



**Radial Cement Bond  
Variable Density Log  
W/Gamma Ray/CCL/Temp**

Company Antero Resources  
Well OXFD 13 EHS  
Field N/A  
County Doddridge  
State West Virginia

Company Antero Resources

Well OXFD 13 EHS

Field N/A

County Doddridge State West Virginia

Location: API #: 47-017-06578

Other Services

SEC TWP RGE

Elevation

Permanent Datum Ground Level Elevation  
Log Measured From Kelly Bushing 30 ft.  
Drilling Measured From Kelly Bushing

Date 12-Feb-2020

Run Number	One				
Depth Driller	N/A				
Depth Logger	7,300 FT				
Bottom Logged Interval	7,300 FT				
Top Log Interval	Surface				
Open Hole Size	N/A				
Type Fluid	Water				
Density / Viscosity	N/A				
Max. Recorded Temp.	152 Deg. F.				
Estimated Cement Top	1,376 ft				
Time Well Ready	09:00				
Time Logger on Bottom	16:32				
Equipment Number	143				
Location	Marietta, Ohio				
Recorded By	Tom Weese				
Witnessed By	Jay				
Borehole Record		Tubing Record			
Run Number	Bit	From	To	Size	Weight
					From
					To
Casing Record	Size			Wgt/Ft	Top
Surface String					Bottom
Prot. String					
Production String	5 1/2 in.			20 lbs.	Surface
Liner					N/A

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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**

Primary Log on Well  
Marker Joint 6673-6685

Main Pass 1,500 PSI  
Repeat Pass 0 PSI

Thank You For Choosing Nine Energy Service Wireline. Marietta, Ohio

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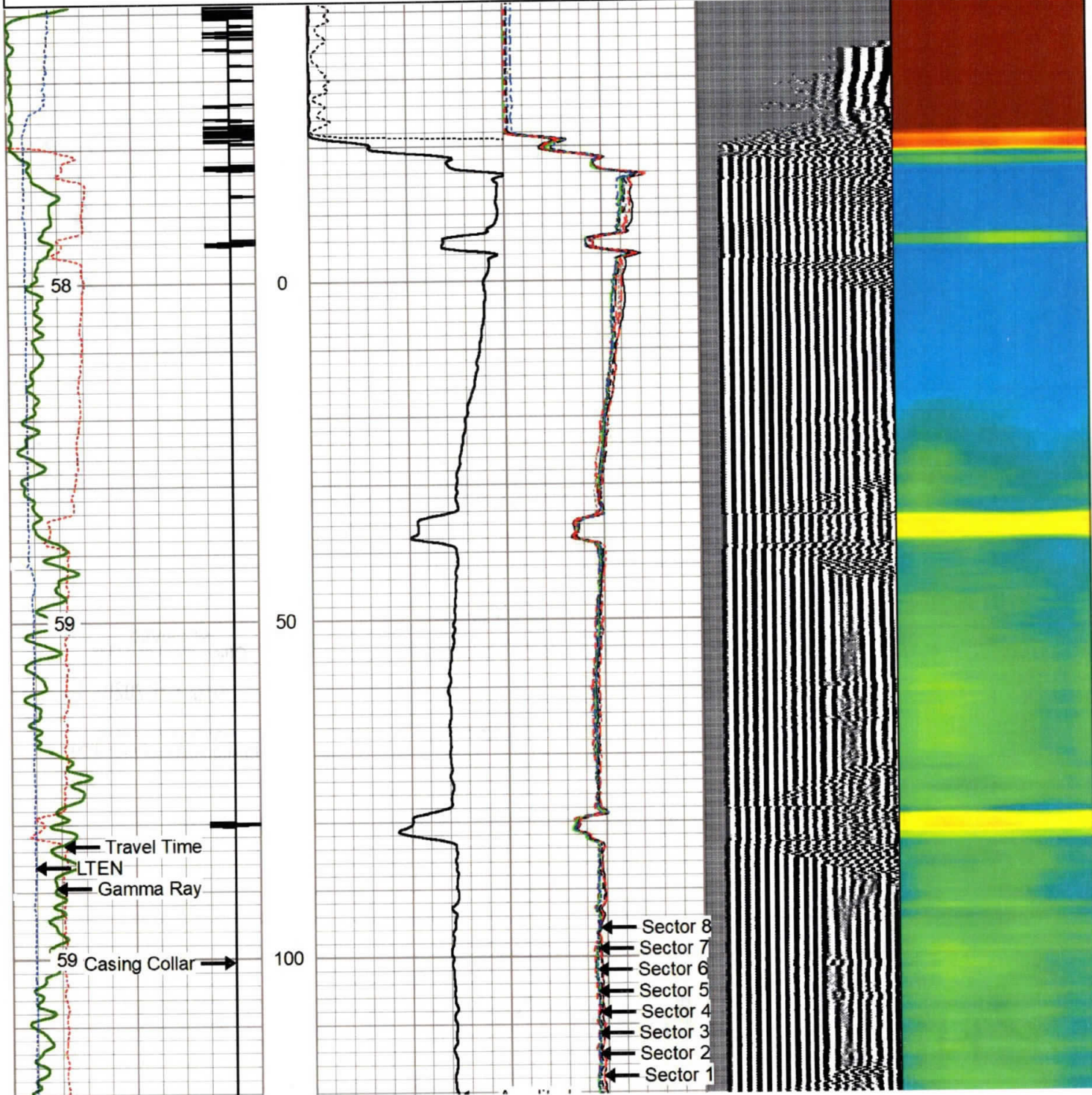
WV Department of  
Environmental Protection



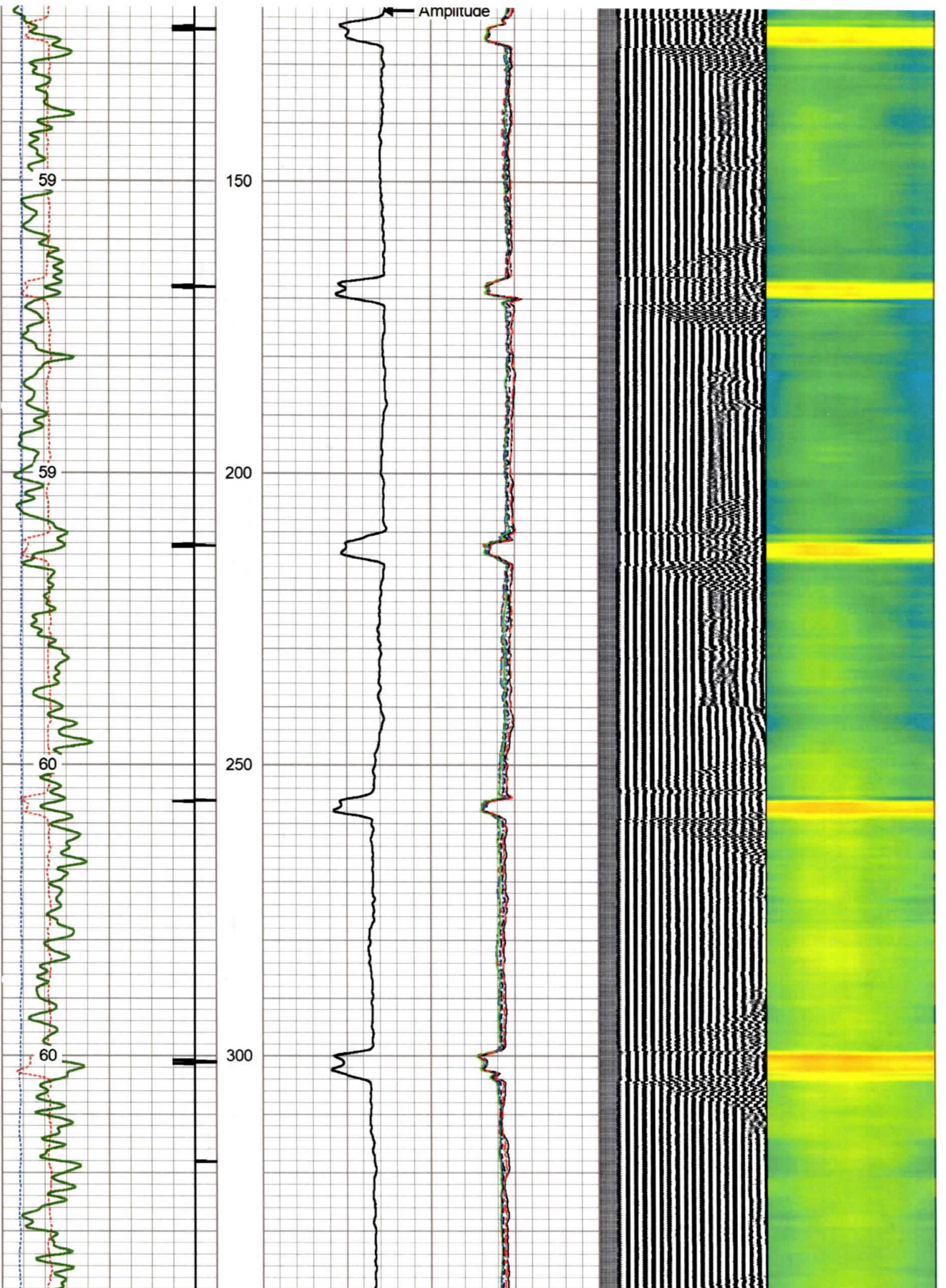
**Main Pass 1,500 PSI**

Database File antero\_oxfd\_13\_ehs\_rcbl\_nineenergy\_12\_feb\_2020.db  
 Dataset Pathname Marcellus/OXFD\_13\_EHS/run1/pass6.1  
 Presentation Format scbl03  
 Dataset Creation Wed Feb 12 19:57:48 2020  
 Charted by Depth in Feet scaled 1:240

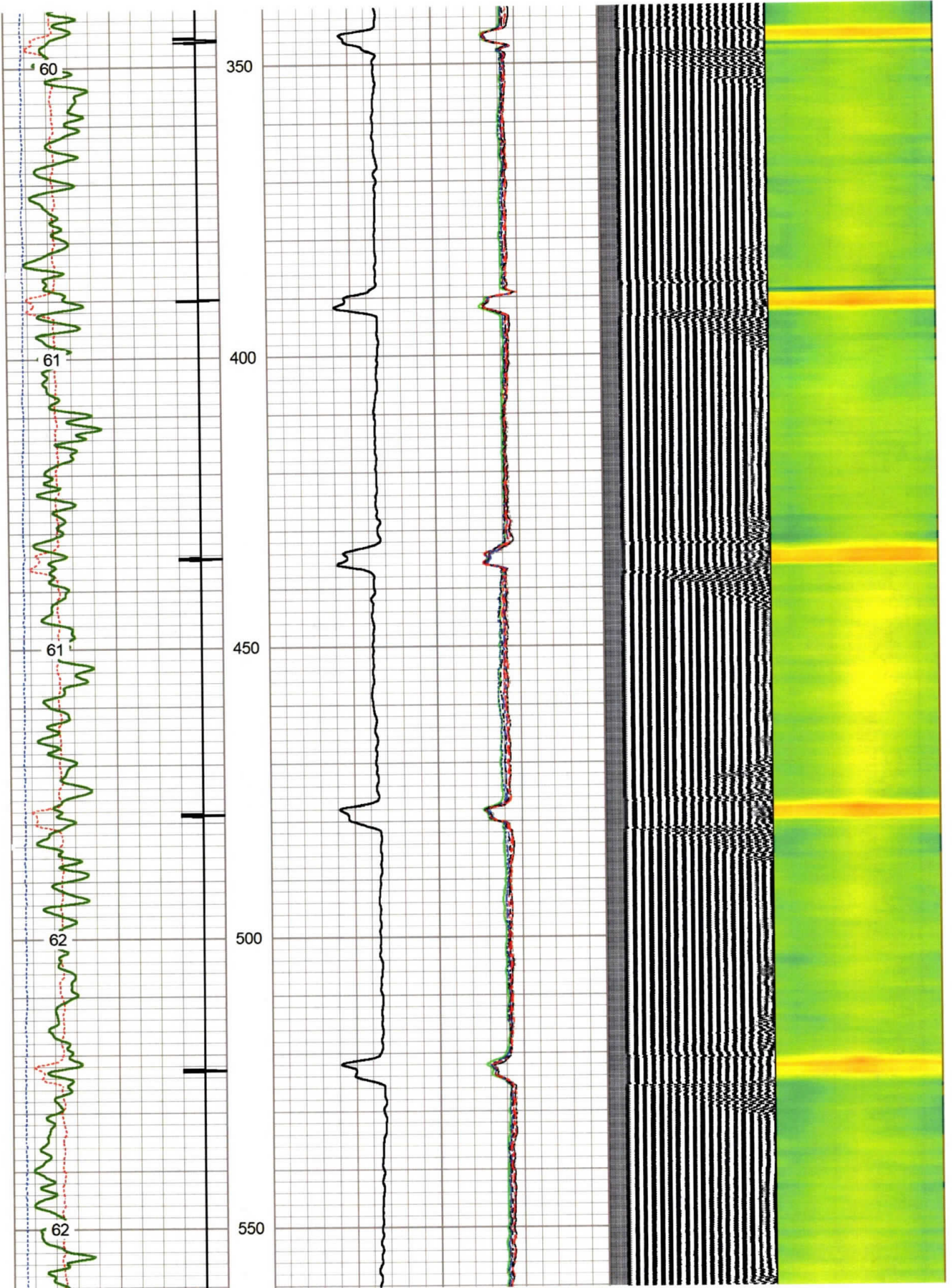
250	Travel Time (usec)	200	0	Amplitude (mV)	100	-5	Sector 1	150	Variable Density	1	Cement Map	8
Casing Collar			Amplified Amplitude		-5	Sector 2	150	200	(usec)	1200		
0	Gamma Ray (GAPI)	150	0	(mV)	10	-5	Sector 3	150				
0	LTEN (lb)	2500				-5	Sector 4	150				
Temp						-5	Sector 5	150				
(degF)						-5	Sector 6	150				
						-5	Sector 7	150				
						-5	Sector 8	150				



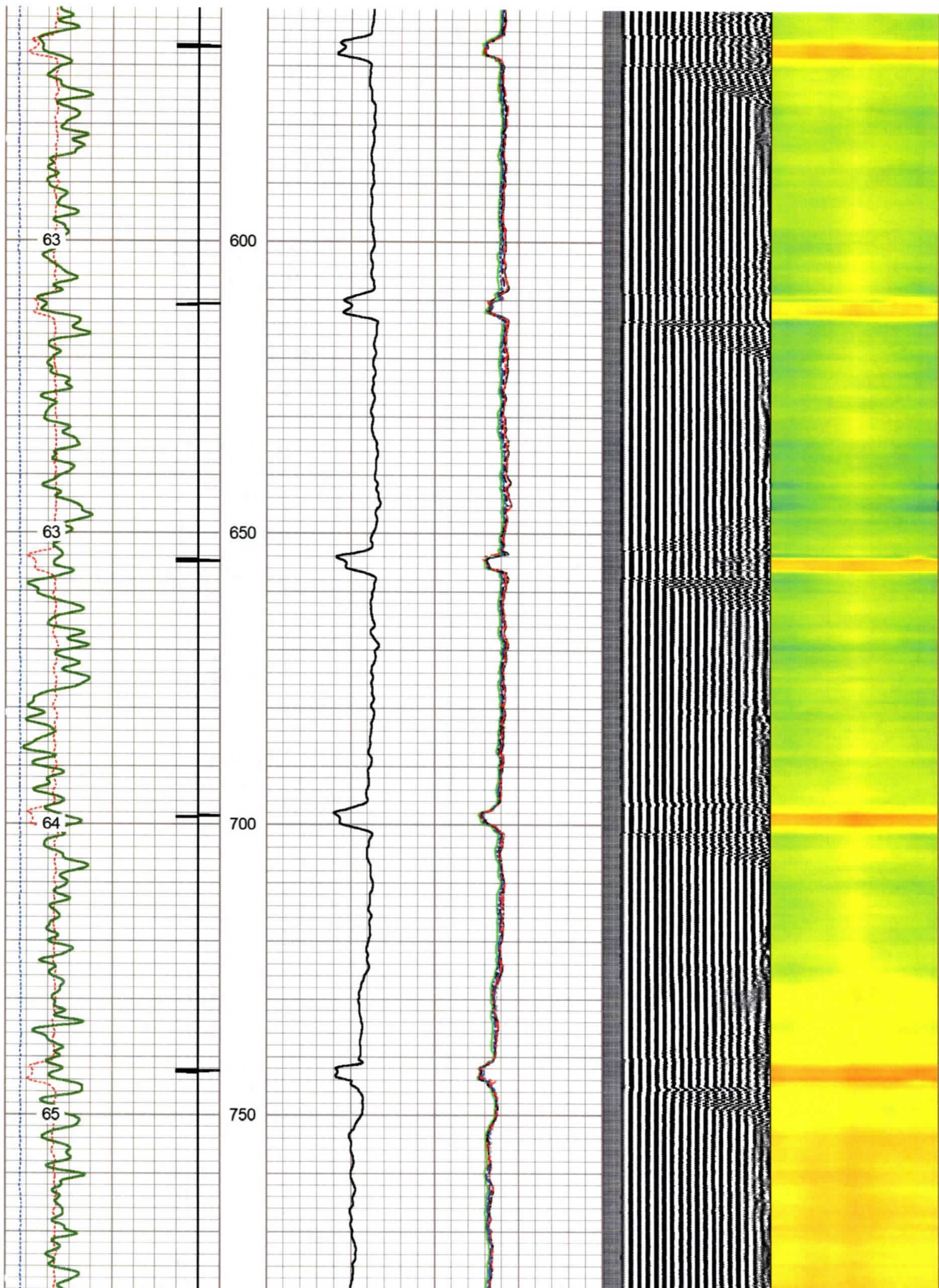




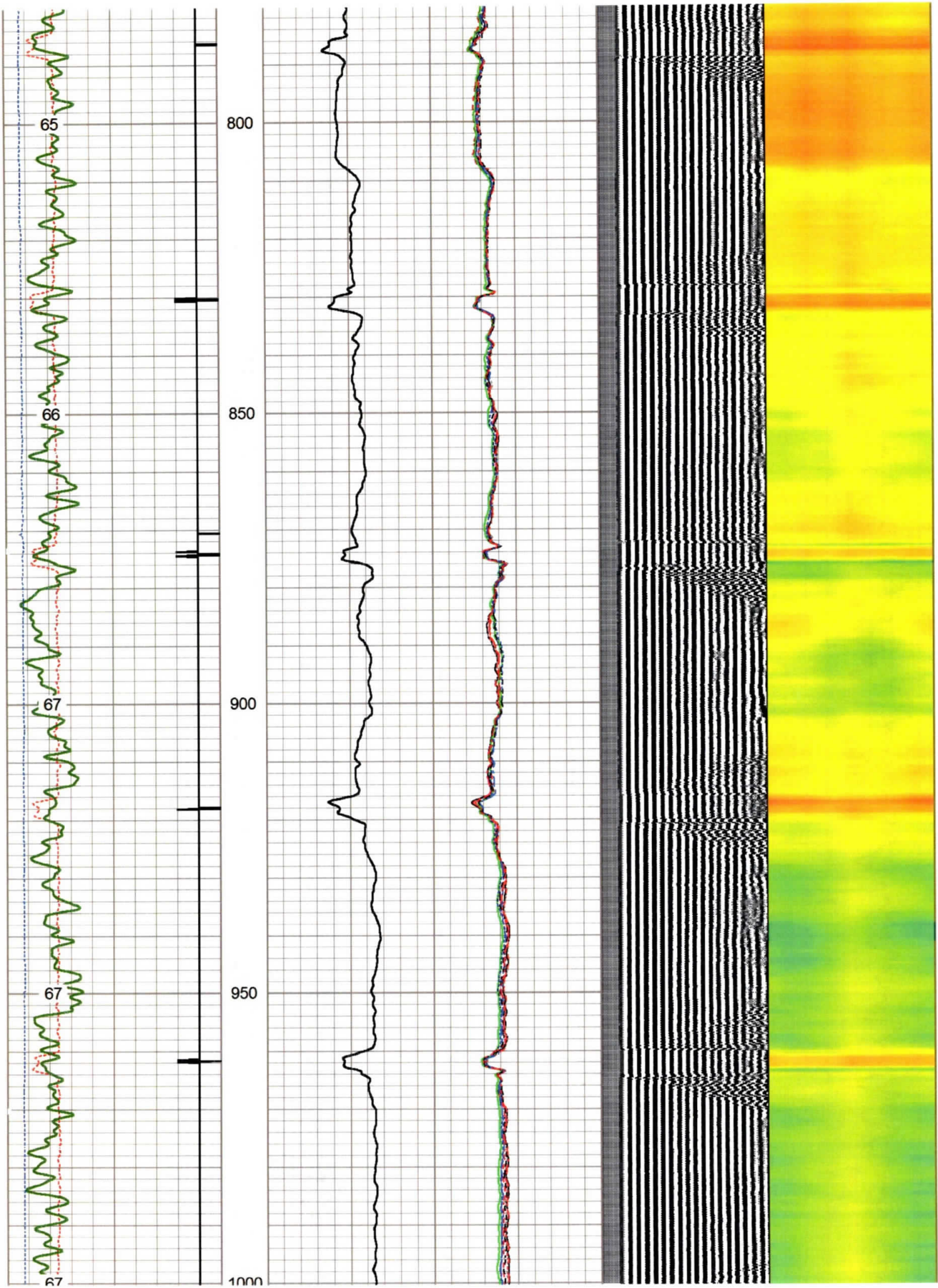




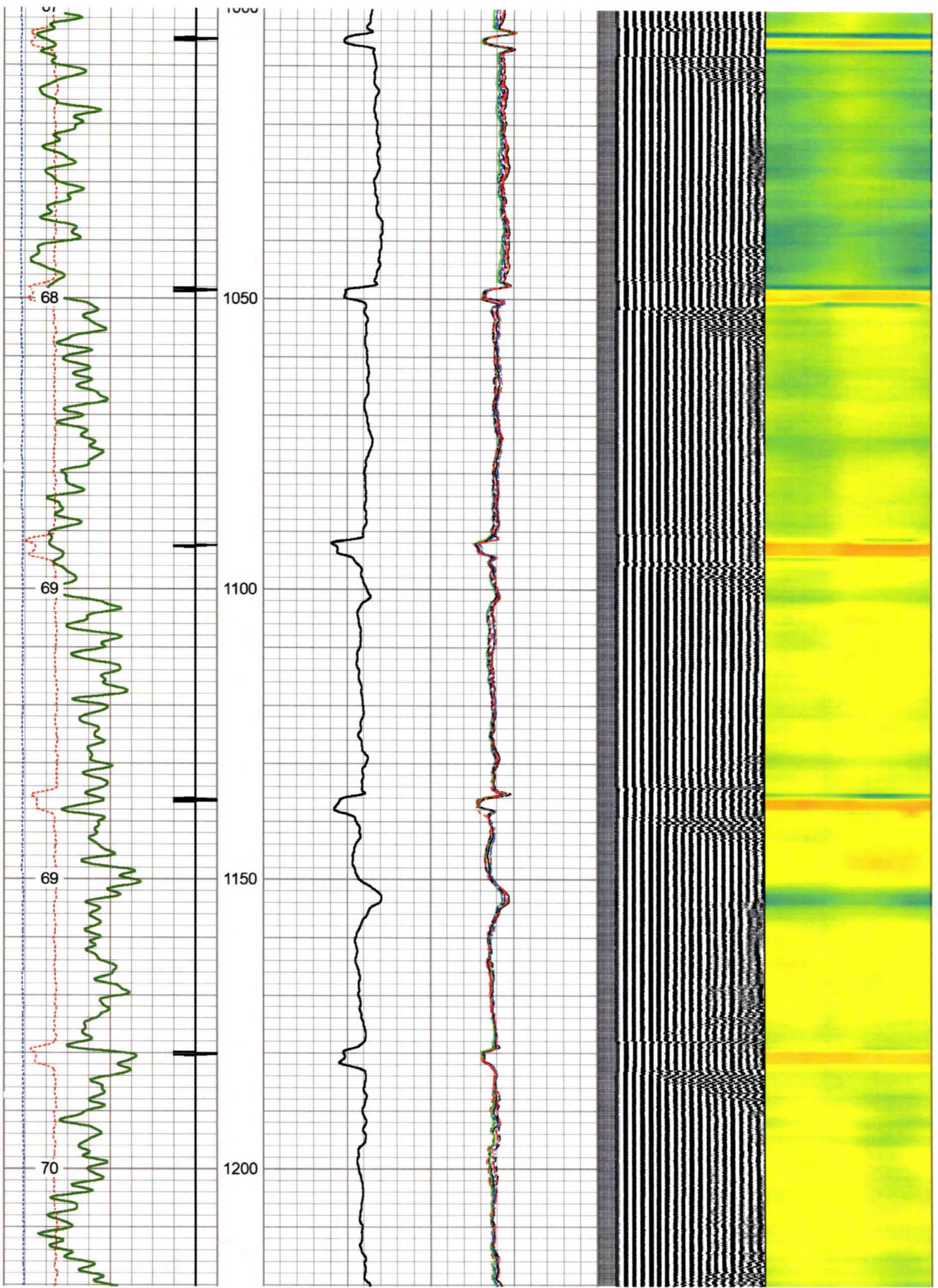




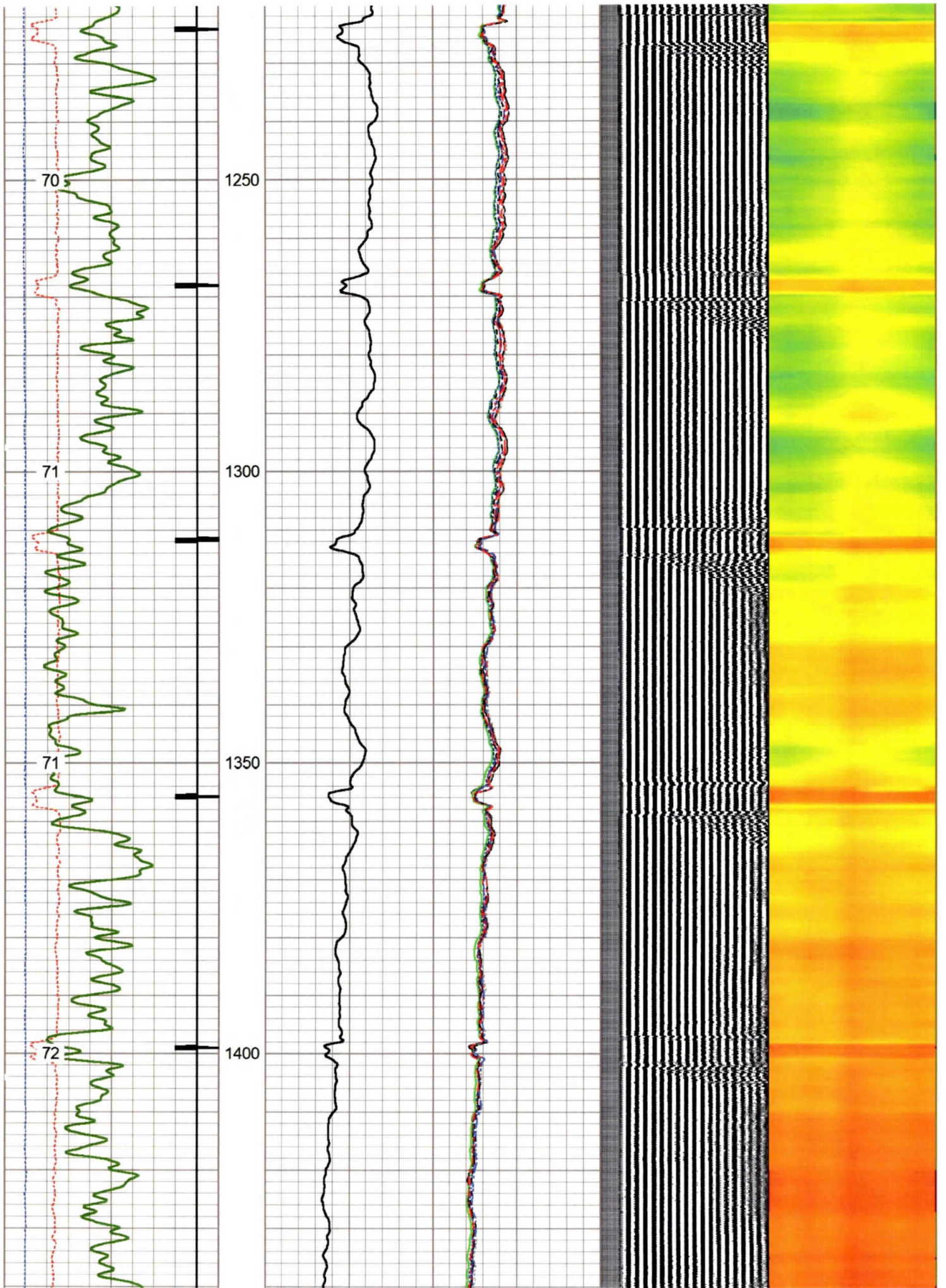




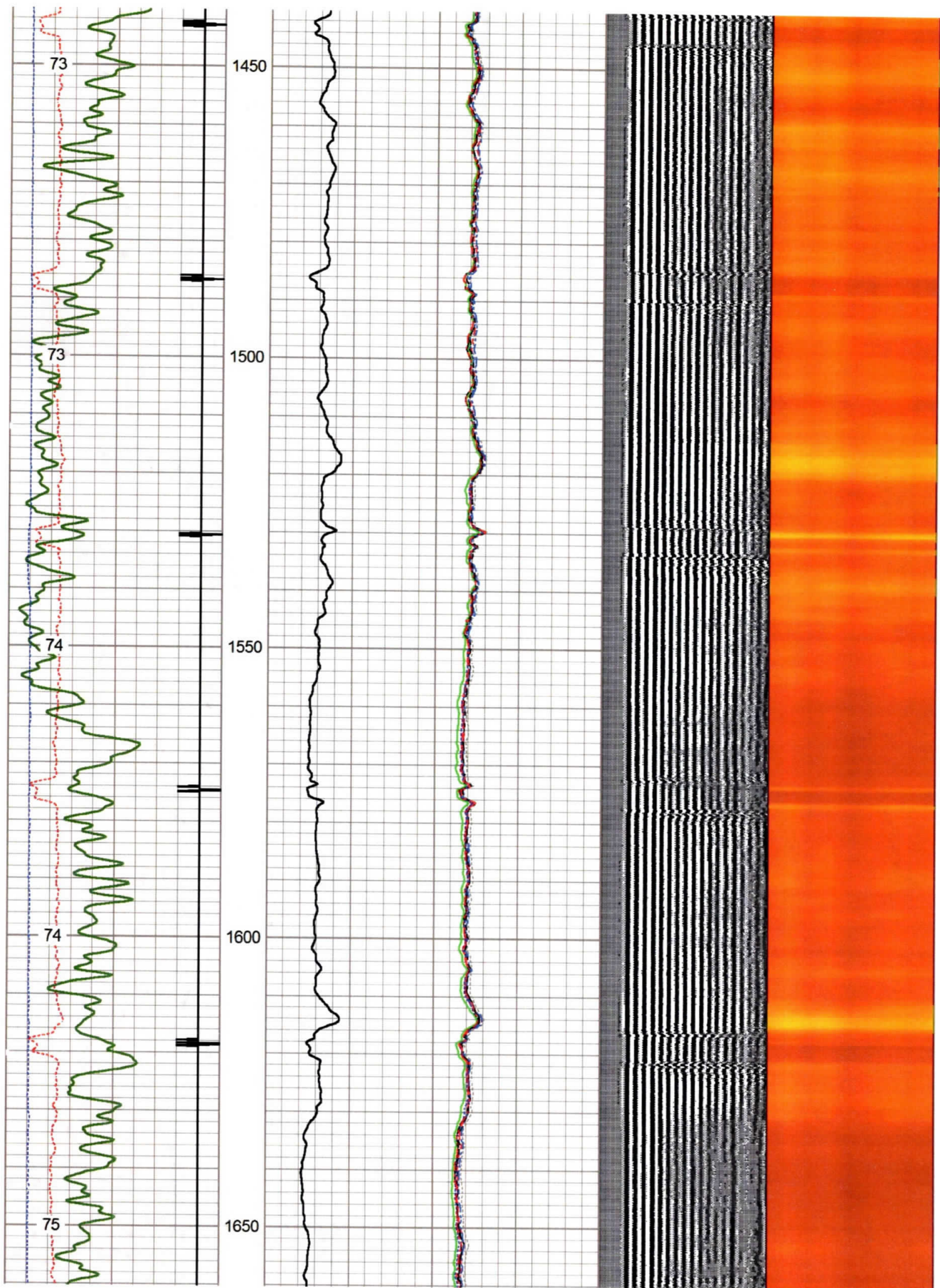




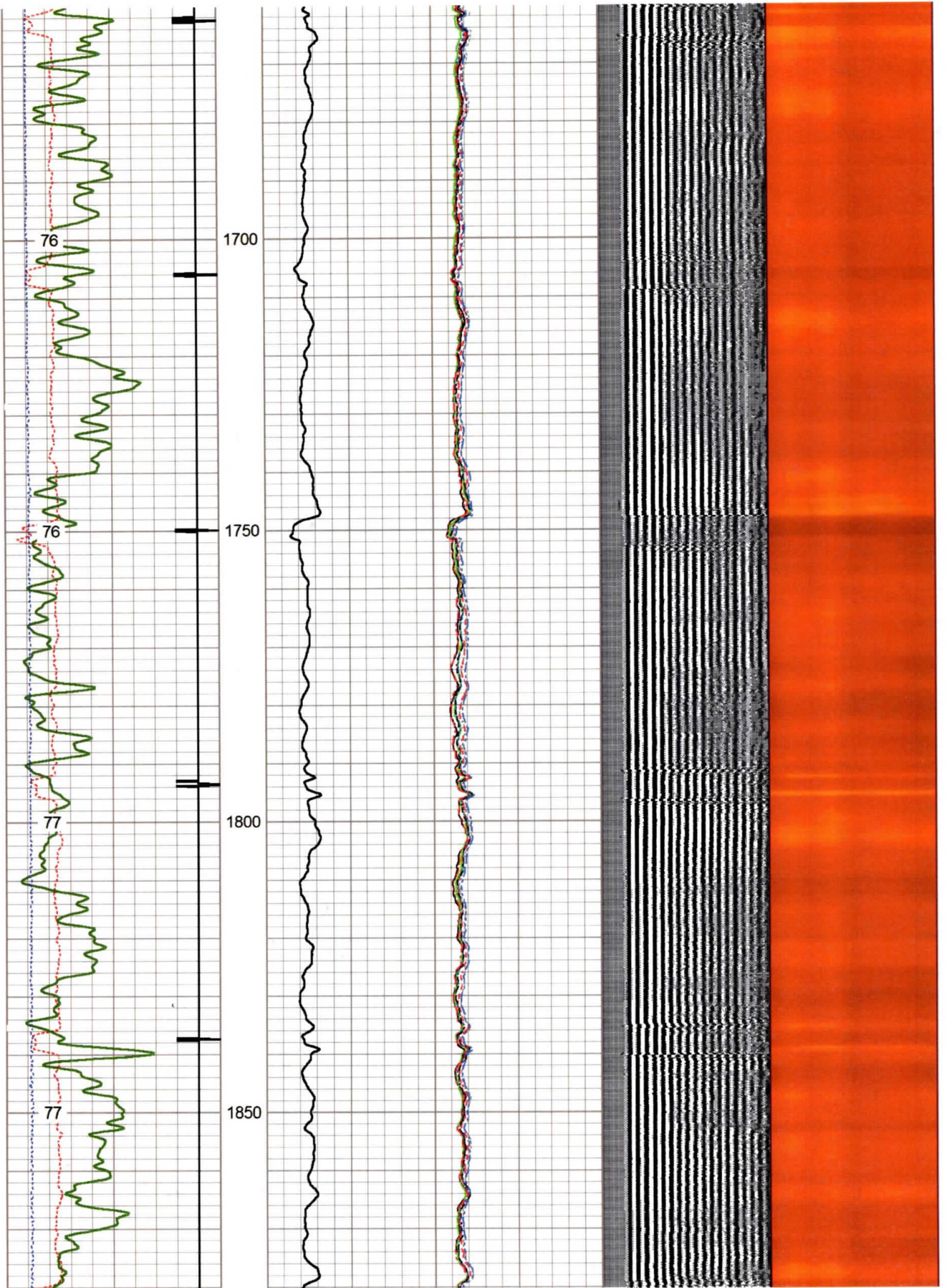




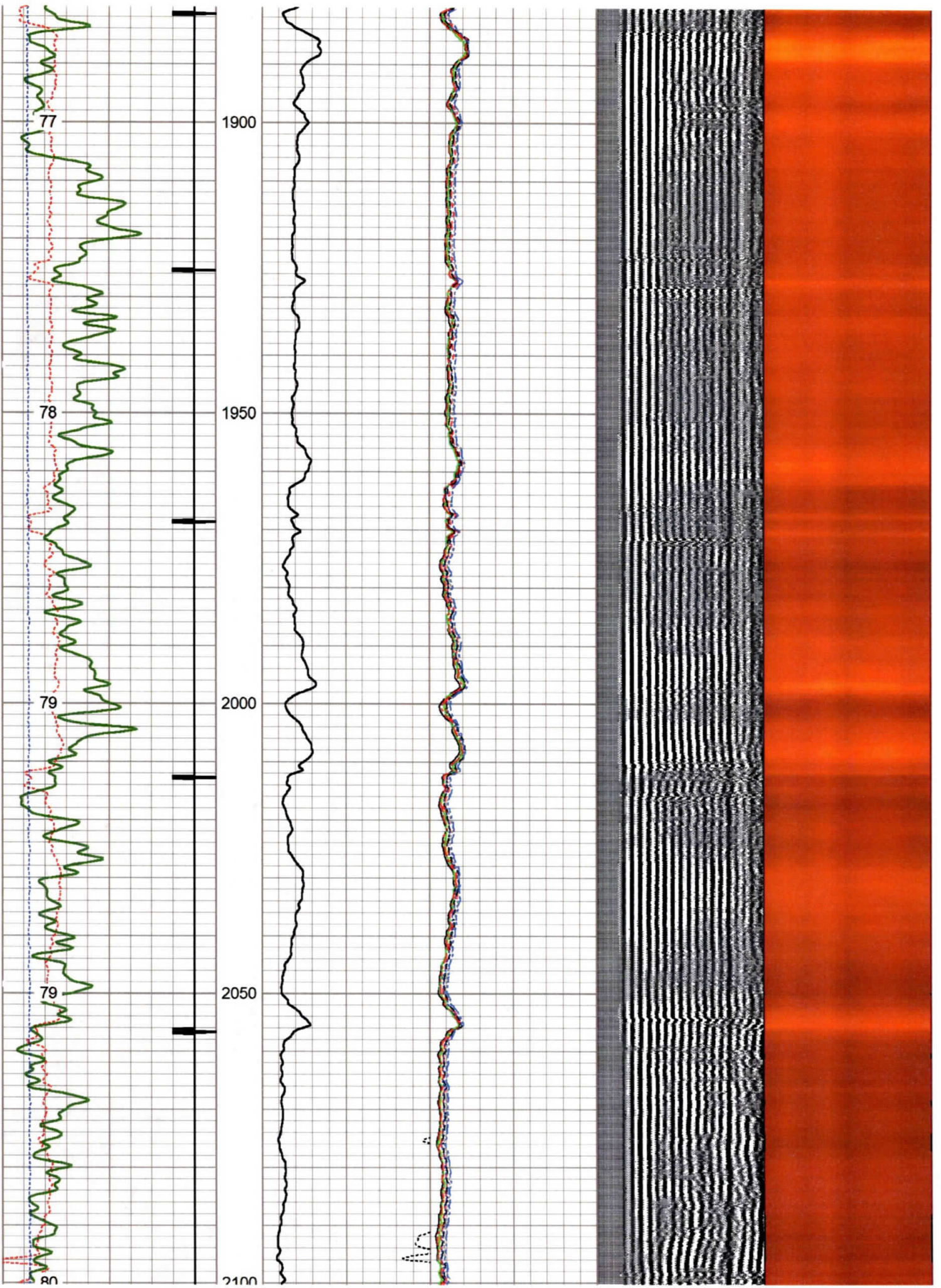




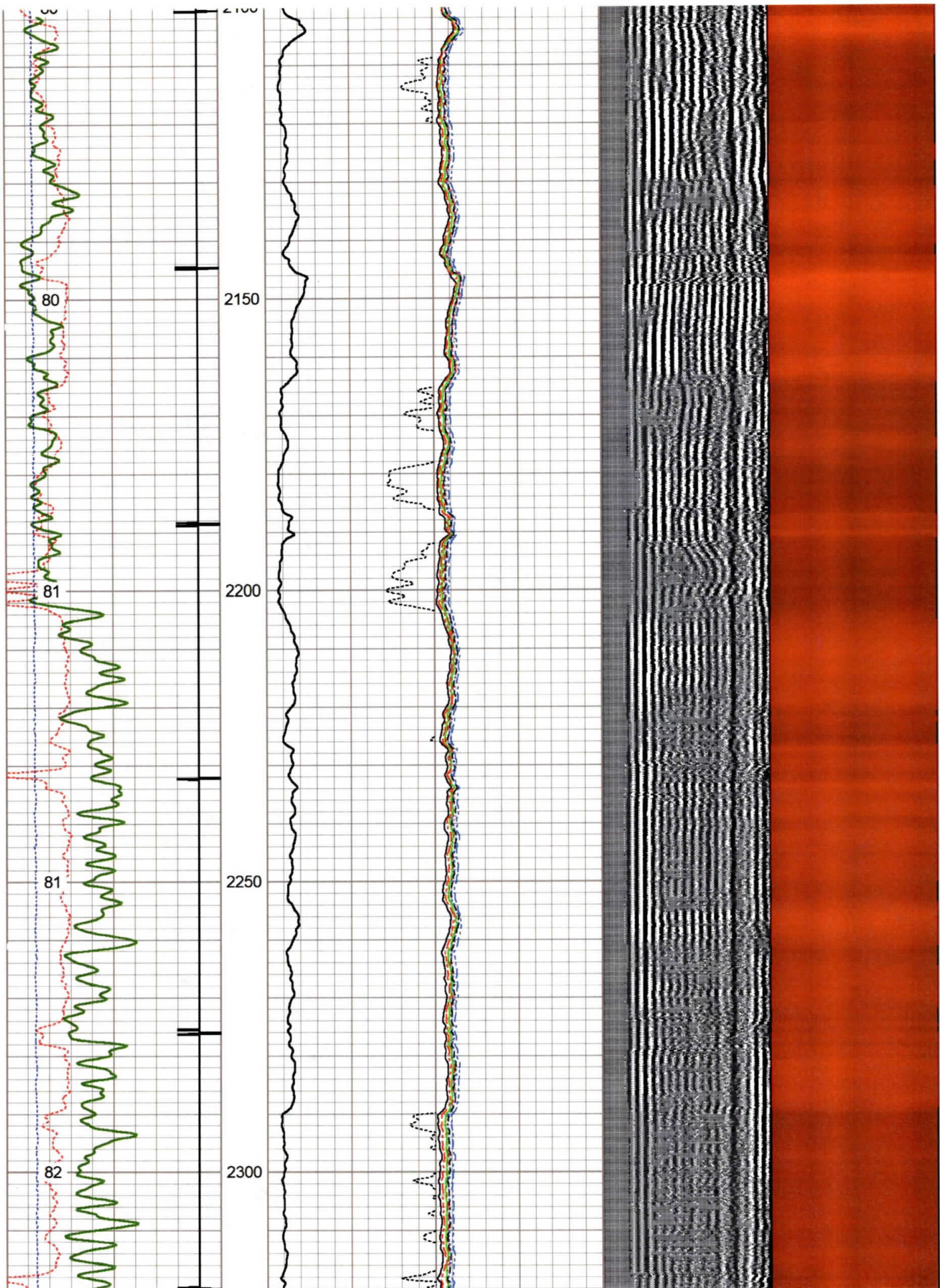




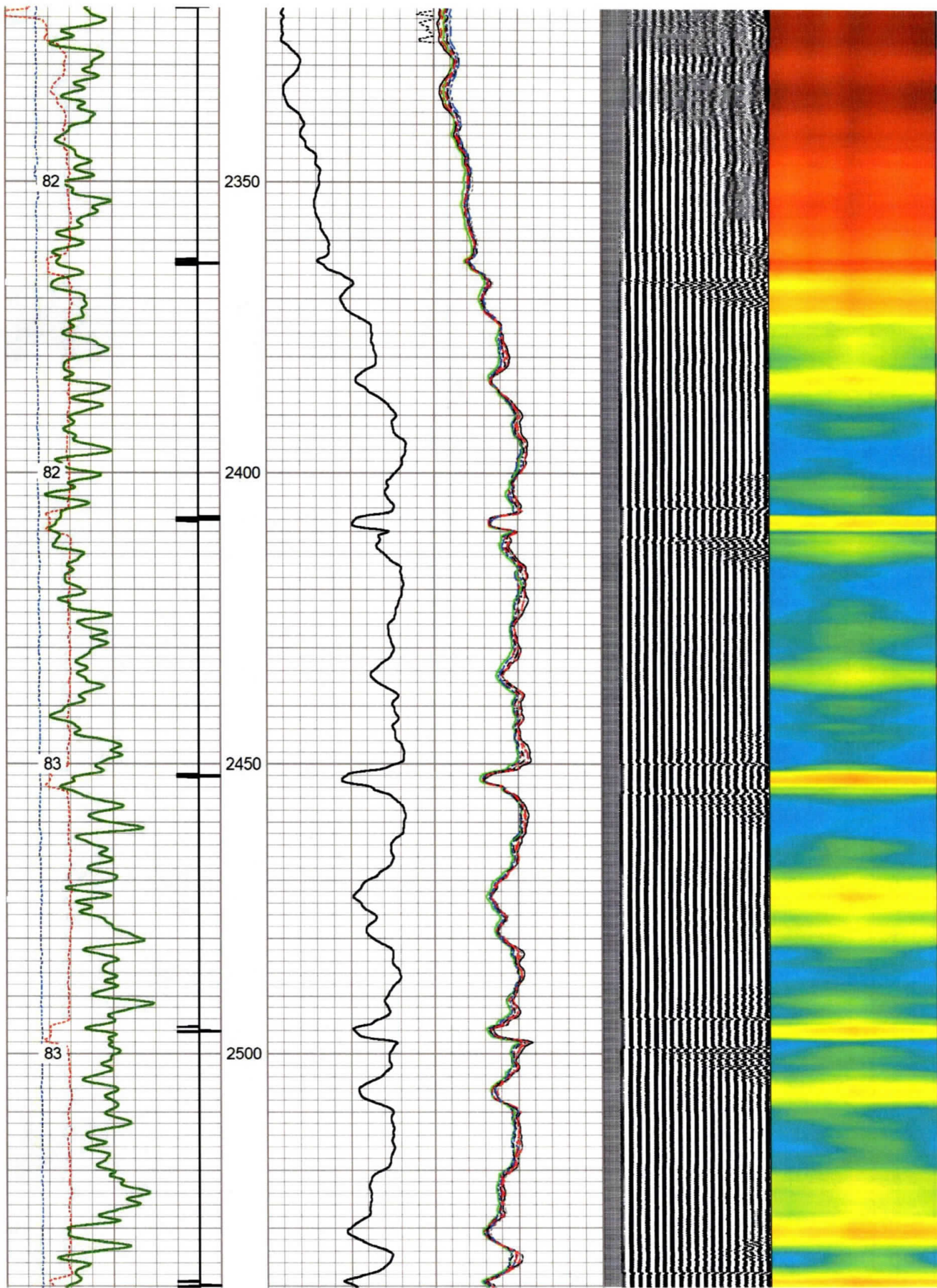




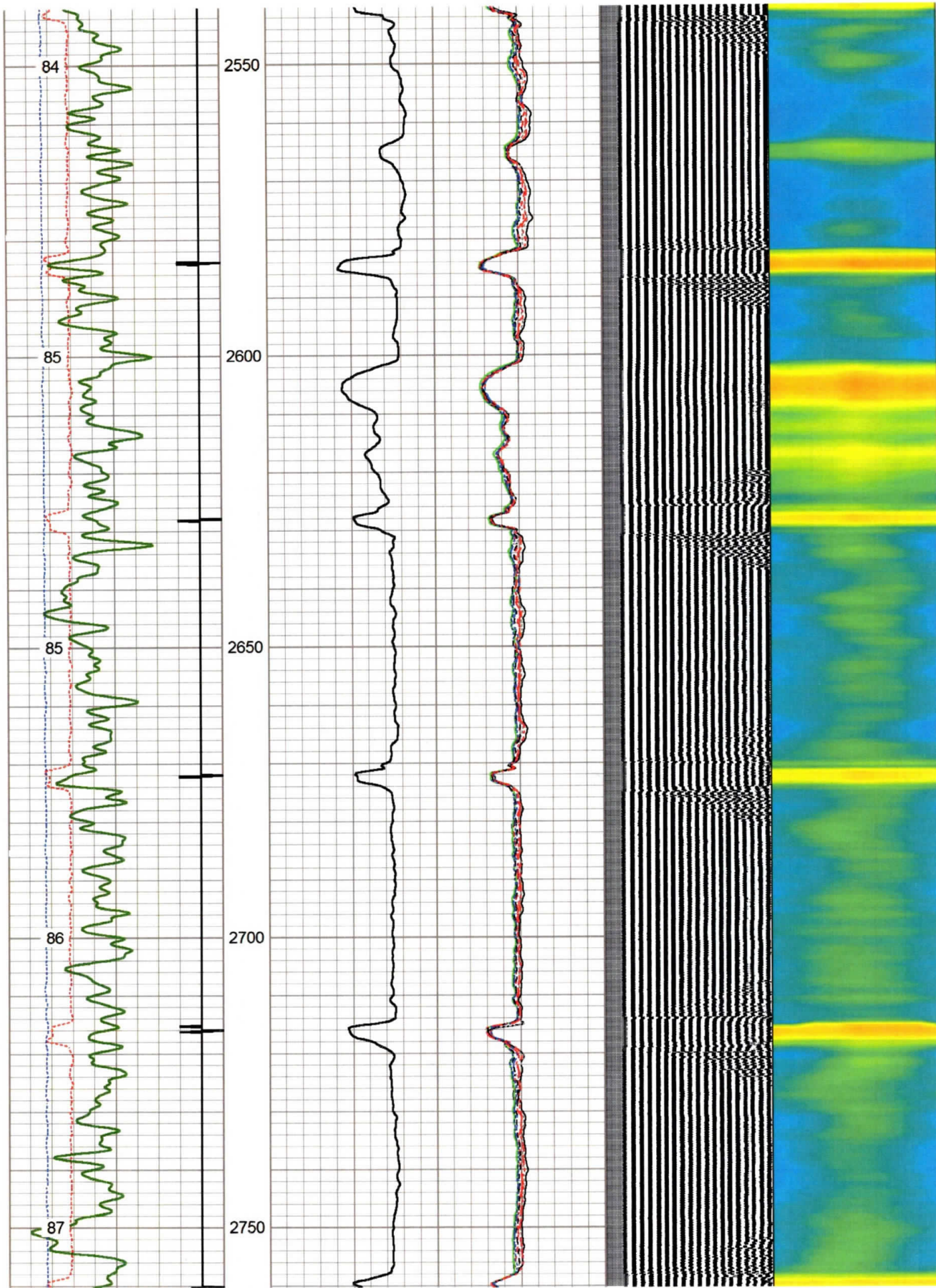




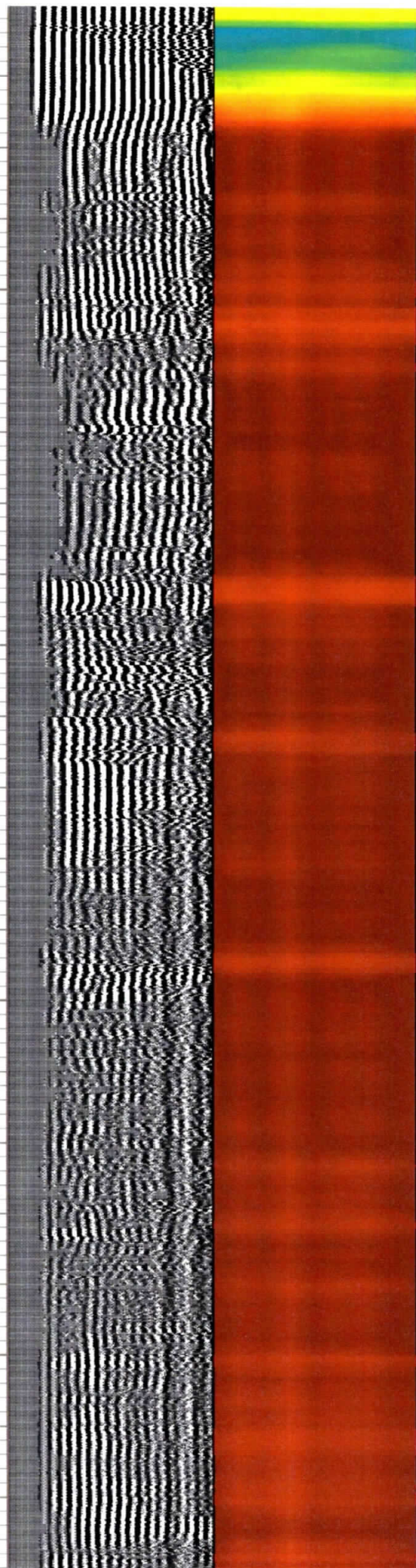
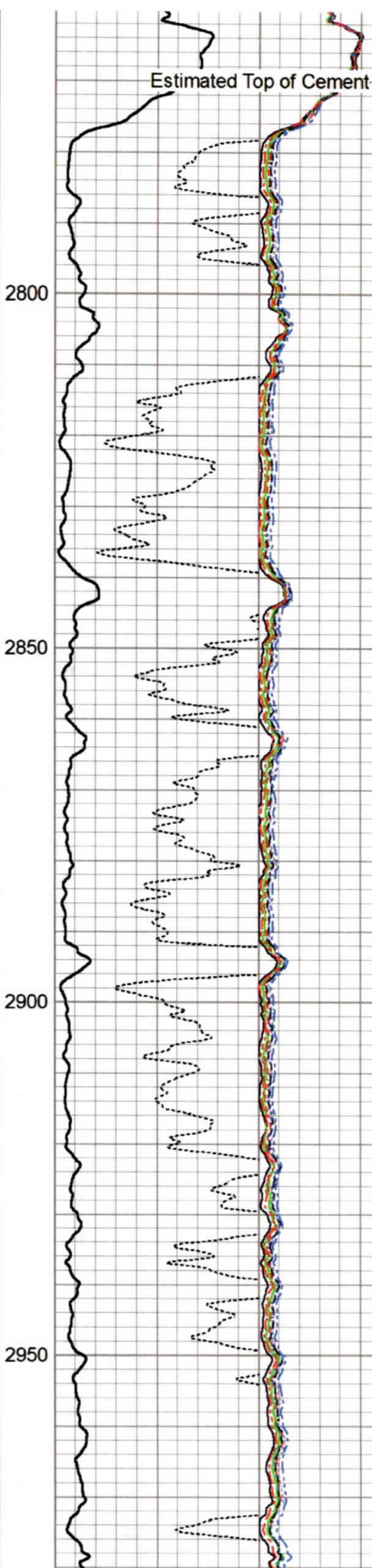
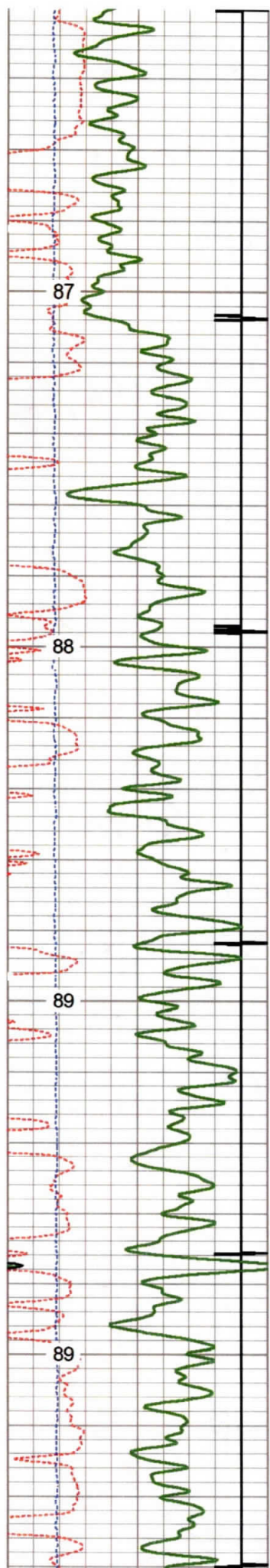




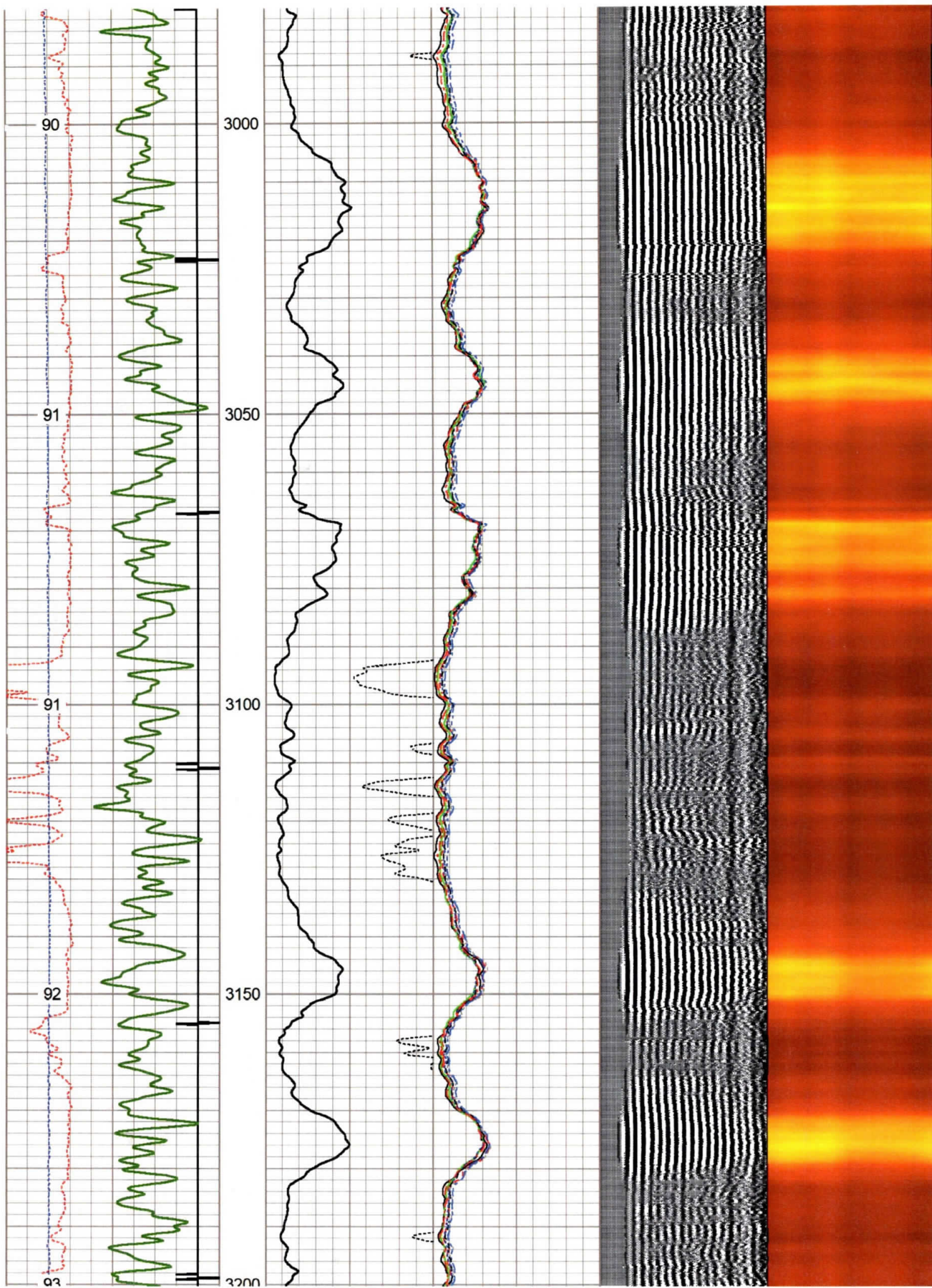




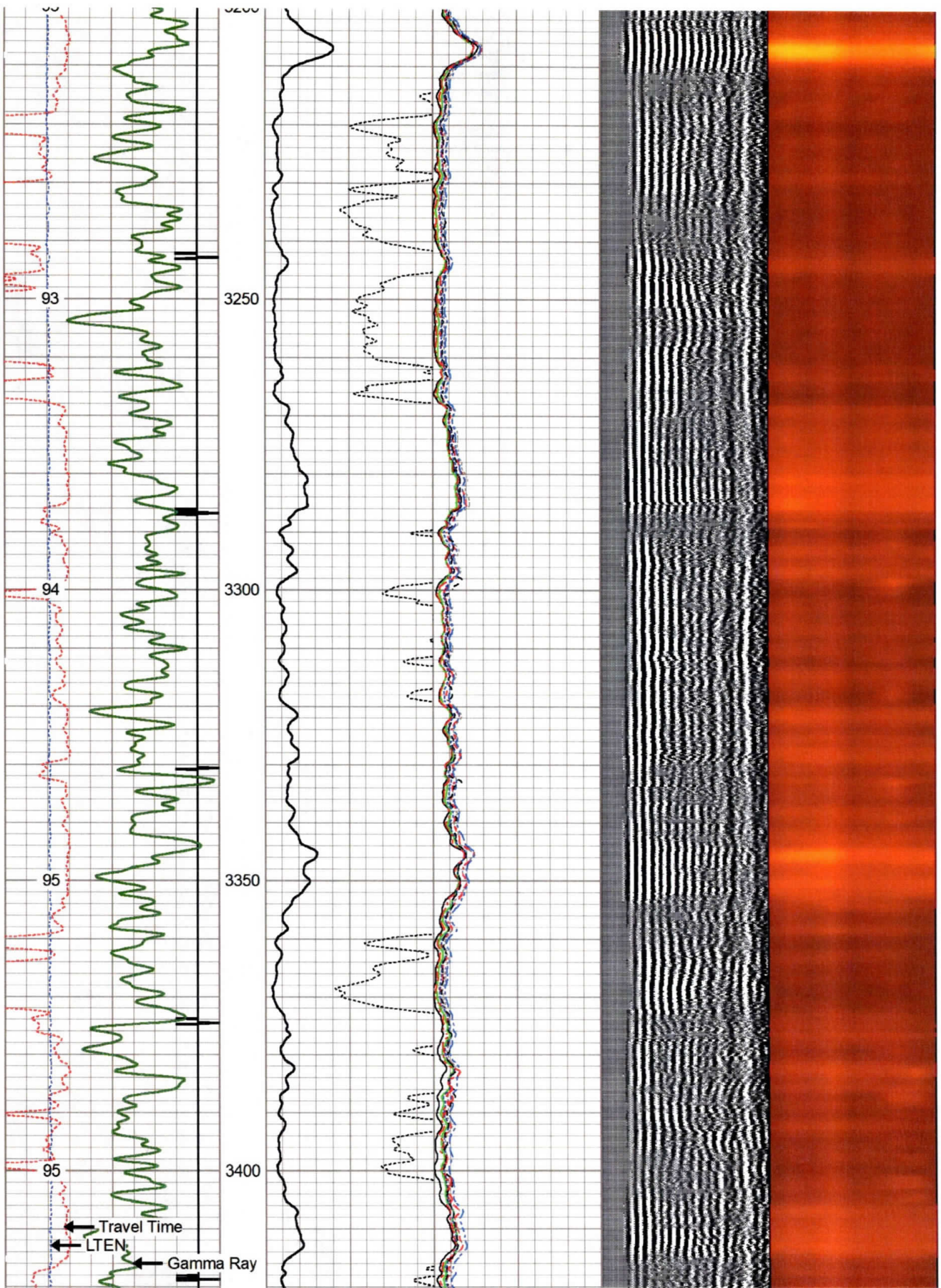




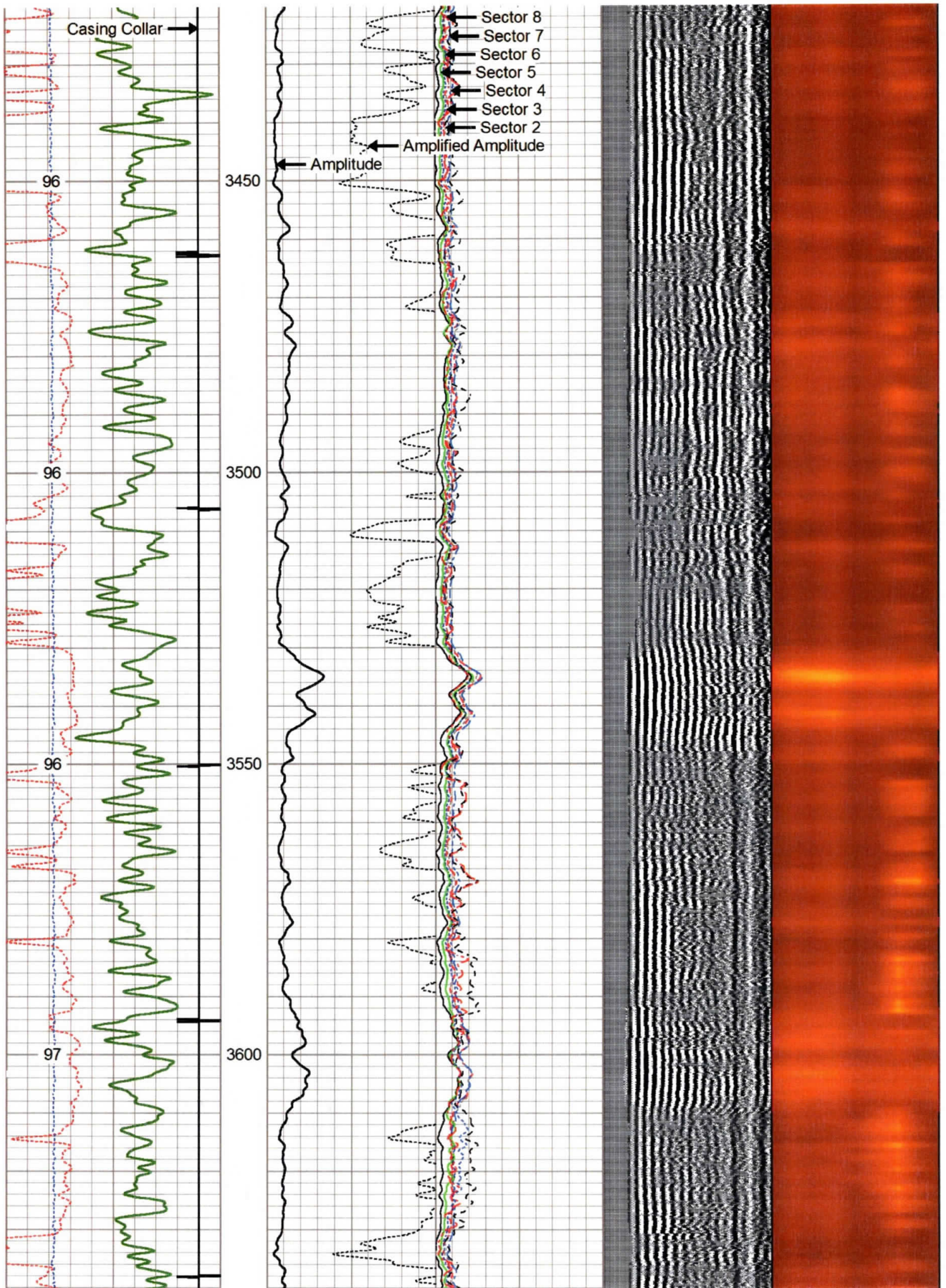




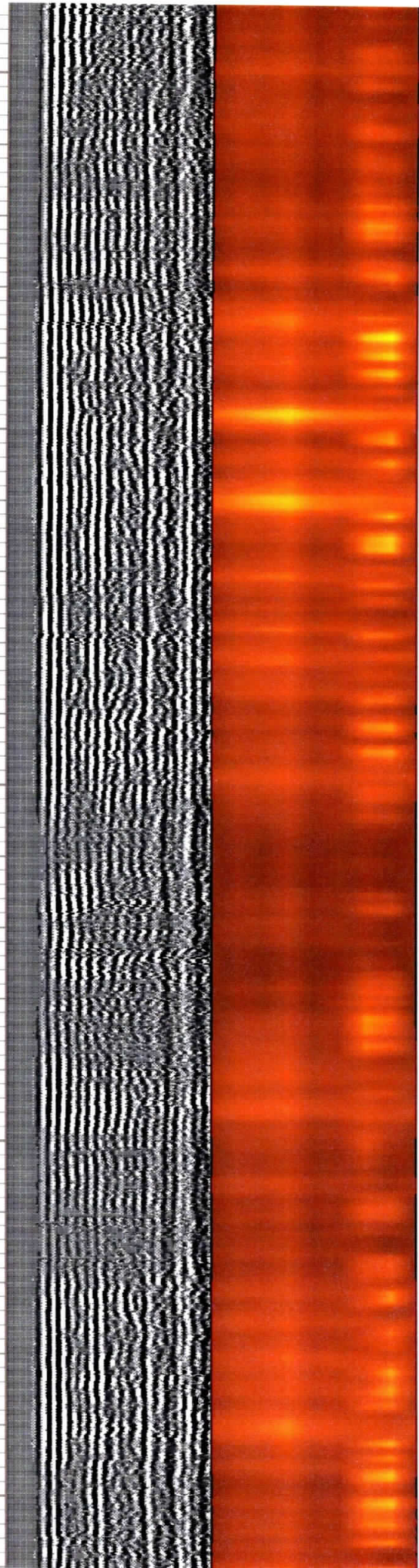
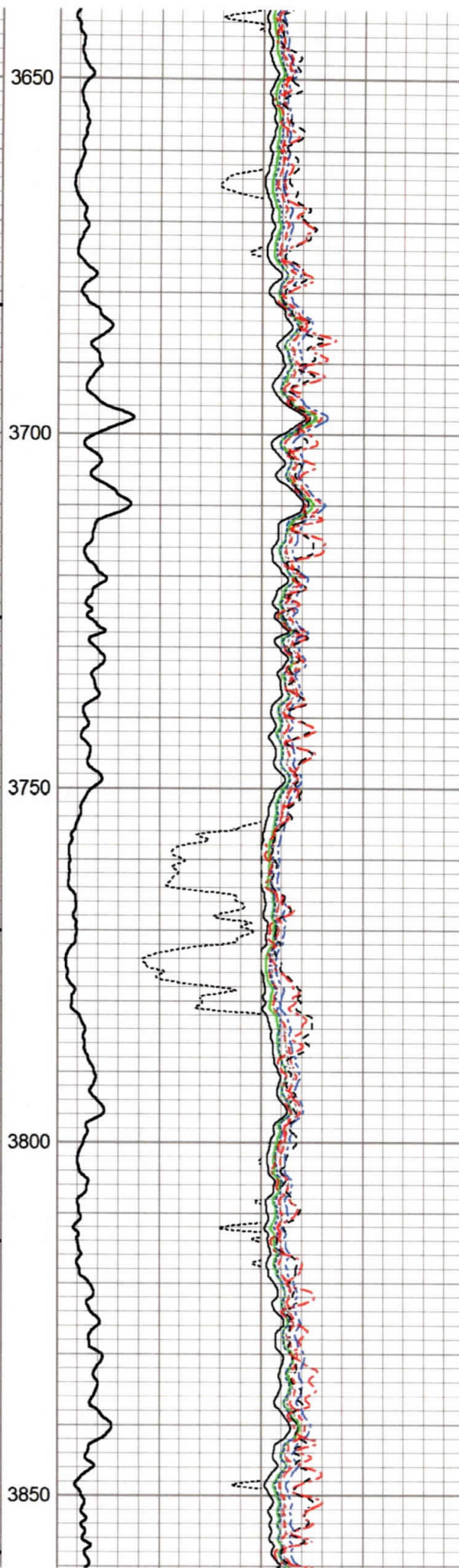
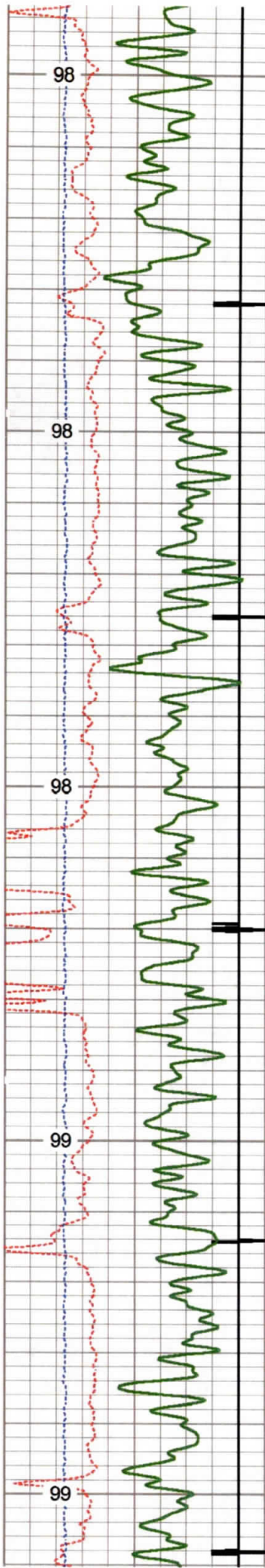




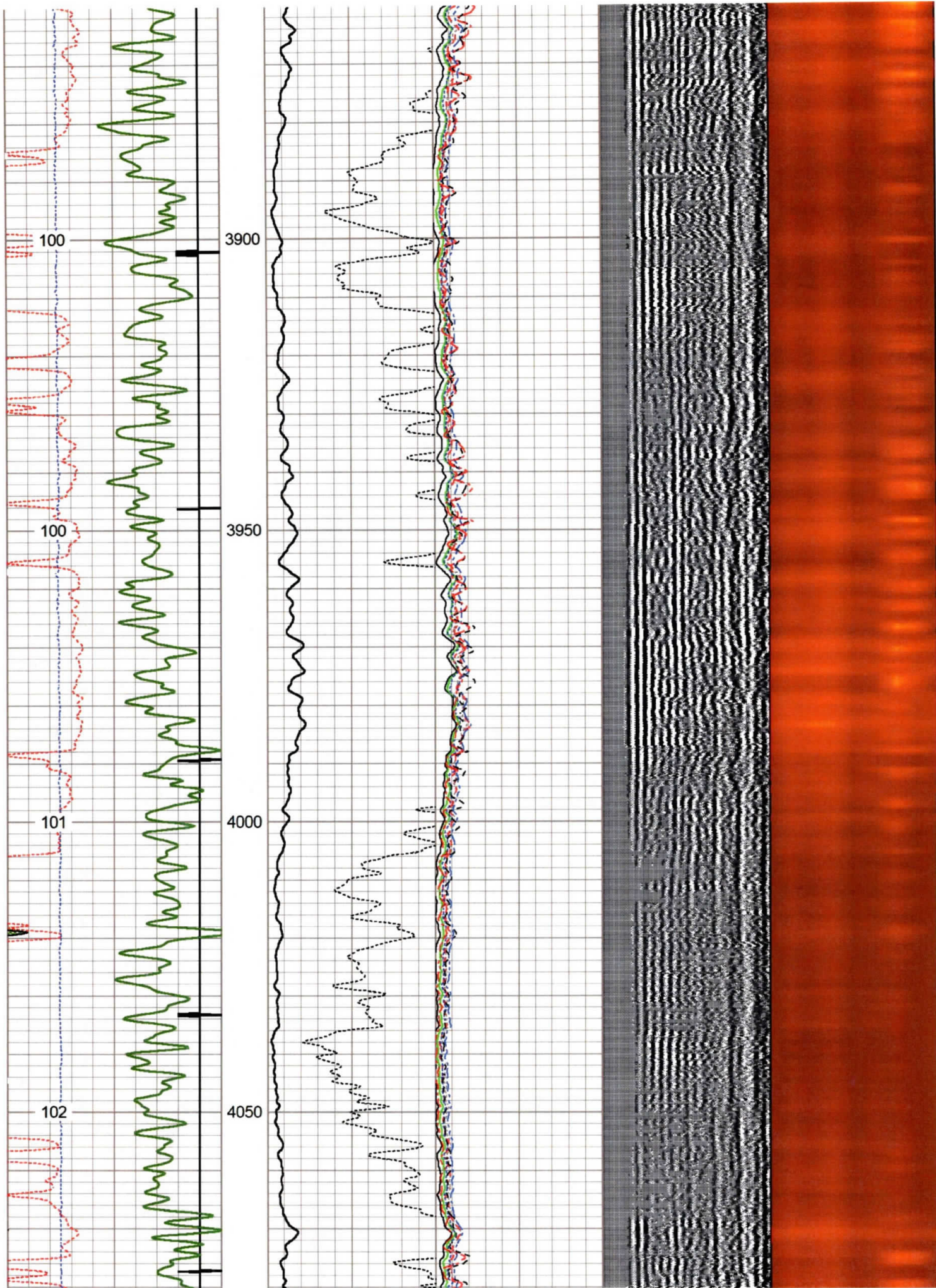




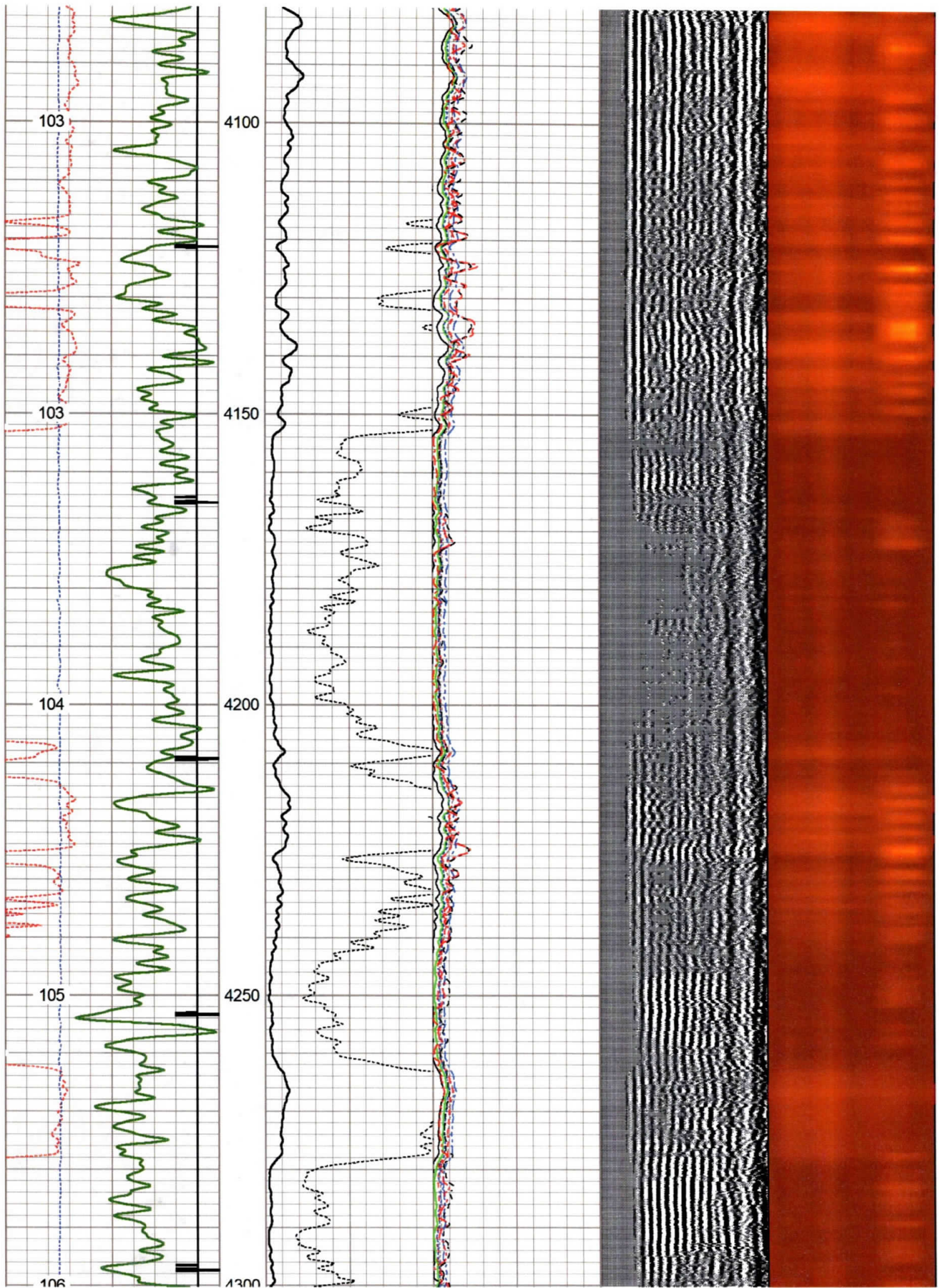




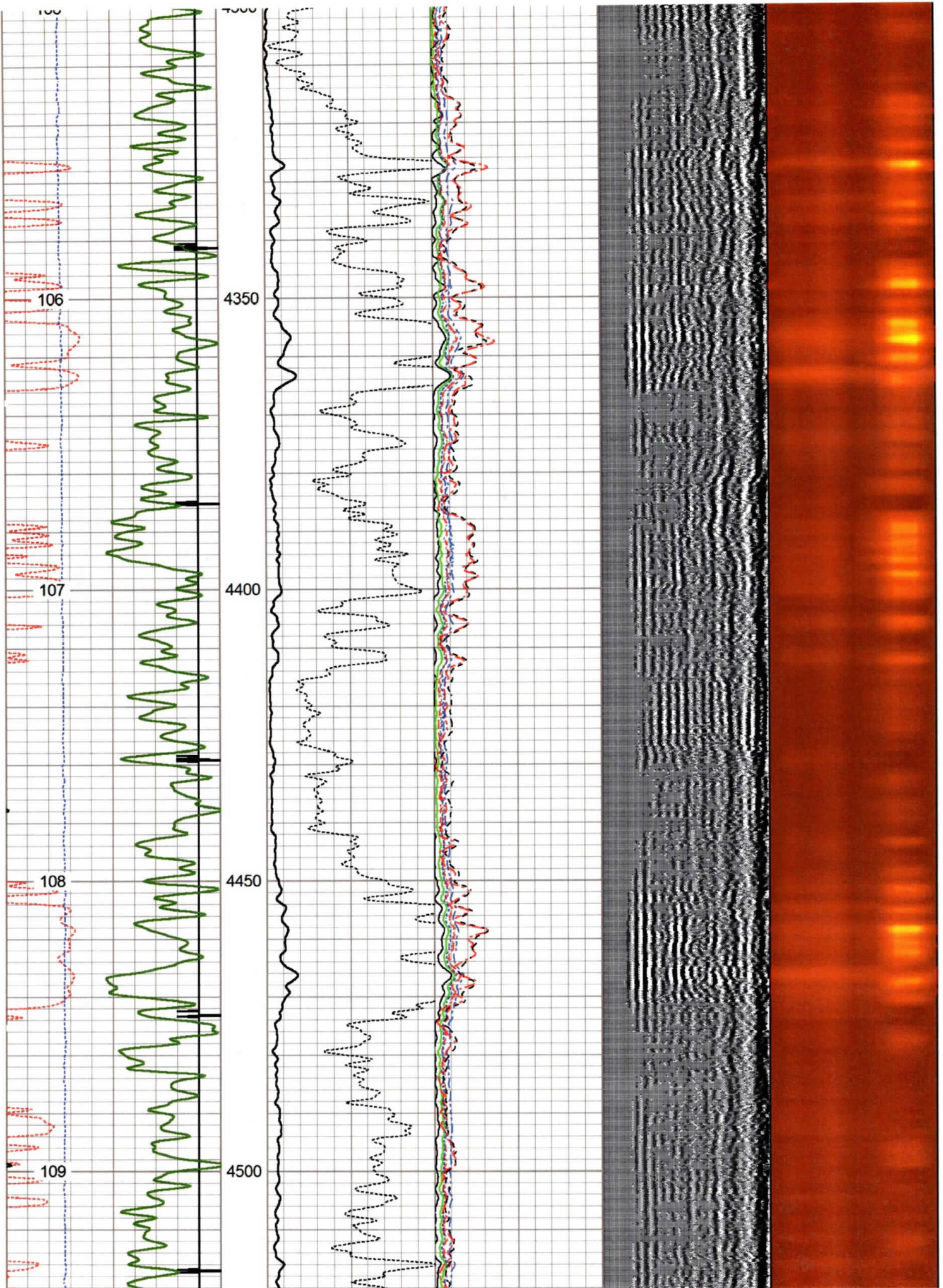




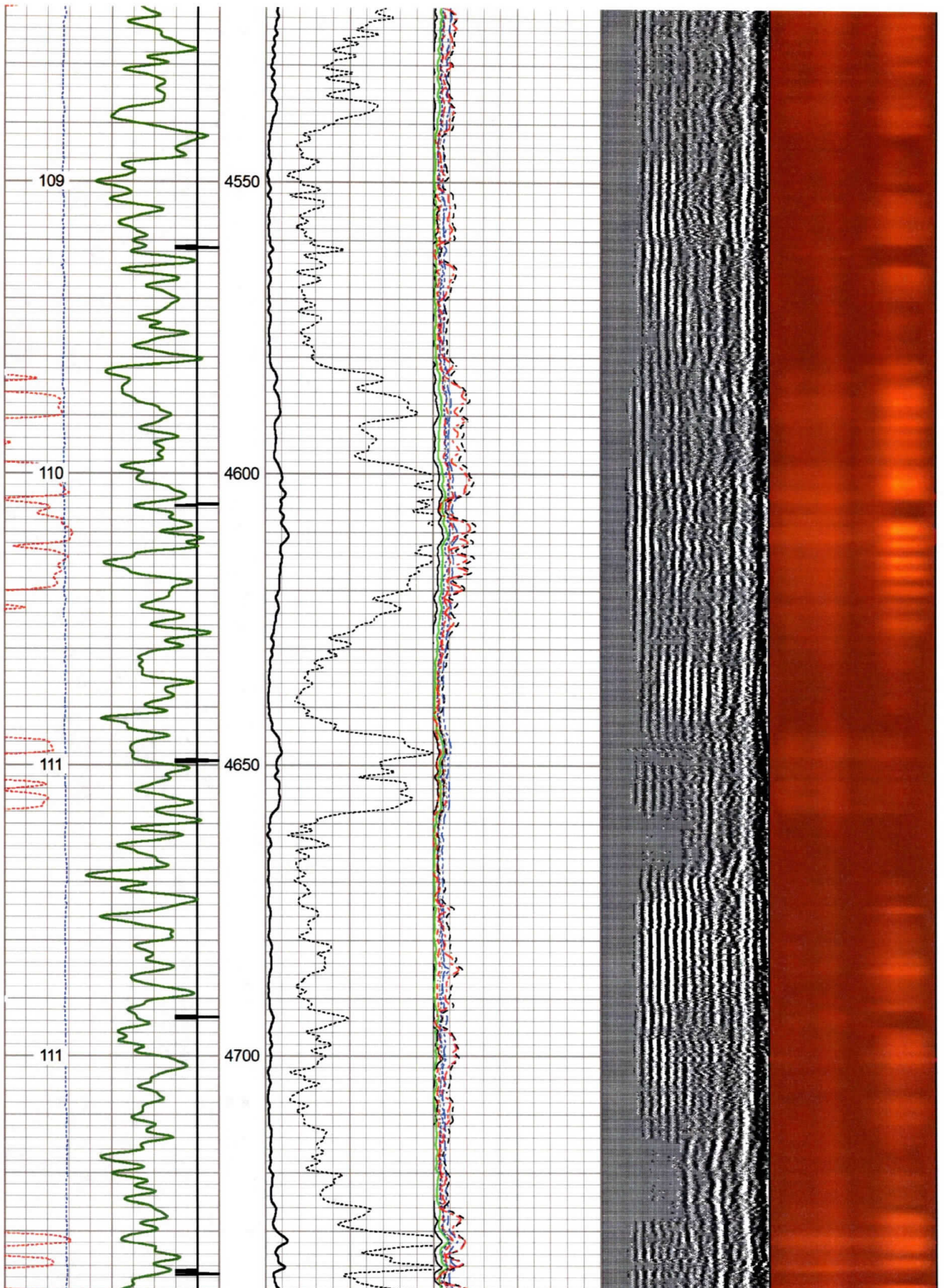




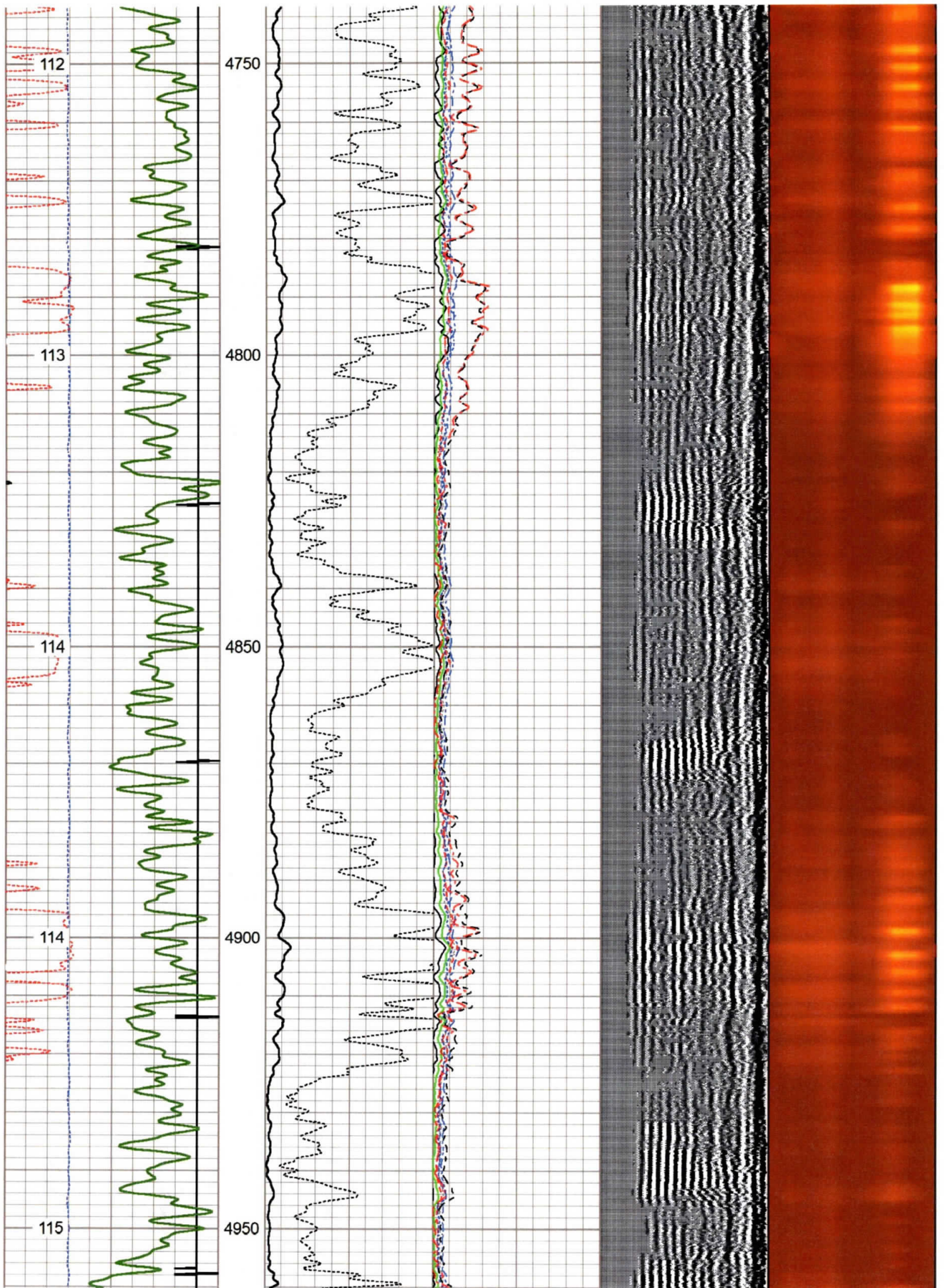




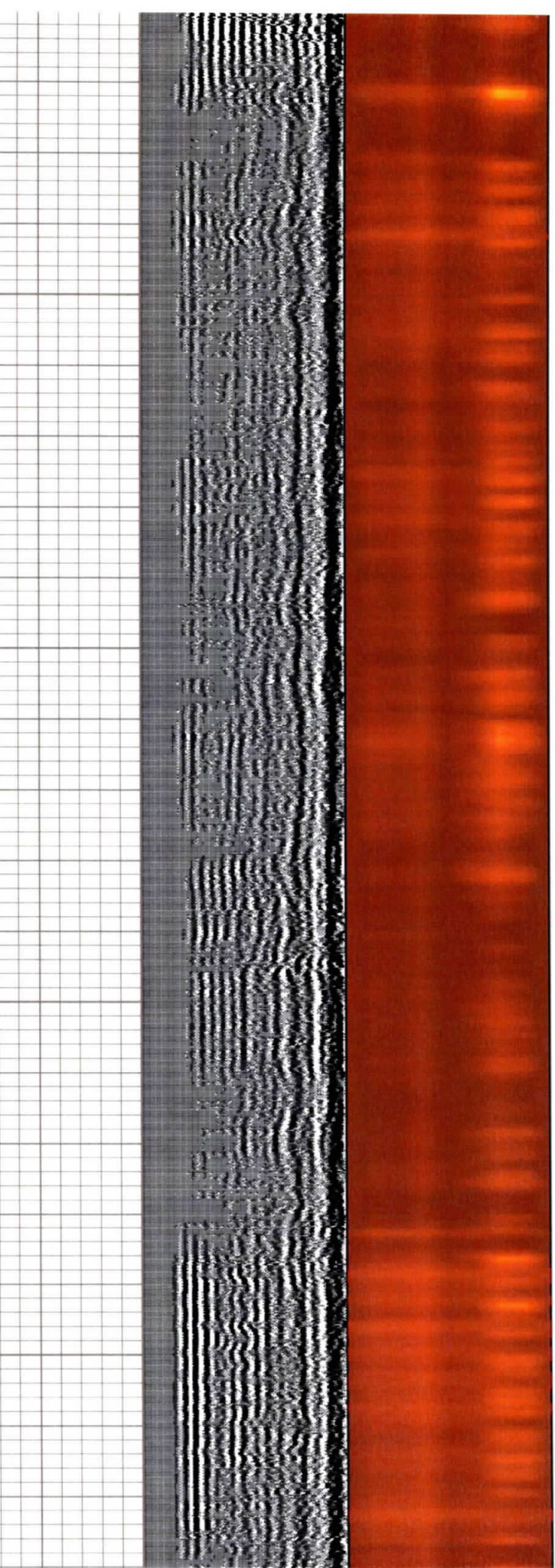
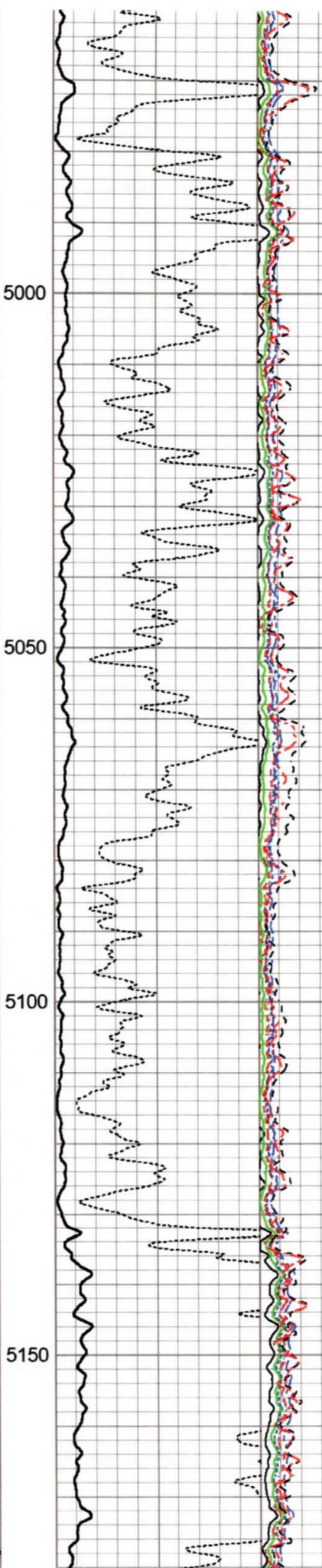
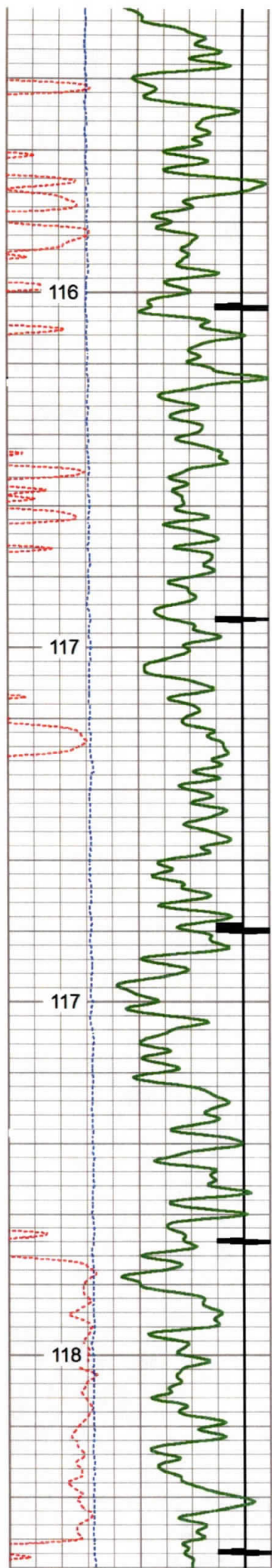




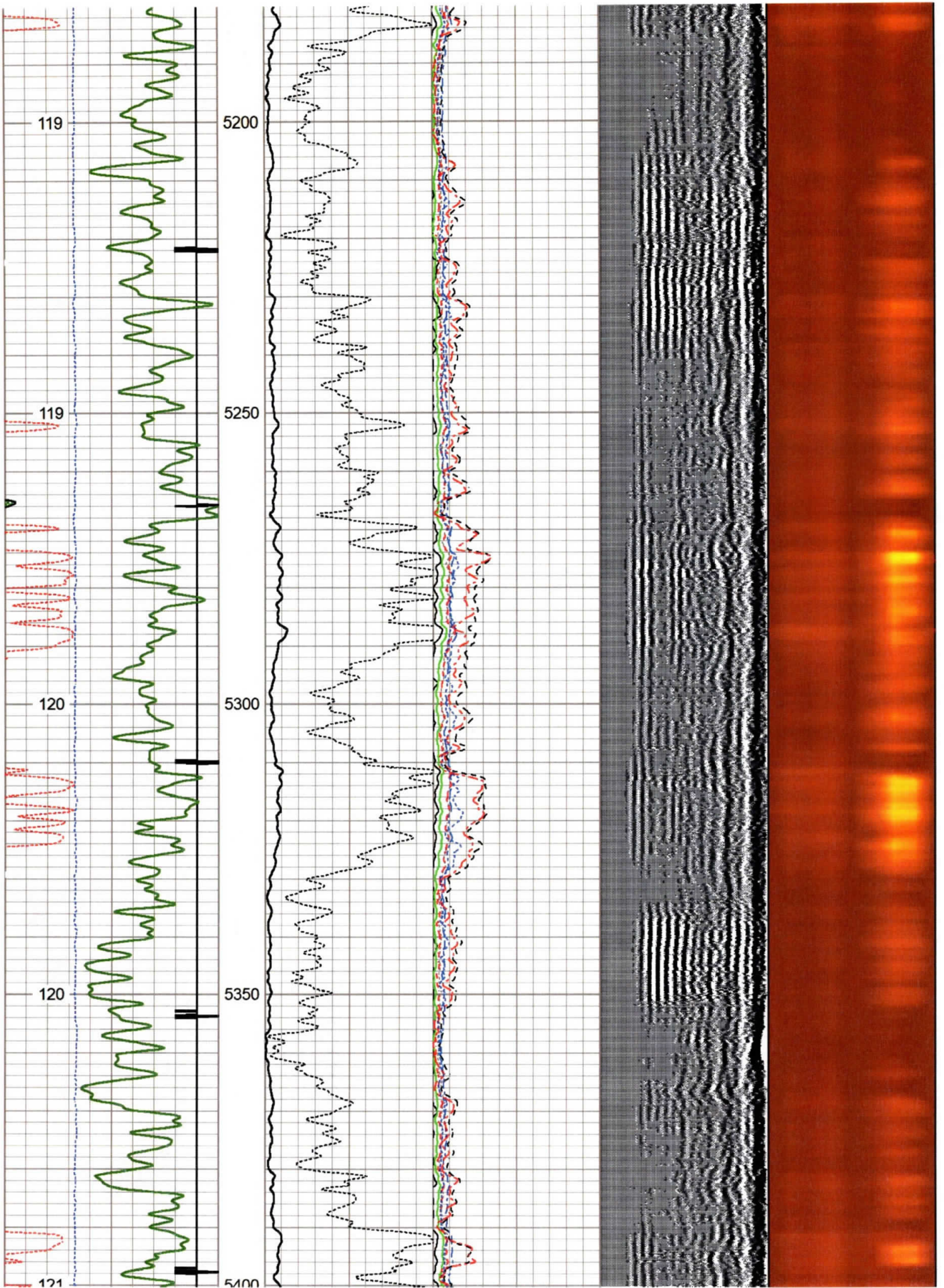




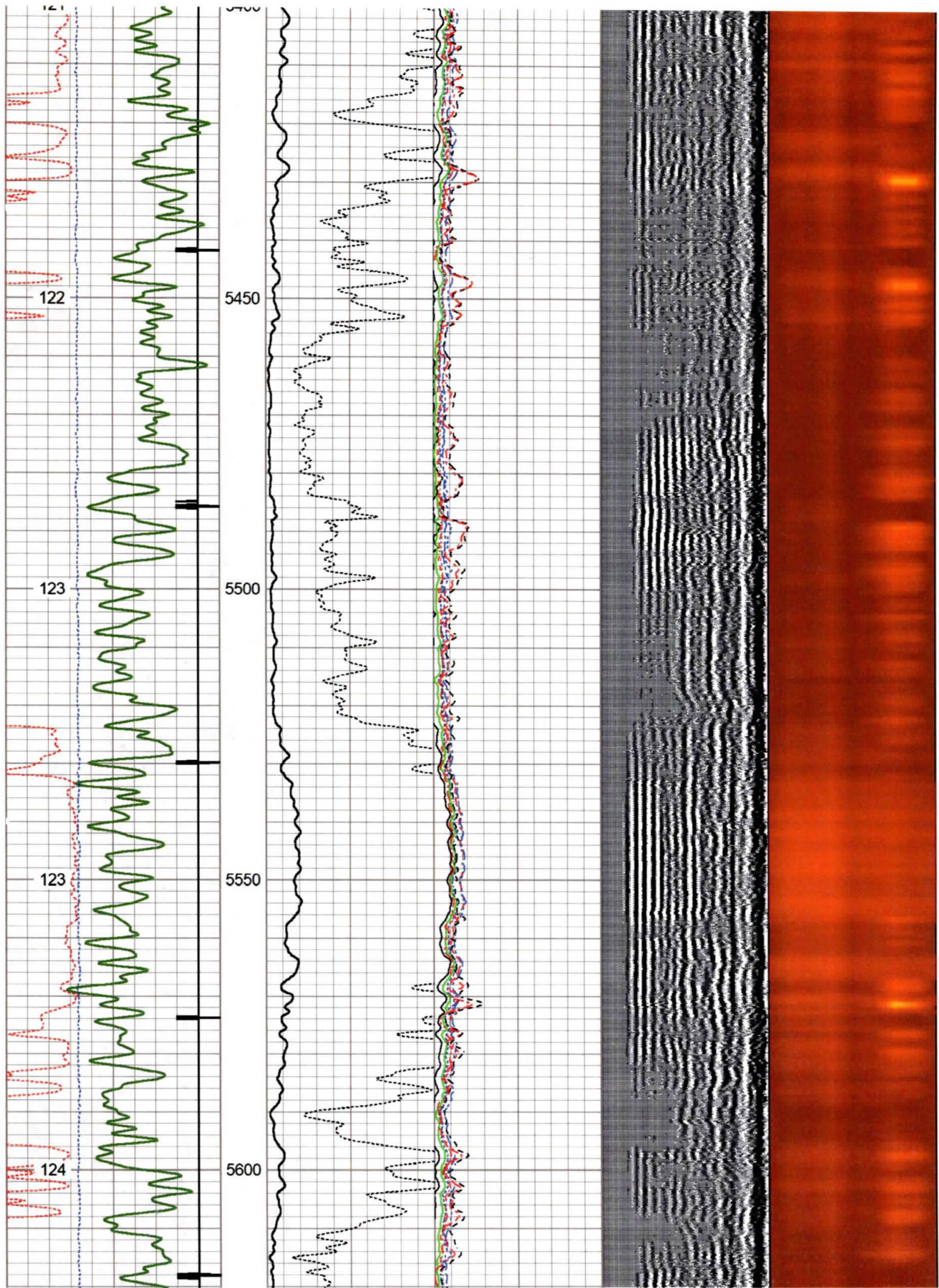




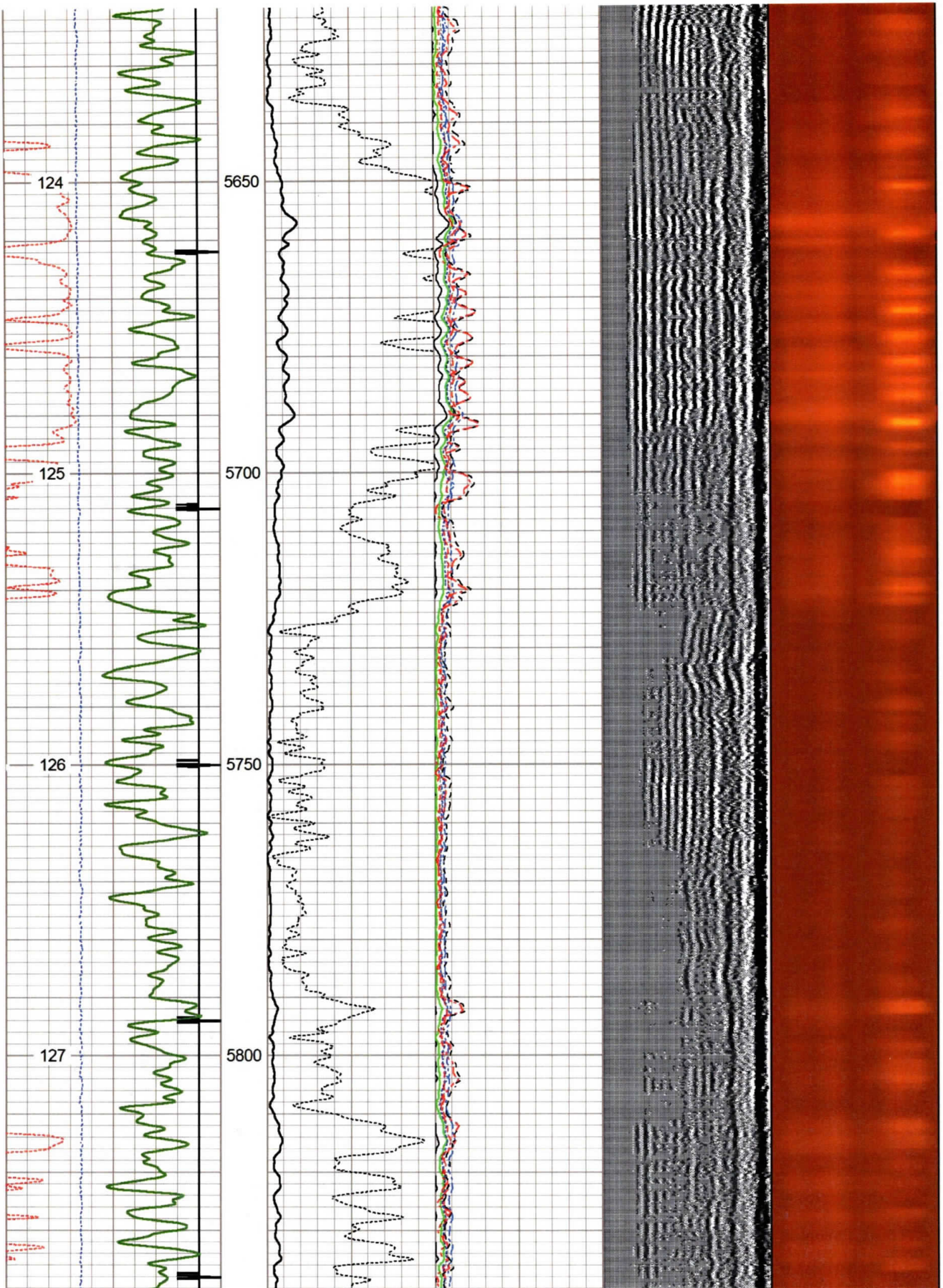




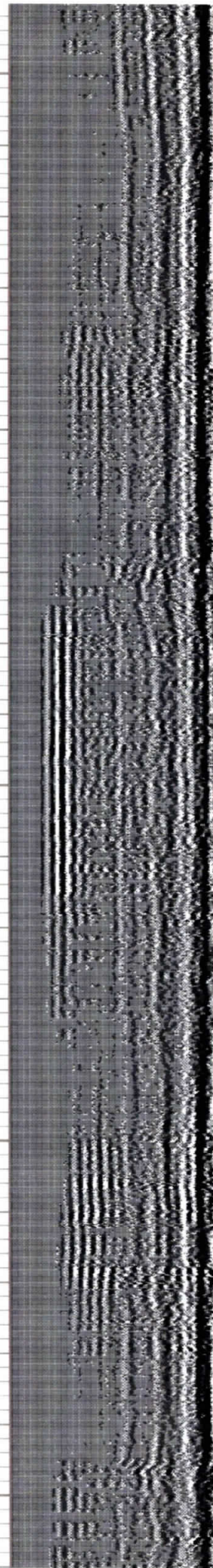
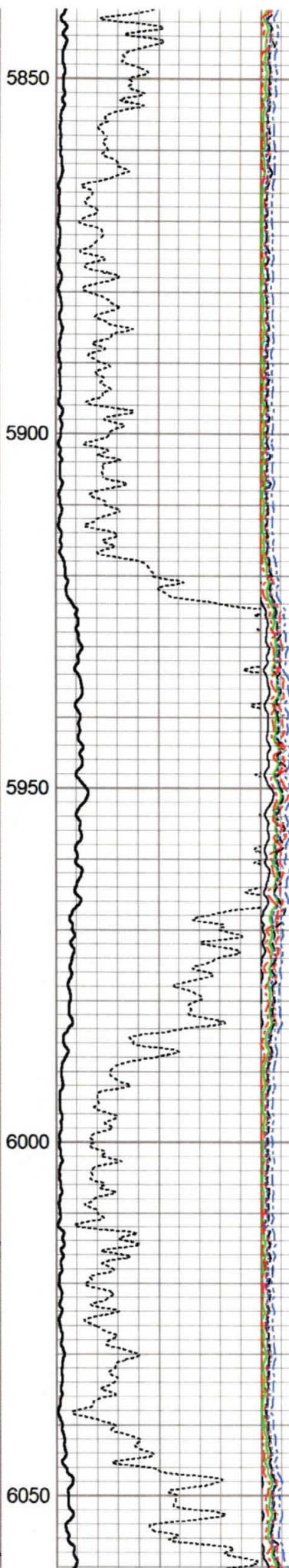
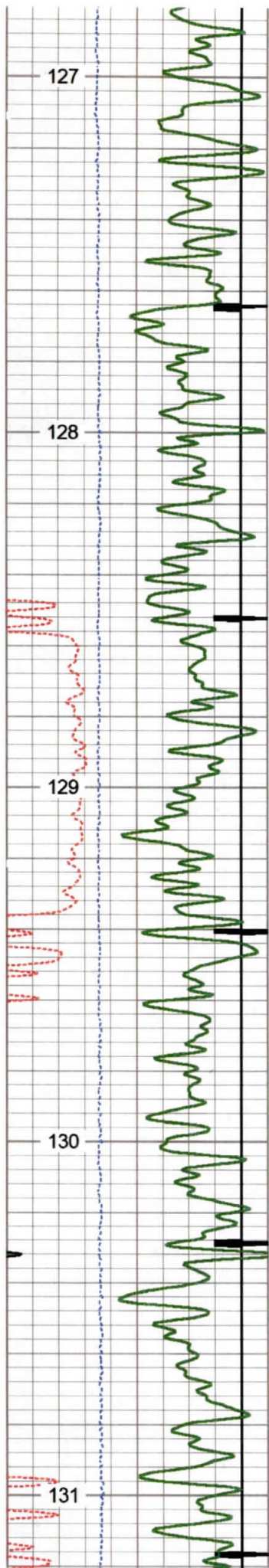




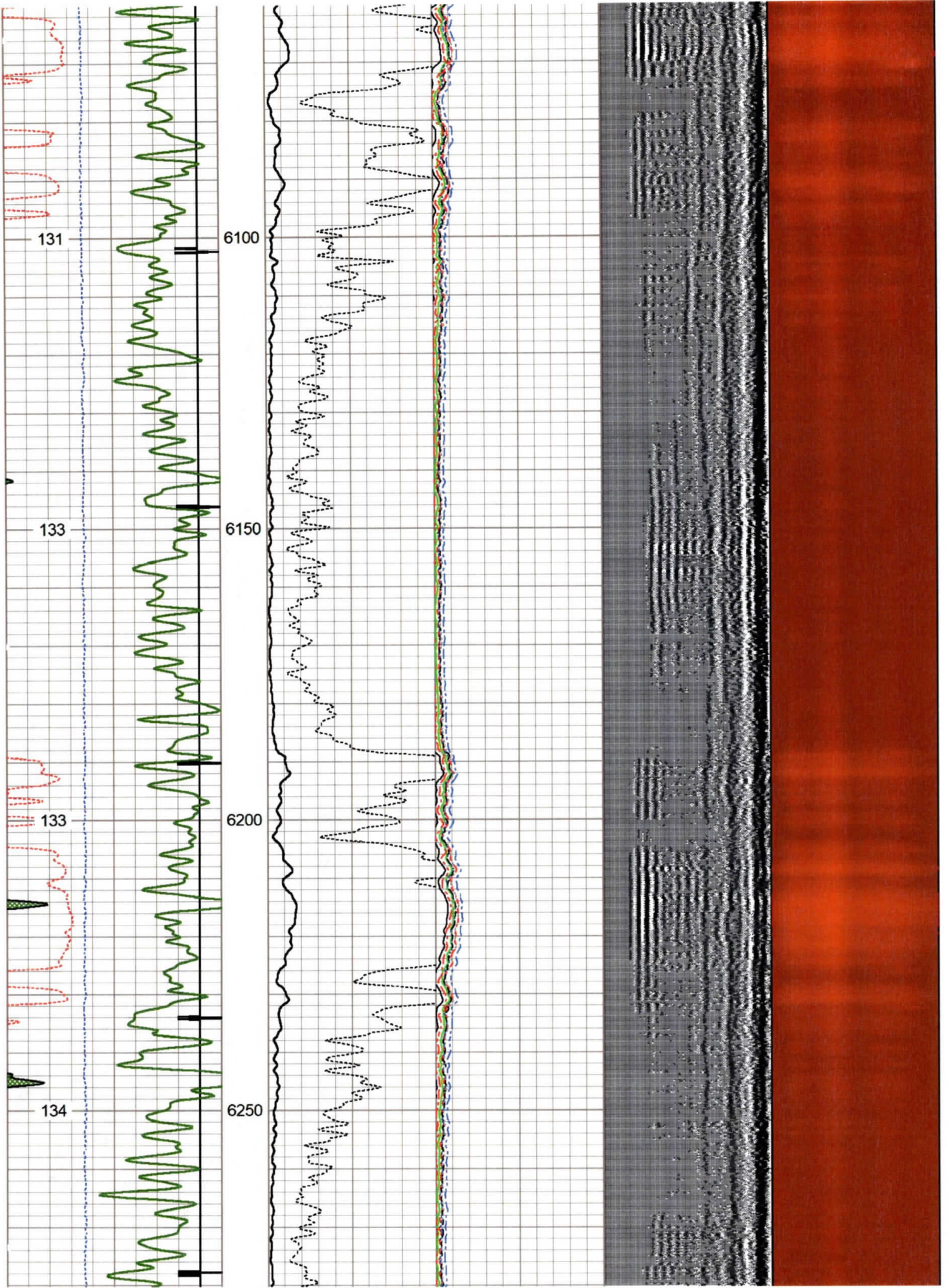




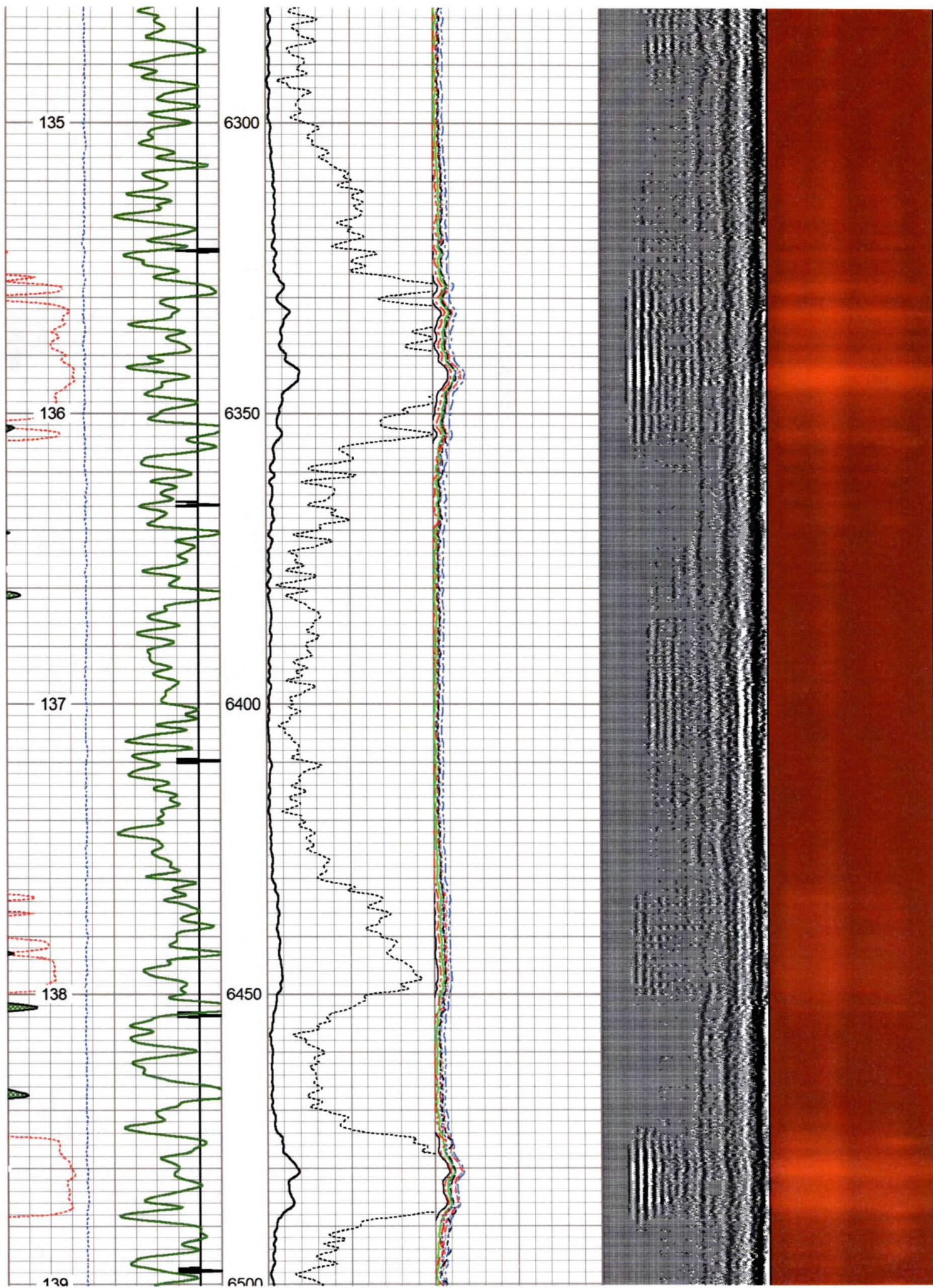




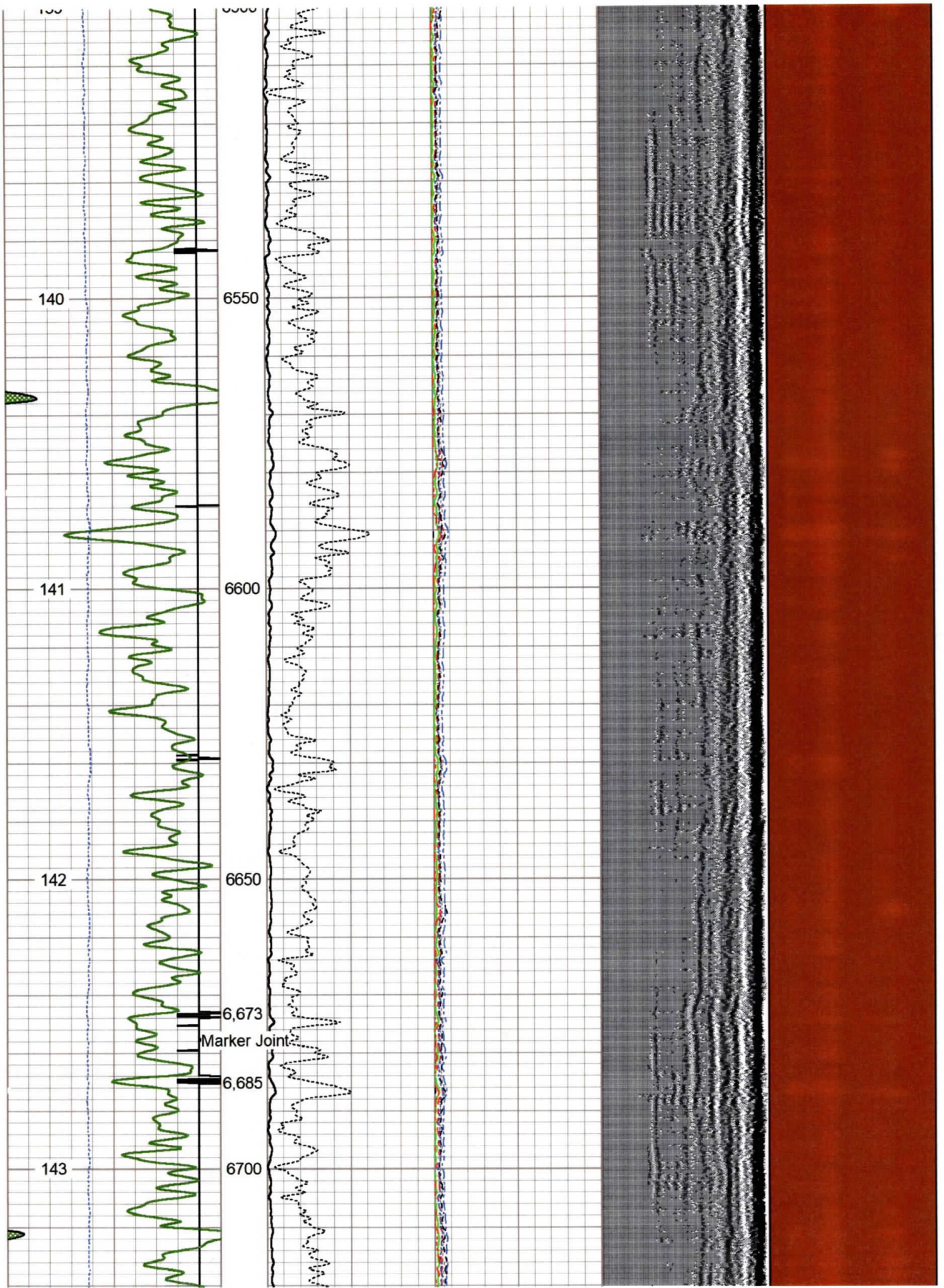




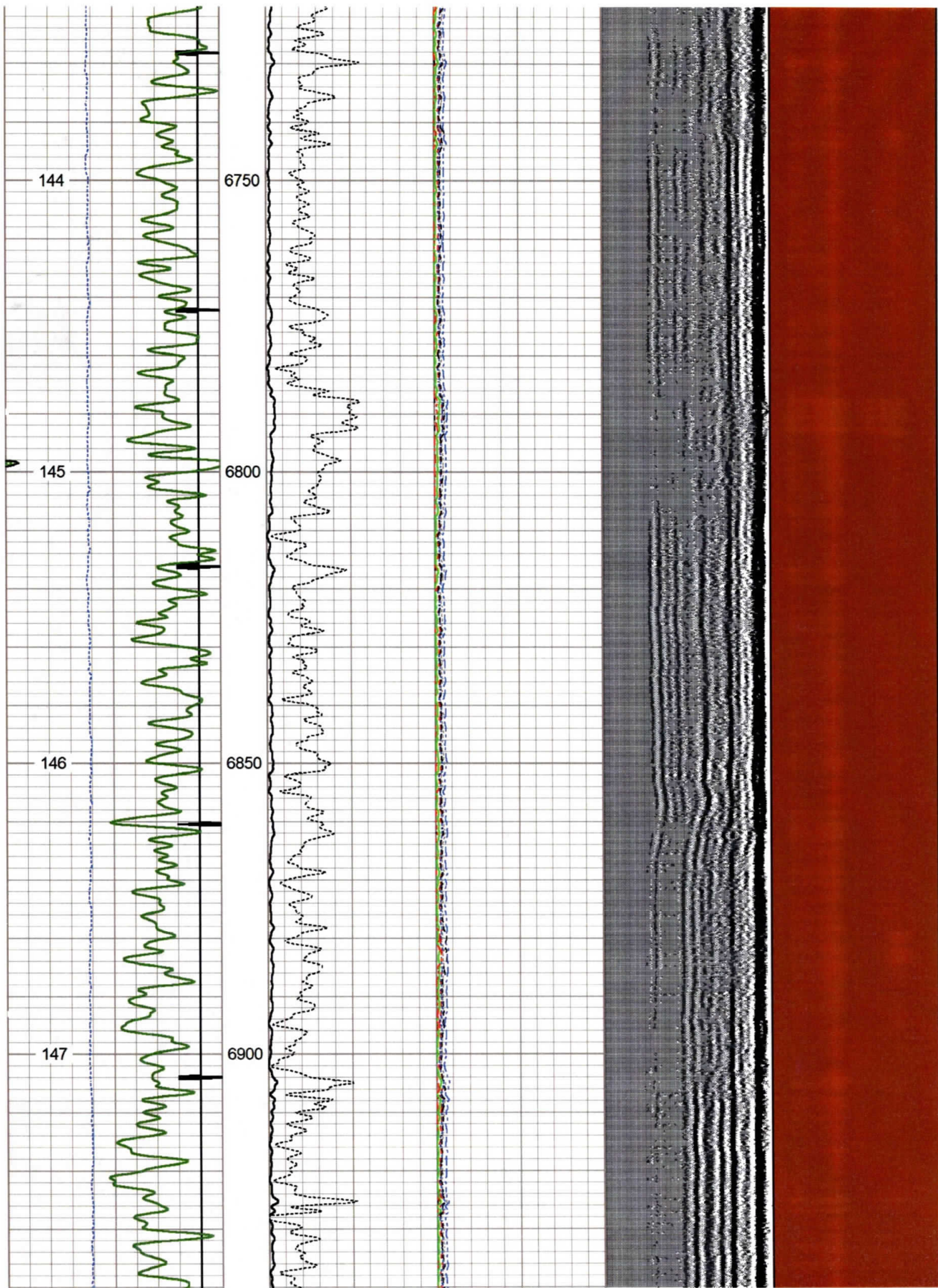




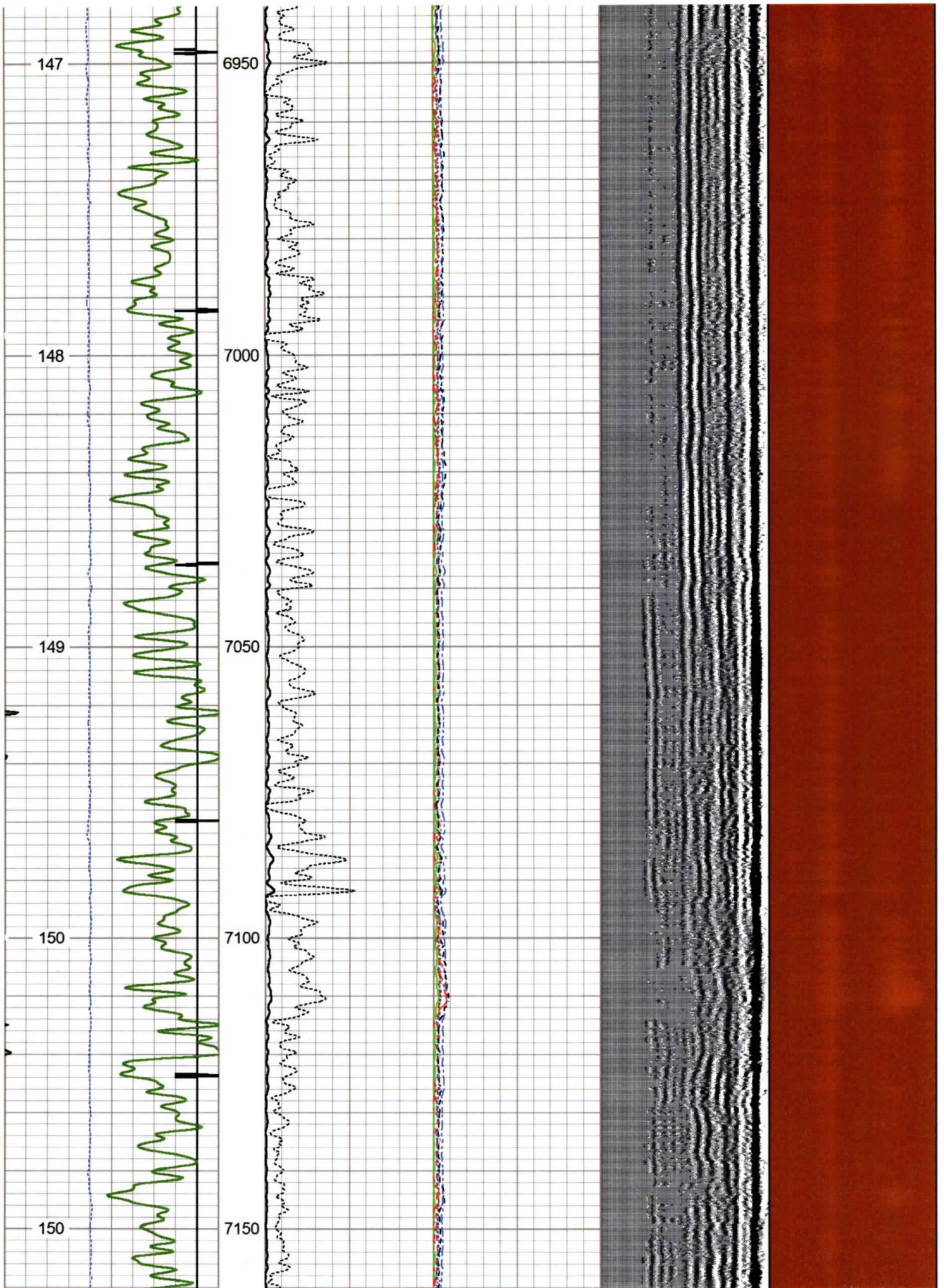




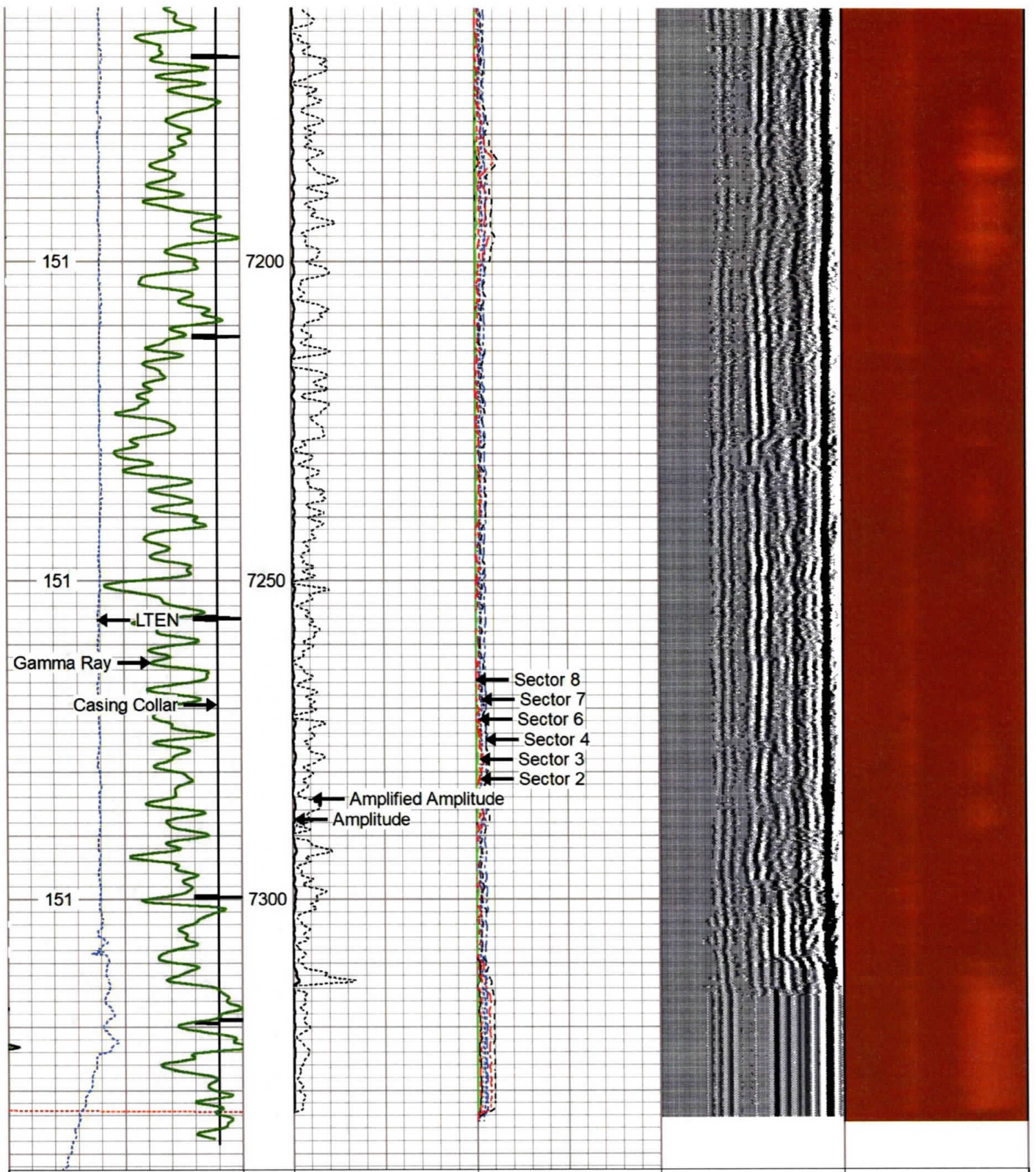












250	Travel Time (usec)	200
Casing Collar		
0	Gamma Ray (GAPI)	150
0	LTEN (lb)	2500

Temp  
(degF)

0	Amplitude (mV)	100	-5	Sector 1	150
Amplified Amplitude					
0	(mV)	10	-5	Sector 2	150
-----					
-5			-5	Sector 3	150
-----					
-5			-5	Sector 4	150
-----					
-5			-5	Sector 5	150
-----					
-5			-5	Sector 6	150
-----					
-5			-5	Sector 7	150
-----					
-5			-5	Sector 8	150

Variable Density  
200 (usec) 1200

1 Cement Map 8



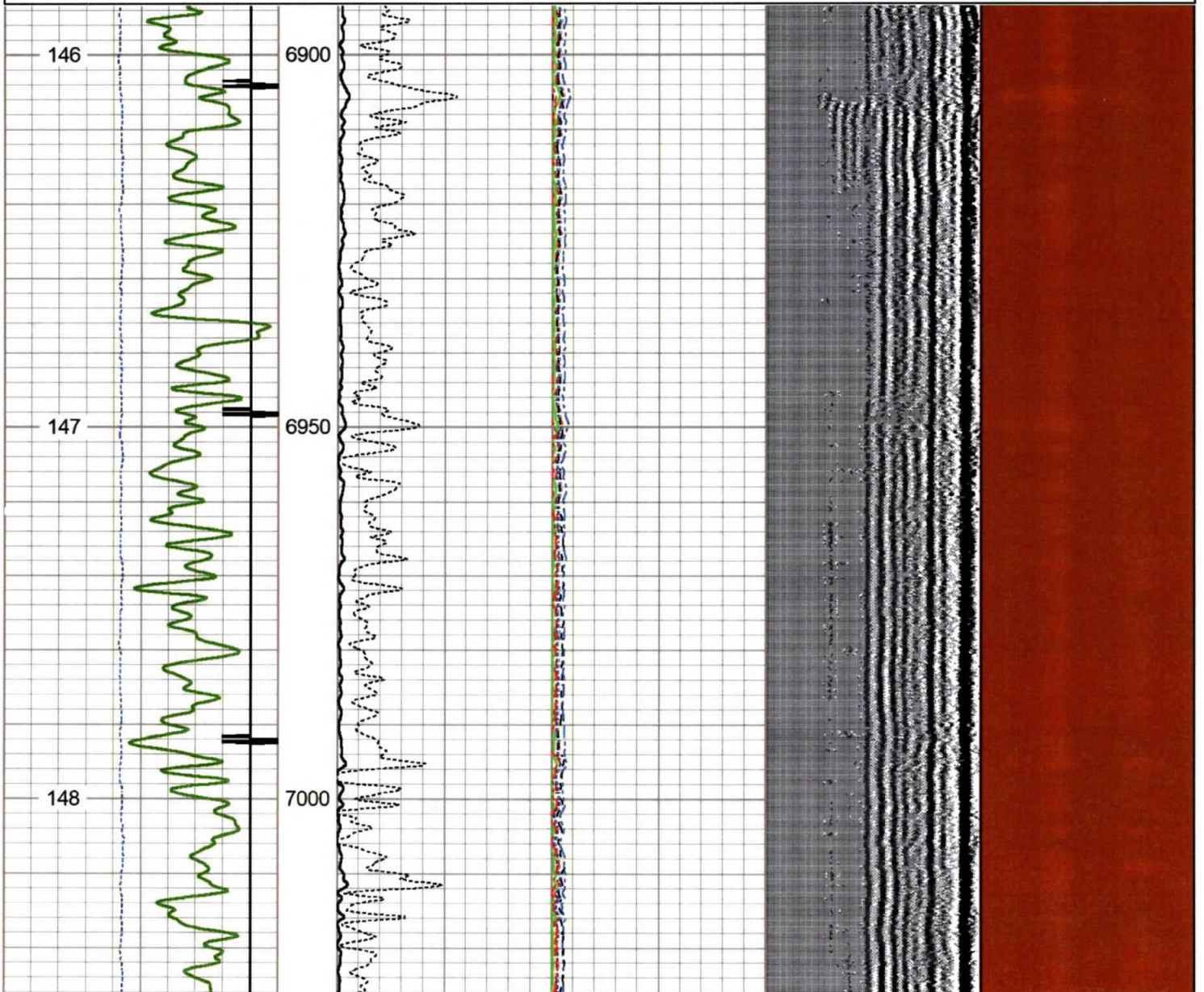




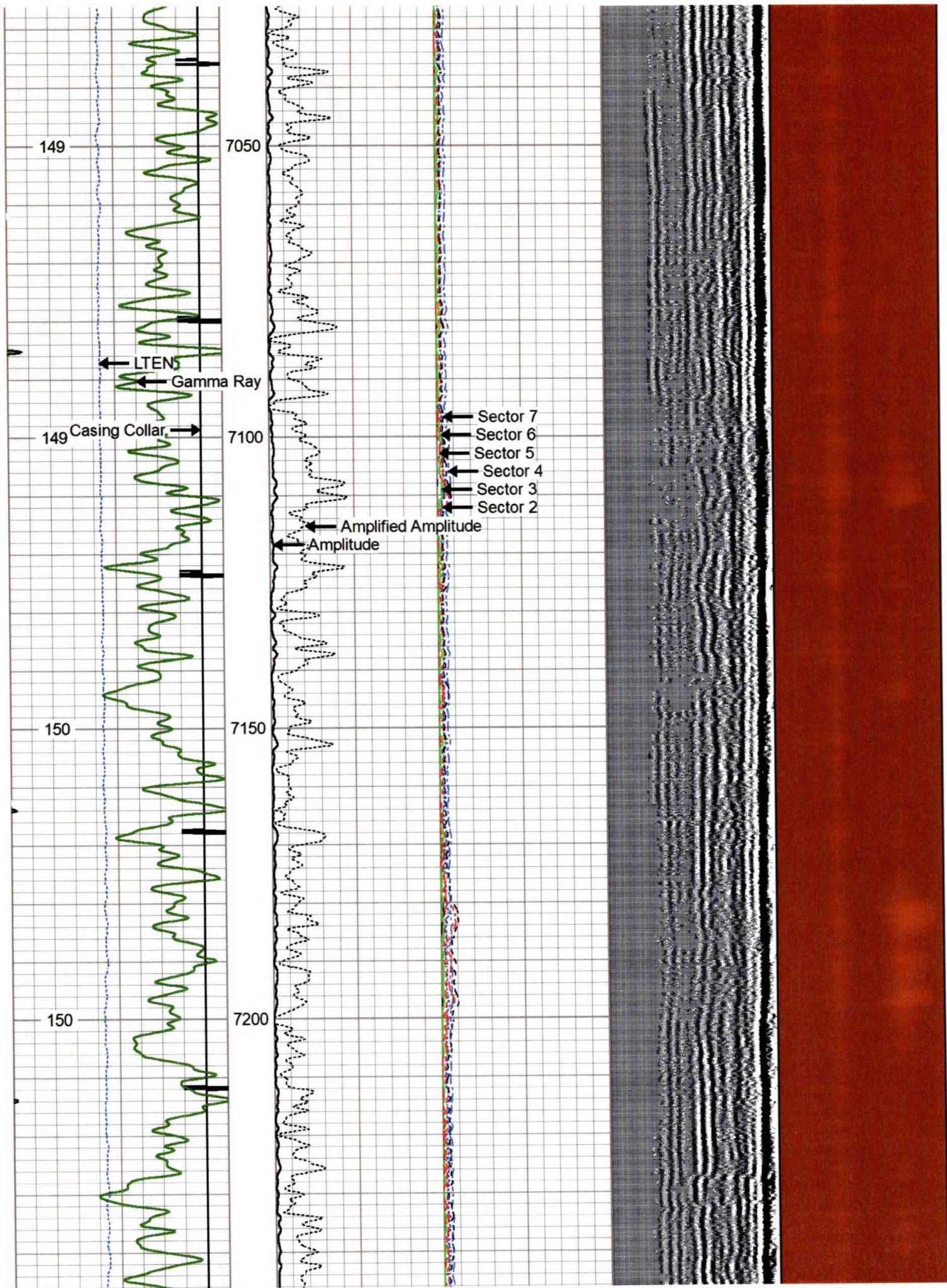
# Repeat Pass 0 PSI

Database File antero\_oxfd\_13\_ehs\_rcbl\_nineenergy\_12\_feb\_2020.db  
 Dataset Pathname Marcellus/OXFD\_13\_EHS/run1/pass4.1  
 Presentation Format scbl03  
 Dataset Creation Wed Feb 12 19:55:45 2020  
 Charted by Depth in Feet scaled 1:240

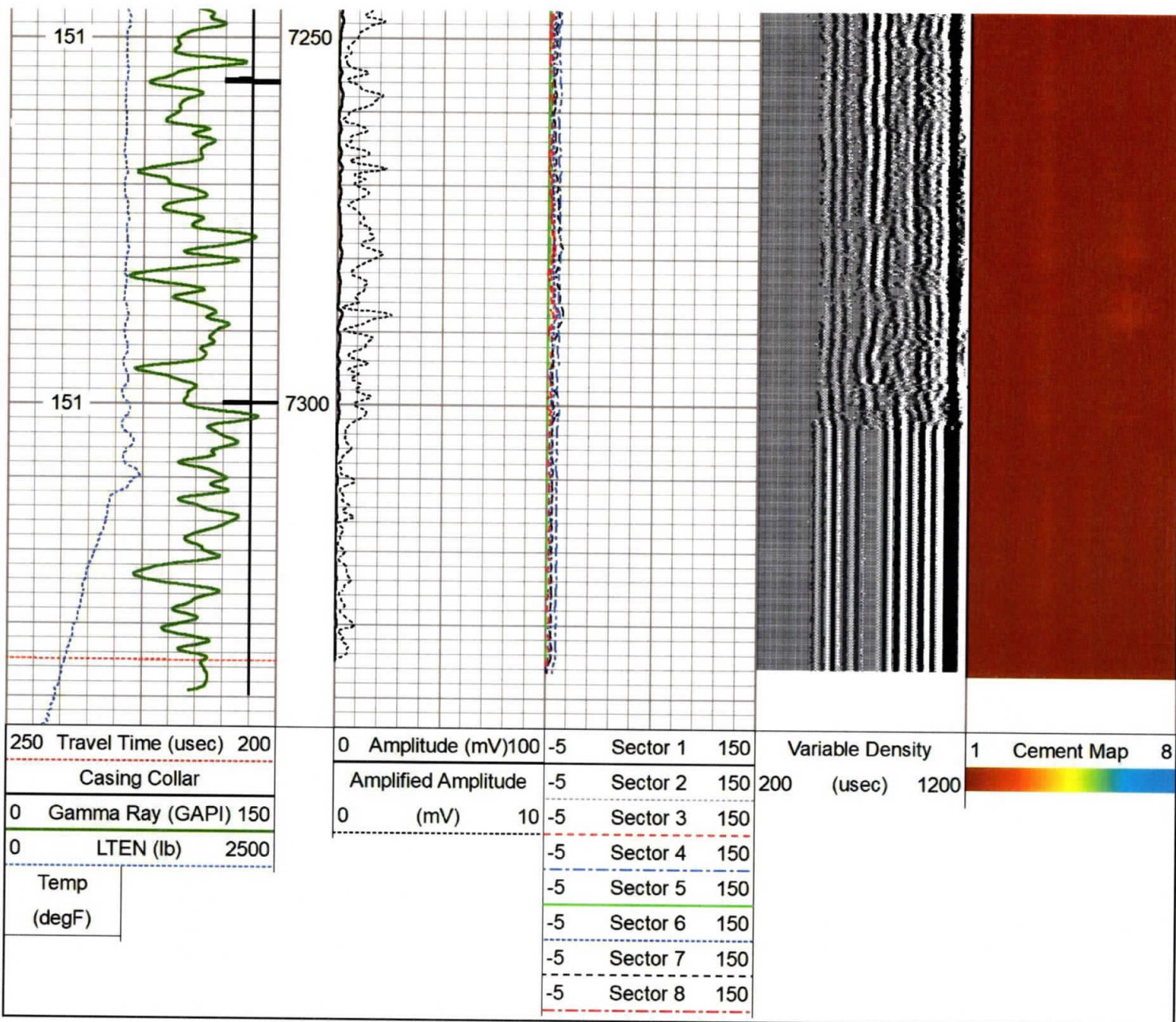
250 Travel Time (usec) 200	0 Amplitude (mV) 100	-5 Sector 1 150	Variable Density	1 Cement Map 8
Casing Collar	Amplified Amplitude	-5 Sector 2 150	200 (usec) 1200	
0 Gamma Ray (GAPI) 150	0 (mV) 10	-5 Sector 3 150		
0 LTEN (lb) 2500		-5 Sector 4 150		
Temp		-5 Sector 5 150		
(degF)		-5 Sector 6 150		
		-5 Sector 7 150		
		-5 Sector 8 150		











## Log Variables

Database: C:\ProgramData\Warrior\Data\antero\_oxfd\_13\_ehs\_rcbl\_nineenergy\_12\_feb\_2020.db  
 Dataset: Marcellus/OXFD\_13\_EHS/run1/pass6.1/\_vars\_

### Top - Bottom

BHTEMP_Src	BOREID	BOTTEMP	CASEOD	CASETHCK	CASEWGHT	MAXAMPL	MINAMPL
TEMP	in	degF	in	in	lb/ft	mV	mV
	7.875	100	5.5	0	11.5	0	1
MINATTN	PERFS	PPT	SRFTEMP	TDEPTH			
db/ft	No	usec	degF	ft			
0.8		0	0	0			

### Variable Description

BHTEMP\_Src : BHTEMP Input Source Selector  
 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



**Calibration Report**

Database File antero\_oxfd\_13\_ehs\_rcbl\_nineenergy\_12\_feb\_2020.db  
 Dataset Pathname Marcellus/OXFD\_13\_EHS/run1/pass6.1  
 Dataset Creation Wed Feb 12 19:57:48 2020

**Gamma Ray Calibration Report**

Serial Number: FW1211-86  
 Tool Model: Probe  
 Performed: Mon Feb 03 13:18:32 2014

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps  
 Calibrator Reading: 1.0 cps

Sensitivity: 0.8000 GAPI/cps

**Segmented Cement Bond Log Calibration Report**

Serial Number: FW1312-32  
 Tool Model: Probe275T

Calibration Casing Diameter: 5.500 in  
 Calibration Depth: 2653.808 ft

Master Calibration, performed Wed Feb 12 17:04:26 2020:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.086	0.841	1.000	71.921	93.884	-1.065
CAL	0.606	1.005				
5'	0.030	0.717	1.000	71.921	103.253	-2.082
SUM						
S1	0.067	0.798	0.000	71.921	98.319	-4.583
S2	0.045	0.888	0.000	71.921	85.359	-3.842
S3	0.055	0.859	0.000	71.921	89.517	-4.943
S4	0.000	0.858	0.000	71.921	83.827	0.000
S5	0.078	0.839	0.000	71.921	94.457	-7.354
S6	0.037	0.805	0.000	71.921	93.633	-3.456
S7	0.037	0.783	0.000	71.921	96.455	-3.571
S8	0.092	0.795	0.000	71.921	102.409	-9.470

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.606	1.005	1.000	0.000

Air Zero Calibration, performed Wed Feb 12 07:58:38 2020:

	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

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 Environmental Protection



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

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
			CHD-Titan Titan 1 7/16" GO Cablehead	1.00	1.44	5.00
Temp	11.27		CENT-Overbody Antelope (SP-919-0233)	1.67	4.88	5.00
			RBT-Probe275T (FW1312-32) Probe 2.75" Radial with Integral Temperature Sub	9.39	2.75	90.00
WVFS8	9.03					
WVFS7	9.03					
WVFS6	9.03					
WVFS5	9.03					
WVFS4	9.03					
WVFS3	9.03					
WVFS2	9.03					
WVFS1	9.03					
WVF3FT	9.03					
WVF5FT	8.03					
HeadVolt	4.78					
WVFCAL	4.78					
CCL	3.88					
GR	2.54		GR-Probe (FW1211-86) Probe 2 3/4" Logging Gamma Ray	4.78	2.75	57.00
			CENT-Overbody Antelope (SP-919-0233)	1.67	4.88	5.00





Dataset:	antero_oxfd_13_ehs_rcbl_nineenergy_12_feb_2020.db: Marcellus/OXFD_13_EHS/run1/pass6.1
Total length:	15.17 ft
Total weight:	162.00 lb
O.D.:	4.88 in



# Nine

Company	Antero Resources
Well	OXFD 13 EHS
Field	N/A
County	Doddridge
State	West Virginia

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Office of Oil and Gas  
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WV Department of  
Environmental Protection