



**CEMENT BOND LOG W/  
VARIABLE DENSITY,  
GAMMA RAY, CCL, TEMP**

**Company** GREAT WESTERN OIL & GAS  
**Well** OTTESEN LE 09-366HN  
**Field** Wattenberg  
**County** Weld  
**State** Colorado

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**Location:** API # : 05-123-44336  
NWSE 33 1N66W  
40.0046/-104.777733  
SEC 33 TWP 1N RGE 66W  
Permanent Datum GL  
Log Measured From KB  
Drilling Measured From KB  
Elevation 5076.5'  
Other Services 4.50" G.R. J.B.  
Elevation K.B. 5096.5'  
D.F. ---  
G.L. 5076.5'

**Date** 31-JAN-2019

Run Number	TWO
Depth Driller	17,813'
Depth Logger	7920'
Bottom Logged Interval	7915'
Top Log Interval	Surface
Open Hole Size	N.A.
Type Fluid	Fresh Water
Density / Viscosity	8.4
Max. Recorded Temp.	251°
Estimated Cement Top	SEE LOG
Time Well Ready	ROA
Time Logger on Bottom	08:29 AM
Equipment Number	80
Location	Platteville, CO
Recorded By	JOSEPH FRESQUEZ
Witnessed By	ETHAN SAVOYA

Borehole Record			Tubing Record				
Run Number	Bit	From	To	Size	Weight	From	To

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	9-5/8"	36#	SURFACE	1772'
Prod. String				
Production String	5-1/2"	17#	SURFACE	17,813'
Liner				

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, 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. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

**Comments**

Cement Bond Log ran as per customer request  
Depth Correlated to Casing Tally reported Marker Joint @ 7634 FT  
Adjusted log +19 FT to correlate with Marker Joint  
Gauge Ring/Junk Basket ran to 7975 FT with no debris  
Log ran from 7915 FT to surface  
Log ran with 0 PSI Surface Induced Pressure.

Thank you for choosing KLX Energy Services!!

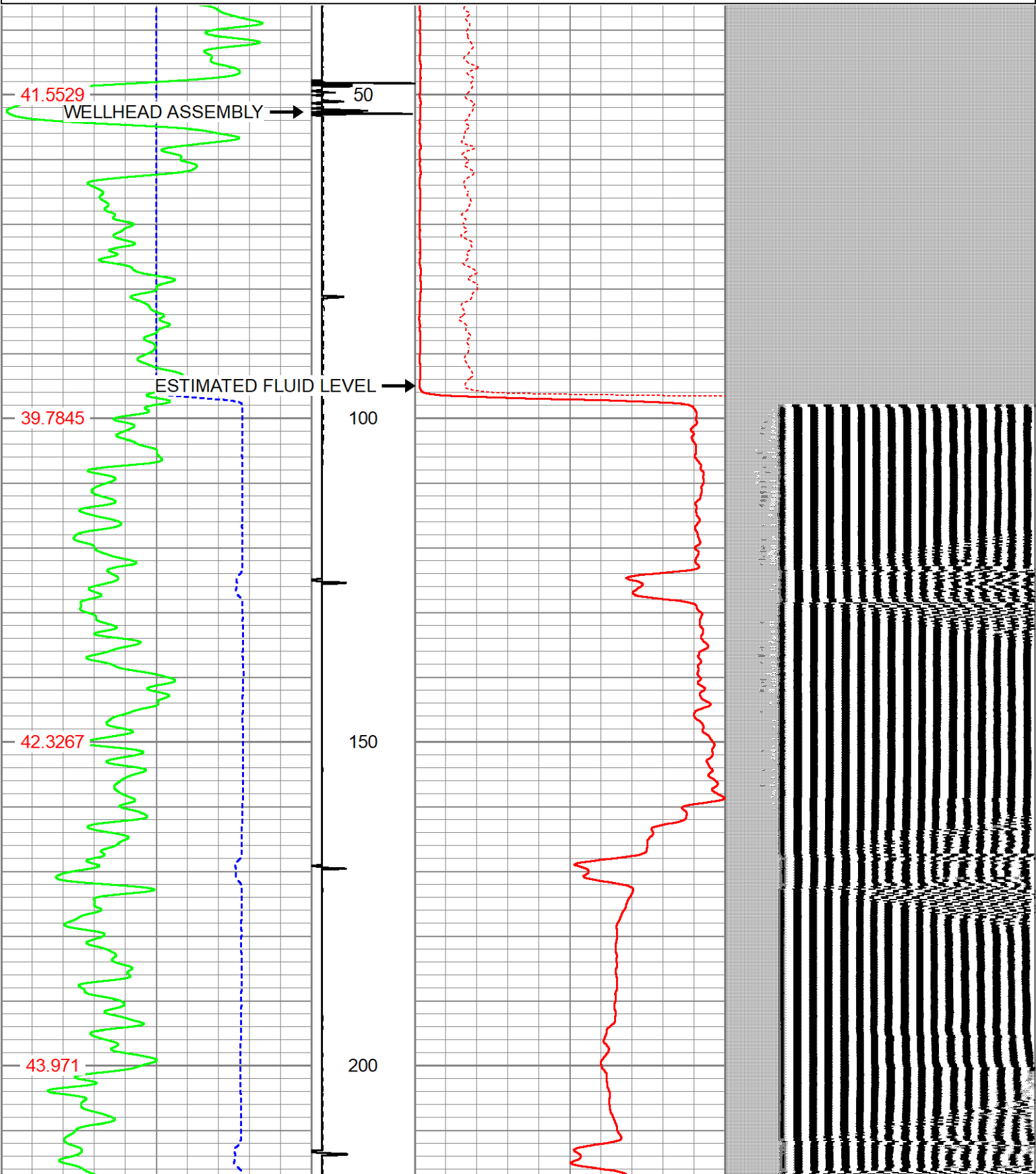


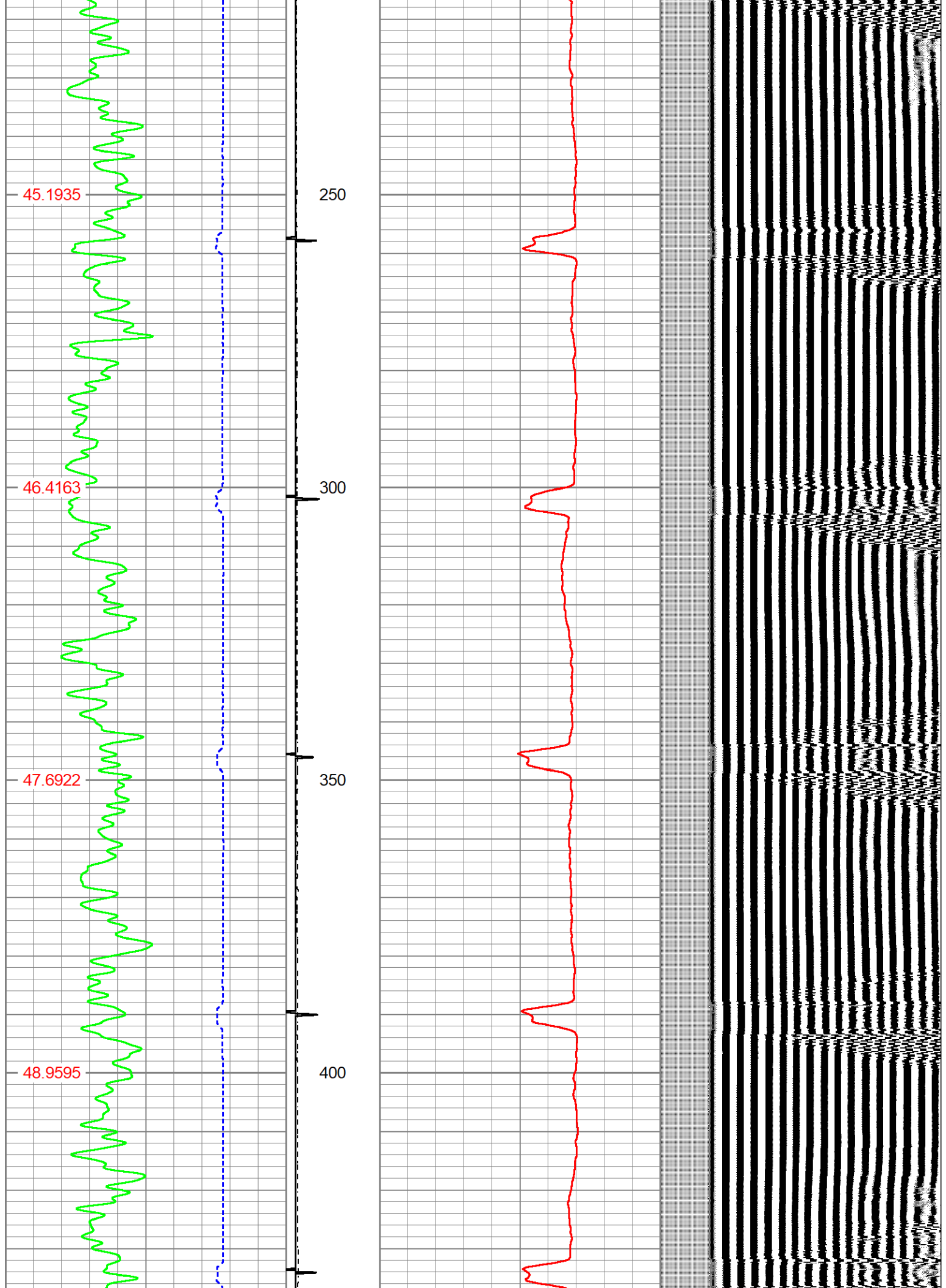
**MAIN PASS**

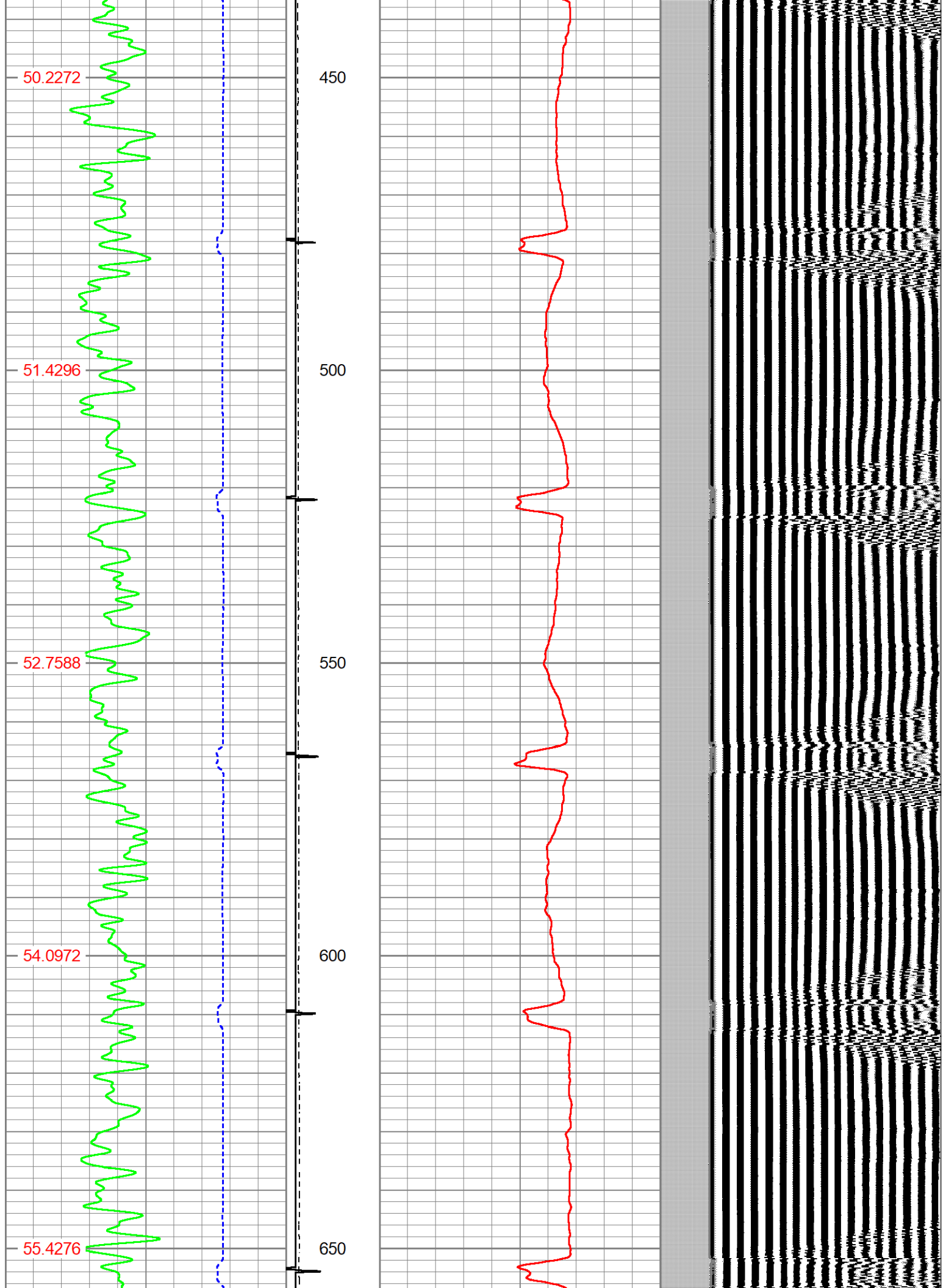
**RECORDED WITH 0 PSI SURFACE INDUCED PRESSURE.**

Database File	gw_ottesen_le_09-366hn_31_2019.db
Dataset Pathname	366HN/run1/pass4
Presentation Format	cbl_cs
Dataset Creation	Thu Jan 31 08:28:56 2019
Charted by	Depth in Feet scaled 1:240

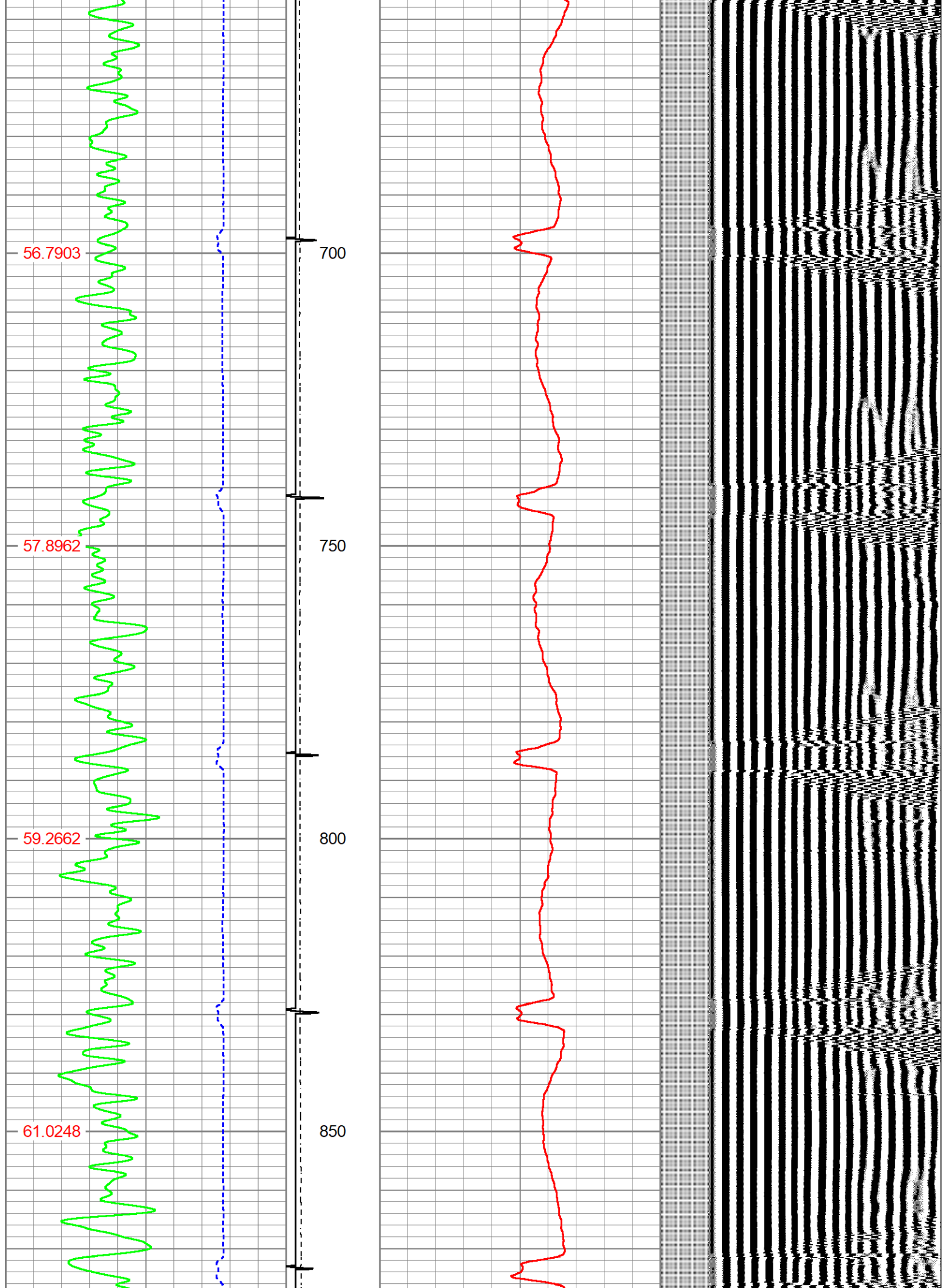
420	TT3FT (usec)	220	CCL	0	Amplitude (mV)	100	200	Variable Density (usec)	1200
0	Gamma Ray (GAPI)	150	Line Tension	0	Amplified Amplitude (mV)	10			
TEMP		0	(lb)2000						
(degF)									

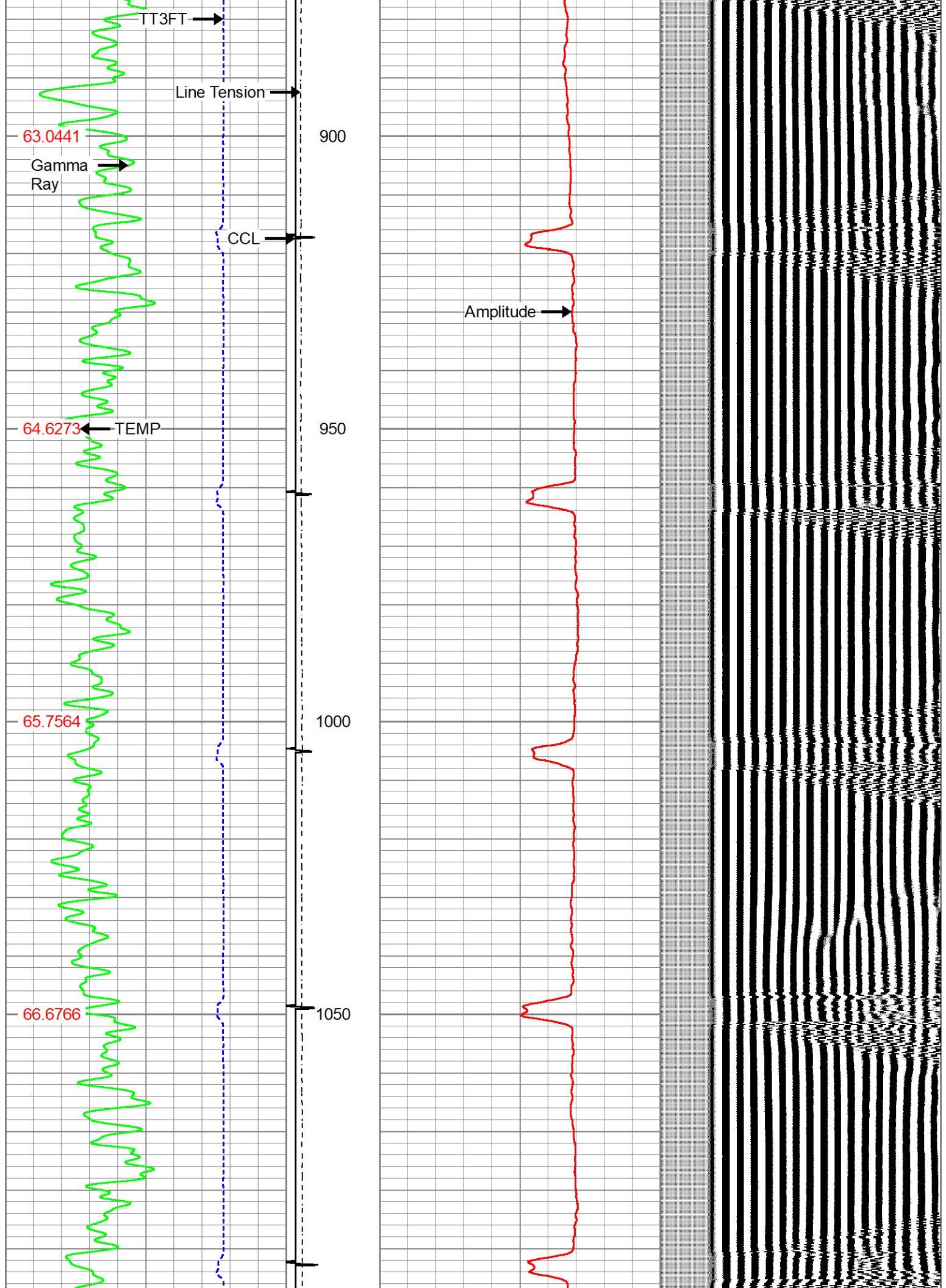


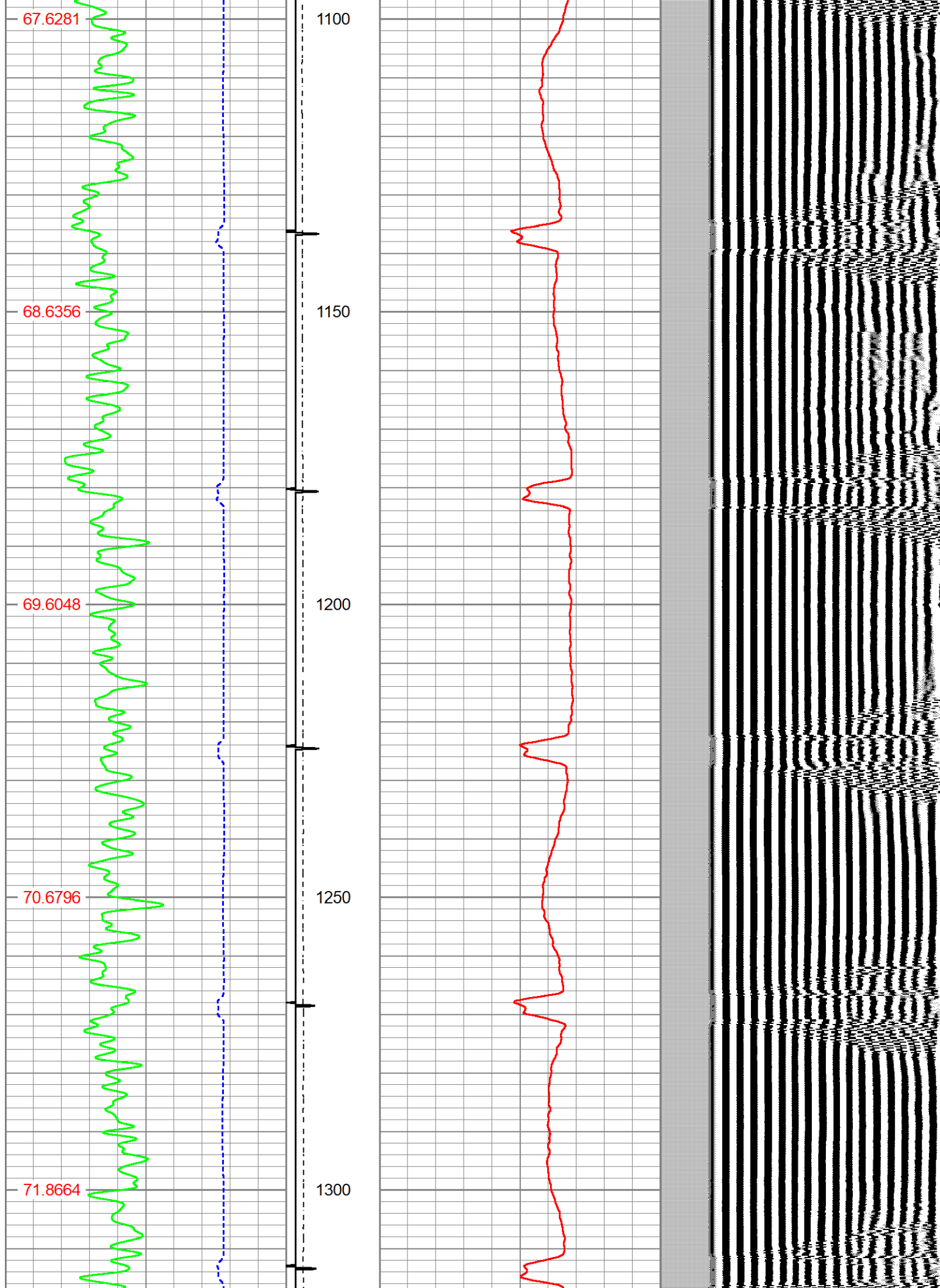


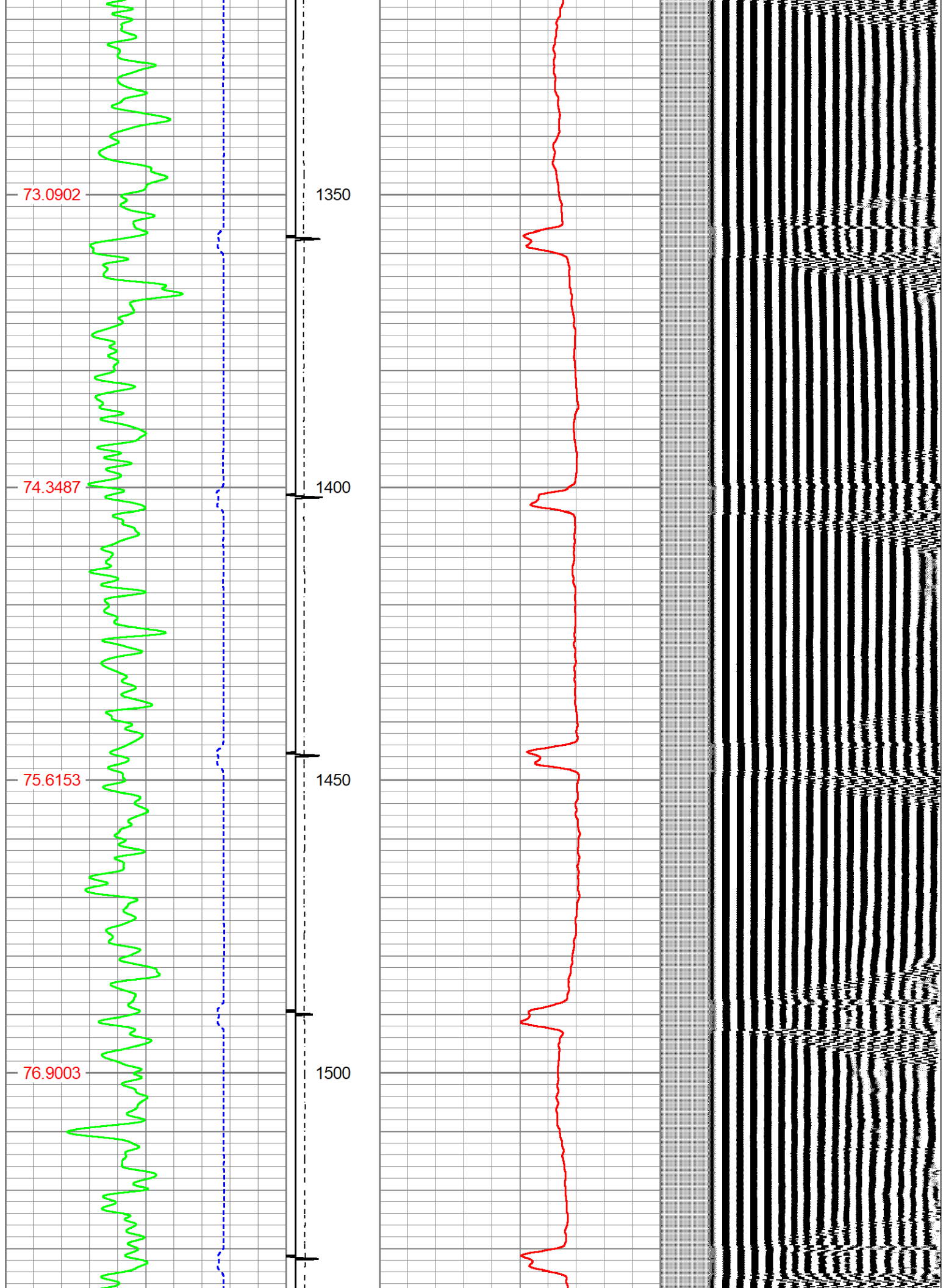




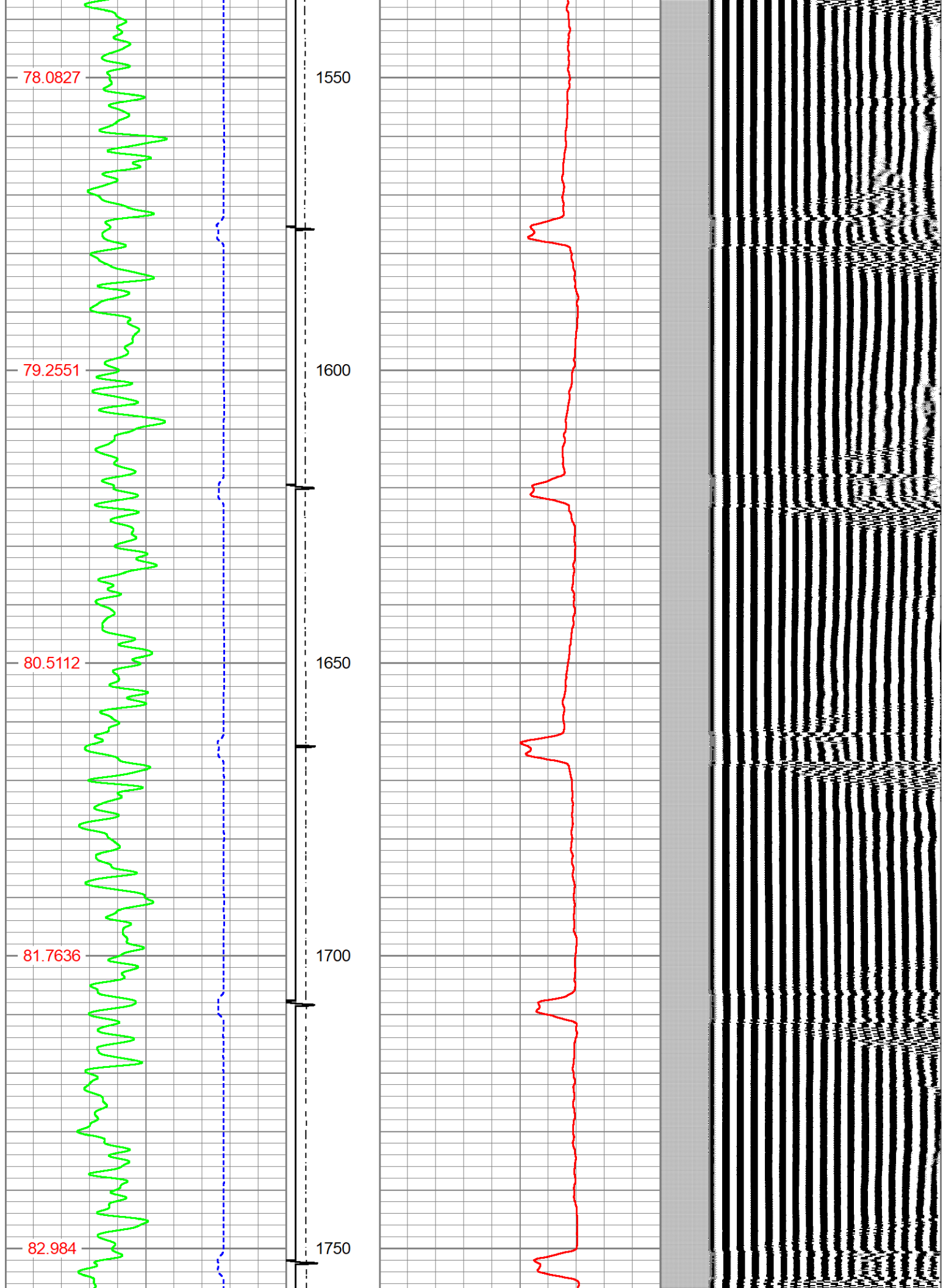


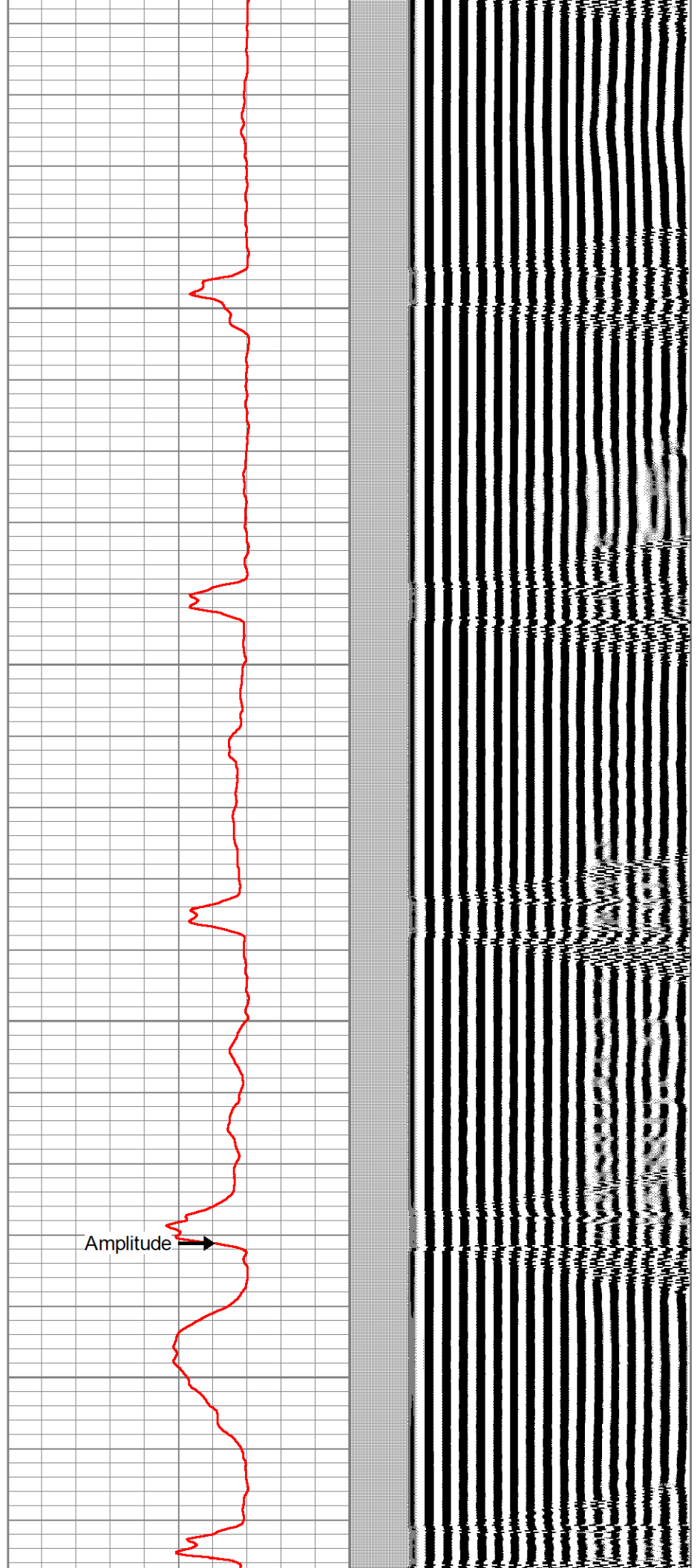
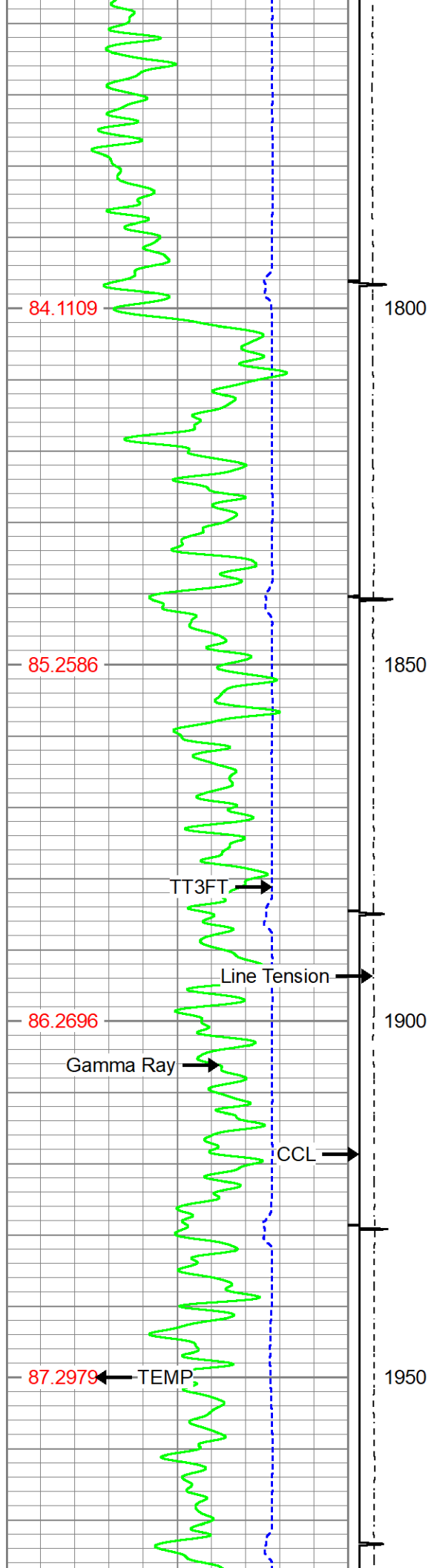


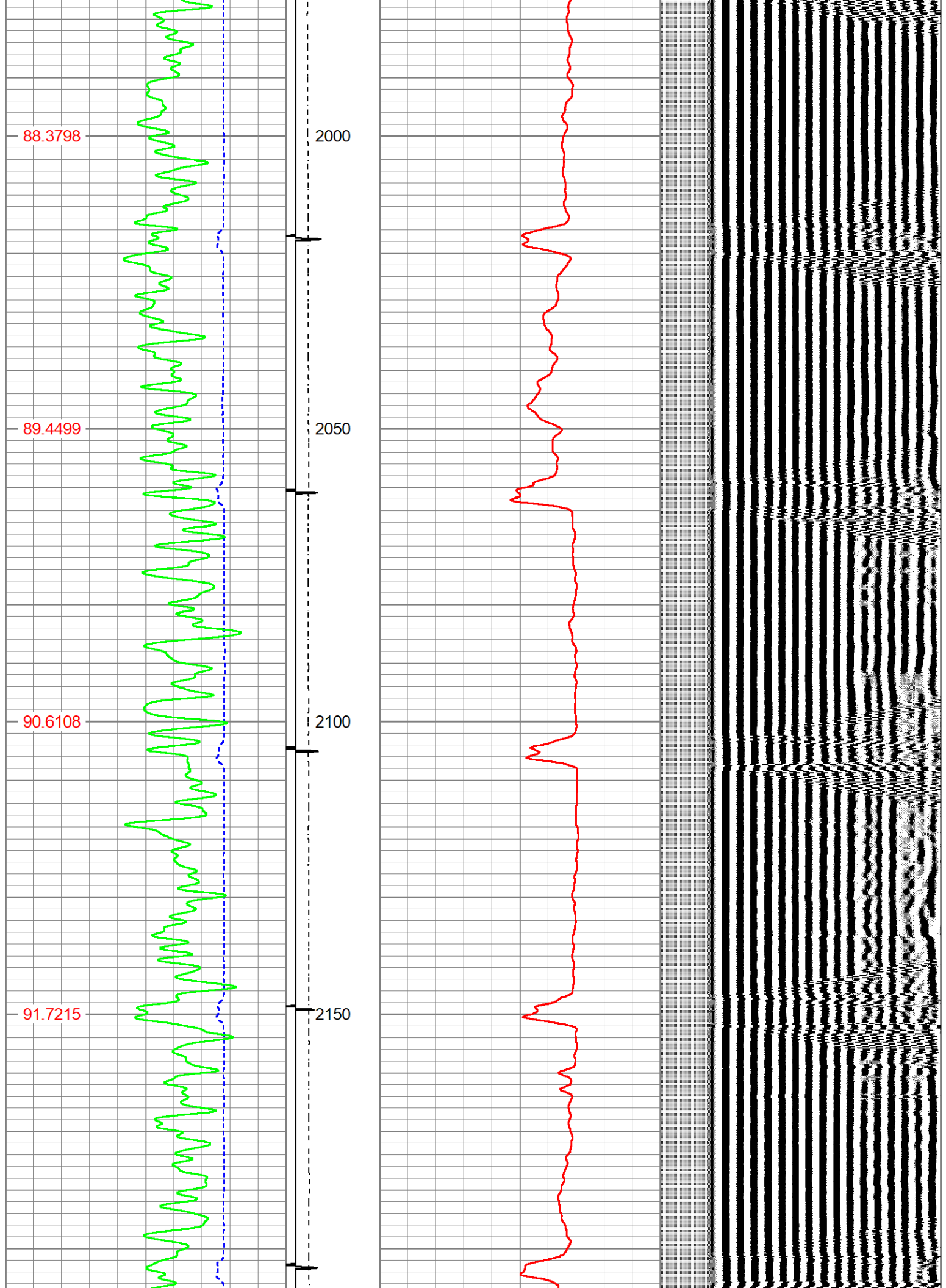


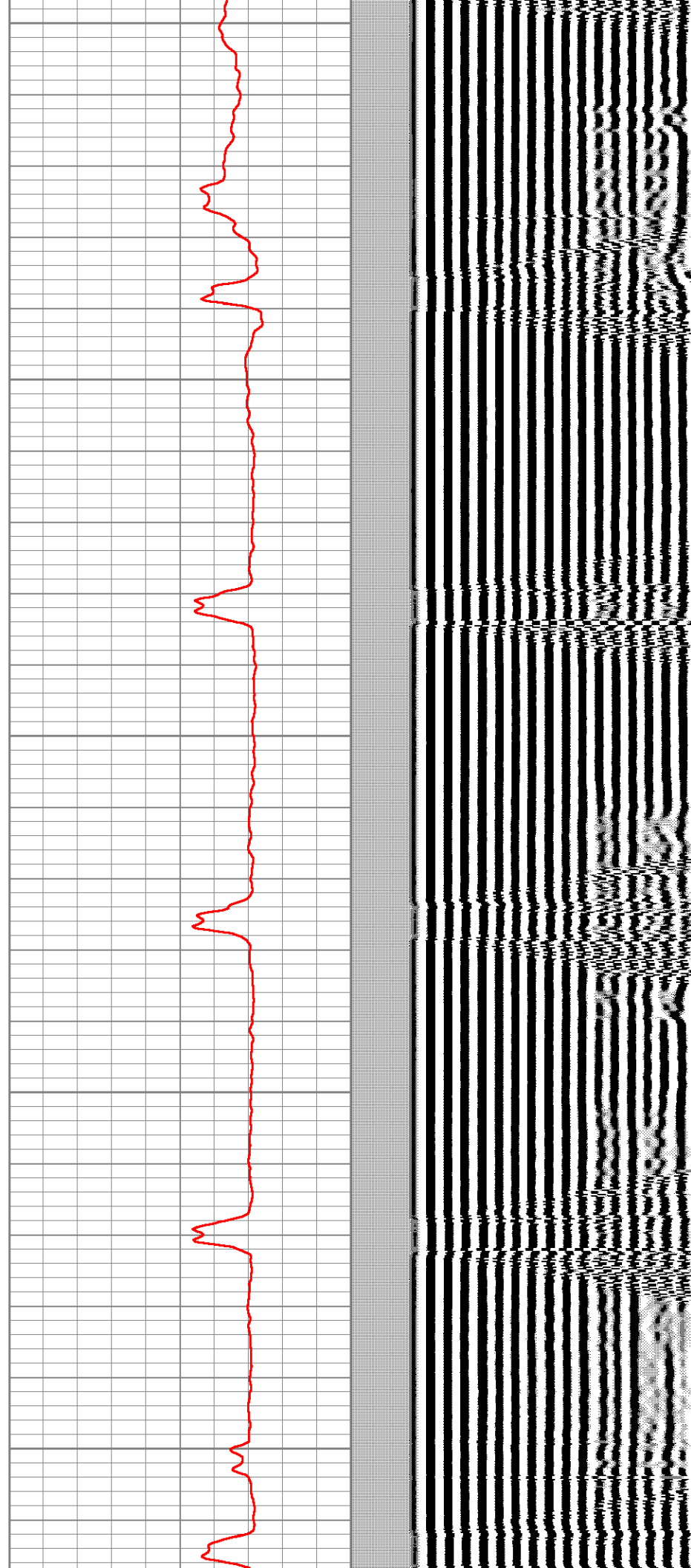
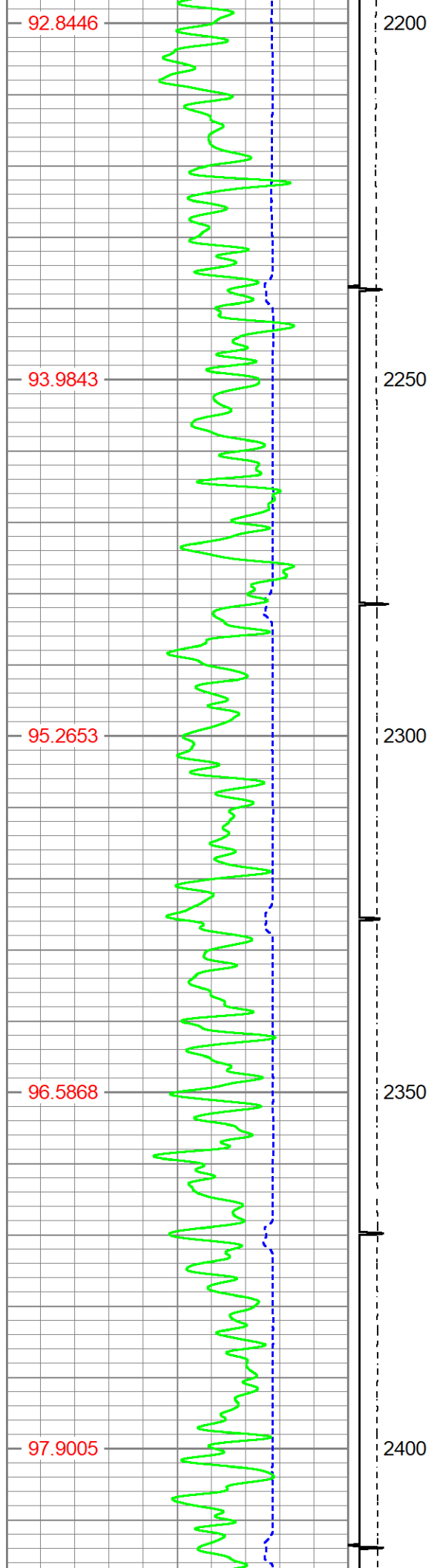




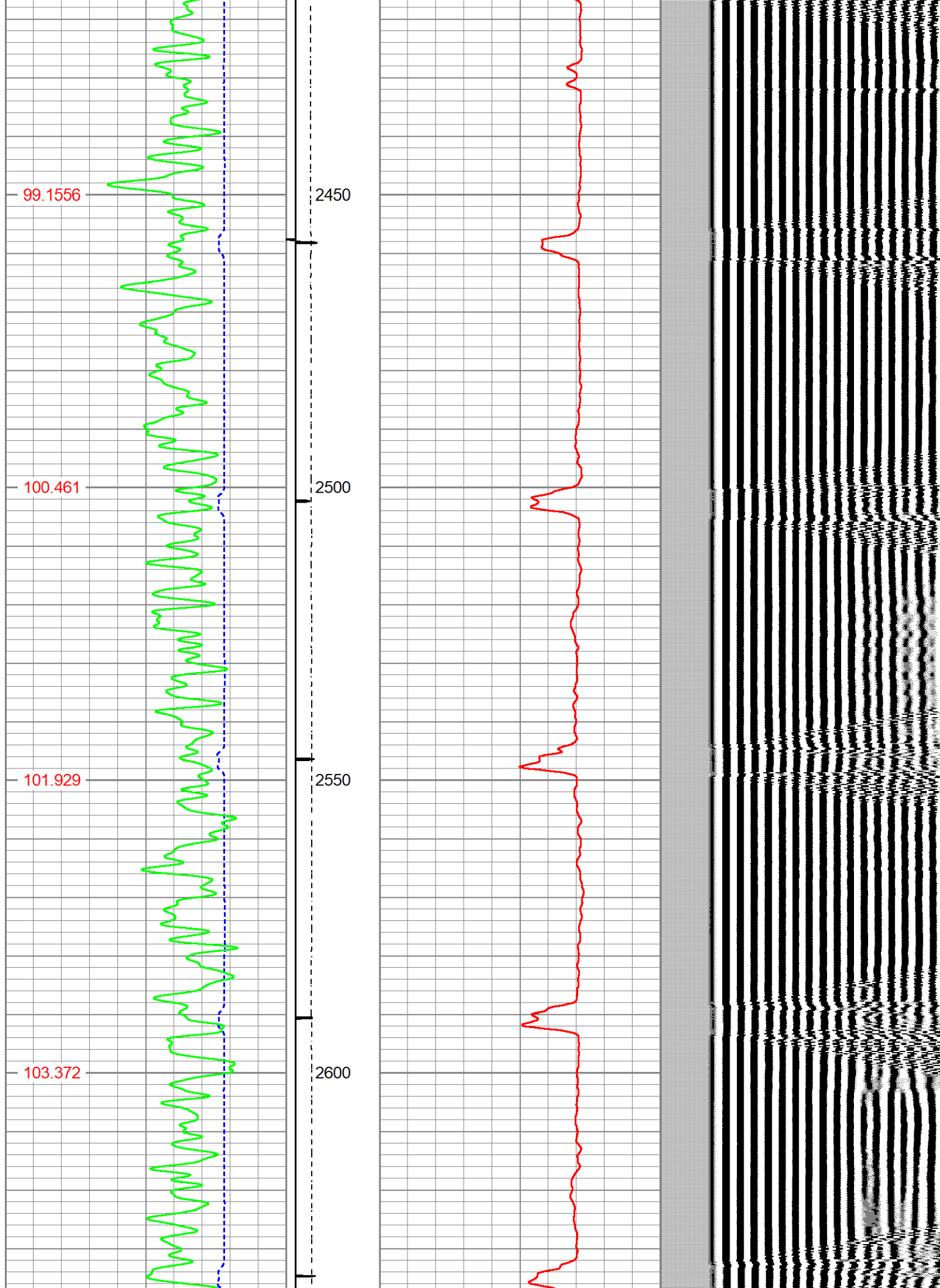


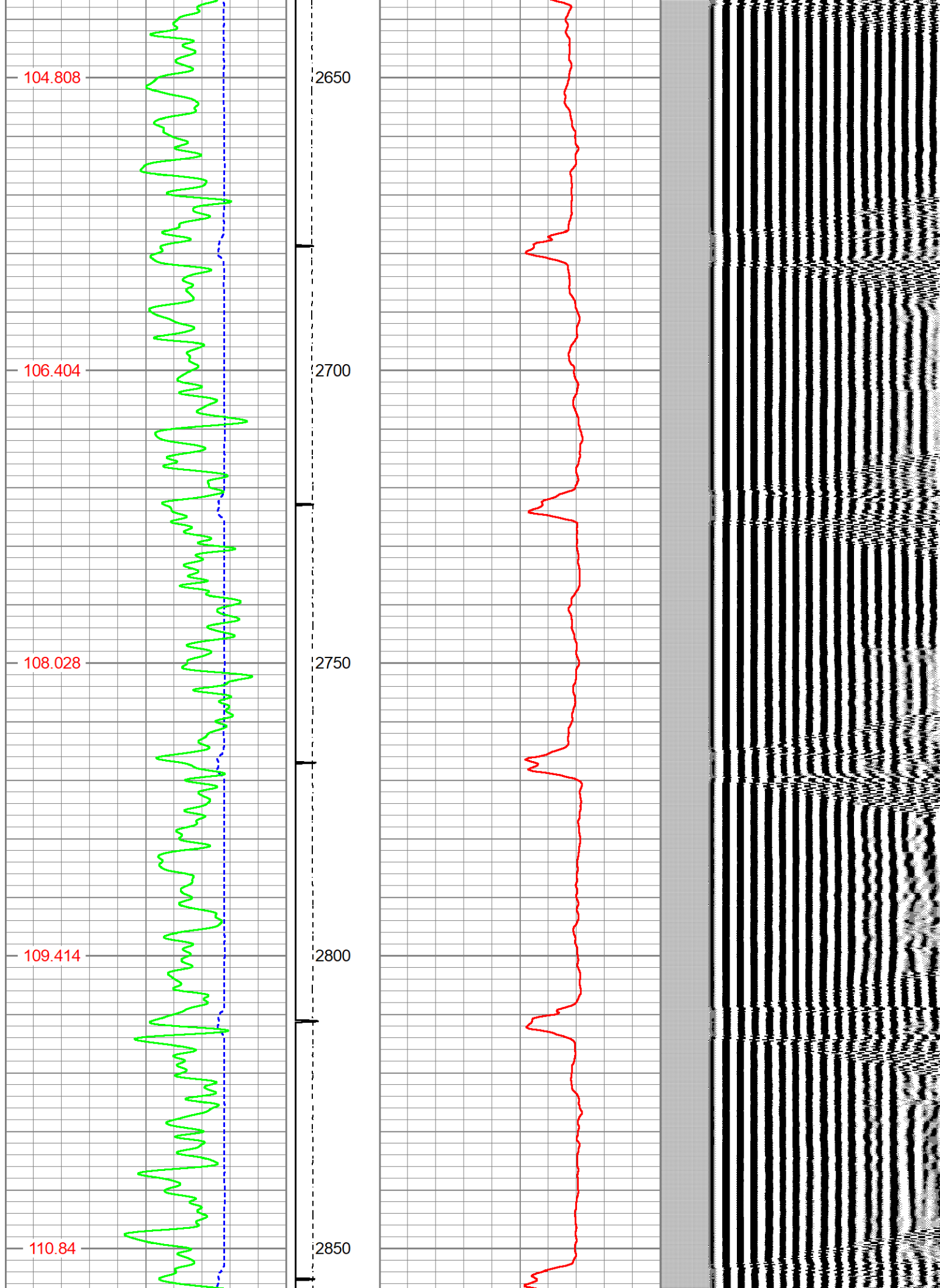


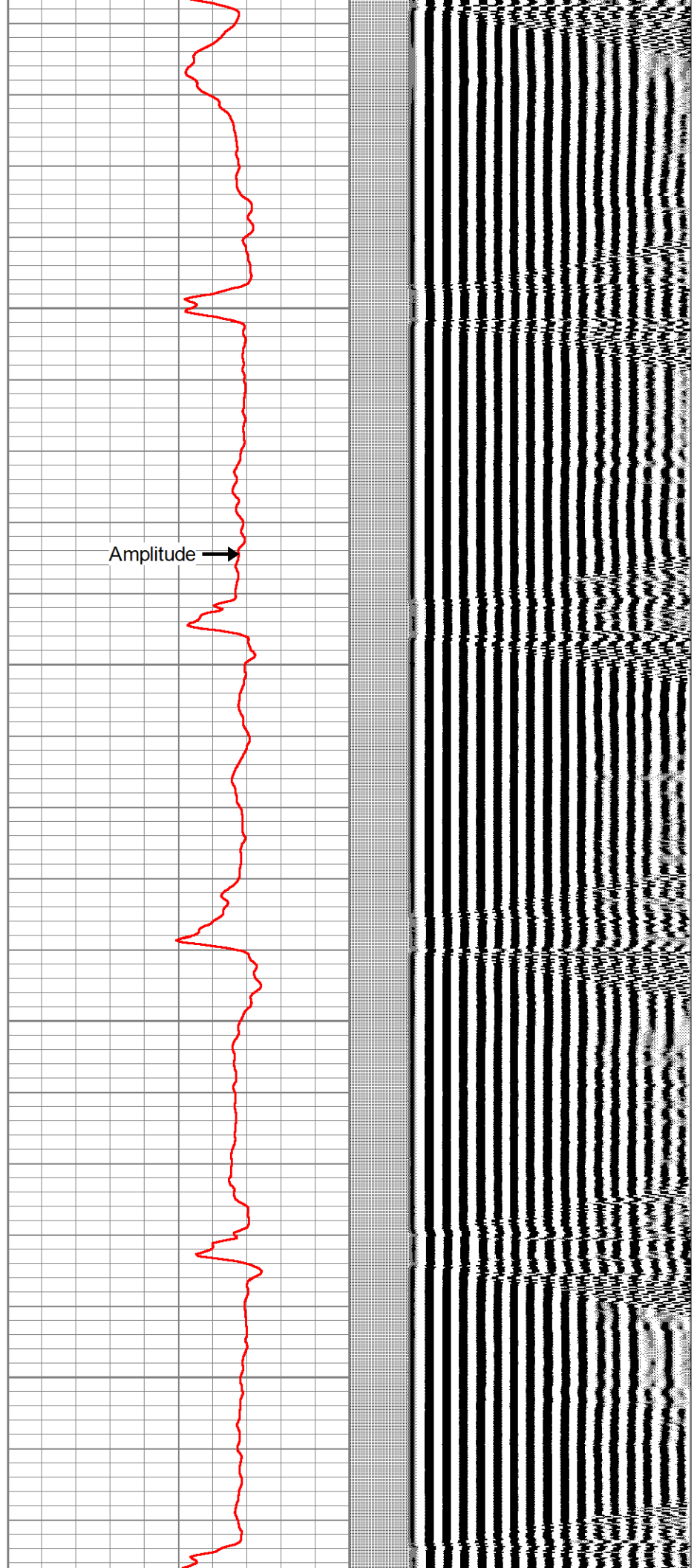
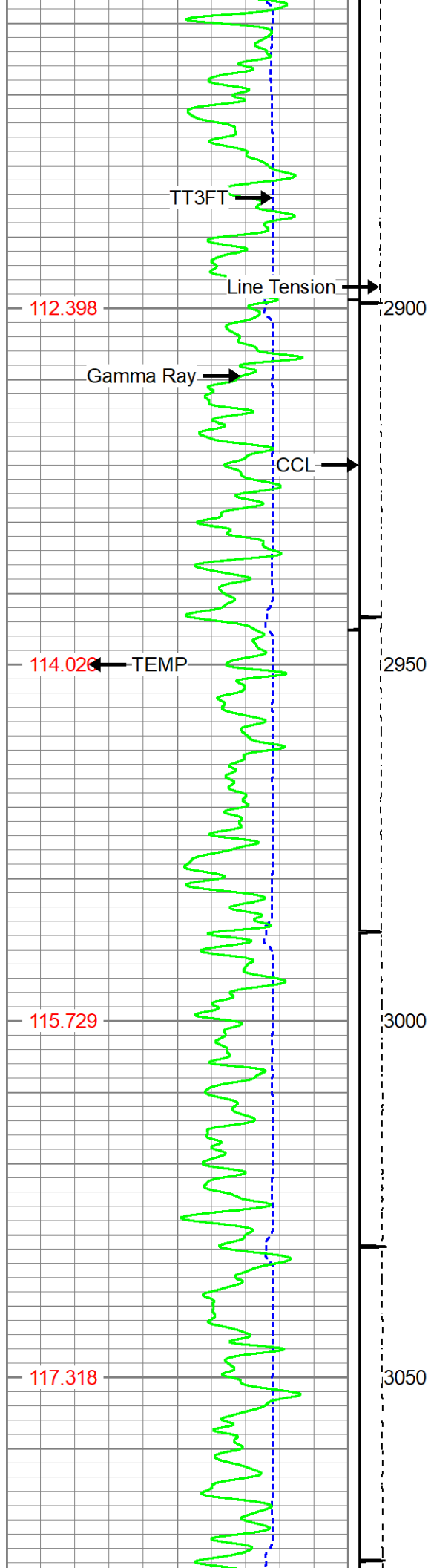




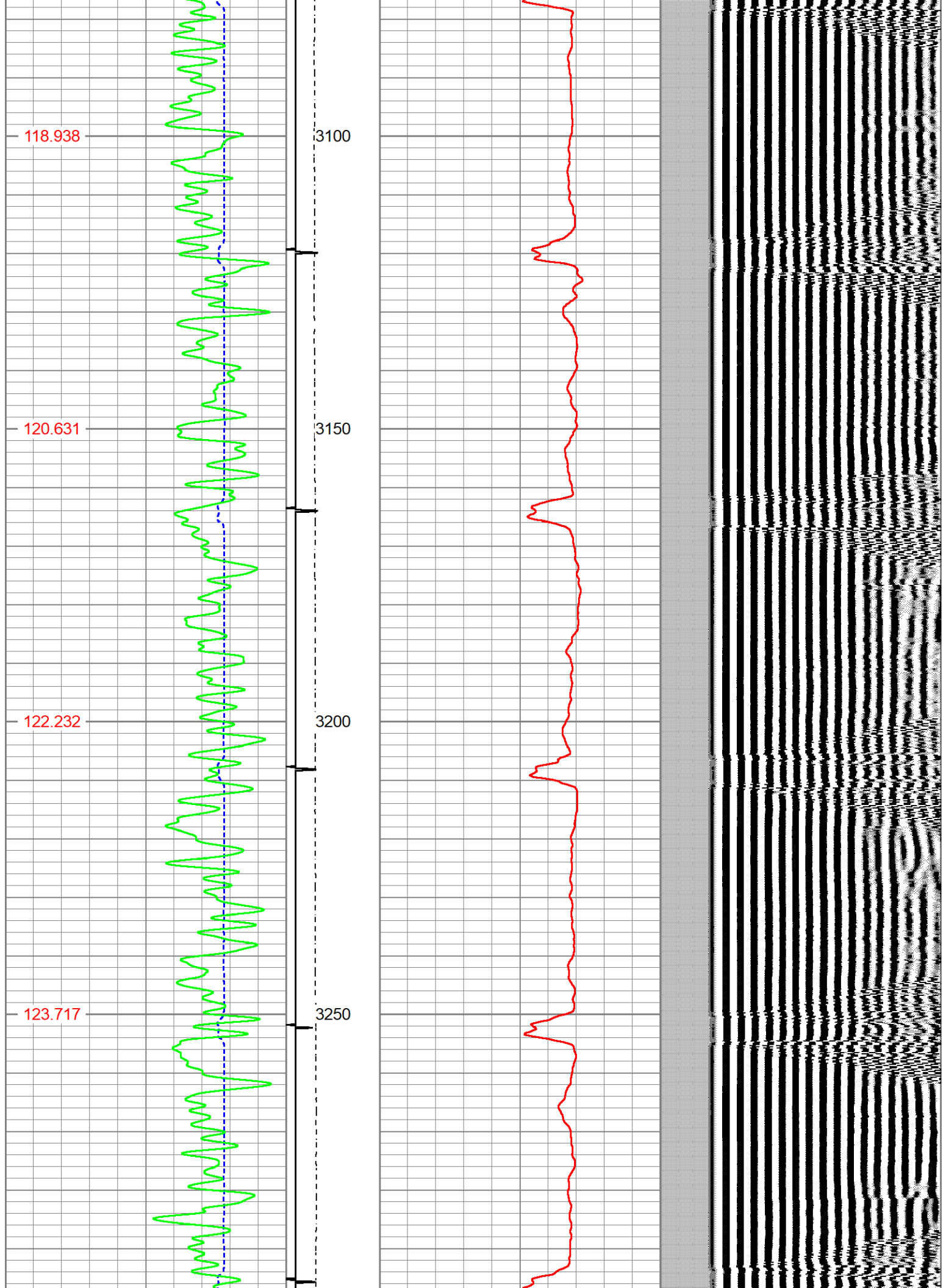




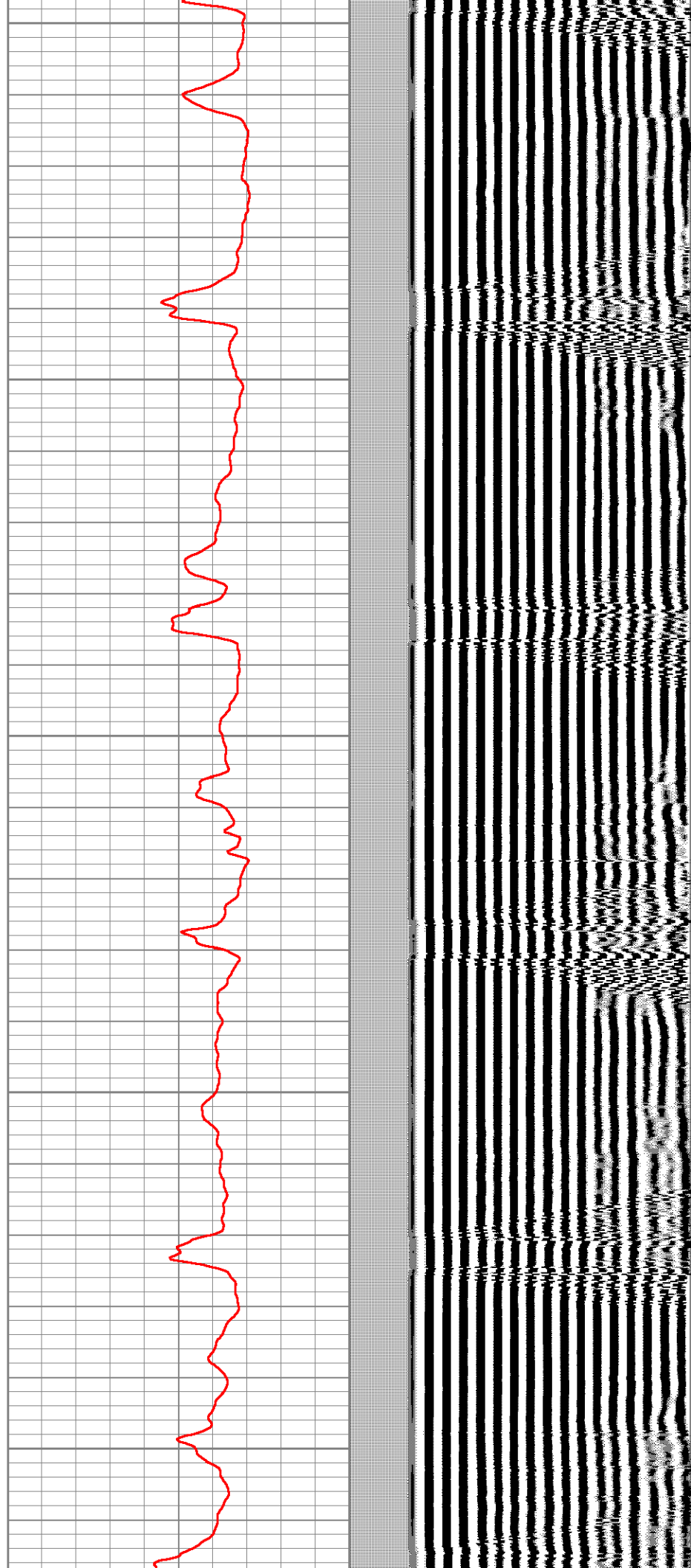
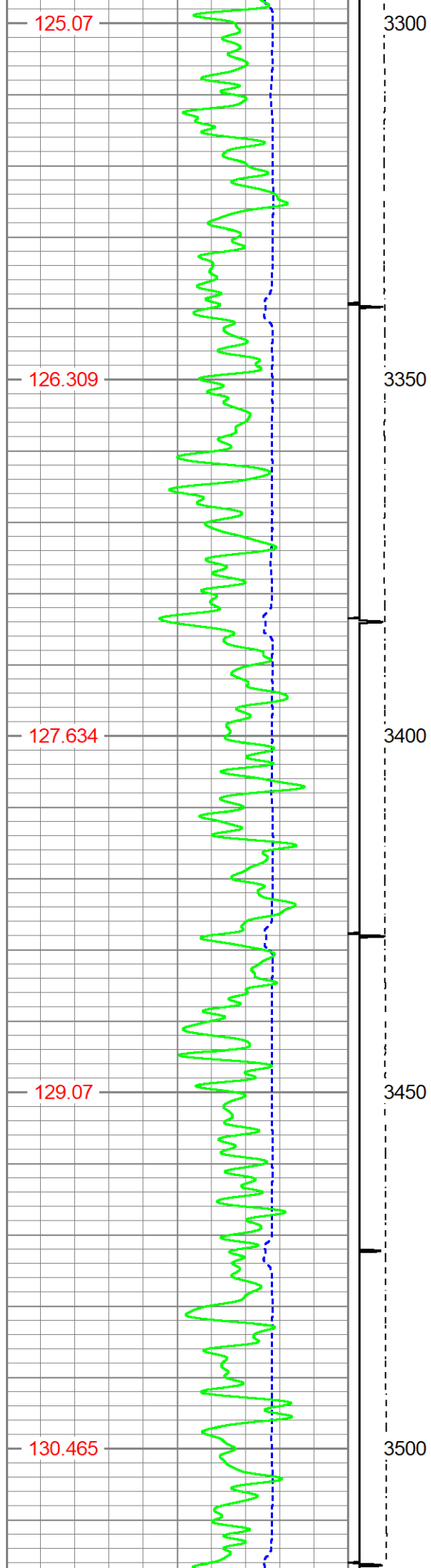


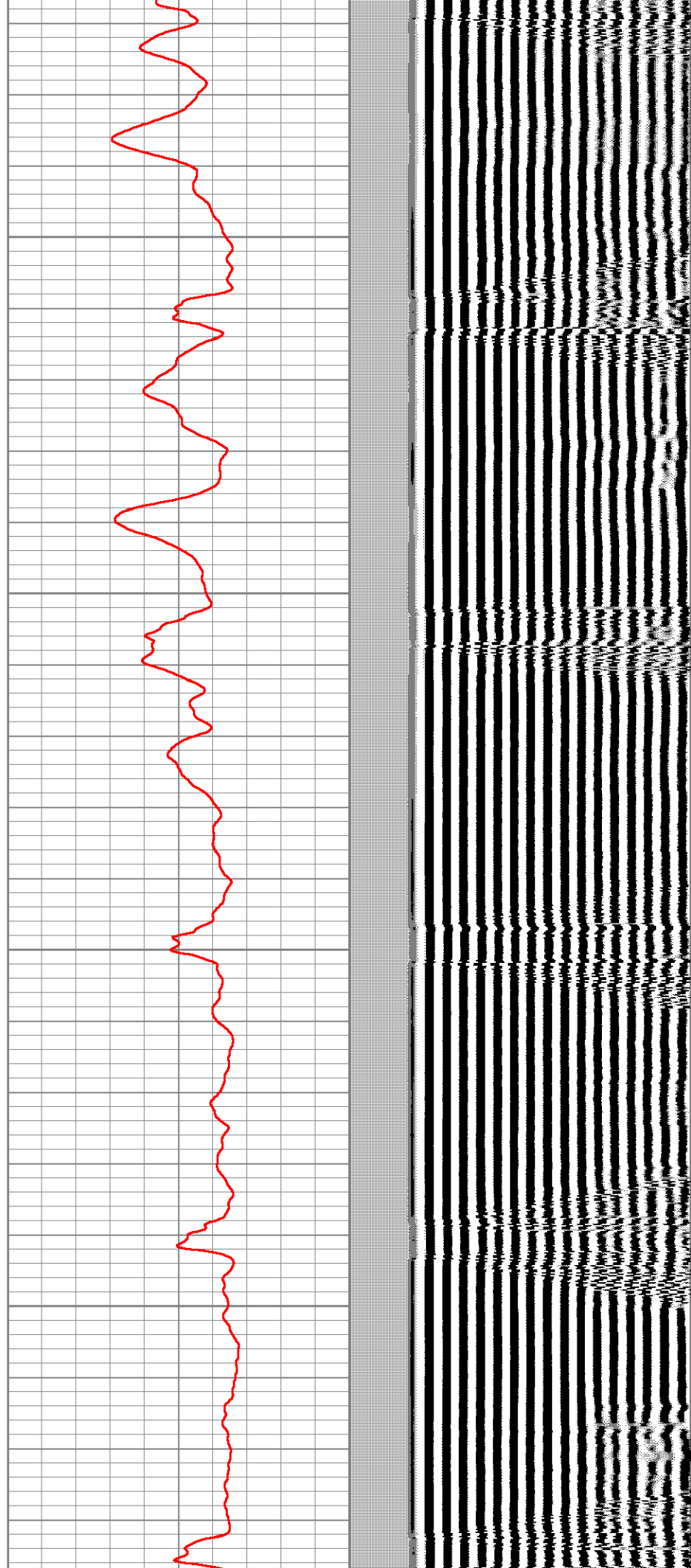
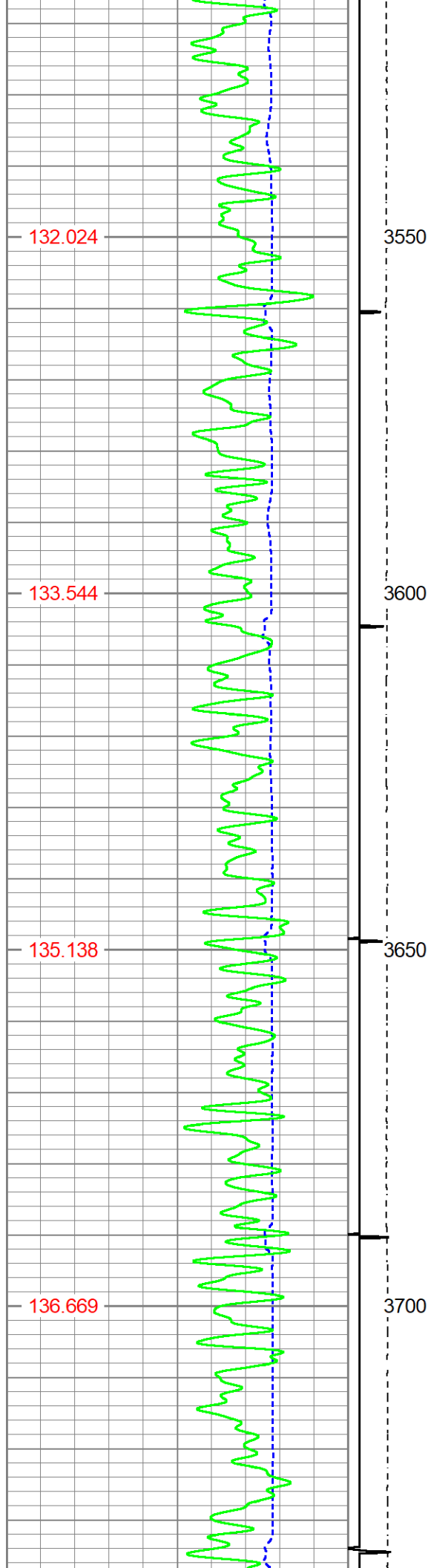


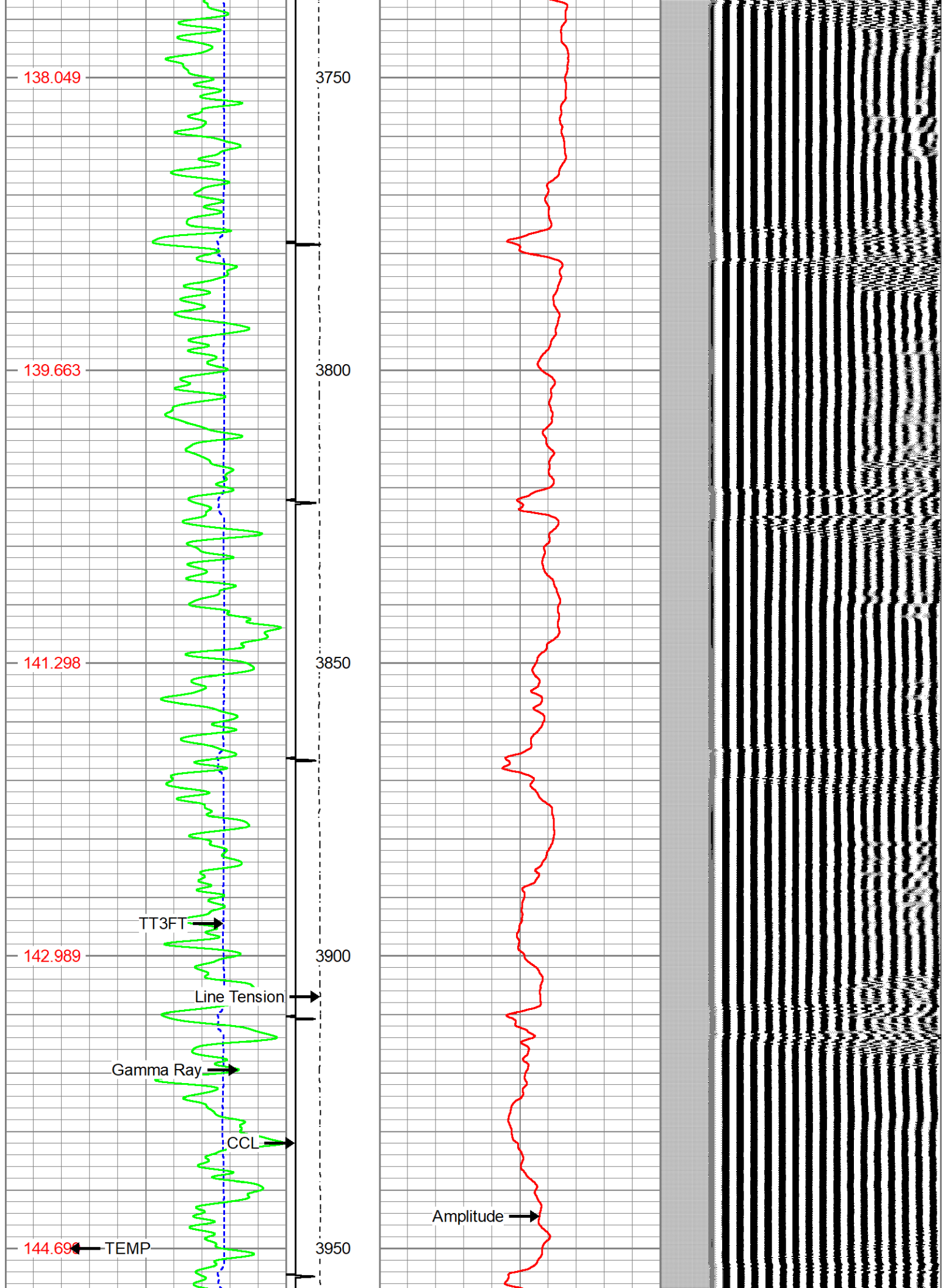




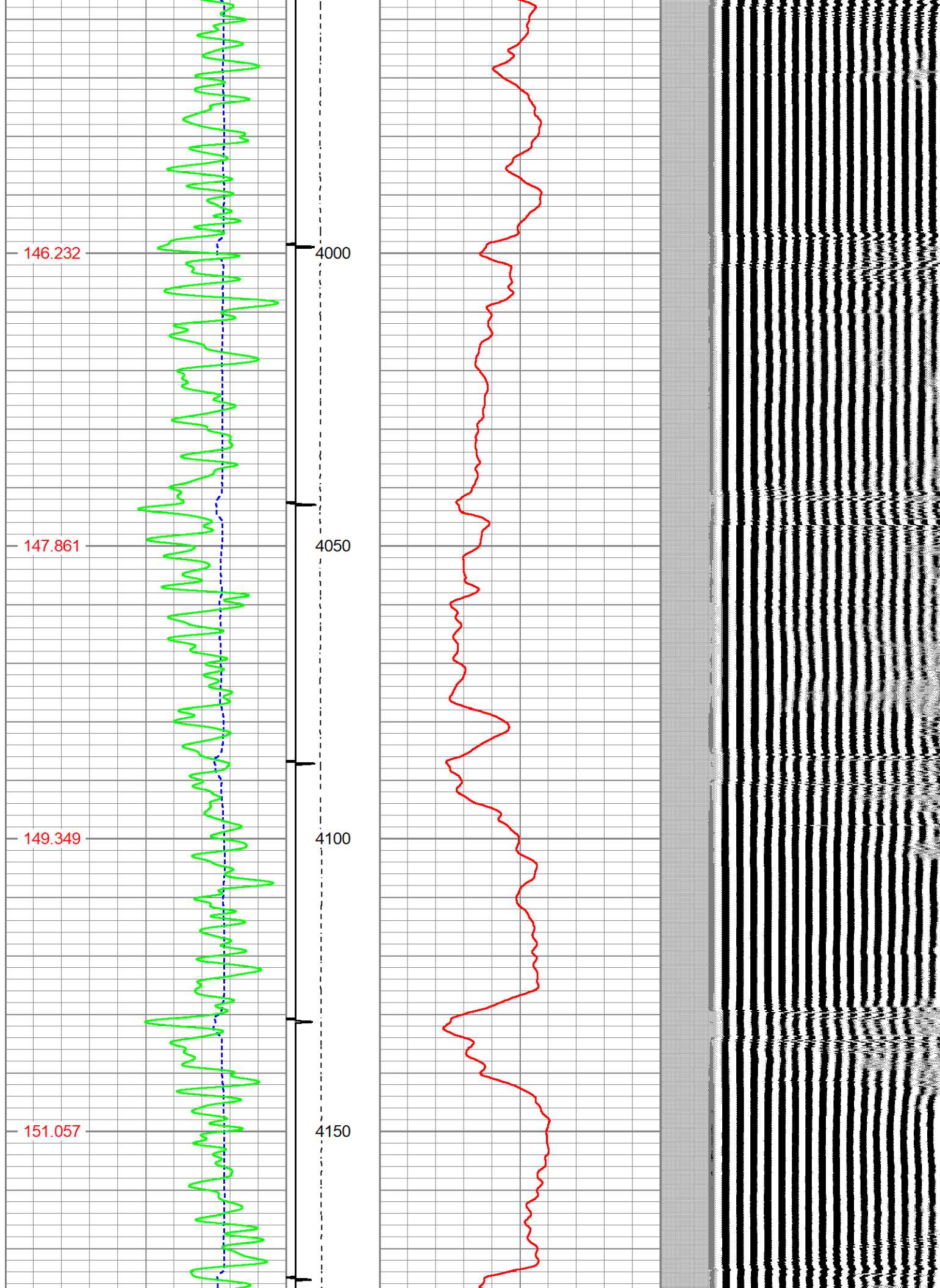




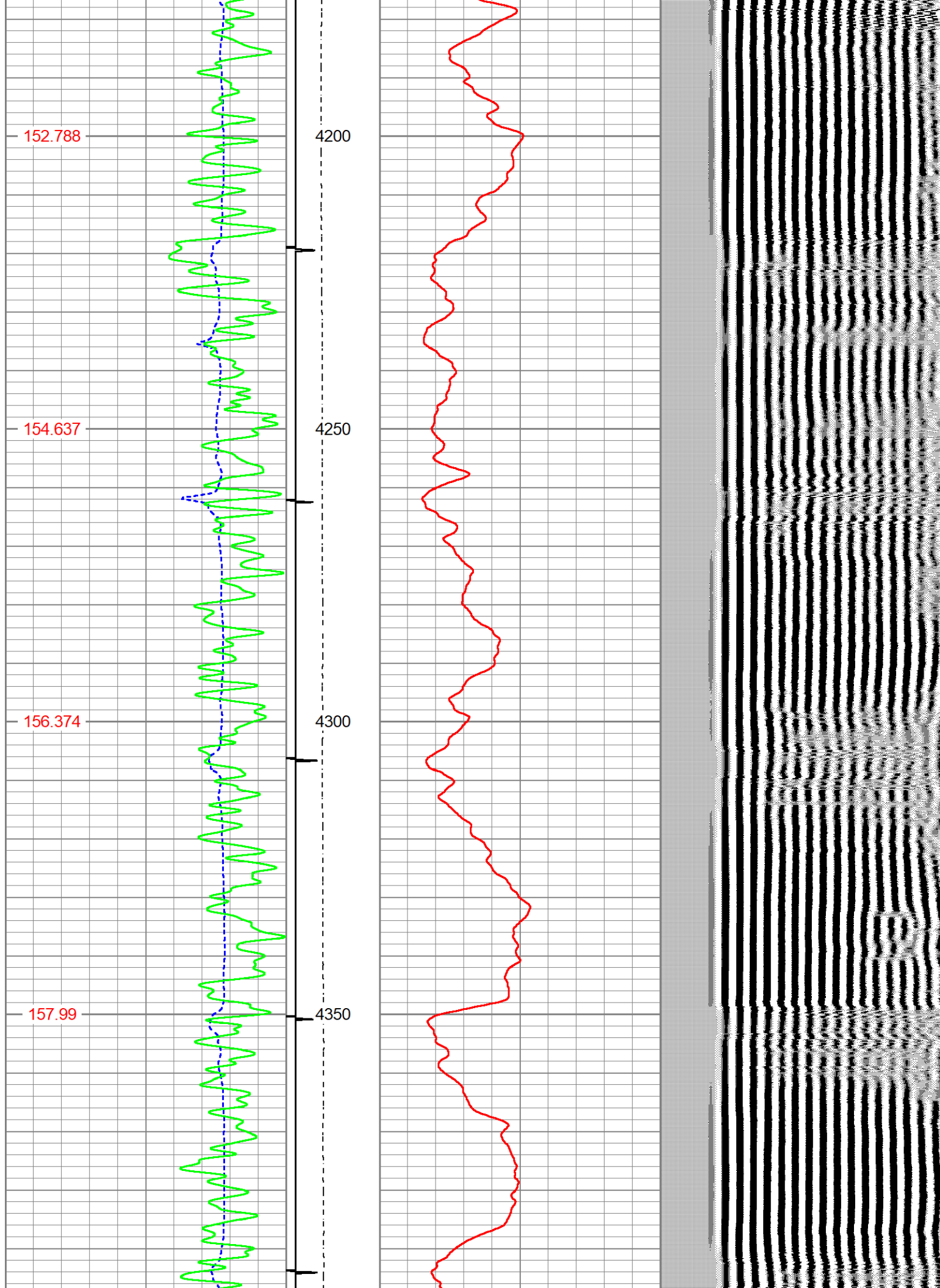


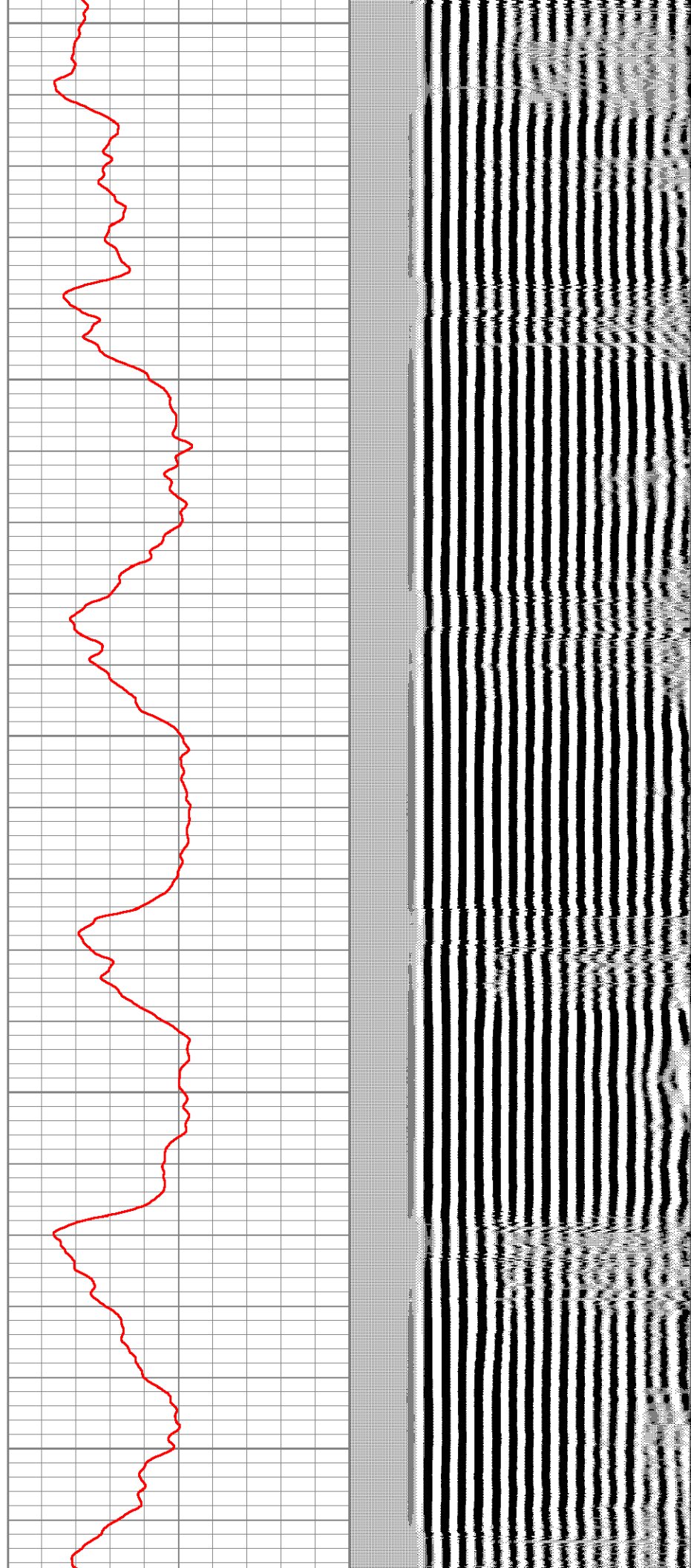
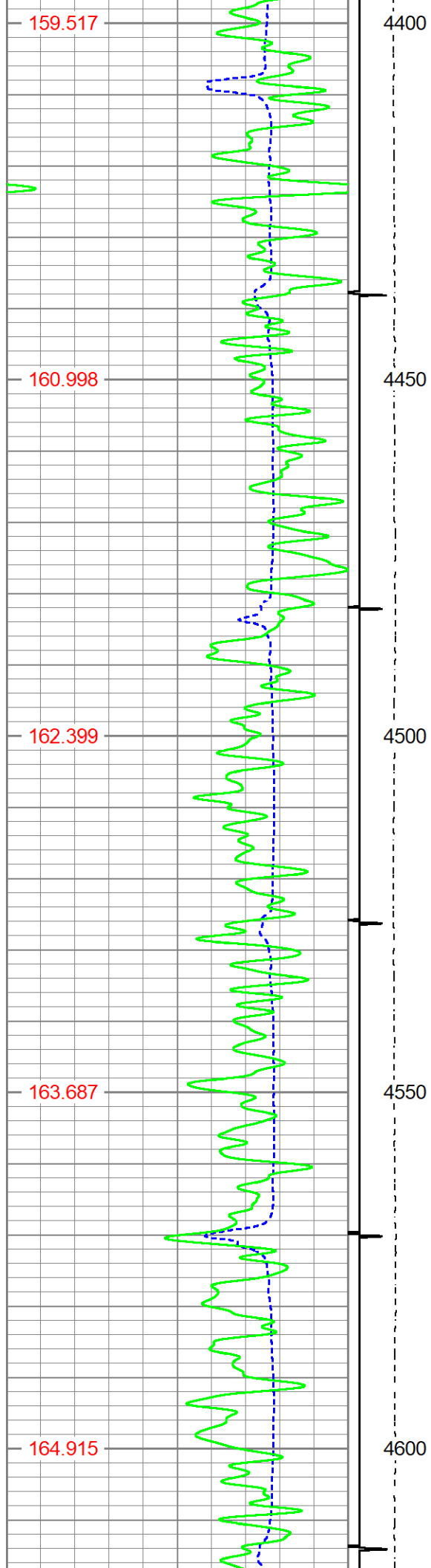




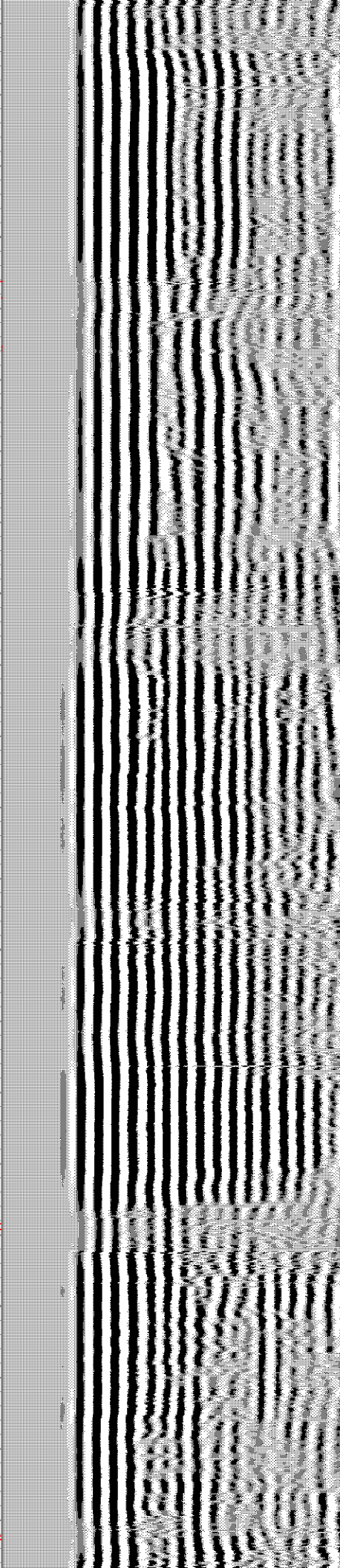
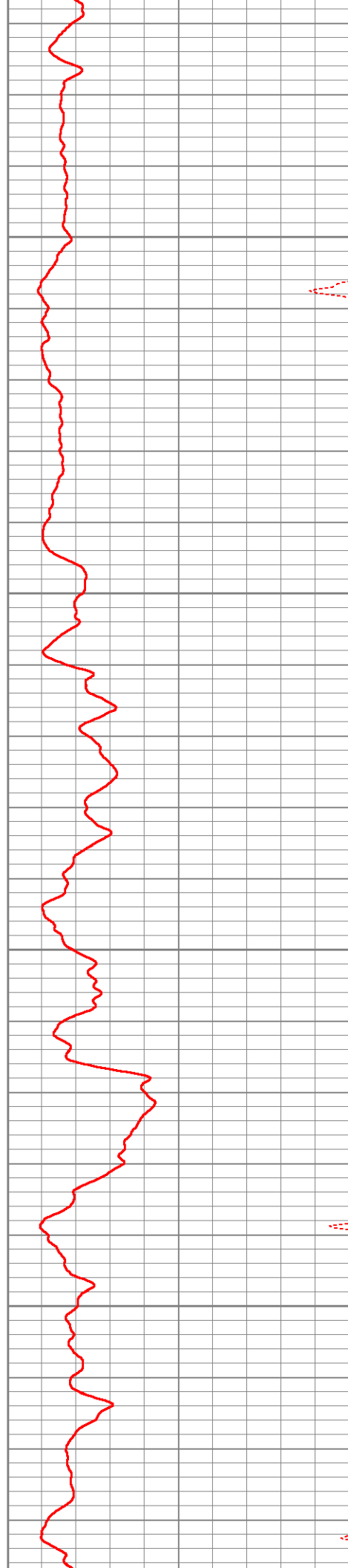
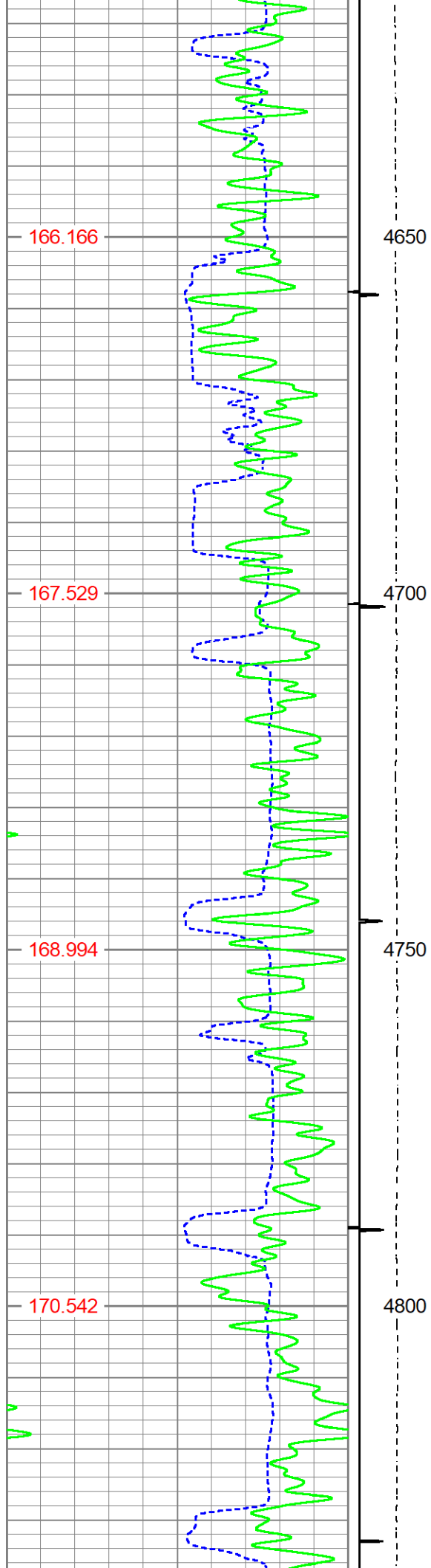


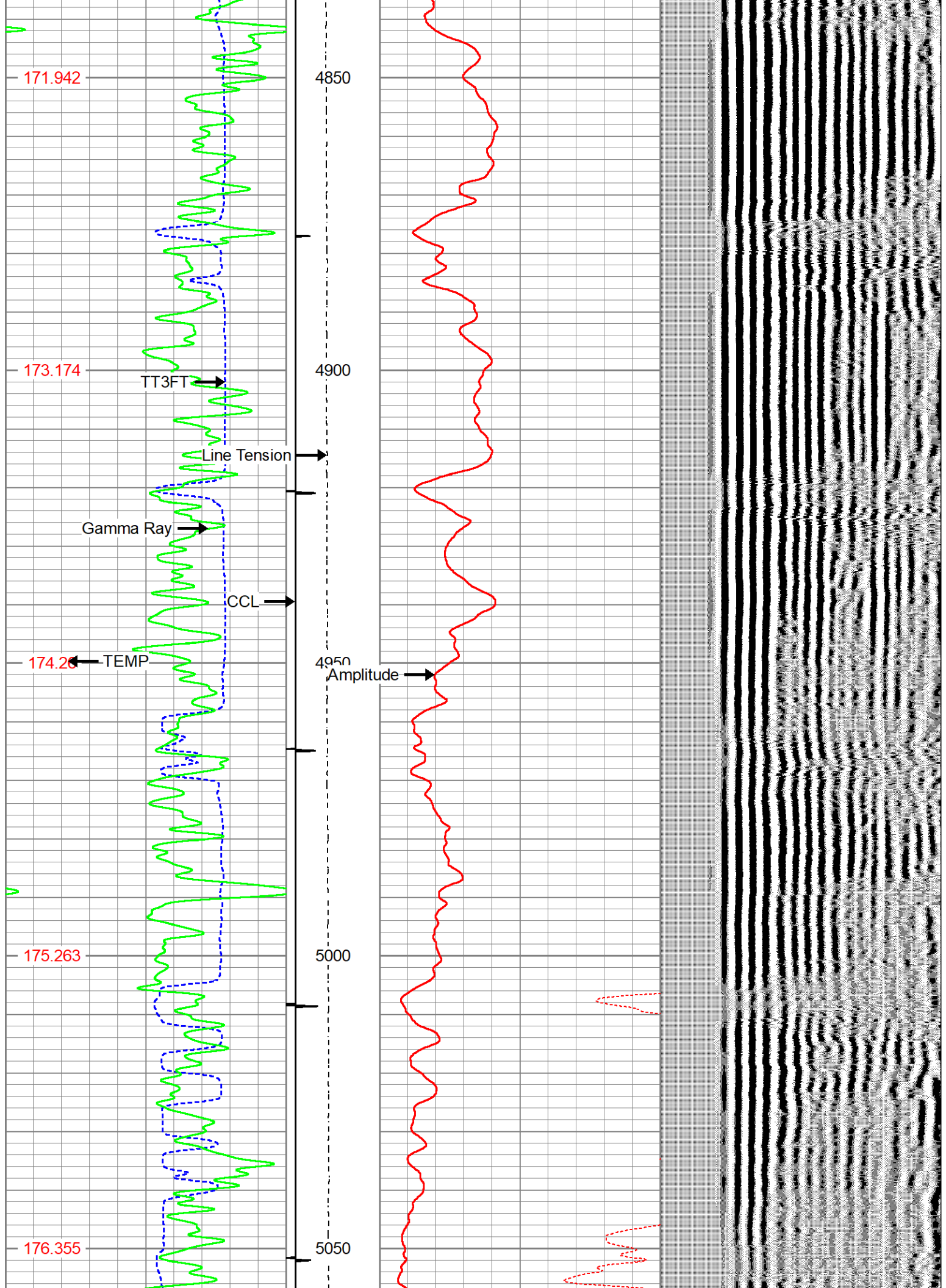




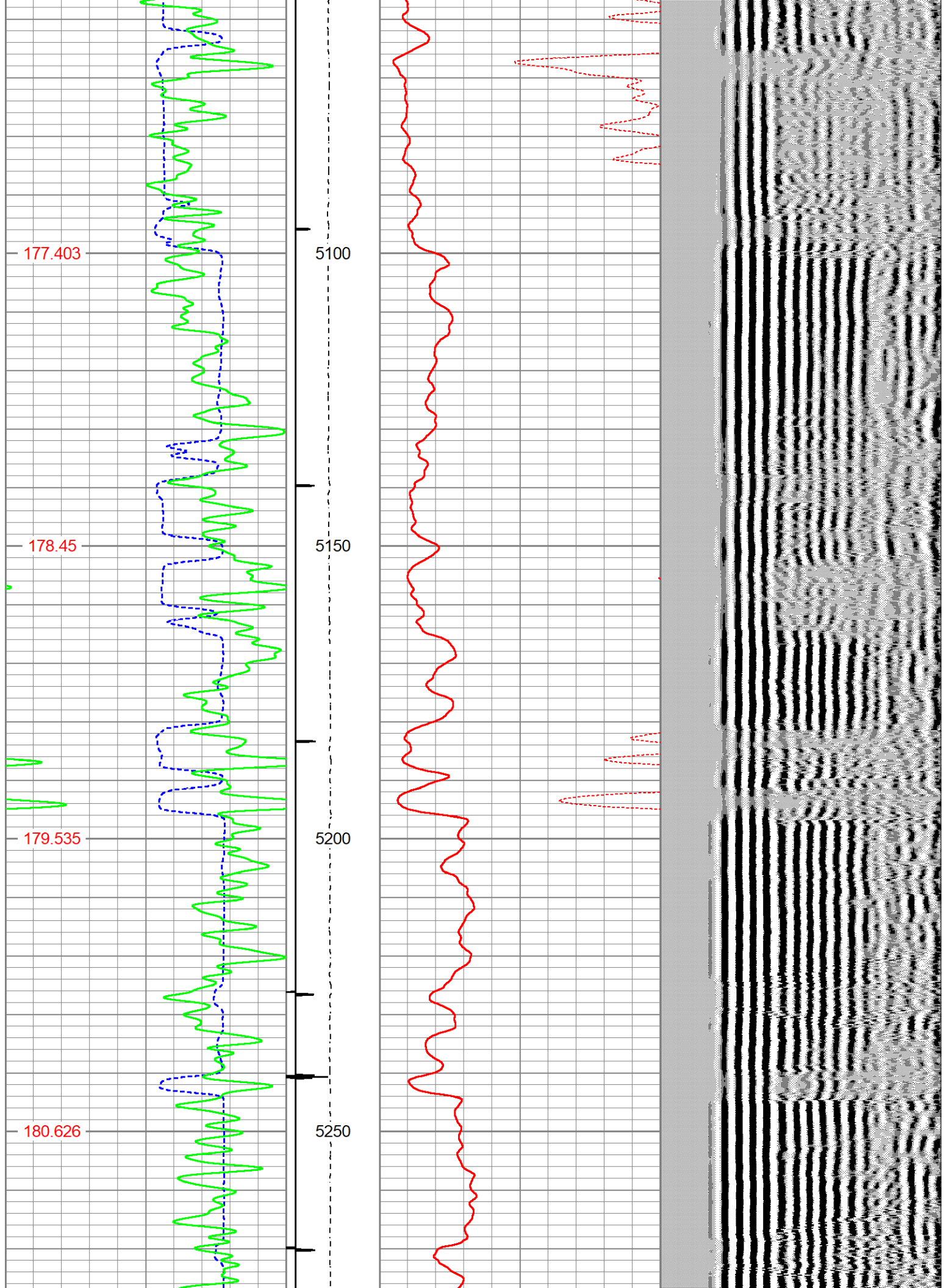


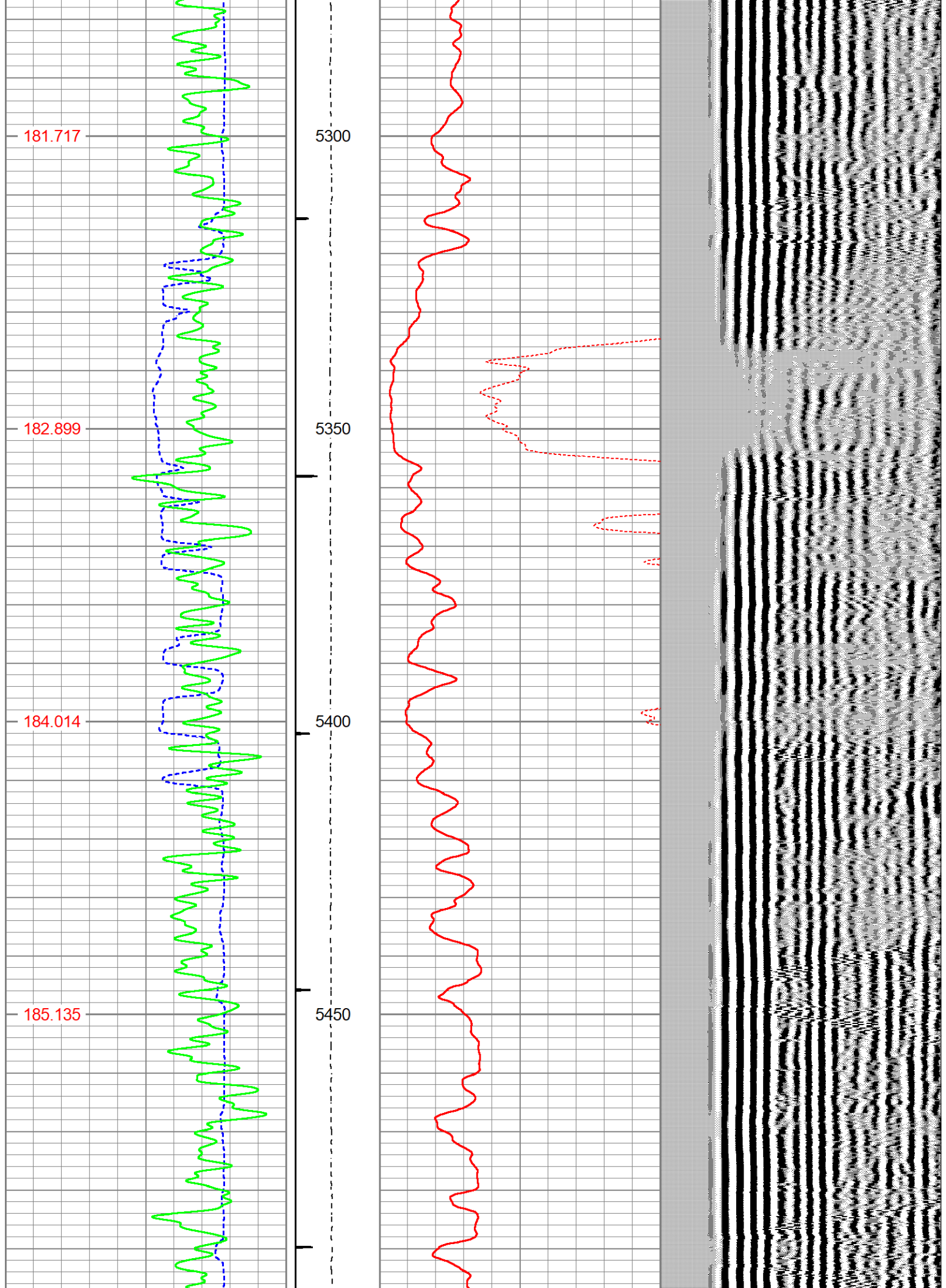




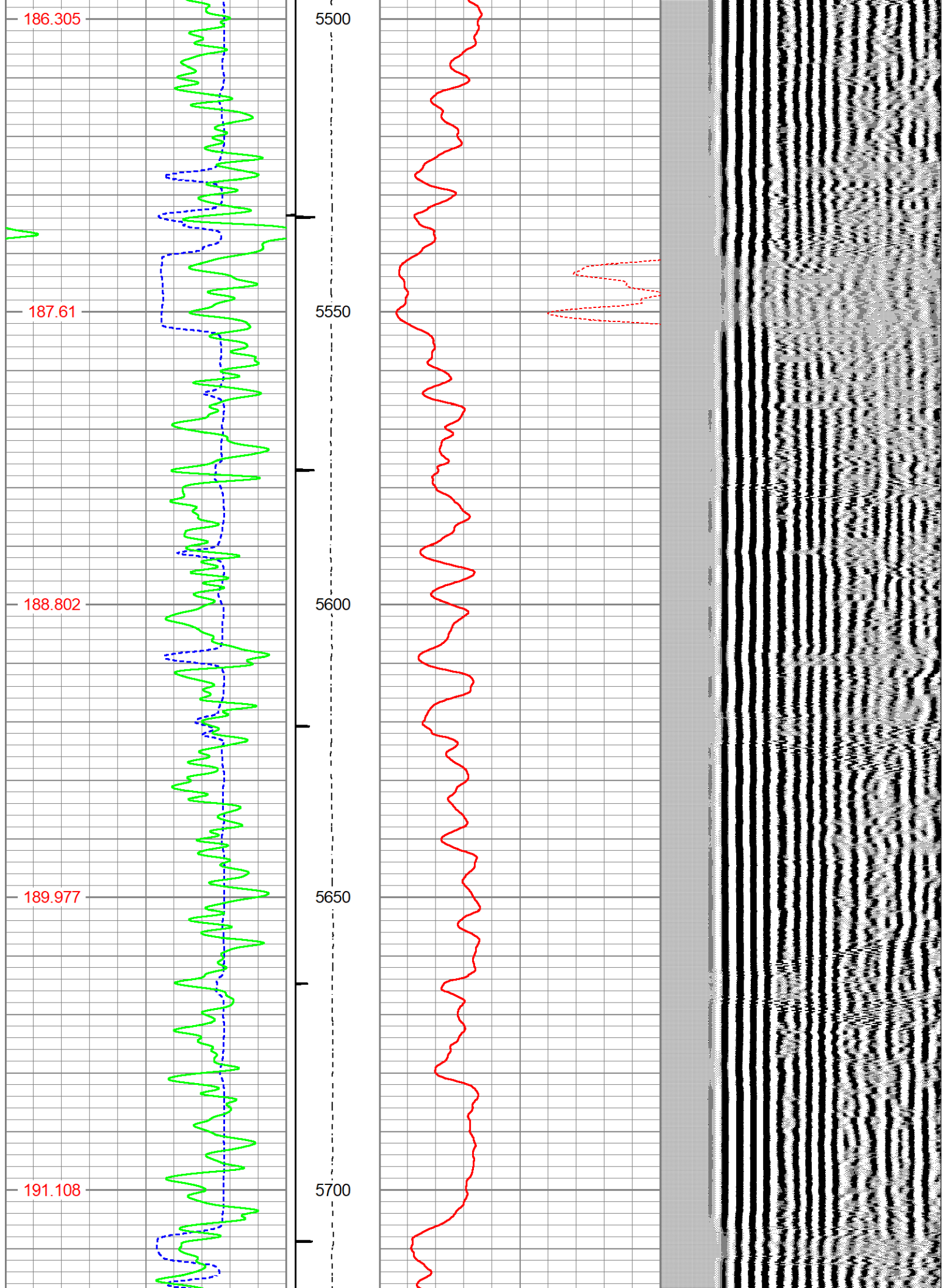


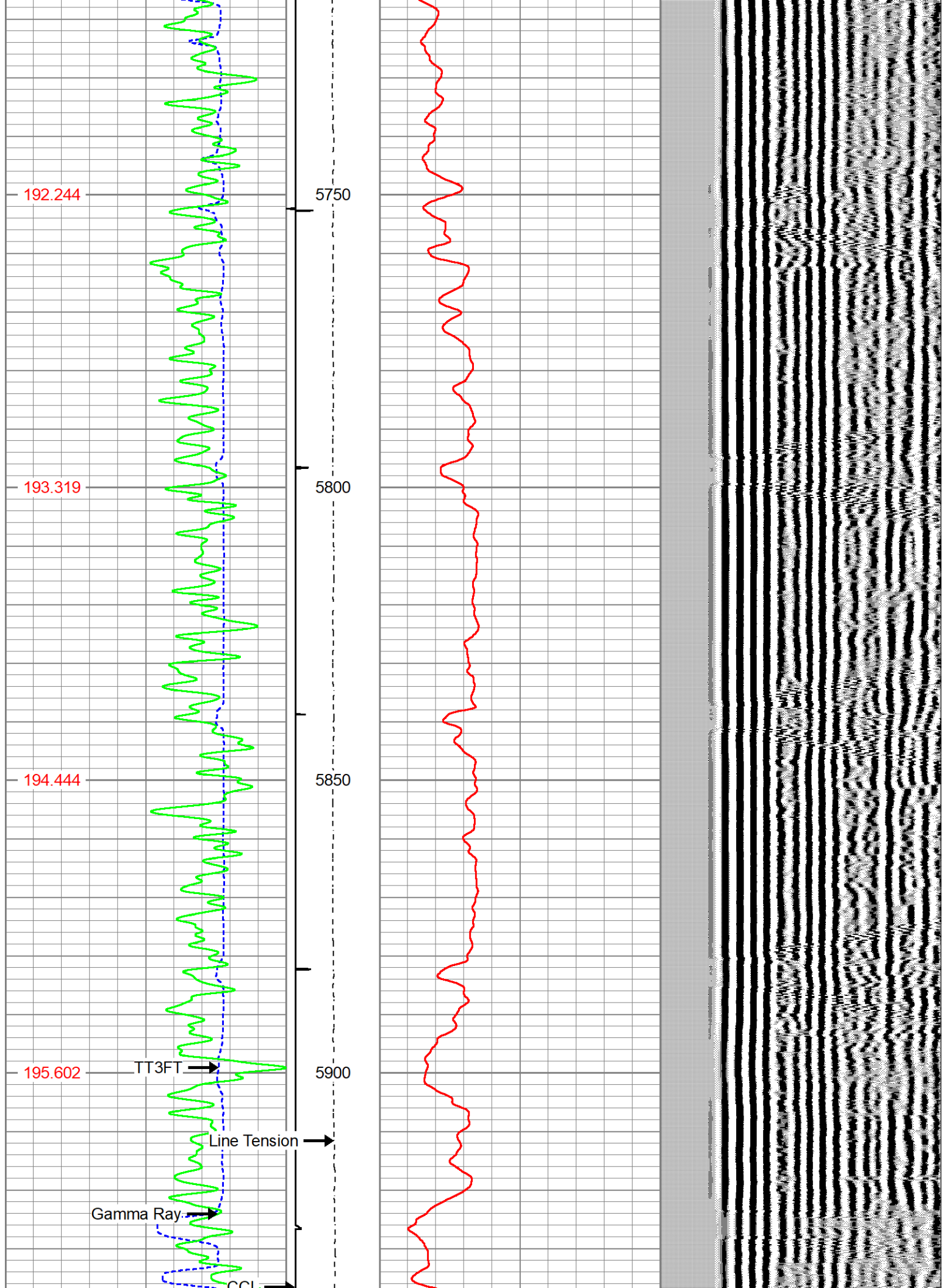




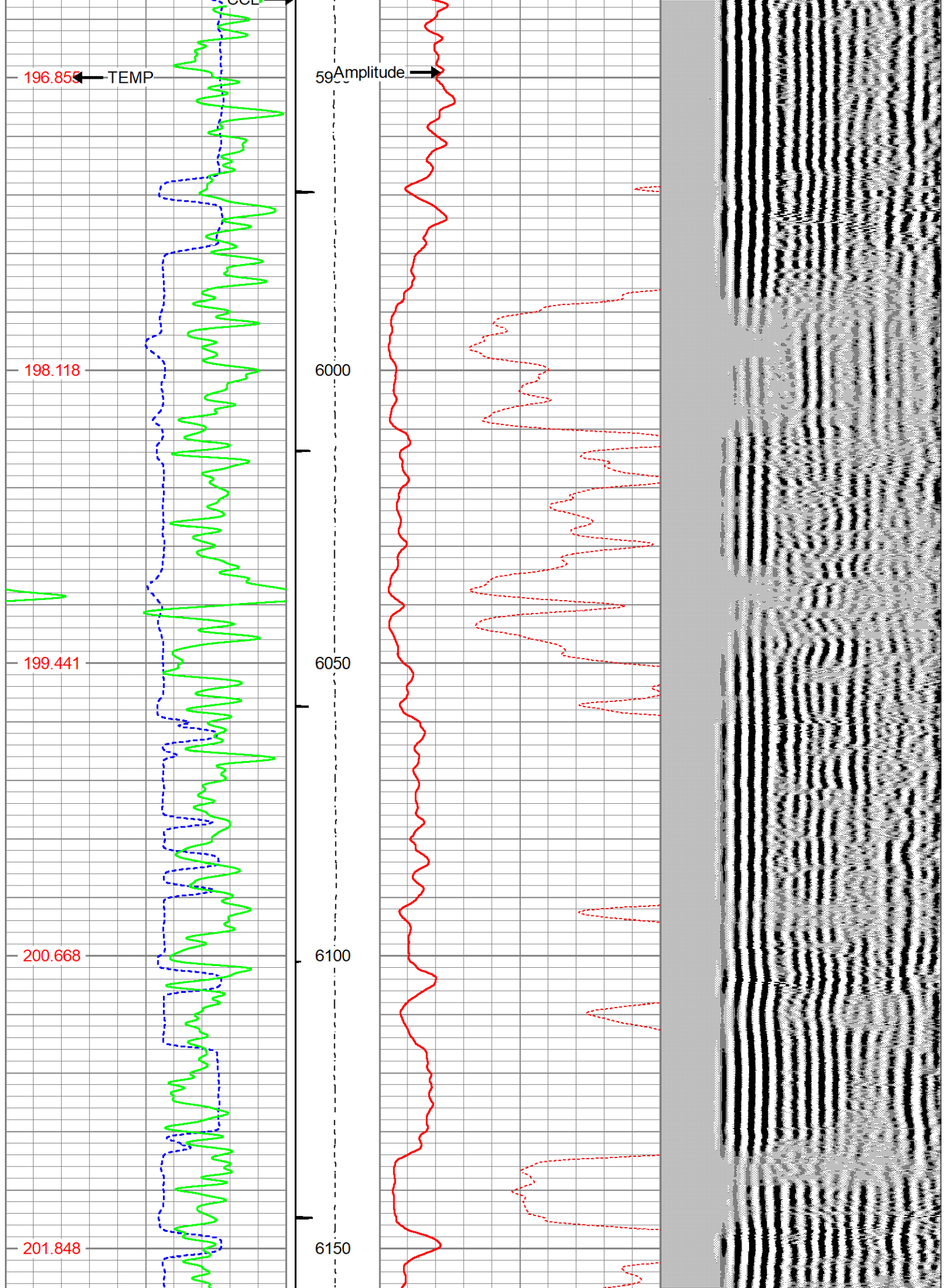


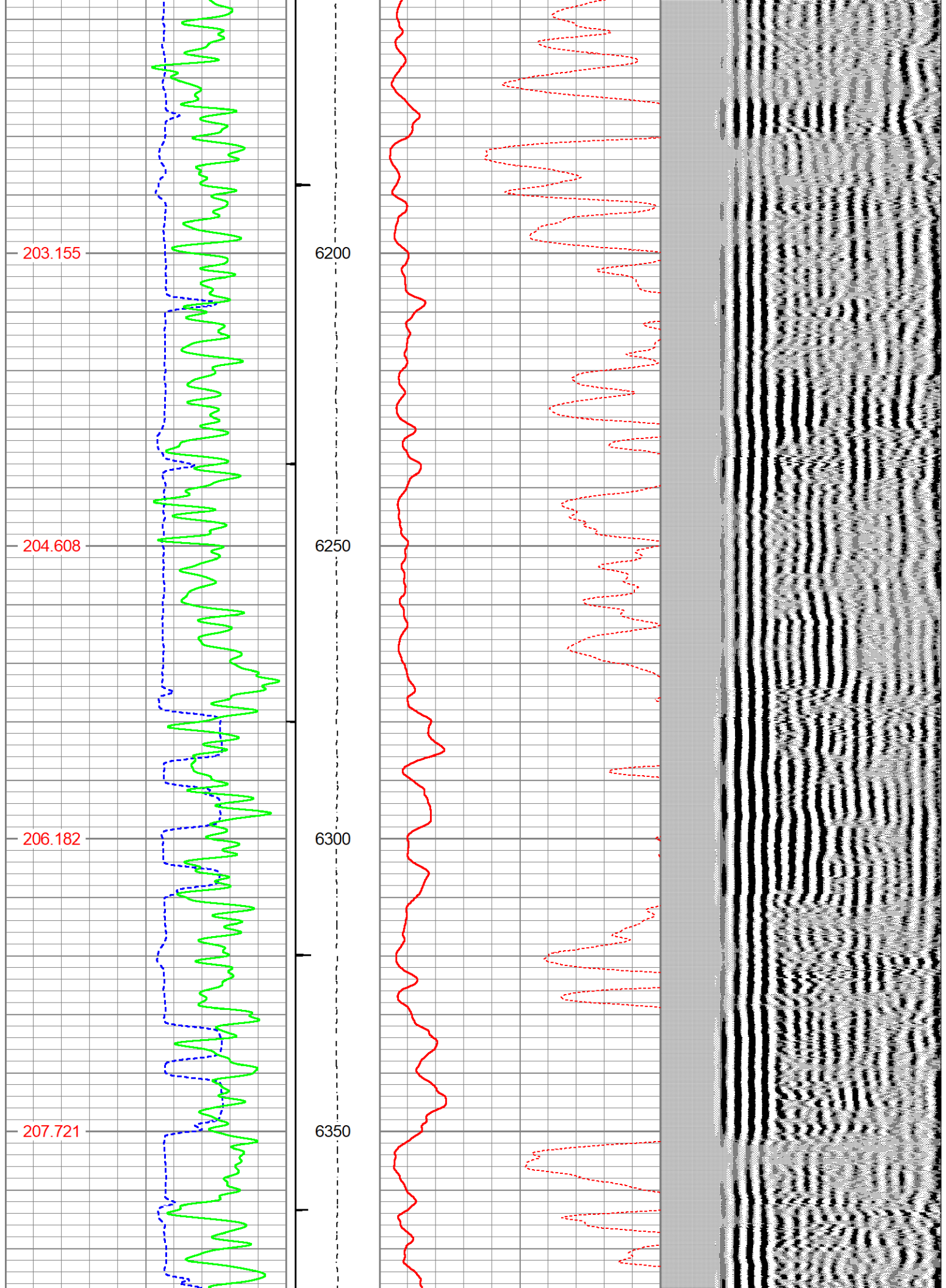




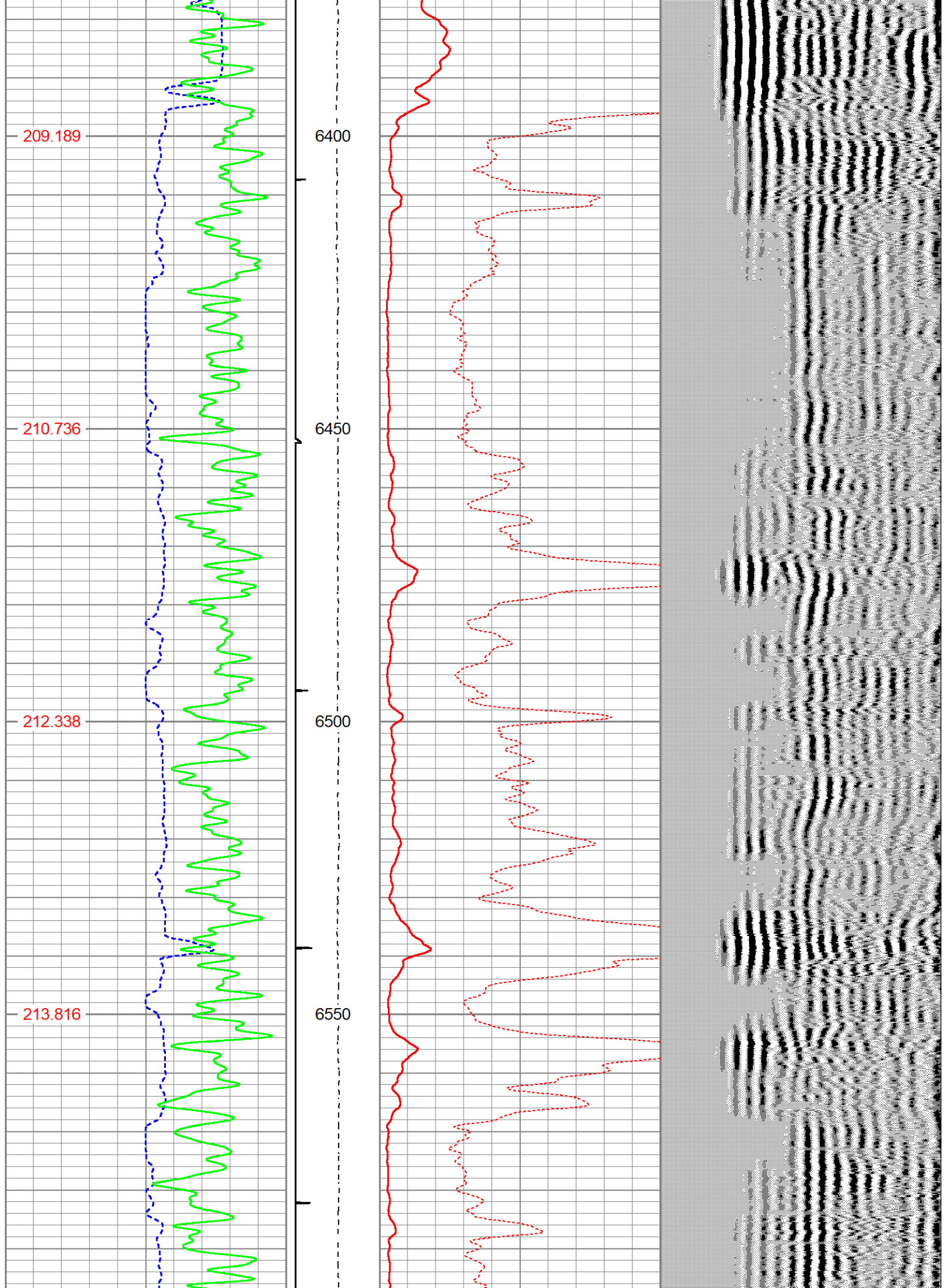


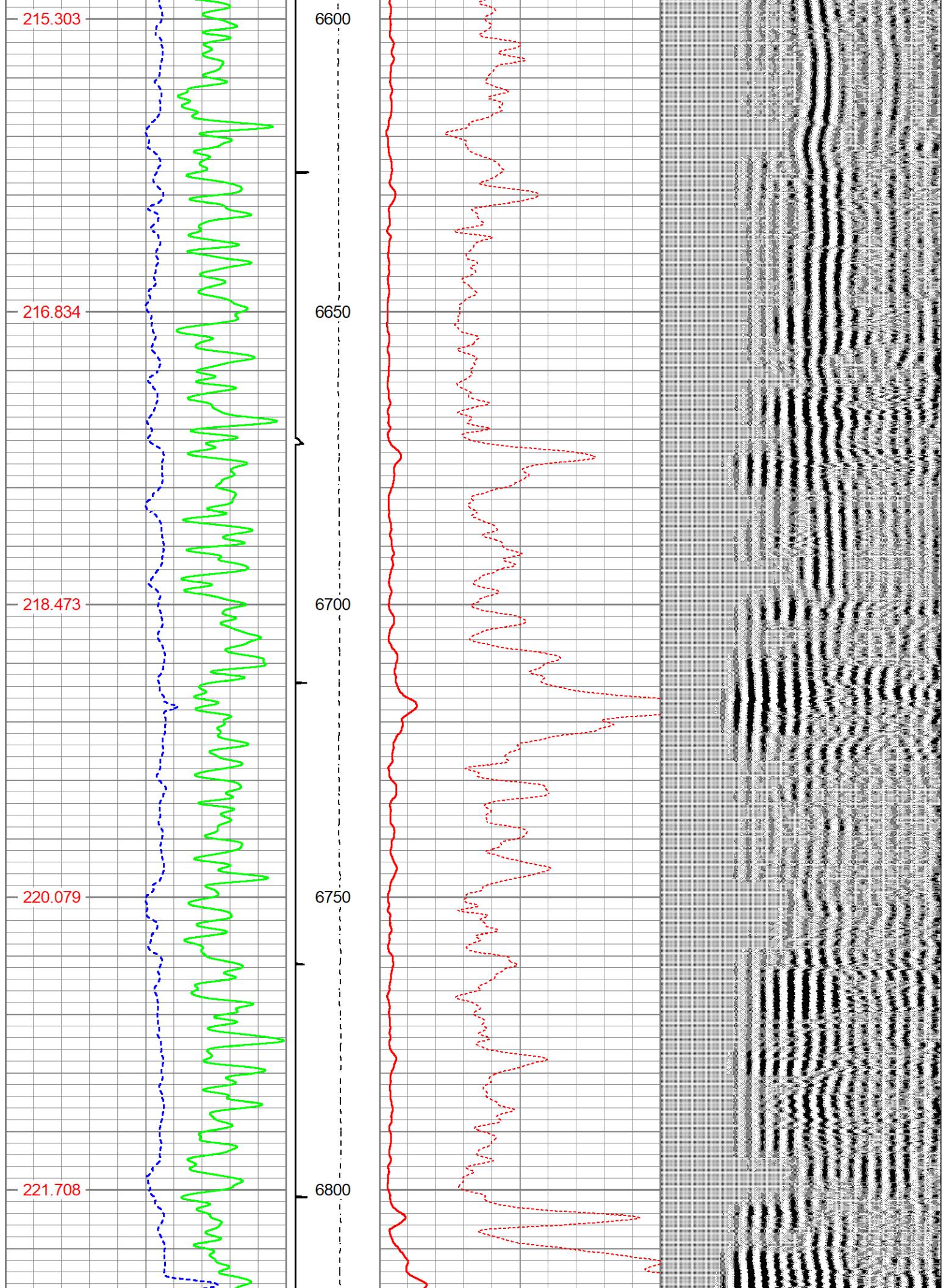




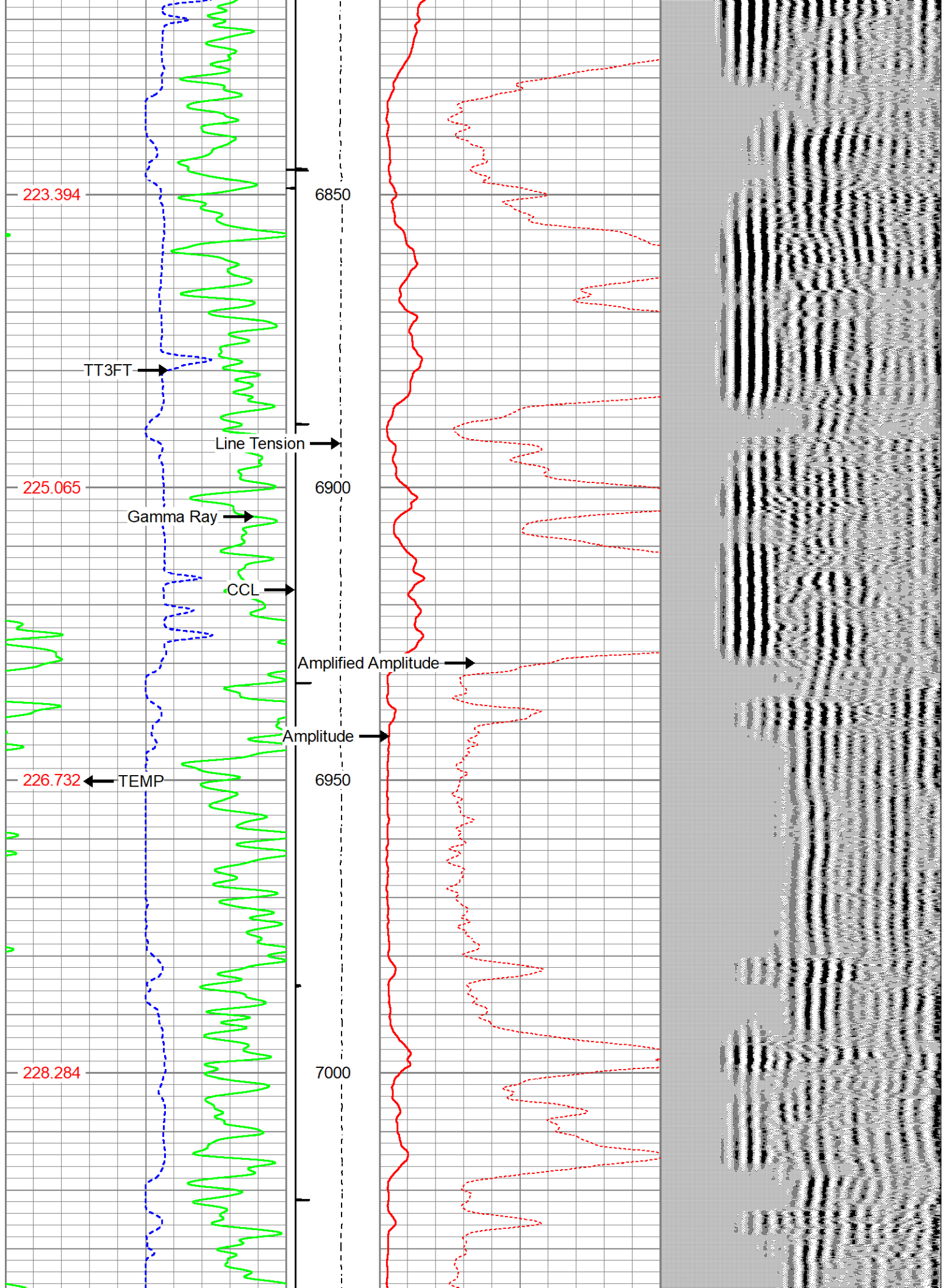


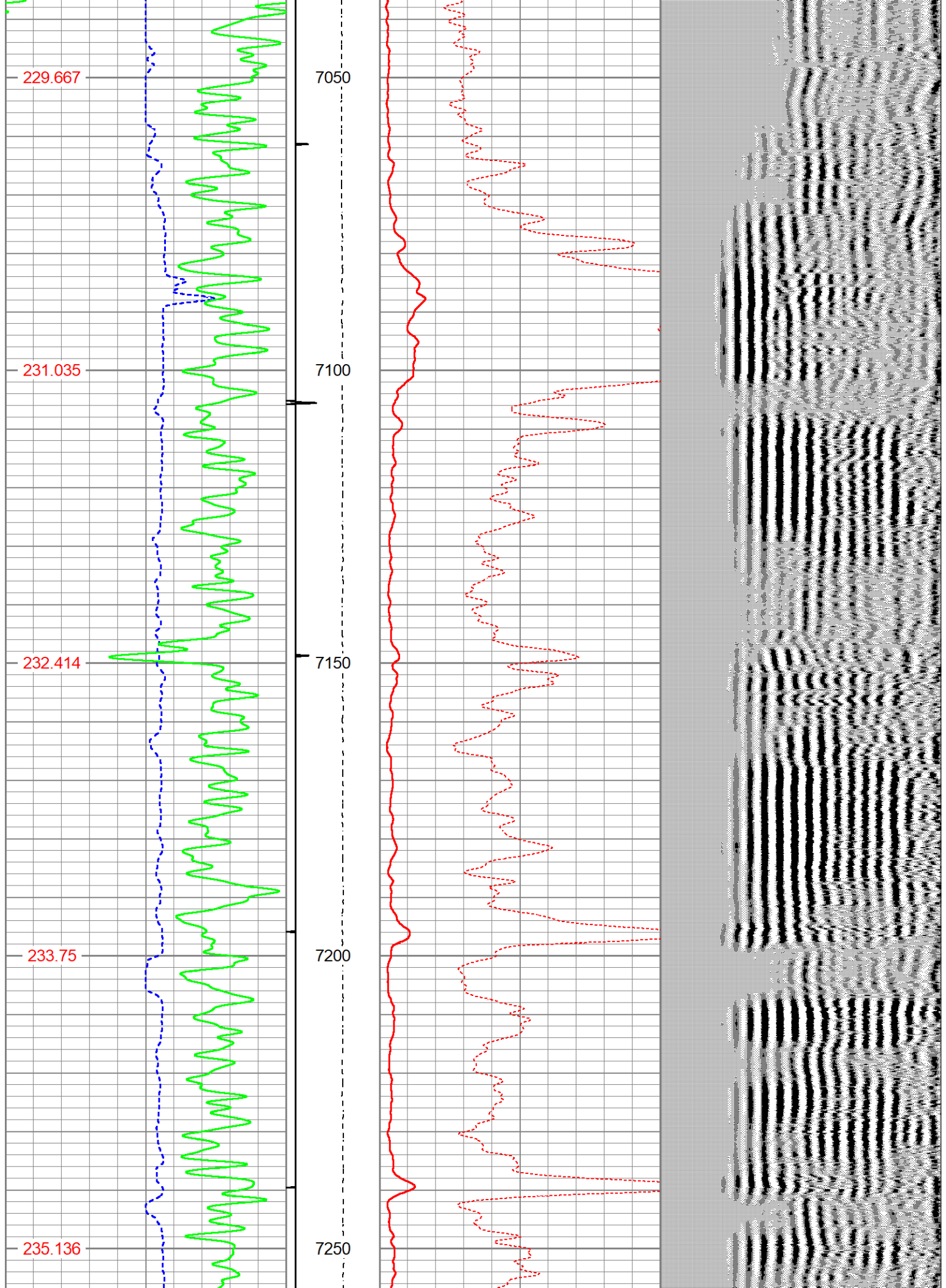




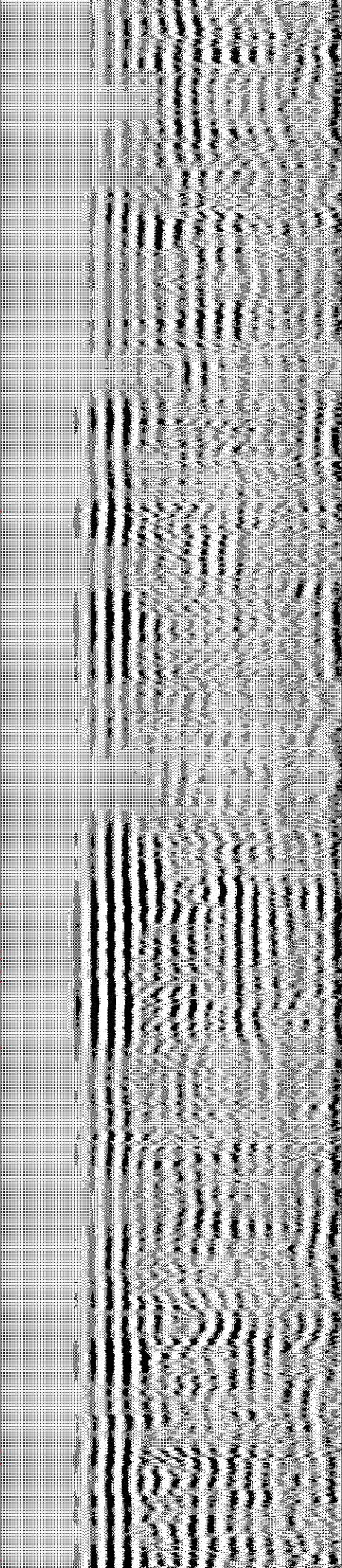
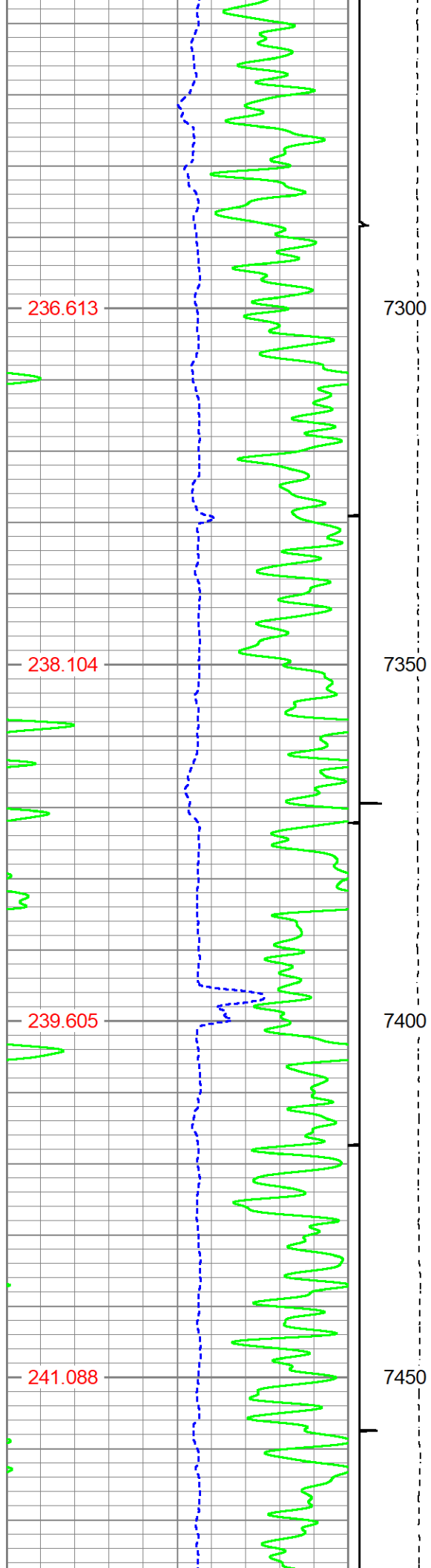




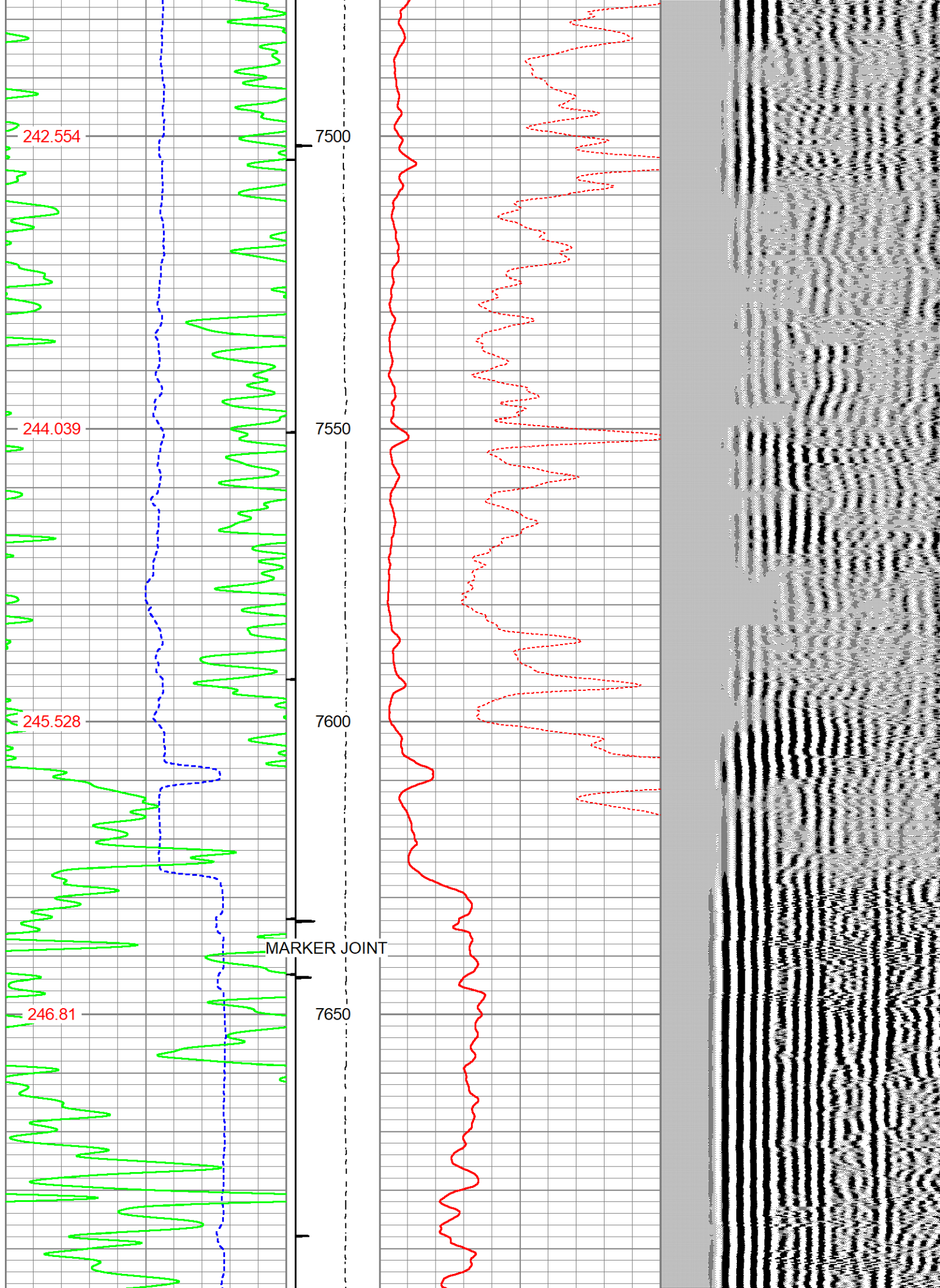


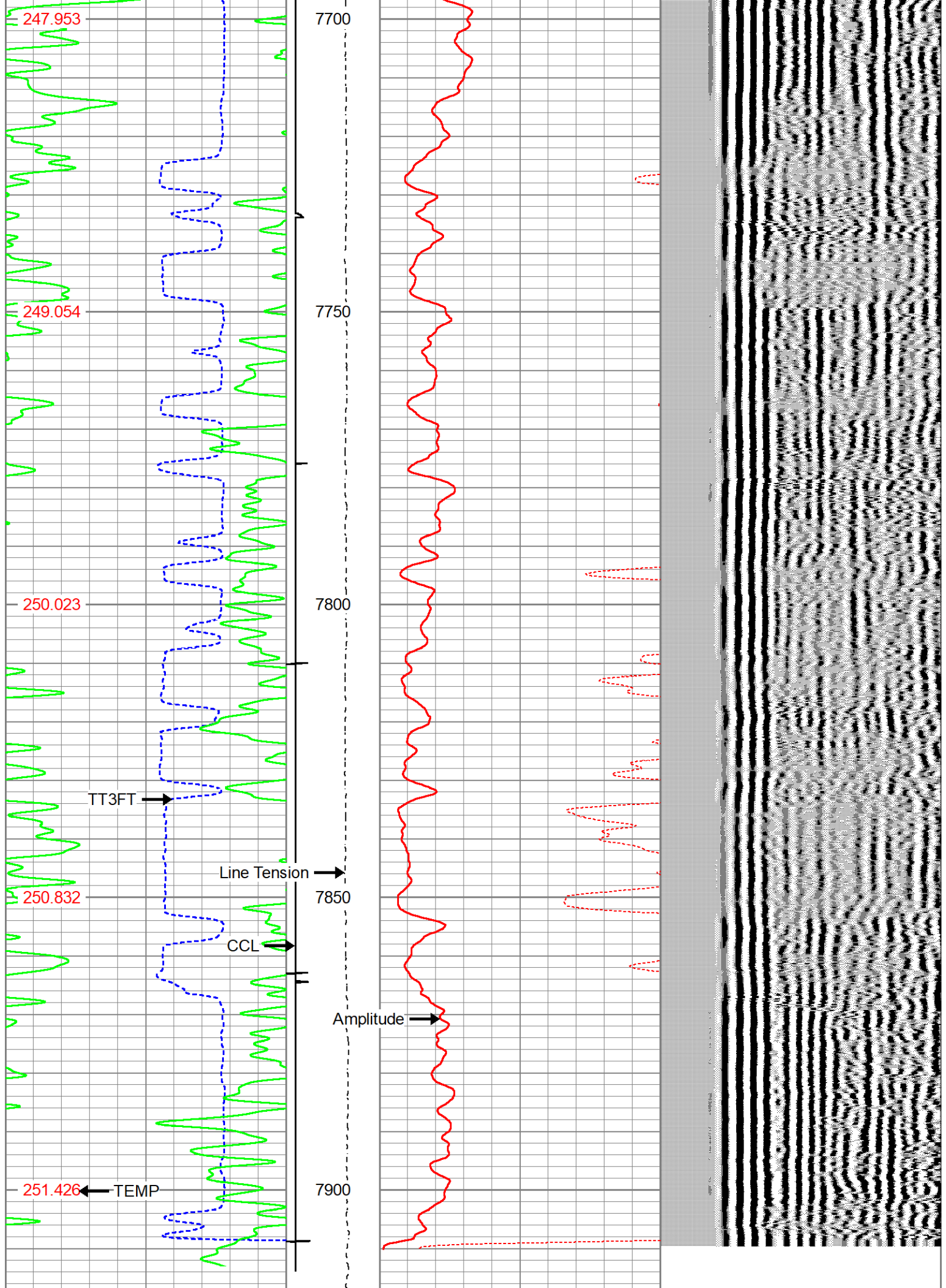













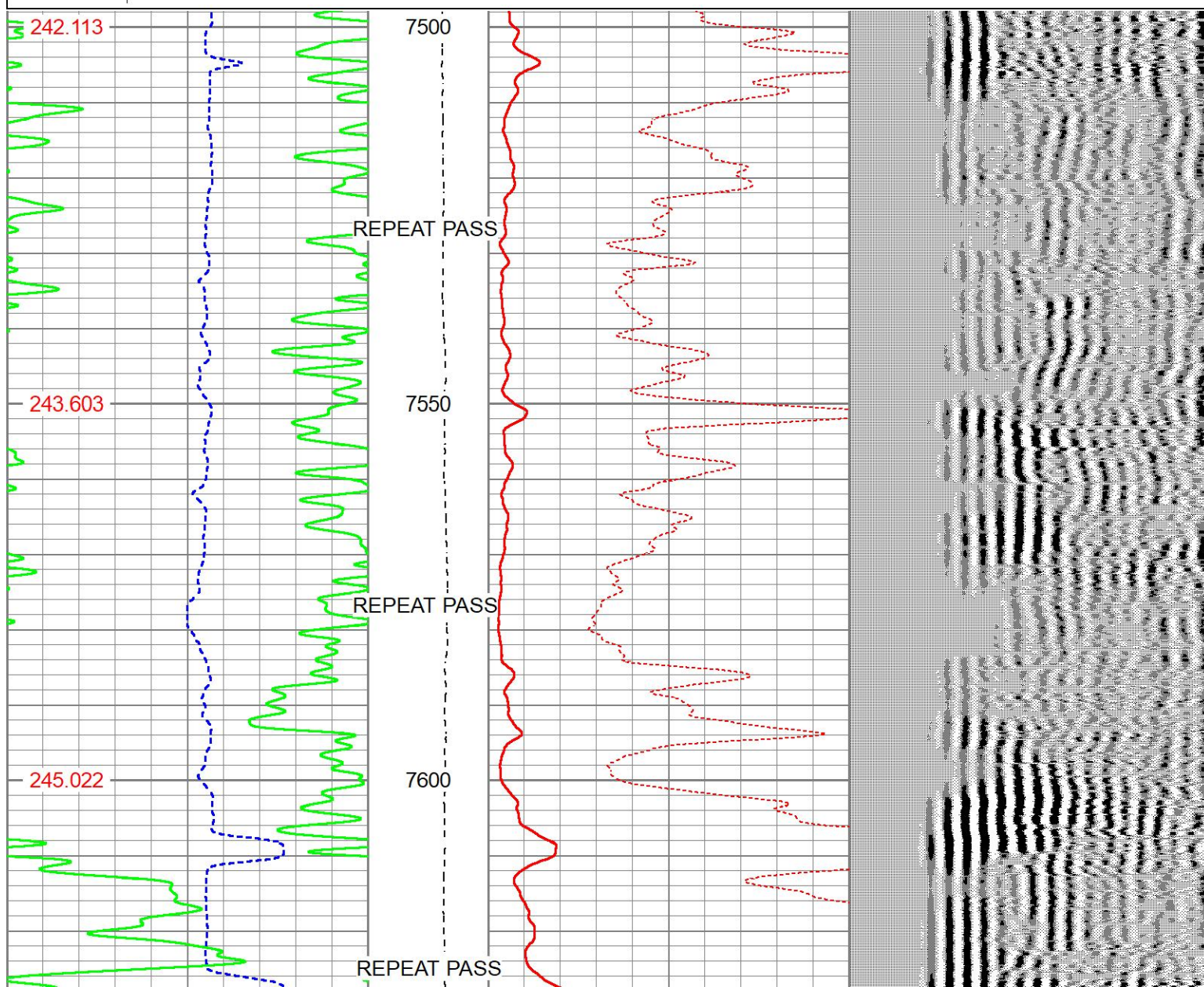


420	TT3FT (usec)	220	CCL	0	Amplitude (mV)	100	200	Variable Density (usec)	1200
0	Gamma Ray (GAPI)	150	Line Tension	0	Amplified Amplitude (mV)	10			
TEMP			0 (lb2000)						
(degF)									

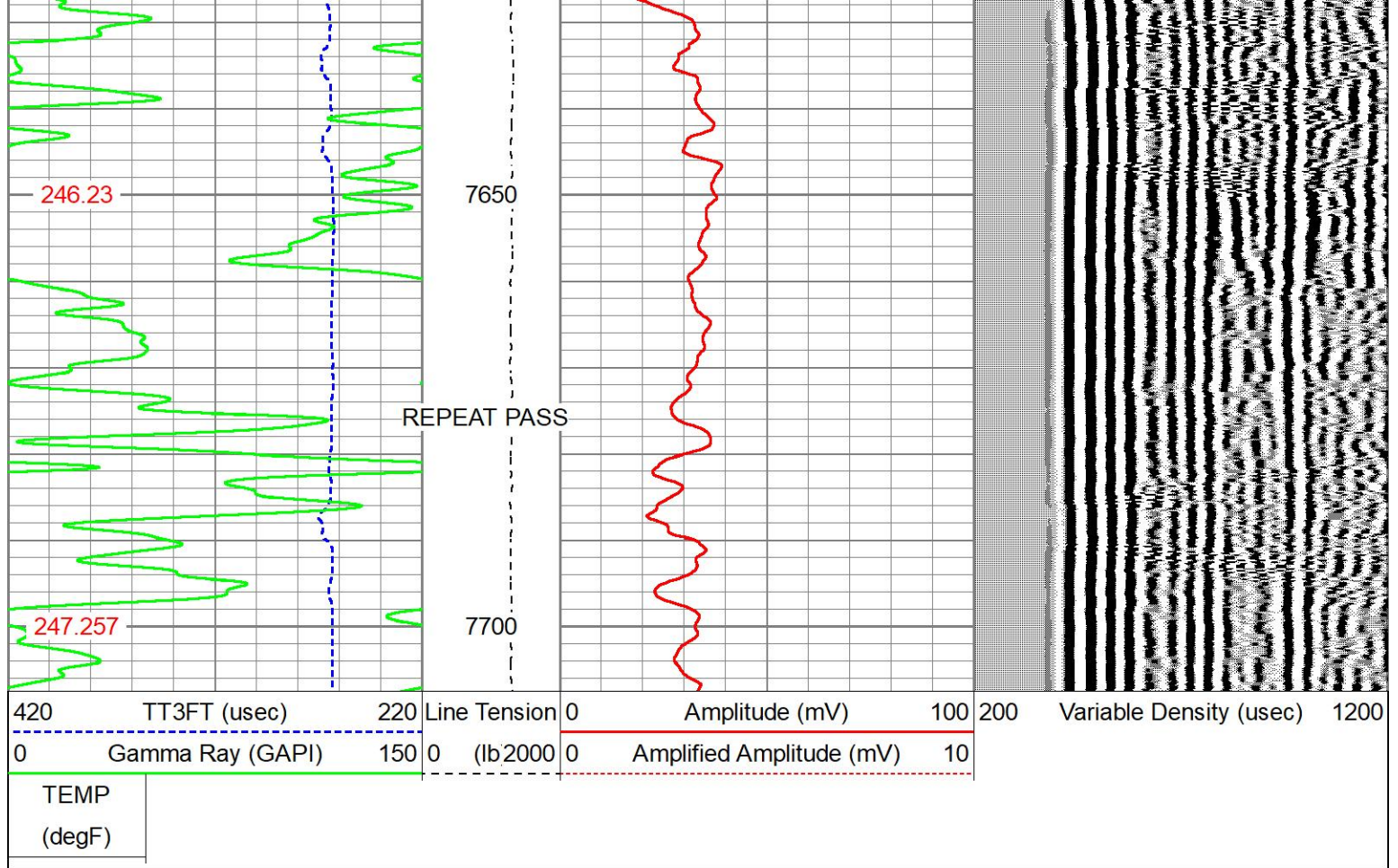
	REPEAT PASS	
	RECORDED WITH 0 PSI SURFACE INDUCED PRESSURE.	

Database File gw\_ottesen\_le\_09-366hn\_31\_2019.db  
 Dataset Pathname 366HN/run1/pass2  
 Presentation Format cbl\_cs  
 Dataset Creation Thu Jan 31 08:23:00 2019  
 Charted by Depth in Feet scaled 1:240

420	TT3FT (usec)	220	Line Tension	0	Amplitude (mV)	100	200	Variable Density (usec)	1200
0	Gamma Ray (GAPI)	150	0 (lb2000)	0	Amplified Amplitude (mV)	10			
TEMP									
(degF)									







## Log Variables

DatabaseC:\ProgramData\Warrior\Data\gw\_ottesen\_le\_09-366hn\_31\_2019.db  
Dataset field/366HN/run1/pass4/\_vars\_

### Top - Bottom


BOREID in 7.875	BOTTEMP degF 250	CASEOD in 5.5	CASETHCK in 0	CASEWGHT lb/ft 17	MAXAMPL mV 719	MINAMPL mV 1	MINATTN db/ft 0.8
PERFS No	PPT uSec 262	SRFTEMP degF 0	TDEPTH ft 0				

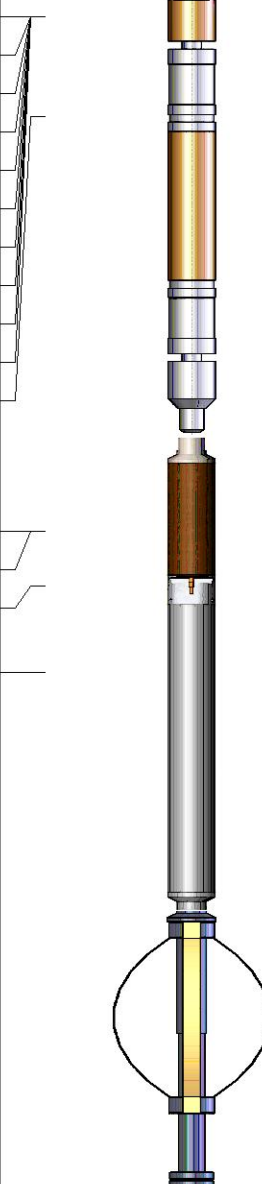
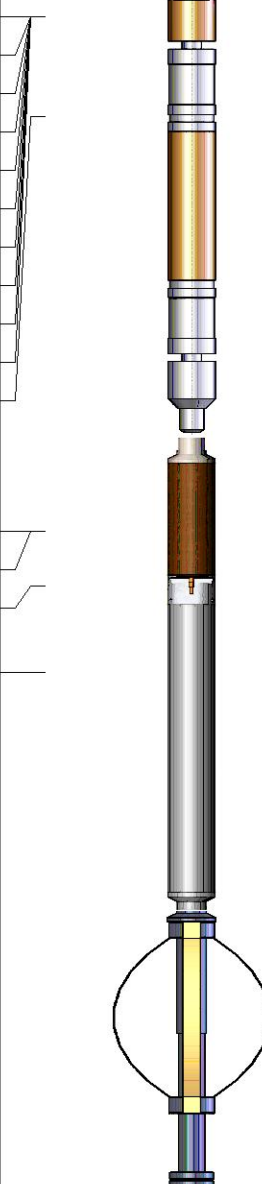
### Variable Description

BOREID : Borehole I.D.  
BOTTEMP : Bottom Hole Temperature  
CASEOD : Casing O.D.  
CASETHCK : Casing Thickness

CASEWGHT : Casing Weight  
MAXAMPL : Maximum Amplitude  
MINAMPL : Minimum Amplitude  
MINATTN : Minimum Attenuation

PERFS : Perforation Flag  
PPT : Predicted Pipe Time  
SRFTEMP : Surface Temperature  
TDEPTH : Total Depth

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
ErrCt	18.89					

			RBT-Probe 2.75 Radii HT (FW1307-48) RADII HT	11.28	2.75	130.00
WVFS8	11.79					
WVFS7	11.79					
WVFS6	11.79					
WVFS5	11.79					
WVFS4	11.79					
WVFS3	11.79					
WVFS2	11.79					
WVFS1	11.79					
WVFCAL	11.79					
WVF3FT	11.79					
WVF5FT	10.79					
CCL\$2	6.64					
CCL\$1	6.64					
GCT_Temp	6.09					
GR	5.22		GC-GCT275-0000 (GCT275 0000_base) Probe GCT275-0000 w/Temp	4.77	2.75	55.00
			CENT-PTS275 BC275-0000 Centralizer	2.83	2.75	24.00
Dataset: gw_ottesen_le_09-366hn_31_2019.db: field/366HN/run1/pass4 Total length: 18.89 ft Total weight: 209.00 lb O.D.: 2.75 in						

Calibration Report	
Database File	gw_ottesen_le_09-366hn_31_2019.db
Dataset Pathname	366HN/run1/pass4
Dataset Creation	Thu Jan 31 08:28:56 2019

Gamma Ray Calibration Report	
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Serial Number:	GCT275-0000_base
Tool Model:	GCT275-0000
Performed:	(Not Performed)

Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.0	cps
Sensitivity:	1.0000	GAPI/cps

### Segmented Cement Bond Log Calibration Report

Serial Number: FW1307-48  
Tool Model: Probe 2.75 Radii HT

Calibration Casing Diameter: 5.500 in  
Calibration Depth: 471.058 ft

Master Calibration, performed Thu Jan 31 07:54:13 2019:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.000	0.316	1.000	71.921	194.386	1.376
CAL	0.002	0.516				
5'	0.001	0.289	1.000	71.921	219.259	1.000
SUM						
S1	0.005	0.305	0.000	71.900	239.491	-1.190
S2	0.000	0.295	0.000	71.900	244.248	-0.089
S3	0.000	0.294	0.000	71.900	244.908	-0.087
S4	0.001	0.310	0.000	71.900	232.093	-0.127
S5	0.001	0.329	0.000	71.900	219.222	-0.128
S6	0.000	0.339	0.000	71.900	212.269	-0.029
S7	0.000	0.338	0.000	71.900	213.184	-0.099
S8	0.000	0.328	0.000	71.900	219.148	-0.075

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.002	0.516	1.000	0.000

Air Zero Calibration, performed Thu Jan 31 05:45:12 2019:

	Raw (v)	Calibrated (v)	Results
	Zero	Zero	Offset
3'	0.000	0.000	0.000
5'	0.000	0.000	0.000
SUM			
S1	0.000	0.000	0.000
S2	0.000	0.000	0.000
S3	0.000	0.000	0.000
S4	0.000	0.000	0.000
S5	0.000	0.000	0.000
S6	0.000	0.000	0.000
S7	0.000	0.000	0.000
S8	0.000	0.000	0.000



Company GREAT WESTERN OIL & GAS

Well OTTESEN LE 09-366HN

File H:\Work\09-366HN\09-366HN-01-31-2019



