RESERVOIR GROUP

Scale: 5" / 100'
Measured Depth Log

Well Name	BEF West 16		
Location	Section 2, Township 1S, Range 66W		
State	Colorado	**County**	Adams
Country	USA	**Rig Number**	True 33
API Number	05-001-10222	**AFE #**	10222
Geographic Region	Rockies	**Field**	Wattenberg
Spud Date	12/25/2018	**Drilling Completed**	1/20/2019
Surface Coordinates	2136' FNL & 321' FEL, Sec. 2, T1S, R66W Latitude: 39.99467, Longitude: -104.7347		
Bottom Hole Coordinates	1605' FNL & 460' FWL, Sec. 2, T1S, R66W		
Ground Elevation	5,049'	**K.B. Elevation**	5,076'
Logged Interval	7,300' **To** 12,197'	**Total Depth**	12,197'
Formation	Niobrara B		
Type of Drilling Fluid	Water Based Mud		

Operator

Company Petro Operating Company, LLC

Address 9033 East Easter Place, Suite 112
Centennial, CO 80112-2105

Petro Operatin
Company, LLC

Geologist

Name Michael Domenick

Company Petro Operating Company, LLC

Address 9033 East Easter Place, Suite 112
Centennial, CO 80112-2105

Petro Operatin
Company, LLC

Other

Loggers: Byron Pitulski/Greg Diefenbach

Services Provided: 2 Man Logging, Geosteering

Equipment: ML-585

Start Date 01/17/2018

Release Date: 01/20/2019

Job #: 1854RK1812

Zone Color Coding

Oil	Condensate	Gas
Note	Core	Pressure
Error	Water	Seal

Rock Types

UNKNOWN	DOLOMITE	SHALE GRAY	TILL
ANHYDRITE	CHERT	SHALE COLORED	BENTONITE
GYPSUM	COAL	SILTSTONE	TUFF
SALT	MARLSTONE	SANDSTONE	IGNEOUS
SIDERITE or LIMONITE	CHALK	CONGLOMERATE	METAMORPHIC
LIMESTONE	SHALE	BRECCIA	CEMENT

Acc

Fossils

F FOSSIL		– ARGILLACEOU
GASTROPOD		ARGILLITE GR
ALGAE	OOLITE	B BENTONITE
AMPHIPORA	OSTRACOD	BITUMENOUS
BELEMNITE	PELECYPOD	BRECCIA FRA
BIOCLASTIC	PELLET	CALCAREOUS
BRACHOIPOD	PISOLITE	CARBONACEO
BRYOZOA	PLANT REMAINS	CHTDK
CEPHALOPOD	PLANT SPORES	CHTLT
CORAL	SCAPHOPOD	COAL - THIN BE
CRINOID	STROMATOPOROID	DOLOMITIC
ECHINOID		FELDSPAR
FISH		FERRUGINOUS
FORAMINIFERA	ANHYDRITIC	FERRUGINOUS

Minerals

Other

Oil Show

D DEAD

EVEN

QUESTIONABLE

SPOTTED STAINING

Porosity

E EARTHY

FENESTRAL

F FRACTURE

INTERCRYSTALLINE

INTEROOLITIC

MOLDIC

O ORGANIC

P PINPOINT

VUGGY

Engineering

BIT

CASING

CONNECTION (LEFT)

CONNECTION (RIGHT)

CONNECTION GAS

CORE - LOST

CORE - RECOVERED

DST INTERVAL

FAULT

essories

S
AIN
SUBSTANCE
GMENTS
US FLAKES
EDS
S PELLET
S

GLAUCONITE
GYPSIFEROUS
HEAVY MINERAL
KAOLIN
MARLSTONE
MINERAL CRYSTALS
NODULES
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

r Symbols

FORMATION TOP
AS SHOW
EPTH MN DEPTH
ORMAL FAULT
L SHOW
VERTURNED STRATA
EVERSE FAULT
DEWALL CORE (LEFT)
DEWALL CORE (RIGHT)
DE
SURVEY
TRIP GAS
RELINE TESTED - LEFT
RELINE TESTED - RT

Rounding

ANGULAR
ROUNDED
SUBANG
SUBRND

Textures

BOUNDSTONE
CHALKY
CRYPTOXLN
EARTHY
FINELYXLN
GRAINSTONE
LITHOGRAPHIC
MICROXLN
MUDSTONE
PACKSTONE
WACKESTONE

Sorting

MODERATE
POOR
WELL

ROP
ROP
GAMMA

Bit #: 2
Type: Z519S
Size: 8.5
Depth In: 1,555'
Depth Out: 12,197'
Hours: 48 hrs
Avg Ft/Hr: 222 '/hr
Jets: 3x12, 5x13

1000
200
ROP (ft/hr)
GAMMA (API)
0
0

Slide/Rotate

Depth Labels

7,260 7,270 7,280 7,290 **7,300** 7,310 7,320 7,330 7,340 7,350 7,360 7,370 7,380 7,390 **7,400** 7,410 7,420 7,430 7,440 **7,450**

Notes

MD: 7,324'
INC: 44.6°
AZM: 270.5°
TVD: 7,192.92'
VS: -267.95'

MW IN: 9.9+
VIS IN: 42
MW OUT: 10
VIS OUT: 42

Niobrara A
7350'MD/7211'TVD

MD: 7,370'
INC: 48.6°
AZM: 270°
TVD: 7,224.52'
VS: -234.74'

WOB: 22klbs
RPM: 0
SPM: 132
SPP: 2,170psi

MD: 7,418'
INC: 53.6°
AZM: 270.2°
TVD: 7,254.66'
VS: -197.63'

MW IN: 9.9
VIS IN: 42
MW OUT: 10
VIS OUT: 42

Total Gas
GAS
C1
C2
C3
C4
C5

System Calibrated
1% Methane = 100 Units
100% Methane = 10000 Units

1E4 2E6
1,000 2E5
GAS (units) C1-C5 (PPM)
100 2E4
10 2E3

981u

2396u

Well Bore
TVD

Petro Operating Co.
BEF West 16

9 5/8' Surface Casing @ 1,535'

Spud Date: 12/25/2018

2 Man Logging Began 01/17/2019

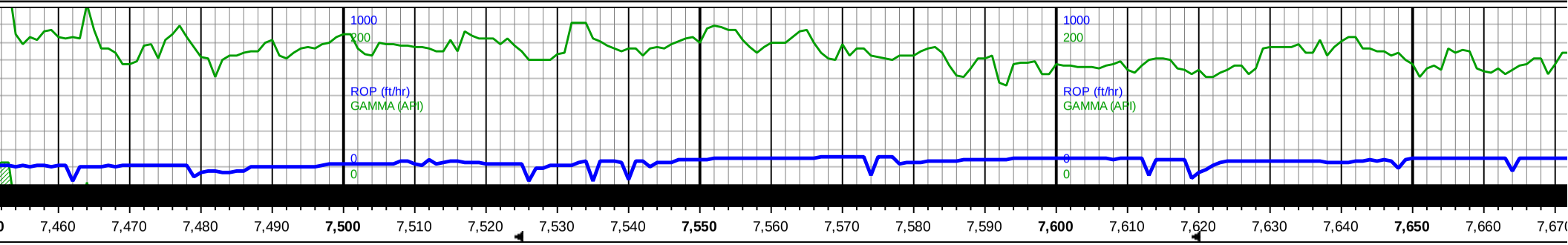
All Depths Correspond to Driller's Pipe Tally

Continued from Vertical Log

7000
TVD (ft)
8000

60% CHK: offwht-lt brn, sft-med frm, blky-sb ang, rthy tex, vugy, com intbd MRLST; 40% MRLST: dk gry-gy, frm-fri, amor, fy lam chk incl, dissm sil, tr forams, v hi calc

Images



MD: 7,464'
INC: 58.5°
AZM: 270°
TVD: 7,280.34'
VS: -159.73'

MW IN: 9.9
VIS IN: 41
MW OUT: 10.1
VIS OUT: 42

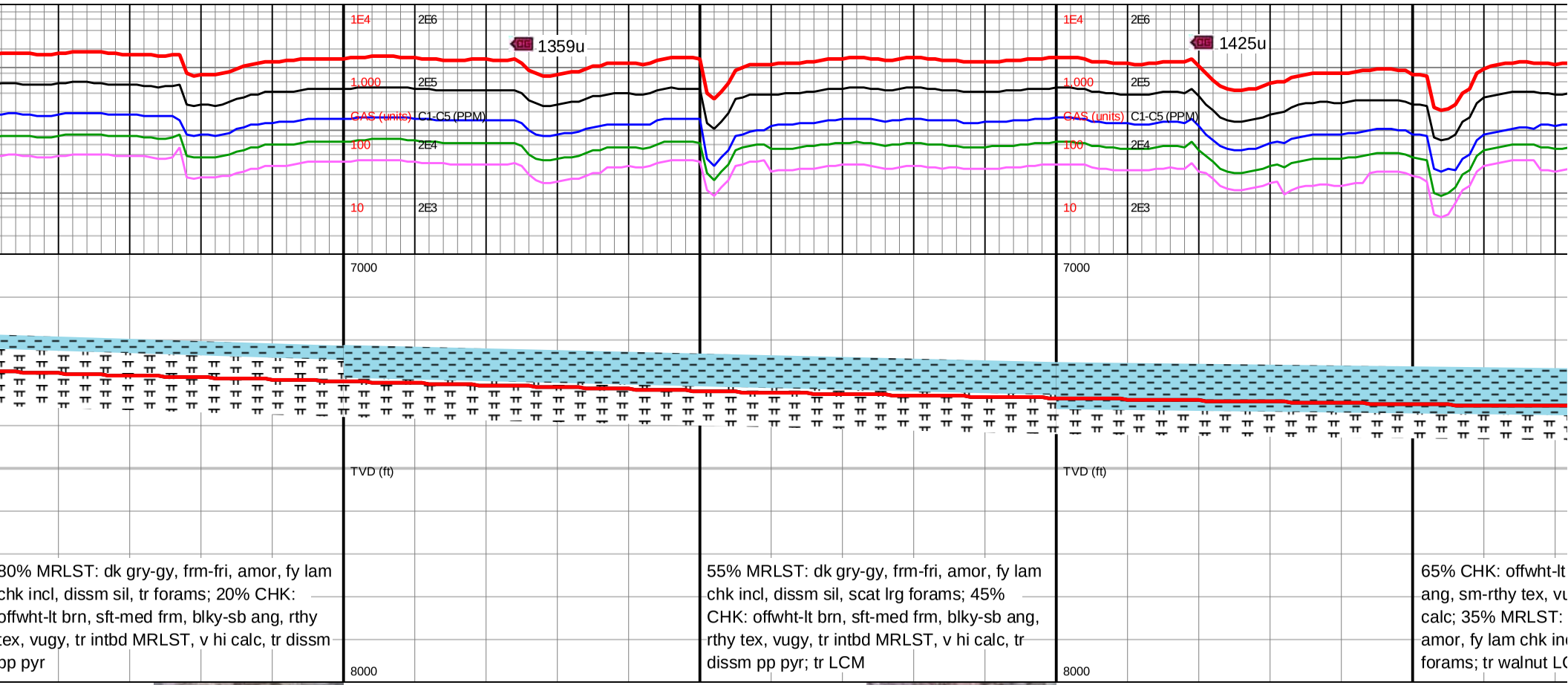
MD: 7,559'
INC: 67.8°
AZM: 272.3°
TVD: 7,323.2'
VS: -75.44'

WOB: 31klbs
RPM: 0
SPM: 143
SPP: 2,600psi

MW IN: 9.9
VIS IN: 41
MW OUT: 10
VIS OUT: 41

MD: 7,654'
INC: 77.5°
AZM: 271.7°
TVD: 7,351.5'
VS: 14.84'

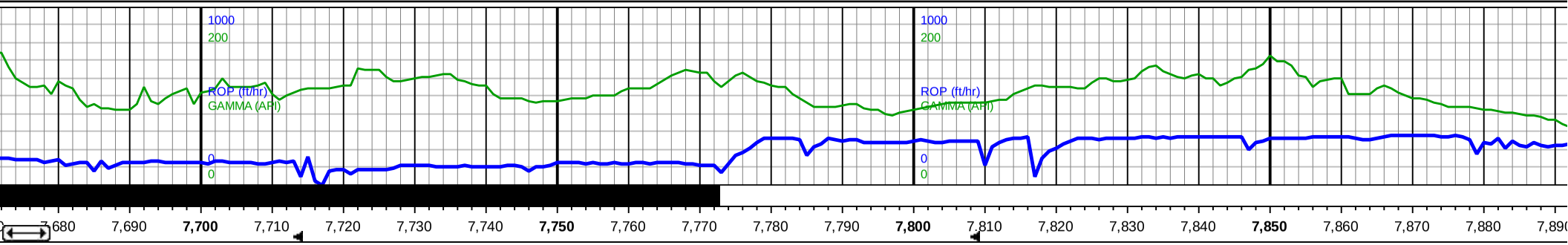
Ni
7674'



80% MRLST: dk gry-gy, frm-fri, amor, fy lam chk incl, dissm sil, tr forams; 20% CHK: offwht-lt brn, sft-med frm, blky-sb ang, rthy tex, vugy, tr intbd MRLST, v hi calc, tr dissm pp pyr

55% MRLST: dk gry-gy, frm-fri, amor, fy lam chk incl, dissm sil, scat lrg forams; 45% CHK: offwht-lt brn, sft-med frm, blky-sb ang, rthy tex, vugy, tr intbd MRLST, v hi calc, tr dissm pp pyr; tr LCM

65% CHK: offwht-lt
ang, sm-rthy tex, vu
calc; 35% MRLST:
amor, fy lam chk in
forams; tr walnut LC



iobrara B
MD/7354'TVD

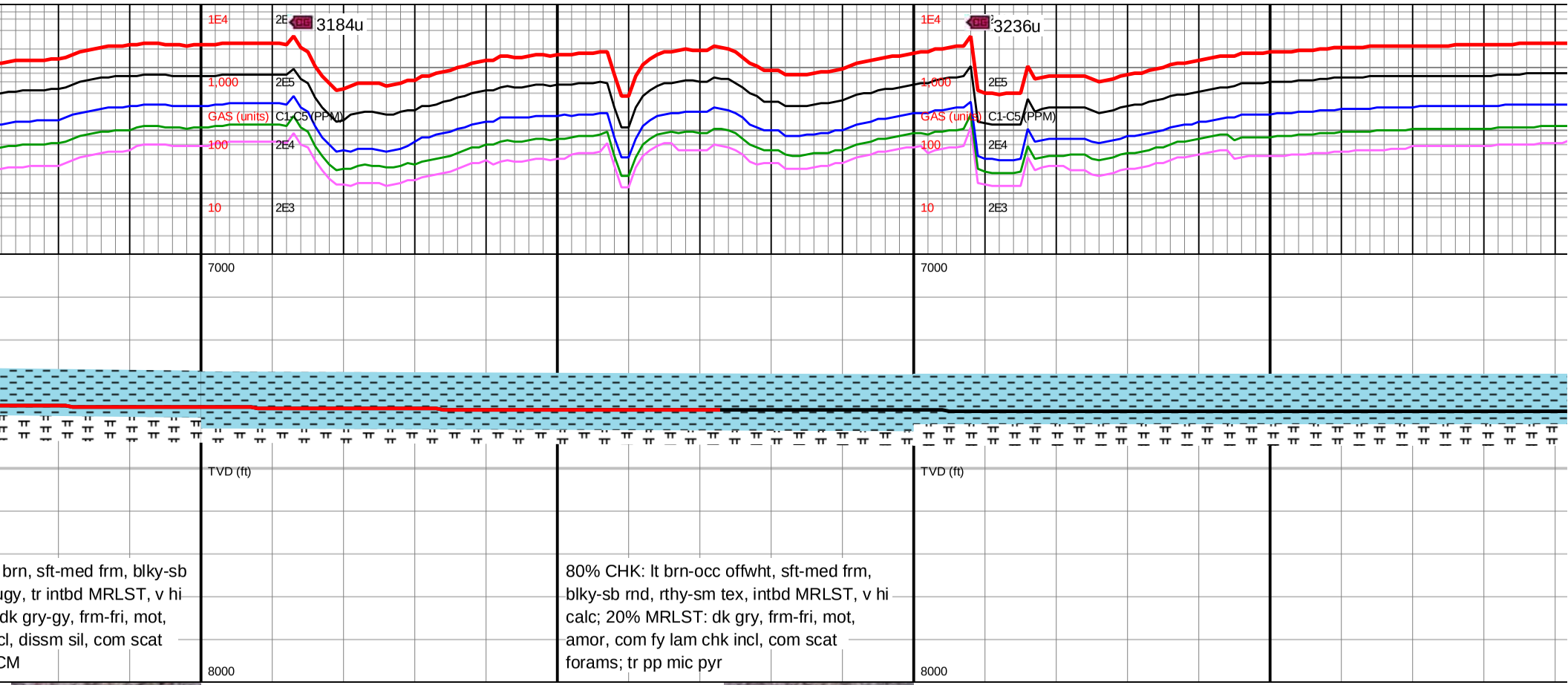
MW IN: 10
VIS IN: 39
MW OUT: 10
VIS OUT: 38

MD: 7,749'
INC: 87.8°
AZM: 268.6°
TVD: 7,363.64'
VS: 108.33'

Land Curve
7,772MD/7,364TVD

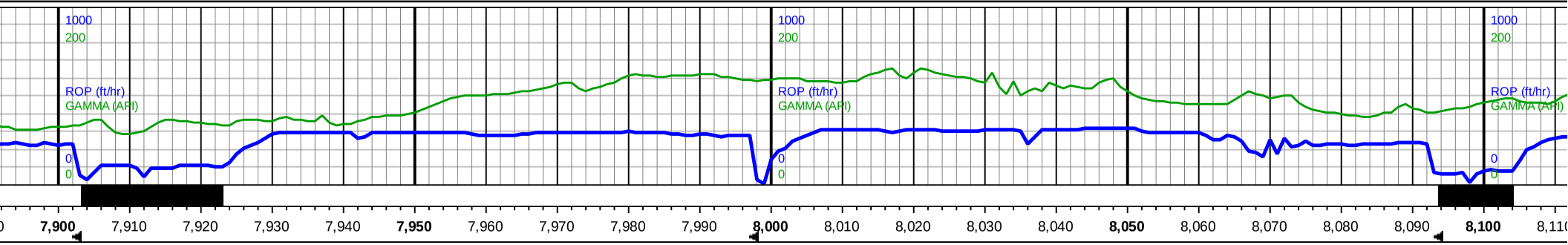
WOB: 27klbs
RPM: 30
SPM: 172
SPP: 3,535psi

MD: 7,843'
INC: 89.4°
AZM: 268.4°
TVD: 7,365.94'
VS: 201.36'



brn, sft-med frm, blky-sb
ugy, tr intbd MRLST, v hi
dk gry-gy, frm-fri, mot,
cl, dissm sil, com scat
CM

80% CHK: lt brn-occ offwht, sft-med frm, blky-sb rnd, rthy-sm tex, intbd MRLST, v hi calc; 20% MRLST: dk gry, frm-fri, mot, amor, com fy lam chk incl, com scat forams; tr pp mic pyr



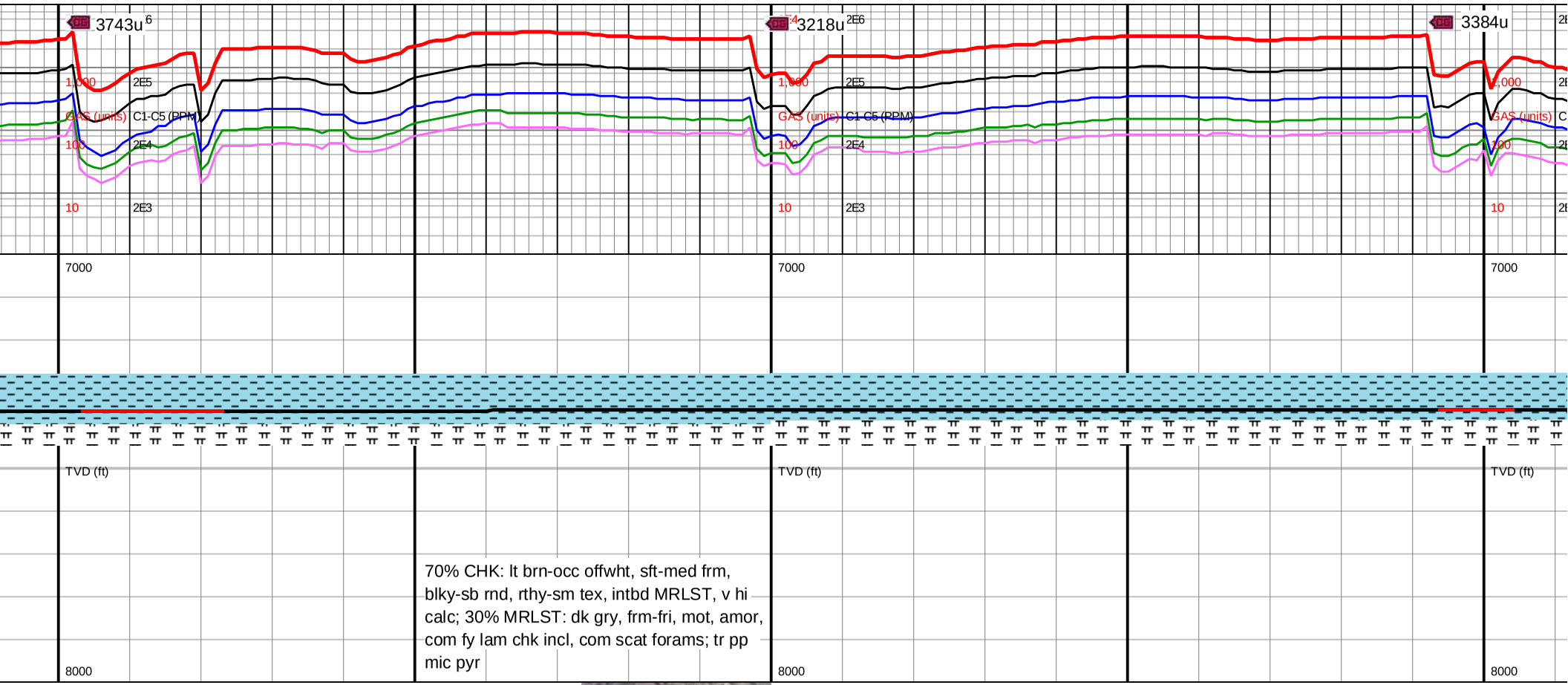
MD: 7,938'
INC: 91.1°
AZM: 269.6°
TVD: 7,365.52'
VS: 295.53'

MW IN: 10
VIS IN: 40
MW OUT: 10
VIS OUT: 39

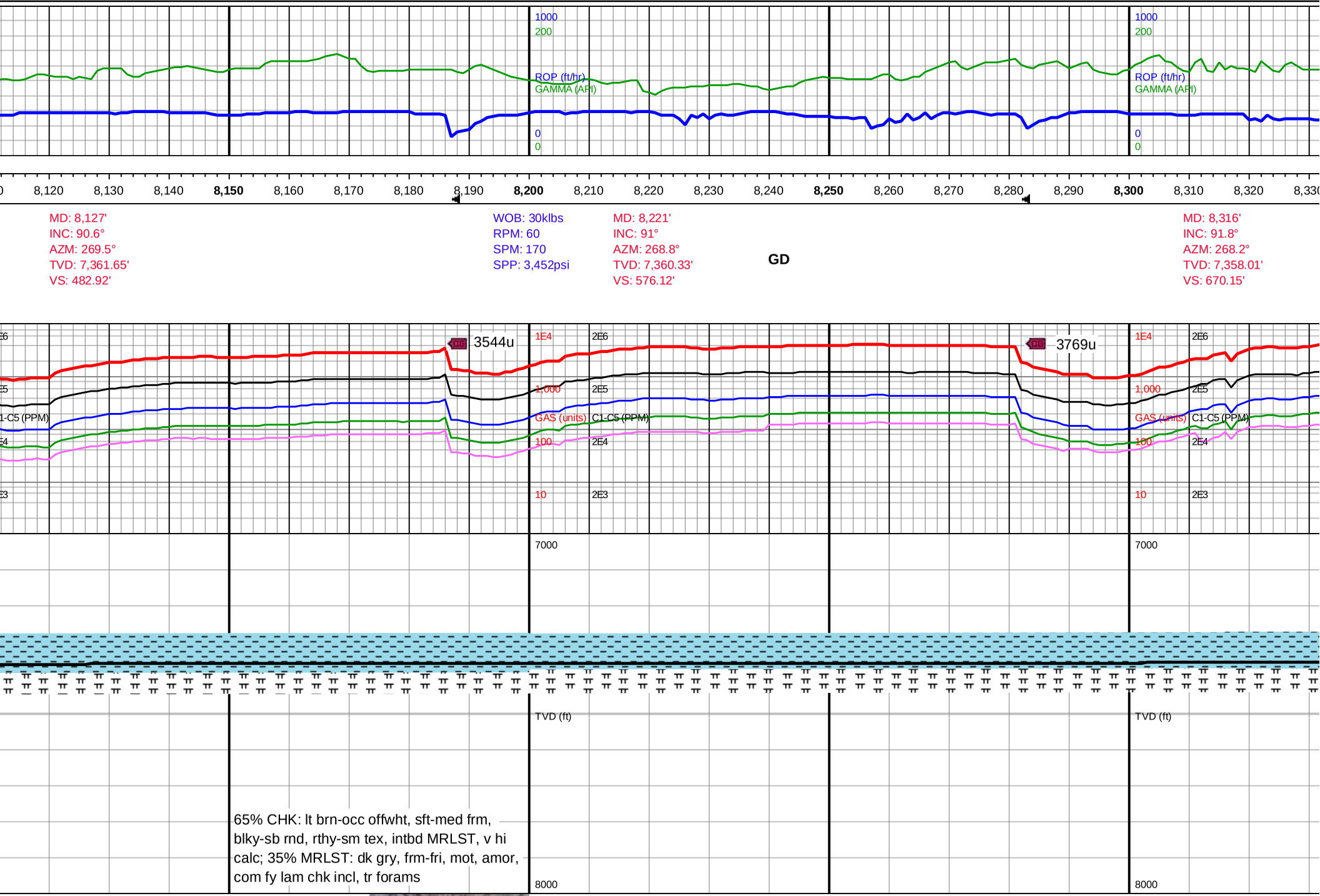
WOB: 25klbs
RPM: 60
SPM: 172
SPP: 3,528psi

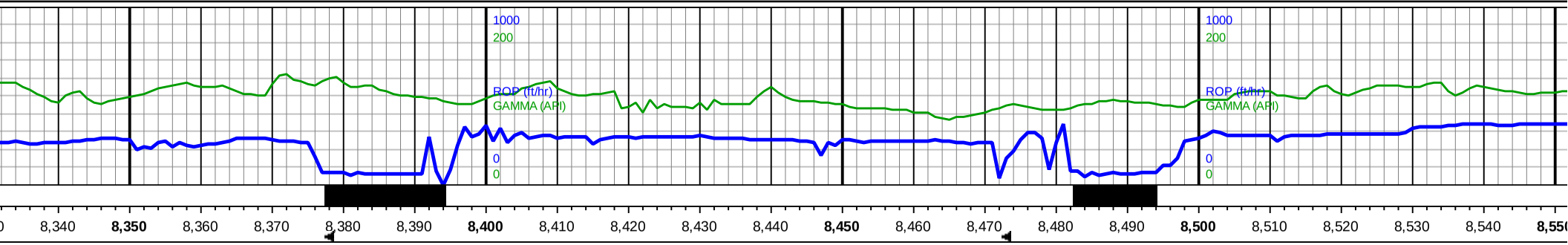
MD: 8,032'
INC: 91.5°
AZM: 268.8°
TVD: 7,363.39'
VS: 388.73'

MW IN: 10
VIS IN: 42
MW OUT: 10
VIS OUT: 41



70% CHK: lt brn-occ offwht, sft-med frm, blky-sb rnd, rthy-sm tex, intbd MRLST, v hi calc; 30% MRLST: dk gry, frm-fri, mot, amor, com fy lam chk incl, com scat forams; tr pp mic pyr


1000
200
ROP (ft/hr)
GAMMA (API)
0
0
8,120
8,130
8,140
8,150
8,160
8,170
8,180
8,190
8,200
8,210
8,220
8,230
8,240
8,250
8,260
8,270
8,280
8,290
8,300
8,310
8,320
MD: 8,127'
INC: 90.6°
AZM: 269.5°
TVD: 7,361.65'
VS: 482.92'
WOB: 30klbs
RPM: 60
SPM: 170
SPP: 3,452psi
MD: 8,221'
INC: 91°
AZM: 268.8°
TVD: 7,360.33'
VS: 576.12'
GD
MD: 8,316'
INC: 91.8°
AZM: 268.2°
TVD: 7,358.01'
VS: 670.15'
3544u
3769u
1E4
2E6
1,000
2E5
GAS (units)
C1-C5 (PPM)
100
2E4
10
2E3
7000
TVD (ft)
8000
65% CHK: lt brn-occ offwht, sft-med frm, blky-sb rnd, rthy-sm tex, intbd MRLST, v hi calc; 35% MRLST: dk gry, frm-fri, mot, amor, com fy lam chk incl, tr forams



MW IN: 10
VIS IN: 43
MW OUT: 10
VIS OUT: 43

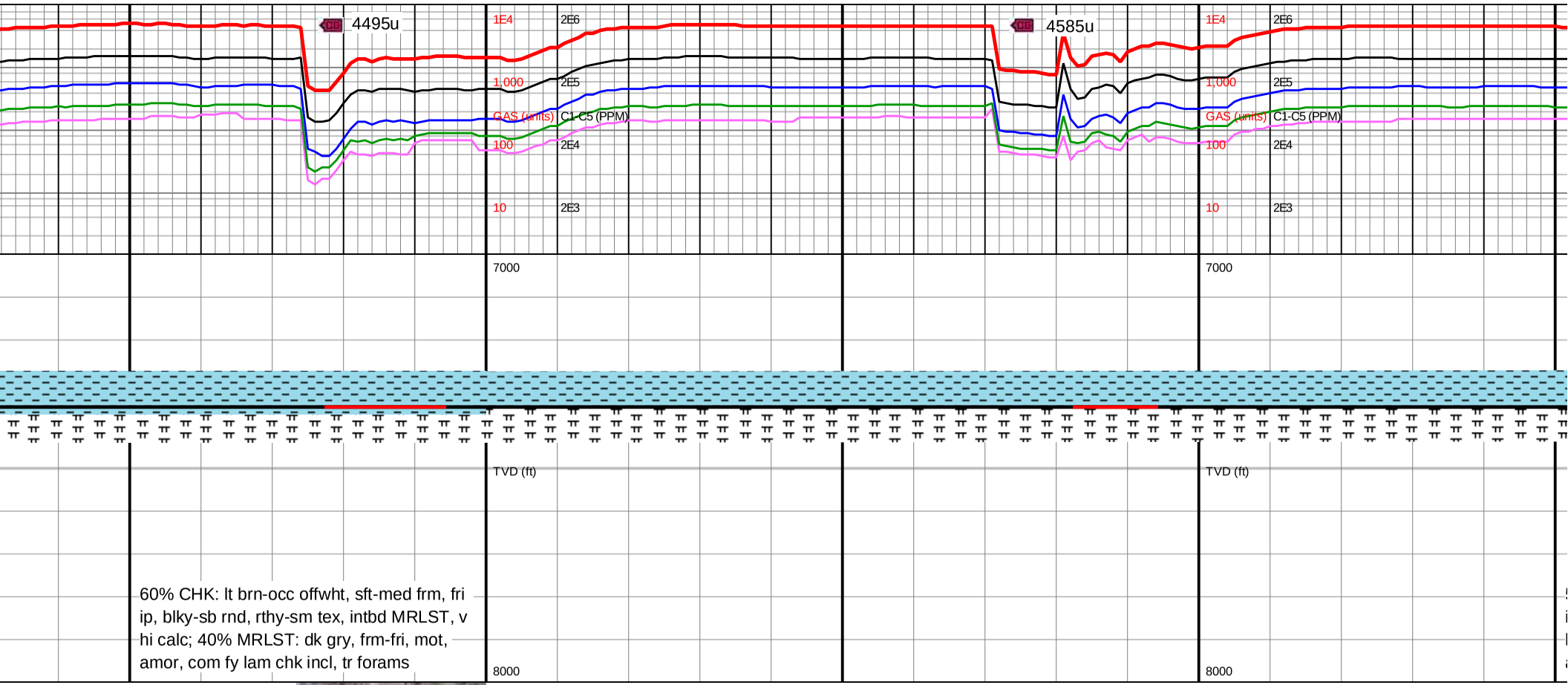
Rig Repair

WOB: 30.7klbs
RPM: 65
SPM: 169
SPP: 3,450psi

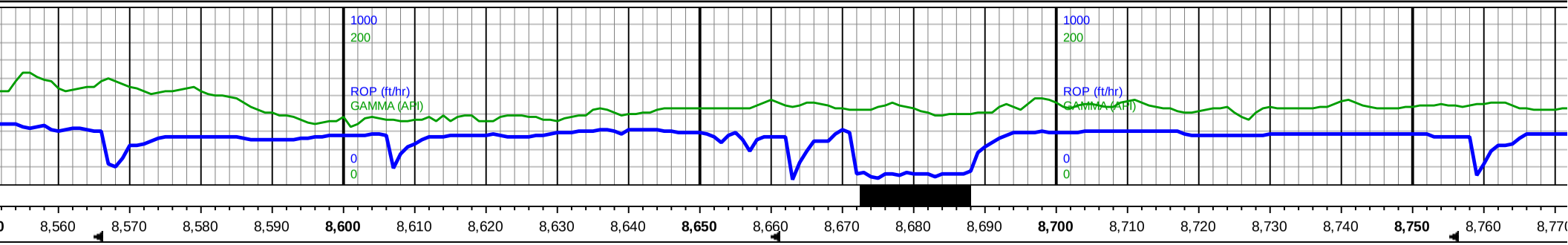
MD: 8,411'
INC: 90.8°
AZM: 269.3°
TVD: 7,355.86'
VS: 764.24'

MW IN: 10
VIS IN: 40
MW OUT: 10
VIS OUT: 40

MD: 8,506'
INC: 89.9°
AZM: 270.2°
TVD: 7,355.28'
VS: 858.56'



60% CHK: lt brn-occ offwht, sft-med frm, fri ip, blky-sb rnd, rthy-sm tex, intbd MRLST, v hi calc; 40% MRLST: dk gry, frm-fri, mot, amor, com fy lam chk incl, tr forams



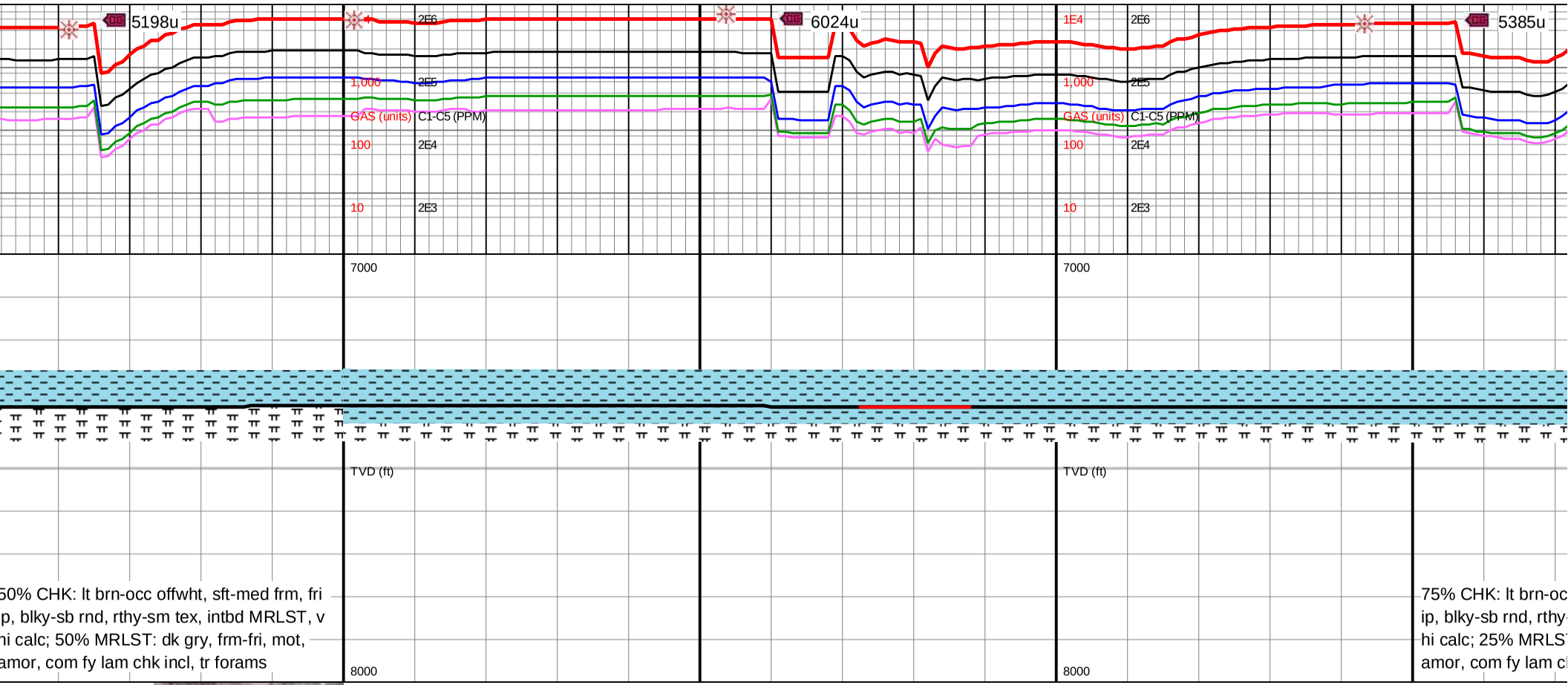
MW IN: 10
VIS IN: 40
MW OUT: 10
VIS OUT: 40

WOB: 29klbs
RPM: 65
SPM: 169
SPP: 3,527psi

MD: 8,601'
INC: 90.5°
AZM: 269.5°
TVD: 7,354.95'
VS: 952.91'

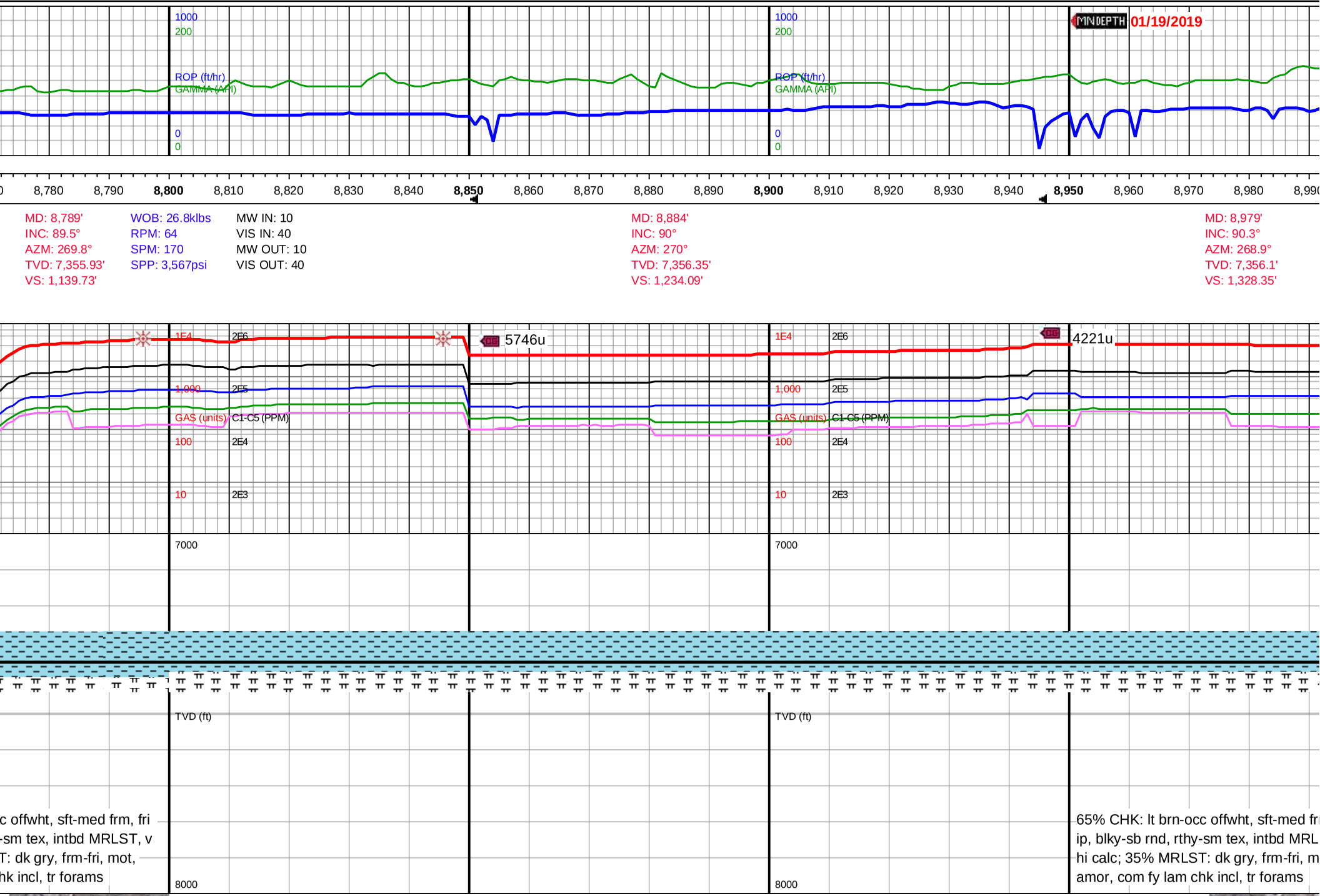
MW IN: 10
VIS IN: 40
MW OUT: 10.1
VIS OUT: 40

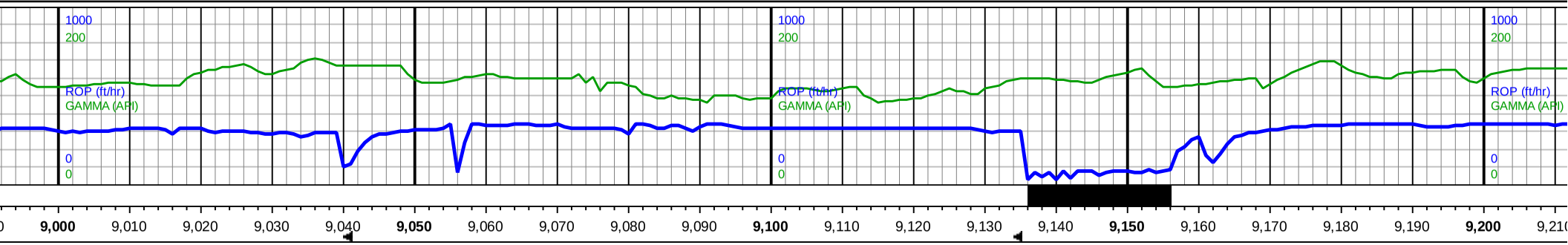
MD: 8,695'
INC: 89.4°
AZM: 270.7°
TVD: 7,355.03'
VS: 1,046.31'



50% CHK: lt brn-occ offwht, sft-med frm, fri
p, blky-sb rnd, rthy-sm tex, intbd MRLST, v
hi calc; 50% MRLST: dk gry, frm-fri, mot,
amor, com fy lam chk incl, tr forams

75% CHK: lt brn-oc
ip, blky-sb rnd, rthy
hi calc; 25% MRLS
amor, com fy lam c


1000
200
ROP (ft/hr)
GAMMA (API)
0
0
MWDEPTH 01/19/2019
8,780
8,790
8,800
8,810
8,820
8,830
8,840
8,850
8,860
8,870
8,880
8,890
8,900
8,910
8,920
8,930
8,940
8,950
8,960
8,970
8,980
MD: 8,789'
INC: 89.5°
AZM: 269.8°
TVD: 7,355.93'
VS: 1,139.73'
WOB: 26.8klbs
RPM: 64
SPM: 170
SPP: 3,567psi
MW IN: 10
VIS IN: 40
MW OUT: 10
VIS OUT: 40
MD: 8,884'
INC: 90°
AZM: 270°
TVD: 7,356.35'
VS: 1,234.09'
MD: 8,979'
INC: 90.3°
AZM: 268.9°
TVD: 7,356.1'
VS: 1,328.35'
1E4
2E6
1,000
2E5
GAS (units)
C1-C5 (PPM)
100
2E4
10
2E3
5746u
4221u
7000
TVD (ft)
8000
c offwht, sft-med frm, fri
-sm tex, intbd MRLST, v
T: dk gry, frm-fri, mot,
hk incl, tr forams
65% CHK: lt brn-occ offwht, sft-med fr
ip, blky-sb rnd, rthy-sm tex, intbd MRL
hi calc; 35% MRLST: dk gry, frm-fri, m
amor, com fy lam chk incl, tr forams



WOB: 22.7klbs
RPM: 64
SPM: 169
SPP: 3,164psi

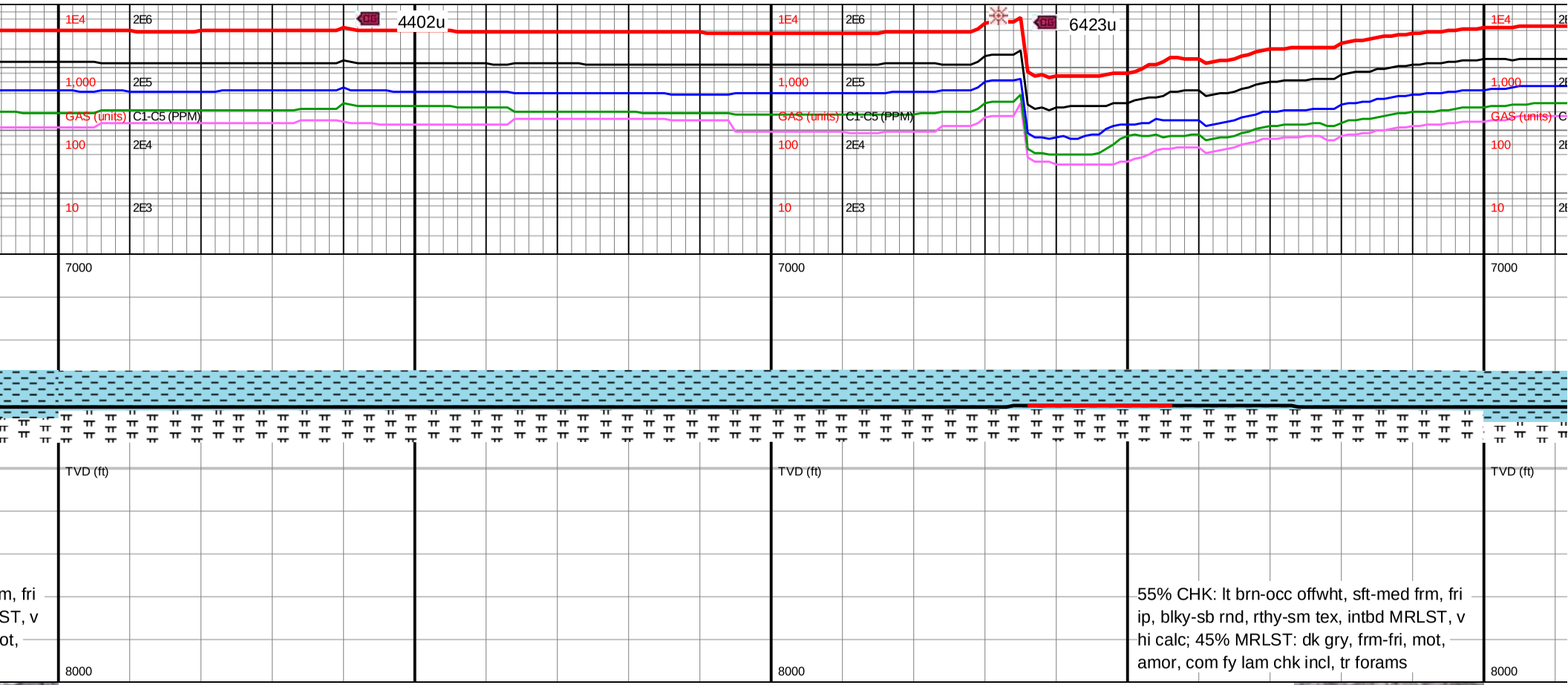
MW IN: 10
VIS IN: 40
MW OUT: 9.9
VIS OUT: 40

MD: 9,074'
INC: 90.9°
AZM: 268.8°
TVD: 7,355.1'
VS: 1,422.48'

MW IN: 10
VIS IN: 40
MW OUT: 10.1
VIS OUT: 40

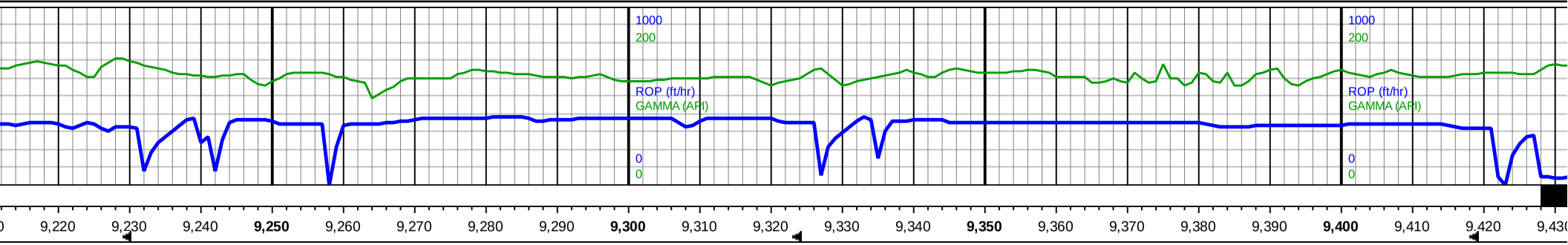
MD: 9,169'
INC: 89.3°
AZM: 269.6°
TVD: 7,354.94'
VS: 1,516.7'

WOB: 30.3klbs
RPM: 65
SPM: 169
SPP: 3,653psi



m, fri
ST, v
ot,

55% CHK: lt brn-occ offwht, sft-med frm, fri ip, blky-sb rnd, rthy-sm tex, intbd MRLST, v hi calc; 45% MRLST: dk gry, frm-fri, mot, amor, com fy lam chk incl, tr forams

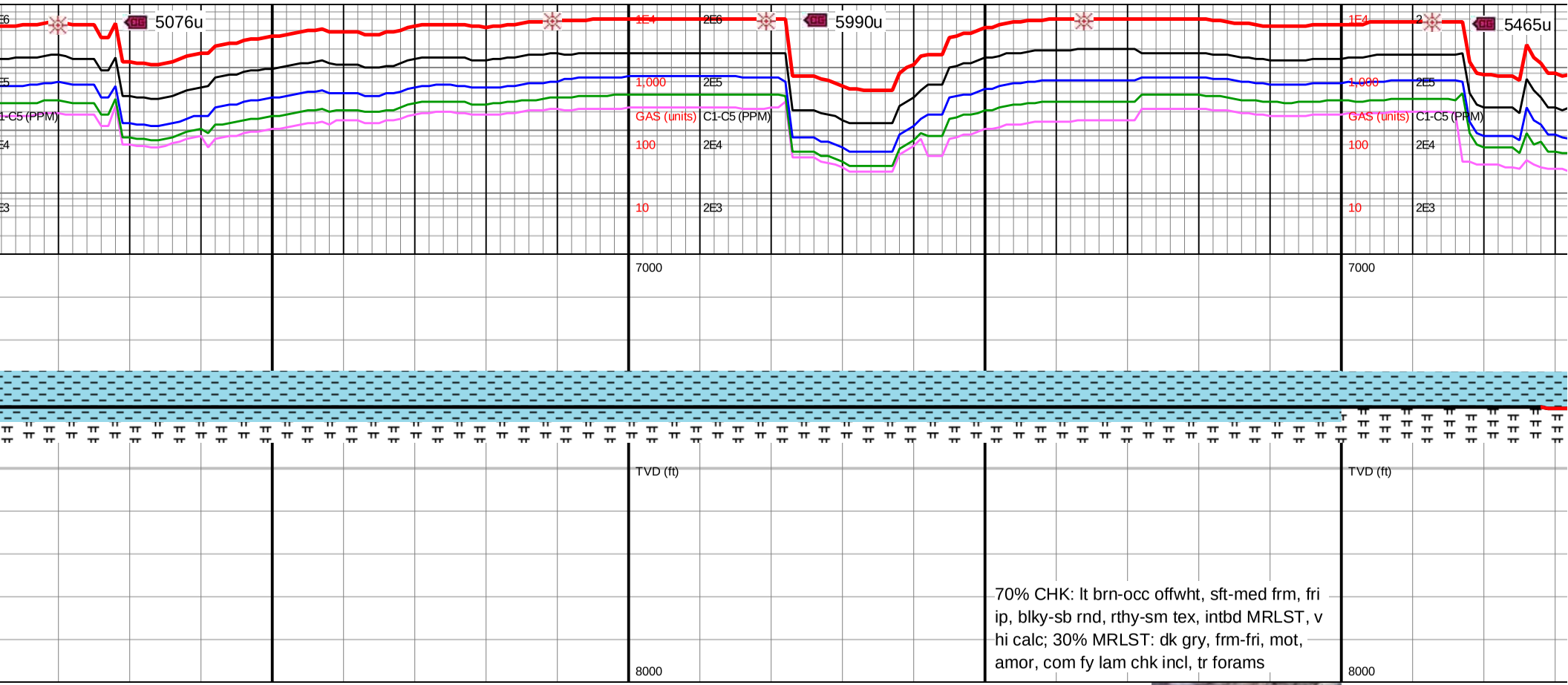


MD: 9,263'
INC: 89.3°
AZM: 267.9°
TVD: 7,356.08'
VS: 1,609.81'

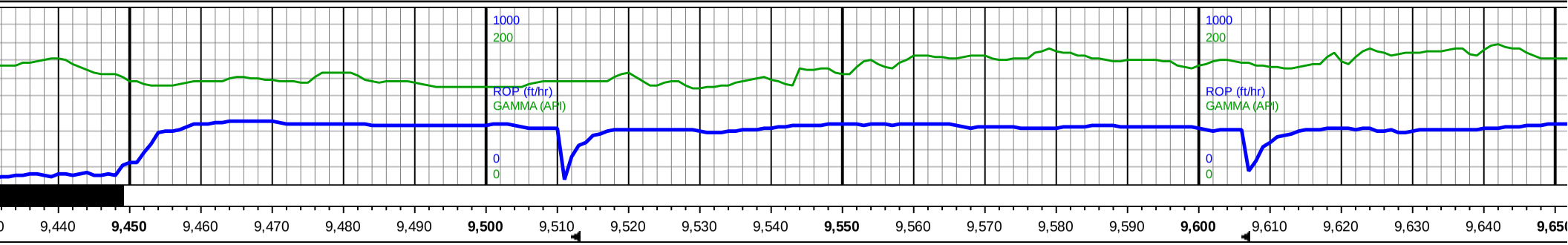
MW IN: 10
VIS IN: 40
MW OUT: 10
VIS OUT: 40

MD: 9,357'
INC: 89.4°
AZM: 267.2°
TVD: 7,357.15'
VS: 1,702.64'

WOB: 32.4klbs
RPM: 65
SPM: 169
SPP: 3,742psi



70% CHK: lt brn-occ offwht, sft-med frm, fri ip, blky-sb rnd, rthy-sm tex, intbd MRLST, v hi calc; 30% MRLST: dk gry, frm-fri, mot, amor, com fy lam chk incl, tr forams



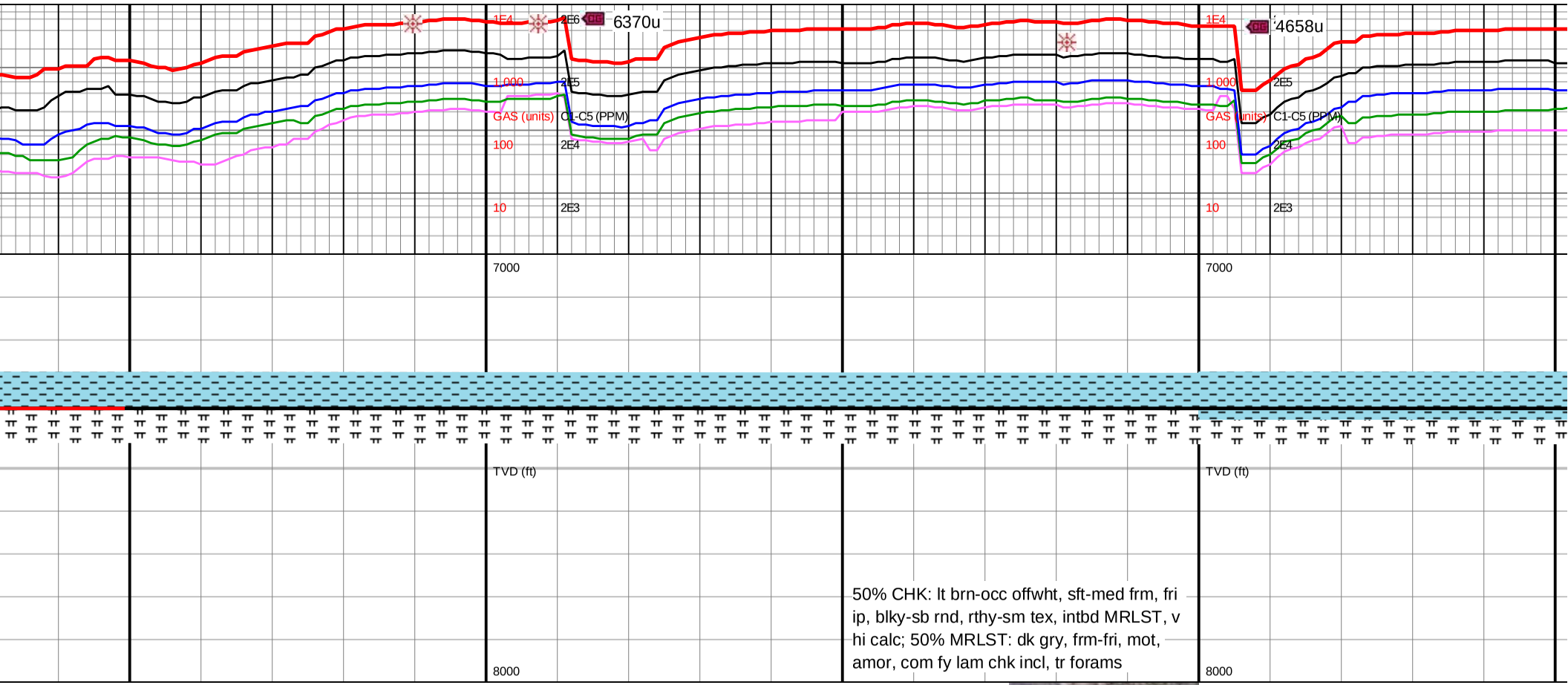
MD: 9,451'
INC: 88.7°
AZM: 268.6°
TVD: 7,358.71'
VS: 1,795.55'

MW IN: 10
VIS IN: 40
MW OUT: 10
VIS OUT: 40

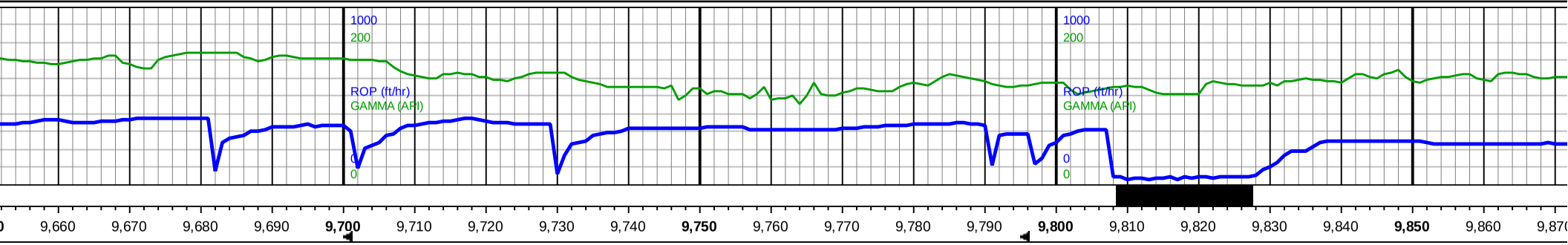
MD: 9,545'
INC: 89.8°
AZM: 269.3°
TVD: 7,359.94'
VS: 1,888.71'

WOB: 30.1klbs
RPM: 65
SPM: 169
SPP: 3,788psi

MD: 9,640'
INC: 90.2°
AZM: 269.1°
TVD: 7,359.94'
VS: 1,982.93'



50% CHK: lt brn-occ offwht, sft-med frm, fri ip, blky-sb rnd, rthy-sm tex, intbd MRLST, v hi calc; 50% MRLST: dk gry, frm-fri, mot, amor, com fy lam chk incl, tr forams



BP

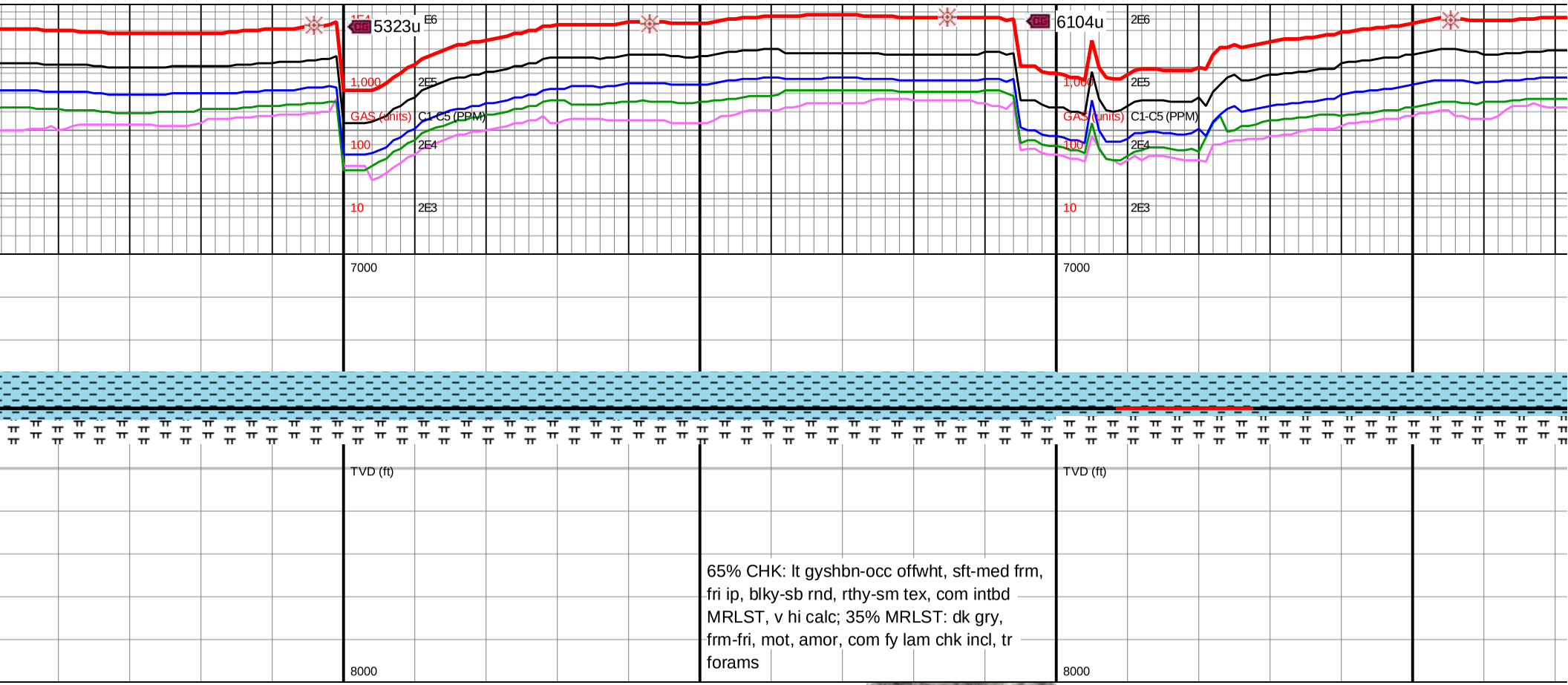
MD: 9,735'
INC: 90.7°
AZM: 268.6°
TVD: 7,359.19'
VS: 2,077.06'

MW IN: 10
VIS IN: 38
MW OUT: 10
VIS OUT: 39

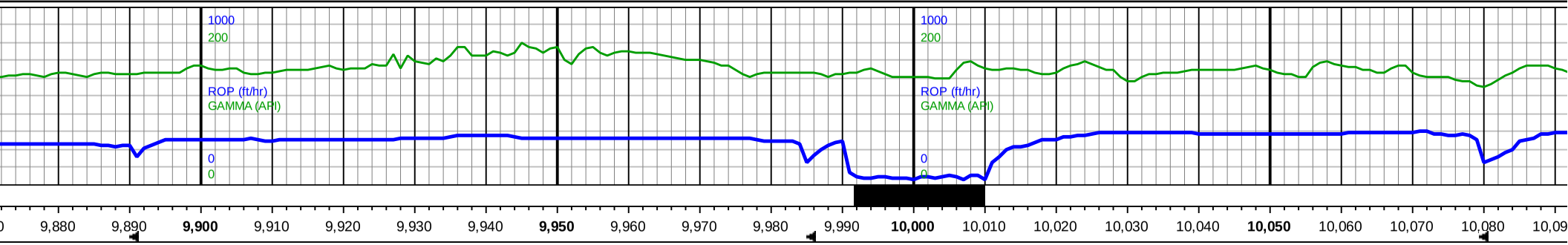
WOB: 30klbs
RPM: 64
SPM: 172
SPP: 3,799psi

MD: 9,829'
INC: 89.7°
AZM: 269.6°
TVD: 7,358.87'
VS: 2,170.26'

MW IN: 10
VIS IN: 38
MW OUT: 10+
VIS OUT: 38



65% CHK: lt gyshbn-occ offwht, sft-med frm, fri ip, blky-sb rnd, rthy-sm tex, com intbd MRLST, v hi calc; 35% MRLST: dk gry, frm-fri, mot, amor, com fy lam chk incl, tr forams

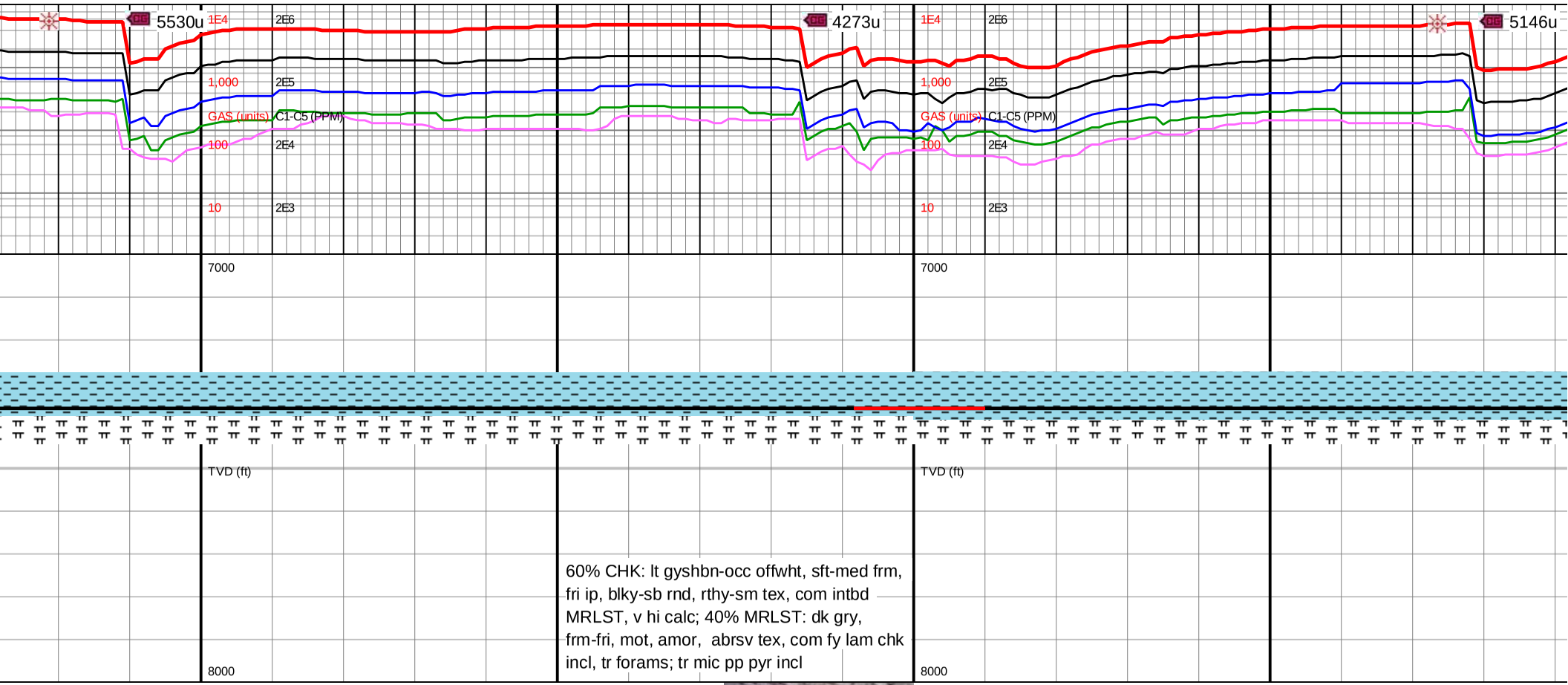


MD: 9,924'
INC: 90.2°
AZM: 269.5°
TVD: 7,358.95'
VS: 2,264.55'

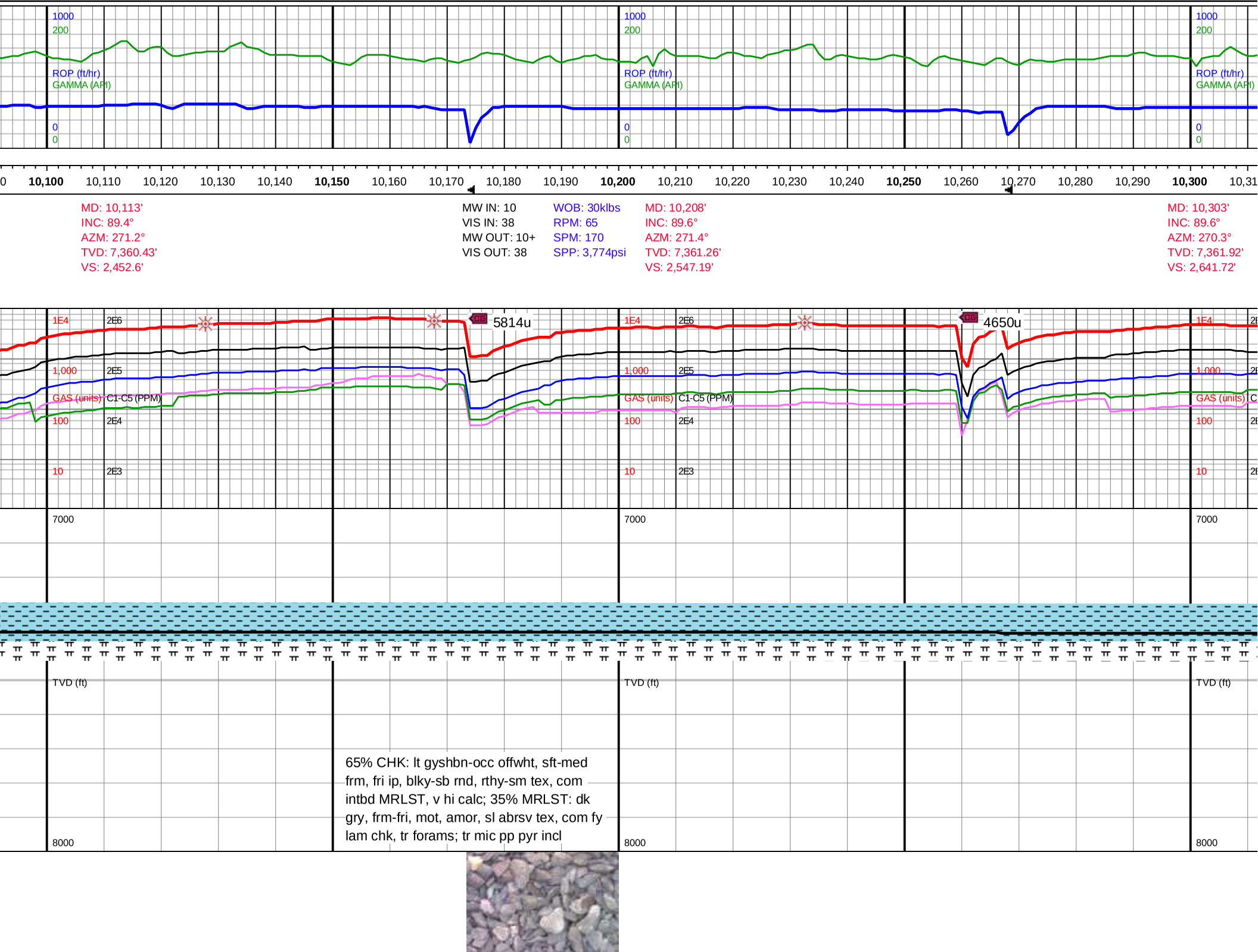
WOB: 36klbs
RPM: 25
SPM: 170
SPP: 3,099psi

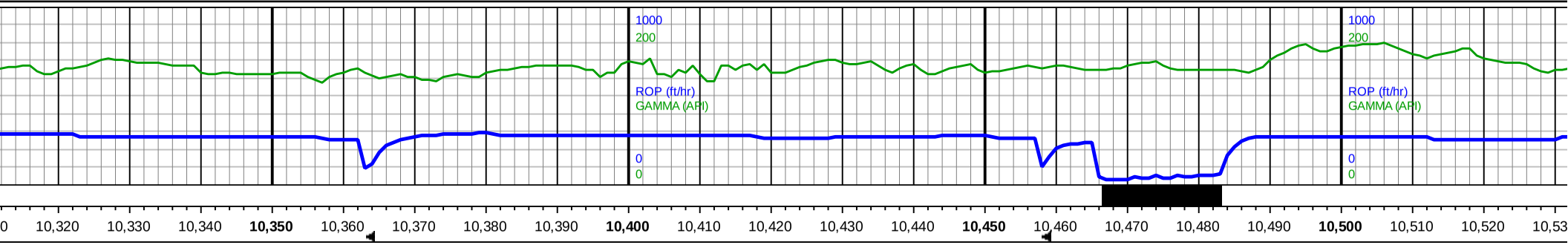
MD: 10,019'
INC: 89.3°
AZM: 271.4°
TVD: 7,359.36'
VS: 2,359'

MW IN: 10
VIS IN: 38
MW OUT: 10.1
VIS OUT: 38



60% CHK: lt gyshbn-occ offwht, sft-med frm, fri ip, blky-sb rnd, rthy-sm tex, com intbd MRLST, v hi calc; 40% MRLST: dk gry, frm-fri, mot, amor, abrsv tex, com fy lam chk incl, tr forams; tr mic pp pyr incl


1000
200
ROP (ft/hr)
GAMMA (API)
0
0
10,100
10,110
10,120
10,130
10,140
10,150
10,160
10,170
10,180
10,190
10,200
10,210
10,220
10,230
10,240
10,250
10,260
10,270
10,280
10,290
10,300
MD: 10,113'
INC: 89.4°
AZM: 271.2°
TVD: 7,360.43'
VS: 2,452.6'
MW IN: 10
VIS IN: 38
MW OUT: 10+
VIS OUT: 38
WOB: 30klbs
RPM: 65
SPM: 170
SPP: 3,774psi
MD: 10,208'
INC: 89.6°
AZM: 271.4°
TVD: 7,361.26'
VS: 2,547.19'
MD: 10,303'
INC: 89.6°
AZM: 270.3°
TVD: 7,361.92'
VS: 2,641.72'
1E4
2E6
1,000
2E5
GAS (units)
C1-C5 (PPM)
100
2E4
10
2E3
5814u
4650u
7000
TVD (ft)
8000
65% CHK: lt gyshbn-occ offwht, sft-med frm, fri ip, blky-sb rnd, rthy-sm tex, com intbd MRLST, v hi calc; 35% MRLST: dk gry, frm-fri, mot, amor, sl abrsv tex, com fy lam chk, tr forams; tr mic pp pyr incl



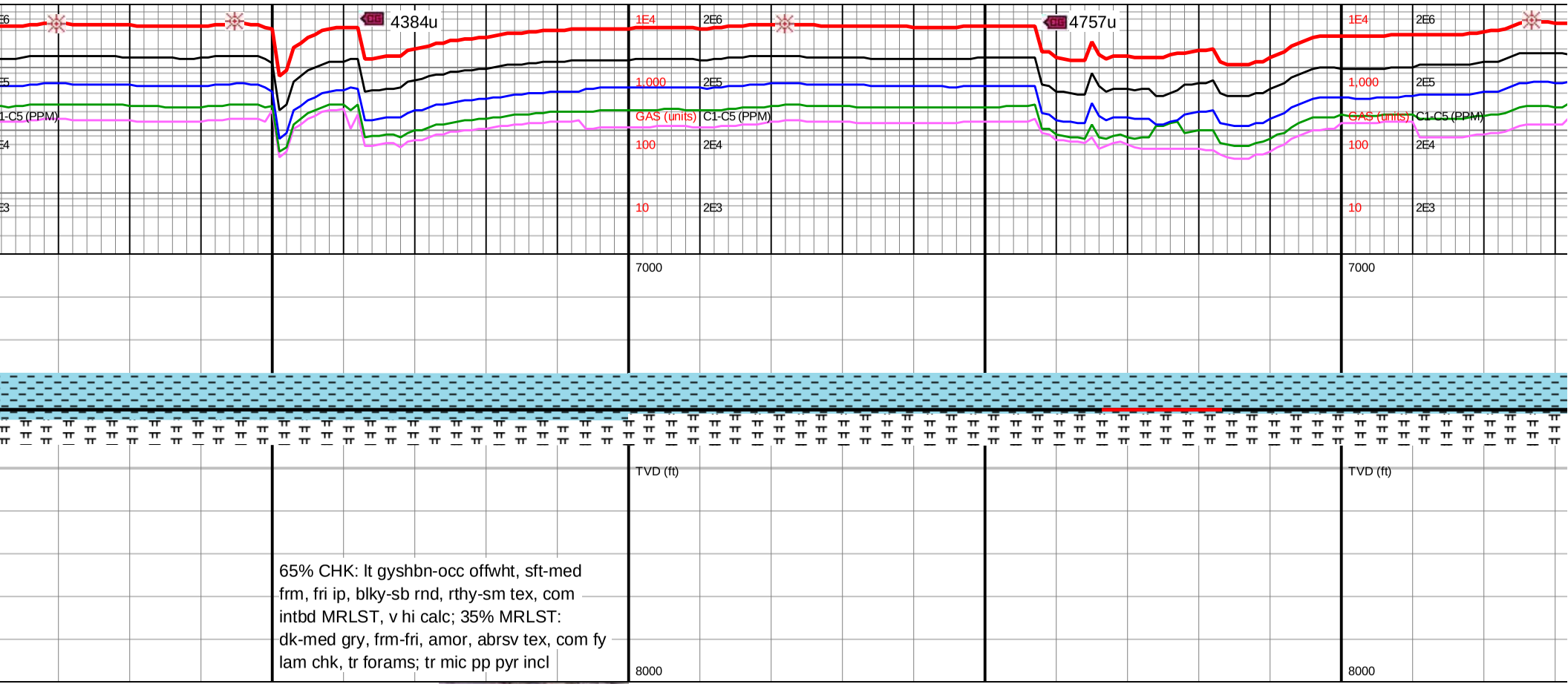
MW IN: 10
VIS IN: 38
MW OUT: 10.1
VIS OUT: 38

MD: 10,398'
INC: 89.4°
AZM: 269.6°
TVD: 7,362.75'
VS: 2,736.08'

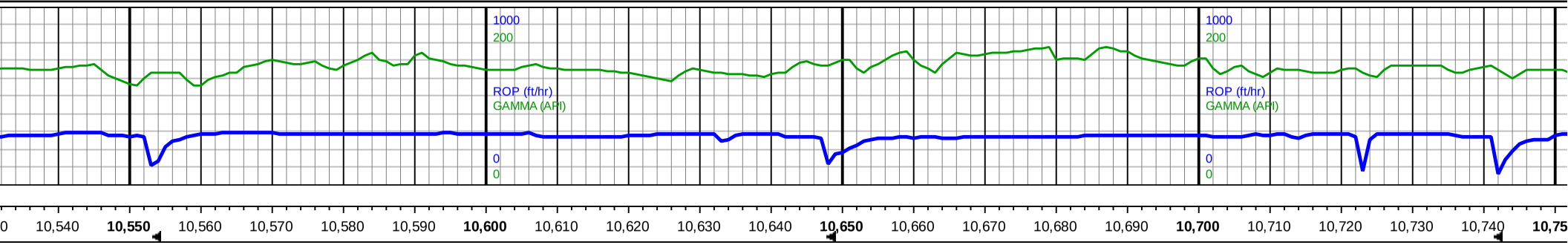
WOB: 27klbs
RPM: 65
SPM: 170
SPP: 3,818psi

MD: 10,492'
INC: 89.3°
AZM: 271.7°
TVD: 7,363.82'
VS: 2,829.57'

MW IN: 10
VIS IN: 40
MW OUT: 10.1
VIS OUT: 39



65% CHK: lt gyshbn-occ offwht, sft-med frm, fri ip, blky-sb rnd, rthy-sm tex, com intbd MRLST, v hi calc; 35% MRLST: dk-med gry, frm-fri, amor, abrsv tex, com fy lam chk, tr forams; tr mic pp pyr incl

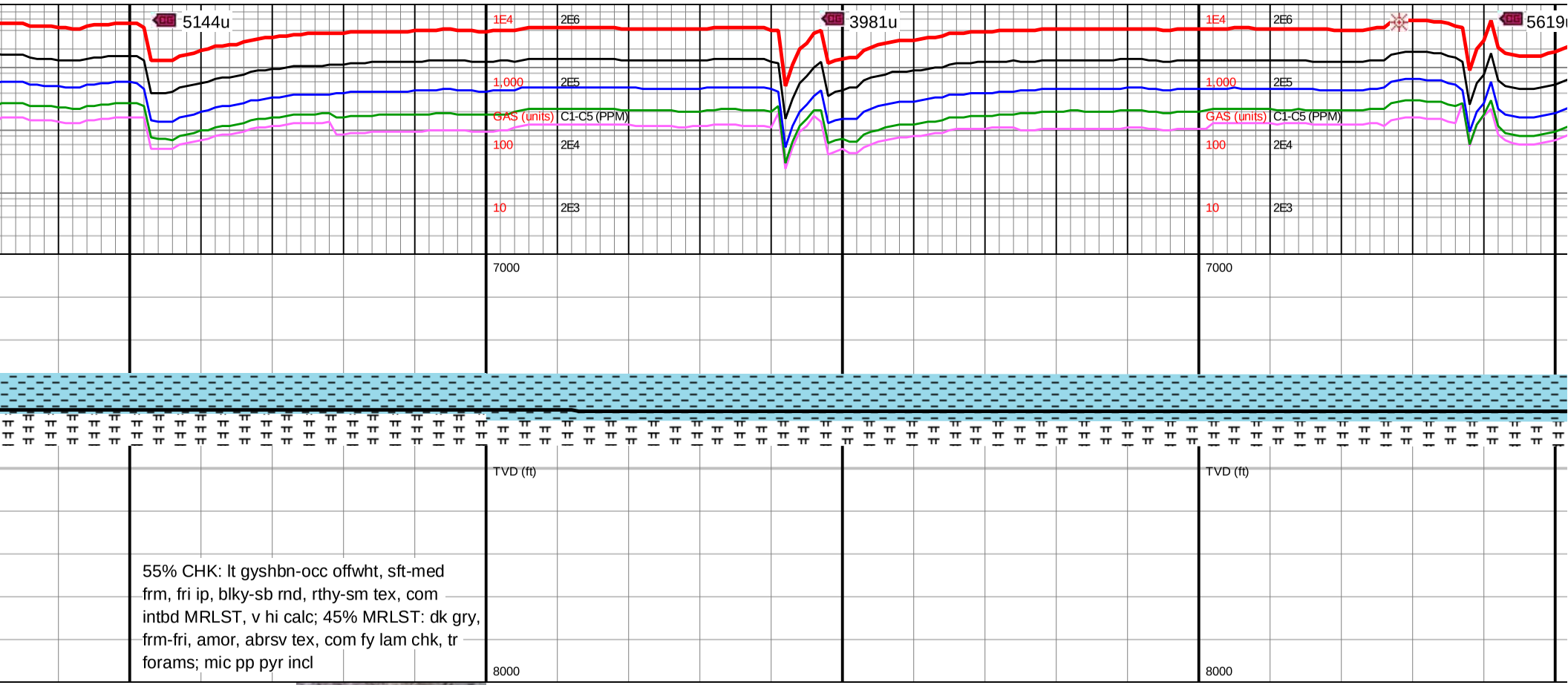


MD: 10,587'
INC: 89.6°
AZM: 271.2°
TVD: 7,364.73'
VS: 2,924.18'

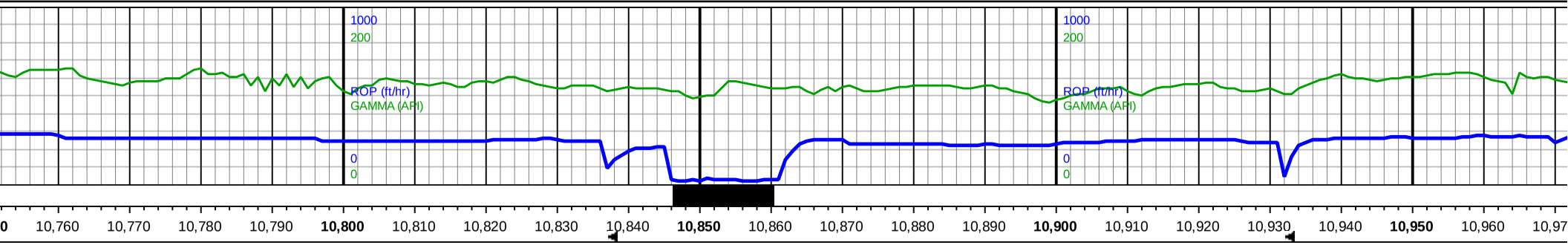
WOB: 29klbs
RPM: 65
SPM: 170
SPP: 3,838psi

MW IN: 10
VIS IN: 40
MW OUT: 10+
VIS OUT: 40

MD: 10,682'
INC: 89.2°
AZM: 269.6°
TVD: 7,365.72'
VS: 3,018.62'



55% CHK: lt gyshbn-occ offwht, sft-med frm, fri ip, blky-sb rnd, rthy-sm tex, com intbd MRLST, v hi calc; 45% MRLST: dk gry, frm-fri, amor, abrsv tex, com fy lam chk, tr forams; mic pp pyr incl



MD: 10,777'
INC: 90°
AZM: 269.8°
TVD: 7,366.39'
VS: 3,112.94'

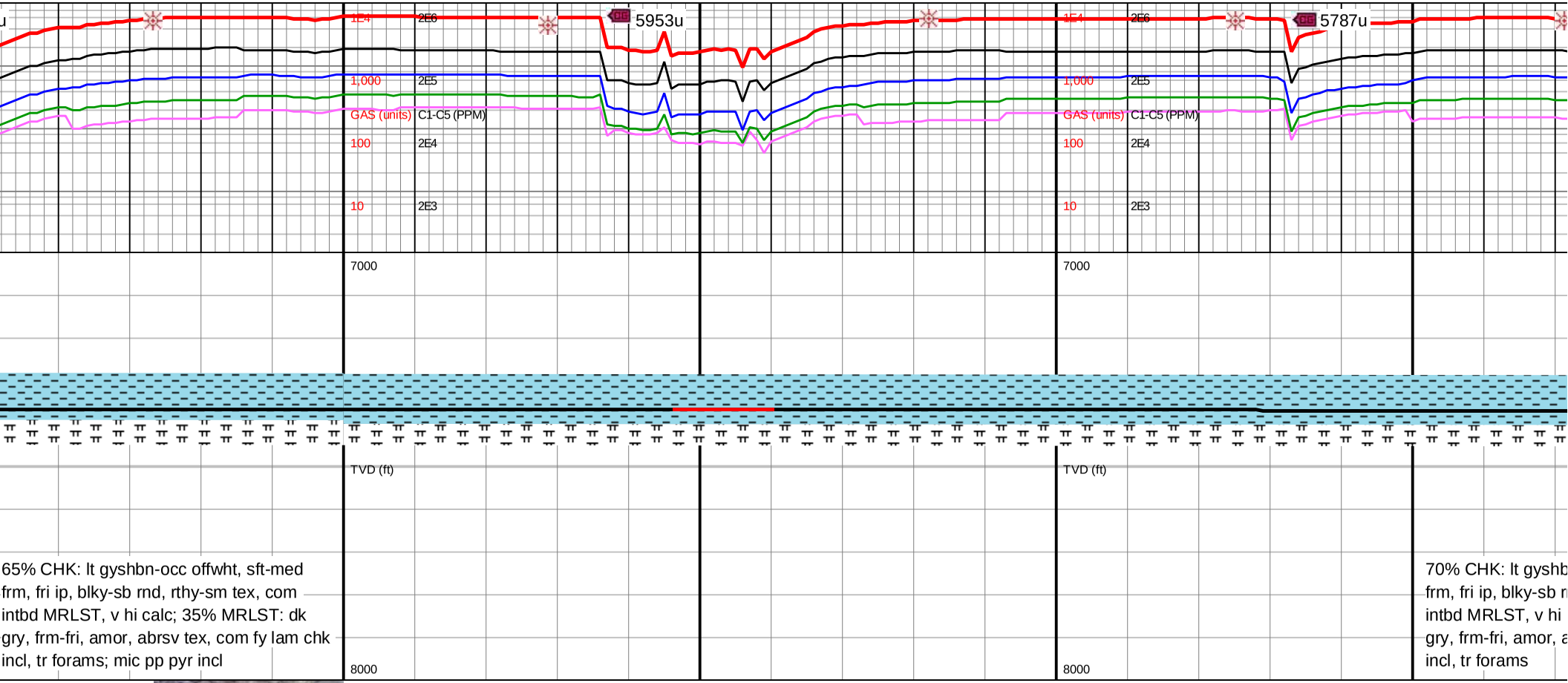
WOB: 31klbs
RPM: 65
SPM: 170
SPP: 3,842psi

MW IN: 10
VIS IN: 40
MW OUT: 10.1
VIS OUT: 39

MD: 10,871'
INC: 88.8°
AZM: 271.7°
TVD: 7,367.37'
VS: 3,206.44'

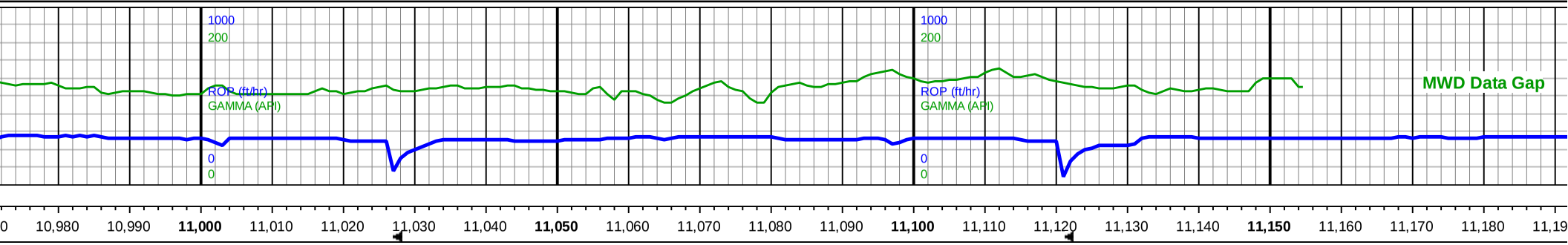
MW IN: 10
VIS IN: 40
MW OUT: 10.1
VIS OUT: 39

MD: 10,966'
INC: 89.3°
AZM: 271.2°
TVD: 7,368.95
VS: 3,301.05'



65% CHK: lt gyshbn-occ offwht, sft-med frm, fri ip, blky-sb rnd, rthy-sm tex, com intbd MRLST, v hi calc; 35% MRLST: dk gry, frm-fri, amor, abrsv tex, com fy lam chk incl, tr forams; mic pp pyr incl

70% CHK: lt gyshb
frm, fri ip, blky-sb r
intbd MRLST, v hi
gry, frm-fri, amor, a
incl, tr forams



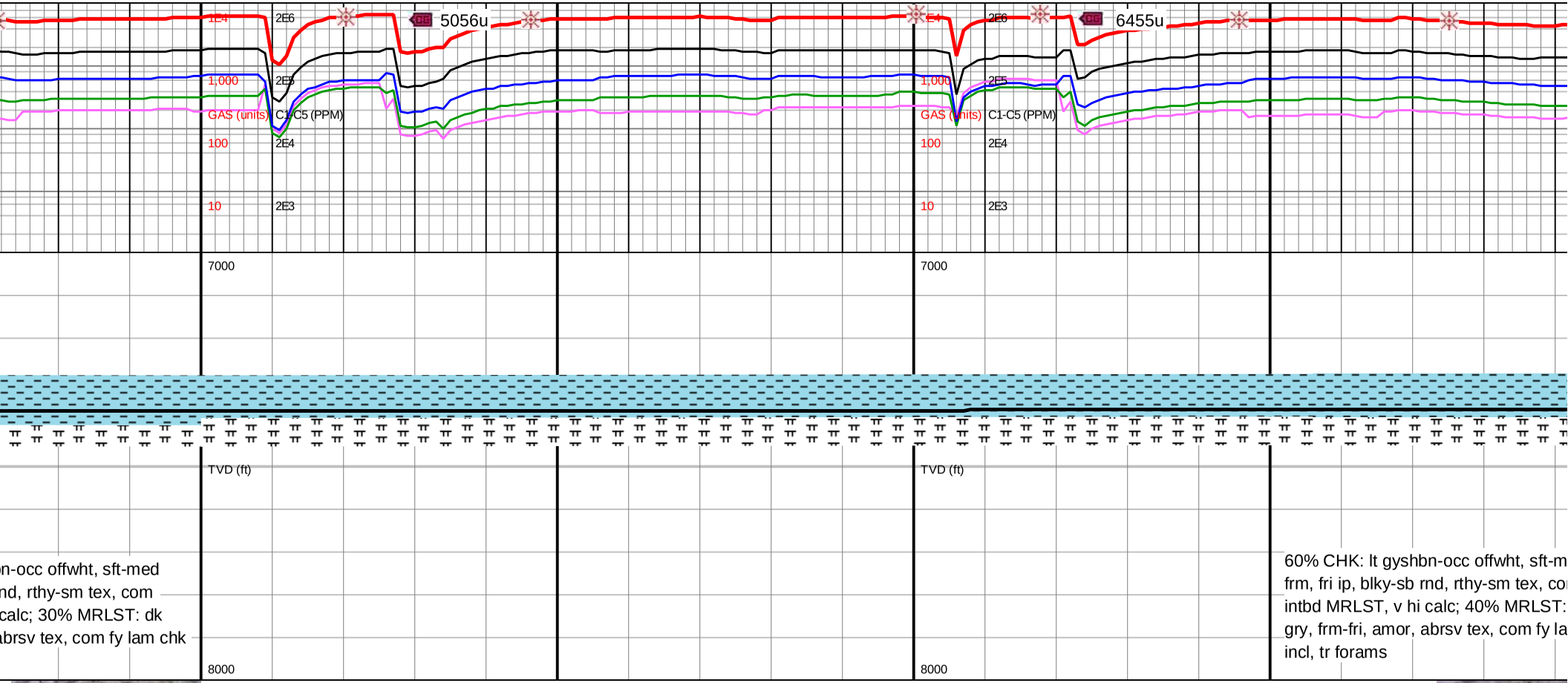
WOB: 30klbs
RPM: 65
SPM: 170
SPP: 3,763psi

MD: 11,061'
INC: 90.6°
AZM: 271.7°
TVD: 7,369.03'
VS: 3,395.67'

MW IN: 10
VIS IN: 40
MW OUT: 10.0+
VIS OUT: 40

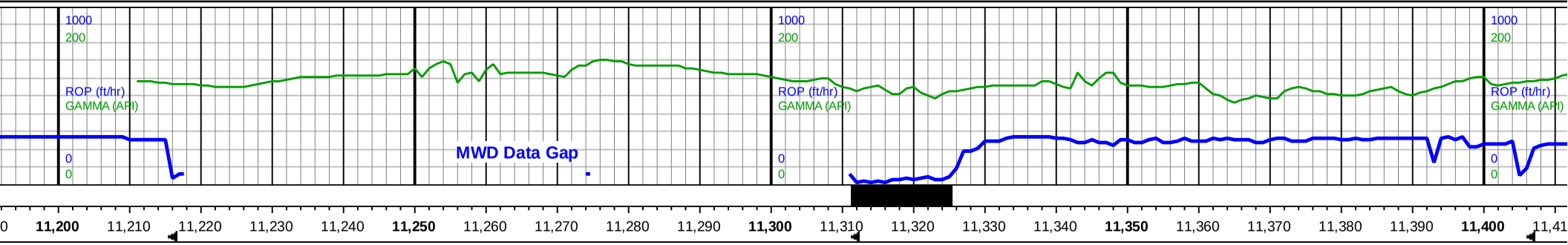
MD: 11,156'
INC: 91.1°
AZM: 271.4°
TVD: 7,367.62'
VS: 3,490.29'

GD



n-occ offwht, sft-med
nd, rthy-sm tex, com
calc; 30% MRLST: dk
brsv tex, com fy lam chk

60% CHK: lt gyshbn-occ offwht, sft-m
frm, fri ip, blky-sb rnd, rthy-sm tex, co
intbd MRLST, v hi calc; 40% MRLST:
gry, frm-fri, amor, abrsv tex, com fy la
incl, tr forams



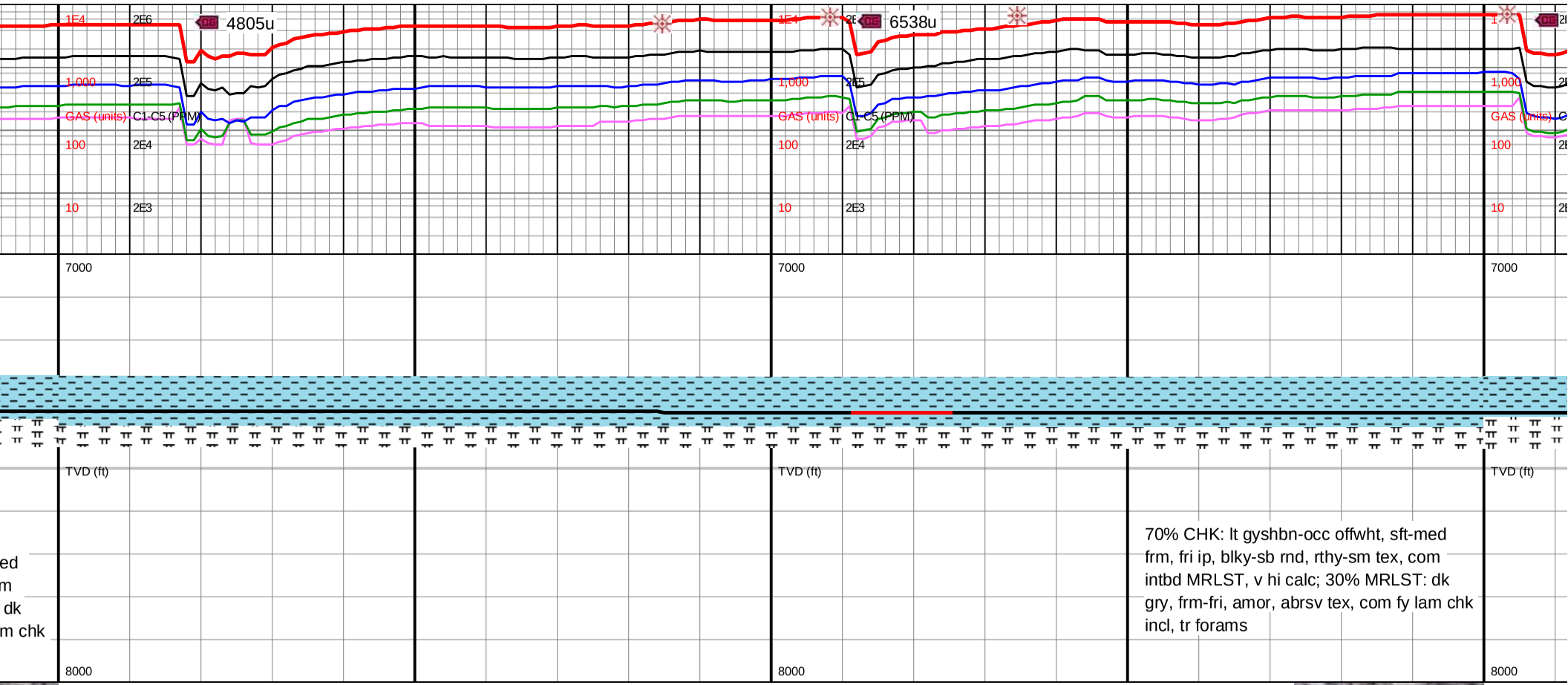
WOB: 25.8klbs
RPM: 65
SPM: 170
SPP: 3,167psi

MD: 11,250'
INC: 88.8°
AZM: 271.2°
TVD: 7,367.7'
VS: 3,583.89'

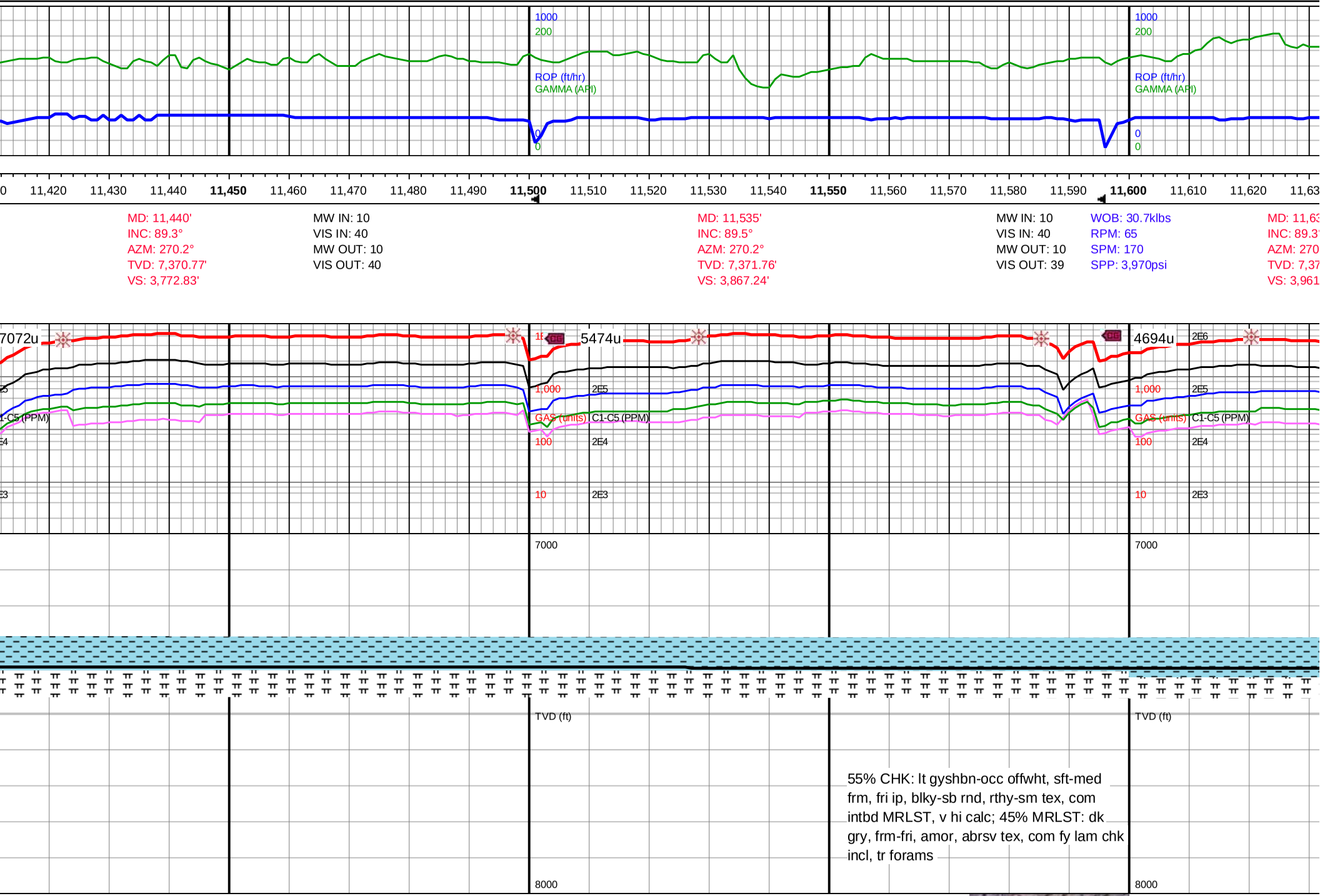
MW IN: 10
VIS IN: 41
MW OUT: 10.1
VIS OUT: 40

MD: 11,345'
INC: 89.1°
AZM: 270.5°
TVD: 7,369.44'
VS: 3,678.4'

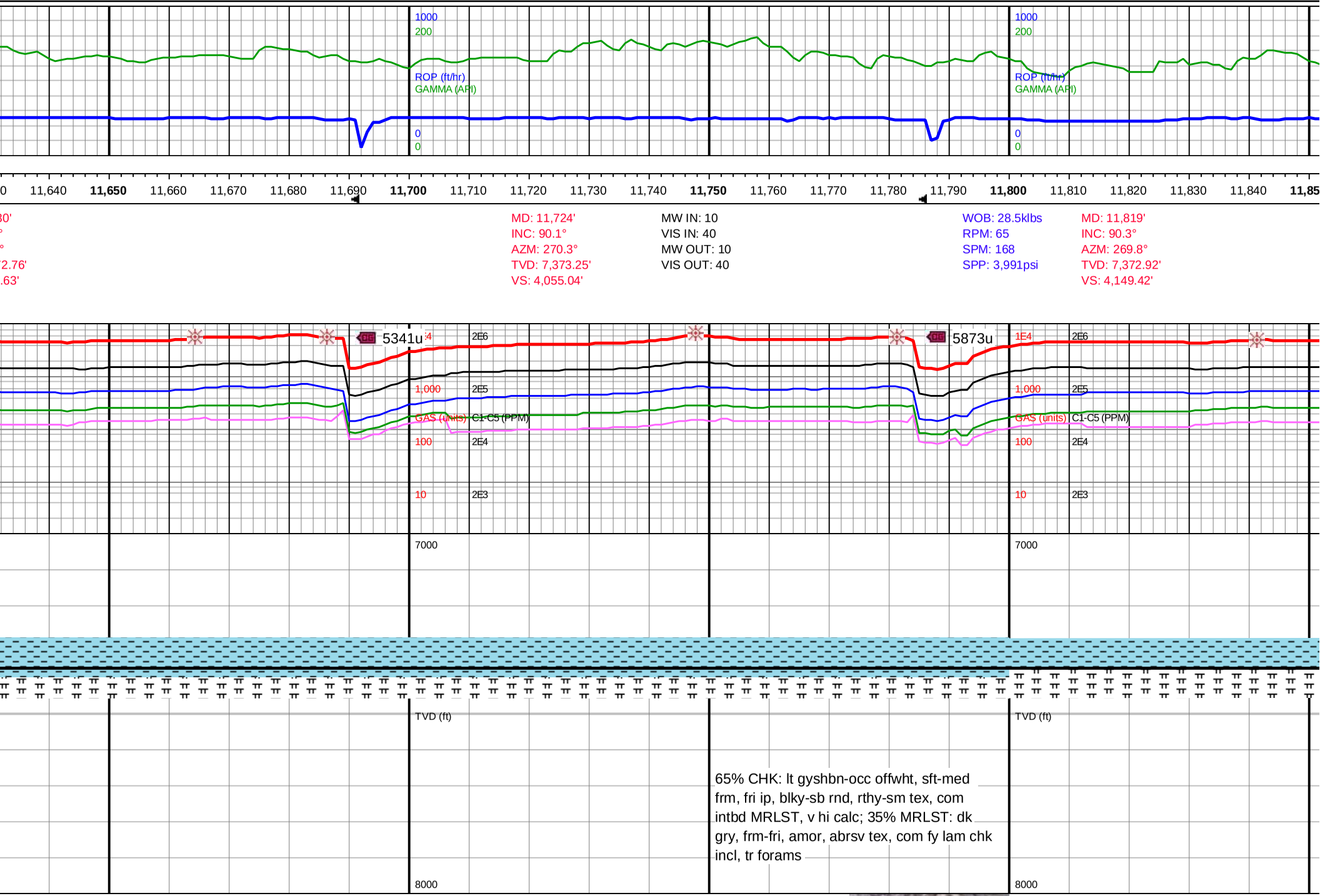
WOB: 16.2klbs
RPM: 65
SPM: 170
SPP: 3,129psi



70% CHK: lt gyshbn-occ offwht, sft-med frm, fri ip, blky-sb rnd, rthy-sm tex, com intbd MRLST, v hi calc; 30% MRLST: dk gry, frm-fri, amor, abrsv tex, com fy lam chk incl, tr forams



55% CHK: lt gyshbn-occ offwht, sft-med frm, fri ip, blky-sb rnd, rthy-sm tex, com intbd MRLST, v hi calc; 45% MRLST: dk gry, frm-fri, amor, abrsv tex, com fy lam chk incl, tr forams



30'
°
°
72.76'
.63'

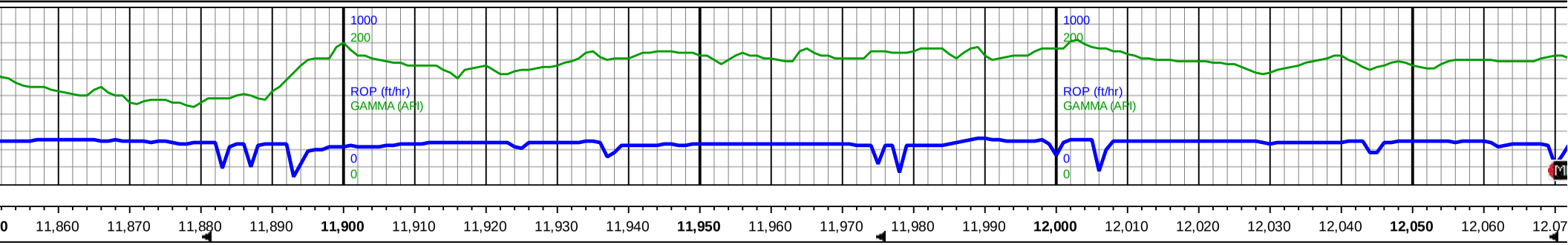
MD: 11,724'
INC: 90.1°
AZM: 270.3°
TVD: 7,373.25'
VS: 4,055.04'

MW IN: 10
VIS IN: 40
MW OUT: 10
VIS OUT: 40

WOB: 28.5klbs
RPM: 65
SPM: 168
SPP: 3,991psi

MD: 11,819'
INC: 90.3°
AZM: 269.8°
TVD: 7,372.92'
VS: 4,149.42'

65% CHK: lt gyshbn-occ offwht, sft-med frm, fri ip, blky-sb rnd, rthy-sm tex, com intbd MRLST, v hi calc; 35% MRLST: dk gry, frm-fri, amor, abrsv tex, com fy lam chk incl, tr forams



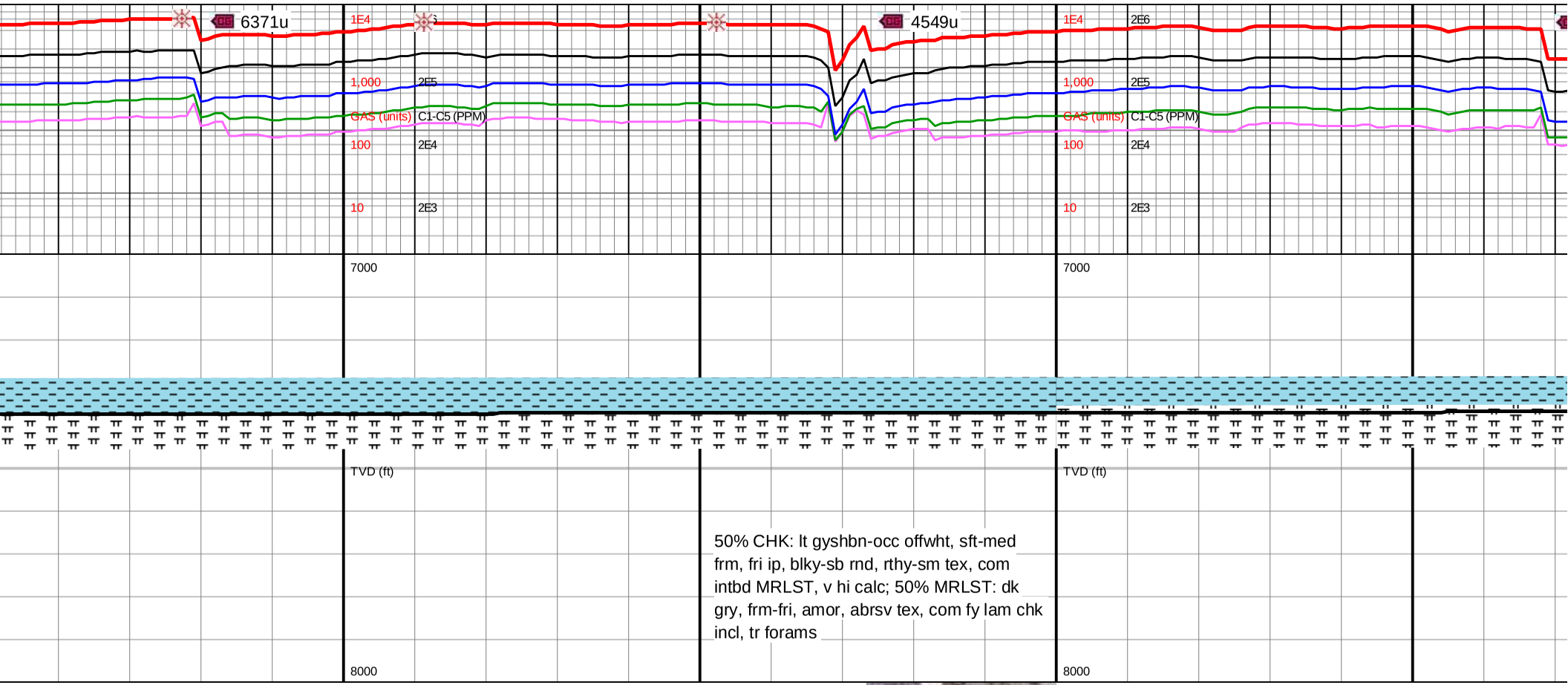
MW IN: 10
VIS IN: 40
MW OUT: 10
VIS OUT: 40

MD: 11,914'
INC: 91°
AZM: 269.5°
TVD: 7,371.84'
VS: 4,243.72'

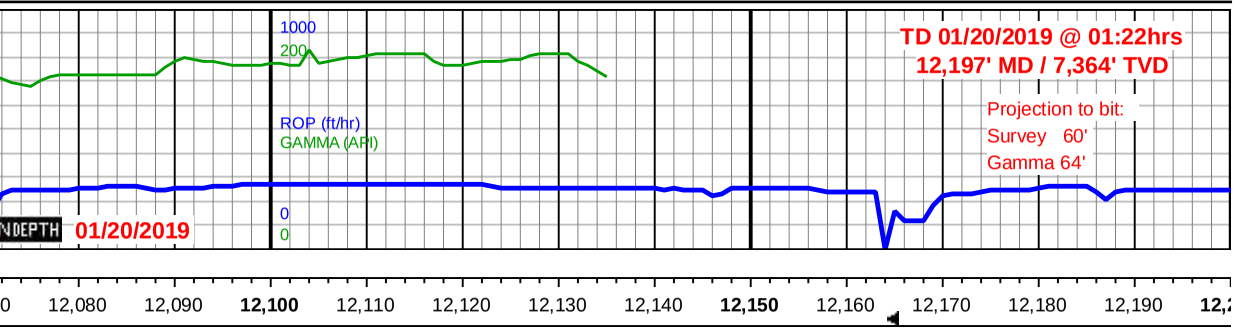
MW IN: 10
VIS IN: 40
MW OUT: 10.0
VIS OUT: 40

WOB: 25.4klbs
RPM: 65
SPM: 170
SPP: 3,956psi

MD: 12,009'
INC: 91.6°
AZM: 269.3°
TVD: 7,369.69'
VS: 4,337.96'



50% CHK: lt gyshbn-occ offwht, sft-med frm, fri ip, blky-sb rnd, rthy-sm tex, com intbd MRLST, v hi calc; 50% MRLST: dk gry, frm-fri, amor, abrsv tex, com fy lam chk incl, tr forams



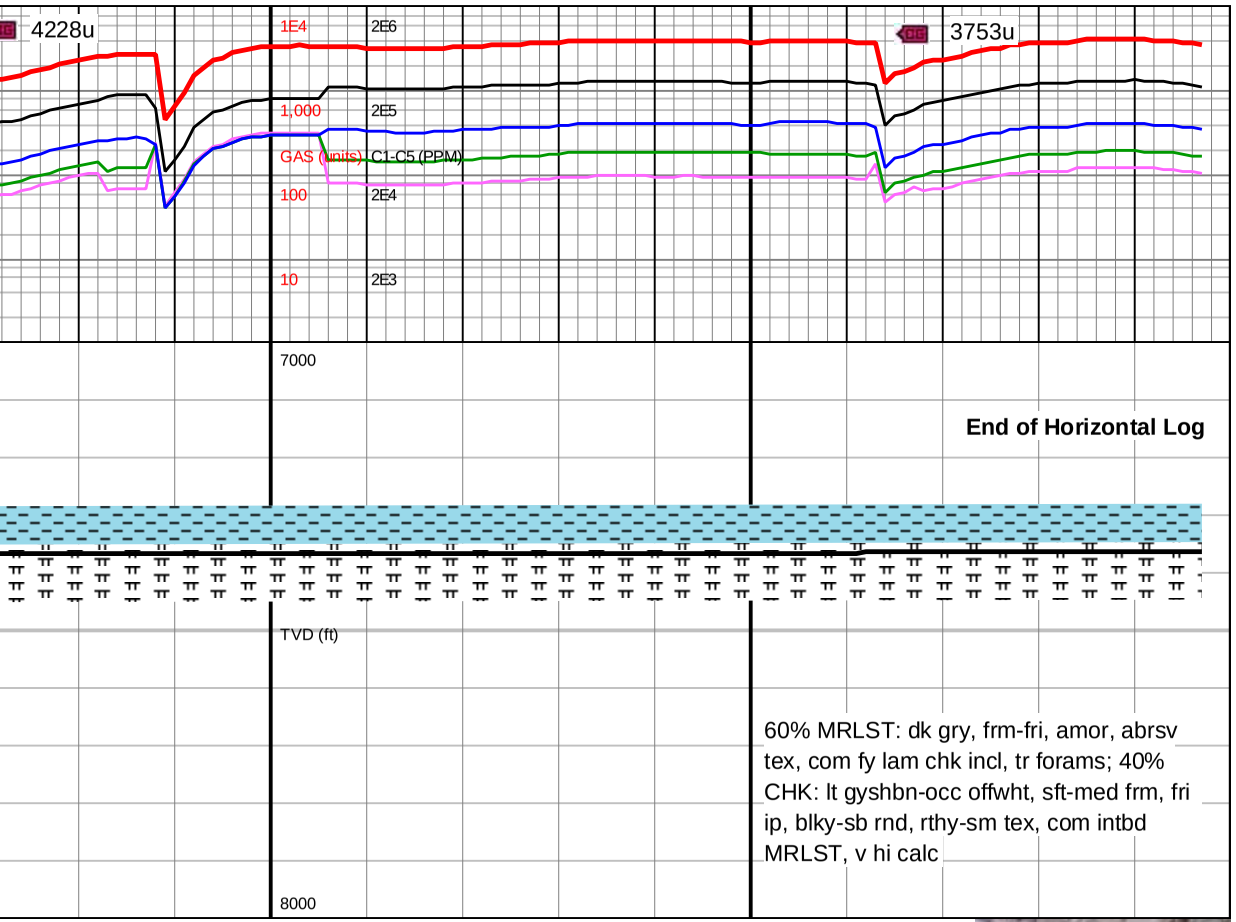
MW IN: 10.1
VIS IN: 40
MW OUT: 10.1
VIS OUT: 40

MD: 12,104'
INC: 92°
AZM: 268.8°
TVD: 7,366.87'
VS: 4,432.1'

MD: 12,137'
INC: 91.8°
AZM: 268.8°
TVD: 7,365.77'
VS: 4,464.78'

MD: 12,197'
INC: 91.8°
AZM: 268.8°
TVD: 7,363.89'
VS: 4,524.2'

WOB: 23.7klbs
RPM: 66
SPM: 170
SPP: 3,961psi



60% MRLST: dk gry, frm-fri, amor, abrsv tex, com fy lam chk incl, tr forams; 40% CHK: lt gyshbn-occ offwht, sft-med frm, fri ip, blky-sb rnd, rthy-sm tex, com intbd MRLST, v hi calc