COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name	Bear 3-65 22-23 3BH		
Location	SEC 22 T3S-R65W		
State	COLORADO	**County**	ADAMS
Country	USA	**Rig Number**	Nabors B16
API Number	050011015100	**AFE #**	WAY.CDR.7048
Geographic Region	DJ BASIN	**Field**	WILDCAT
Spud Date	7/25/2018	**Drilling Completed**	8/8/2018
Surface Coordinates	1440ft FSL 533ft FWL SEC 22 T3SR65W SL Lat: 39° 46' 22.73" (NAD83) SL Long: 104° 39' 27.17" (NAD83)		
Bottom Hole Coordinates	Proposed BHL: 2166ft FSL 325ft FEL SEC 23 T 3SR65W		
Ground Elevation	5571	**K.B. Elevation**	5596'
Logged Interval	6000 **To** 18,165	**Total Depth**	18,165
Formation	Niobrara D Chalk		
Type of Drilling Fluid	OBM		

Operator

Company Conoco Phillips

Address 600 N. Dairy Ashford Rd.
Houston, TX 77079-1175

ConocoPhillip

Geologist

Name Dave Aldridge

Company Conoco Phillips Central Rockies Implementation

Address Dave.E.Aldridge@conocophillips.com
Office:(832)486-3983
600 N Dairy Ashford EC3 14-W134
Houston, TX 77079

ConocoPhillip

Other

Columbine Logging Inc.	Mud Logging Company
Geologists/Geosteerers on Location:	Todd Thiesse,
Gas Detection:	Bloodhound chromatograph gas unit #311
DD/MWD:	Baker Hughes
Columbine Computer	87A

Color Coding

Oil	Condensate	Gas
Note	Core	Pressure
Error	Water	Seal

Rock Types

UNKNOWN	COAL	MARLSTONE	SHALY SANDSTONE
ANHYDRITE	CONGLOMERATE	METAMORPHIC	SHALY SILTSTONE
BENTONITE	DOLOMITE	NO SAMPLE	SILTY SHALE
BRECCIA	DOLOMITIC LIMESTONE	SALT	SILTSTONE
CHALK	GRANITE	SANDSTONE	TILL
CEMENT	GYPSUM	SALT-PEPPER SAND	TUFF
CHERT	IGNEOUS	SHALE	WELDED TUFF
CLAY CHOKE SAND	SIDERITE or LIMONITE	SHALE COLORED	
CLAYSTONE	LIMESTONE	SHALE GRAY	

Fossils

ALGAE	GASTROPOD	
AMPHIPORA	INOCERAMUS	
BELEMNITE	OOLITE	
BIOCLASTIC	OSTRACOD	
BRACHOIPOD	PELECYPOD	
BRYOZOA	PELLET	
CEPHALOPOD	PISOLITE	
CORAL	PLANT REMAINS	
CRINOID	PLANT SPORES	
ECHINOID	SCAPHOPOD	
FISH	STROMATOPOROID	
FORAMINIFERA		
FOSSIL		

Minerals

ANHYDRITIC	
ARGILLACEOUS	

Oil Show

PINPOINT	
VUGGY	
DEAD	
EVEN	
QUESTIONABLE	
SPOTTED STAINING	

Engineering

BIT	
CONNECTION (UP)	
CONNECTION (DOW	
CONNECTION GAS	
CONNECTION GA	
TRIP GAS	
TRIP GAS (LEFT)	
DOWN TIME GAS	
DOWN TIME GAS	
CORE - LOST	
CORE - RECOVERED	

Porosity

EARTHY	
FENESTRAL	
FRACTURE	
INTERCRYSTALLINE	
INTEROOLITIC	
MOLDIC	
ORGANIC	

Accessories

- ARGILLITE GRAIN
- BENTONITE
- BITUMENOUS SUBSTANCE
- BRECCIA FRAGMENTS
- CALCAREOUS
- CARBONACEOUS FLAKES
- CHTDK
- CHTLT
- COAL - THIN BEDS
- DOLOMITIC
- FELDSPAR
- FERRUGINOUS PELLET
- FERRUGINOUS
- GLAUCONITE
- GYPSIFEROUS
- HEAVY MINERAL
- KAOLIN
- MARCASITE
- MARLSTONE
- MICACEOUS
- MINERAL CRYSTALS
- NODULES
- PHOSPHATE PELLETS
- PYRITE
- SALT CAST
- SANDY
- SIDERITE
- 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

Other Symbols

- DST INTERVAL
- FAULT
- FORMATION TOP
- GAS SHOW
- OIL SHOW
- MN DEPTH UP
- MN DEPTH (DOWN)
- NORMAL FAULT
- OVERTURNED STRATA
- REVERSE FAULT
- CASING
- SIDEWALL CORE (LEFT)
- SIDEWALL CORE (RIGHT)
- SLIDE
- SURVEY
- WIRELINE TESTED - LEFT
- WIRELINE TESTED - RT
- DRILL STEM TEST
- MN DEPTH

Rounding

- ANGULAR
- ROUNDED
- SUBANG
- SUBRND

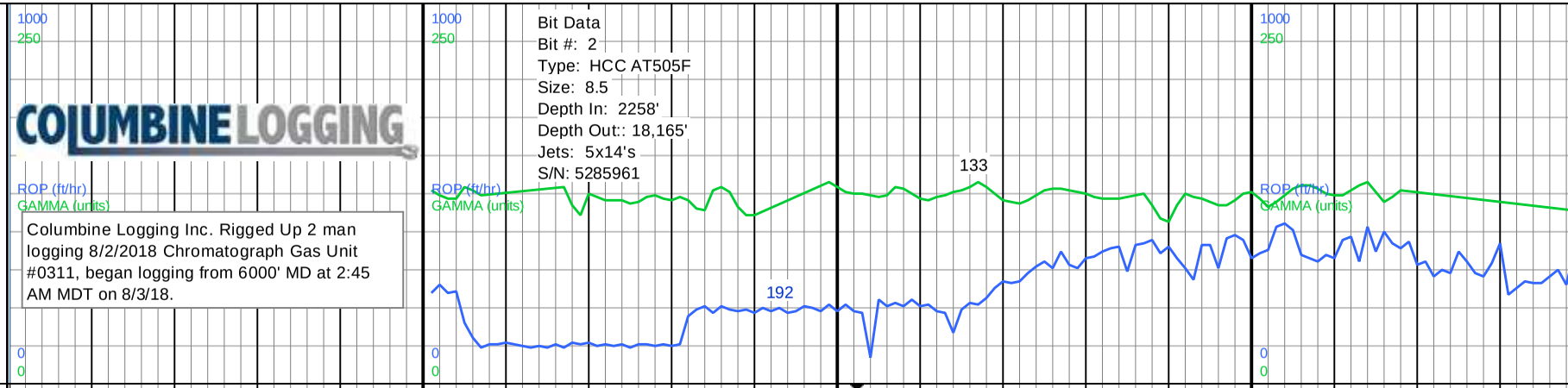
Textures

- BOUNDSTONE
- CHALKY
- CRYPTOXLN
- EARTHY
- FINELYXLN
- GRAINSTONE
- LITHOGRAPHIC
- MICROXLN
- MUDSTONE
- PACKSTONE
- WACKESTONE

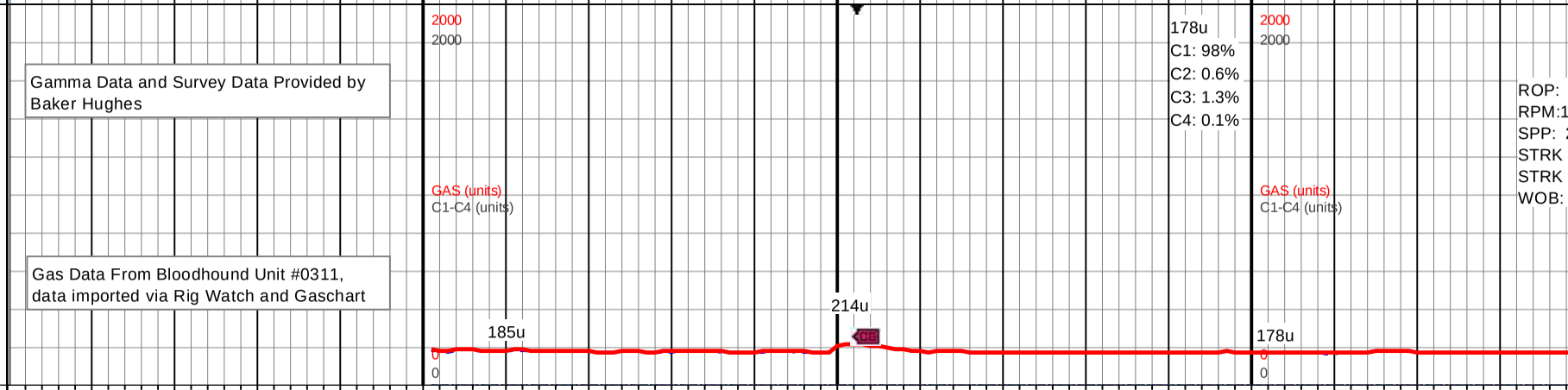
Sorting

- MODERATE
- POOR
- WELL

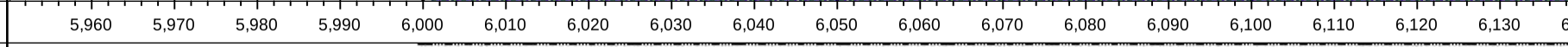
ROP & Gamma
ROP
GAMMA



Total Gas & Chromatograph
GAS
C1
C2
C3
C4

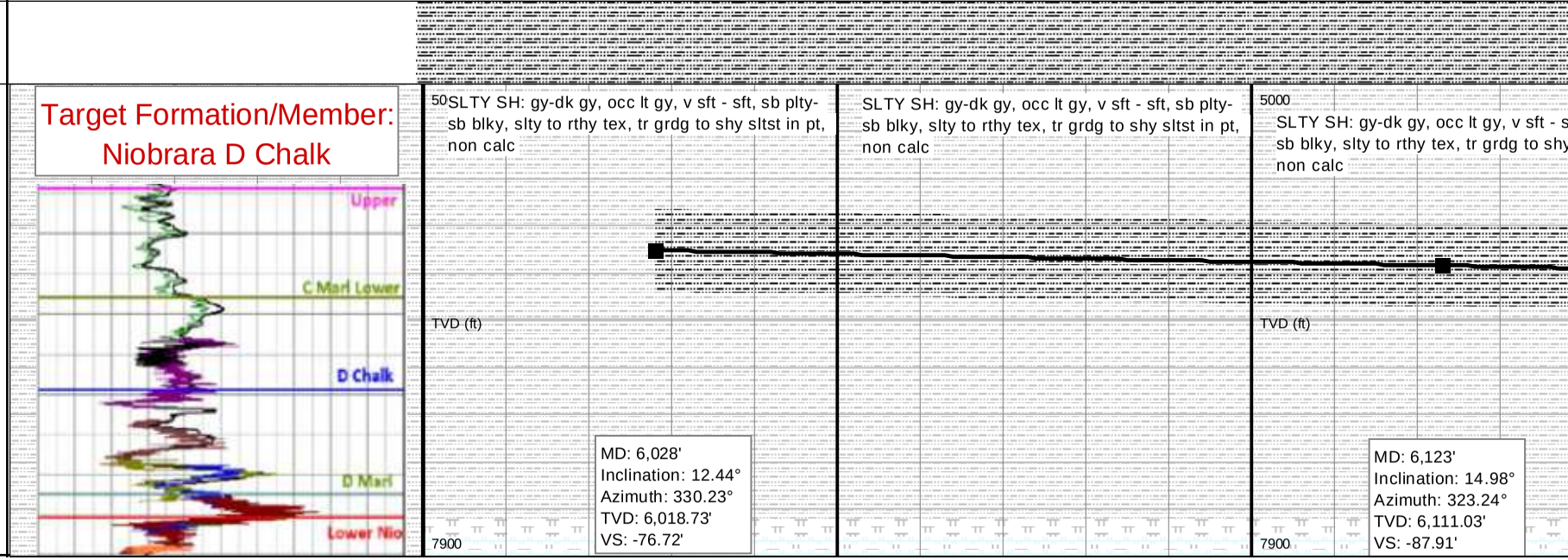


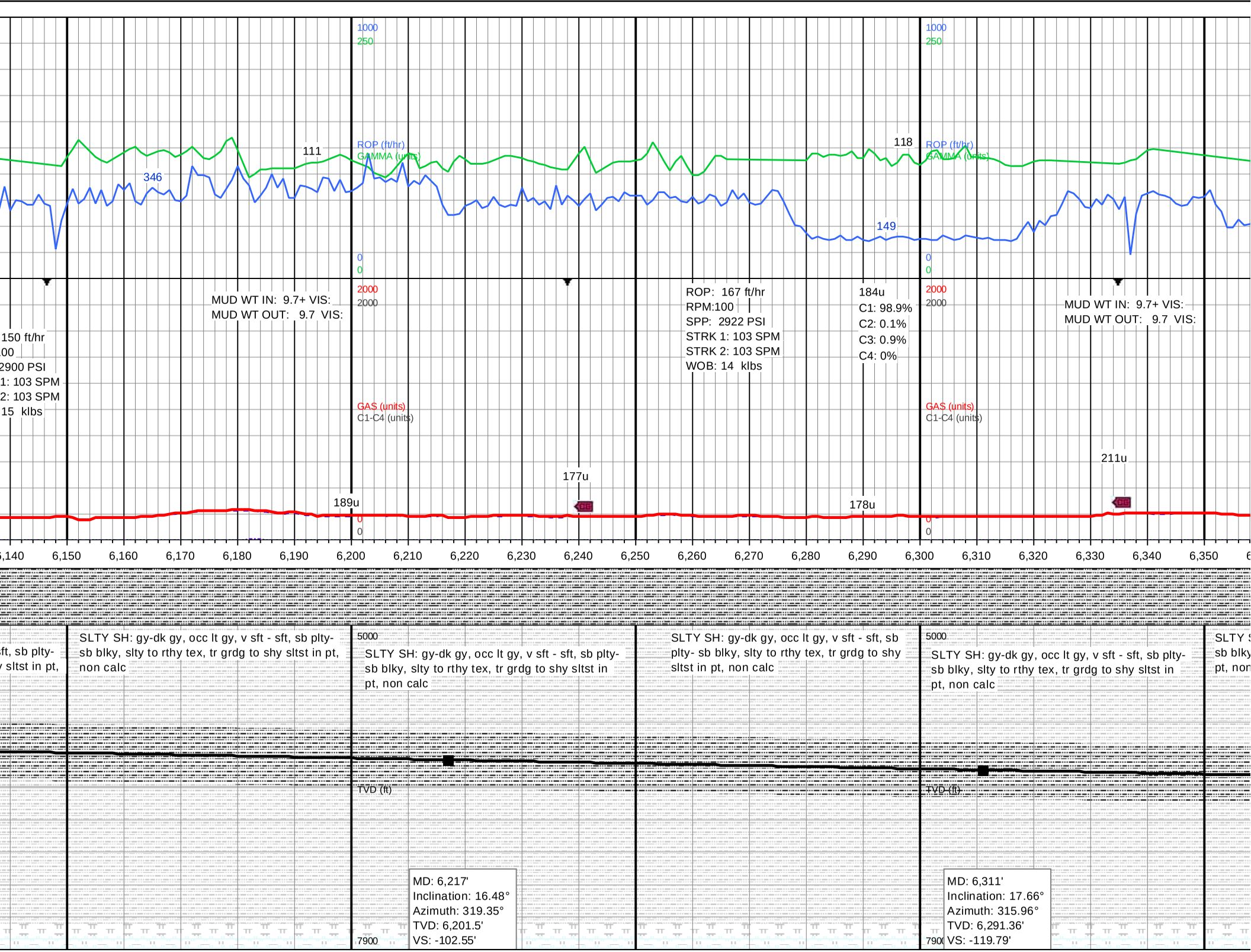
Depth Labels

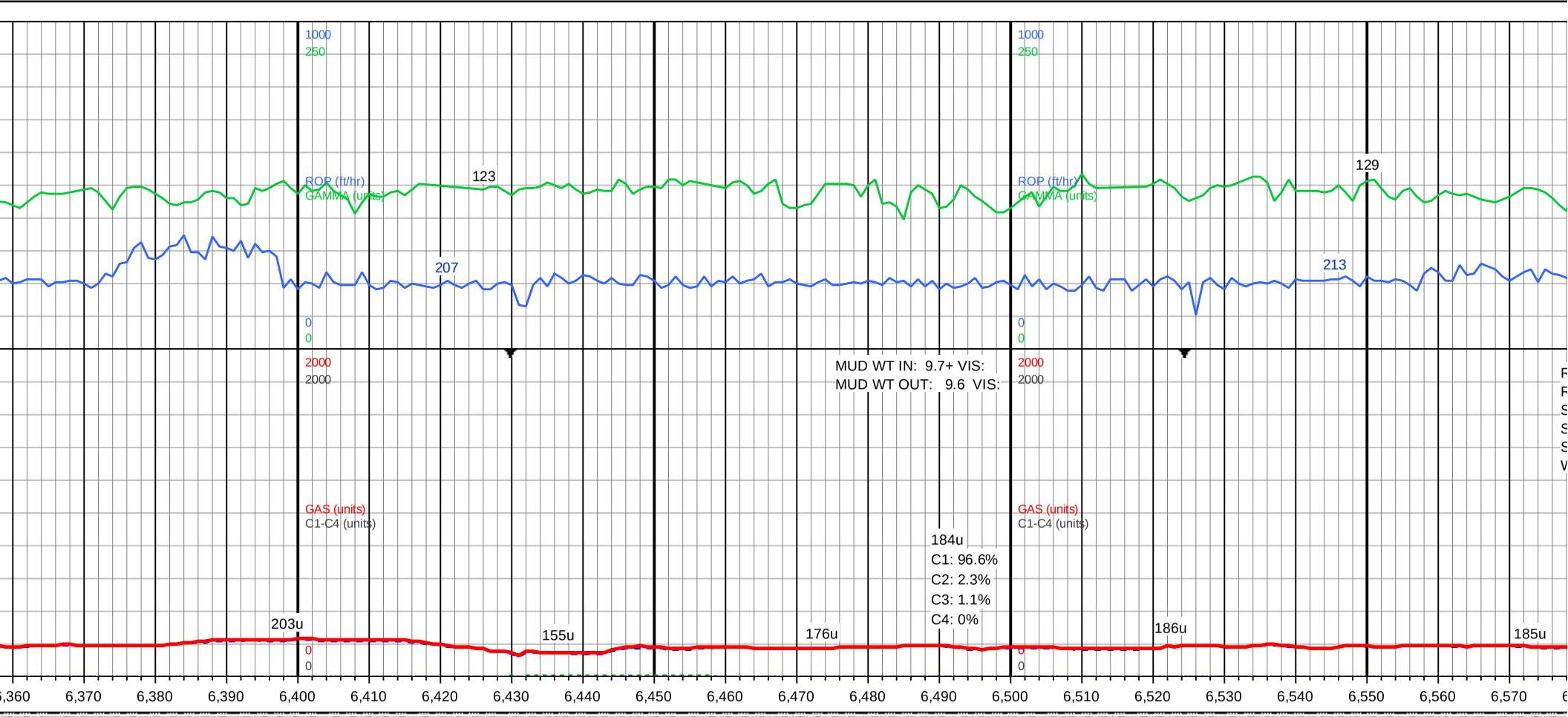


% Lith

Well Bore
TVD




1000
250
ROP (ft/hr)
GAMMA (units)
111
346
0
0
2000
2000
MUD WT IN: 9.7+ VIS:
MUD WT OUT: 9.7 VIS:
150 ft/hr
00
2900 PSI
1: 103 SPM
2: 103 SPM
15 klbs
GAS (units)
C1-C4 (units)
189u
177u
0
0
6,140
6,150
6,160
6,170
6,180
6,190
6,200
6,210
6,220
6,230
6,240
6,250
6,260
6,270
6,280
6,290
6,300
6,310
6,320
6,330
6,340
6,350
1000
250
ROP (ft/hr)
GAMMA (units)
118
149
0
0
2000
2000
ROP: 167 ft/hr
RPM:100
SPP: 2922 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 14 klbs
184u
C1: 98.9%
C2: 0.1%
C3: 0.9%
C4: 0%
GAS (units)
C1-C4 (units)
178u
211u
0
0
MUD WT IN: 9.7+ VIS:
MUD WT OUT: 9.7 VIS:
ft, sb plty-
sltst in pt,
SLTY SH: gy-dk gy, occ lt gy, v sft - sft, sb plty-sb blky, slty to rthy tex, tr grdg to shy sltst in pt, non calc
5000
SLTY SH: gy-dk gy, occ lt gy, v sft - sft, sb plty-sb blky, slty to rthy tex, tr grdg to shy sltst in pt, non calc
SLTY SH: gy-dk gy, occ lt gy, v sft - sft, sb plty- sb blky, slty to rthy tex, tr grdg to shy sltst in pt, non calc
5000
SLTY SH: gy-dk gy, occ lt gy, v sft - sft, sb plty-sb blky, slty to rthy tex, tr grdg to shy sltst in pt, non calc
SLTY S
sb blky
pt, non
TVD (ft)
TVD (ft)
MD: 6,217'
Inclination: 16.48°
Azimuth: 319.35°
TVD: 6,201.5'
VS: -102.55'
7900
MD: 6,311'
Inclination: 17.66°
Azimuth: 315.96°
TVD: 6,291.36'
VS: -119.79'
7900



SH: gy-dk gy, occ lt gy, v sft - sft, sb plty-
, slty to rthy tex, tr grdg to shy sltst in
calc

5000

SLTY SH: gy-dk gy, occ lt gy, v sft - sft, sb plty- sb blky, slty to rthy tex, tr grdg to shy sltst in pt, non calc

TVD (ft)

MD: 6,406'
Inclination: 18.85°
Azimuth: 310.27°
TVD: 6,381.59'
VS: -140.16'

7900

SLTY SH: gy-dk gy, occ lt gy, v sft - sft, sb plty- sb blky, slty to rthy tex, tr grdg to shy sltst in pt, non calc

5000

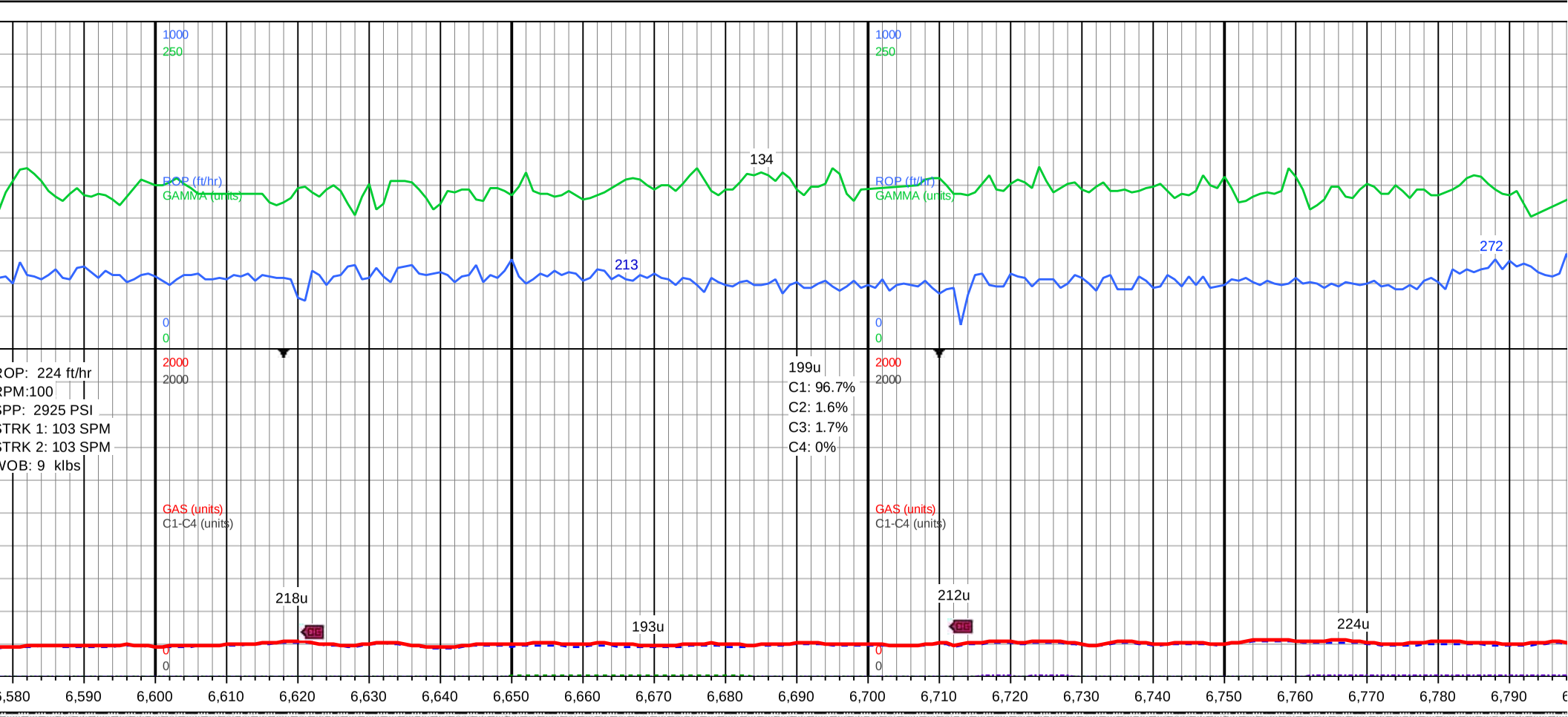
SLTY SH: gy-dk gy, occ lt gy, v sft - sft, sb plty- sb blky, slty to rthy tex, tr grdg to shy sltst in pt, non calc

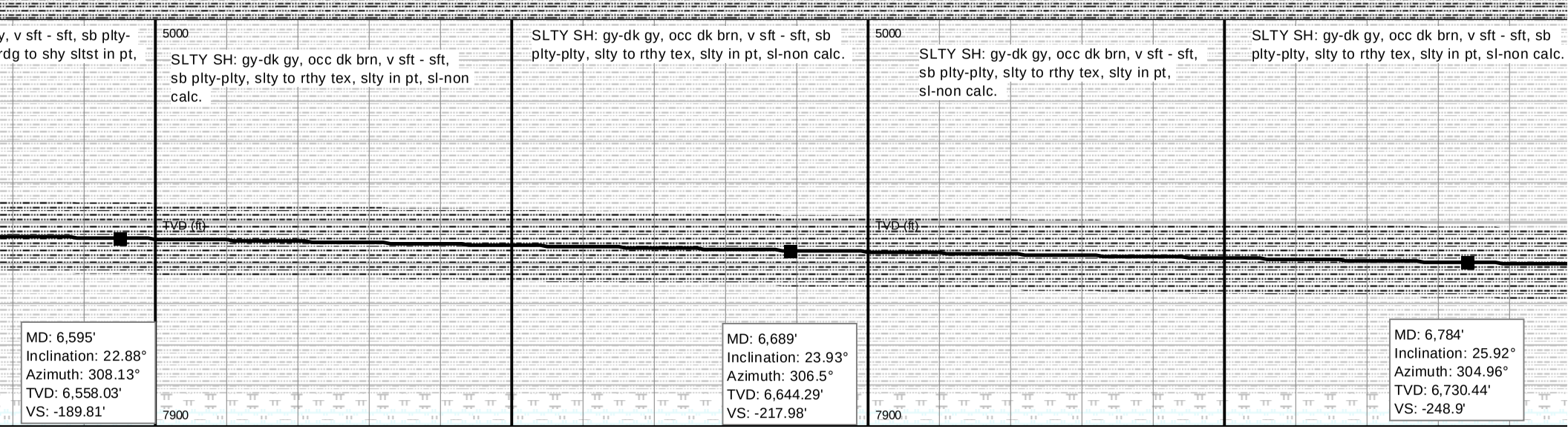
TVD (ft)

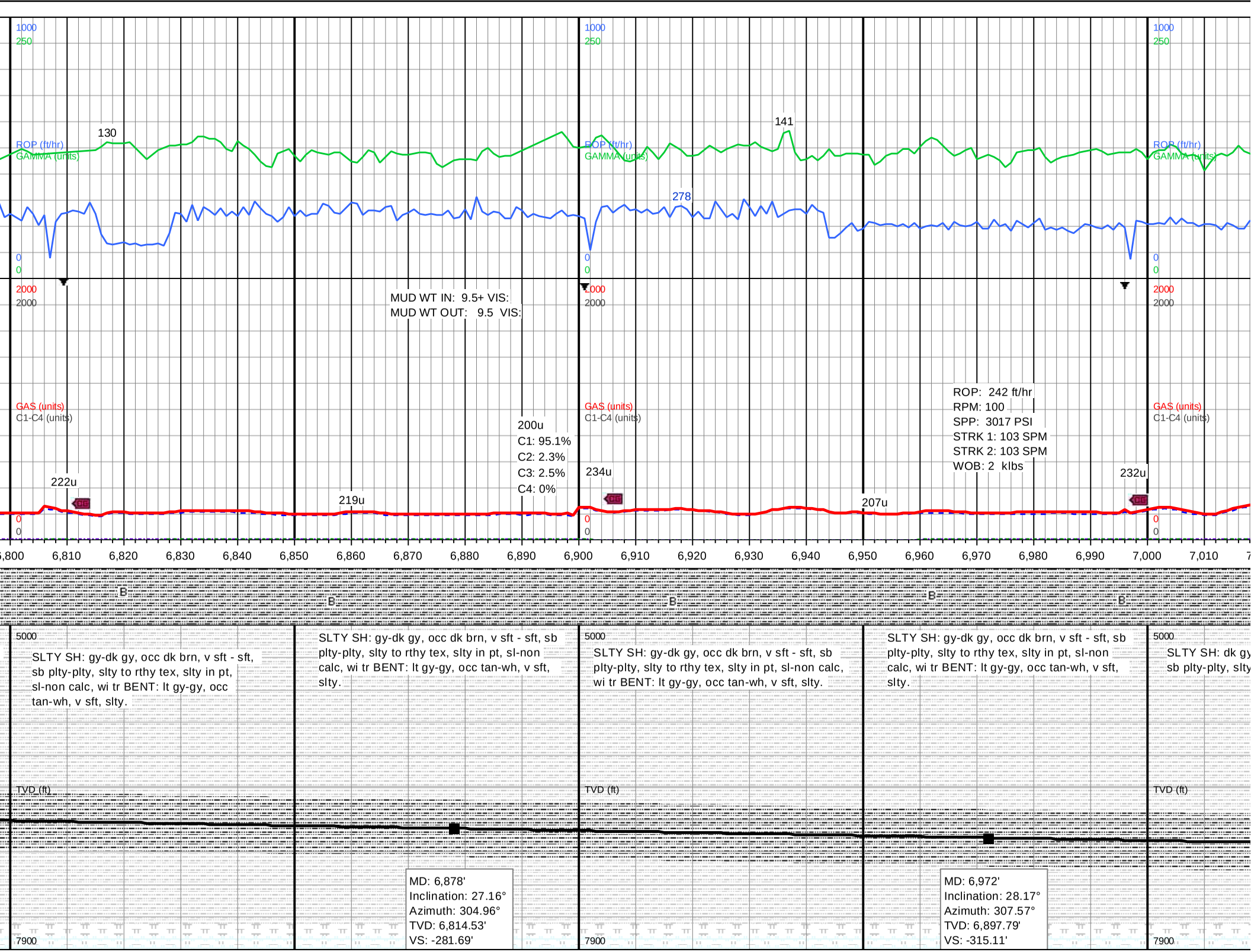
MD: 6,500'
Inclination: 21.08°
Azimuth: 309.02°
TVD: 6,469.93'
VS: -163.5'

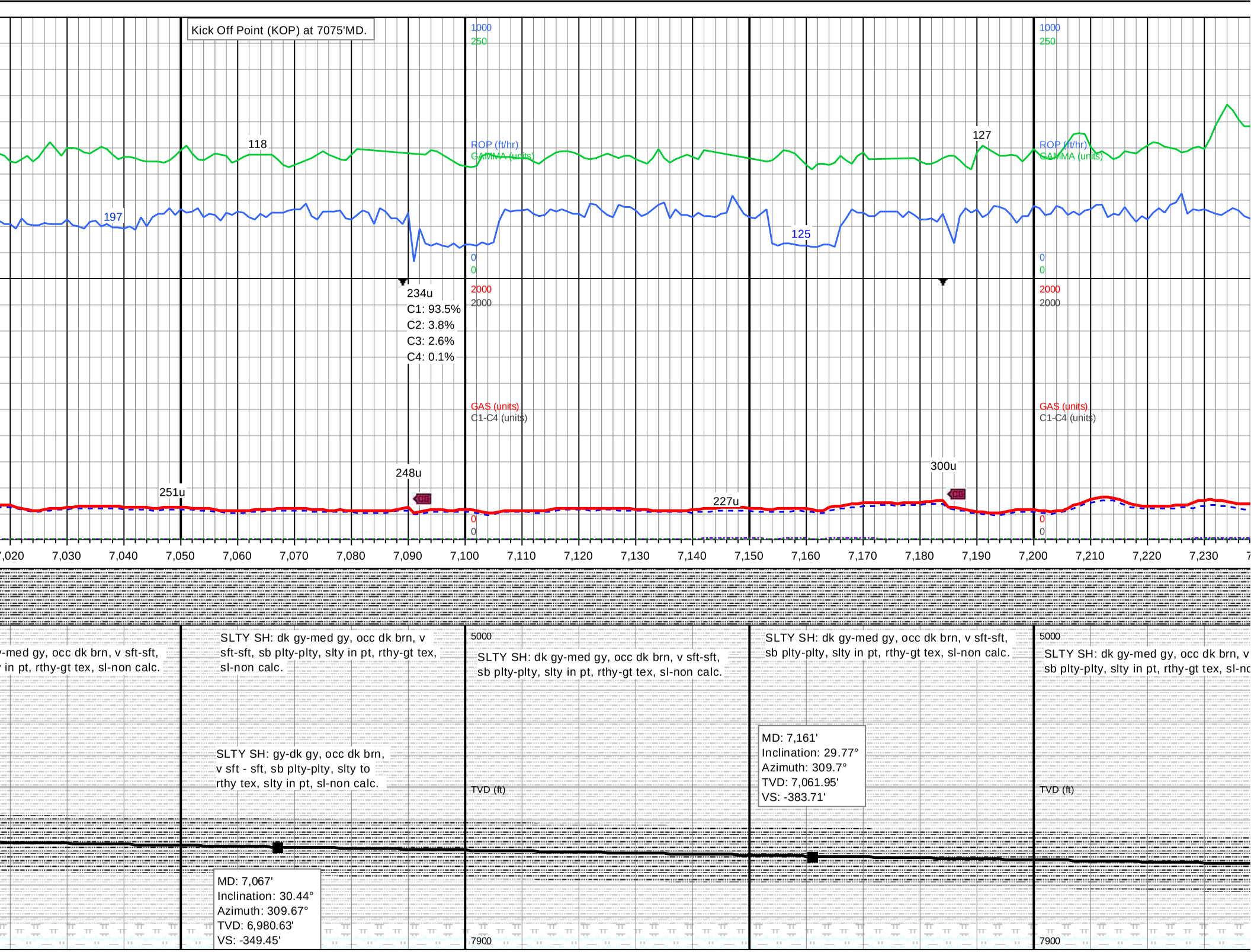
7900

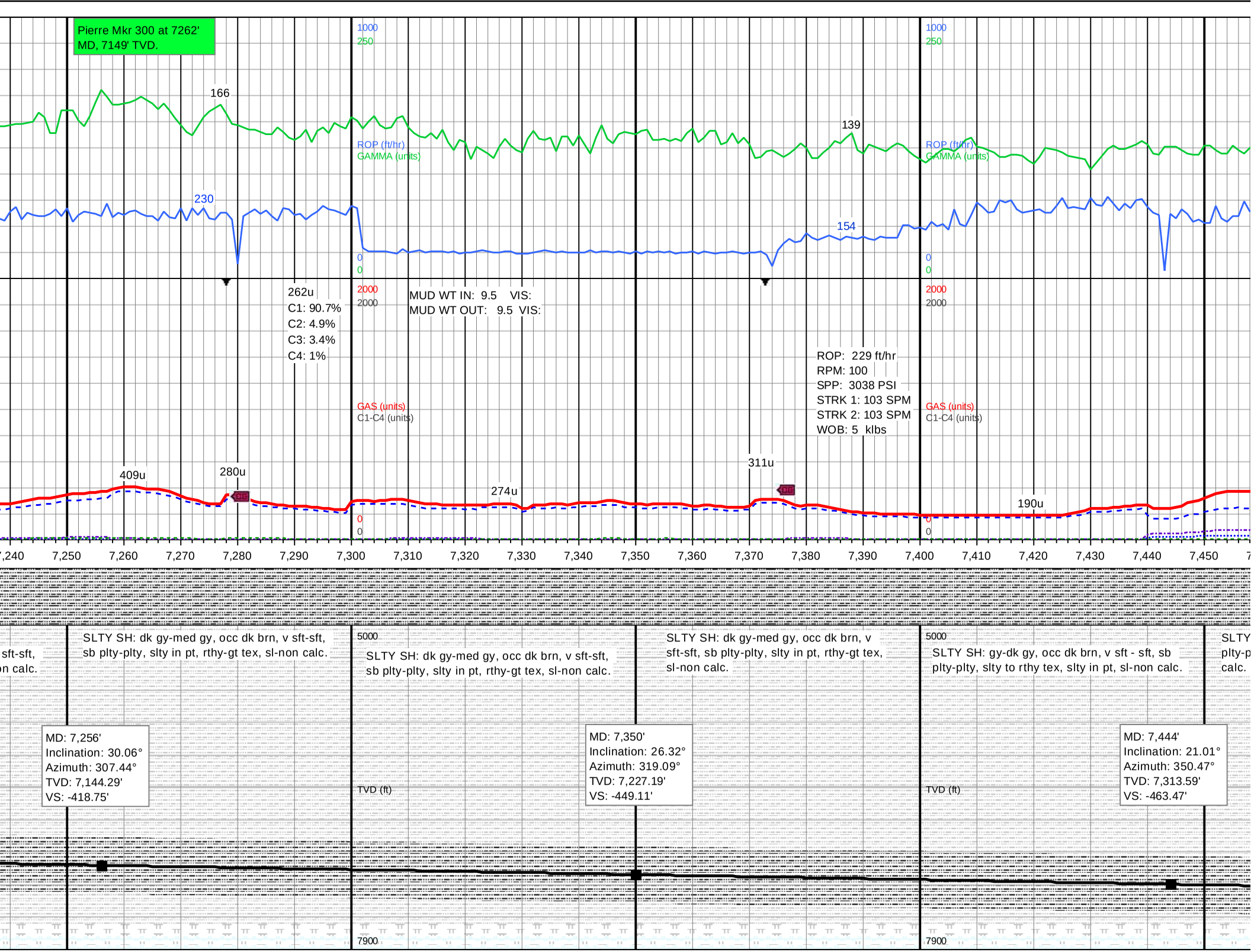
SLTY SH: gy-dk gy, occ lt gy
sb blky, slty to rthy tex, tr g
non calc

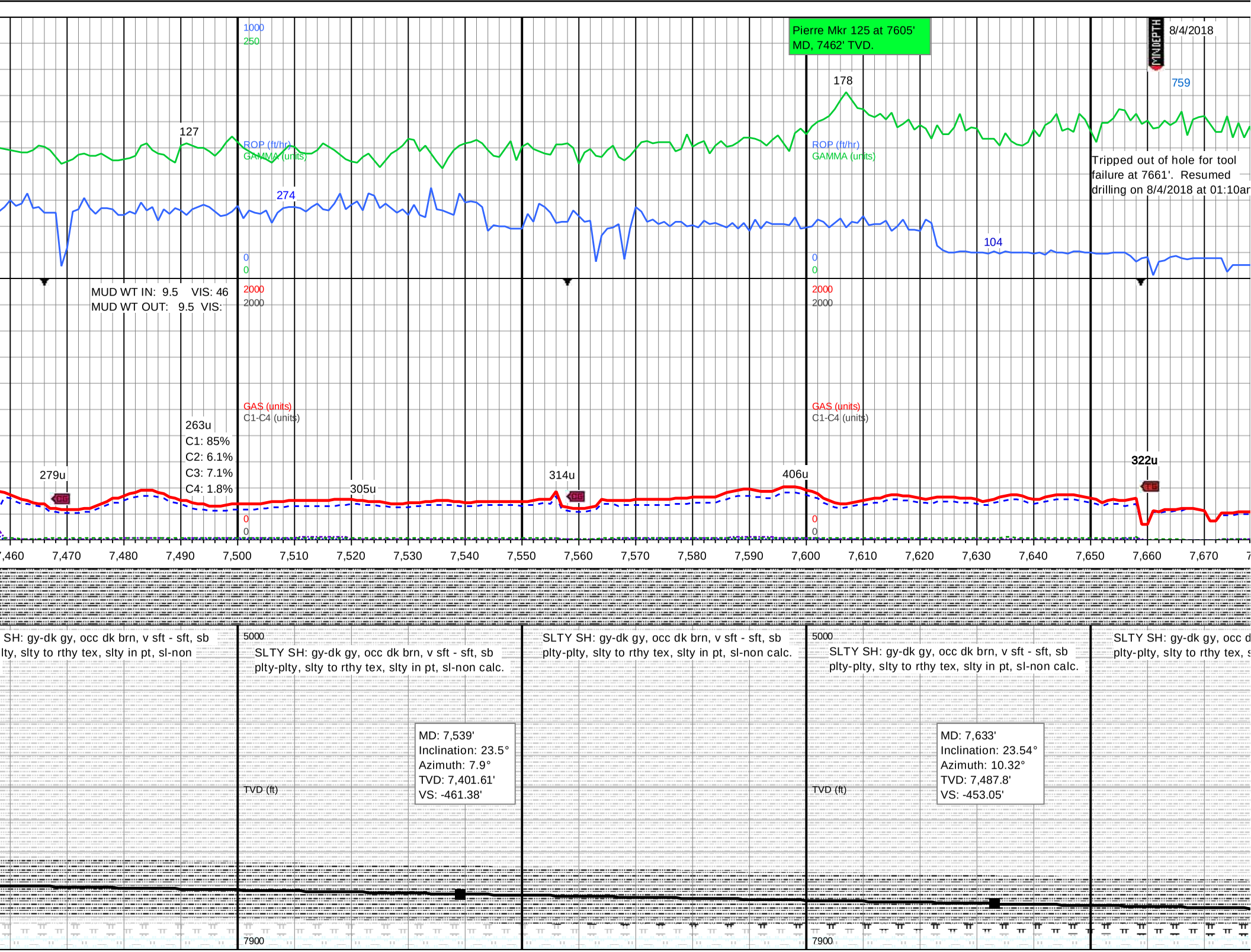

1000
250
ROP (ft/hr)
GAMMA (units)
134
213
272
0
0
2000
2000
ROP: 224 ft/hr
RPM:100
SPP: 2925 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 9 klbs
199u
C1: 96.7%
C2: 1.6%
C3: 1.7%
C4: 0%
GAS (units)
C1-C4 (units)
218u
193u
212u
224u
6,580
6,590
6,600
6,610
6,620
6,630
6,640
6,650
6,660
6,670
6,680
6,690
6,700
6,710
6,720
6,730
6,740
6,750
6,760
6,770
6,780
6,790

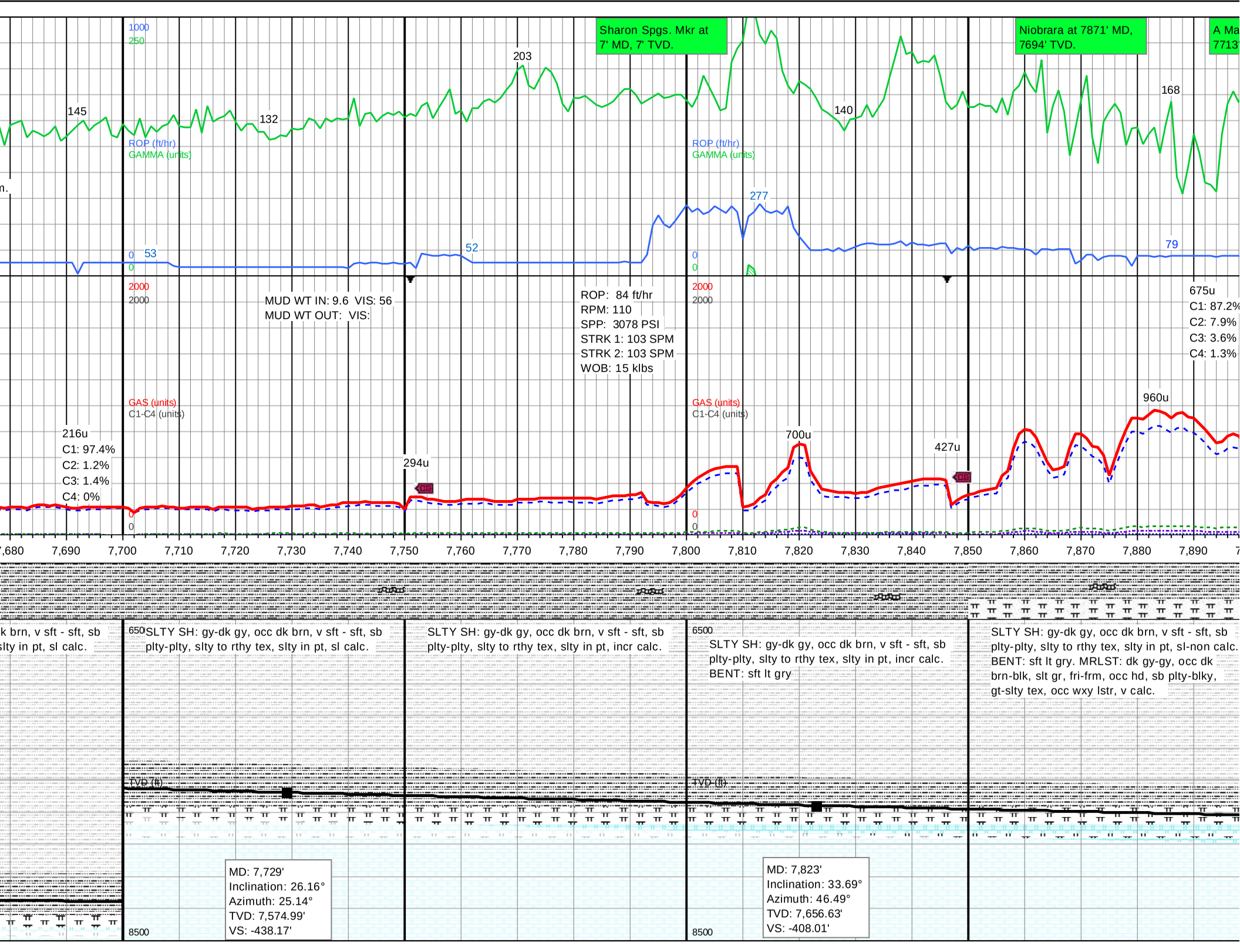

y, v sft - sft, sb plty-
rdg to shy sltst in pt,
5000
SLTY SH: gy-dk gy, occ dk brn, v sft - sft, sb plty-plty, slty to rthy tex, slty in pt, sl-non calc.
TVD (ft)
7900
MD: 6,595'
Inclination: 22.88°
Azimuth: 308.13°
TVD: 6,558.03'
VS: -189.81'
SLTY SH: gy-dk gy, occ dk brn, v sft - sft, sb plty-plty, slty to rthy tex, slty in pt, sl-non calc.
MD: 6,689'
Inclination: 23.93°
Azimuth: 306.5°
TVD: 6,644.29'
VS: -217.98'
SLTY SH: gy-dk gy, occ dk brn, v sft - sft, sb plty-plty, slty to rthy tex, slty in pt, sl-non calc.
MD: 6,784'
Inclination: 25.92°
Azimuth: 304.96°
TVD: 6,730.44'
VS: -248.9'

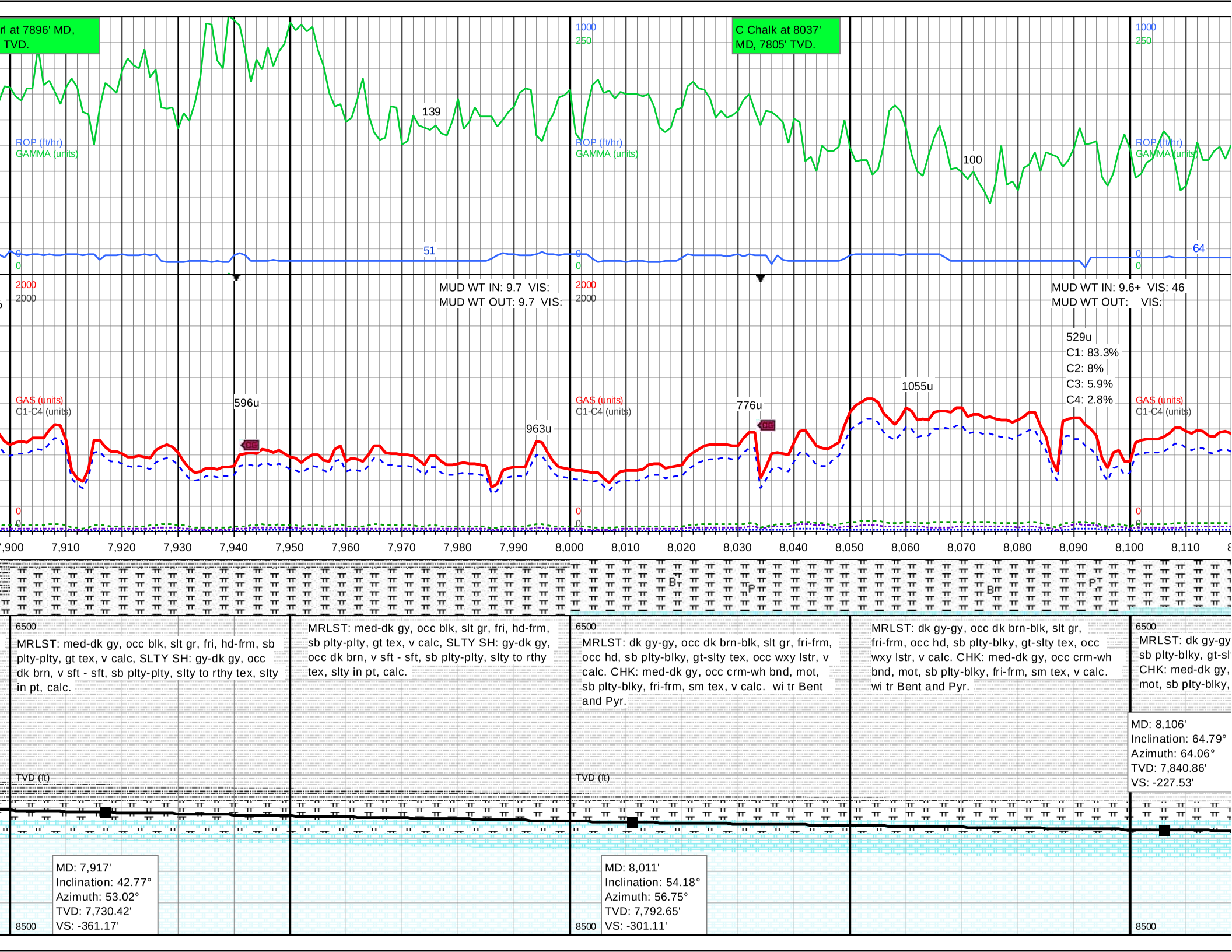

1000
250
ROP (ft/hr)
GAMMA (units)
130
141
278
0
0
2000
2000
MUD WT IN: 9.5+ VIS:
MUD WT OUT: 9.5 VIS:
GAS (units)
C1-C4 (units)
222u
219u
200u
C1: 95.1%
C2: 2.3%
C3: 2.5%
C4: 0%
234u
207u
232u
ROP: 242 ft/hr
RPM: 100
SPP: 3017 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 2 klbs
6,800
6,810
6,820
6,830
6,840
6,850
6,860
6,870
6,880
6,890
6,900
6,910
6,920
6,930
6,940
6,950
6,960
6,970
6,980
6,990
7,000
7,010
B
5000
SLTY SH: gy-dk gy, occ dk brn, v sft - sft, sb plty-plty, slty to rthy tex, slty in pt, sl-non calc, wi tr BENT: lt gy-gy, occ tan-wh, v sft, slty.
TVD (ft)
7900
MD: 6,878'
Inclination: 27.16°
Azimuth: 304.96°
TVD: 6,814.53'
VS: -281.69'
MD: 6,972'
Inclination: 28.17°
Azimuth: 307.57°
TVD: 6,897.79'
VS: -315.11'

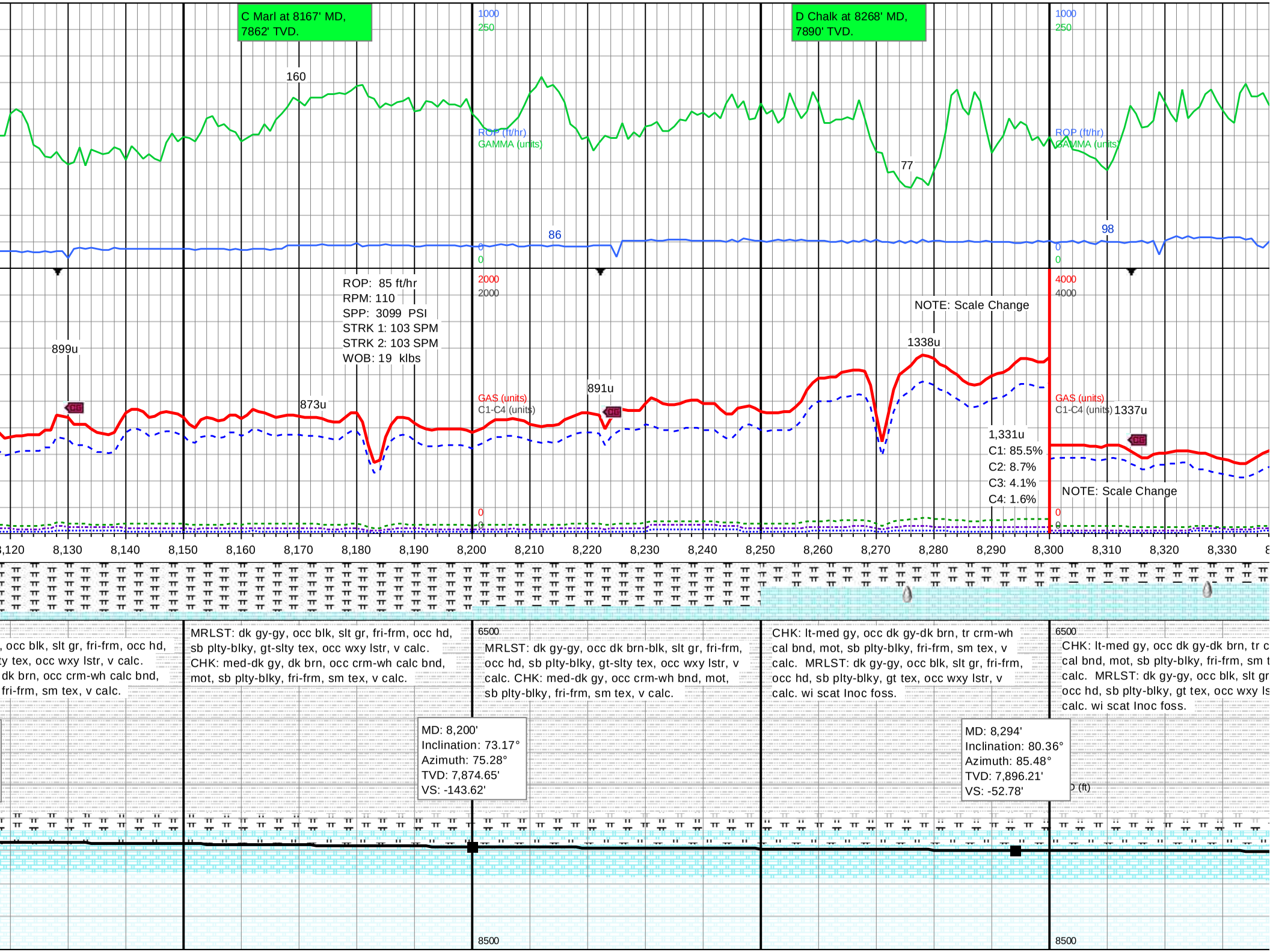

Kick Off Point (KOP) at 7075'MD.
1000
250
ROP (ft/hr)
GAMMA (units)
118
197
0
0
2000
2000
234u
C1: 93.5%
C2: 3.8%
C3: 2.6%
C4: 0.1%
GAS (units)
C1-C4 (units)
251u
248u
227u
300u
127
125
7,020
7,030
7,040
7,050
7,060
7,070
7,080
7,090
7,100
7,110
7,120
7,130
7,140
7,150
7,160
7,170
7,180
7,190
7,200
7,210
7,220
7,230
-med gy, occ dk brn, v sft-sft,
in pt, rthy-gt tex, sl-non calc.
SLTY SH: dk gy-med gy, occ dk brn, v sft-sft, sb plty-plty, slty in pt, rthy-gt tex, sl-non calc.
SLTY SH: gy-dk gy, occ dk brn, v sft - sft, sb plty-plty, slty to rthy tex, slty in pt, sl-non calc.
5000
TVD (ft)
7900
MD: 7,067'
Inclination: 30.44°
Azimuth: 309.67°
TVD: 6,980.63'
VS: -349.45'
SLTY SH: dk gy-med gy, occ dk brn, v sft-sft, sb plty-plty, slty in pt, rthy-gt tex, sl-non calc.
MD: 7,161'
Inclination: 29.77°
Azimuth: 309.7°
TVD: 7,061.95'
VS: -383.71'

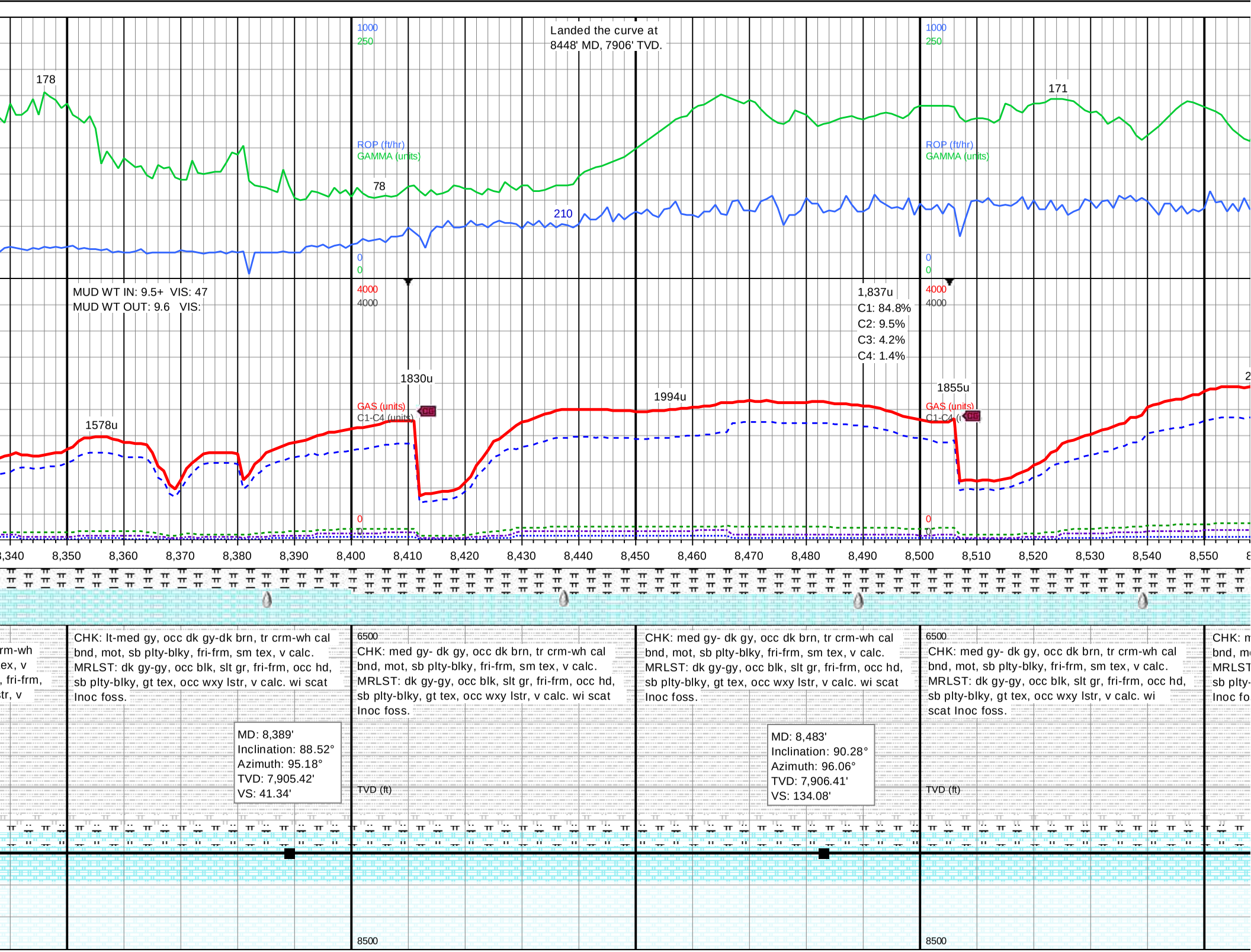

Pierre Mkr 300 at 7262' MD, 7149' TVD.
1000
250
166
ROP (ft/hr)
GAMMA (units)
230
0
0
2000
2000
262u
C1: 90.7%
C2: 4.9%
C3: 3.4%
C4: 1%
MUD WT IN: 9.5 VIS:
MUD WT OUT: 9.5 VIS:
GAS (units)
C1-C4 (units)
409u
280u
274u
311u
190u
139
154
ROP: 229 ft/hr
RPM: 100
SPP: 3038 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 5 klbs
7,240
7,250
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
SLTY SH: dk gy-med gy, occ dk brn, v sft-sft, sb plty-plty, slty in pt, rthy-gt tex, sl-non calc.
MD: 7,256'
Inclination: 30.06°
Azimuth: 307.44°
TVD: 7,144.29'
VS: -418.75'
5000
SLTY SH: dk gy-med gy, occ dk brn, v sft-sft, sb plty-plty, slty in pt, rthy-gt tex, sl-non calc.
MD: 7,350'
Inclination: 26.32°
Azimuth: 319.09°
TVD: 7,227.19'
VS: -449.11'
SLTY SH: dk gy-med gy, occ dk brn, v sft-sft, sb plty-plty, slty in pt, rthy-gt tex, sl-non calc.
5000
SLTY SH: gy-dk gy, occ dk brn, v sft - sft, sb plty-plty, slty to rthy tex, slty in pt, sl-non calc.
MD: 7,444'
Inclination: 21.01°
Azimuth: 350.47°
TVD: 7,313.59'
VS: -463.47'
TVD (ft)
7900

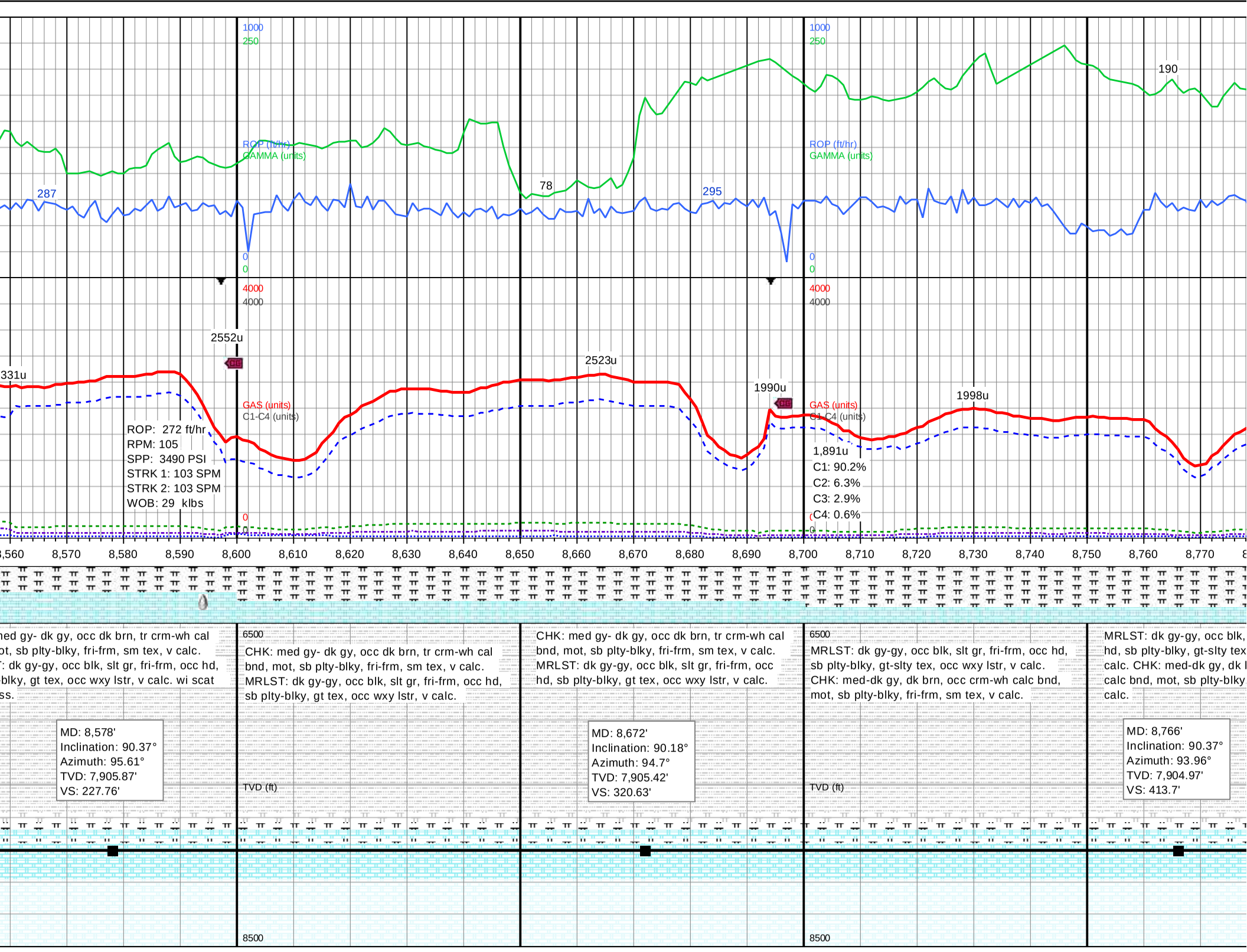

Pierre Mkr 125 at 7605' MD, 7462' TVD.
8/4/2018
MNODEPTH
759
1000
250
127
178
ROP (ft/hr)
GAMMA (units)
274
104
Tripped out of hole for tool failure at 7661'. Resumed drilling on 8/4/2018 at 01:10ar
MUD WT IN: 9.5 VIS: 46
MUD WT OUT: 9.5 VIS:
2000
GAS (units)
C1-C4 (units)
263u
C1: 85%
C2: 6.1%
C3: 7.1%
C4: 1.8%
279u
305u
314u
406u
322u
7,460
7,470
7,480
7,490
7,500
7,510
7,520
7,530
7,540
7,550
7,560
7,570
7,580
7,590
7,600
7,610
7,620
7,630
7,640
7,650
7,660
7,670
SH: gy-dk gy, occ dk brn, v sft - sft, sb
lty, slty to rthy tex, slty in pt, sl-non
5000
SLTY SH: gy-dk gy, occ dk brn, v sft - sft, sb
plty-plty, slty to rthy tex, slty in pt, sl-non calc.
MD: 7,539'
Inclination: 23.5°
Azimuth: 7.9°
TVD: 7,401.61'
VS: -461.38'
TVD (ft)
7900
SLTY SH: gy-dk gy, occ dk brn, v sft - sft, sb
plty-plty, slty to rthy tex, slty in pt, sl-non calc.
5000
SLTY SH: gy-dk gy, occ dk brn, v sft - sft, sb
plty-plty, slty to rthy tex, slty in pt, sl-non calc.
MD: 7,633'
Inclination: 23.54°
Azimuth: 10.32°
TVD: 7,487.8'
VS: -453.05'
TVD (ft)
7900
SLTY SH: gy-dk gy, occ d
plty-plty, slty to rthy tex, s

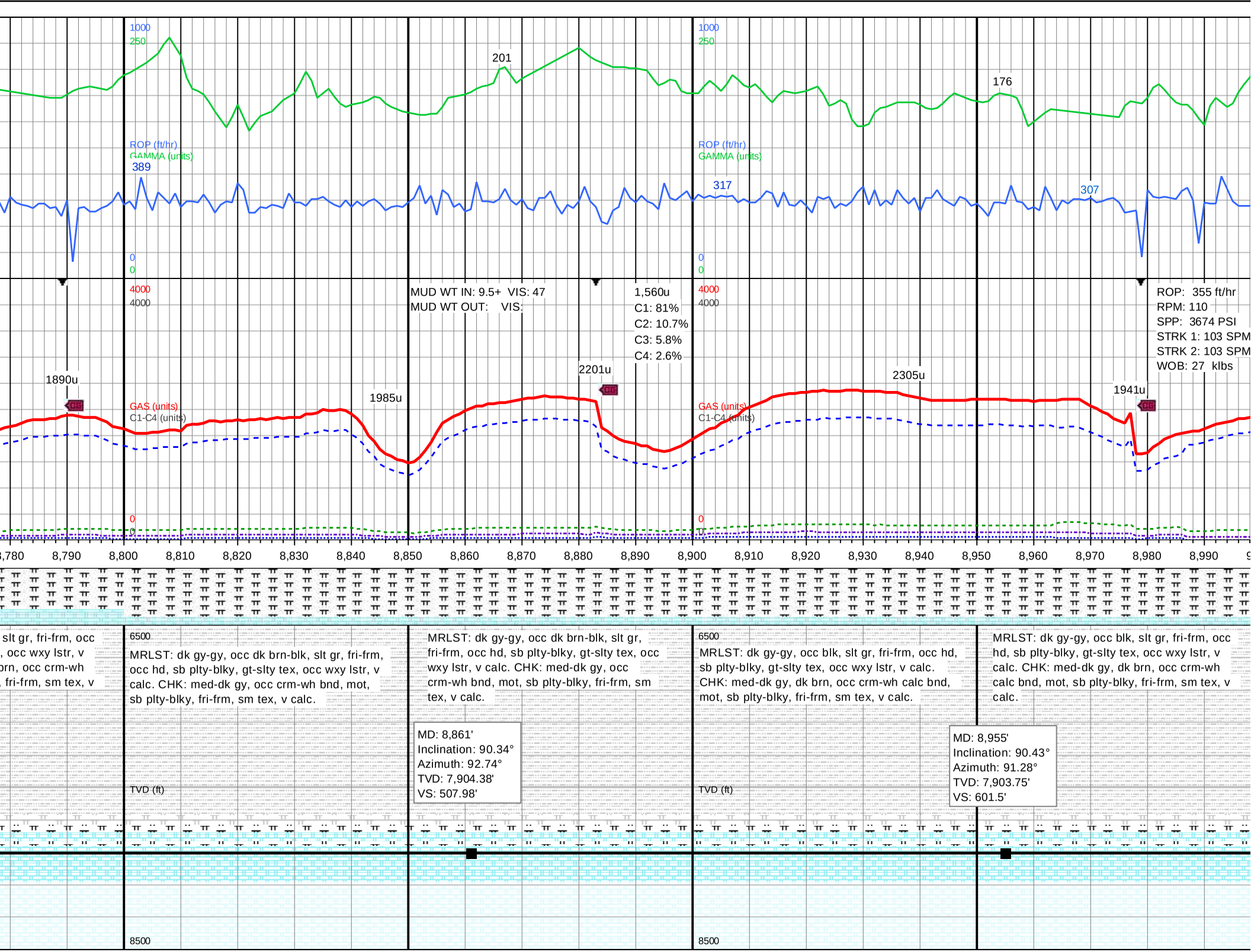

Sharon Spgs. Mkr at 7' MD, 7' TVD.
Niobrara at 7871' MD, 7694' TVD.
A Ma 7713
1000
250
ROP (ft/hr)
GAMMA (units)
145
132
203
140
168
277
79
52
53
0
0
2000
2000
MUD WT IN: 9.6 VIS: 56
MUD WT OUT: VIS:
ROP: 84 ft/hr
RPM: 110
SPP: 3078 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 15 klbs
675u
C1: 87.2%
C2: 7.9%
C3: 3.6%
C4: 1.3%
GAS (units)
C1-C4 (units)
216u
C1: 97.4%
C2: 1.2%
C3: 1.4%
C4: 0%
294u
700u
427u
960u
7,680
7,690
7,700
7,710
7,720
7,730
7,740
7,750
7,760
7,770
7,780
7,790
7,800
7,810
7,820
7,830
7,840
7,850
7,860
7,870
7,880
7,890
k brn, v sft - sft, sb
slty in pt, sl calc.
650
SLTY SH: gy-dk gy, occ dk brn, v sft - sft, sb plty-plty, slty to rthy tex, slty in pt, sl calc.
SLTY SH: gy-dk gy, occ dk brn, v sft - sft, sb plty-plty, slty to rthy tex, slty in pt, incr calc.
6500
SLTY SH: gy-dk gy, occ dk brn, v sft - sft, sb plty-plty, slty to rthy tex, slty in pt, incr calc.
BENT: sft lt gry
SLTY SH: gy-dk gy, occ dk brn, v sft - sft, sb plty-plty, slty to rthy tex, slty in pt, sl-non calc.
BENT: sft lt gry. MRLST: dk gy-gy, occ dk brn-blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc.
TVD (ft)
MD: 7,729'
Inclination: 26.16°
Azimuth: 25.14°
TVD: 7,574.99'
VS: -438.17'
MD: 7,823'
Inclination: 33.69°
Azimuth: 46.49°
TVD: 7,656.63'
VS: -408.01'
8500

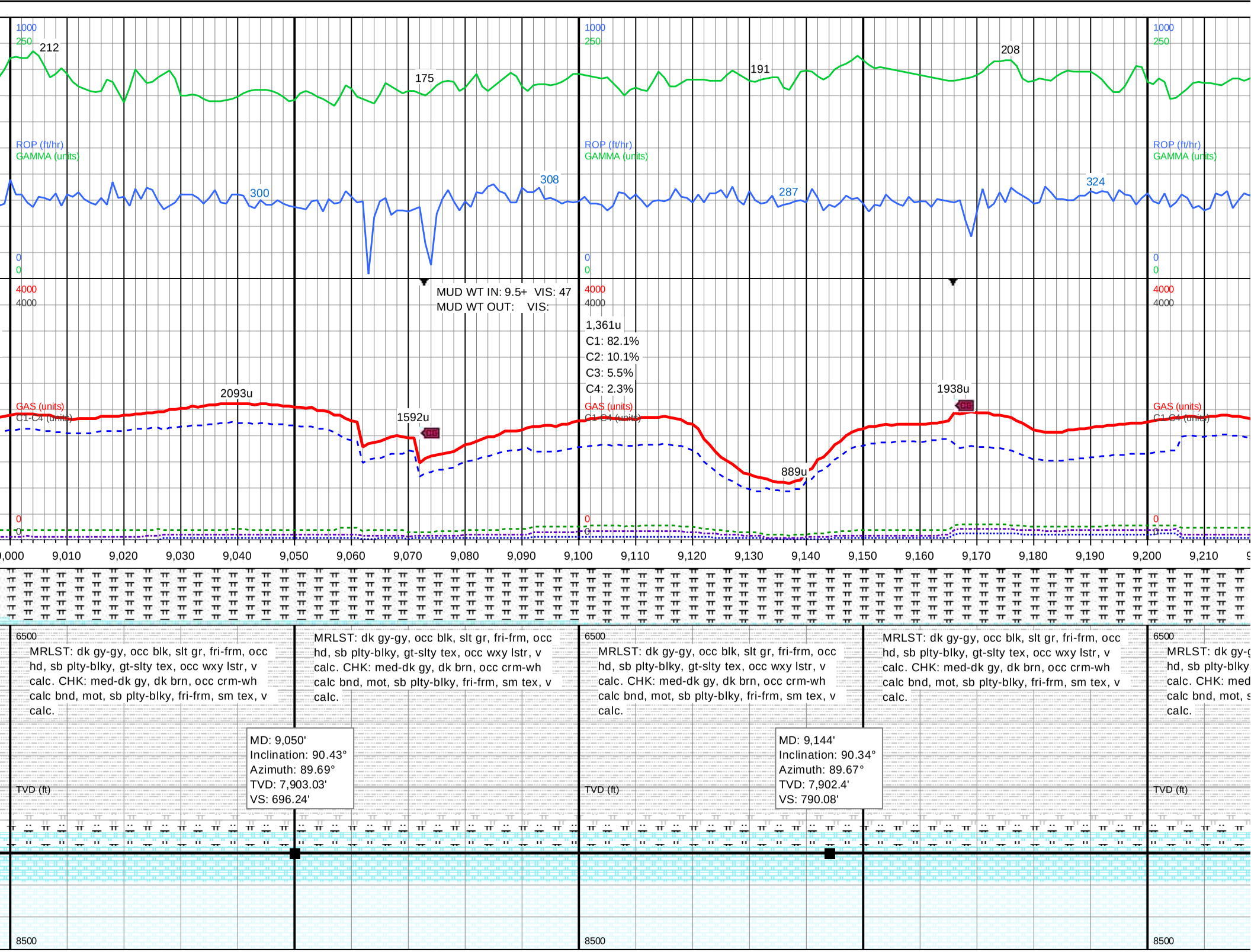

rl at 7896' MD,
TVD.
C Chalk at 8037'
MD, 7805' TVD.
ROP (ft/hr)
GAMMA (units)
1000
250
139
100
51
64
MUD WT IN: 9.7 VIS:
MUD WT OUT: 9.7 VIS:
MUD WT IN: 9.6+ VIS: 46
MUD WT OUT: VIS:
GAS (units)
C1-C4 (units)
2000
596u
963u
776u
1055u
529u
C1: 83.3%
C2: 8%
C3: 5.9%
C4: 2.8%
7,900
7,910
7,920
7,930
7,940
7,950
7,960
7,970
7,980
7,990
8,000
8,010
8,020
8,030
8,040
8,050
8,060
8,070
8,080
8,090
8,100
8,110
6500
MRLST: med-dk gy, occ blk, slt gr, fri, hd-frm, sb plty-plty, gt tex, v calc, SLTY SH: gy-dk gy, occ dk brn, v sft - sft, sb plty-plty, slty to rthy tex, slty in pt, calc.
MRLST: med-dk gy, occ blk, slt gr, fri, hd-frm, sb plty-plty, gt tex, v calc, SLTY SH: gy-dk gy, occ dk brn, v sft - sft, sb plty-plty, slty to rthy tex, slty in pt, calc.
MRLST: dk gy-gy, occ dk brn-blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, occ crm-wh bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. wi tr Bent and Pyr.
MRLST: dk gy-gy, occ dk brn-blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, occ crm-wh bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. wi tr Bent and Pyr.
MRLST: dk gy-gy
sb plty-blky, gt-sl
CHK: med-dk gy,
mot, sb plty-blky,
TVD (ft)
8500
MD: 7,917'
Inclination: 42.77°
Azimuth: 53.02°
TVD: 7,730.42'
VS: -361.17'
MD: 8,011'
Inclination: 54.18°
Azimuth: 56.75°
TVD: 7,792.65'
VS: -301.11'
MD: 8,106'
Inclination: 64.79°
Azimuth: 64.06°
TVD: 7,840.86'
VS: -227.53'

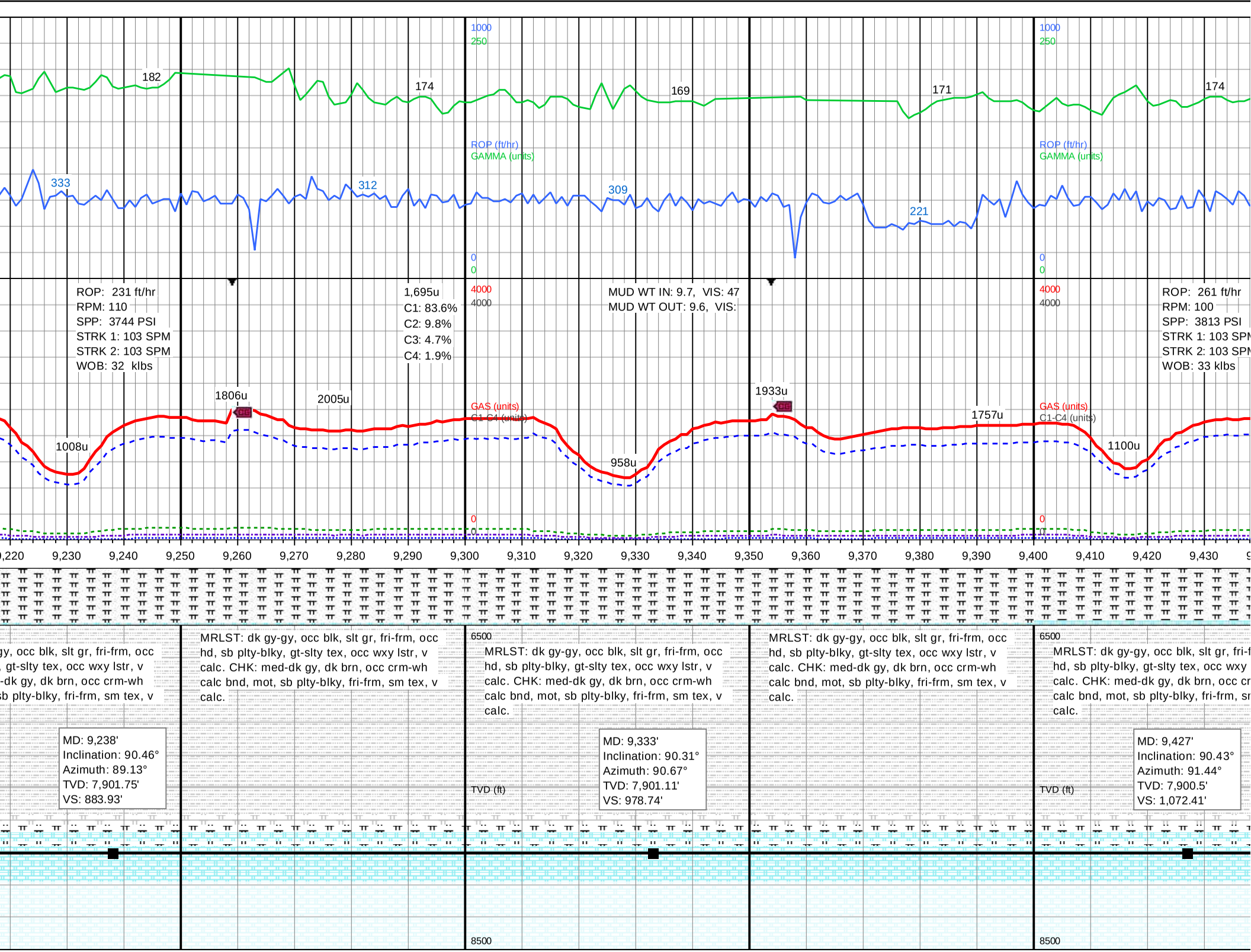

C Marl at 8167' MD, 7862' TVD.
D Chalk at 8268' MD, 7890' TVD.
1000
250
ROP (ft/hr)
GAMMA (units)
160
77
86
98
0
0
ROP: 85 ft/hr
RPM: 110
SPP: 3099 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 19 klbs
2000
2000
4000
4000
NOTE: Scale Change
899u
873u
891u
1338u
1337u
1,331u
C1: 85.5%
C2: 8.7%
C3: 4.1%
C4: 1.6%
GAS (units)
C1-C4 (units)
NOTE: Scale Change
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
8,330
, occ blk, slt gr, fri-frm, occ hd,
y tex, occ wxy lstr, v calc.
dk brn, occ crm-wh calc bnd,
fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
6500
MRLST: dk gy-gy, occ dk brn-blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, occ crm-wh bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
CHK: lt-med gy, occ dk gy-dk brn, tr crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc. wi scat Inoc foss.
6500
CHK: lt-med gy, occ dk gy-dk brn, tr c
cal bnd, mot, sb plty-blky, fri-frm, sm t
calc. MRLST: dk gy-gy, occ blk, slt gr
occ hd, sb plty-blky, gt tex, occ wxy ls
calc. wi scat Inoc foss.
MD: 8,200'
Inclination: 73.17°
Azimuth: 75.28°
TVD: 7,874.65'
VS: -143.62'
MD: 8,294'
Inclination: 80.36°
Azimuth: 85.48°
TVD: 7,896.21'
VS: -52.78'
D (ft)
8500
8500

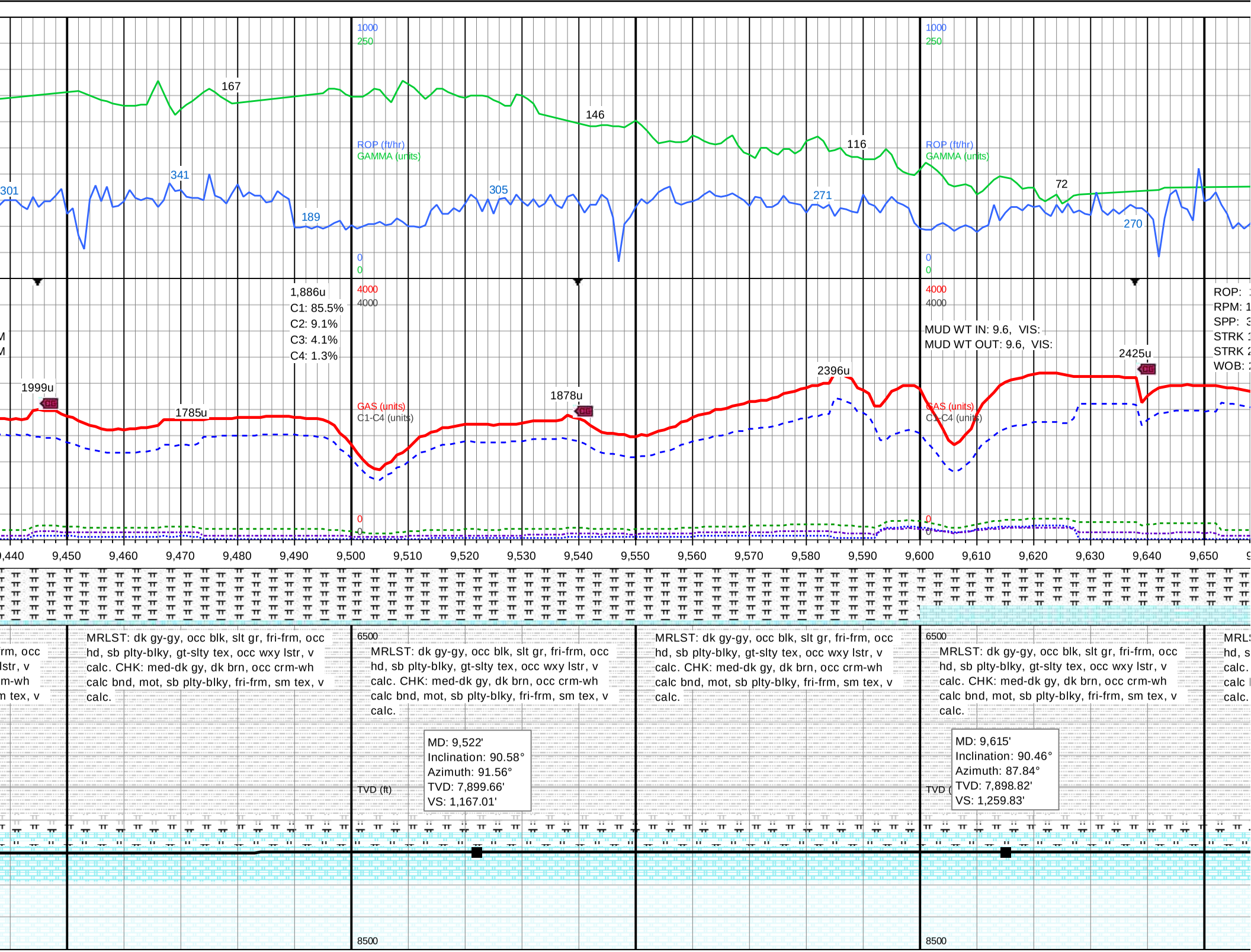

Landed the curve at
8448' MD, 7906' TVD.
1000
250
ROP (ft/hr)
GAMMA (units)
178
78
210
171
0
0
MUD WT IN: 9.5+ VIS: 47
MUD WT OUT: 9.6 VIS:
4000
4000
1,837u
C1: 84.8%
C2: 9.5%
C3: 4.2%
C4: 1.4%
1830u
1994u
1855u
1578u
GAS (units)
C1-C4 (units)
0
8,340
8,350
8,360
8,370
8,380
8,390
8,400
8,410
8,420
8,430
8,440
8,450
8,460
8,470
8,480
8,490
8,500
8,510
8,520
8,530
8,540
8,550
CHK: lt-med gy, occ dk gy-dk brn, tr crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc. wi scat Inoc foss.
MD: 8,389'
Inclination: 88.52°
Azimuth: 95.18°
TVD: 7,905.42'
VS: 41.34'
6500
CHK: med gy- dk gy, occ dk brn, tr crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc. wi scat Inoc foss.
TVD (ft)
8500
MD: 8,483'
Inclination: 90.28°
Azimuth: 96.06°
TVD: 7,906.41'
VS: 134.08'

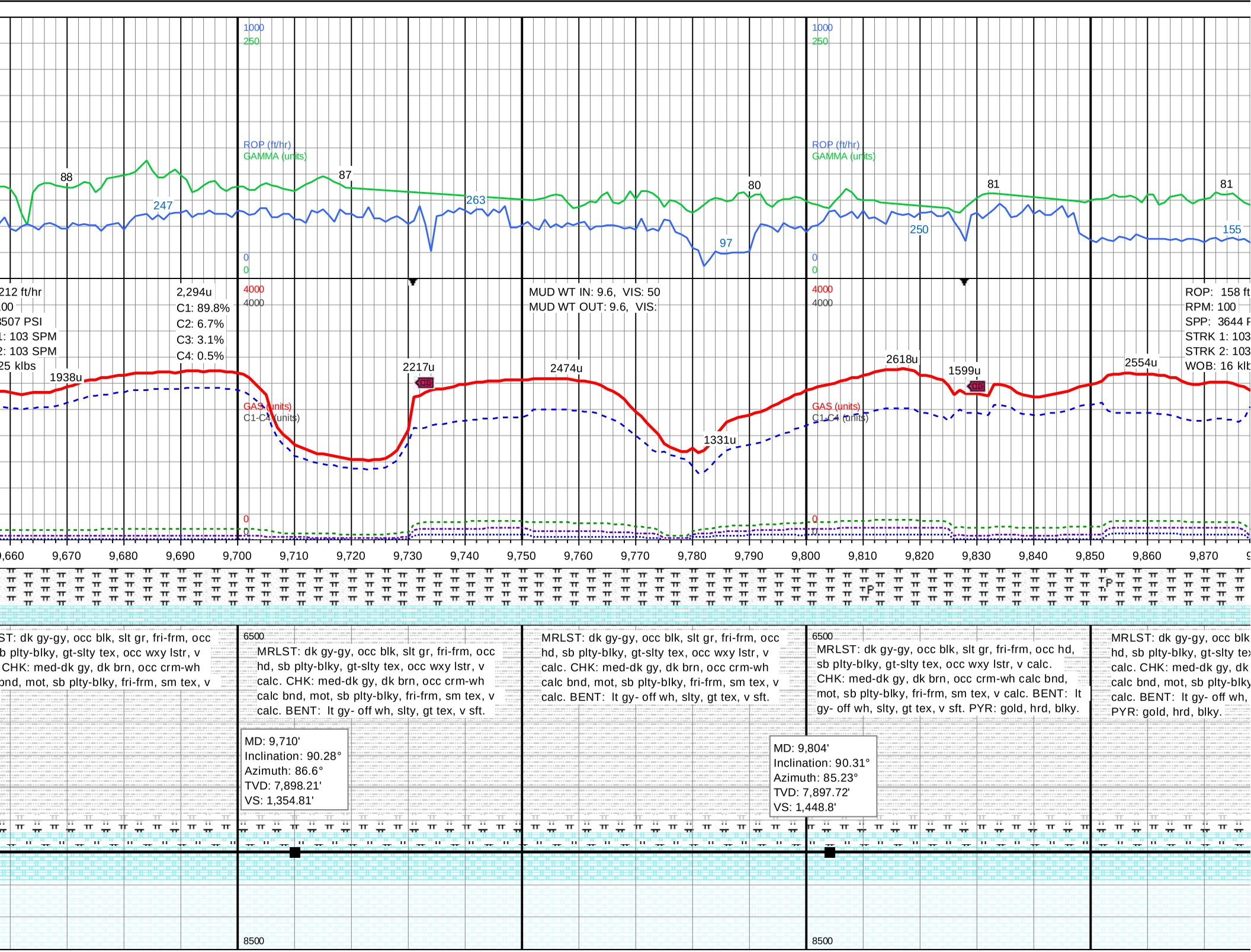

1000
250
ROP (ft/hr)
GAMMA (units)
287
78
295
190
0
0
4000
4000
2552u
2523u
1990u
1998u
331u
GAS (units)
C1-C4 (units)
ROP: 272 ft/hr
RPM: 105
SPP: 3490 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 29 klbs
1,891u
C1: 90.2%
C2: 6.3%
C3: 2.9%
C4: 0.6%
8,560
8,570
8,580
8,590
8,600
8,610
8,620
8,630
8,640
8,650
8,660
8,670
8,680
8,690
8,700
8,710
8,720
8,730
8,740
8,750
8,760
8,770
med gy- dk gy, occ dk brn, tr crm-wh cal
ot, sb plty-blky, fri-frm, sm tex, v calc.
: dk gy-gy, occ blk, slt gr, fri-frm, occ hd,
blky, gt tex, occ wxy lstr, v calc. wi scat
ss.
MD: 8,578'
Inclination: 90.37°
Azimuth: 95.61°
TVD: 7,905.87'
VS: 227.76'
6500
CHK: med gy- dk gy, occ dk brn, tr crm-wh cal
bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd,
sb plty-blky, gt tex, occ wxy lstr, v calc.
TVD (ft)
8500
CHK: med gy- dk gy, occ dk brn, tr crm-wh cal
bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
MD: 8,672'
Inclination: 90.18°
Azimuth: 94.7°
TVD: 7,905.42'
VS: 320.63'
6500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd,
sb plty-blky, gt-slty tex, occ wxy lstr, v calc.
CHK: med-dk gy, dk brn, occ crm-wh calc bnd,
mot, sb plty-blky, fri-frm, sm tex, v calc.
TVD (ft)
8500
MRLST: dk gy-gy, occ blk,
hd, sb plty-blky, gt-slty tex
calc. CHK: med-dk gy, dk
calc bnd, mot, sb plty-blky
calc.
MD: 8,766'
Inclination: 90.37°
Azimuth: 93.96°
TVD: 7,904.97'
VS: 413.7'

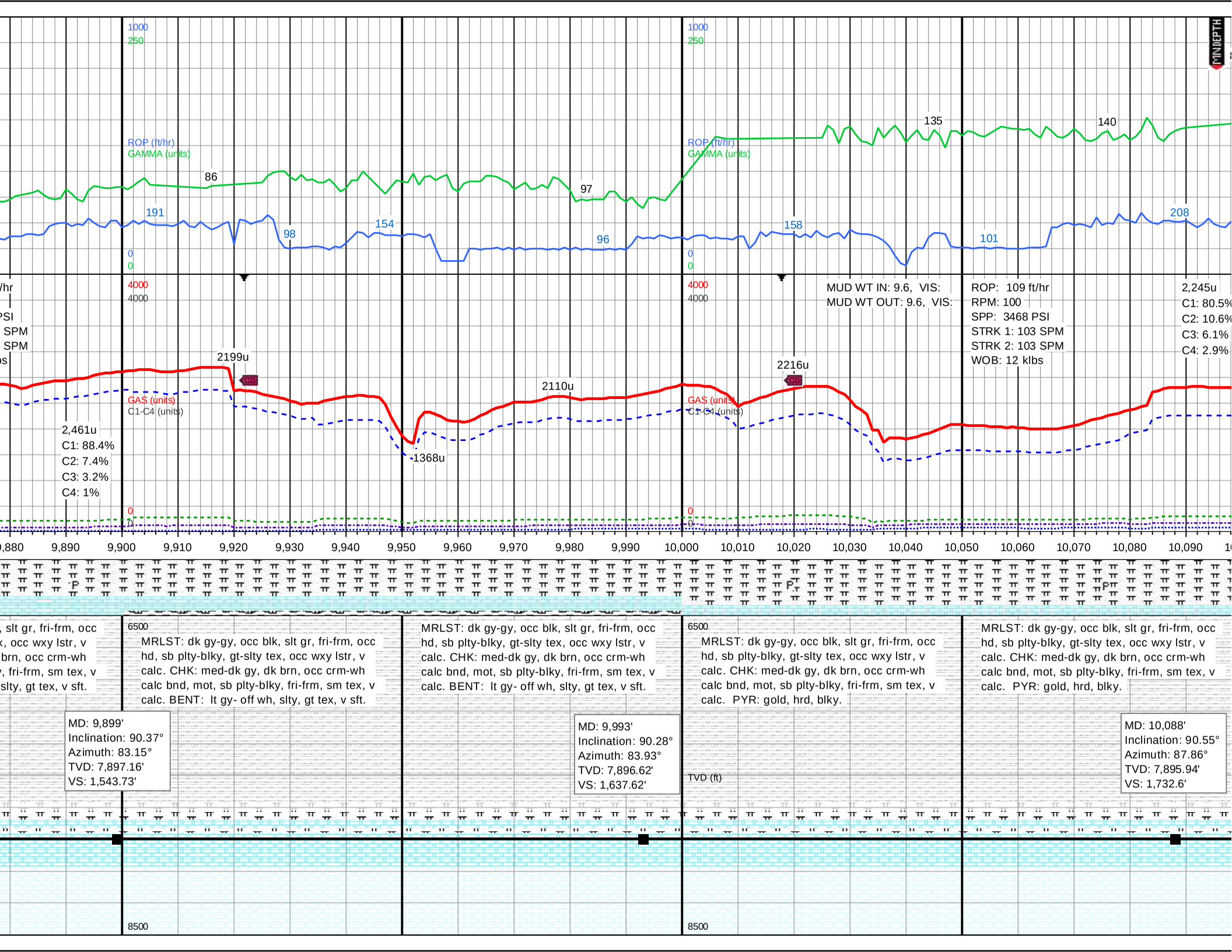

1000
250
201
ROP (ft/hr)
GAMMA (units)
389
0
0
1000
250
176
ROP (ft/hr)
GAMMA (units)
317
307
0
0
4000
4000
MUD WT IN: 9.5+ VIS: 47
MUD WT OUT: VIS:
1,560u
C1: 81%
C2: 10.7%
C3: 5.8%
C4: 2.6%
4000
4000
ROP: 355 ft/hr
RPM: 110
SPP: 3674 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 27 klbs
1890u
1985u
2201u
2305u
1941u
GAS (units)
C1-C4 (units)
GAS (units)
C1-C4 (units)
0
0
0
0
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
8,990
slt gr, fri-frm, occ
, occ wxy lstr, v
brn, occ crm-wh
, fri-frm, sm tex, v
6500
MRLST: dk gy-gy, occ dk brn-blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, occ crm-wh bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
TVD (ft)
8500
MRLST: dk gy-gy, occ dk brn-blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, occ crm-wh bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MD: 8,861'
Inclination: 90.34°
Azimuth: 92.74°
TVD: 7,904.38'
VS: 507.98'
6500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
TVD (ft)
8500
MD: 8,955'
Inclination: 90.43°
Azimuth: 91.28°
TVD: 7,903.75'
VS: 601.5'
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.

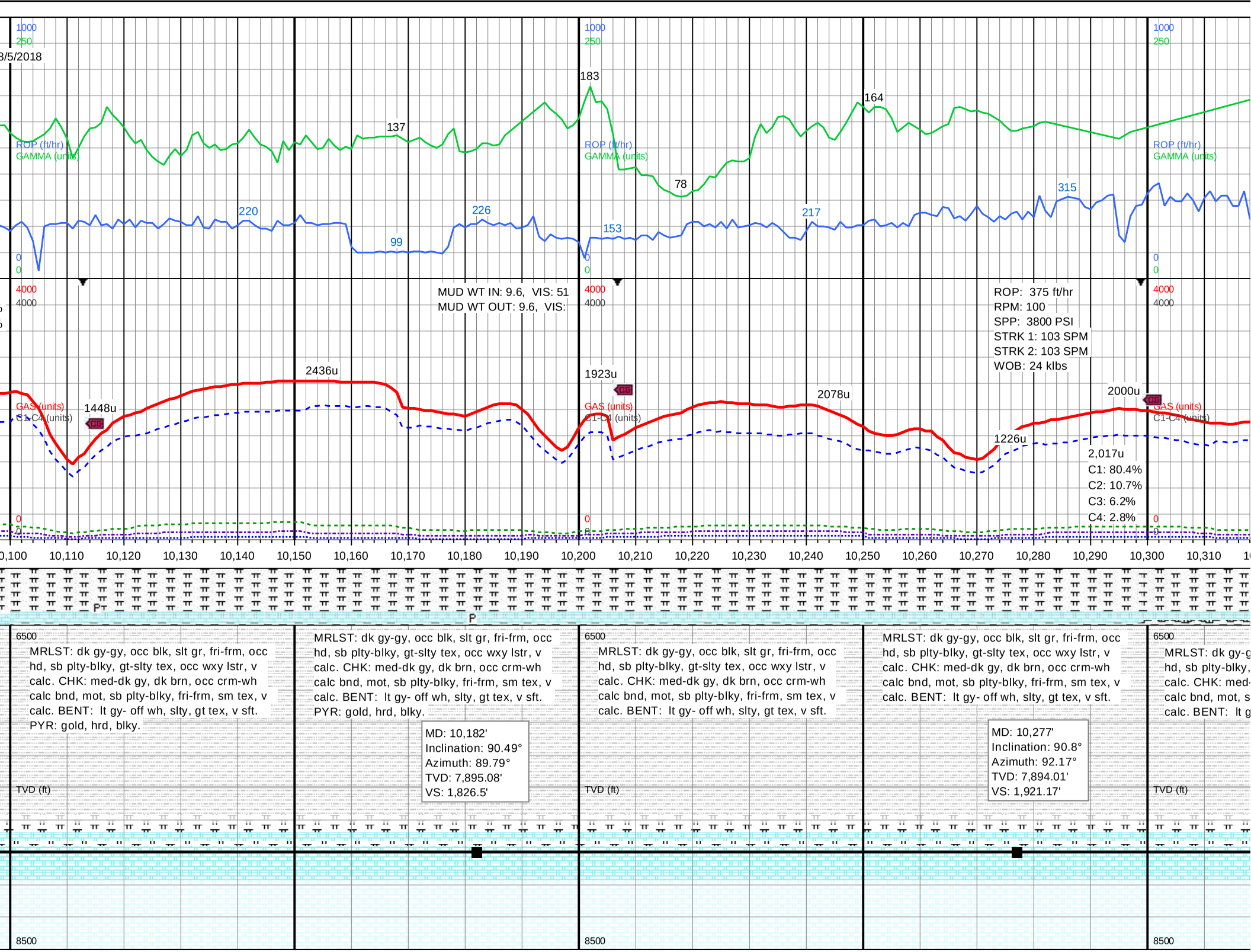

1000
250
212
175
191
208
ROP (ft/hr)
GAMMA (units)
300
308
287
324
0
0
4000
4000
MUD WT IN: 9.5+ VIS: 47
MUD WT OUT: VIS:
1,361u
C1: 82.1%
C2: 10.1%
C3: 5.5%
C4: 2.3%
GAS (units)
C1-C4 (units)
2093u
1592u
1938u
889u
9,000
9,010
9,020
9,030
9,040
9,050
9,060
9,070
9,080
9,090
9,100
9,110
9,120
9,130
9,140
9,150
9,160
9,170
9,180
9,190
9,200
9,210
6500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v
calc. CHK: med-dk gy, dk brn, occ crm-wh
calc bnd, mot, sb plty-blky, fri-frm, sm tex, v
calc.
MD: 9,050'
Inclination: 90.43°
Azimuth: 89.69°
TVD: 7,903.03'
VS: 696.24'
MD: 9,144'
Inclination: 90.34°
Azimuth: 89.67°
TVD: 7,902.4'
VS: 790.08'
TVD (ft)
8500

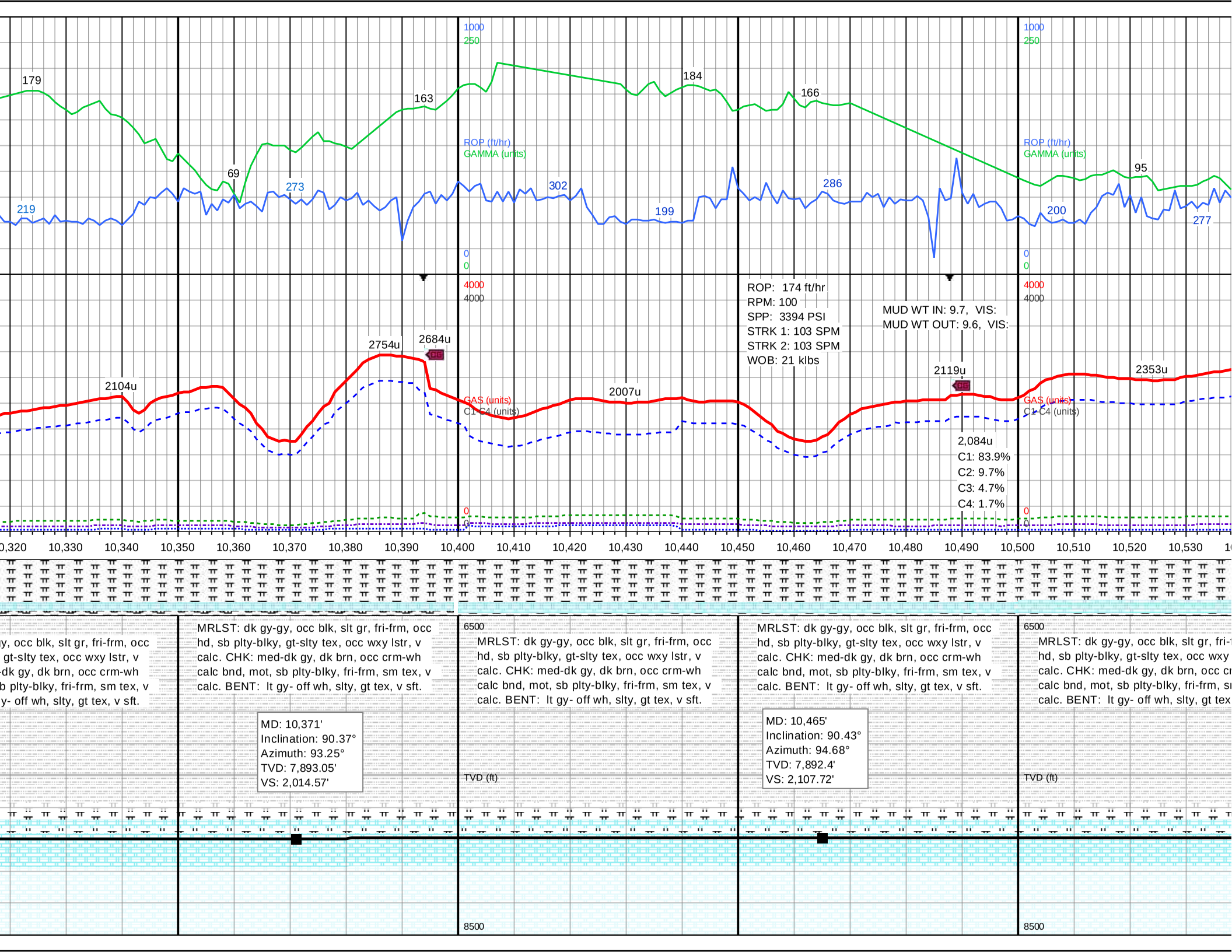

1000
250
182
174
169
171
174
ROP (ft/hr)
GAMMA (units)
333
312
309
221
0
0
ROP: 231 ft/hr
RPM: 110
SPP: 3744 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 32 klbs
1,695u
C1: 83.6%
C2: 9.8%
C3: 4.7%
C4: 1.9%
MUD WT IN: 9.7, VIS: 47
MUD WT OUT: 9.6, VIS:
ROP: 261 ft/hr
RPM: 100
SPP: 3813 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 33 klbs
4000
4000
1806u
2005u
1933u
1757u
1008u
958u
1100u
GAS (units)
C1-C4 (units)
9,220
9,230
9,240
9,250
9,260
9,270
9,280
9,290
9,300
9,310
9,320
9,330
9,340
9,350
9,360
9,370
9,380
9,390
9,400
9,410
9,420
9,430
gy, occ blk, slt gr, fri-frm, occ
gt-slty tex, occ wxy lstr, v
-dk gy, dk brn, occ crm-wh
sb plty-blky, fri-frm, sm tex, v
MD: 9,238'
Inclination: 90.46°
Azimuth: 89.13°
TVD: 7,901.75'
VS: 883.93'
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt-slty tex, occ wxy lstr, v
calc. CHK: med-dk gy, dk brn, occ crm-wh
calc bnd, mot, sb plty-blky, fri-frm, sm tex, v
calc.
6500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt-slty tex, occ wxy lstr, v
calc. CHK: med-dk gy, dk brn, occ crm-wh
calc bnd, mot, sb plty-blky, fri-frm, sm tex, v
calc.
MD: 9,333'
Inclination: 90.31°
Azimuth: 90.67°
TVD: 7,901.11'
VS: 978.74'
TVD (ft)
8500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt-slty tex, occ wxy lstr, v
calc. CHK: med-dk gy, dk brn, occ crm-wh
calc bnd, mot, sb plty-blky, fri-frm, sm tex, v
calc.
6500
MRLST: dk gy-gy, occ blk, slt gr, fri-f
hd, sb plty-blky, gt-slty tex, occ wxy
calc. CHK: med-dk gy, dk brn, occ cr
calc bnd, mot, sb plty-blky, fri-frm, sr
calc.
MD: 9,427'
Inclination: 90.43°
Azimuth: 91.44°
TVD: 7,900.5'
VS: 1,072.41'
TVD (ft)
8500

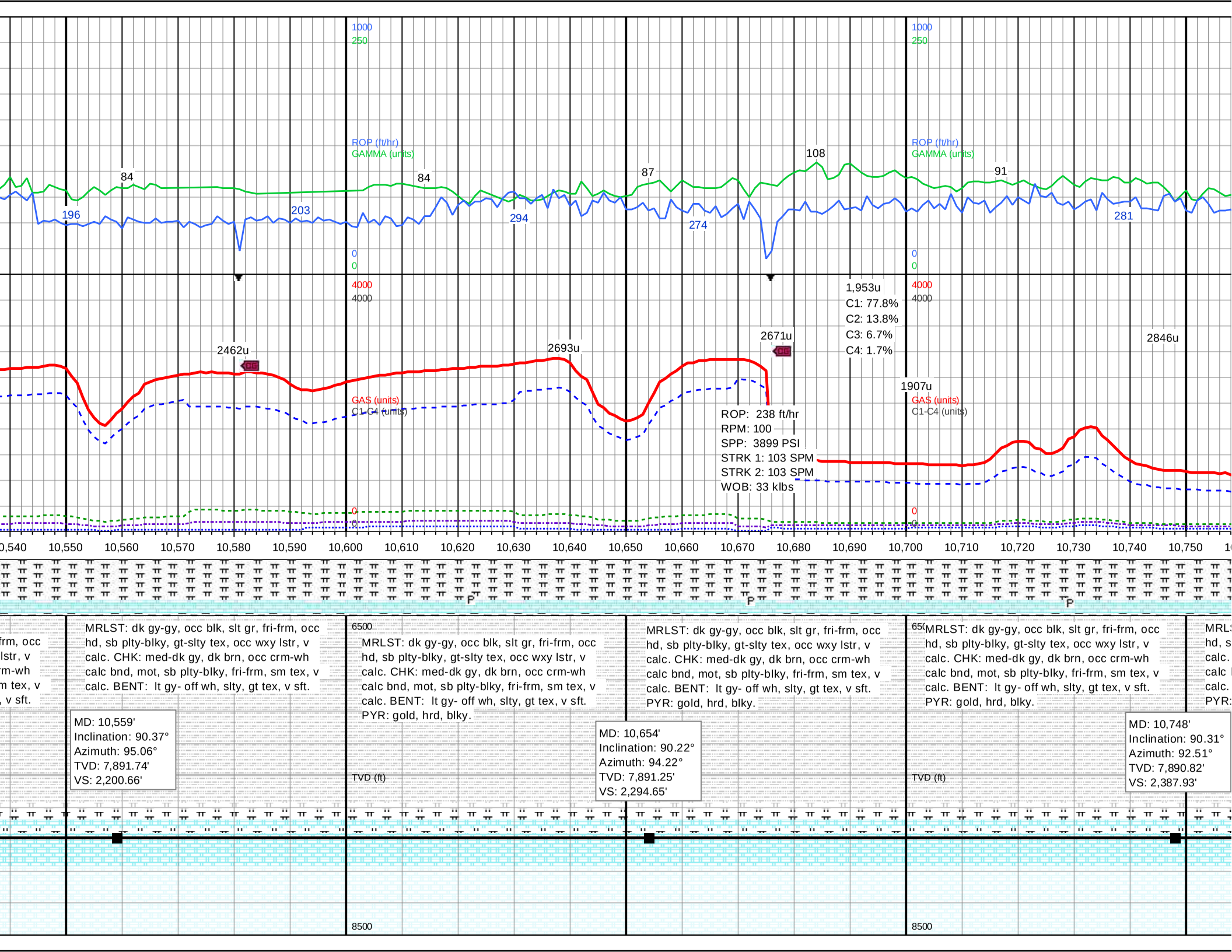

1000
250
ROP (ft/hr)
GAMMA (units)
167
146
116
72
301
341
189
305
271
270
0
0
4000
4000
GAS (units)
C1-C4 (units)
1,886u
C1: 85.5%
C2: 9.1%
C3: 4.1%
C4: 1.3%
1999u
1785u
1878u
2396u
2425u
MUD WT IN: 9.6, VIS:
MUD WT OUT: 9.6, VIS:
ROP:
RPM:
SPP:
STRK
STRK
WOB:
9,440
9,450
9,460
9,470
9,480
9,490
9,500
9,510
9,520
9,530
9,540
9,550
9,560
9,570
9,580
9,590
9,600
9,610
9,620
9,630
9,640
9,650
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v
calc. CHK: med-dk gy, dk brn, occ crm-wh
calc bnd, mot, sb plty-blky, fri-frm, sm tex, v
calc.
6500
TVD (ft)
MD: 9,522'
Inclination: 90.58°
Azimuth: 91.56°
TVD: 7,899.66'
VS: 1,167.01'
MD: 9,615'
Inclination: 90.46°
Azimuth: 87.84°
TVD: 7,898.82'
VS: 1,259.83'
8500

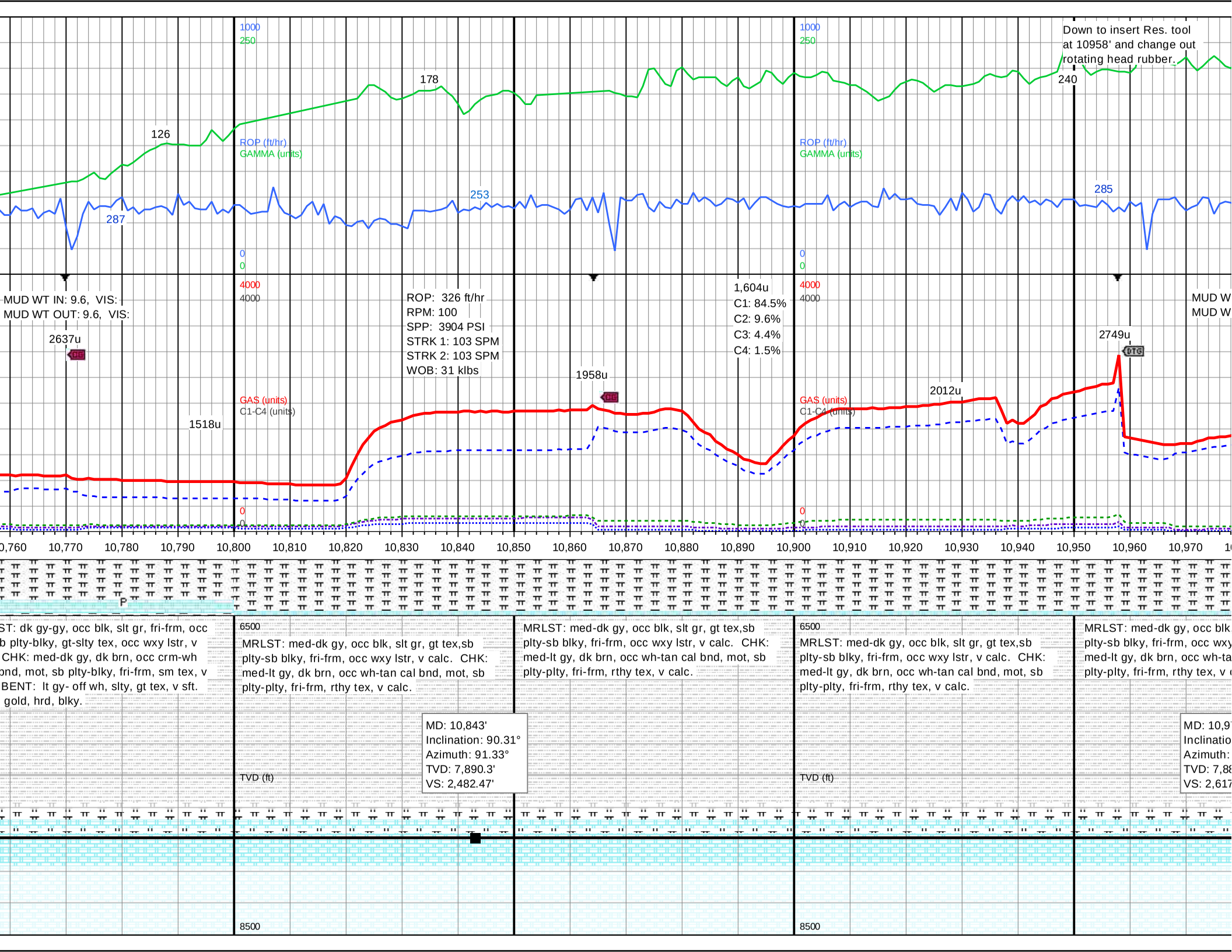

1000
250
ROP (ft/hr)
GAMMA (units)
88
247
87
263
80
97
81
250
81
155
0
0
212 ft/hr
00
3507 PSI
1: 103 SPM
2: 103 SPM
25 klbs
2,294u
C1: 89.8%
C2: 6.7%
C3: 3.1%
C4: 0.5%
4000
4000
MUD WT IN: 9.6, VIS: 50
MUD WT OUT: 9.6, VIS:
ROP: 158 ft
RPM: 100
SPP: 3644 P
STRK 1: 103
STRK 2: 103
WOB: 16 klb
1938u
2217u
2474u
1331u
2618u
1599u
2554u
GAS (units)
C1-C4 (units)
0
0
9,660
9,670
9,680
9,690
9,700
9,710
9,720
9,730
9,740
9,750
9,760
9,770
9,780
9,790
9,800
9,810
9,820
9,830
9,840
9,850
9,860
9,870
ST: dk gy-gy, occ blk, slt gr, fri-frm, occ
b plty-blky, gt-slty tex, occ wxy lstr, v
CHK: med-dk gy, dk brn, occ crm-wh
bnd, mot, sb plty-blky, fri-frm, sm tex, v
6500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. BENT: lt gy- off wh, slty, gt tex, v sft.
MD: 9,710'
Inclination: 90.28°
Azimuth: 86.6°
TVD: 7,898.21'
VS: 1,354.81'
8500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. BENT: lt gy- off wh, slty, gt tex, v sft.
6500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. BENT: lt gy- off wh, slty, gt tex, v sft. PYR: gold, hrd, blky.
MD: 9,804'
Inclination: 90.31°
Azimuth: 85.23°
TVD: 7,897.72'
VS: 1,448.8'
8500
MRLST: dk gy-gy, occ blk
hd, sb plty-blky, gt-slty tex
calc. CHK: med-dk gy, dk
calc bnd, mot, sb plty-blky
calc. BENT: lt gy- off wh,
PYR: gold, hrd, blky.

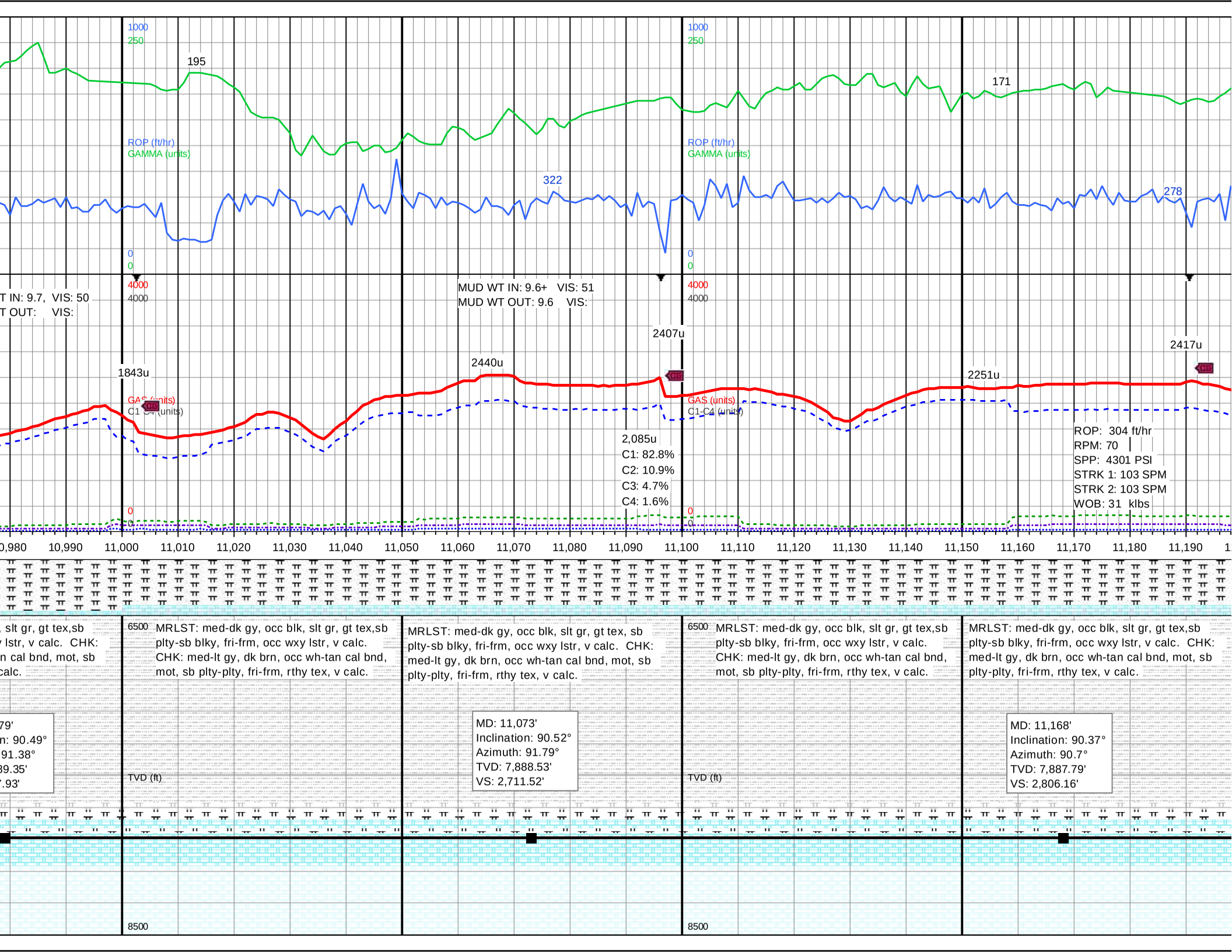

1000
250
ROP (ft/hr)
GAMMA (units)
86
191
98
154
97
96
135
158
140
208
101
0
0
MN1DEPTH
4000
4000
GAS (units)
C1-C4 (units)
2199u
2110u
1368u
2216u
2,461u
C1: 88.4%
C2: 7.4%
C3: 3.2%
C4: 1%
MUD WT IN: 9.6, VIS:
MUD WT OUT: 9.6, VIS:
ROP: 109 ft/hr
RPM: 100
SPP: 3468 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 12 klbs
2,245u
C1: 80.5%
C2: 10.6%
C3: 6.1%
C4: 2.9%
9,880
9,890
9,900
9,910
9,920
9,930
9,940
9,950
9,960
9,970
9,980
9,990
10,000
10,010
10,020
10,030
10,040
10,050
10,060
10,070
10,080
10,090
6500
8500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v
calc. CHK: med-dk gy, dk brn, occ crm-wh
calc bnd, mot, sb plty-blky, fri-frm, sm tex, v
calc. BENT: lt gy- off wh, slty, gt tex, v sft.
MD: 9,899'
Inclination: 90.37°
Azimuth: 83.15°
TVD: 7,897.16'
VS: 1,543.73'
MD: 9,993'
Inclination: 90.28°
Azimuth: 83.93°
TVD: 7,896.62'
VS: 1,637.62'
calc. PYR: gold, hrd, blky.
MD: 10,088'
Inclination: 90.55°
Azimuth: 87.86°
TVD: 7,895.94'
VS: 1,732.6'
TVD (ft)

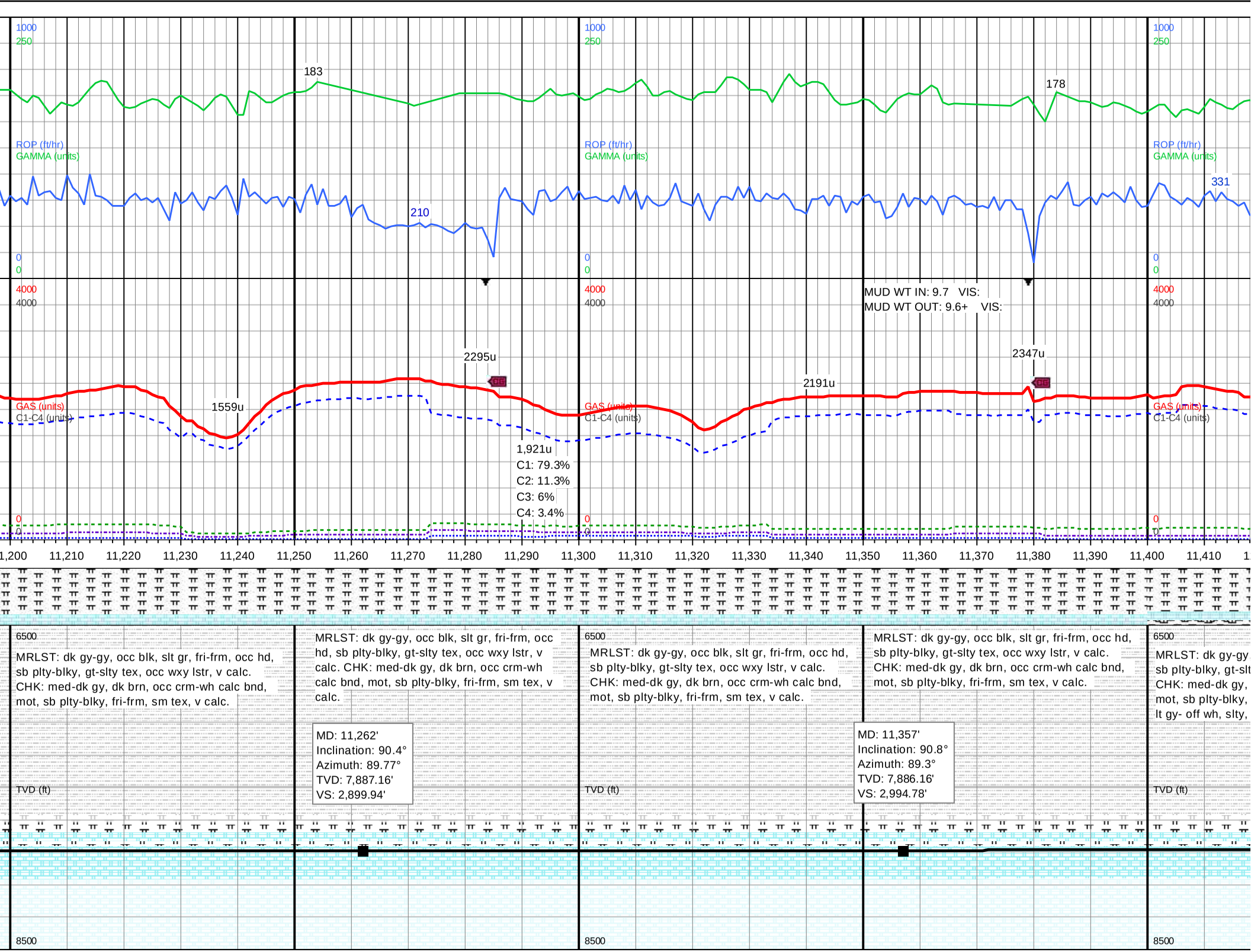

1000
250
3/5/2018
ROP (ft/hr)
GAMMA (units)
137
220
99
226
183
153
78
164
217
315
0
0
4000
4000
MUD WT IN: 9.6, VIS: 51
MUD WT OUT: 9.6, VIS:
GAS (units)
C1-C4 (units)
1448u
2436u
1923u
2078u
1226u
2000u
ROP: 375 ft/hr
RPM: 100
SPP: 3800 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 24 klbs
2,017u
C1: 80.4%
C2: 10.7%
C3: 6.2%
C4: 2.8%
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
10,310
6500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v
calc. CHK: med-dk gy, dk brn, occ crm-wh
calc bnd, mot, sb plty-blky, fri-frm, sm tex, v
calc. BENT: lt gy- off wh, slty, gt tex, v sft.
PYR: gold, hrd, blky.
MD: 10,182'
Inclination: 90.49°
Azimuth: 89.79°
TVD: 7,895.08'
VS: 1,826.5'
MD: 10,277'
Inclination: 90.8°
Azimuth: 92.17°
TVD: 7,894.01'
VS: 1,921.17'
TVD (ft)
8500

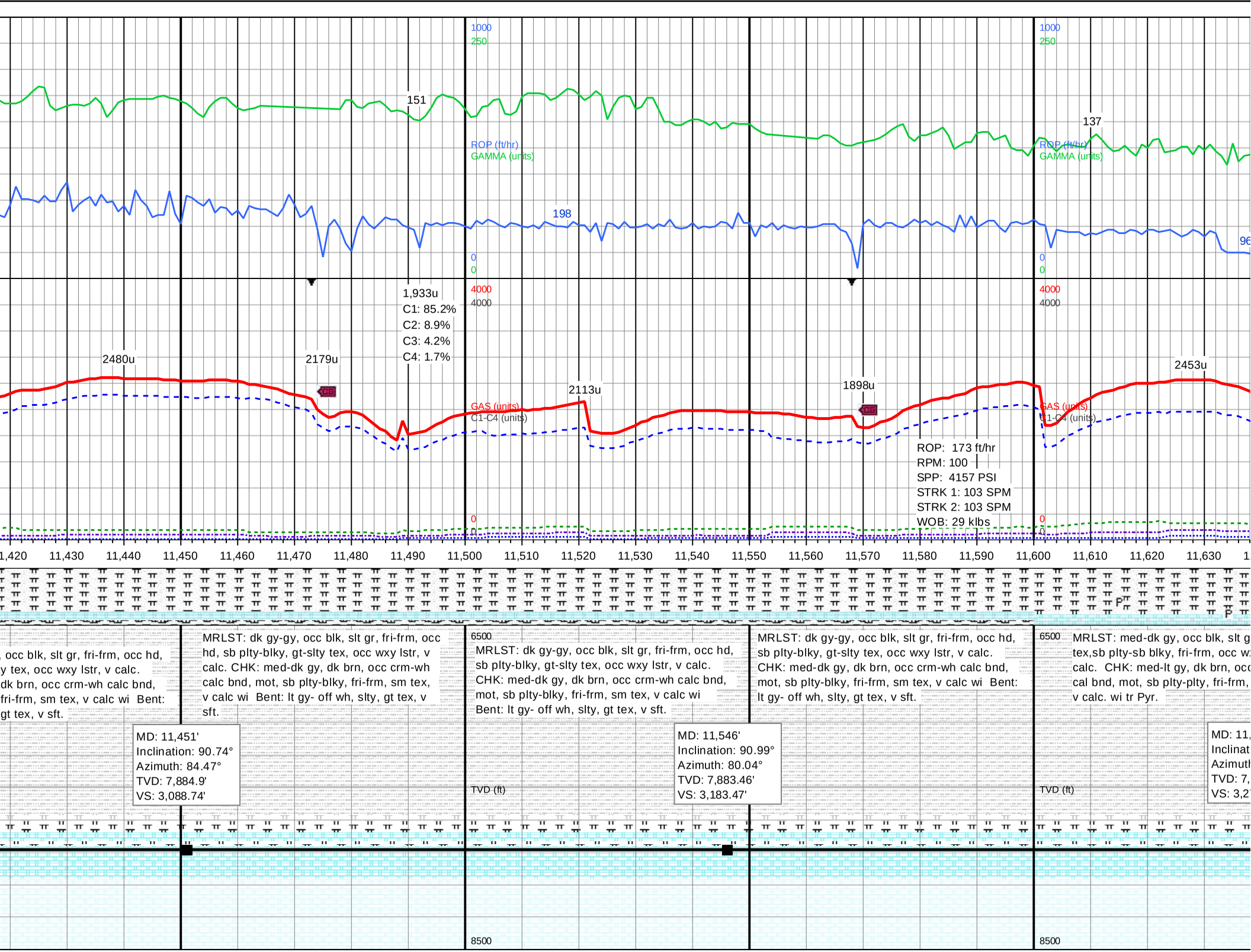

1000
250
ROP (ft/hr)
GAMMA (units)
179
163
184
166
69
273
302
286
95
219
199
200
277
0
0
4000
4000
GAS (units)
C1-C4 (units)
2754u
2684u
2104u
2007u
2119u
2353u
ROP: 174 ft/hr
RPM: 100
SPP: 3394 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 21 klbs
MUD WT IN: 9.7, VIS:
MUD WT OUT: 9.6, VIS:
2,084u
C1: 83.9%
C2: 9.7%
C3: 4.7%
C4: 1.7%
10,320
10,330
10,340
10,350
10,360
10,370
10,380
10,390
10,400
10,410
10,420
10,430
10,440
10,450
10,460
10,470
10,480
10,490
10,500
10,510
10,520
10,530
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v
calc. CHK: med-dk gy, dk brn, occ crm-wh
calc bnd, mot, sb plty-blky, fri-frm, sm tex, v
calc. BENT: lt gy- off wh, slty, gt tex, v sft.
MD: 10,371'
Inclination: 90.37°
Azimuth: 93.25°
TVD: 7,893.05'
VS: 2,014.57'
6500
TVD (ft)
8500
MD: 10,465'
Inclination: 90.43°
Azimuth: 94.68°
TVD: 7,892.4'
VS: 2,107.72'

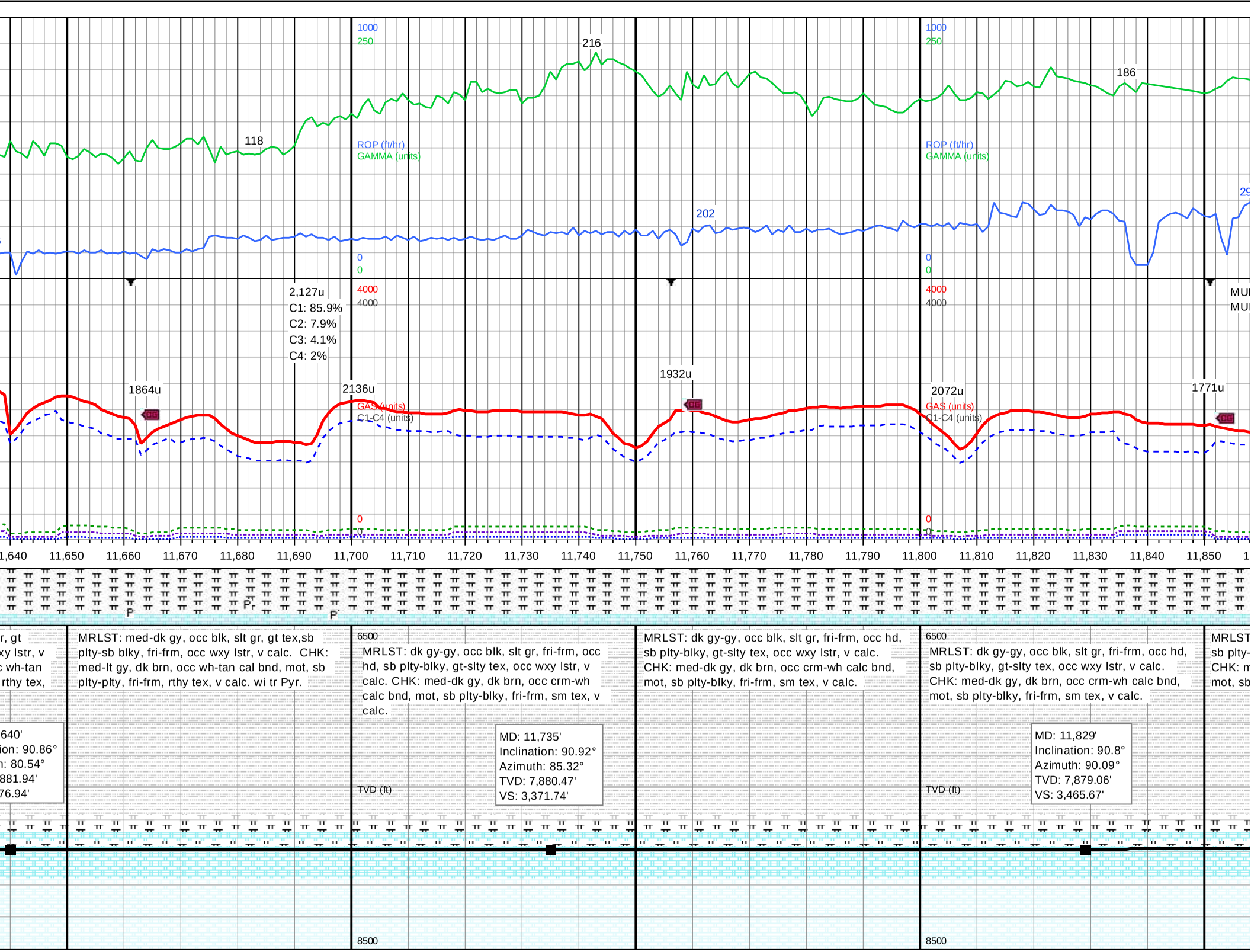

1000
250
ROP (ft/hr)
GAMMA (units)
84
196
203
84
294
87
274
108
91
281
0
0
4000
4000
2462u
2693u
2671u
1,953u
C1: 77.8%
C2: 13.8%
C3: 6.7%
C4: 1.7%
2846u
1907u
GAS (units)
C1-C4 (units)
ROP: 238 ft/hr
RPM: 100
SPP: 3899 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 33 klbs
10,540
10,550
10,560
10,570
10,580
10,590
10,600
10,610
10,620
10,630
10,640
10,650
10,660
10,670
10,680
10,690
10,700
10,710
10,720
10,730
10,740
10,750
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v
calc. CHK: med-dk gy, dk brn, occ crm-wh
calc bnd, mot, sb plty-blky, fri-frm, sm tex, v
calc. BENT: lt gy- off wh, slty, gt tex, v sft.
MD: 10,559'
Inclination: 90.37°
Azimuth: 95.06°
TVD: 7,891.74'
VS: 2,200.66'
6500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v
calc. CHK: med-dk gy, dk brn, occ crm-wh
calc bnd, mot, sb plty-blky, fri-frm, sm tex, v
calc. BENT: lt gy- off wh, slty, gt tex, v sft.
PYR: gold, hrd, blky.
TVD (ft)
8500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v
calc. CHK: med-dk gy, dk brn, occ crm-wh
calc bnd, mot, sb plty-blky, fri-frm, sm tex, v
calc. BENT: lt gy- off wh, slty, gt tex, v sft.
PYR: gold, hrd, blky.
MD: 10,654'
Inclination: 90.22°
Azimuth: 94.22°
TVD: 7,891.25'
VS: 2,294.65'
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v
calc. CHK: med-dk gy, dk brn, occ crm-wh
calc bnd, mot, sb plty-blky, fri-frm, sm tex, v
calc. BENT: lt gy- off wh, slty, gt tex, v sft.
PYR: gold, hrd, blky.
MD: 10,748'
Inclination: 90.31°
Azimuth: 92.51°
TVD: 7,890.82'
VS: 2,387.93'

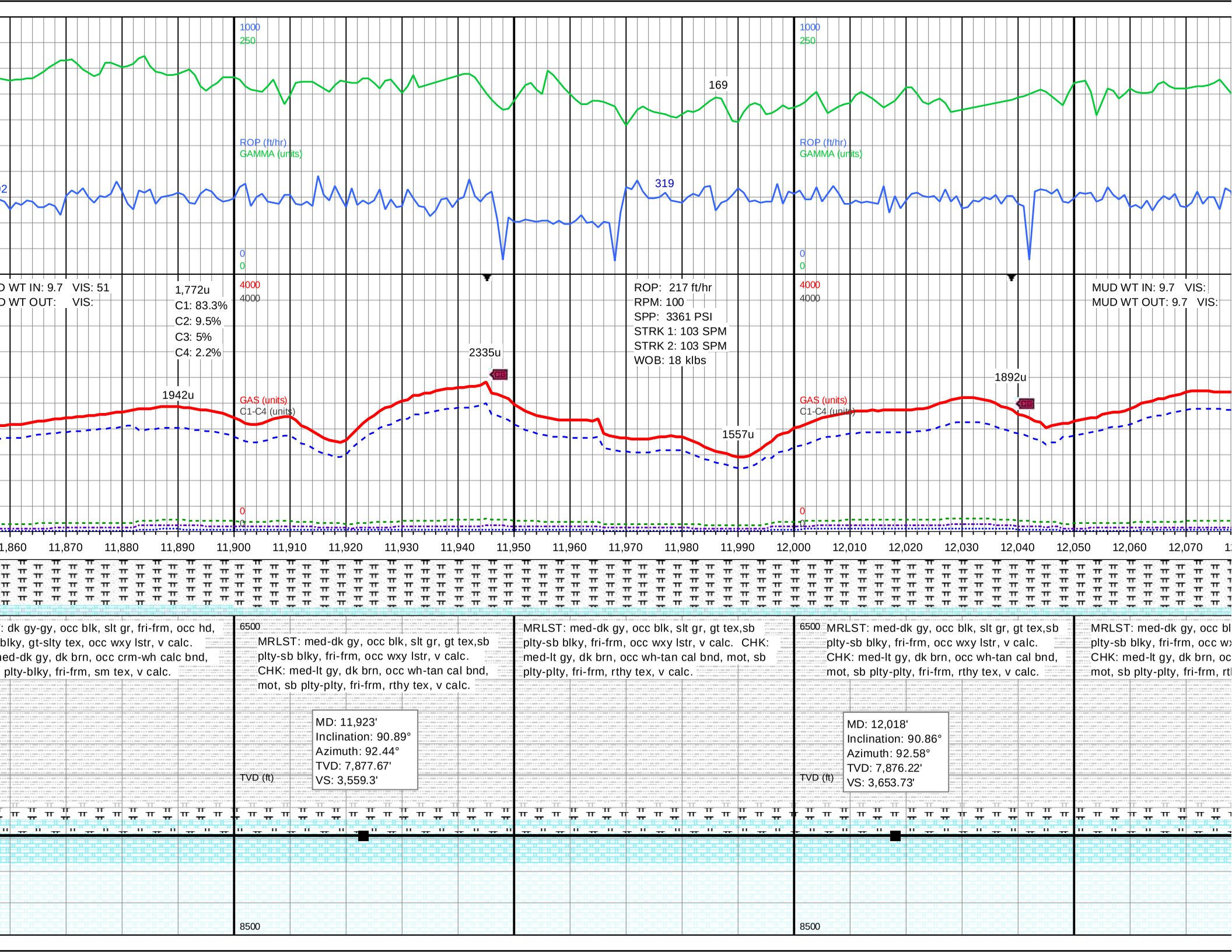

1000
250
ROP (ft/hr)
GAMMA (units)
126
178
253
287
285
240
Down to insert Res. tool at 10958' and change out rotating head rubber.
0
0
4000
4000
GAS (units)
C1-C4 (units)
MUD WT IN: 9.6, VIS:
MUD WT OUT: 9.6, VIS:
2637u
ROP: 326 ft/hr
RPM: 100
SPP: 3904 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 31 klbs
1518u
1958u
1,604u
C1: 84.5%
C2: 9.6%
C3: 4.4%
C4: 1.5%
2012u
2749u
MUD W
MUD W
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
10,960
10,970
ST: dk gy-gy, occ blk, slt gr, fri-frm, occ
b plty-blky, gt-slty tex, occ wxy lstr, v
CHK: med-dk gy, dk brn, occ crm-wh
nd, mot, sb plty-blky, fri-frm, sm tex, v
BENT: lt gy- off wh, slty, gt tex, v sft.
gold, hrd, blky.
6500
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb
plty-sb blky, fri-frm, occ wxy lstr, v calc. CHK:
med-lt gy, dk brn, occ wh-tan cal bnd, mot, sb
plty-plty, fri-frm, rthy tex, v calc.
MD: 10,843'
Inclination: 90.31°
Azimuth: 91.33°
TVD: 7,890.3'
VS: 2,482.47'
TVD (ft)
8500
MD: 10,9
Inclinatio
Azimuth:
TVD: 7,88
VS: 2,617

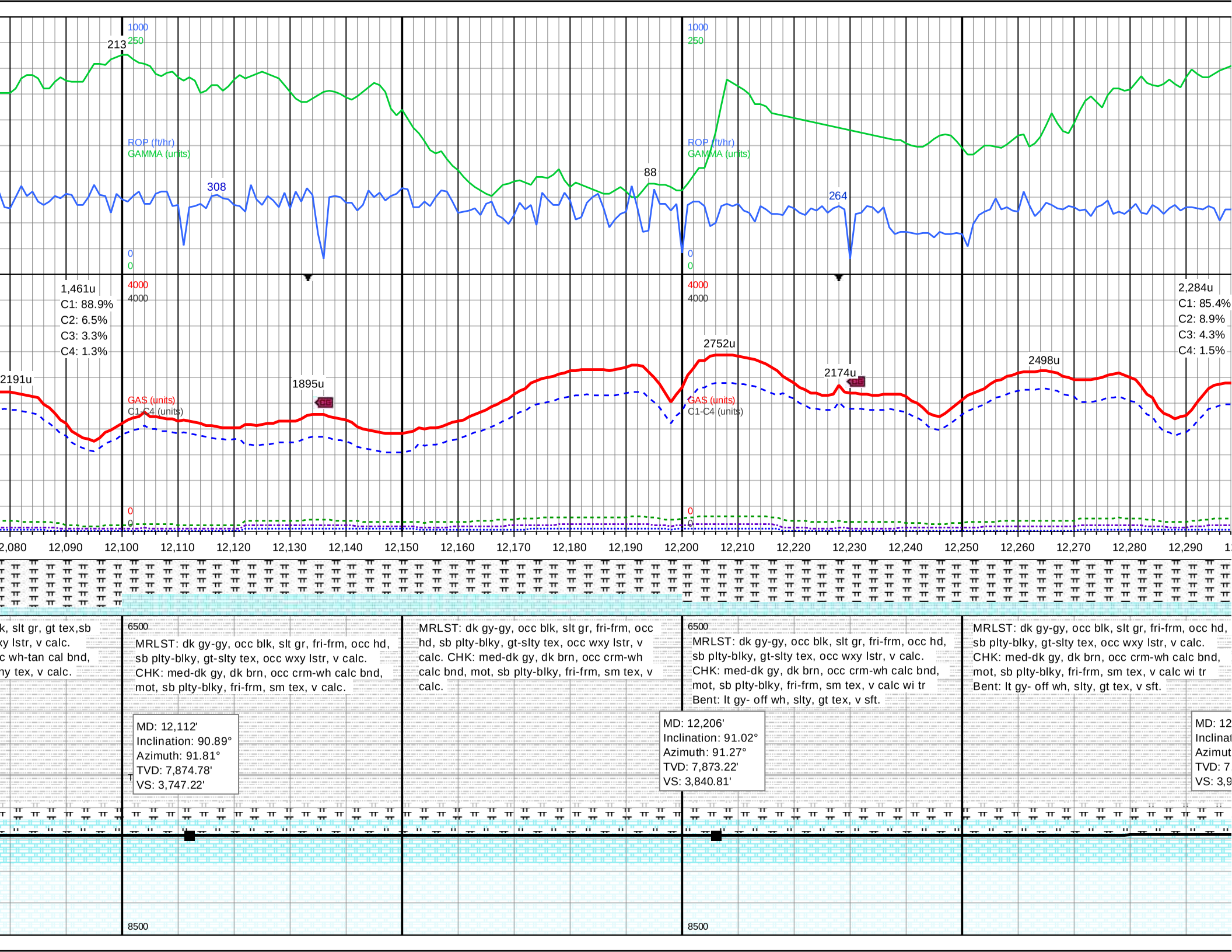

1000
250
195
ROP (ft/hr)
GAMMA (units)
322
0
0
4000
4000
T IN: 9.7, VIS: 50
T OUT: VIS:
MUD WT IN: 9.6+ VIS: 51
MUD WT OUT: 9.6 VIS:
1000
250
171
ROP (ft/hr)
GAMMA (units)
278
0
0
4000
4000
2407u
2417u
1843u
2440u
2251u
GAS (units)
C1-C4 (units)
2,085u
C1: 82.8%
C2: 10.9%
C3: 4.7%
C4: 1.6%
ROP: 304 ft/hr
RPM: 70
SPP: 4301 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 31 klbs
0
0
10,980
10,990
11,000
11,010
11,020
11,030
11,040
11,050
11,060
11,070
11,080
11,090
11,100
11,110
11,120
11,130
11,140
11,150
11,160
11,170
11,180
11,190
slt gr, gt tex,sb
lstr, v calc. CHK:
n cal bnd, mot, sb
calc.
6500
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb
plty-sb blky, fri-frm, occ wxy lstr, v calc.
CHK: med-lt gy, dk brn, occ wh-tan cal bnd,
mot, sb plty-plty, fri-frm, rthy tex, v calc.
MRLST: med-dk gy, occ blk, slt gr, gt tex, sb
plty-sb blky, fri-frm, occ wxy lstr, v calc. CHK:
med-lt gy, dk brn, occ wh-tan cal bnd, mot, sb
plty-plty, fri-frm, rthy tex, v calc.
6500
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb
plty-sb blky, fri-frm, occ wxy lstr, v calc.
CHK: med-lt gy, dk brn, occ wh-tan cal bnd,
mot, sb plty-plty, fri-frm, rthy tex, v calc.
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb
plty-sb blky, fri-frm, occ wxy lstr, v calc. CHK:
med-lt gy, dk brn, occ wh-tan cal bnd, mot, sb
plty-plty, fri-frm, rthy tex, v calc.
79'
n: 90.49°
91.38°
39.35'
7.93'
TVD (ft)
MD: 11,073'
Inclination: 90.52°
Azimuth: 91.79°
TVD: 7,888.53'
VS: 2,711.52'
TVD (ft)
MD: 11,168'
Inclination: 90.37°
Azimuth: 90.7°
TVD: 7,887.79'
VS: 2,806.16'
8500
8500

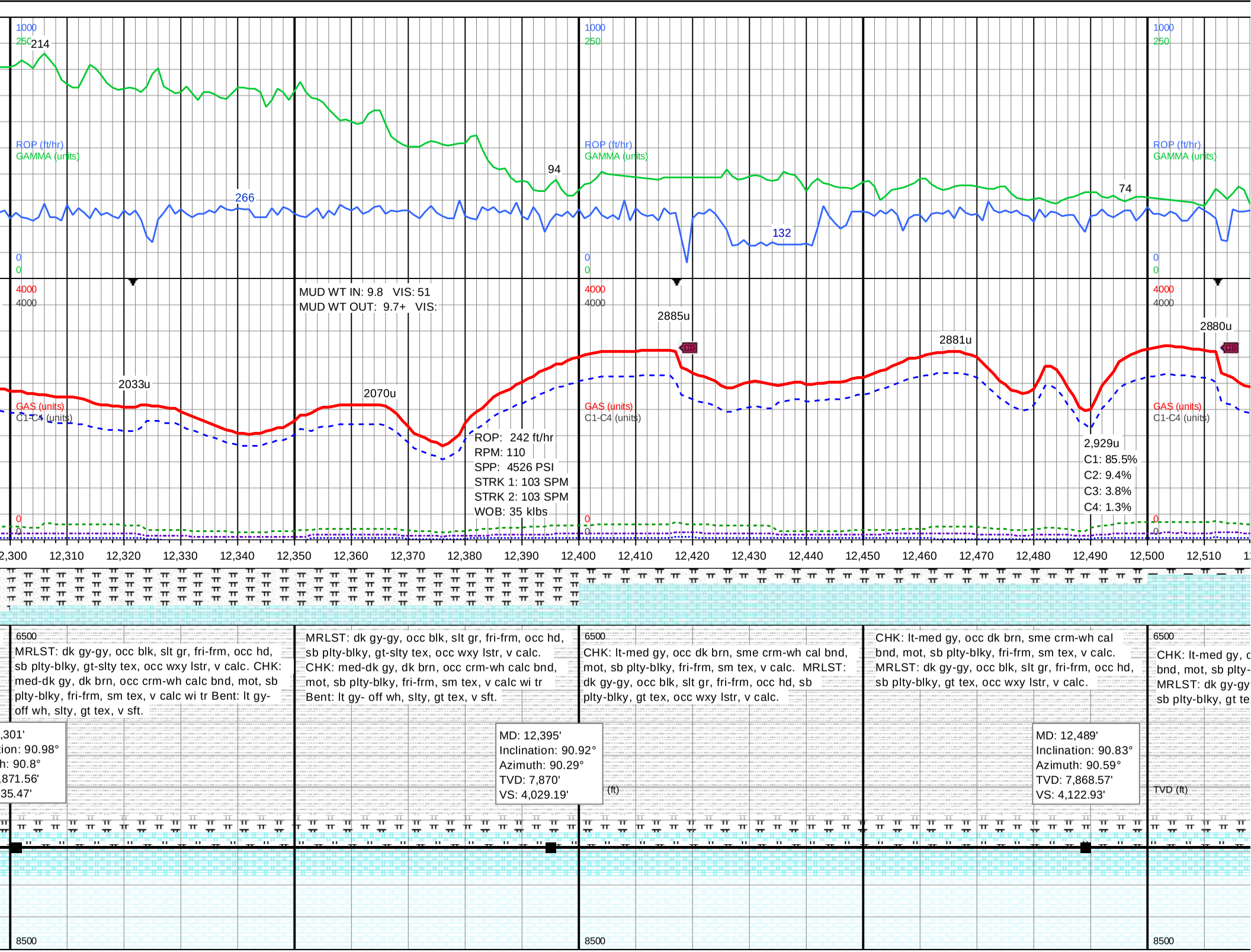

1000
250
183
ROP (ft/hr)
GAMMA (units)
210
0
0
4000
4000
2295u
GAS (units)
C1-C4 (units)
1559u
1,921u
C1: 79.3%
C2: 11.3%
C3: 6%
C4: 3.4%
0
0
11,200
11,210
11,220
11,230
11,240
11,250
11,260
11,270
11,280
11,290
11,300
11,310
11,320
11,330
11,340
11,350
11,360
11,370
11,380
11,390
11,400
11,410
1000
250
178
ROP (ft/hr)
GAMMA (units)
0
0
4000
4000
MUD WT IN: 9.7 VIS:
MUD WT OUT: 9.6+ VIS:
2191u
GAS (units)
C1-C4 (units)
0
0
1000
250
331
ROP (ft/hr)
GAMMA (units)
0
0
4000
4000
2347u
GAS (units)
C1-C4 (units)
0
0
6500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc.
CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
TVD (ft)
8500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MD: 11,262'
Inclination: 90.4°
Azimuth: 89.77°
TVD: 7,887.16'
VS: 2,899.94'
6500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc.
CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
TVD (ft)
8500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc.
CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MD: 11,357'
Inclination: 90.8°
Azimuth: 89.3°
TVD: 7,886.16'
VS: 2,994.78'
6500
MRLST: dk gy-gy
sb plty-blky, gt-slt
CHK: med-dk gy,
mot, sb plty-blky,
lt gy- off wh, slty,
TVD (ft)
8500

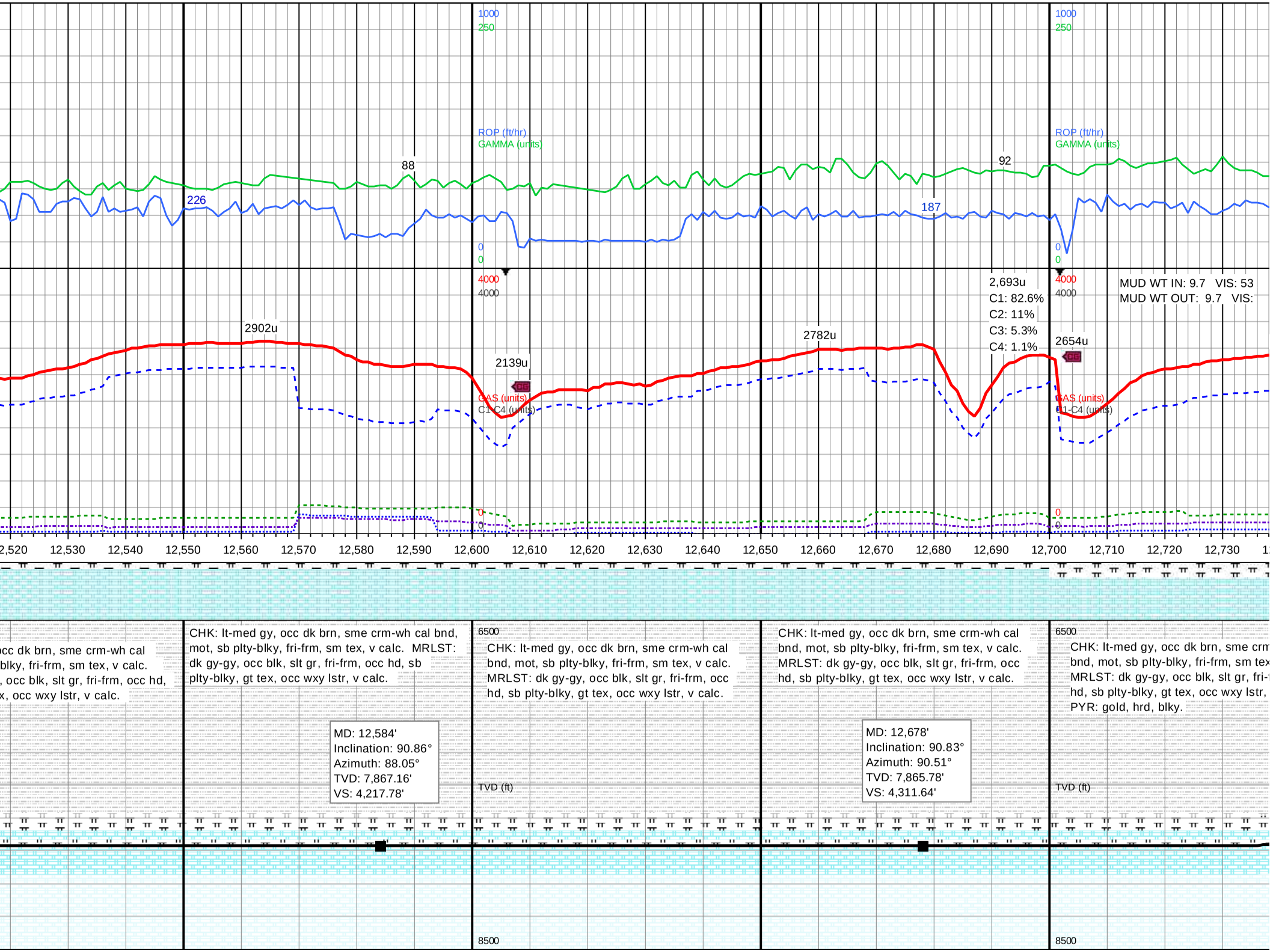

1000
250
151
ROP (ft/hr)
GAMMA (units)
198
0
0
1000
250
137
ROP (ft/hr)
GAMMA (units)
96
0
0
4000
4000
1,933u
C1: 85.2%
C2: 8.9%
C3: 4.2%
C4: 1.7%
2480u
2179u
2113u
1898u
2453u
GAS (units)
C1-C4 (units)
ROP: 173 ft/hr
RPM: 100
SPP: 4157 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 29 klbs
0
0
11,420
11,430
11,440
11,450
11,460
11,470
11,480
11,490
11,500
11,510
11,520
11,530
11,540
11,550
11,560
11,570
11,580
11,590
11,600
11,610
11,620
11,630
, occ blk, slt gr, fri-frm, occ hd,
y tex, occ wxy lstr, v calc.
dk brn, occ crm-wh calc bnd,
fri-frm, sm tex, v calc wi Bent:
gt tex, v sft.
MD: 11,451'
Inclination: 90.74°
Azimuth: 84.47°
TVD: 7,884.9'
VS: 3,088.74'
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc wi Bent: lt gy- off wh, slty, gt tex, v sft.
6500
TVD (ft)
8500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc wi Bent: lt gy- off wh, slty, gt tex, v sft.
MD: 11,546'
Inclination: 90.99°
Azimuth: 80.04°
TVD: 7,883.46'
VS: 3,183.47'
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc wi Bent: lt gy- off wh, slty, gt tex, v sft.
6500
TVD (ft)
8500
MRLST: med-dk gy, occ blk, slt g
tex,sb plty-sb blky, fri-frm, occ w
calc. CHK: med-lt gy, dk brn, occ
cal bnd, mot, sb plty-plty, fri-frm,
v calc. wi tr Pyr.
MD: 11,
Inclinat
Azimuth
TVD: 7,
VS: 3,2
Pyr
Pyr

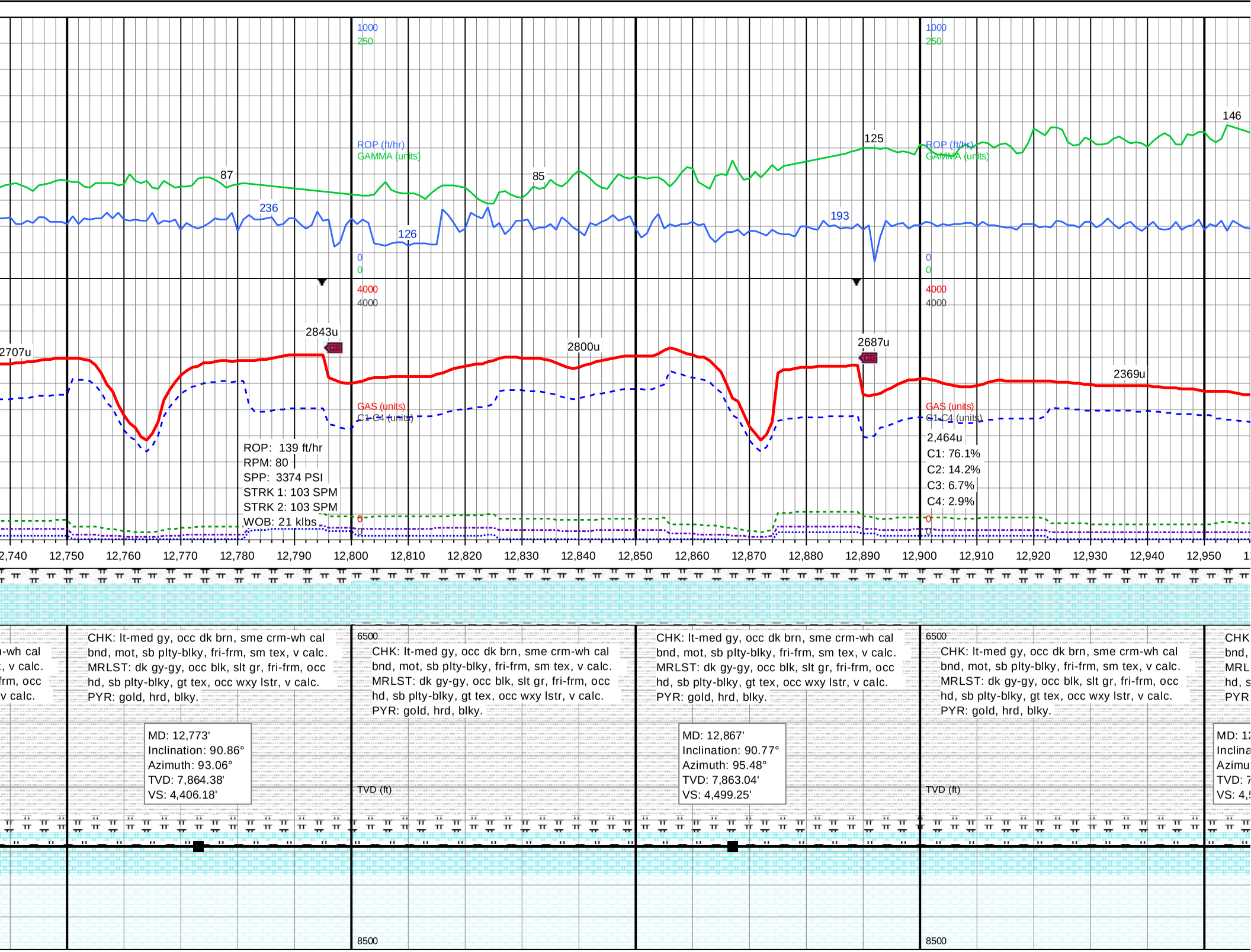

1000
250
216
118
ROP (ft/hr)
GAMMA (units)
0
0
1000
250
186
ROP (ft/hr)
GAMMA (units)
202
0
0
2,127u
C1: 85.9%
C2: 7.9%
C3: 4.1%
C4: 2%
4000
4000
4000
4000
1864u
2136u
GAS (units)
C1-C4 (units)
1932u
2072u
GAS (units)
C1-C4 (units)
1771u
0
0
0
0
11,640
11,650
11,660
11,670
11,680
11,690
11,700
11,710
11,720
11,730
11,740
11,750
11,760
11,770
11,780
11,790
11,800
11,810
11,820
11,830
11,840
11,850
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb plty-sb blky, fri-frm, occ wxy lstr, v calc. CHK: med-lt gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc. wi tr Pyr.
6500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MD: 11,735'
Inclination: 90.92°
Azimuth: 85.32°
TVD: 7,880.47'
VS: 3,371.74'
TVD (ft)
8500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
6500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MD: 11,829'
Inclination: 90.8°
Azimuth: 90.09°
TVD: 7,879.06'
VS: 3,465.67'
TVD (ft)
8500

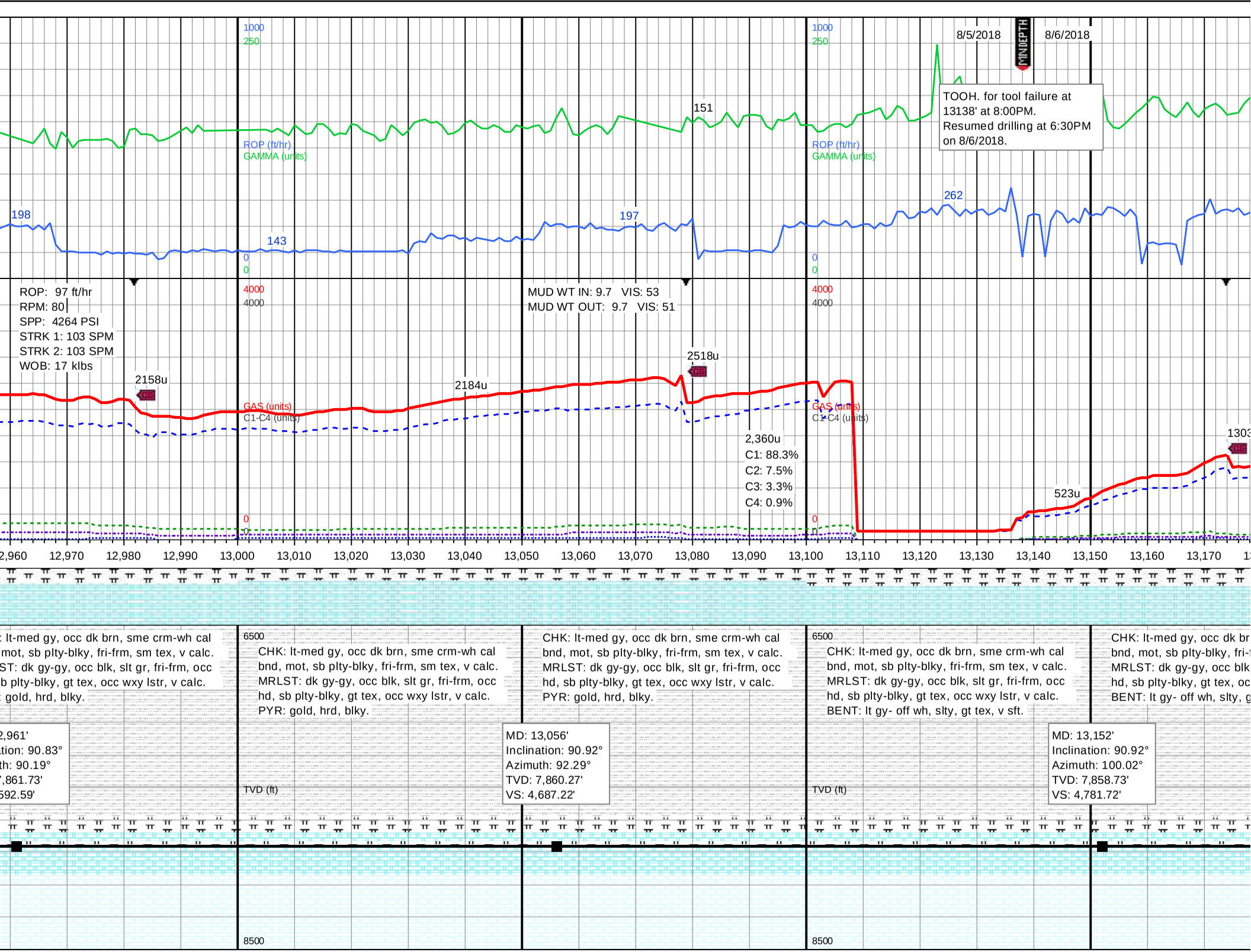

1000
250
ROP (ft/hr)
GAMMA (units)
169
319
0
0
D WT IN: 9.7 VIS: 51
D WT OUT: VIS:
1,772u
C1: 83.3%
C2: 9.5%
C3: 5%
C4: 2.2%
4000
4000
GAS (units)
C1-C4 (units)
1942u
2335u
1557u
1892u
ROP: 217 ft/hr
RPM: 100
SPP: 3361 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 18 klbs
MUD WT IN: 9.7 VIS:
MUD WT OUT: 9.7 VIS:
11,860
11,870
11,880
11,890
11,900
11,910
11,920
11,930
11,940
11,950
11,960
11,970
11,980
11,990
12,000
12,010
12,020
12,030
12,040
12,050
12,060
12,070
: dk gy-gy, occ blk, slt gr, fri-frm, occ hd,
blky, gt-slty tex, occ wxy lstr, v calc.
ed-dk gy, dk brn, occ crm-wh calc bnd,
plty-blky, fri-frm, sm tex, v calc.
6500
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb
plty-sb blky, fri-frm, occ wxy lstr, v calc.
CHK: med-lt gy, dk brn, occ wh-tan cal bnd,
mot, sb plty-plty, fri-frm, rthy tex, v calc.
MD: 11,923'
Inclination: 90.89°
Azimuth: 92.44°
TVD: 7,877.67'
VS: 3,559.3'
TVD (ft)
8500
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb
plty-sb blky, fri-frm, occ wxy lstr, v calc. CHK:
med-lt gy, dk brn, occ wh-tan cal bnd, mot, sb
plty-plty, fri-frm, rthy tex, v calc.
6500
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb
plty-sb blky, fri-frm, occ wxy lstr, v calc.
CHK: med-lt gy, dk brn, occ wh-tan cal bnd,
mot, sb plty-plty, fri-frm, rthy tex, v calc.
MD: 12,018'
Inclination: 90.86°
Azimuth: 92.58°
TVD: 7,876.22'
VS: 3,653.73'
TVD (ft)
8500
MRLST: med-dk gy, occ bl
plty-sb blky, fri-frm, occ wx
CHK: med-lt gy, dk brn, oc
mot, sb plty-plty, fri-frm, rt

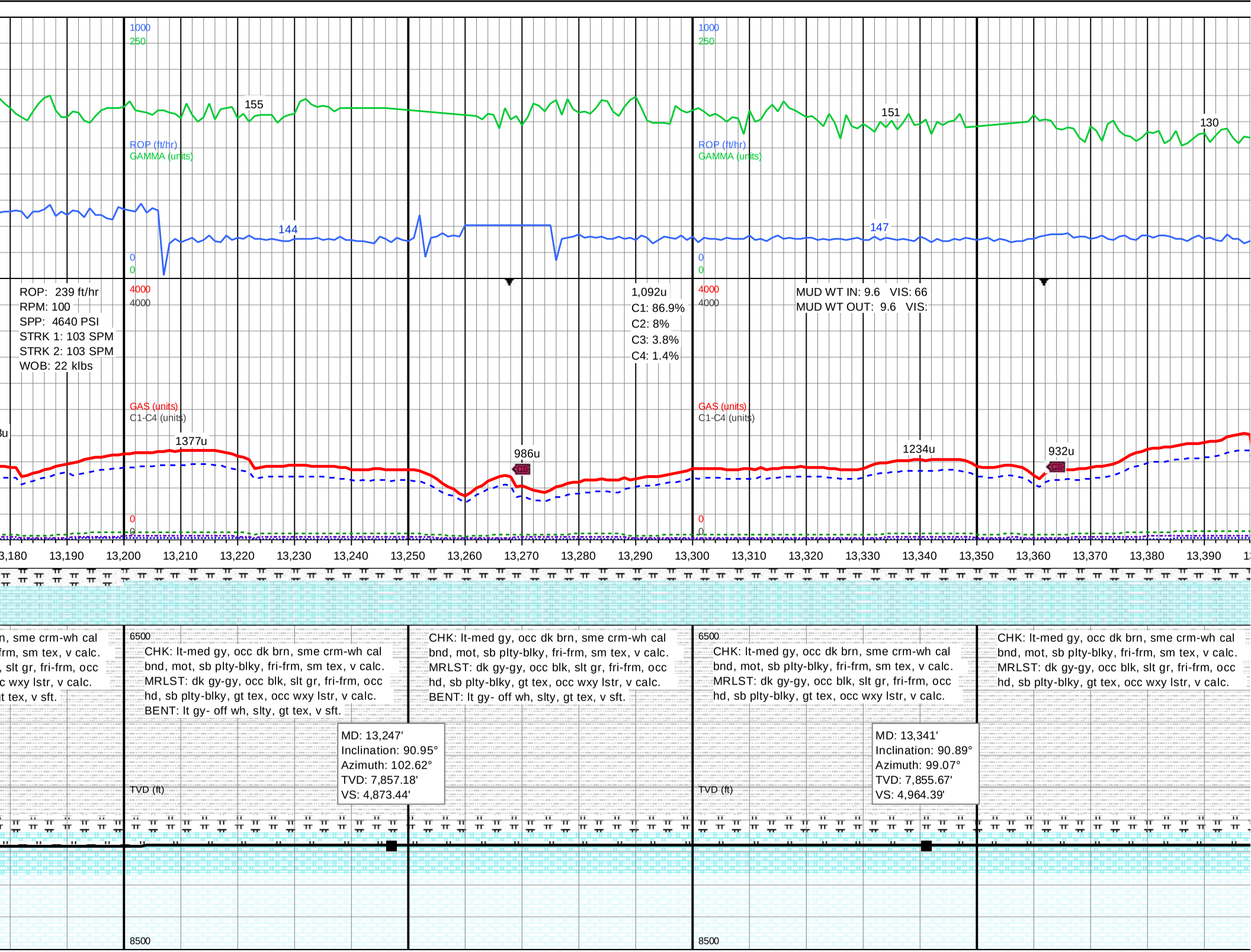

1000
250
213
ROP (ft/hr)
GAMMA (units)
308
88
264
0
0
1000
250
ROP (ft/hr)
GAMMA (units)
0
0
1,461u
C1: 88.9%
C2: 6.5%
C3: 3.3%
C4: 1.3%
4000
4000
2191u
1895u
GAS (units)
C1-C4 (units)
2752u
2174u
2498u
2,284u
C1: 85.4%
C2: 8.9%
C3: 4.3%
C4: 1.5%
GAS (units)
C1-C4 (units)
0
0
0
0
2,080
12,090
12,100
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
12,280
12,290
k, slt gr, gt tex,sb
y lstr, v calc.
c wh-tan cal bnd,
ny tex, v calc.
6500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd,
sb plty-blky, gt-slty tex, occ wxy lstr, v calc.
CHK: med-dk gy, dk brn, occ crm-wh calc bnd,
mot, sb plty-blky, fri-frm, sm tex, v calc.
MD: 12,112'
Inclination: 90.89°
Azimuth: 91.81°
TVD: 7,874.78'
VS: 3,747.22'
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt-slty tex, occ wxy lstr, v
calc. CHK: med-dk gy, dk brn, occ crm-wh
calc bnd, mot, sb plty-blky, fri-frm, sm tex, v
calc.
6500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd,
sb plty-blky, gt-slty tex, occ wxy lstr, v calc.
CHK: med-dk gy, dk brn, occ crm-wh calc bnd,
mot, sb plty-blky, fri-frm, sm tex, v calc wi tr
Bent: lt gy- off wh, slty, gt tex, v sft.
MD: 12,206'
Inclination: 91.02°
Azimuth: 91.27°
TVD: 7,873.22'
VS: 3,840.81'
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd,
sb plty-blky, gt-slty tex, occ wxy lstr, v calc.
CHK: med-dk gy, dk brn, occ crm-wh calc bnd,
mot, sb plty-blky, fri-frm, sm tex, v calc wi tr
Bent: lt gy- off wh, slty, gt tex, v sft.
8500
8500

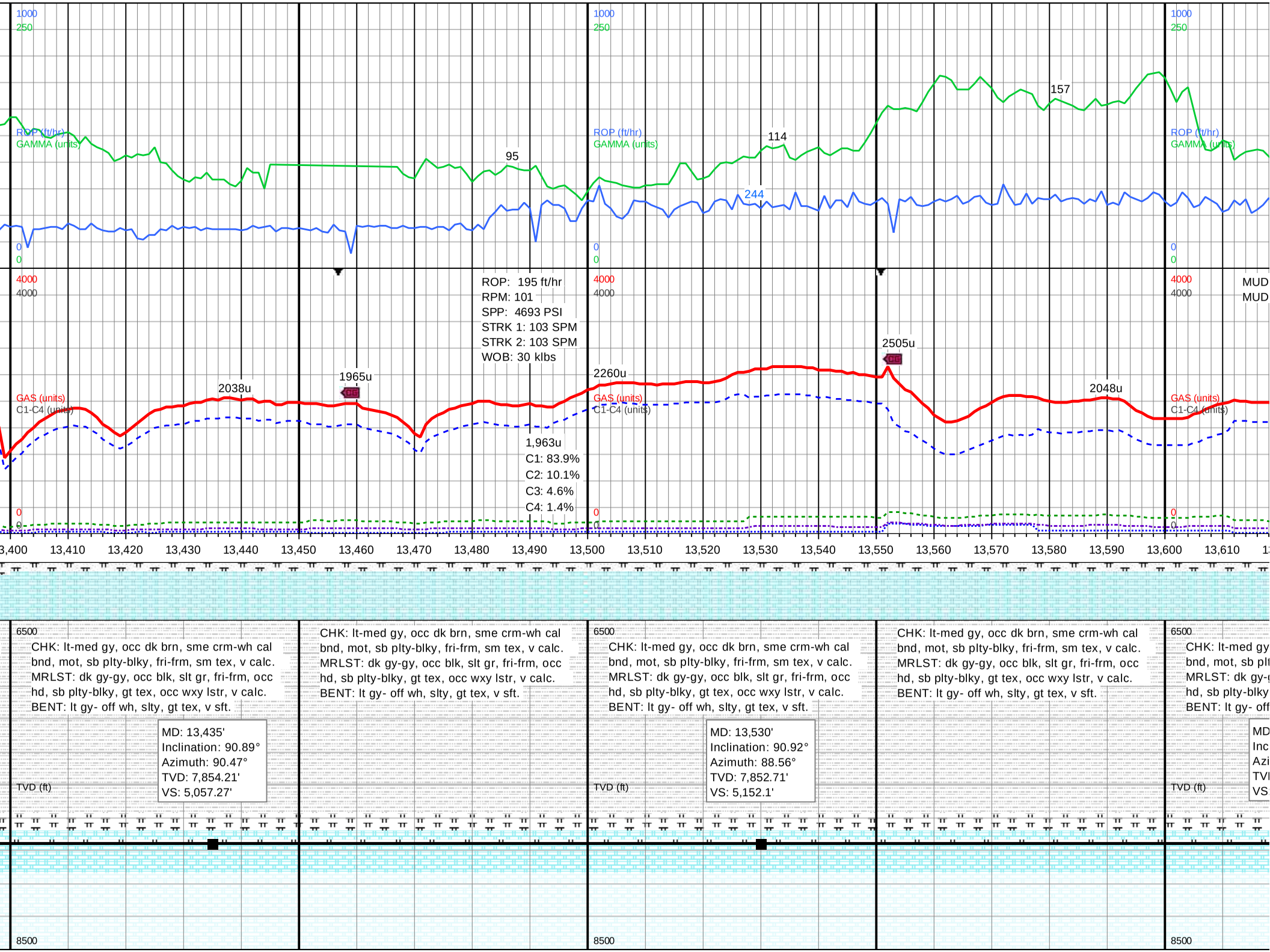

1000
250
214
ROP (ft/hr)
GAMMA (units)
266
94
132
74
0
0
4000
4000
MUD WT IN: 9.8 VIS: 51
MUD WT OUT: 9.7+ VIS:
2033u
2070u
2885u
2881u
2880u
GAS (units)
C1-C4 (units)
ROP: 242 ft/hr
RPM: 110
SPP: 4526 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 35 klbs
2,929u
C1: 85.5%
C2: 9.4%
C3: 3.8%
C4: 1.3%
12,300
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
12,500
12,510
6500
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc wi tr Bent: lt gy- off wh, slty, gt tex, v sft.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt-slty tex, occ wxy lstr, v calc. CHK: med-dk gy, dk brn, occ crm-wh calc bnd, mot, sb plty-blky, fri-frm, sm tex, v calc wi tr Bent: lt gy- off wh, slty, gt tex, v sft.
MD: 12,395'
Inclination: 90.92°
Azimuth: 90.29°
TVD: 7,870'
VS: 4,029.19'
CHK: lt-med gy, occ dk brn, sme crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
(ft)
CHK: lt-med gy, occ dk brn, sme crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
MD: 12,489'
Inclination: 90.83°
Azimuth: 90.59°
TVD: 7,868.57'
VS: 4,122.93'
TVD (ft)
8500

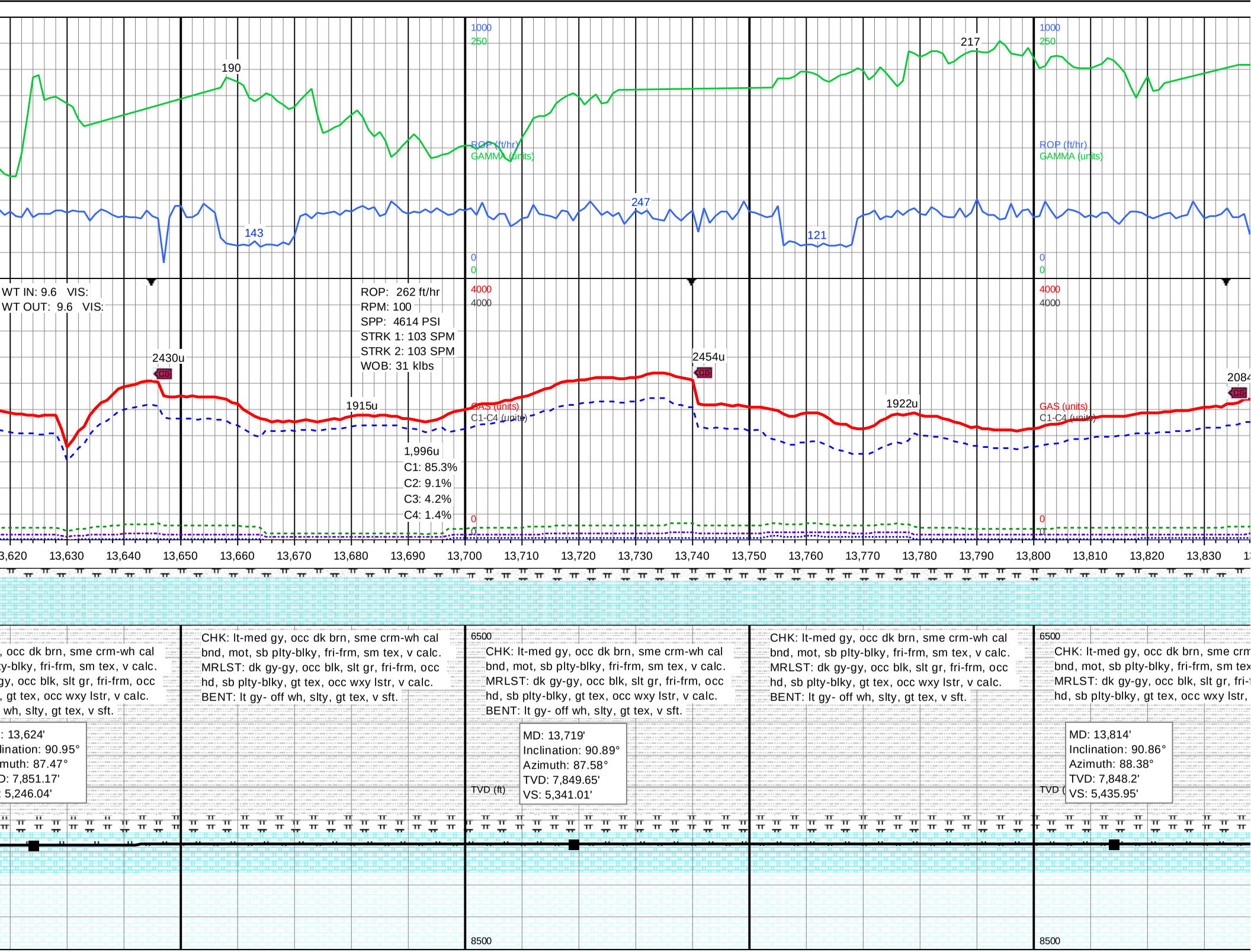

1000
250
ROP (ft/hr)
GAMMA (units)
88
226
92
187
0
0
4000
4000
2902u
2139u
2782u
2,693u
C1: 82.6%
C2: 11%
C3: 5.3%
C4: 1.1%
2654u
MUD WT IN: 9.7 VIS: 53
MUD WT OUT: 9.7 VIS:
GAS (units)
C1-C4 (units)
12,520
12,530
12,540
12,550
12,560
12,570
12,580
12,590
12,600
12,610
12,620
12,630
12,640
12,650
12,660
12,670
12,680
12,690
12,700
12,710
12,720
12,730
cc dk brn, sme crm-wh cal
blky, fri-frm, sm tex, v calc.
, occ blk, slt gr, fri-frm, occ hd,
x, occ wxy lstr, v calc.
CHK: lt-med gy, occ dk brn, sme crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
MD: 12,584'
Inclination: 90.86°
Azimuth: 88.05°
TVD: 7,867.16'
VS: 4,217.78'
6500
CHK: lt-med gy, occ dk brn, sme crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
TVD (ft)
8500
CHK: lt-med gy, occ dk brn, sme crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
MD: 12,678'
Inclination: 90.83°
Azimuth: 90.51°
TVD: 7,865.78'
VS: 4,311.64'
6500
CHK: lt-med gy, occ dk brn, sme crm
bnd, mot, sb plty-blky, fri-frm, sm tex
MRLST: dk gy-gy, occ blk, slt gr, fri-
hd, sb plty-blky, gt tex, occ wxy lstr,
PYR: gold, hrd, blky.
TVD (ft)
8500

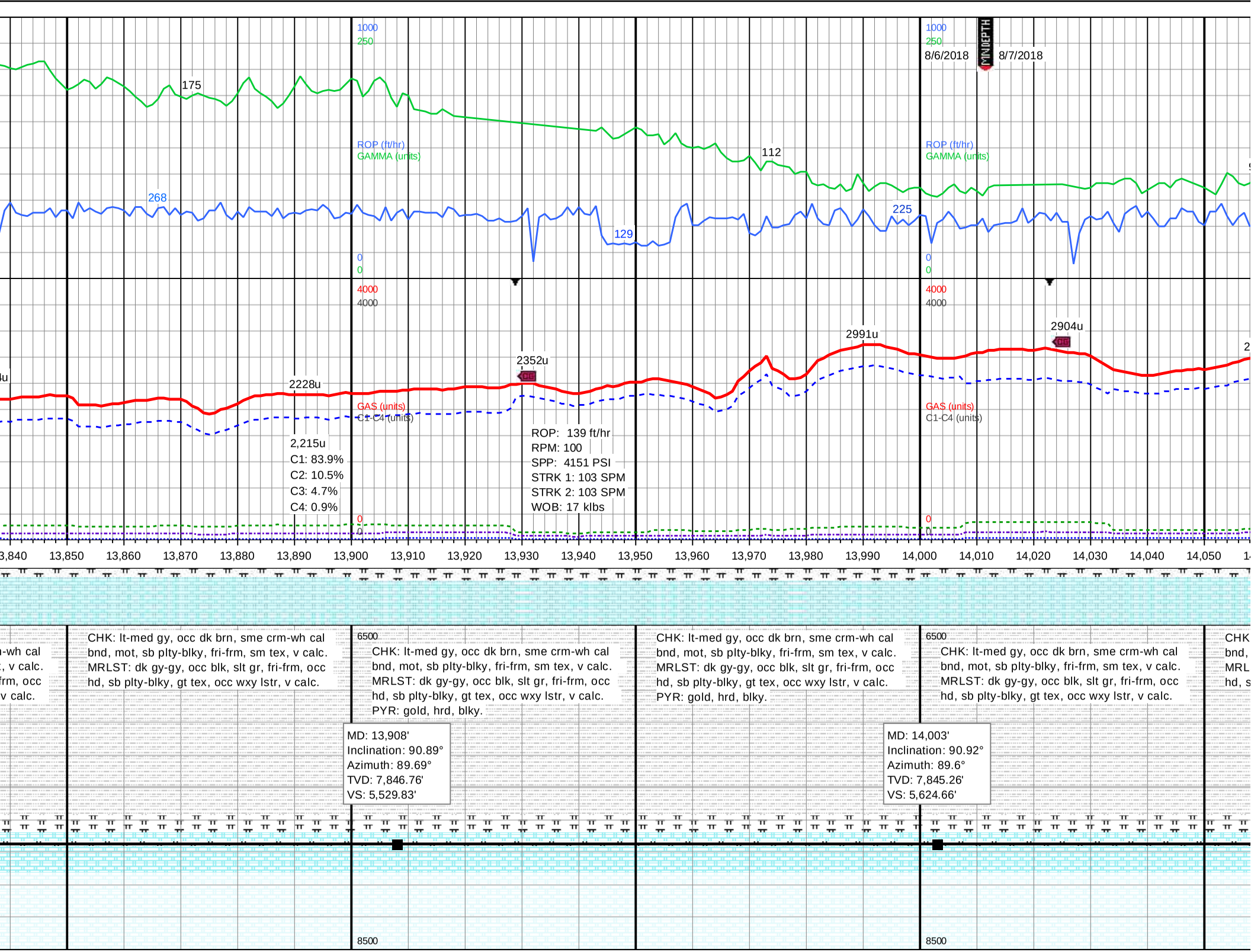

1000
250
ROP (ft/hr)
GAMMA (units)
87
236
85
126
125
193
146
0
0
4000
4000
2843u
2707u
2800u
2687u
2369u
GAS (units)
C1-C4 (units)
ROP: 139 ft/hr
RPM: 80
SPP: 3374 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 21 klbs
2,464u
C1: 76.1%
C2: 14.2%
C3: 6.7%
C4: 2.9%
12,740
12,750
12,760
12,770
12,780
12,790
12,800
12,810
12,820
12,830
12,840
12,850
12,860
12,870
12,880
12,890
12,900
12,910
12,920
12,930
12,940
12,950
CHK: lt-med gy, occ dk brn, sme crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
PYR: gold, hrd, blky.
MD: 12,773'
Inclination: 90.86°
Azimuth: 93.06°
TVD: 7,864.38'
VS: 4,406.18'
6500
TVD (ft)
8500
MD: 12,867'
Inclination: 90.77°
Azimuth: 95.48°
TVD: 7,863.04'
VS: 4,499.25'

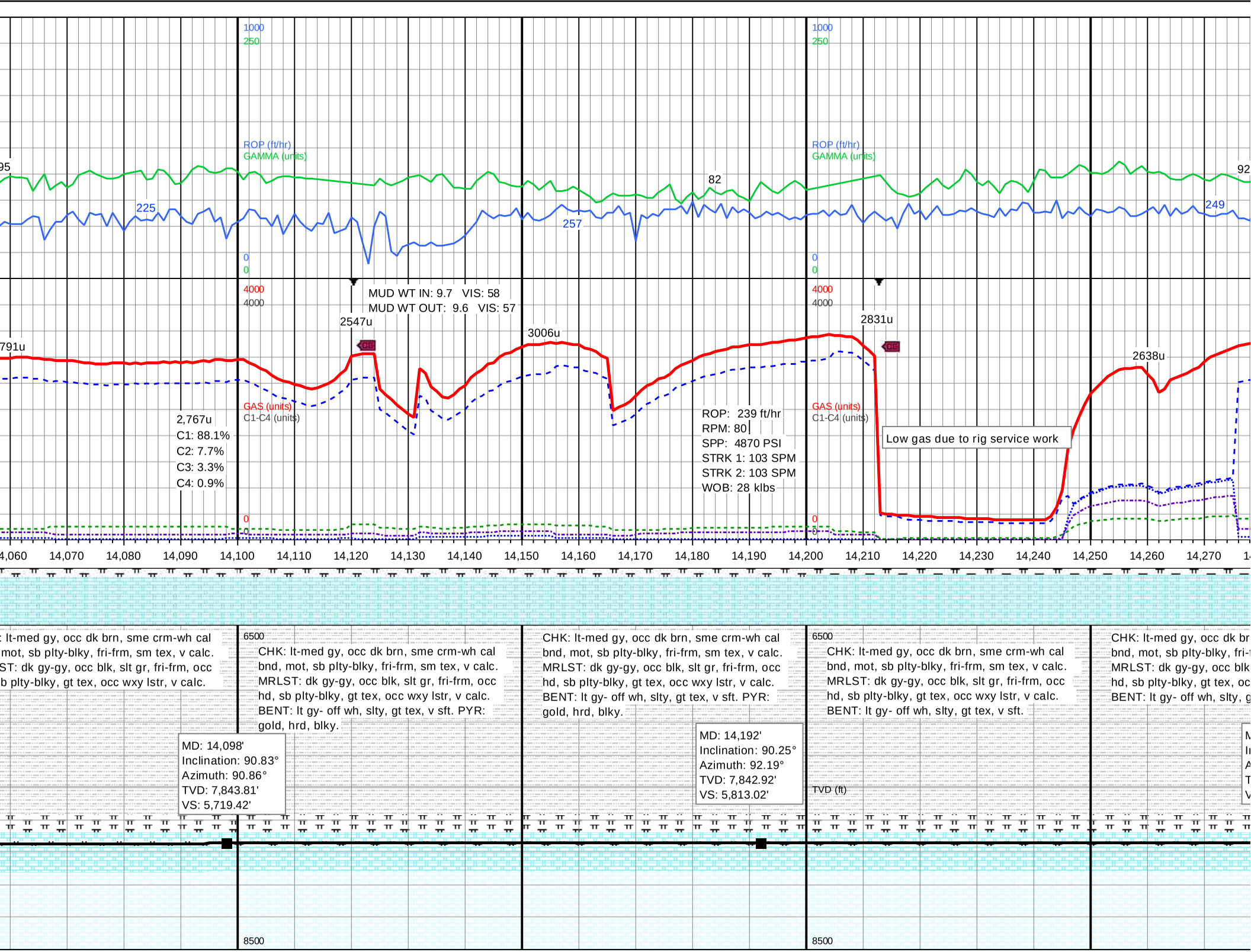

1000
250
ROP (ft/hr)
GAMMA (units)
151
198
197
143
262
0
0
8/5/2018
MNODEPTH
8/6/2018
TOOH. for tool failure at 13138' at 8:00PM.
Resumed drilling at 6:30PM on 8/6/2018.
ROP: 97 ft/hr
RPM: 80
SPP: 4264 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 17 klbs
MUD WT IN: 9.7 VIS: 53
MUD WT OUT: 9.7 VIS: 51
4000
4000
GAS (units)
C1-C4 (units)
2158u
2184u
2518u
2,360u
C1: 88.3%
C2: 7.5%
C3: 3.3%
C4: 0.9%
523u
1303
12,960
12,970
12,980
12,990
13,000
13,010
13,020
13,030
13,040
13,050
13,060
13,070
13,080
13,090
13,100
13,110
13,120
13,130
13,140
13,150
13,160
13,170
6500
8500
TVD (ft)
CHK: lt-med gy, occ dk brn, sme crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
PYR: gold, hrd, blky.
BENT: lt gy- off wh, slty, gt tex, v sft.
MD: 13,056'
Inclination: 90.92°
Azimuth: 92.29°
TVD: 7,860.27'
VS: 4,687.22'
MD: 13,152'
Inclination: 90.92°
Azimuth: 100.02°
TVD: 7,858.73'
VS: 4,781.72'

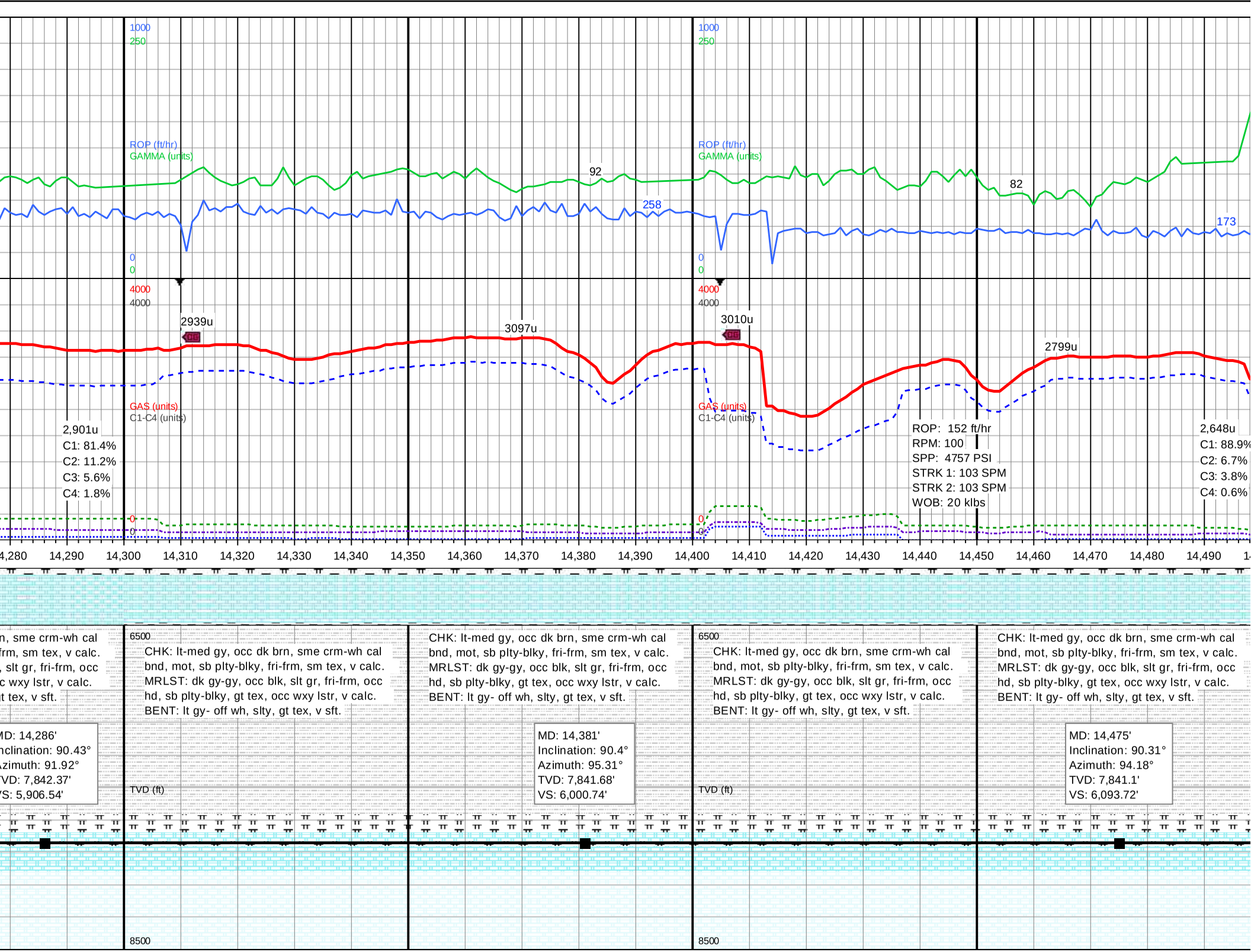

1000
250
155
ROP (ft/hr)
GAMMA (units)
144
0
0
ROP: 239 ft/hr
RPM: 100
SPP: 4640 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 22 klbs
4000
4000
1,092u
C1: 86.9%
C2: 8%
C3: 3.8%
C4: 1.4%
GAS (units)
C1-C4 (units)
1377u
986u
0
0
1000
250
151
130
ROP (ft/hr)
GAMMA (units)
147
0
0
4000
4000
MUD WT IN: 9.6 VIS: 66
MUD WT OUT: 9.6 VIS:
GAS (units)
C1-C4 (units)
1234u
932u
0
0
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
13,380
13,390
n, sme crm-wh cal
frm, sm tex, v calc.
, slt gr, fri-frm, occ
c wxy lstr, v calc.
t tex, v sft.
6500
CHK: lt-med gy, occ dk brn, sme crm-wh cal
bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
BENT: lt gy- off wh, slty, gt tex, v sft.
MD: 13,247'
Inclination: 90.95°
Azimuth: 102.62°
TVD: 7,857.18'
VS: 4,873.44'
TVD (ft)
8500
CHK: lt-med gy, occ dk brn, sme crm-wh cal
bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
BENT: lt gy- off wh, slty, gt tex, v sft.
6500
CHK: lt-med gy, occ dk brn, sme crm-wh cal
bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
MD: 13,341'
Inclination: 90.89°
Azimuth: 99.07°
TVD: 7,855.67'
VS: 4,964.39'
TVD (ft)
8500
CHK: lt-med gy, occ dk brn, sme crm-wh cal
bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt tex, occ wxy lstr, v calc.

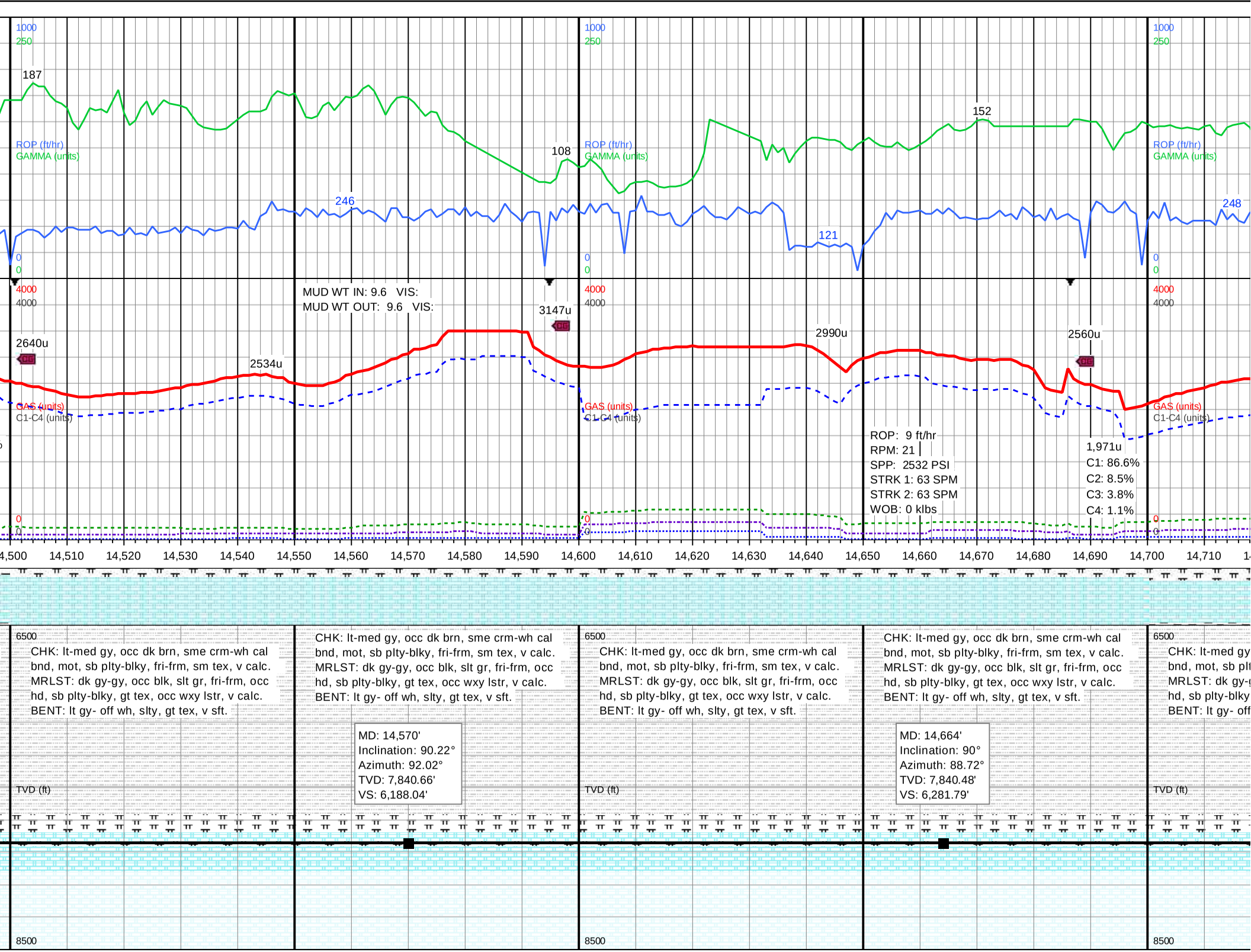

1000
250
ROP (ft/hr)
GAMMA (units)
95
114
157
244
0
0
4000
4000
ROP: 195 ft/hr
RPM: 101
SPP: 4693 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 30 klbs
GAS (units)
C1-C4 (units)
2038u
1965u
2260u
2505u
2048u
1,963u
C1: 83.9%
C2: 10.1%
C3: 4.6%
C4: 1.4%
MUD
13,400
13,410
13,420
13,430
13,440
13,450
13,460
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
13,600
13,610
6500
CHK: lt-med gy, occ dk brn, sme crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
BENT: lt gy- off wh, slty, gt tex, v sft.
MD: 13,435'
Inclination: 90.89°
Azimuth: 90.47°
TVD: 7,854.21'
VS: 5,057.27'
MD: 13,530'
Inclination: 90.92°
Azimuth: 88.56°
TVD: 7,852.71'
VS: 5,152.1'
TVD (ft)
8500

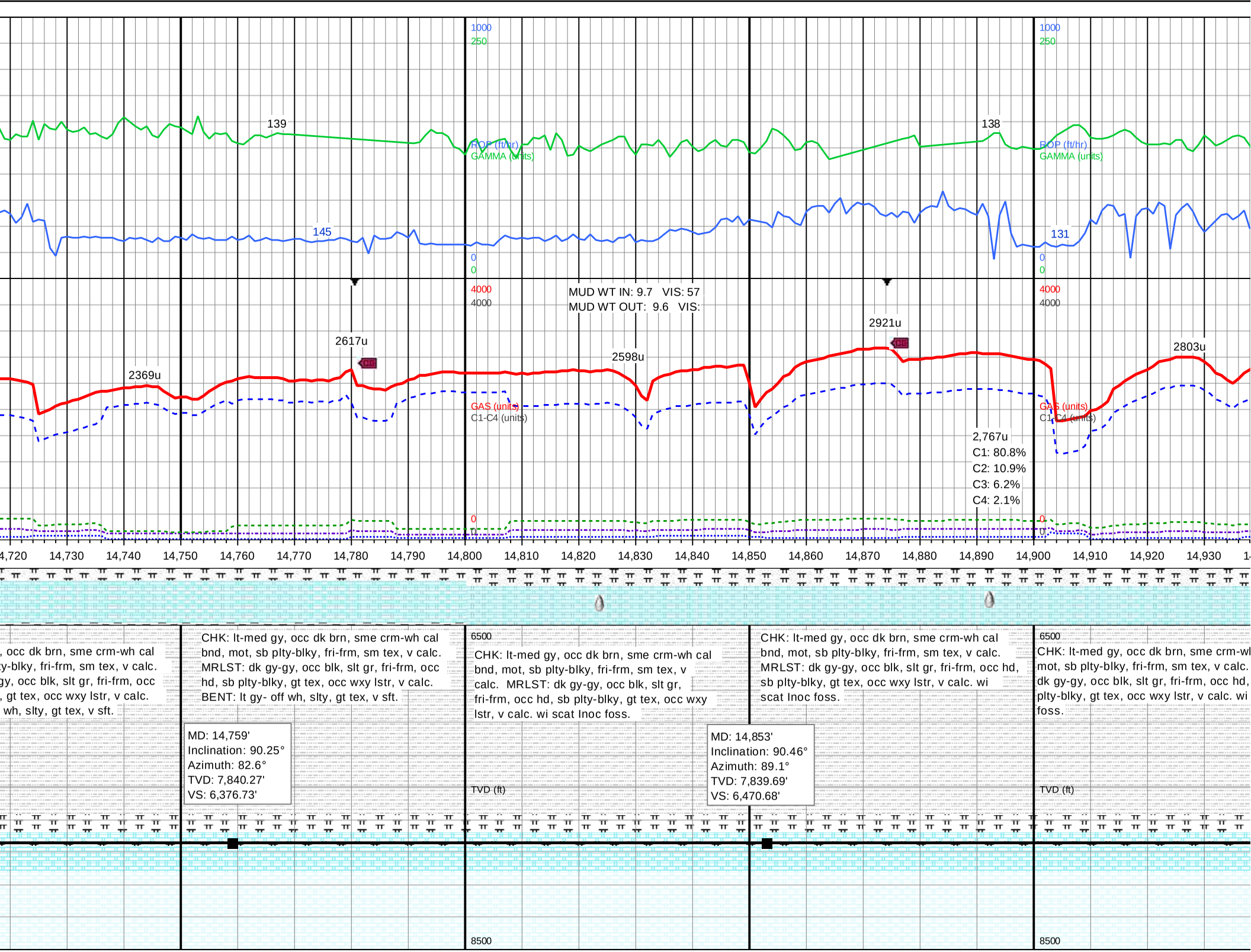

1000
250
ROP (ft/hr)
GAMMA (units)
190
143
247
217
121
0
0
WT IN: 9.6 VIS:
WT OUT: 9.6 VIS:
ROP: 262 ft/hr
RPM: 100
SPP: 4614 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 31 klbs
4000
4000
2430u
1915u
1,996u
C1: 85.3%
C2: 9.1%
C3: 4.2%
C4: 1.4%
2454u
1922u
2084
GAS (units)
C1-C4 (units)
0
0
13,620
13,630
13,640
13,650
13,660
13,670
13,680
13,690
13,700
13,710
13,720
13,730
13,740
13,750
13,760
13,770
13,780
13,790
13,800
13,810
13,820
13,830
, occ dk brn, sme crm-wh cal
y-blky, fri-frm, sm tex, v calc.
gy, occ blk, slt gr, fri-frm, occ
, gt tex, occ wxy lstr, v calc.
wh, slty, gt tex, v sft.
: 13,624'
lination: 90.95°
muth: 87.47°
D: 7,851.17'
: 5,246.04'
CHK: lt-med gy, occ dk brn, sme crm-wh cal
bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
BENT: lt gy- off wh, slty, gt tex, v sft.
6500
CHK: lt-med gy, occ dk brn, sme crm-wh cal
bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
BENT: lt gy- off wh, slty, gt tex, v sft.
MD: 13,719'
Inclination: 90.89°
Azimuth: 87.58°
TVD: 7,849.65'
VS: 5,341.01'
TVD (ft)
8500
CHK: lt-med gy, occ dk brn, sme crm-wh cal
bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
BENT: lt gy- off wh, slty, gt tex, v sft.
6500
CHK: lt-med gy, occ dk brn, sme crm
bnd, mot, sb plty-blky, fri-frm, sm tex
MRLST: dk gy-gy, occ blk, slt gr, fri-
hd, sb plty-blky, gt tex, occ wxy lstr,
MD: 13,814'
Inclination: 90.86°
Azimuth: 88.38°
TVD: 7,848.2'
VS: 5,435.95'
8500

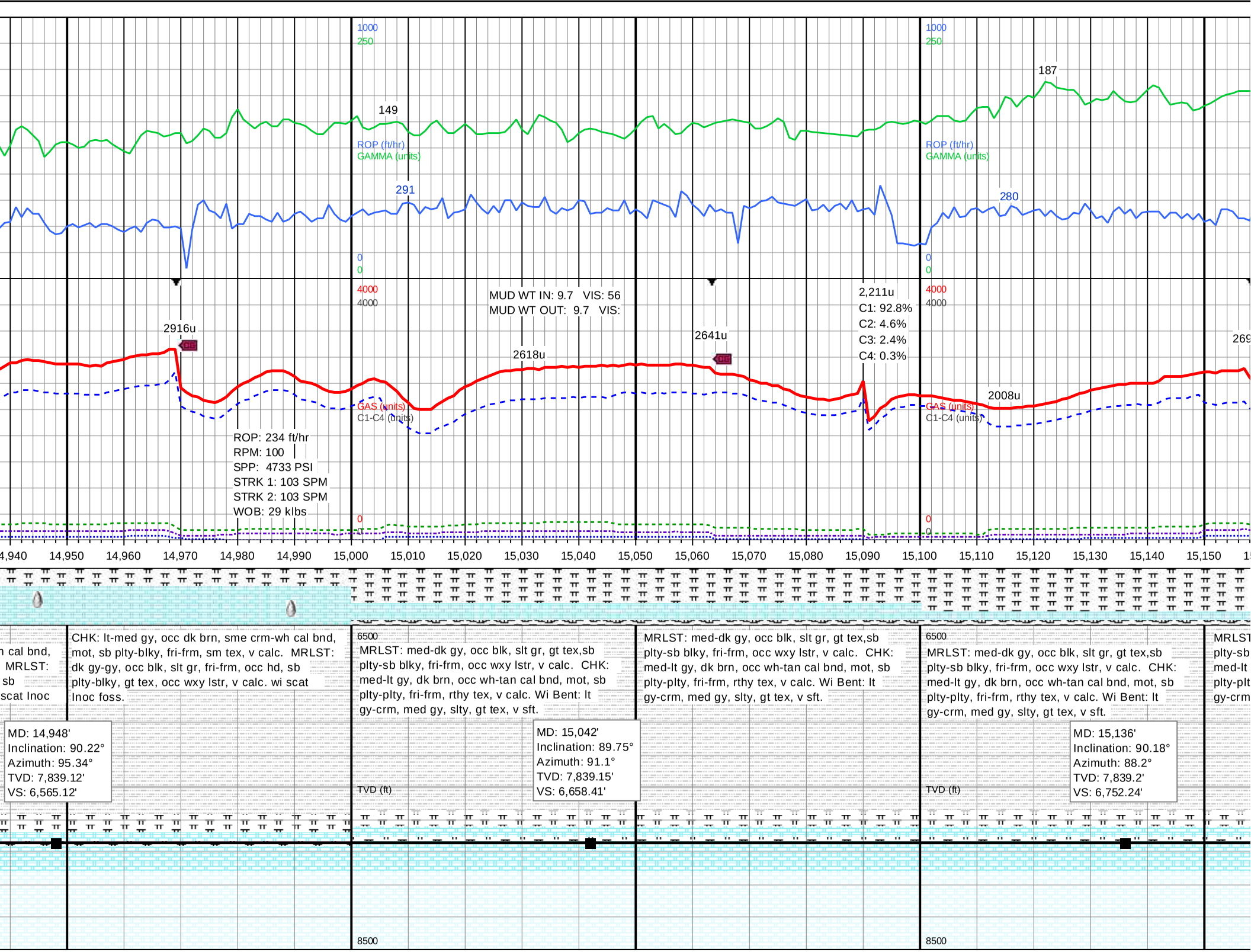

1000
250
ROP (ft/hr)
GAMMA (units)
175
268
112
129
225
0
0
4000
4000
GAS (units)
C1-C4 (units)
2228u
2352u
2991u
2904u
2,215u
C1: 83.9%
C2: 10.5%
C3: 4.7%
C4: 0.9%
ROP: 139 ft/hr
RPM: 100
SPP: 4151 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 17 klbs
8/6/2018
8/7/2018
MINDEPTH
13,840
13,850
13,860
13,870
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
14,040
14,050
CHK: lt-med gy, occ dk brn, sme crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
PYR: gold, hrd, blky.
6500
8500
MD: 13,908'
Inclination: 90.89°
Azimuth: 89.69°
TVD: 7,846.76'
VS: 5,529.83'
MD: 14,003'
Inclination: 90.92°
Azimuth: 89.6°
TVD: 7,845.26'
VS: 5,624.66'

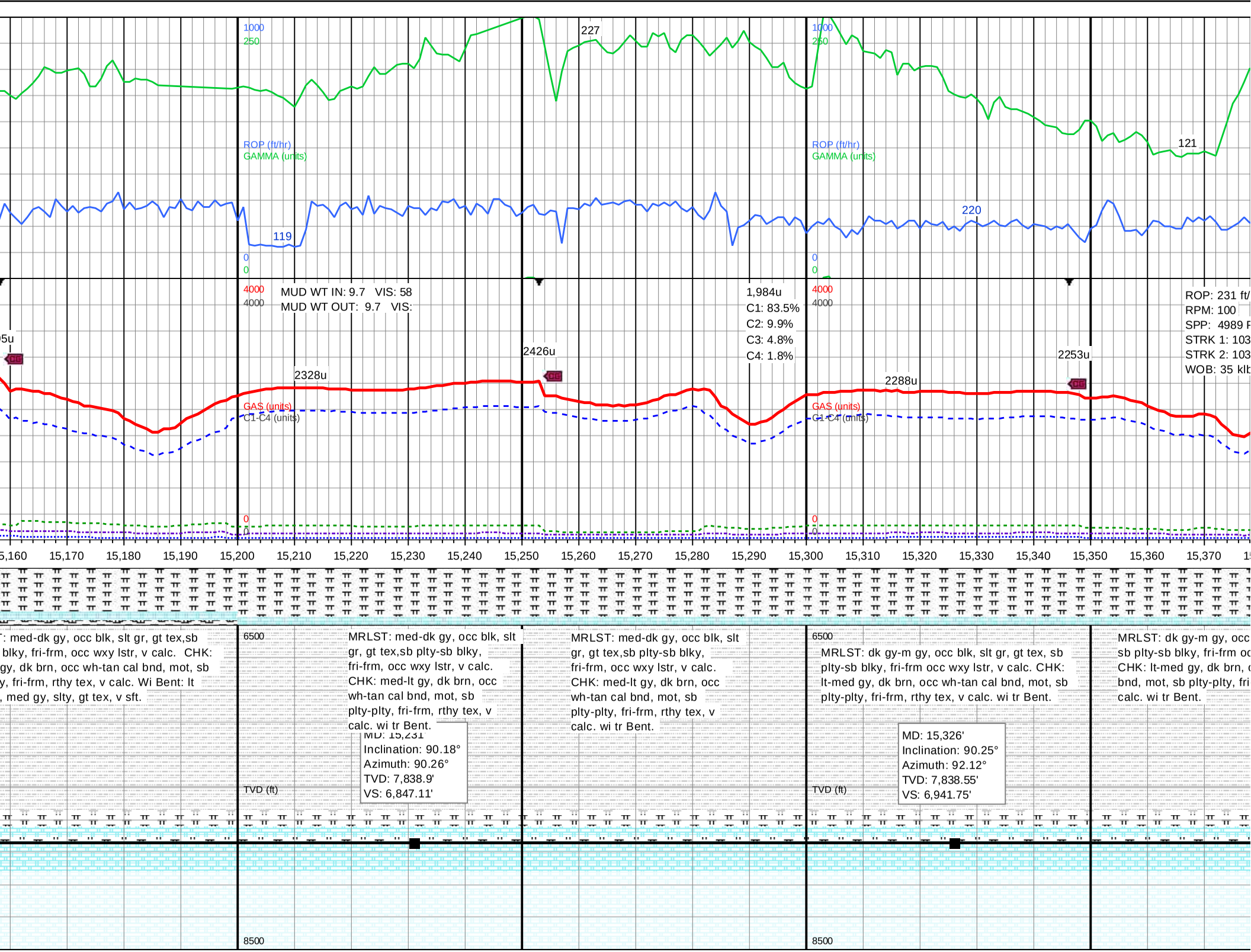

1000
250
ROP (ft/hr)
GAMMA (units)
95
225
82
257
92
249
0
0
4000
4000
MUD WT IN: 9.7 VIS: 58
MUD WT OUT: 9.6 VIS: 57
2547u
3006u
2831u
2638u
791u
GAS (units)
C1-C4 (units)
2,767u
C1: 88.1%
C2: 7.7%
C3: 3.3%
C4: 0.9%
ROP: 239 ft/hr
RPM: 80
SPP: 4870 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 28 klbs
Low gas due to rig service work
14,060
14,070
14,080
14,090
14,100
14,110
14,120
14,130
14,140
14,150
14,160
14,170
14,180
14,190
14,200
14,210
14,220
14,230
14,240
14,250
14,260
14,270
lt-med gy, occ dk brn, sme crm-wh cal
mot, sb plty-blky, fri-frm, sm tex, v calc.
ST: dk gy-gy, occ blk, slt gr, fri-frm, occ
b plty-blky, gt tex, occ wxy lstr, v calc.
6500
CHK: lt-med gy, occ dk brn, sme crm-wh cal
bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
BENT: lt gy- off wh, slty, gt tex, v sft. PYR:
gold, hrd, blky.
MD: 14,098'
Inclination: 90.83°
Azimuth: 90.86°
TVD: 7,843.81'
VS: 5,719.42'
8500
CHK: lt-med gy, occ dk brn, sme crm-wh cal
bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
BENT: lt gy- off wh, slty, gt tex, v sft. PYR:
gold, hrd, blky.
MD: 14,192'
Inclination: 90.25°
Azimuth: 92.19°
TVD: 7,842.92'
VS: 5,813.02'
6500
CHK: lt-med gy, occ dk brn, sme crm-wh cal
bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
BENT: lt gy- off wh, slty, gt tex, v sft.
TVD (ft)
8500
CHK: lt-med gy, occ dk br
bnd, mot, sb plty-blky, fri-
MRLST: dk gy-gy, occ blk
hd, sb plty-blky, gt tex, oc
BENT: lt gy- off wh, slty, g

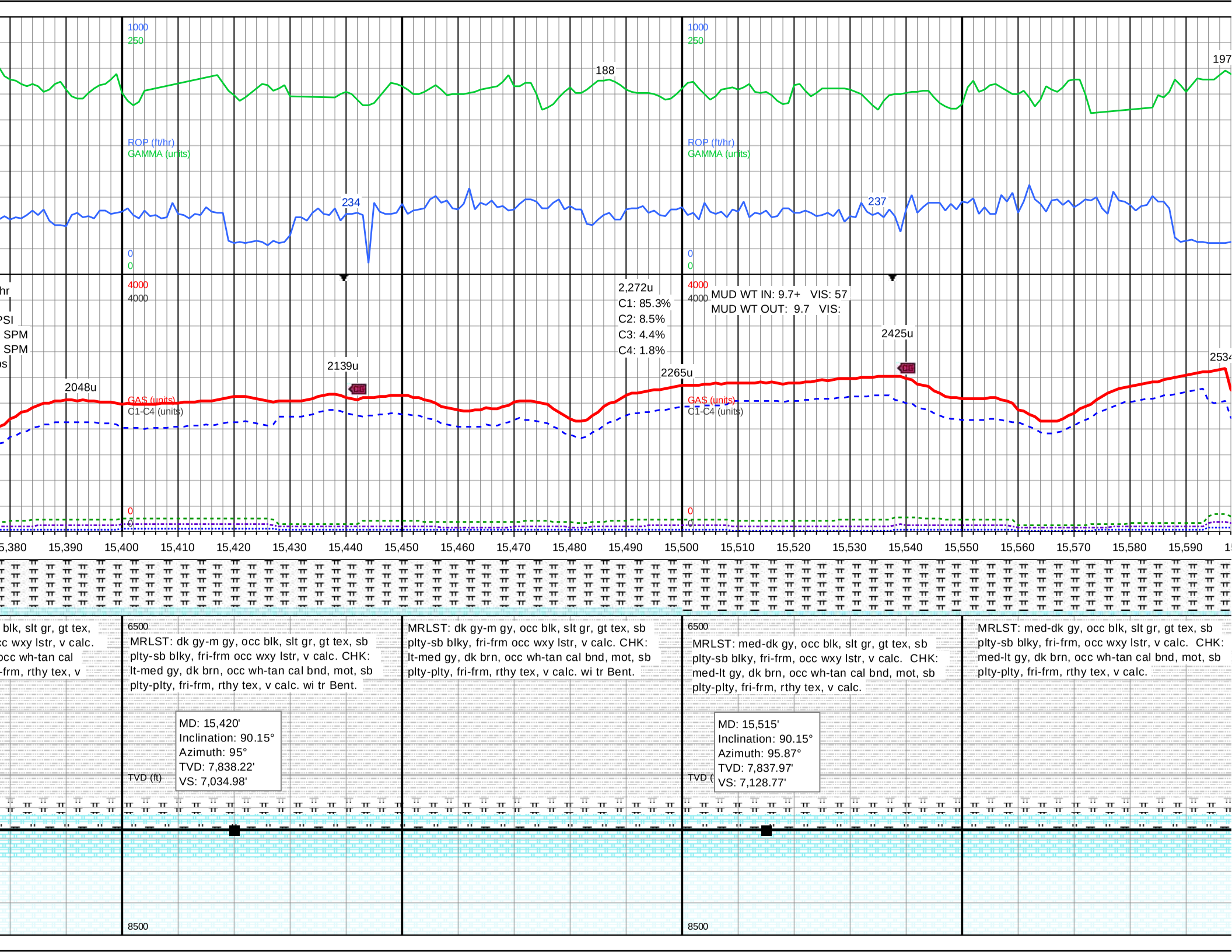

1000
250
ROP (ft/hr)
GAMMA (units)
92
258
0
0
4000
4000
2939u
3097u
GAS (units)
C1-C4 (units)
2,901u
C1: 81.4%
C2: 11.2%
C3: 5.6%
C4: 1.8%
0
0
14,280
14,290
14,300
14,310
14,320
14,330
14,340
14,350
14,360
14,370
14,380
14,390
14,400
1000
250
ROP (ft/hr)
GAMMA (units)
82
173
0
0
4000
4000
3010u
2799u
GAS (units)
C1-C4 (units)
ROP: 152 ft/hr
RPM: 100
SPP: 4757 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 20 klbs
2,648u
C1: 88.9%
C2: 6.7%
C3: 3.8%
C4: 0.6%
0
0
14,410
14,420
14,430
14,440
14,450
14,460
14,470
14,480
14,490
n, sme crm-wh cal
rm, sm tex, v calc.
slt gr, fri-frm, occ
c wxy lstr, v calc.
t tex, v sft.
MD: 14,286'
nclination: 90.43°
zimuth: 91.92°
VD: 7,842.37'
S: 5,906.54'
6500
CHK: lt-med gy, occ dk brn, sme crm-wh cal
bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
BENT: lt gy- off wh, slty, gt tex, v sft.
TVD (ft)
8500
CHK: lt-med gy, occ dk brn, sme crm-wh cal
bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
BENT: lt gy- off wh, slty, gt tex, v sft.
MD: 14,381'
Inclination: 90.4°
Azimuth: 95.31°
TVD: 7,841.68'
VS: 6,000.74'
6500
CHK: lt-med gy, occ dk brn, sme crm-wh cal
bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
BENT: lt gy- off wh, slty, gt tex, v sft.
TVD (ft)
8500
CHK: lt-med gy, occ dk brn, sme crm-wh cal
bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
BENT: lt gy- off wh, slty, gt tex, v sft.
MD: 14,475'
Inclination: 90.31°
Azimuth: 94.18°
TVD: 7,841.1'
VS: 6,093.72'

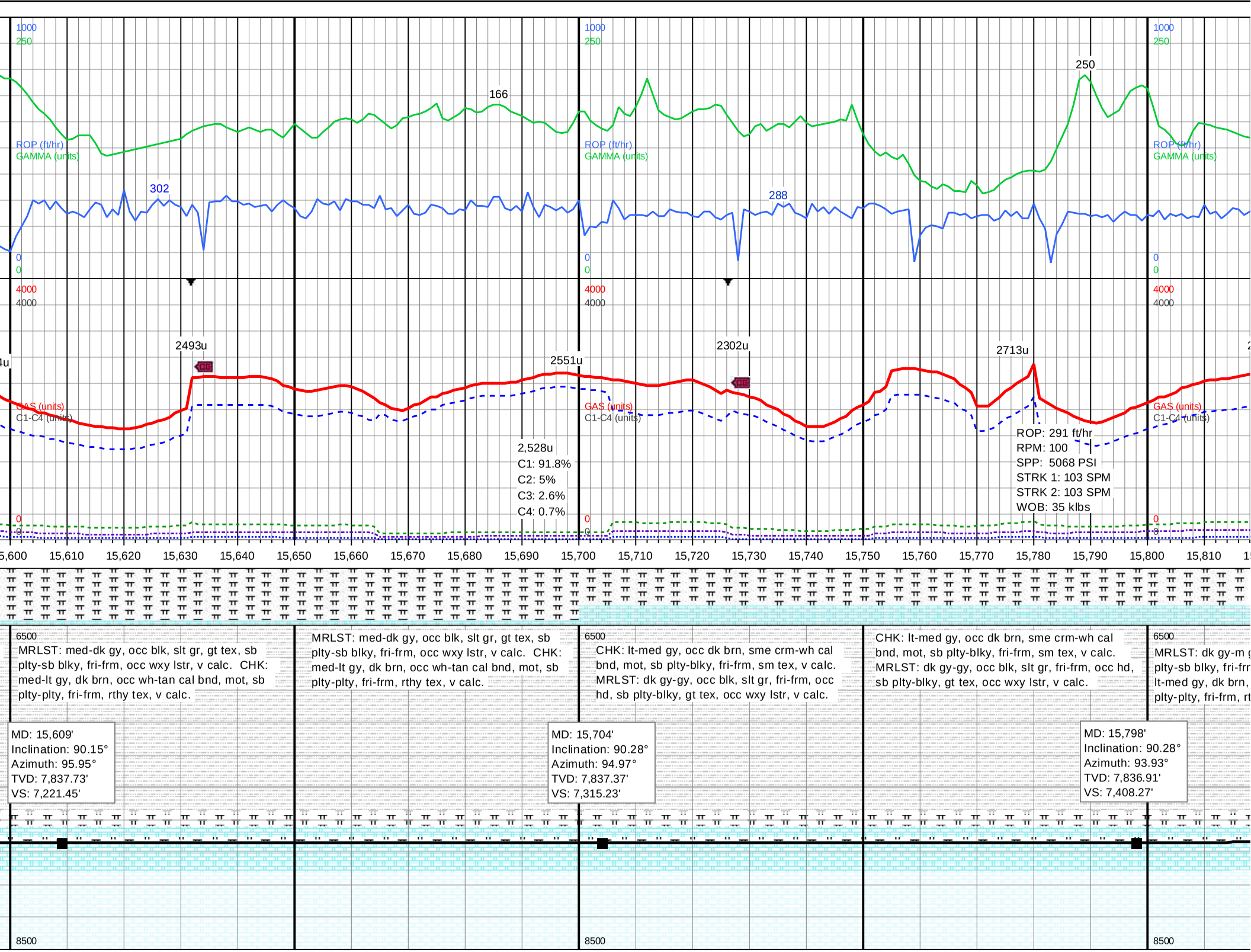

1000
250
187
ROP (ft/hr)
GAMMA (units)
108
246
152
121
248
0
0
4000
4000
MUD WT IN: 9.6 VIS:
MUD WT OUT: 9.6 VIS:
3147u
2640u
2534u
2990u
2560u
GAS (units)
C1-C4 (units)
ROP: 9 ft/hr
RPM: 21
SPP: 2532 PSI
STRK 1: 63 SPM
STRK 2: 63 SPM
WOB: 0 klbs
1,971u
C1: 86.6%
C2: 8.5%
C3: 3.8%
C4: 1.1%
14,500
14,510
14,520
14,530
14,540
14,550
14,560
14,570
14,580
14,590
14,600
14,610
14,620
14,630
14,640
14,650
14,660
14,670
14,680
14,690
14,700
14,710
6500
CHK: lt-med gy, occ dk brn, sme crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc.
MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
BENT: lt gy- off wh, slty, gt tex, v sft.
MD: 14,570'
Inclination: 90.22°
Azimuth: 92.02°
TVD: 7,840.66'
VS: 6,188.04'
MD: 14,664'
Inclination: 90°
Azimuth: 88.72°
TVD: 7,840.48'
VS: 6,281.79'
TVD (ft)
8500

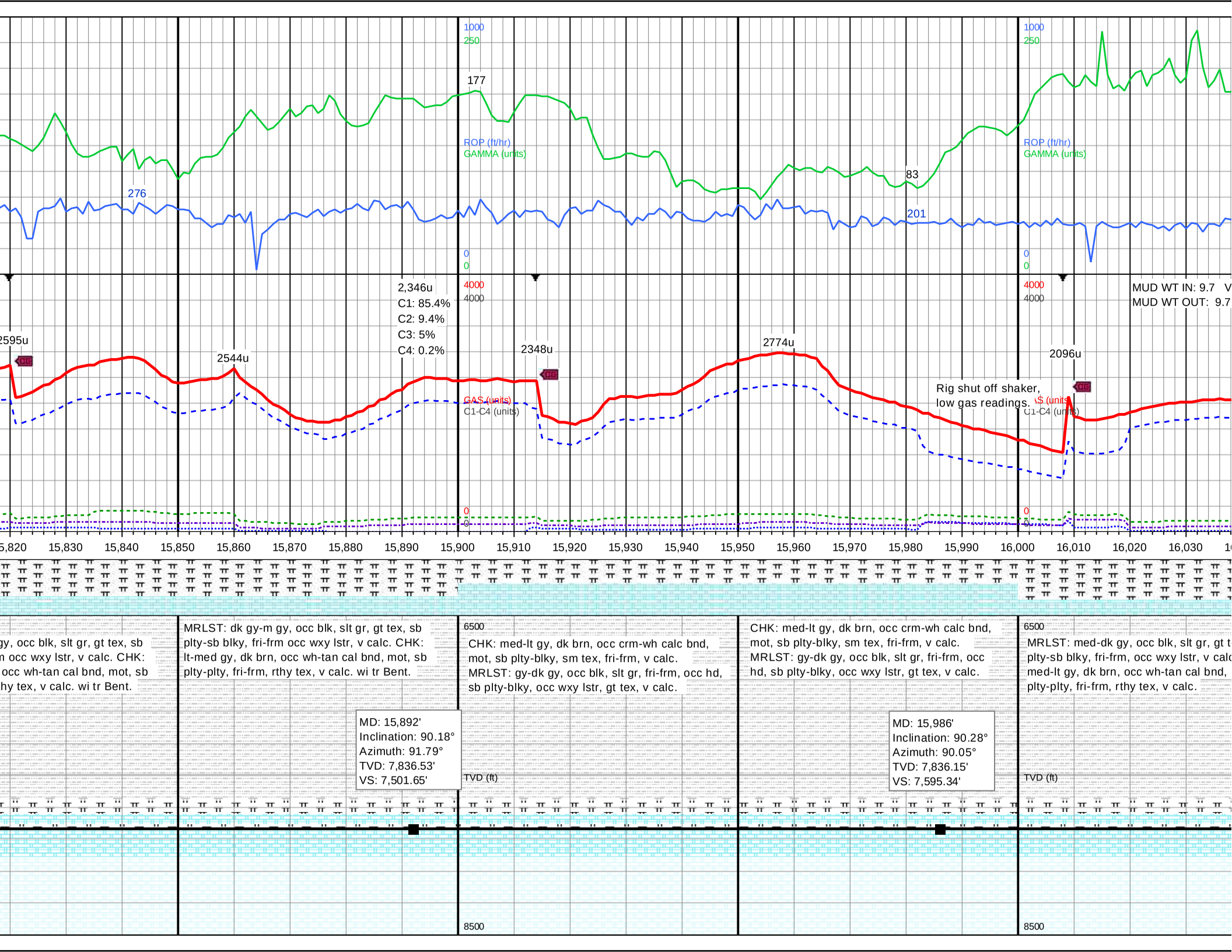

1000
250
ROP (ft/hr)
GAMMA (units)
139
145
138
131
0
0
4000
4000
MUD WT IN: 9.7 VIS: 57
MUD WT OUT: 9.6 VIS:
2369u
2617u
2598u
2921u
2803u
GAS (units)
C1-C4 (units)
2,767u
C1: 80.8%
C2: 10.9%
C3: 6.2%
C4: 2.1%
14,720
14,730
14,740
14,750
14,760
14,770
14,780
14,790
14,800
14,810
14,820
14,830
14,840
14,850
14,860
14,870
14,880
14,890
14,900
14,910
14,920
14,930
, occ dk brn, sme crm-wh cal
y-blky, fri-frm, sm tex, v calc.
gy, occ blk, slt gr, fri-frm, occ
, gt tex, occ wxy lstr, v calc.
wh, slty, gt tex, v sft.
CHK: lt-med gy, occ dk brn, sme crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc. BENT: lt gy- off wh, slty, gt tex, v sft.
MD: 14,759'
Inclination: 90.25°
Azimuth: 82.6°
TVD: 7,840.27'
VS: 6,376.73'
6500
CHK: lt-med gy, occ dk brn, sme crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc. wi scat Inoc foss.
TVD (ft)
8500
MD: 14,853'
Inclination: 90.46°
Azimuth: 89.1°
TVD: 7,839.69'
VS: 6,470.68'
CHK: lt-med gy, occ dk brn, sme crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc. wi scat Inoc foss.
6500
CHK: lt-med gy, occ dk brn, sme crm-wh
mot, sb plty-blky, fri-frm, sm tex, v calc.
dk gy-gy, occ blk, slt gr, fri-frm, occ hd,
plty-blky, gt tex, occ wxy lstr, v calc. wi
foss.
TVD (ft)
8500

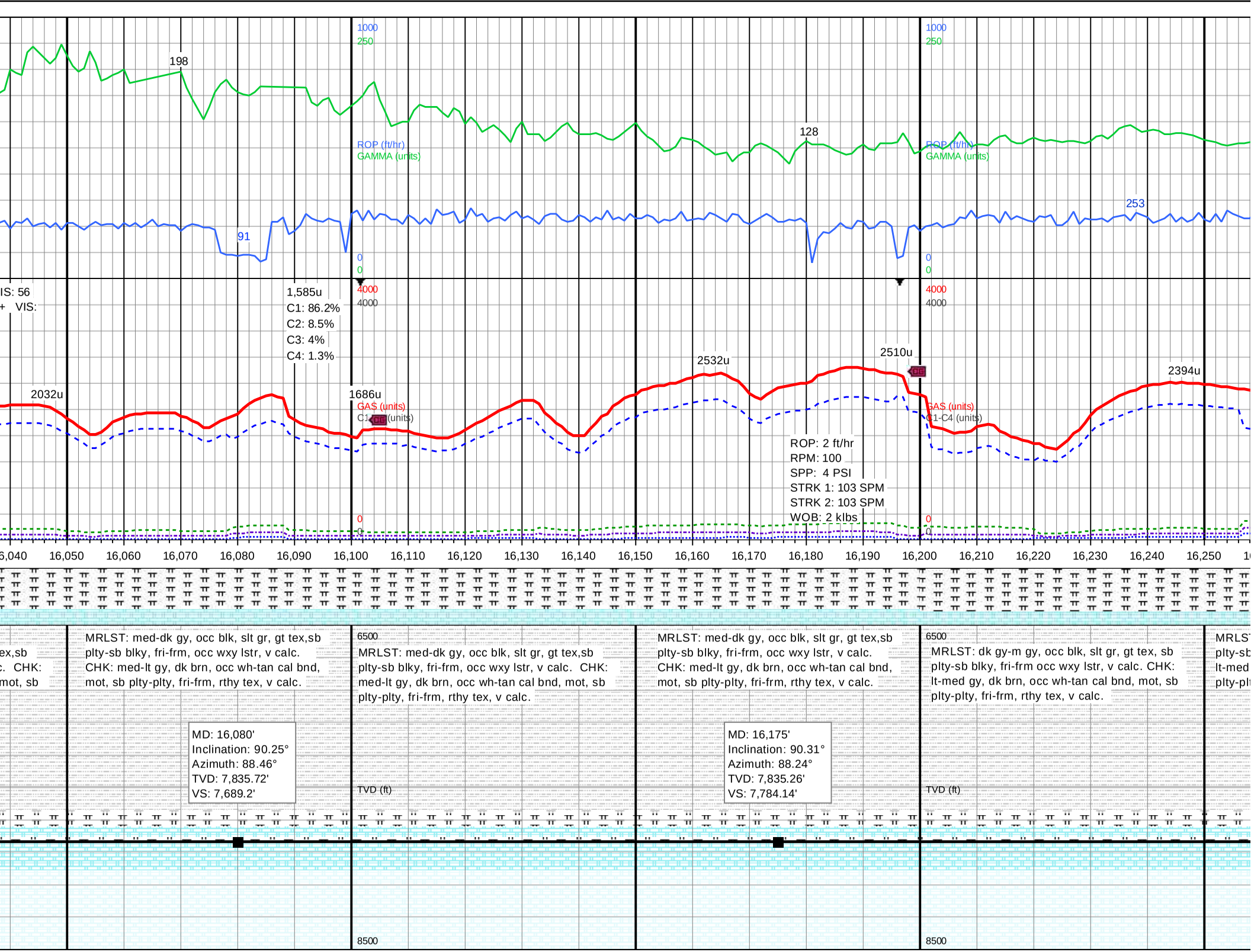

1000
250
149
ROP (ft/hr)
GAMMA (units)
291
0
0
4000
4000
2916u
GAS (units)
C1-C4 (units)
ROP: 234 ft/hr
RPM: 100
SPP: 4733 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 29 klbs
0
0
MUD WT IN: 9.7 VIS: 56
MUD WT OUT: 9.7 VIS:
2618u
2641u
2,211u
C1: 92.8%
C2: 4.6%
C3: 2.4%
C4: 0.3%
1000
250
187
ROP (ft/hr)
GAMMA (units)
280
0
0
4000
4000
2008u
GAS (units)
C1-C4 (units)
0
0
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
15,140
15,150
cal bnd,
MRLST:
sb
scat Inoc
MD: 14,948'
Inclination: 90.22°
Azimuth: 95.34°
TVD: 7,839.12'
VS: 6,565.12'
CHK: lt-med gy, occ dk brn, sme crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc. wi scat Inoc foss.
6500
TVD (ft)
8500
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb plty-sb blky, fri-frm, occ wxy lstr, v calc. CHK: med-lt gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc. Wi Bent: lt gy-crm, med gy, slty, gt tex, v sft.
MD: 15,042'
Inclination: 89.75°
Azimuth: 91.1°
TVD: 7,839.15'
VS: 6,658.41'
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb plty-sb blky, fri-frm, occ wxy lstr, v calc. CHK: med-lt gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc. Wi Bent: lt gy-crm, med gy, slty, gt tex, v sft.
6500
TVD (ft)
8500
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb plty-sb blky, fri-frm, occ wxy lstr, v calc. CHK: med-lt gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc. Wi Bent: lt gy-crm, med gy, slty, gt tex, v sft.
MD: 15,136'
Inclination: 90.18°
Azimuth: 88.2°
TVD: 7,839.2'
VS: 6,752.24'
MRLST
plty-sb
med-lt
plty-plt
gy-crm

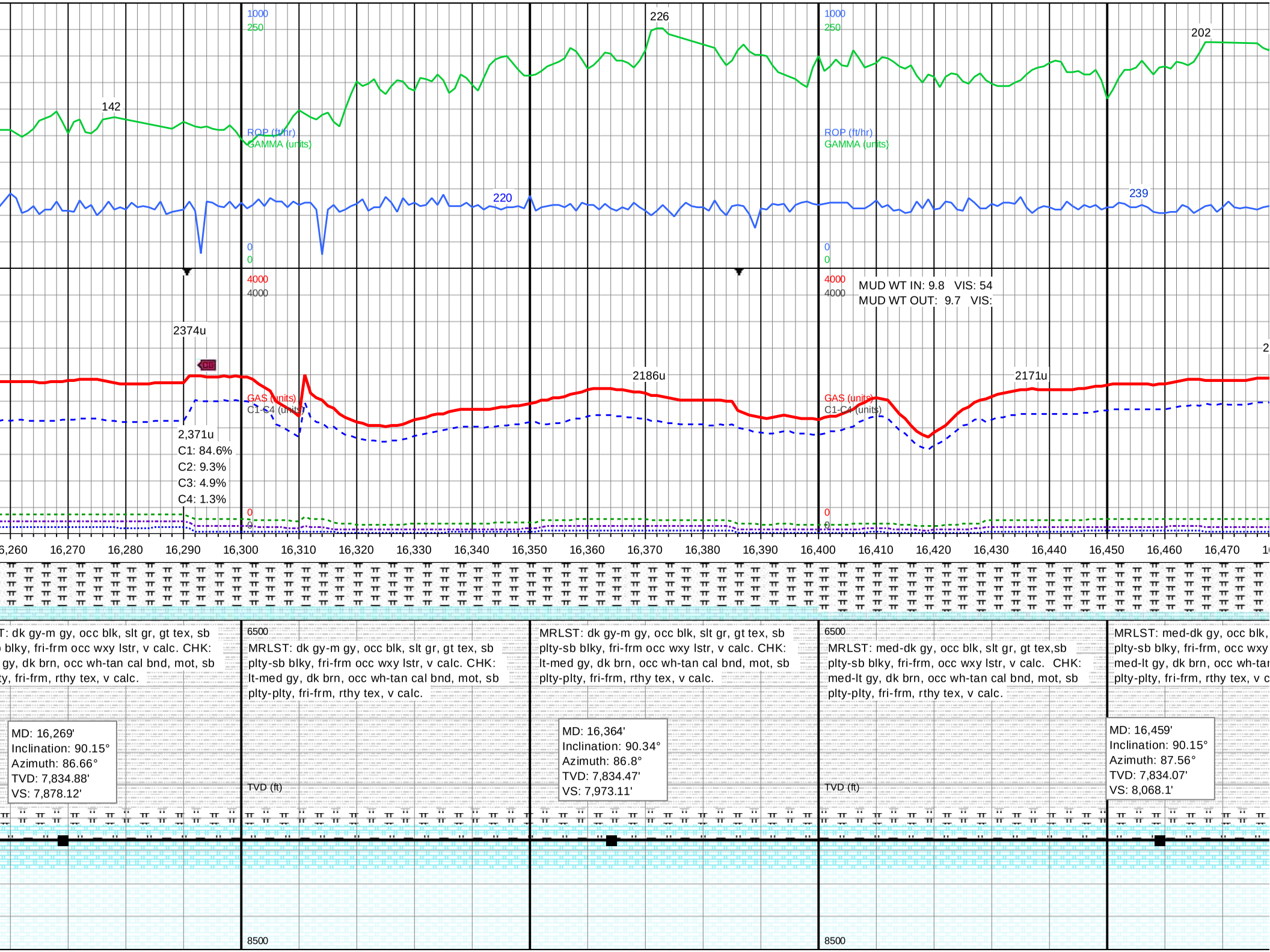

1000
250
ROP (ft/hr)
GAMMA (units)
227
119
121
220
0
0
4000
4000
MUD WT IN: 9.7 VIS: 58
MUD WT OUT: 9.7 VIS:
1,984u
C1: 83.5%
C2: 9.9%
C3: 4.8%
C4: 1.8%
ROP: 231 ft/
RPM: 100
SPP: 4989 F
STRK 1: 103
STRK 2: 103
WOB: 35 klb
2328u
2426u
2288u
2253u
GAS (units)
C1-C4 (units)
15,160
15,170
15,180
15,190
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
15,360
15,370
6500
8500
TVD (ft)
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb plty-sb blky, fri-frm, occ wxy lstr, v calc. CHK: med-lt gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc. wi tr Bent.
MD: 15,231'
Inclination: 90.18°
Azimuth: 90.26°
TVD: 7,838.9'
VS: 6,847.11'
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb plty-sb blky, fri-frm, occ wxy lstr, v calc. CHK: med-lt gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc. wi tr Bent.
MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb plty-sb blky, fri-frm occ wxy lstr, v calc. CHK: lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc. wi tr Bent.
MD: 15,326'
Inclination: 90.25°
Azimuth: 92.12°
TVD: 7,838.55'
VS: 6,941.75'

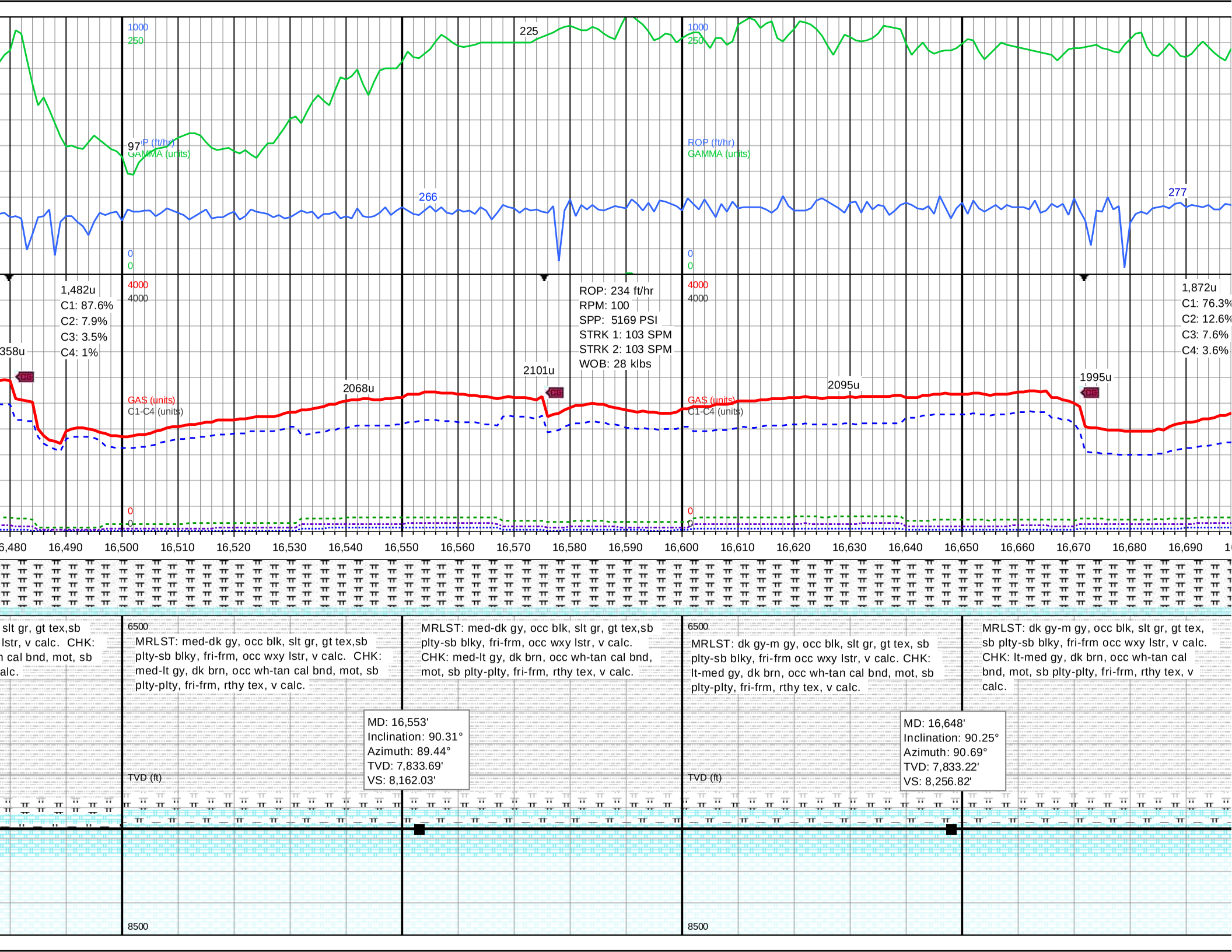

1000
250
188
ROP (ft/hr)
GAMMA (units)
234
0
0
4000
4000
2,272u
C1: 85.3%
C2: 8.5%
C3: 4.4%
C4: 1.8%
2048u
2139u
GAS (units)
C1-C4 (units)
0
0
15,380
15,390
15,400
15,410
15,420
15,430
15,440
15,450
15,460
15,470
15,480
15,490
15,500
15,510
15,520
15,530
15,540
15,550
15,560
15,570
15,580
15,590
1000
250
197
ROP (ft/hr)
GAMMA (units)
237
0
0
4000
4000
MUD WT IN: 9.7+ VIS: 57
MUD WT OUT: 9.7 VIS:
2425u
2265u
GAS (units)
C1-C4 (units)
0
0
blk, slt gr, gt tex,
cc wxy lstr, v calc.
occ wh-tan cal
-frm, rthy tex, v
6500
MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb
plty-sb blky, fri-frm occ wxy lstr, v calc. CHK:
lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb
plty-plty, fri-frm, rthy tex, v calc. wi tr Bent.
MD: 15,420'
Inclination: 90.15°
Azimuth: 95°
TVD: 7,838.22'
VS: 7,034.98'
TVD (ft)
8500
MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb
plty-sb blky, fri-frm occ wxy lstr, v calc. CHK:
lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb
plty-plty, fri-frm, rthy tex, v calc. wi tr Bent.
6500
MRLST: med-dk gy, occ blk, slt gr, gt tex, sb
plty-sb blky, fri-frm, occ wxy lstr, v calc. CHK:
med-lt gy, dk brn, occ wh-tan cal bnd, mot, sb
plty-plty, fri-frm, rthy tex, v calc.
MD: 15,515'
Inclination: 90.15°
Azimuth: 95.87°
TVD: 7,837.97'
VS: 7,128.77'
8500
MRLST: med-dk gy, occ blk, slt gr, gt tex, sb
plty-sb blky, fri-frm, occ wxy lstr, v calc. CHK:
med-lt gy, dk brn, occ wh-tan cal bnd, mot, sb
plty-plty, fri-frm, rthy tex, v calc.

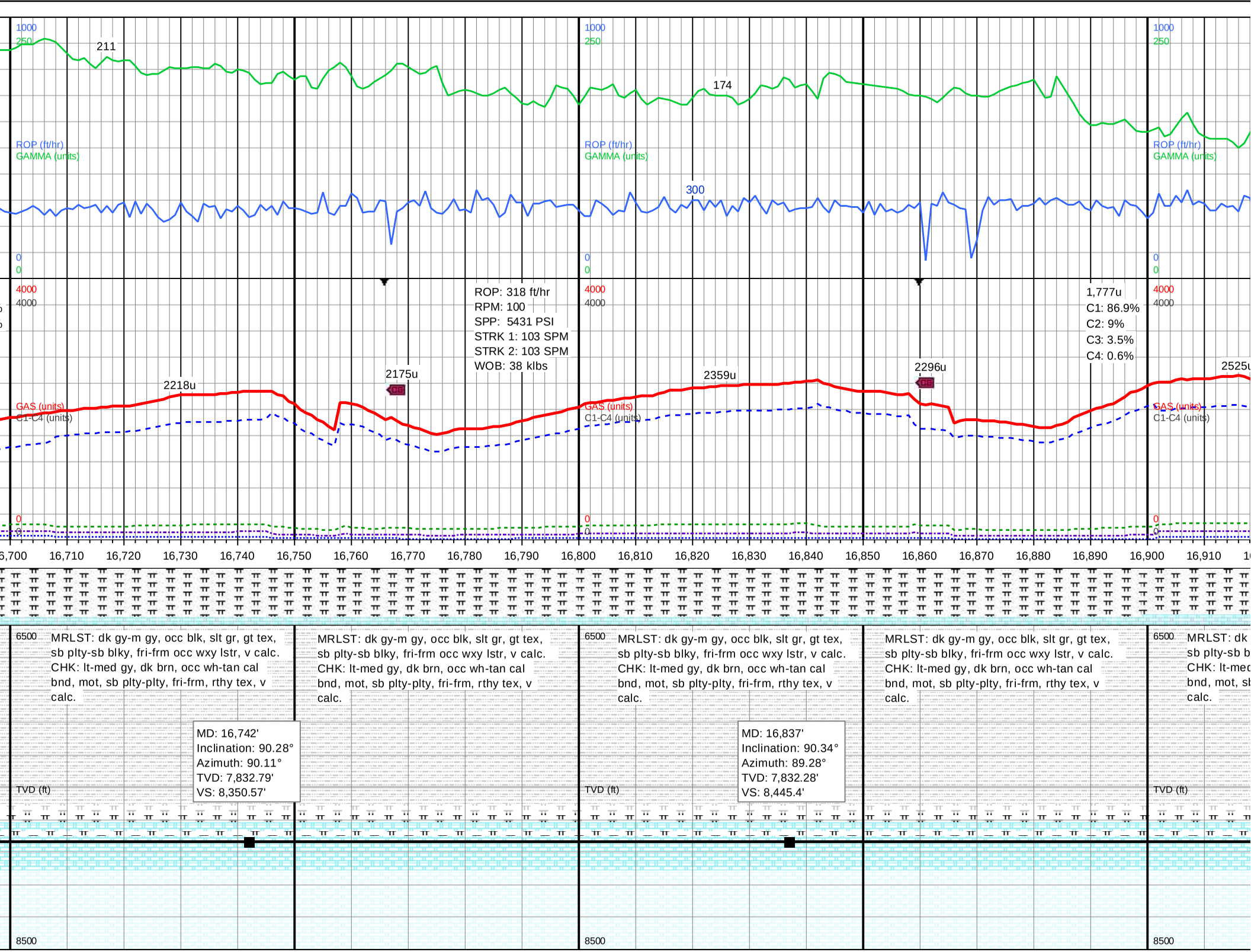

1000
250
ROP (ft/hr)
GAMMA (units)
166
302
250
288
0
0
4000
4000
GAS (units)
C1-C4 (units)
2493u
2551u
2302u
2713u
2,528u
C1: 91.8%
C2: 5%
C3: 2.6%
C4: 0.7%
ROP: 291 ft/hr
RPM: 100
SPP: 5068 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 35 klbs
15,600
15,610
15,620
15,630
15,640
15,650
15,660
15,670
15,680
15,690
15,700
15,710
15,720
15,730
15,740
15,750
15,760
15,770
15,780
15,790
15,800
15,810
6500
MRLST: med-dk gy, occ blk, slt gr, gt tex, sb plty-sb blky, fri-frm, occ wxy lstr, v calc. CHK: med-lt gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc.
MD: 15,609'
Inclination: 90.15°
Azimuth: 95.95°
TVD: 7,837.73'
VS: 7,221.45'
MRLST: med-dk gy, occ blk, slt gr, gt tex, sb plty-sb blky, fri-frm, occ wxy lstr, v calc. CHK: med-lt gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc.
MD: 15,704'
Inclination: 90.28°
Azimuth: 94.97°
TVD: 7,837.37'
VS: 7,315.23'
CHK: lt-med gy, occ dk brn, sme crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
CHK: lt-med gy, occ dk brn, sme crm-wh cal bnd, mot, sb plty-blky, fri-frm, sm tex, v calc. MRLST: dk gy-gy, occ blk, slt gr, fri-frm, occ hd, sb plty-blky, gt tex, occ wxy lstr, v calc.
MD: 15,798'
Inclination: 90.28°
Azimuth: 93.93°
TVD: 7,836.91'
VS: 7,408.27'
8500

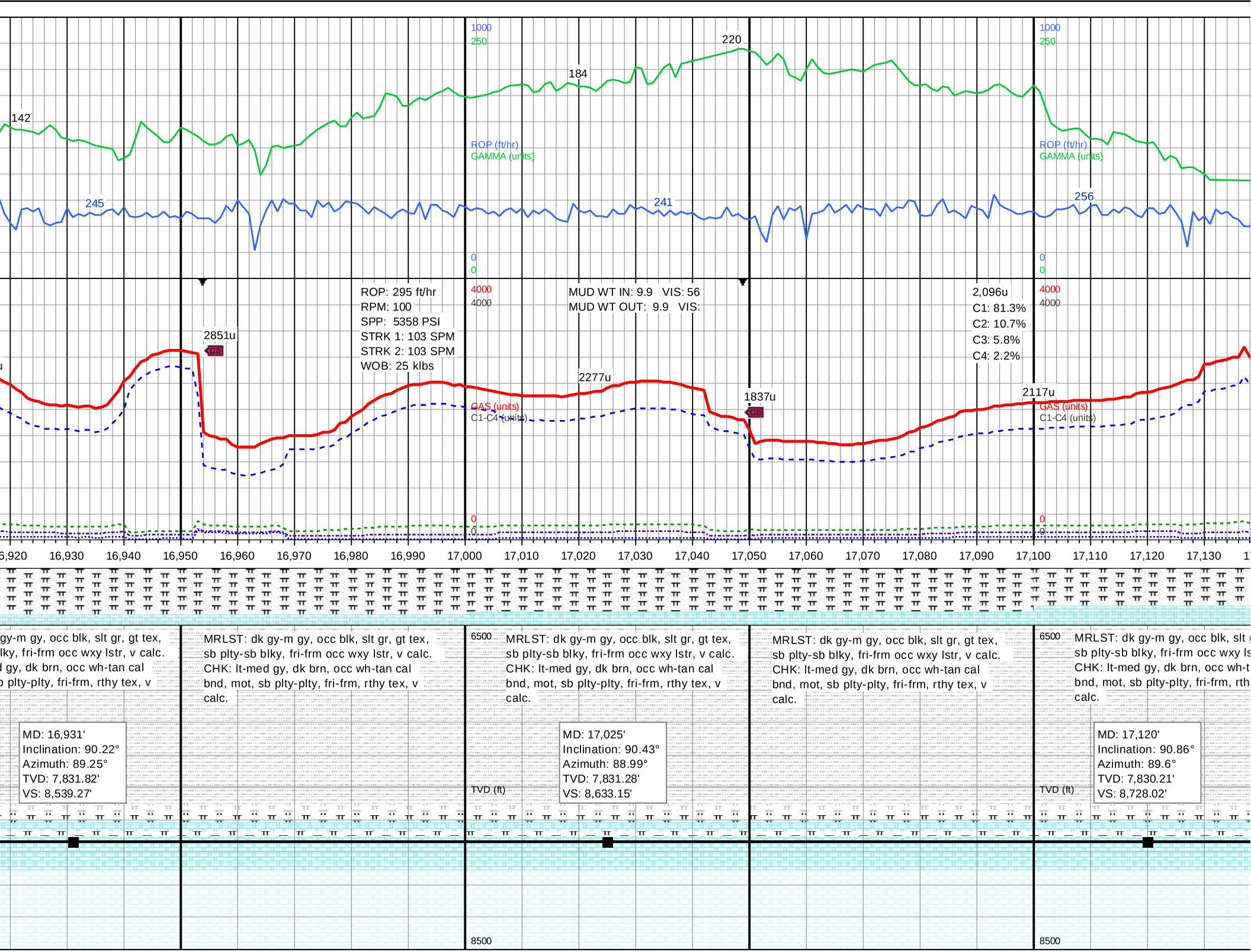

1000
250
177
ROP (ft/hr)
GAMMA (units)
276
0
0
83
201
1000
250
ROP (ft/hr)
GAMMA (units)
0
0
2,346u
C1: 85.4%
C2: 9.4%
C3: 5%
C4: 0.2%
4000
4000
2595u
2544u
2348u
2774u
2096u
GAS (units)
C1-C4 (units)
Rig shut off shaker,
low gas readings.
MUD WT IN: 9.7 V
MUD WT OUT: 9.7
0
0
15,820
15,830
15,840
15,850
15,860
15,870
15,880
15,890
15,900
15,910
15,920
15,930
15,940
15,950
15,960
15,970
15,980
15,990
16,000
16,010
16,020
16,030
gy, occ blk, slt gr, gt tex, sb
n occ wxy lstr, v calc. CHK:
occ wh-tan cal bnd, mot, sb
hy tex, v calc. wi tr Bent.
MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb
plty-sb blky, fri-frm occ wxy lstr, v calc. CHK:
lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb
plty-plty, fri-frm, rthy tex, v calc. wi tr Bent.
6500
CHK: med-lt gy, dk brn, occ crm-wh calc bnd,
mot, sb plty-blky, sm tex, fri-frm, v calc.
MRLST: gy-dk gy, occ blk, slt gr, fri-frm, occ hd,
sb plty-blky, occ wxy lstr, gt tex, v calc.
CHK: med-lt gy, dk brn, occ crm-wh calc bnd,
mot, sb plty-blky, sm tex, fri-frm, v calc.
MRLST: gy-dk gy, occ blk, slt gr, fri-frm, occ
hd, sb plty-blky, occ wxy lstr, gt tex, v calc.
6500
MRLST: med-dk gy, occ blk, slt gr, gt t
plty-sb blky, fri-frm, occ wxy lstr, v calc
med-lt gy, dk brn, occ wh-tan cal bnd,
plty-plty, fri-frm, rthy tex, v calc.
MD: 15,892'
Inclination: 90.18°
Azimuth: 91.79°
TVD: 7,836.53'
VS: 7,501.65'
TVD (ft)
MD: 15,986'
Inclination: 90.28°
Azimuth: 90.05°
TVD: 7,836.15'
VS: 7,595.34'
TVD (ft)
8500
8500

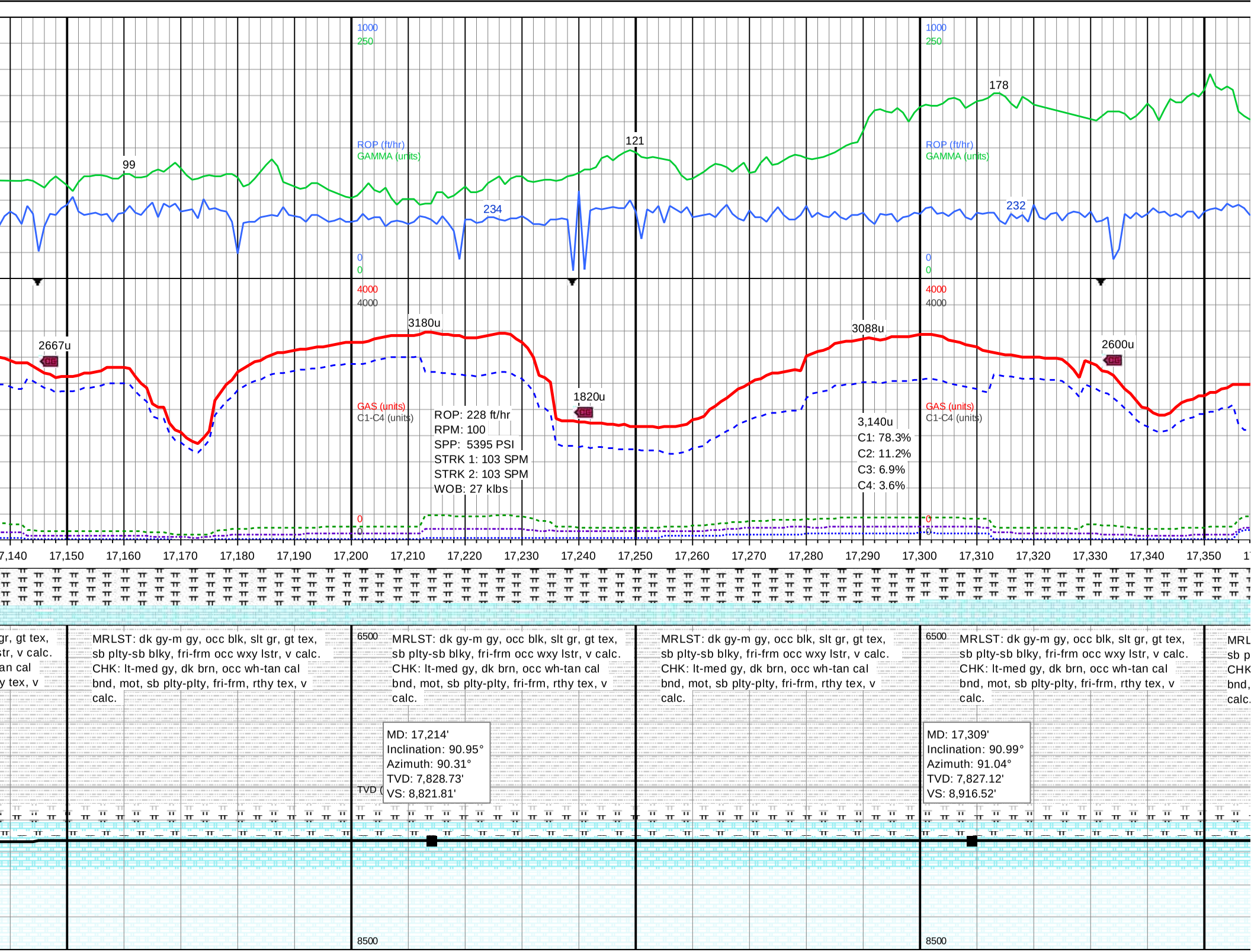

1000
250
198
ROP (ft/hr)
GAMMA (units)
91
128
253
0
0
IS: 56
+ VIS:
1,585u
C1: 86.2%
C2: 8.5%
C3: 4%
C4: 1.3%
4000
4000
2032u
1686u
GA$ (units)
C1 (units)
2532u
2510u
2394u
GA$ (units)
C1-C4 (units)
ROP: 2 ft/hr
RPM: 100
SPP: 4 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 2 klbs
16,040
16,050
16,060
16,070
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
16,240
16,250
ex,sb
c. CHK:
mot, sb
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb
plty-sb blky, fri-frm, occ wxy lstr, v calc.
CHK: med-lt gy, dk brn, occ wh-tan cal bnd,
mot, sb plty-plty, fri-frm, rthy tex, v calc.
MD: 16,080'
Inclination: 90.25°
Azimuth: 88.46°
TVD: 7,835.72'
VS: 7,689.2'
6500
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb
plty-sb blky, fri-frm, occ wxy lstr, v calc. CHK:
med-lt gy, dk brn, occ wh-tan cal bnd, mot, sb
plty-plty, fri-frm, rthy tex, v calc.
TVD (ft)
8500
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb
plty-sb blky, fri-frm, occ wxy lstr, v calc.
CHK: med-lt gy, dk brn, occ wh-tan cal bnd,
mot, sb plty-plty, fri-frm, rthy tex, v calc.
MD: 16,175'
Inclination: 90.31°
Azimuth: 88.24°
TVD: 7,835.26'
VS: 7,784.14'
6500
MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb
plty-sb blky, fri-frm occ wxy lstr, v calc. CHK:
lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb
plty-plty, fri-frm, rthy tex, v calc.
TVD (ft)
8500

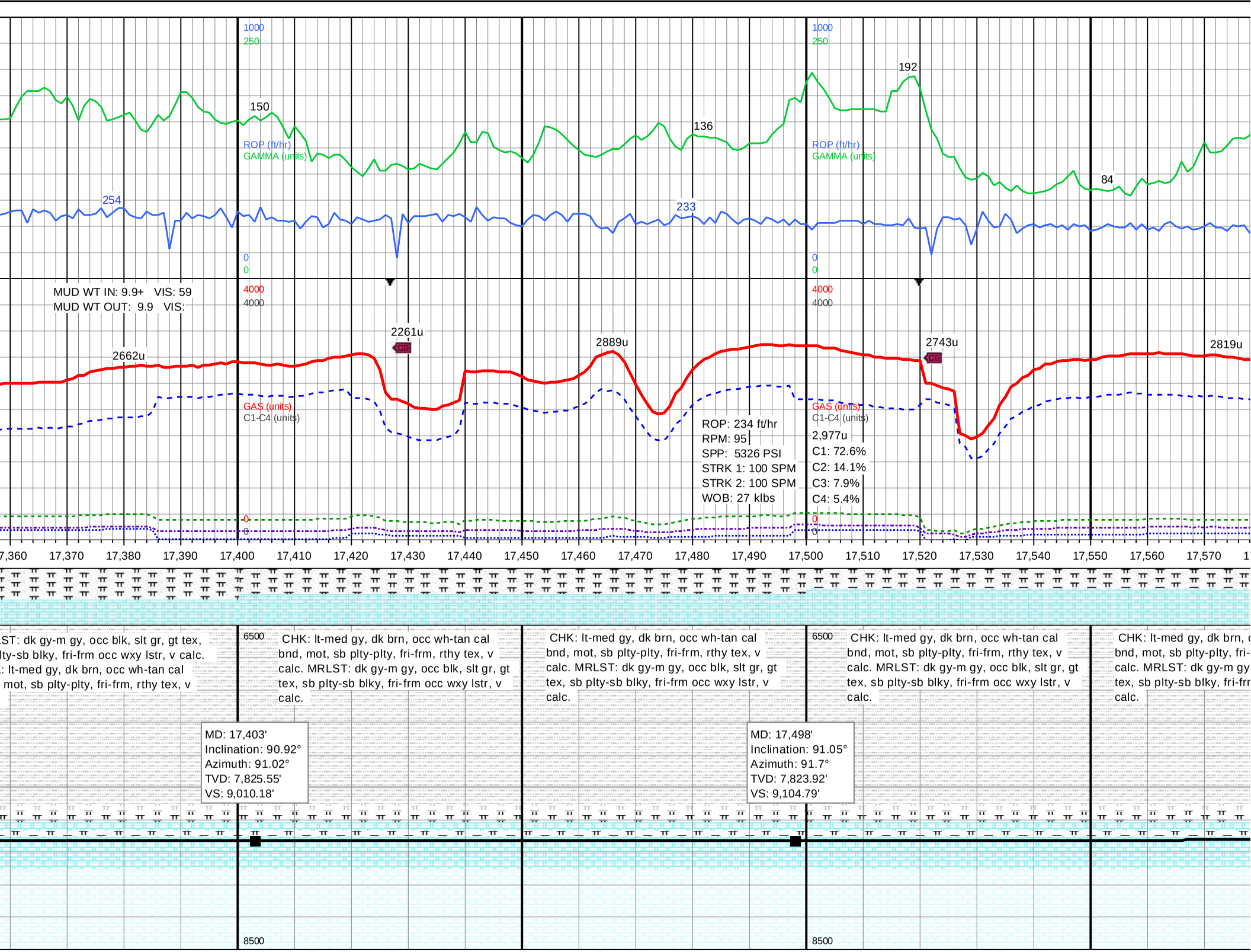

1000
250
142
226
202
ROP (ft/hr)
GAMMA (units)
220
239
0
0
4000
4000
MUD WT IN: 9.8 VIS: 54
MUD WT OUT: 9.7 VIS:
2374u
2186u
2171u
GAS (units)
C1-C4 (units)
2,371u
C1: 84.6%
C2: 9.3%
C3: 4.9%
C4: 1.3%
16,260
16,270
16,280
16,290
16,300
16,310
16,320
16,330
16,340
16,350
16,360
16,370
16,380
16,390
16,400
16,410
16,420
16,430
16,440
16,450
16,460
16,470
T: dk gy-m gy, occ blk, slt gr, gt tex, sb
blky, fri-frm occ wxy lstr, v calc. CHK:
gy, dk brn, occ wh-tan cal bnd, mot, sb
y, fri-frm, rthy tex, v calc.
MD: 16,269'
Inclination: 90.15°
Azimuth: 86.66°
TVD: 7,834.88'
VS: 7,878.12'
6500
MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb
plty-sb blky, fri-frm occ wxy lstr, v calc. CHK:
lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb
plty-plty, fri-frm, rthy tex, v calc.
TVD (ft)
8500
MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb
plty-sb blky, fri-frm occ wxy lstr, v calc. CHK:
lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb
plty-plty, fri-frm, rthy tex, v calc.
MD: 16,364'
Inclination: 90.34°
Azimuth: 86.8°
TVD: 7,834.47'
VS: 7,973.11'
6500
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb
plty-sb blky, fri-frm, occ wxy lstr, v calc. CHK:
med-lt gy, dk brn, occ wh-tan cal bnd, mot, sb
plty-plty, fri-frm, rthy tex, v calc.
TVD (ft)
8500
MRLST: med-dk gy, occ blk,
plty-sb blky, fri-frm, occ wxy
med-lt gy, dk brn, occ wh-tan
plty-plty, fri-frm, rthy tex, v c
MD: 16,459'
Inclination: 90.15°
Azimuth: 87.56°
TVD: 7,834.07'
VS: 8,068.1'

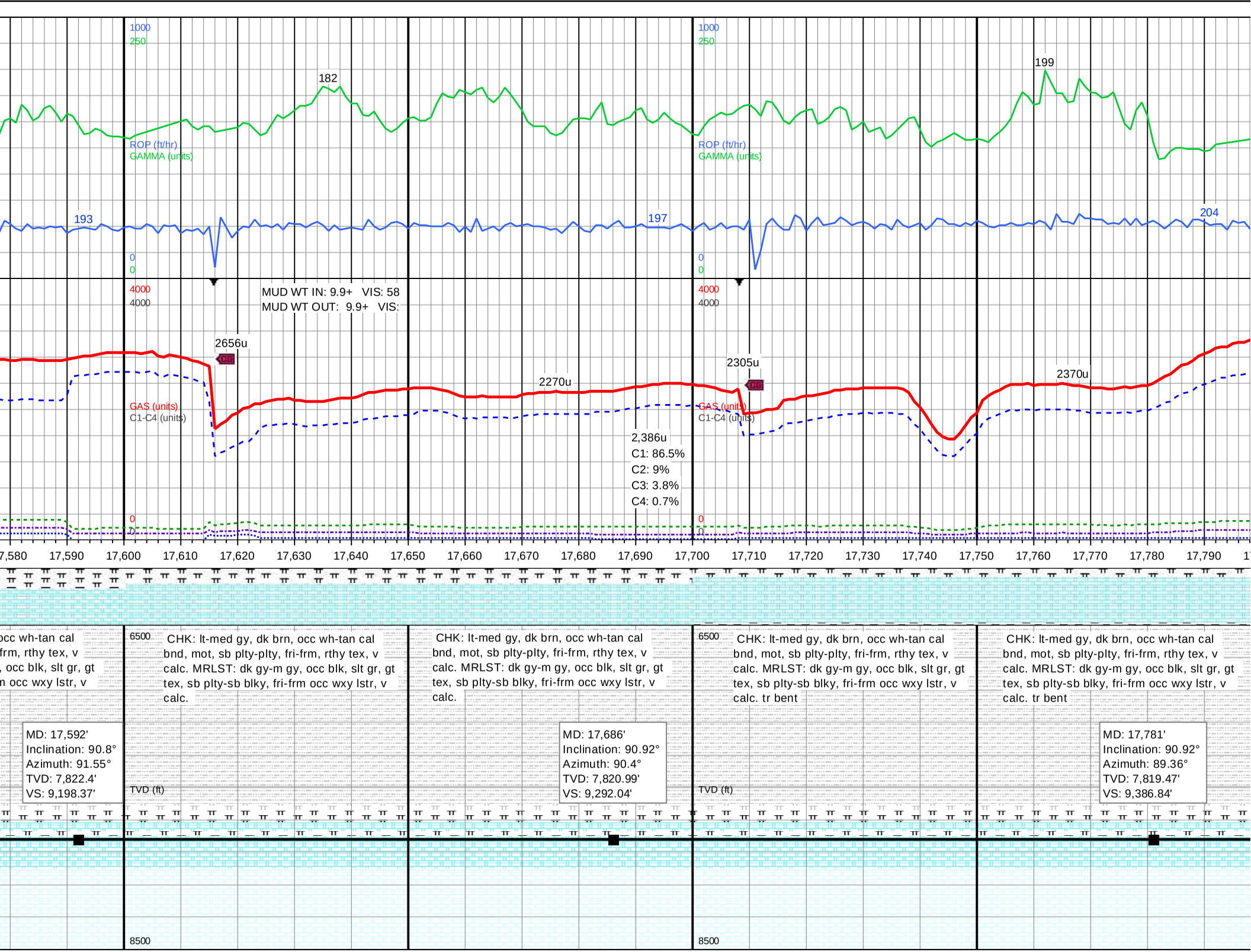

1000
250
225
97
P (ft/hr)
GAMMA (units)
266
277
0
0
4000
4000
1,482u
C1: 87.6%
C2: 7.9%
C3: 3.5%
C4: 1%
358u
ROP: 234 ft/hr
RPM: 100
SPP: 5169 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 28 klbs
2101u
2068u
2095u
1995u
1,872u
C1: 76.3%
C2: 12.6%
C3: 7.6%
C4: 3.6%
GAS (units)
C1-C4 (units)
16,480
16,490
16,500
16,510
16,520
16,530
16,540
16,550
16,560
16,570
16,580
16,590
16,600
16,610
16,620
16,630
16,640
16,650
16,660
16,670
16,680
16,690
slt gr, gt tex,sb
lstr, v calc. CHK:
n cal bnd, mot, sb
alc.
6500
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb
plty-sb blky, fri-frm, occ wxy lstr, v calc. CHK:
med-lt gy, dk brn, occ wh-tan cal bnd, mot, sb
plty-plty, fri-frm, rthy tex, v calc.
MRLST: med-dk gy, occ blk, slt gr, gt tex,sb
plty-sb blky, fri-frm, occ wxy lstr, v calc.
CHK: med-lt gy, dk brn, occ wh-tan cal bnd,
mot, sb plty-plty, fri-frm, rthy tex, v calc.
6500
MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb
plty-sb blky, fri-frm occ wxy lstr, v calc. CHK:
lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb
plty-plty, fri-frm, rthy tex, v calc.
MRLST: dk gy-m gy, occ blk, slt gr, gt tex,
sb plty-sb blky, fri-frm occ wxy lstr, v calc.
CHK: lt-med gy, dk brn, occ wh-tan cal
bnd, mot, sb plty-plty, fri-frm, rthy tex, v
calc.
MD: 16,553'
Inclination: 90.31°
Azimuth: 89.44°
TVD: 7,833.69'
VS: 8,162.03'
MD: 16,648'
Inclination: 90.25°
Azimuth: 90.69°
TVD: 7,833.22'
VS: 8,256.82'
TVD (ft)
TVD (ft)
8500
8500

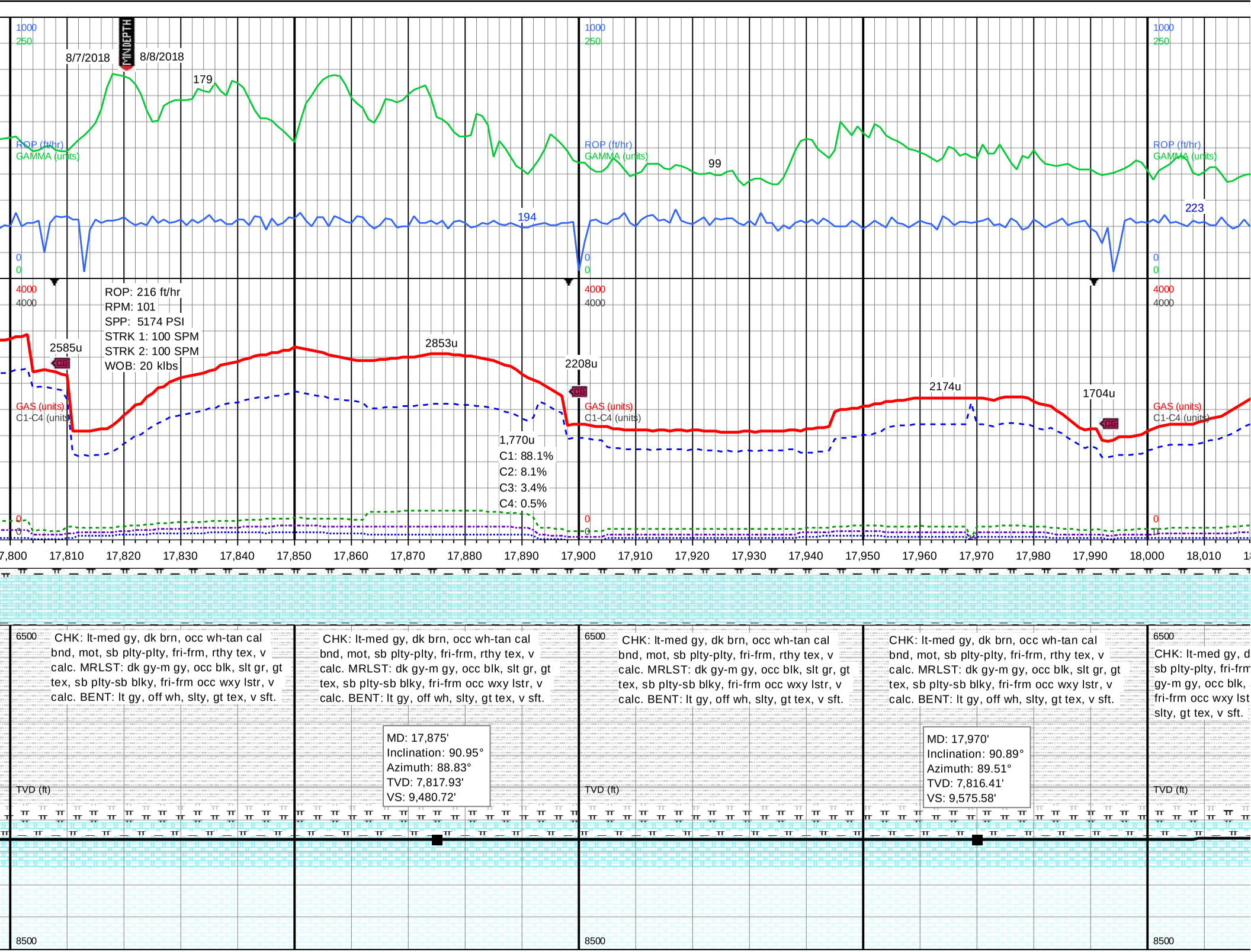

1000
250
211
ROP (ft/hr)
GAMMA (units)
0
0
4000
4000
2218u
GAS (units)
C1-C4 (units)
0
0
2175u
ROP: 318 ft/hr
RPM: 100
SPP: 5431 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 38 klbs
1000
250
174
ROP (ft/hr)
GAMMA (units)
300
0
0
4000
4000
2359u
GAS (units)
C1-C4 (units)
0
0
2296u
1,777u
C1: 86.9%
C2: 9%
C3: 3.5%
C4: 0.6%
1000
250
ROP (ft/hr)
GAMMA (units)
0
0
4000
4000
2525u
GAS (units)
C1-C4 (units)
0
0
6,700
16,710
16,720
16,730
16,740
16,750
16,760
16,770
16,780
16,790
16,800
16,810
16,820
16,830
16,840
16,850
16,860
16,870
16,880
16,890
16,900
16,910
6500
MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb plty-sb blky, fri-frm occ wxy lstr, v calc.
CHK: lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc.
MD: 16,742'
Inclination: 90.28°
Azimuth: 90.11°
TVD: 7,832.79'
VS: 8,350.57'
TVD (ft)
8500
MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb plty-sb blky, fri-frm occ wxy lstr, v calc.
CHK: lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc.
6500
MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb plty-sb blky, fri-frm occ wxy lstr, v calc.
CHK: lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc.
MD: 16,837'
Inclination: 90.34°
Azimuth: 89.28°
TVD: 7,832.28'
VS: 8,445.4'
TVD (ft)
8500
MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb plty-sb blky, fri-frm occ wxy lstr, v calc.
CHK: lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc.
6500
MRLST: dk
sb plty-sb b
CHK: lt-med
bnd, mot, sb
calc.
TVD (ft)
8500

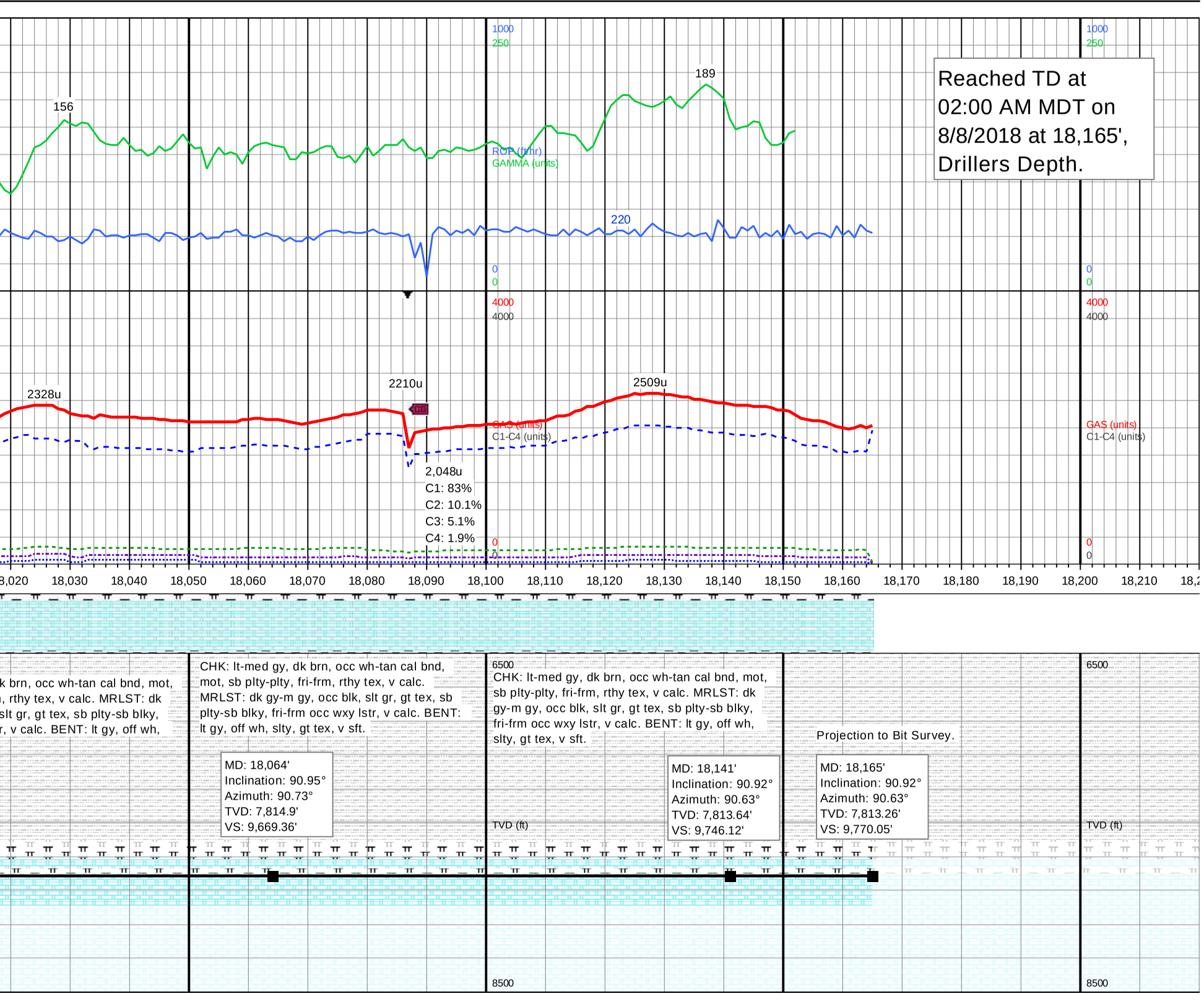

1000
250
220
184
142
ROP (ft/hr)
GAMMA (units)
245
241
256
0
0
ROP: 295 ft/hr
RPM: 100
SPP: 5358 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 25 klbs
MUD WT IN: 9.9 VIS: 56
MUD WT OUT: 9.9 VIS:
2,096u
C1: 81.3%
C2: 10.7%
C3: 5.8%
C4: 2.2%
4000
4000
2851u
2277u
1837u
2117u
GAS (units)
C1-C4 (units)
0
0
16,920
16,930
16,940
16,950
16,960
16,970
16,980
16,990
17,000
17,010
17,020
17,030
17,040
17,050
17,060
17,070
17,080
17,090
17,100
17,110
17,120
17,130
MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb plty-sb blky, fri-frm occ wxy lstr, v calc. CHK: lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc.
MD: 16,931'
Inclination: 90.22°
Azimuth: 89.25°
TVD: 7,831.82'
VS: 8,539.27'
6500
TVD (ft)
MD: 17,025'
Inclination: 90.43°
Azimuth: 88.99°
TVD: 7,831.28'
VS: 8,633.15'
MD: 17,120'
Inclination: 90.86°
Azimuth: 89.6°
TVD: 7,830.21'
VS: 8,728.02'
8500


1000
250
ROP (ft/hr)
GAMMA (units)
99
234
121
178
232
0
0
4000
4000
2667u
3180u
1820u
3088u
2600u
GAS (units)
C1-C4 (units)
ROP: 228 ft/hr
RPM: 100
SPP: 5395 PSI
STRK 1: 103 SPM
STRK 2: 103 SPM
WOB: 27 klbs
3,140u
C1: 78.3%
C2: 11.2%
C3: 6.9%
C4: 3.6%
7,140
17,150
17,160
17,170
17,180
17,190
17,200
17,210
17,220
17,230
17,240
17,250
17,260
17,270
17,280
17,290
17,300
17,310
17,320
17,330
17,340
17,350
gr, gt tex,
str, v calc.
an cal
y tex, v
MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb plty-sb blky, fri-frm occ wxy lstr, v calc. CHK: lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc.
6500
MD: 17,214'
Inclination: 90.95°
Azimuth: 90.31°
TVD: 7,828.73'
VS: 8,821.81'
MD: 17,309'
Inclination: 90.99°
Azimuth: 91.04°
TVD: 7,827.12'
VS: 8,916.52'
8500


1000
250
150
ROP (ft/hr)
GAMMA (units)
254
0
0
136
233
1000
250
192
ROP (ft/hr)
GAMMA (units)
84
0
0
MUD WT IN: 9.9+ VIS: 59
MUD WT OUT: 9.9 VIS:
4000
4000
2662u
2261u
2889u
2743u
2819u
GAS (units)
C1-C4 (units)
ROP: 234 ft/hr
RPM: 95
SPP: 5326 PSI
STRK 1: 100 SPM
STRK 2: 100 SPM
WOB: 27 klbs
GAS (units)
C1-C4 (units)
2,977u
C1: 72.6%
C2: 14.1%
C3: 7.9%
C4: 5.4%
0
0
0
0
17,360
17,370
17,380
17,390
17,400
17,410
17,420
17,430
17,440
17,450
17,460
17,470
17,480
17,490
17,500
17,510
17,520
17,530
17,540
17,550
17,560
17,570
ST: dk gy-m gy, occ blk, slt gr, gt tex,
lty-sb blky, fri-frm occ wxy lstr, v calc.
: lt-med gy, dk brn, occ wh-tan cal
mot, sb plty-plty, fri-frm, rthy tex, v
6500
CHK: lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc. MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb plty-sb blky, fri-frm occ wxy lstr, v calc.
MD: 17,403'
Inclination: 90.92°
Azimuth: 91.02°
TVD: 7,825.55'
VS: 9,010.18'
8500
CHK: lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc. MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb plty-sb blky, fri-frm occ wxy lstr, v calc.
MD: 17,498'
Inclination: 91.05°
Azimuth: 91.7°
TVD: 7,823.92'
VS: 9,104.79'
6500
CHK: lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc. MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb plty-sb blky, fri-frm occ wxy lstr, v calc.
8500
CHK: lt-med gy, dk brn, c
bnd, mot, sb plty-plty, fri-
calc. MRLST: dk gy-m gy
tex, sb plty-sb blky, fri-fr
calc.


1000
250
182
ROP (ft/hr)
GAMMA (units)
193
197
0
0
4000
4000
MUD WT IN: 9.9+ VIS: 58
MUD WT OUT: 9.9+ VIS:
2656u
2270u
GAS (units)
C1-C4 (units)
2,386u
C1: 86.5%
C2: 9%
C3: 3.8%
C4: 0.7%
0
0
1000
250
199
ROP (ft/hr)
GAMMA (units)
204
0
0
4000
4000
2305u
2370u
GAS (units)
C1-C4 (units)
0
0
7,580
17,590
17,600
17,610
17,620
17,630
17,640
17,650
17,660
17,670
17,680
17,690
17,700
17,710
17,720
17,730
17,740
17,750
17,760
17,770
17,780
17,790
occ wh-tan cal
frm, rthy tex, v
, occ blk, slt gr, gt
n occ wxy lstr, v
MD: 17,592'
Inclination: 90.8°
Azimuth: 91.55°
TVD: 7,822.4'
VS: 9,198.37'
6500
TVD (ft)
8500
CHK: lt-med gy, dk brn, occ wh-tan cal
bnd, mot, sb plty-plty, fri-frm, rthy tex, v
calc. MRLST: dk gy-m gy, occ blk, slt gr, gt
tex, sb plty-sb blky, fri-frm occ wxy lstr, v
calc.
CHK: lt-med gy, dk brn, occ wh-tan cal
bnd, mot, sb plty-plty, fri-frm, rthy tex, v
calc. MRLST: dk gy-m gy, occ blk, slt gr, gt
tex, sb plty-sb blky, fri-frm occ wxy lstr, v
calc.
MD: 17,686'
Inclination: 90.92°
Azimuth: 90.4°
TVD: 7,820.99'
VS: 9,292.04'
6500
TVD (ft)
8500
CHK: lt-med gy, dk brn, occ wh-tan cal
bnd, mot, sb plty-plty, fri-frm, rthy tex, v
calc. MRLST: dk gy-m gy, occ blk, slt gr, gt
tex, sb plty-sb blky, fri-frm occ wxy lstr, v
calc. tr bent
CHK: lt-med gy, dk brn, occ wh-tan cal
bnd, mot, sb plty-plty, fri-frm, rthy tex, v
calc. MRLST: dk gy-m gy, occ blk, slt gr, gt
tex, sb plty-sb blky, fri-frm occ wxy lstr, v
calc. tr bent
MD: 17,781'
Inclination: 90.92°
Azimuth: 89.36°
TVD: 7,819.47'
VS: 9,386.84'


1000
250
8/7/2018
MN10EPTH
8/8/2018
179
ROP (ft/hr)
GAMMA (units)
194
99
223
0
0
4000
4000
ROP: 216 ft/hr
RPM: 101
SPP: 5174 PSI
STRK 1: 100 SPM
STRK 2: 100 SPM
WOB: 20 klbs
2585u
2853u
2208u
2174u
1704u
GAS (units)
C1-C4 (units)
1,770u
C1: 88.1%
C2: 8.1%
C3: 3.4%
C4: 0.5%
17,800
17,810
17,820
17,830
17,840
17,850
17,860
17,870
17,880
17,890
17,900
17,910
17,920
17,930
17,940
17,950
17,960
17,970
17,980
17,990
18,000
18,010
6500
CHK: lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc. MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb plty-sb blky, fri-frm occ wxy lstr, v calc. BENT: lt gy, off wh, slty, gt tex, v sft.
MD: 17,875'
Inclination: 90.95°
Azimuth: 88.83°
TVD: 7,817.93'
VS: 9,480.72'
MD: 17,970'
Inclination: 90.89°
Azimuth: 89.51°
TVD: 7,816.41'
VS: 9,575.58'
TVD (ft)
8500


1000
250
156
189
ROP (ft/hr)
GAMMA (units)
220
0
0
4000
4000
2328u
2210u
2509u
GAS (units)
C1-C4 (units)
2,048u
C1: 83%
C2: 10.1%
C3: 5.1%
C4: 1.9%
Reached TD at 02:00 AM MDT on 8/8/2018 at 18,165', Drillers Depth.
18,020
18,030
18,040
18,050
18,060
18,070
18,080
18,090
18,100
18,110
18,120
18,130
18,140
18,150
18,160
18,170
18,180
18,190
18,200
18,210
k brn, occ wh-tan cal bnd, mot,
, rthy tex, v calc. MRLST: dk
slt gr, gt tex, sb plty-sb blky,
r, v calc. BENT: lt gy, off wh,
CHK: lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc. MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb plty-sb blky, fri-frm occ wxy lstr, v calc. BENT: lt gy, off wh, slty, gt tex, v sft.
MD: 18,064'
Inclination: 90.95°
Azimuth: 90.73°
TVD: 7,814.9'
VS: 9,669.36'
6500
CHK: lt-med gy, dk brn, occ wh-tan cal bnd, mot, sb plty-plty, fri-frm, rthy tex, v calc. MRLST: dk gy-m gy, occ blk, slt gr, gt tex, sb plty-sb blky, fri-frm occ wxy lstr, v calc. BENT: lt gy, off wh, slty, gt tex, v sft.
MD: 18,141'
Inclination: 90.92°
Azimuth: 90.63°
TVD: 7,813.64'
VS: 9,746.12'
Projection to Bit Survey.
MD: 18,165'
Inclination: 90.92°
Azimuth: 90.63°
TVD: 7,813.26'
VS: 9,770.05'
TVD (ft)
8500