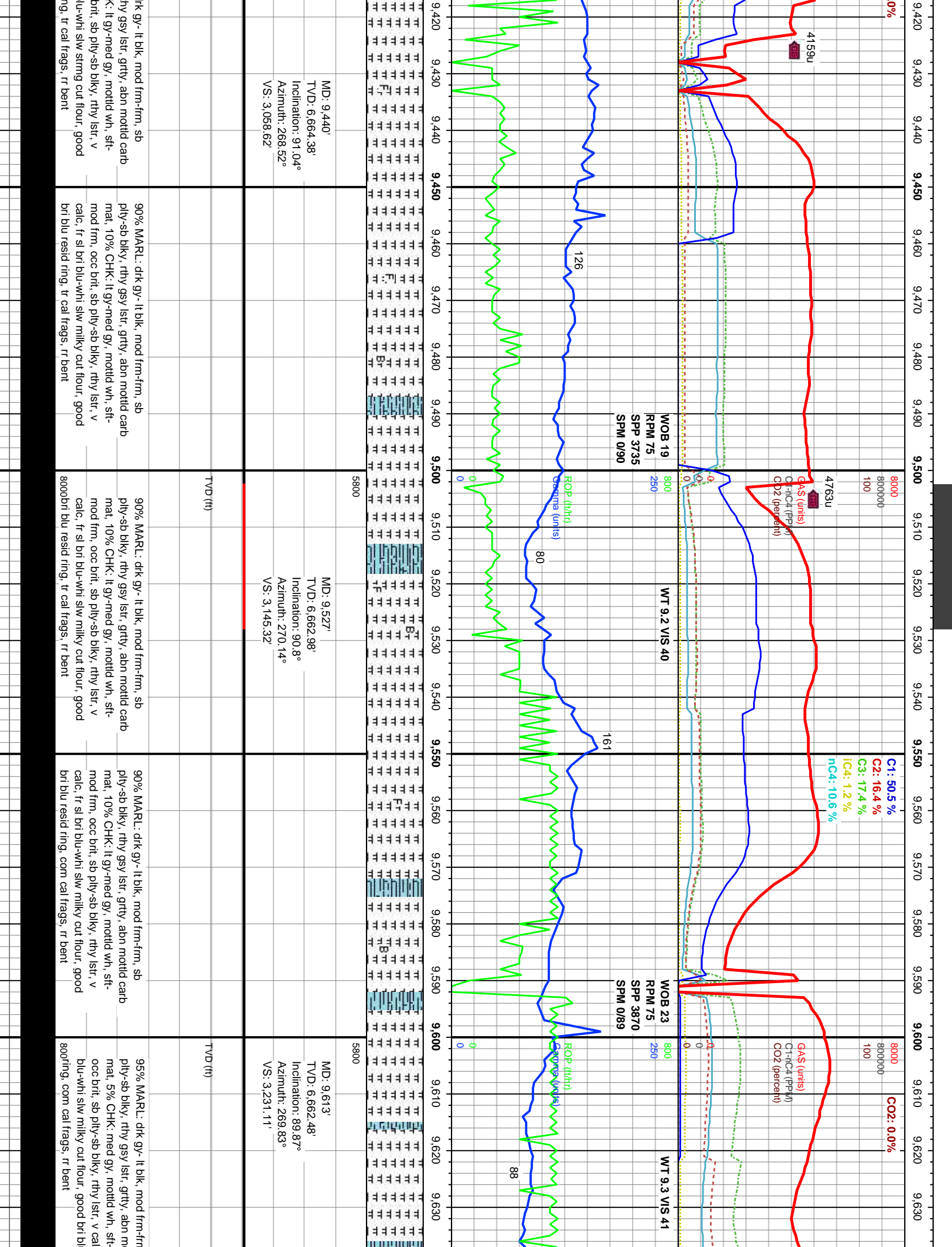
tr calc xls & com bent SH w/ntbd pyr nodes.

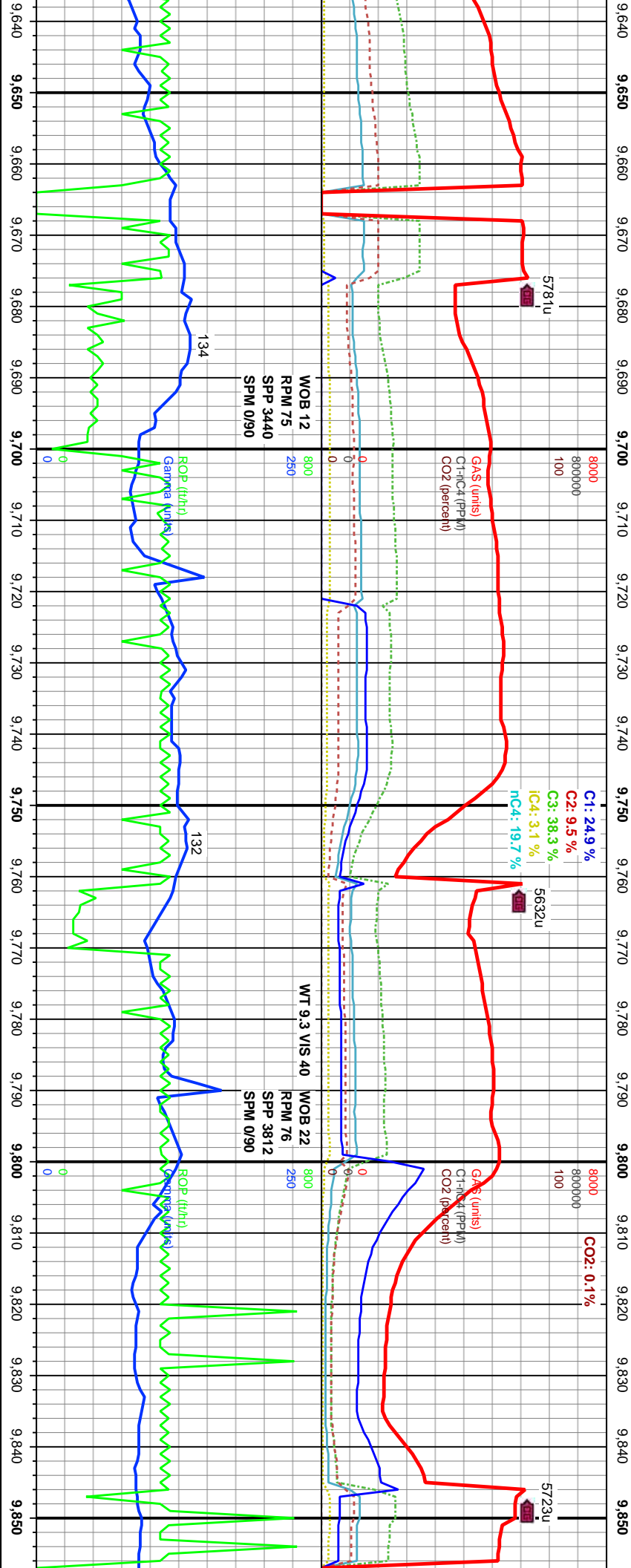




MARL: dk gy- lt blk, mod frm-frm, sb b blk, rthy gsy istr, grty, abn motild carb r sld yllw-ormg slw cut flour, fair-good hi resid ring.		100% MARL: dk gy- lt blk, mod frm-frm, sb ply-sb blk, rthy gsy istr, grty, abn motild carb mat, g sl bri blu-whi mod fst cut flour, fair-good blu-whi resid ring.		100% MARL: dk gy- lt blk, mod frm-frm, sb ply-sb blk, rthy gsy istr, grty, abn motild carb mat, g sl bri blu-whi mod fst cut flour, fair-good blu-whi resid ring.		8000 rr bent, rr cal frags		rr bent, rr cal frags	
MD: 8.841' TVD: 6,668.92' Inclination: 91.35° Azimuth: 268.06° VS: 2,462.53'		MD: 8.926' TVD: 6,667.49' Inclination: 90.58° Azimuth: 268.01° VS: 2,547.06'		MD: 8.926' TVD: 6,667.49' Inclination: 90.58° Azimuth: 268.01° VS: 2,547.06'		MD: 8.926' TVD: 6,667.49' Inclination: 90.58° Azimuth: 268.01° VS: 2,547.06'		MD: 8.926' TVD: 6,667.49' Inclination: 90.58° Azimuth: 268.01° VS: 2,547.06'	
TVD (ft)		TVD (ft)		TVD (ft)		TVD (ft)		TVD (ft)	

[illegible]





WOB 12
RPM 75
SPM 3440
SPM 0/90

WT 9.3 VIS 40

WOB 22
RPM 76
SPM 3812
SPM 0/90

MD: 9.783'
TVD: 6.661.59'
Inclination: 90.73°
Azimuth: 271.49°
VS: 3.400.81'

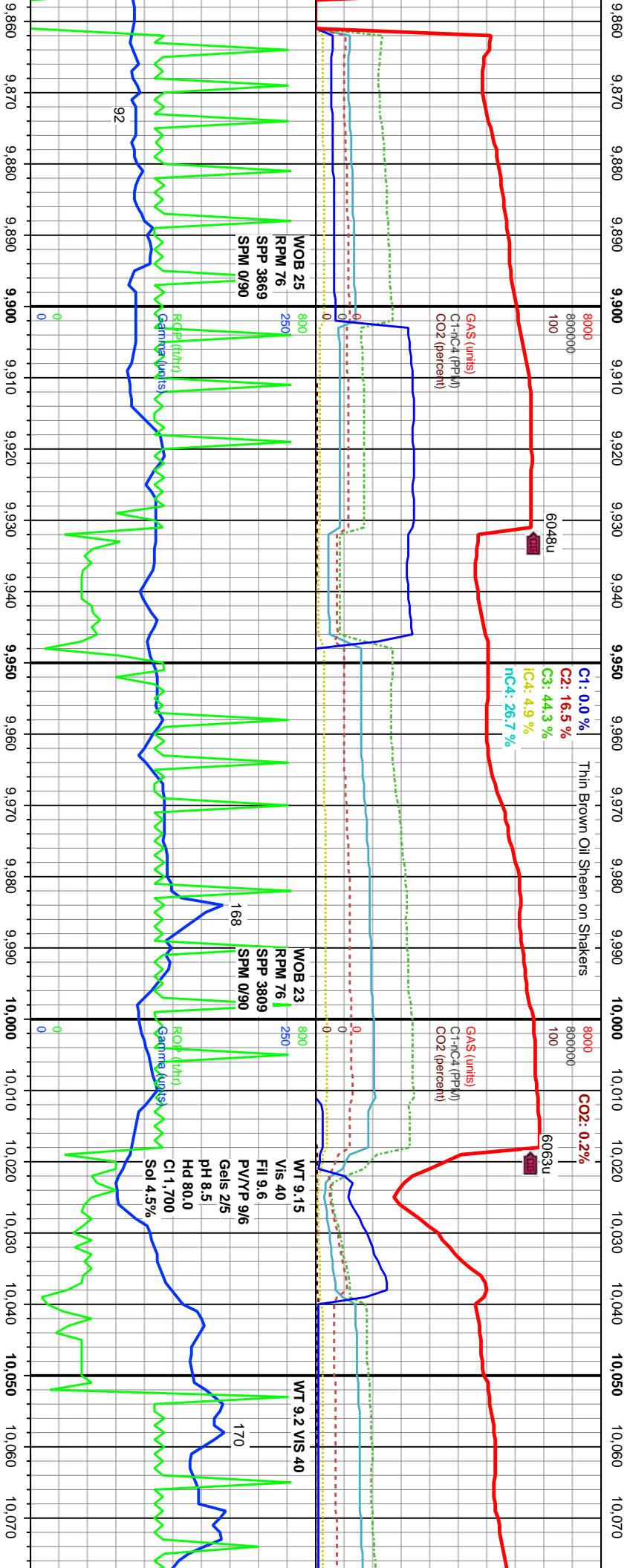
90% MARL: dk. gy- lt blk, mod frm-frm, sb
ply-sb blk, rthy gsy lst, grty, abn mottld carb
mat, 10% CHK: med gy, mottld wh, sft- mod
frm, occ brt, sb ply-sb blk, rthy lst, v calc, fr
sl bri blu-whi slw milky cut flour, good bri blu
resid ring, com cal frags, rr bent

60% CHK: med gy, mottld wh, sft- mod frm,
occ brt, sb ply-sb blk, rthy lst, v calc, 40%
MARL: dk gy- lt blk, mod frm-frm, sb ply-sb
blk, rthy gsy lst, grty, abn mottld carb mat, g
bri blu-whi milky cut flour, good bri blu resid
ring, rr cal frags, rr bent

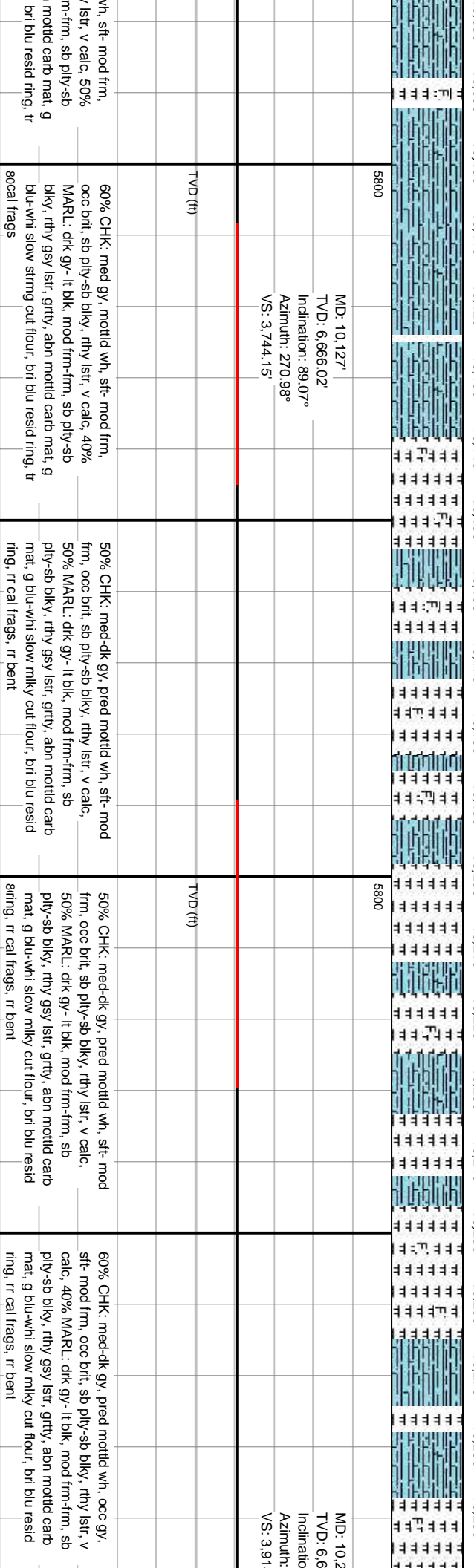
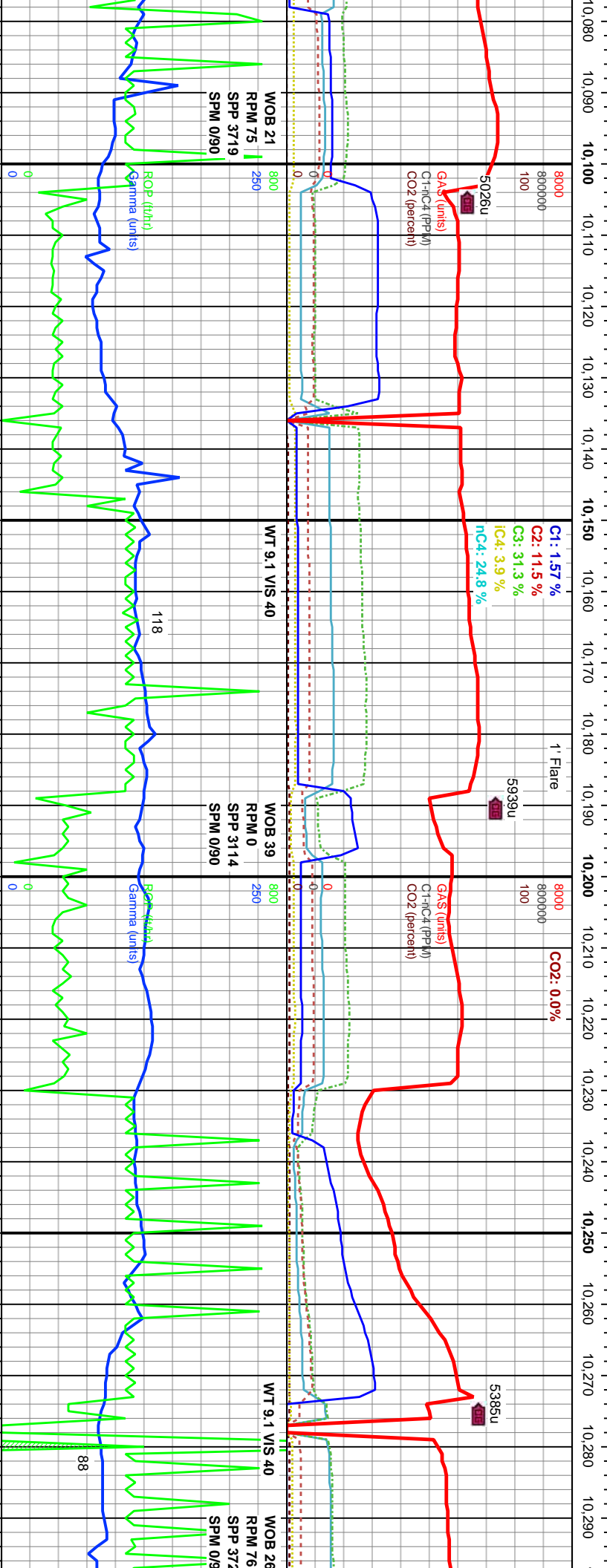
60% CHK: med gy, mottld wh, sft- mod frm,
occ brt, sb ply-sb blk, rthy lst, v calc, 40%
MARL: dk gy- lt blk, mod frm-frm, sb ply-sb
blk, rthy gsy lst, grty, abn mottld carb mat, g
bri blu-whi milky cut flour, good bri blu resid
ring, rr cal frags, rr bent

95% CHK: med gy, mottld wh, sft- mod frm,
occ b rty, sb ply-sb blk, rthy lst, v calc, 5%
MARL: dk gy- lt blk, mod frm-frm, sb ply-sb
blk, rthy gsy lst, grty, abn mottld carb mat, g
bri blu-whi milky cut flour, good bri blu resid
ring, rr cal frags

95% CHK: med gy, mottld wh, sft- mod frm,
occ b rty, sb ply-sb blk, rthy lst, v calc, 5%
MARL: dk gy- lt blk, mod frm-frm, sb ply-sb
blk, rthy gsy lst, grty, abn mottld carb mat, g
bri blu-whi milky cut flour, good bri blu resid
ring, rr cal frags



MD: 9.869' TVD: 6.661.53' Inclination: 89.35° Azimuth: 270.64° VS: 3.486.7'	5800	MD: 9.956' TVD: 6.663.01' Inclination: 88.7° Azimuth: 270.68° VS: 3.573.54'	5800	MD: 10.042' TVD: 6.664.66' Inclination: 89.1° Azimuth: 269.65° VS: 3.659.33'	50% CHK: med gy, mottld wh, sft- mod frm, occ brt, sb ply-sb blk, rthy lstr, v calc, 20% MARL: dk gy- lt blk, mod frm-frn, sb ply-sb blk, rthy gsy lstr, grty, abn mottld carb mat, g blu-whi sl fstr milky cut flour, bri blu resid ring, r cal frags
CHK: med gy, mottld wh, sft- mod frm, occ brt, sb ply-sb blk, rthy lstr, v calc, 5% MARL: dk gy- lt blk, mod frm-frn, sb ply-sb blk, rthy gsy lstr, grty, abn mottld carb mat, g bri blu-whi milky cut flour, good bri blu resid r cal frags	TVD (ft)	90% CHK: med gy, mottld wh, sft- mod frm, occ brt, sb ply-sb blk, rthy lstr, v calc, 10% MARL: dk gy- lt blk, mod frm-frn, sb ply-sb blk, rthy gsy lstr, grty, abn mottld carb mat, g bri blu-whi mod fstr milky cut flour, bri blu resid ring, r cal frags	TVD (ft)	80% CHK: med gy, mottld wh, sft- mod frm, occ brt, sb ply-sb blk, rthy lstr, v calc, 20% MARL: dk gy- lt blk, mod frm-frn, sb ply-sb blk, rthy gsy lstr, grty, abn mottld carb mat, g blu-whi sl fstr milky cut flour, bri blu resid ring, r cal frags	



10,740 10,750 10,760 10,770 10,780 10,790 10,800 10,810 10,820 10,830 10,840 10,850 10,860 10,870 10,880 10,890 10,900 10,910 10,920 10,930 10,940 10,950

C1: 2.32 %
C2: .012 %
C3: 36.72 %
iC4: 4.87 %
nC4: 24.61 %

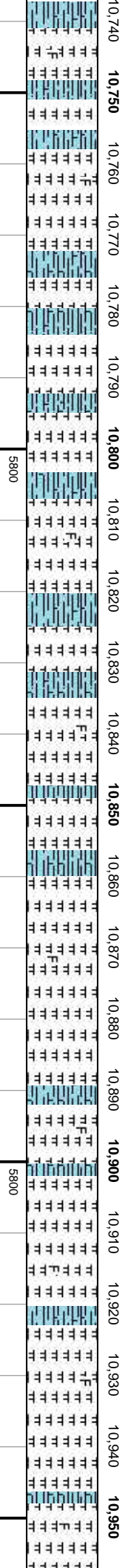
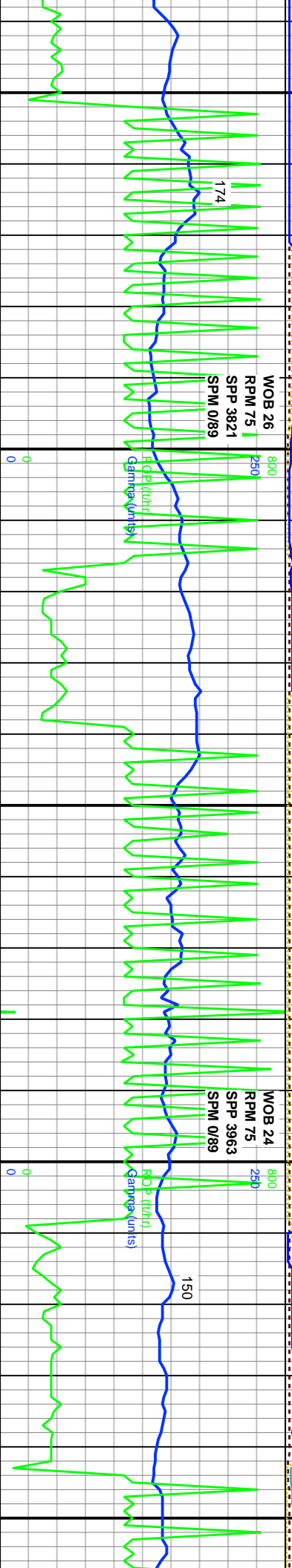
CO2: 1.20%

C1: 5.5 %
C2: 1.1 %
C3: 16.1 %
iC4: 1 %
nC4: 1 %

GAS (units)
C1+IC4 (PPM)
CO2 (percent)

GAS (units)
C1+IC4 (PPM)
CO2 (percent)

Very good oil sheen observed across shaker.



MD: 10,755'
TVD: 6,656.14'
Inclination: 91.82°
Azimuth: 273.07°
VS: 4,371.58'

MD: 10,848'
TVD: 6,653.62'
Inclination: 91.29°
Azimuth: 272.25°
VS: 4,464.52'

MD: 10,940'
TVD: 6,653.13'
Inclination: 89.32°
Azimuth: 271.47°
VS: 4,556.45'

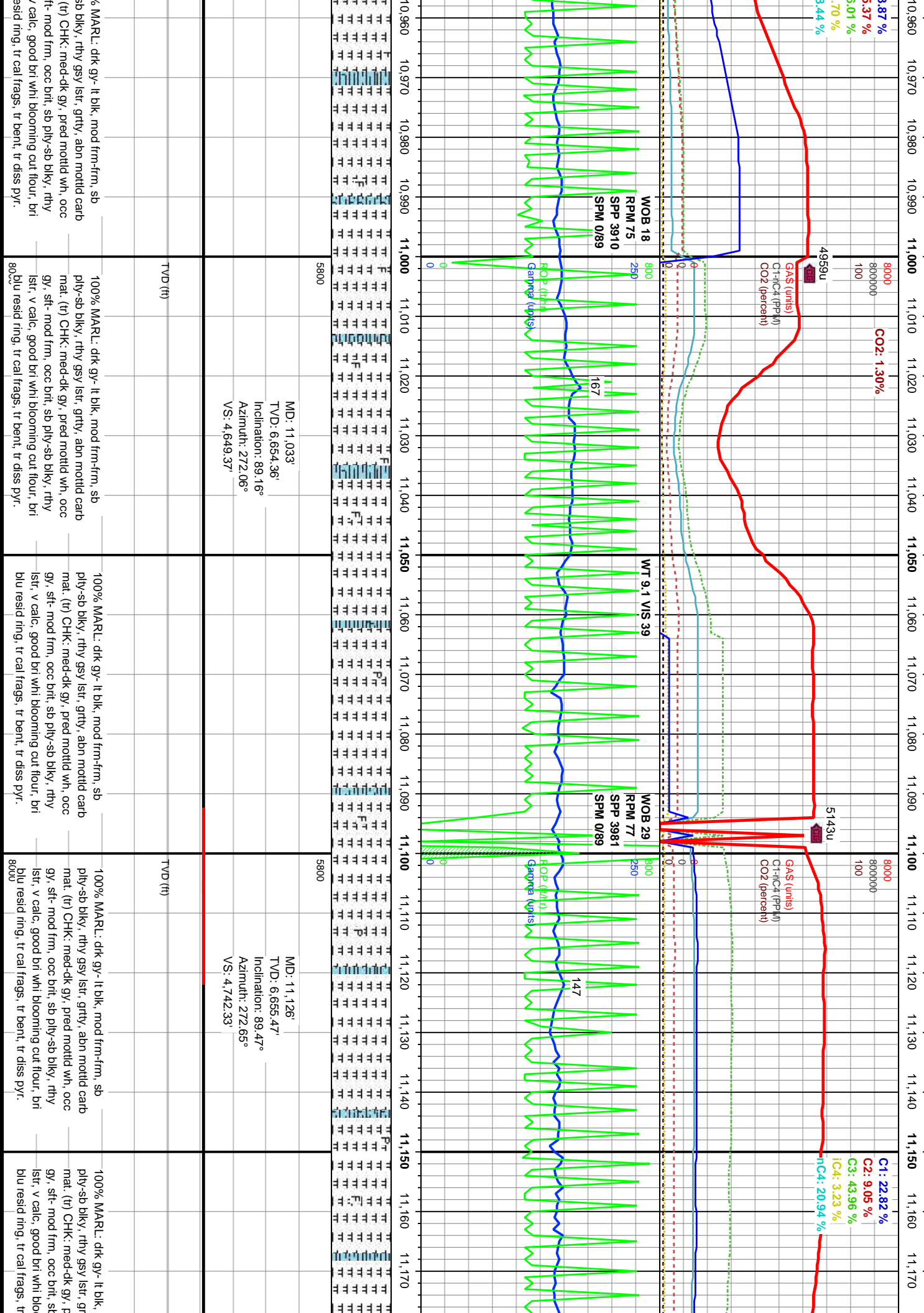
90% MARL: drk gy- lt blk, mod frm-frm, sb
ply-sb blkly, rthy gsy lstr, grtty, abn motitd carb
mat. 10% CHK: med-dk gy, pred motitd wh, occ
gy, sft- mod frm, occ brt, sb ply-sb blkly, rthy
lstr, v calc, mod slw yllw-whi blooming cut flour,
brt blu resid ring, tr cal frags, tr bent, tr diss
pyr.

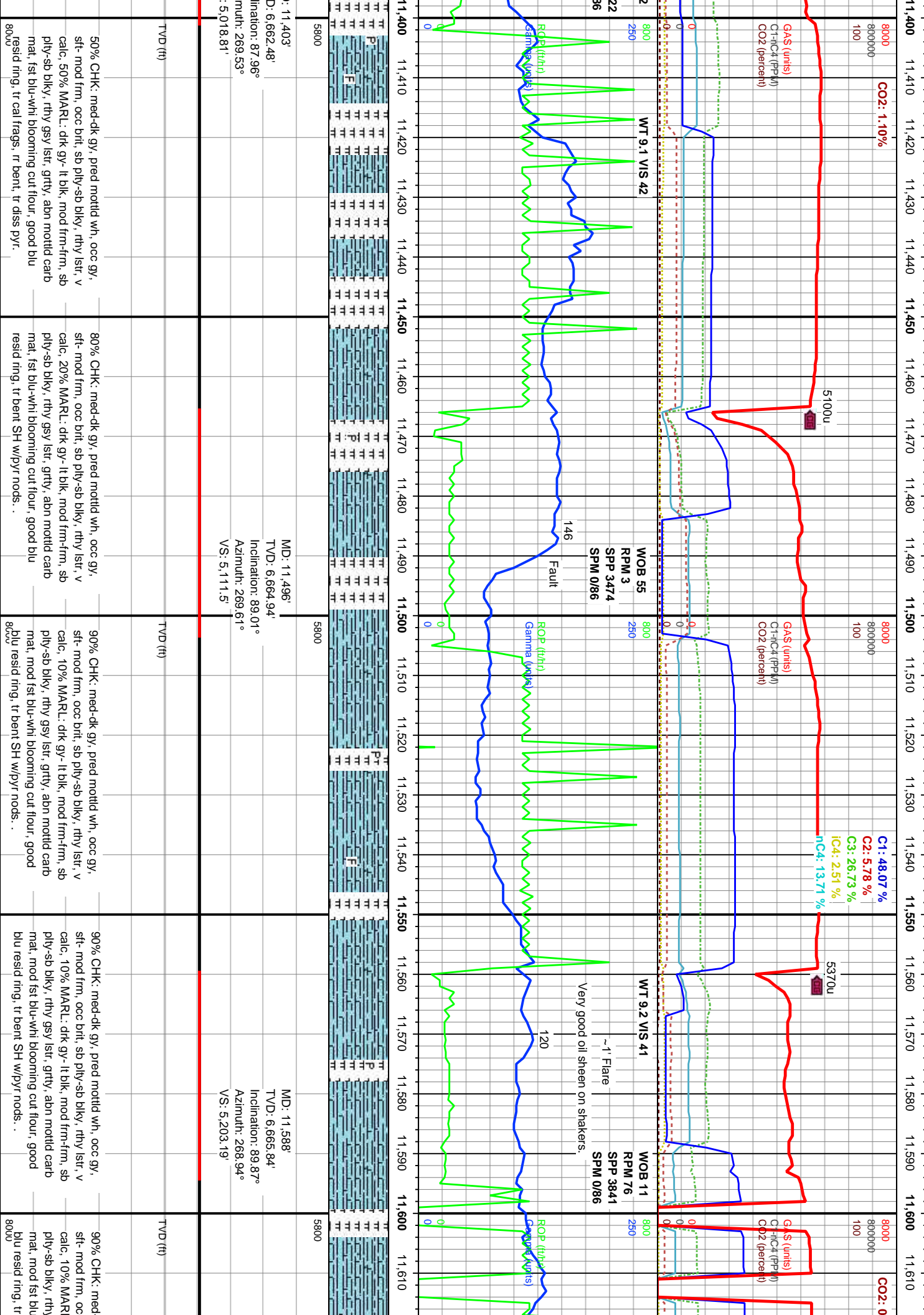
90% MARL: drk gy- lt blk, mod frm-frm, sb
ply-sb blkly, rthy gsy lstr, grtty, abn motitd carb
mat. 10% CHK: med-dk gy, pred motitd wh, occ
gy, sft- mod frm, occ brt, sb ply-sb blkly, rthy
lstr, v calc, mod slw yllw-whi blooming cut flour,
brt blu resid ring, abn cal frags, tr bent, tr diss
pyr.

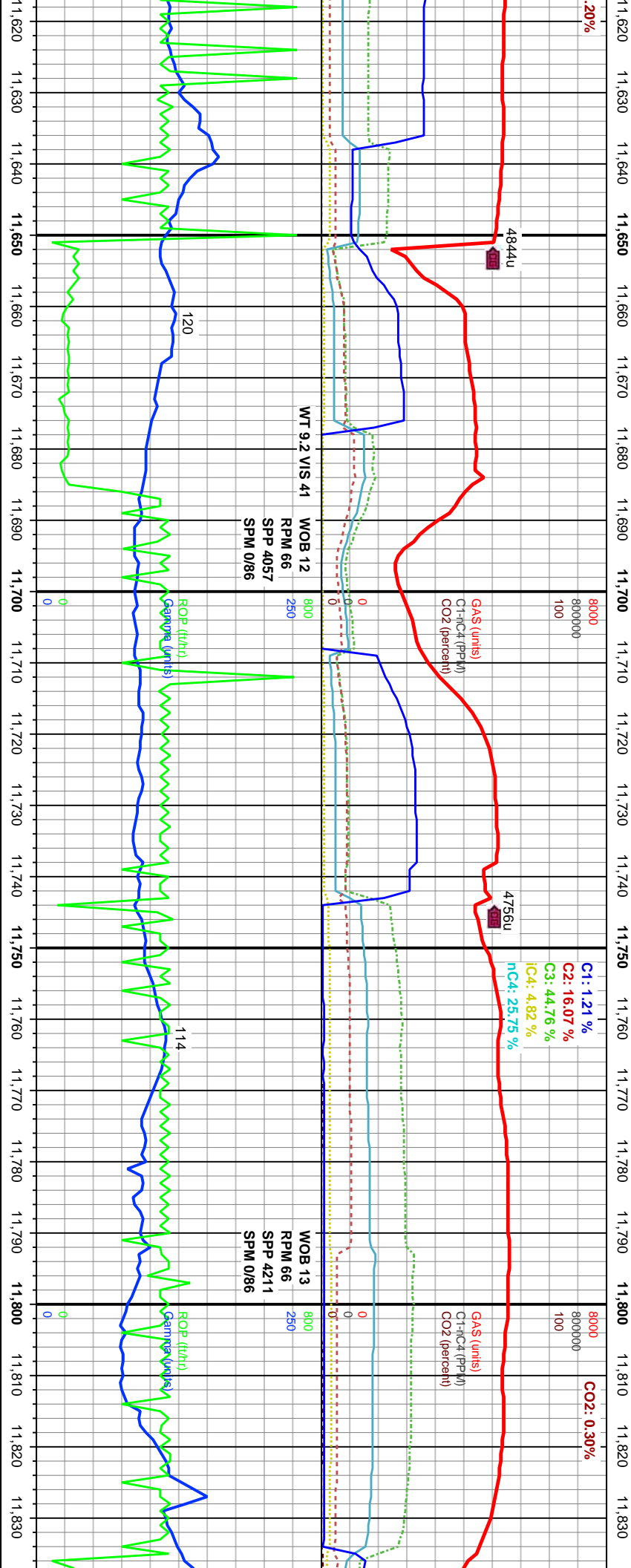
95% MARL: drk gy- lt blk, mod frm-frm, sb
ply-sb blkly, rthy gsy lstr, grtty, abn motitd carb
mat. 5% CHK: med-dk gy, pred motitd wh, occ
gy, sft- mod frm, occ brt, sb ply-sb blkly, rthy
lstr, v calc, inst brt whi blooming cut flour, brt
blu resid ring, abn cal frags, tr bent, tr diss
pyr.

95% MARL: drk gy- lt blk, mod frm-frm, sb
ply-sb blkly, rthy gsy lstr, grtty, abn motitd carb
mat. 5% CHK: med-dk gy, pred motitd wh, occ
gy, sft- mod frm, occ brt, sb ply-sb blkly, rthy
lstr, v calc, good brt whi blooming cut flour, brt
blu resid ring, tr cal frags, tr bent, tr diss
pyr.

100% MARL: drk gy- lt blk, mod frm-frm, sb
ply-sb blkly, rthy gsy lstr, grtty, abn motitd carb
mat. 5% CHK: med-dk gy, pred motitd wh, occ
gy, sft- mod frm, occ brt, sb ply-sb blkly, rthy
lstr, v calc, good brt whi blooming cut flour, brt
blu resid ring, tr cal frags, tr bent, tr diss
pyr.







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12.060 12.070 12.080 12.090 12.100 12.110 12.120 12.130 12.140 12.150 12.160 12.170 12.180 12.190 12.200 12.210 12.220 12.230 12.240 12.250 12.260 12.270

8000
800000
100

C1: 0.0 %
C2: 29.2 %
C3: 43.6 %
iC4: 1.9 %
nC4: 25.3 %

7/20/2015
CO2: 0.30%

GAS (units)
C1-C4 (PPM)
CO2 (percent)

GAS (units)
C1-C4 (PPM)
CO2 (percent)

4822u

WOB 17
RPM 65
SPM 4148
SPM 0/82

1" Flare
WT 9.2 VIS 40

WOB 6
RPM 65
SPM 3459
SPM 0/83

WT 9.2 VIS 39

WT 9.2 VIS 40

186

129

201

ROP (ft/hr)
Gamma (units)

ROP (ft/hr)
Gamma (units)

0

0

0

5800

5800

MD: 12.145'
TVD: 6,660.62'
Inclination: 89.56°
Azimuth: 270°
VS: 5,758.49'

MD: 12.238'
TVD: 6,662.06'
Inclination: 88.67°
Azimuth: 270.03°
VS: 5,851.26'

TVD (ft)

TVD (ft)

CHK: med-dk gy, pred mottld wh, occ gy, mod frm, occ brt, sb ply-sb blk, rthy lstr, v 40% MARL: dk gy- lt blk, mod frm-frm, sb blk, rthy gsy lstr, grty, abn mottld carb mod-1st yllw-whi blooming cut flour, good resid ring.

90% MARL: dk gy- lt blk, mod frm-frm, sb ply-sb blk, rthy gsy lstr, grty, abn mottld carb mat, 10% CHK: med-dk gy, pred mottld wh, occ gy, sft- mod frm, occ brt, sb ply-sb blk, rthy lstr, v calc, mod fst blu-whi blooming cut 80flour, good blu resid ring.

100% MARL: dk gy- lt blk, mod frm-frm, sb ply-sb blk, rthy gsy lstr, grty, abn mottld carb mat, CHK (tr): med-dk gy, pred mottld wh, occ gy, sft- mod frm, occ brt, sb ply-sb blk, rthy lstr, v calc, mod fst blu-whi milky cut flour, good blu resid ring.

95% MARL: med gy- lt blk, mod frm-frm, sb ply-sb blk, rthy gsy lstr, grty, abn mottld carb mat, CHK (5%): med-dk gy, pred mottld wh, occ gy, sft- mod frm, occ brt, sb ply-sb blk, rthy lstr, v calc, slw blu-whi bleeding cut flour, 80good blu resid ring, rr cal frags

100% MARL: dk gy- blk, m blk, rthy gsy lstr, grty, abr CHK (tr): med-dk gy, pred mottld wh, sft- mod frm, occ brt, sb ply-sb blk, calc, v slw blu-whi milky cut resid ring, rr cal frags

12,280 12,290 12,300 12,310 12,320 12,330 12,340 12,350 12,360 12,370 12,380 12,390 12,400 12,410 12,420 12,430 12,440 12,450 12,460 12,470 12,480 12,490

8000
800000
100

GAS (units)
C1-nC4 (PPM)
CO2 (percent)

C1: 8.8 %
C2: 15.1 %
C3: 40.6 %
iC4: 3.9 %
nC4: 20.5 %

8000
800000
100

GAS (units)
C1-nC4 (PPM)
CO2 (percent)

CO2: 0.0%

7763u

WOB 61
RPM 0
SPM 3705
SPM 860

WT 9.1 VIS 41

Brown Oil Sheen on Shakers

WOB 15
RPM 61
SPM 4192
SPM 830

WT 9.0 VIS 42

WOB 13
RPM 61
SPM 4115
SPM 833

ROP (t/hr)
Gamma (units)

ROP (t/hr)
Gamma (units)

5800

5800

MD: 12,329'
TVD: 6,662.77'
Inclination: 90.43°
Azimuth: 267.95°
VS: 5.941.9'

MD: 12,421'
TVD: 6,661.71'
Inclination: 90.89°
Azimuth: 268.64°
VS: 6.033.44'

TVD (ft)

TVD (ft)

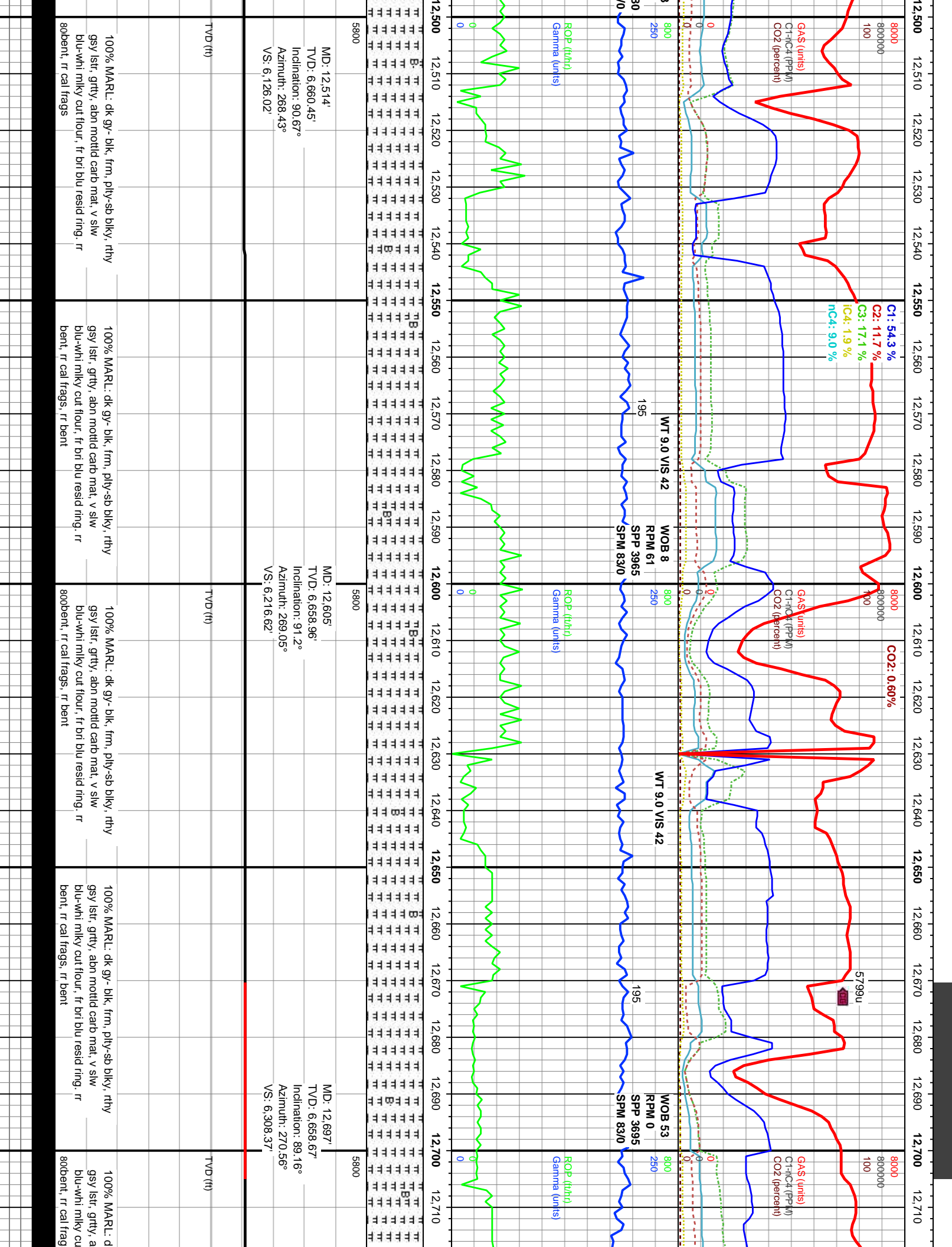
100% MARL: dk gy- blk, frm, pty-sb blk, rthy
gsy lst, grtty, abn mottld carb mat. v slw
blu-whi milky cut flour, fr bri blu resid ring. rr
800bent, rr cal frags

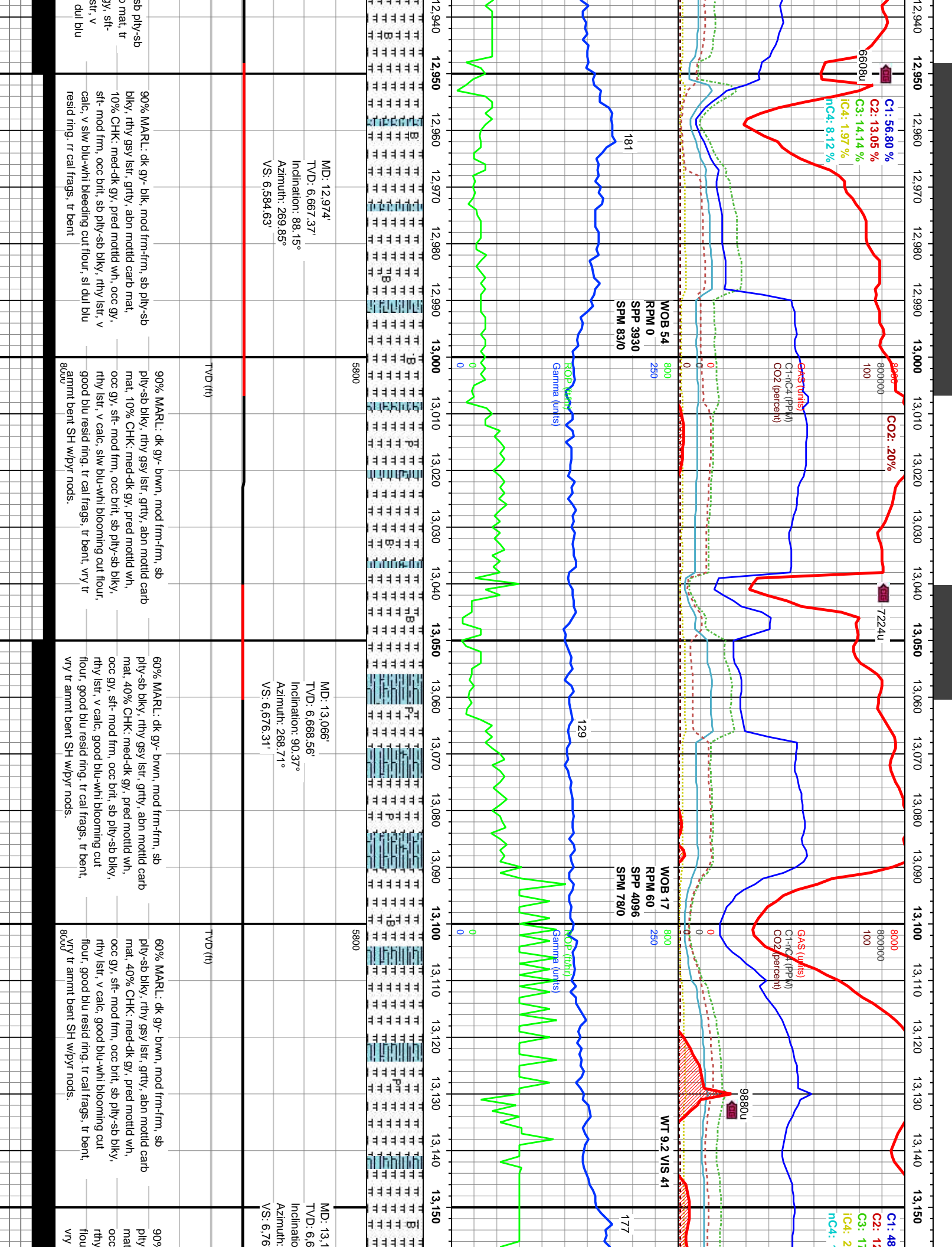
100% MARL: dk gy- blk, frm, pty-sb blk, rthy
gsy lst, grtty, abn mottld carb mat. v slw
blu-whi milky cut flour, fr bri blu resid ring. rr
bent

100% MARL: dk gy- blk, frm, pty-sb blk, rthy
gsy lst, grtty, abn mottld carb mat. v slw
blu-whi milky cut flour, fr bri blu resid ring. rr
800bent

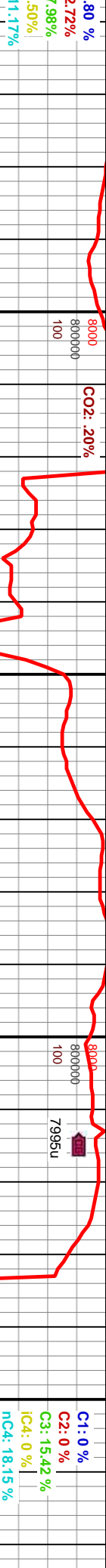
100% MARL: dk gy- blk, frm, pty-sb blk, rthy
gsy lst, grtty, abn mottld carb mat. v slw
blu-whi milky cut flour, fr bri blu resid ring. rr
bent

od frm-frm, sb pty-sb
mottld carb mat,
mottld wh, occ gy,
y-sb blk, rthy lst, v
four, good bri blu





13.160 13.170 13.180 13.190 13.200 13.210 13.220 13.230 13.240 13.250 13.260 13.270 13.280 13.290 13.300 13.310 13.320 13.330 13.340 13.350 13.360 13.370



WOB 12
RPM 77
SPM 4032
SPM 780

WT 9.2 VIS 41

WOB 12
RPM 61
SPM 4023
SPM 780

ROP (l/hr)
Gamma (m/s)

ROP (l/hr)
Gamma (m/s)



58' 68.91' n: 89.19° 269.1° 7.95'

MD: 13.264'
TVD: 6.670.69'
Inclination: 88.89°
Azimuth: 269.9°
VS: 6.873.61'

TVD (ft)

TVD (ft)

90% MARL: dk gy- brwn, mod frm-firm, sb ply-sb blkly, rthy gsy lstr, grtty, abn motild carb mat, 10% CHK: med-dk gy, pred motild wh, occ gy, sft- mod frm, occ brt, sb ply-sb blkly, rthy lstr, v calc, good blu-whi blooming cut flour, good blu resid ring, tr cal frags, tr bent, vry tr amnt bent SH w/pyr nods.

70% MARL: dk gy- brwn, mod frm-firm, sb ply-sb blkly, rthy gsy lstr, grtty, abn motild carb mat, 30% CHK: med-dk gy, pred motild wh, occ gy, sft- mod frm, occ brt, sb ply-sb blkly, rthy lstr, v calc, good blu-whi blooming cut flour, good blu resid ring, tr cal frags, tr bent, vry tr amnt bent SH w/pyr nods.

50% MARL: dk gy- brwn, mod frm-firm, sb ply-sb blkly, rthy gsy lstr, grtty, abn motild carb mat, 50% CHK: med-dk gy, pred motild wh, occ gy, sft- mod frm, occ brt, sb ply-sb blkly, rthy lstr, v calc, good blu-whi blooming cut flour, good blu resid ring, tr cal frags, tr bent.

50% MARL: dk gy- brwn, r ply-sb blkly, rthy gsy lstr, gr mat, 50% CHK: med-dk gy, occ gy, sft- mod frm, occ br flour, good blu resid ring, tr

13,380 13,390 13,400 13,410 13,420 13,430 13,440 13,450 13,460 13,470 13,480 13,490 13,500 13,510 13,520 13,530 13,540 13,550 13,560 13,570 13,580 13,590

8000
800000
100

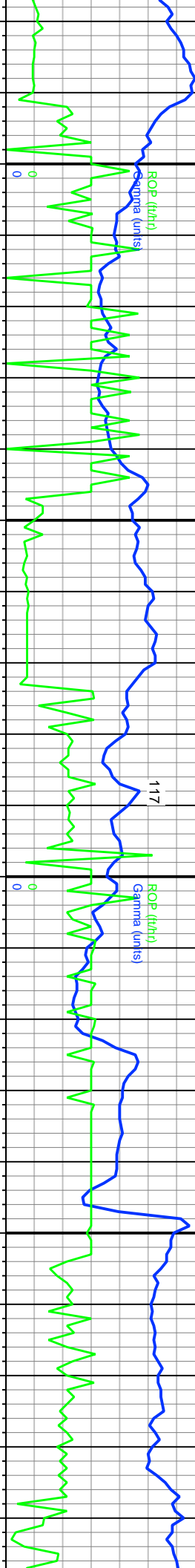
CO2: .0%

Gas (units)
C1+C4 (PPM)
CO2 (percent)

Gas line cut by rig crew

WT 9.2 VIS 40
MOB 16
RPM 65
SPM 4074
SPM 780

ROP (ft/hr)
Gamma (units)



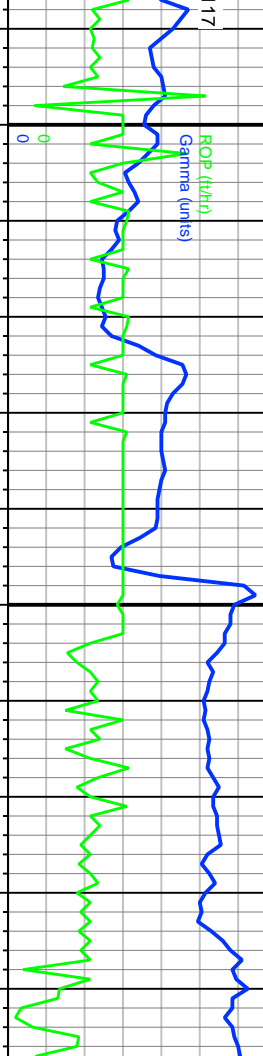
8000
800000
100

CO2: .0%

Gas (units)
C1+C4 (PPM)
CO2 (percent)

WT 9.2 VIS 42
MOB 12
RPM 76
SPM 3935
SPM 074

ROP (ft/hr)
Gamma (units)



C1: 38.81 %
C2: 13.87 %
C3: 24.39 %
C4: 3.19 %
nC4: 13.60 %

WT 9.2 VIS 42
Downthrow Fault into A-Chalk

3,380'
1,671.44'
Inclination: 90.37°
Azimuth: 268.13°
VS: 7.042, 96°
389.17'

MD: 13,434'
TVD: 6,671.09'
Inclination: 90.37°
Azimuth: 269.82°
VS: 7.042, 96°

MD: 13,526'
TVD: 6,670.92'
Inclination: 89.84°
Azimuth: 269.43°
VS: 7.134, 69°

TVD (ft)

TVD (ft)

mod firm-frn, sb
lty, abn mottld carb
pred mottld wh,
pred mottld wh,
it, sb pily-sb blkly,
n blooming cut
cal frags, tr bent.
50% MARL: dk gy- brwn, mod firm-frn, sb
pily-sb blkly, rthy gsy lst, grtty, abn mottld carb
mat, 50% CHK: med-dk gy, pred mottld wh,
occ gy, sft- mod frm, occ brt, sb pily-sb blkly,
rthy lst, v calc, good blu-whi blooming cut
flour, good blu resid ring, tr cal frags, tr bent.
80% CHK: med-dk gy, pred mottld wh, occ gy,
sft- mod frm, occ brt, sb pily-sb blkly, rthy lst, v
calc, 20% MARL: dk gy- lt brwn, mod firm-frn,
sb pily-sb blkly, rthy gsy lst, grtty, abn mottld
carb mat, good blu-whi blooming cut flour,
good blu resid ring.
80% CHK: med-dk gy, pred mottld wh, occ gy,
sft- mod frm, occ brt, sb pily-sb blkly, rthy lst, v
calc, 20% MARL: dk gy- lt brwn, mod firm-frn,
sb pily-sb blkly, rthy gsy lst, grtty, abn mottld
carb mat, good blu-whi blooming cut flour,
good blu resid ring.
90% CHK: med-dk gy, pred mottld wh, occ gy,
sft- mod frm, occ brt, sb pily-sb blkly, rthy lst, v
calc, 10% MARL: dk gy- lt brwn, mod firm-frn,
sb pily-sb blkly, rthy gsy lst, grtty, abn mottld
carb mat, good blu-whi blooming cut flour,
good blu resid ring.

13,820 13,830 13,840 13,850 13,860 13,870 13,880 13,890 13,900 13,910 13,920 13,930 13,940 13,950 13,960 13,970 13,980 13,990 14,000 14,010 14,020 14,030

0% 8000 800000 100 6980u 8000 800000 100 5917u 8000 800000 100 7/21/2015

WT 9.2 VIS 42 WT 9.2 VIS 42 WT 9.2 VIS 42

GAS (units) CH4 (PPM) CO2 (percent) GAS (units) CH4 (PPM) CO2 (percent) GAS (units) CH4 (PPM) CO2 (percent)

WT 9.2 VIS 42 WT 9.2 VIS 42 WT 9.2 VIS 42

WOB 5 RPM 60 SPP 3875 SPM 0/74 WOB 5 RPM 60 SPP 4068 SPM 0/74 WOB 5 RPM 60 SPP 4068 SPM 0/74

ROP (ft/hr) Gamma (units) ROP (ft/hr) Gamma (units) ROP (ft/hr) Gamma (units)

135 176

MD: 13.895' TVD: 6,667.19' Inclination: 90.21° Azimuth: 270.24° VS: 7,502.82'

MD: 13.987' TVD: 6,665.36' Inclination: 92.06° Azimuth: 269.79° VS: 7,594.58'

MD: 13.987' TVD: 6,665.36' Inclination: 92.06° Azimuth: 269.79° VS: 7,594.58'

MD: 13.987' TVD: 6,665.36' Inclination: 92.06° Azimuth: 269.79° VS: 7,594.58'

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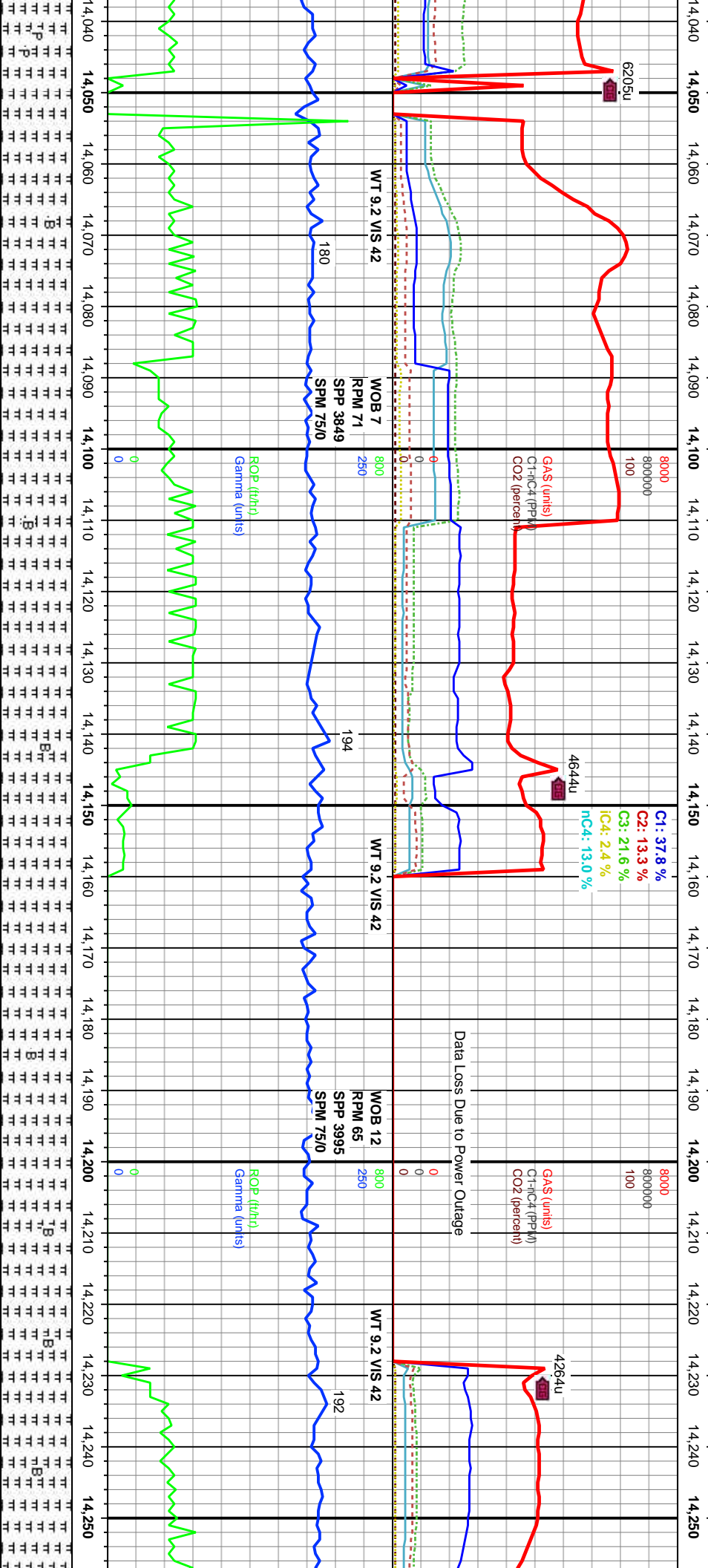
MD: 13.987' TVD: 6,665.36' Inclination: 92.06° Azimuth: 269.79° VS: 7,594.58'

MD: 13.987' TVD: 6,665.36' Inclination: 92.06° Azimuth: 269.79° VS: 7,594.58'

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MD: 13.987' TVD: 6,665.36' Inclination: 92.06° Azimuth: 269.79° VS: 7,594.58'

[illegible]

14.260 14.270 14.280 14.290 14.300 14.310 14.320 14.330 14.340 14.350 14.360 14.370 14.380 14.390 14.400 14.410 14.420 14.430 14.440 14.450 14.460 14.470

8000
800000
100

Gas (units)
C1+C4 (PPM)
CO2 (percent)

Data Loss Due to Power Outage

WOB 11
RPM 61
SPM 3933
SPM 75/0

WT 9.2 VIS 42
209

ROP (t/hr)
Gamma (units)

0
0
0

C1: 53.98 %
C2: 7.30 %
C3: 17.44 %
iC4: 2.03 %
nC4: 10.71%

8000
800000
100

CO2: 1.10%

WOB 4
RPM 60
SPM 3921
SPM 75/0

WT 9.2 VIS 42
209

ROP (t/hr)
Gamma (units)

0
0

MD: 14.336'
TVD: 6.660.58'
Inclination: 90.33°
Azimuth: 270.56°
VS: 7.942.75'

TVD (ft)

5800

MARL: dk gy- med brwn, mod frm-hd, sb
b blkly, rthy gsy lst, grtly, abn motild carb
slw blu bleeding cut flour, mod thn
h resid ring, rr bent

100% MARL: dk gy- med brwn, mod frm-hd, sb
ply-sb blkly, rthy gsy lst, grtly, abn motild carb
mat, mod slw dul blu bleeding cut flour, mod
8ftn blu-whi resid ring, rr bent

100% MARL: dk gy- med brwn, mod frm-hd, sb
ply-sb blkly, rthy gsy lst, grtly, abn motild carb
mat, mod slw dul blu bleeding cut flour, mod
thn blu-whi resid ring, rr bent

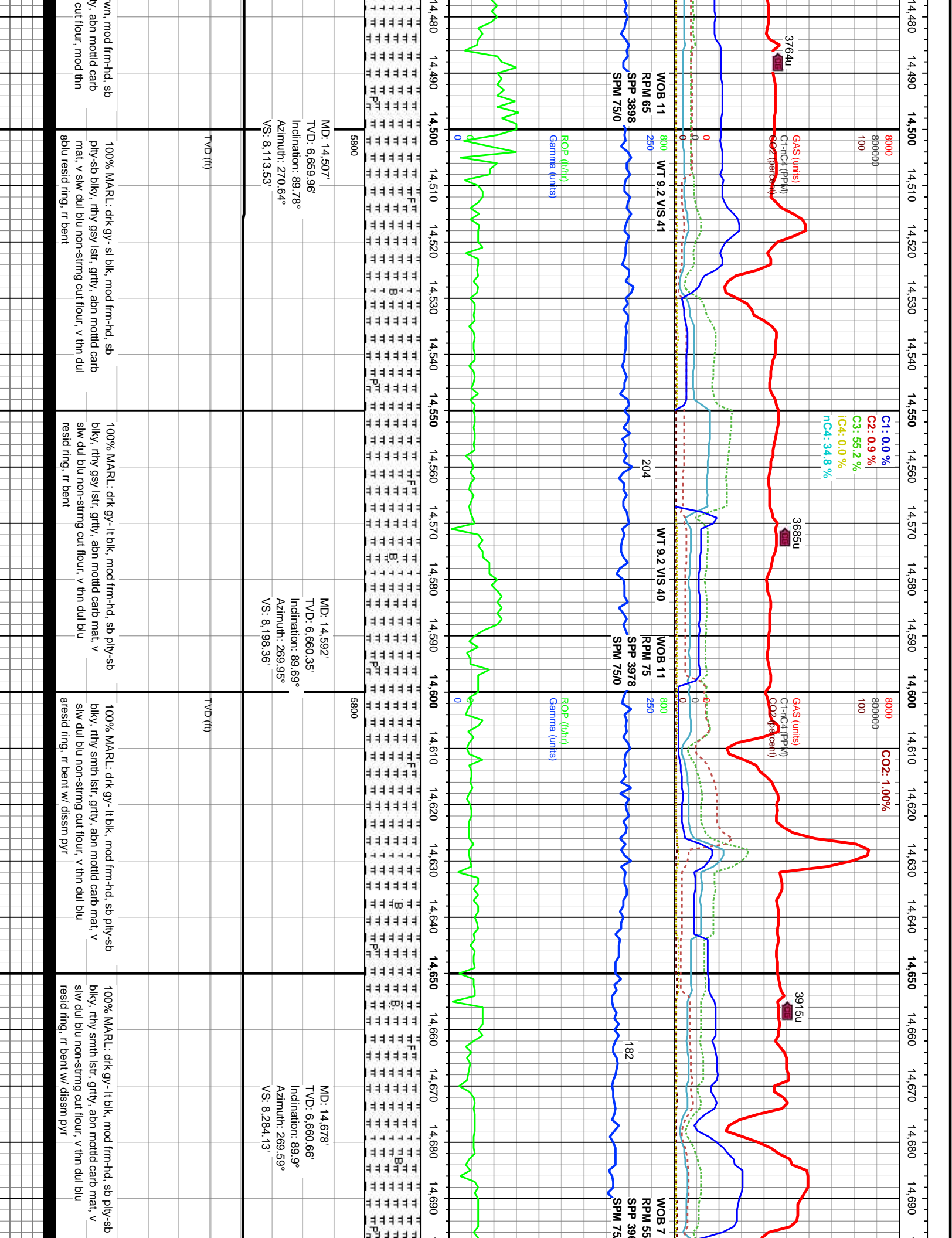
MD: 14.421'
TVD: 6.660.07'
Inclination: 90.36°
Azimuth: 271.64°
VS: 8.027.64'

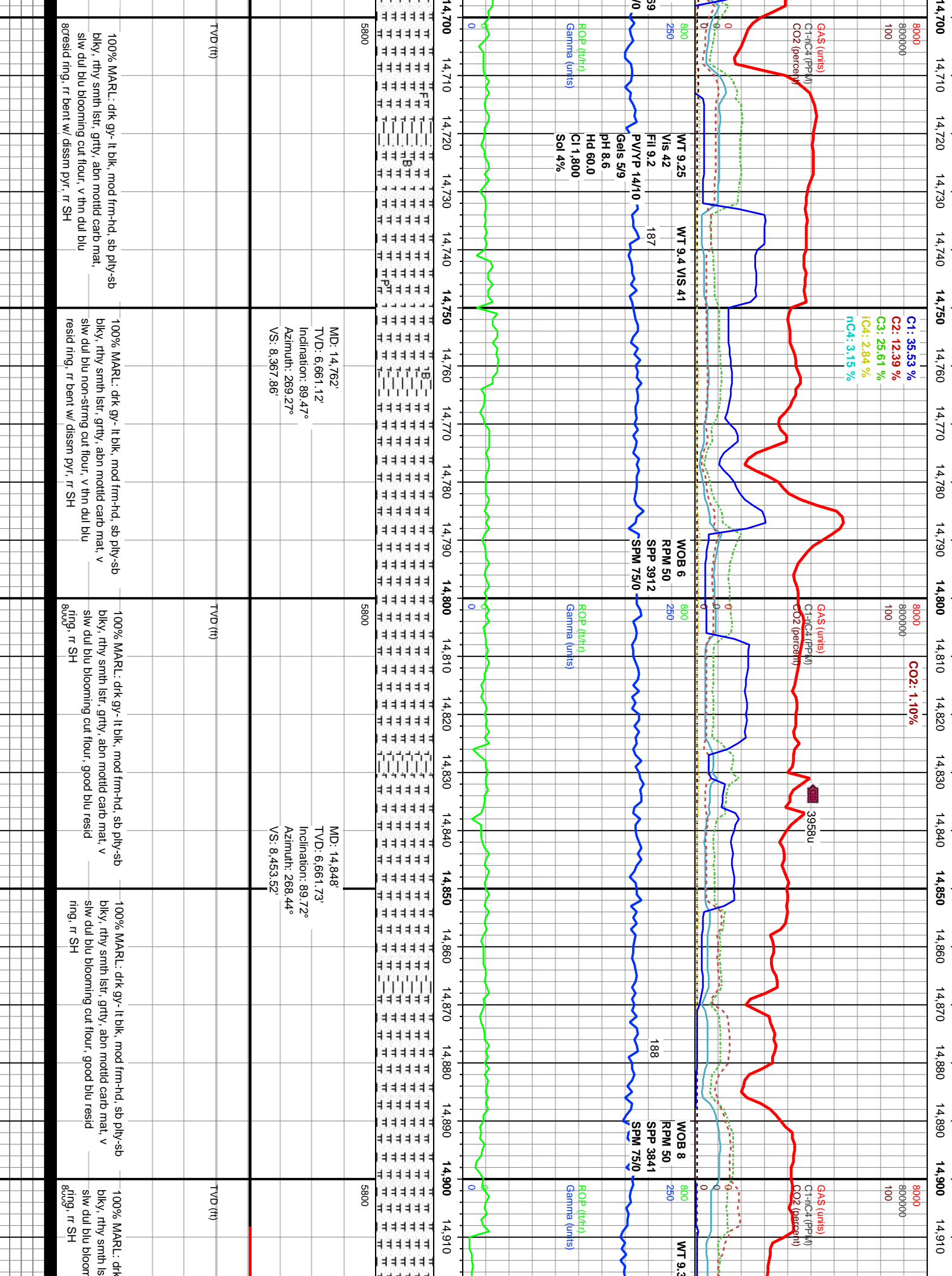
TVD (ft)

5800

100% MARL: dk gy- med brwn, mod frm-hd, sb
ply-sb blkly, rthy gsy lst, grtly, abn motild carb
mat, v slw dul blu non-strng cut flour, mod thn
dul blu resid ring, rr bent

100% MARL: dk gy- med brwn, mod frm-hd, sb
ply-sb blkly, rthy gsy lst, grtly, abn motild carb
mat, v slw dul blu non-strng cut flour, mod thn
dul blu resid ring, rr bent





14.920 14.930 14.940 14.950 14.960 14.970 14.980 14.990 15.000 15.010 15.020 15.030 15.040 15.050 15.060 15.070 15.080 15.090 15.100 15.110 15.120 15.130

C1: 25.74 %
C2: 18.78 %
C3: 27.23 %
iC4: 2.76 %
nC4: 17.11 %

8000
CO2: 1.0 %
800000
100

8000
800000
100

GAS (units)
CH4 (PPM)
CO2 (percent)

GAS (units)
CH4 (PPM)
CO2 (percent)

4442u

8564u

VIS 40

WOB 91
RPM 0
SPP 3641
SPM 0/75

WT 9.3 VIS 39

WOB 62
RPM 0
SPP 4023
SPM 0/79

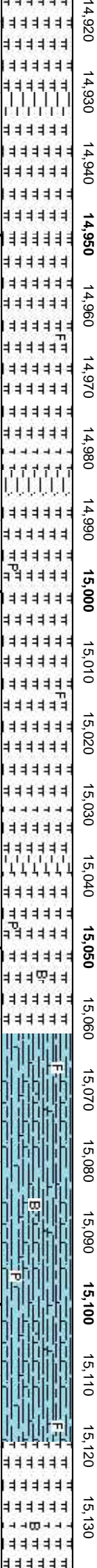
WT 9.3
Vis 37
Fil 8.8
PVYP 8/5
Gels 2/2
pH 9.4
Hd 100.0
Cl 1,500

ROP (t/hr)
Gamma (units)

ROP (t/hr)
Gamma (units)

WT 9.3
Vis 37
Fil 8.8
PVYP 8/5
Gels 2/2
pH 9.4
Hd 100.0
Cl 1,500

Sol 4.5%



MD: 14.933'
TVD: 6.662.54'
Inclination: 89.19°
Azimuth: 267.42°
VS: 8.538.04'

MD: 15.019'
TVD: 6.663.82'
Inclination: 89.1°
Azimuth: 268.48°
VS: 8.623.55'

MD: 15.105'
TVD: 6.664.66'
Inclination: 89.78°
Azimuth: 270.48°
VS: 8.709.28'

TVD (ft)

TVD (ft)

gy- lt blk, mod frm-hd, sb pty-sb
r, rthy smth isr, gtty, abn mottld carb mat, v
ring cut flour, good blu resid

100% MARL: drk gy- lt blk, mod frm-hd, sb pty-sb
blk, rthy smth isr, gtty, abn mottld carb mat, v
slw dul blu blooming cut flour, good blu resid
ring, rr SH

100% MARL: drk gy- lt blk, mod frm-hd, sb pty-sb
blk, rthy smth isr, gtty, abn mottld carb mat,
mod slw dul blu blooming cut flour, mod thick
blu resid ring, rr SH

100% MARL: drk gy- lt blk, mod frm-hd, sb pty-sb
blk, rthy smth isr, gtty, abn mottld carb mat,
slw dul blu blooming cut flour, good blu resid
ring, abn SH, abn bent SH w/ pyr nodes, abn calc
xis

100% MARL: drk gy- lt blk, mod frm-hd,
blk, rthy smth isr, gtty, abn mottld carb
slw dul blu blooming cut flour, good blu
ring, abn SH, com bent SH w/ pyr, rr carb

15,140 15,150 15,160 15,170 15,180 15,190 15,200 15,210 15,220 15,230 15,240 15,250 15,260 15,270 15,280 15,290 15,300 15,310 15,320 15,330 15,340 15,350

C1: 100.0 %
C2: 0.0 %
C3: 0.0 %
iC4: 0.0 %
nC4: 0.0 %

GAS (units)
C1-iC4 (PPM)
CO2 (percent)

Blocked sample line

WT 9.3 VIS 40

WOB 11
RPM 56
SPM 4110
SPM 074

WT 9.3 VIS 40

WT 9.3 VIS 40

WOB 9
RPM 51
SPM 4016
SPM 074

WT 9.3 VIS 41

WT 9.3 VIS 42

ROP (t/hr)
Gamma (units)

ROP (t/hr)
Gamma (units)

C1: 51
C2: 6.9
C3: 24
iC4: 2
nC4: 1

MD: 15,190'
TVD: 6,664.99'
Inclination: 89.78°
Azimuth: 271.84°
VS: 8,794.18'

MD: 15,276'
TVD: 6,665.62'
Inclination: 89.38°
Azimuth: 271.28°
VS: 8,880.1'

TVD (ft)

TVD (ft)

sb pily-sb
b mat,
resid
frags
100% MARL: dk gy- med blk, mod frm-hd, sb
pily-sb blkly, rthy smth lsfr, grty, abn motild carb
mat, slw sl dri blu blooming cut flour, good blu
resid ring, abn blk SH, tr cal frags, tr bent w/ pyr

100% MARL: med gy- lt blk, mod frm-hd, sb
pily-sb blkly, rthy smth lsfr, grty ip, abn motild
carb mat, slw dul blu milky cut flour, thin mod dri
8blu resid ring, abn SH,

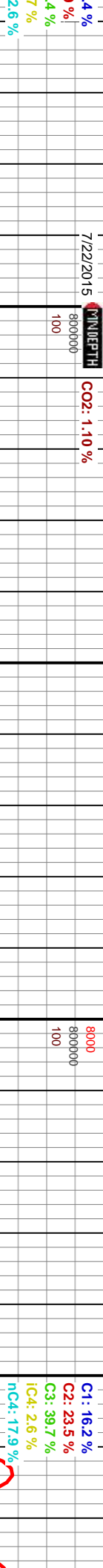
100% MARL: med gy- lt blk, mod frm-hd, sb
pily-sb blkly, rthy smth lsfr, grty, abn motild carb
mat, slw dul blu blooming cut flour, v thin dul
blu resid ring, abn SH,

100% MARL: med-dk gy, occ lt blk, mod frm-hd,
sb pily-sb blkly, rthy smth lsfr, grty, abn motild
carb mat, slw sl dri blu bleeding cut flour, good
80blu resid ring, abn SH, tr bent,

MD: 15,350'
TVD: 6,666.22'
Inclin
Azim
VS: 8,966.04'

15,360 15,370 15,380 15,390 15,400 15,410 15,420 15,430 15,440 15,450 15,460 15,470 15,480 15,490 15,500 15,510 15,520 15,530 15,540 15,550 15,560 15,570

7/22/2015 **MINDEPTH** **CO2: 1.10 %**



WT 9.3 VIS 42
WOB 13
RPM 42
SPP 4055
SPM 75/0

WT 9.3 VIS 42

WOB 14
RPM 51
SPP 3953
SPM 75/0

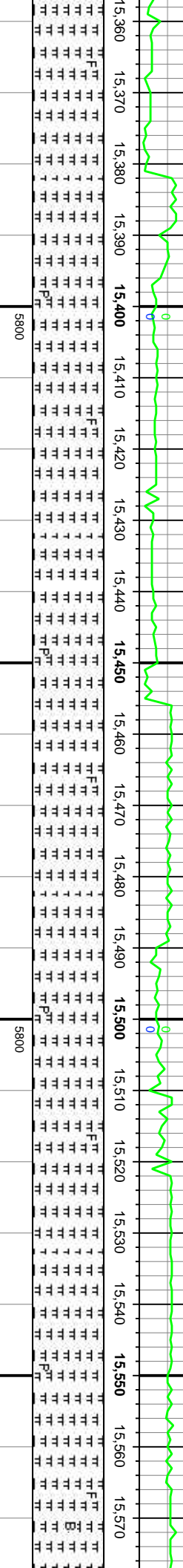
WT 9.3 VIS 42

WT 9.3

ROP (ft/hr)
Gamma (units)

ROP (ft/hr)
Gamma (units)

ROP (ft/hr)
Gamma (units)



5,361'
6,666.86'
ation: 88.95°
dth: 271.37°
.965'

MD: 15.446'
TVD: 6,666.98'
Inclination: 90.89°
Azimuth: 271.51°
VS: 9.049.91'

MD: 15.532'
TVD: 6,665.36'
Inclination: 91.26°
Azimuth: 271.76°
VS: 9.135.82'

TVD (ft)

TVD (ft)

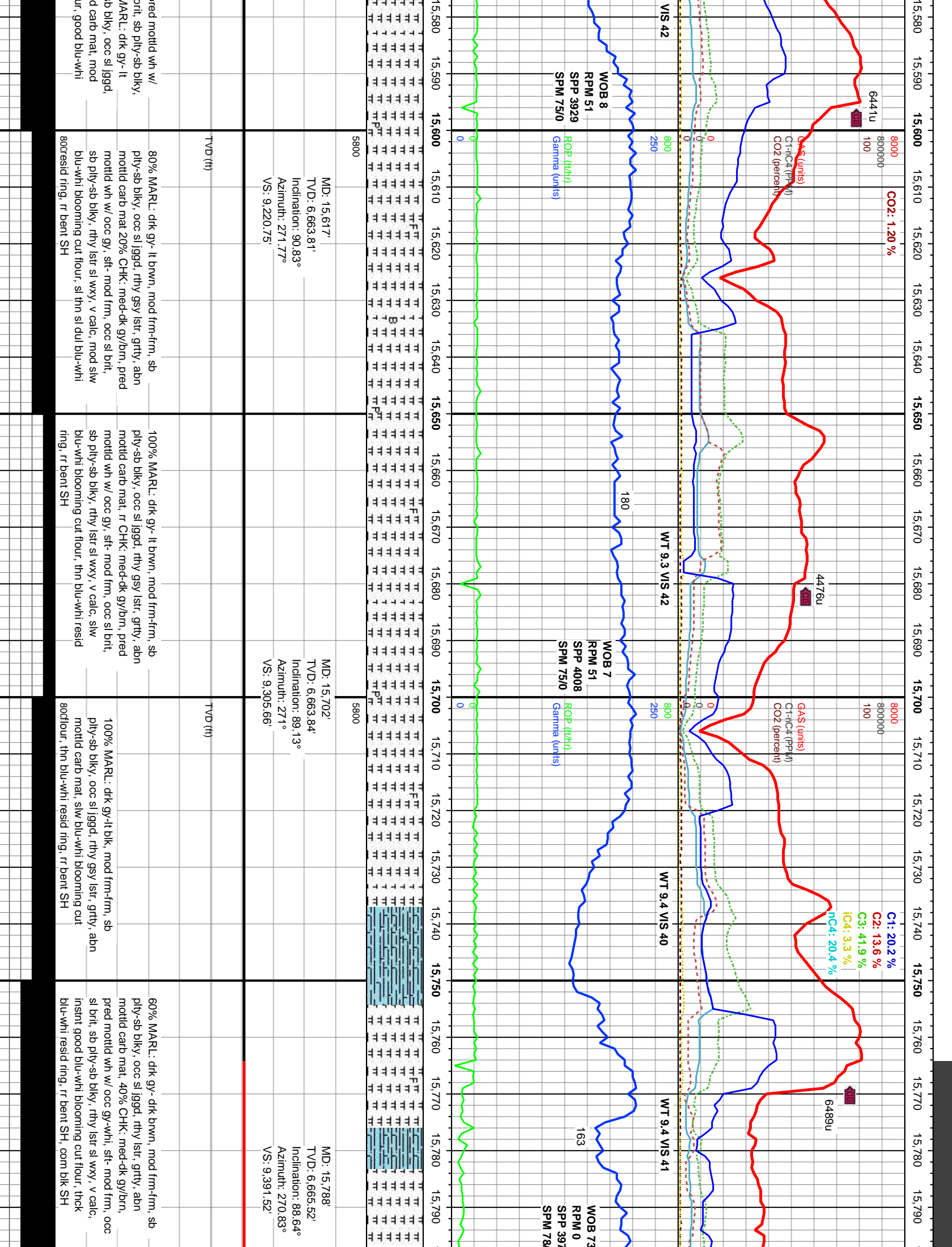
MARL: med-dk gy, occ lt blk, mod frm-hd, sb blk/y, rthy smth istr, grty, abn mottld at, slw sl dul blu bleeding cut flour, good ring.

100% MARL: med-dk gy/brn, occ lt blk, mod frm-hd, sb ply-sb blk/y, rthy smth istr, grty, abn mottld carb mat, slw sl dul blu bleeding cut flour, good blu resid ring.

100% MARL: med-dk gy/brn, occ lt blk, mod frm-hd, sb ply-sb blk/y, rthy smth istr, grty, abn mottld carb mat, slw sl dul blu bleeding cut flour, thin dul blu resid ring.

100% MARL: med-dk gy/brn, occ lt blk, sl frm-hd, sb ply-sb blk/y, rthy smth istr, grty, abn mottld carb mat, v slw dul blu bleeding cut flour, 8thn dul blu resid ring.

60% CHK: med-dk gy/brn, f-occ gy, sft- mod frm, occ sl l rthy istr sl wxy, v calc 40% b brwn, mod frm-frn, sb ply-s- rthy gsy istr, grty, abn mottld slw blu-whi blooming cut flour resid ring, rr bent SH



16,020 16,030 16,040 16,050 16,060 16,070 16,080 16,090 16,100 16,110 16,120 16,130 16,140 16,150 16,160 16,170 16,180 16,190 16,200 16,210 16,220 16,230

20 %

8000
800000
100

C1: 30.84 %
C2: 22.39 %
C3: 25.46 %
iC4: 2.31 %
nC4: 11.78 %

CO2: 1.20 %

GAS (units)
C1+IC4 (PPM)
CO2 (percent)

4073u

4073u

5740u

5740u

4732u

4732u

VIS 42

WOB 13
RPM 40
SPM 4076

WT 9.5 VIS 43

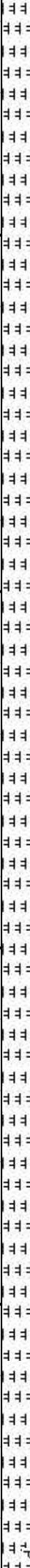
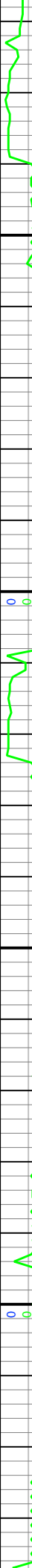
WOB 9
RPM 50
SPM 0/69

WT 9.4 VIS 42

Sharor
Sharor
Sharor
Niobra
Niobra

ROP (t/hr)
Gamma (units)

ROP (t/hr)
Gamma (units)



5800

5800

MD: 16.044'
TVD: 6.672.02'
Inclination: 88.27°
Azimuth: 271.51°
VS: 9.647.15'

MD: 16.186'
TVD: 6.676.84'
Inclination: 87.84°
Azimuth: 272.17°
VS: 9.788.97'

TVD (ft)

TVD (ft)

k gy-lt blk, mod frm-frm, sb
sl lggd, rthy gsy lstr, grtty, abn
slw blu-whi blooming cut
flour, tr bent SH, abn
resid ring, rr bent SH, abn

100% MARL: dk gy-lt blk, mod frm-frm, sb
ply-sb blk, occ sl lggd, rthy gsy lstr, grtty, abn
mottld carb mat, slw blu-whi blooming cut
flour, thn blu-whi resid ring, rr bent SH, abn
calc xls.

100% MARL: dk gy-lt blk, mod frm-frm, sb
ply-sb blk, occ sl lggd, rthy gsy lstr, grtty, abn
mottld carb mat, slw blu-whi blooming cut
flour, thn blu-whi resid ring, rr bent SH, abn
calc xls.

100% MARL: dk gy-lt blk, mod frm-frm, sb
ply-sb blk, occ sl lggd, rthy gsy lstr, grtty, abn
mottld carb mat, vry fnt blu-whi blooming cut
flour, vry fnt blu-whi resid ring, rr bent SH, tr
calc xls.

100% MARL: dk gy-lt blk, mod frm-frm
ply-sb blk, occ sl lggd, rthy gsy lstr, gr
mottld carb mat, vry fnt blu-whi bloomin
flour, vry fnt blu-whi resid ring, tr bent S
8000s, abn calc xls.

