

Décollement Consulting Inc.



Scale: 5" / 100'
Measured Depth Log

Well Name State Antelope 24-21-12 HNC

Location SESW Sec 12 T5N R62W

State Colorado

Country USA

API Number 05-123-38888-00

County Weld

Rig Number Cade 22

Field D.J. Basin

Spud Date 3/10/2014

Drilling Completed 3/18/2014

Surface Coordinates 350 FSL X 1389 FWL

Ground Elevation 4575'

K.B. Elevation 4592'

Logged Interval 5700'

To 10840'

Total Depth 10840'

Formation Niobrara "C"

Type of Drilling Fluid WBM

Company Bonanza Creek Energy

Address 410 17th Street, Suite 1100
Denver, CO 80202

Name Leo Carrasco/Chris Irwin

Company Décollement Consulting

Address 13300 Braun Road
Golden, CO 80401



Operator

500

Accessories

- F FOSSIL
- GASTROPD
- ARGILLACEOUS
- ARGILLITE GRAIN
- GLAUCONITE
- GYPSEFEROUS
- Stringer
- ALGAE
- AMPHIPORA
- BELMNTITE
- BIOCLASTIC
- BRACHIOPOD
- BRYOZOA
- CEPHALOPOD
- CORAL
- CRINOID
- ECHINOID
- FISH
- FORAMINIFERA
- ANHYDRITIC
- FERRUGINOUS
- FERRUGINOUS PELLETT
- FERRUGINOUS
- TUFFACEOUS
- OOLITE
- OSTRACOD
- PELECYPOD
- PELLET
- PISOLITE
- PLANT REMAINS
- PLANT SPORES
- SCAPHOPOD
- STROMATOPOROID
- FELDSPAR
- SILTY
- TUFFACEOUS
- HEAVY MINERAL
- KAOLIN
- MARLSTONE
- MINERAL CRYSTALS
- NODULES
- PHOSPHATE PELLETT
- PYRITE
- SALT CAST
- SANDY
- SILICEOUS
- ANHYDRITE STRINGER
- BENTONITE STRINGER
- COAL STRINGER
- DOLOMITE STRINGER
- GYPSEM STRINGER
- LIMESTONE STRINGER
- MARLSTONE (CALC) STRG
- MARLSTONE (DOL) STRG
- SANDSTONE STRINGER
- SHALE STRINGER
- SILTSTONE STRINGER

Geologist

Inc.

Rock Types

- SHALE GRAY
- SHALE COLORED
- SILTSTONE
- SANDSTONE
- CONGLOMERATE
- TILL
- BENTONITE
- TUFF
- IGNEOUS
- METAMORPHIC
- SHALE
- BRECCIA
- Chalk

Other Symbols

- ORGANIC
- PINPOINT
- DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING
- Engineering
- BIT
- CONNECTION (LEFT)
- CONNECTION (RIGHT)
- CONNECTION GAS
- CORE - LOST
- CORE - RECOVERED
- DST INTERVAL
- FAULT
- FORMATION TOP
- GAS SHOW
- MIN DEPTH
- NORMAL FAULT
- OIL SHOW
- OVERTURNED STRATA
- REVERSE FAULT
- SIDEWALL CORE (LEFT)
- SIDEWALL CORE (RIGHT)
- SIDEWALL CORE (RIGHT)
- SLIDE
- SURVEY
- TRIP GAS
- WIRELINE TESTED - LEFT
- WIRELINE TESTED - RT
- LITHOGRAPHIC
- ANGULAR
- ROUNDED
- SUBANG
- SUBRND
- TEXTURES
- BOUNDSTONE
- CHALKY
- CRYPTOXLN
- E EARTHY
- FINEYXLN
- GRAINSTONE
- LITHOGRAPHIC
- MIX MICROXLN
- MUDSTONE
- PACKSTONE
- WACKESTONE
- Sorting
- MODERATE
- POOR
- WELL
- Chalk

Rounding

ROP
 ROF
 GAMMA
 GR
 Gamma

Total Gas & Chromatograph

GAS
 C1
 C2
 C3
 C4

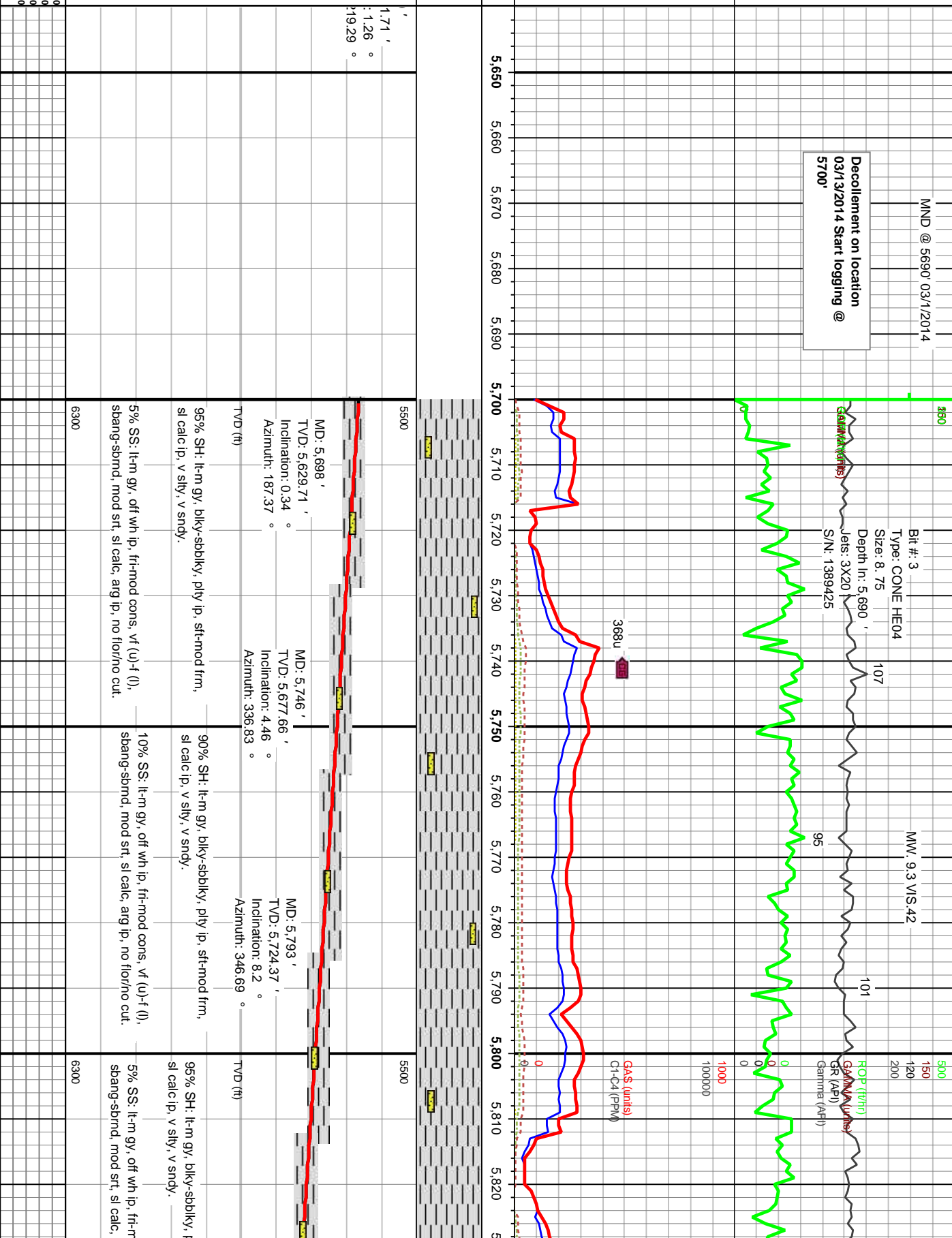
Depth Labels

Interp Lith

Well Bore
 TVD

Oil Show

Images



20
40
60
80

1.71'
: 1.26°
: 19.29°

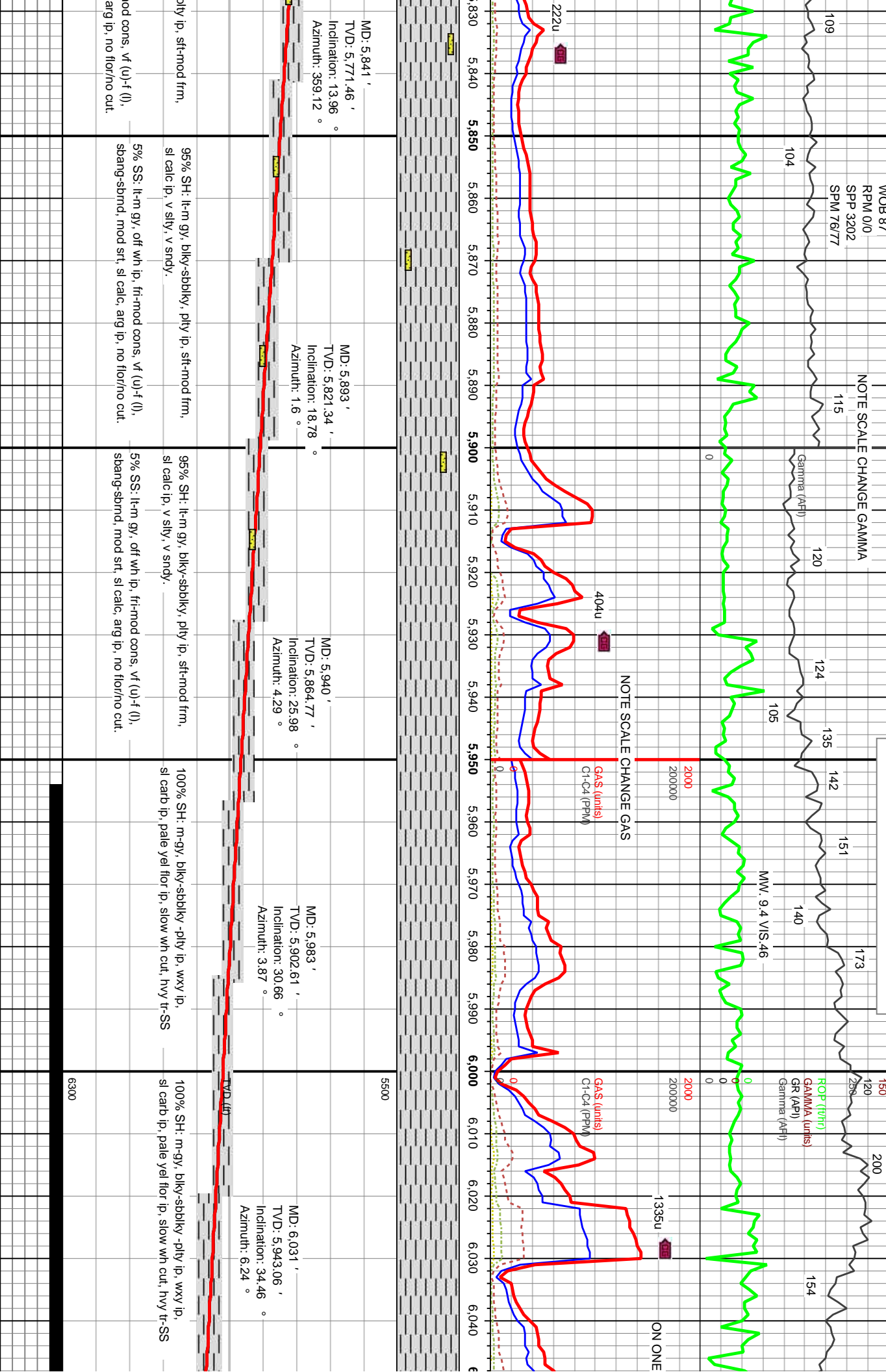
5500

5500

6300

6300

SHARON SPRINGS" @ 5981' MD 5900' TVD



NOTE SCALE CHANGE GAMMA

NOTE SCALE CHANGE GAS

ROP (ft/hr)

GAMMA (API)

GR (API)

Gamma (API)

WOB 87

RPM 0/0

SPP 3202

SPM 76/77

Gamma (API)

GAS (units) C1-C4 (PPM)

GAS (units) C1-C4 (PPM)

GAS (units) C1-C4 (PPM)

GAS (units) C1-C4 (PPM)

GAS (units) C1-C4 (PPM)

GAS (units) C1-C4 (PPM)

GAS (units) C1-C4 (PPM)

GAS (units) C1-C4 (PPM)

GAS (units) C1-C4 (PPM)

GAS (units) C1-C4 (PPM)

222u

404u

1335u

ON ONE

109

104

115

120

124

135

142

151

140

173

200

154

200

500

250

5500

6300

5830

5840

5850

5860

5870

5880

5890

5900

5910

5920

5930

5940

5950

5960

5970

5980

5990

6000

6010

6020

6030

6040

6050

6060

6070

6080

6090

6100

6110

6120

6130

6140

6150

6160

6170

6180

6190

6200

6210

6220

6230

6240

6250

6260

6270

6280

6290

6300

6310

6320

6330

6340

6350

6360

6370

6380

6390

6400

6410

6420

6430

6440

6450

6460

6470

6480

6490

6500

6510

6520

6530

6540

6550

6560

6570

6580

6590

6600

6610

6620

6630

6640

6650

6660

6670

6680

6690

6700

6710

6720

6730

6740

6750

6760

6770

6780

6790

6800

6810

6820

6830

6840

6850

6860

6870

6880

6890

6900

6910

6920

6930

6940

6950

6960

6970

6980

6990

7000

7010

7020

7030

7040

7050

7060

7070

7080

7090

7100

7110

7120

7130

7140

7150

7160

7170

7180

7190

7200

7210

7220

7230

7240

7250

7260

7270

7280

7290

7300

7310

7320

7330

7340

7350

7360

7370

7380

7390

7400

7410

7420

7430

7440

7450

1' MD

MW: 9.1 VIS.43

165

MW: 9.1 VIS.43

NOBRARA "C" Chalk @ 6159' TVD, 6408' MD

136

WOB
RPM
SPP
SPM

NOBRARA "B" Marl @ 6130' TVD, 6319' MD

92

73

63

ROP (ft/hr)
GAMMA (API)
GR (API)
Gamma (API)

500

150

120

200

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

55

5000

500000

Gas Scale Change

GAS (mls)

C1-C4 (PPM)

0

0

0

0

0

0

0

0

0

0

0

0

0

0

3318u

2661u

2633u

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

6.480

6.490

6.500

5500

6300

off wh, sft-mod frm, blk-y-sbbkly,
wh cut, bl res ring.

70% MRL: m-dk gy, sft-frm, sbbkly, occ specs,
v calc, sm tr-fos, no flor, diffuse wh cuts.

30% CHKL: lt-dk gy, off wh, sft-mod frm, blk-y-sbbkly,
calc, wxy ip, no flor, wh cut, bl res ring.

MD: 6.314'

TVD: 6.129.1'

Inclination: 64.24 °

Azimuth: 1.09 °

off wh, sft-mod frm, blk-y-sbbkly,
wh cut, bl res ring.

70% MRL: m-dk gy, sft-frm, sbbkly, occ specs,
v calc, sm tr-fos, no flor, diffuse wh cuts.

30% CHKL: lt-dk gy, off wh, sft-mod frm, blk-y-sbbkly,
calc, wxy ip, no flor, wh cut, bl res ring.

MD: 6.361'

TVD: 6.147.7'

Inclination: 69.14 °

Azimuth: 1.77 °

off wh, sft-mod frm, blk-y-sbbkly,
wh cut, bl res ring.

85% CHKL: m-lt gy, off wh, sft-mod frm, blk-y-sbbkly,
calc, wxy ip, no flor, wh cut, bl res ring.

15% MRL: m-dk gy, sft-frm, sbbkly, occ specs,
v calc, sm tr-fos, no flor, diffuse wh cuts.

MD: 6.409'

TVD: 6.162.17'

Inclination: 75.75 °

off wh, sft-mod frm, blk-y-sbbkly,
wh cut, bl res ring.

80% CHKL: m-lt gy, off wh, sft-mod frm, blk-y-sbbkly,
calc, wxy ip, no flor, wh cut, bl res ring.

20% MRL: m-dk gy, sft-frm, sbbkly, occ specs,
v calc, sm tr-fos, no flor, diffuse wh cuts.

MD: 6.456'

TVD: 6.171.23'

Inclination: 82 °

Azimuth: 0.15 °

off wh, sft-mod frm, blk-y-sbbkly,
wh cut, bl res ring.

70% MRL: m-dk gy, sft-frm, sbbkly, occ specs,
v calc, sm tr-fos, no flor, diffuse wh cuts.

30% CHKL: lt-dk gy, off wh, sft-mod frm, blk-y-sbbkly,
calc, wxy ip, no flor, wh cut, bl res ring.

MD: 6.314'

TVD: 6.129.1'

Inclination: 64.24 °

Azimuth: 1.09 °

off wh, sft-mod frm, blk-y-sbbkly,
wh cut, bl res ring.

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v calc, sm tr-fos, no flor, diffuse wh cuts.

MD: 6.409'

TVD: 6.162.17'

Inclination: 75.75 °

Azimuth: 1.97 °

off wh, sft-mod frm, blk-y-sbbkly,
wh cut, bl res ring.

80% CHKL: m-lt gy, off wh, sft-mod frm, blk-y-sbbkly,
calc, wxy ip, no flor, wh cut, bl res ring.

20% MRL: m-dk gy, sft-frm, sbbkly, occ specs,
v calc, sm tr-fos, no flor, diffuse wh cuts.

MD: 6.456'

TVD: 6.171.23'

Inclination: 82 °

Azimuth: 0.15 °

off wh, sft-mod frm, blk-y-sbbkly,
wh cut, bl res ring.

70% MRL: m-dk gy, sft-frm, sbbkly, occ specs,
v calc, sm tr-fos, no flor, diffuse wh cuts.

30% CHKL: lt-dk gy, off wh, sft-mod frm, blk-y-sbbkly,
calc, wxy ip, no flor, wh cut, bl res ring.

MD: 6.314'

TVD: 6.129.1'

Inclination: 64.24 °

Azimuth: 1.09 °

off wh, sft-mod frm, blk-y-sbbkly,
wh cut, bl res ring.

70% MRL: m-dk gy, sft-frm, sbbkly, occ specs,
v calc, sm tr-fos, no flor, diffuse wh cuts.

30% CHKL: lt-dk gy, off wh, sft-mod frm, blk-y-sbbkly,
calc, wxy ip, no flor, wh cut, bl res ring.

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TVD: 6.129.1'

Inclination: 64.24 °

Azimuth: 1.09 °

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wh cut, bl res ring.

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calc, wxy ip, no flor, wh cut, bl res ring.

MD: 6.314'

TVD: 6.129.1'

Inclination: 64.24 °

Azimuth: 1.09 °

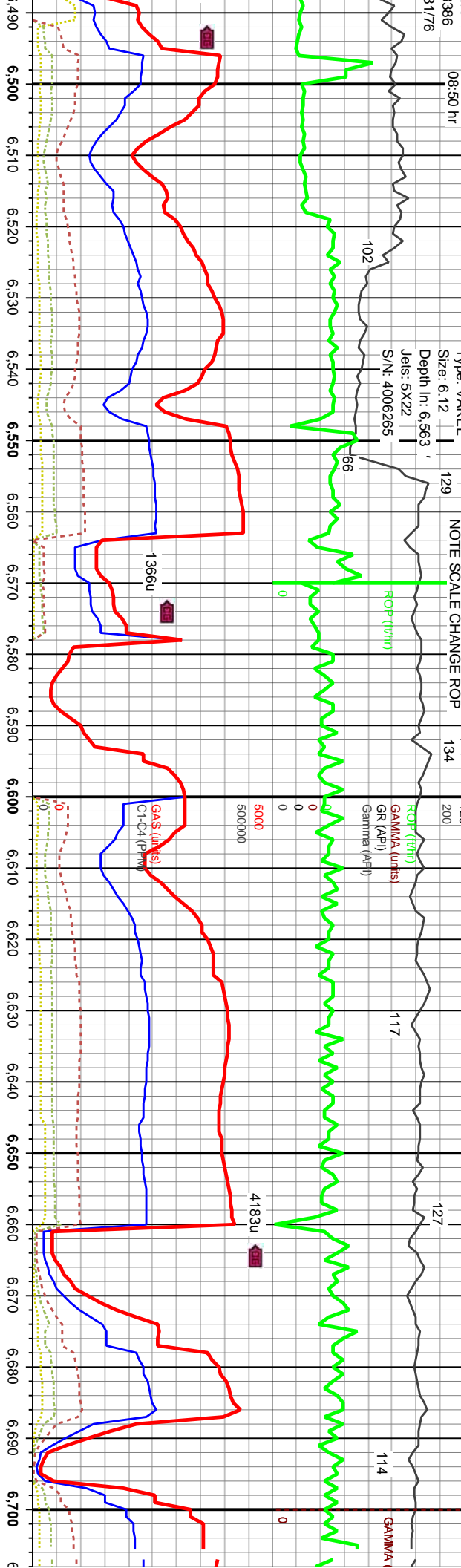
59 TD landing Curve @ 6563 03/15/2014
 08:50 hr

Bit # 4
 Type: VAREL
 Size: 6.12
 Depth In: 6.563
 Jets: 5X22
 S/N: 4006265

129 NOTE SCALE CHANGE ROP
 134

MMW 8.4 VIS.29

150



70% CHKL: m-lt gy, off wh, sft-mod frm, blk-y-sbbkly,
 calc, wxy ip, no flor, wh cut, bl res ring.
 30% MRL: m-dk gy, sft-frm, sbbkly, occ specs,
 v calc, sm tr-fos, no flor, diffuse wh cuts.

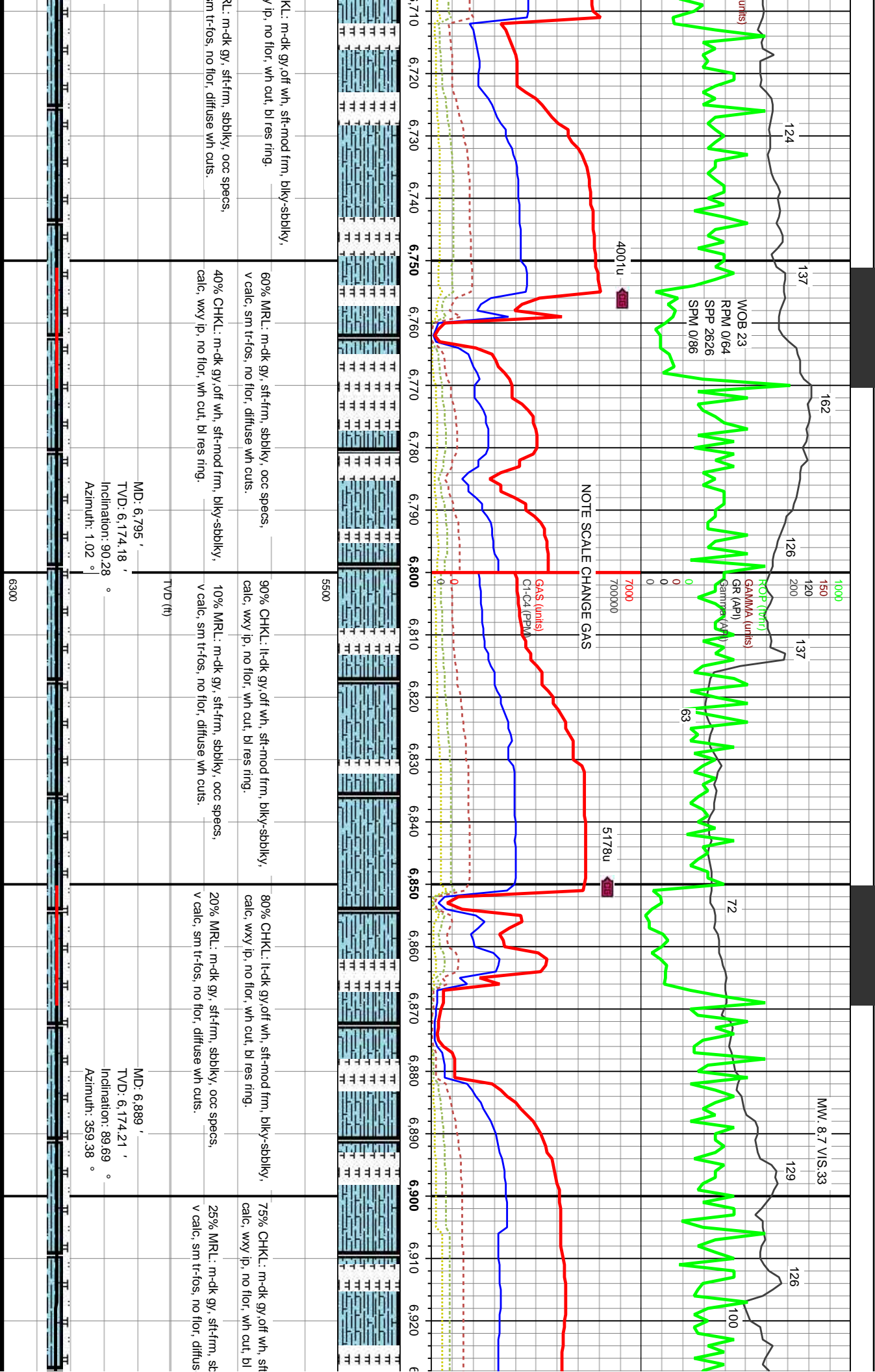
90% CHKL: m-dk gy, off wh, sft-mod frm, blk-y-sbbkly,
 calc, wxy ip, no flor, wh cut, bl res ring.
 10% MRL: m-dk gy, sft-frm, sbbkly, occ specs,
 v calc, sm tr-fos, no flor, diffuse wh cuts.

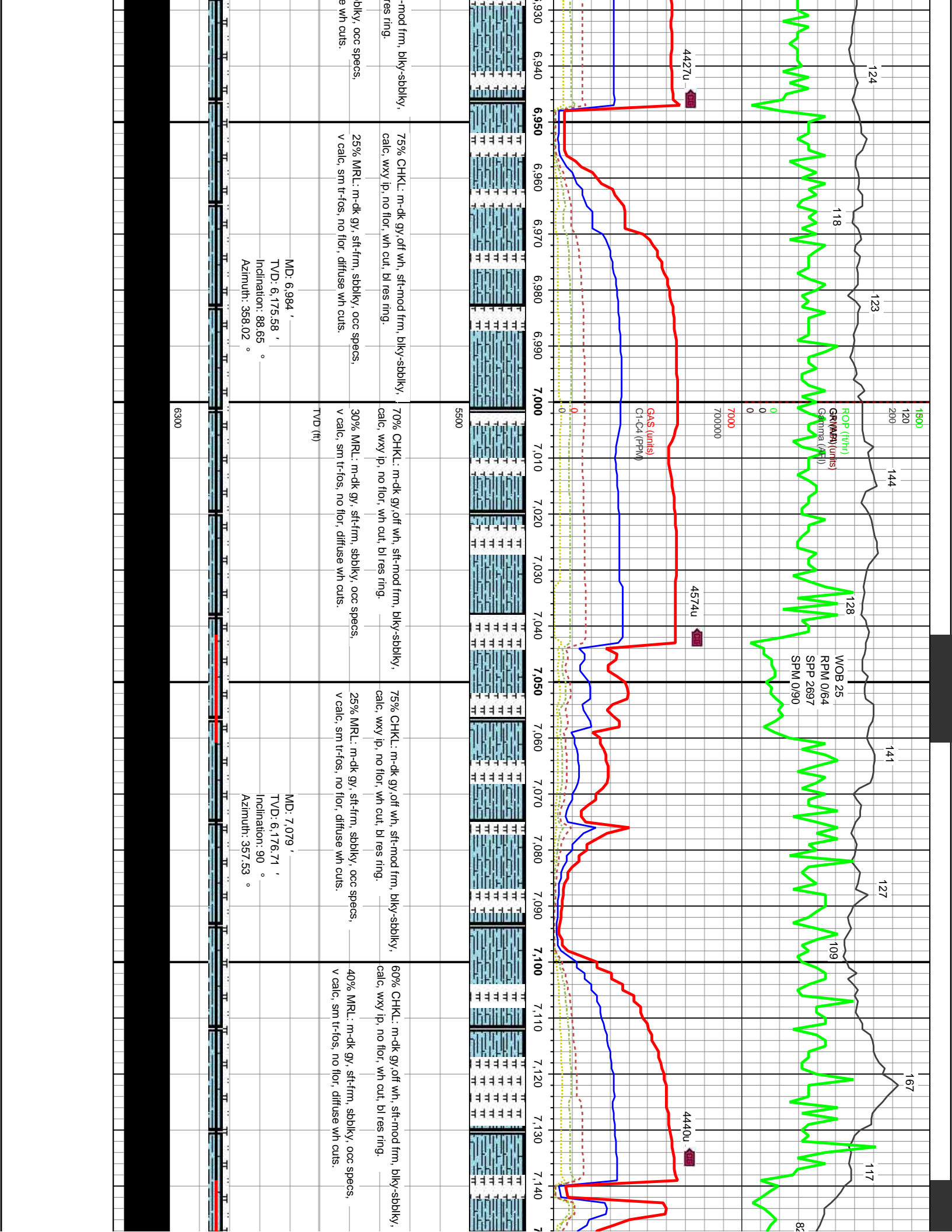
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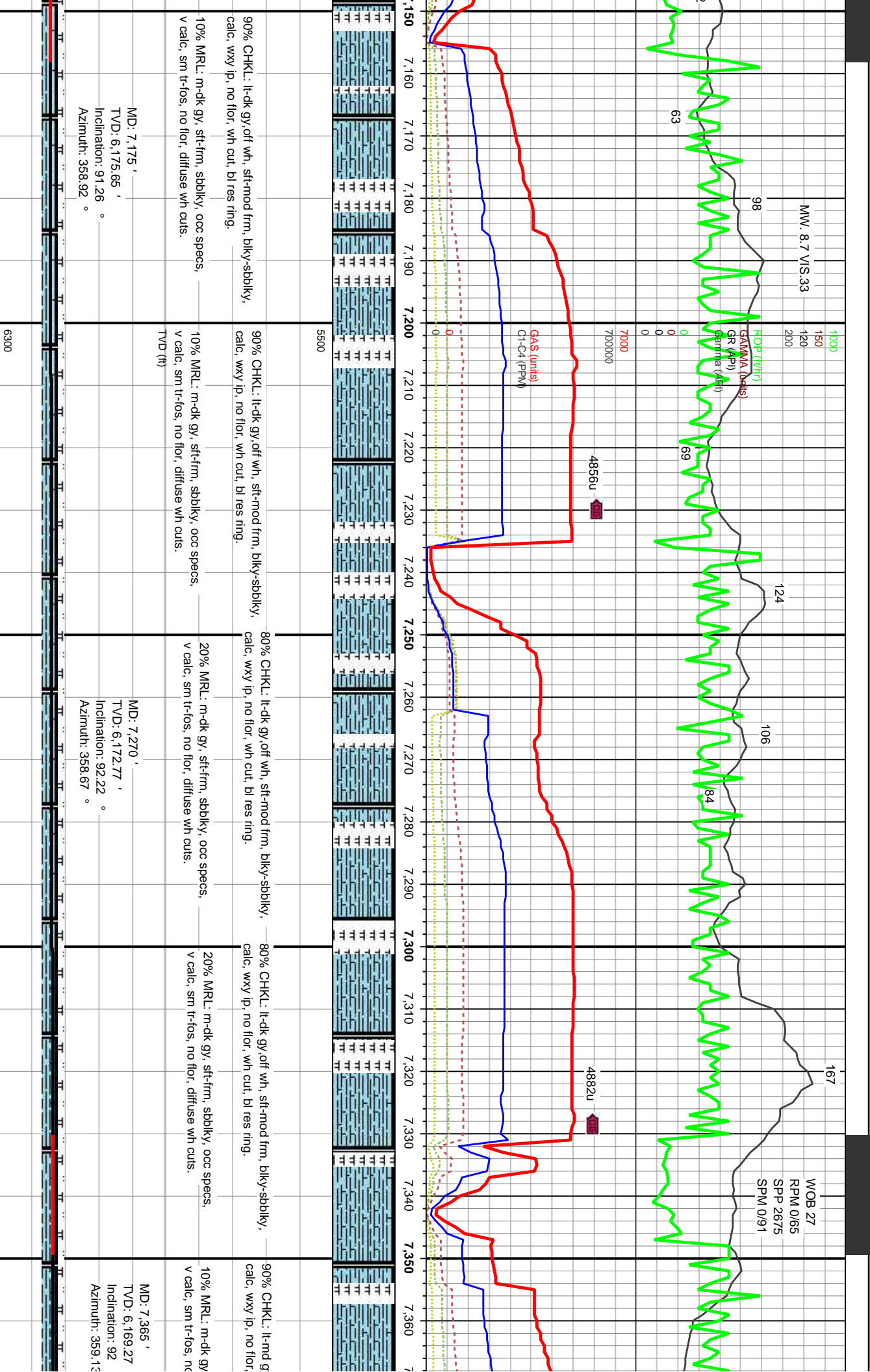
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 v calc, sm tr-fos, no flor, diffuse wh cuts.

MD: 6.504 ' TVD: 6.521 '
 TVD: 6.174.69 ' Inclination: 89.91 °
 Inclination: 89.72 ° Azimuth: 359.51 °
 Azimuth: 358.68 °
 MD: 6.563 ' TVD: 6.174.5 '
 TVD: 6.174.63 ' Inclination: 90.19 °
 Inclination: 90.7 ° Azimuth: 0.56 °
 Azimuth: 0.18 °
 MD: 6.657 ' TVD: 6.174.51 '
 TVD: 6.174.51 ' Inclination: 90.12 °
 Inclination: 90.12 ° Azimuth: 0.18 °
 Azimuth: 0.18 °
 TVD (ft)
 6300







MW: 8.7 VS.33

ROP (ft/hr)
GMA (lb/hr)
GR (API)
GPR (API)
G1-C4 (PPM)
G2

124

106

167

WOB 27
RPM 0/65
SPP 2675
SPM 0/91

7000
700000

4856u

4882u

GAS (units)
C1-C4 (PPM)

5500

6300

MD: 7,175'
TVD: 6,175.66'
Inclination: 91.26°
Azimuth: 358.92°

MD: 7,270'
TVD: 6,172.77'
Inclination: 92.22°
Azimuth: 358.67°

MD: 7,365'
TVD: 6,169.27'
Inclination: 92°
Azimuth: 359.13°

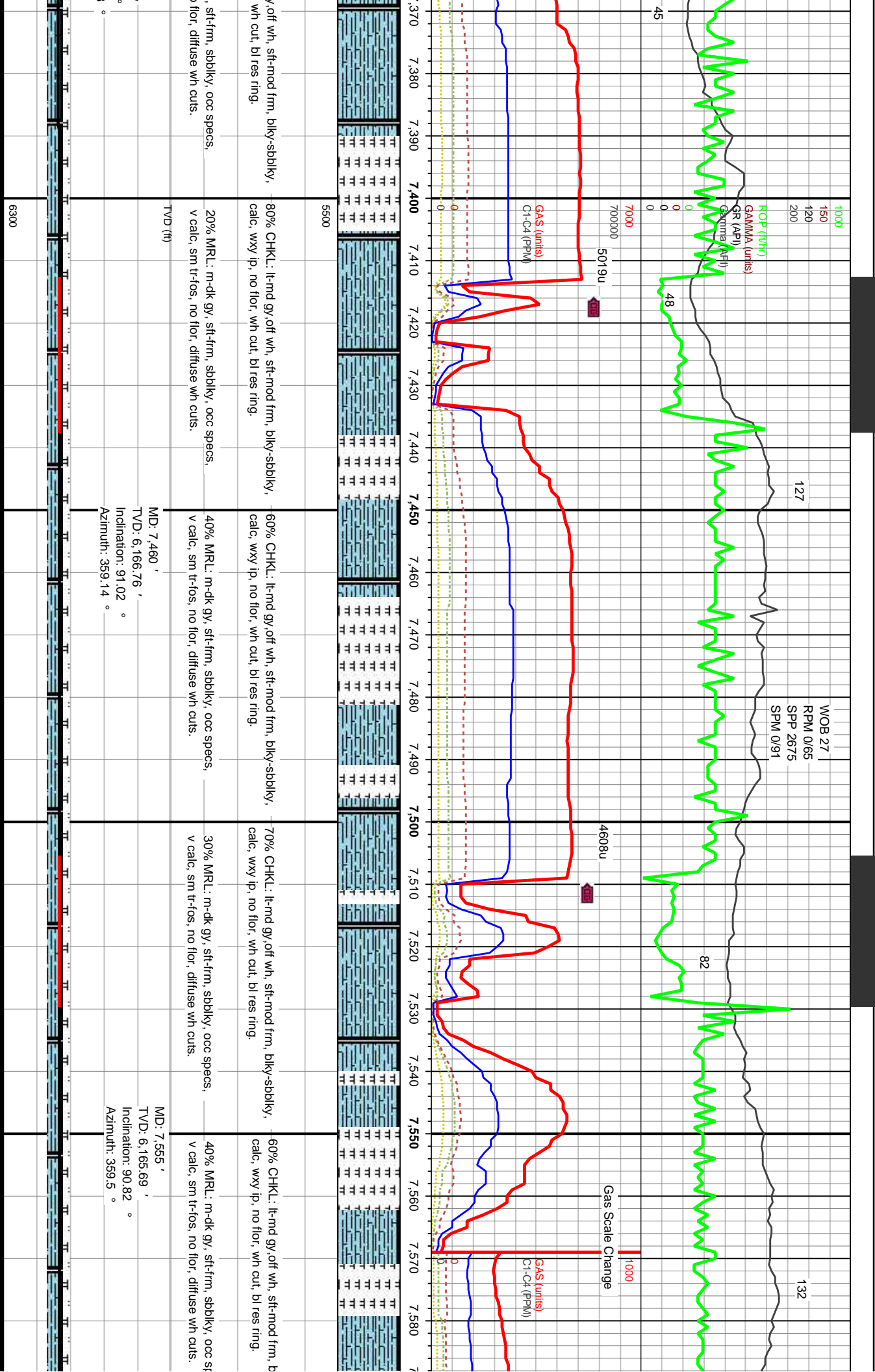
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10% MRL: m-dk gy, sft-frm, sbbkly, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.



132

127

45

48

82

70000
70000
5019u

4608u

GAS (units)
C1-C4 (PPM)

GAS (units)
C1-C4 (PPM)

Gas Scale Change
1000

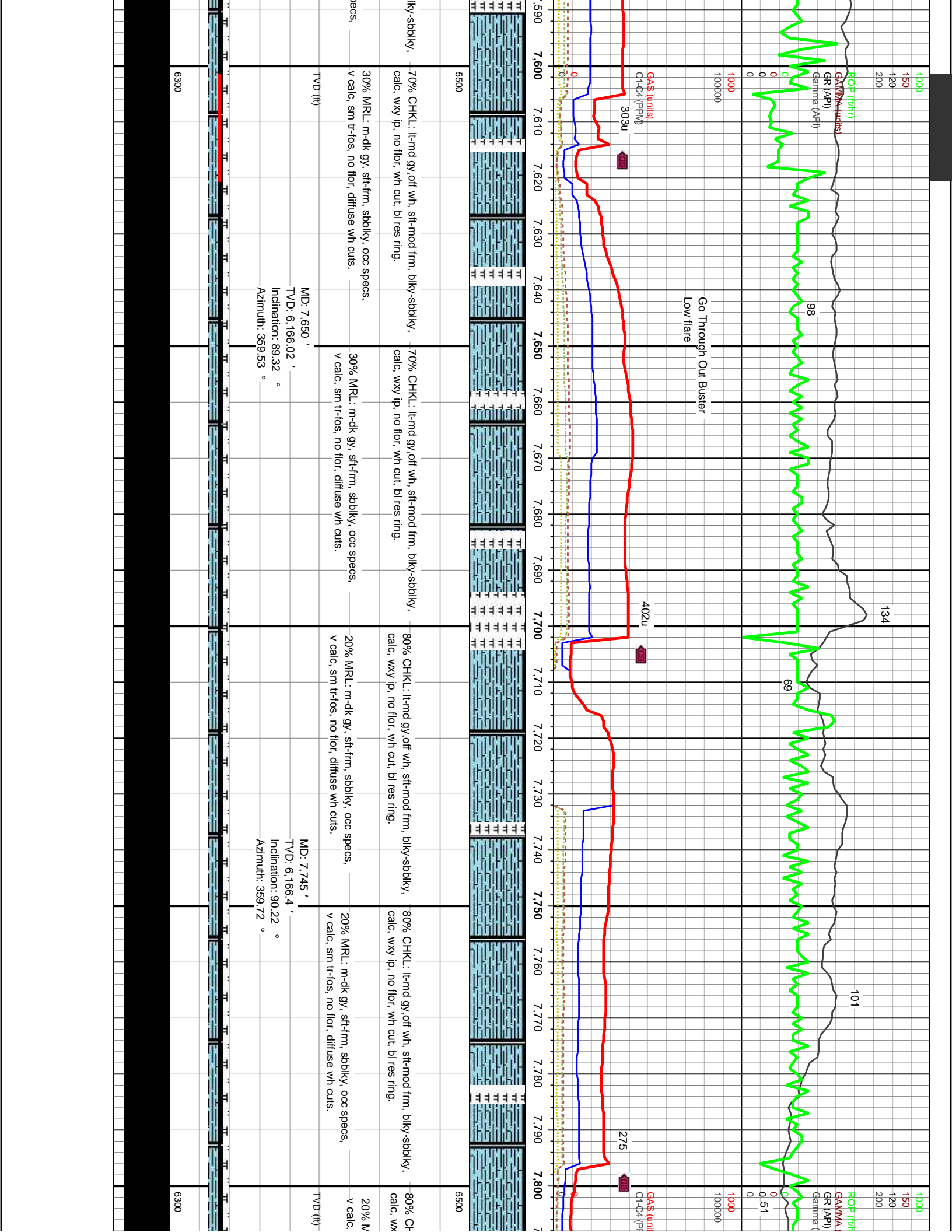
TVD (ft)

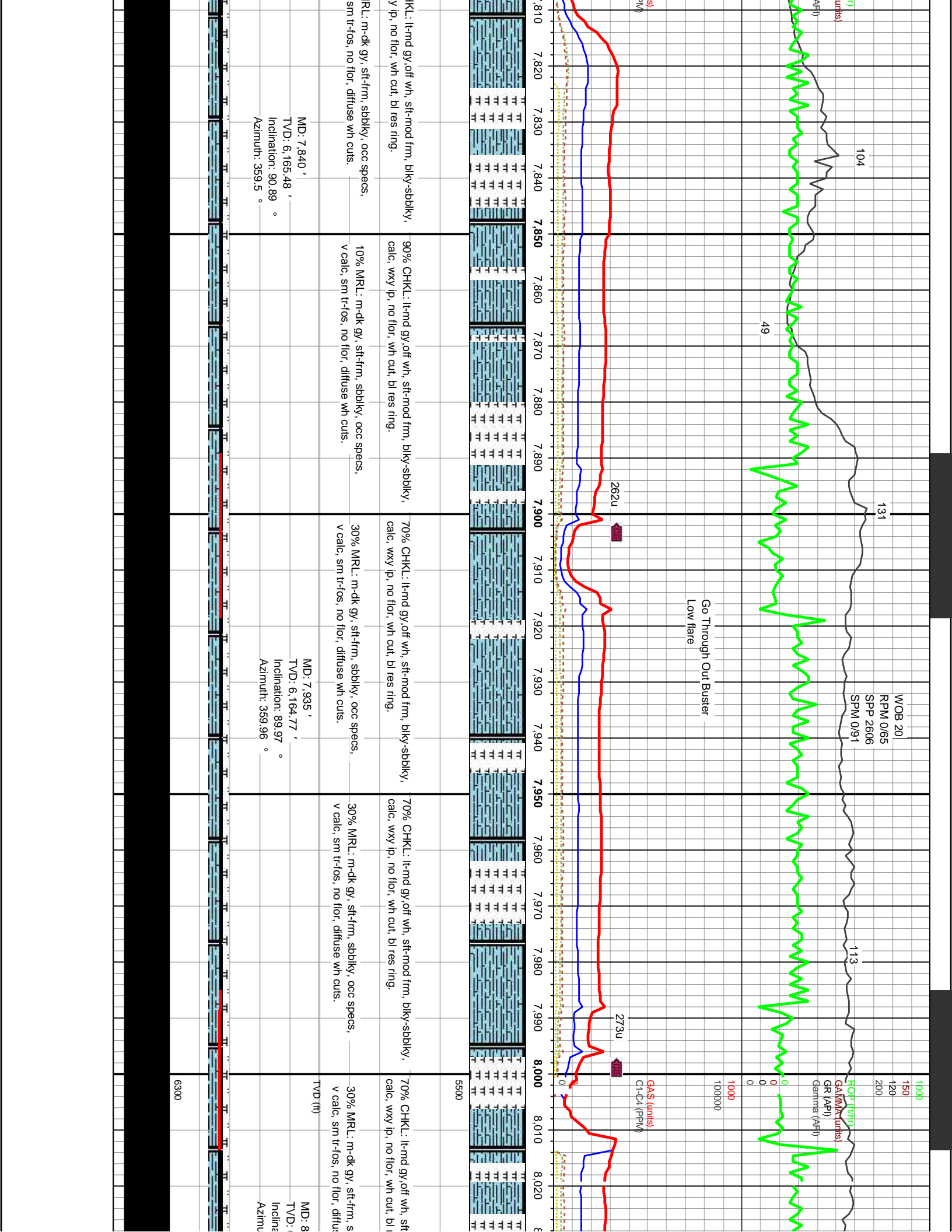
MD: 7,460'
TVD: 6,166.76'
Inclination: 91.02°
Azimuth: 359.14°

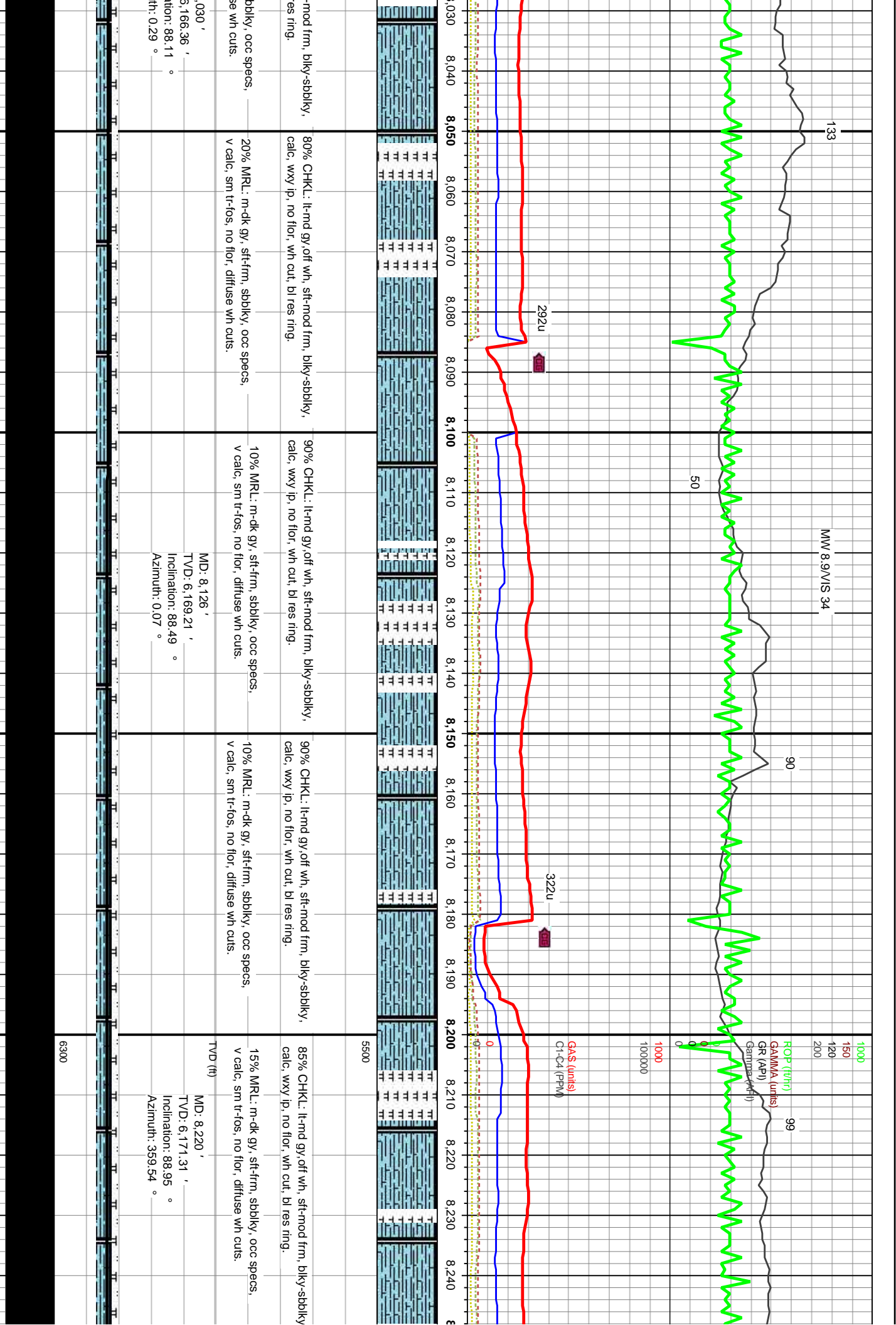
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TVD: 6,165.69'
Inclination: 90.82°
Azimuth: 359.5°

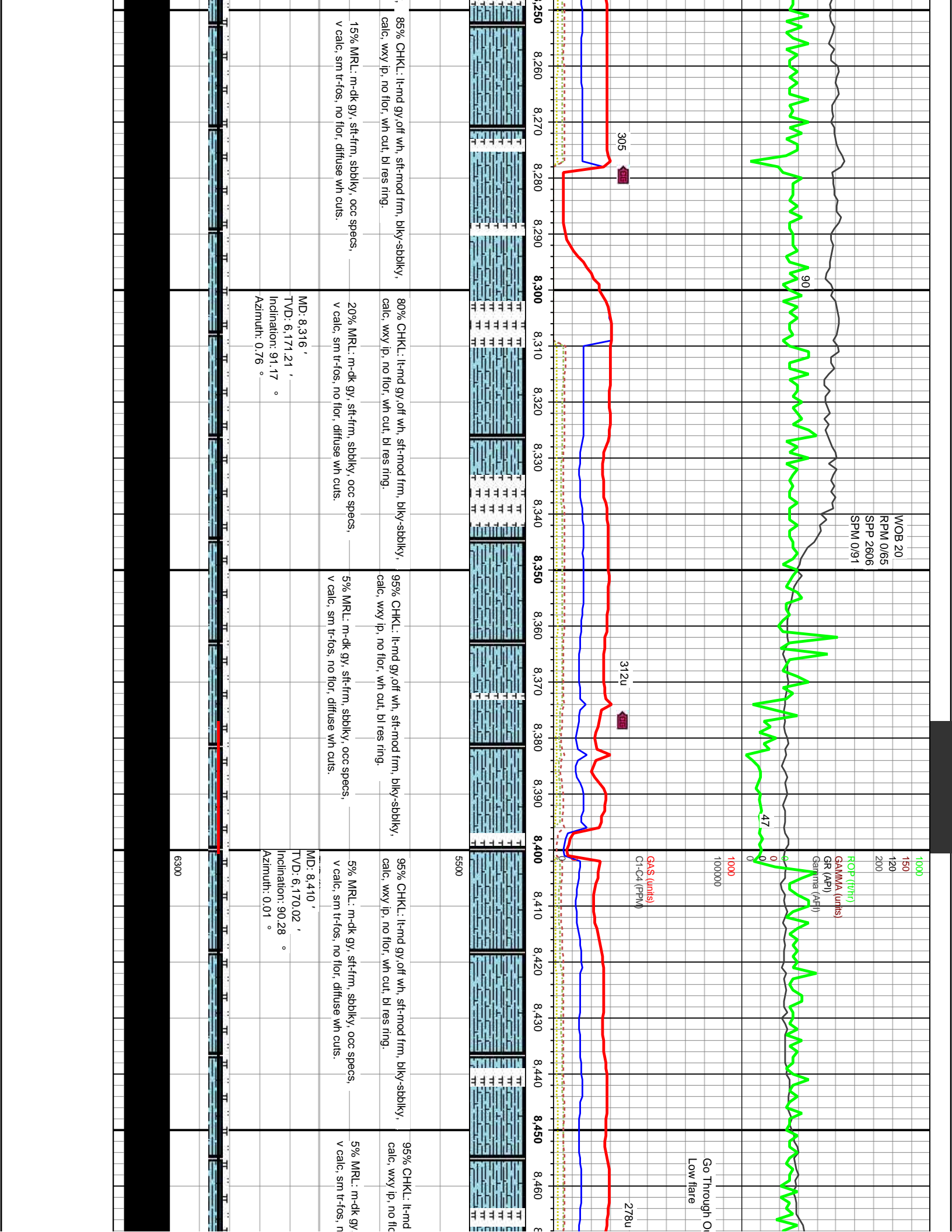
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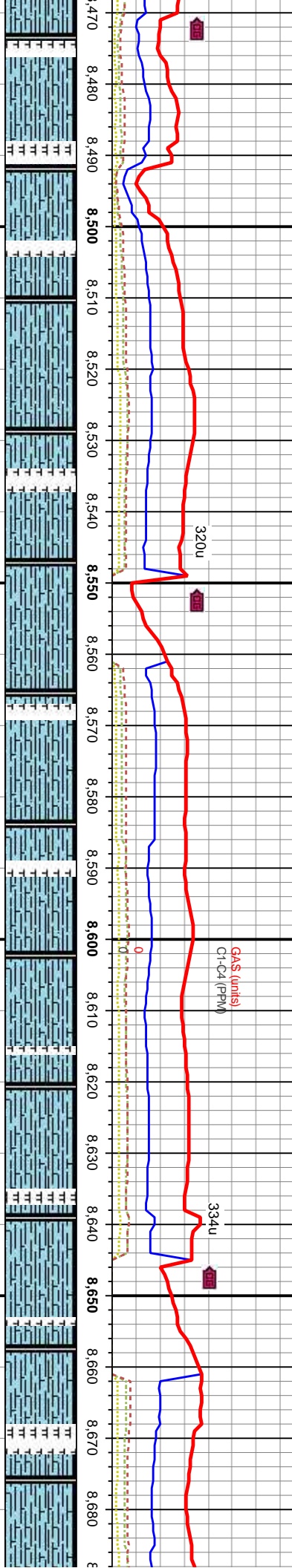
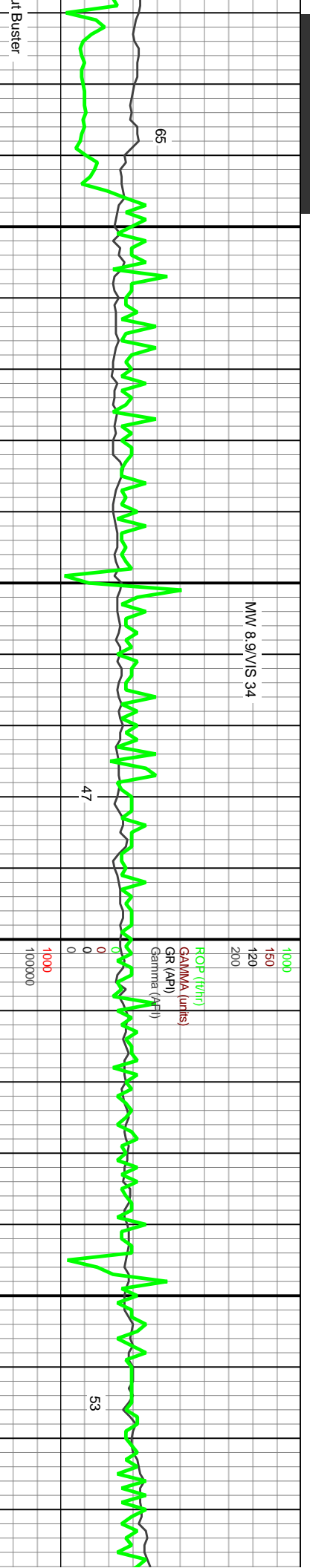
5500







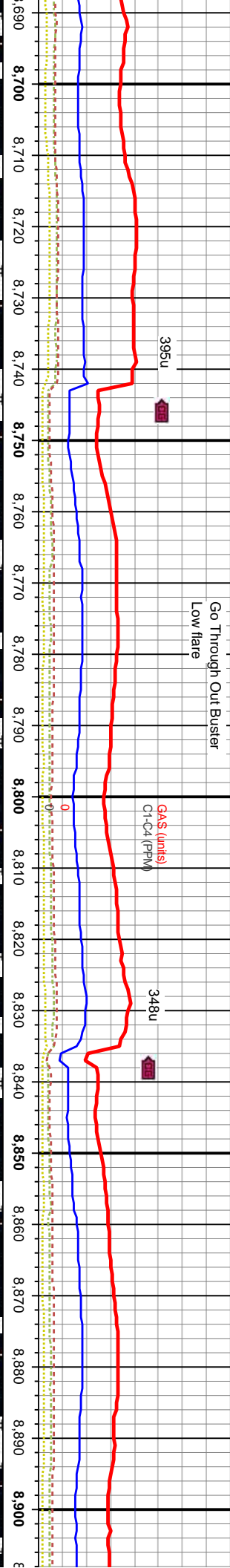
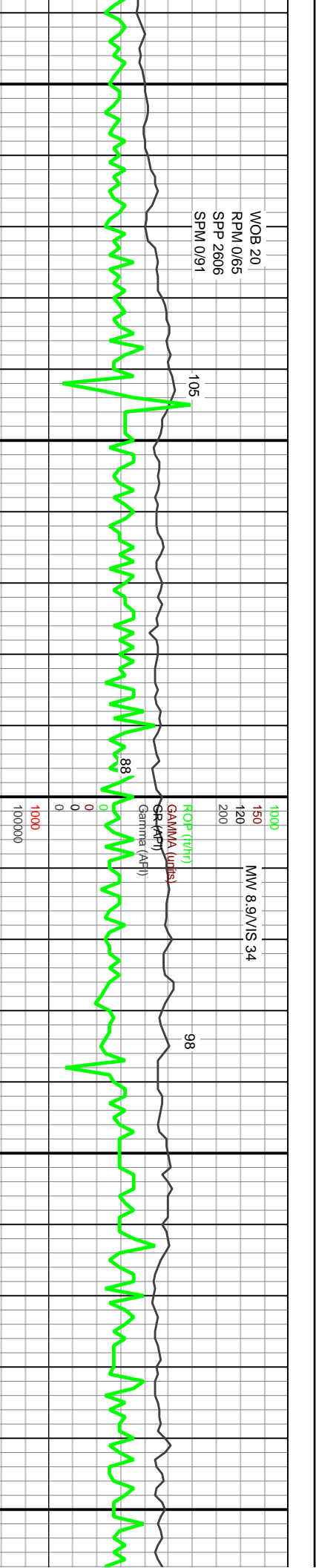




Depth (ft)	95% CHKL: It-md gy, of wh, sft-mod frm, blk-y-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	5% MRL: m-dk gy, sft-frm, sbbkly, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.	MD: 8,505'	TVD: 6,170.56'	Inclination: 89.07°	Azimuth: 359.6°
8470						
8480						
8490						
8500						
8510						
8520						
8530						
8540						
8550						
8560						
8570						
8580						
8590						
8600						
8610						
8620						
8630						
8640						
8650						
8660						
8670						
8680						

Depth (ft)	85% CHKL: It-md gy, of wh, sft-mod frm, blk-y-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	15% MRL: m-dk gy, sft-frm, sbbkly, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.	MD: 8,600'	TVD: 6,171.58'	Inclination: 89.69°	Azimuth: 0.3°
5500						
6300						

MOB 20
RPM 0/65
SPP 2606
SPM 0/91



Depth (ft)	Log Description	Notes
8690 - 8700	50% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8700 - 8710	50% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8710 - 8720	50% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8720 - 8730	50% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8730 - 8740	50% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8740 - 8750	50% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8750 - 8760	60% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8760 - 8770	60% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8770 - 8780	60% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8780 - 8790	60% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8790 - 8800	60% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8800 - 8810	60% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8810 - 8820	60% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8820 - 8830	60% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8830 - 8840	60% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8840 - 8850	60% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8850 - 8860	60% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8860 - 8870	60% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8870 - 8880	60% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8880 - 8890	60% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	
8890 - 8900	60% CHKL: lt-mnd gy, off wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.	

Parameter	Value
MD	8,695'
TVD	6,172.23'
Inclination	89.53°
Azimuth	359.32°
MD	8,790'
TVD	6,172.54'
Inclination	90.09°
Azimuth	359.58°
MD	8,885'
TVD	6,173.03'
Inclination	89.32°
Azimuth	357.66°

MOB 20
RPM 0/65
SPP 2385
SPM 0/91

MW 8.9/VIS 34

ROP (ft/hr)
GAMMA (units)
GAS (units)
C1-C4 (PPM)



91
96
84
102

Go Through Gas Buster
Low flare

368u
360u

910 8920 8930 8940 8950 8960 8970 8980 8990 9000 9010 9020 9030 9040 9050 9060 9070 9080 9090 9100 9110 9120

KL: lt-md gy, off wh, stf-mod frm, blkly-sbbkly, v ip, no flor, wh cut, bl res ring.
RL: m-dk gy, stf-frm, sbbkly, occ specs, sm tr-fos, no flor, diffuse wh cuts.

60% CHKL: lt-md gy, off wh, stf-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.
40% MRL: m-dk gy, stf-frm, sbbkly, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

60% CHKL: lt-md gy, off wh, stf-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.
40% MRL: m-dk gy, stf-frm, sbbkly, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

50% CHKL: lt-md gy, off wh, stf-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.
50% MRL: m-dk gy, stf-frm, sbbkly, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

80% MRL: m-dk gy, stf-frm, sbbkly, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.
20% CHKL: lt-dk gy, off wh, stf-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.

MD: 8.980 '
TVD: 6,173.75 '
Inclination: 89.82 °
Azimuth: 356.93 °

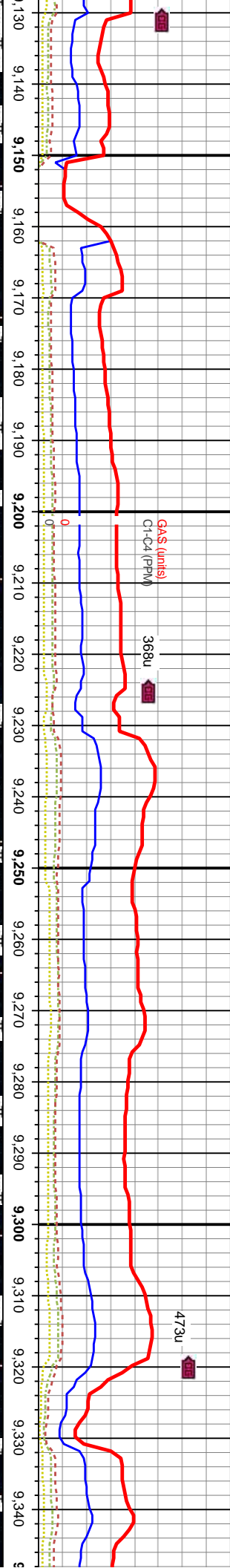
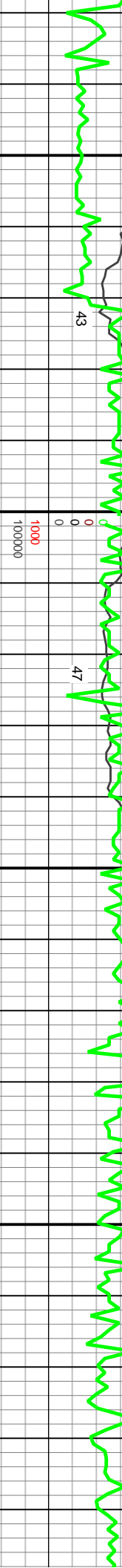
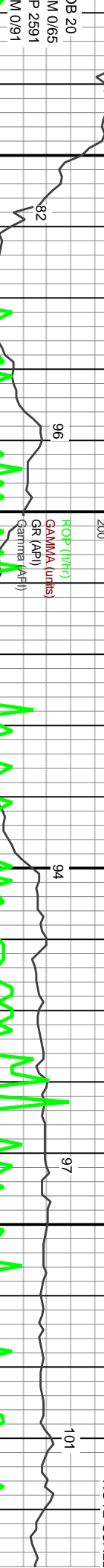
MD: 9.075 '
TVD: 6,173.43 '
Inclination: 90.56 °
Azimuth: 358.55 °

5500

6300

TVD (ft)

174
147
82
43
96
1000
150
120
200
ROP (ft/hr)
GAMMA (units)
GR (API)
Gamma (API)
368u
473u
101
NOTE SCALE



mod frm, blkly-sbbkly, res ring.
 60% CHKL: lt-dk gy, oft wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.
 40% MRL: m-dk gy, sft-frm, sbbkly, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.
 90% CHKL: lt-md gy, oft wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.
 10% MRL: m-dk gy, sft-frm, sbbkly, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.
 70% CHKL: lt-md gy, oft wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.
 30% MRL: m-dk gy, sft-frm, sbbkly, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.
 70% CHKL: lt-md gy, oft wh, sft-mod frm, blkly-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.
 30% MRL: m-dk gy, sft-frm, sbbkly, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

MD: 9,170 '
 TVD: 6,173.27 '
 Inclination: 89.63 °
 Azimuth: 1.32 °

MD: 9,264 '
 TVD: 6,174.16 '
 Inclination: 89.29 °
 Azimuth: 1.54 °

5500
 6300

MMW 8.9M/S 36

150

CHANGE GAMMA

Gamma (API) 101

69

59

52

69

99

47

1000

150

120

150

ROP (ft/hr)

GAMMA (API)

GR (API)

377u

322u

WOB 20

RPM 0/70

SPP 2804

SPM 0/91

MD: 9.359'

TVD: 6.174.26'

Inclination: 90.59°

Azimuth: 1.81°

MW

6300

5500

5560

5500

5560

5500

5560

5500

5560

5500

5560

5500

5560

5500

5560

5500

5560

5500

5560

5500

5560

5500

5560

5500

MD: 9.454'

TVD: 6.173.31'

Inclination: 90.56°

Azimuth: 1.15°

MD: 9.549'

TVD: 6.171.84'

Inclination: 91.21°

Azimuth: 1.31°

75% CHKL: lt-md gy, off wh, sft-mod frm, blk-ssbiky, calc, wxy ip, no flor, wh cut, bl res ring.

25% MRL: m-dk gy, sft-frm, sbbiky, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

85% CHKL: lt-md gy, off wh, sft-mod frm, blk-ssbiky, calc, wxy ip, no flor, wh cut, bl res ring.

15% MRL: m-dk gy, sft-frm, sbbiky, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

90% CHKL: lt-md gy, off wh, sft-mod frm, blk-ssbiky, calc, wxy ip, no flor, wh cut, bl res ring.

10% MRL: m-dk gy, sft-frm, sbbiky, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

80% CHKL: lt-md gy, off wh, sft-mod frm, blk-ssbiky, calc, wxy ip, no flor, wh cut, bl res ring.

20% MRL: m-dk gy, sft-frm, sbbiky, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

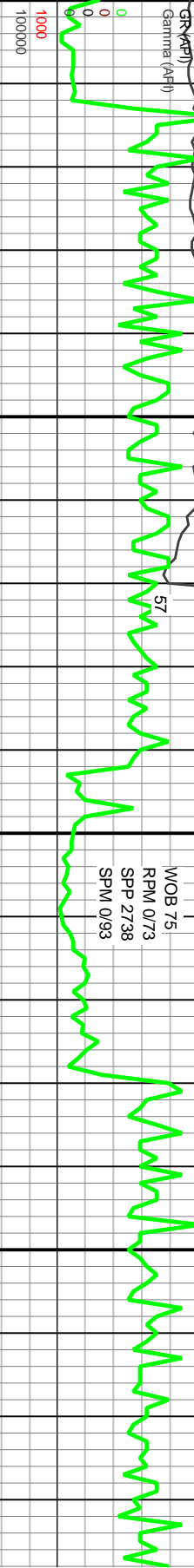
90% CHKL: lt-md gy, off wh, sft-mod frm, blk-ssbiky, calc, wxy ip, no flor, wh cut, bl res ring.

10% MRL: m-dk gy, sft-frm, sbbiky, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

8.9V/S 30

1000
150
120
150

ROP (ft/hr)
GAMMA (API)
GAS (units)
G1-C4 (PPM)



MOB 75
RPM 0/73
SPP 2738
SPM 0/93

302u

417u

9570 9580 9590 9600 9610 9620 9630 9640 9650 9660 9670 9680 9690 9700 9710 9720 9730 9740 9750 9760 9770 9780



5500

v-off wh, sft-nod frm, blk-y-sbbkly,
wh cut, bl res ring.
sft-frm, sbbkly, occ specs,
p flor, diffuse wh cuts.

85% CHKL: lt-md gy, off wh, sft-mod frm, blk-y-sbbkly,
calc, wxy ip, no flor, wh cut, bl res ring.
15% MRSL: m-dk gy, sft-frm, sbbkly, occ specs,
v calc, sm tr-fos, no flor, diffuse wh cuts.
TVD (ft)

MD: 9,645 '
TVD: 6,169.33 '
Inclination: 91.79 °
Azimuth: 2.57 °

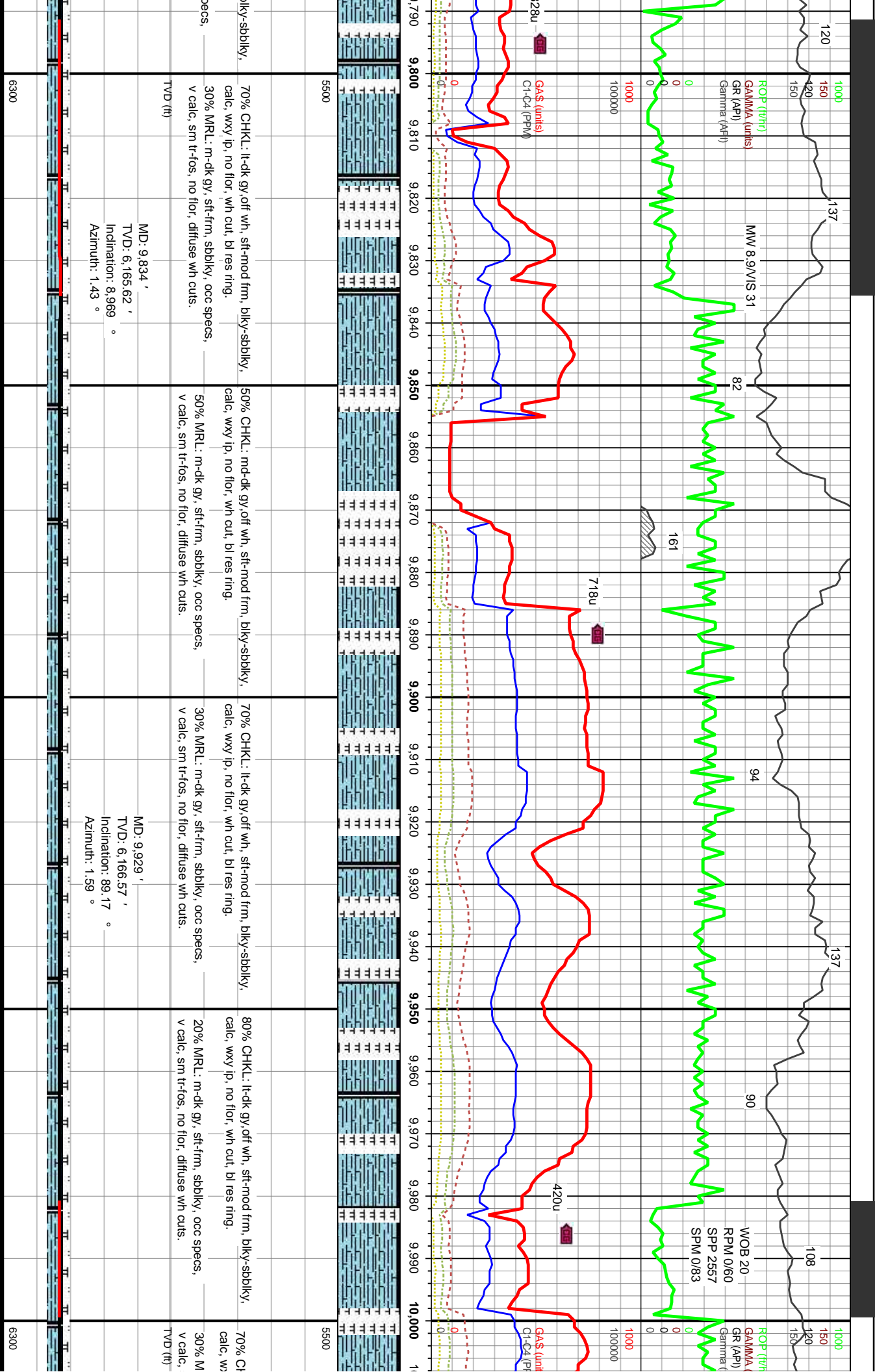
90% CHKL: lt-md gy, off wh, sft-mod frm, blk-y-sbbkly,
calc, wxy ip, no flor, wh cut, bl res ring.
10% MRSL: m-dk gy, sft-frm, sbbkly, occ specs,
v calc, sm tr-fos, no flor, diffuse wh cuts.

MD: 9,739 '
TVD: 6,166.62 '
Inclination: 91.51 °
Azimuth: 2.25 °

80% CHKL: lt-dk gy, off wh, sft-mod frm, blk-y-sbbkly,
calc, wxy ip, no flor, wh cut, bl res ring.
20% MRSL: m-dk gy, sft-frm, sbbkly, occ specs,
v calc, sm tr-fos, no flor, diffuse wh cuts.

70% CHKL: lt-dk gy, off wh, sft-nod frm, t
calc, wxy ip, no flor, wh cut, bl res ring.
30% MRSL: m-dk gy, sft-frm, sbbkly, occ sp
v calc, sm tr-fos, no flor, diffuse wh cuts.

6300



790 9800 9810 9820 9830 9840 9850 9860 9870 9880 9890 9900 9910 9920 9930 9940 9950 9960 9970 9980 9990 10,000

5500 5500

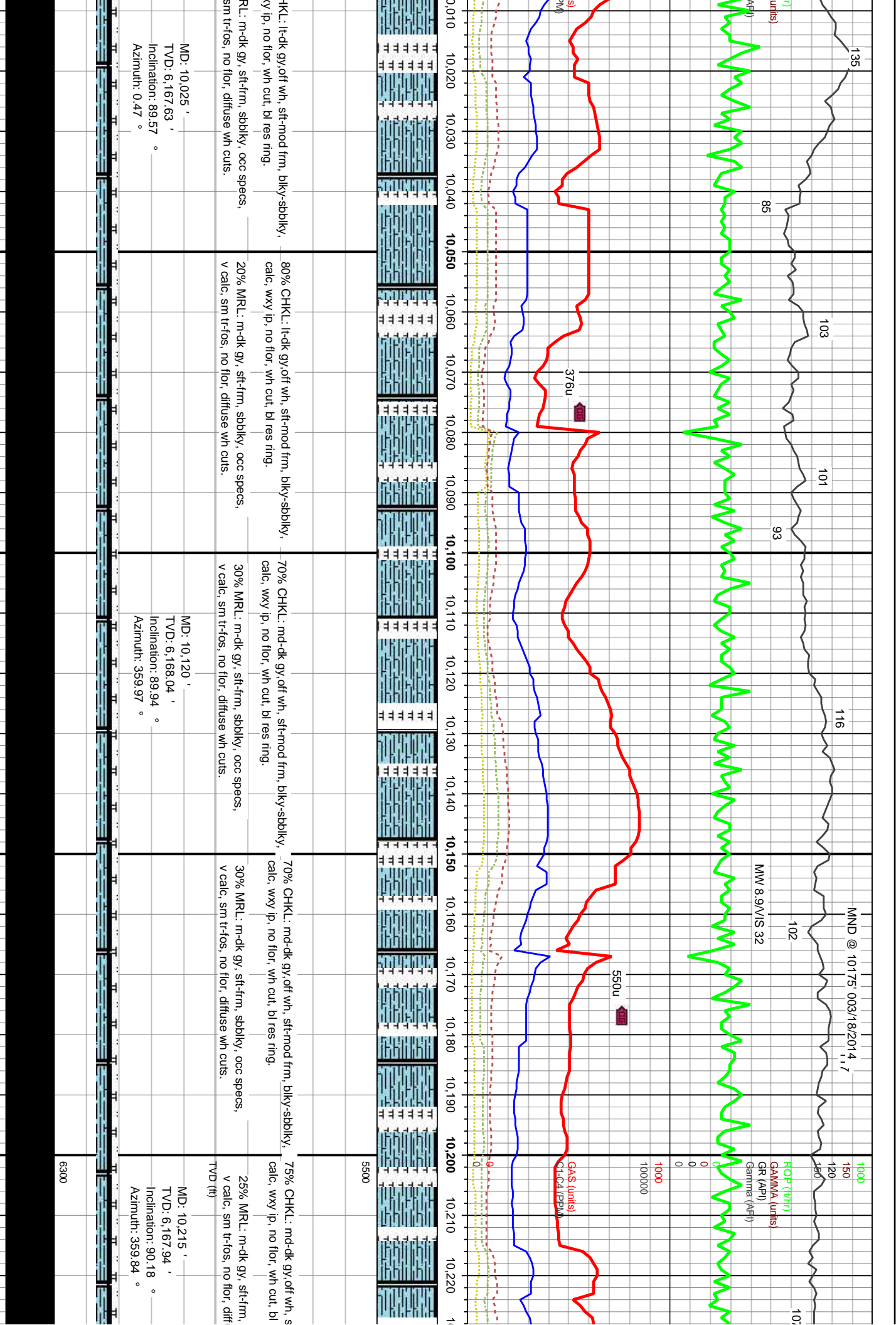
6300 6300

120 137 137 161 718u 94 137 90 108 1000 150 120 150

ROP (ft/hr) GAMMA (units) GR (API) G1-C4 (PPM) SPP (0/83)

MD: 9.834' TVD: 6,165.62' Inclination: 8.969° Azimuth: 1.43°

MD: 9.929' TVD: 6,166.57' Inclination: 89.17° Azimuth: 1.59°



1000
 150
 120
 150
 150
 0
 0
 0
 1000
 100000

ROP (ft/hr)
 GAMMA (units)
 GR (API)
 Gamma (API)

MND @ 10175: 003/18/2014 11:17
 MMW 8.9V/S 32

135
 85
 103
 101
 93
 116
 102

MD: 10,025 '
 TVD: 6,167.63 '
 Inclination: 89.57 °
 Azimuth: 0.47 °

MD: 10,120 '
 TVD: 6,168.04 '
 Inclination: 89.94 °
 Azimuth: 359.97 °

MD: 10,215 '
 TVD: 6,167.94 '
 Inclination: 90.18 °
 Azimuth: 359.84 °

CHKL: lt-dk gy/off wh, stf-mod frm, biky-sbbiky,
 v calc, sm tr-fos, no flor, diffuse wh cuts.

80% CHKL: lt-dk gy/off wh, stf-mod frm, biky-sbbiky,
 calc, wxy ip, no flor, wh cut, bl res ring.

70% CHKL: md-dk gy/off wh, stf-mod frm, biky-sbbiky,
 calc, wxy ip, no flor, wh cut, bl res ring.

70% CHKL: md-dk gy/off wh, stf-mod frm, biky-sbbiky,
 calc, wxy ip, no flor, wh cut, bl res ring.

75% CHKL: md-dk gy/off wh, stf-mod frm, biky-sbbiky,
 calc, wxy ip, no flor, wh cut, bl res ring.

20% MRL: m-dk gy, stf-frm, sbbiky, occ specs,
 v calc, sm tr-fos, no flor, diffuse wh cuts.

30% MRL: m-dk gy, stf-frm, sbbiky, occ specs,
 v calc, sm tr-fos, no flor, diffuse wh cuts.

30% MRL: m-dk gy, stf-frm, sbbiky, occ specs,
 v calc, sm tr-fos, no flor, diffuse wh cuts.

25% MRL: m-dk gy, stf-frm,
 v calc, sm tr-fos, no flor, diff

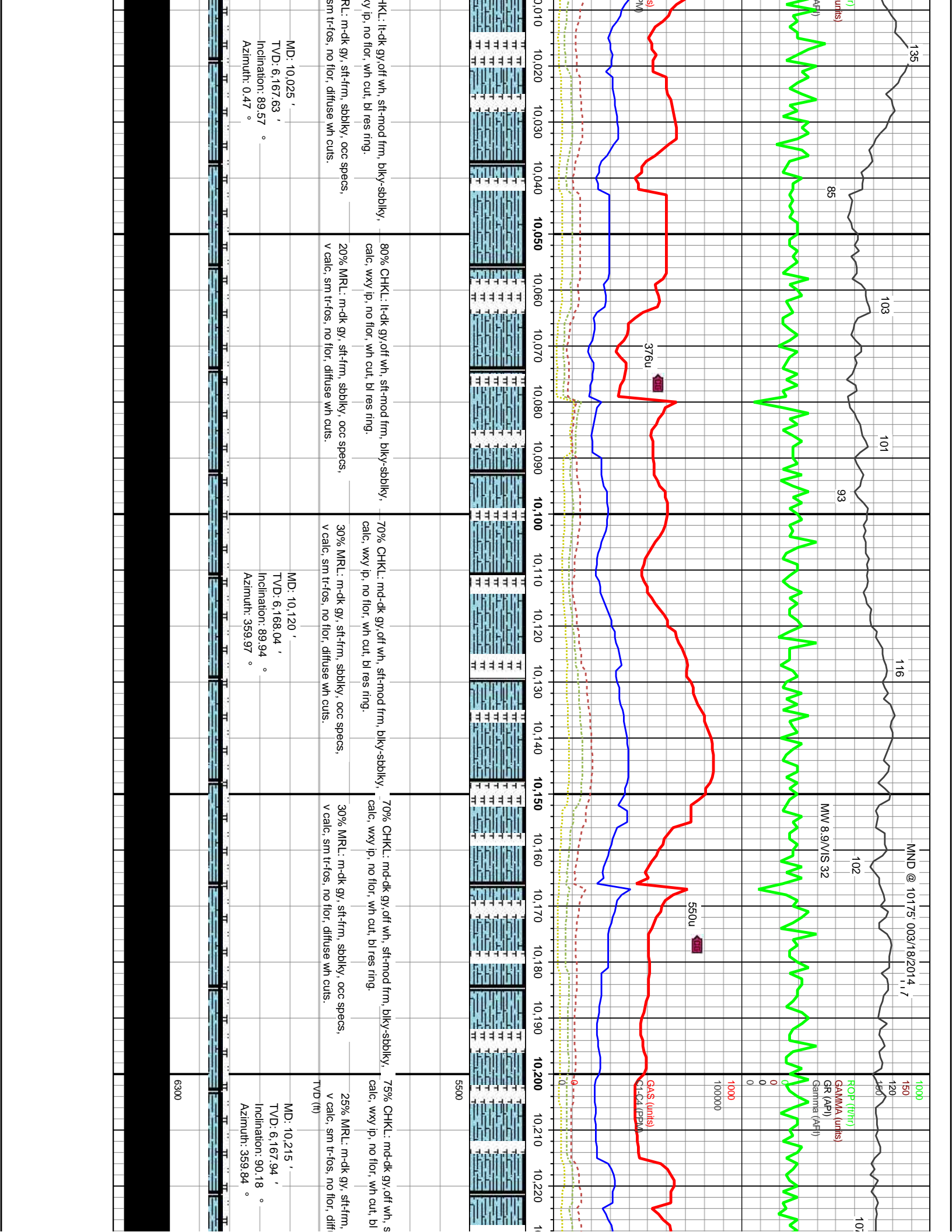
376u

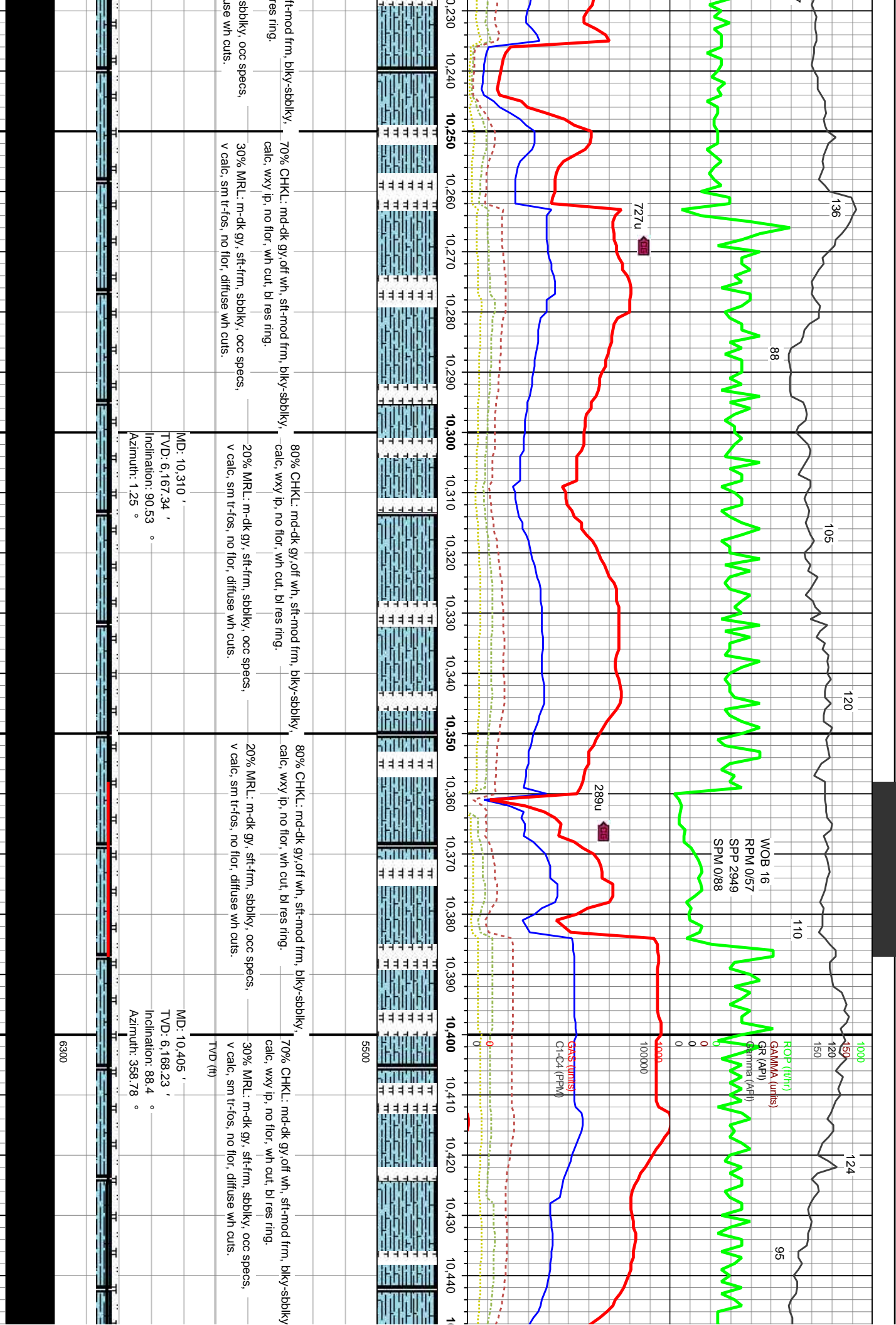
550u

GAS (units)
11.04 (ppm)

6300

5500





70% CHKL: md-dk gy, off wh, sft-mod frm, biky-sbbiky, calc, wxy ip, no flor, wh cut, bl res ring.
 30% MRL: m-dk gy, sft-frm, sbbiky, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

80% CHKL: md-dk gy, off wh, sft-mod frm, biky-sbbiky, calc, wxy ip, no flor, wh cut, bl res ring.
 20% MRL: m-dk gy, sft-frm, sbbiky, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

80% CHKL: md-dk gy, off wh, sft-mod frm, biky-sbbiky, calc, wxy ip, no flor, wh cut, bl res ring.
 20% MRL: m-dk gy, sft-frm, sbbiky, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

70% CHKL: md-dk gy, off wh, sft-mod frm, biky-sbbiky, calc, wxy ip, no flor, wh cut, bl res ring.
 30% MRL: m-dk gy, sft-frm, sbbiky, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

MD: 10,310 '
 TVD: 6,167.34 '
 Inclination: 90.53 °
 Azimuth: 1.25 °

MD: 10,405 '
 TVD: 6,168.23 '
 Inclination: 88.4 °
 Azimuth: 358.78 °

6300

5500

136

88

105

120

727u

289u

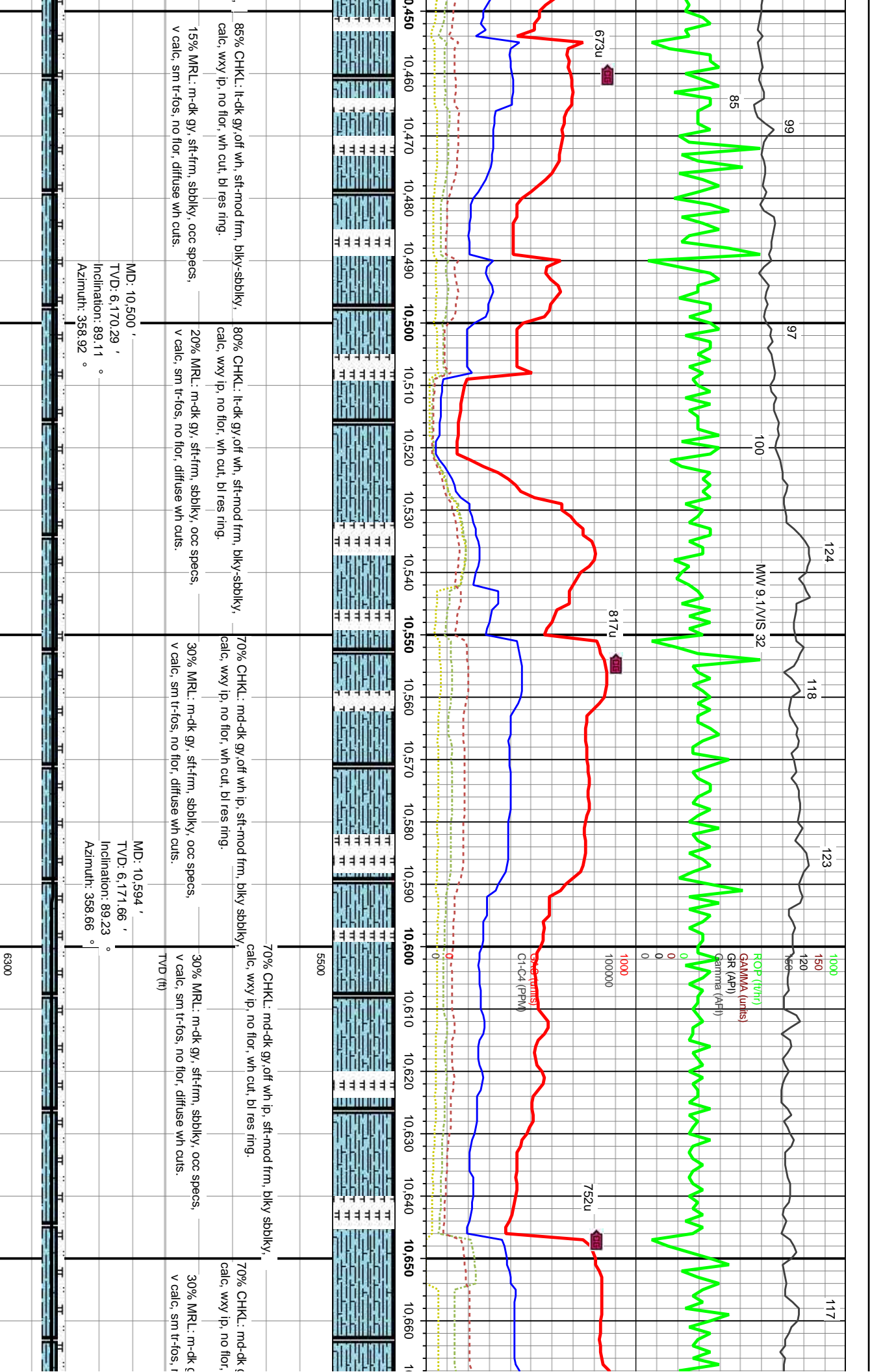
WOB 16
 RPM 0/57
 SPP 2949
 SPM 0/88

110

124

95

ROP (ft/hr)
 GAMMA (API)
 GR (API)
 Gamma (API)
 SPP (2949)
 SPM (0/88)
 WOB (16)
 RPM (0/57)
 G1-C4 (PPM)



85% CHKL: lt-dk gy, off wh, sft-mod frm, blk-y-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.

80% CHKL: lt-dk gy, off wh, sft-mod frm, blk-y-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.

70% CHKL: md-dk gy, off wh ip, sft-mod frm, blk-y-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.

70% CHKL: md-dk gy, off wh ip, sft-mod frm, blk-y-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.

70% CHKL: md-dk gy, off wh ip, sft-mod frm, blk-y-sbbkly, calc, wxy ip, no flor, wh cut, bl res ring.

15% MRL: m-dk gy, sft-frm, sbbkly, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

20% MRL: m-dk gy, sft-frm, sbbkly, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

30% MRL: m-dk gy, sft-frm, sbbkly, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

30% MRL: m-dk gy, sft-frm, sbbkly, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

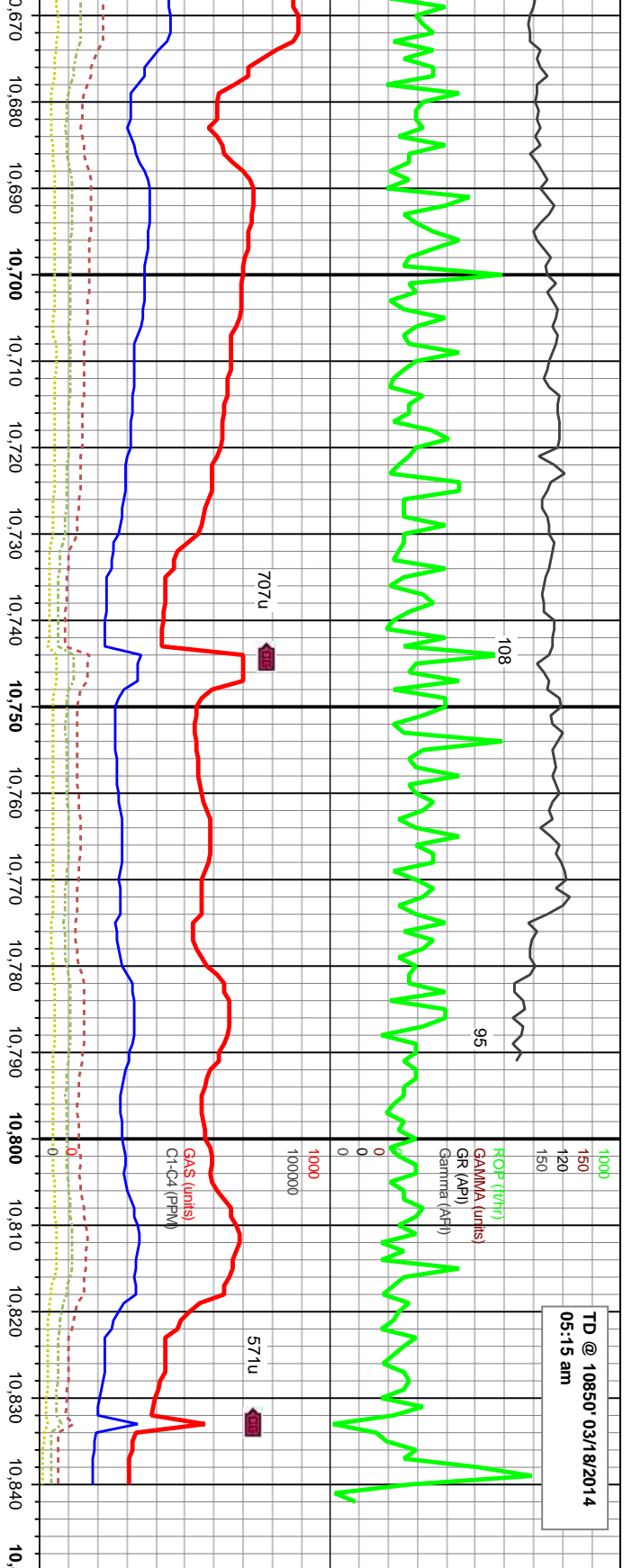
30% MRL: m-dk gy, sft-frm, sbbkly, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

MD: 10,500 '
 TVD: 6,170.29 '
 Inclination: 89.11 °
 Azimuth: 358.92 °

MD: 10,594 '
 TVD: 6,171.66 '
 Inclination: 89.23 °
 Azimuth: 358.66 °

6300

TD @ 10850' 03/18/2014
05:15 am



70% CHKL: md-dk gy, off wh ip, sft-mod frm, blkly sbblky, calc, wxy ip, no flor, wh cut, bl res ring.

30% MRL: m-dk gy, sft-frm, sbblky, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

MD: 10,689' TVD: 6,171.86' Inclination: 90.53° Azimuth: 359.46°

70% CHKL: md-dk gy, off wh ip, sft-mod frm, blkly sbblky, calc, wxy ip, no flor, wh cut, bl res ring.

30% MRL: m-dk gy, sft-frm, sbblky, occ specs, v calc, sm tr-fos, no flor, diffuse wh cuts.

MD: 10,788' TVD: 6,171.05' Inclination: 90.4° Azimuth: 358.94°

Bit Projection

MD: 10,840' TVD: 6,170.68' Inclination: 90.5° Azimuth: 359°

