



MIDWEST WIRELINE

# BOREHOLE COMPENSATED SONIC LOG

Company Murfin Drilling Company, Inc.  
 Well Armbrister #1-36  
 Field Nicholson  
 County Trego  
 State Kansas

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Location: API #: 15-195-23150-00-00  
 330 FNL & 1700 FWL  
 SEC 36 TWP 11S RGE 21W  
 Permanent Datum Ground Level Elevation 2296  
 Log Measured From Kelly Bushing  
 Drilling Measured From Kelly Bushing  
 Other Services  
 CNL/CDL  
 DIL/MEL  
 Elevation  
 K.B. 2301  
 D.F.  
 G.L. 2296

Date	11/19/2022						
Run Number	Two						
Type Log	BHCS						
Depth Driller	4000						
Depth Logger	3998						
Bottom Logged Interval	3986						
Top Logged Interval	200						
Type Fluid In Hole	Chemical						
Salinity, PPM CL	3500						
Density	9.0						
Level	Full						
Max. Rec. Temp. F	116						
Operating Rig Time	5 Hours						
Equipment -- Location	P-24 Hays						
Recorded By	D. Schmidt						
Witnessed By	Rod Anderson						
Borehole Record							
Run No.	Bit	From	To	Size	Wgt.	From	To
One	12.25	0	220	8.625	23	0	220
Two	7.875	220	TD				
Casing Record							

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All interpretations are opinions based on inferences from electrical or other measurements and Midwest Wireline LLC cannot and does not guarantee the accuracy or correctness of any interpretation, and Midwest Wireline 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.

Ellis,  
 North to Sleepy Hollow, 3 West,  
 South into

Log Measured From: Kelly Bushing                      5 Ft. Above Permanent Datum

THANK YOU FOR USING MIDWEST WIRELINE LLC  
 785-625-3858

Your Midwest Wireline Crew	This Log Record Was Witnessed By
Engineer: D. Schmidt	Primary Witness: Rod Anderson
Operator:	Secondary Witness:
Operator:	Secondary Witness:
Operator:	Secondary Witness:

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
			CENT-PENGO (3-PENGO)	4.25	3.00	70.00
WVF4 WVF1	12.25 12.25		SLT-PENGO (601) 3 1/2 BHC Sonic	16.00	3.50	300.00
WVF3 WVF2	10.25 10.25					
			CENT-PENGO (4-PENGO)	4.25	3.00	70.00

Dataset: murfin\_arbrister 1-36.db: field/well/son/pass2  
 Total length: 24.50 ft  
 Total weight: 440.00 lb  
 O.D.: 3.50 in

# Log Variables

DatabaseC:\ProgramData\Warrior\Data\murfin\_arbrister 1-36.db  
 Dataset field/well/stkml/pass3.1/\_vars\_

## Top - Bottom

A	BOREID in	BOTTEMP degF	CASEOD in	CASETHCK in	FLUIDDEN g/cc	M	MATRXDEN g/cc
1	7.875	116	4.5	0	1	2	2.71
NPORSEL	PERFS	SNDERR mmho/m	SNDERRM mmho/m	SPSHIFT mV	SRFTEMP degF	SZCOR	TDEPTH ft
Limestone	0	0	0	33	40	Off	3998

## Variable Description

A : Cement Factor (a)  
 BOREID : Borehole I.D.  
 BOTTEMP : Bottom Hole Temperature  
 CASEOD : Casing O.D.  
 CASETHCK : Casing Thickness  
 FLUIDDEN : Fluid Density  
 M : Cement Exp (m)  
 MATRXDEN : Matrix Density

NPORSEL : Neutron Porosity Curve Select  
 PERFS : Perforation Flag  
 SNDERR : Deep Sonde Error Correction  
 SNDERRM : Medium Sonde Error Correction  
 SPSHIFT : S.P. Baseline Offset  
 SRFTEMP : Surface Temperature  
 SZCOR : CN Size Cor. ?  
 TDEPTH : Total Depth

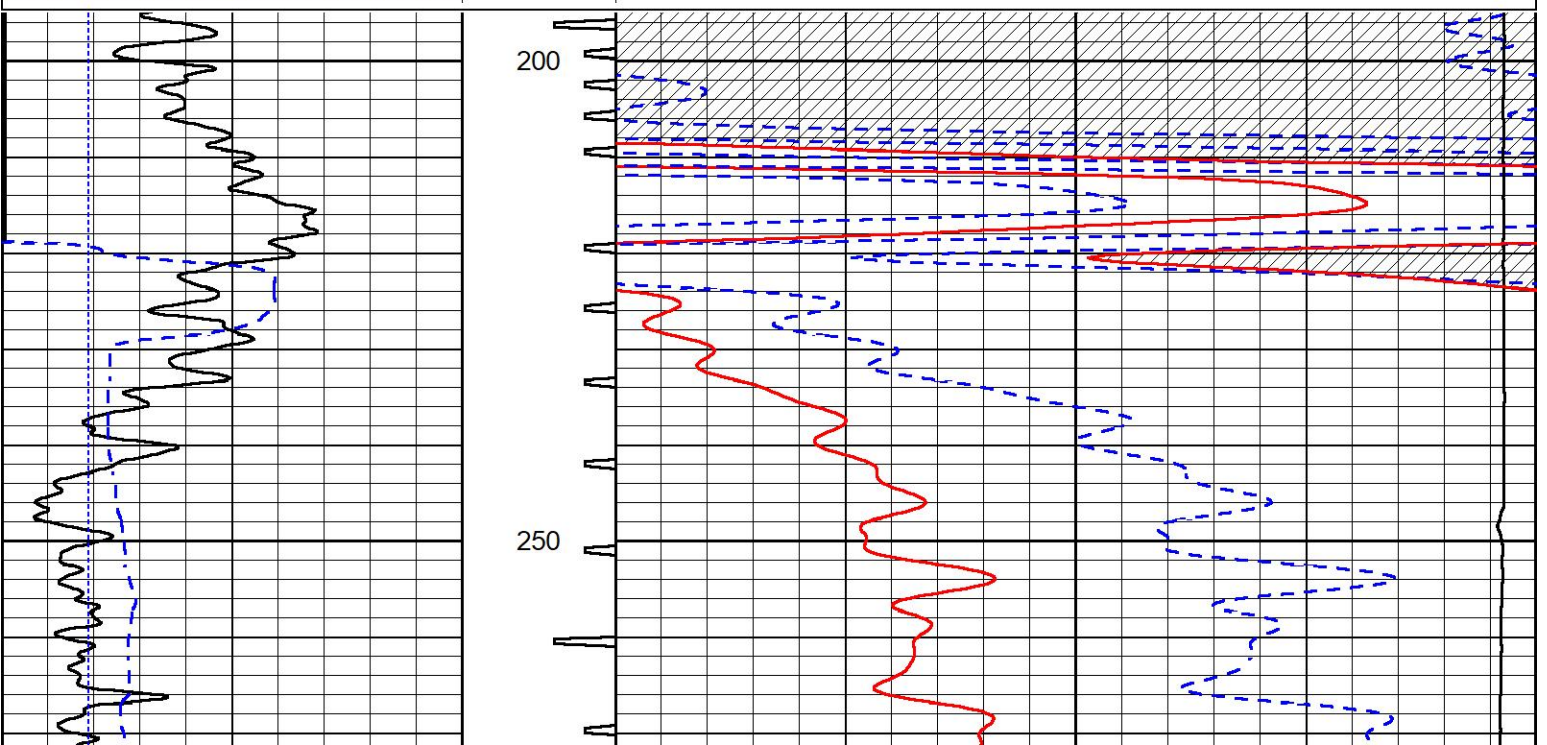


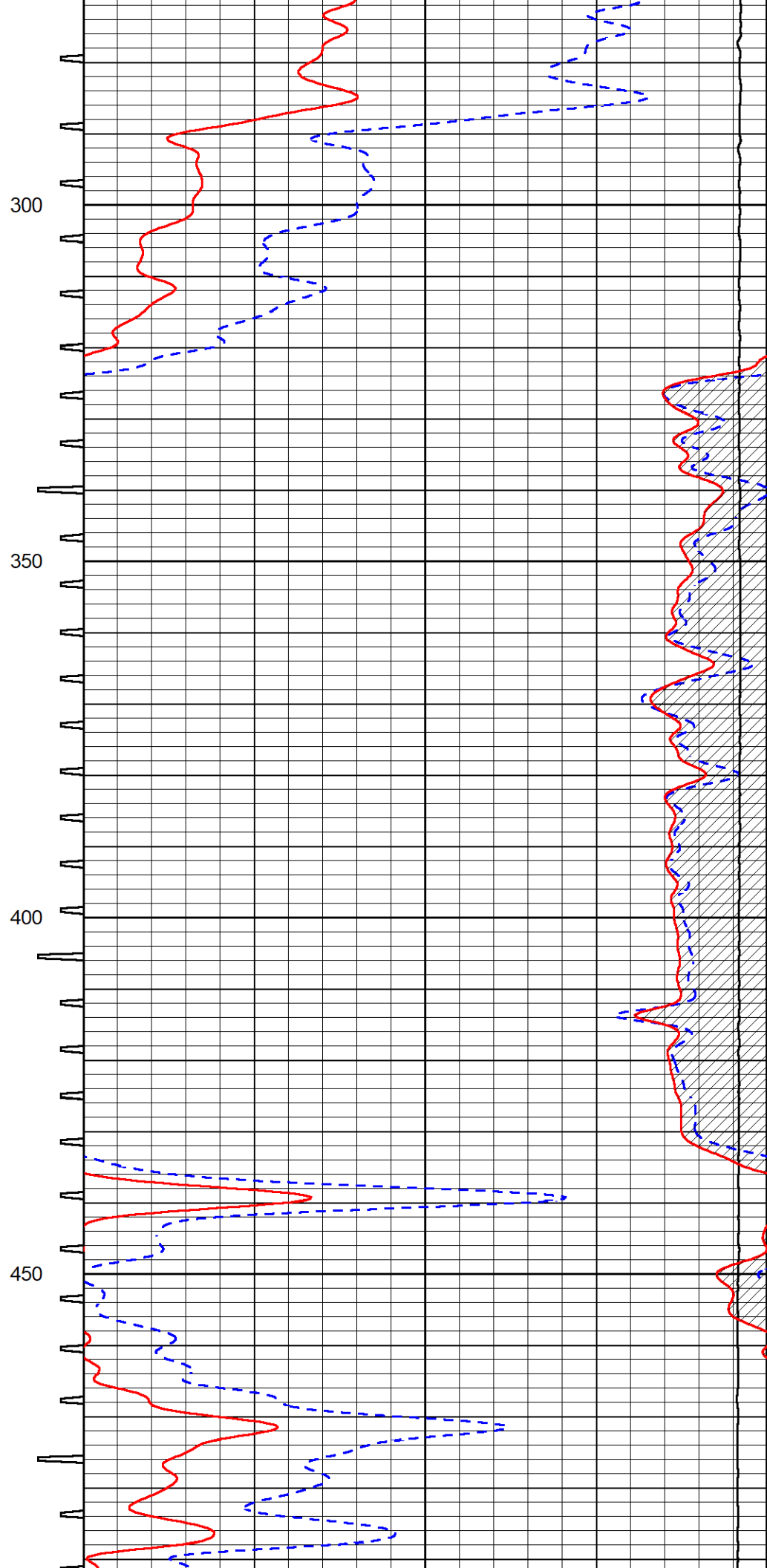
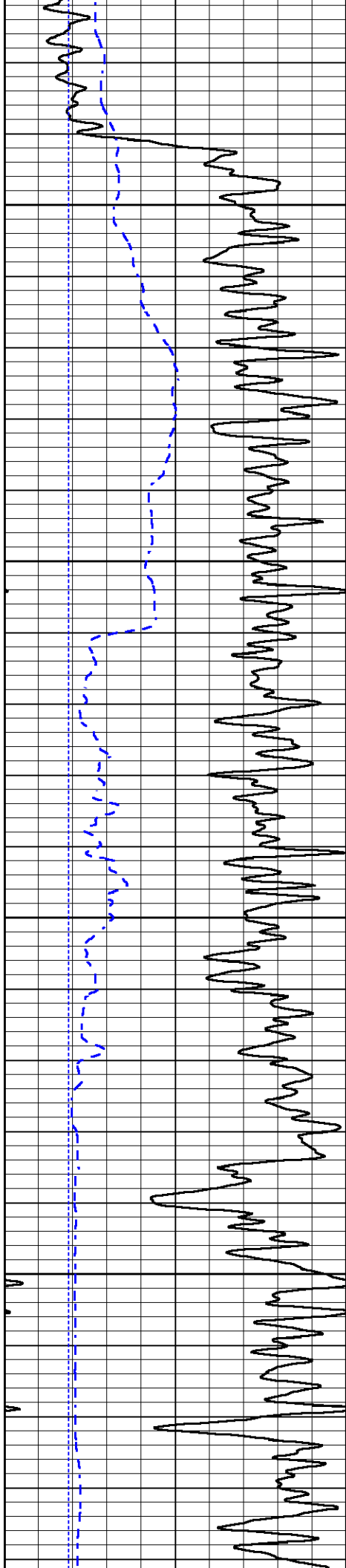
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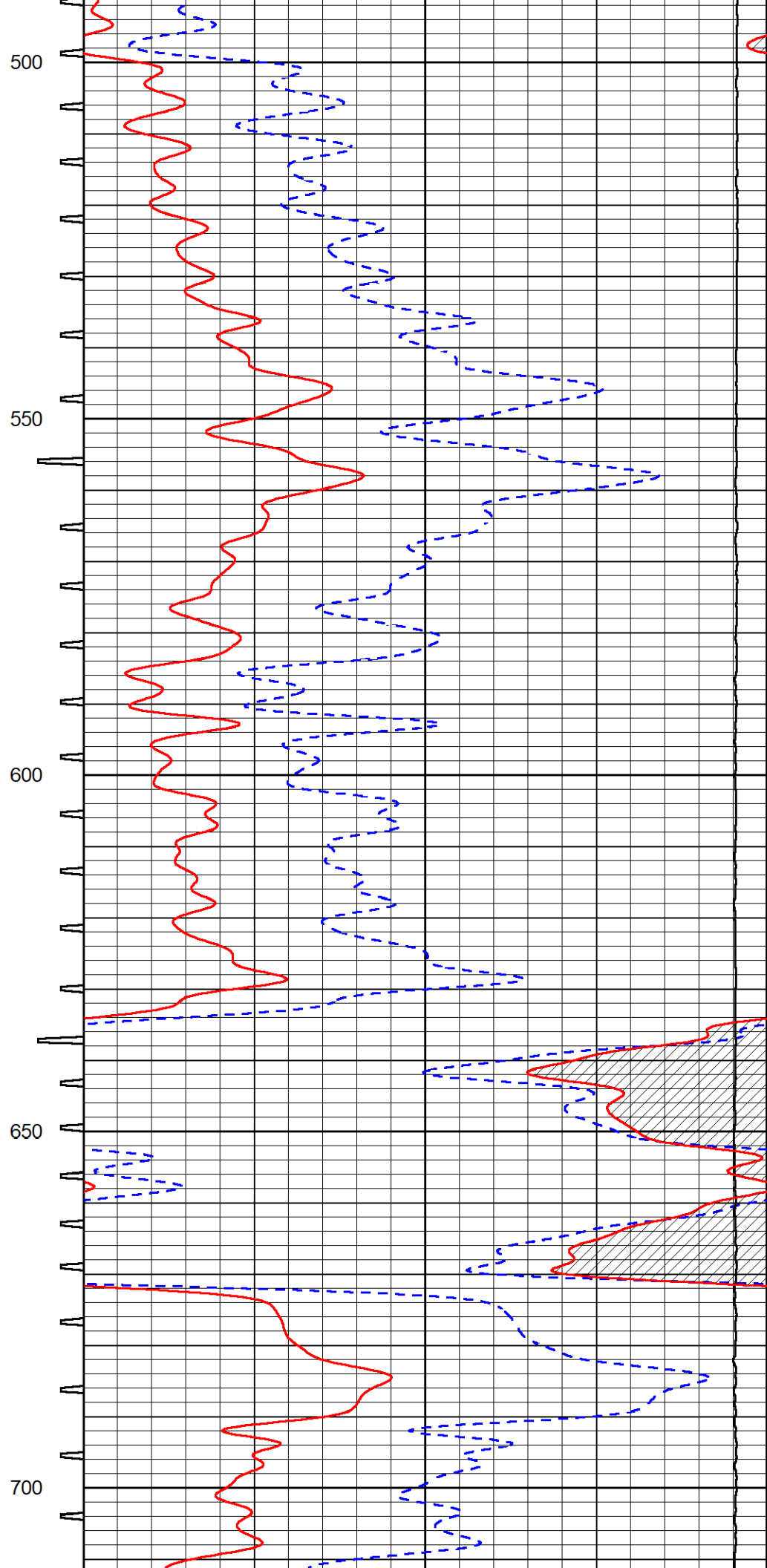
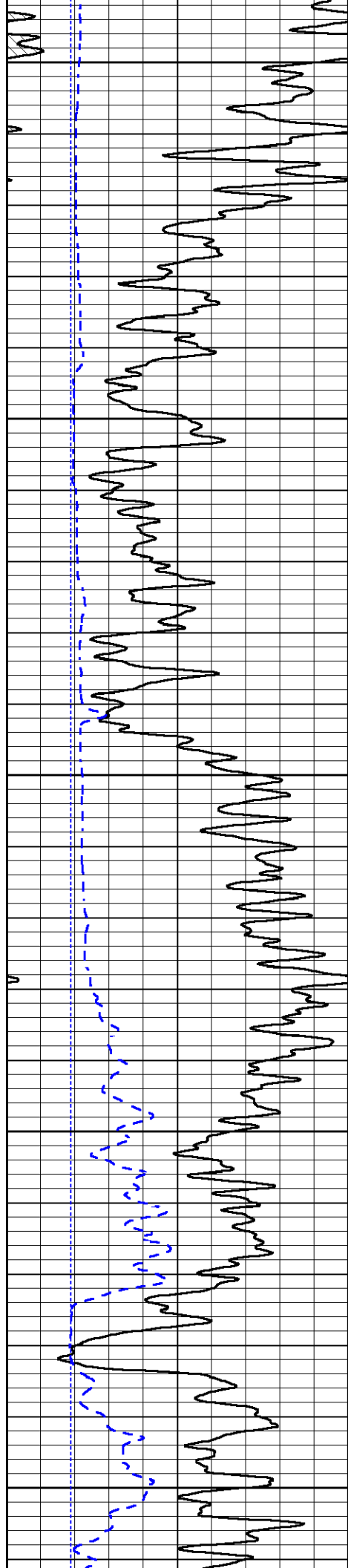
### MAIN PASS

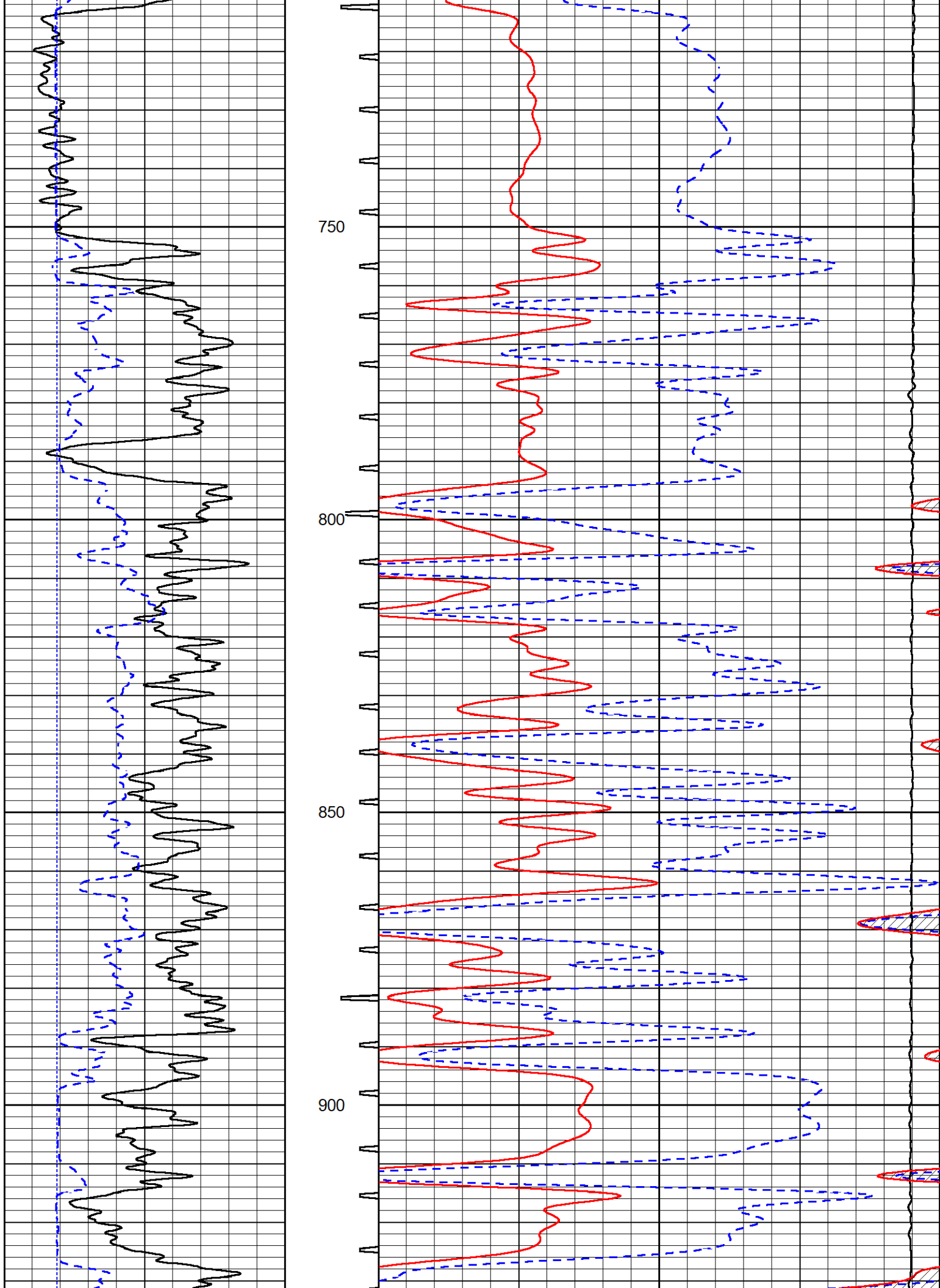
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 Dataset Pathname stkml/pass3.4  
 Presentation Format \_sonic  
 Dataset Creation Sat Nov 19 15:53:44 2022  
 Charted by Depth in Feet scaled 1:240

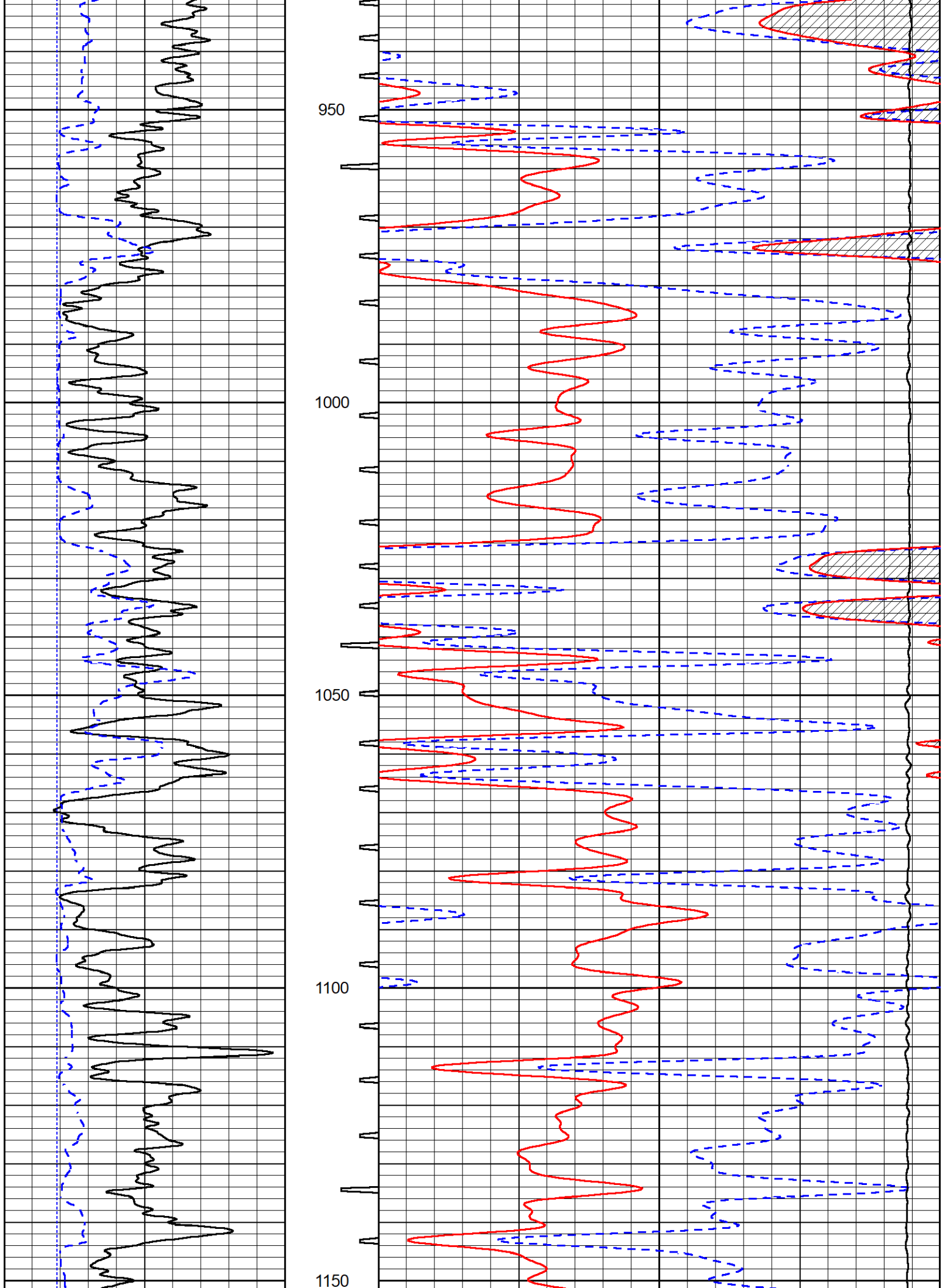
0	Gamma Ray (GAPI)	150	Sonic Int	140	Delta Time (usec/ft) (usec/ft)	40
150	GR (GAPI)	300	5 (msec) 0	30	Sonic Porosity (pu) (pu)	-10
6	Caliper (in)	16		15000	Line Tension (lb)	0

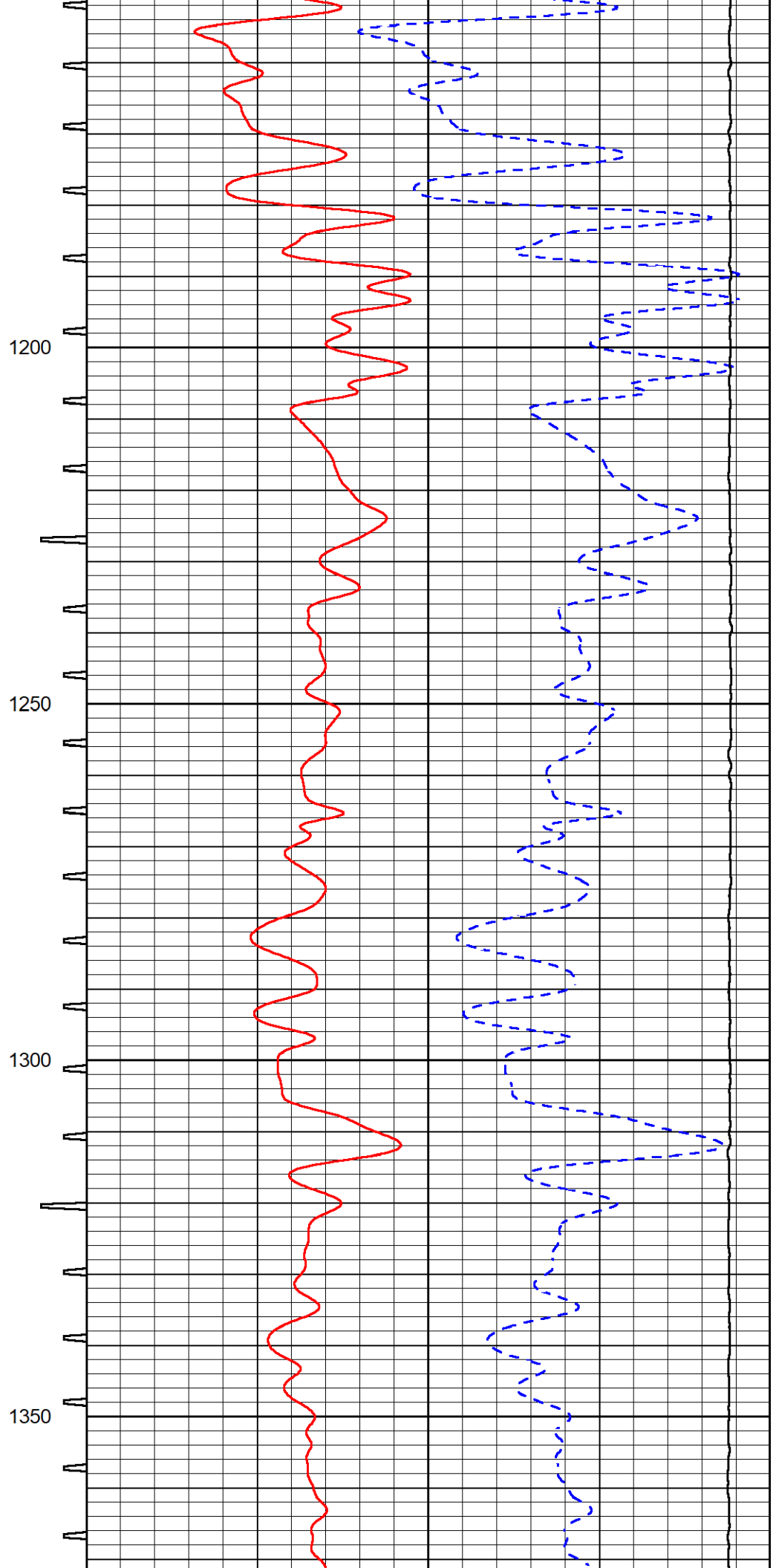
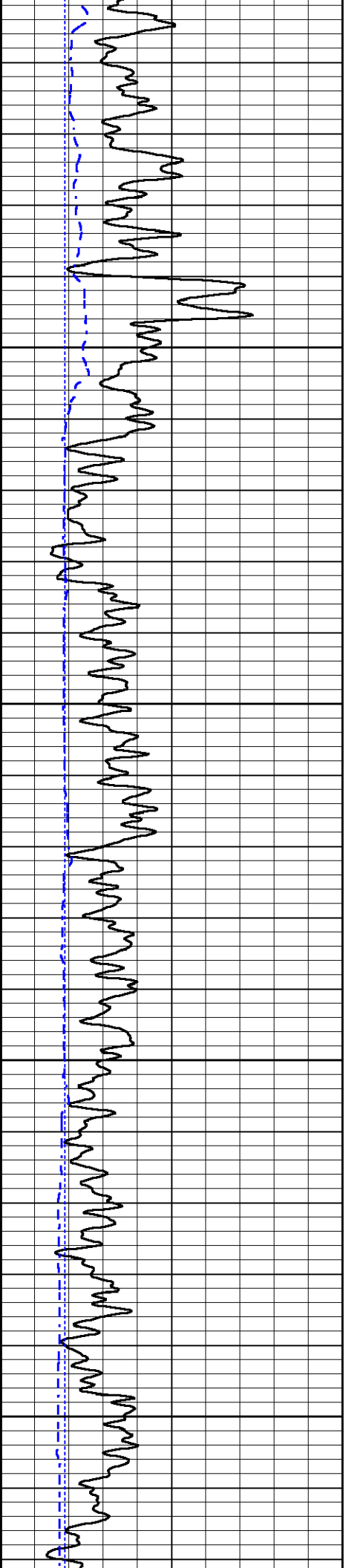


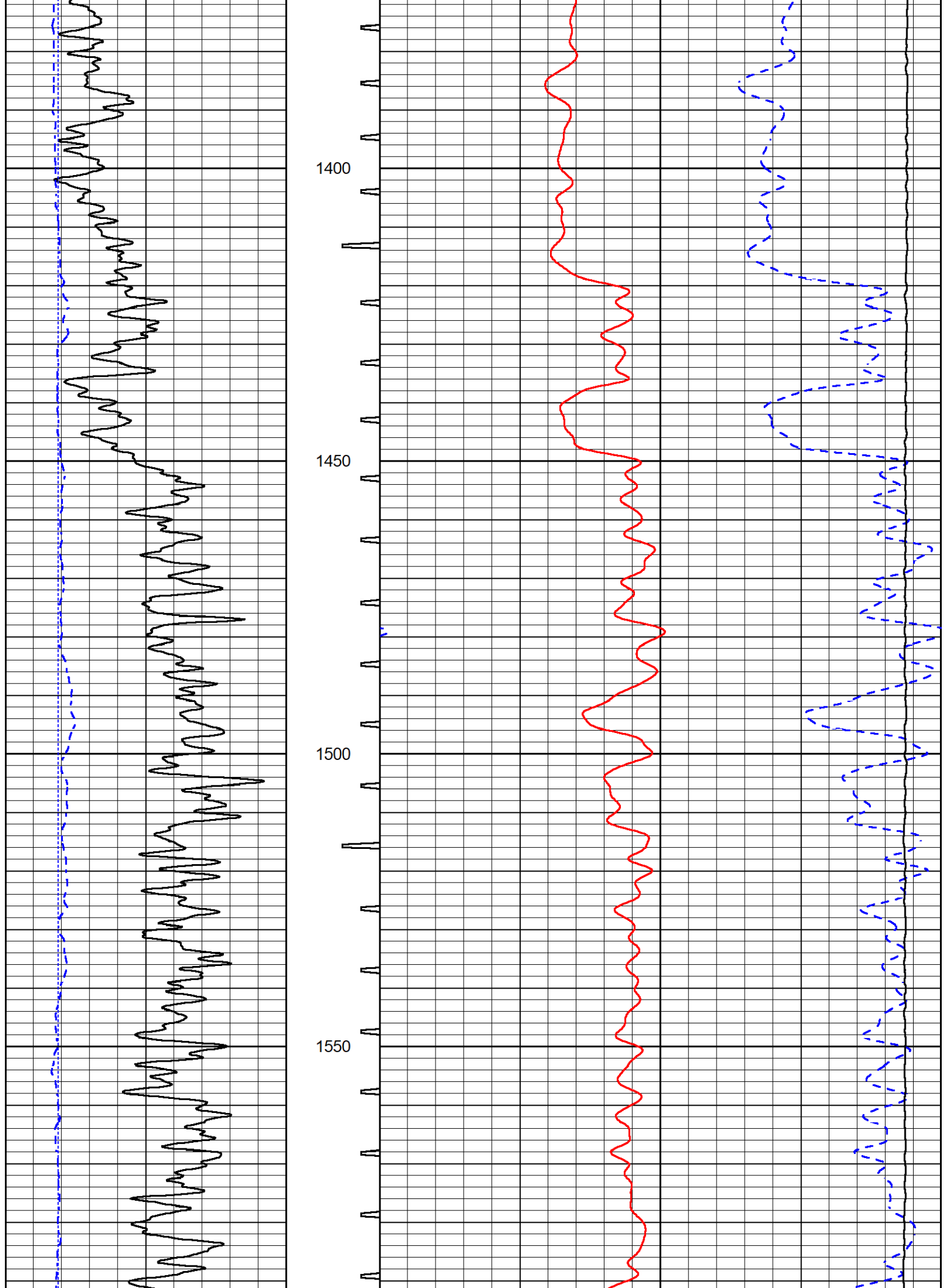


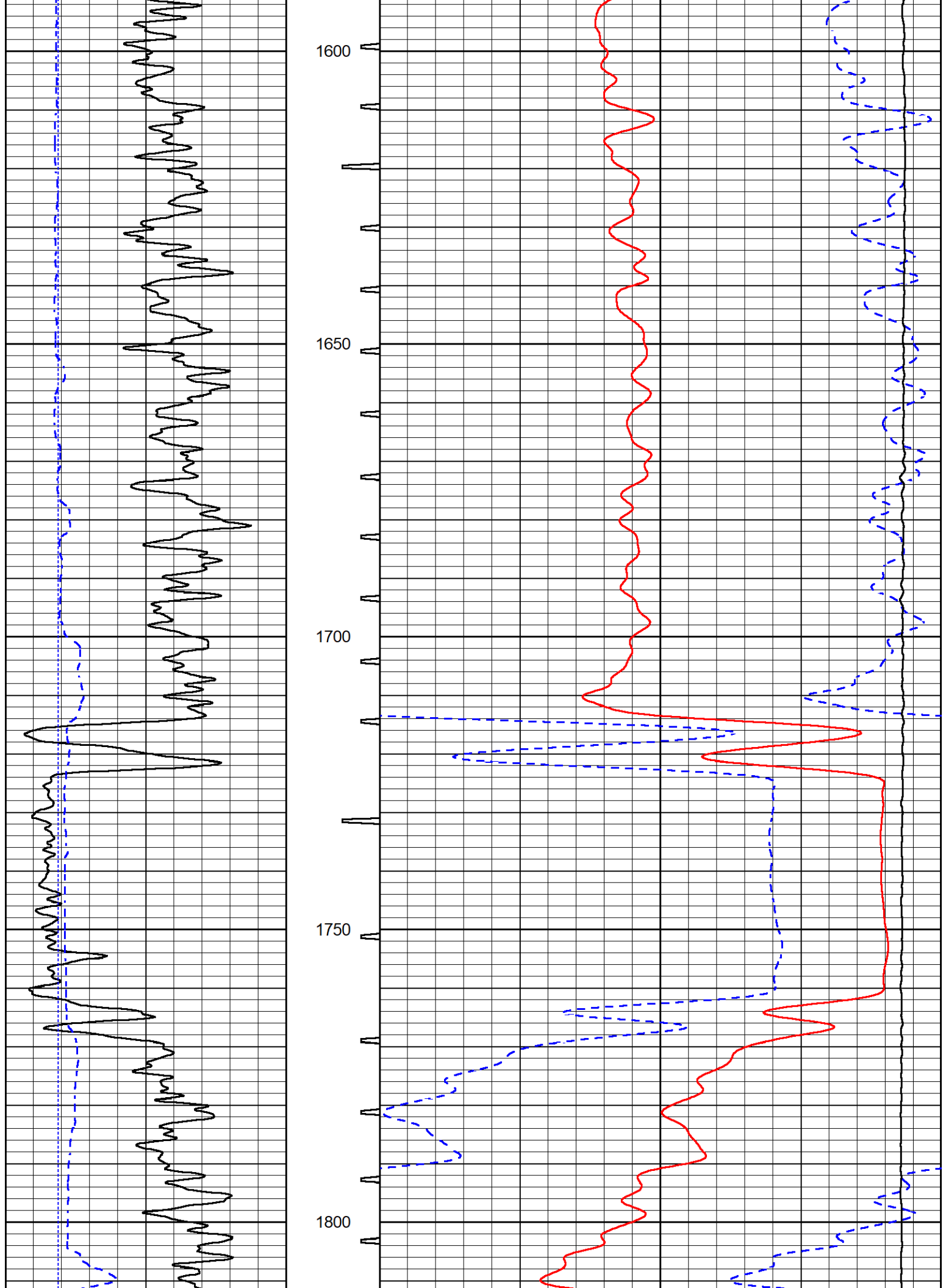


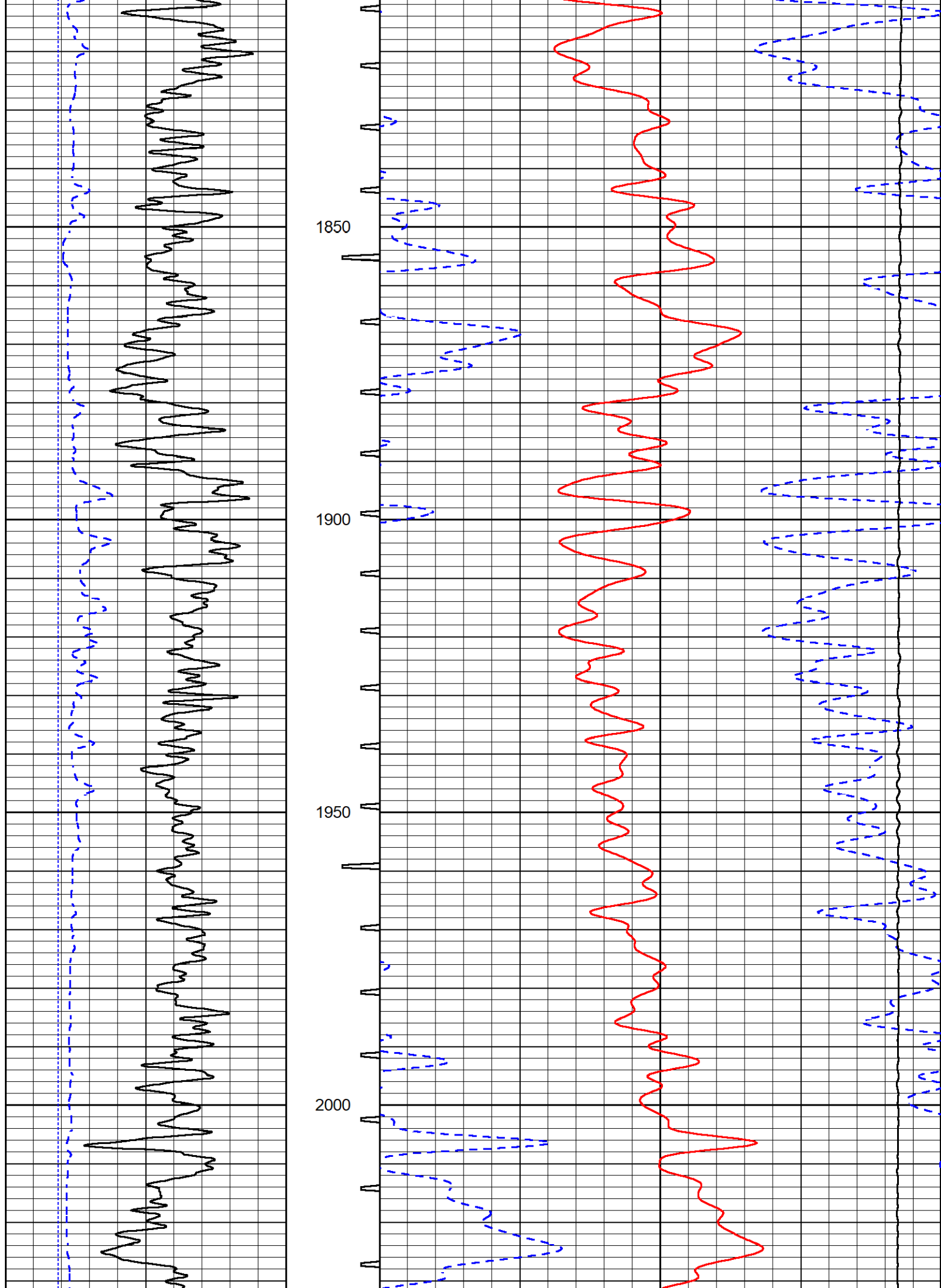


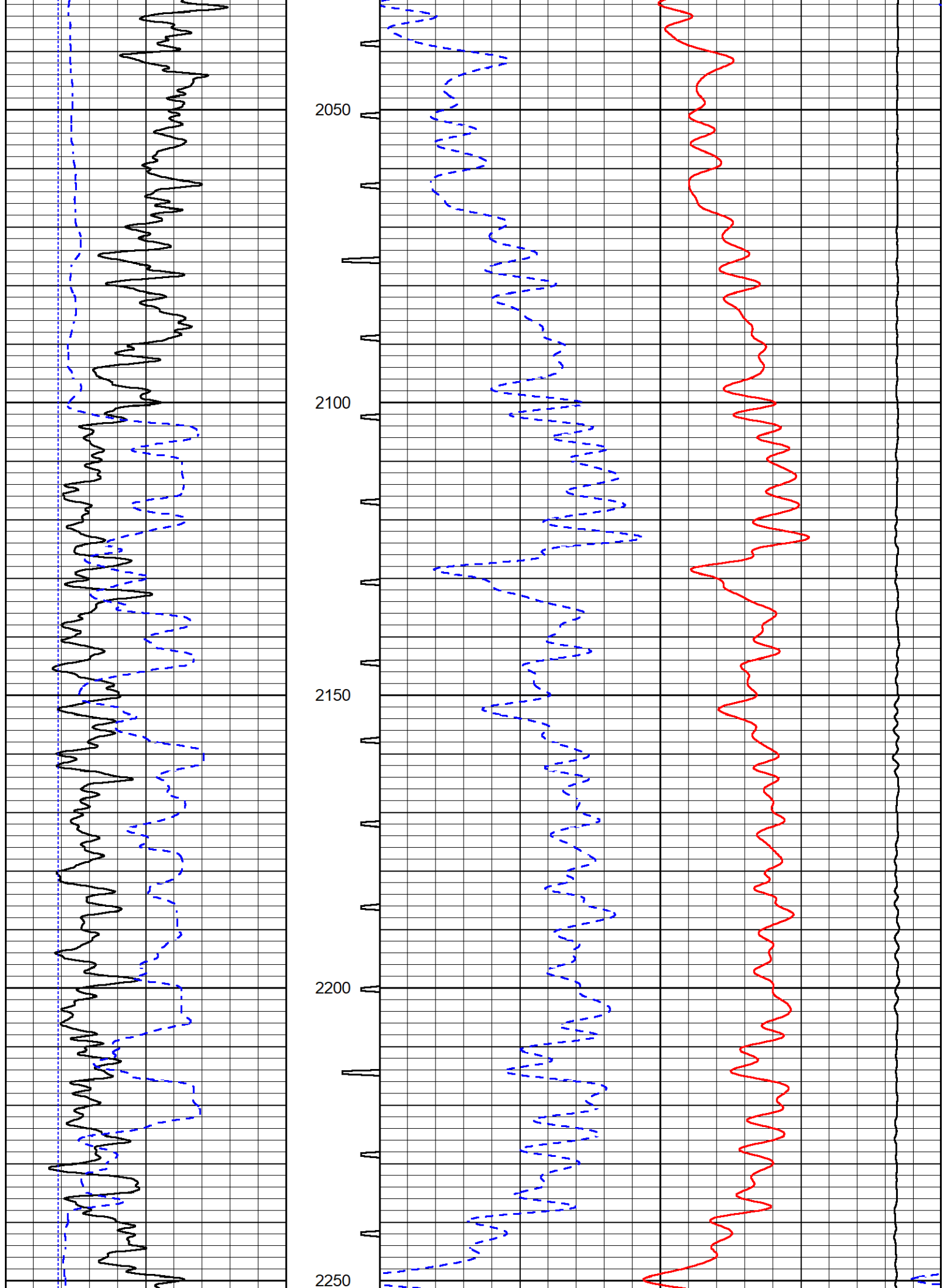


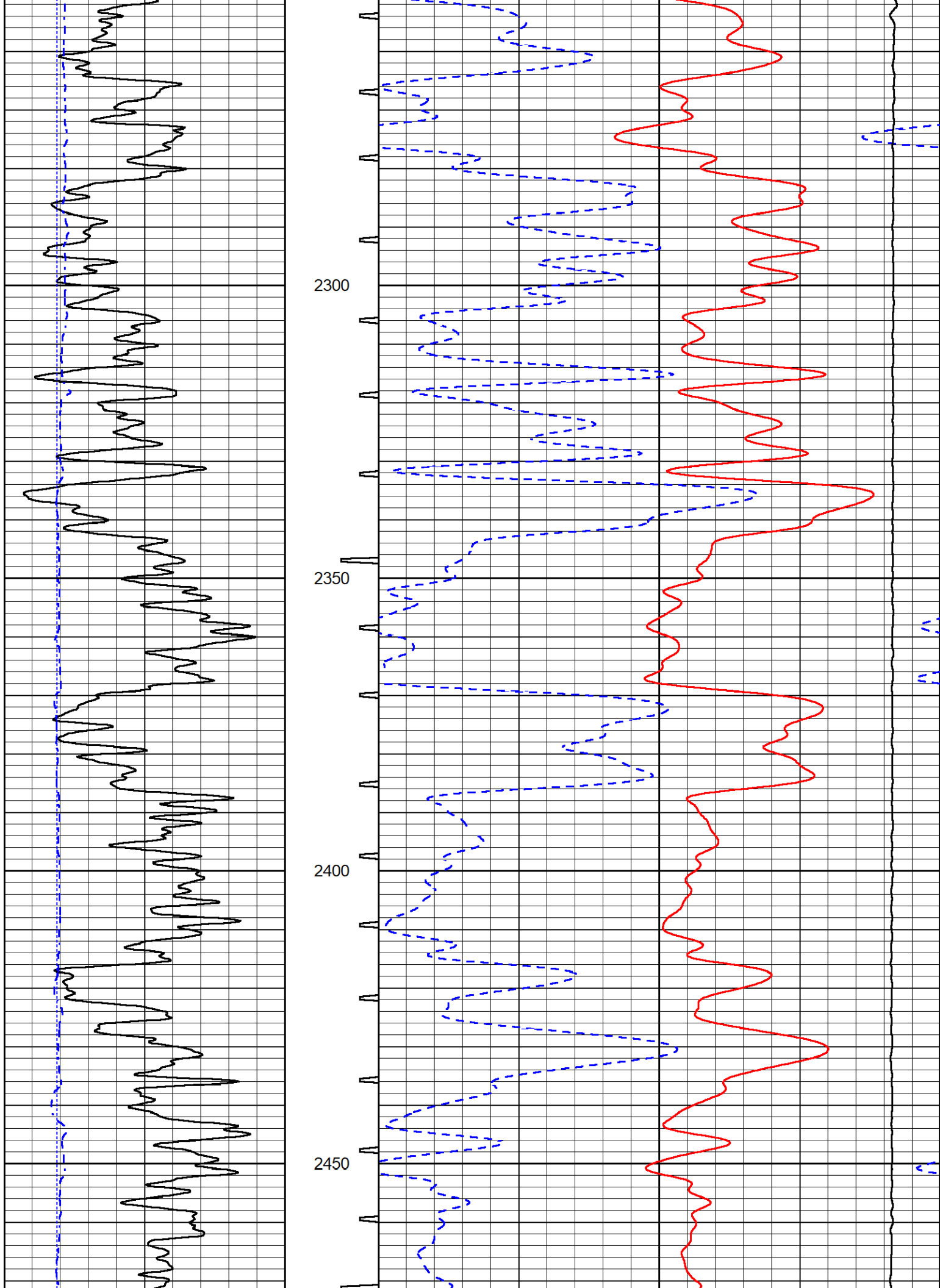


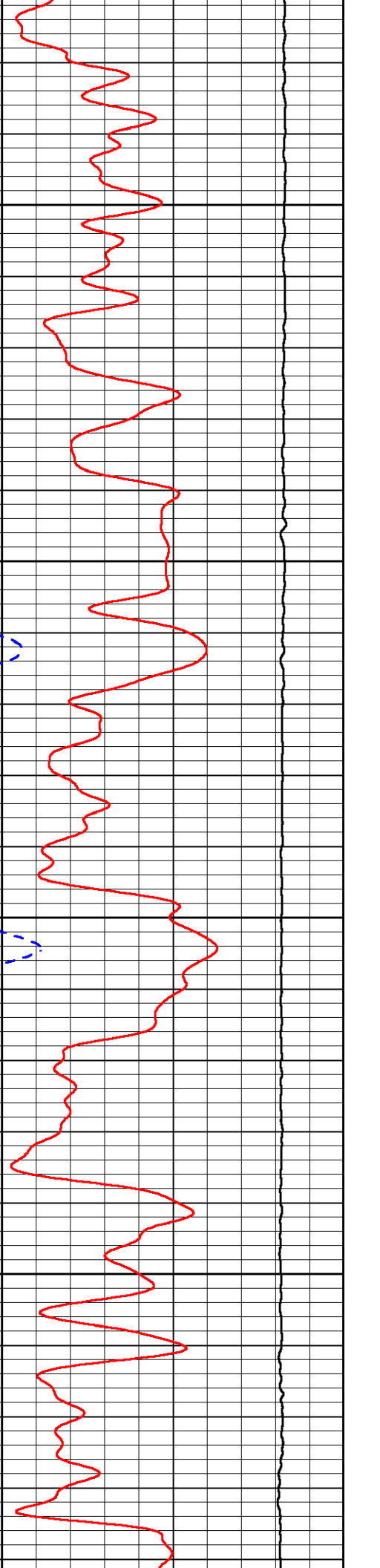
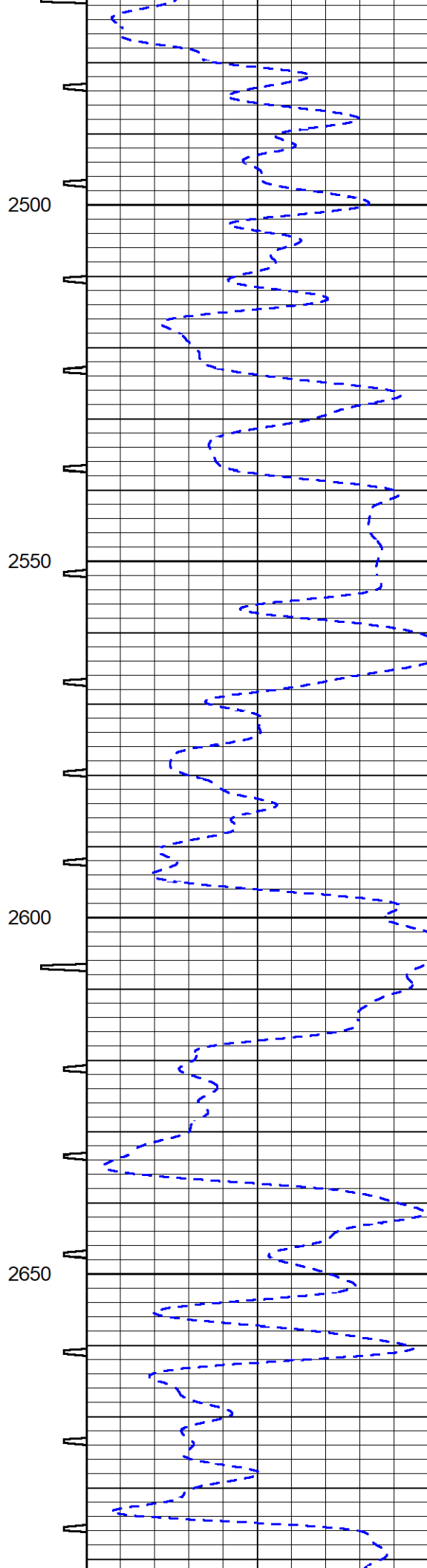
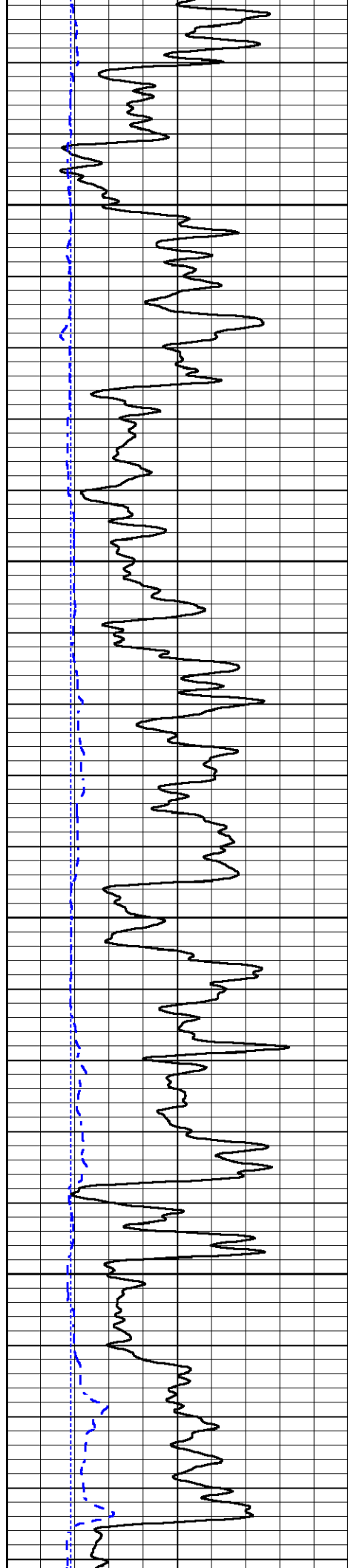


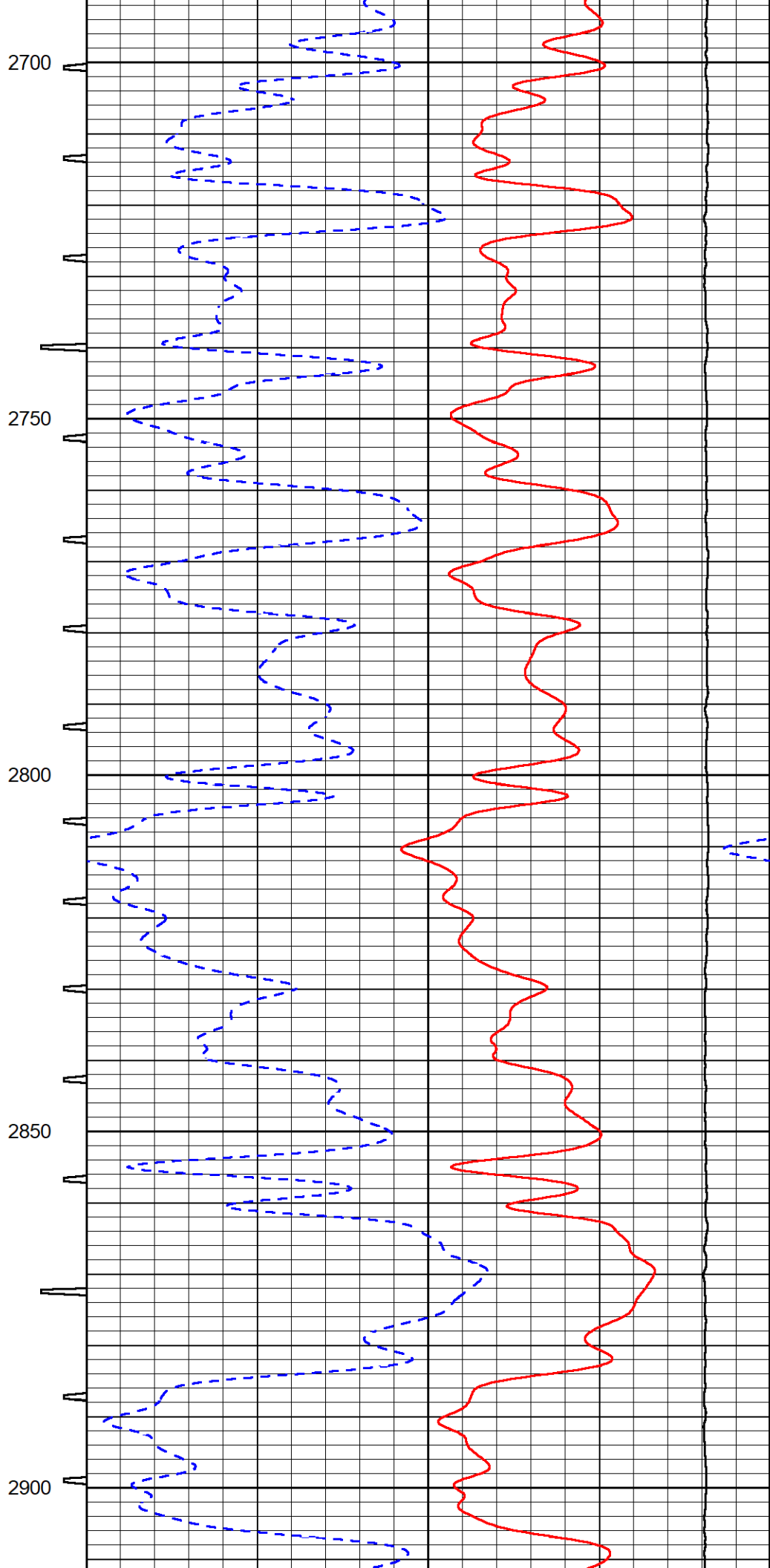
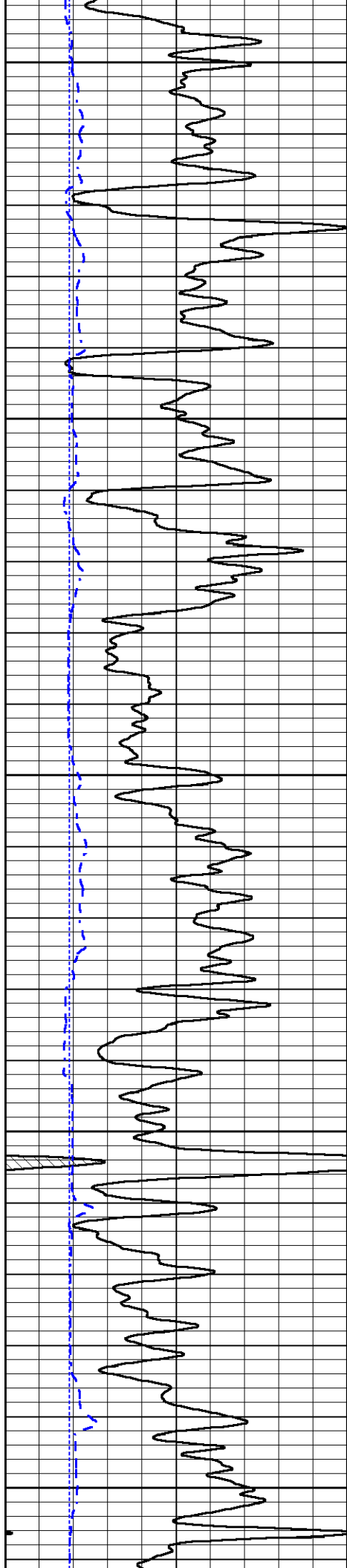


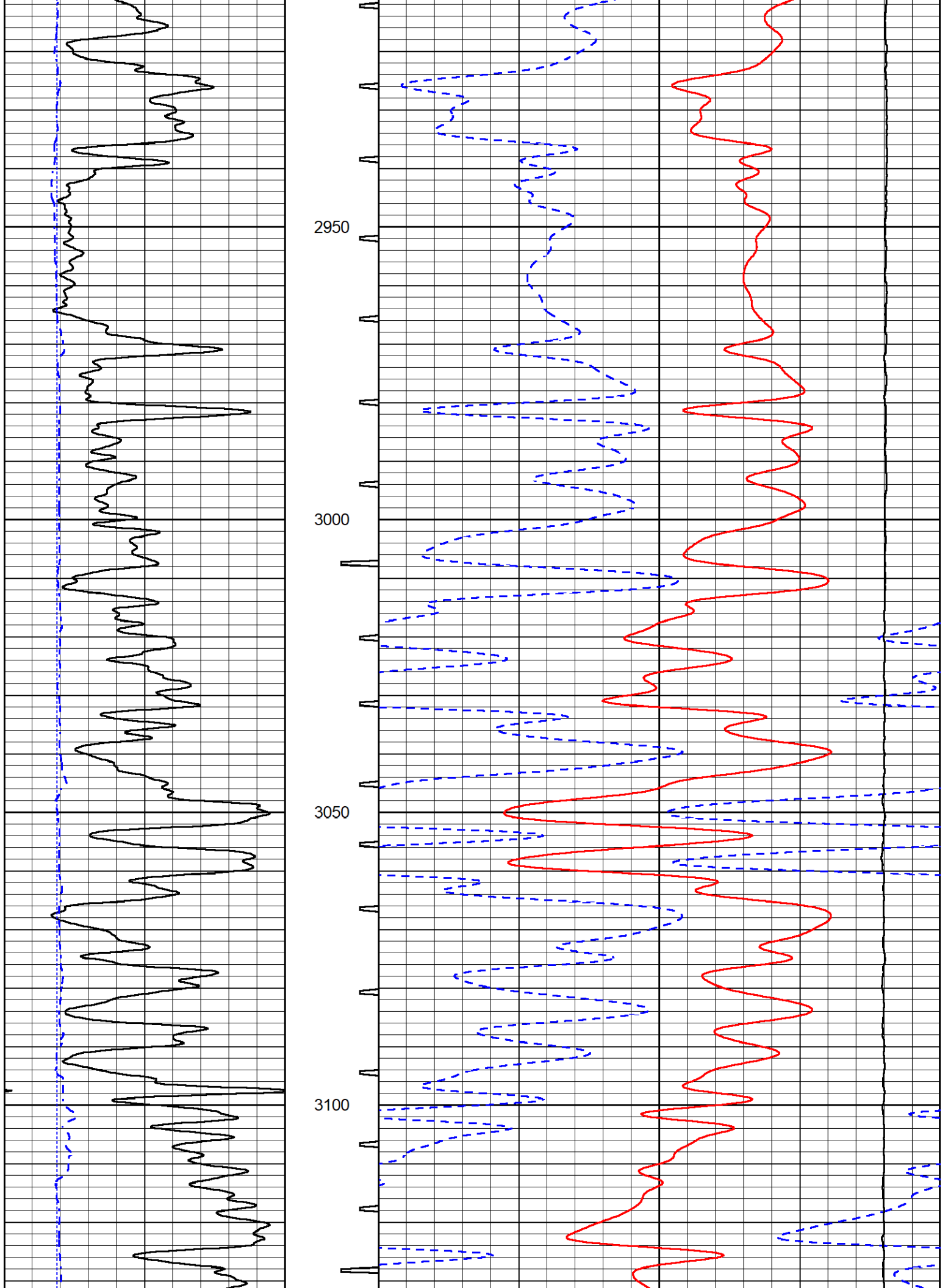


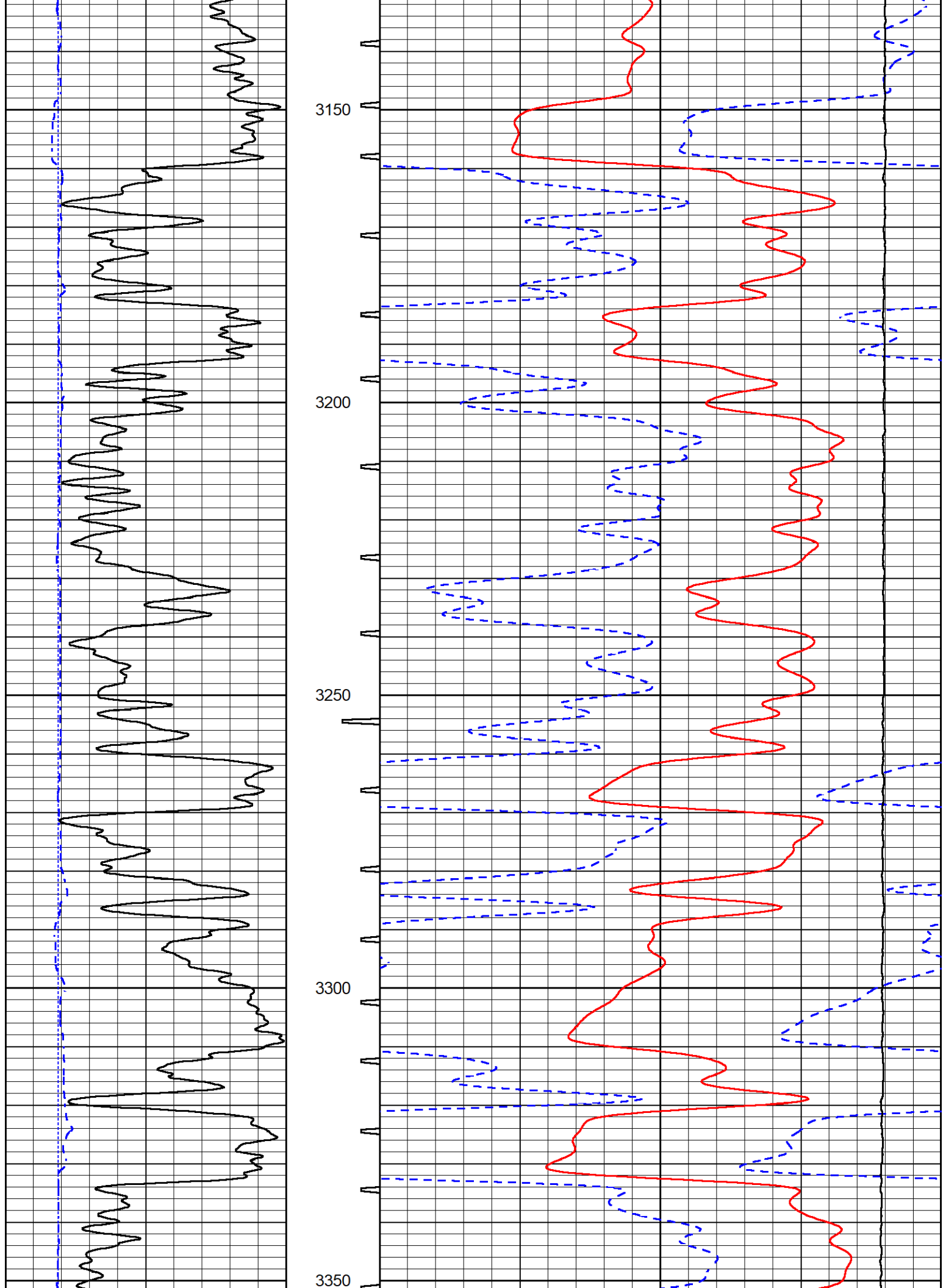


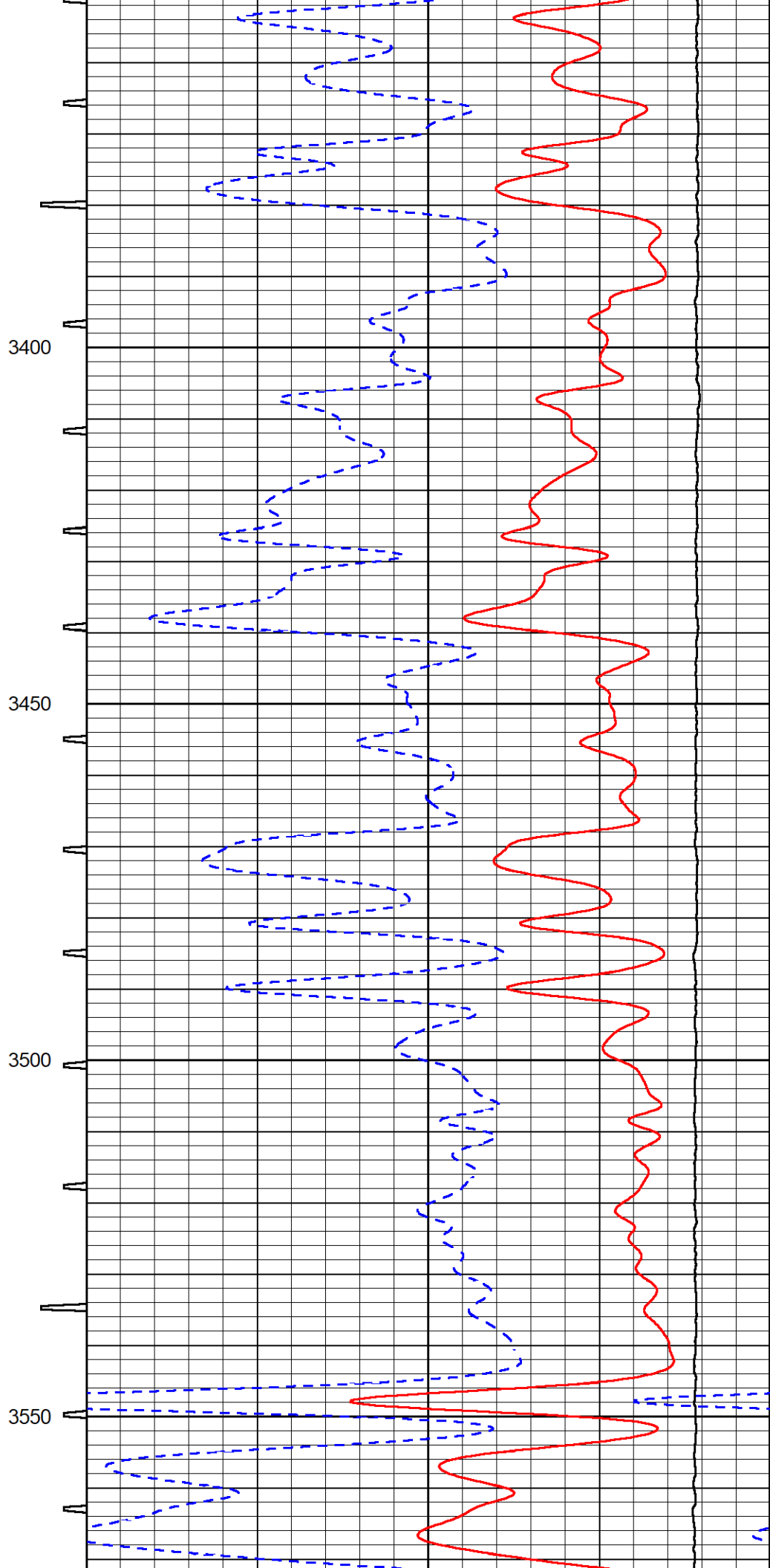
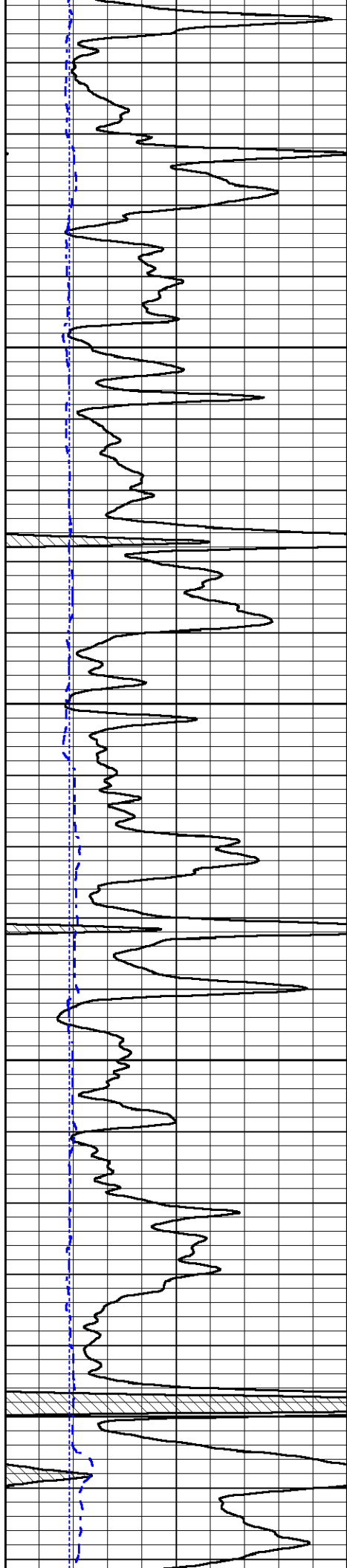


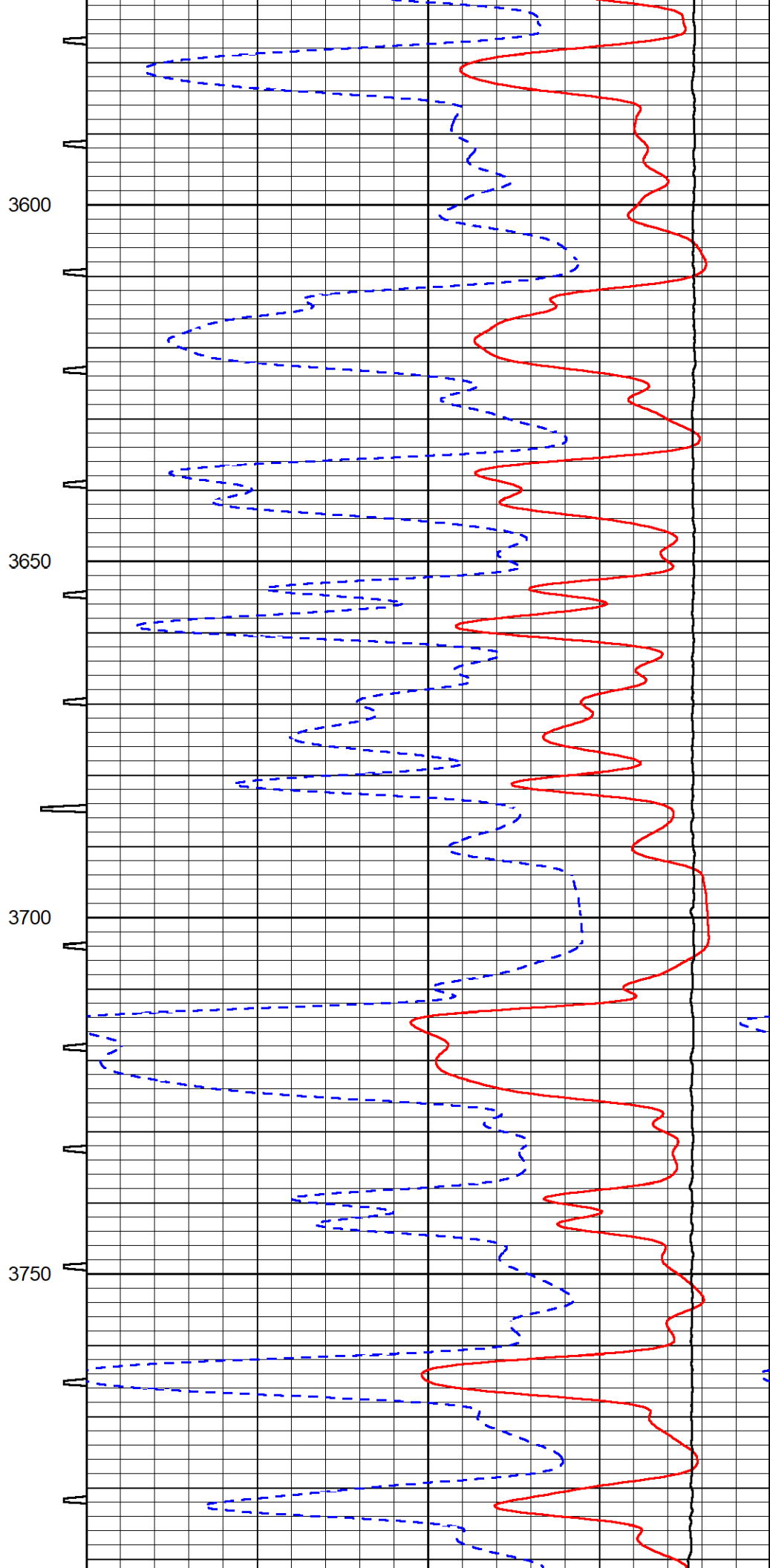
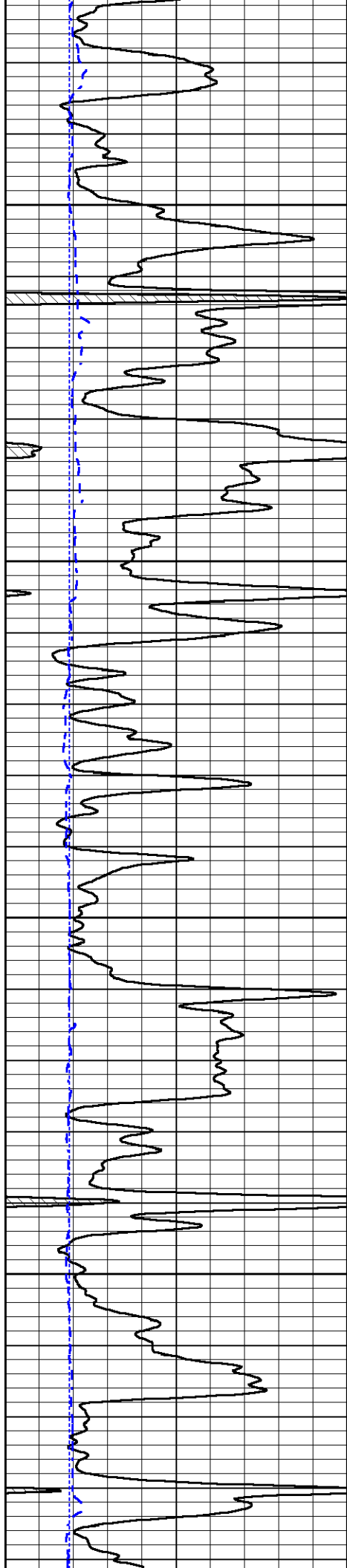


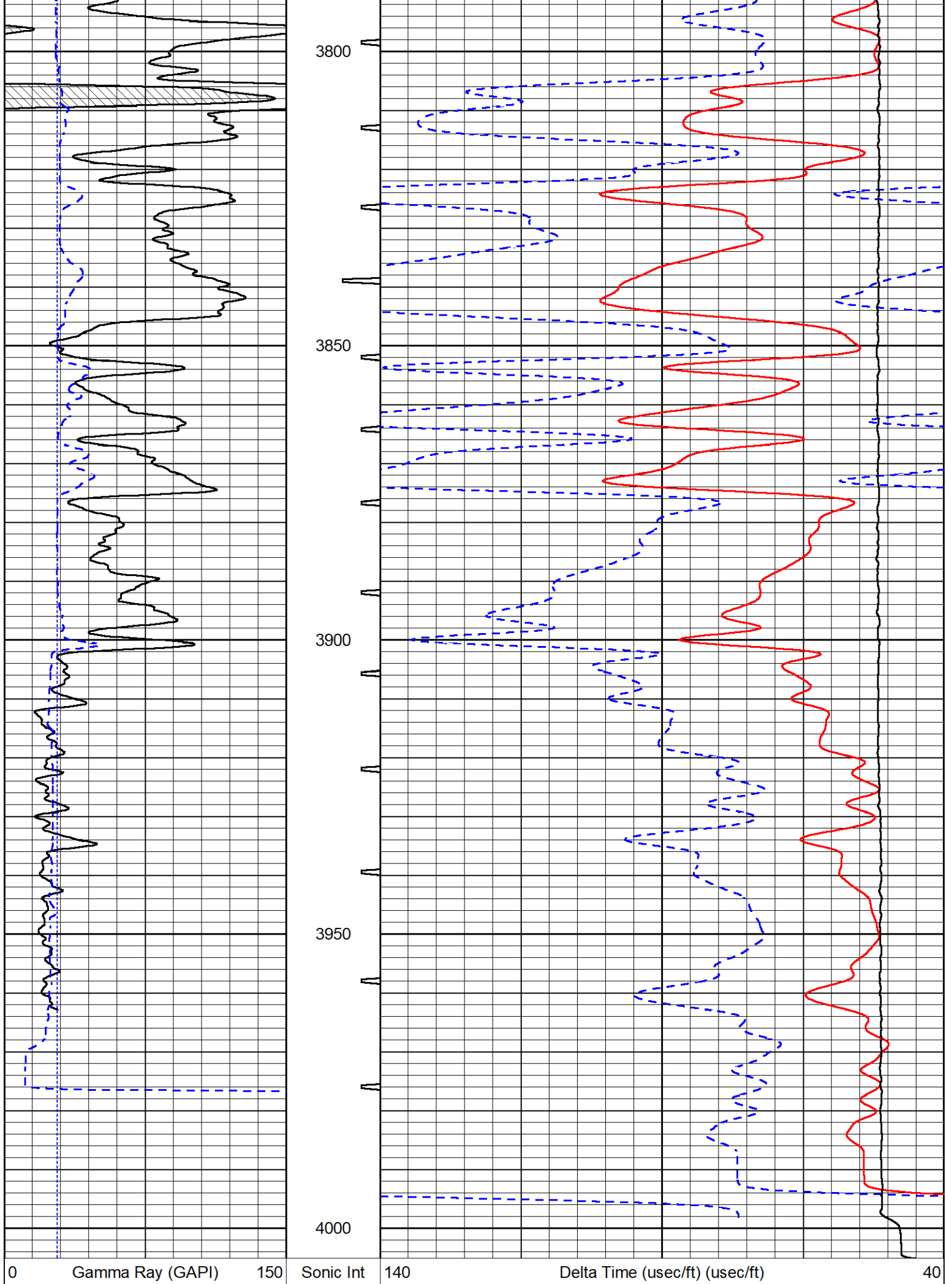












150	GR (GAPI)	300	5 (msec)	0	30	Sonic Porosity (pu)	(pu)	-10
6	Caliper (in)	16			15000	Line Tension (lb)		0



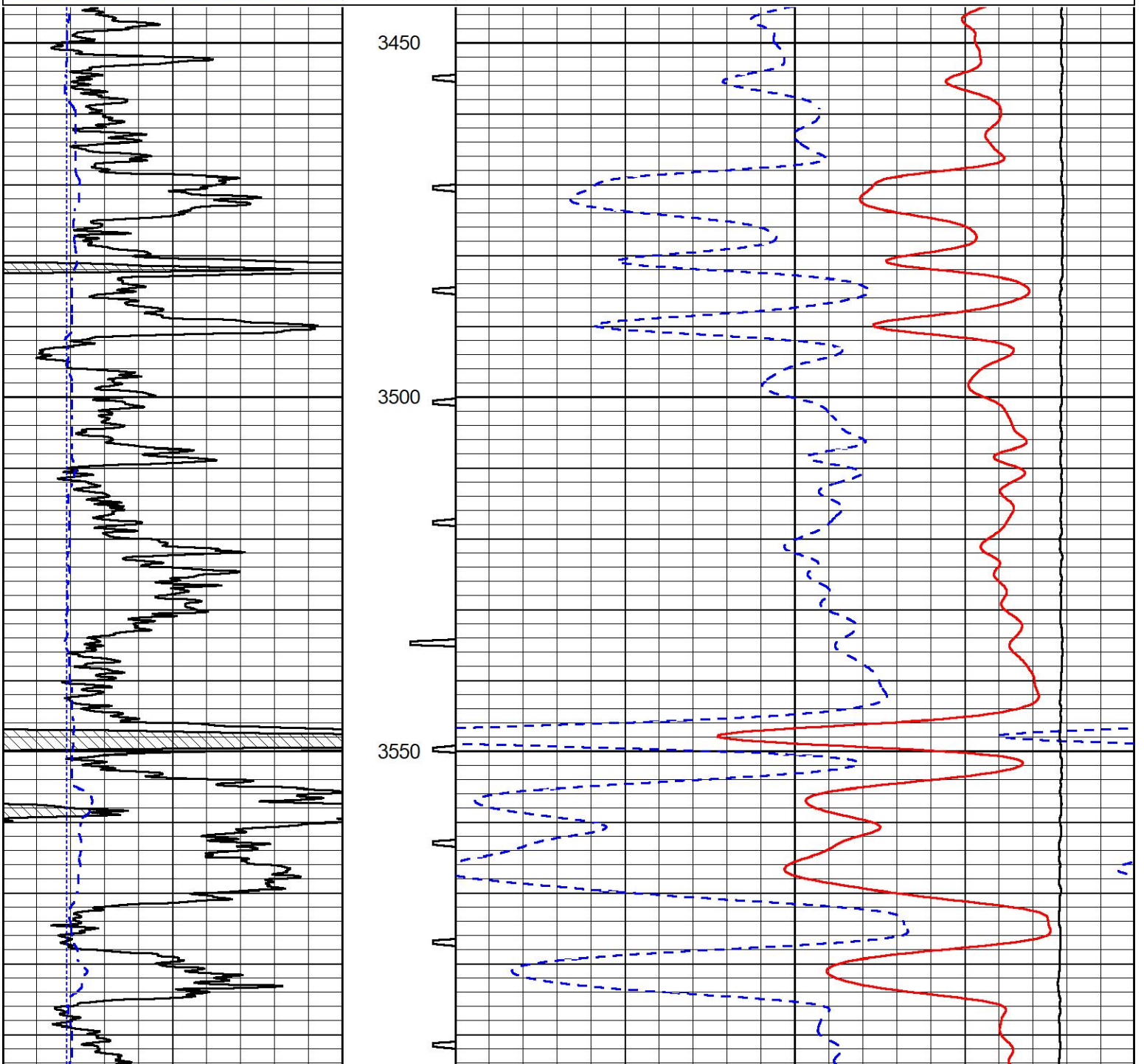
MIDWEST WIRELINE

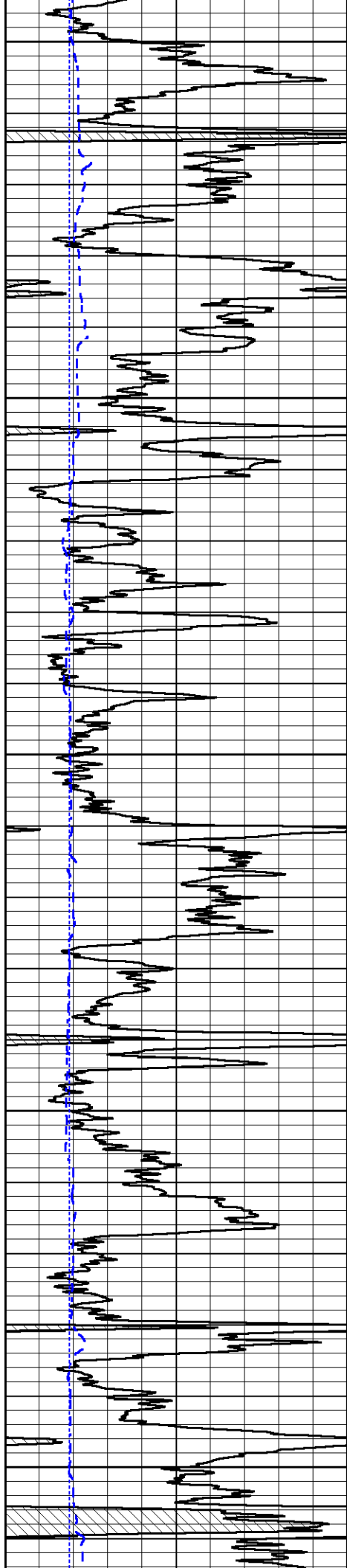
# REPEAT SECTION

## REPEAT PASS

Database File: murfin\_arbrister 1-36.db  
 Dataset Pathname: stkml/pass2.16  
 Presentation Format: \_sonic  
 Dataset Creation: Sat Nov 19 15:44:43 2022  
 Charted by: Depth in Feet scaled 1:240

0	Gamma Ray (GAPI)	150	Sonic Int	140	Delta Time (usec/ft)	(usec/ft)	40	
150	GR (GAPI)	300	5 (msec)	0	30	Sonic Porosity (pu)	(pu)	-10
6	Caliper (in)	16			15000	Line Tension (lb)	0	





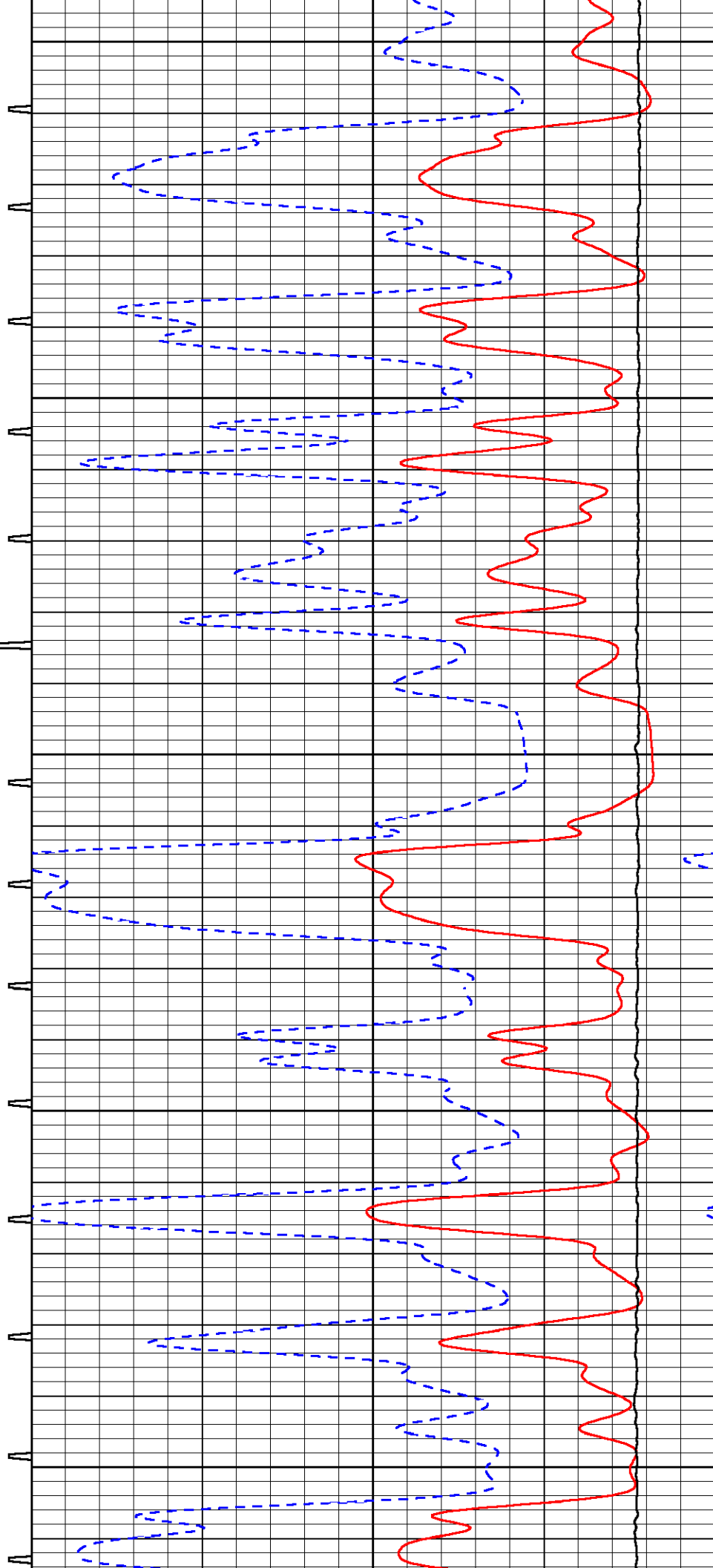
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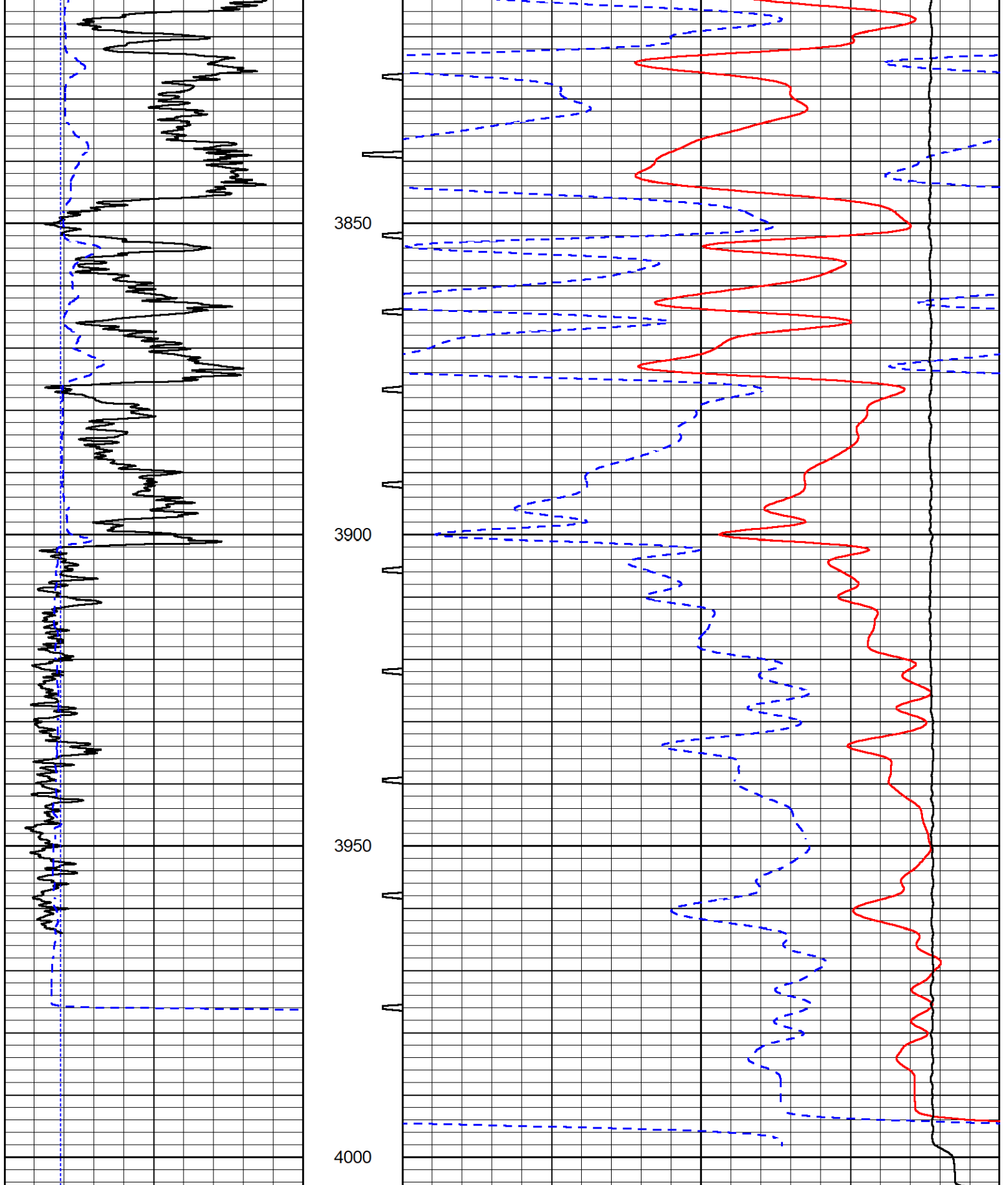
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3700

3750

3800





0	Gamma Ray (GAPI)	150	Sonic Int	140	Delta Time (usec/ft) (usec/ft)	40
150	GR (GAPI)	300	5 (msec) 0	30	Sonic Porosity (pu) (pu)	-10
6	Caliper (in)	16		15000	Line Tension (lb)	0

Calibration Report

Dual Induction Calibration Report

Serial-Model: 502 HT-M&W  
 Surface Cal Performed: Mon Nov 7 15:53:48 2022

Loop:	Readings		References			Results	
	Air	Loop	Air	Loop		m	b
Deep	83.639	487.104	0.000	255.800	mmho/m	0.454	-31.000
Medium	113.335	1585.690	0.000	255.800	mmho/m	0.350	-11.000

Microlog Calibration Report

Serial-Model: 401-PSIML  
 Performed: Mon Nov 7 15:53:59 2022

	Readings		References			Results	
	Zero	Cal	Zero	Cal		m	b
Normal	0.0000	1.0000	0.0000	1.0000	Ohm-m	9000.0000	-0.6500
Inverse	0.0000	1.0000	0.0000	1.0000	Ohm-m	8000.0000	0.0000
Caliper	1.0052	1.0858	5.0000	16.5000	in	98.0000	-93.2500

Compensated Density Calibration Report

Serial-Model: 305-24-M&W  
 Source #: 20762B  
 Master Calibration Performed: Mon Jun 20 16:54:11 2022

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	4771.35	5494.27	cps
Aluminum	2.650	g/cc	908.54	3539.54	cps
Spine Angle = 75.15			Density/Spine Ratio = 0.522		
	Size		Reading		
Small Ring	4.00	in	1.74		
Large Ring	14.00	in	1.38		

Compensated Neutron Calibration Report

Serial Number: 207-MW  
 Tool Model: M&W

CALIBRATION

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

PRE-SURVEY VERIFICATION

Detector	Readings	Measured	Target
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1)	Short Space Long Space	cps cps	pu	pu
2)	Short Space Long Space	cps cps	pu	
3)	Short Space Long Space	cps cps	pu	

POST-SURVEY VERIFICATION

	Detector	Readings	Measured	Target
1)	Short Space Long Space	cps cps	pu	pu
2)	Short Space Long Space	cps cps	pu	pu
3)	Short Space Long Space	cps cps	pu	pu

Gamma Ray Calibration Report

Serial Number:	106	
Tool Model:	M&W	
Performed:	Fri Dec 3 15:10:46 2021	
Calibrator Value:	500.0	GAPI
Background Reading:	24.0	cps
Calibrator Reading:	637.0	cps
Sensitivity:	0.5500	GAPI/cps



MIDWEST WIRELINE

Company	Murfin Drilling Company, Inc.
Well	Armbrister #1-36
Field	Nicholson
County	Trego
State	Kansas