

# COLUMBINE LOGGING

Scale: 5" / 100'  
Measured Depth Log

**Well Name** Piceance 28-07W

**Location** SW NW SEC 28 T9S R93W 1551 FNL 1192 FWL

**State** Colorado

**County** Mesa

**Country** United States

**Rig Number** Patterson 306

**API Number** 05-077-09775

**Field** Vega

**Region** Piceance Basin

**Spud Date** 9/5/2015

**Surface Coordinates** N 39.251086 W 107.779581

**Ground Elevation** 7556'

**K.B. Elevation** 7578'

**Logged Interval** 1582'

**Formation** Rollins

## 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

## Other

**Columbine Logging Computer** 14A

**Bloodhound Unit** 273

**Jordan Mccullugh** Wellsite Geologist

## Rock Types

UNKNOWN

ANHYDRITE

BENTONITE

BRECCIA

CEMENT

CHALK

CHERT

CLAY CHOKE SAND

CLAYSTONE

COAL

CONGLOMERATE

DOLOMITE

DOLOMITIC LIMESTONE

GRANITE

GYPHUM

IGNEOUS

LIMESTONE

SIDERITE or LIMONITE

MARLSTONE

METAMORPHIC

NO SAMPLE

SALT

SALT- PEPPER SAND

SANDSTONE

SHALE

SHALE COLORED

SHALE GRAY

SHALY SANDSTONE

SHALY SILTSTONE

SILTSTONE

SILTY SHALE

TILL

TUFF

WELDED TUFF

## 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  
 O INTEROOLITIC  
 M MOLDIC

O ORGANIC  
 P PINPOINT  
 V VUGGY

### Engineering

BIT CHANGE  
 CONNECTION (LEFT)  
 CONNECTION (RIGHT)  
 CONNECTION GAS  
 TRIP GAS  
 DTS 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

DST DRILL STEM TEST  
 WIRELINE TESTED - LEFT  
 WIRELINE TESTED - RT

### Rounding

A ANGULAR  
 R ROUNDED  
 S SUBANG  
 SUBRND

### Textures

BS BOUNDSTONE  
 C CHALKY  
 CX CRYPTOXLN

E EARTHY  
 FX FINELYXLN  
 GS GRAINSTONE  
 L LITHOGRAPHIC  
 MX MICROXLN  
 MS MUDSTONE  
 PS PACKSTONE  
 WS WACKESTONE

### Sorting

M MODERATE  
 P POOR  
 W WELL

## Zone Color Coding

Oil  
 Note  
 Error

Condensate  
 Core  
 Water

Gas  
 Pressure  
 Seal

ROP  
ROP

One-Man Strip Logging  
Rigged Up 9/6/2015  
Began Logging @ 1582'  
@ 0100 hrs on 9/7/2015

ROP (min/ft)

Slide/Rotate

Depth Labels

Total Gas & Chromatograph

GAS  
C1  
C2  
C3  
C4  
C5

Bit #: 2  
Type: PDC  
Size: 7 7/8  
Depth In: 1582'  
Depth Out: 7873'  
Hours: 48.25  
Avg Ft/Hr: 193.8  
Jets: 5x12  
S/N: 12686104

MUD WT 8.6 VIS 28

MD: 1,602'

TVD: 1,559'

Inclination: 4.09°

Azimuth: 260.22°

GAS (units)  
C1 107u (its)

MUD WT 8.6 VIS 27

17u

MD: 1,697'

TVD: 1,694'

Inclination: 3.69°

Azimuth: 253.8°

GAS (units)  
C1-C5 (units)

WOB: 4.6 klbs  
ROP: 25 ft/hr  
SPP: 1034 psi  
RPM: 60  
Strokes: 49 spm

0.17 min/ft

0.14 min/ft

WOB: 18.2 klbs  
ROP: 240 ft/hr  
SPP: 1140 psi  
RPM: 60  
Strokes: 45 spm

0.25 min/ft

ROP (min/ft)

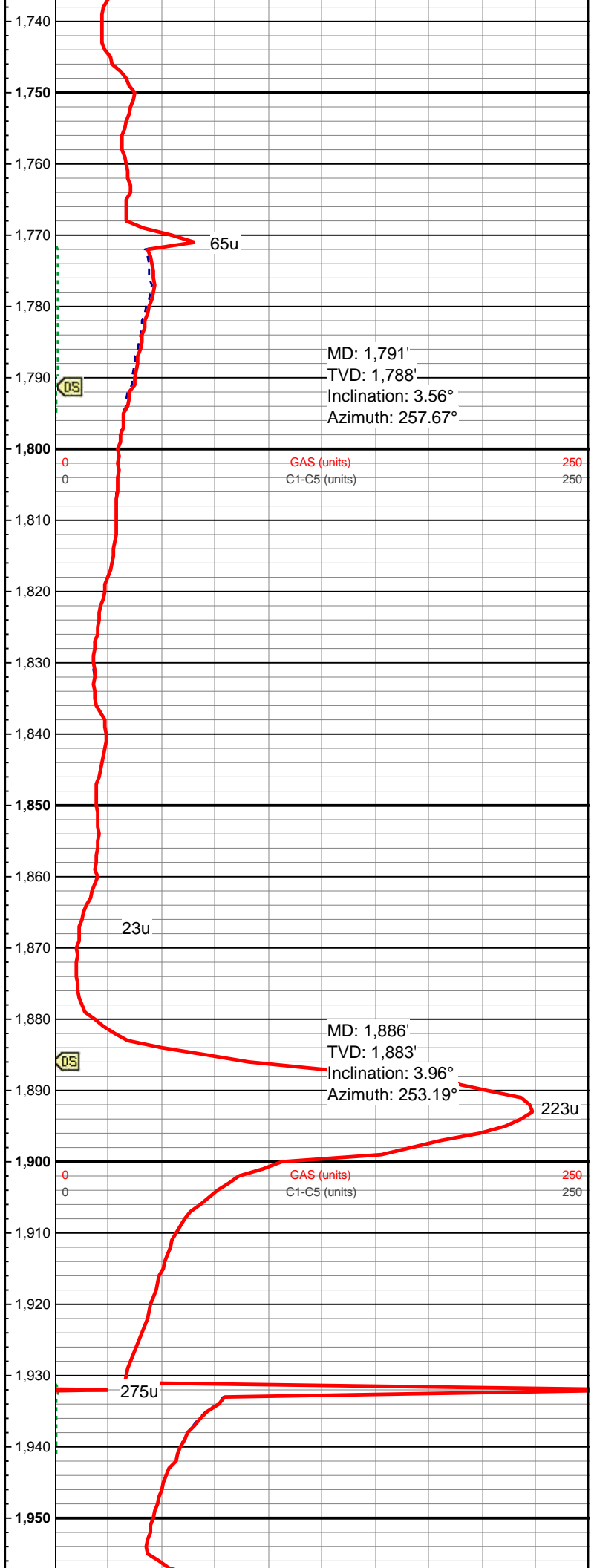
0.75 min/ft

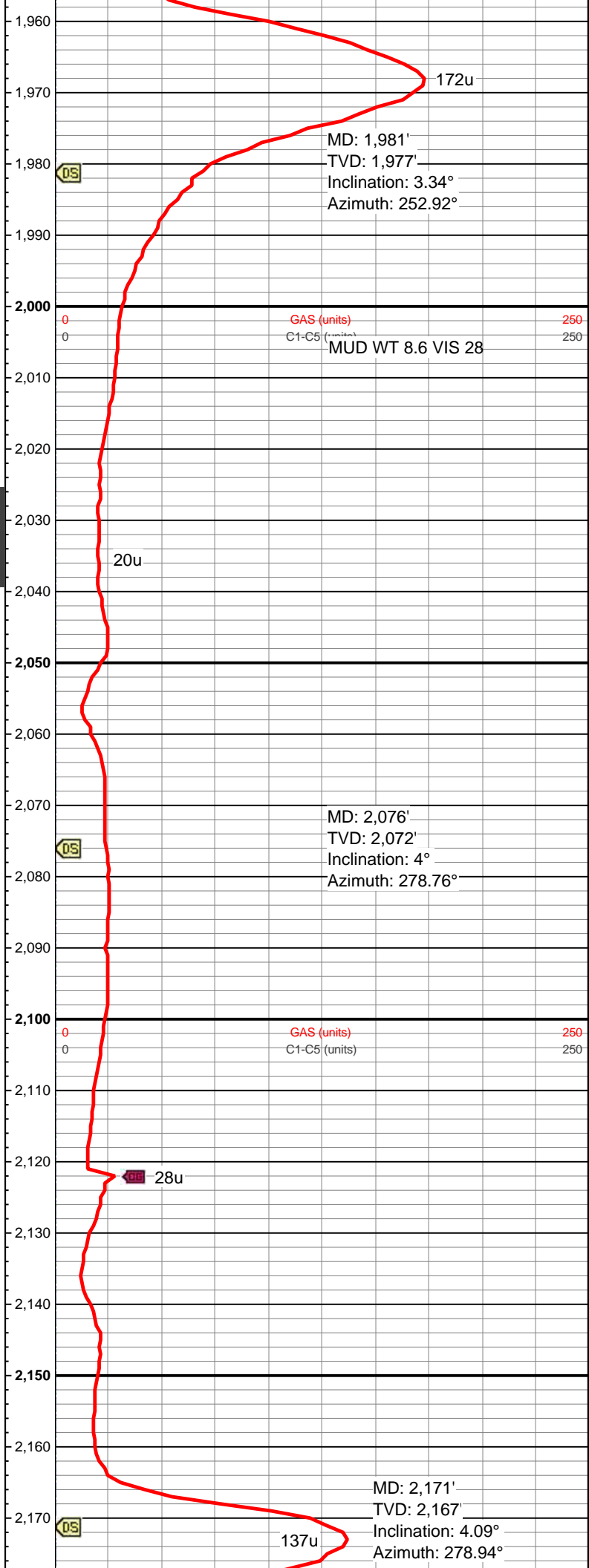
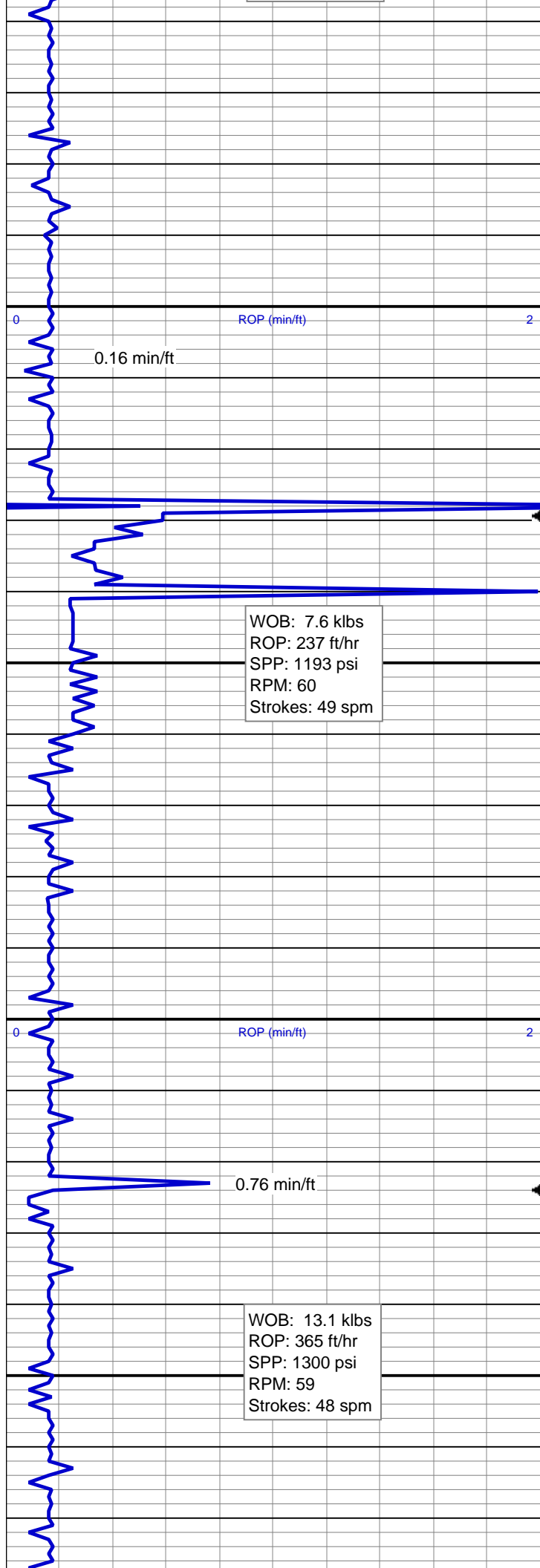
WOB: 9.2 klbs  
ROP: 240 ft/hr  
SPP: 1165 psi  
RPM: 59  
Strokes: 49 spm

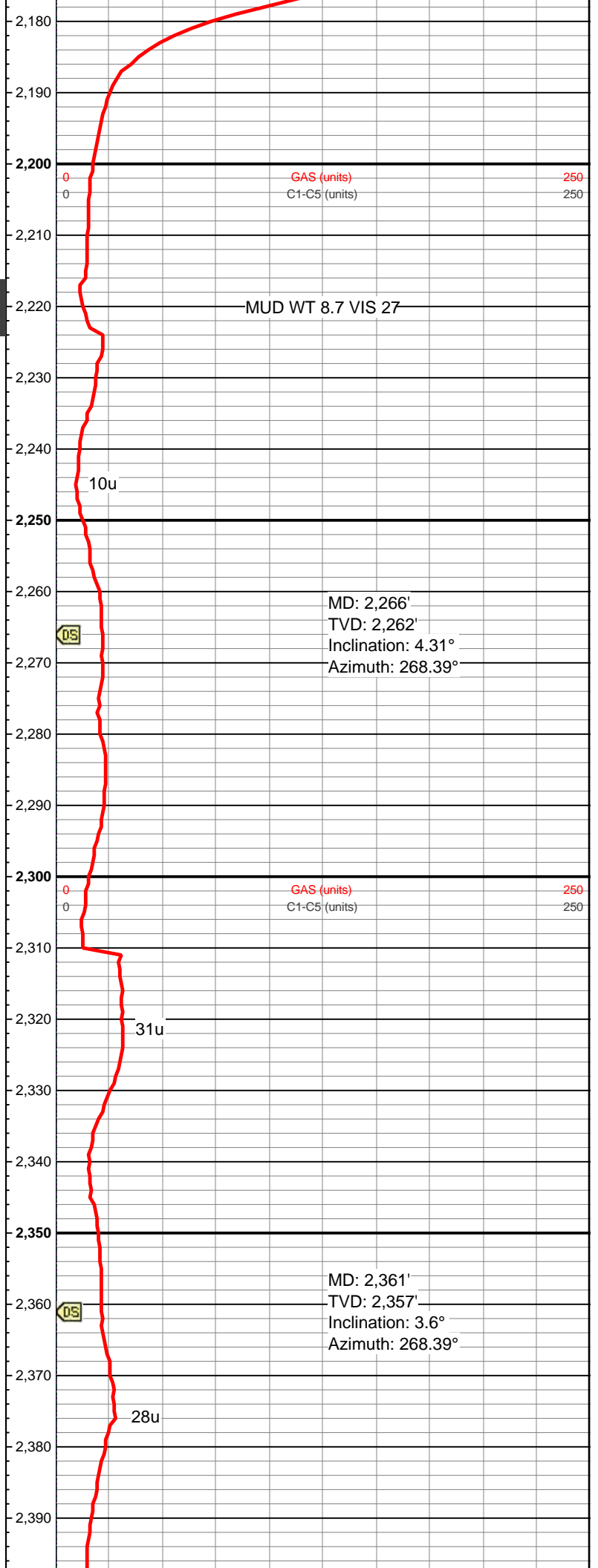
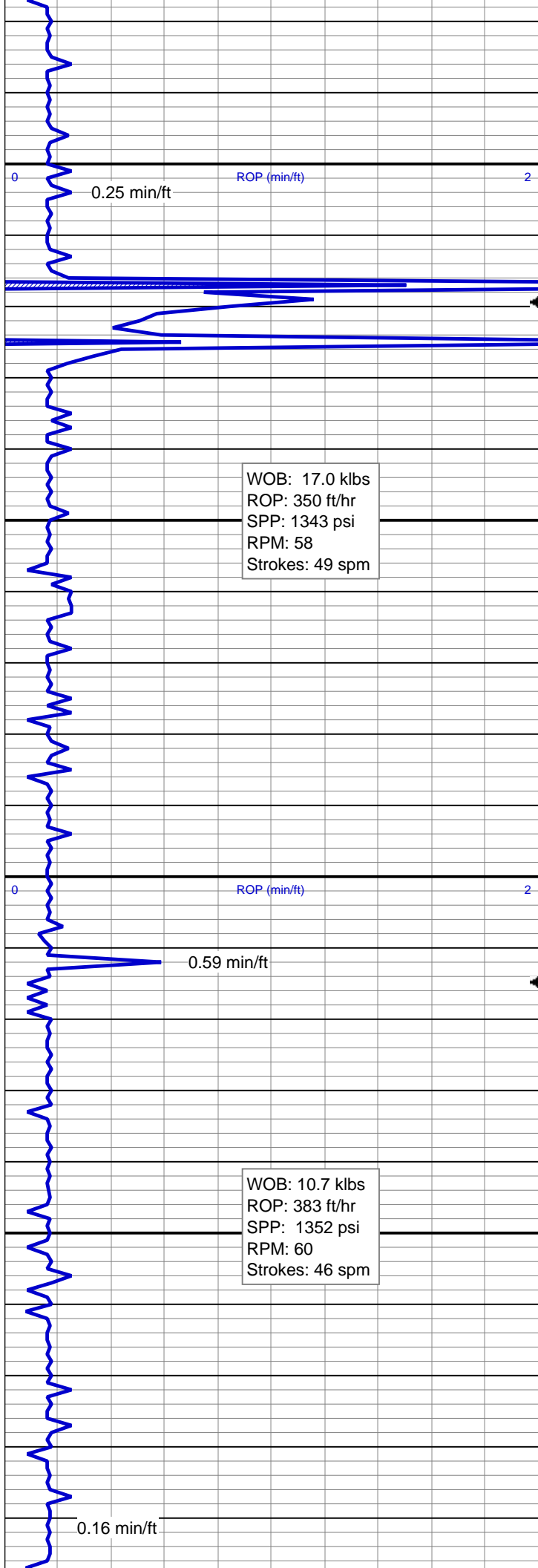
ROP (min/ft)

0.50 min/ft

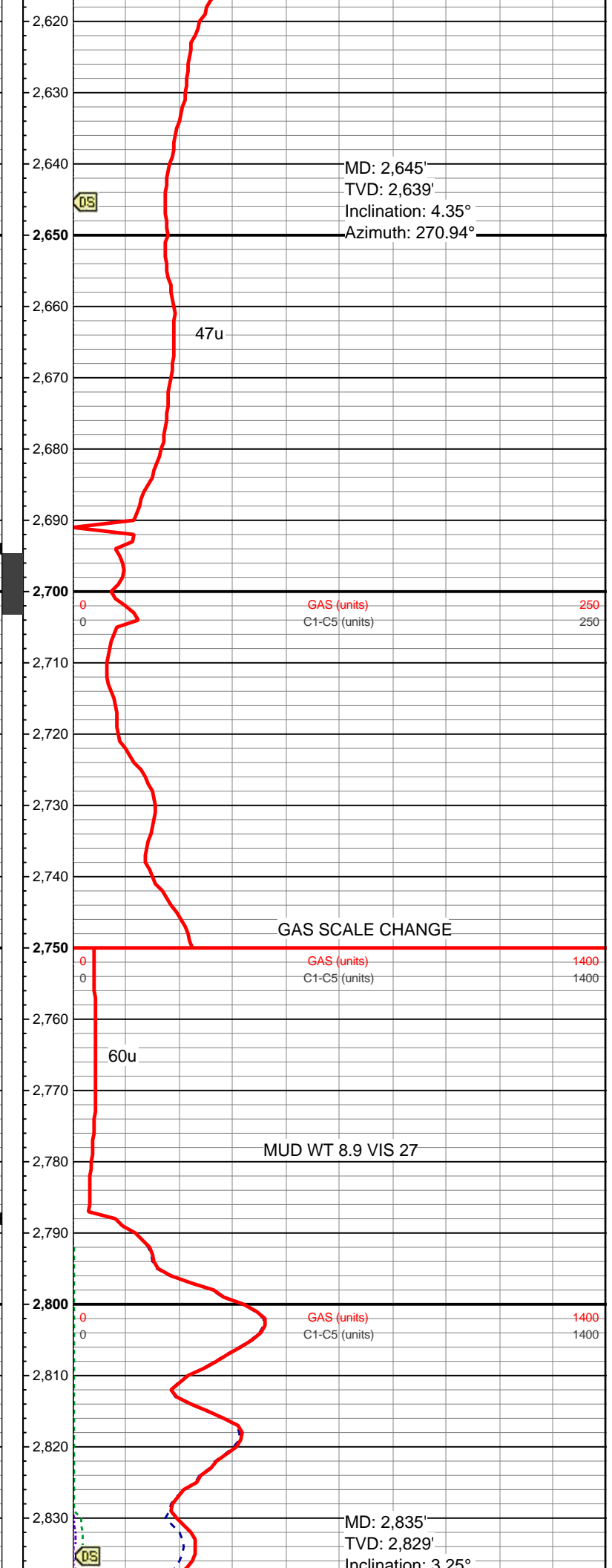
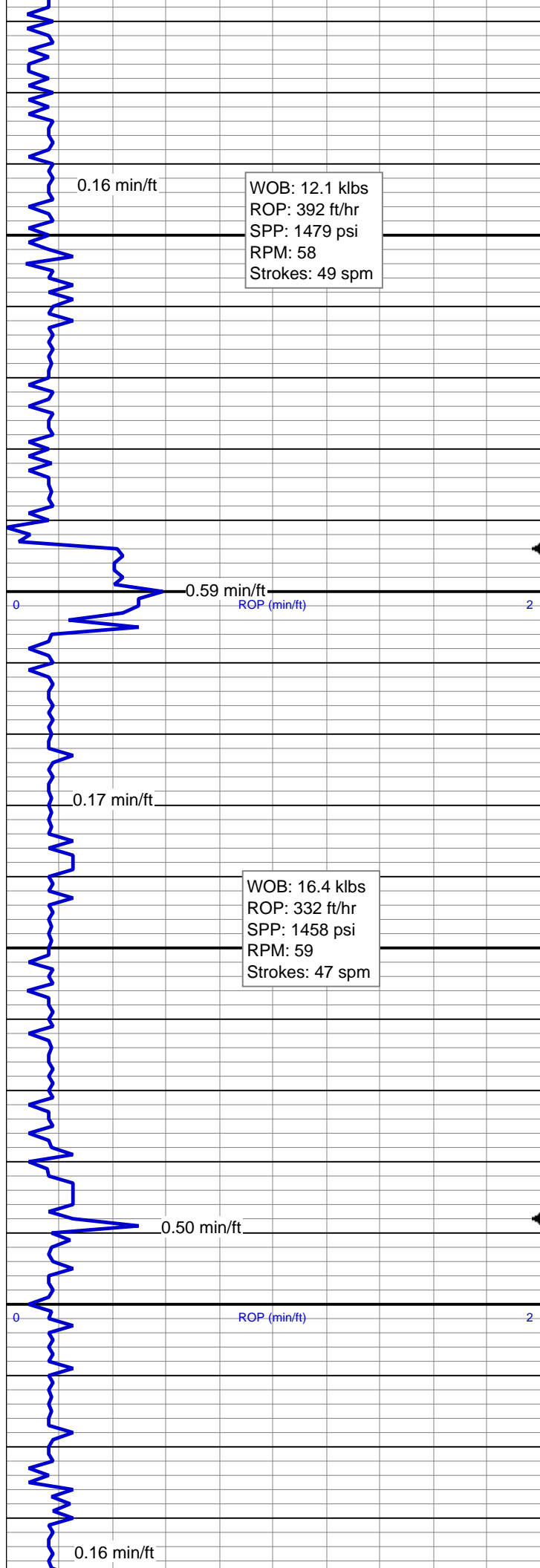
WOB: 15.7 klbs  
ROP: 356 ft/hr  
SPP: 1335 psi  
RPM: 60  
Strokes: 49 spm



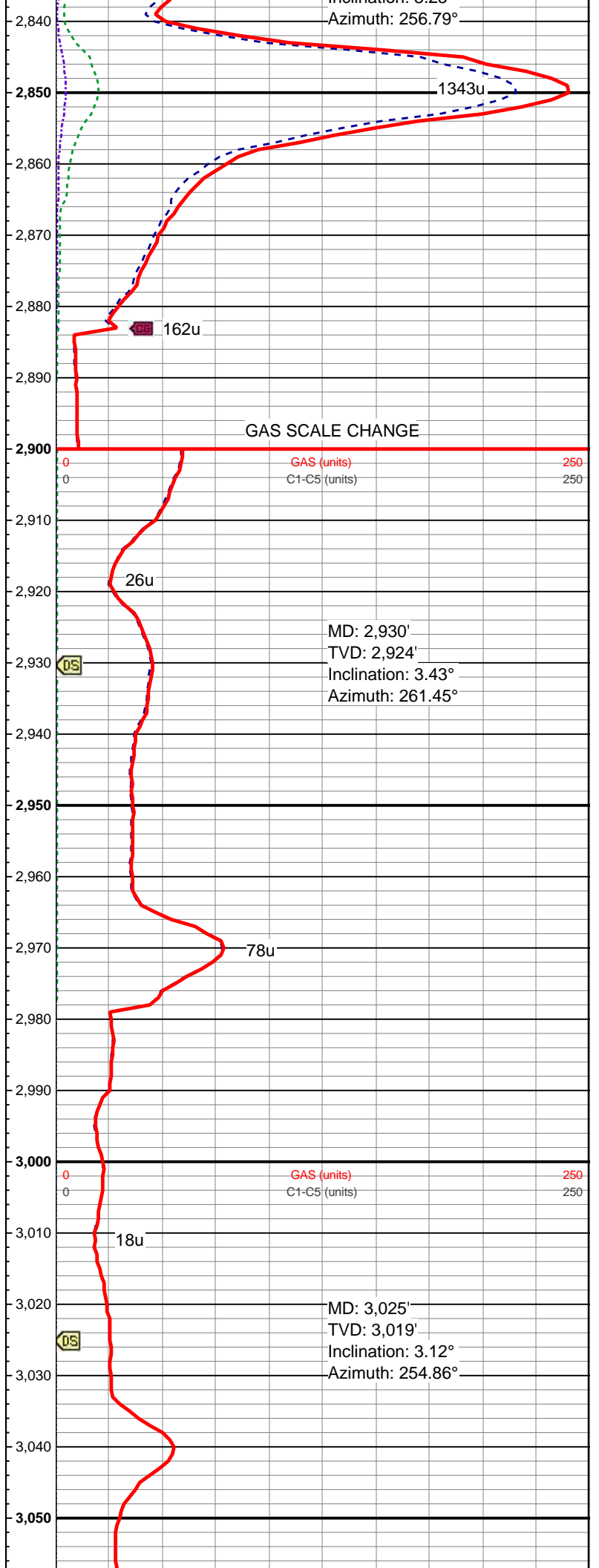
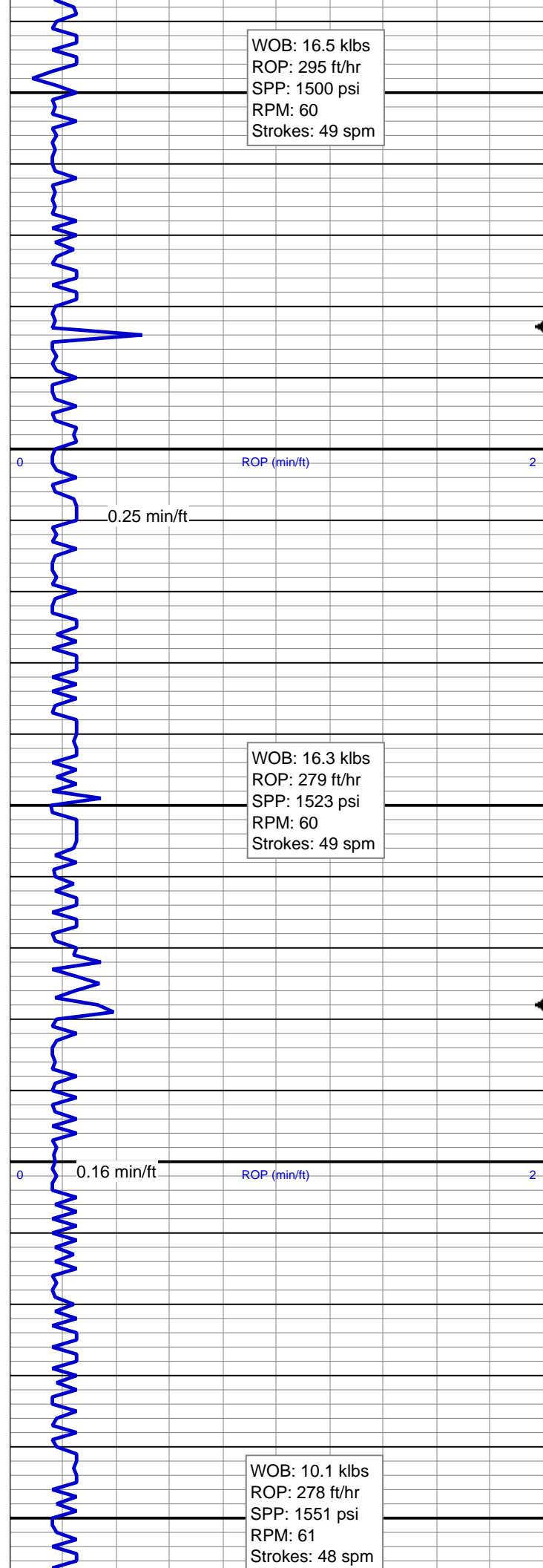


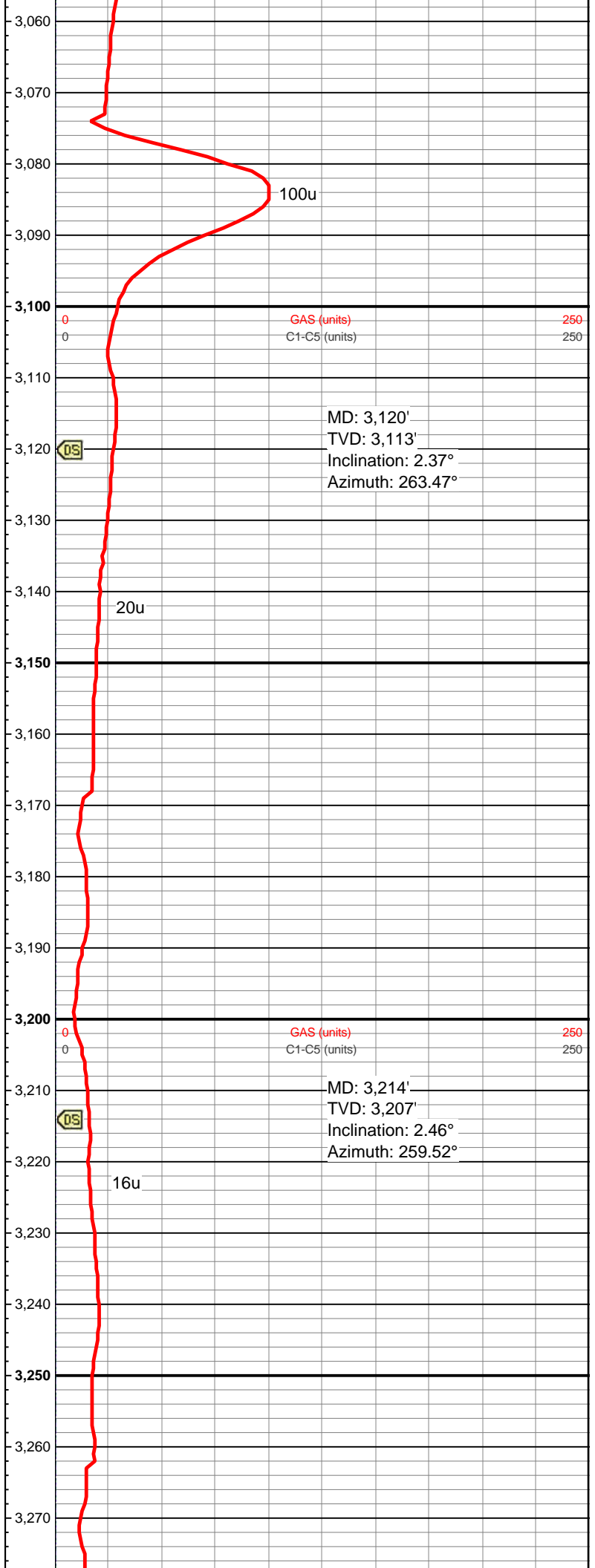
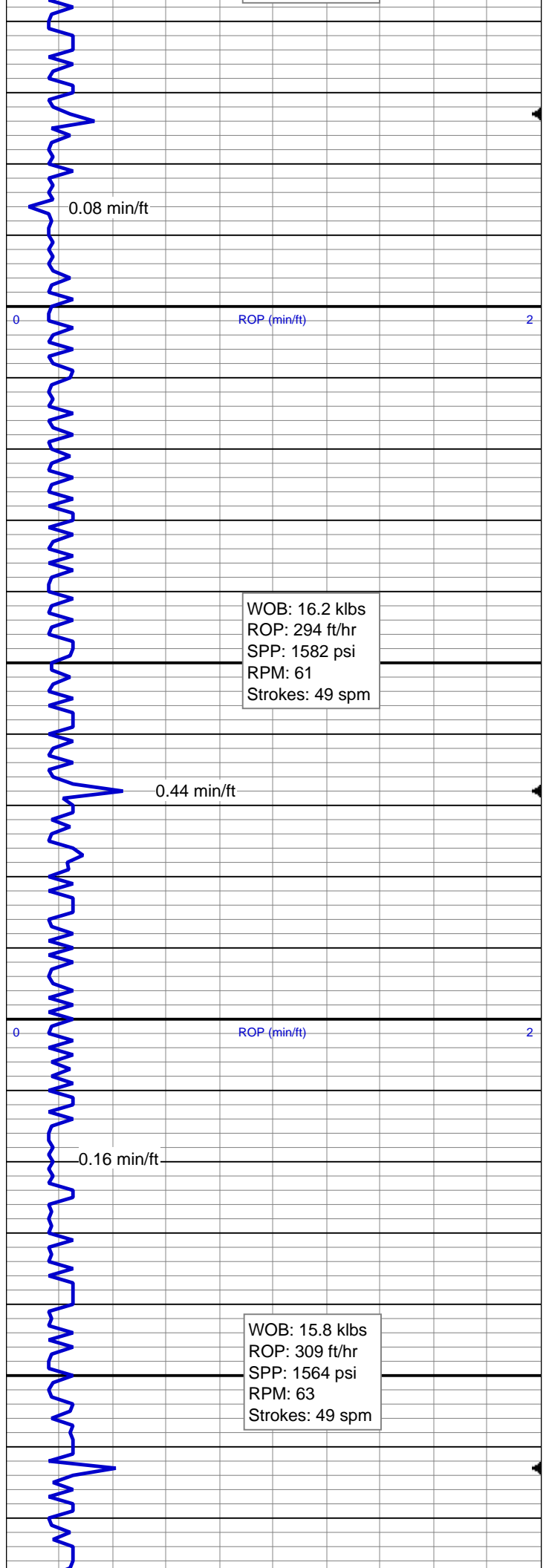


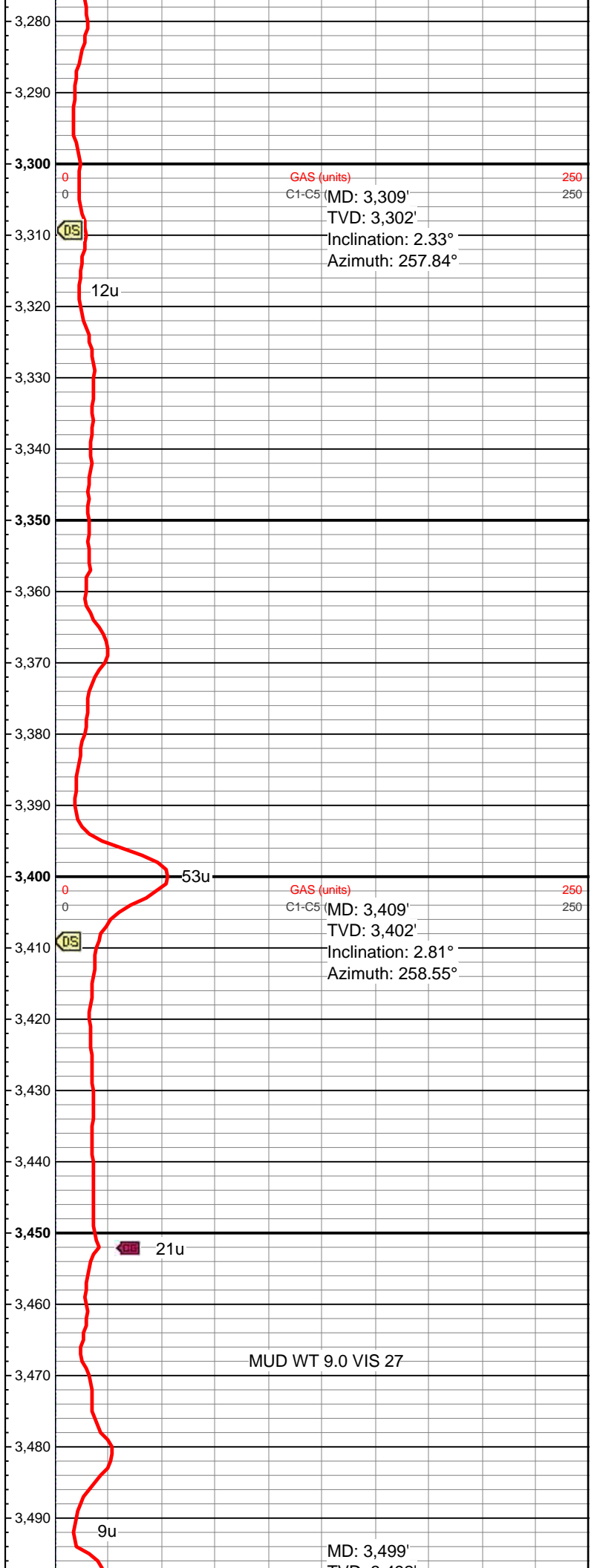
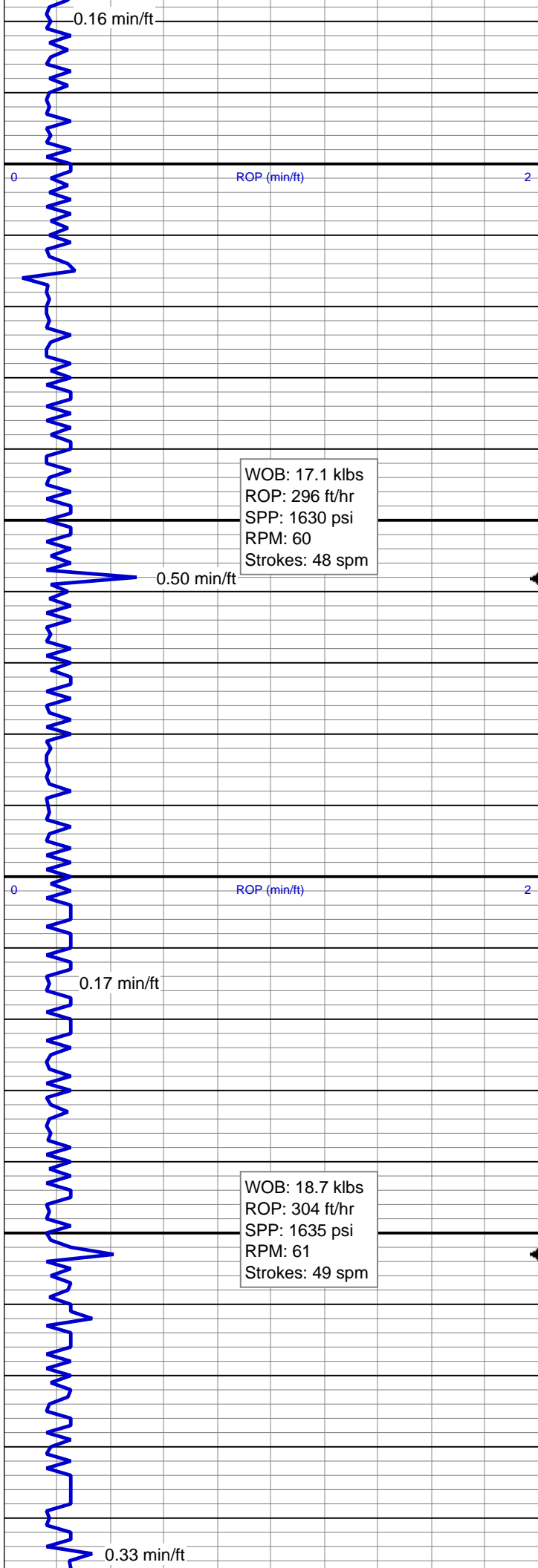




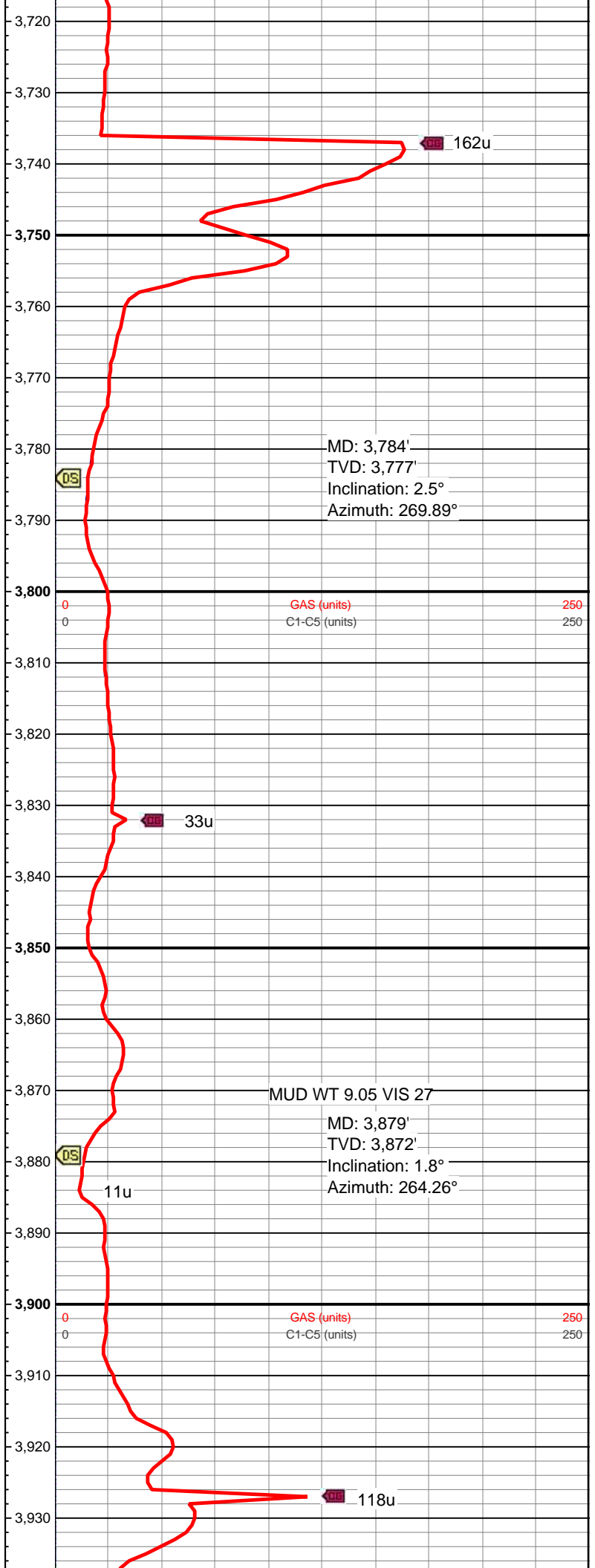
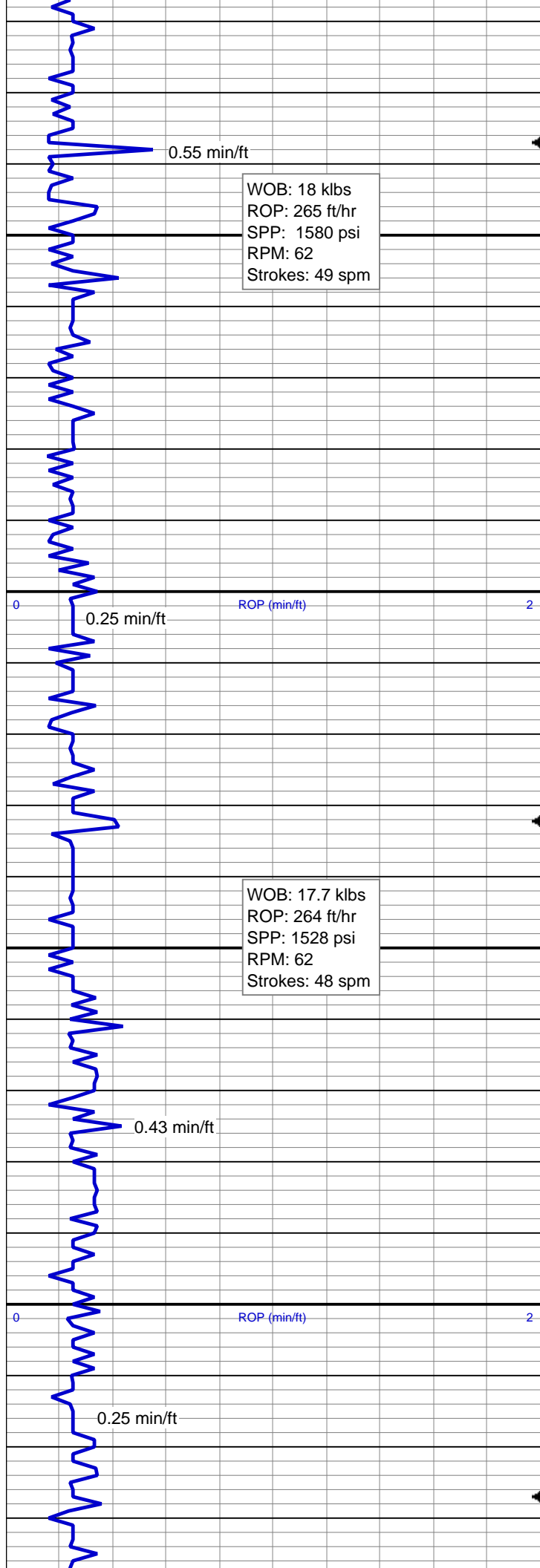


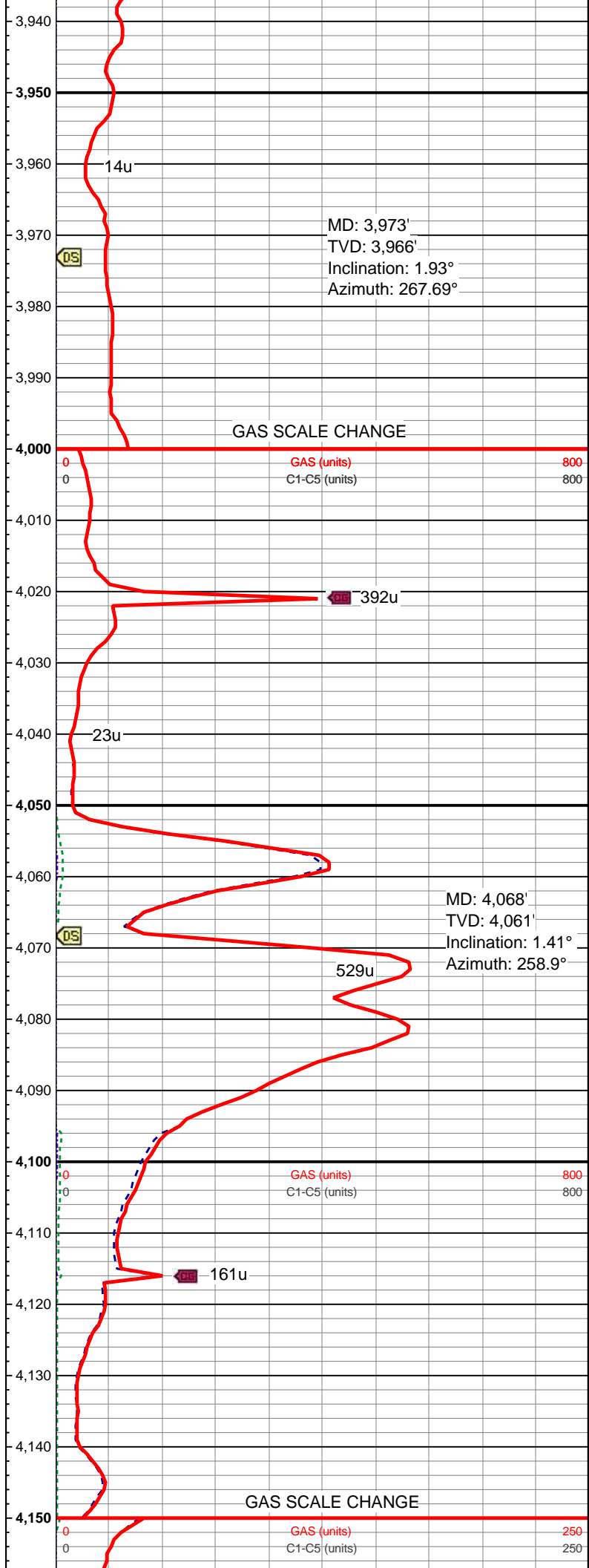
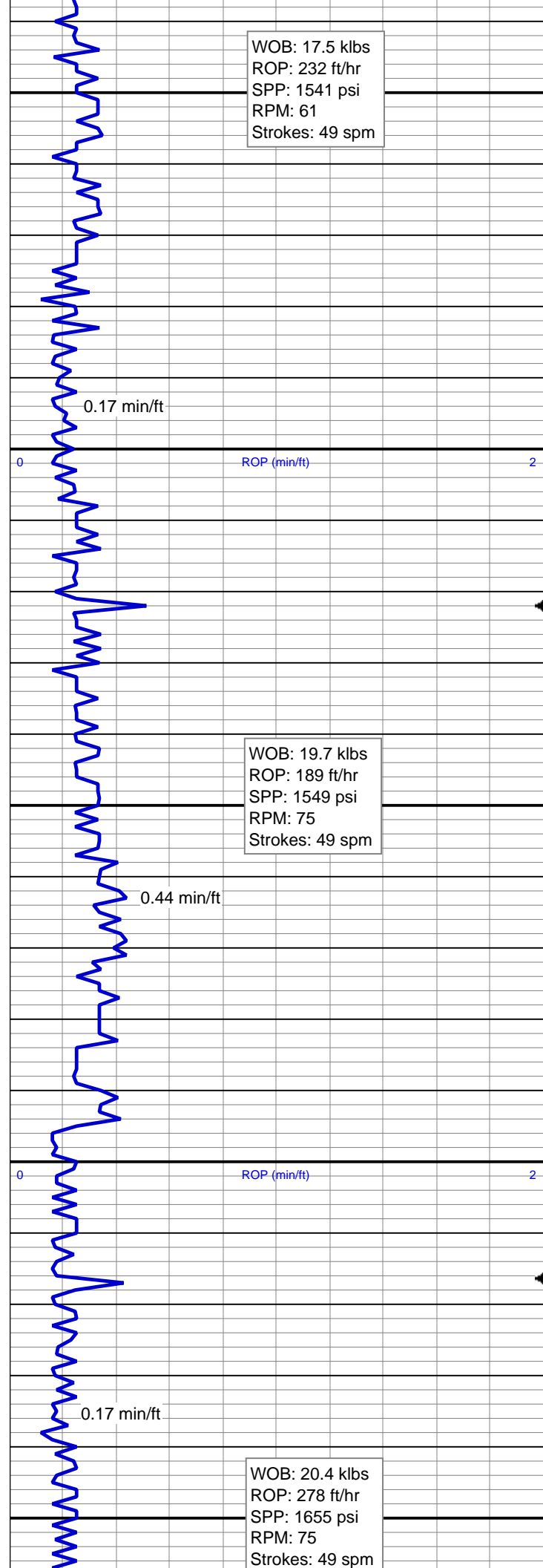


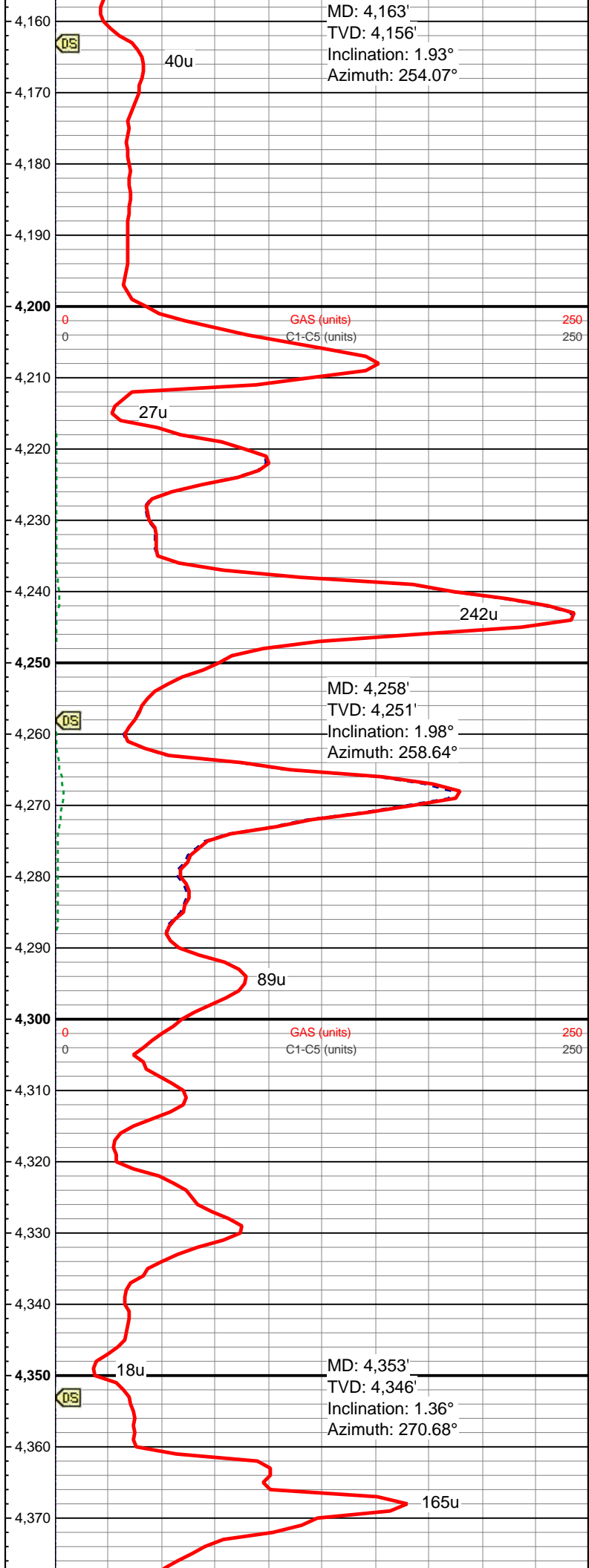
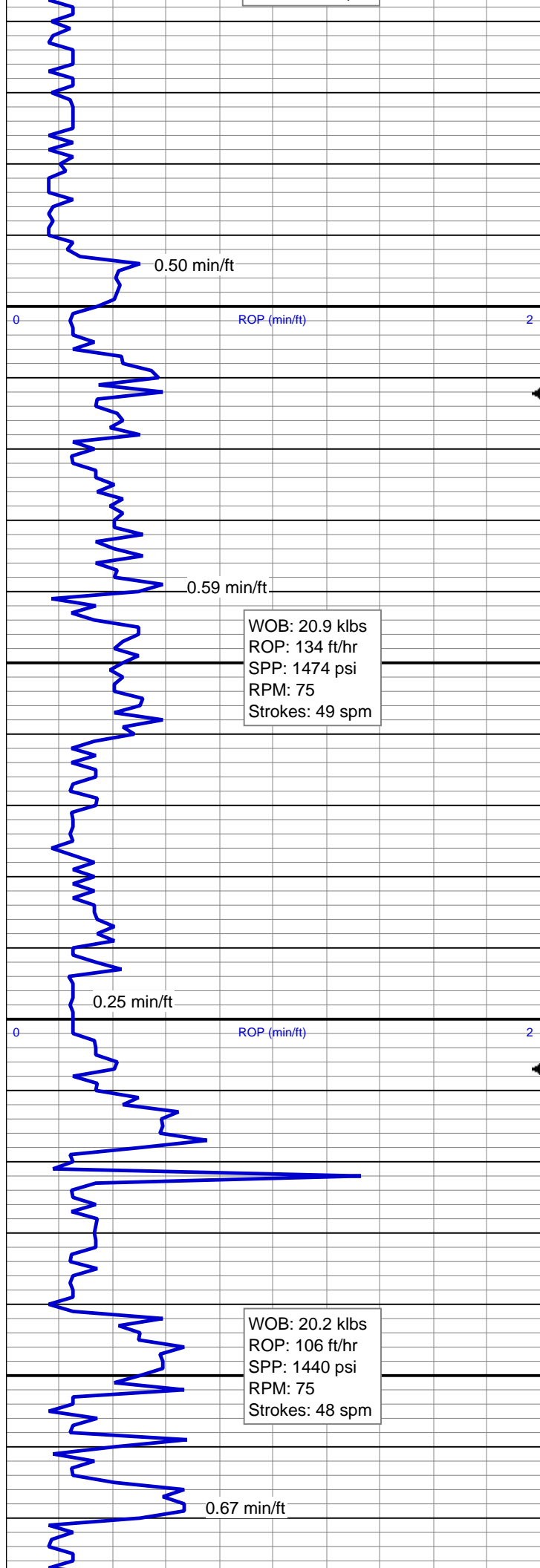


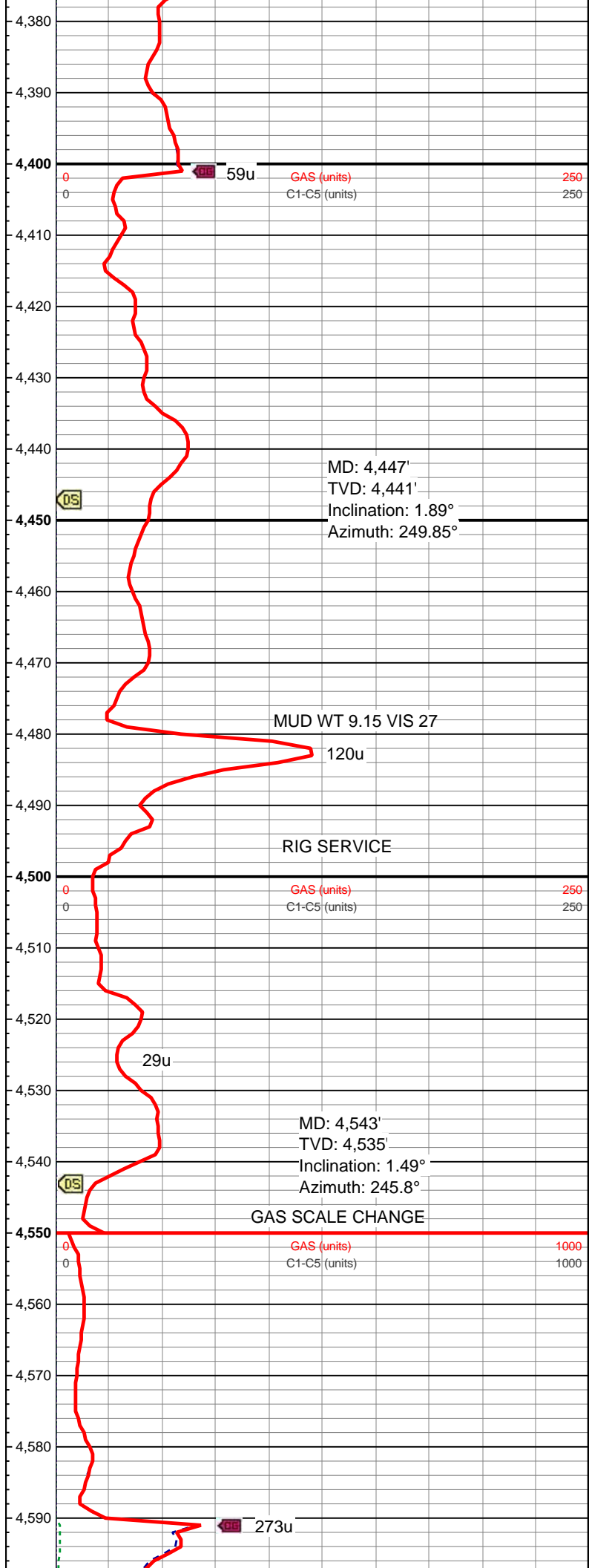
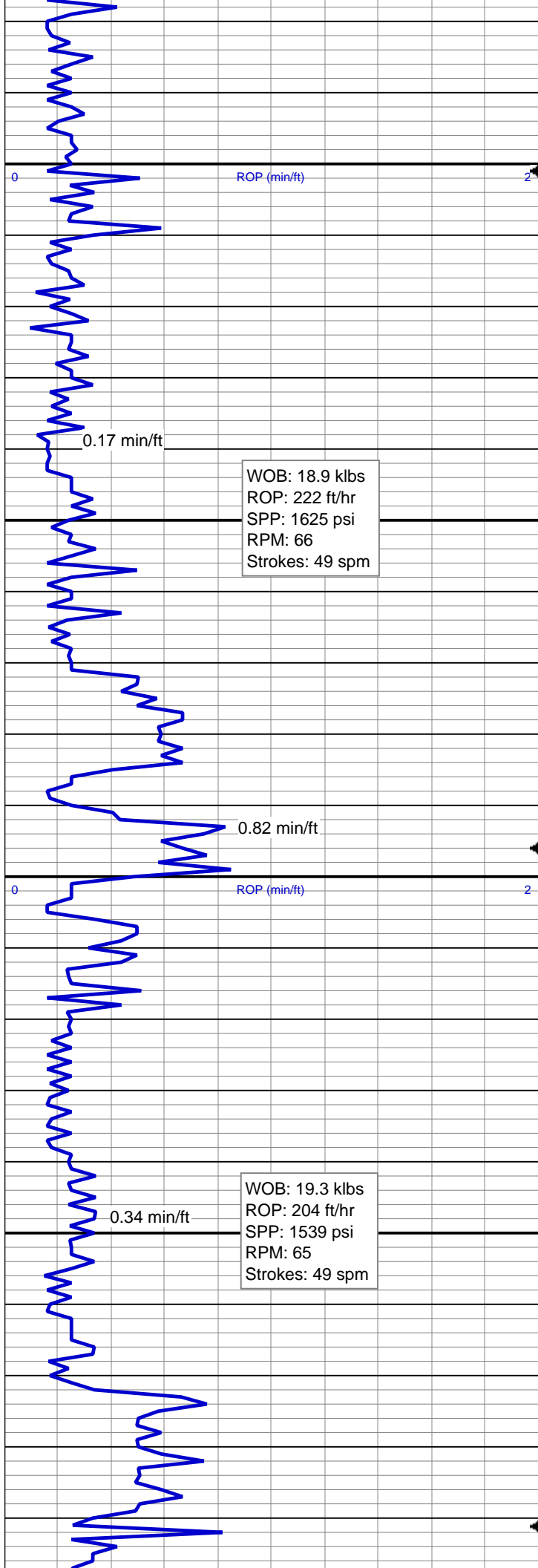




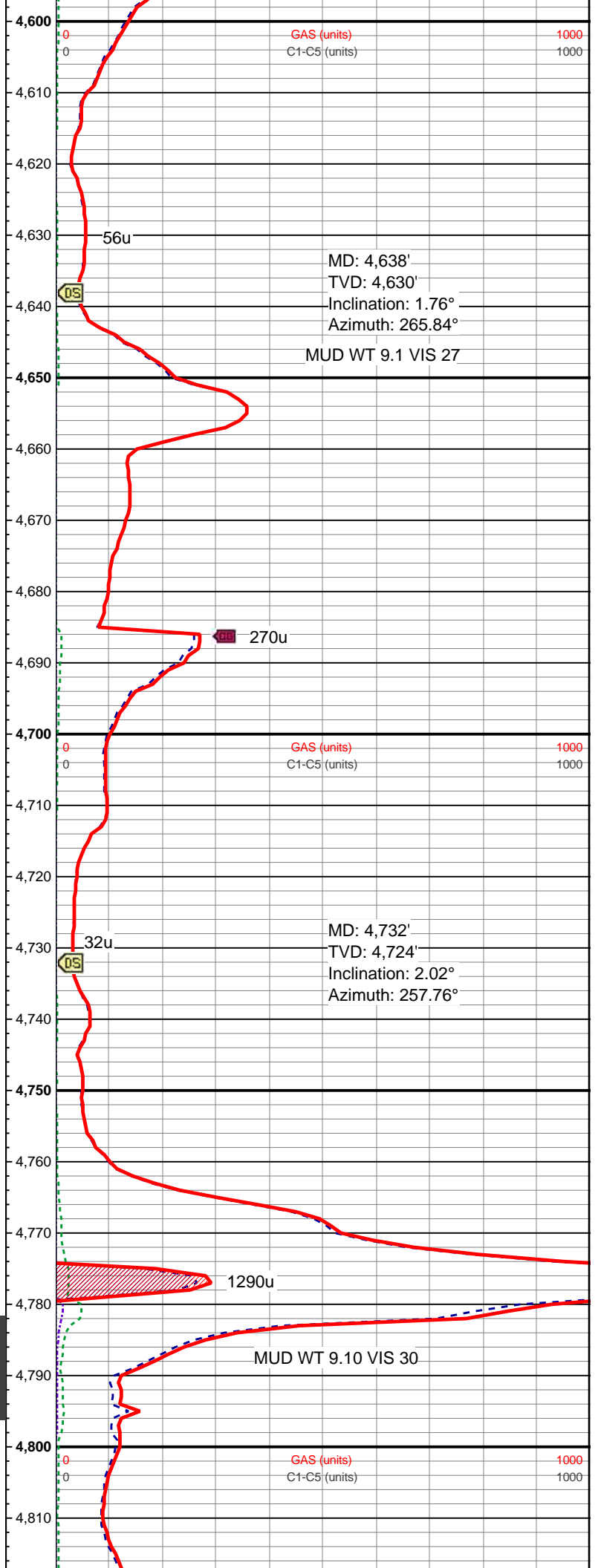
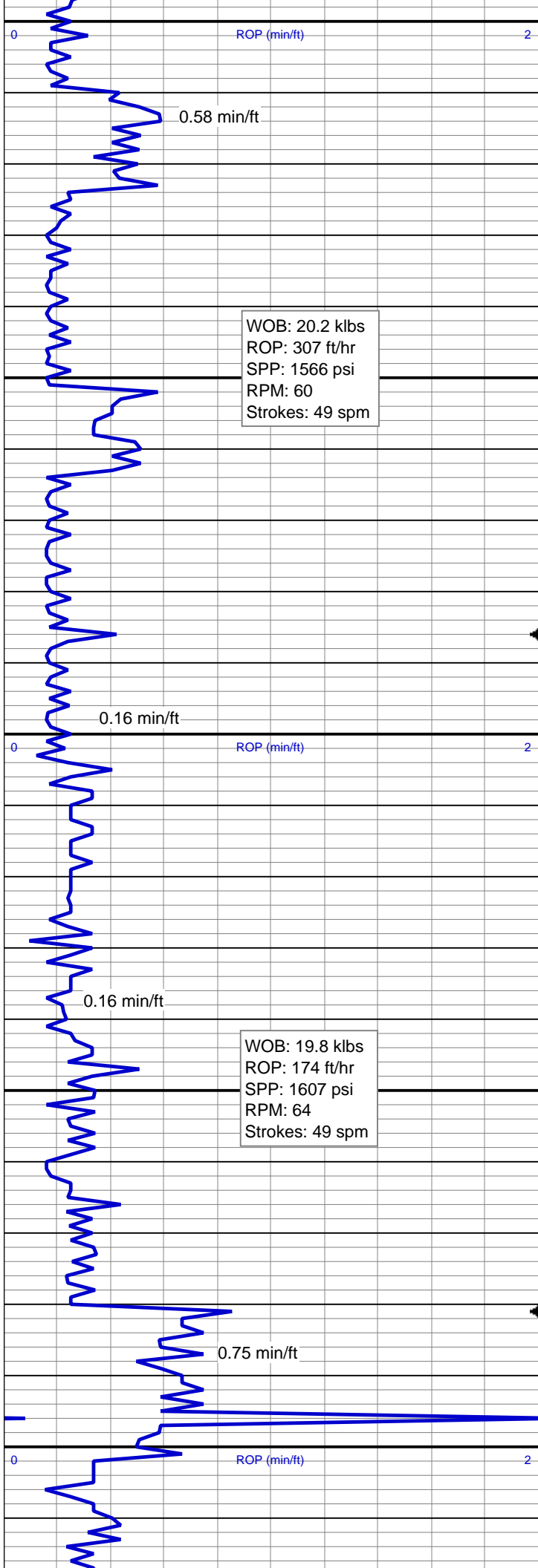


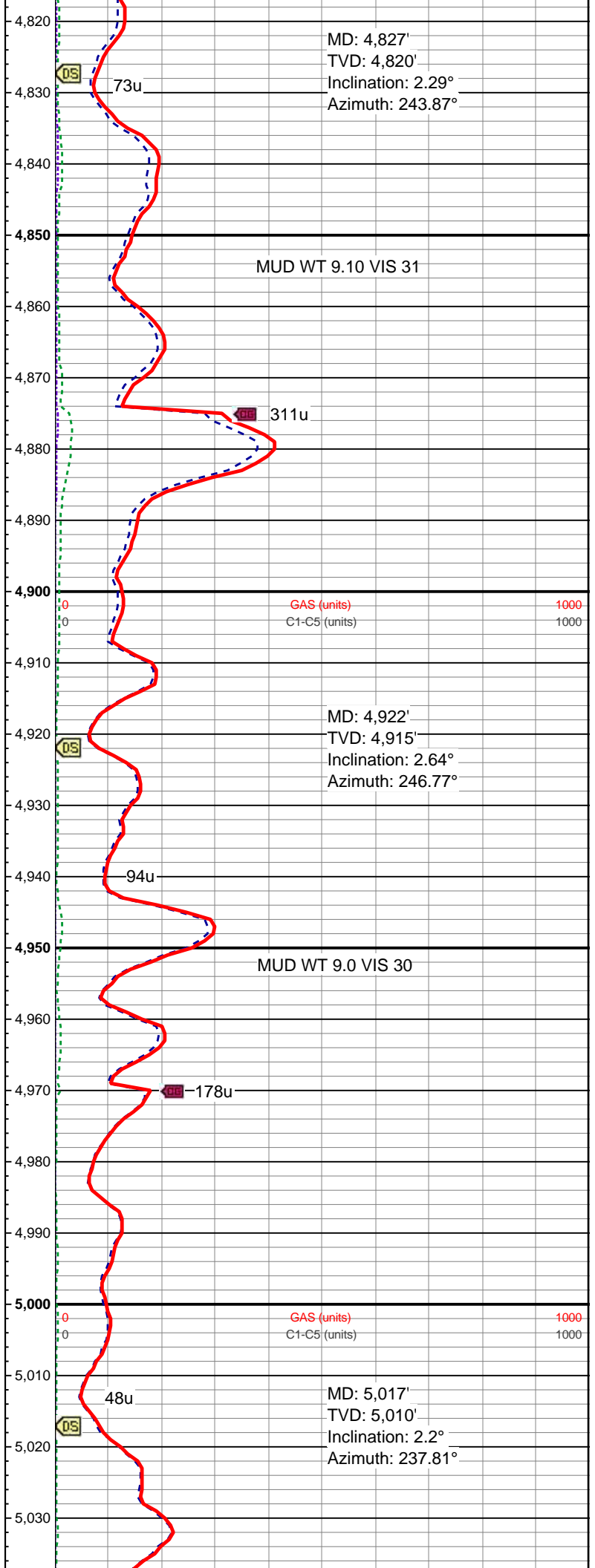
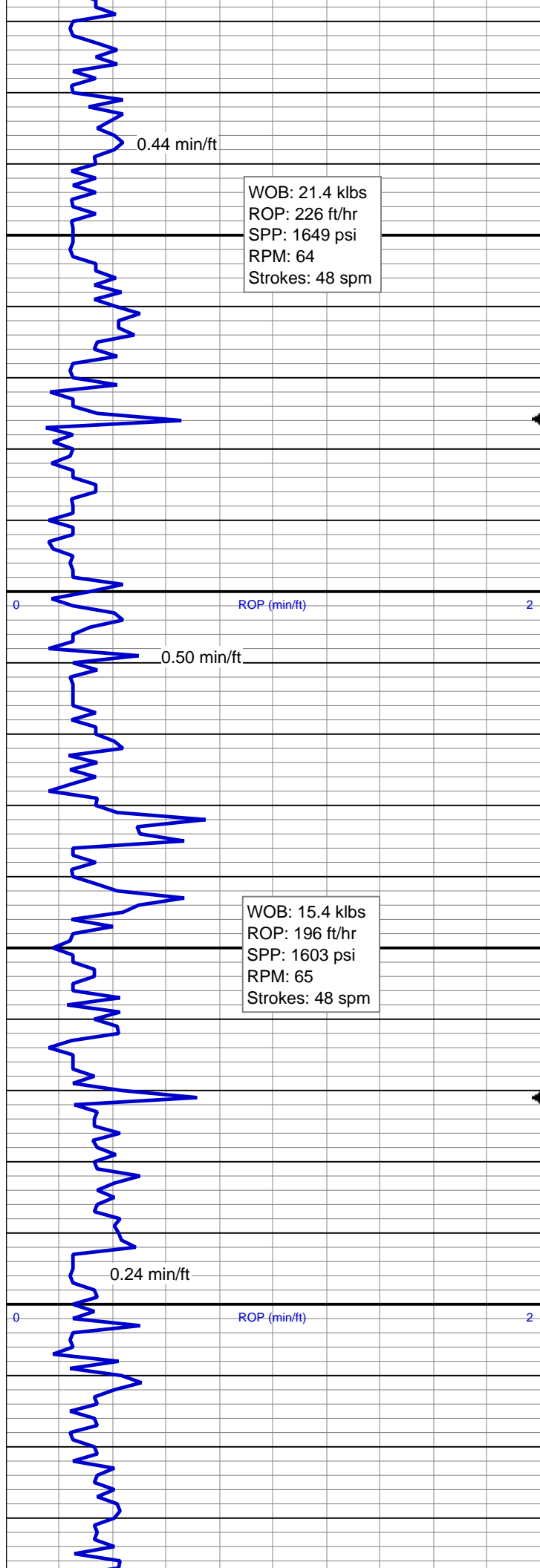












WOB: 19.4 klbs  
ROP: 173 ft/hr  
SPP: 1511 psi  
RPM: 65  
Strokes: 49 spm

0.82 min/ft

ROP (min/ft)

0.25 min/ft

WOB: 11.9 klbs  
ROP: 197 ft/hr  
SPP: 1583 psi  
RPM: 65  
Strokes: 49 spm

0.34 min/ft

ROP (min/ft)

WOB: 12.9 klbs  
ROP: 133 ft/hr  
SPP: 1470 psi  
RPM: 61  
Strokes: 50 spm

1.33 min/ft

GAS SCALE CHANGE

GAS (units)  
C1-C5 (units)

1600  
1600

737u

MUD WT 9.05 VIS 28

GAS (units)  
C1-C5 (units)

1600  
1600

MD: 5,112'  
TVD: 5,105'  
Inclination: 2.46°  
Azimuth: 245.54°

DS

121u

1521u

628u

GAS (units)  
C1-C5 (units)

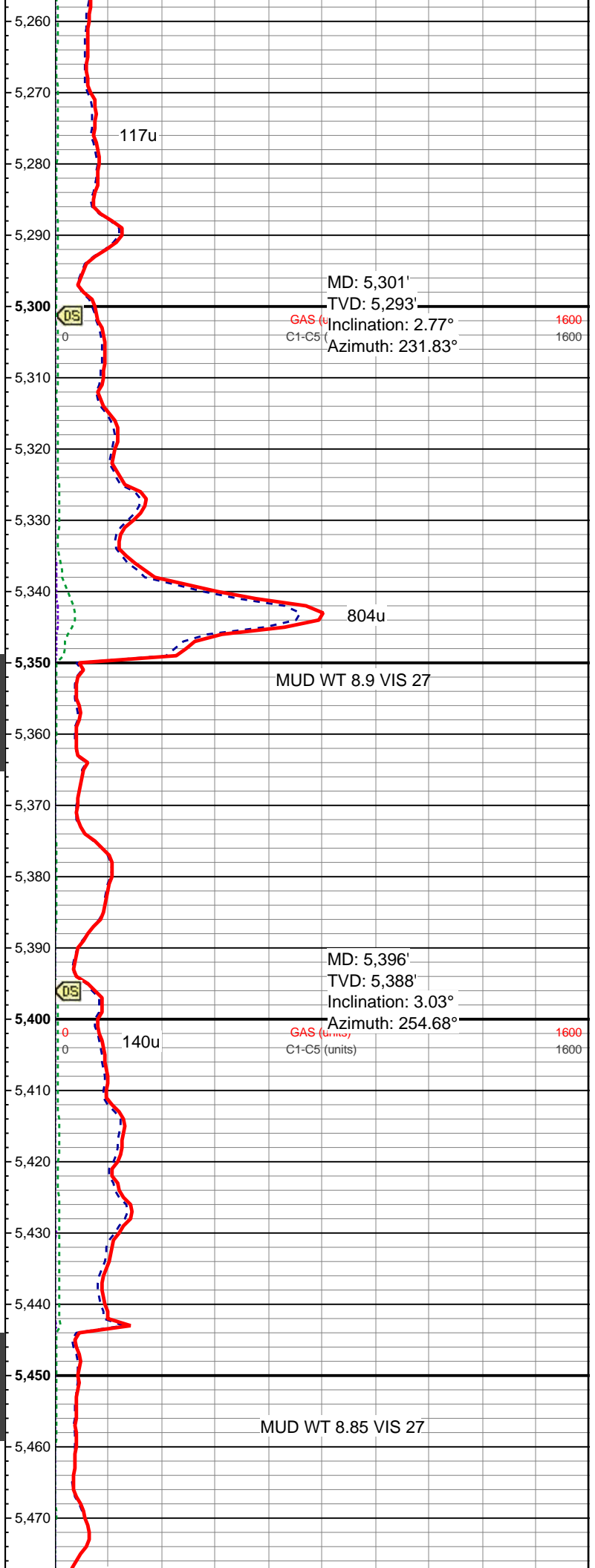
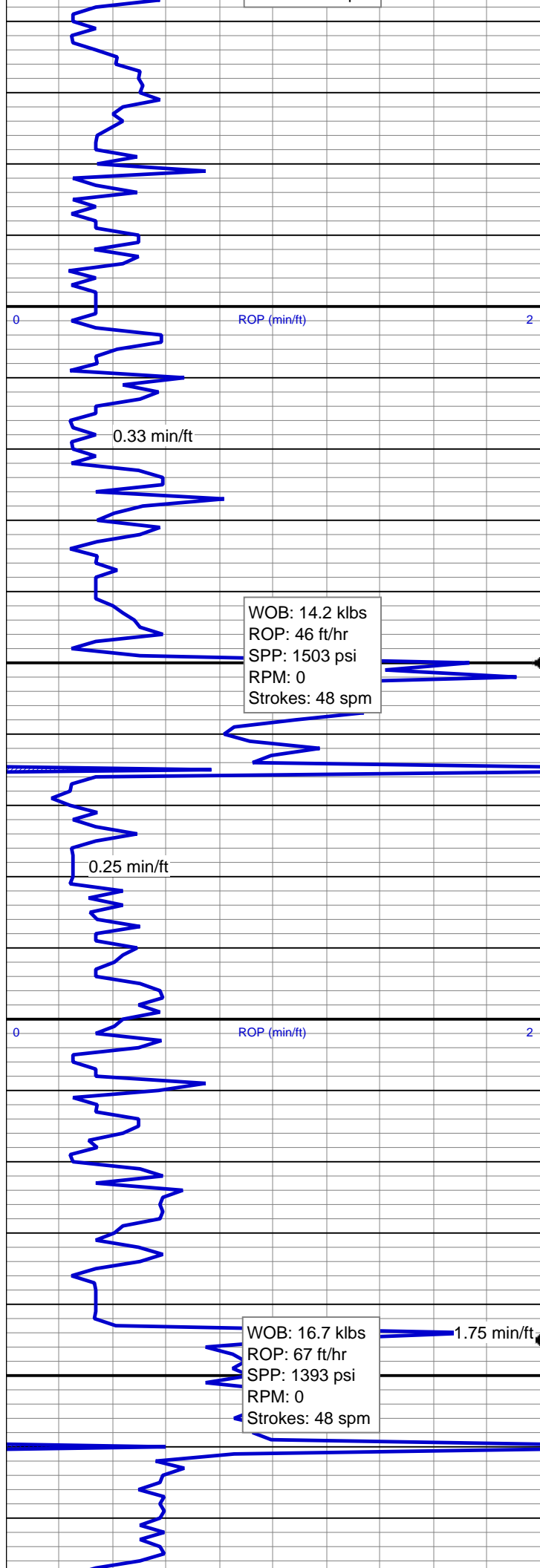
1600  
1600

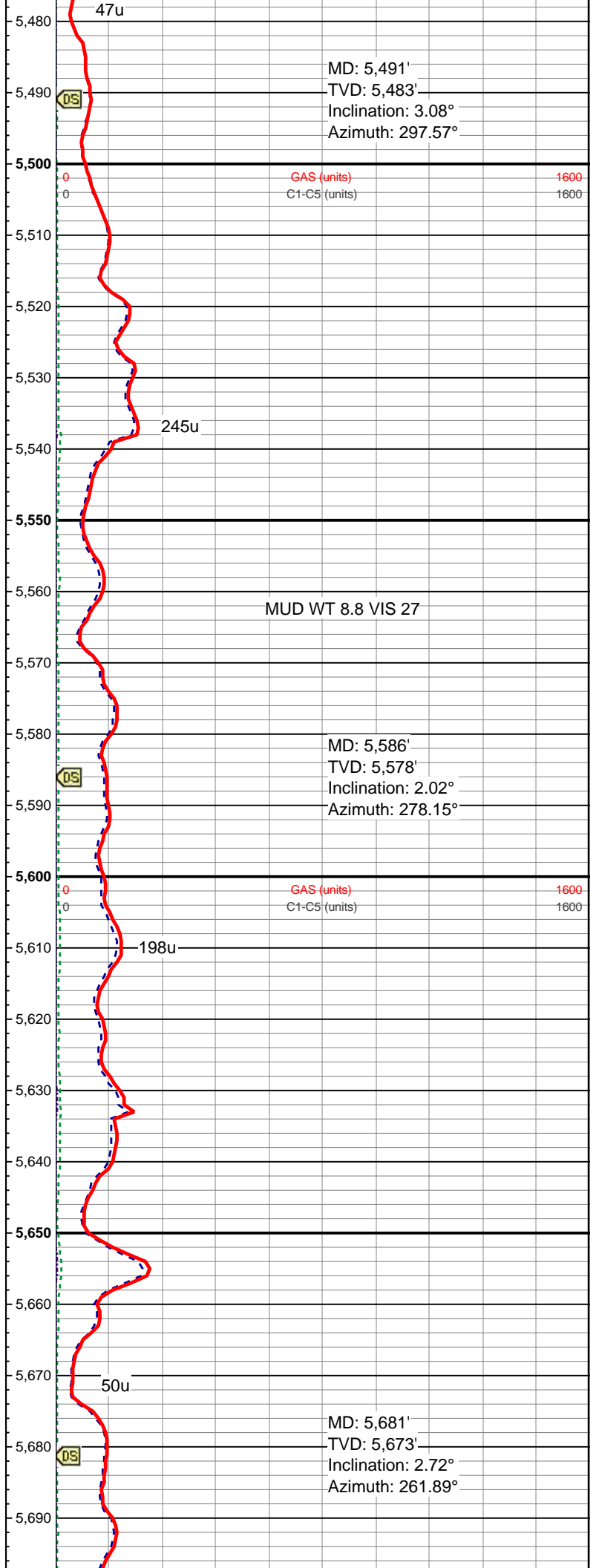
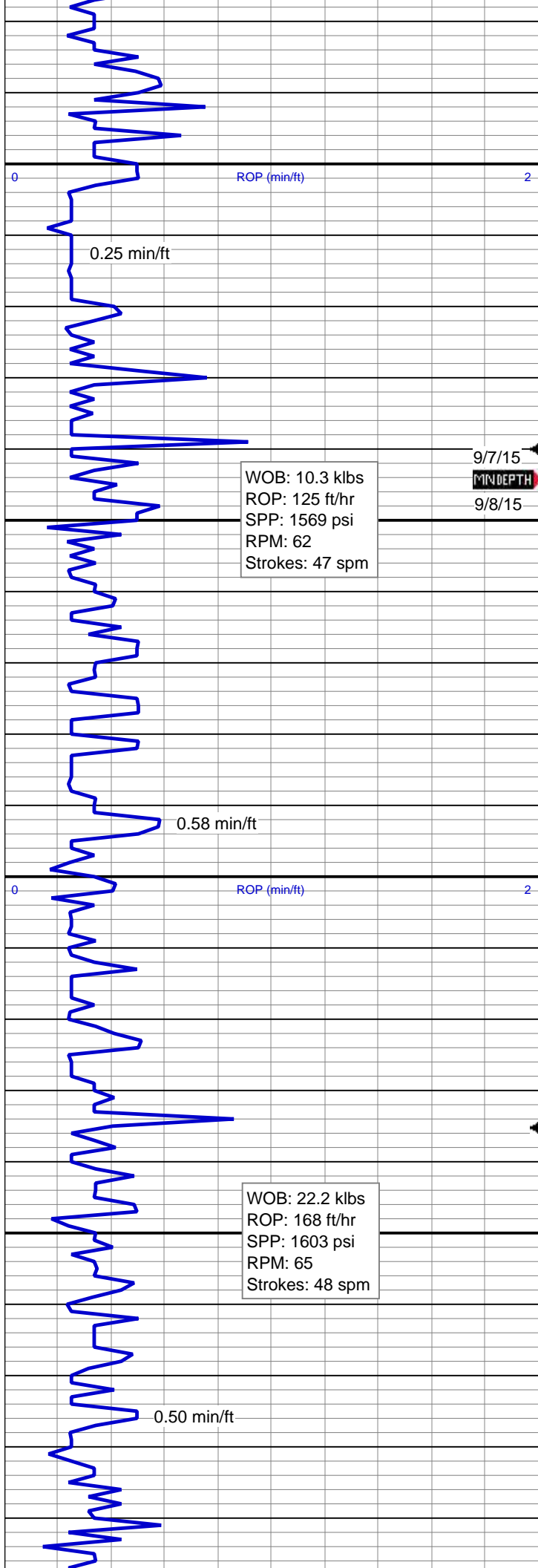
MD: 5,207'  
TVD: 5,200'  
Inclination: 2.72°  
Azimuth: 250.46°

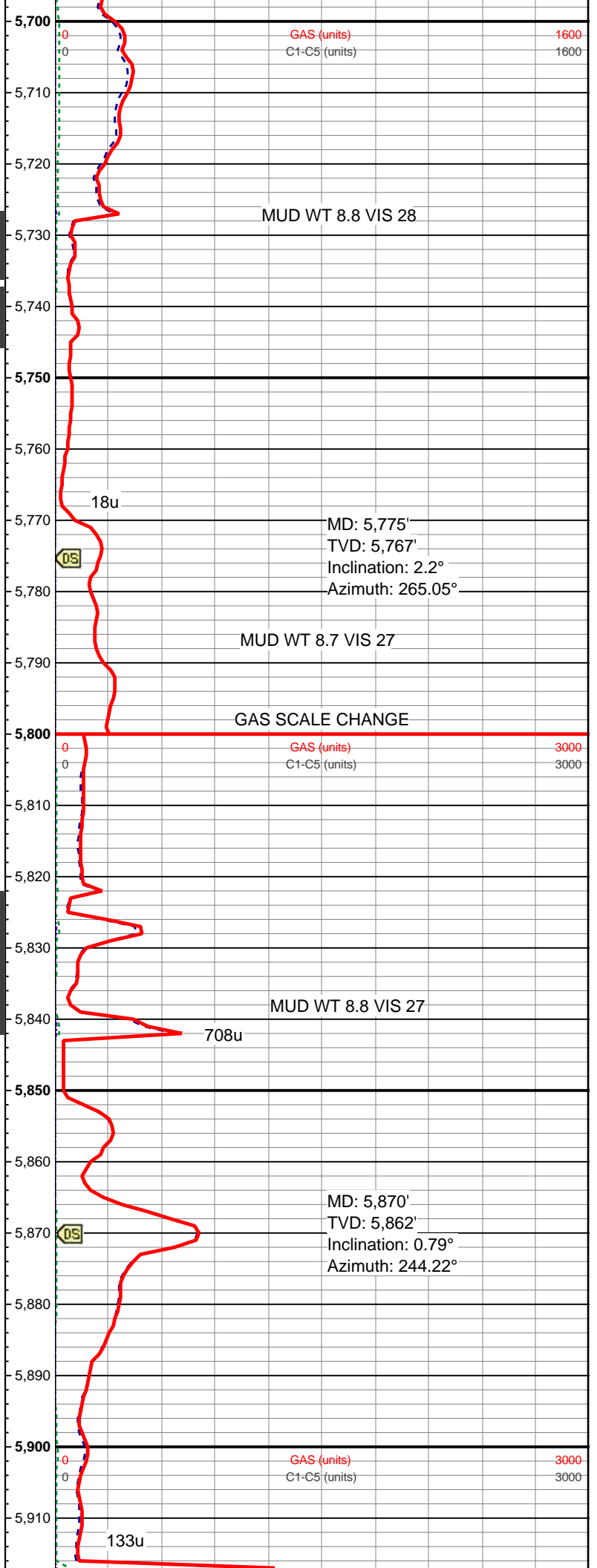
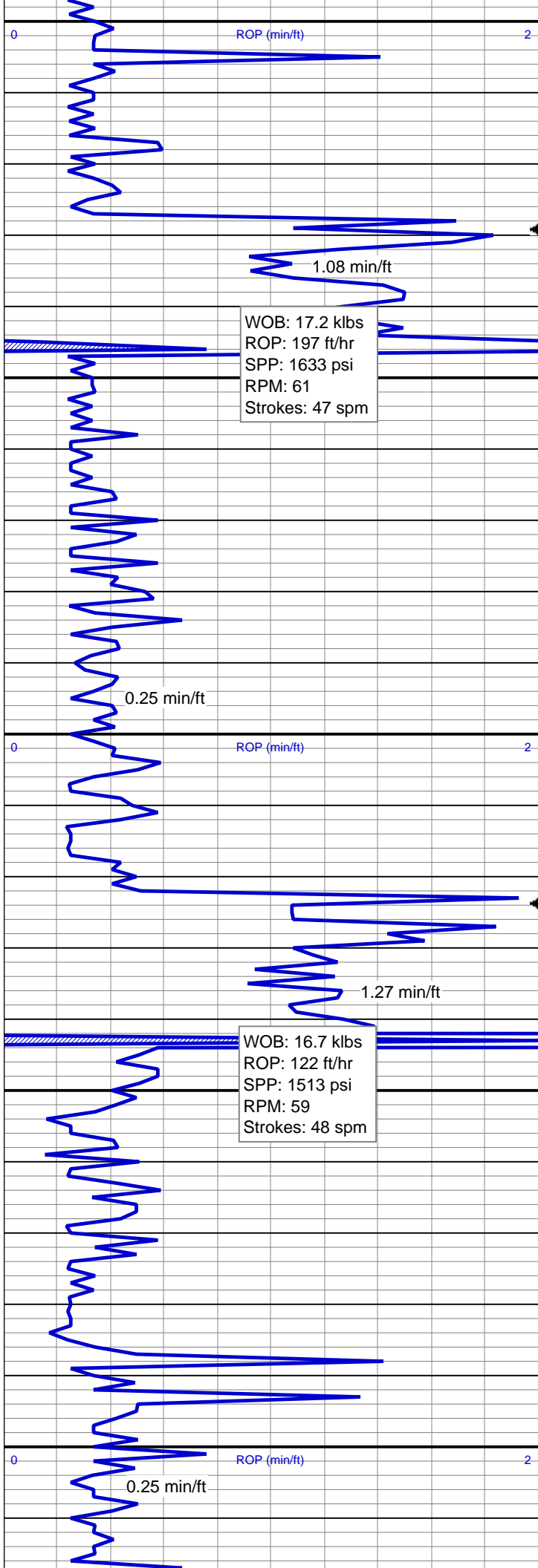
DS

142u

MUD WT 9.0 VIS 28







WOB: 10.8 klbs  
ROP: 206 ft/hr  
SPP: 1610 psi  
RPM: 62  
Strokes: 48 spm

0.65 min/ft

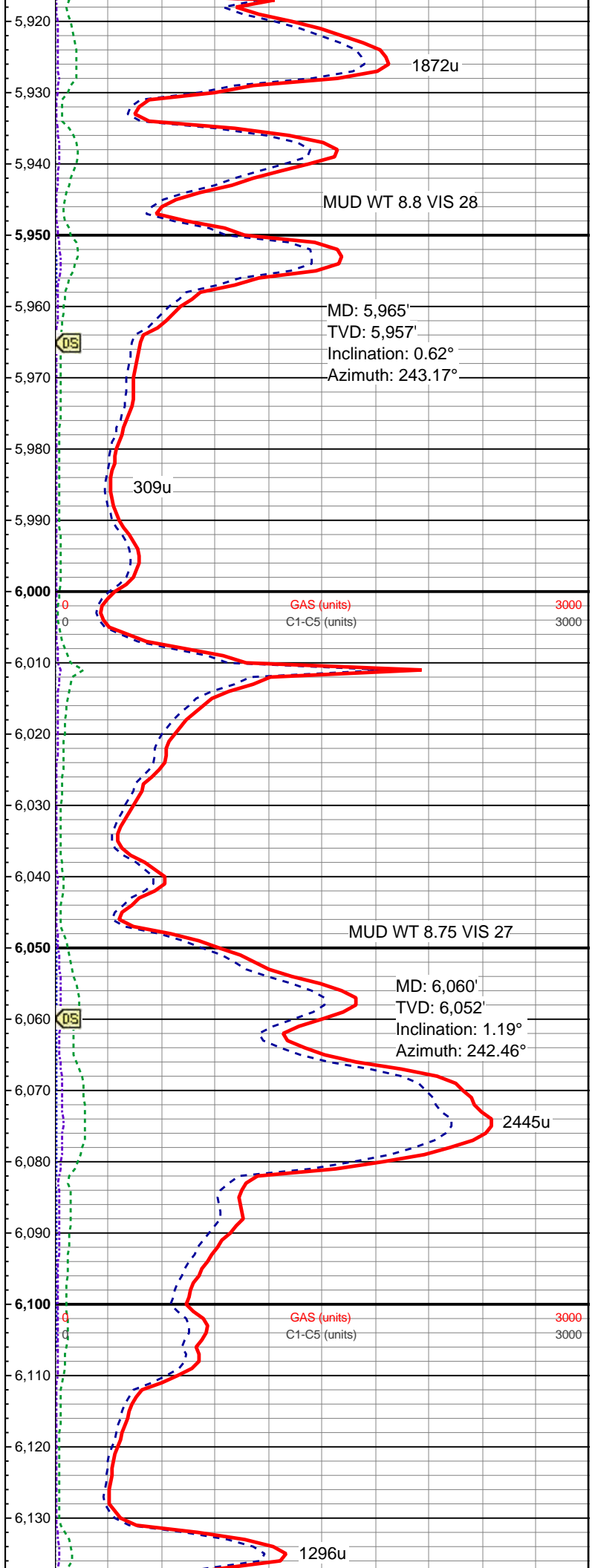
ROP (min/ft)

0.25 min/ft

WOB: 19.9 klbs  
ROP: 208 ft/hr  
SPP: 1700 psi  
RPM: 60  
Strokes: 49 spm

0.76 min/ft

ROP (min/ft)



WOB: 19.3 klbs  
ROP: 125 ft/hr  
SPP: 1614 psi  
RPM: 64  
Strokes: 49 spm

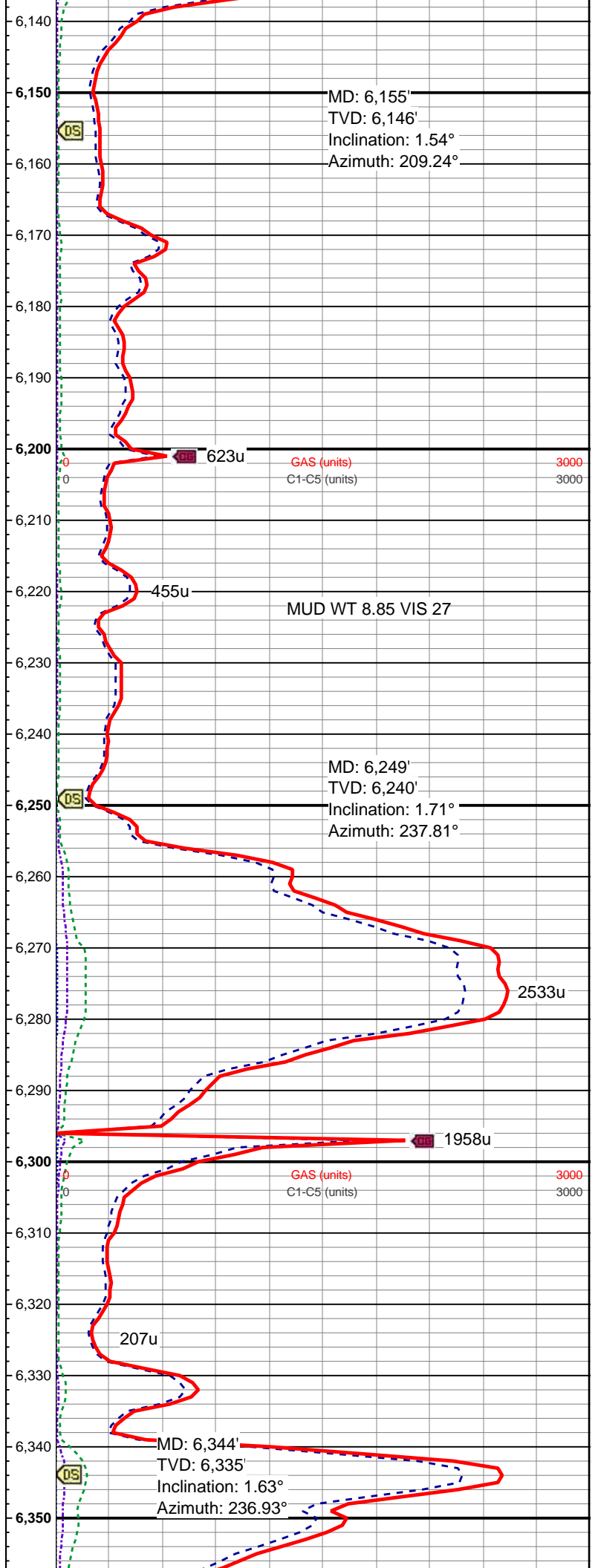
0.41 min/ft

WOB: 20.0 klbs  
ROP: 117 ft/hr  
SPP: 1571 psi  
RPM: 63  
Strokes: 50 spm

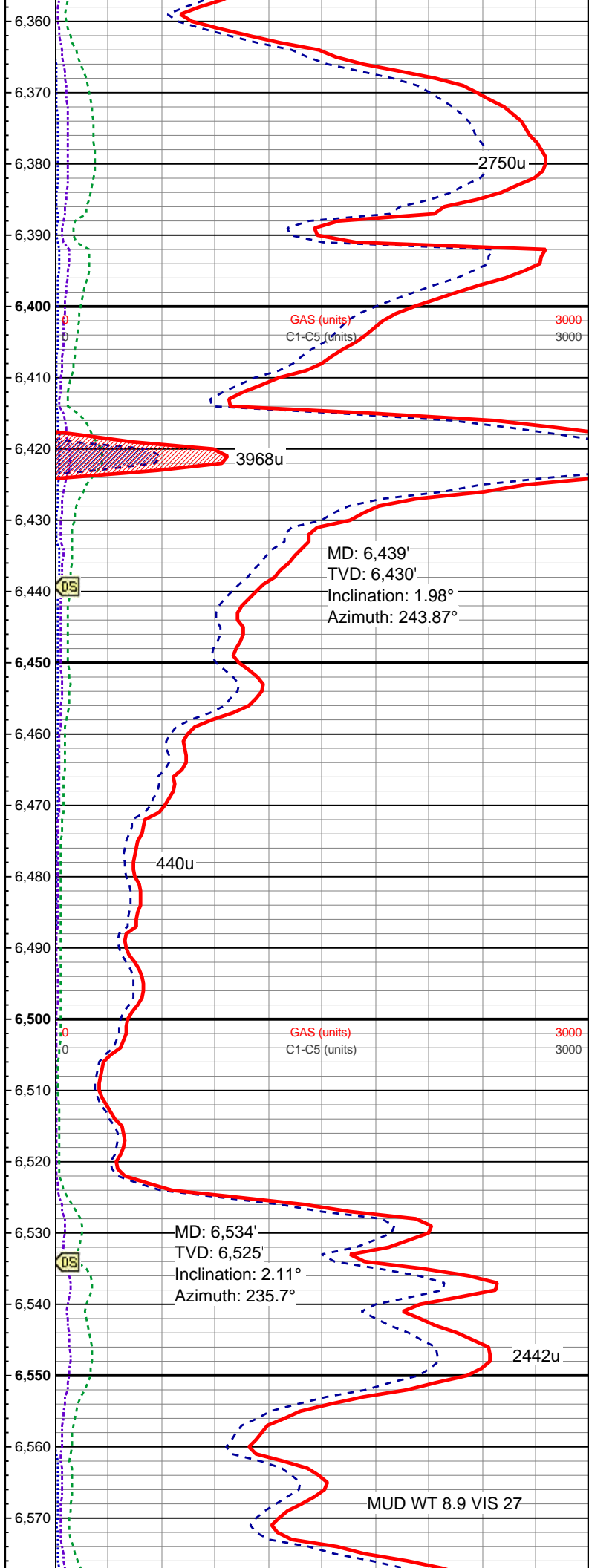
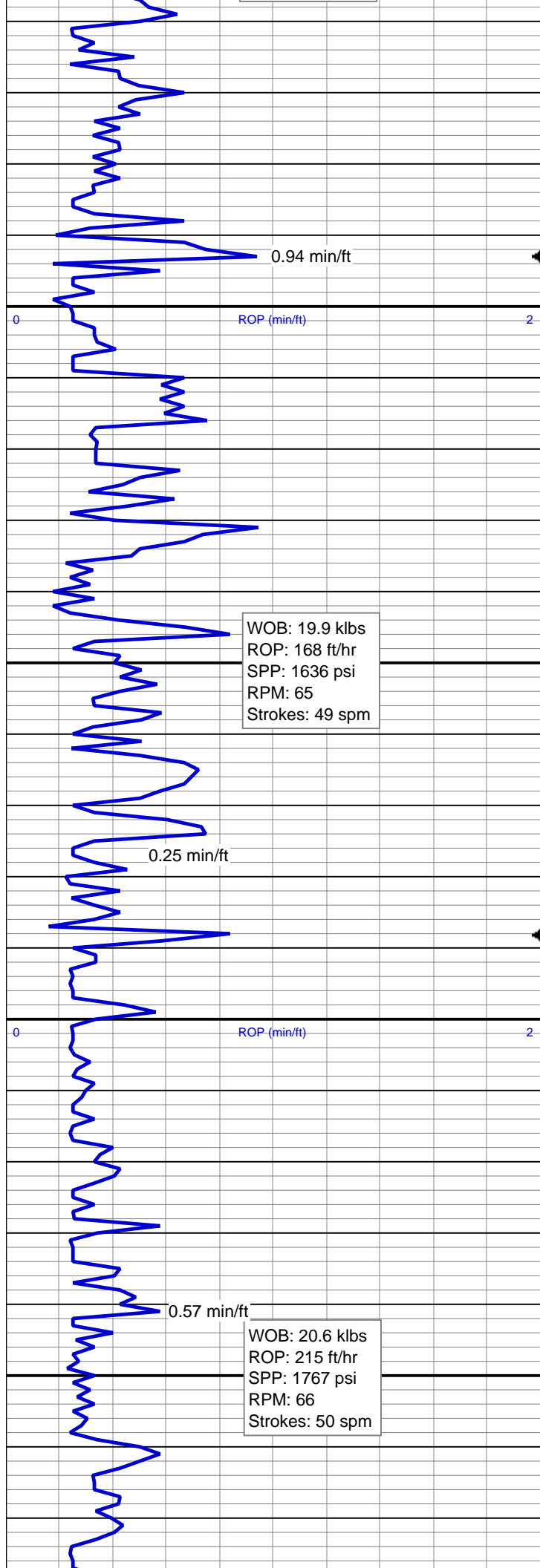
1.0 min/ft

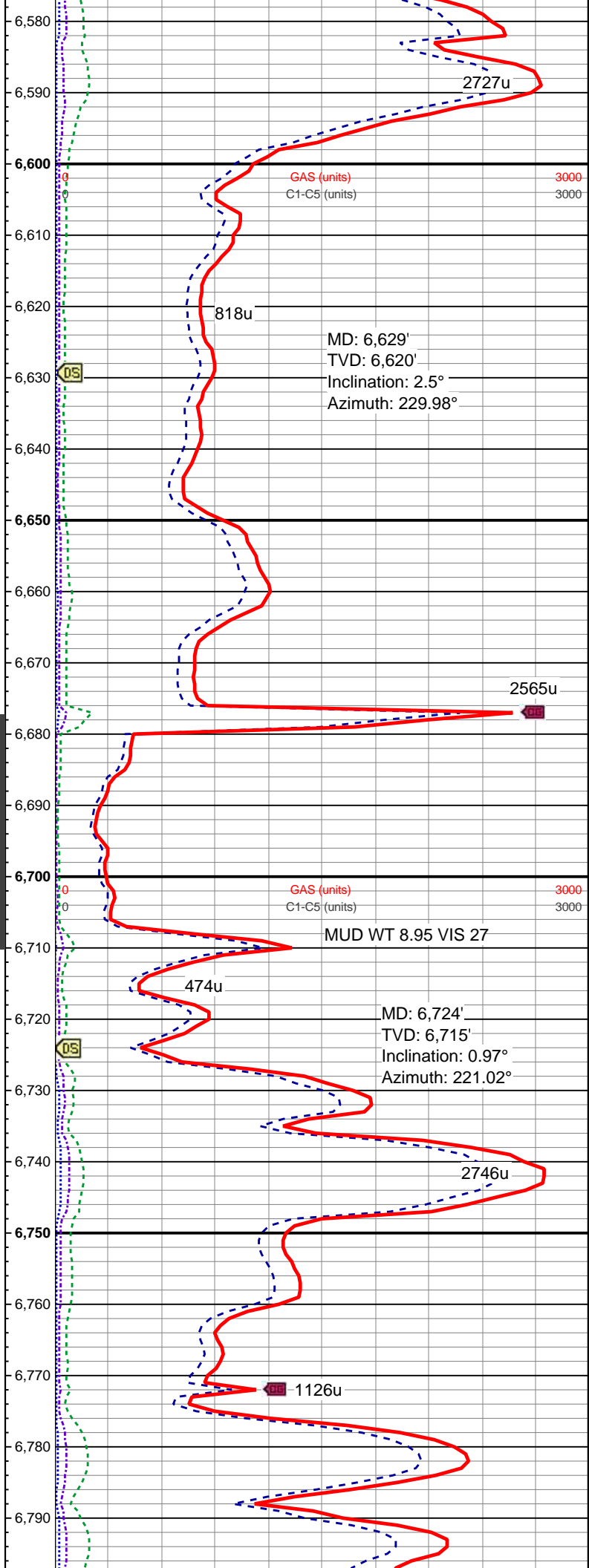
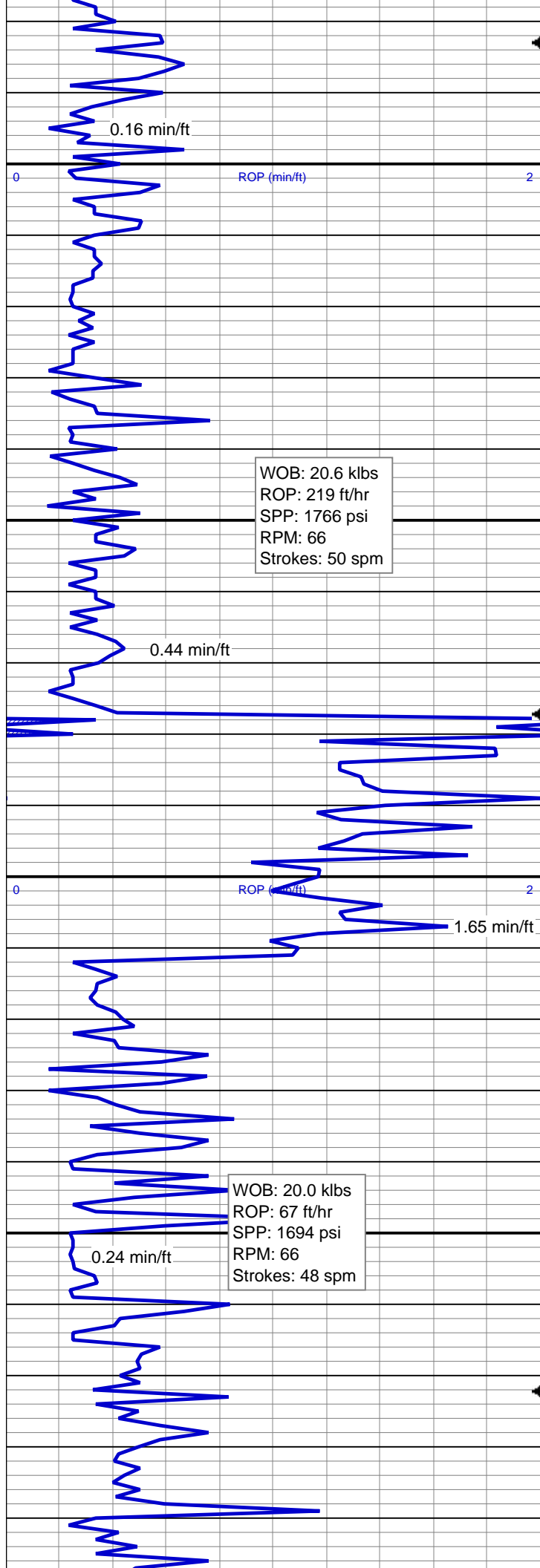
0.25 min/ft

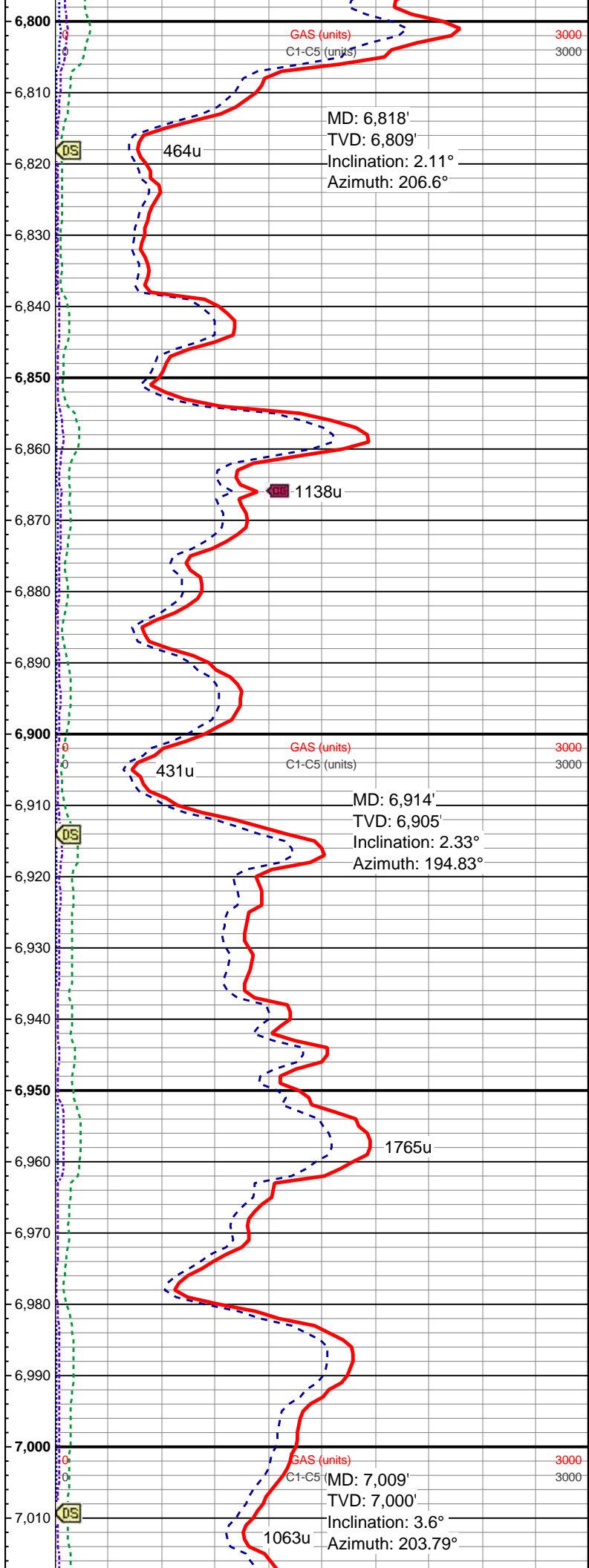
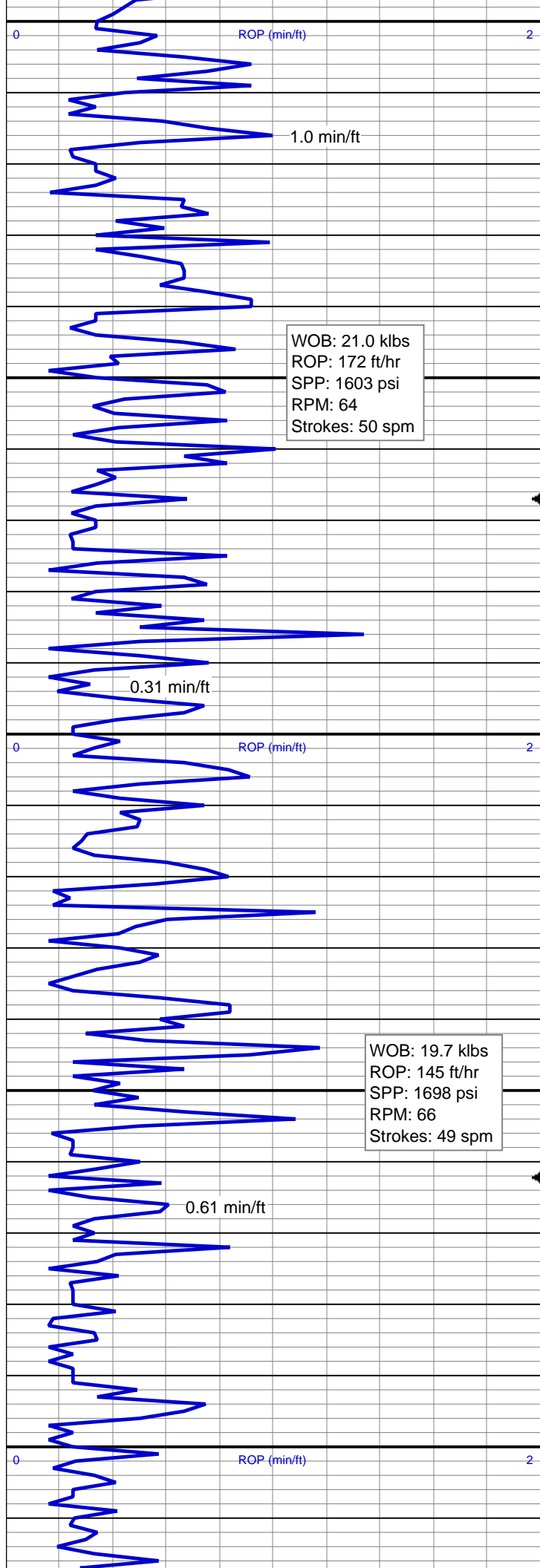
WOB: 20.6 klbs  
ROP: 107 ft/hr  
SPP: 1547 psi  
RPM: 64  
Strokes: 49 spm

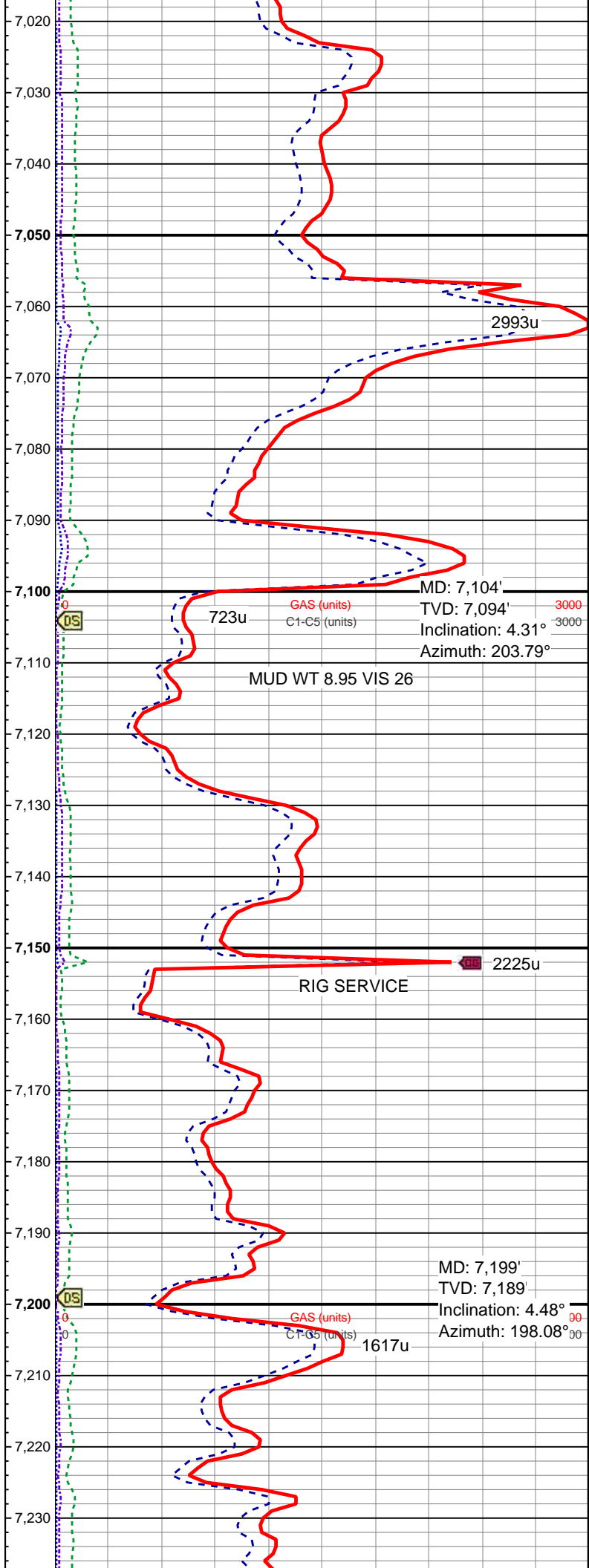
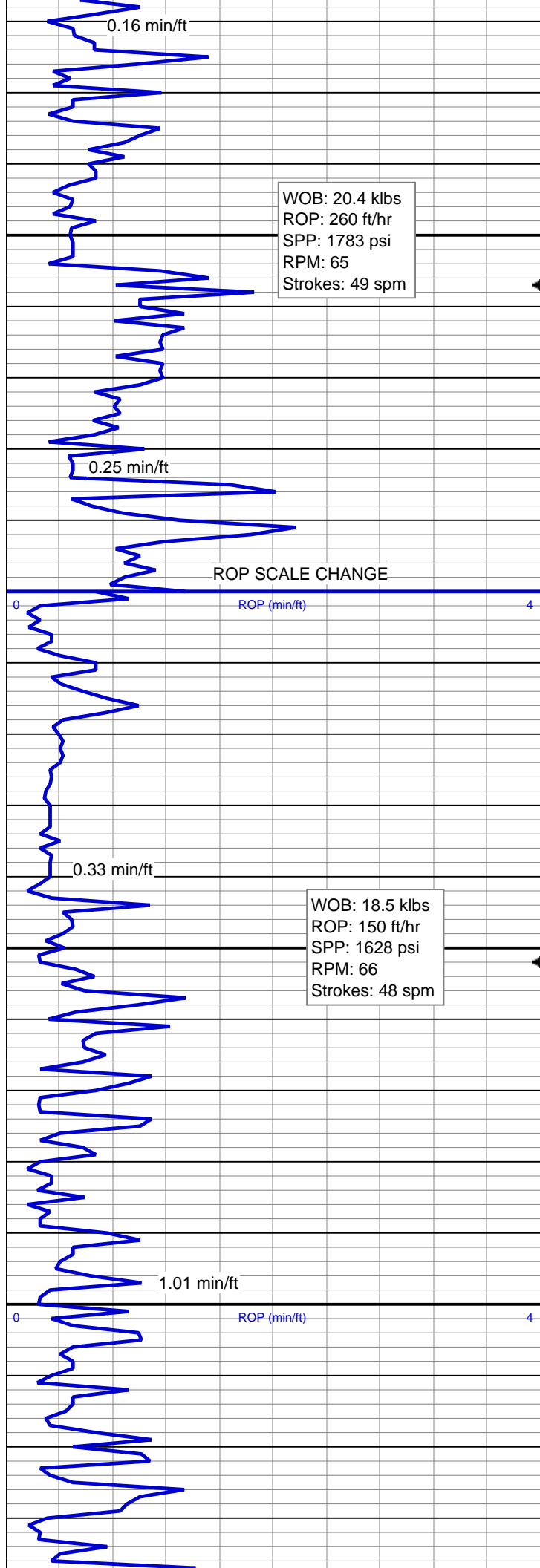












WOB: 26.1 klbs  
ROP: 72 ft/hr  
SPP: 1577 psi  
RPM: 0  
Strokes: 48 spm

2.66 min/ft

ROP (min/ft)

0.33 min/ft

WOB: 20.2 klbs  
ROP: 47 ft/hr  
SPP: 1583 psi  
RPM: 0  
Strokes: 50 spm

2.76 min/ft

ROP (min/ft)

0.34 min/ft

WOB: 12.9 klbs  
ROP: 7.7 ft/hr  
SPP: 1441 psi  
RPM: 0  
Strokes: 49 spm

3.08 min/ft

