

Décollement
Consulting
Inc.



Scale: 4.78" / 100'
Measured Depth Log

Well Name Antelope K-0-18HNB

Location NWNW Sec 18, T5N, R62W

State Colorado

Country USA

API Number 05-123-36836-00

County Weld

Rig Number Ensign 136

Field Wattenberg

Spud Date 3/31/2013

Drilling Completed 4/1/2013

Surface Coordinates 565 FNL X 1179 FWL

Ground Elevation 4,614

K.B. Elevation 4,626

Logged Interval 5,560 To 11,104

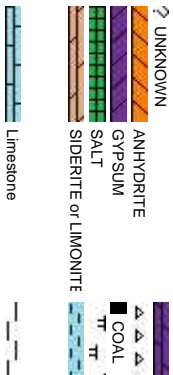
Total Depth 11,104

Formation Niobrara "B" Chalk

Type of Drilling Fluid WBM

Company Bonanza Creek Energy
Address 410 17th Street, Suite 1000
Denver, CO 80202

Name Leo Carrasco/Chris I
Company Decollement Consulting
13300 Braun Road
Golden, CO 80401



Operator

gy

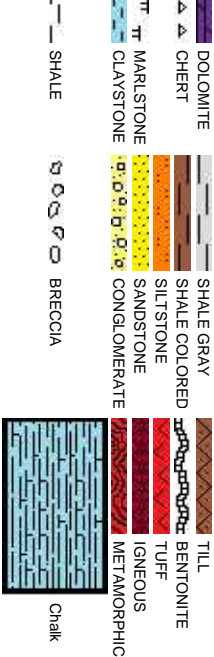
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Geologist

twin

ing Inc.

Rock Types



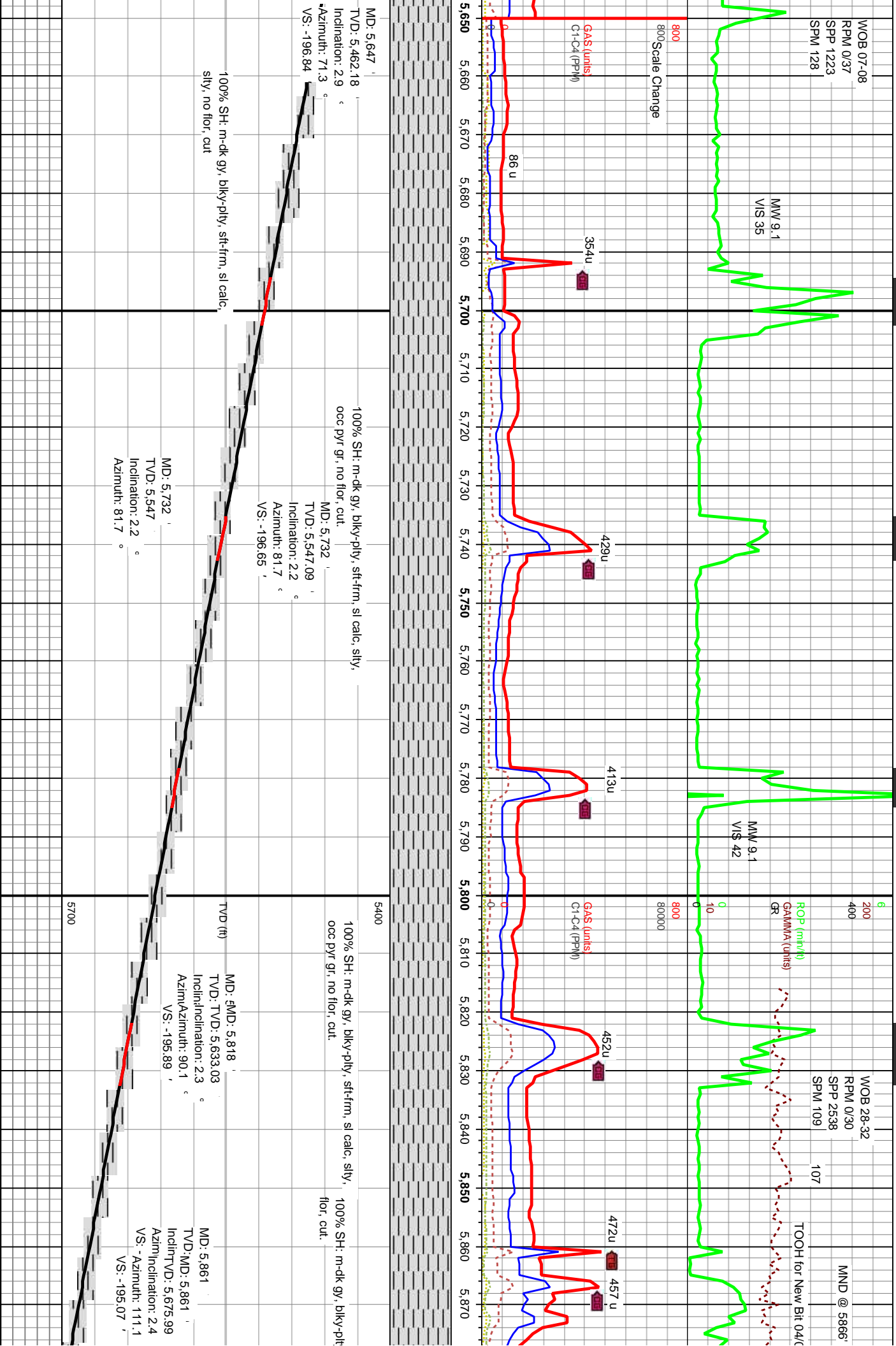
Accessories

| | | | | |
|----------------|----------------------|-----------------------|---------------------|-----------------------|
| Fossils | F FOSSIL | - ARGILLACEOUS | ✓ GLAUCONITE | Stringer |
| GASTROPOD | GA GASTROPOD | / ARGILLITE GRAIN | ≡ GYPSIFEROUS | ANHYDRITE STRINGER |
| ALGAE | Ø OOLITE | B BENTONITE | ↑ HEAVY MINERAL | BENTONITE STRINGER |
| AMPHIPORA | Ø OSTRACOD | BITUMENOUS SUBSTANCE | K KAOLIN | COAL STRINGER |
| BELEMNITE | ▽ PELECYPOD | BRECCIA FRAGMENTS | TT MARLSTONE | DOLOMITE STRINGER |
| BIOCLASTIC | ℳ PELLET | ⊥ CALCAREOUS | ⌘ MINERAL CRYSTALS | GYPSUM STRINGER |
| BRACHIOPOD | ℳ PISOLITE | ■ CARBONACEOUS FLAKES | ⊙ NODULES | LIMESTONE STRINGER |
| BRYOZOA | ℳ PLANT REMAINS | ▲ CHTDK | ● PHOSPHATE PELLET: | MARLSTONE (CALC) STRG |
| CEPHALOPOD | ℳ PLANT SPORES | △ CHTLT | P PYRITE | MARLSTONE (DOL) STRG |
| CORAL | ℳ SCAPHOPOD | — COAL - THIN BEDS | ⊞ SALT CAST | SANDSTONE STRINGER |
| CRINOID | ℳ STROMATOPOROID | ∠ DOLOMITIC | · SANDY | SHALE STRINGER |
| ECHINOID | + | FEELDSPAR | ∧ SILICEOUS | SILTSTONE STRINGER |
| FISH | ● FERRUGINOUS PELLET | ● FERRUGINOUS | .. SILTY | |
| FORAMINIFERA | /// ANHYDRITIC | ∧ FERRUGINOUS | ✓ TUFACEOUS | |

Other Symbols

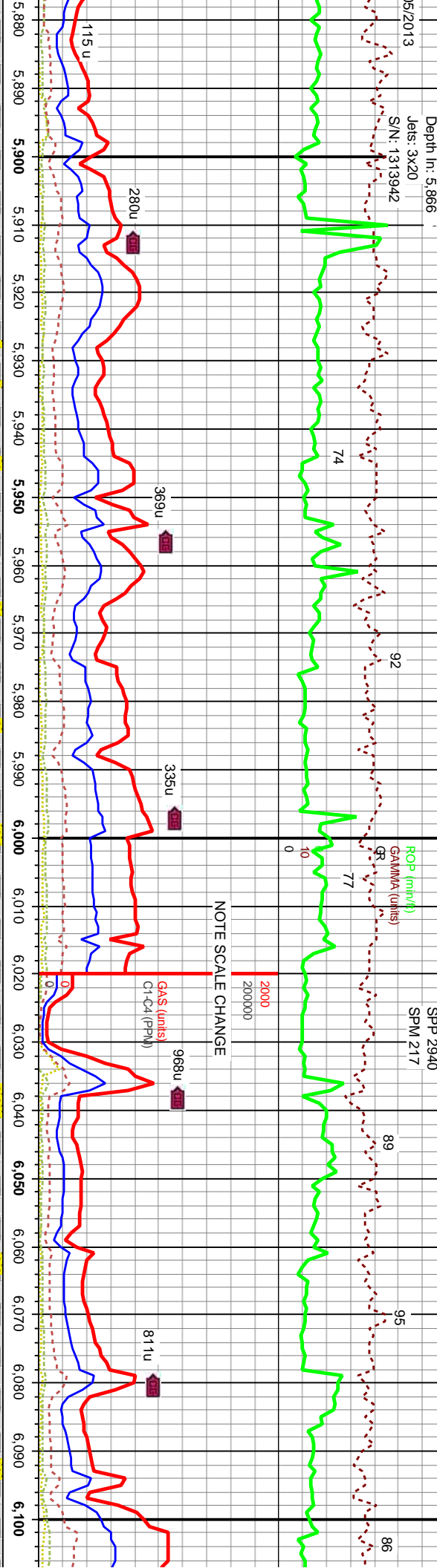
| | | | |
|--------------------|----------------------|-------------------------|-----------------|
| Oil Show | Ø ORGANIC | ✖ GAS SHOW | MX MICROXLN |
| P PINPOINT | ✓ VUGGY | MINDEPTH MN DEPTH | MS MUDSTONE |
| D DEAD | ● EVEN | ↘ NORMAL FAULT | R ROUNDED |
| ○ QUESTIONABLE | ● SPOTTED STAINING | ↗ OIL SHOW | B SUBANG |
| | BIT | ↕ OVERTURNED STRATA | TT SUBRND |
| Porosity | ↔ CONNECTION (LEFT) | ↗ REVERSE FAULT | Textures |
| E EARTHY | ↔ CONNECTION (RIGHT) | ↘ SIDEWALL CORE (LEFT) | B3 BOUNDSTONE |
| F FENESTRAL | ↔ CONNECTION GAS | ↘ SIDEWALL CORE (RIGHT) | P POOR |
| F FRACTURE | ↔ CORE - LOST | ↘ SLIDE | C CHALKY |
| ✕ INTERCRYSTALLINE | ■ CORE - RECOVERED | 05 SURVEY | CX CRYPTOXLN |
| Ø INTEROOLITIC | ↔ DST INTERVAL | TRIP GAS | E EARTHY |
| ↘ MOLDIC | ↗ FAULT | WIRELINE TESTED - LEFT | FX FINELYXLN |
| | ↔ FORMATION TOP | WIRELINE TESTED - RT | BS GRAINSTONE |
| | | | L LITHOGRAPHIC |
| | | Rounding | |

| Slide/Rotate | |
|---|--|
| <p>ROP</p> <p>ROF ———</p> <p>GAMMA - - - -</p> <p>GR ———</p> | <p>Decollement on location 04/04/2013 Start logging @ 5500'</p> <p>Bit #: 2 Type: VM613SH Size: 8.75" Depth In: 509' Depth Out: 5,695' Hours: 24.2 hrs Avg F/H: 214' /hr Jets: 7x14 S/N: 4005133</p> <p>WOB 11-13 RPM 0/33 SPM 1296 SPM 128</p> <p>ROP (min/hr) GAMMA (units) GR</p> |
| <p>Total Gas & Chromatograph</p> <p>GAS ———</p> <p>C1 ———</p> <p>C2 - - - -</p> <p>C3 - - - -</p> <p>C4 </p> | |
| Depth Labels | <p>MD: 5,476' TVD: 5,291.5' Inclination: 4.6° Azimuth: 59.6° VS: -195.73°</p> <p>MD: 5,561' TVD: 5,376.3' Inclination: 3.2° Azimuth: 69.8° VS: -196.65°</p> <p>MD: 5,647' TVD: 5,462' Inclination: 2.9° Azimuth: 71.3°</p> |
| Interp Lith | <p>100% SH: m-dk gy, blk y, sft, vy sl calc, silty, no flor, cut</p> <p>100% SH: m-dk gy, blk y-ply, sft-frn, sl calc, silty, occ pyr gr, no flor, cut</p> |
| Oil Show | |
| Images | |

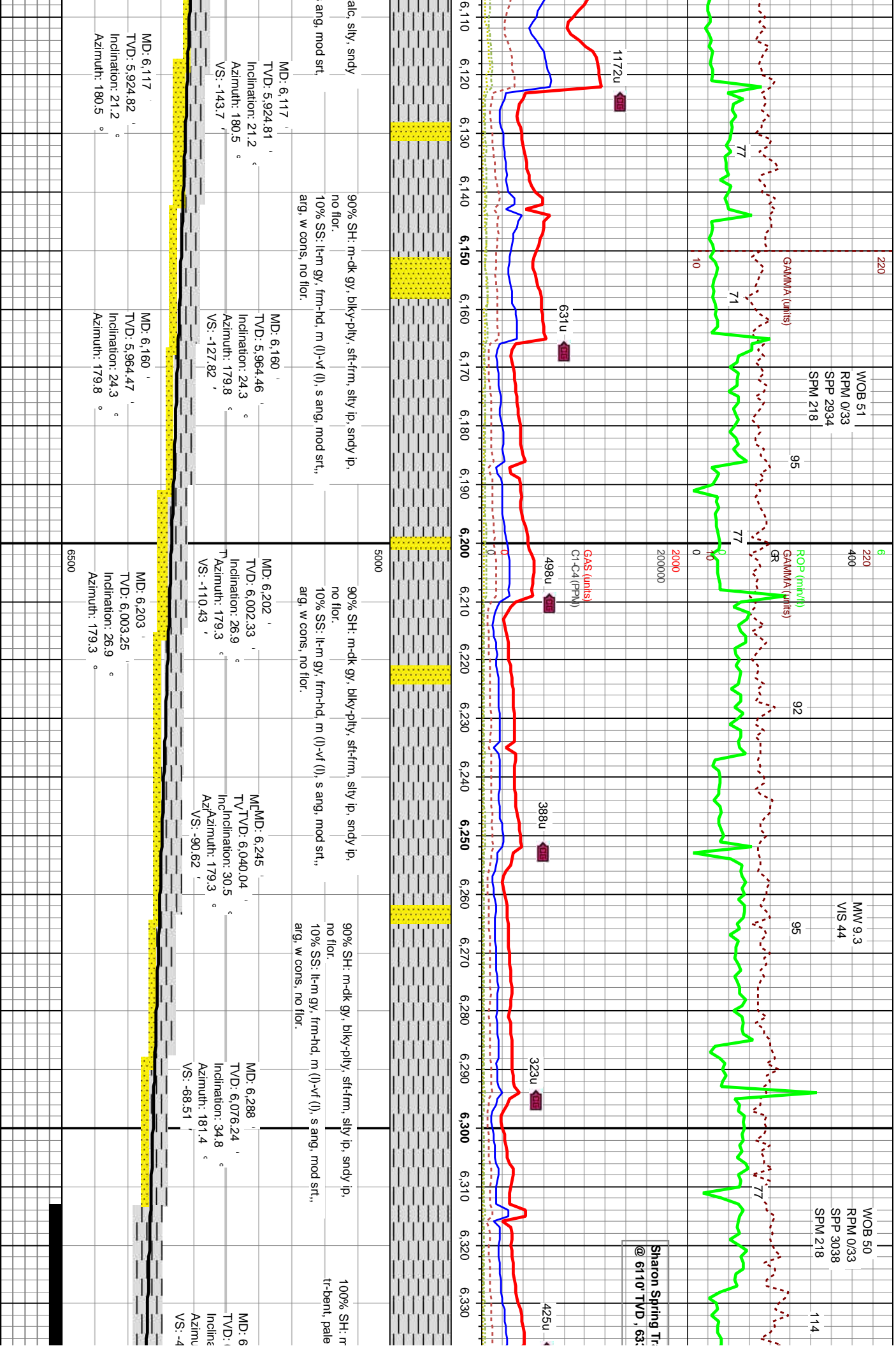


Bit #: 3
Type: HEADJMRSV
Size: 8.75
Depth In: 5.866
Jets: 3x20
S/N: 1313942

WOB 52
RPM 0/33
SPP 2940
SPM 217
MW 9.2
VIS 37



| | | | | |
|----------|--|--|--|---|
| 5000 | 80% SH: m-dk gy, blk-y-pty, sft-frm, calc, silty, no floor MD: 5.903 20° TVD: 5.717.91 calc Inclination: 5.2 Azimuth: 166.8 VS: -192.63 | 80% SH: m-dk gy, blk-y-pty, sft-frm, calc, silty, no floor MD: 5.946 S: lt-m gy, frm-hd, m (l)-vf (l), s ang TVD: 5.760.54 Inclination: 9.7 Azimuth: 180.5 VS: -187.23 | 75% SH: m-dk gy, blk-y-pty, sft-frm, calc, silty, sandy ip, no floor. 25% SS: lt-m gy, frm-hd, m (l)-vf (l), s ang, mod srt, calc, arg, w cons, no floor. MD: 6.031 TVD: 5.843.29 Inclination: 16.1 Azimuth: 186.5 VS: -169.2 | 80% SH: m-dk gy, blk-y-pty, sft-frm, calc, silty, no ip, no floor. 20% SS: lt-m gy, frm-hd, m (l)-vf (l), s ang, mod srt, calc, arg w cons, no floor. MD: 6.074 TVD: 5.884.35 Inclination: 18.4 Azimuth: 184.5 VS: -157.42 |
| TVD (ft) | MD: 5.903 TVD: 5.717.91 Inclination: 5.2 Azimuth: 166.8 VS: -192.63 | MD: 5.946 TVD: 5.760 Inclination: 9.7 Azimuth: 180.5 VS: -187.23 | MD: 5.989 TVD: 5.802.67 Inclination: 13.3 Azimuth: 182.1 VS: -179.1 | MD: 6.031 TVD: 5.843.29 Inclination: 16.1 Azimuth: 186.5 VS: -169.2 |
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| 6500 | MD: 5.903 TVD: 5.717.91 Inclination: 5.2 Azimuth: 166.8 VS: -192.63 | MD: 5.946 TVD: 5.760 Inclination: 9.7 Azimuth: 180.5 VS: -187.23 | MD: 5.989 TVD: 5.802.67 Inclination: 13.3 Azimuth: 182.1 VS: -179.1 | MD: 6.031 TVD: 5.843.29 Inclination: 16.1 Azimuth: 186.5 VS: -169.2 |
| 6500 | MD: 5.903 TVD: 5.717.91 Inclination: 5.2 Azimuth: 166.8 VS: -192.63 | MD: 5.946 TVD: 5.760 Inclination: 9.7 Azimuth: 180.5 VS: -187.23 | MD: 5.989 TVD: 5.802.67 Inclination: 13.3 Azimuth: 182.1 VS: -179.1 | MD: 6.031 TVD: 5.843.29 Inclination: 16.1 Azimuth: 186.5 VS: -169.2 |
| 6500 | MD: 5.903 TVD: 5.717.91 Inclination: 5.2 Azimuth: 166.8 VS: -192.63 | MD: 5.946 TVD: 5.760 Inclination: 9.7 Azimuth: 180.5 VS: -187.23 | MD: 5.989 TVD: 5.802.67 Inclination: 13.3 Azimuth: 182.1 VS: -179.1 | MD: 6.031 TVD: 5.843.29 Inclination: 16.1 Azimuth: 186.5 VS: -169.2 |
| 6500 | MD: 5.903 TVD: 5.717.91 Inclination: 5.2 Azimuth: 166.8 VS: -192.63 | MD: 5.946 TVD: 5.760 Inclination: 9.7 Azimuth: 180.5 VS: -187.23 | MD: 5.989 TVD: 5.802.67 Inclination: 13.3 Azimuth: 182.1 VS: -179.1 | MD: 6.031 TVD: 5.843.29 Inclination: 16.1 Azimuth: 186.5 VS: -169.2 |
| 6500 | MD: 5.903 TVD: 5.717.91 Inclination: 5.2 Azimuth: 166.8 VS: -192.63 | MD: 5.946 TVD: 5.760 Inclination: 9.7 Azimuth: 180.5 VS: -187.23 | MD: 5.989 TVD: 5.802.67 Inclination: 13.3 Azimuth: 182.1 VS: -179.1 | MD: 6.031 TVD: 5.843.29 Inclination: 16.1 Azimuth: 186.5 VS: -169.2 |
| 6500 | MD: 5.903 TVD: 5.717.91 Inclination: 5.2 Azimuth: 166.8 VS: -192.63 | MD: 5.946 TVD: 5.760 Inclination: 9.7 Azimuth: 180.5 VS: -187.23 | MD: 5.989 TVD: 5.802.67 Inclination: 13.3 Azimuth: 182.1 VS: -179.1 | MD: 6.031 TVD: 5.843.29 Inclination: 16.1 Azimuth: 186.5 VS: -169.2 |
| 6500 | MD: 5.903 TVD: 5.717.91 Inclination: 5.2 Azimuth: 166.8 VS: -192.63 | MD: 5.946 TVD: 5.760 Inclination: 9.7 Azimuth: 180.5 VS: -187.23 | MD: 5.989 TVD: 5.802.67 Inclination: 13.3 Azimuth: 182.1 VS: -179.1 | MD: 6.031 TVD: 5.843.29 Inclination: 16.1 Azimuth: 186.5 VS: -169.2 |
| 6500 | MD: 5.903 TVD: 5.717.91 Inclination: 5.2 Azimuth: 166.8 VS: -192.63 | MD: 5.946 TVD: 5.760 Inclination: 9.7 Azimuth: 180.5 VS: -187.23 | MD: 5.989 TVD: 5.802.67 Inclination: 13.3 Azimuth: 182.1 VS: -179.1 | MD: 6.031 TVD: 5.843.29 Inclination: 16.1 Azimuth: 186.5 VS: -169.2 |
| 6500 | MD: 5.903 TVD: 5.717.91 Inclination: 5.2 Azimuth: 166.8 VS: -192.63 | MD: 5.946 TVD: 5.760 | | |



MIND @ 6367' 04/06/2013

"Top NIOBRARA" A" Cha
@ 6244' TVD, 6534' MD"

6
220
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
4200
4400
4600
4800
5000
5200
5400
5600
5800
6000
6200
6400
6600
6800
7000
7200
7400
7600
7800
8000
8200
8400
8600
8800
9000
9200
9400
9600
9800
10000

ROP (mm/f)
GAMMA (units)
GR

WOB 50
RPM 0/33
SPM 3038
SPM 218

Transition Zone
12' MD

775u

1103u

1309u

1354u

5133u

GAS (units)
C1-C4 (PPM)

GAS (units)
C1-C4 (PPM)

5000

100% SH: m-dk gy, blk-y-sbbkly
ip, tr-bent, pale yel flr, slw wht cut

100% SH: m-dk gy, blk-y-sbbkly
ip, carb ip, tr-bent, pale yel flr, slw wht cut

100% SH: m-dk gy, blk-y-sbbkly
ip, carb ip, tr-bent, pale yel flr, slw wht cut

40% CHKL: lt-m gy, off wht, slt-mod frm,
blk-y-sbbkly, calc, wxy ip, tr Bent, no 20% MRL: dkgy, slt-fr
diffuse wh cut, v calc, no flr, diffuse

MD: 6.374
TVD: 6.142.8
Inclination: 43.7
Azimuth: 181.4
VS: -17.03

MD: 6.416
TVD: 6.172.02
Inclination: 48.1
Azimuth: 180.3
VS: 11.66 80.3

MD: 6.459
TVD: 6.199.54
Inclination: 52.3
Azimuth: 178.7
VS: 43.32

MD: 6.502
TVD: 6.224.81
Inclination: 56.3
Azimuth: 178.7
VS: 76.91

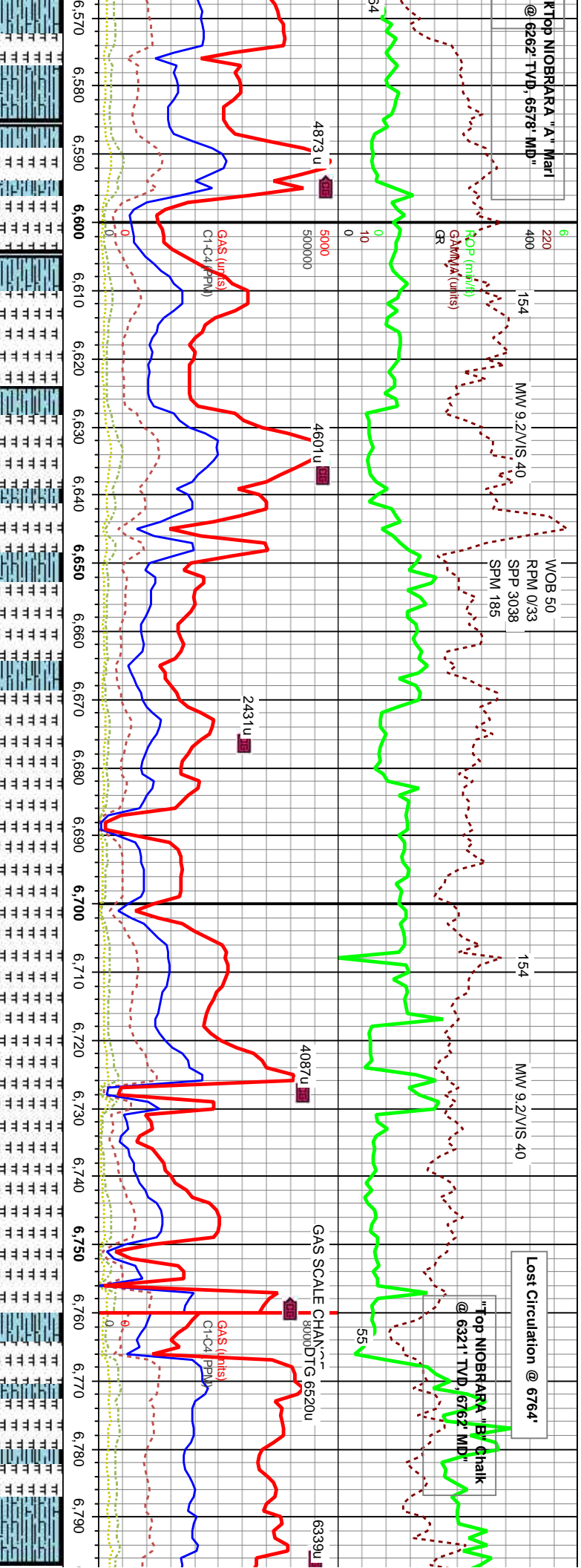
MD: 6.5MD: 6.545
TVD: 6.247.12
Inclination: 60.6
Azimuth: 176.6
VS: 112.34

6600

KTOP NIOBRARA "A" Mari
@ 6262' TVD, 6578' MD"

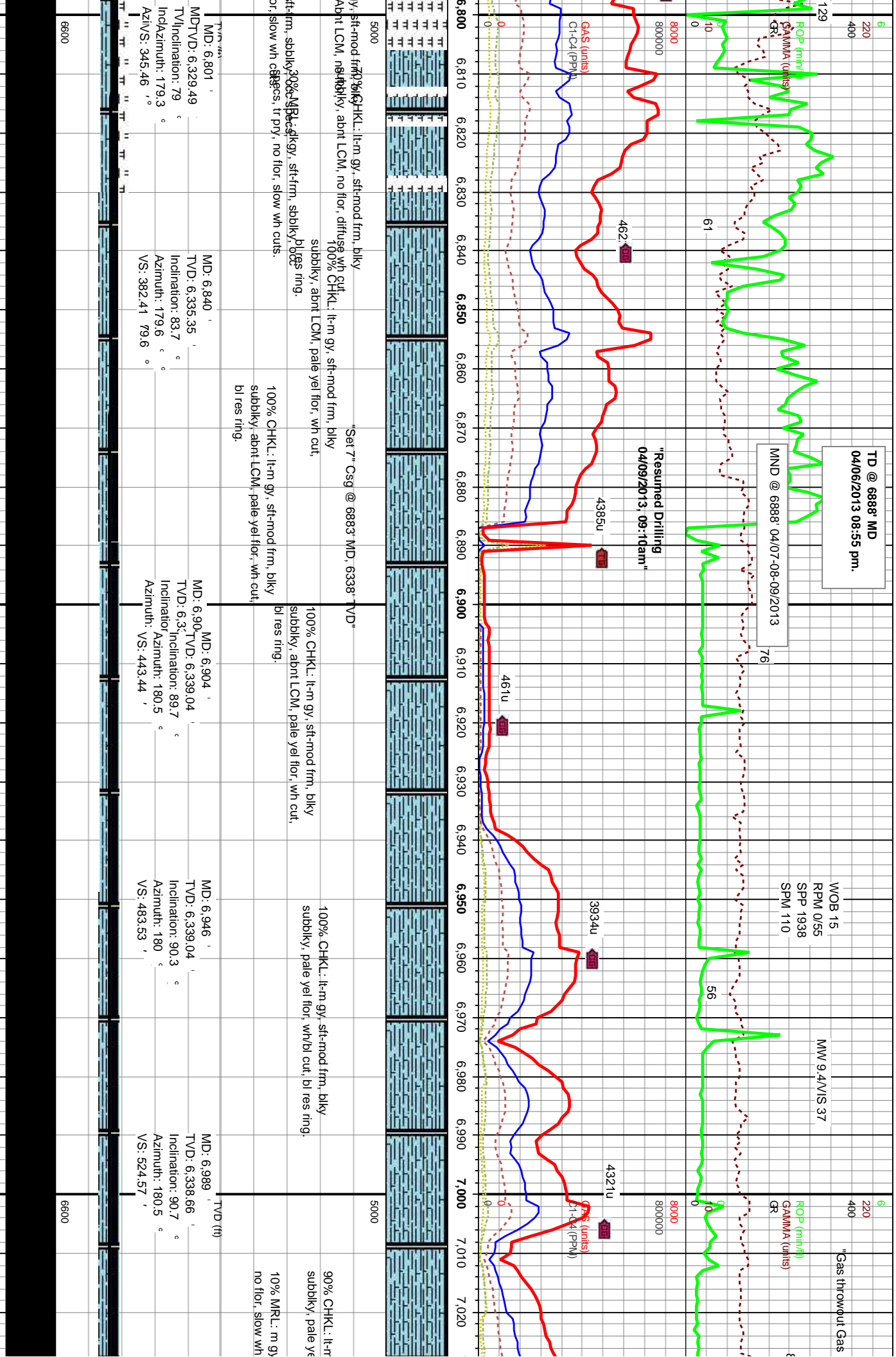
Lost Circulation @ 6764'

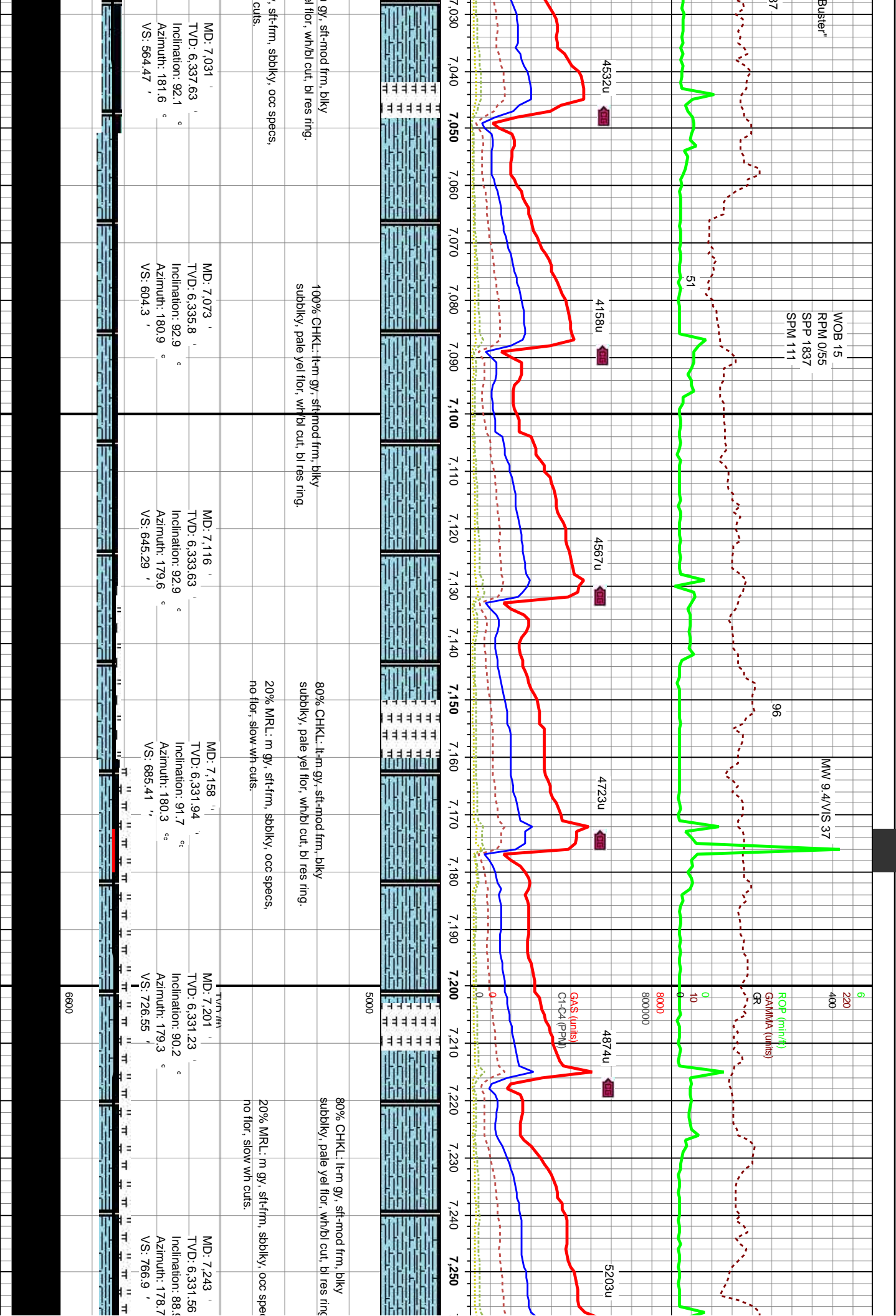
"KTOP NIOBRARA" By Chalk
@ 6321' TVD, 6762' MD"

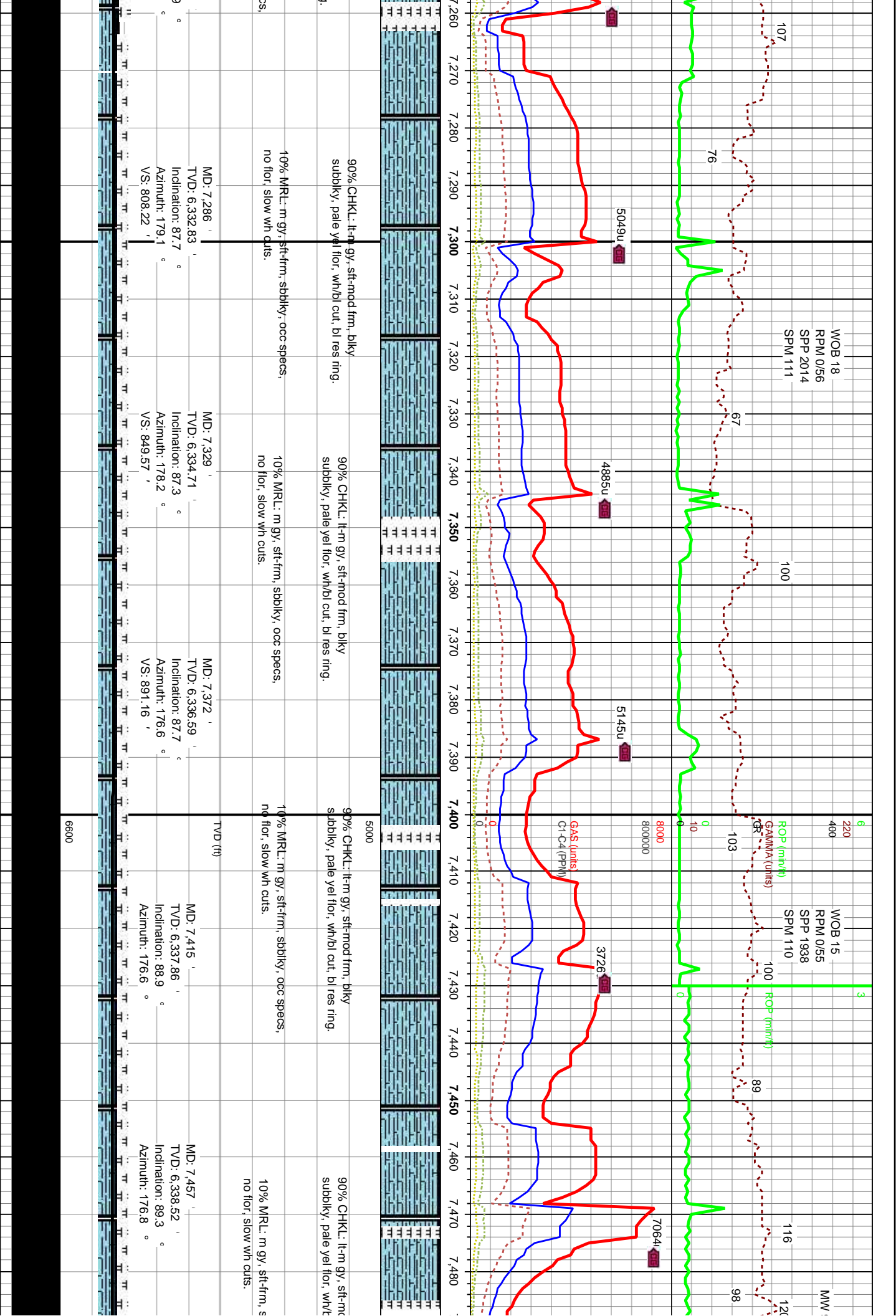


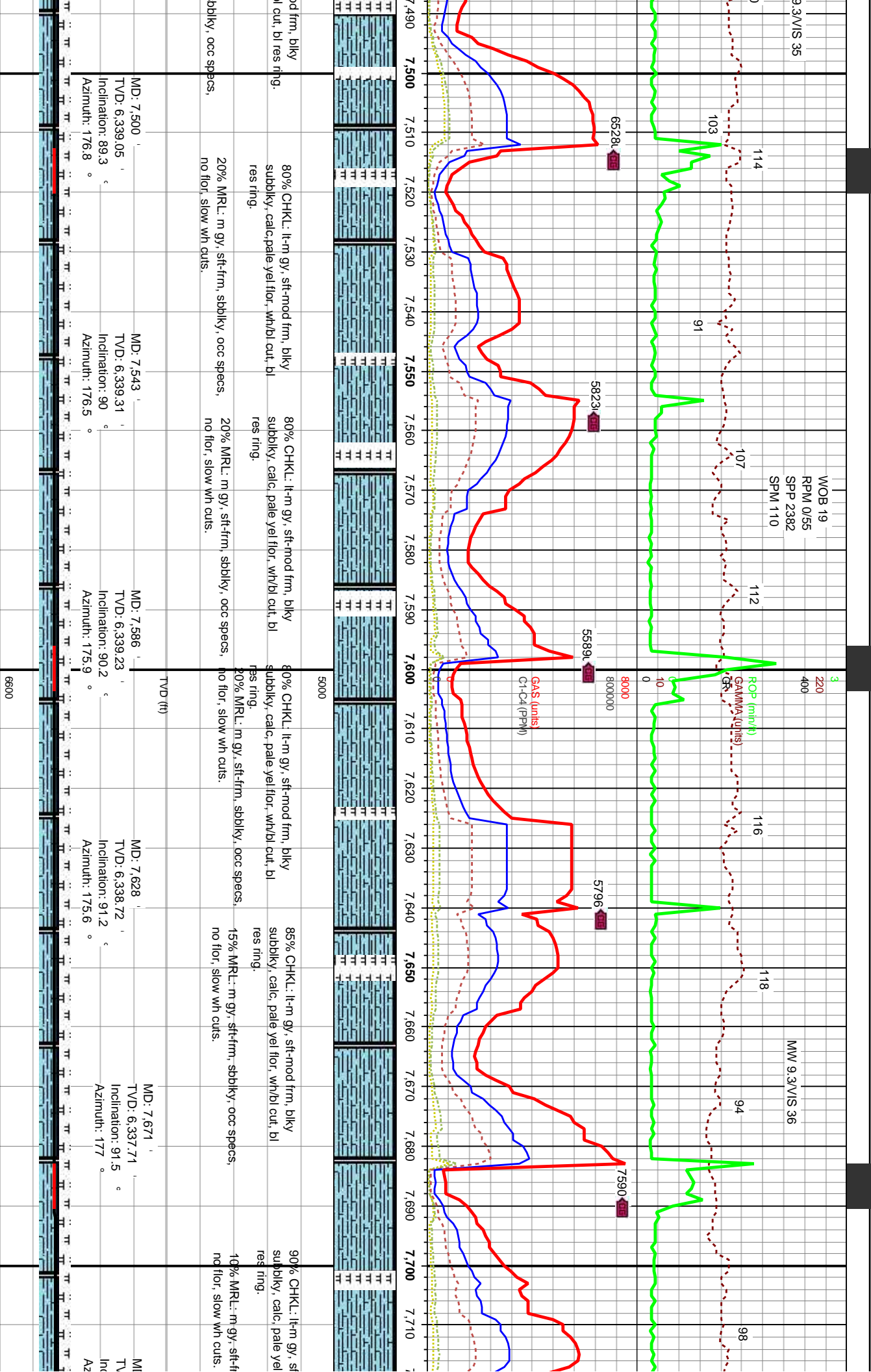
whit, sft-firm, sbblky, calc, wxy ip, tr Bent, no floor, diffuse wh cuts.
40% CHKL: lt-m gy, sft-firm, sbblky, calc, tr Bent, no floor, diffuse wh cuts.
100% MRL: dkgy, sft-firm, sbblky, calc, tr Bent, no floor, diffuse wh cuts.
90% MRL: dkgy, sft-firm, sbblky, calc, tr Bent, no floor, diffuse wh cuts.
10% CHKL: lt-m gy, sft-firm, sbblky, calc, tr Bent, no floor, diffuse wh cuts.
20% MRL: dkgy, sft-firm, sbblky, calc, tr Bent, no floor, diffuse wh cuts.

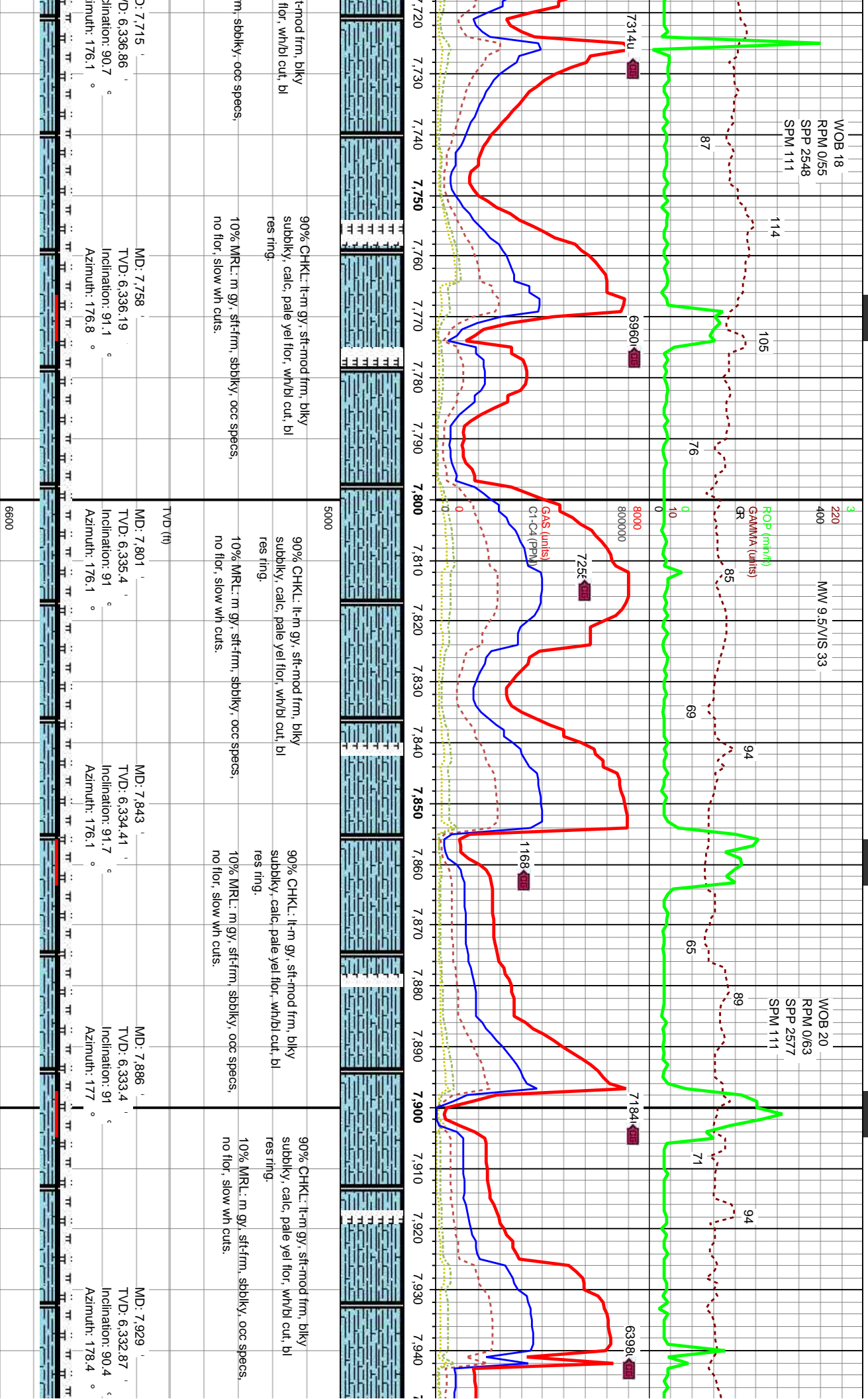
MD: 6,587 TVD: 6,266.25
Inclination: 65.2
Azimuth: 177.3
VS: 148.6
MD: 6,630 TVD: 6,282.77
Inclination: 69.6
Azimuth: 178
VS: 186.99
MD: 6,673 TVD: 6,296.27
Inclination: 73.8
Azimuth: 178.2
VS: 226.37
MD: 6,716 TVD: 6,308.26
Inclination: 73.8
Azimuth: 177.7
VS: 266.25
MD: 6,759 TVD: 6,319.94
Inclination: 74.7
Azimuth: 178.7
VS: 306.17

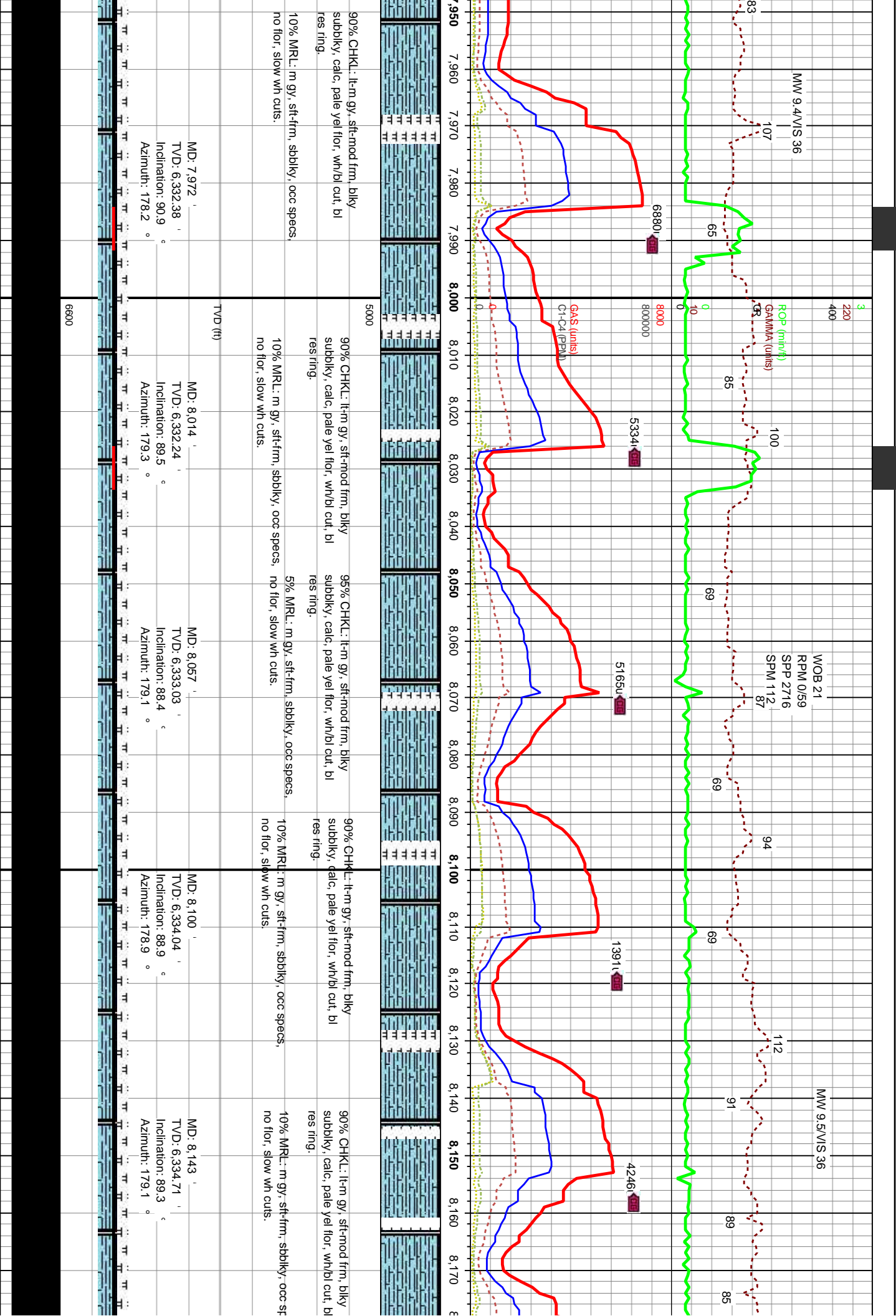


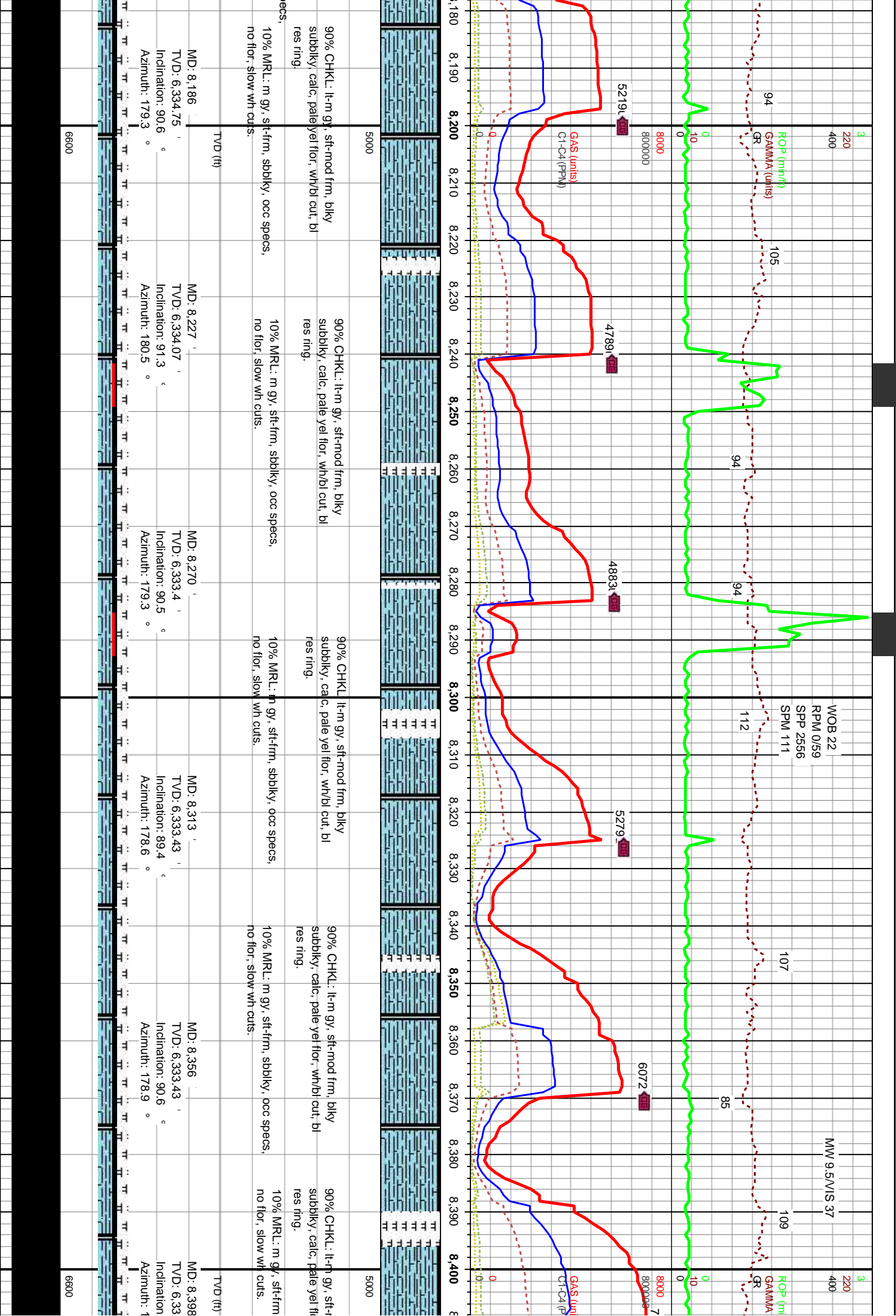


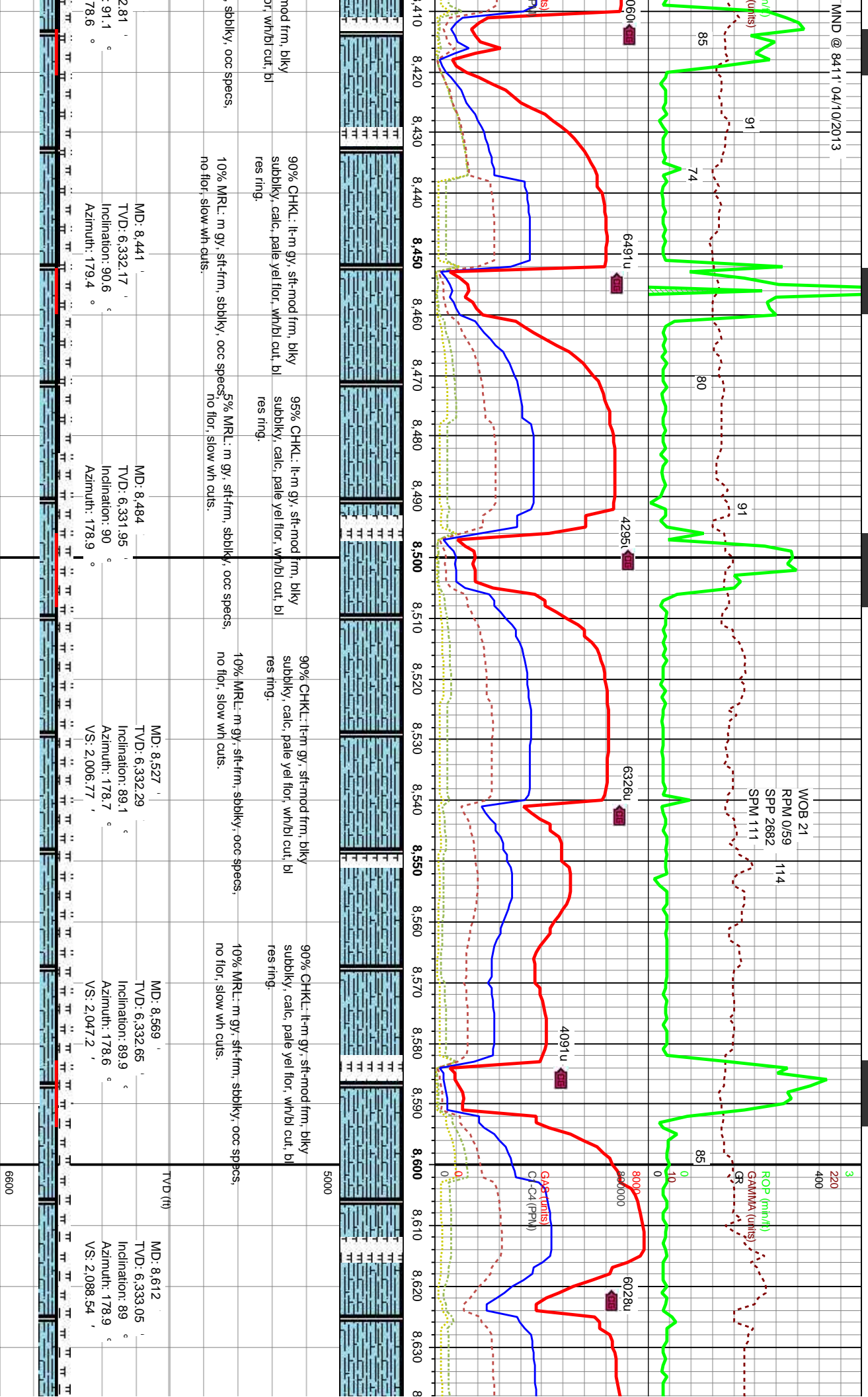


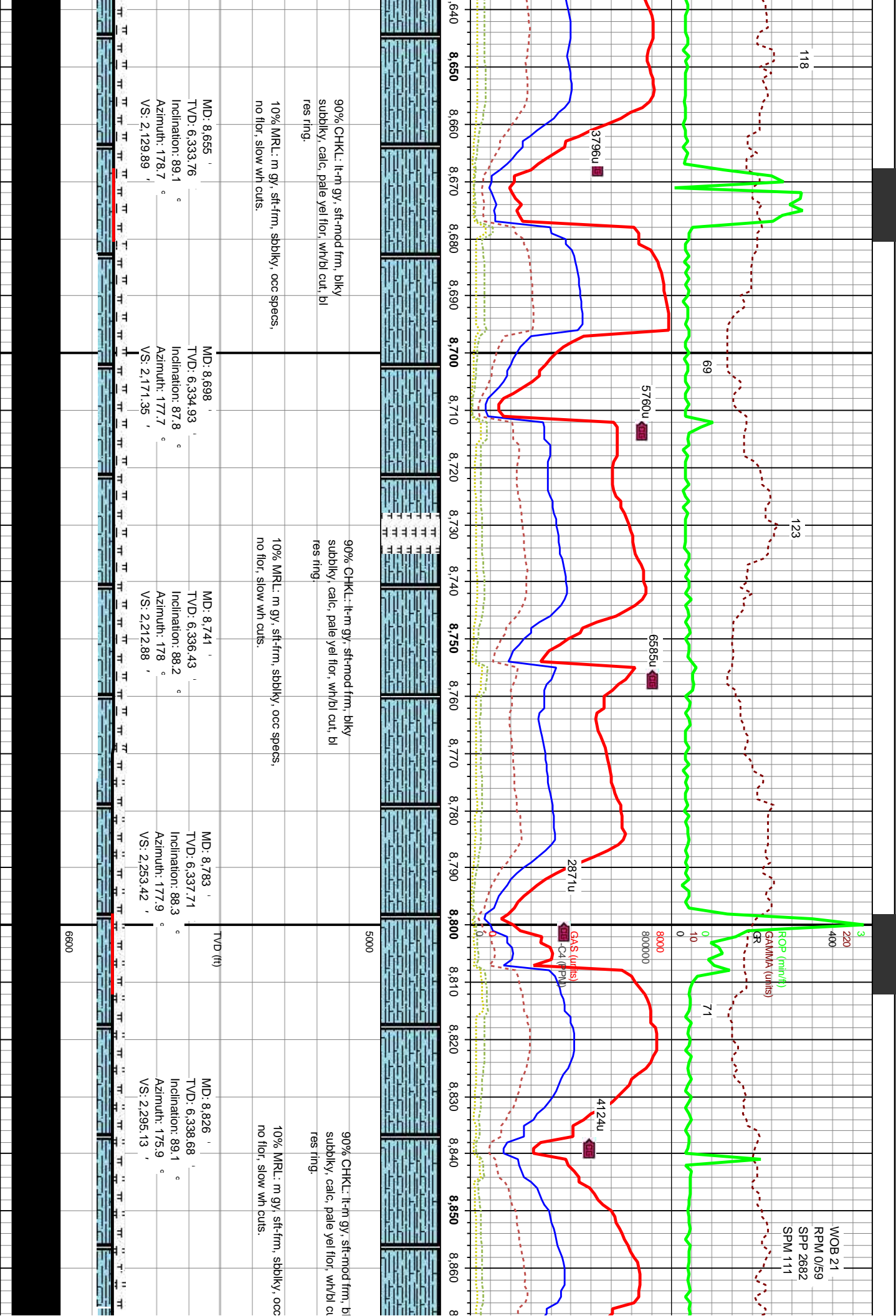


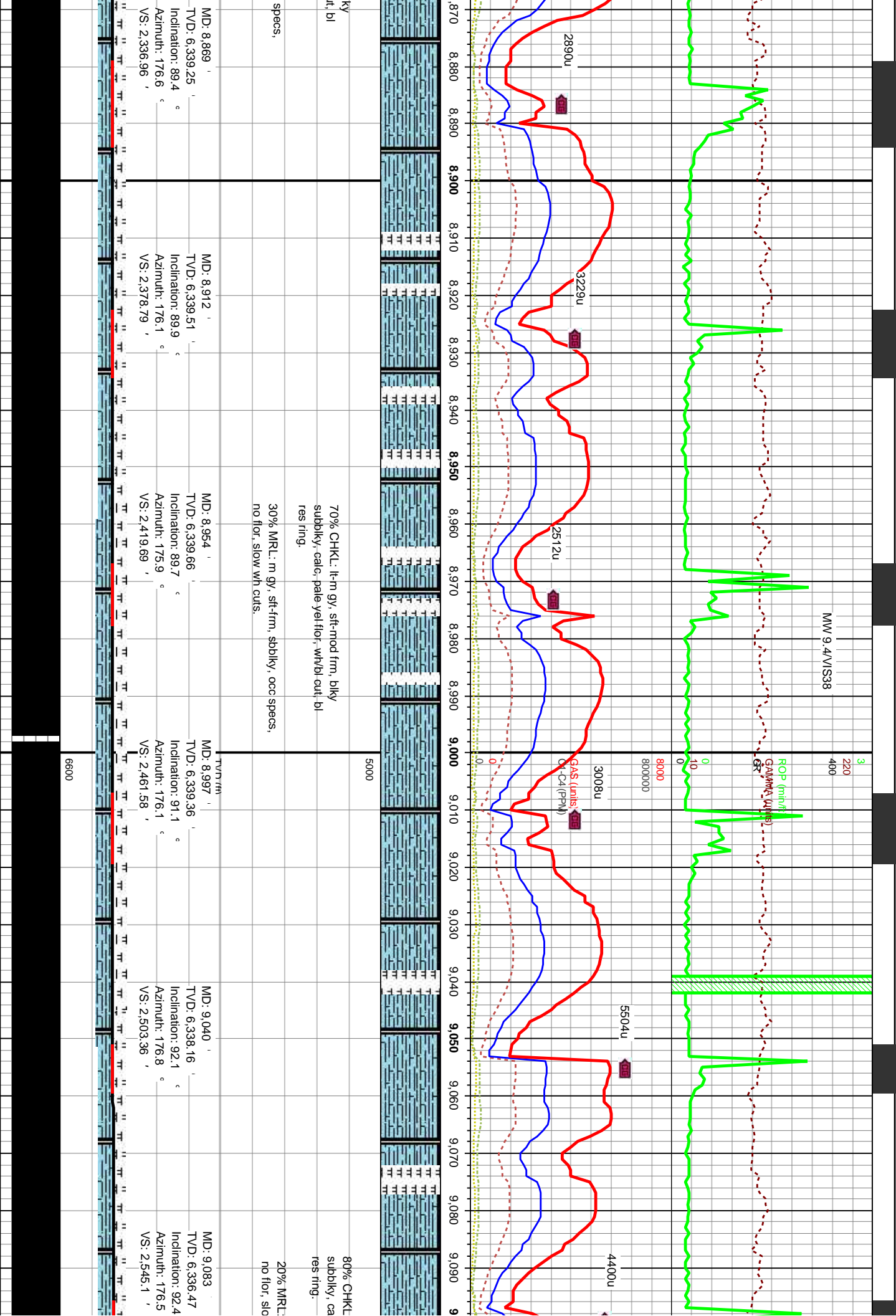


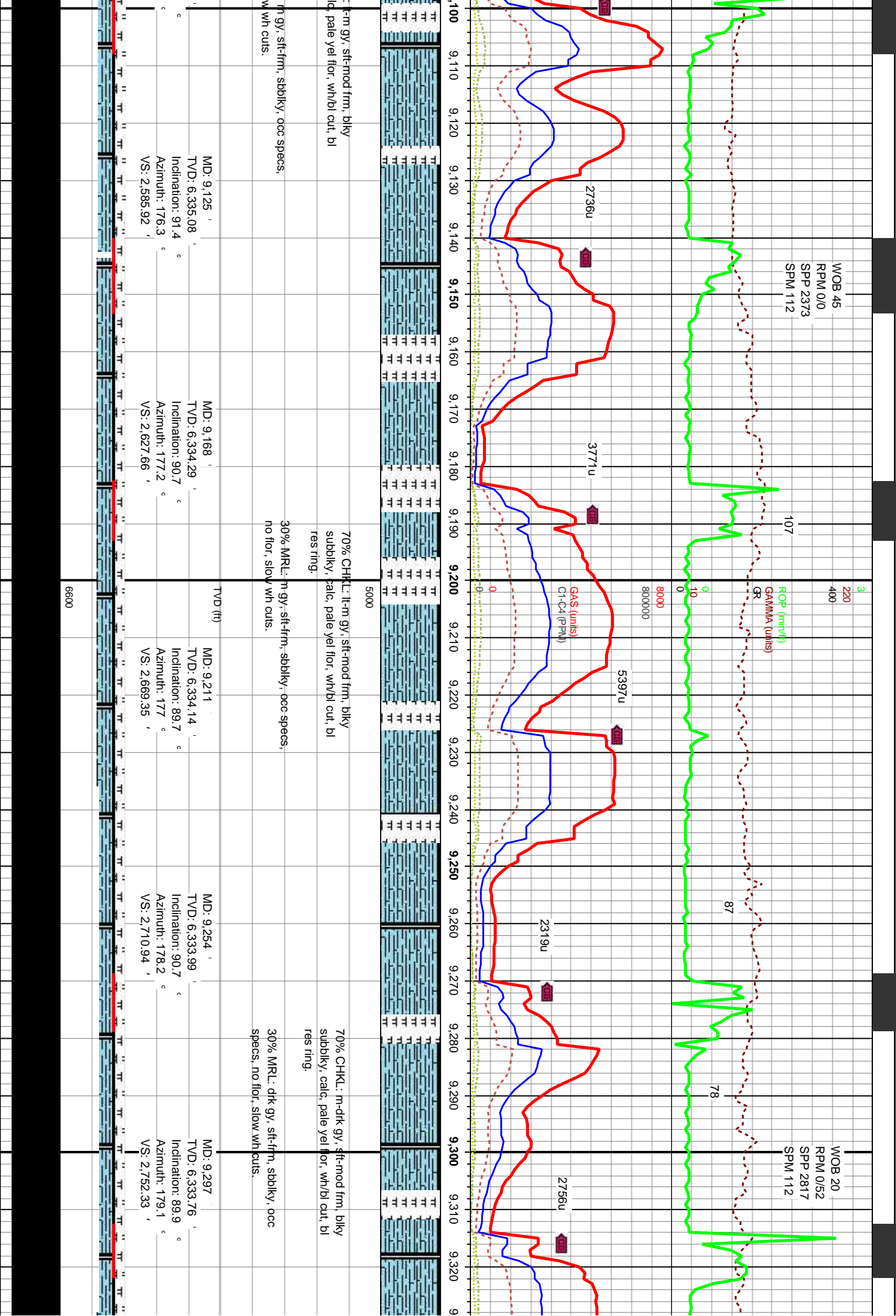


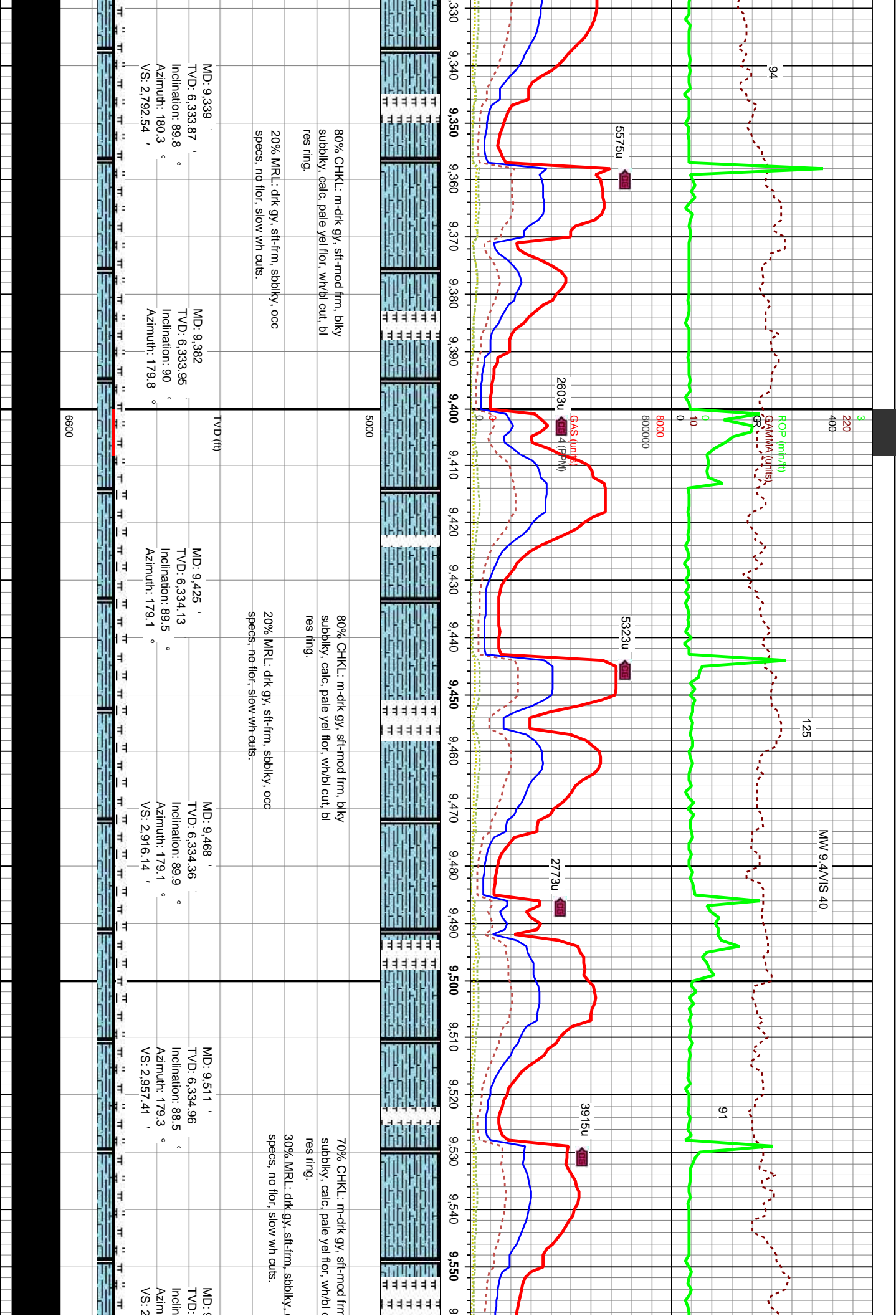


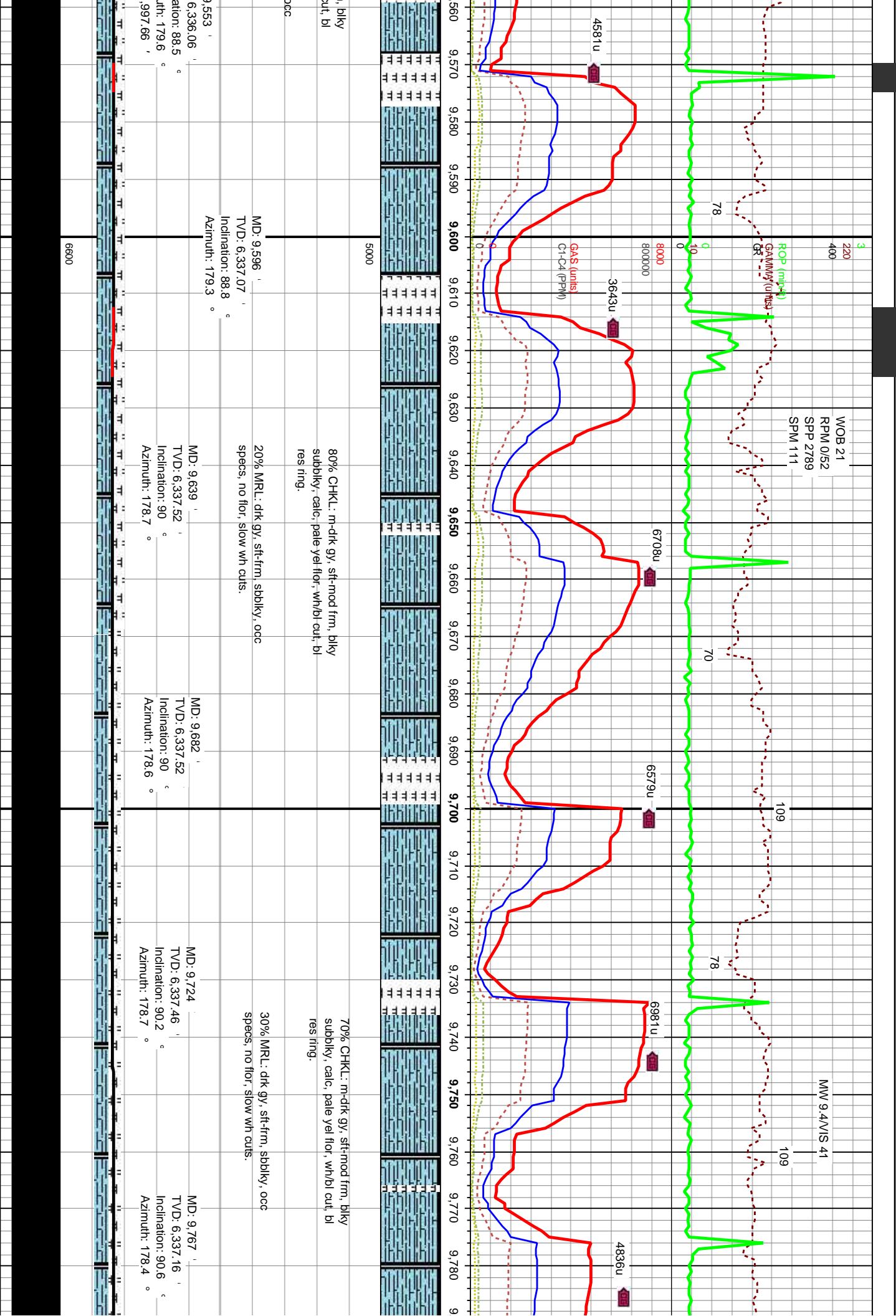


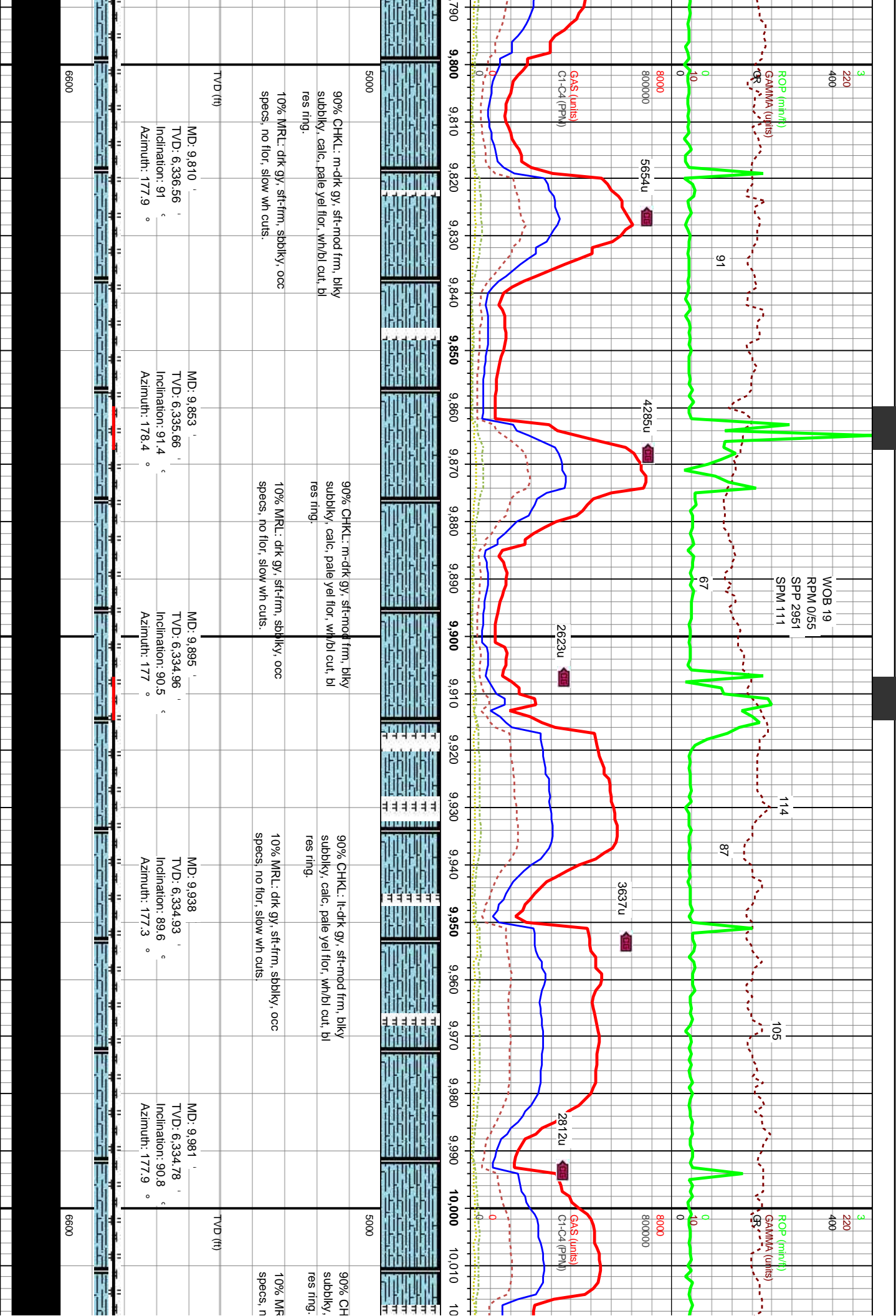


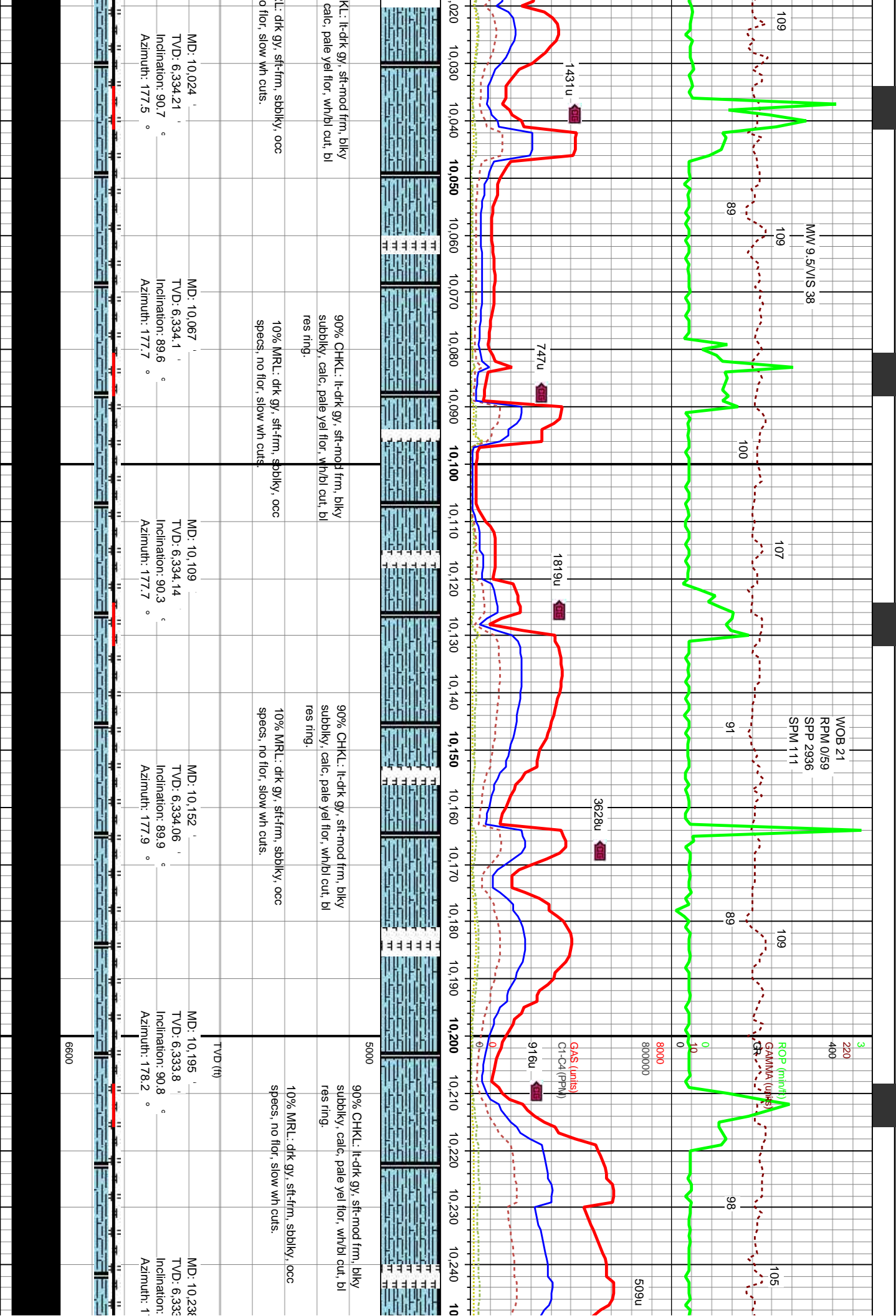


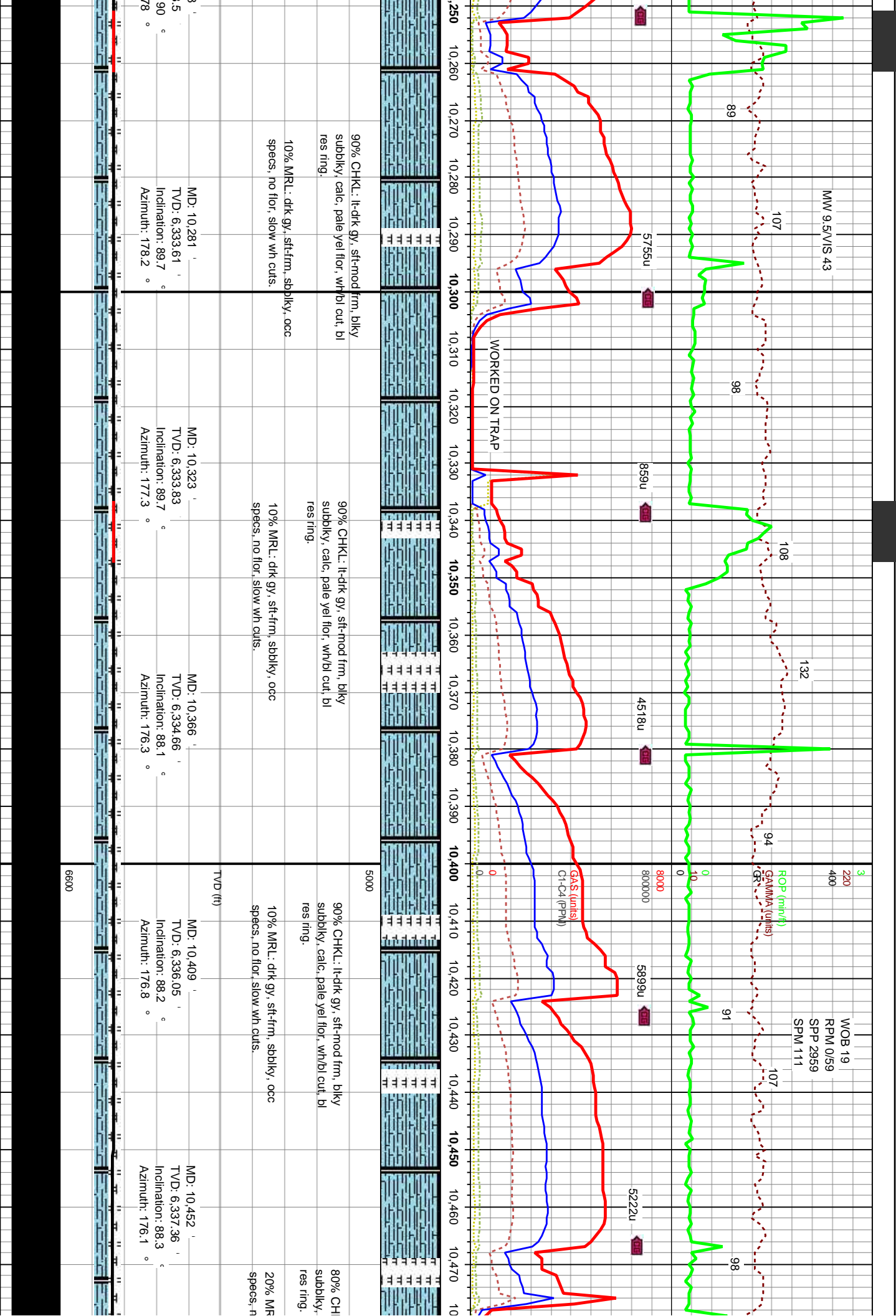


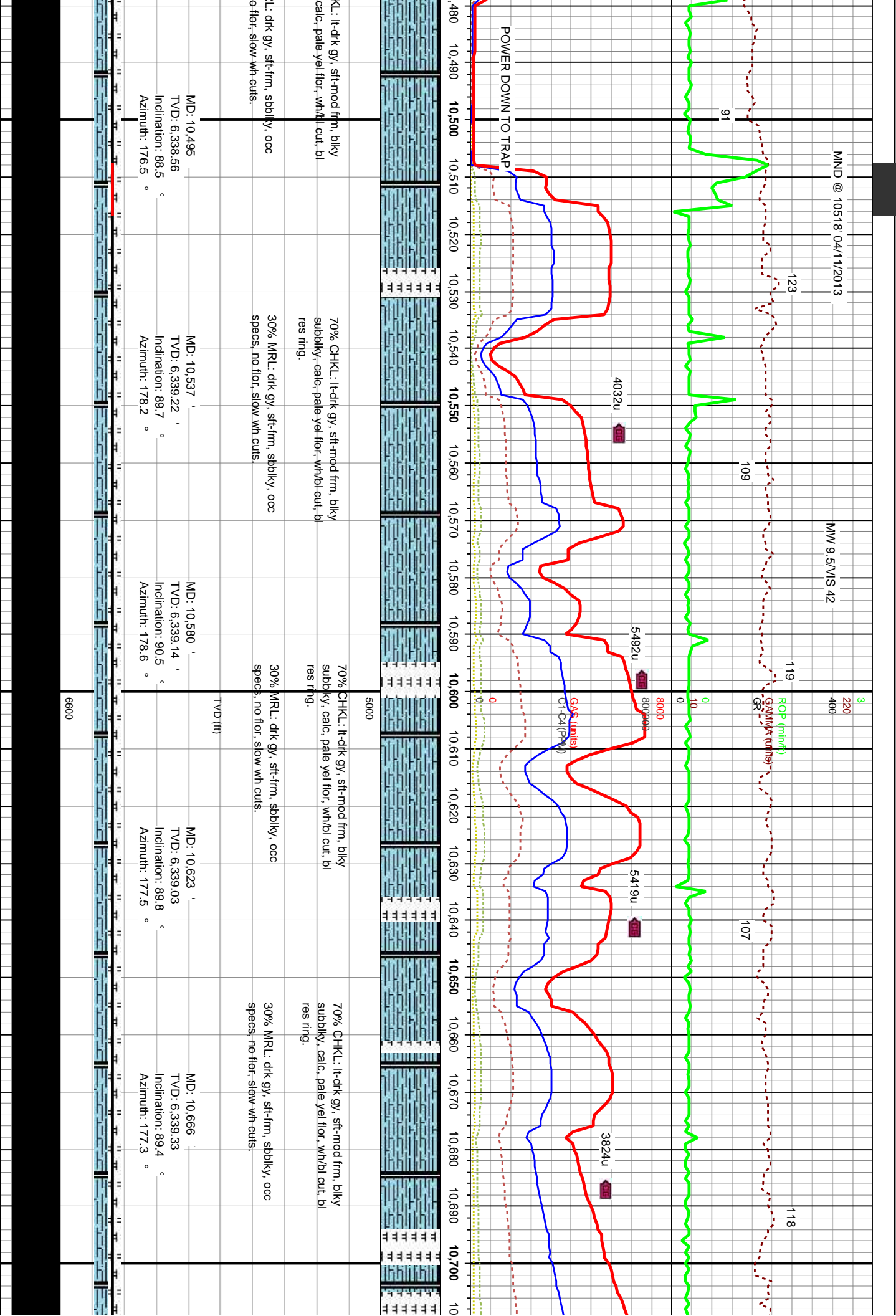


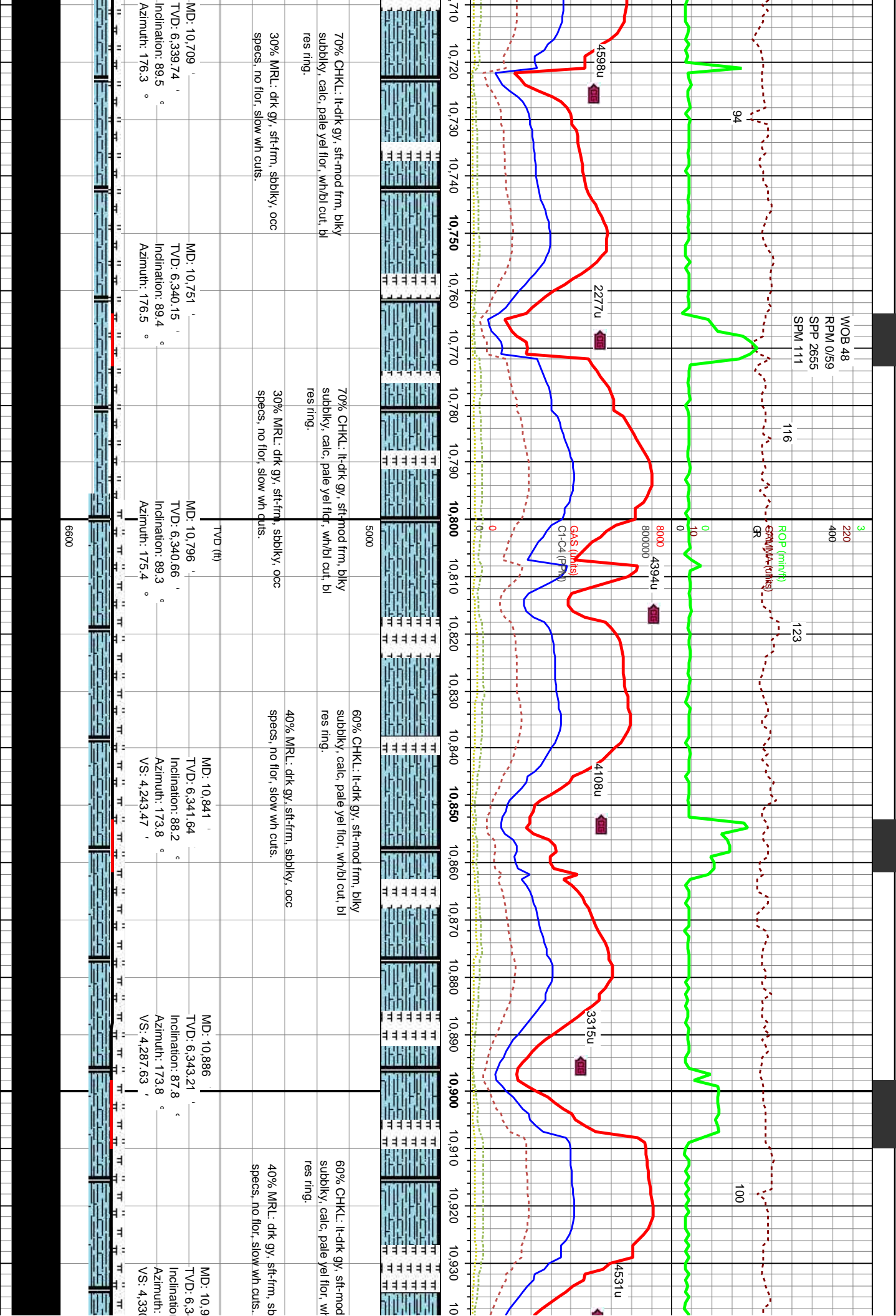




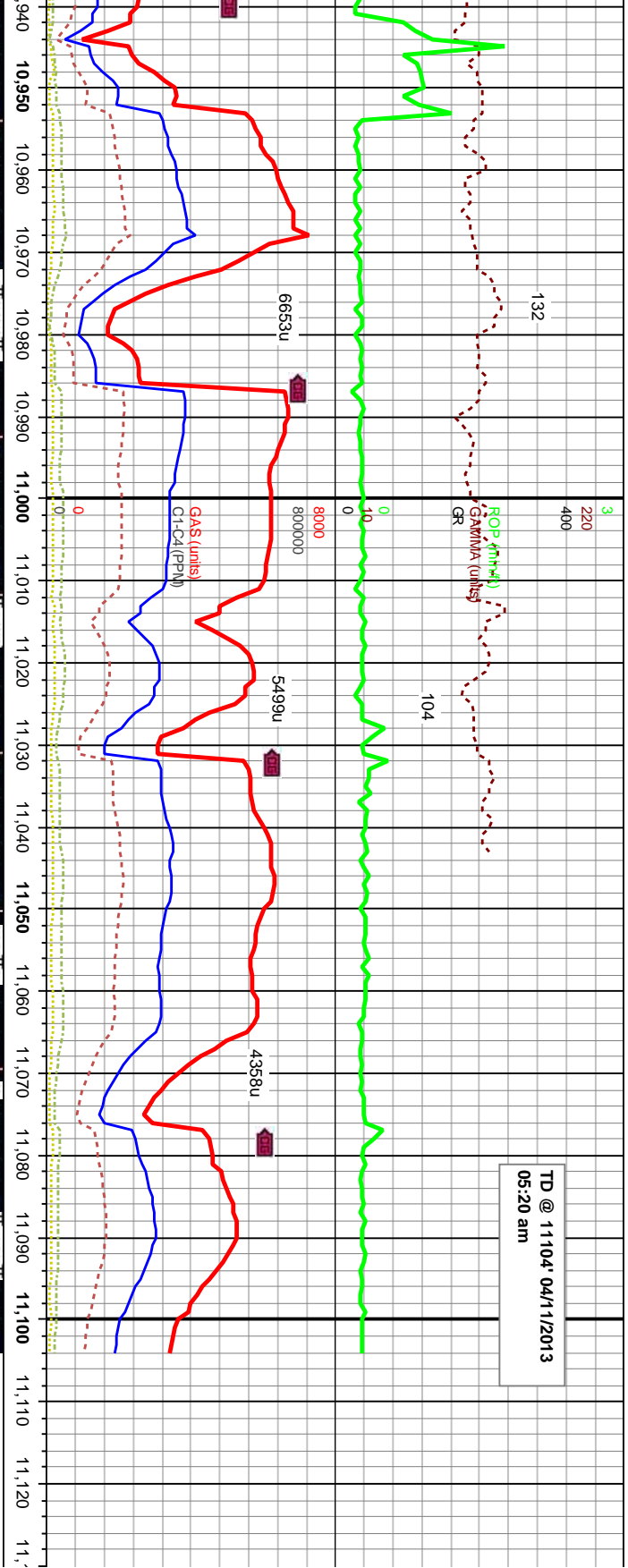








TD @ 11104' 04/11/2013
05:20 am



| | | | |
|--|--|---|---|
| frm, blkly /bl cut, bl | 5000 | 50% CHKL: lt-dtk gy, sft-mod frm, blkly subbiky, calc, pale yel flor, wh/bl cut, bl res ring. | 50% CHKL: lt-dtk gy, sft-mod frm, blkly subbiky, calc, pale yel flor, wh/bl cut, bl res ring. |
| blkly, occ | 50% MRL: dtk gy, sft-frm, sbbiky, occ specs, no flor, slow wh cuts. | 50% MRL: dtk gy, sft-frm, sbbiky, occ specs, no flor, slow wh cuts. | 50% MRL: dtk gy, sft-frm, sbbiky, occ specs, no flor, slow wh cuts. |
| MD: 10,975 ' TVD: 6,345.3 ' Inclination: 90 ° Azimuth: 172.8 ° VS: 4,375.1 ' | TVD (ft) | MD: 11,020 ' TVD: 6,345.18 ' Inclination: 90.3 ° Azimuth: 172.6 ° VS: 4,419.44 ' | MD: 11,104 ' TVD: 6,344.35 ' Inclination: 90.8 ° Azimuth: 173.4 ° |
| 6600 | BIT PROJECTION | | |