



**RADIAL CEMENT BOND LOG  
VARIABLE DENSITY LOG  
GAMMA/CCL/TEMP**

Company ANTERO RESOURCES  
Well ASPEN 1H  
Field WEST UNION  
County DODDRIDGE  
State WV

Company ANTERO RESOURCES  
Well ASPEN 1H  
Field WEST UNION  
County DODDRIDGE State WV

Location: 39.256436, -80.791916 (ENTERANCE)  
APL # : 47-017-06926  
SEC TWP RGE  
Permanent Datum GROUND LEVEL Elevation 25.5"  
Log Measured From KELLY BUSHING  
Drilling Measured From KELLY BUSHING  
Other Services  
Elevation  
K.B. 1155.5  
D.F. 1145.5  
G.L. 1121

Date	NOVEMBER 14, 2022						
Run Number	ONE						
Depth Driller	16.203'						
Depth Logger	7.130'						
Bottom Logged Interval	7.124						
Top Log Interval	SURFACE						
Open Hole Size	NA						
Type Fluid	FRESH WATER						
Density / Viscosity	8.6 LB/GAL						
Max. Recorded Temp.	143.2						
Estimated Cement Top	3.740'						
Time Well Ready	UPON ARRIVAL						
Time Logger on Bottom	15:05						
Equipment Number	116						
Location	CHARLEROI, PA						
Recorded By	C. DRUMMOND						
Witnessed By	Keith Stansbury						
Borehole Record							
Run Number	Bit	From	To	Size	Weight	From	To
Tubing Record							
Casing Record	Size	Mgt/ft	Top	Bottom			
Conductor String	13.375"		SURFACE	365'			
Surface String	9.625"	36 LBS.	SURFACE	2.650'			
Intermediate String	5.5	20 LBS.	SURFACE	16.203'			
Production String							

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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**

LOG CORRELATED TO MARKER JOINT  
DEPTH SHIFT +3  
MARKER JOINT 5,979' - 5,989'  
MAIN PASS LOGGED WITH 1500 PSI  
REPEAT PASS LOGGED WITH 0 PSI  
  
THANK YOU FOR USING NINE ENERGY SERVICES

RECEIVED  
Office of Oil and Gas  
APR 24 2023  
WV Department of  
Environmental Protection



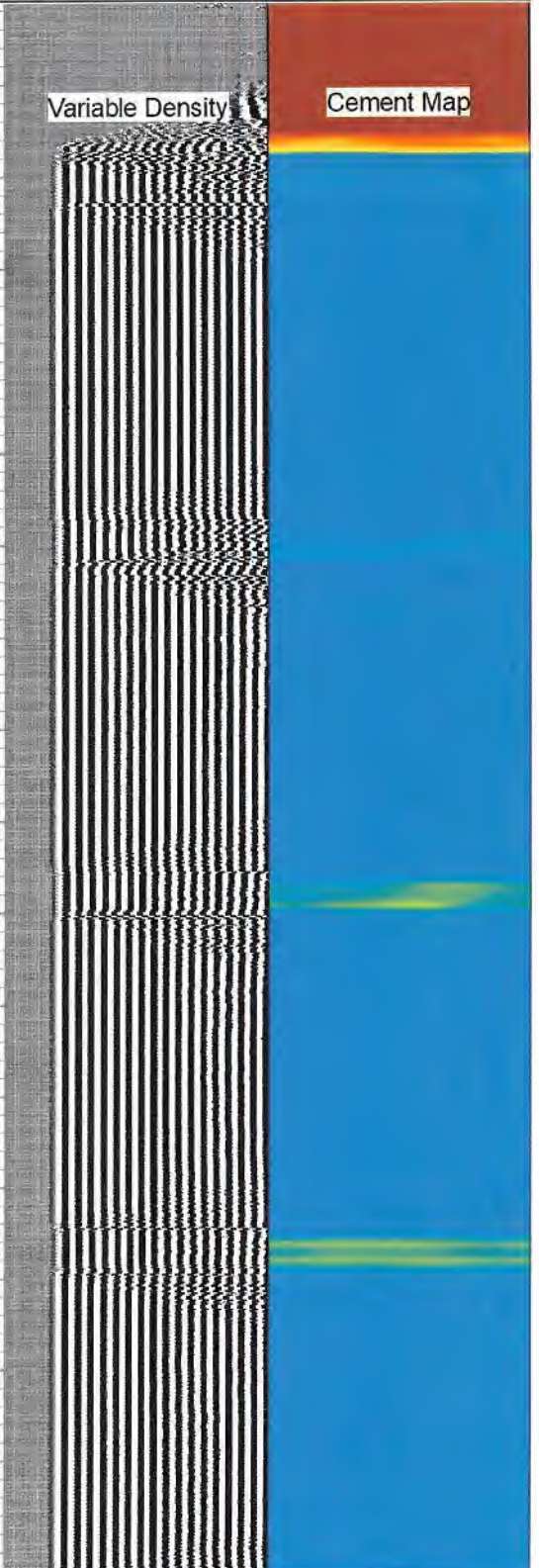
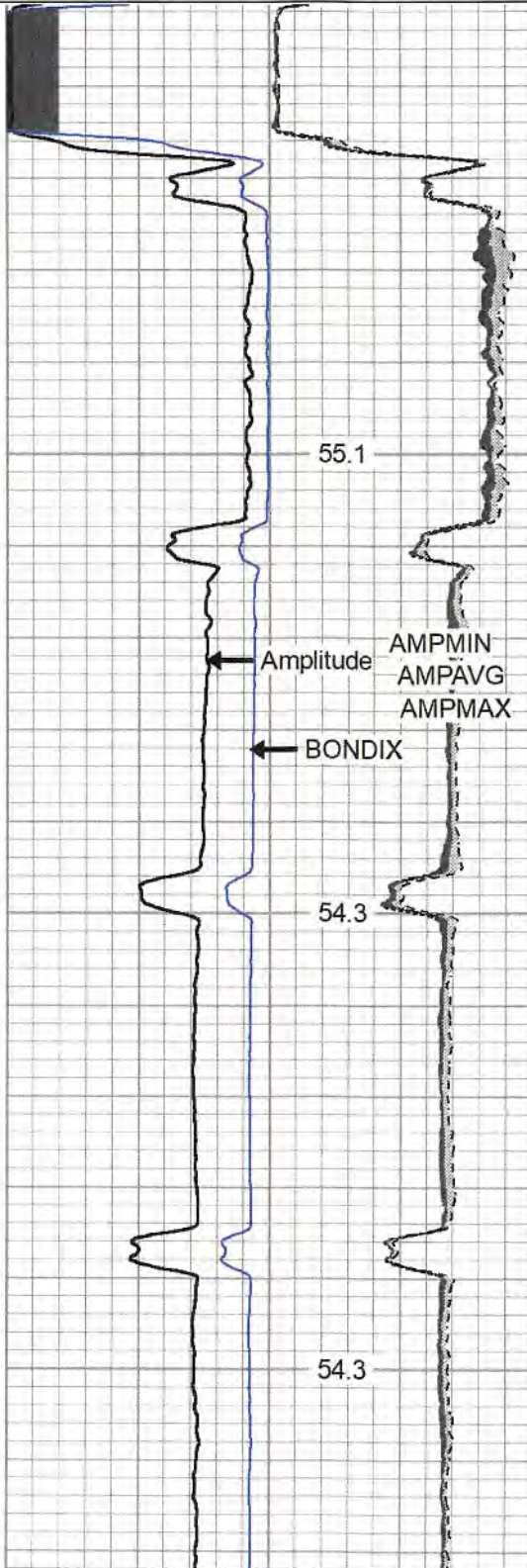
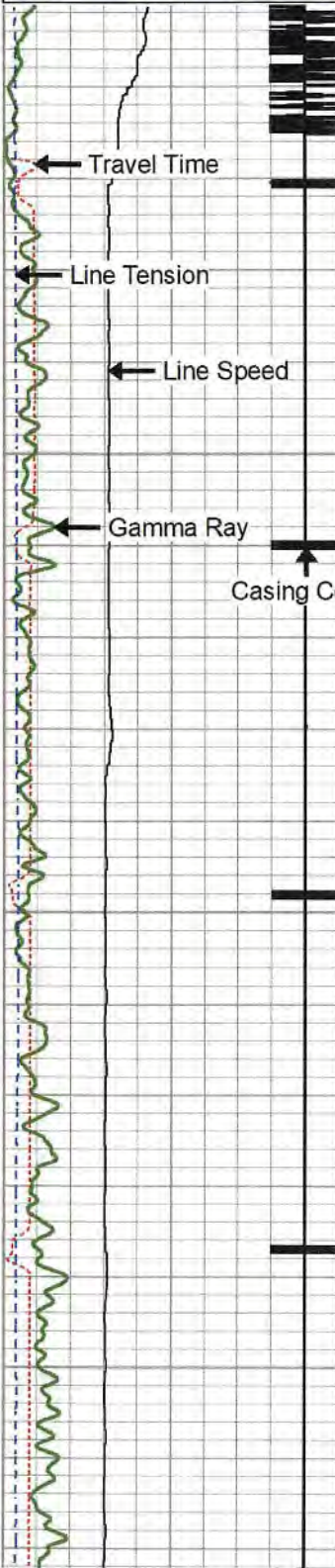
**Main Pass 1500 PSI**

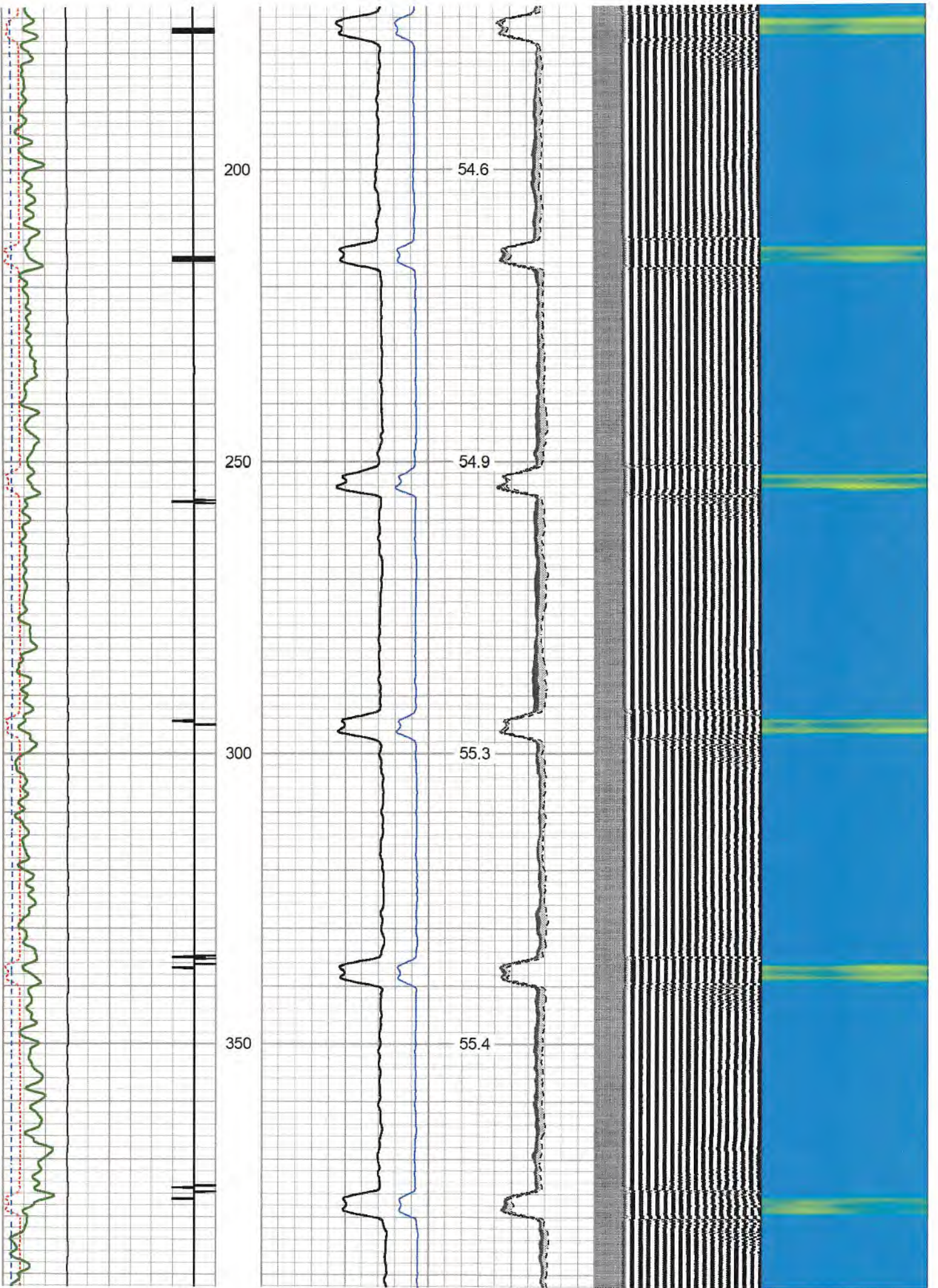
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 Dataset Pathname pass4  
 Presentation Format rcbl-bond index for antero 1020  
 Dataset Creation Mon Nov 14 15:10:33 2022  
 Charted by Depth in Feet scaled 1:240

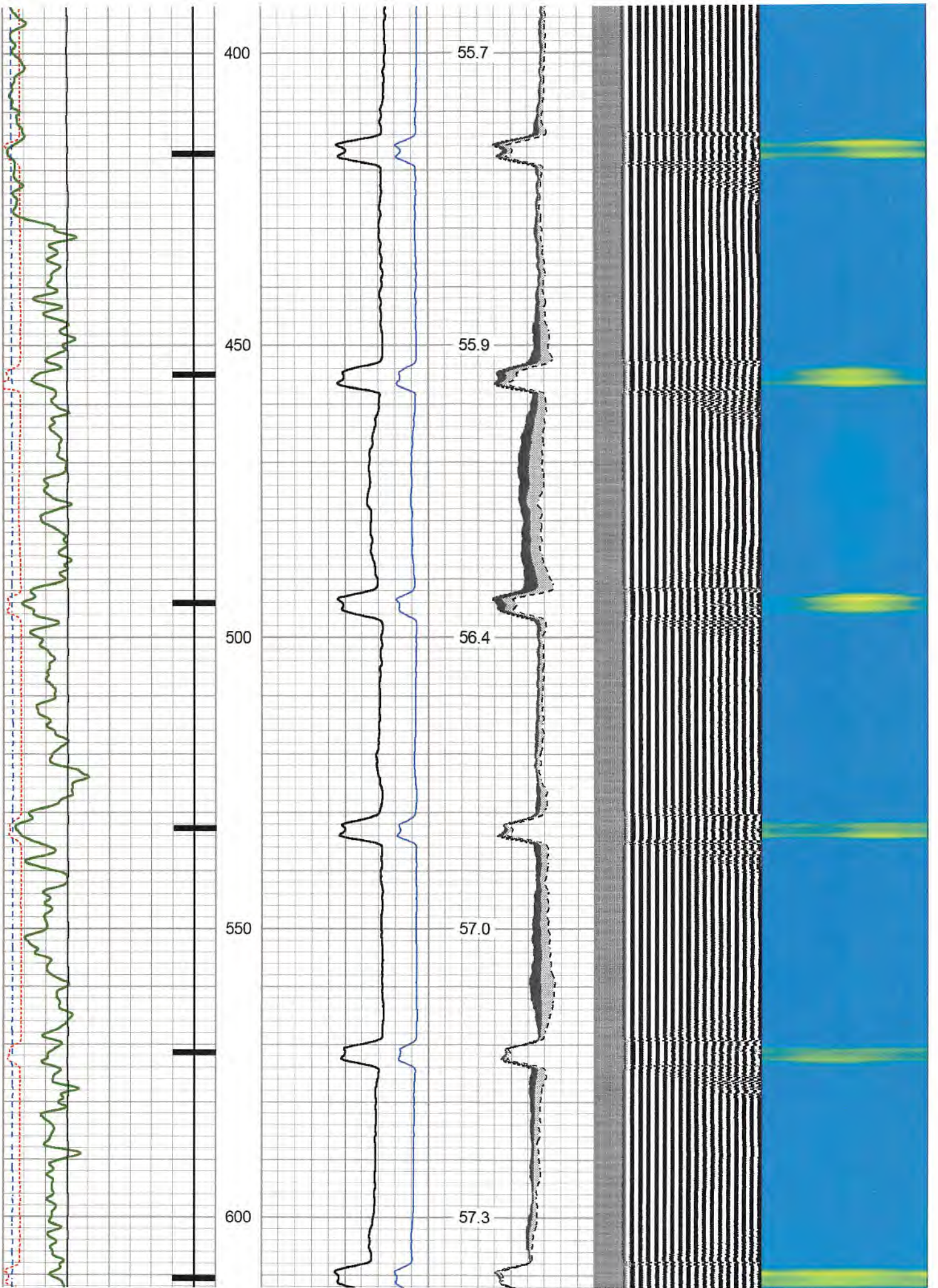
265	Travel Time (usec)	165
9	Casing Collar	-1
0	Gamma Ray (GAPI)	150
Line Speed		
-200	(ft/min)	200
0	Line Tension (lb)	5000

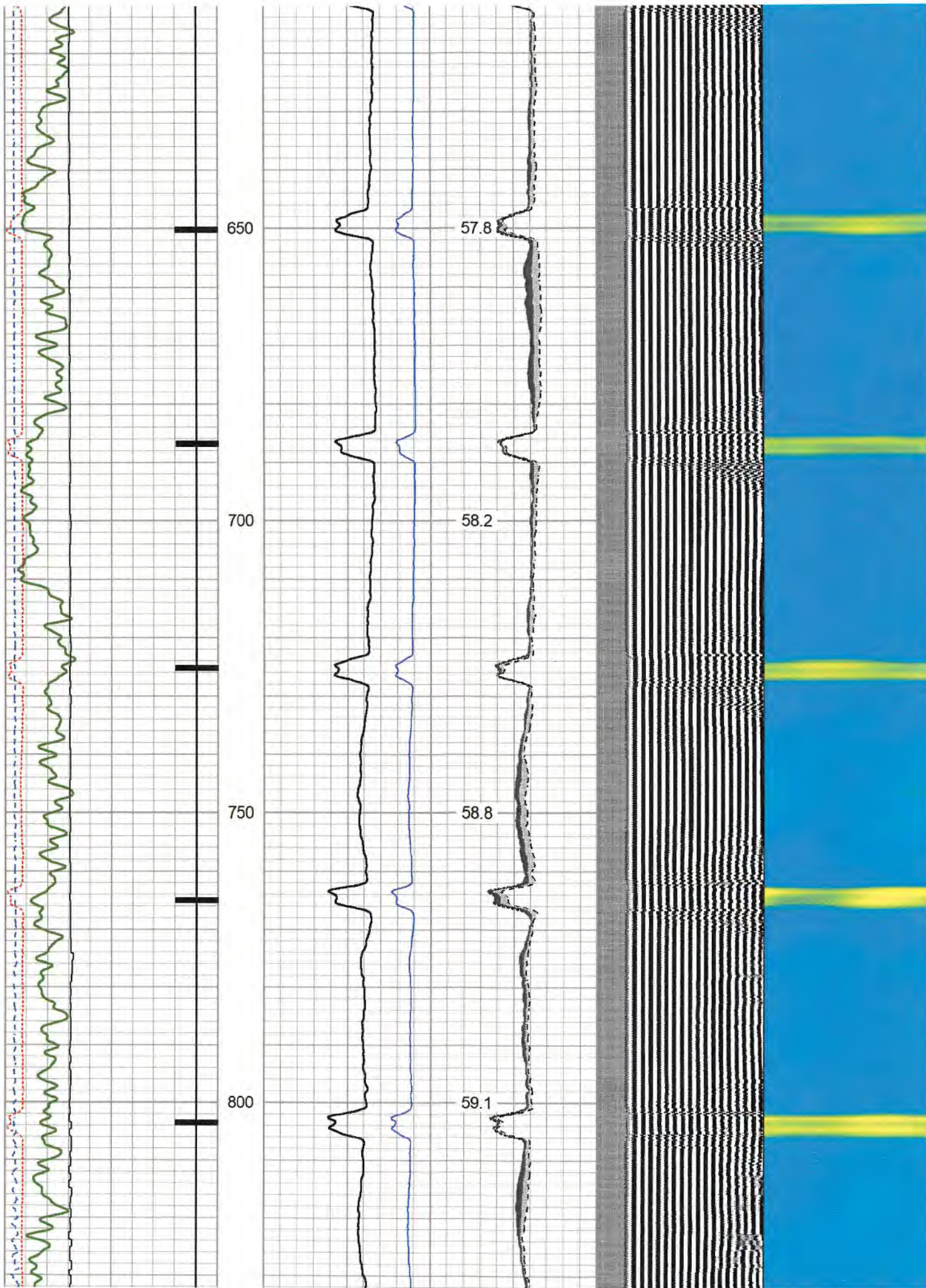
0	Amplitude (mV)	100	-5	AMPMIN	150
1	BONDIX	0	-5	AMPMAX	150
			-5	AMPAVG	150
TEMP					
(degF)					

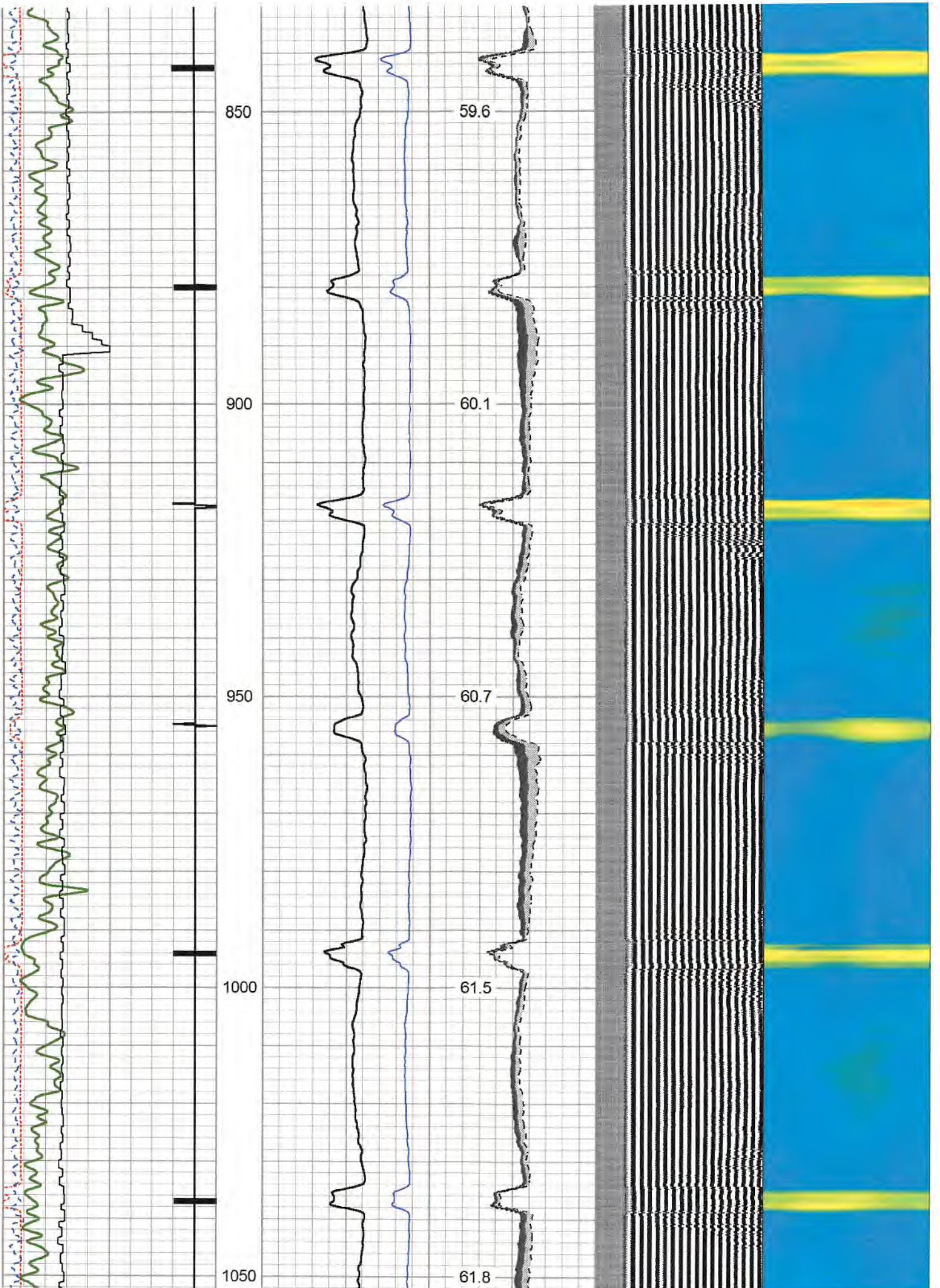
Variable Density	1	Cement Map	8
200	(usec)	1200	

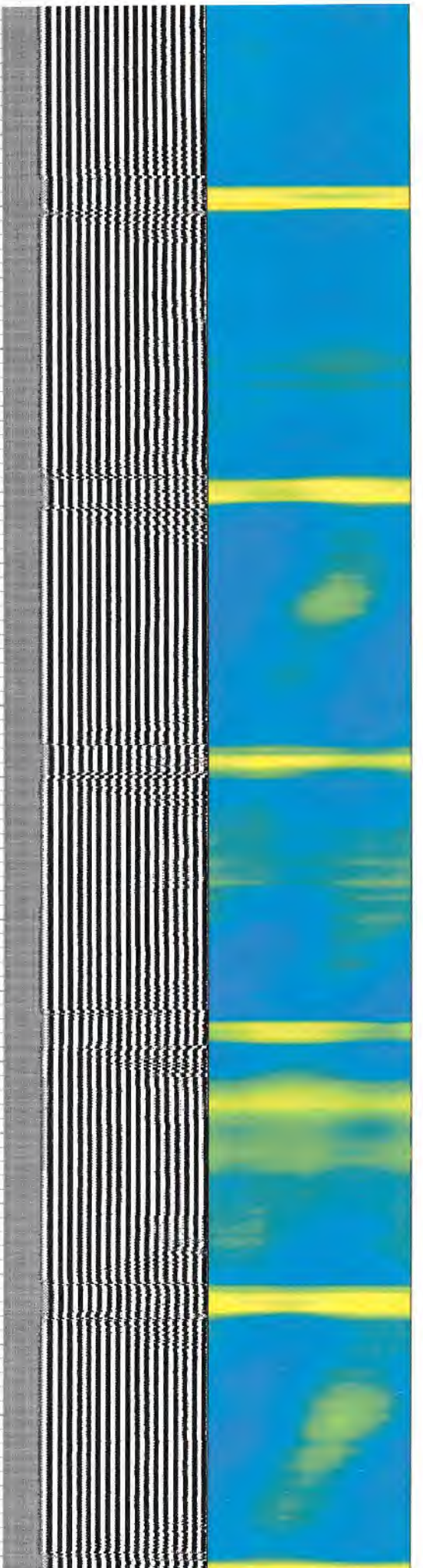
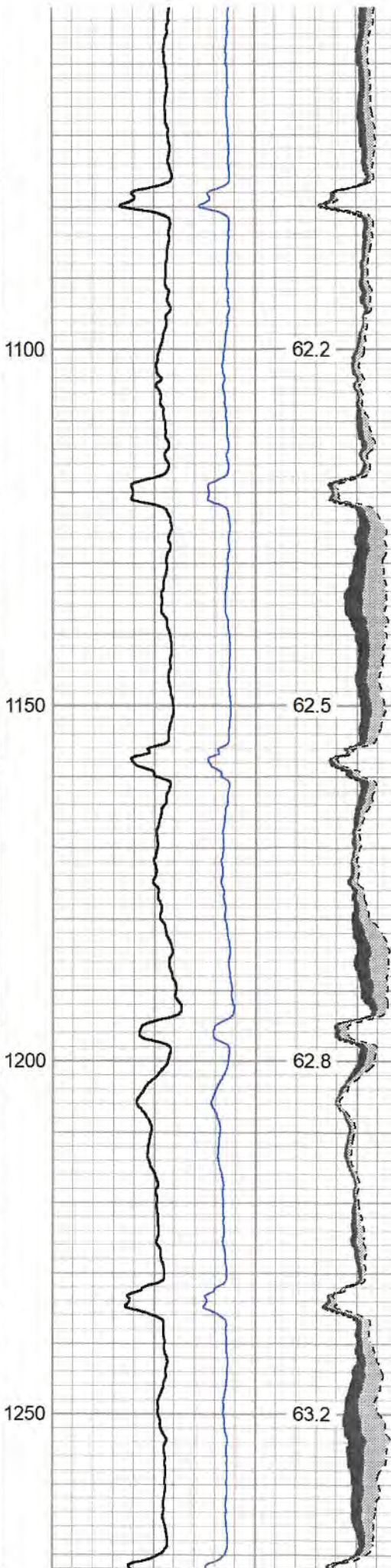
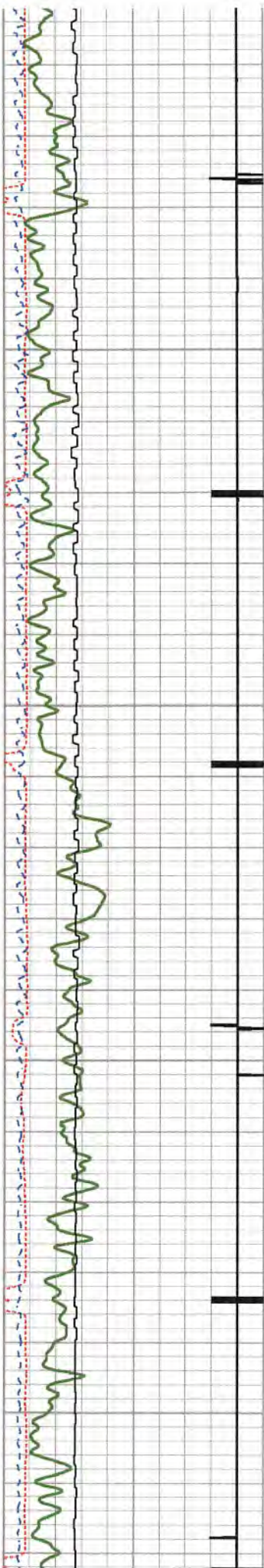


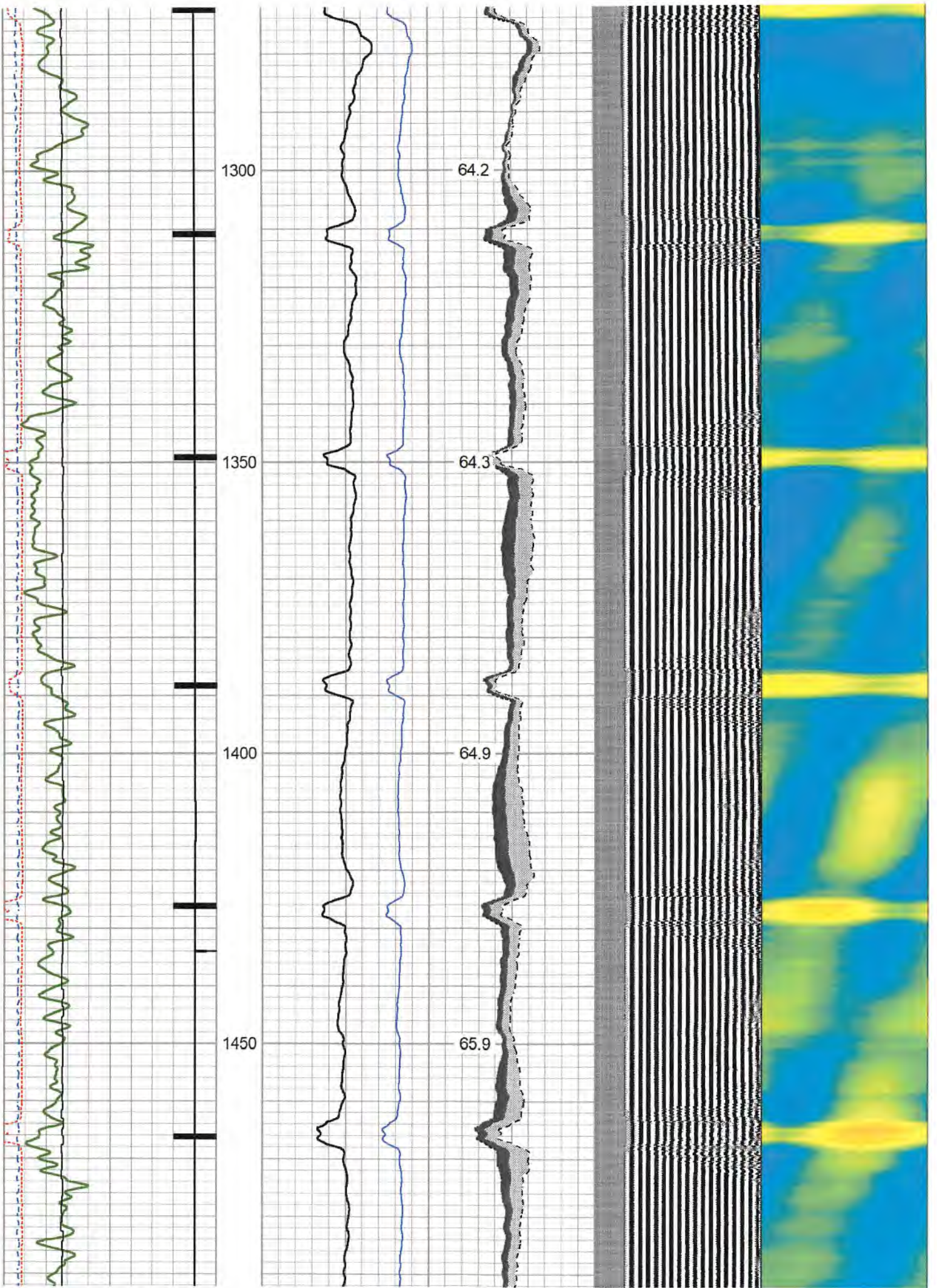




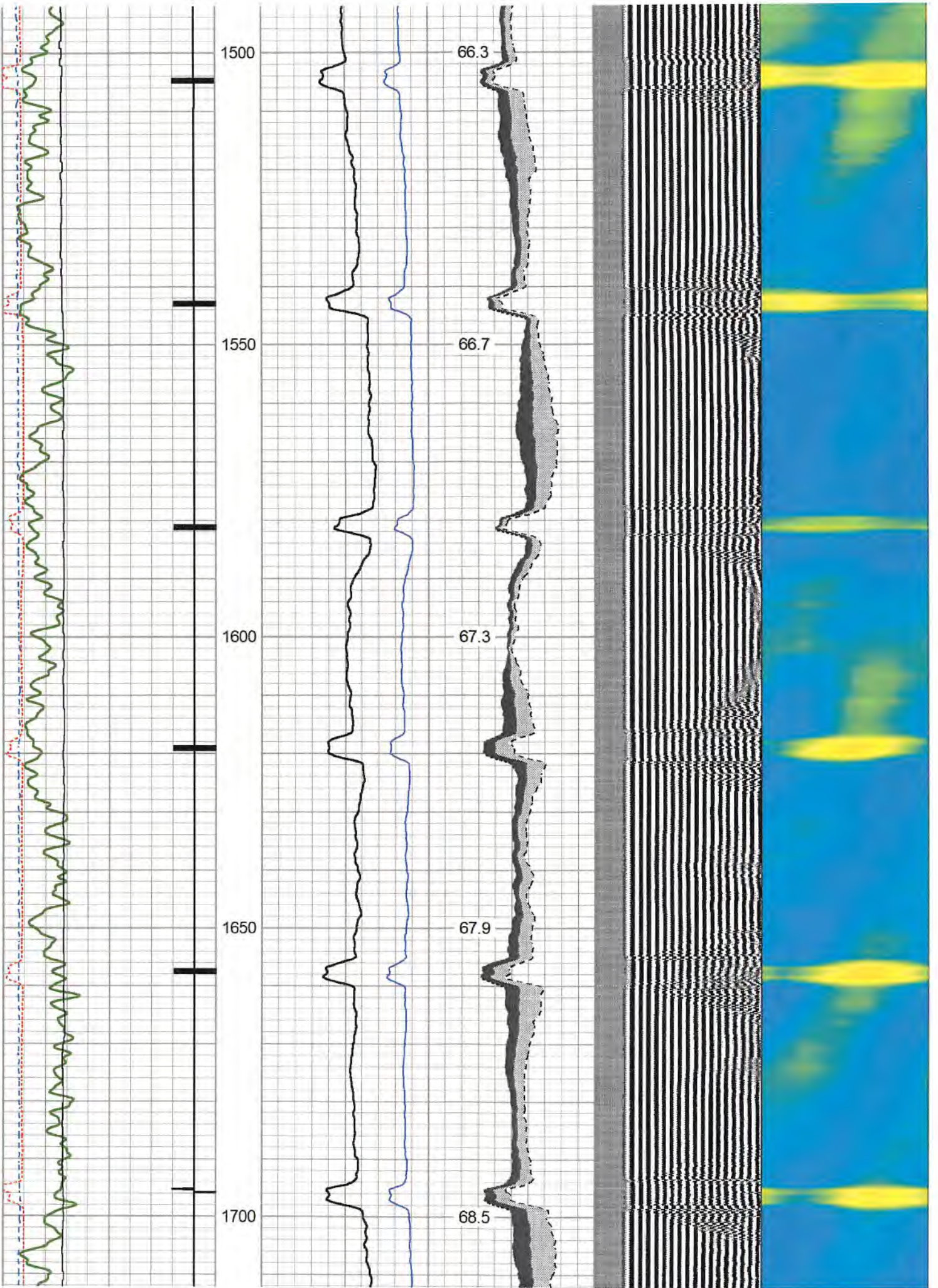


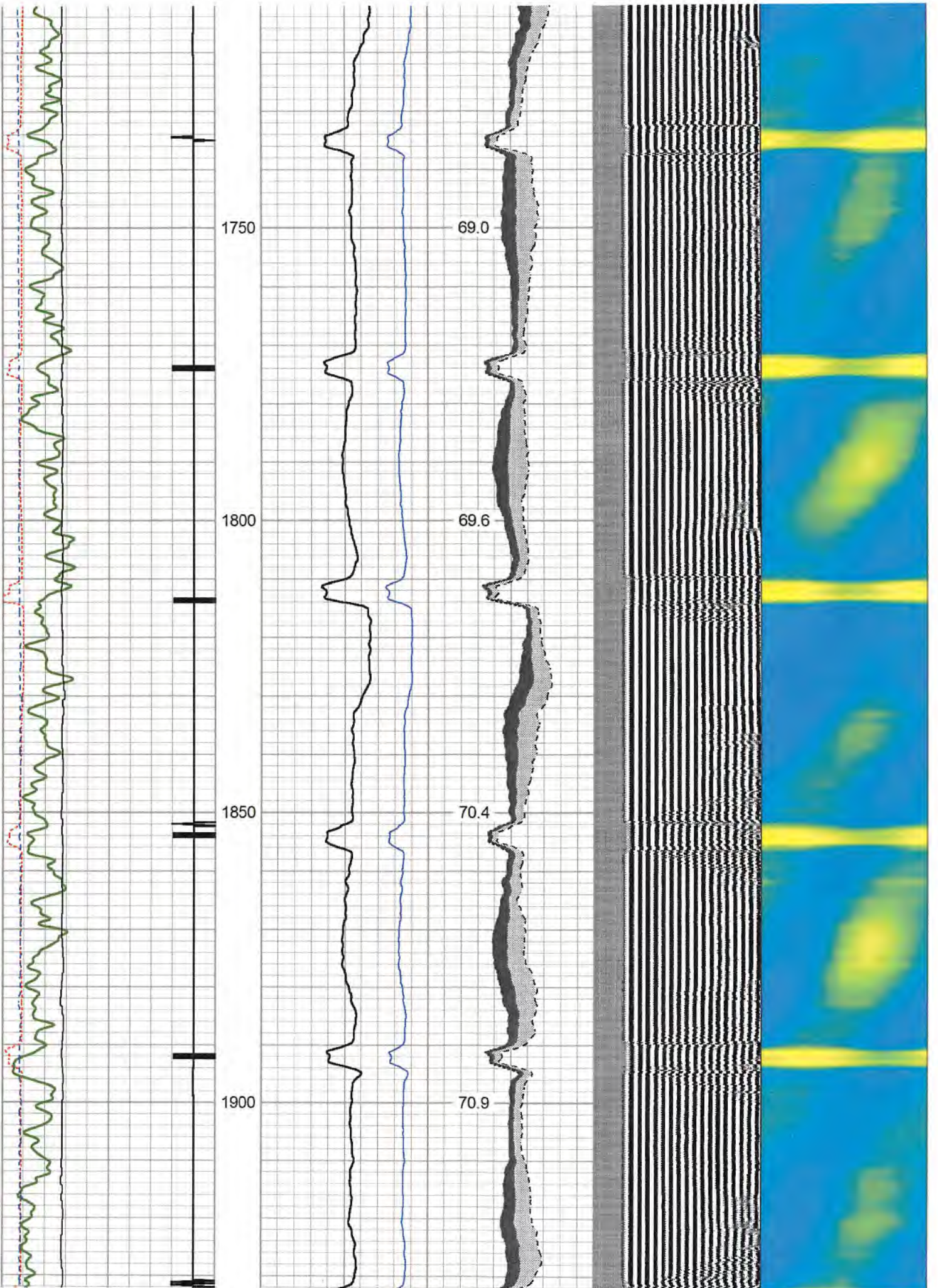


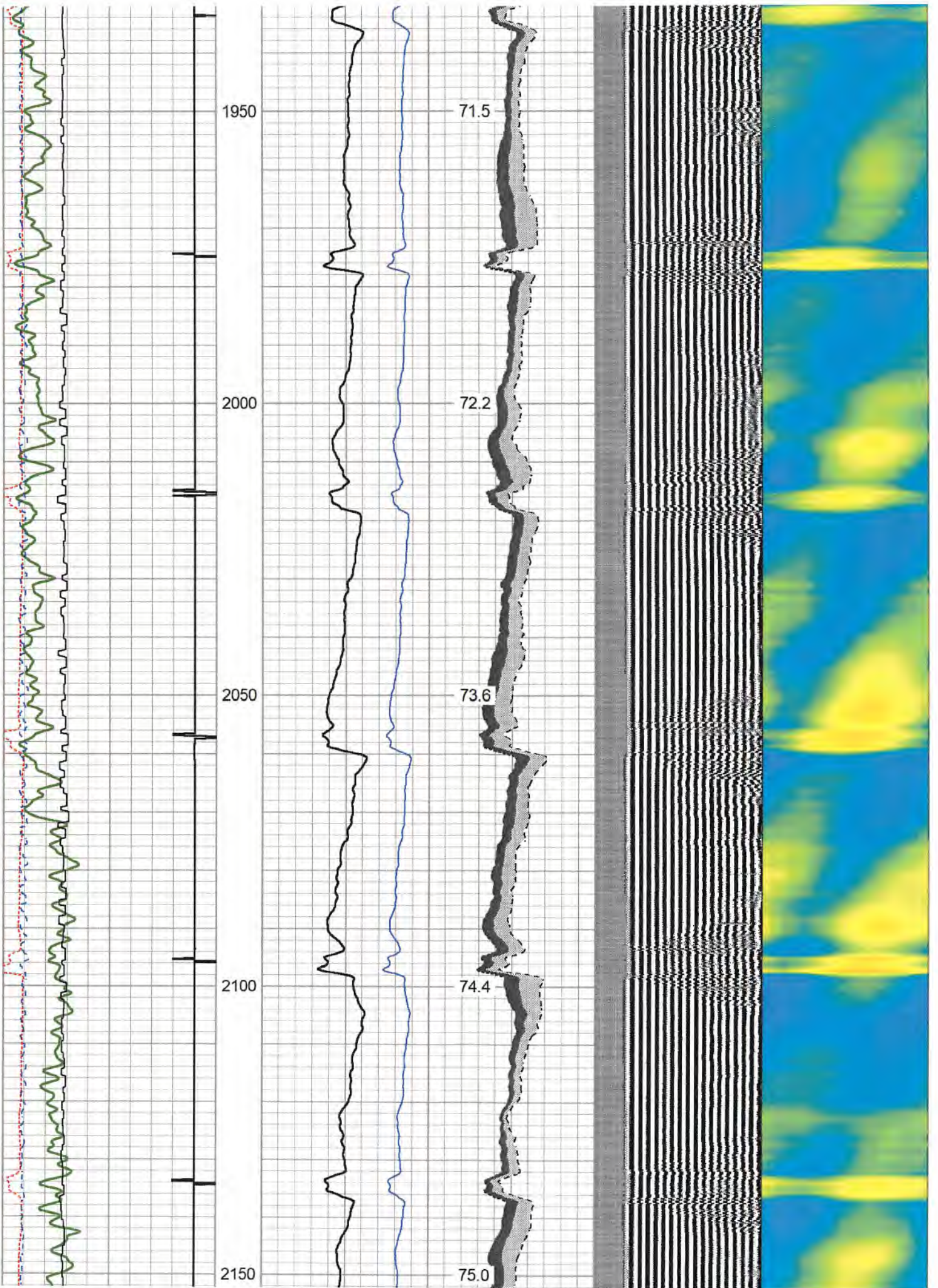


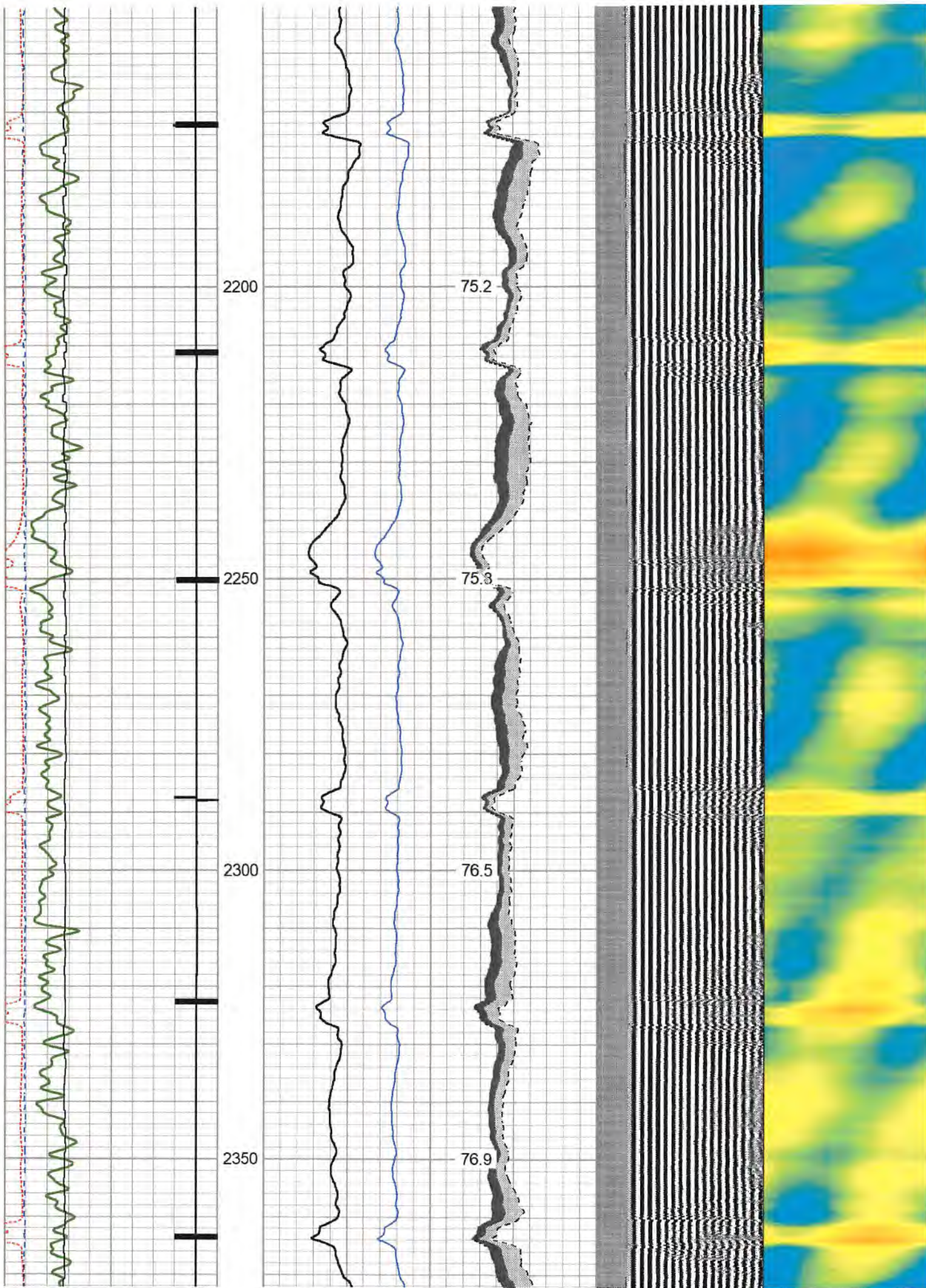


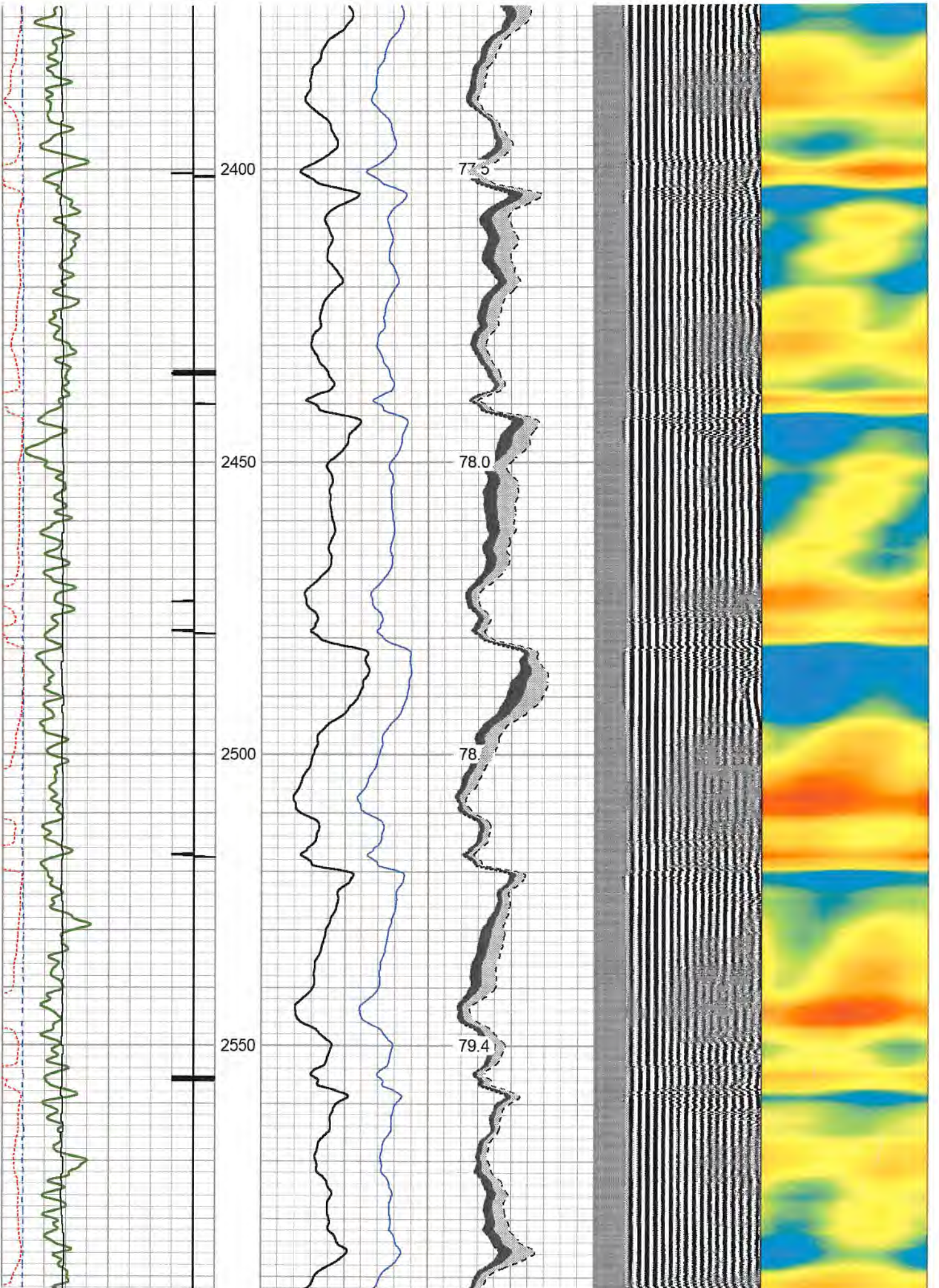


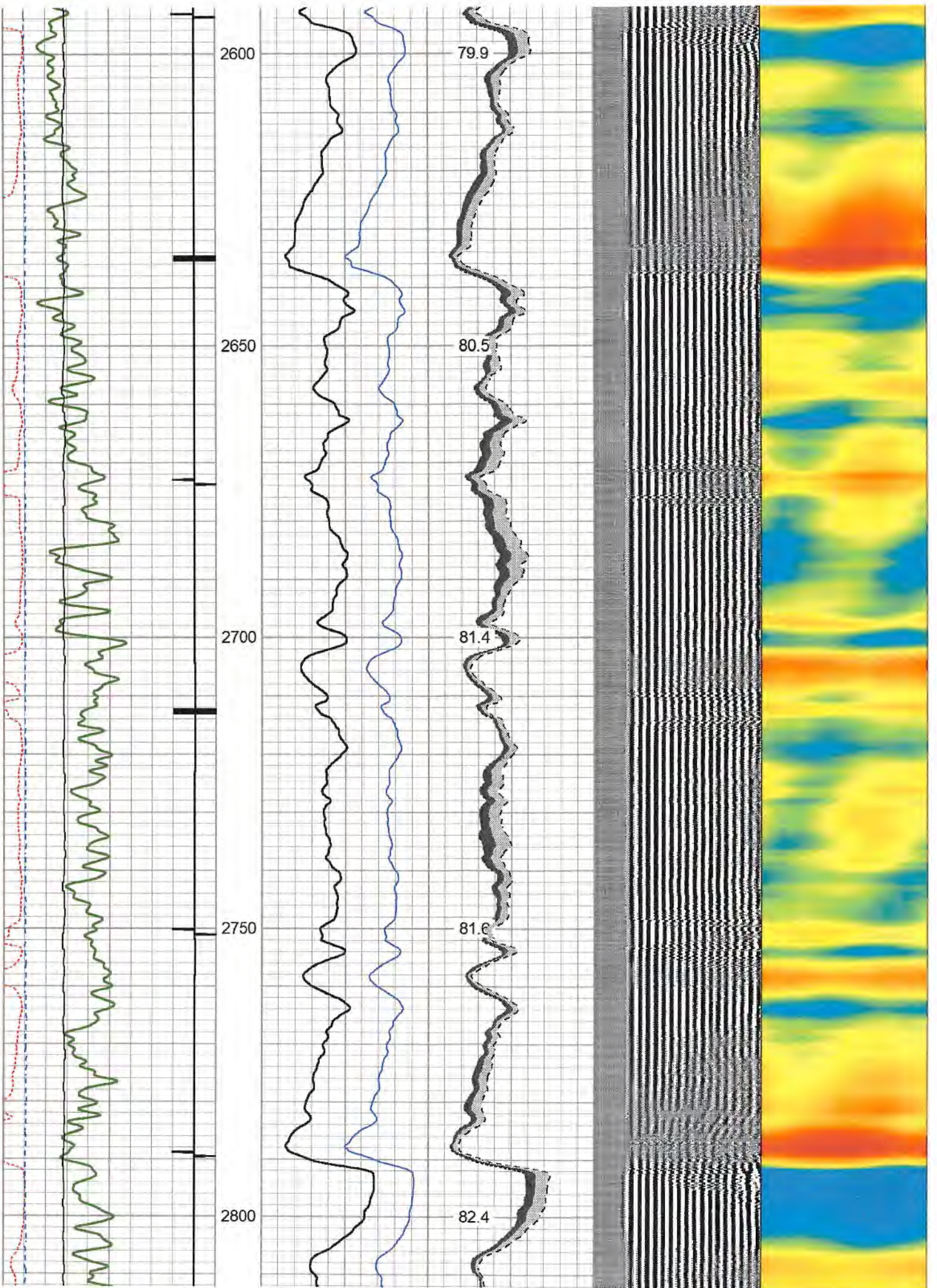


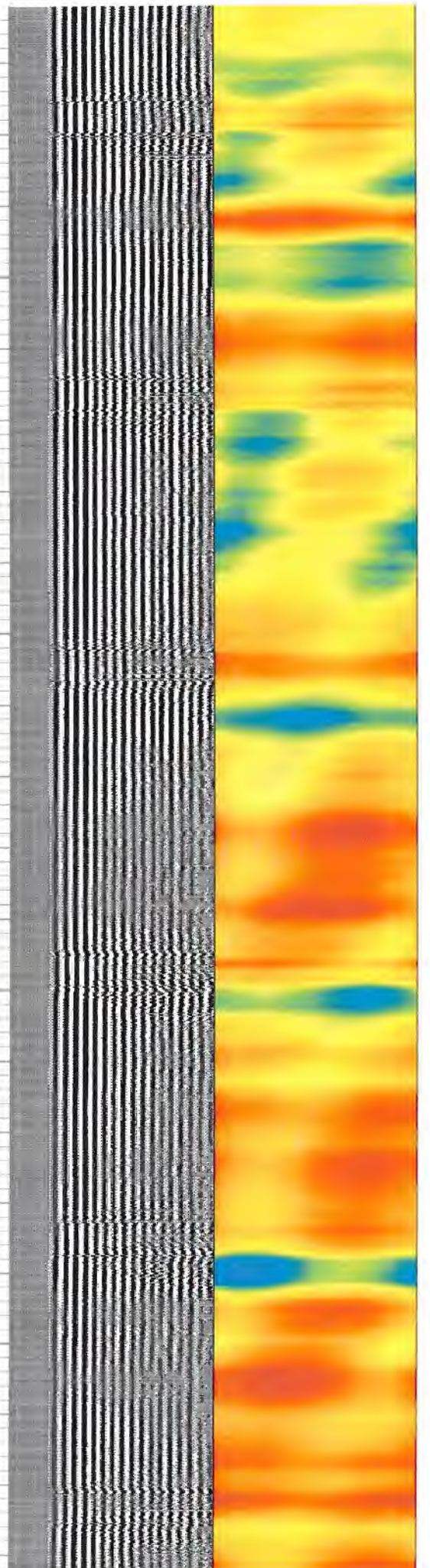
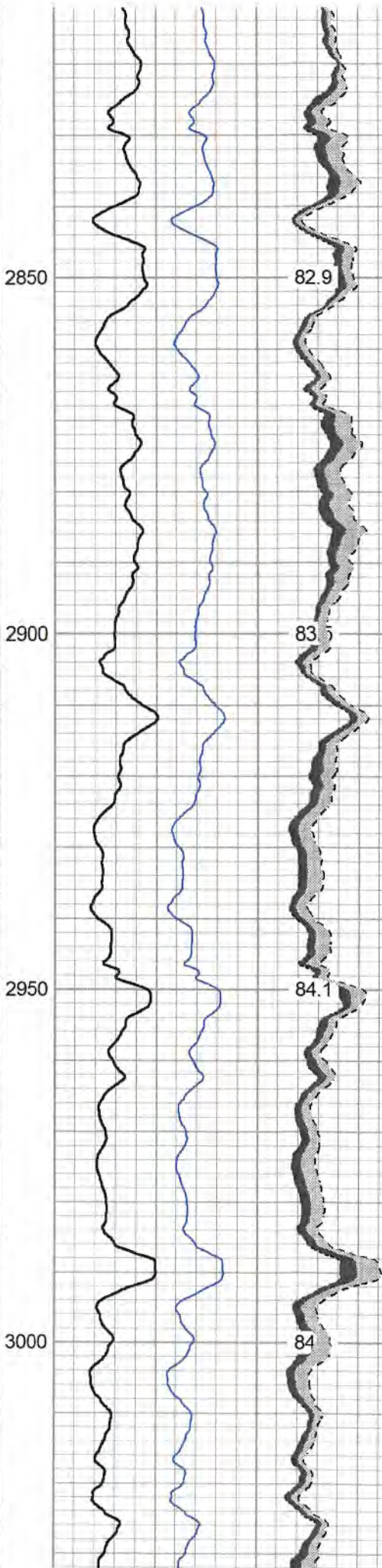
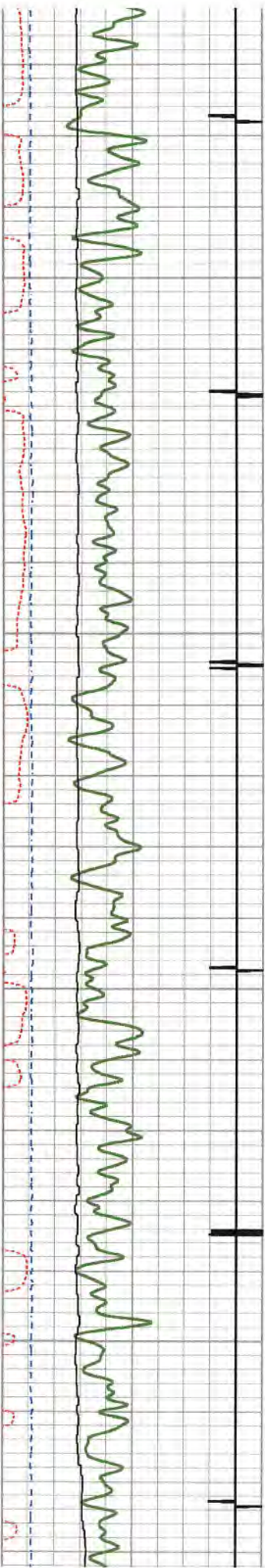


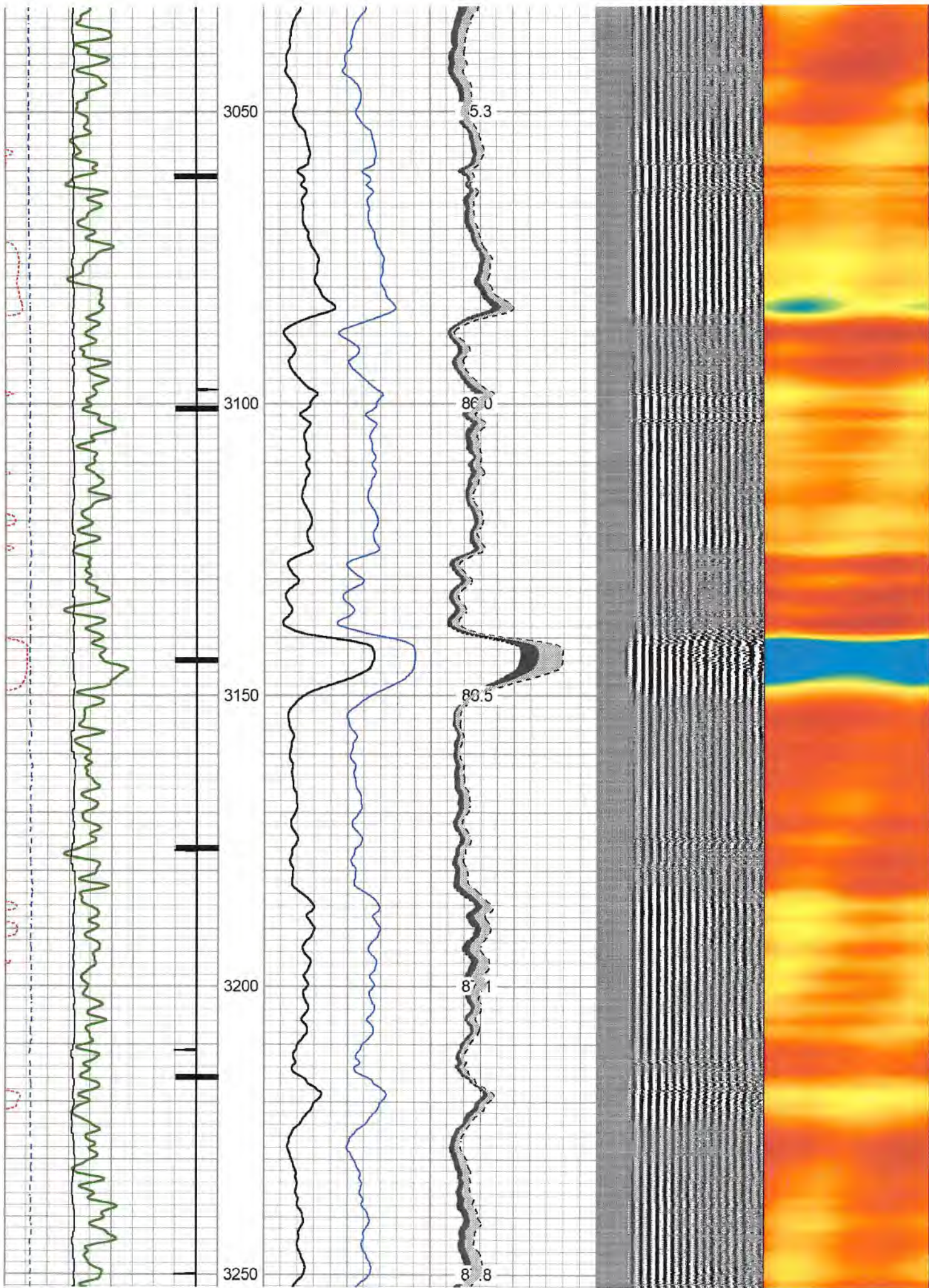




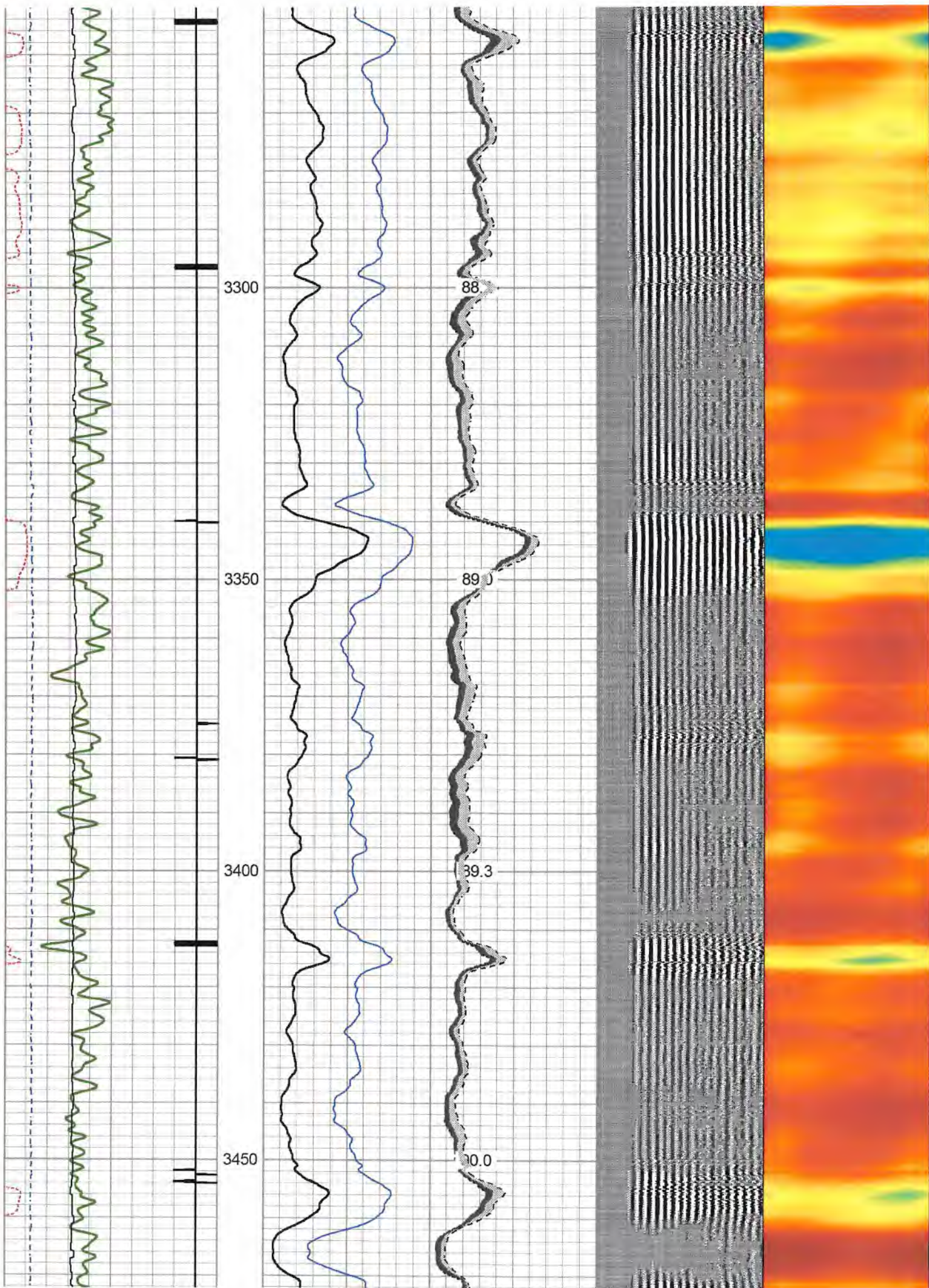


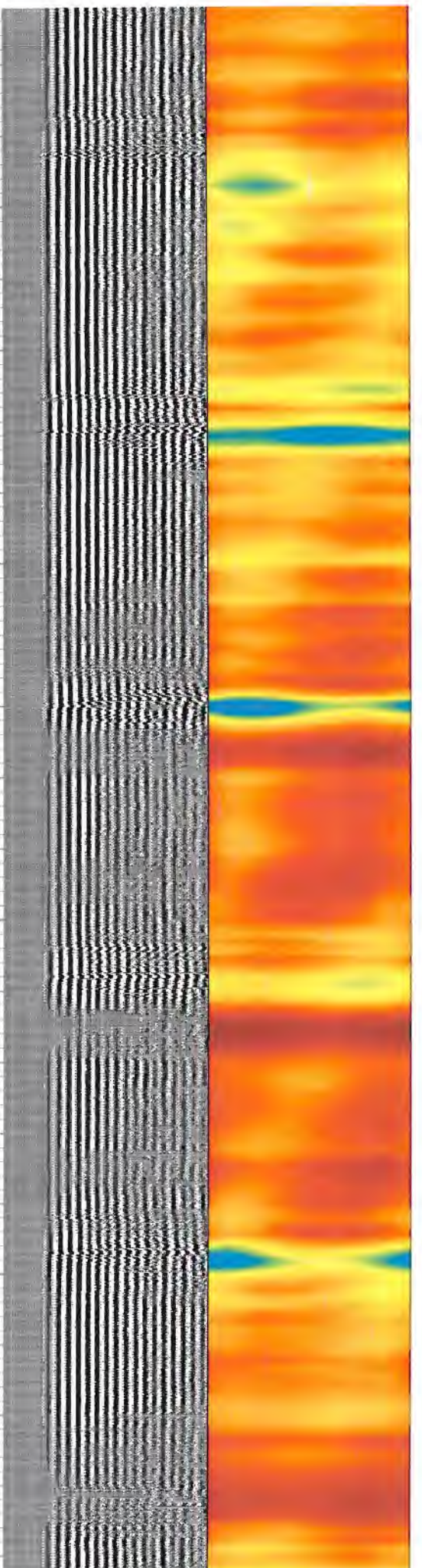
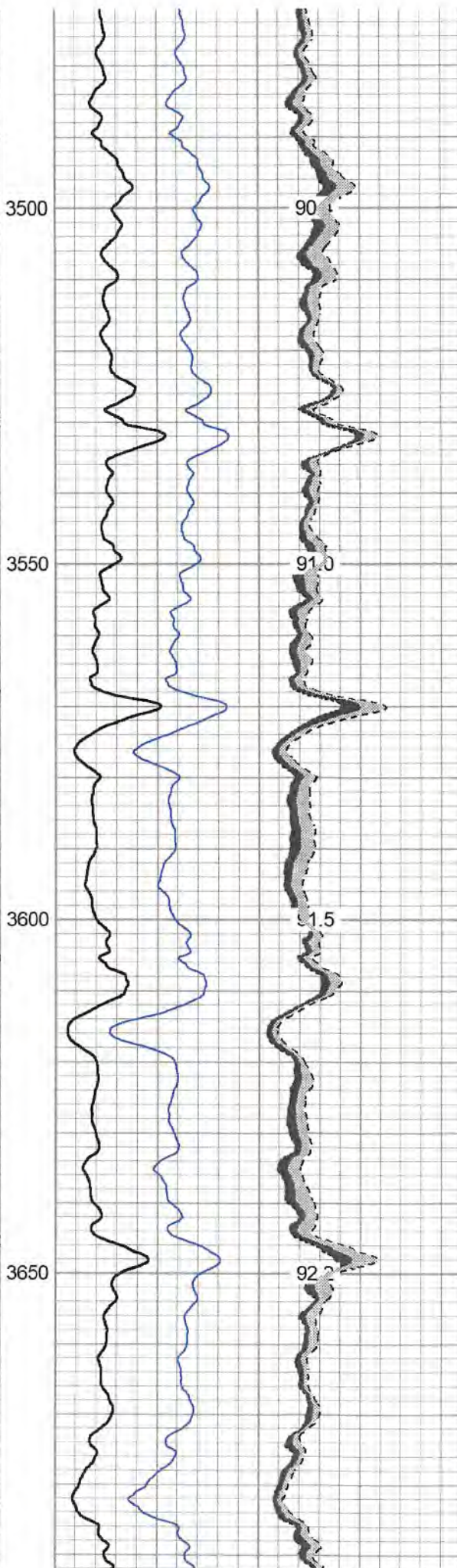
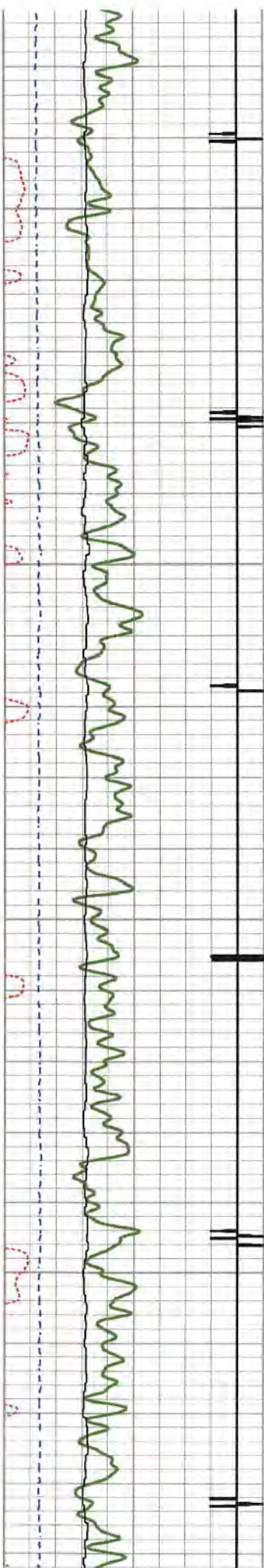


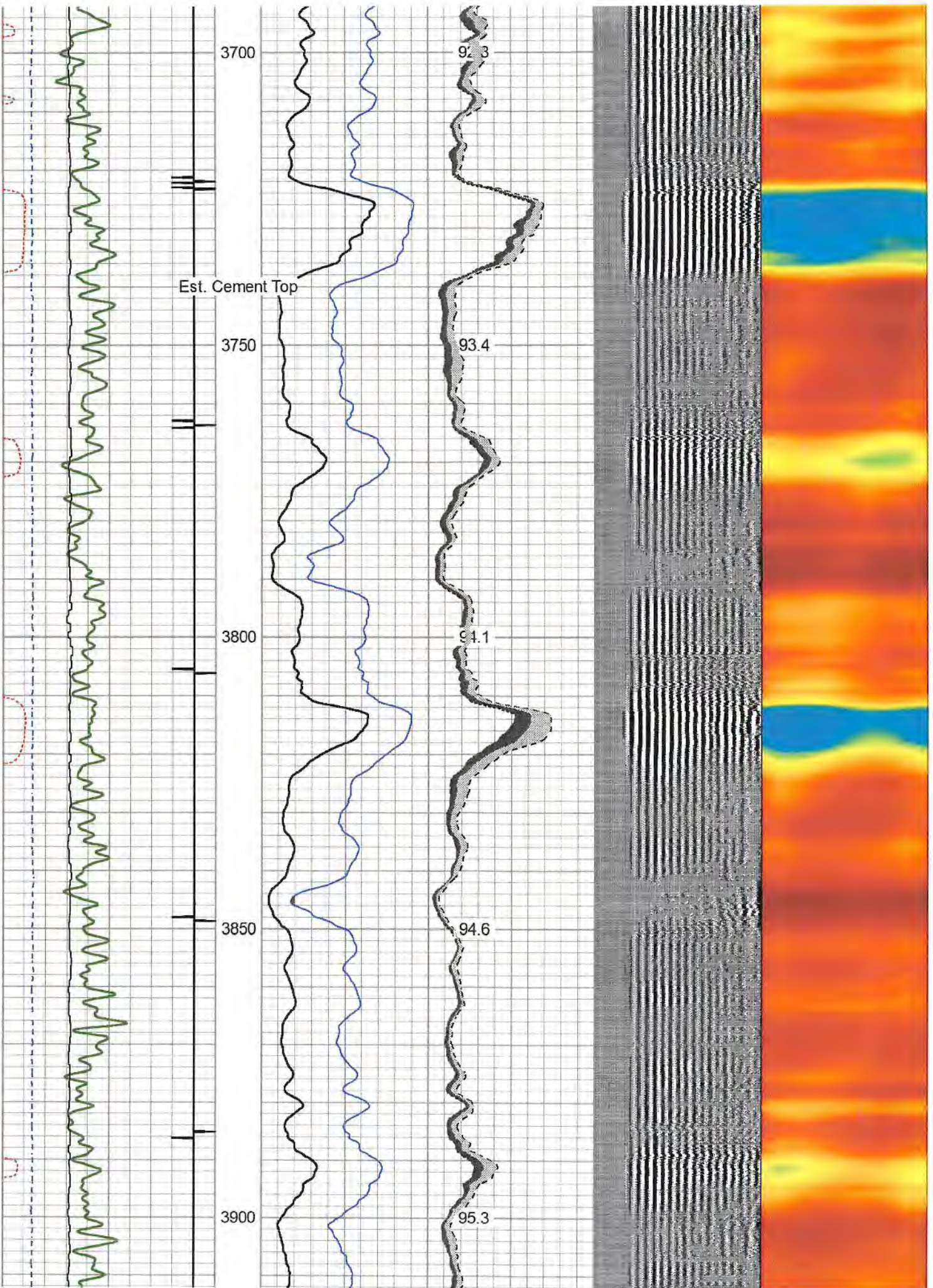


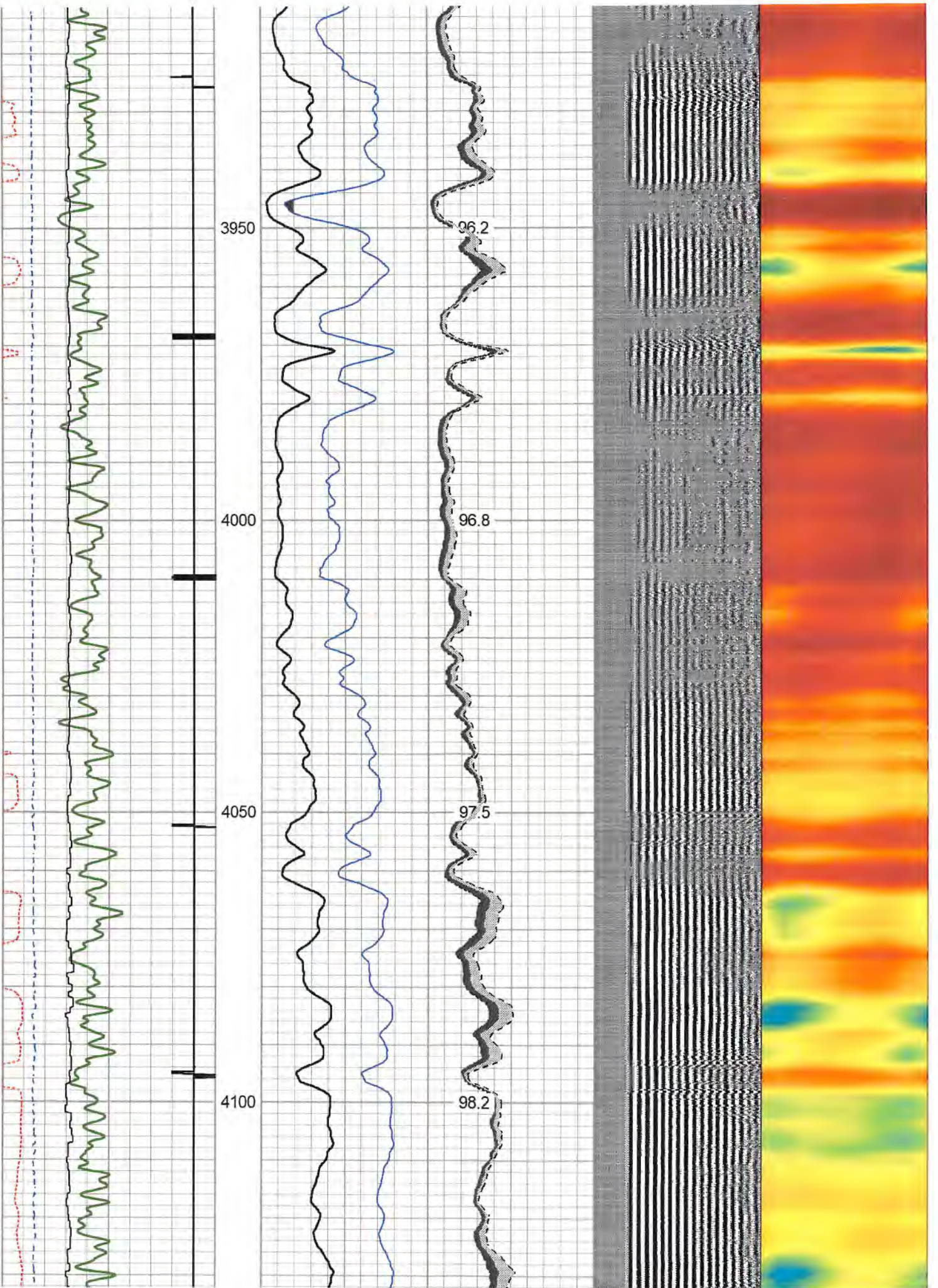


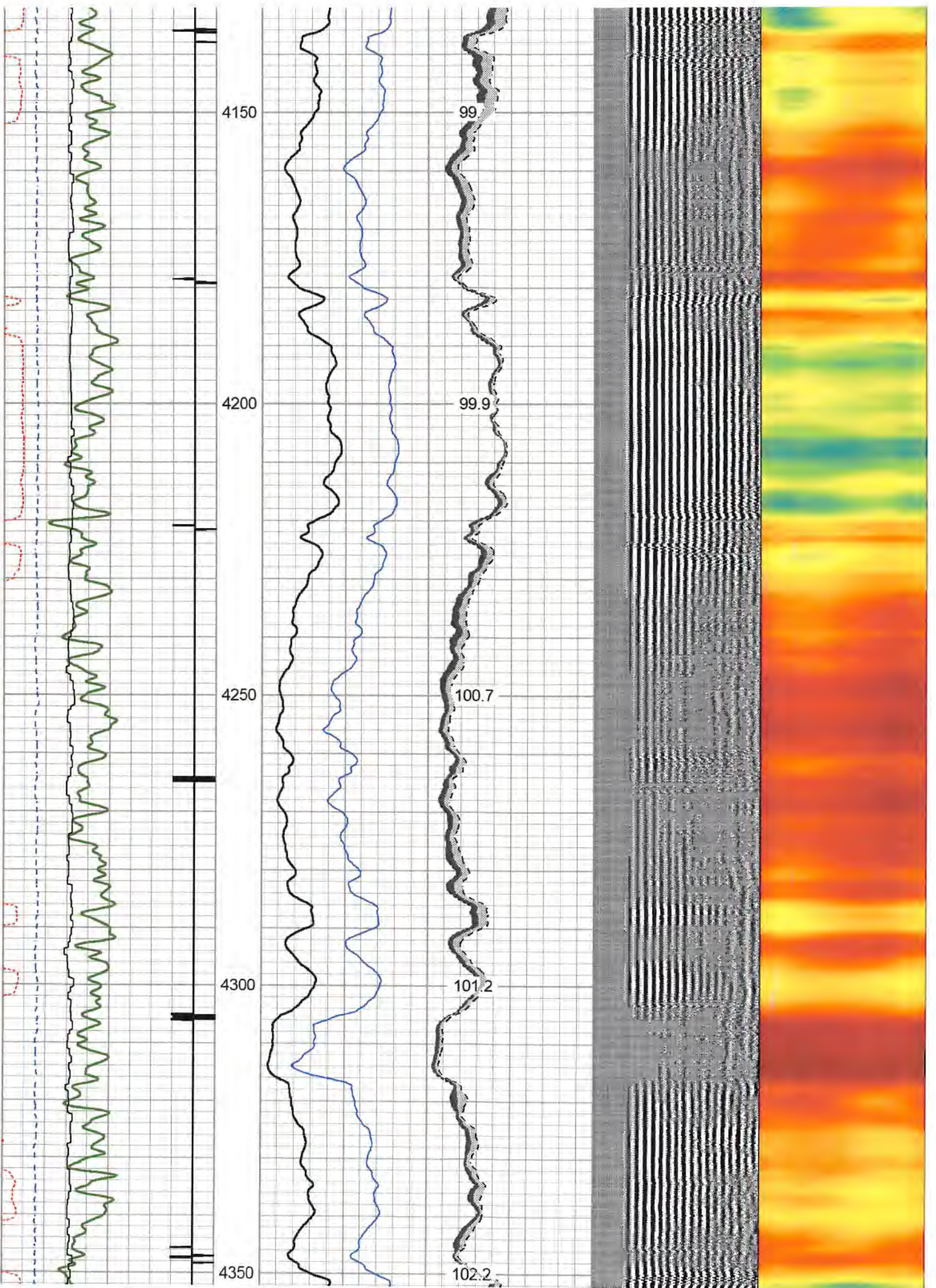


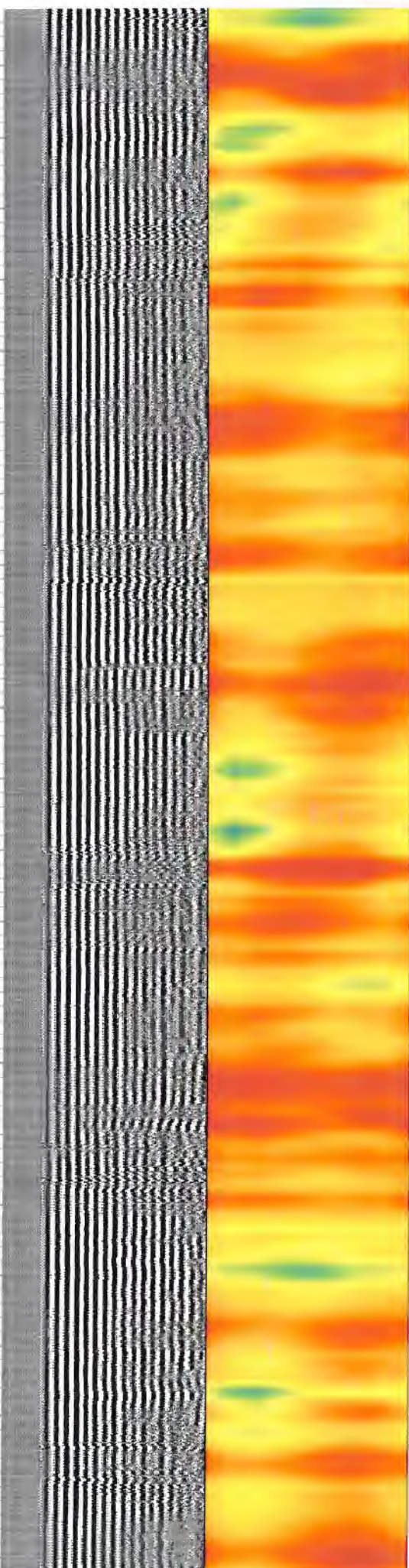
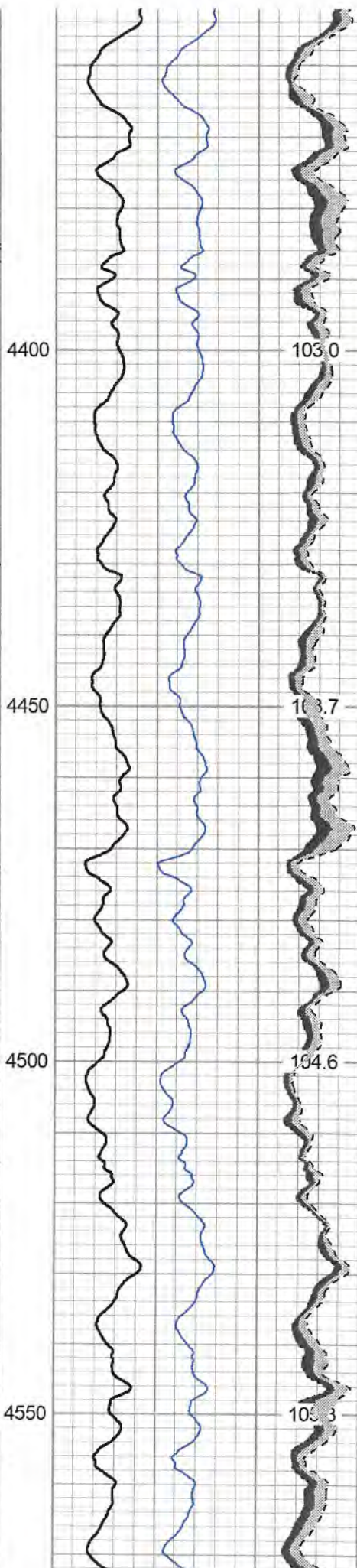
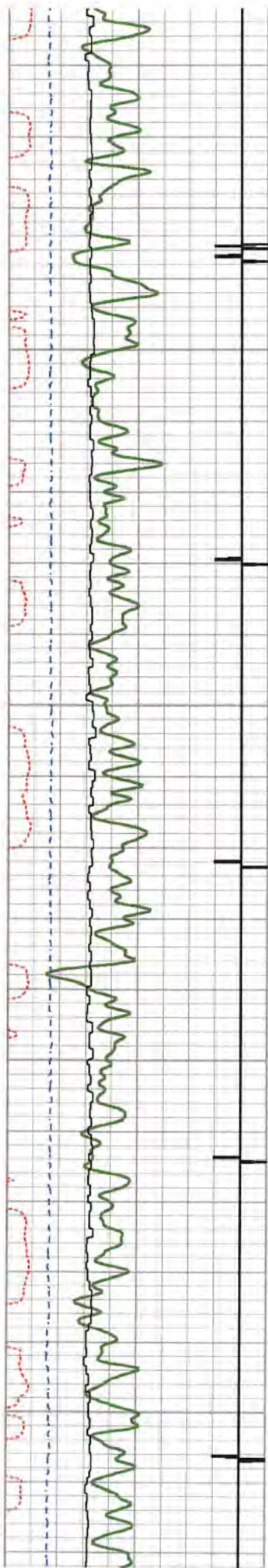


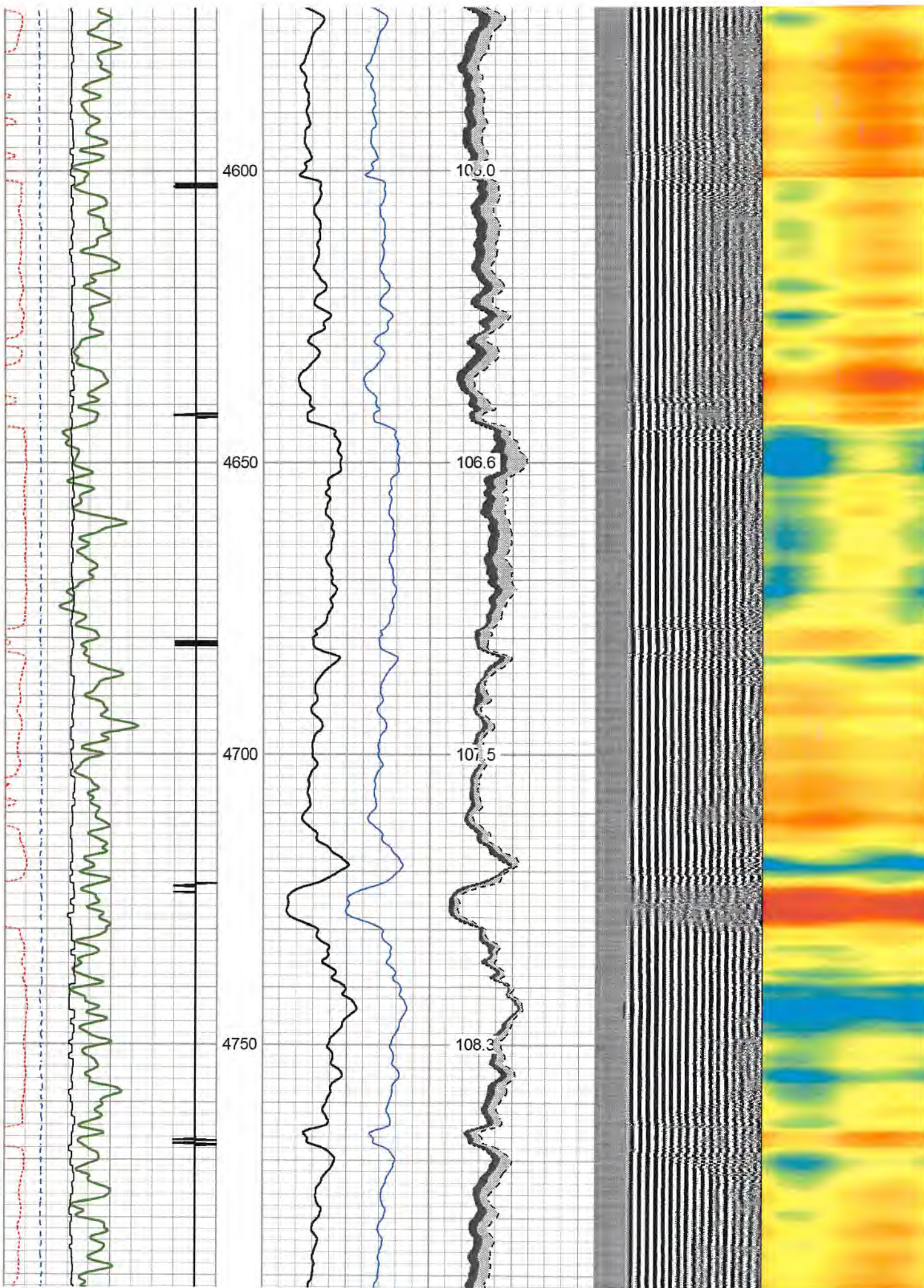


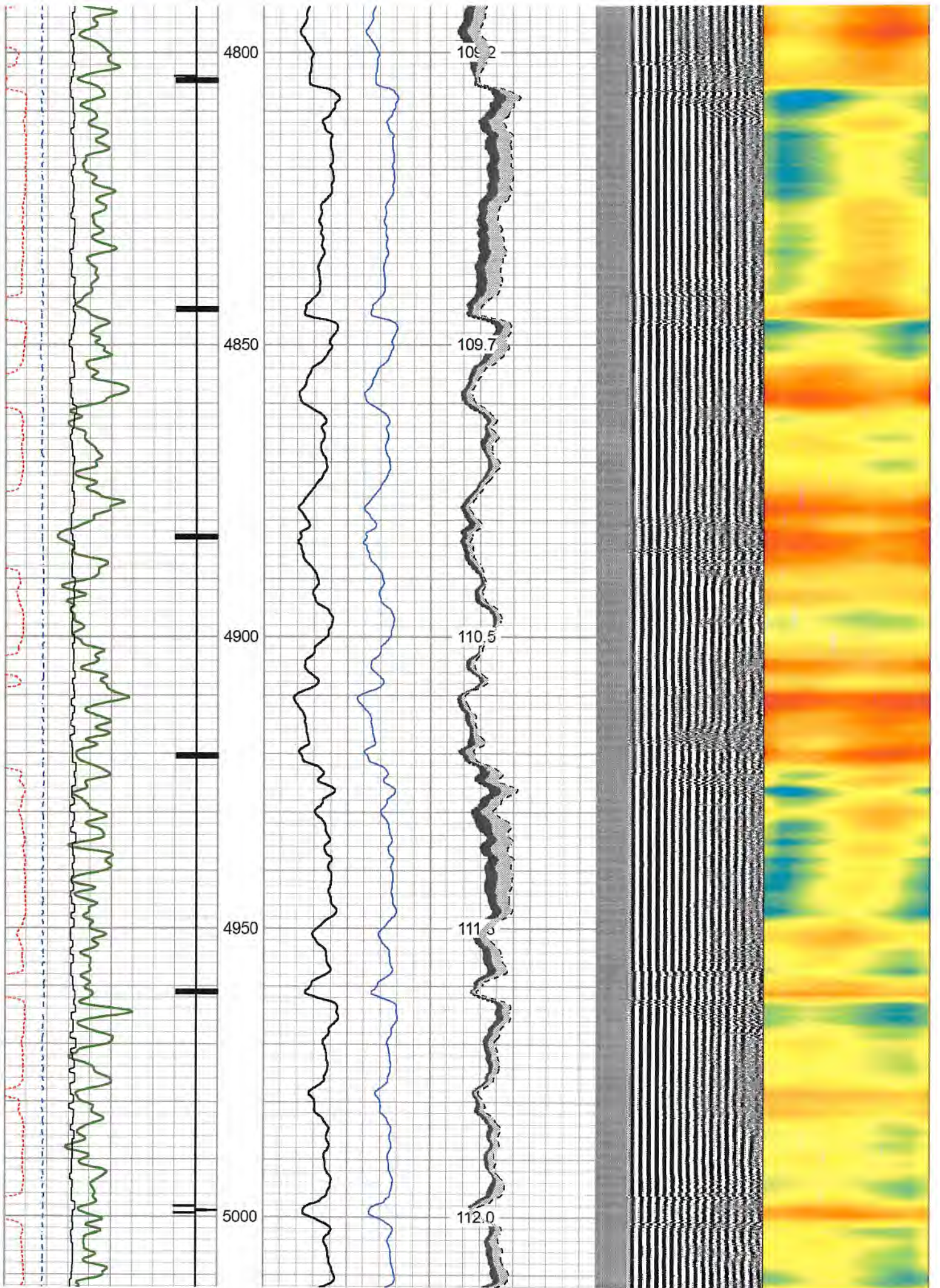




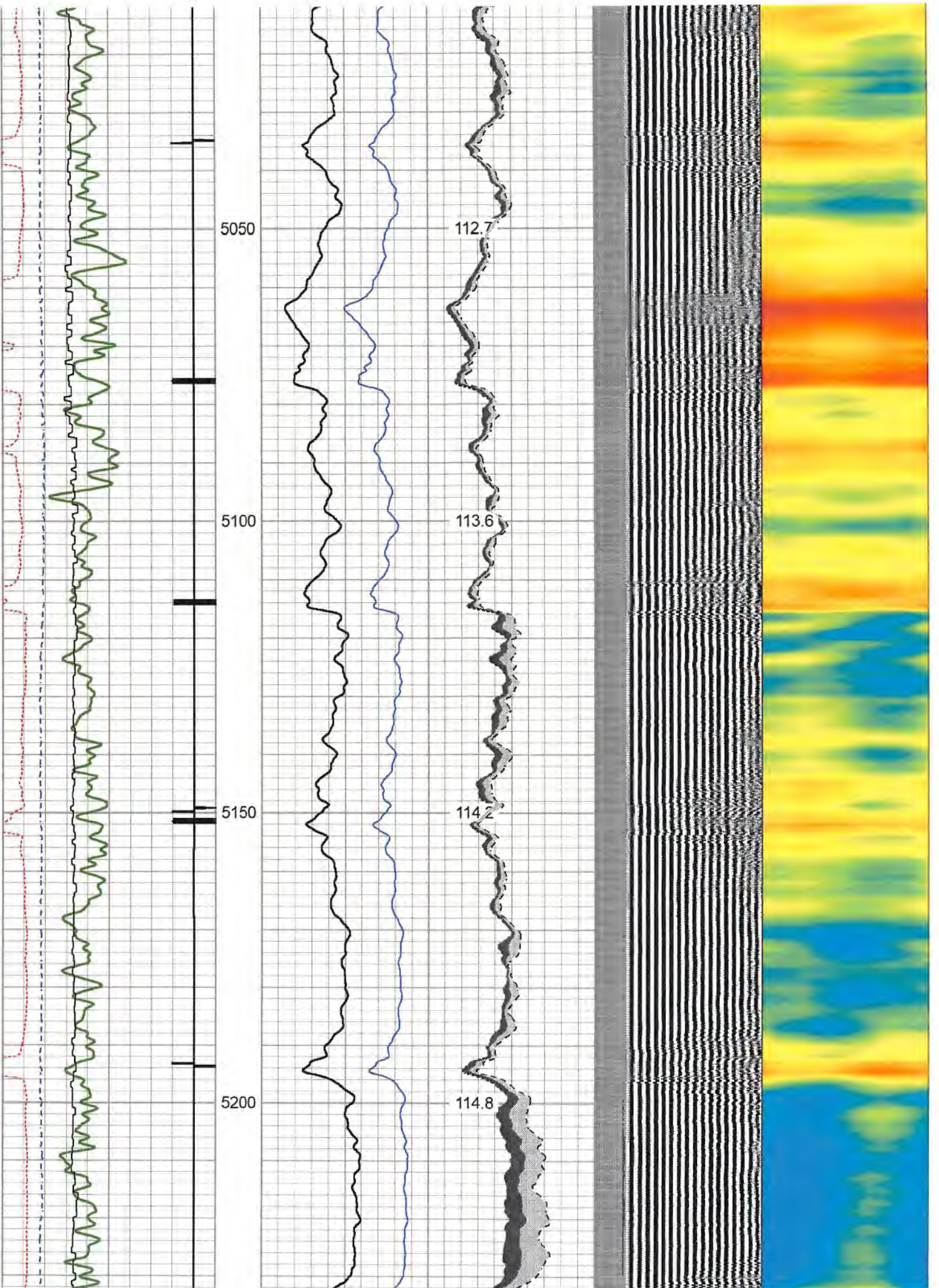


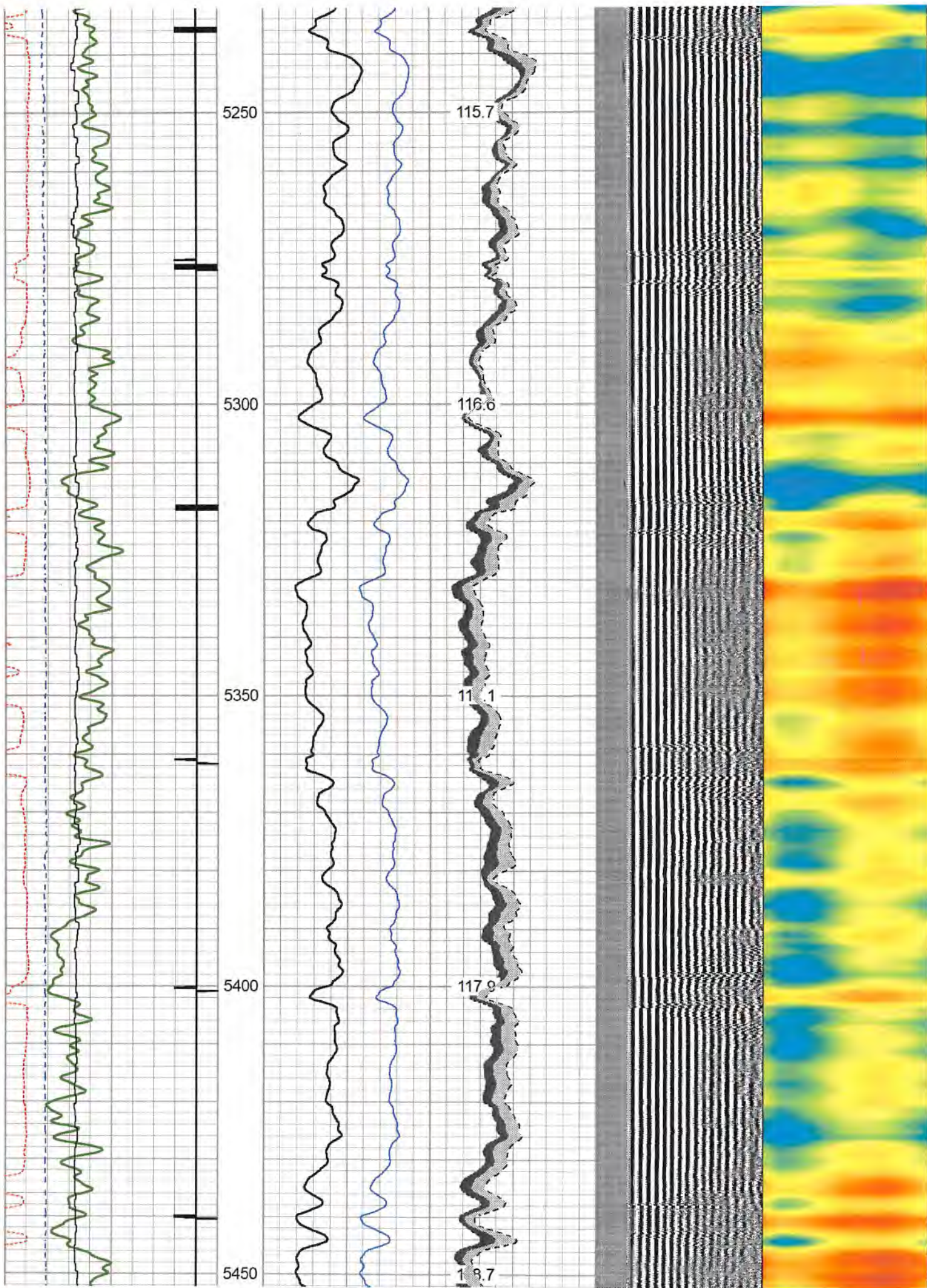


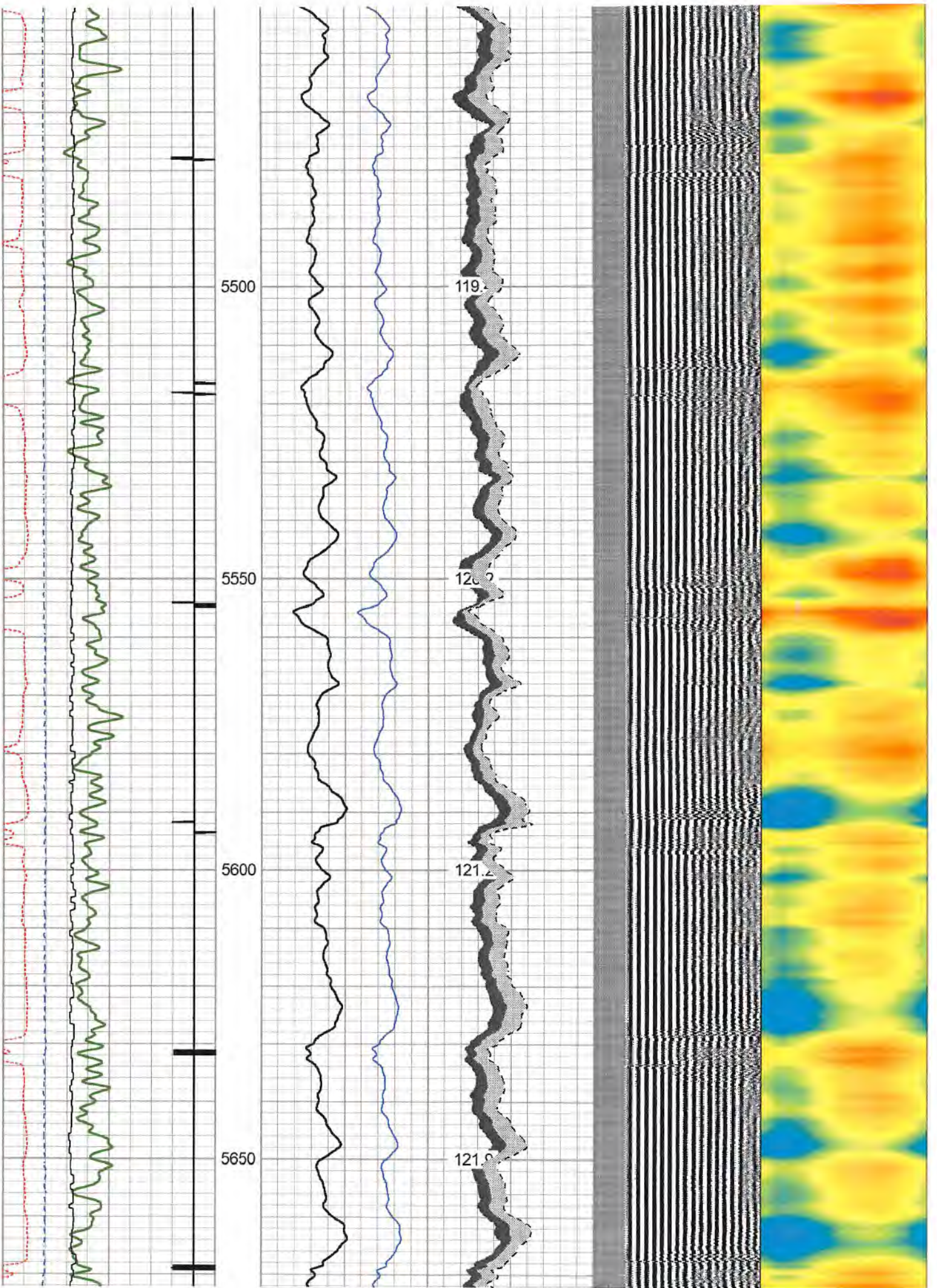


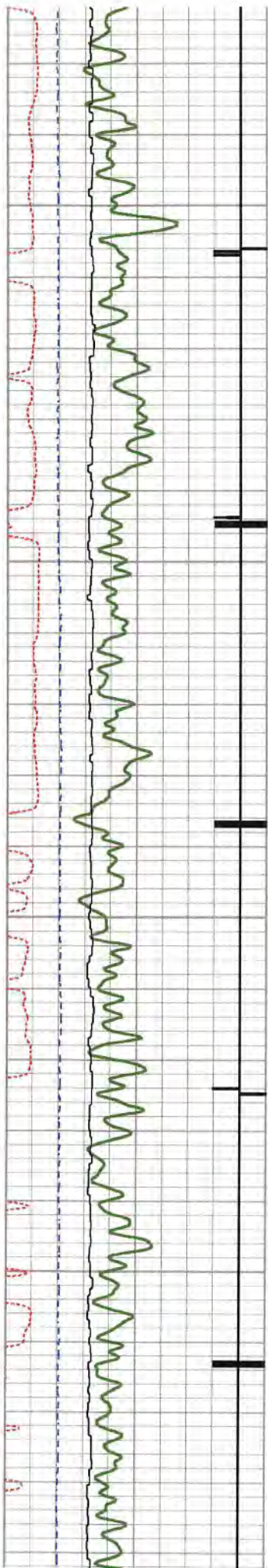










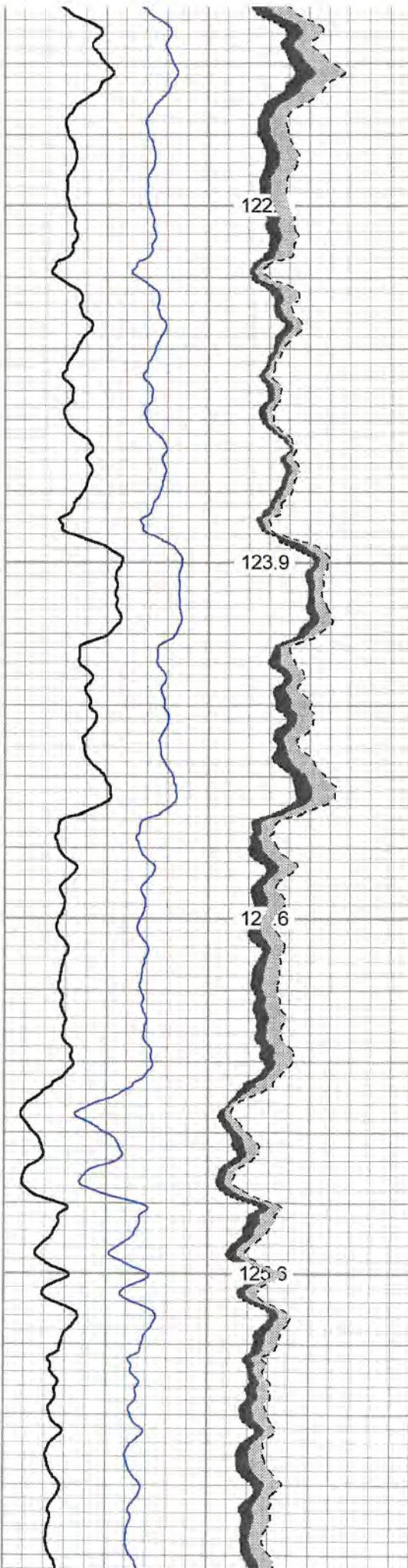


5700

5750

5800

5850

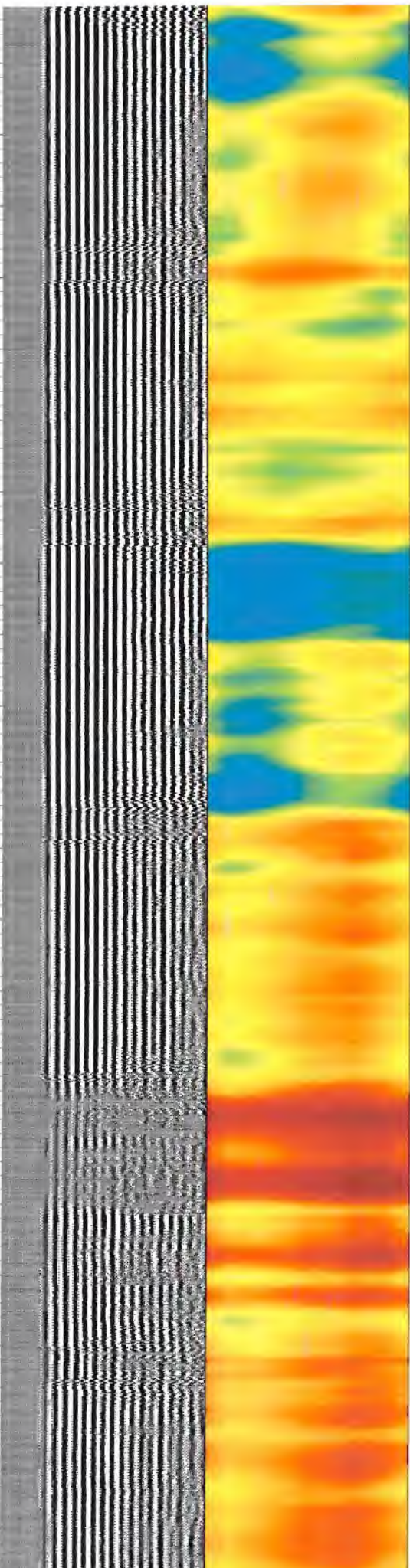


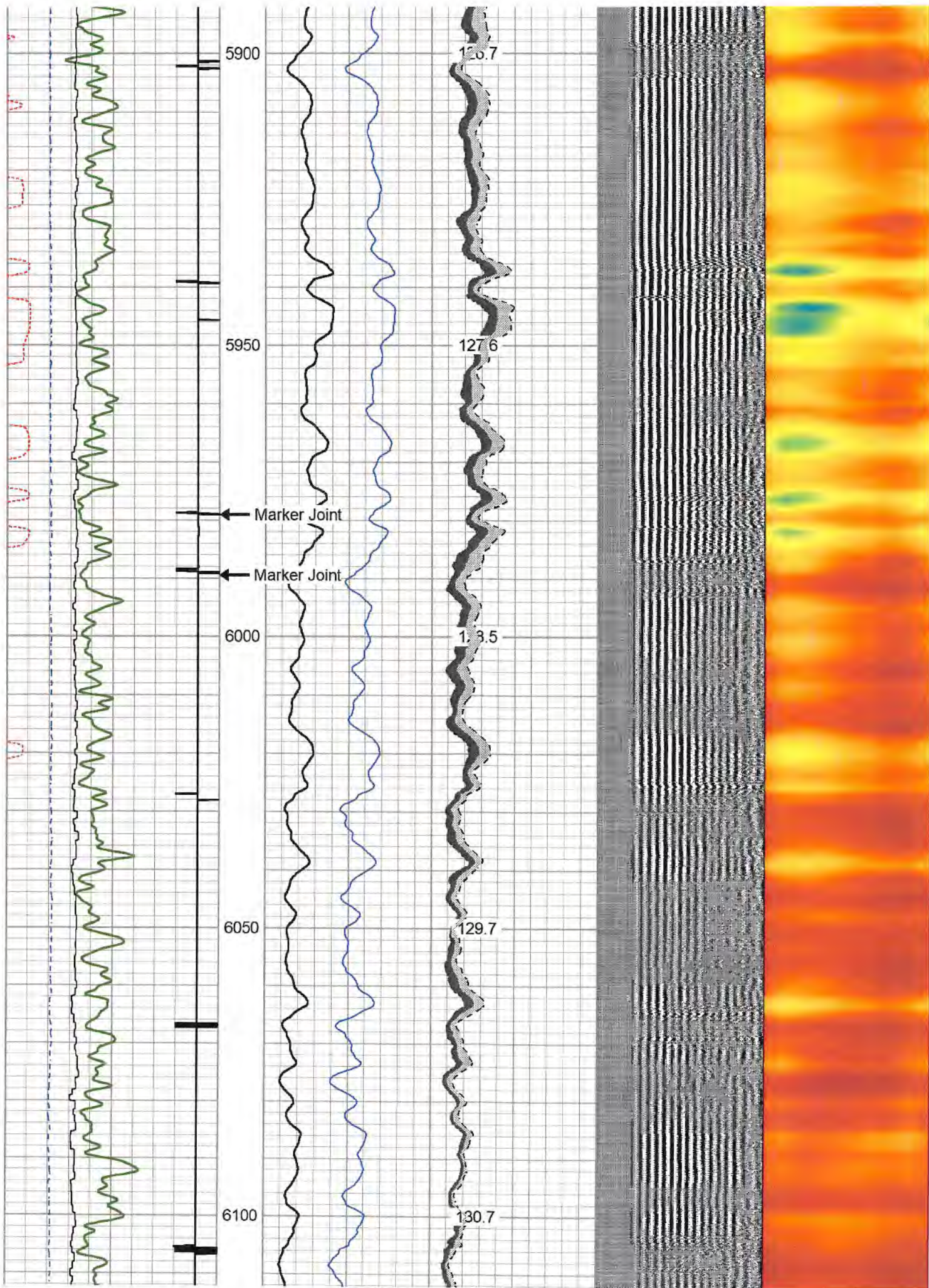
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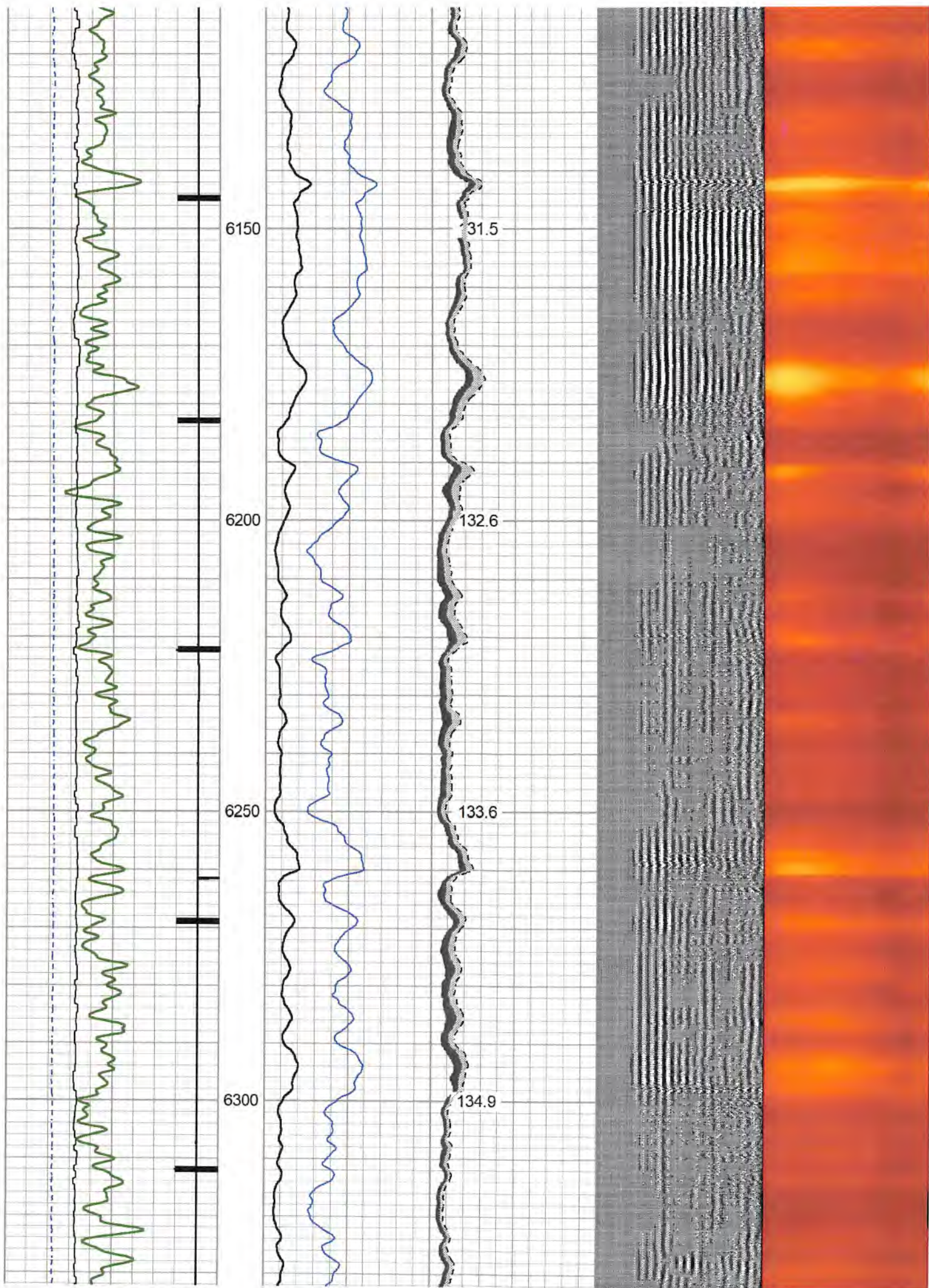
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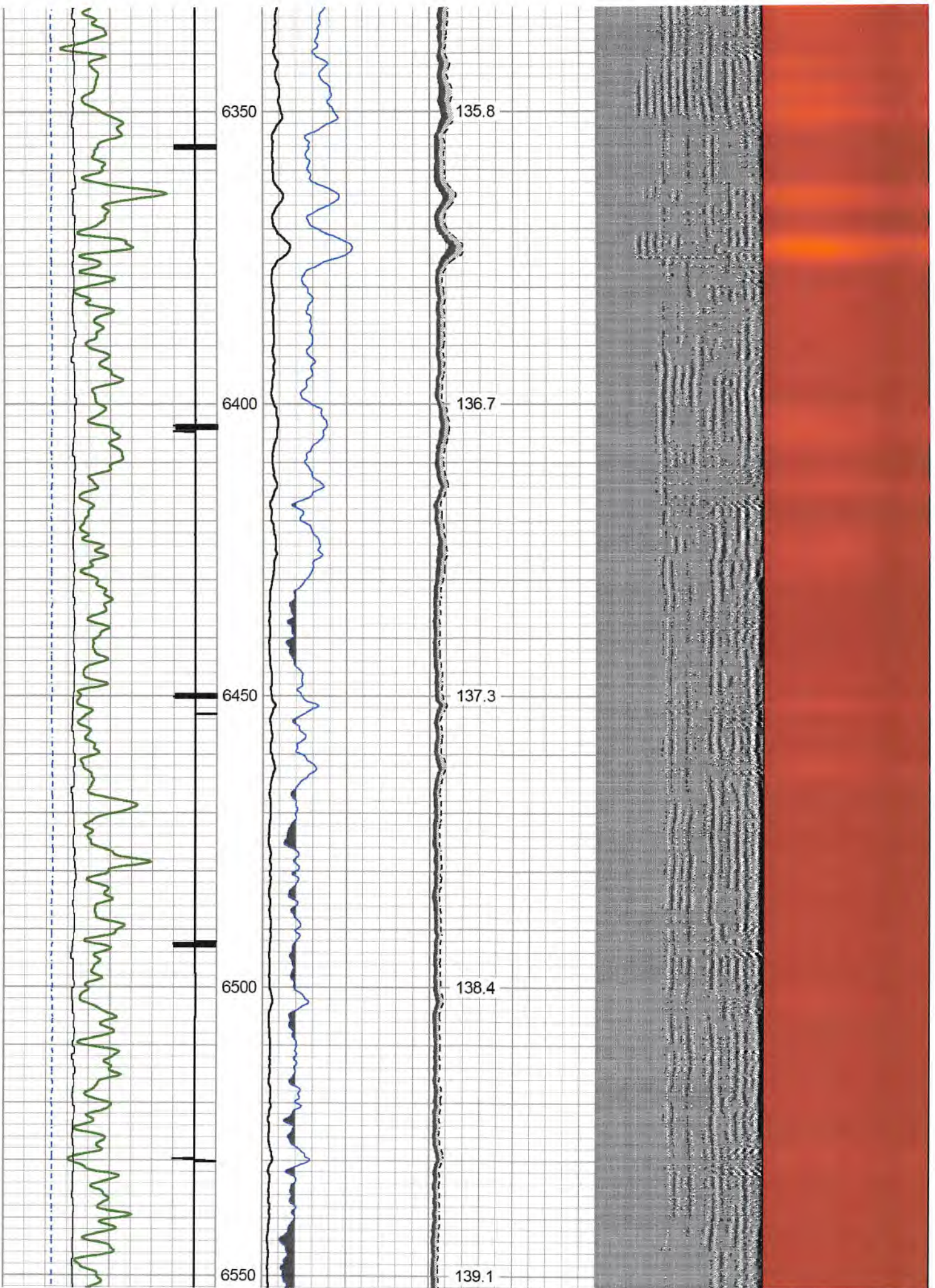
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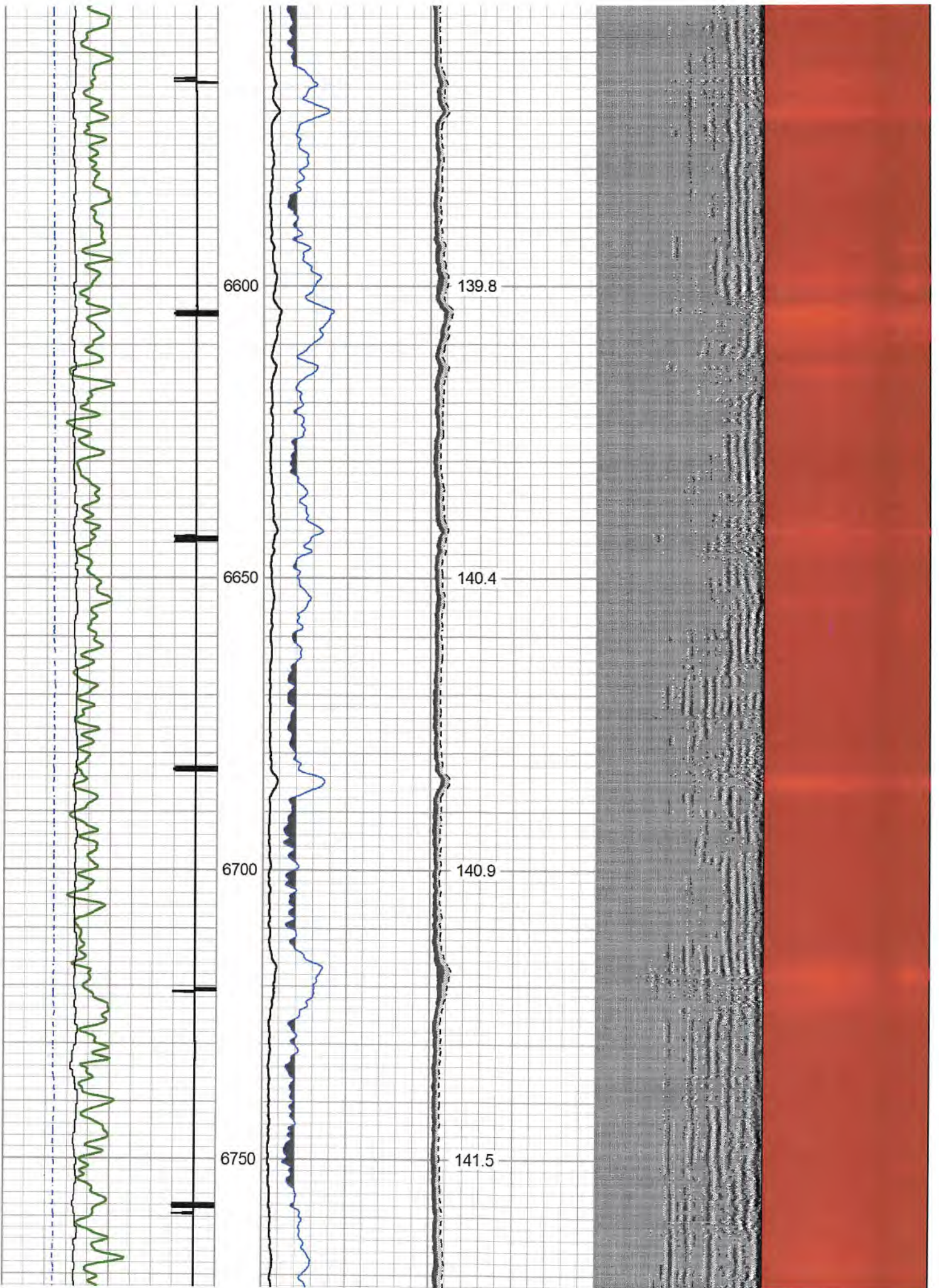
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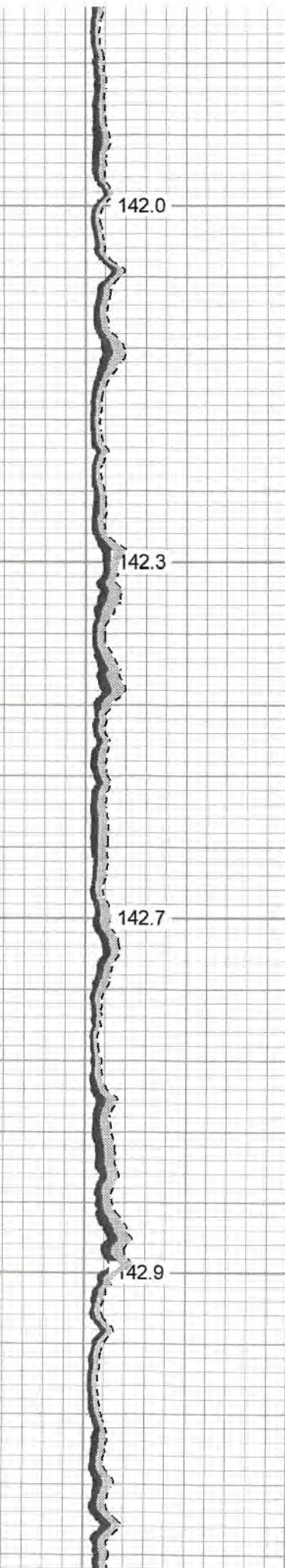
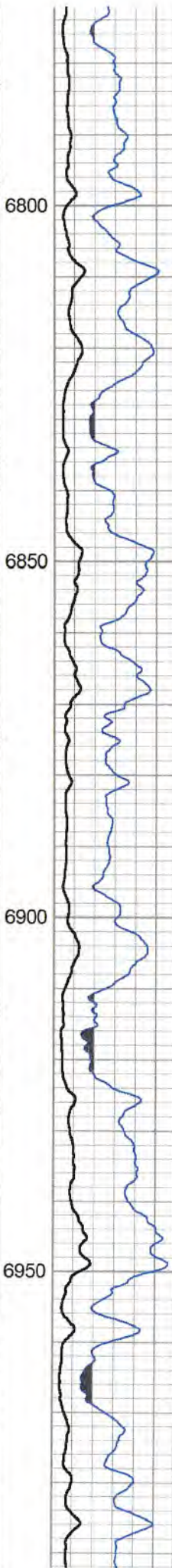
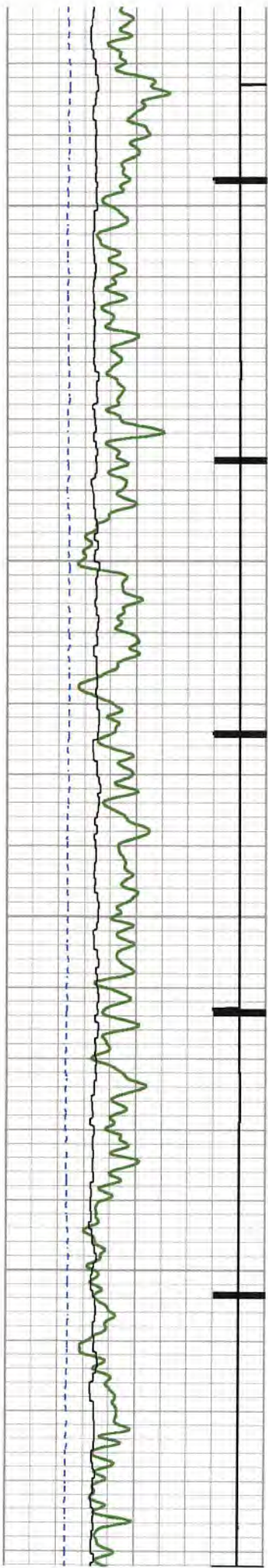


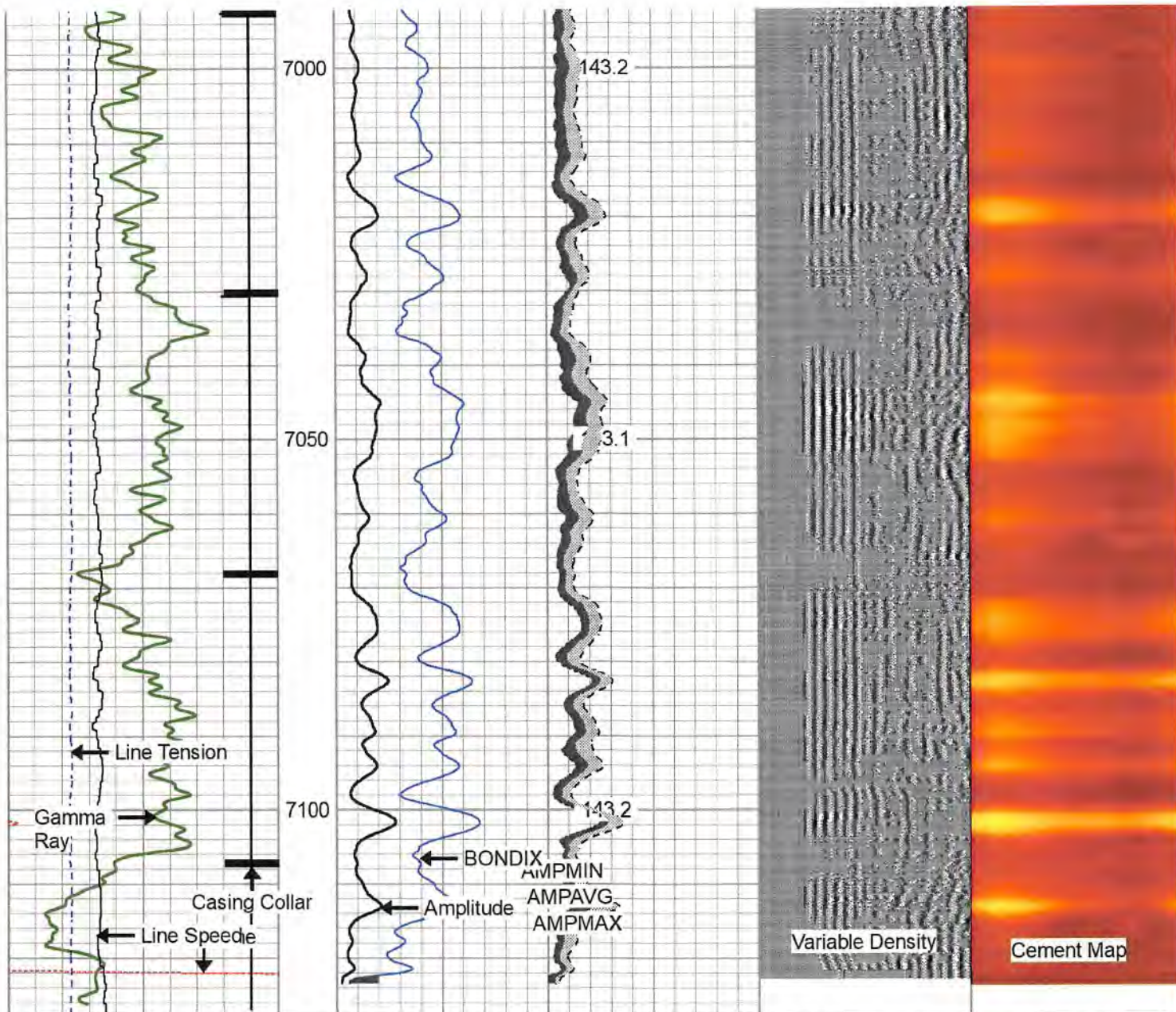












265	Travel Time (usec)	165	0	Amplitude (mV)	100	-5	AMPMIN	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	1	BONDIX	0	-5	AMPMAX	150	200 (usec)	1200		
0	Gamma Ray (GAPI)	150				-5	AMPAVG	150				
	Line Speed						TEMP					
-200	(ft/min)	200					(degF)					
0	Line Tension (lb)	5000										



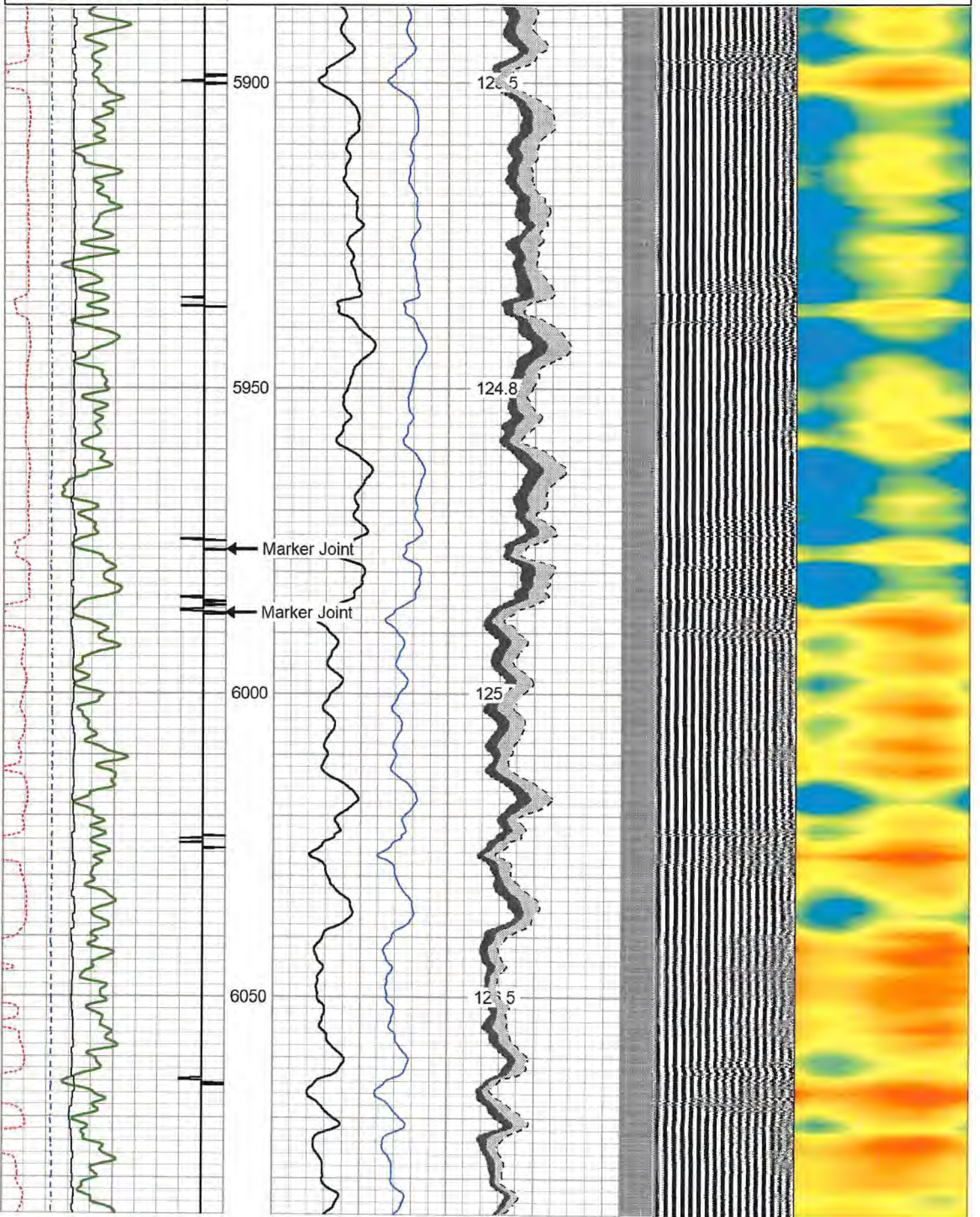
# Repeat Pass 0 PSI

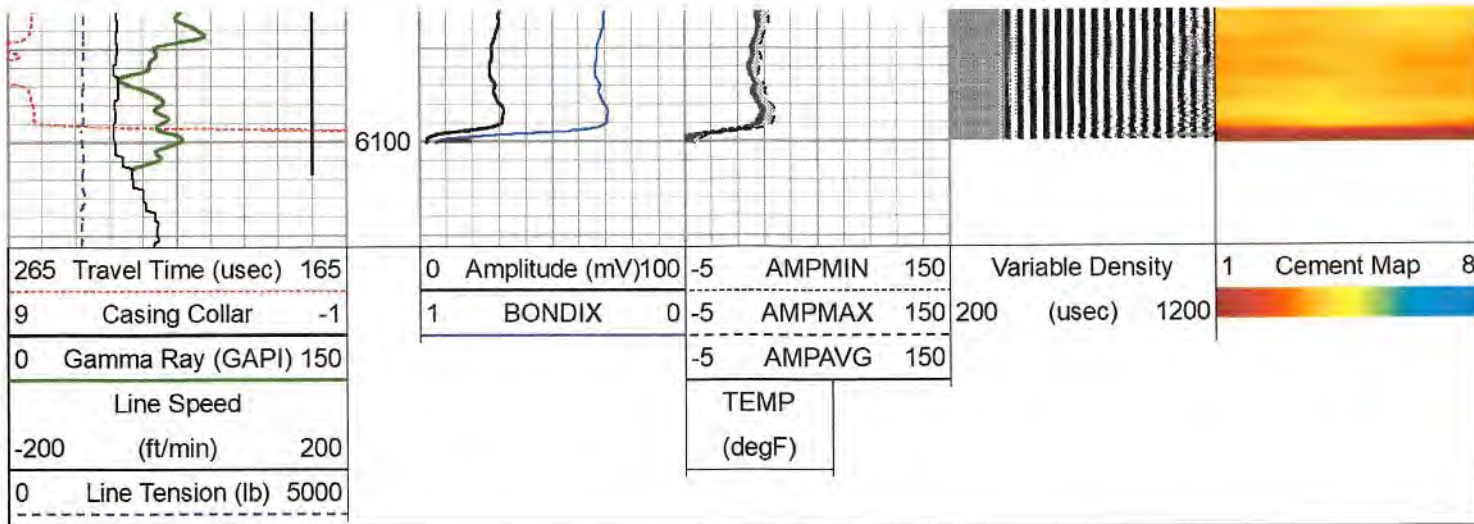
Database File: antero\_aspen\_1h\_rcbl\_nov\_14\_2022.db  
 Dataset Pathname: pass2  
 Presentation Format: rcbl-bond index for antero 1020  
 Dataset Creation: Mon Nov 14 14:50:22 2022  
 Charted by: Depth in Feet scaled 1:240

265	Travel Time (usec)	165	0	Amplitude (mV)	100	-5	AMPMIN	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	1	BONDIX	0	-5	AMPMAX	150	200 (usec)	1200		

0 Gamma Ray (GAPI) 150  
 Line Speed  
 -200 (ft/min) 200  
 0 Line Tension (lb) 5000

-5 AMPAVG 150  
 TEMP  
 (degF)





### Log Variables

Database: C:\ProgramData\Worrior\Data\antero\_aspen\_1h\_rcbl\_nov\_14\_2022.db  
 Dataset: field/well/run1/pass4/\_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	20	71.9	2.2
MINATTN	PERFS	PPT	SRFTEMP	TDEPTH			
db/ft		usec	degF	ft			
0.8	No	261	0	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_aspen_1h_rcbl_nov_14_2022.db
Dataset Pathname	pass4
Dataset Creation	Mon Nov 14 15:10:33 2022

**Gamma Ray Calibration Report**

Serial Number:	FW1211-86
Tool Model:	Probe
Performed:	Sun Nov 13 11:04:25 2022
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:	2.75"
Tool Model:	Probe275T
Calibration Casing Diameter:	5.500 in

Calibration Casing Diameter: 3.500  
 Calibration Depth: 249.675 ft

Master Calibration, performed Mon Nov 14 11:49:21 2022:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.003	0.367	2.200	71.921	188.425	2.759
CAL	0.596	0.594				
5'	-0.009	0.366	2.200	71.921	185.959	3.803
SUM						
S1	0.033	0.363	0.000	100.000	302.835	-10.059
S2	-0.011	0.328	0.000	100.000	295.026	3.256
S3	-0.006	0.351	0.000	100.000	279.743	1.731
S4	-0.007	0.370	0.000	100.000	265.156	1.787
S5	-0.006	0.397	0.000	100.000	247.747	1.609
S6	-0.009	0.410	0.000	100.000	238.757	2.183
S7	-0.004	0.390	0.000	100.000	253.622	0.994
S8	-0.009	0.361	0.000	100.000	270.551	2.368


Internal Reference Calibration, performed Wed Nov 23 14:17:52 2011:

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.596	0.594	1.000	0.000

Air Zero Calibration, performed Mon Nov 14 09:33:23 2022:

	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

RECEIVED  
 Office of Oil and Gas  
 APR 24 2023  
 WV Department of  
 Environmental Protection

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
HeadVolt	17.53		CHD-Titan Standard 1 7/16" Cable Head	1.02	1.44	1.00
			Centralizer-2.75_Overbody	1.67	3.12	5.00
Temp	14.68					

WVFS8	12.45		RBT-Probe275T (2.75") Probe 2.75" Radial with Integral Temperature Sub	9.39	2.75	90.00
WVFS7	12.45					
WVFS6	12.45					
WVFS5	12.45					
WVFS4	12.45					
WVFS3	12.45					
WVFS2	12.45					
WVFS1	12.45					
WVF3FT	12.45					
WVF5FT	11.45					
WVFCAL	8.20					
HEADVOLT	8.20					
CCL	7.29					
GR	5.96		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
			Centralizers-5419-312-S600 Titan 3 1/8" Adjustable Centralizer	3.42	3.13	34.00

Dataset: antero\_aspen\_1h\_rcbl\_nov\_14\_2022.db: field/well/run1/pass4  
 Total length: 18.61 ft  
 Total weight: 192.00 lb  
 O.D.: 3.13 in

	Company	ANTERO RESOURCES	RECEIVED Office of Oil and Gas APR 24 2023 WV Department of Environmental Protection
	Well	ASPEN 1H	
	Field	WEST UNION	
	County	DODDRIDGE	
	State	WV	