

# COLUMBINE LOGGING

Scale: 5" / 100'  
Measured Depth Log

**Well Name** Piceance 28-05W

**Location** SW NW SEC 28 T9S R93W 1520 FNL 1167 FWL

**State** Colorado

**County** Mesa

**Country** United States

**Rig Number** Patterson 306

**API Number** 05-077-09773

**Field** Vega

**Region** Piceance Basin

**Spud Date** 9/25/2015

**Surface Coordinates** N 39.251172 W 107.779669

**Ground Elevation** 7556'

**K.B. Elevation** 7578'

**Logged Interval** 1582'

**Formation** Rollins

**Type of Drilling Fluid** Water Based

## Operator

**Company** Piceance Energy, LLC.

**Address** 1512 Larimer Street, Suite 1000  
Denver, CO 80202


## Geologist

**Name** Andy McCarthy

**Company** Laramie Energy II, LLC.

**Address** 1512 Larimer Street, Suite 1000  
Denver, CO 80202

## Zone Color Coding

 Oil	 Condensate	 Gas
 Note	 Core	 Pressure
 Error	 Water	 Seal

## Other

**Jordan Mccullugh** Well Site Geologist

**Columbine Logging Computer** 14A

**Bloodhound Unit** 273

## Rock Types

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

## Accessories

### Fossils

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

GASTROPOD

INOCERAMUS

OOLITE

OSTRACOD

PELECYPOD

PELLET

PISOLITE

PLANT REMAINS

PLANT SPORES

SCAPHOPOD

STROMATOPOROID

### Minerals

ANHYDRITIC
ARGILLACEOUS

ARGILLITE GRAIN

BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

CALCAREOUS

CARBONACEOUS FLAKES

CHTDK

CHTLT

COAL - THIN BEDS

DOLOMITIC

FELDSPAR

FERRUGINOUS PELLET

FERRUGINOUS

GLAUCONITE

GYPSIFEROUS

HEAVY MINERAL

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

### Oil Show

DEAD
EVEN
QUESTIONABLE
SPOTTED STAINING

### Porosity

E EARTHY
F FENESTRAL
F FRACTURE
X INTERCRYSTALLINE
Q INTEROOLITIC
M MOLDIC

ORGANIC

P PINPOINT

V VUGGY

### Engineering

BIT CHANGE
CONNECTION (LEFT)
CONNECTION (RIGHT)
CONNECTION GAS
TRIP GAS
DOWN TIME GAS
CORE - LOST
CORE - RECOVERED
DST INTERVAL

FAULT

FORMATION TOP

GAS SHOW

OIL SHOW

MN DEPTH

MN DEPTH (RIGHT)

NORMAL FAULT

OVERTURNED STRATA

REVERSE FAULT

CASING

SIDEWALL CORE (LEFT)

SIDEWALL CORE (RIGHT)

SLIDE

SURVEY

DRILL STEM TEST

WIRELINE TESTED - LEFT

WIRELINE TESTED - RT

### Rounding

ANGULAR
ROUNDED
SUBANG
SUBRND

### Textures

BOUNDSTONE
CHALKY
CRYPTOXLN

E EARTHY

FX FINELYXLN

GS GRAINSTONE

L LITHOGRAPHIC

MX MICROXLN

MS MUDSTONE

PS PACKSTONE

WS WACKESTONE

### Sorting

M MODERATE
P POOR
W WELL

ROP  
ROP

One-Man Strip Logging  
Rigged Up 9/26/15  
Began Logging @ 1582' MD  
@ 21:58 hrs MST on 9/26/15

0.16 min/ft

ROP (min/ft)

WOB: 12.6 klbs  
ROP: 25.4 ft/hr  
SPP: 1058 psi  
RPM: 57  
Strokes: 49 spm

0.25 min/ft

ROP (min/ft)

Slide/Rotate

Depth Labels

Total Gas & Chromatograph

GAS  
C1  
C2  
C3  
C4  
C5

Bit #: 2  
Type: PDC  
Size: 7.875  
Depth In: 1582  
Depth Out:  
Hours:  
Avg Ft/Hr:  
Jets: 5x12  
S/N: A218398

MD: 1,601'

TVD: 1,590'

Inclination: 8.61°

Azimuth: 325.25°

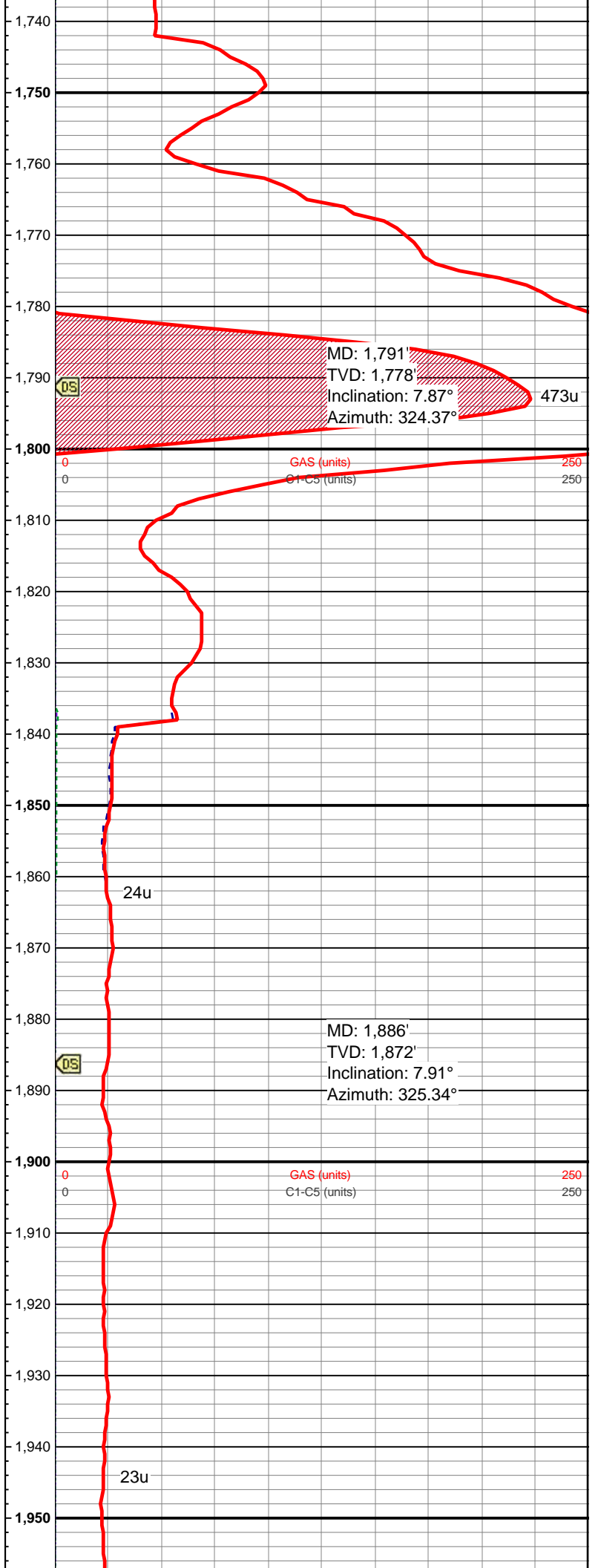
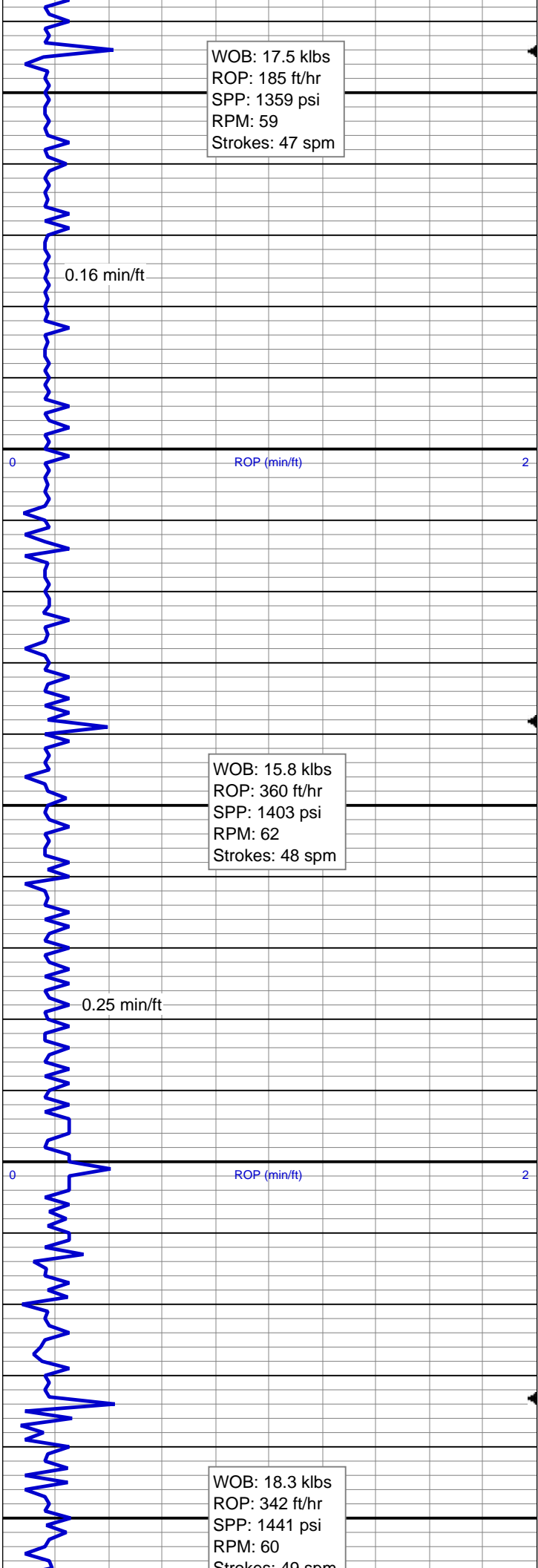
MUD WT 8.6 VIS 28

MD: 1,696'

TVD: 1,684'

Inclination: 8.13°

Azimuth: 324.37°



Strokes: 49 spm

0.17 min/ft

ROP (min/ft)

WOB: 18.4 klbs  
ROP: 253 ft/hr  
SPP: 1524 psi  
RPM: 61  
Strokes: 49 spm

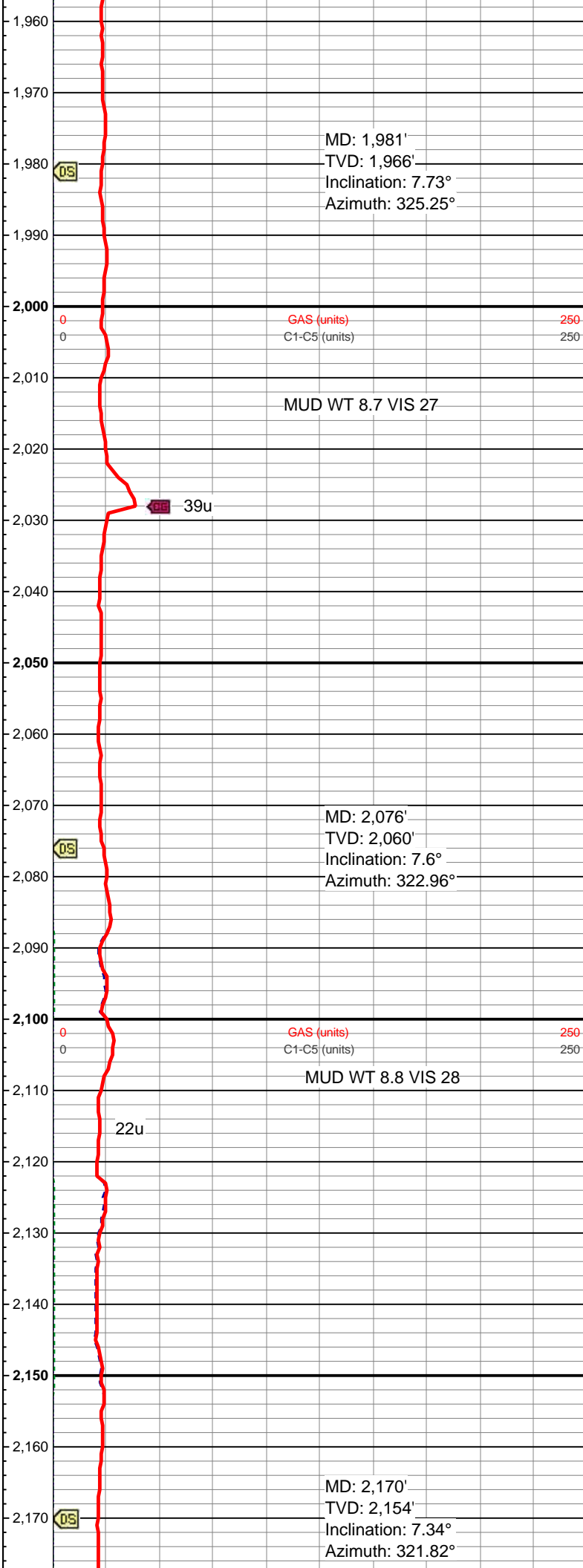
0.83 min/ft

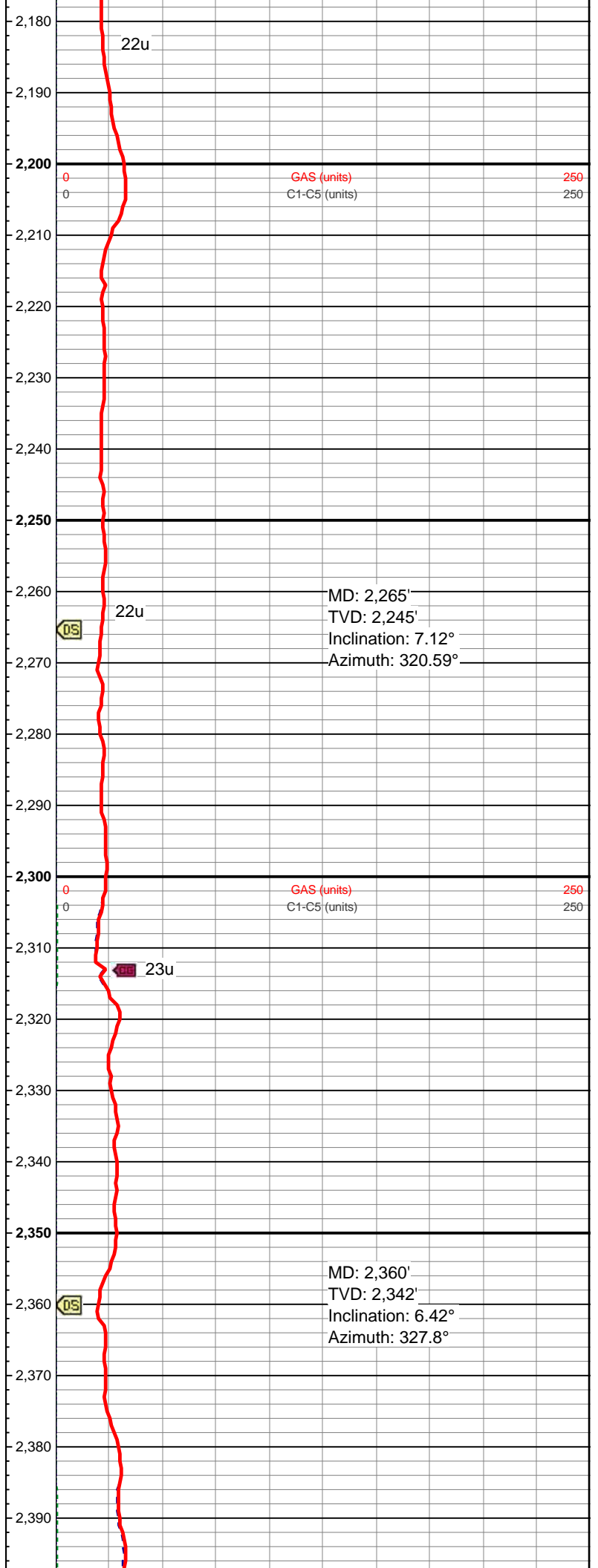
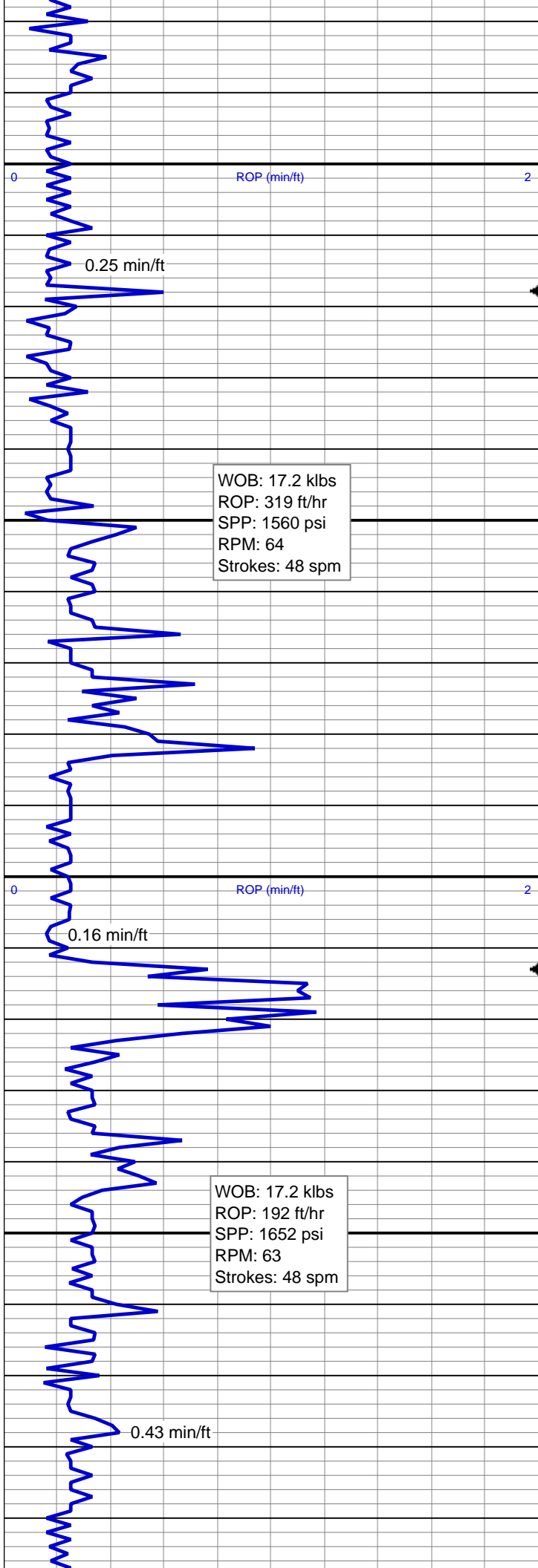
9/26/15  
MINDEPTH  
9/27/15

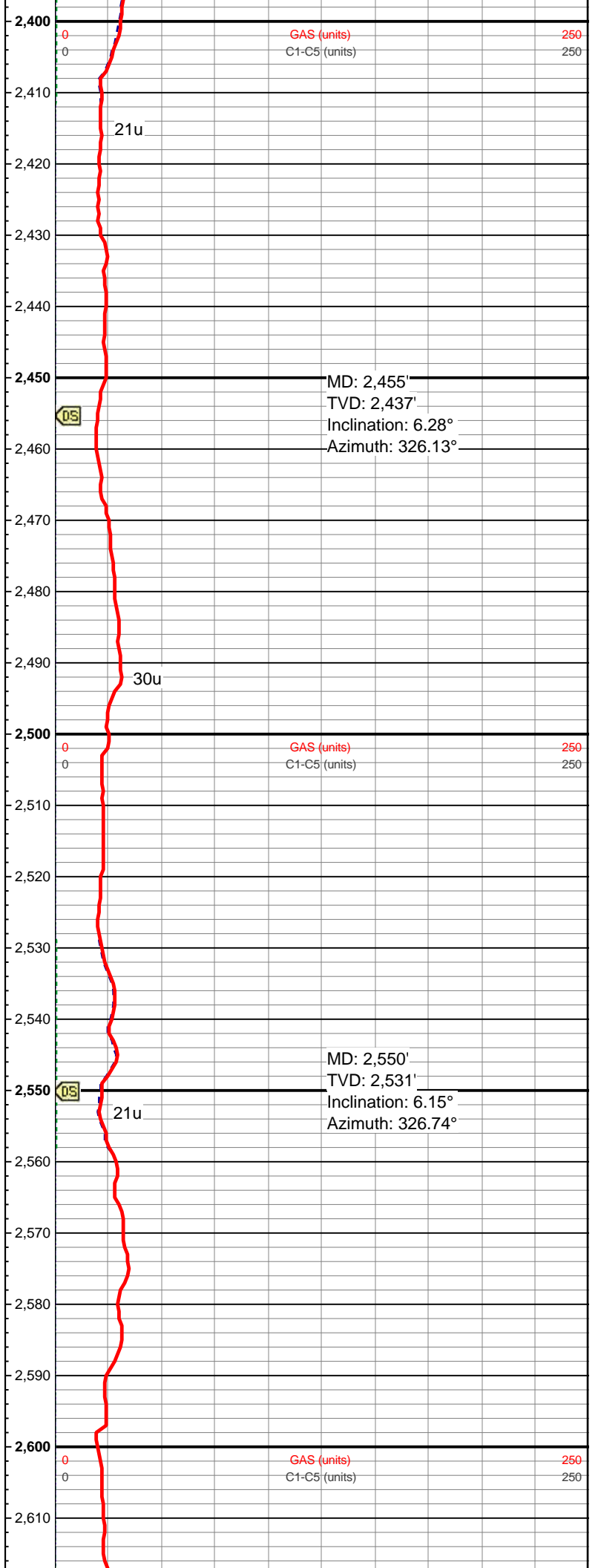
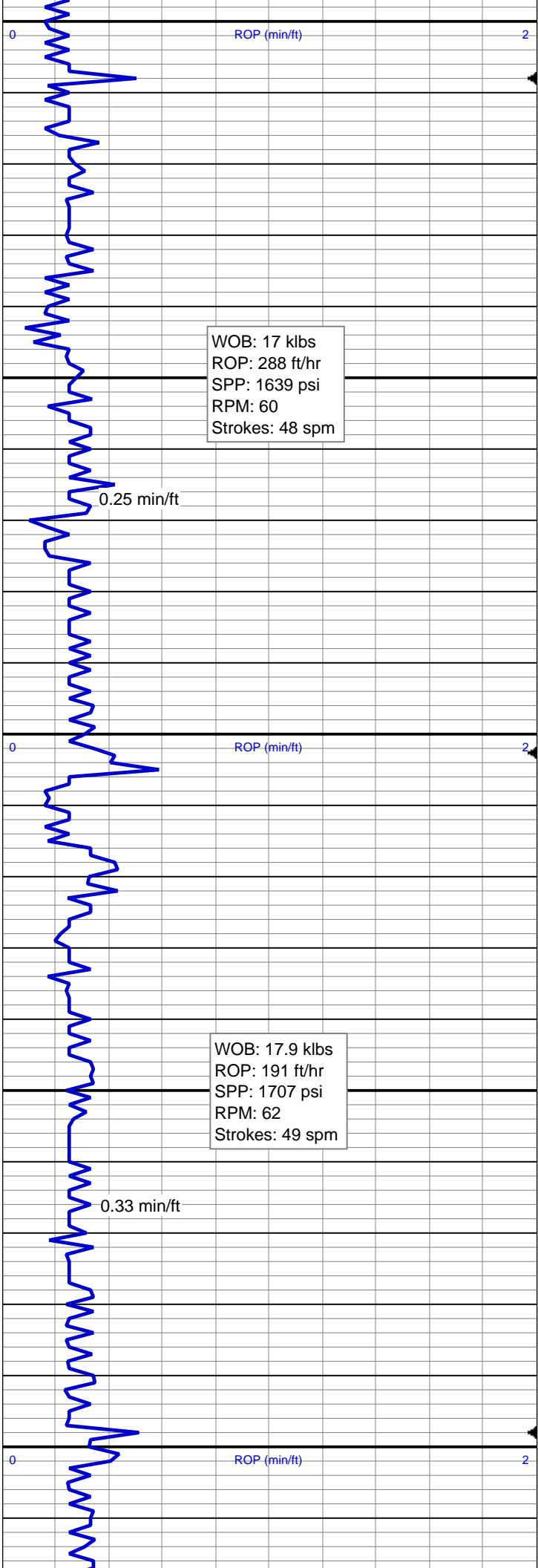
ROP (min/ft)

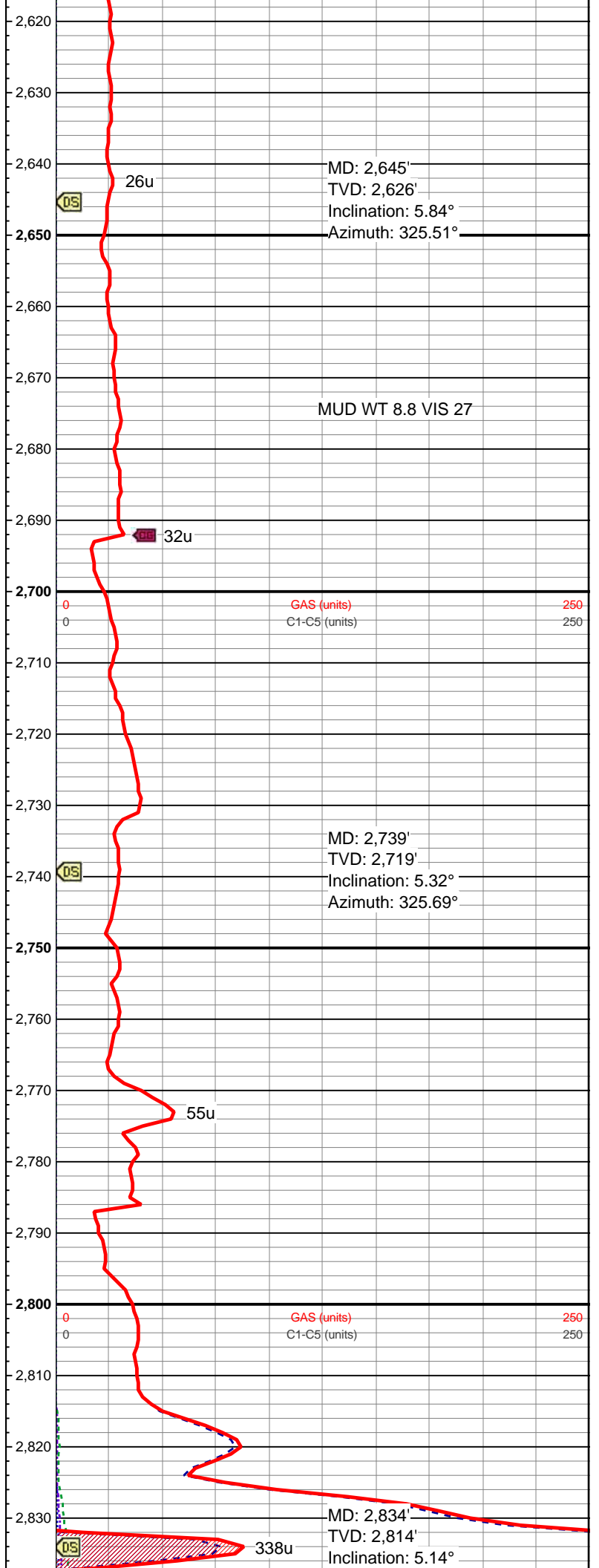
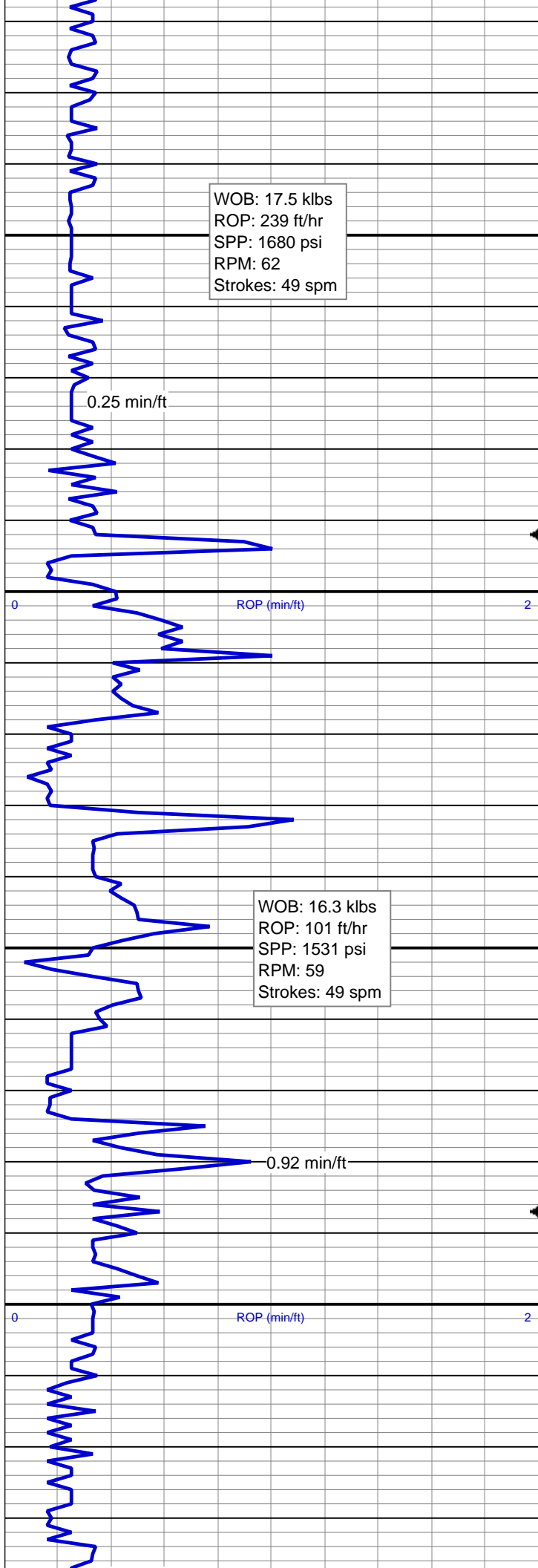
0.16 min/ft

WOB: 16.9 klbs  
ROP: 109 ft/hr  
SPP: 1468 psi  
RPM: 59  
Strokes: 49 spm

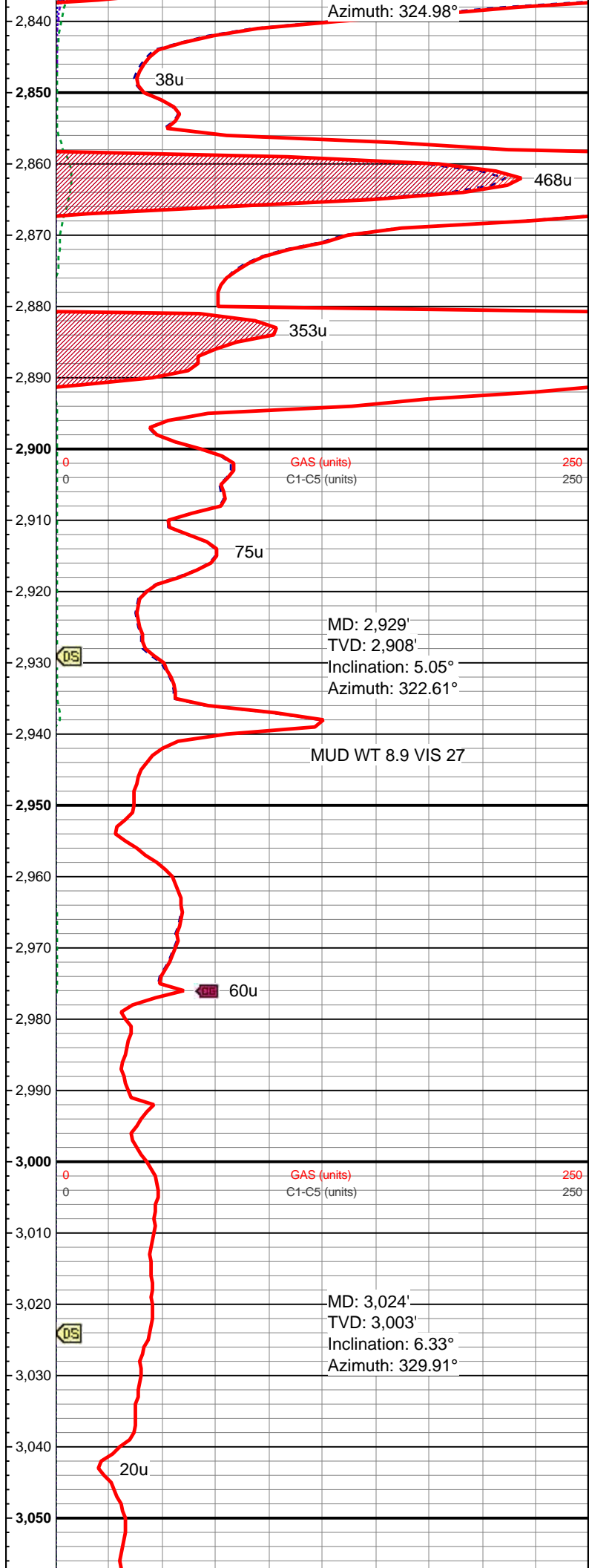
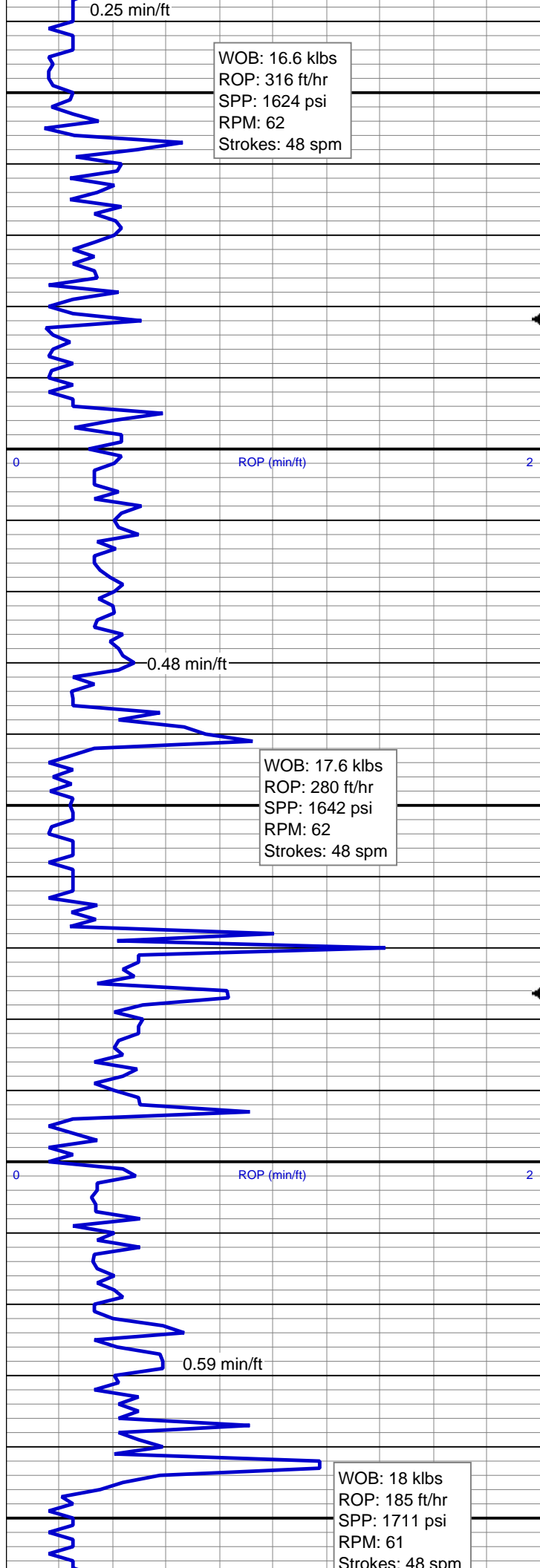


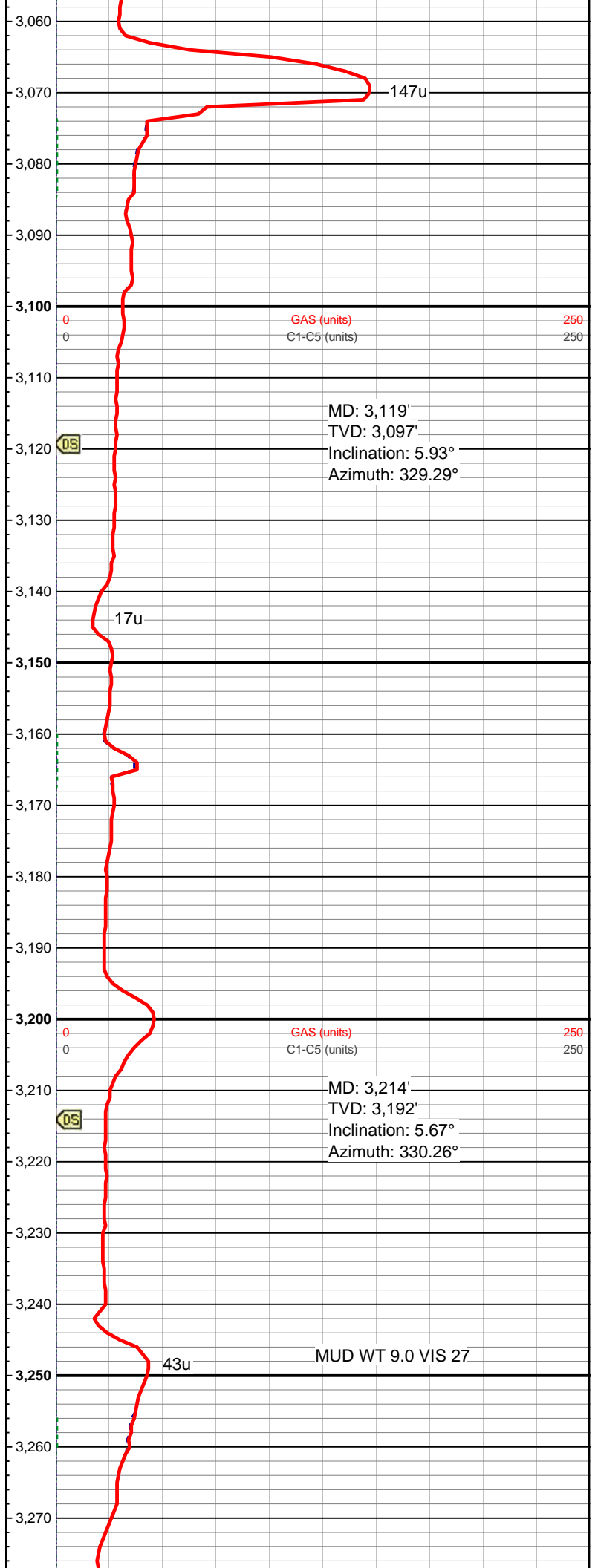
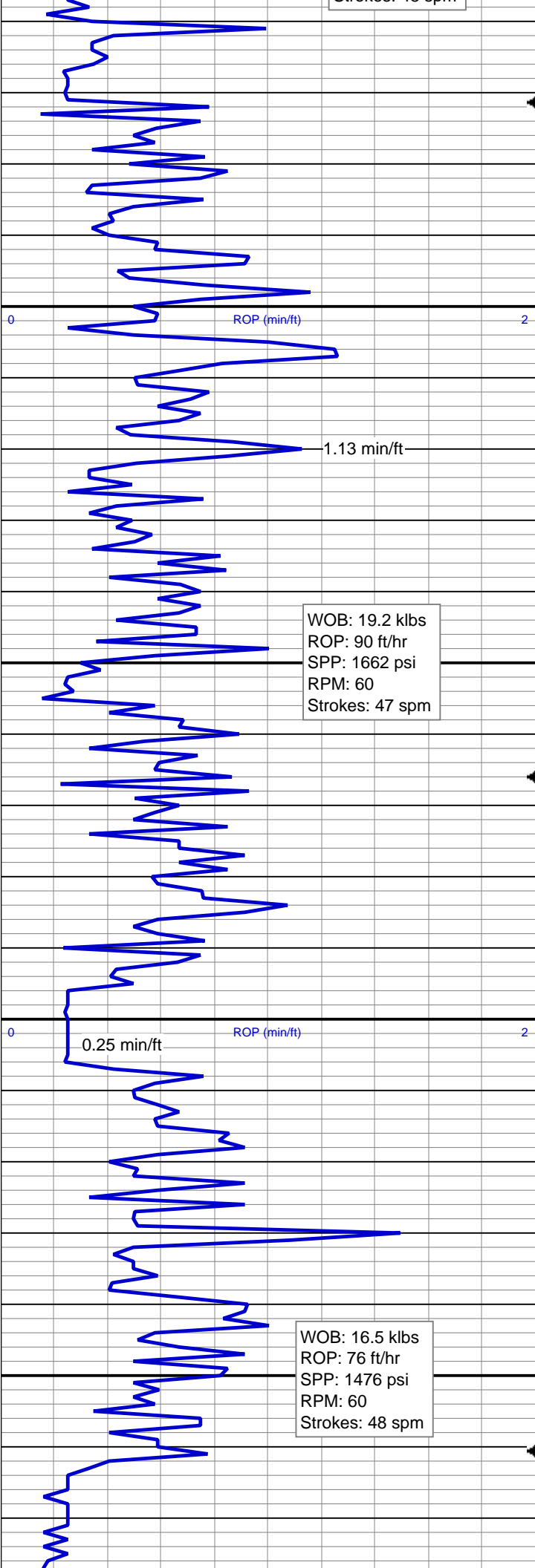


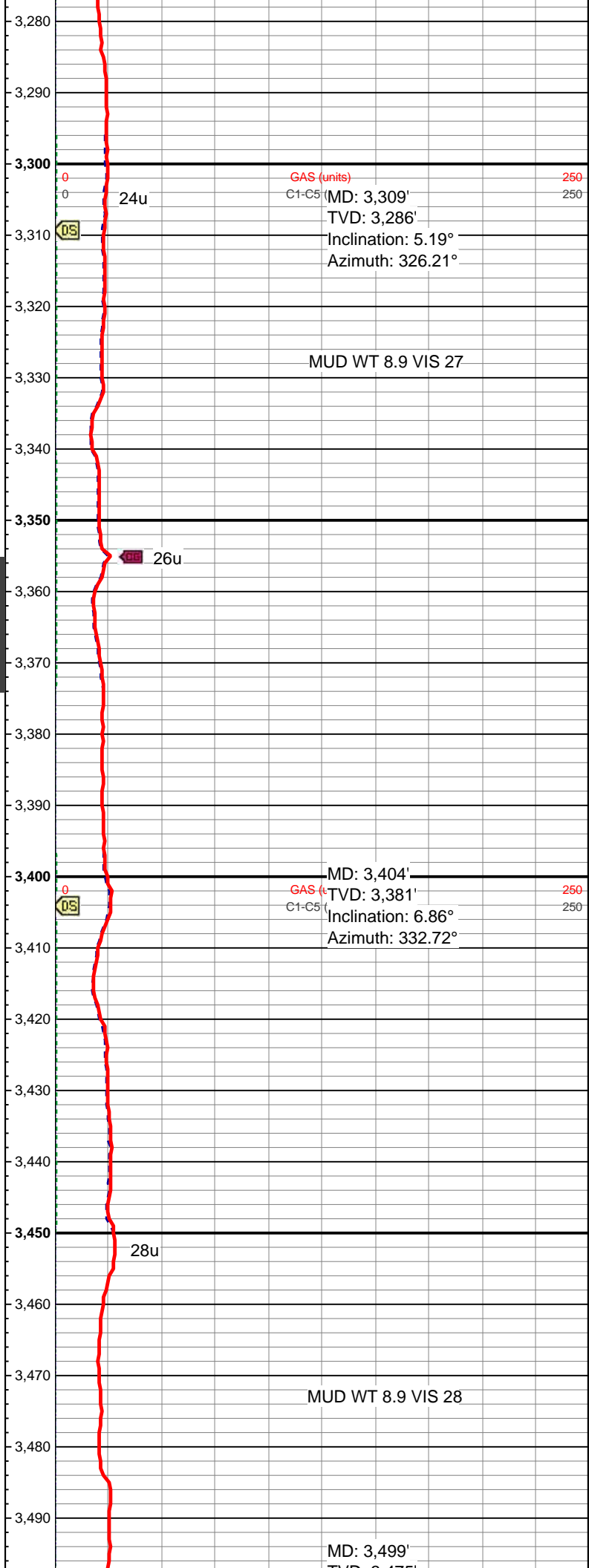
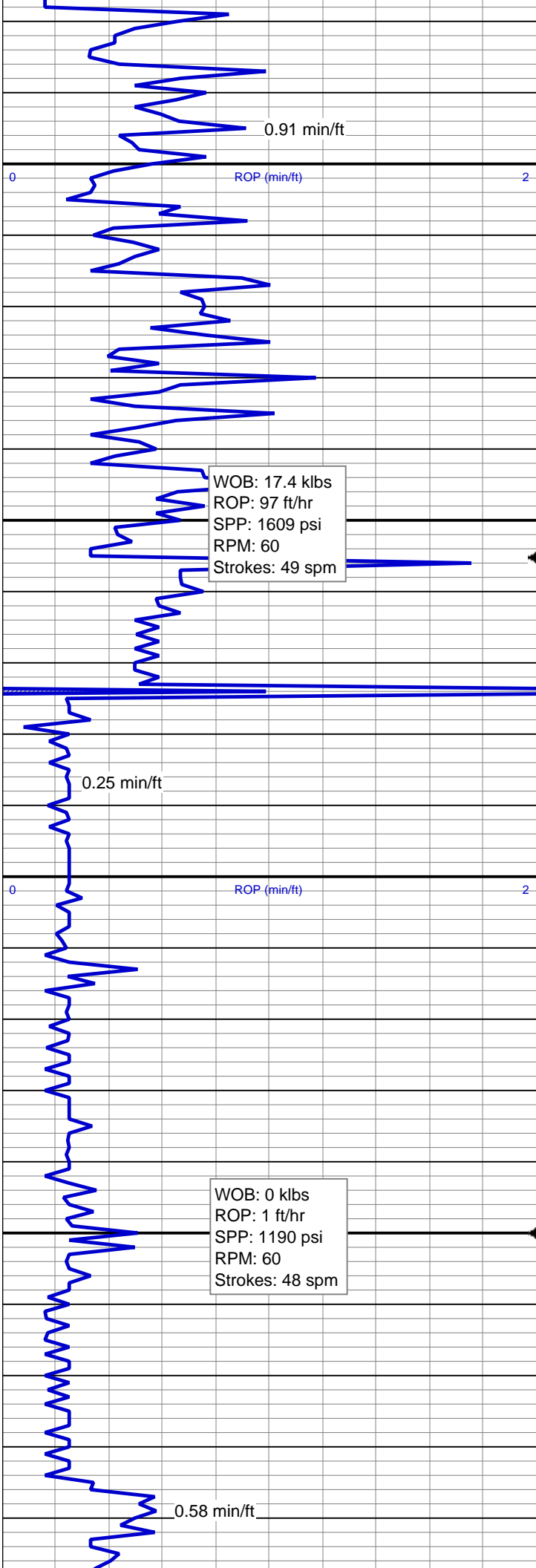


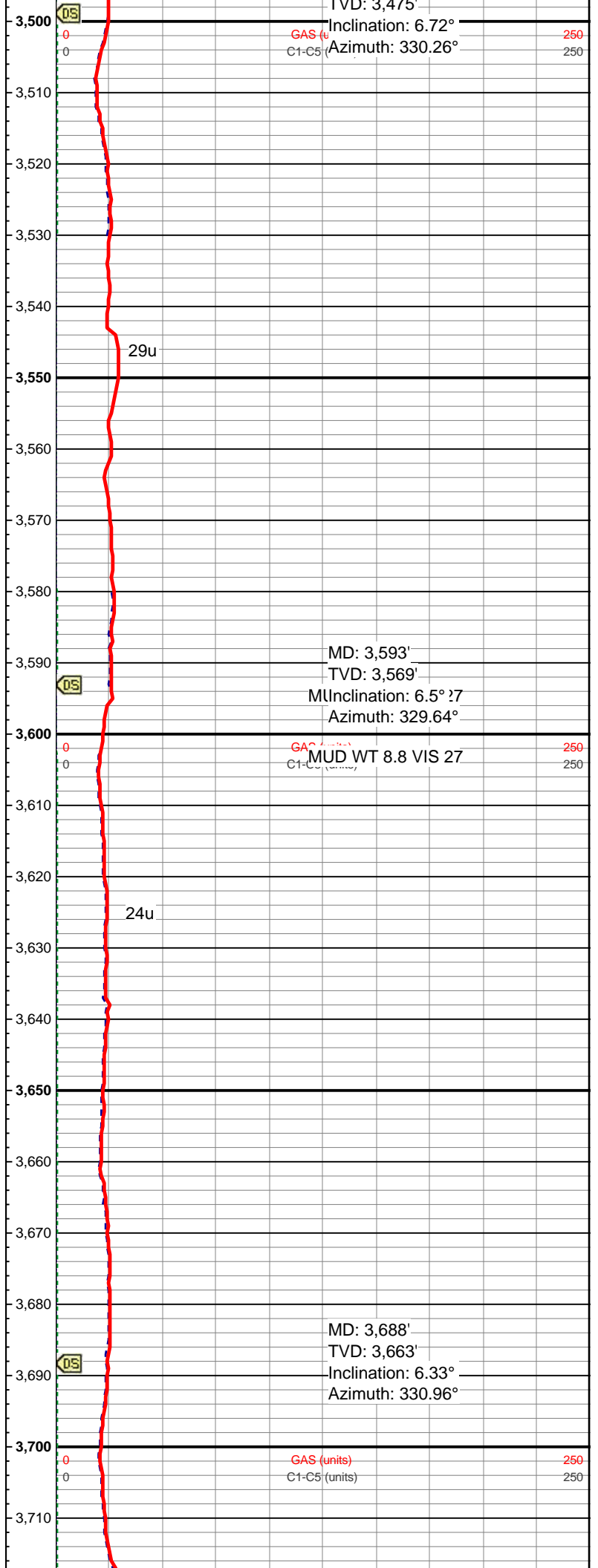
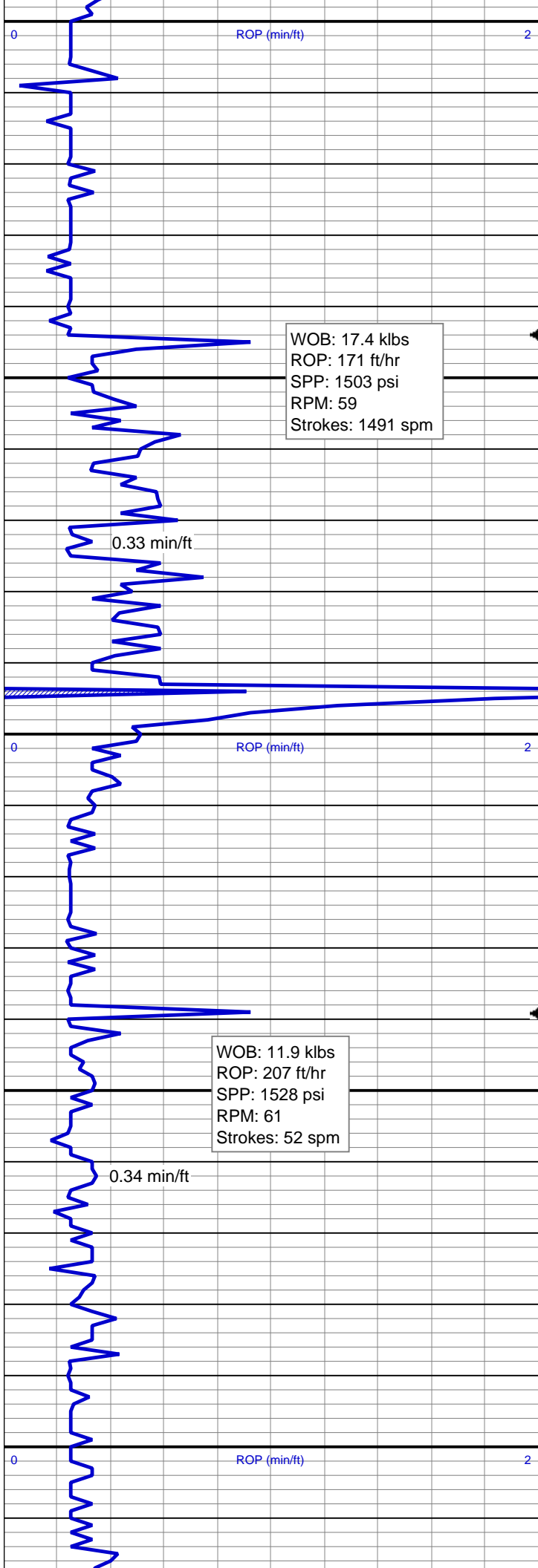


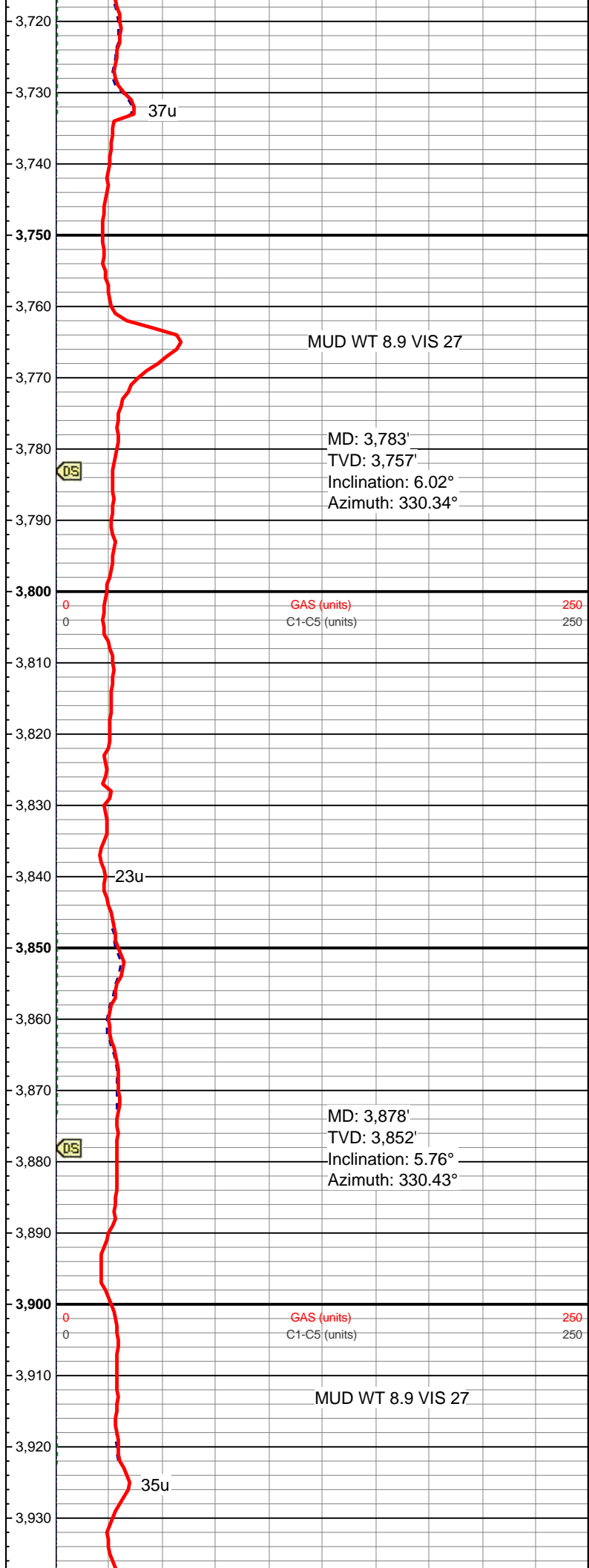
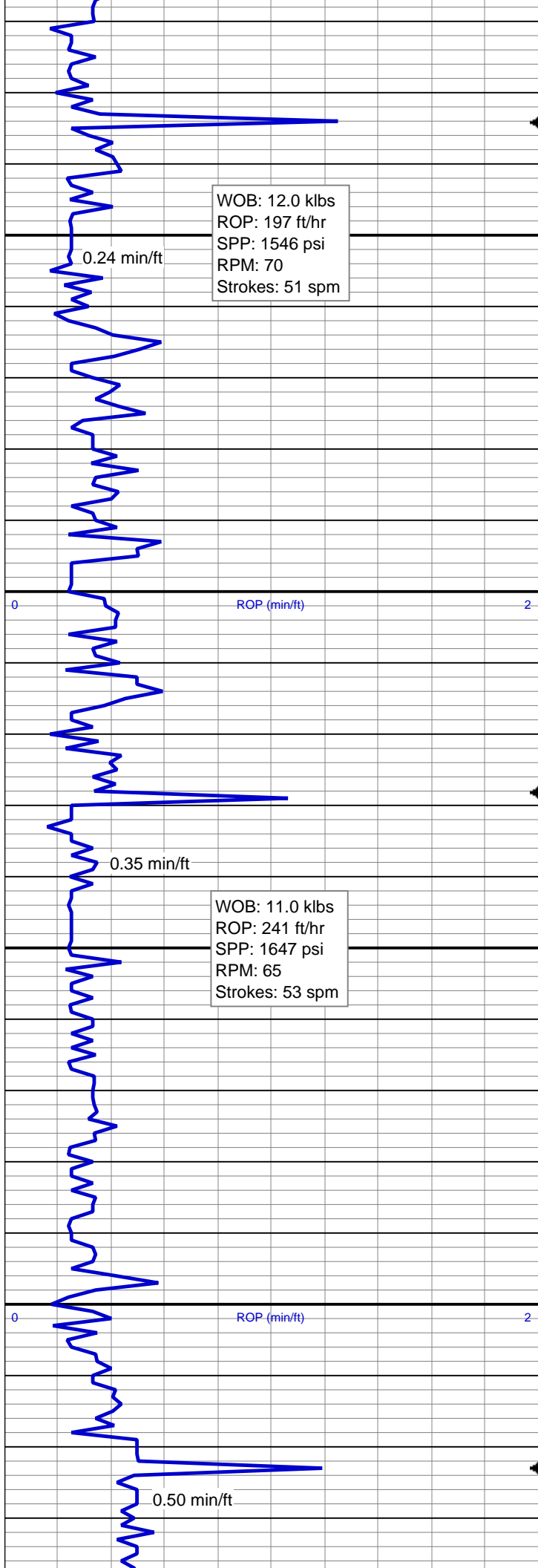












WOB: 8.0 klbs  
ROP: 112 ft/hr  
SPP: 1335 psi  
RPM: 65  
Strokes: 53 spm

WOB: 11.2 klbs  
ROP: 181 ft/hr  
SPP: 1546 psi  
RPM: 65  
Strokes: 51 spm

WOB: 10.5 klbs  
ROP: 152 ft/hr  
SPP: 1509 psi  
RPM: 66  
Strokes: 52 spm

0.50 min/ft

0.76 min/ft

MD: 3,973'  
TVD: 3,947'  
Inclination: 5.54°  
Azimuth: 330.08°

MD: 4,068'  
TVD: 4,041'  
Inclination: 5.36°  
Azimuth: 330.96°

MUD WT 8.8 VIS 27

21u

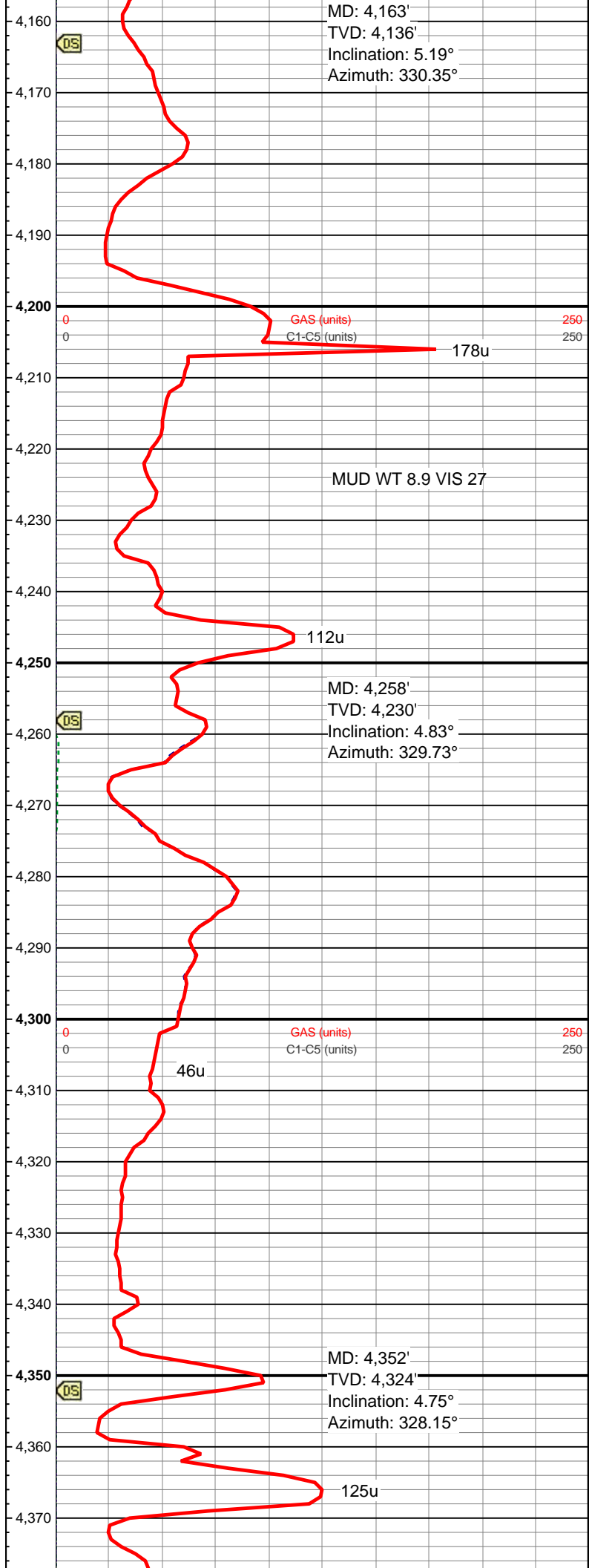
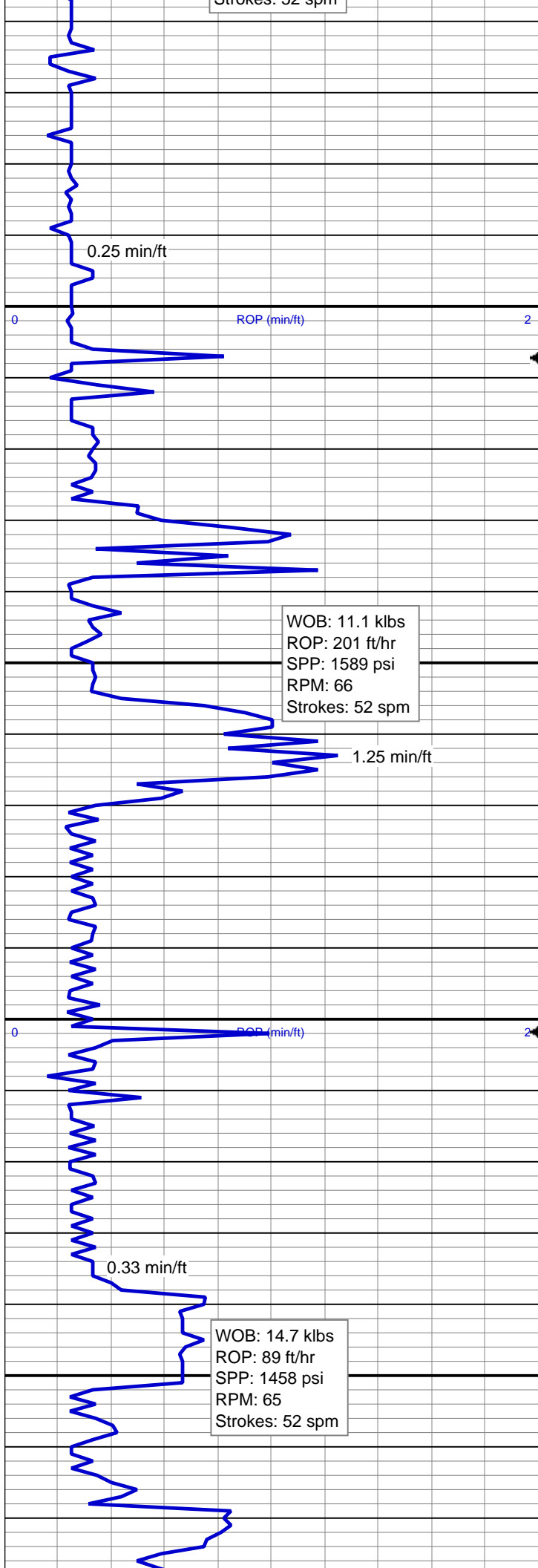
83u

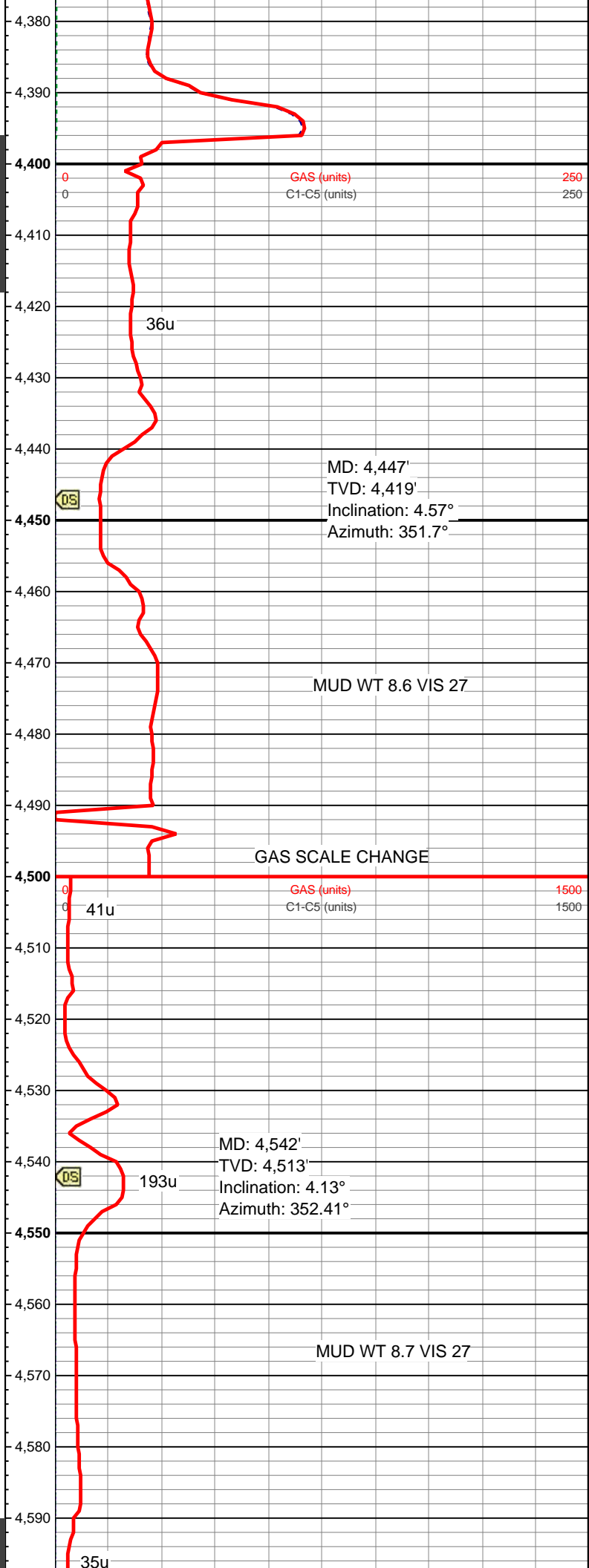
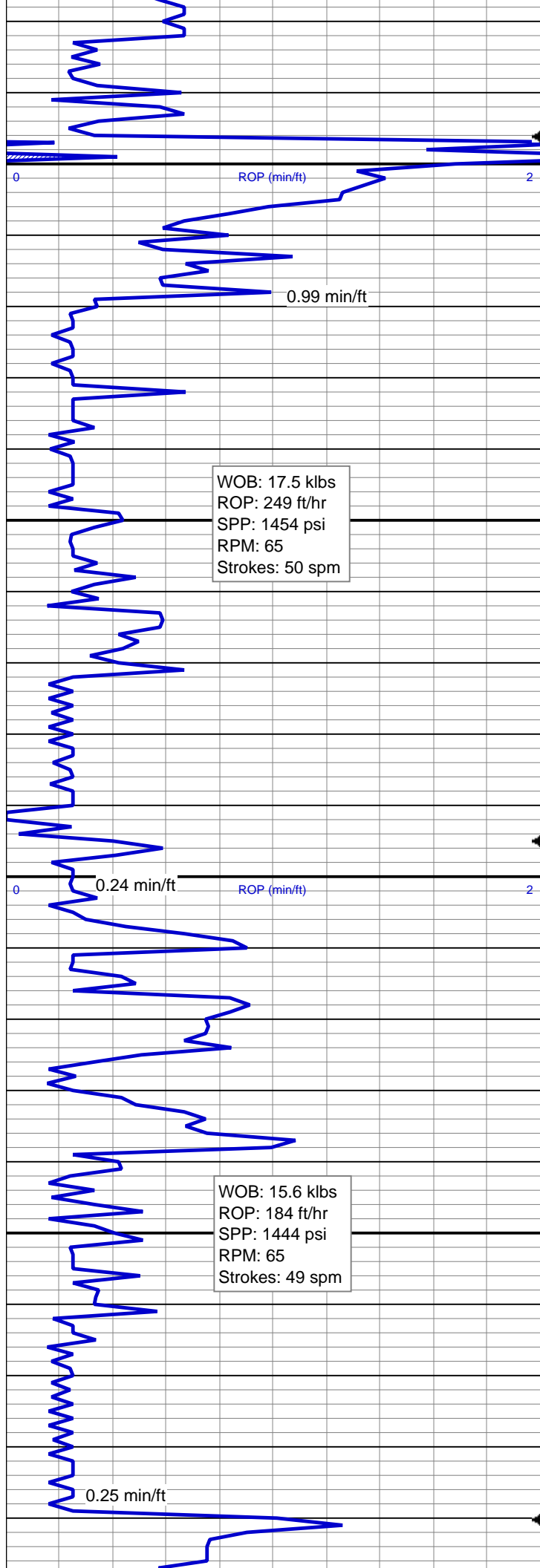
166u

30u

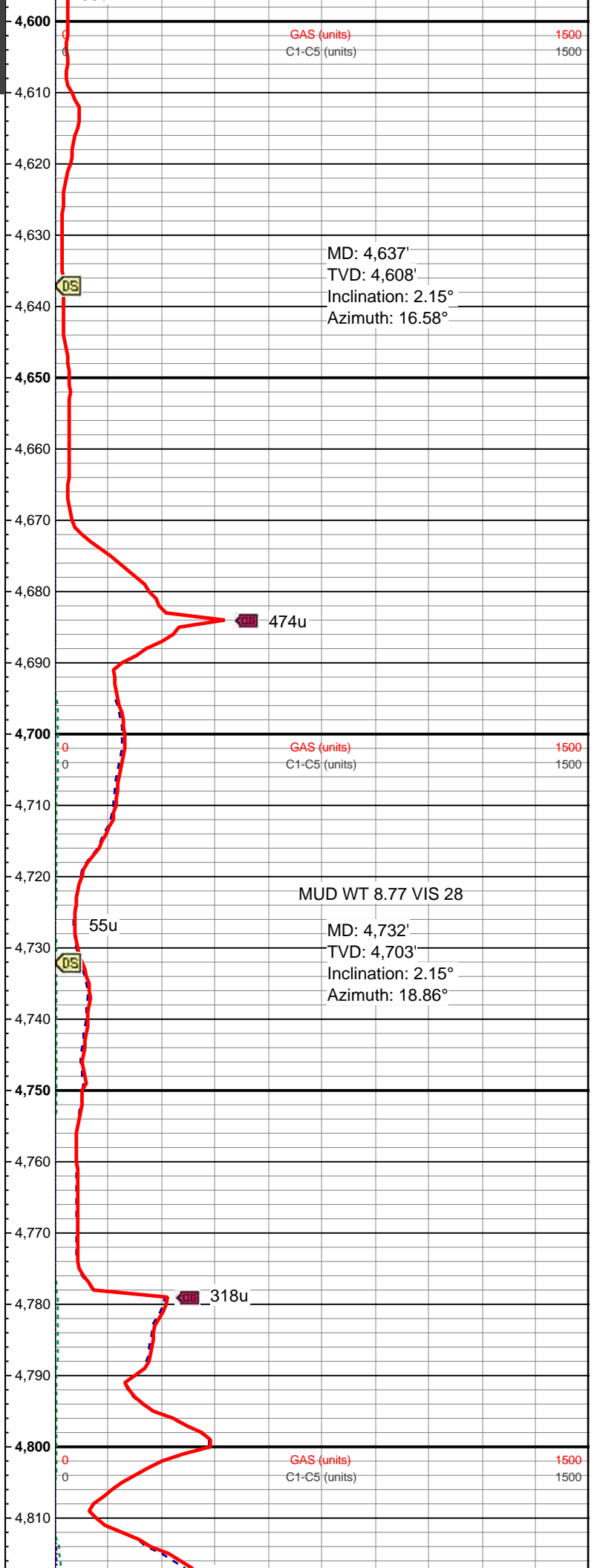
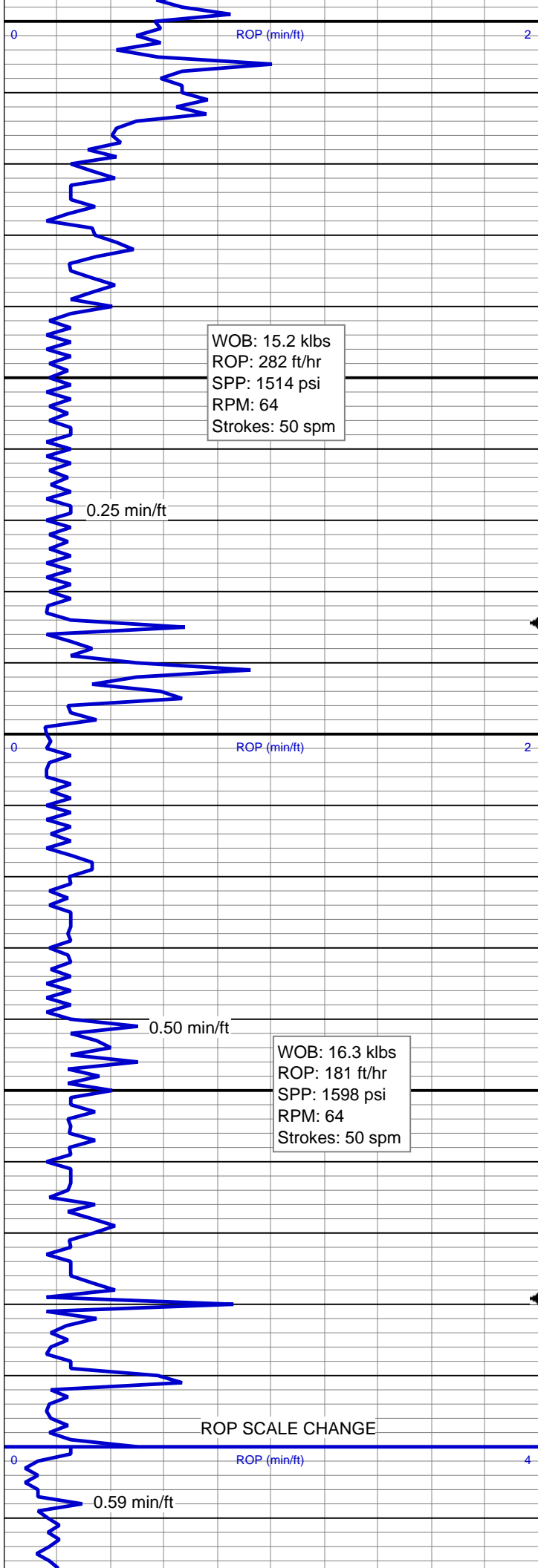
GAS (units)  
C1-C5 (units)

GAS (units)  
C1-C5 (units)









WOB: 14.7 klbs  
ROP: 220 ft/hr  
SPP: 1614 psi  
RPM: 66  
Strokes: 50 spm

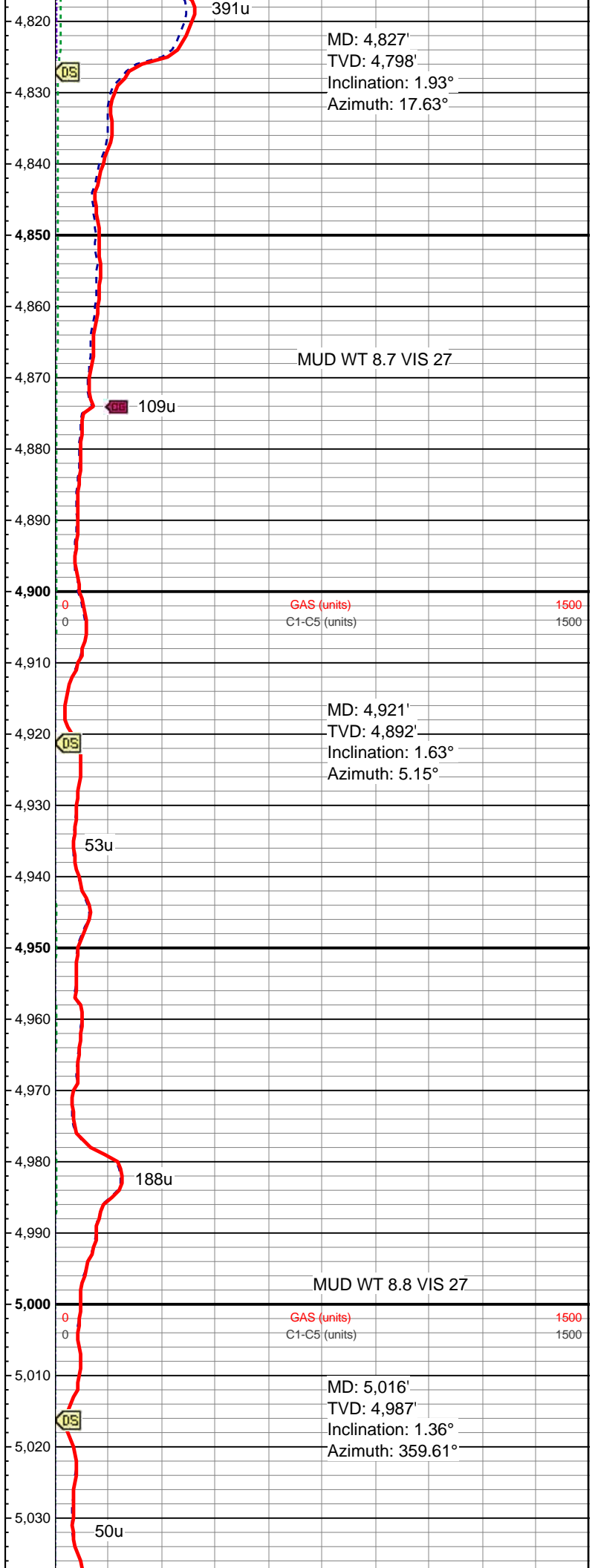
0.25 min/ft

ROP (min/ft)

WOB: 18.3 klbs  
ROP: 119 ft/hr  
SPP: 1591 psi  
RPM: 64  
Strokes: 50 spm

0.76 min/ft

ROP (min/ft)



WOB: 18.9 klbs  
ROP: 102 ft/hr  
SPP: 1490 psi  
RPM: 64  
Strokes: 50 spm

0.31 min/ft

ROP (min/ft)

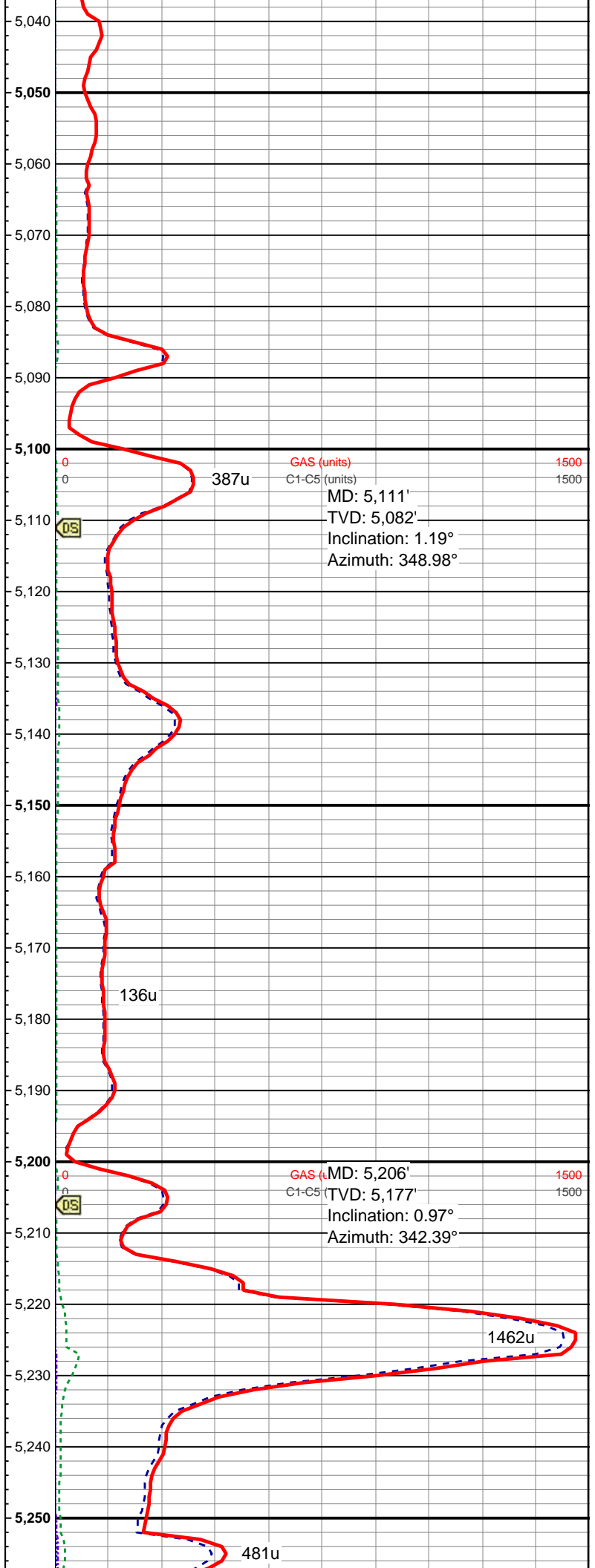
WOB: 19 klbs  
ROP: 176 ft/hr  
SPP: 1708 psi  
RPM: 64  
Strokes: 51 spm

0.24 min/ft

ROP (min/ft)

WOB: 18.7 klbs  
ROP: 201 ft/hr  
SPP: 1622 psi  
RPM: 64  
Strokes: 50 spm

0.42 min/ft



Strokes: 50 spm

9/27/15  
MINDEPTH  
9/28/15

ROP (min/ft)

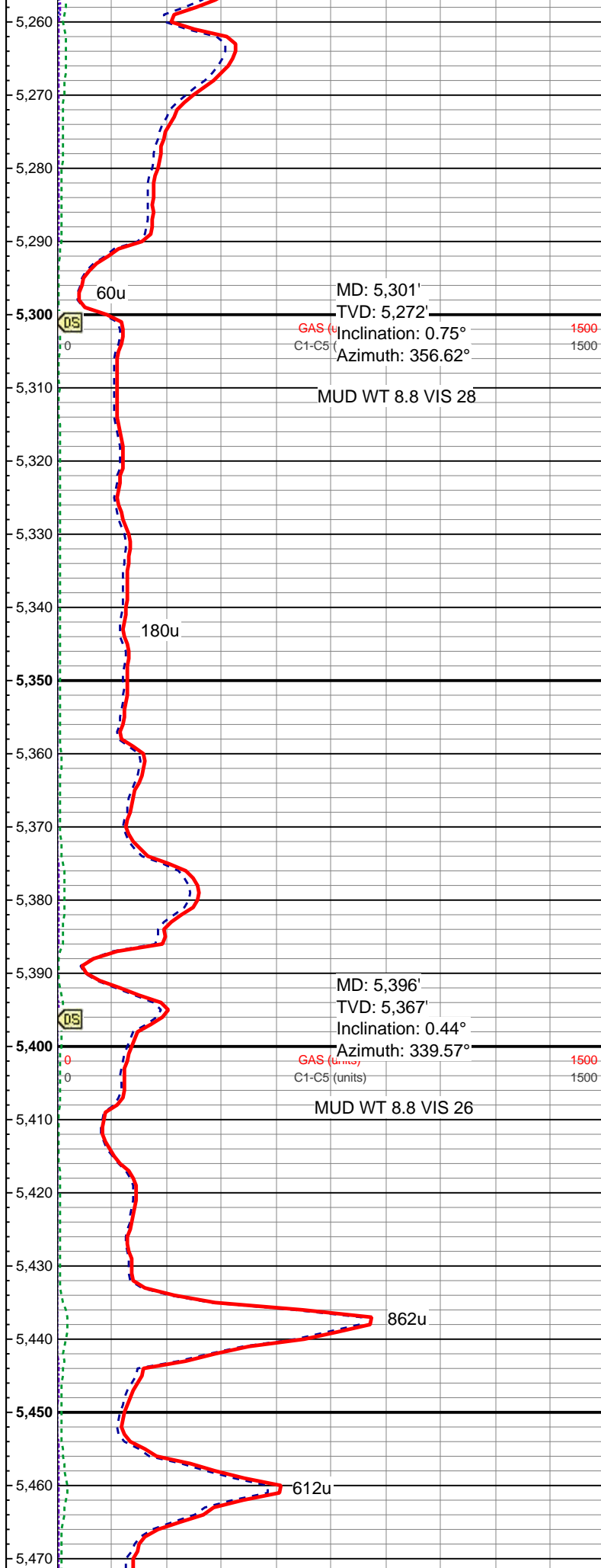
0.41 min/ft

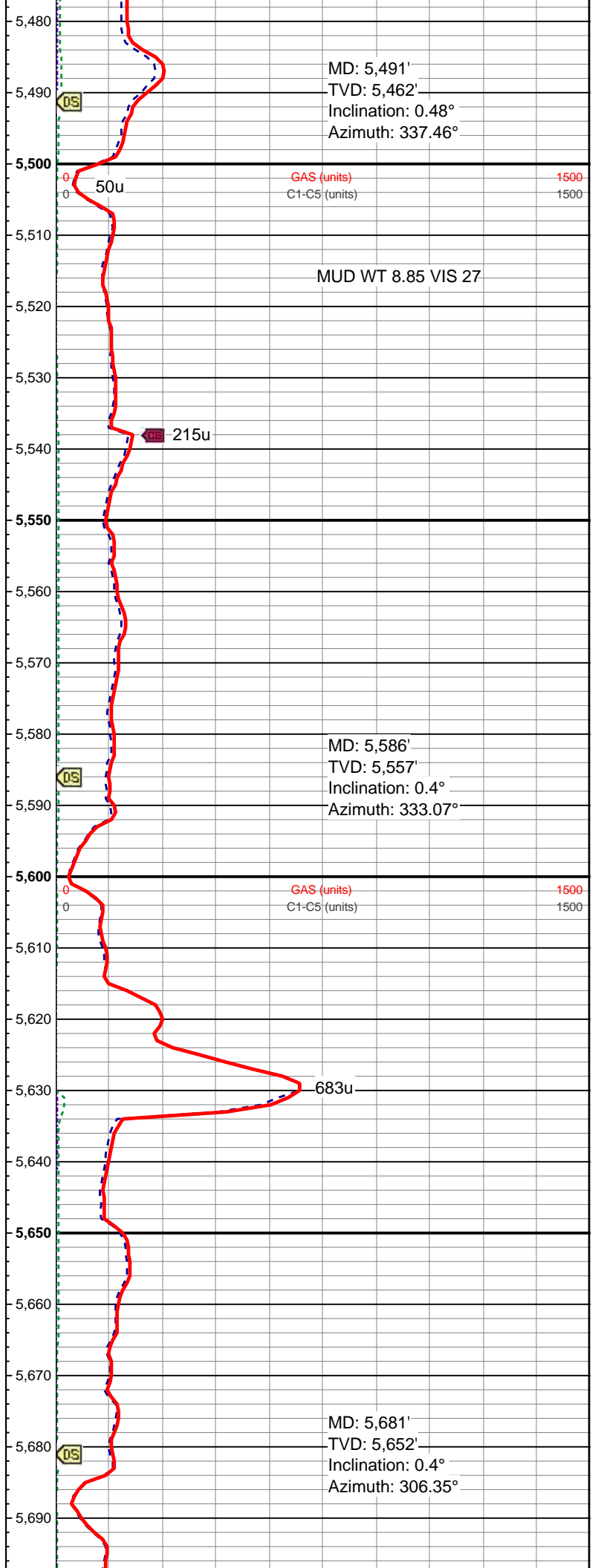
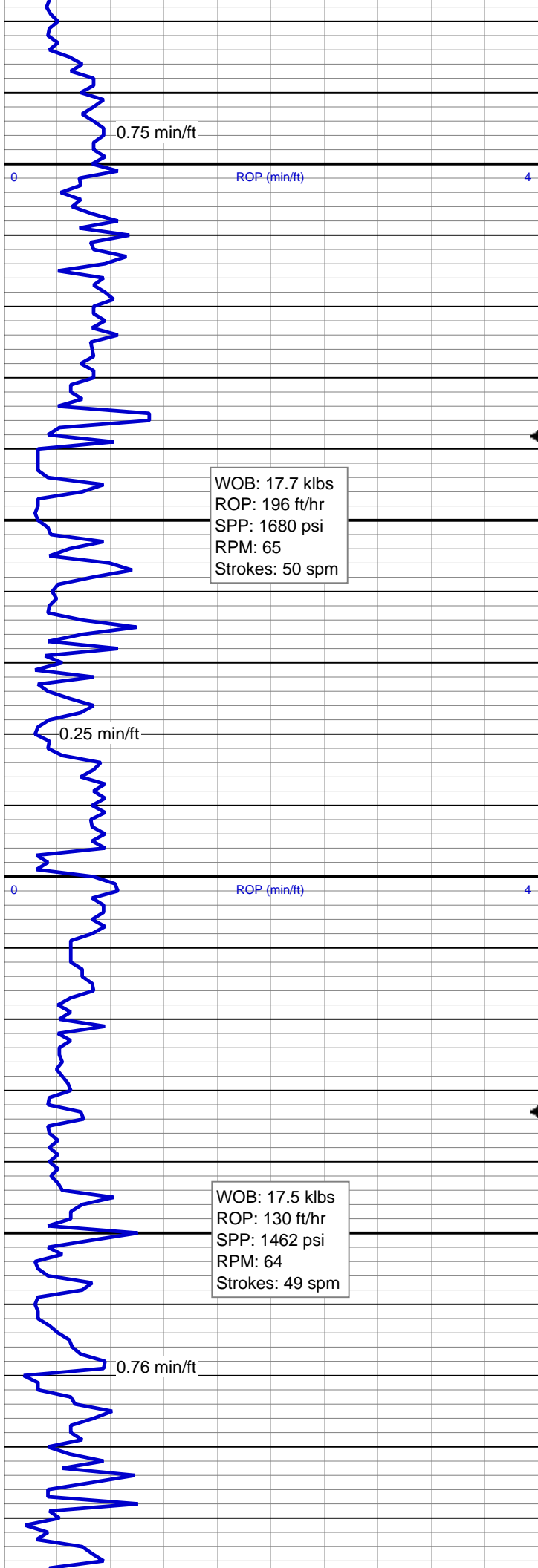
WOB: 17.5 klbs  
ROP: 47 ft/hr  
SPP: 1571 psi  
RPM: 66  
Strokes: 50 spm

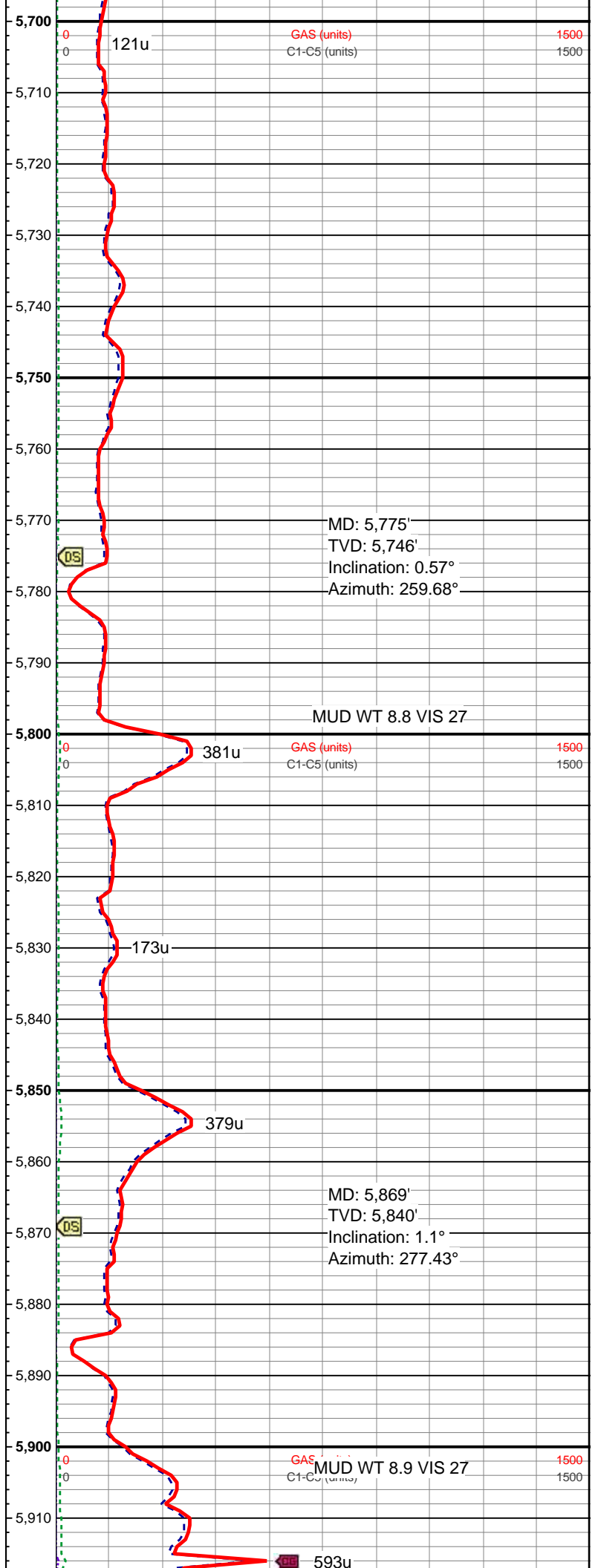
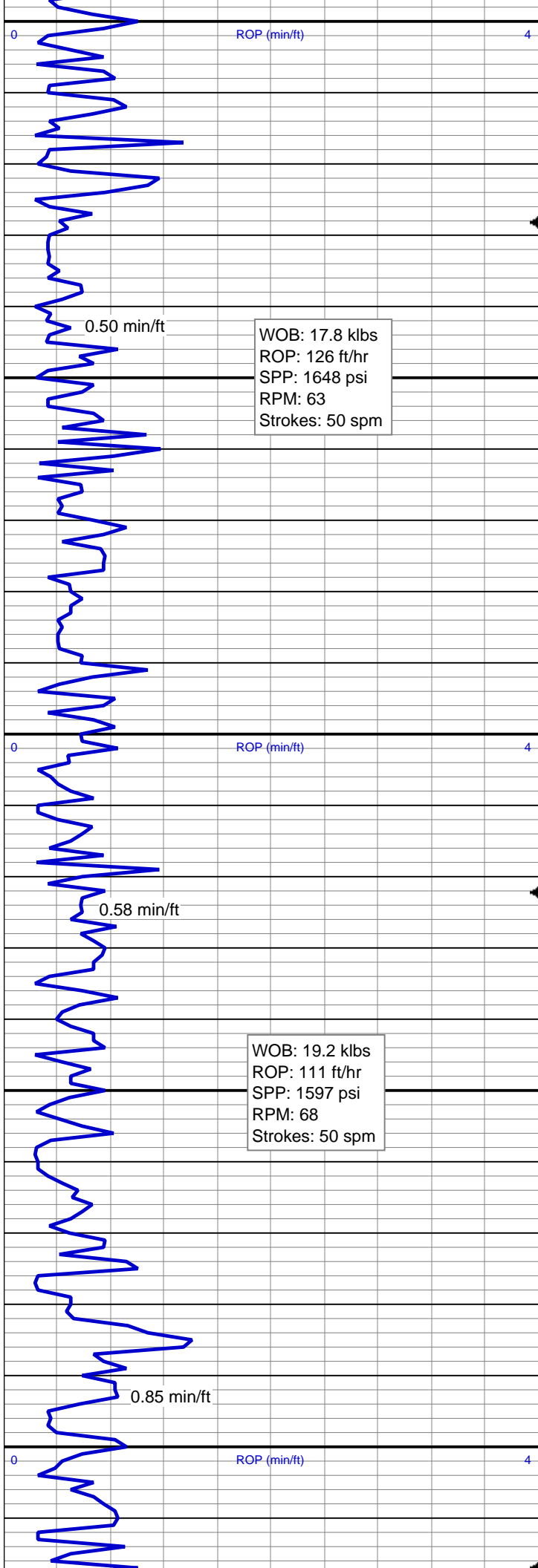
ROP (min/ft)

0.44 min/ft

WOB: 17.8 klbs  
ROP: 166 ft/hr  
SPP: 1655 psi  
RPM: 65  
Strokes: 50 spm







WOB: 17.4 klbs  
ROP: 118 ft/hr  
SPP: 1867 psi  
RPM: 63  
Strokes: 52 spm

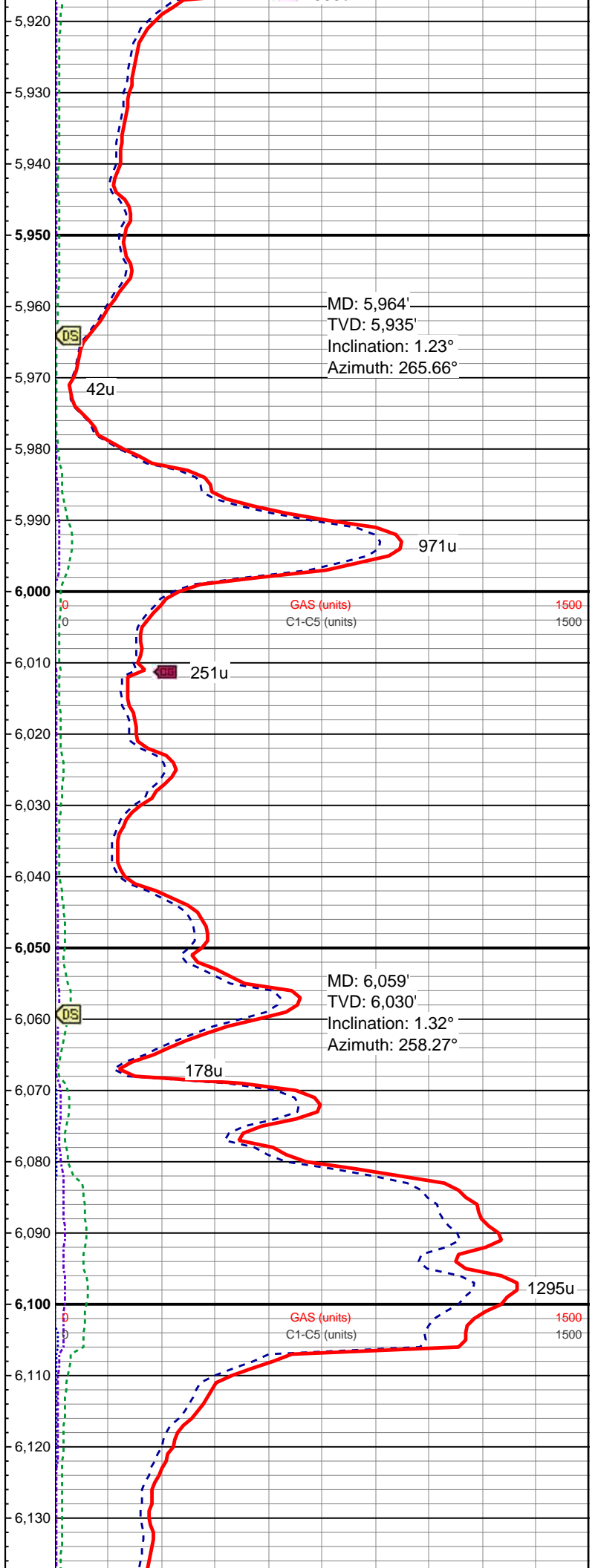
1.0 min/ft

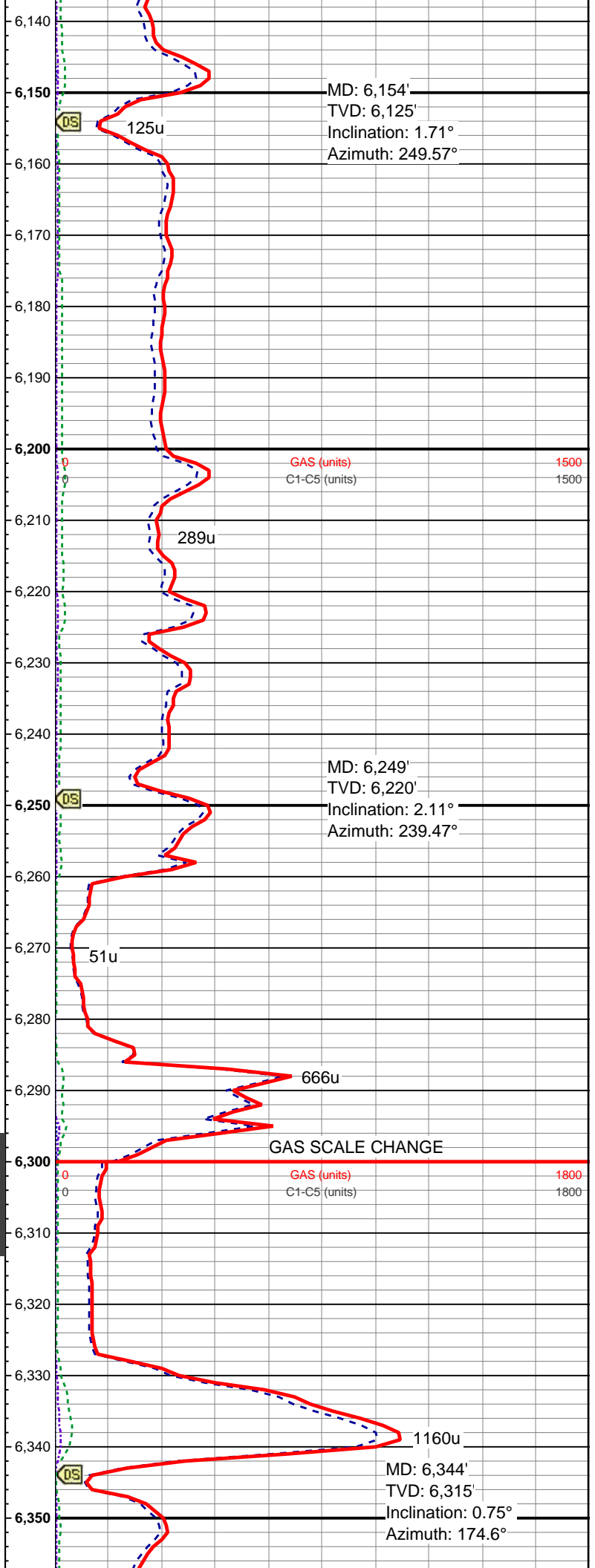
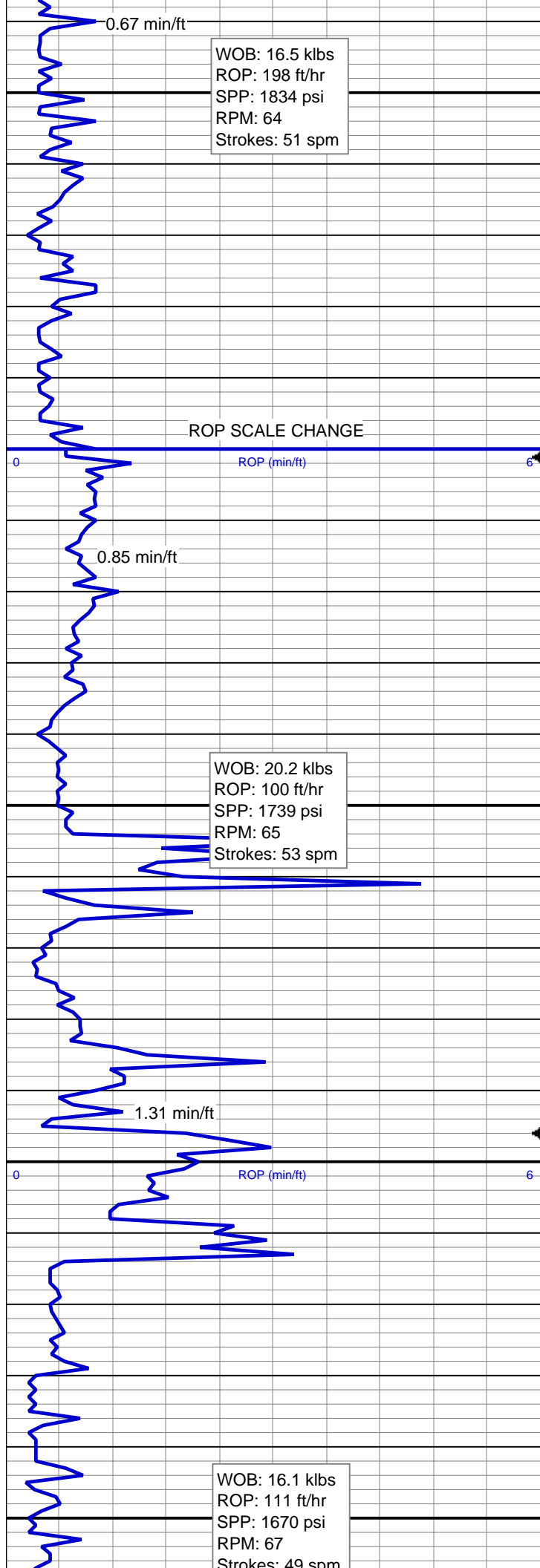
ROP (min/ft)

WOB: 17.1 klbs  
ROP: 128 ft/hr  
SPP: 1792 psi  
RPM: 65  
Strokes: 52 spm

0.25 min/ft

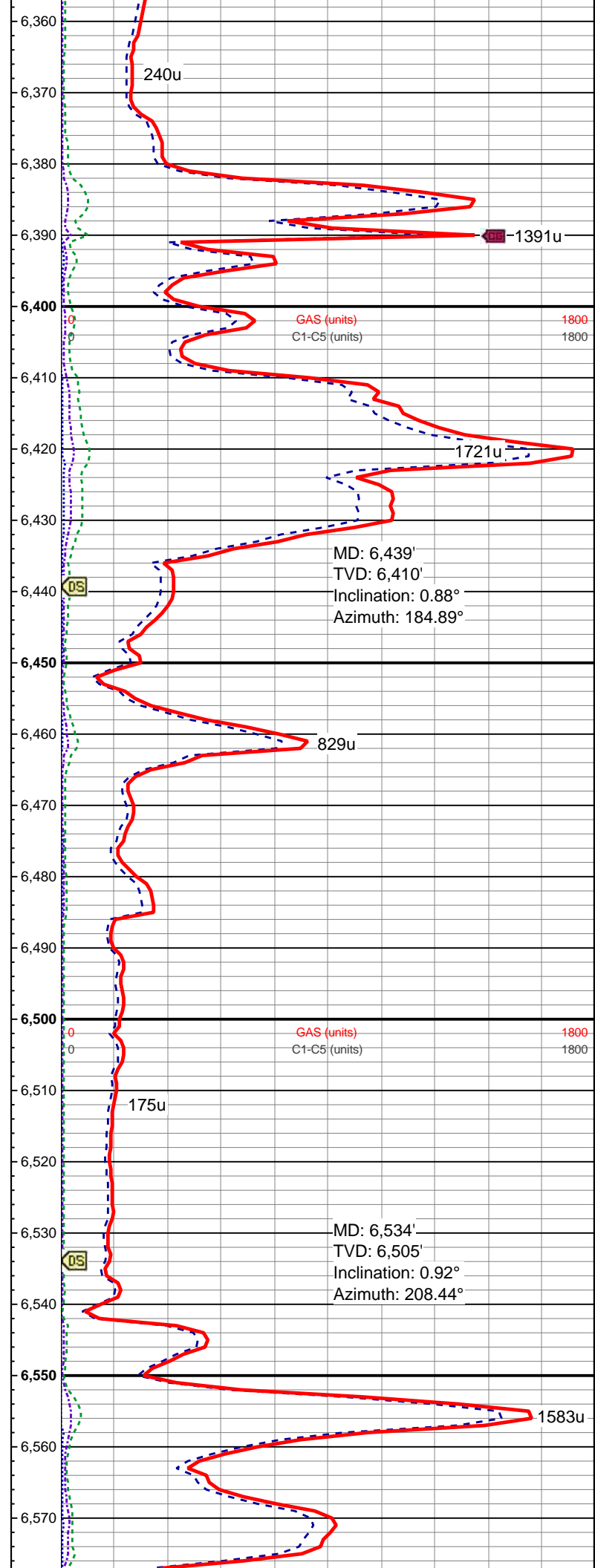
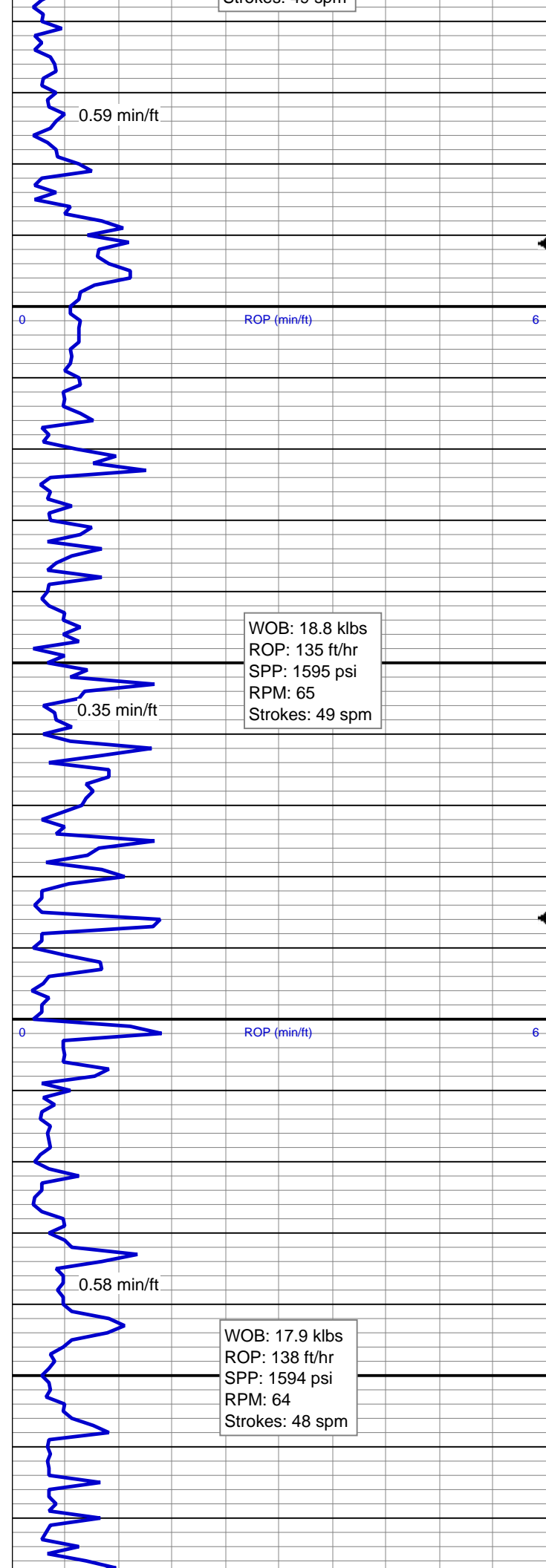
ROP (min/ft)

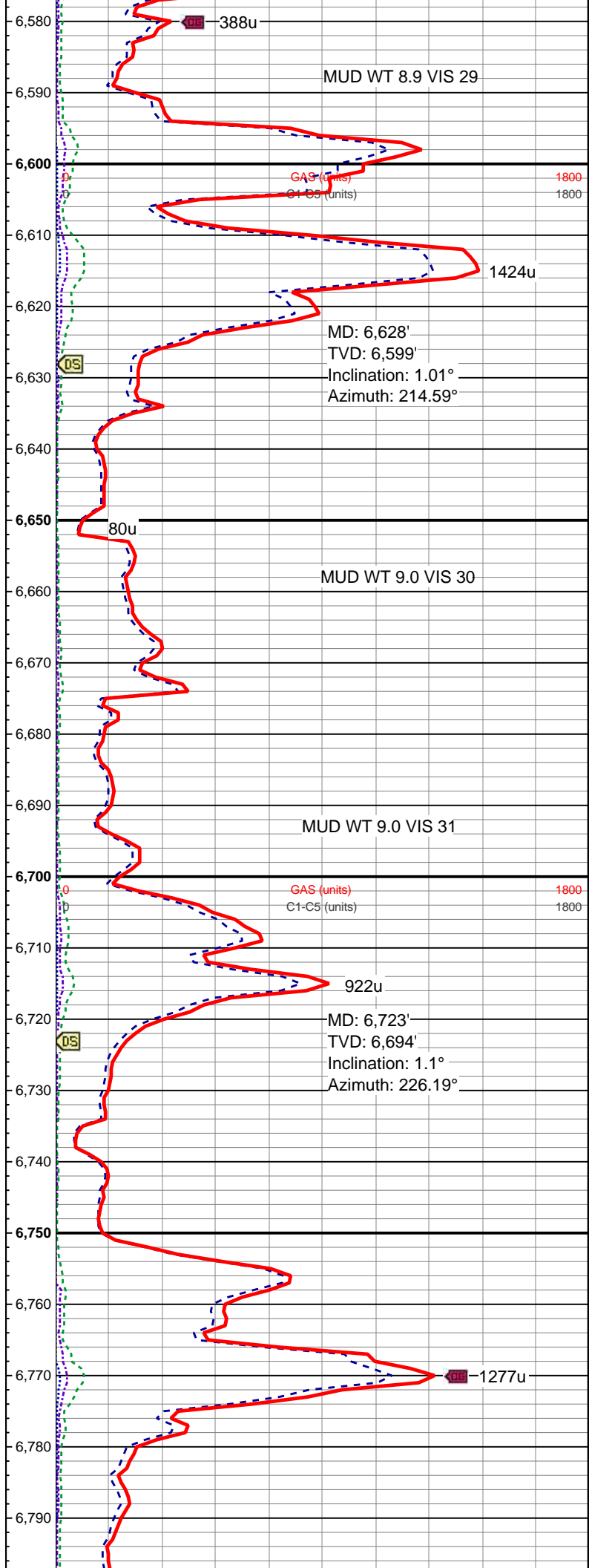
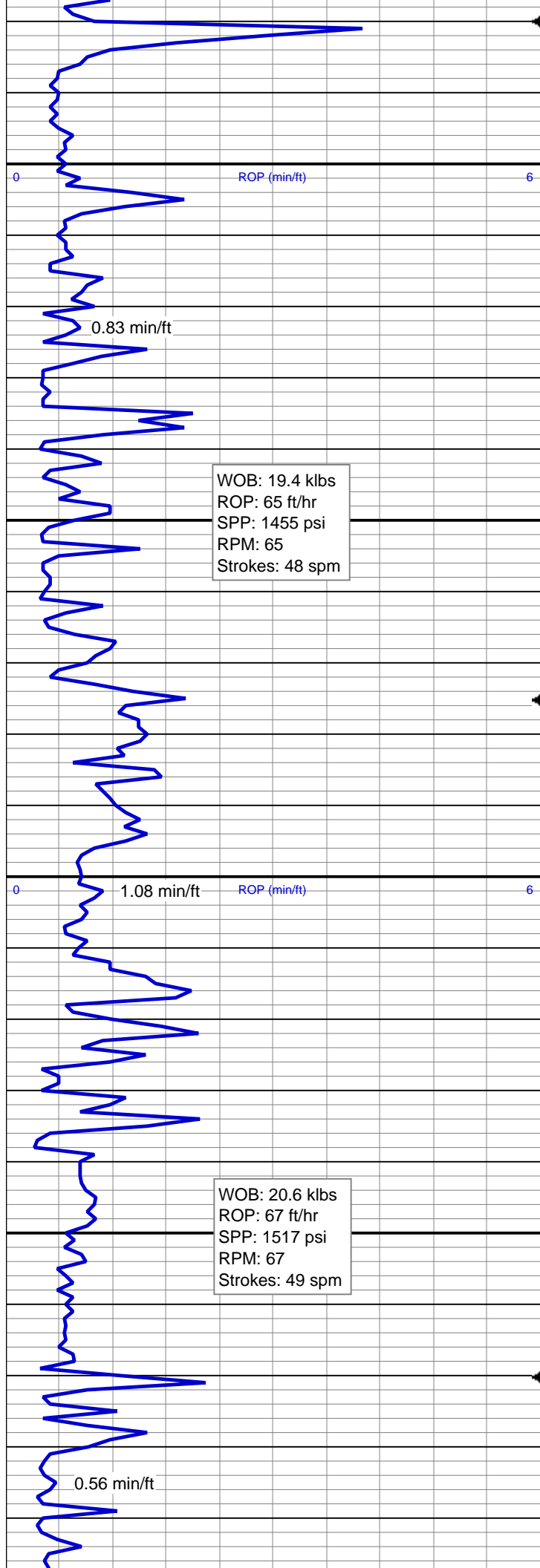


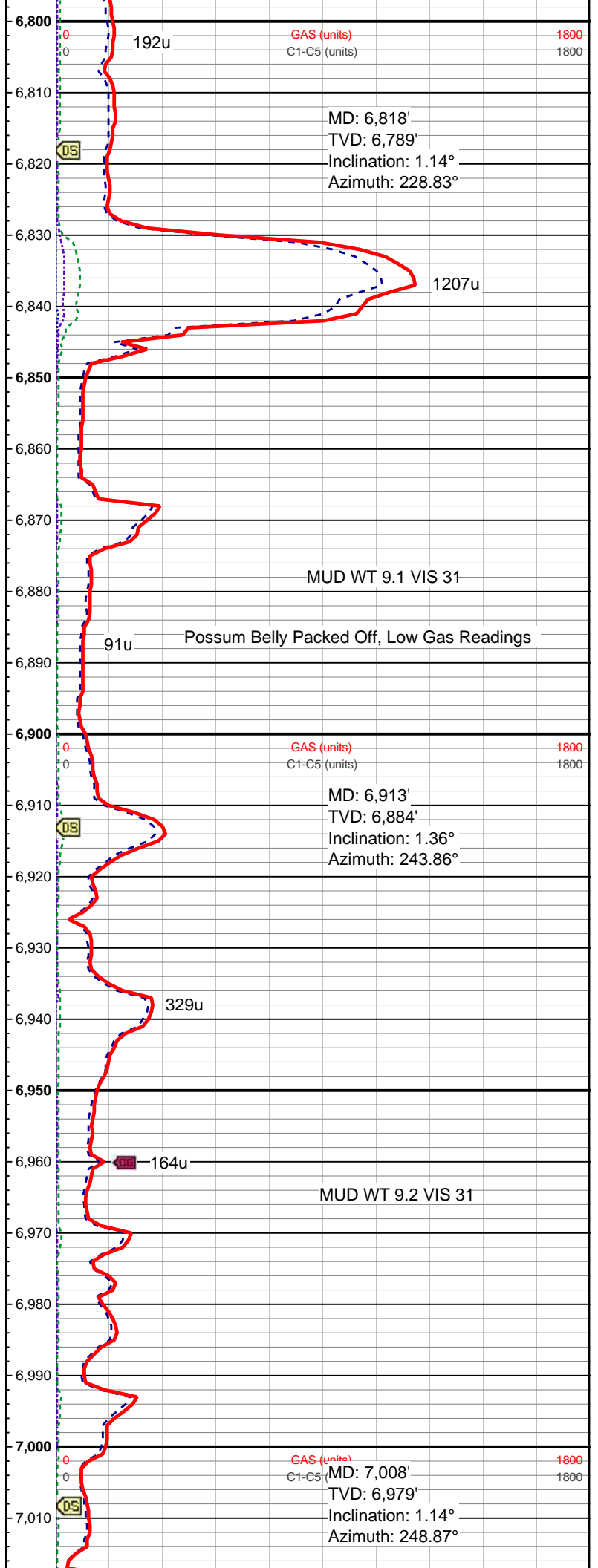
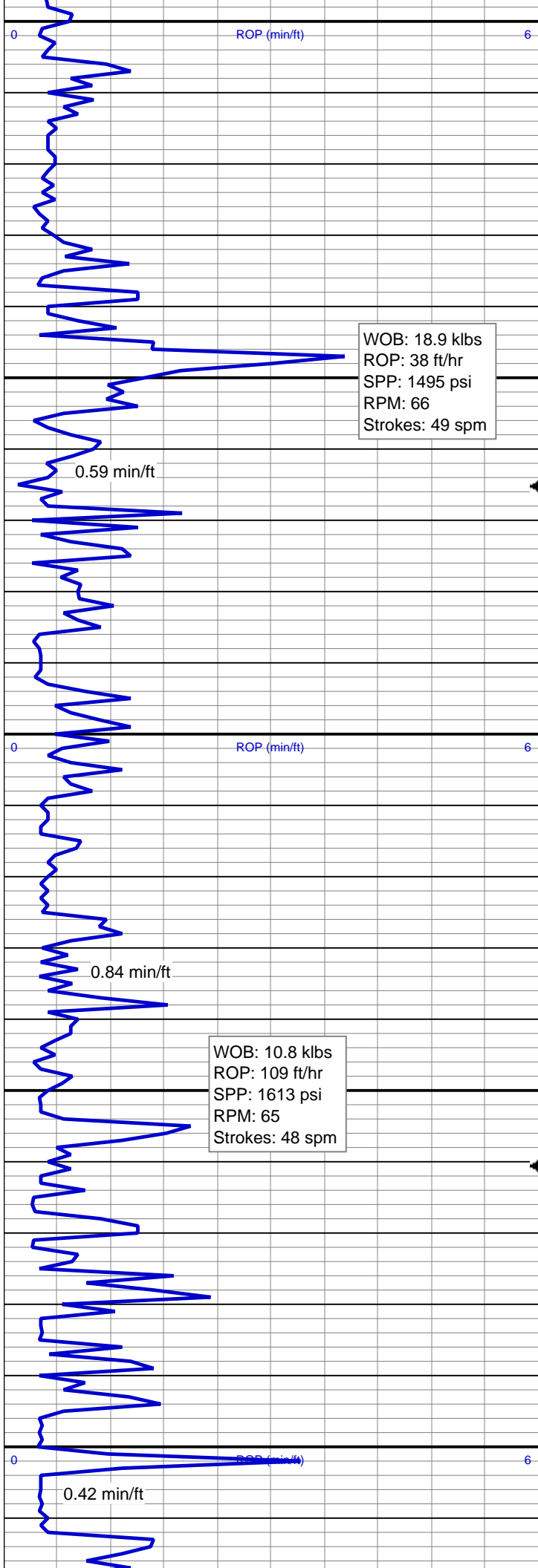


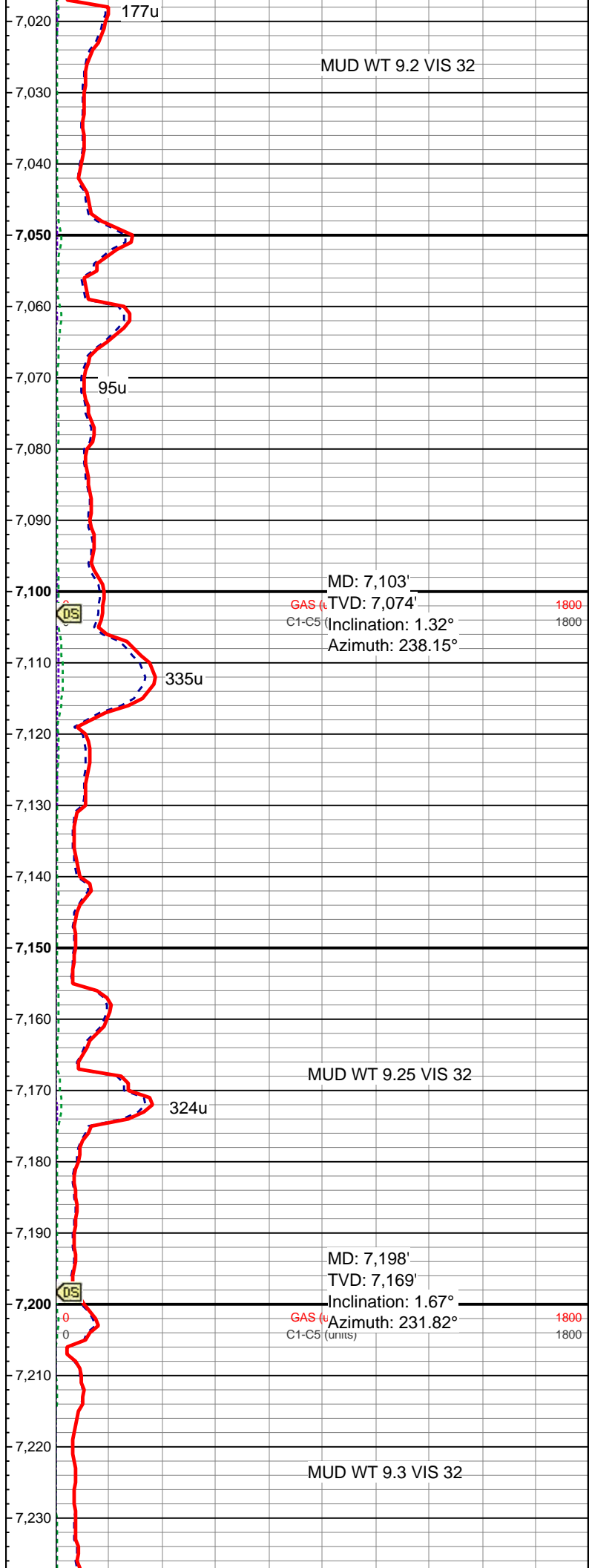
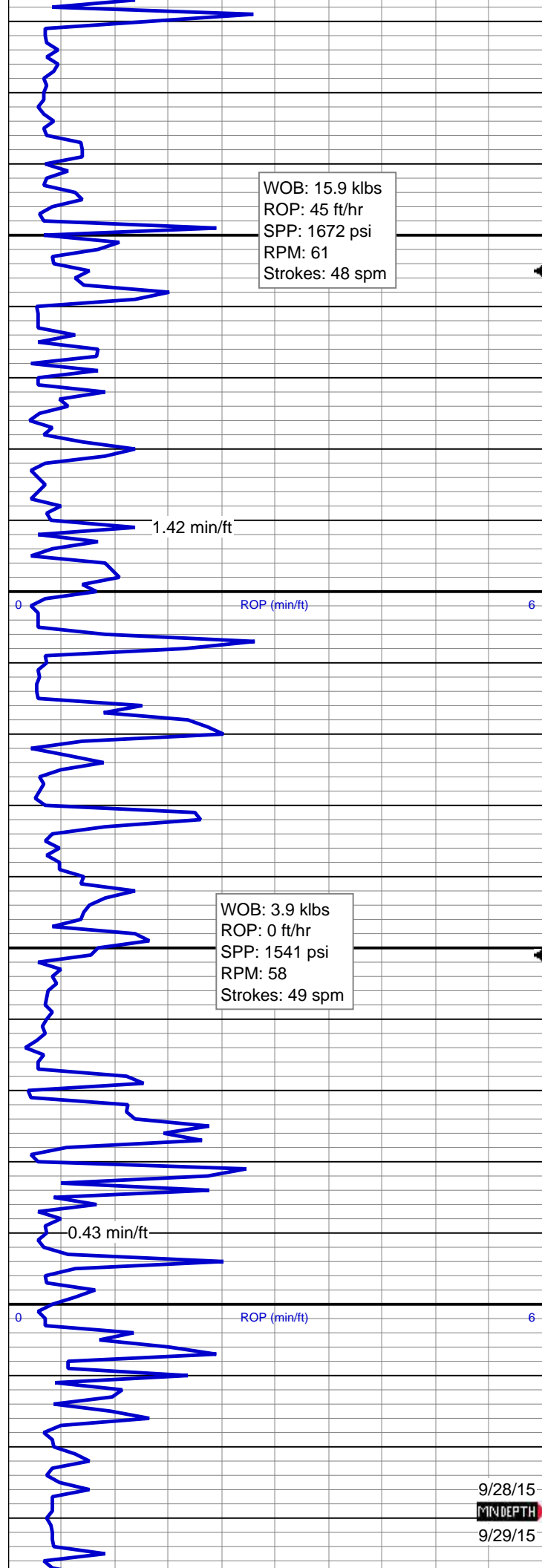


Strokes: 49 spm









WOB: 16.6 klbs  
ROP: 128 ft/hr  
SPP: 1815 psi  
RPM: 64  
Strokes: 49 spm

1.00 min/ft

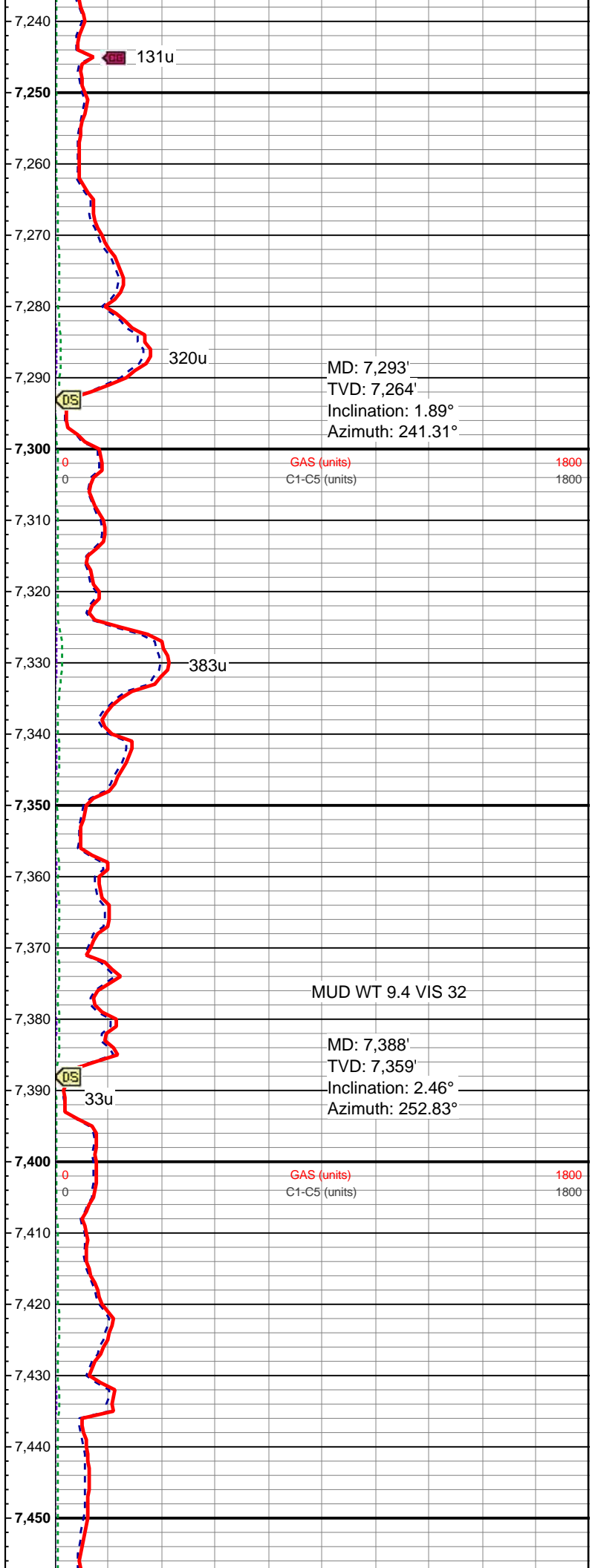
ROP (min/ft)

WOB: 12.8 klbs  
ROP: 44 ft/hr  
SPP: 1813 psi  
RPM: 62  
Strokes: 49 spm

0.34 min/ft

ROP (min/ft)

WOB: 19.3 klbs  
ROP: 194 ft/hr  
SPP: 1855 psi  
RPM: 57  
Strokes: 49 spm



Strokes: 49 spm

0.32 min/ft

ROP (min/ft)

WOB: 18 klbs  
ROP: 156 ft/hr  
SPP: 1890 psi  
RPM: 62  
Strokes: 49 spm

0.66 min/ft

ROP (min/ft)

WOB: 19 klbs  
ROP: 103 ft/hr  
SPP: 1948 psi  
RPM: 61  
Strokes: 48 spm

0.50 min/ft

