



# RADIAL CEMENT BOND LOG

Company	ANTERO	
Well	VULCAN 1H	
Field	RABBIT EARS	
County	TYLER	
State	WEST VIRGINIA	
Company	ANTERO	
Well	VULCAN 1H	
Field	RABBIT EARS	
County	TYLER	
State	WEST VIRGINIA	
Location:	API #: 47-095-02701-0000	
Other Services	GR CCL TEMP	
SEC	TWP	RGE
Permanent Datum	GL	Elevation 25'
Log Measured From	KB	
Drilling Measured From	KB	
Elevation		
K.B.	N/A	
D.F.	N/A	
G.L.	N/A	

Date	7-NOV-2020
Run Number	ONE
Depth Driller	21,399'
Depth Logger	
Bottom Logged Interval	
Top Log Interval	
Open Hole Size	8.50"
Type Fluid	FRESH WATER
Density / Viscosity	8.4#
Max. Recorded Temp.	
Estimated Cement Top	
Time Well Ready	
Time Logger on Bottom	
Equipment Number	TK-127 / P2,G1
Location	CHARLEROI, PA
Recorded By	D.JOSEPHIK
Witnessed By	JERRAKO EVEANS

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
Casing Record		Size	Wgt/Ft	Top	Bottom		
Surface String		17 1/2"	N/A	105'	390'		
Prot. String							
Production String		5 1/2"	23#	SURFACE	21,379'		
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

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**LOG CORRELATED TO MARKER JOINT @ 5773'-5784'**

**100%FREE PIPE=71.9mv**  
**100%BOND=3.4mv**

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

			CENT-Titn275Adj Titan 2 3/4" Adjustable Centralizer	2.75	2.75	35.00
HeadVolt	16.86					
Temp	14.02					
			RBT-Probe275T (FW1312-32) Probe 2.75" Radial with Integral Temperature Sub	9.39	2.75	90.00
WVFS8	11.78					
WVFS7	11.78					
WVFS6	11.78					
WVFS5	11.78					
WVFS4	11.78					
WVFS3	11.78					
WVFS2	11.78					
WVFS1	11.78					
WVF3FT	11.78					
WVF5FT	10.78					
WVFCAL	7.53					
HEADVOLT	7.53					
			CENT-Titn275Adj Titan 2 3/4" Adjustable Centralizer	2.75	2.75	35.00
CCL	3.88					
GR	2.54		GR-Probe (FW1211-86) Probe 2 3/4" Logging Gamma Ray	4.78	2.75	57.00

Dataset: antero\_vulcan\_1h\_nov\_7\_2020\_cbl.db: field/well/run1/pass14  
 Total length: 20.67 ft  
 Total weight: 222.00 lb  
 O.D.: 2.75 in

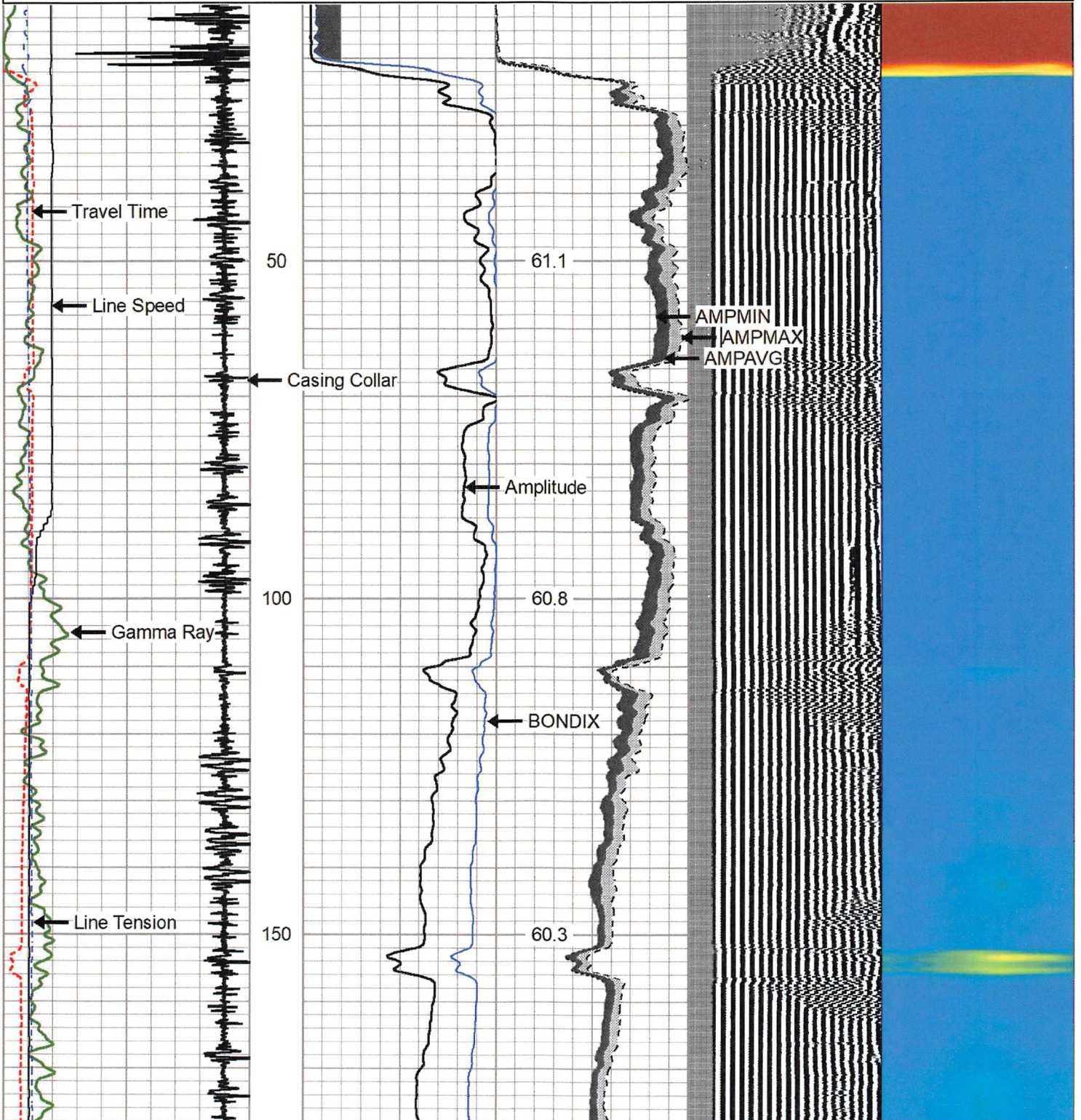


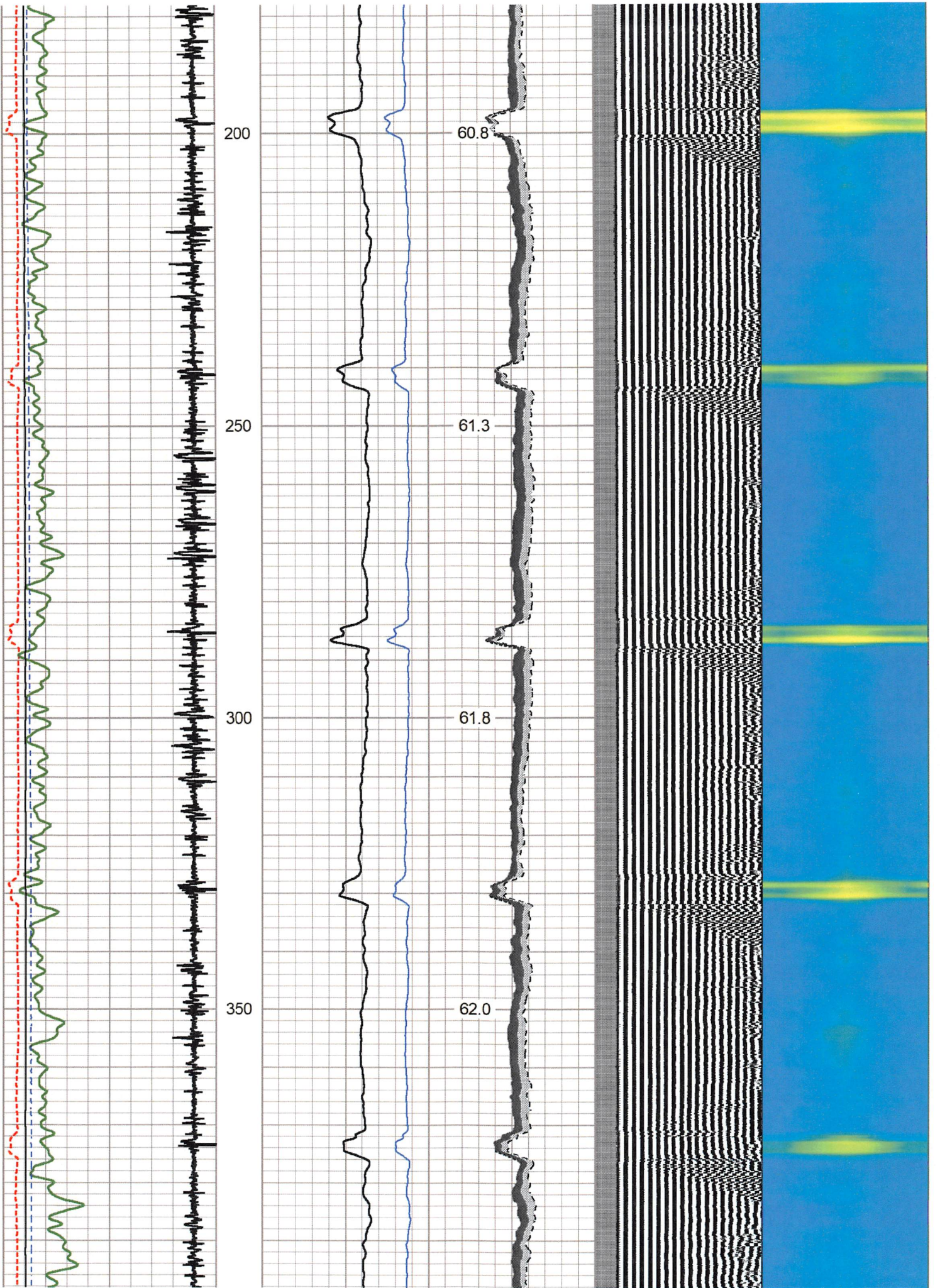
# MAIN LOG

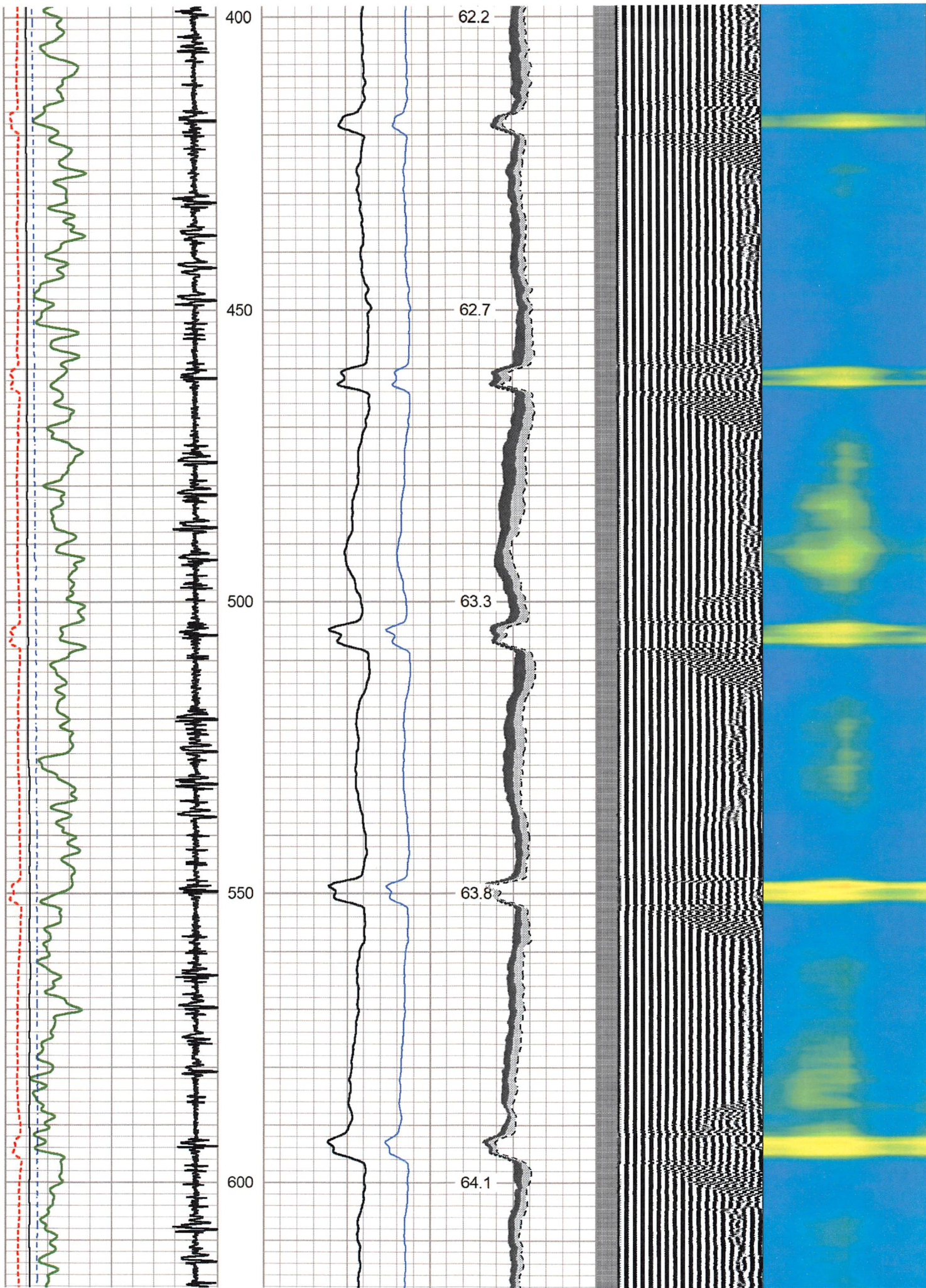
1500 psi

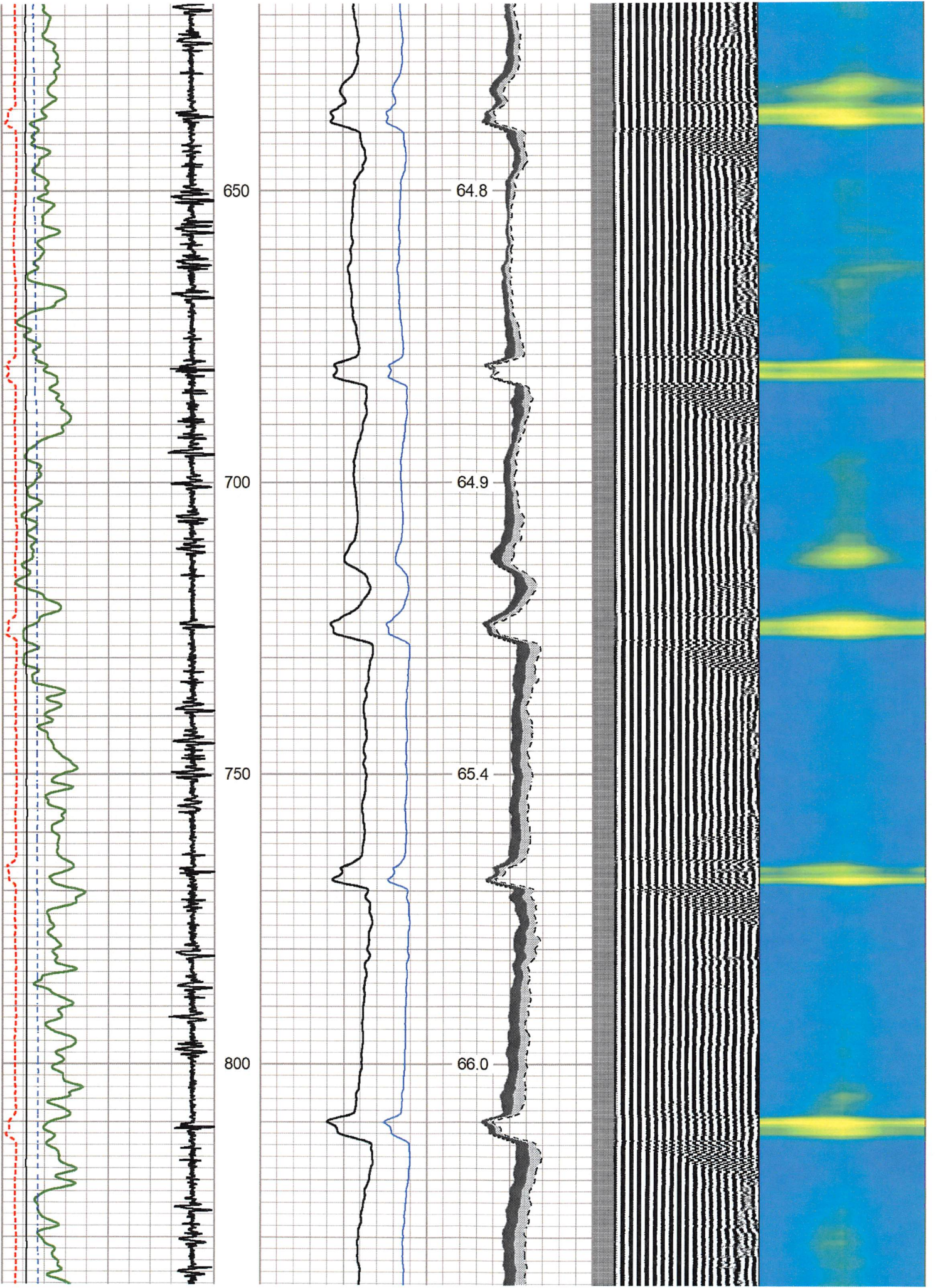
Database File antero\_vulcan\_1h\_nov\_7\_2020\_cbl.db  
 Dataset Pathname pass14  
 Presentation Format rcbI-bond index for antero 1020  
 Dataset Creation Sat Nov 07 13:29:01 2020  
 Charted by Depth in Feet scaled 1:240

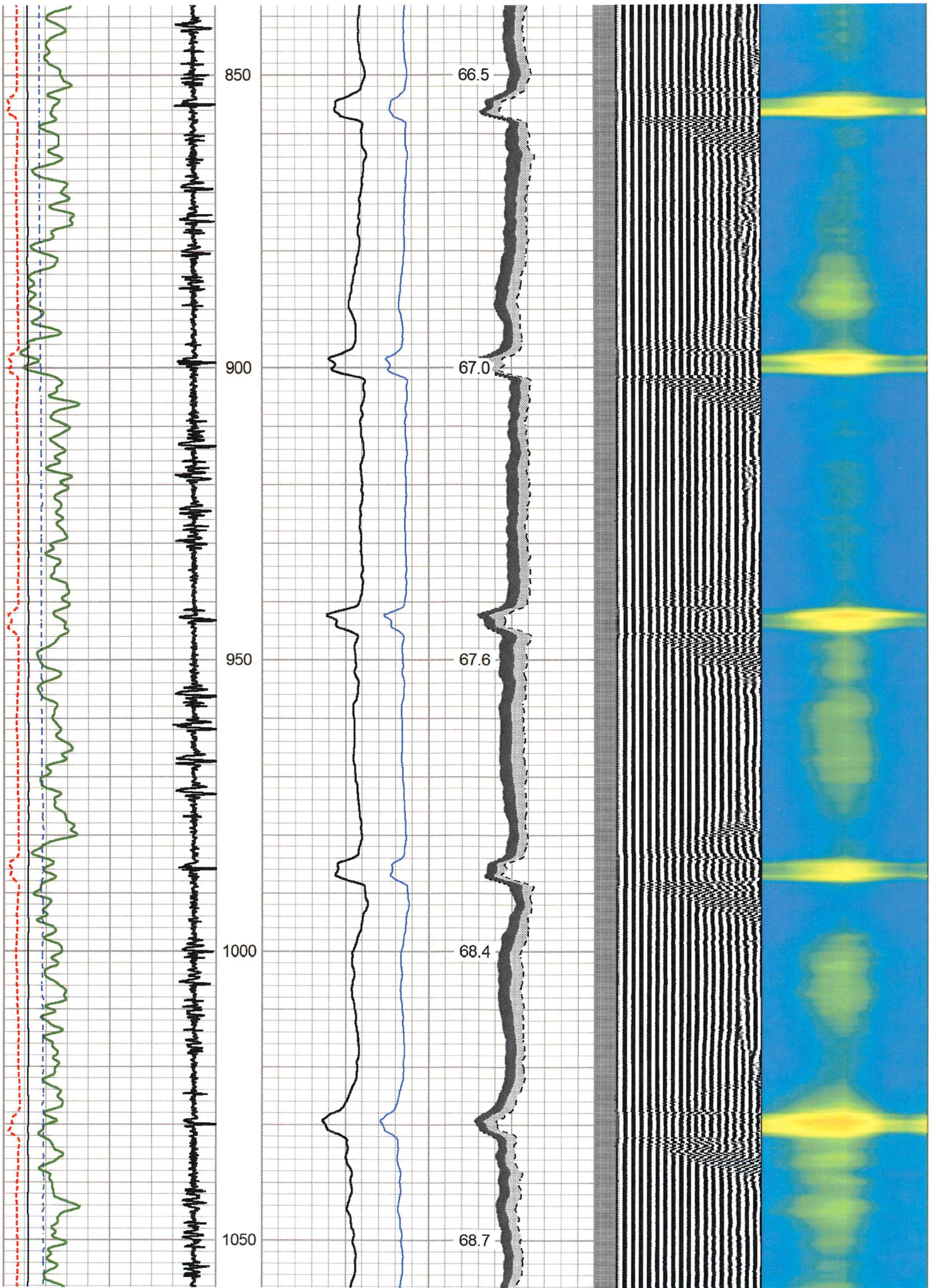
268	Travel Time (usec)	168	0	Amplitude (mV)	100	0	AMPMIN	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	1	BONDIX	0	0	AMPMAX	150	200 (usec)	1200		
0	Gamma Ray (GAPI)	150	0	AMP	150	0	AMPAVG	150				
Line Speed			TEMP									
-100	(ft/min)	100	(degF)									
0	Line Tension (lb)	2000										

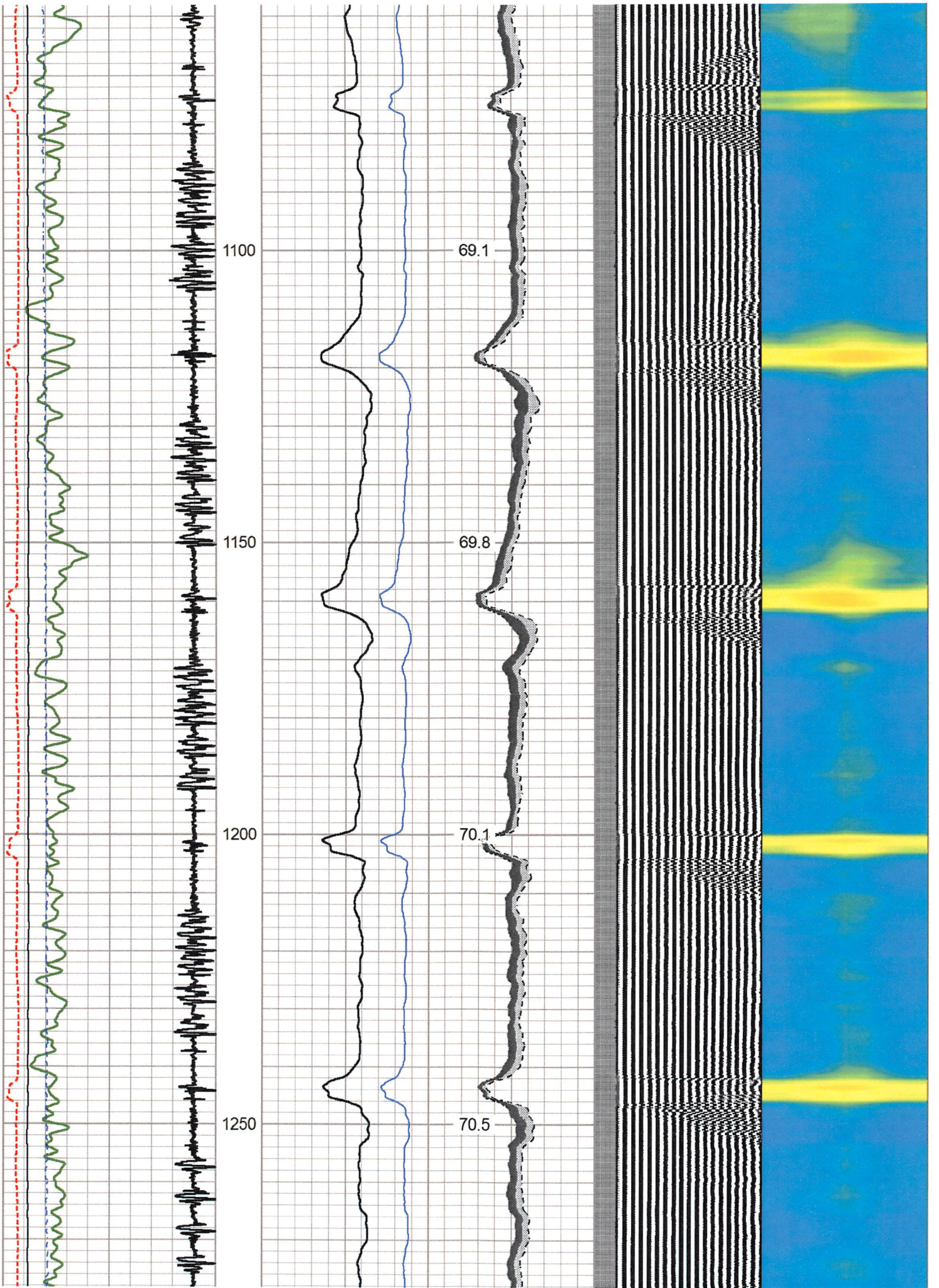




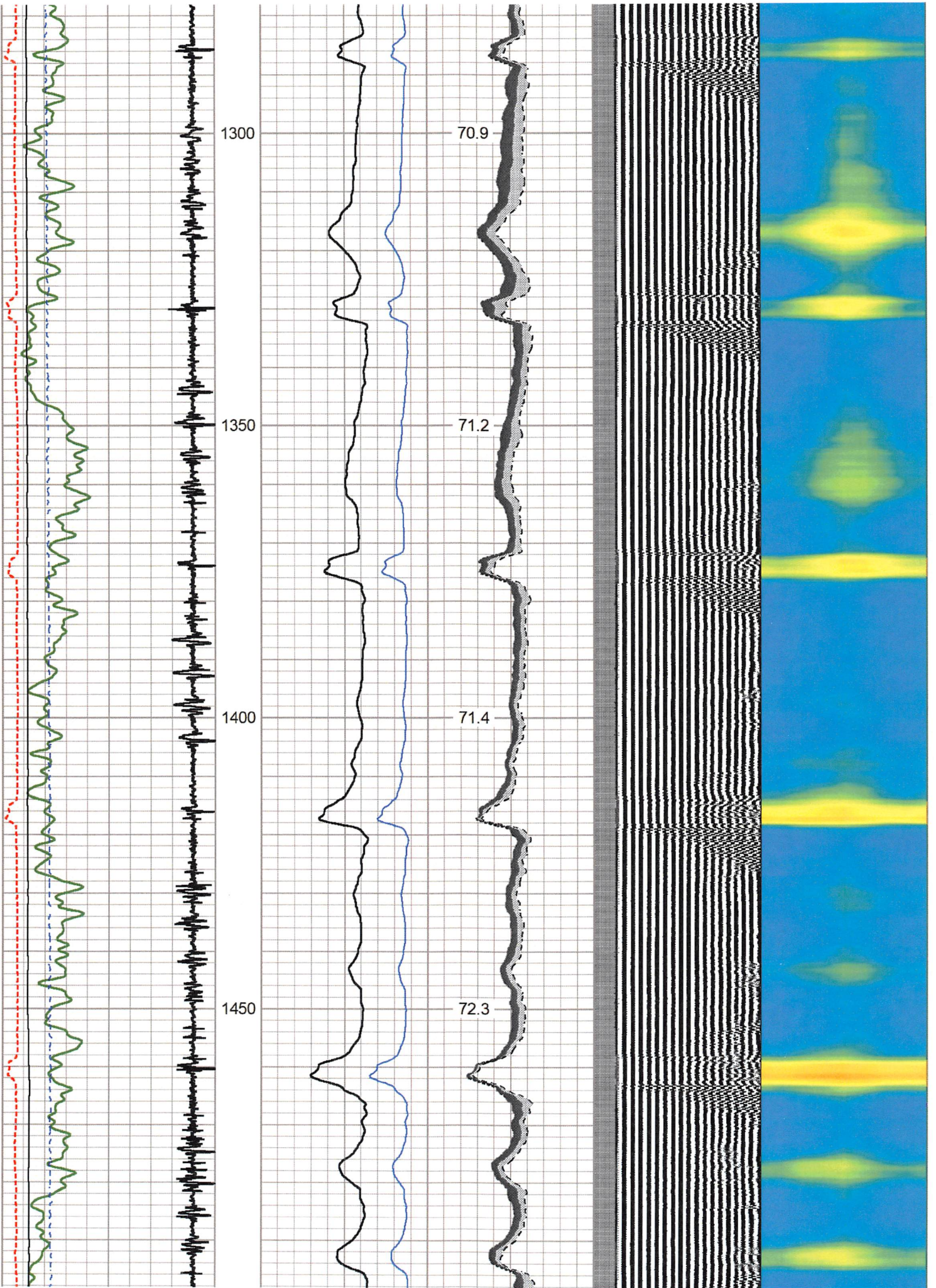


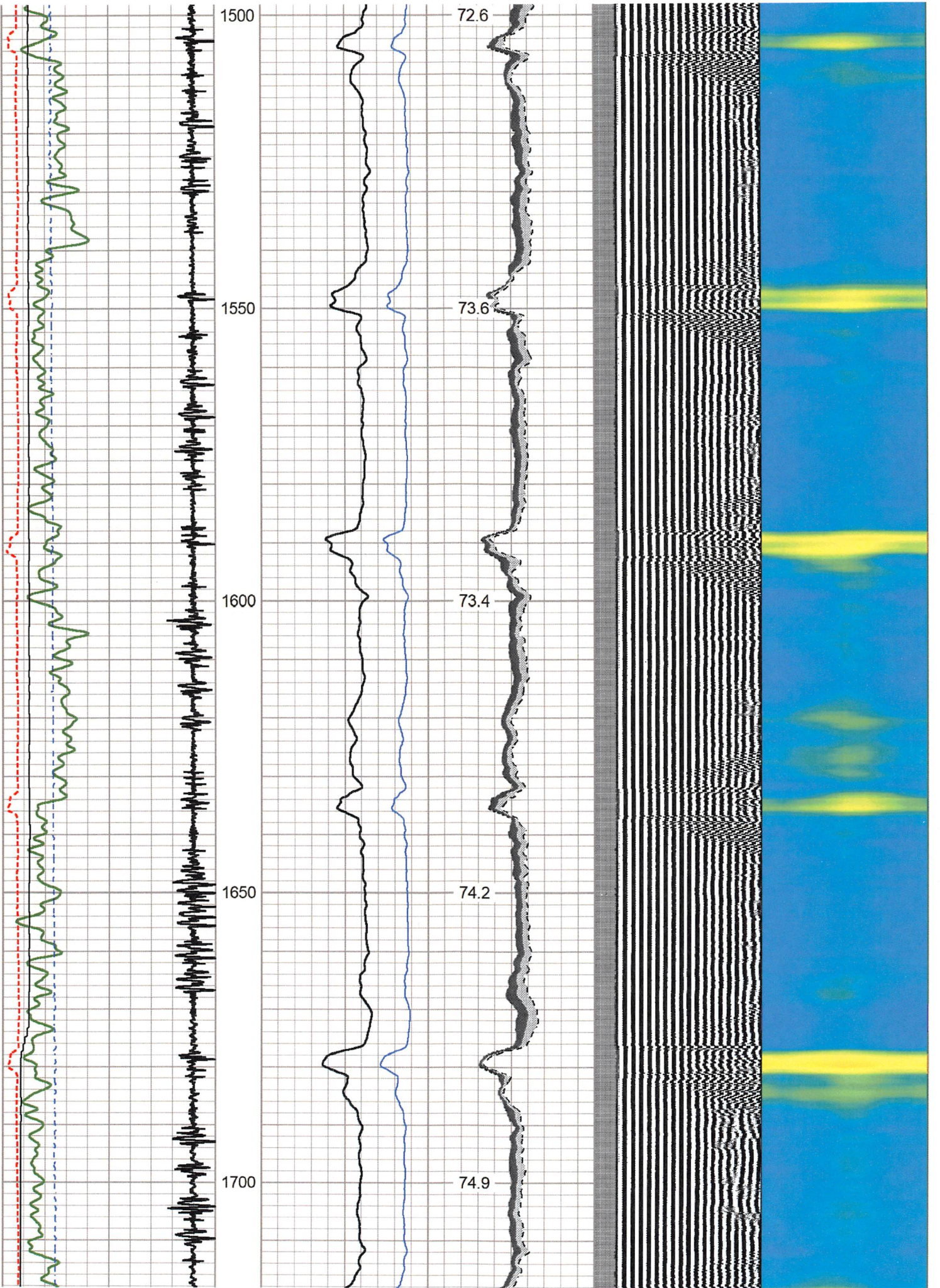


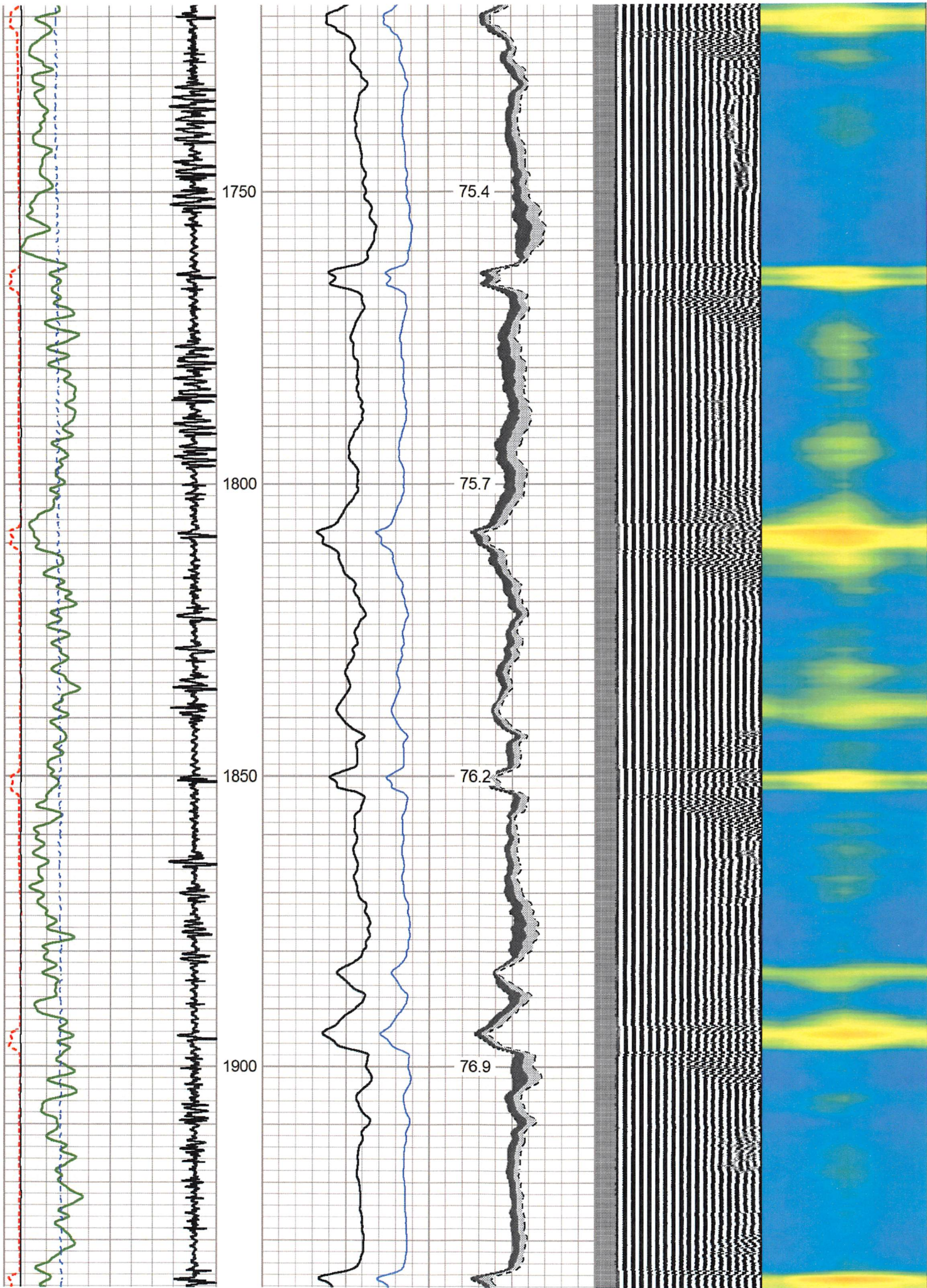


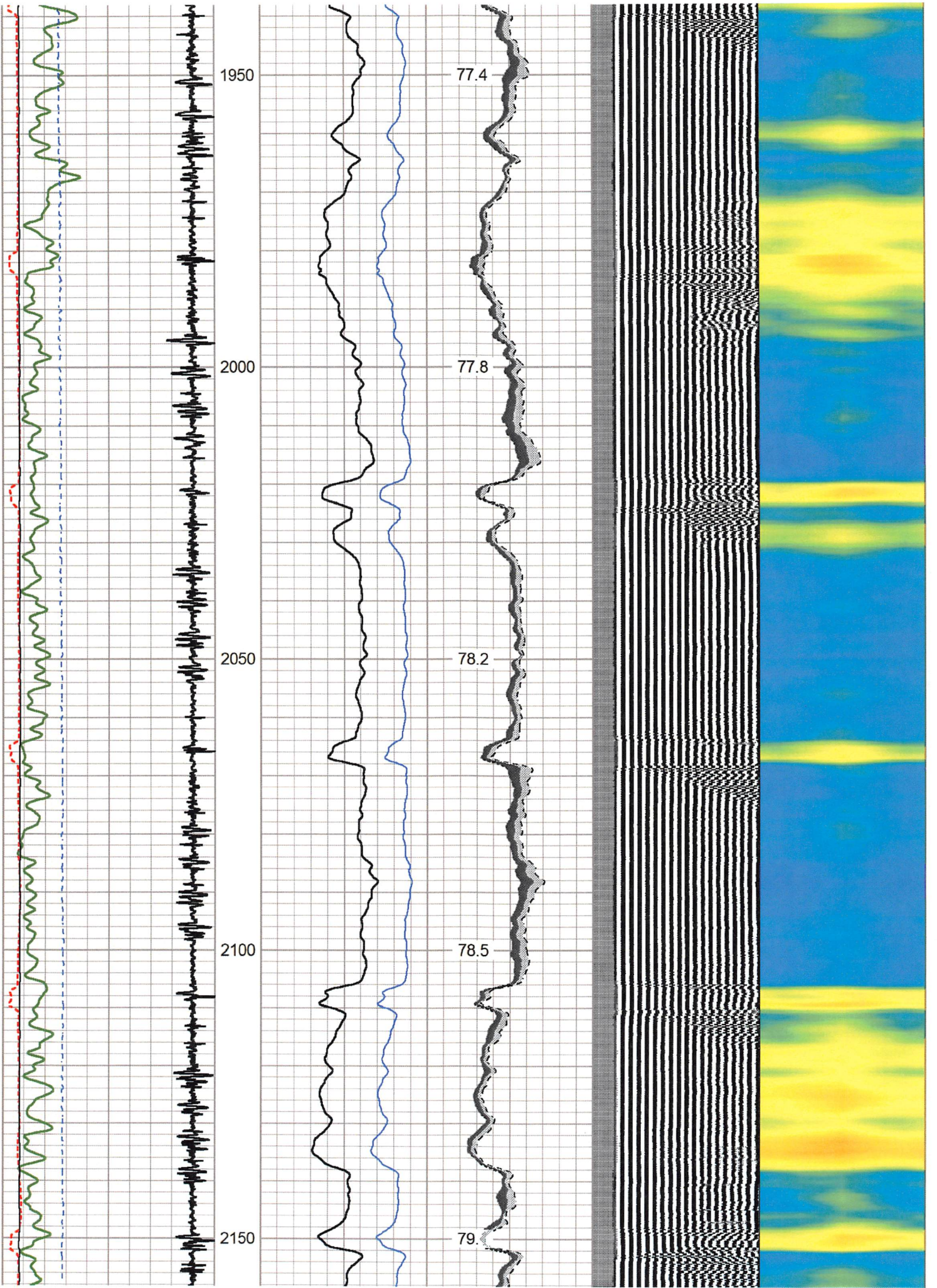


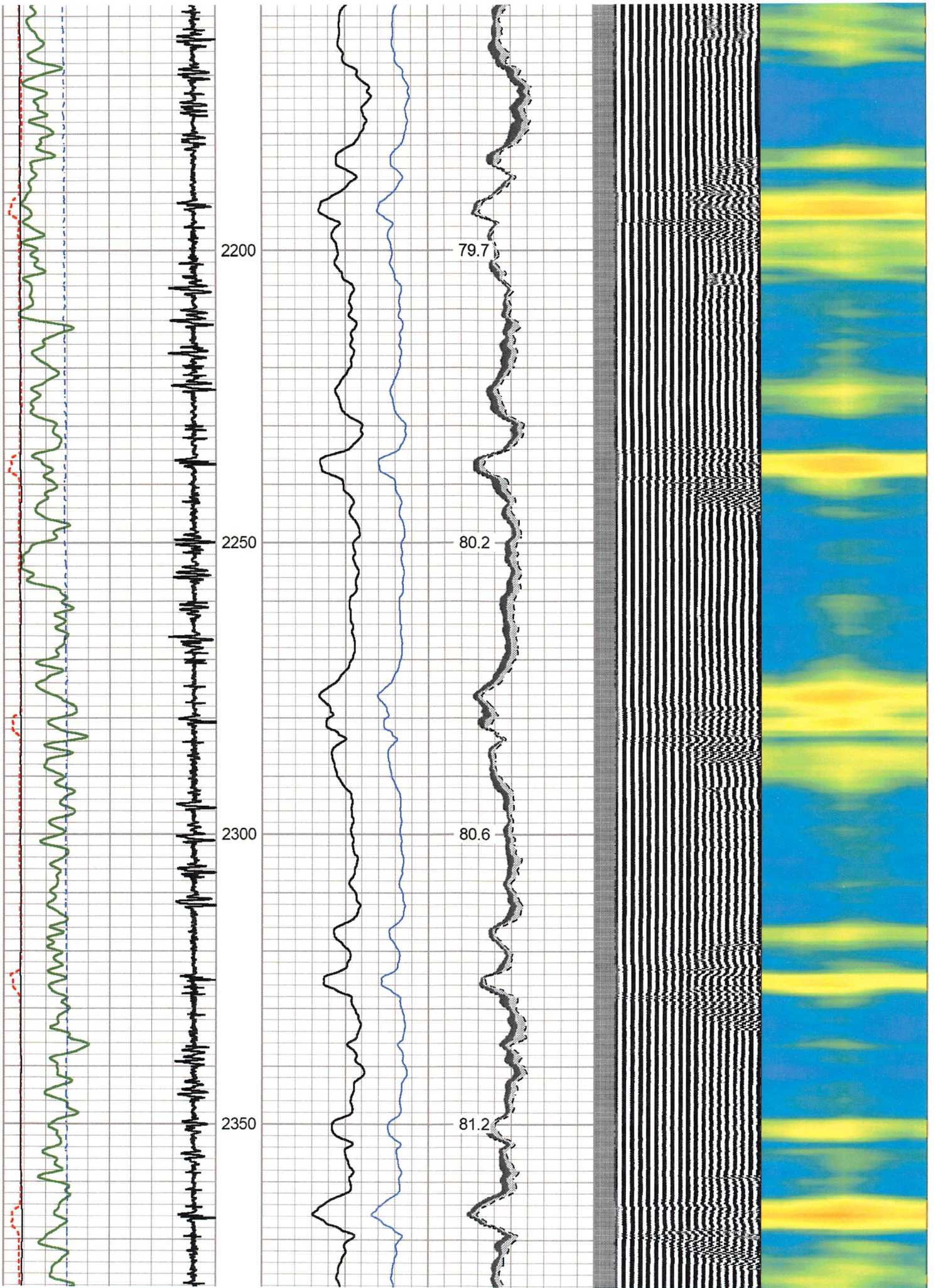


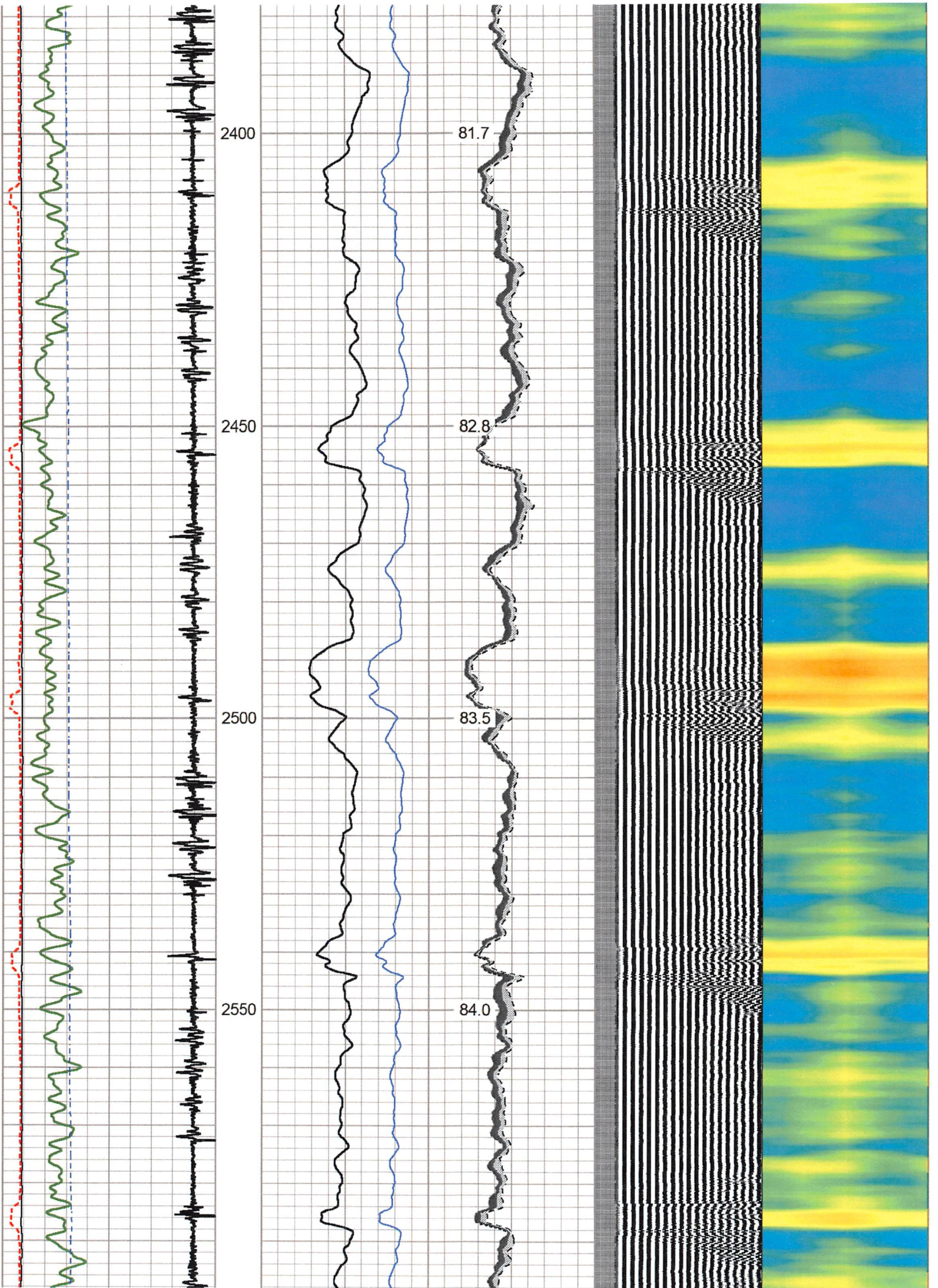


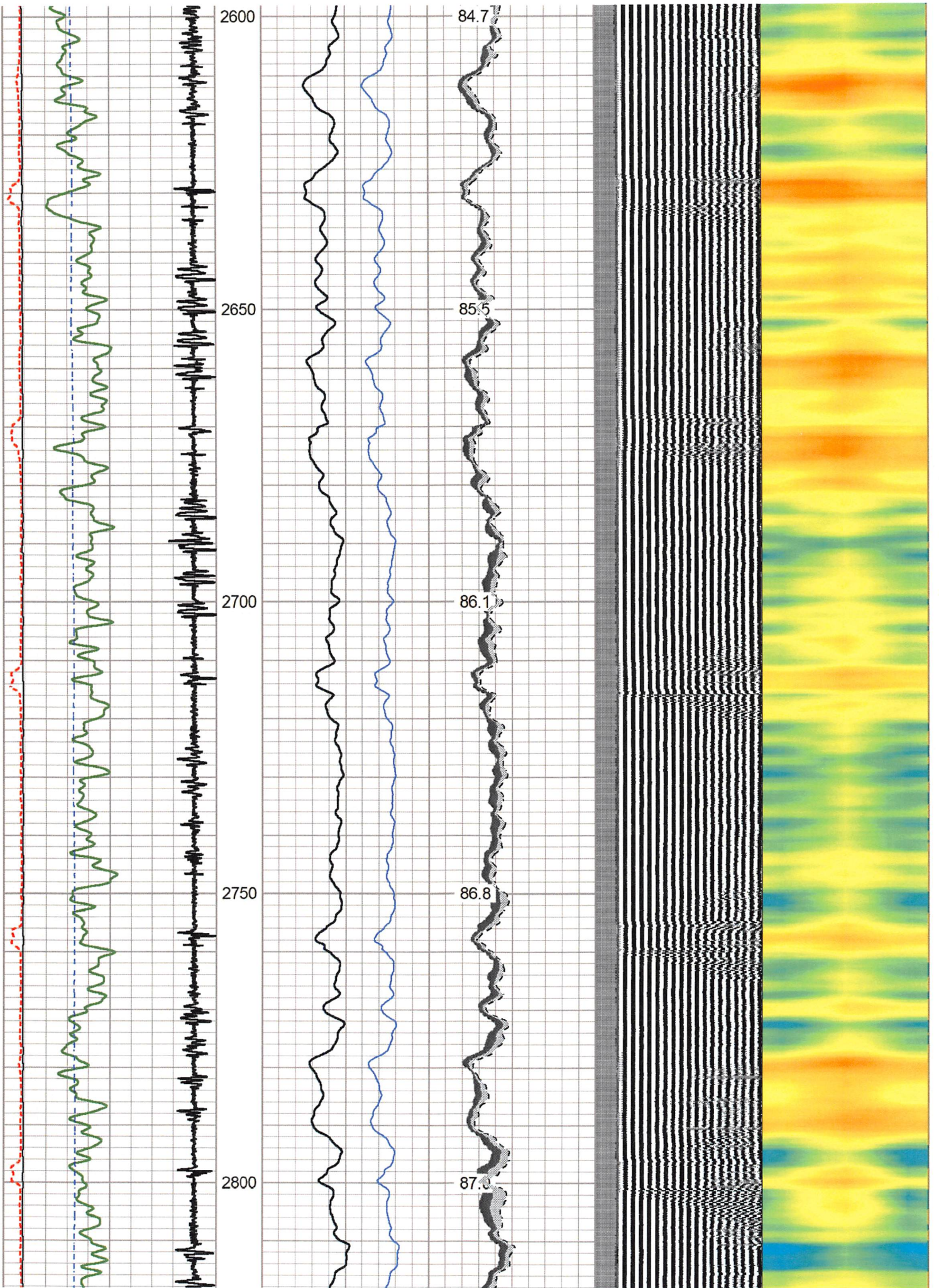


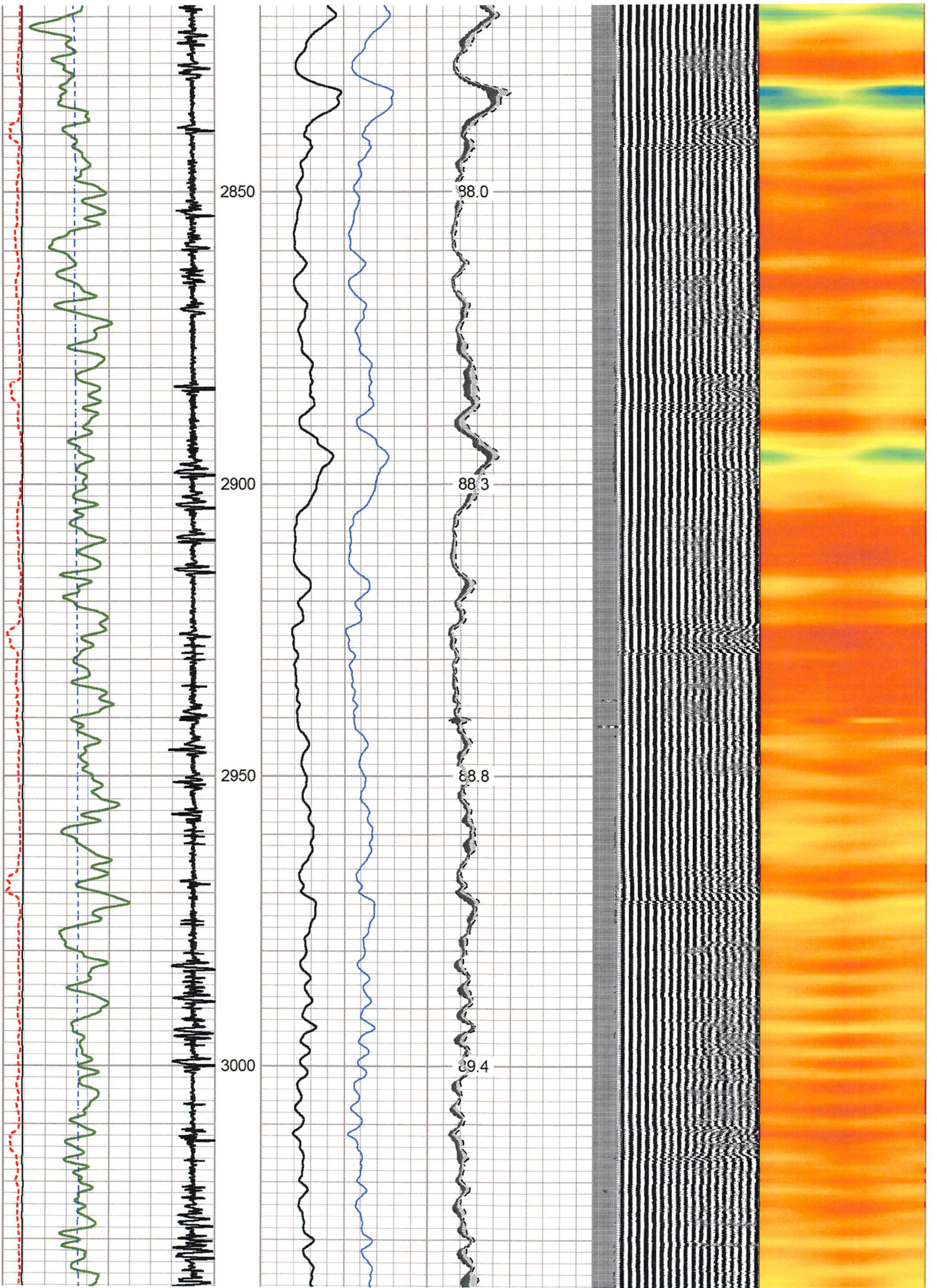




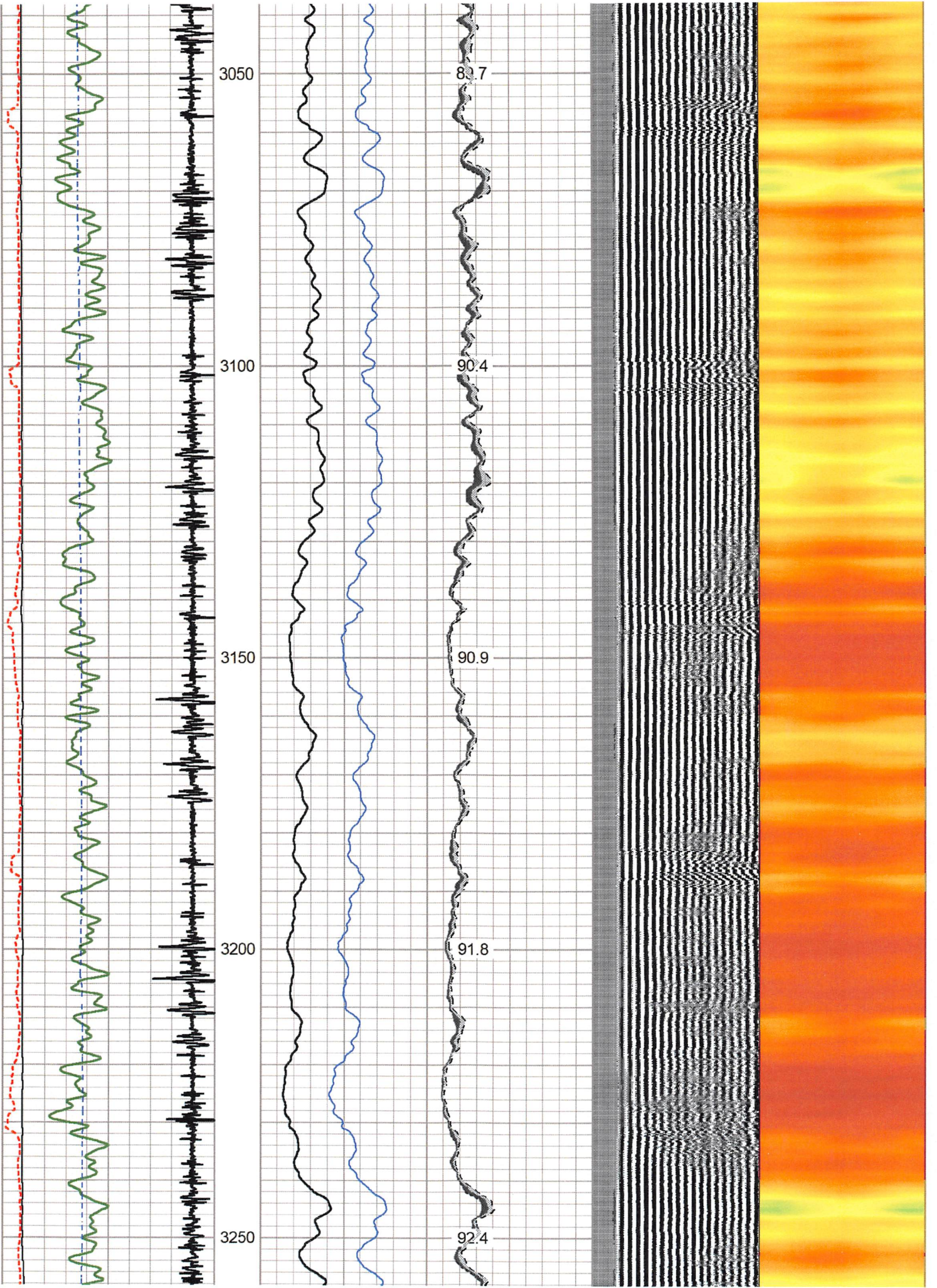


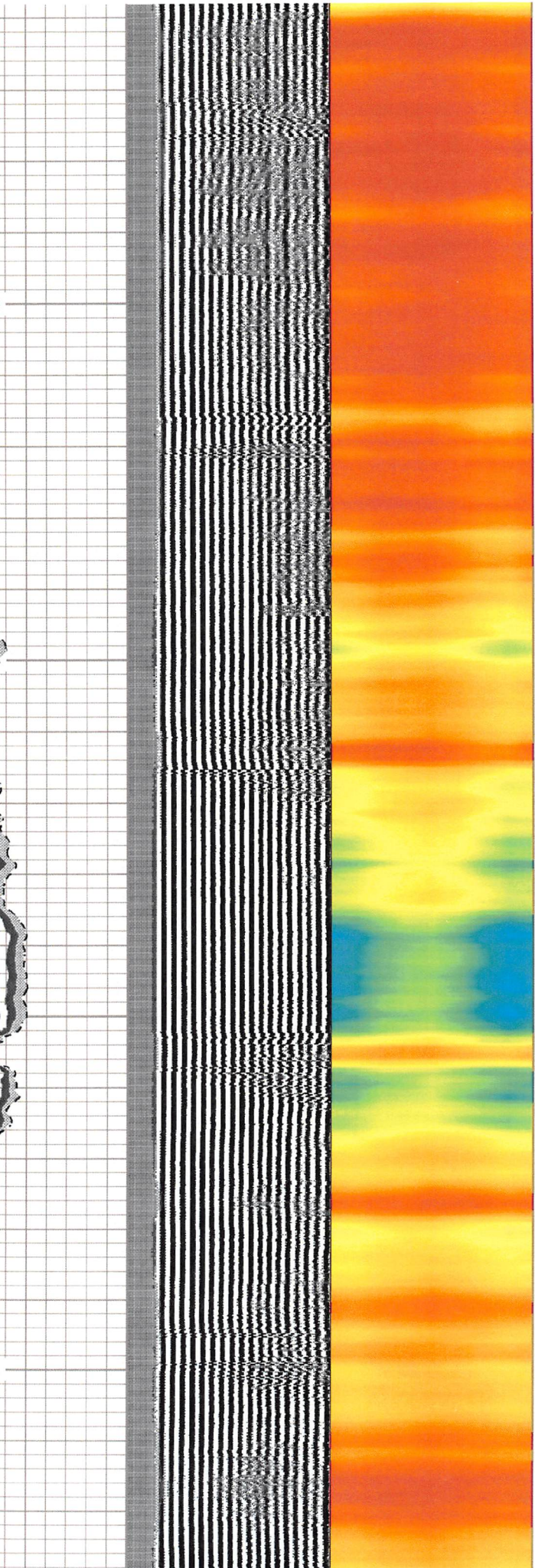
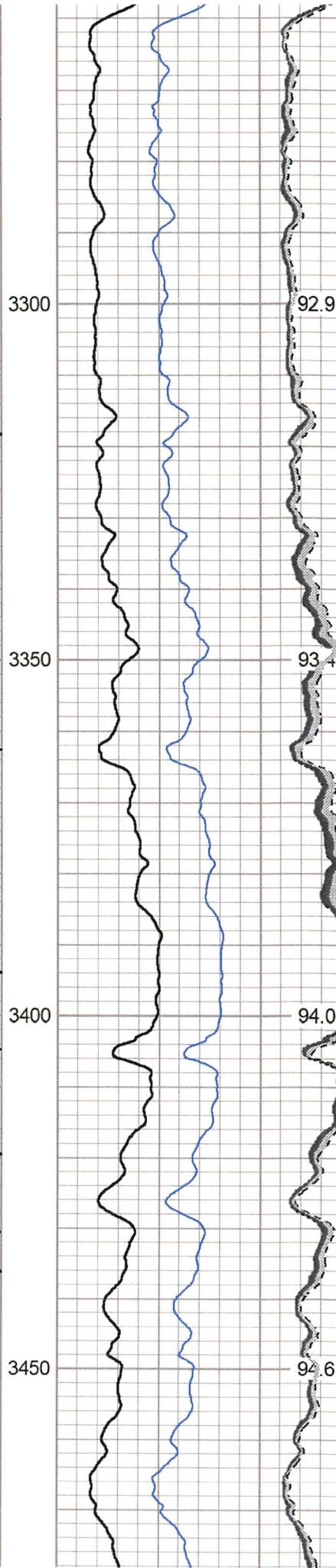
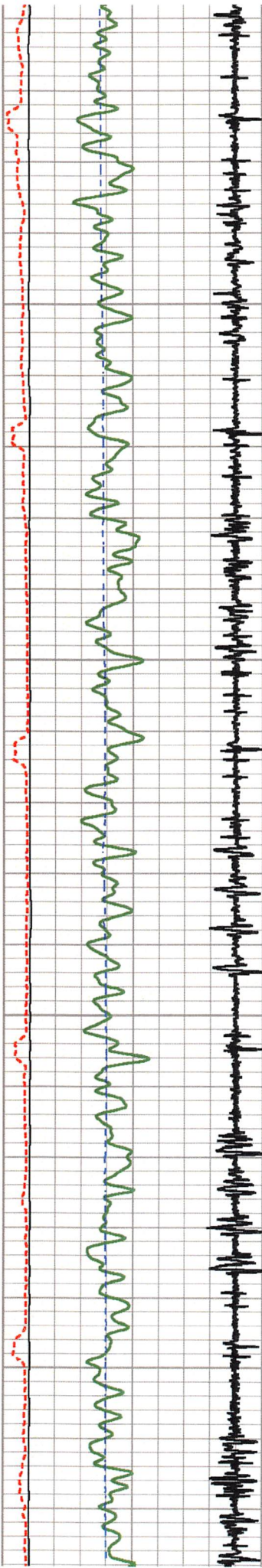


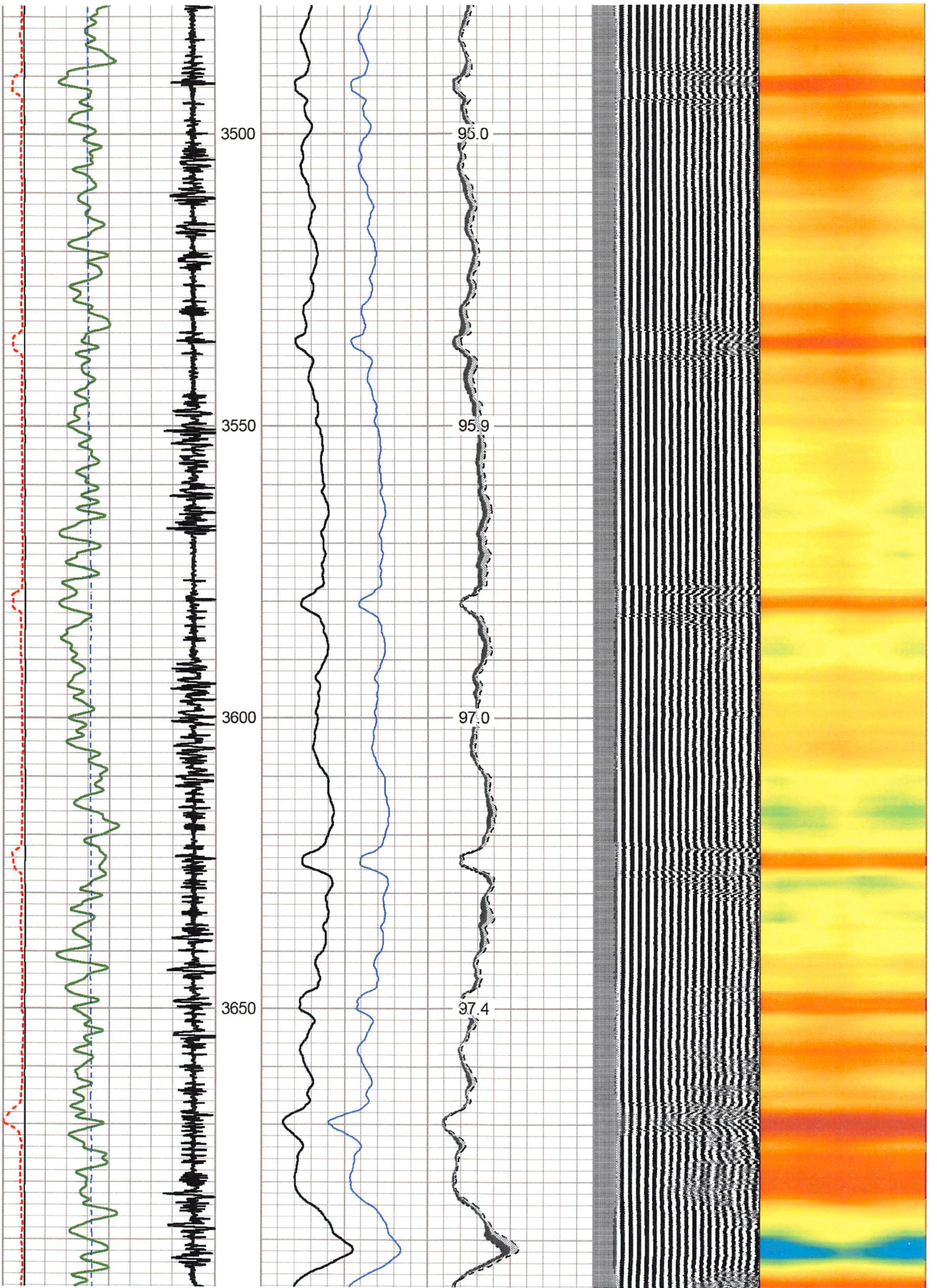


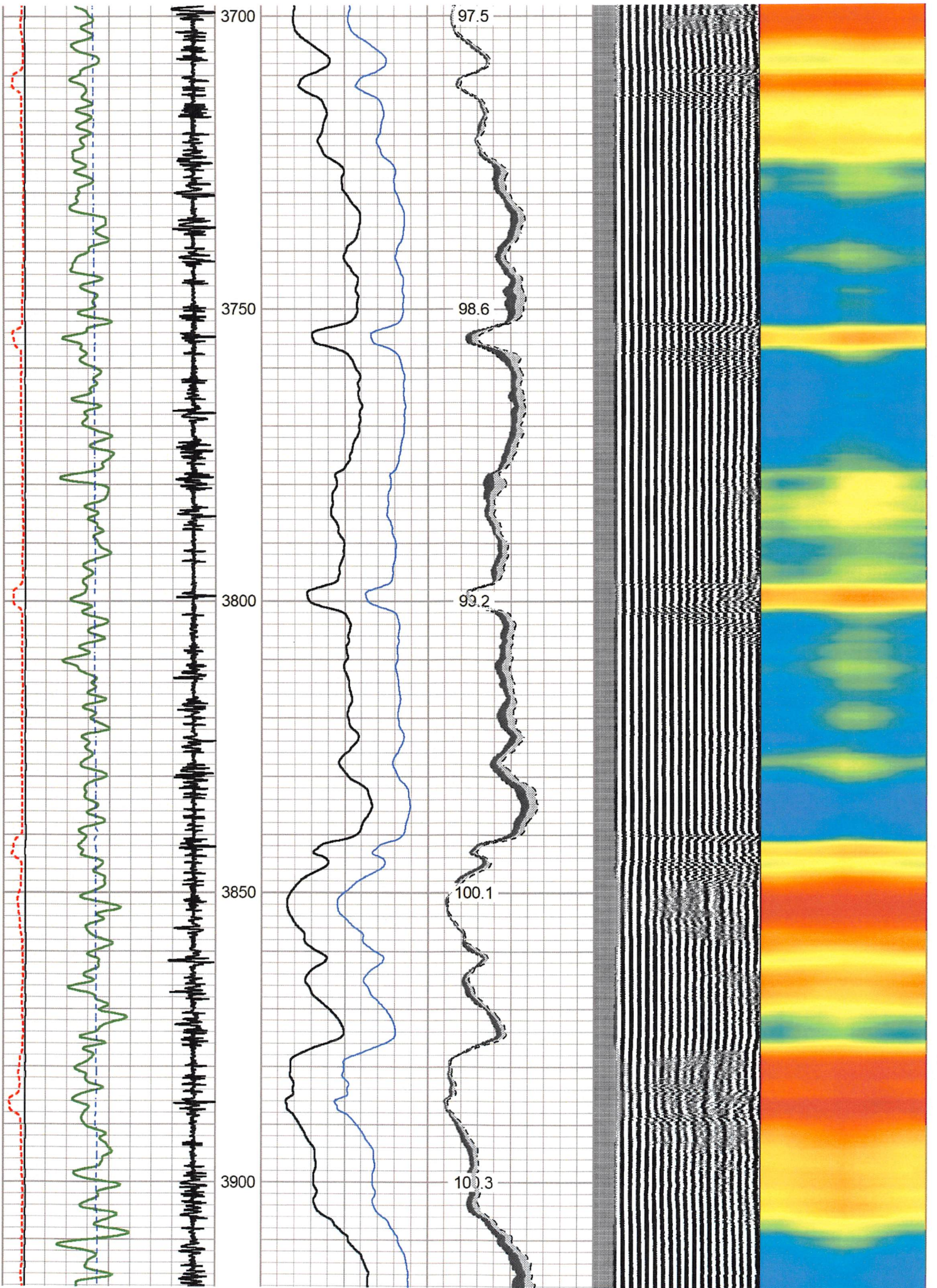


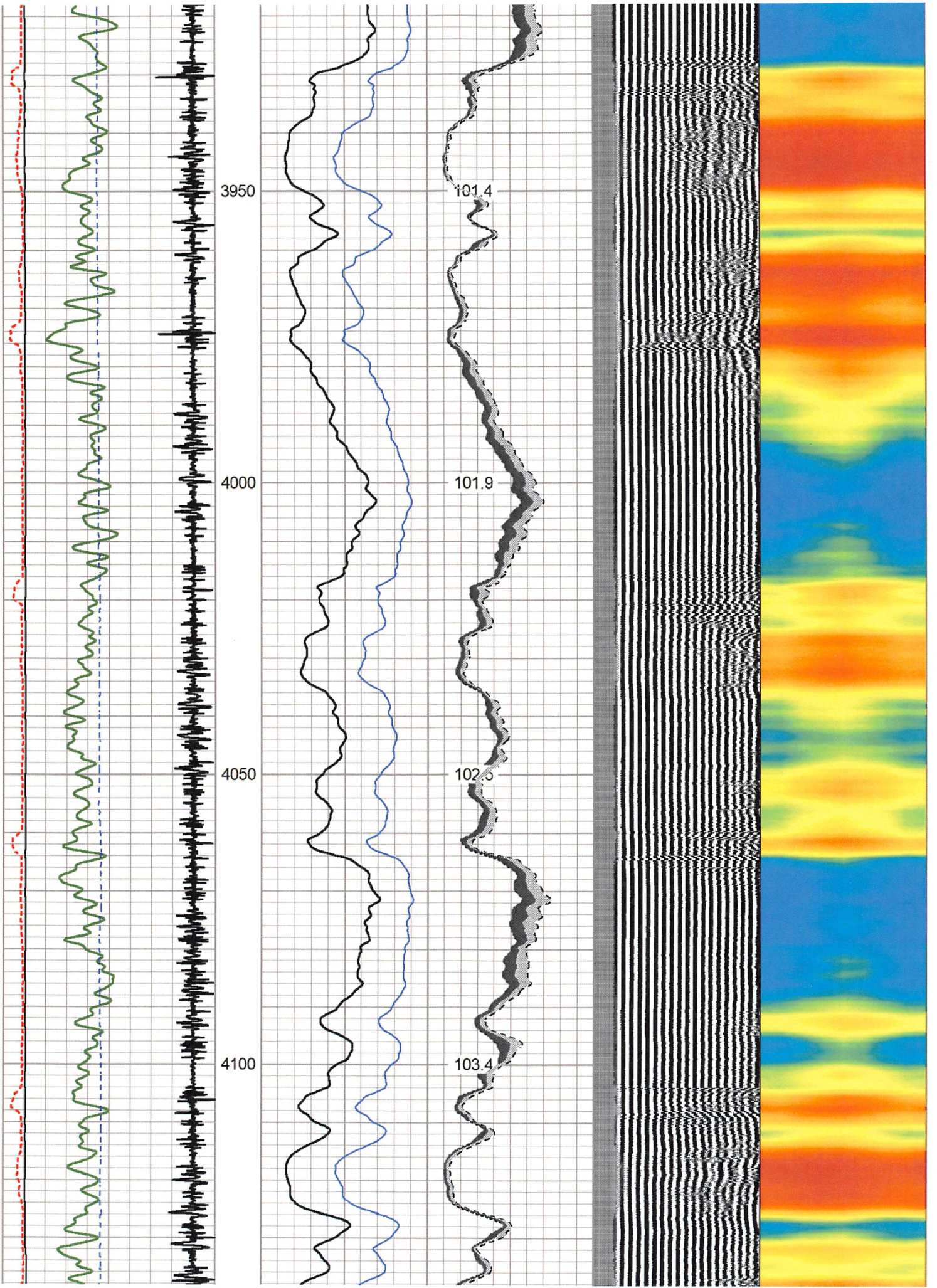


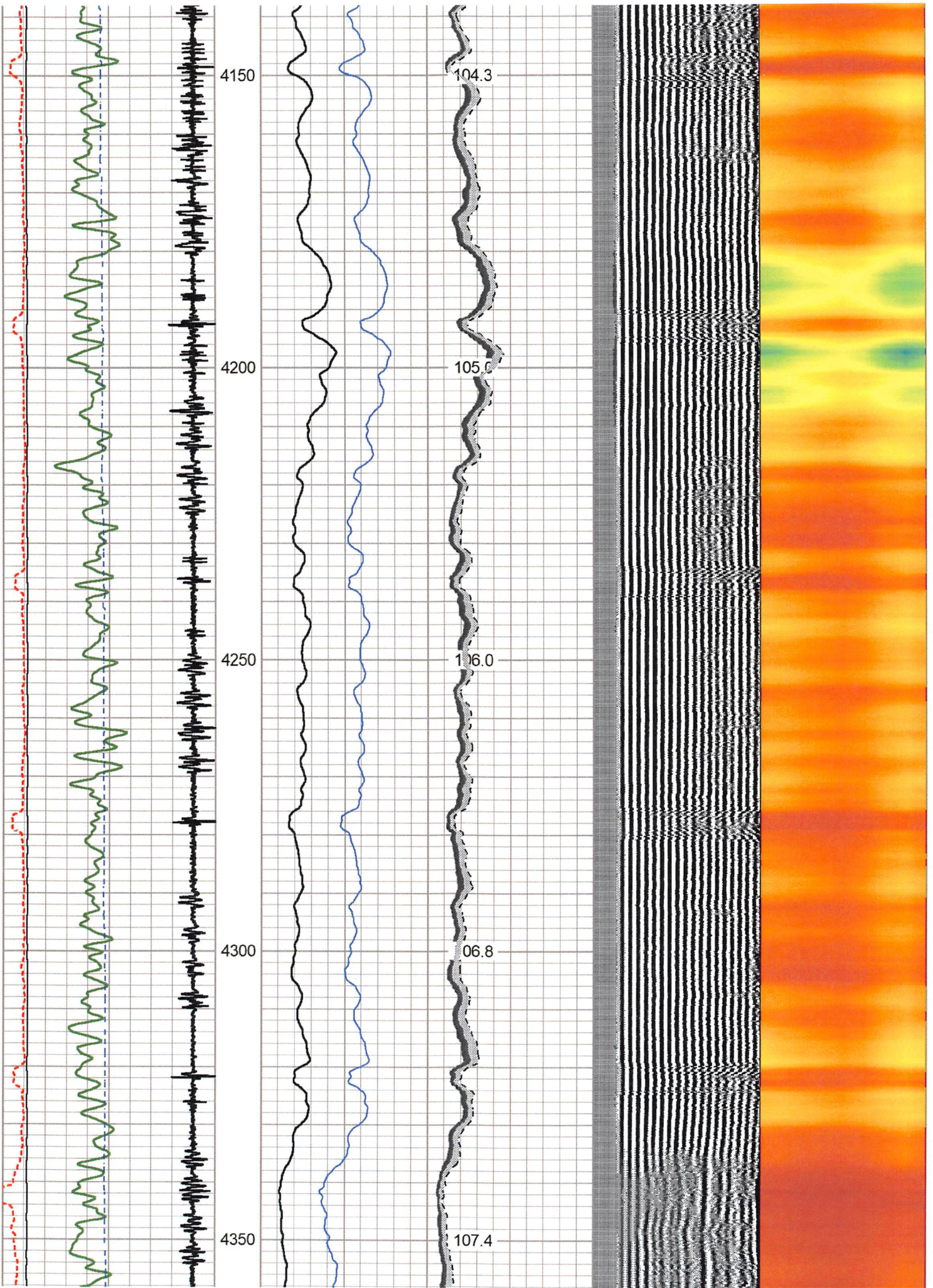


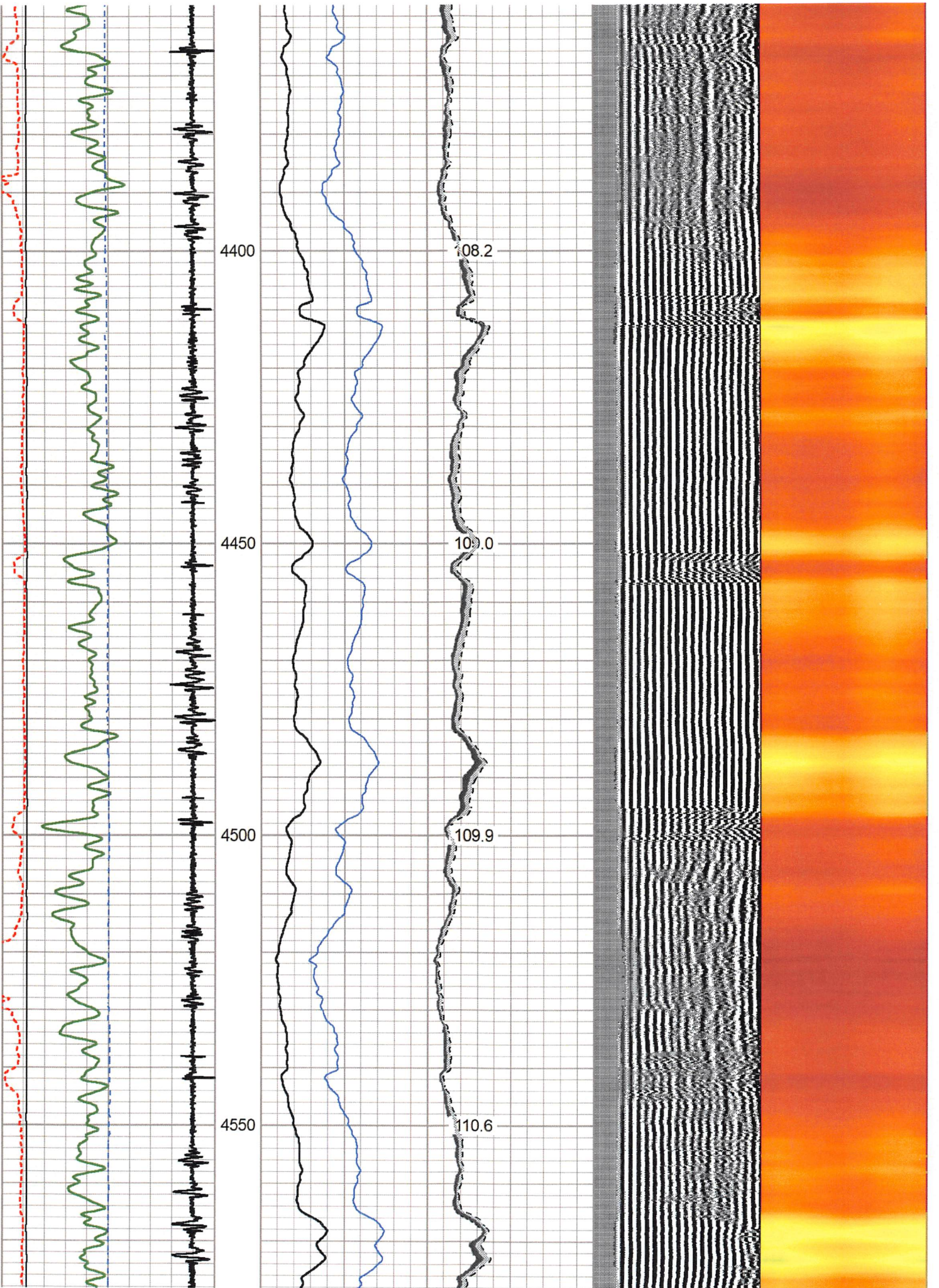


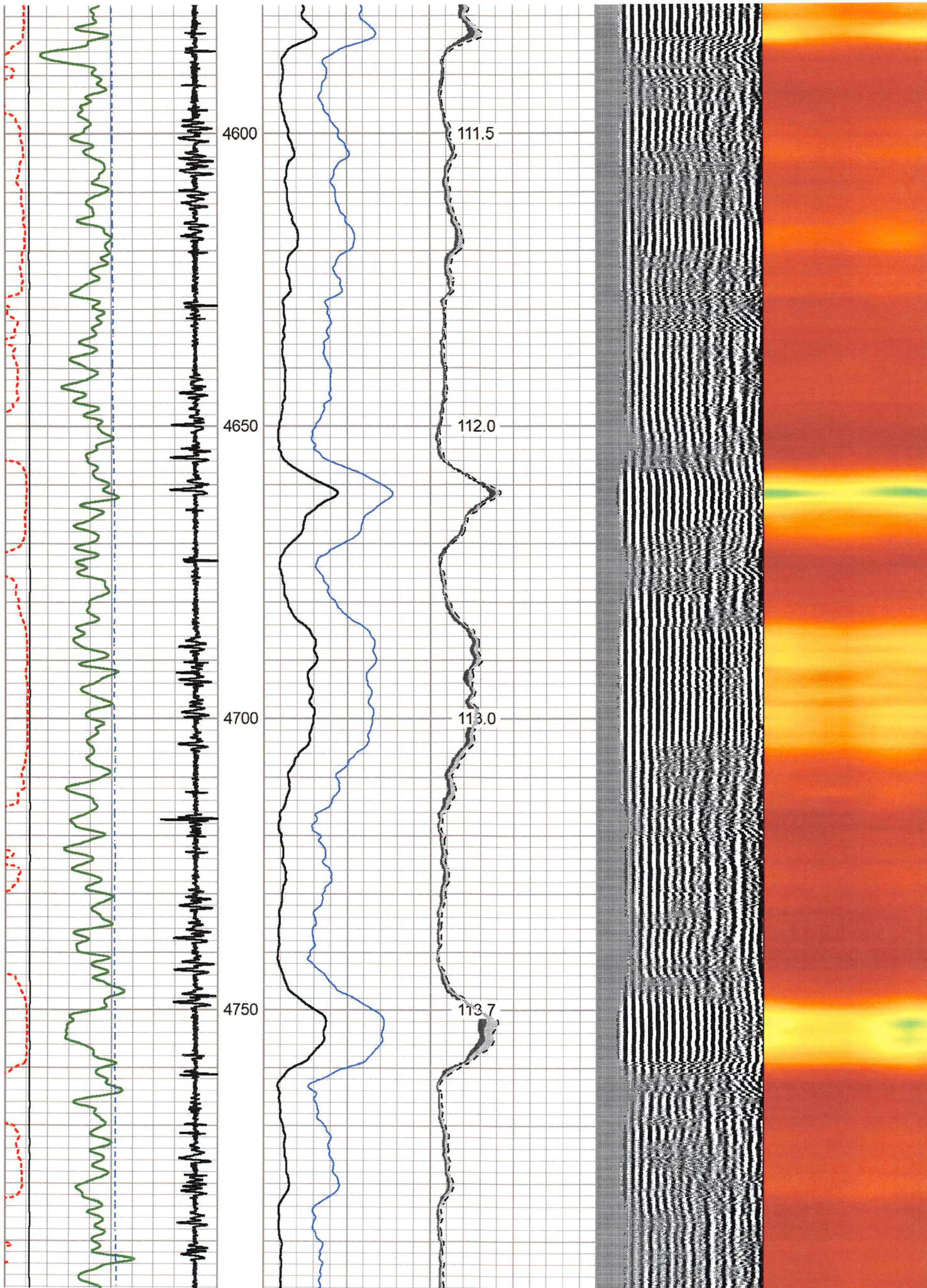




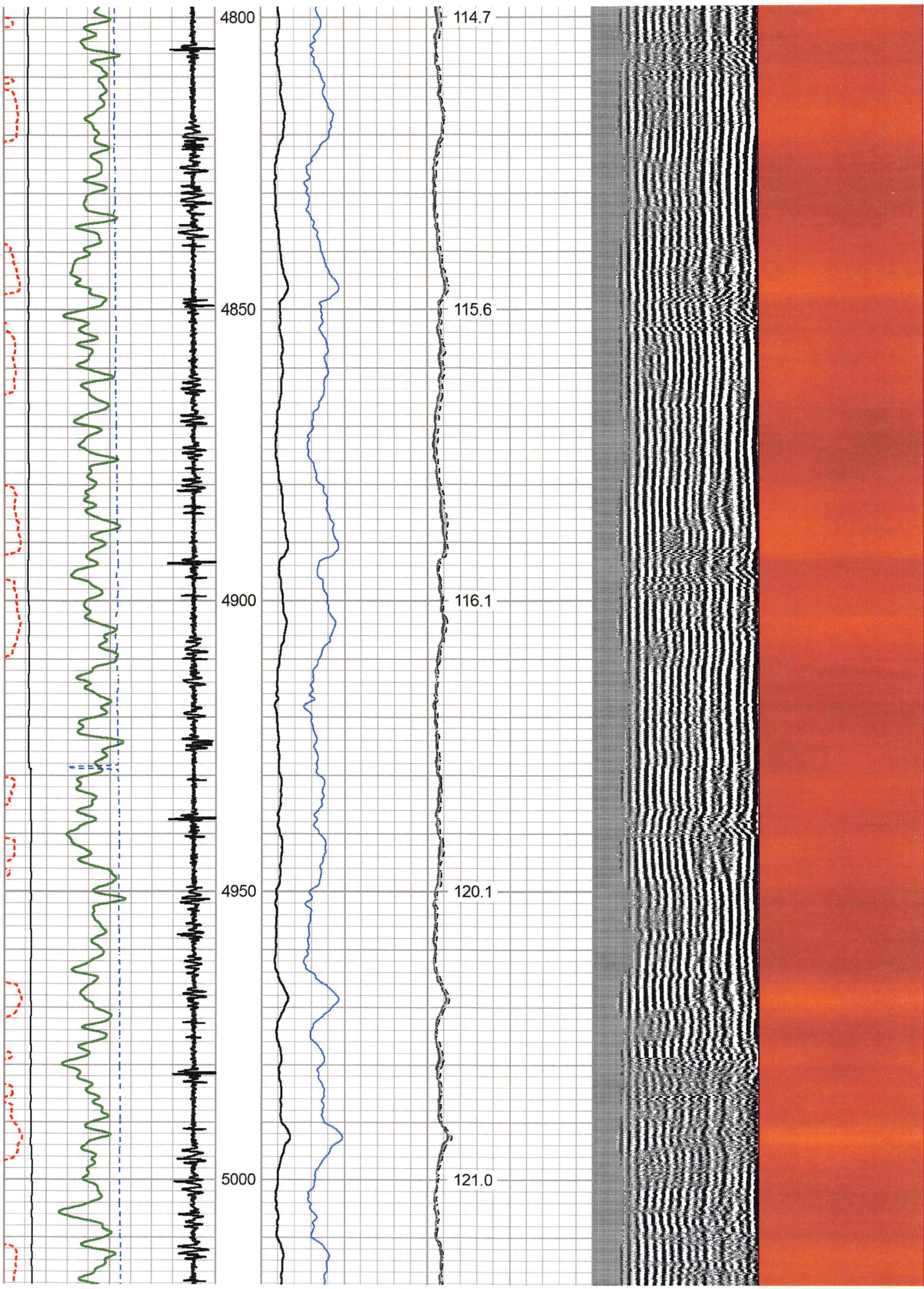


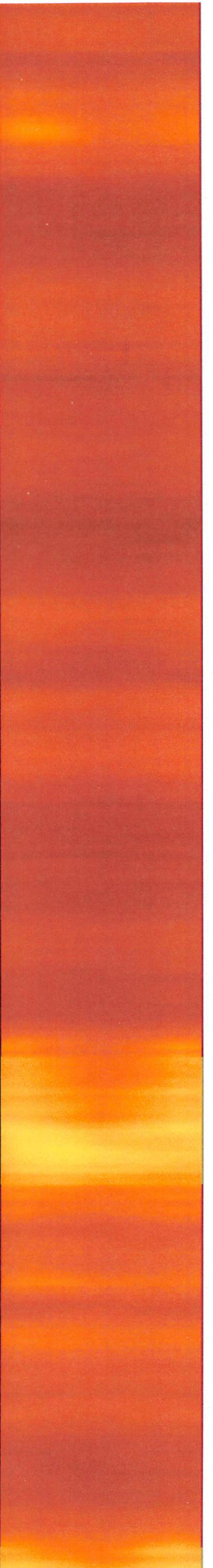
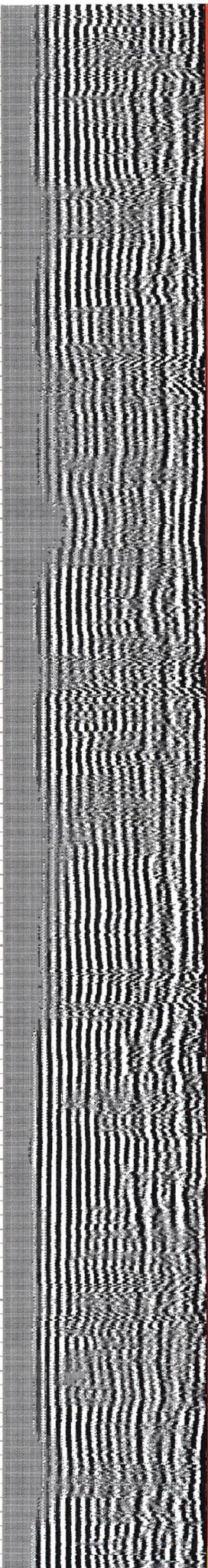
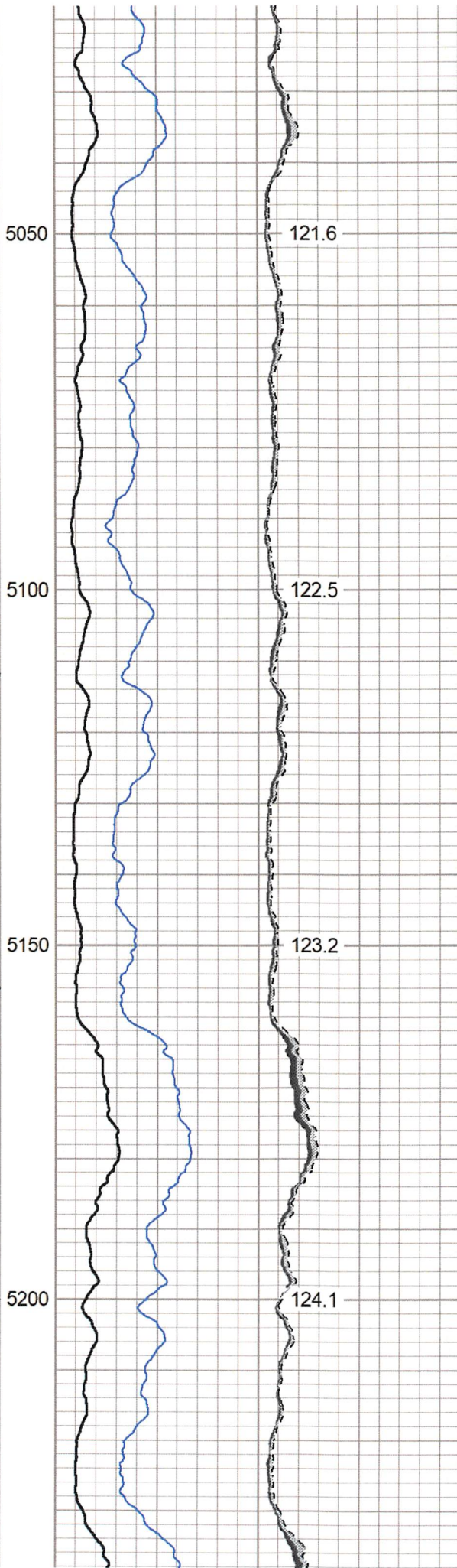
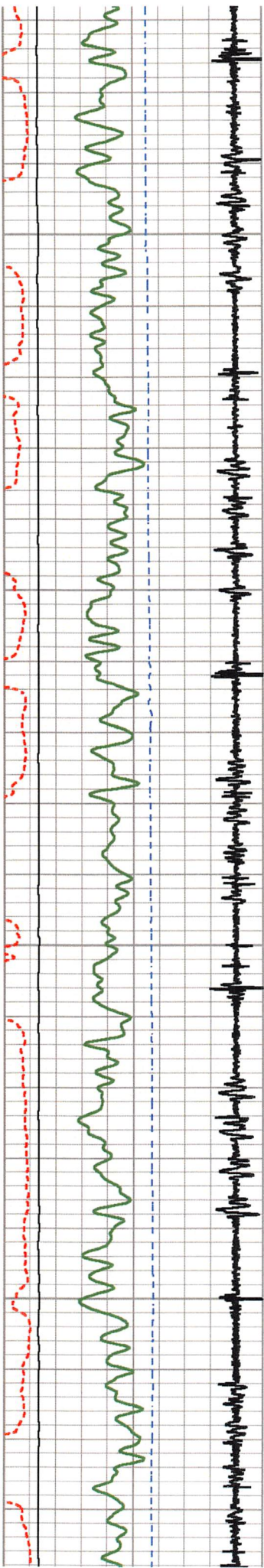


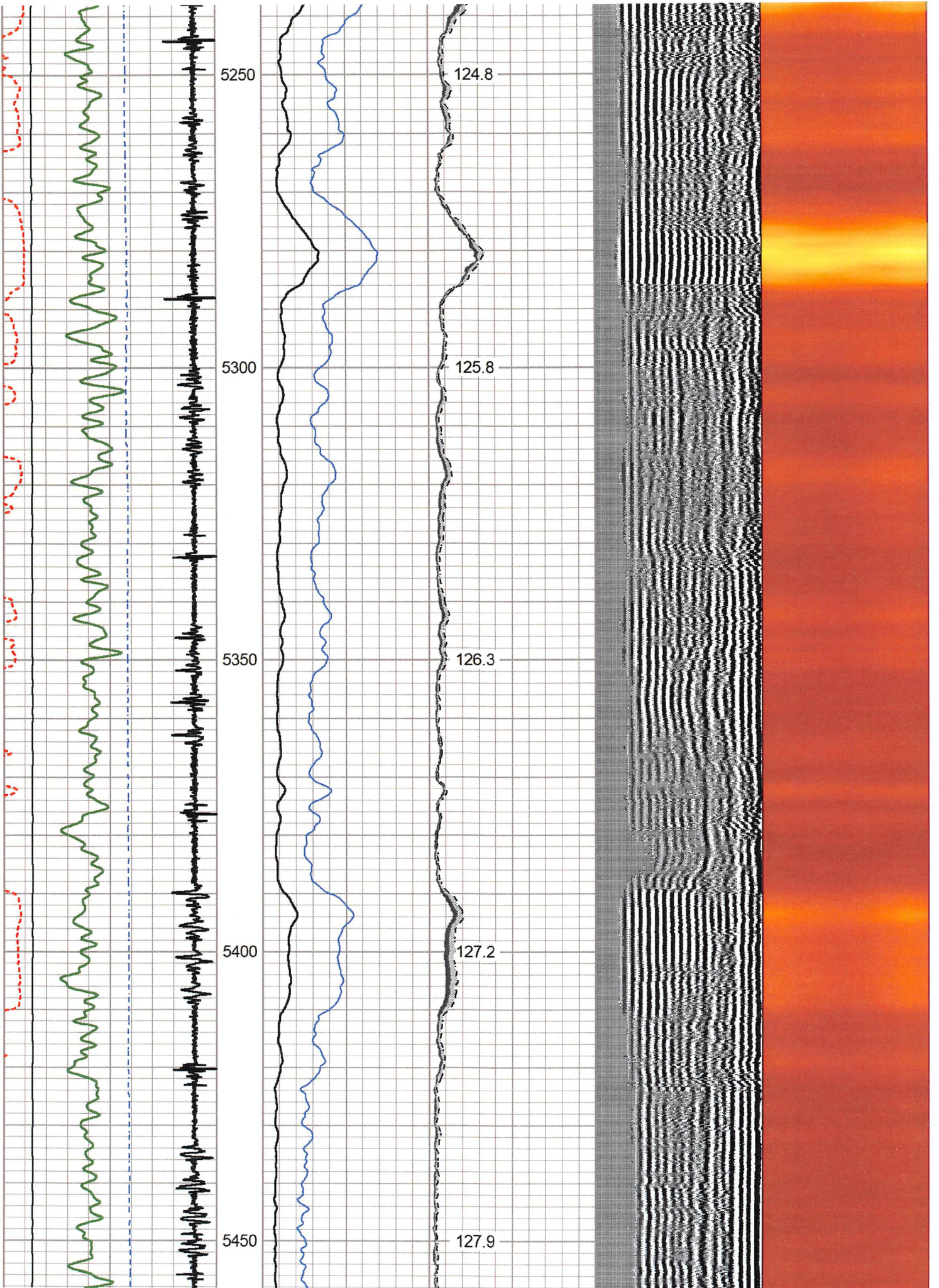


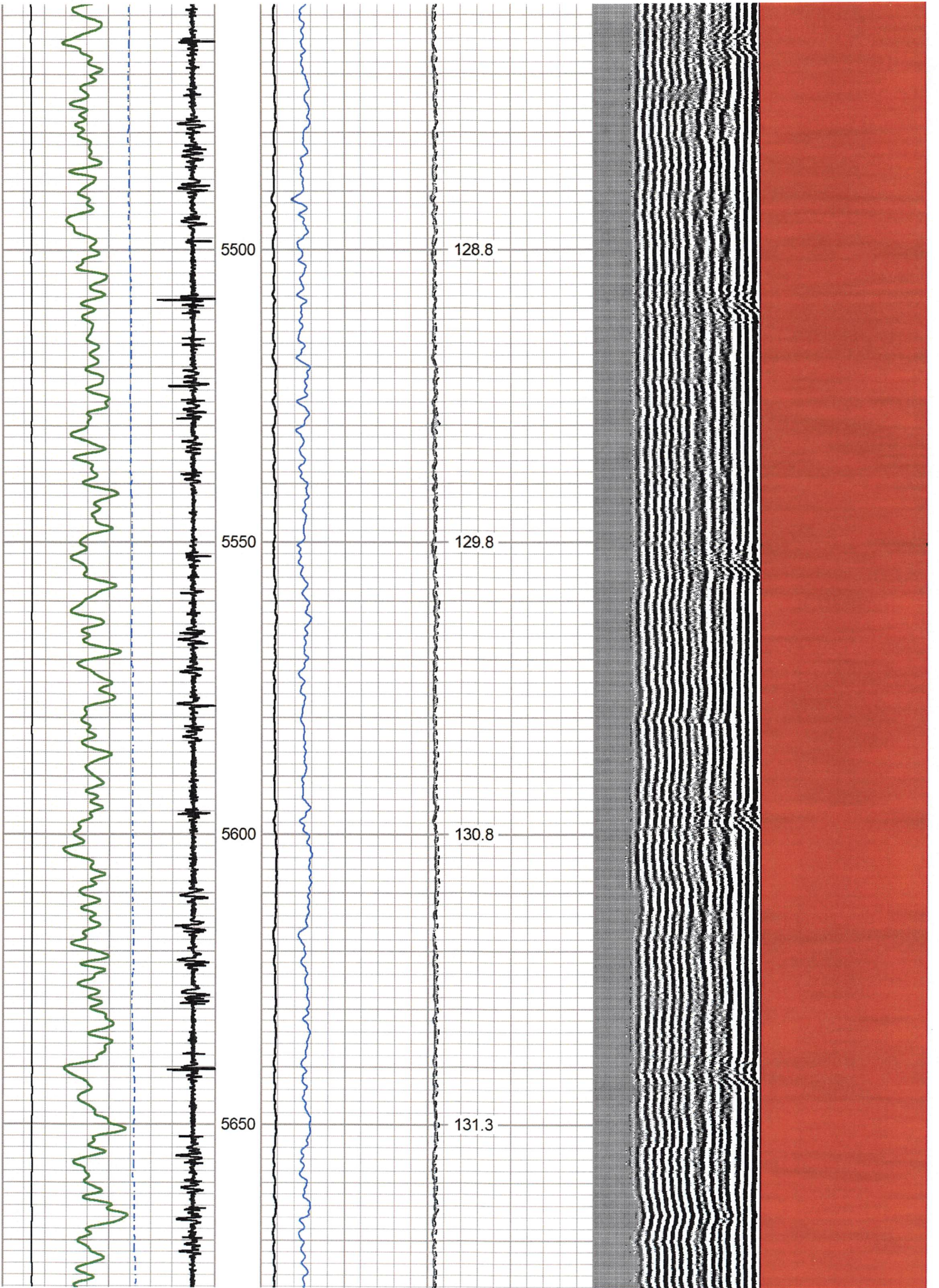


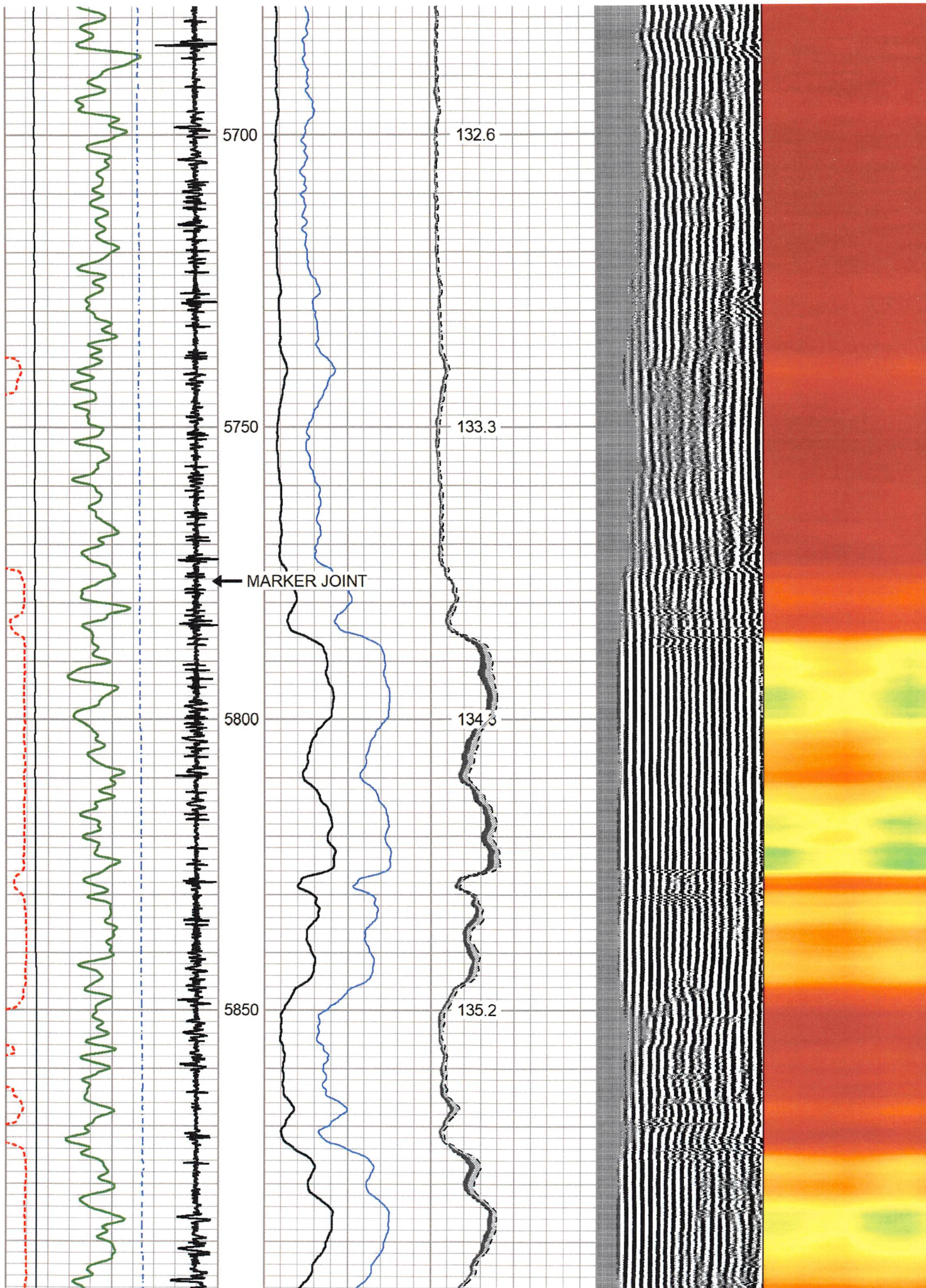


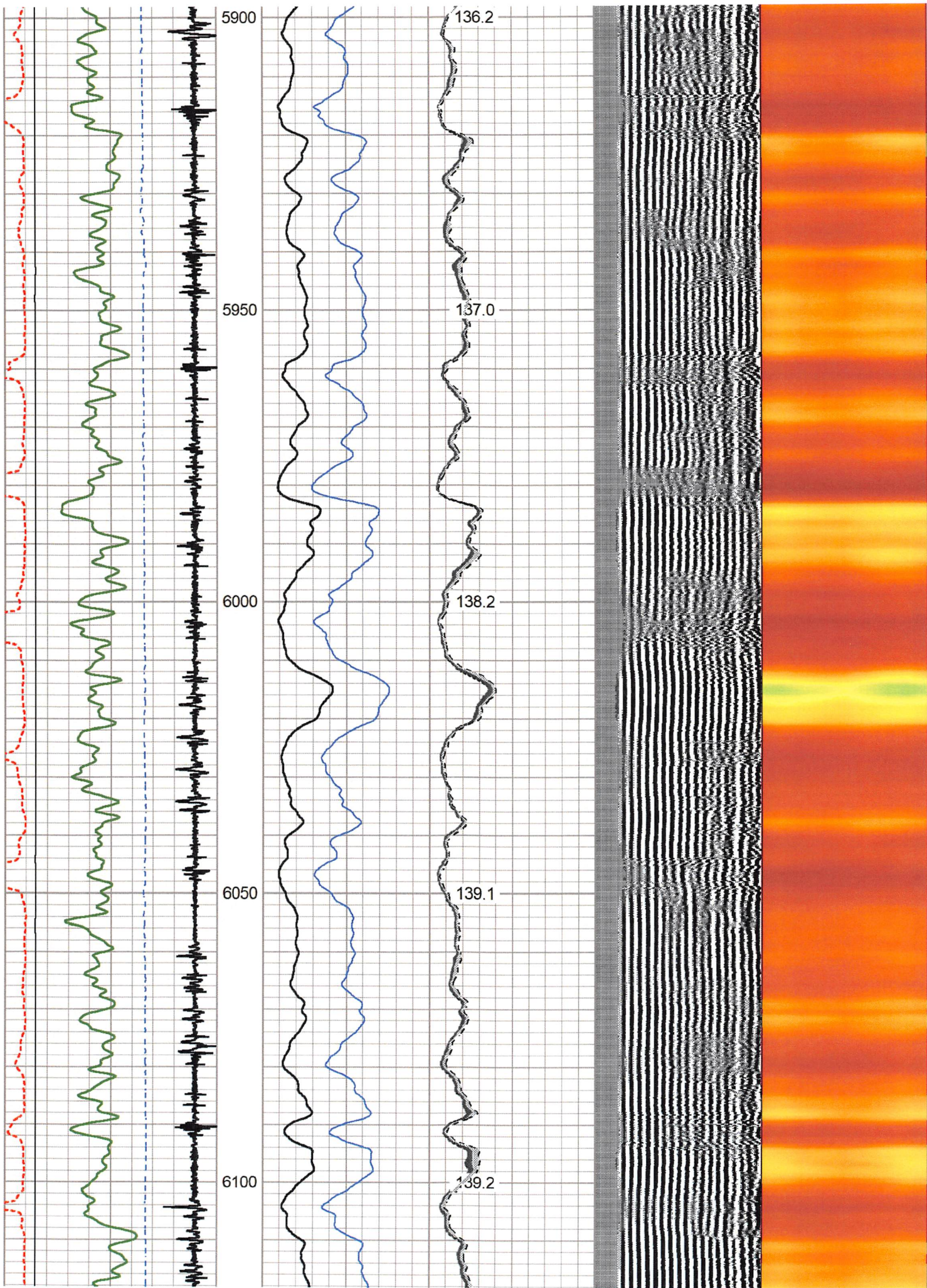


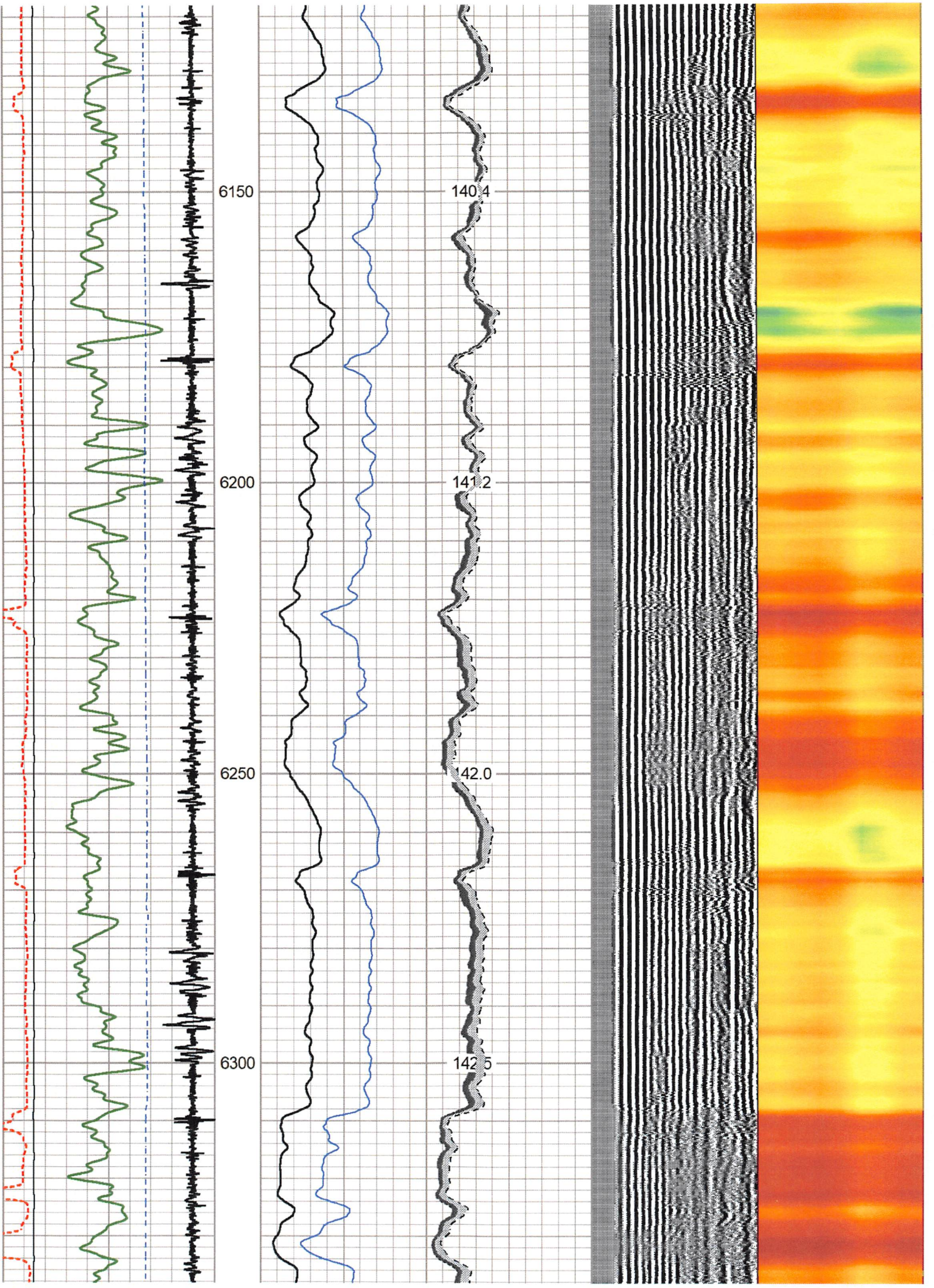


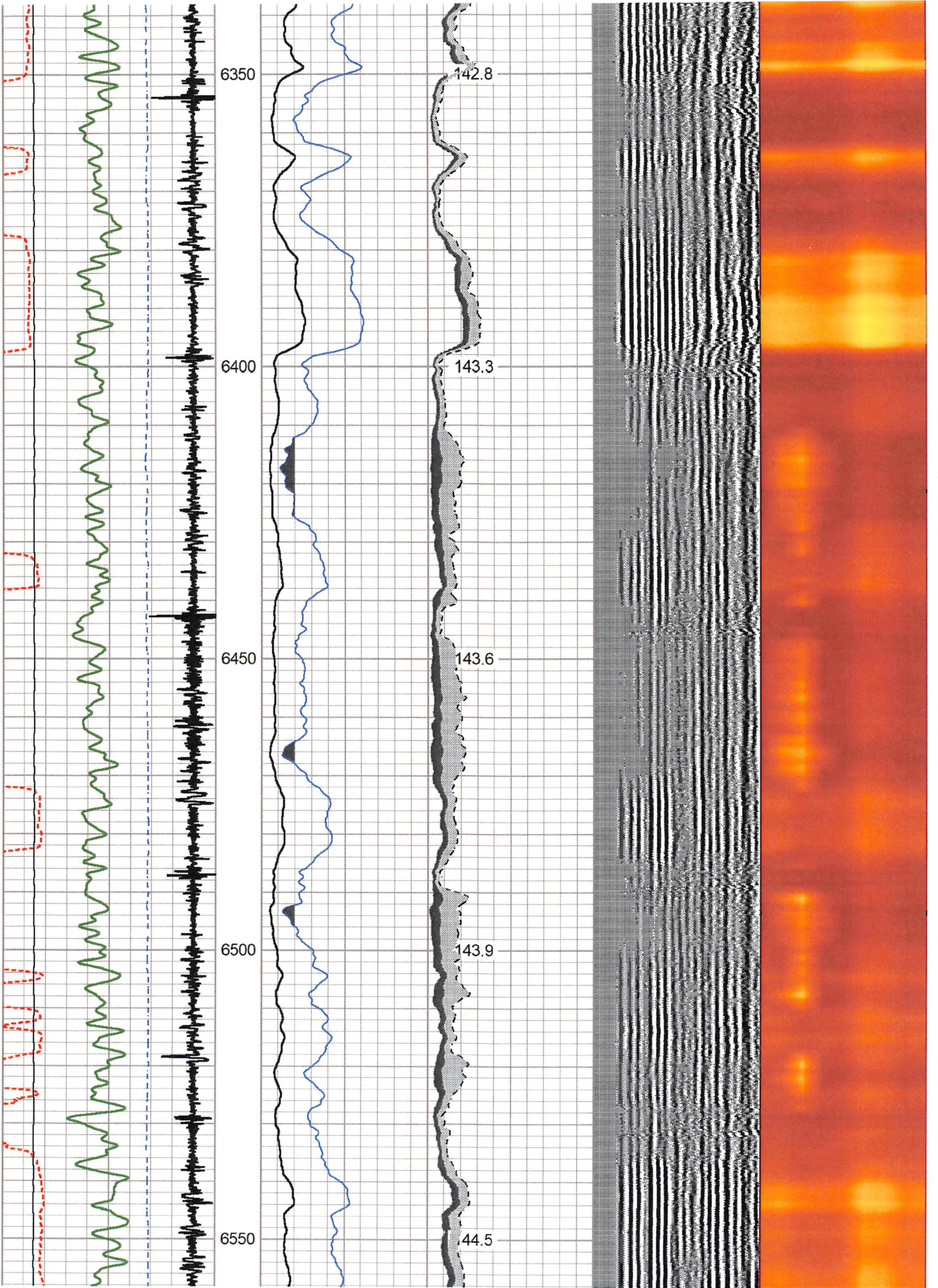




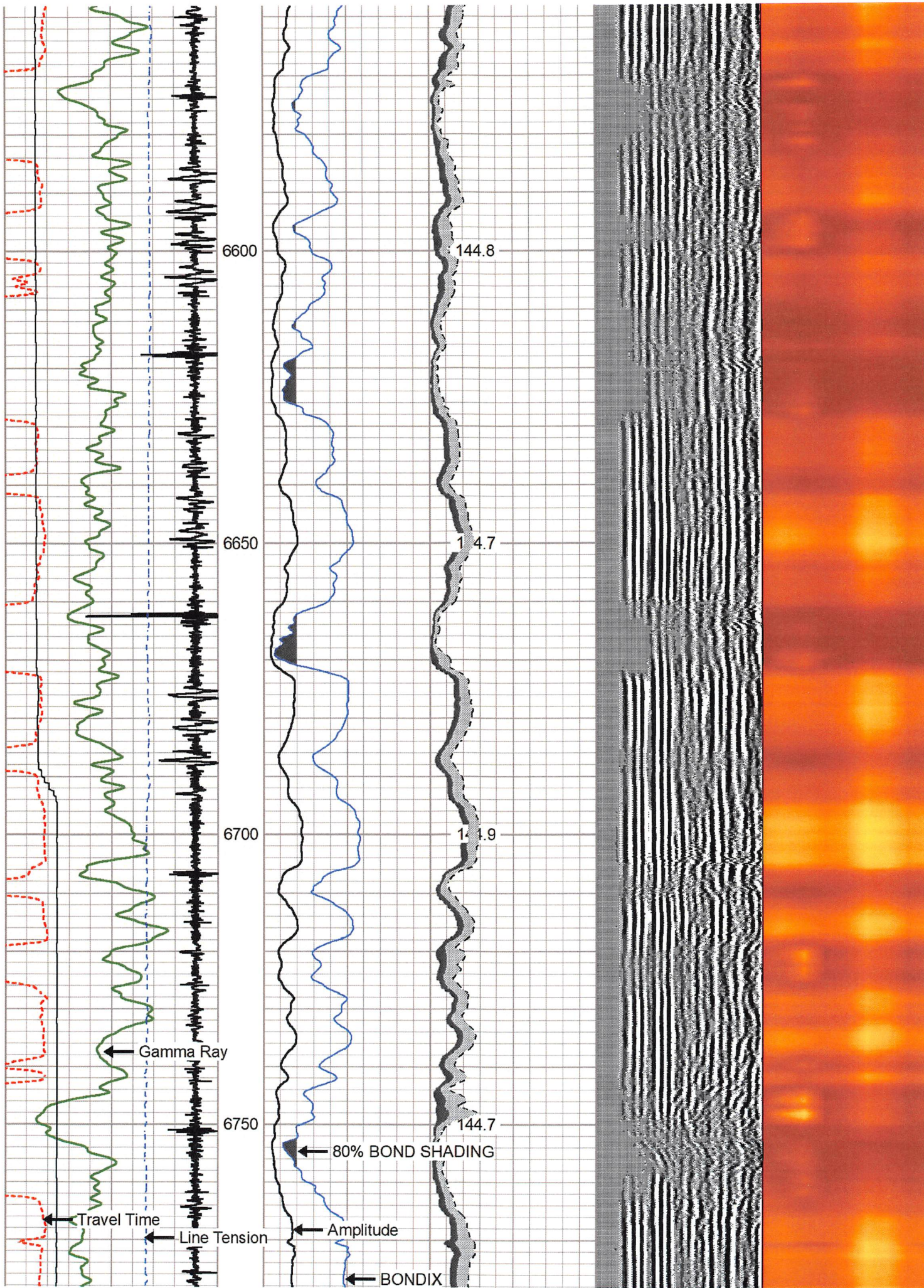


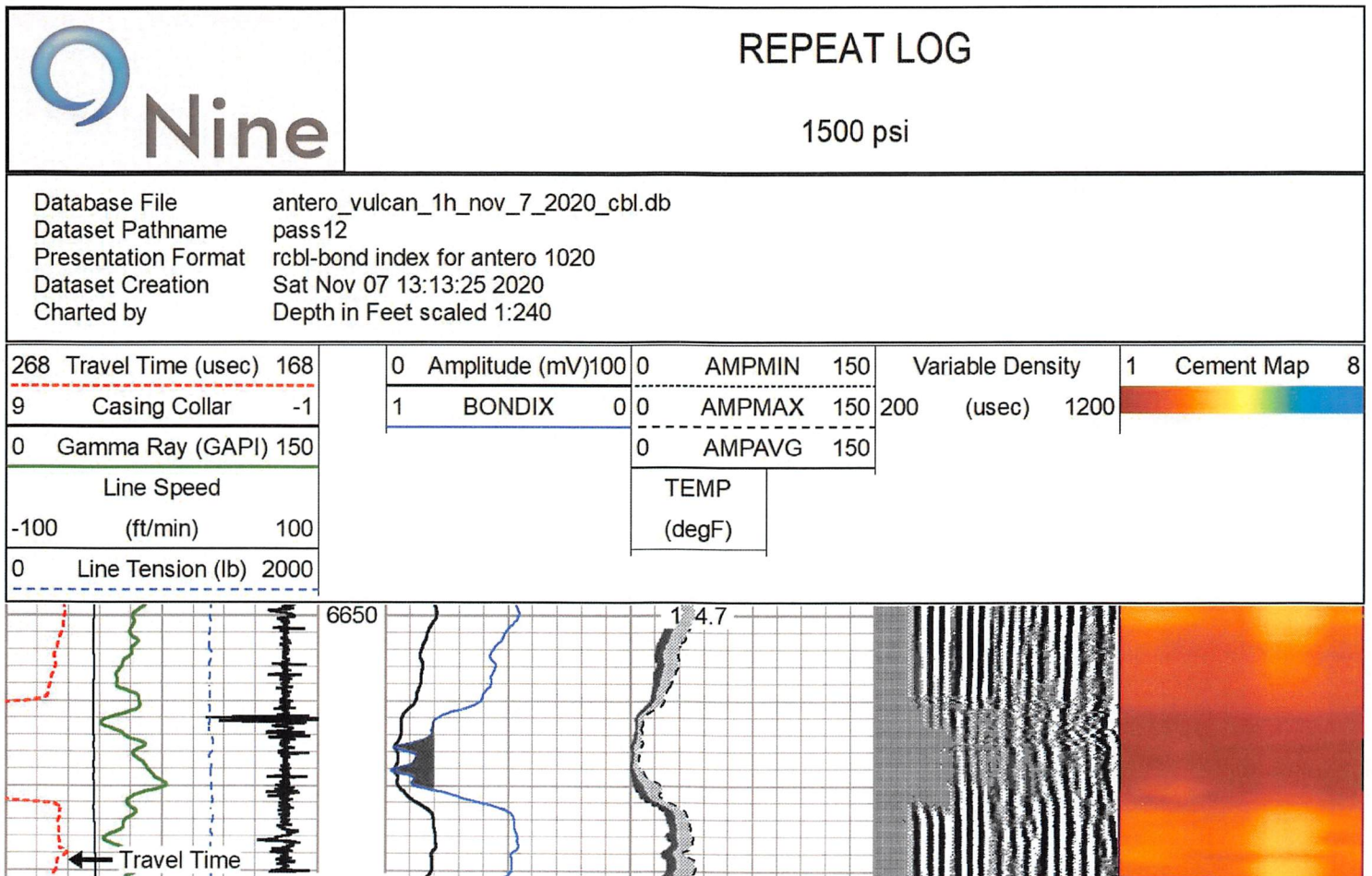
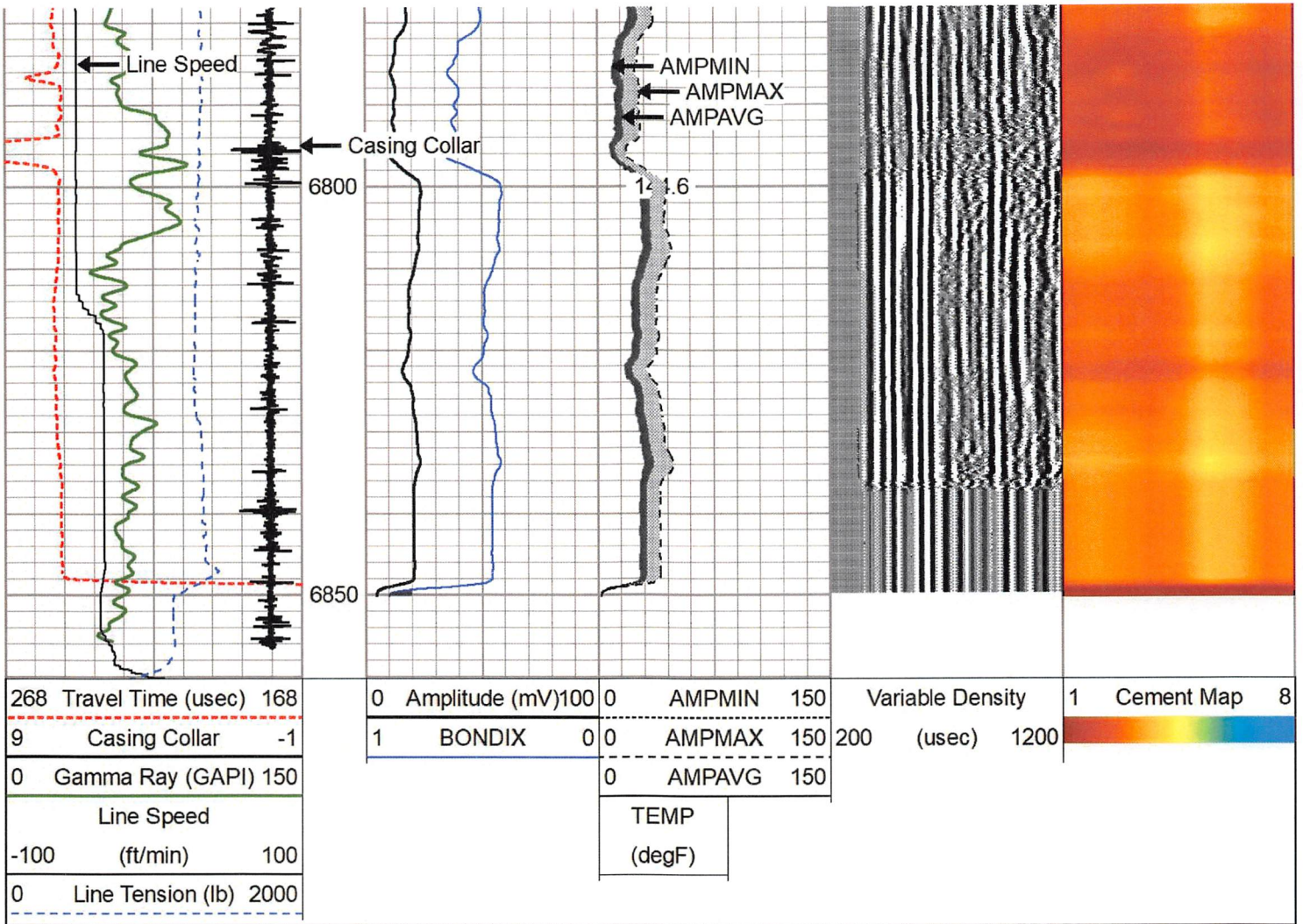


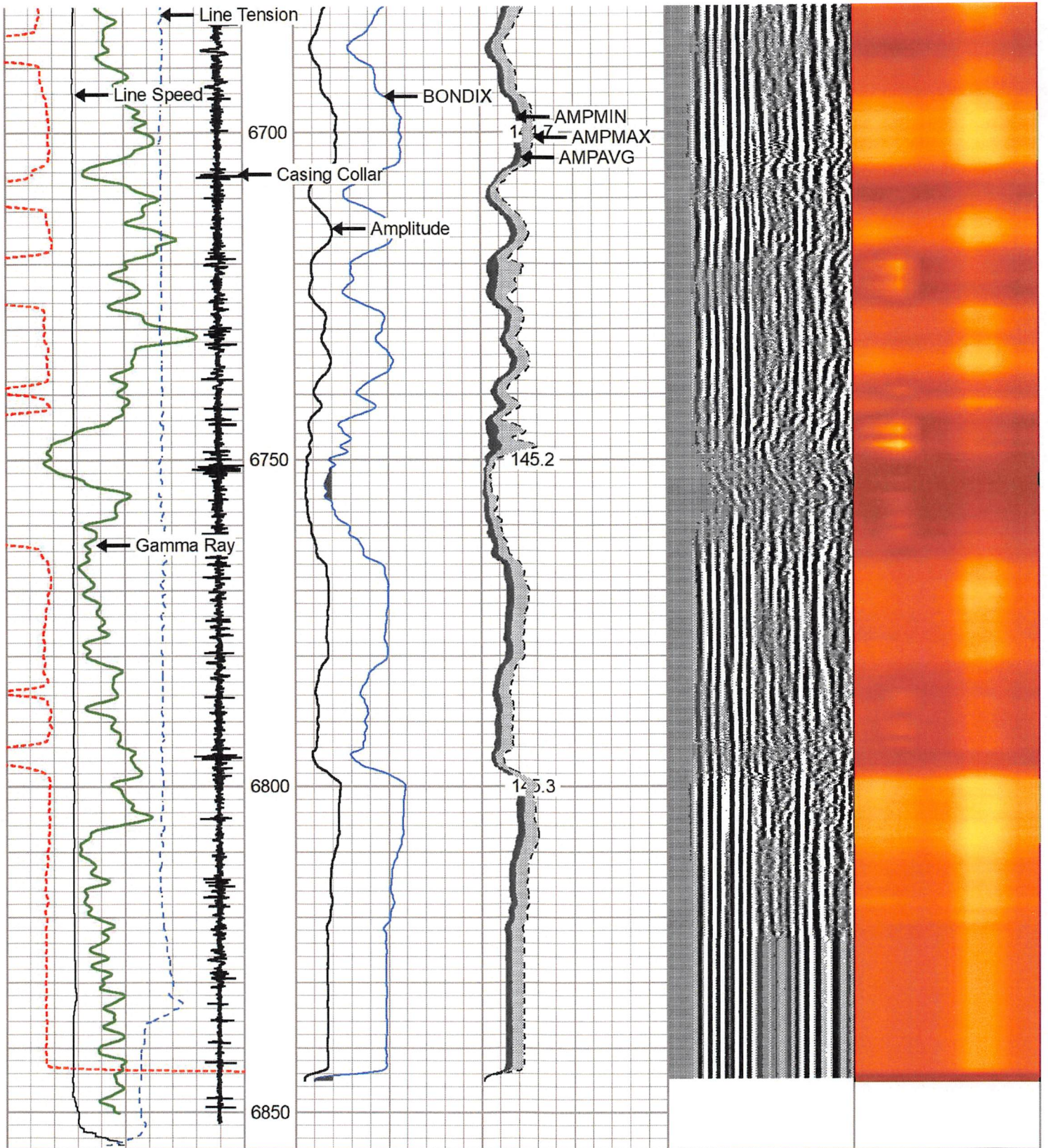












268	Travel Time (usec)	168
9	Casing Collar	-1
0	Gamma Ray (GAPI)	150
	Line Speed	
-100	(ft/min)	100
0	Line Tension (lb)	2000

0	Amplitude (mV)	100
1	BONDIX	0
0	AMPMIN	150
0	AMPMAX	150
0	AMPAVG	150
	TEMP	
	(degF)	

Variable Density  
200 (usec) 1200

1 Cement Map 8

**Top - Bottom**

BHTEMP_Src TEMP	BOREID in 8.5	BOTTEMP degF 100	CASEOD in 5.5	CASETHCK in 0	CASEWGHT lb/ft 23	MAXAMPL mV 71.9	MINAMPL mV 3.4
MINATTN db/ft 0.8	PERFS No	PPT usec 222	SRFTEMP degF 0	TDEPTH ft 0			

**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 antero\_vulcan\_1h\_nov\_7\_2020\_cbl.db  
 Dataset Pathname pass14  
 Dataset Creation Sat Nov 07 13:29:01 2020

**Gamma Ray Calibration Report**

Serial Number: FW1211-86  
 Tool Model: Probe  
 Performed: Sun Sep 13 14:03:29 2020

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps  
 Calibrator Reading: 1.0 cps

Sensitivity: 0.5000 GAPI/cps

**Segmented Cement Bond Log Calibration Report**

Serial Number: FW1312-32  
 Tool Model: Probe275T

Calibration Casing Diameter: 5.500 in  
 Calibration Depth: 4012.250 ft

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 Environmental Protection

Master Calibration, performed Sat Nov 07 12:42:28 2020:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.021	1.081	3.400	71.921	62.157	4.716
CAL	-0.021	1.627				
5'	-0.021	0.939	3.400	71.921	71.337	4.919
SUM						
S1	-0.021	1.020	0.000	100.000	96.027	2.020
S2	-0.021	1.033	0.000	100.000	94.849	2.011
S3	-0.021	1.082	0.000	100.000	90.693	1.914
S4	-0.021	1.137	0.000	100.000	86.382	1.824
S5	-0.021	1.199	0.000	100.000	81.957	1.727
S6	-0.021	1.181	0.000	100.000	83.170	1.764
S7	-0.021	1.115	0.000	100.000	88.012	1.848
S8	-0.021	1.074	0.000	100.000	91.282	1.925

Internal Reference Calibration, performed Thu Sep 27 16:01:58 2018:

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	-0.021	1.627	1.000	0.000

Air Zero Calibration, performed Sat Nov 07 10:29:21 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	

	Company	ANTERO
	Well	VULCAN 1H
	Field	RABBIT EARS
	County	TYLER
	State	WEST VIRGINIA

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WV Department of  
Environmental Protection