



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

Company	ANTERO	Country	USA
Well	Elk Fork Cheat 1H		
Field	RABBIT EARS		
County	TYLER		
State	WEST VIRGINIA		
Company	ANTERO	Country	USA
Well	Elk Fork Cheat 1H		
Field	RABBIT EARS		
County	TYLER		
State	WEST VIRGINIA	Country	USA
Location:	API #: 47-095-02719	Other Services	
	Lat: 39.539881		
	Long: -80.887809		
Permanent Datum	SEC	Ground Level	Elevation 25'
Log Measured From	TWP	Kelly Bushing	Kelly Bushing 25.5' A.P.D.
Drilling Measured From	RGE	Kelly Bushing	Elevation
			KB: N/A
			D.F.: N/A
			G.L.: N/A

Date	18-Mar-2021						
Run Number	ONE						
Depth Driller	21,810'						
Depth Logger	6,665'						
Bottom Logged Interval	6,702'						
Top Log Interval	SURFACE						
Open Hole Size	8.50"						
Type Fluid	FRESH WATER						
Density / Viscosity	8.4#						
Max. Recorded Temp.	146 Deg.F.						
Estimated Cement Top	4,000'						
Time Well Ready	15:00						
Time Logger on Bottom	15:30						
Equipment Number	TK-104 / P1.G2						
Location	CHARLEROI, PA						
Recorded By	Matt McNally						
Witnessed By	Chris Young						
Borehole Record		Tubing Record					
Run Number	Bit	From	To	Size	Weight	From	To
Casing Record	Size	Wgt/Ft	Top	Bottom			
Surface String							
Prot. String	5 1/2"	23#	SURFACE	21,810'			
Production String							
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

LOG CORRELATED TO MARKER JOINT @ 5,568' -5,579"
Depth Correction -25'

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

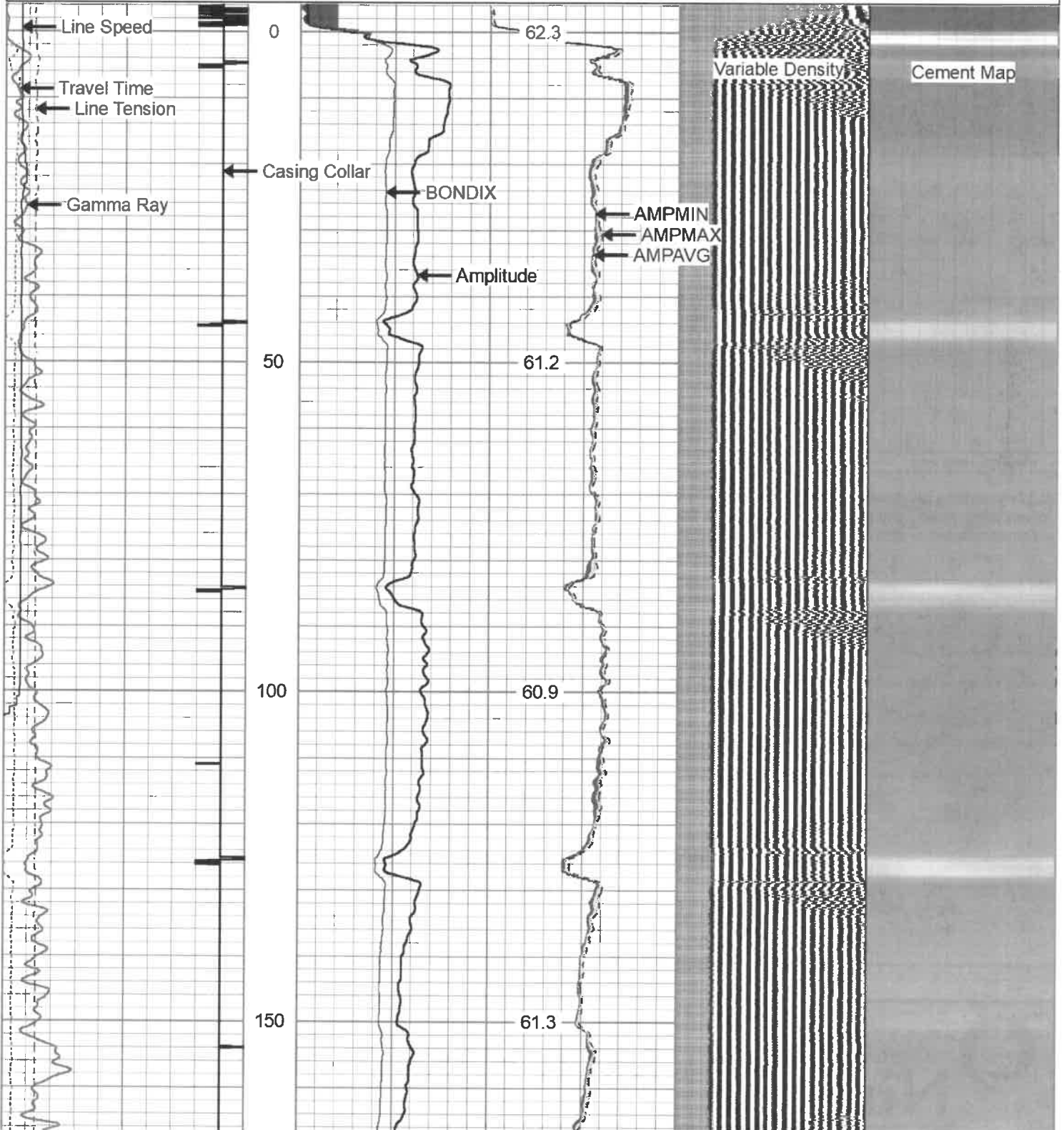
Thank You for Choosing Nine Energy Service.Charleroi, PA

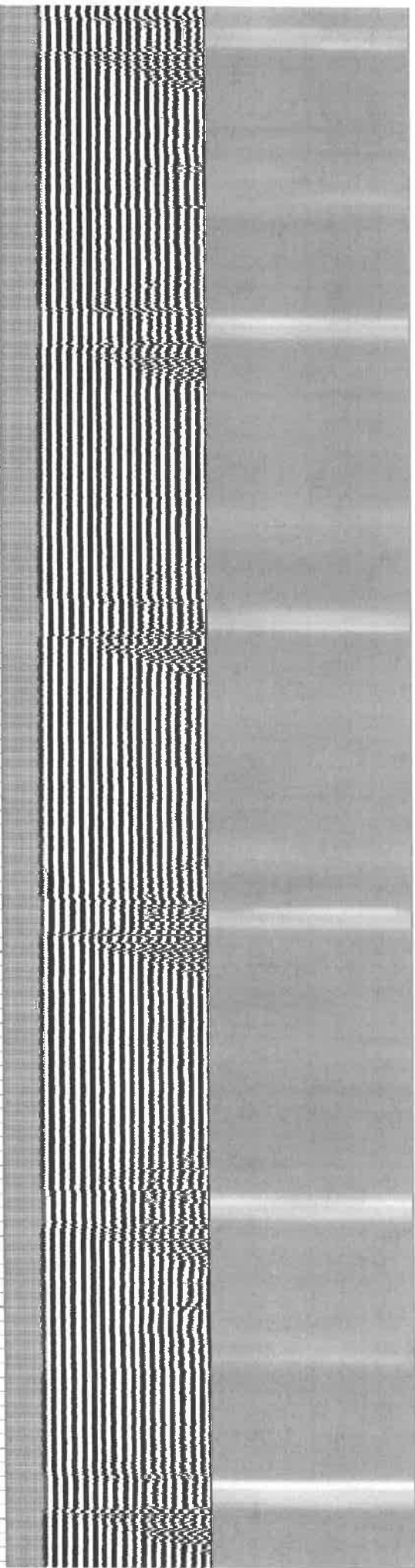
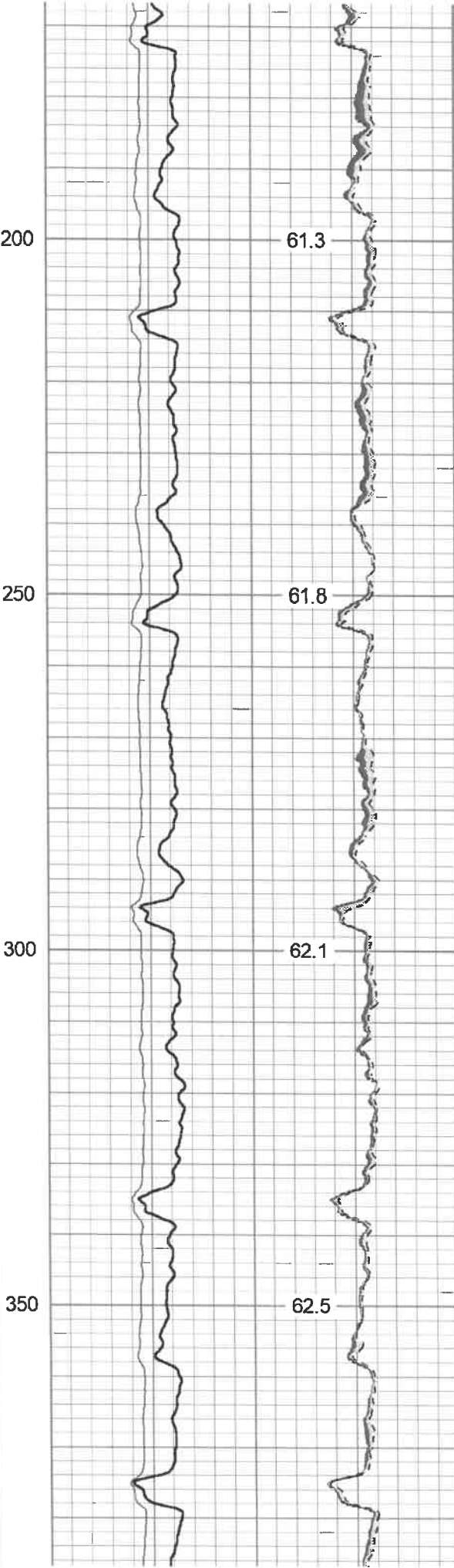
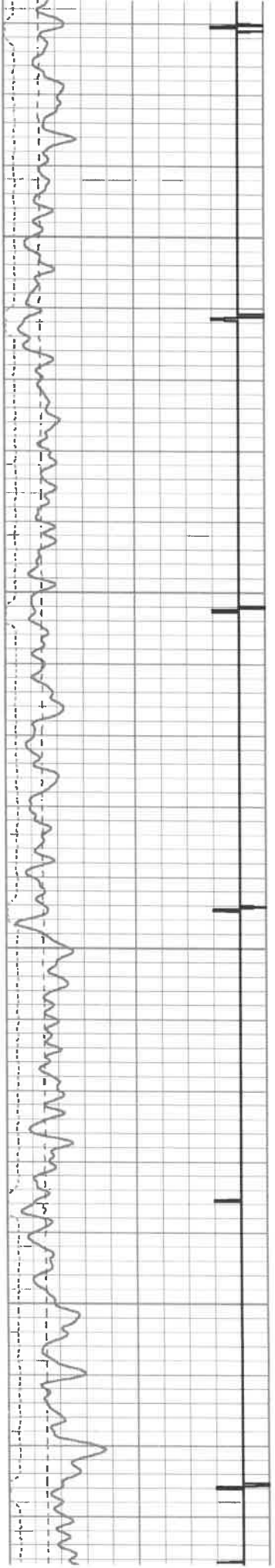


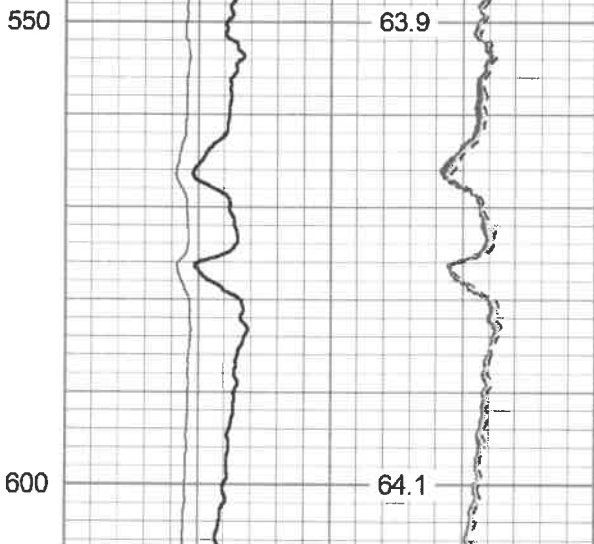
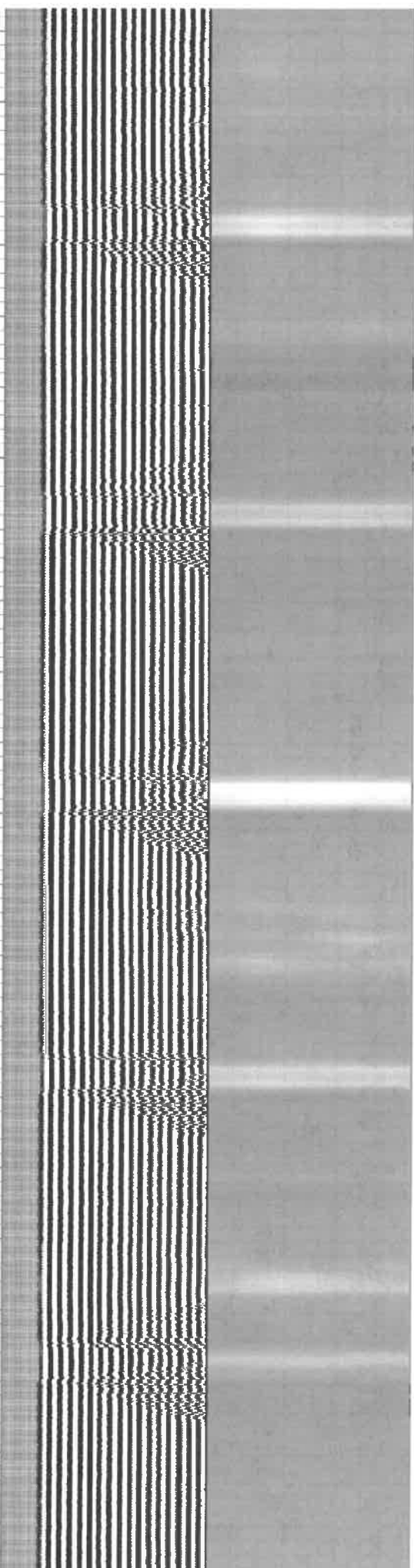
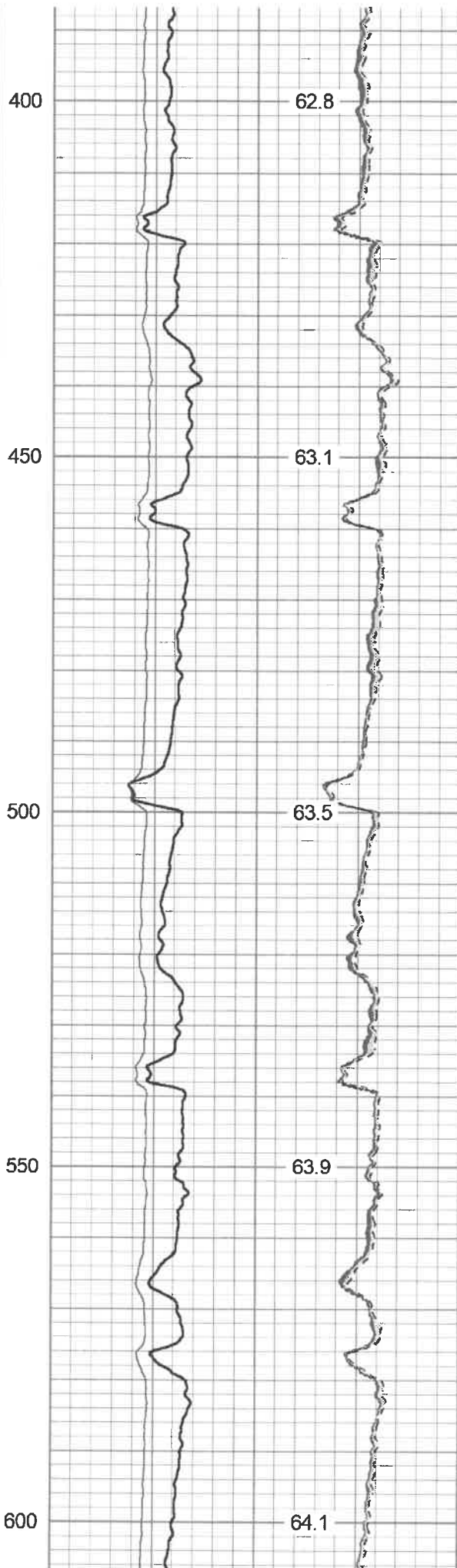
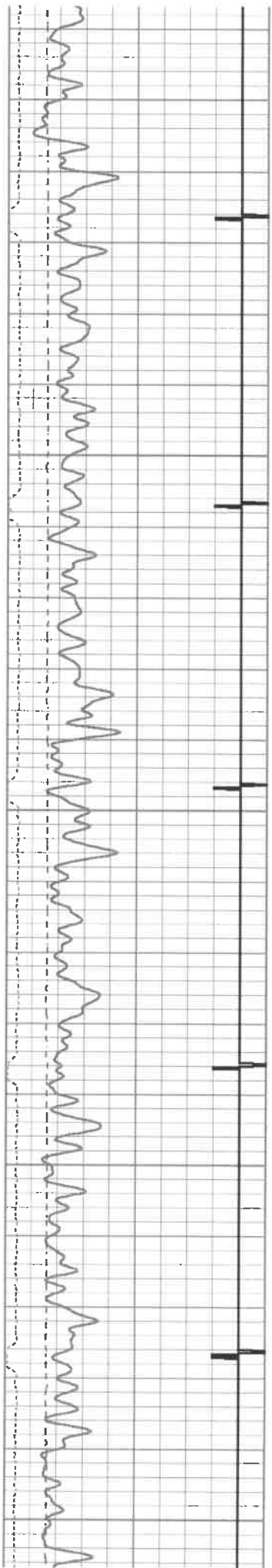
Main Pass 1,500 PSI

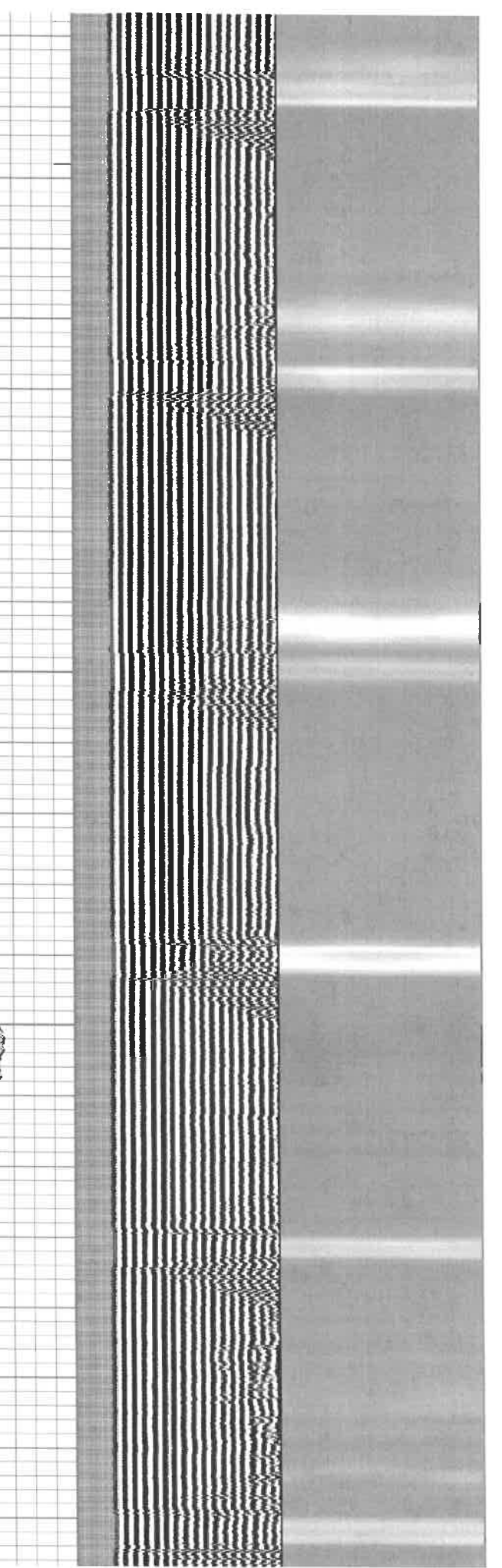
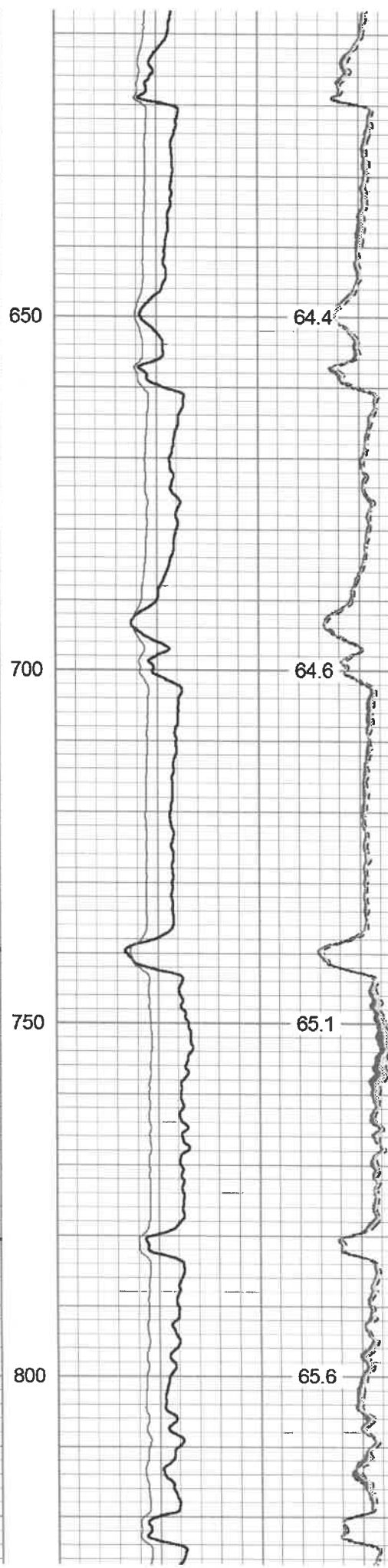
Database File antero_elk_fork_cheat_1h_rcbl_18_mar_2021.db
 Dataset Pathname rabbit_ears/cheat_1h/run1/pass4
 Presentation Format rcbl-bond index for antero 1020
 Dataset Creation Thu Mar 18 15:26:48 2021
 Charted by Depth in Feet scaled 1:240

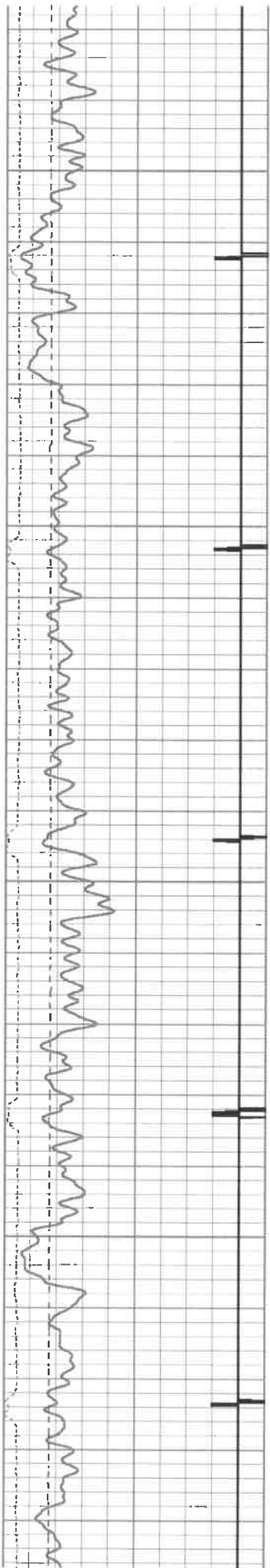
265	Travel Time (usec)	165	0	Amplitude (mV)	100	0	AMPMIN	150	Variable Density (usec)	1200	1	Cement Map	8
9	Casing Collar	-1	1	BONDIX	0	0	AMPMAX	150					
0	Gamma Ray (GAPI)	150	0	AMPAVG	150	0	TEMP	(degF)					
Line Speed													
-100	(ft/min)	100											
0	Line Tension (lb)	2000											









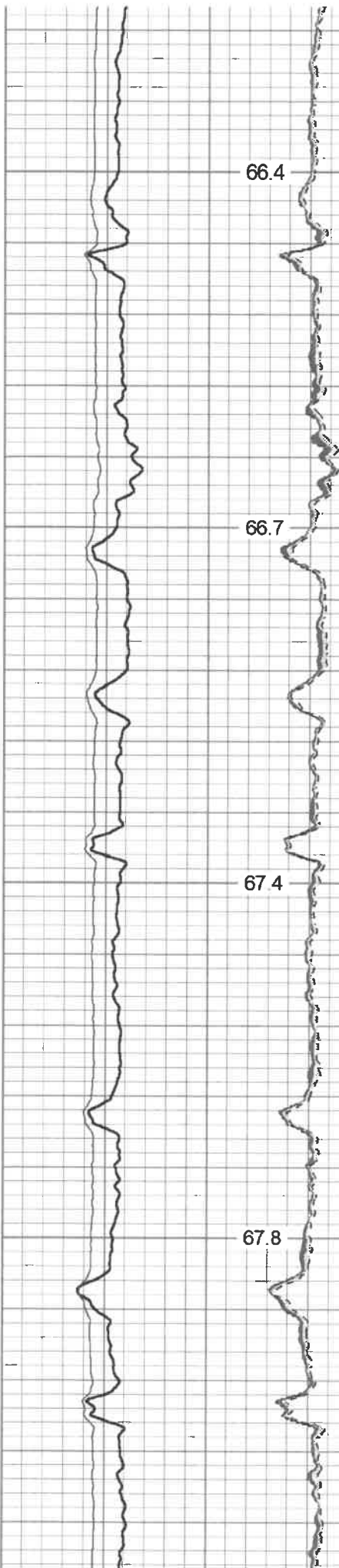


850

900

950

1000

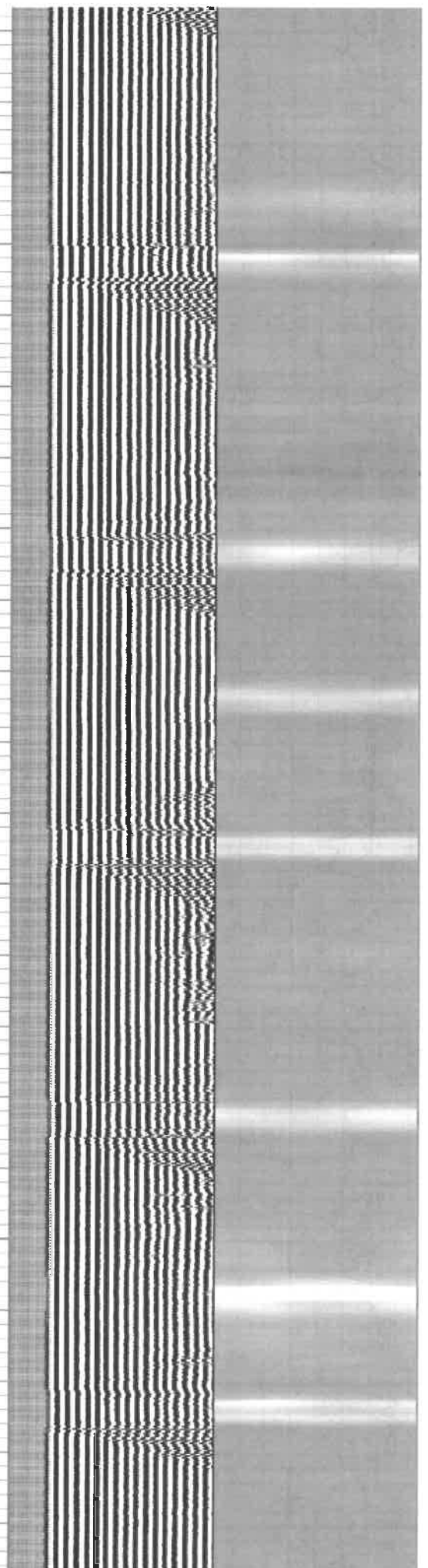


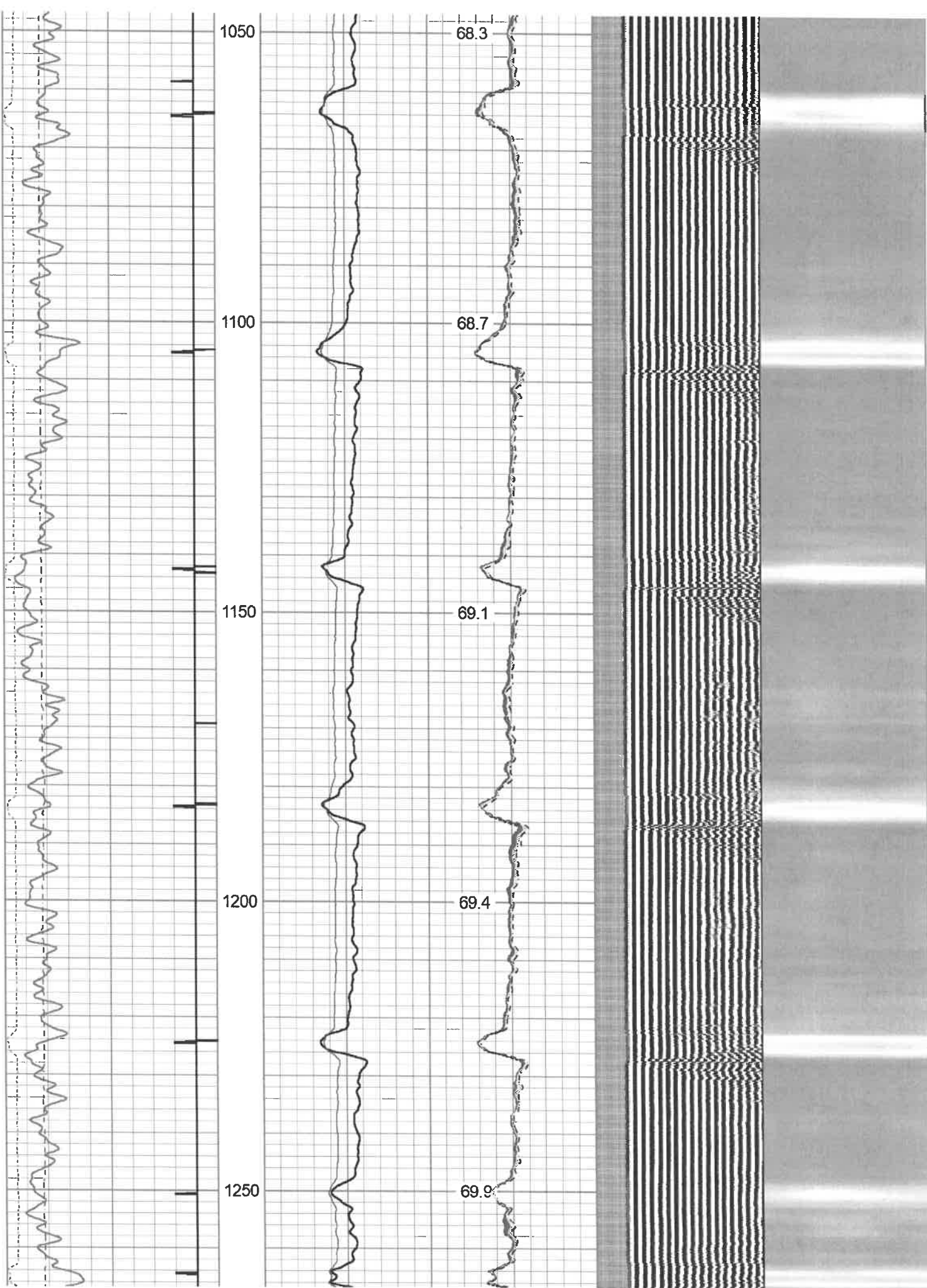
66.4

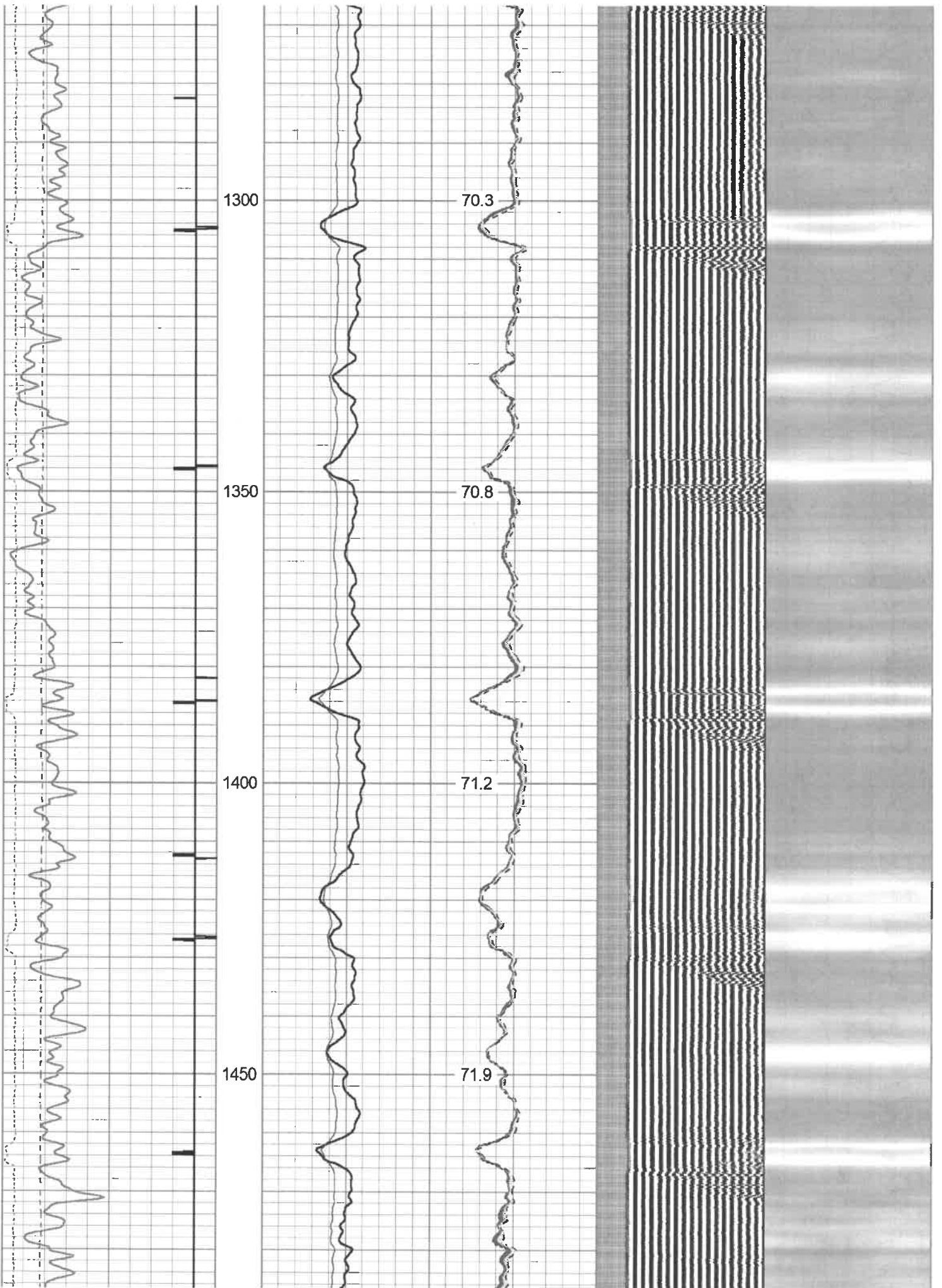
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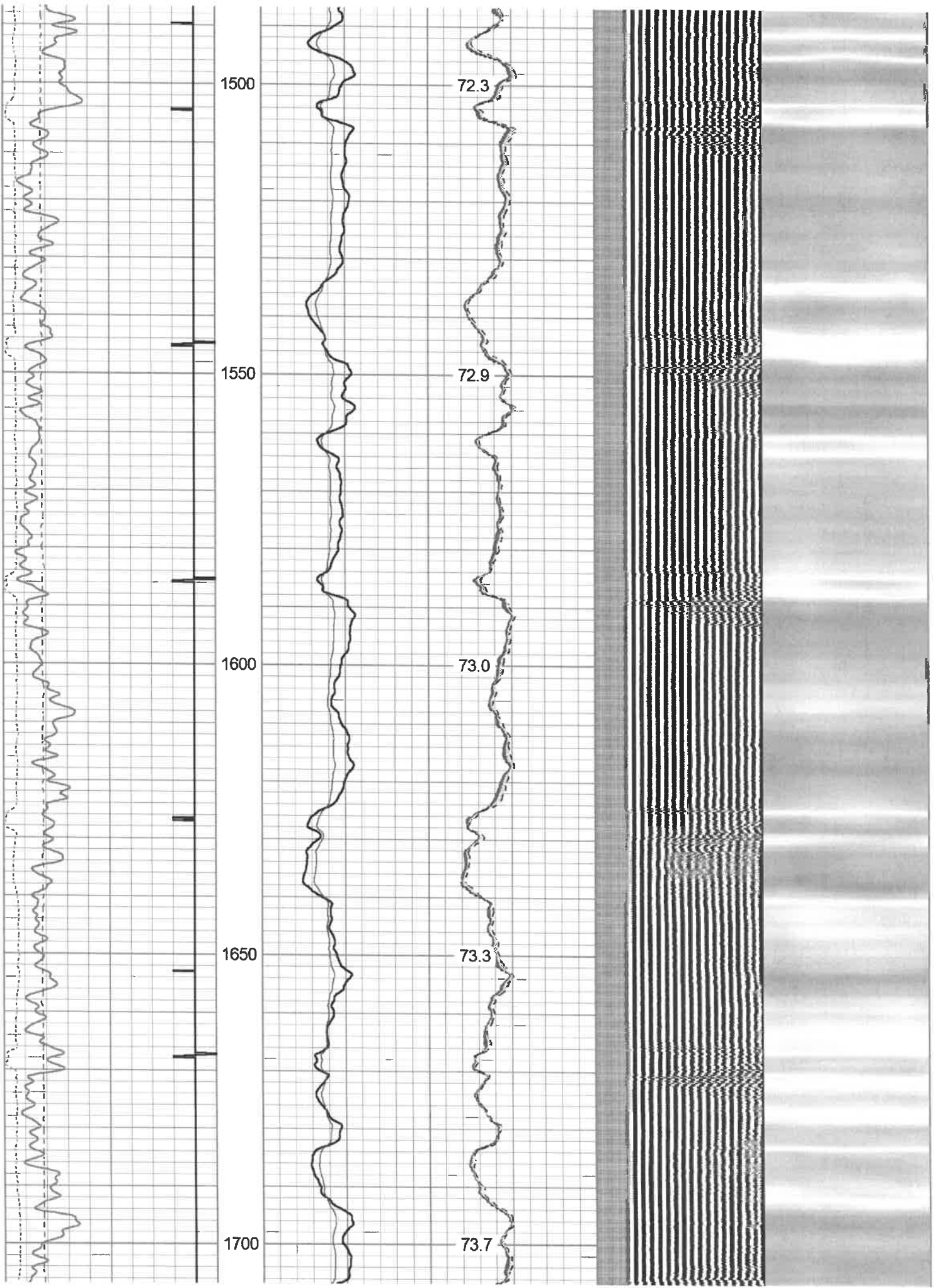
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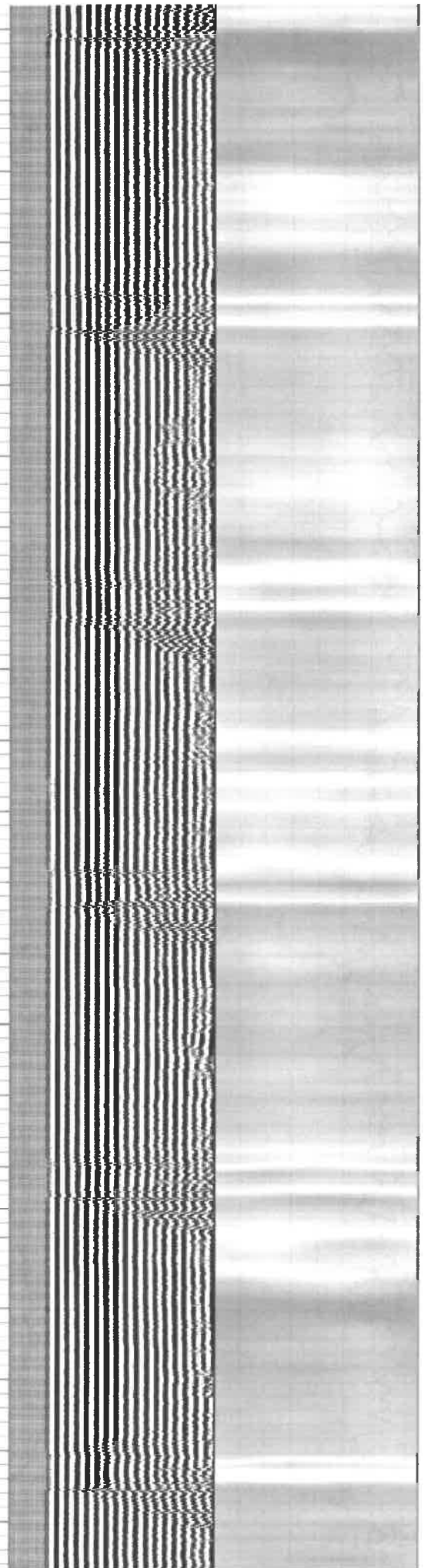
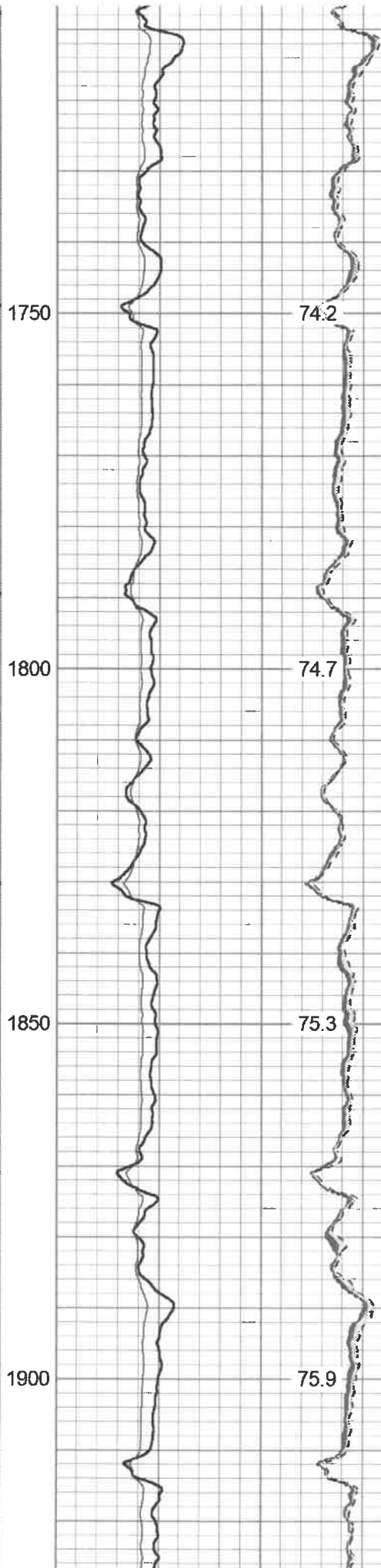
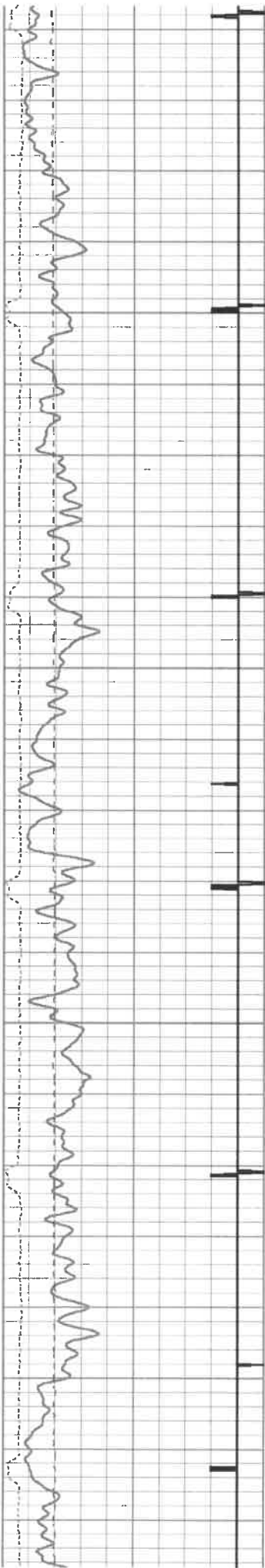
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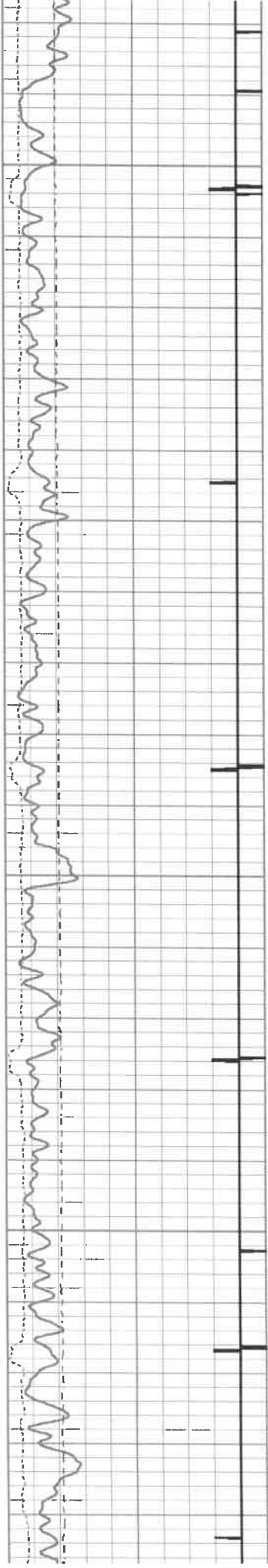










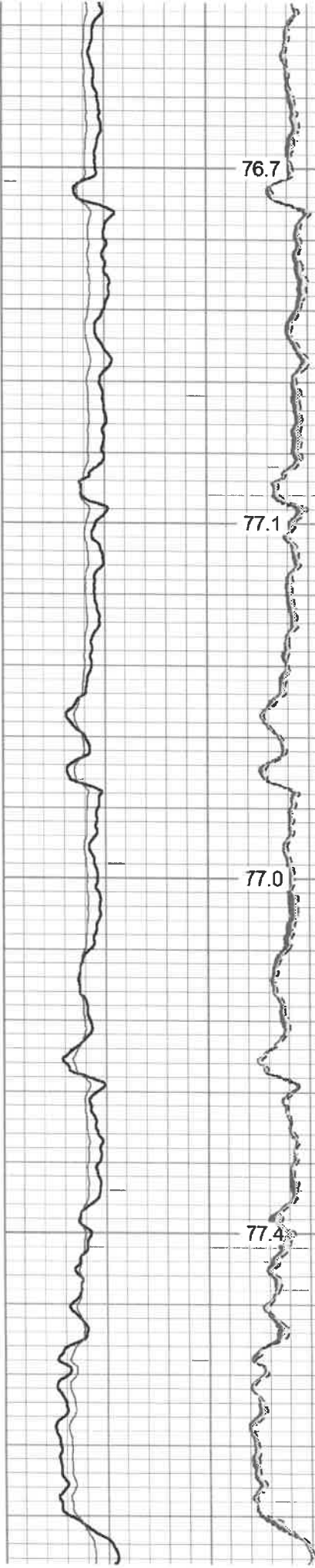


1950

2000

2050

2100

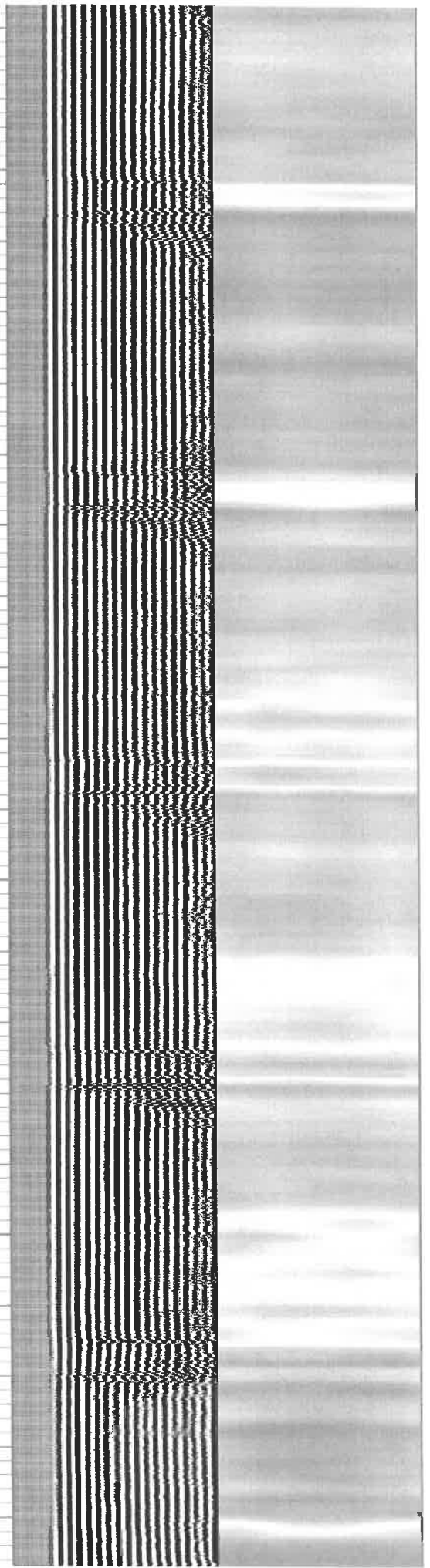


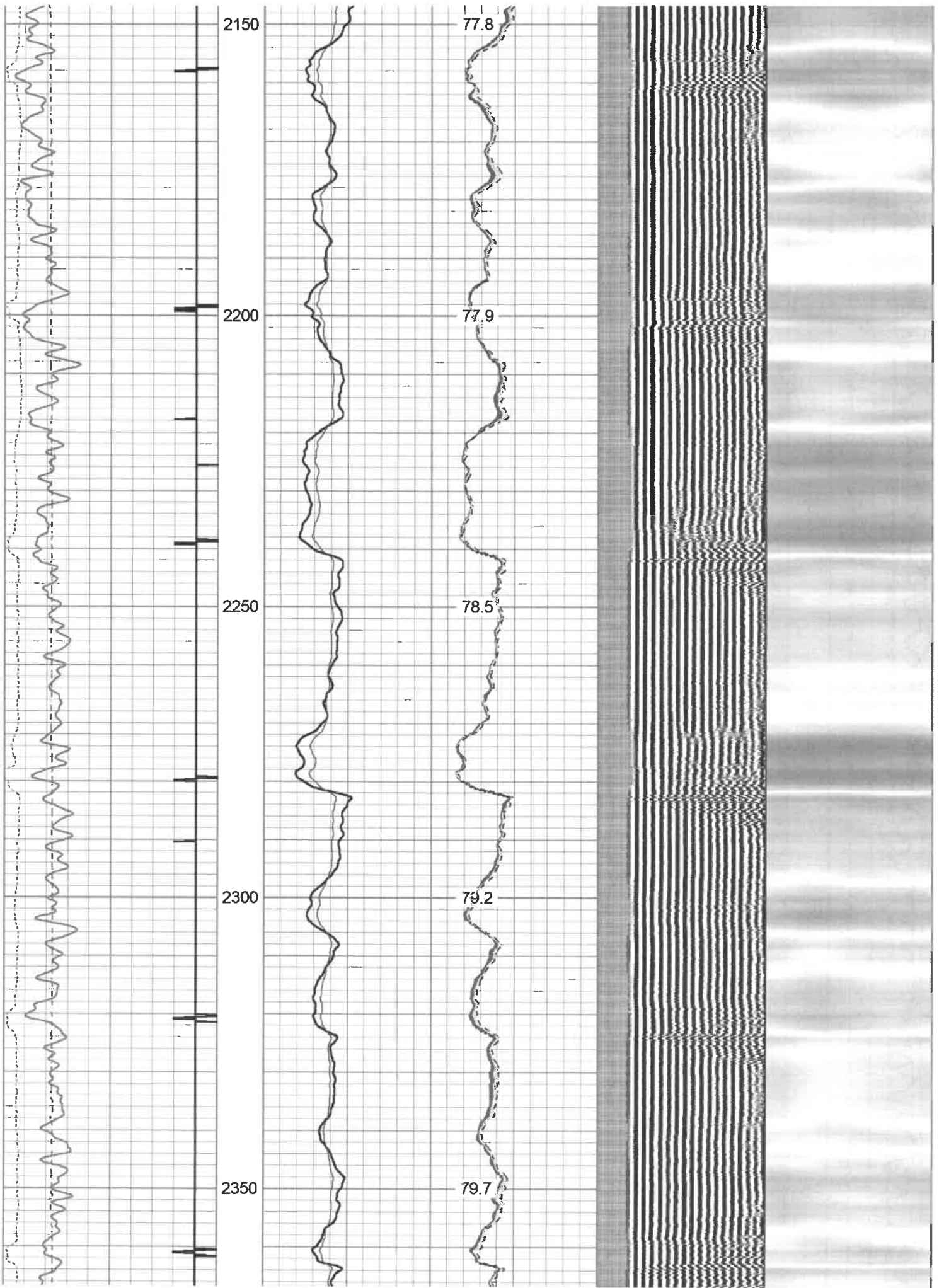
76.7

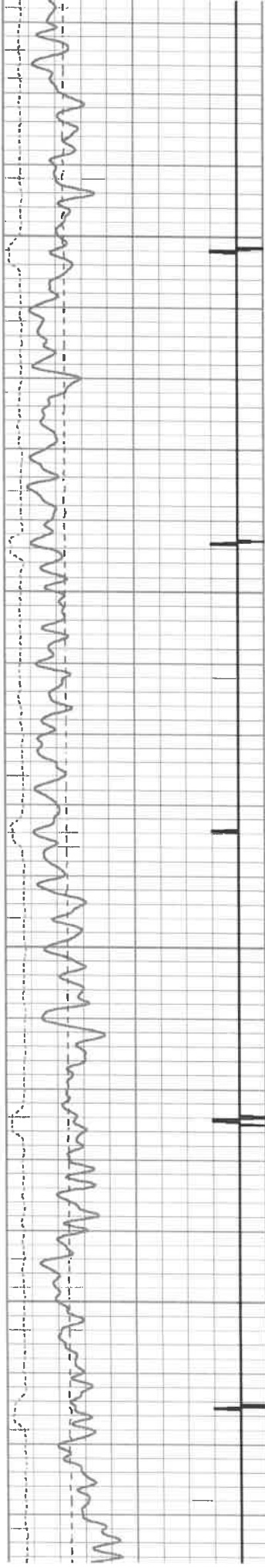
77.1

77.0

77.4





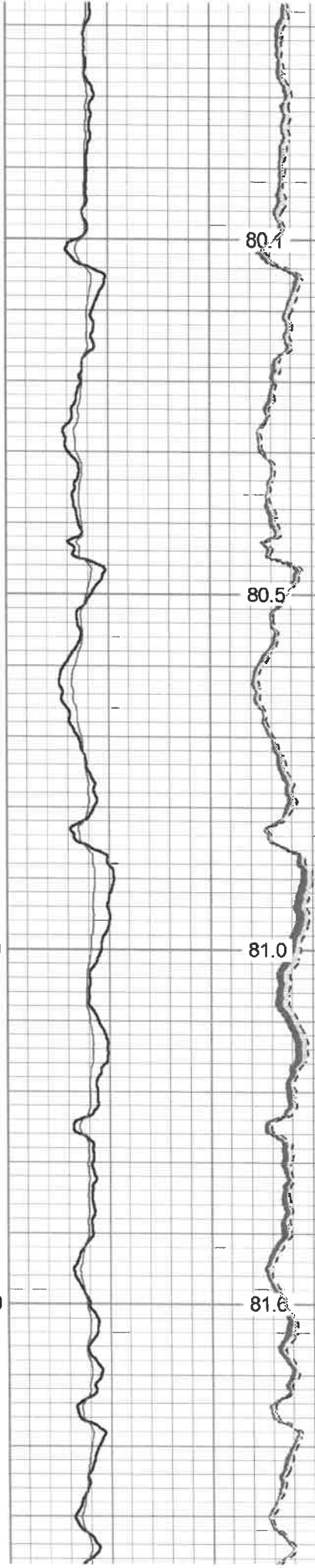


2400

2450

2500

2550

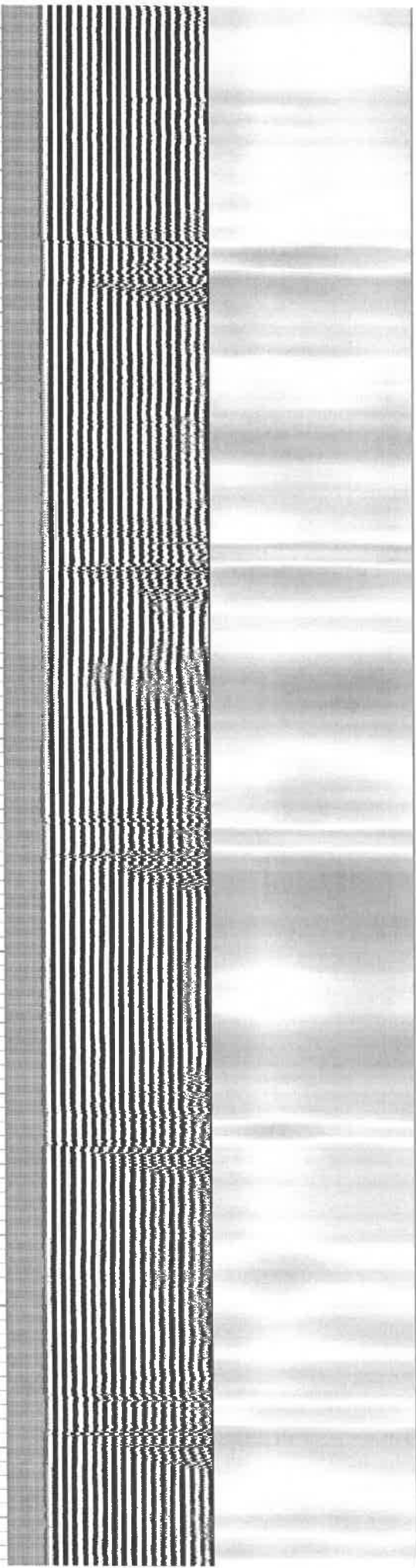


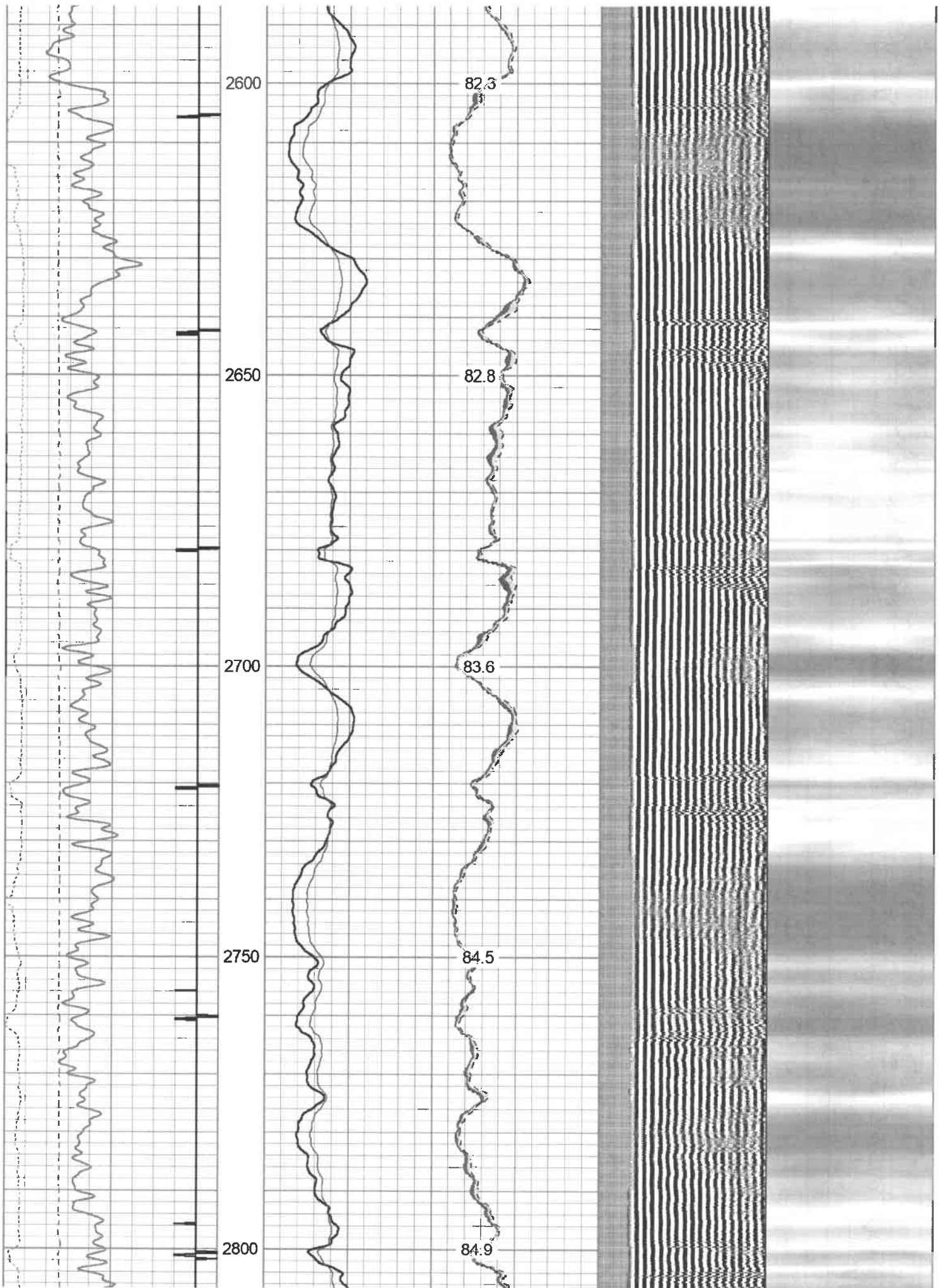
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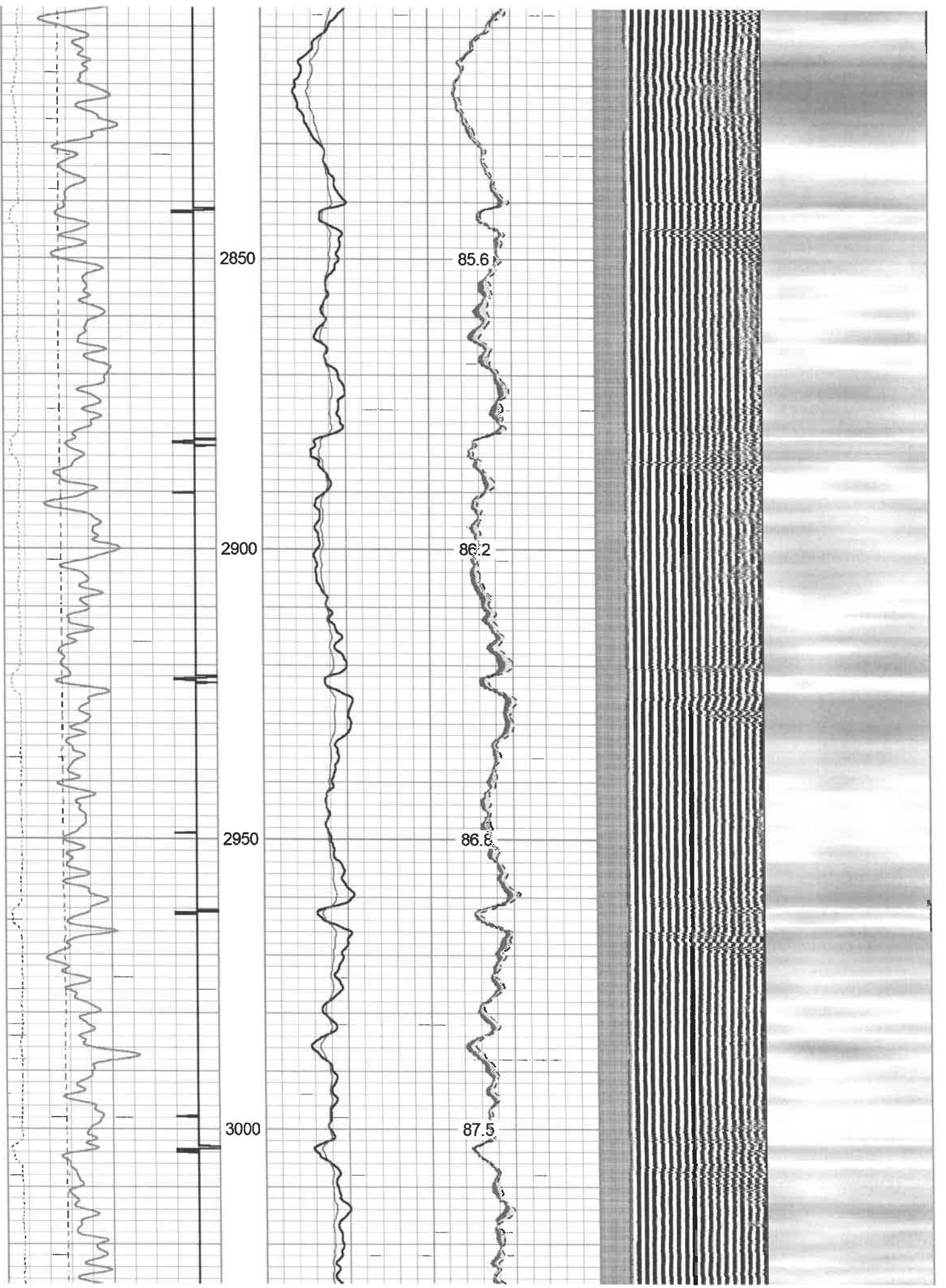
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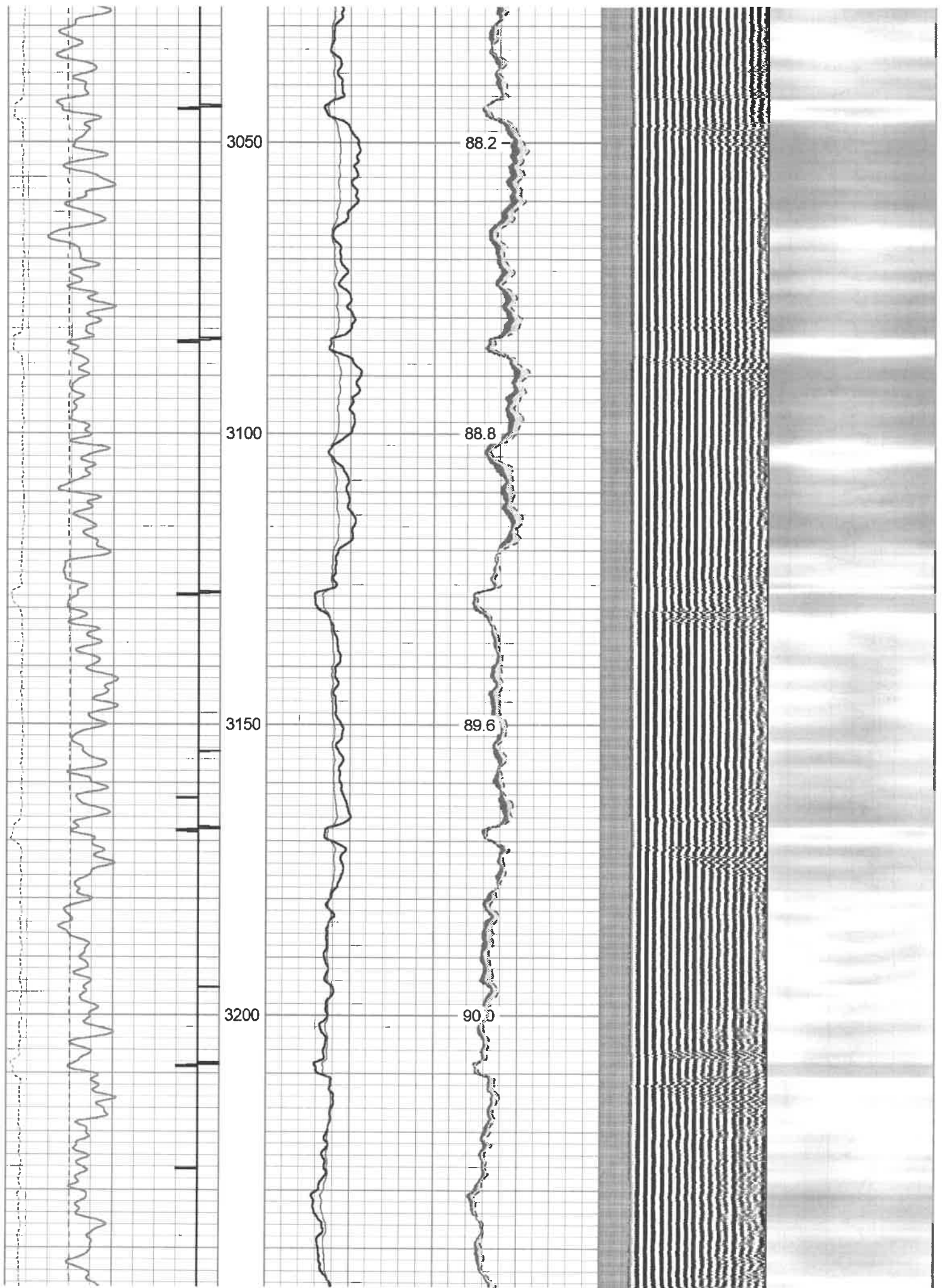
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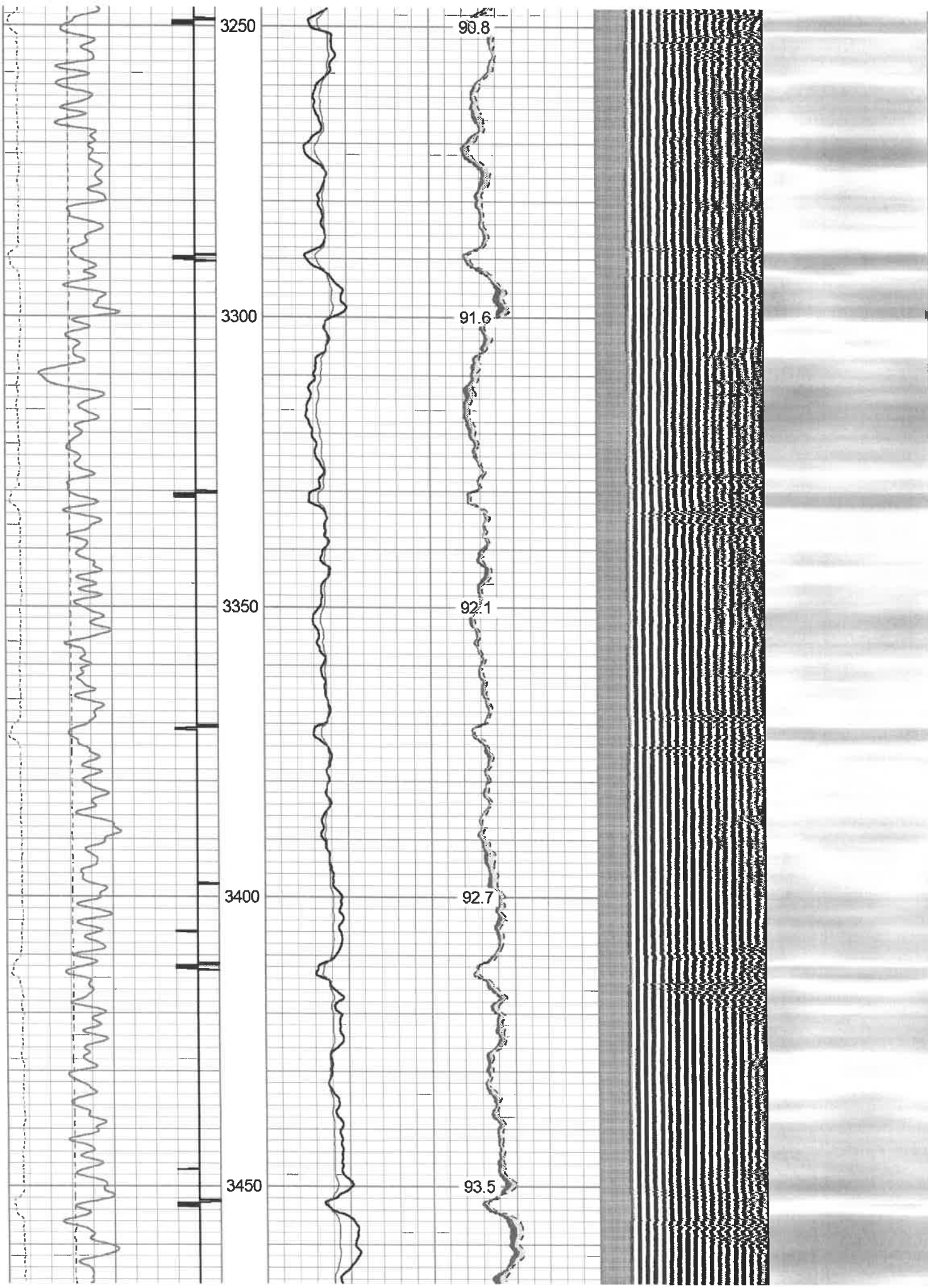
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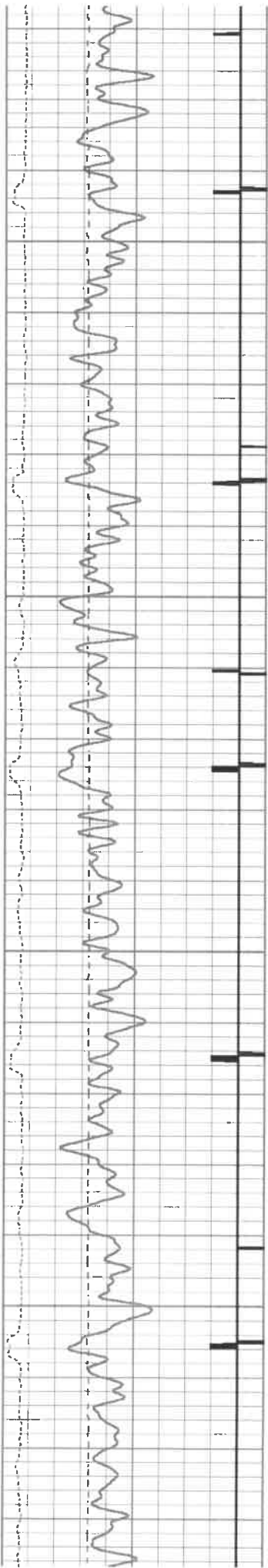










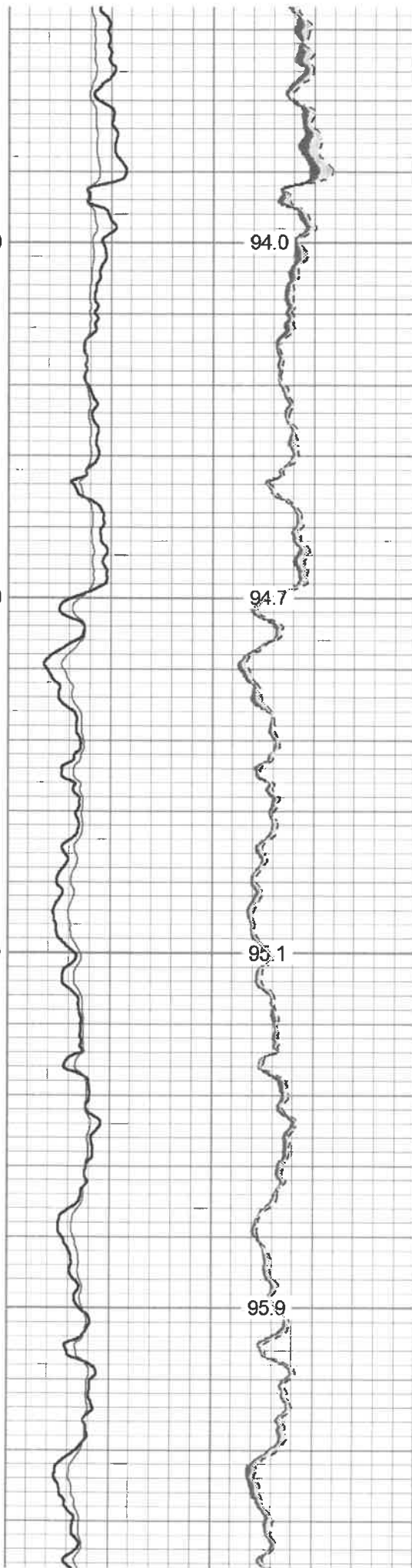


3500

3550

3600

3650

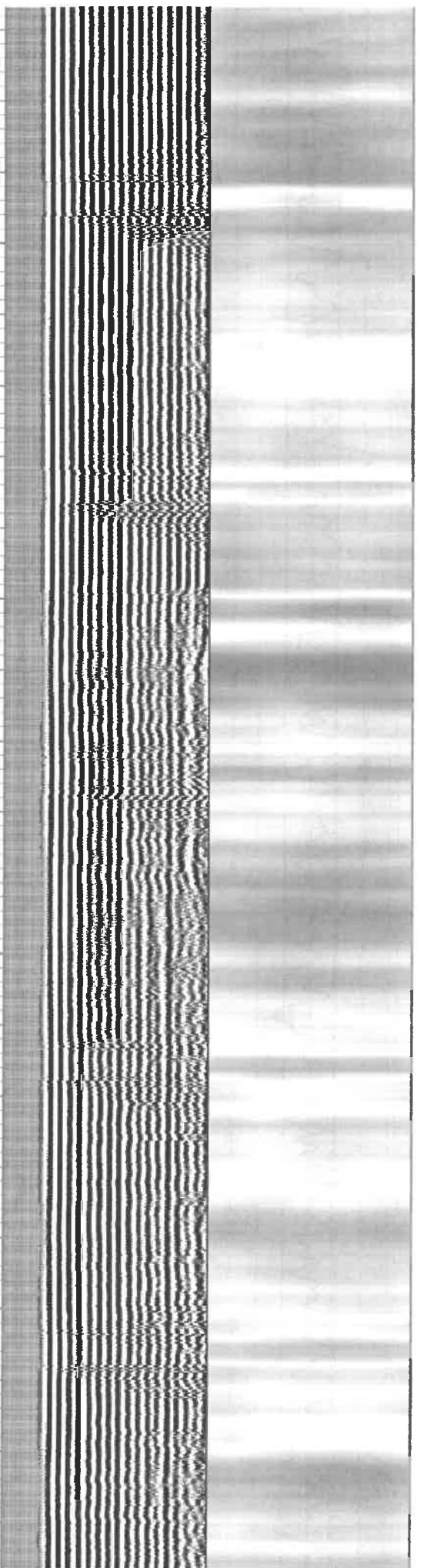


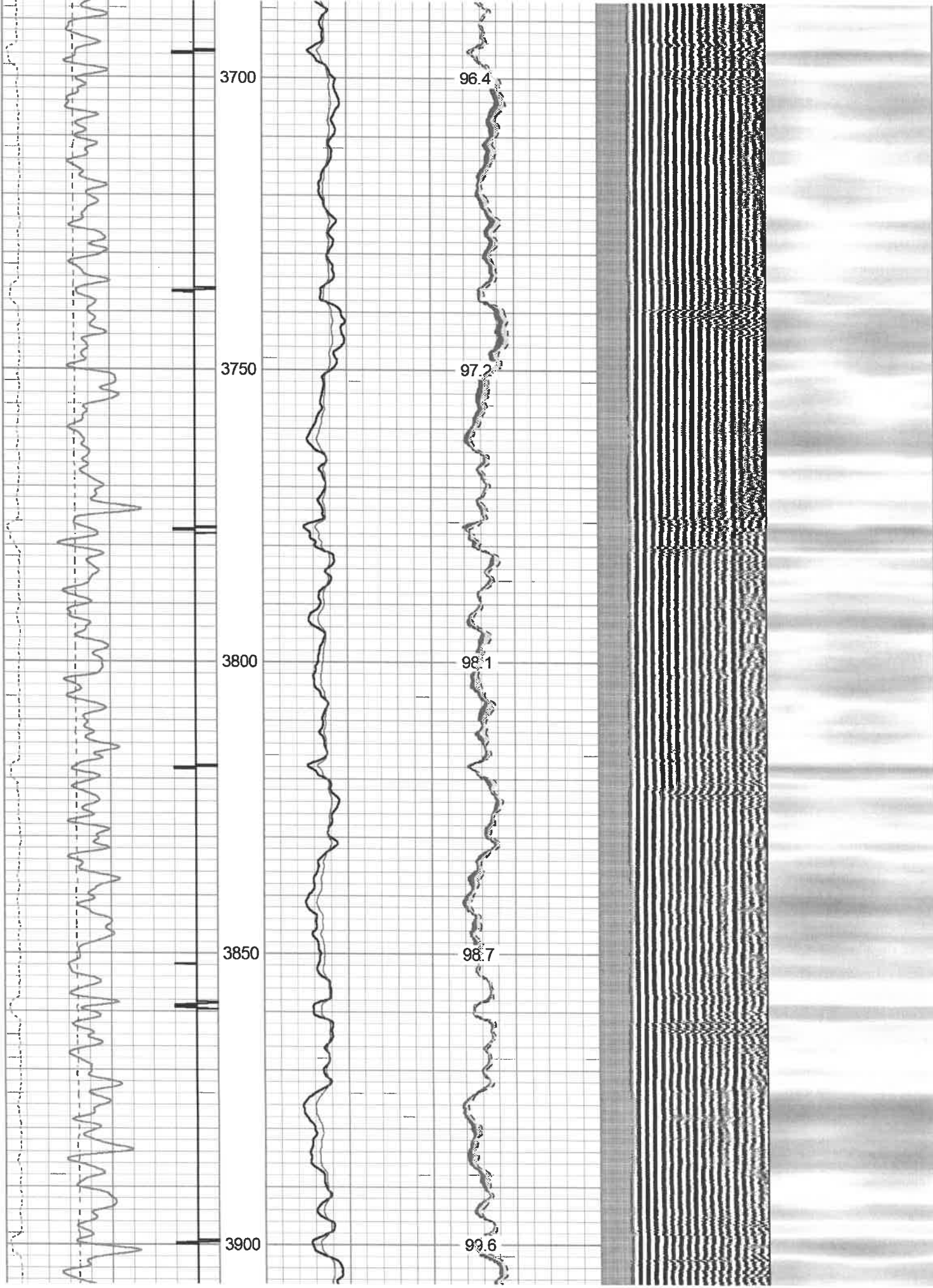
94.0

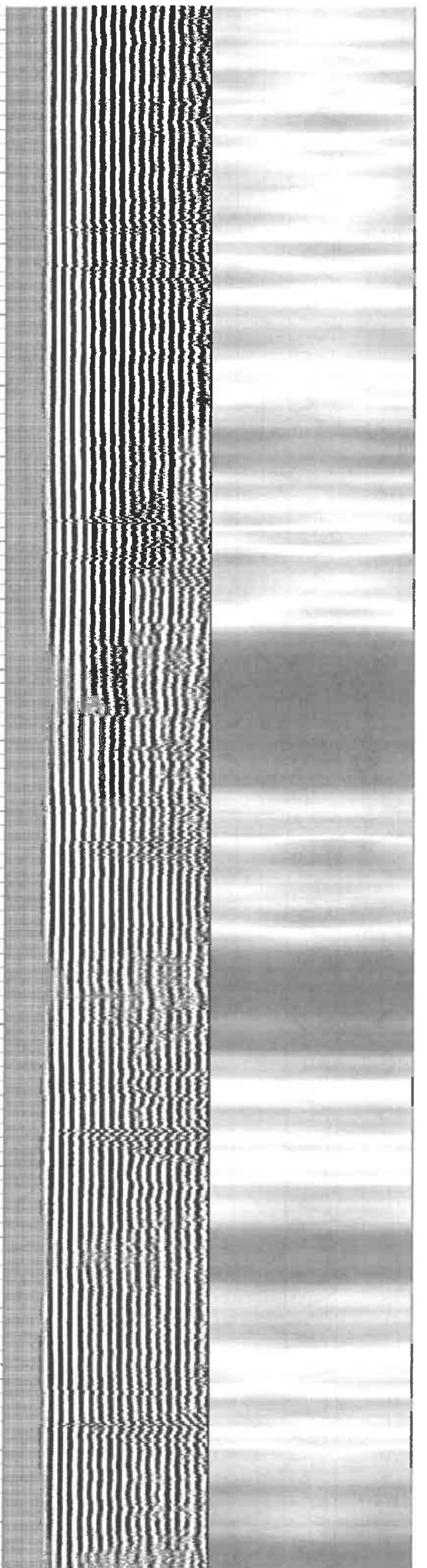
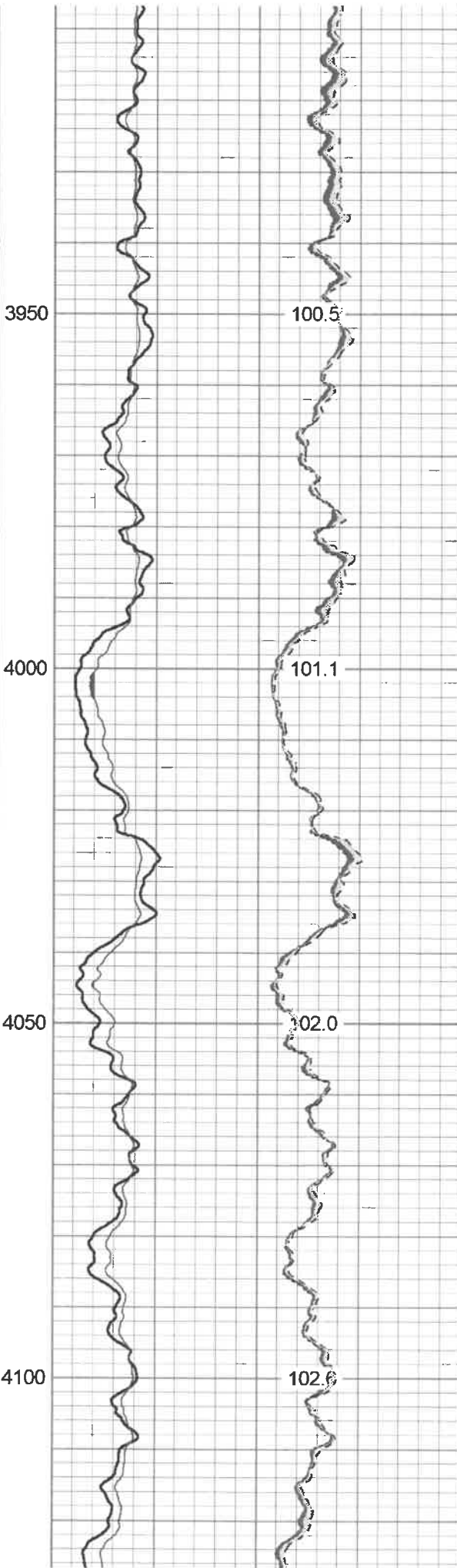
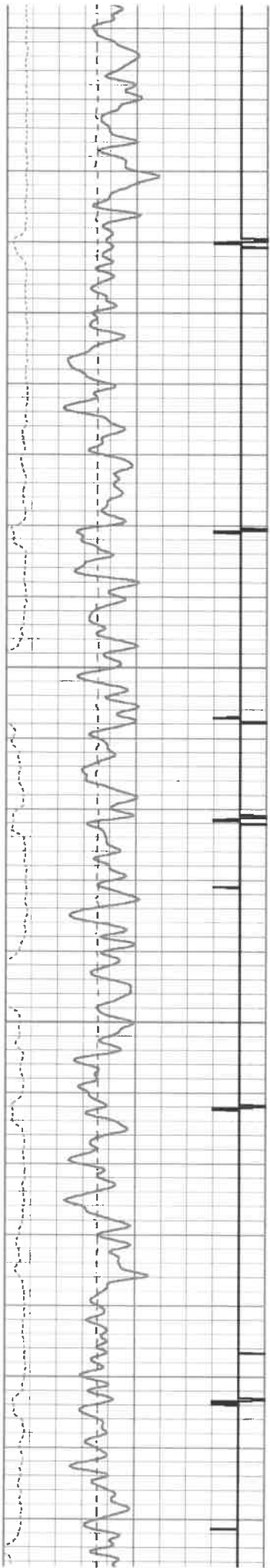
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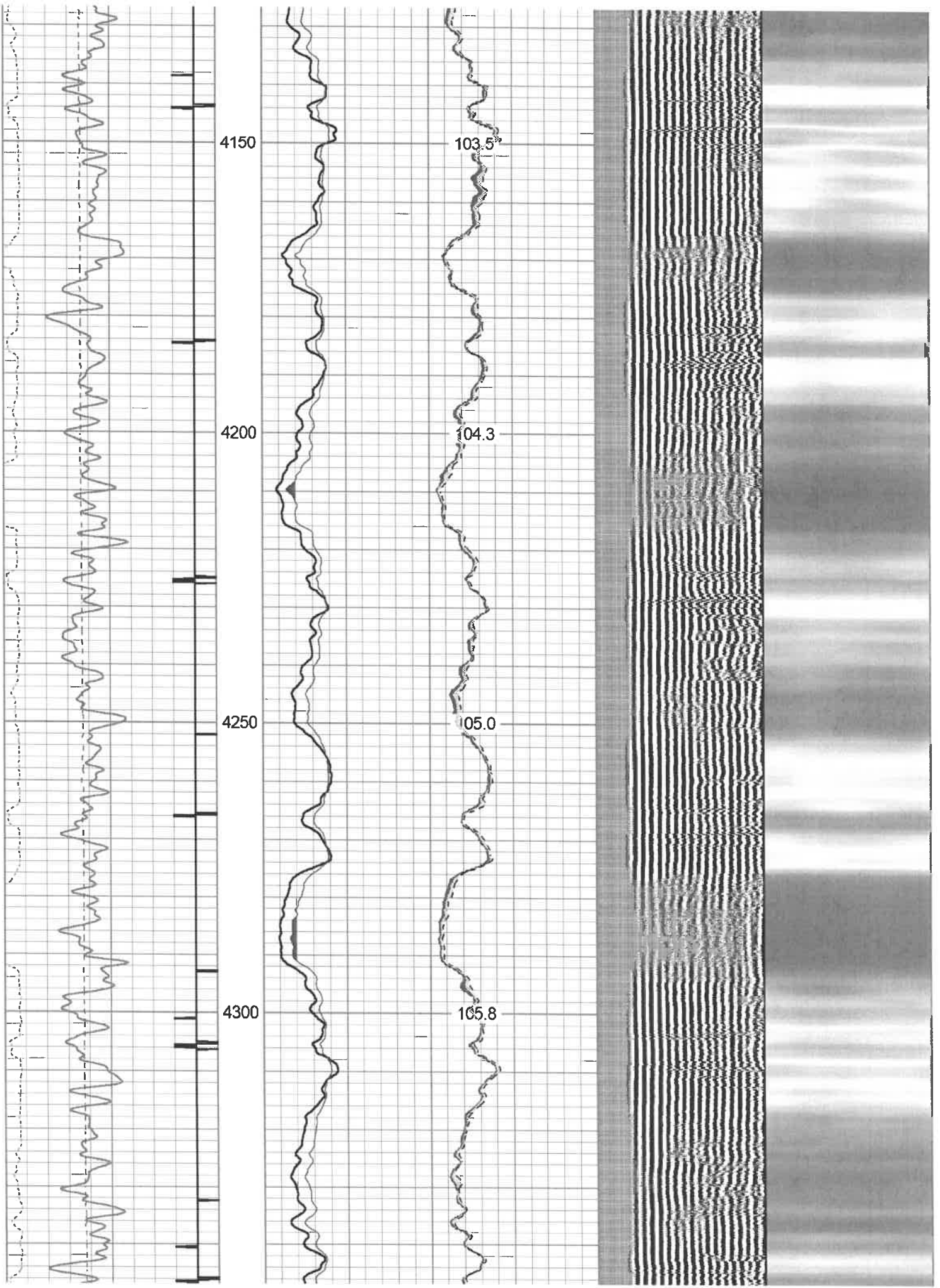
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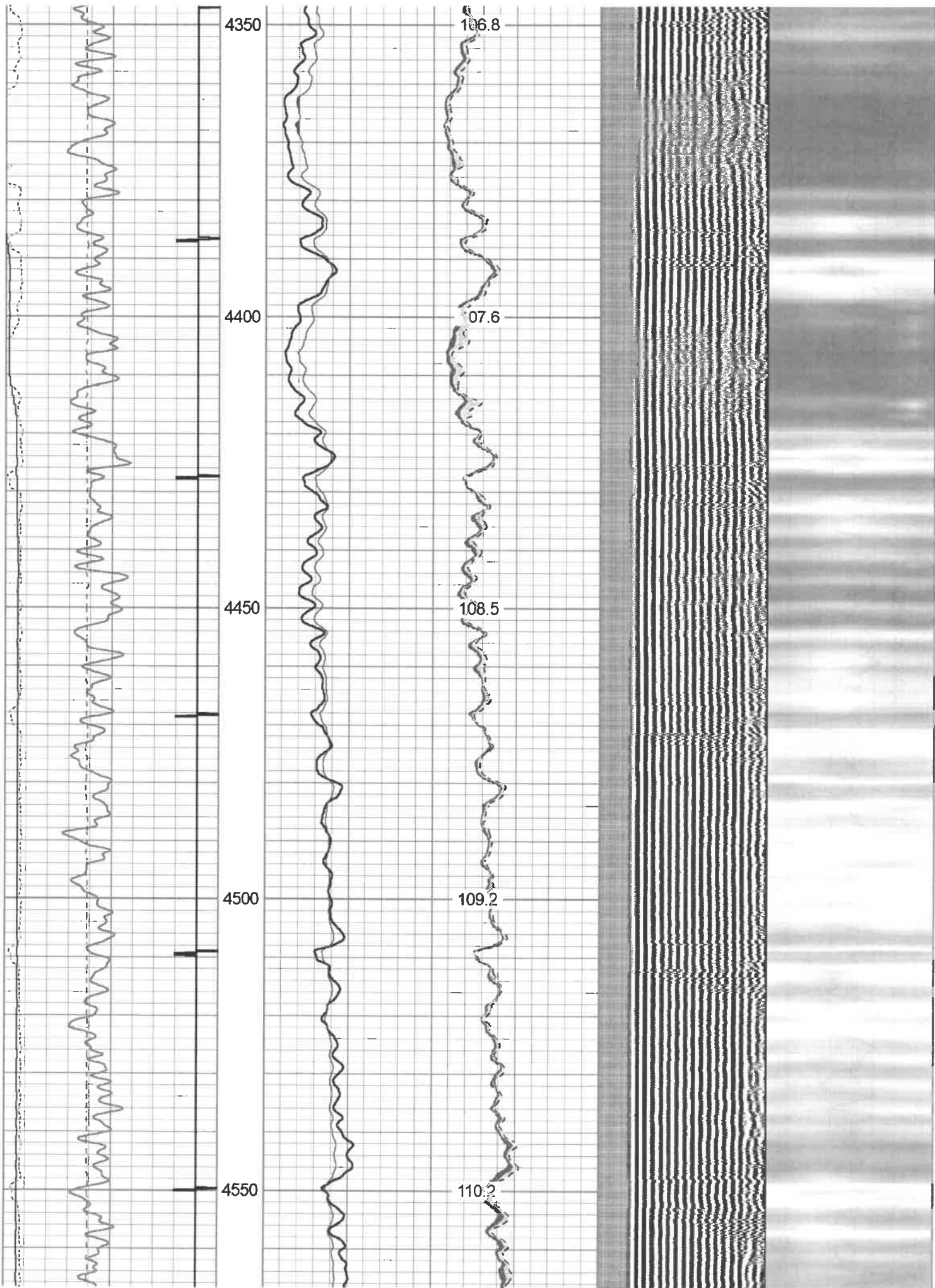
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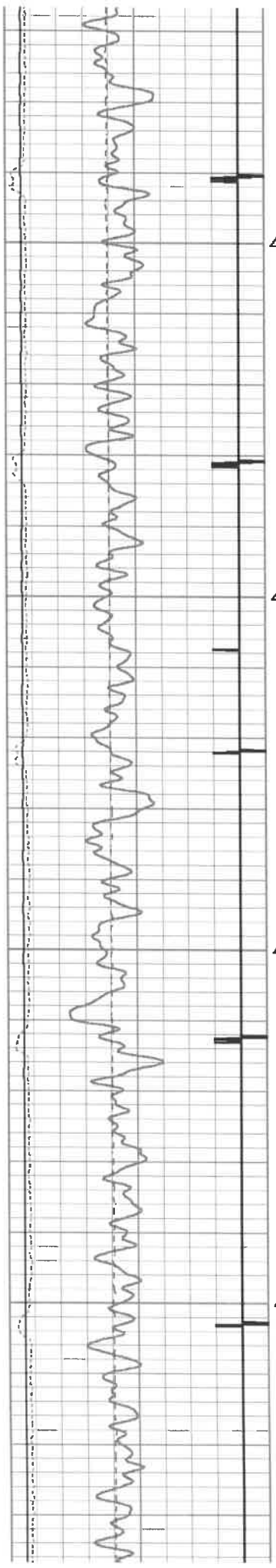










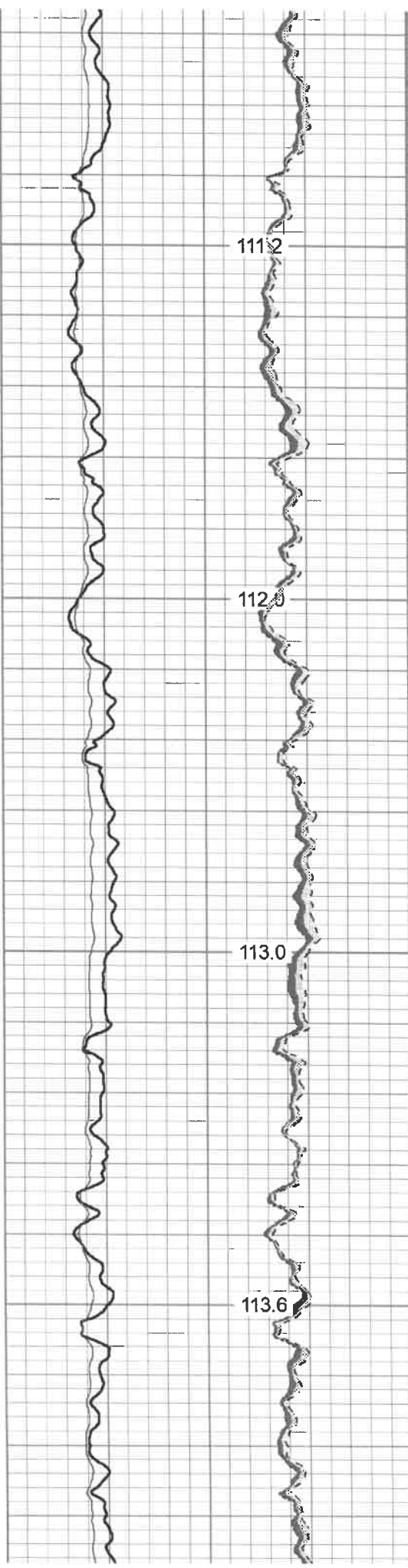


4600

4650

4700

4750

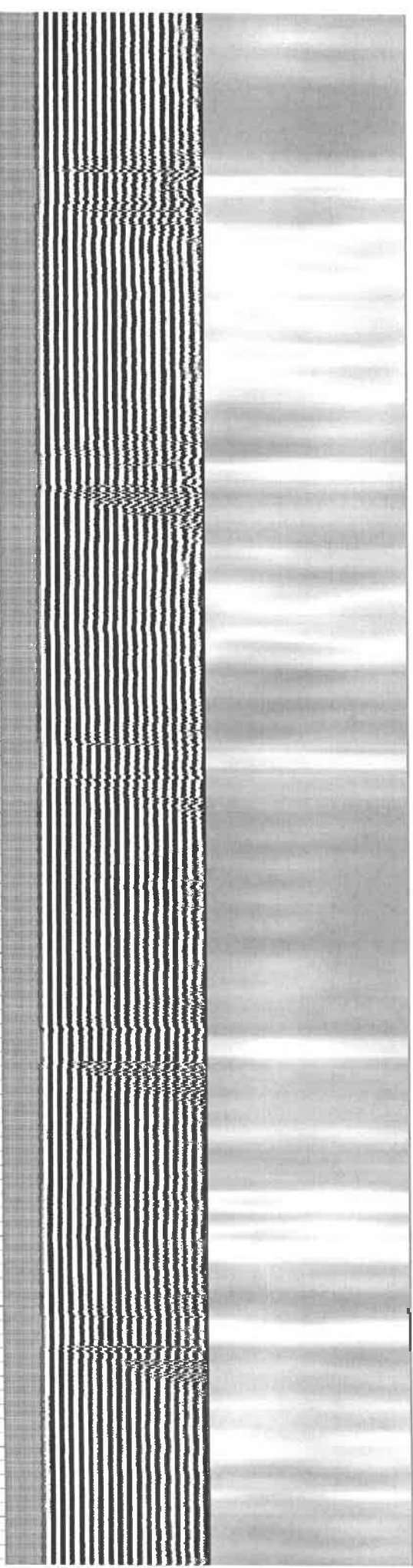


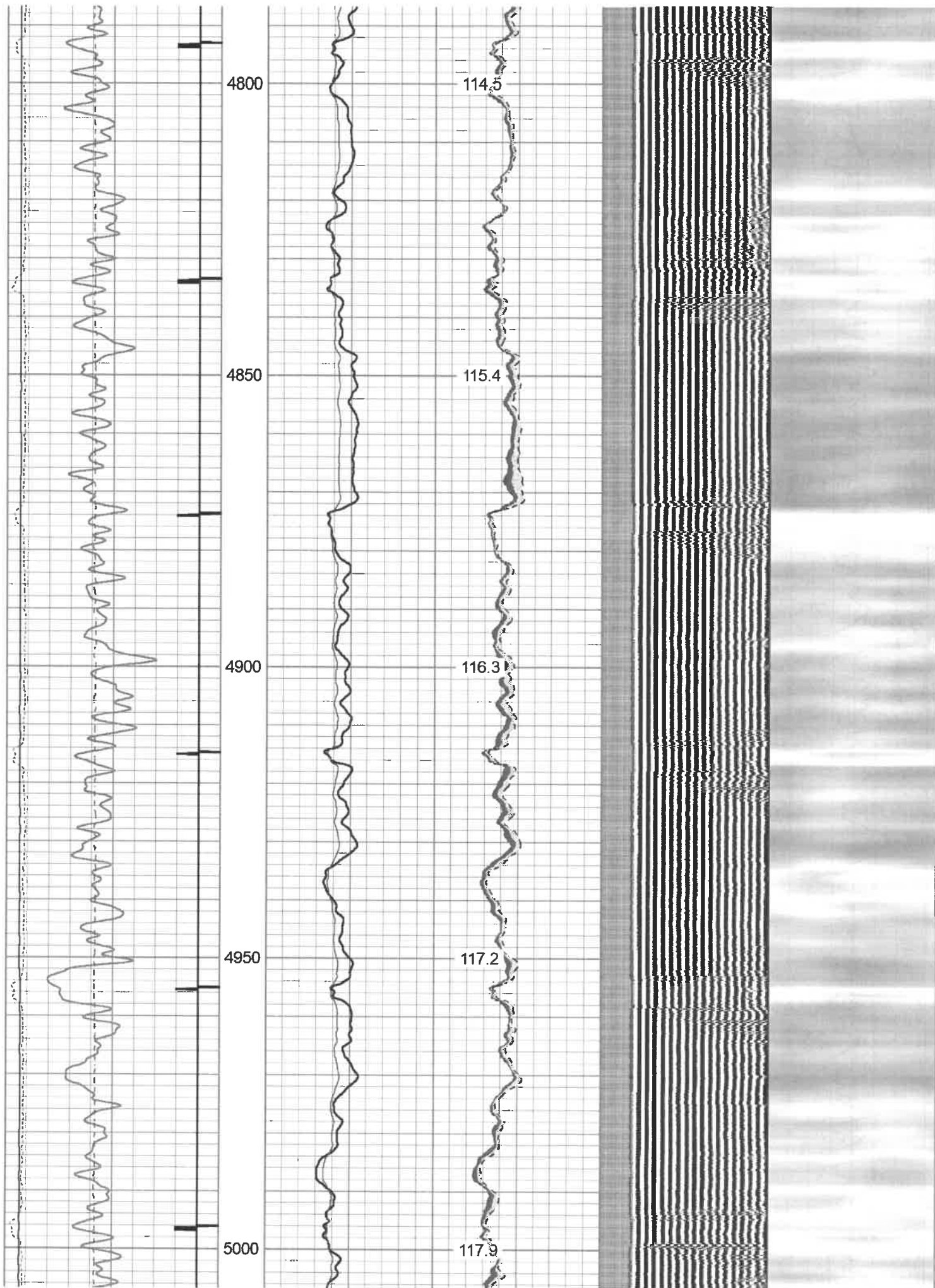
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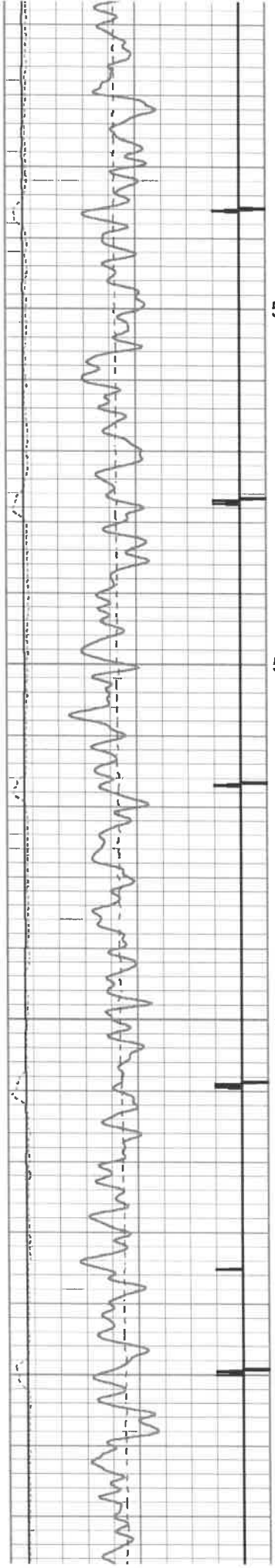
112.0

113.0

113.6







5050

5100

5150

5200

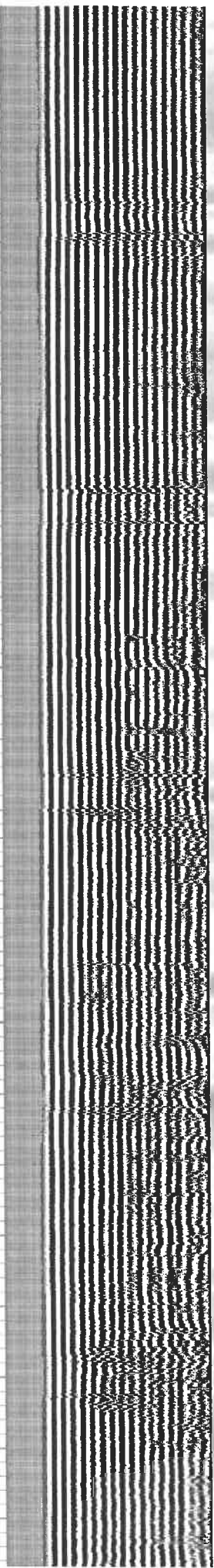


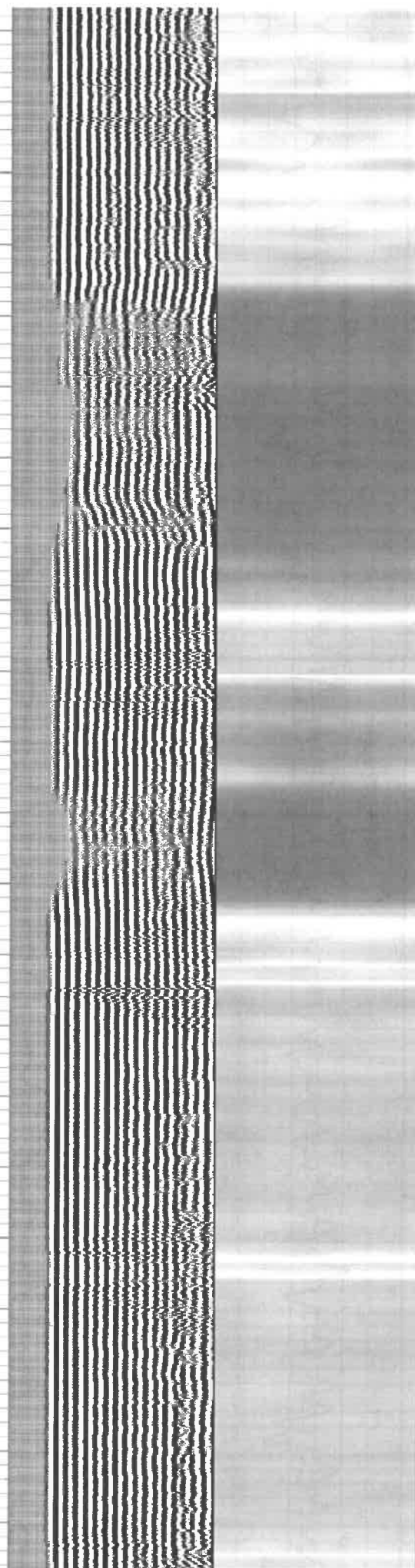
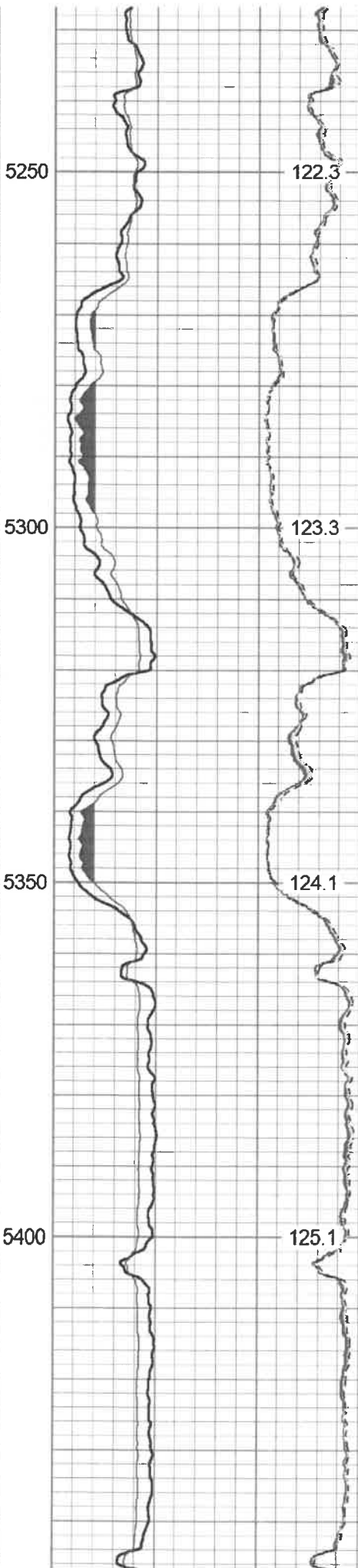
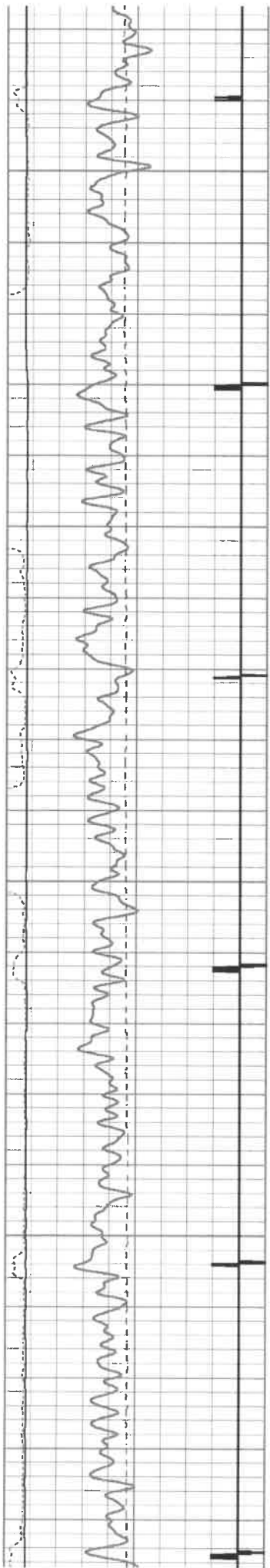
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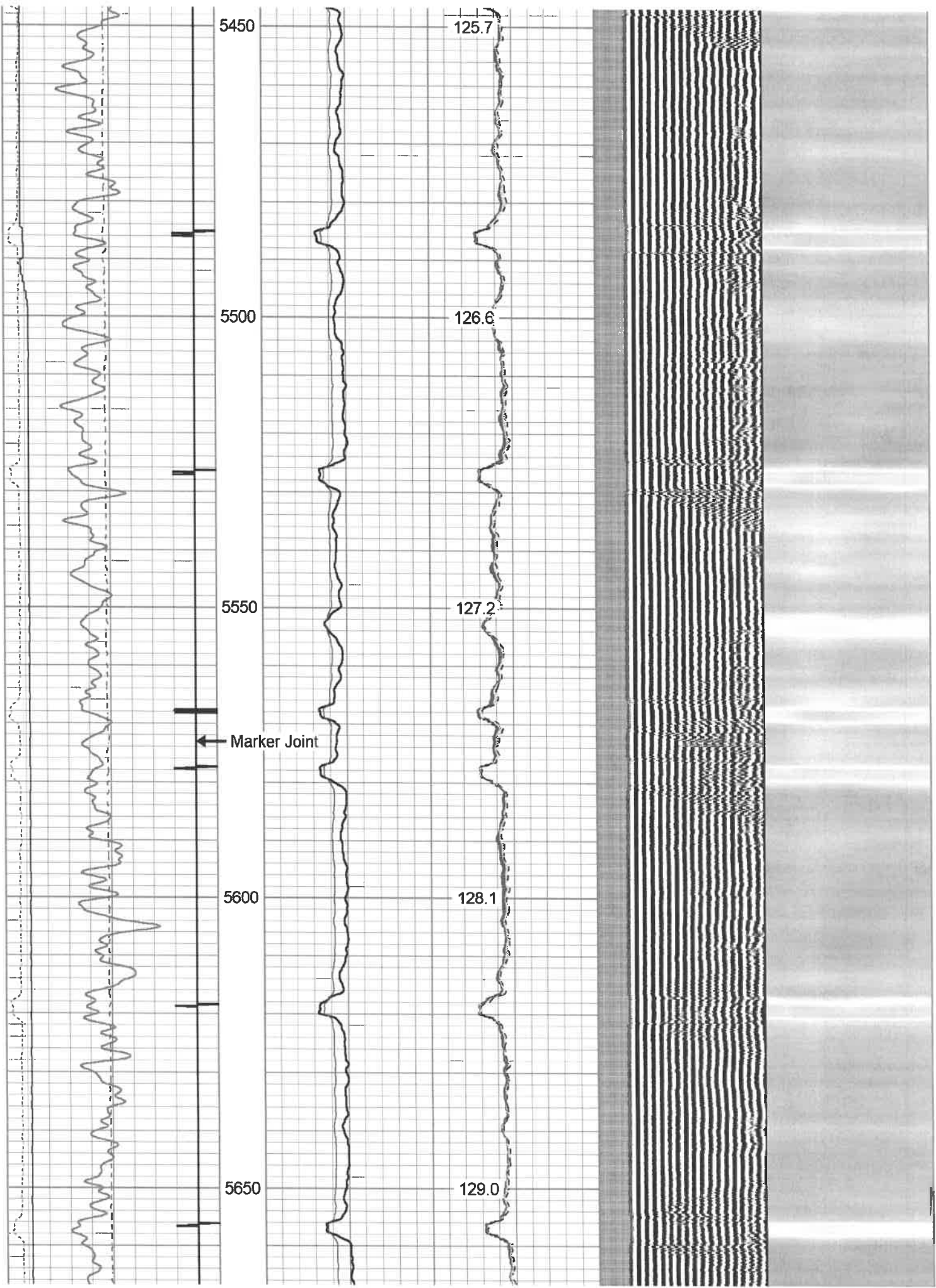
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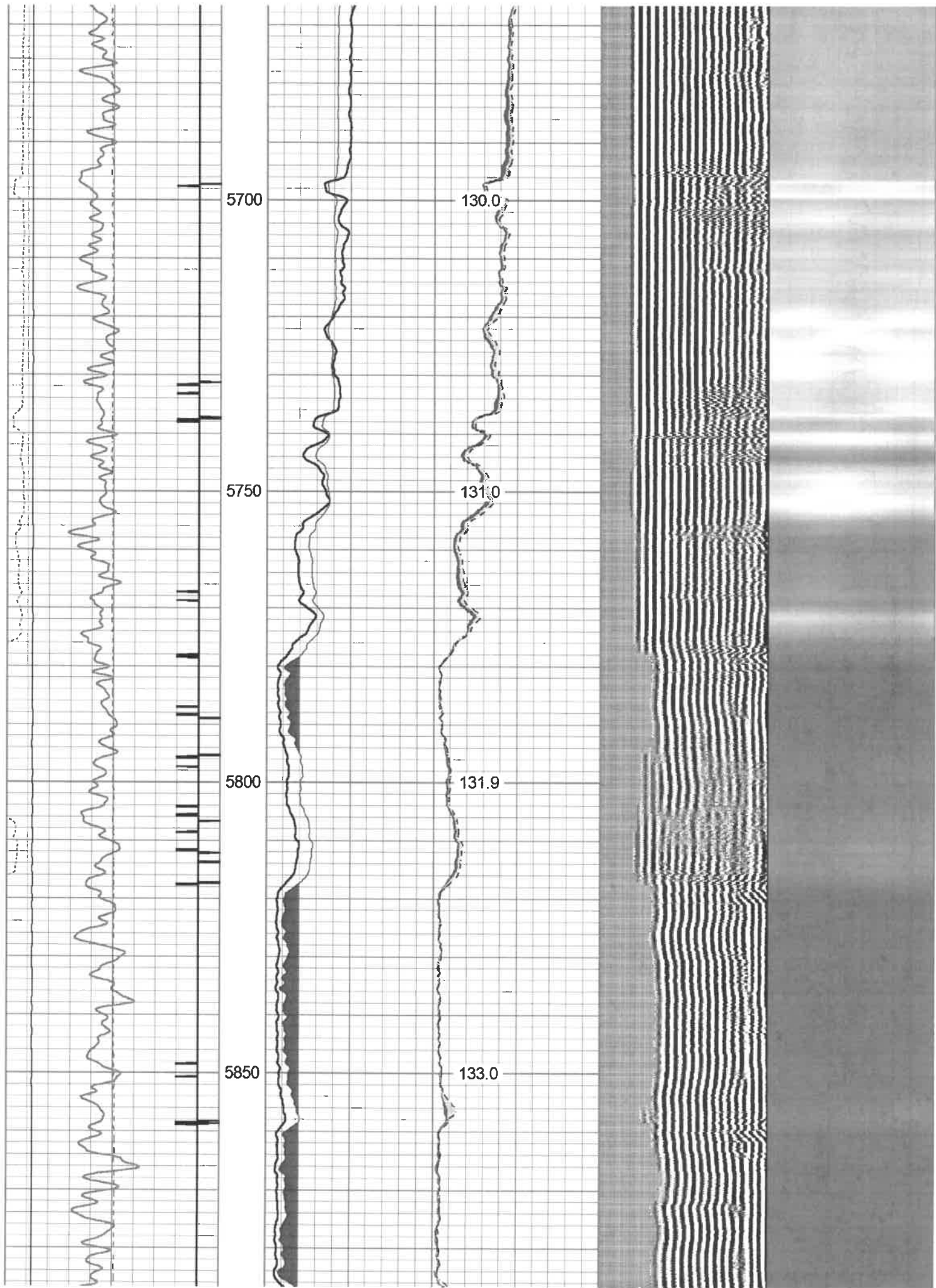
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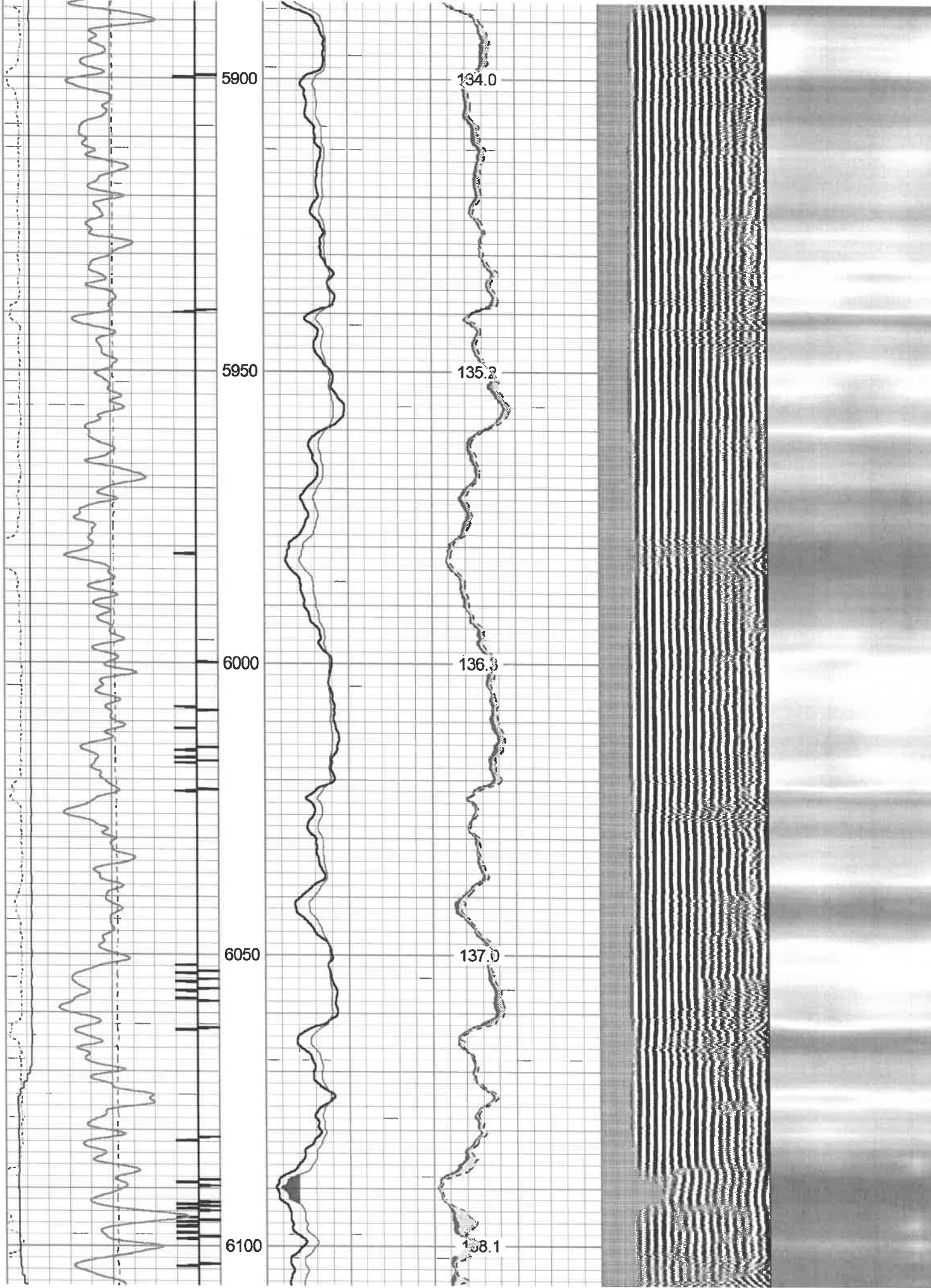
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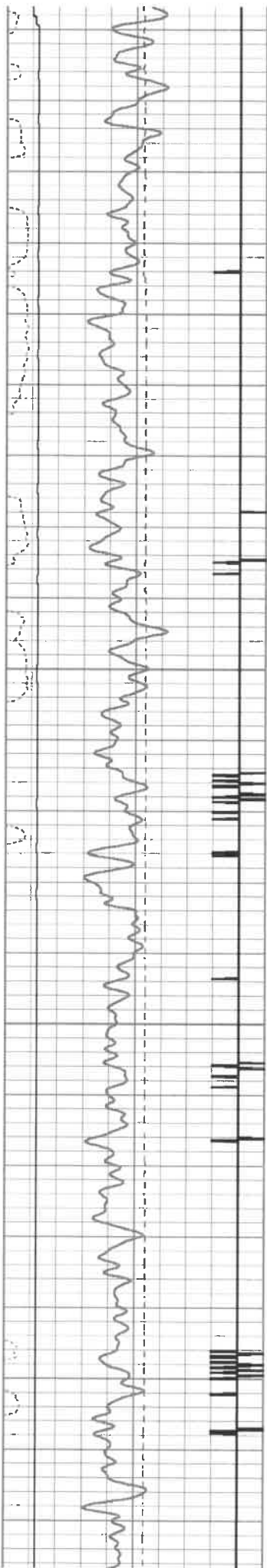










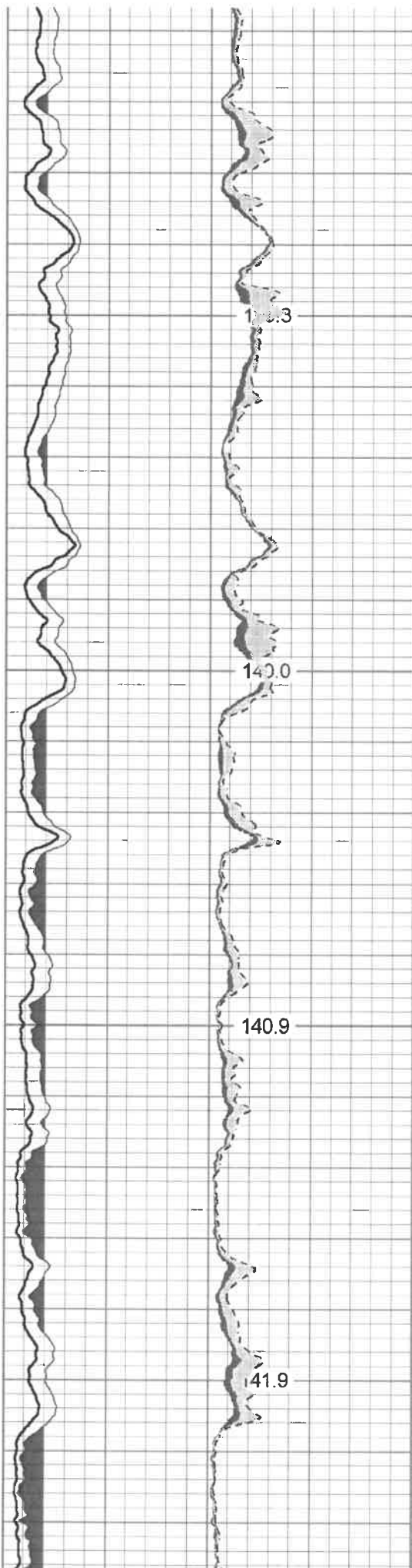


6150

6200

6250

6300

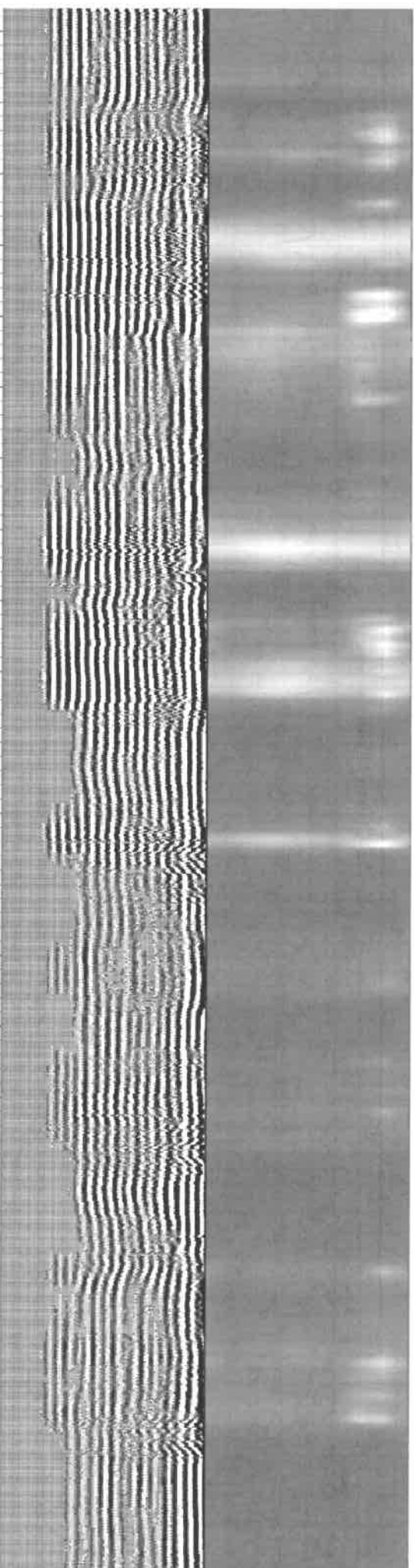


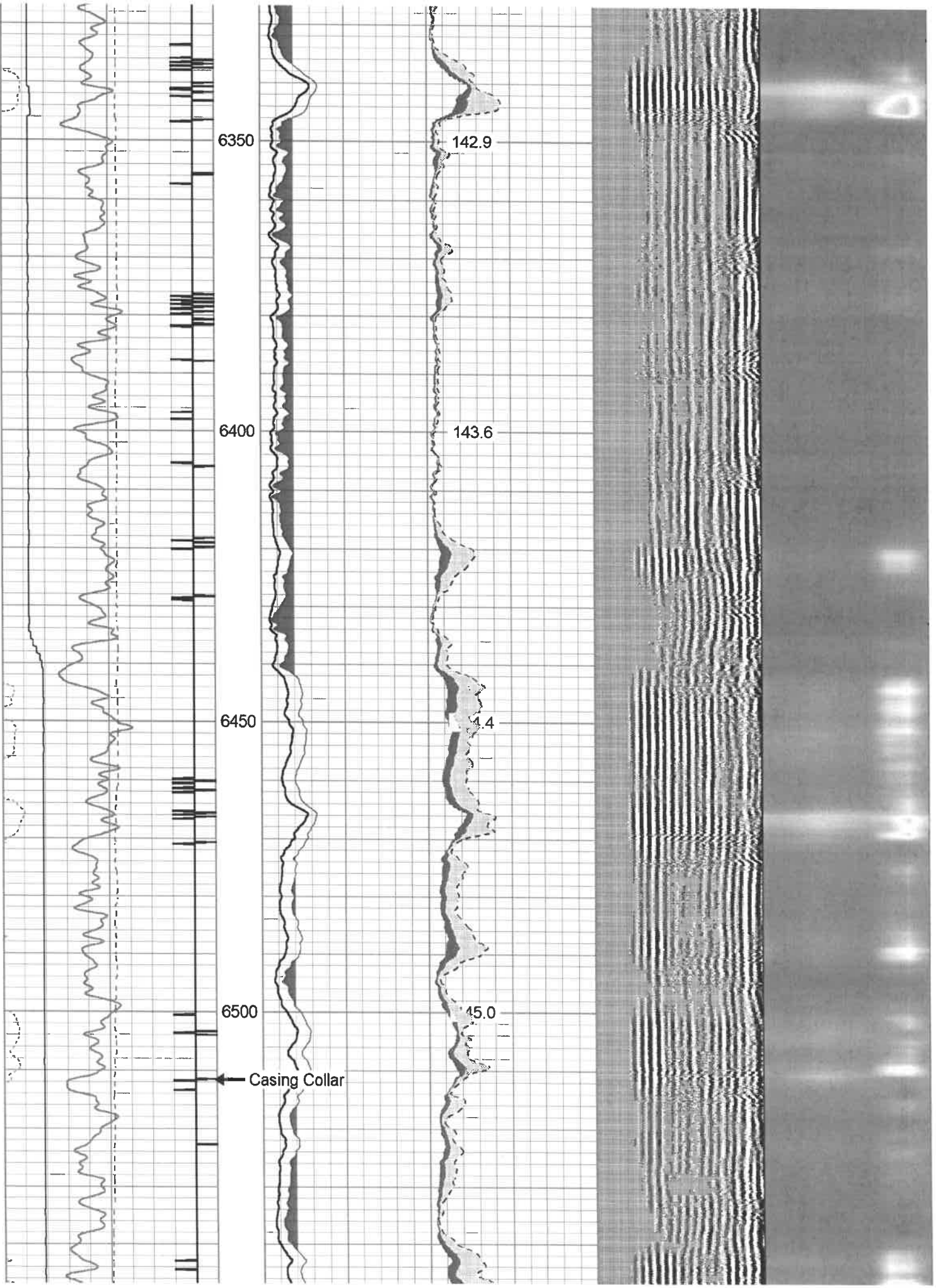
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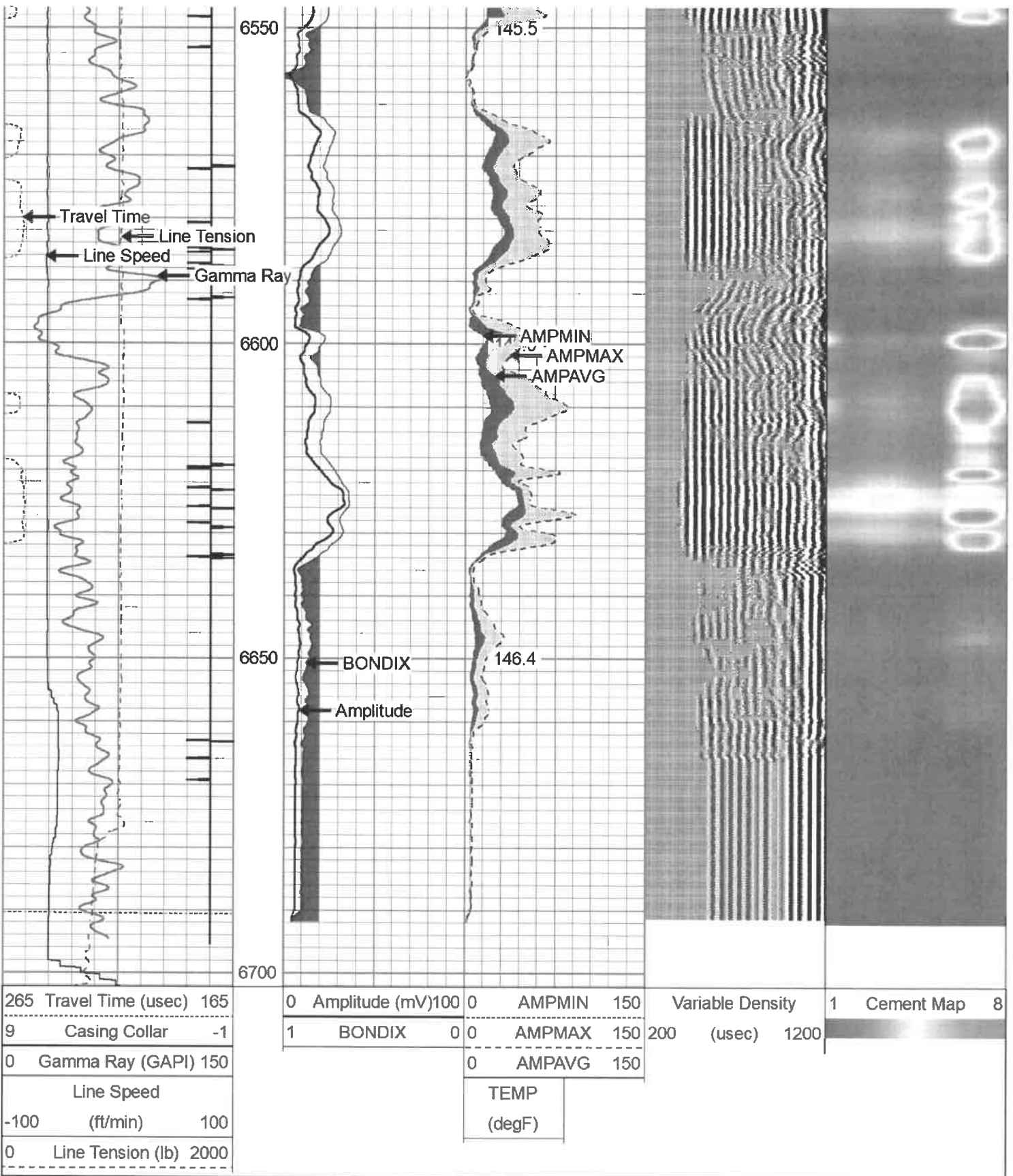
140.0

140.9

41.9



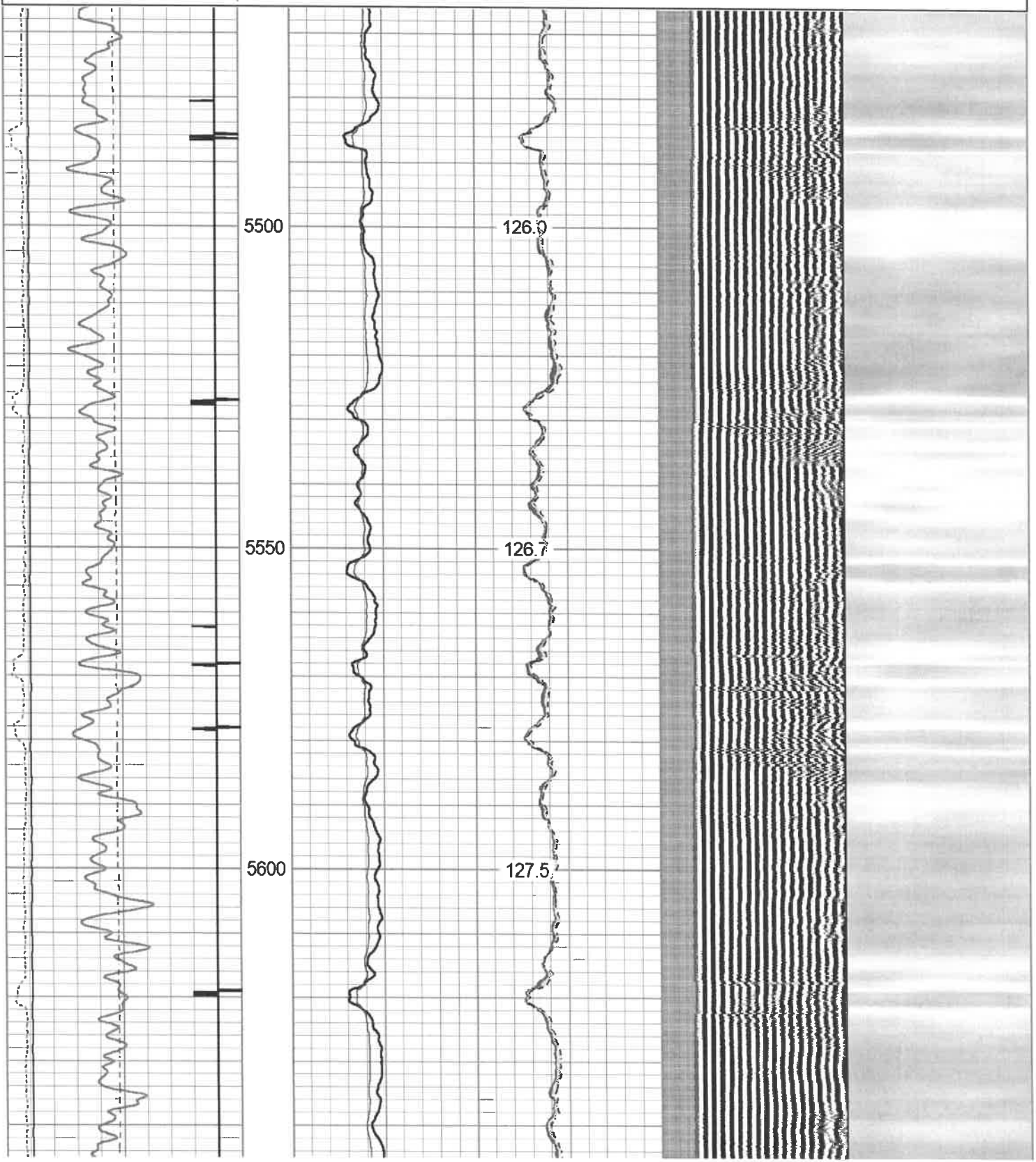


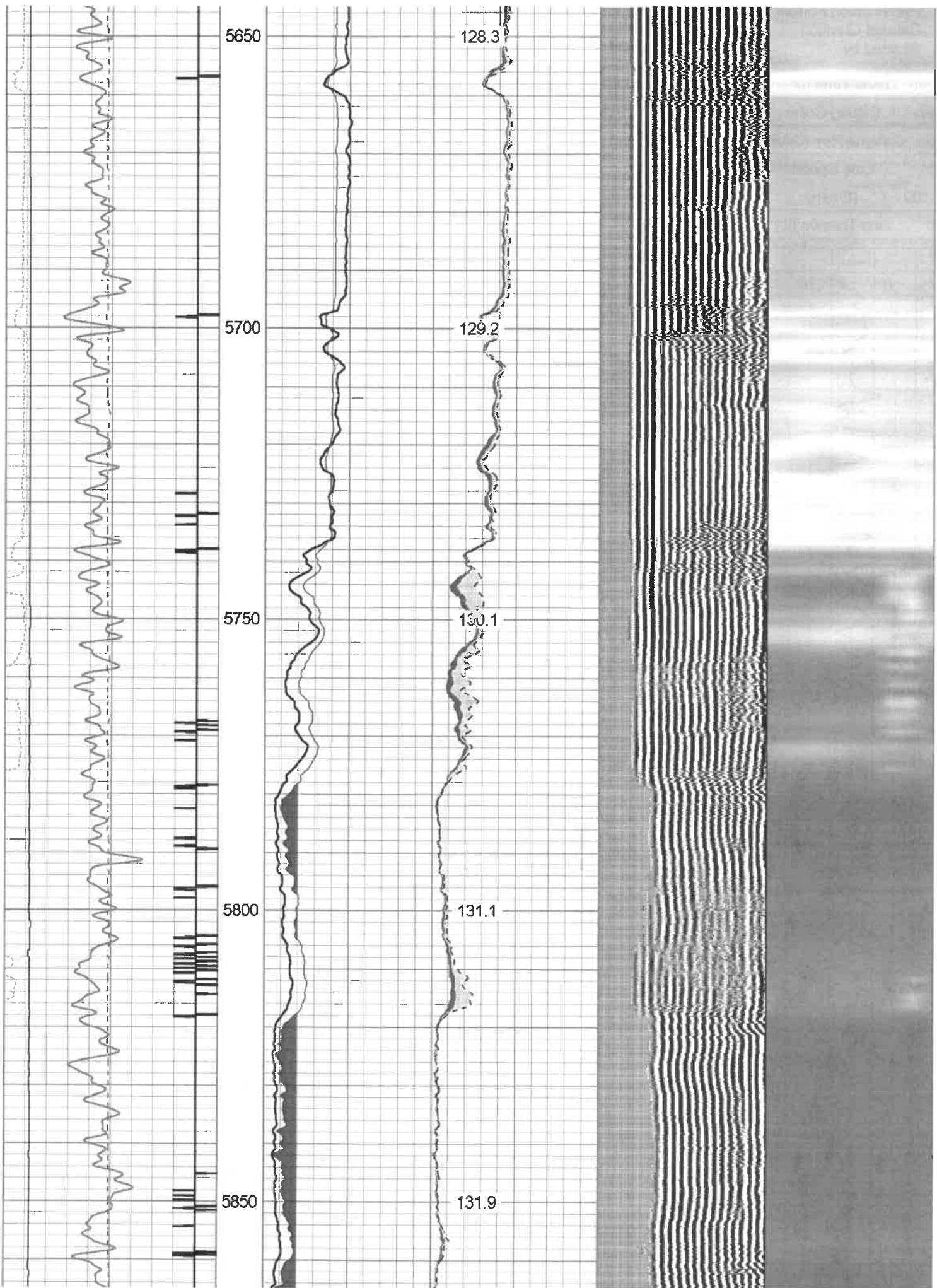


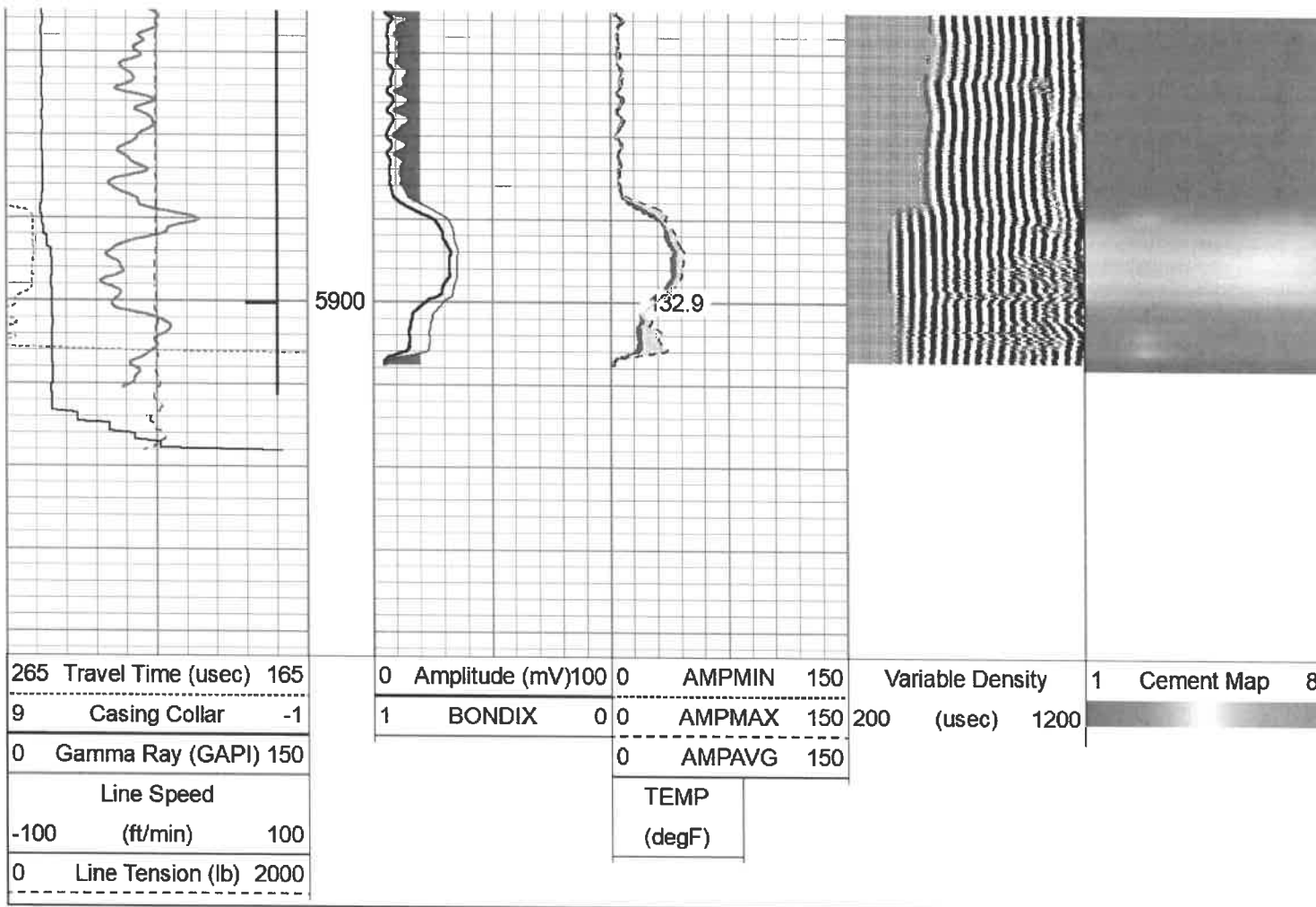
Repeat Pass 1,500 PSI

Database File antero_elk_fork_cheat_1h_rcbl_18_mar_2021.db
 Dataset Pathname rabbit_ears/cheat_1h/run1/pass2
 Presentation Format sub-band index for output 4000

265	Travel Time (usec)	165	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										







Log Variables

Database: C:\ProgramData\Warrior\Data\antero_elk_fork_cheat_1h_rcbl_18_mar_2021.db
 Dataset: rabbit_ears/cheat_1h/run1/pass4/_vars_

Top - Bottom

BHTEMP_Src	BOREID	BOTTEMP	CASEOD	CASETHCK	CASEWGHT	MAXAMPL	MINAMPL
	in	degF	in	in	lb/ft	mV	mV
TEMP	8.5	146	5.5	0.415	23	71.9	3.4
MINATTN	PERFS	PPT	SRFTEMP	TDEPTH			
db/ft		uSec	degF	ft			
9.6	No	260	58	6665			

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_elk_fork_cheat_1h_rcbl_18_mar_2021.db
 Dataset Pathname rabbit_ears/cheat_1h/run1/pass4
 Dataset Creation Thu Mar 18 15:26:48 2021

Gamma Ray Calibration Report

Serial Number: FW1211-86
 Tool Model: Probe
 Performed: Wed Jan 20 08:05:30 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: 59.283 ft

Master Calibration, performed Thu Mar 18 09:09:29 2021:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.020	0.990	3.400	71.921	67.873	4.751
CAL	0.064	1.065				
5'	-0.020	0.868	3.400	71.921	77.152	4.921
SUM						
S1	-0.011	1.039	0.000	100.000	95.301	1.025
S2	-0.019	1.065	0.000	100.000	92.192	1.788
S3	-0.020	1.088	0.000	100.000	90.251	1.842
S4	-0.020	1.046	0.000	100.000	93.843	1.880
S5	-0.021	0.976	0.000	100.000	100.350	2.059
S6	-0.021	0.917	0.000	100.000	106.626	2.235
S7	-0.021	0.890	0.000	100.000	109.737	2.285
S8	-0.021	0.933	0.000	100.000	104.866	2.177

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.064	1.065	1.000	0.000

Air Zero Calibration, performed Thu Mar 18 08:40:59 2021:

	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	

Cursor	Start (ft)	Component	Description	Length (ft)	O.D. (in)	Weight (lb)
HeadVolt	16.86		CHD-Titan Titan 1 7/16" GO Cablehead	1.00	1.44	5.00
Temp	14.02		CENT-Overbody Antelope (SP-919-0233)	1.67	4.88	5.00
WVFS8	11.78		RBT-Probe275T (FW1312-32) Probe 2.75" Radial with Integral Temperature Sub	9.39	2.75	90.00
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					
CCL	6.63					
GR	5.29		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-Titn275Adj Titan 2 3/4" Adjustable Centralizer	2.75	2.75	35.00

Dataset: antero_elk_fork_cheat_1h_rcbl_18_mar_2021.db: rabbit_ears/cheat_1h/run1/pass4
 Total length: 17.92 ft
 Total weight: 197.00 lb
 O.D.: 4.88 in



Nine

Company	ANTERO	
Well	Elk Fork Cheat 1H	
Field	RABBIT EARS	
County	TYLER	
State	WEST VIRGINIA	Country USA