



# RADIAL CEMENT BOND LOG

FILE NO: CH136065	COMPANY <b>LARAMIE ENERGY LLC</b>
API NO: 05077103950000	WELL <b>NICHOLS 0994-24-10W</b>
	FIELD <b>VEGA</b>
	COUNTY <b>MESA</b> STATE <b>COLORADO</b>

Ver. 4.10	LOCATION: SHL: 2256' FNL & 2787' FWL BHL: 2328' FNL & 1550' FWL SEC <u>24</u> TWP <u>9 S</u> RGE <u>94 W</u>	OTHER SERVICES RPM
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PERMANENT DATUM LOG MEASURED FROM DRILL. MEAS. FROM	GL ELEVATION 7212 FT 24 FT ABOVE P.D. KB 7212 FT	ELEVATIONS: KB 7236 FT DF GL 7212 FT
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DATE	26-Apr-2018
RUN	1
TRIP	1
SERVICE ORDER	US136065
DEPTH DRILLER	7435 FT
DEPTH LOGGER	7398 FT
BOTTOM LOGGED INTERVAL	7398 FT
TOP LOGGED INTERVAL	24 FT
TIME STARTED	09:00
TIME FINISHED	11:30
OPERATOR RIG TIME	2.5 HRS
TYPE OF FLUID IN HOLE	WATER
FLUID DENSITY	NA
FLUID SALINITY	NA
FLUID LEVEL	104 FT
LOGGED CEMENT TOP	2990 FT
WELLHEAD PRESSURE	0 PSI
MAXIMUM HOLE DEVIATION	NA
NOMINAL LOGGING SPEED	95 FMIN
MAX. RECORDED TEMP.	224 DEGF
REFERENCE LOG	NA
REFERENCE LOG DATE	NA
EQUIP. NO.	ML-4291
LOCATION	GRAND JCT.
RECORDED BY	M. BAUKA
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: 5620' - 5639'  
SJ: 6563' - 6582'

## EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	RAL	1426XA	11871500	CENTRALIZED
1	1	GR/CCL	1355XA	11871507	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: Thu Apr 26 14:15:27 2018

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_NICHOLS\_0994\_24\_10W/p012g02.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 19.500 ft BOTTOM DEPTH: 7418.000 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*)	186	us	TOP	BOTTOM
	AMP WINDOW START (fgp2*)	186	us	"	"
	AMP WINDOW START (fgp3*)	186	us	"	"
	AMP WINDOW START (fgp4*)	186	us	"	"
	AMP WINDOW START (fgp5*)	186	us	"	"
	AMP WINDOW START (fgp6*)	186	us	"	"
	AMP WINDOW START (fgp7*)	186	us	"	"
	AMP WINDOW START (fgp8*)	186	us	"	"
	AMP WINDOW START (fgpn*)	186	us	"	"
	AMP WINDOW LENGTH	25	us	"	"
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	192	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	5	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	200.391	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-65	us	"	"
	TOOL DELAY (str2*)	-65	us	"	"
	TOOL DELAY (str3*)	-65	us	"	"
	TOOL DELAY (str4*)	-65	us	"	"
	TOOL DELAY (str5*)	-65	us	"	"
	TOOL DELAY (str6*)	-65	us	"	"
	TOOL DELAY (str7*)	-65	us	"	"
	TOOL DELAY (str8*)	-65	us	"	"
	TOOL DELAY (strn*)	-65	us	"	"
BASELINE NOISE (NEAR)	NOISE WINDOW START	125	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	3	mV	"	"
	FULL BOND AMP REC 2	3	mV	"	"
	FULL BOND AMP REC 3	3	mV	"	"

FULL BOND AMP REC 4	3	mV	"	"
FULL BOND AMP REC 5	3	mV	"	"
FULL BOND AMP REC 6	3	mV	"	"
FULL BOND AMP REC 7	3	mV	"	"
FULL BOND AMP REC 8	3	mV	"	"

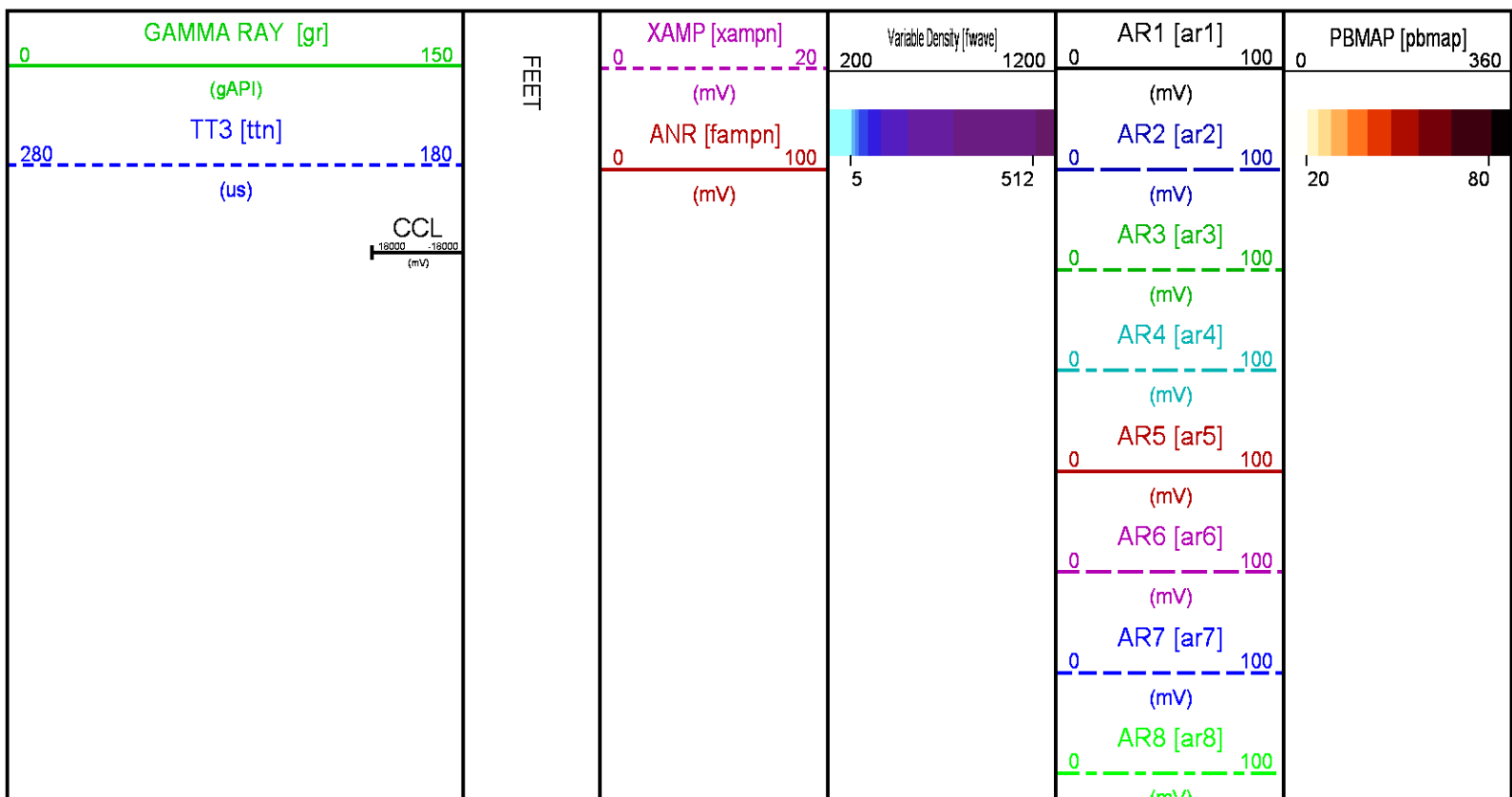
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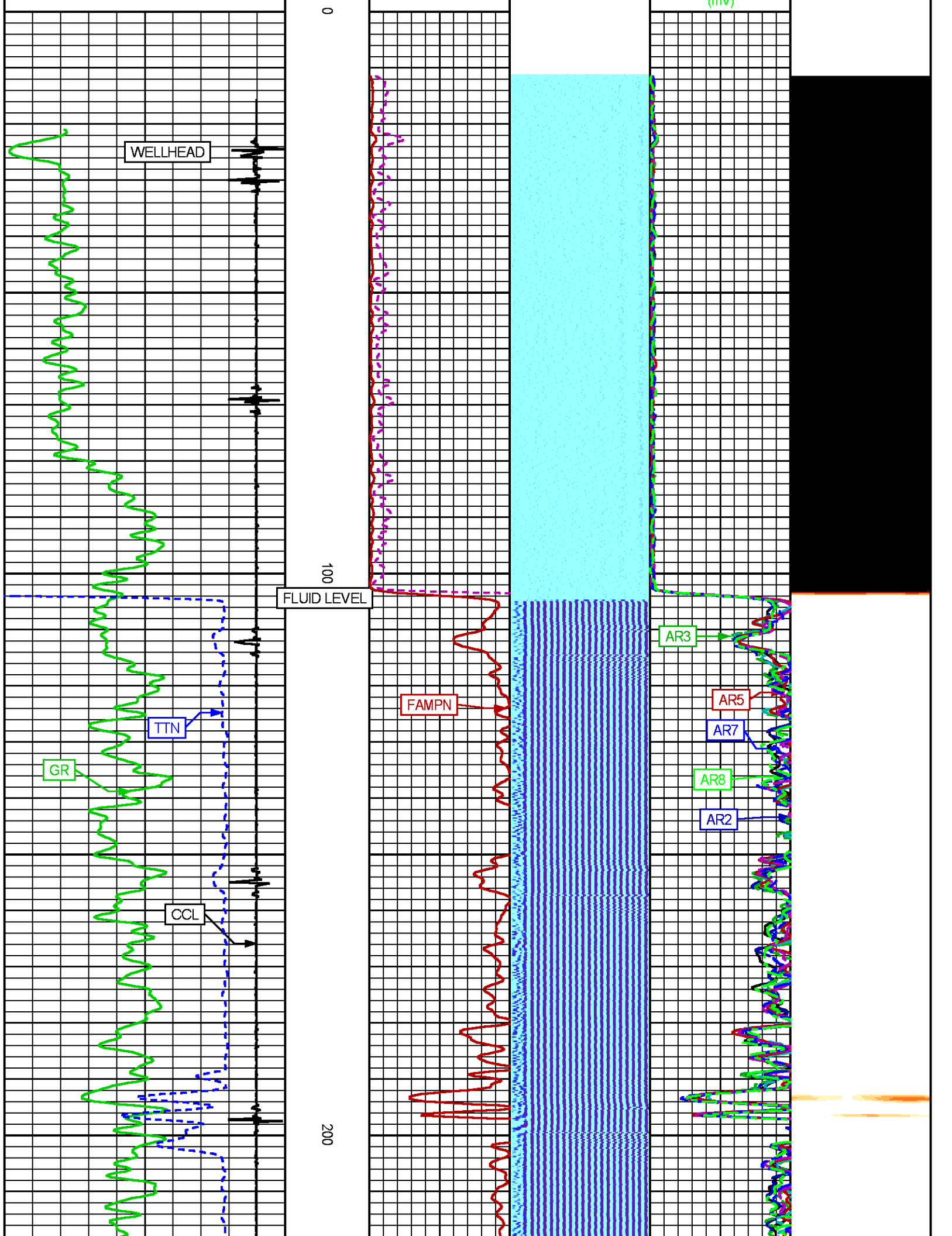
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	FIXED GATE AMPLITUDE T-R7
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

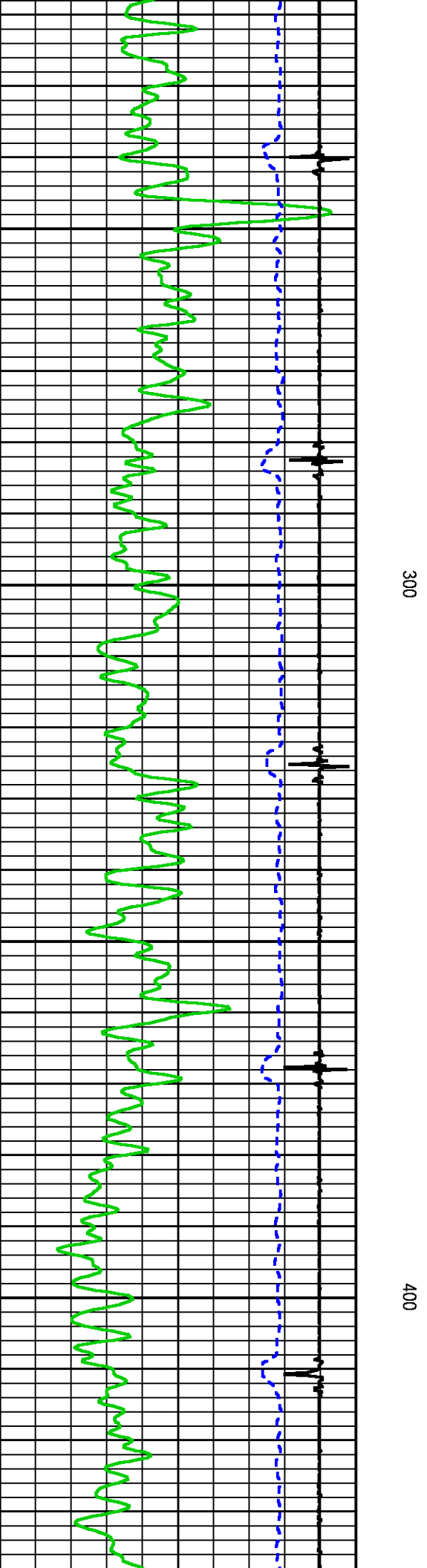
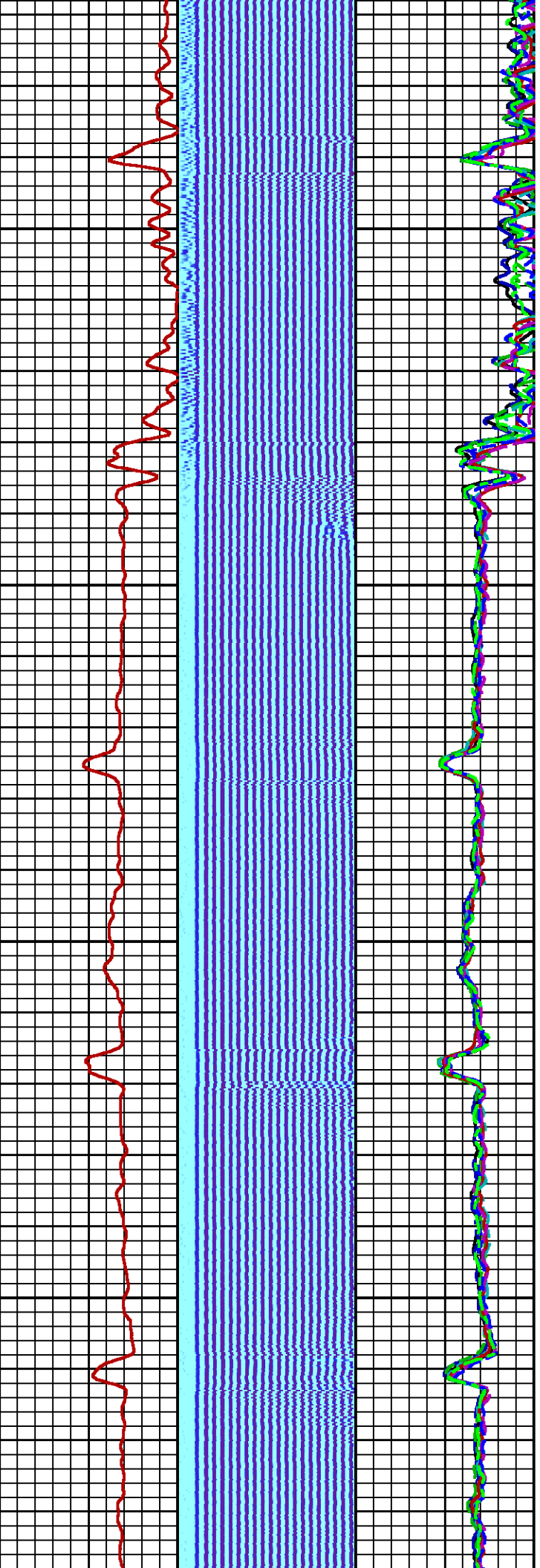
## CURVE MEASURE POINT OFFSET

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		

<b>Presentation</b>	: SysA:/dat1a/LARAMIE_NICHOLS_0994_24_10W/0994-24-10W_RAL_MAIN.fvpdf [5"/100' Scale]
<b>Plot Interval</b>	: 0 - 7418.75 Feet
<b>Data File 1</b>	: F1 : SysA:/dat1a/LARAMIE_NICHOLS_0994_24_10W/0994-24-10W_RAL_MAIN.xtf
<b>Created On</b>	: N/A
<b>Company</b>	: LARAMIE ENERGY LLC
<b>Well</b>	: NICHOLS 0994-24-10W
<b>Field</b>	: VEGA
<b>File Interval</b>	: 10.25 - 7420 Feet
<b>OCT</b>	: p012g

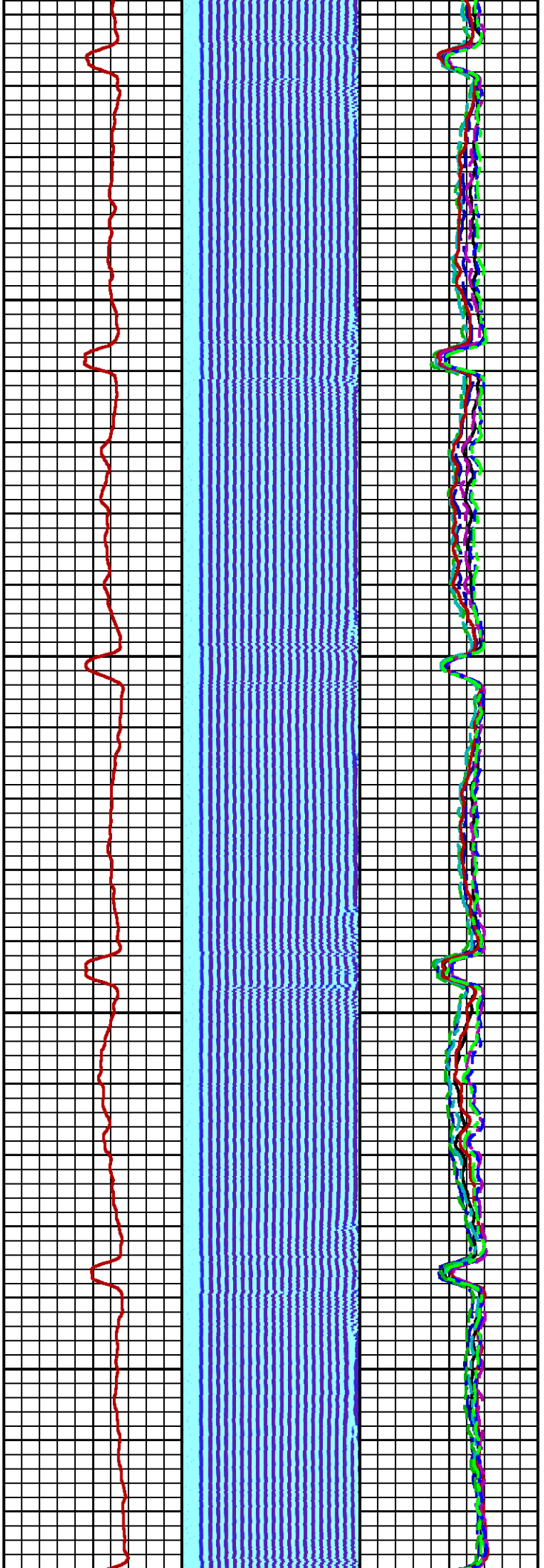






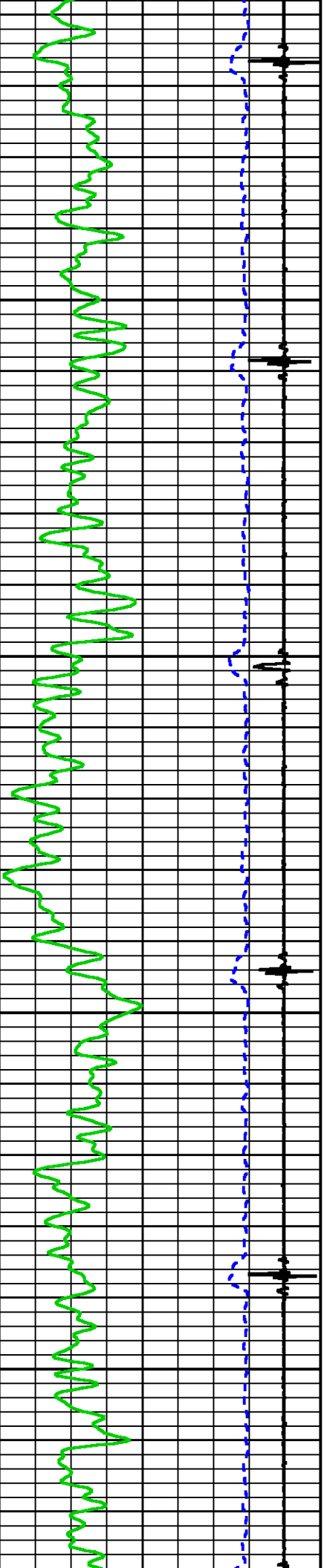


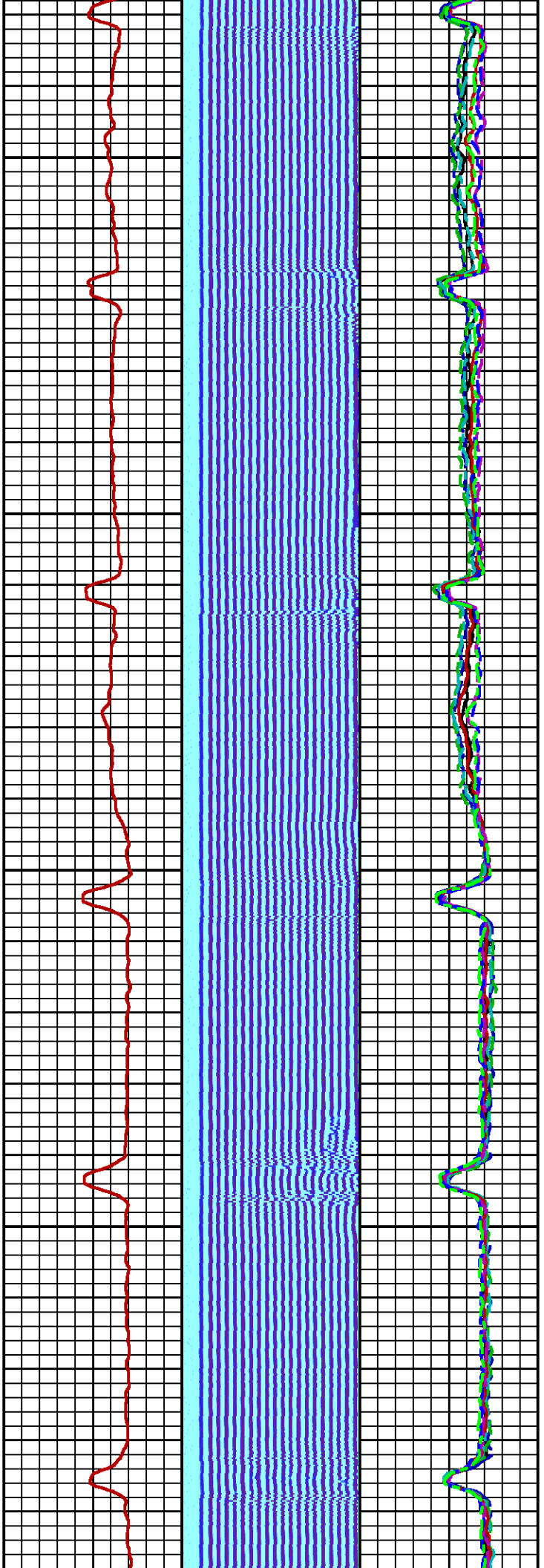




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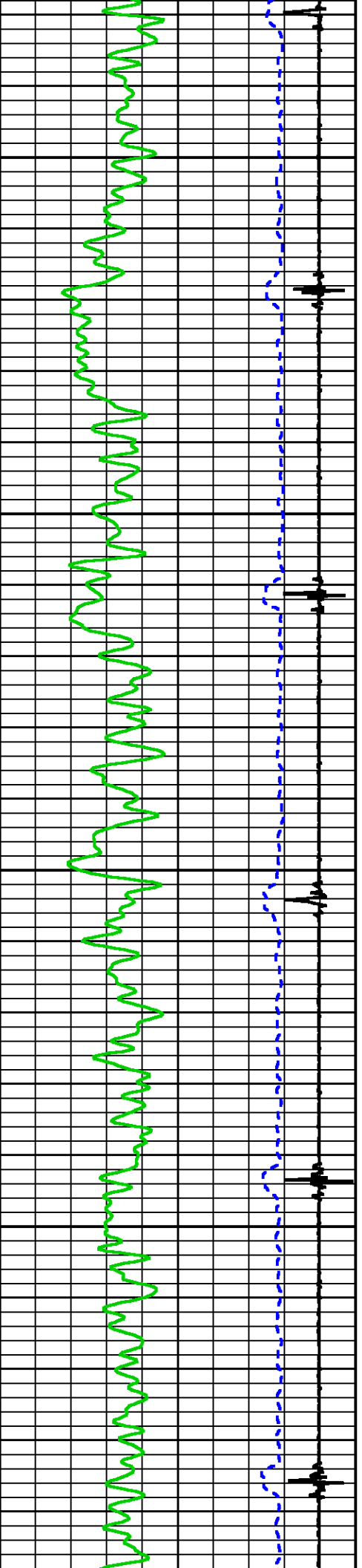
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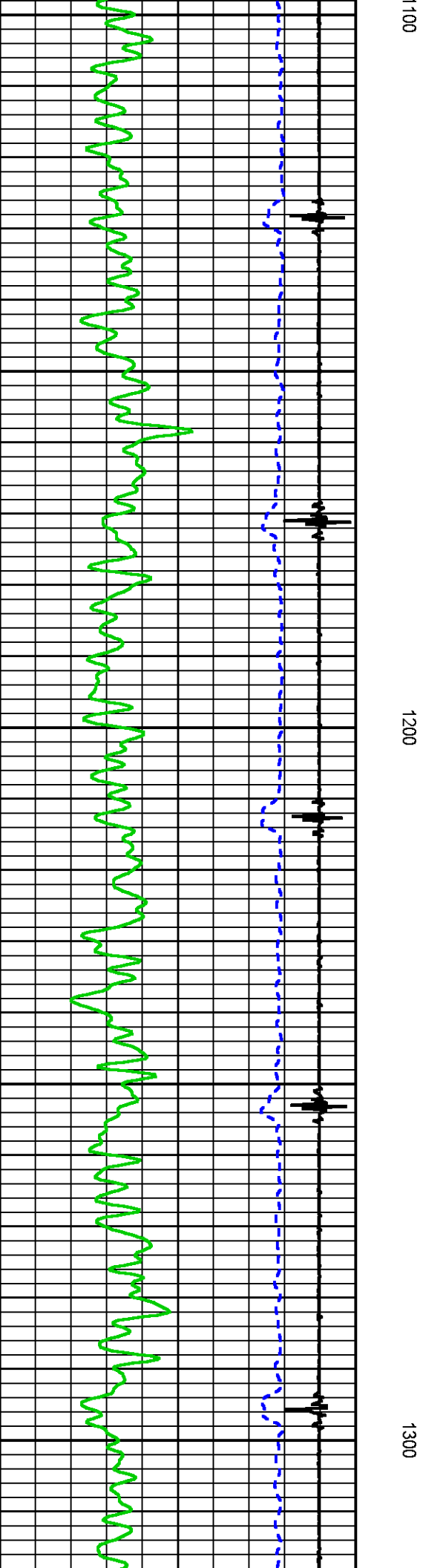
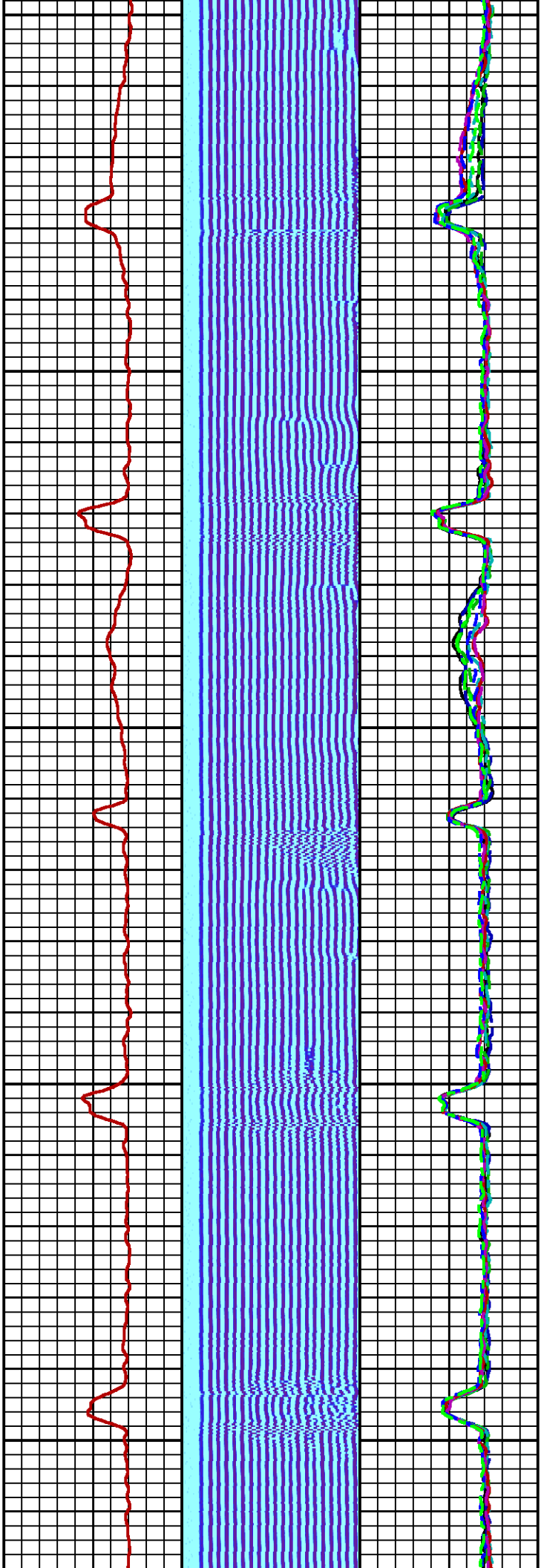


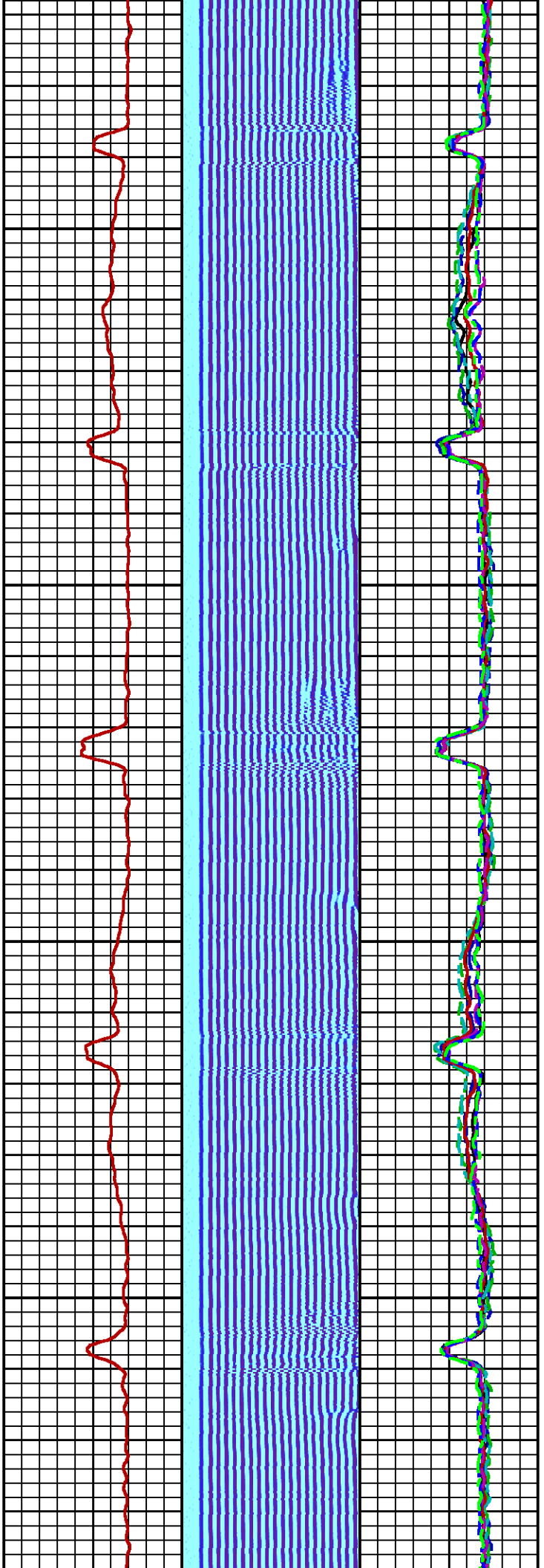
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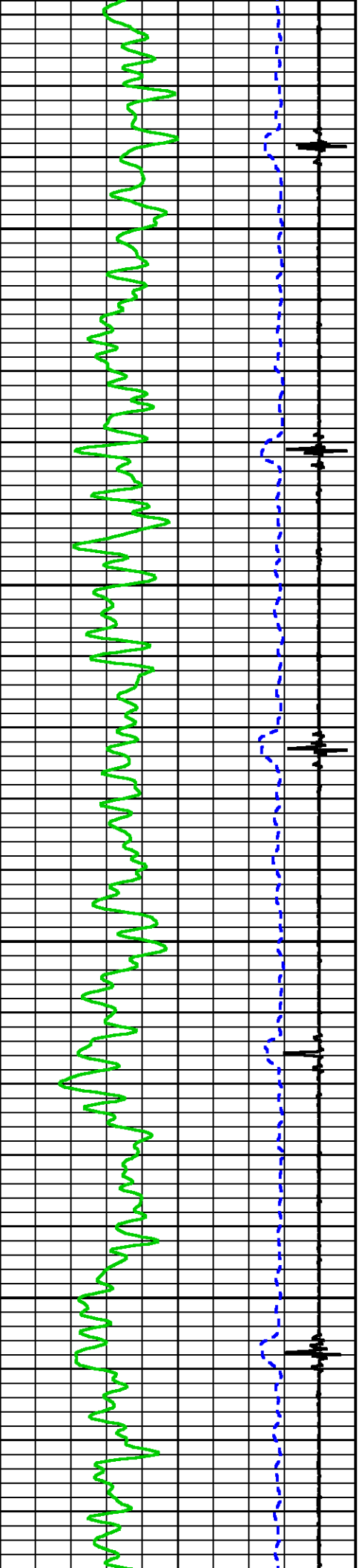


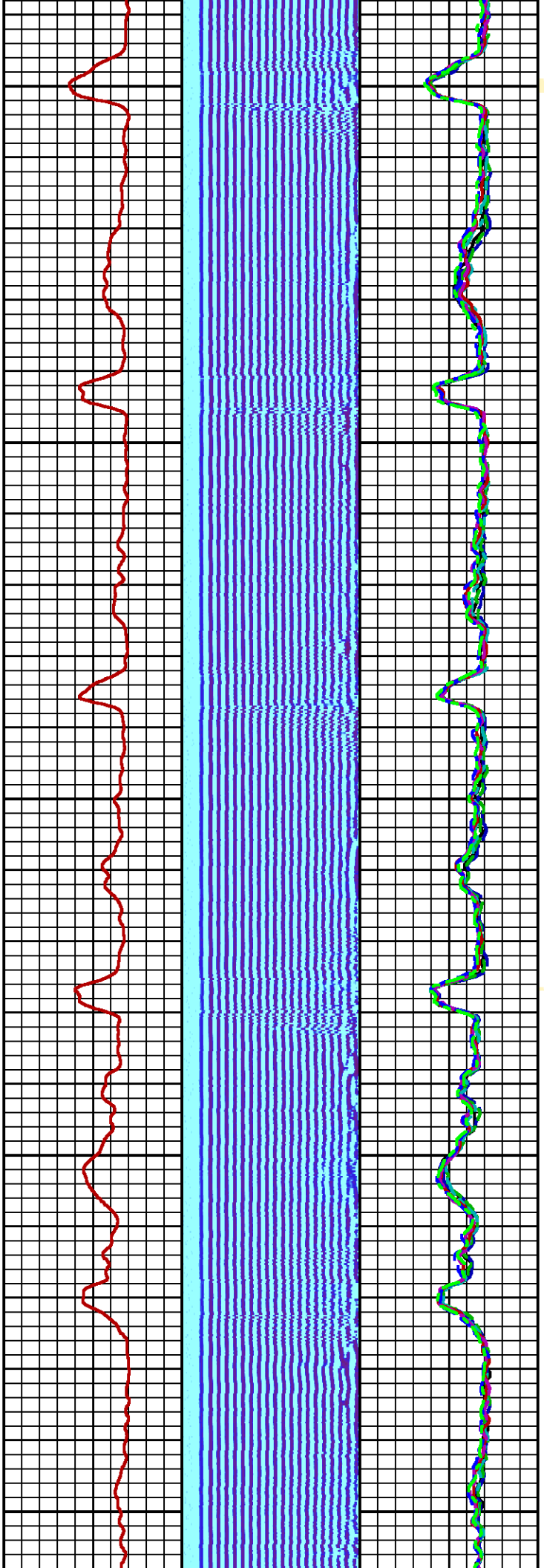




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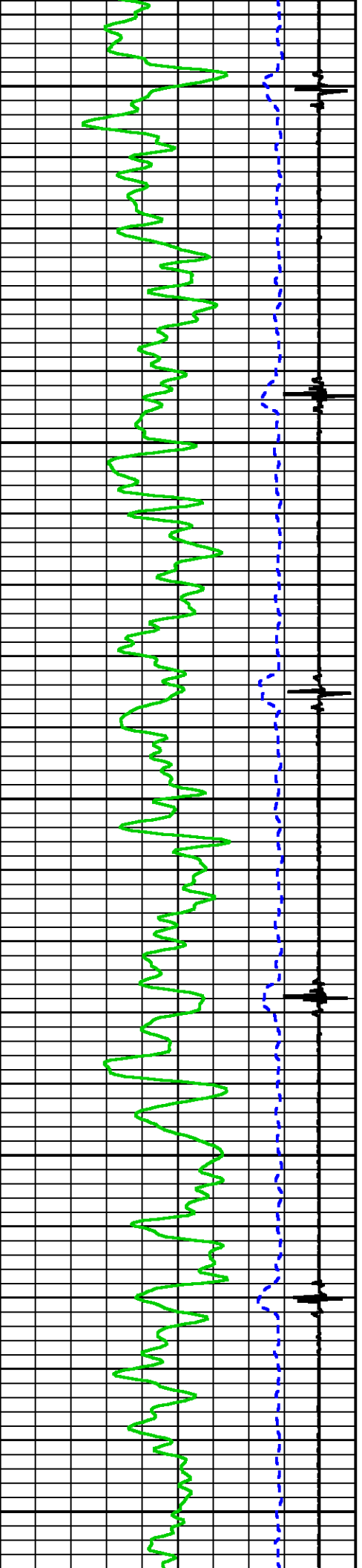
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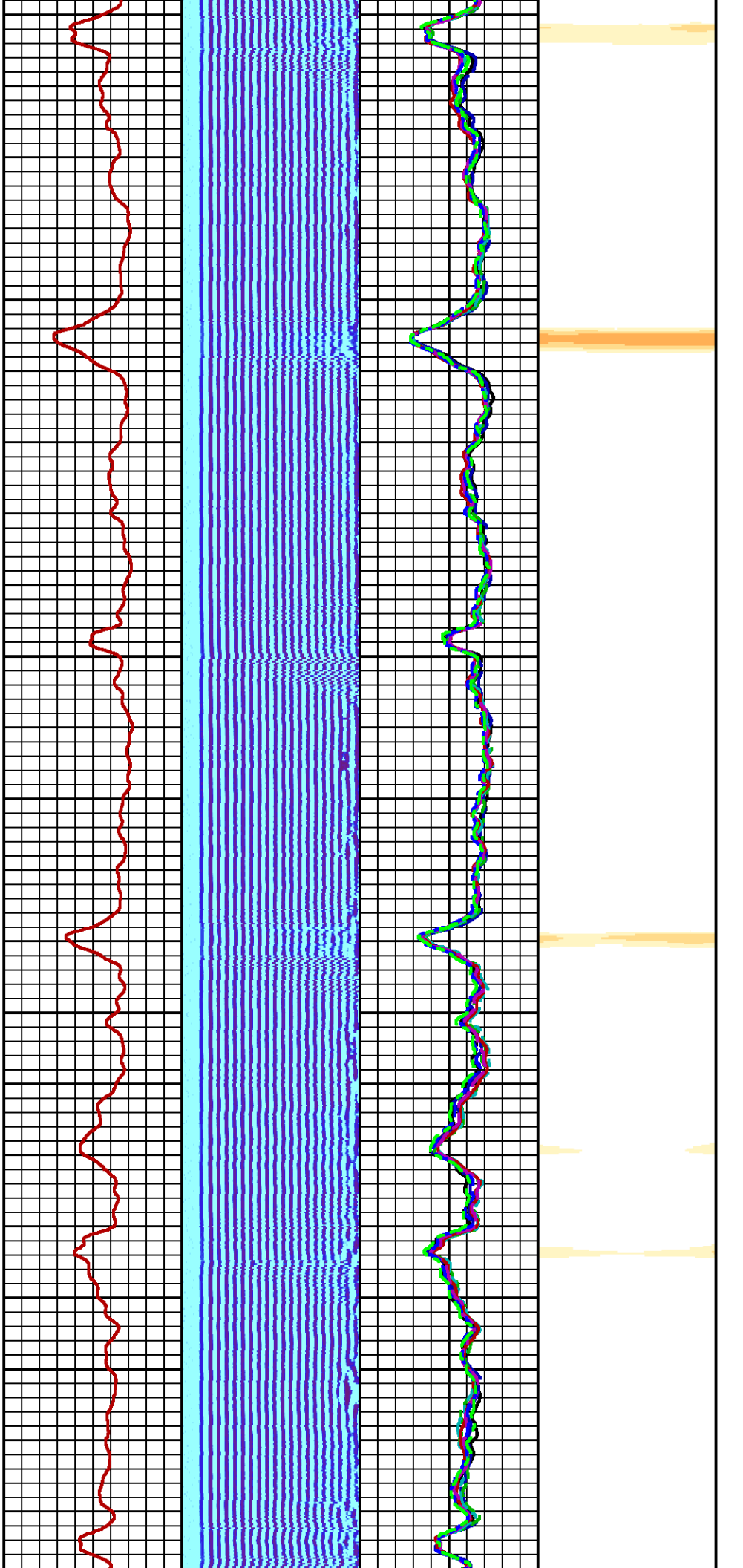




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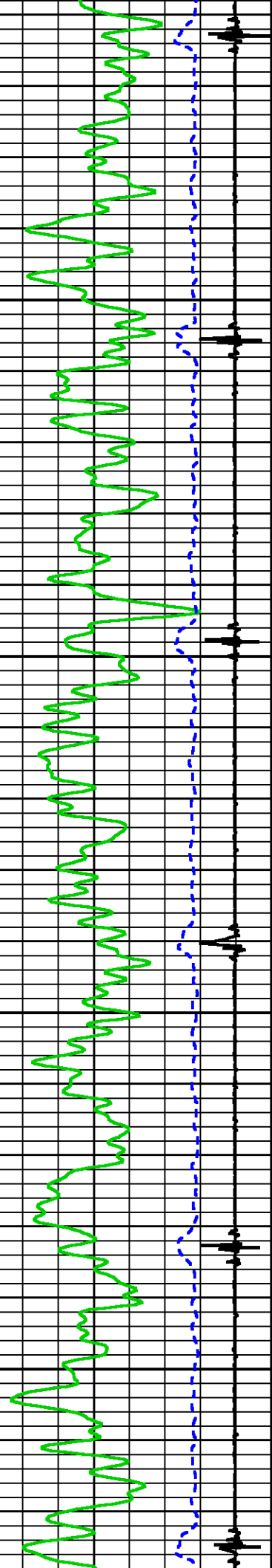
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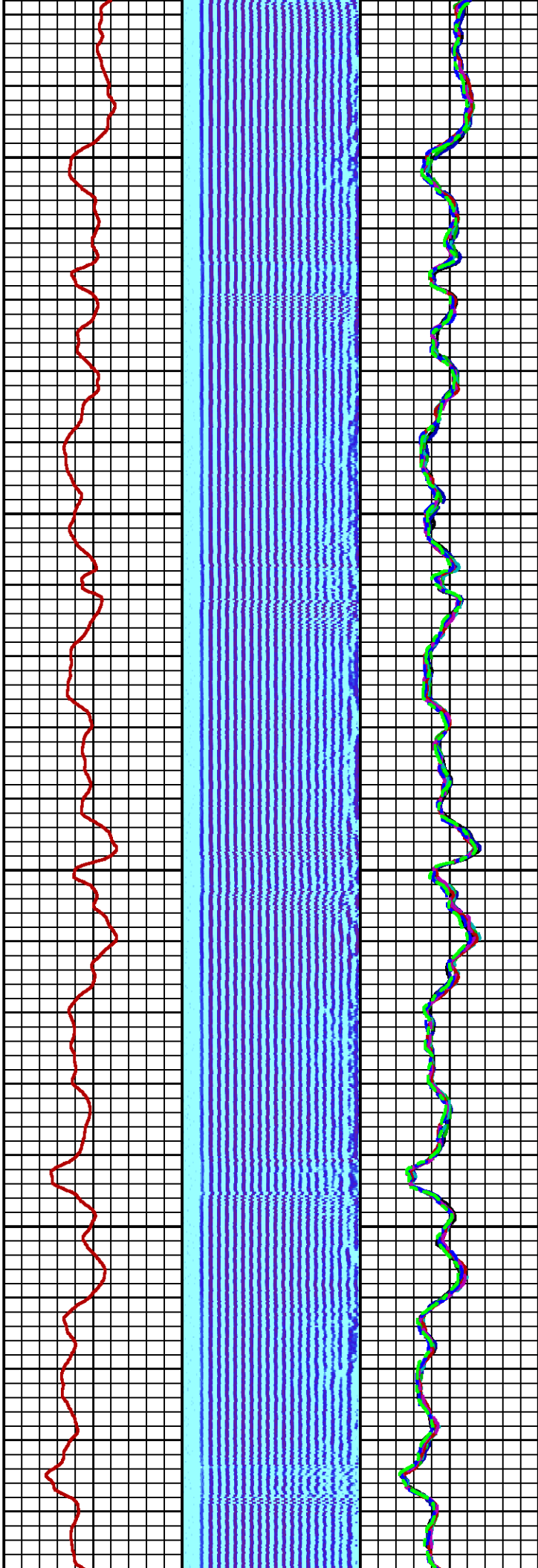
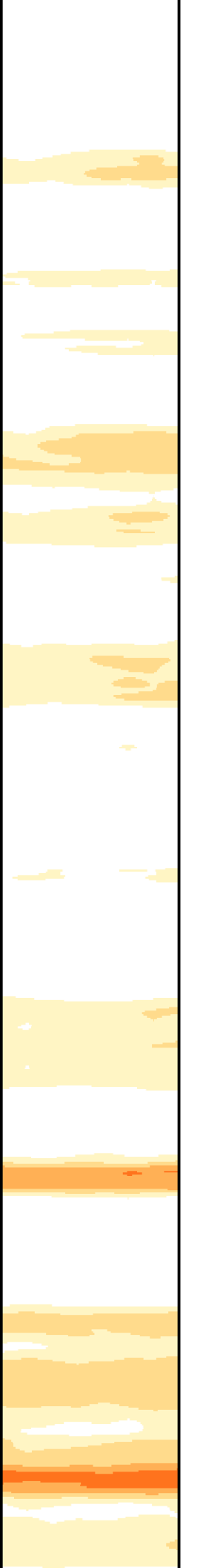




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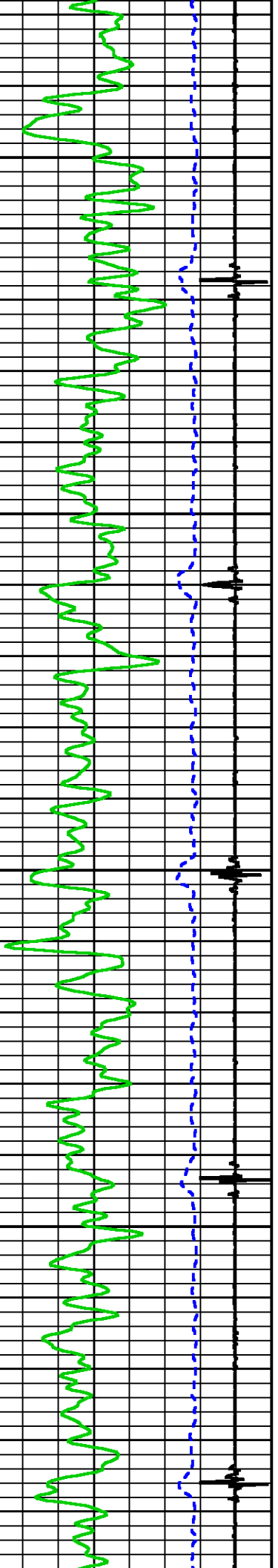
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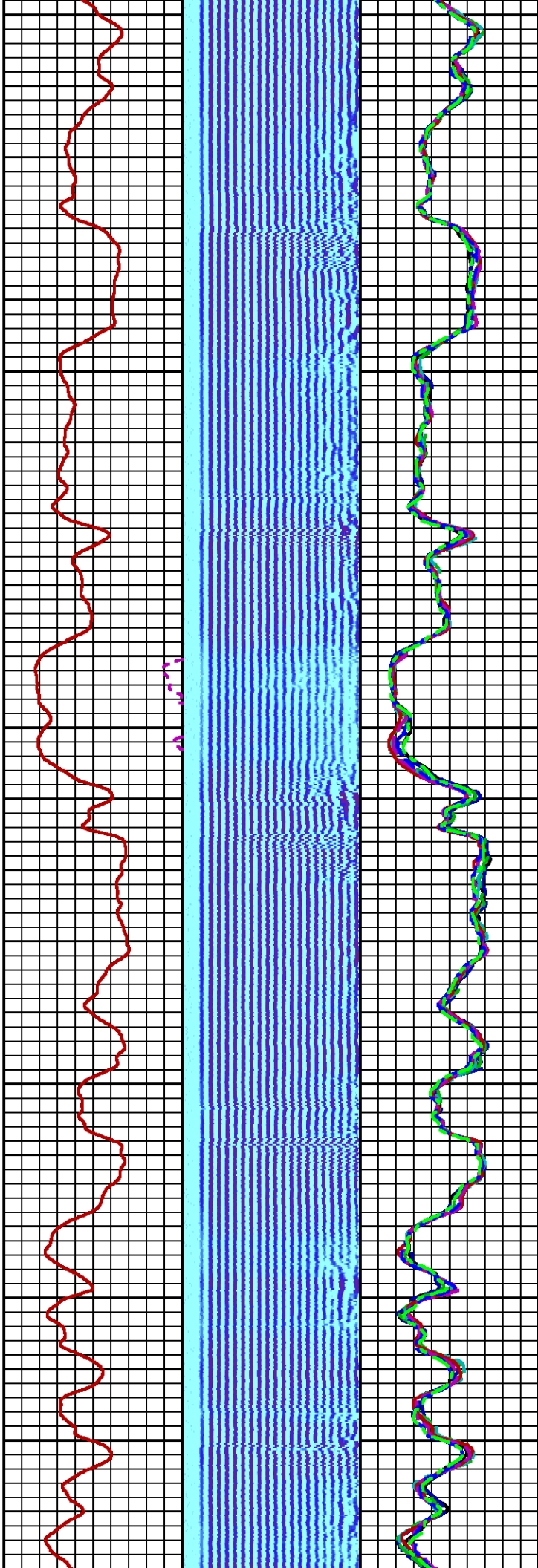


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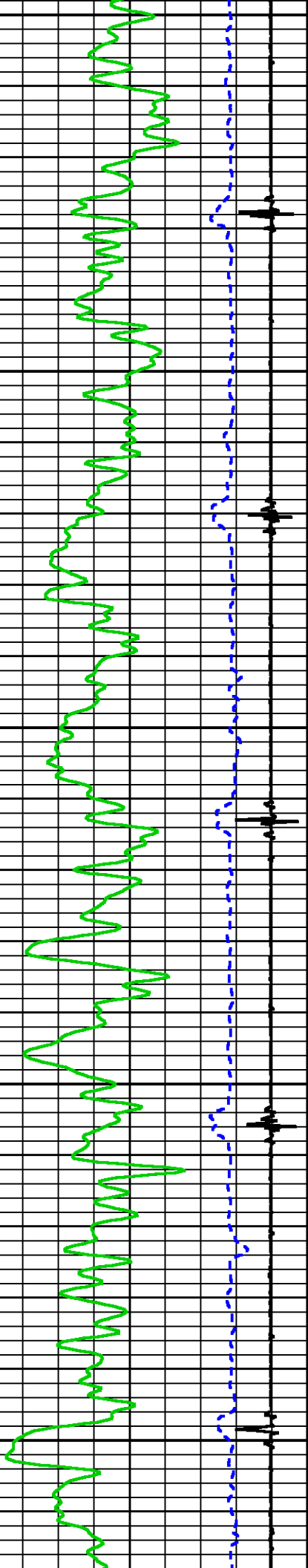




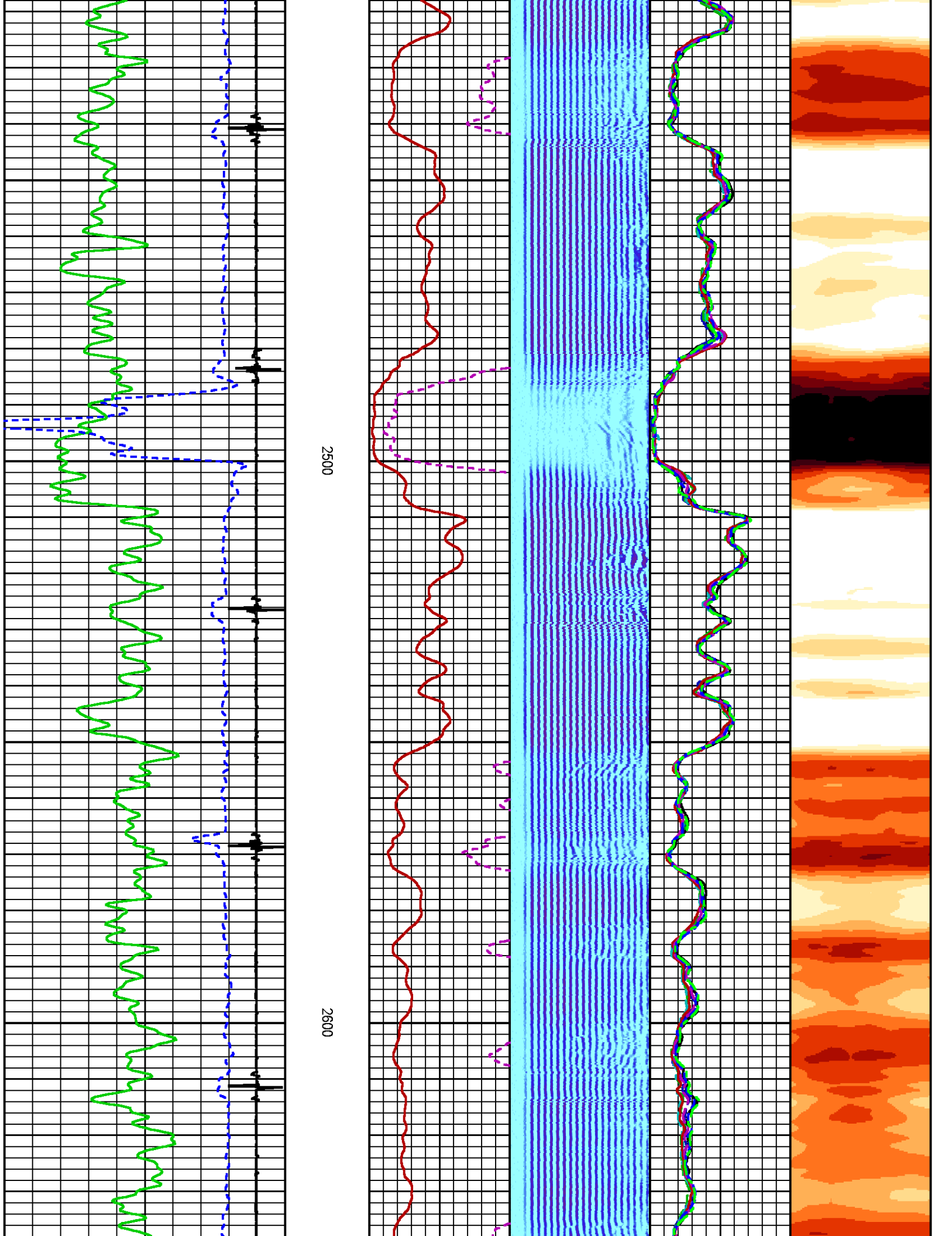
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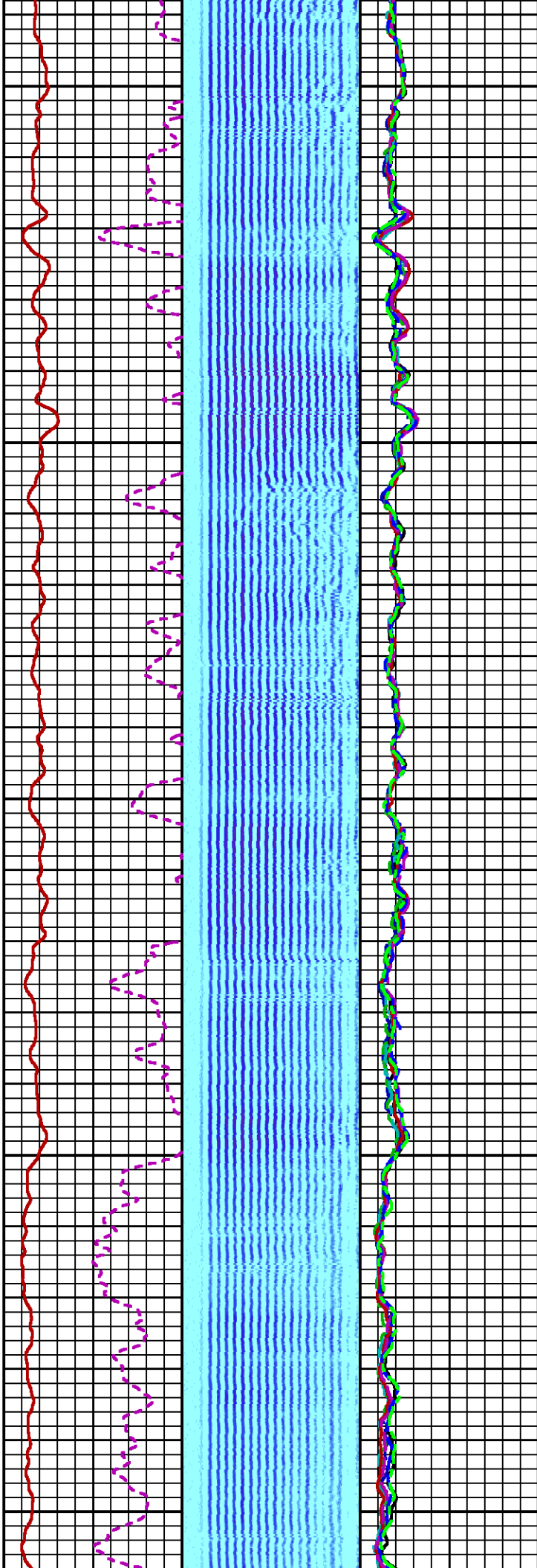
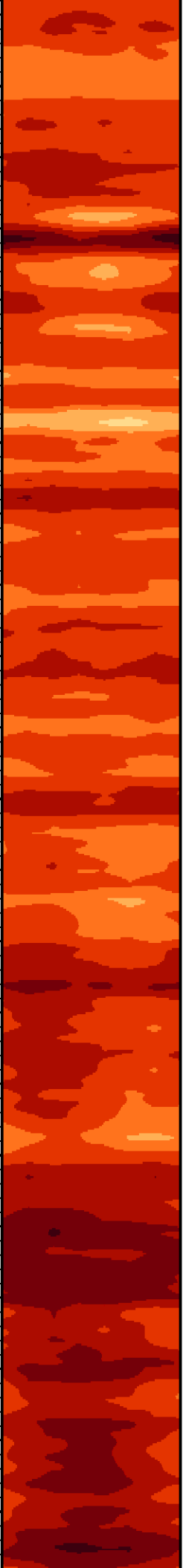
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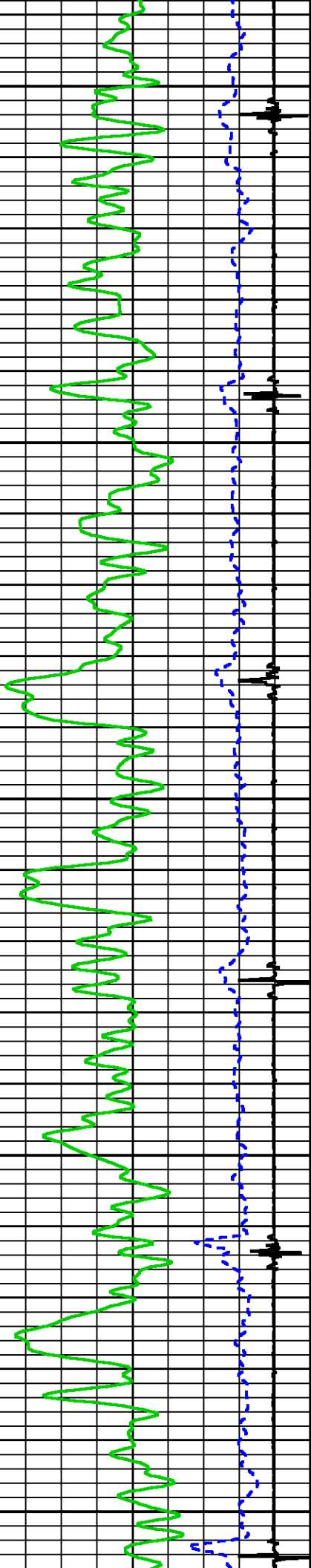


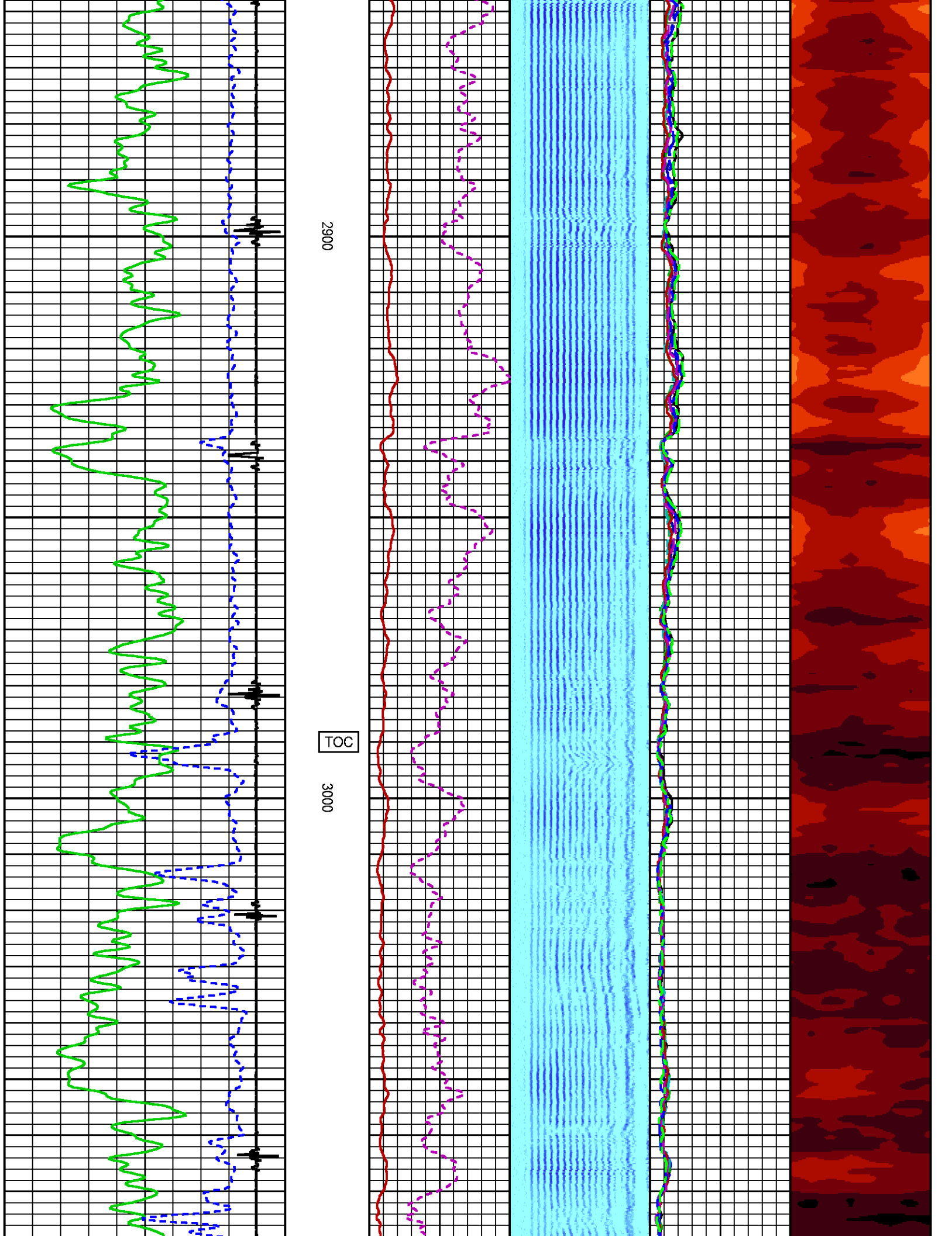


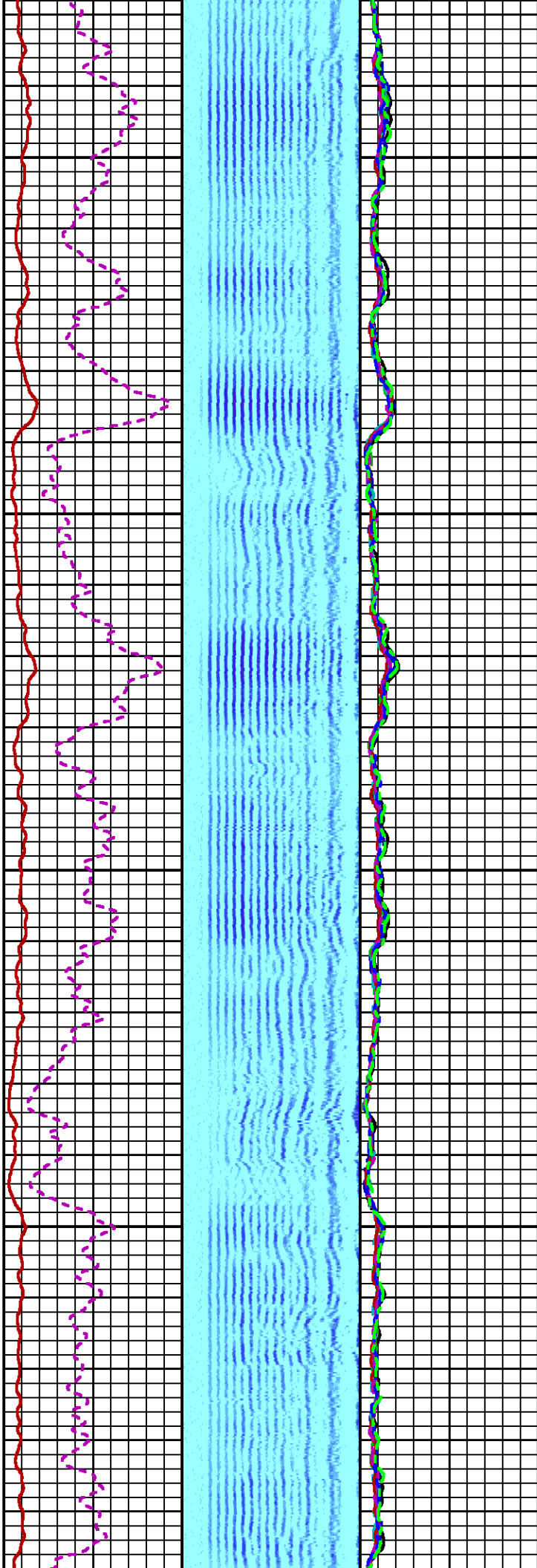


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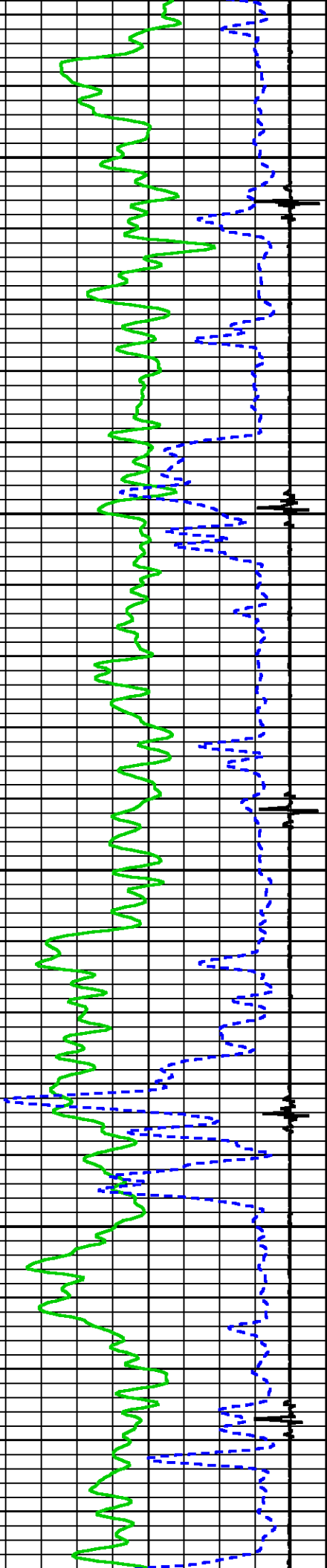




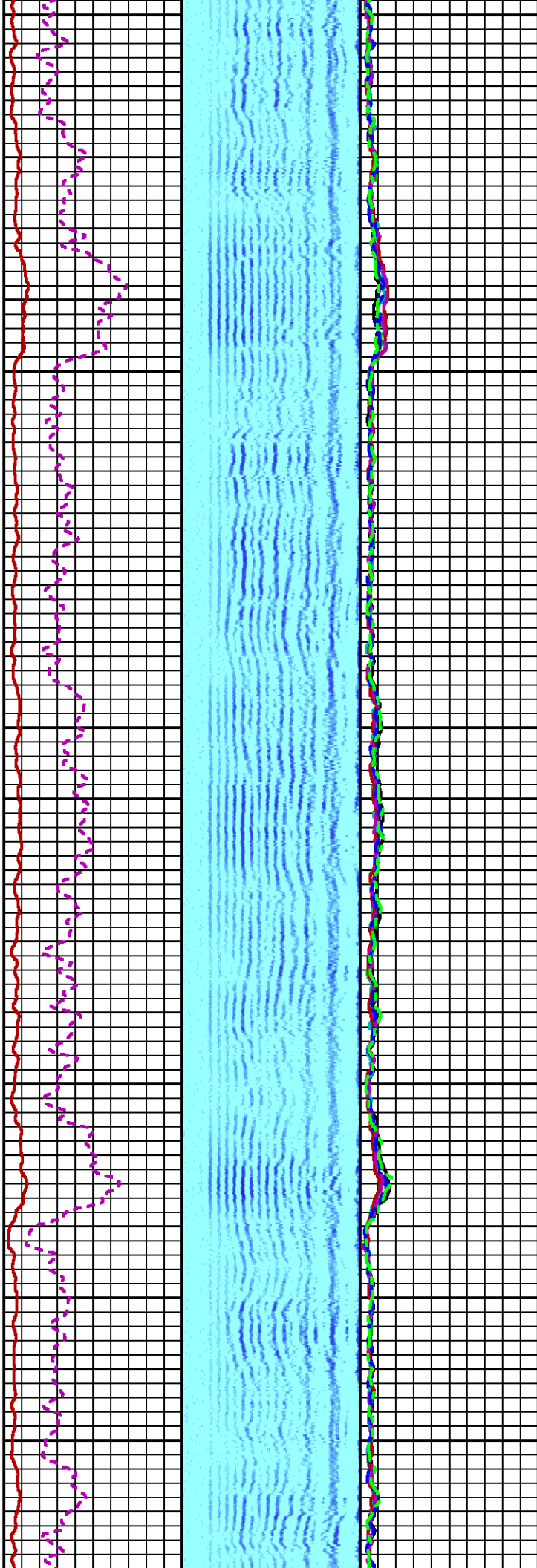
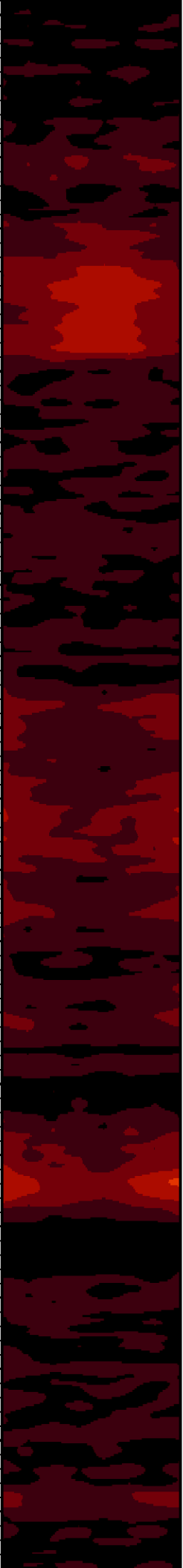
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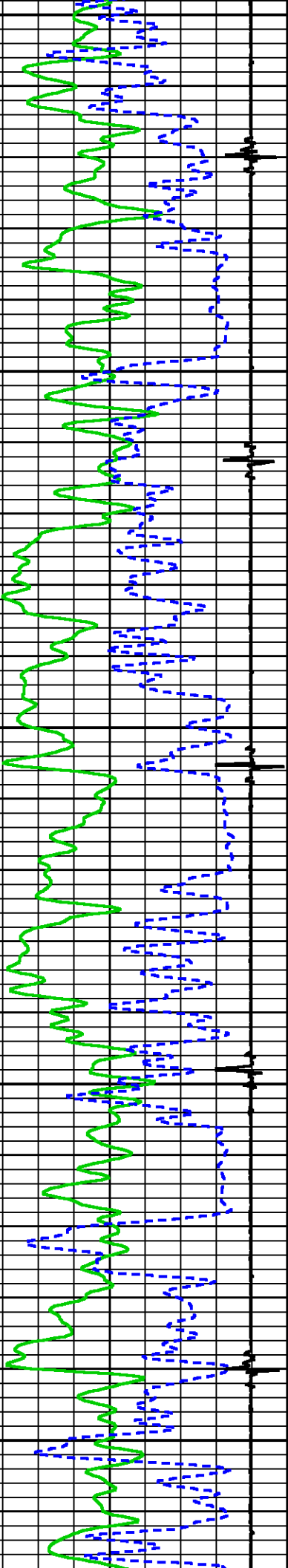


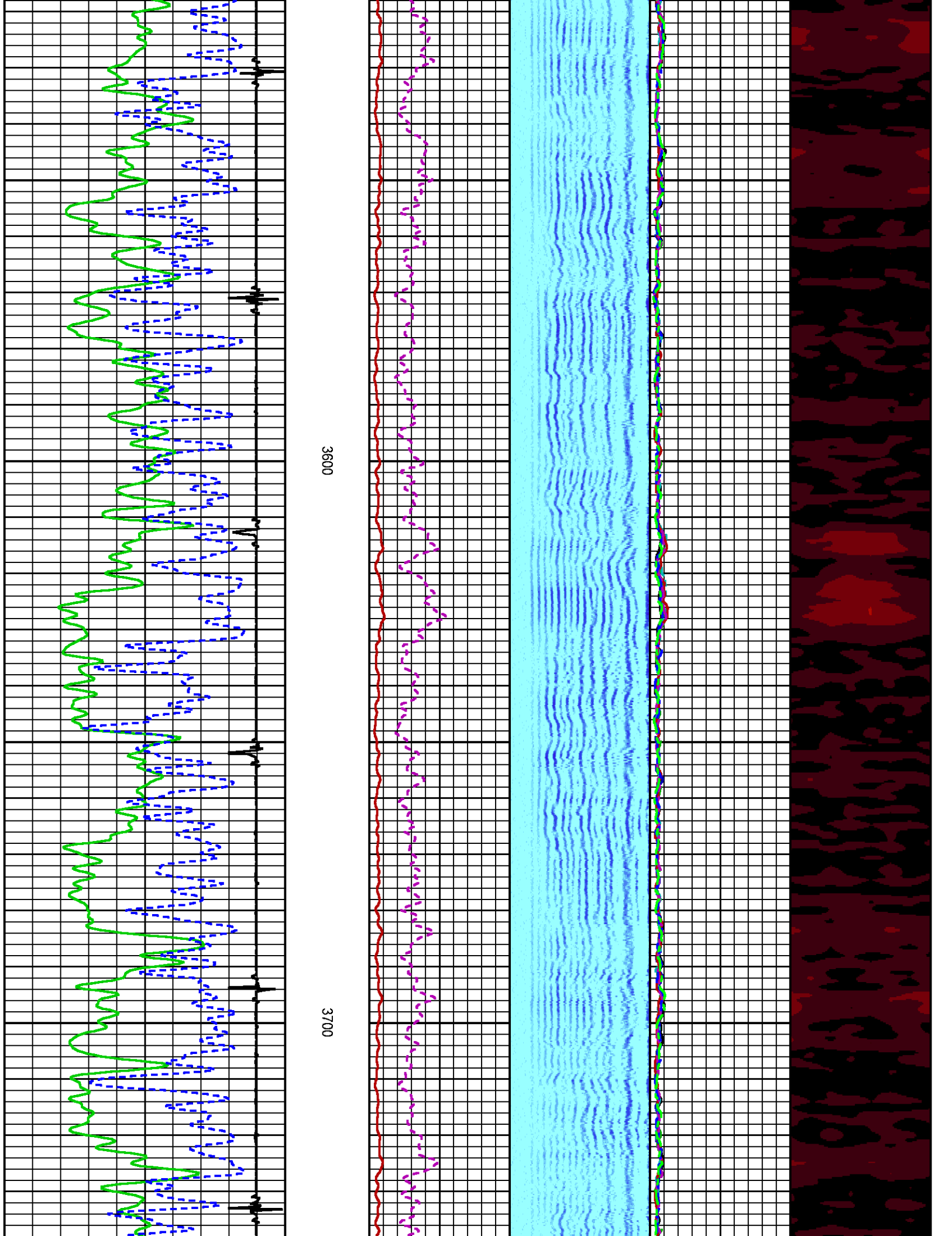


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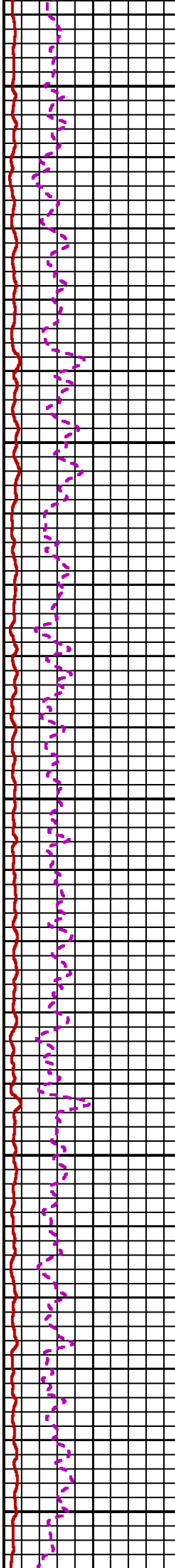
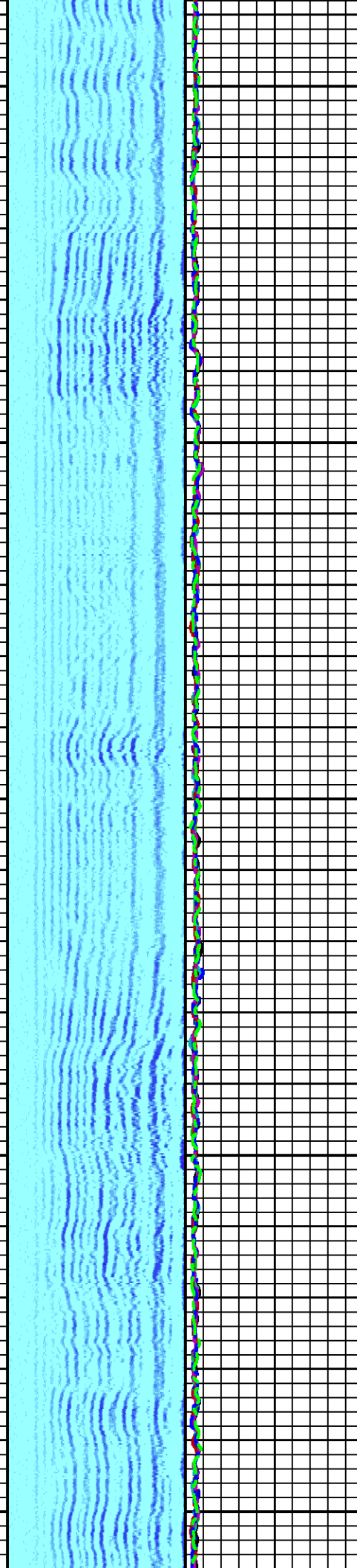
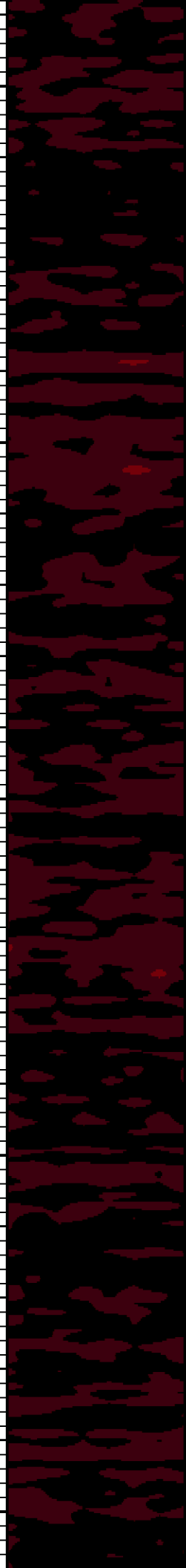
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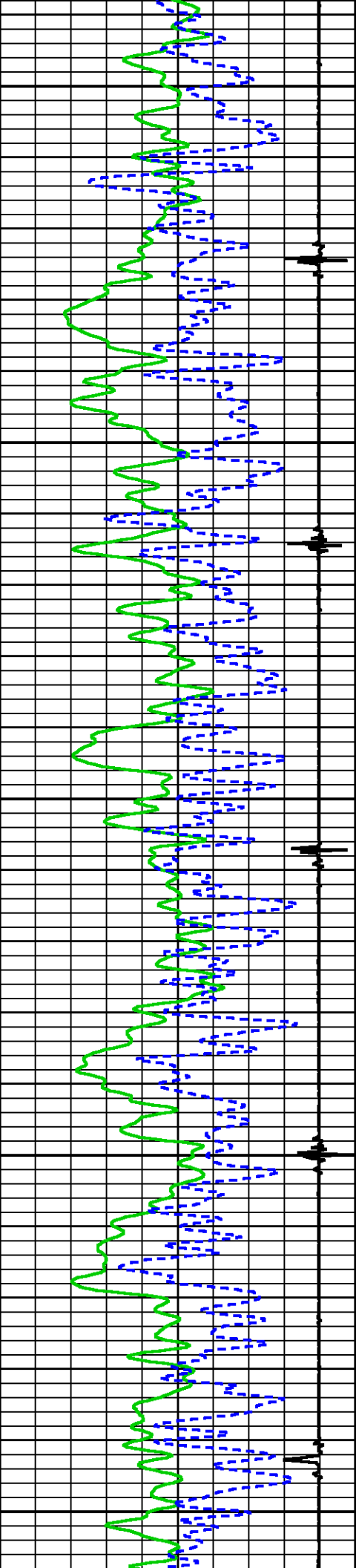


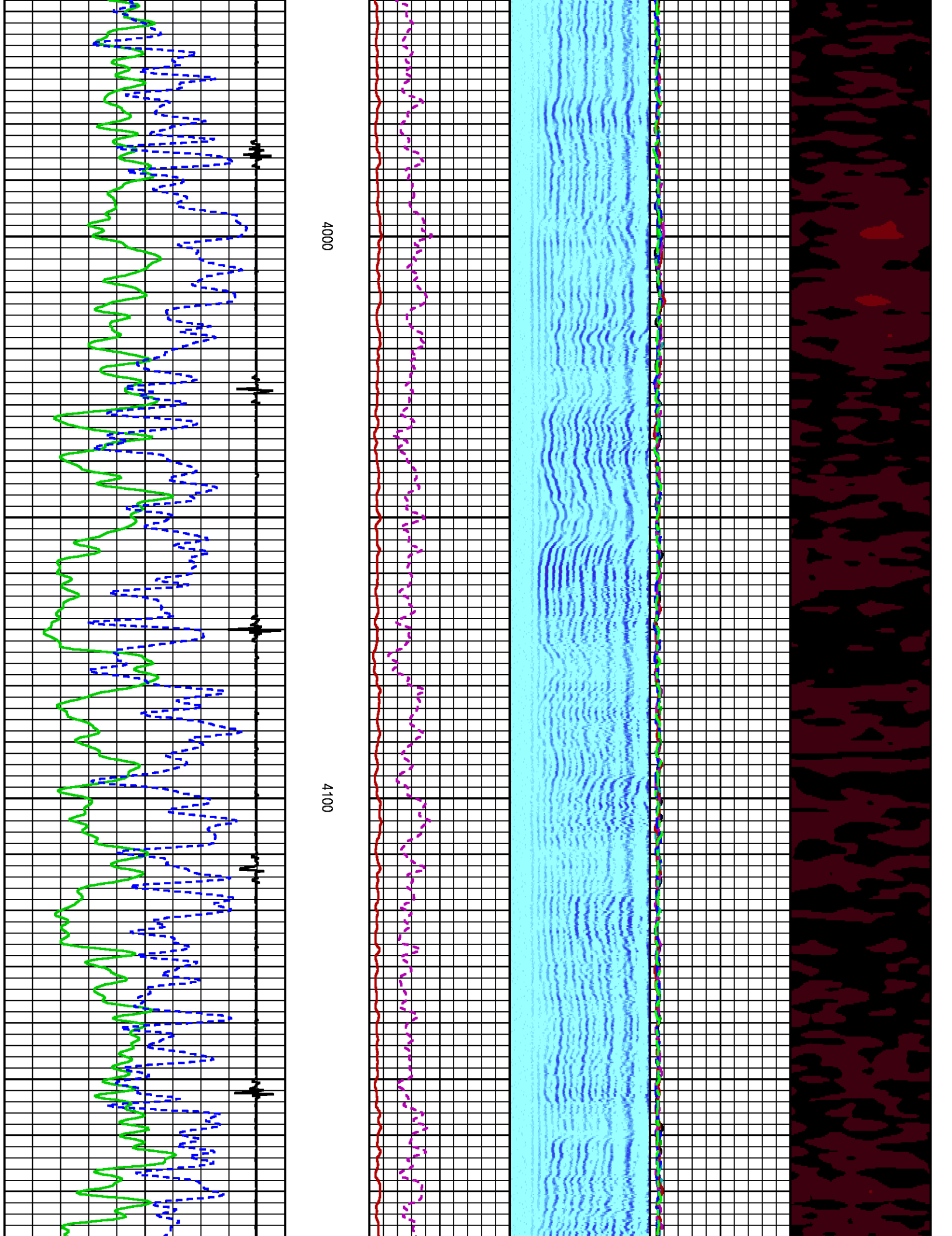


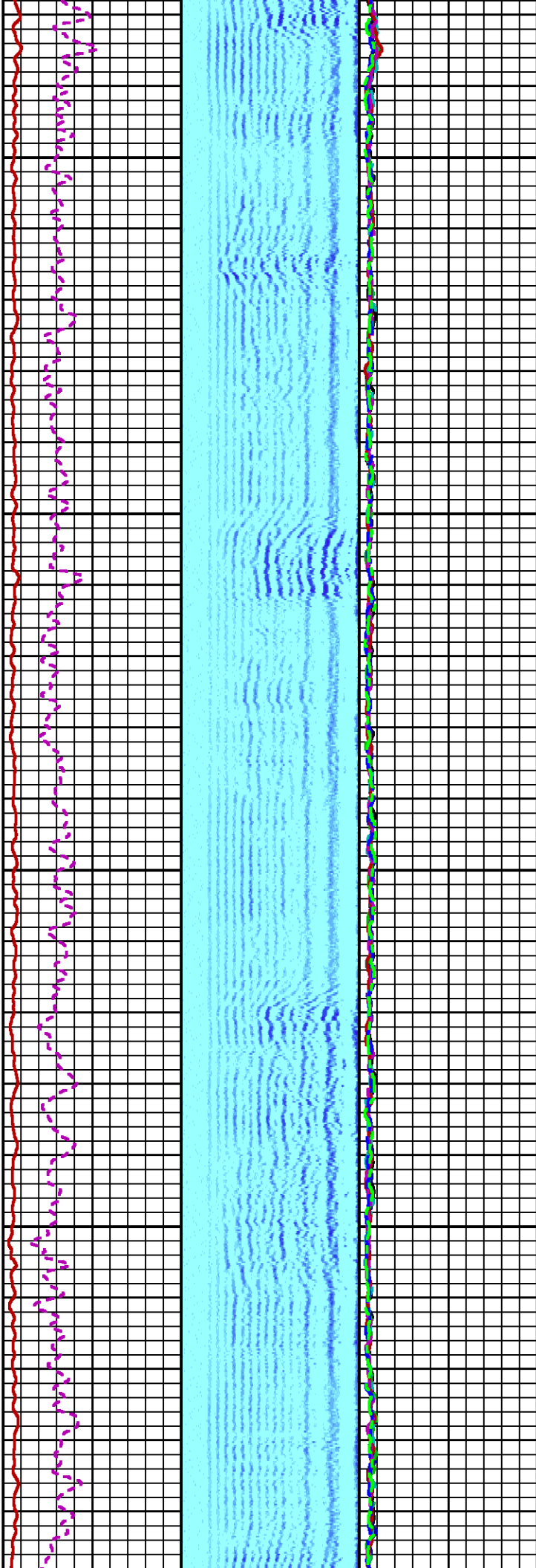


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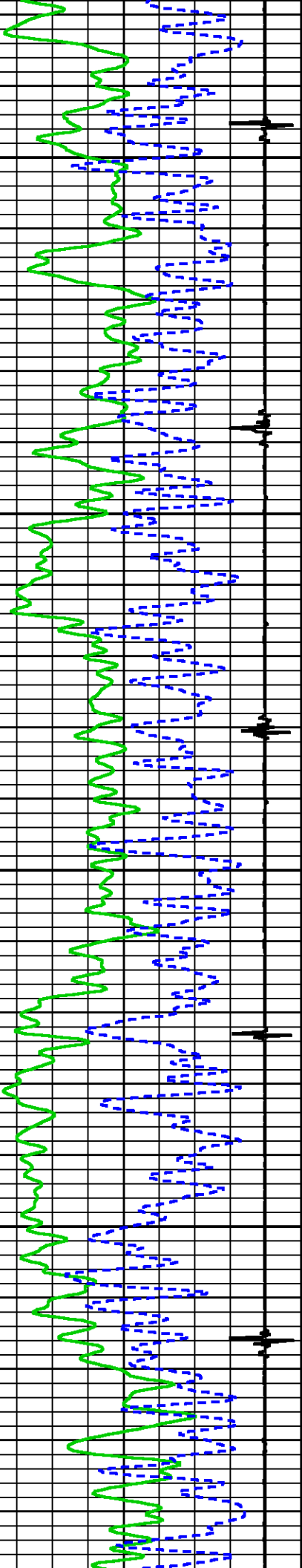


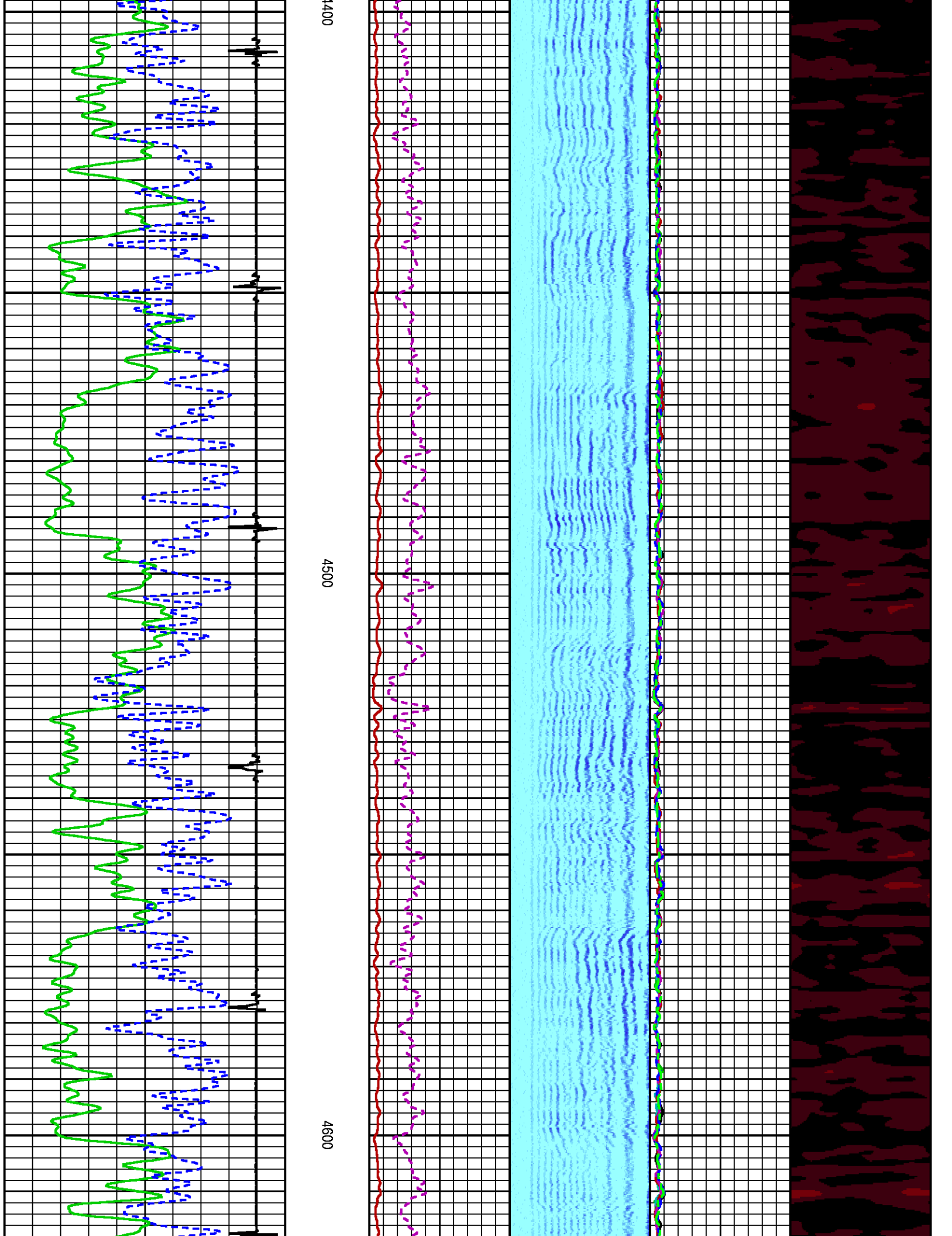


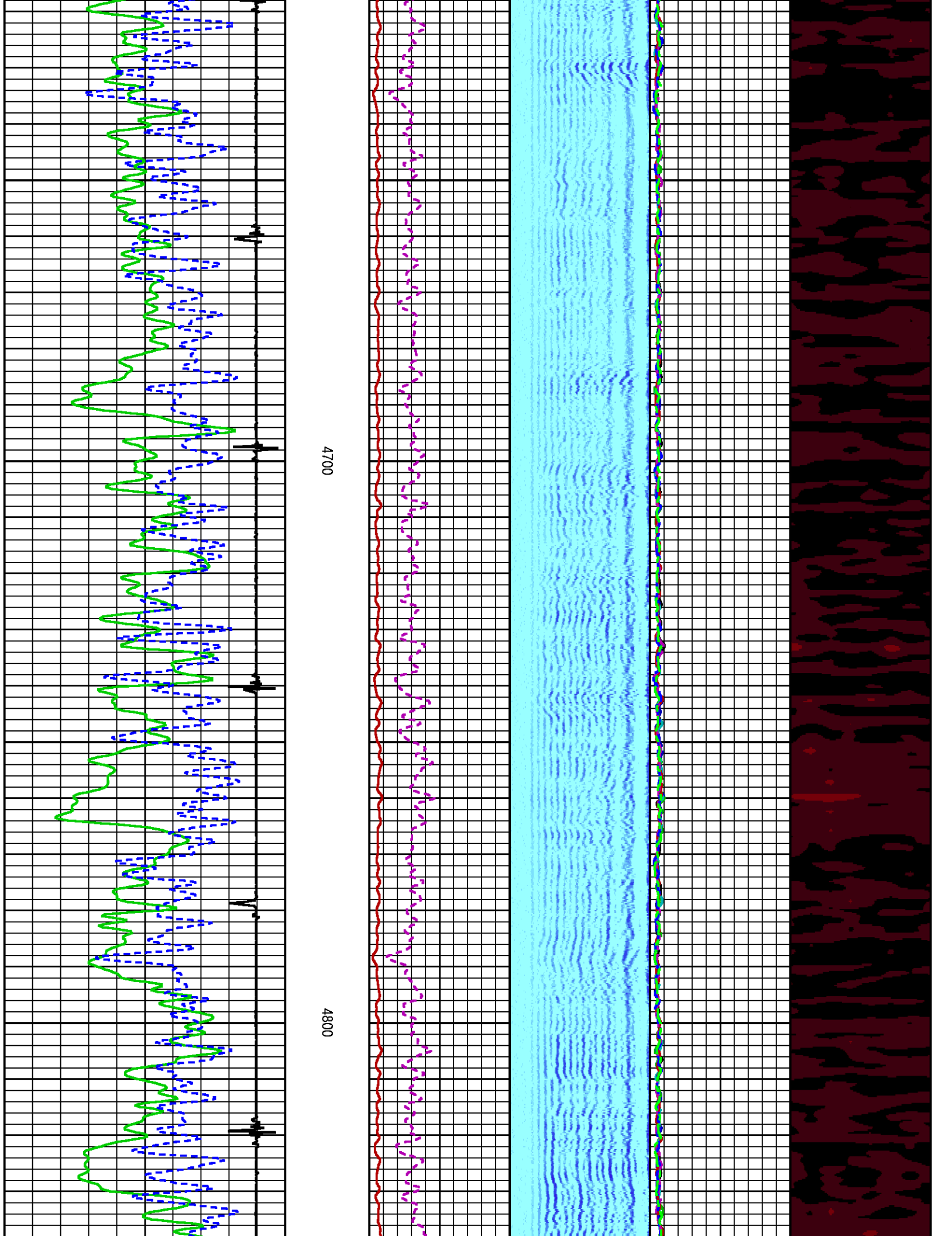


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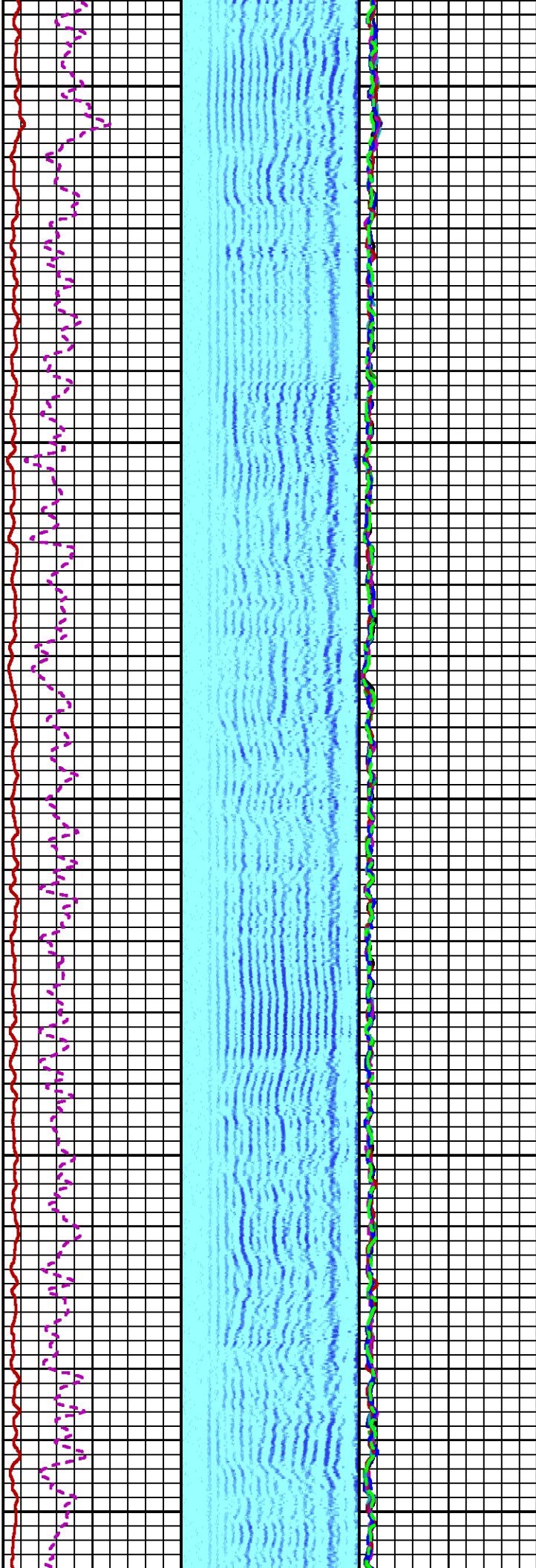
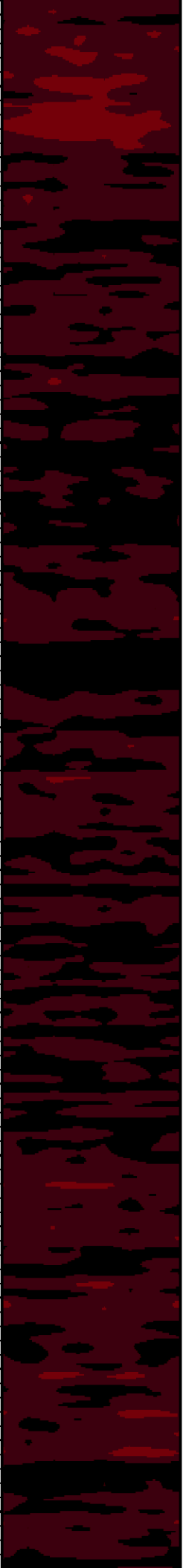
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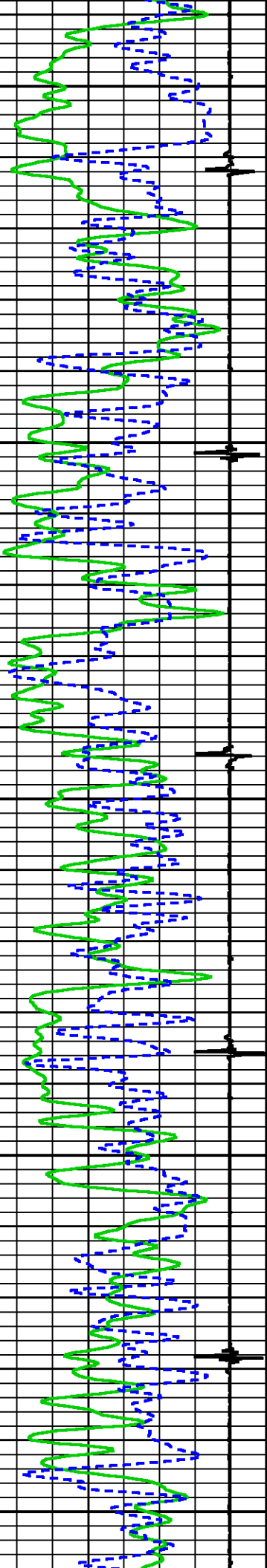




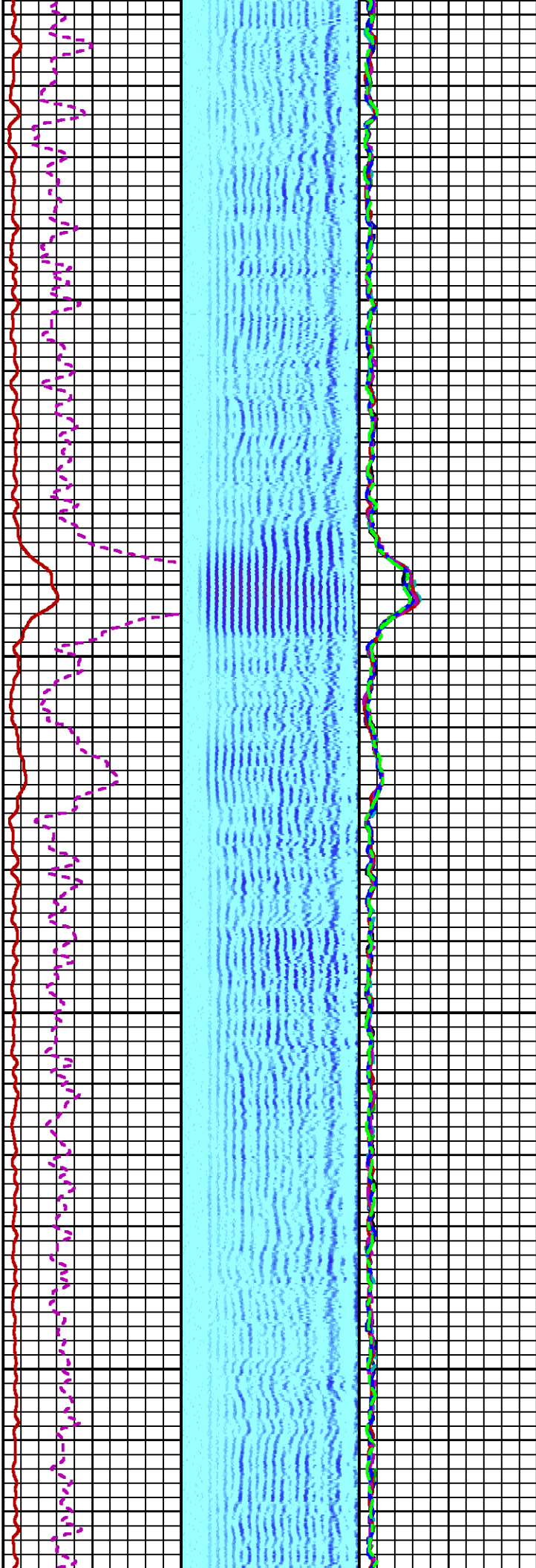
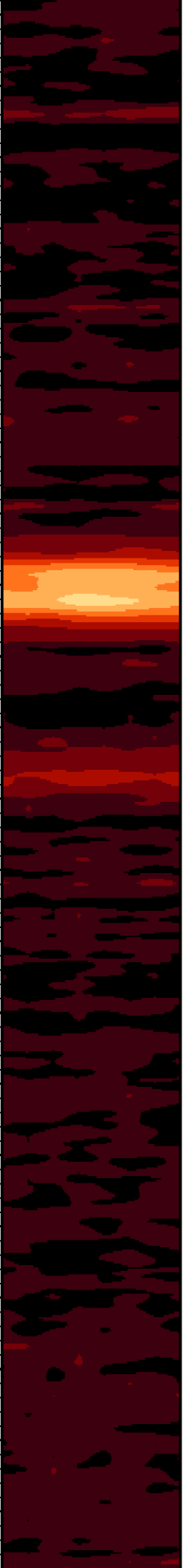


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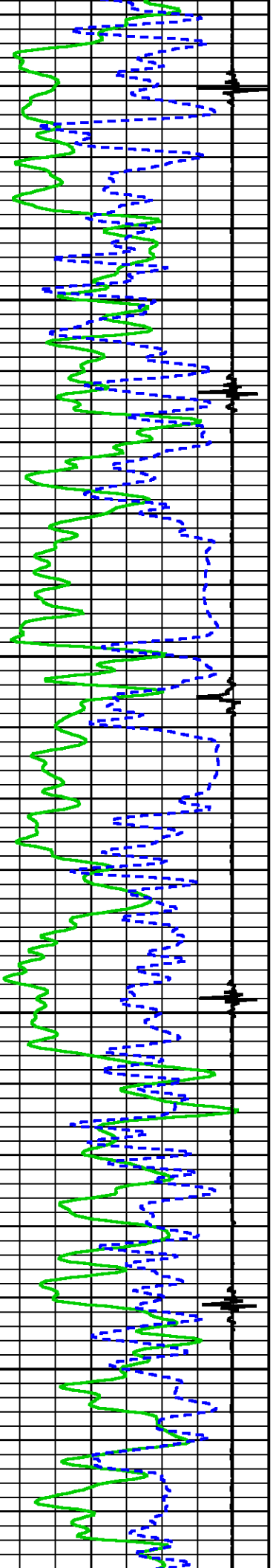


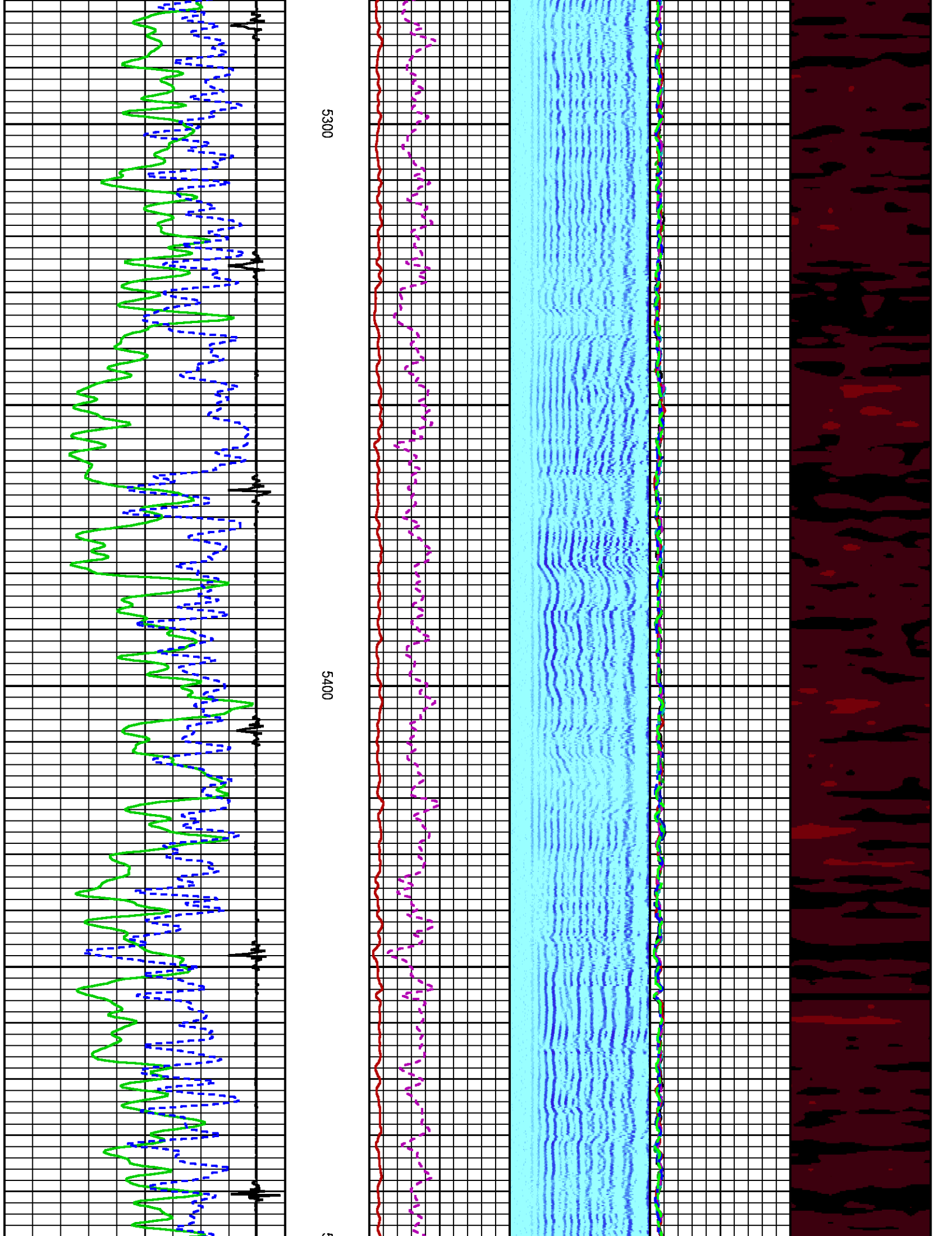


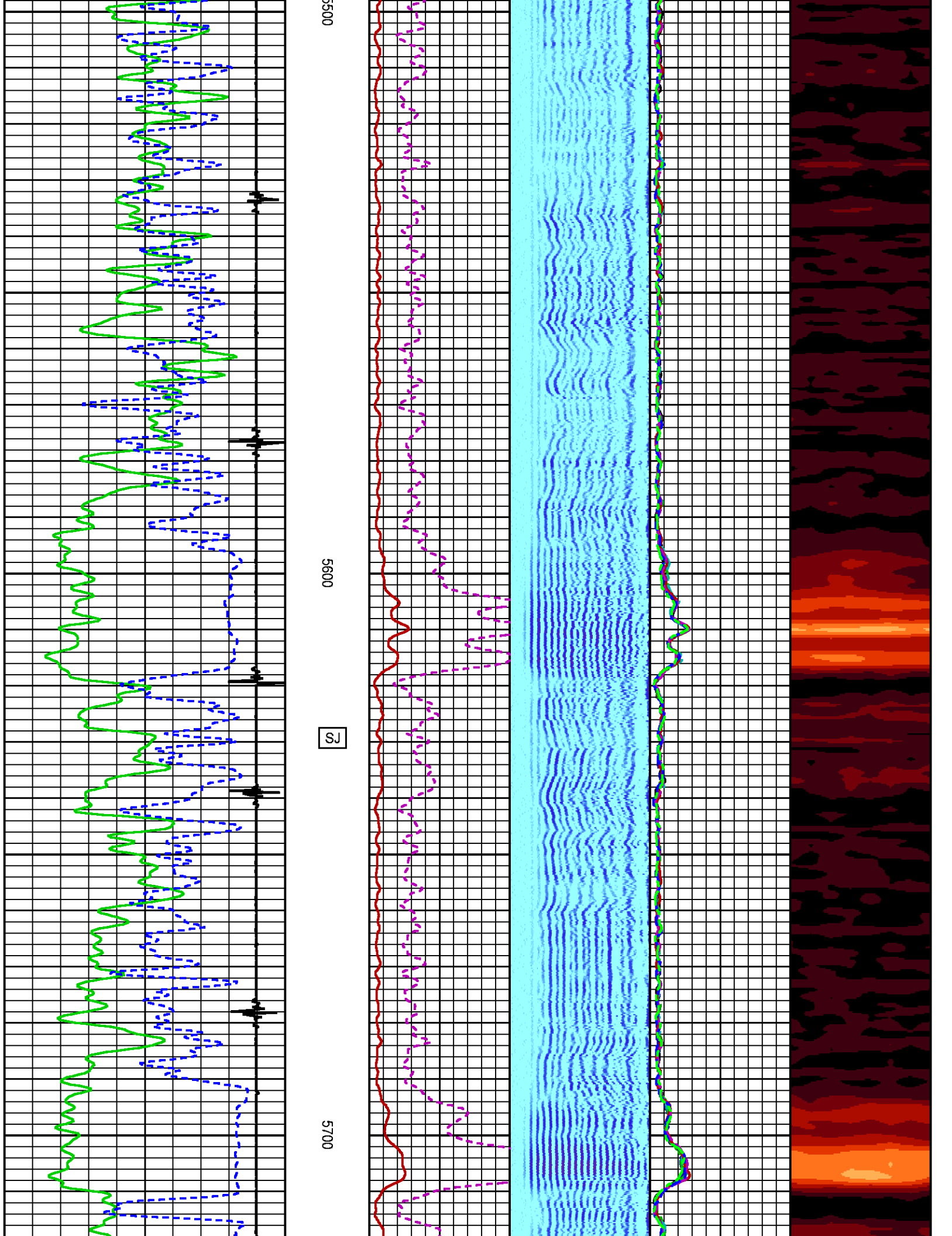


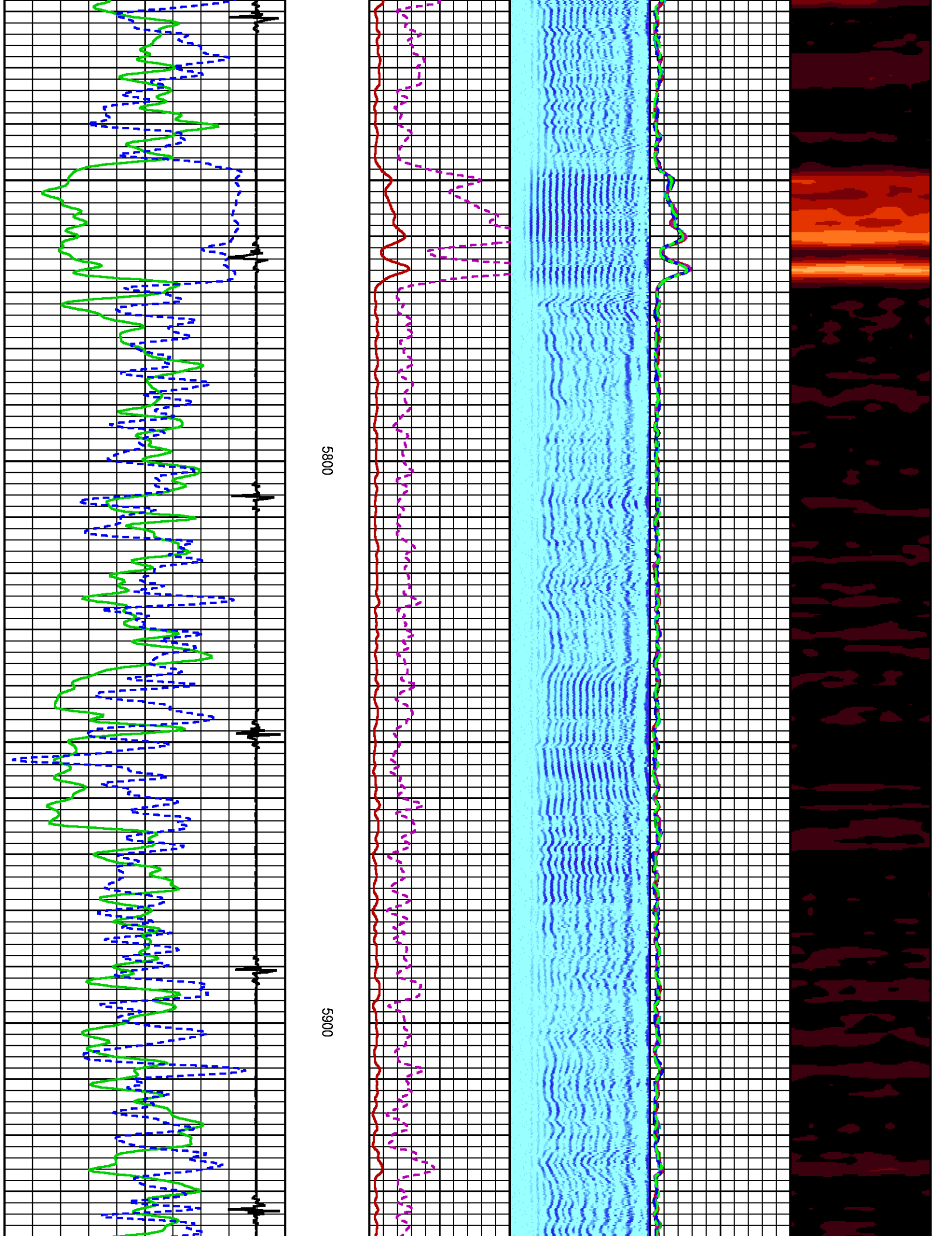
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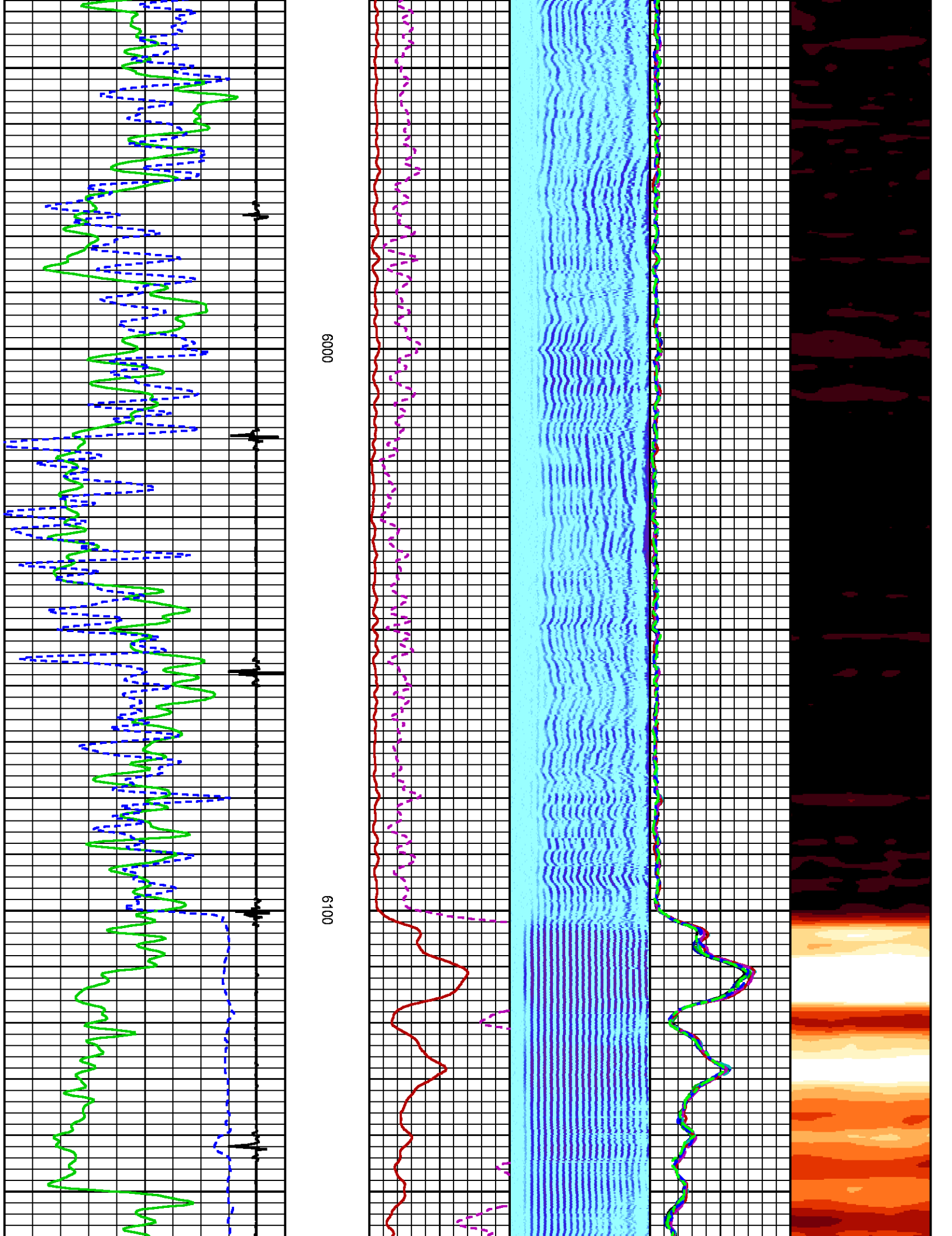


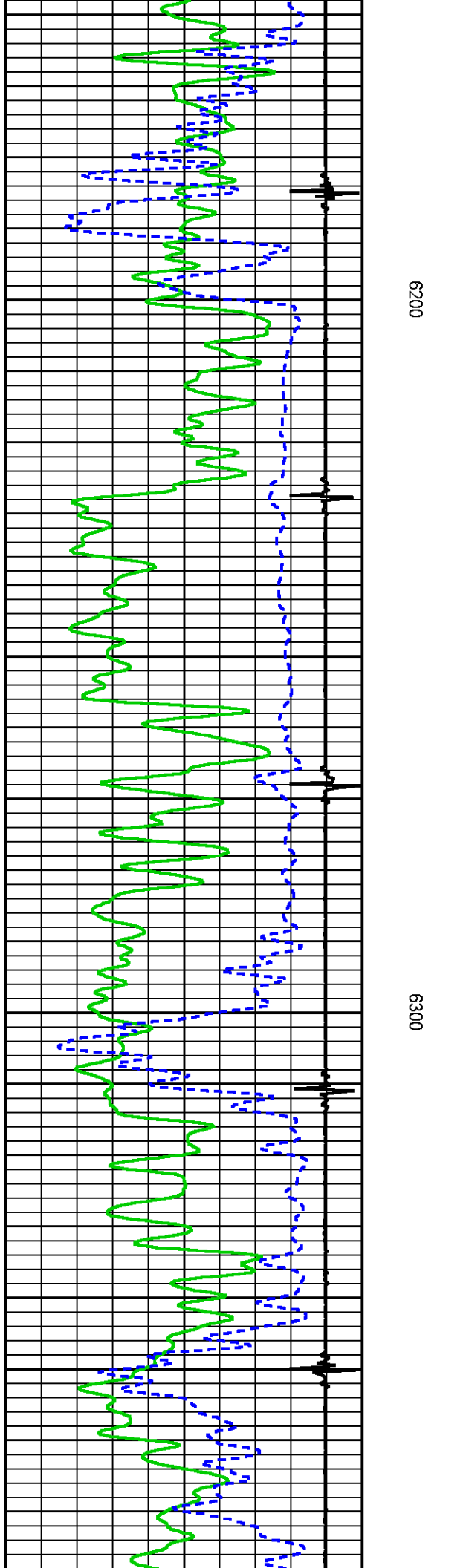
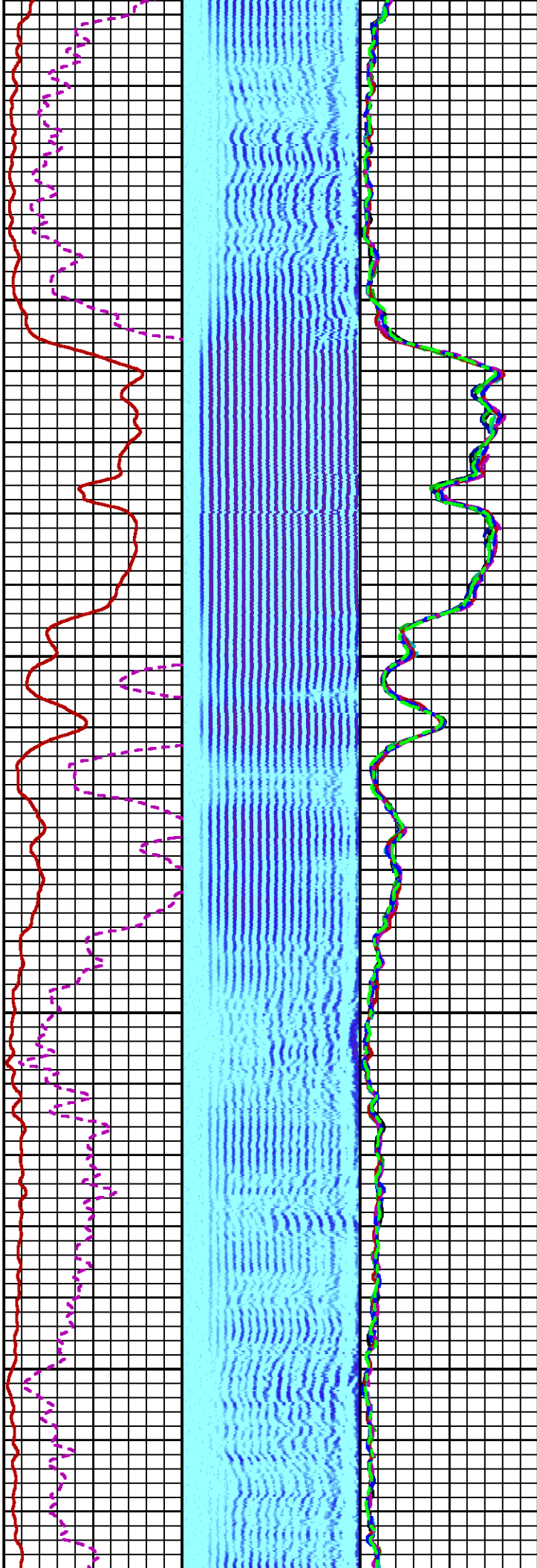
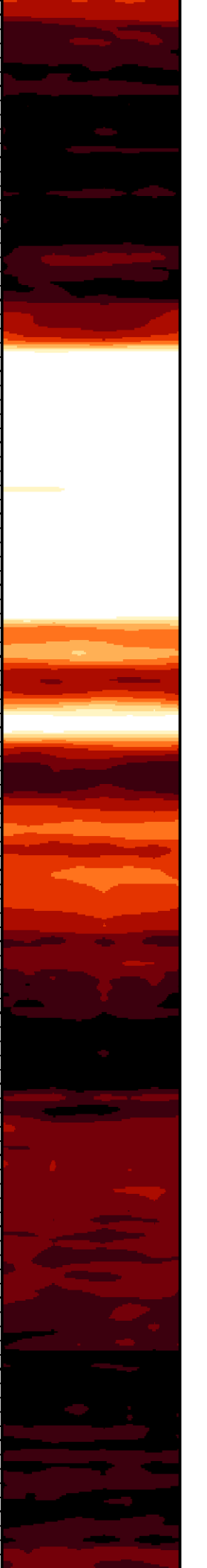




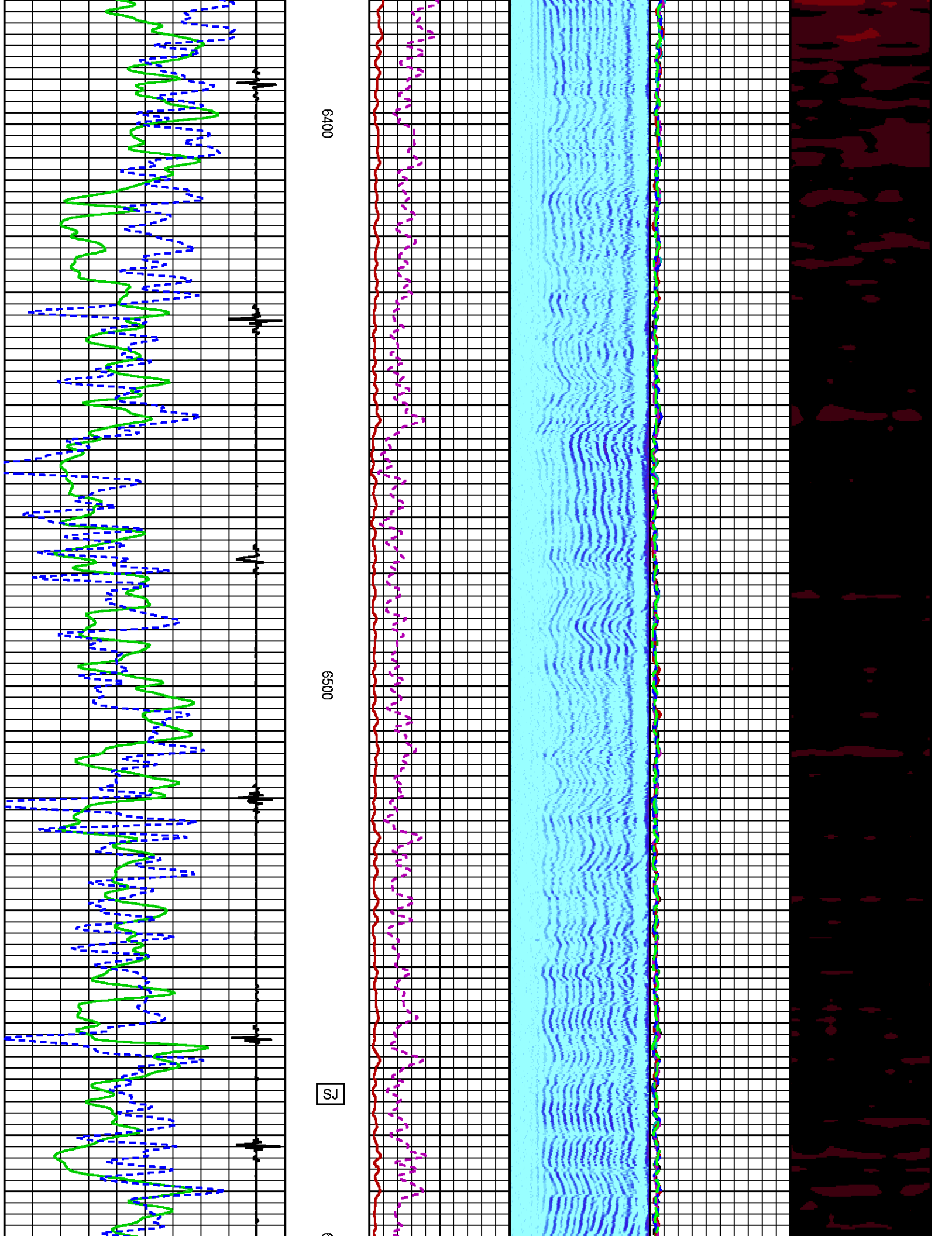


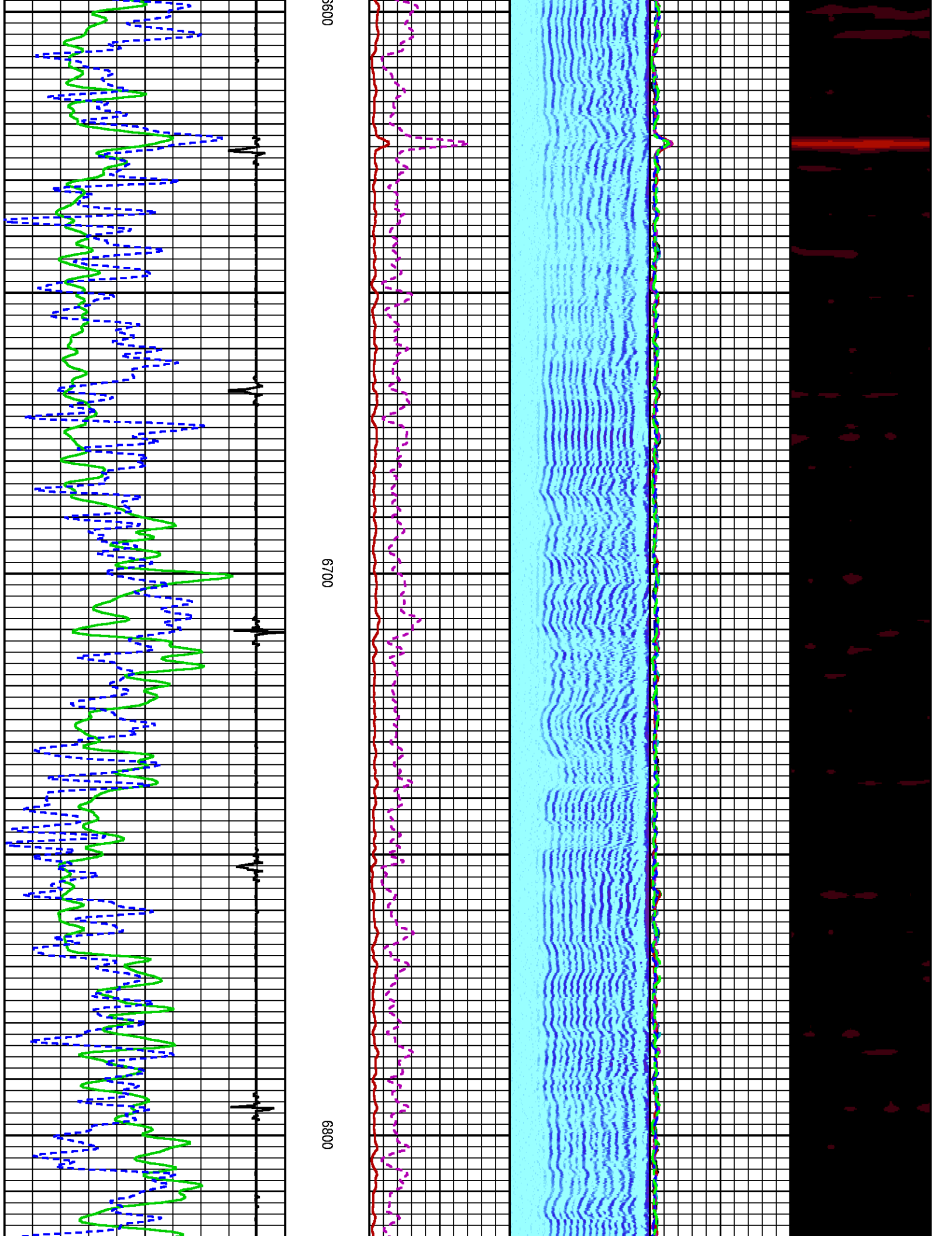


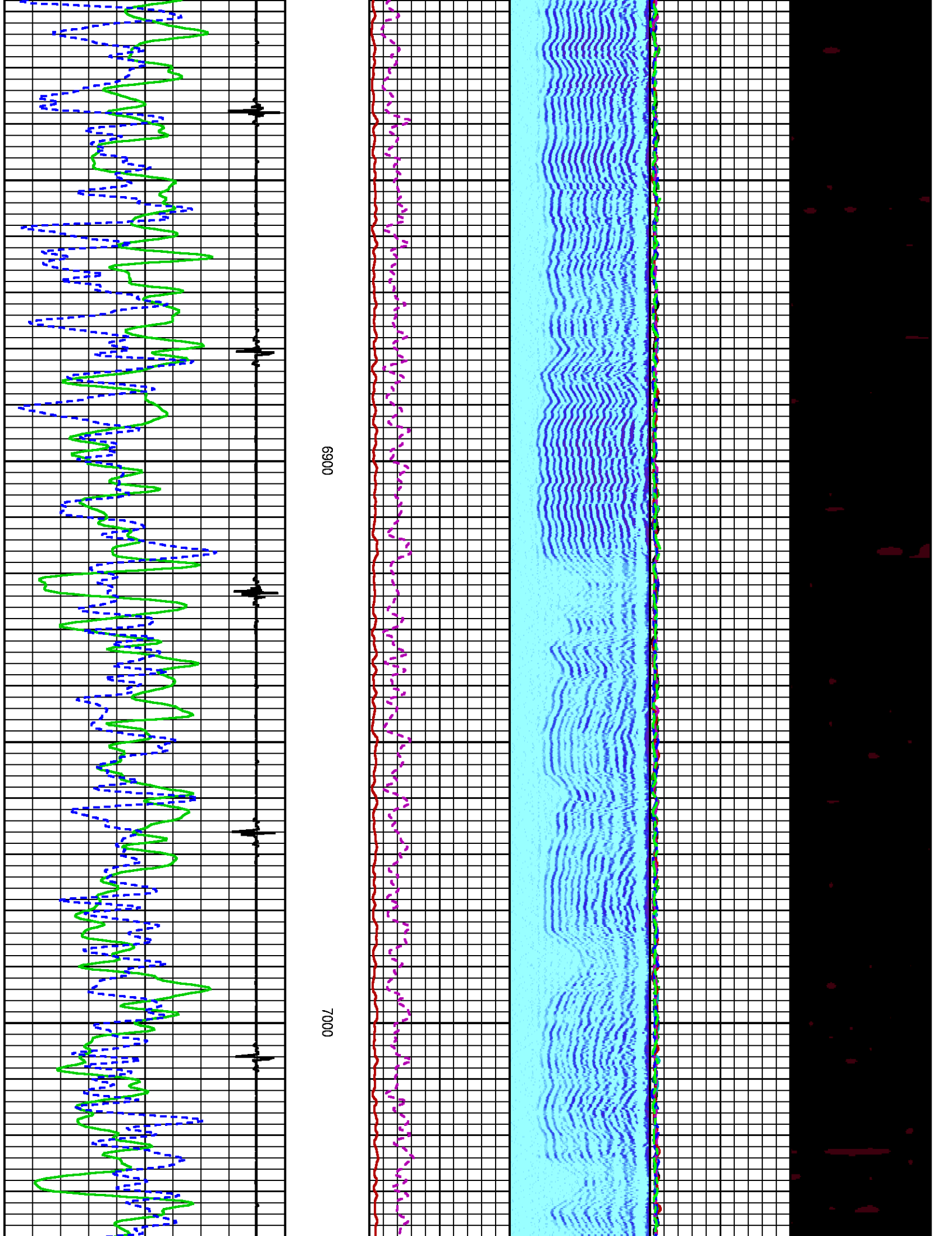


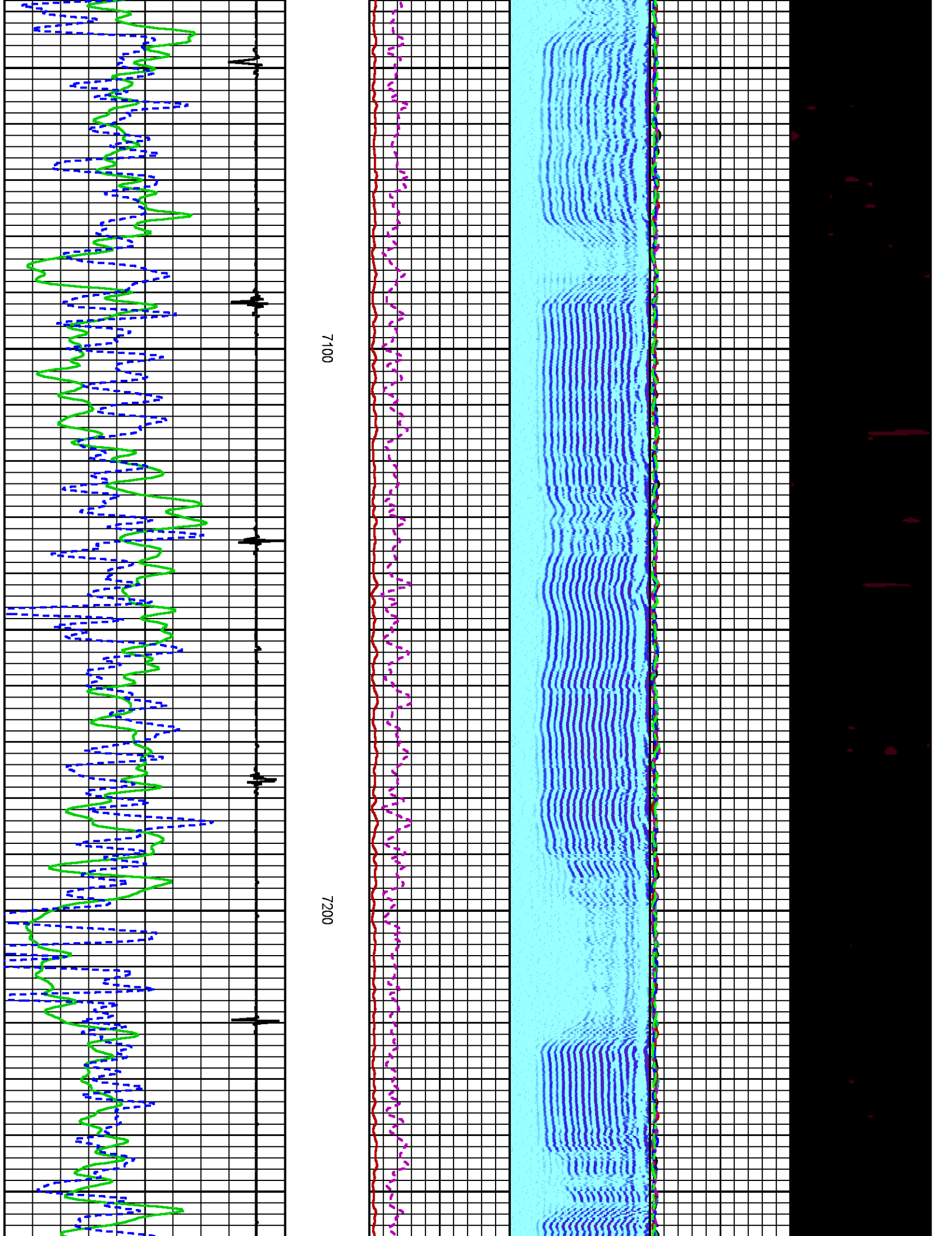


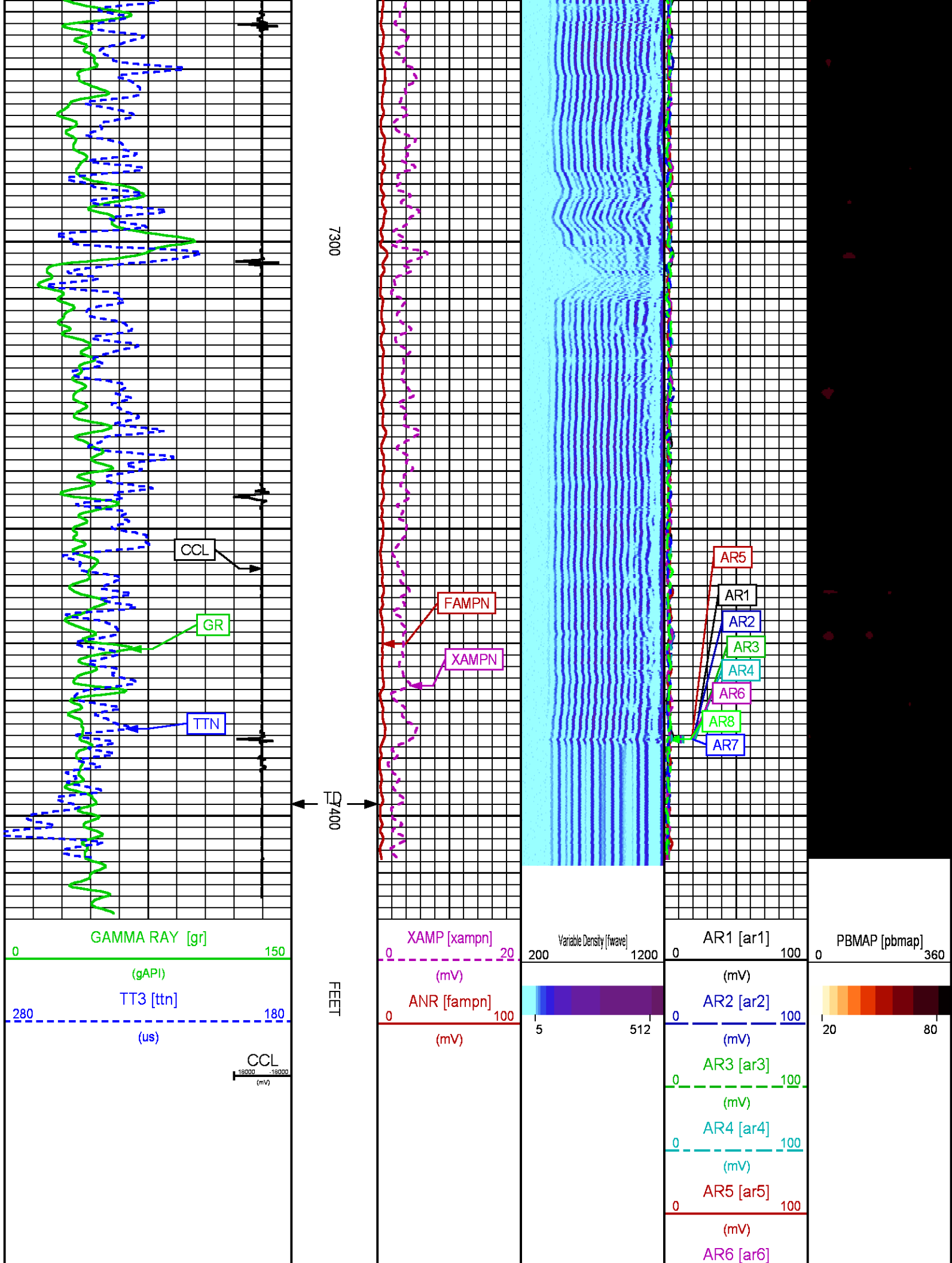




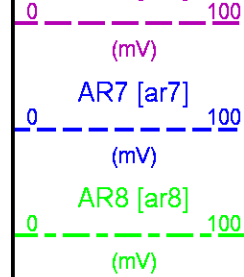












REPEAT PASS 0 PSI

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

Plotted: Thu Apr 26 14:17:50 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_NICHOLS\_0994\_24\_10W/p012g01.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 7162.500 ft BOTTOM DEPTH: 7404.433 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*)	186	us	TOP	BOTTOM
	AMP WINDOW START (fgp2*)	186	us	"	"
	AMP WINDOW START (fgp3*)	186	us	"	"
	AMP WINDOW START (fgp4*)	186	us	"	"
	AMP WINDOW START (fgp5*)	186	us	"	"
	AMP WINDOW START (fgp6*)	186	us	"	"
	AMP WINDOW START (fgp7*)	186	us	"	"
	AMP WINDOW START (fgp8*)	186	us	"	"
	AMP WINDOW START (fgpn*)	186	us	"	"
	AMP WINDOW LENGTH	25	us	"	"
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	192	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	5	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	200.391	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-65	us	"	"
	TOOL DELAY (str2*)	-65	us	"	"
	TOOL DELAY (str3*)	-65	us	"	"
	TOOL DELAY (str4*)	-65	us	"	"
	TOOL DELAY (str5*)	-65	us	"	"
	TOOL DELAY (str6*)	-65	us	"	"
	TOOL DELAY (str7*)	-65	us	"	"
	TOOL DELAY (str8*)	-65	us	"	"
	TOOL DELAY (strn*)	-65	us	"	"
BASELINE NOISE (NEAR)	NOISE WINDOW START	125	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	3	mV	"	"
	FULL BOND AMP REC 2	3	mV	"	"
	FULL BOND AMP REC 3	3	mV	"	"
	FULL BOND AMP REC 4	3	mV	"	"
	FULL BOND AMP REC 5	3	mV	"	"
	FULL BOND AMP REC 6	3	mV	"	"
	FULL BOND AMP REC 7	3	mV	"	"
	FULL BOND AMP REC 8	3	mV	"	"

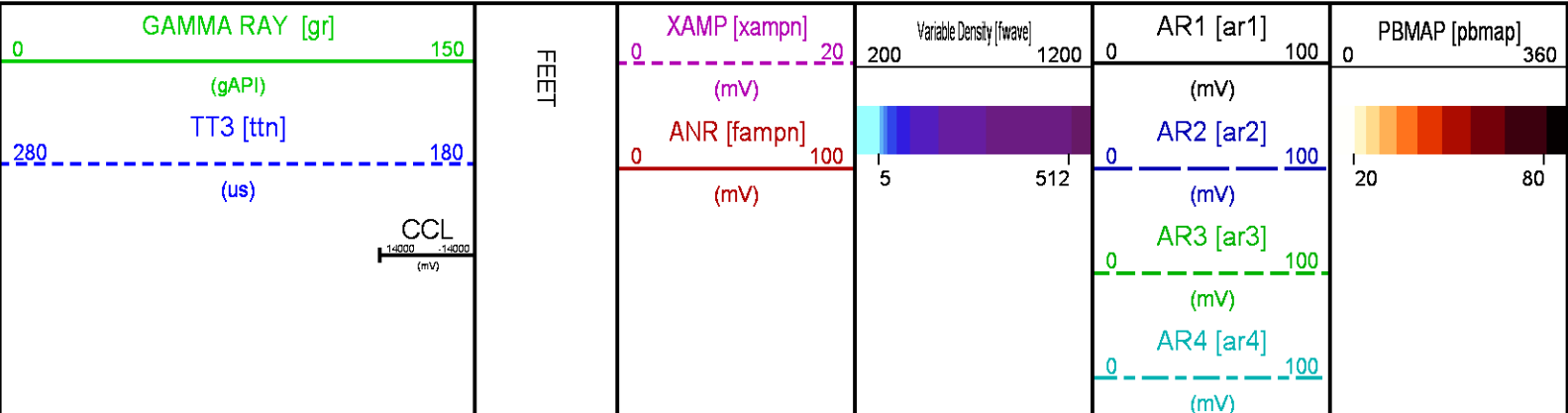
# CURVE DESCRIPTION REPORT

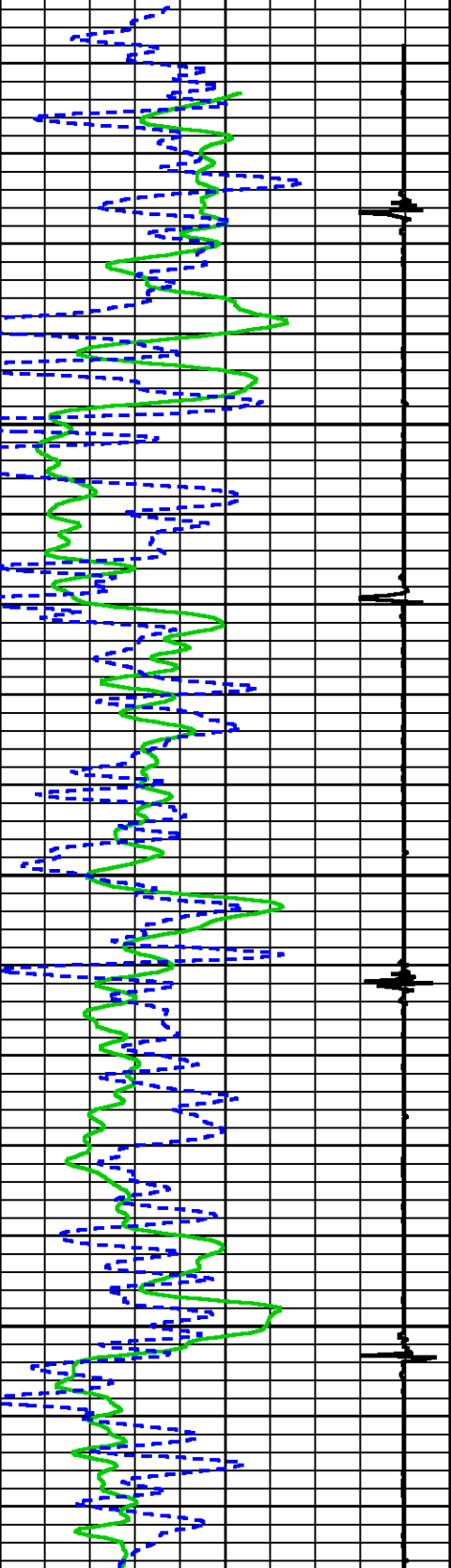
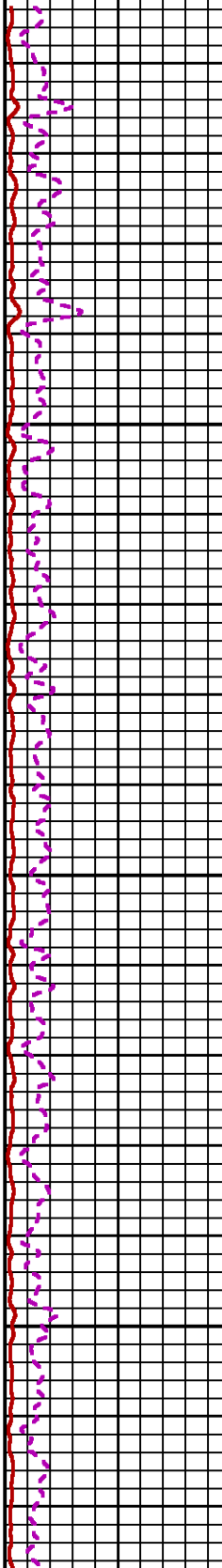
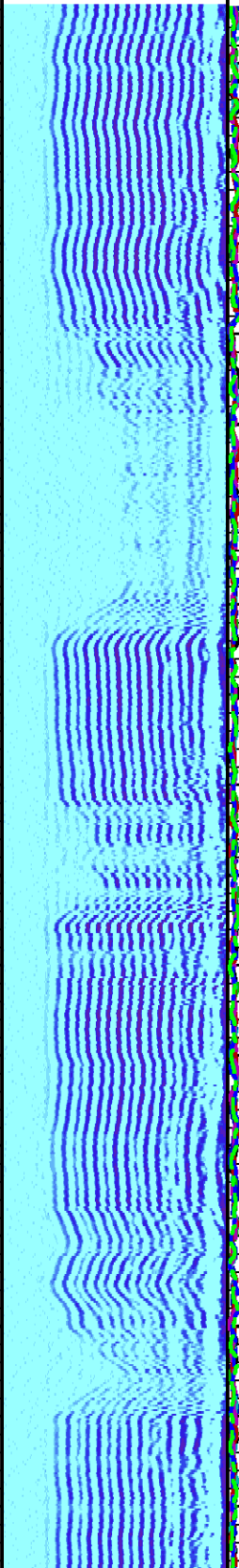
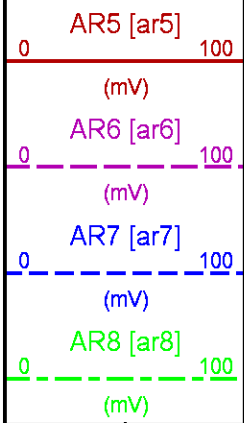
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	FIXED GATE AMPLITUDE T-R7
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		

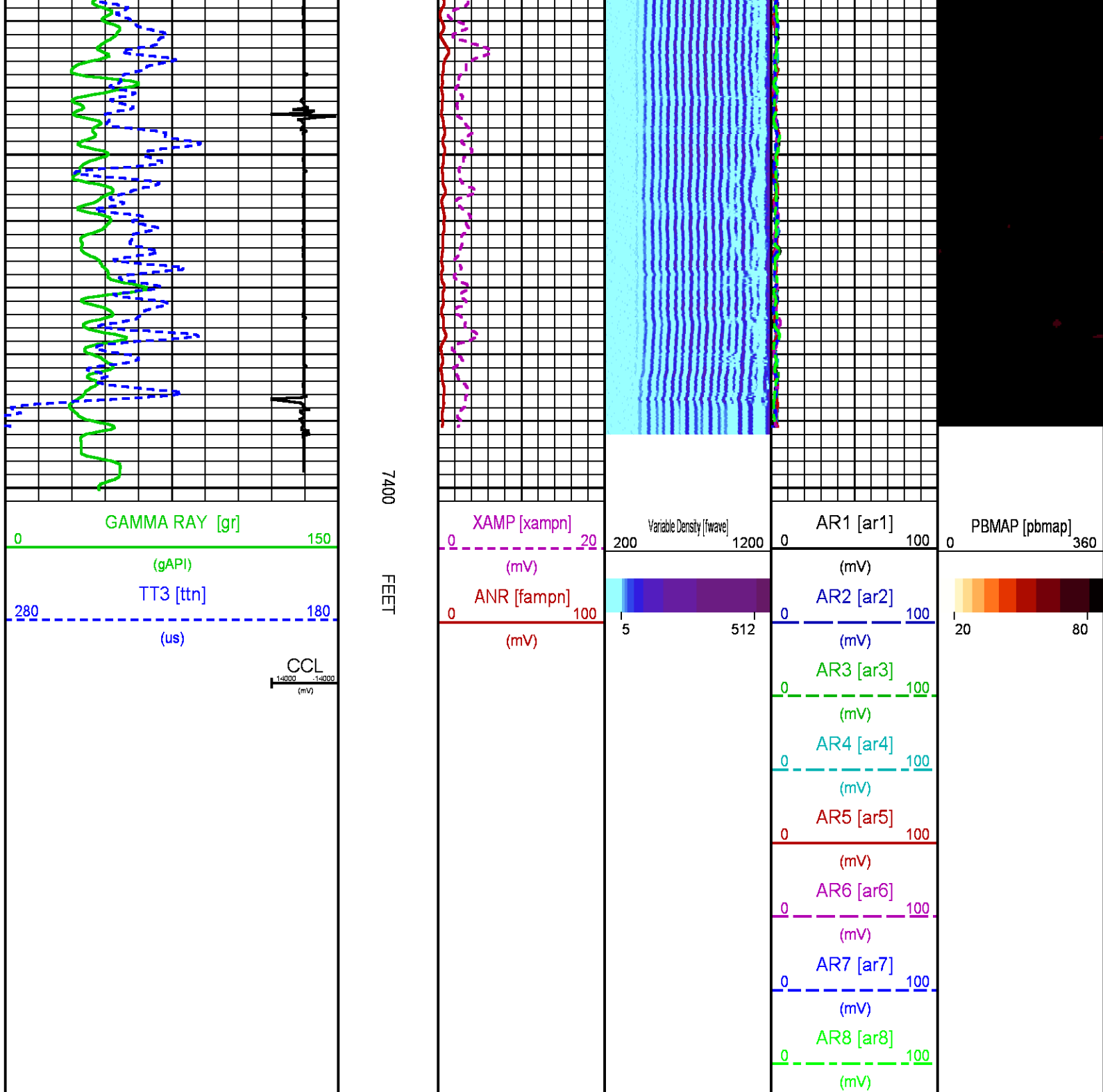
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<b>Plot Interval</b>	: 7153.5 - 7402 Feet
<b>Data File 1</b>	: F1 : SysA:/dat1a/LARAMIE_NICHOLS_0994_24_10W/0994-24-10W_RAL_REPEAT.xtf
<b>Created On</b>	: N/A
<b>Company</b>	: LARAMIE ENERGY LLC
<b>Well</b>	: NICHOLS 0994-24-10W
<b>Field</b>	: VEGA
<b>File Interval</b>	: 7152.5 - 7403.25 Feet
<b>OCT</b>	: p012g





7200

7300



## CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/LARAMIE\_NICHOLS\_0994\_24\_10W/p012g.tp1

## RAL PRIMARY CALIBRATION SUMMARY

TOOL #: 1426XA 11871500

DATE/TIME PERFORMED: Thu Apr 26 10:02:12 2018

UNIT #: 5753XD 111111

NEAR RADIAL FAR

	(mV)	(mV)	(mV)
TARGETS	100.00	100.00	150.00

	NEAR	R1	R2	R3	R4	R5	R6	R7	R8	FAR	CAL
ZERO (mV)	-0.58	-0.17	-0.13	-0.36	-0.17	-0.28	-0.05	-0.02	0.05	-0.34	0.02
AMP FLUID (mV)	42	41	41	42	42	42	42	42	41	57	41
TT (us)	221	219	219	220	220	218	218	218	221	328	220
M FACTOR	2.34	2.41	2.41	2.36	2.36	2.35	2.37	2.40	2.42	2.64	2.46

### RAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1426XA 11871500      DATE/TIME PERFORMED: Thu Apr 26 10:09:43 2018      DAYS SINCE CAL: 0

UNIT #: 5753XD 111111      CABLE #: ML4291 SMALL1

	NEAR (mV)	R1 (mV)	R2 (mV)	R3 (mV)	R4 (mV)	R5 (mV)	R6 (mV)	R7 (mV)	R8 (mV)	FAR (mV)	CAL (mV)
ZERO	-0.36	-0.52	0.00	-0.38	-0.48	0.01	-0.10	1.04	0.39	-0.55	0.05
AMP AIR	2.43	2.60	2.74	2.98	2.18	2.80	3.08	2.09	2.22	2.40	100.46

SHOP M FACTOR	SHOP A FACTOR	WIRELINE FACTOR
2.46	0.00	1.00

### GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1355XA 11871507      DATE/TIME PERFORMED: Thu Mar 29 16:58:14 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	26.49	135.56	109.1	0.917	24.29	124.29	100

### GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1355XA 11871507      DATE/TIME PERFORMED: Thu Mar 29 17:00:00 2018

UNIT #: 4352 ML4352      VERI JIG #: 4702NK DA\_228

	BACKGROUND (cts)	CALBRTR ON (cts)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	26.53	135.96	0.917	24.33	124.65	100.33
						90.00      110.00

## INSTRUMENT CONFIGURATION



Diameter : 1.37"

#### RADIAL BOND TOOL

Diameter : 2.75"  
Length : 11.17'  
Weight : 126 lbs  
Series : 1426XA  
Mnemonic : RAL  
Measure Point: 4.21': NEAR RCVR  
Measure Point: 3.25': FAR RCVR

NEAR RCVR 11.17'

FAR RCVR 10.21'

#### RAL GR/TEMP/CCL/CHV DETECTOR

Diameter : 2.75"  
Length : 6.96'  
Weight : 85 lbs  
Series : 1355XA  
Mnemonic : RAL  
Measure Point: 5.79': CCL  
Measure Point: 1.67': GR  
Measure Point: 0.17': TEMP

CCL 5.79'

GR 1.67'

TEMP 0.17'

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

**BAKER  
HUGHES**  
a GE company



**COMPANY**  
**WELL**  
**FIELD**  
**COUNTY**

**LARAMIE ENERGY LLC**  
**NICHOLS 0994-24-10W**  
**VEGA**  
**MESA**

**STATE** **COLORADO**

**FILE NO:**

**CH136065**

**API NO:**

**05077103950000**

**LOCATION:**

SHL: 2256' FNL & 2787' FWL  
BHL: 2328' FNL & 1550' FWL

**ELEVATIONS:**

KB 7236 FT  
DF  
GL 7212 FT

SEC 24 TWP 9 S RGE 94 W

DATE **26-Apr-2018**

**ECLIPS**