



# RADIAL CEMENT BOND LOG

FILE NO: CH133063	COMPANY <b>LARAMIE ENERGY LLC</b>
API NO: 05077104680000	WELL <b>BRUTON FEDERAL 30-17W</b>
	FIELD <b>VEGA</b>
	COUNTY <b>MESA</b> STATE <b>COLORADO</b>

Ver. 4.10	LOCATION: SHL: 2639' FSL & 1868' FEL BHL: 1158' FSL & 1308' FSL SEC <u>30</u> TWP <u>9S</u> RGE <u>93W</u>	OTHER SERVICES RPM
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PERMANENT DATUM LOG MEASURED FROM DRILL. MEAS. FROM	GL KB KB KB	ELEVATION 7643 FT 30 FT 30 FT 30 FT	ABOVE P.D.	ELEVATIONS: KB 30 FT DF 7672 FT GL 7643 FT
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DATE	RUN	TRIP	1	1
SERVICE ORDER	US133063			
DEPTH DRILLER	8222 FT			
DEPTH LOGGER	8177 FT			
BOTTOM LOGGED INTERVAL	8177 FT			
TOP LOGGED INTERVAL	30 FT			
TIME STARTED	8:00			
TIME FINISHED	10:30			
OPERATOR RIG TIME	2.5 HOURS			
TYPE OF FLUID IN HOLE	WATER			
FLUID DENSITY	NA			
FLUID SALINITY	NA			
FLUID LEVEL	55 FT			
LOGGED CEMENT TOP	1530 FT			
WELLHEAD PRESSURE	0 PSI			
MAXIMUM HOLE DEVIATION	NA			
NOMINAL LOGGING SPEED	100 F/MIN			
MAX. RECORDED TEMP.	228 DEGF			
REFERENCE LOG	NA			
REFERENCE LOG DATE	NA			
EQUIP. NO.	ML-4291	GRAND JCT.		
RECORDED BY	T. NEWELL			
WITNESSED BY	NA			

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE THE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT. BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

## REMARKS

RUN 1 TRIP 1: \*2 OPERATIONS IN WELLBORE\*

\*\*OPERATION 1: RAL/GR/CCL RUN CENTRALIZED\*\*

LOGGED WITH 0 PSI ON WELLHEAD

SJ: 6300' - 6318'

SJ: 7406' - 7426'

## EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	RAL	1426XA	10154958	CENTRALIZED
1	1	GR/CCL	1355XA	12670180	CENTRALIZED

# RAL MAIN PASS 0 PSI

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017

Patches: 3

Plotted: Sun Apr 1 12:34:25 2018

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_BRUTON\_19\_17W/p012g02.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 12.000 ft BOTTOM DEPTH: 8169.000 ft

### SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
GR	FILTER ()	medium (1)		TOP	BOTTOM
AMPLITUDE	FILTER ()	medium (1)		"	"
TRAVEL TIME	FILTER ()	medium (1)		"	"

### RAL CCL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CCL FLOOR	CCL FLOOR	0.00		TOP	BOTTOM

### ANALOG RAL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
AMPLITUDE WINDOW (NEAR)	AMP WINDOW START (fgp1*)	185	us	TOP	BOTTOM
	AMP WINDOW START (fgp2*)	185	us	"	"
	AMP WINDOW START (fgp3*)	185	us	"	"
	AMP WINDOW START (fgp4*)	185	us	"	"
	AMP WINDOW START (fgp5*)	185	us	"	"
	AMP WINDOW START (fgp6*)	185	us	"	"
	AMP WINDOW START (fgp7*)	185	us	"	"
	AMP WINDOW START (fgp8*)	185	us	"	"
	AMP WINDOW START (fgpn*)	185	us	"	"
	AMP WINDOW LENGTH	30	us	"	"
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	180	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	4	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	200.391	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-62	us	"	"
	TOOL DELAY (str2*)	-62	us	"	"
	TOOL DELAY (str3*)	-62	us	"	"
	TOOL DELAY (str4*)	-62	us	"	"
	TOOL DELAY (str5*)	-62	us	"	"
	TOOL DELAY (str6*)	-62	us	"	"
	TOOL DELAY (str7*)	-62	us	"	"
	TOOL DELAY (str8*)	-62	us	"	"
	TOOL DELAY (strn*)	-62	us	"	"
BASELINE NOISE (NEAR)	NOISE WINDOW START	144	us	"	"
	NOISE WINDOW LENGTH	25	us	"	"

### PERCENT BOND CEMENT MAP

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
RAL FREE PIPE AMPLITUDE	FREE AMP REC 1	80	mV	TOP	BOTTOM
	FREE AMP REC 2	80	mV	"	"
	FREE AMP REC 3	80	mV	"	"
	FREE AMP REC 4	80	mV	"	"
	FREE AMP REC 5	80	mV	"	"
	FREE AMP REC 6	80	mV	"	"
	FREE AMP REC 7	80	mV	"	"
	FREE AMP REC 8	80	mV	"	"
RAL FULL BOND AMPLITUDE	FULL BOND AMP REC 1	2	mV	"	"
	FULL BOND AMP REC 2	2	mV	"	"
	FULL BOND AMP REC 3	2	mV	"	"
	FULL BOND AMP REC 4	2	mV	"	"

FULL BOND AMP REC 5	2	mV	"	"
FULL BOND AMP REC 6	2	mV	"	"
FULL BOND AMP REC 7	2	mV	"	"
FULL BOND AMP REC 8	2	mV	"	"

## CURVE DESCRIPTION REPORT

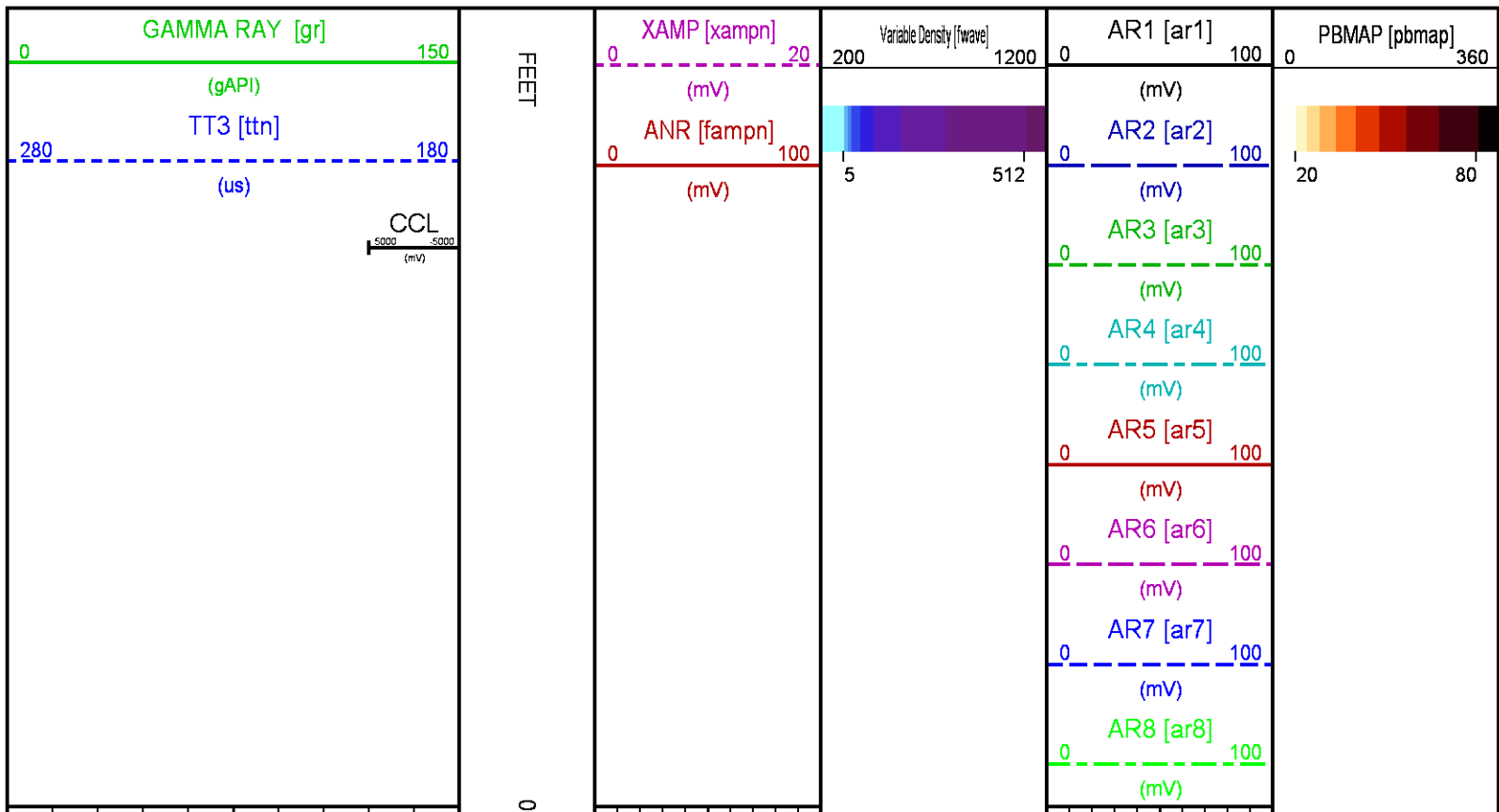
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	FIXED GATE AMPLITUDE T-R7
F1:AR8	N/A	FIXED GATE AMPLITUDE T-R8
F1:CCL	N/A	CASING COLLAR LOCATOR
F1:FAMPN	N/A	FIXED GATE AMPLITUDE NEAR RECEIVER
F1:FWAVE	N/A	FAR WAVE FORM
F1:GR	N/A	GAMMA RAY
F1:PBMAP	N/A	PERCENT BOND CEMENT MAP
F1:TTN	N/A	TRAVELTIME FROM NEAR TRANSMITTER-RECEIVER
F1:XAMPN	N/A	FIXED GATE AMPLITUDE NEAR RECEIVER TIMES FIVE

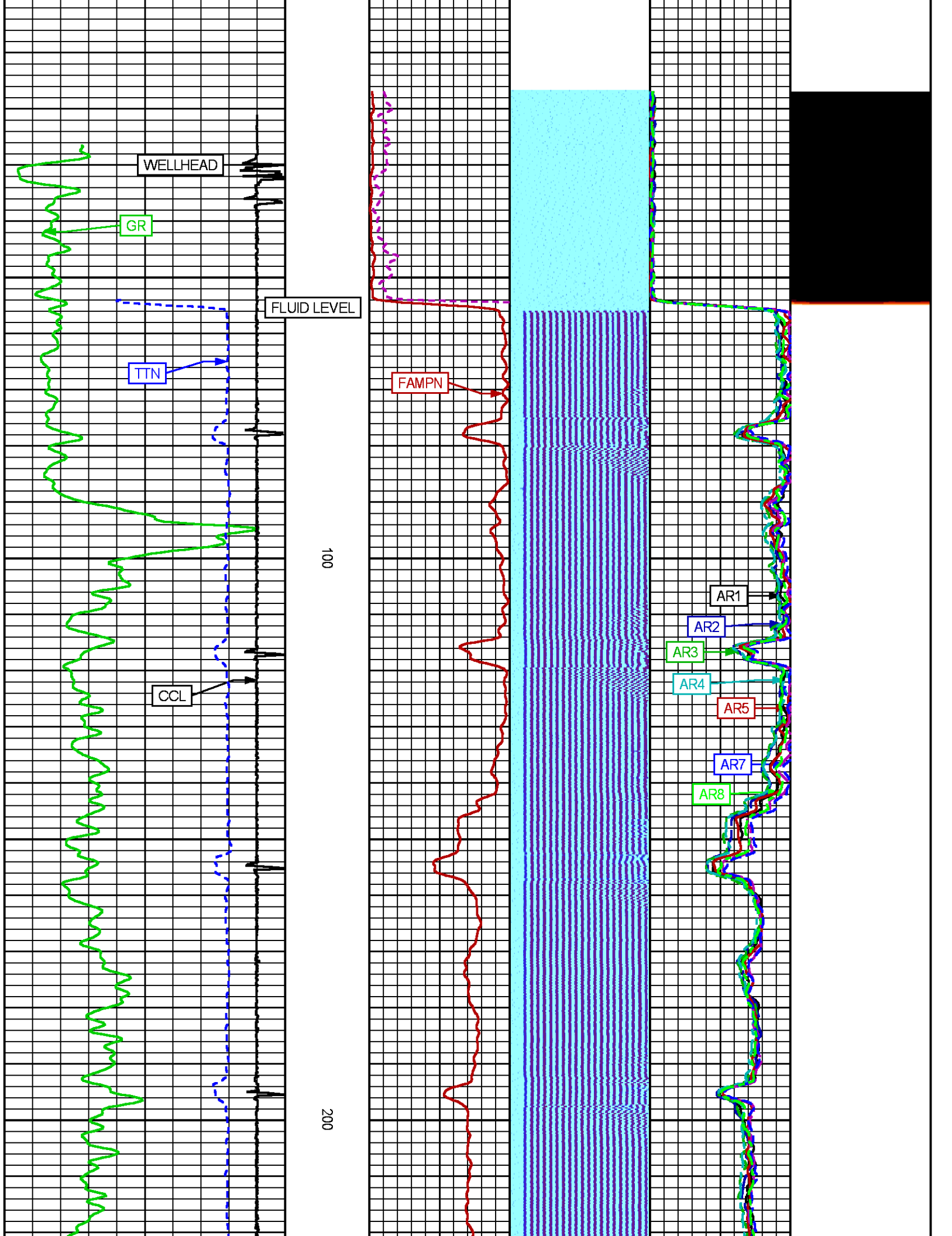
## CURVE MEASURE POINT OFFSET

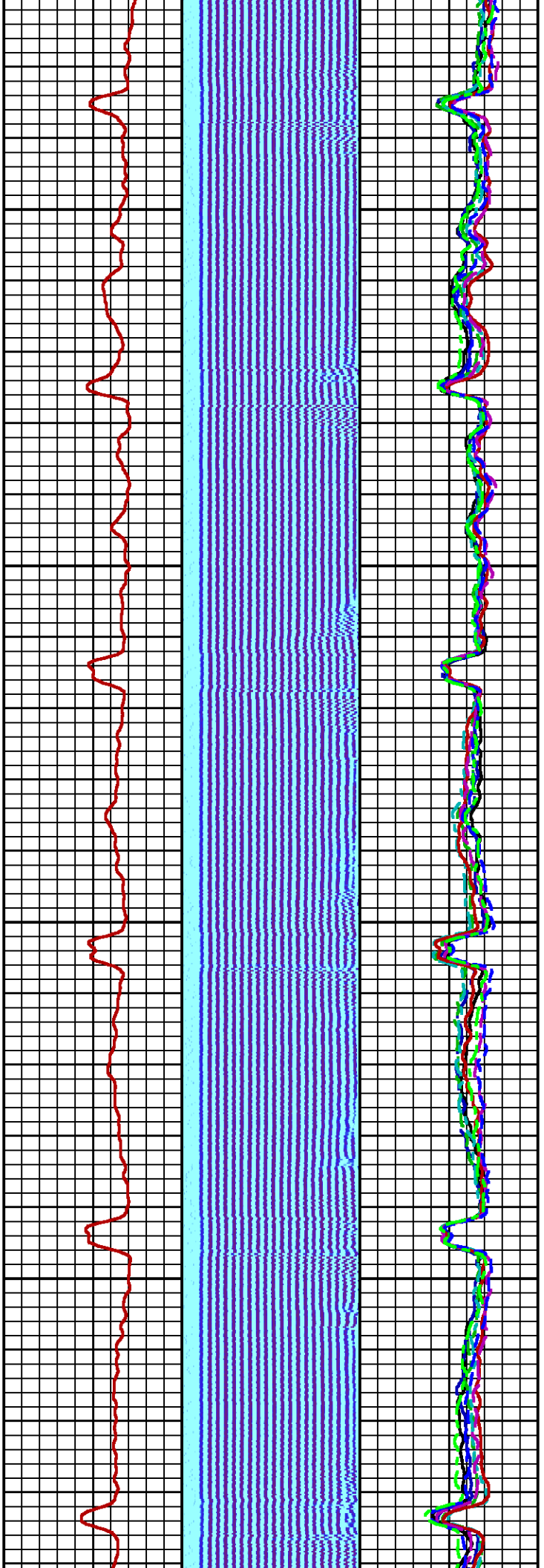
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
AR1	-11.25	AR5	-11.25	CCL	-5.75	XAMPN	-11.25
AR2	-11.25	AR6	-11.25	FAMPN	-11.25		
AR3	-11.25	AR7	-11.25	GR	-1.75		
AR4	-11.25	AR8	-11.25	TTN	-11.25		

**Presentation** : SysA:/dat1a/LARAMIE\_BRUTON\_19\_17W/30-17W\_RAL\_MAIN.fvpdf [5"/100' Scale]  
**Plot Interval** : 0 - 8190 Feet

**Data File 1** : F1 : SysA:/dat1a/LARAMIE\_BRUTON\_19\_17W/30-17W\_RAL\_MAIN.xtf  
**Created On** : N/A  
**Company** : LARAMIE ENERGY LLC  
**Well** : BRUTON FEDERAL 30-17W  
**Field** : VEGA  
**File Interval** : 12 - 8184.25 Feet  
**OCT** : p012g

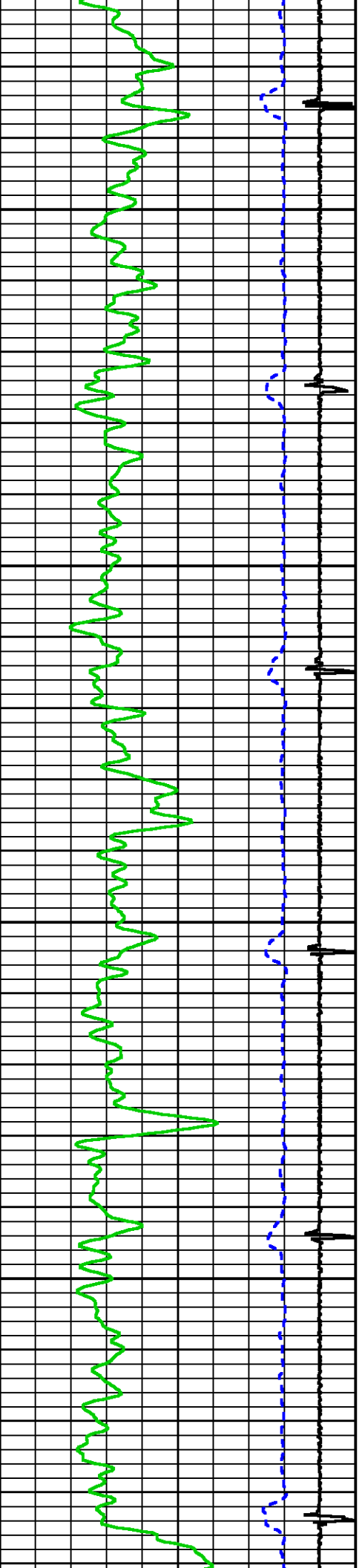


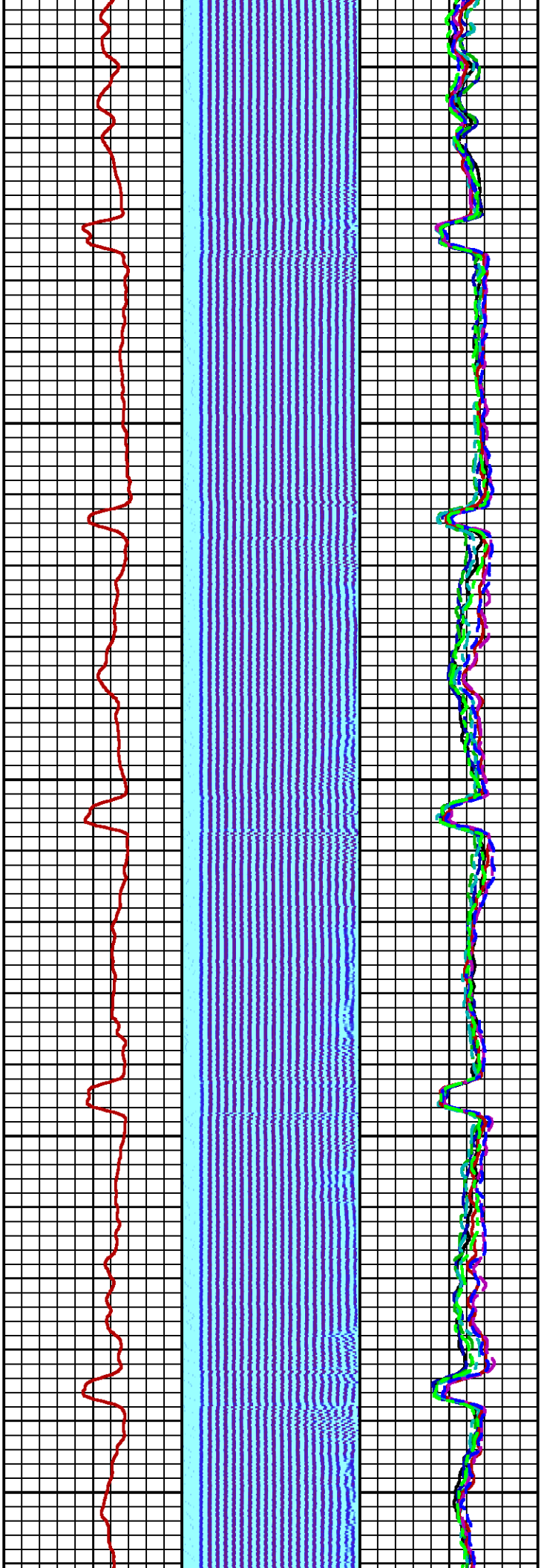




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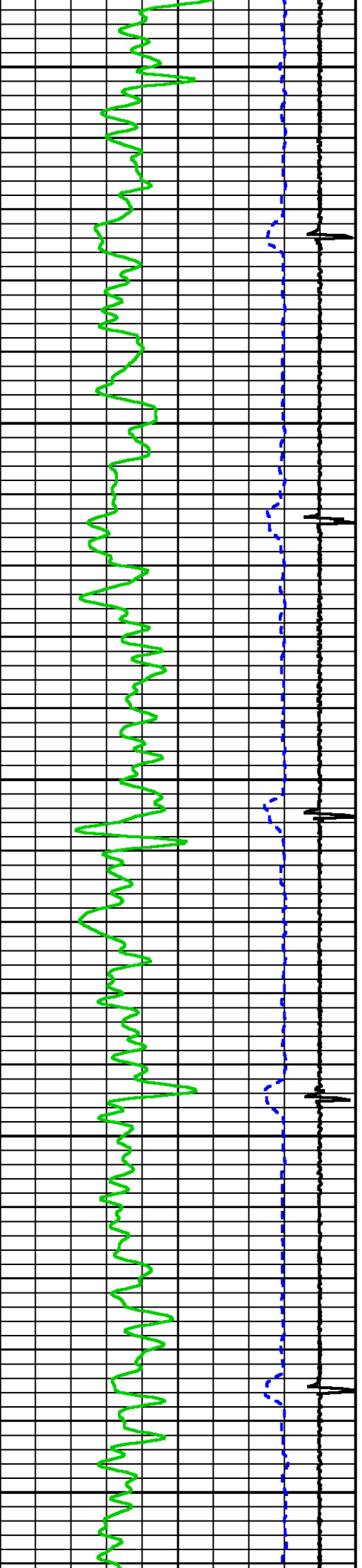
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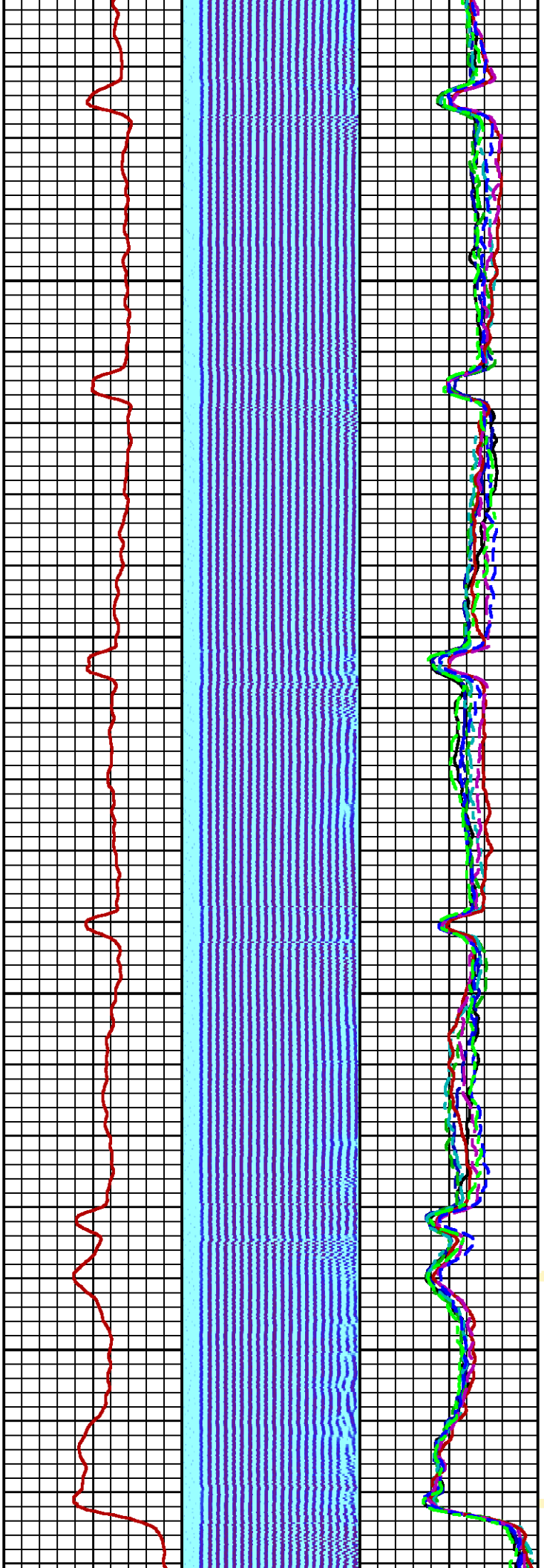


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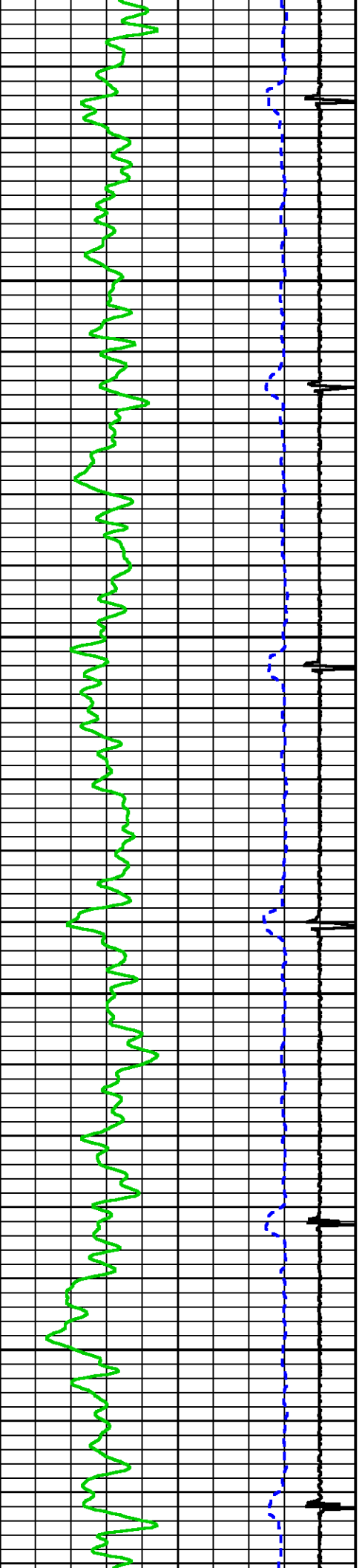


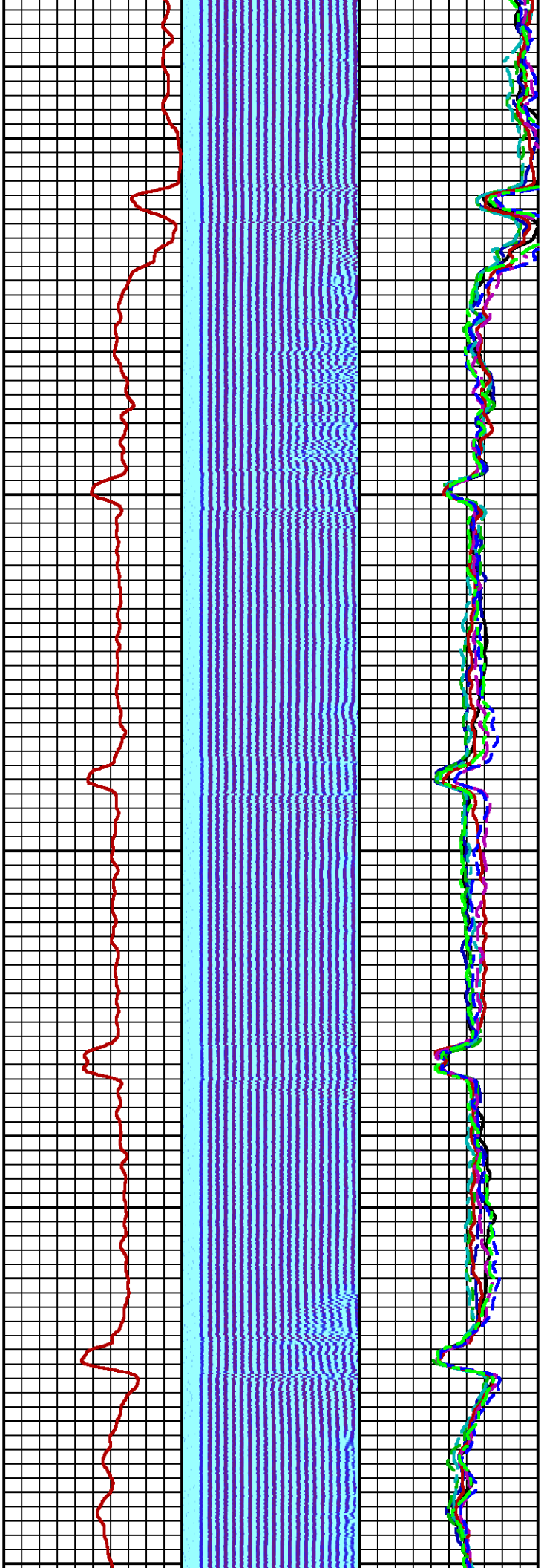




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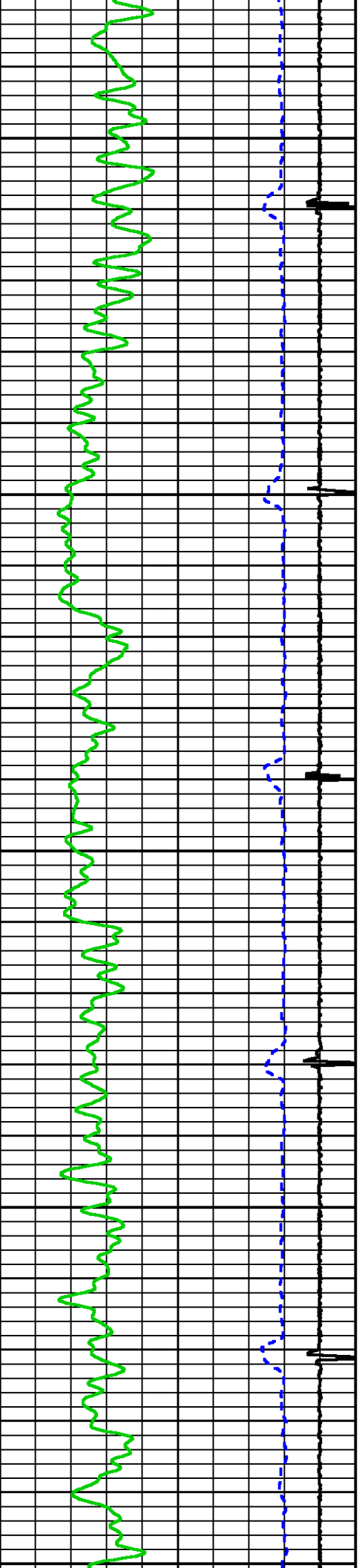




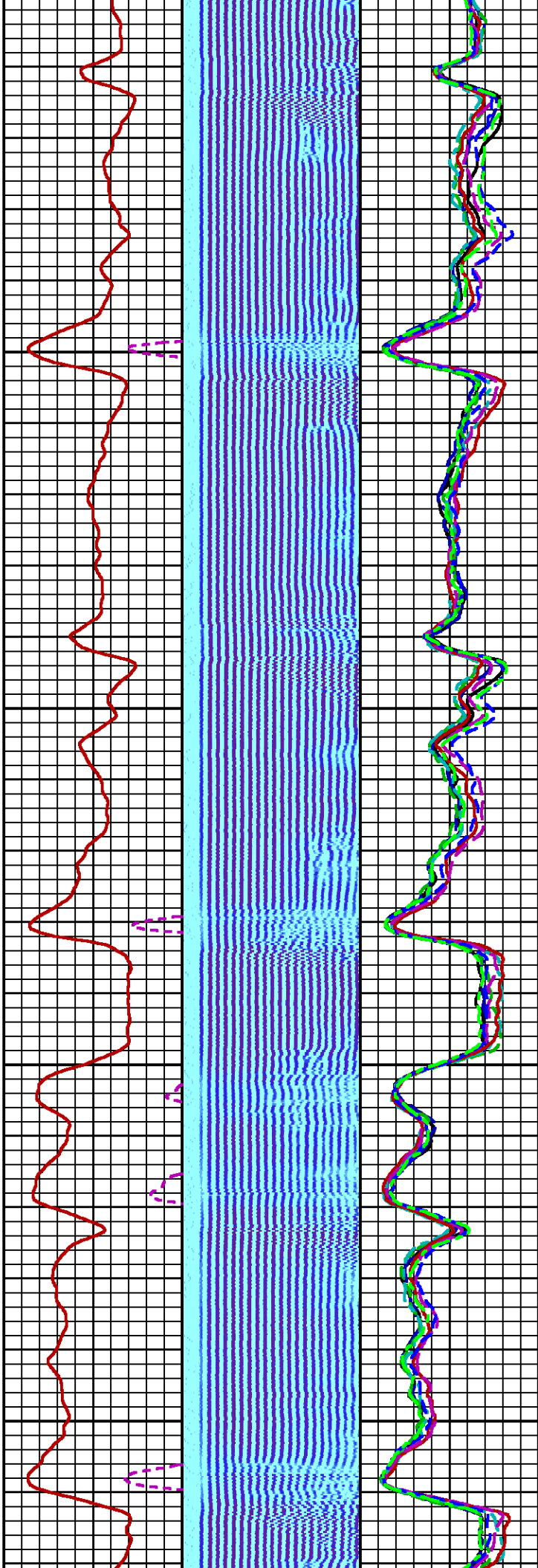
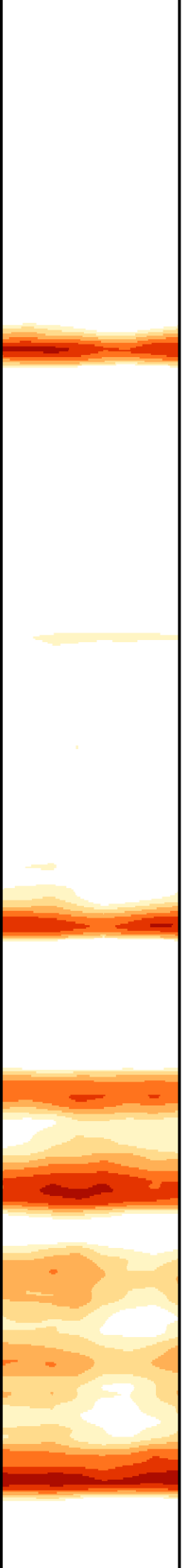
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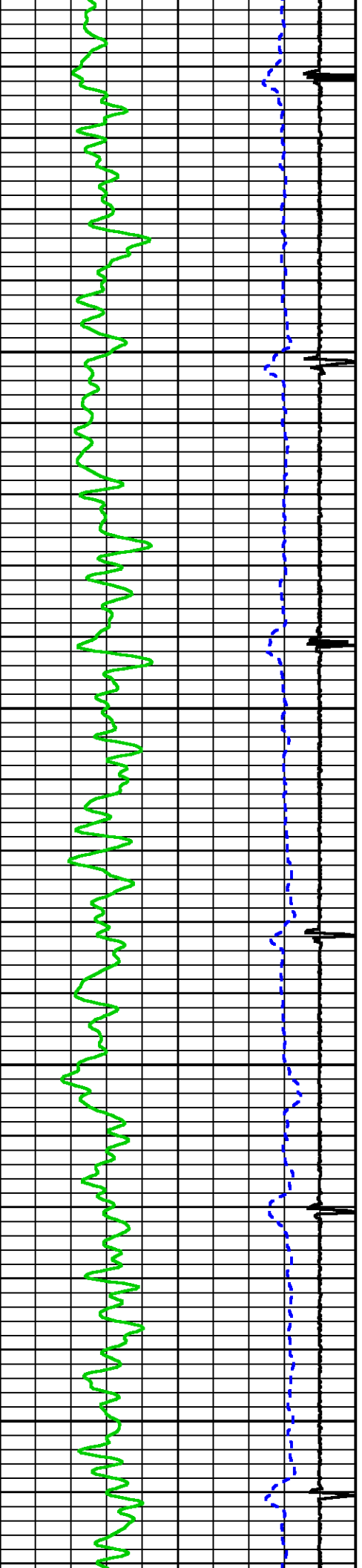


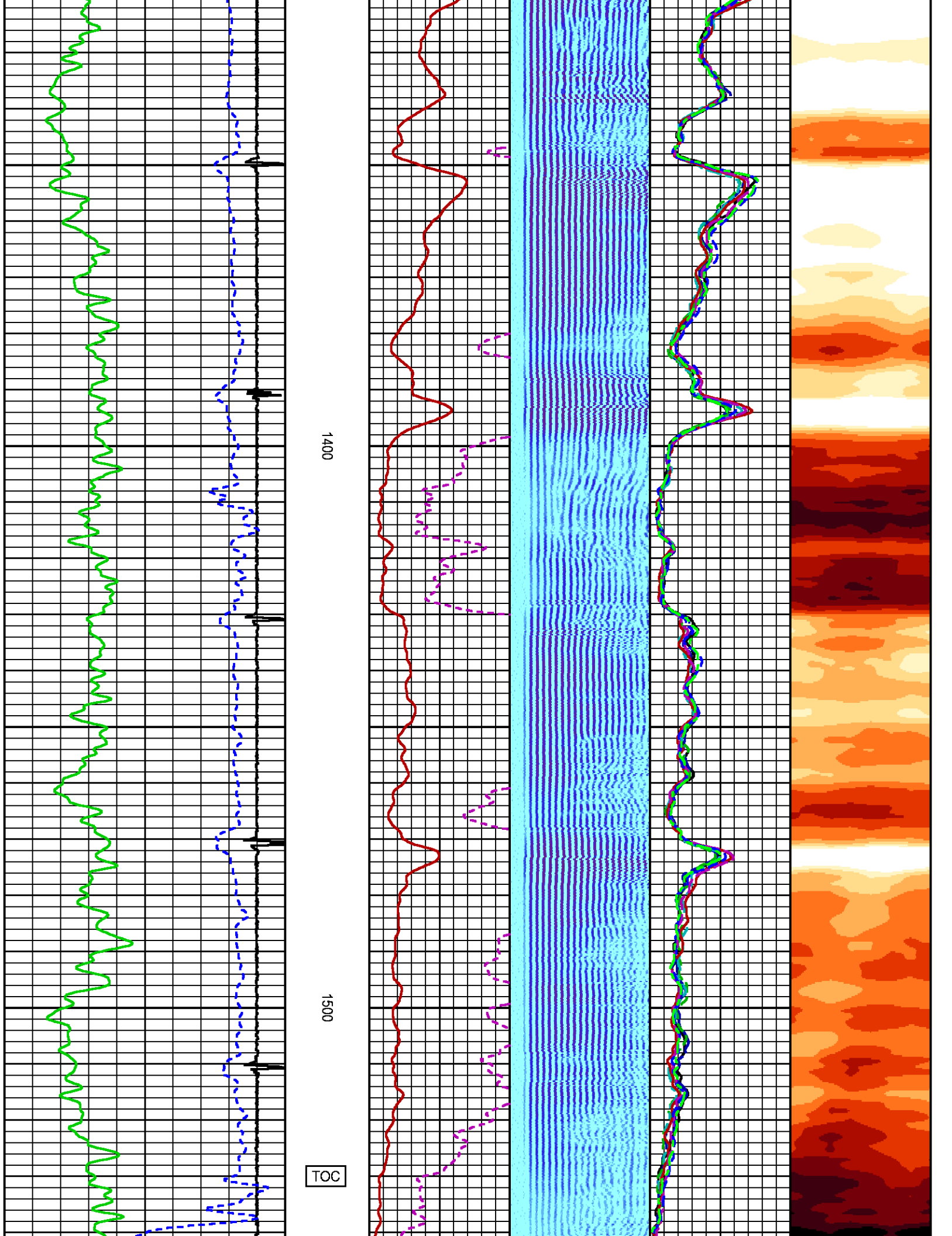


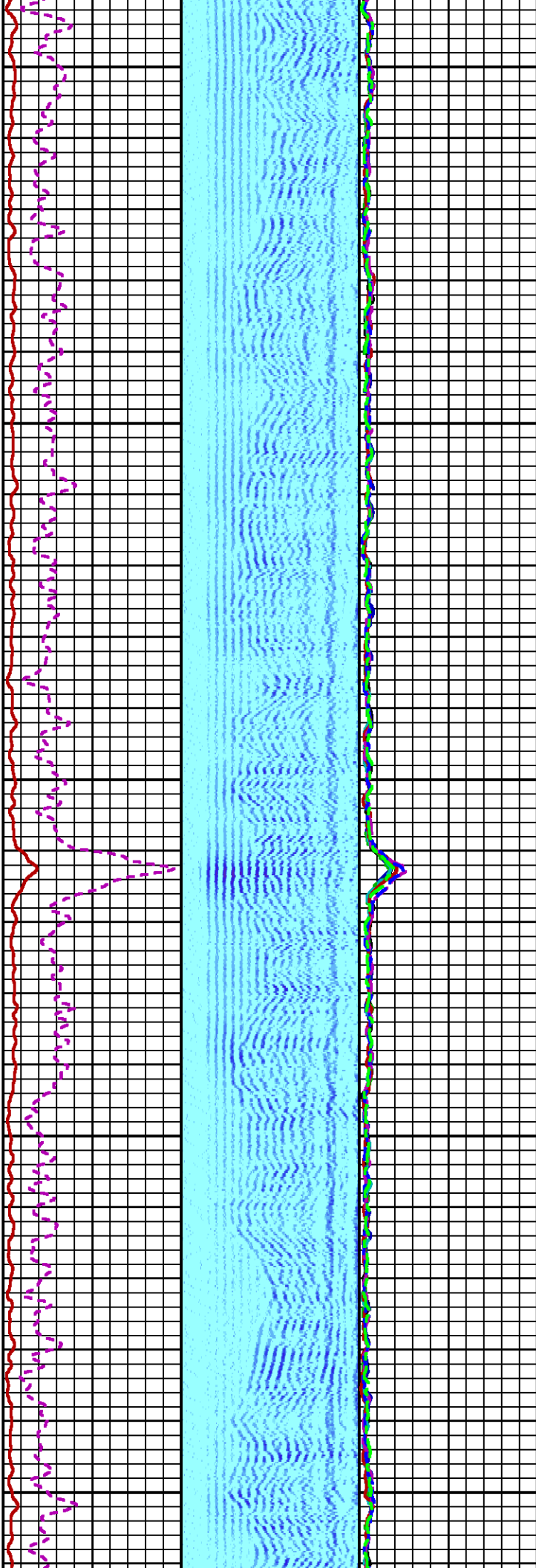
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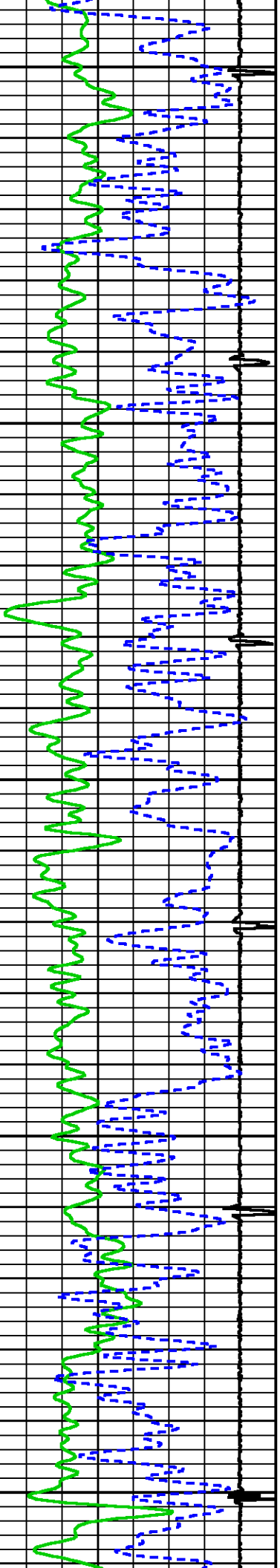


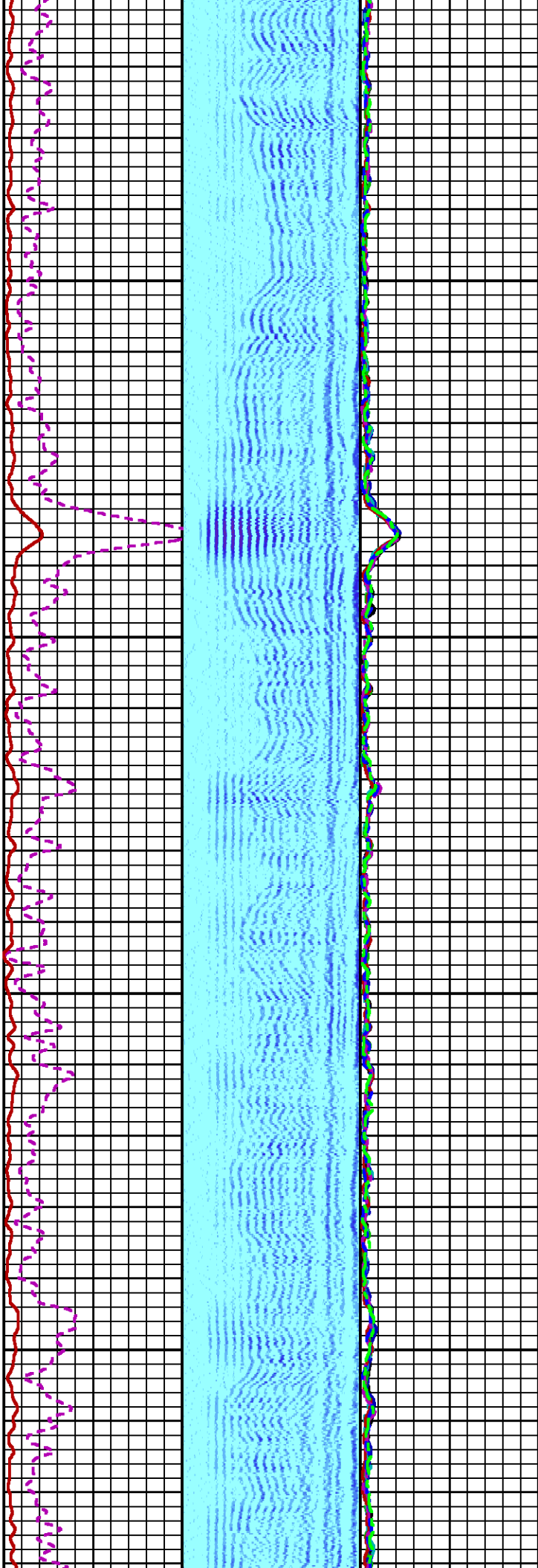
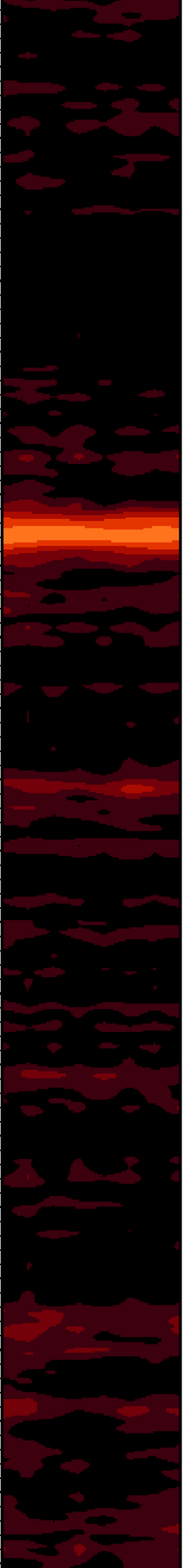




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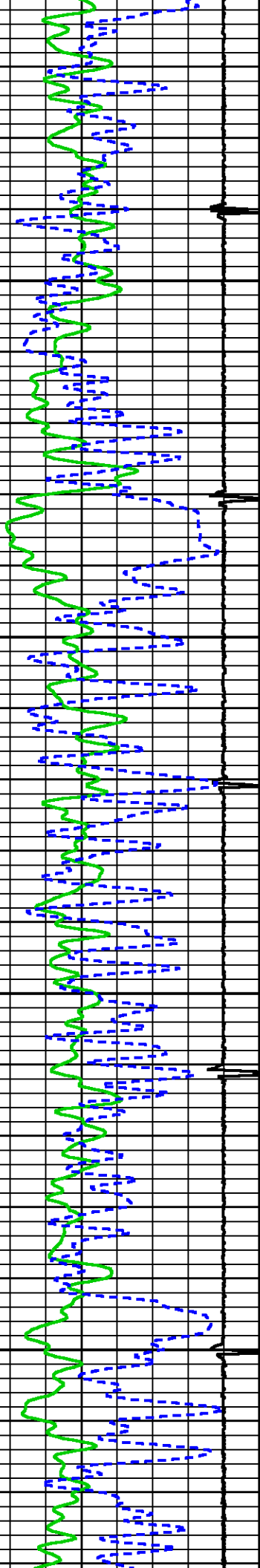
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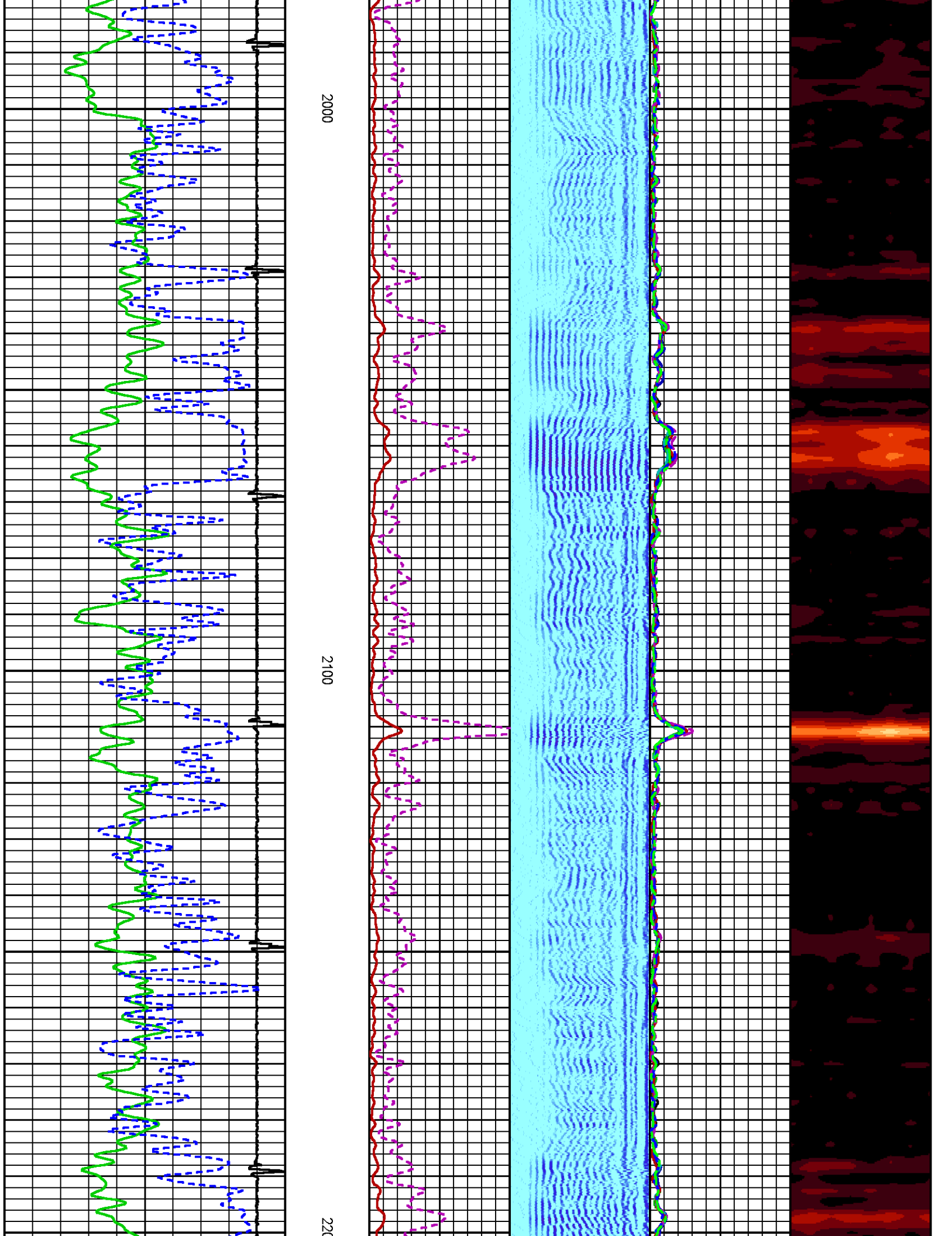


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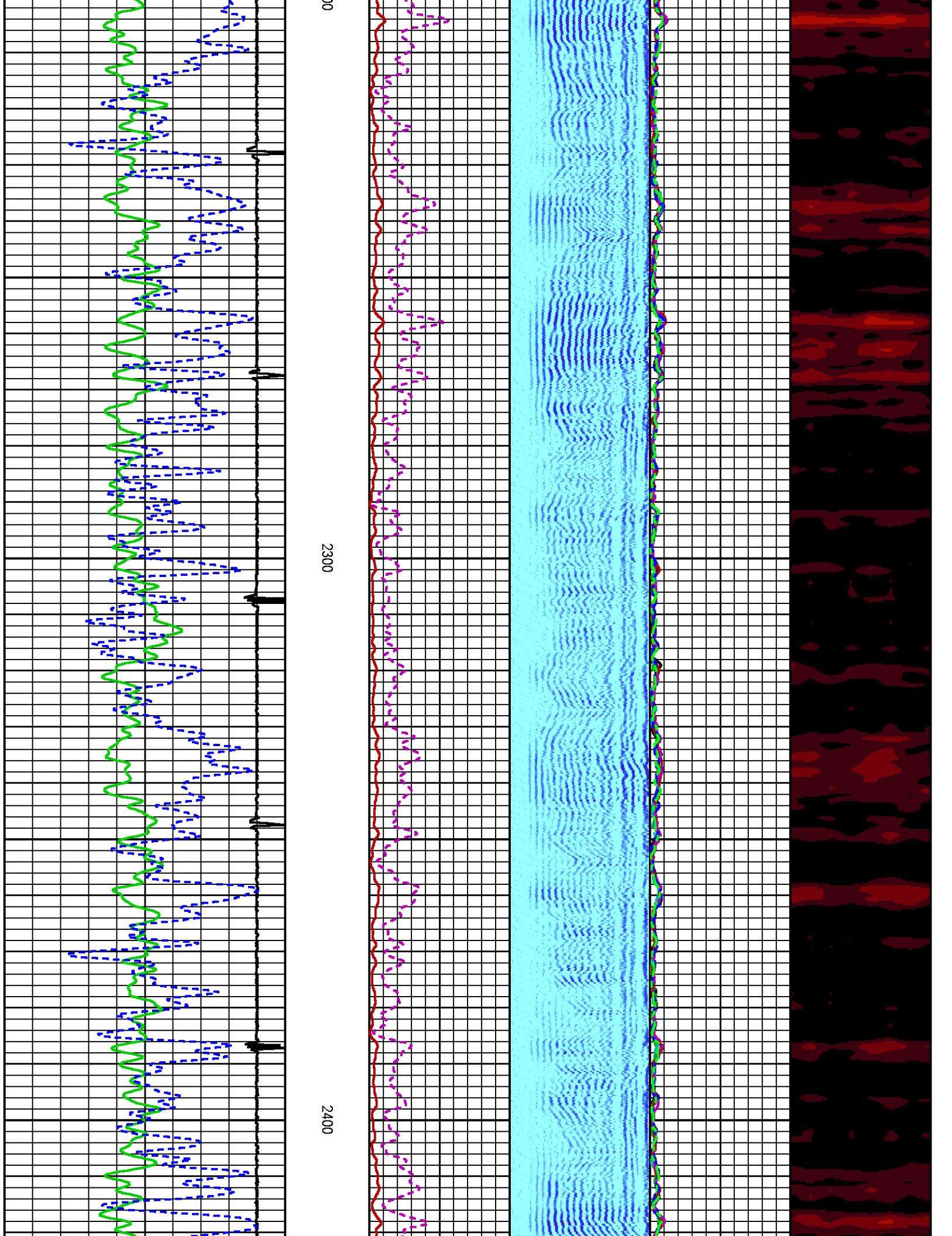


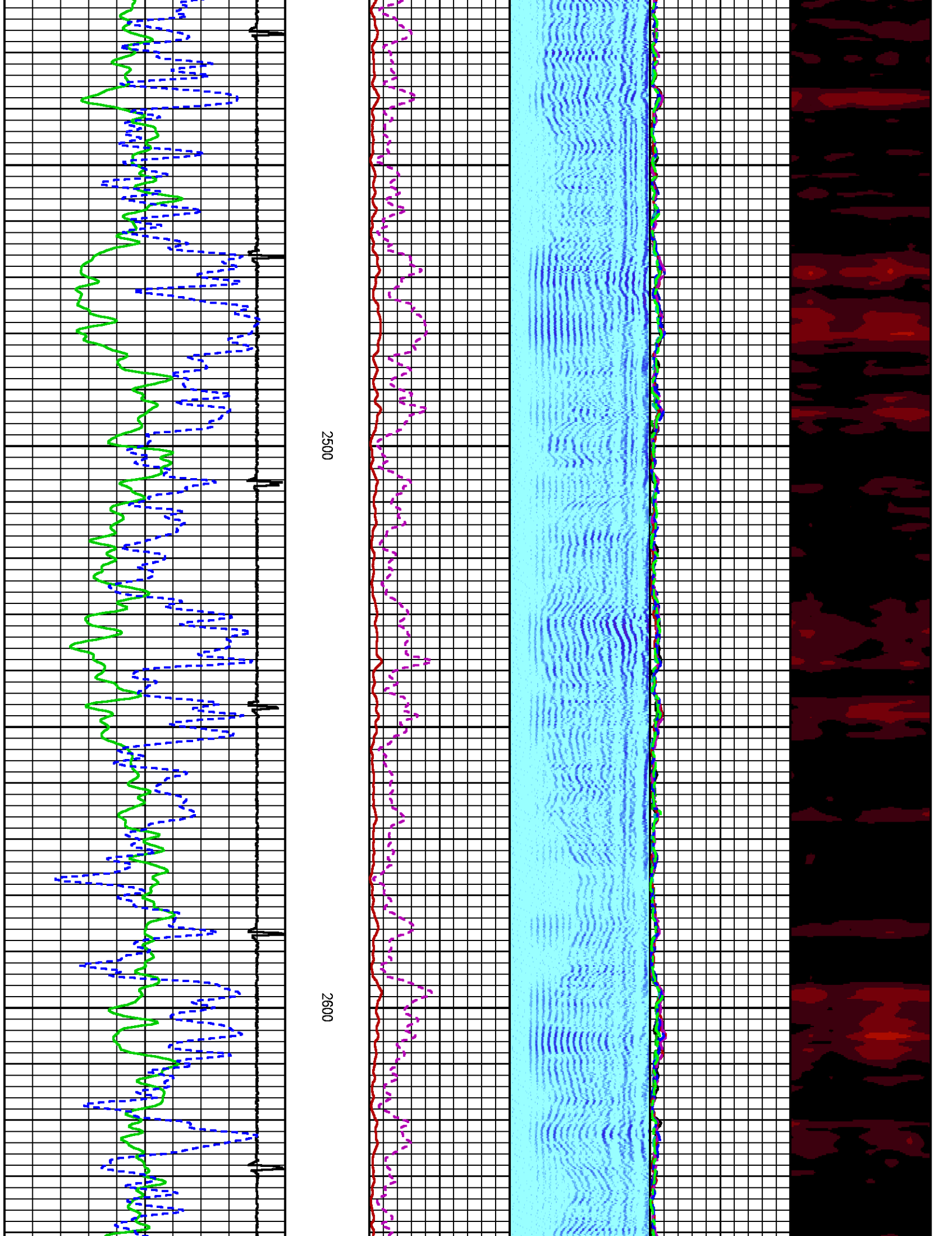
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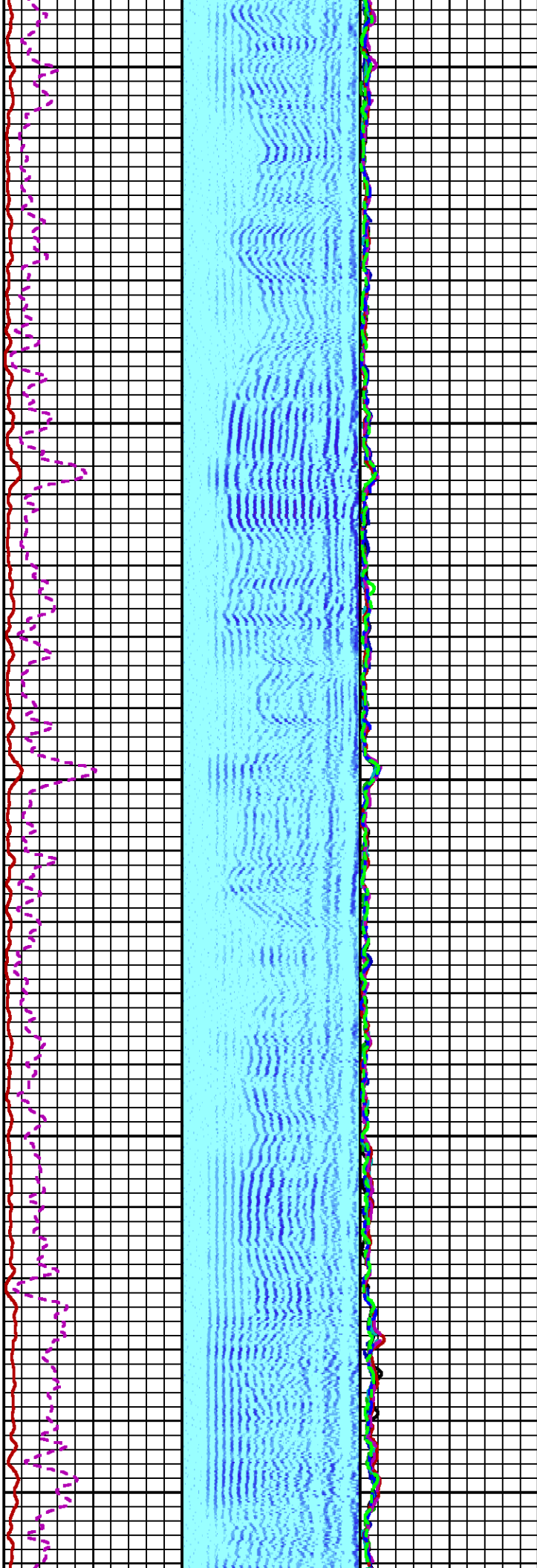
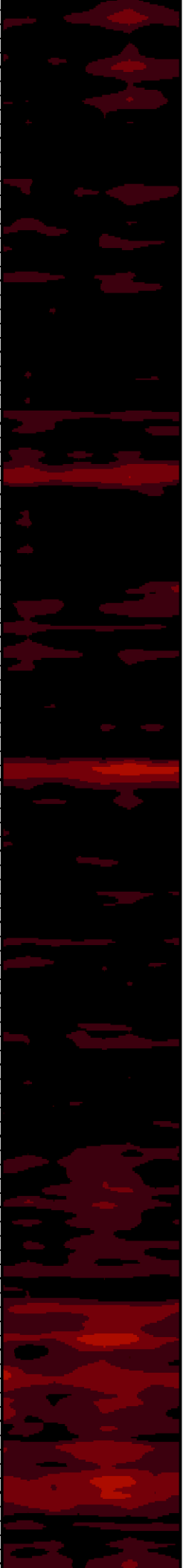
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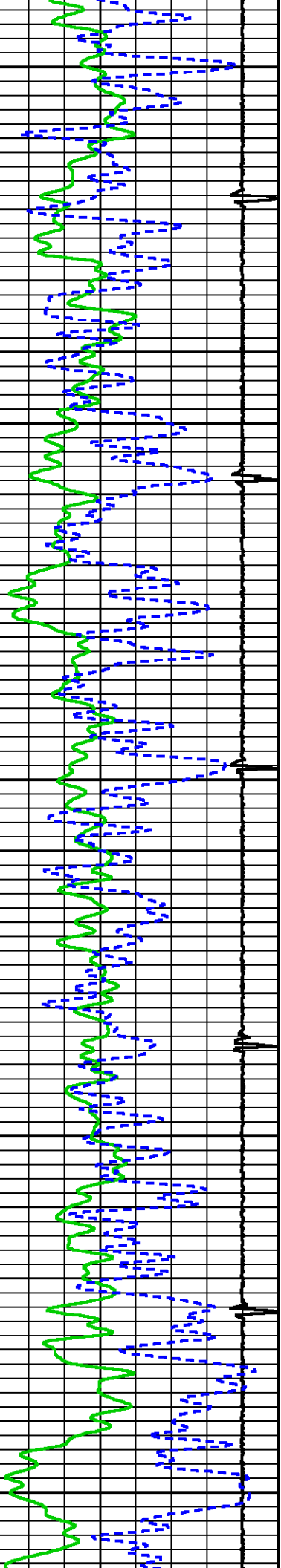


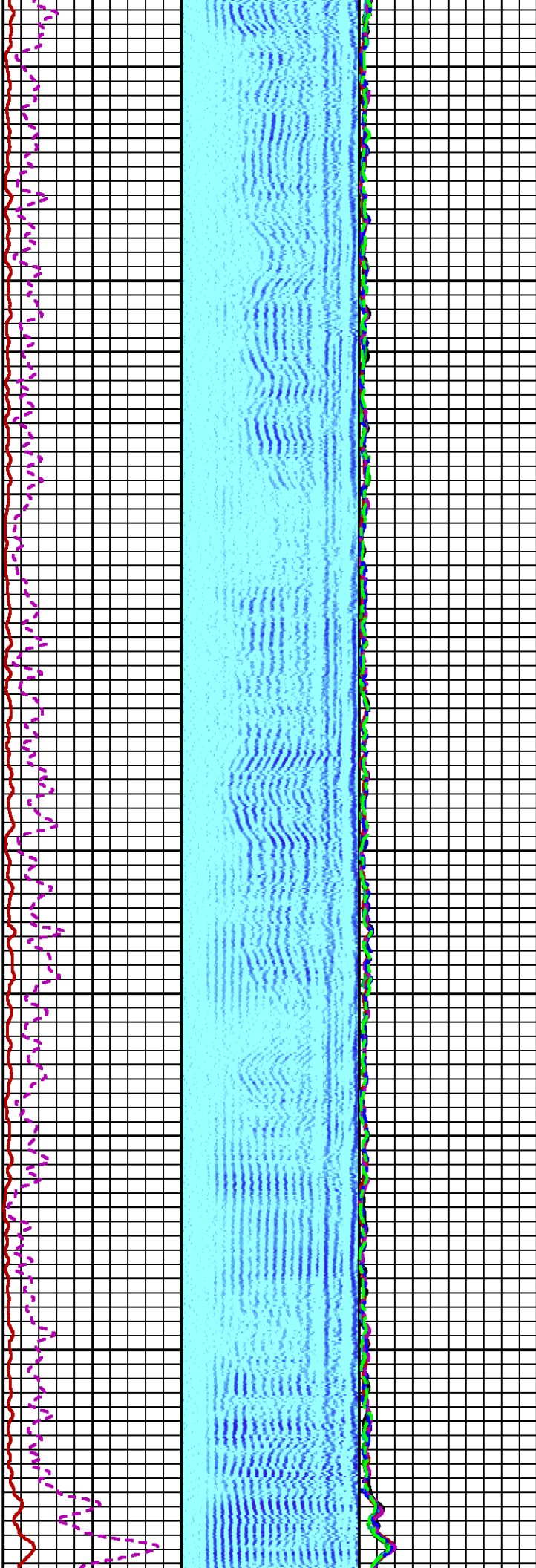




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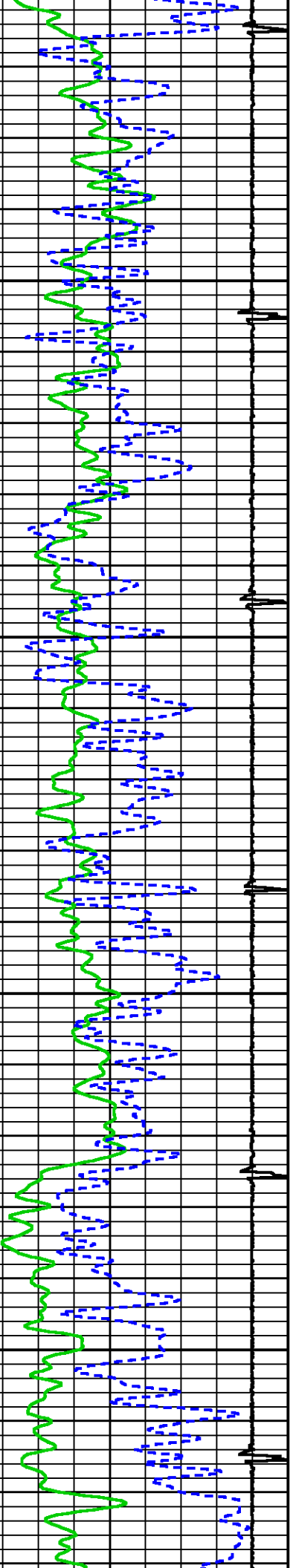
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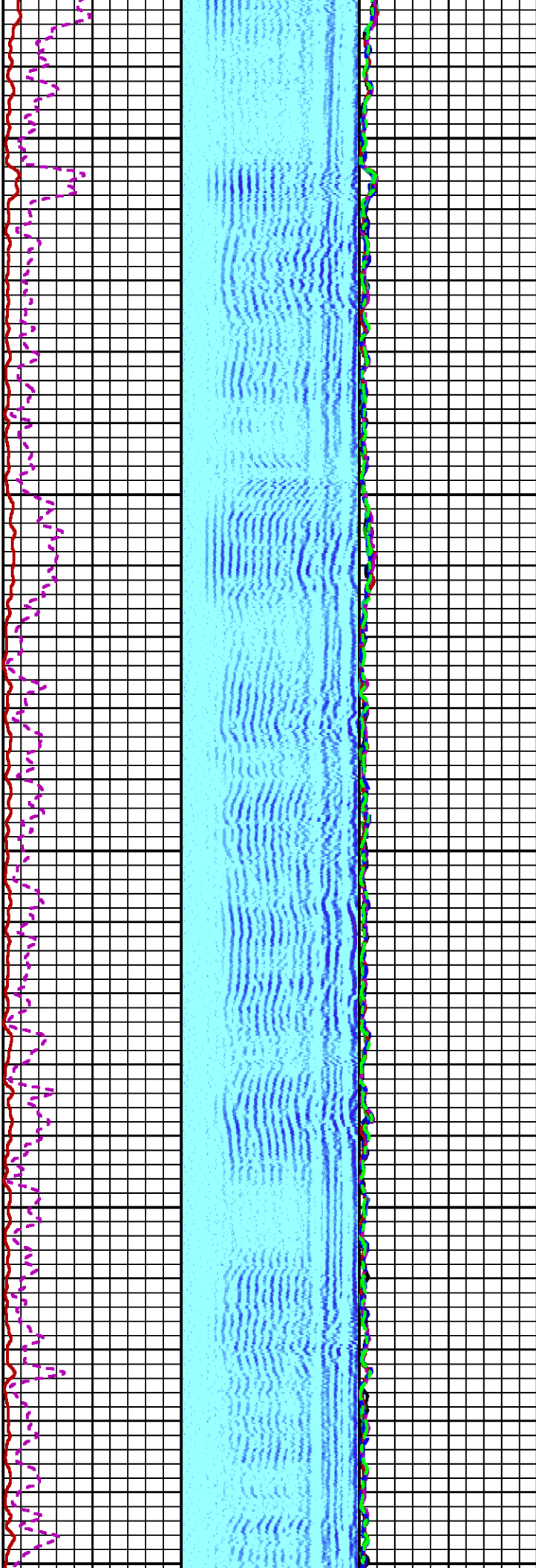


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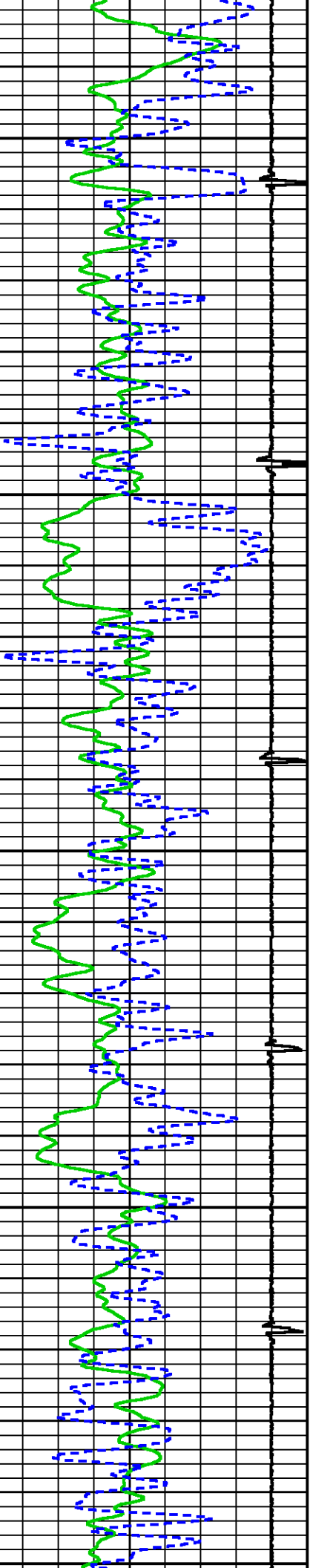




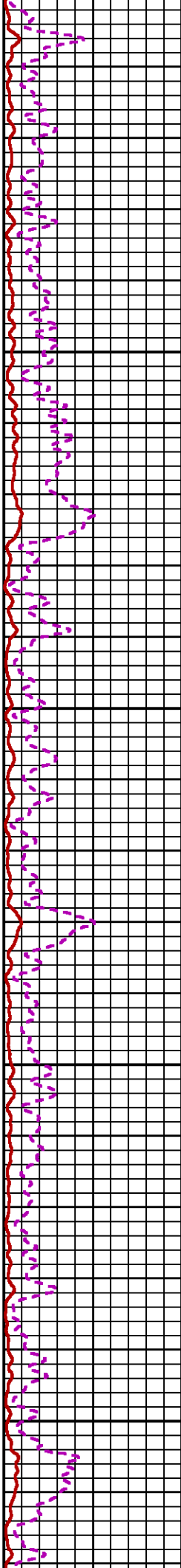
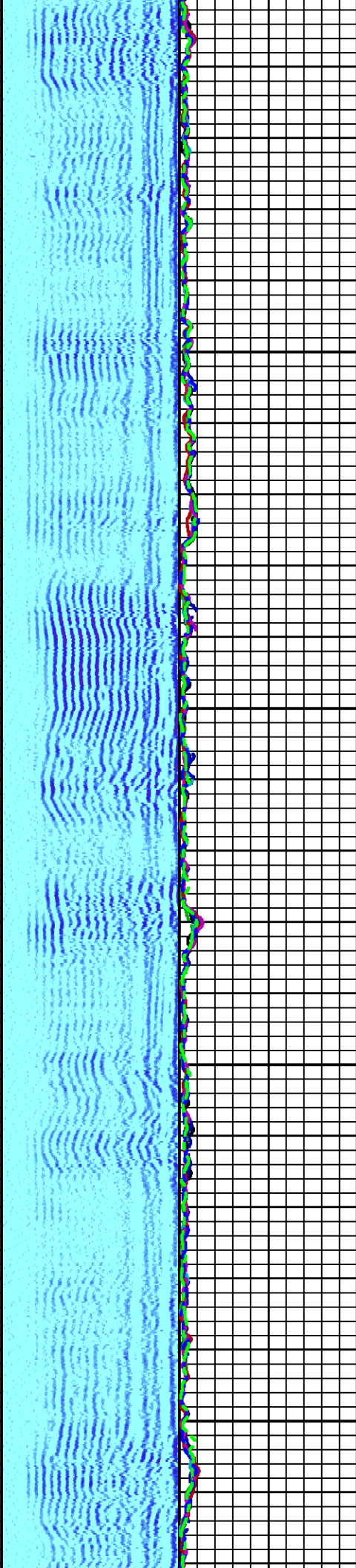
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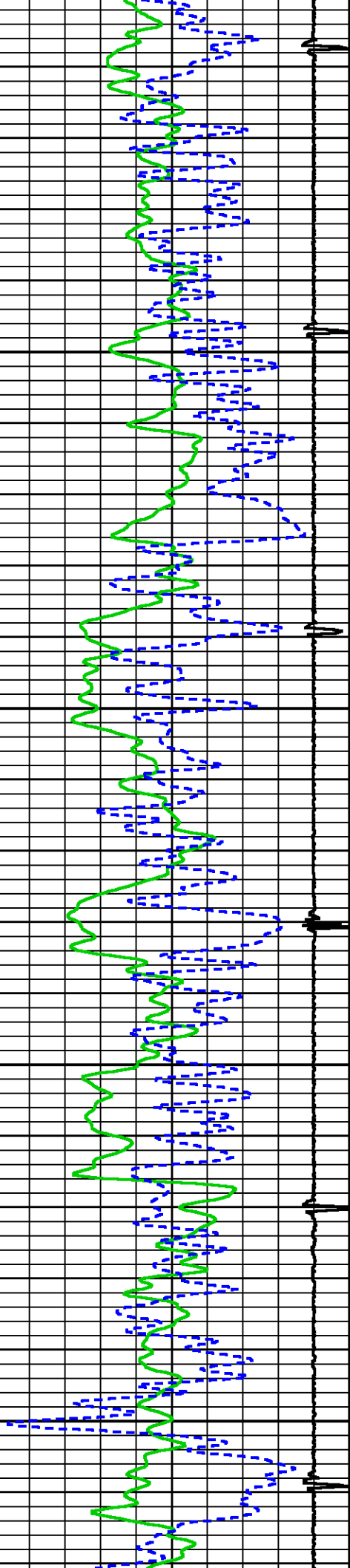
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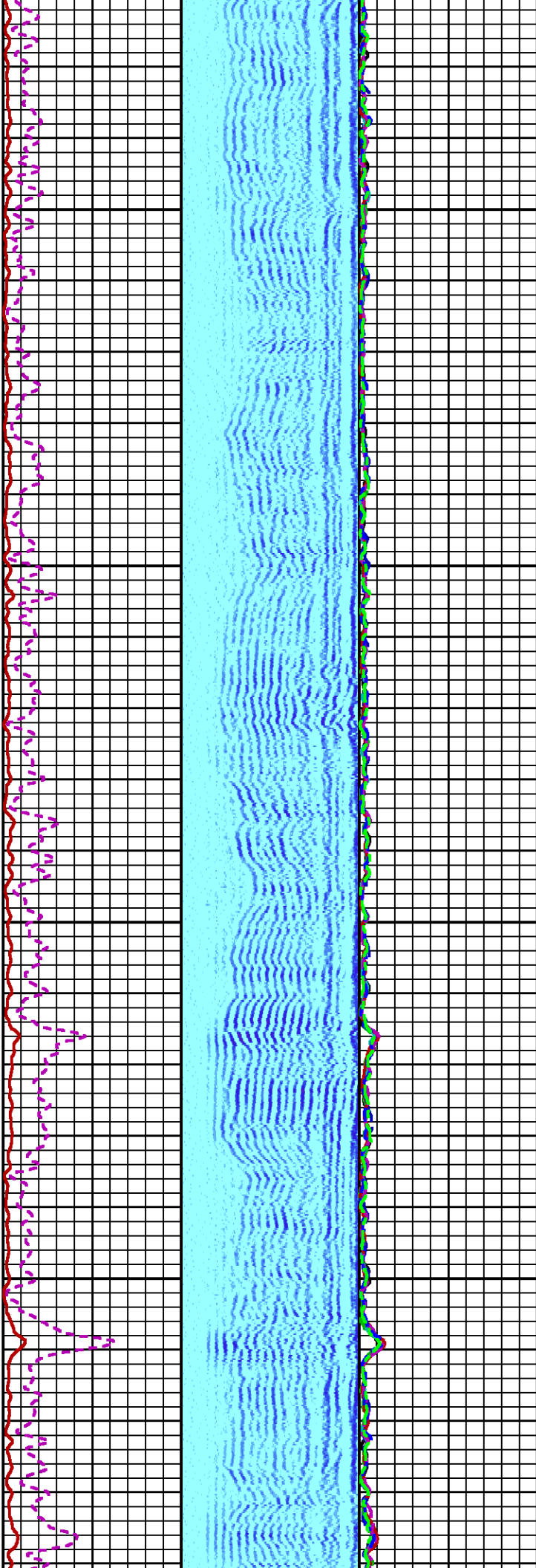






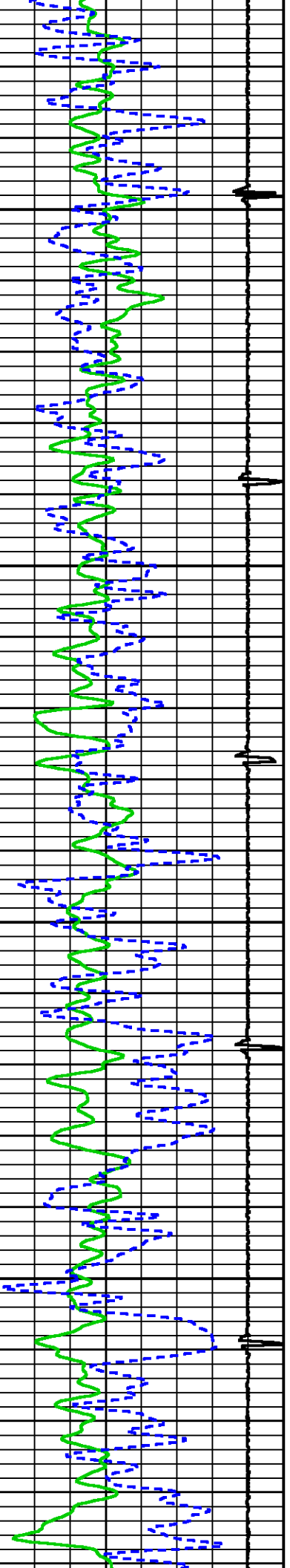
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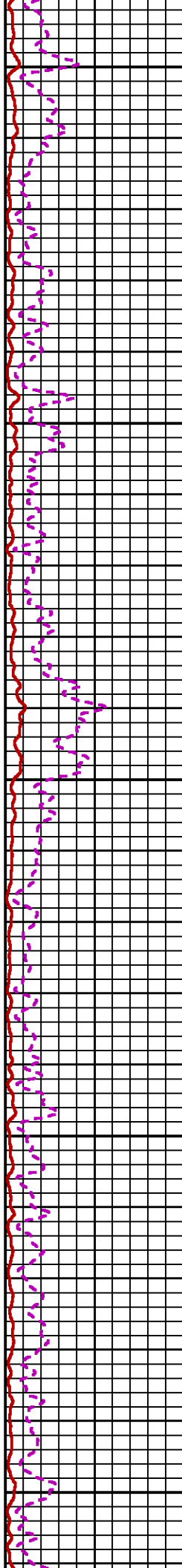
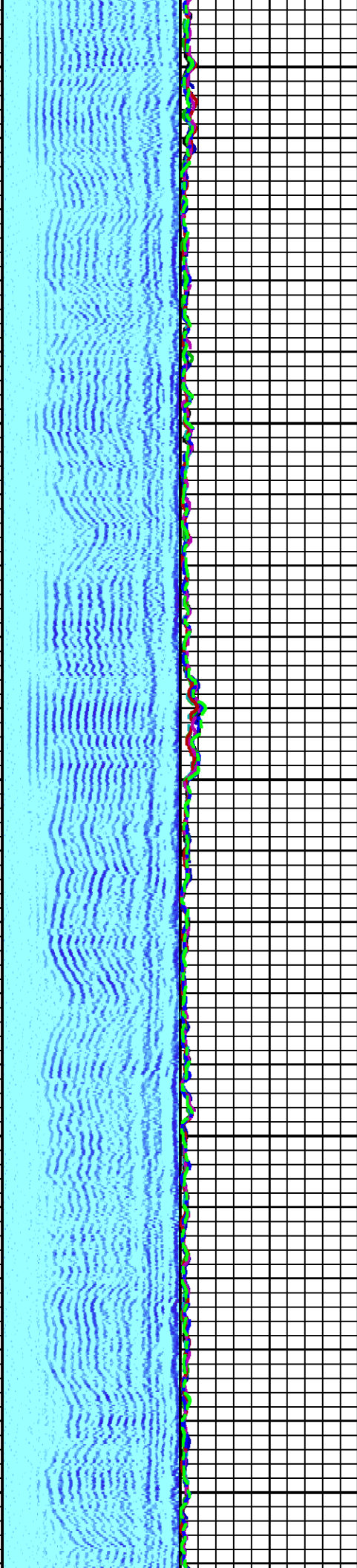




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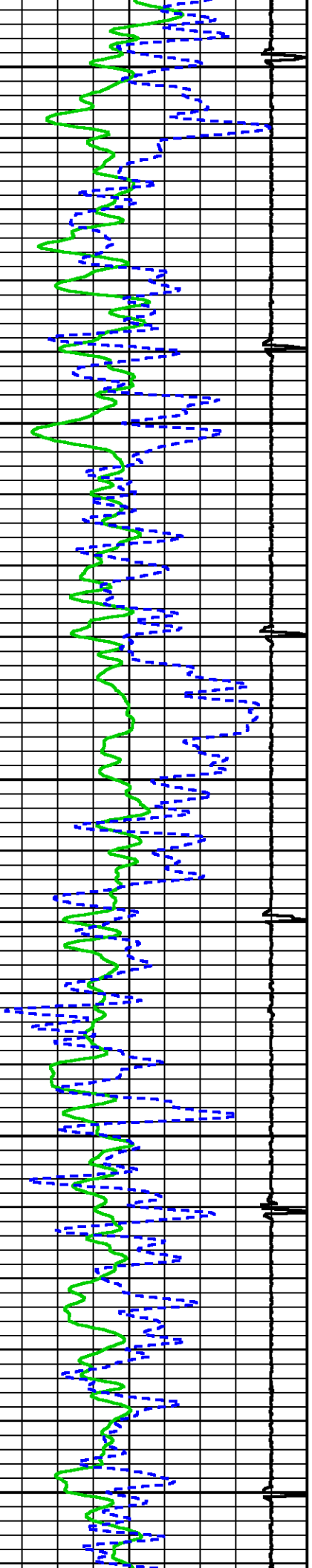
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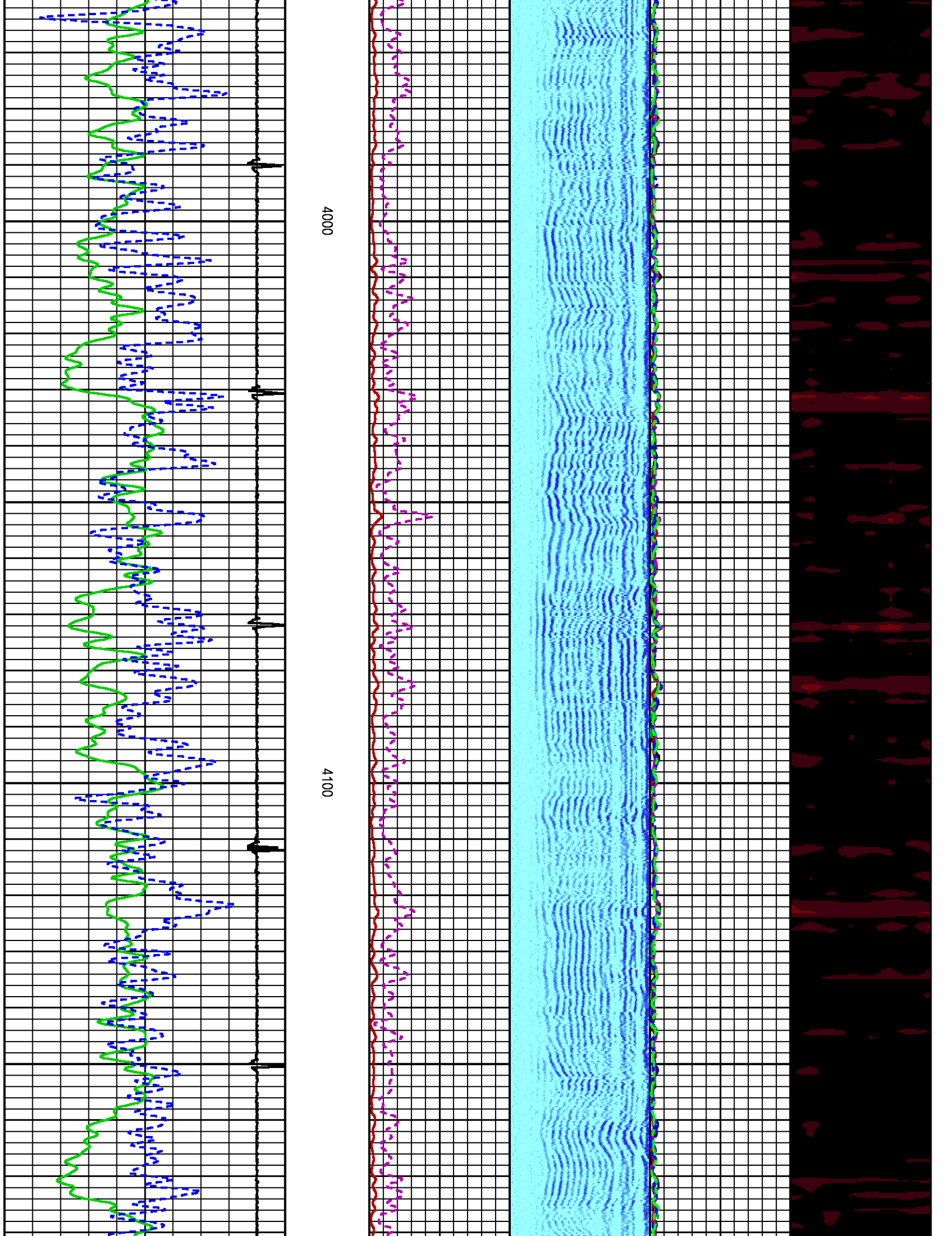




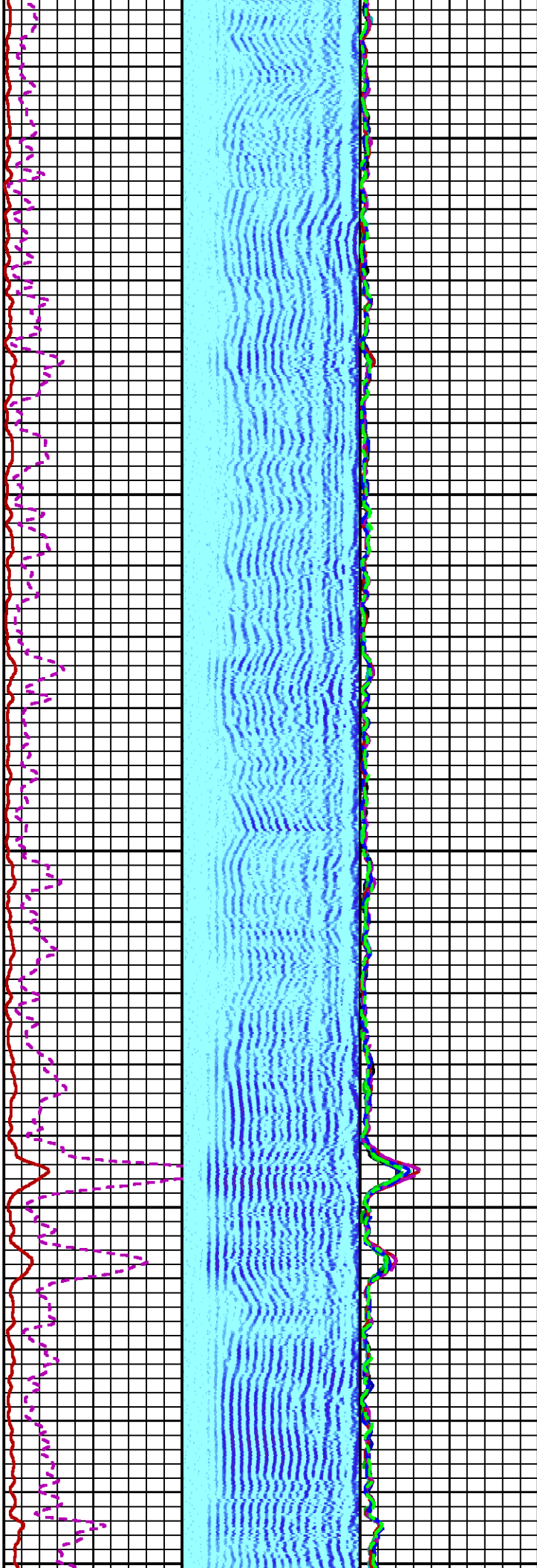
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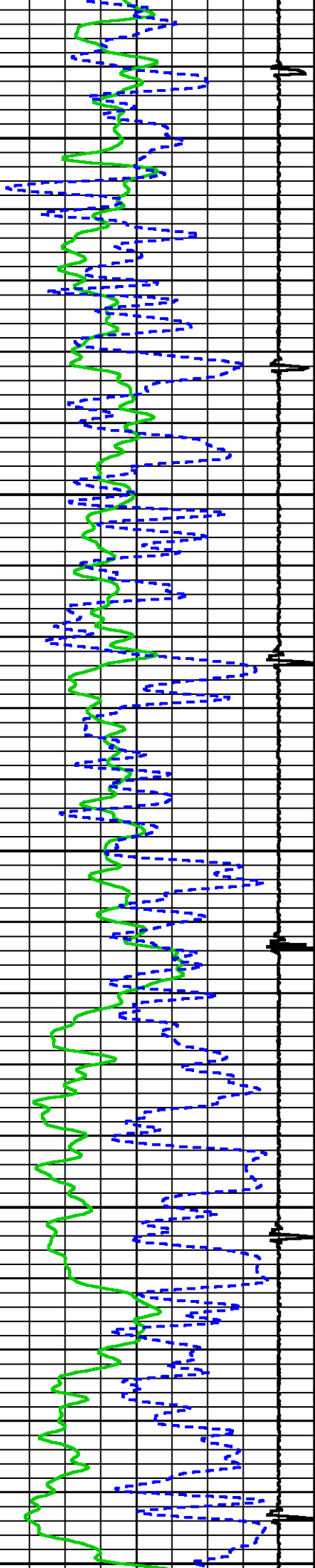




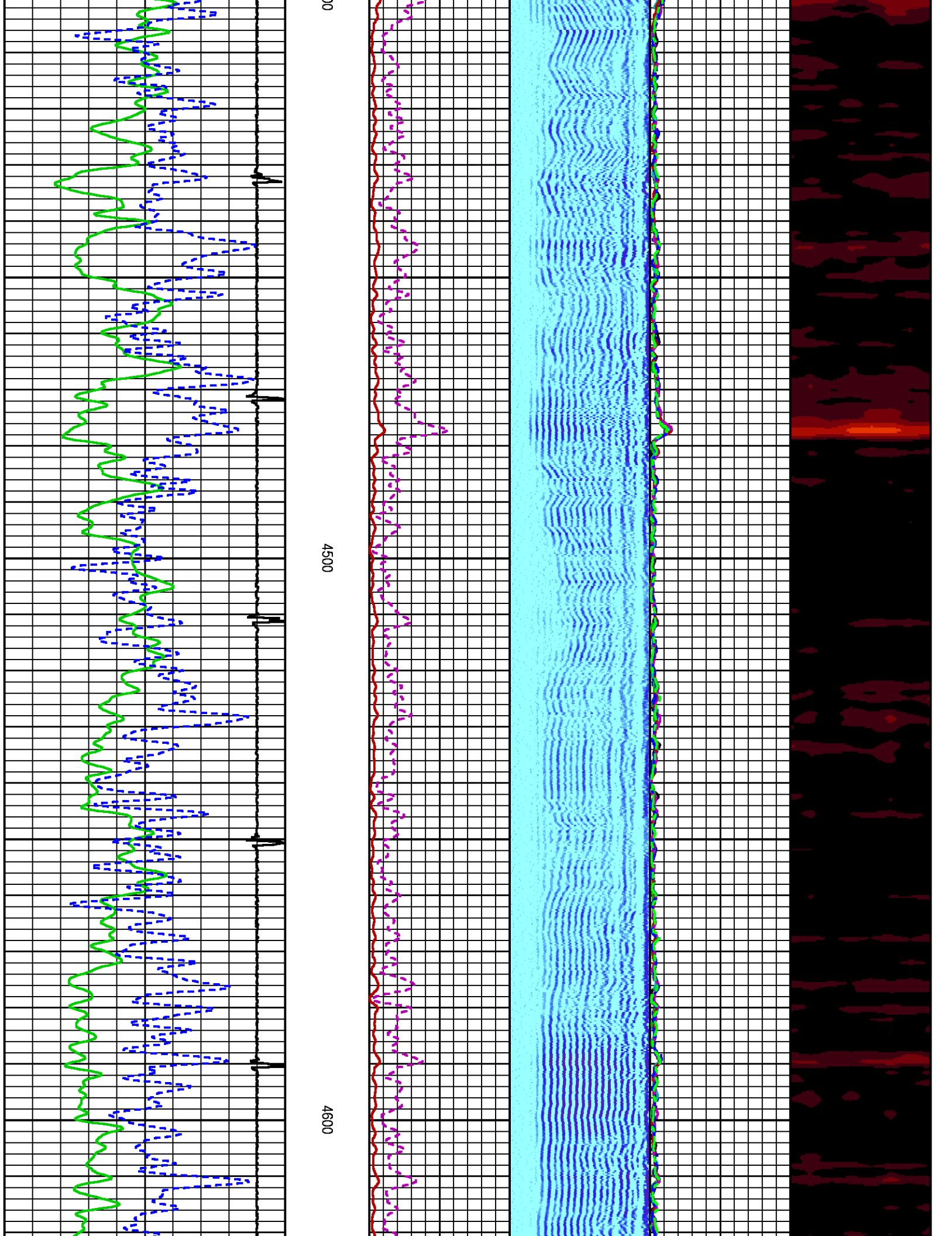
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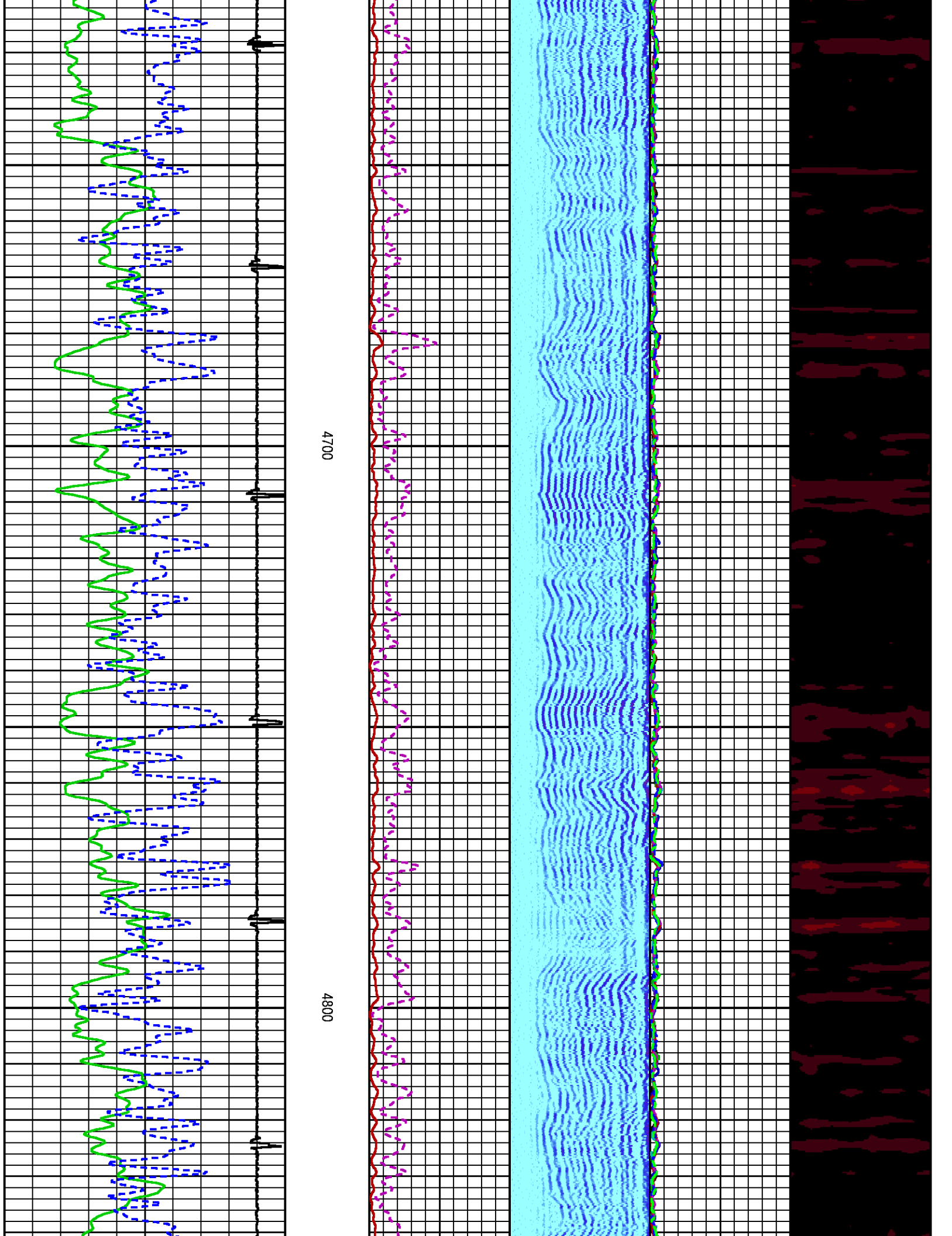
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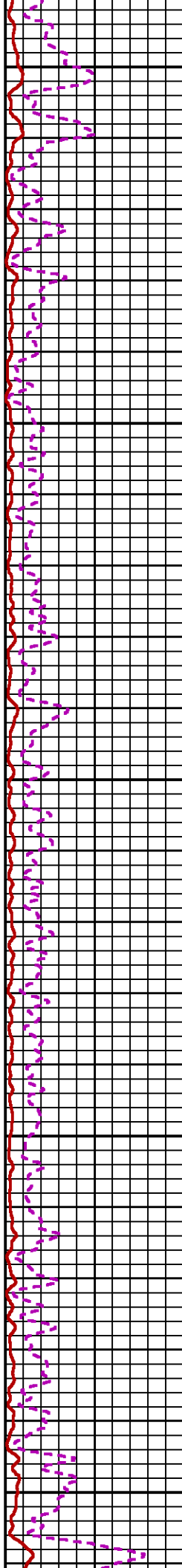
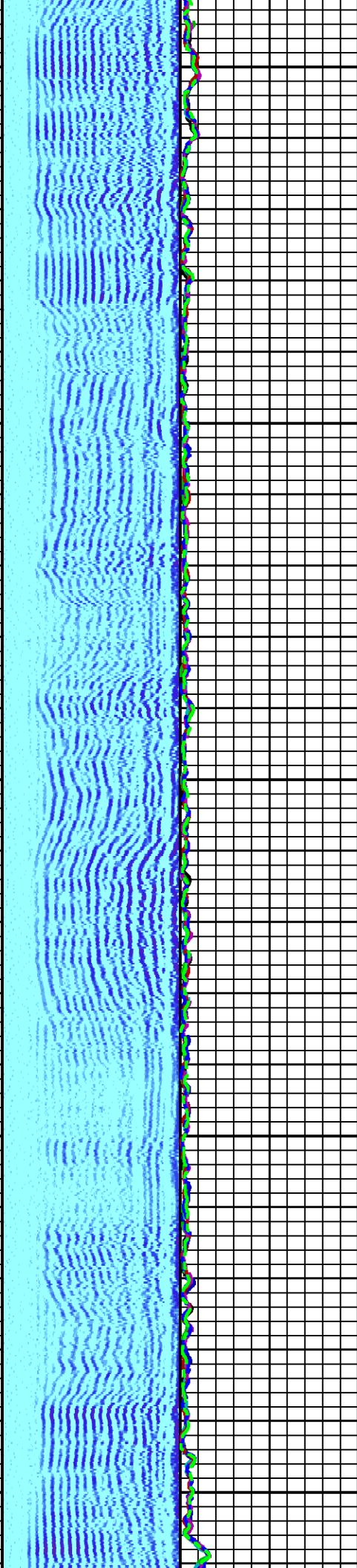
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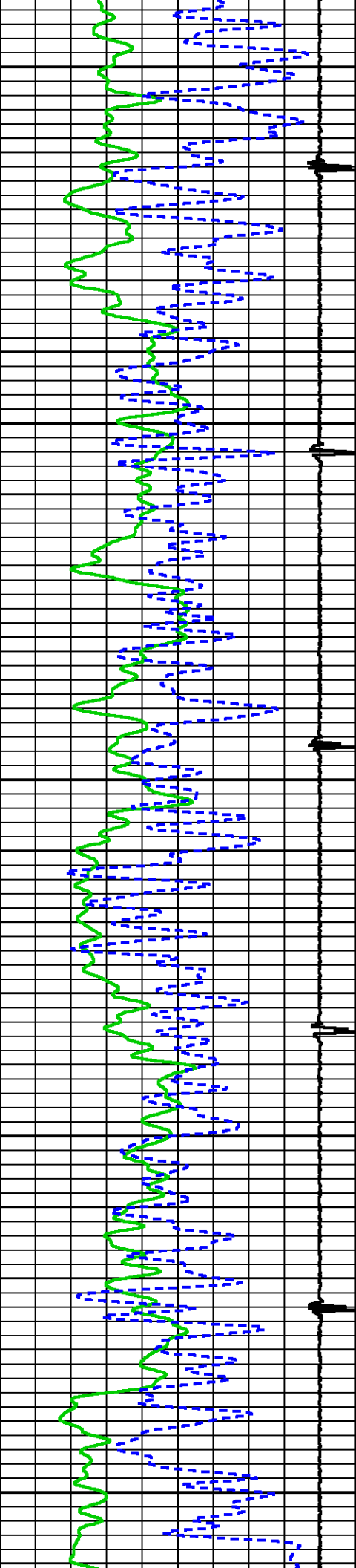


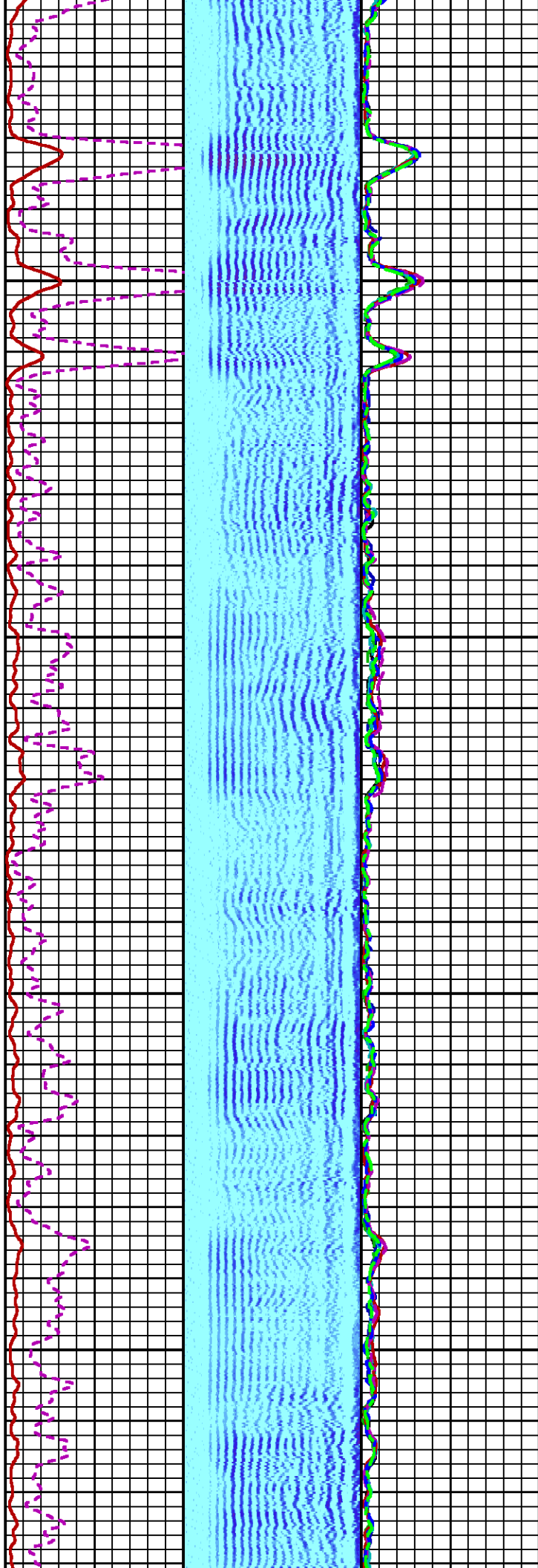
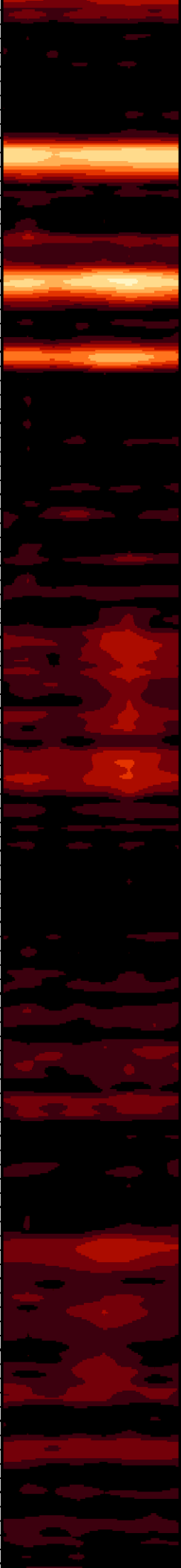




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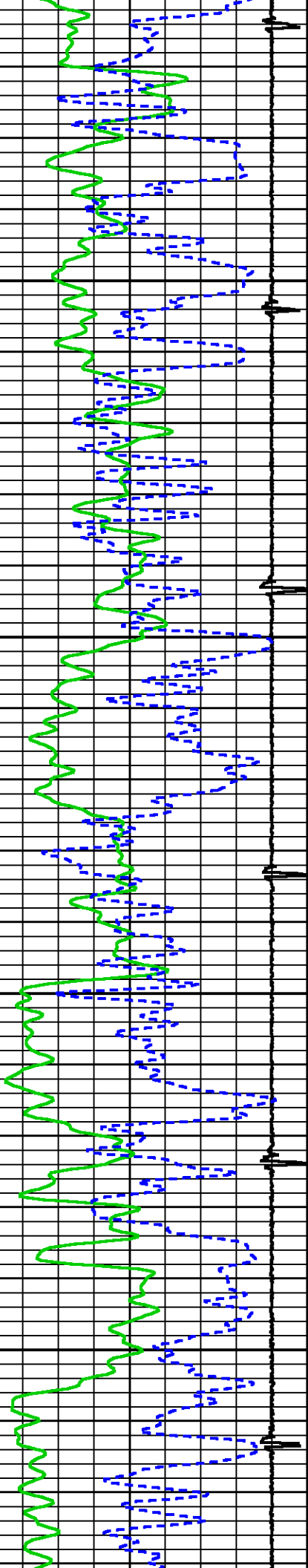
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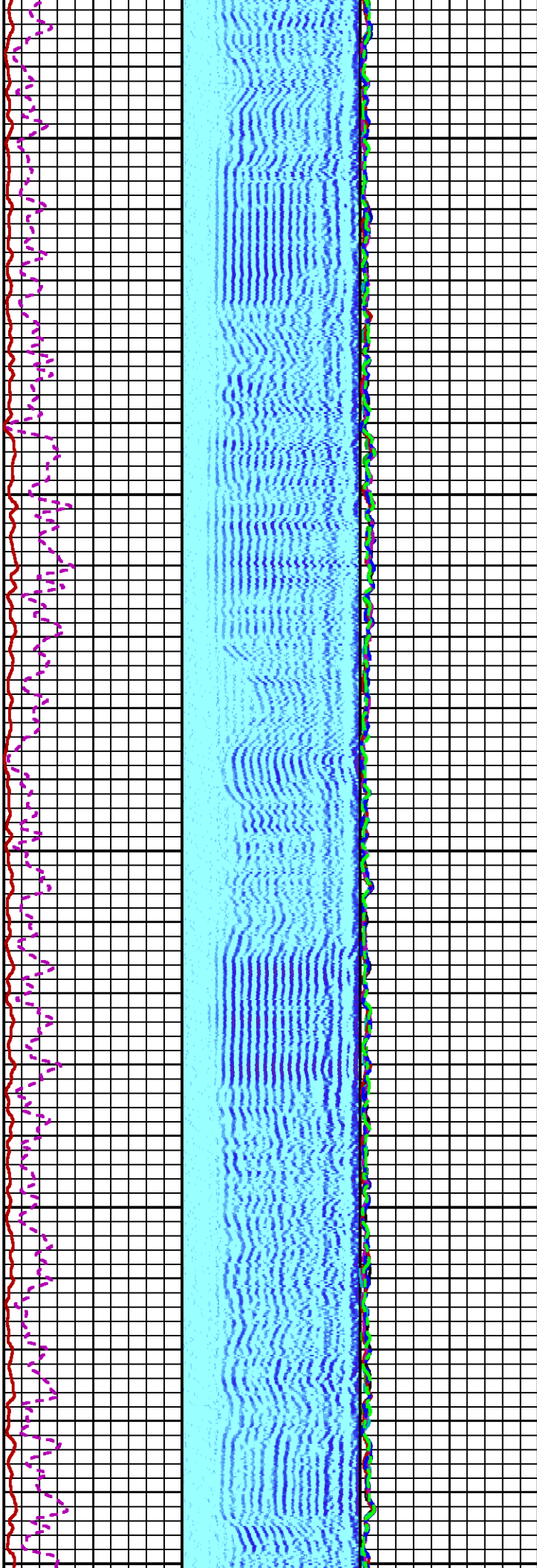


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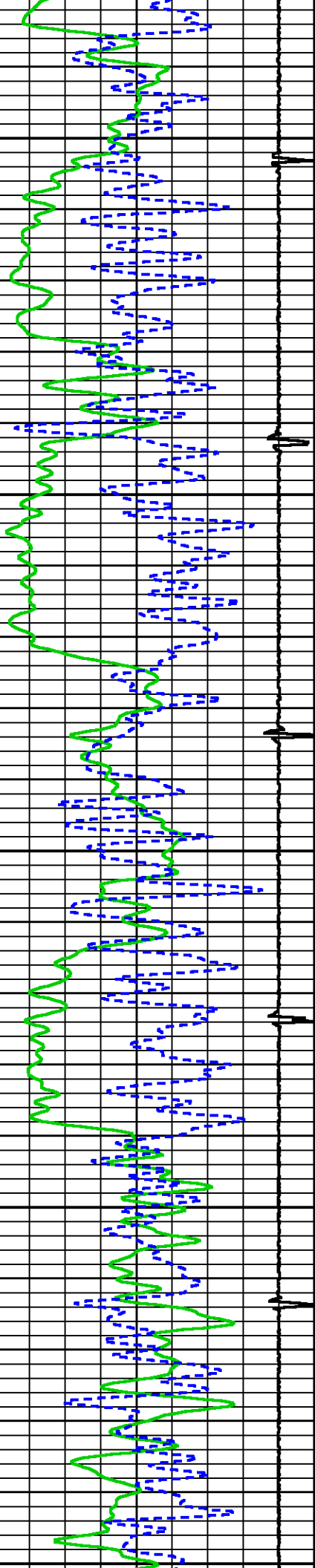




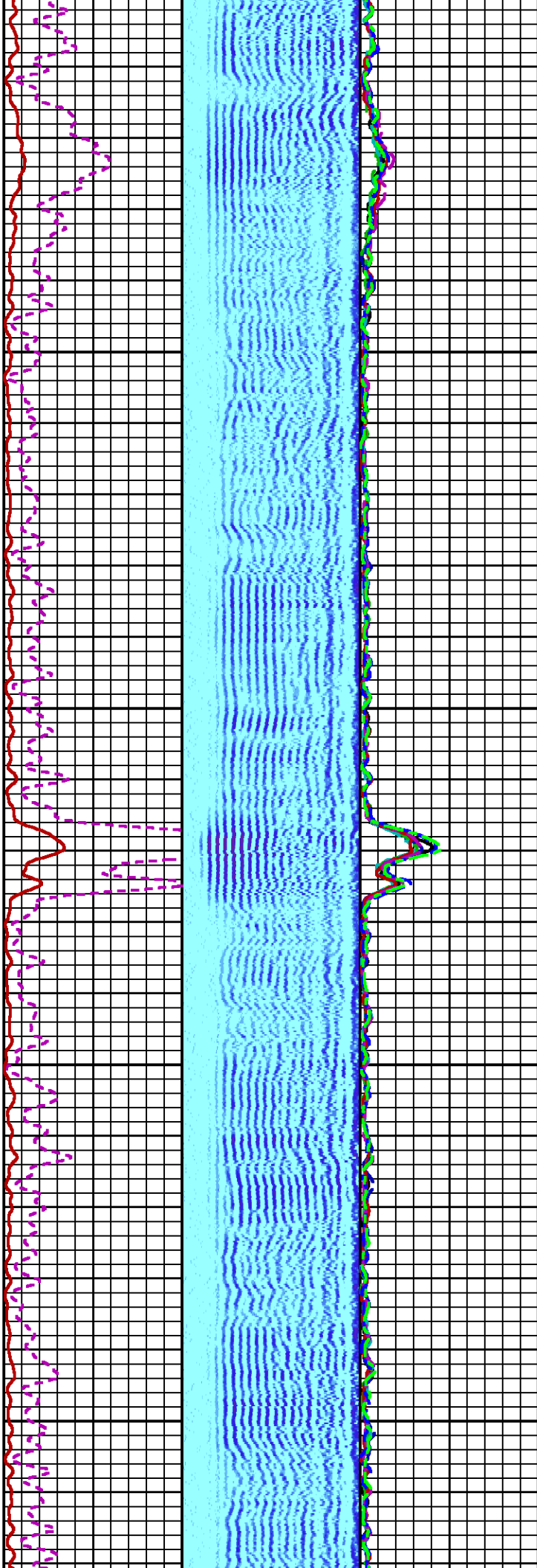
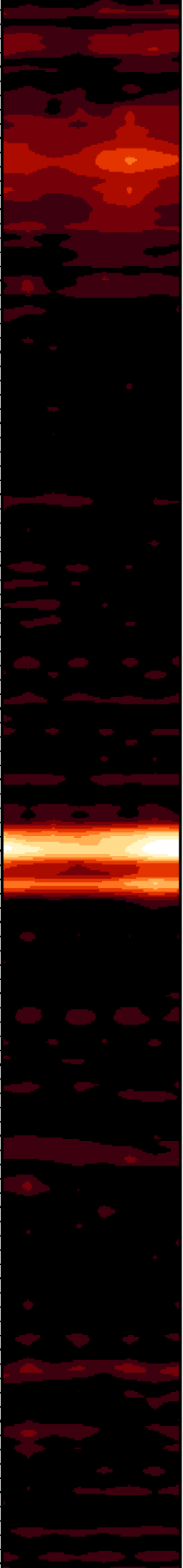
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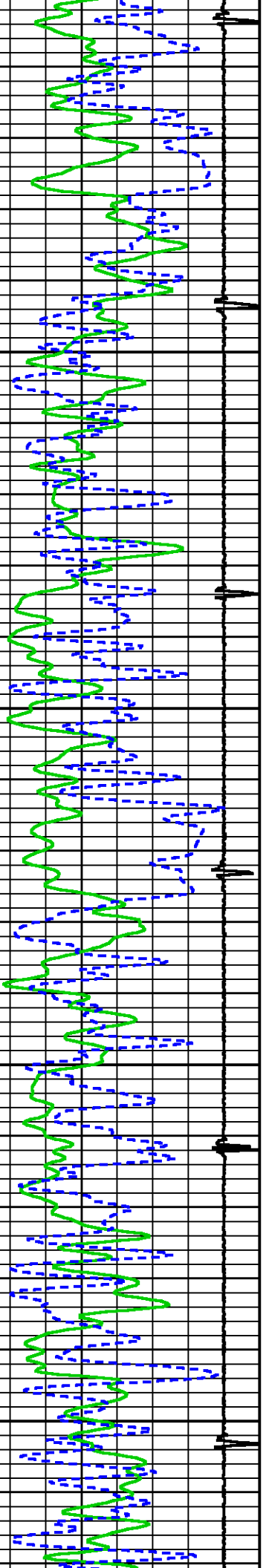
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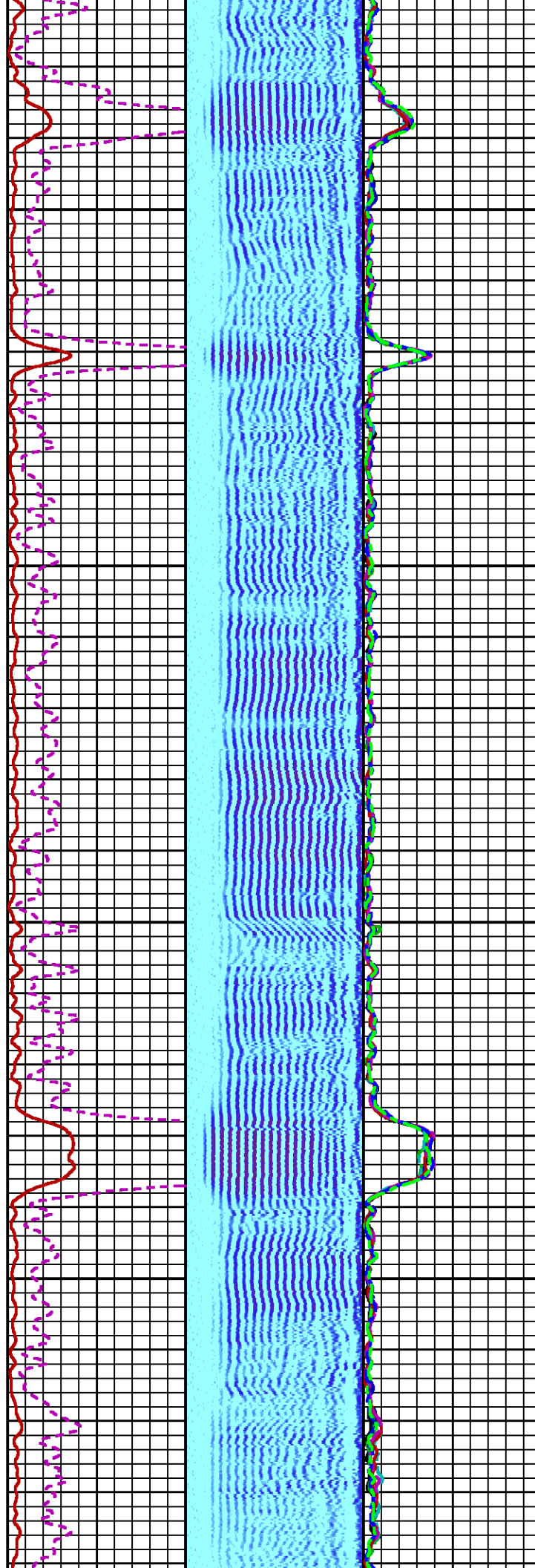
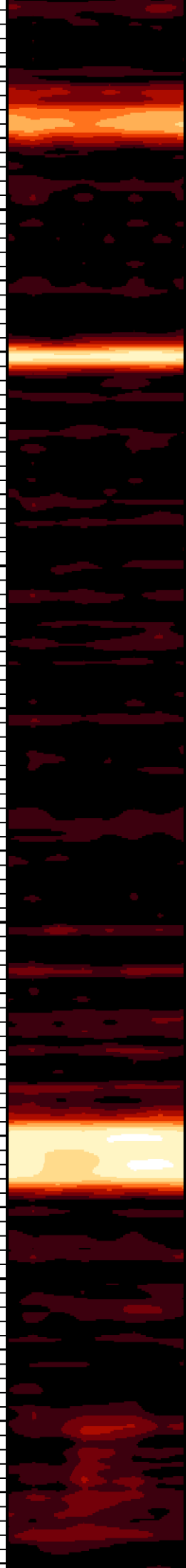






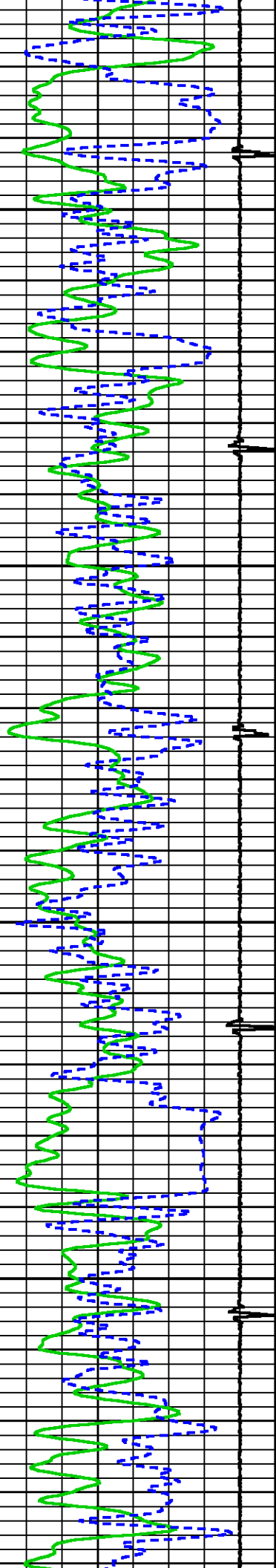
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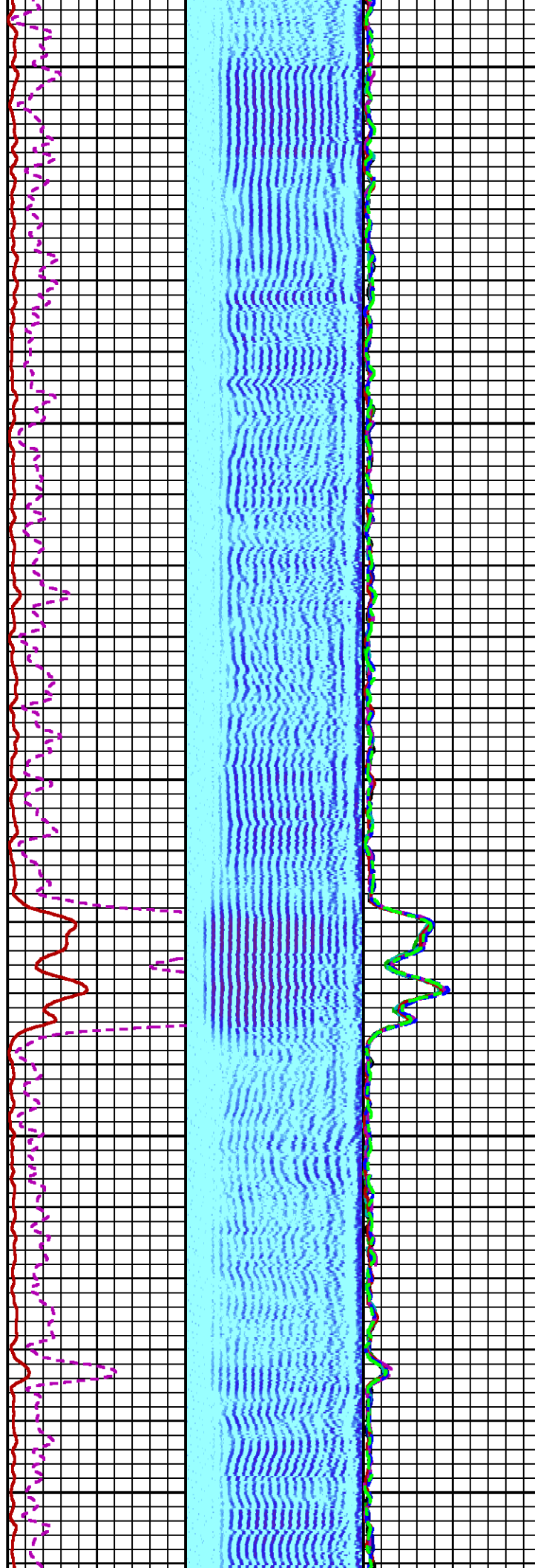
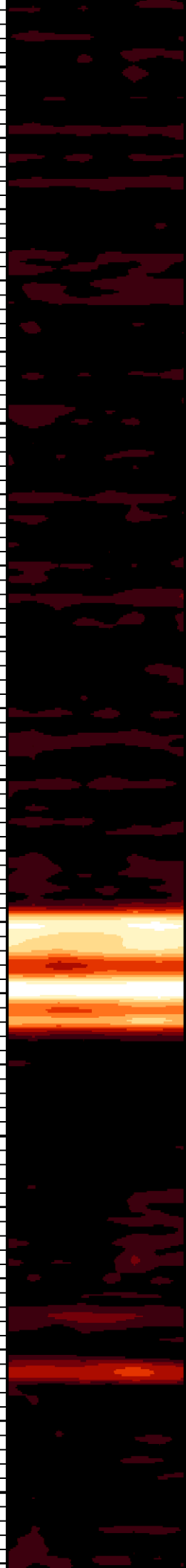




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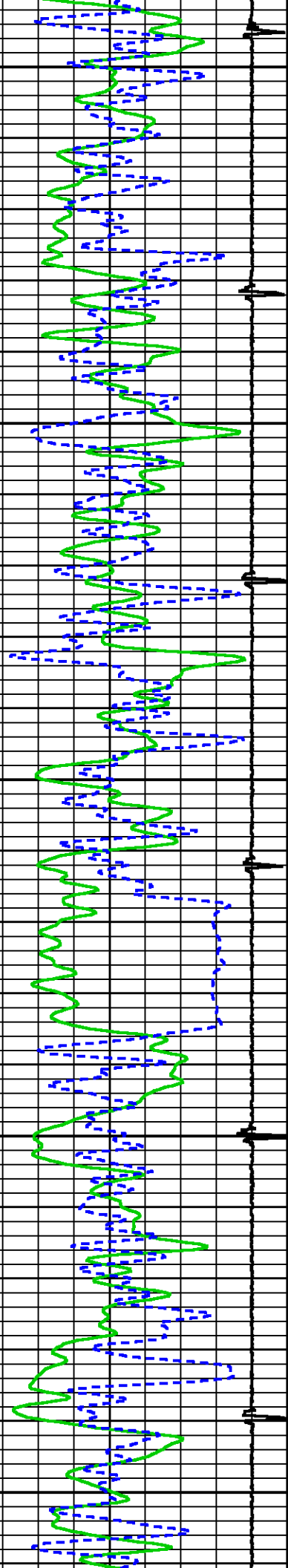
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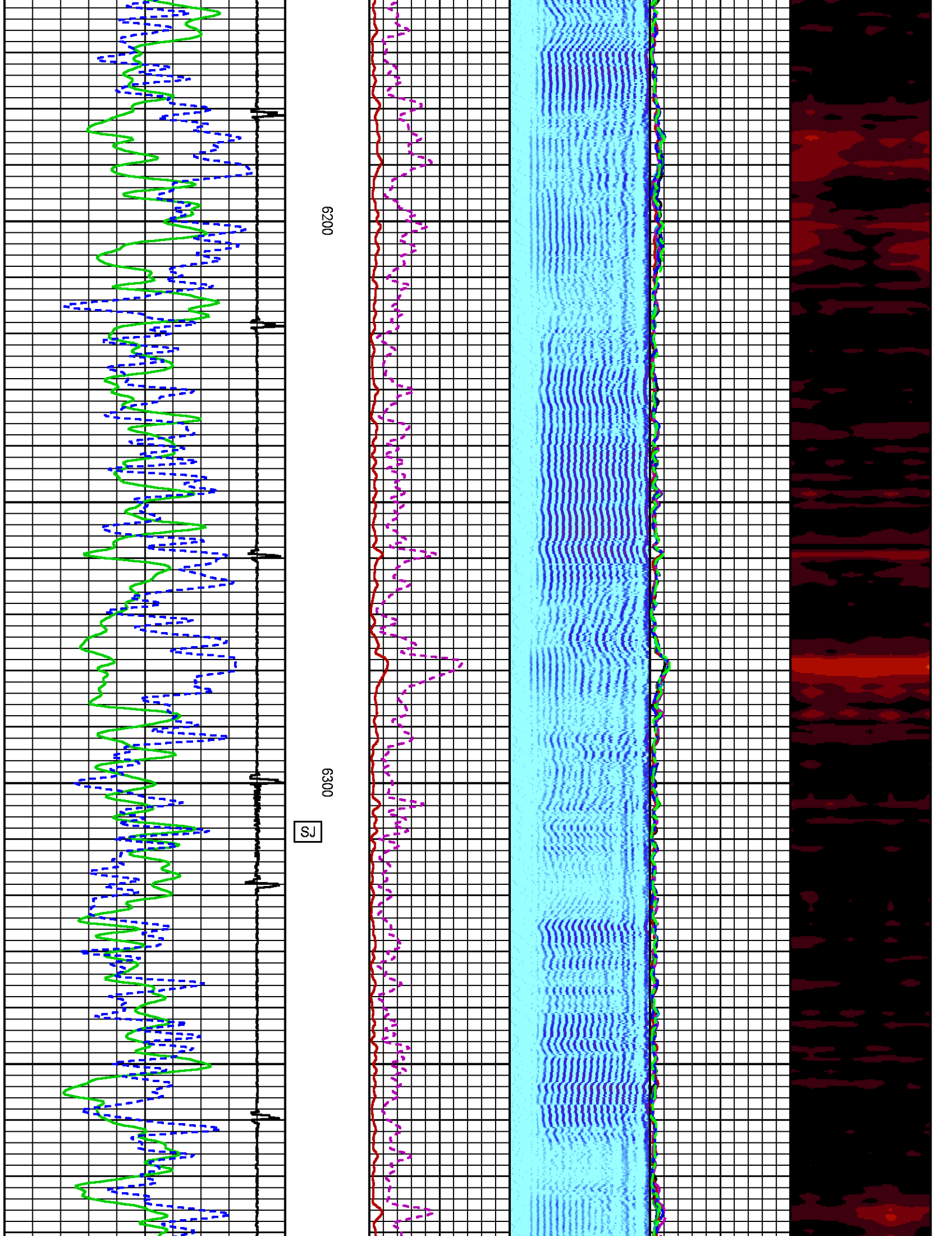




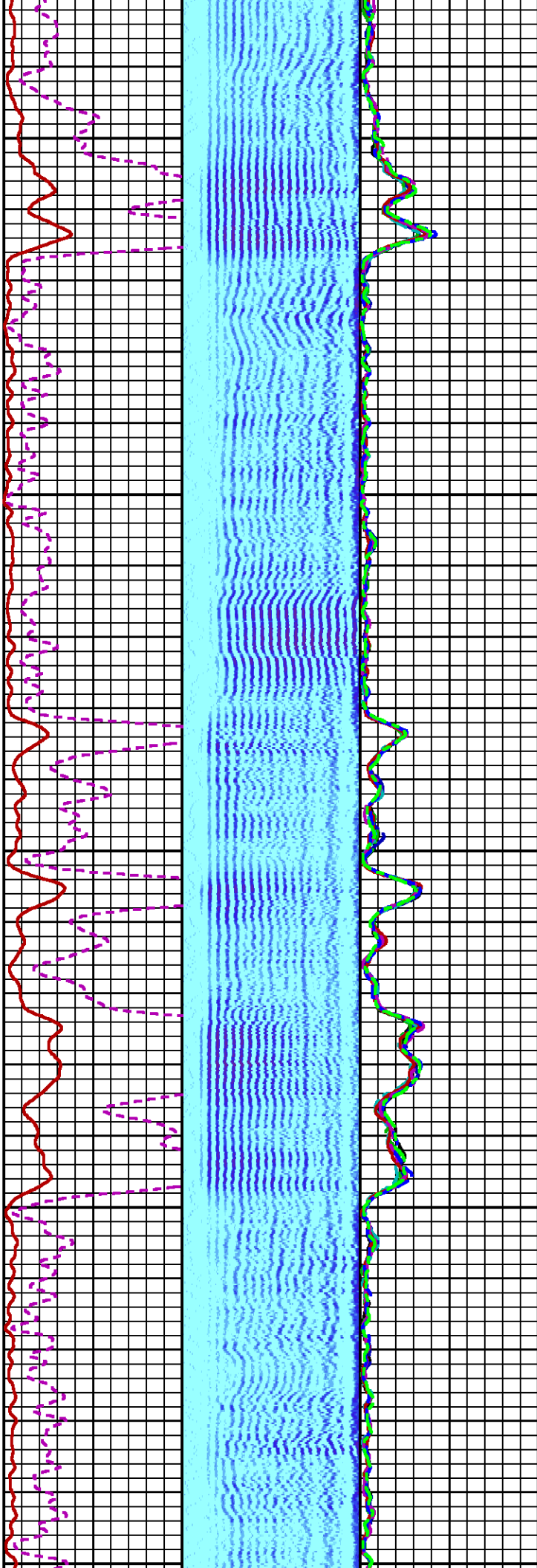
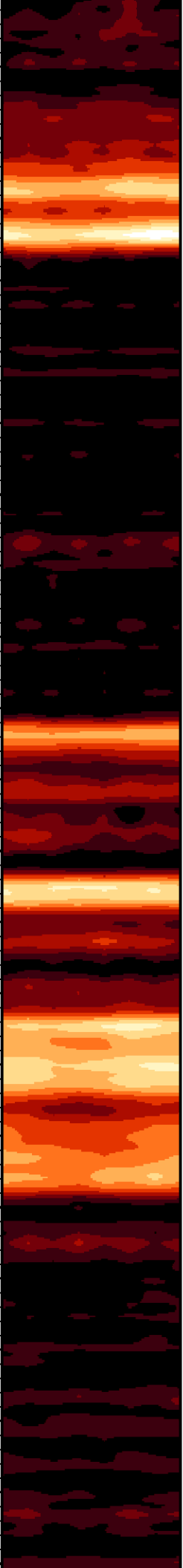
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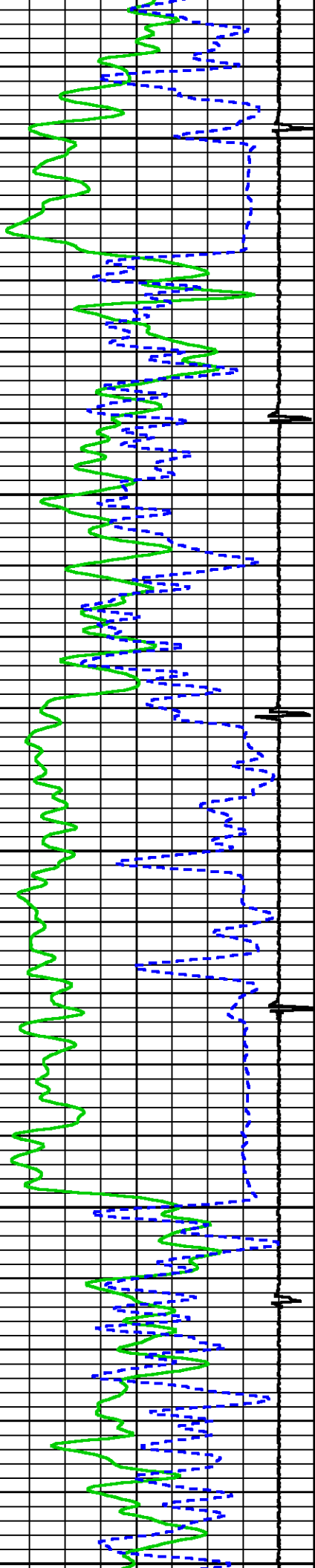


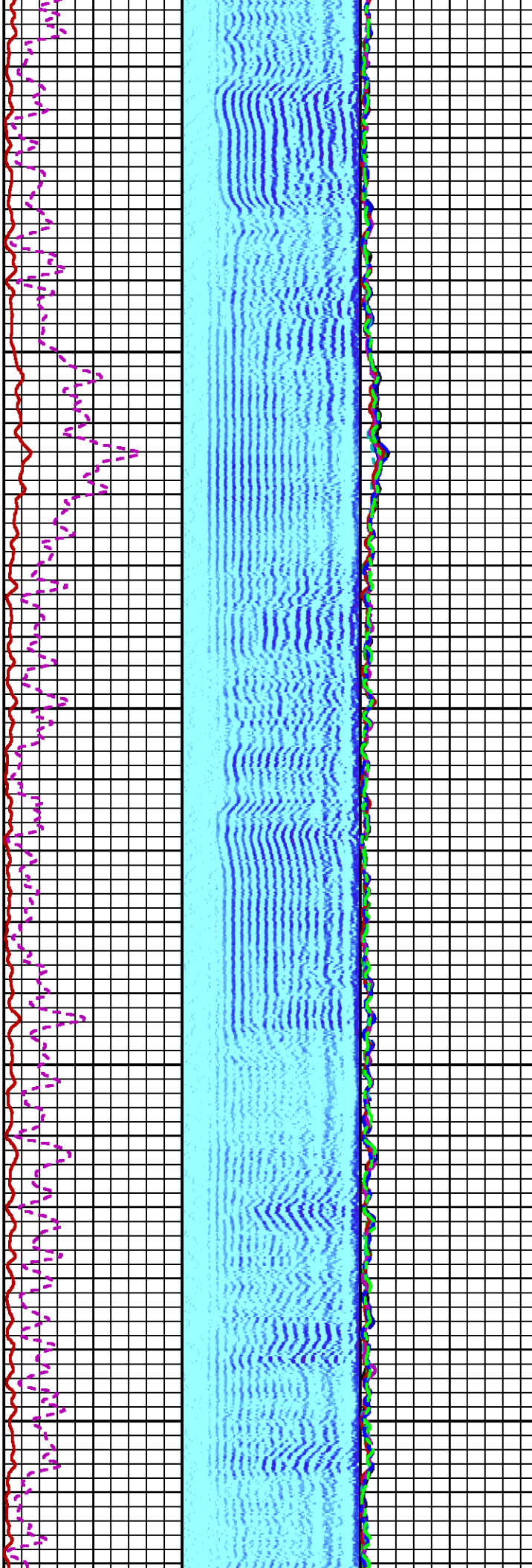


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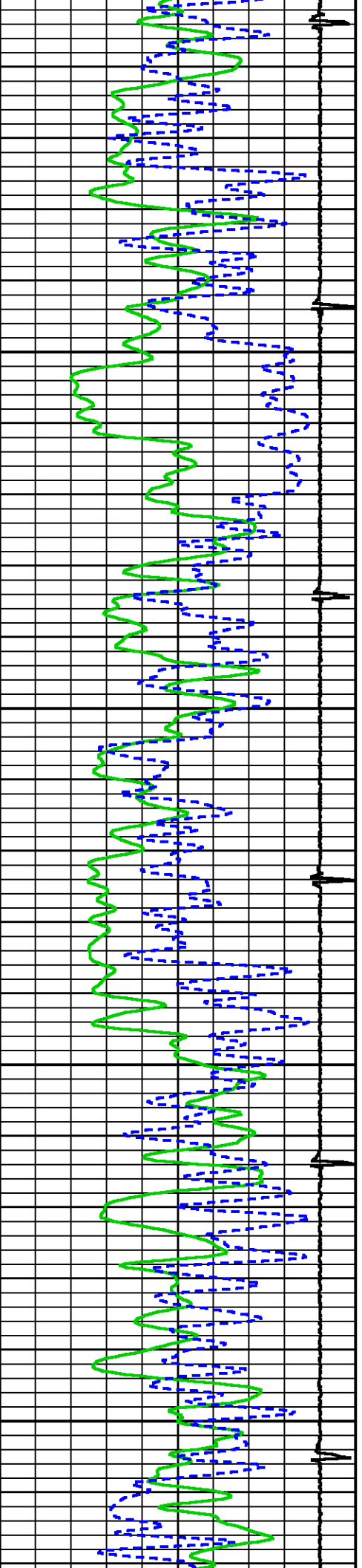
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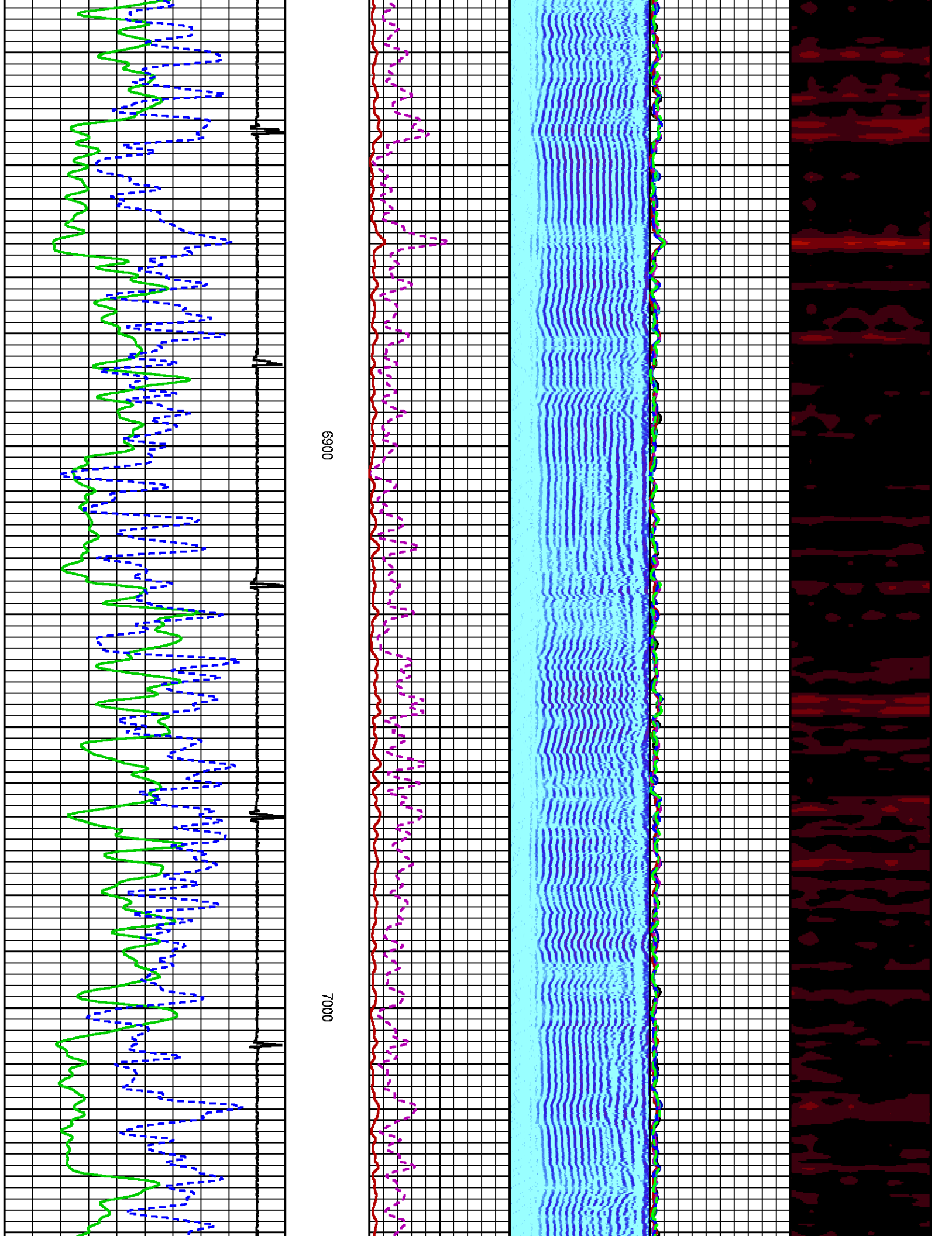
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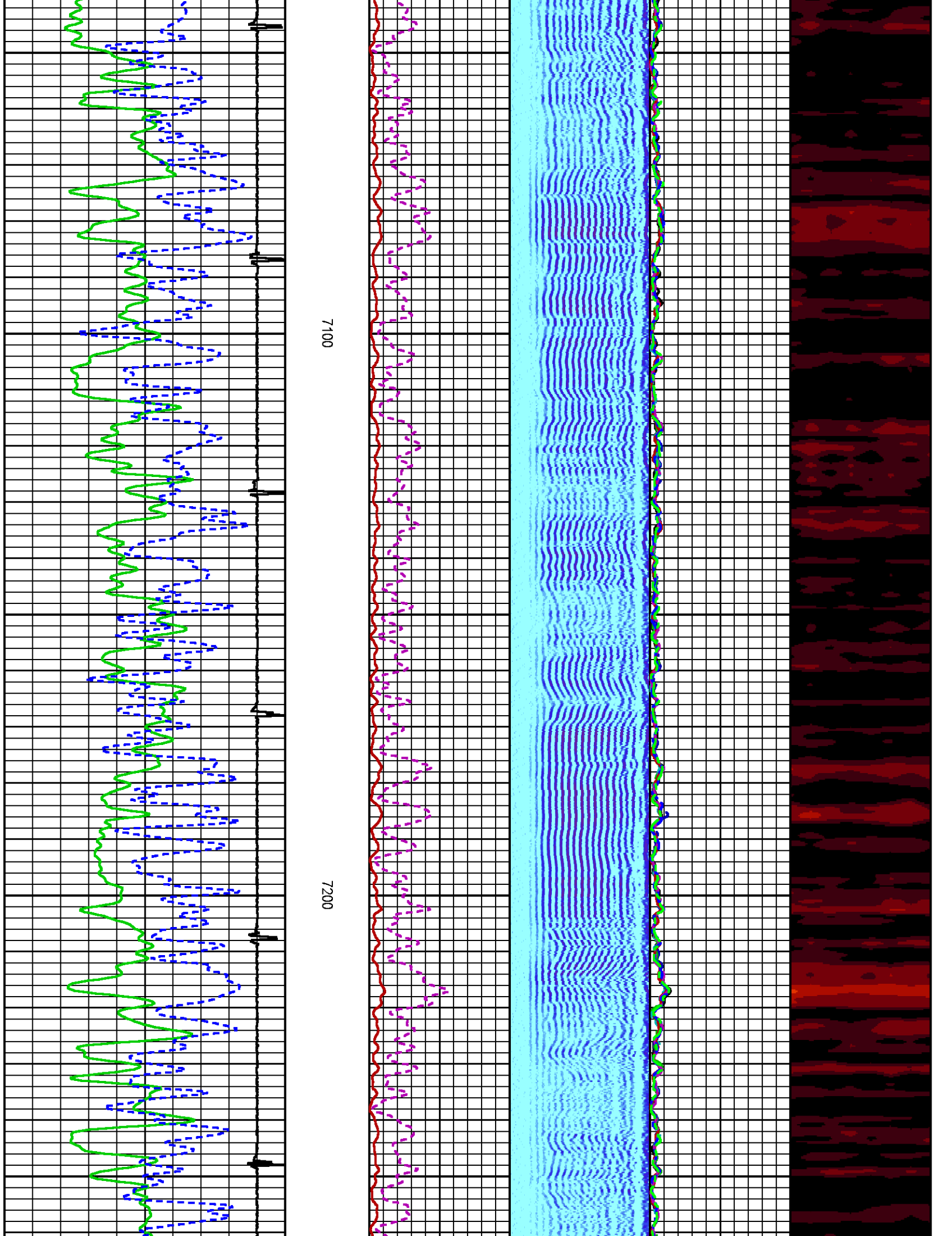




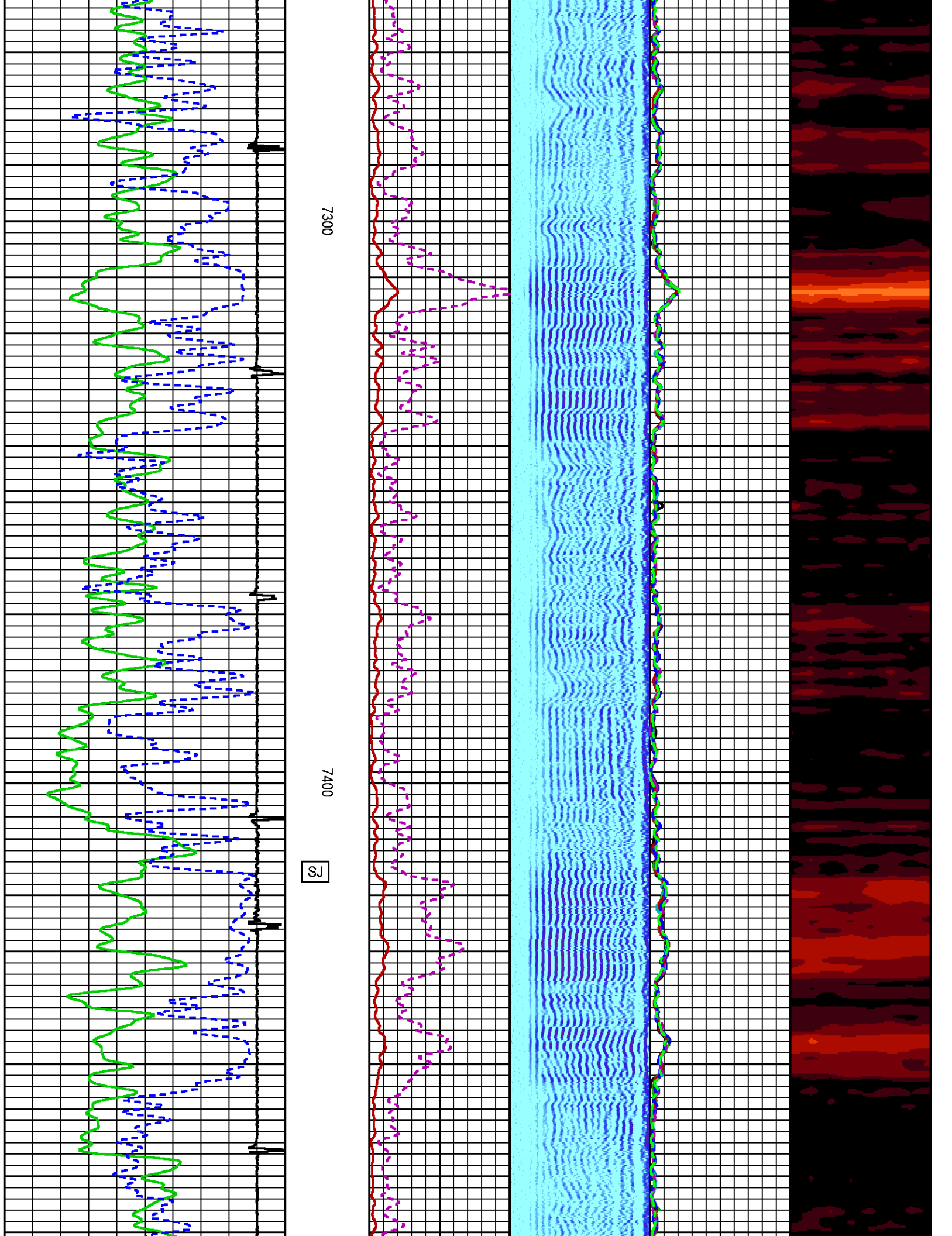
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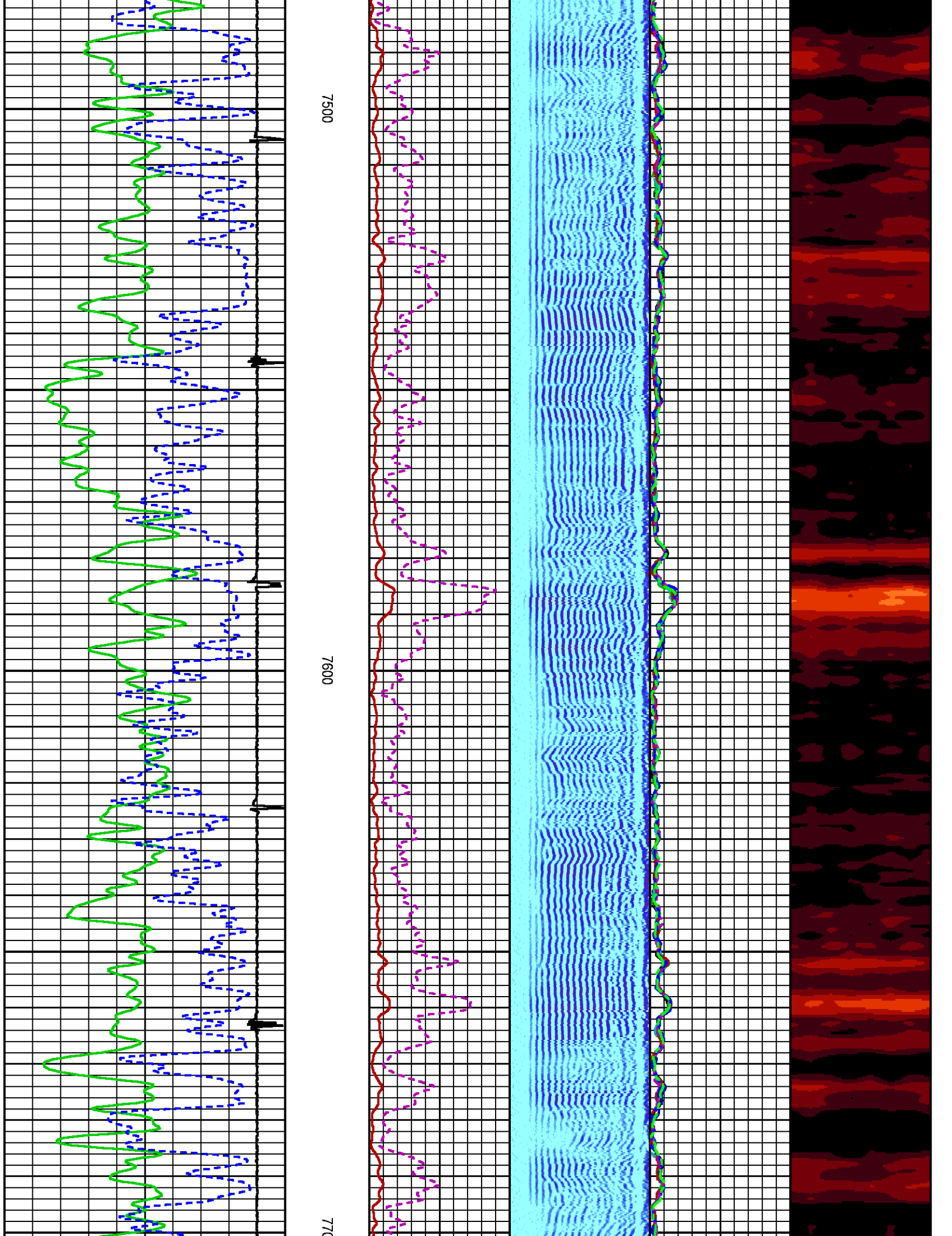


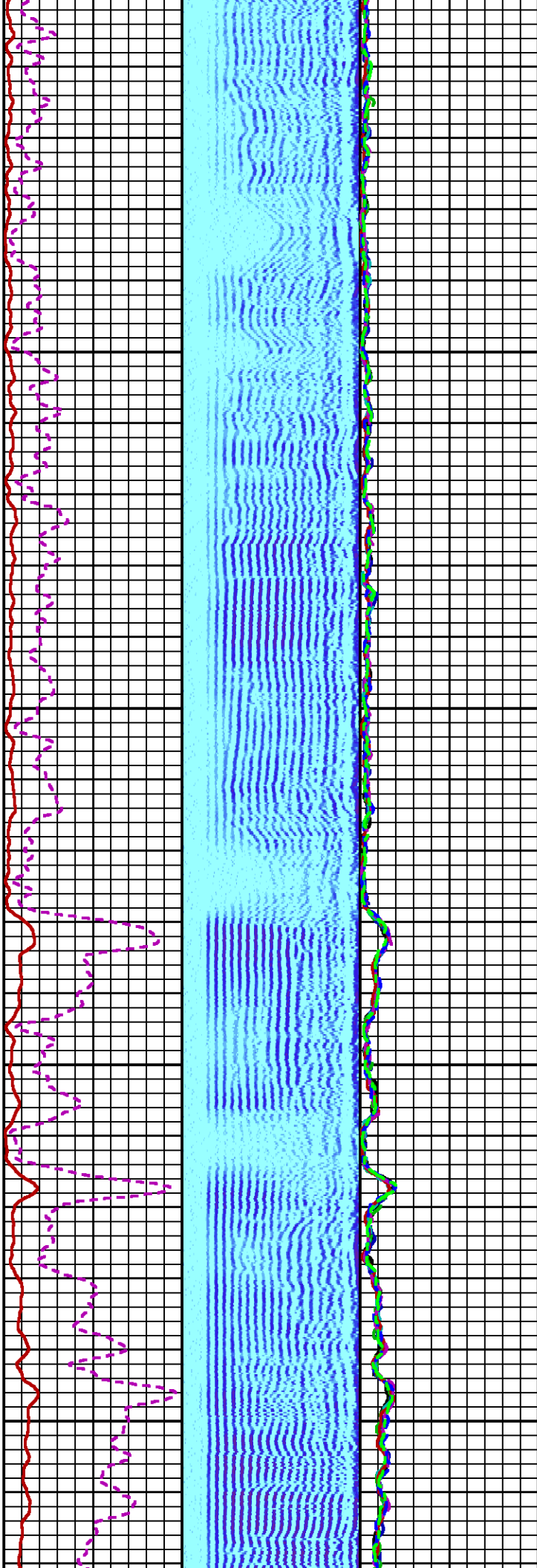




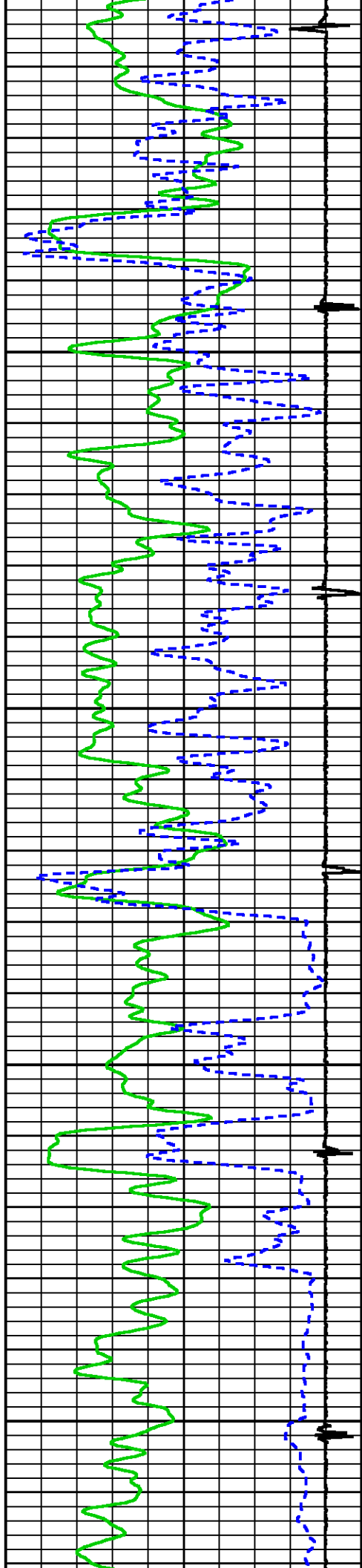


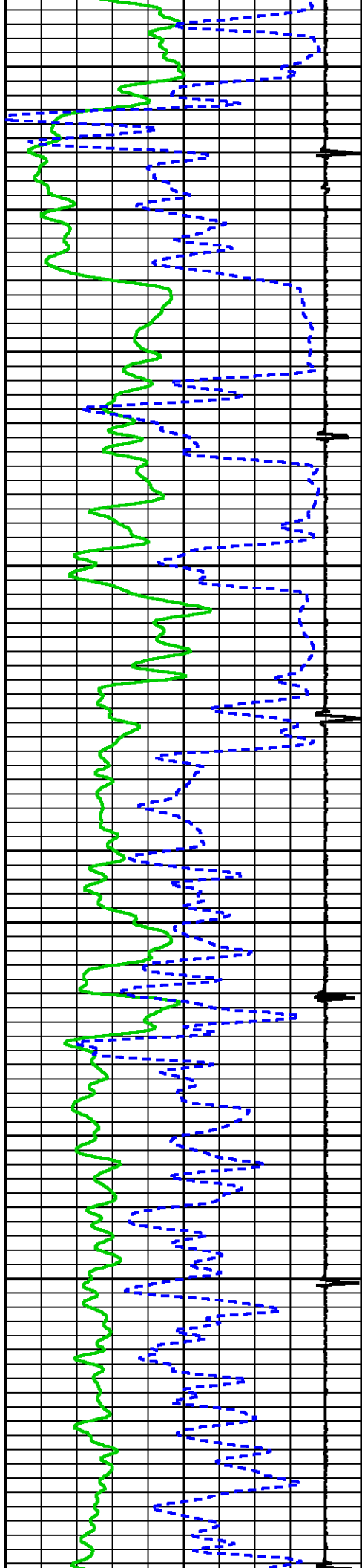






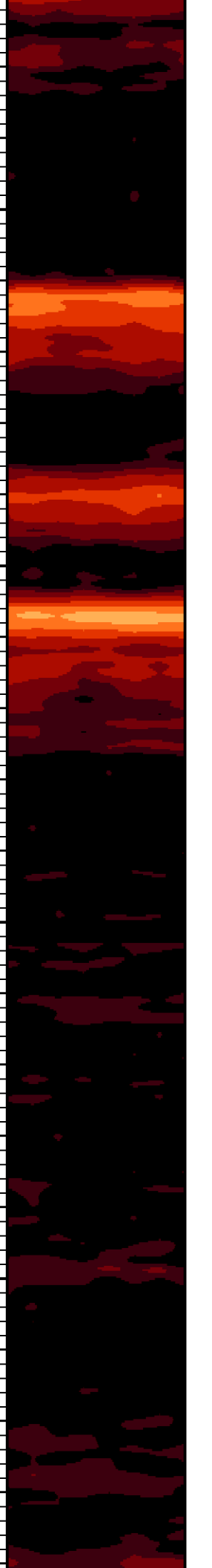
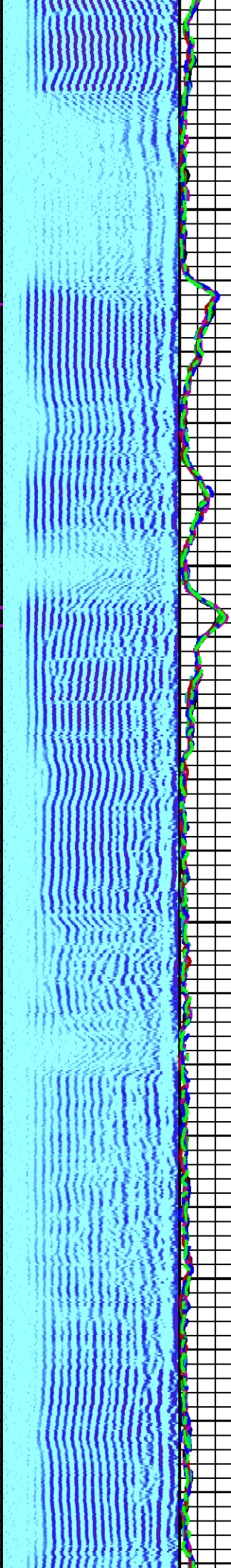
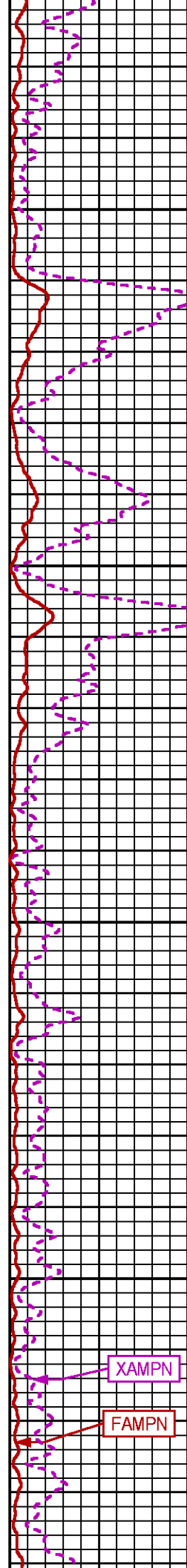
7800 7900



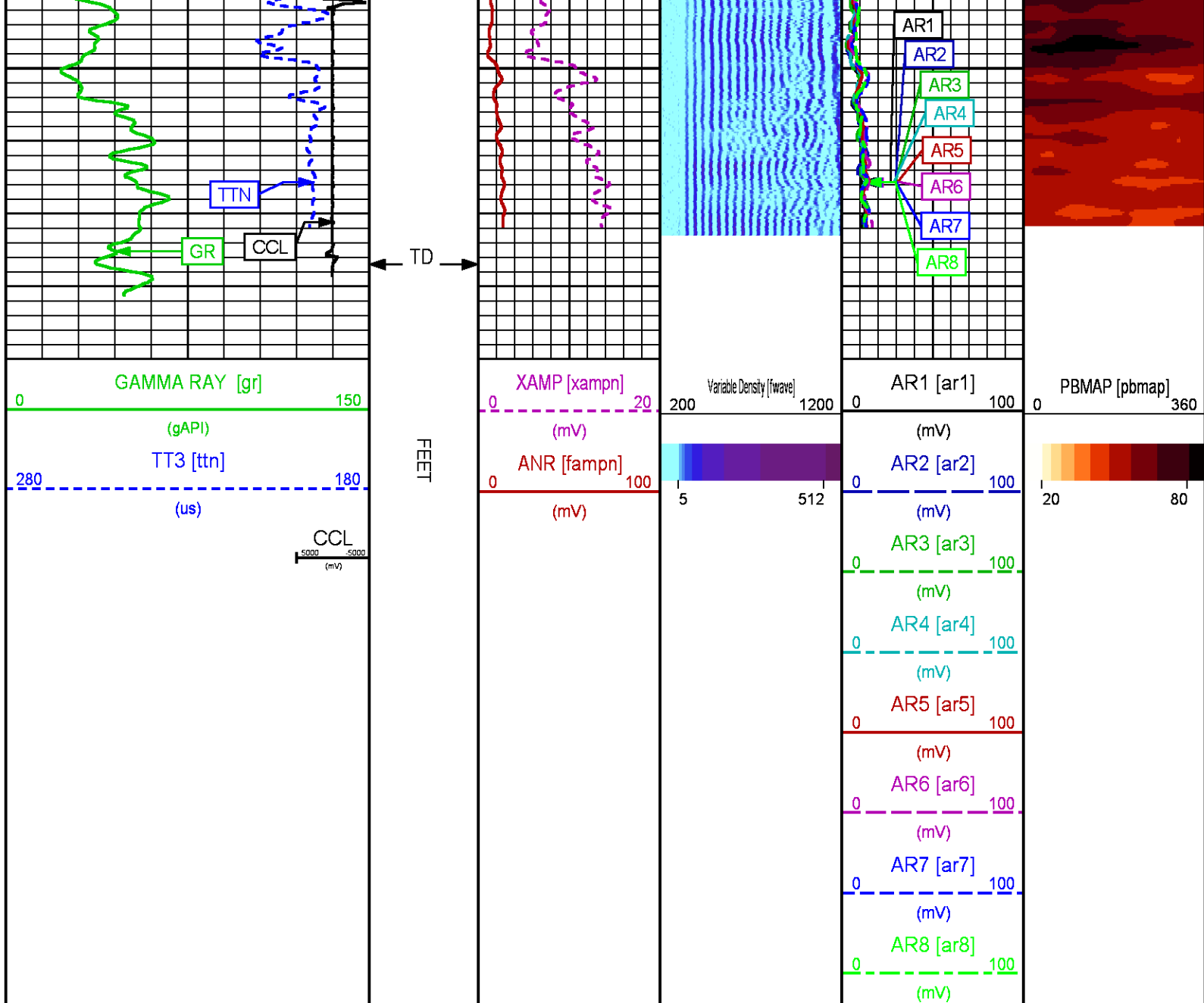


8000

8100







REPEAT PASS 0 PSI

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017  
Patches: 3

Plotted: Sun Apr 1 10:18:47 2018

### PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_BRUTON\_19\_17W/p012g01.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 7939.500 ft BOTTOM DEPTH: 8166.157 ft

### SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
GR	FILTER A	medium (1)		TOP BOTTOM

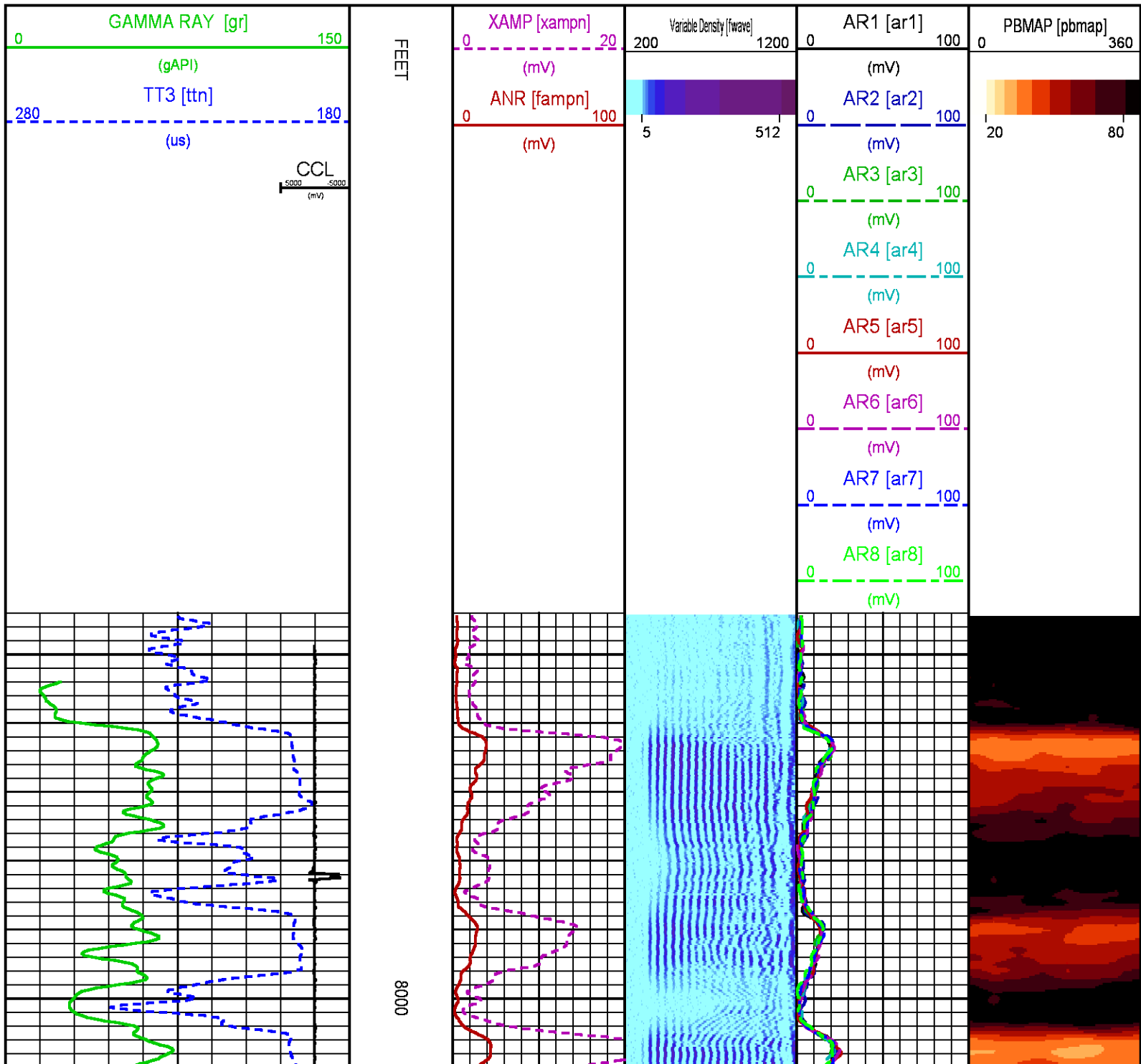
GR	FILTER ( )	medium (1)	TOP	BOTTOM
AMPLITUDE	FILTER ( )	medium (1)	"	"
TRAVEL TIME	FILTER ( )	medium (1)	"	"
RAL CCL PROCESSING				
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
CCL FLOOR	CCL FLOOR	0.00		TOP BOTTOM
ANALOG RAL PROCESSING				
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
AMPLITUDE WINDOW (NEAR)	AMP WINDOW START (fgp1*)	185	us	TOP BOTTOM
	AMP WINDOW START (fgp2*)	185	us	" "
	AMP WINDOW START (fgp3*)	185	us	" "
	AMP WINDOW START (fgp4*)	185	us	" "
	AMP WINDOW START (fgp5*)	185	us	" "
	AMP WINDOW START (fgp6*)	185	us	" "
	AMP WINDOW START (fgp7*)	185	us	" "
	AMP WINDOW START (fgp8*)	185	us	" "
	AMP WINDOW START (fgpn*)	185	us	" "
TRAVEL TIME WINDOW (NEAR)	AMP WINDOW LENGTH	30	us	" "
	TT WINDOW START (ttn*)	180	us	" "
	TT WINDOW LENGTH	500	us	" "
	FIRST BRK THRESHOLD (ttn*)	4	mV	" "
RAL CASING PARAMETERS	PPT NEAR	200.391	us	" "
RAL TOOL DELAY	TOOL DELAY (str1*)	-62	us	" "
	TOOL DELAY (str2*)	-62	us	" "
	TOOL DELAY (str3*)	-62	us	" "
	TOOL DELAY (str4*)	-62	us	" "
	TOOL DELAY (str5*)	-62	us	" "
	TOOL DELAY (str6*)	-62	us	" "
	TOOL DELAY (str7*)	-62	us	" "
	TOOL DELAY (str8*)	-62	us	" "
	TOOL DELAY (strn*)	-62	us	" "
BASELINE NOISE (NEAR)	NOISE WINDOW START	144	us	" "
	NOISE WINDOW LENGTH	25	us	" "
PERCENT BOND CEMENT MAP				
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
RAL FREE PIPE AMPLITUDE	FREE AMP REC 1	80	mV	TOP BOTTOM
	FREE AMP REC 2	80	mV	" "
	FREE AMP REC 3	80	mV	" "
	FREE AMP REC 4	80	mV	" "
	FREE AMP REC 5	80	mV	" "
	FREE AMP REC 6	80	mV	" "
	FREE AMP REC 7	80	mV	" "
	FREE AMP REC 8	80	mV	" "
RAL FULL BOND AMPLITUDE	FULL BOND AMP REC 1	2	mV	" "
	FULL BOND AMP REC 2	2	mV	" "
	FULL BOND AMP REC 3	2	mV	" "
	FULL BOND AMP REC 4	2	mV	" "
	FULL BOND AMP REC 5	2	mV	" "
	FULL BOND AMP REC 6	2	mV	" "
	FULL BOND AMP REC 7	2	mV	" "
	FULL BOND AMP REC 8	2	mV	" "
CURVE DESCRIPTION REPORT				
CURVE NAME	CREATION DATE	CURVE DESCRIPTION		
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1		
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2		
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3		
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4		
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5		
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6		
F1:AR7	N/A	FIXED GATE AMPLITUDE T-R7		
F1:AR8	N/A	FIXED GATE AMPLITUDE T-R8		
F1:CCL	N/A	CASING COLLAR LOCATOR		
F1:FAMPN	N/A	FIXED GATE AMPLITUDE NEAR RECEIVER		
F1:FWAVE	N/A	FAR WAVE FORM		
F1:GR	N/A	GAMMA RAY		
F1:PBMAP	N/A	PERCENT BOND CEMENT MAP		
F1:TTN	N/A	TRAVEL TIME FROM NEAR TRANSMITTER RECEIVER		

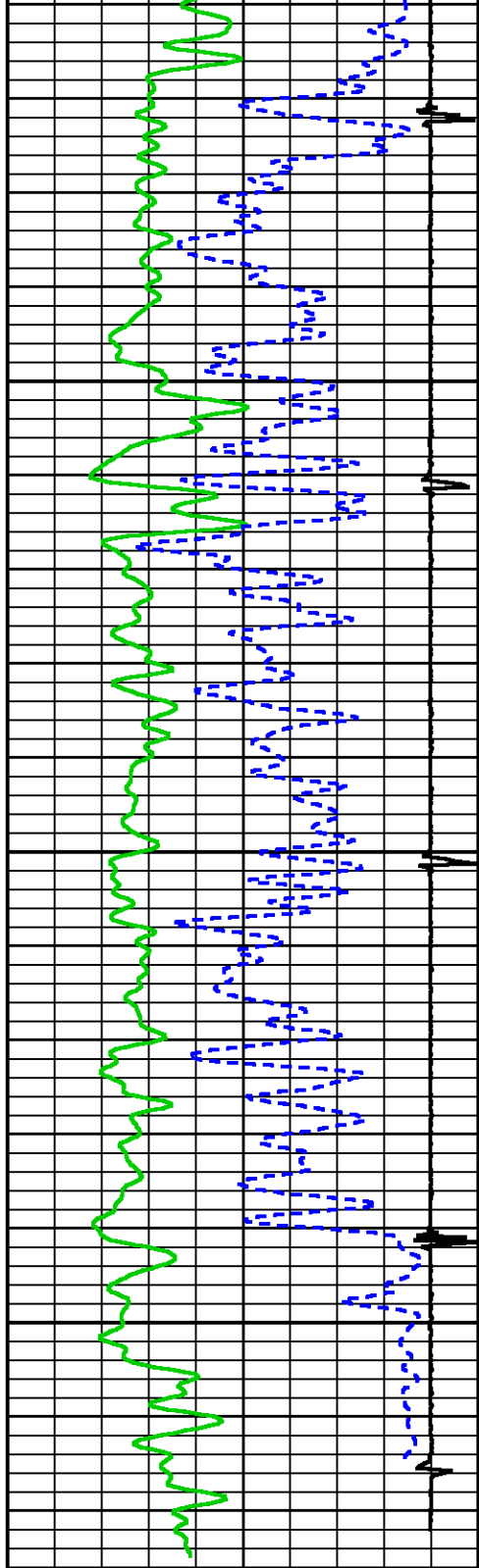
CURVE MEASURE POINT OFFSET

CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
AR1	-11.25	AR5	-11.25	CCL	-5.75	XAMPN	-11.25
AR2	-11.25	AR6	-11.25	FAMPN	-11.25		
AR3	-11.25	AR7	-11.25	GR	-1.75		
AR4	-11.25	AR8	-11.25	TTN	-11.25		

Presentation : SysA:/dat1a/LARAMIE\_BRUTON\_19\_17W/30-17W\_RAL\_REPEAT.fvpdf [5"/100' Scale]  
Plot Interval : 7929.25 - 8161.5 Feet

Data File 1 : F1 : SysA:/dat1a/LARAMIE\_BRUTON\_19\_17W/30-17W\_RAL\_REPEAT.xtf  
Created On : N/A  
Company : LARAMIE ENERGY LLC  
Well : BRUTON FEDERAL 30-17W  
Field : VEGA  
File Interval : 7928.25 - 8162.75 Feet  
OCT : p012g

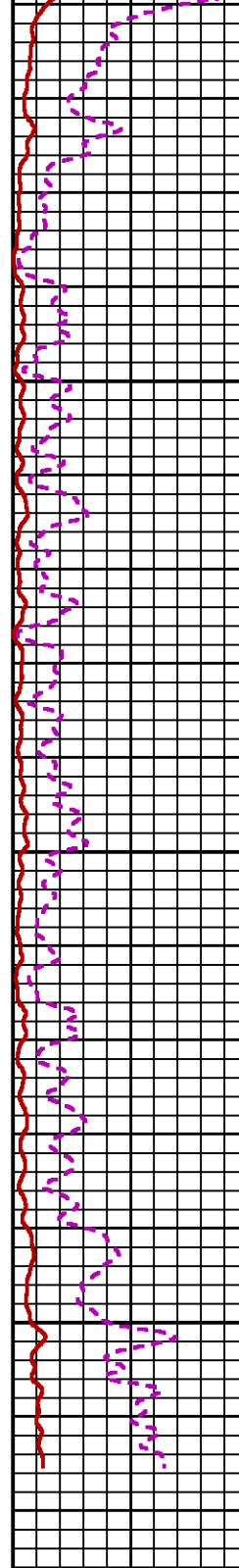




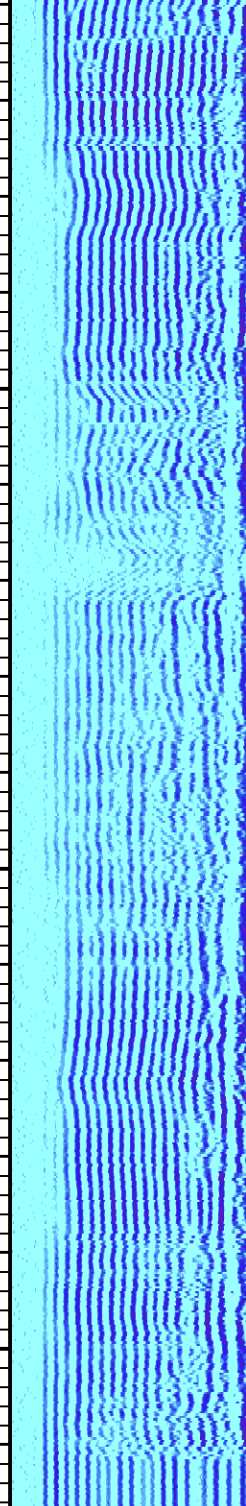
GAMMA RAY [gr]  
(gAPI)  
TT3 [ttn]  
(us)  
CCL  
(mV)

8100

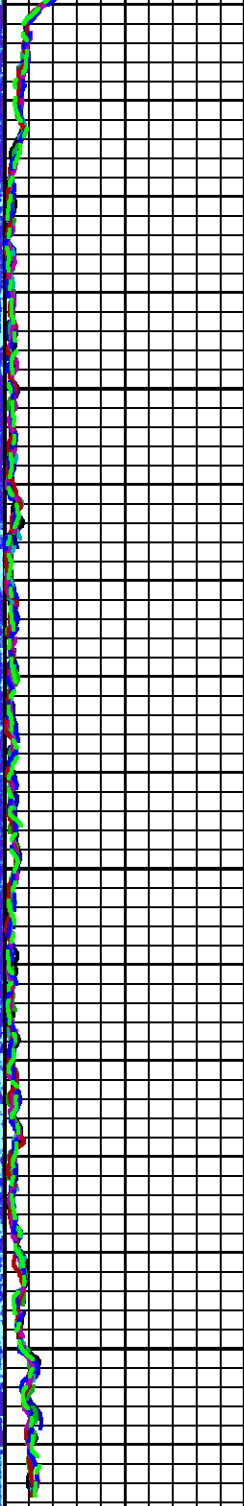
FEET



XAMP [xampn]  
(mV)  
ANR [fampn]  
(mV)



Variable Density [twave]  
(mV)  
5 512



AR1 [ar1]  
(mV)  
AR2 [ar2]  
(mV)  
AR3 [ar3]  
(mV)  
AR4 [ar4]  
(mV)  
AR5 [ar5]  
(mV)



PBMAP [pbmap]  
(mV)  
20 80





## CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/LARAMIE\_BRUTON\_19\_17W/p012g.lp1

### RAL PRIMARY CALIBRATION SUMMARY

TOOL #: 1426XA 10154958

DATE/TIME PERFORMED: Sun Apr 1 09:24:27 2018

UNIT #: 5753XD 111111

	NEAR (mV)	RADIAL (mV)	FAR (mV)
TARGETS	100.00	100.00	150.00

	NEAR	R1	R2	R3	R4	R5	R6	R7	R8	FAR	CAL
ZERO (mV)	-0.13	-0.18	-0.11	0.13	0.15	-0.19	-0.21	0.15	0.16	0.30	-0.22
AMP FLUID (mV)	38	38	37	38	39	38	38	39	39	49	37
TT (us)	216	217	217	217	216	215	215	215	216	324	212
M FACTOR	2.60	2.65	2.66	2.65	2.56	2.60	2.60	2.61	2.54	3.06	2.66

### RAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1426XA 10154958

DATE/TIME PERFORMED: Sun Apr 1 09:35:49 2018

DAYS SINCE CAL: 0

UNIT #: 5753XD 111111

CABLE #: 4291SM SMALL1

	NEAR (mV)	R1 (mV)	R2 (mV)	R3 (mV)	R4 (mV)	R5 (mV)	R6 (mV)	R7 (mV)	R8 (mV)	FAR (mV)	CAL (mV)
ZERO	-0.47	-0.33	-0.23	-0.72	-0.66	-0.75	-0.51	-0.53	-0.39	-1.56	-0.03
AMP AIR	4.91	4.78	5.57	4.53	4.08	4.30	4.24	3.81	4.37	5.41	100.25

SHOP M FACTOR	SHOP A FACTOR	WIRELINE FACTOR
2.66	0.00	1.00

### GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1355XA 12670180

DATE/TIME PERFORMED: Thu Mar 29 16:39:27 2018

UNIT #: 4352 ML4352

CALB JIG #: 4702NK DA\_228

	BACKGROUND (cts)	CALBRTR ON (cts)	CR DIFF (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	CALBRTR (gAPI)
GR	41.51	221.16	179.6	0.557	23.11	123.11	100

## GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1355XA 12670180

DATE/TIME PERFORMED: Thu Mar 29 16:50:56 2018

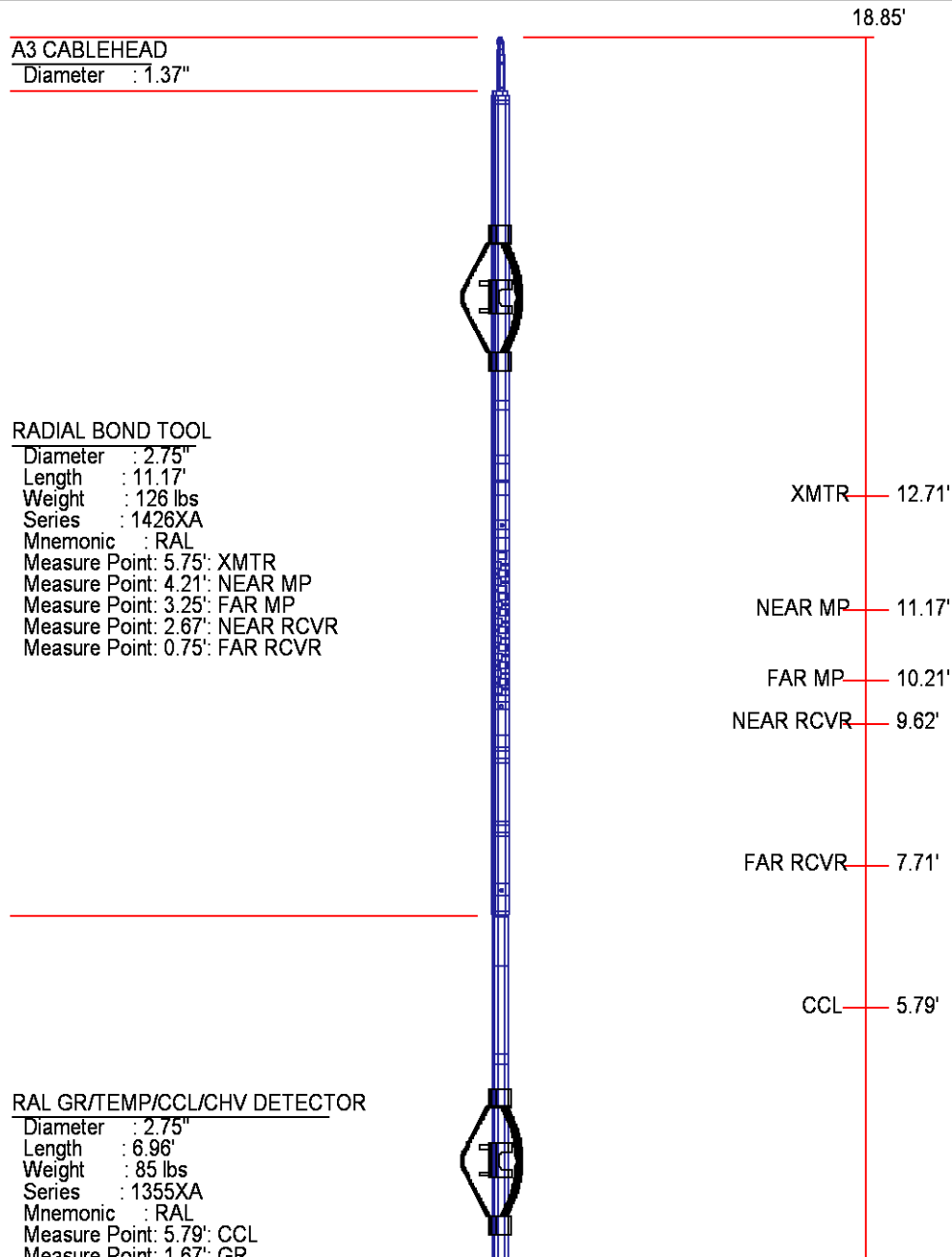
UNIT #: 4352 ML4352

VERI JIG #: 4702NK DA\_228

	BACKGROUND (cts)	CALBRTR ON (cts)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	40.09	214.13	0.557	22.32	119.20	96.88
						90.00 110.00

## INSTRUMENT CONFIGURATION

Source File: /dat1a/LARAMIE\_BRUTON\_19\_17W/RAL-tdg



Measure Point: 1.07': GR  
Measure Point: 0.17': TEMP

GR 1.67'

TEMP 0.17'  
0.00'

TOTAL LENGTH: 18.85'  
TOTAL WEIGHT: 227 lbs  
MAX DIAMETER: 0'4.00"

**BAKER  
HUGHES**  
a GE company



**ECLIPS**

**COMPANY**

LARAMIE ENERGY LLC

**WELL**

BRUTON FEDERAL 30-17W

**FIELD**

VEGA

**COUNTY**

MESA

**STATE**

COLORADO

**FILE NO:**

CH133063

**API NO:**

05077104680000

**LOCATION:**

SHL: 2639' FSL & 1868' FEL

BHL: 1158' FSL & 1308' FSL

**ELEVATIONS:**

KB 30 FT

DF 7672 FT

GL 7643 FT

SEC 30

TWP 9S

RGE 93W

DATE

01-Apr-2018