



**Radial Cement Bond  
Variable Density Log  
Gamma Ray/CCL/Temperature**

Company Antero Resources  
Well Little 1H  
Field Marcellus  
County Tyler  
State WV

Country U.S.A.  
RECEIVED  
Office of Oil and Gas  
AUG 21 2023  
WV Department of  
Environmental Protection

Location:

API #: 47-095-02811

Country U.S.A.

Other Services

Company Antero Resources  
Well Little 1H  
Field Marcellus  
County Tyler  
State WV

SEC TWP RGE  
Permanent Datum Ground Level Elevation 937'  
Log Measured From Kelly Bushing 30'  
Drilling Measured From Kelly Bushing

Elevation  
K.B. 967'  
D.F. 967'  
G.L. 937'

Date	02-April-2023						
Run Number	ONE						
Depth Driller	17,792'						
Depth Logger	6,400'						
Bottom Logged Interval	6,396'						
Top Log Interval	Surface						
Open Hole Size	NA						
Type Fluid	Fresh Water						
Density / Viscosity	8.6 LB/GAL						
Max. Recorded Temp.	138.1						
Estimated Cement Top	N/A						
Time Well Ready	11:20						
Time Logger on Bottom	12:10						
Equipment Number	116						
Location	Charleroi, PA						
Recorded By	Calvin Drummond						
Witnessed By	Cory Porter						
Borehole Record			Tubing Record				
Run Number	Bit	From	To	Size	Weight	From	To
Casing Record	Size	Wgt/Ft	Top	Bottom			
Surface String	13.375"	54.5#	Surface	Surface			594'
Prot. String	9.625"	36#	Surface	Surface			3,299'
Production String	5.5	23#	Surface	Surface			17,792'
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

Comments

Log Correlated to Marker Joint at (5,671' - 5,681')  
Depth Correction +4

Main Pass 1500 PSI  
Repeat Pass 0 PSI

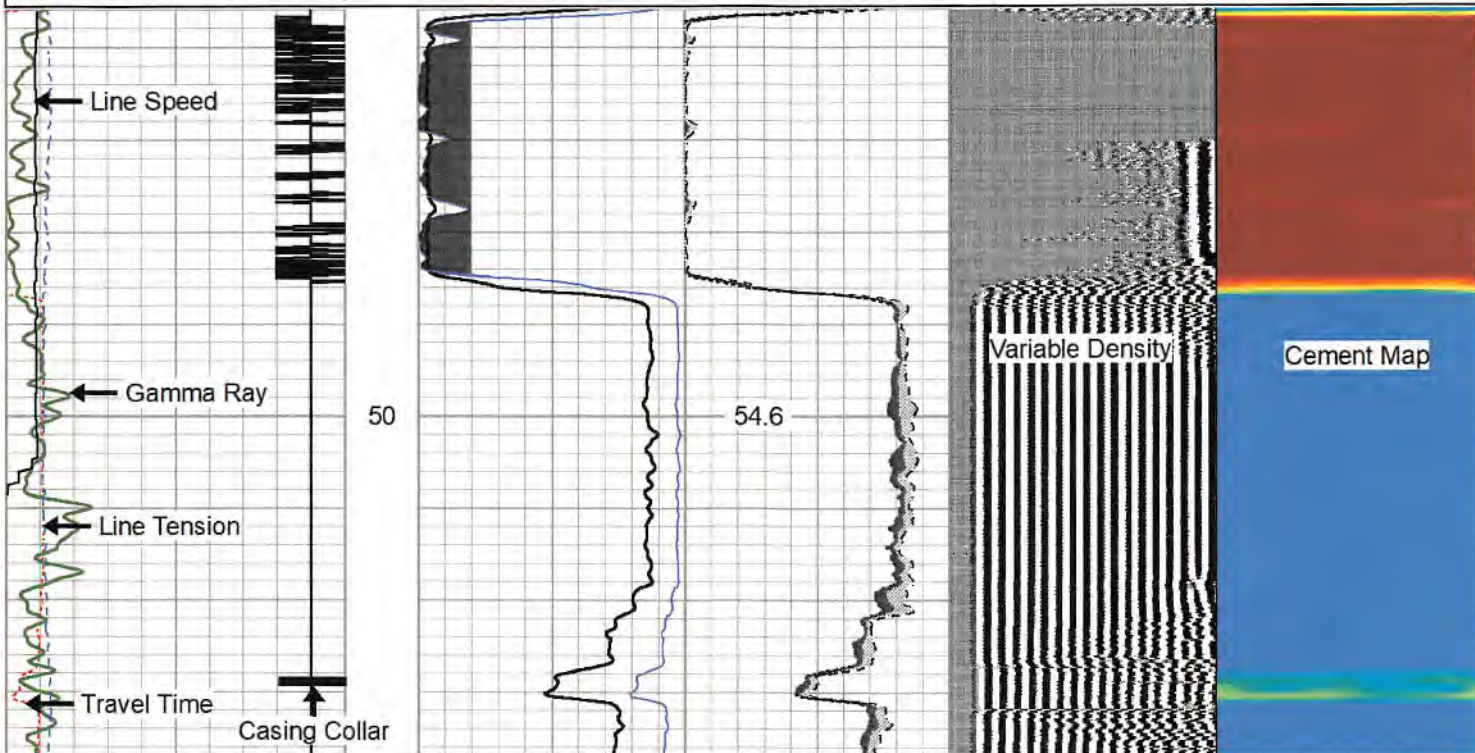
Thank You For Choosing Nine Energy Service Wireline.Charleroi,PA

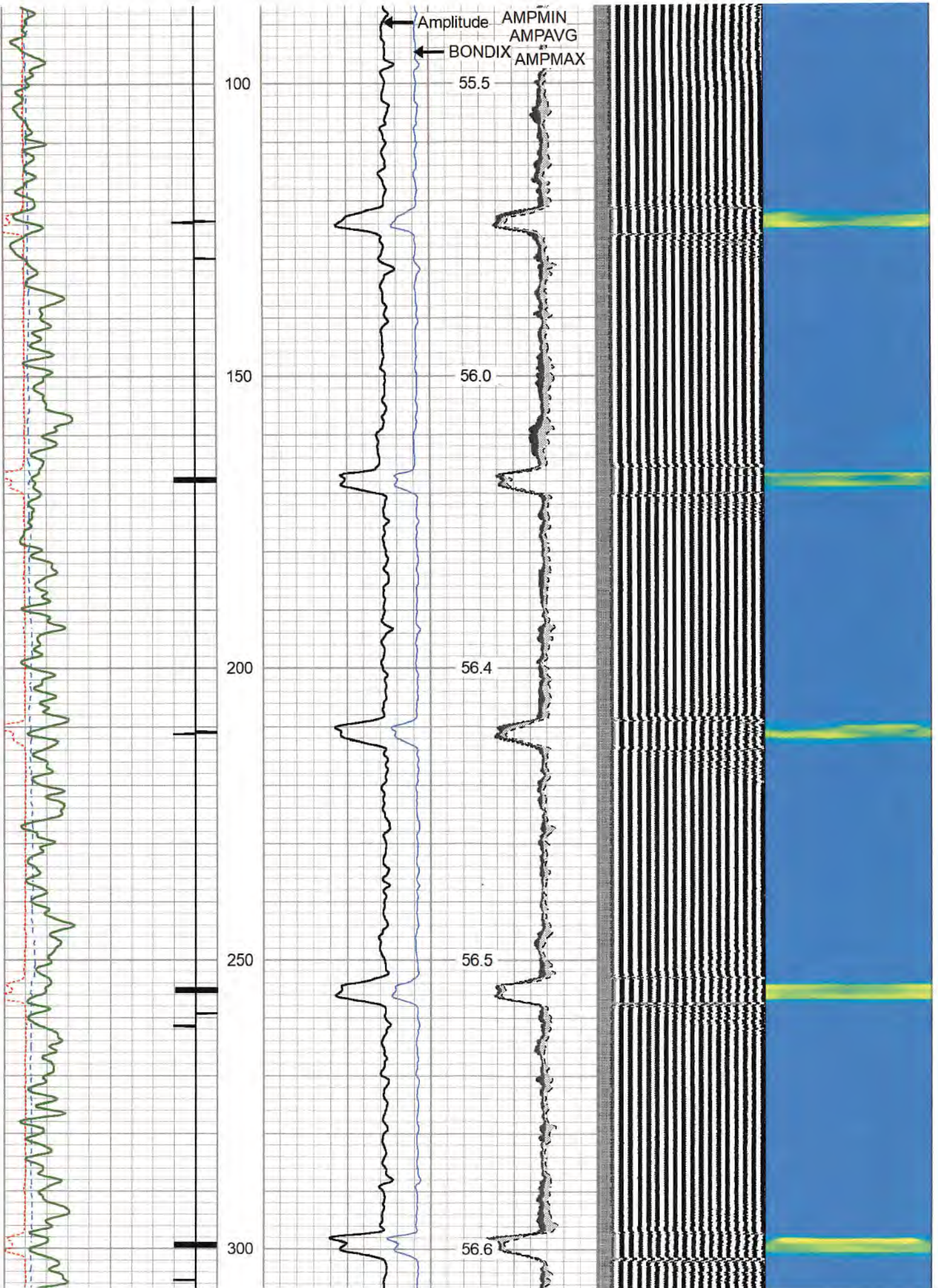


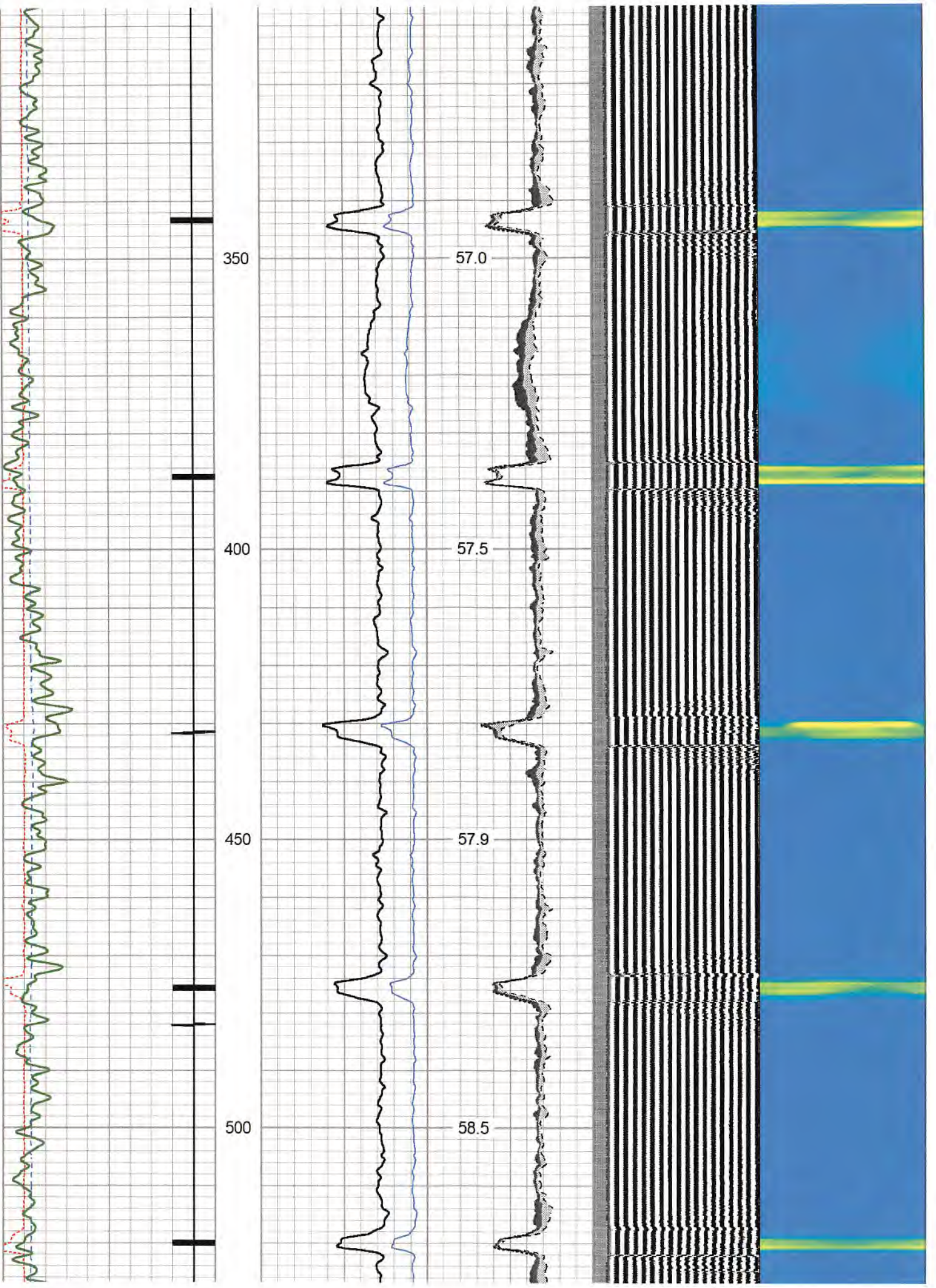
# Main Pass 1500 PSI

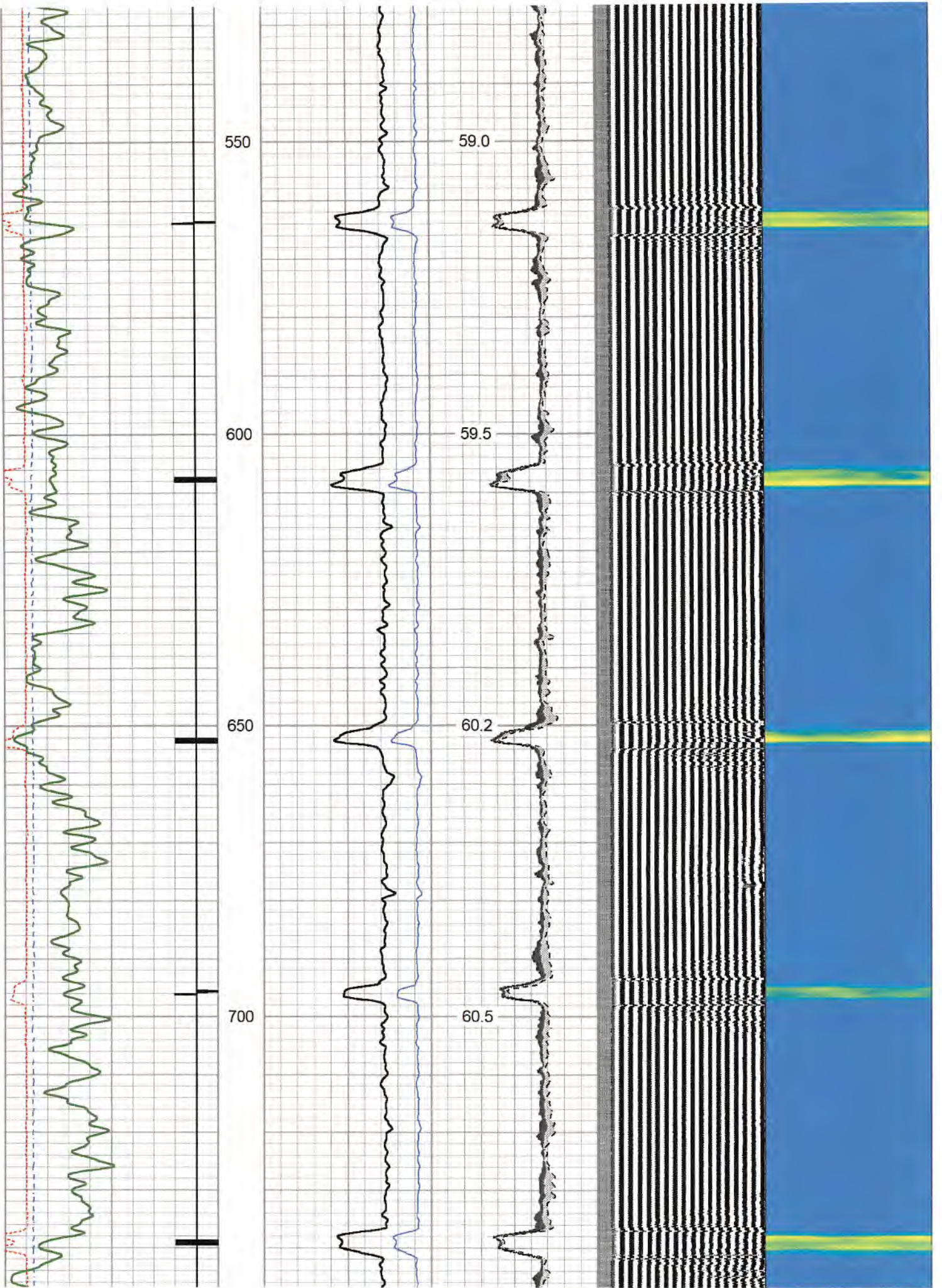
Database File antero\_little\_1h\_rcbl\_02\_april\_2023.db  
Dataset Pathname pass6  
Presentation Format rcbl-bond index for antero 1020  
Dataset Creation Sun Apr 02 12:11:16 2023  
Charted by Depth in Feet scaled 1:240

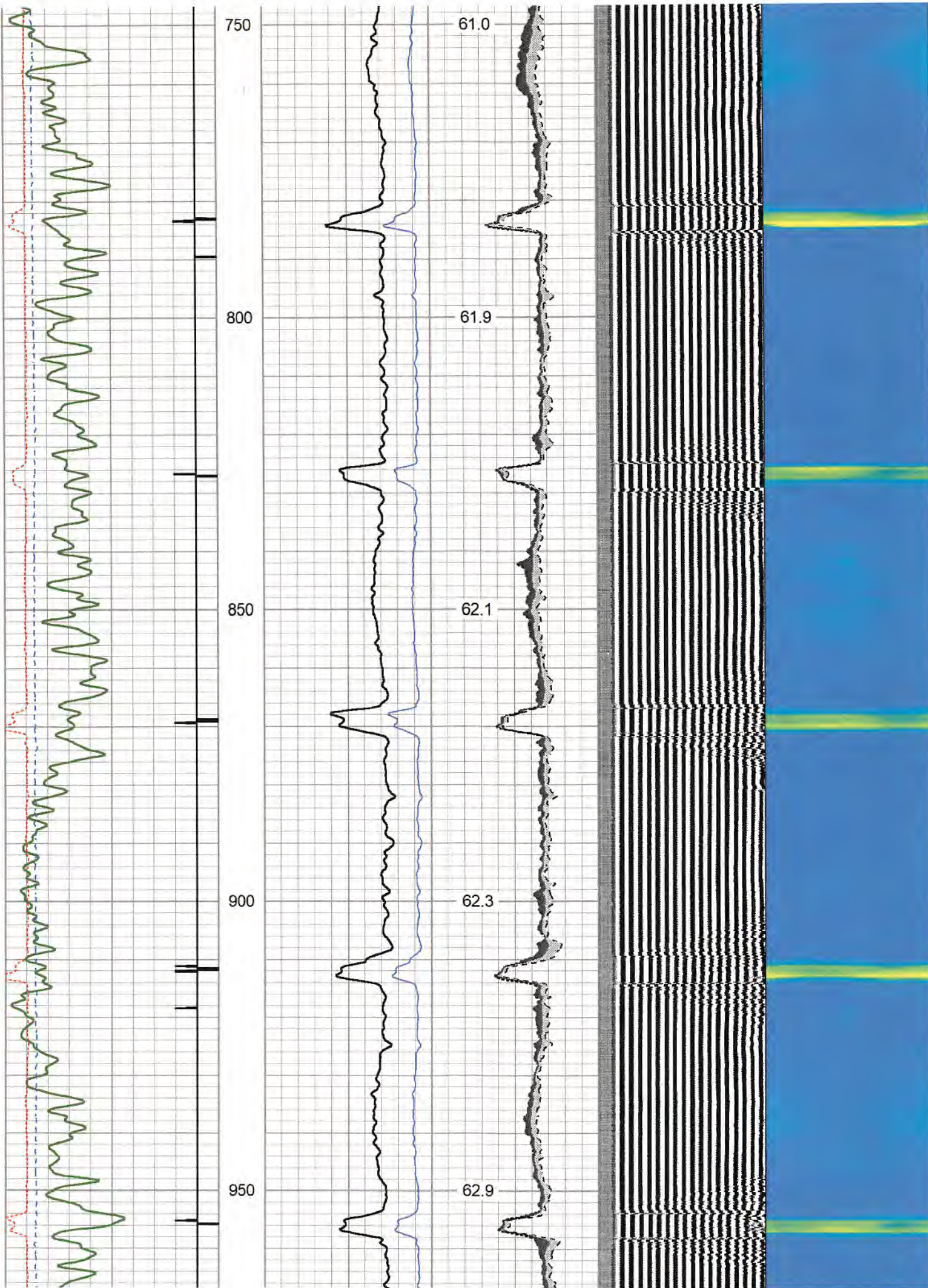
268	Travel Time (usec)	168	0	Amplitude (mV)	100	0	AMPMIN	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	1	BONDIX	0	0	AMPMAX	150	300 (usec)	1200		
0	Gamma Ray (GAPI)	150	0	AMPAVG	150							
Line Speed			TEMP									
-100	(ft/min)	100	(degF)									
0	Line Tension (lb)	2000										

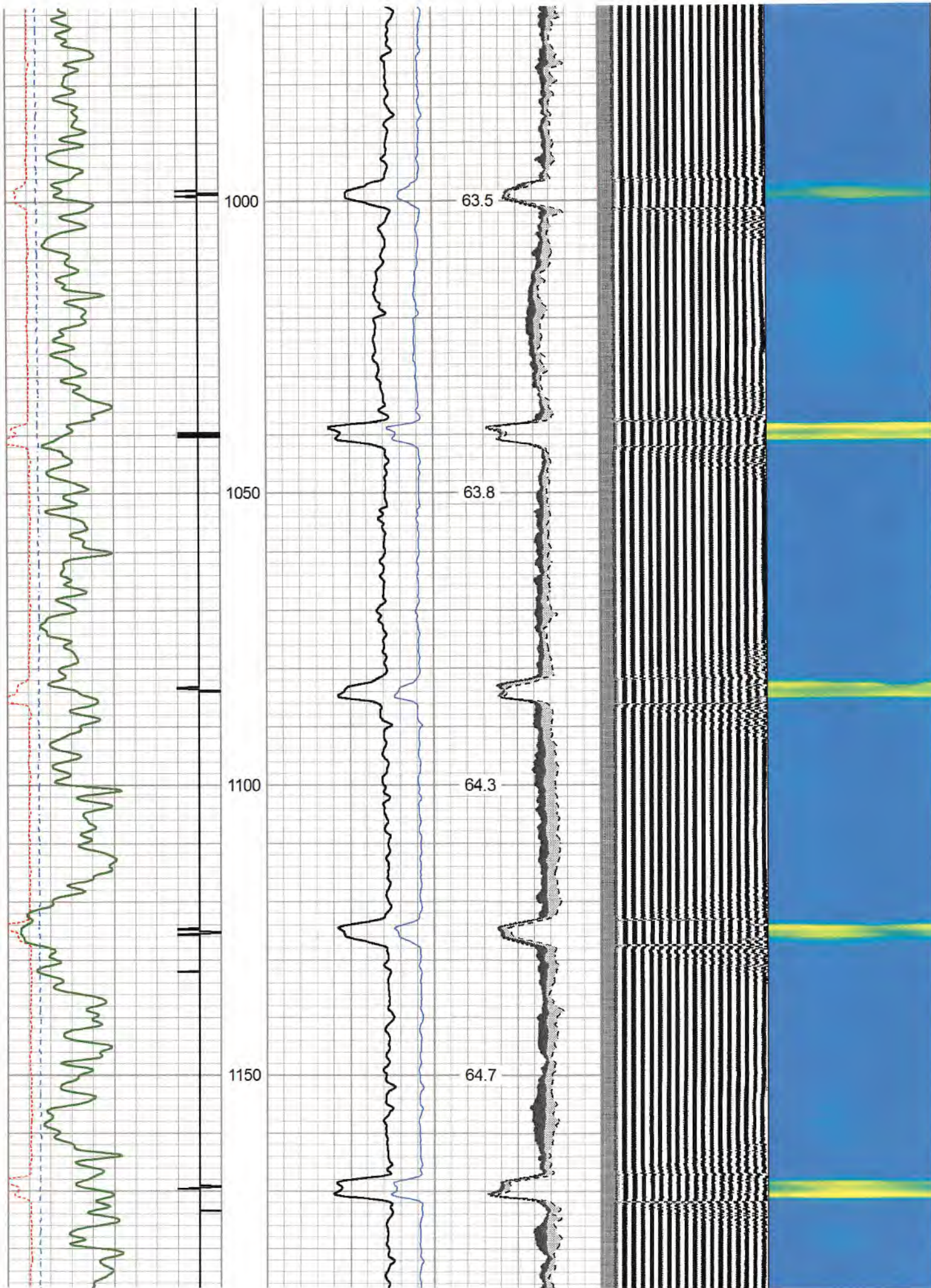


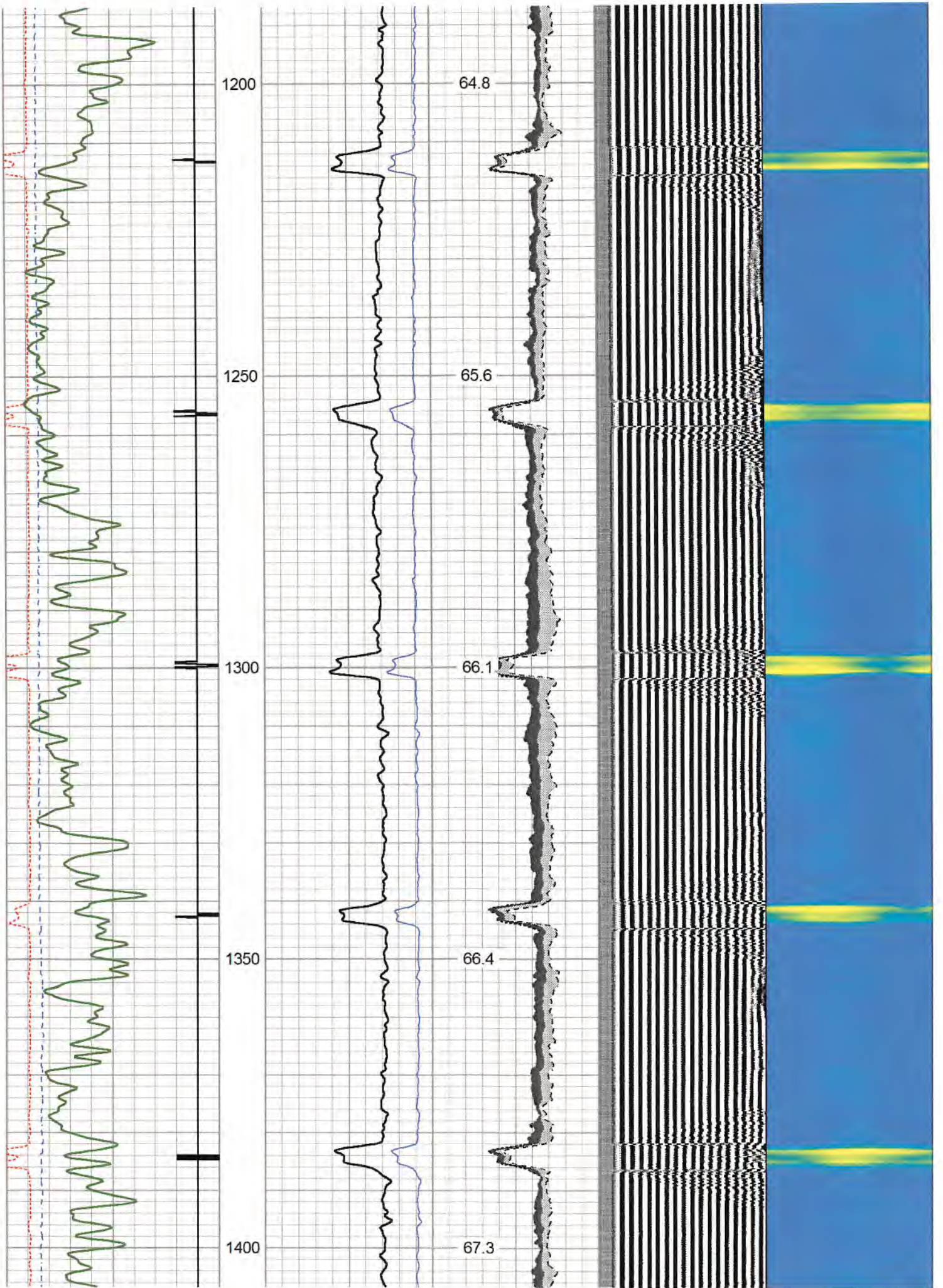




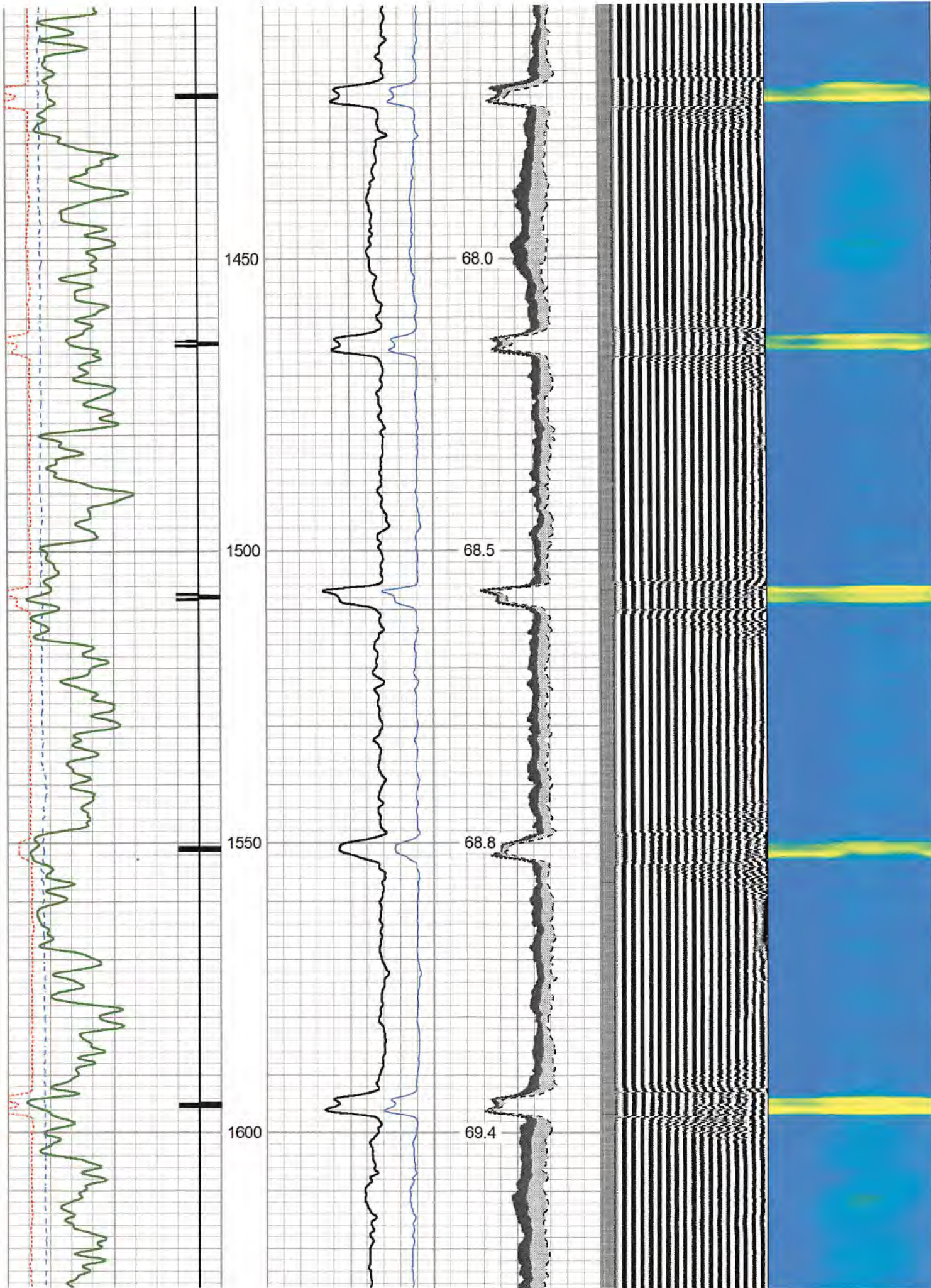


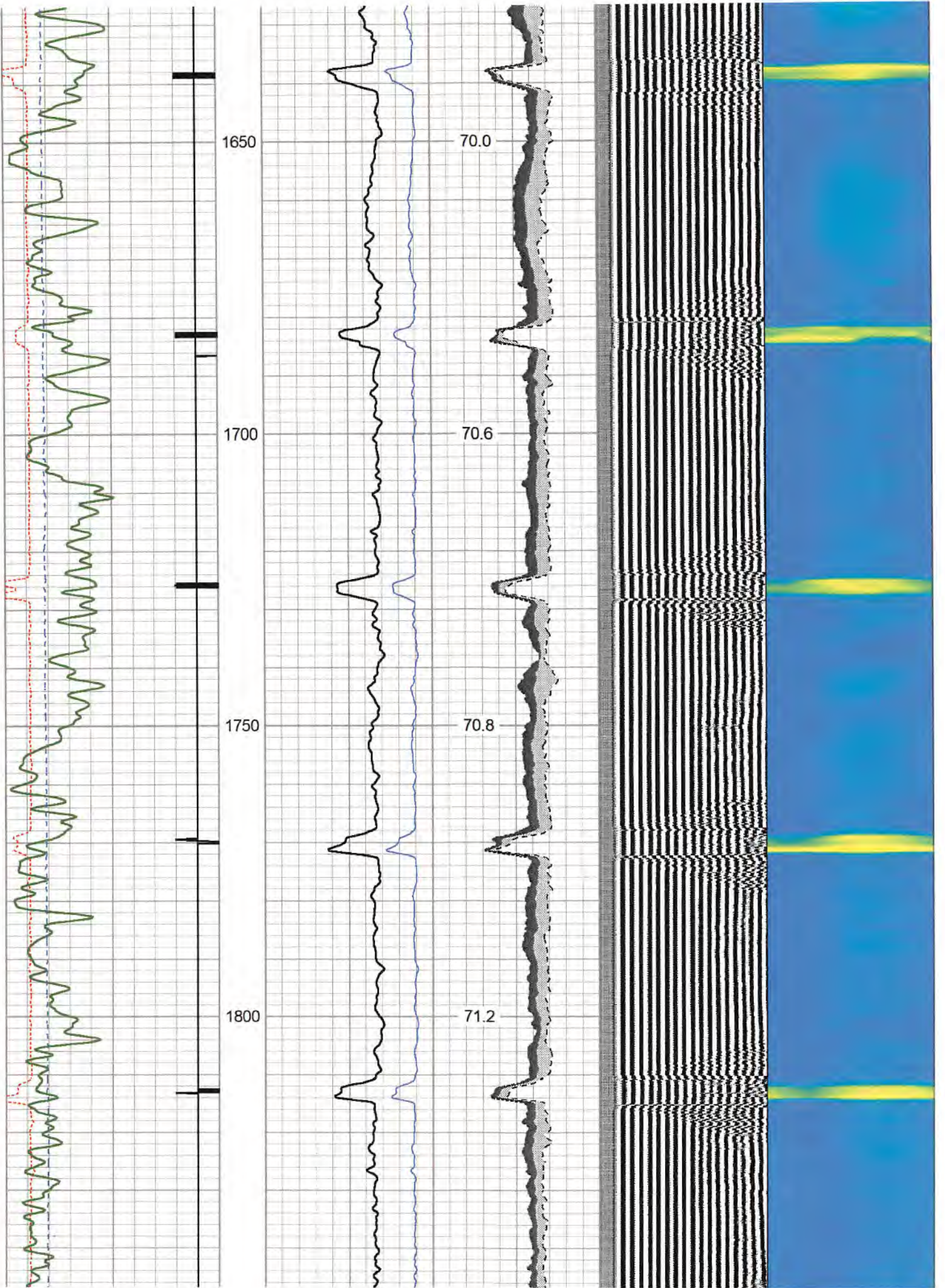


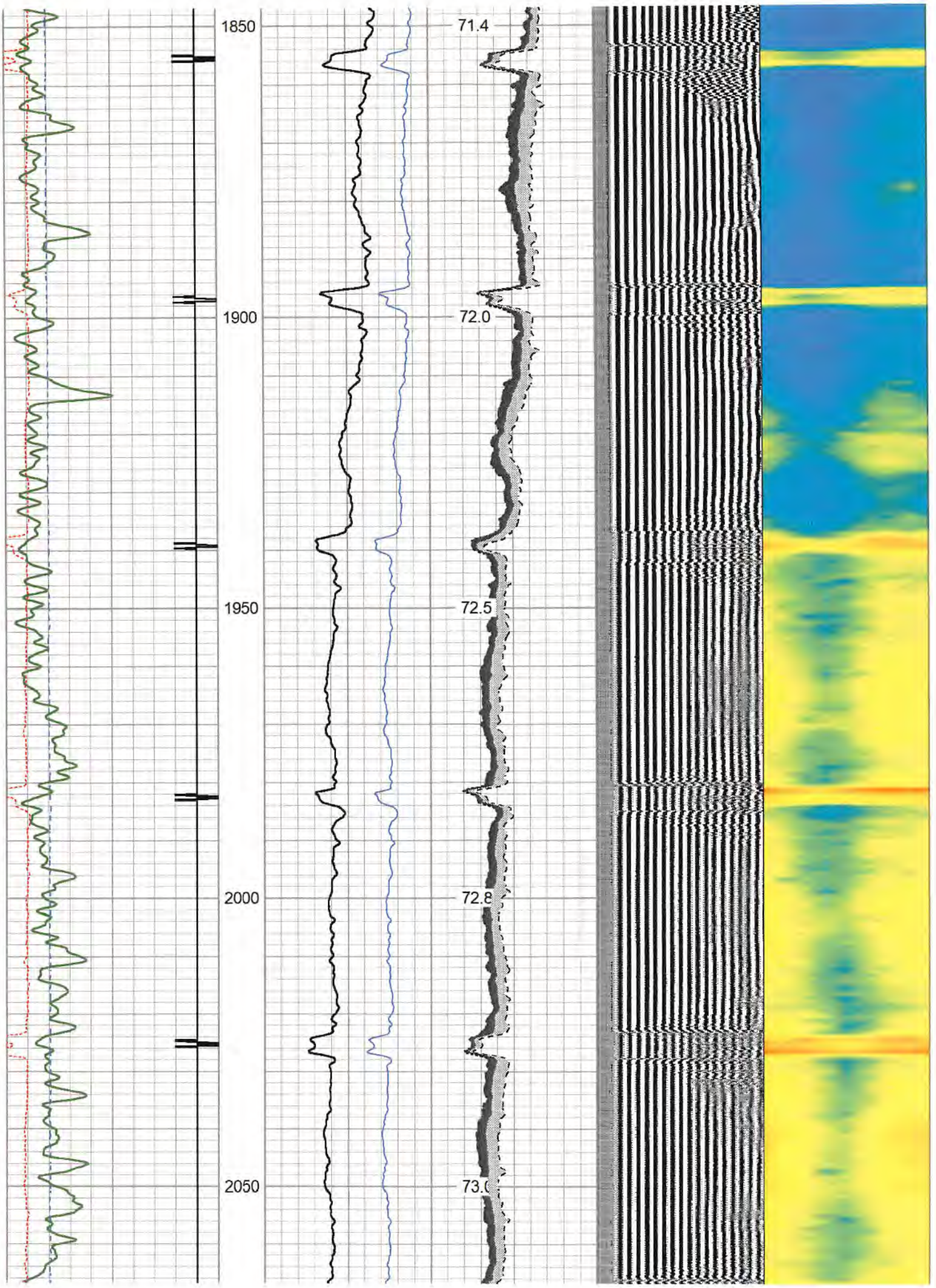


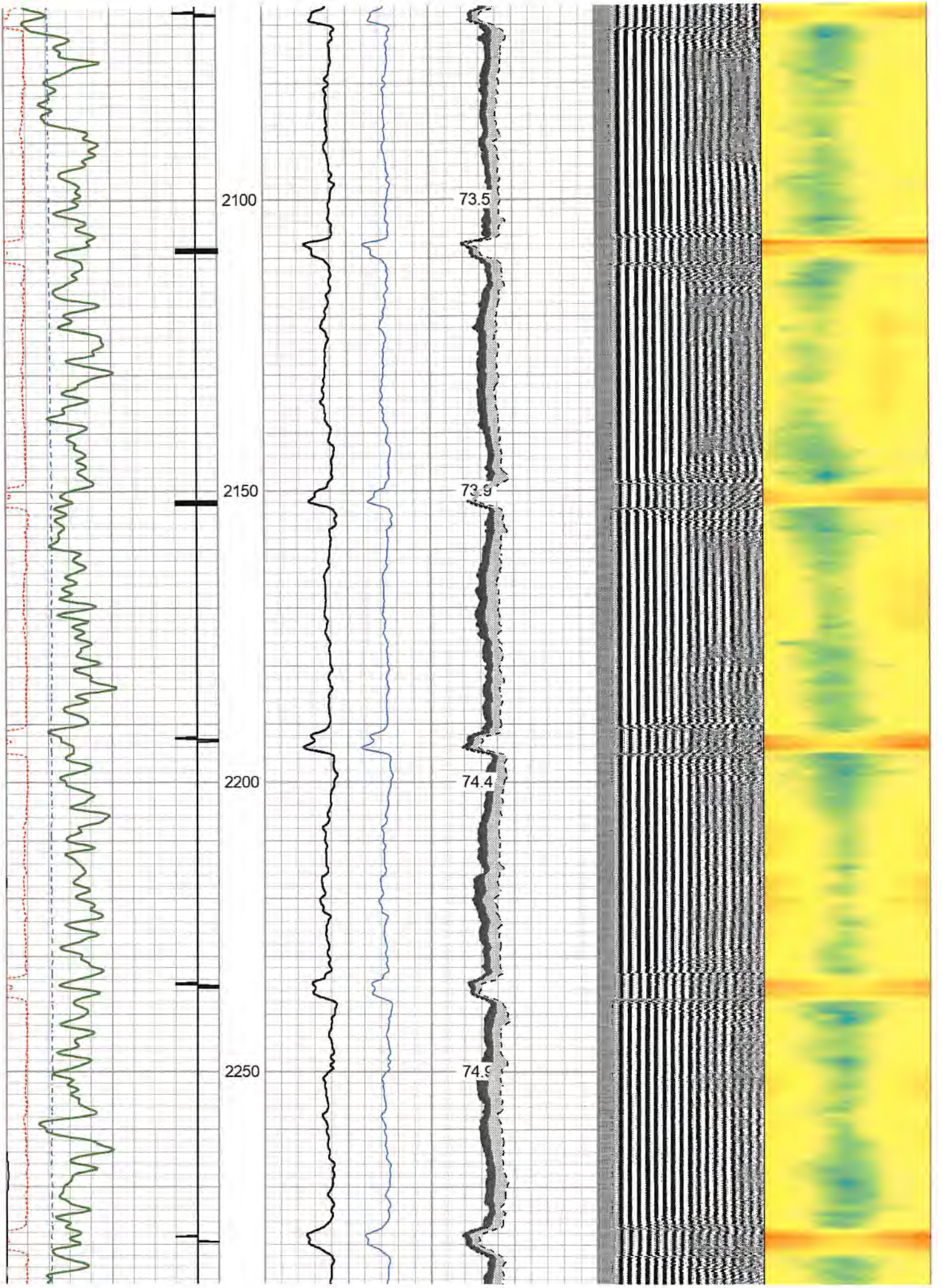


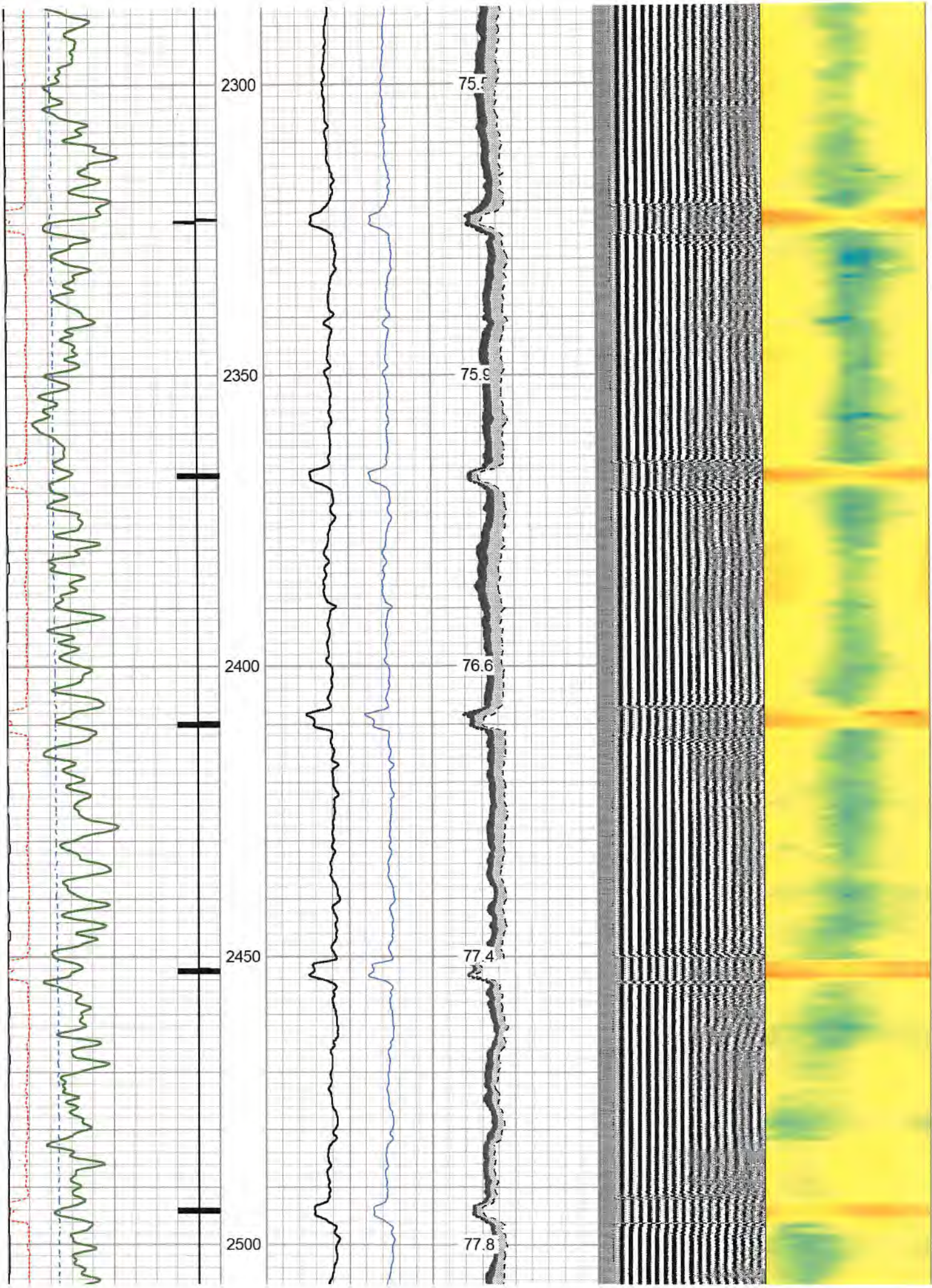


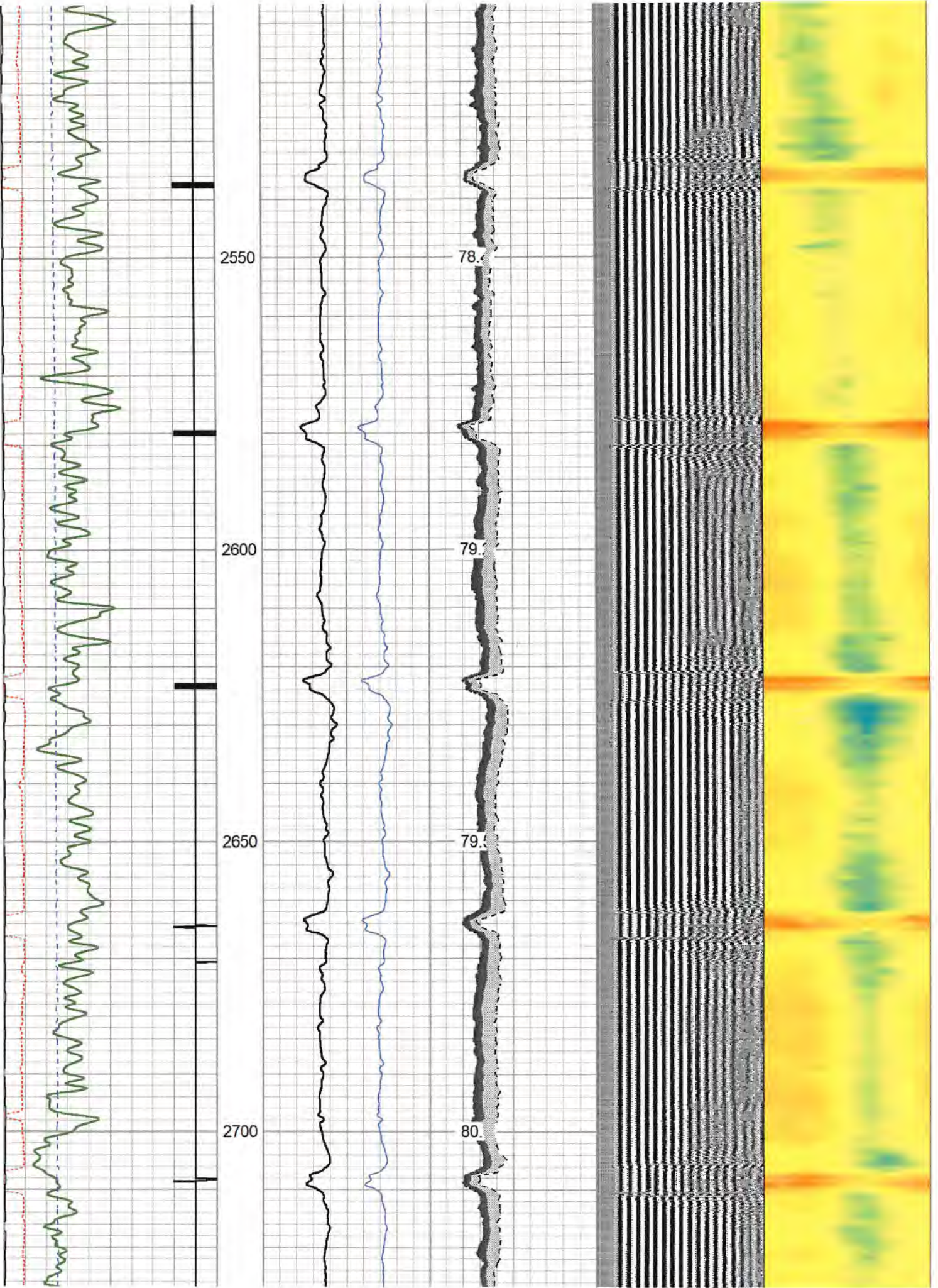


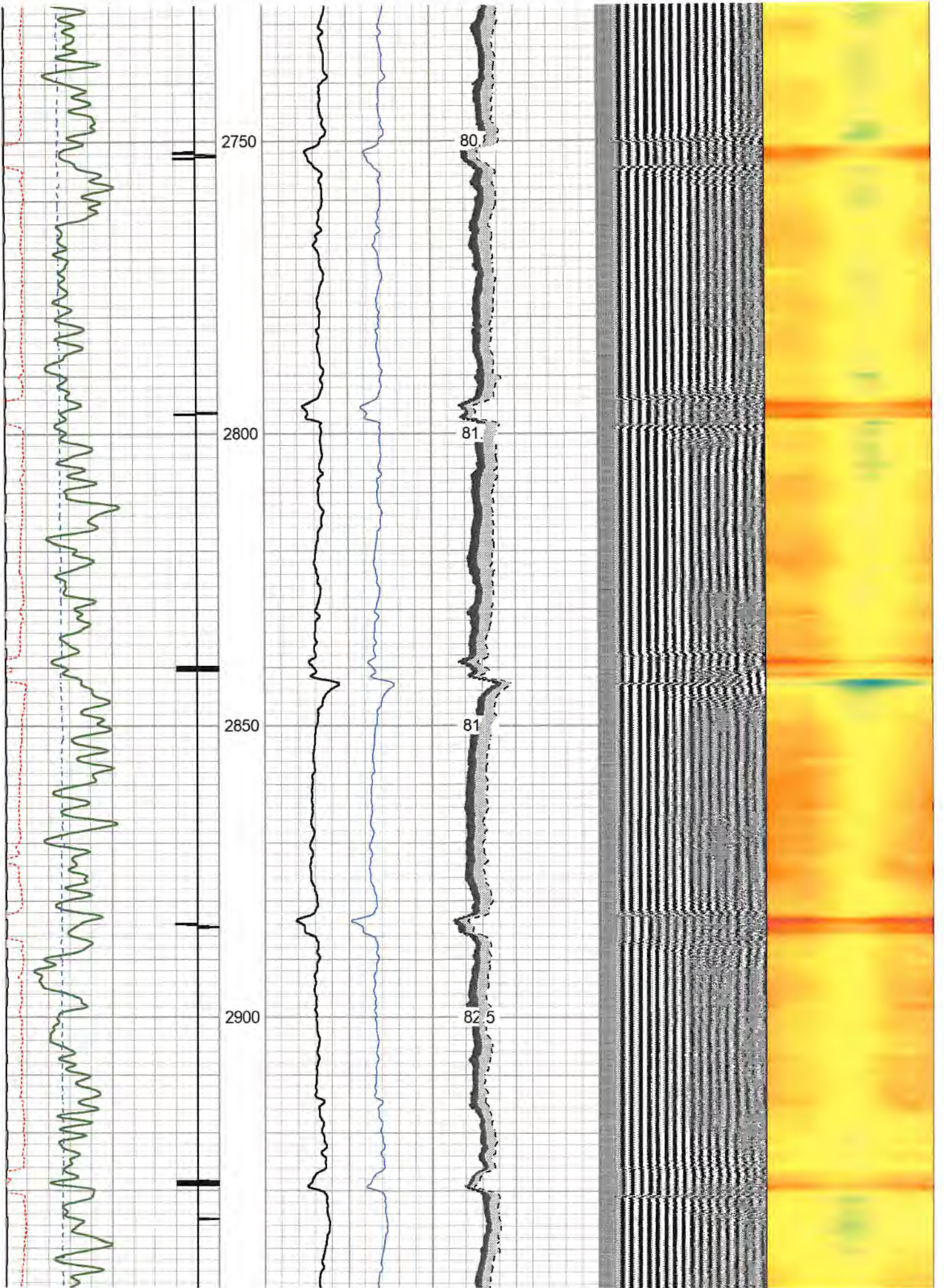


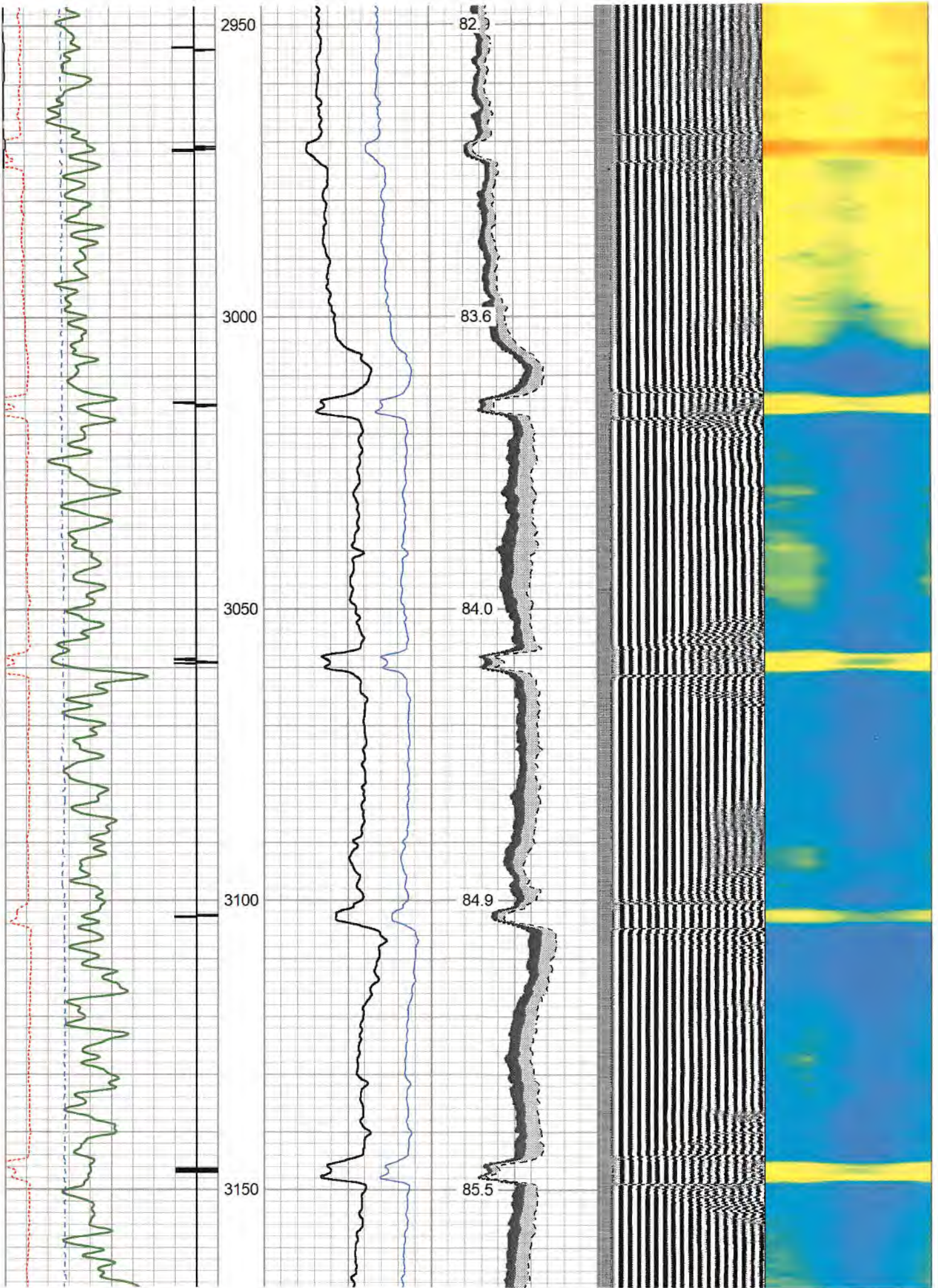




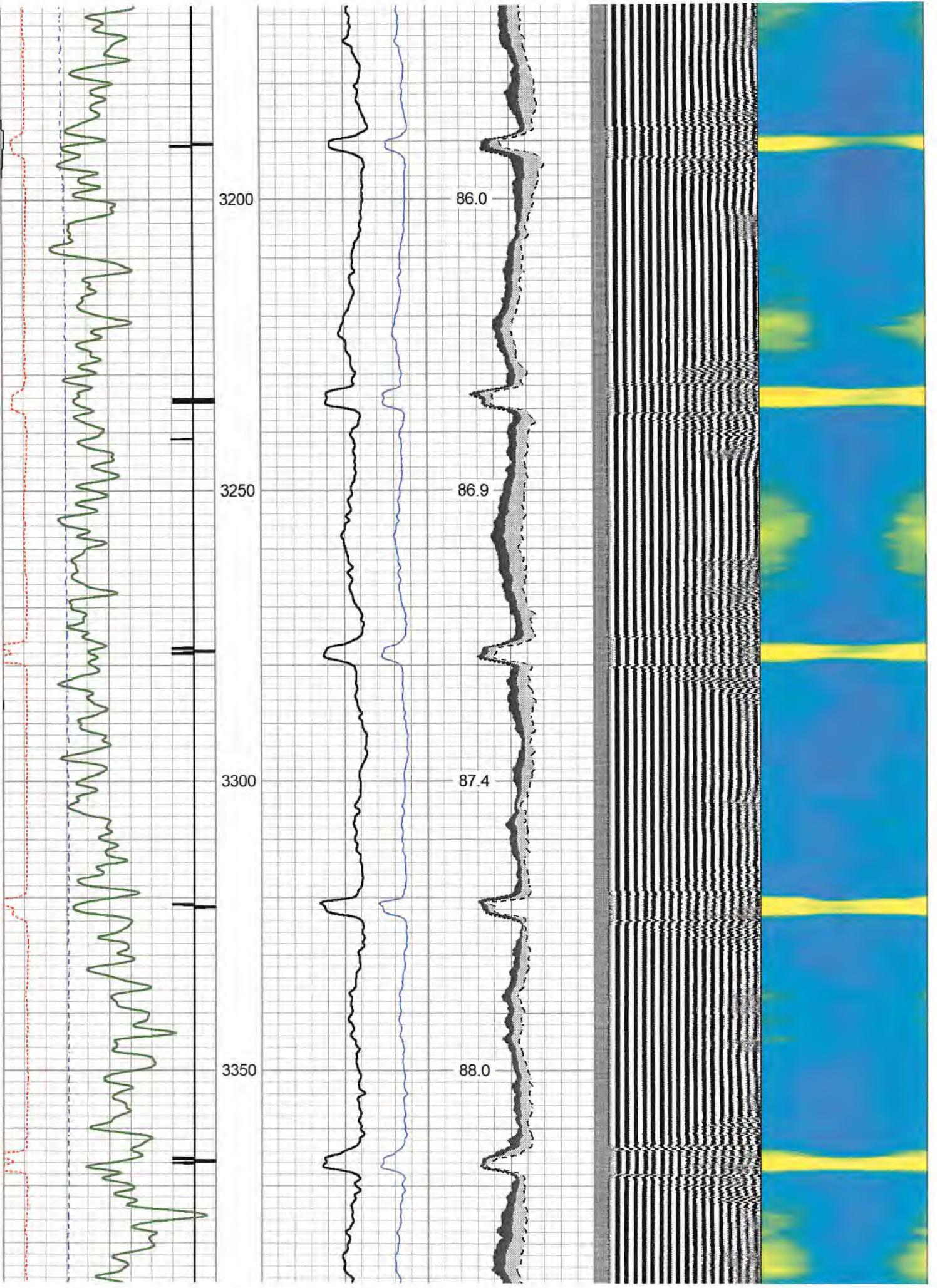


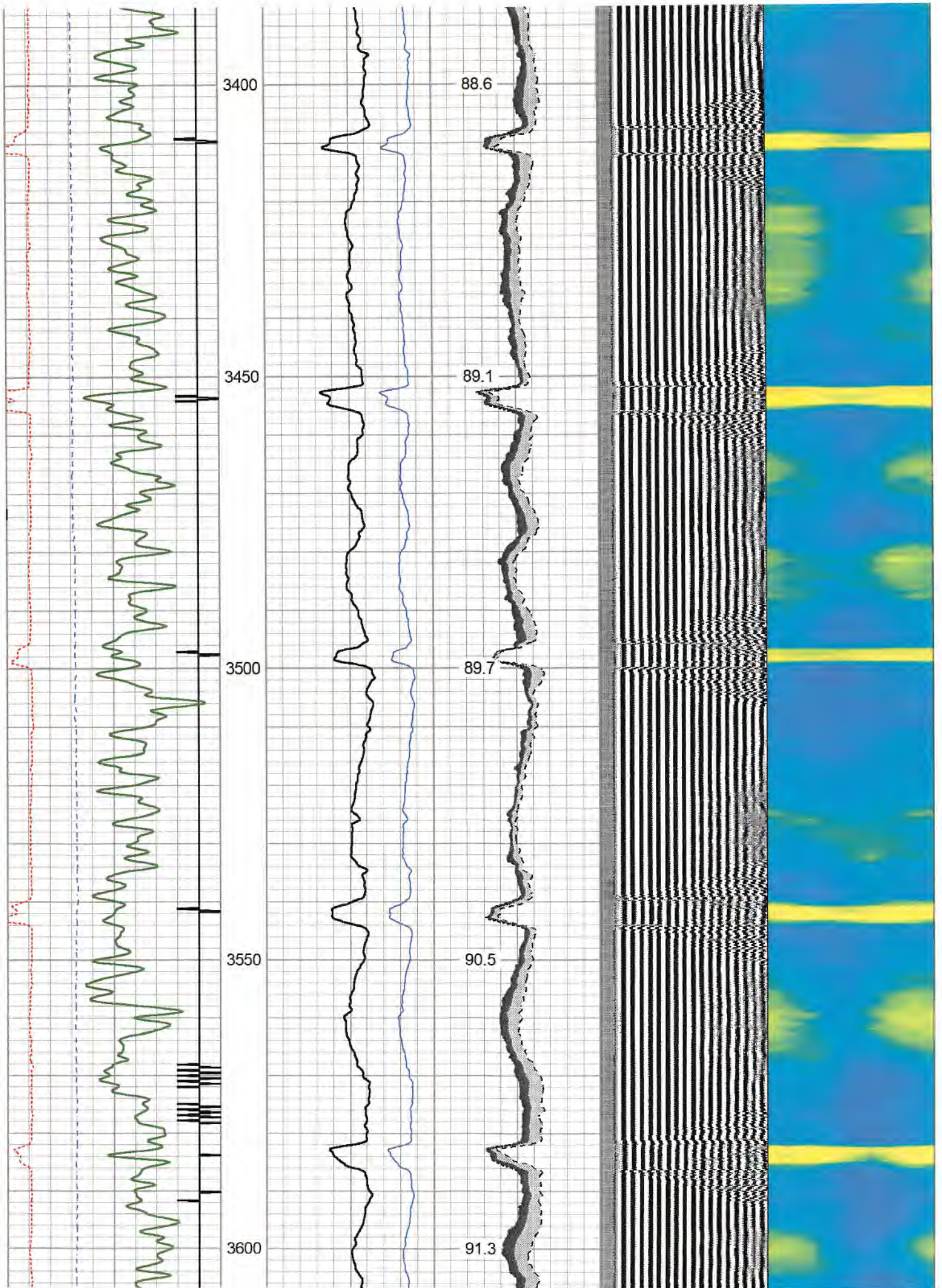


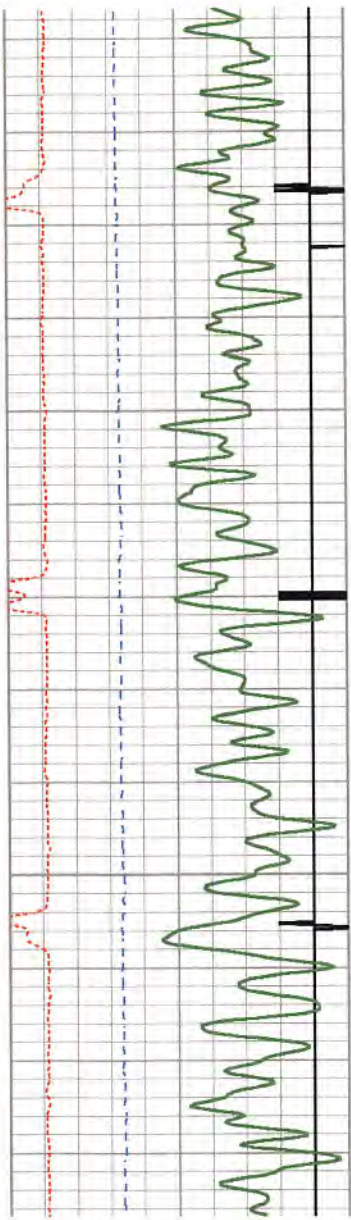






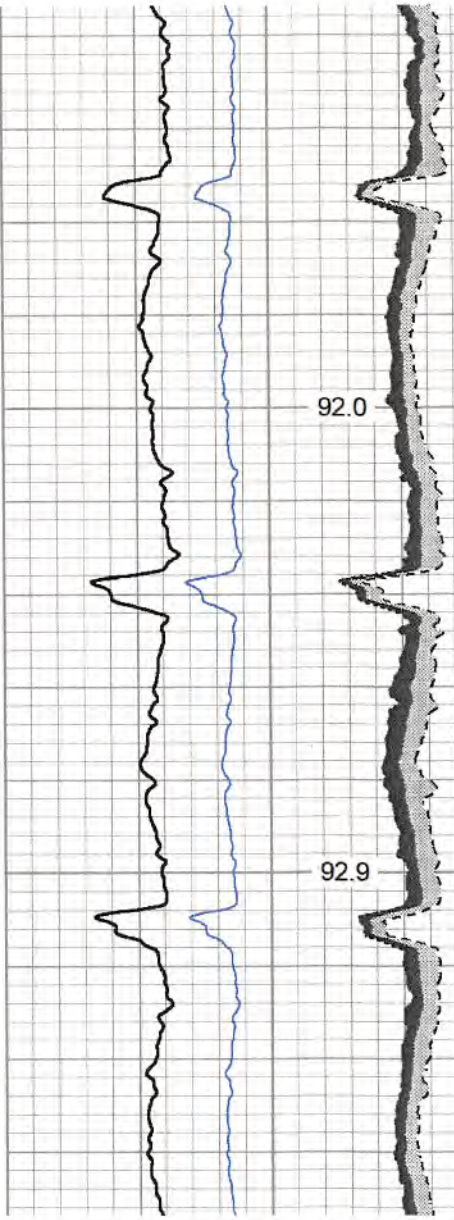






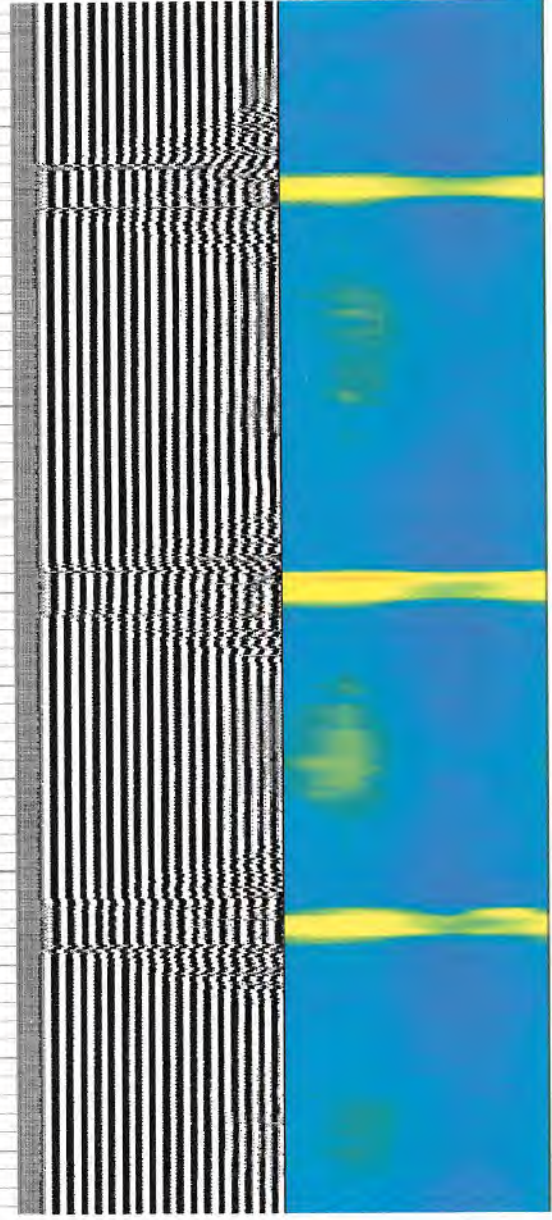
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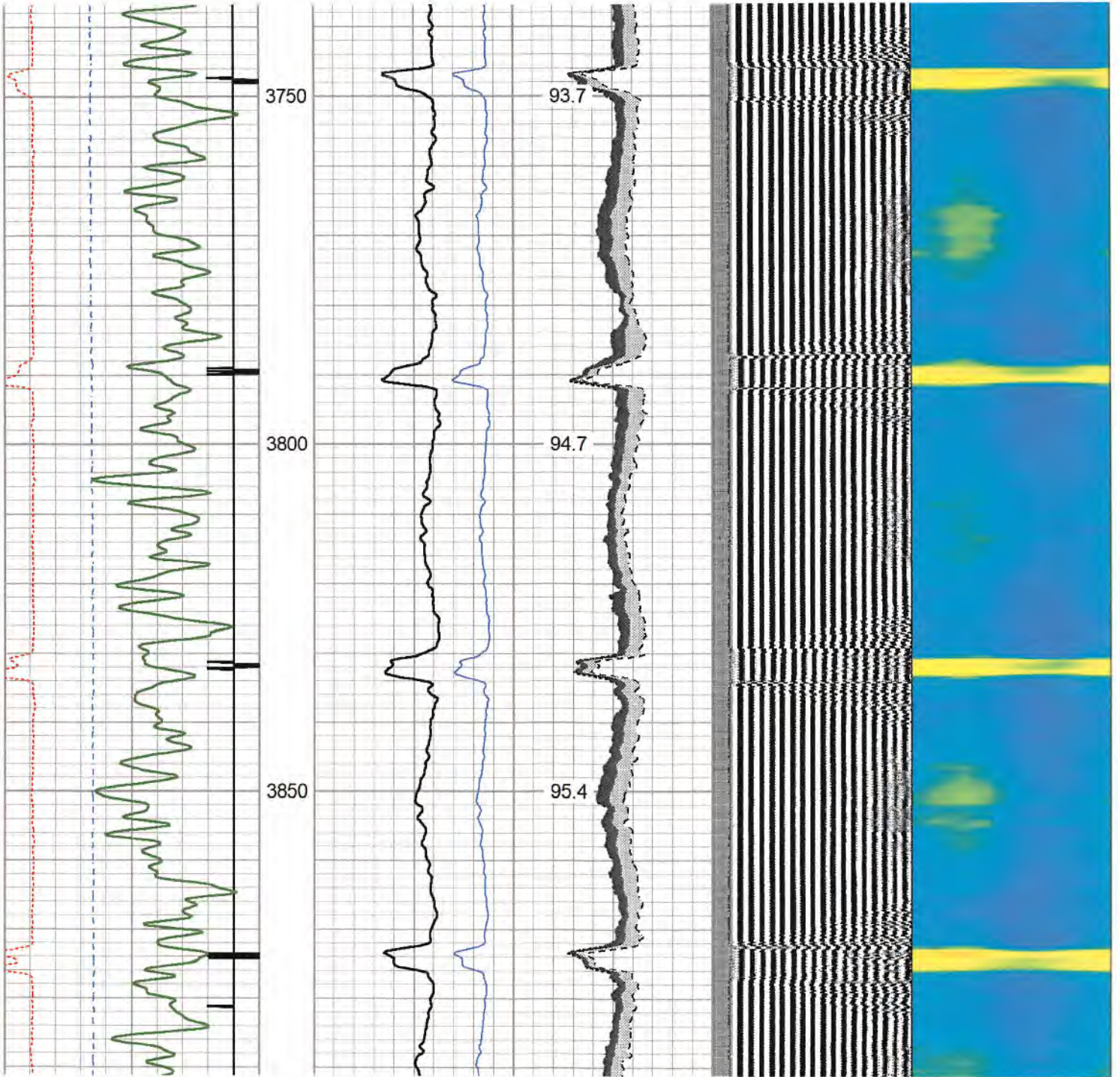
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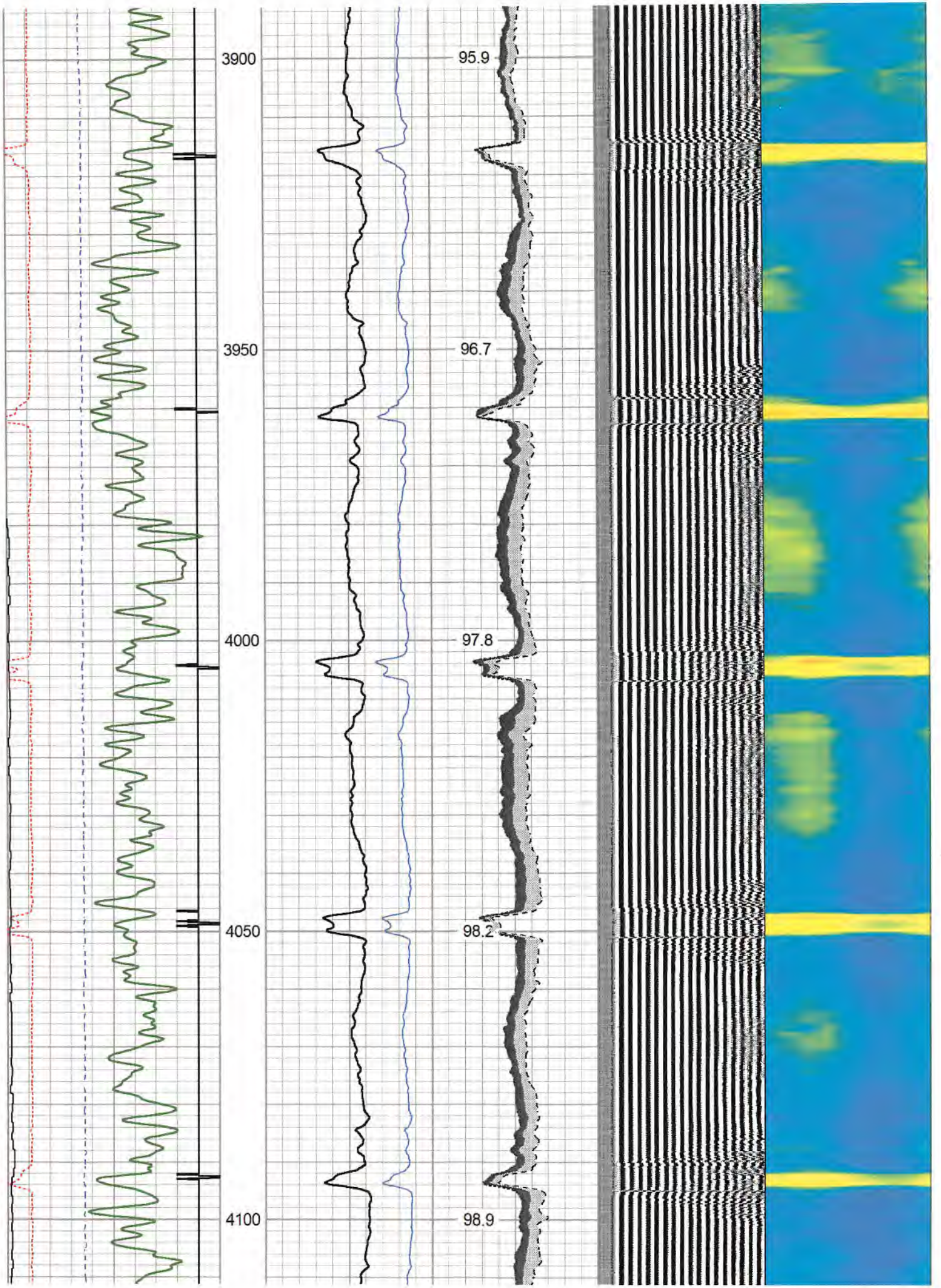


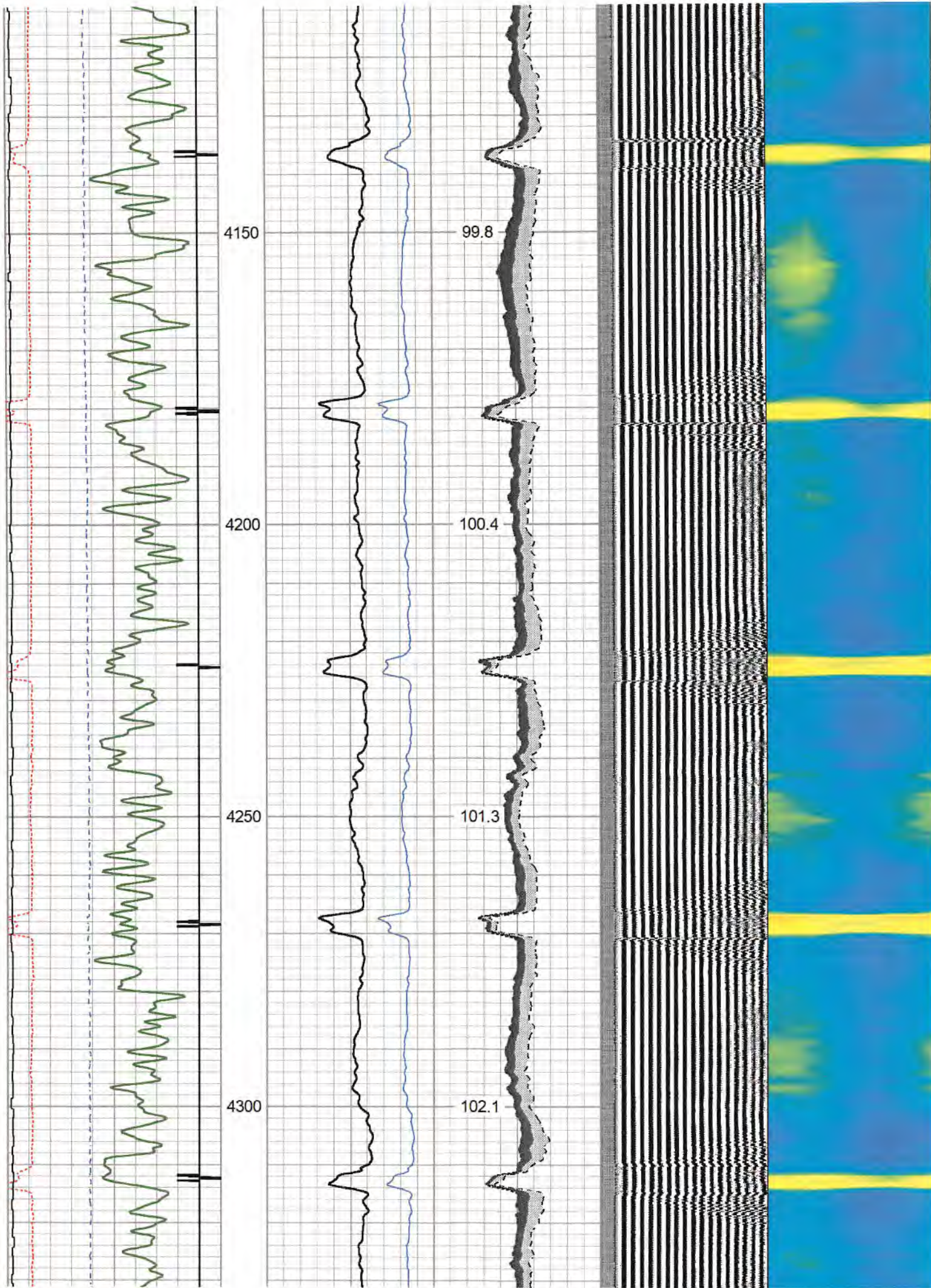
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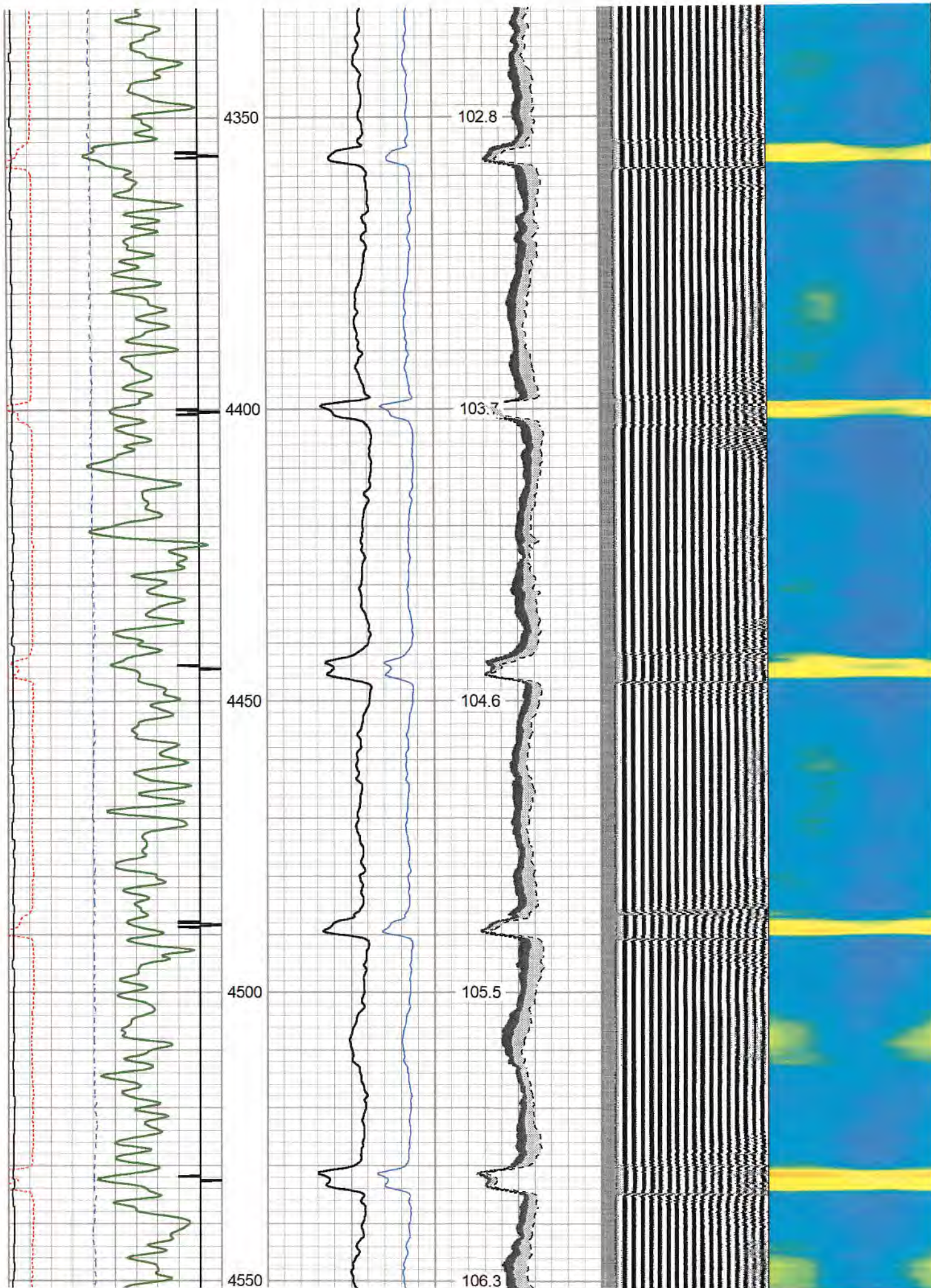
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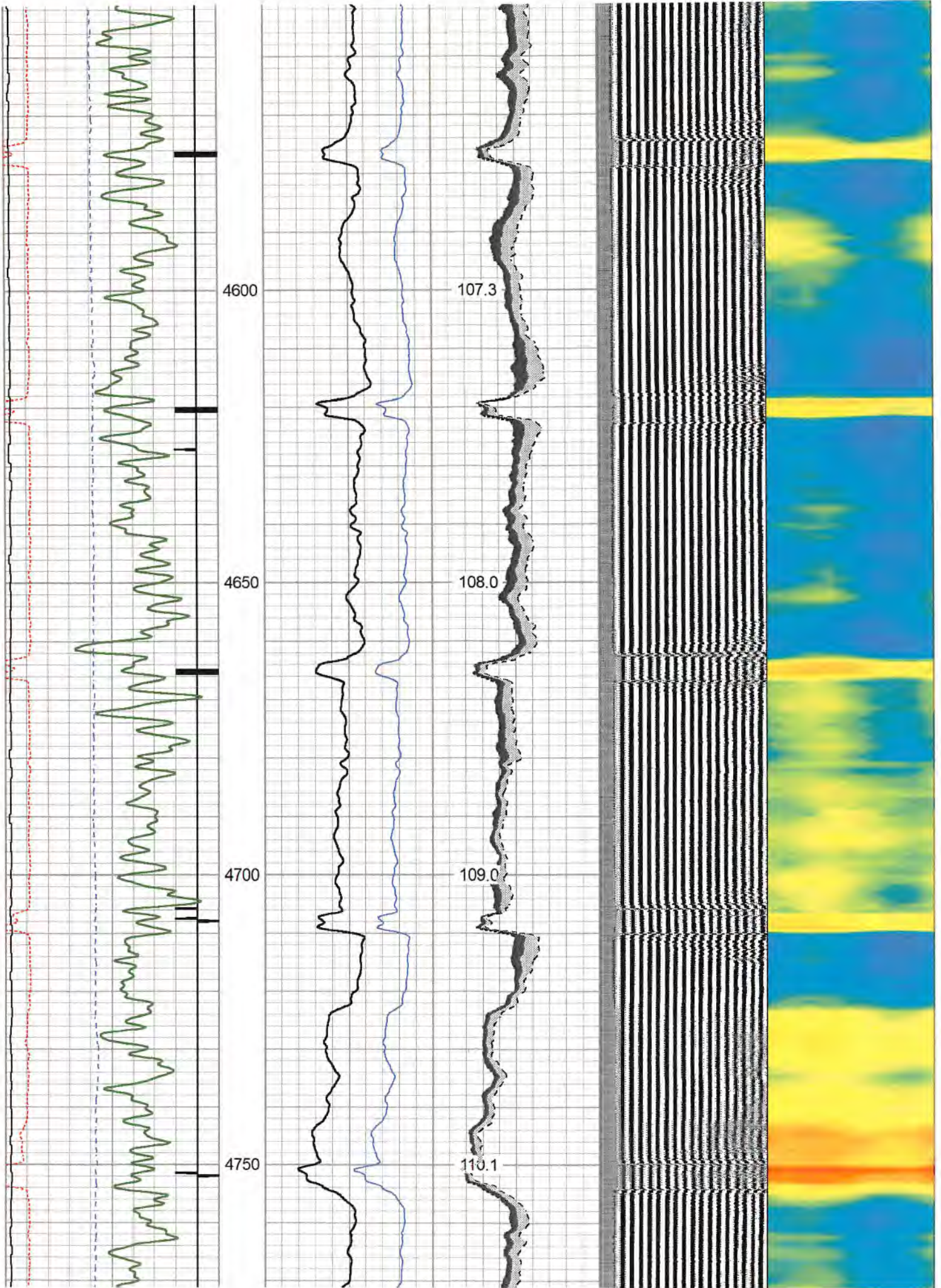




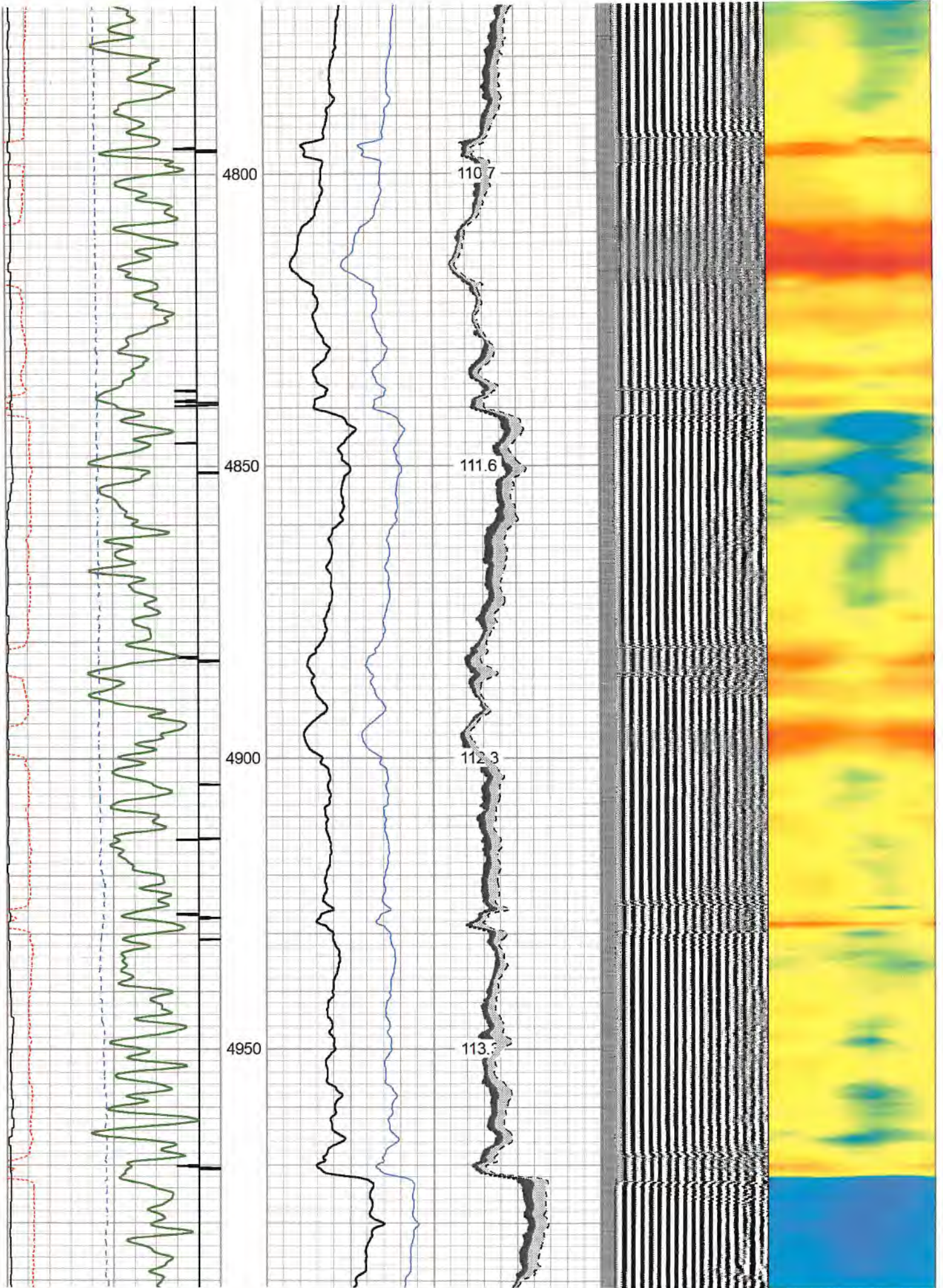


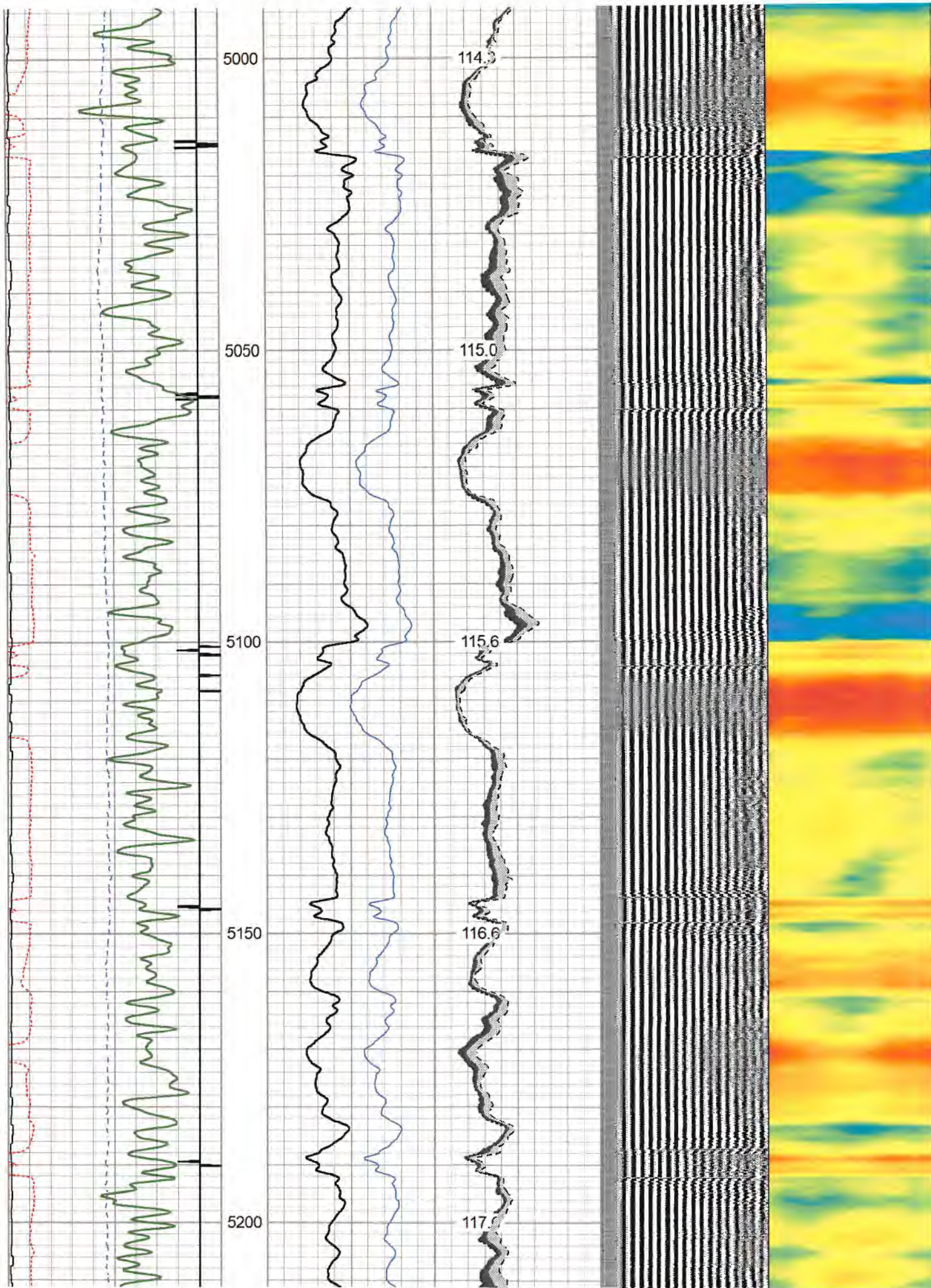


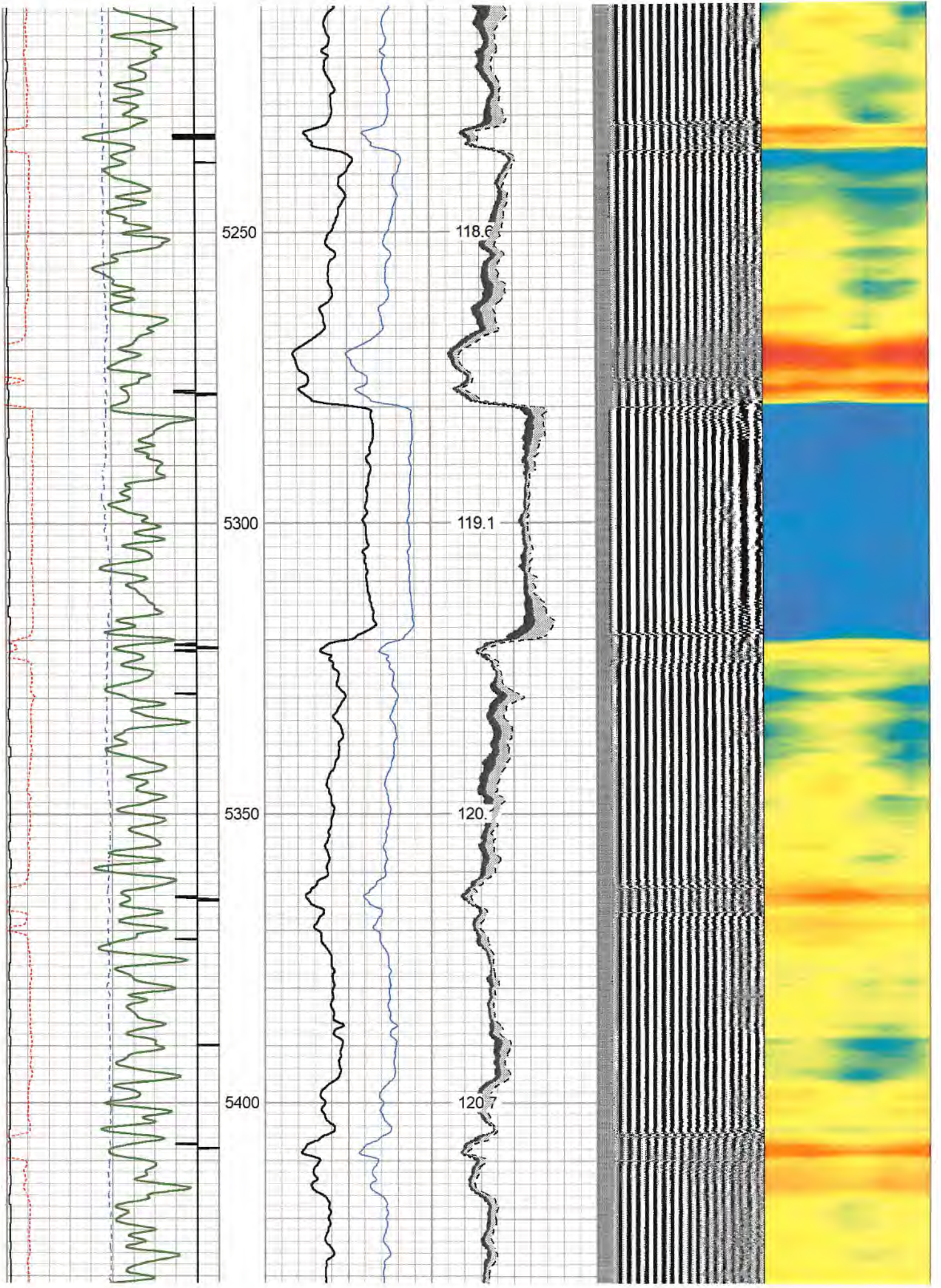


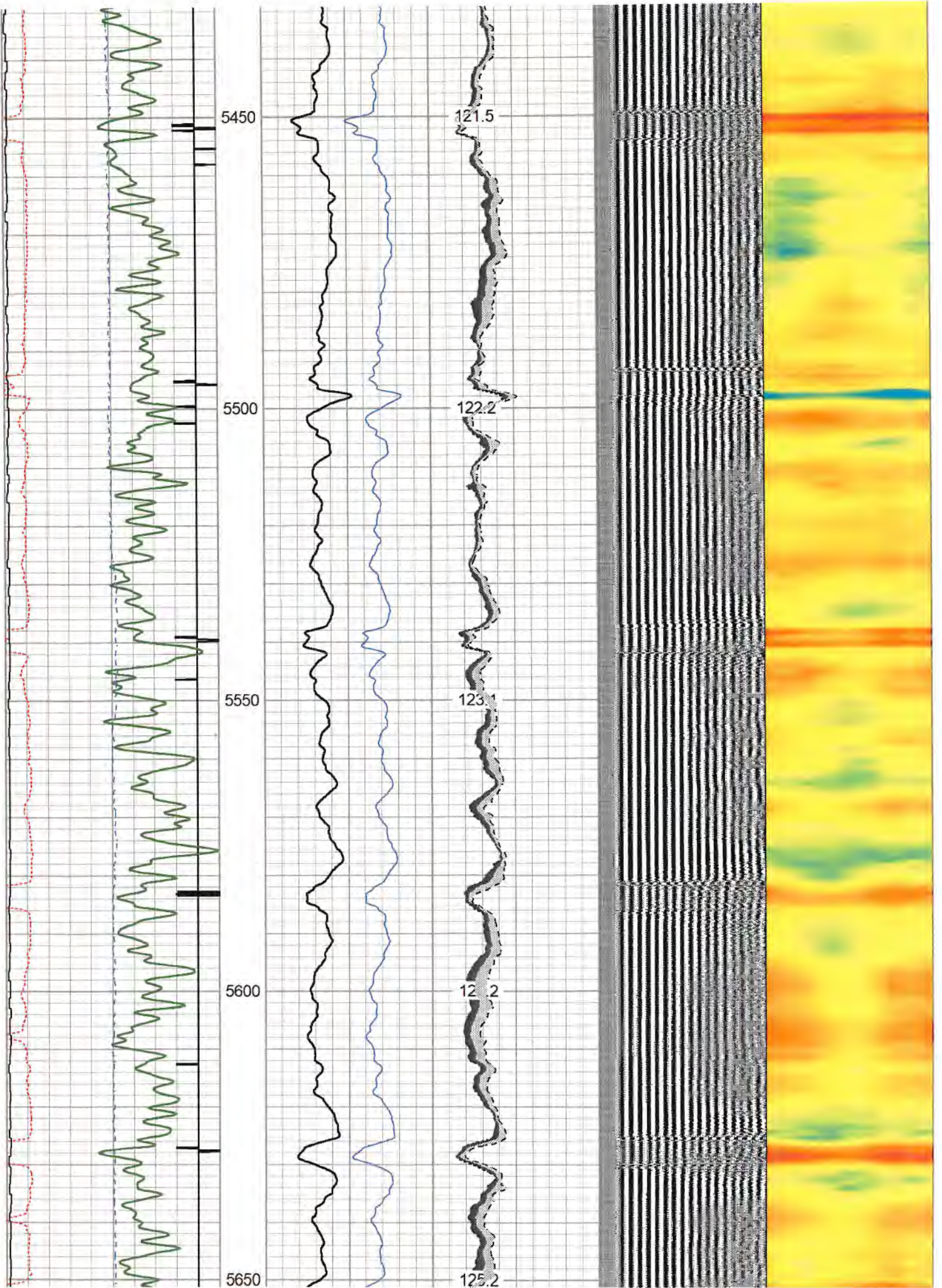


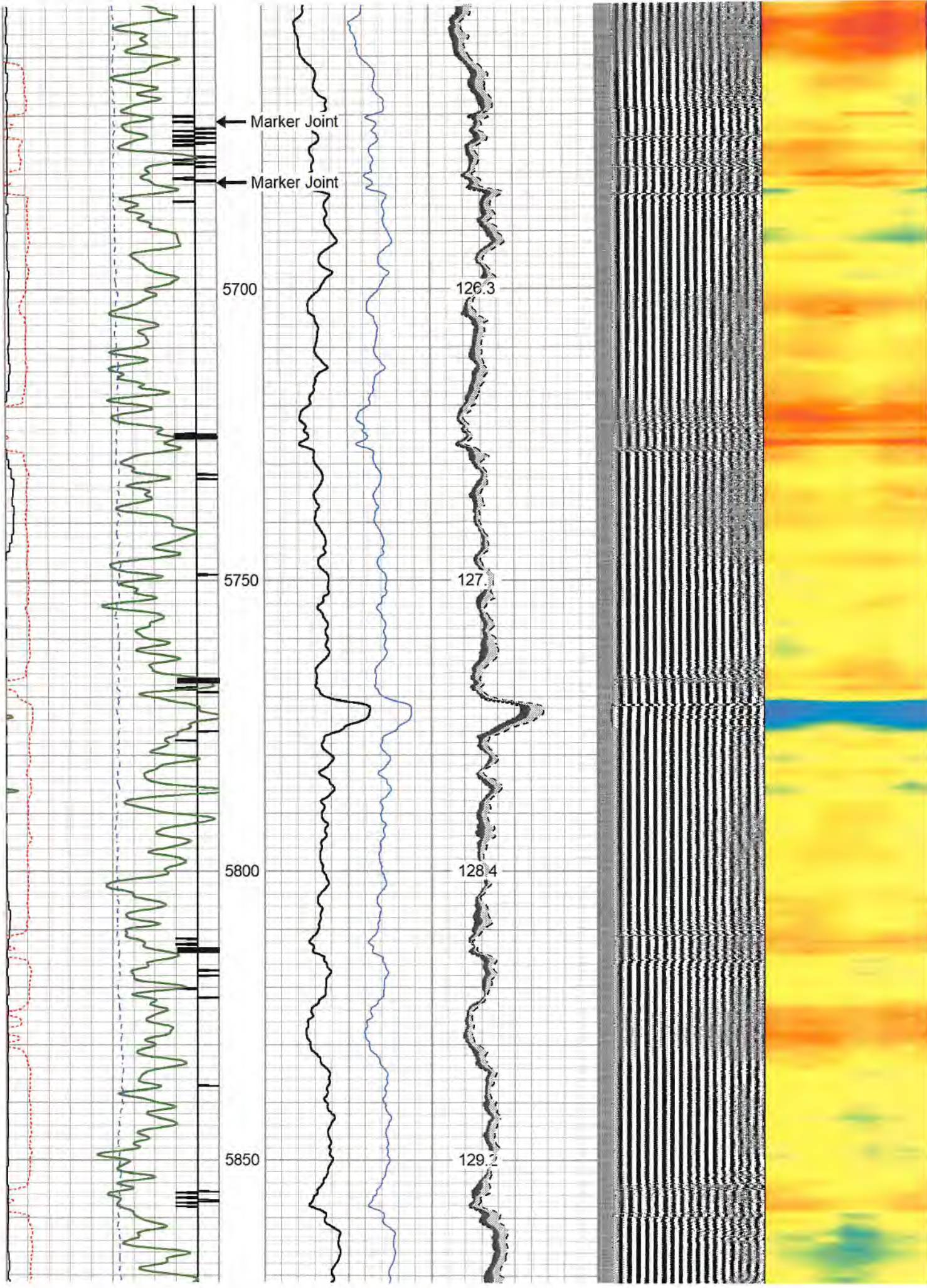


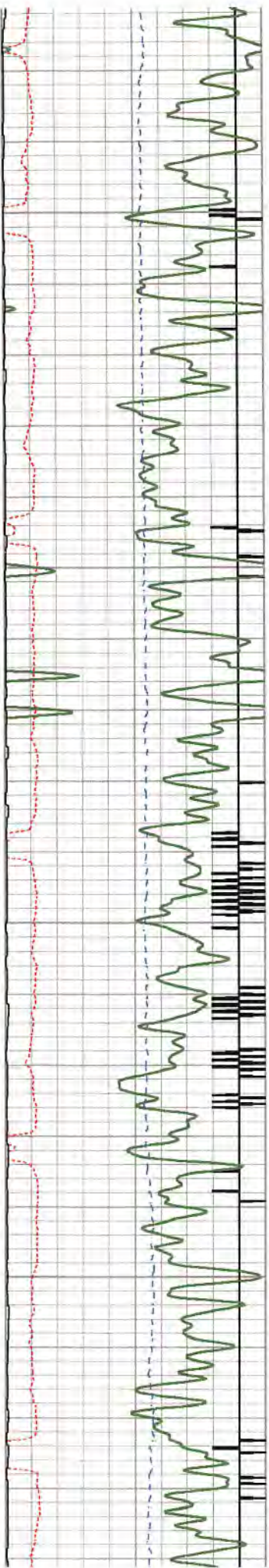










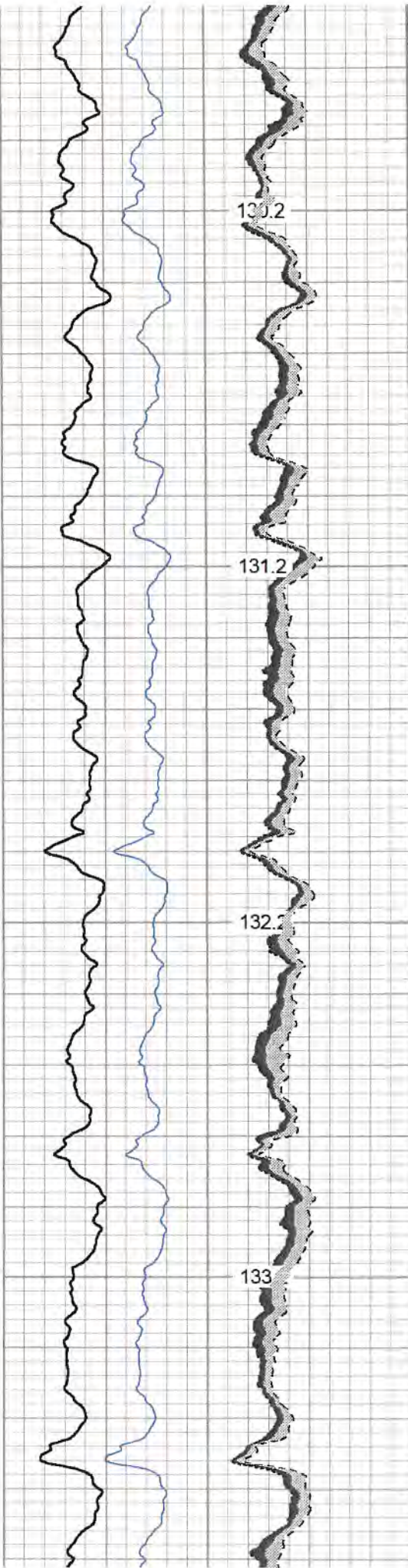


5900

5950

6000

6050

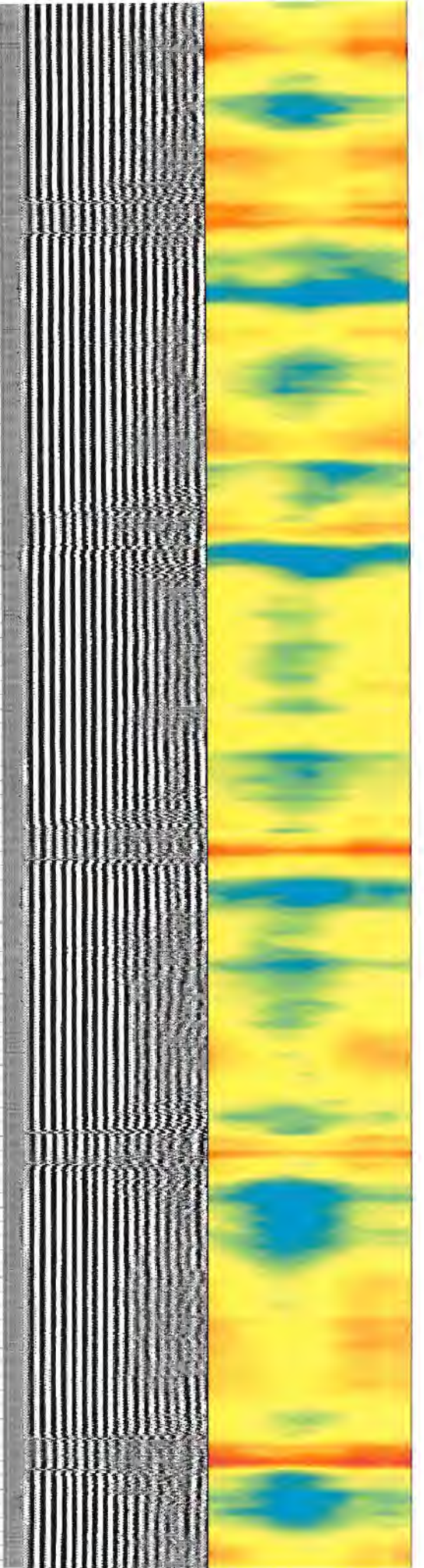


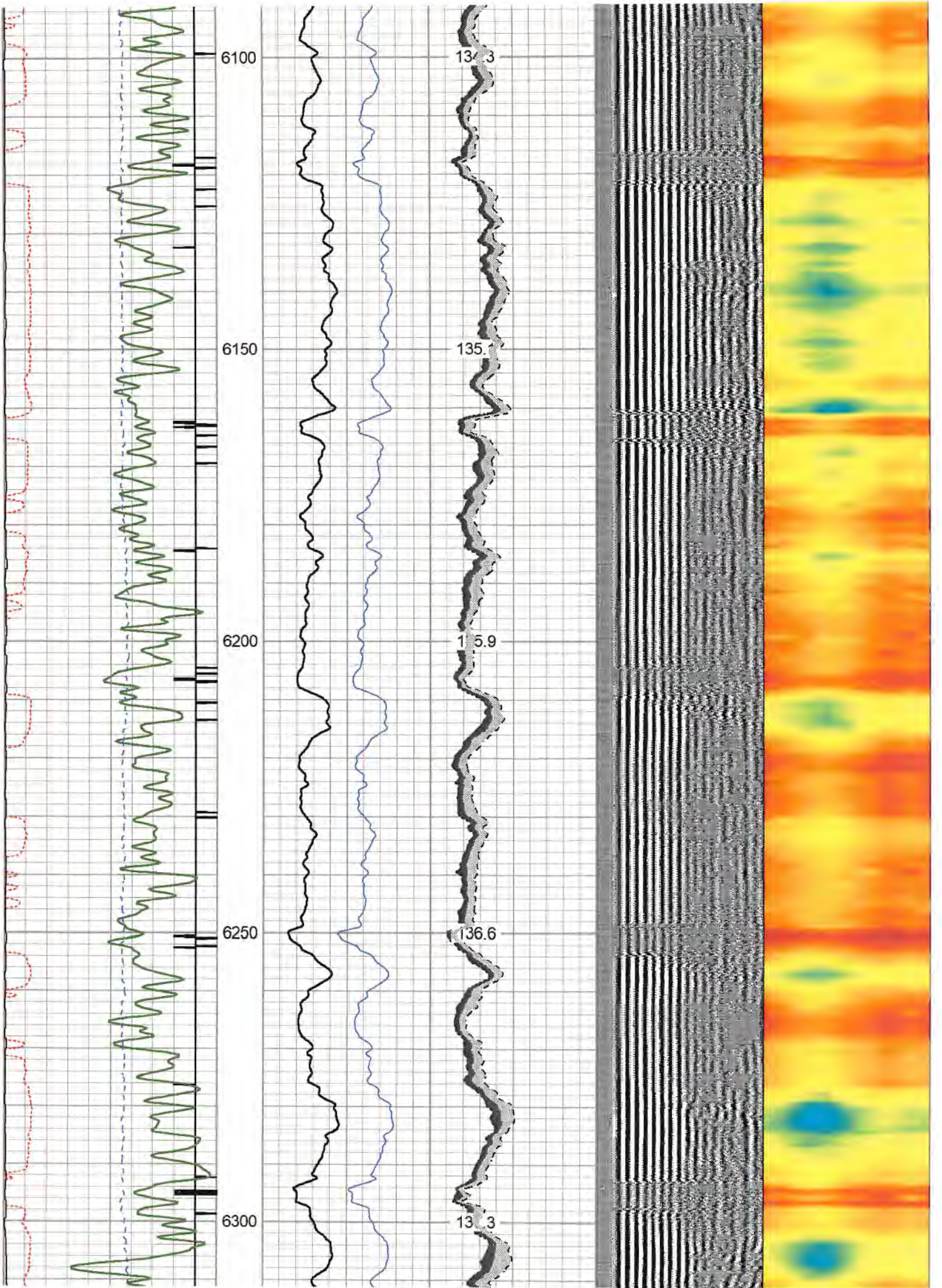
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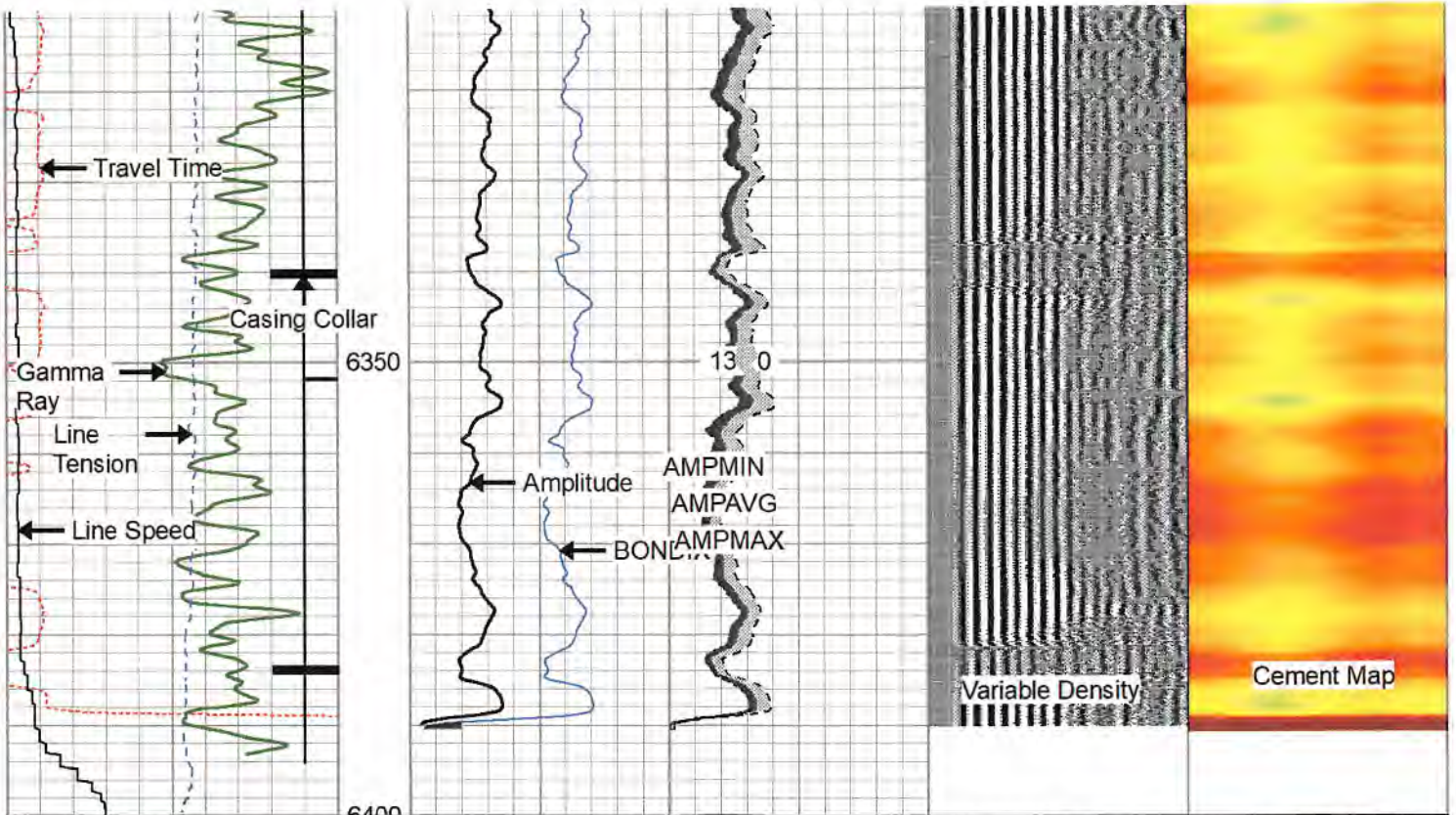
131.2

132.2

133





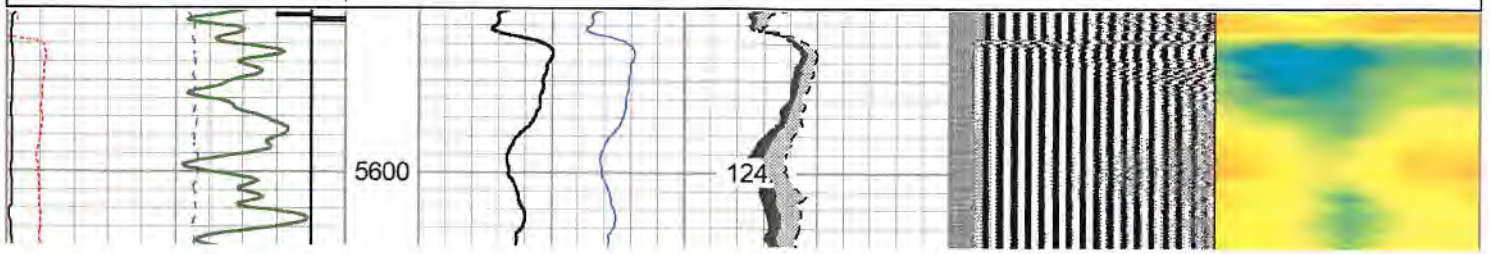


268	Travel Time (usec)	168	0	Amplitude (mV)	100	0	AMPMIN	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	1	BONDIX	0	0	AMPMAX	150	300 (usec)	1200		
0	Gamma Ray (GAPI)	150	0	AMPAVG	150	0	AMPAVG	150				
	Line Speed			TEMP								
-100	(ft/min)	100		(degF)								
0	Line Tension (lb)	2000										

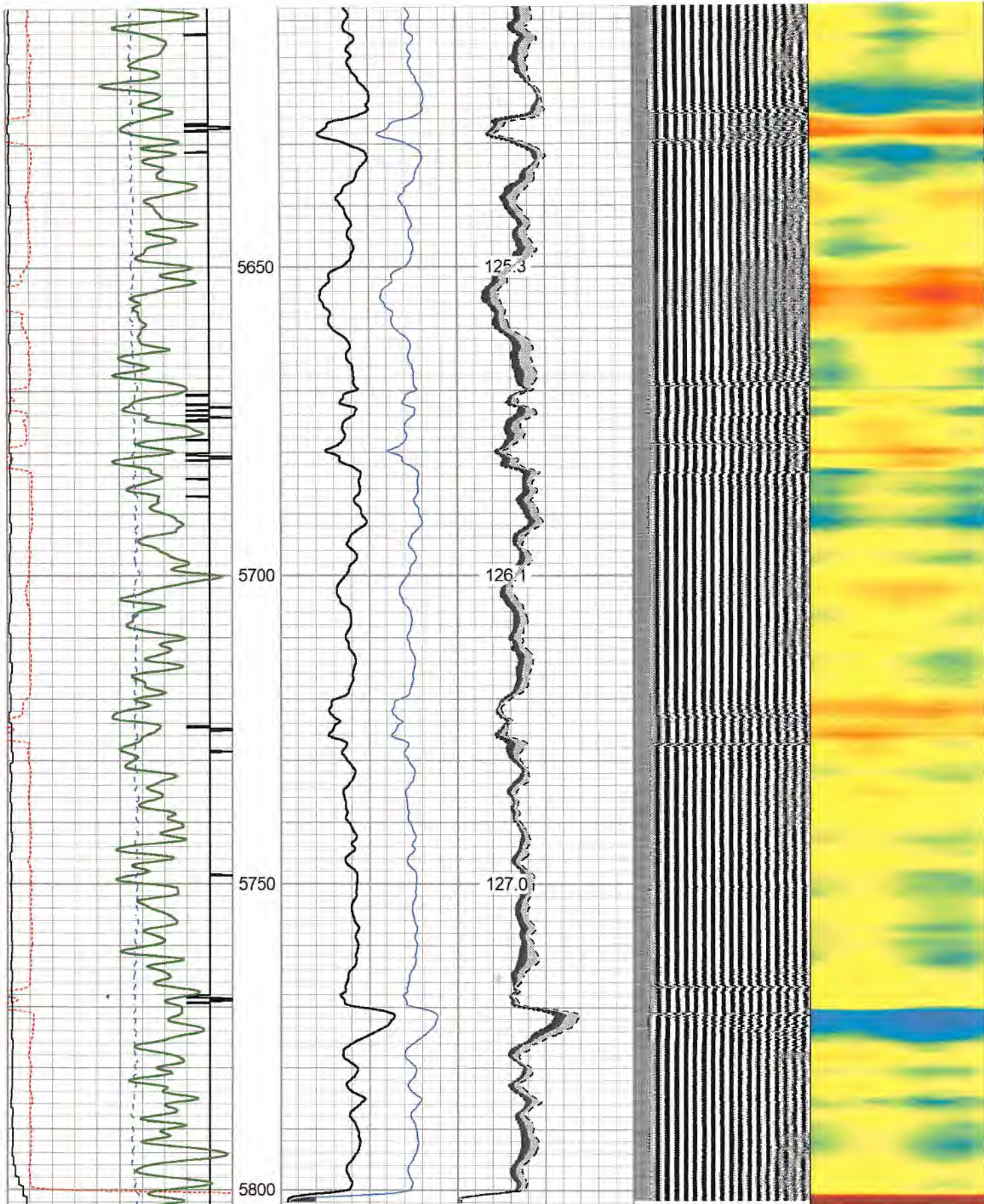
# Nine Repeat Pass 0 PSI

Database File antero\_little\_1h\_rcbl\_02\_april\_2023.db  
 Dataset Pathname pass3  
 Presentation Format rcbl-bond index for antero 1020  
 Dataset Creation Sun Apr 02 11:54:20 2023  
 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	300 (usec)	1200		
0	Gamma Ray (GAPI)	150	0	AMPAVG	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		

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

Variable Density  
300 (usec) 1200

1	Cement Map	8
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-100	(ft/min)	100
0	Line Tension (lb)	2000

(degF)

# Log Variables

DatabaseC:\ProgramData\Warrior\Data\antero\_little\_1h\_rcbl\_02\_april\_2023.db  
 Dataset field/well/run1/pass6/\_vars\_

## Top - Bottom

BHTEMP_Src TEMP	BOREID in 7.875	BOTTEMP degF 138.1	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 260	SRFTEMP degF 43	TDEPTH ft 6400			

## 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\_little\_1h\_rcbl\_02\_april\_2023.db  
 Dataset Pathname pass6  
 Dataset Creation Sun Apr 02 12:11:16 2023

## Gamma Ray Calibration Report

Serial Number: FW1211-86  
 Tool Model: Probe  
 Performed: Sun Apr 2 11:15:39 2023

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: 403.558 ft

Master Calibration, performed Sun Apr 2 08:35:53 2023:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.004	0.441	3.400	71.921	153.787	4.065
CAL	0.663	0.706				
5'	-0.006	0.457	3.400	71.921	148.212	4.258
SUM						
Σ1	0.003	0.406	0.000	100.000	217.994	0.763

S1	0.000	0.400	0.000	100.000	247.804	-0.700
S2	-0.010	0.411	0.000	100.000	237.718	2.385
S3	-0.006	0.436	0.000	100.000	226.049	1.449
S4	-0.006	0.465	0.000	100.000	212.437	1.302
S5	-0.005	0.471	0.000	100.000	209.809	1.142
S6	-0.009	0.465	0.000	100.000	211.254	1.813
S7	-0.001	0.441	0.000	100.000	226.398	0.171
S8	-0.012	0.424	0.000	100.000	229.635	2.722

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.663	0.706	1.000	0.000

Air Zero Calibration, performed Sun Apr 2 07:49:54 2023:

	Raw (v)		Calibrated (v)		Results	
	Zero		Zero		Gain	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)
Centralizer	32.54					
Centralizer	21.47					
CABLE HEADS	18.07		CABLE_HEADS-TITAN_1_7/16	1.04	1.44	4.00
RBT	17.03					
HeadVolt	16.97					
Centralizer	16.13		Centralizer-2.75_Overbody	1.67	3.12	5.00
Temp	14.12					
			RBT-Probe275T (FW1312-32) Probe 2.75" Radial with Integral Temperature Sub	9.39	2.75	90.00
WVFS8	11.89					
WVFS7	11.89					
WVFS6	11.89					
WVFS5	11.89					
WVFS4	11.89					
WVFS3	11.89					
WVFS2	11.89					
WVFS1	11.89					

WVF5T	11.89					
WVF3FT	11.89					
WVF5FT	10.89					
GR	7.64					
WVFCAL	7.64					
HEADVOLT	7.64					
CCL	6.73					
Centralizer	5.86					
GR	5.40					
			GR-Probe (FW1211-86) Probe 2 3/4" Logging Gamma Ray	4.78	2.75	57.00
			Centralizer-2.75_Overbody	1.67	3.12	5.00
Centralizer	2.86					
			Centralizer-Titan_2.75 Bowspring Centralizer	2.86	2.75	35.00

Dataset: antero\_little\_1h\_rcbl\_02\_april\_2023.db: field/well/run1/pass6  
 Total length: 18.07 ft  
 Total weight: 206.00 lb  
 O.D.: 3.12 in



Company Antero Resources  
 Well Litte 1H  
 Field Marcellus  
 County Tyler  
 State WV

Country U.S.A.