



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

Company Antero Resources  
Well George Scott Cortina Unit 1H  
Field South Canton  
County Doddridge  
State West Virginia

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Well George Scott Cortina Unit 1H  
Field South Canton  
County Doddridge State West Virginia

Location: API # : 47-017-06889  
SEC TWP RGE  
Lat: 39. 18' 27.169" N  
Long: -80. 44' 0.181" W  
Permanent Datum Ground Level Elevation  
Log Measured From Kelly Bushing 25.5' A.P.D.  
Drilling Measured From Kelly Bushing  
Other Services  
Elevation  
K.B.  
D.F.  
G.L.

Date	04-Jan-2020	
Run Number	One	
Depth Driller	18,377'	
Depth Logger	7,290'	
Bottom Logged Interval	7,290'	
Top Log Interval	Surface	
Open Hole Size	NA	
Type Fluid	Water	
Density / Viscosity	NA	
Max. Recorded Temp.	153 Deg. F.	
Estimated Cement Top	2,796'	
Time Well Ready	07:00	
Time Logger on Bottom	08:00	
Equipment Number	104 (P1)(G3)	
Location	Bentleyville, PA	
Recorded By	Matt McNally	
Witnessed By	Chad Roy	
Borehole Record		
Run Number	Bit	From To
Tubing Record		
Run Number	Bit	From To
Casing Record		
Surface String	Size	Wgt/Ft
Surface String	13 3/8"	54.5 lbs
Production String	9 5/8"	36 lbs
Production String	5 1/2"	20 lbs
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  
Log Correlated to Marker Joint at ( 6,102' - 6,112' )  
Depth Correction ( - 23' )  
Main Pass 1,500 PSI  
Repeat Pass 0 PSI


RECEIVED  
Office of Oil and Gas  
OCT 28 2020  
WV Department of  
Environmental Protection

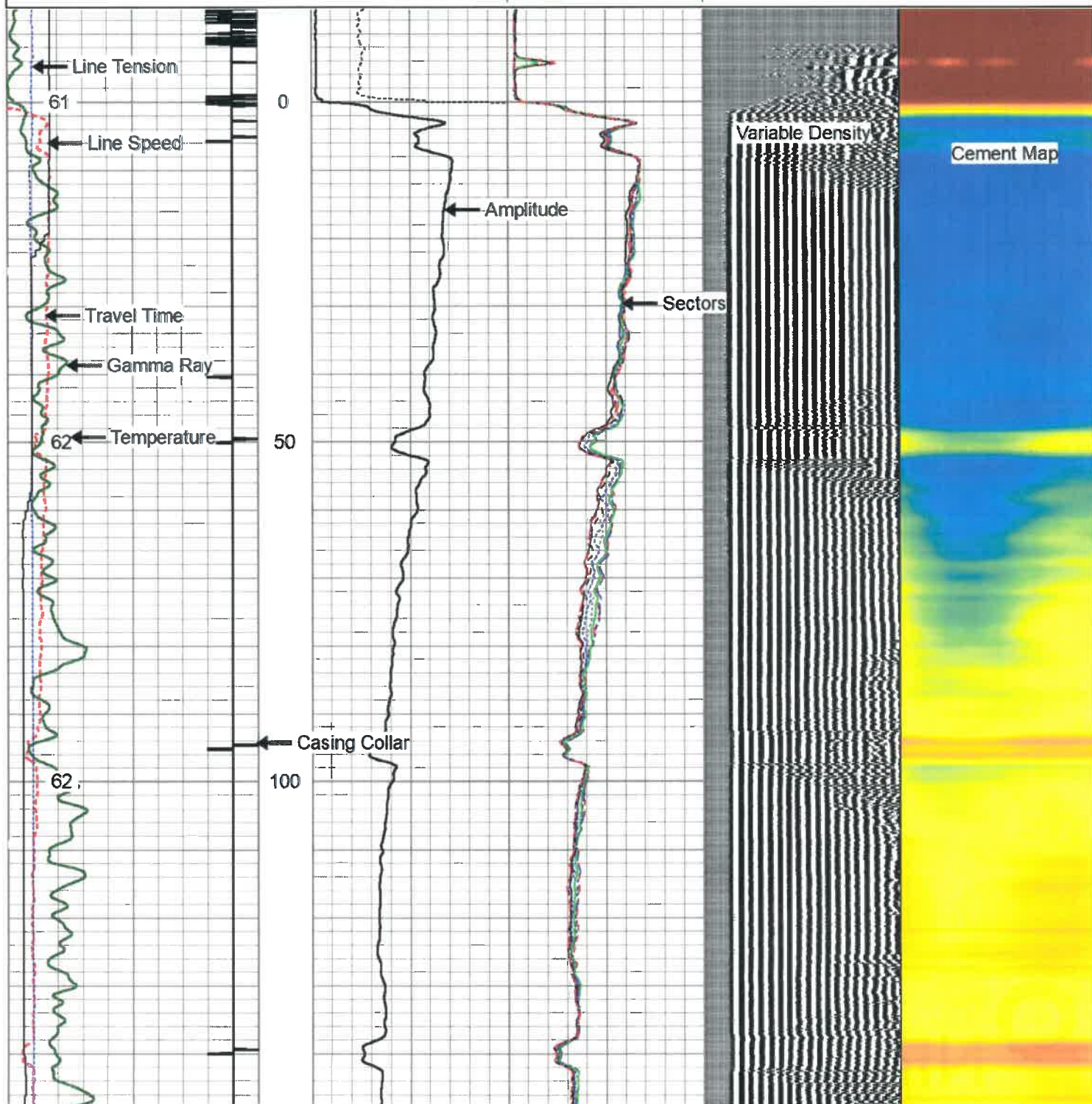
Thank You For Choosing Nine Energy Service Wireline Bentleyville, PA

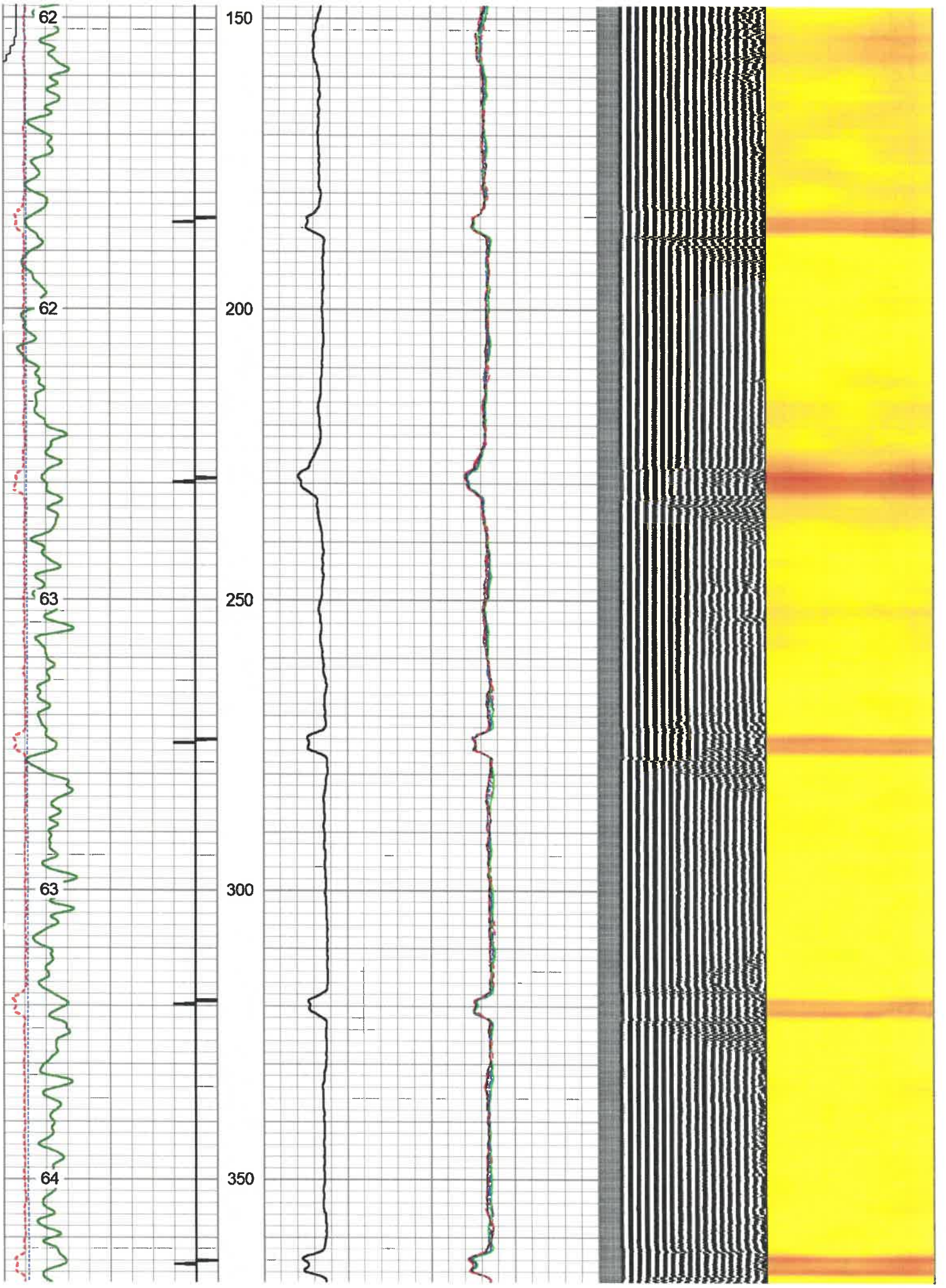


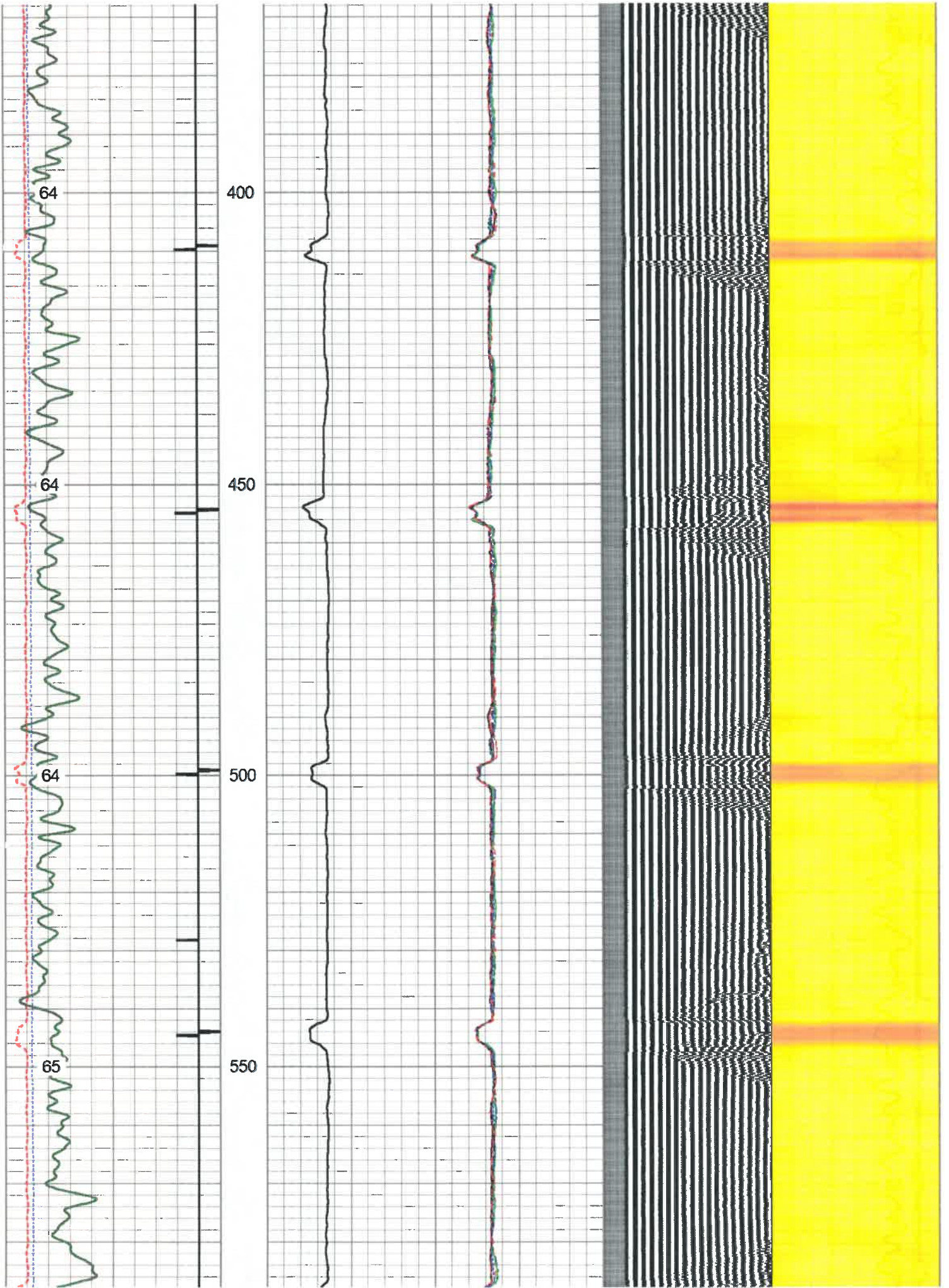
**Main Pass 1,500 PSI**

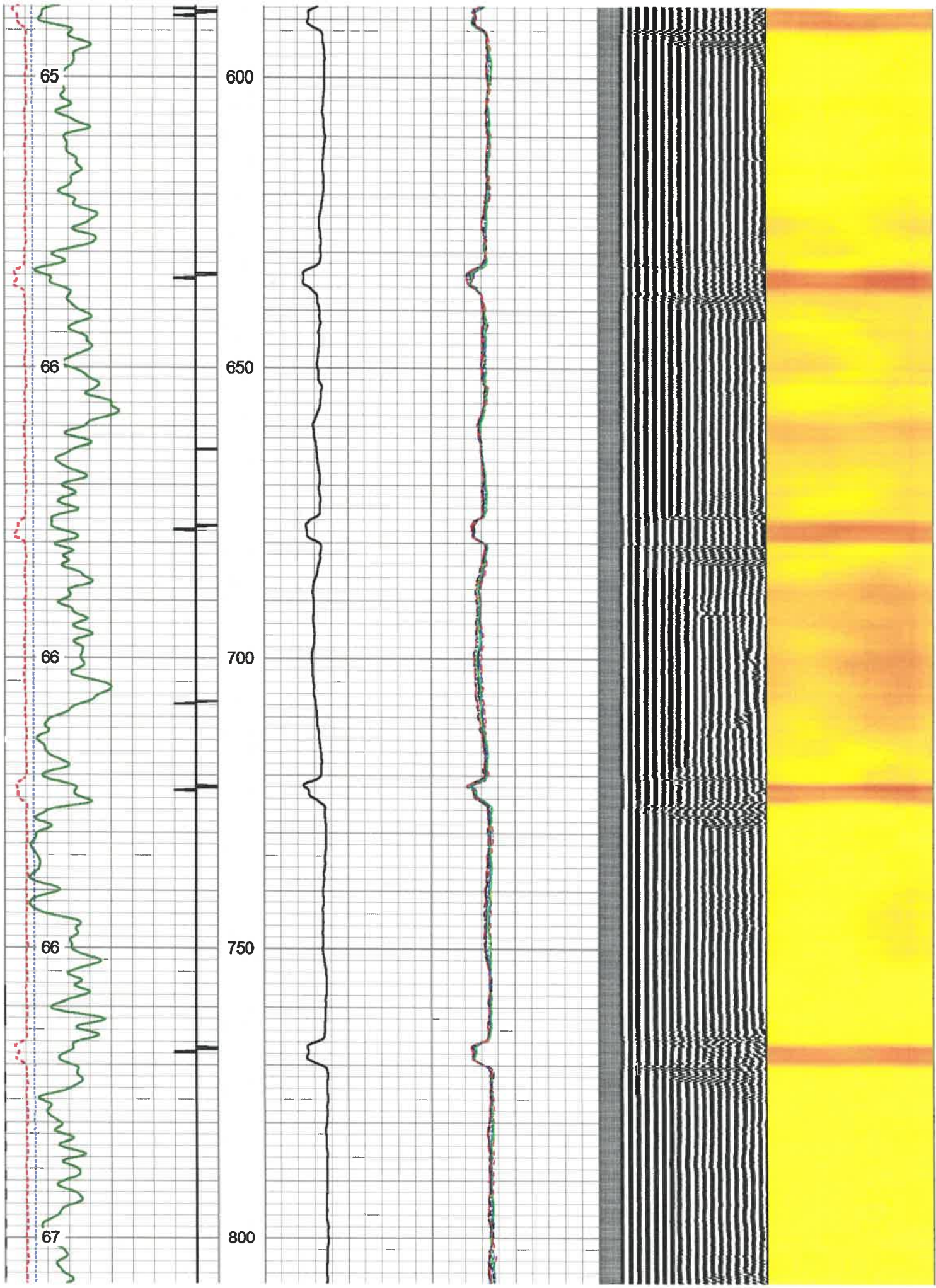
Database File antero\_george\_scott\_cortina1h\_04\_jan\_2020.db  
 Dataset Pathname south\_canton/cortina1h/rcbl/pass4.2  
 Presentation Format rcbl 2  
 Dataset Creation Sat Jan 04 09:41:04 2020  
 Charted by Depth in Feet scaled 1:240

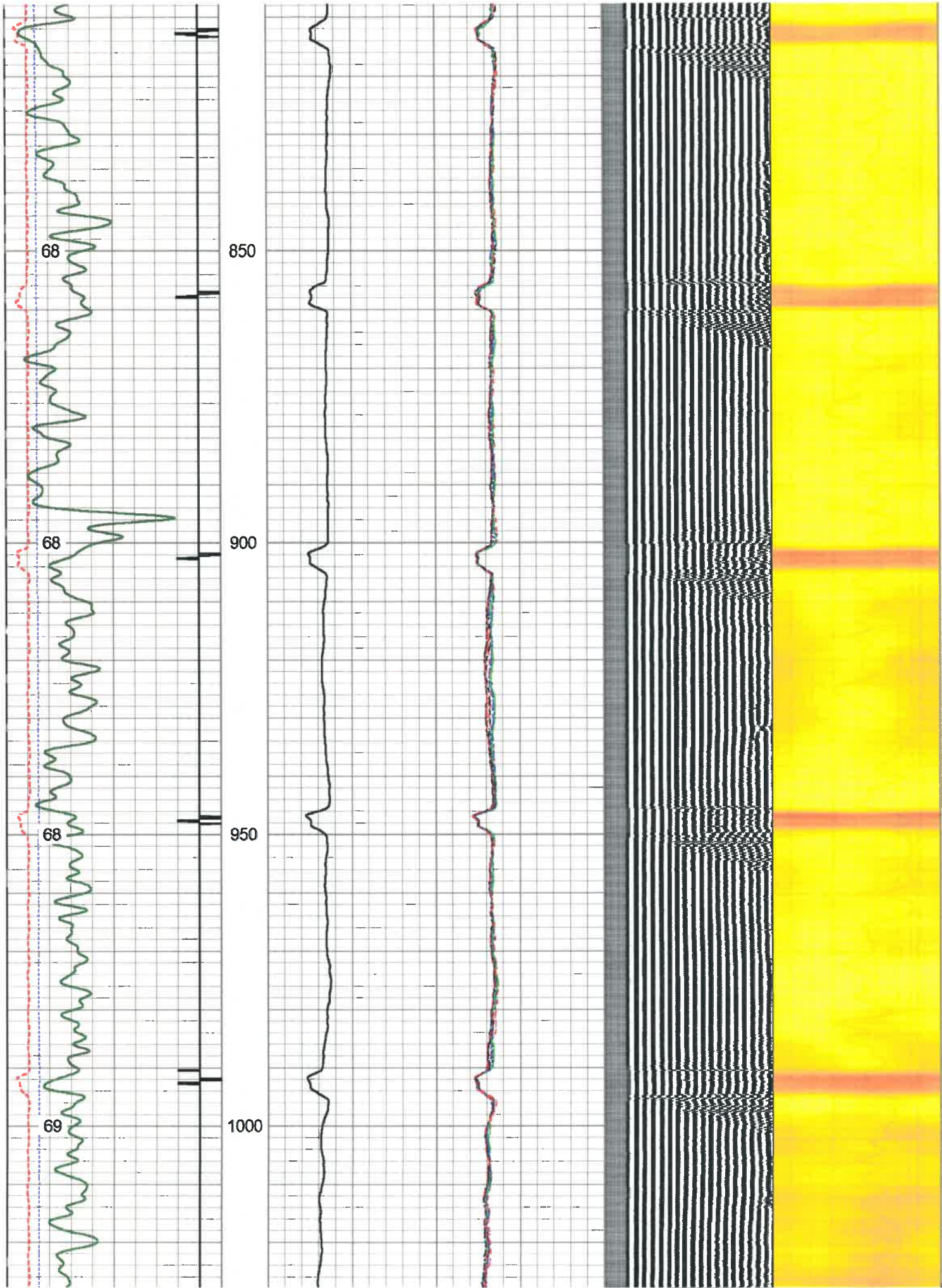
270	Travel Time (usec)	170	0	Amplitude (mV)	100	-5	Sector 1	150	Variable Density	1	Cement Map	8
Casing Collar			Amplified Amplitude		-5	Sector 2	150	200	(usec)	1200		
0	Gamma Ray (GAPI)	120	0	(mV)	10	-5	Sector 3	150				
0	LTEN (lb)	2500			-5	Sector 4	150					
-100	LSPD (ft/min)	100			-5	Sector 5	150					
Temp						-5	Sector 6	150				
(degF)						-5	Sector 7	150				
						-5	Sector 8	150				

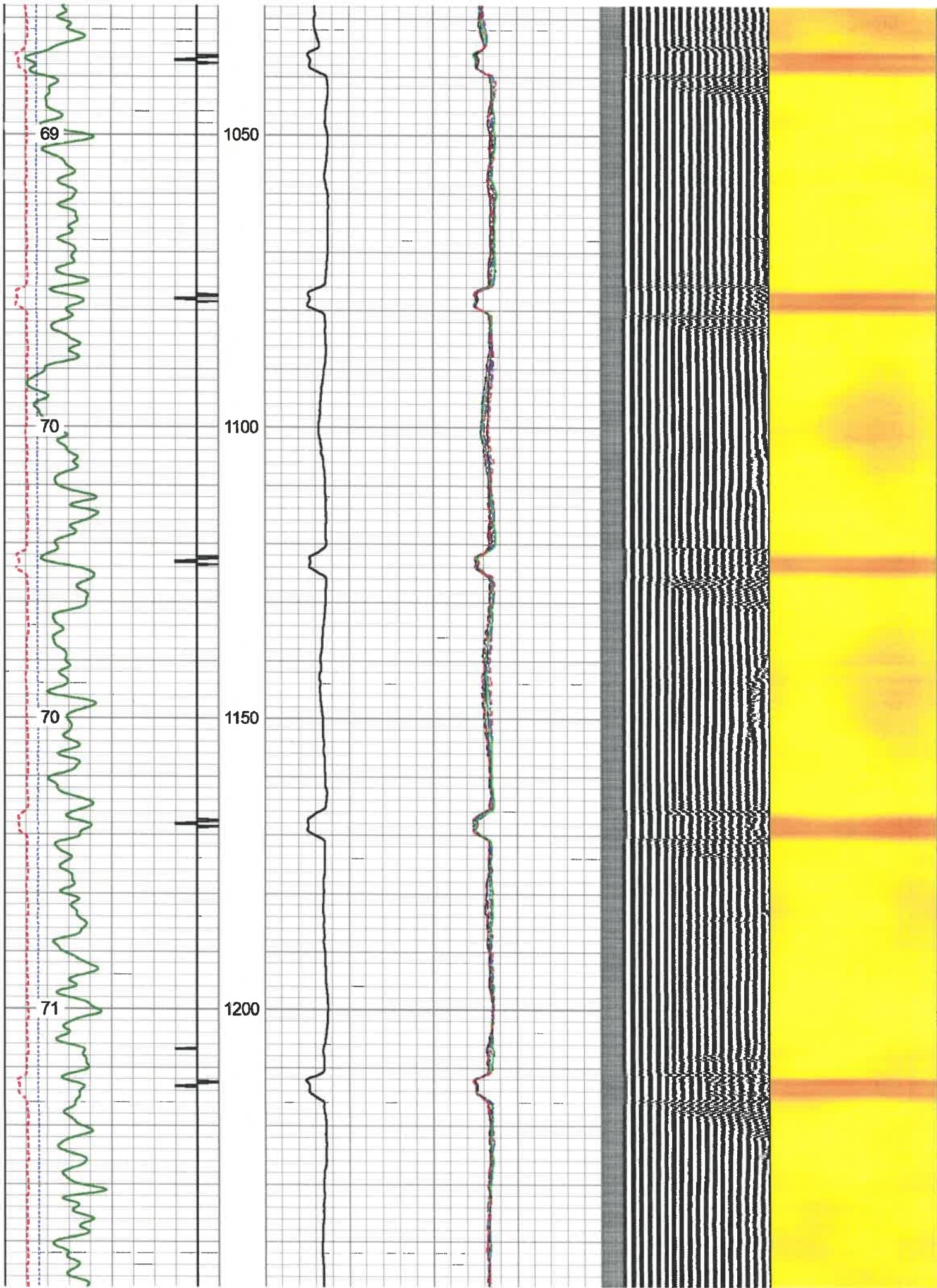


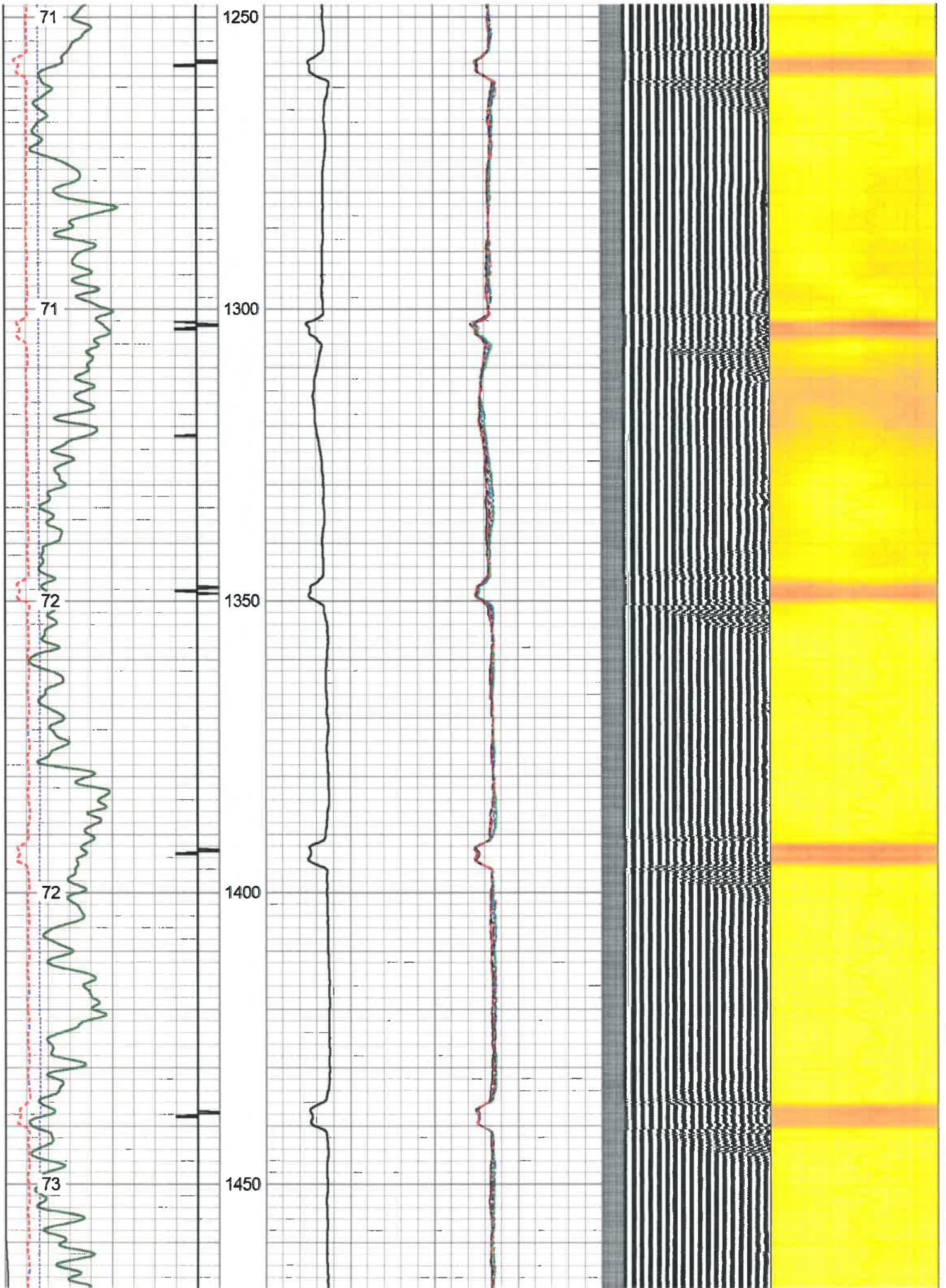




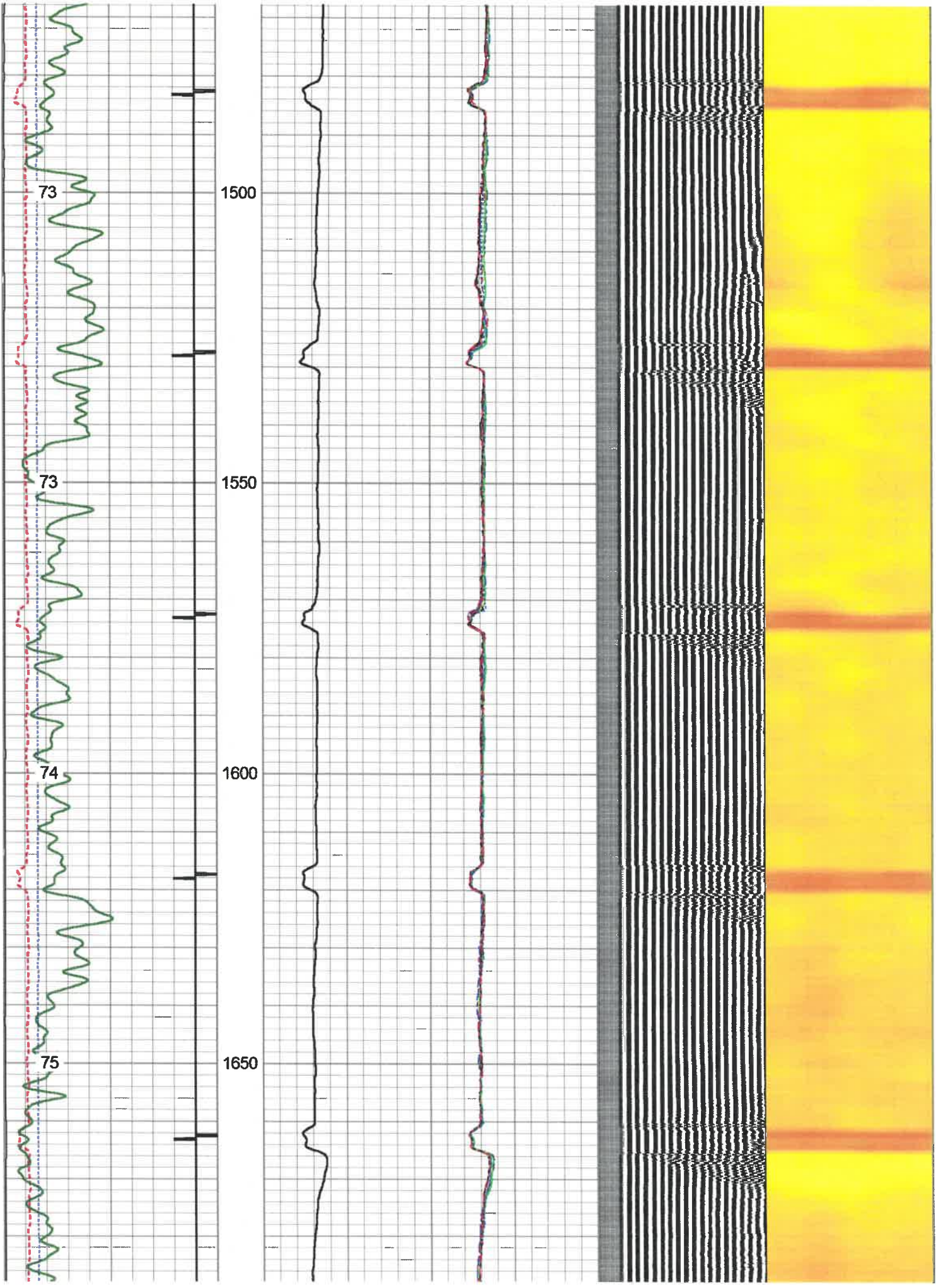


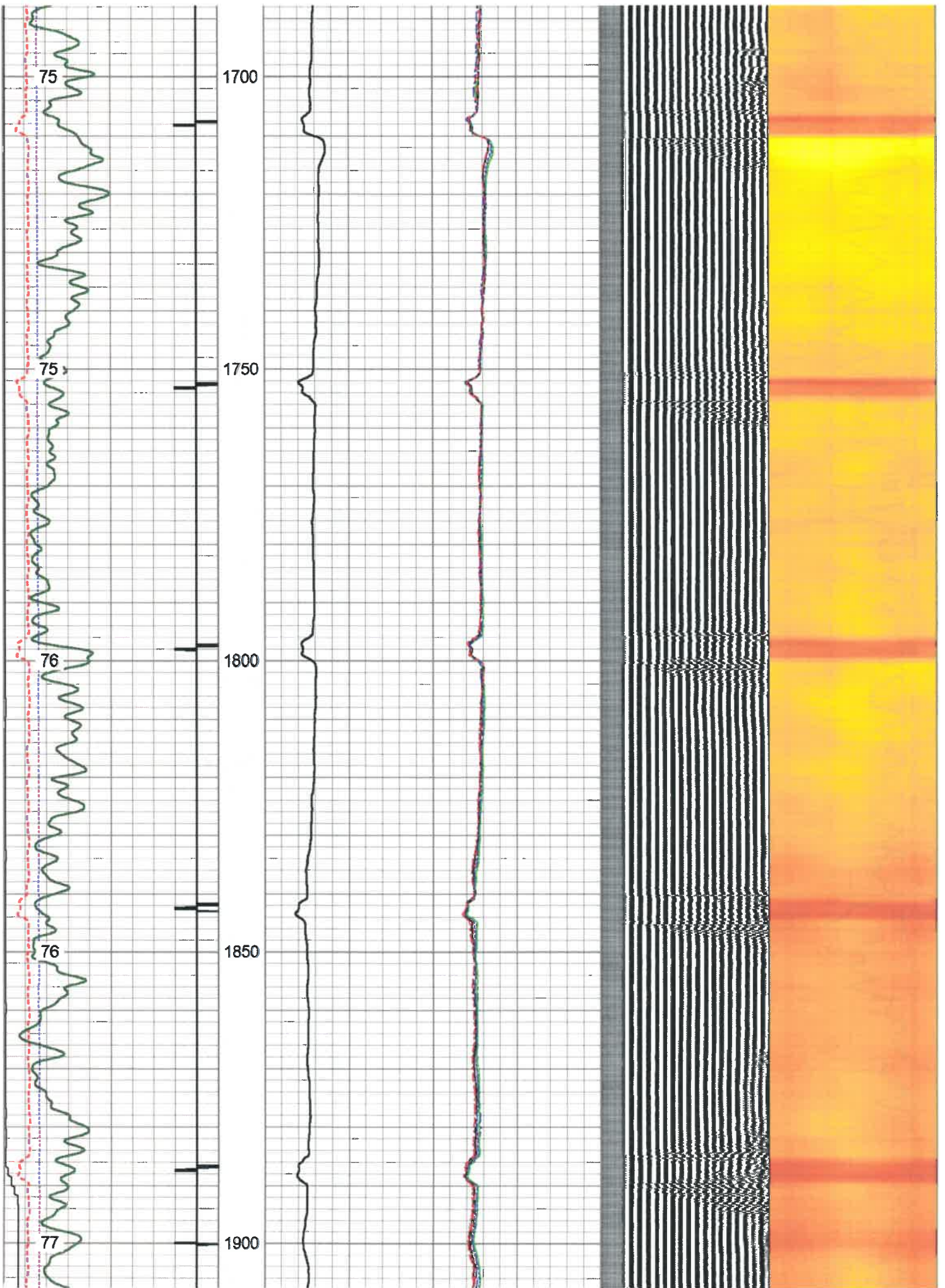


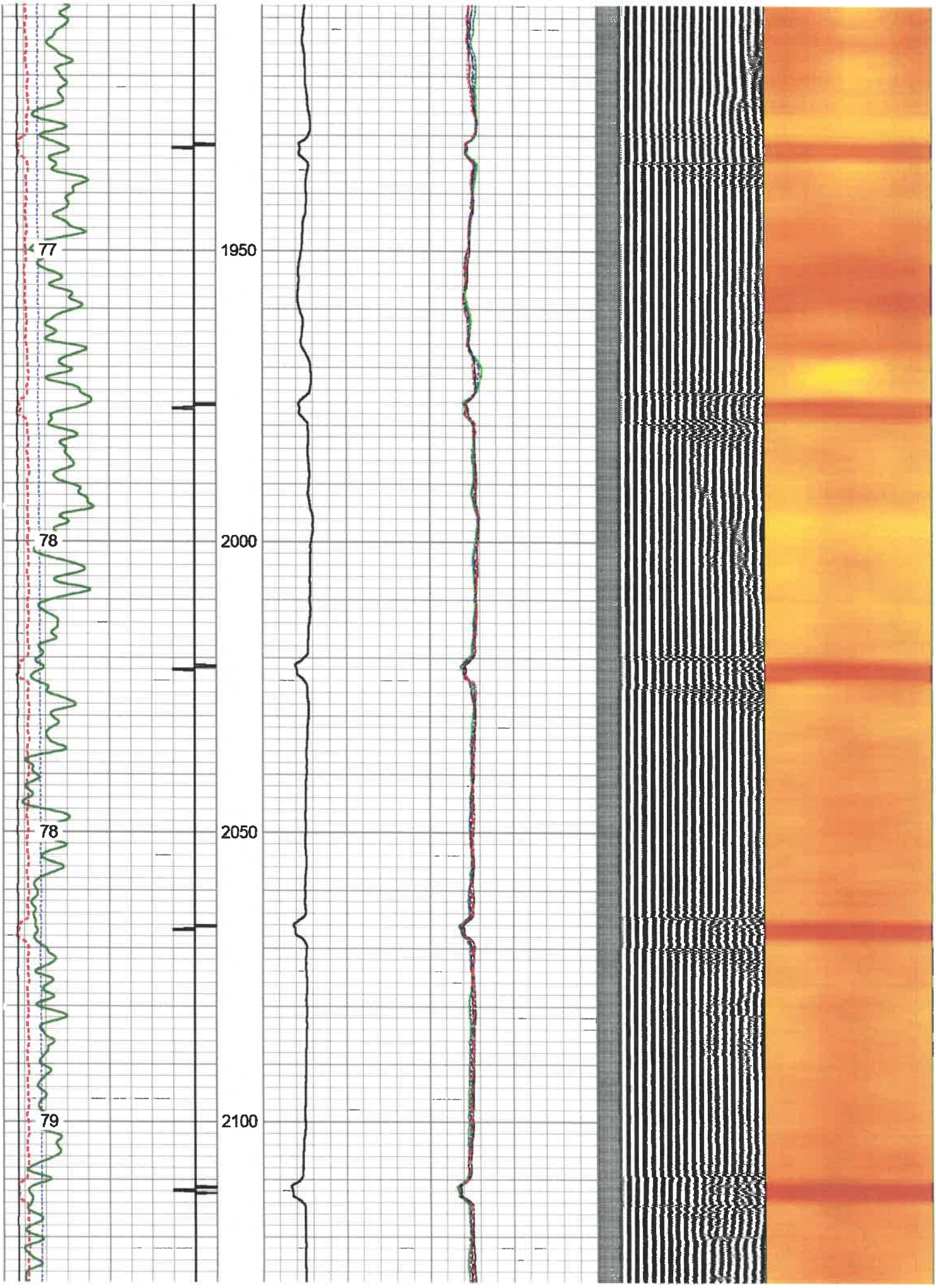


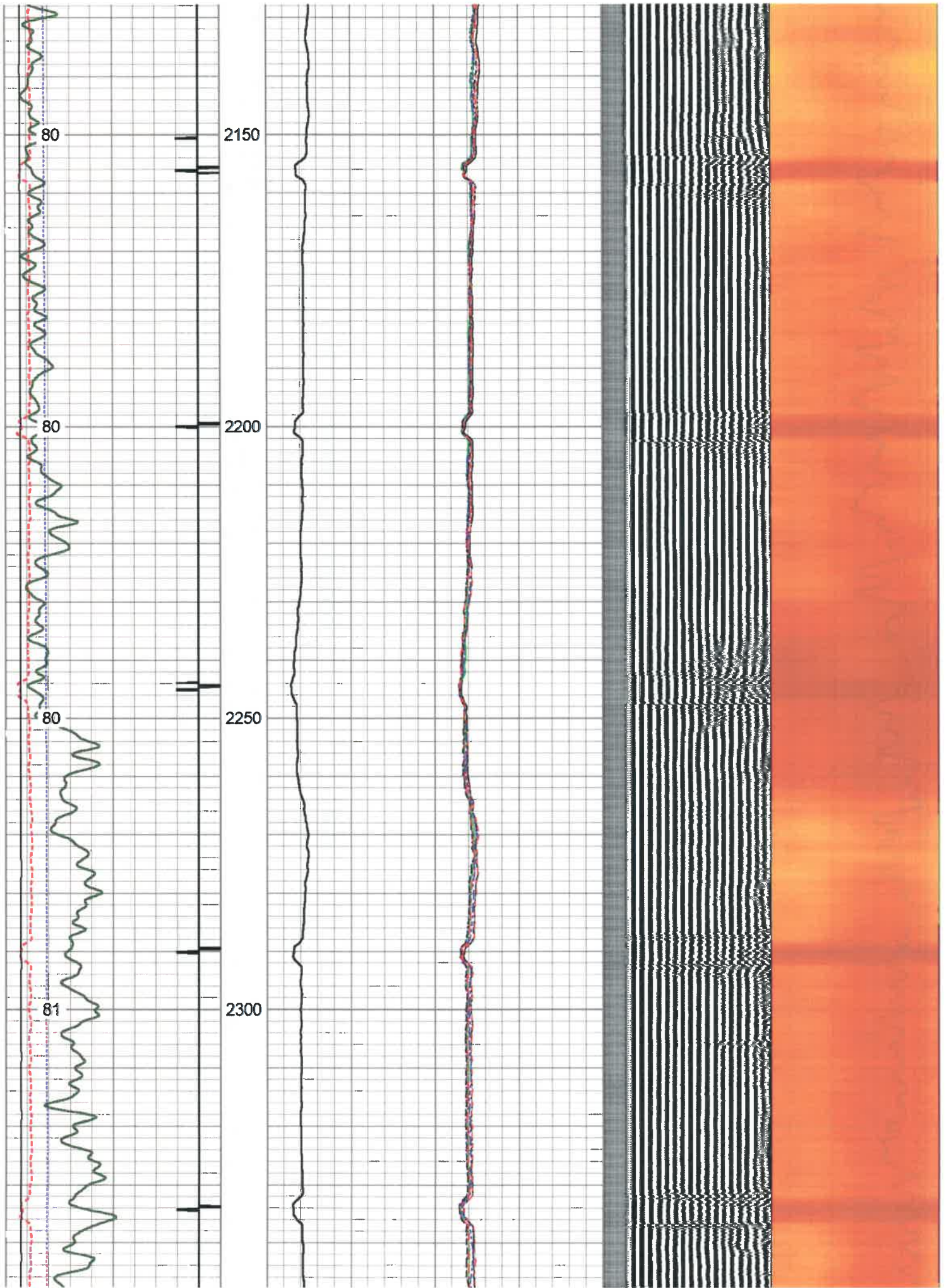


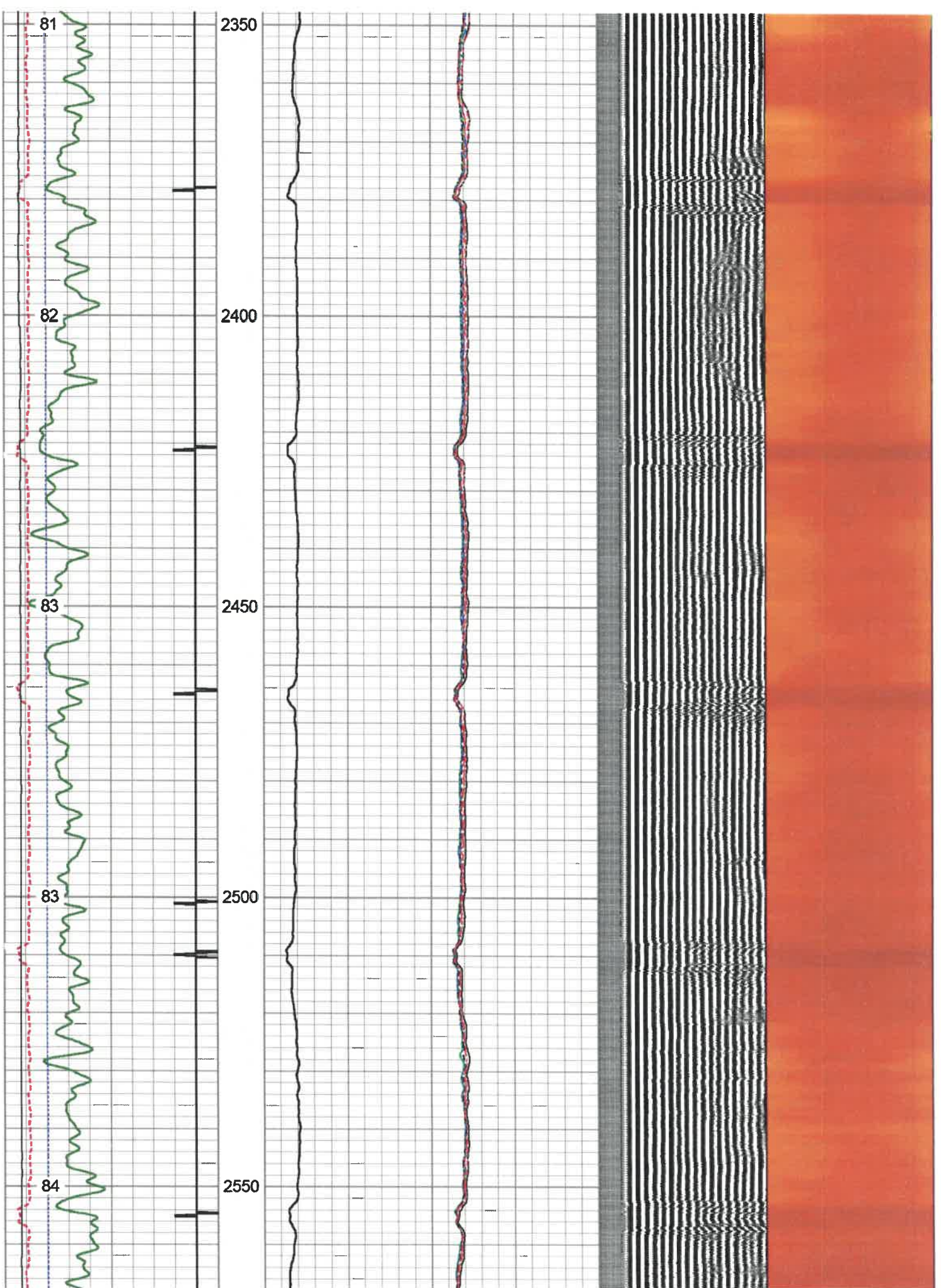


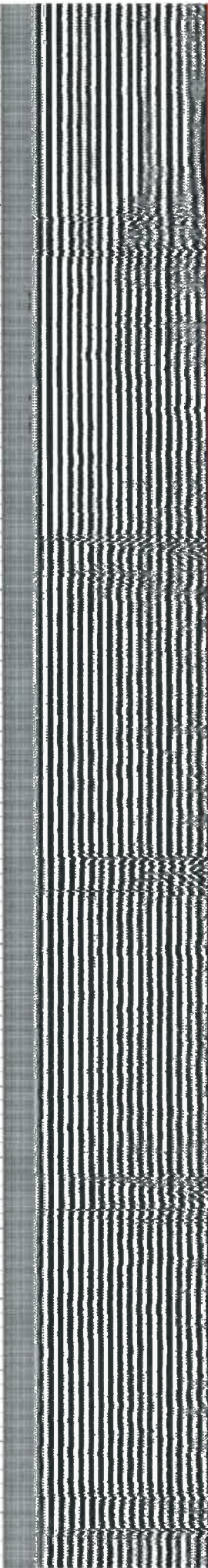
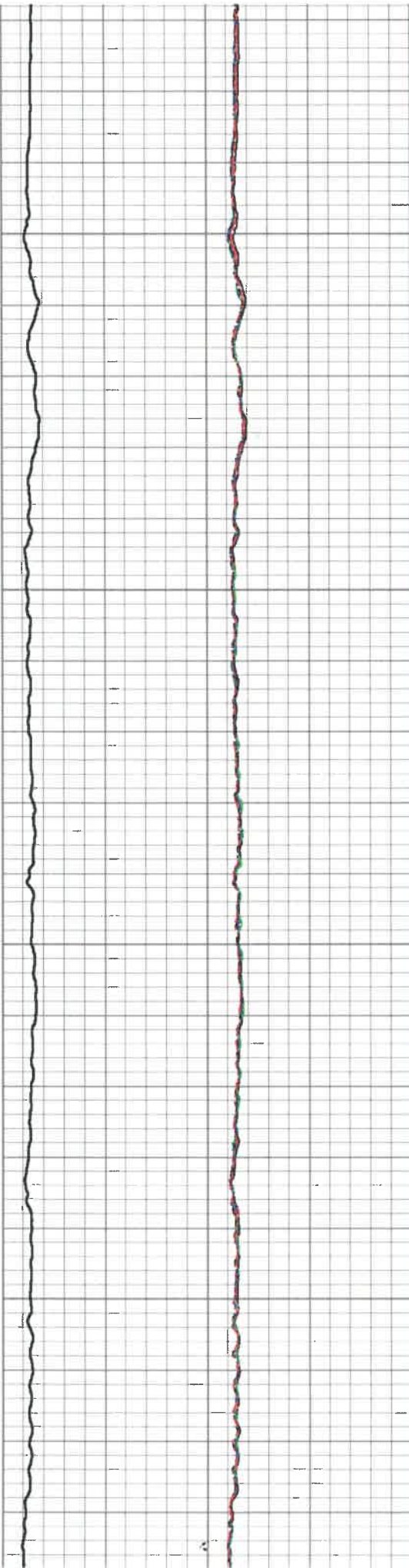
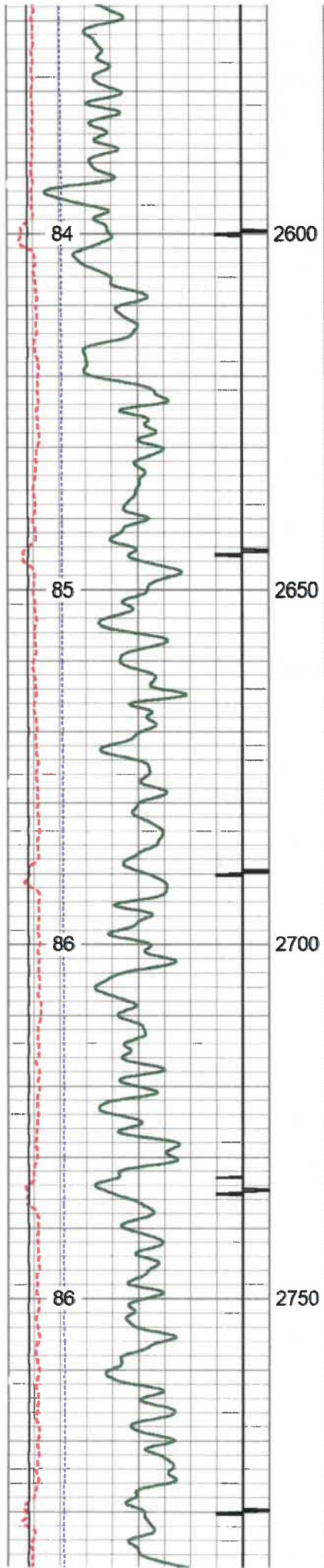


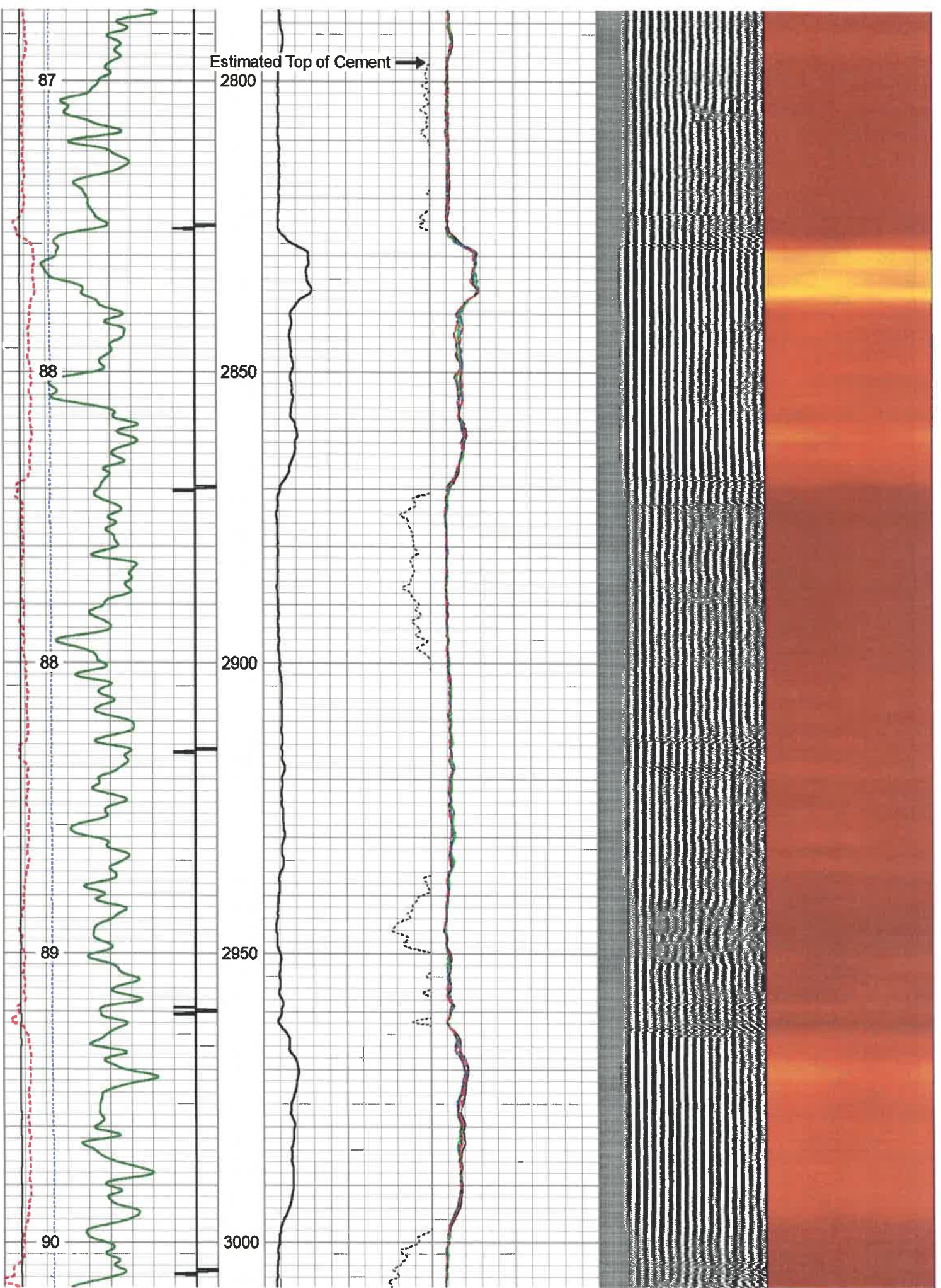


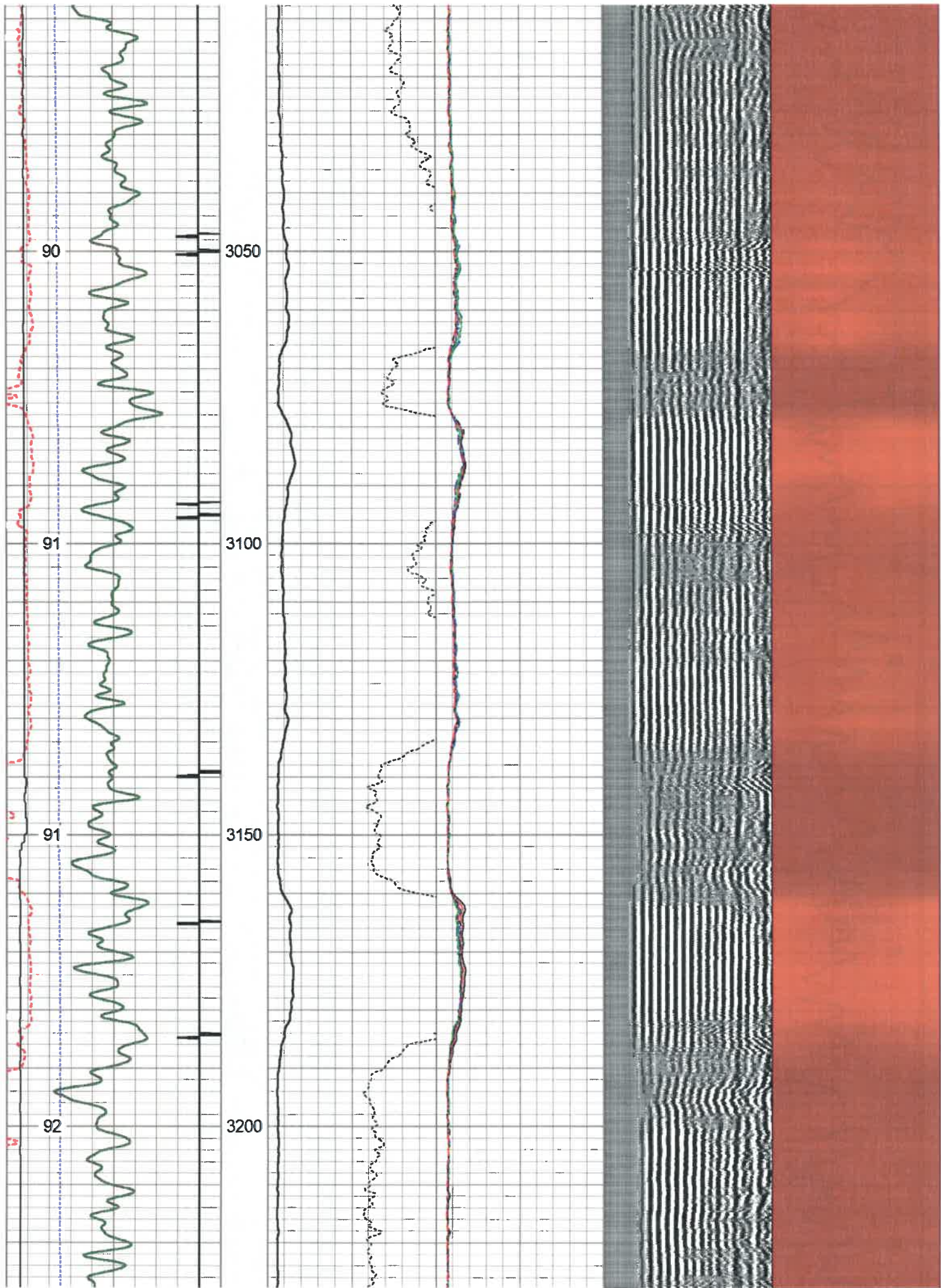




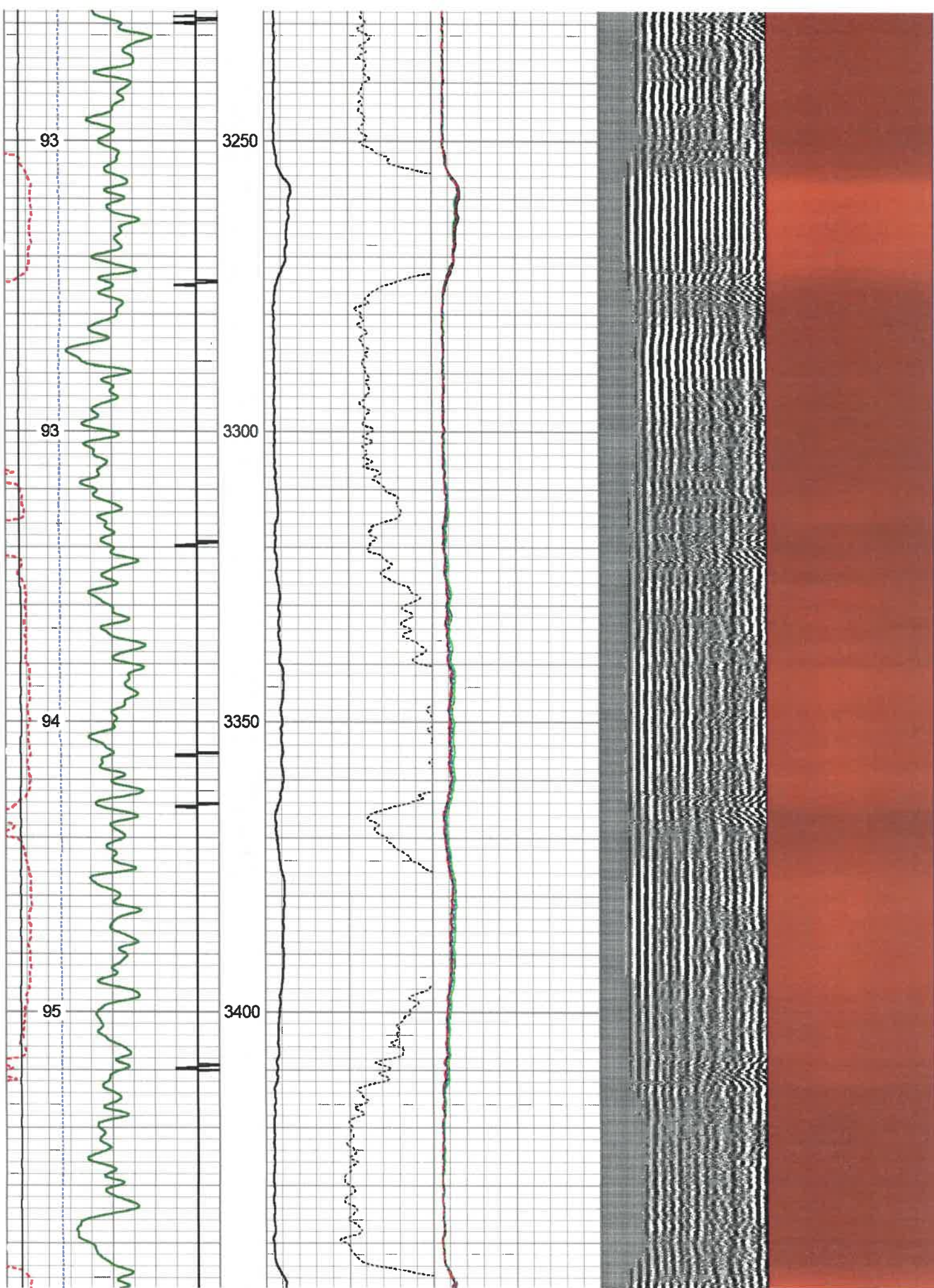


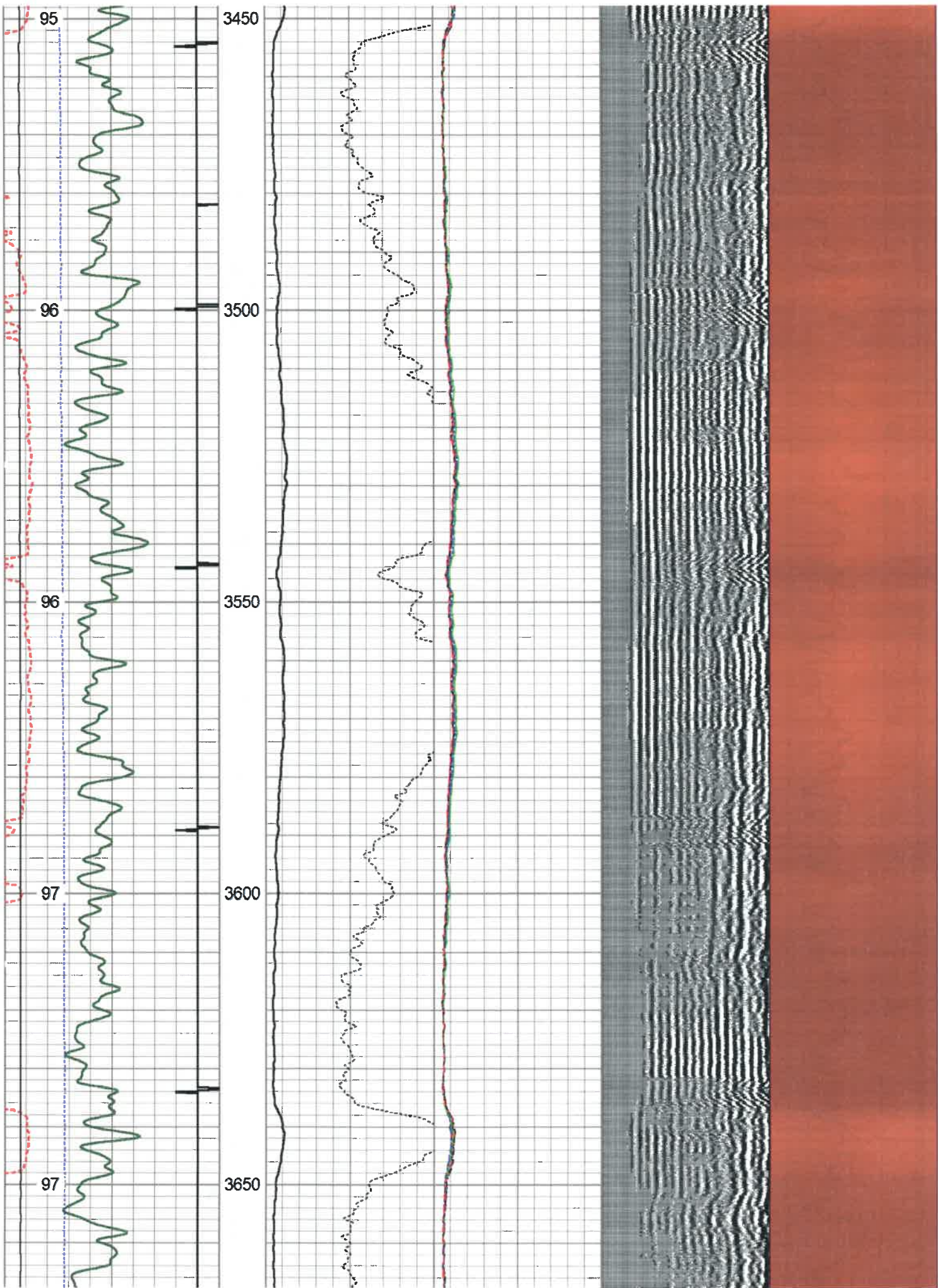


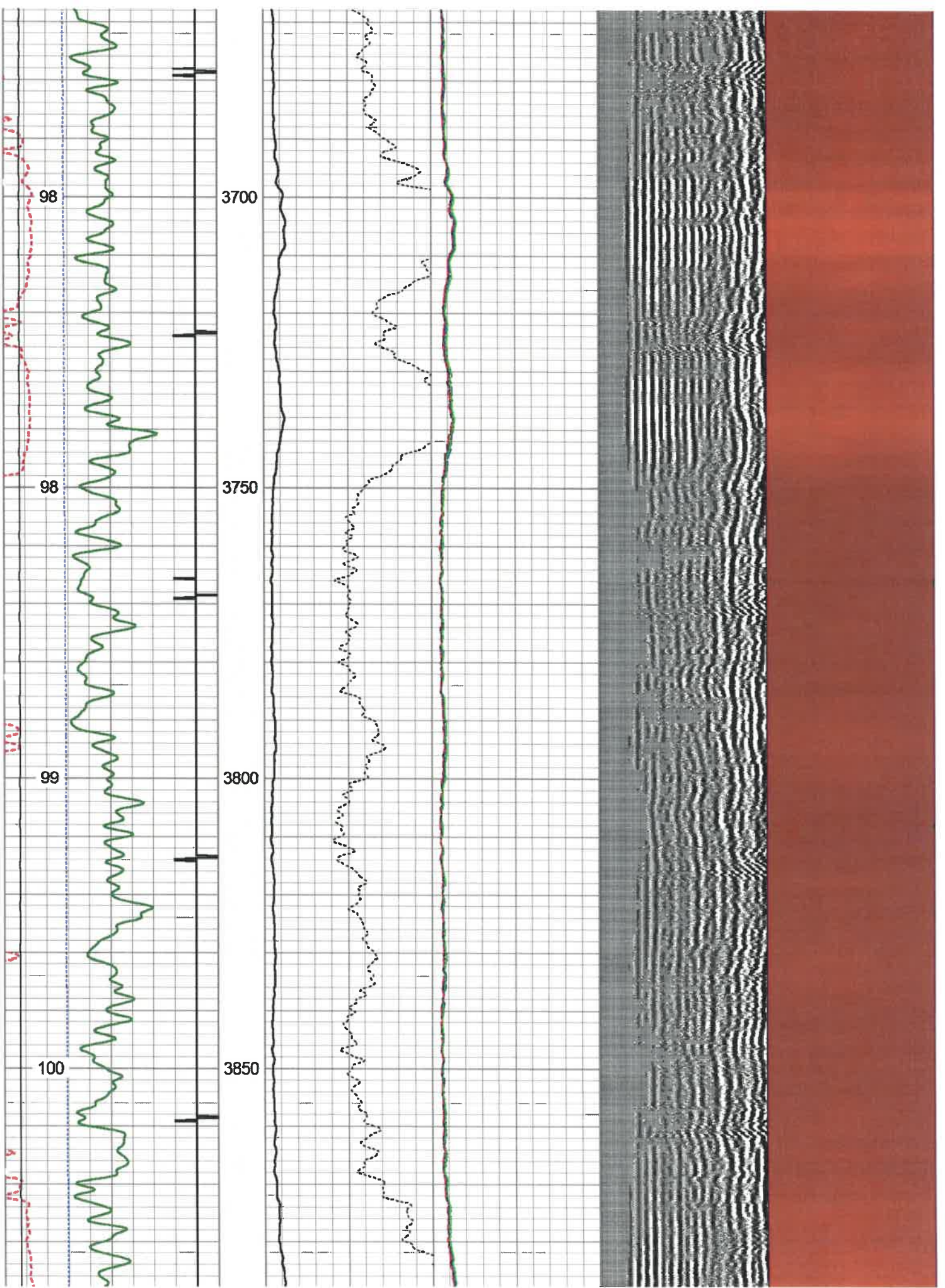


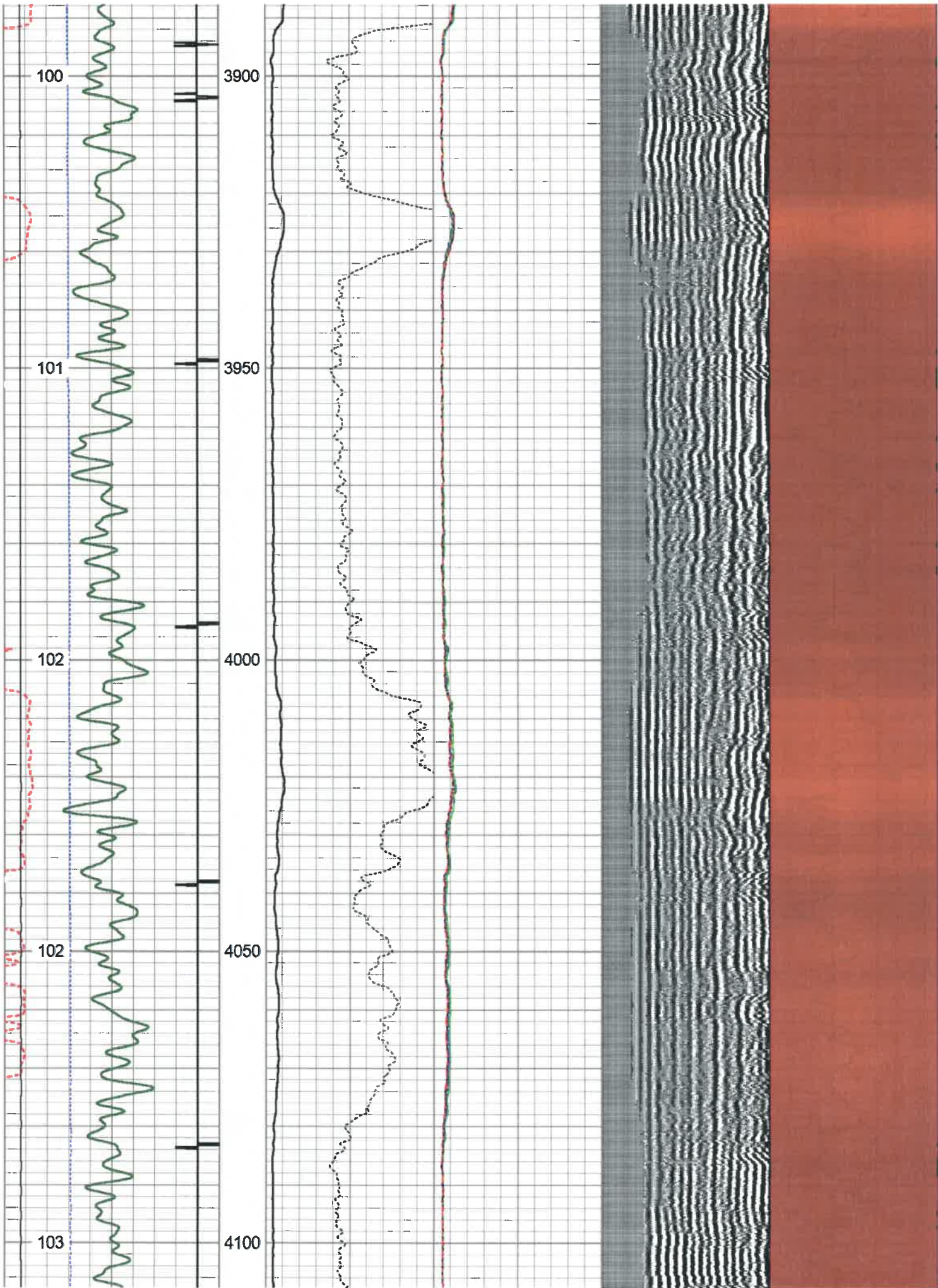


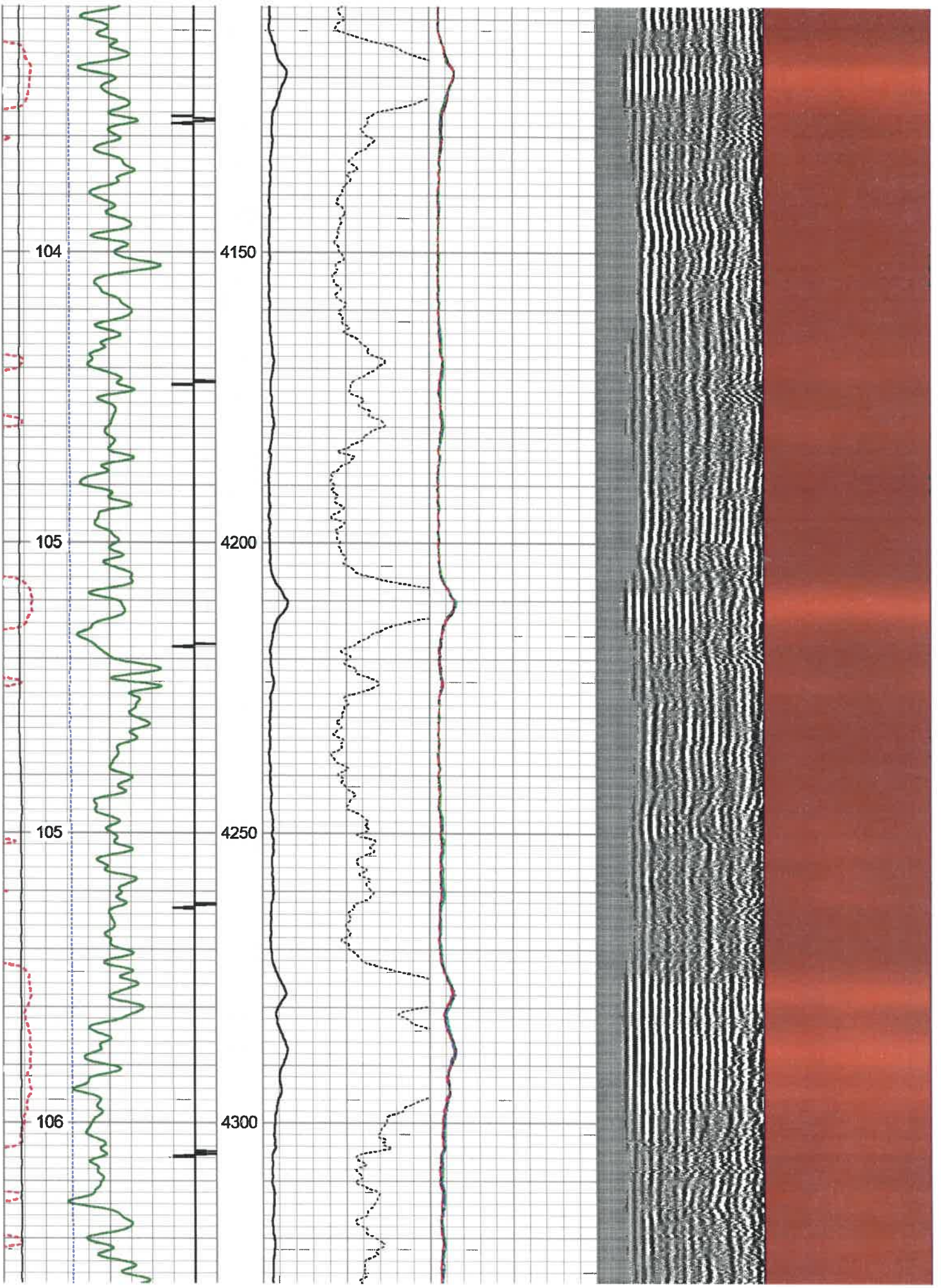


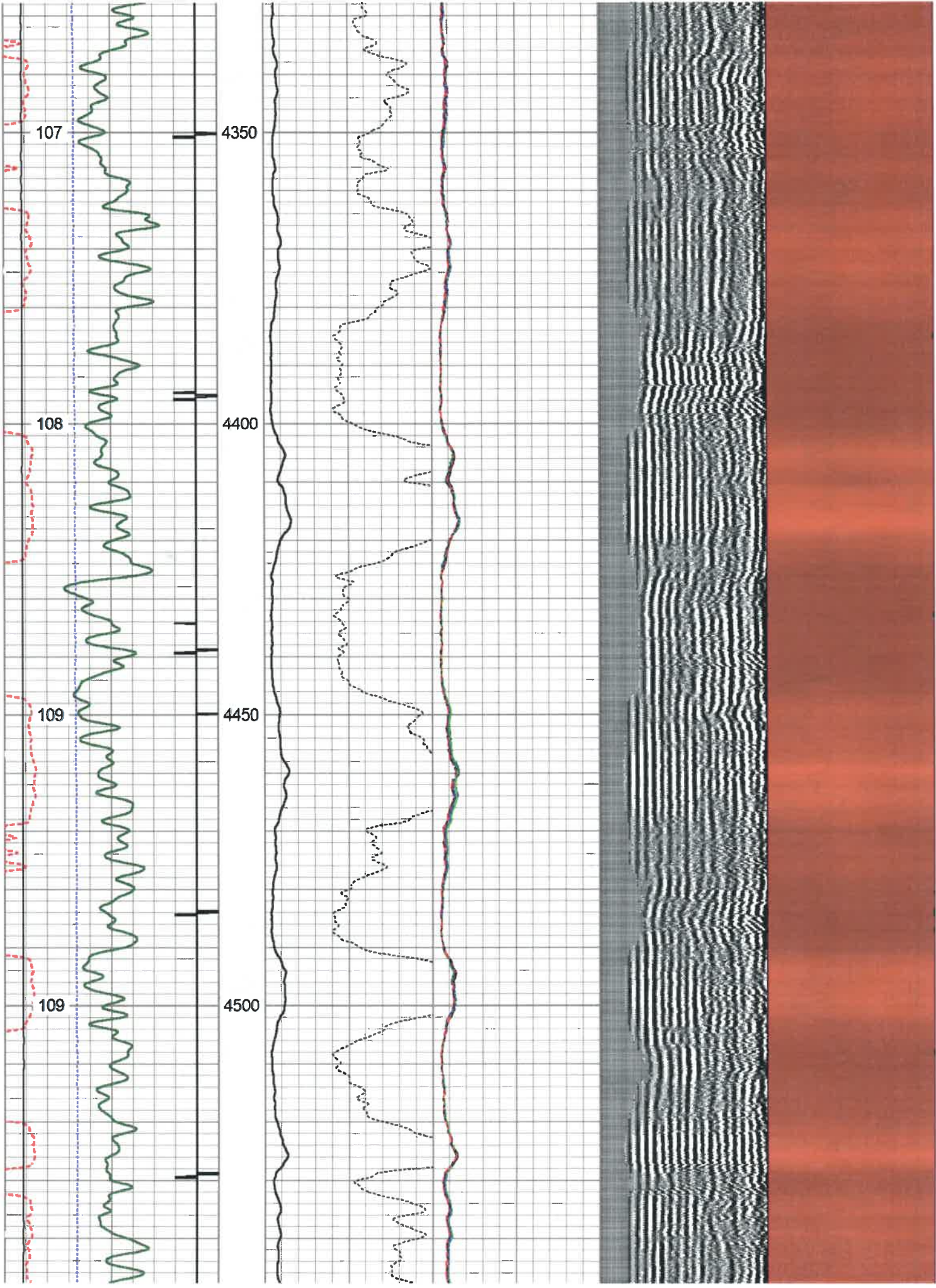


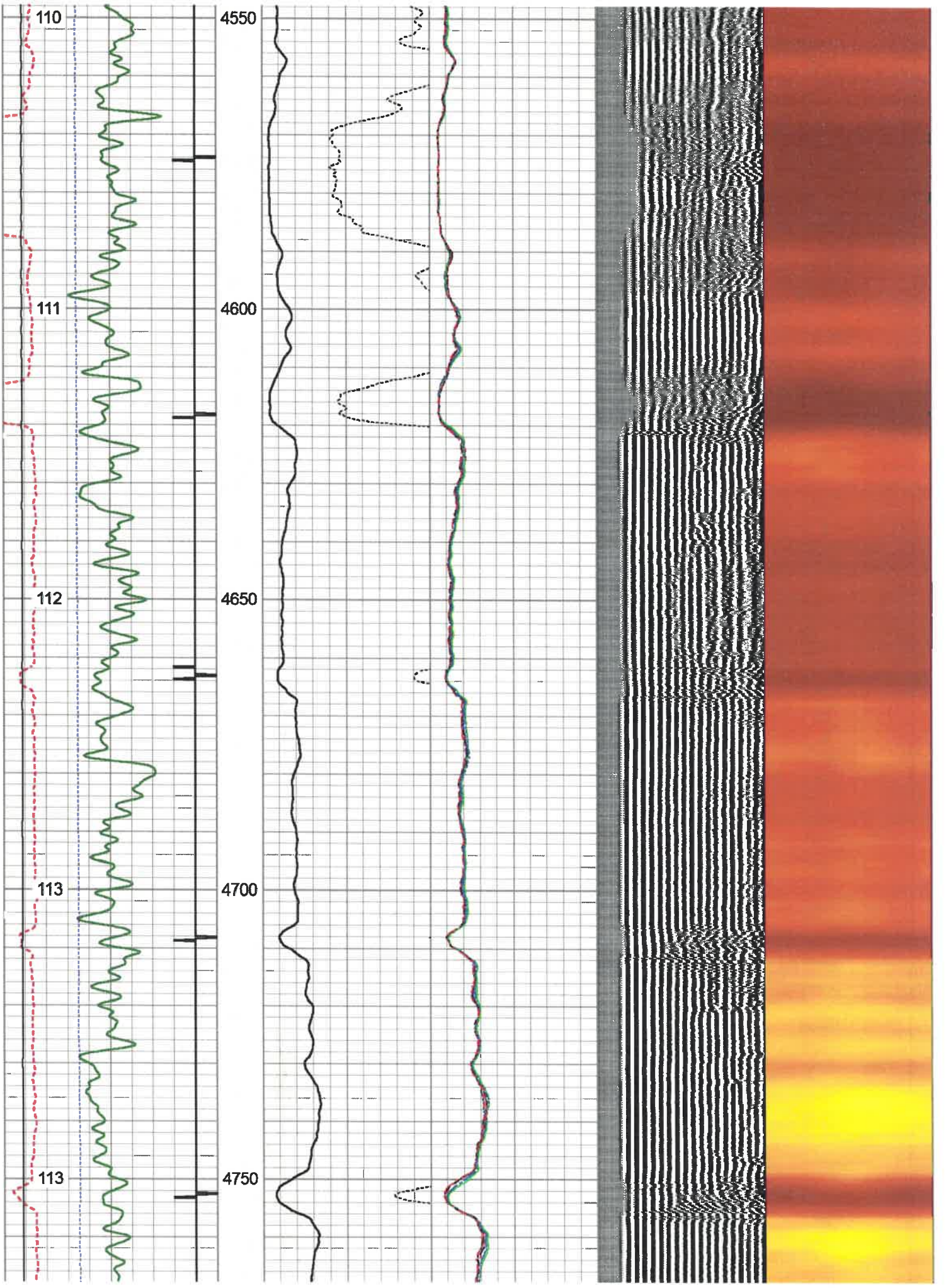


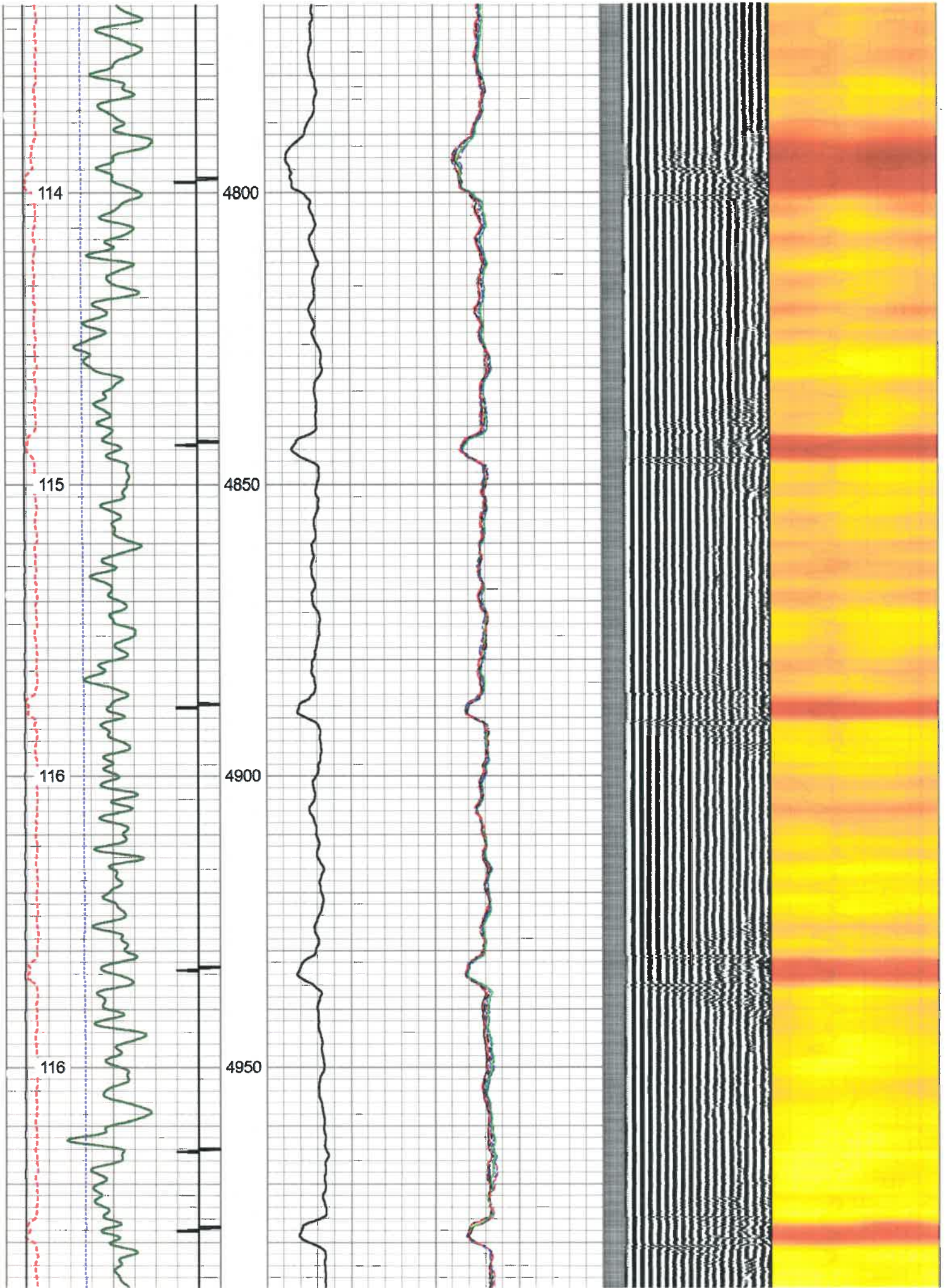




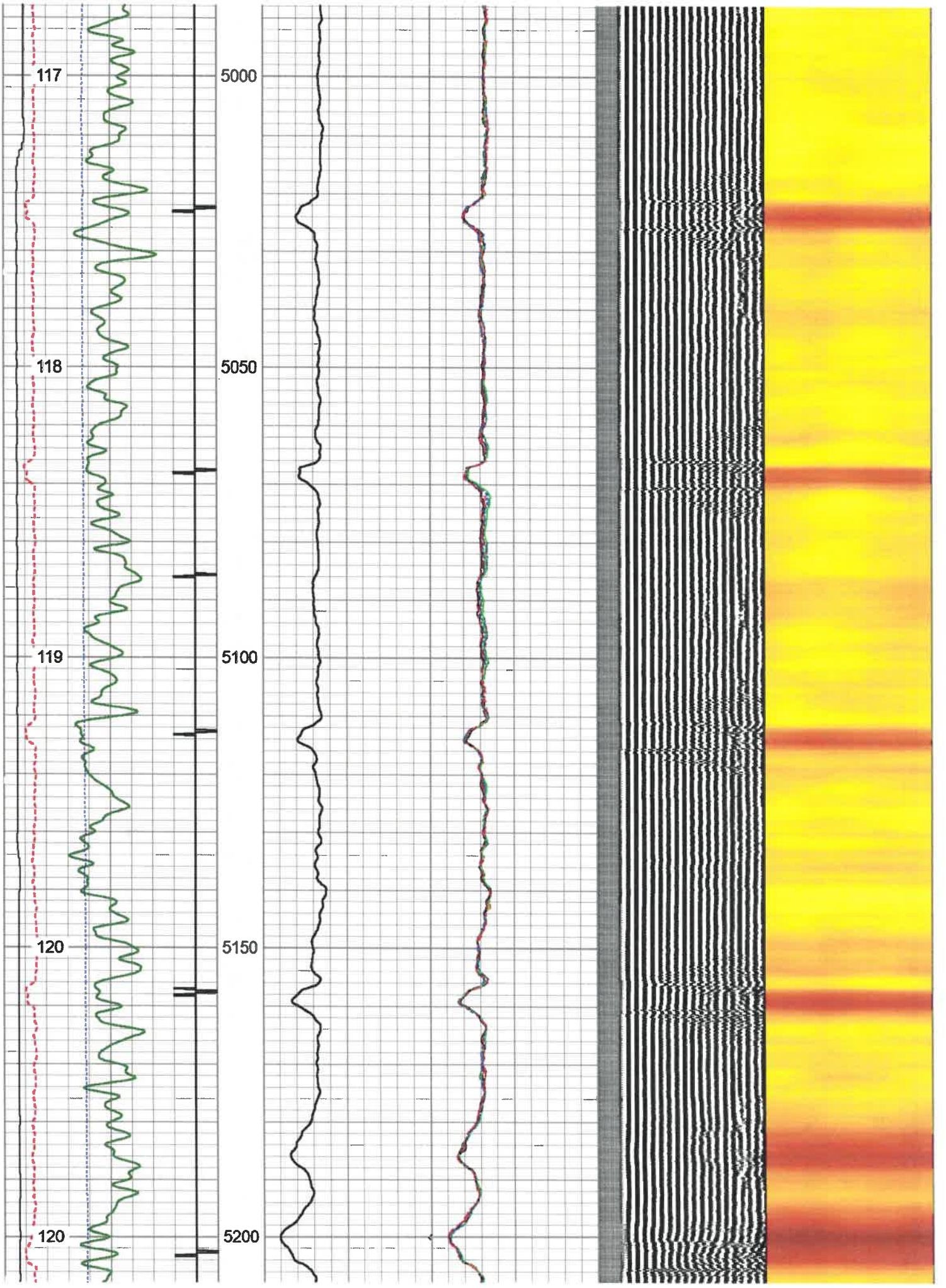


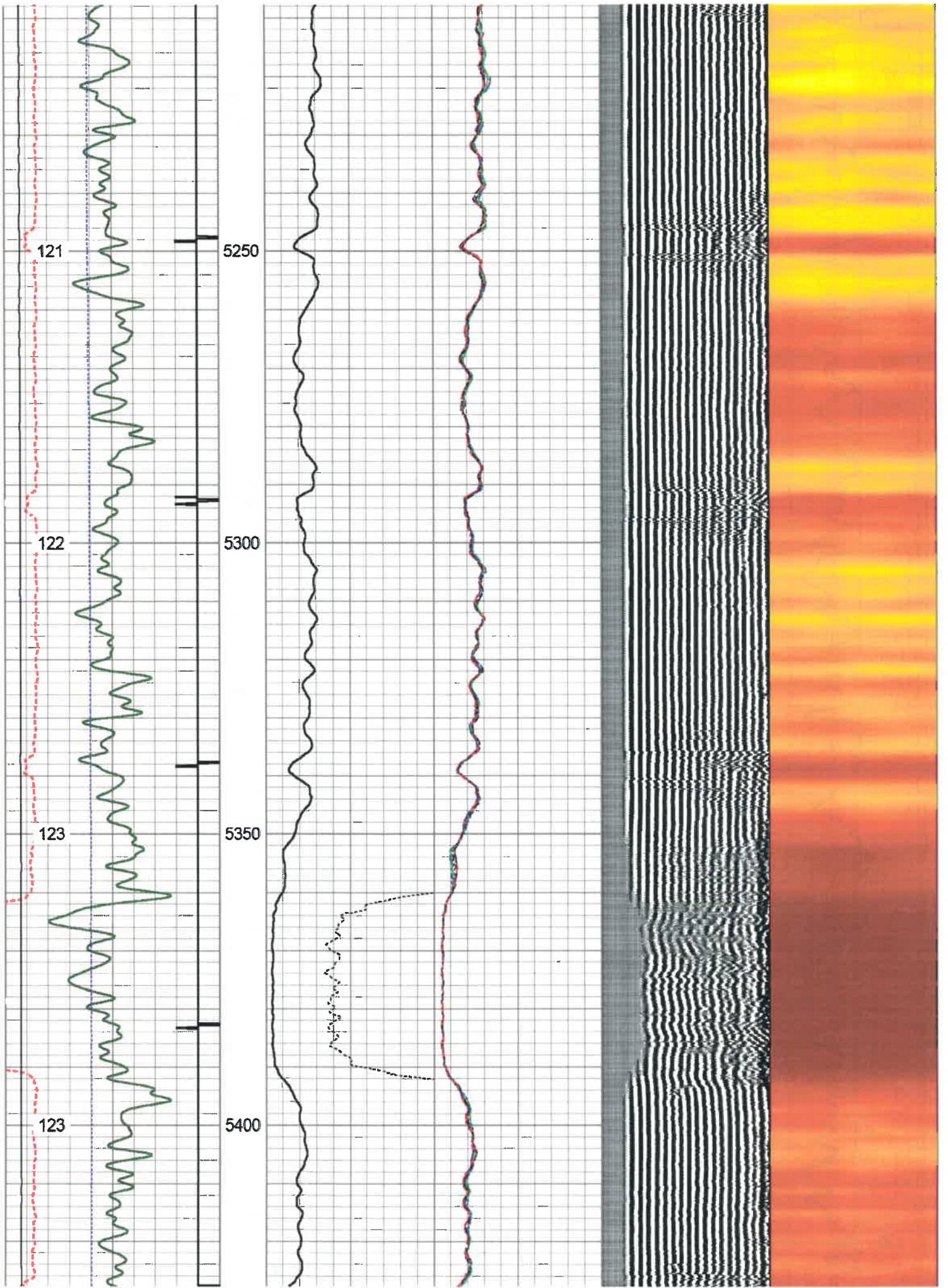


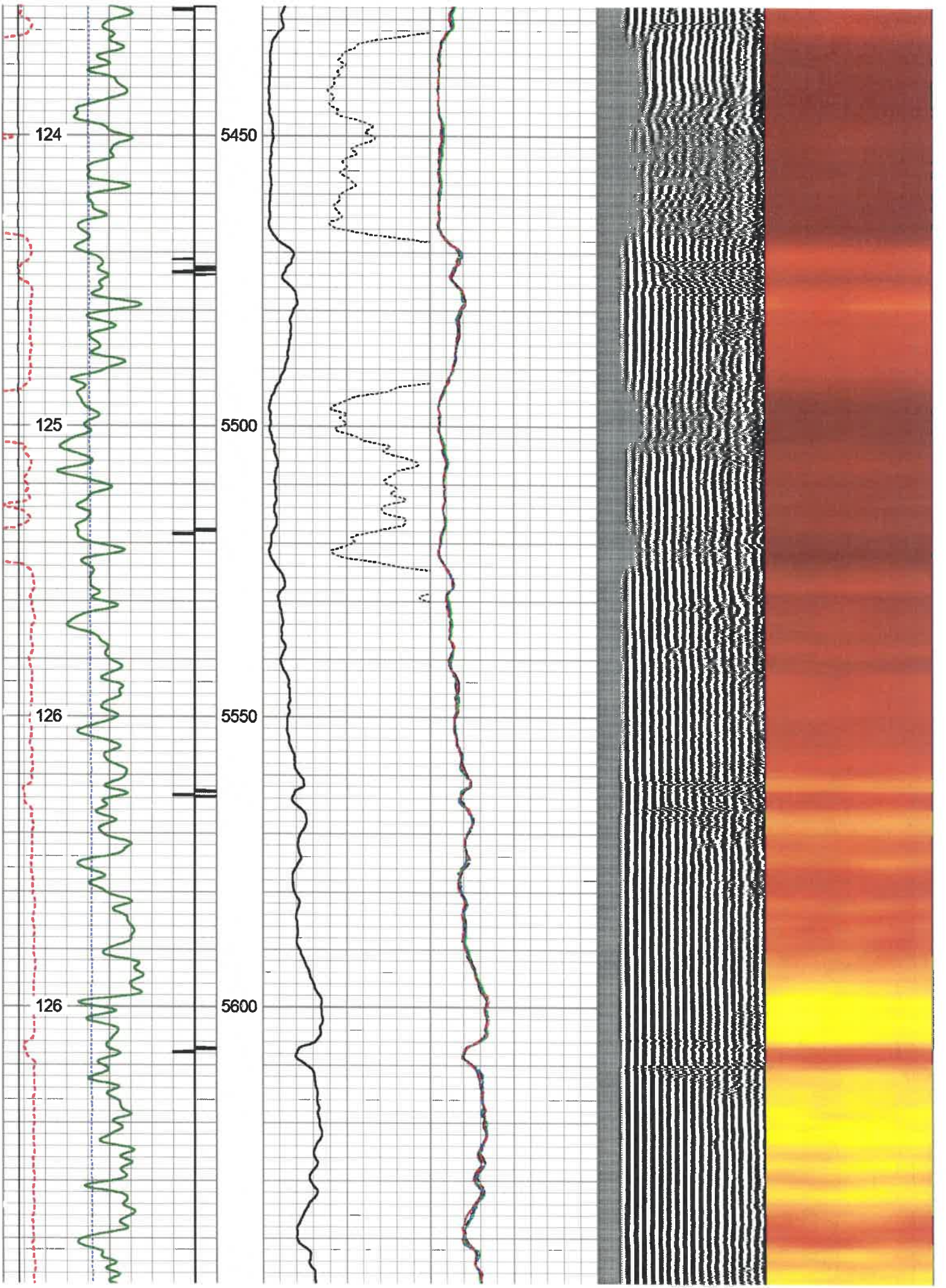


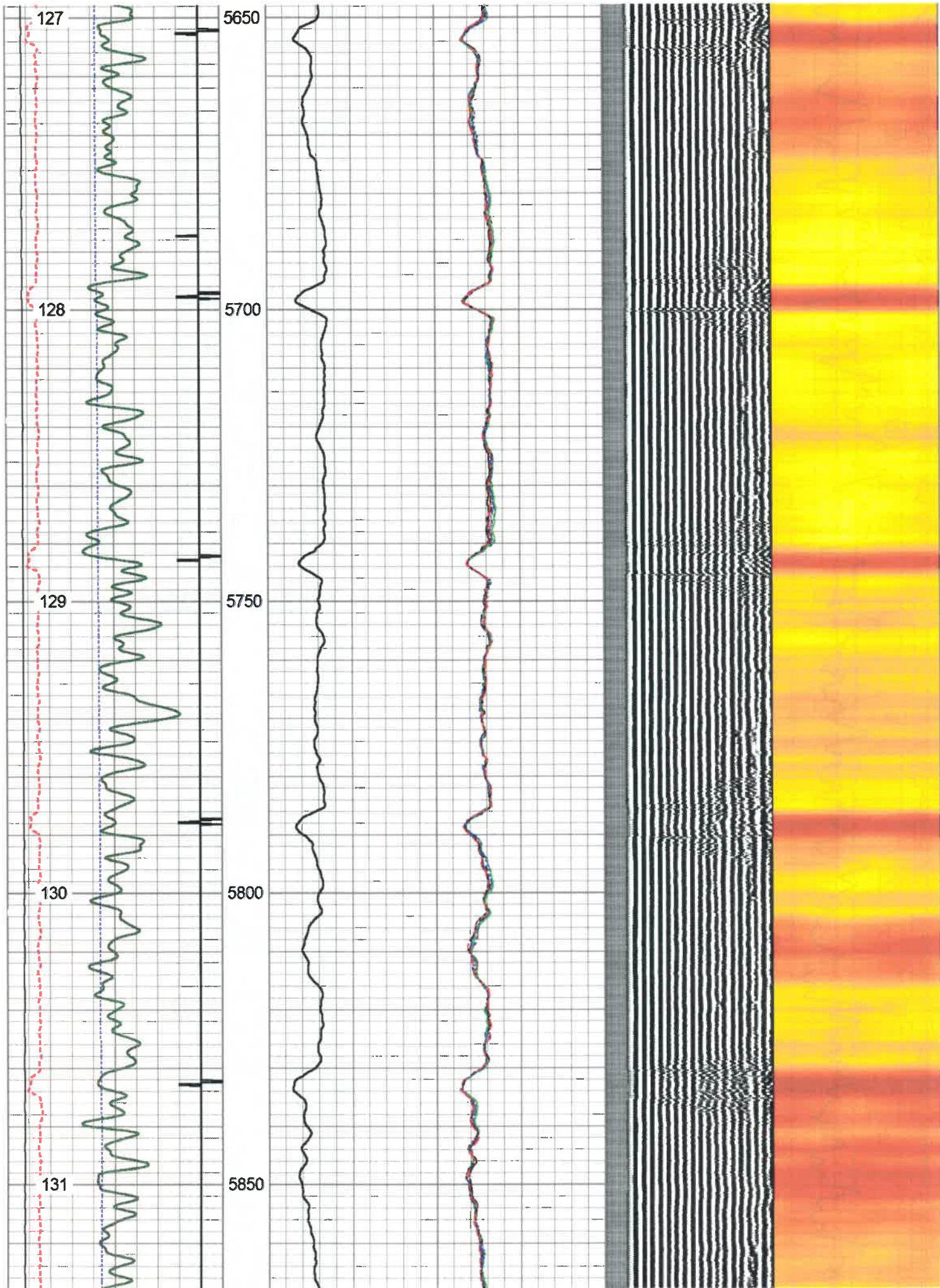


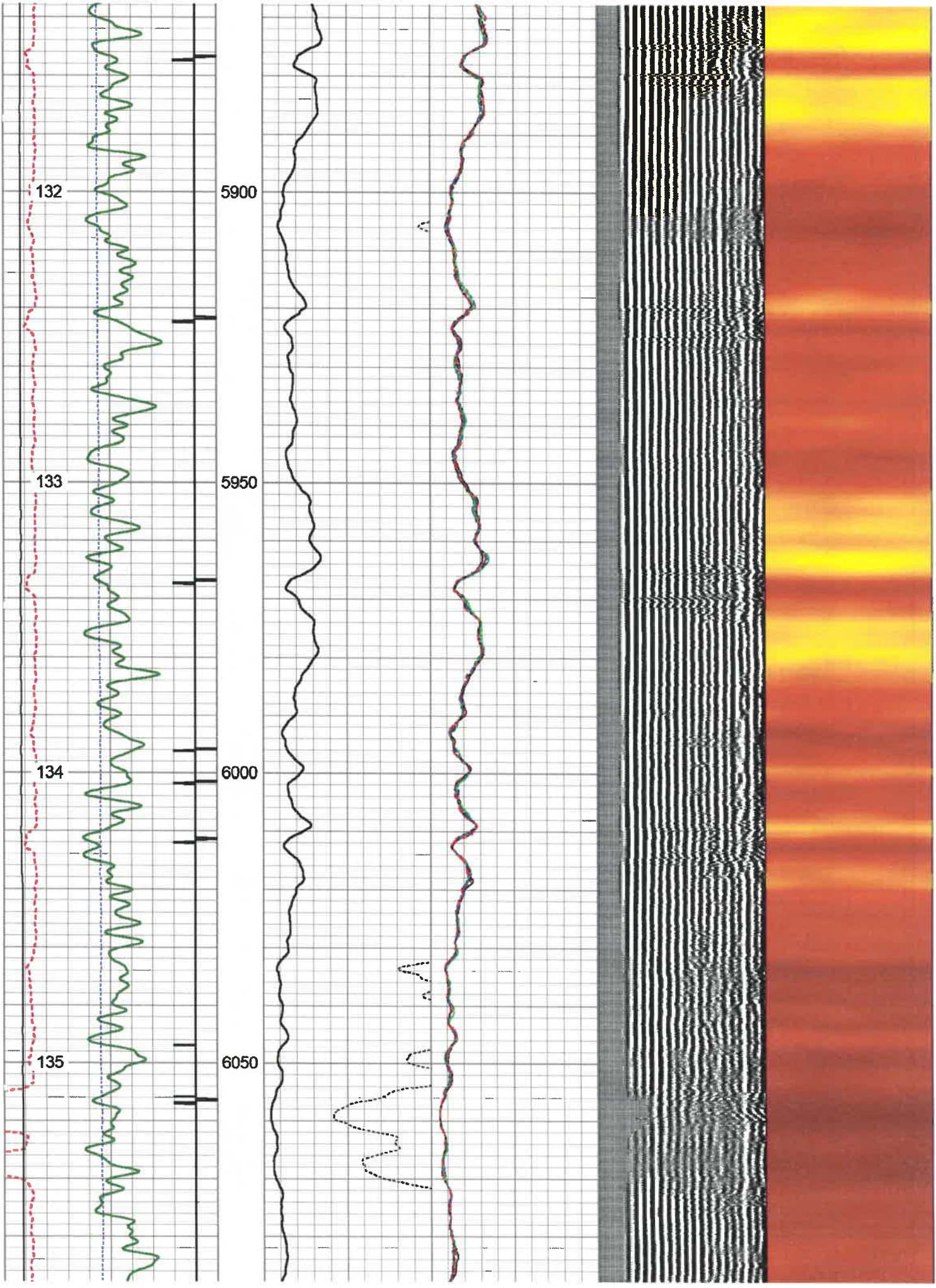


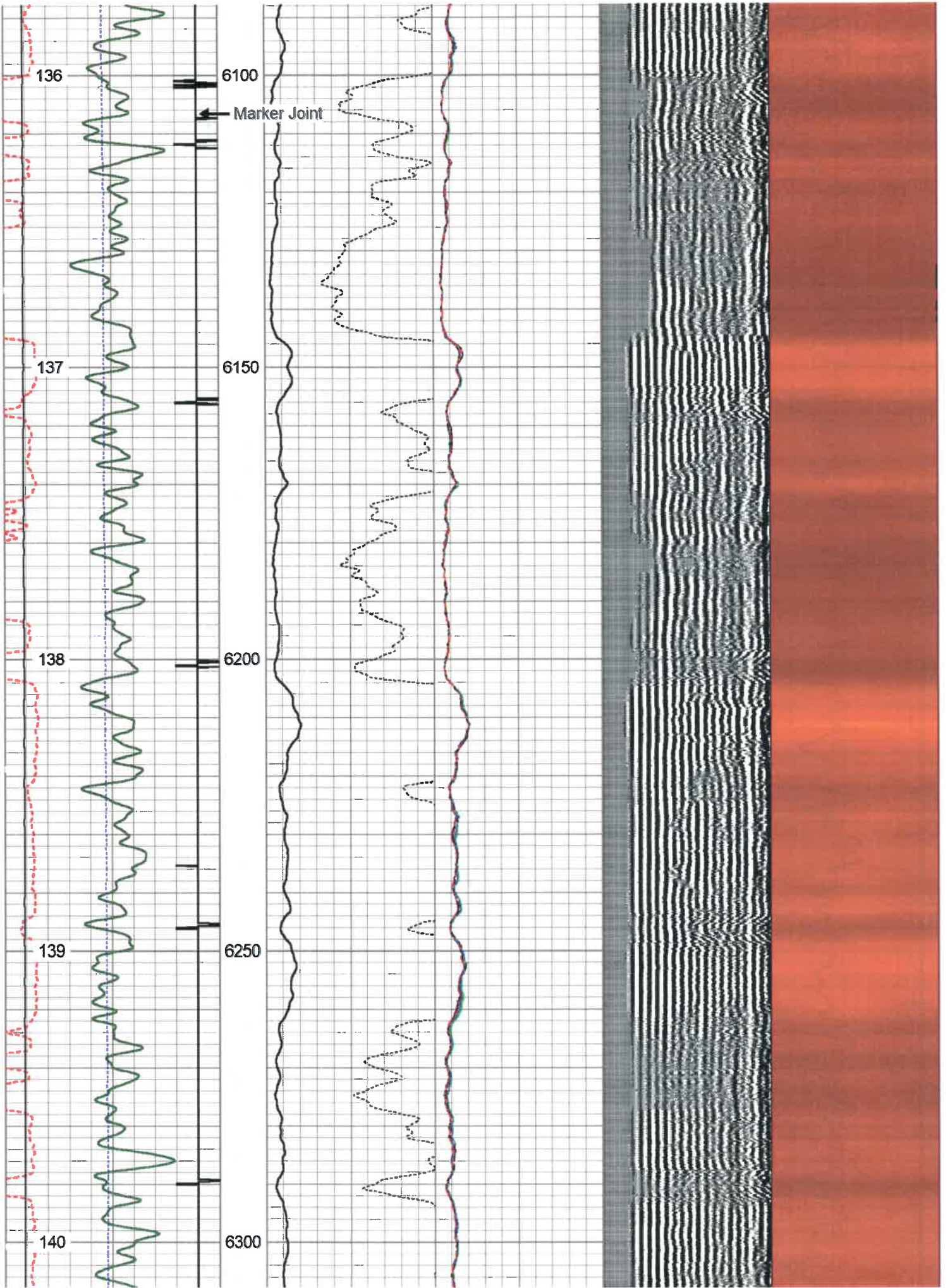


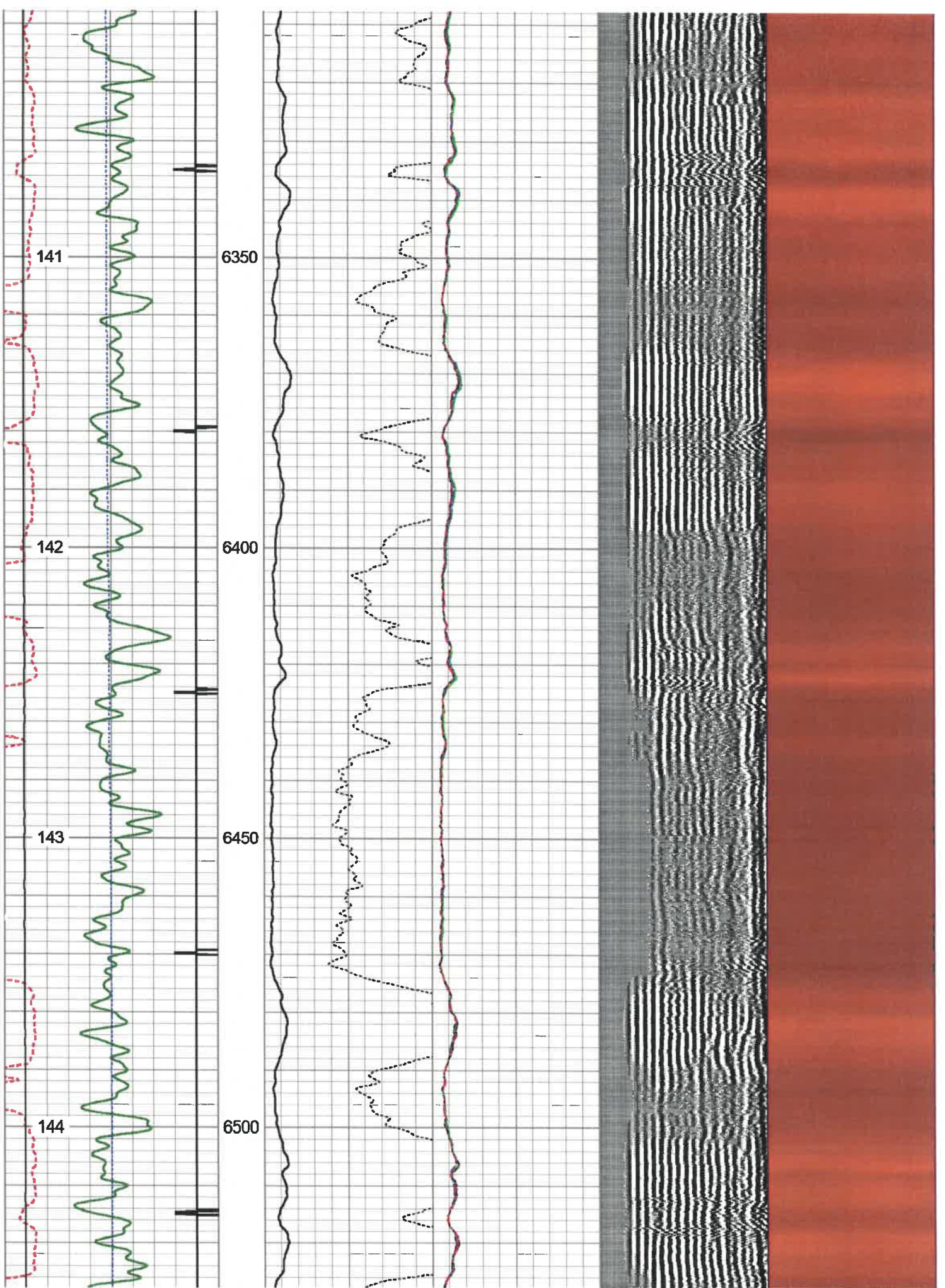


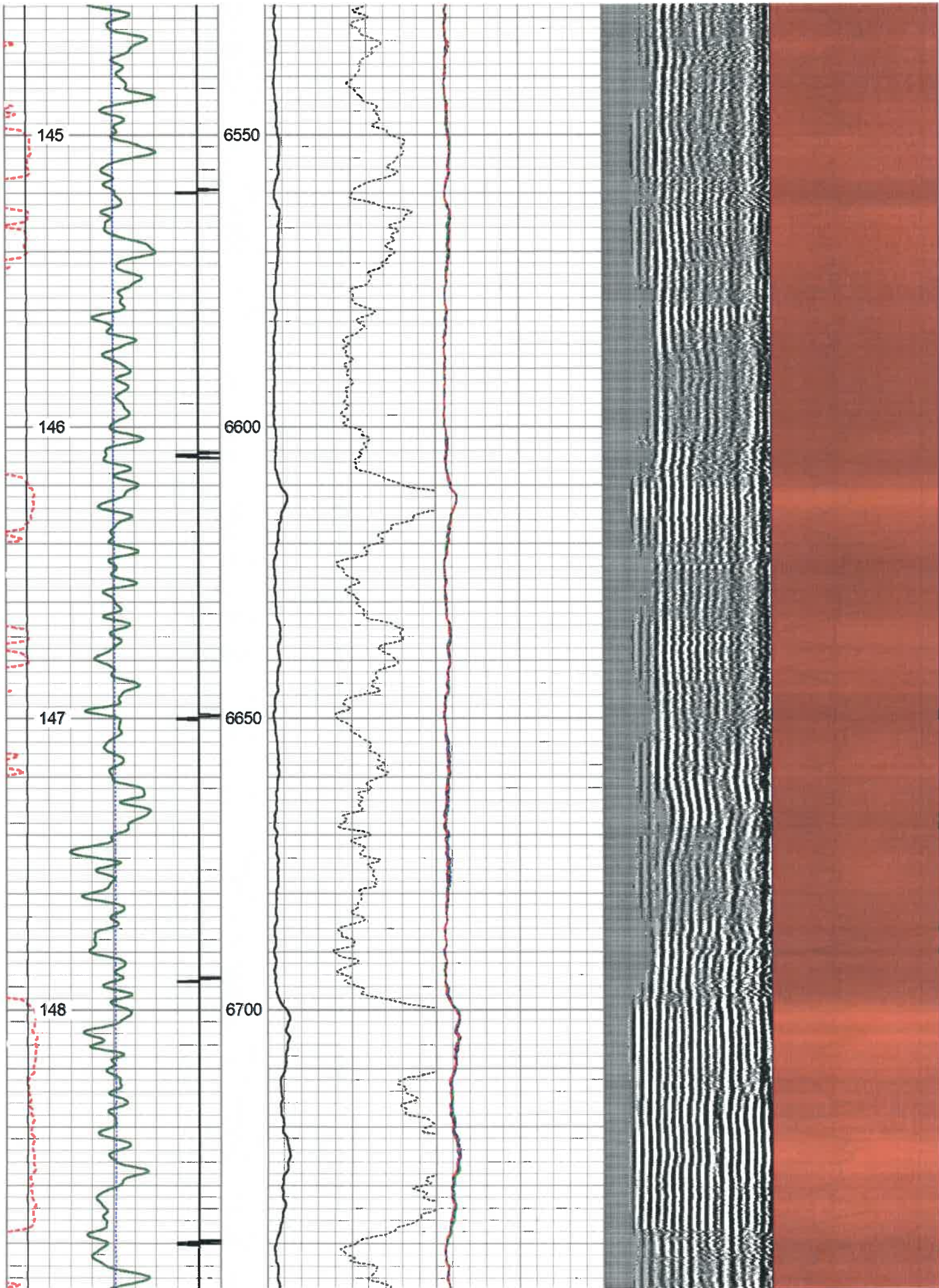




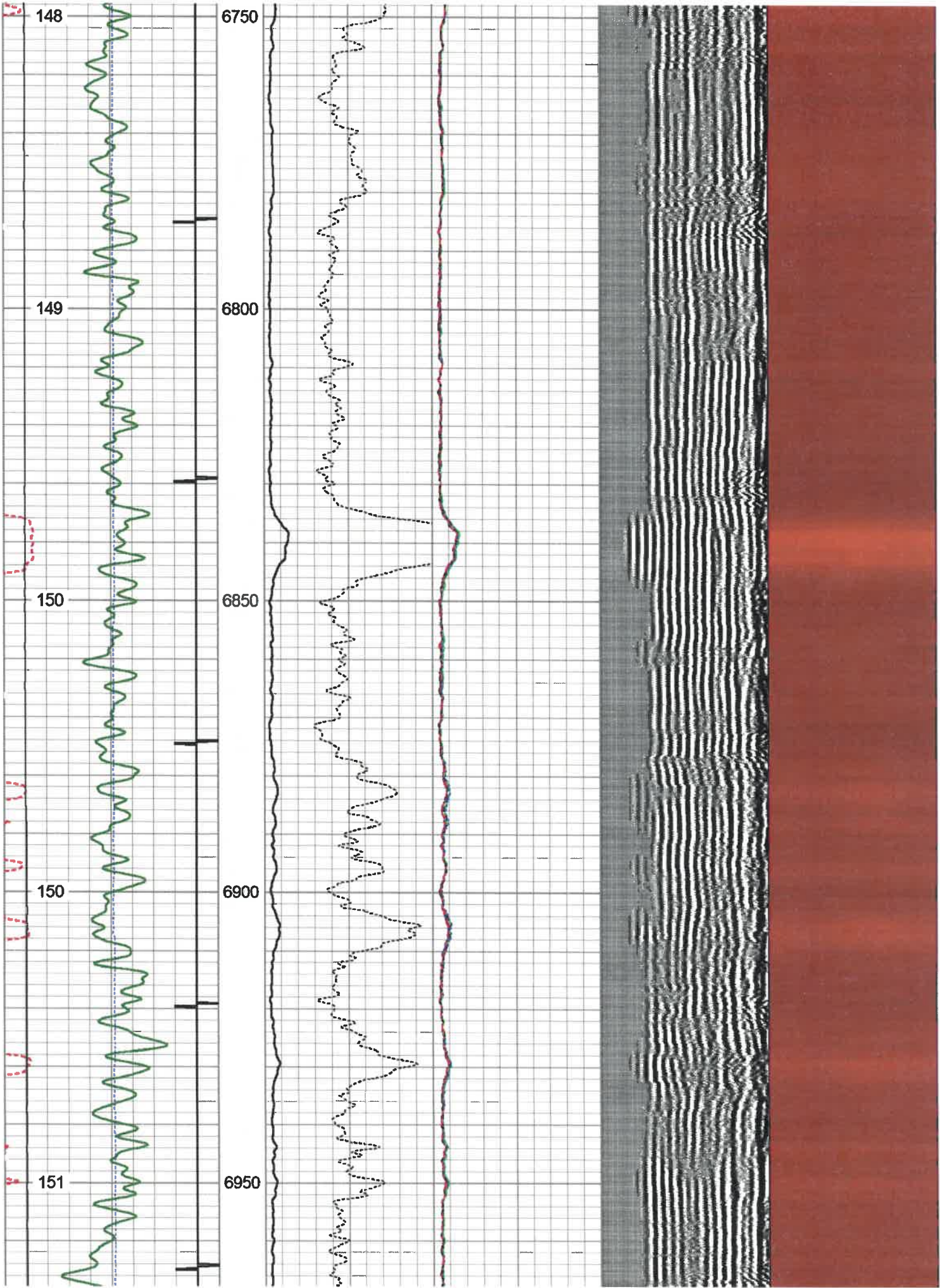


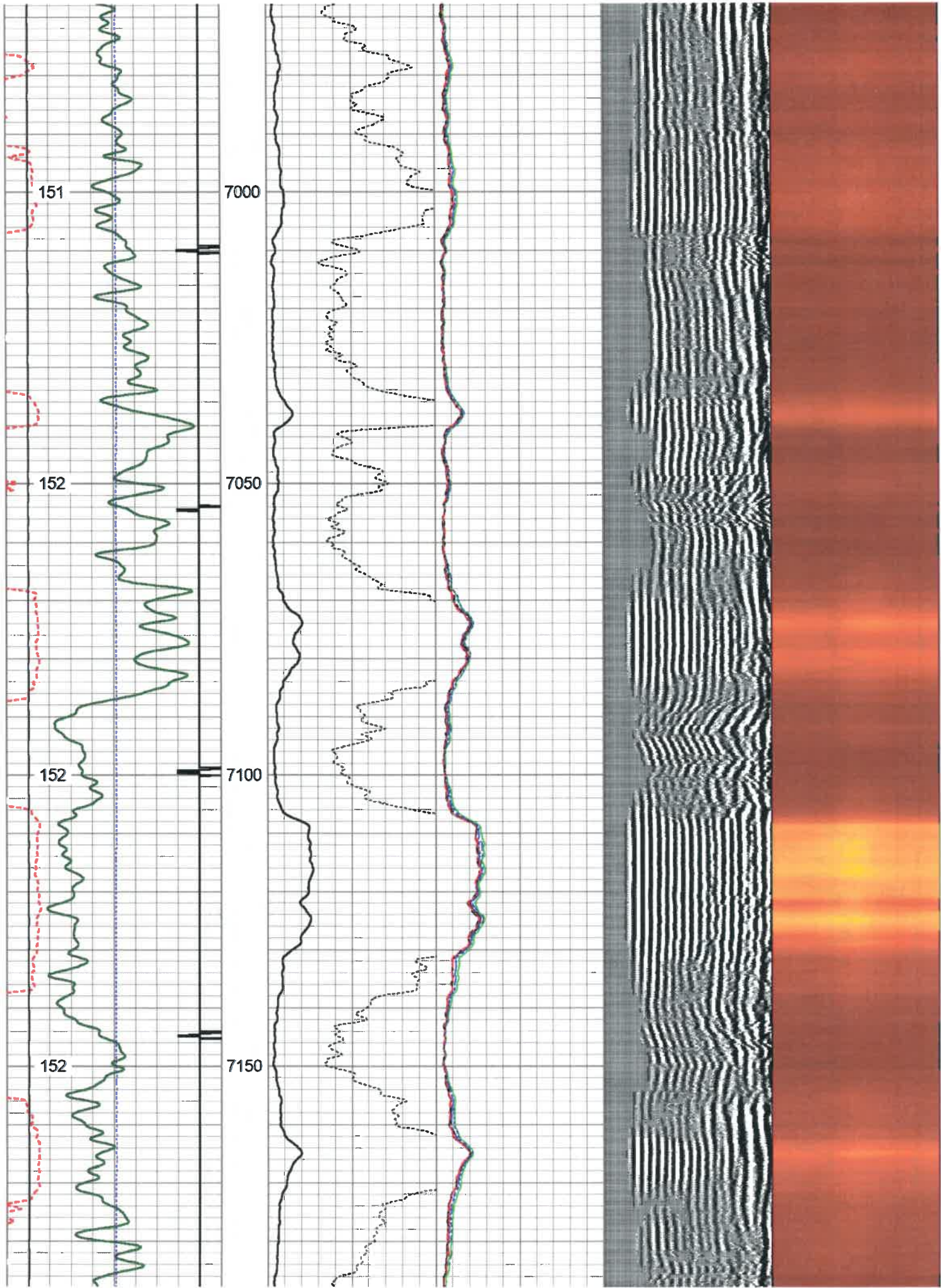


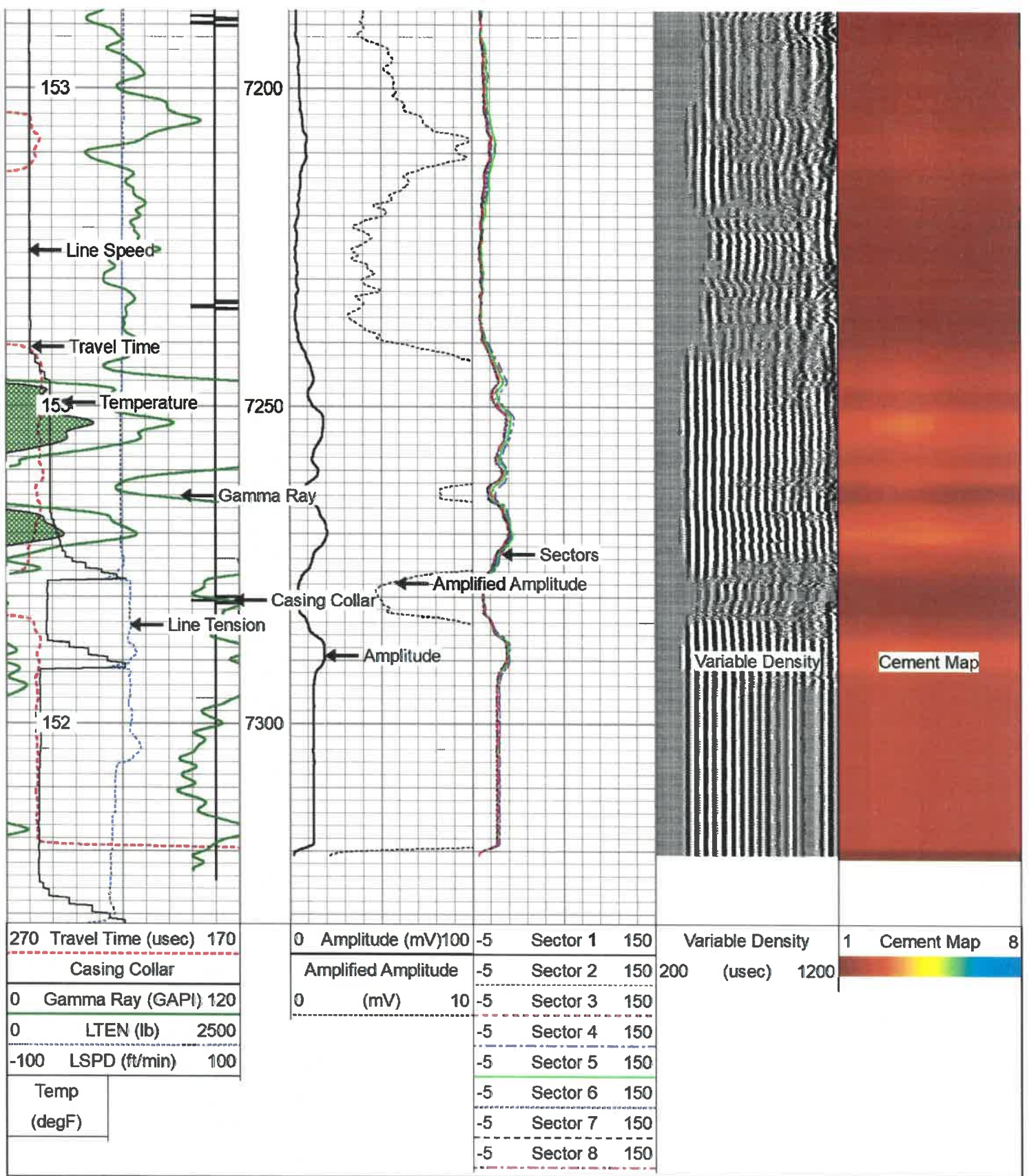












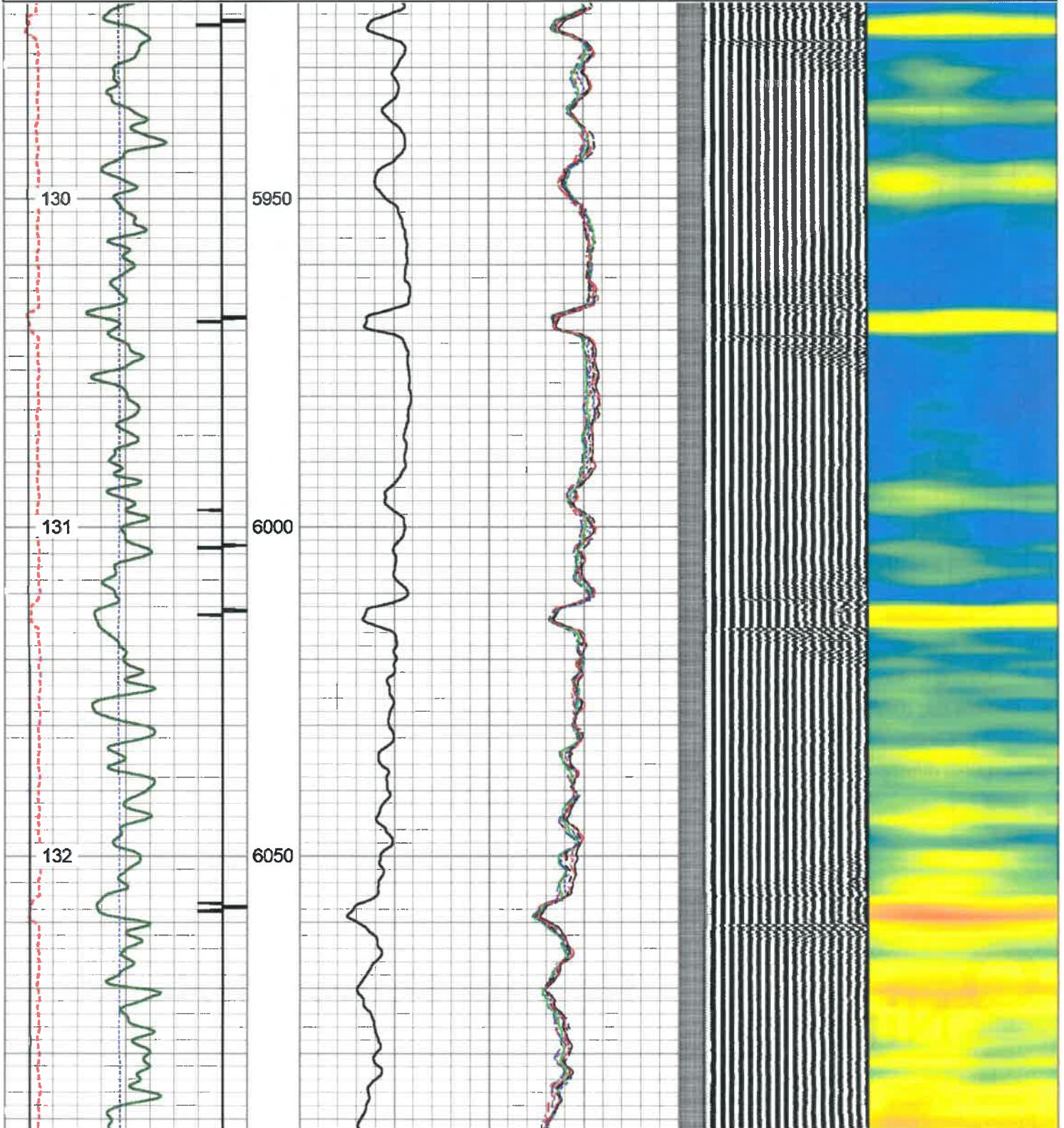
# Repeat Pass 0 PSI

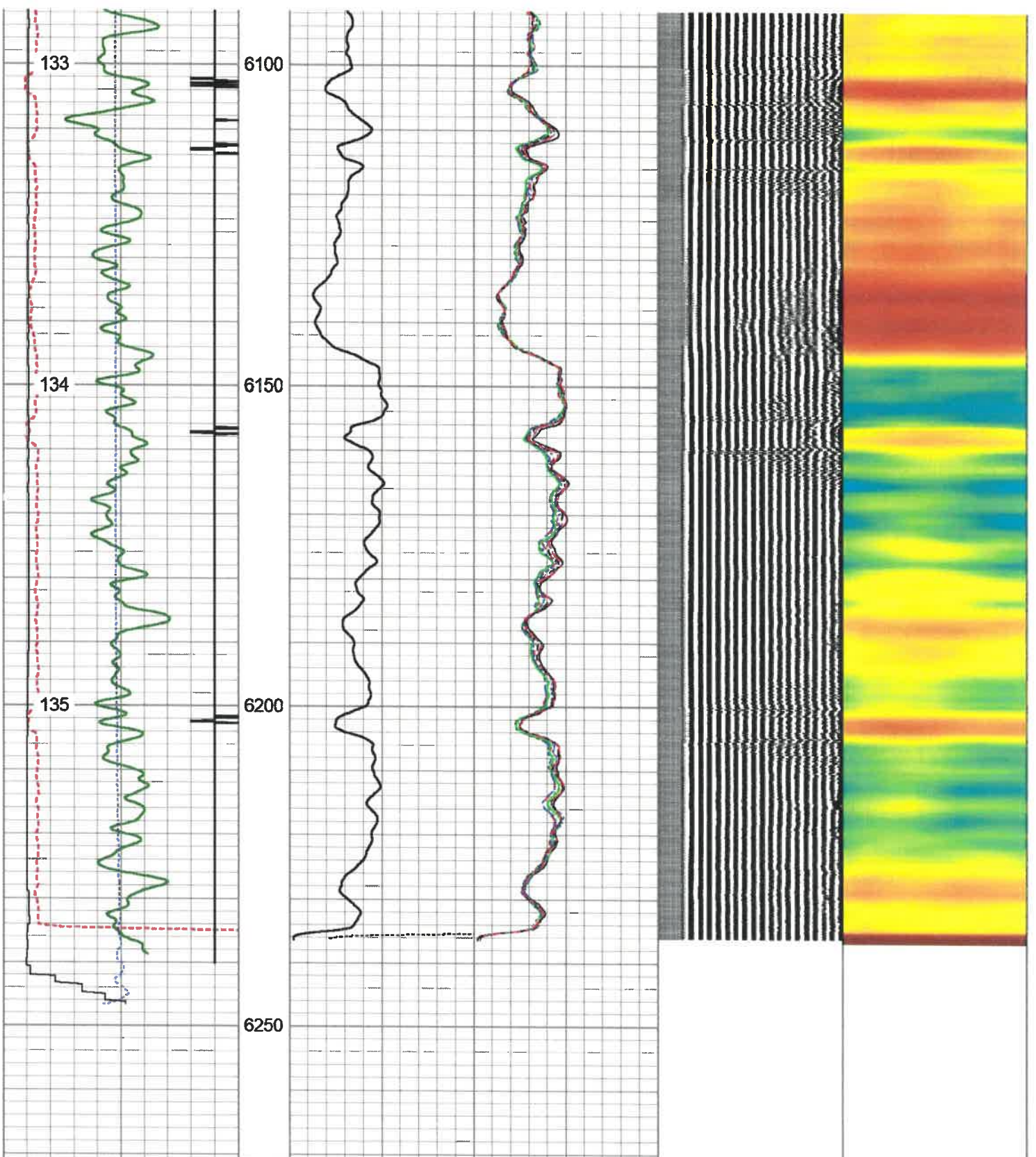
Database File antero\_george\_scott\_cortina1h\_04\_jan\_2020.db  
 Dataset Pathname south\_canton/cortina1h/rcbl/pass2  
 Presentation Format rcbl 2

270	Travel Time (usec)	170
Casing Collar		
0	Gamma Ray (GAPI)	120
0	LTEN (lb)	2500
-100	LSPD (ft/min)	100
Temp (degF)		

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

Variable Density	1	Cement Map	8
200	(usec)	1200	





270	Travel Time (usec)	170
Casing Collar		
0	Gamma Ray (GAPI)	120
0	LTEN (lb)	2500
-100	LSPD (ft/min)	100
Temp (degF)		

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

Variable Density	1	Cement Map	8
200	(usec)	1200	



# Log Variables

DatabaseC:\ProgramData\Warrior\Data\antero\_george\_scott\_cortina1h\_04\_jan\_2020.db  
 Dataset south\_canton/cortina1h/rcbl/pass4.2/\_vars\_

## Top - Bottom

BHTEMP_Src TEMP	BOREID in 8.75	BOTTEMP degF 152	CASEOD in 5.5	CASETHCK in 0.361	CASEWGHT lb/ft 20	MAXAMPL mV 72	MINAMPL mV 2.2
MINATTN db/ft 10.6	PERFS No	PPT usec 261	SRFTEMP degF 55	TDEPTH ft 7290			

## 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\_george\_scott\_cortina1h\_04\_jan\_2020.db  
 Dataset Pathname south\_canton/cortina1h/rcbl/pass4.2  
 Dataset Creation Sat Jan 04 09:41:04 2020

### Gamma Ray Calibration Report

Serial Number: FW1211-86  
 Tool Model: Probe  
 Performed: Sat Jan 04 04:26:07 2020

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps  
 Calibrator Reading: 1.0 cps

Sensitivity: 0.7000 GAPI/cps

### Segmented Cement Bond Log Calibration Report

Serial Number: FW1312-32  
 Tool Model: Probe275T

Calibration Casing Diameter: 5.500 in  
 Calibration Depth: -3373.370 ft

### Master Calibration, performed (Derived):

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.000	1.860	2.200	71.921	37.475	2.199
CAL	0.419	1.217				
5'	-0.002	1.596	2.200	71.921	43.621	2.287
SUM						
S1	0.000	1.796	0.000	100.000	55.669	-0.001
S2	0.000	1.967	0.000	100.000	50.838	-0.001
S3	0.000	1.943	0.000	100.000	51.466	-0.002
S4	0.000	1.939	0.000	100.000	51.570	-0.002

S5	0.000	1.870	0.000	100.000	53.473	-0.001
S6	0.000	1.786	0.000	100.000	55.998	-0.001
S7	0.000	1.733	0.000	100.000	57.688	-0.001
S8	0.000	1.786	0.000	100.000	55.985	-0.001

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	0.419	1.217	1.000	0.000

Air Zero Calibration, performed Fri Jan 03 15:06:42 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)
			CHD-Titan Titan 1 7/16" GO Cablehead	1.00	1.44	5.00
Temp	14.14		CENT-Overbody Antelope (SP-919-0233)	1.67	4.88	5.00
WVFS8	11.91		RBT-Probe275T (FW1312-32) Probe 2.75" Radial with Integral Temperature Sub	9.39	2.75	90.00
WVFS7	11.91					
WVFS6	11.91					
WVFS5	11.91					
WVFS4	11.91					
WVFS3	11.91					
WVFS2	11.91					
WVFS1	11.91					
WVF3FT	11.91					
WVF5FT	10.91					

