



**PIONEER**

Pioneer Energy Services

## BOREHOLE COMPENSATED SONIC LOG

Company MURFIN DRILLING, INC.

Well RED POLL #10-21

Field WILDCAT

County LINCOLN State COLORADO

Location: API #: 05-073-06720

2200' FSL & 1500' FEL

SEC 21 TWP 10S RGE 56W

Permanent Datum GROUND LEVEL Elevation 5492'  
Log Measured From KELLY BUSHING  
Drilling Measured From KELLY BUSHING

Other Services  
CNL/CDL  
DIL/MEL  
BHCS  
Elevation  
K.B. 5505'  
D.F. N/A  
G.L. 5492'

Date 9/1/2017

Run Number TWO

Type Log BHCS

Depth Driller 8500'

Depth Logger 8499'

Bottom Logged Interval 8487'

Top Logged Interval 450'

Type Fluid In Hole CHEMICAL

Salinity, PPM CL 500

Density 9.3

Level FULL

Max. Rec. Temp. F N/A

Operating Rig Time 7 HOURS

Equipment -- Location 91 HAYS

Recorded By D. SCHMIDT

Witnessed By WES HANSEN

### Borehole Record

### Casing Record

Run No.	Bit	From	To	Size	Wgt.	From	To
ONE	12.25"	0'	476'	8.625"	23#	0'	476'
8.625"	7.875"	476'	TD				

<<< Fold Here >>>

All interpretations are opinions based on inferences from electrical or other measurements and Pioneer Wireline Services, LLC cannot and does not guarantee the accuracy or correctness of any interpretation, and Pioneer Wireline Services, LLC will not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees.

### Comments

N/A DENOTES NOT AVAILABLE OR NON-APPLICABLE.

LIMON, COLORADO,  
SOUTH ON HWY 71 TO 2Z RD, 1 EAST, 1/2 SOUTH,  
EAST INTO

NO REPEAT DUE TO HOLE CONDITIONS

Log Measured From: KELLY BUSHING 13 Ft. Above Permanent Datum

THANK YOU FOR USING PIONEER ENERGY SERVICES  
www.pioneerenergy.com 785-625-3858

### Your Pioneer Energy Services Crew


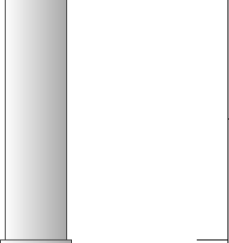
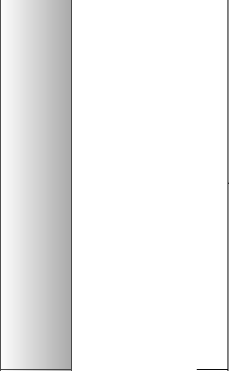
Engineer: D. SCHMIDT  
Operator:  
Operator:  
Operator:

### This Log Record Was Witnessed By

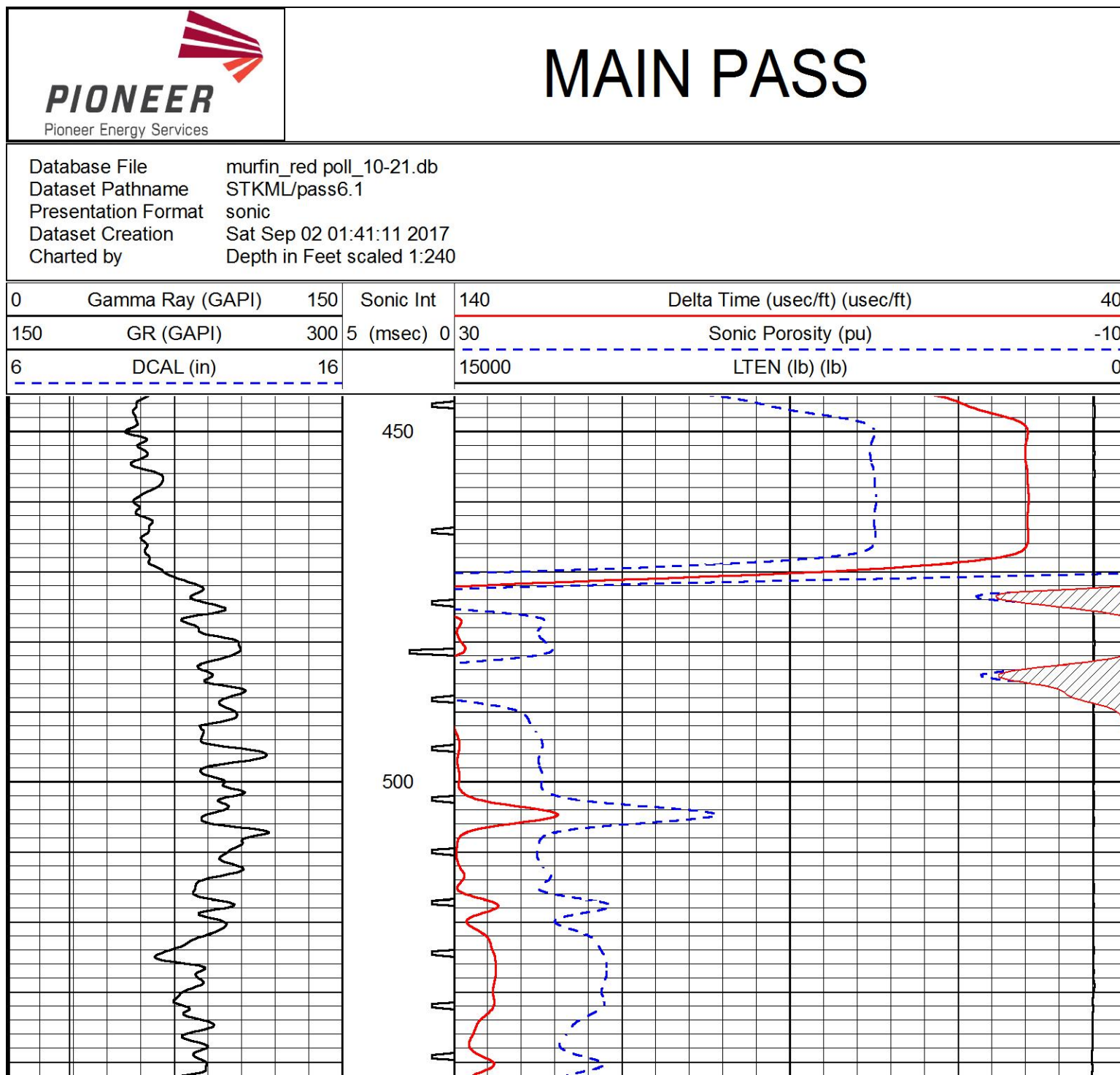
Primary Witness: WES HANSEN  
Secondary Witness:  
Secondary Witness:  
Secondary Witness:

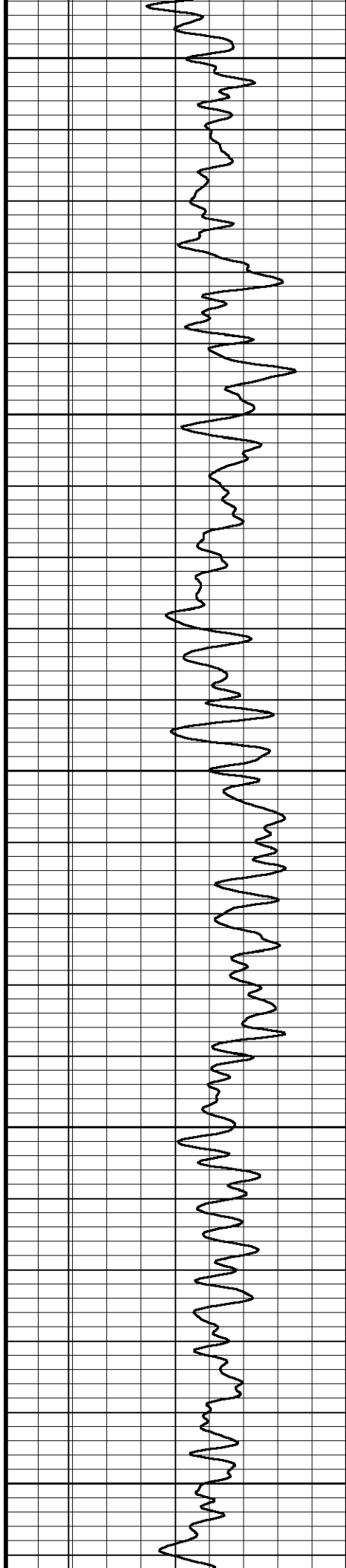
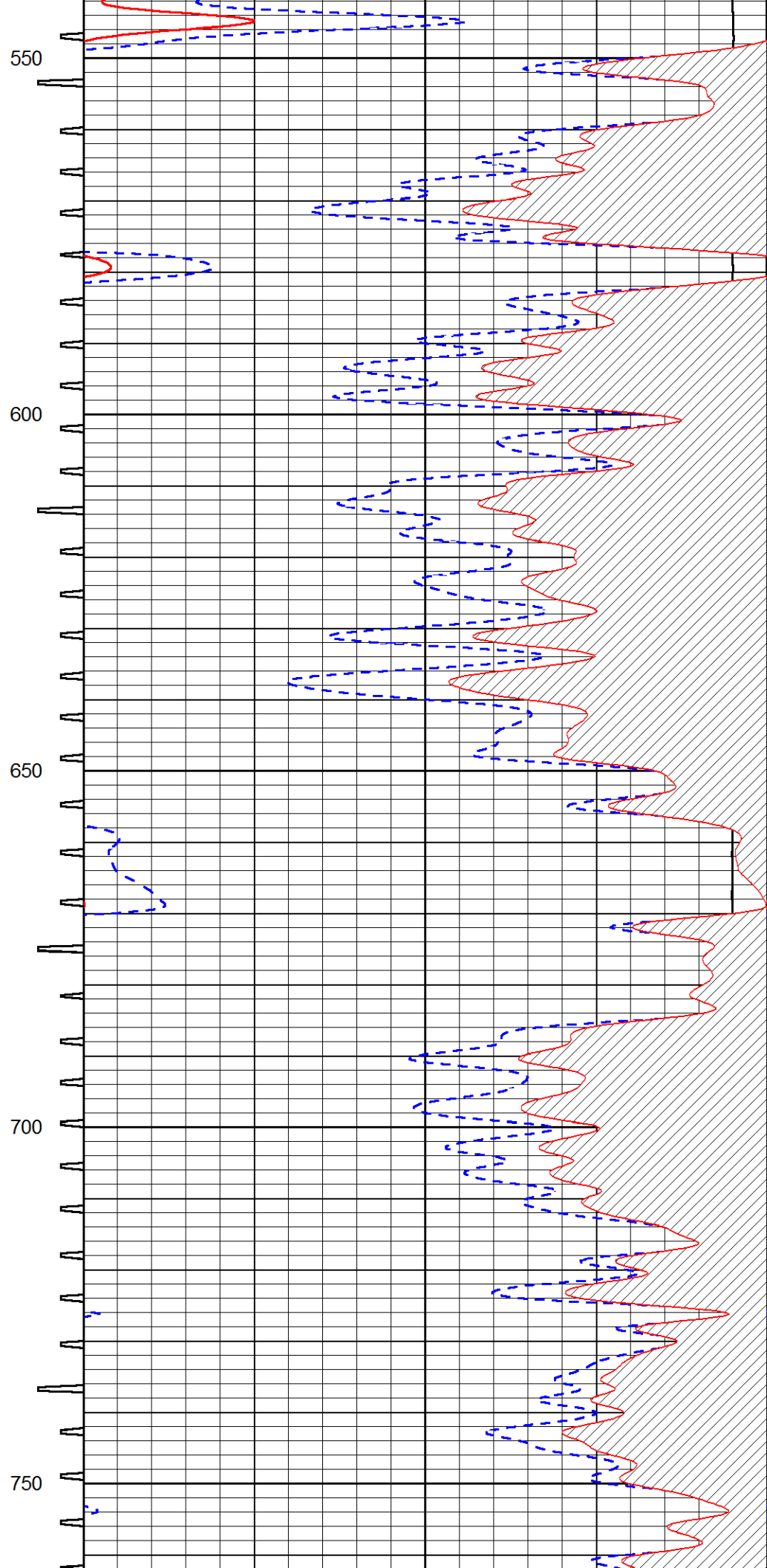
Top - Bottom

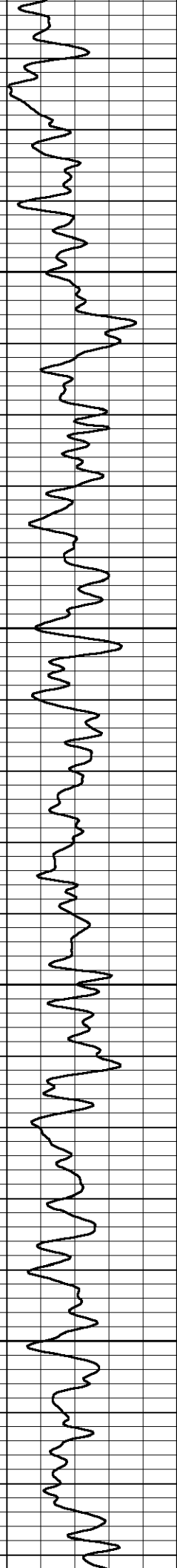
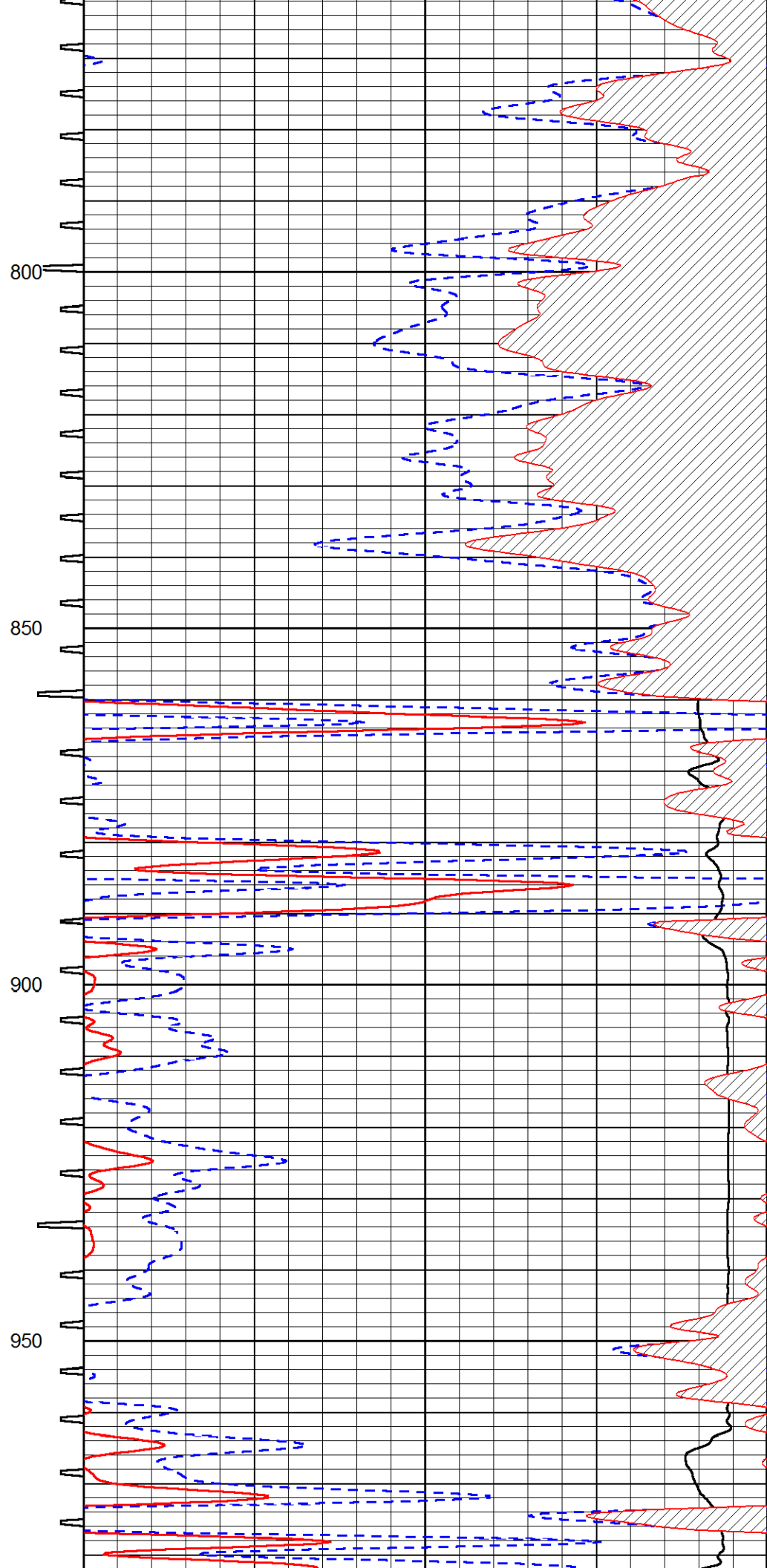
A	BOREID	BOTTEMP	CASEOD	CASETHCK	FLUIDDEN	M	MATRXDEN
1	in 7.875	degF 100	in 5.5	in 0	g/cc 1	2	g/cc 2.71
NPORSEL	PERFS	SNDERR	SNDERRM	SPSHIFT	SRFTEMP	SZCOR	TDEPTH
Limestone	0	mmho/m 0	mmho/m 0	mV 0	degF 80	Off	ft 8499

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
GR	40.58		GR-M&W (89)	3.00	3.50	50.00
CNLSC CNSSC	37.48 36.73		CNT-M&W (207-MW)	5.50	3.50	100.00
LSD DCAL SSD	28.43 28.42 27.93		CDL-M&W (90-1031)	8.50	4.00	250.00
MCAL MI MN	19.83 19.83 19.83		ML-PSIML (PSI-01) GO Micro log tools converted to Simplec electronics	7.58	4.00	65.00
RLL3F RLL3	15.80 15.80					

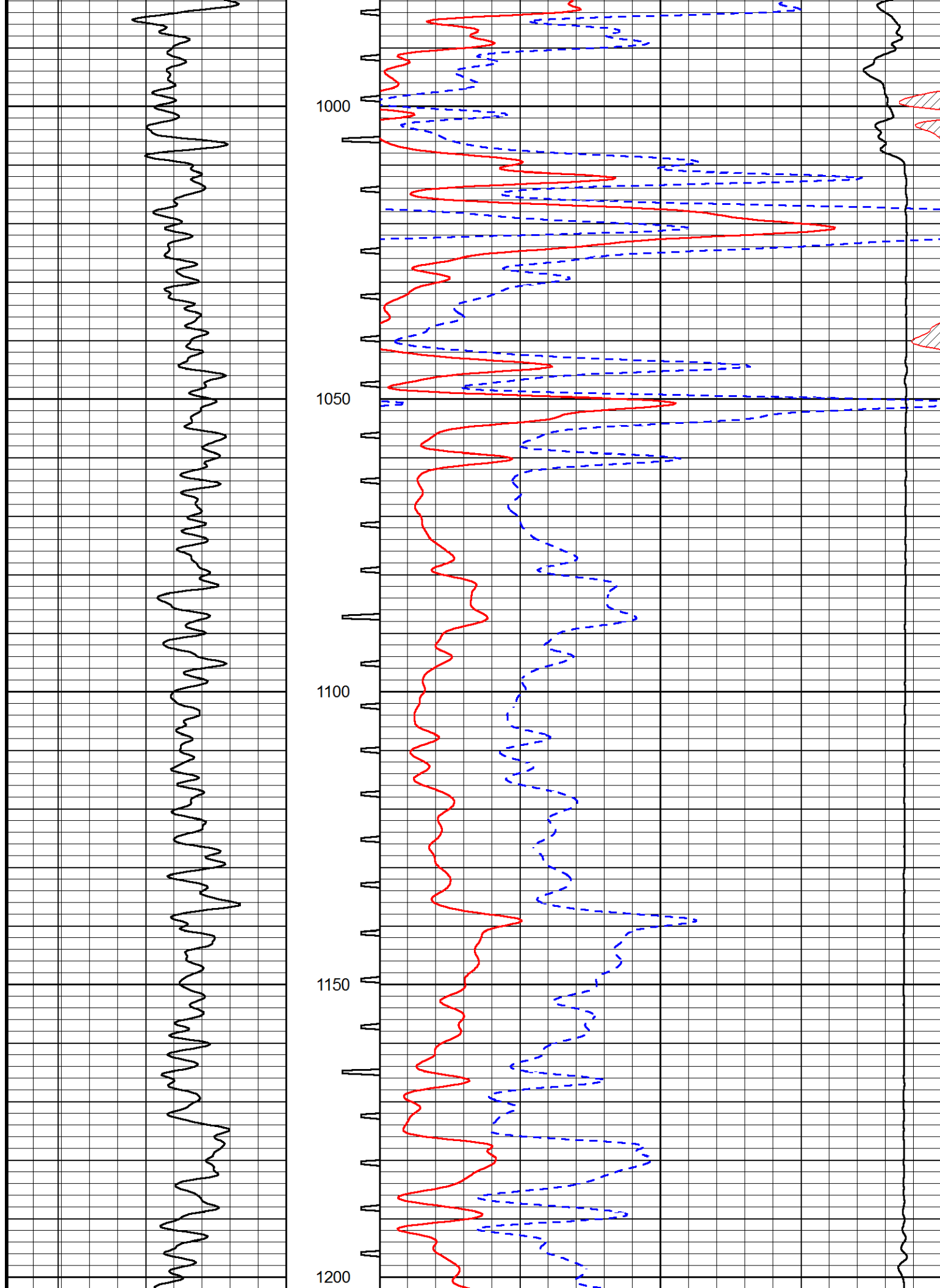
			DIL-M&W (PSI 91)	18.50	3.50	220.00
CILD	8.00					
CILM	4.70					
SP	0.20					
Dataset: murfin_red poll_10-21.db: field/well/STKML/pass6.1 Total length: 43.08 ft Total weight: 685.00 lb O.D.: 4.00 in						

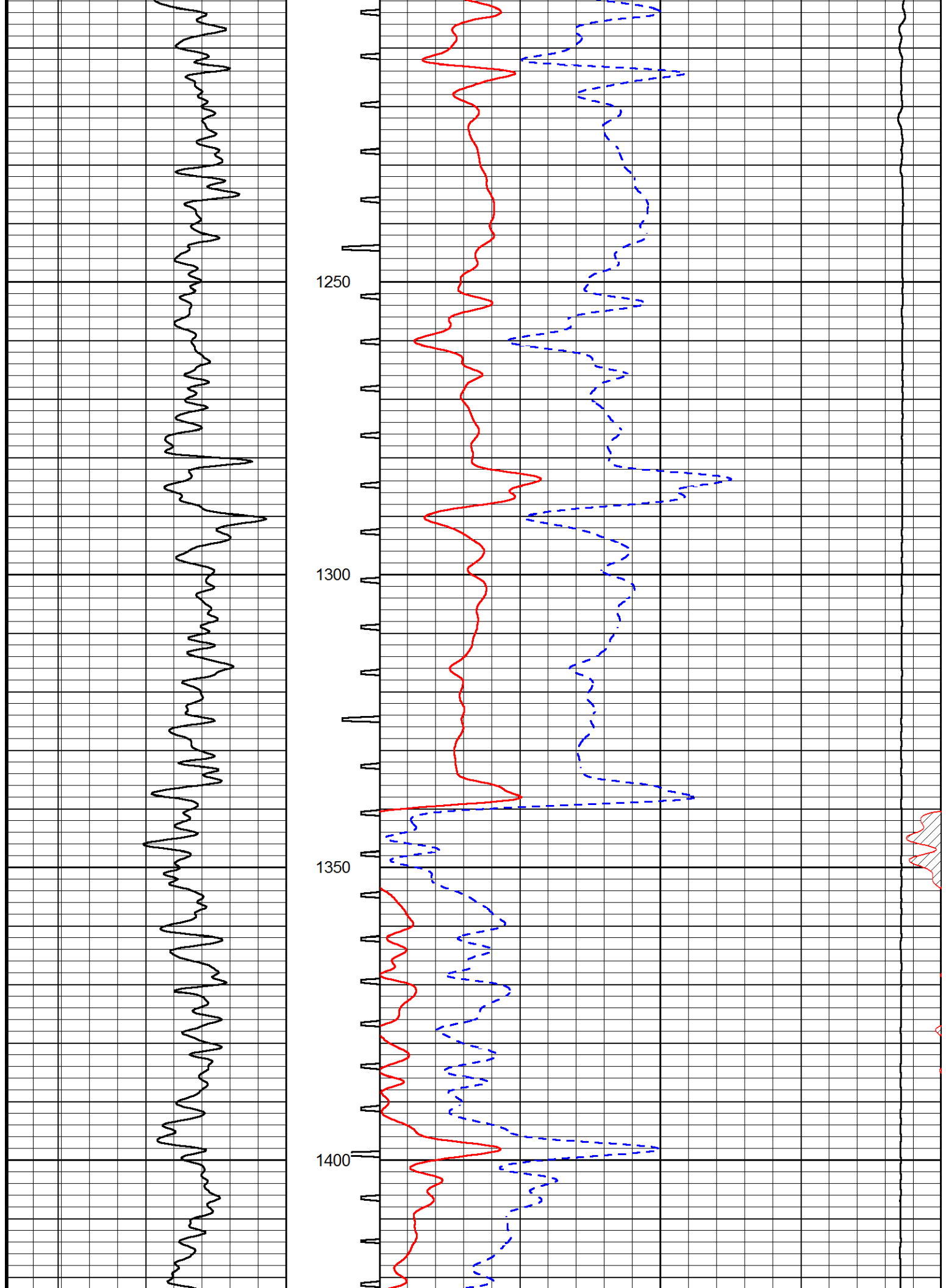


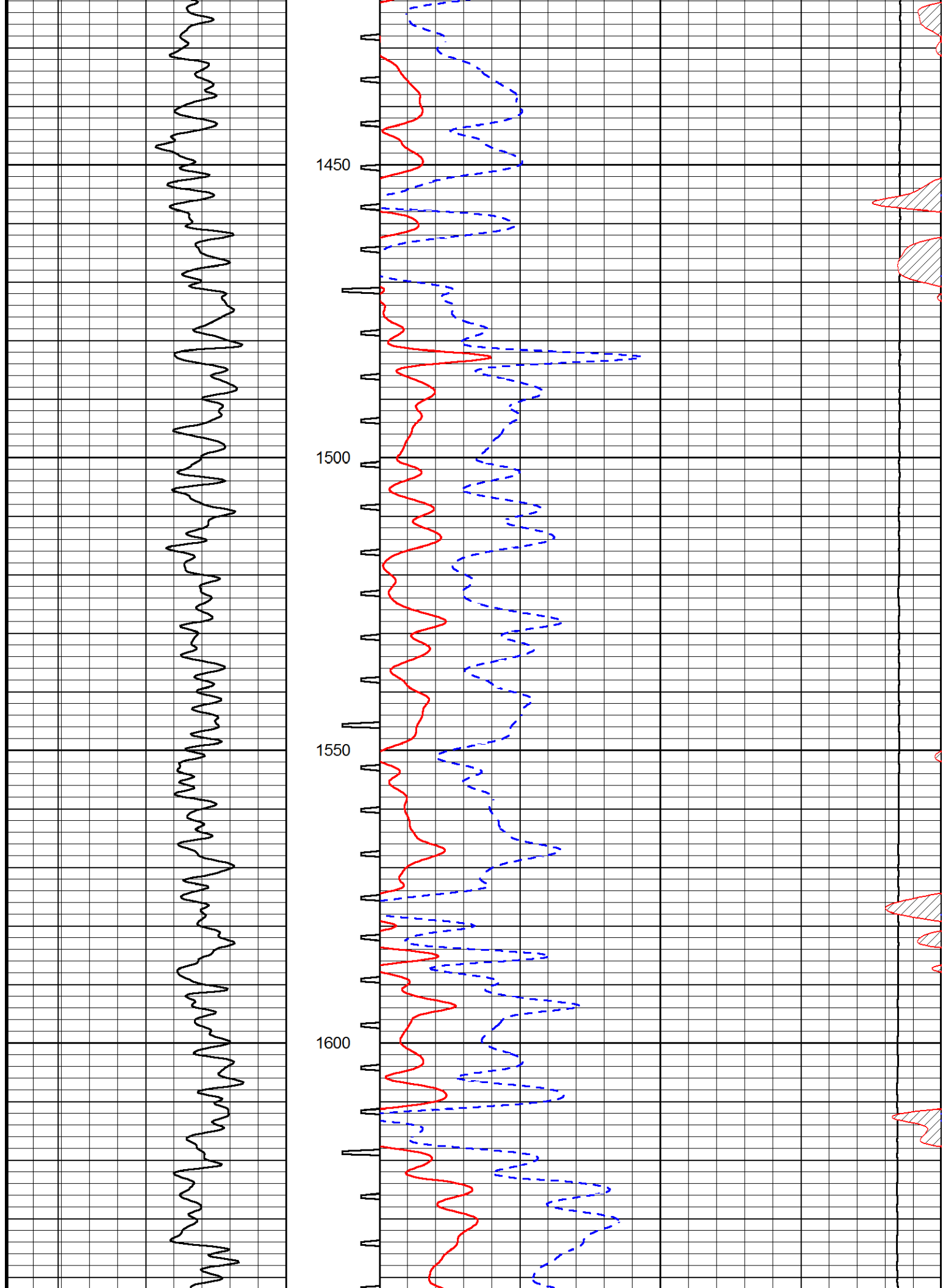




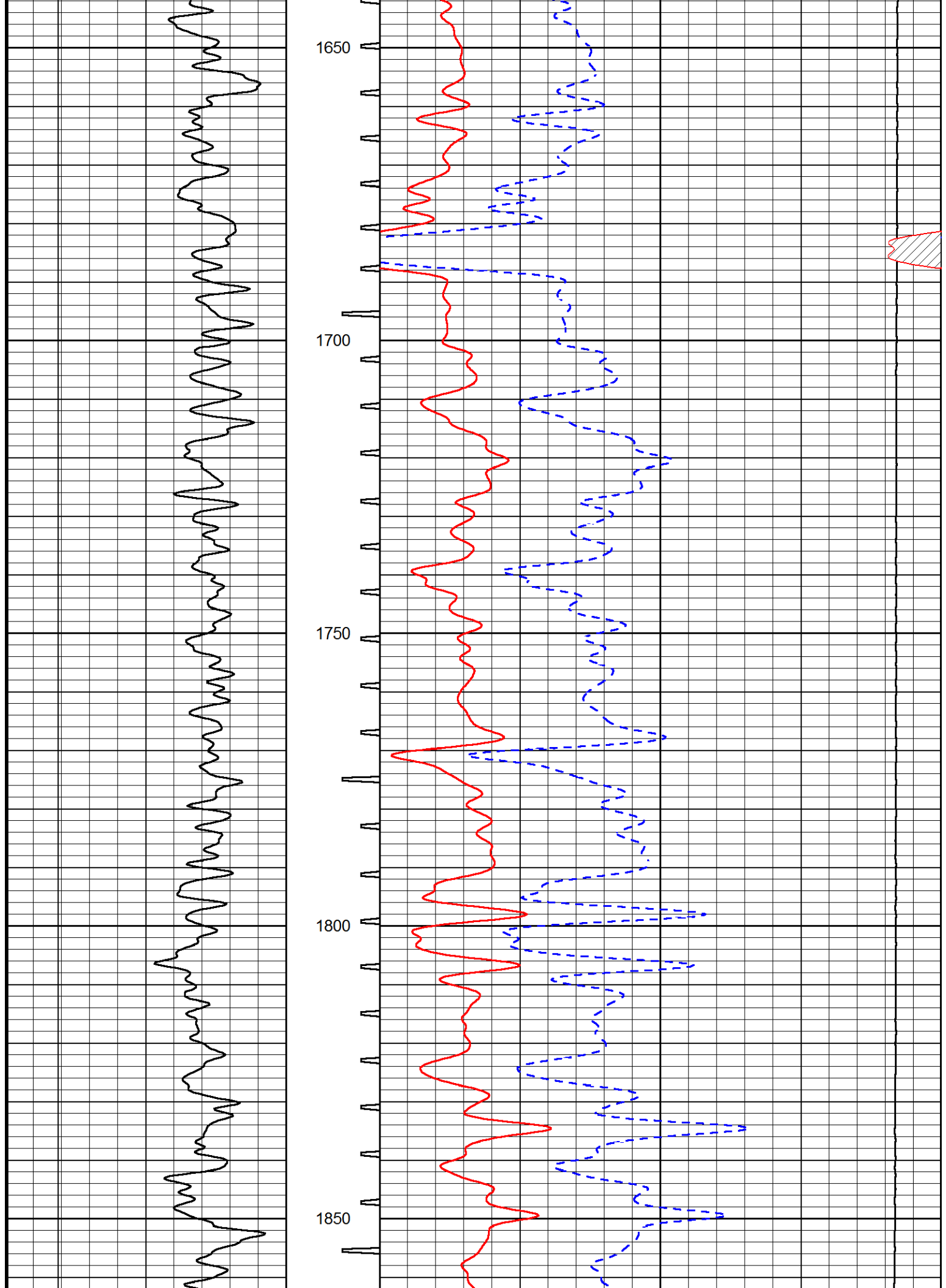


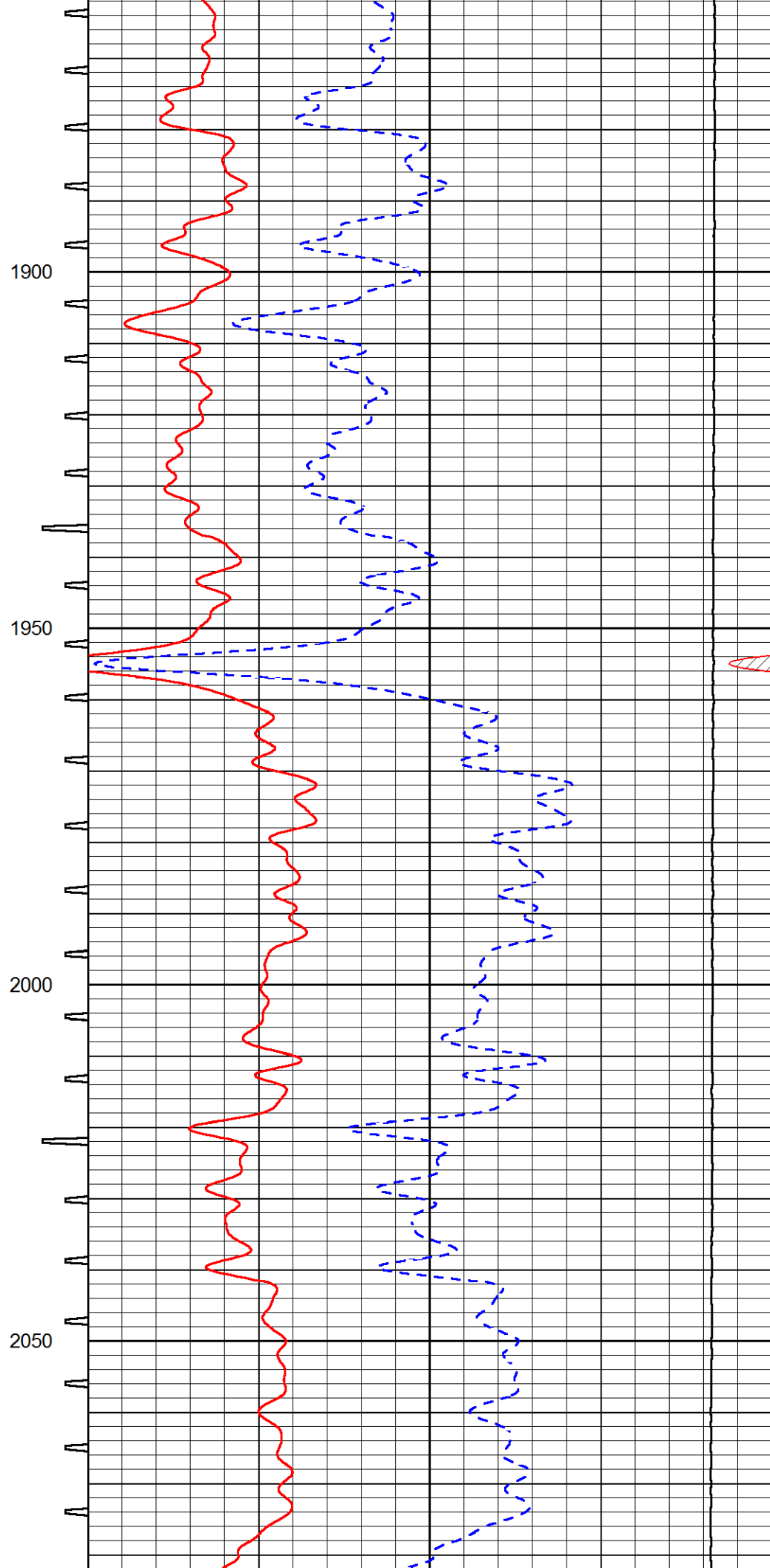
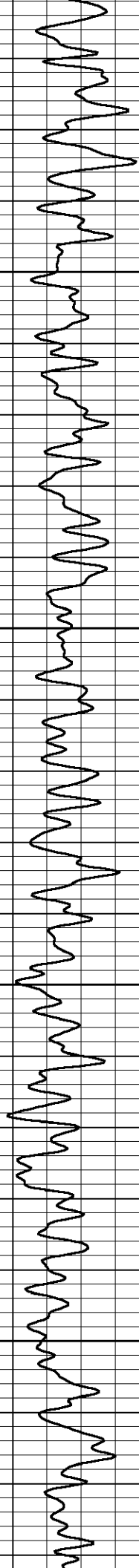


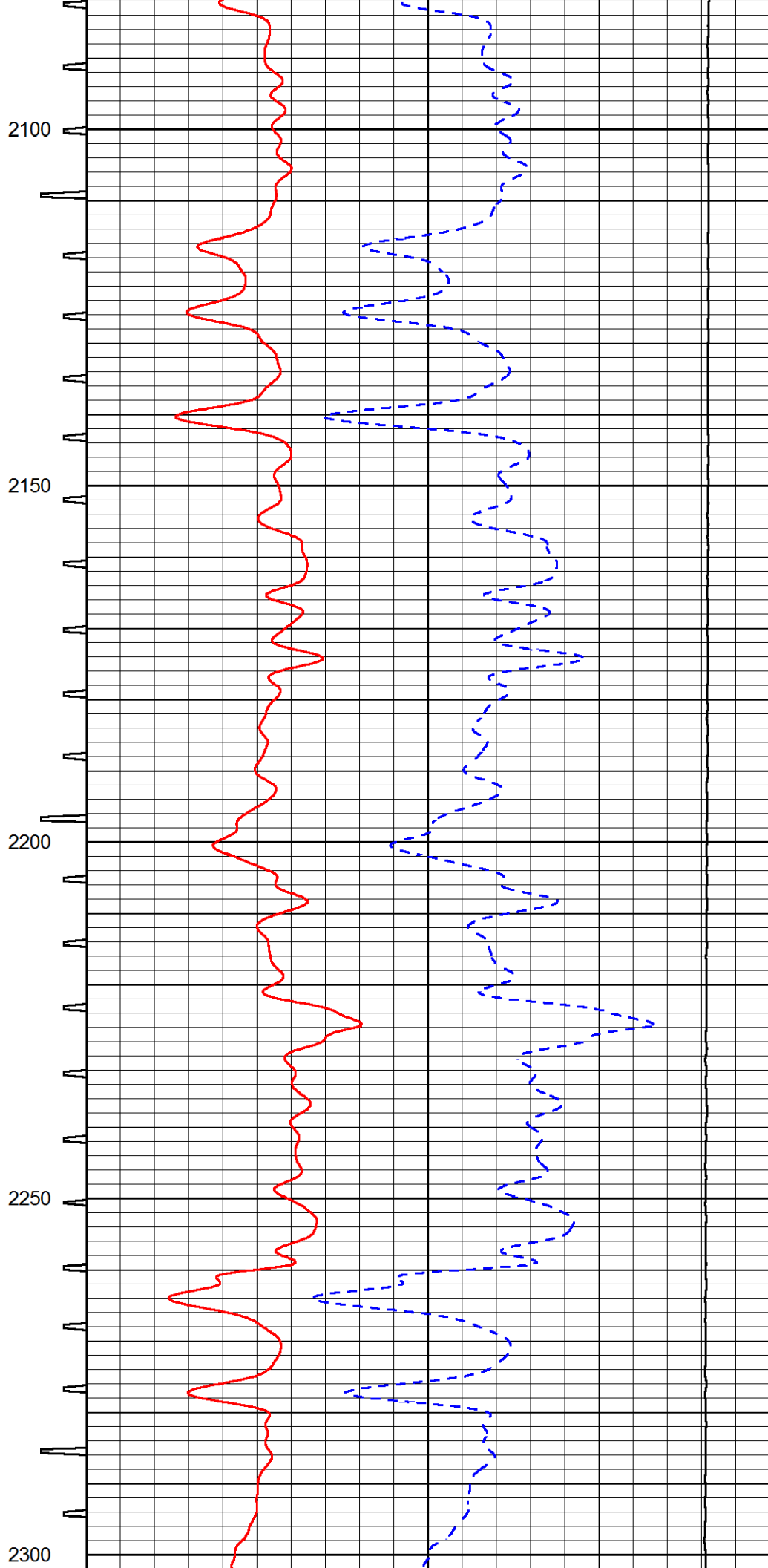
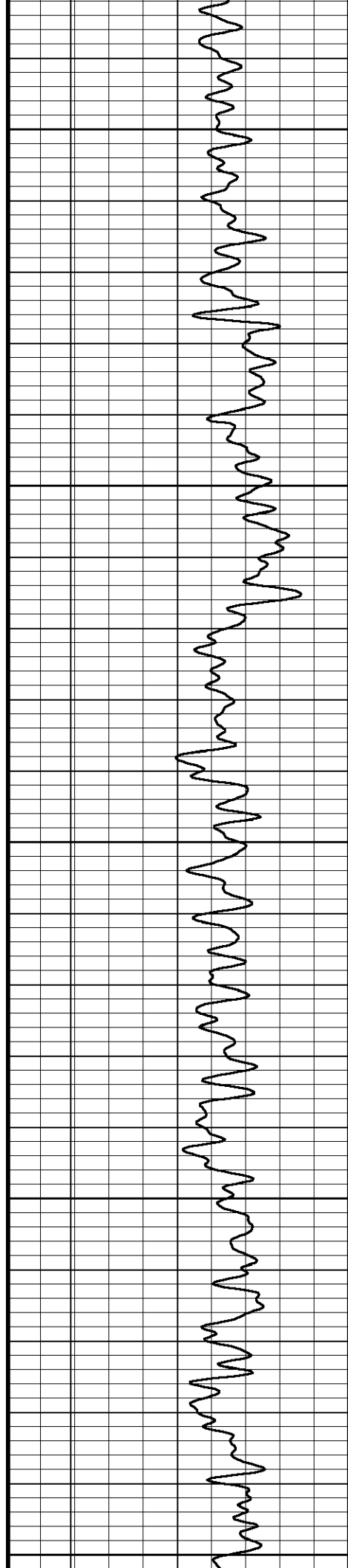


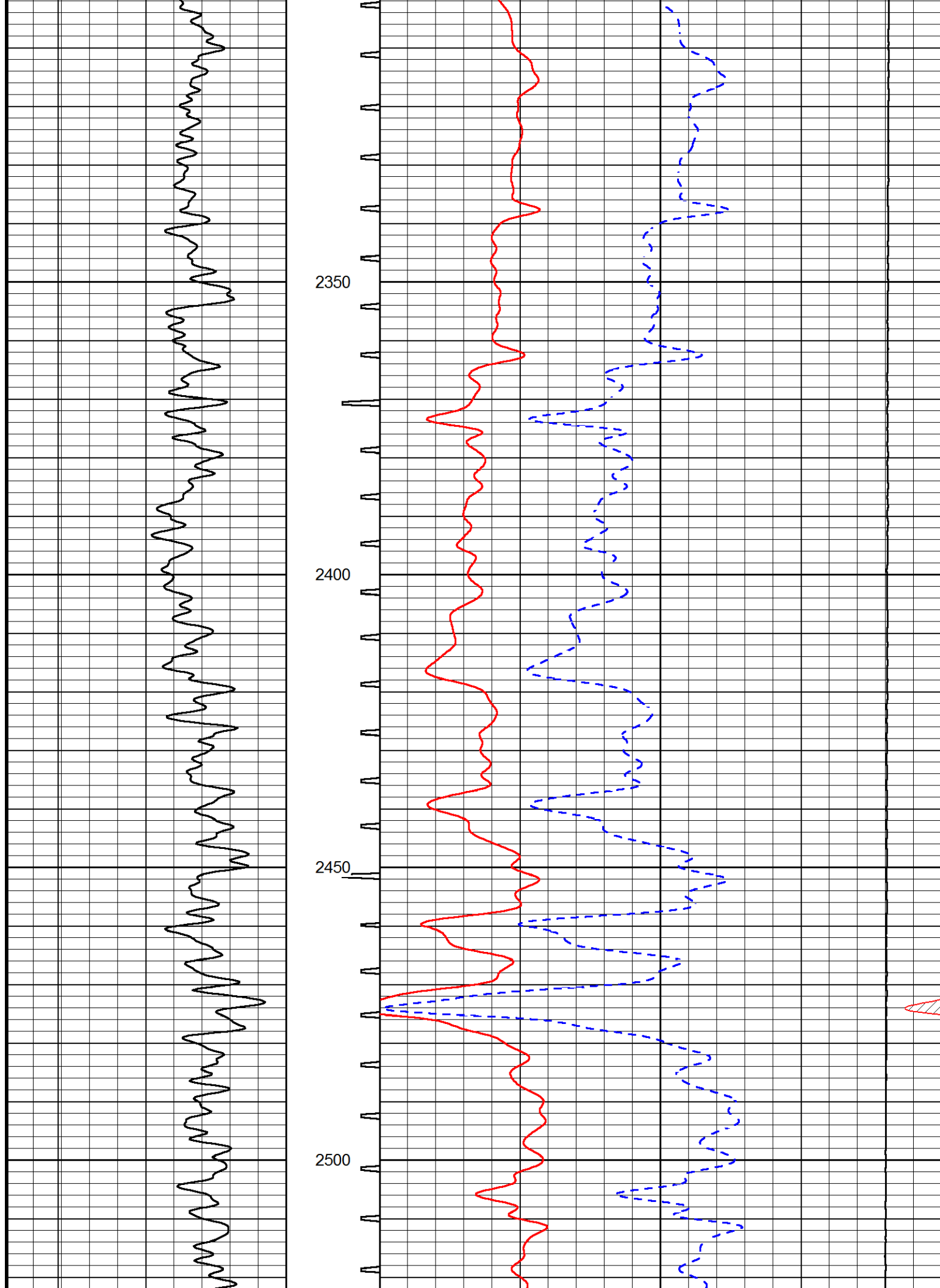


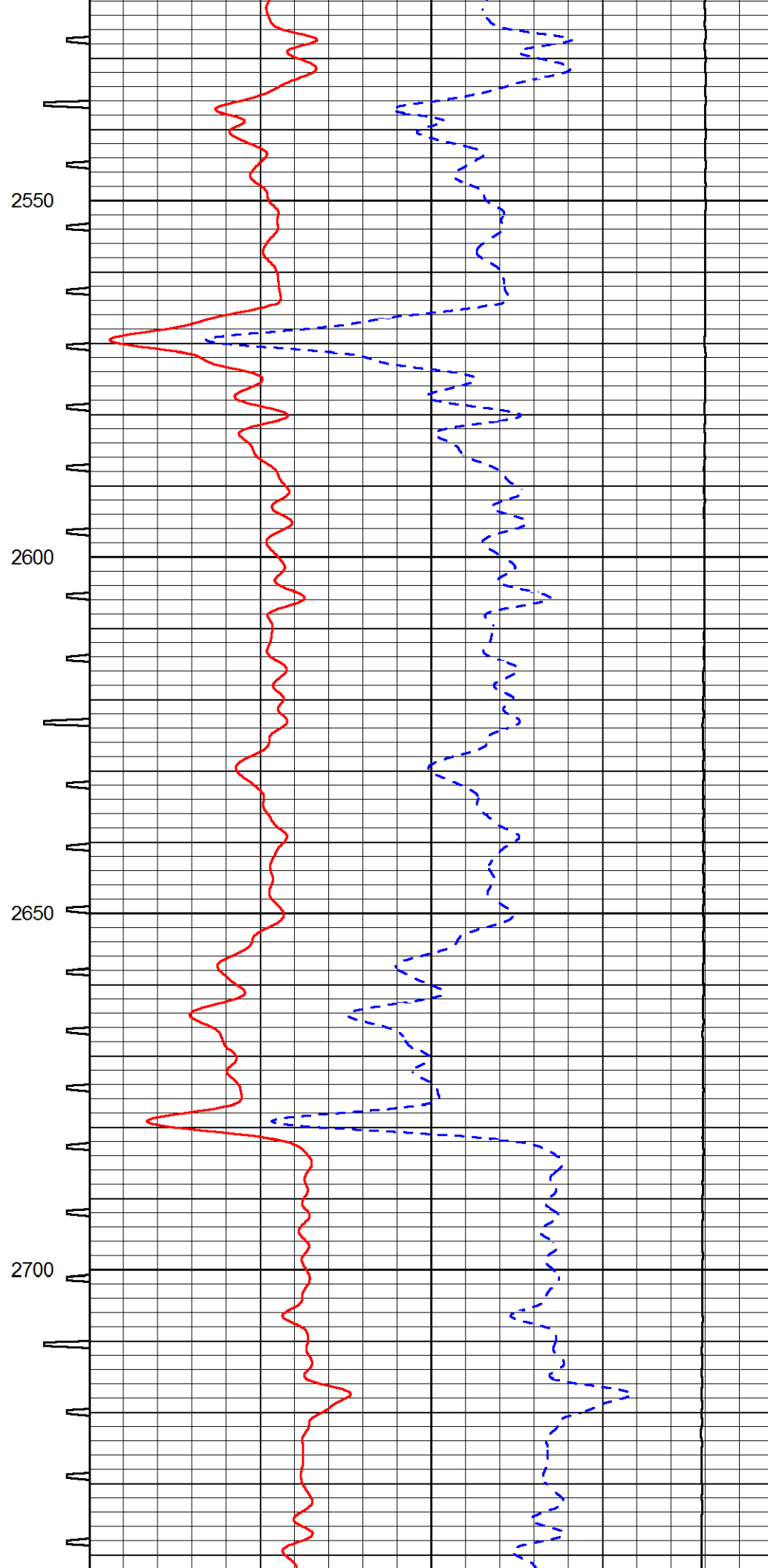
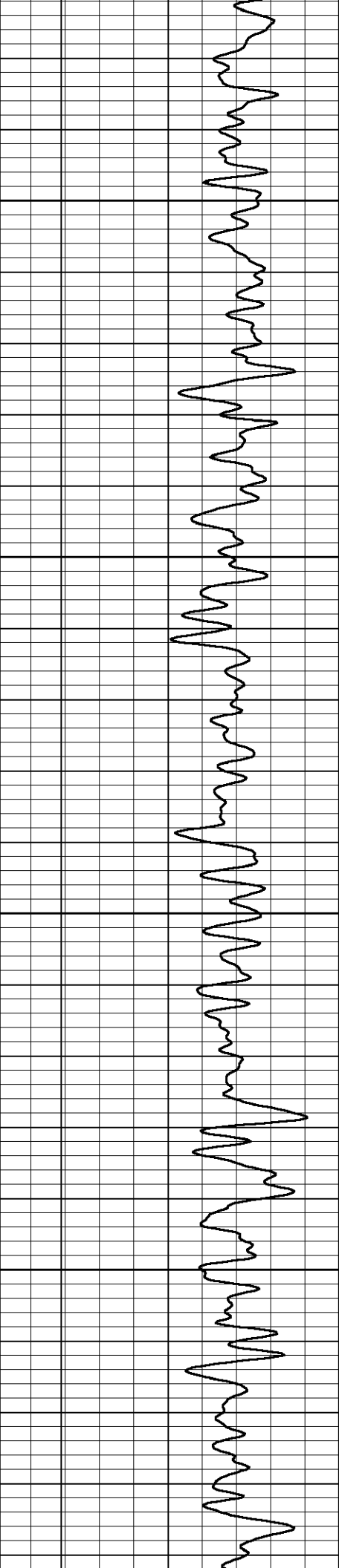


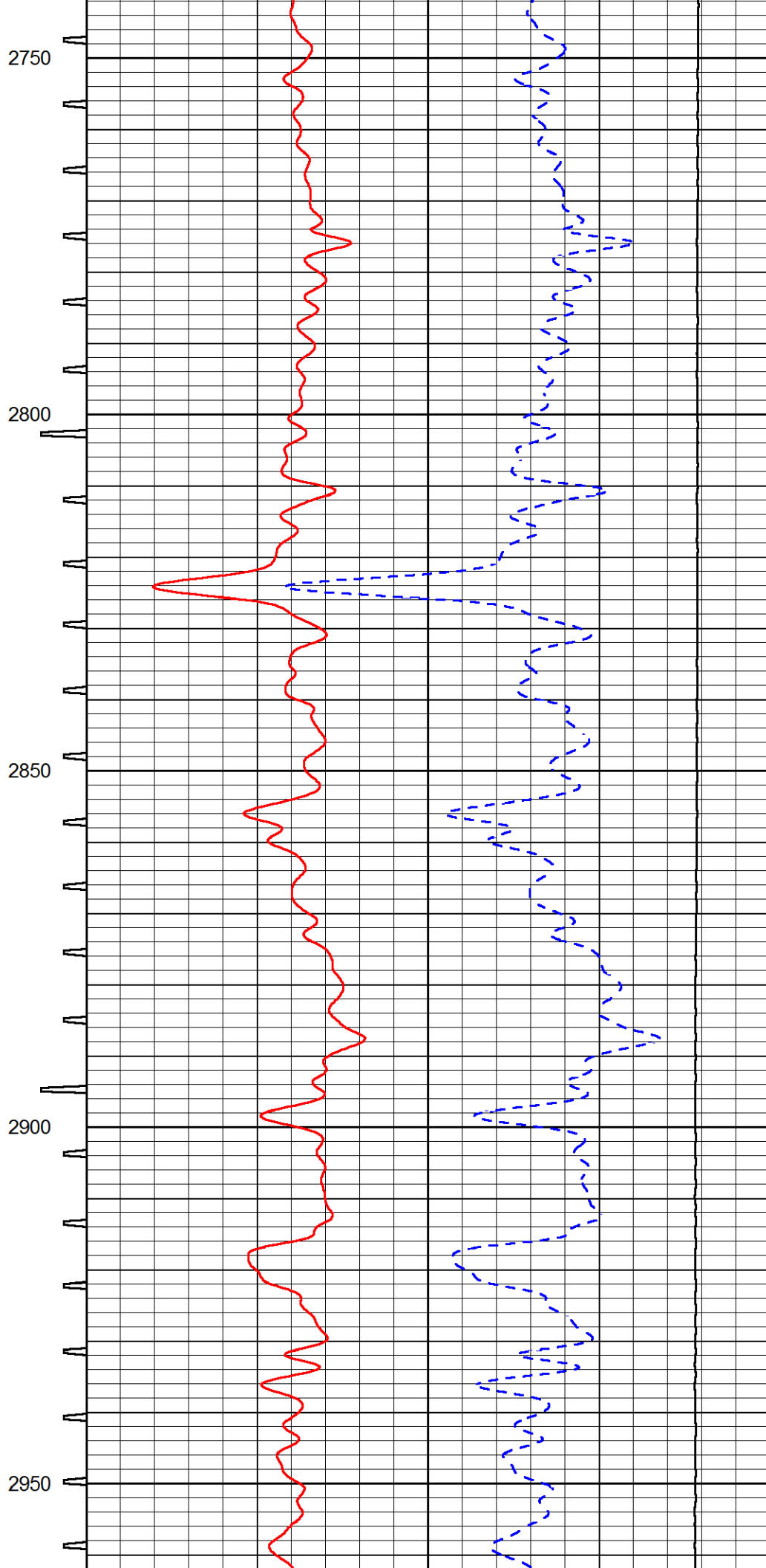
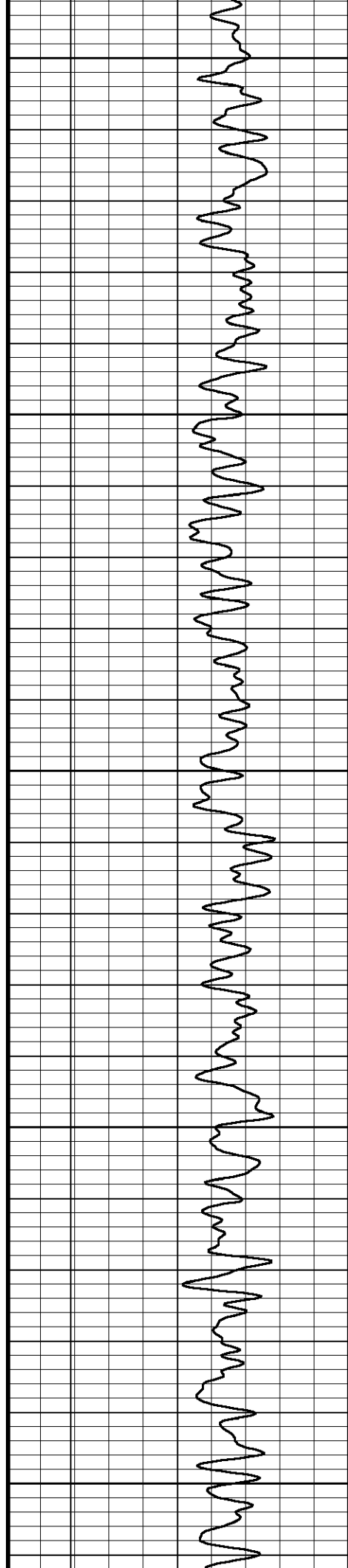




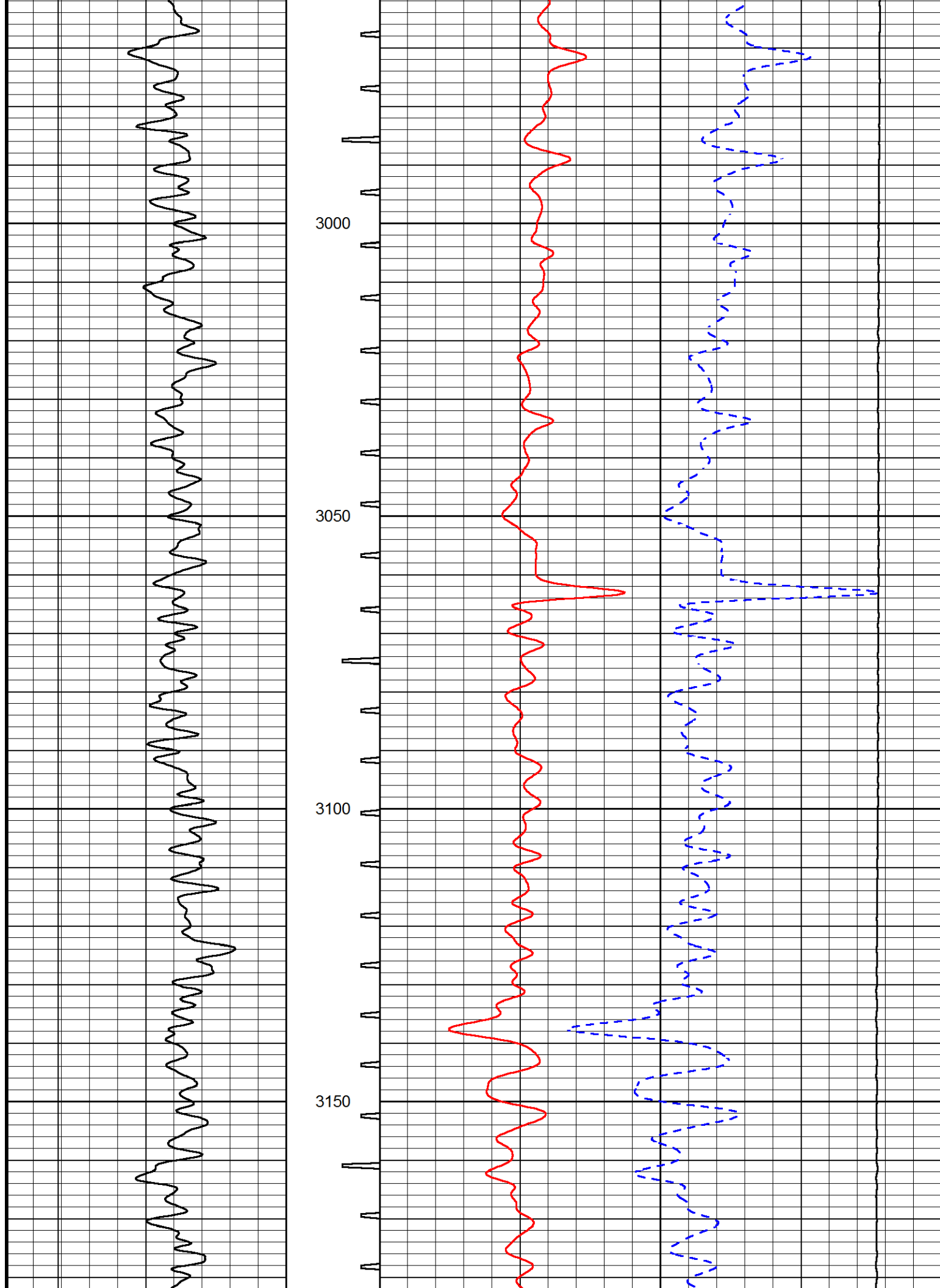


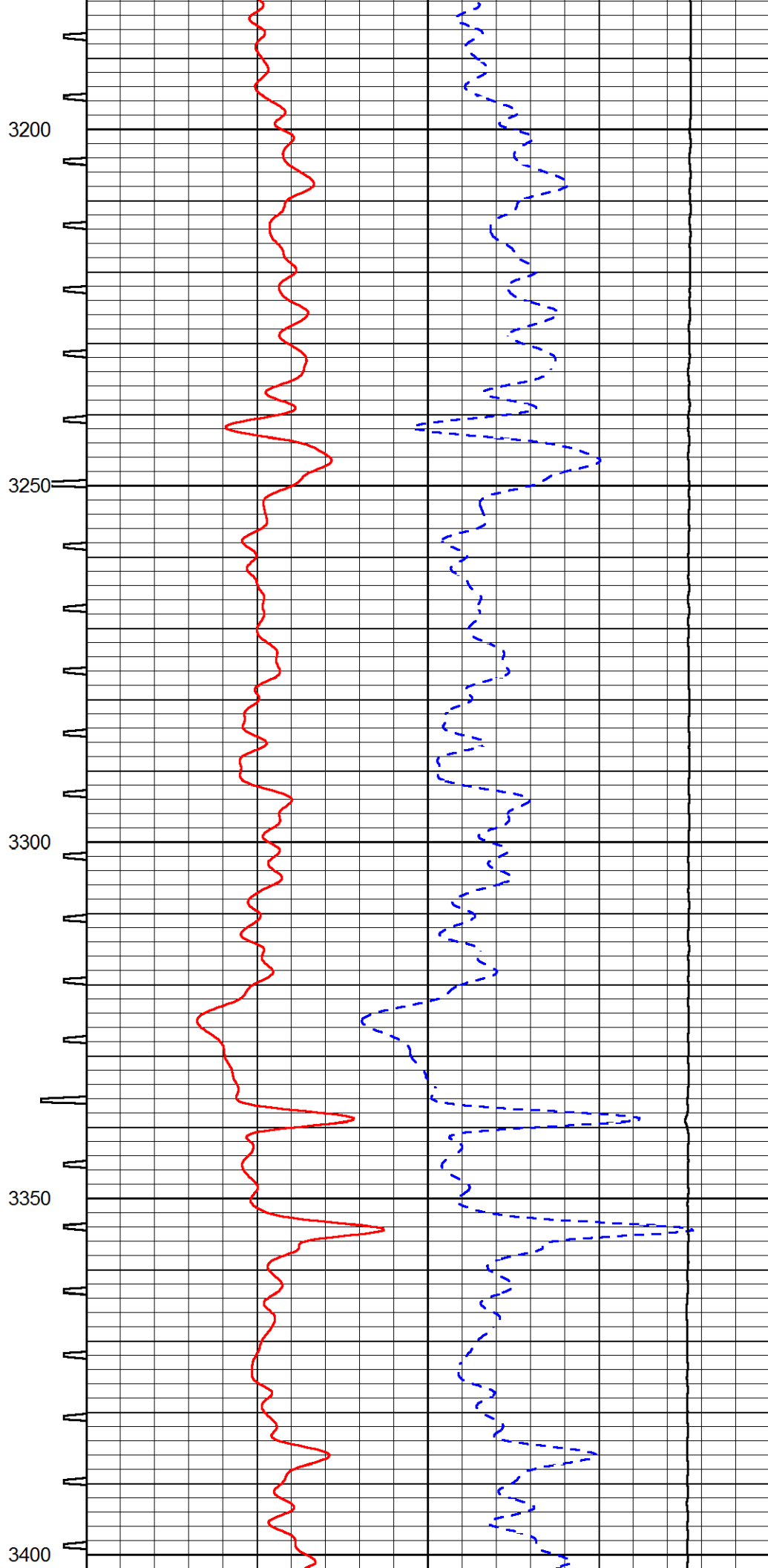
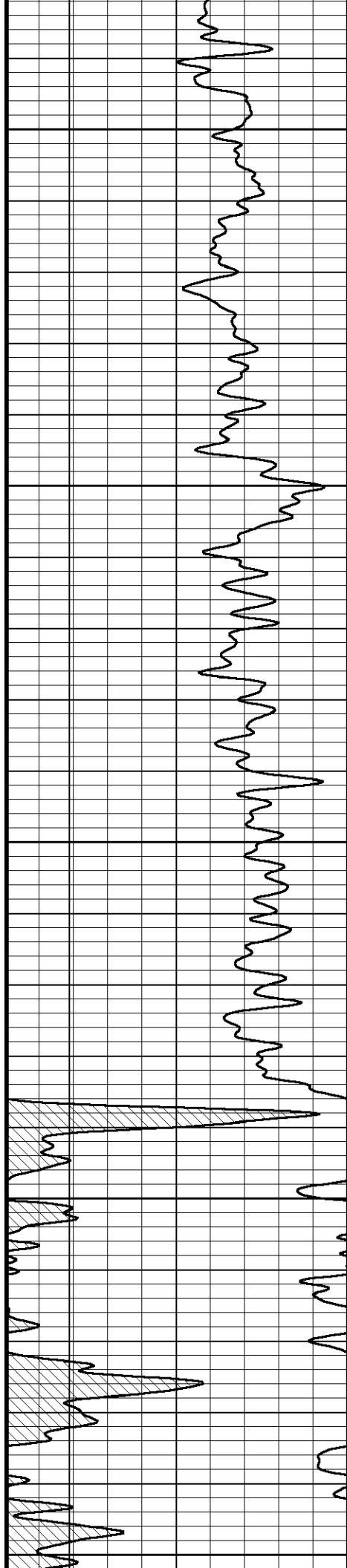


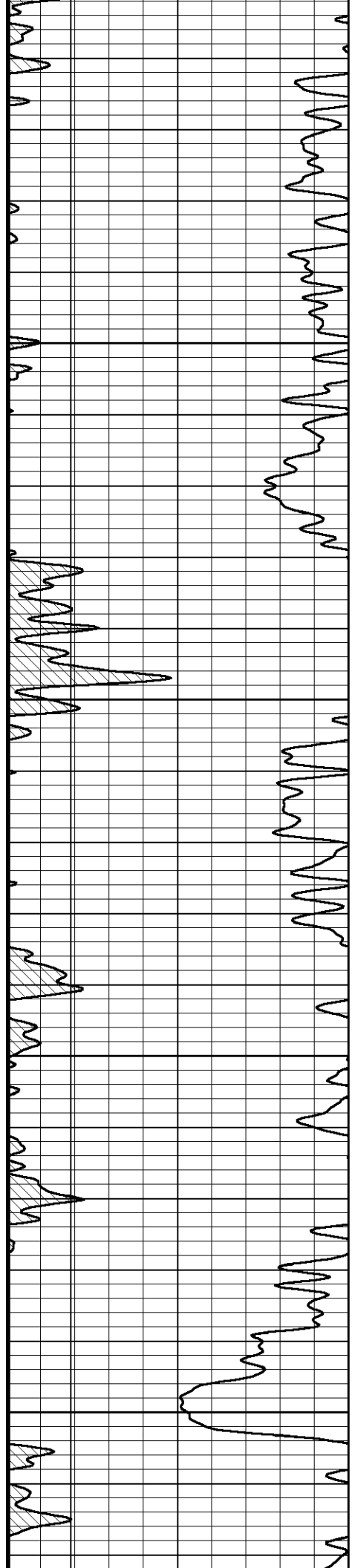
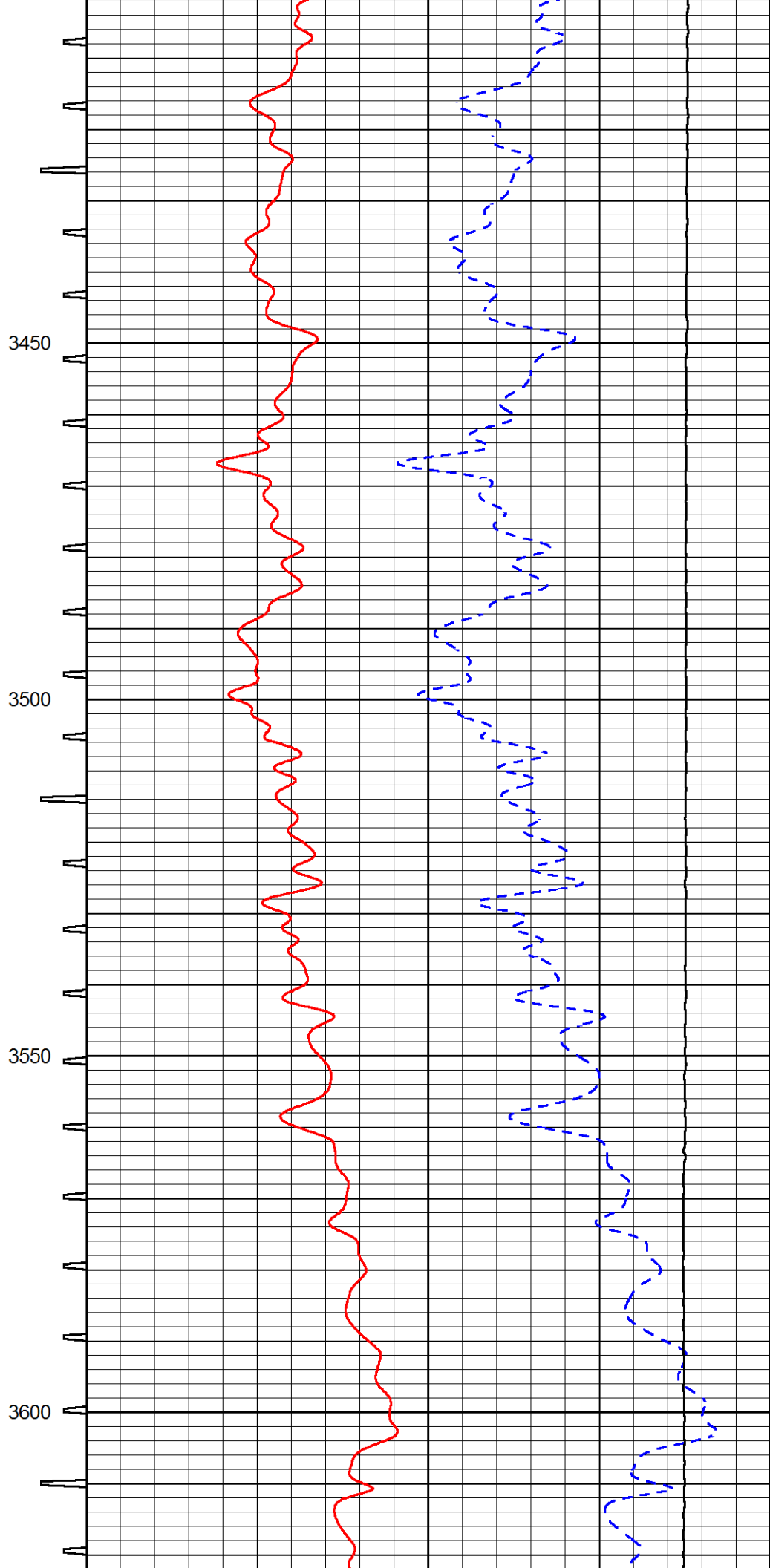


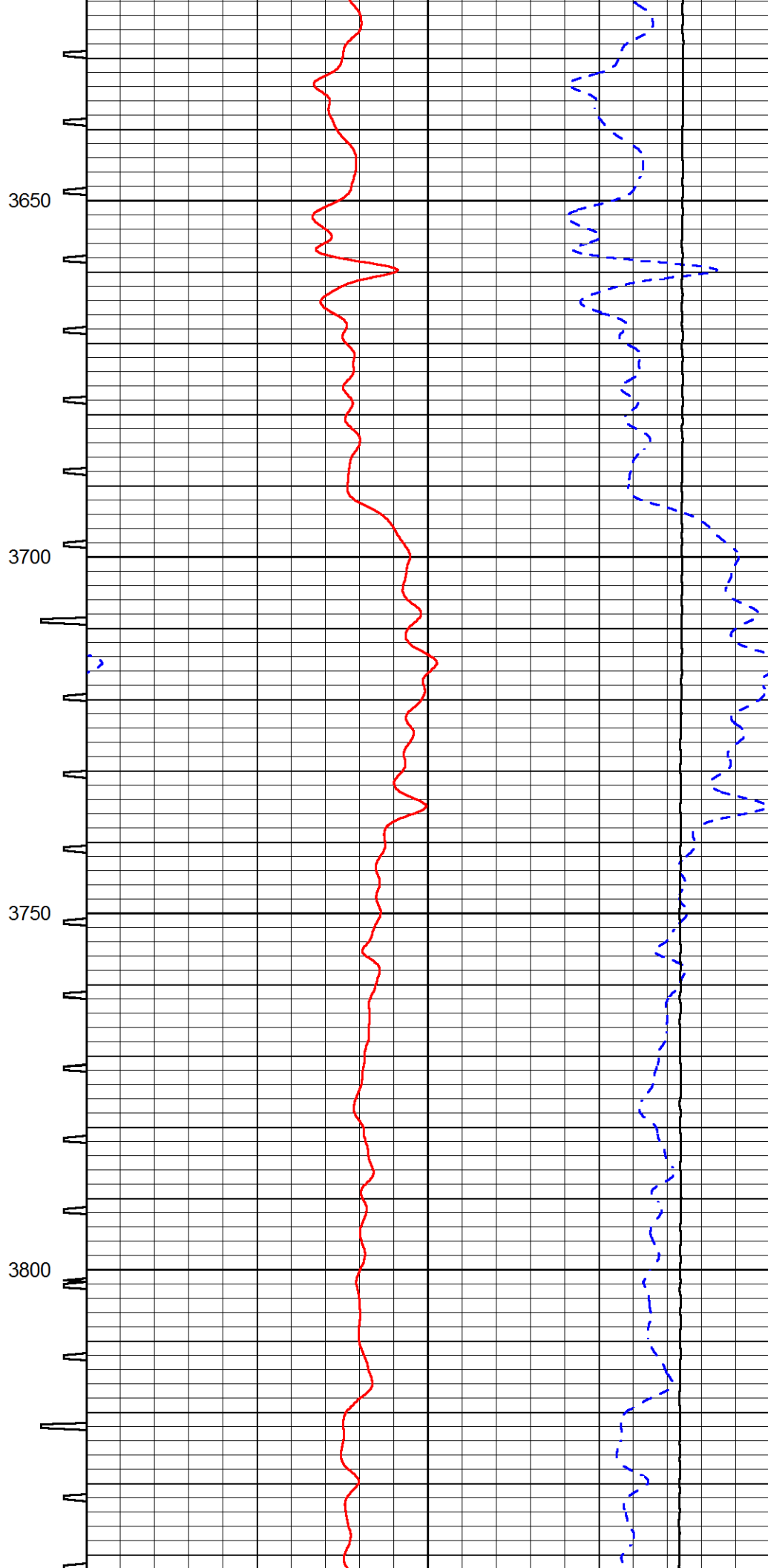
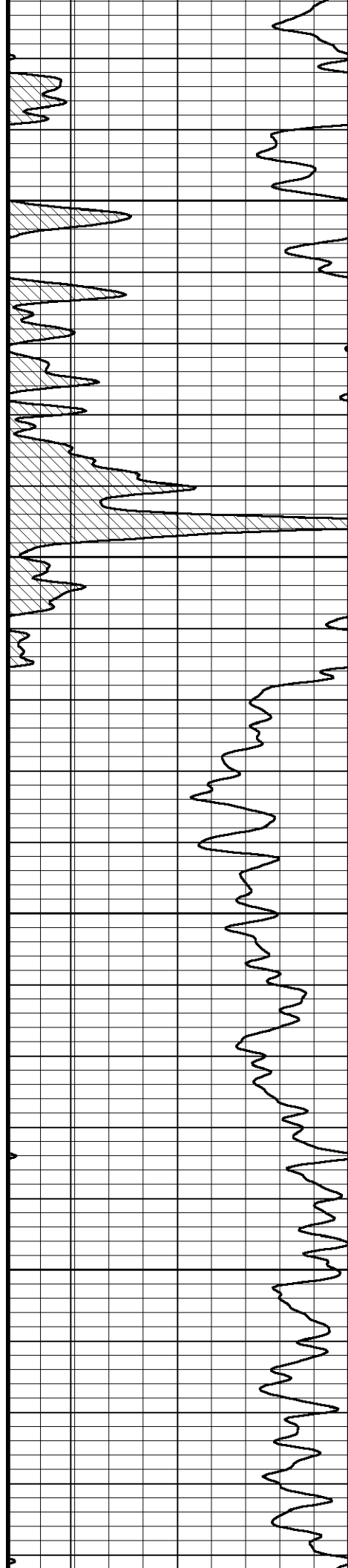


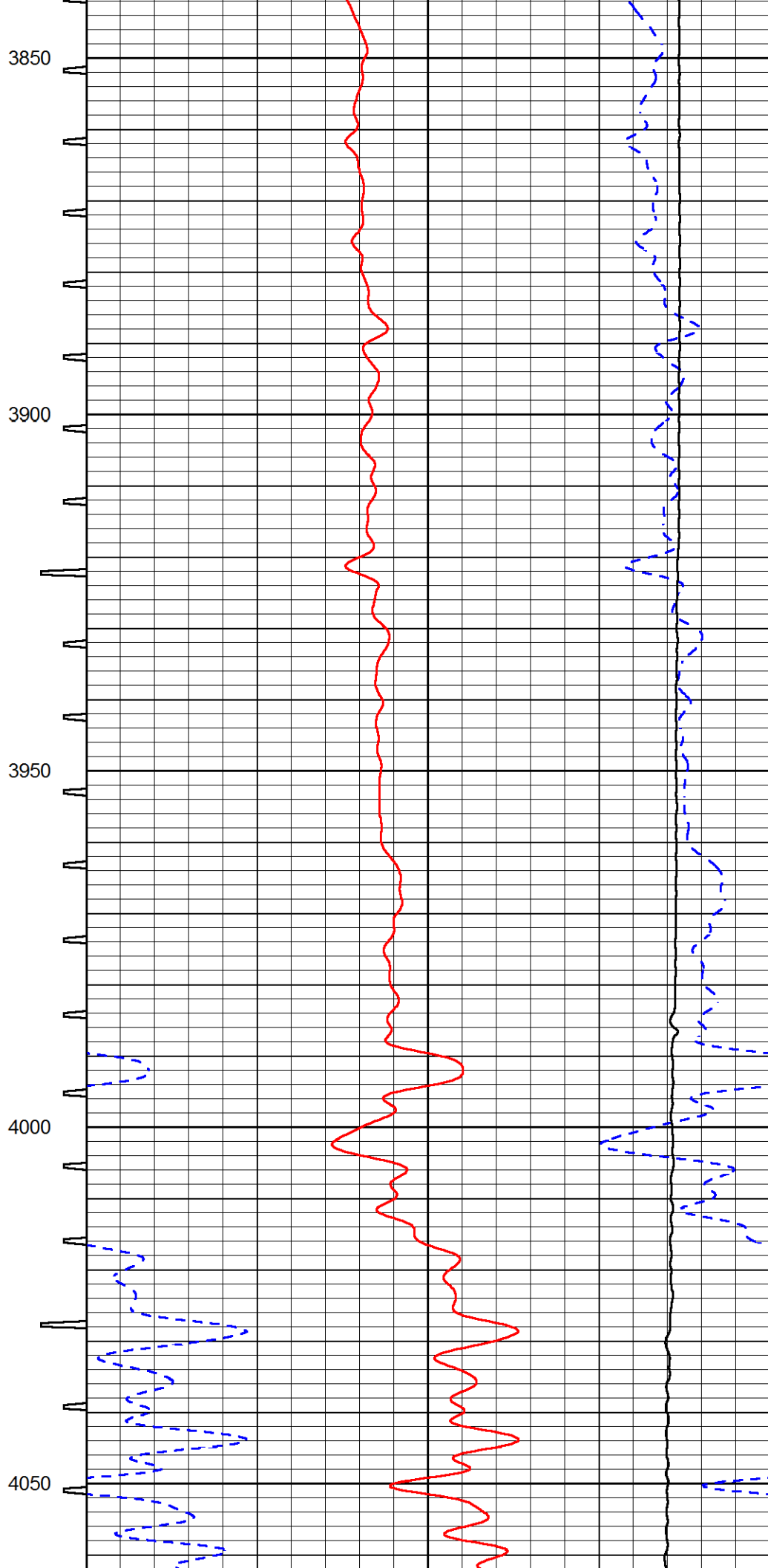
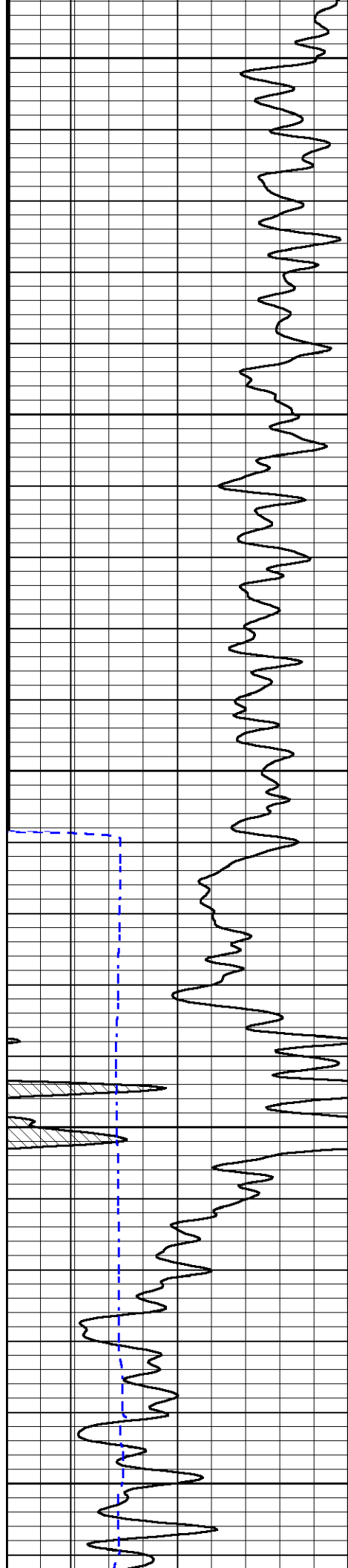


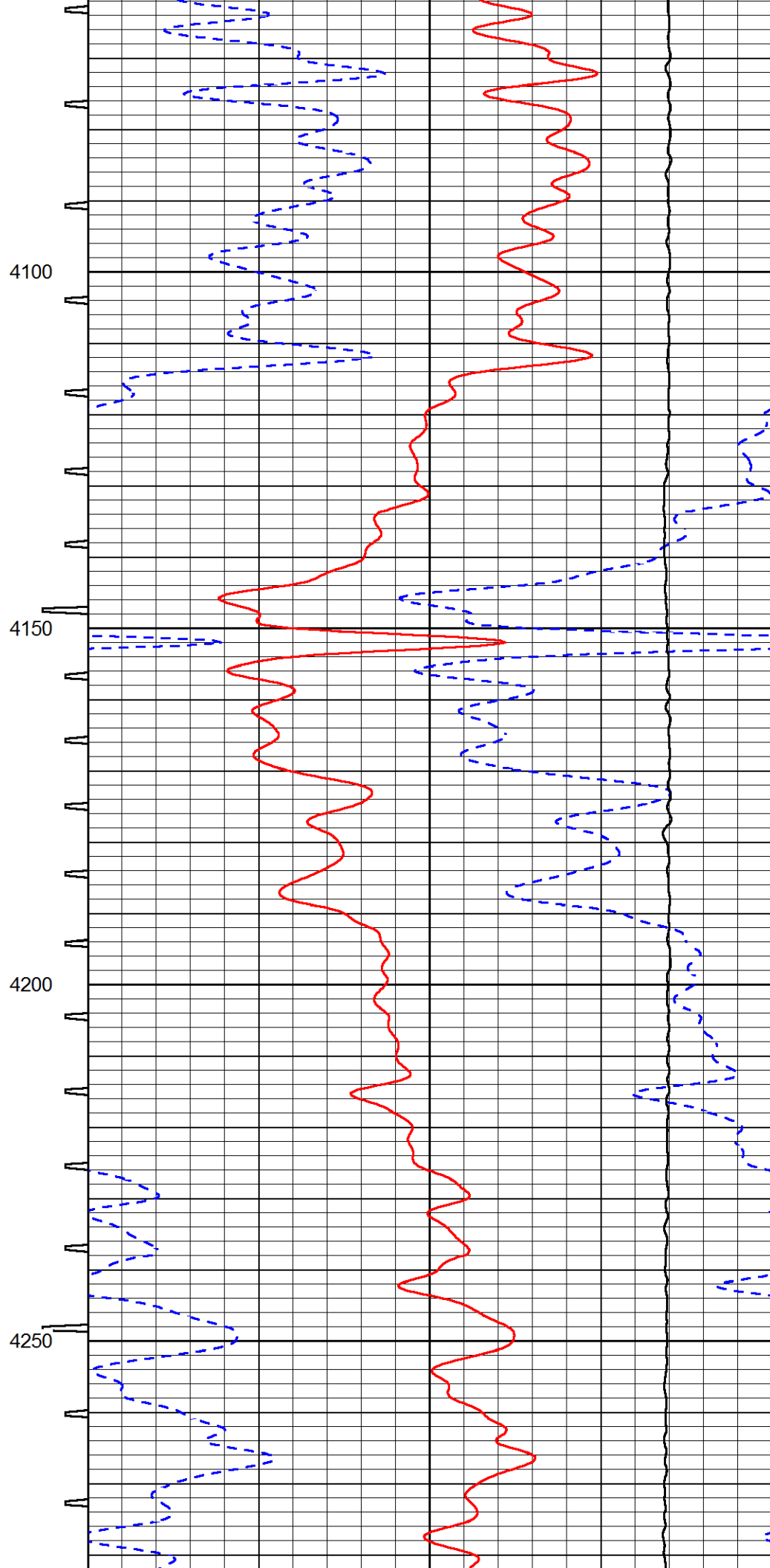
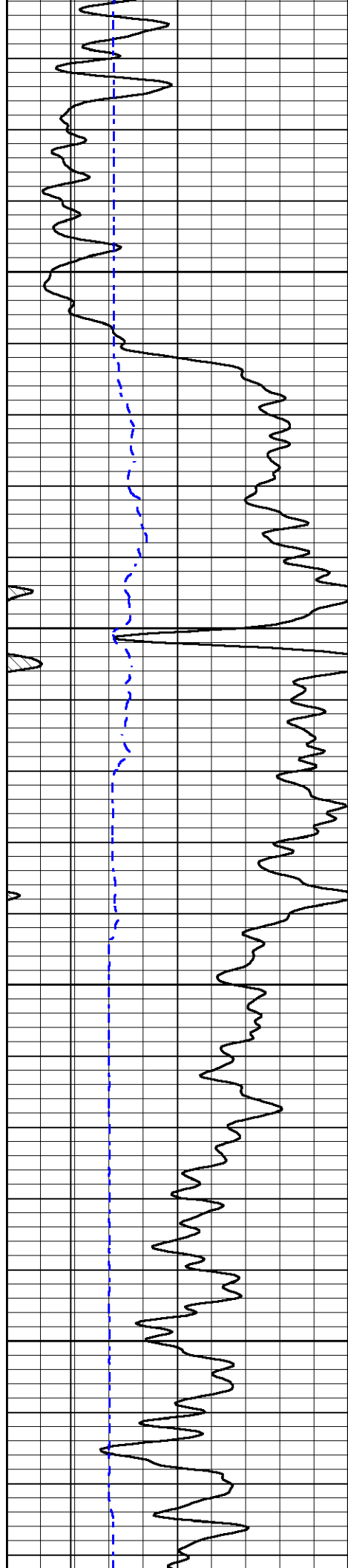




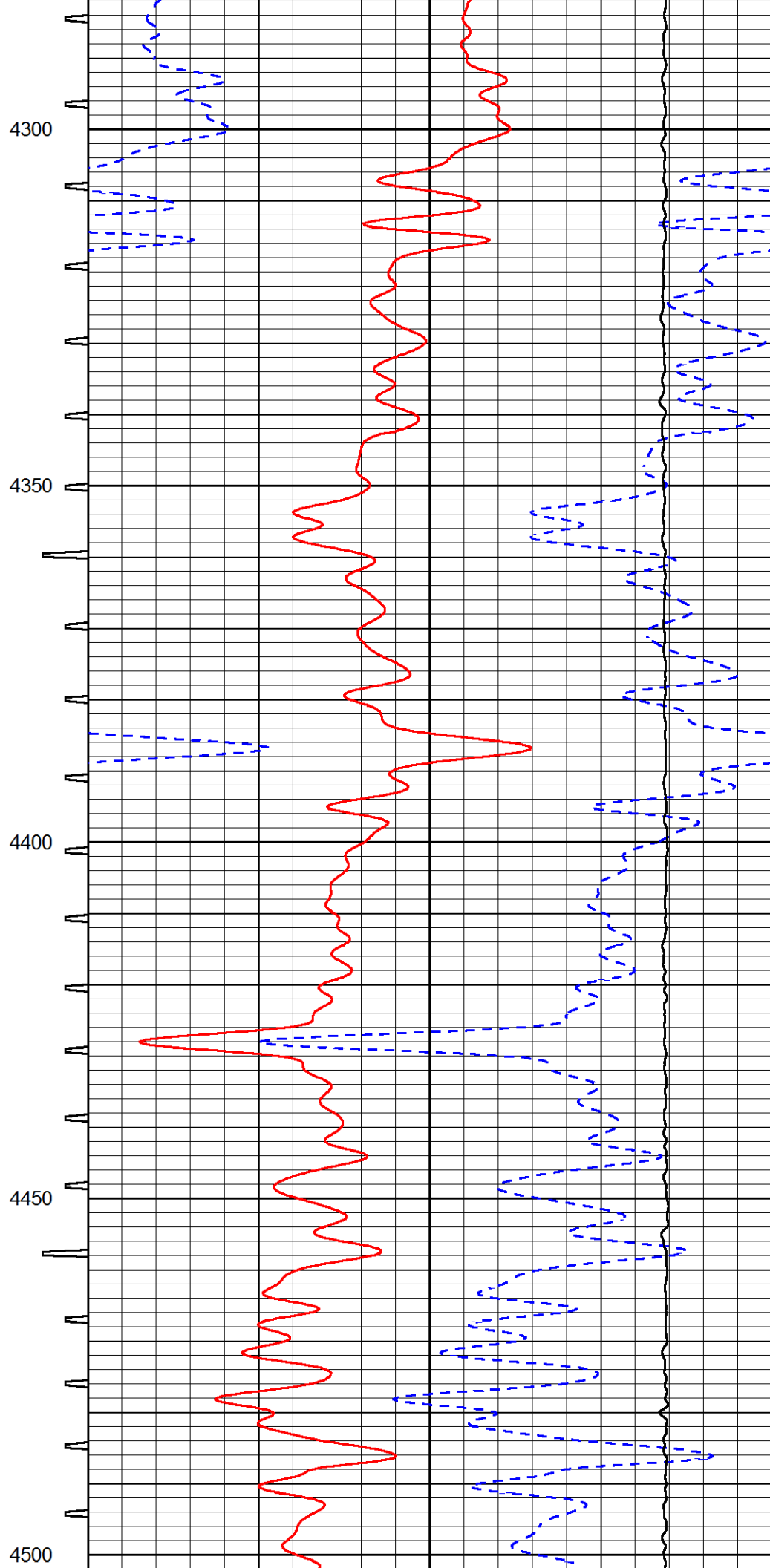
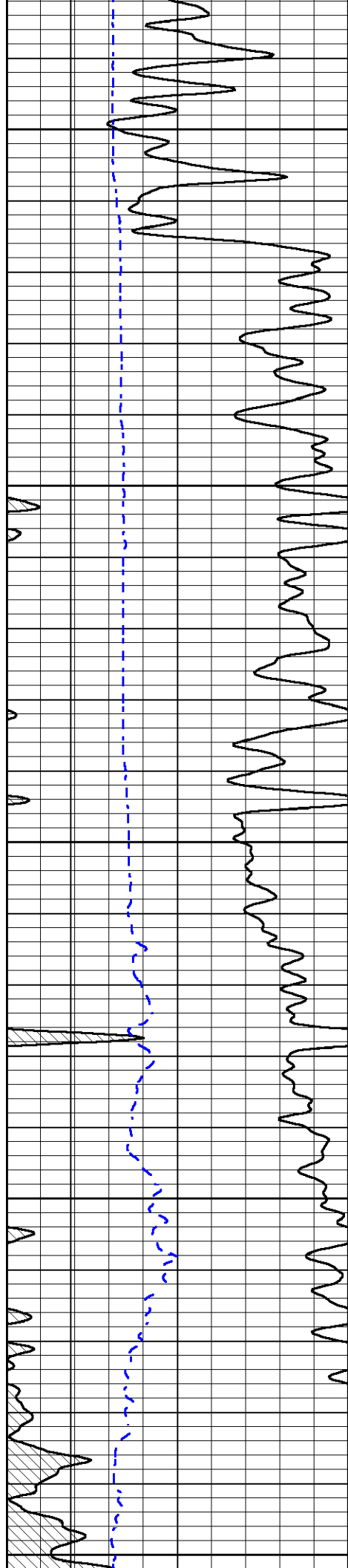


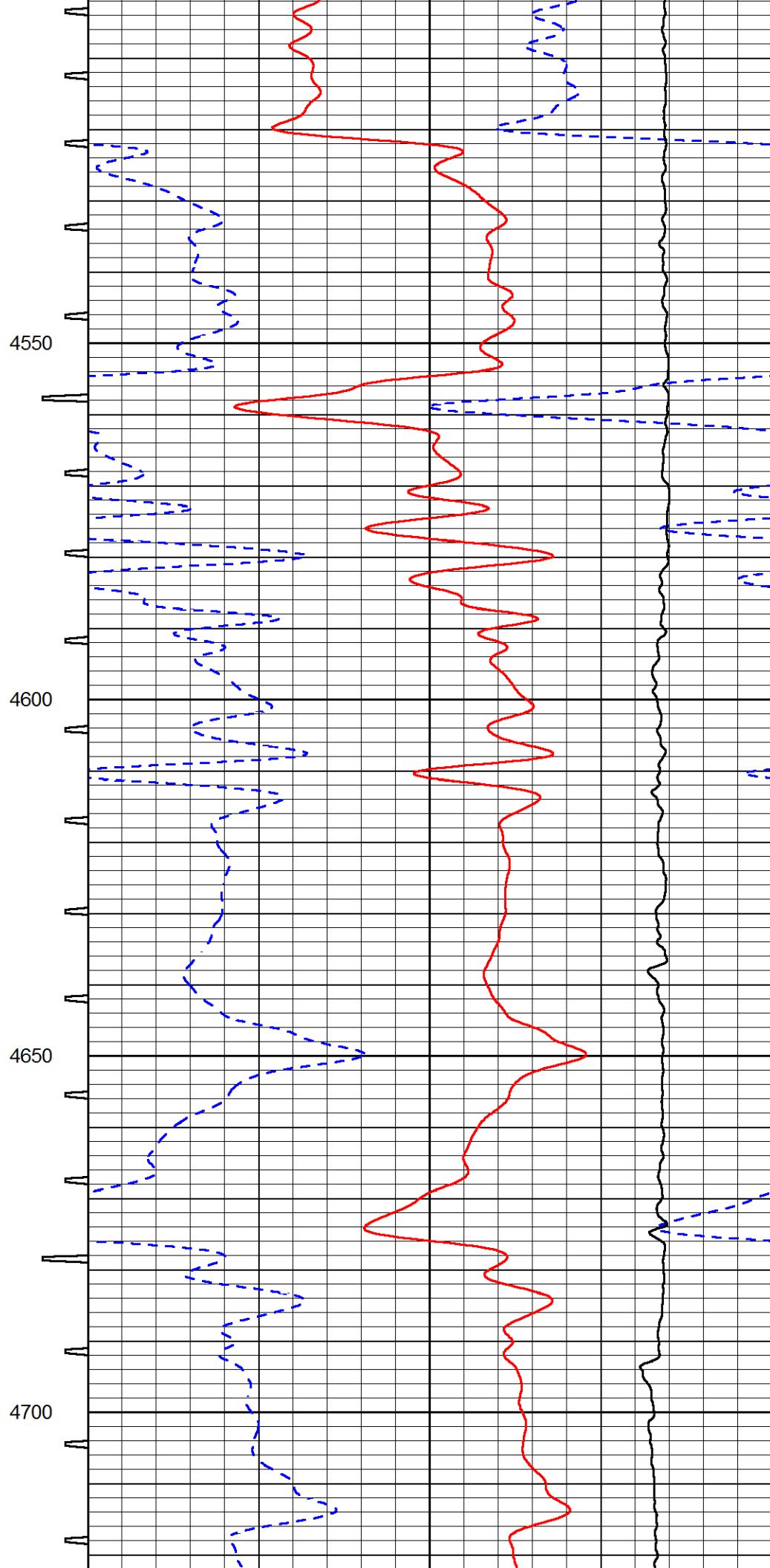
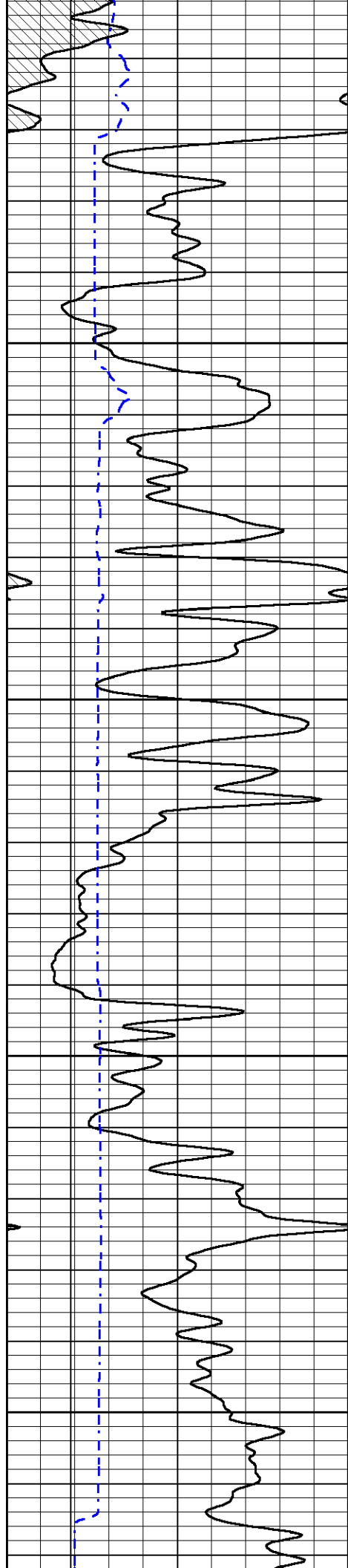


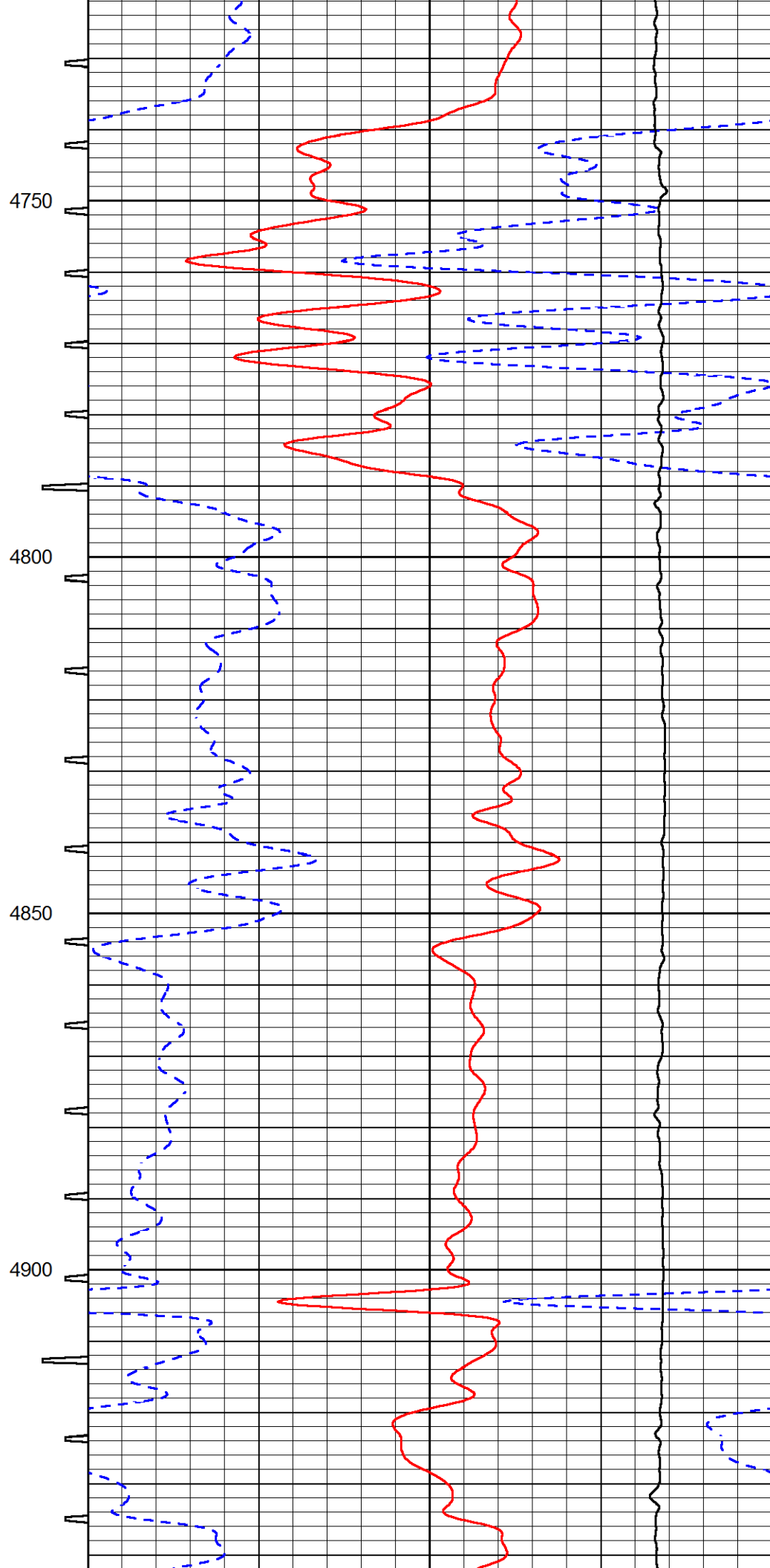
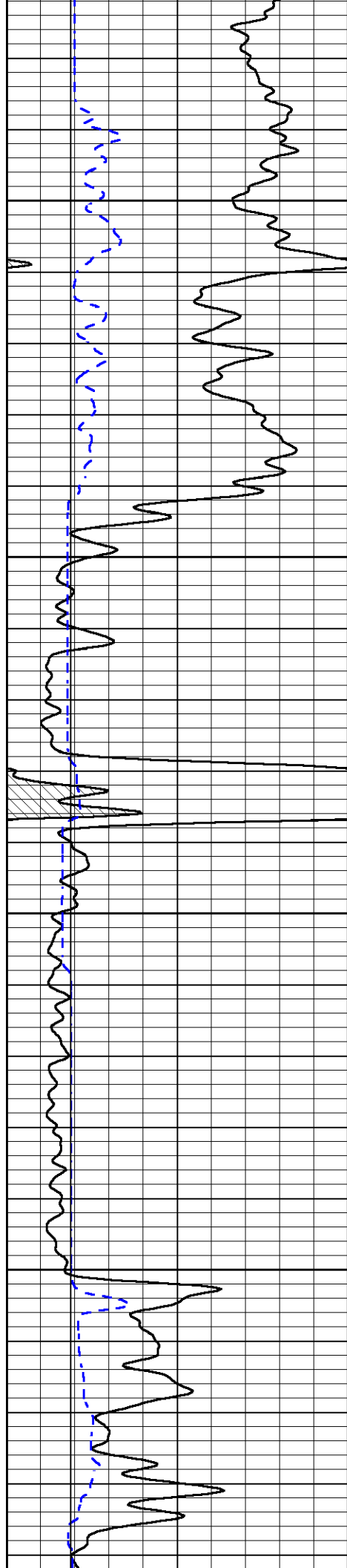


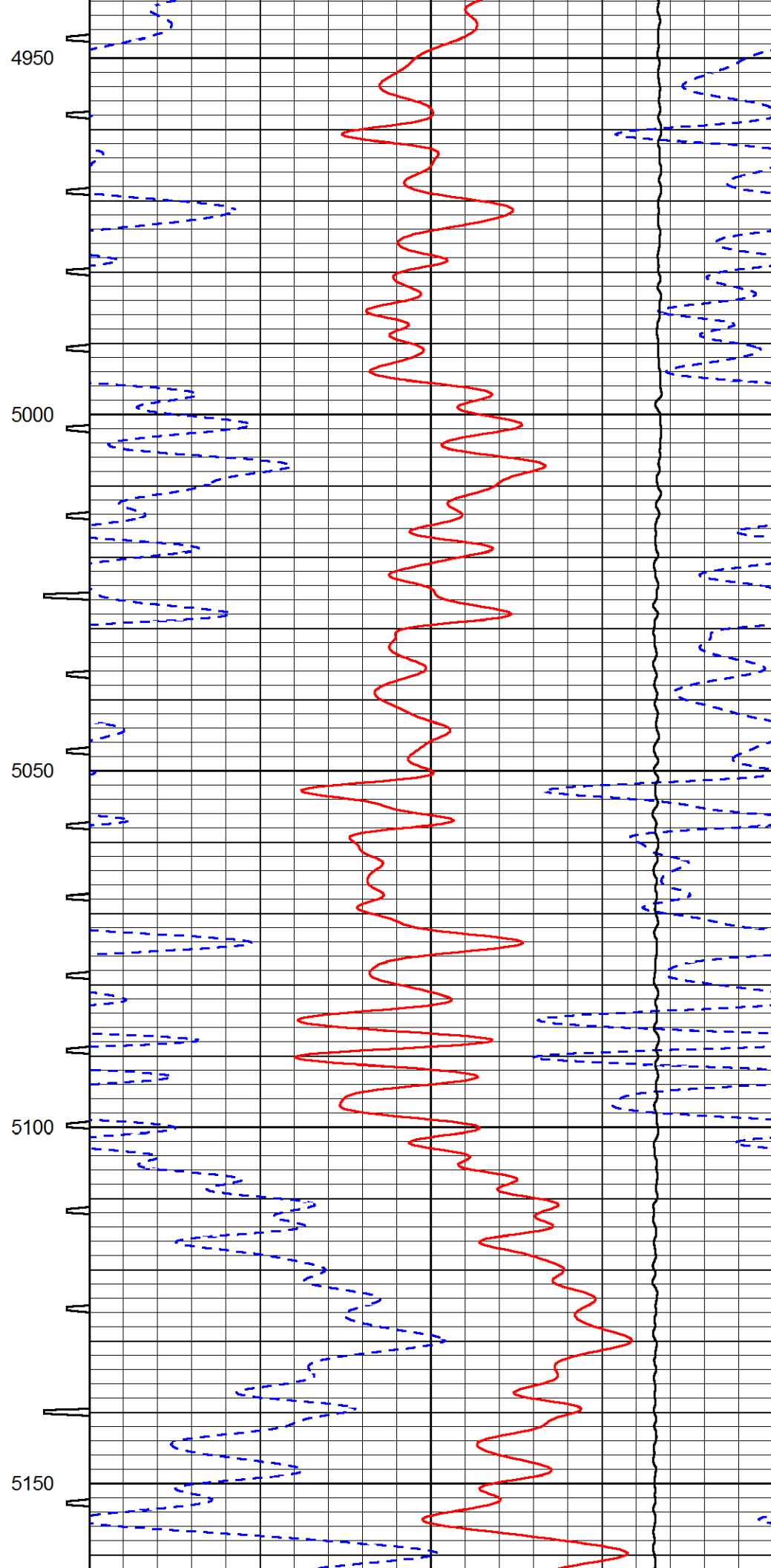
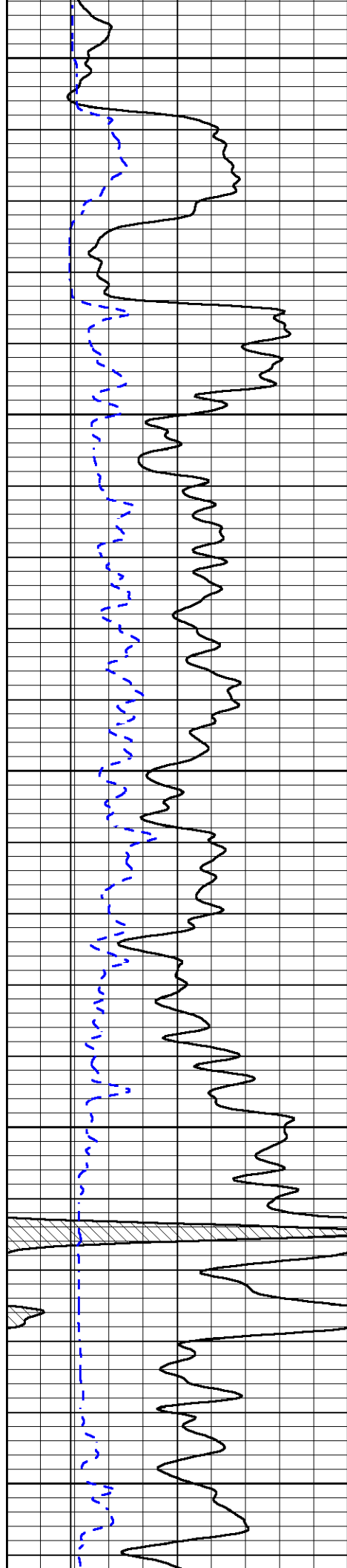


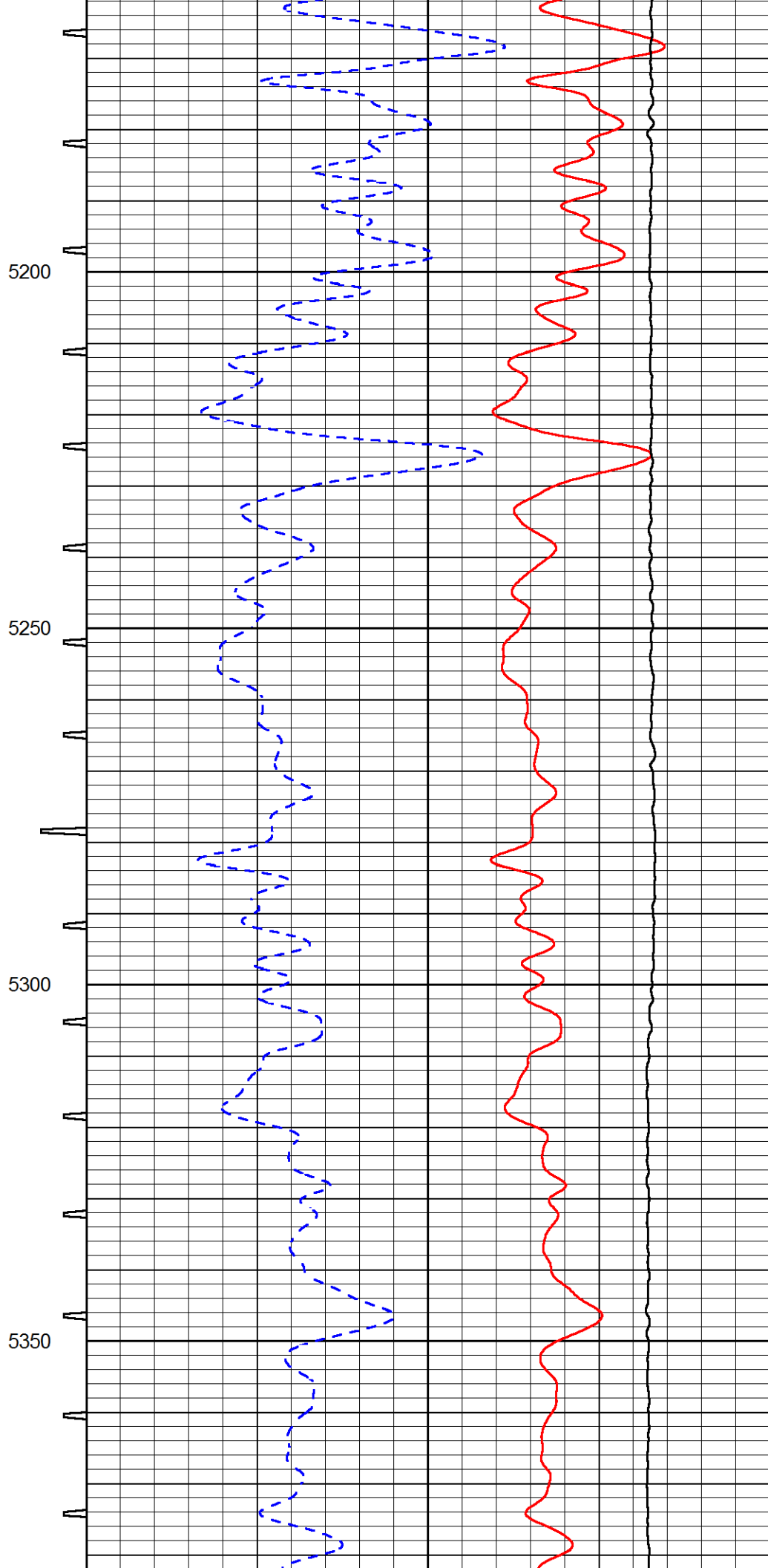
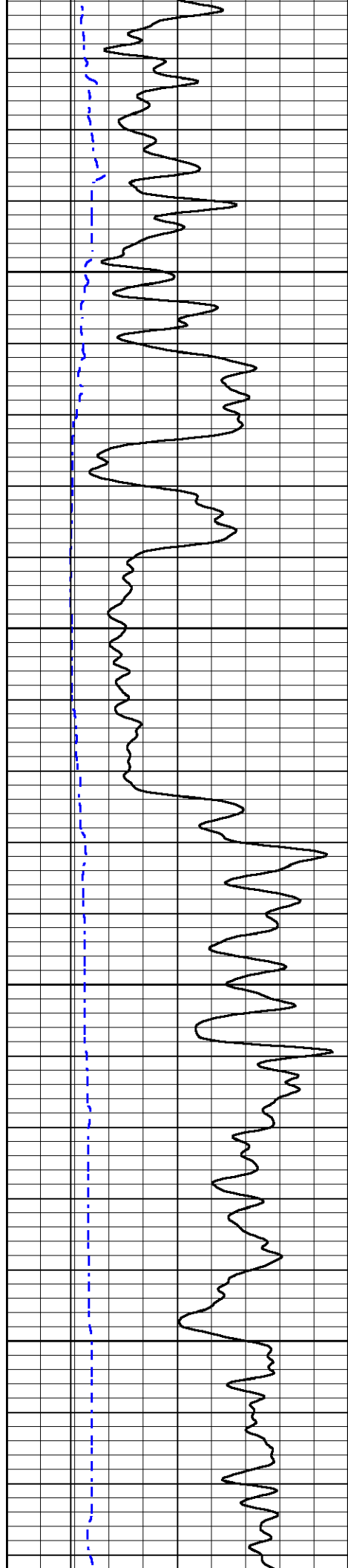


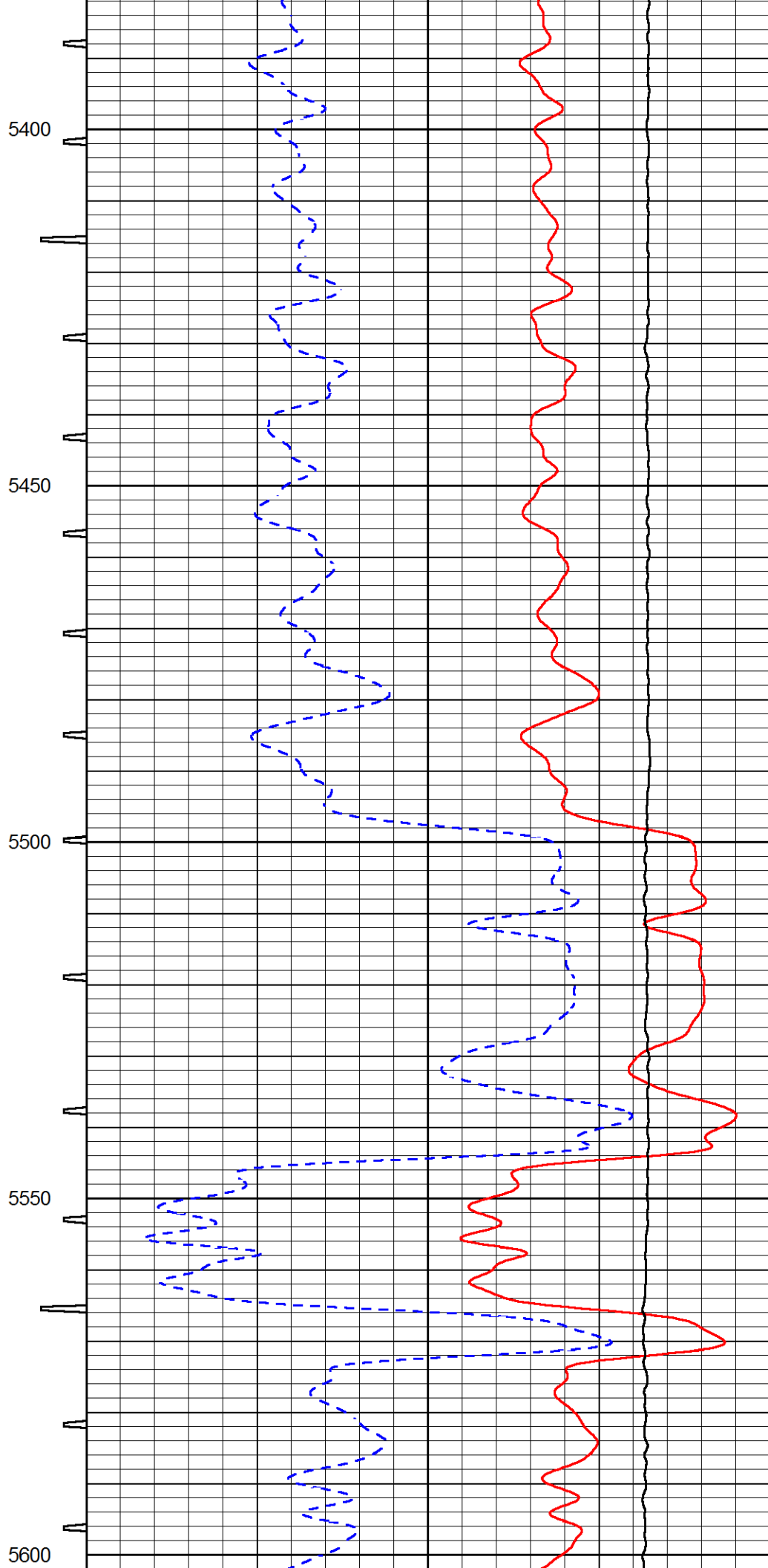
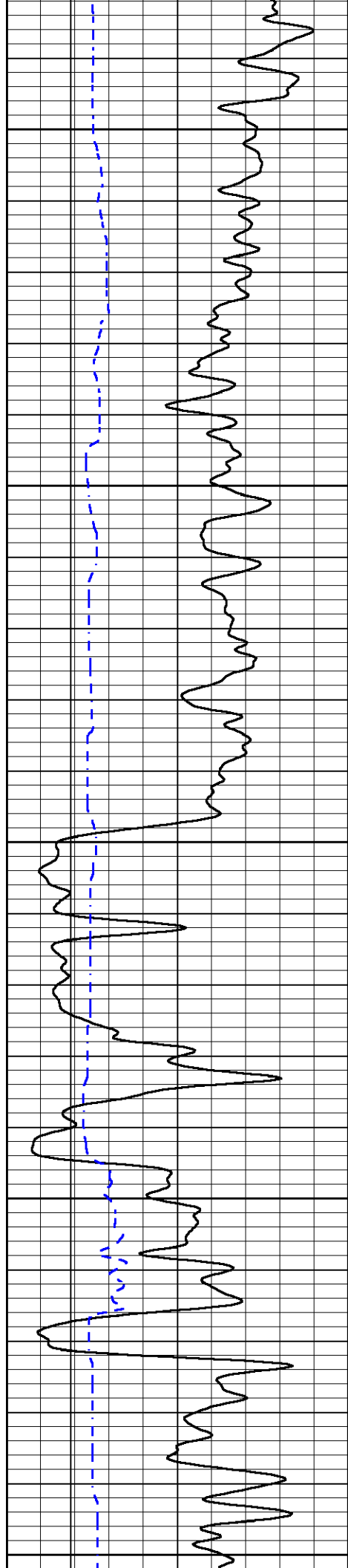




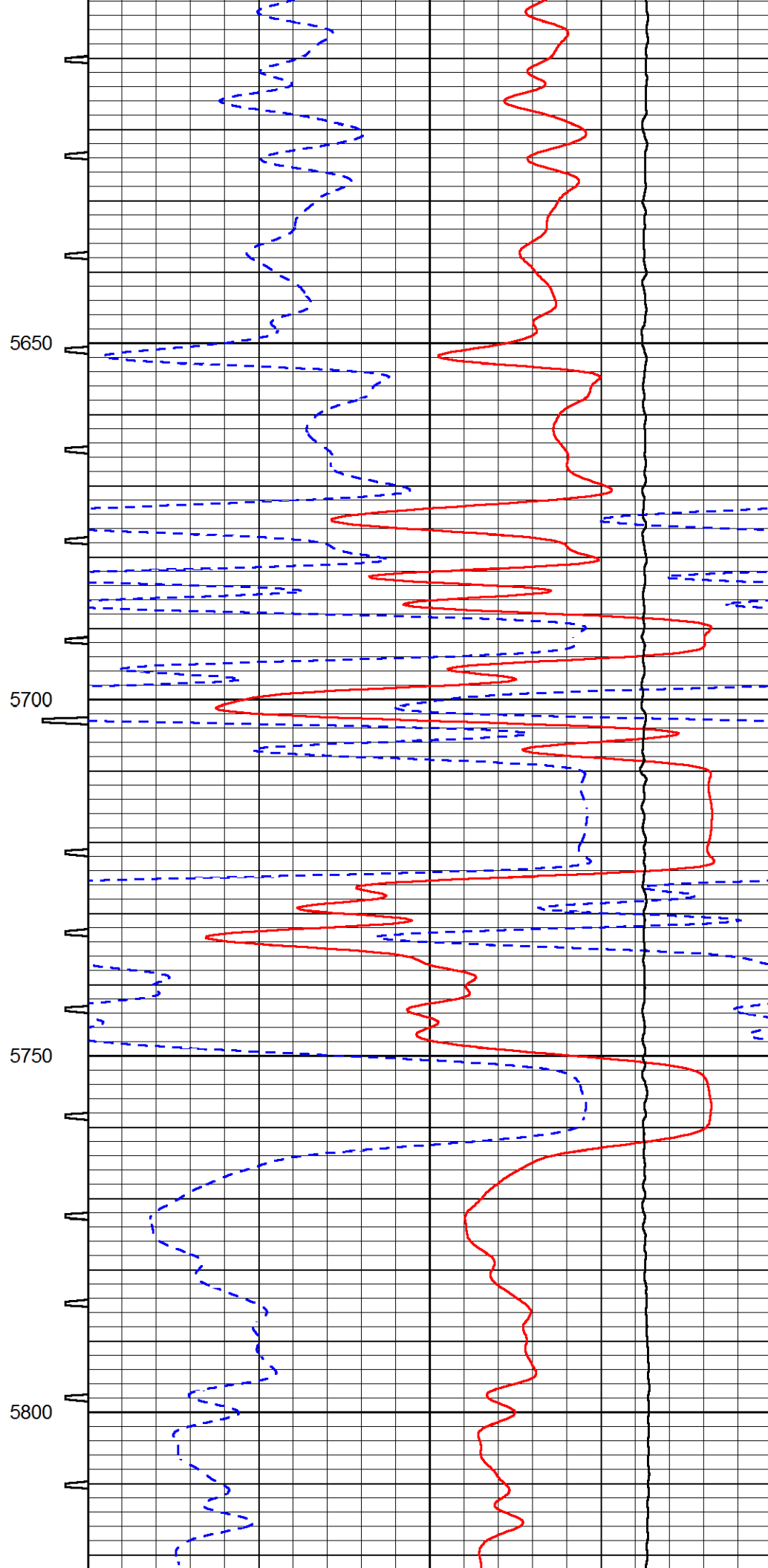
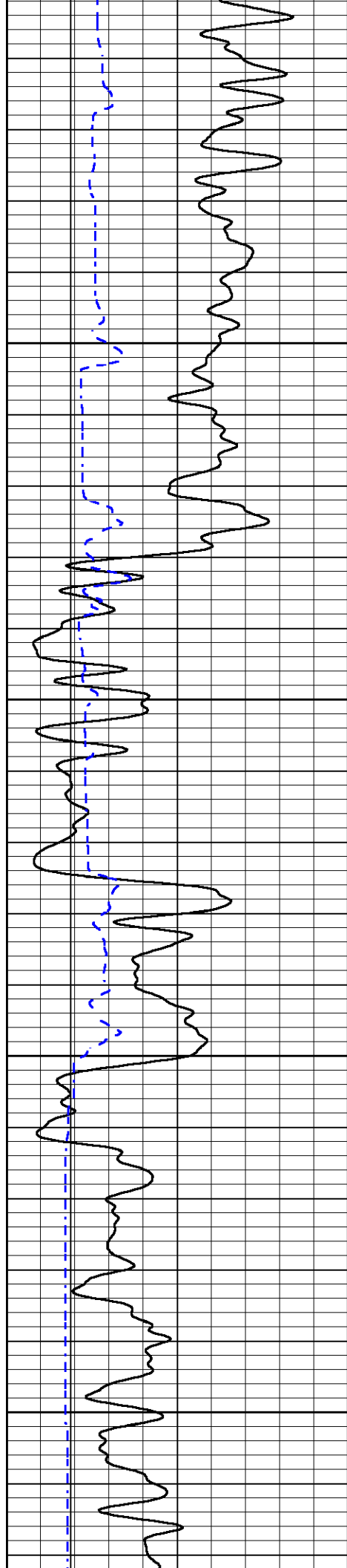


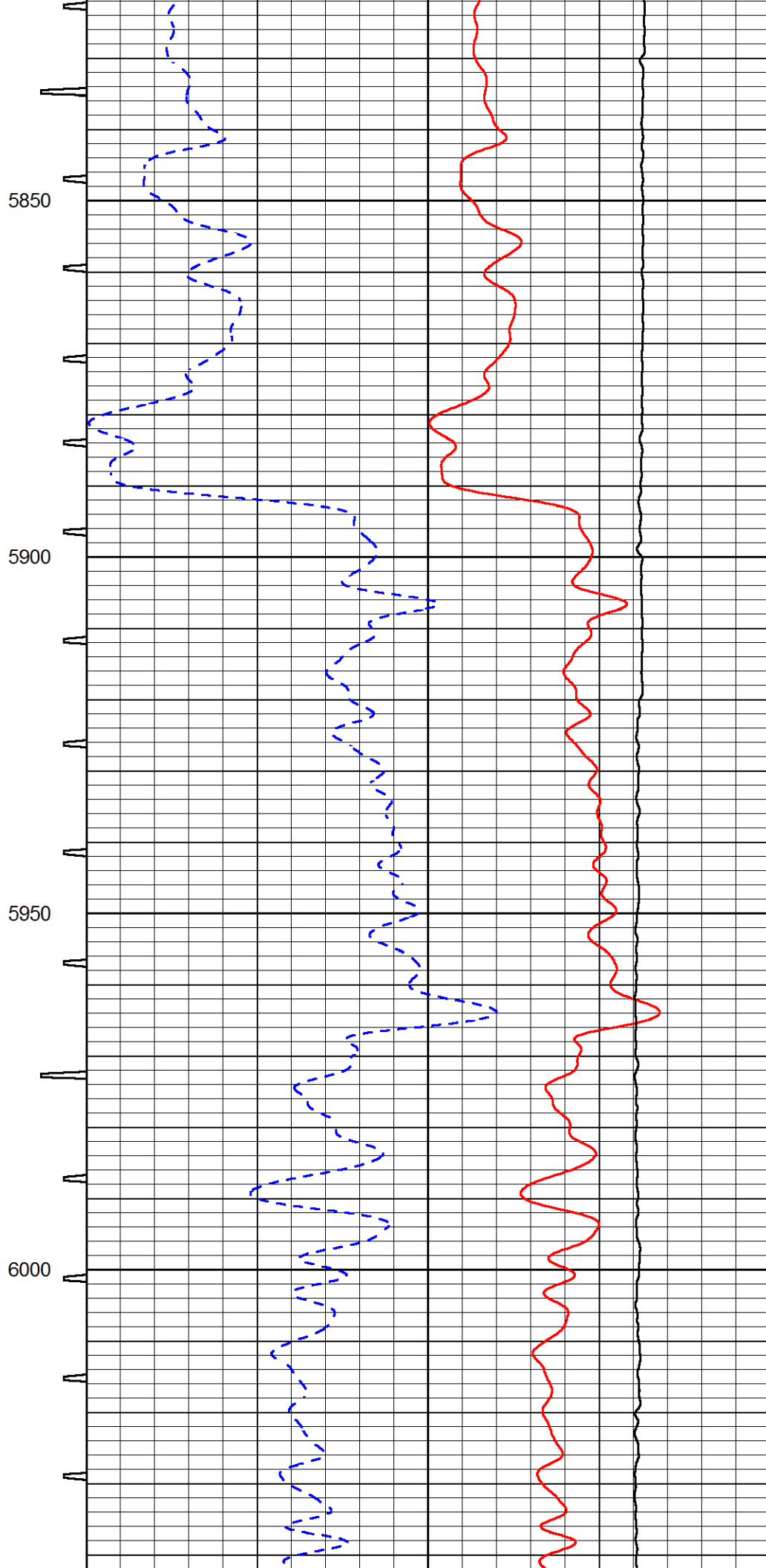
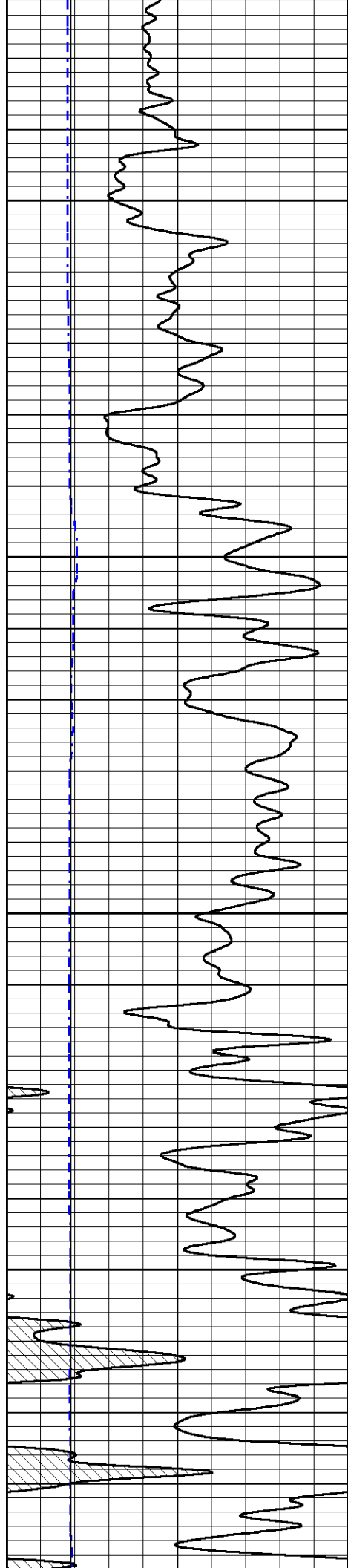


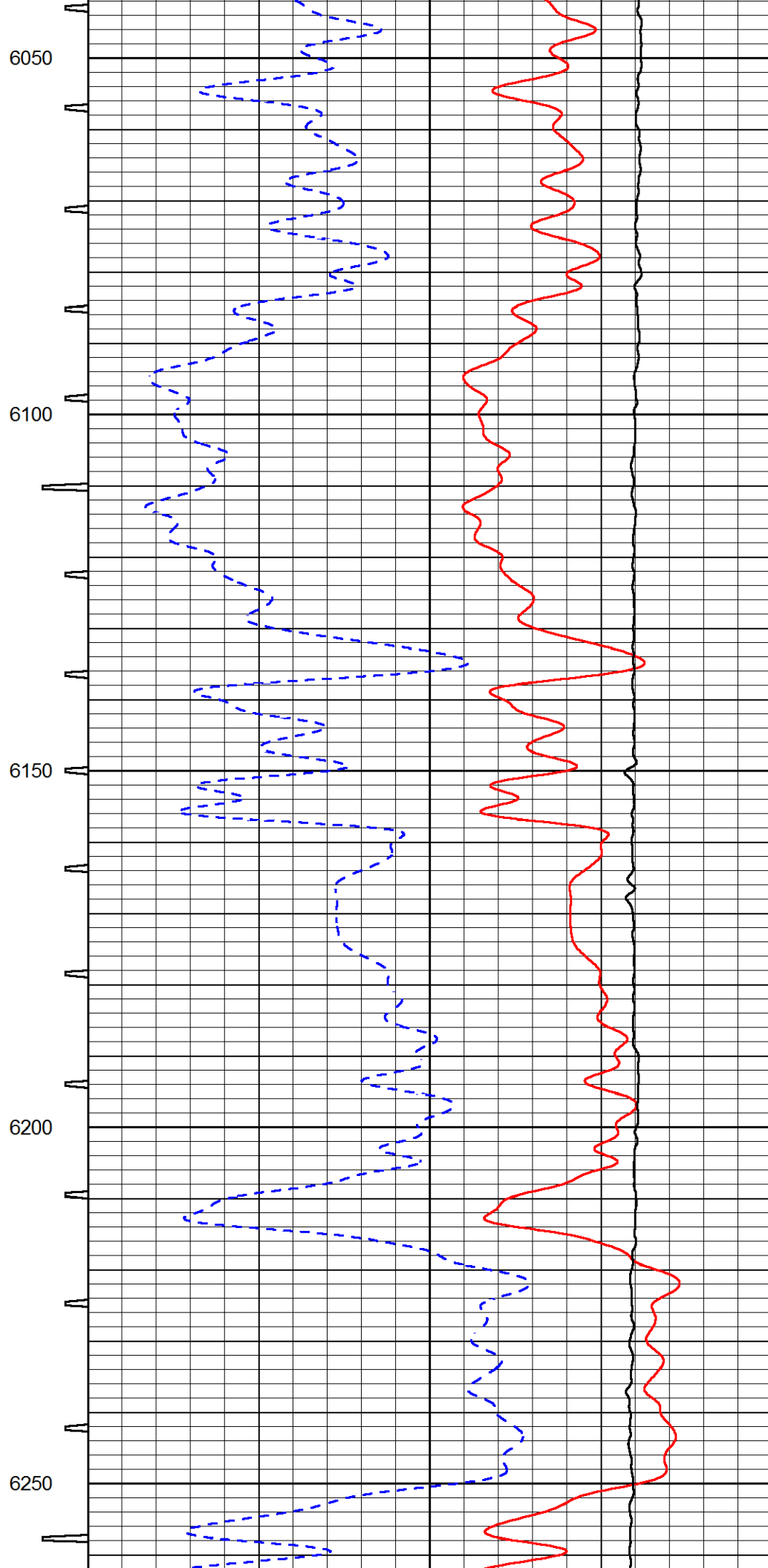
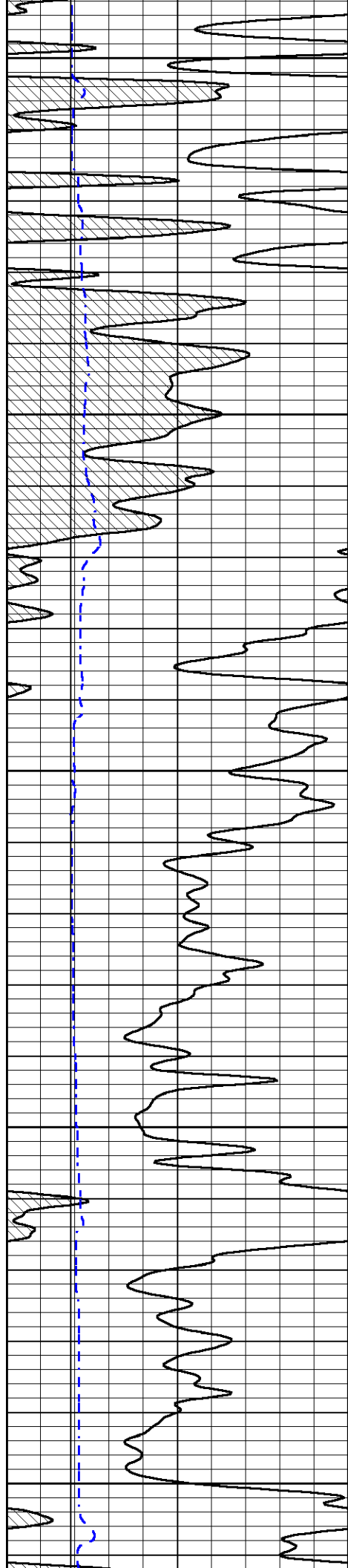


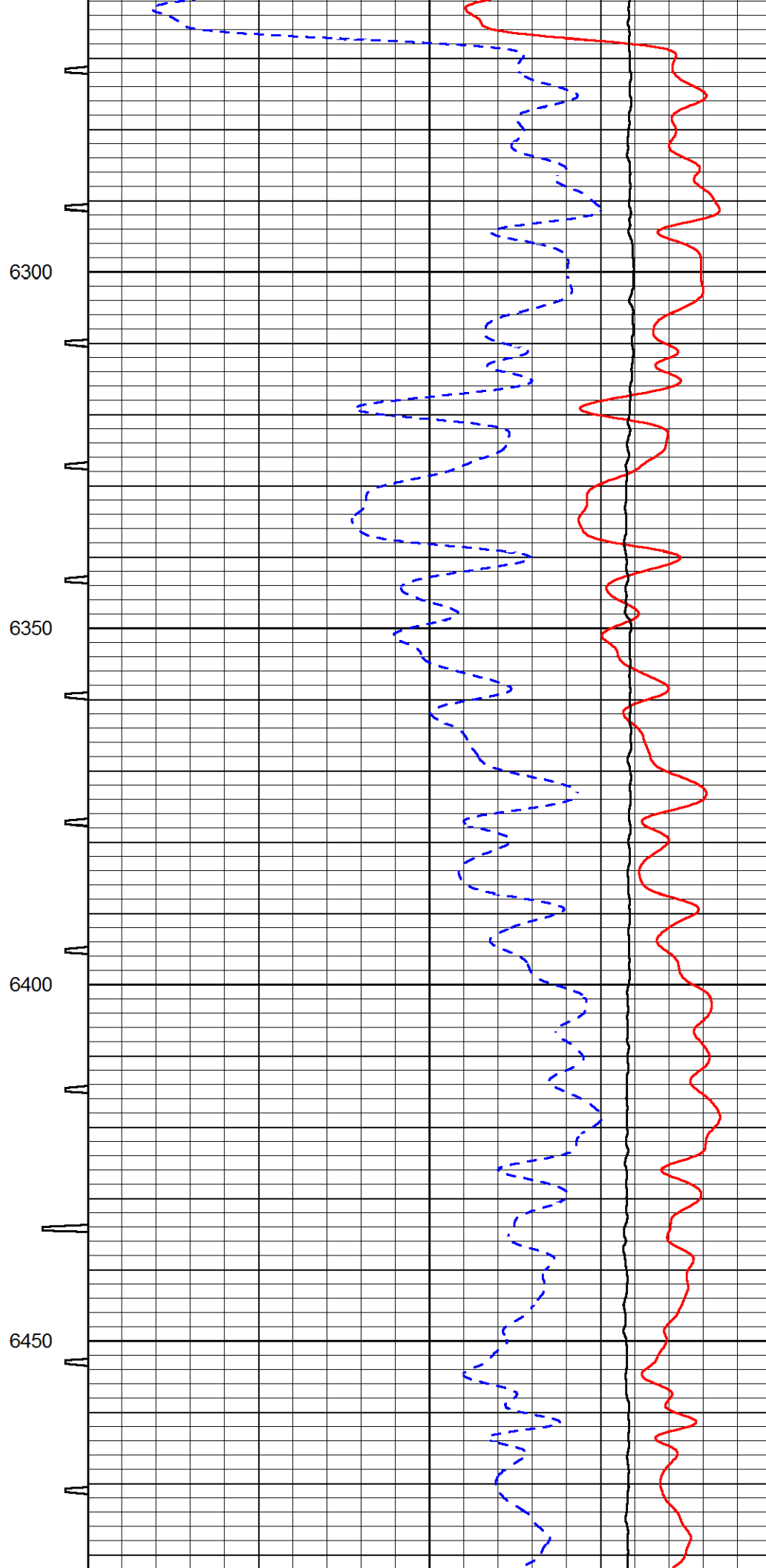
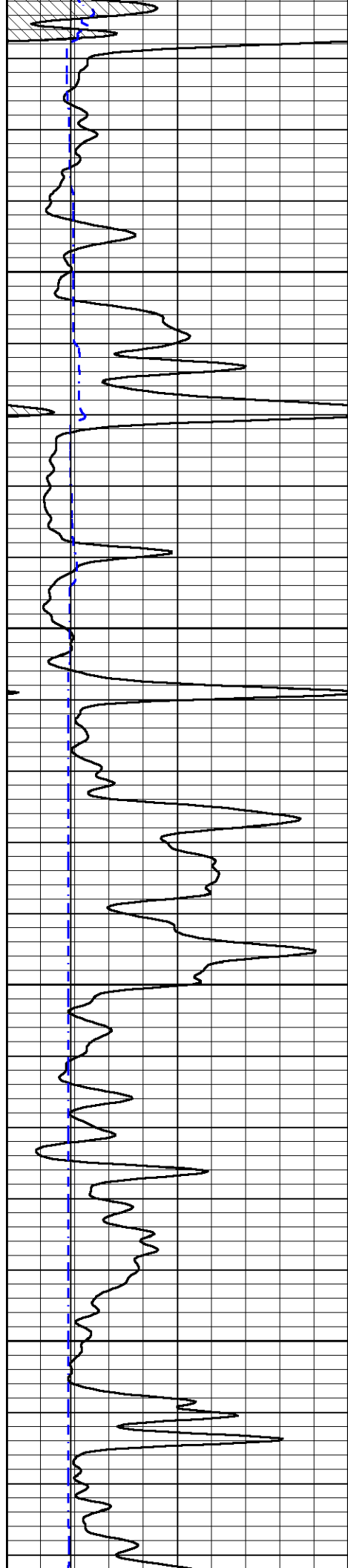


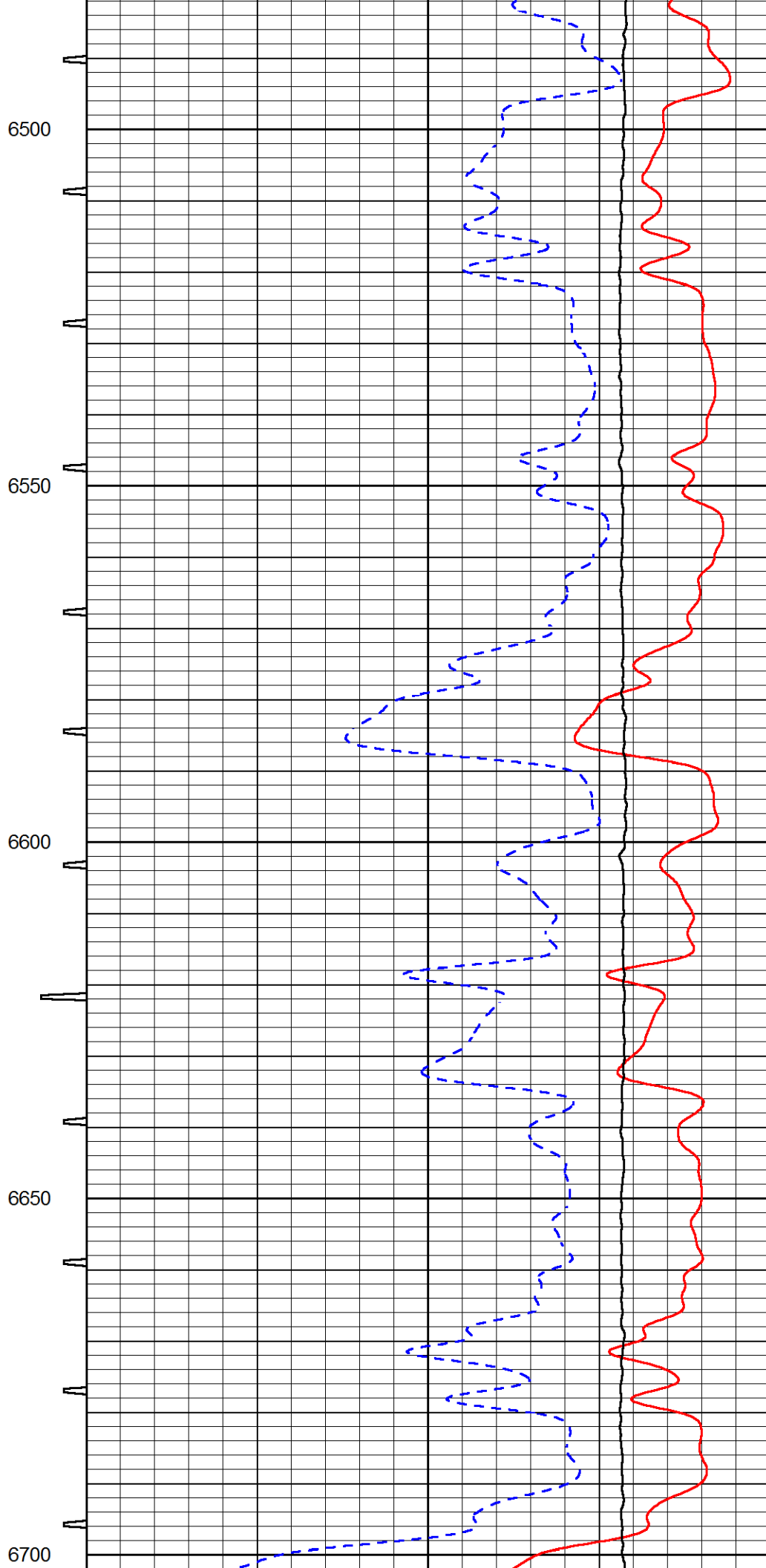
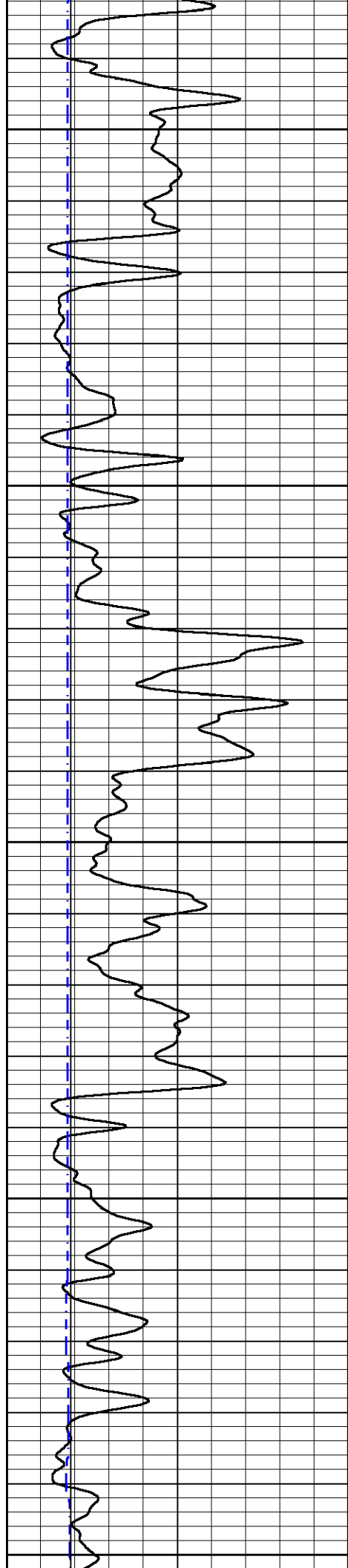


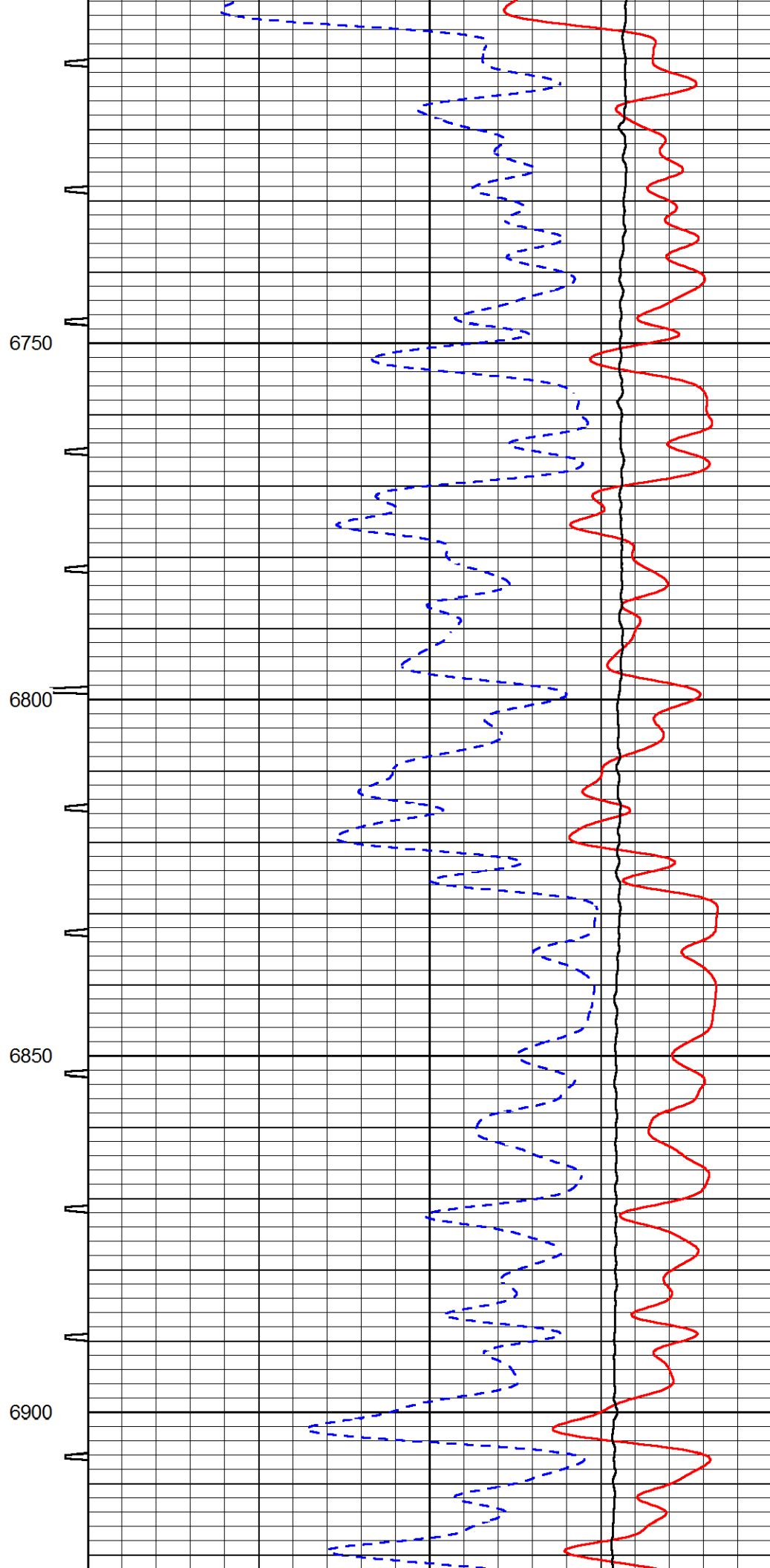
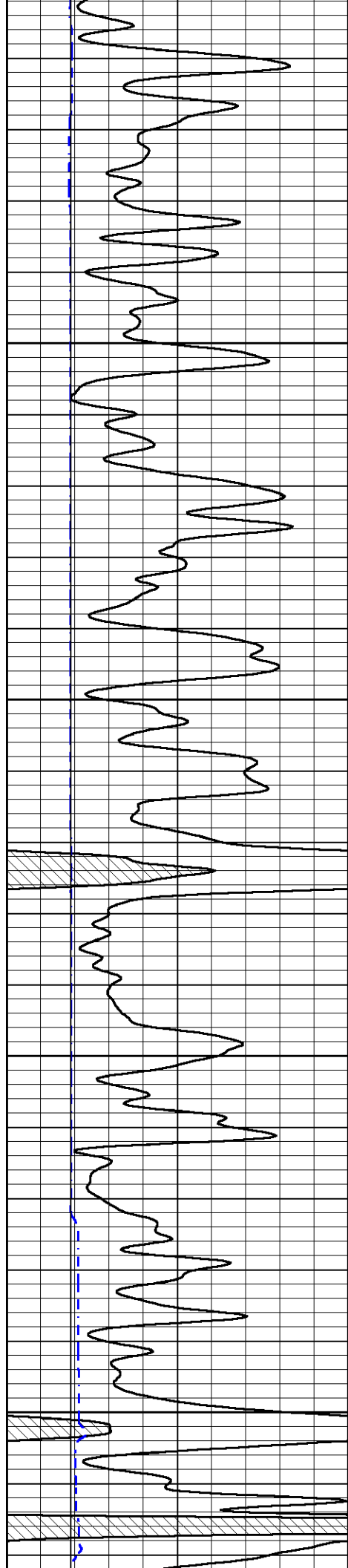




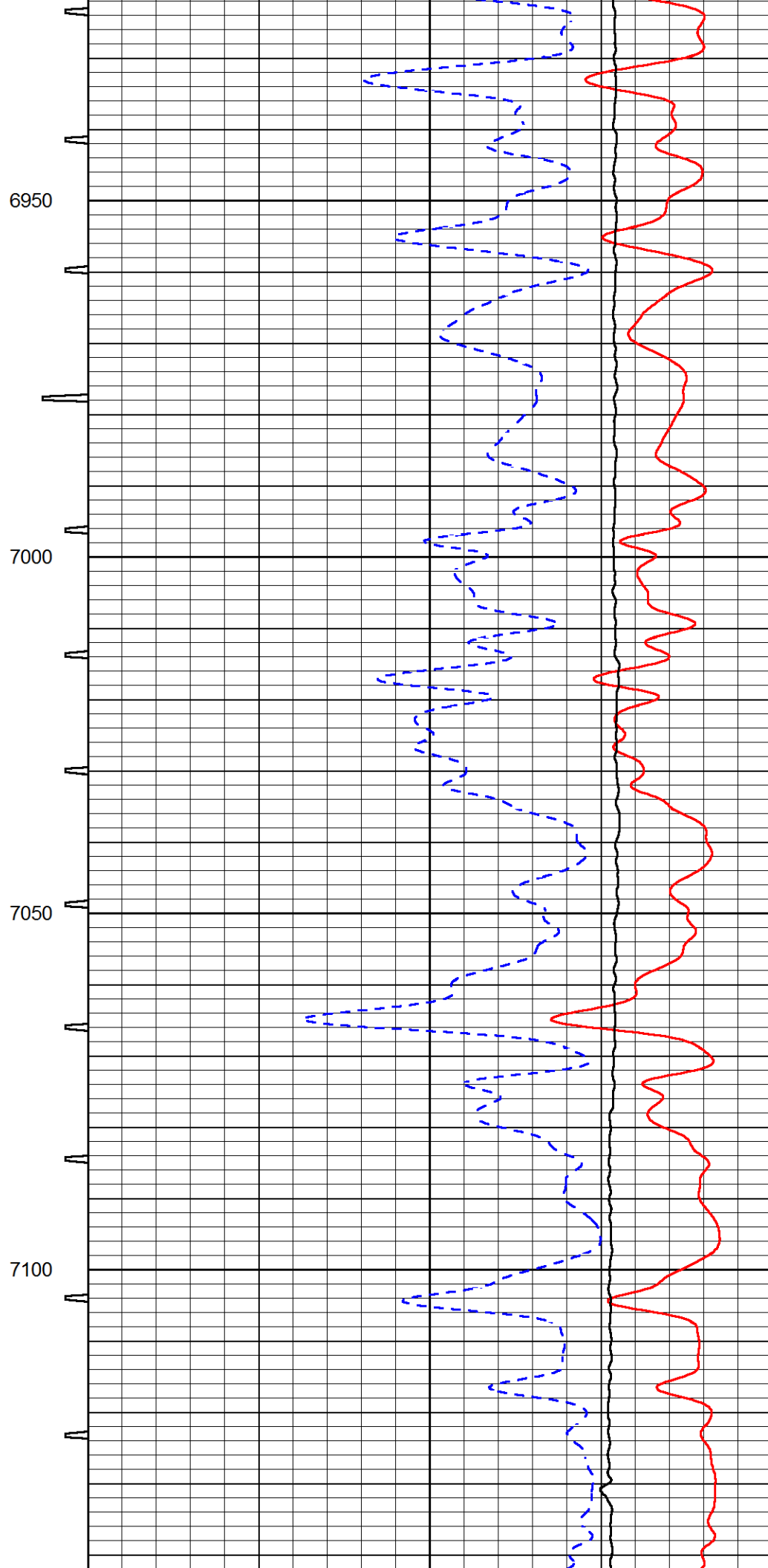
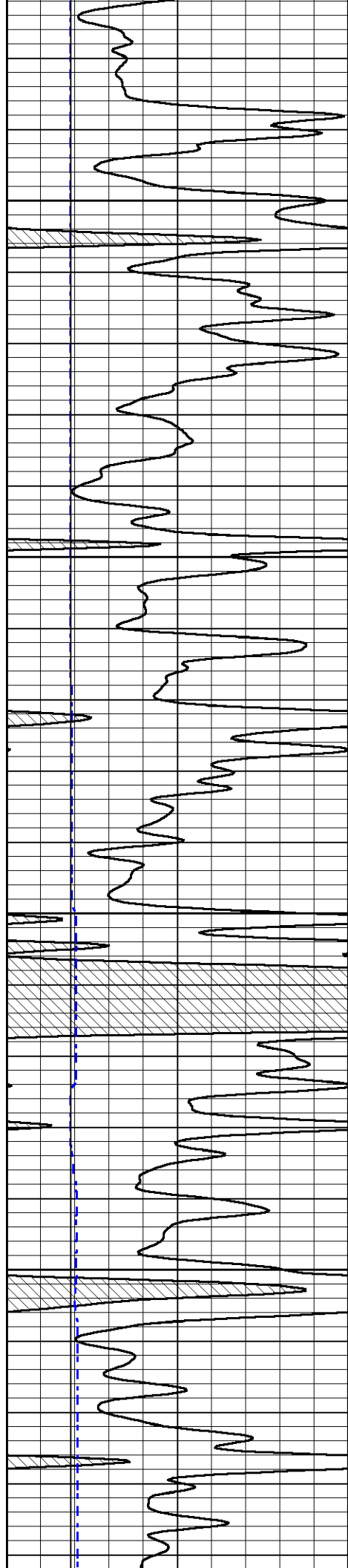


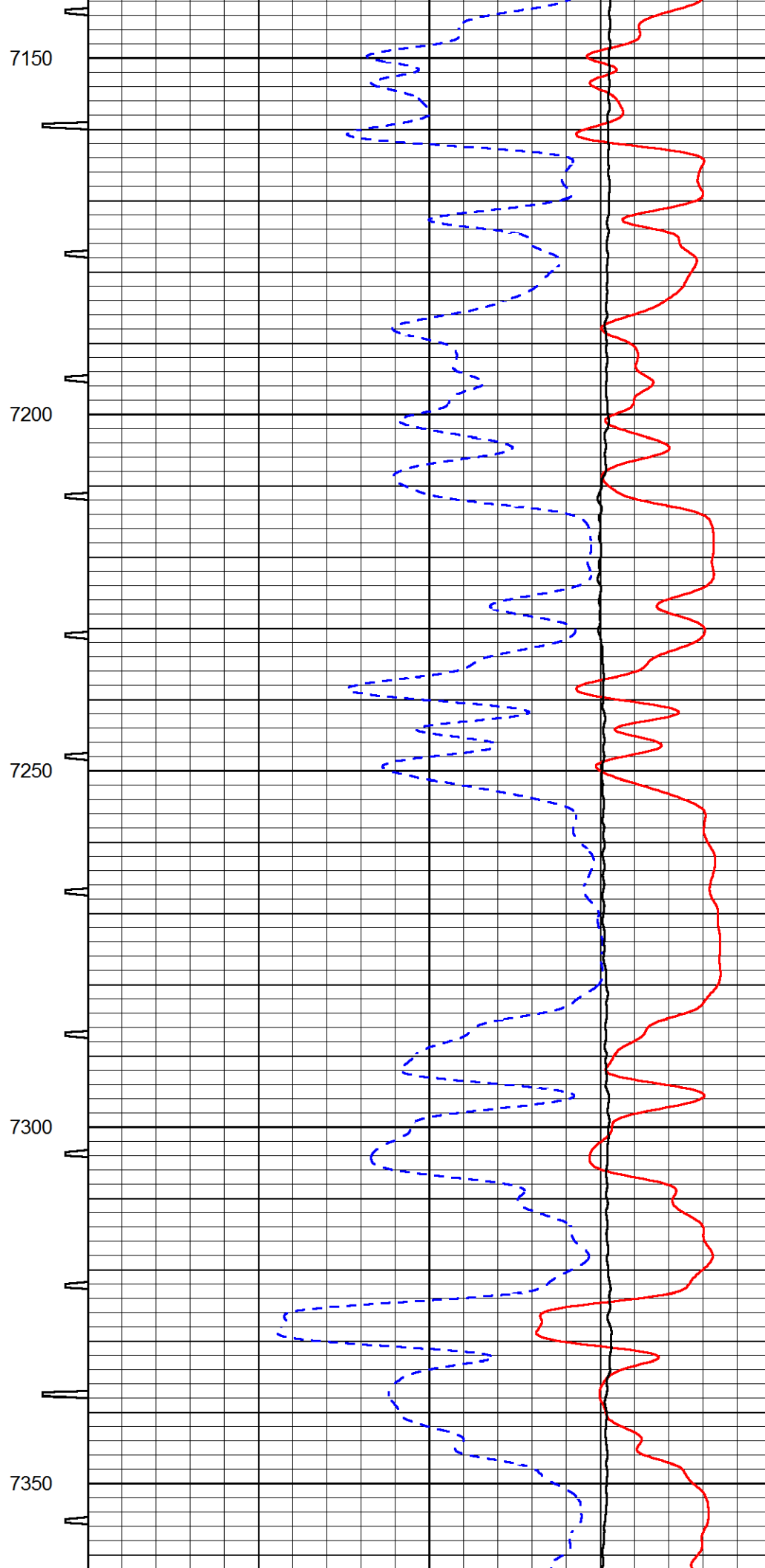
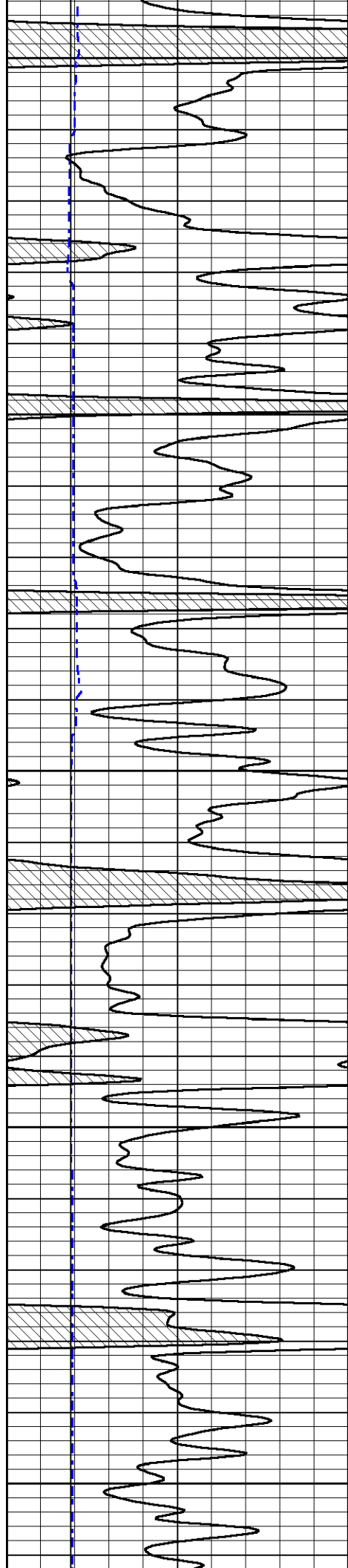


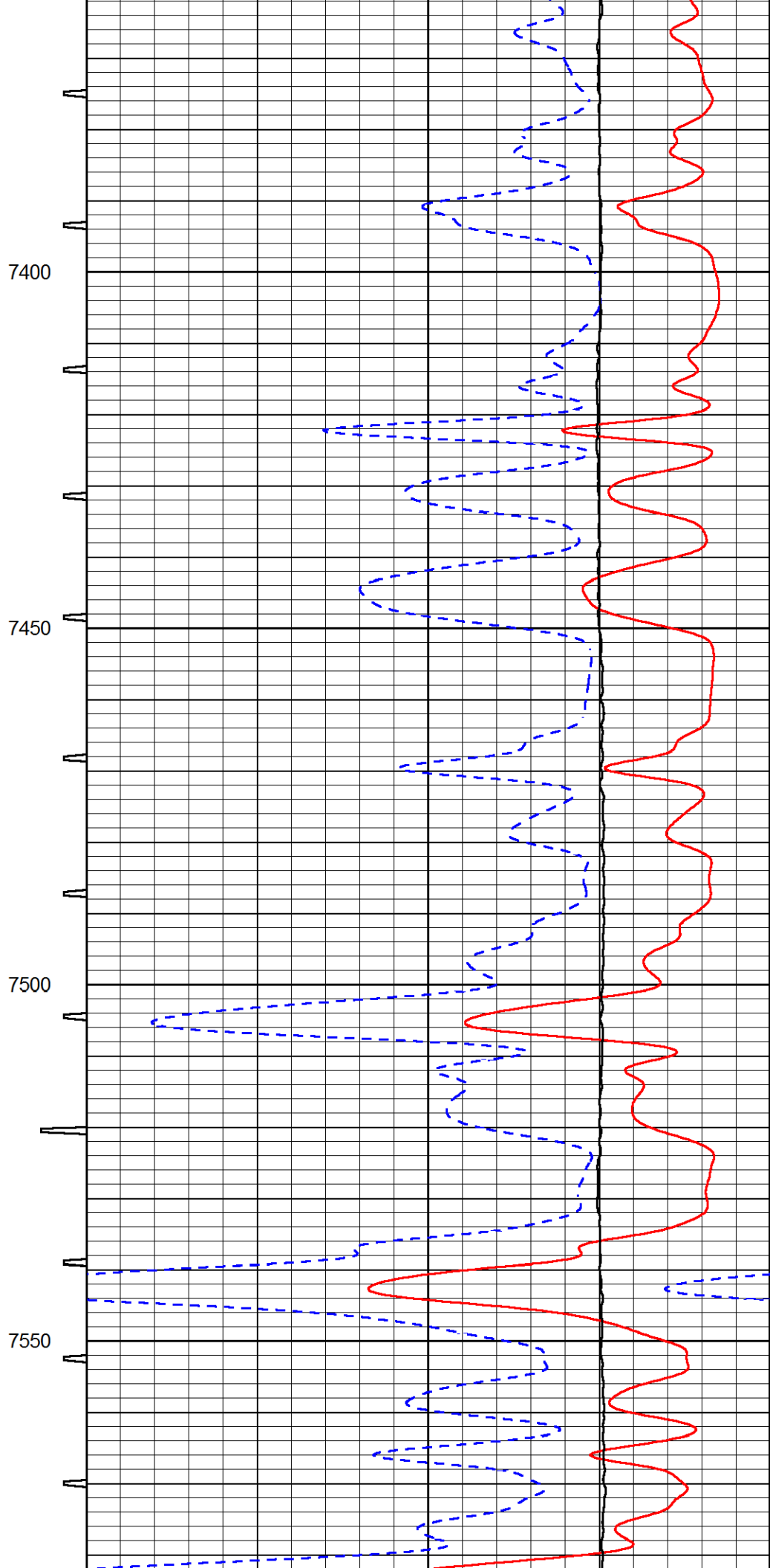
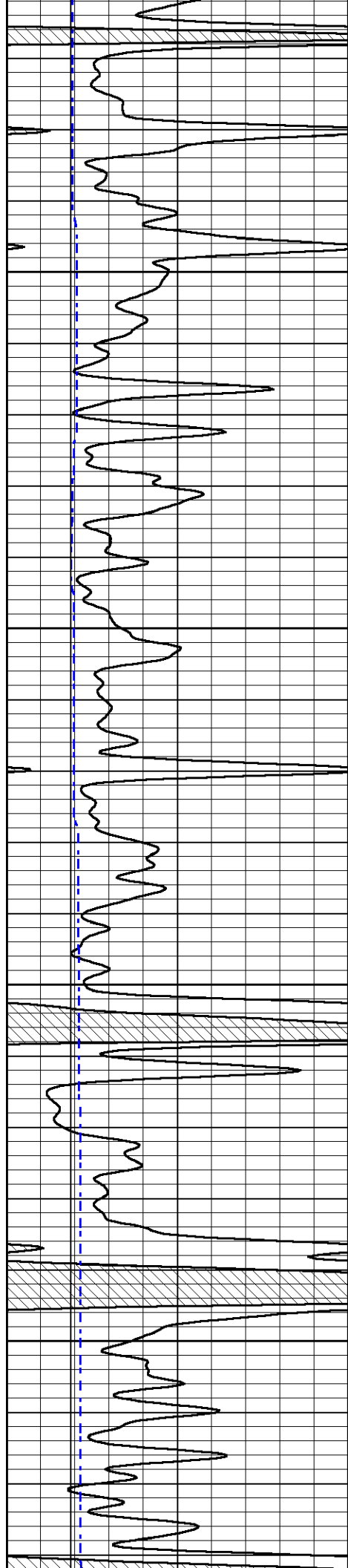


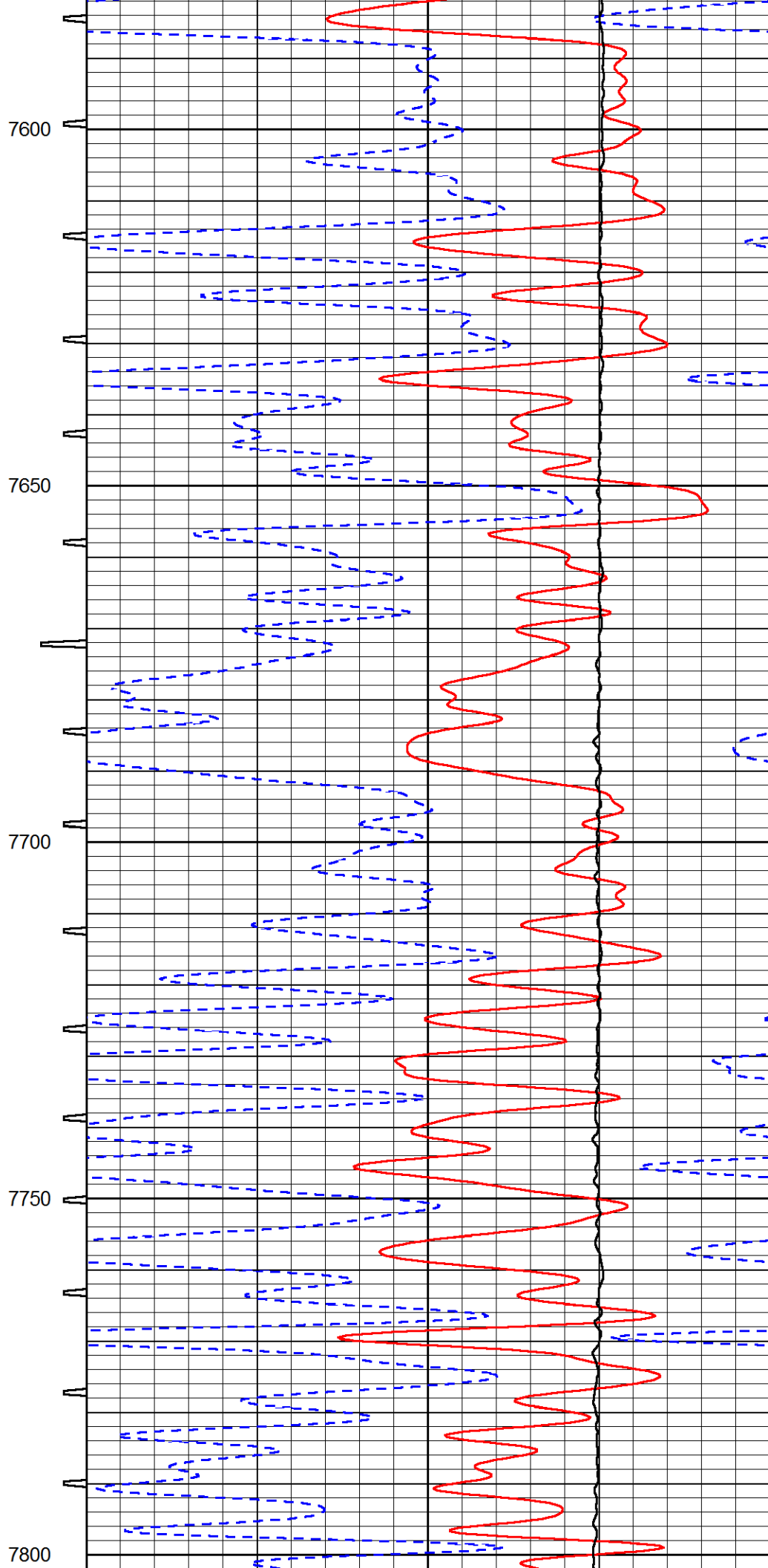
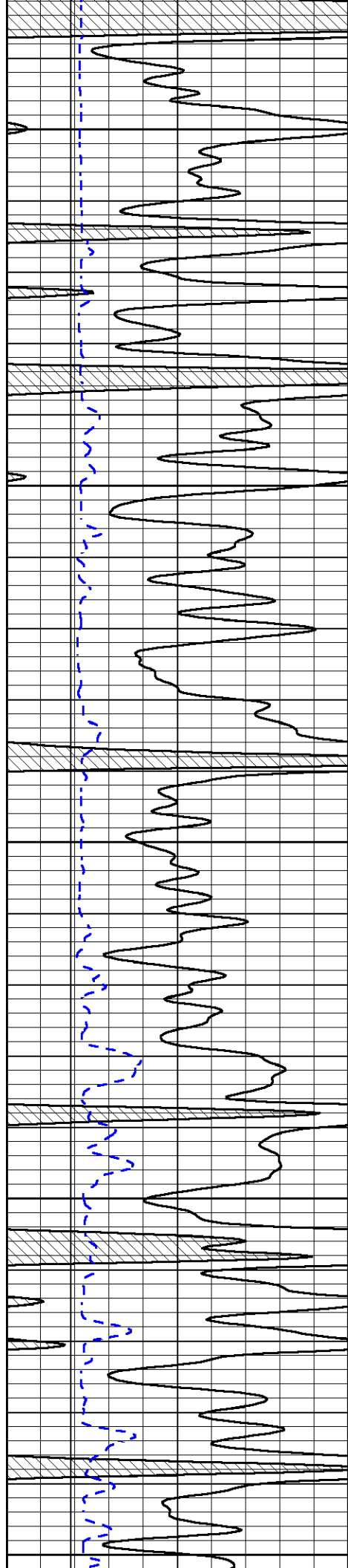


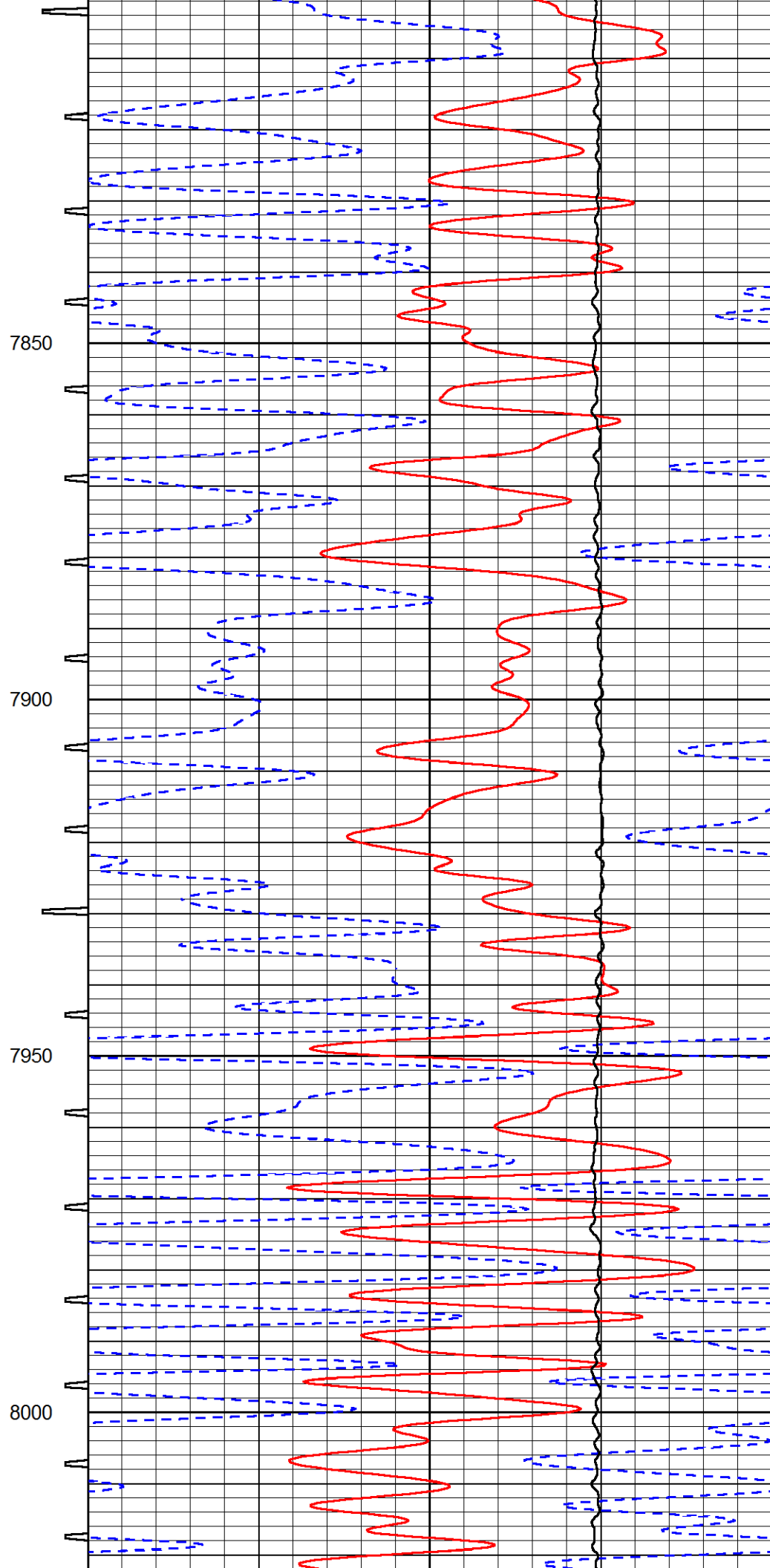
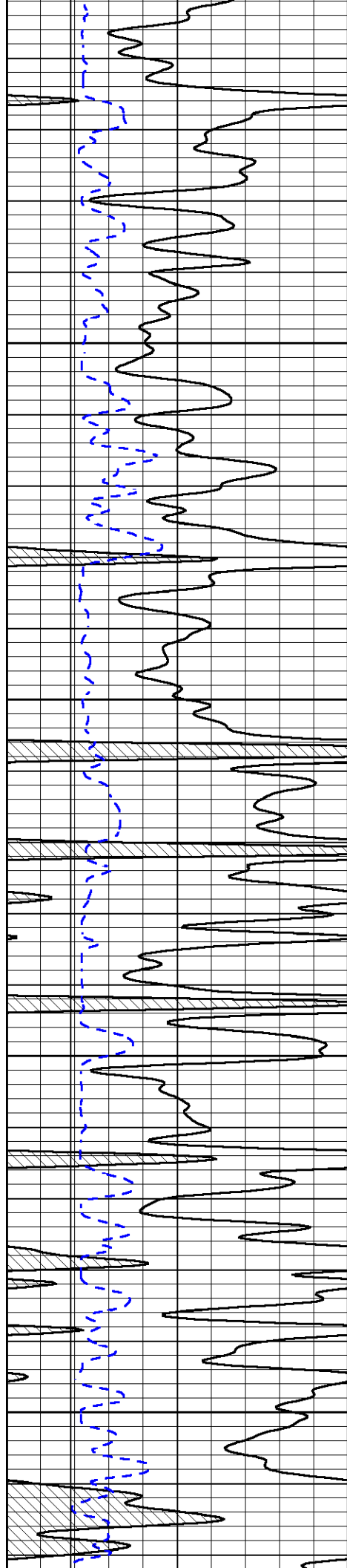


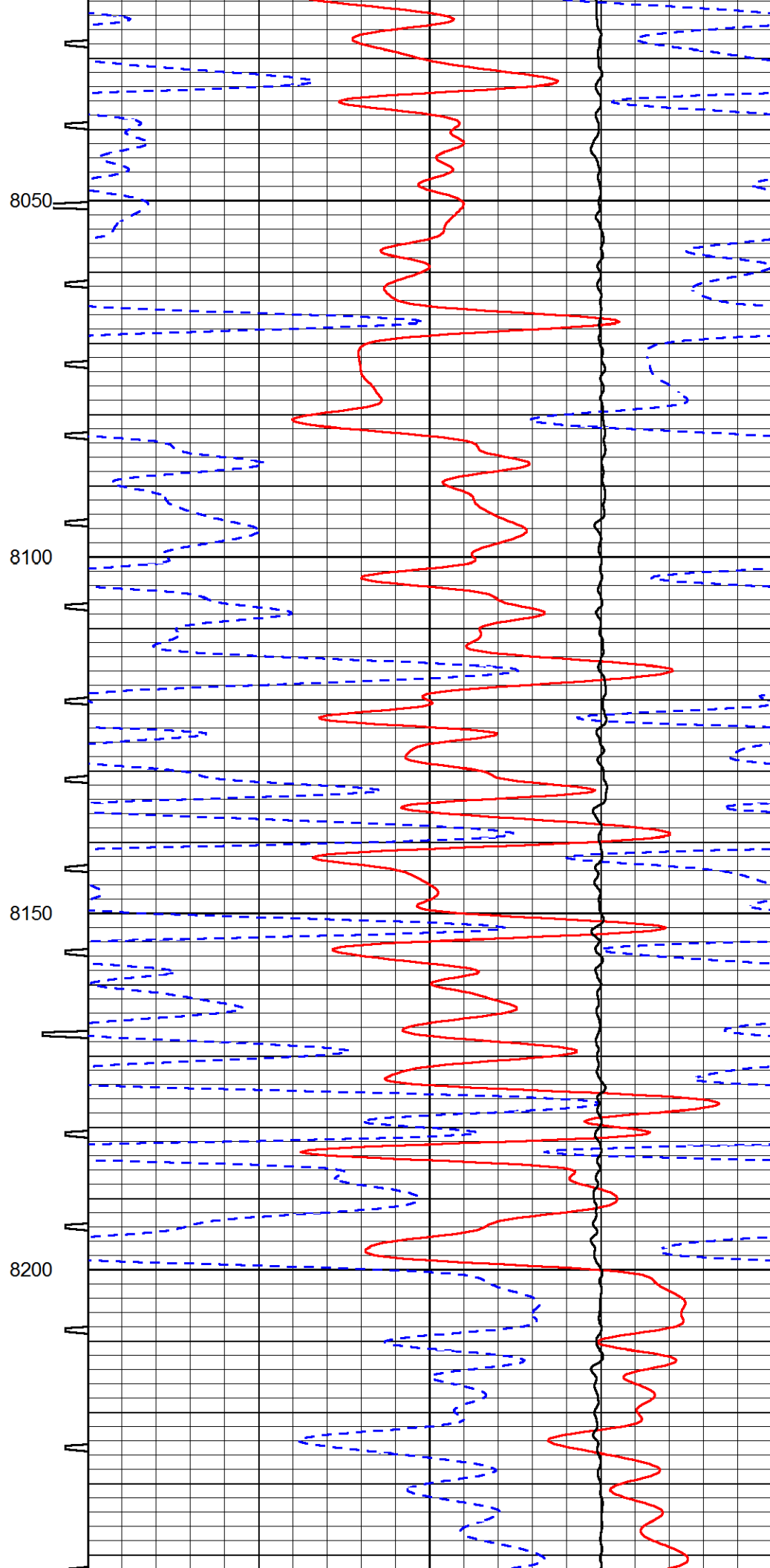
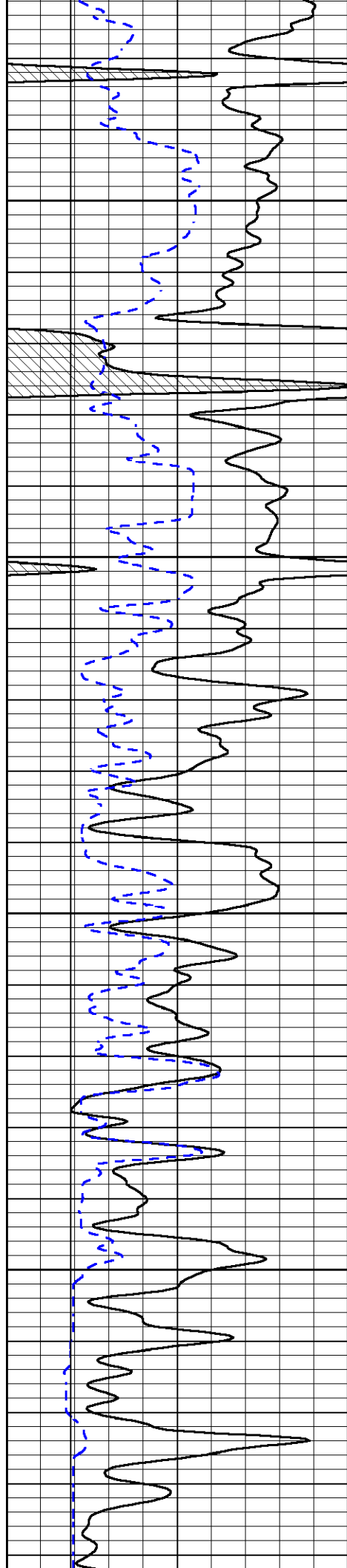


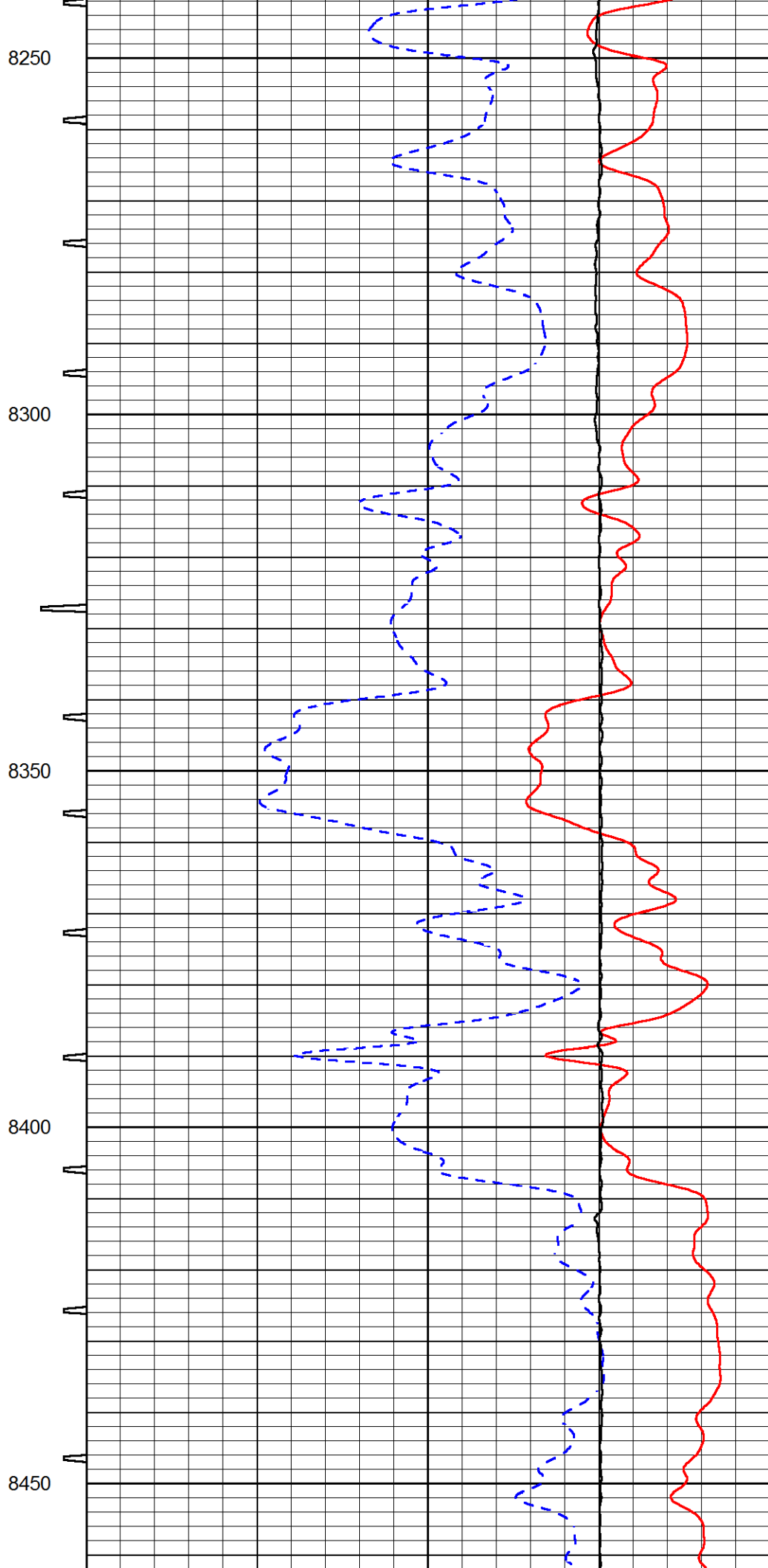
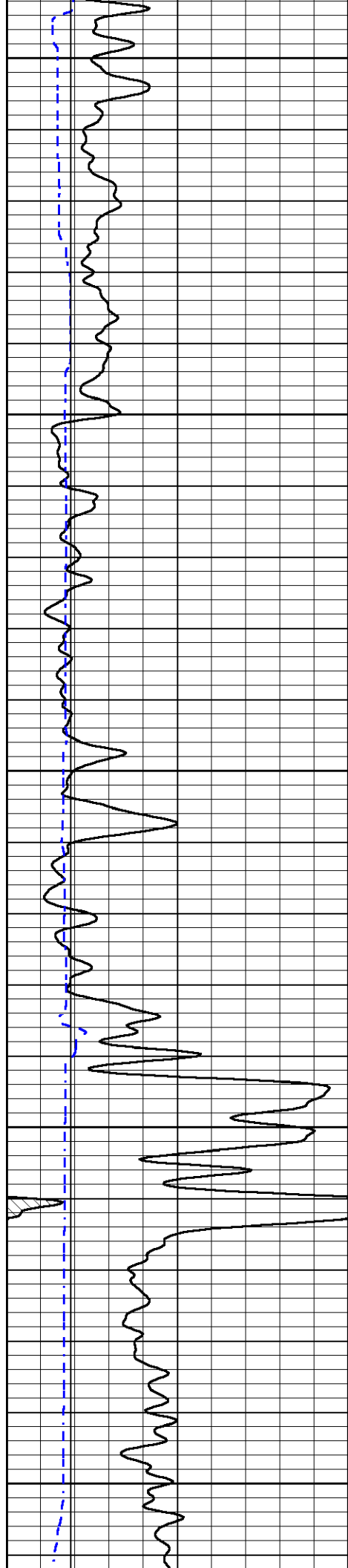


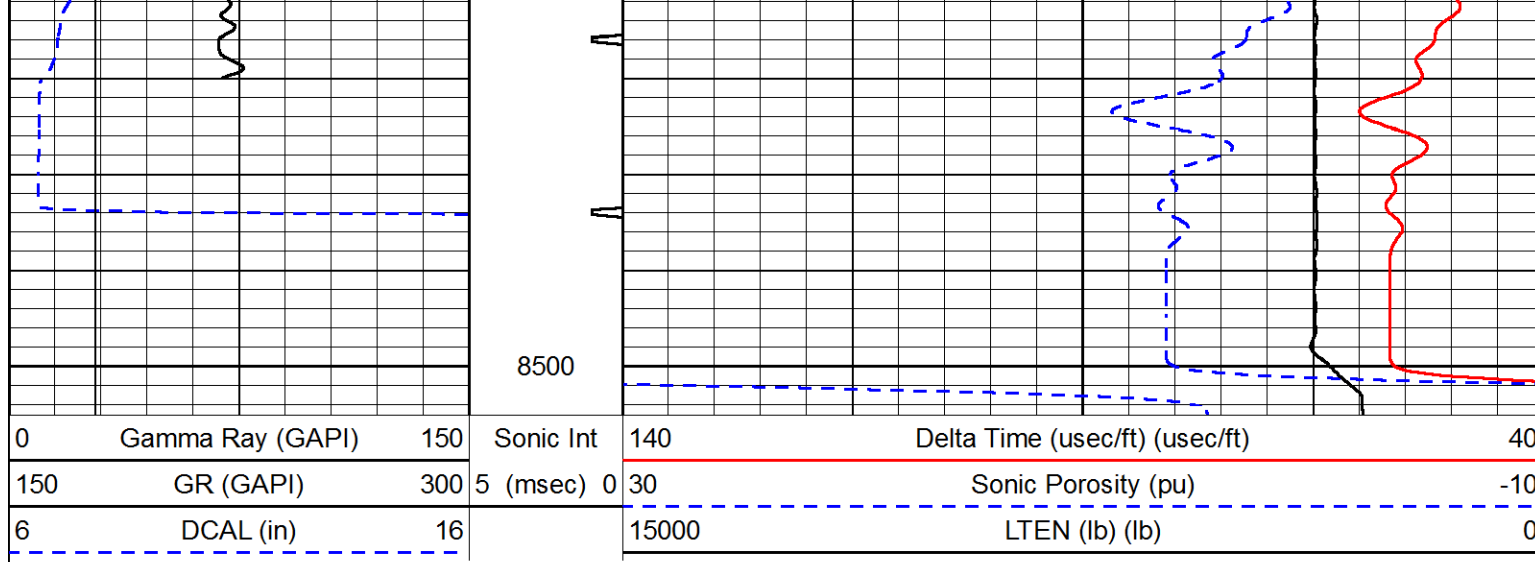












### Calibration Report

Database File murfin\_red poll\_10-21.db  
 Dataset Pathname STKML/pass6.1  
 Dataset Creation Sat Sep 02 01:41:11 2017

### Dual Induction Calibration Report

Serial-Model: PSI 91-M&W  
 Calibration Performed: Thu Aug 10 08:41:25 2017

Readings			References			Results	
Loop:	Air	Loop	Air	Loop		Gain	Offset
Deep	166.796	835.089	0.000	255.800	mmho/m	0.430	-32.000
Medium	142.009	1348.560	0.000	255.800	mmho/m	0.360	-27.000

### Microlog Calibration Report

Serial-Model: PSI-01-PSIML  
 Performed: Fri Aug 11 11:41:38 2017

	Readings		References			Results	
	Zero	Cal	Zero	Cal		m	b
Normal	0.0000	1.0000	0.0000	1.0000	Ohm-m	35000.0000	-0.8000
Inverse	0.0000	1.0000	0.0000	1.0000	Ohm-m	35000.0000	-0.4000
Caliper	1.0001	1.1397	6.5000	18.5000	in	100.0000	-97.1750

### Compensated Density Calibration Report

Serial-Model: 90-1031-M&W  
 Source / Verifier: 16955B / 2ci  
 Master Calibration Performed: Wed Aug 02 00:28:57 2017

### Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	4903.44	6153.79	cps
Aluminum	2.685	g/cc	934.50	4021.31	cps



Spine Angle = 75.61

Density/Spine Ratio = 0.543

	Size		Reading
Small Ring	8.00	in	1.84
Large Ring	22.00	in	1.46

## Compensated Neutron Calibration Report

Serial Number: 207-MW  
Tool Model: M&W  
Calibration Performed: Tues Aug 1 10:30:30 2017

Detector	Readings		Target	Normalization
Short Space	6240.00	cps	1000.00 cps	1.6025
Long Space	460.00	cps	1000.00 cps	1.9500

## Gamma Ray Calibration Report

Serial Number: 89  
Tool Model: M&W  
Calibration Performed: Wed Aug 02 00:29:15 2017

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps  
Calibrator Reading: 1.0 cps

Sensitivity: 0.6000 GAPI/cps



Company MURFIN DRILLING, INC.  
Well RED POLL #10-21  
Field WILDCAT  
County LINCOLN  
State COLORADO