



# RADIAL CEMENT BOND LOG

FILE NO:	COMPANY	LARAMIE ENERGY II LLC
API NO:	WELL	NICHOLS 0994-13-18W
05077104170000	FIELD	VEGA
	COUNTY	MESA
	STATE	COLORADO

Ver. 4.10	LOCATION:	OTHER SERVICES
	SHL 1765 FNL 2781 FEL	RPM
	BHL 971 FNL 1616 FEL	
	SEC 24 TWP 9 RGE 94W	

PERMANENT DATUM	GL	ELEVATION	7137 FT	ELEVATIONS: KB 7161 FT DF GL 7137 FT
LOG MEASURED FROM	KB	24 FT	ABOVE P.D.	
DRILL. MEAS. FROM	KB			

DATE	20-Mar-2018	
RUN	TRIP	1
SERVICE ORDER	US133019J	
DEPTH DRILLER	8228 FT	
DEPTH LOGGER	8171 FT	
BOTTOM LOGGED INTERVAL	8170 FT	
TOP LOGGED INTERVAL	24 FT	
TIME STARTED	16:00	
TIME FINISHED	19:30	
OPERATOR RIG TIME	LOGGER	
TYPE OF FLUID IN HOLE	WATER	
FLUID DENSITY	NA	
FLUID SALINITY	NA	
FLUID LEVEL	51 FT	
LOGGED CEMENT TOP	2335 FT	
WELLHEAD PRESSURE	0 PSI	
MAXIMUM HOLE DEVIATION	NA	
NOMINAL LOGGING SPEED	90 FMIN	
MAX. RECORDED TEMP.	229 DEGF	
REFERENCE LOG	NA	
REFERENCE LOG DATE	NA	
EQUIP. NO.	LOCATION	4291
RECORDED BY	R. ZUNIGA	GRAND JCT
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: RAL/GR/CCL RUN CENTRALIZED

LOGGED WITH 0 PSI AT WELLHEAD

SJ: 6409-6427  
SJ: 7308-7327

CREW: R. ZUNIGA, J. PENA, A. SHAHNOOSHI

## EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	RAL	1426XA	10404539a	CENTRALIZED
1	1	GR/CCL	1355XA	12670180	CENTRALIZED

# MAIN PASS 0 PSI

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

Patches: 3

Plotted: Wed Mar 21 14:51:20 2018

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_NICHOLS\_0994-13-18W/p012g02.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 8.500 ft BOTTOM DEPTH: 8182.140 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	4000.00		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*)	183	us	TOP	3904.750
		182	us	3904.750	3910.000
		181	us	3910.000	5564.250
		180	us	5564.250	5566.000
		179	us	5566.000	5567.500
		178	us	5567.500	5569.500
		177	us	5569.500	5572.000
		175	us	5572.000	5575.000
		173	us	5575.000	BOTTOM
	TT WINDOW LENGTH	500	us	TOP	BOTTOM
	FIRST BRK THRESHOLD (ttn*)	4	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	200.391	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-74	us	"	"
	TOOL DELAY (str2*)	-74	us	"	"
	TOOL DELAY (str3*)	-74	us	"	"
	TOOL DELAY (str4*)	-74	us	"	"
	TOOL DELAY (str5*)	-74	us	"	"
	TOOL DELAY (str6*)	-74	us	"	"
	TOOL DELAY (str7*)	-74	us	"	"
	TOOL DELAY (str8*)	-74	us	"	"
BASELINE NOISE (NEAR)	TOOL DELAY (strn*)	-74	us	"	"
	NOISE WINDOW START	99	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

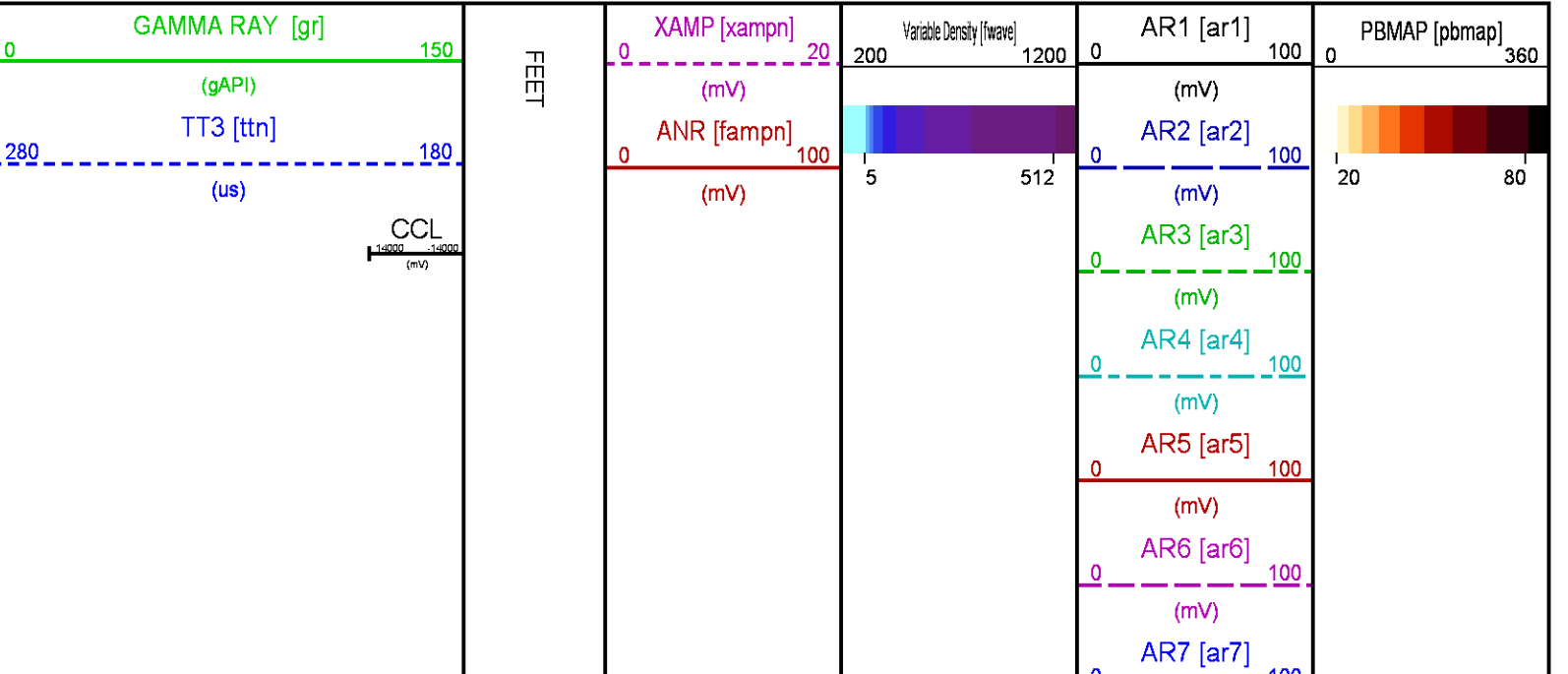
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
AR1	-11.25	AR5	-11.25	CCL	-5.75	XAMPN	-11.25
AR2	-11.25	AR6	-11.25	FAMPN	-11.25		
AR3	-11.25	AR7	-11.25	GR	-1.75		
AR4	-11.25	AR8	-11.25	TTN	-11.25		

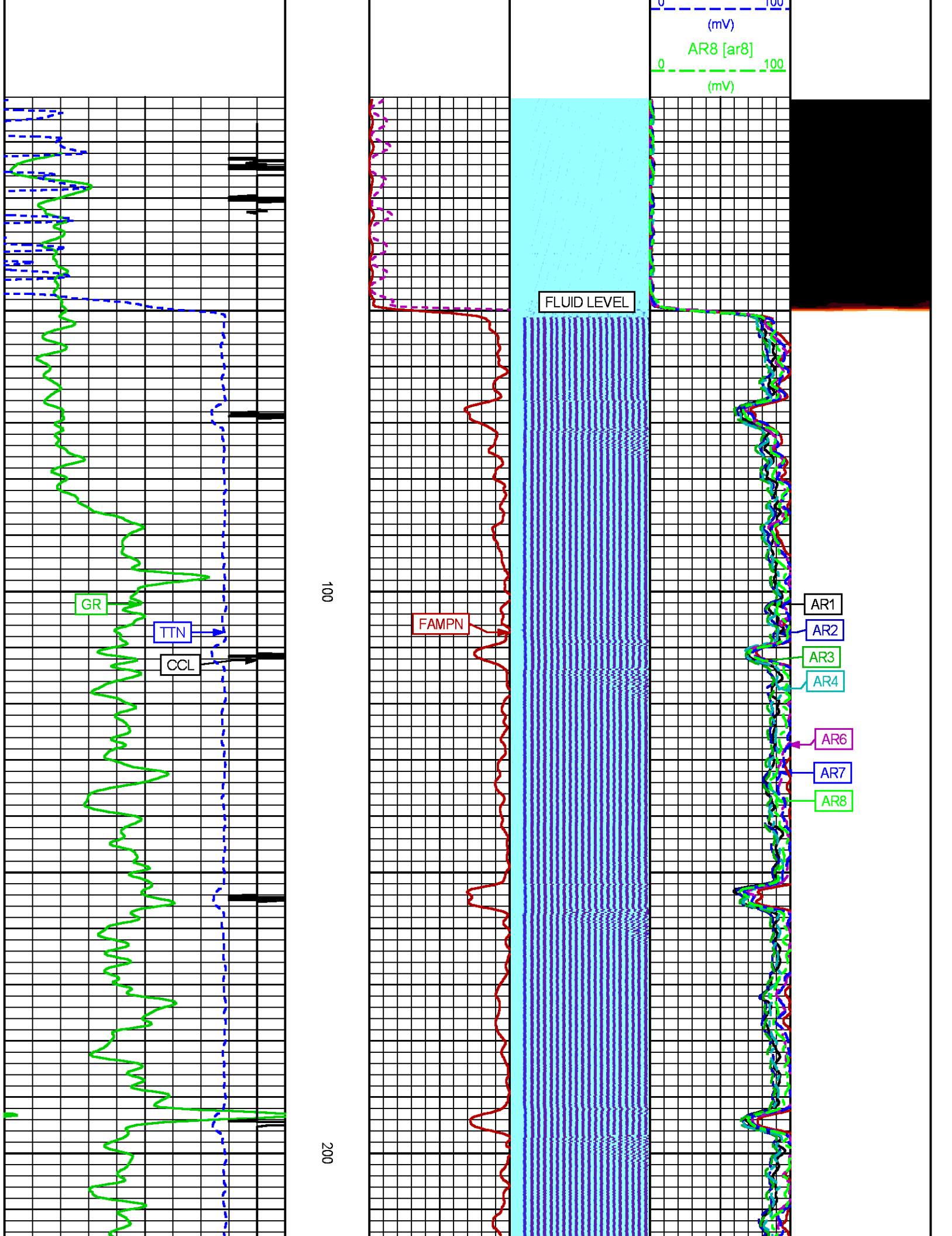
Presentation
Plot Interval

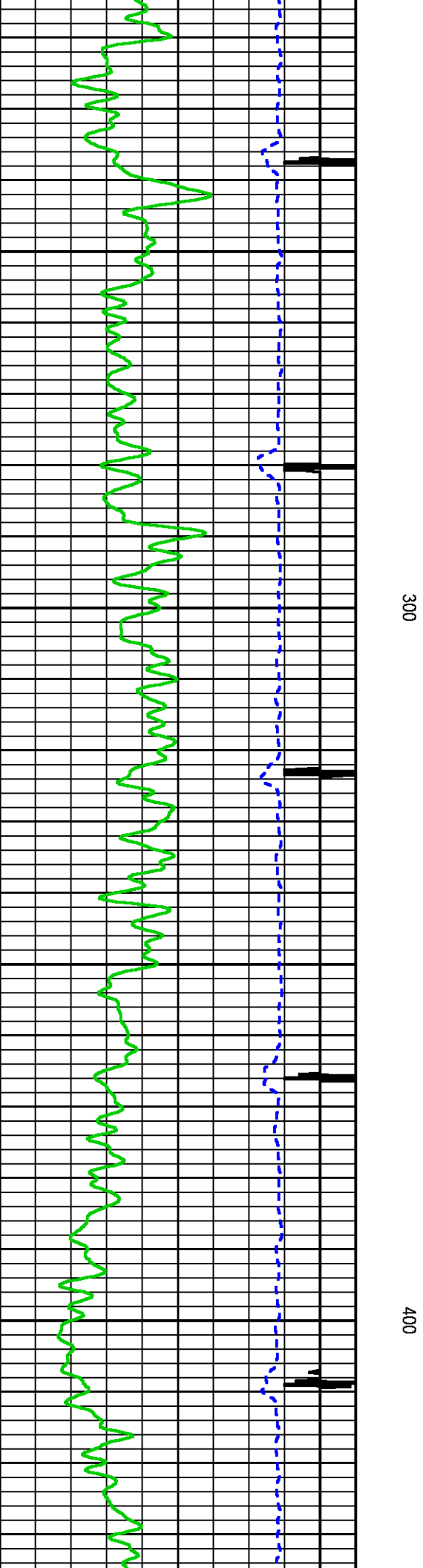
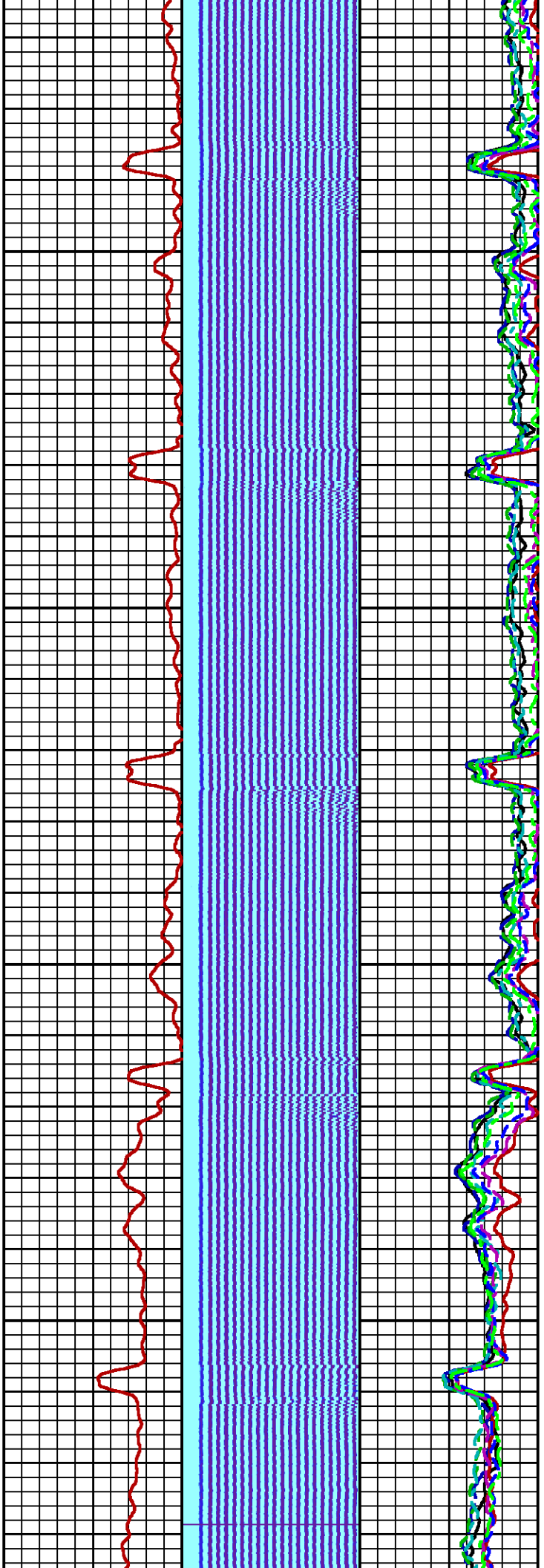
: SysA:LARAMIE\_RAL\_MAIN.fvpdf [5"/100' Scale]
: 12.25 - 8192 Feet

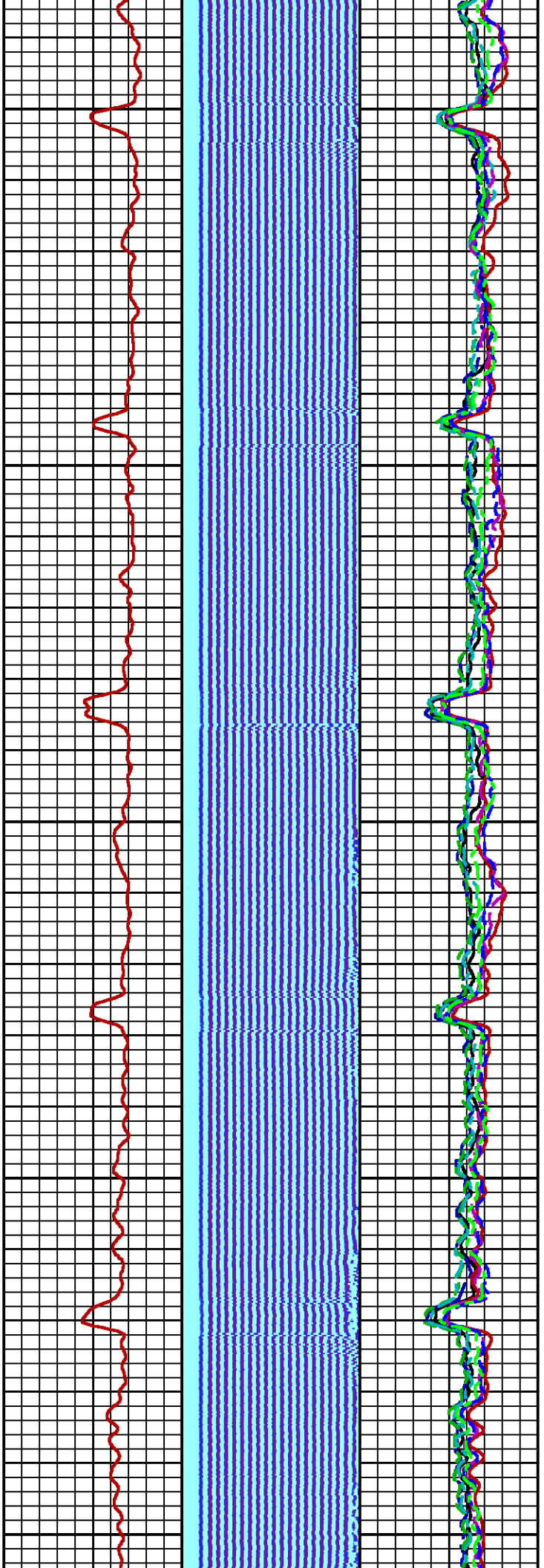
Data File 1
Created On
Company
Well
Field
File Interval
OCT

: F1 : SysA:/dat1a/LARAMIE\_NICHOLS\_0994-13-18W/RAL\_MAIN.xtf
: N/A
: LARAMIE ENERGY II LLC
: NICHOLS 0994-13-18W
: VEGA
: 8.5 - 8193.25 Feet
: p012g



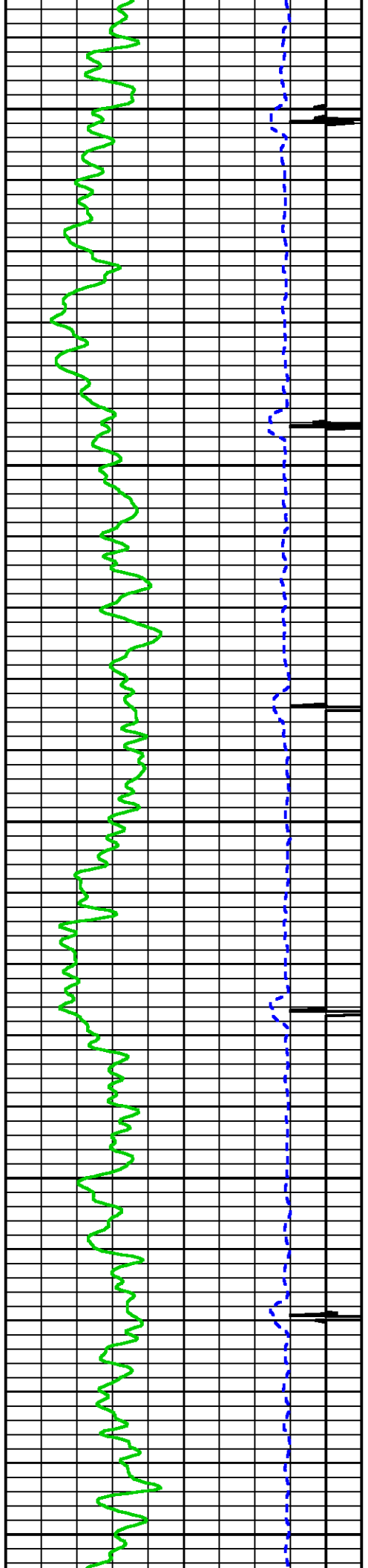




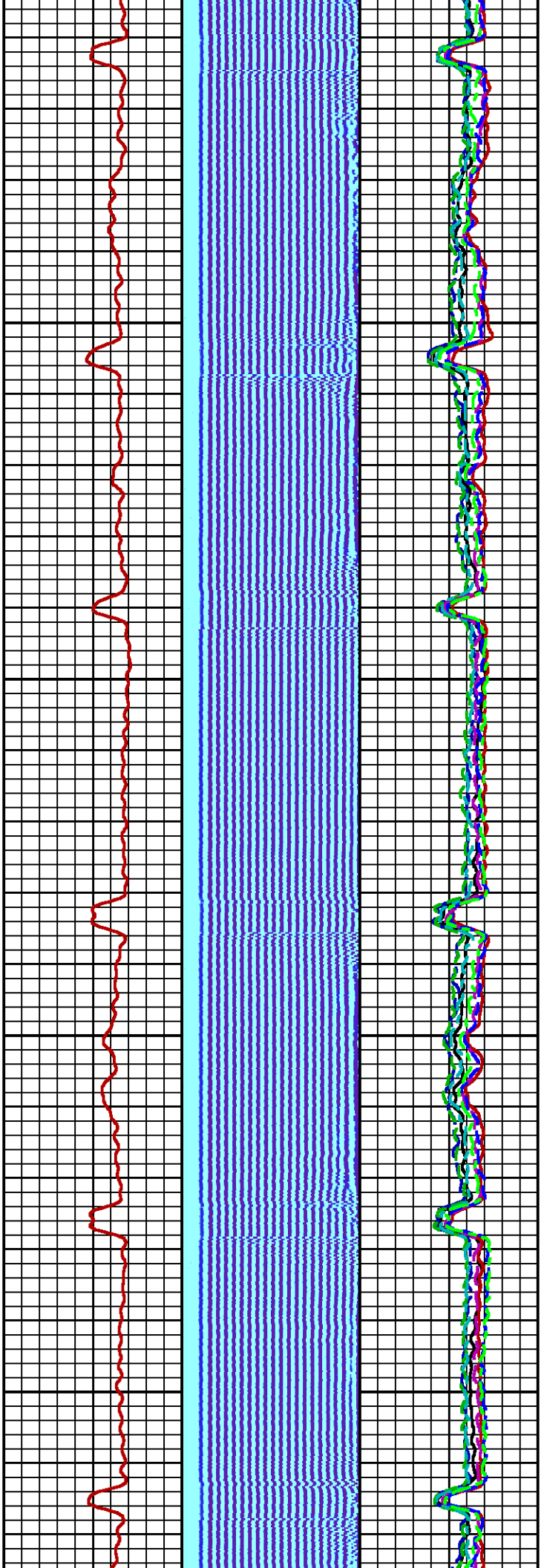


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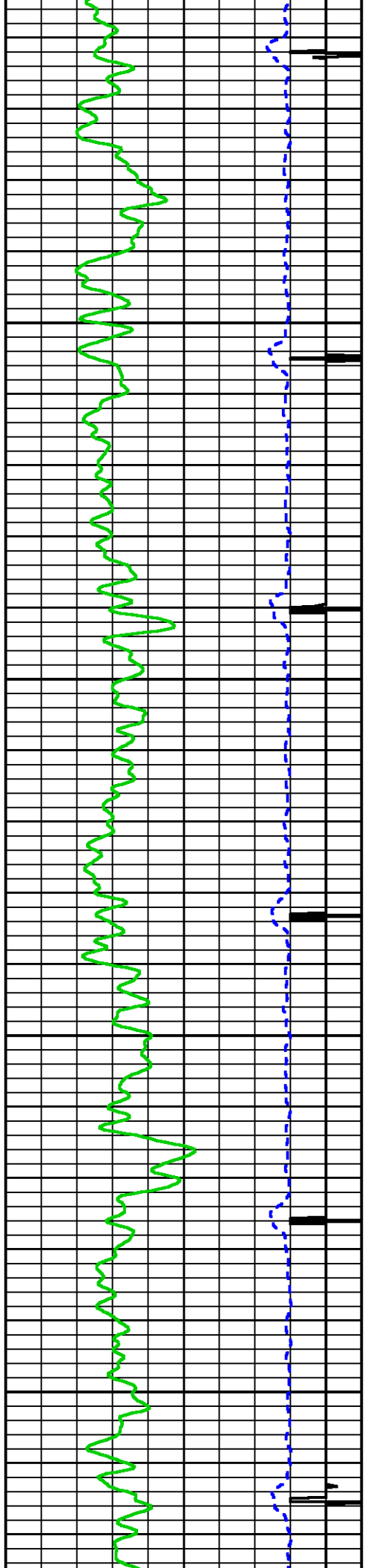


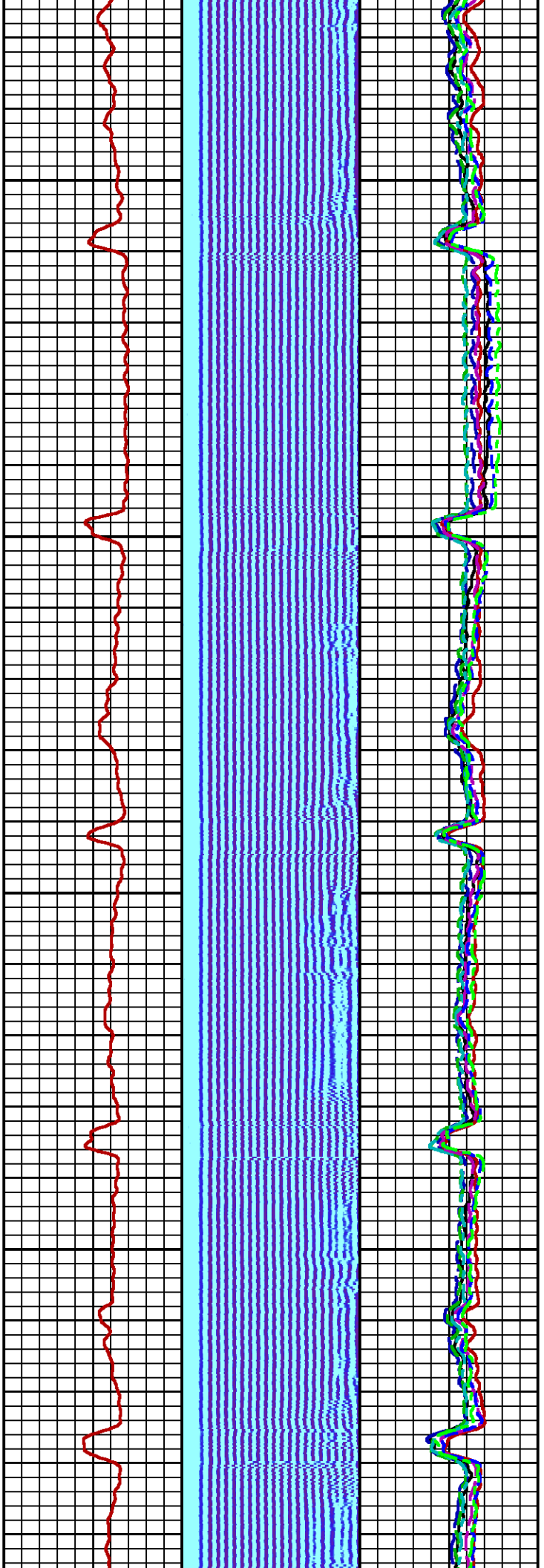




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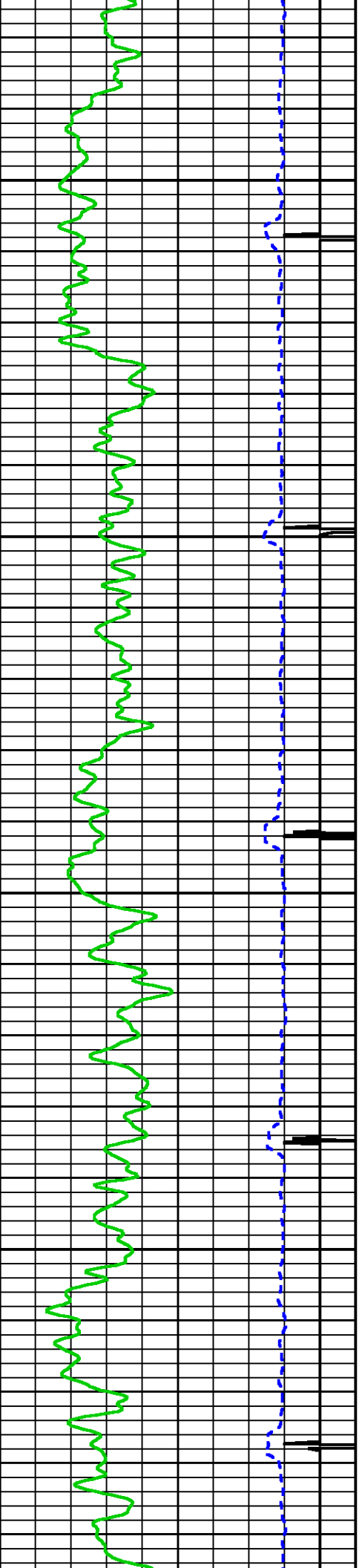
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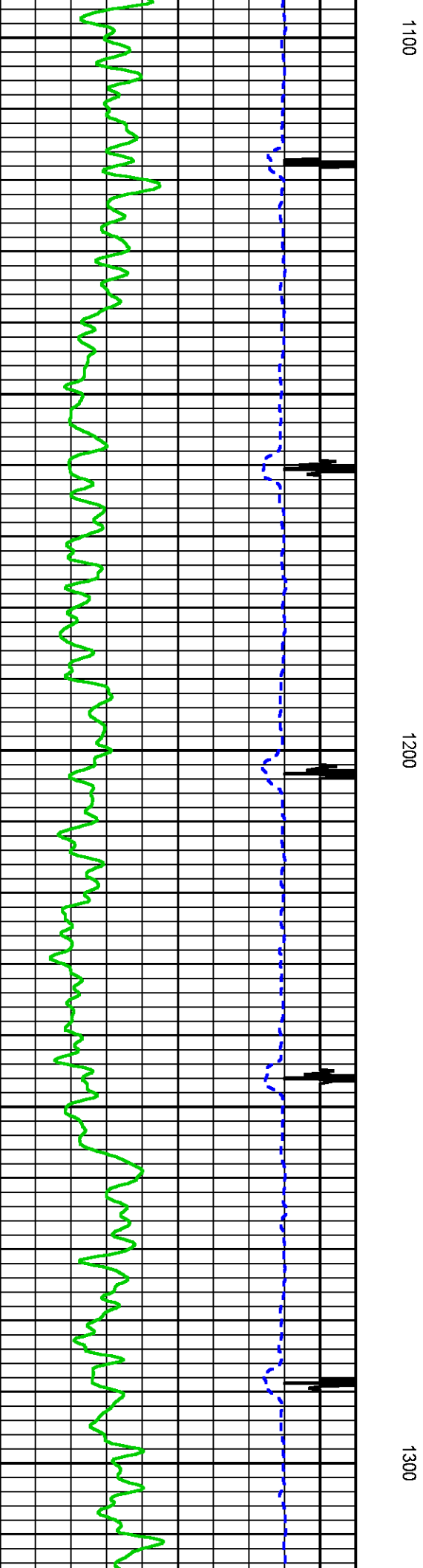
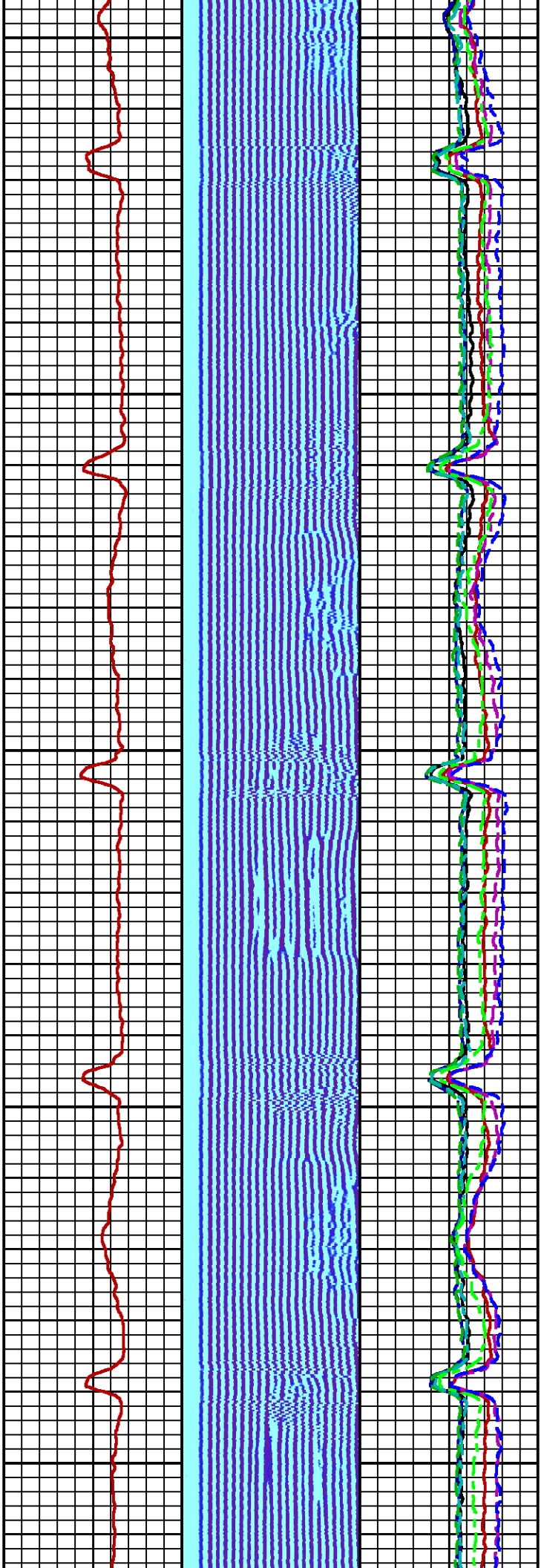


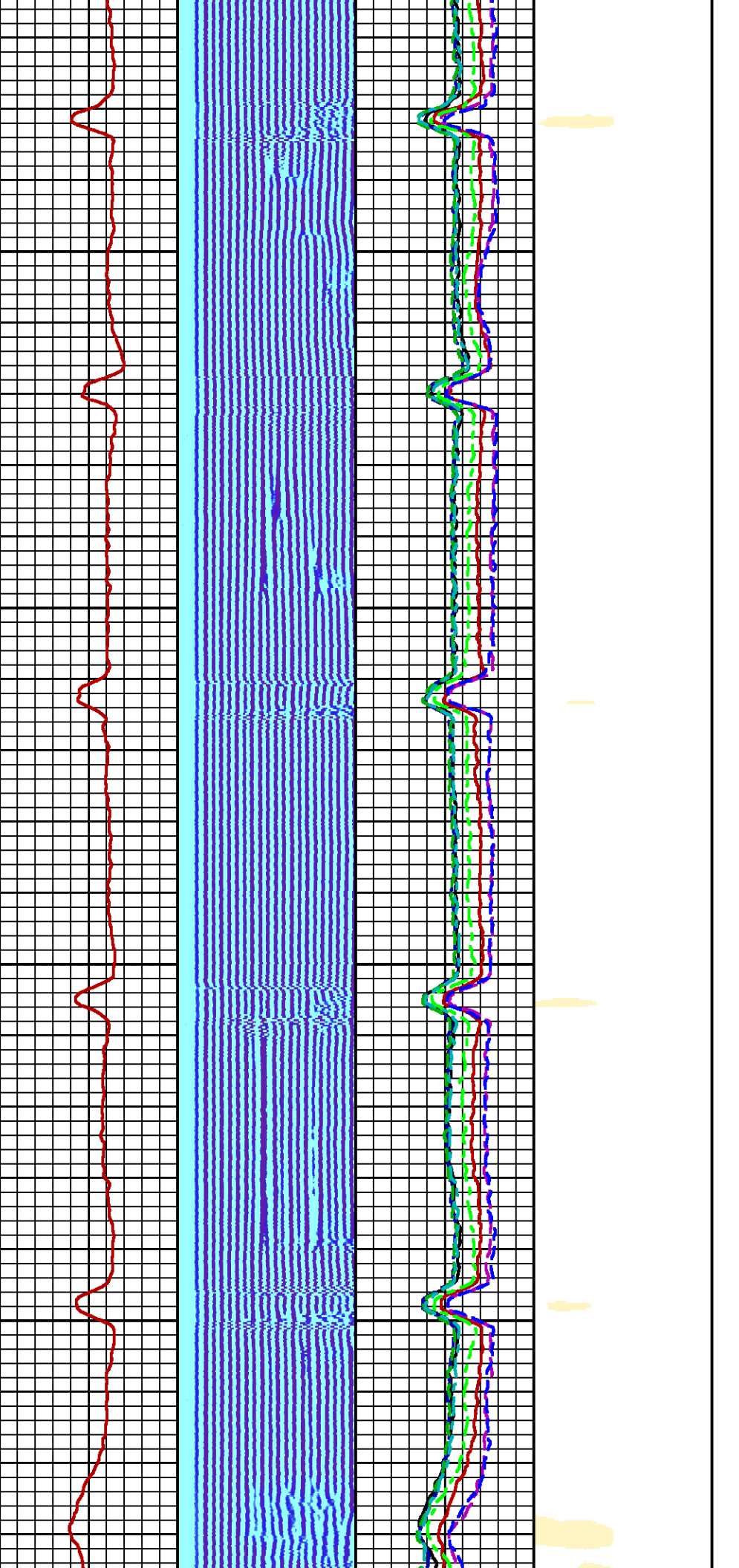
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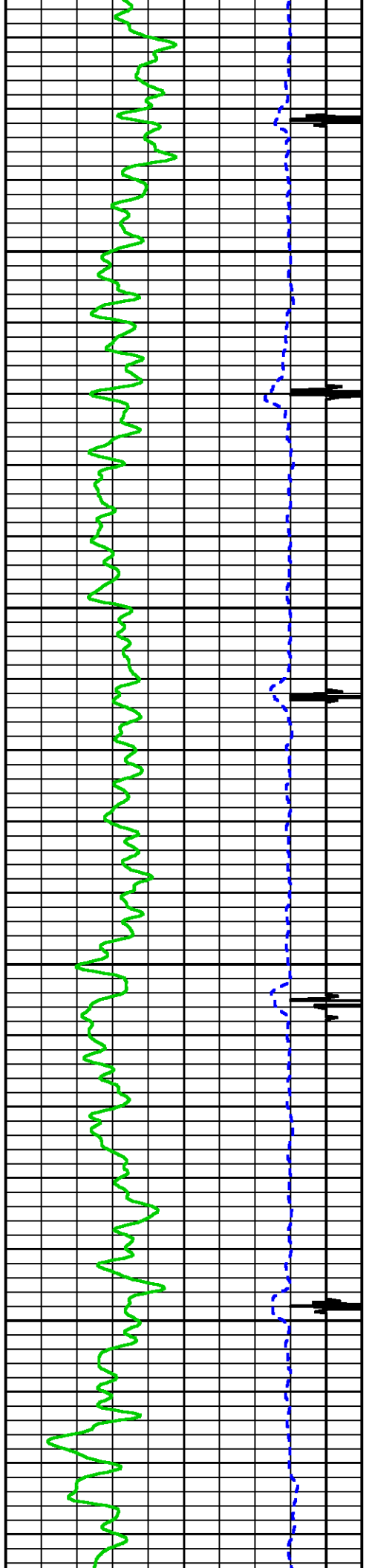


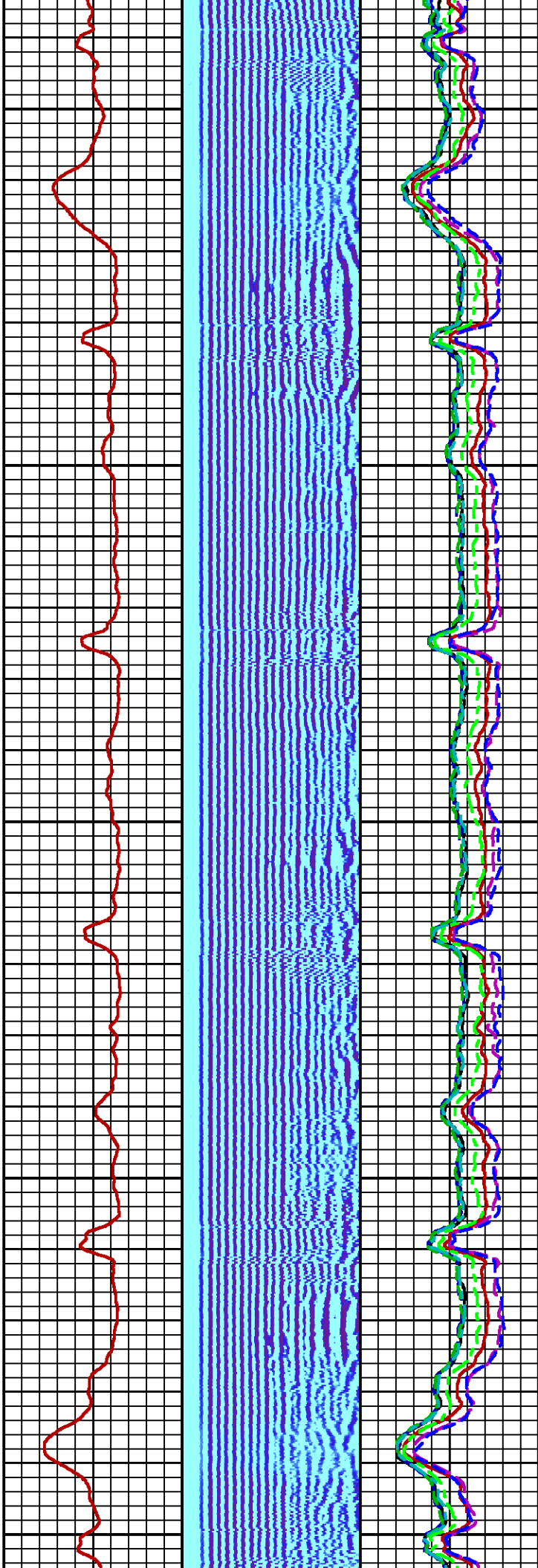
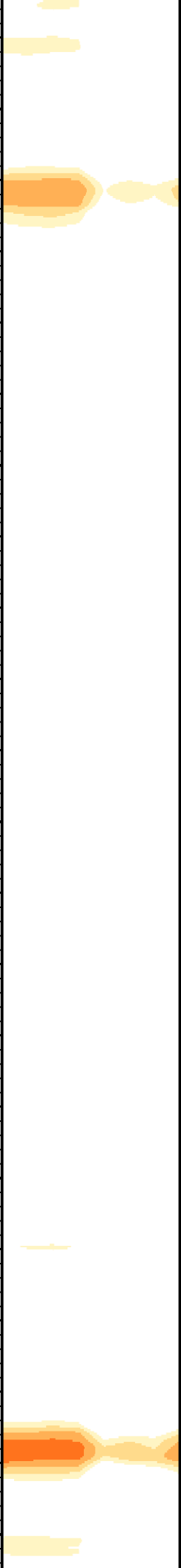




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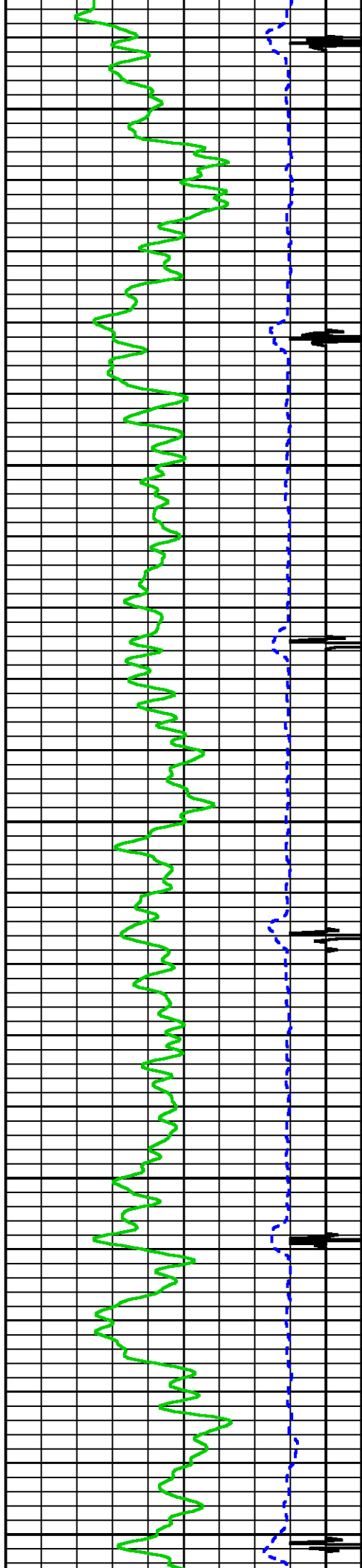
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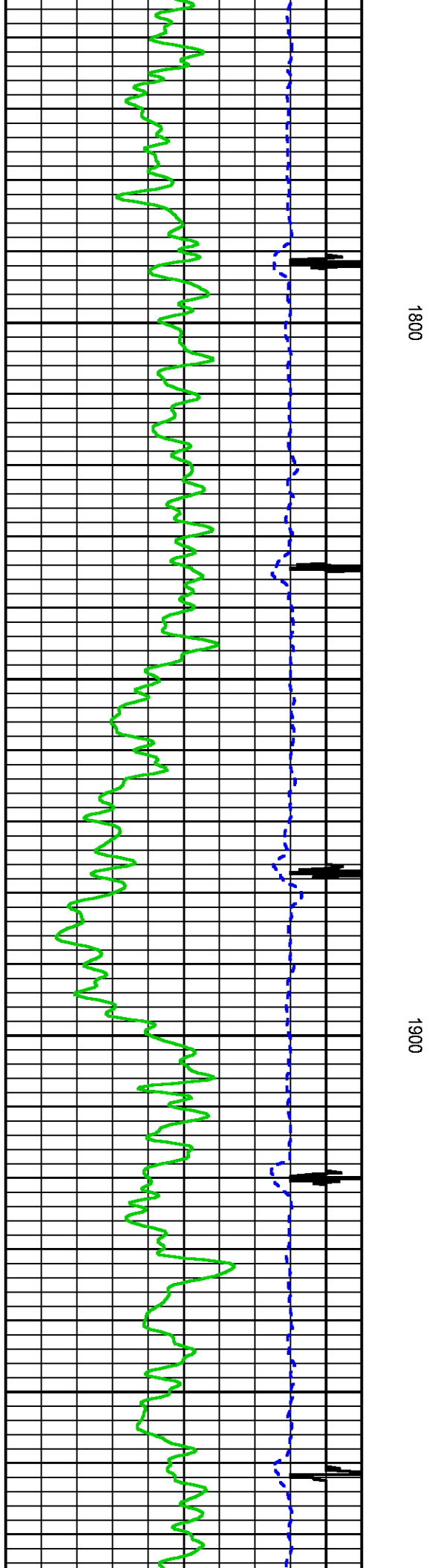
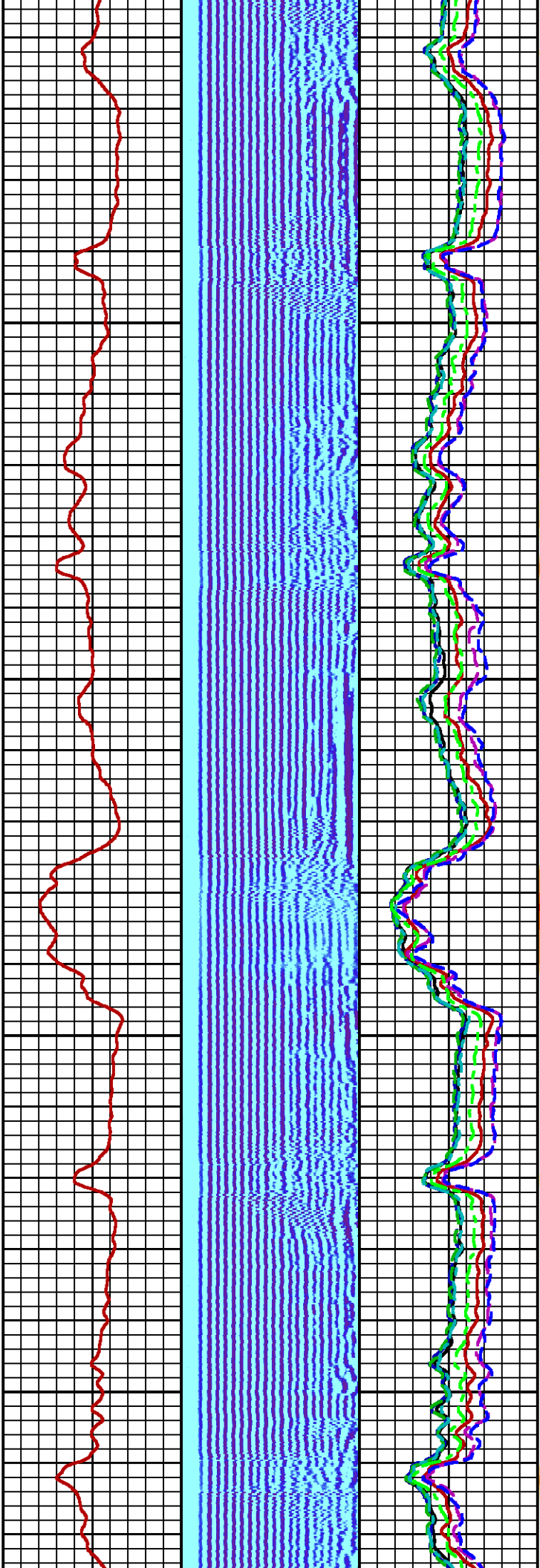
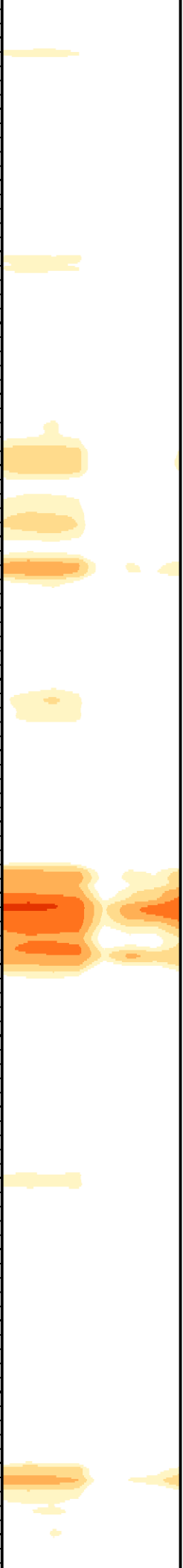




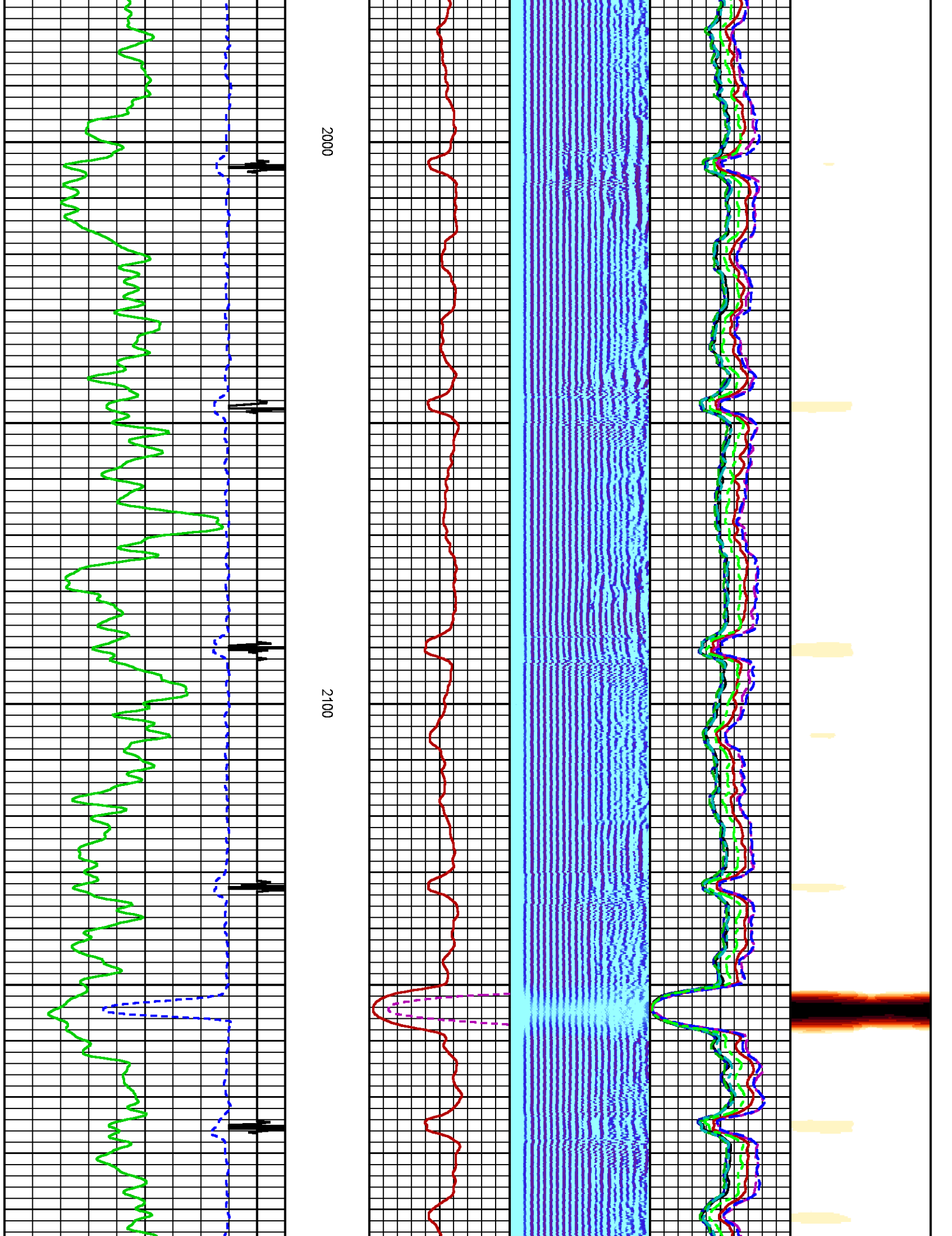
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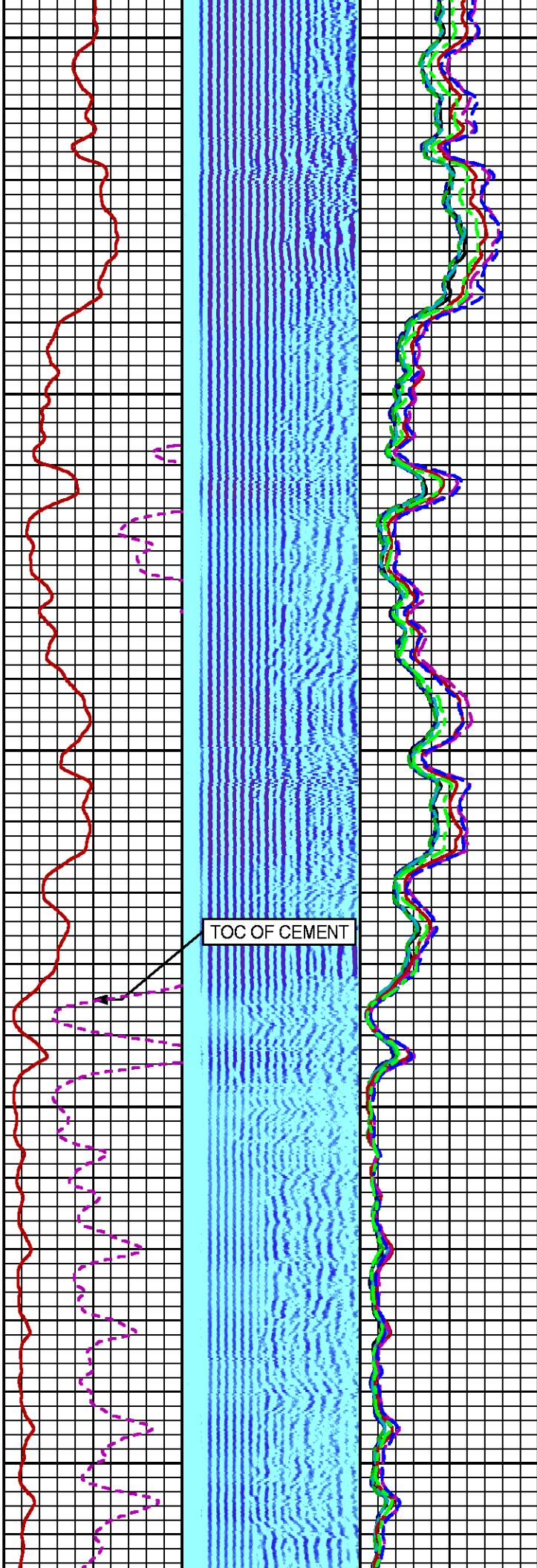
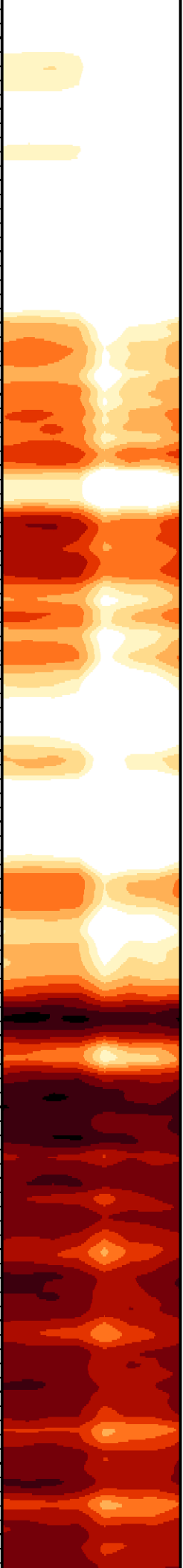
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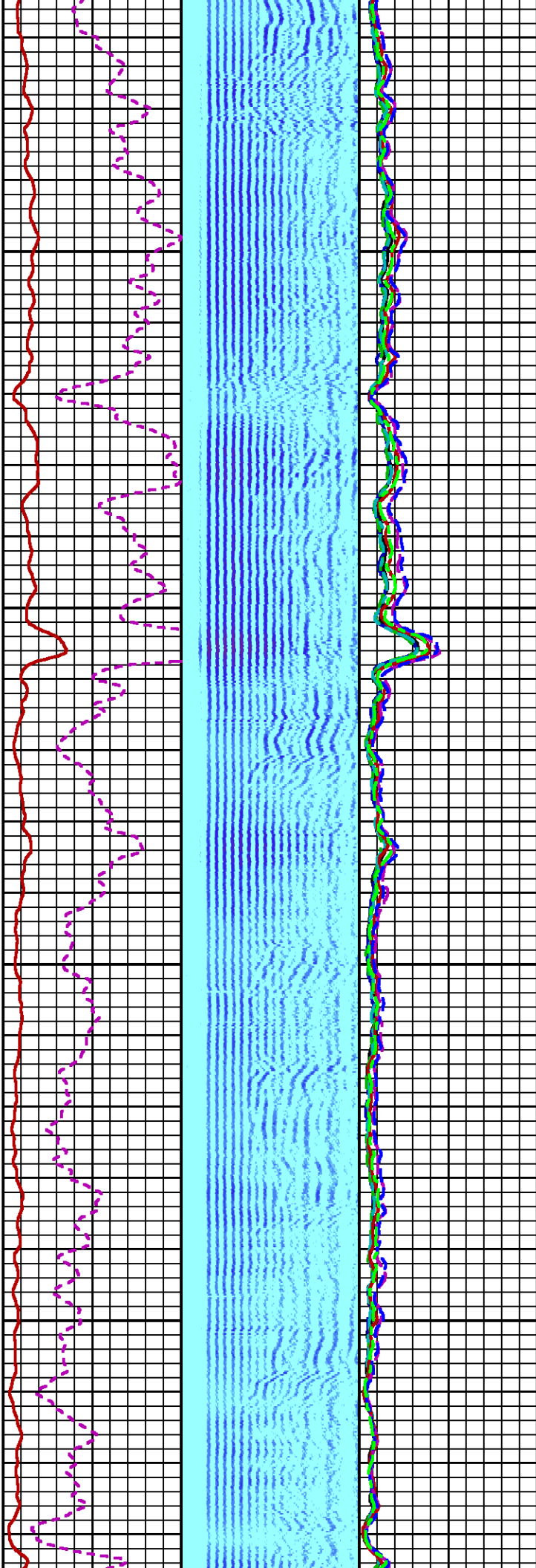
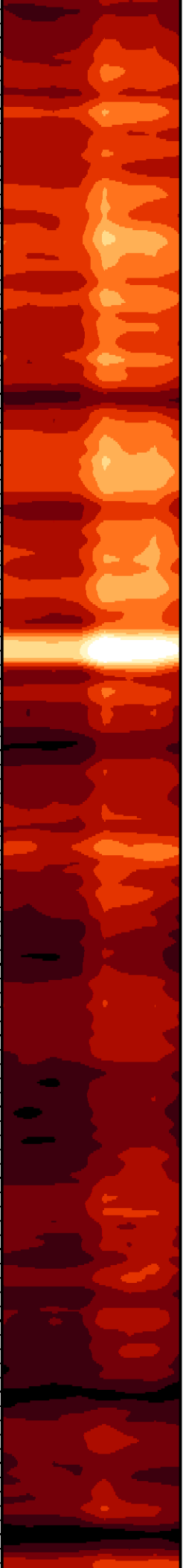
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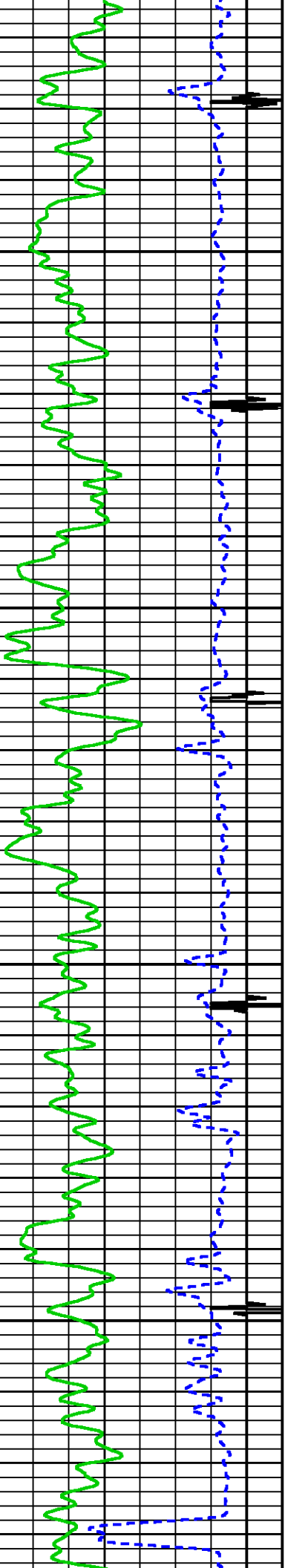
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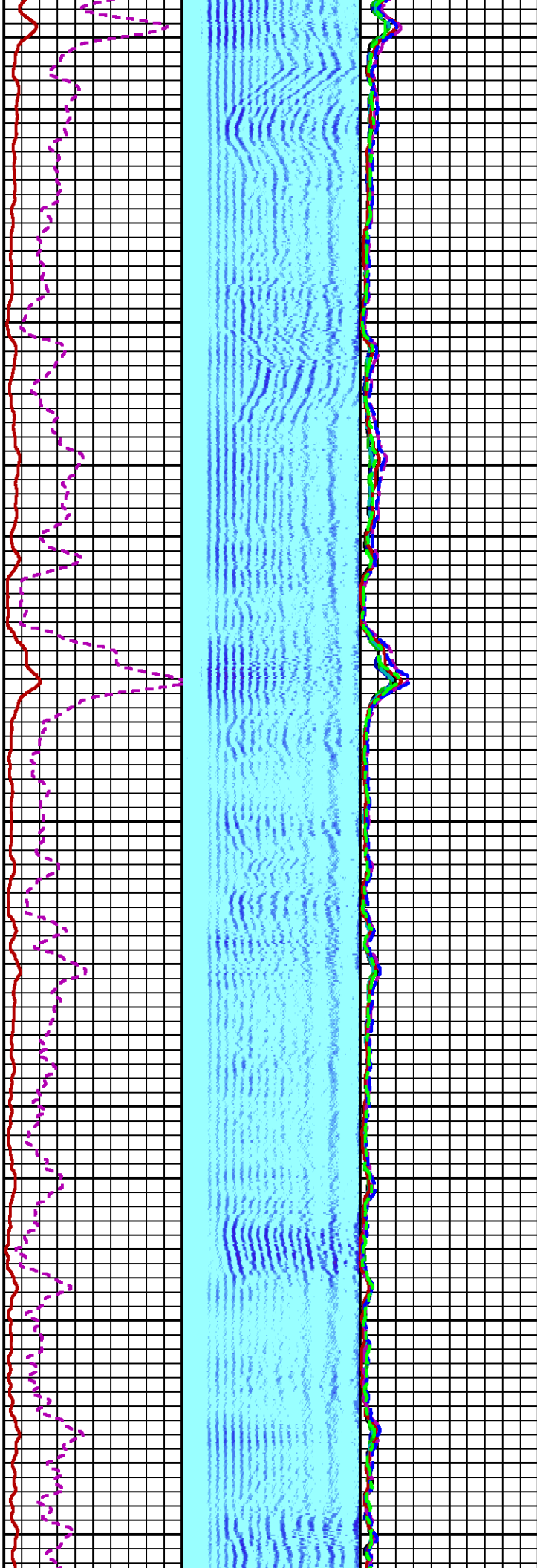




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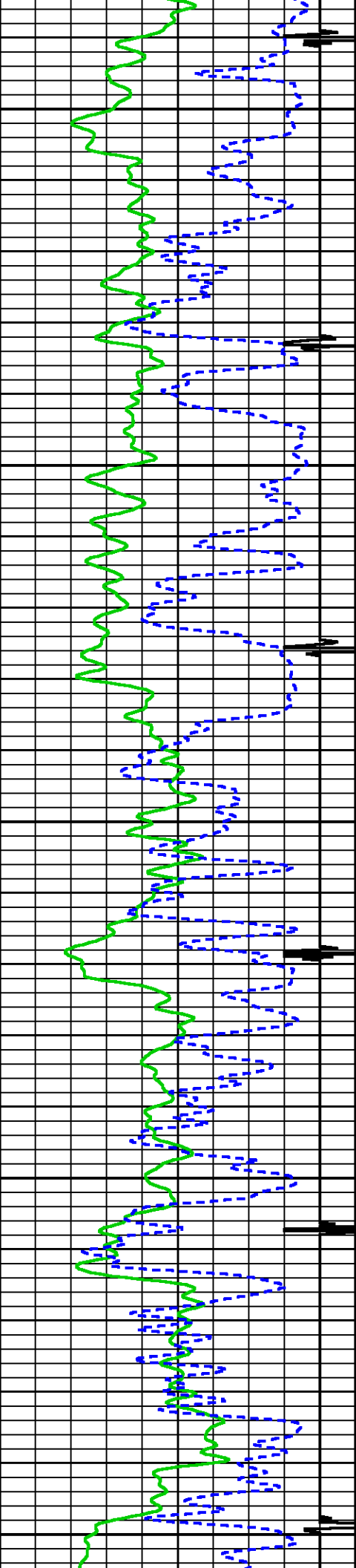
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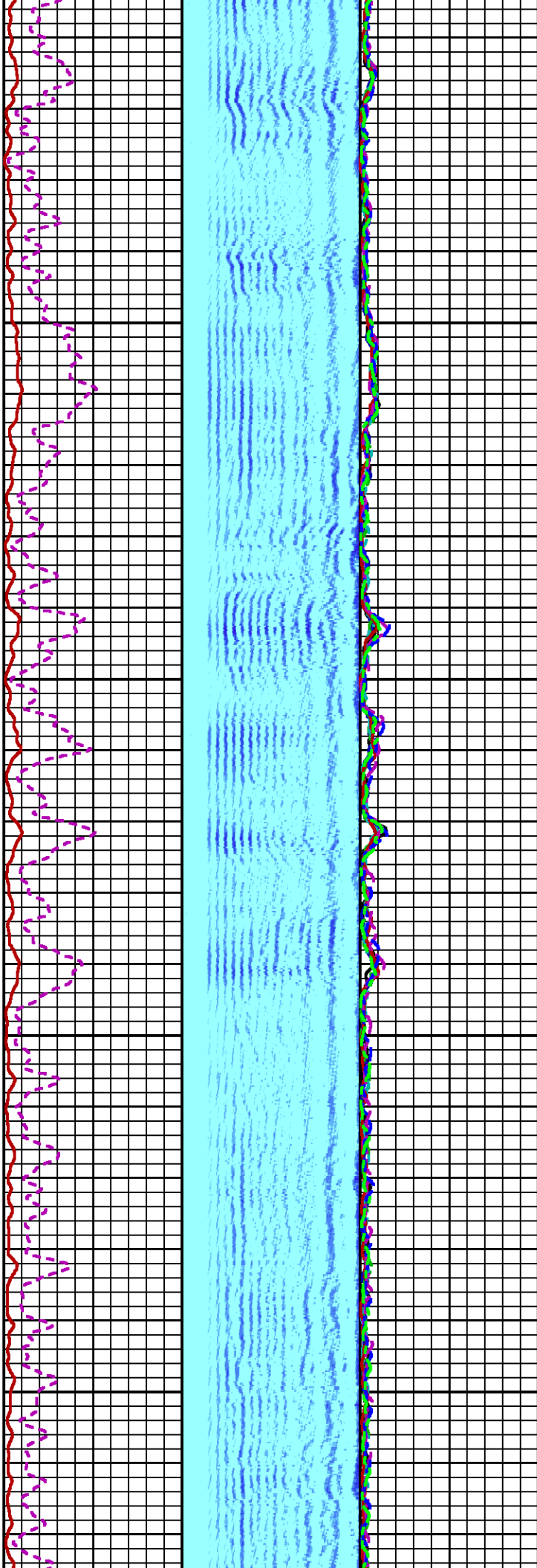
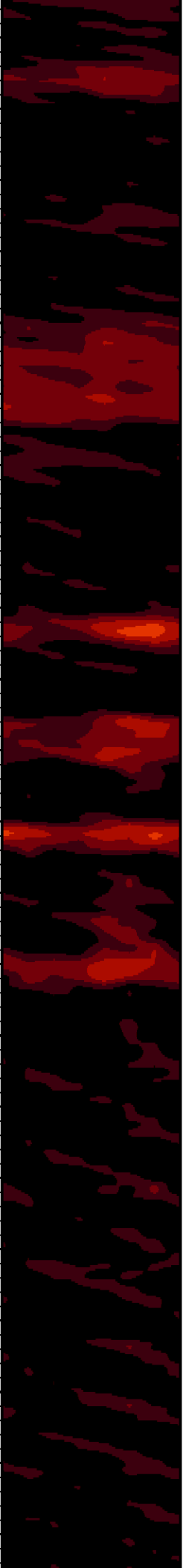




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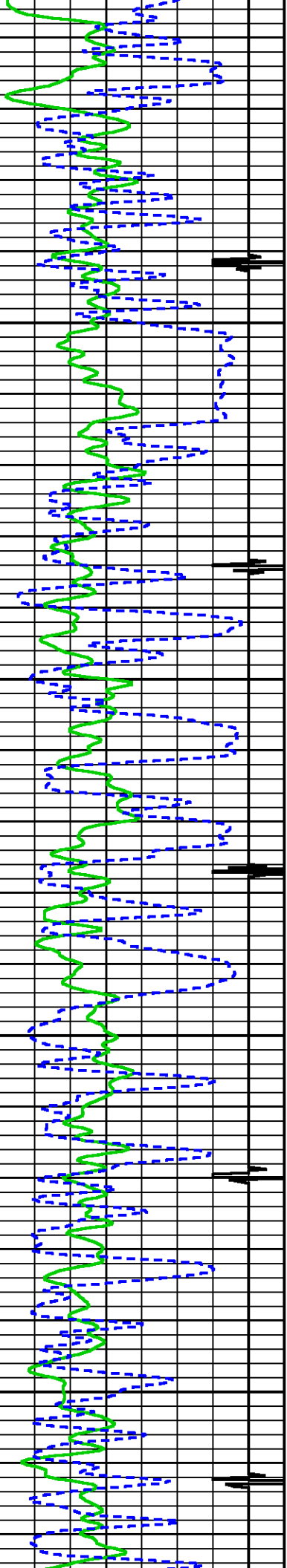
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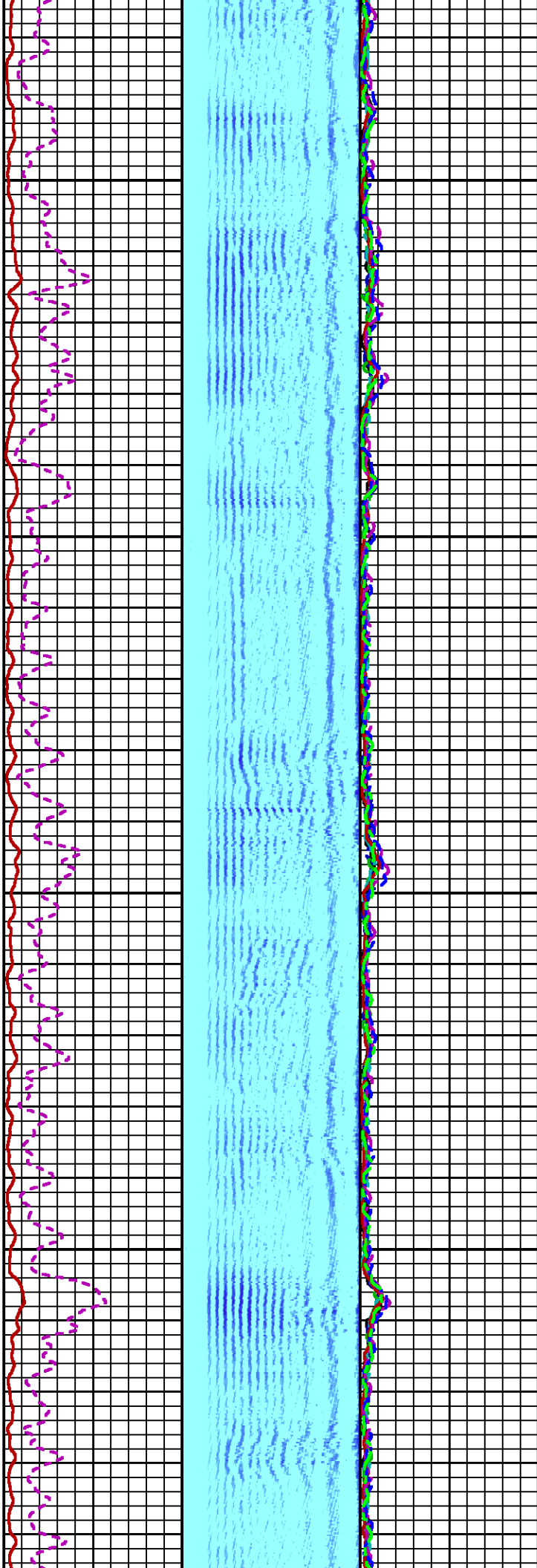
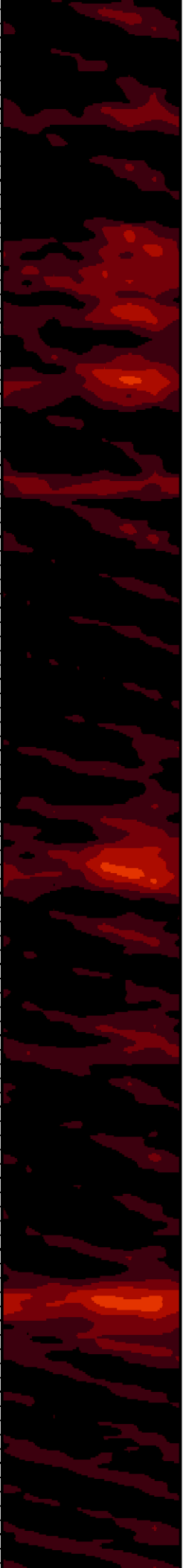




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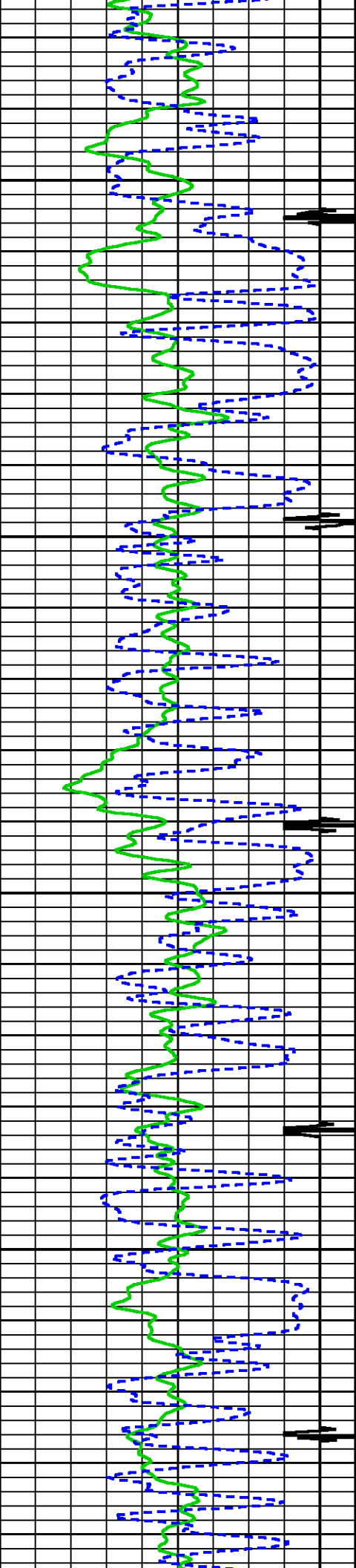
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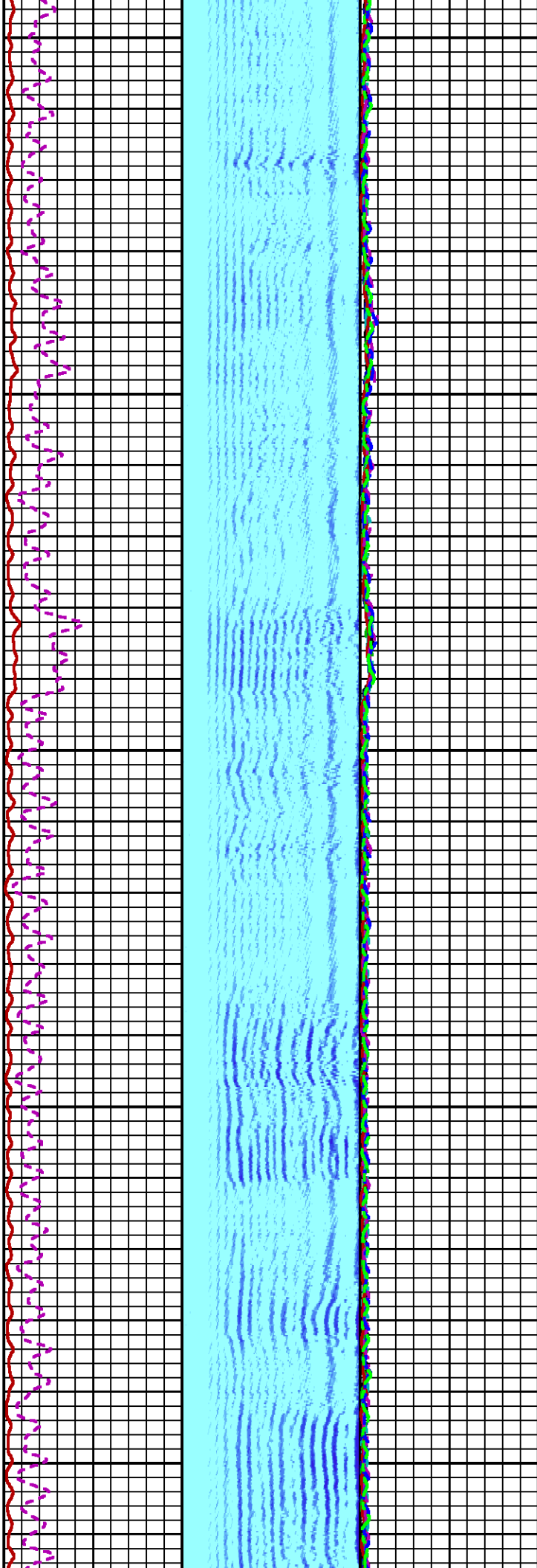
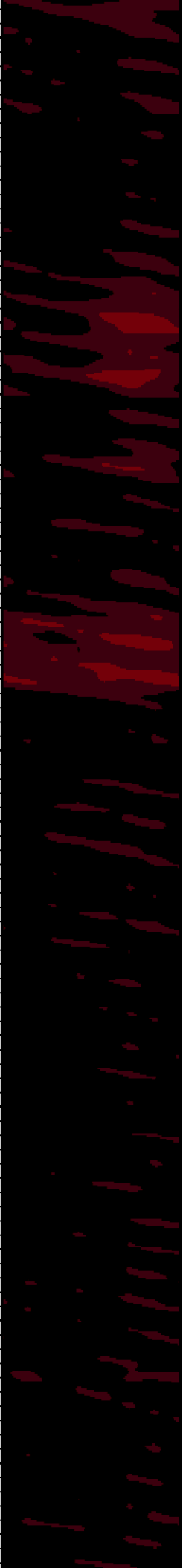




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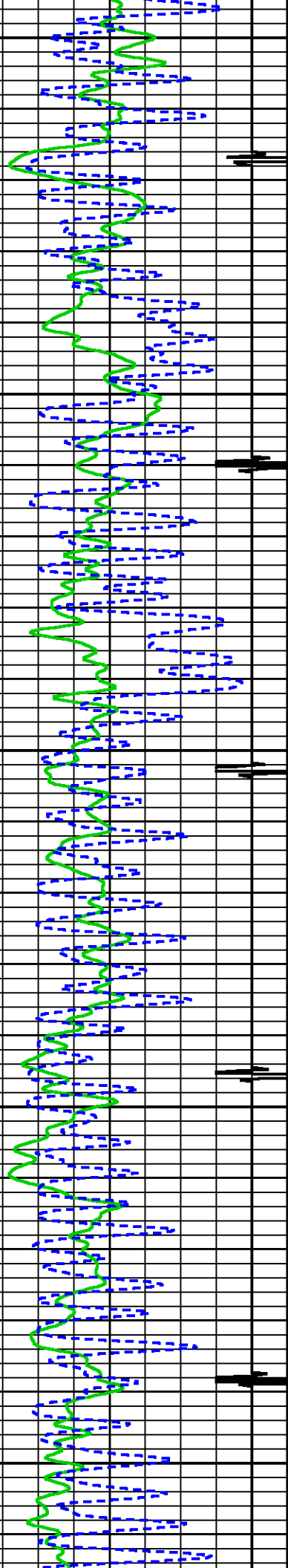




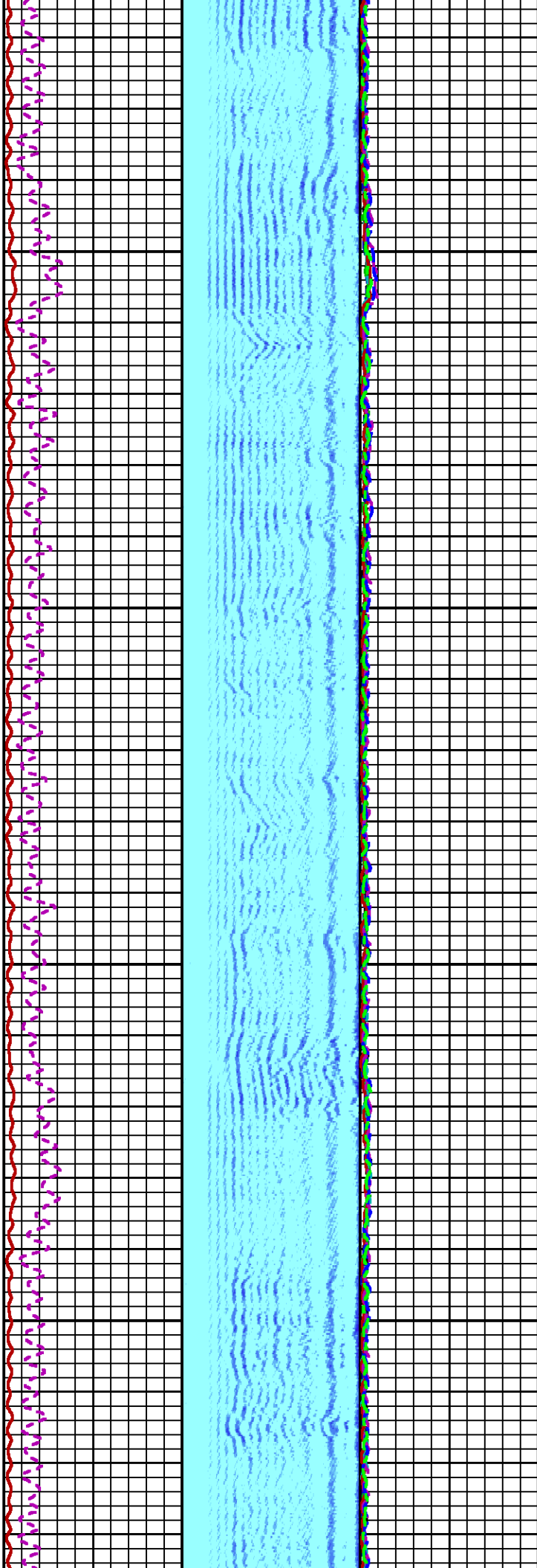
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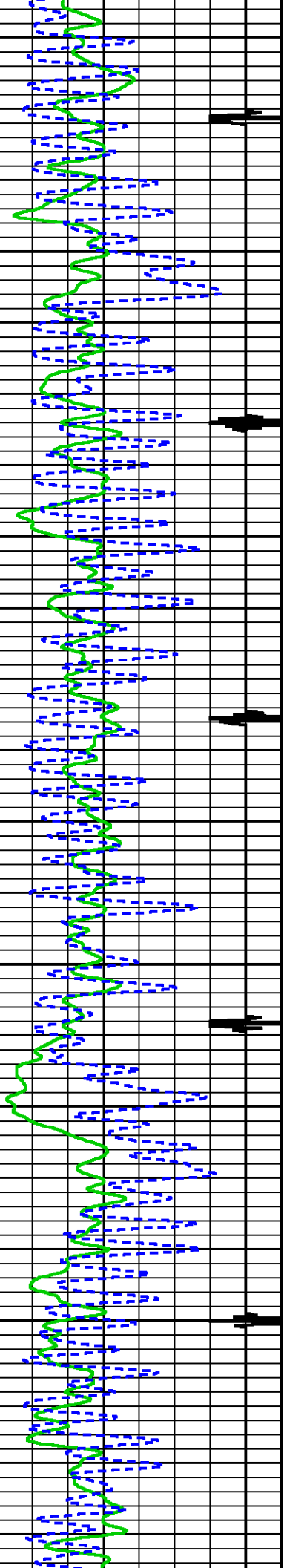




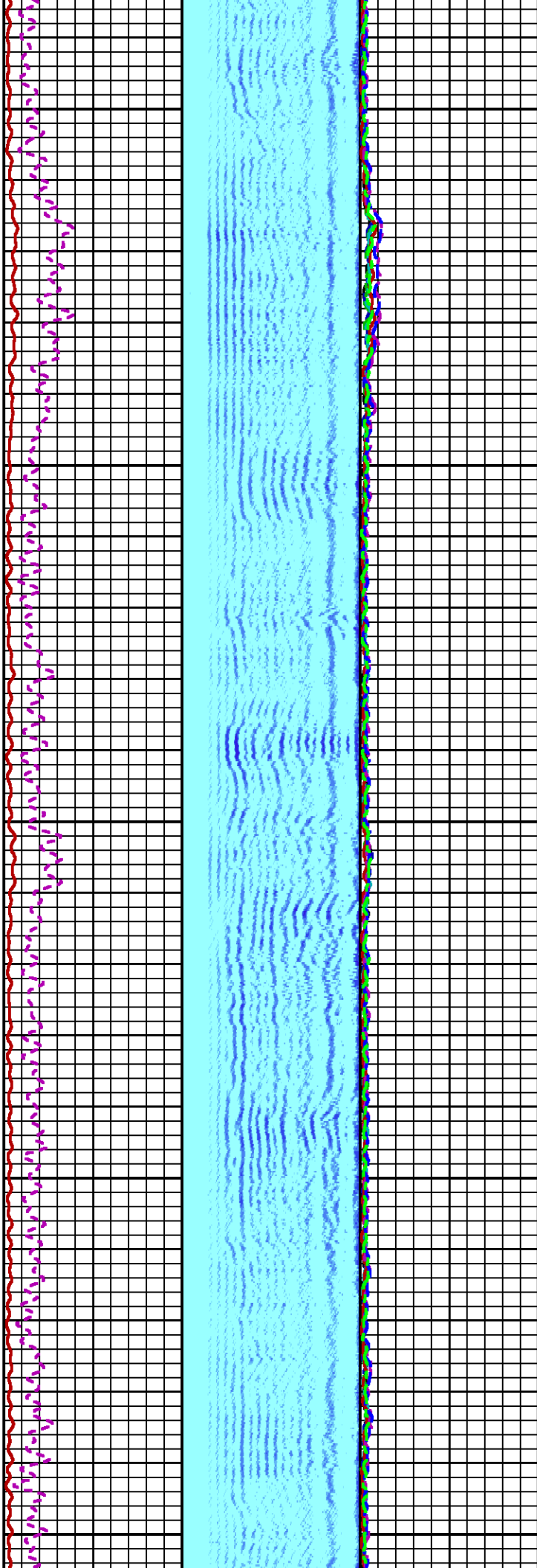


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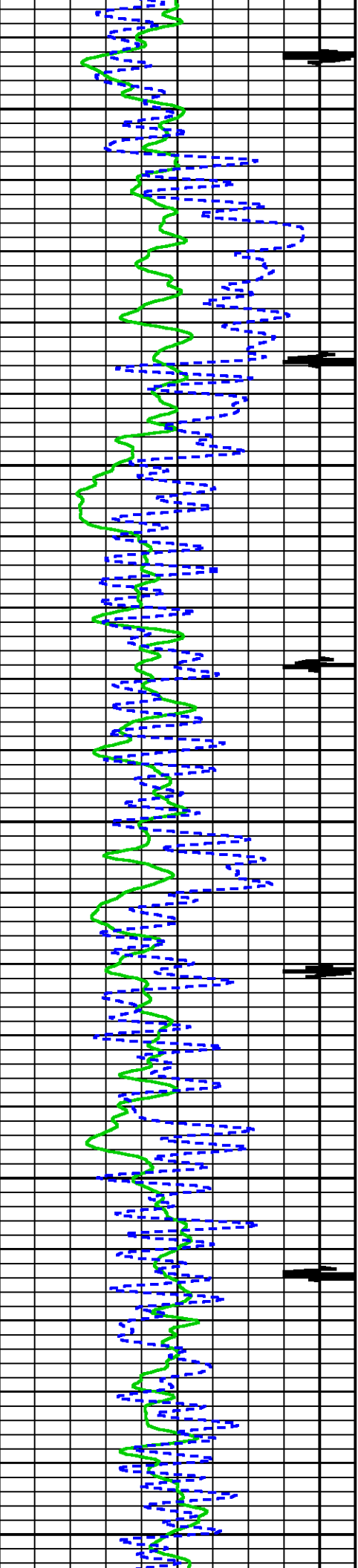


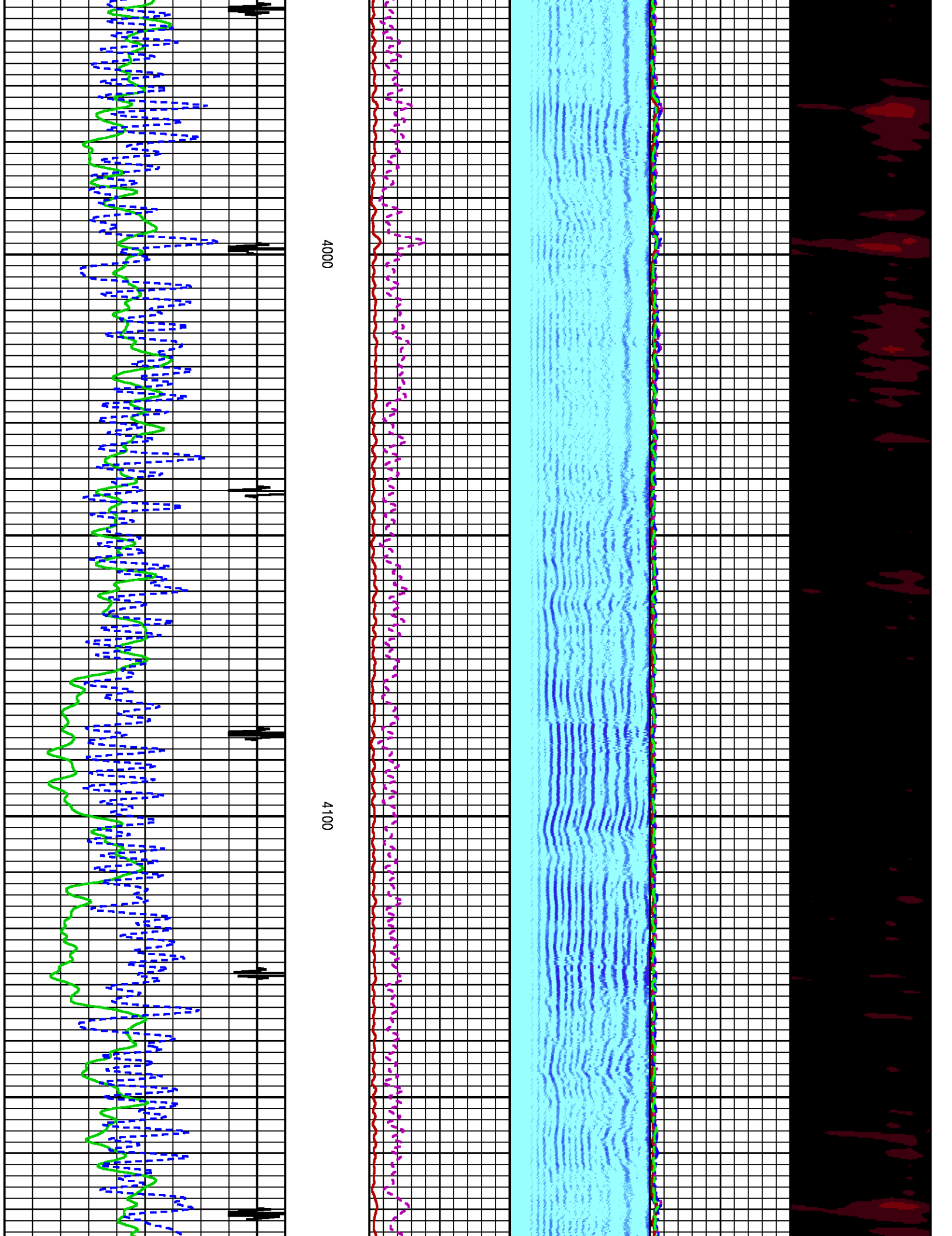


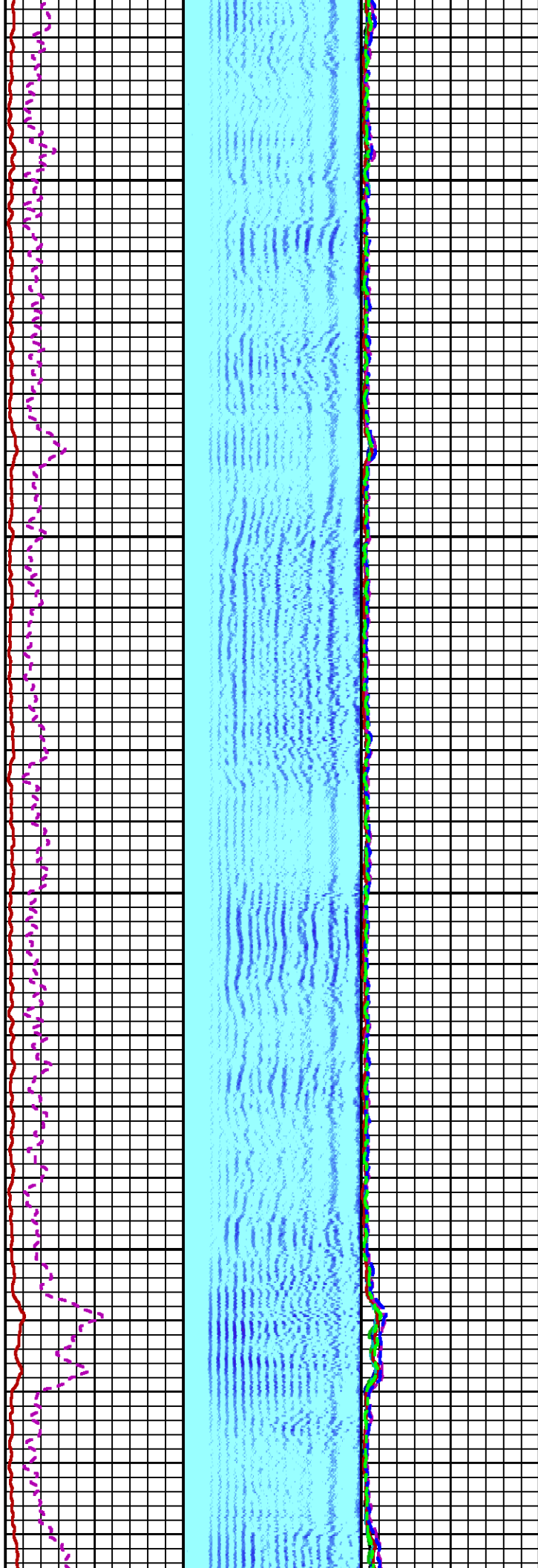


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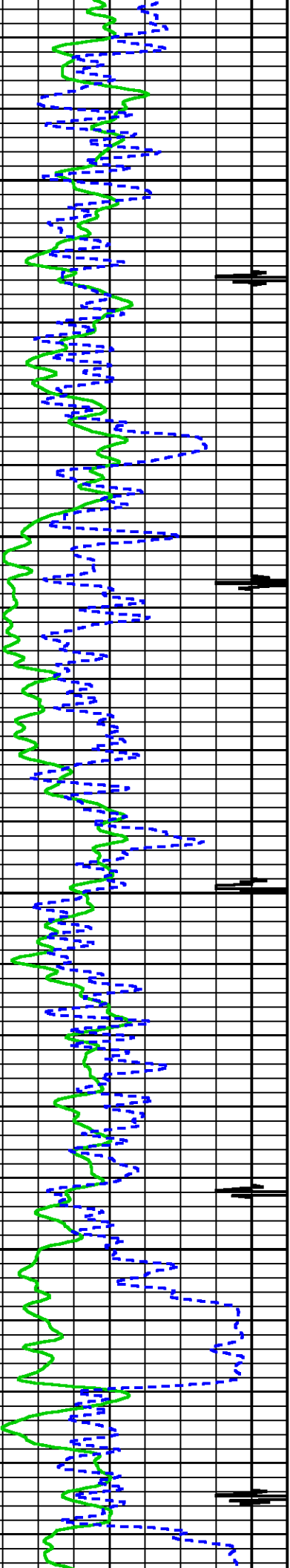


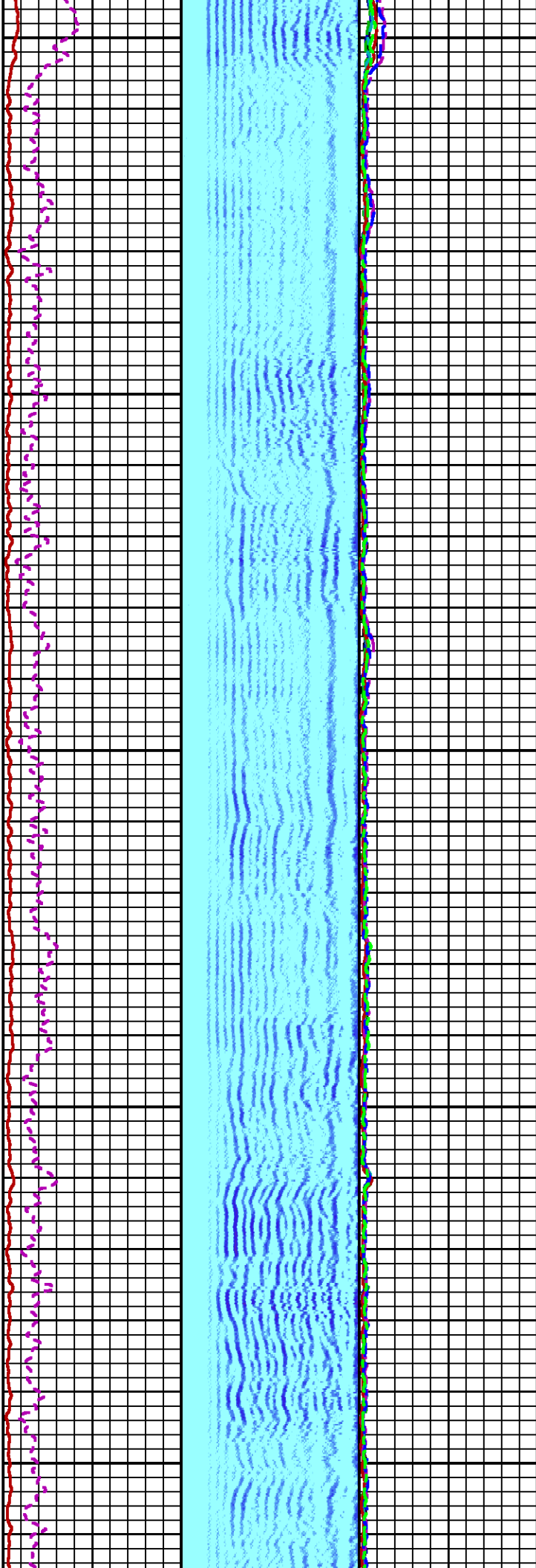




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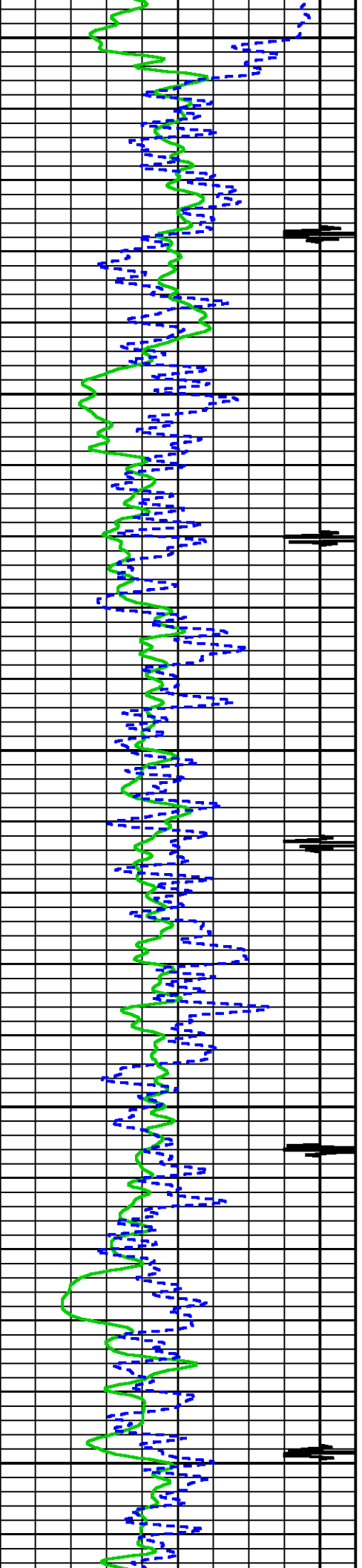


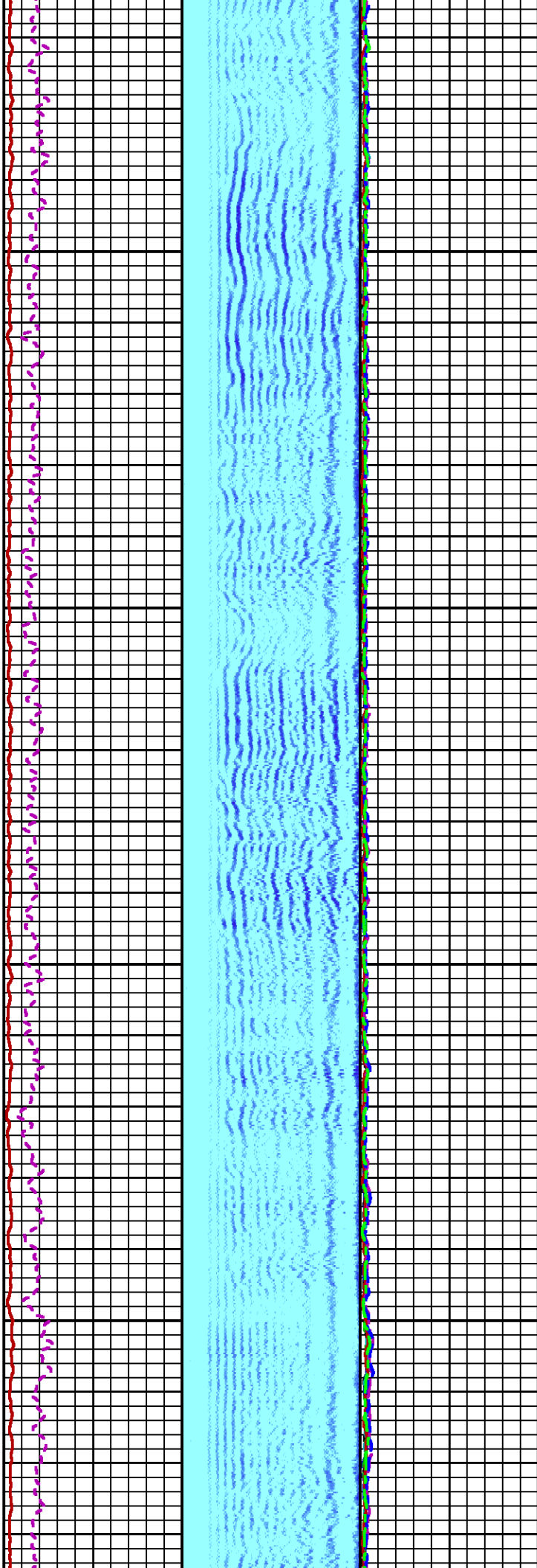


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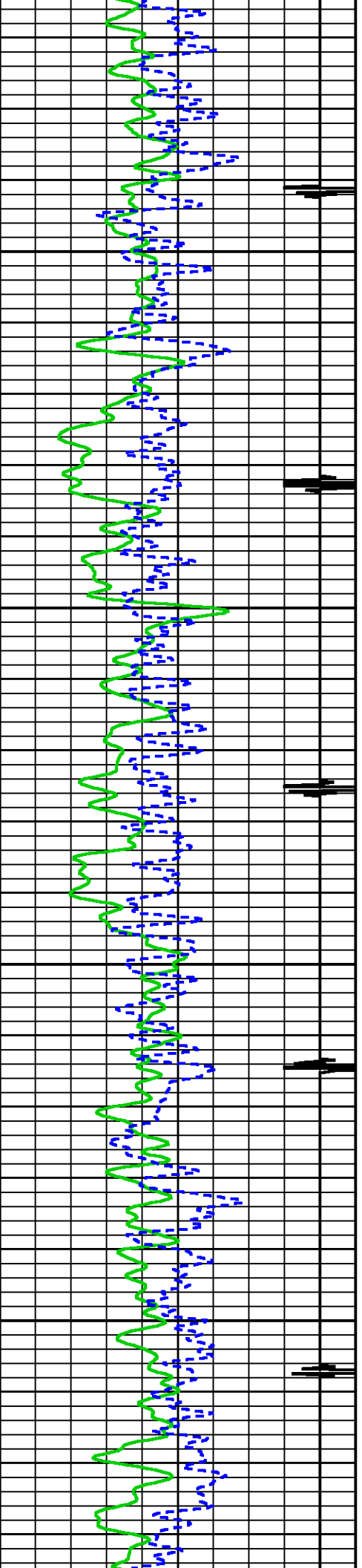
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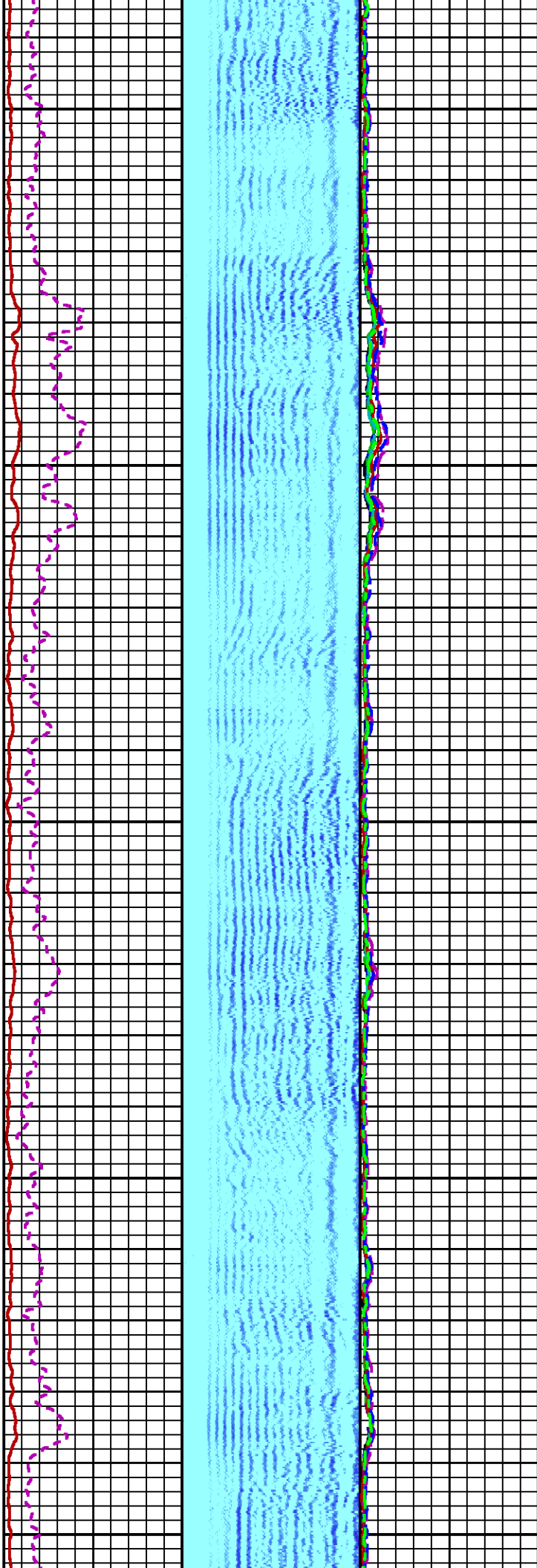


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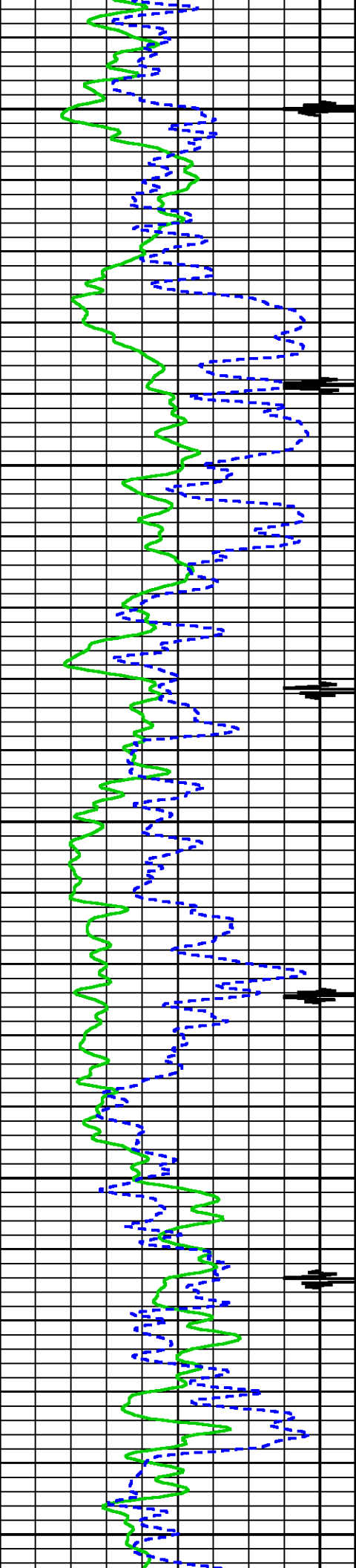




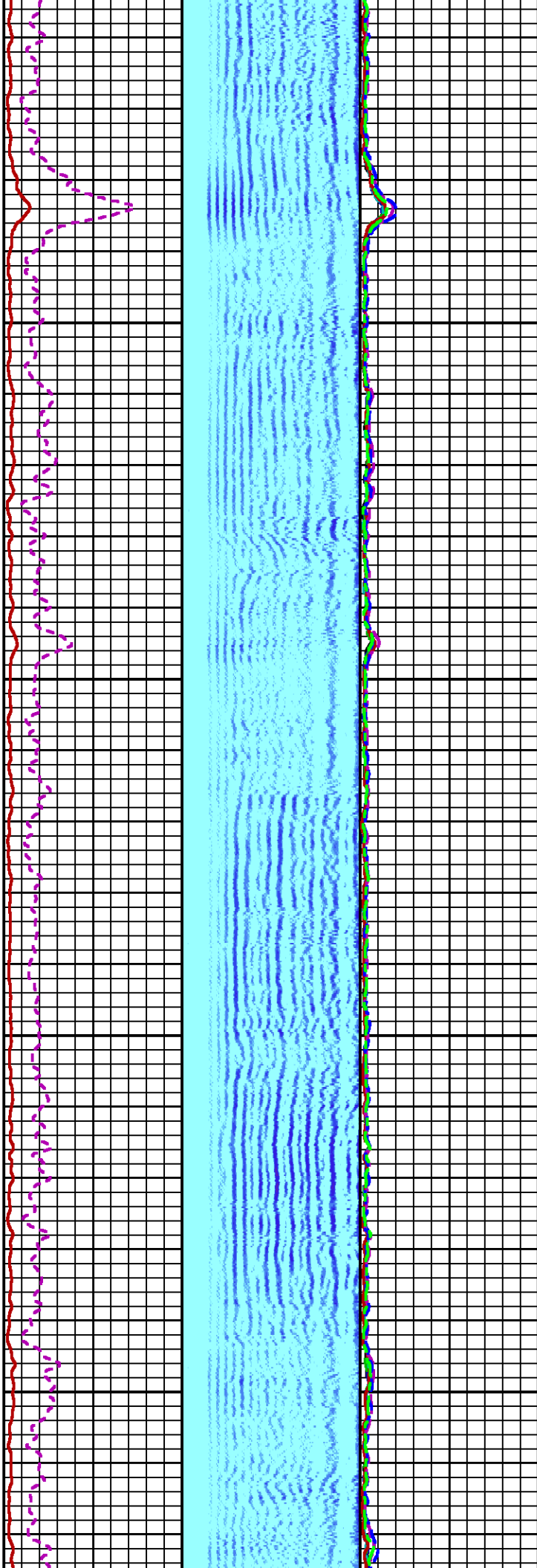
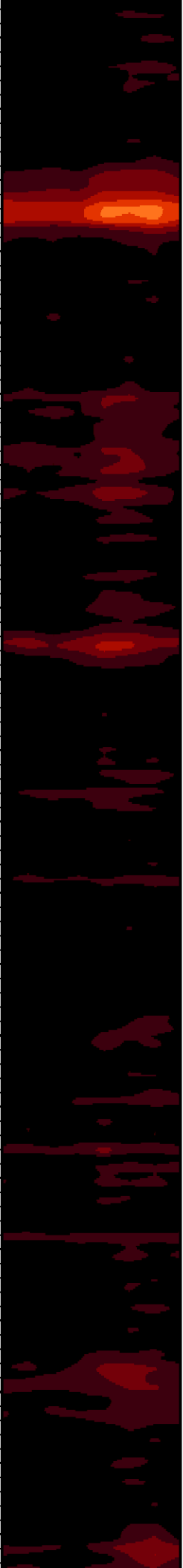


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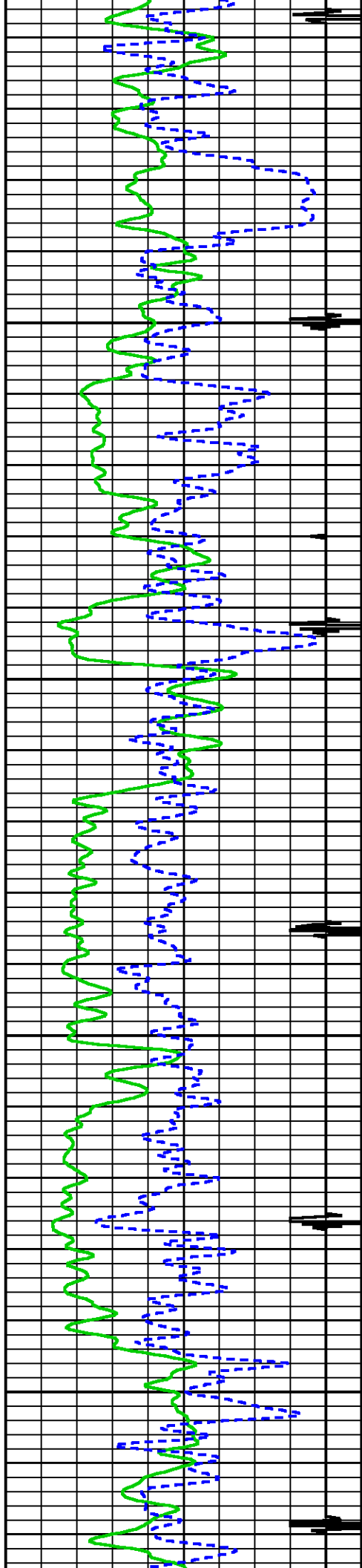


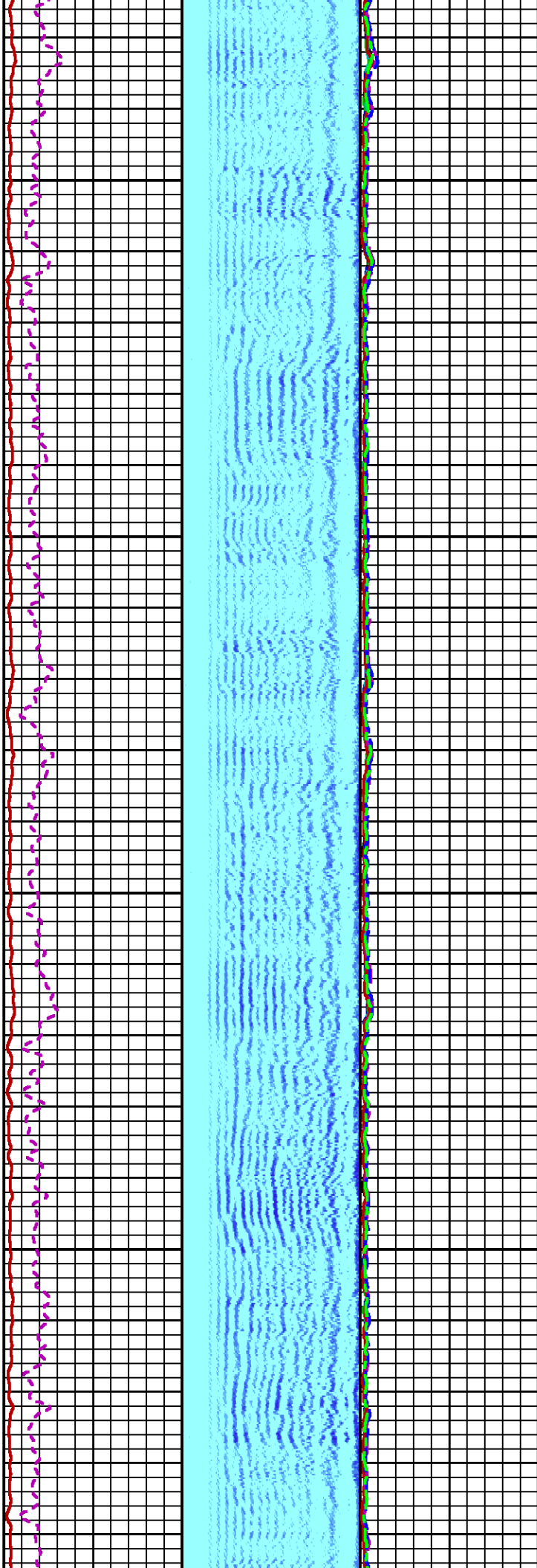
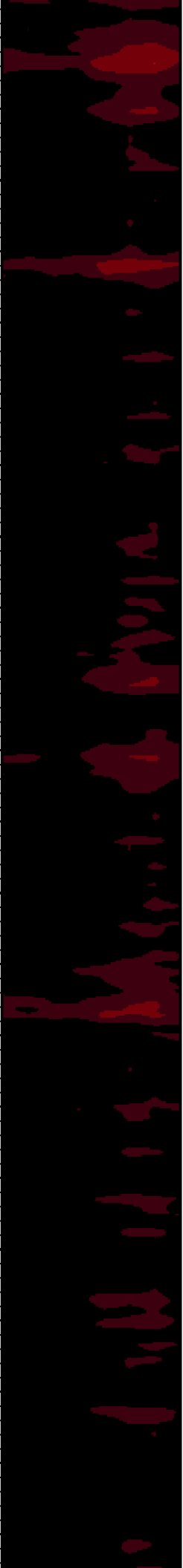




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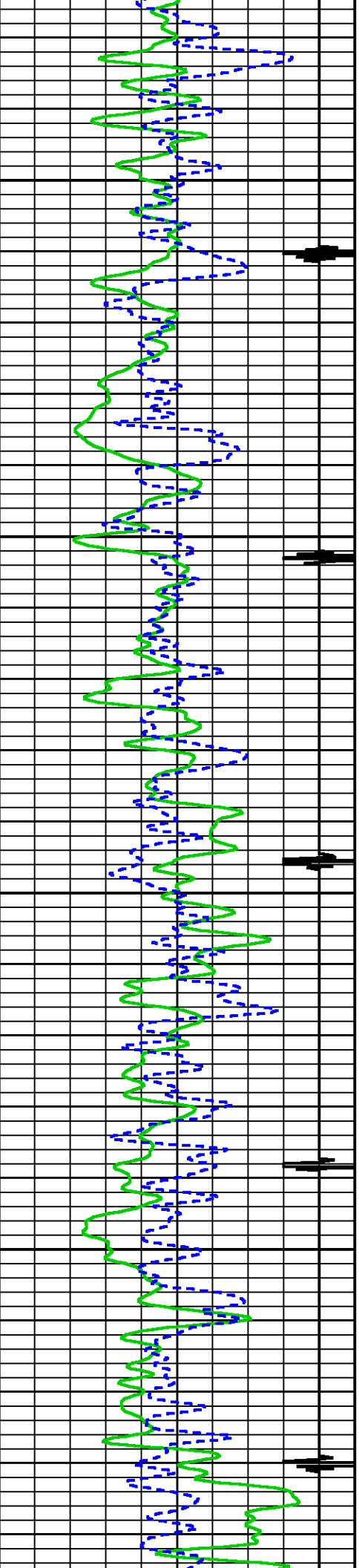
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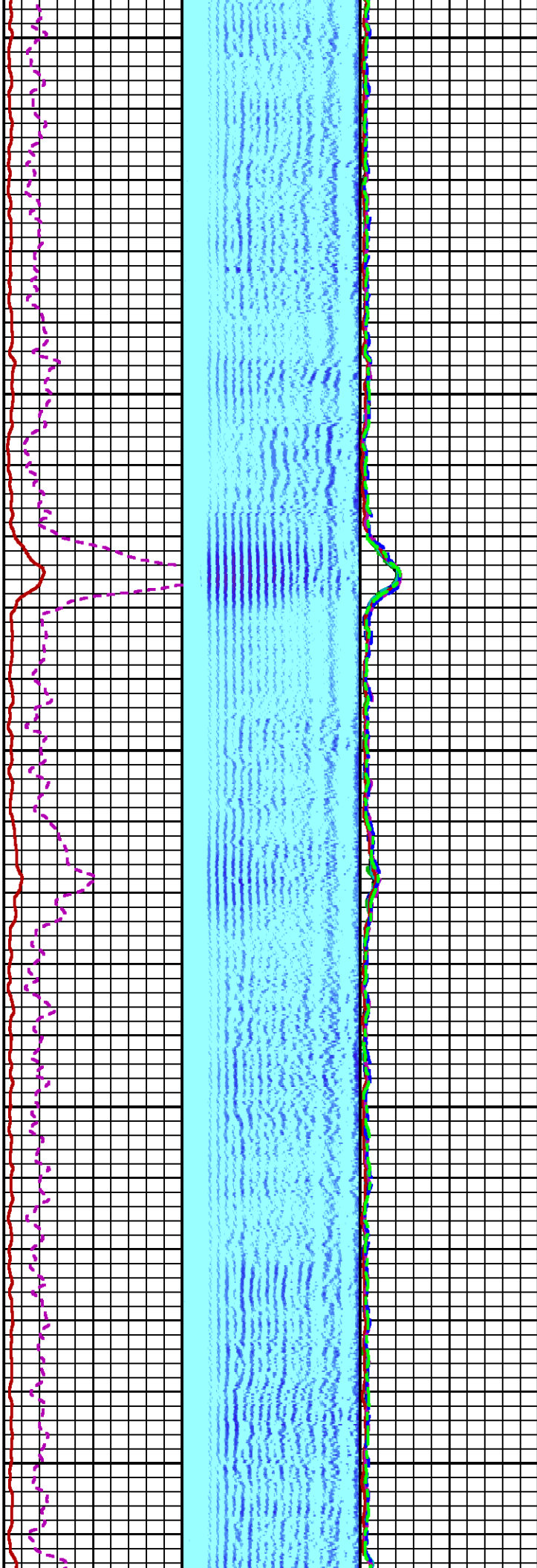




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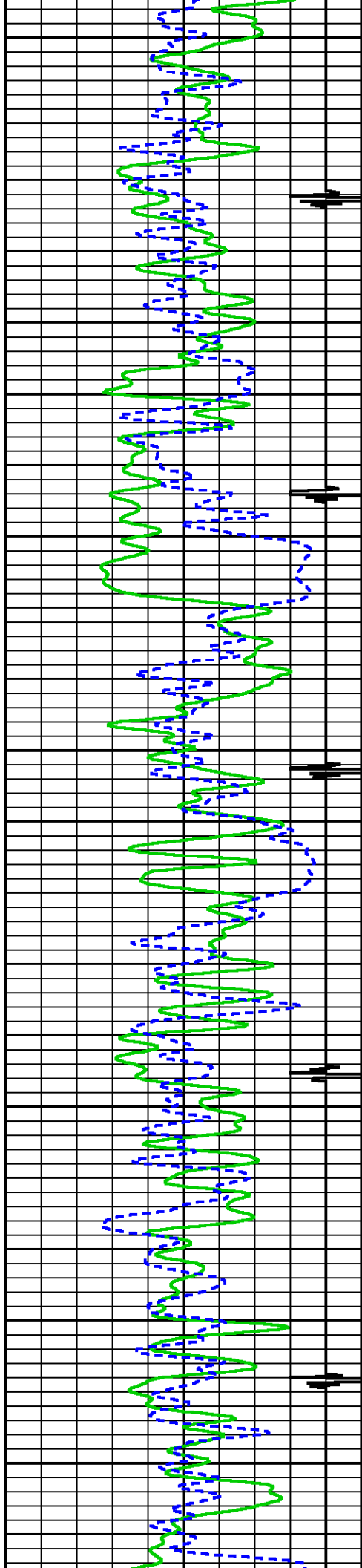


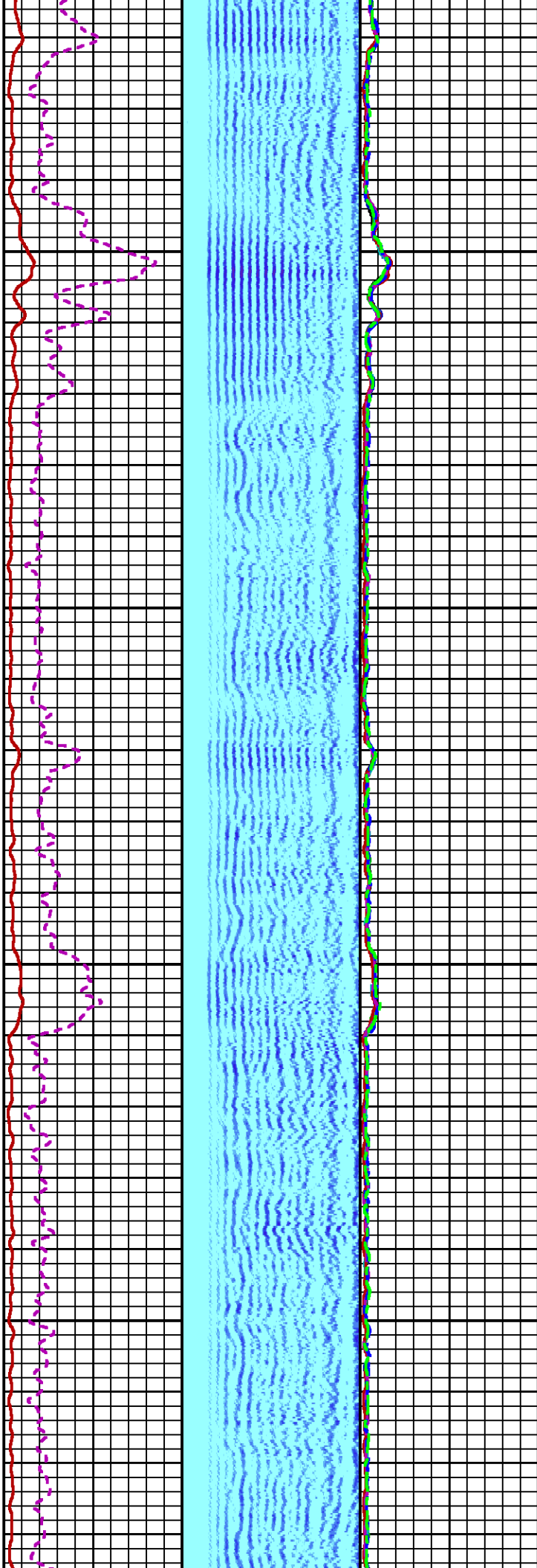


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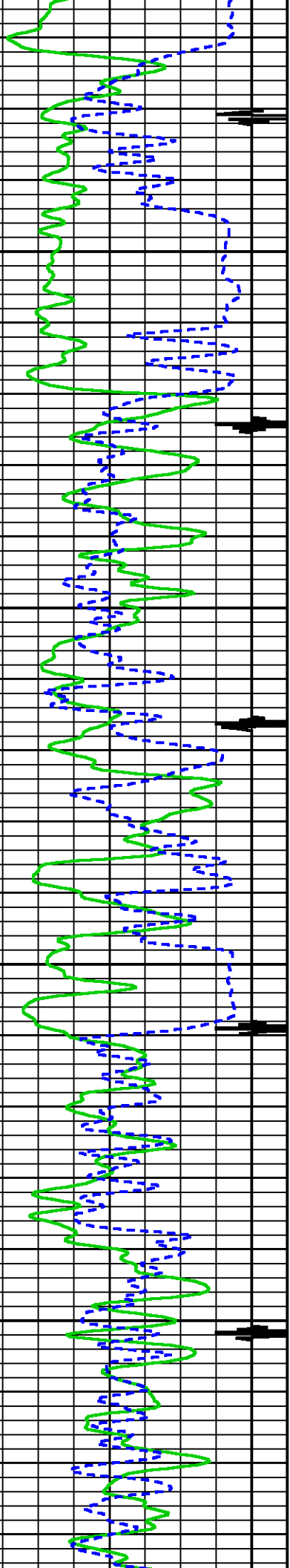
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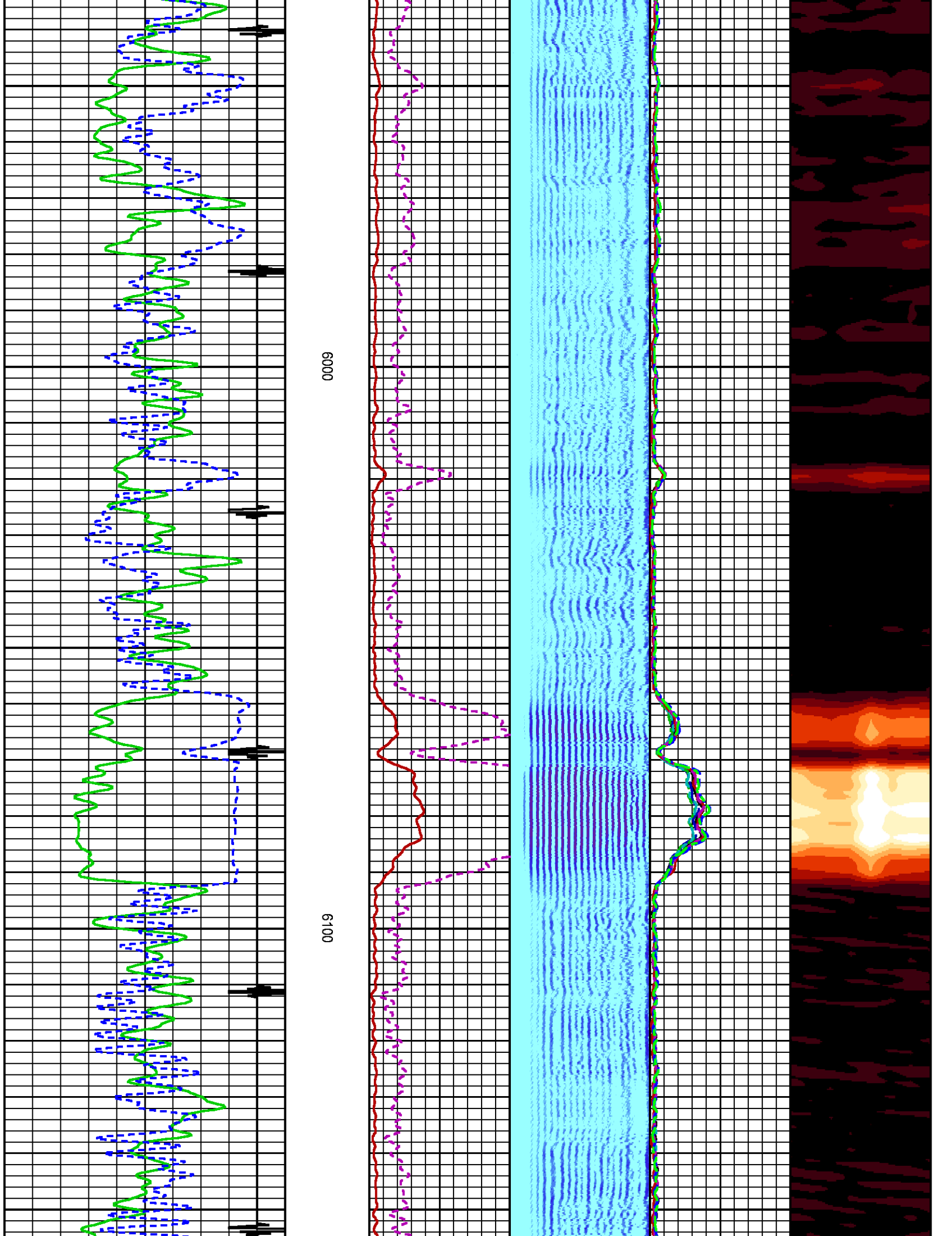




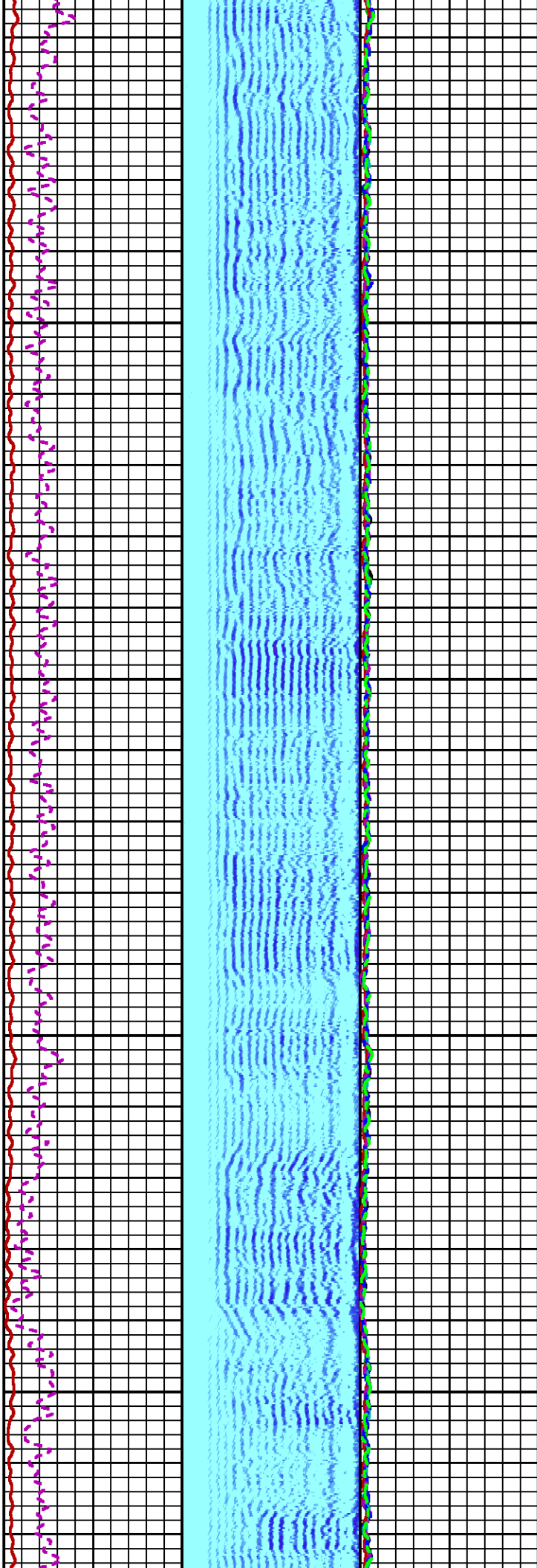
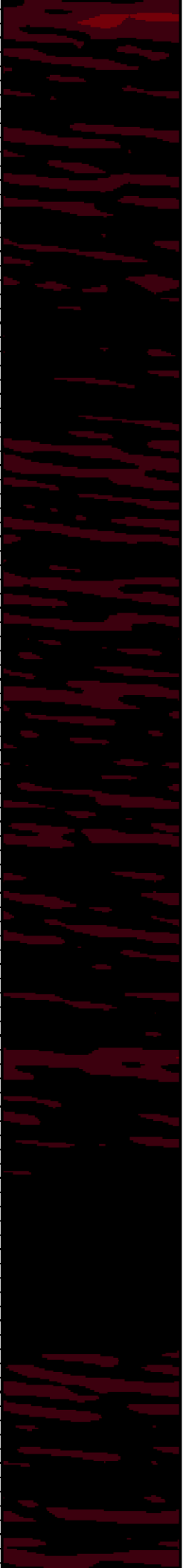
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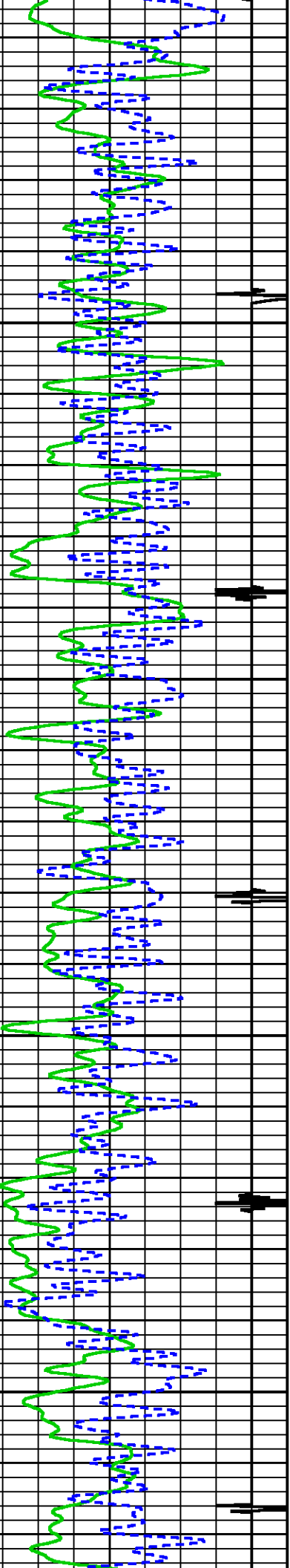




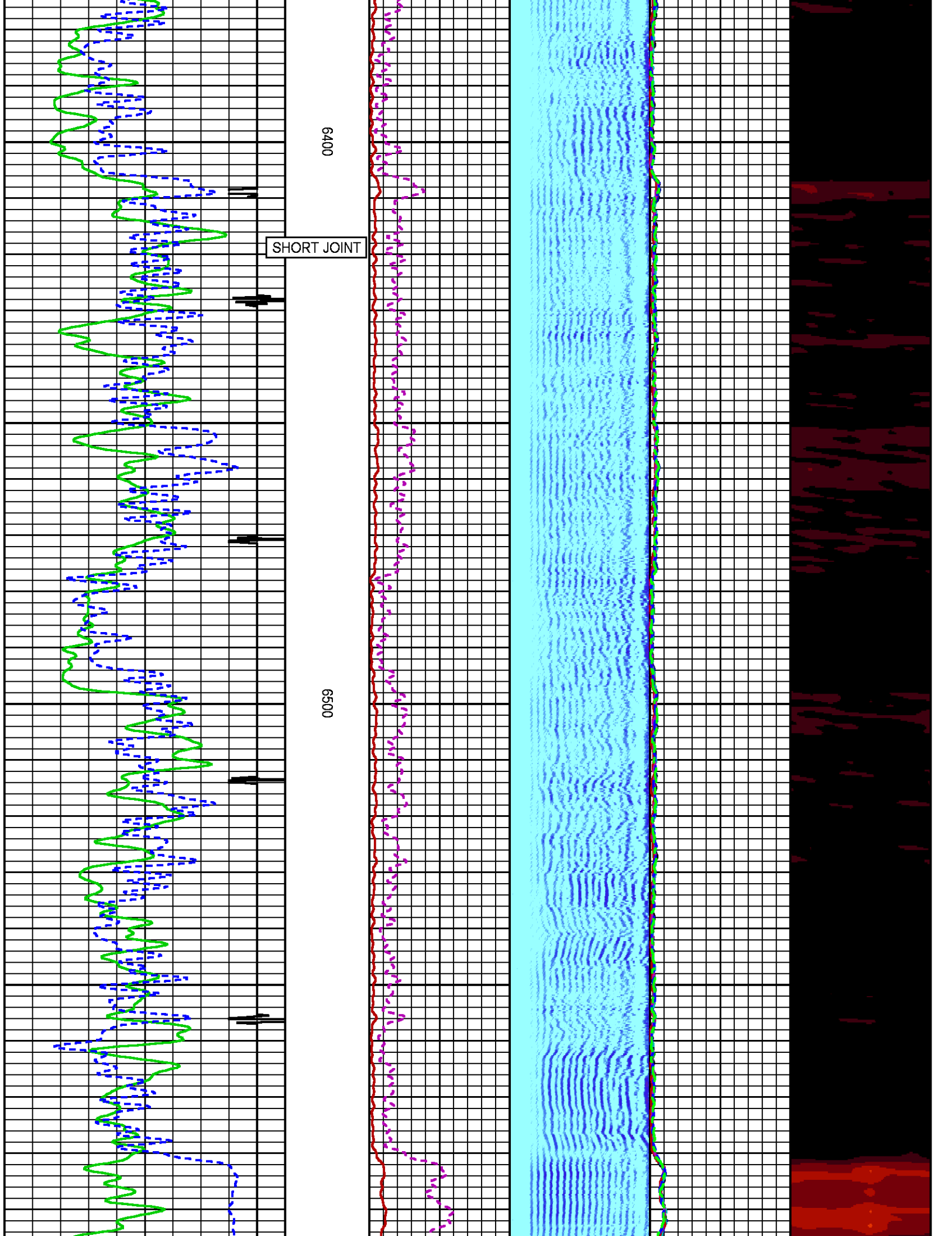


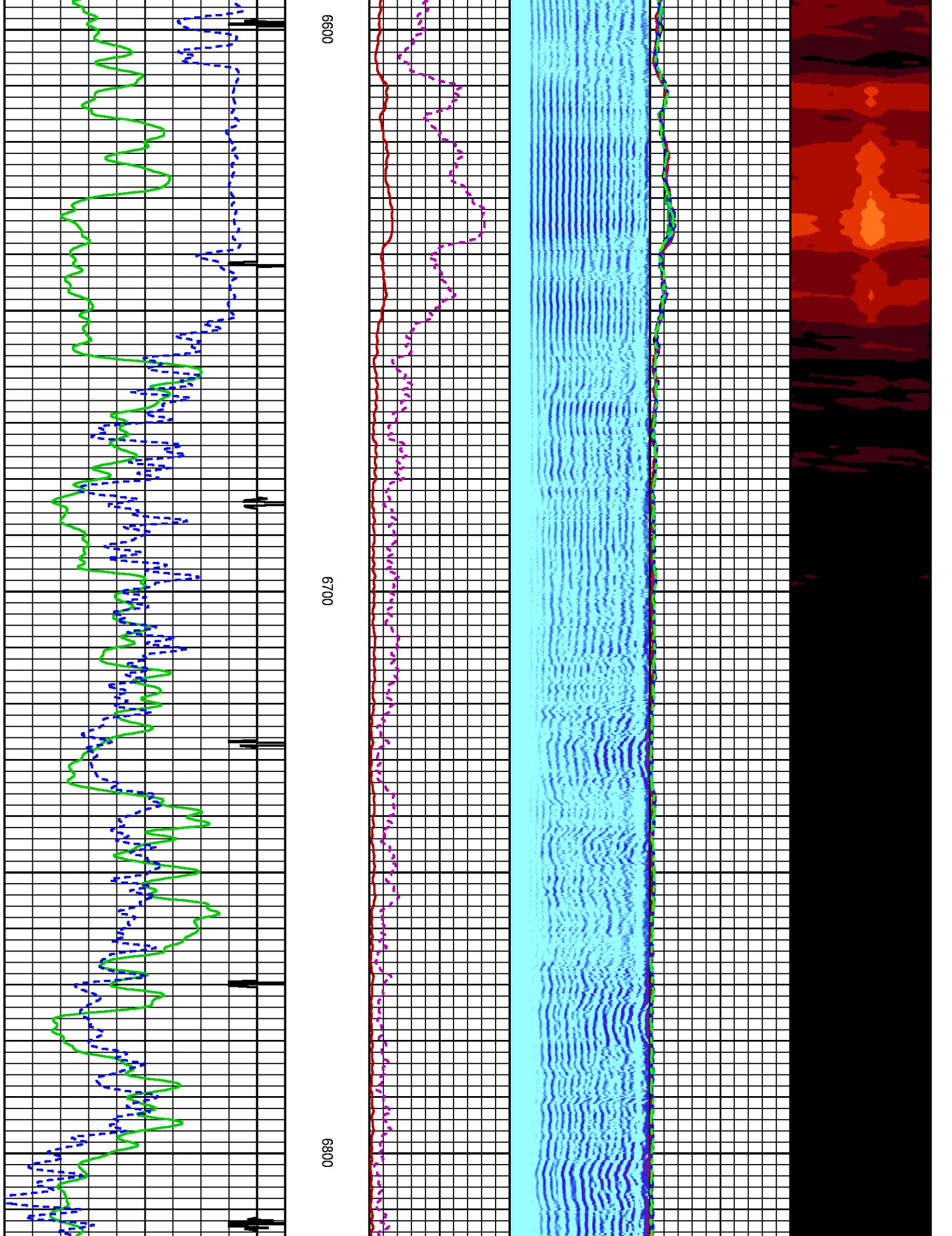
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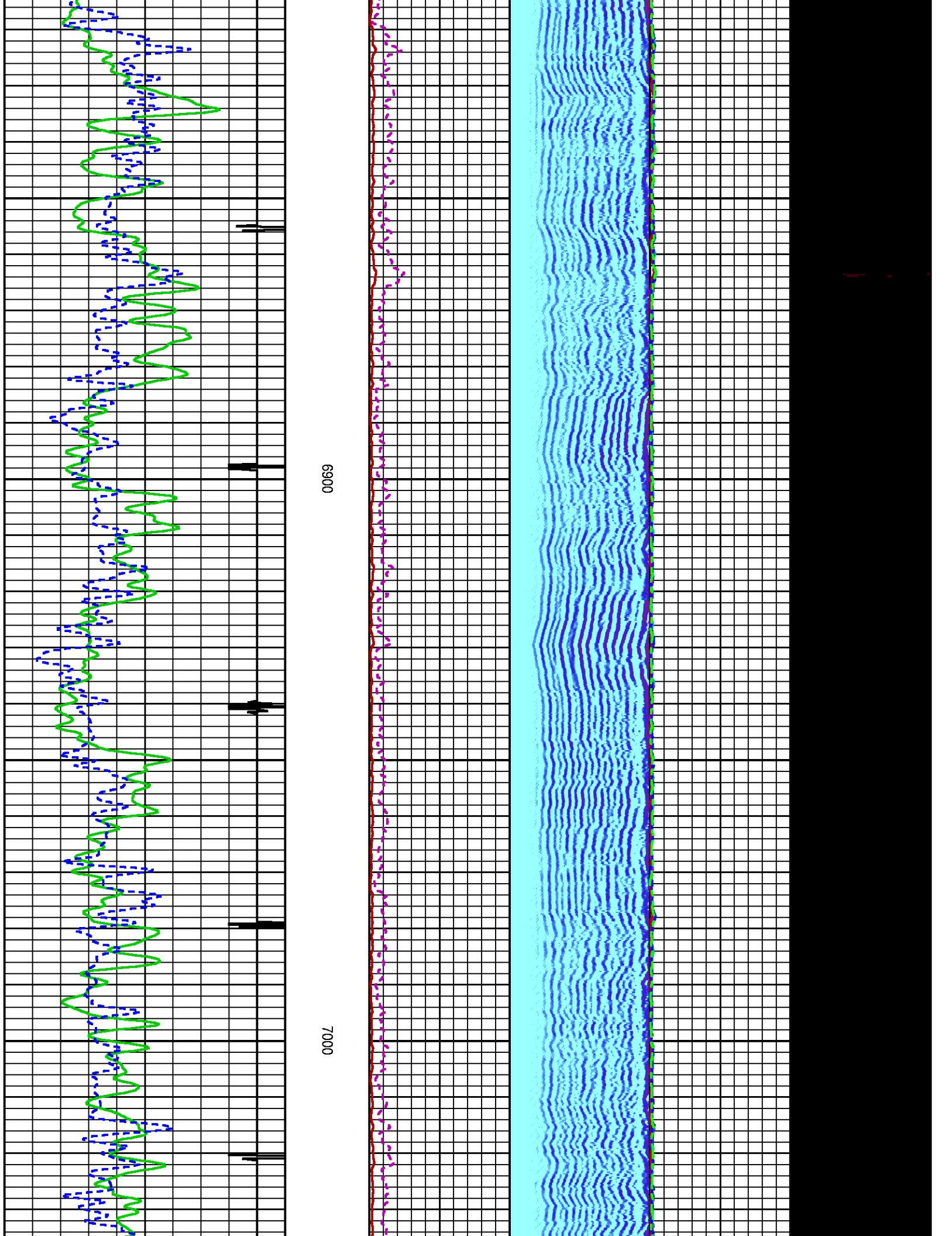
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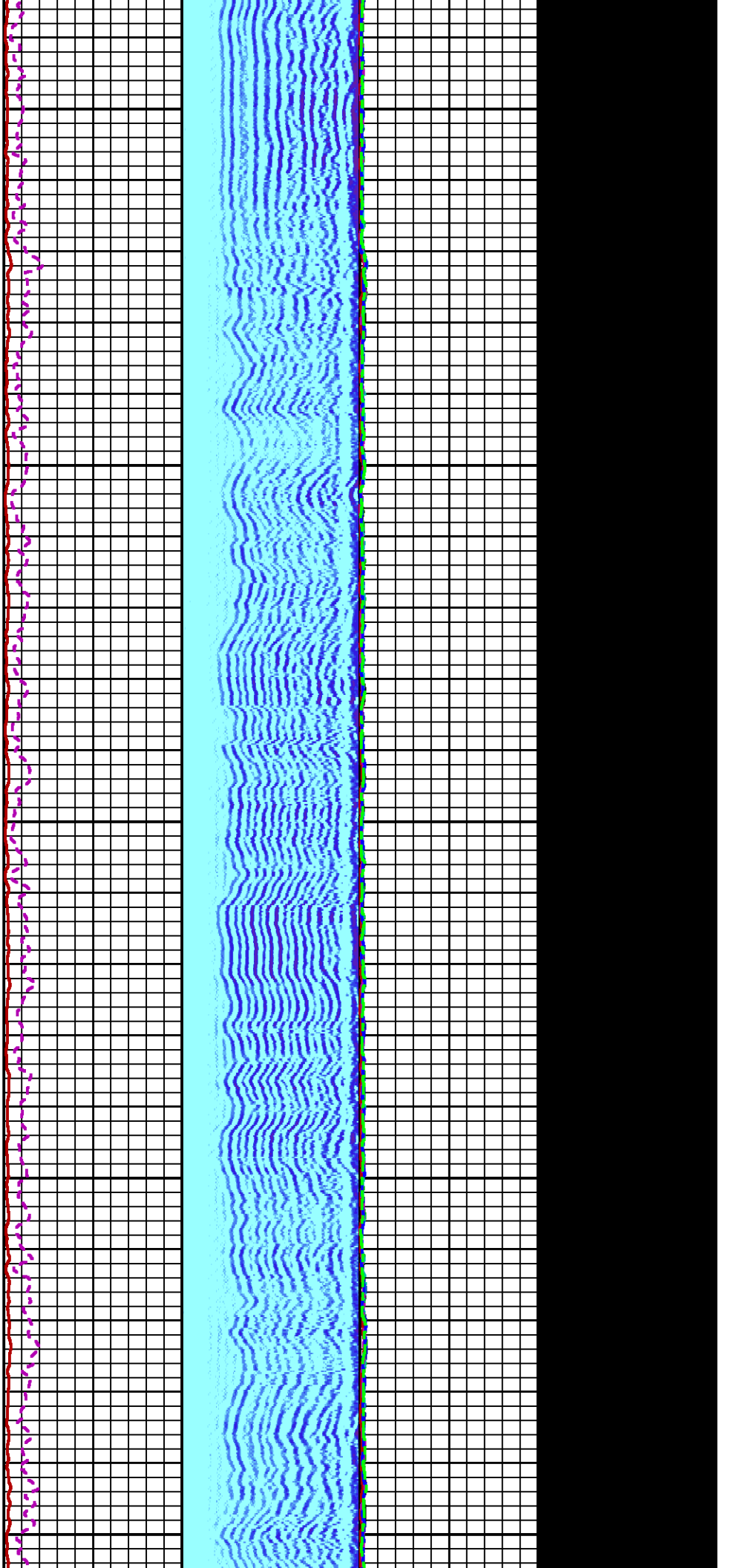






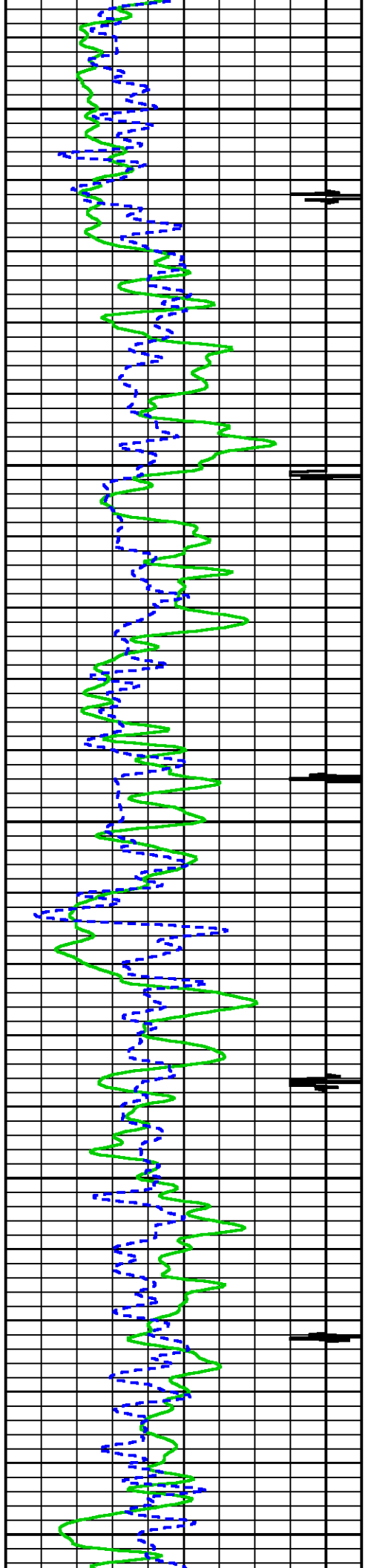


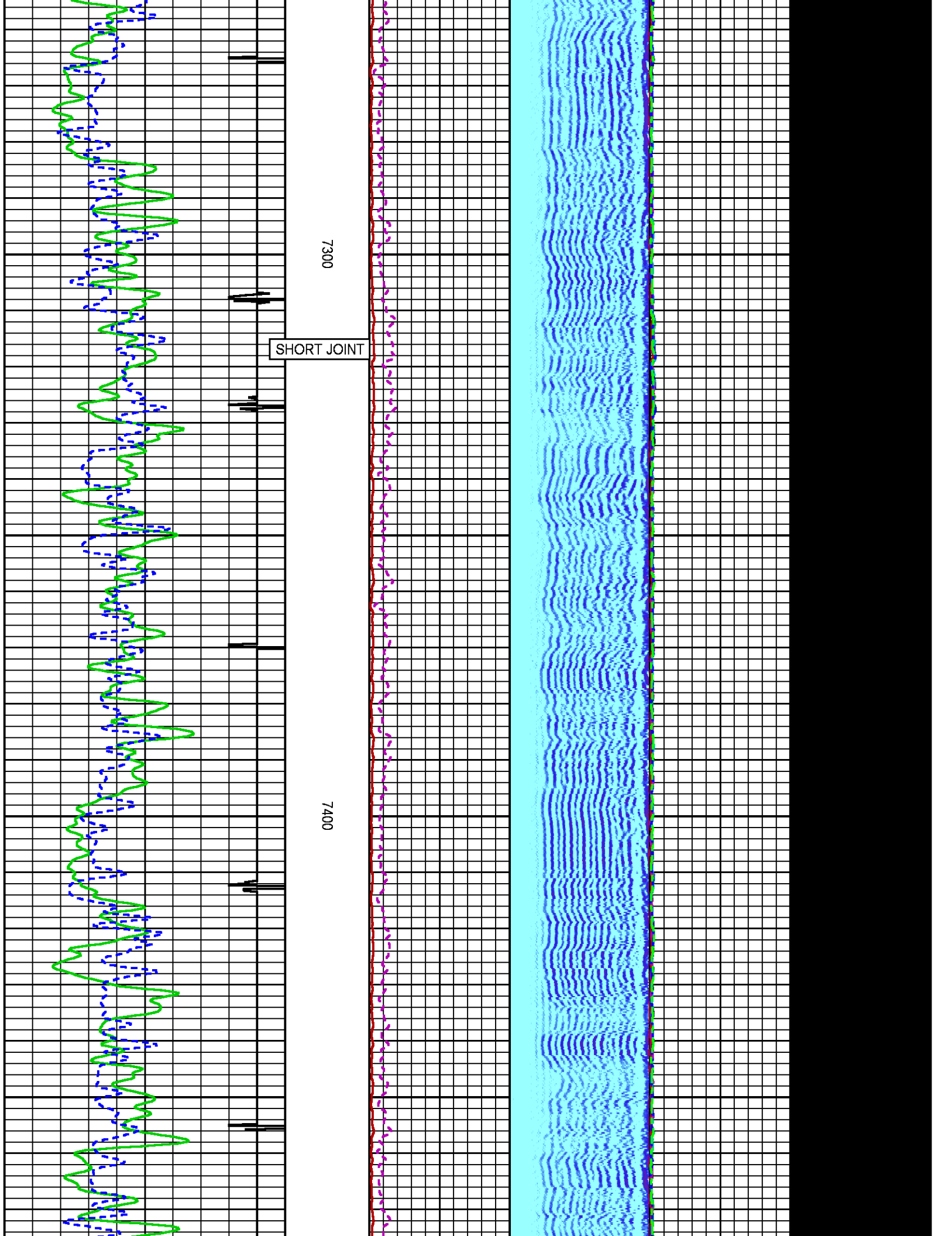




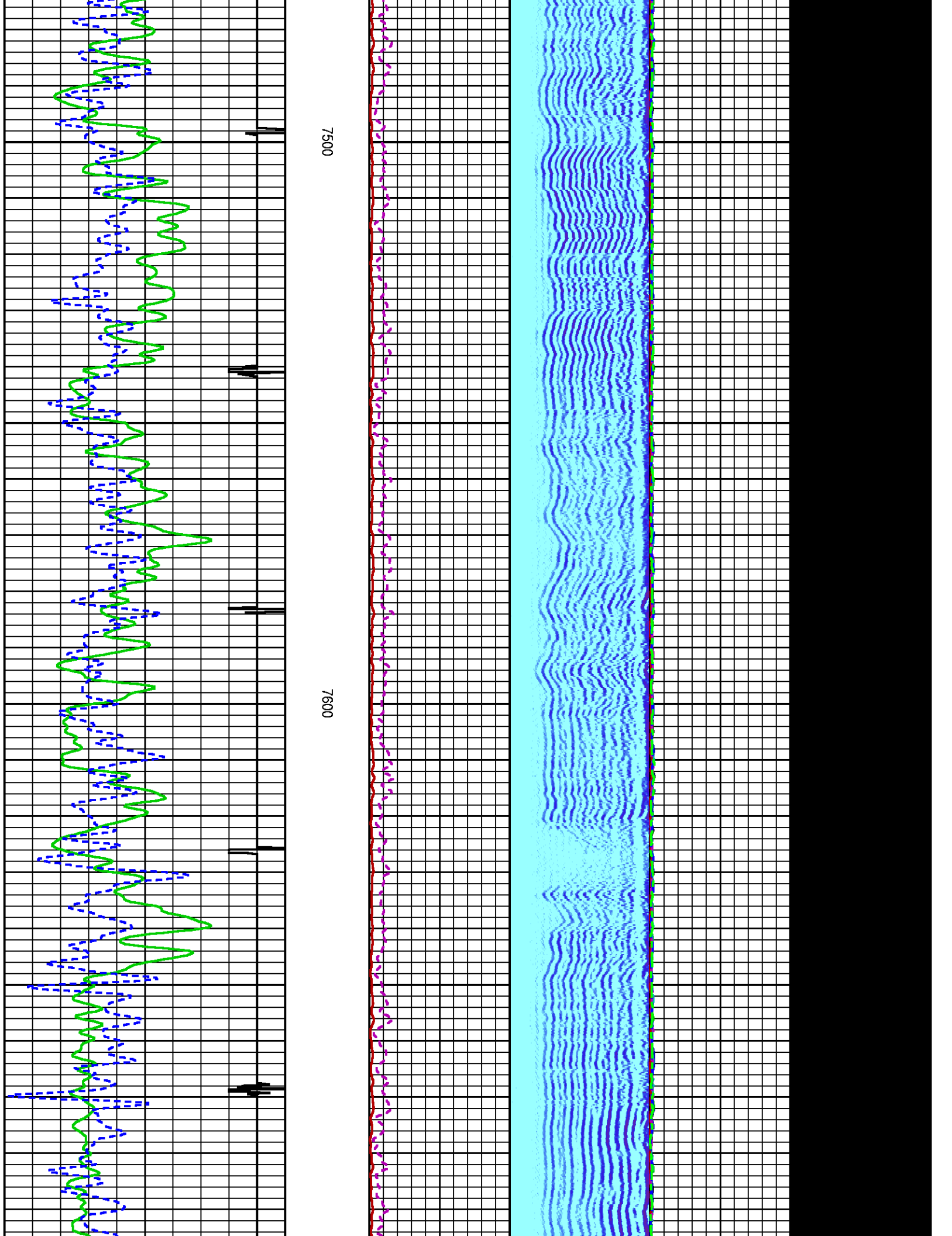
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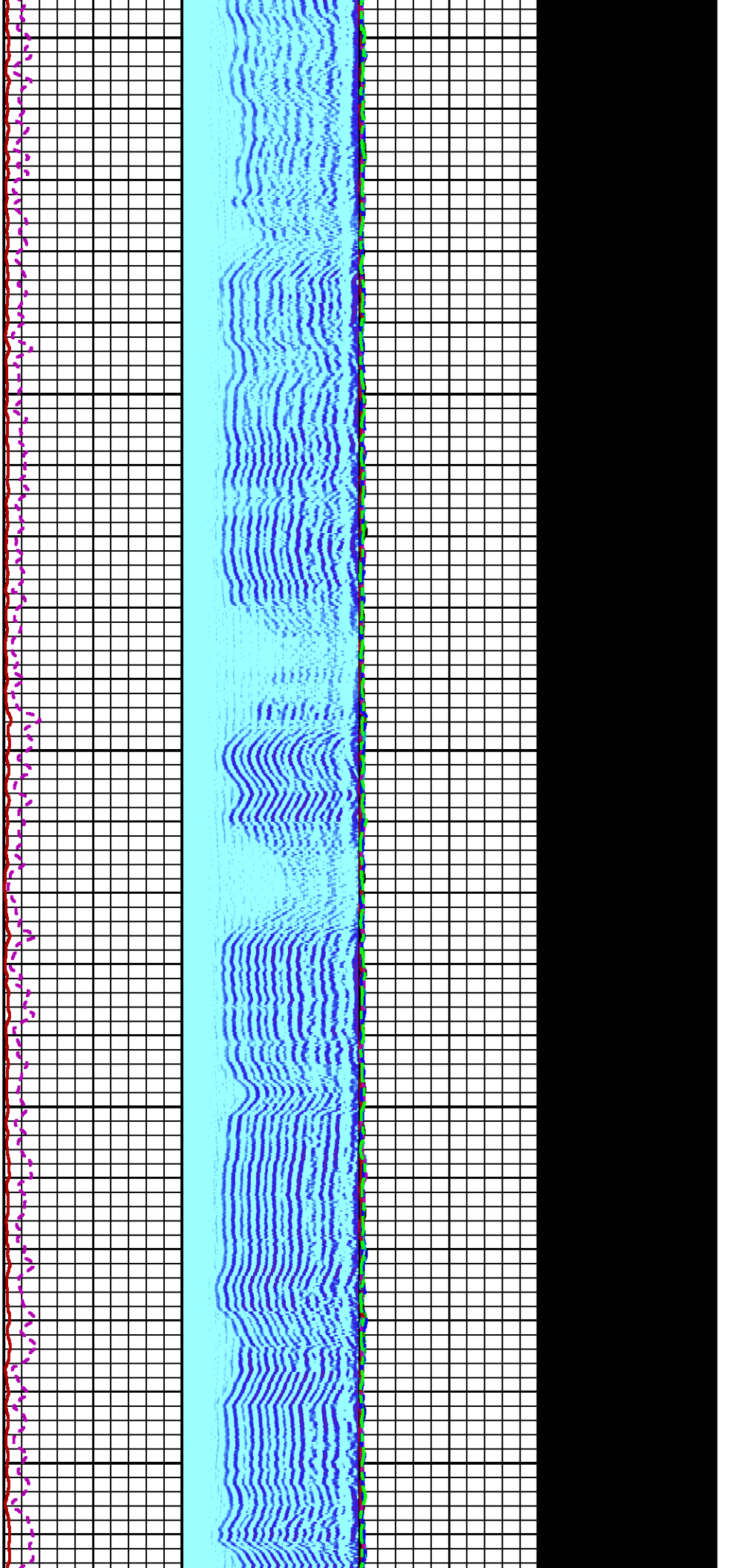
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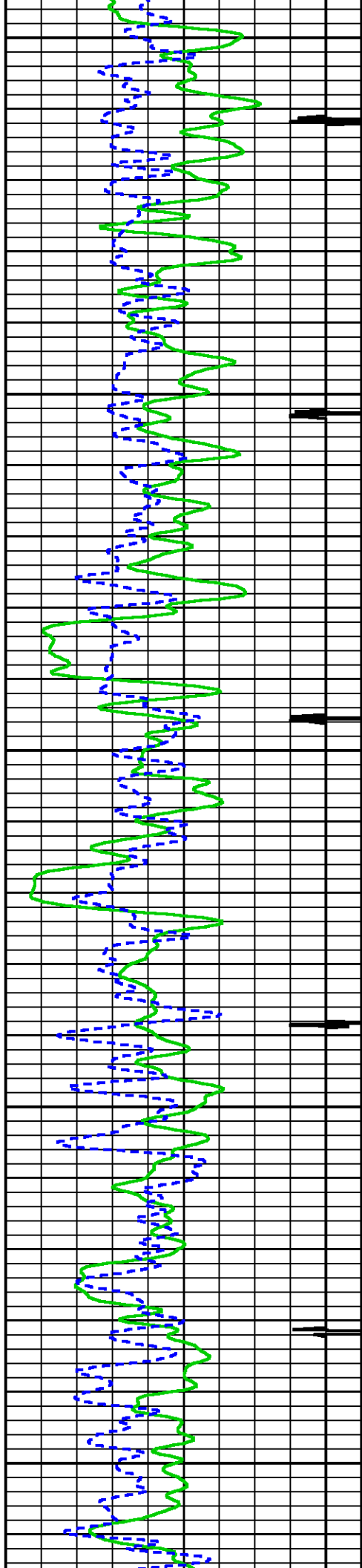


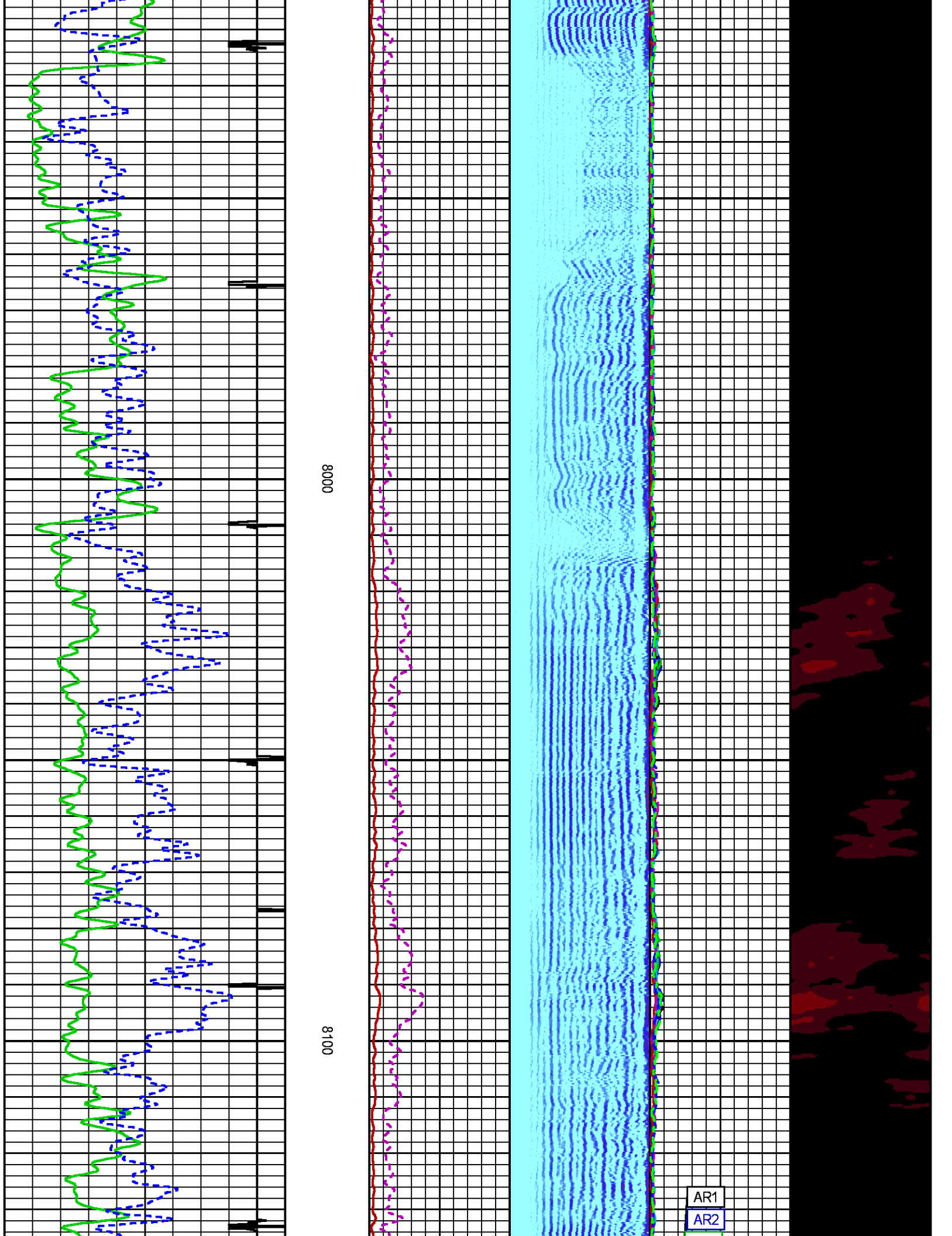


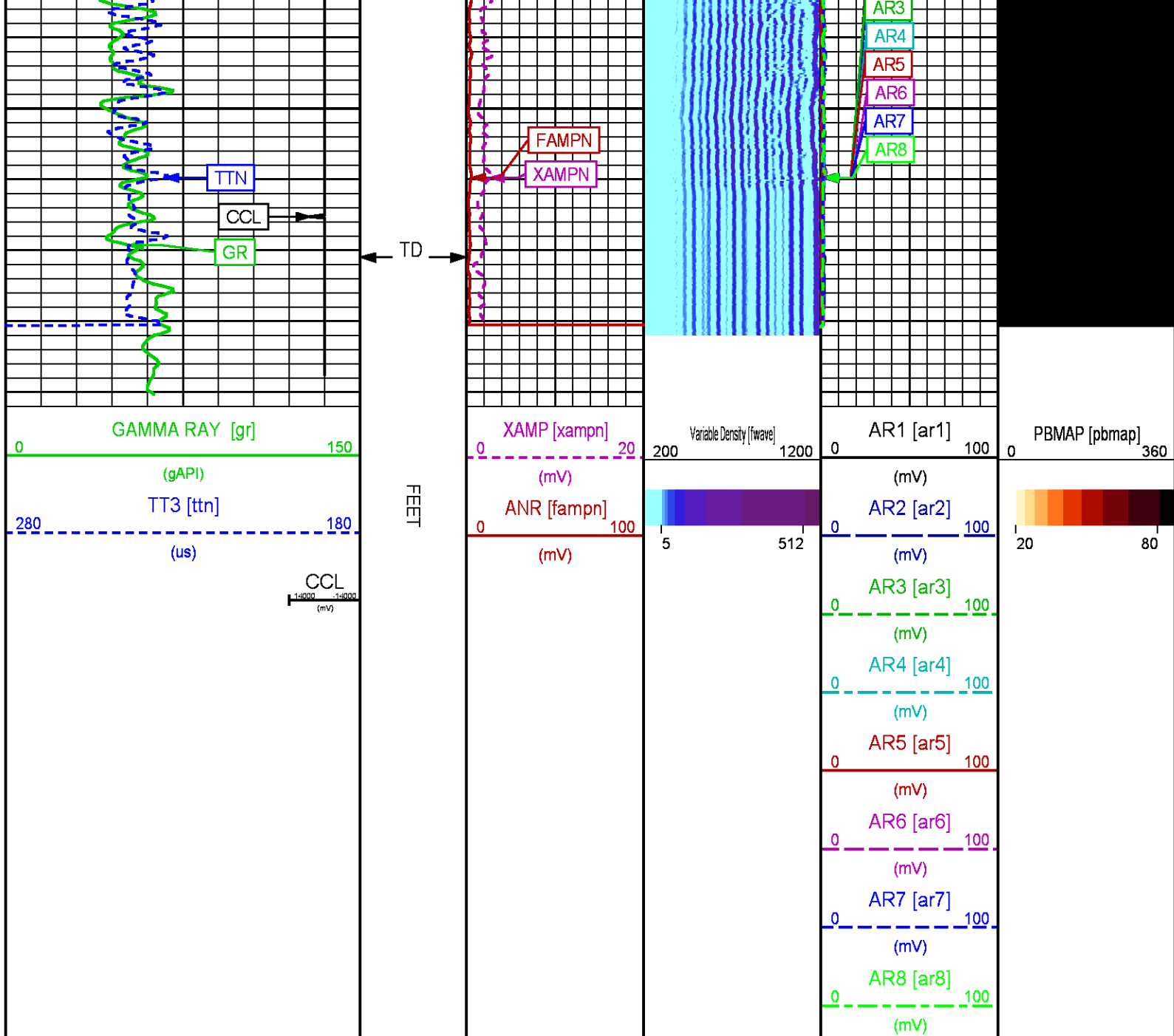
7700

7800

7900







REPEAT PASS 0 PSI

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

Plotted: Wed Mar 21 14:54:42 2018

### PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_NICHOLS\_0994-13-18W/p012g01.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 7943.500 ft BOTTOM DEPTH: 8182.500 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	4000.00		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*)	173	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*)	-74	us	"	"
	TOOL DELAY (str2*)	-74	us	"	"
	TOOL DELAY (str3*)	-74	us	"	"
	TOOL DELAY (str4*)	-74	us	"	"
	TOOL DELAY (str5*)	-74	us	"	"
	TOOL DELAY (str6*)	-74	us	"	"
	TOOL DELAY (str7*)	-74	us	"	"
	TOOL DELAY (str8*)	-74	us	"	"
	TOOL DELAY (strn*)	-74	us	"	"
BASELINE NOISE (NEAR)	NOISE WINDOW START	99	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	EAR WAVE FORM

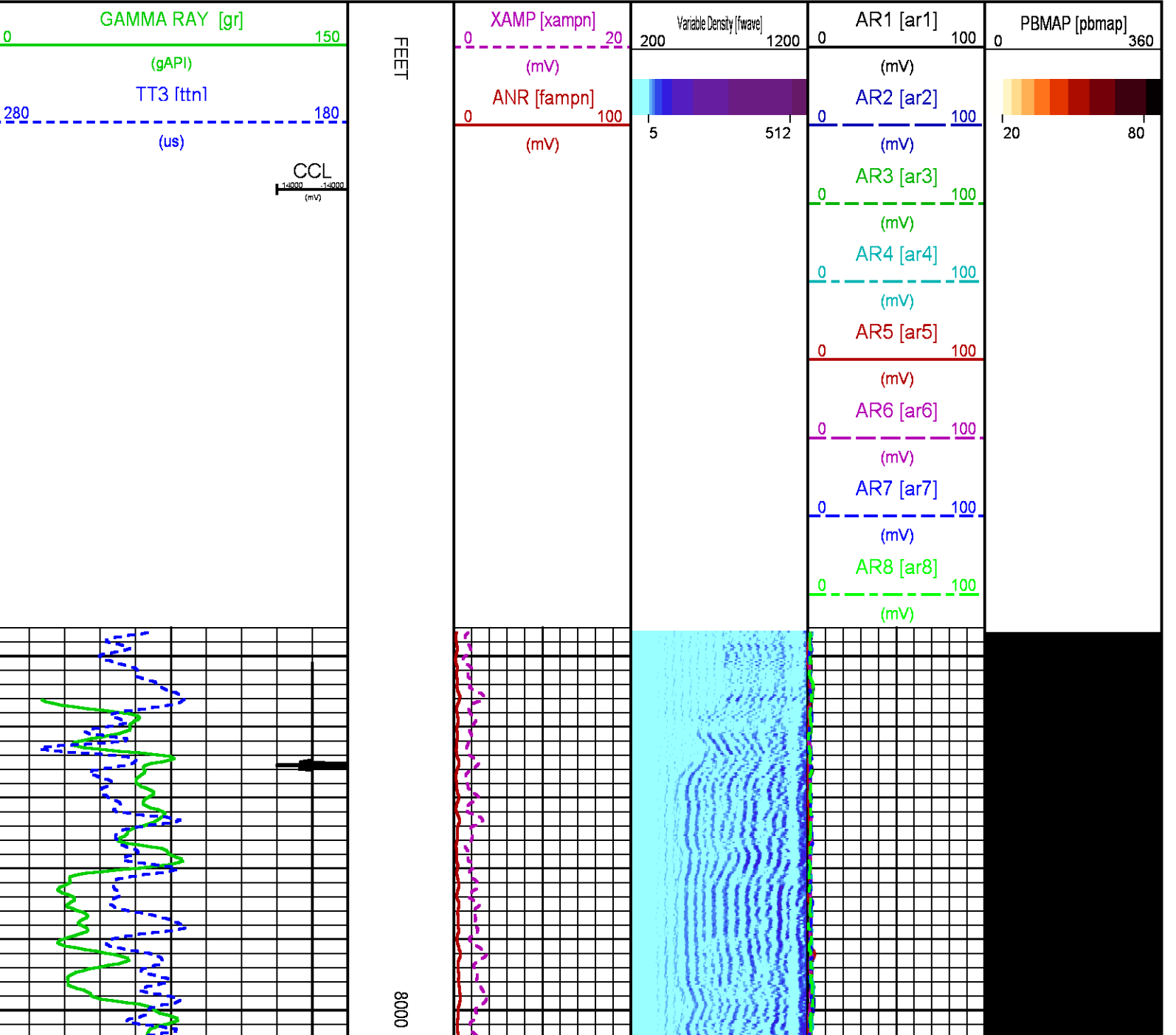


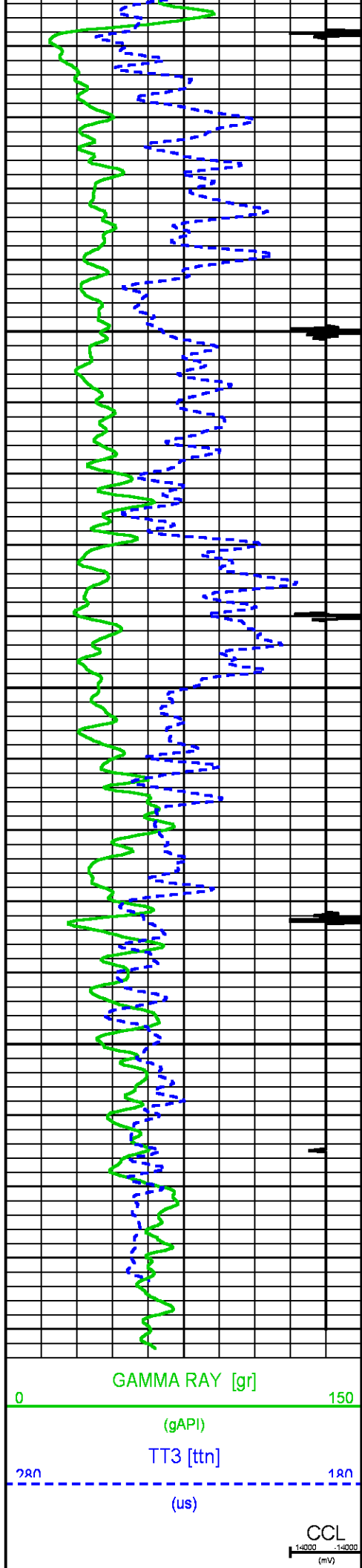
F1:WAVE	N/A	RAW WAVEFORM
F1:GR	N/A	GAMMA RAY
F1:PBMAP	N/A	PERCENT BOND CEMENT MAP
F1:TTN	N/A	TRAVELTIME FROM NEAR TRANSMITTER-RECEIVER
F1:XAMPN	N/A	FIXED GATE AMPLITUDE NEAR RECEIVER TIMES FIVE

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		

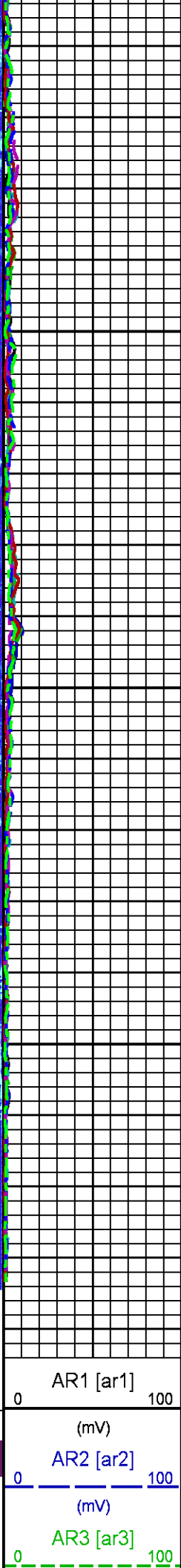
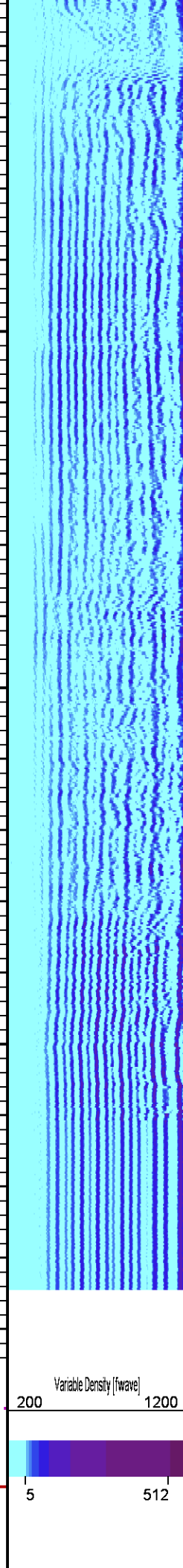
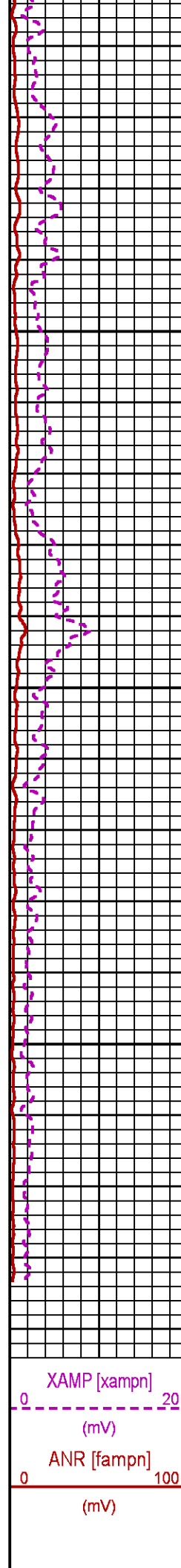
Presentation : SysA:LARAMIE\_RALRPT.fvpdf [5"/100' Scale]  
Plot Interval : 7946.5 - 8194.5 Feet  
  
Data File 1 : F1 : SysA:/dat1a/LARAMIE\_NICHOLS\_0994-13-18W/RAL\_REPEAT.xtf  
Created On : N/A  
Company : LARAMIE ENERGY II LLC  
Well : NICHOLS 0994-13-18W  
Field : VEGA  
File Interval : 7943.5 - 8195.75 Feet  
OCT : p012g

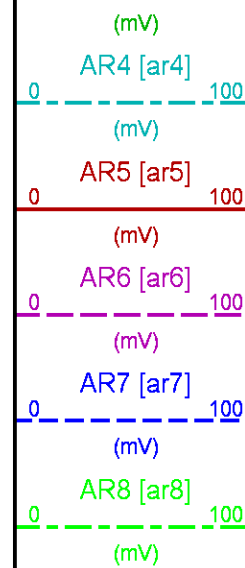




8100

FEET





## CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/LARAMIE\_NICHOLS\_0994-13-18W/p012g.tp1

### RAL PRIMARY CALIBRATION SUMMARY

TOOL #: 1426XA 10404539a

DATE/TIME PERFORMED: Tue Mar 20 16:57:37 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)	-0.08	-0.22	-0.14	-0.17	-0.24	-0.31	-0.20	-0.07	-0.22	-1.07	-0.03
AMP FLUID (mV)	46	46	46	46	45	46	46	46	46	63	47
TT (us)	216	216	216	216	215	215	214	214	217	322	217
M FACTOR	2.17	2.15	2.18	2.18	2.20	2.15	2.16	2.15	2.15	2.33	2.15

### RAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1426XA 10404539a

DATE/TIME PERFORMED: Tue Mar 20 16:59:34 2018

DAYS SINCE CAL: 0

UNIT #: 5753XD 111111

CABLE #: ml4291 smallline

	NEAR (mV)	R1 (mV)	R2 (mV)	R3 (mV)	R4 (mV)	R5 (mV)	R6 (mV)	R7 (mV)	R8 (mV)	FAR (mV)	CAL (mV)
ZERO	-0.07	-0.03	-0.03	-0.15	-0.00	-0.19	0.17	-0.09	0.05	-0.04	-0.01
AMP AIR	1.44	0.79	0.68	1.41	0.90	0.17	0.14	0.46	0.23	1.60	100.10

SHOP M FACTOR	SHOP A FACTOR	WIRELINE FACTOR
2.15	0.00	1.00

### GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1355XA 12670180

DATE/TIME PERFORMED: Wed Feb 7 16:57:59 2018

UNIT #: 3882TD HL6741

CALB JIG #: 4702NK DA\_228

	BACKGROUND (cts)	CALBTR ON (cts)	CR DIFF (cts/s)	MULT	BACKGROUND (gAPI)	CALBTR ON (gAPI)	CALBTR (gAPI)
GR	48.98	223.16	174.2	0.574	28.12	128.12	100

## GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1355XA 12670180

DATE/TIME PERFORMED: Wed Feb 7 16:59:44 2018

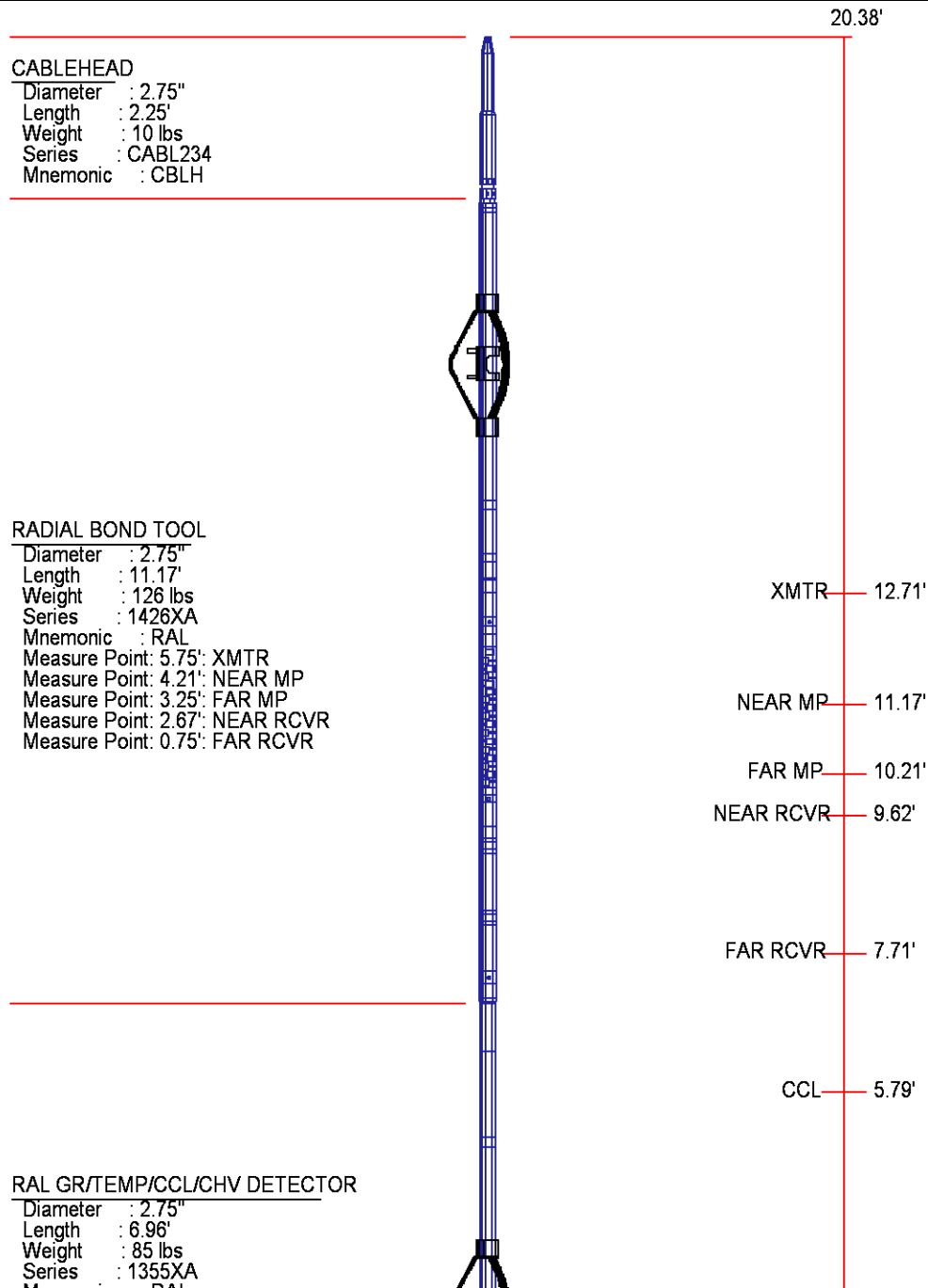
UNIT #: 3882TD HL6741

VERI JIG #: 4702NK DA\_228

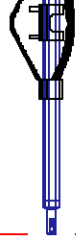
	BACKGROUND (cts)	CALBRTR ON (cts)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	49.82	213.56	0.574	28.60	122.61	94.00
						90.00 110.00

## INSTRUMENT CONFIGURATION

Source File: /dat1a/LARAMIE\_NICHOLS\_0994-13-18W/p012g~-tdg



Mnemonic : RAL  
Measure Point: 5.79': CCL  
Measure Point: 1.67': GR  
Measure Point: 0.17': TEMP



GR 1.67'

TEMP 0.17'

TOTAL LENGTH: 20.38'  
TOTAL WEIGHT: 235 lbs  
MAX DIAMETER: 0'4.00"

**BAKER  
HUGHES**  
a GE company



**ECLIPS**

**COMPANY** LARAMIE ENERGY II LLC  
**WELL** NICHOLS 0994-13-18W  
**FIELD** VEGA  
**COUNTY** MESA **STATE** COLORADO

**FILE NO:**

**API NO:**

05077104170000

**LOCATION:**

SHL 1765 FNL 2781 FEL  
BHL 971 FNL 1616 FEL

**ELEVATIONS:**

KB 7161 FT

DF

GL 7137 FT

**SEC** 24 **TWP** 9 **RGE** 94W

**DATE** 20-Mar-2018