



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

Company	Antero Resources	Company	Antero Resources
Well	Blizzard Wade 2H	Well	Blizzard Wade 2H
Field	Rabbit Ears	Field	Rabbit Ears
County	Tyler	County	Tyler
State	WV	State	WV
Location:	API #: 47-095-027280		Other Services
Permanent Datum	SEC	TWP	RGE
Log Measured From		Ground Level	Elevation
Drilling Measured From		Kelly Bushing 25.5"	K.B. D.F. G.L.
Date	26-JUL-2021		
Run Number	One		
Depth Driller	25,846'		
Depth Logger	6,718'		
Bottom Logged Interval	6,730'		
Top Log Interval	Surface		
Open Hole Size	N/A		
Type Fluid	Water		
Density / Viscosity	N/A		
Max. Recorded Temp.	143 Deg.F.		
Estimated Cement Top	5,026'		
Time Well Ready	1:1:00		
Time Logger on Bottom	11:20		
Equipment Number	116 (P4) (G1)		
Location	Charleroi, PA		
Recorded By	Matt McNally		
Witnessed By	James Carter		

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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 5,530' - 5,540'  
Depth Correction +10'

Main Pass 1,500 PSI  
Repeat 0 PSI

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

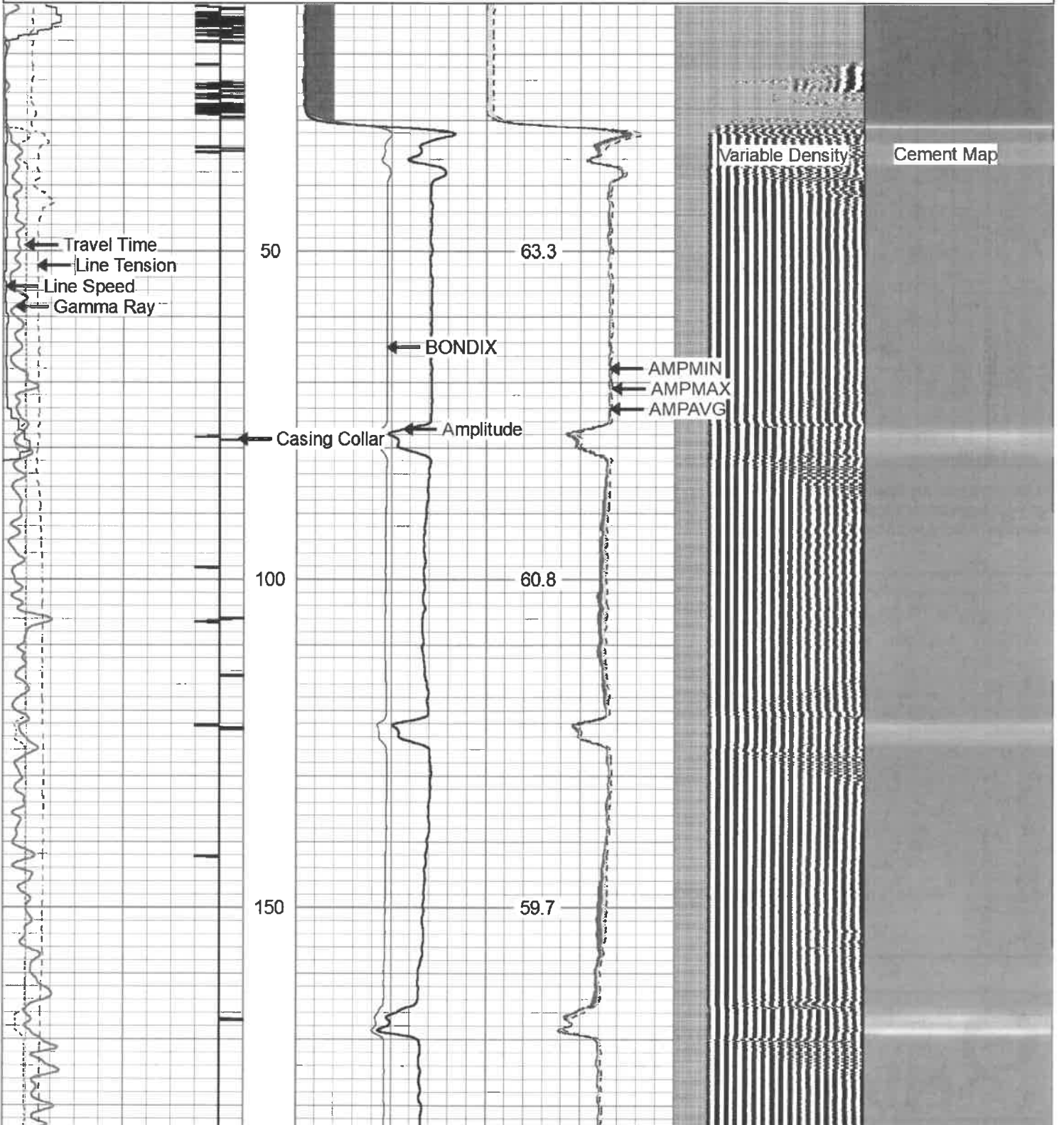


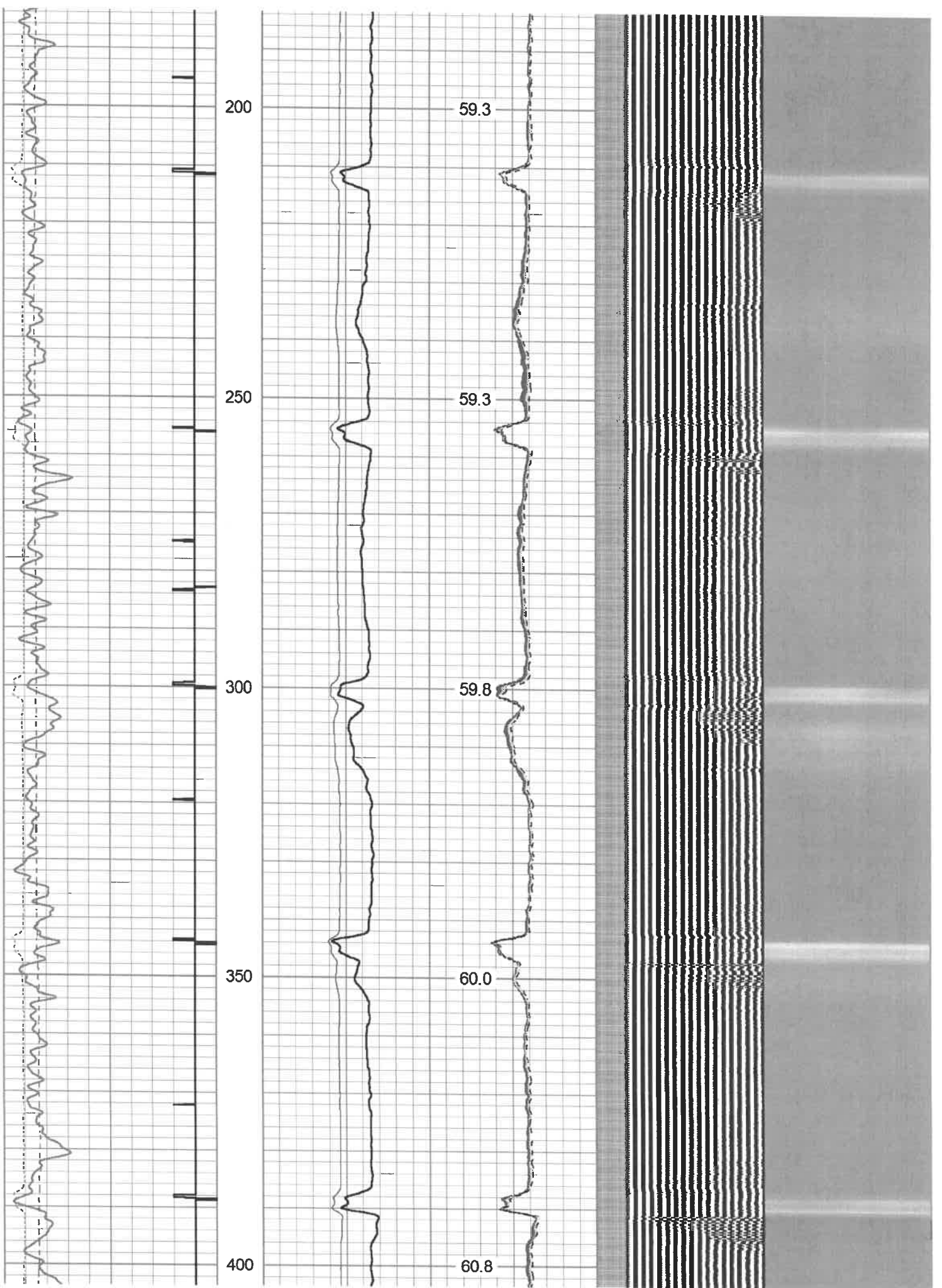
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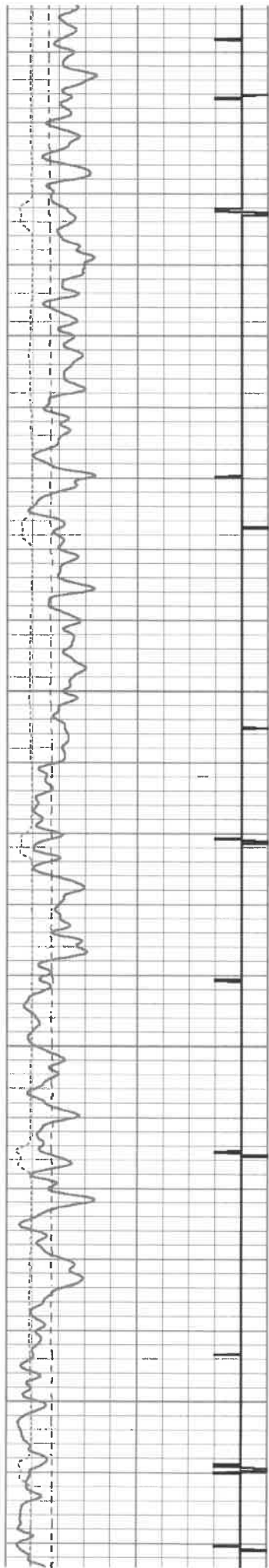
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Database File antero\_blizzard\_wade\_2h\_rcbl\_26\_jul\_2021.db  
 Dataset Pathname rabbit\_ears/wade\_2h/run1/pass9  
 Presentation Format rcbl-bond index for antero 1020  
 Dataset Creation Mon Jul 26 11:23:45 2021  
 Charted by Depth in Feet scaled 1:240

270	Travel Time (usec)	160	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	AMPAVG	150				
	Line Speed						TEMP					
-100	(ft/min)	100					(degF)					
0	Line Tension (lb)	2000										





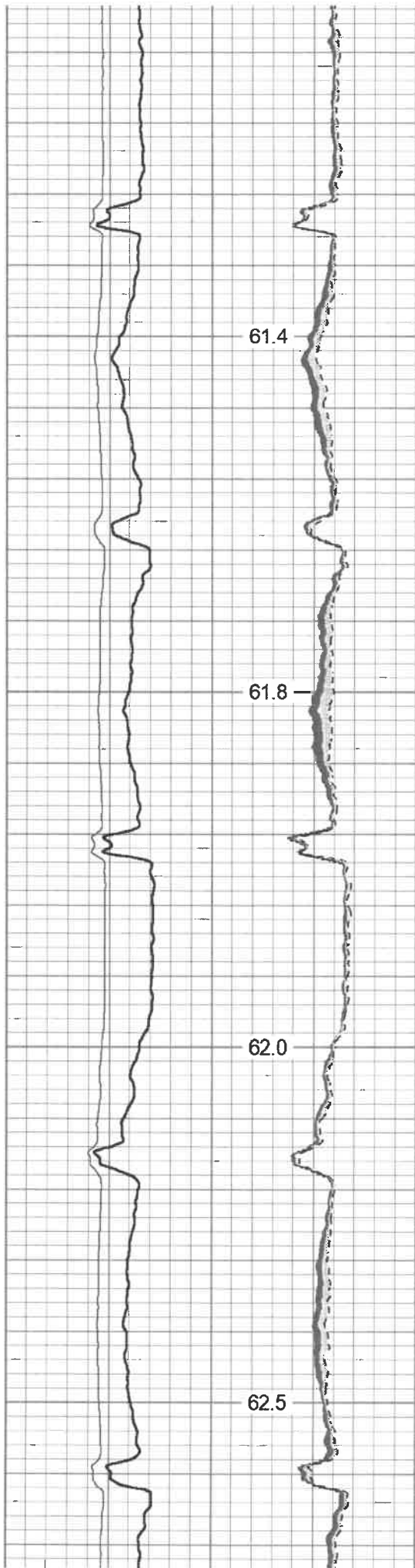


450

500

550

600

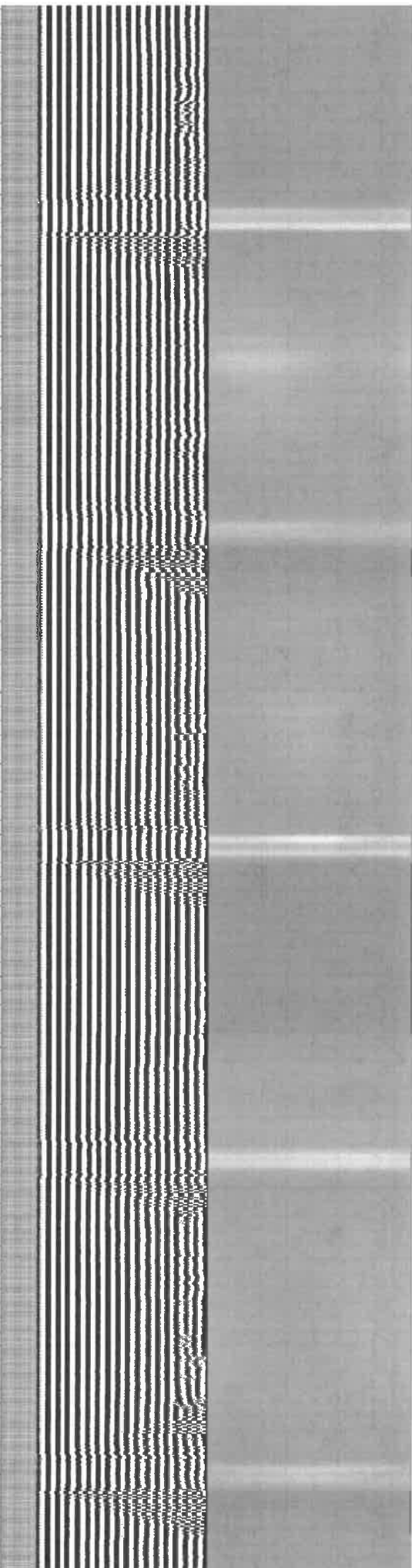


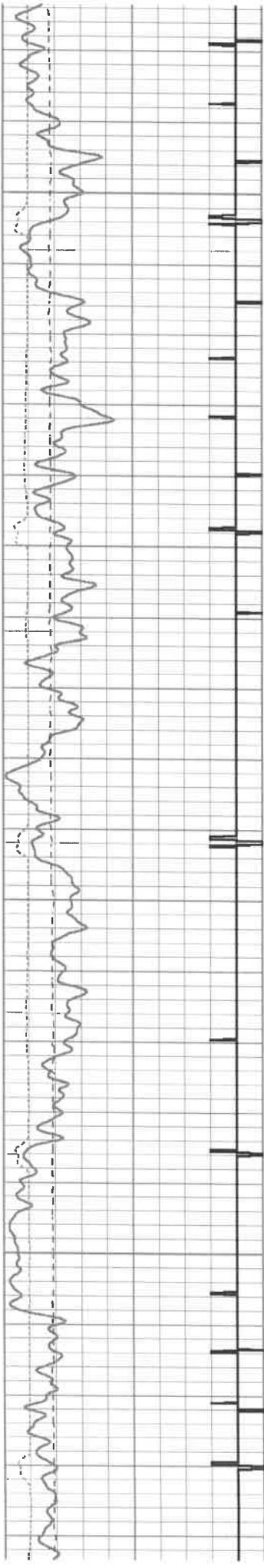
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61.8

62.0

62.5



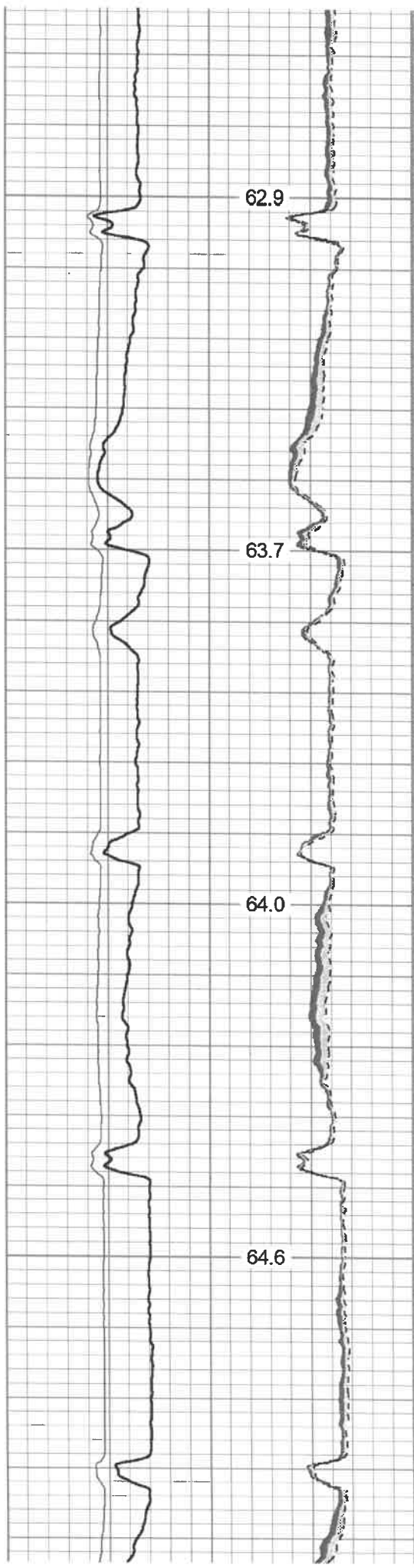


650

700

750

800

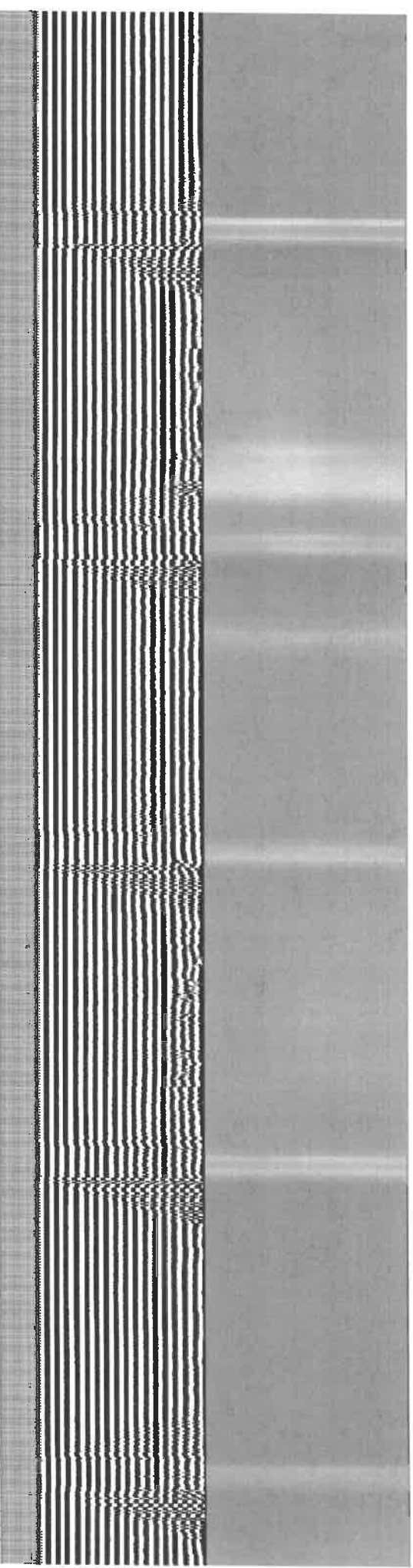


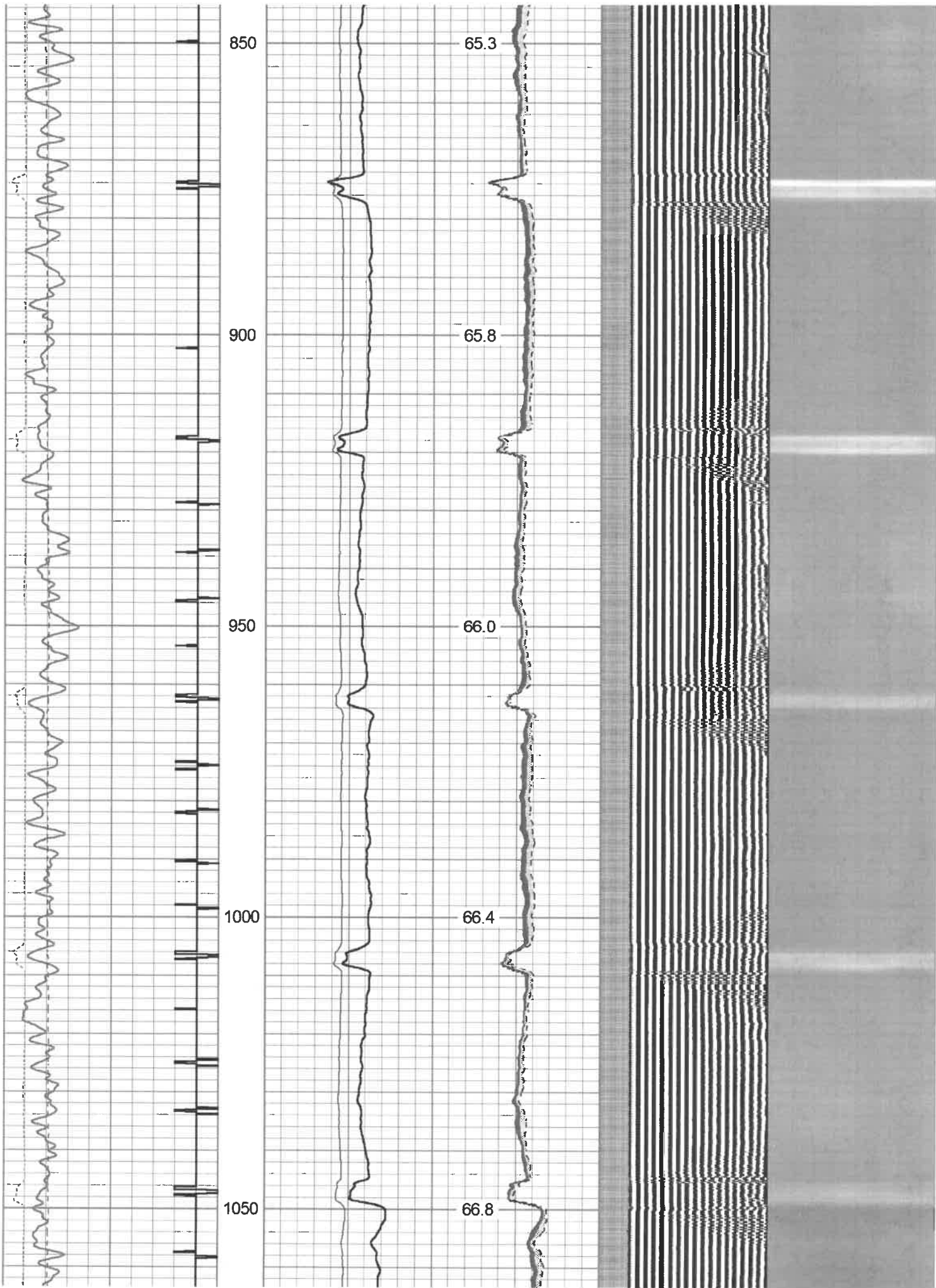
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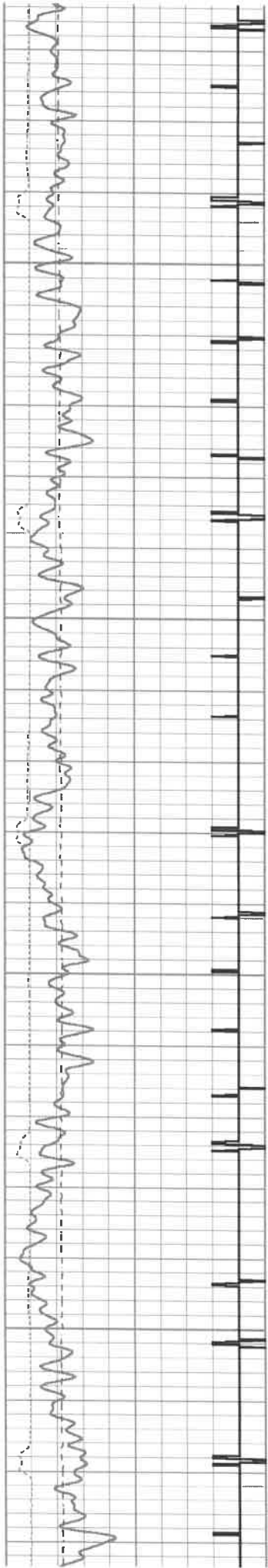
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64.0

64.6





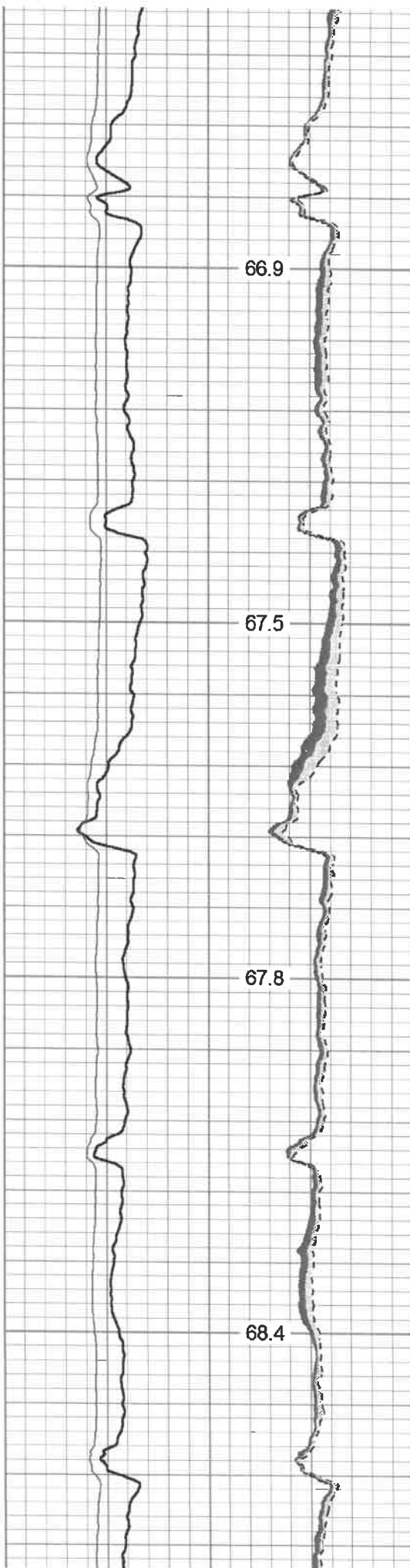


1100

1150

1200

1250

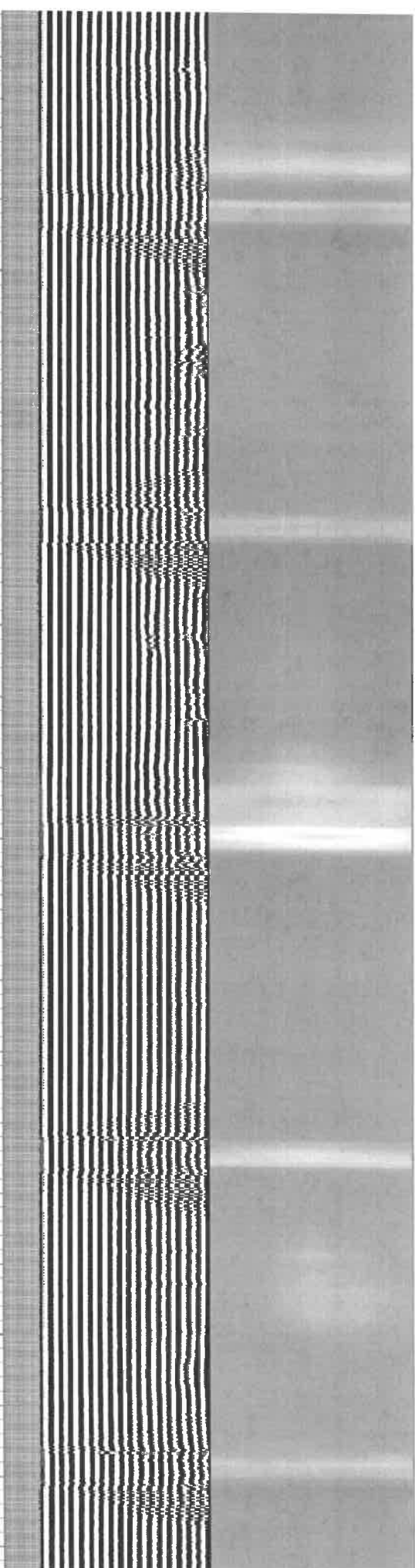


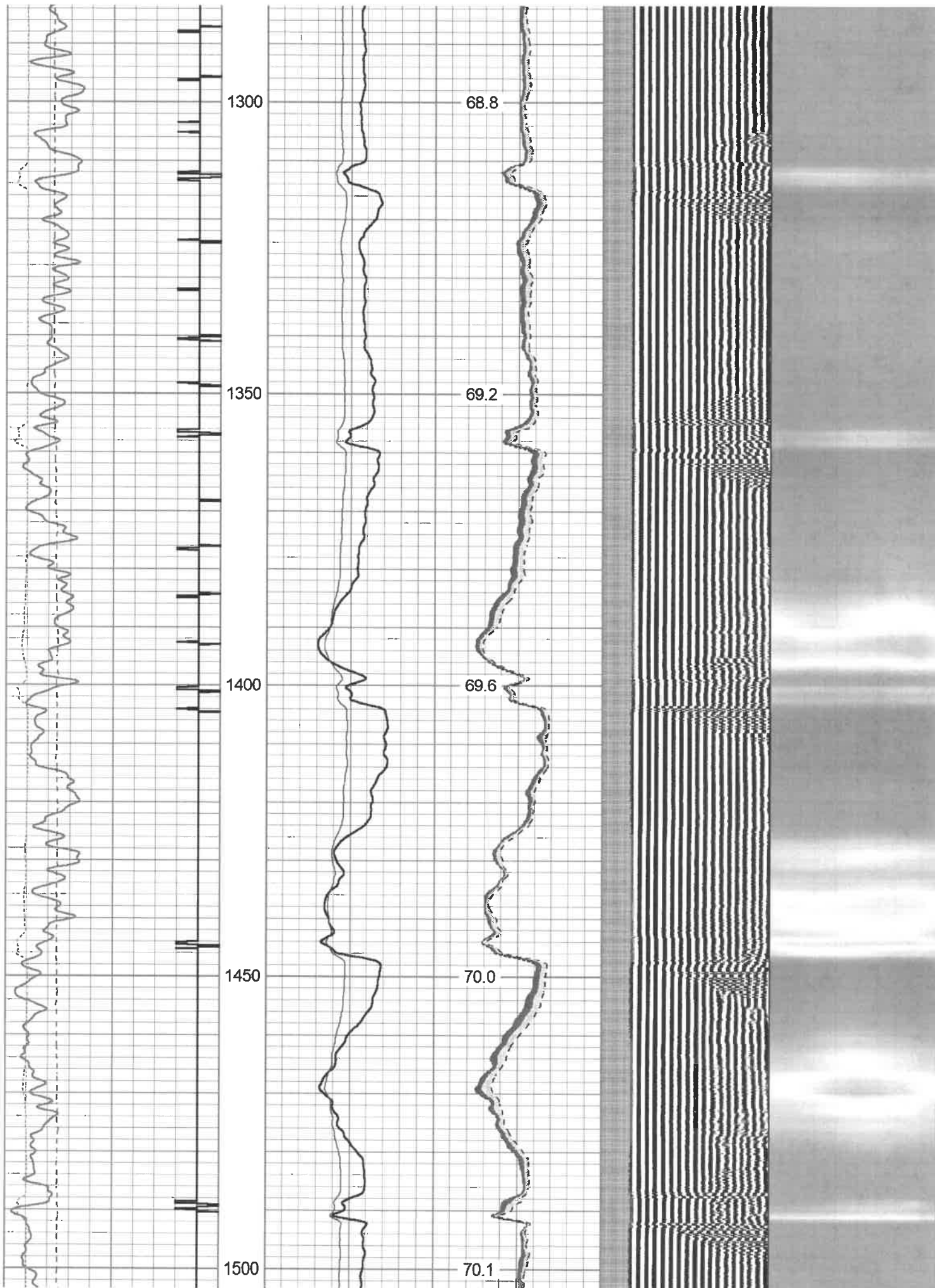
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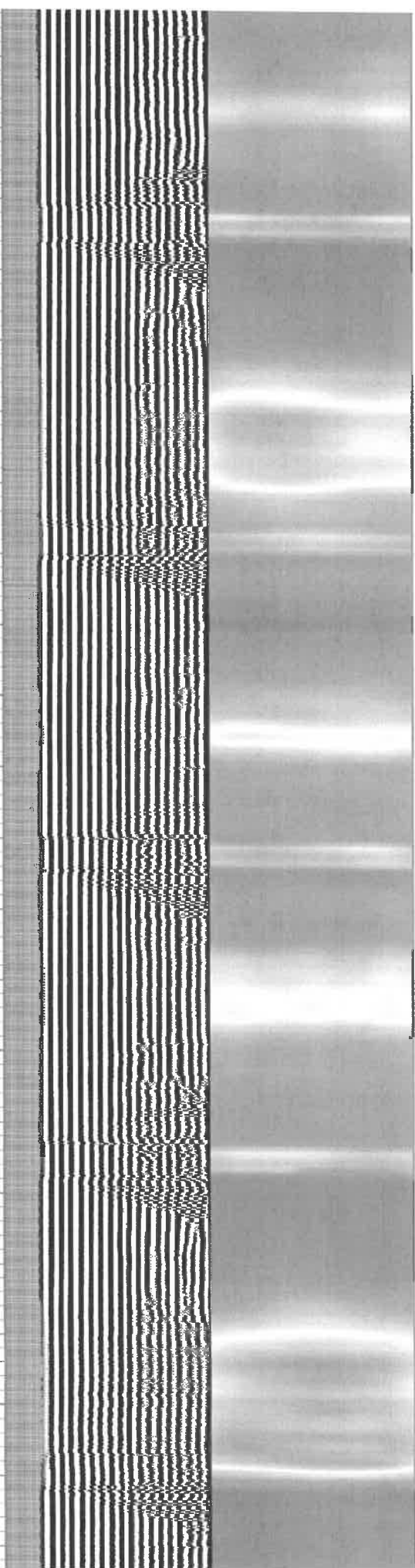
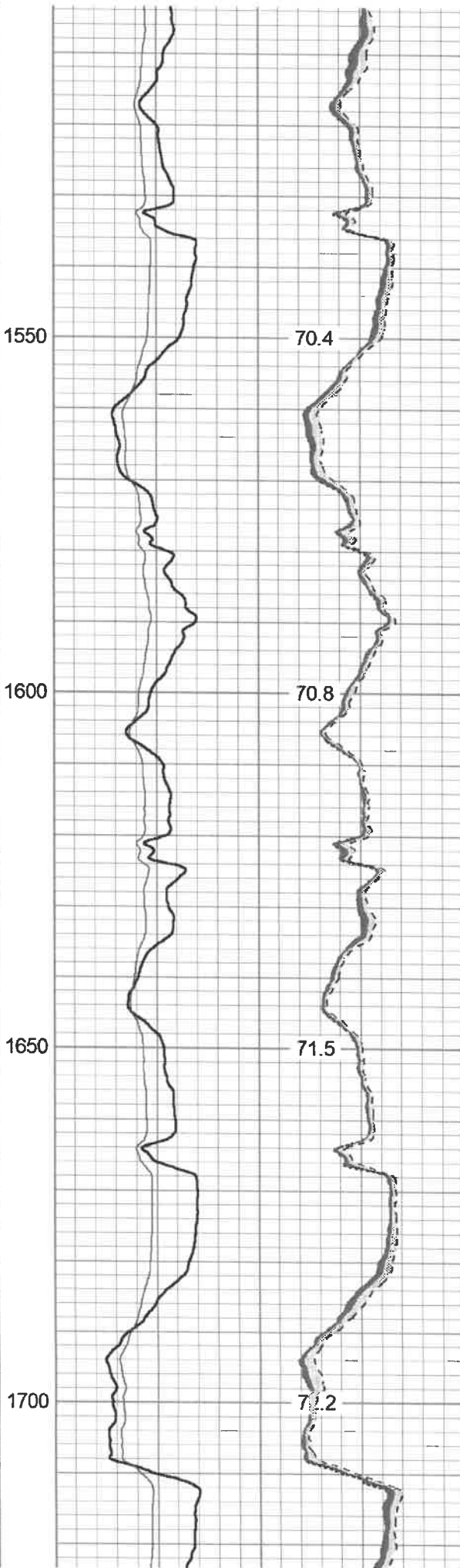
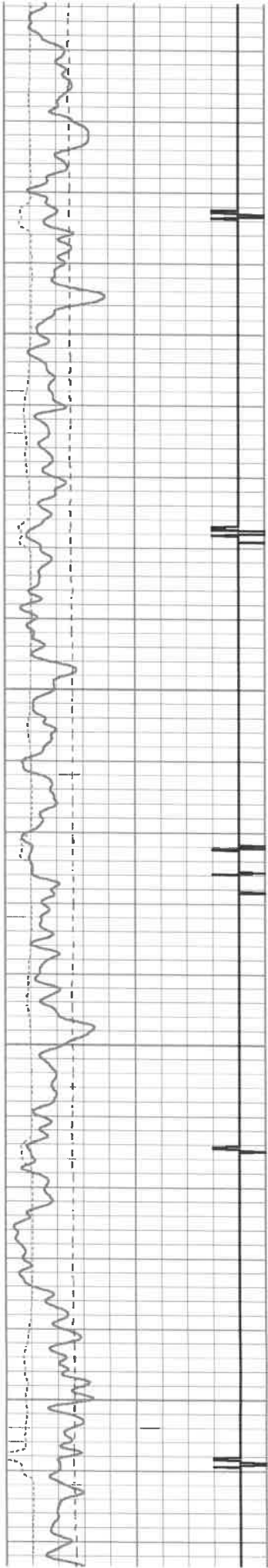
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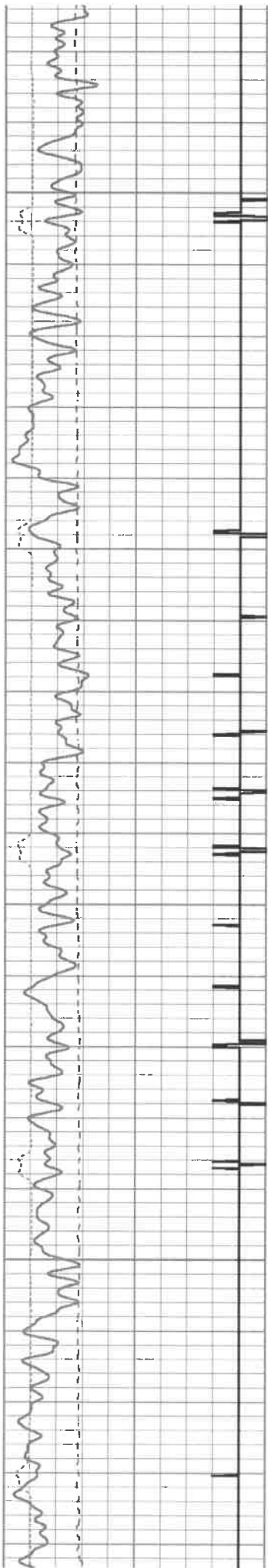
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1750

1800

1850

1900

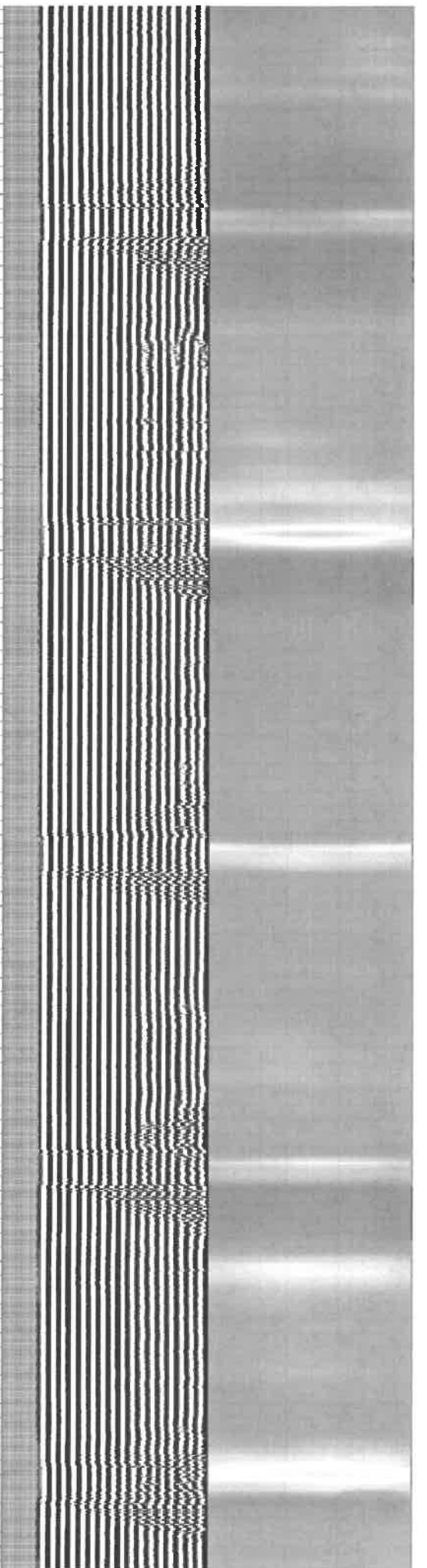


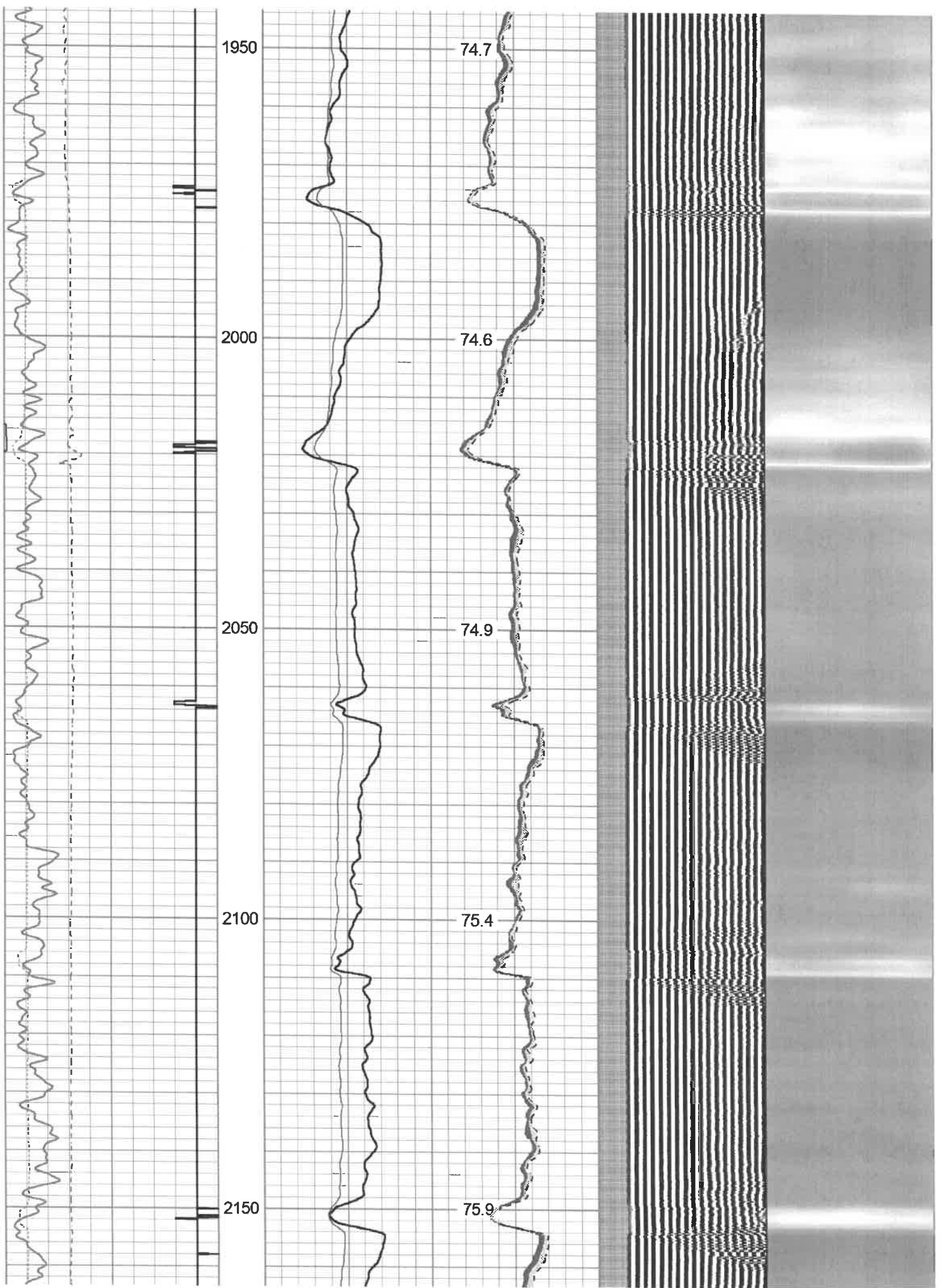
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73.2

74.2

74.6





1950

74.7

2000

74.6

2050

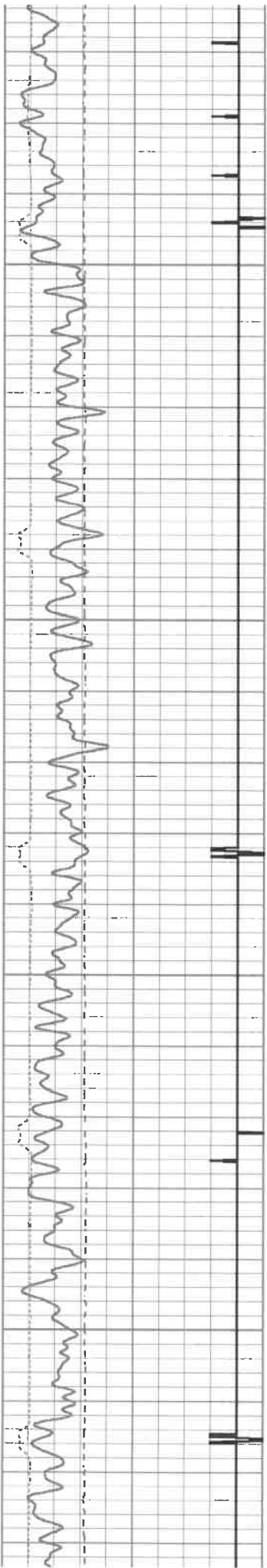
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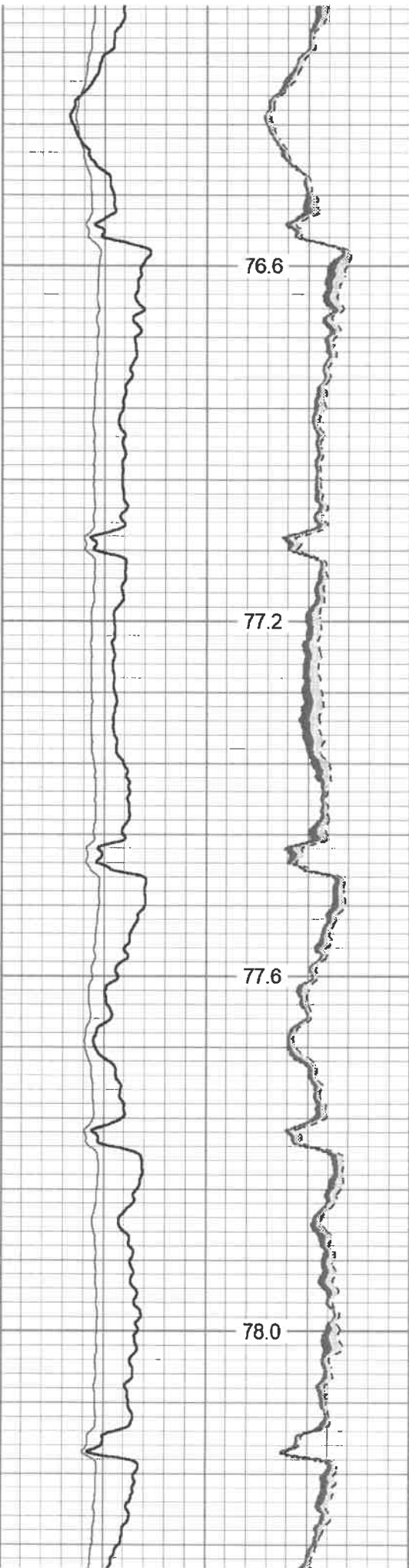
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2150

75.9



2200  
2250  
2300  
2350

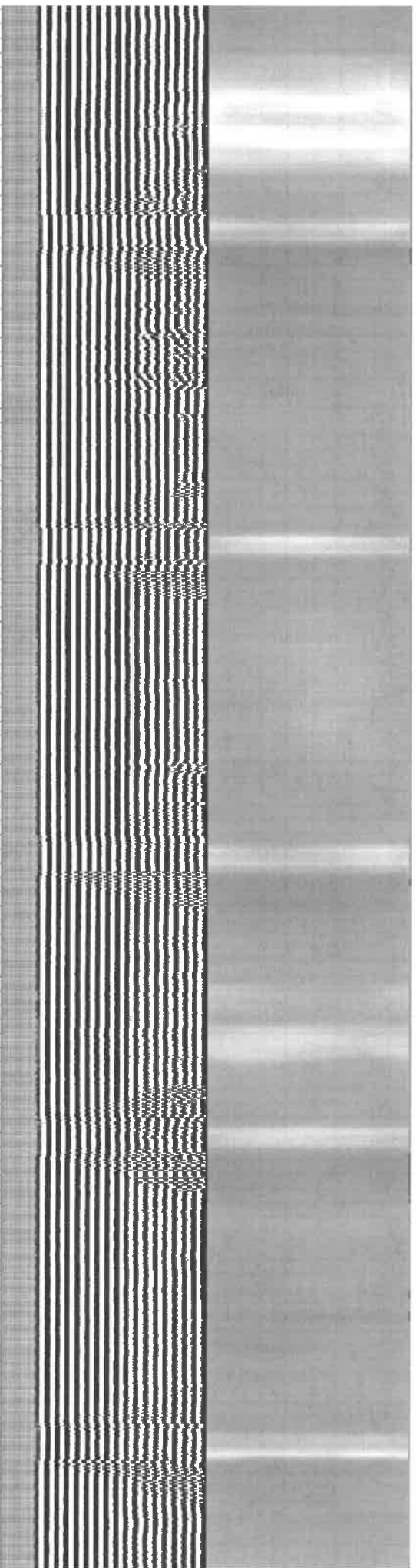


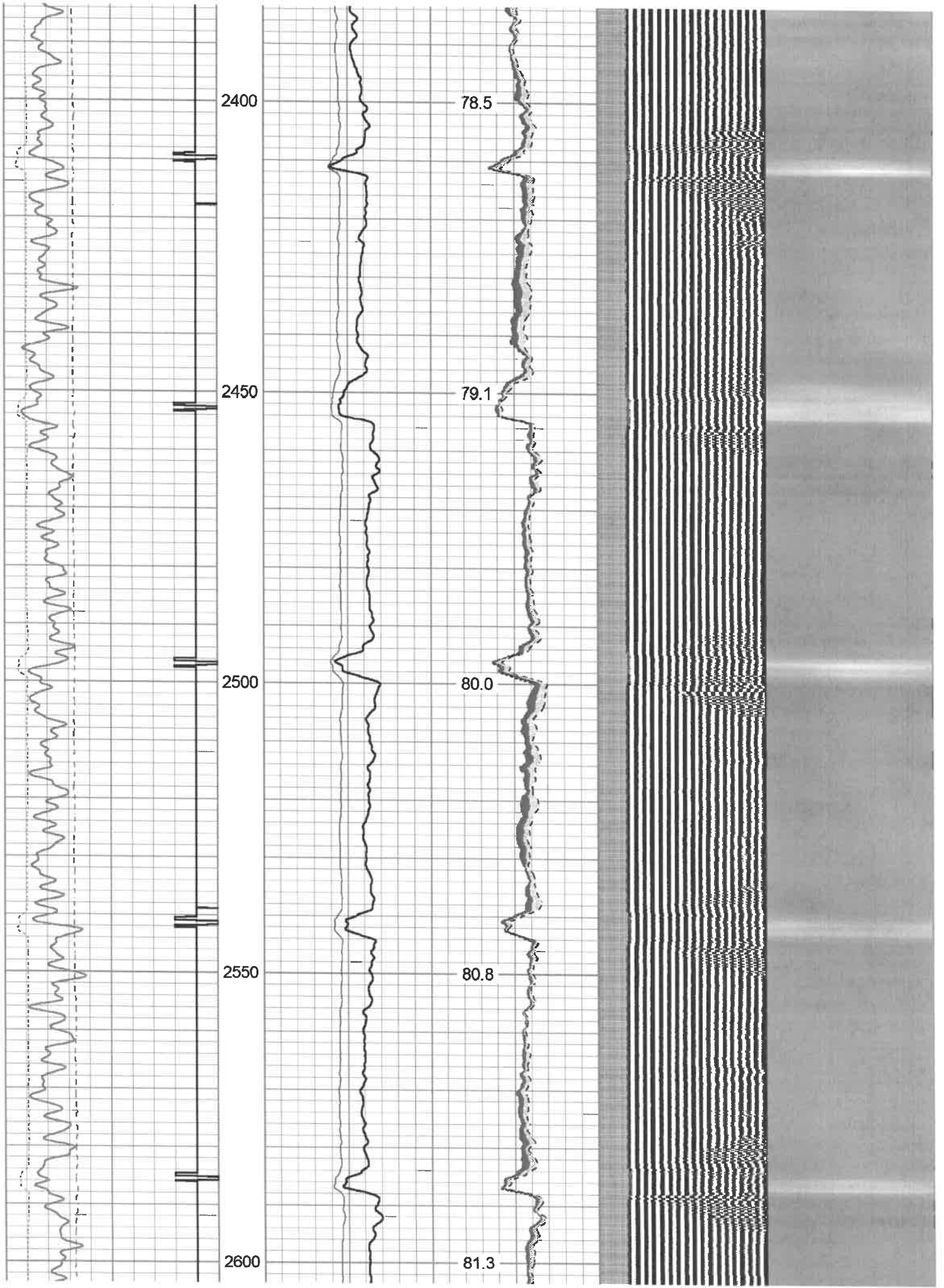
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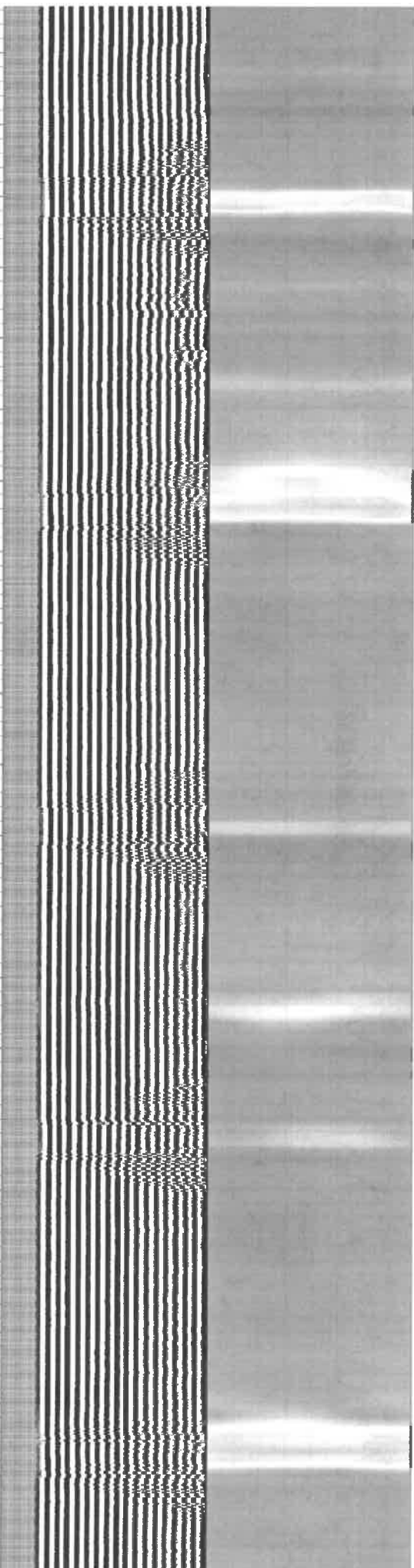
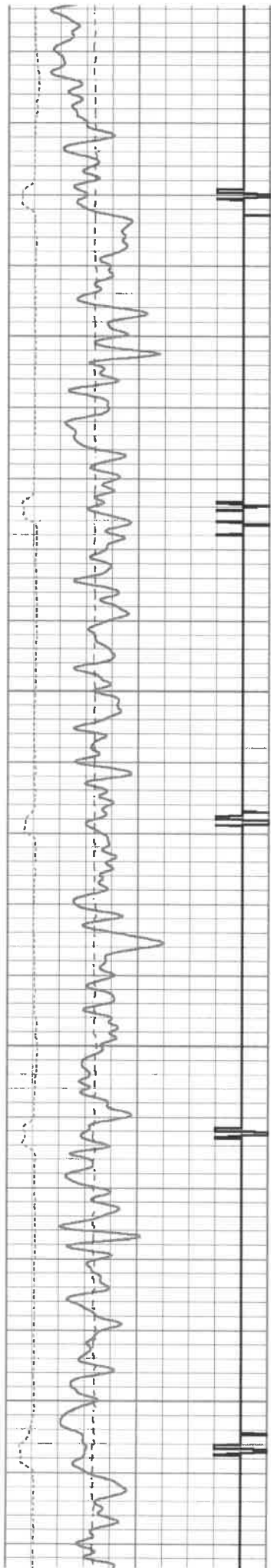
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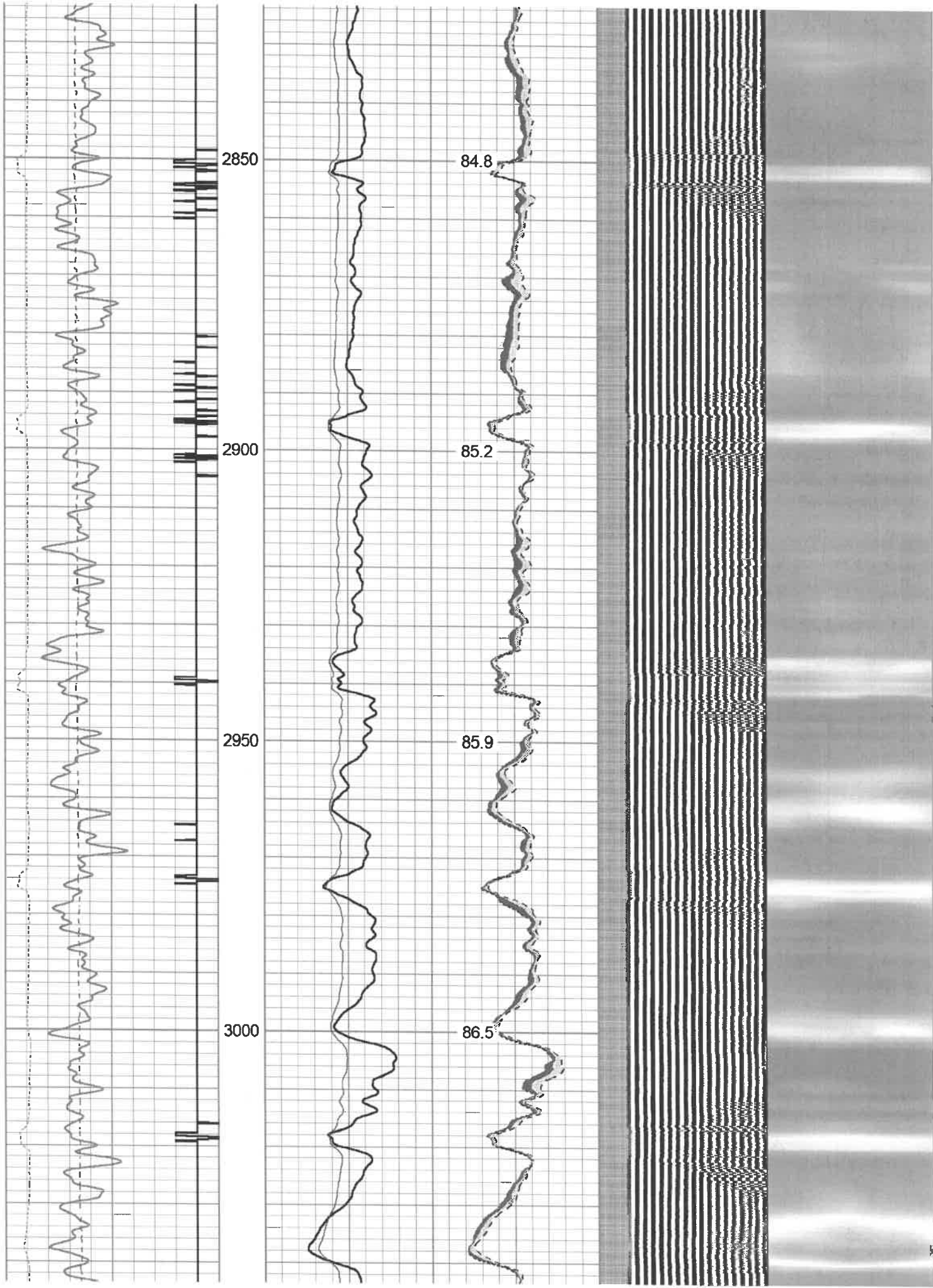
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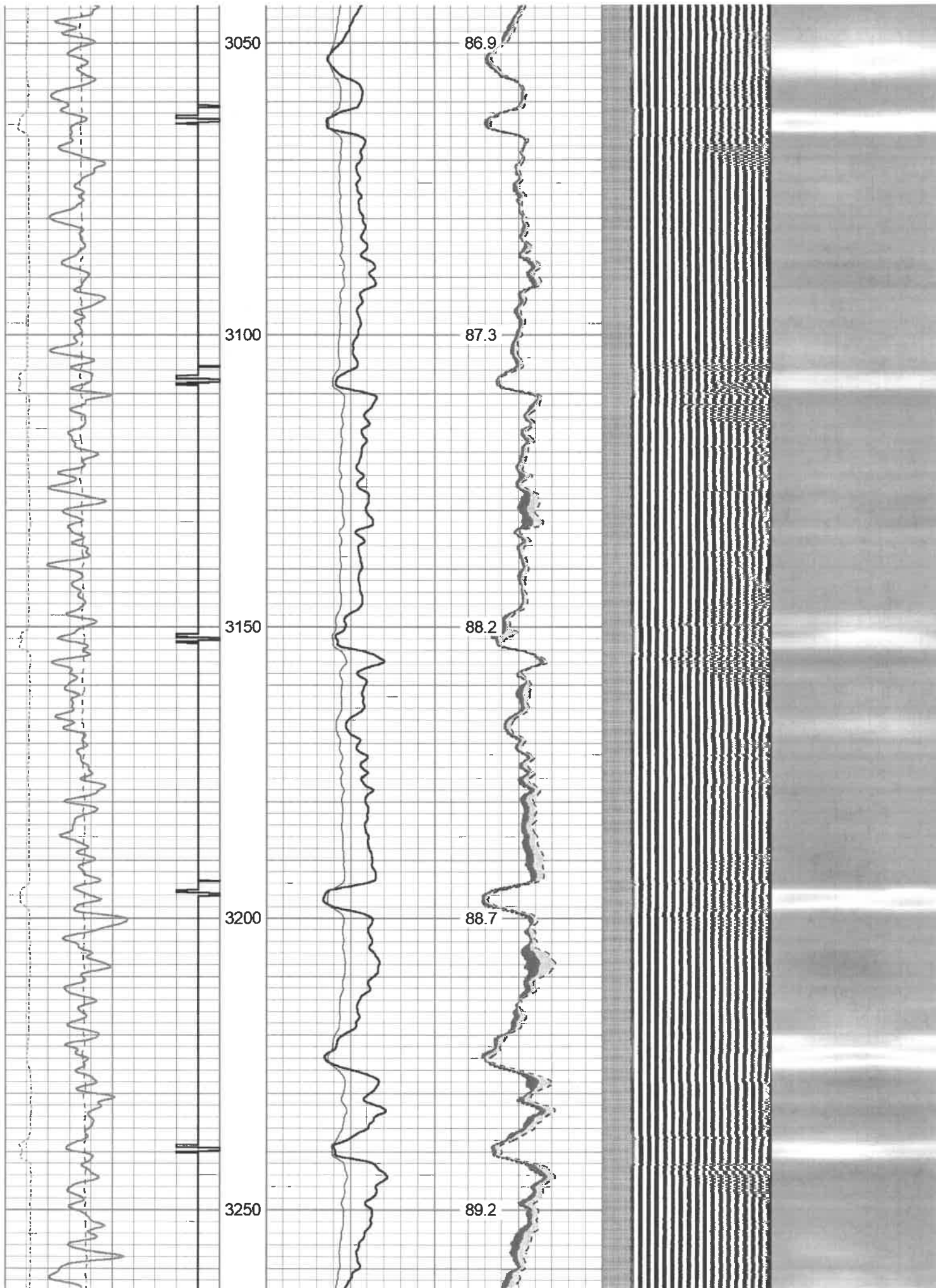
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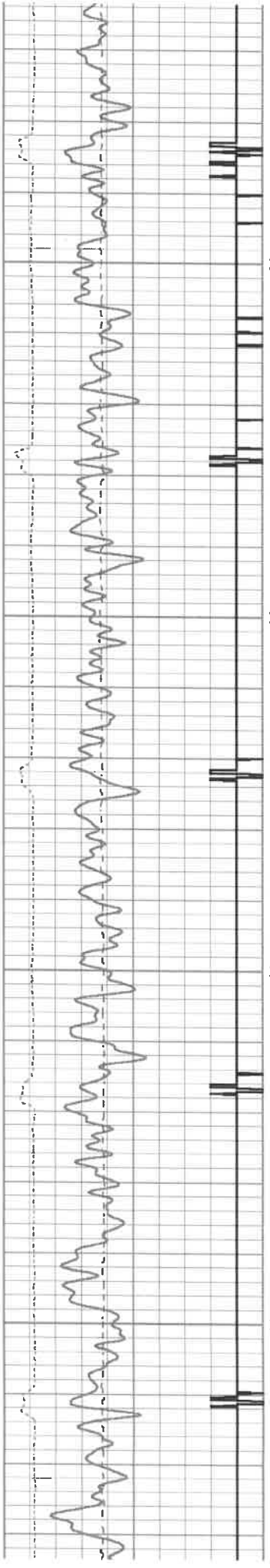




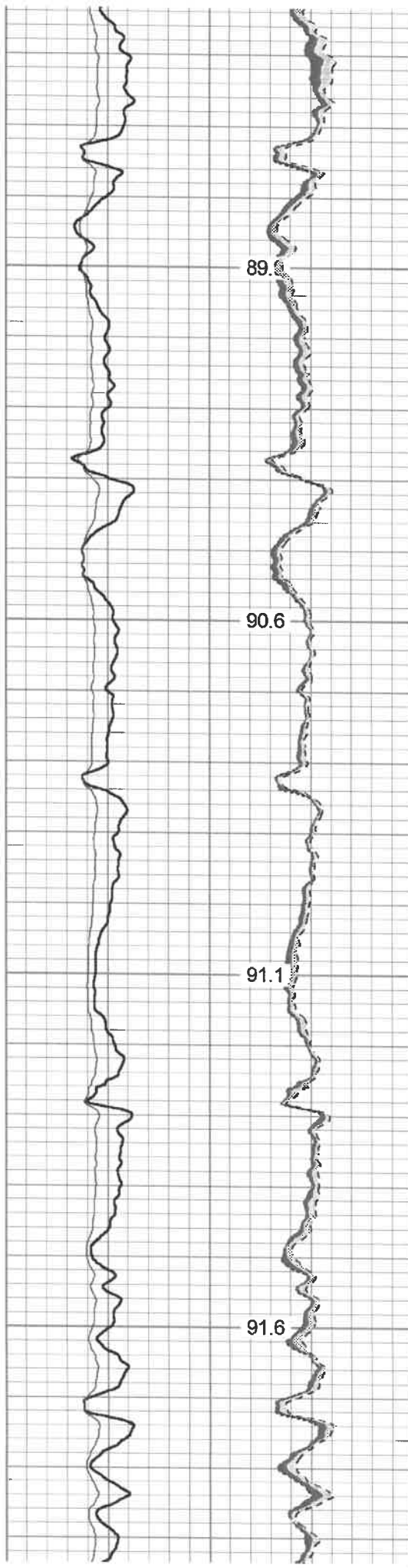




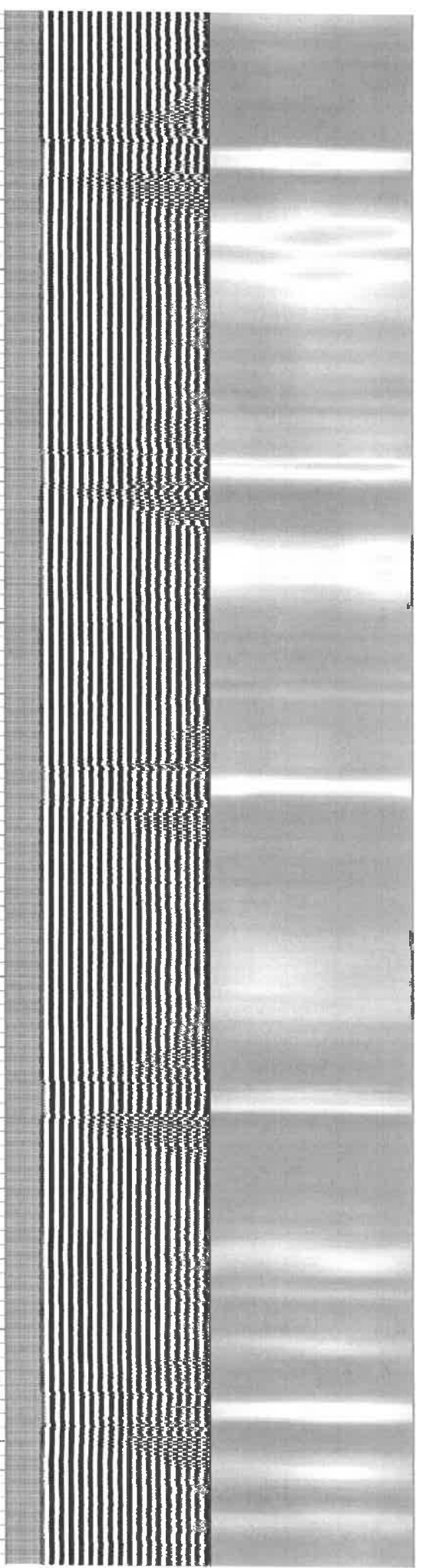


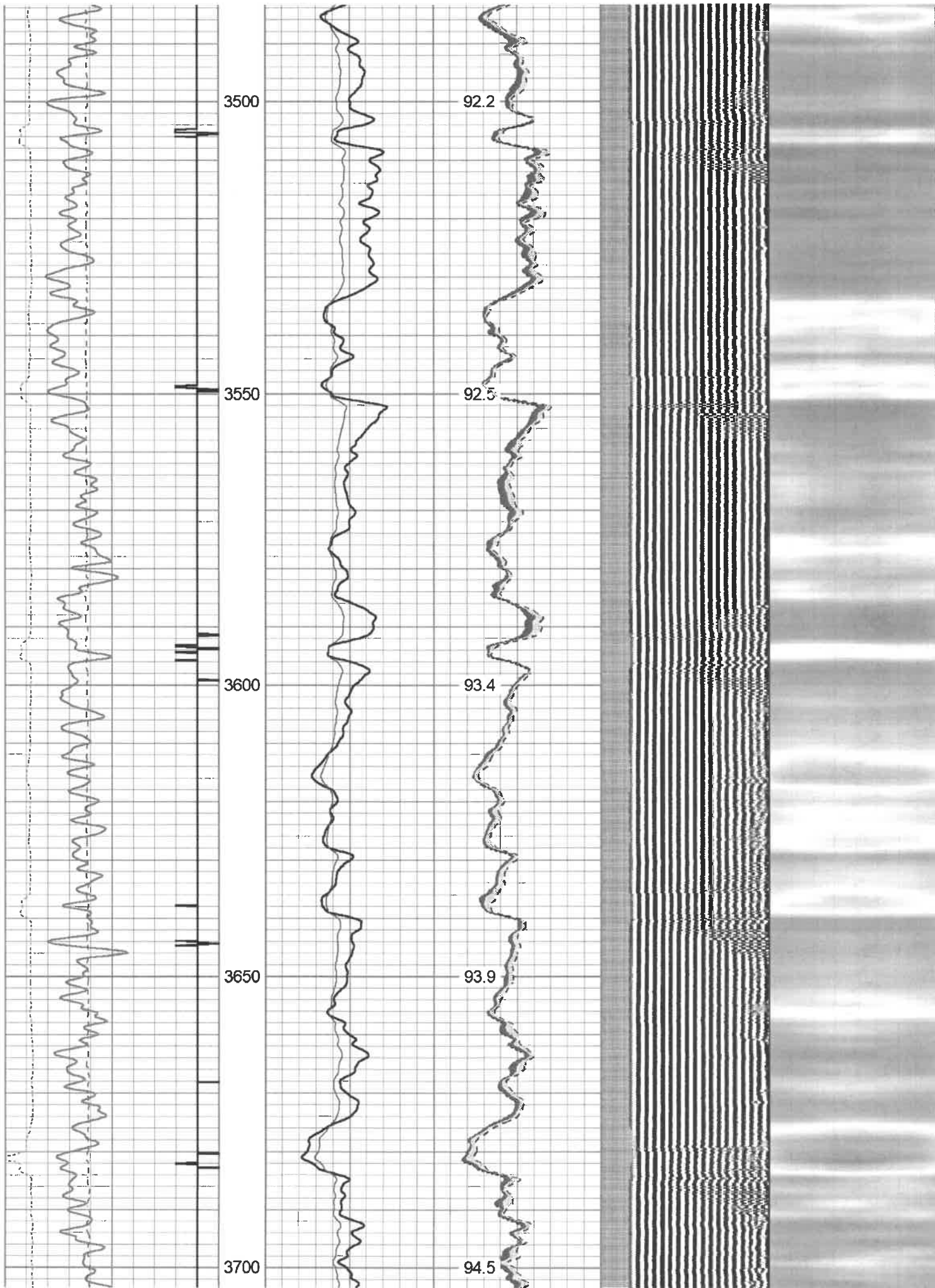


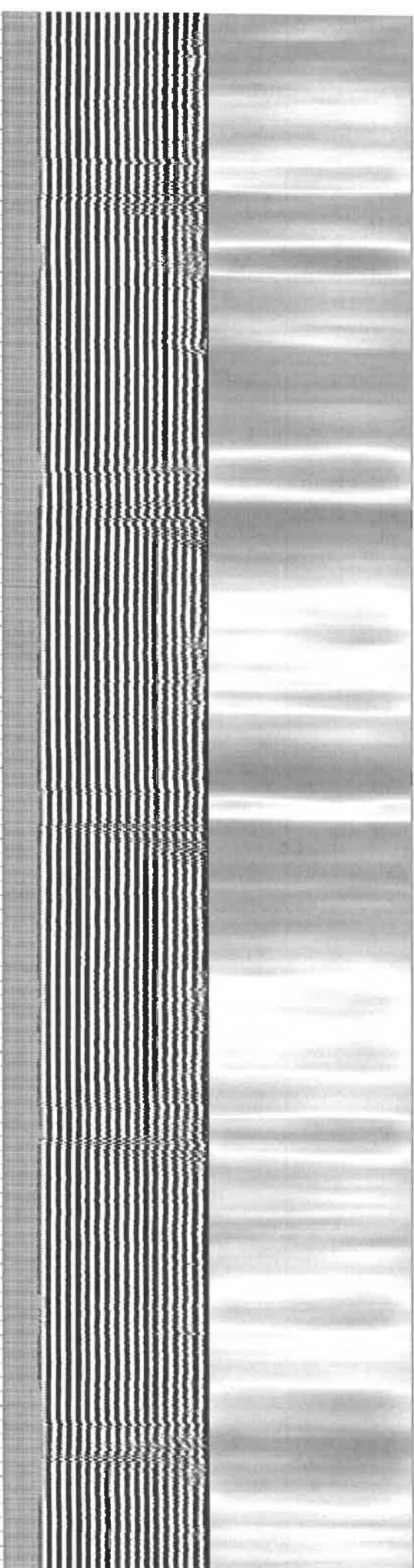
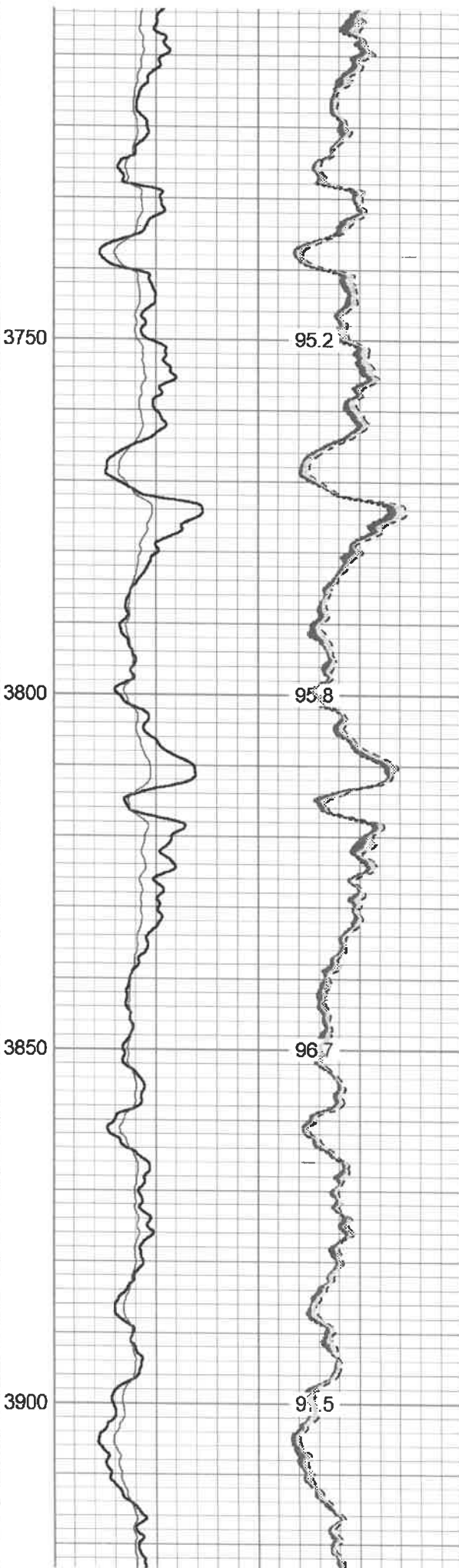
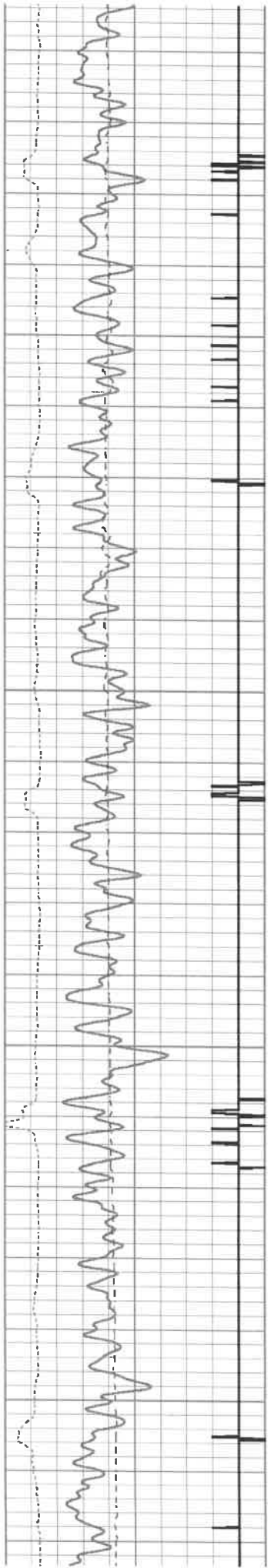
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3400  
3450

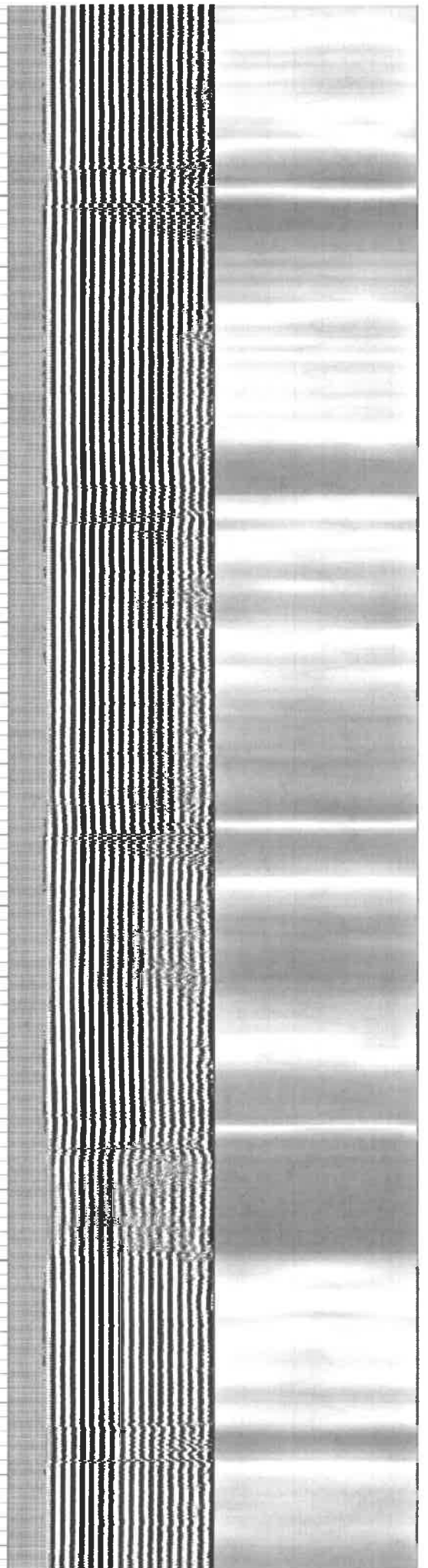
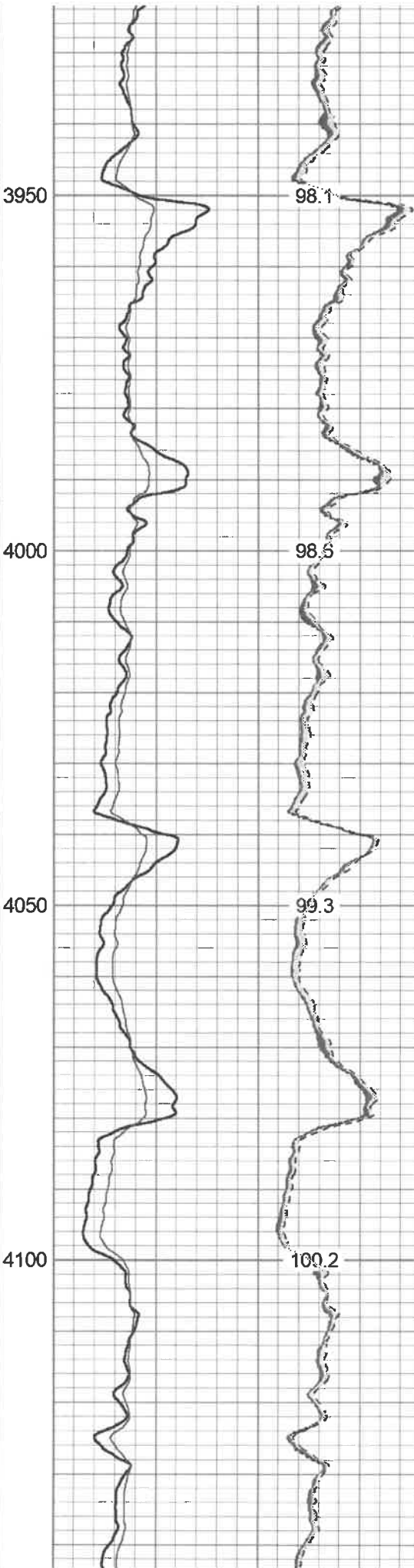
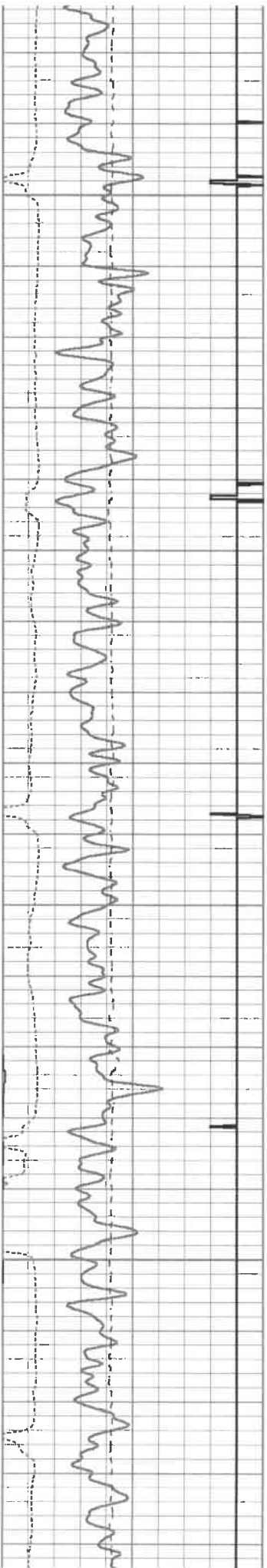


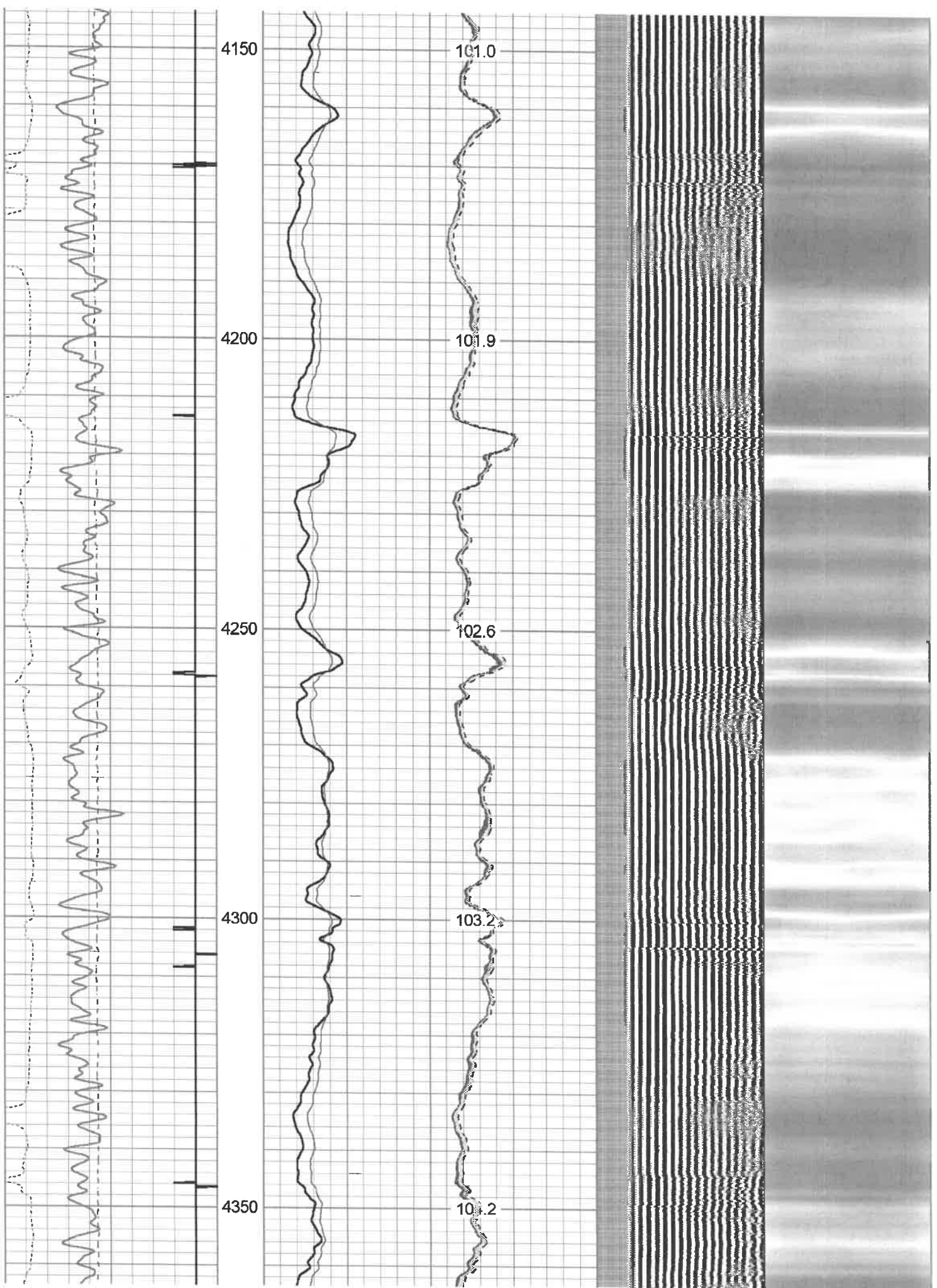
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90.6  
91.1  
91.6

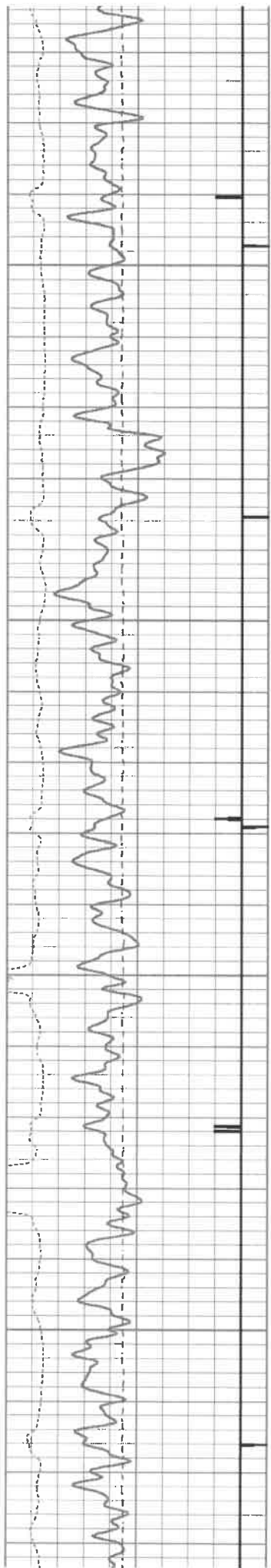










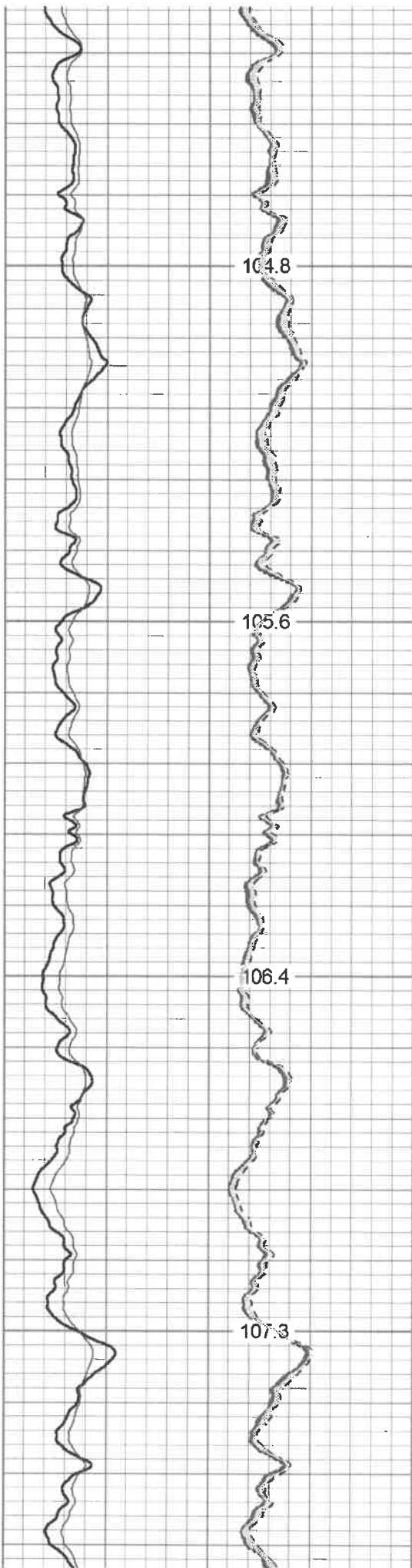


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4450

4500

4550

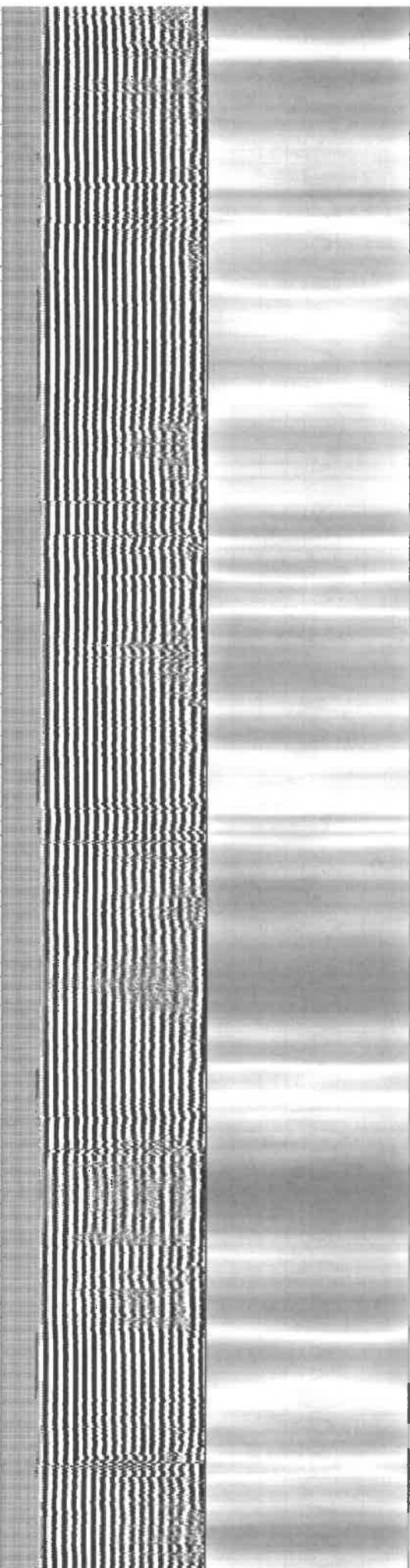


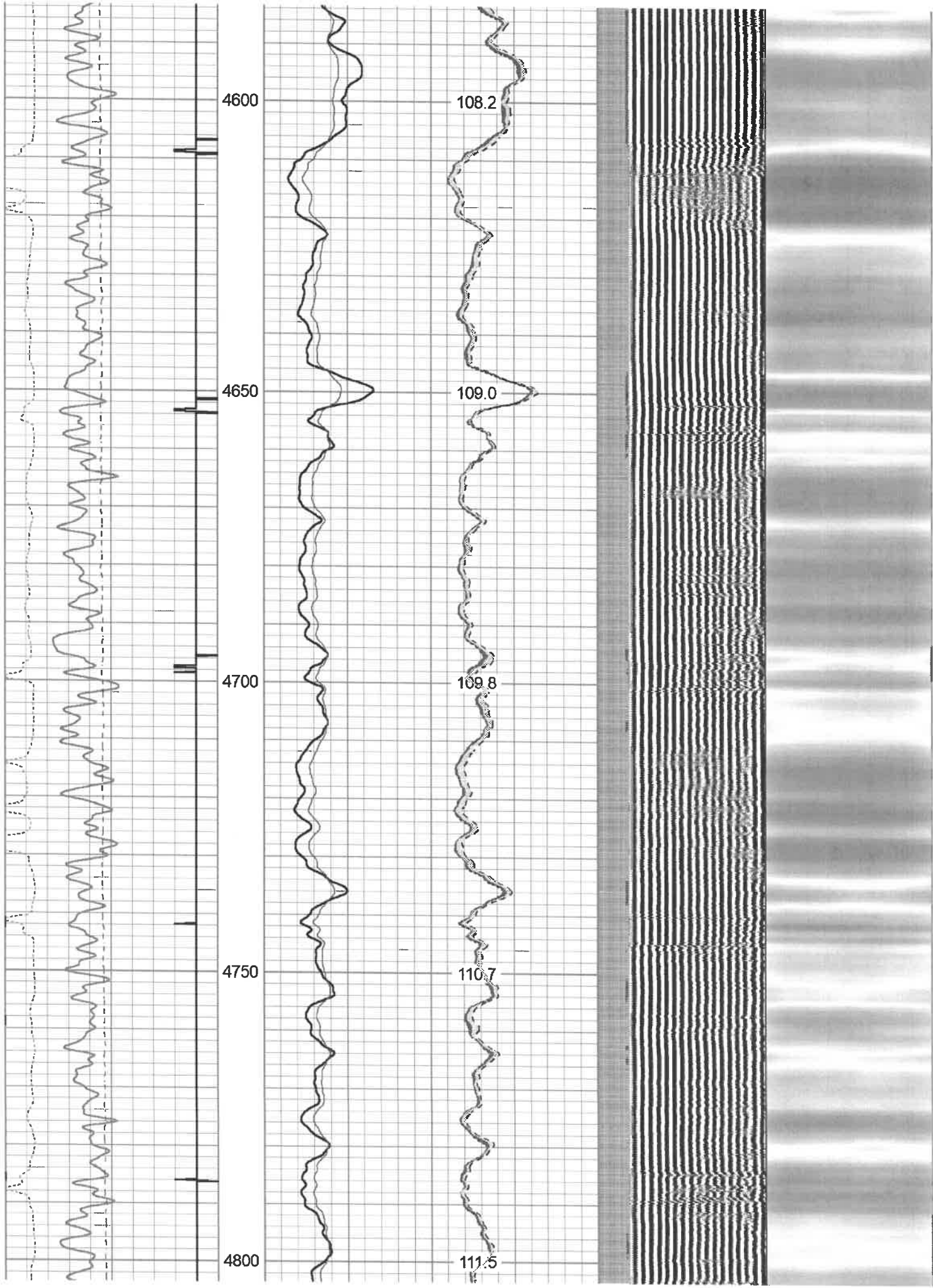
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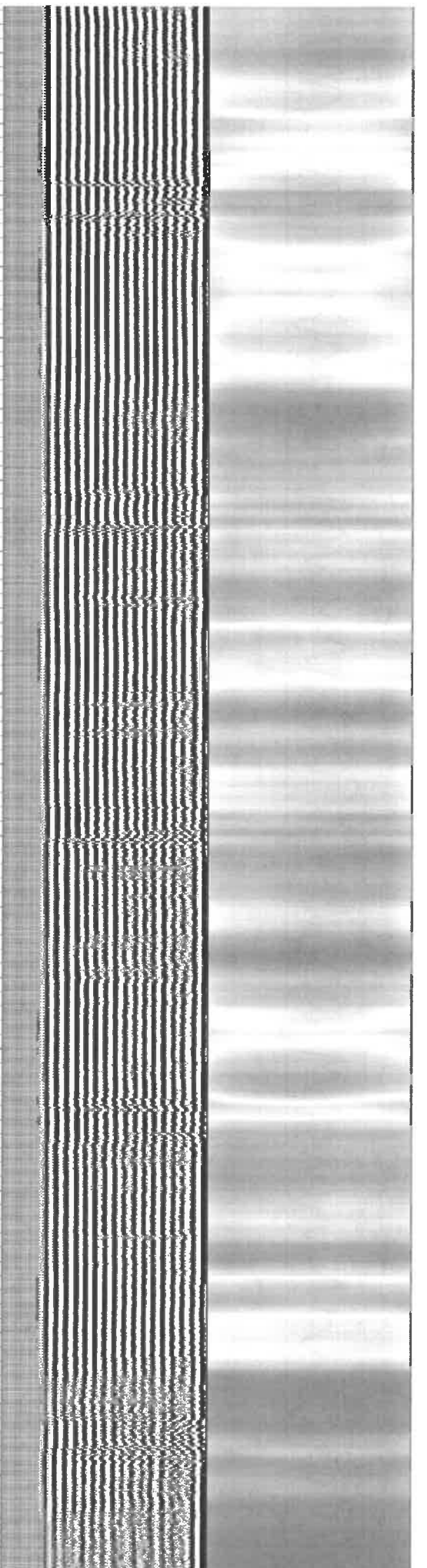
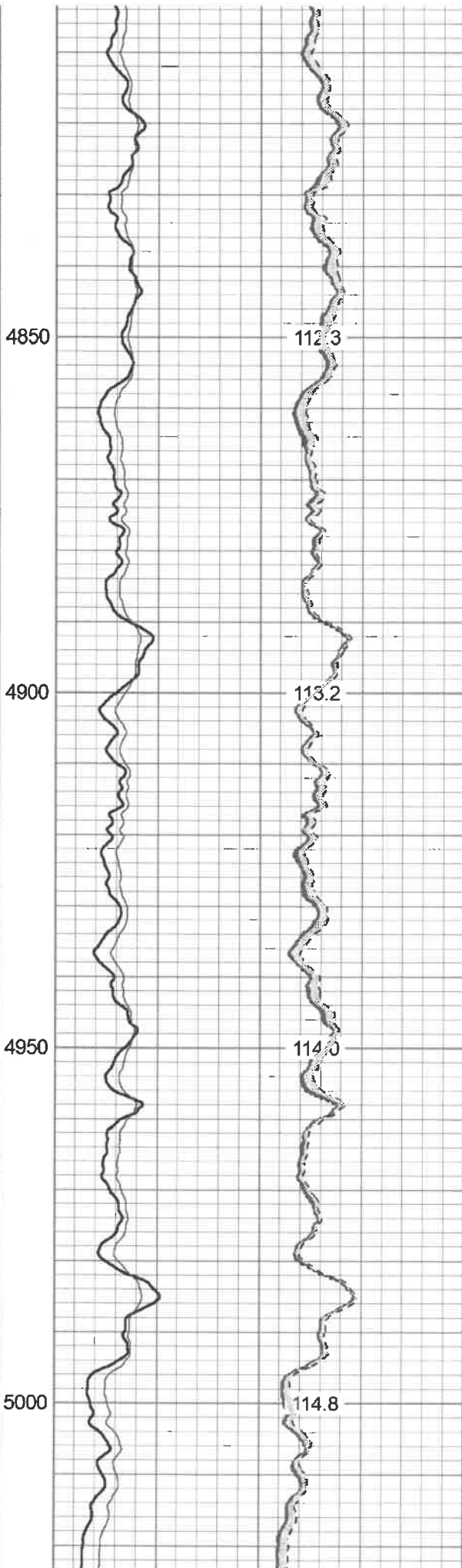
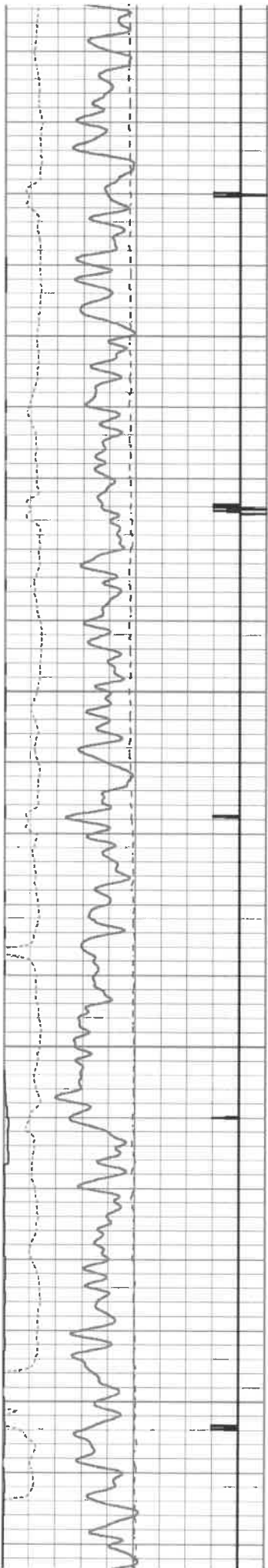
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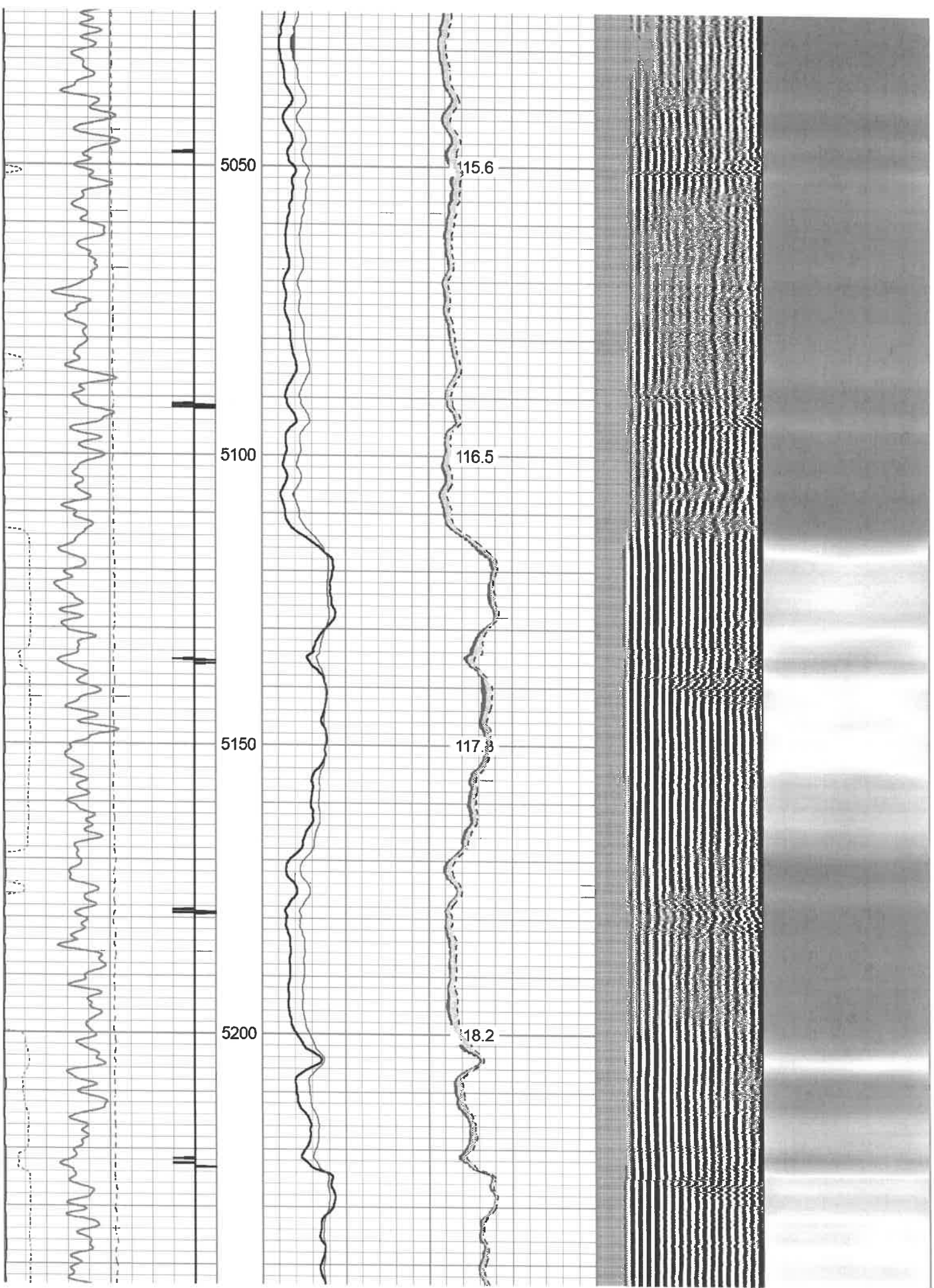
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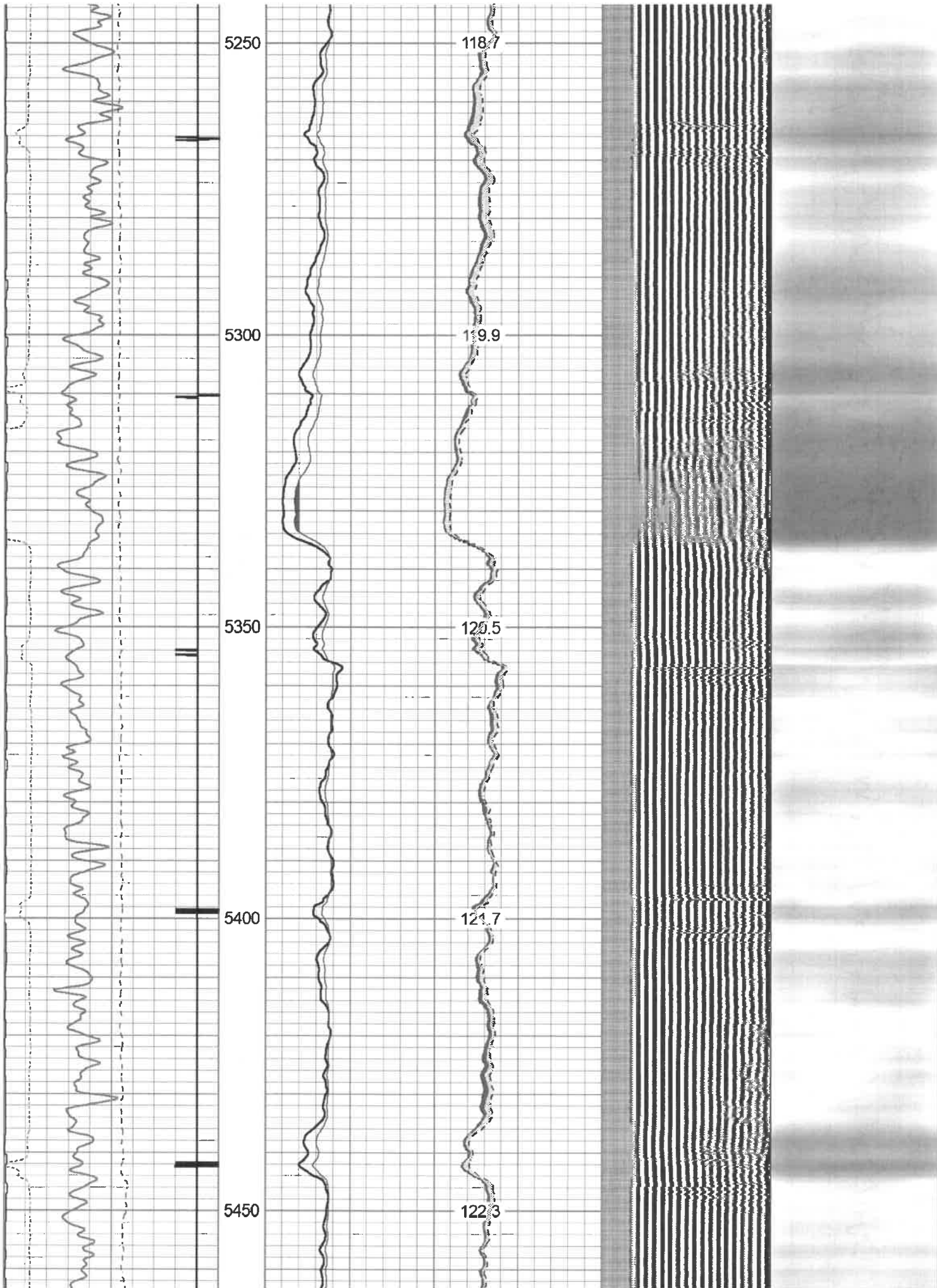


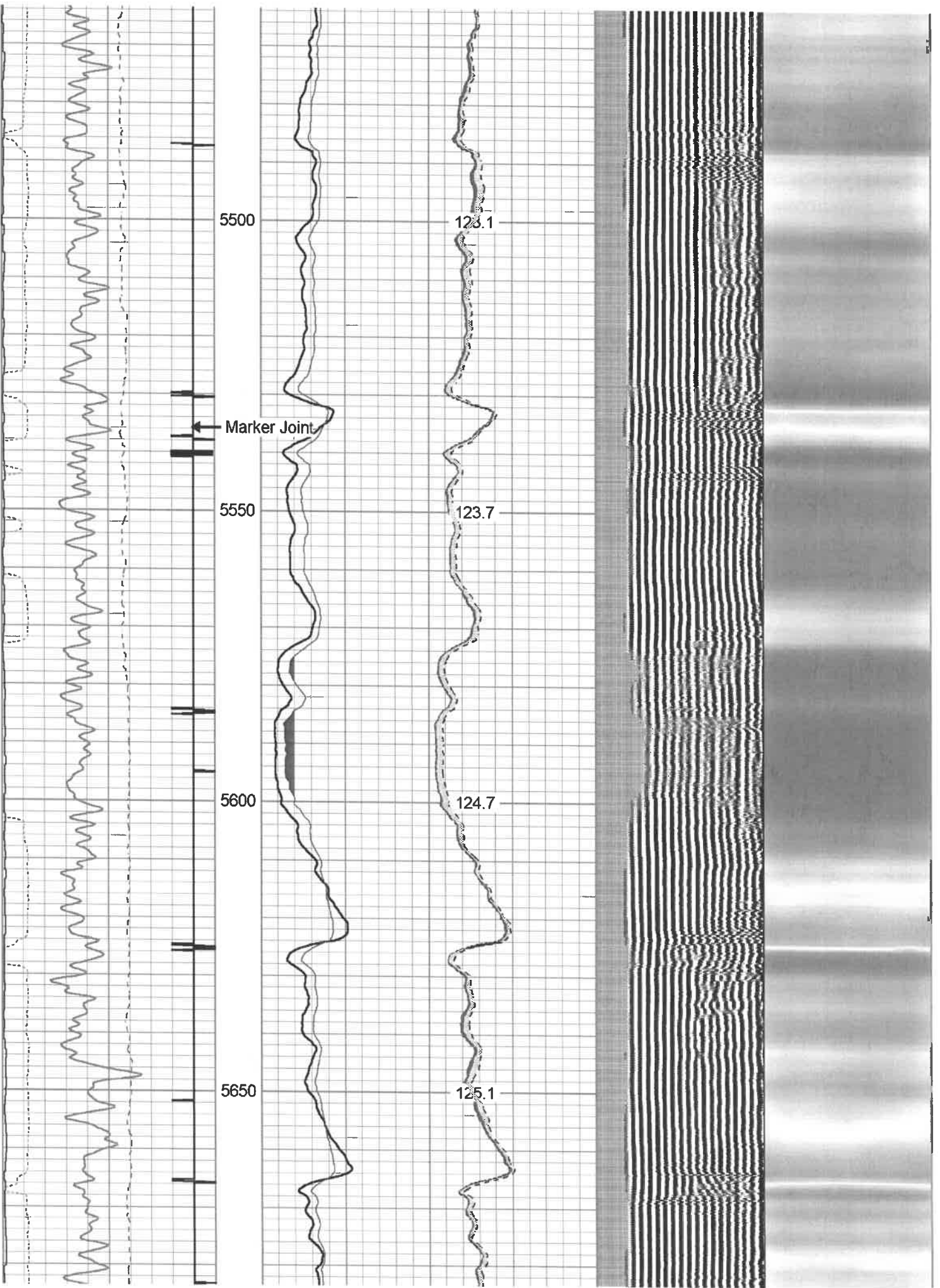


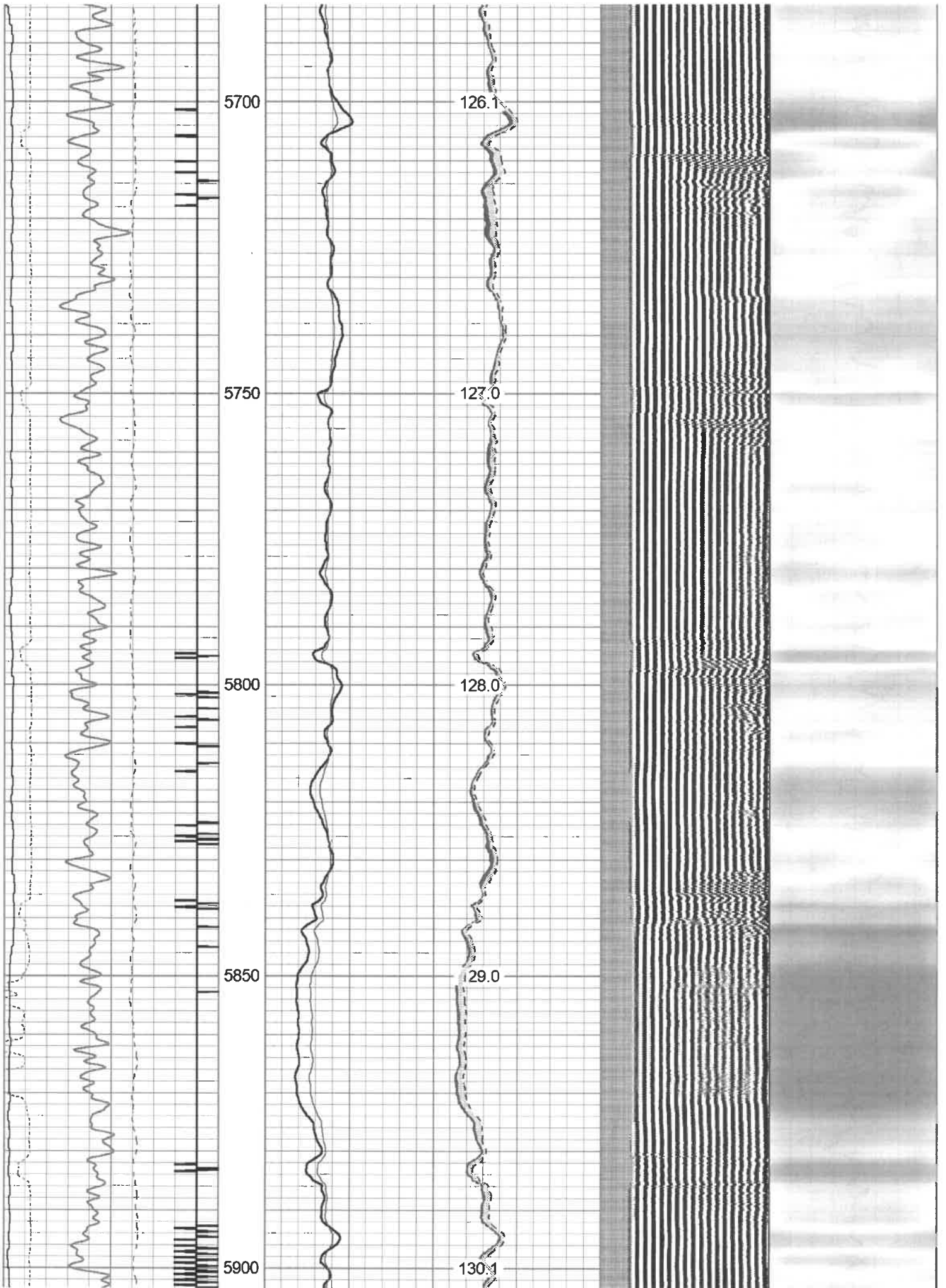


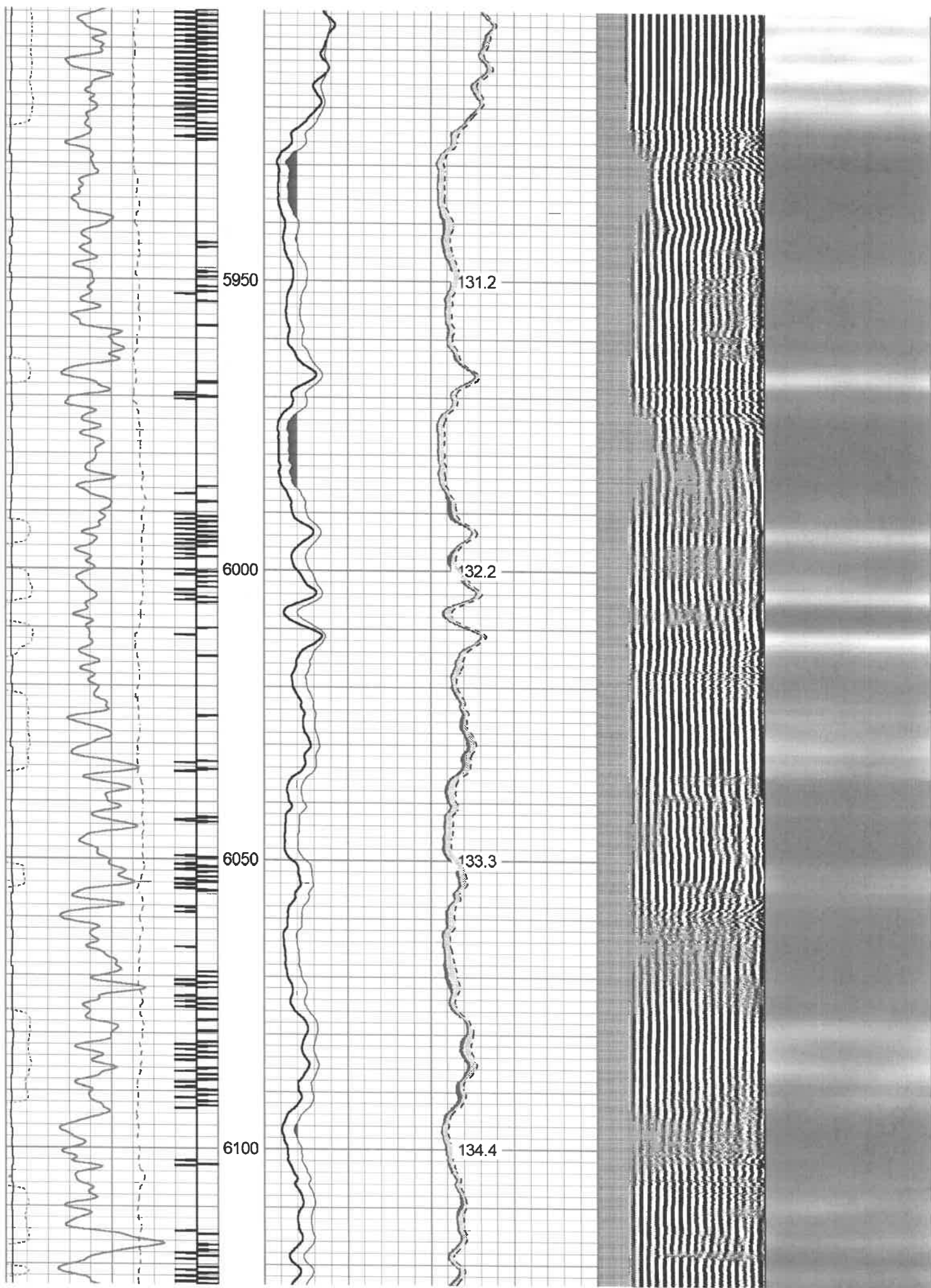


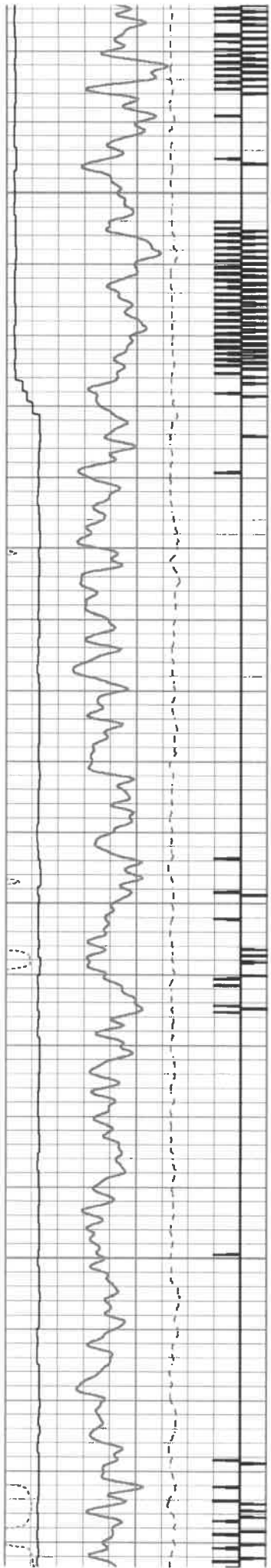










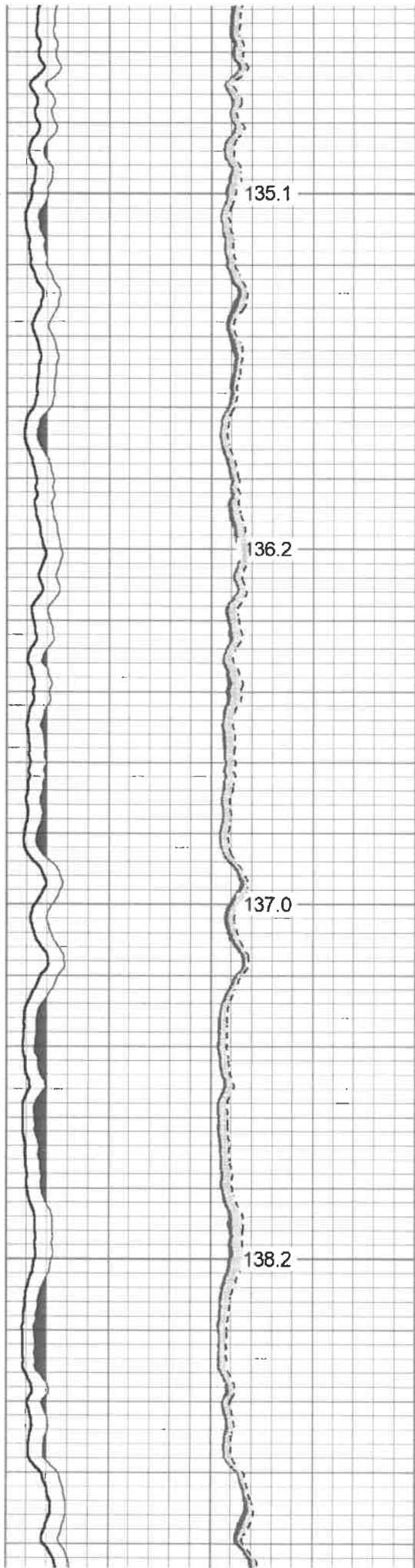


6150

6200

6250

6300

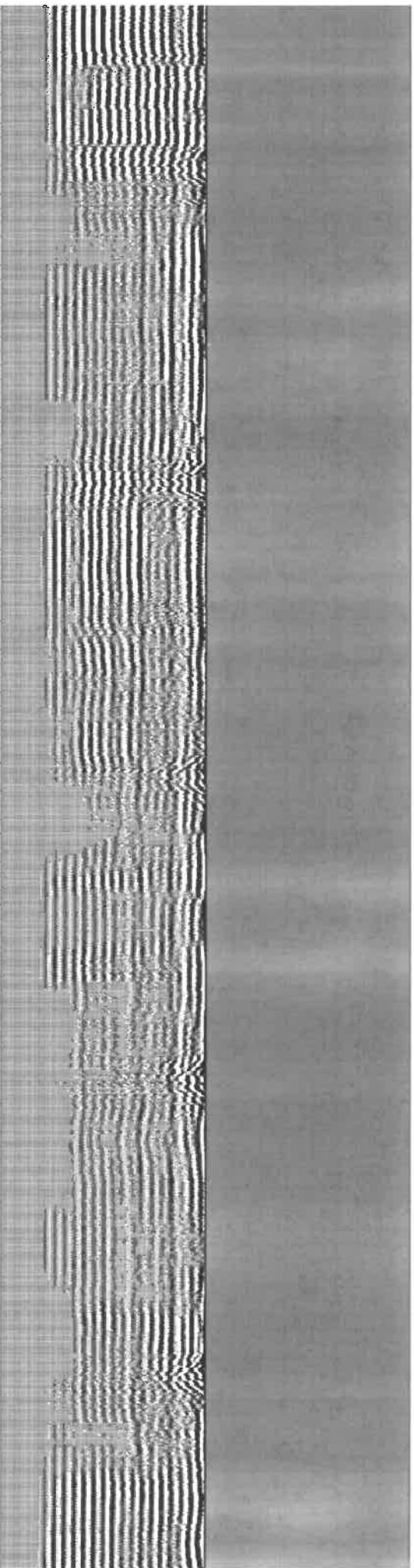


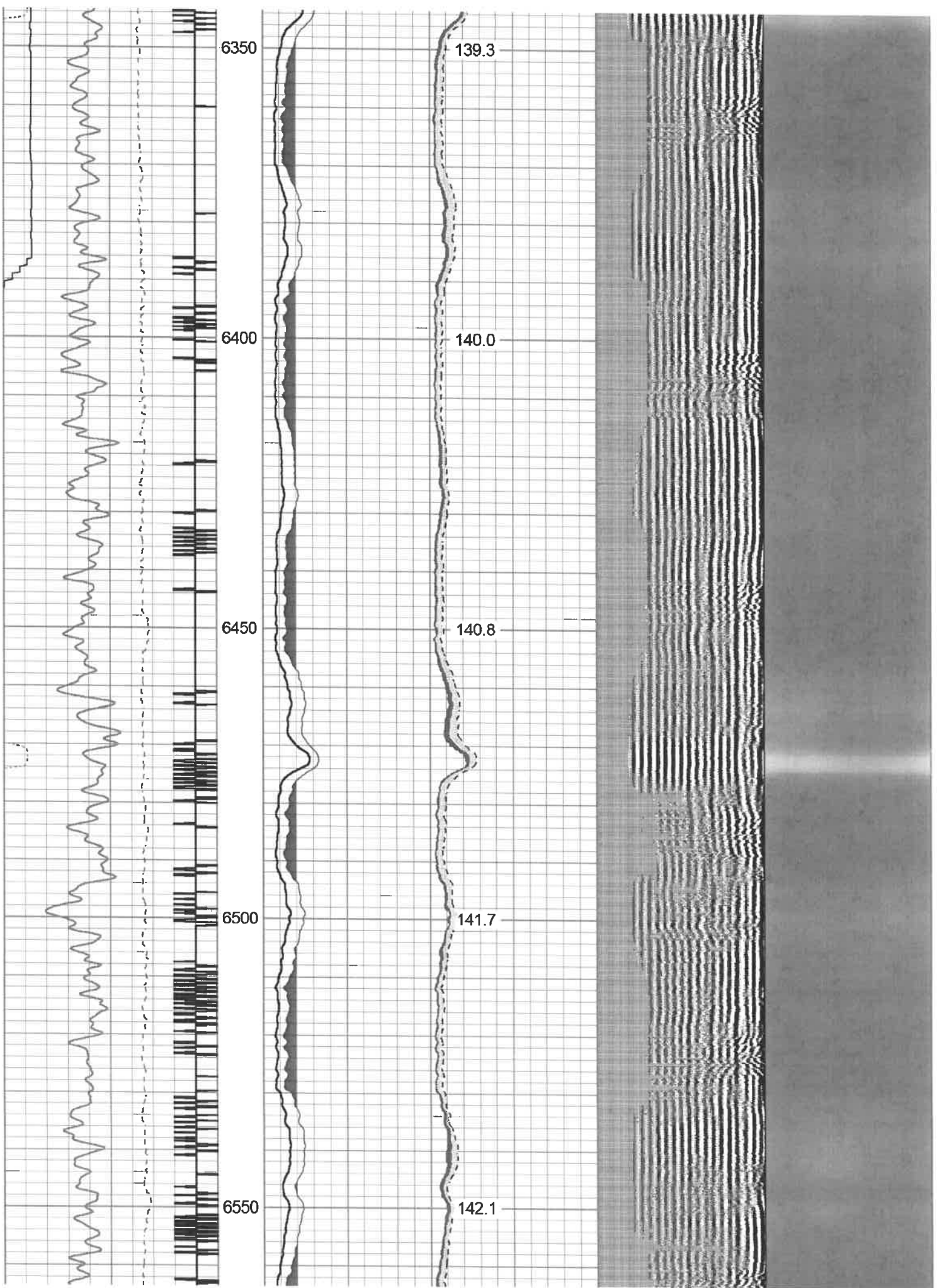
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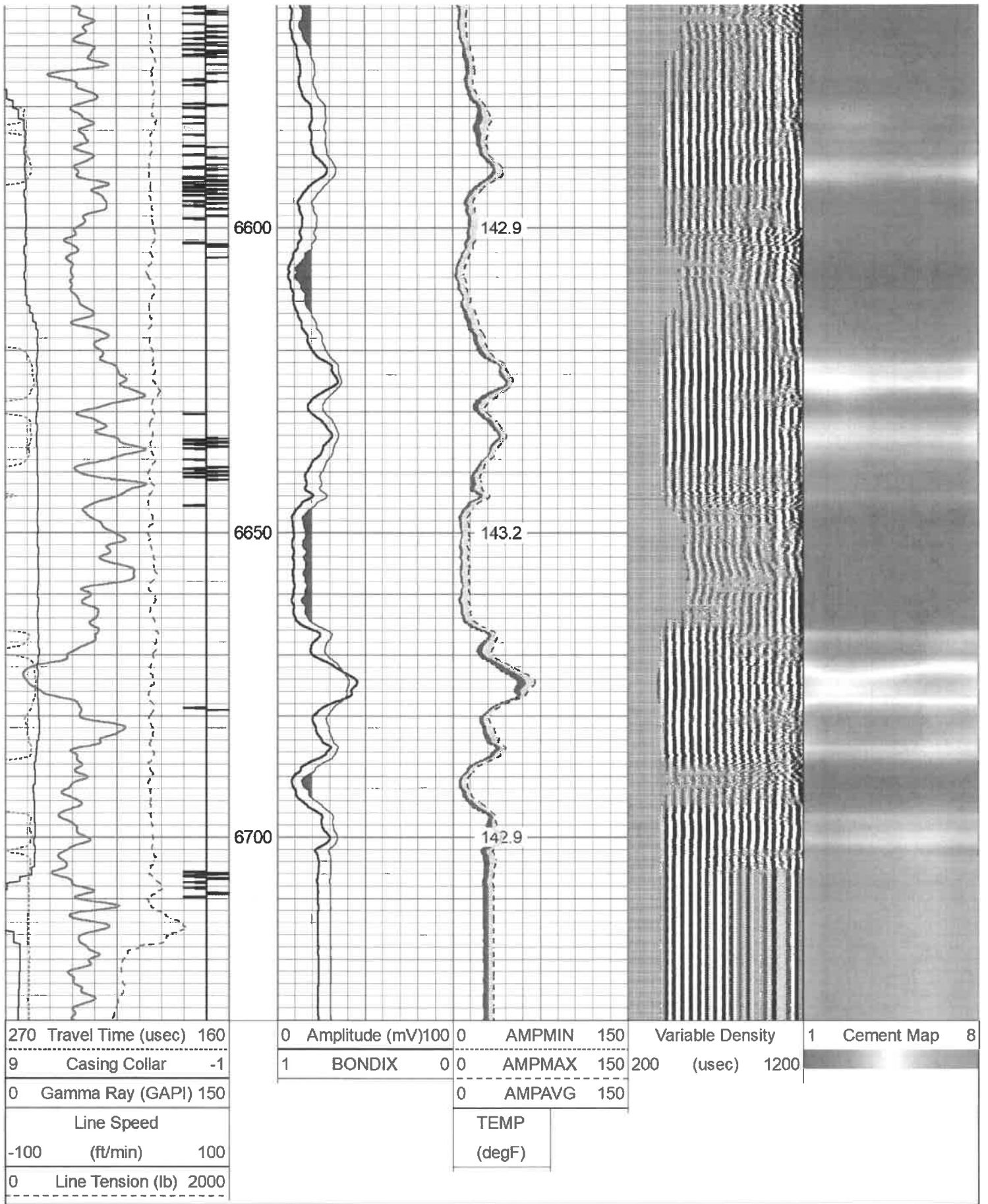
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137.0

138.2





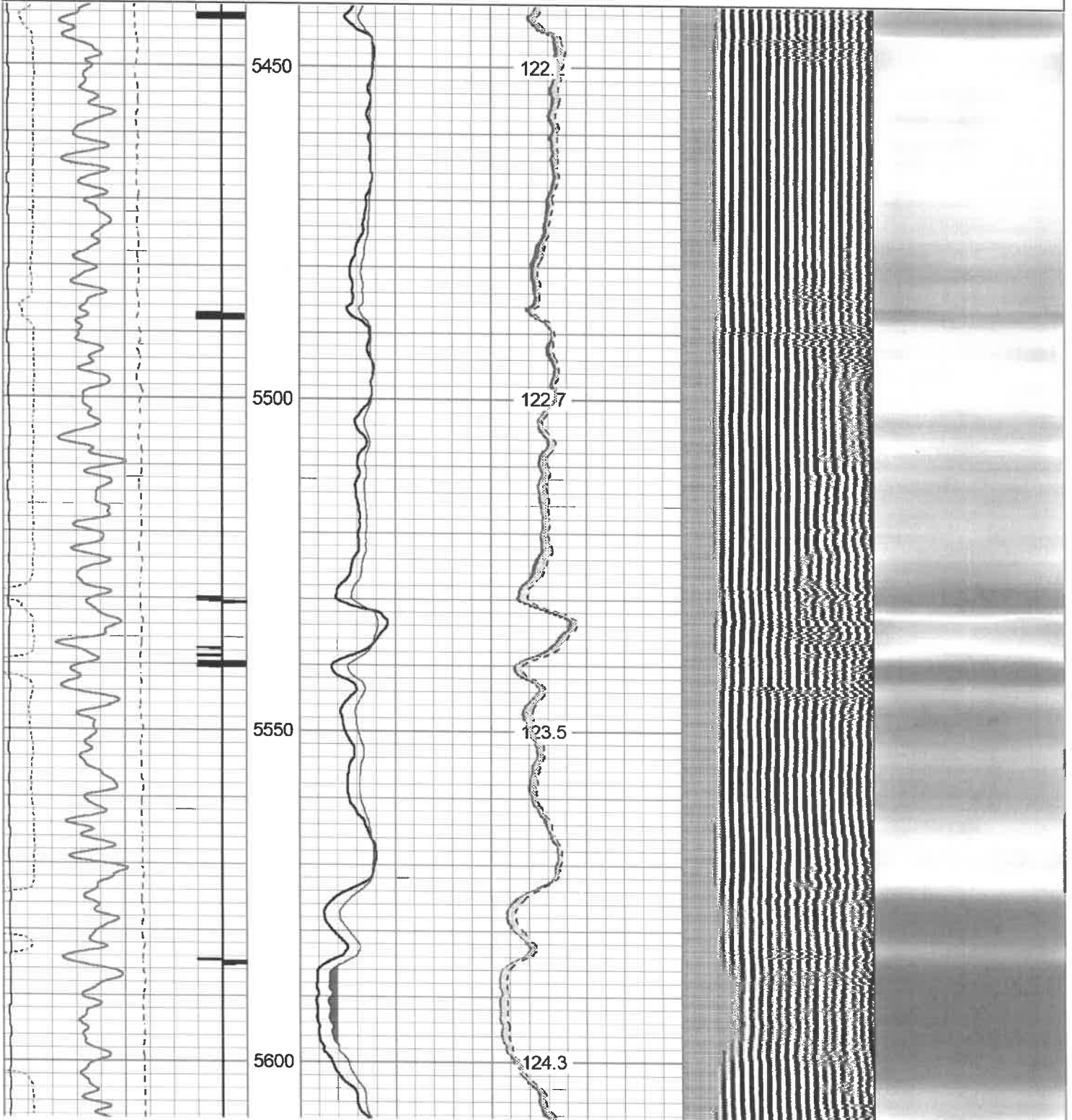


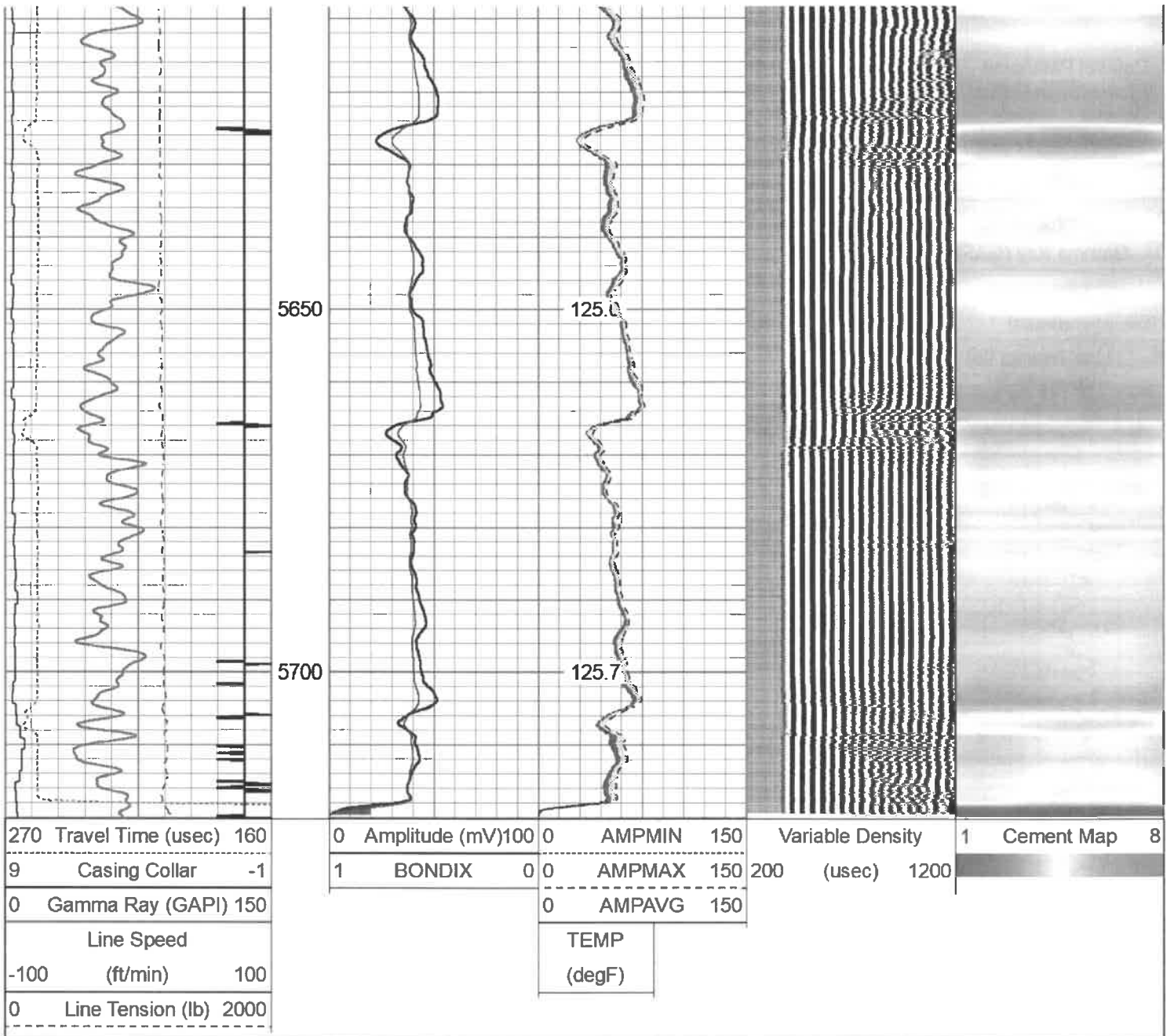
Repeat Pass 0 PSI



Database File antero\_blizzard\_wade\_2h\_rcbl\_26\_jul\_2021.db  
 Dataset Pathname rabbit\_ears/wade\_2h/run1/pass7  
 Presentation Format rcbl-bond index for antero 1020  
 Dataset Creation Mon Jul 26 11:16:34 2021  
 Charted by Depth in Feet scaled 1:240

270	Travel Time (usec)	160	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			0	AMPAVG	150				
	Line Speed						TEMP					
-100	(ft/min)	100					(degF)					
0	Line Tension (lb)	2000										





## Log Variables

Database: C:\ProgramData\Warrior\Data\antero\_blizzard\_wade\_2h\_rcbl\_26\_jul\_2021.db  
 Dataset: rabbit\_ears/wade\_2h/run1/pass9/\_vars\_

### Top - Bottom

BHTEMP_Src	BOREID	BOTTEMP	CASEOD	CASETHCK	CASEWGHT	MAXAMPL	MINAMPL
TEMP	in 7.875	degF 143	in 5.5	in 0.415	lb/ft 23	mV 71.9	mV 3.4
MINATTN	PERFS	PPT	SRFTEMP	TDEPTH			
db/ft 9.6	No	usec 260	degF 80	ft 6718			

### 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\_blizzard\_wade\_2h\_rcbl\_26\_jul\_2021.db  
 Dataset Pathname rabbit\_ears/wade\_2h/run1/pass9  
 Dataset Creation Mon Jul 26 11:23:45 2021

Gamma Ray Calibration Report

Serial Number: FW1211-86  
 Tool Model: Probe  
 Performed: Sun Jul 25 14:29:09 2021  
 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: 180.275 ft

Master Calibration, performed Sun Jul 25 18:06:02 2021:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.001	0.993	3.400	71.921	68.884	3.490
CAL	-0.027	1.462				
5'	0.003	0.940	3.400	71.921	73.139	3.183
SUM						
S1	0.025	1.079	0.000	100.000	94.950	-2.414
S2	-0.001	0.937	0.000	100.000	106.618	0.083
S3	0.001	0.920	0.000	100.000	108.846	-0.133
S4	0.000	0.942	0.000	100.000	106.147	-0.009
S5	0.000	1.000	0.000	100.000	100.045	-0.009
S6	0.000	1.031	0.000	100.000	97.006	-0.006
S7	0.001	1.058	0.000	100.000	94.603	-0.066
S8	0.000	1.053	0.000	100.000	94.969	-0.015

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	-0.027	1.462	1.000	0.000

Air Zero Calibration, performed Sun Jul 25 13:23:14 2021:

	Raw (v)		Calibrated (v)		Results	
	Zero		Zero		Offset	
3'	0.000		0.000		0.000	
5'	0.000		0.000		0.000	
SUM						

SM

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	16.99		CHD-Titan Standard 1 7/16" Cable Head	1.02	1.44	1.00
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					
WVFCAL HEADVOLT	7.66 7.66					
CCL	6.75					
GR	5.42		CENT-Overbody Antelope (SP-919-0233)	1.67	4.88	5.00
		GR-Probe (FW1211-86) Probe 2 3/4" Logging Gamma Ray	4.78	2.75	57.00	
		CENT-Probe275 2.75" Centralizer	2.88	2.75	20.00	



Dataset:	antero_blizzard_wade_2h_rcbl_26_jul_2021.db: rabbit_ears/wade_2h/run1/pass9
Total length:	18.07 ft
Total weight:	178.00 lb
O.D.:	4.88 in



Company	Antero Resources
Well	Blizzard Wade 2H
Field	Rabbit Ears
County	Tyler
State	WV