



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

Company	Antero Resources	Location:	SEC N/A TWP N/A RGE N/A	Other Services
Well	Mammoth Unit 1H	Permanent Datum	Ground Level	Elevation
Field	North Canton	Log Measured From	Kelly Bushing (25')	K.B. D.F. G.L.
County	Tyler	Drilling Measured From	Kelly Bushing	
State	West Virginia	API # :	47-095-02605	

Date	14-Mar-2020
Run Number	One
Depth Driller	18,467 ft.
Depth Logger	6,910 ft.
Bottom Logged Interval	6,910 ft.
Top Log Interval	Surface
Open Hole Size	N/A
Type Fluid	Water
Density / Viscosity	N/A
Max. Recorded Temp.	147 Deg. F.
Estimated Cement Top	1,232 ft.
Time Well Ready	07:00
Time Logger on Bottom	14:20
Equipment Number	132
Location	Marietta, Ohio
Recorded By	Tom Wease
Witnessed By	Dan Fisher

	Borehole Record		Tubing Record	
	Bit	From	To	Size
Casing Record				
Surface String				
Prot. String				
Production String				
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

Primary Log on Well

Marker Joint @ 6,371-6,381 ft.
Correction to Pipe Tally Depth Shifted (-11)

Main Pass 1,500 PSI
Repeat Pass 0 PSI

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



Main Pass 1,500 PSI

Database File c:\users\thomas.weese\desktop\bond logs\antero\colorado east\antero_colorado_east_mammoth_1h_rcbl
 Dataset Pathname Marcellus/Mammoth_1H/RCBL_1/pass4
 Presentation Format scbl03
 Dataset Creation Sat Mar 14 14:11:00 2020
 Charted by Depth in Feet scaled 1:240

272	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					

-5					

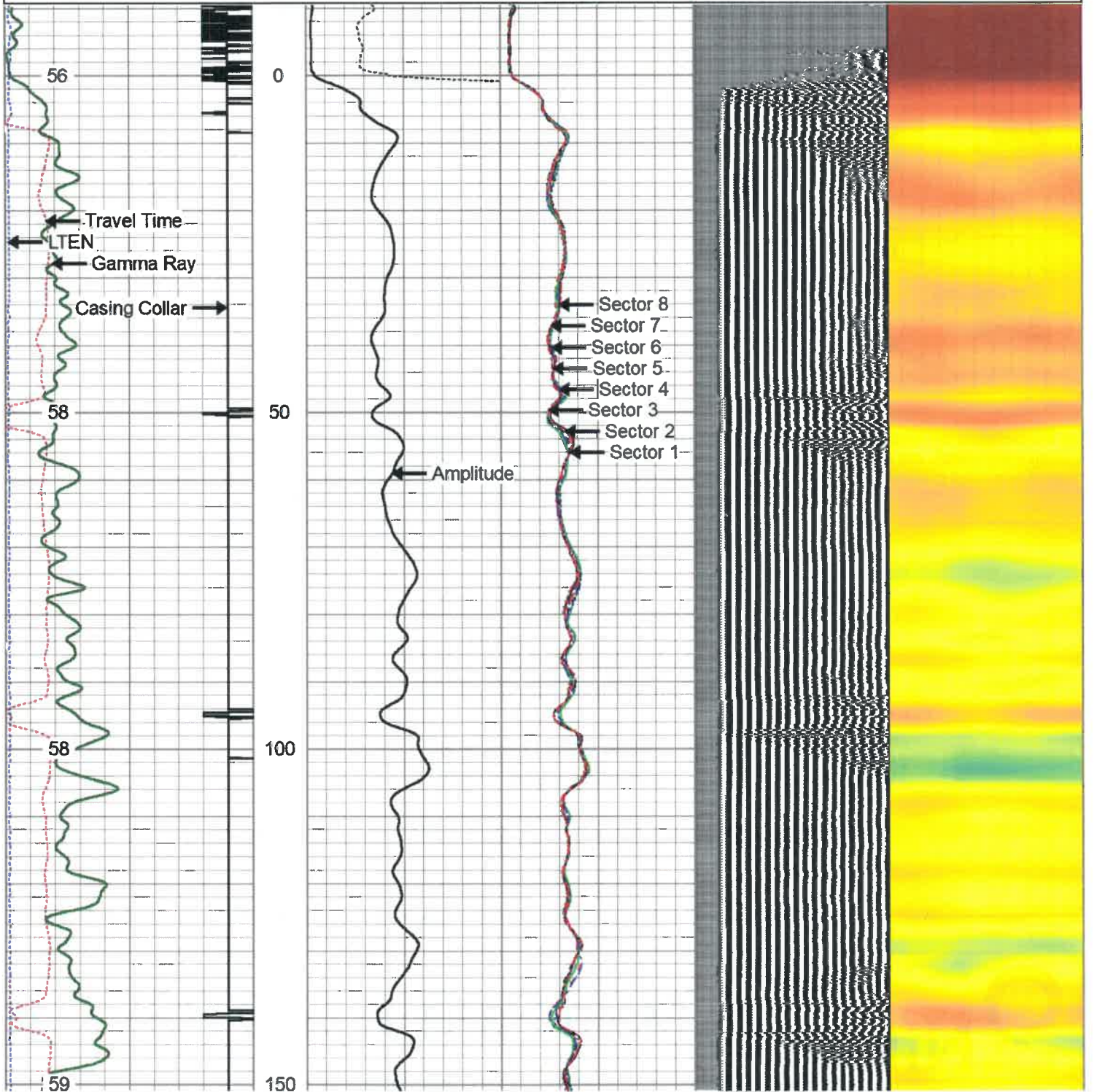
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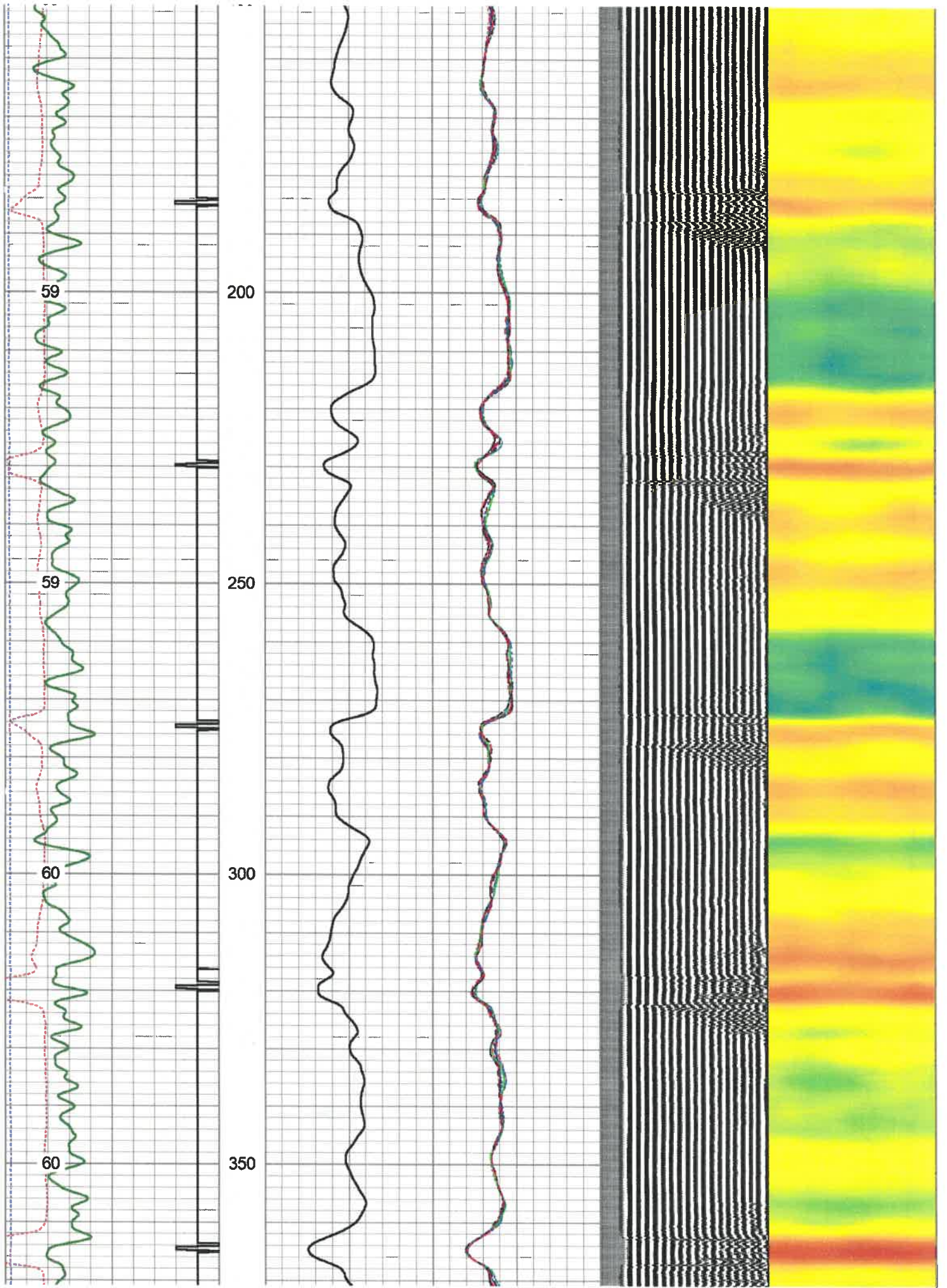
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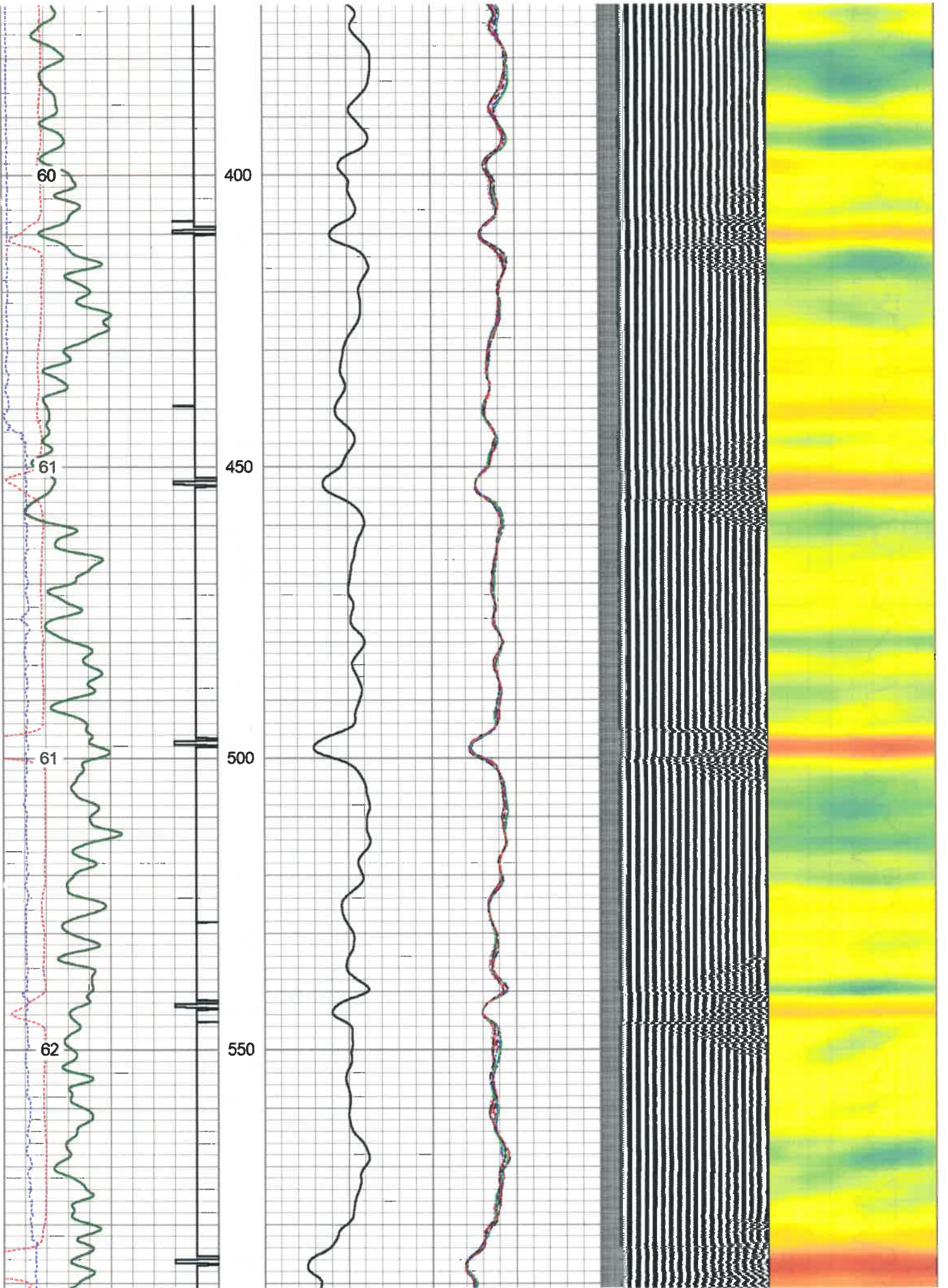
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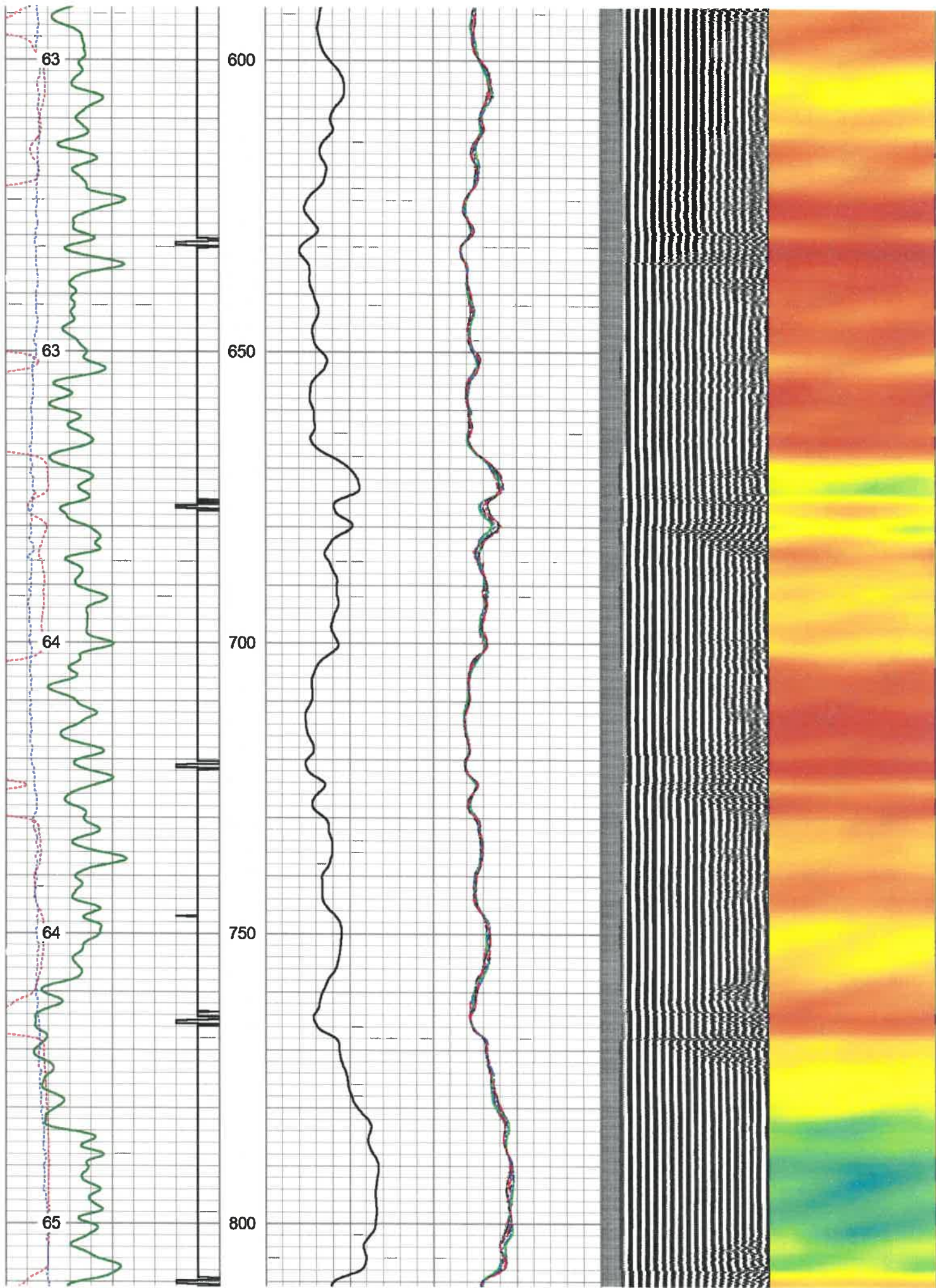
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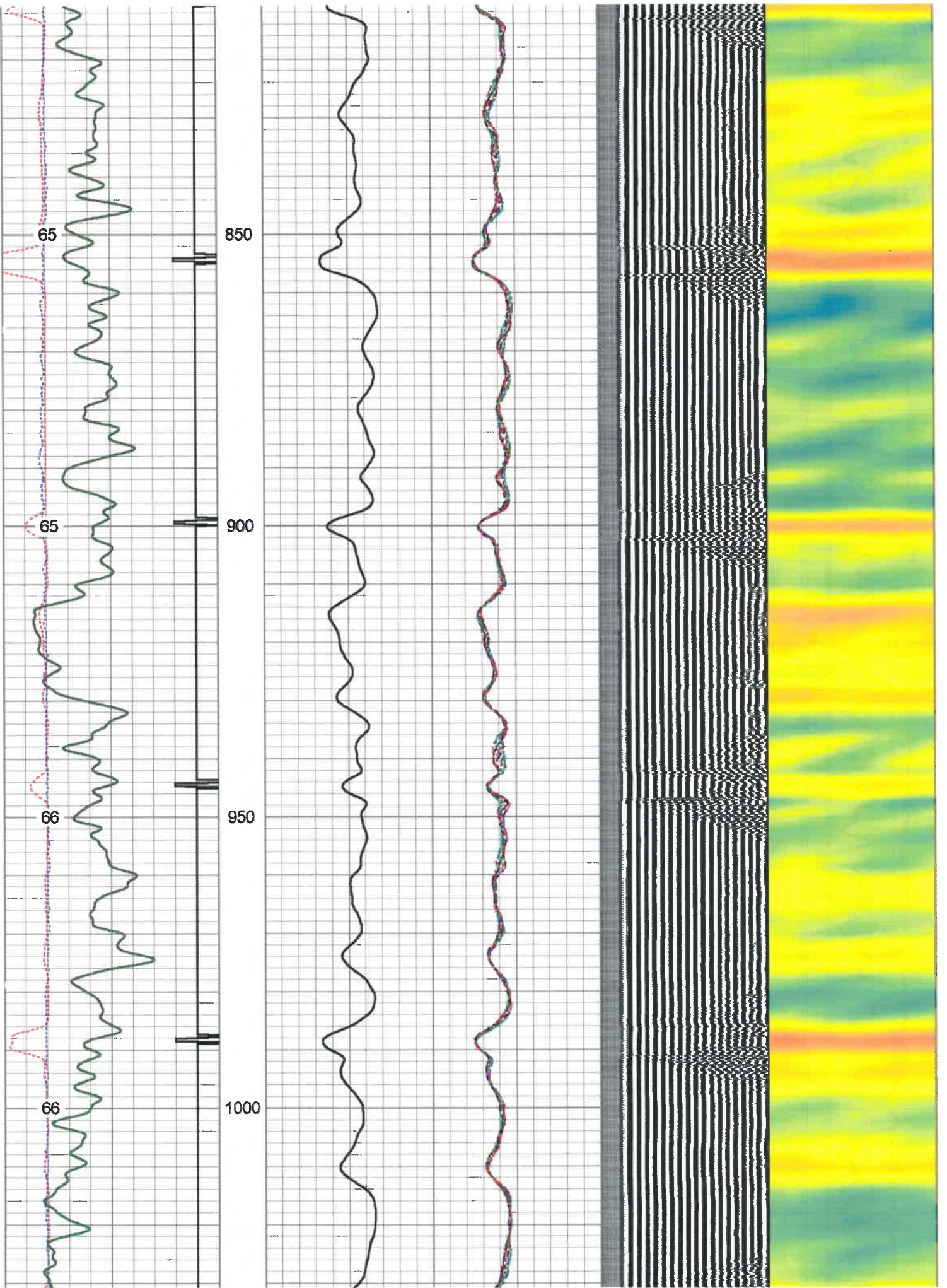
Variable Density 1 Cement Map 8
 200 (usec) 1200

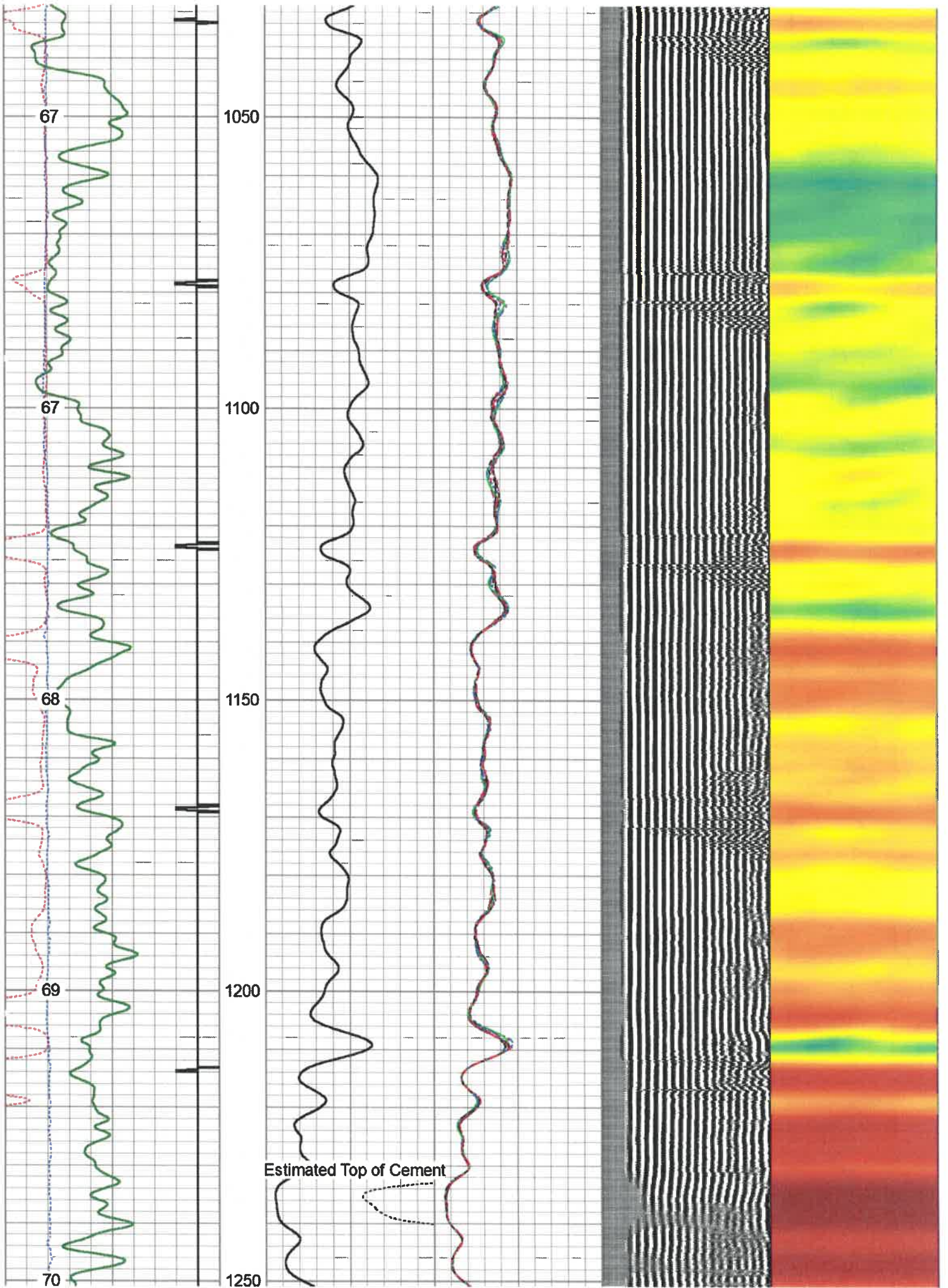


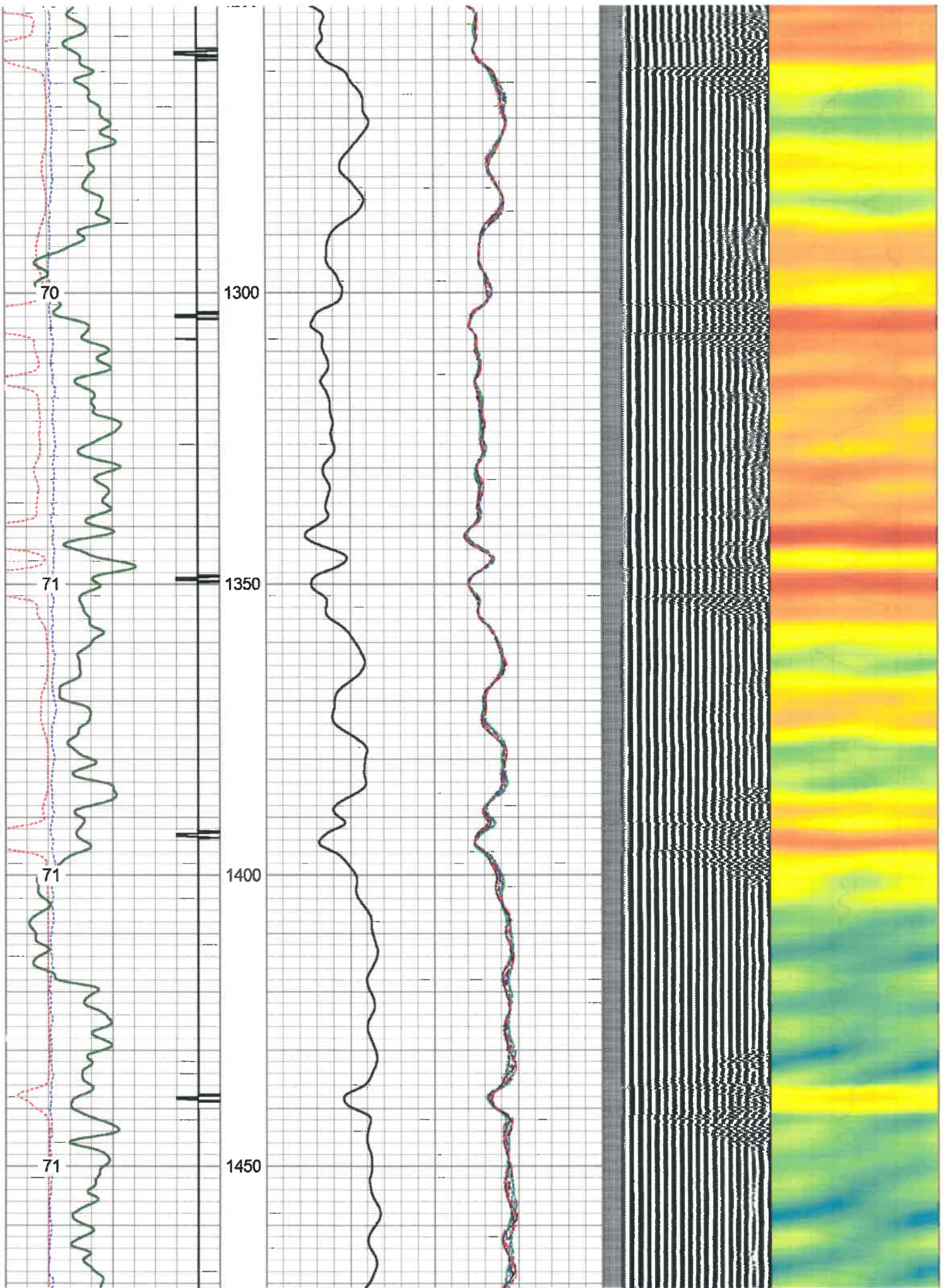


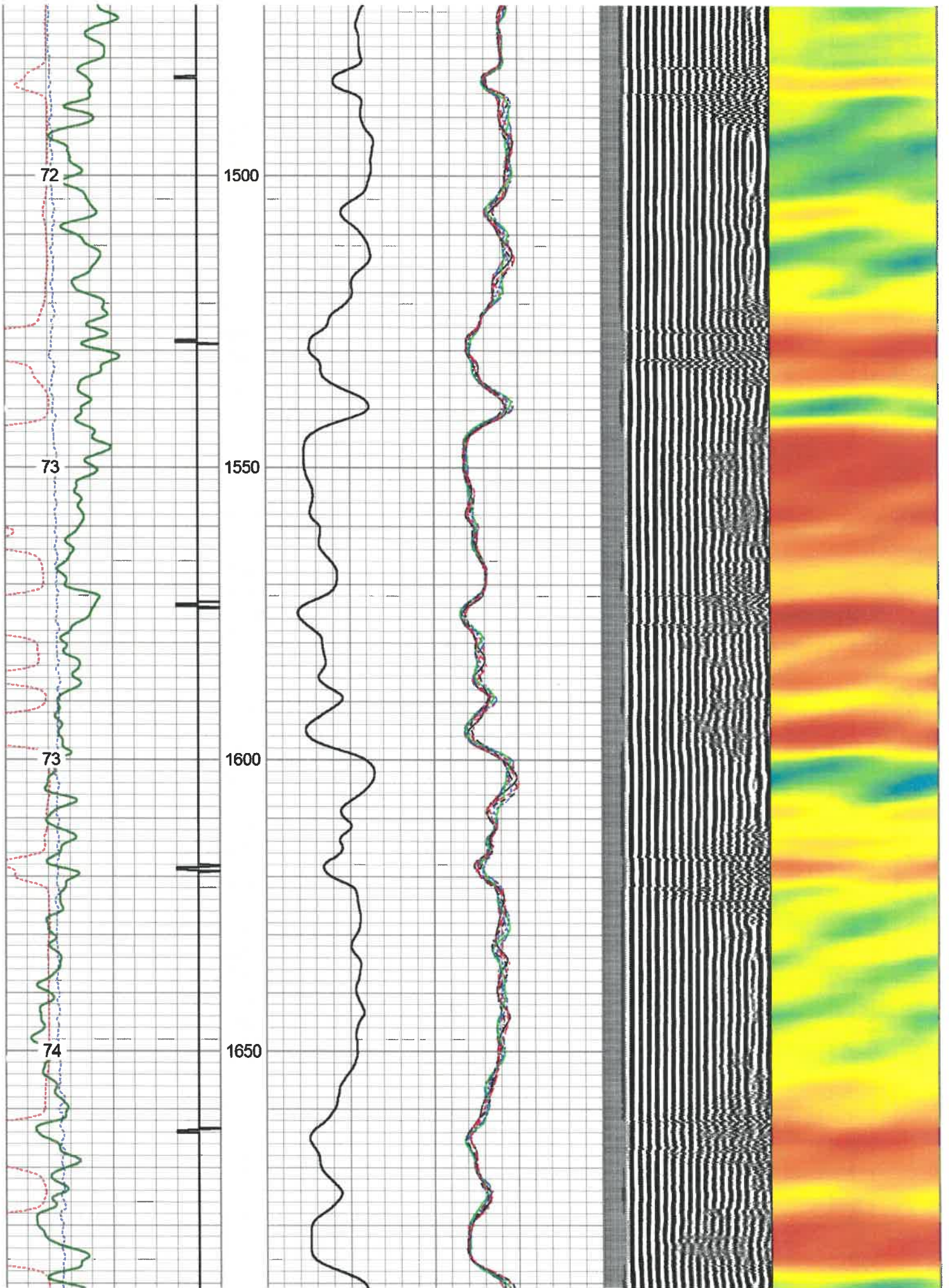


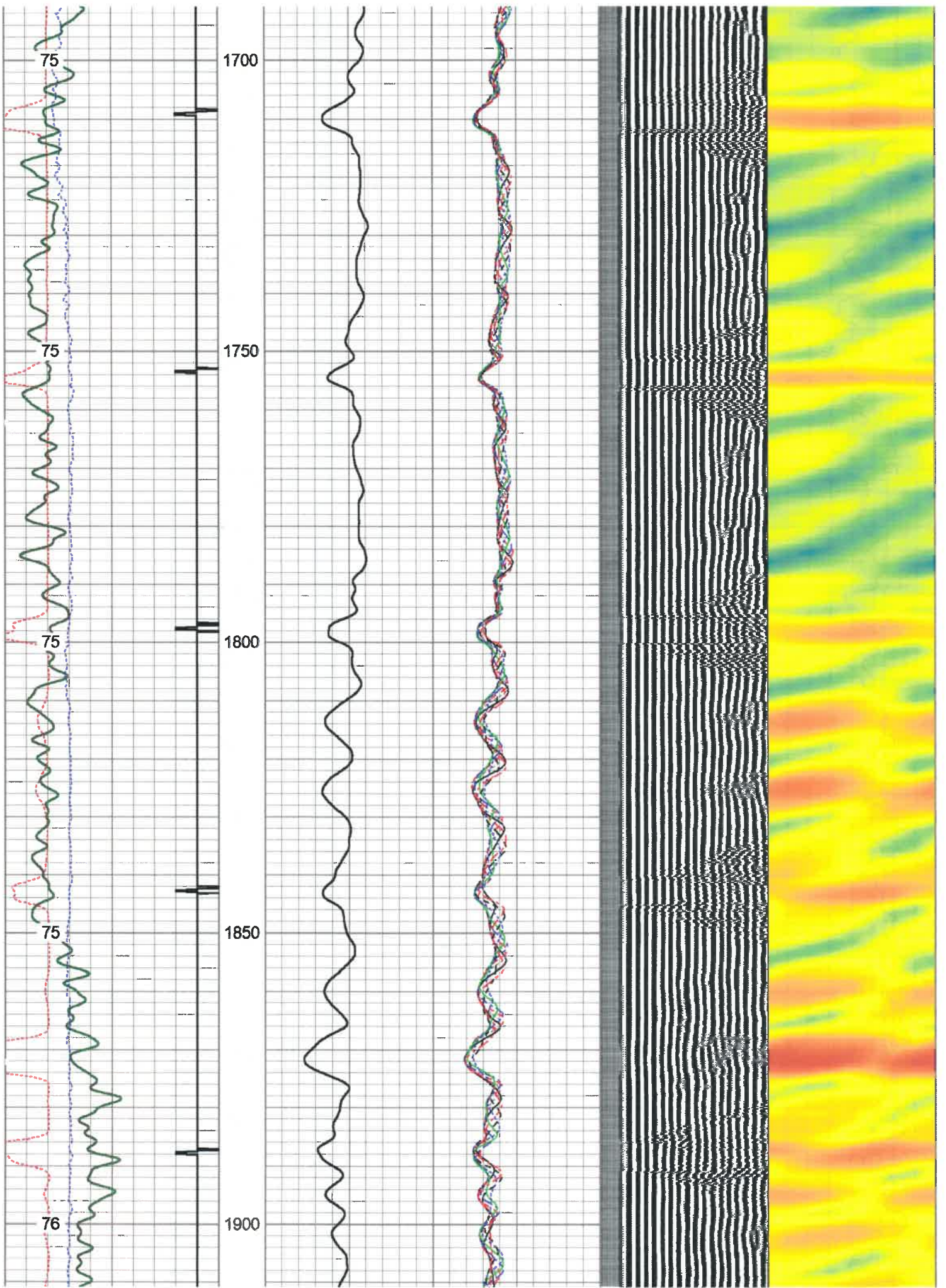


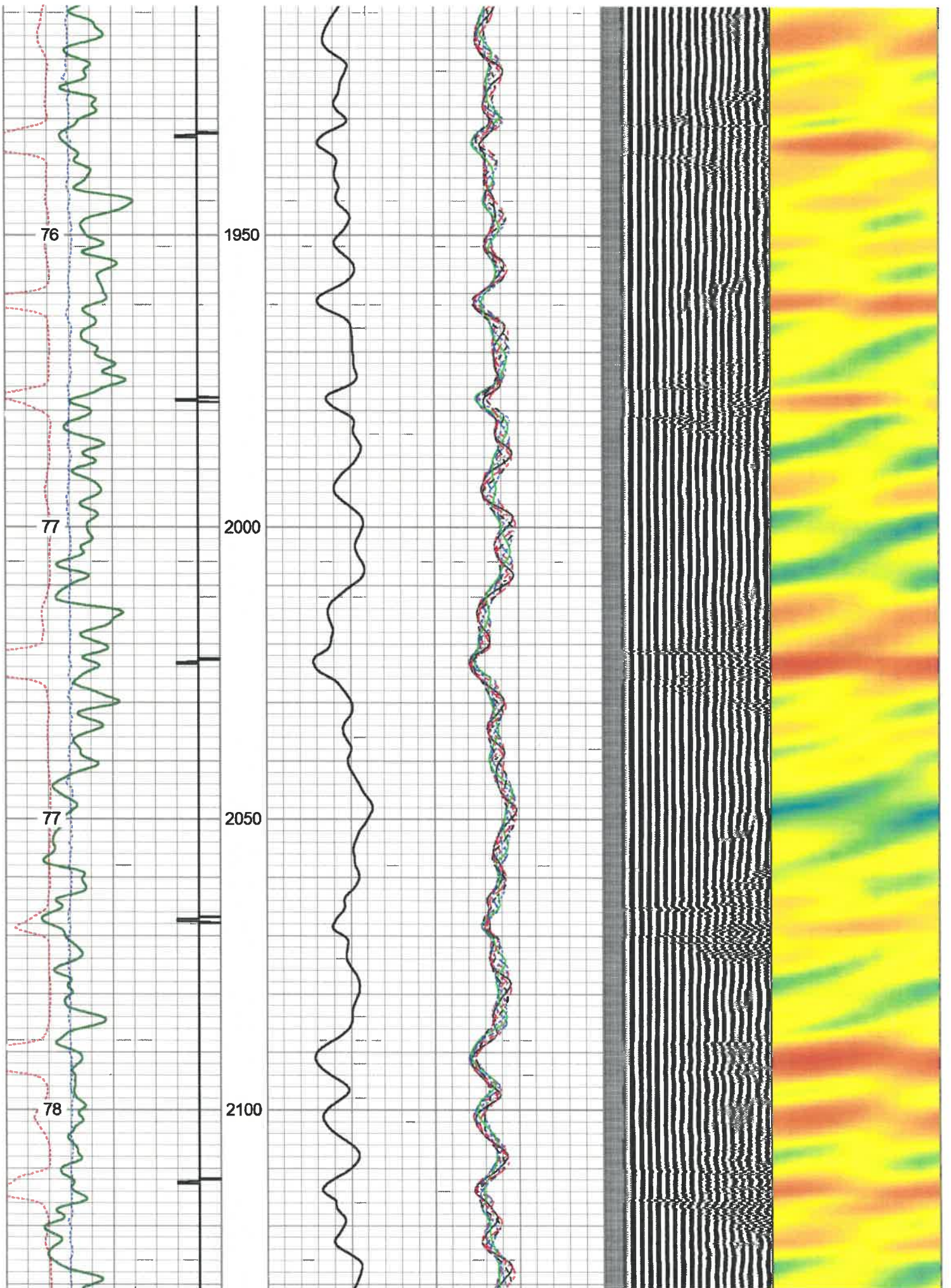


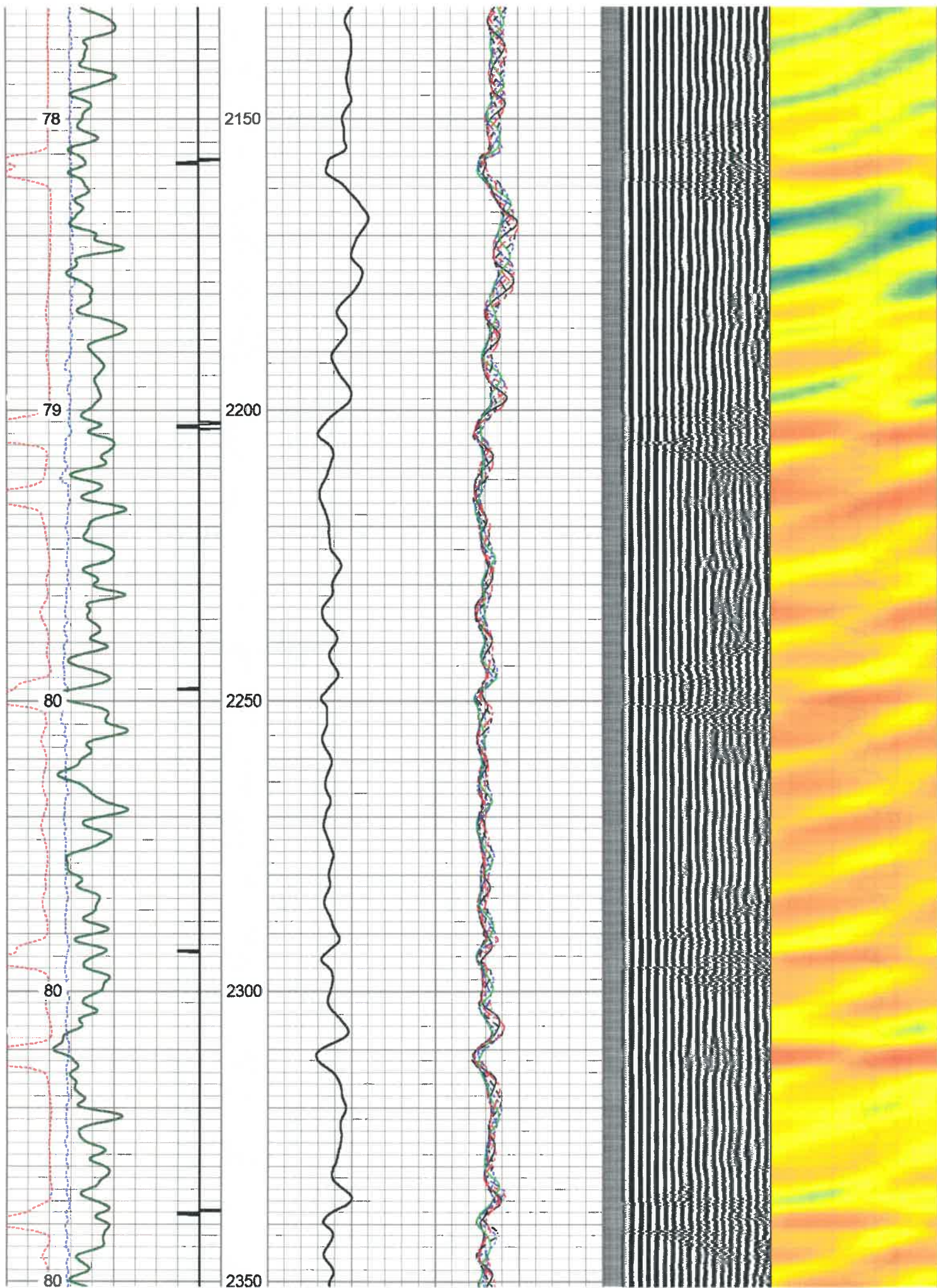


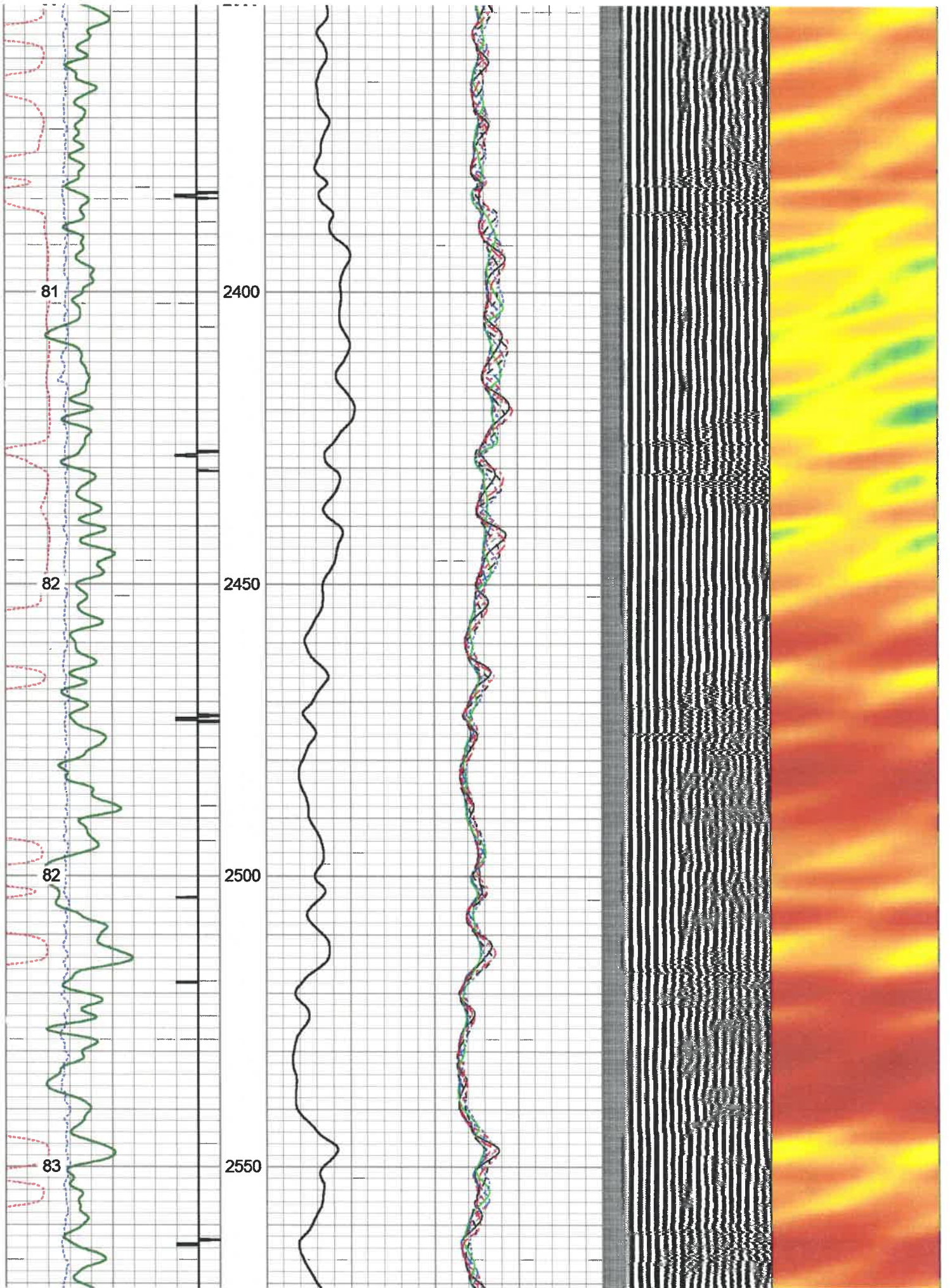


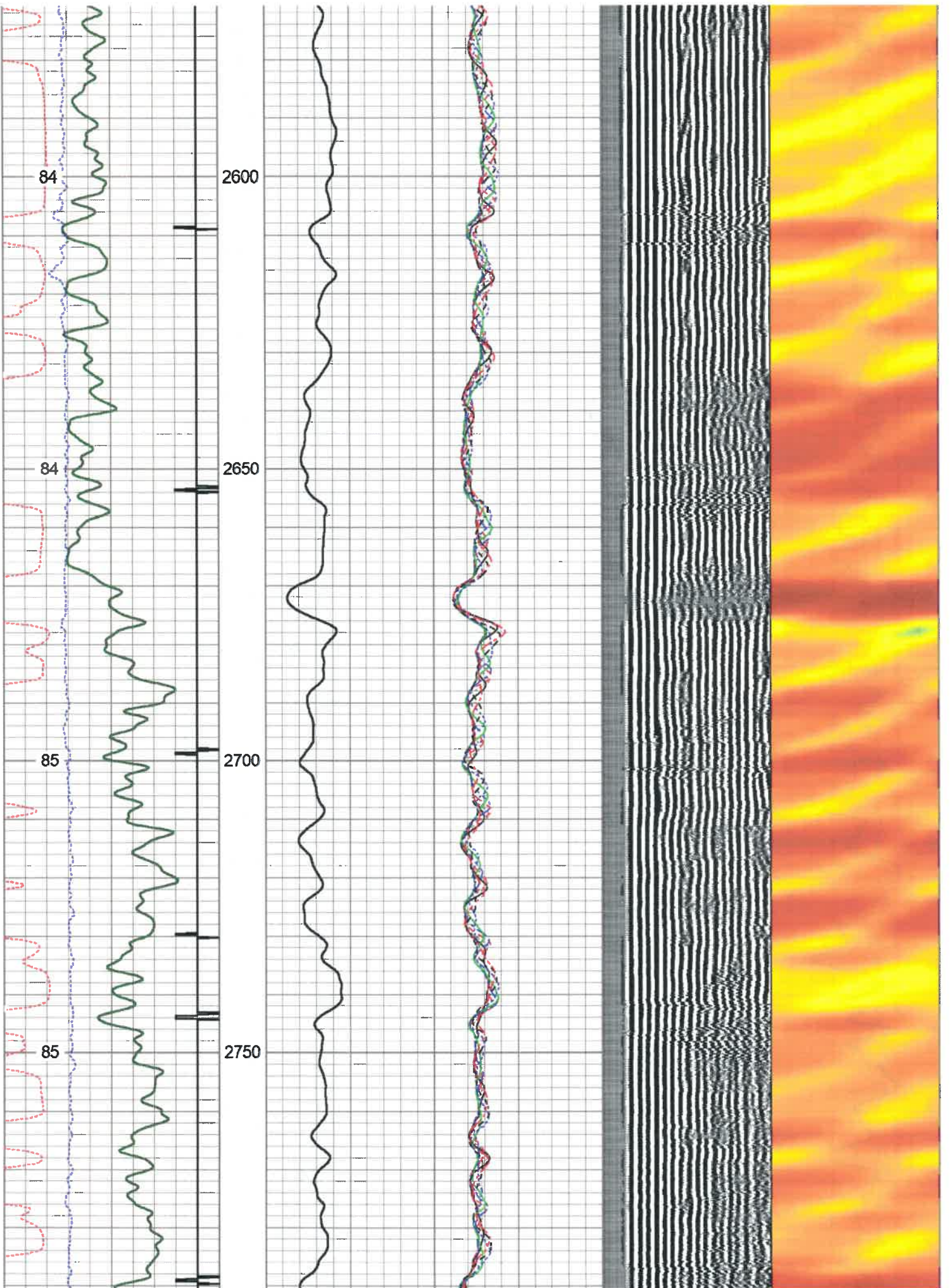


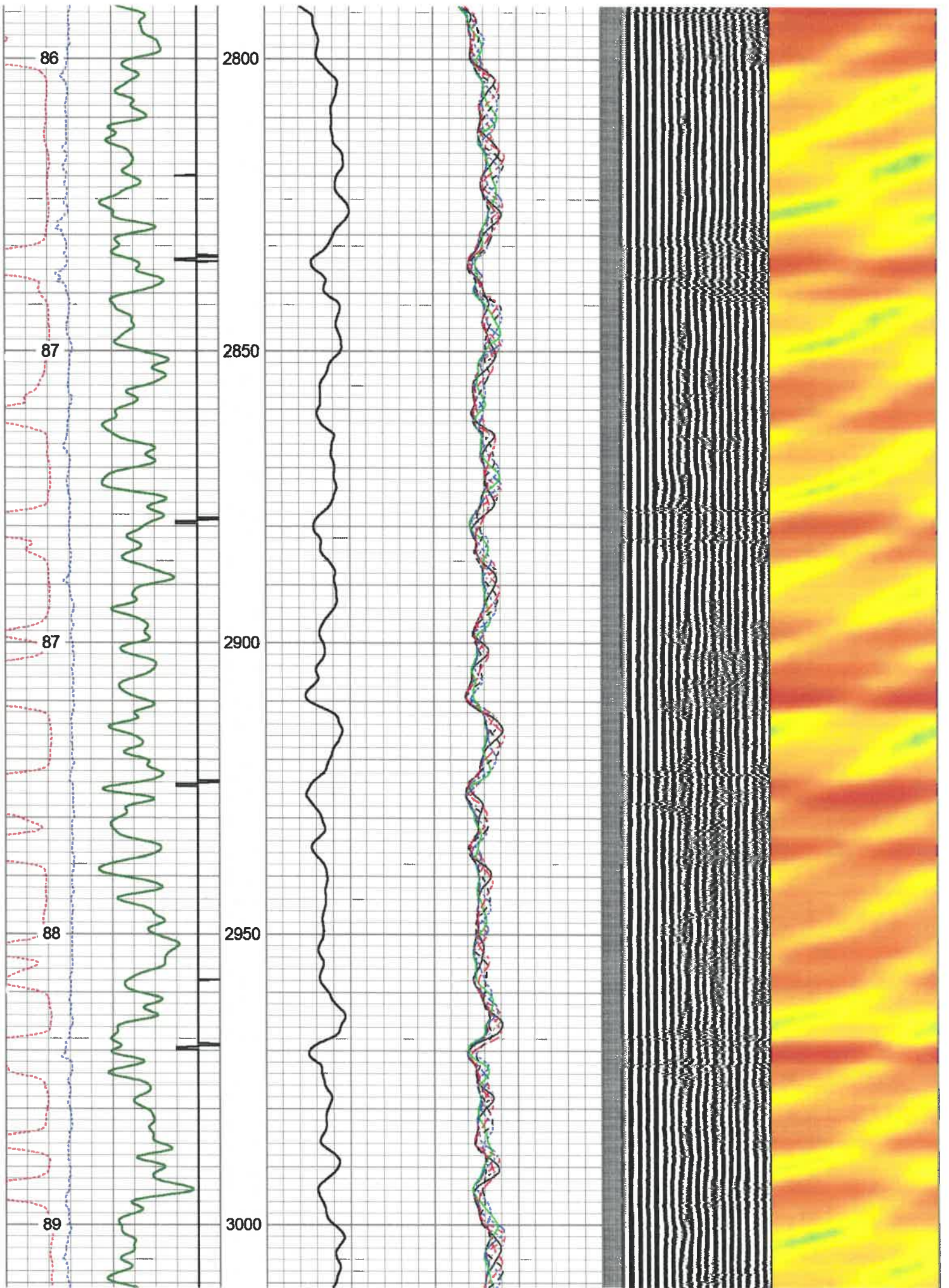


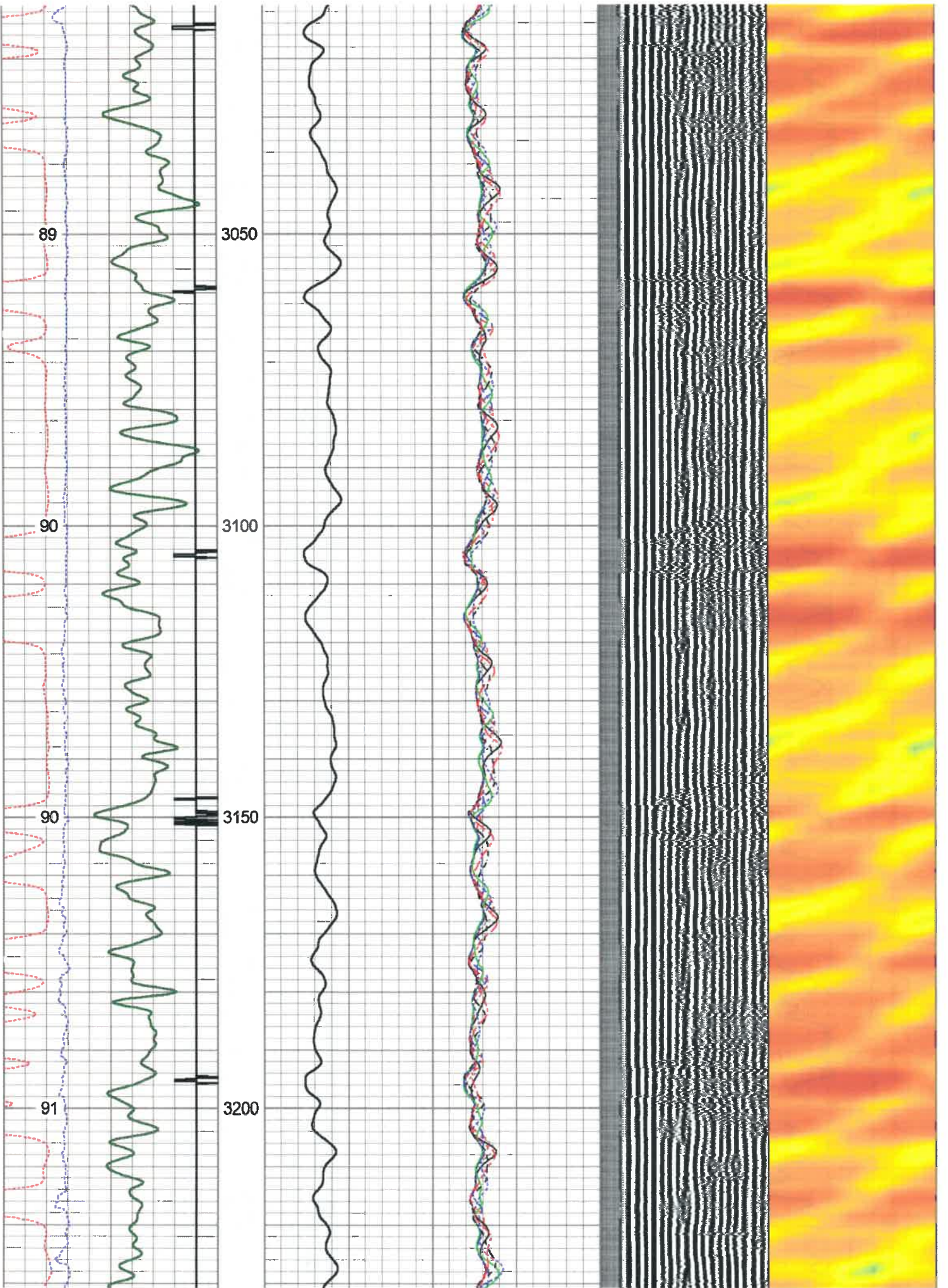


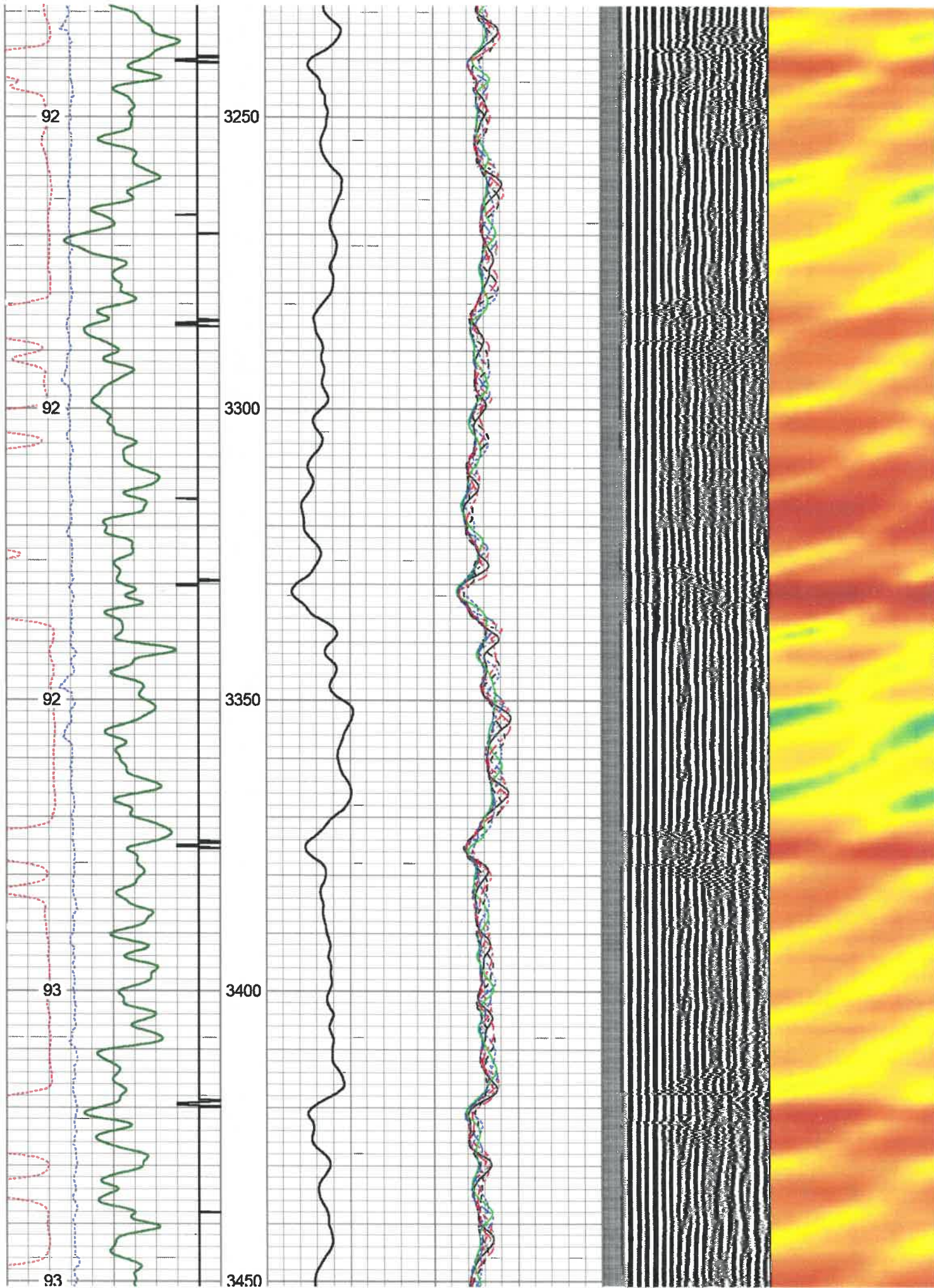


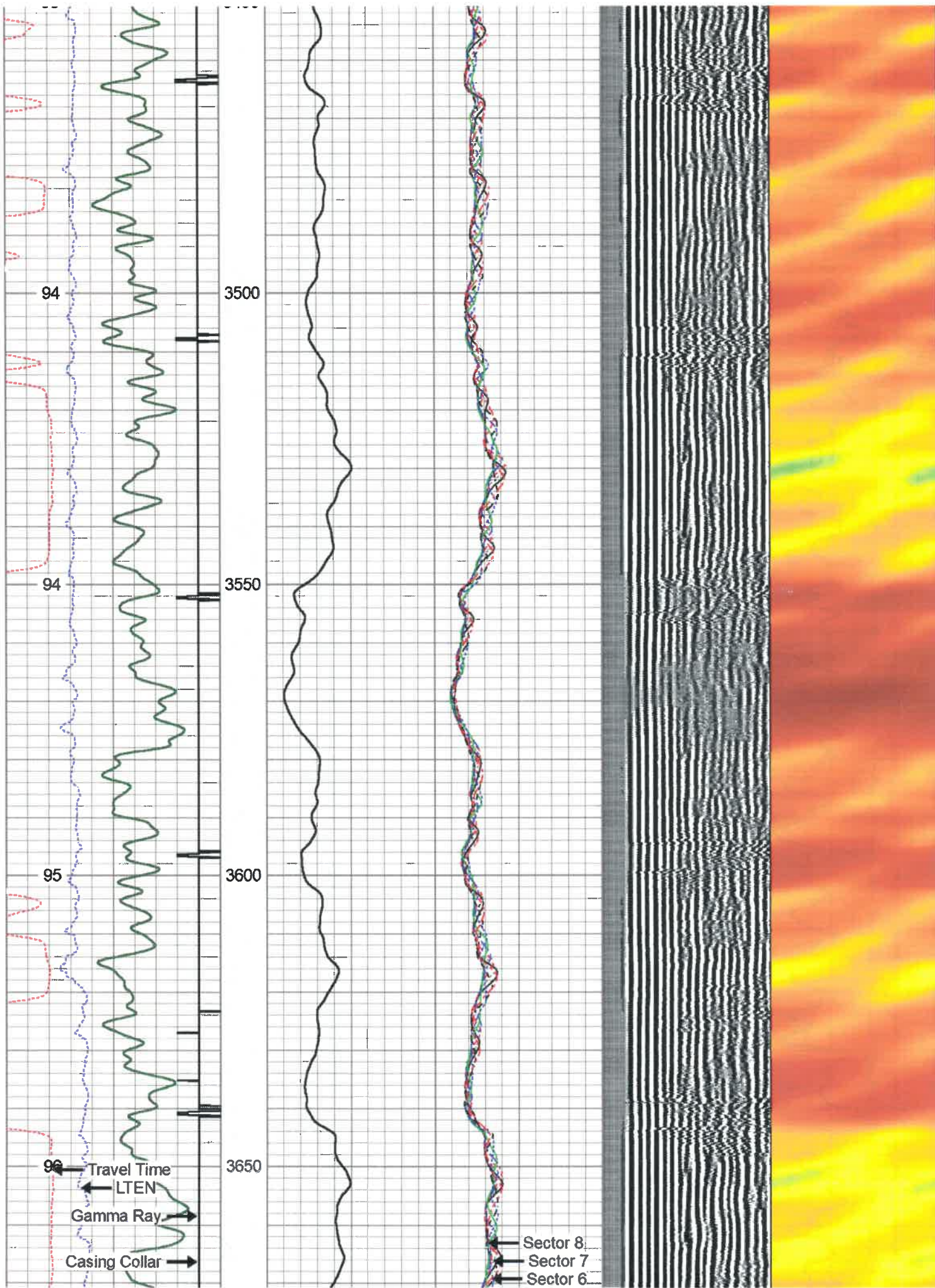


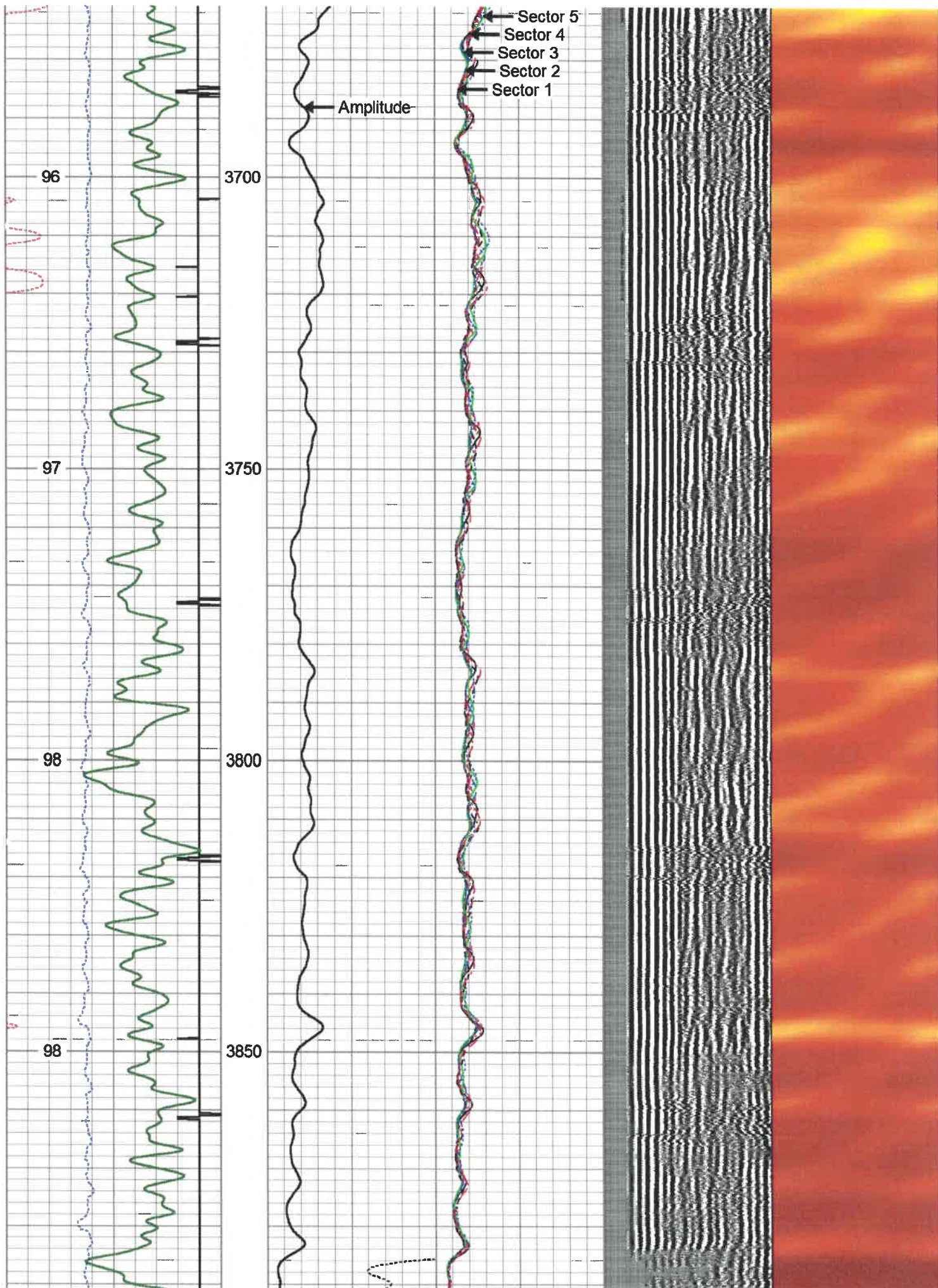


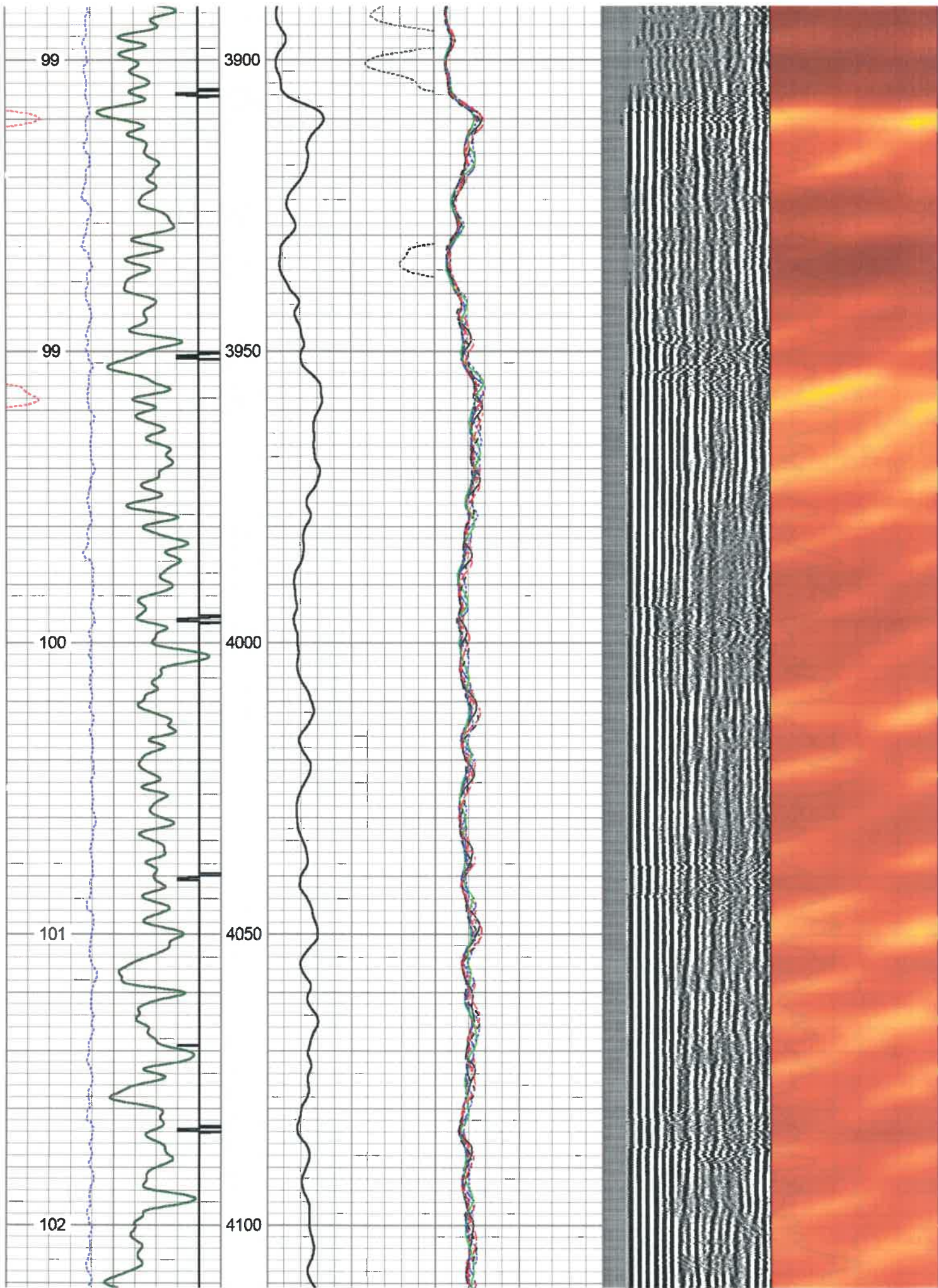


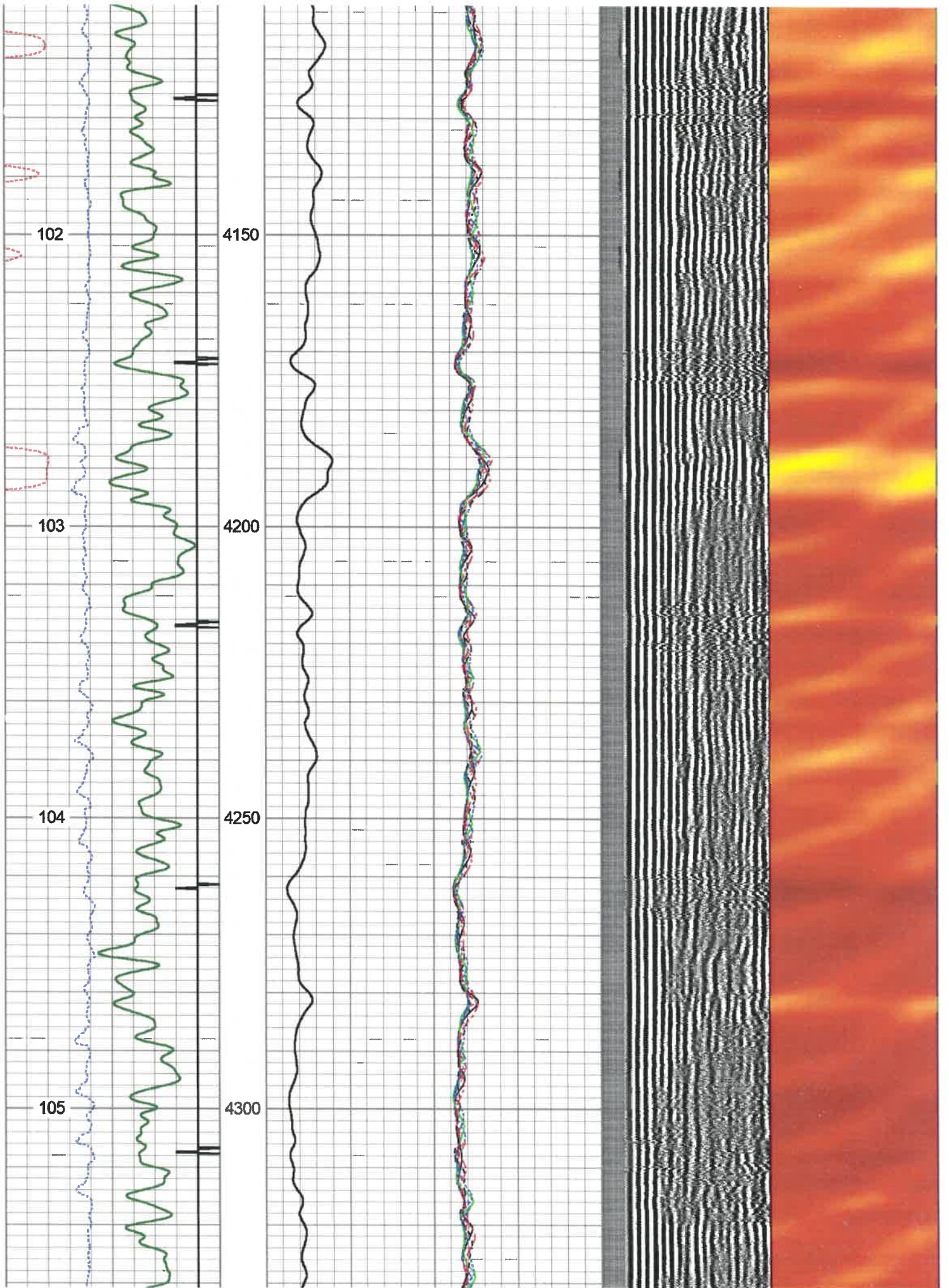


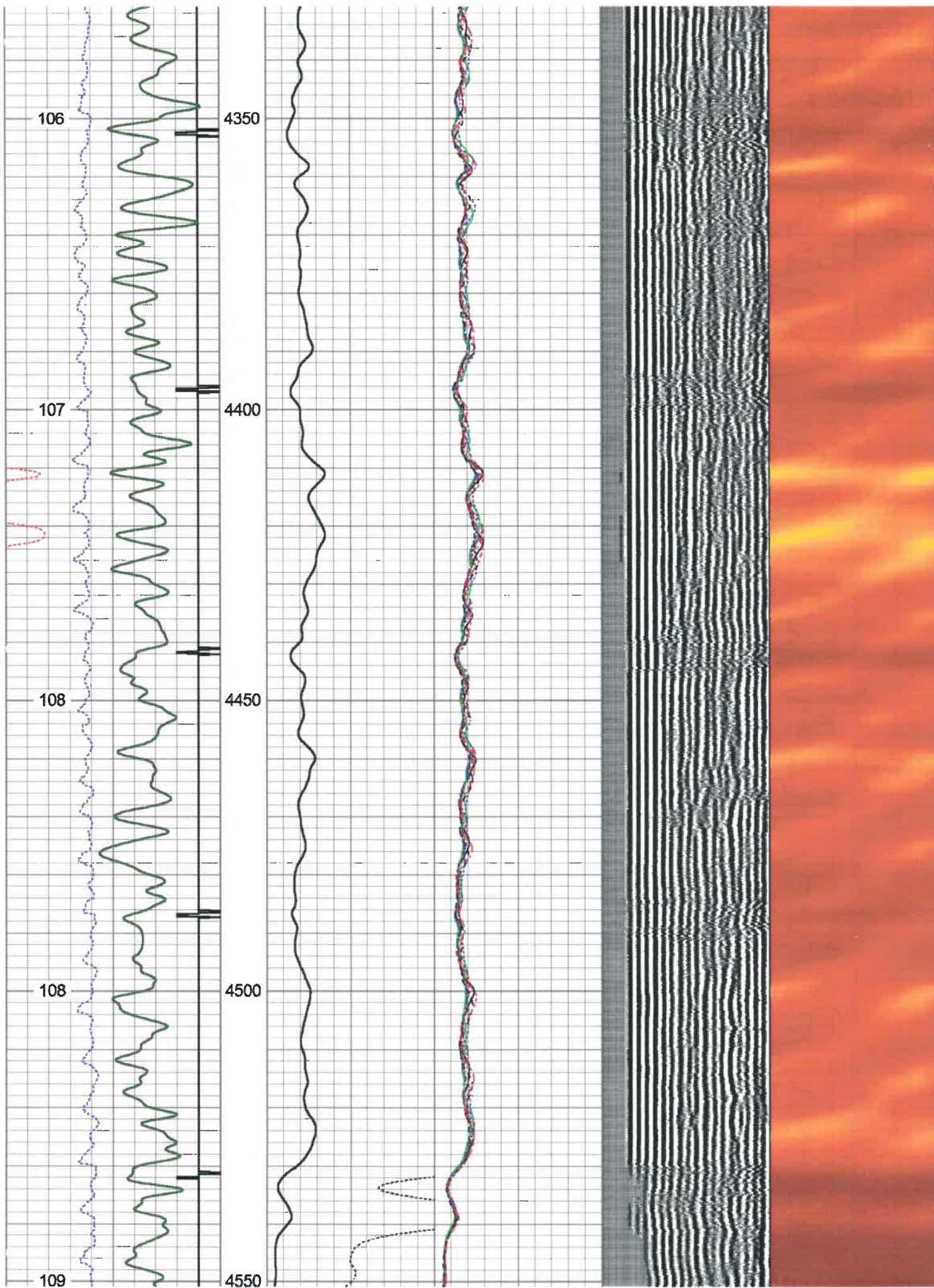


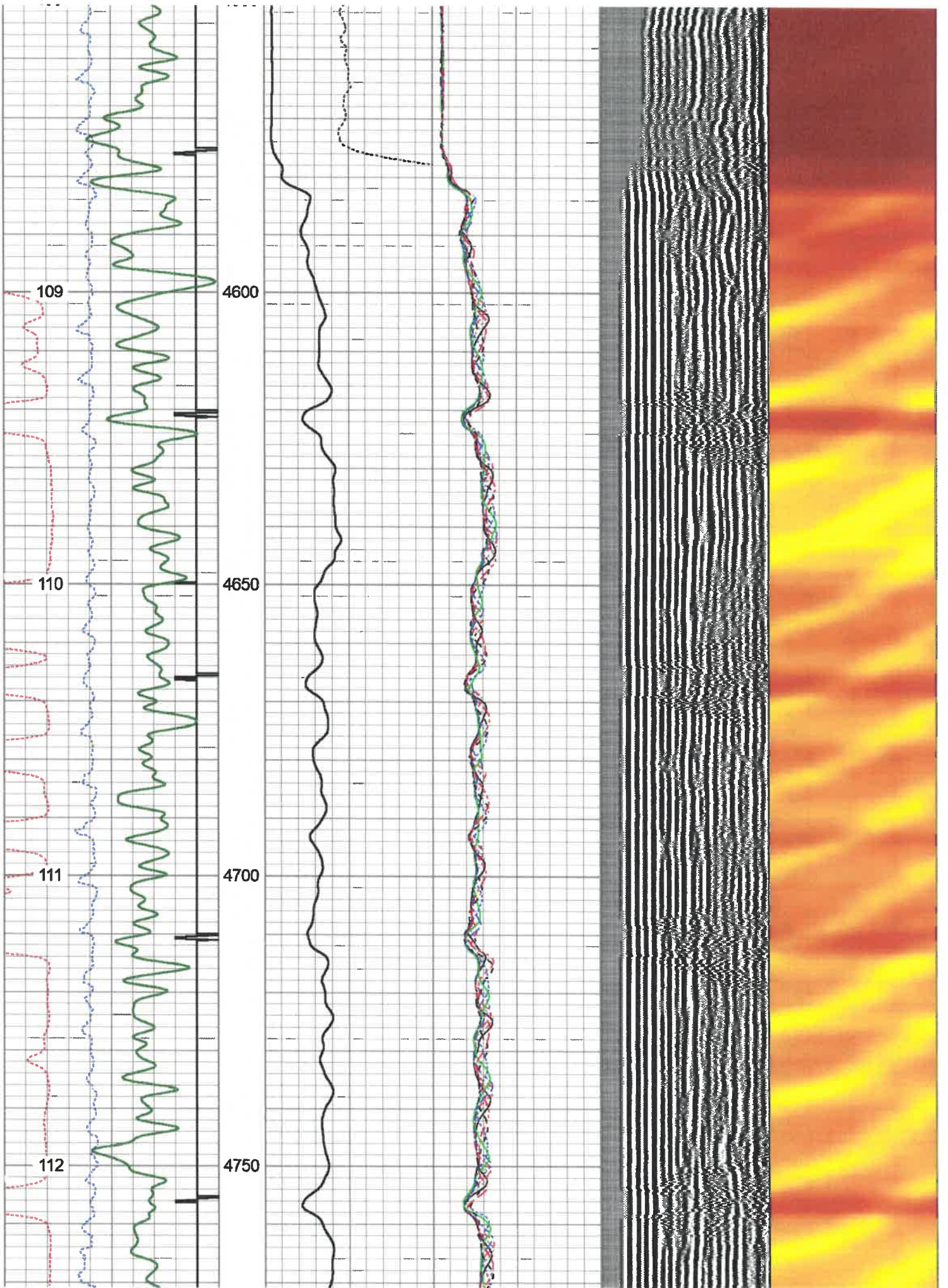


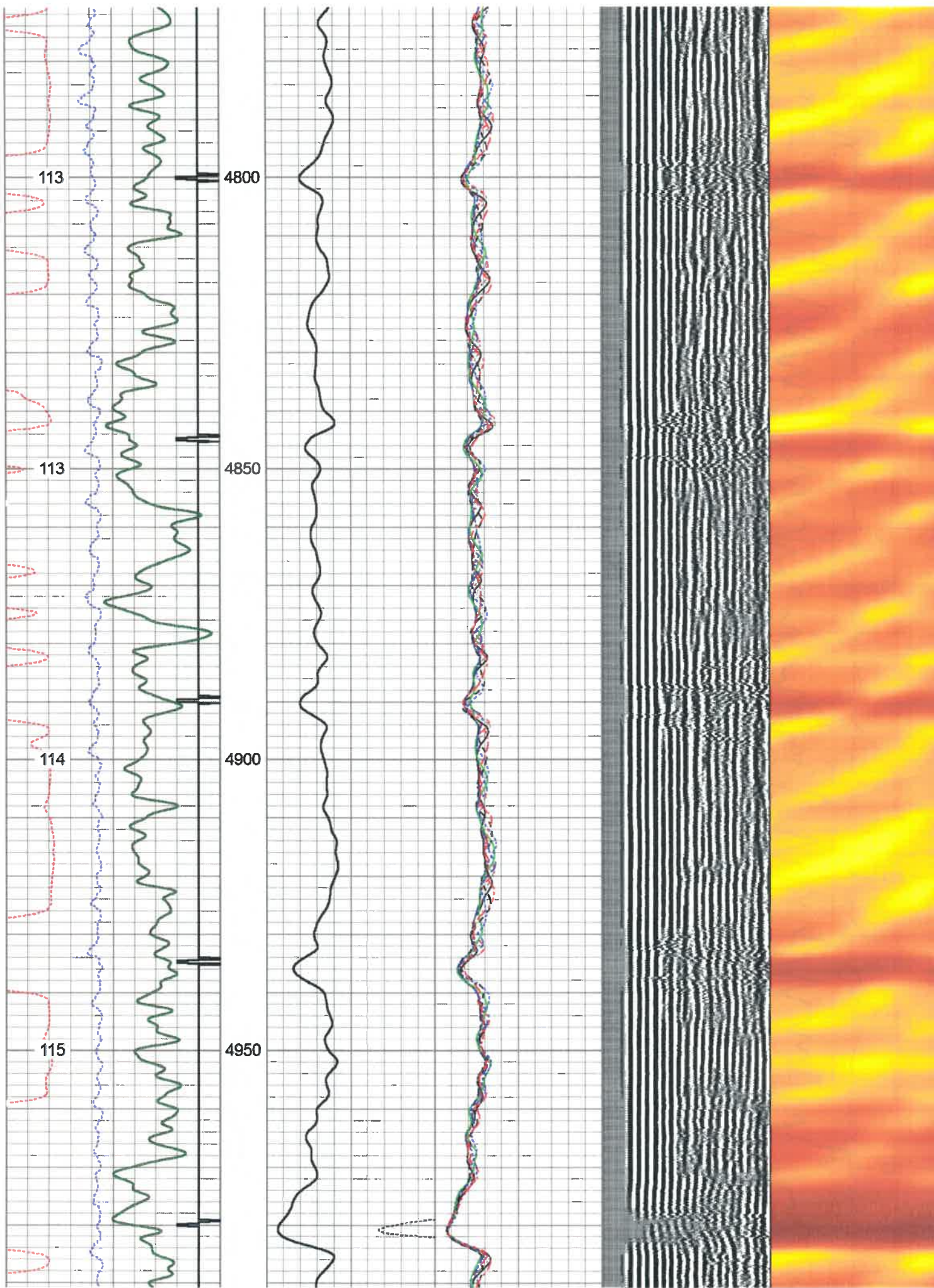


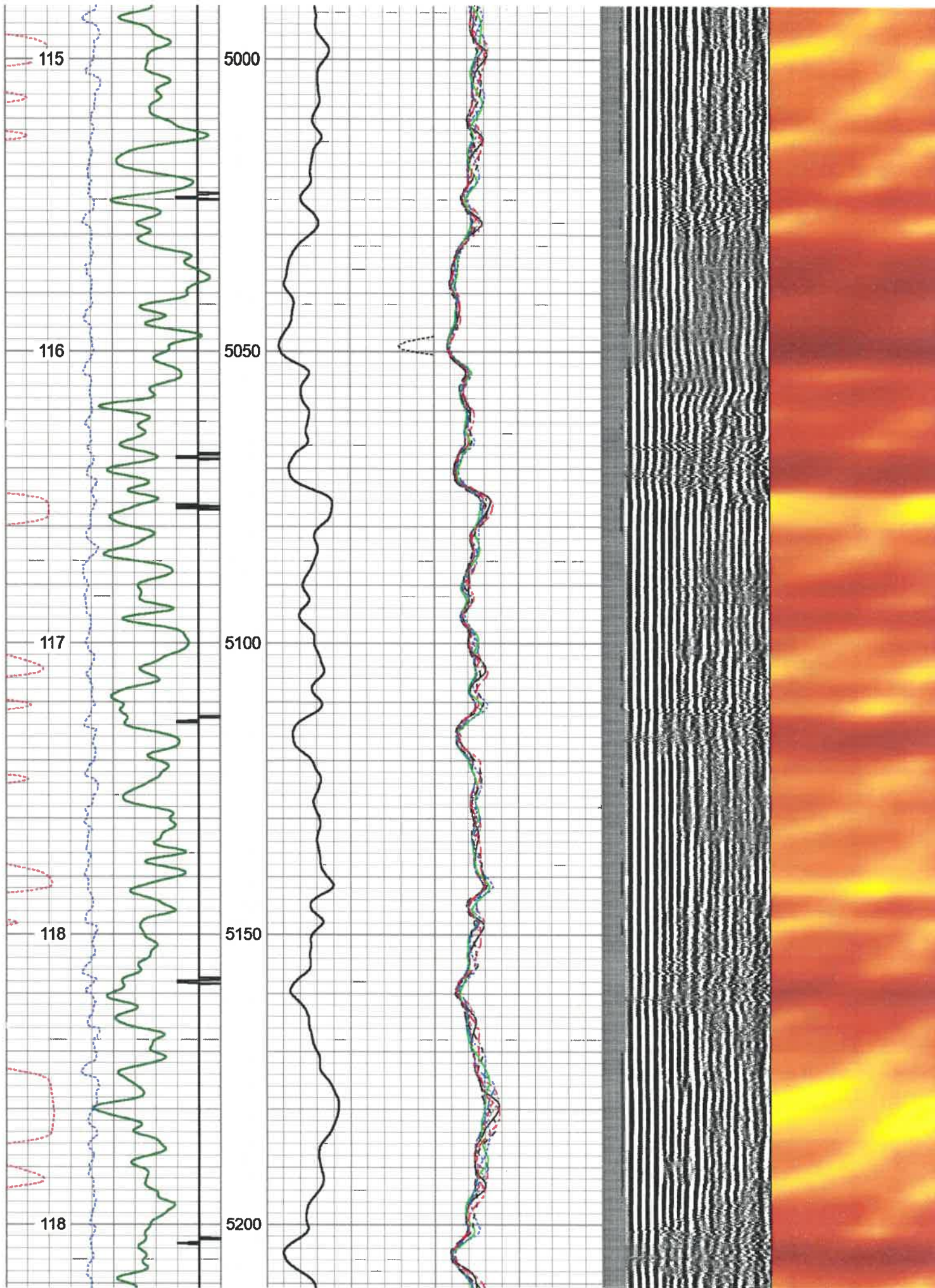


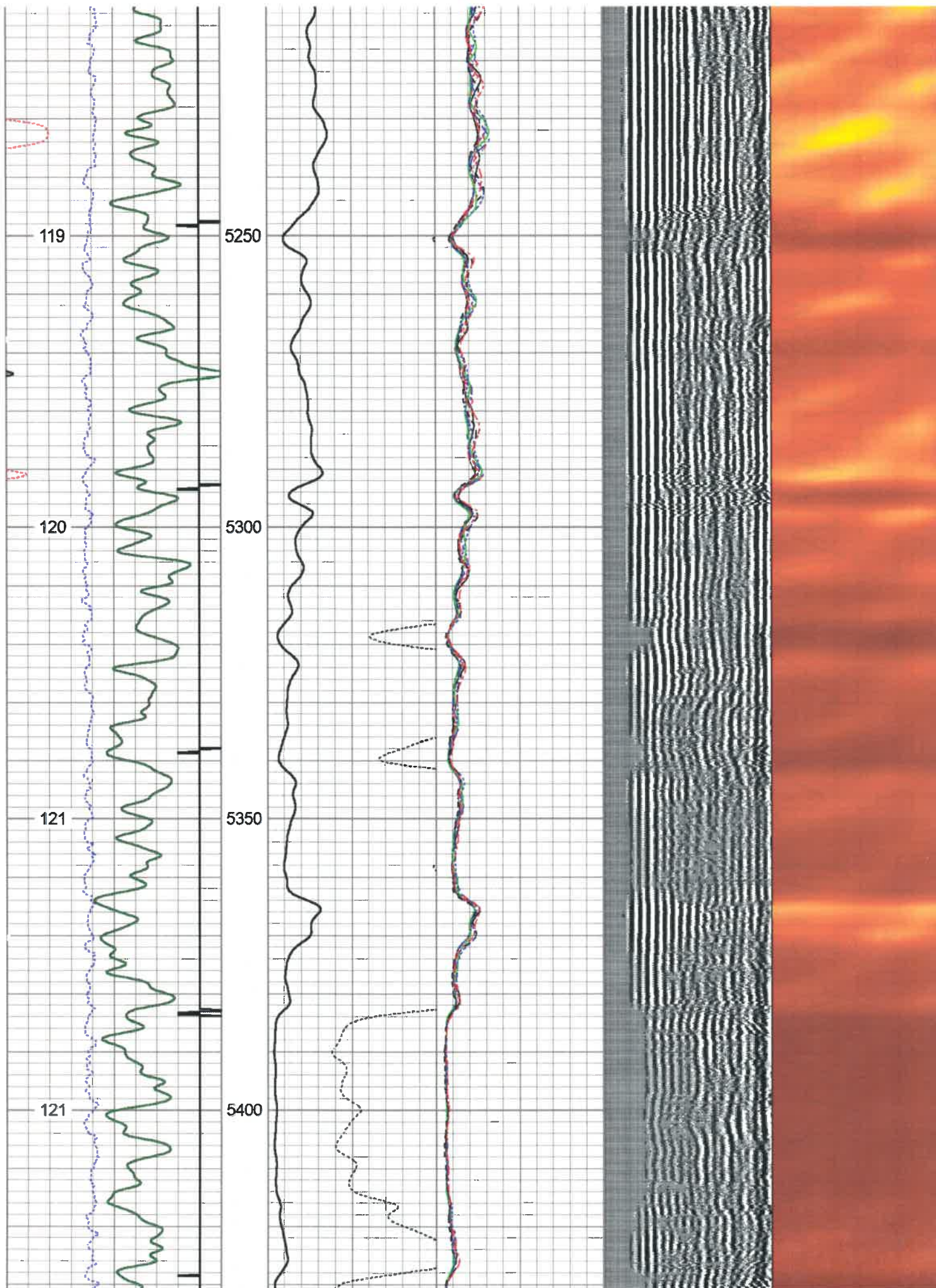


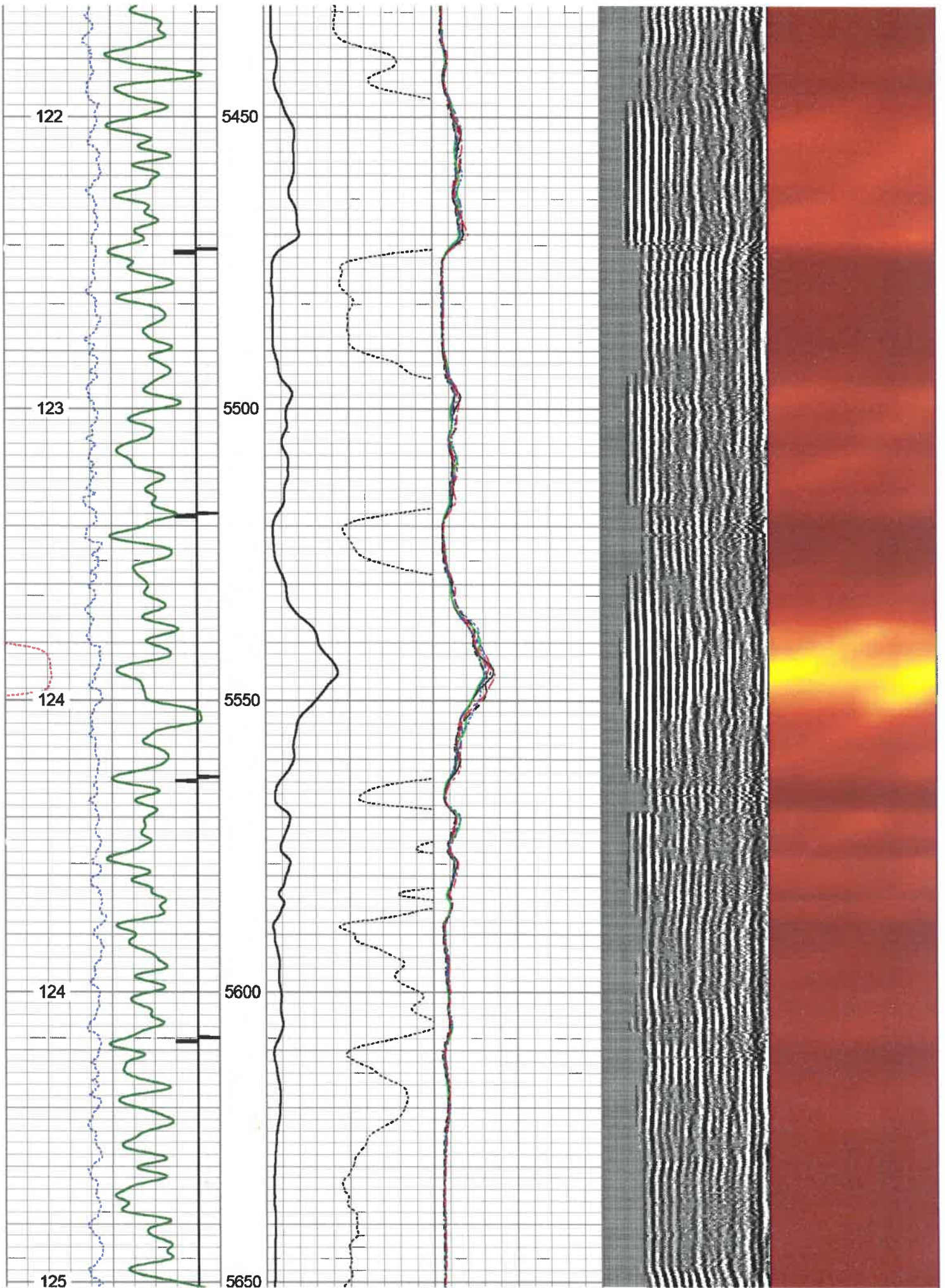


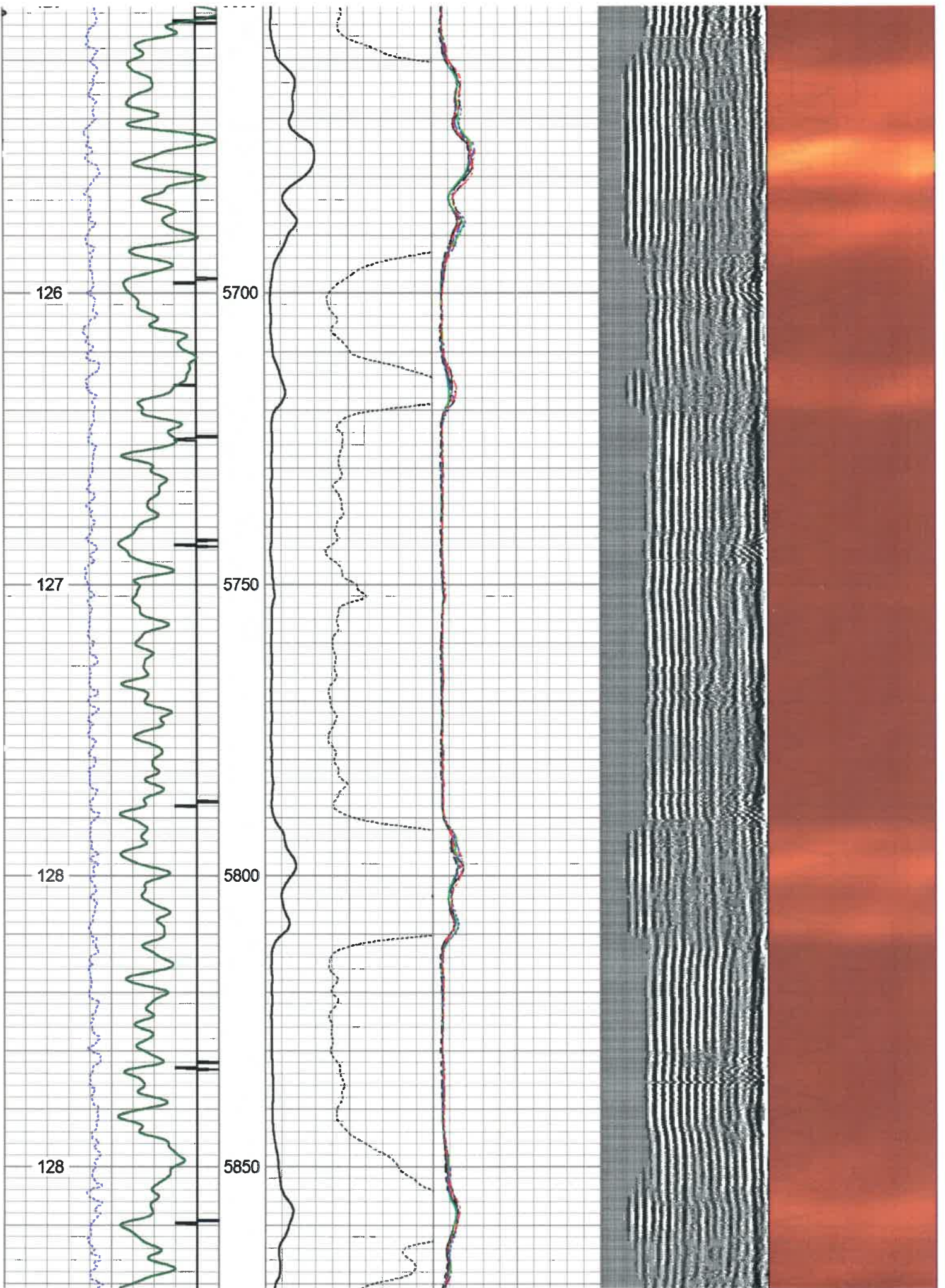


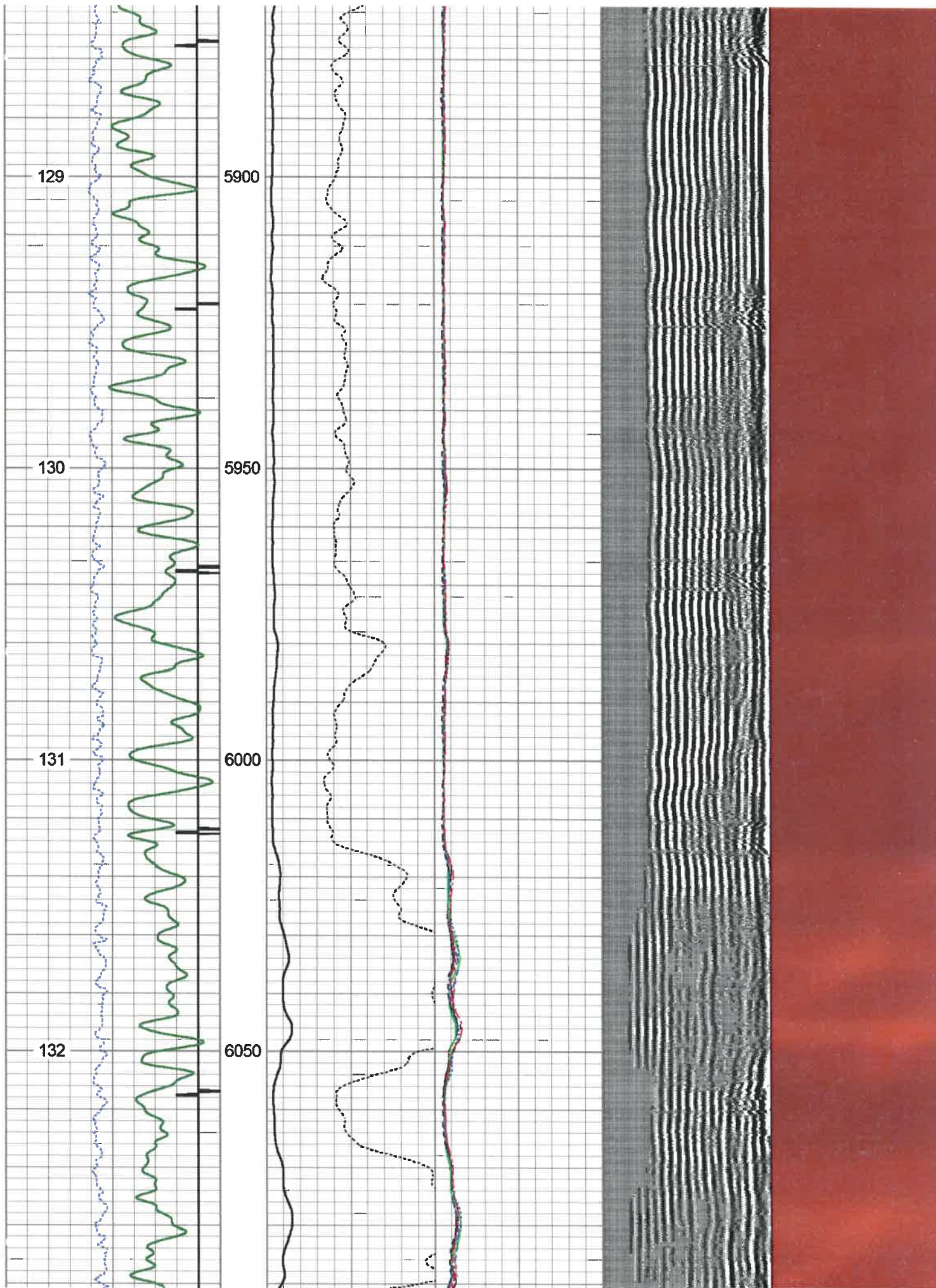


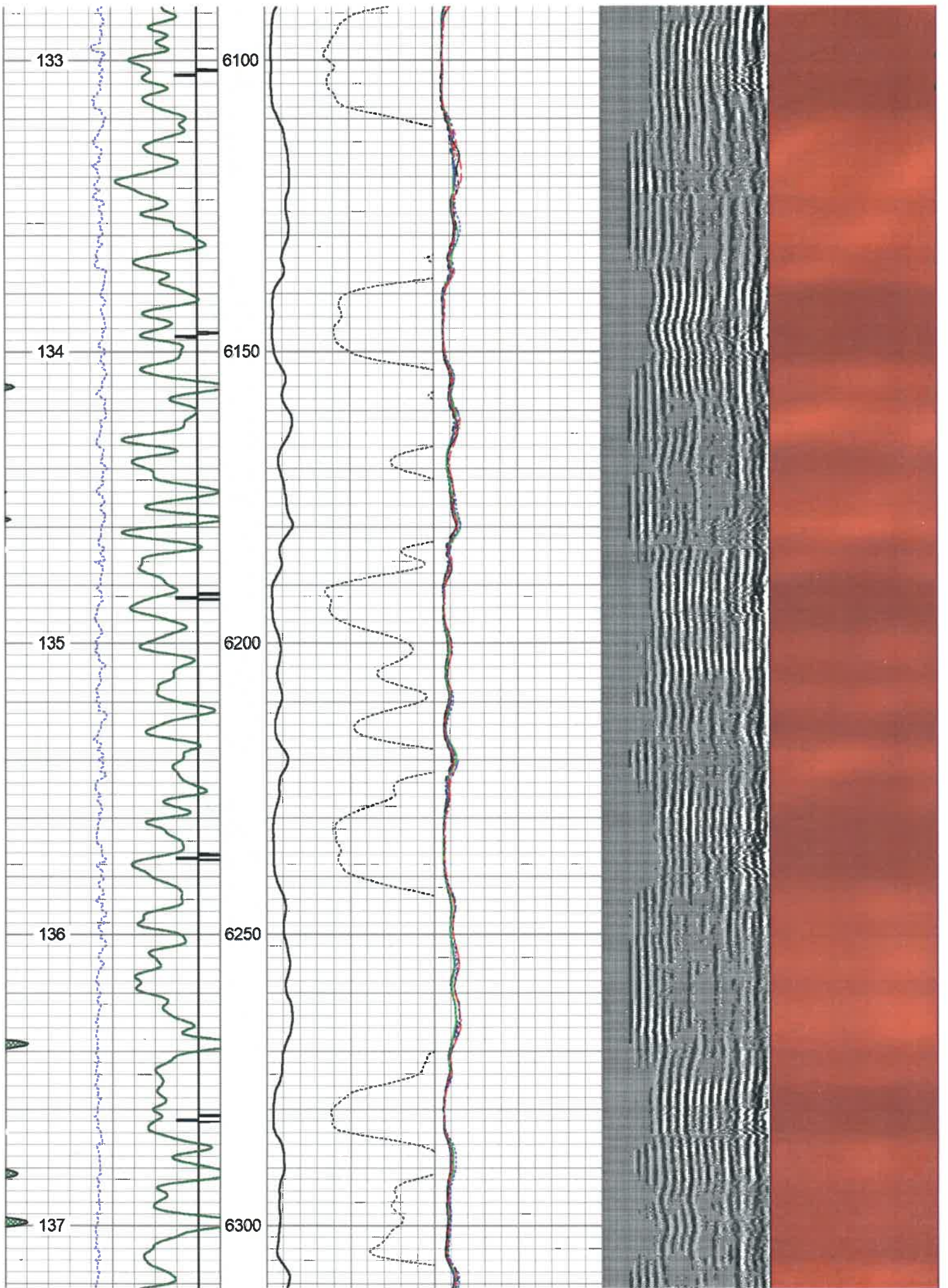


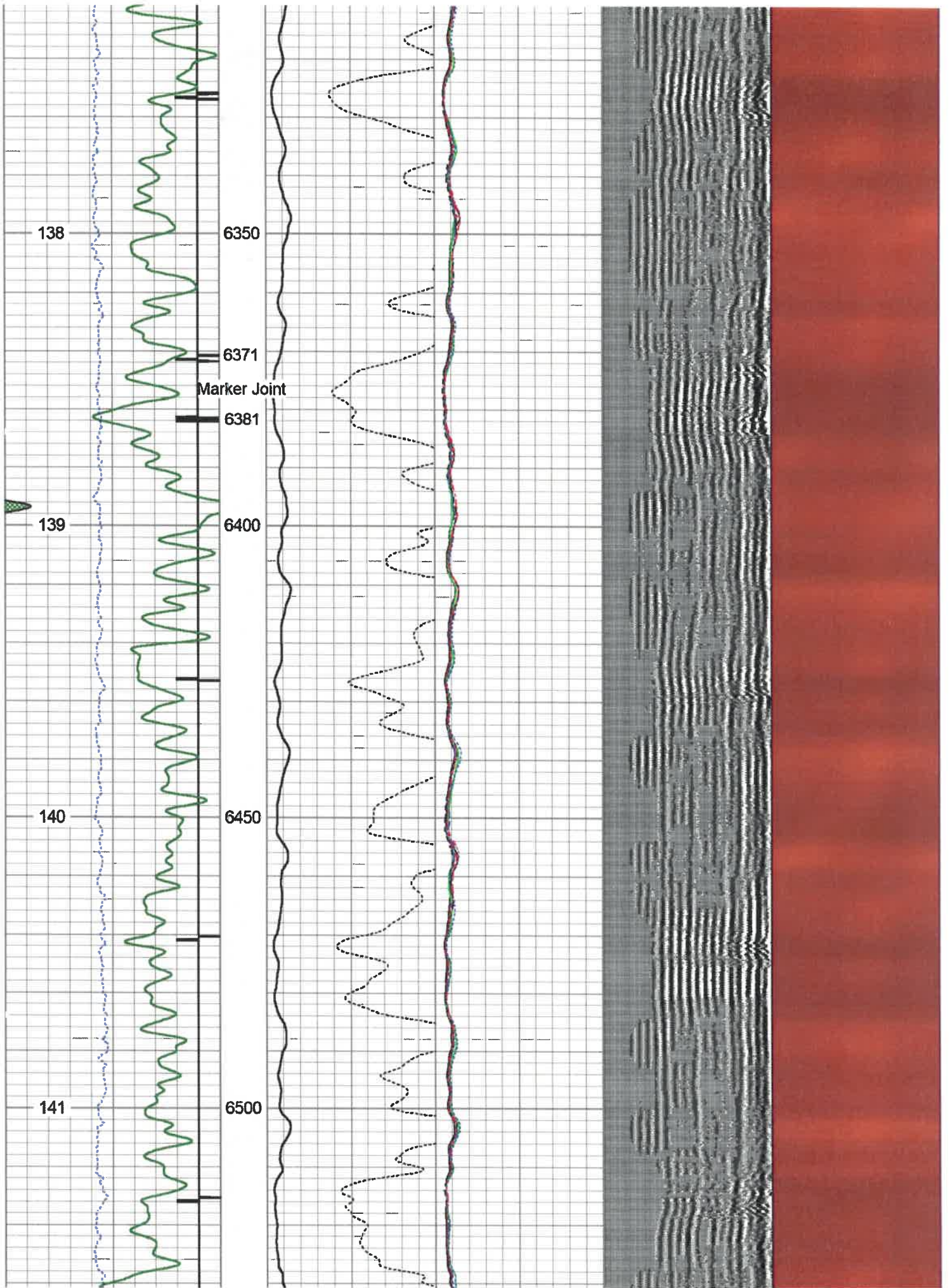


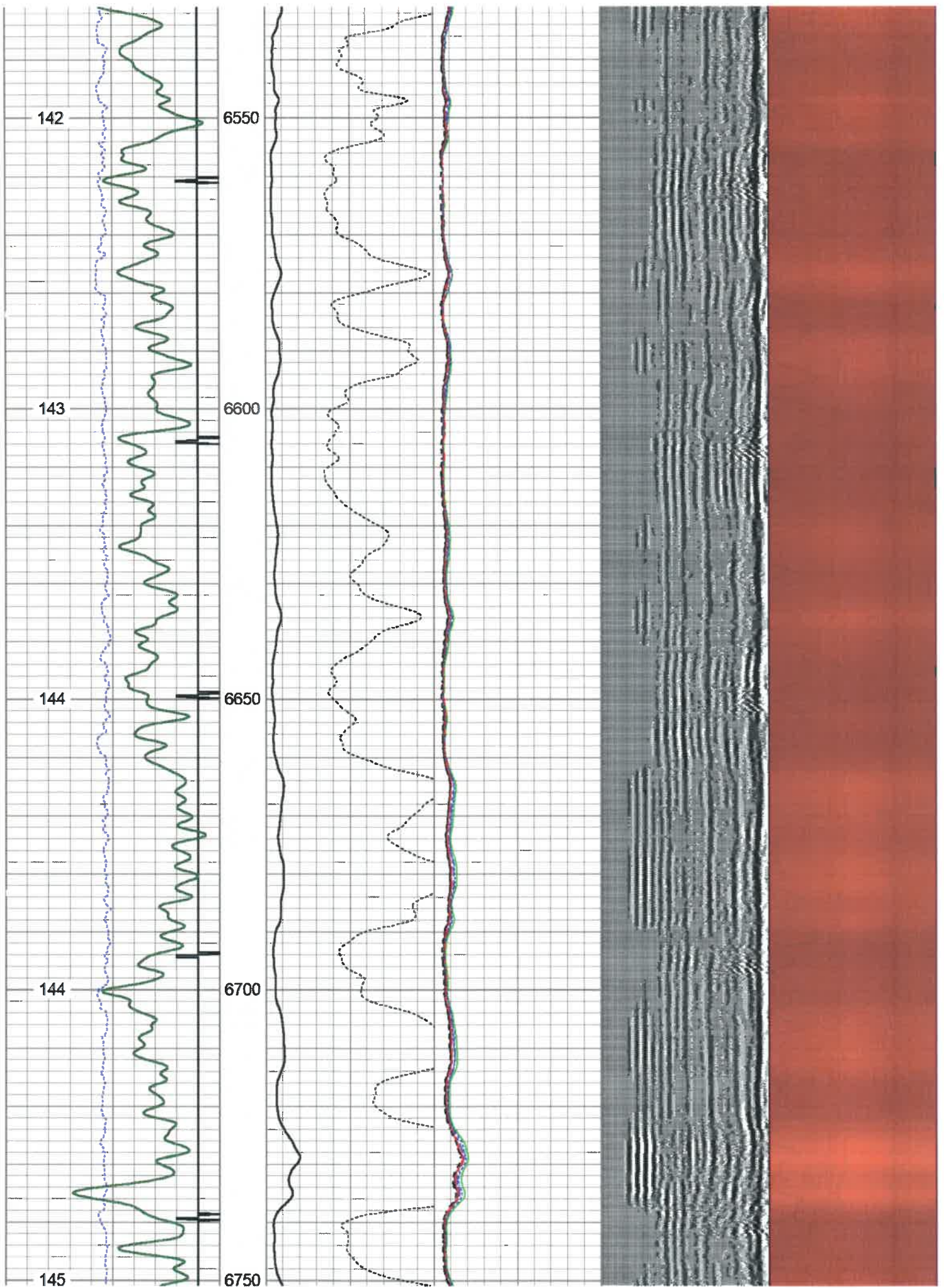


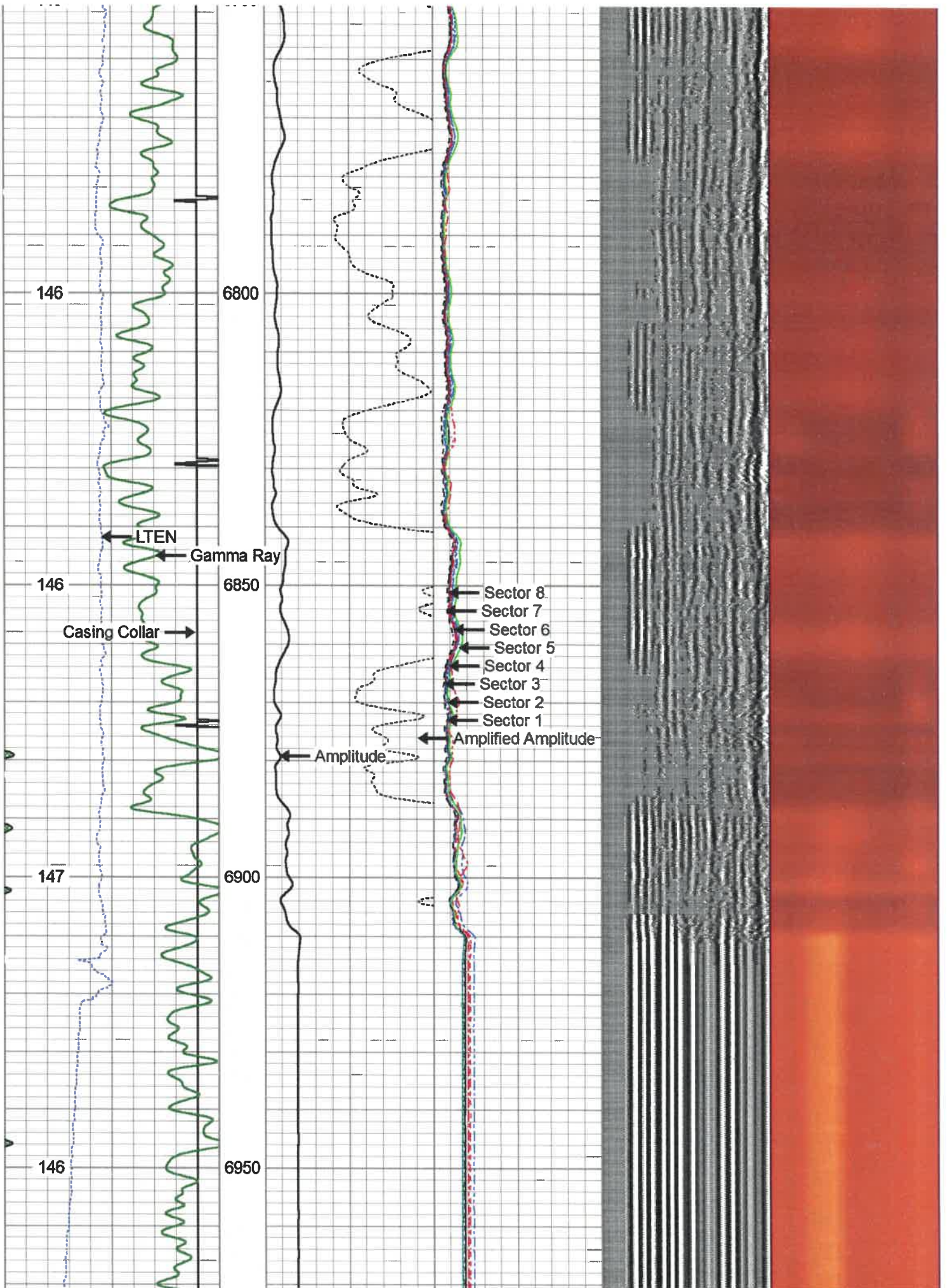


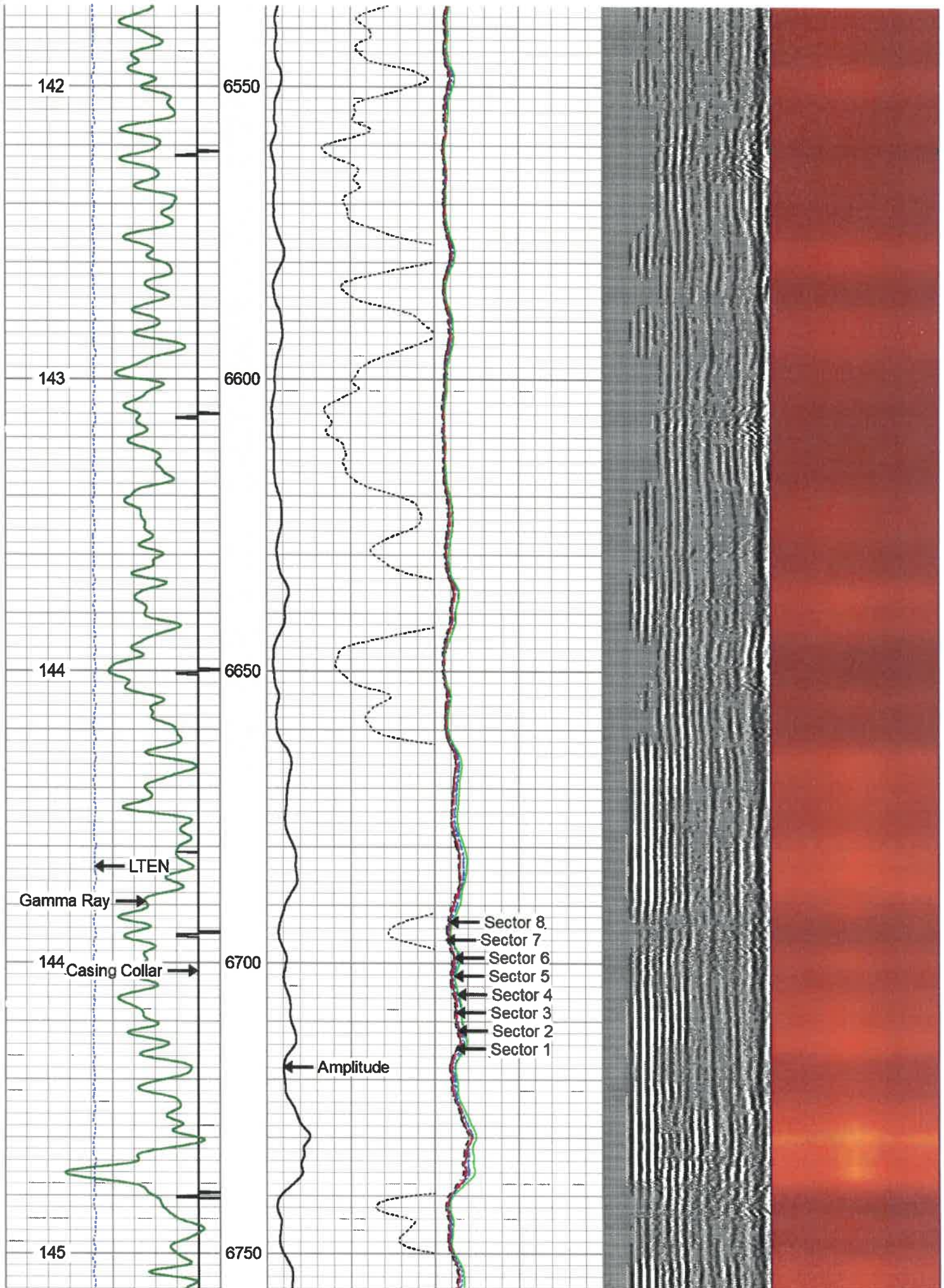


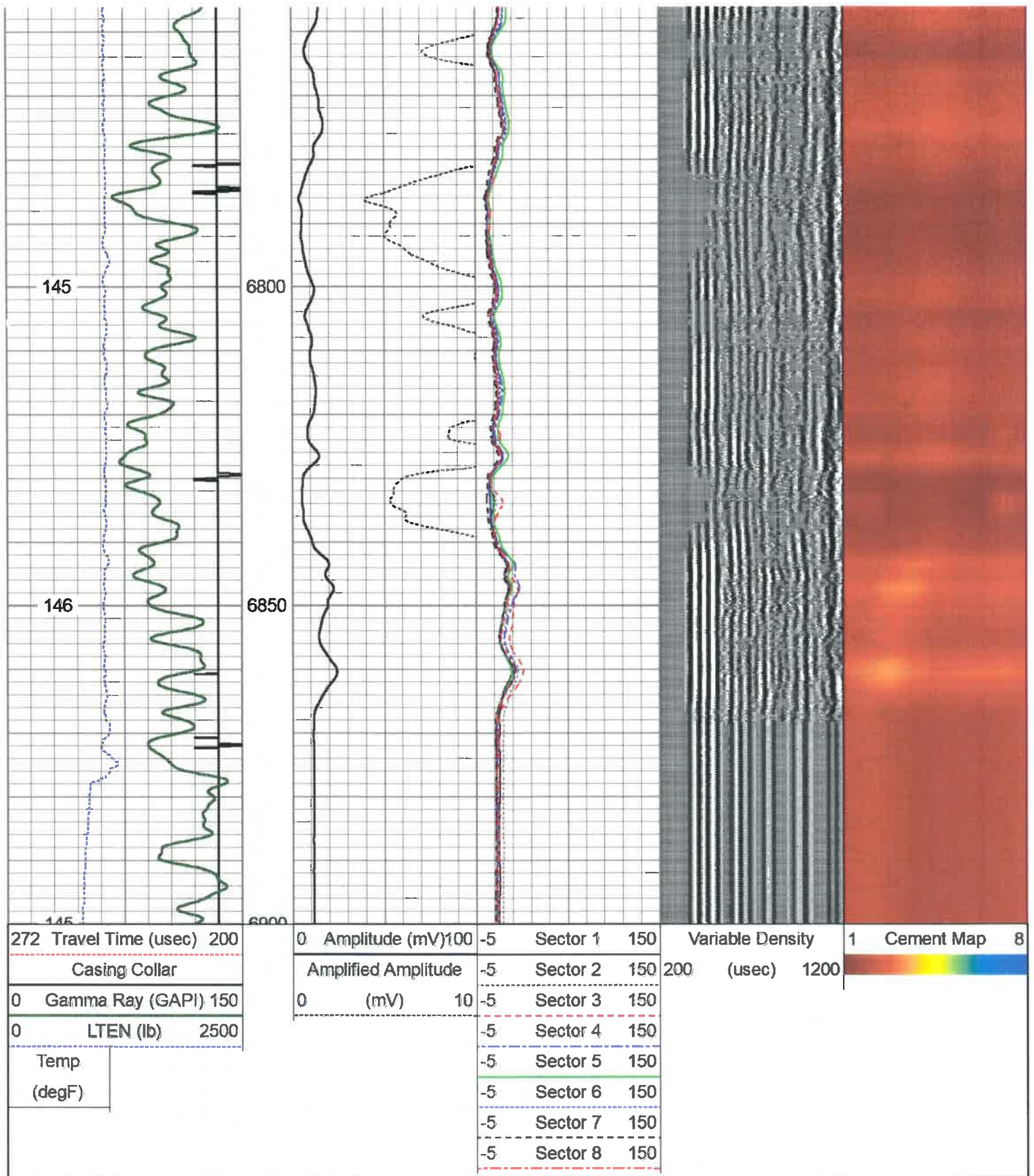












Log Variables

DatabaseC:\Users\thomas.weese\Desktop\Bond Logs\Antero\Colorado East\antero_colorado_east Dataset Marcellus\Mammoth_1H/RCBL_1/pass4/_vars_

Top - Bottom

BHTEMP_Src	BOREID	BOTTEMP	CASEOD	CASETHCK	CASEWGHT	MAXAMPL	MINAMPL
	in	degF	in	in	lb/ft	mV	mV
TEMP	7.875	148	5.5	0.361	20	71.921	2.2

MINATTN db/ft 0.8	PERFS No	PPT usec 0	SRFTEMP degF 0	TDEPTH ft 0
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Variable Description

BHTEMP_Src : BHTEMP Input Source Selector	MINAMPL : Minimum Amplitude
BOREID : Borehole I.D.	MINATTN : Minimum Attenuation
BOTTEMP : Bottom Hole Temperature	PERFS : Perforation Flag
CASEOD : Casing O.D.	PPT : Predicted Pipe Time
CASETHCK : Casing Thickness	SRFTEMP : Surface Temperature
CASEWGHT : Casing Weight	TDEPTH : Total Depth
MAXAMPL : Maximum Amplitude	

Calibration Report

Database File C:\Users\thomas.weese\Desktop\Bond Logs\Antero\Colorado East\antero_colorado_east_mammoth_1h_ro
Dataset Pathname Marcellus\Mammoth_1H/RCBL_1/pass4
Dataset Creation Sat Mar 14 14:11:00 2020

Gamma Ray Calibration Report

Serial Number: FW1211-86
Tool Model: Probe
Performed: Mon Feb 03 15:18:32 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: 50.633 ft

Master Calibration, performed Sat Mar 14 11:48:58 2020:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.015	0.828	2.200	71.921	105.801	0.913
CAL	1.019	1.026				
5'	0.005	0.815	2.200	71.921	106.112	1.744
SUM						
S1	0.068	0.871	2.200	71.921	106.820	-3.735
S2	0.002	0.811	2.200	71.921	106.173	2.037
S3	0.008	0.811	2.200	71.921	106.819	1.534
S4	0.006	0.803	2.200	71.921	107.448	1.674
S5	0.005	0.811	2.200	71.921	106.502	1.795
S6	0.005	0.820	2.200	71.921	105.573	1.747
S7	0.006	0.815	2.200	71.921	106.196	1.649
S8	0.006	0.814	2.200	71.921	106.281	1.647

Internal Reference Calibration, performed (Not Performed):


	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset

CAL 0.000 0.000 1.019 1.026 1.000 0.000

Air Zero Calibration, performed Sat Mar 14 08:20:43 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
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)
HeadVolt	14.11		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
WVFS8	9.03		RBT-Probe275T (FW1312-32) Probe 2.75" Radial with Integral Temperature Sub	9.39	2.75	90.00
WVFS7	9.03					
WVFS6	9.03					
WVFS5	9.03					
WVFS4	9.03					
WVFS3	9.03					
WVFS2	9.03					
WVFS1	9.03					
WV3FT	9.03					
WV5FT	8.03					
WVFCAL	4.78					
HEADVOLT	4.78					

CCL	3.88		GR-Probe (FW1211-86) Probe 2 3/4" Logging Gamma Ray CENT-Overbody Antelope (SP-919-0233)			
GR	2.54			4.78	2.75	57.00
			1.67	4.88	5.00	

Dataset: antero_colorado_east_mammoth_1h_rcbl_nineenergy_14_mar_2020.db: Marcellus/Mammoth_1H/RCBL_1/pass4
 Total length: 15.17 ft
 Total weight: 162.00 lb
 O.D.: 4.88 in

	Company	Antero Resources
	Well	Mammoth Unit 1H
	Field	North Canton
	County	Tyler
	State	West Virginia

