



**Segmented Radial Cement Bond  
W/Gamma Ray, CCL  
Log**

Company: Antero Resources Corporation		Country: USA	
Well: GALT 2H	Field: Marcellus	Company: Antero Resources Corporation	Well: GALT 2H
County: TYLER	State: WV	Field: Marcellus	Field: Marcellus
Location: State: WV		County: TYLER	County: TYLER
Country: USA		State: WV	State: WV
Country: USA		Country: USA	Country: USA
API #: 47095025620000		Other Services API A05131	
SEC	TWP	RGE	Elevation
Permanent Datum	Ground Level	Elevation	K.B. D.F. G.L.
Log Measured From	R.K.B. 30'		
Drilling Measured From	R.K.B.		
Date	17-DEC-2019		
Run Number	ONE		
Depth Driller	14869'		
Depth Logger	6520'		
Bottom Logged Interval	6520'		
Top Log Interval	Surface		
Open Hole Size	8.25"		
Type Fluid	FW		
Density / Viscosity	N/A		
Max. Recorded Temp.	134.5 DEG		
Estimated Cement Top	3910'		
Time Well Ready	N/A		
Time Logger on Bottom	N/A		
Equipment Number	214182		
Location	Bridgeport, WV		
Recorded By	P DAVIDSON		
Witnessed By	B BETCHER		
Borehole Record		Tubing Record	
Run Number	Bit	From	To
ONE	24"		
TWO	17.5"		
THREE	12.25"		
FOUR	8.25"		
Casing Record	Size	Wgt/Ft	Top
Surface String	13.375"	54.5	Surface
Prot. String	9.625"	40	Surface
Production String	5.5"	20	Surface
Liner			Bottom

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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**

Zero @ R.K.B. 30'  
Marker Joint  
Log TD 6520'  
Cement Top @ 3910'  
Log Ran Under 1500 PSI

RECEIVED  
Office of Oil and Gas  
SEP 24 2020  
WV Department of Environmental Protection



# 1500 PSI PRESSURE PASS

Database File ant\_galt2h.db  
 Dataset Pathname pass2.1  
 Presentation Format antero  
 Dataset Creation Tue Dec 17 15:32:50 2019  
 Charted by Depth in Feet scaled 1:240

280	Travel Time (usec)	180
9	Casing Collar	-1
0	Gamma Ray	180
0	TEMP (degF)	100
180	GR	360

0	Amplitude (mV)	100
0	Amp X5 (mV)	20
1	BONDIX	0

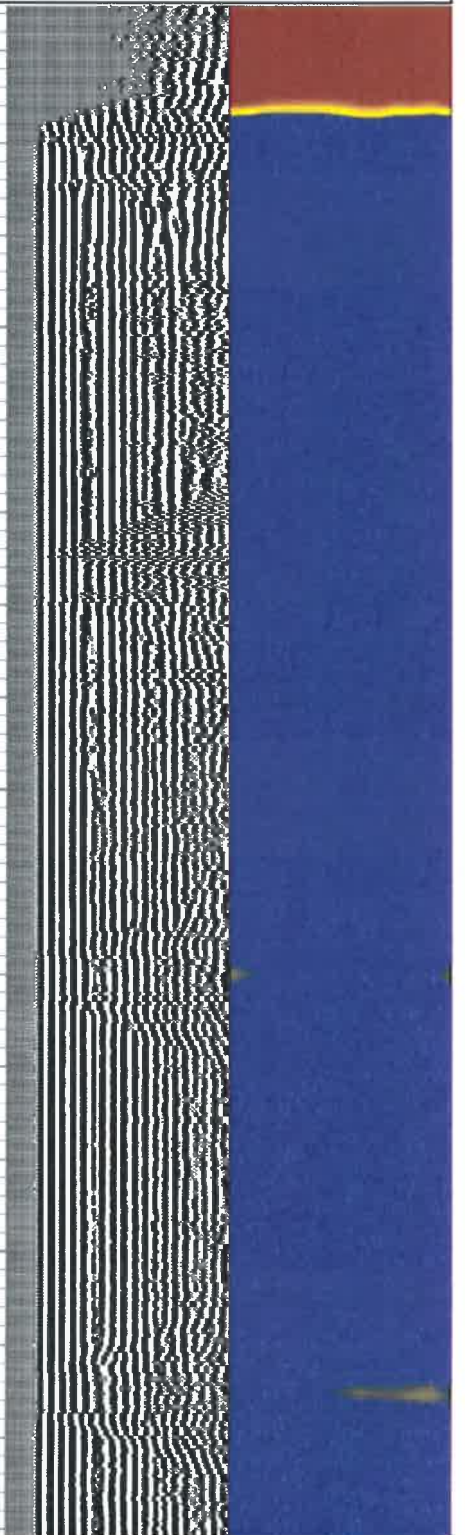
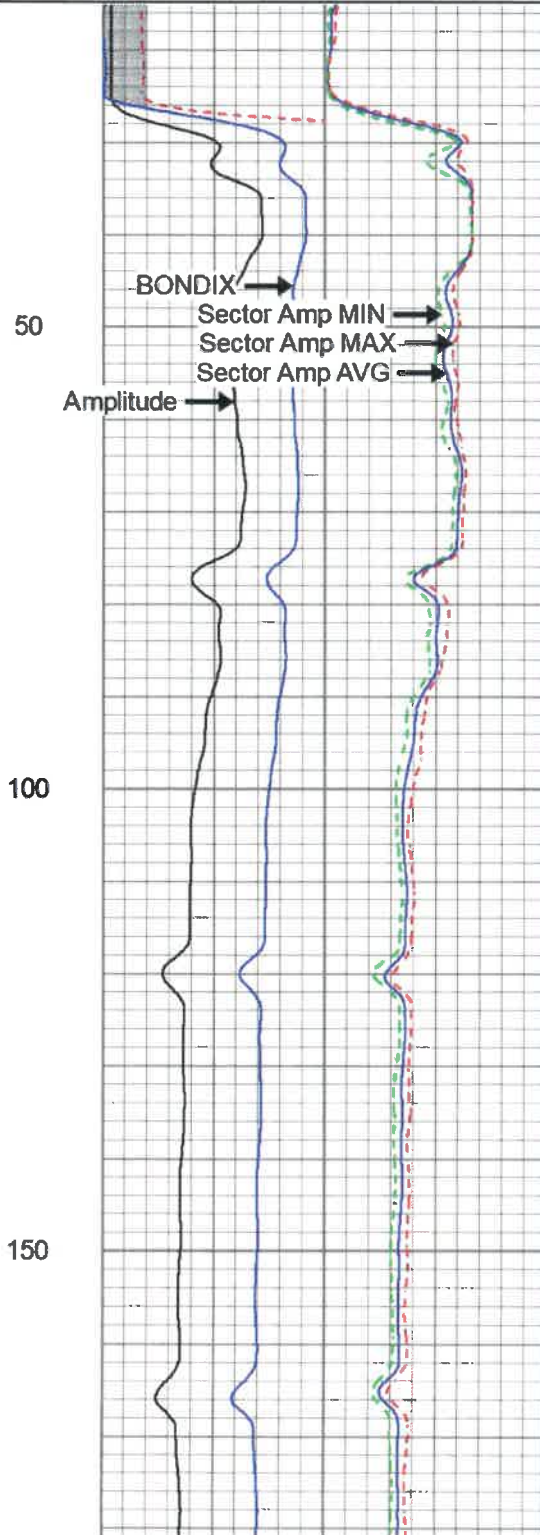
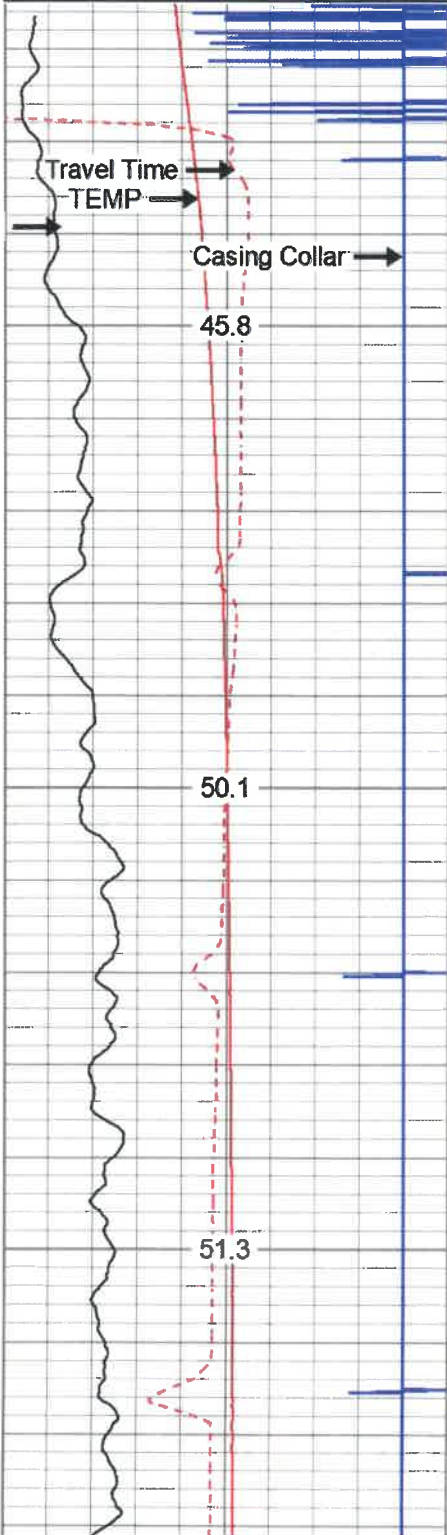
Sector Amp AVG
Sector Amp MAX
Sector Amp MIN

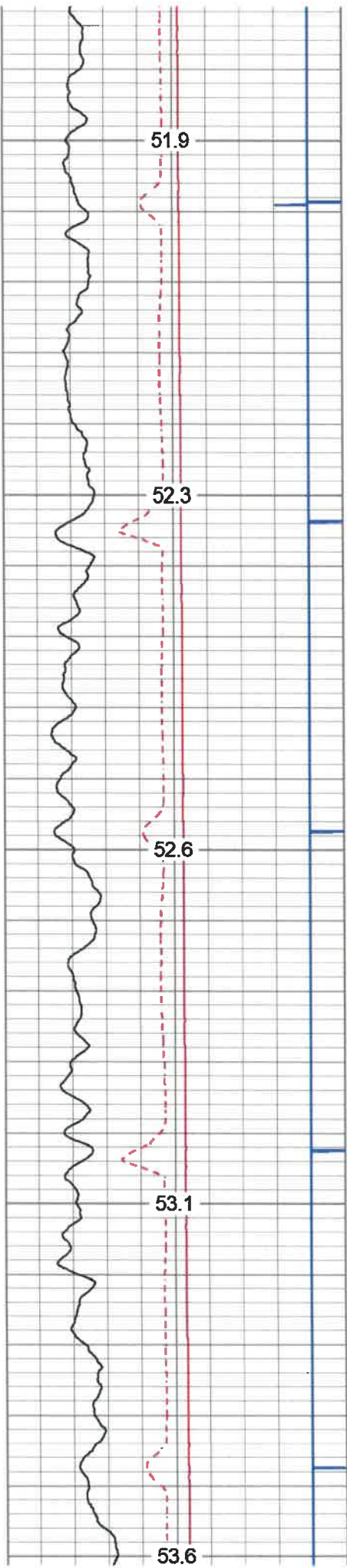
VDL 200 (usec) 1200

1 Sector Map 12



TEMP (degF)





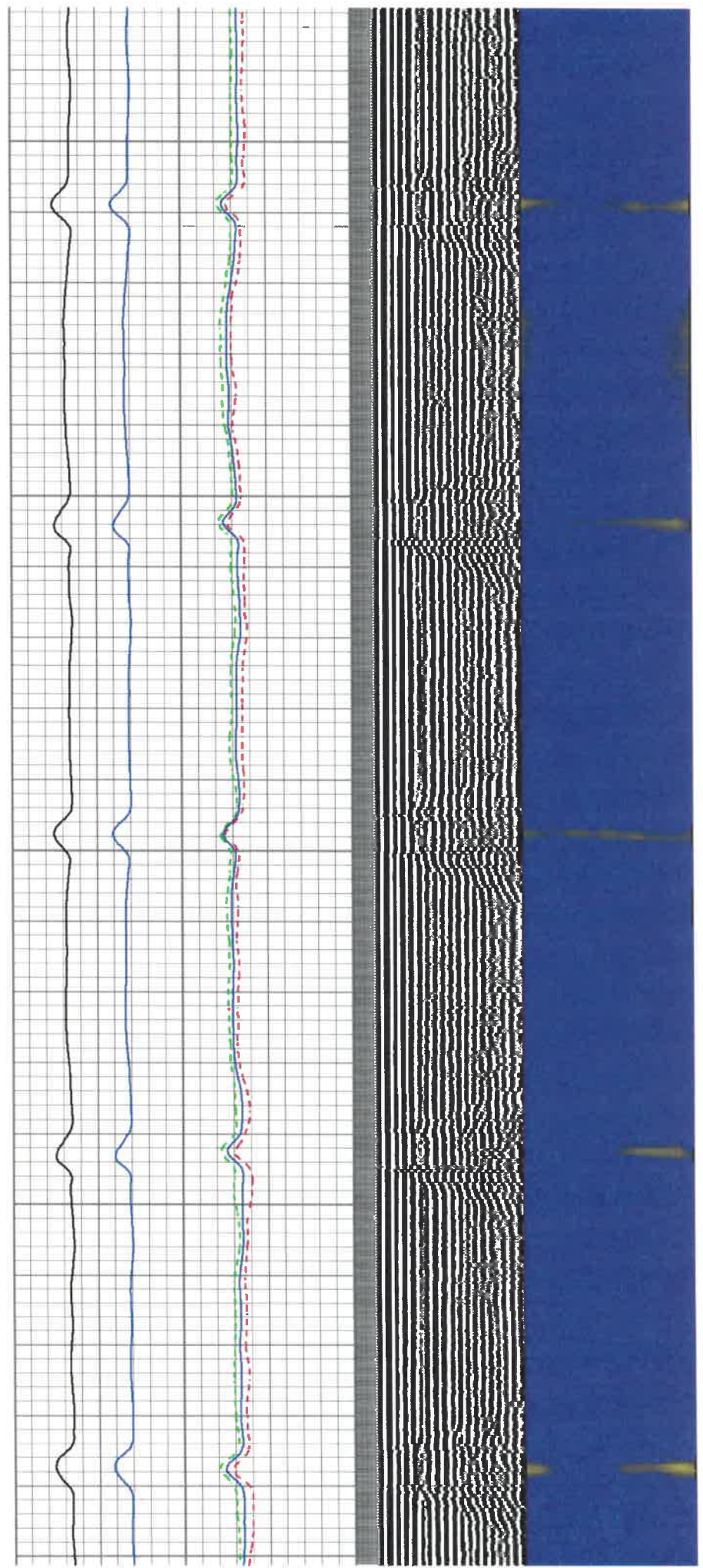
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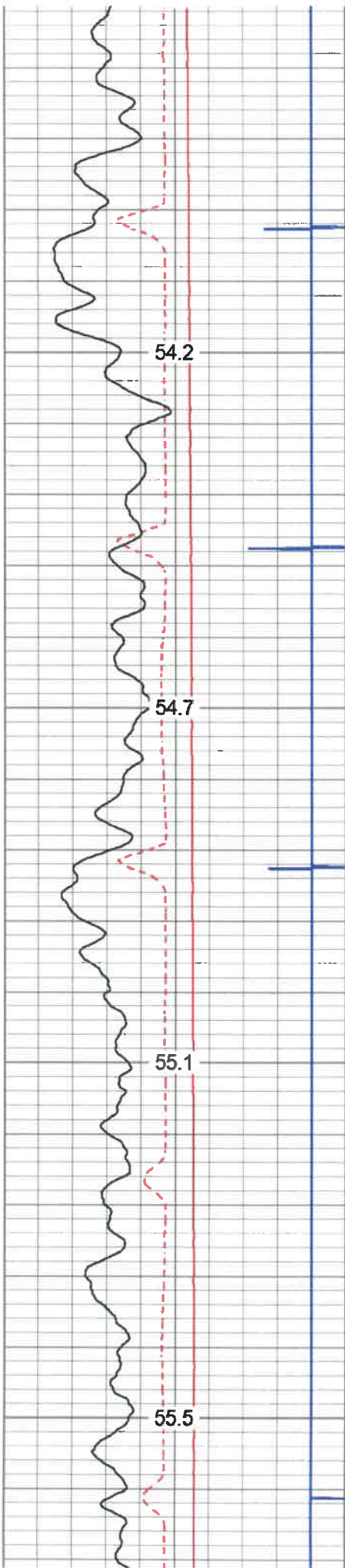
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300

350

400



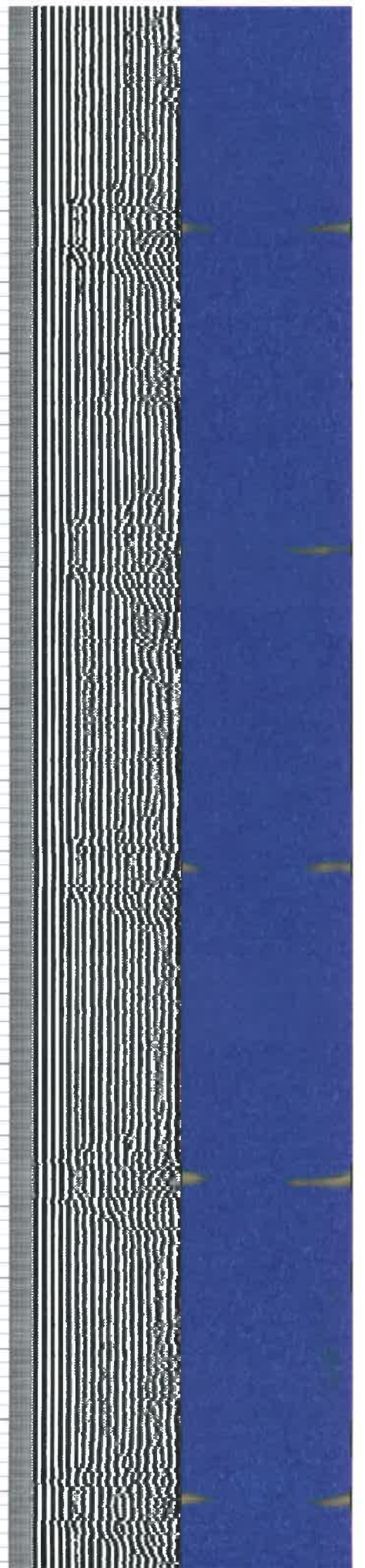
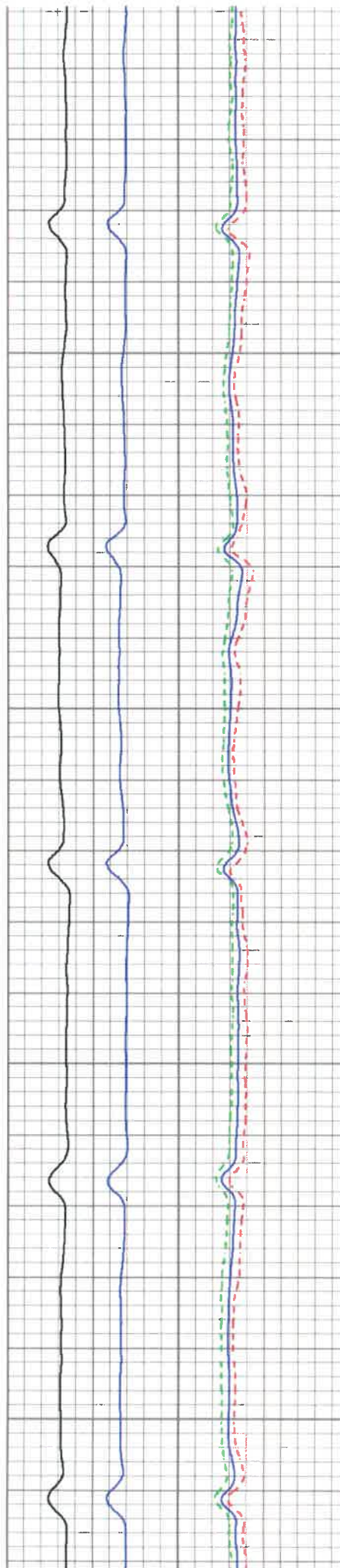


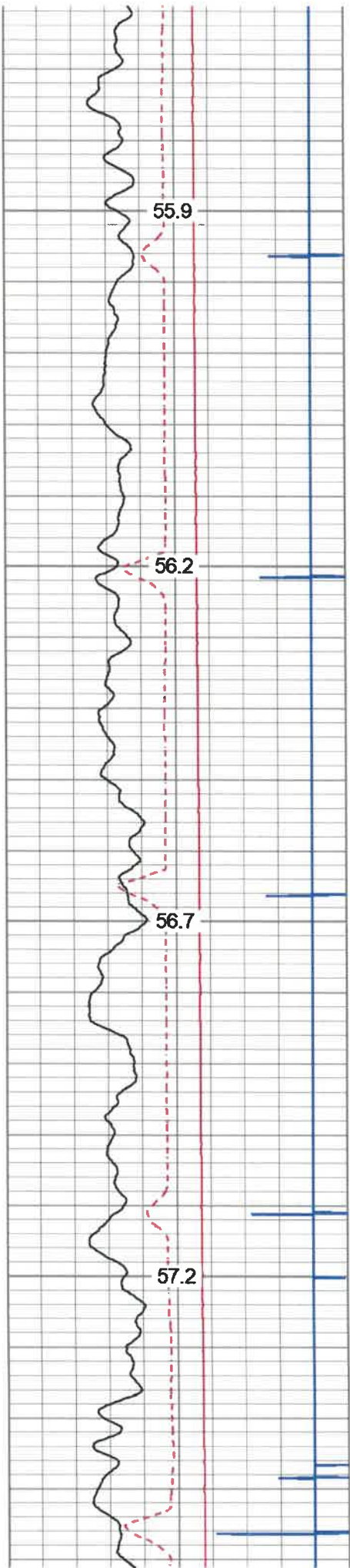
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500

550

600



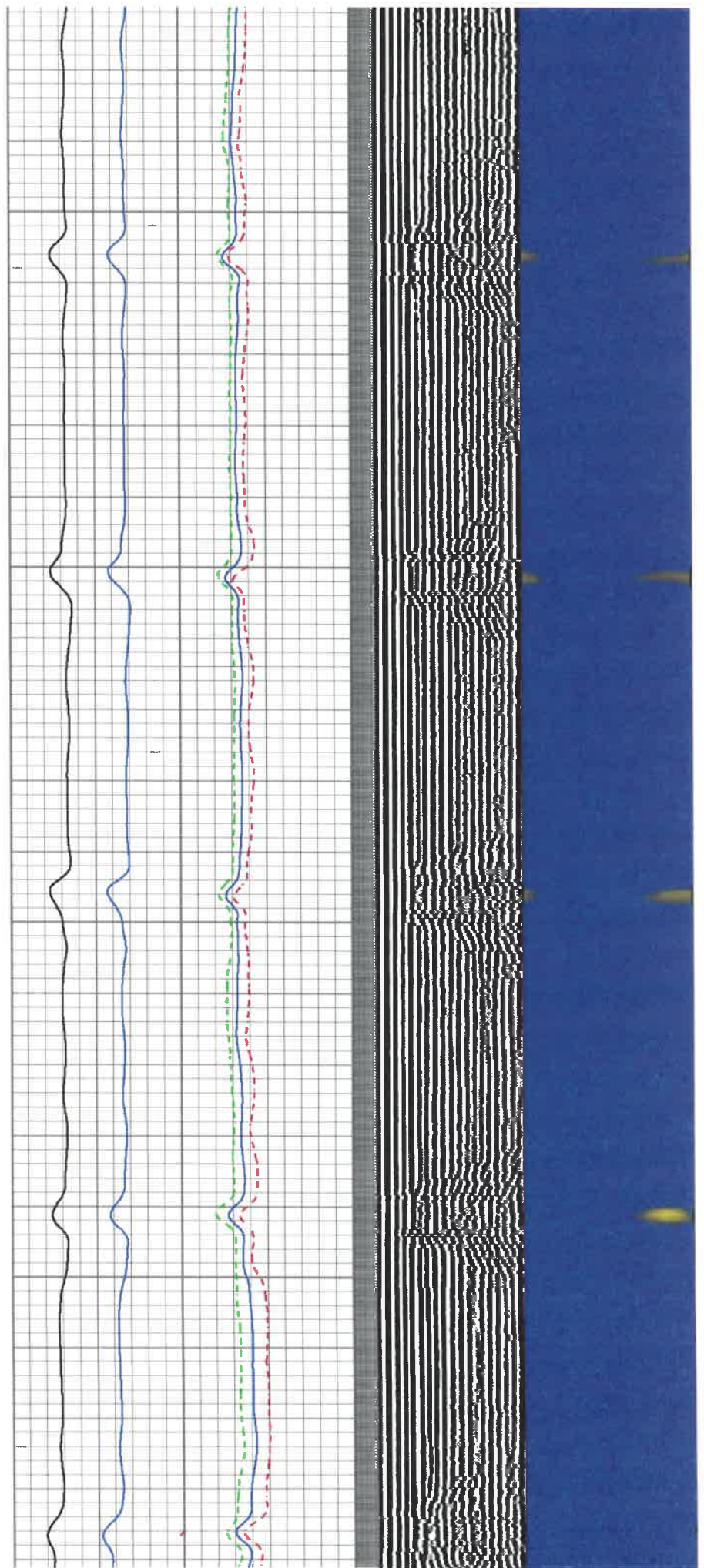


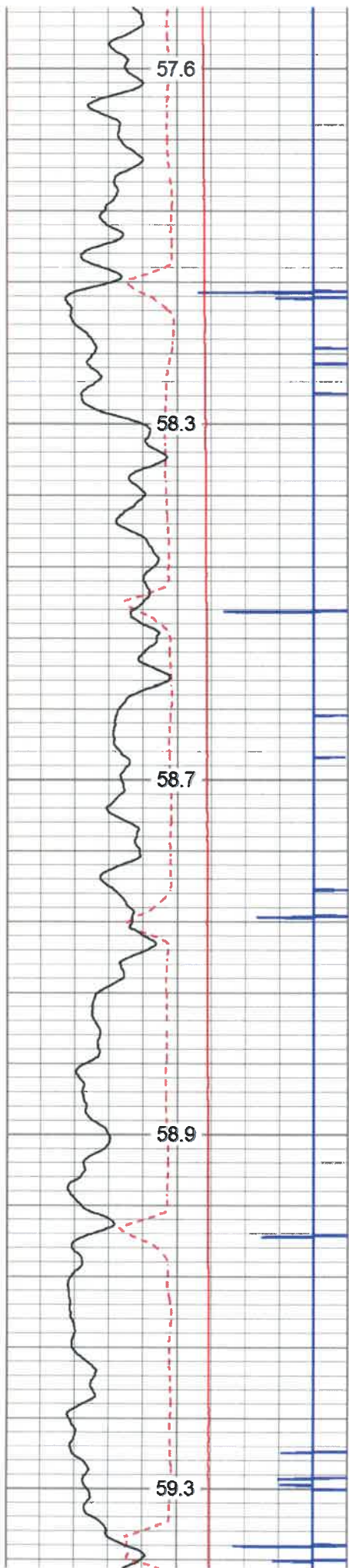
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800





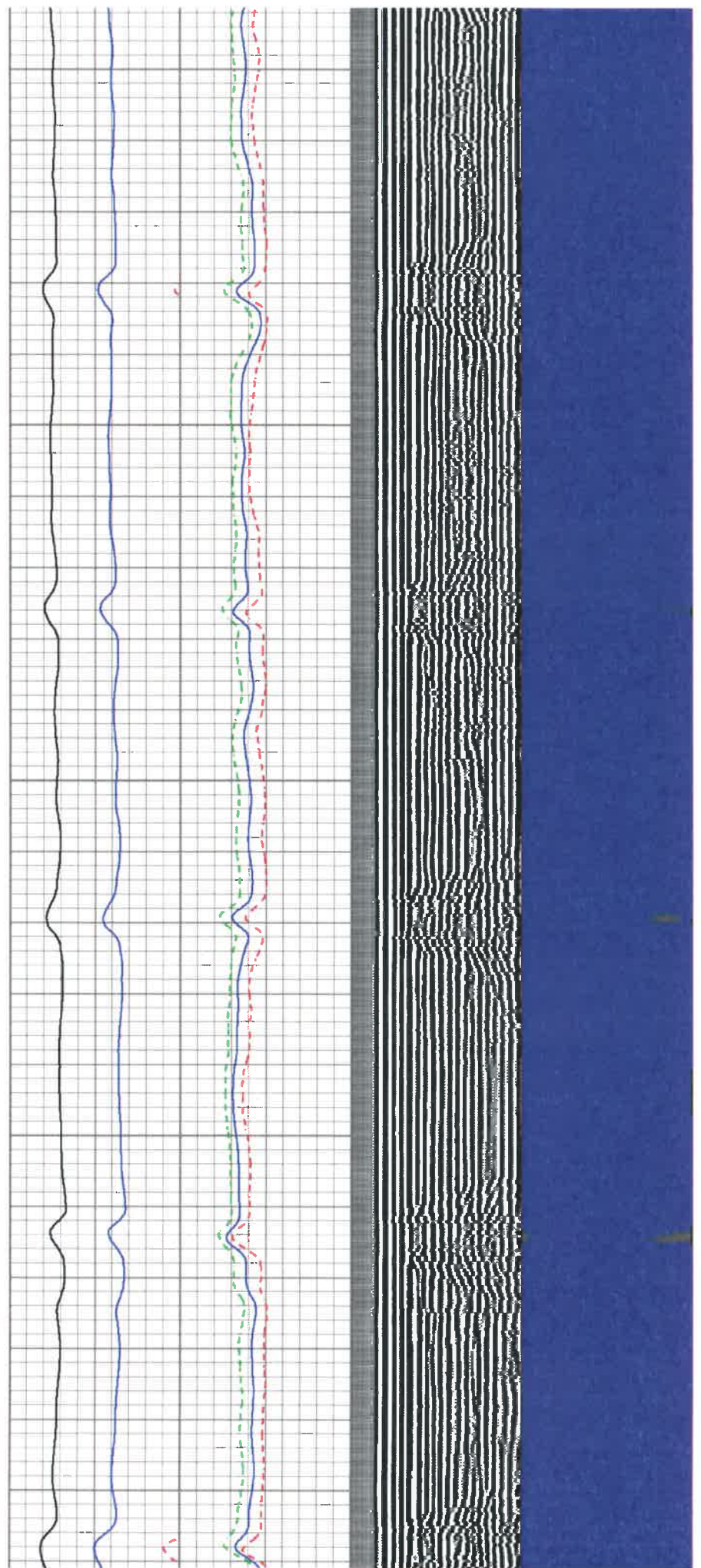
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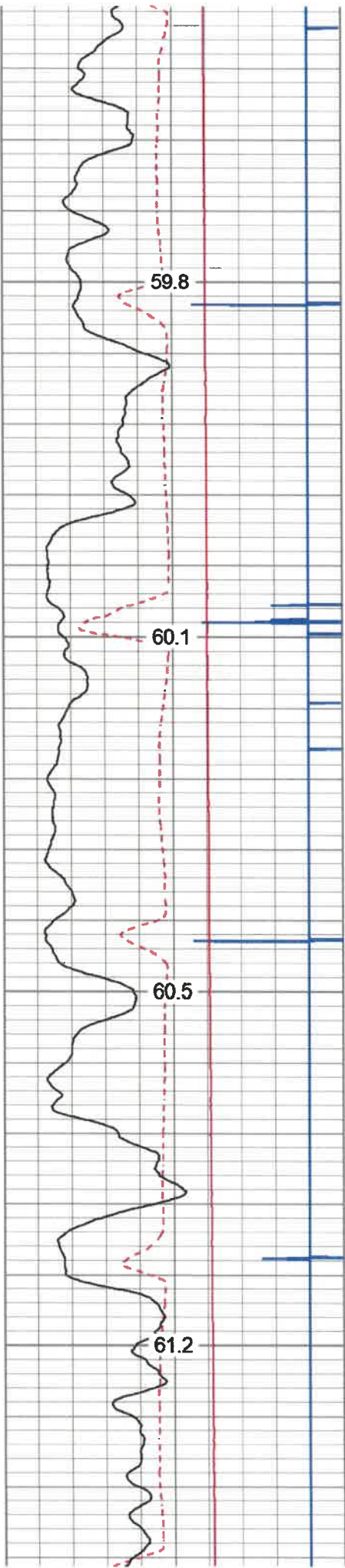
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950

1000

1050



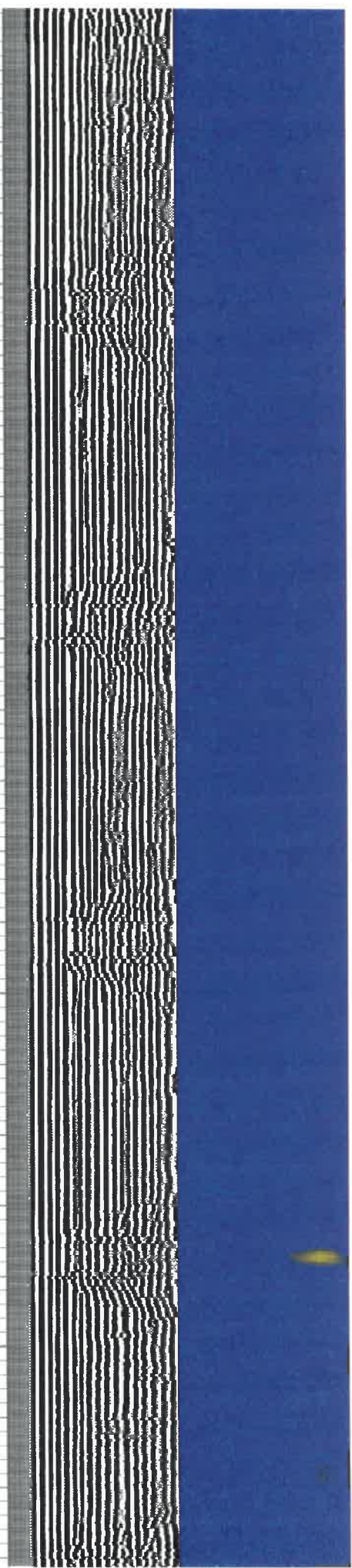
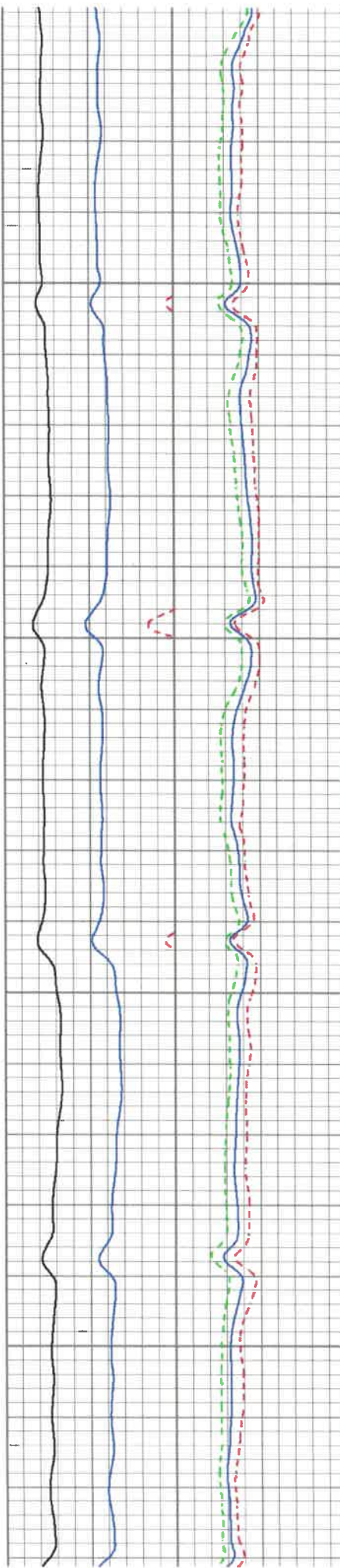


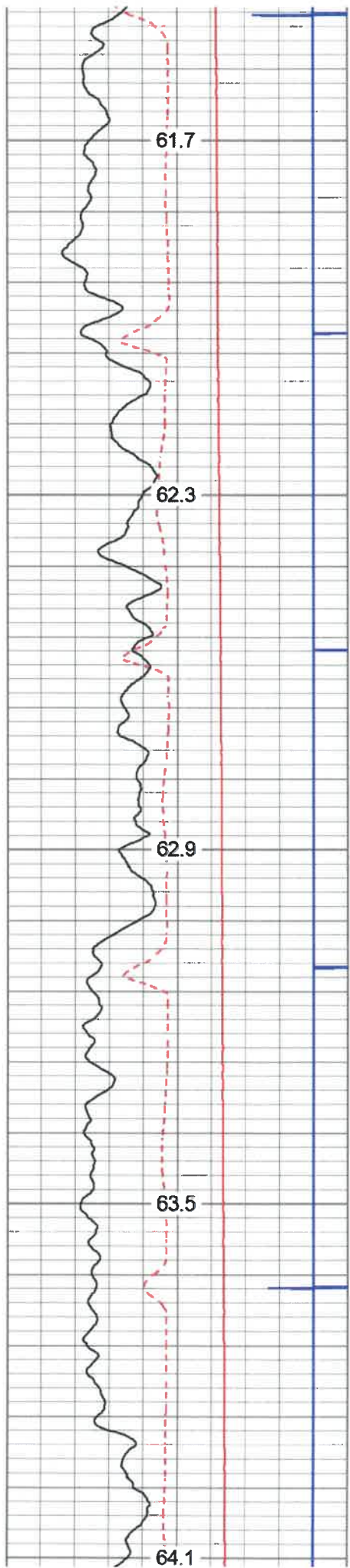
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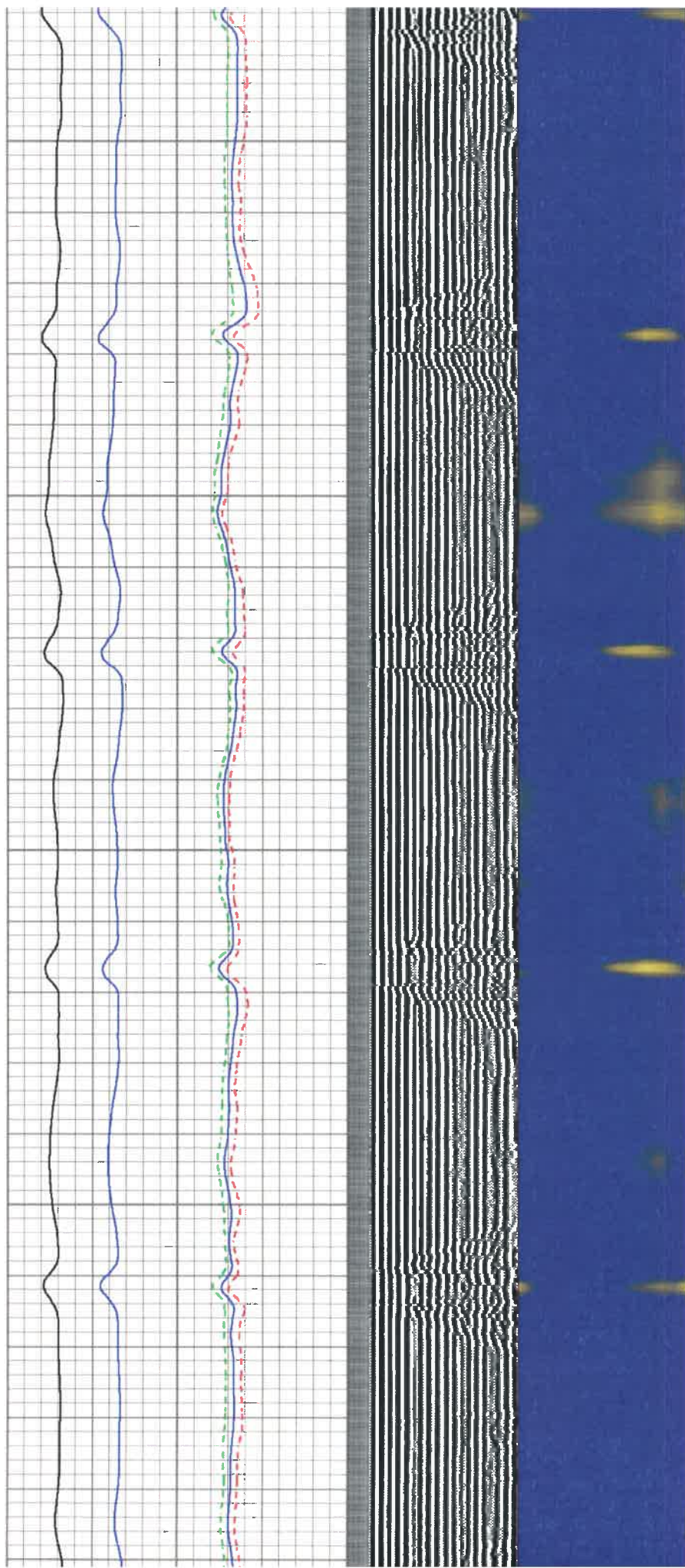
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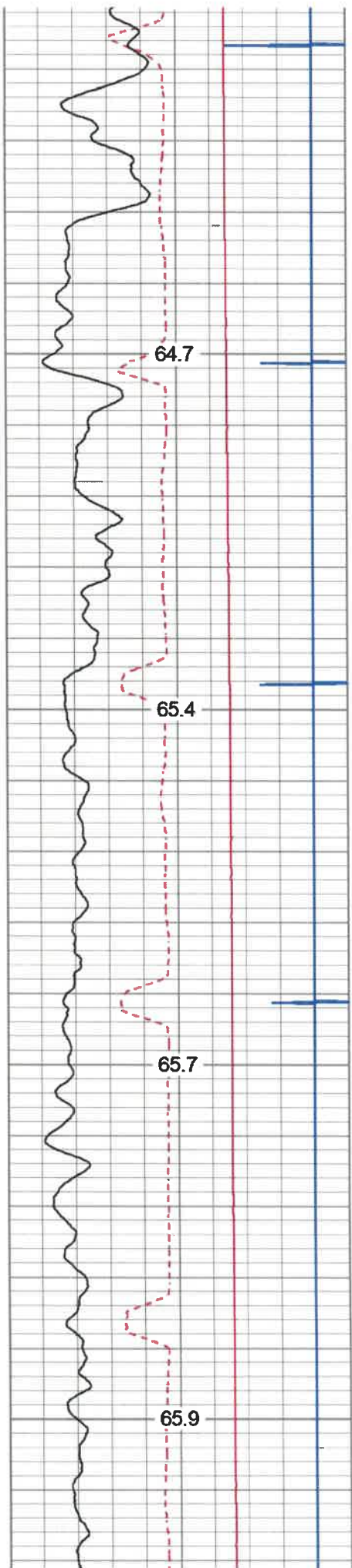




1300  
1350  
1400  
1450  
1500





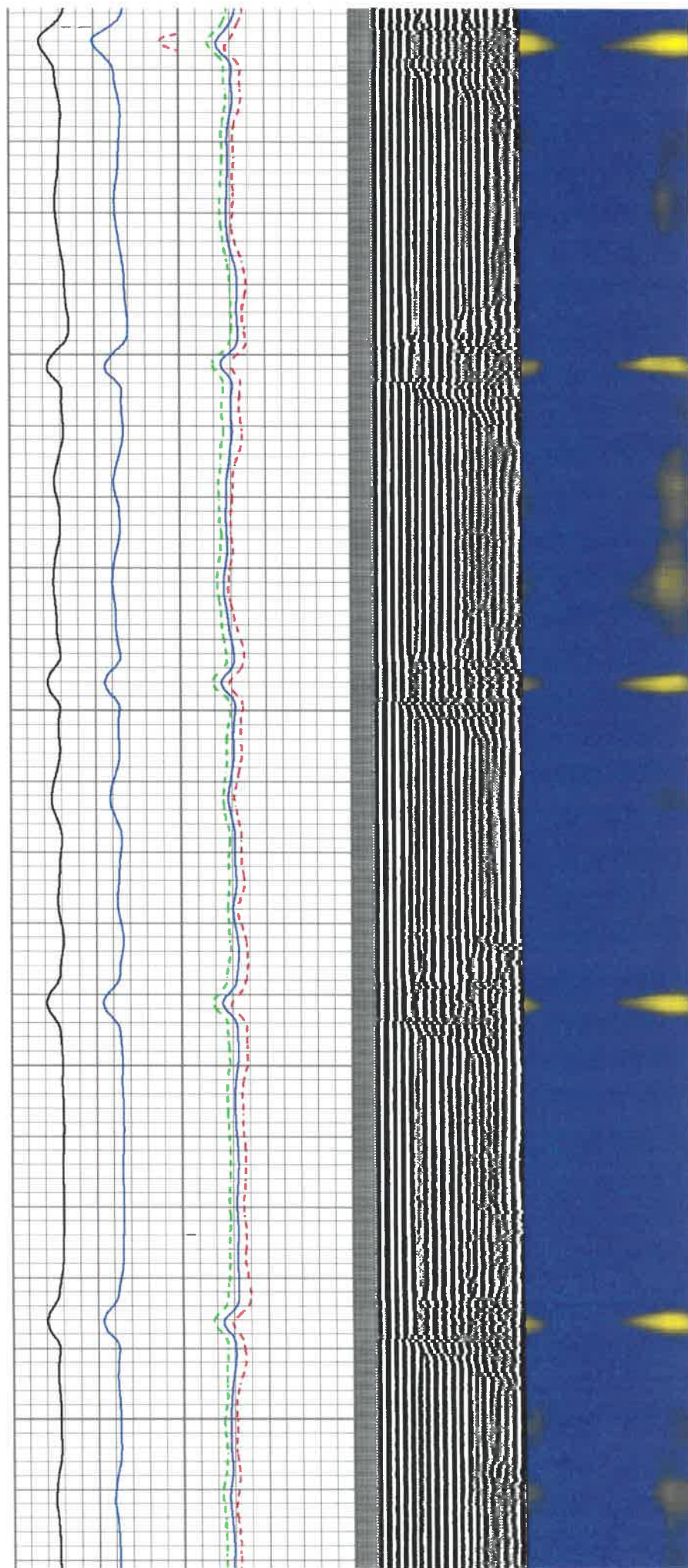


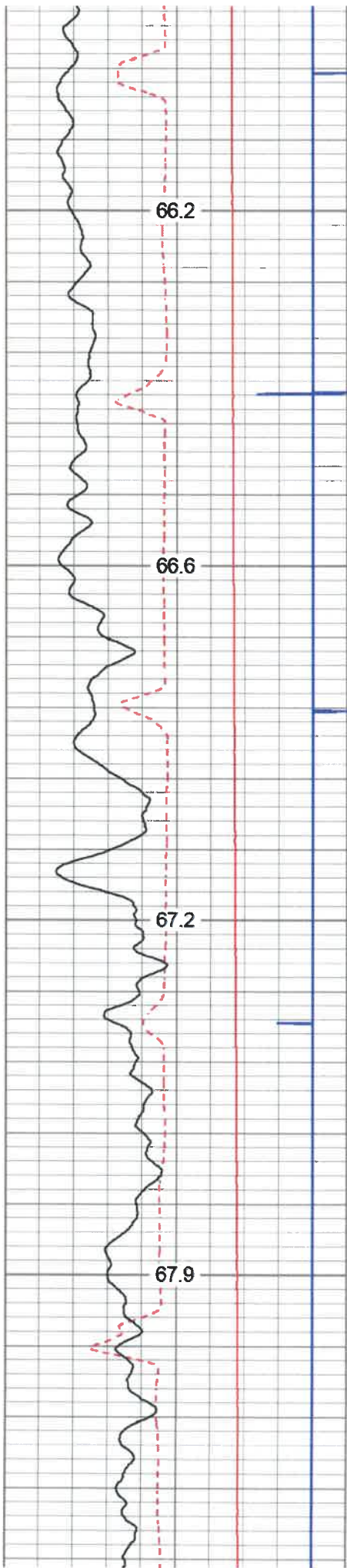
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1600

1650

1700



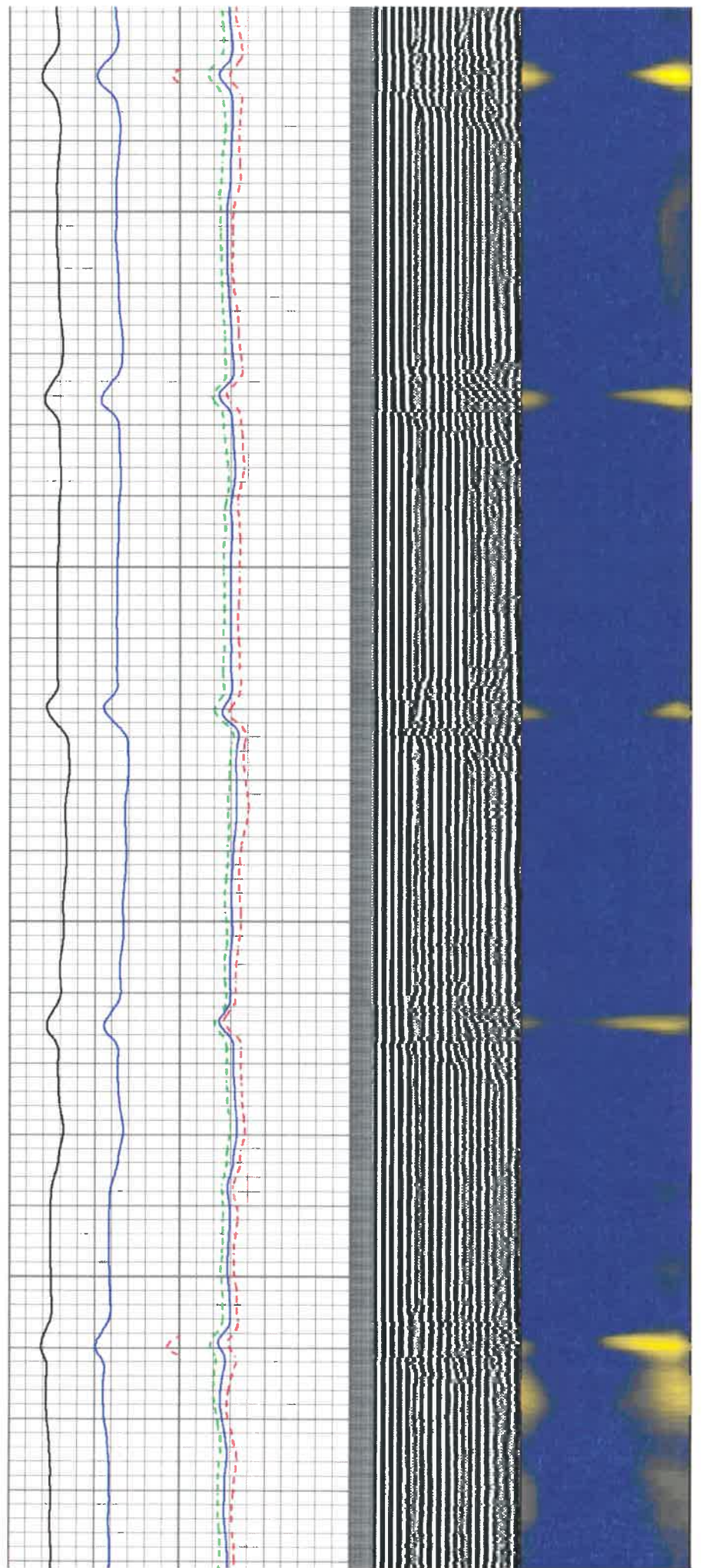


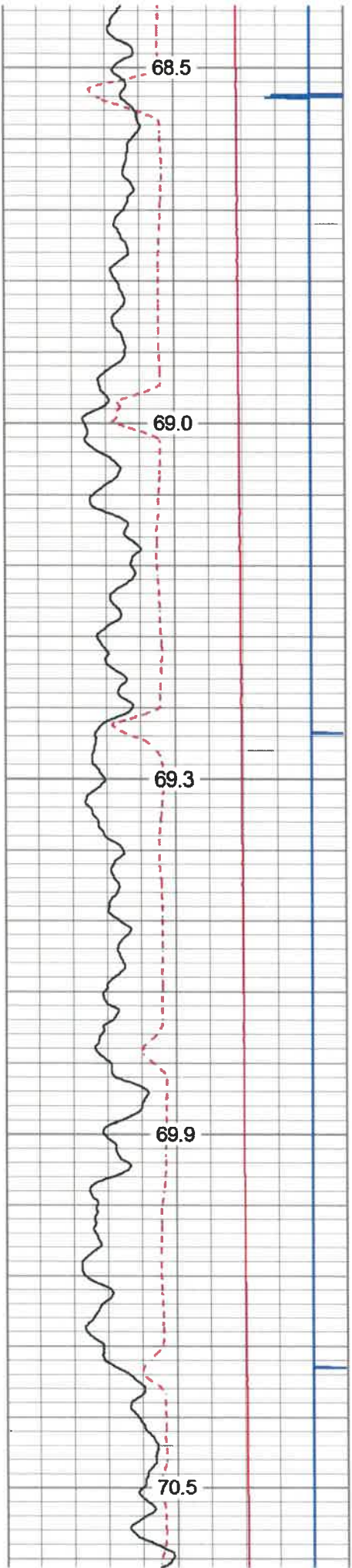
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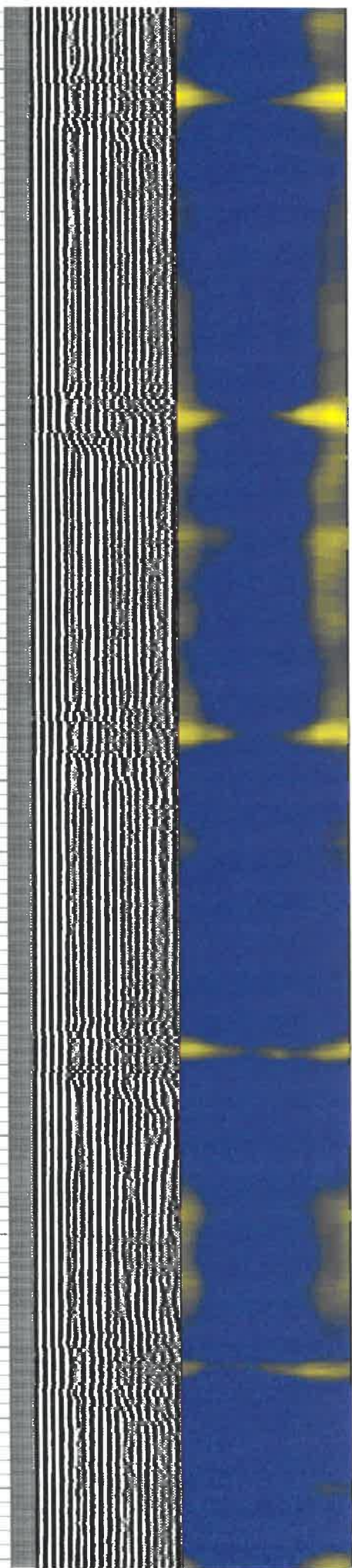
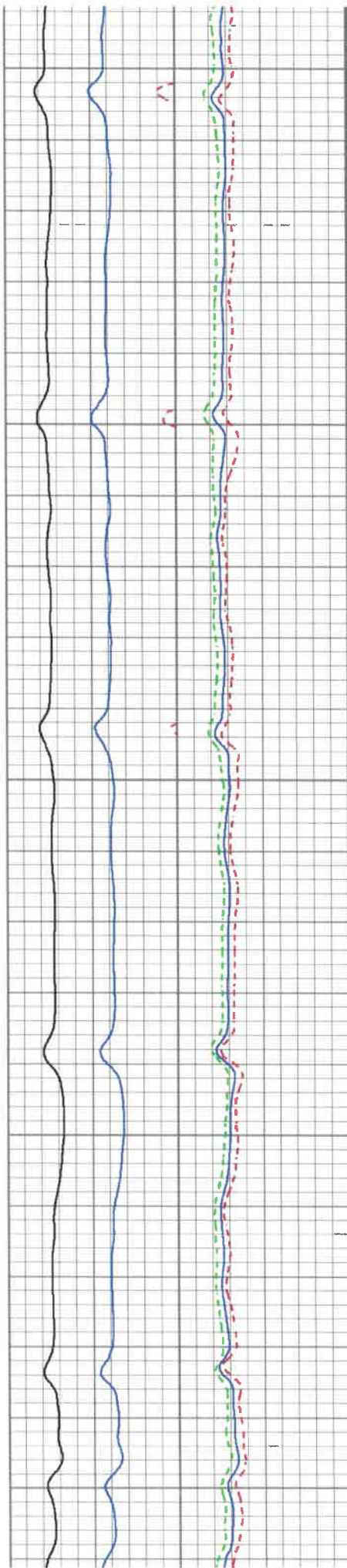
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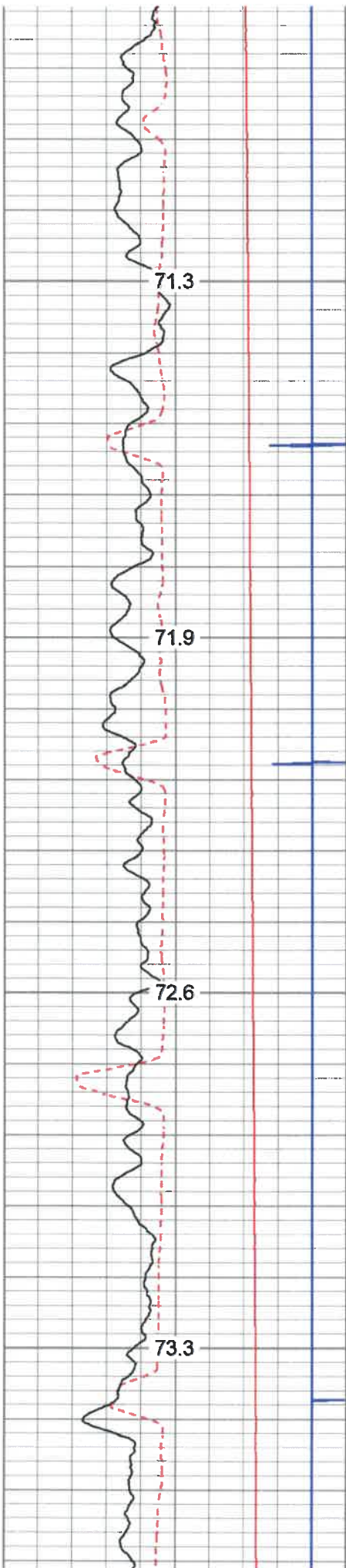
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1950  
2000  
2050  
2100  
2150



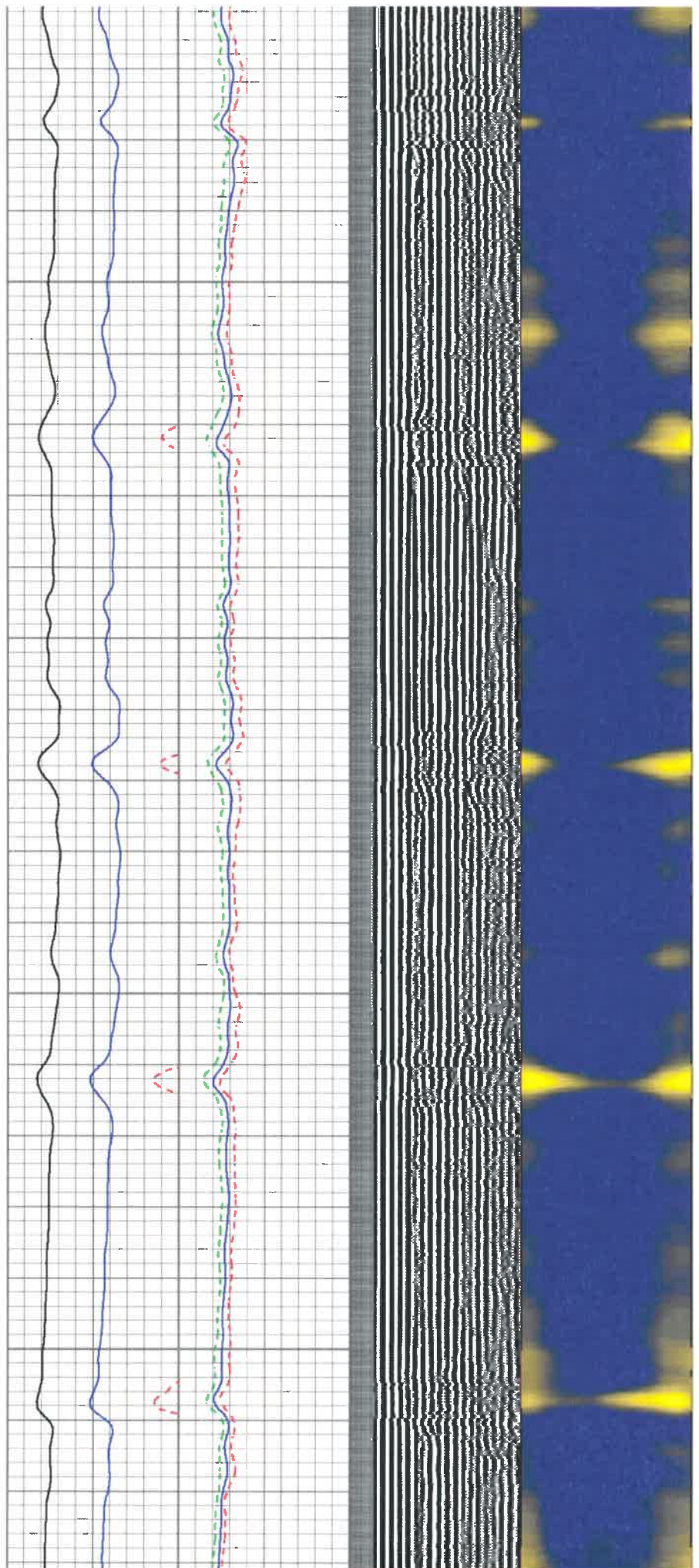


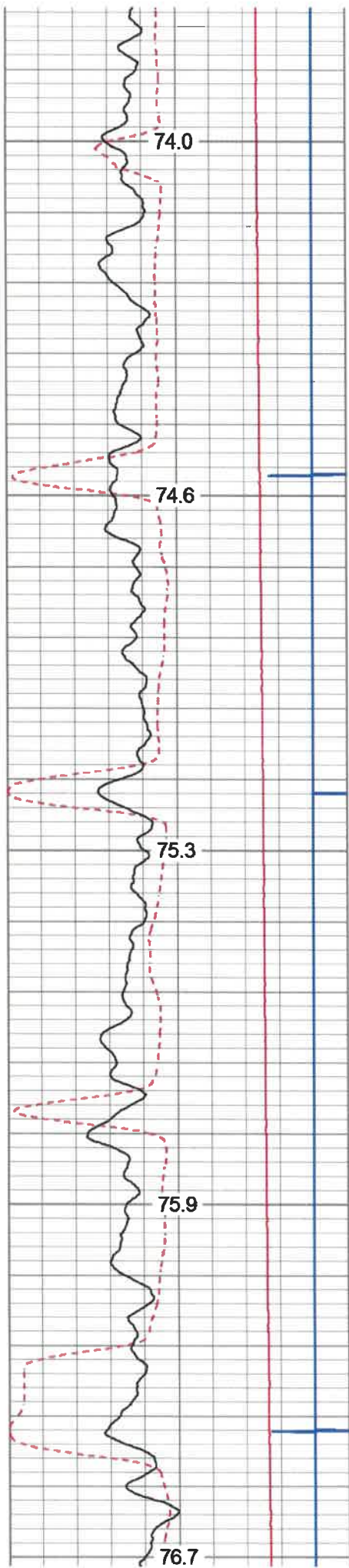
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2250

2300

2350





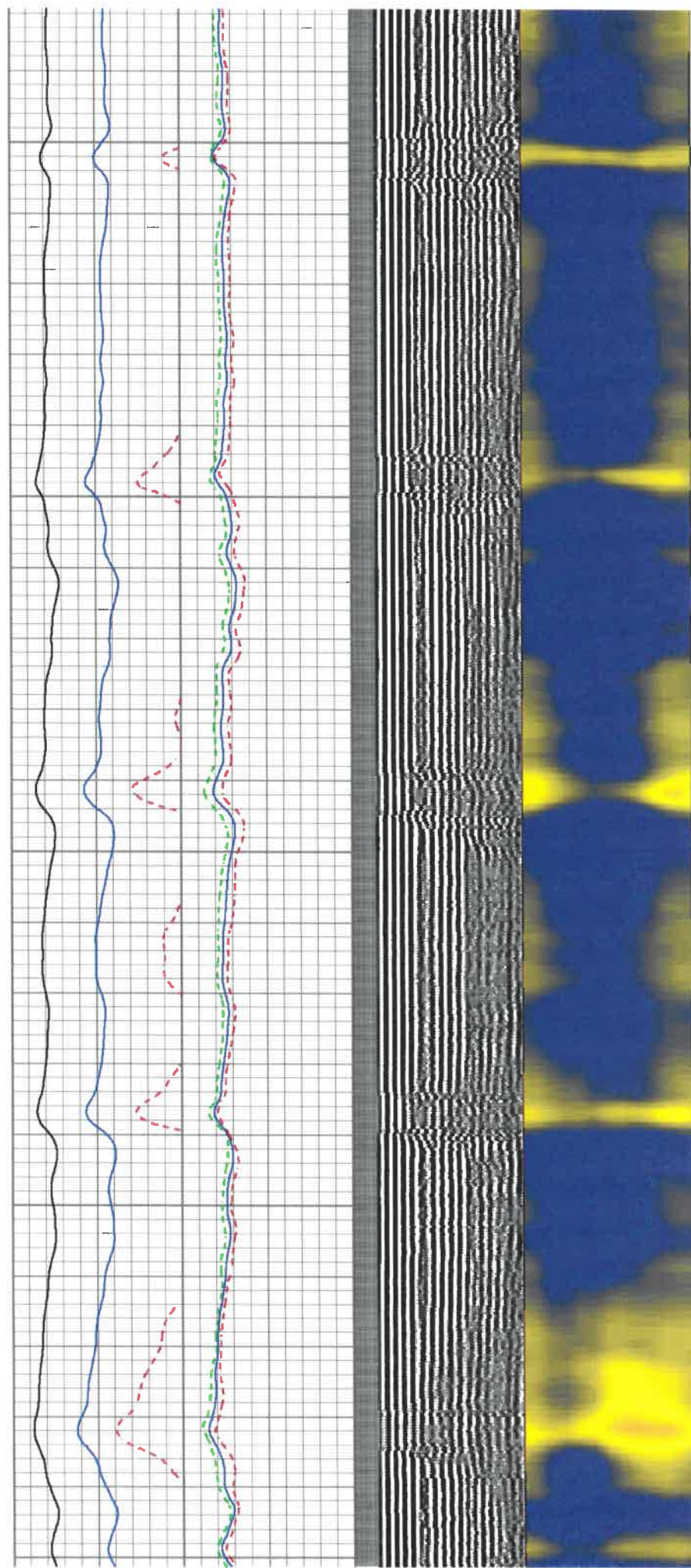
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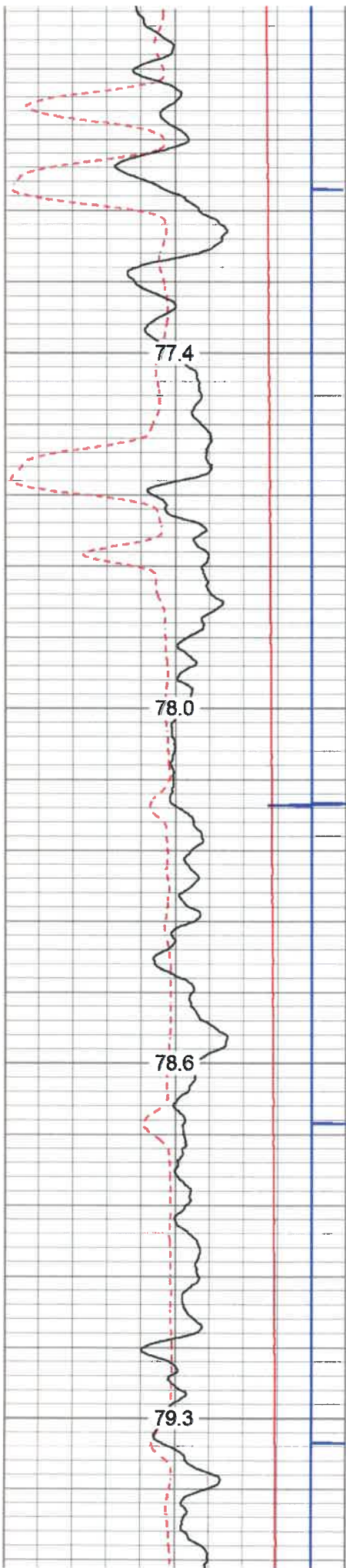
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2500

2550

2600



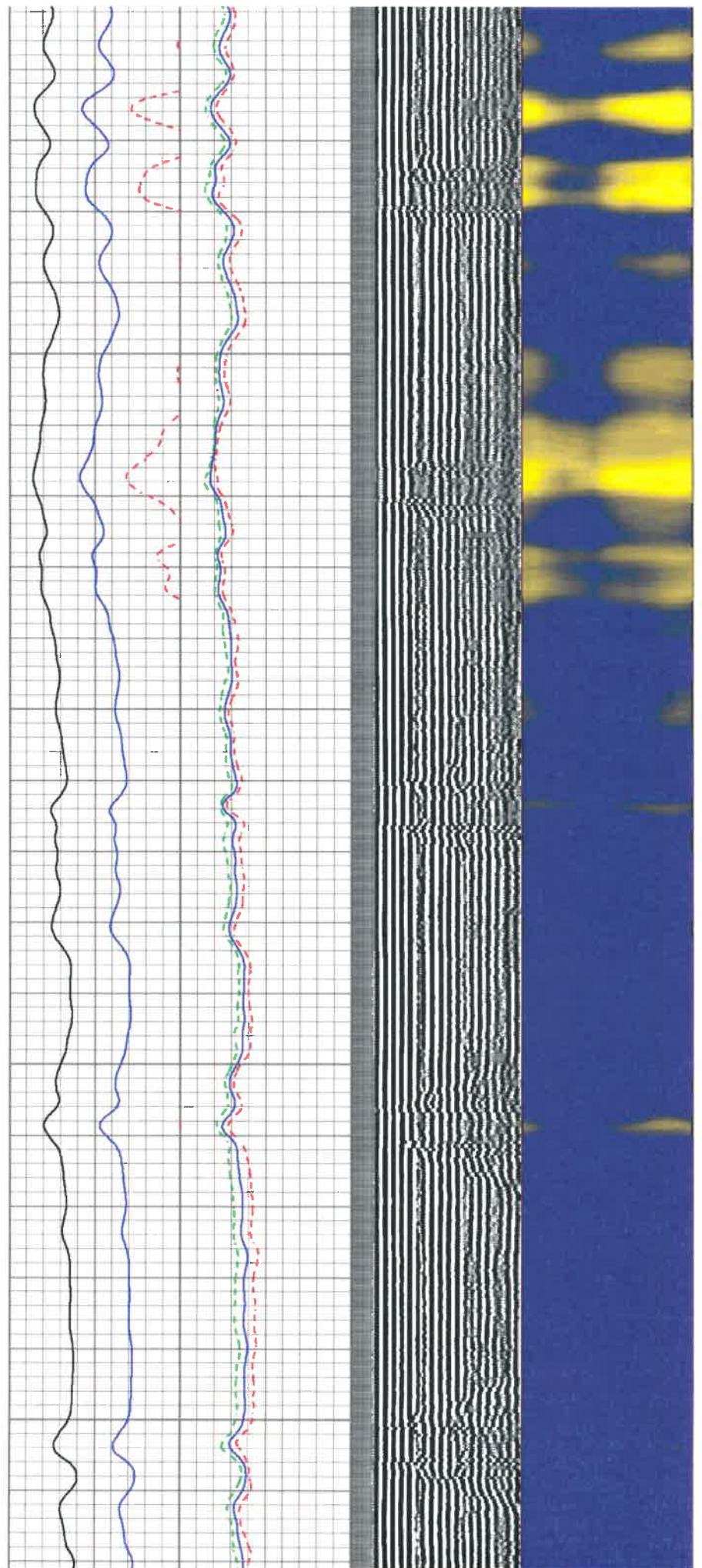


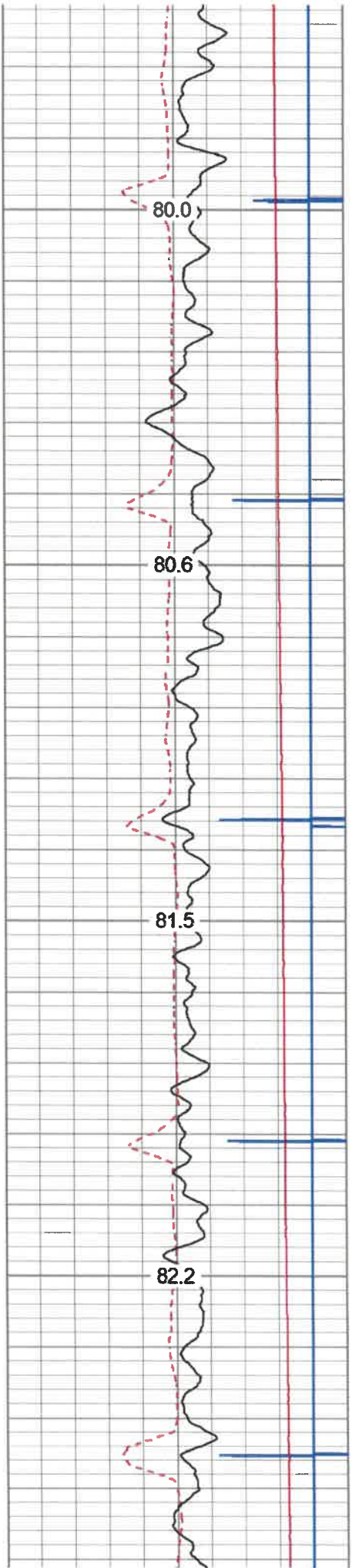
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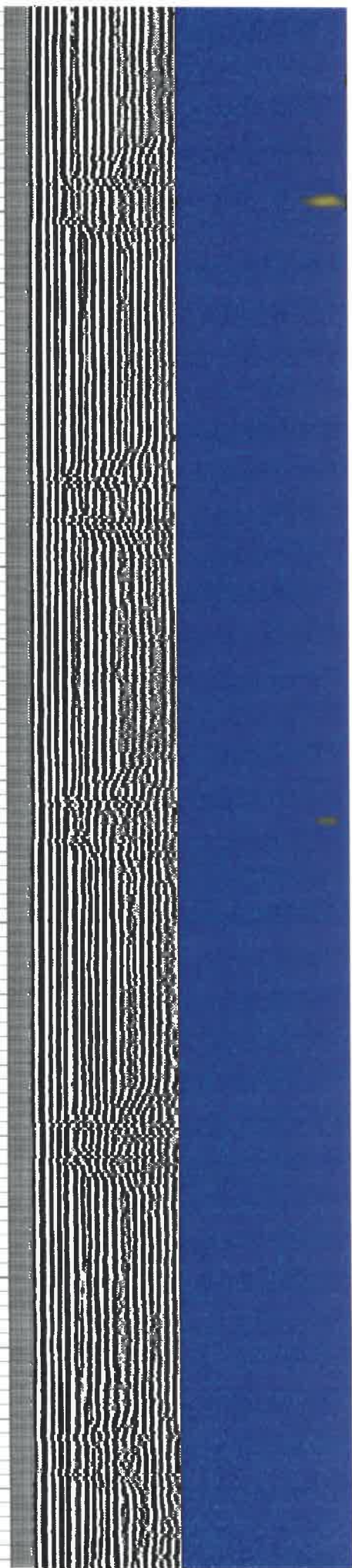
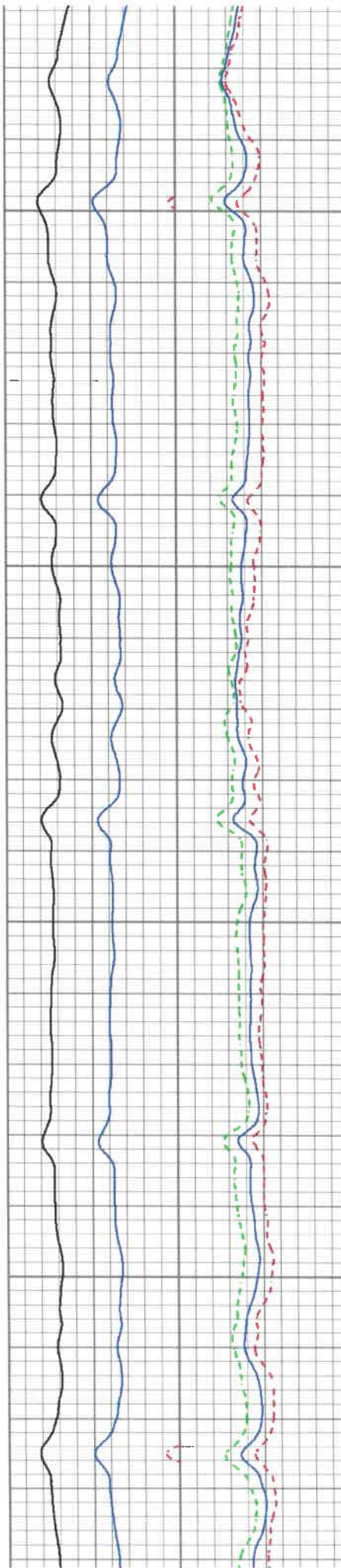
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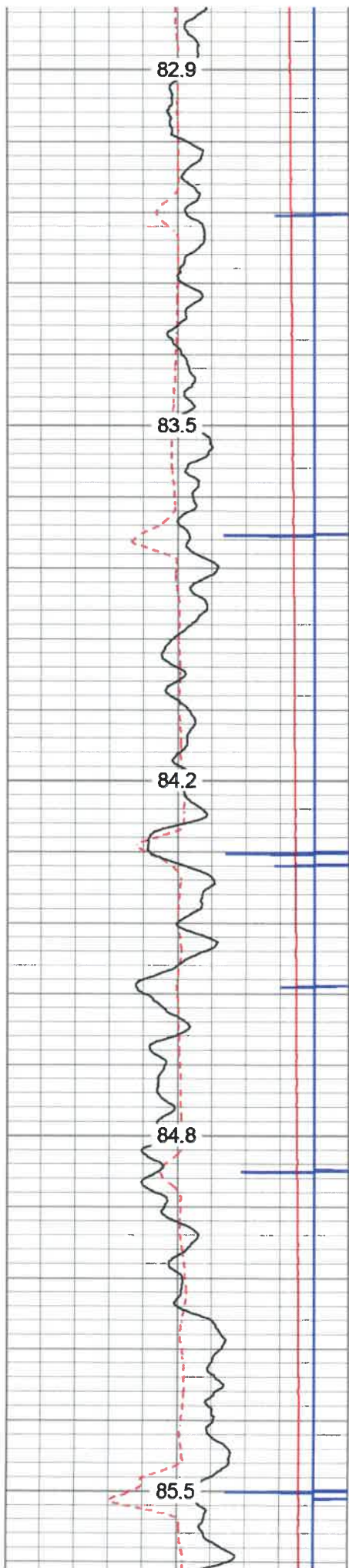
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2850  
2900  
2950  
3000





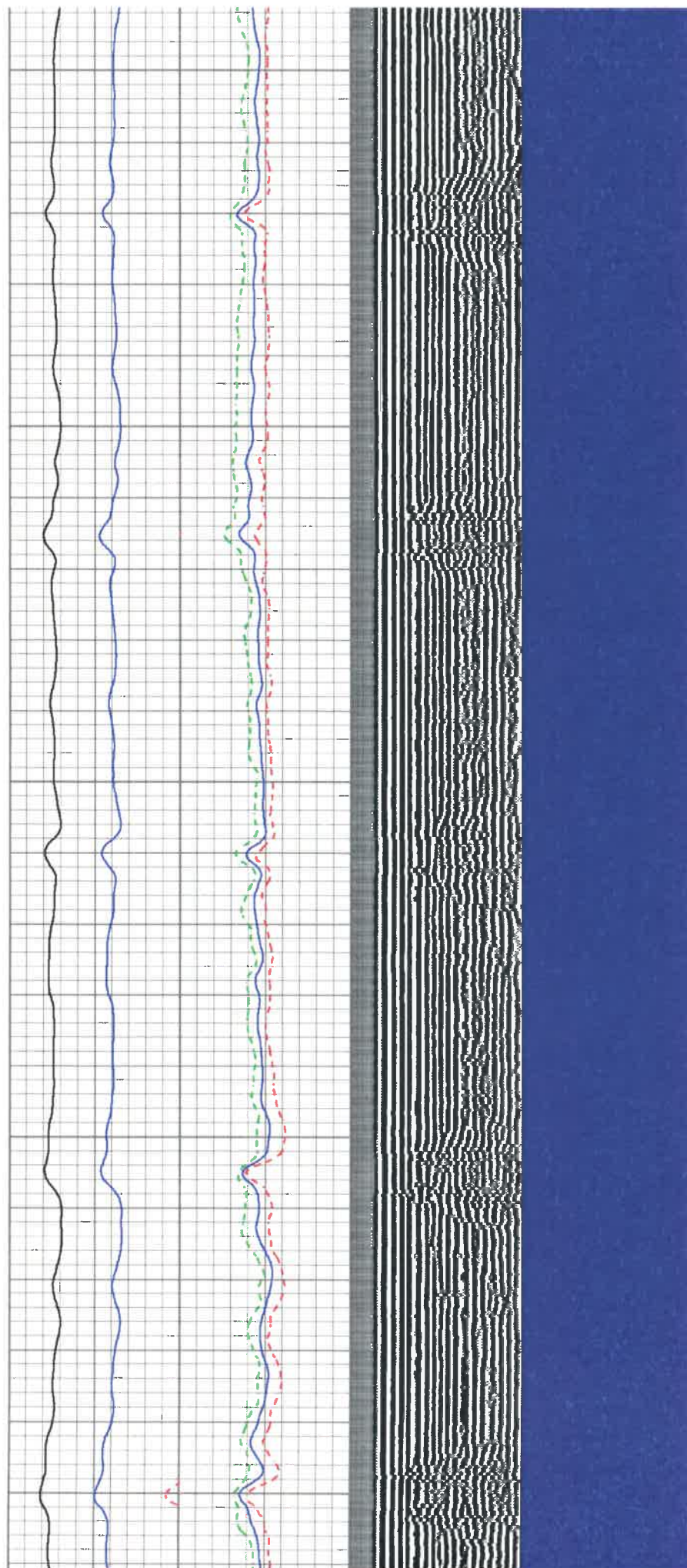
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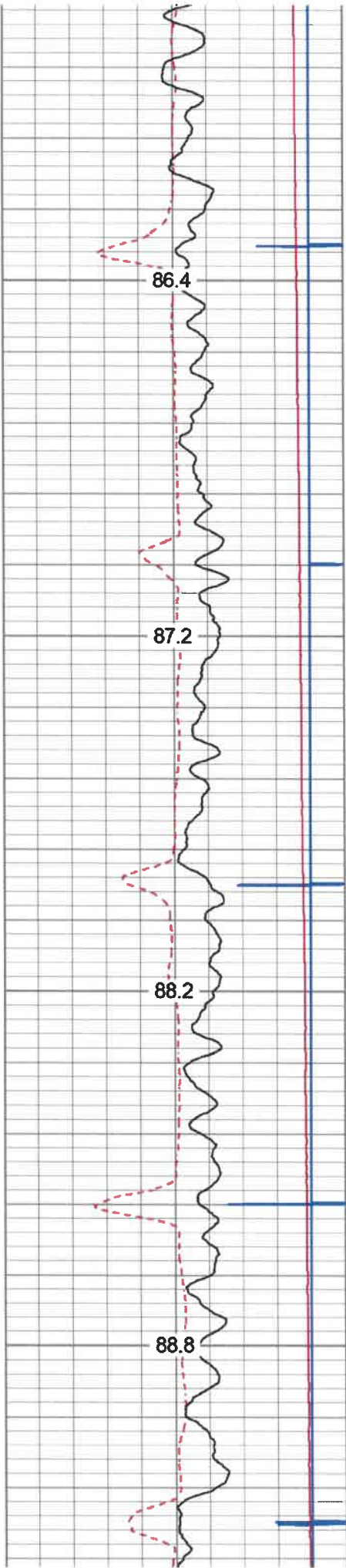
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3200

3250







3300

3350

3400

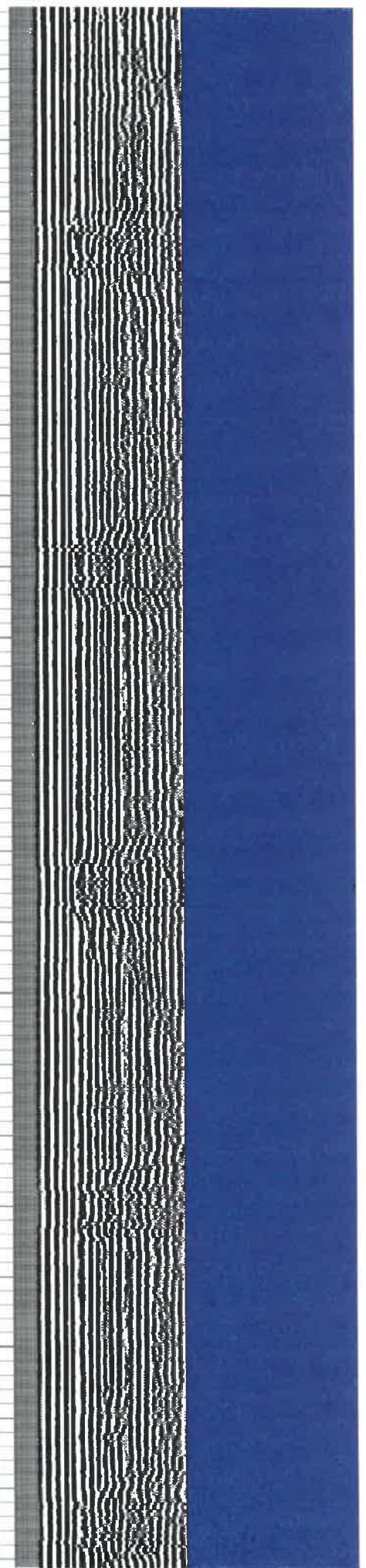
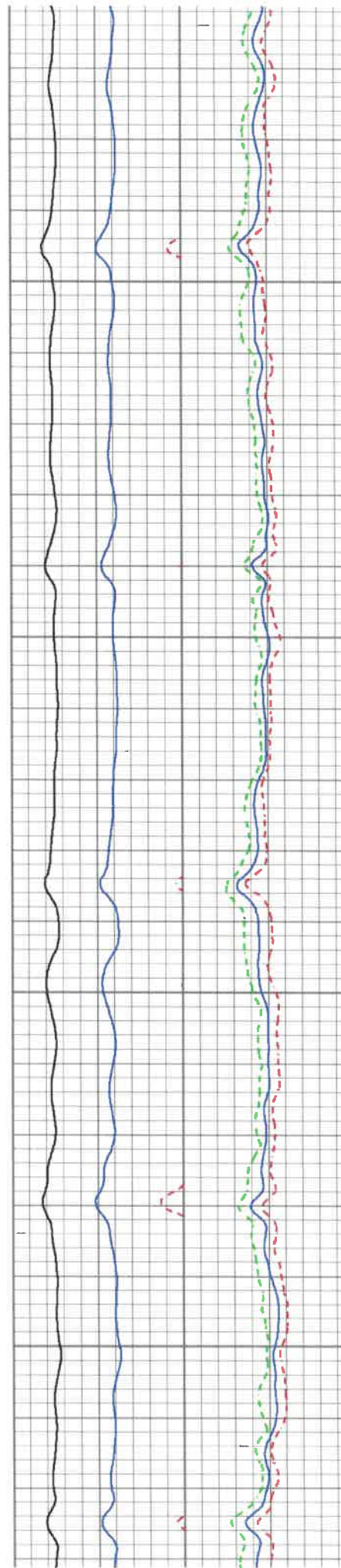
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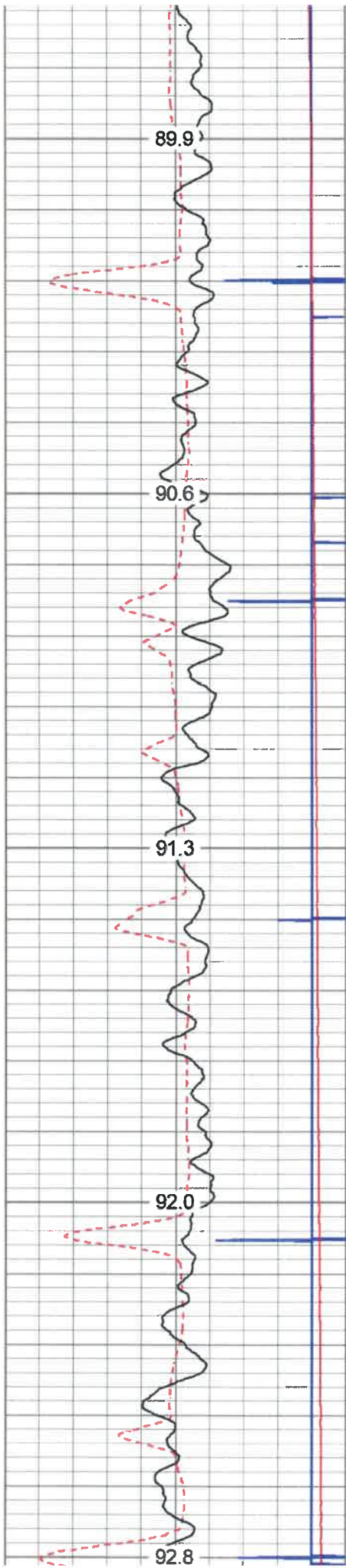
86.4

87.2

88.2

88.8





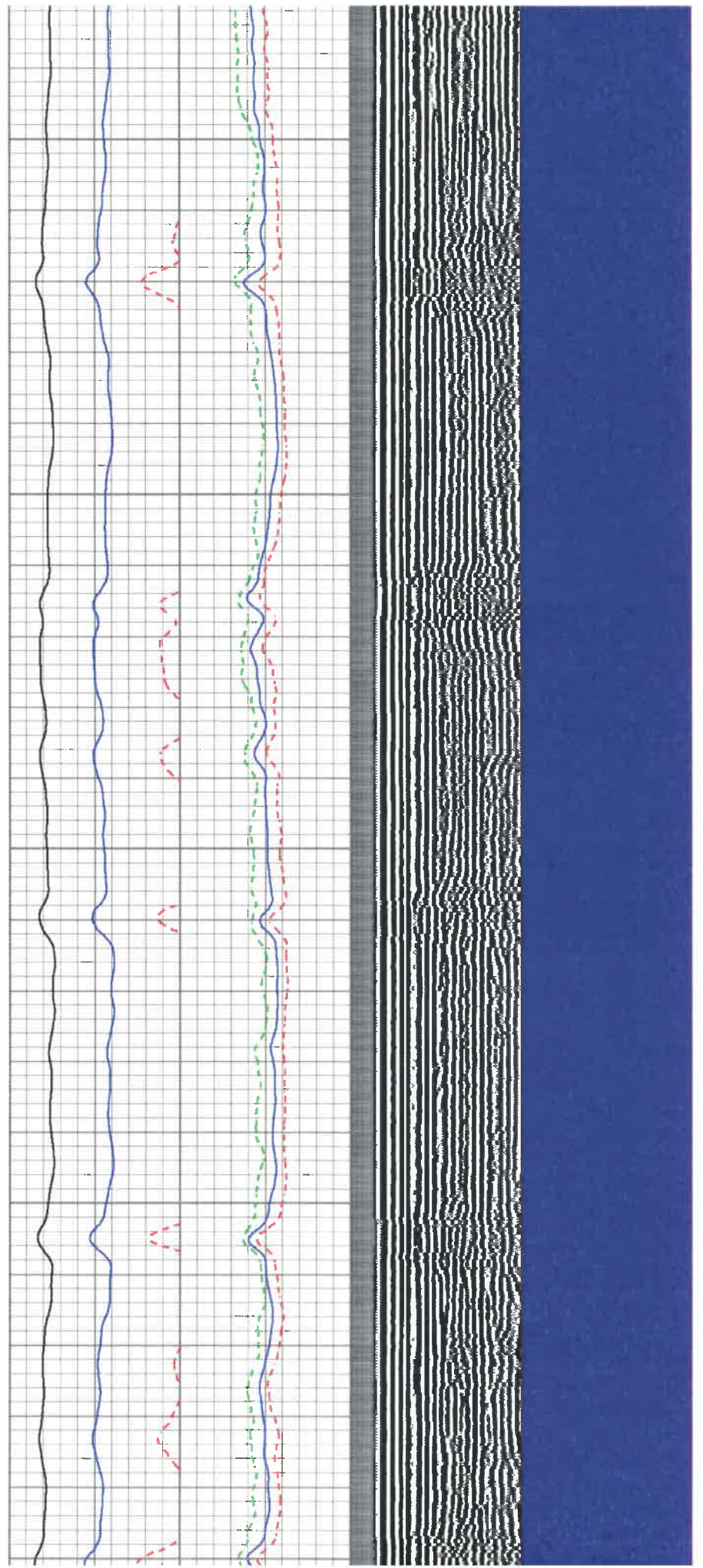
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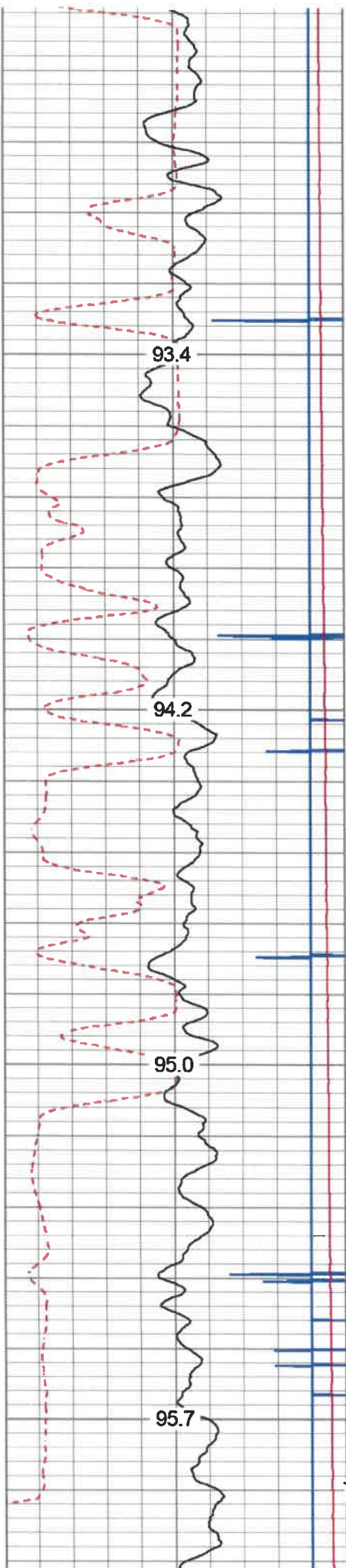
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3600

3650

3700





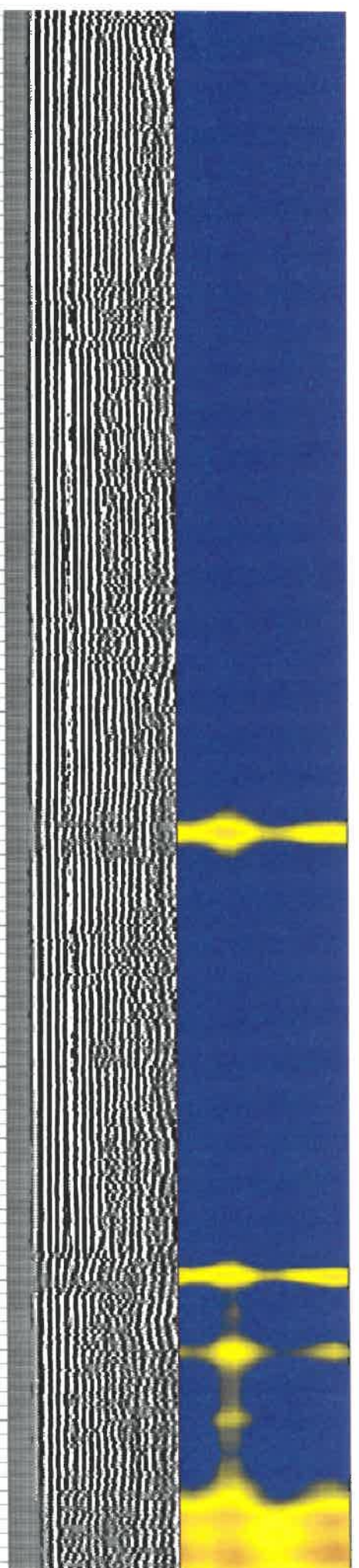
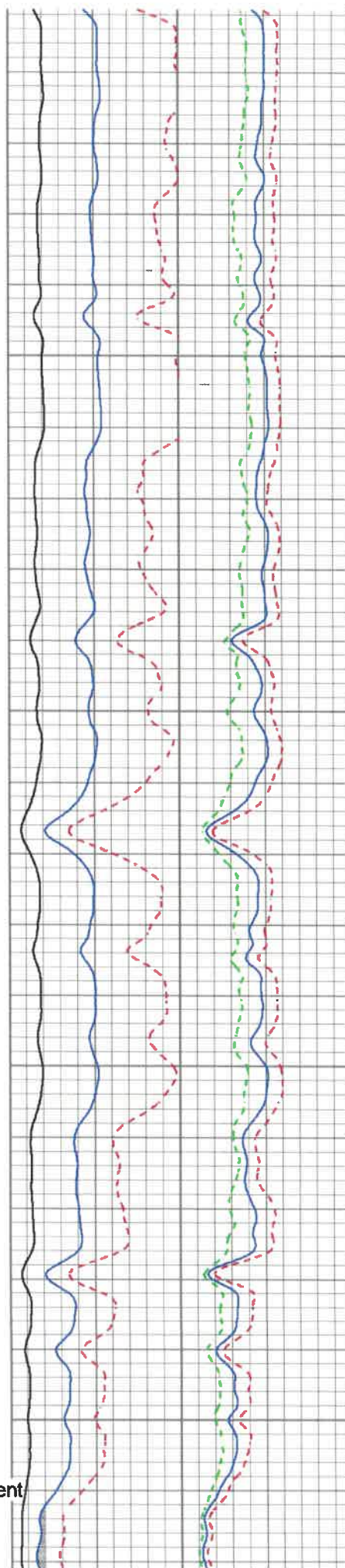
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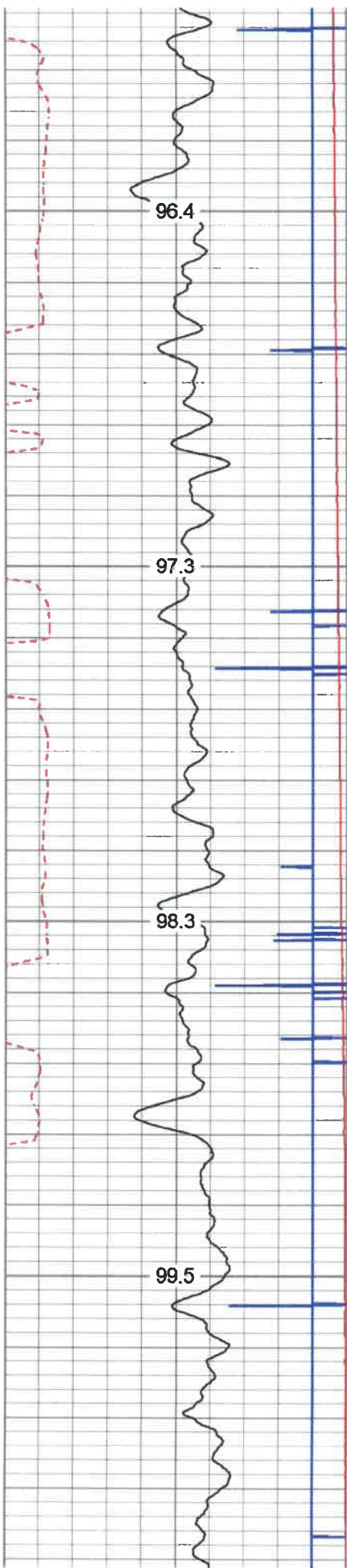
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3850

3900

Top of Cement



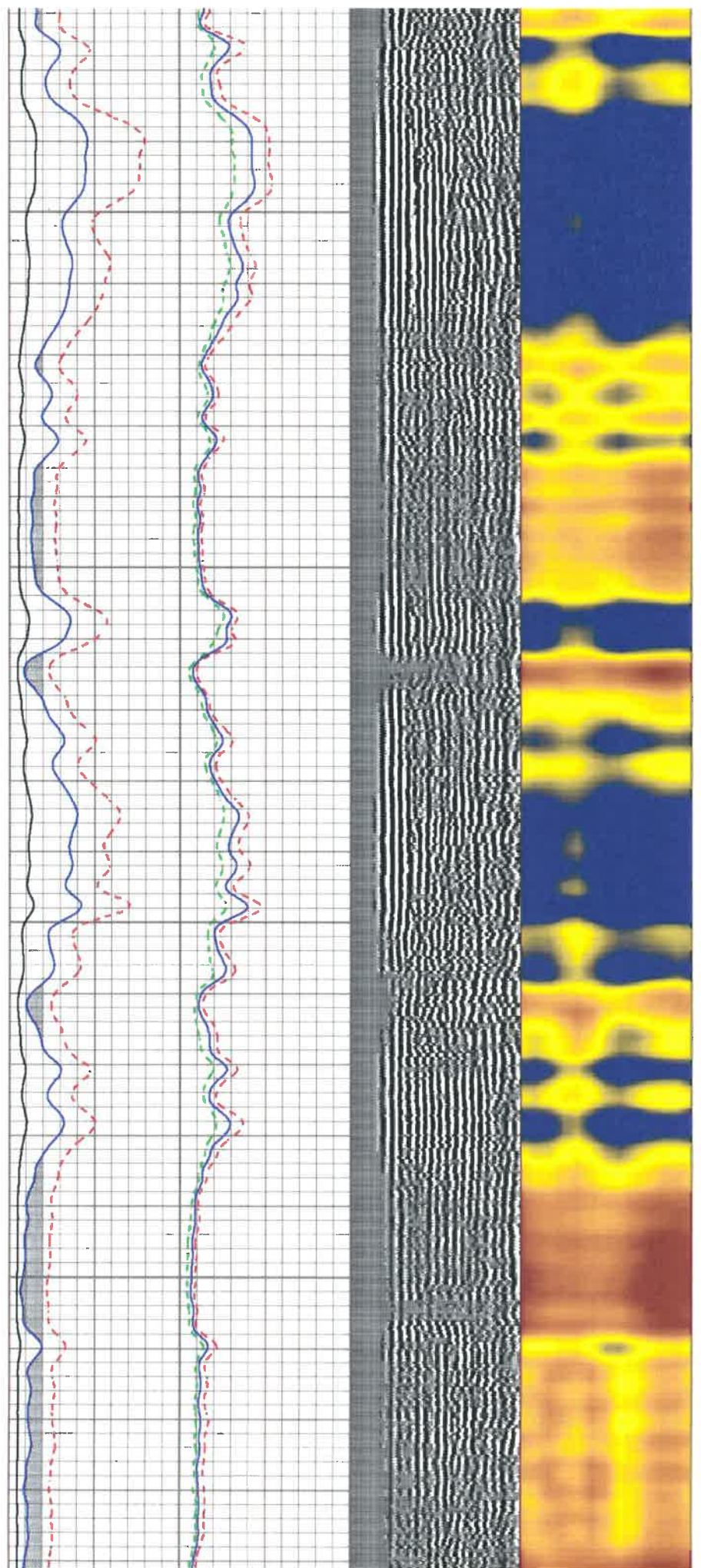


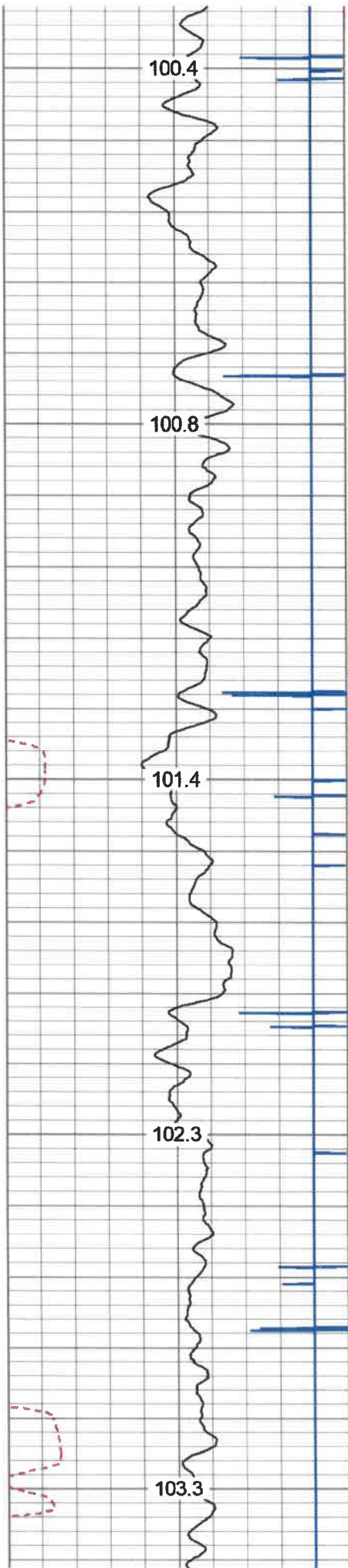
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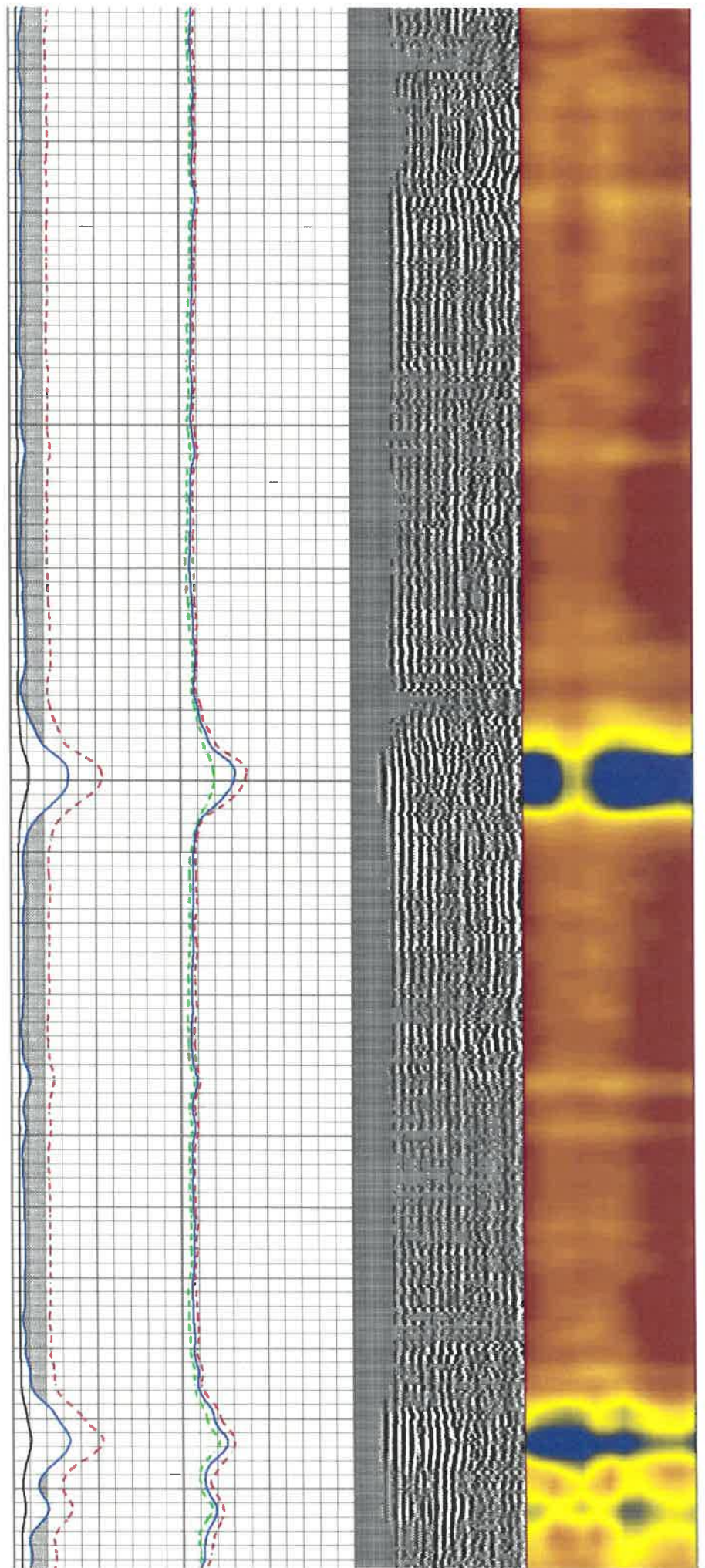
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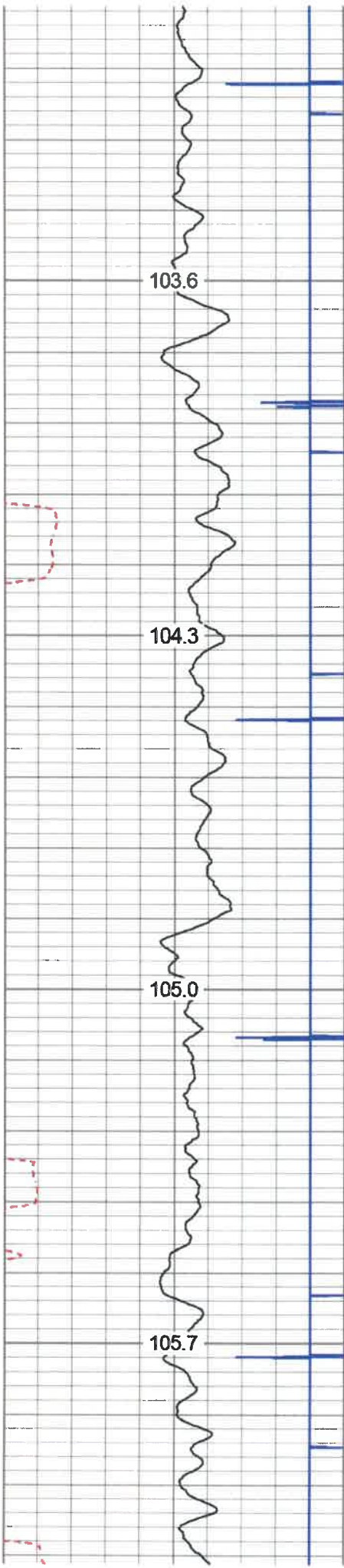
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4350



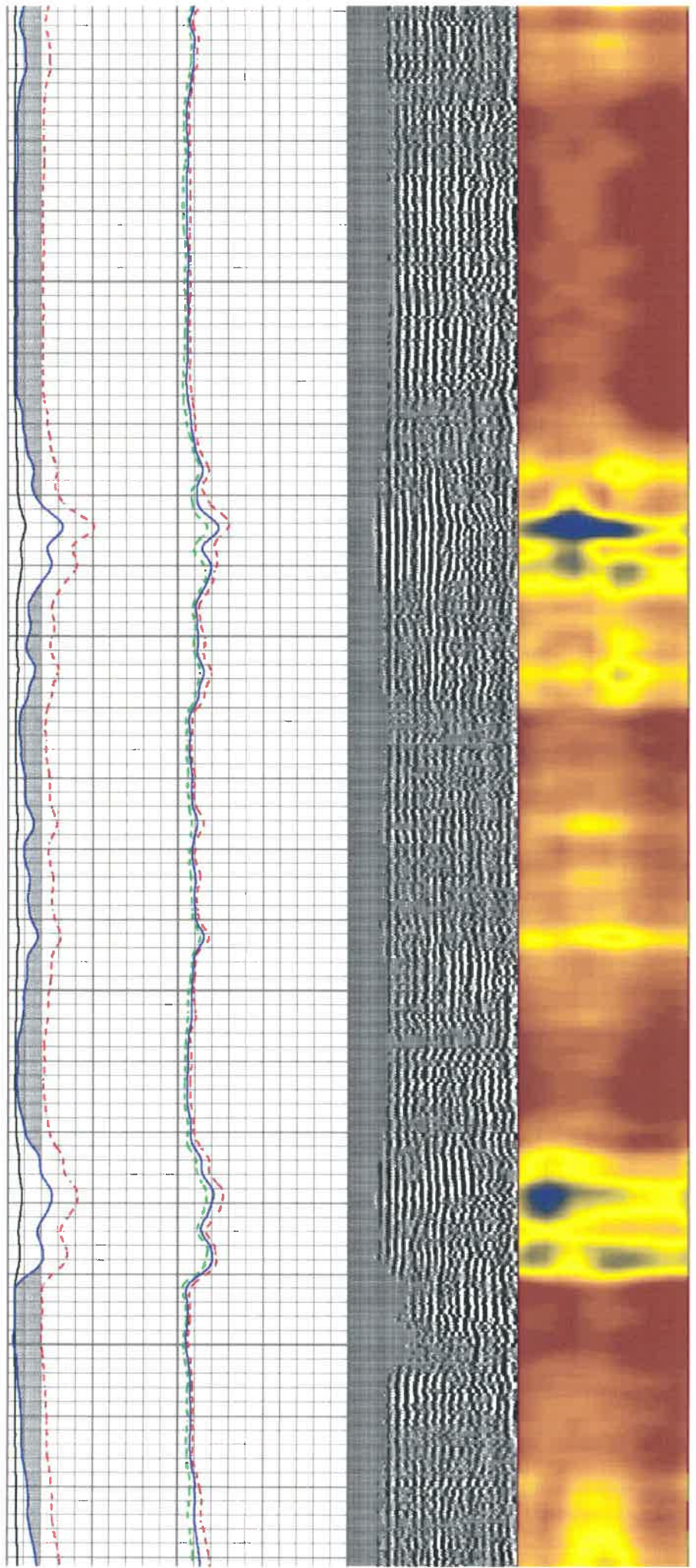


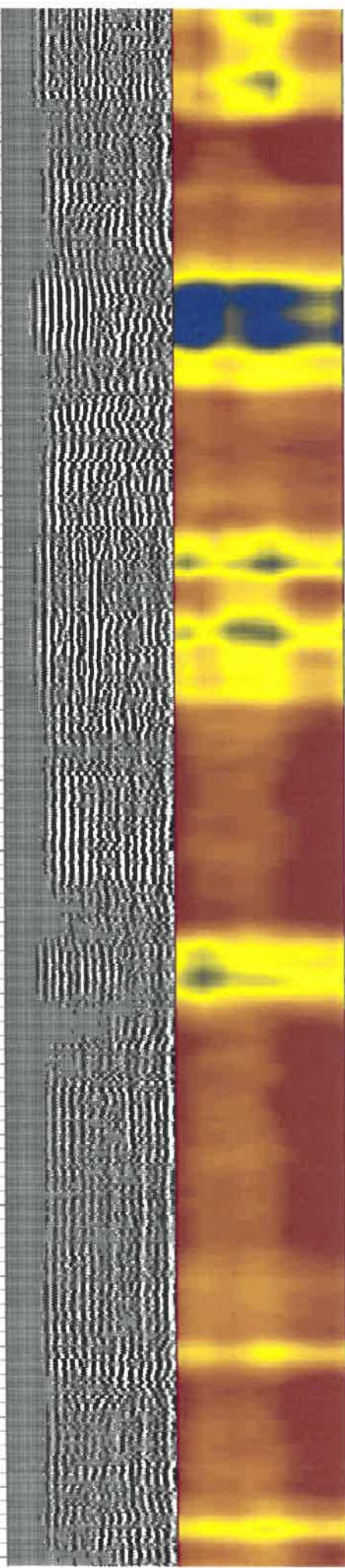
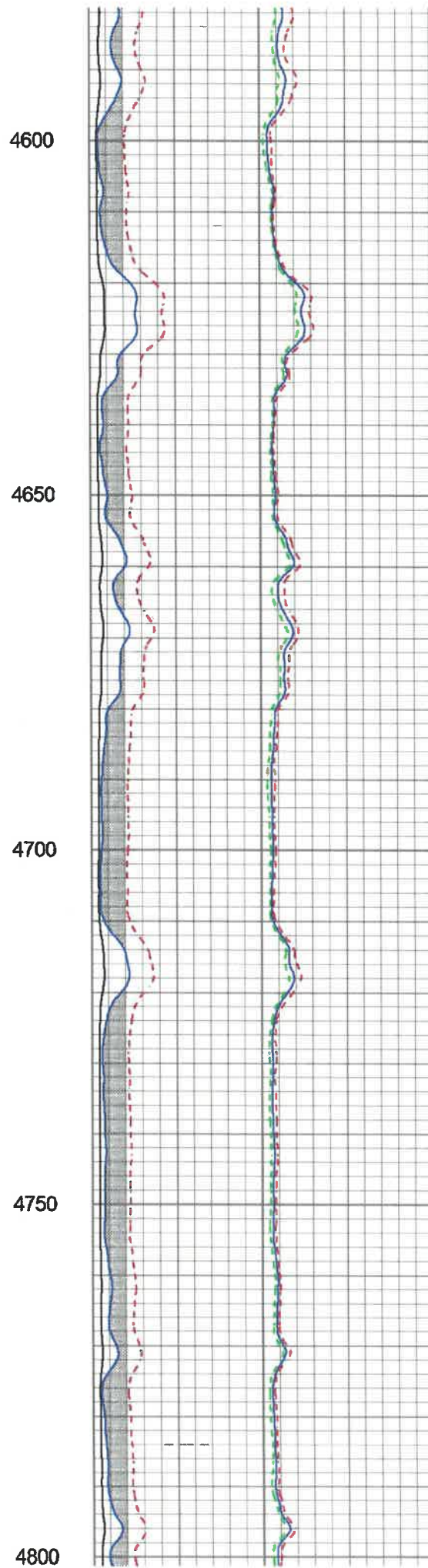
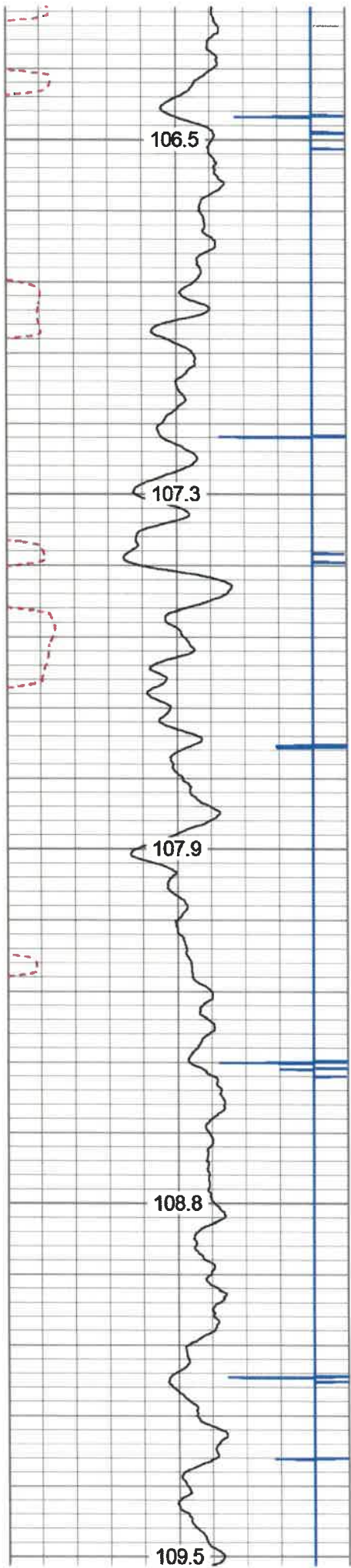
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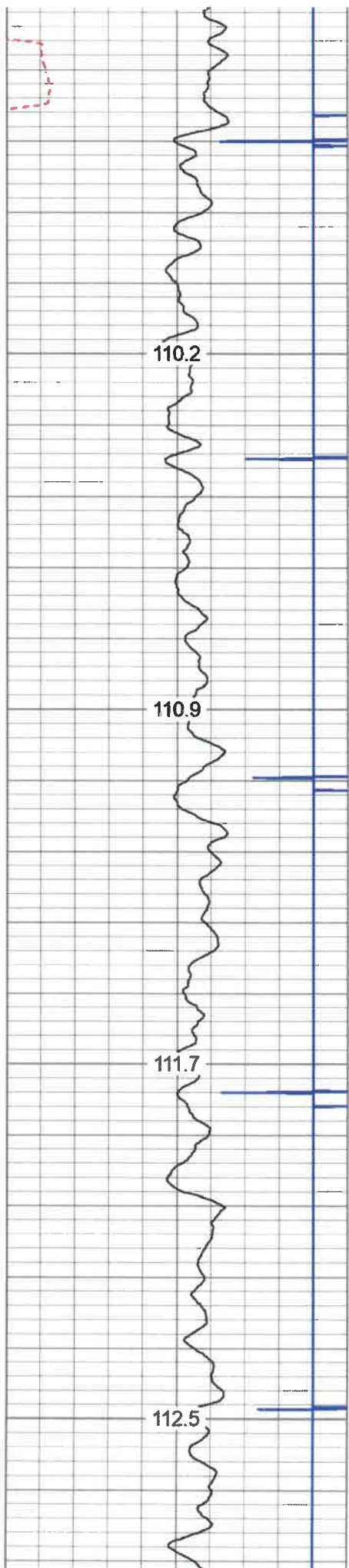
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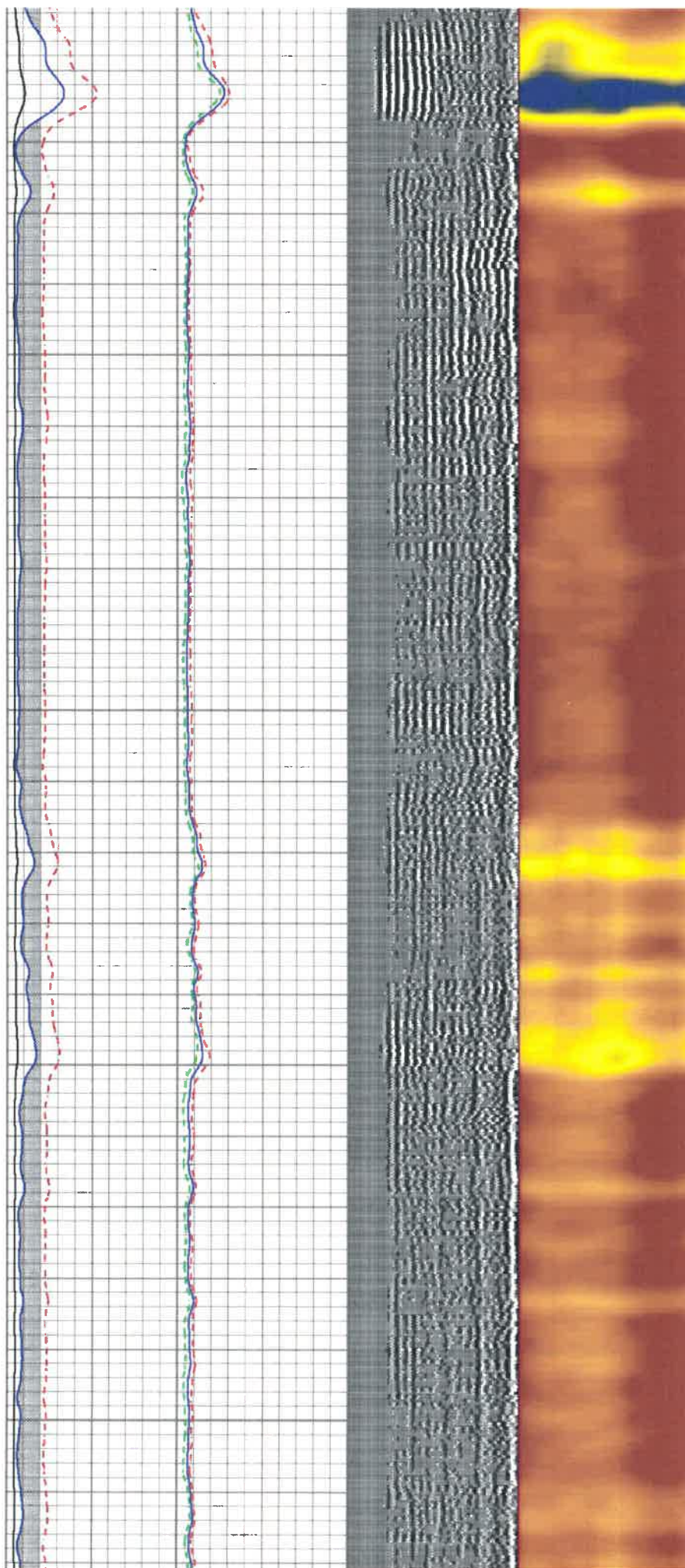


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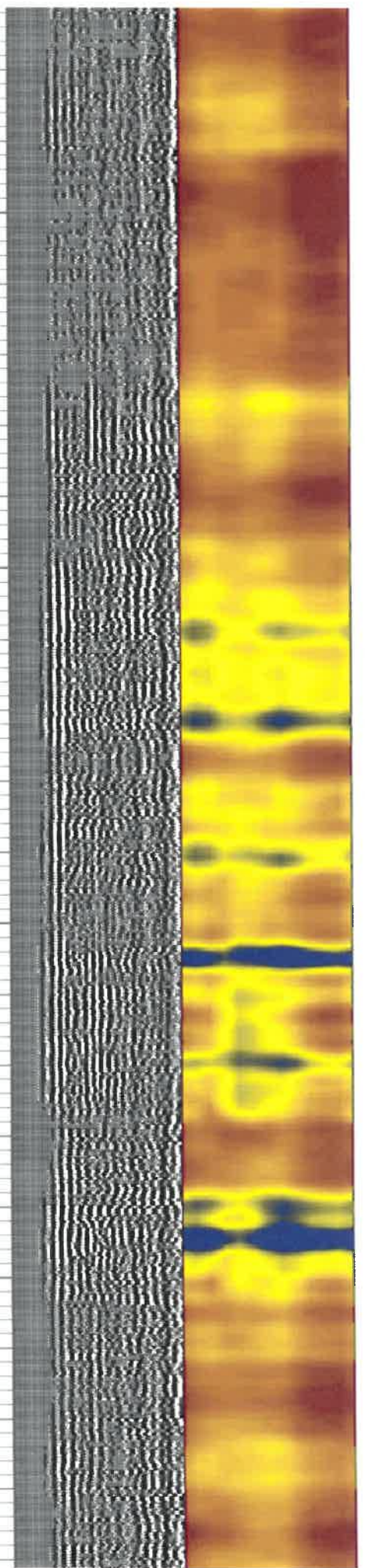
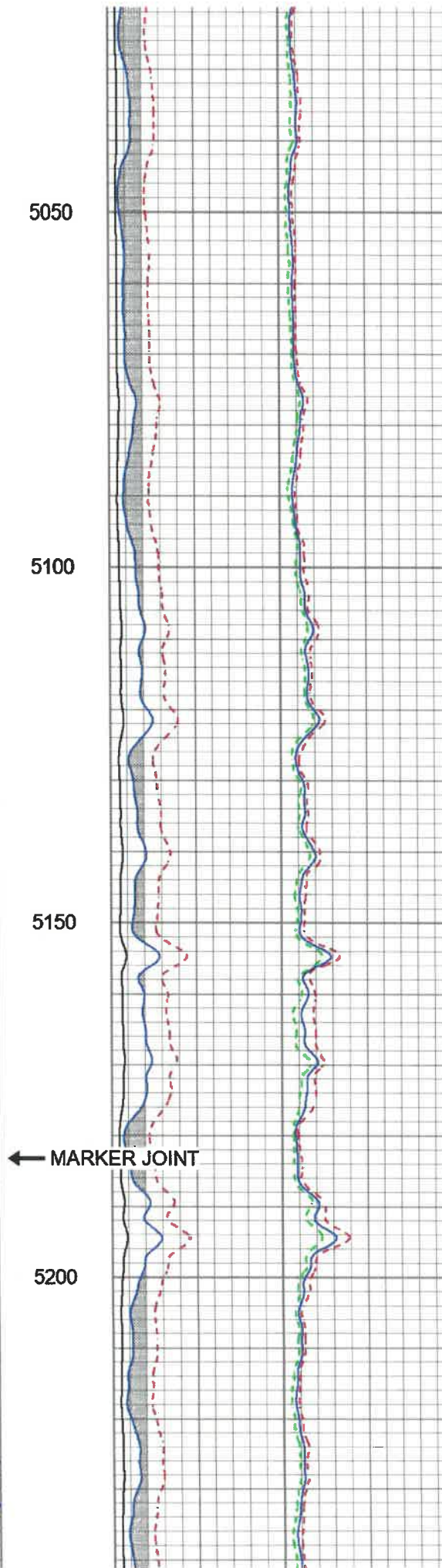
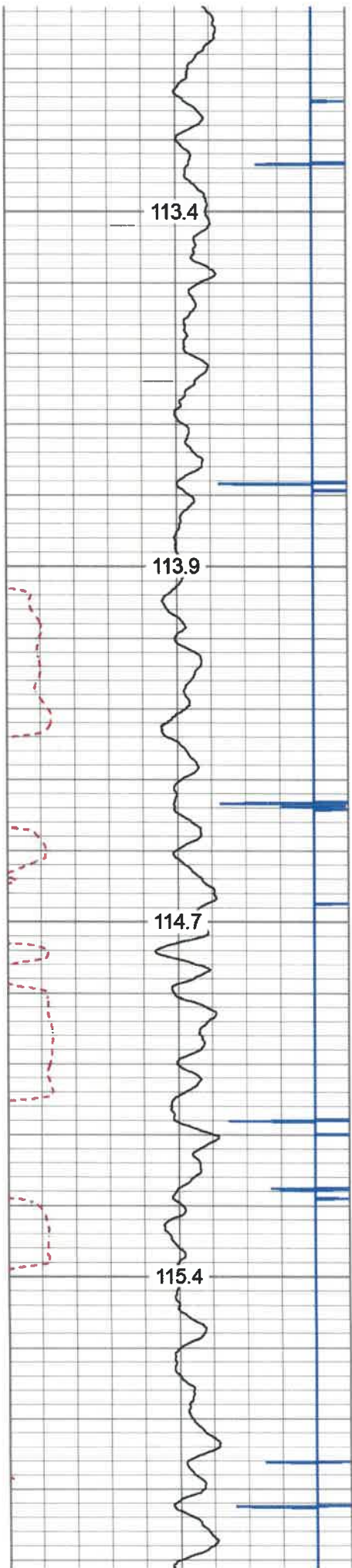
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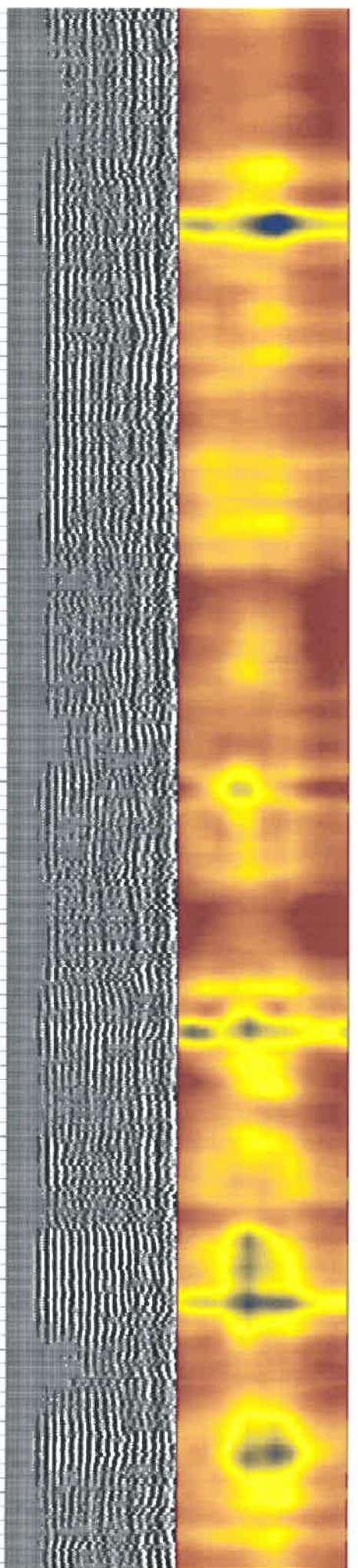
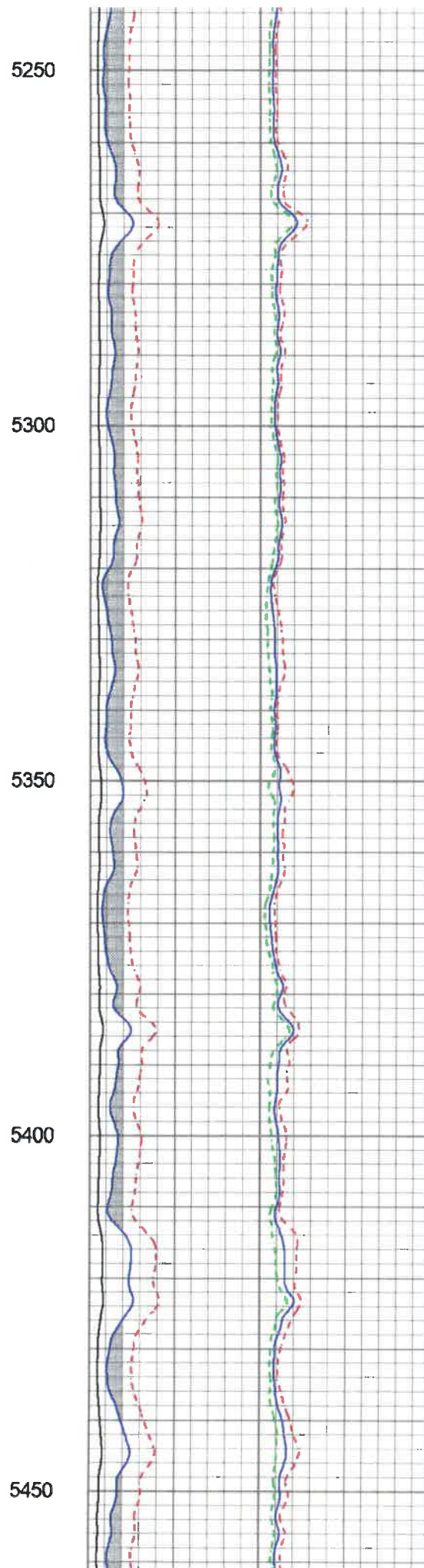
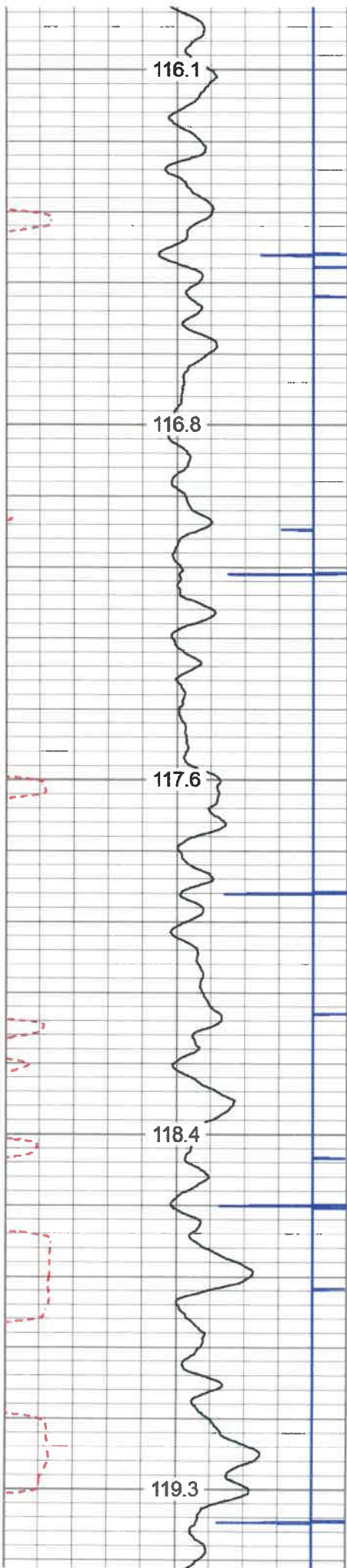
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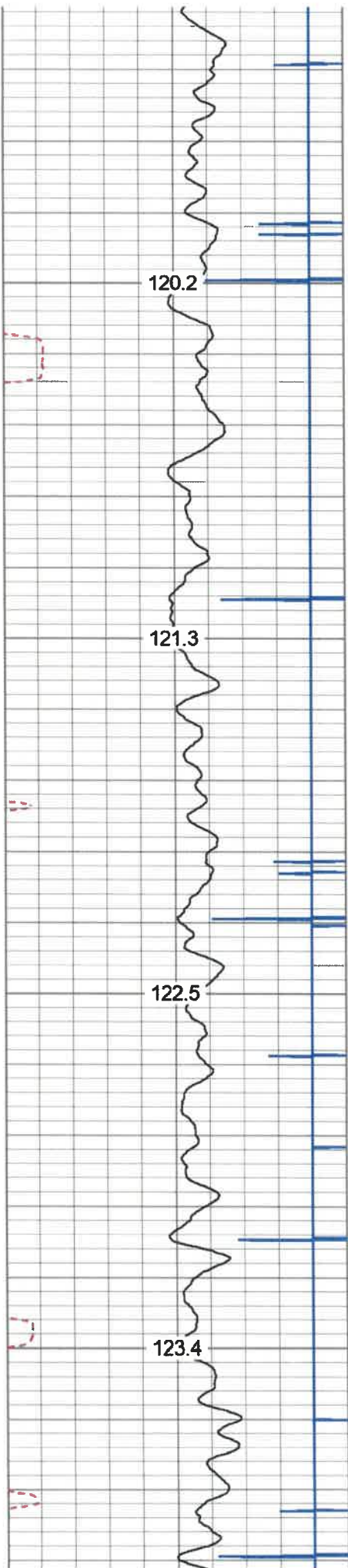
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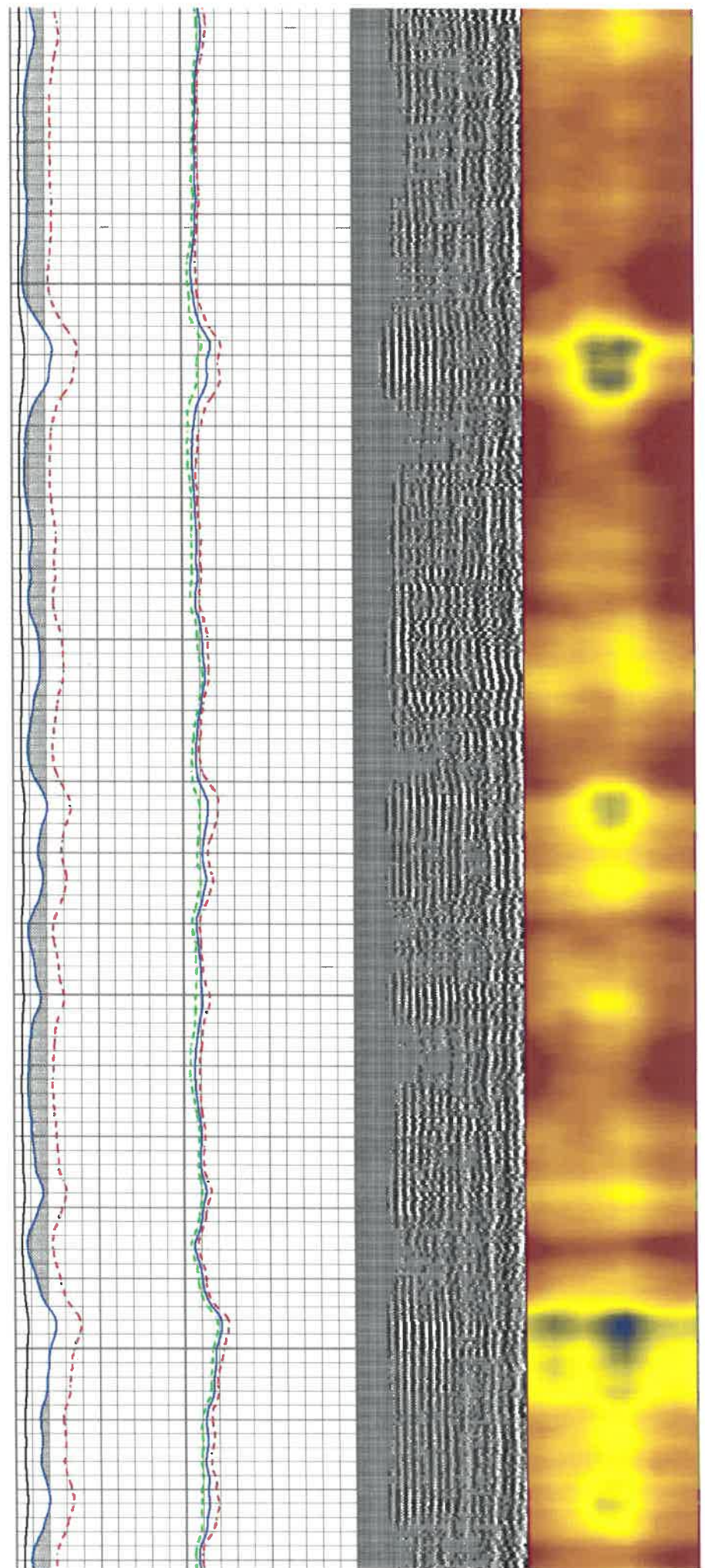


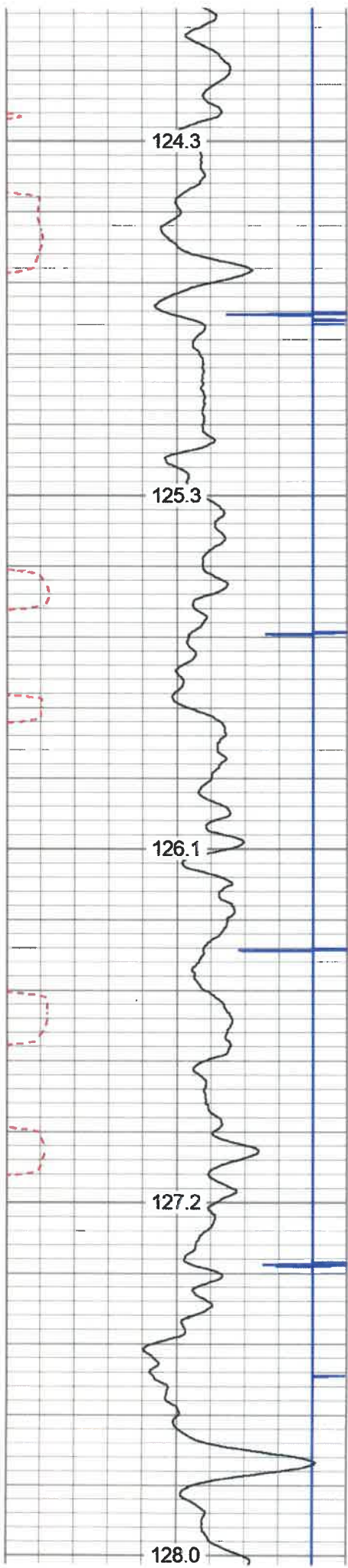
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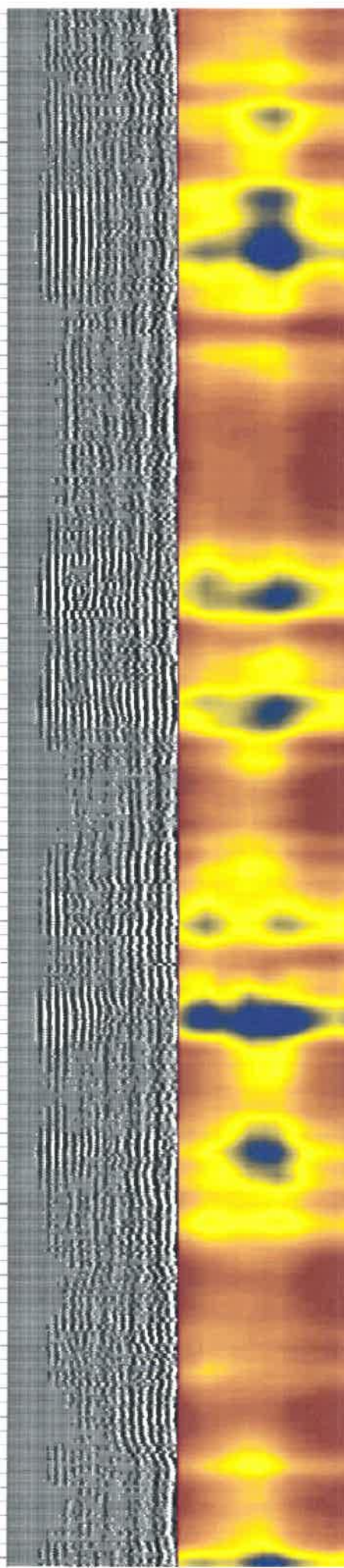
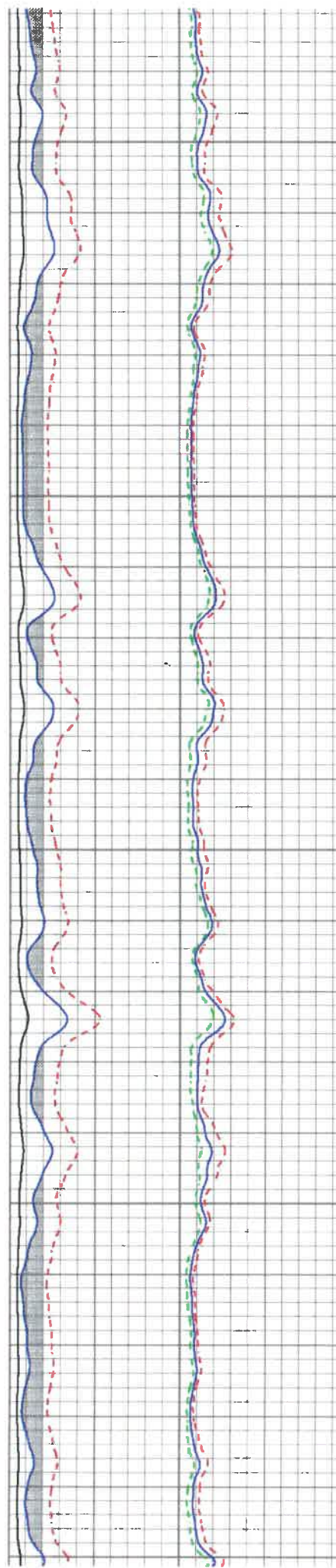
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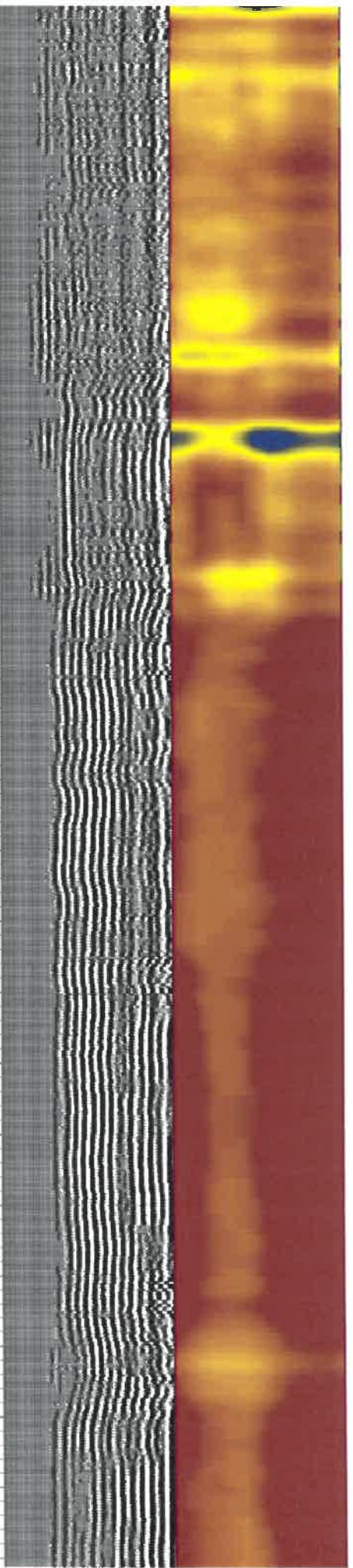
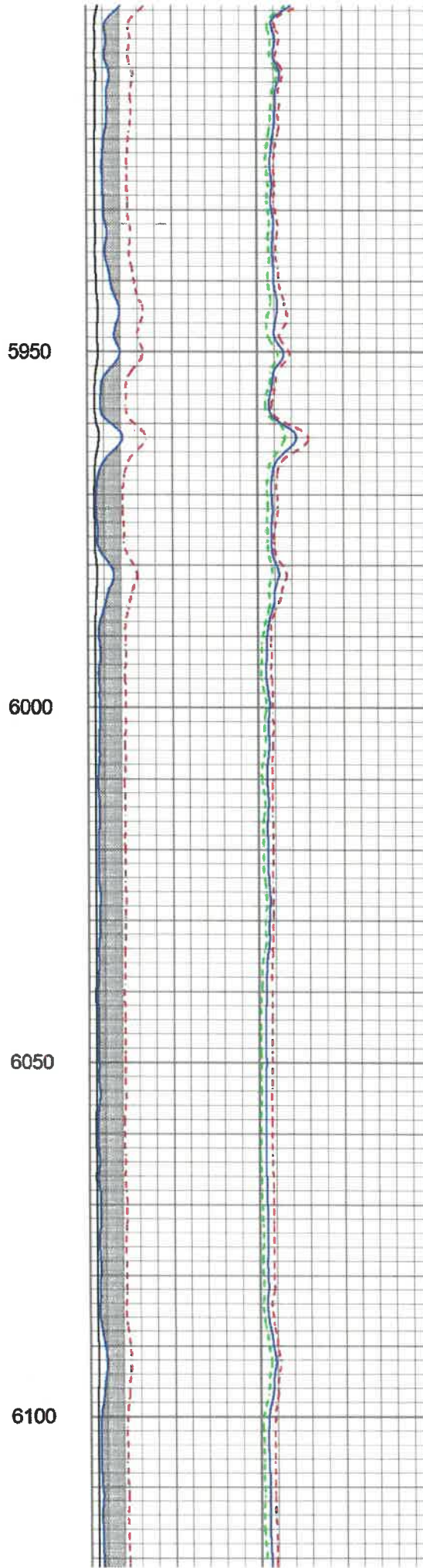
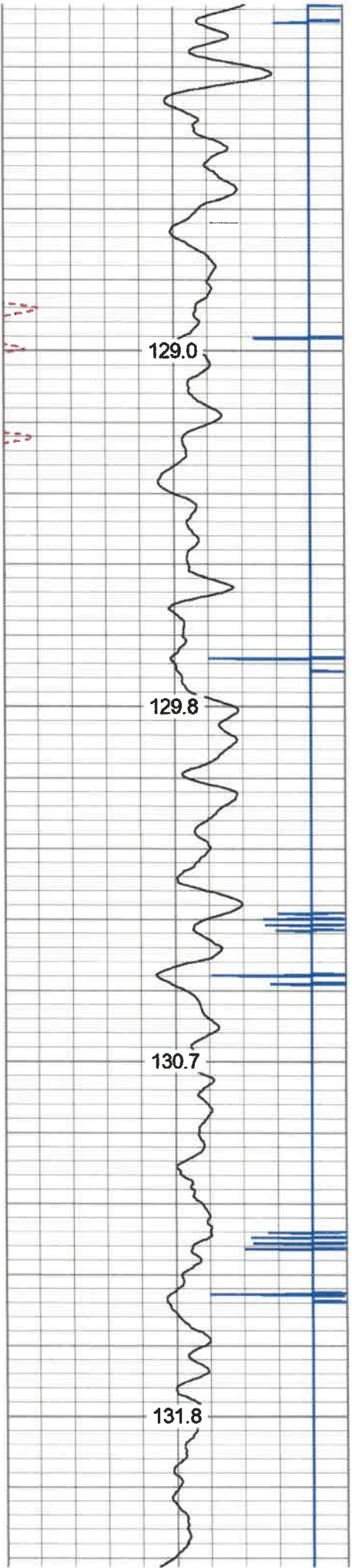
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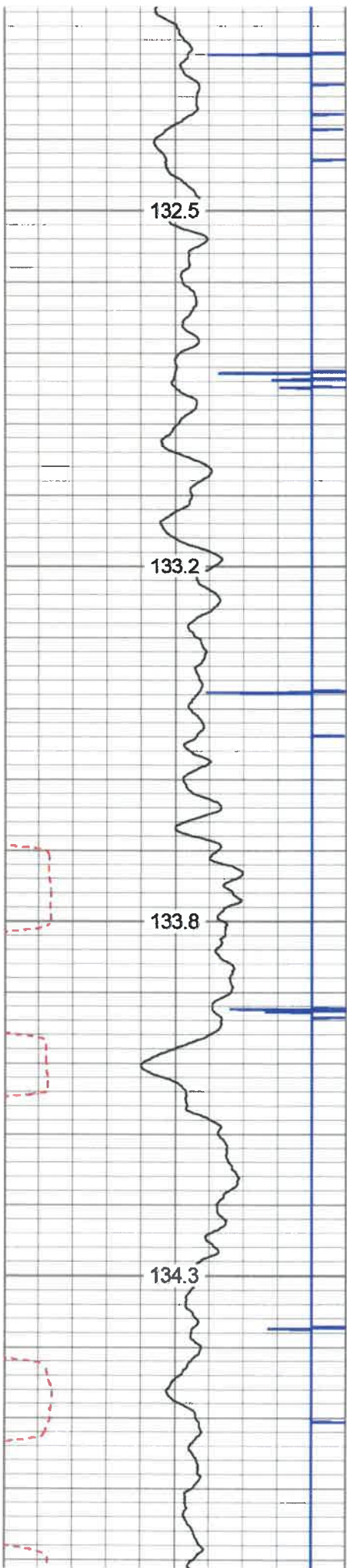




5700  
5750  
5800  
5850  
5900





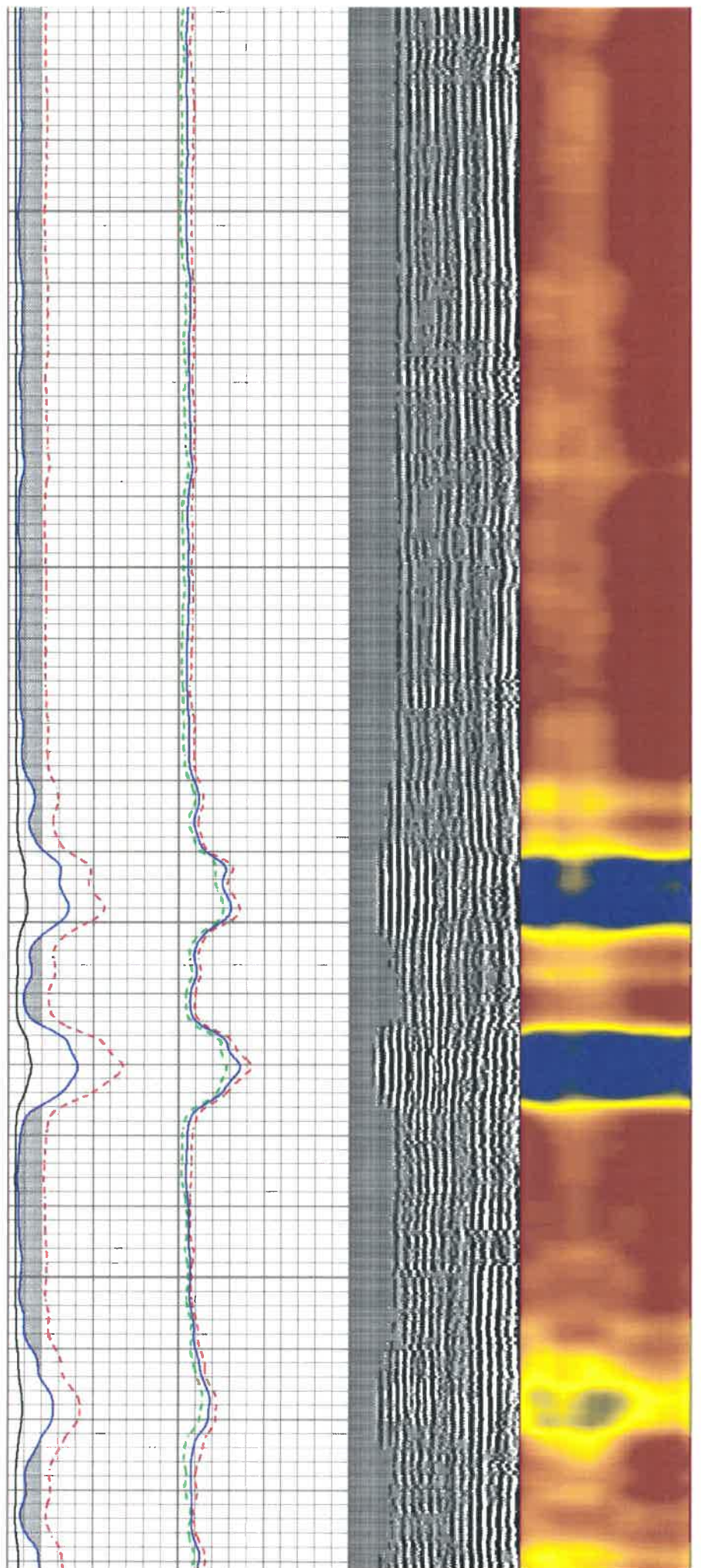


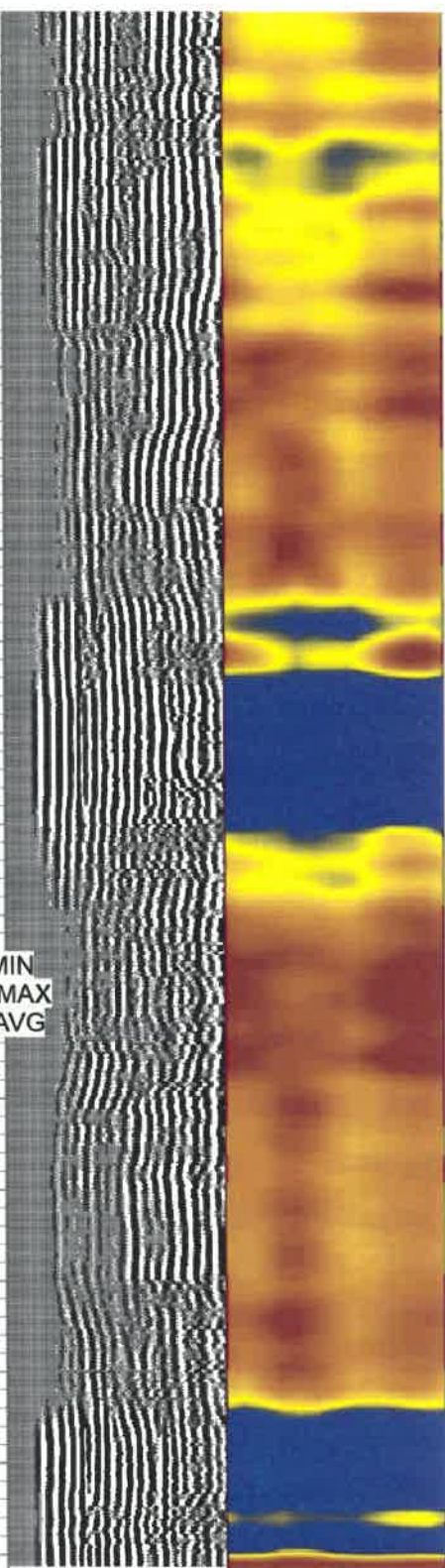
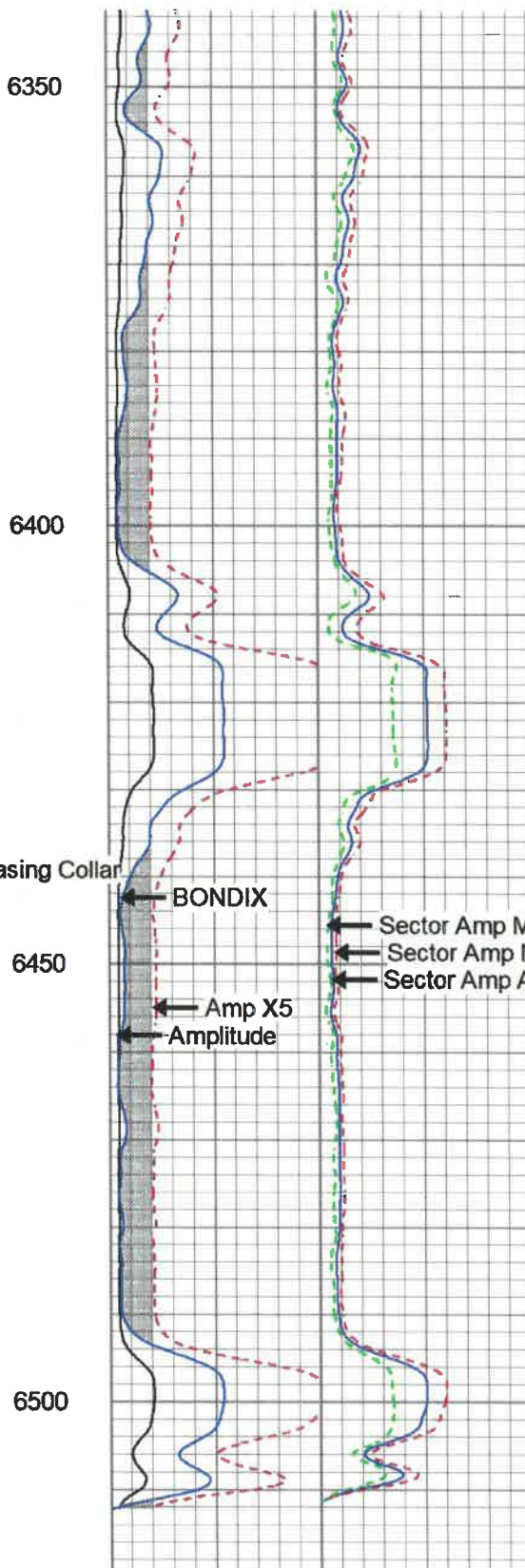
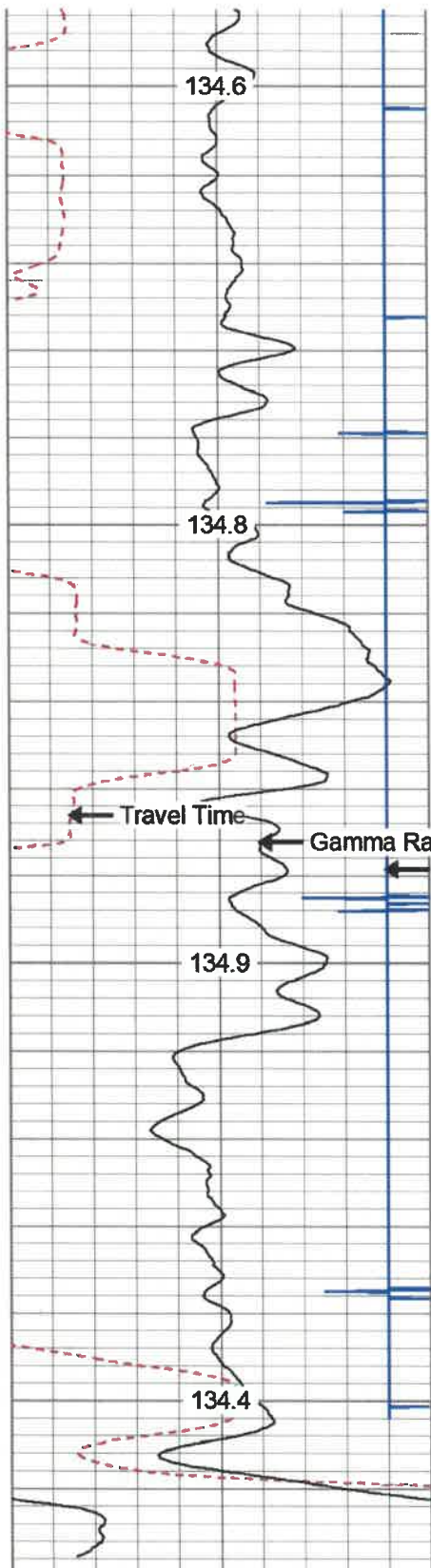
6150

6200

6250

6300





280	Travel Time (usec)	180
9	Casing Collar	-1
0	Gamma Ray	180
0	TEMP (degF)	100
180	GR	360

TEMP
(degF)

Amplitude	Sector Amp AVG
0 (mV) 100	Sector Amp MAX
Amp X5	Sector Amp MIN
0 (mV) 20	
1 BONDIX 0	

VDL	1	Sector Map	12
200 (usec) 1200			





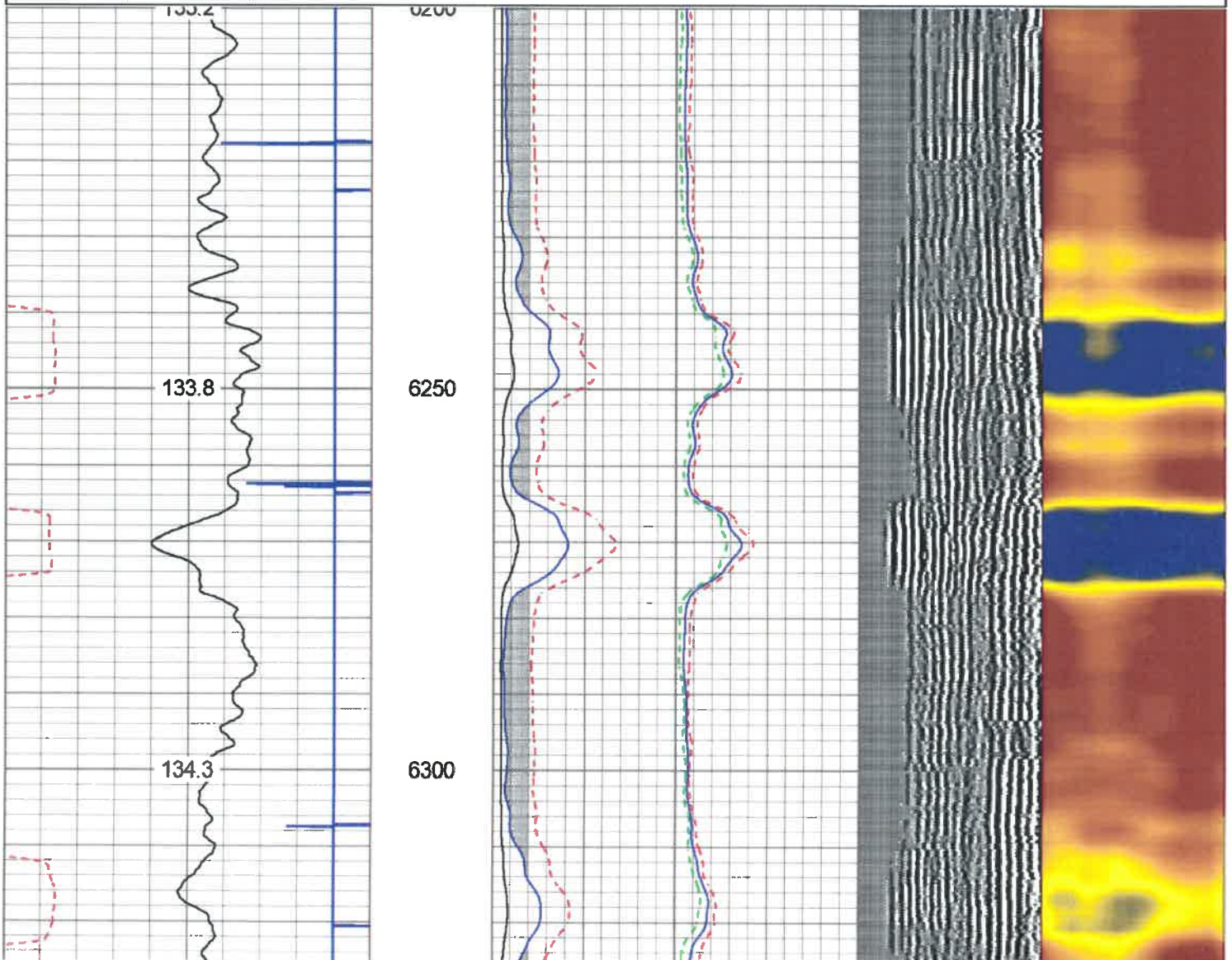
# 1500 PSI PRESSURE PASS



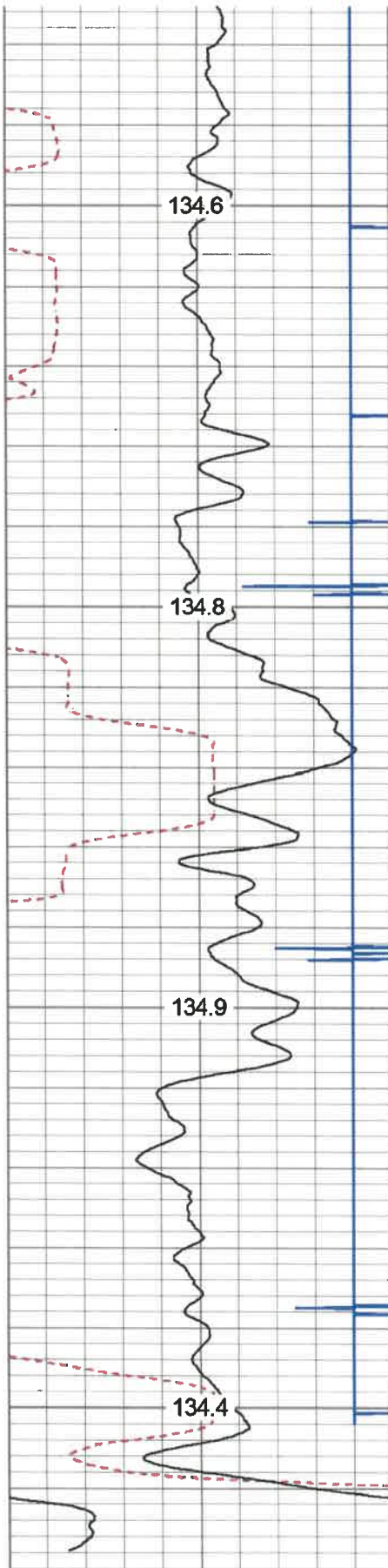
# REPEAT PASS

Database File ant\_galt2h.db  
 Dataset Pathname REPEAT1  
 Presentation Format antero  
 Dataset Creation Tue Dec 17 18:51:20 2019  
 Charted by Depth in Feet scaled 1:240

280	Travel Time (usec)	180	Amplitude	Sector Amp AVG	VDL	1 Sector Map 12
9	Casing Collar	-1	0 (mV) 100	Sector Amp MAX	200 (usec) 1200	
0	Gamma Ray	180	Amp X5	Sector Amp MIN		
0	TEMP (degF)	100	0 (mV) 20			
180	GR	360	1 BONDIX 0			
	TEMP (degF)					

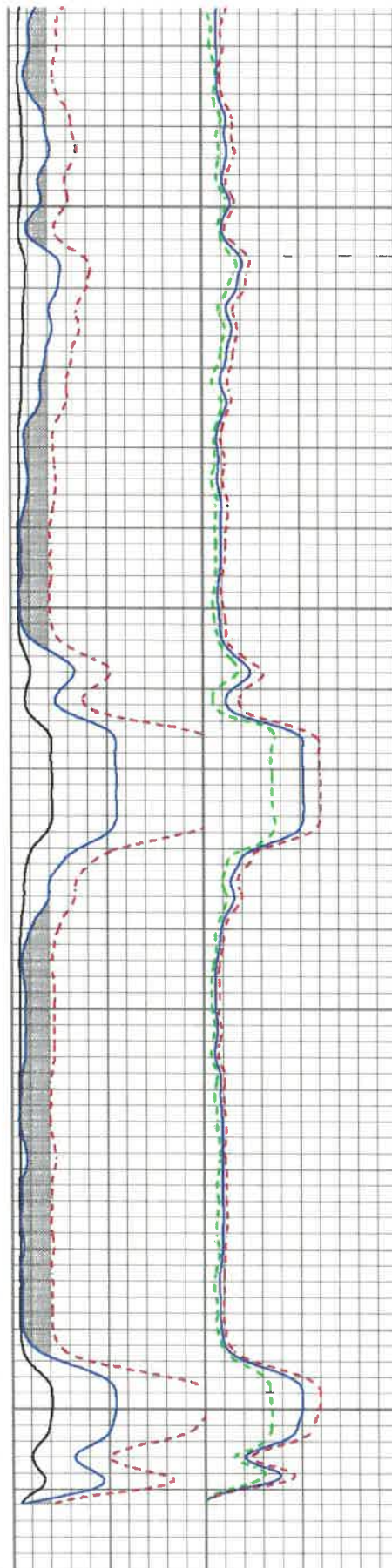




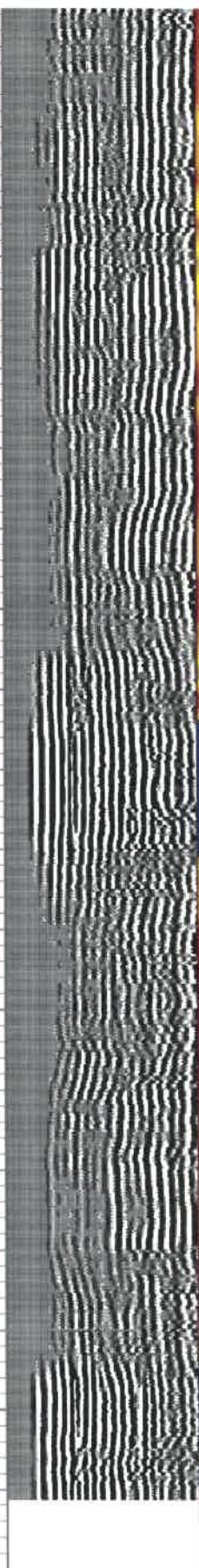


280	Travel Time (usec)	180
9	Casing Collar	-1
0	Gamma Ray	180
0	TEMP (degF)	100
180	GR	360

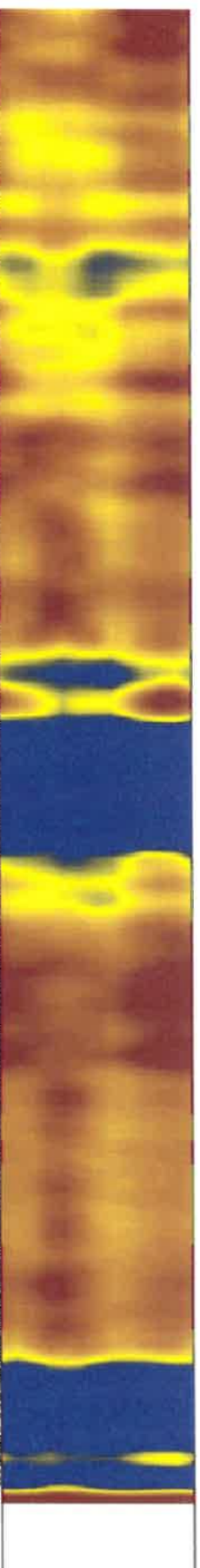
6350  
6400  
6450  
6500



0	Amplitude	100
0	(mV)	20
0	Amp X5	20
1	BONDIX	0



200	VDL	1200
-----	-----	------



1	Sector Map	12
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TEMP  
(degF)



# REPEAT PASS

## Log Variables

DatabaseC:\ProgramData\Warrior\Data\ant\_galt2h.db  
Dataset field/well/run1/pass2.1/\_vars\_

### Top - Bottom

BHTEMP_Src TEMP	BOREID in 8.25	BOTTEMP degF 100	CASEOD in 5.5	CASETHCK in 0	CASEWGHT lb/ft 20	MAXAMPL mV 71.9	MINAMPL mV 3.5
MINATTN db/ft 0.8	PERFS No	PPT usec 219	SRFTEMP degF 0	TDEPTH ft 0			

### 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 ant\_galt2h.db  
Dataset Pathname pass2.1  
Dataset Creation Tue Dec 17 15:32:50 2019

### Gamma Ray Calibration Report

Serial Number: IPSNO-03  
Tool Model: Tek-Co 2 3/4  
Performed: Tue Nov 12 16:11:18 2019

Calibrator Value: 1.0

Background Reading: 0.0 cps  
Calibrator Reading: 1.0 cps

Sensitivity: 0.5000 /cps

### Segmented Cement Bond Log Calibration Report

Serial Number: IOL40-03\_5\_5  
Tool Model: Tek12

Calibration Casing Diameter: 5.500 in  
Calibration Depth: 476.042 ft

Master Calibration, performed (Derived):

Raw (v)

Calibrated (mv)

Results

	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.004	1.446	3.500	71.921	47.417	3.334
CAL	0.022	0.414				
5'	-0.006	1.518	3.500	71.921	44.891	3.774
SUM						
S1	0.022	2.281	0.000	100.000	44.267	-0.977
S2	0.023	2.313	0.000	100.000	43.652	-0.987
S3	0.021	2.394	0.000	100.000	42.136	-0.881
S4	0.016	2.420	0.000	100.000	41.602	-0.685
S5	0.016	2.414	0.000	100.000	41.696	-0.650
S6	0.018	2.428	0.000	100.000	41.488	-0.727
S7	0.022	2.372	0.000	100.000	42.560	-0.935
S8	0.024	2.328	0.000	100.000	43.415	-1.057
S9	0.025	2.327	0.000	100.000	43.436	-1.081
S10	0.023	2.308	0.000	100.000	43.764	-1.022
S11	0.021	2.271	0.000	100.000	44.450	-0.954
S12	0.021	2.265	0.000	100.000	44.560	-0.924

**Temperature Calibration Report**

Serial Number: IOL40-03\_5\_5  
 Tool Model: Tek12  
 Performed: Fri Oct 20 09:51:21 2017

	Reference	Reading
Low Reference:	0.00 degF	0.00 usec
High Reference:	1.00 degF	1.00 usec
Gain:	0.33	
Offset:	0.00	
Delta Spacing	2	

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
CCL	18.93		CCL-312tekco (I08X3-01) Tekco 3 1/8" 450 Deg. "F" SmCo Logging CCL	1.82	3.12	25.00
			Tek-2.75 2 3/4" Tekco Adjustable Centralizer	2.73	2.75	25.00
TEMP	12.77					
WVFS12	11.48		SCBL-Tek12 (IOL40-03_5_5) Tekco 400 Deg F 12 Sector RIB with Temp	9.13	3.25	135.00
WVFS11	11.48					
WVFS10	11.48					
WVFS9	11.48					
WVFS8	11.48					

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WVFS7	11.48				
WVFS6	11.48				
WVFS5	11.48				
WVFS4	11.48				
WVFS3	11.48				
WVFS2	11.48				
WVFS1	11.48				
WVFCAL	10.73				
WV3FT	10.73				
WV5FT	9.73				
WVFSYNC	6.40				
WVTEMP	6.40				
GR	1.04		Tek-2.75 2 3/4" Tekco Adjustable Centralizer	2.73	2.75
		GR-Tek-Co 2 3/4 (IPSNO-03) Tekco 2 3/4" 400 Deg. F Logging Gamma Ray	3.67	2.75	40.00

Dataset: ant\_galt2h.db: field/well/run1/pass2.1  
 Total length: 20.07 ft  
 Total weight: 250.00 lb  
 O.D.: 3.25 in



Company Antero Resources Corporation  
 Well GALT 2H  
 Field Marcellus  
 County TYLER  
 State WV

Country USA