



# RADIAL CEMENT BOND LOG

FILE NO: CH133066	COMPANY LARAMIE ENERGY LLC
API NO: 05077104730000	WELL BRUTON 30-19E
	FIELD VEGA
	COUNTY MESA
	STATE COLORADO

Ver. 4.10	LOCATION: SHL: 2636' FSL & 1854' FEL BHL: 615' FSL & 1175' FEL SEC 30 TWP 9S RGE 93W	OTHER SERVICES RPM
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PERMANENT DATUM LOG MEASURED FROM DRILL. MEAS. FROM	GL KB KB KB	ELEVATION 7643 FT 30 FT ABOVE P.D.
		ELEVATIONS: KB 7673 FT DF GL 7643 FT

DATE		03-Apr-2018			
RUN	TRIP	1	1		
SERVICE ORDER		US133066			
DEPTH DRILLER		8122 FT			
DEPTH LOGGER		8036 FT			
BOTTOM LOGGED INTERVAL		8036 FT			
TOP LOGGED INTERVAL		30 FT			
TIME STARTED		10:00			
TIME FINISHED		13:00			
OPERATOR RIG TIME		3 HOURS			
TYPE OF FLUID IN HOLE		WATER			
FLUID DENSITY		NA			
FLUID SALINITY		NA			
FLUID LEVEL		56 FT			
LOGGED CEMENT TOP		1560 FT			
WELLHEAD PRESSURE		0 PSI			
MAXIMUM HOLE DEVIATION		NA			
NOMINAL LOGGING SPEED		100 F/MN			
MAX. RECORDED TEMP.		230 DEGF			
REFERENCE LOG		NA			
REFERENCE LOG DATE		NA			
EQUIP. NO.	LOCATION	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: 6085' - 6104'  
SJ: 7184' - 7203'

## EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	RAL	1426XA	10417451	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: Tue Apr 3 14:49:58 2018

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_BRUTON\_30\_19E/p012g02.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 15.750 ft BOTTOM DEPTH: 8038.000 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*)	187	us	TOP	BOTTOM
	AMP WINDOW START (fgp2*)	187	us	"	"
	AMP WINDOW START (fgp3*)	187	us	"	"
	AMP WINDOW START (fgp4*)	187	us	"	"
	AMP WINDOW START (fgp5*)	187	us	"	"
	AMP WINDOW START (fgp6*)	187	us	"	"
	AMP WINDOW START (fgp7*)	187	us	"	"
	AMP WINDOW START (fgp8*)	187	us	"	"
	AMP WINDOW START (fgpn*)	187	us	"	"
	AMP WINDOW LENGTH	25	us	"	"
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	197	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

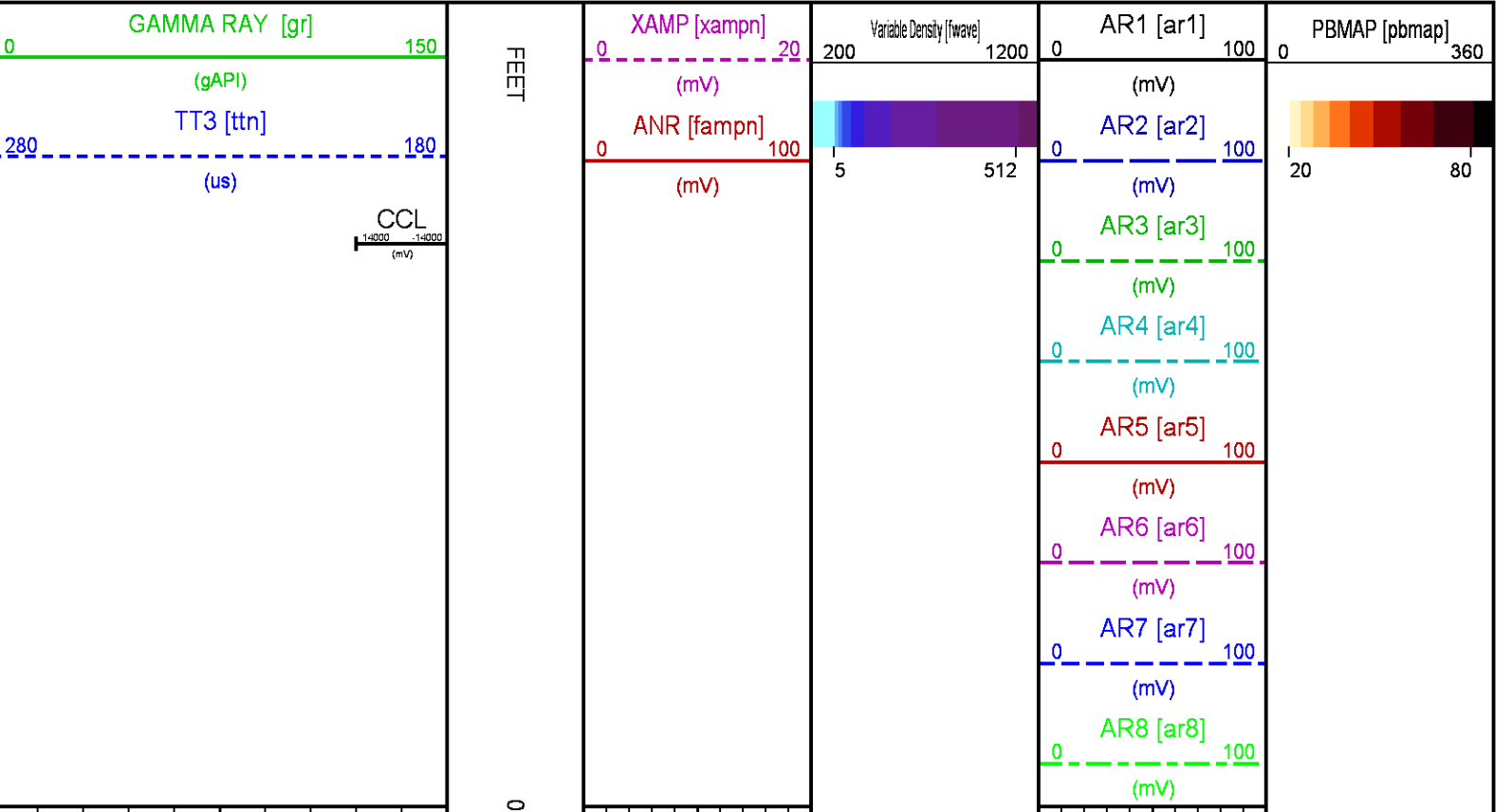
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	FIXED GATE AMPLITUDE T-R7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

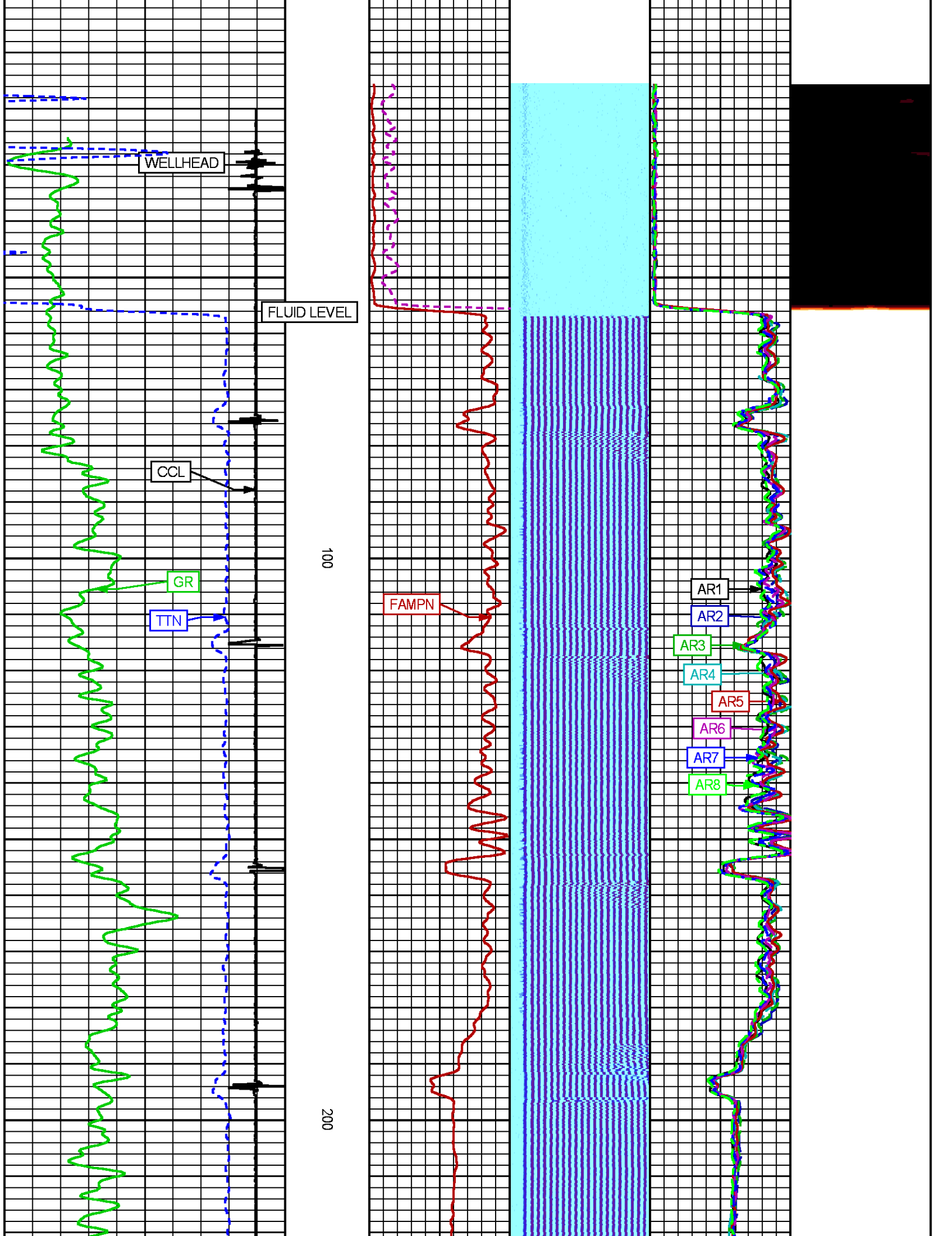
CURVE MEASURE POINT OFFSET

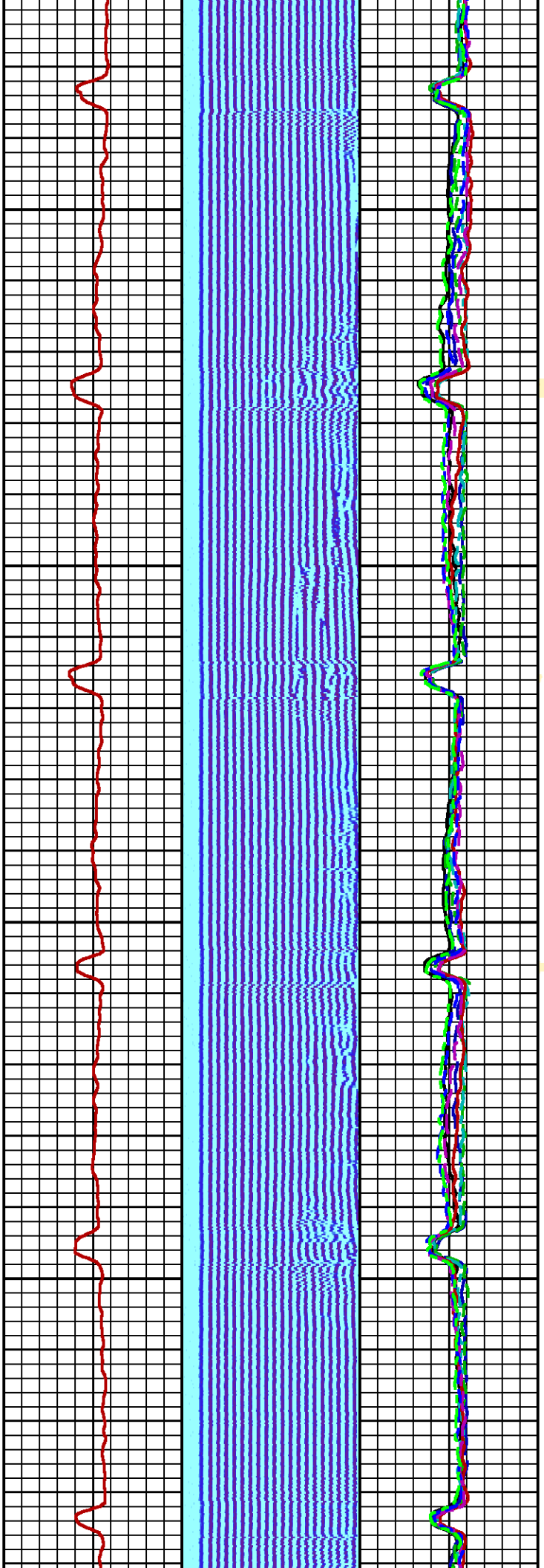
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
AR1	-11.25	AR5	-11.25	CCL	-5.75	XAMPN	-11.25
AR2	-11.25	AR6	-11.25	FAMPN	-11.25		
AR3	-11.25	AR7	-11.25	GR	-1.75		
AR4	-11.25	AR8	-11.25	TTN	-11.25		

Presentation : SysA:/dat1a/LARAMIE\_BRUTON\_30\_19E/30-19E\_RAL\_MAIN.fvpdf [5"/100' Scale]  
Plot Interval : 0 - 8050 Feet

Data File 1 : F1 : SysA:/dat1a/LARAMIE\_BRUTON\_30\_19E/30-19E\_RAL\_MAIN.xtf  
Created On : N/A  
Company : LARAMIE ENERGY LLC  
Well : BRUTON 30-19E  
Field : VEGA  
File Interval : 14.5 - 8048 Feet  
OCT : p012g

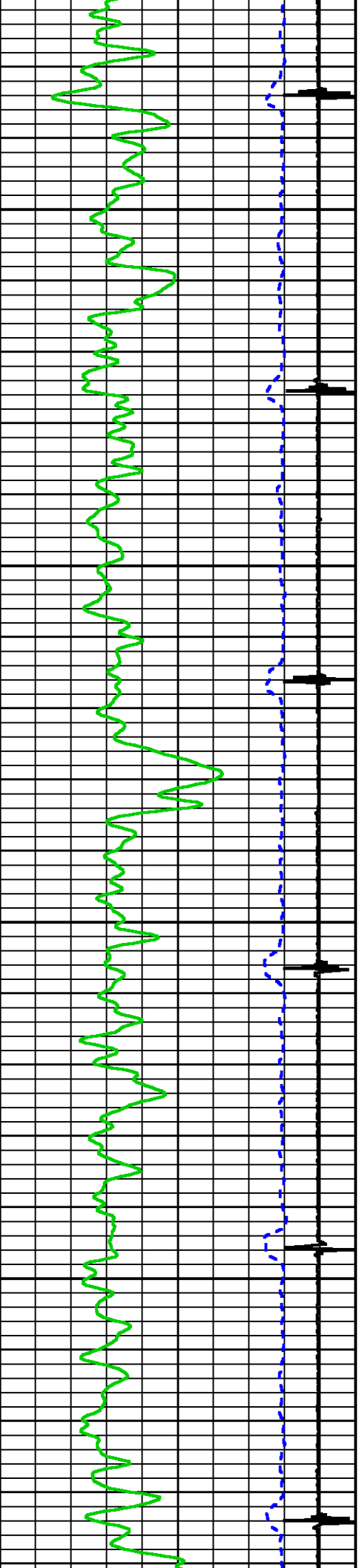


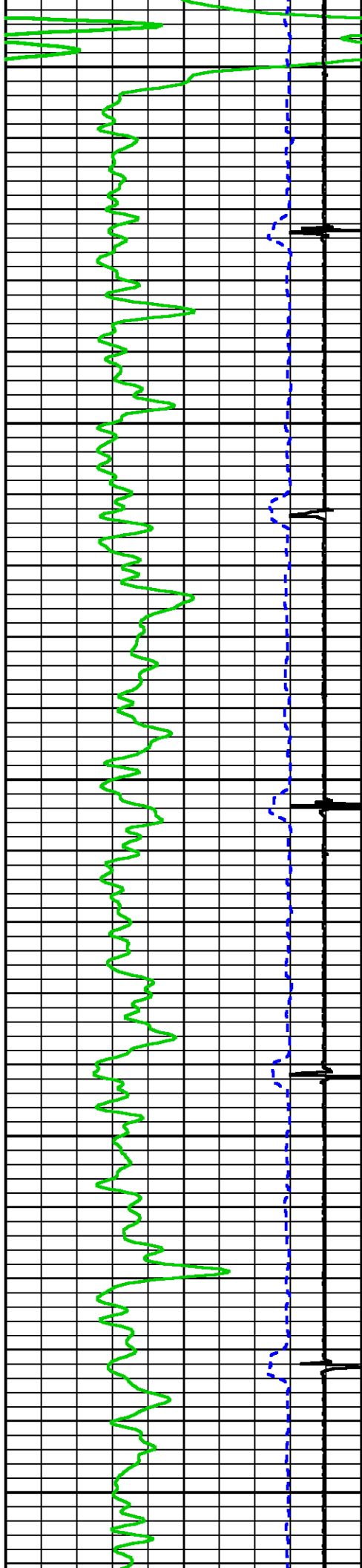




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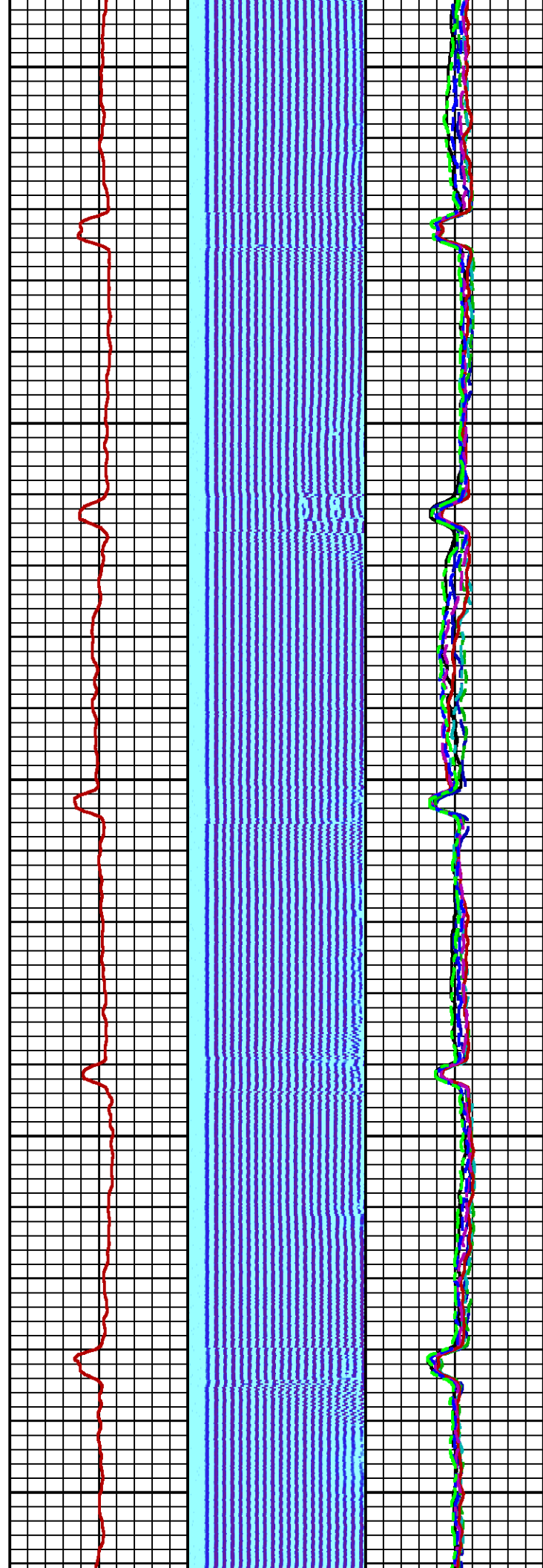
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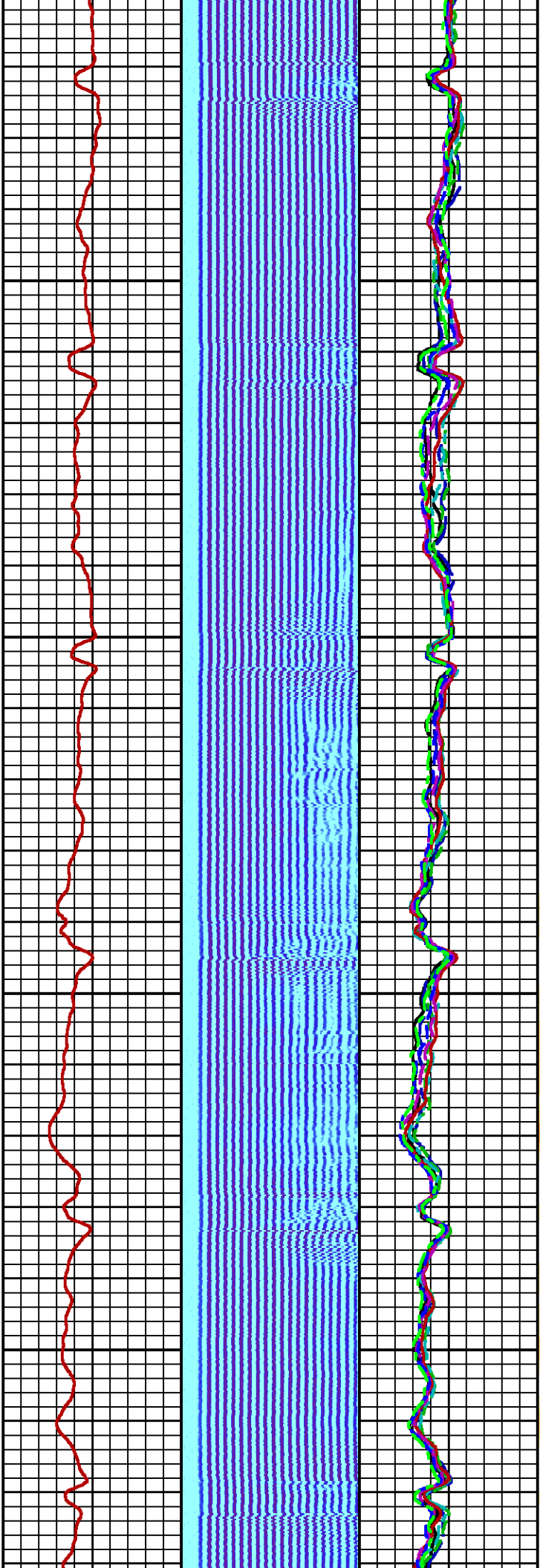
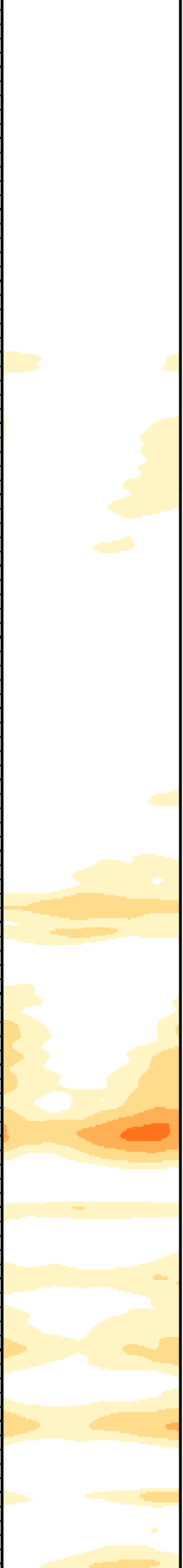


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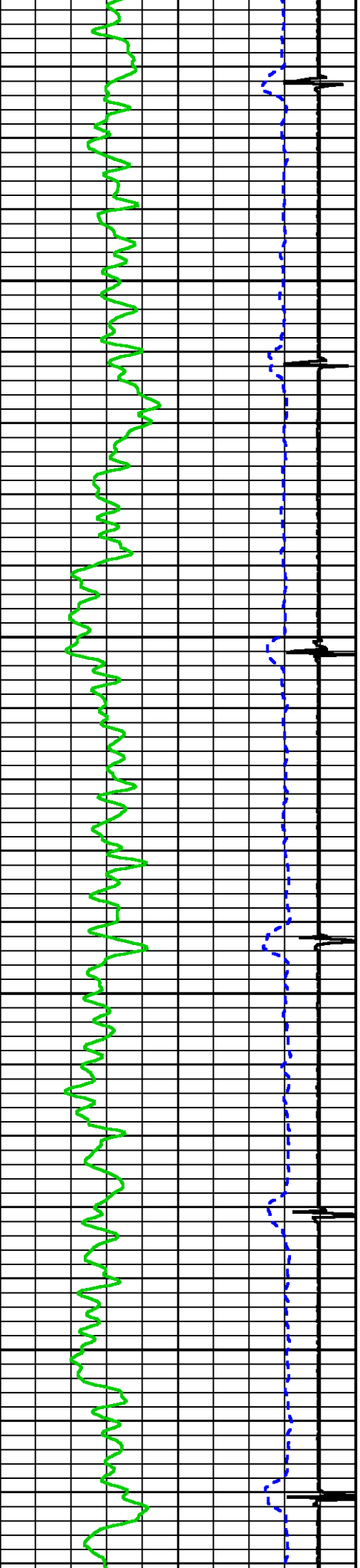


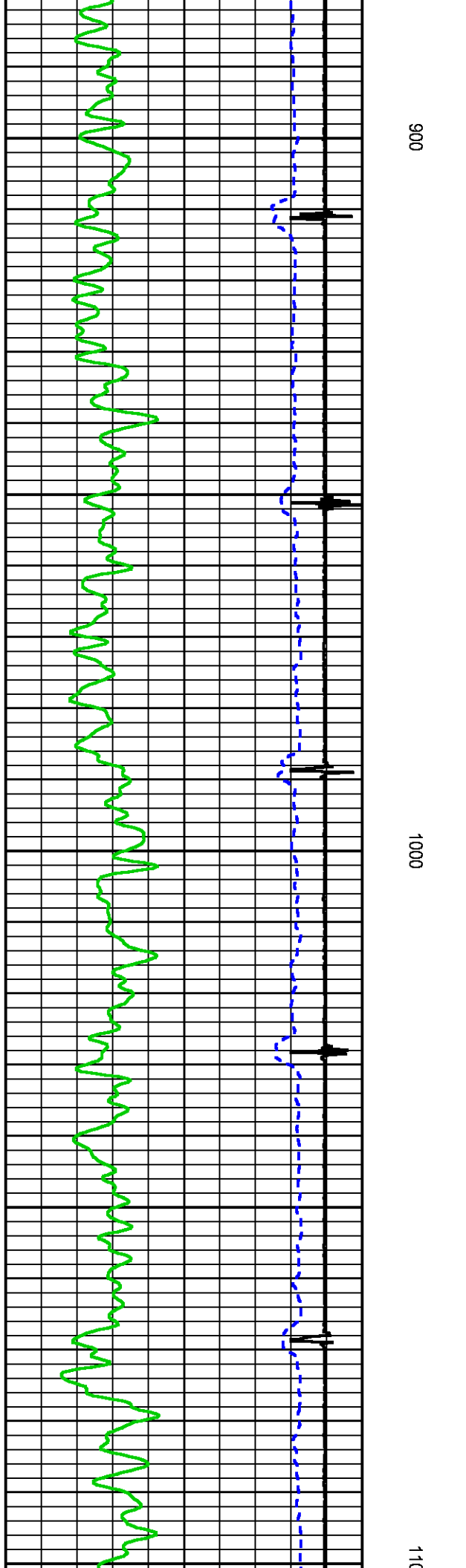
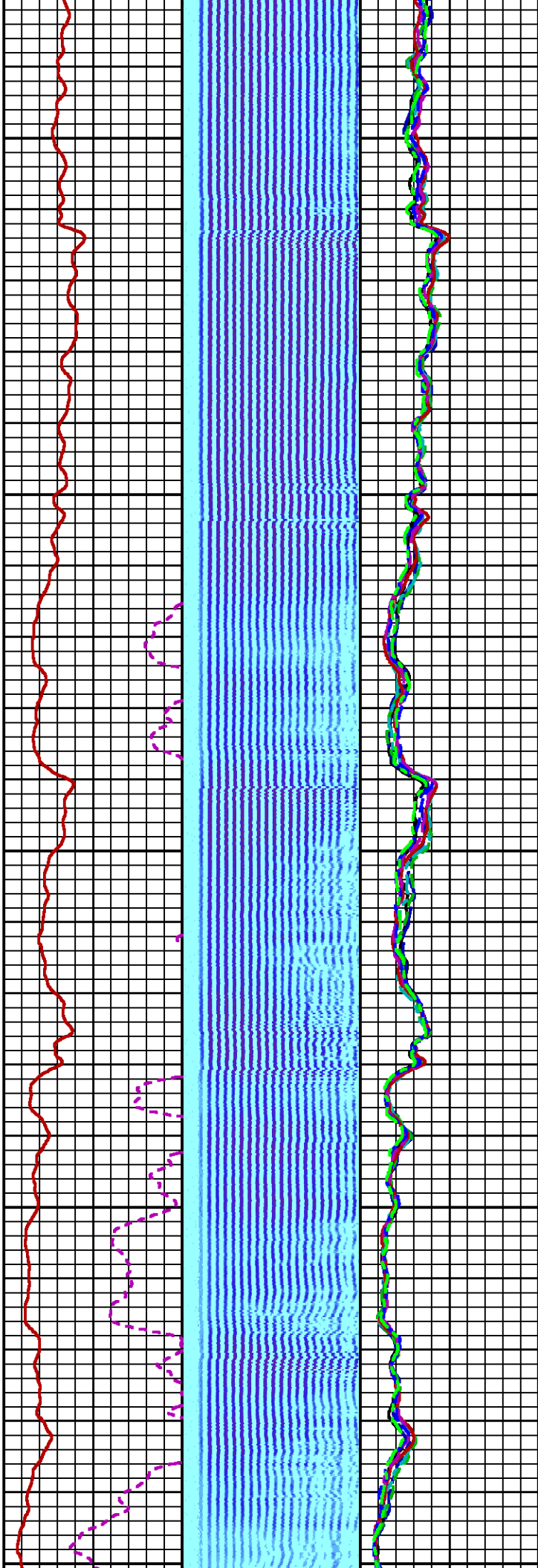
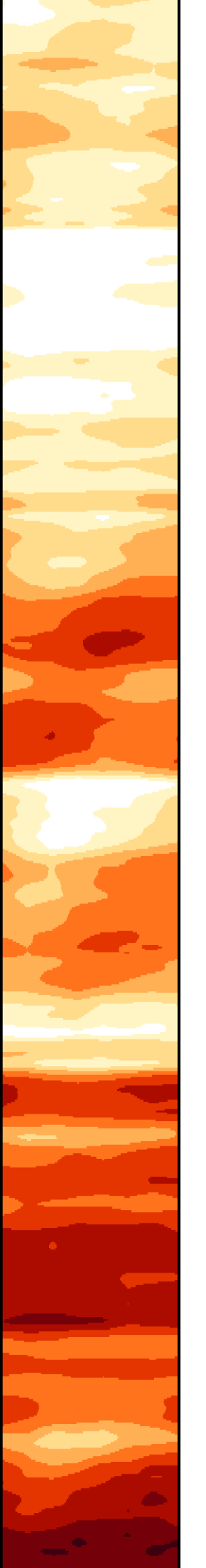




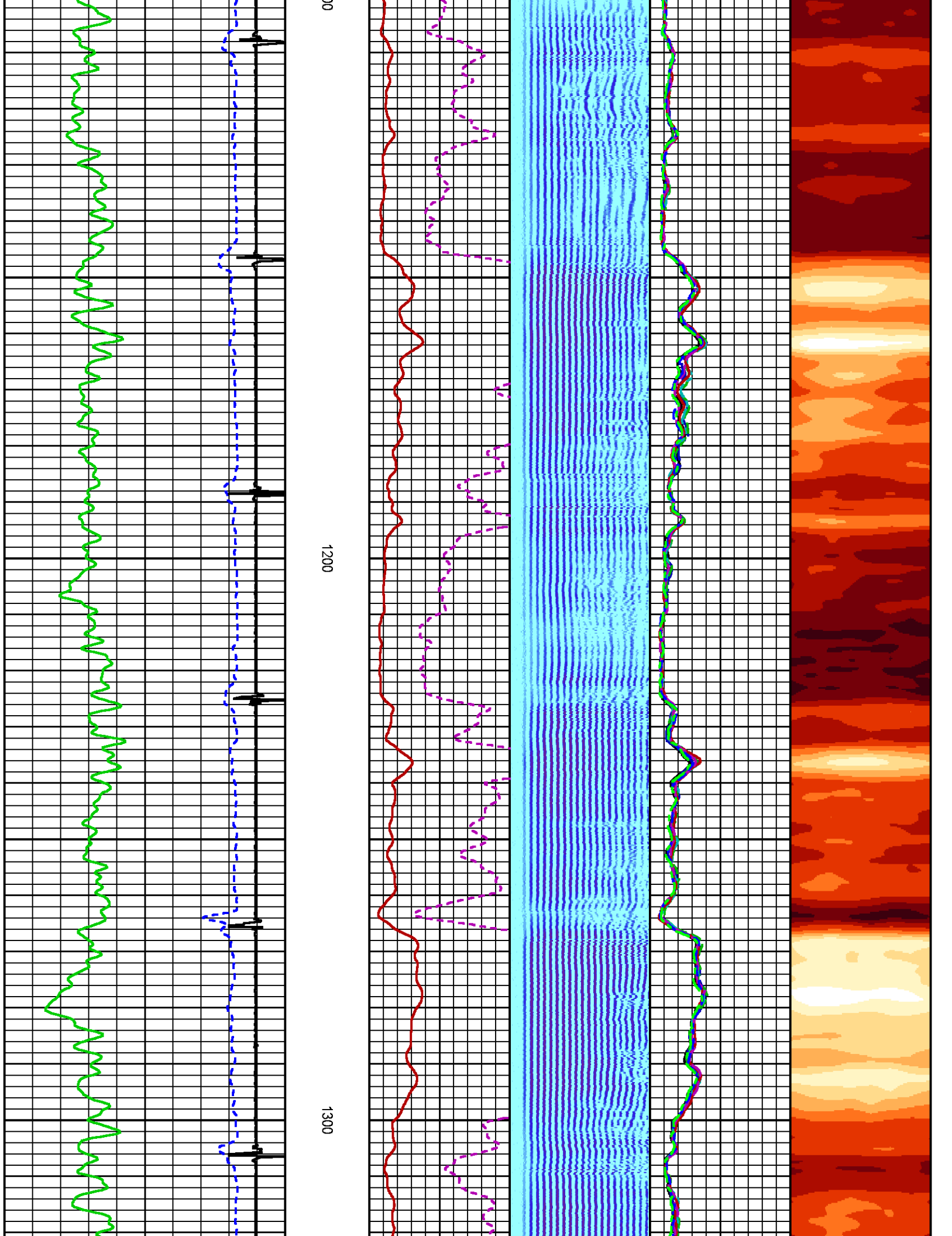
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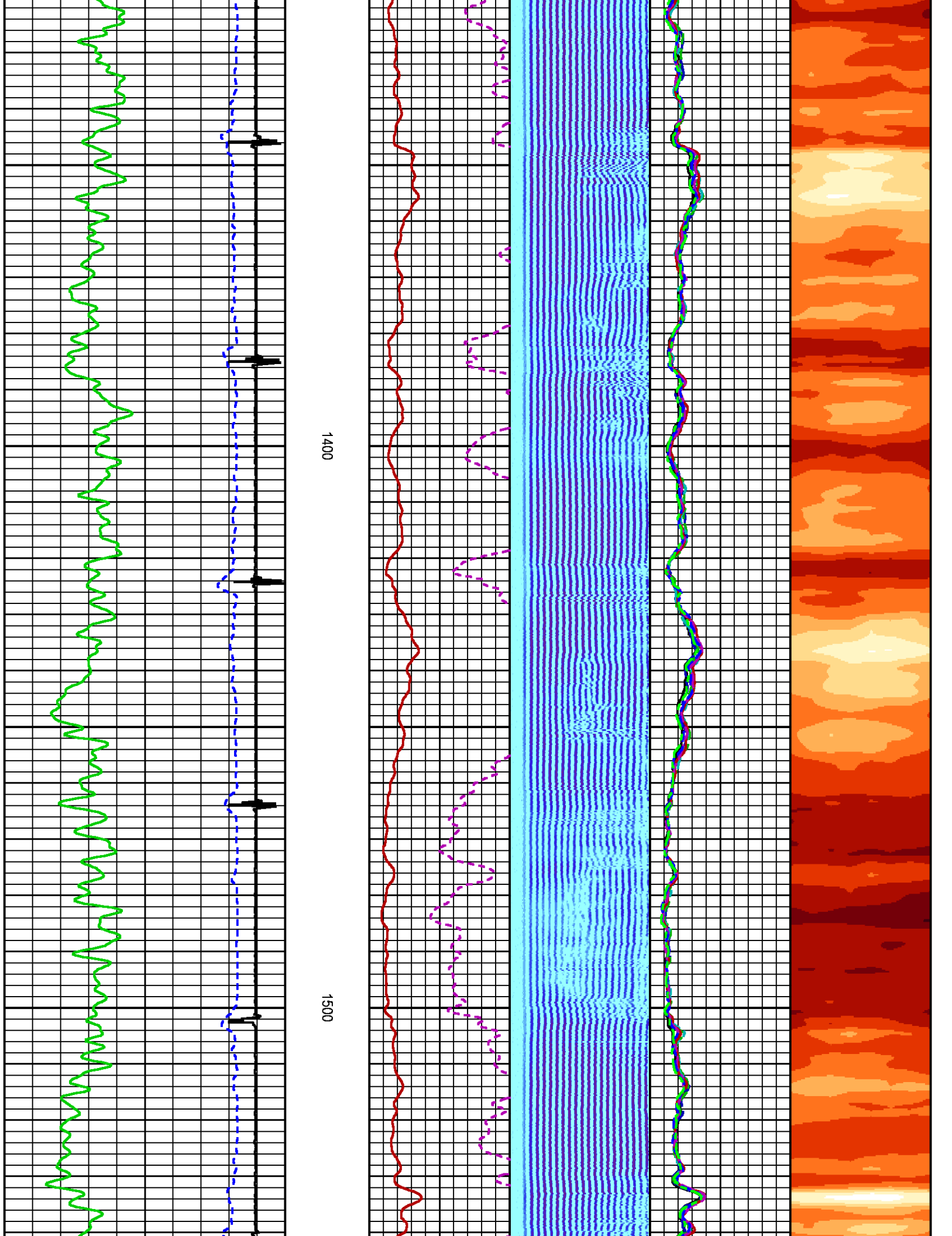
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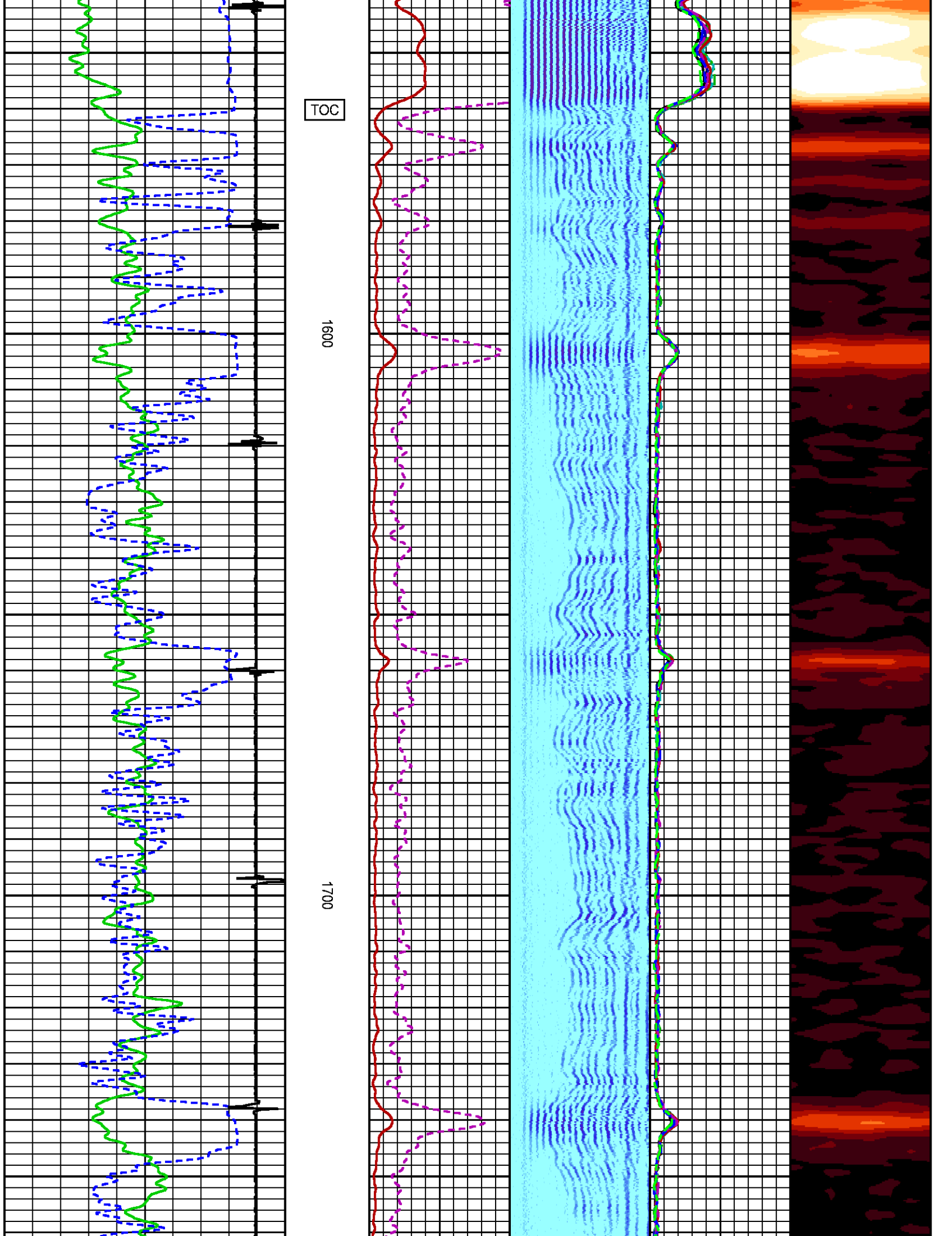


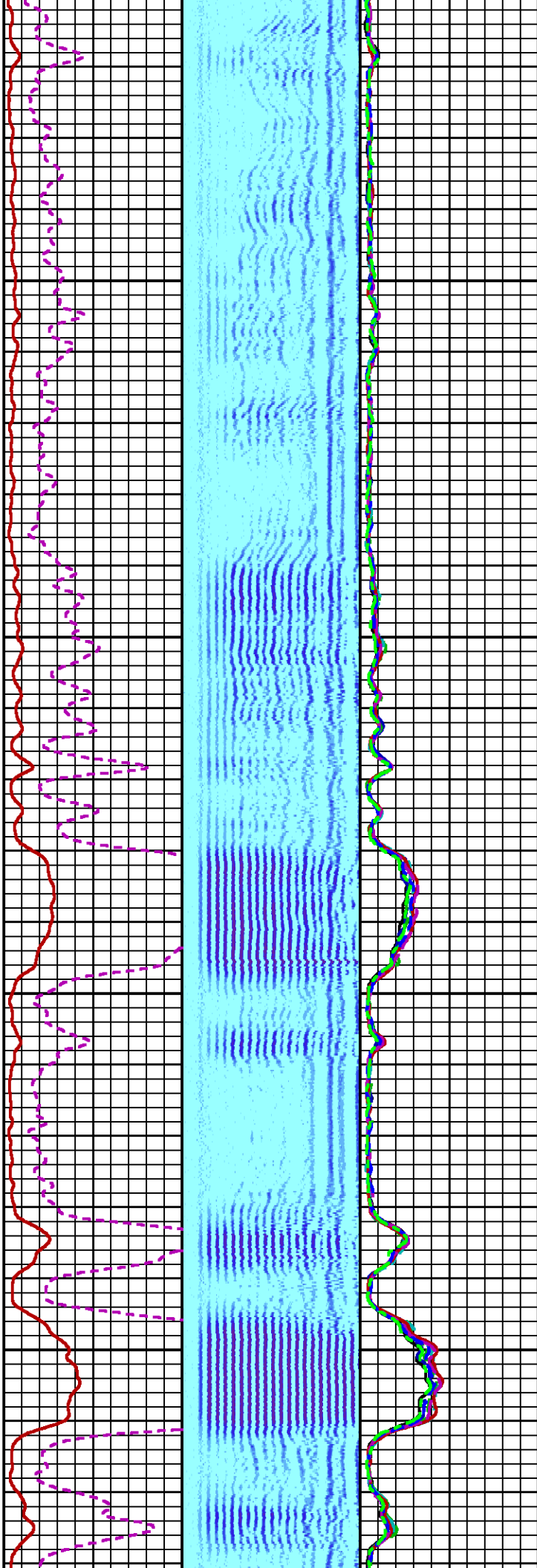
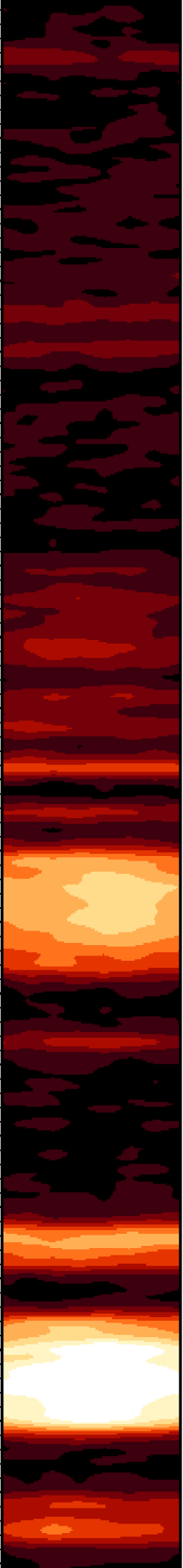






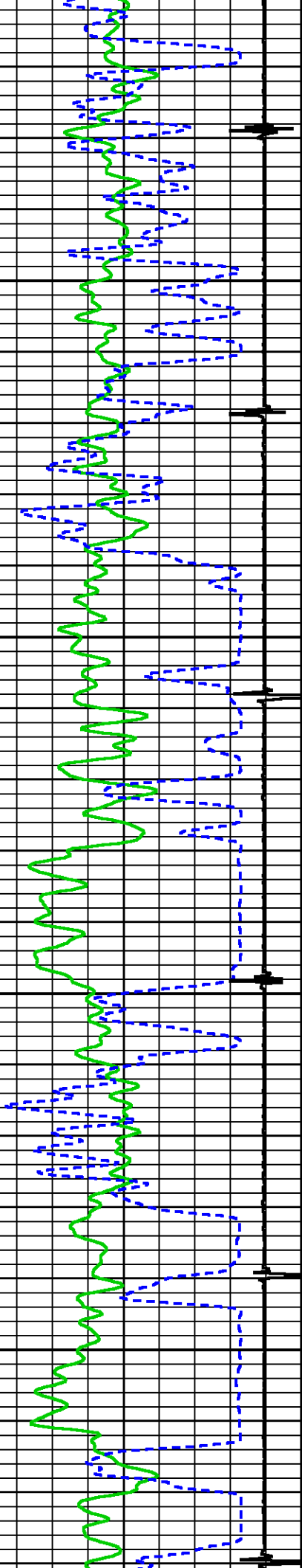




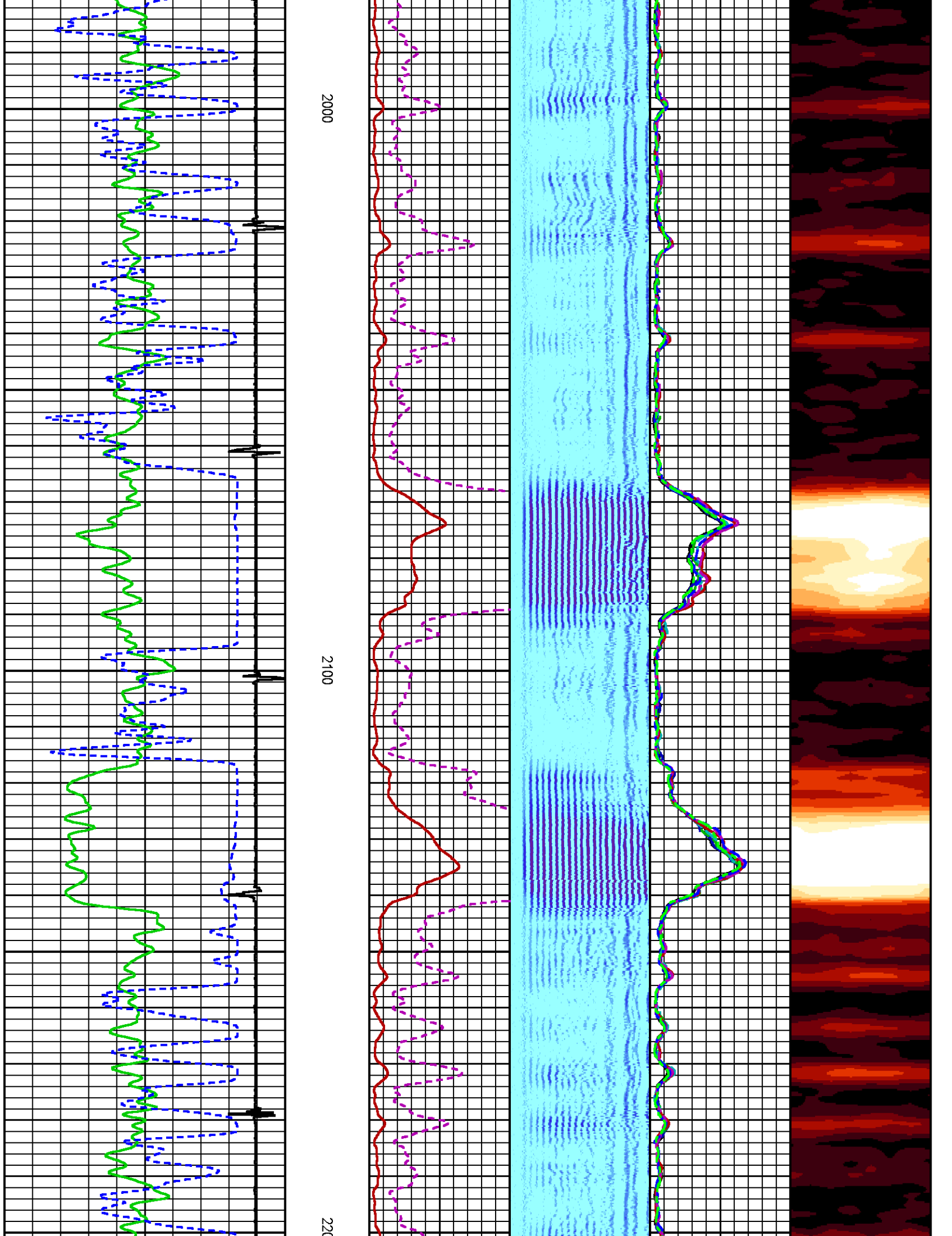


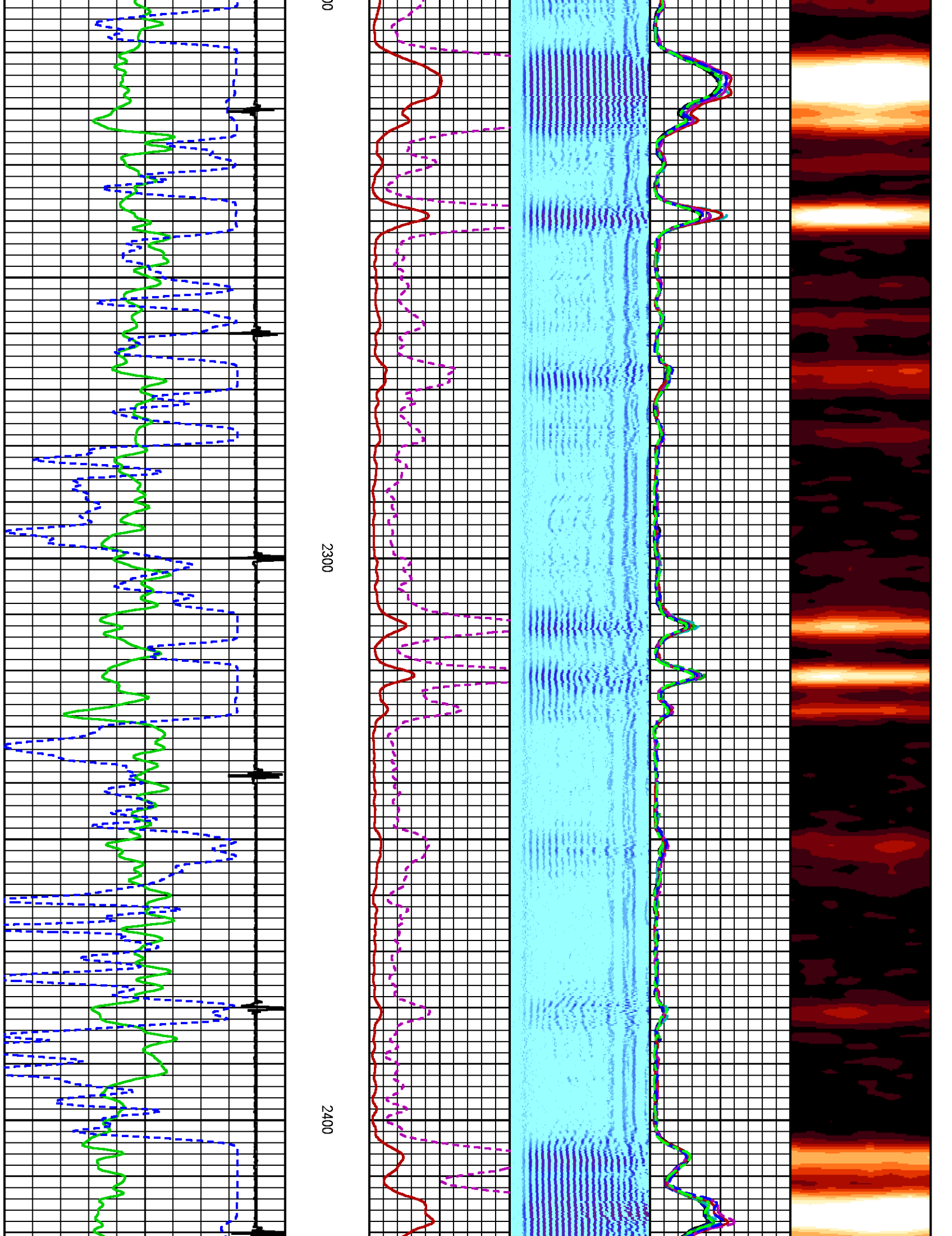
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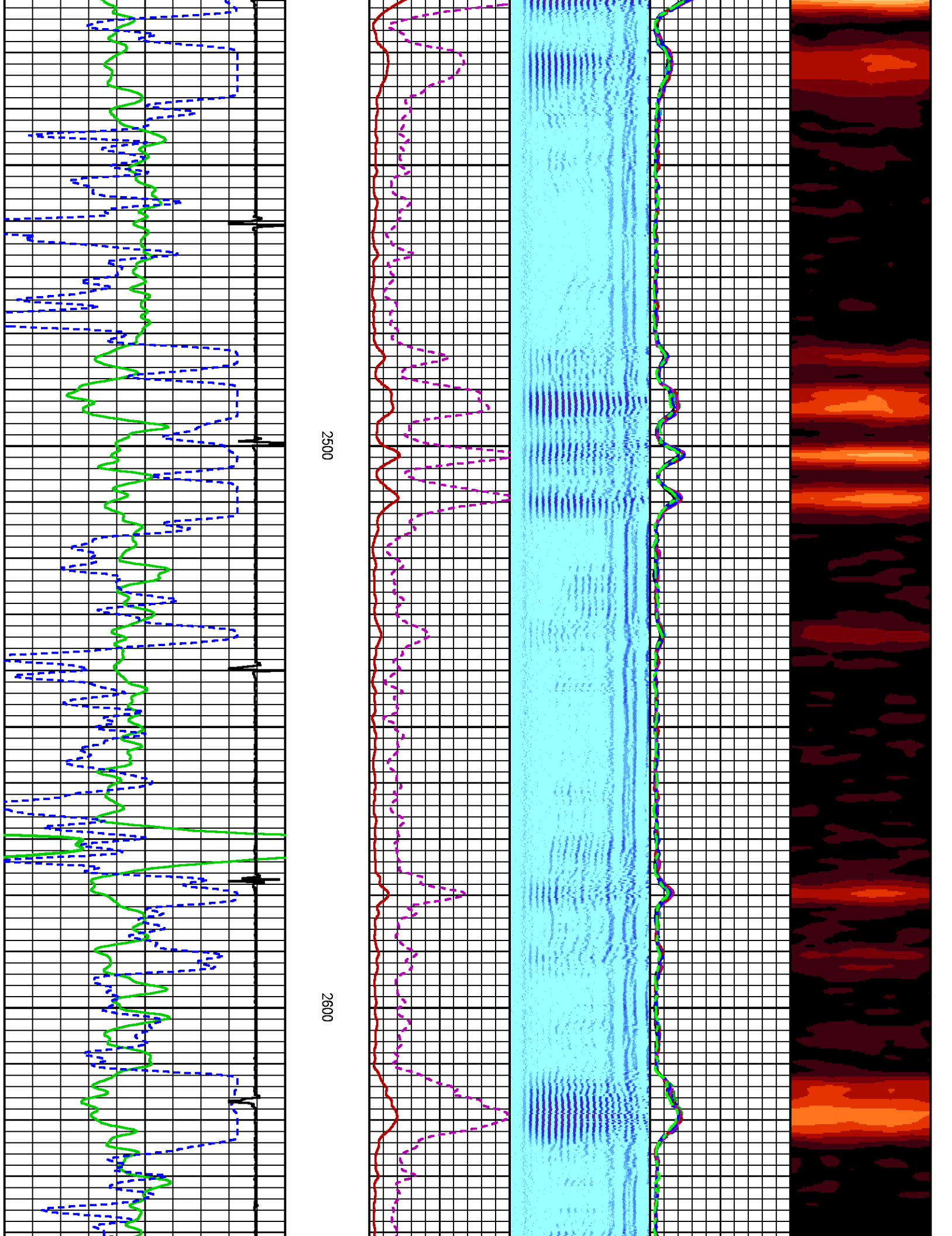


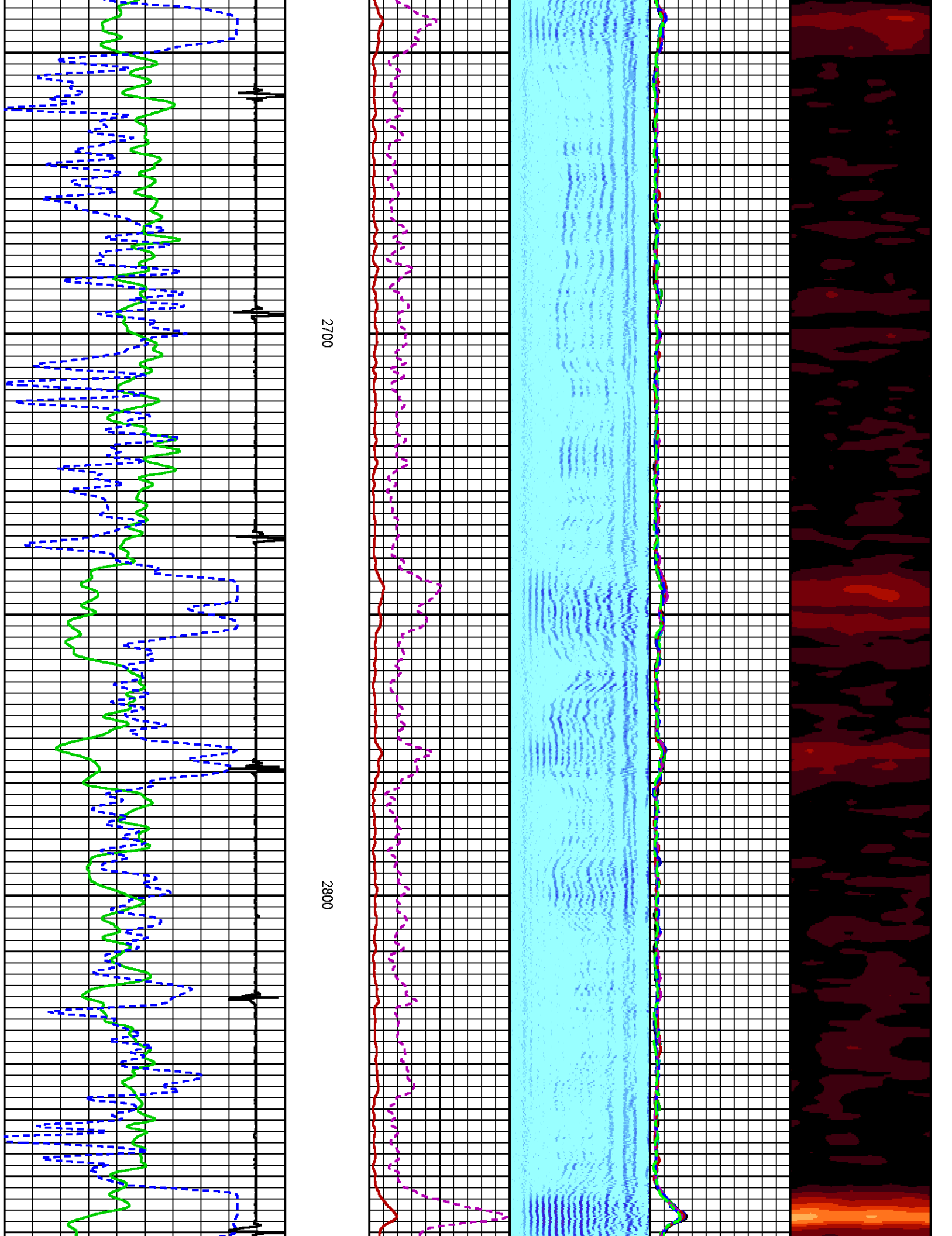


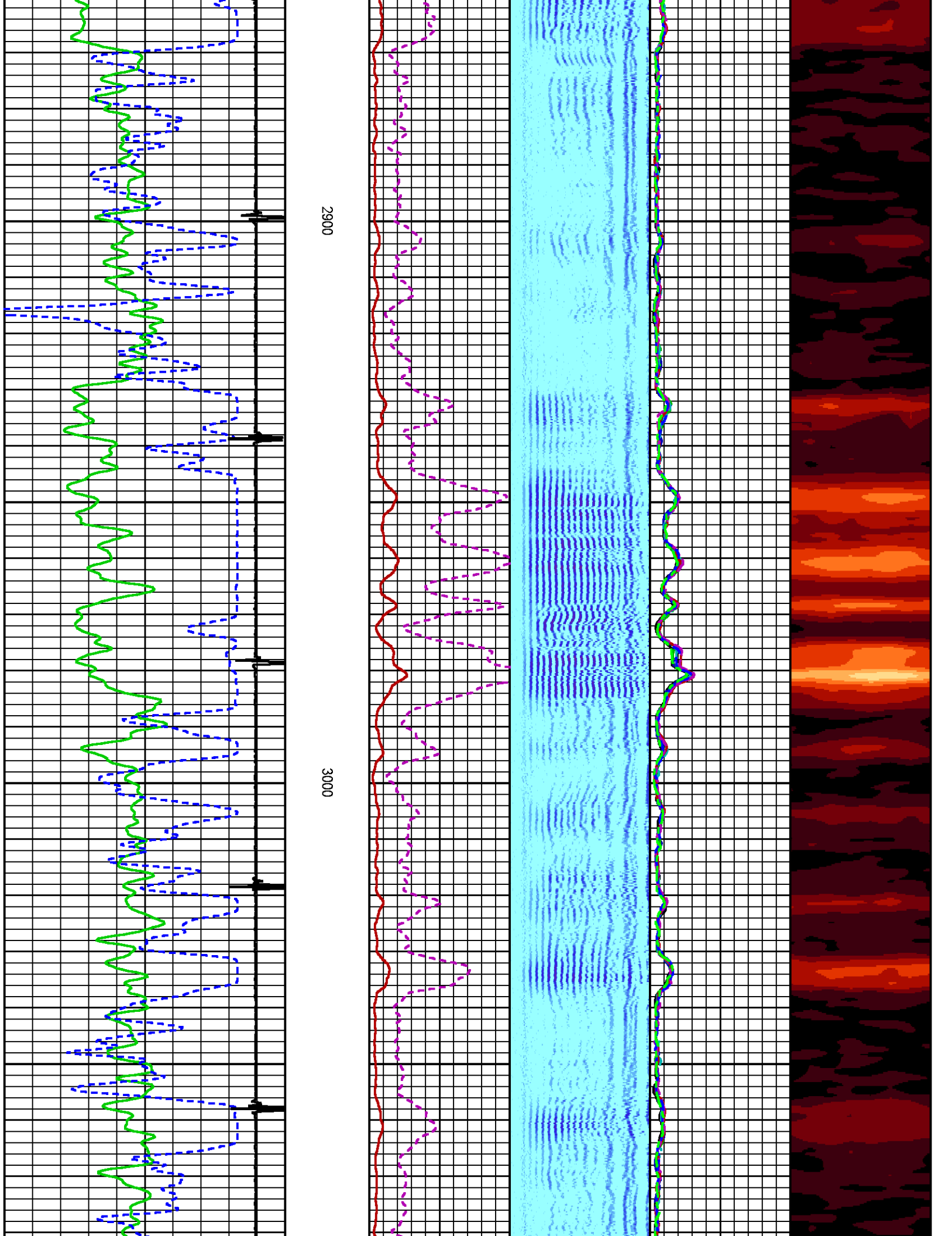


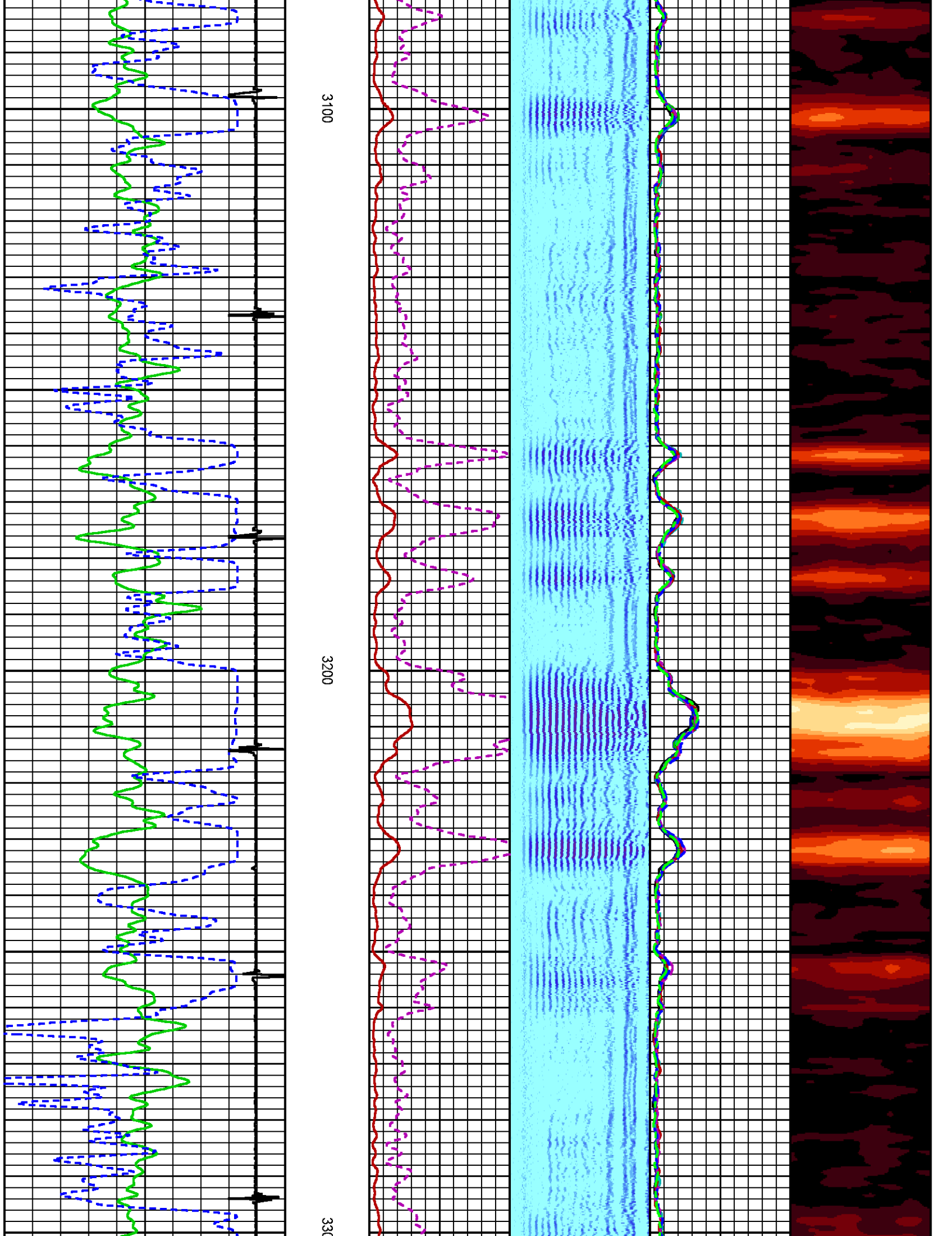


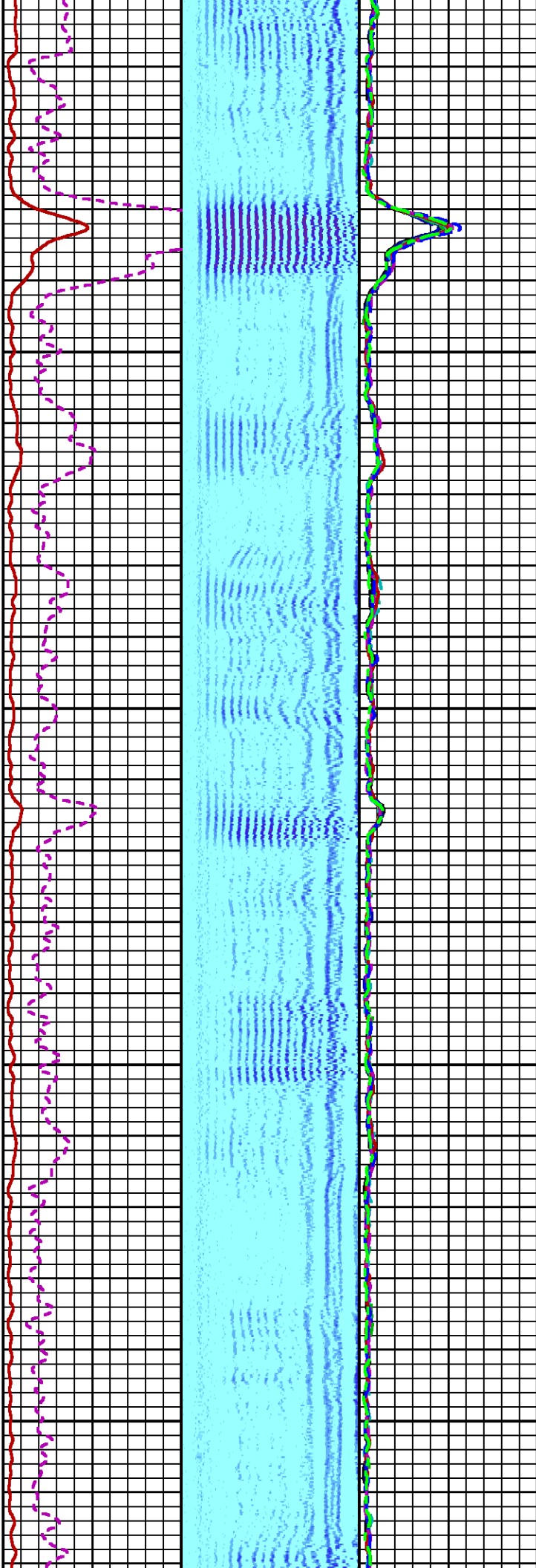




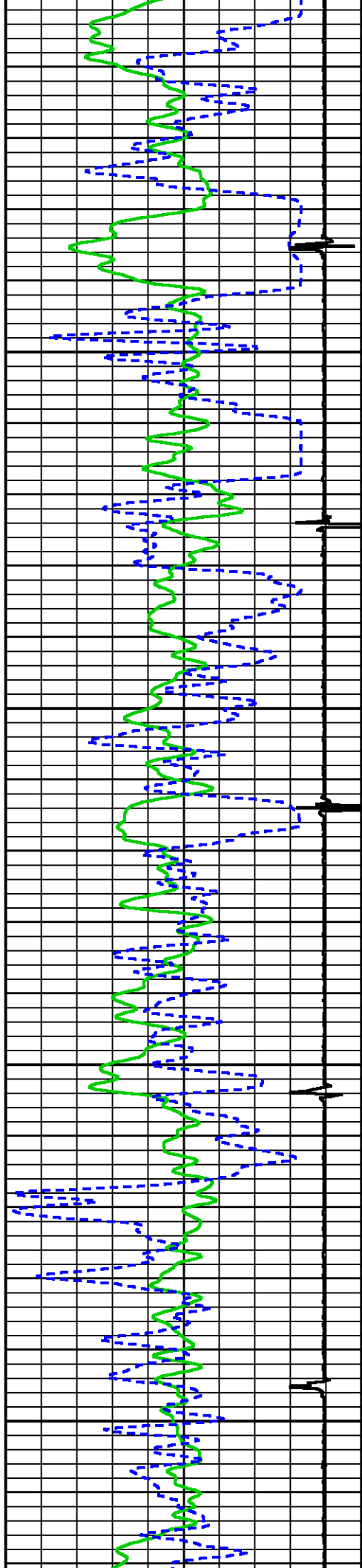




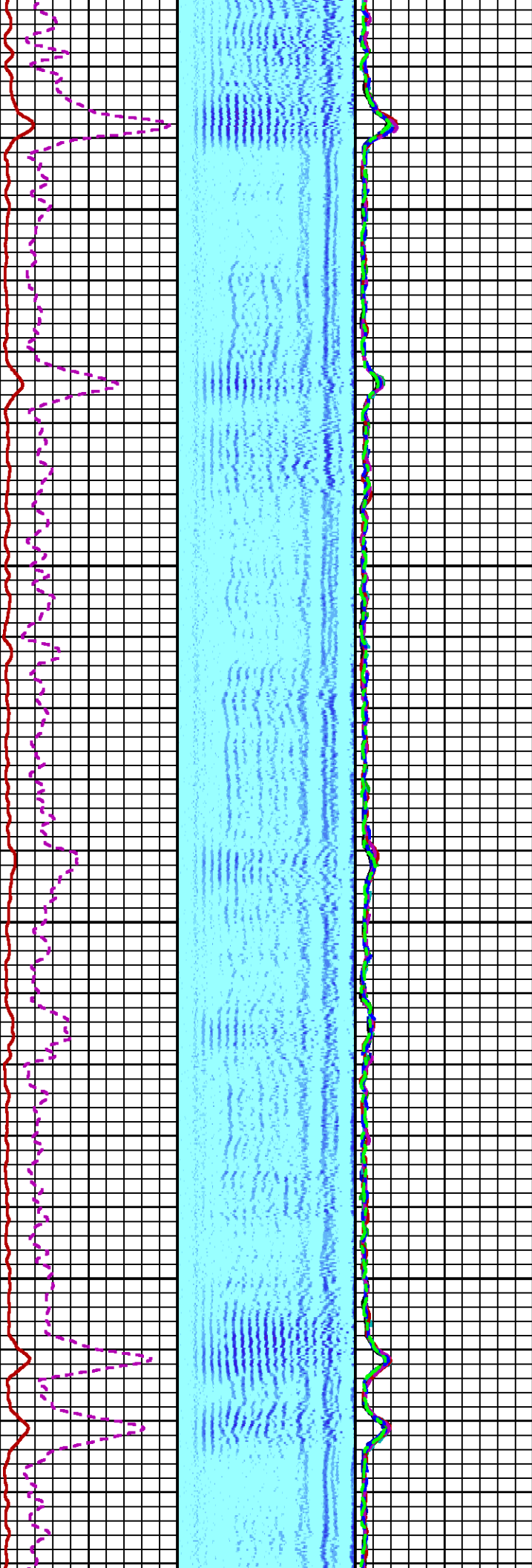




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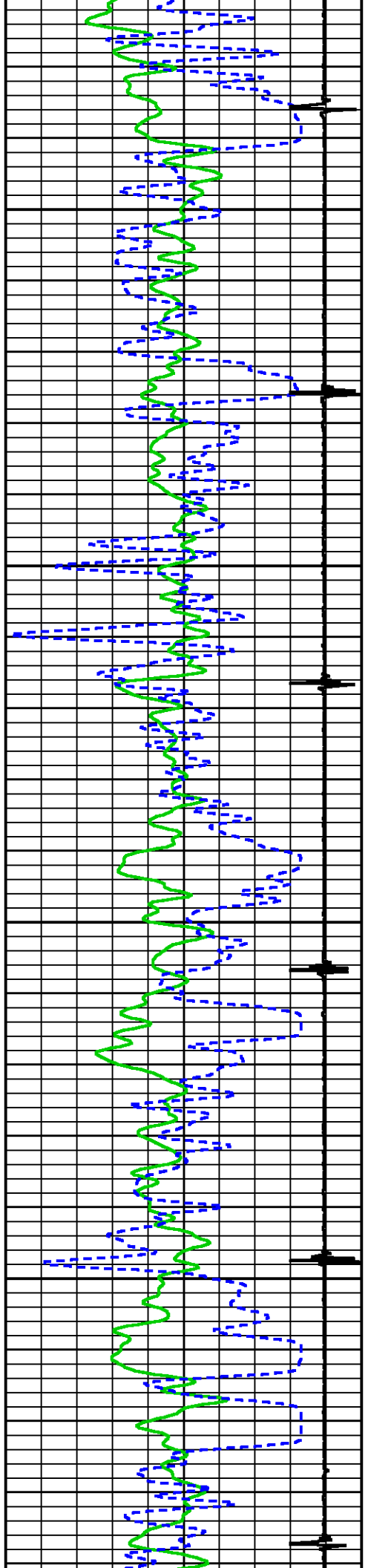




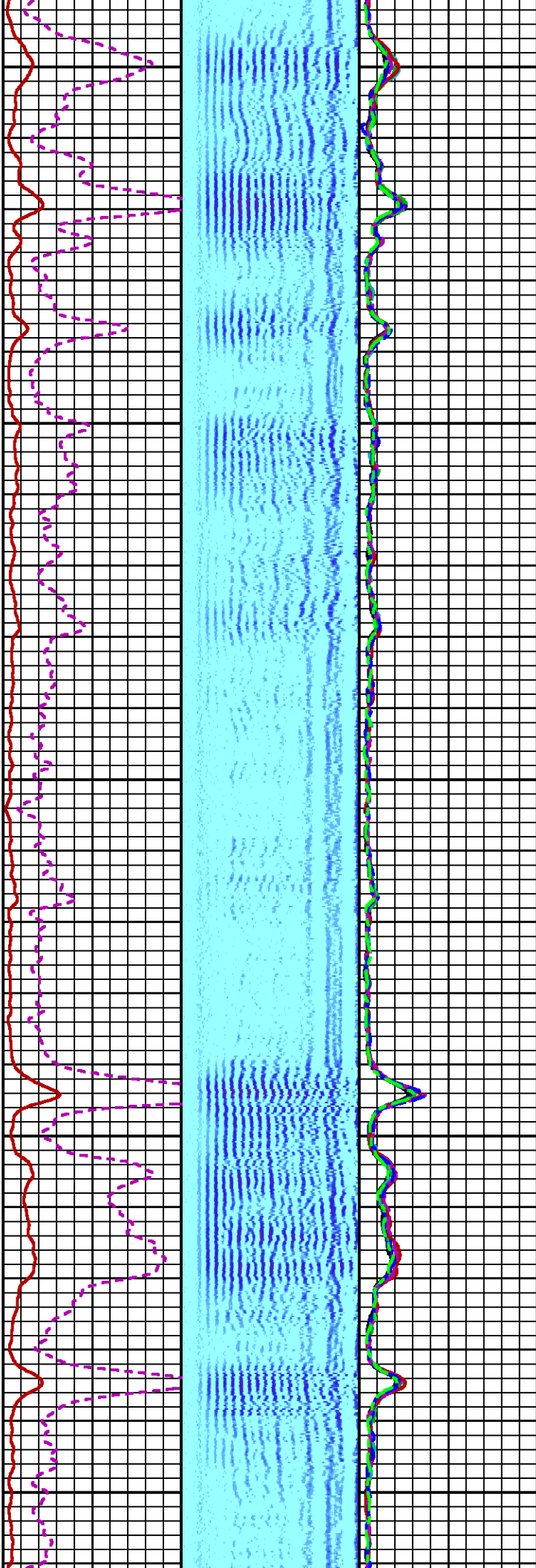


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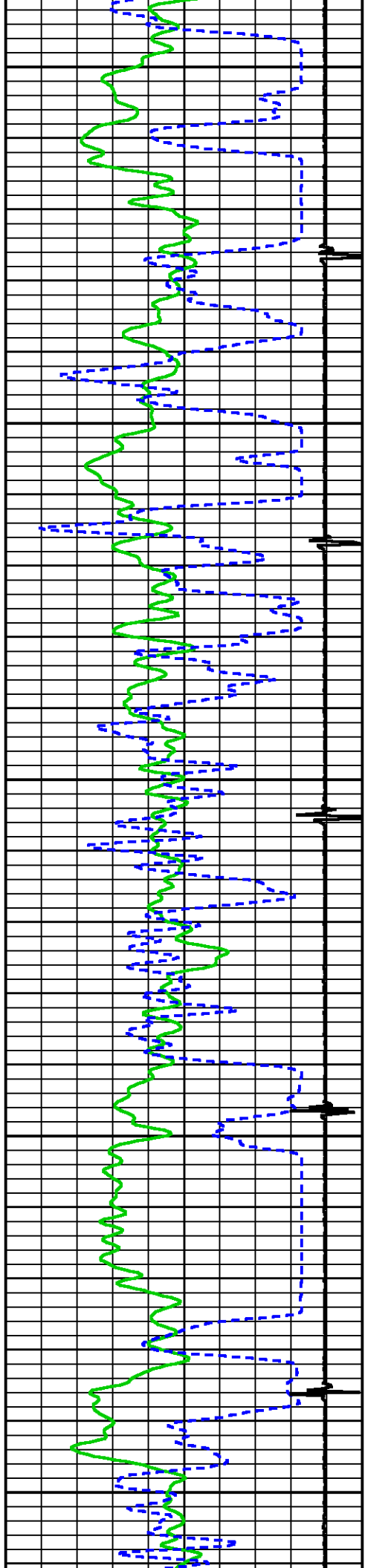


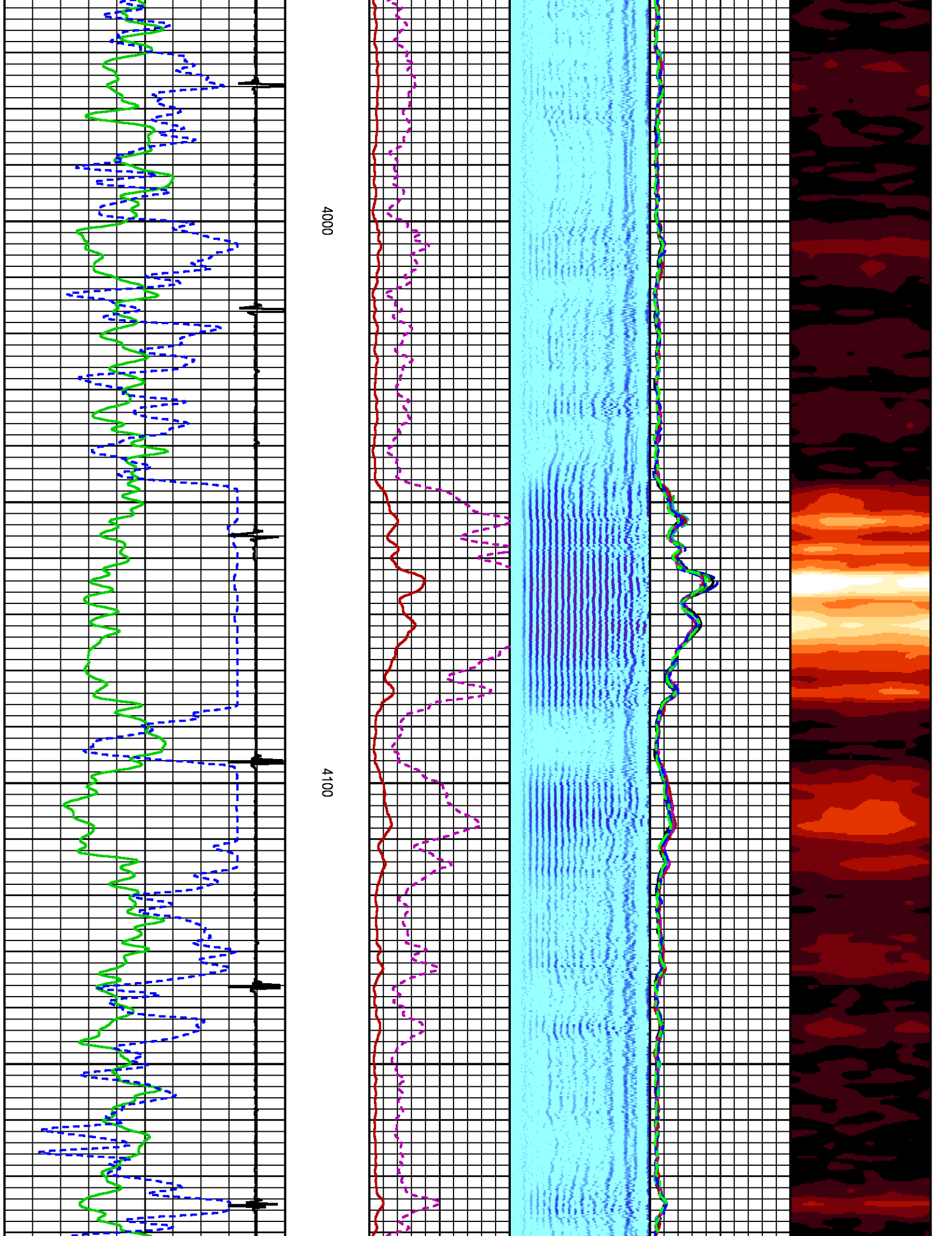


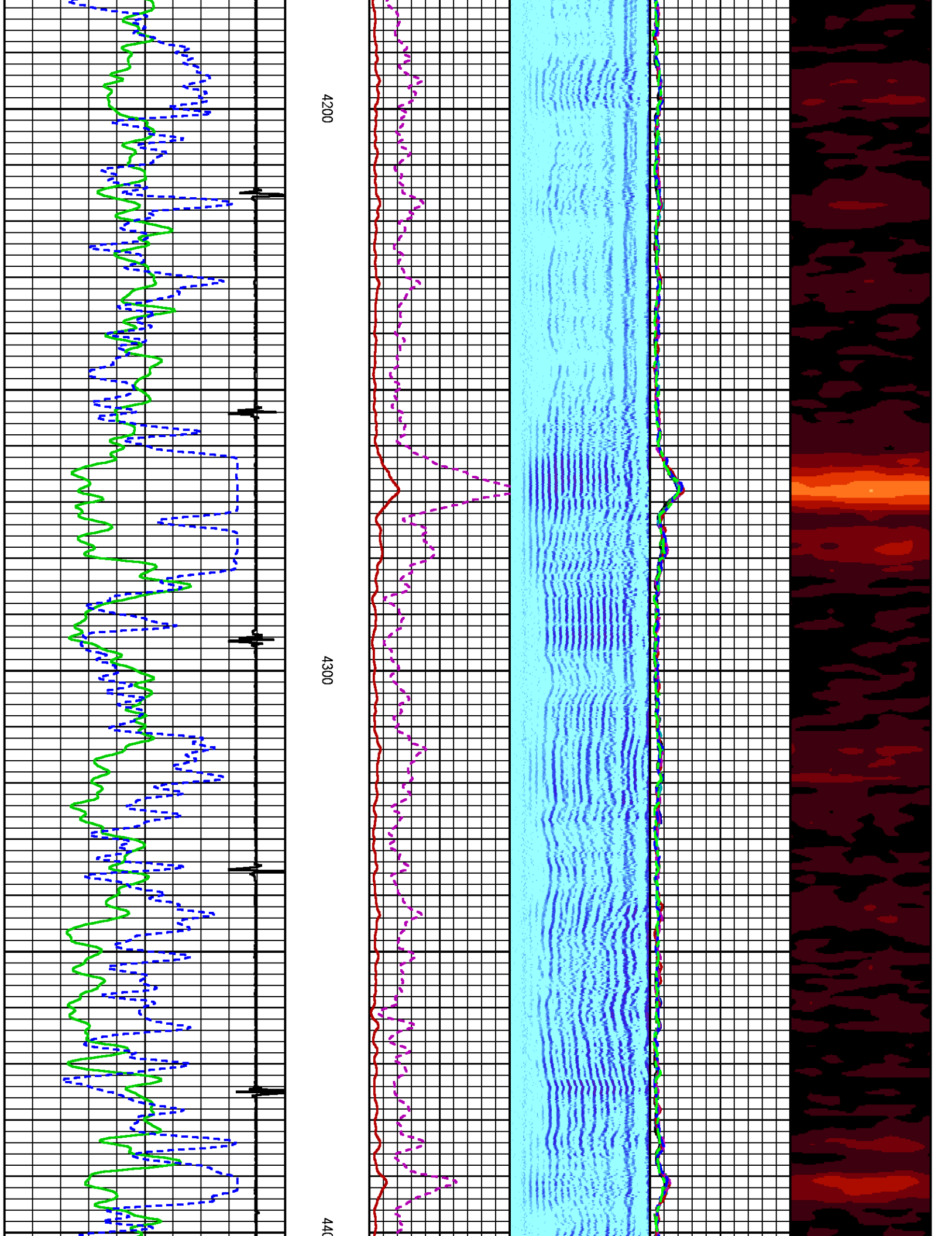


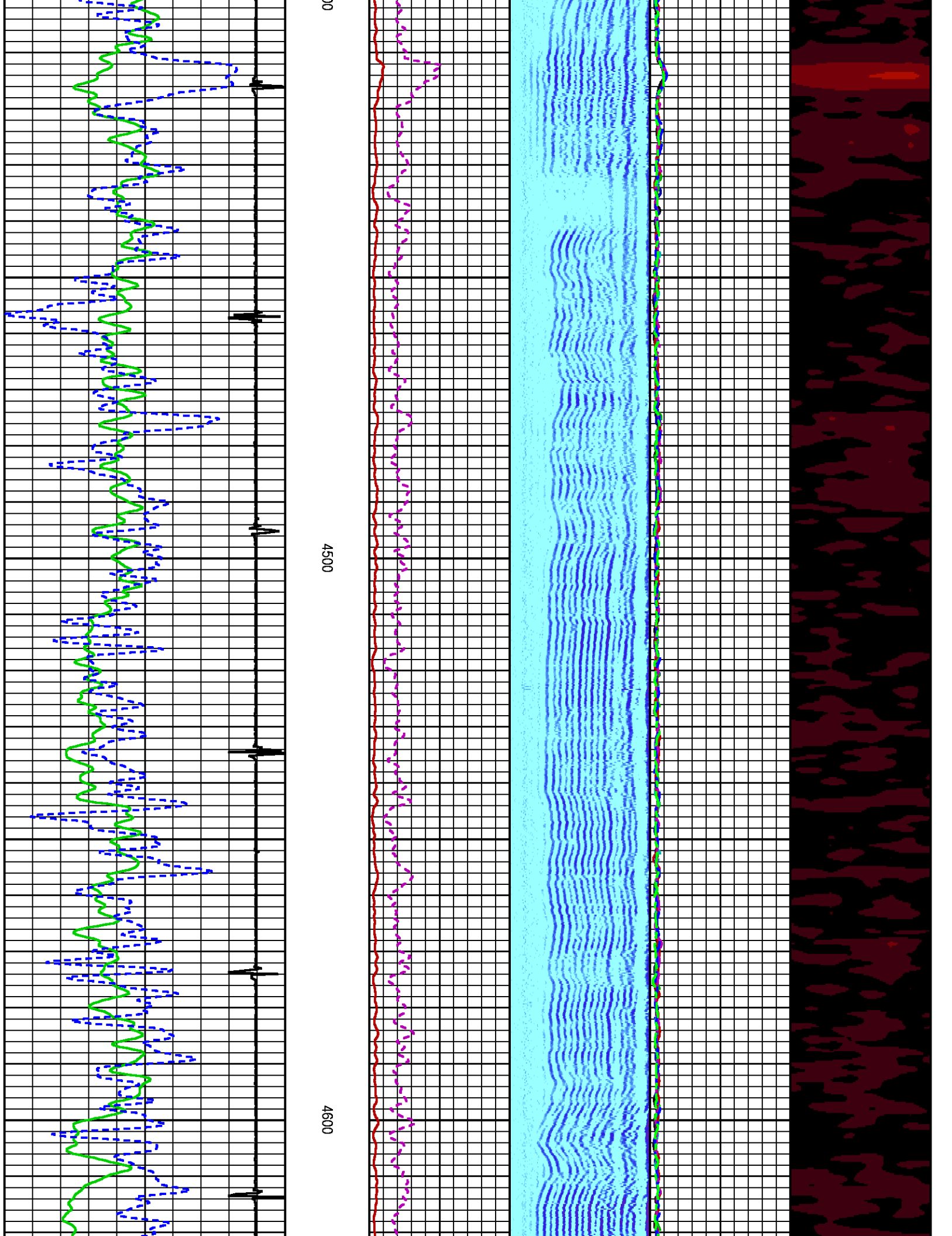
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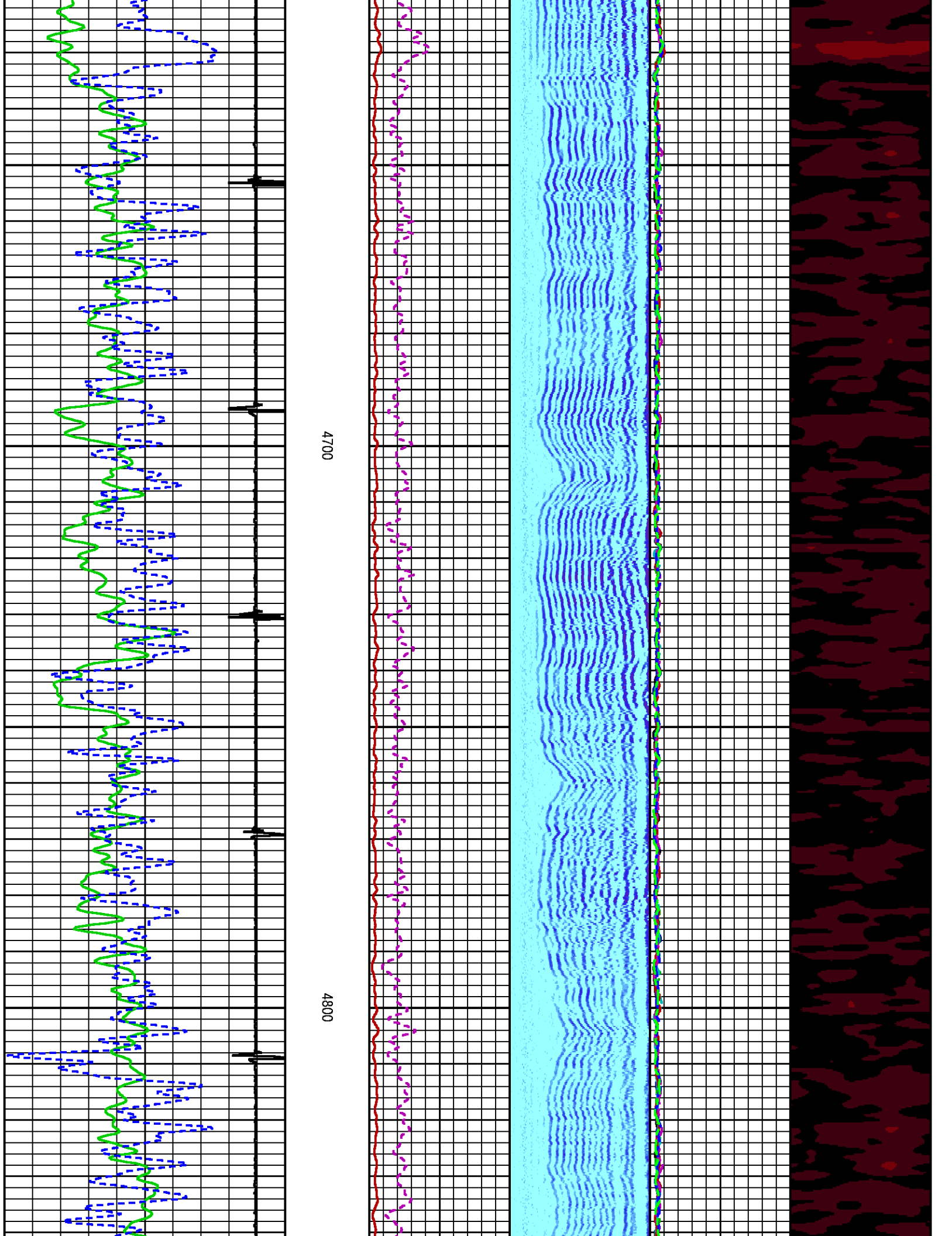


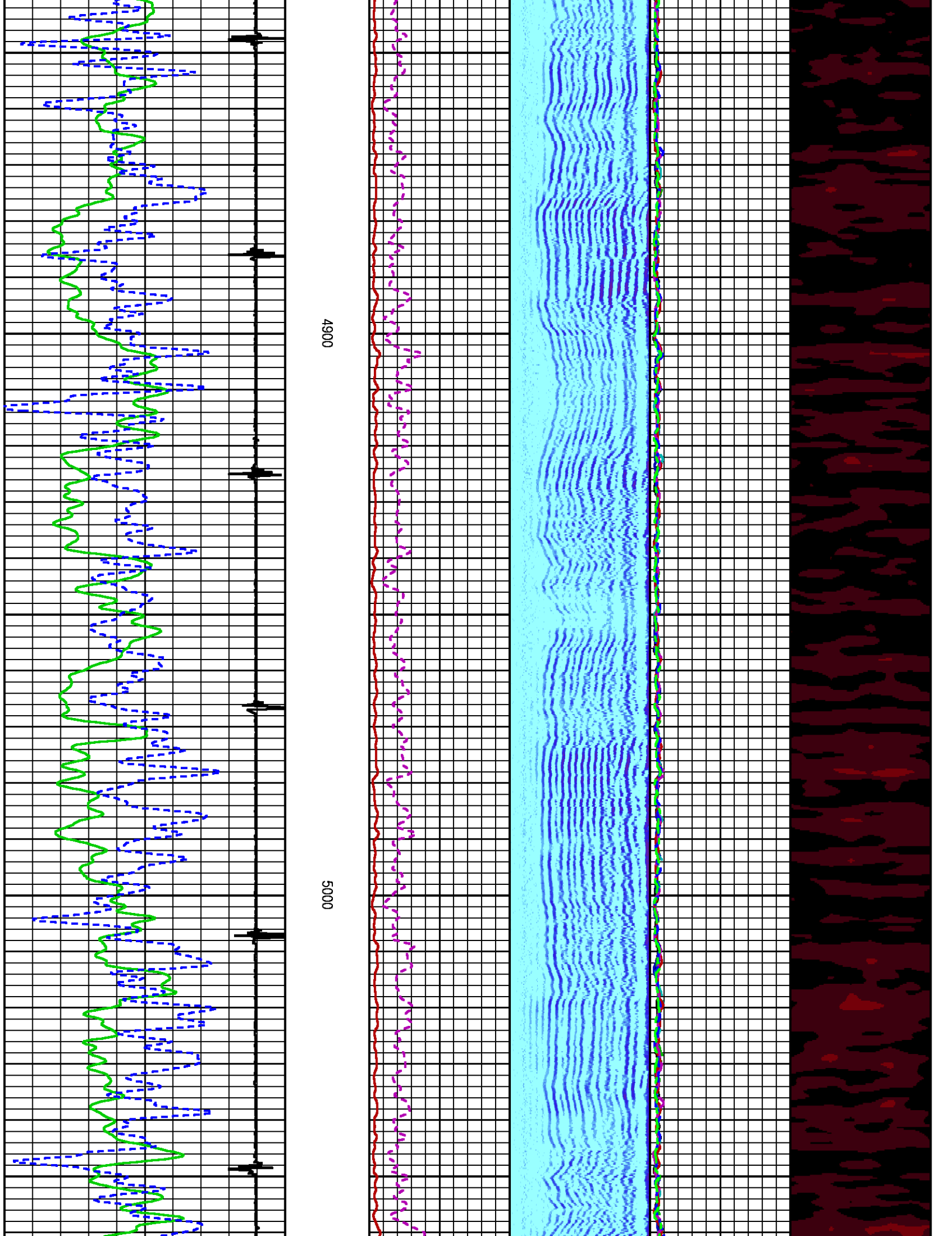




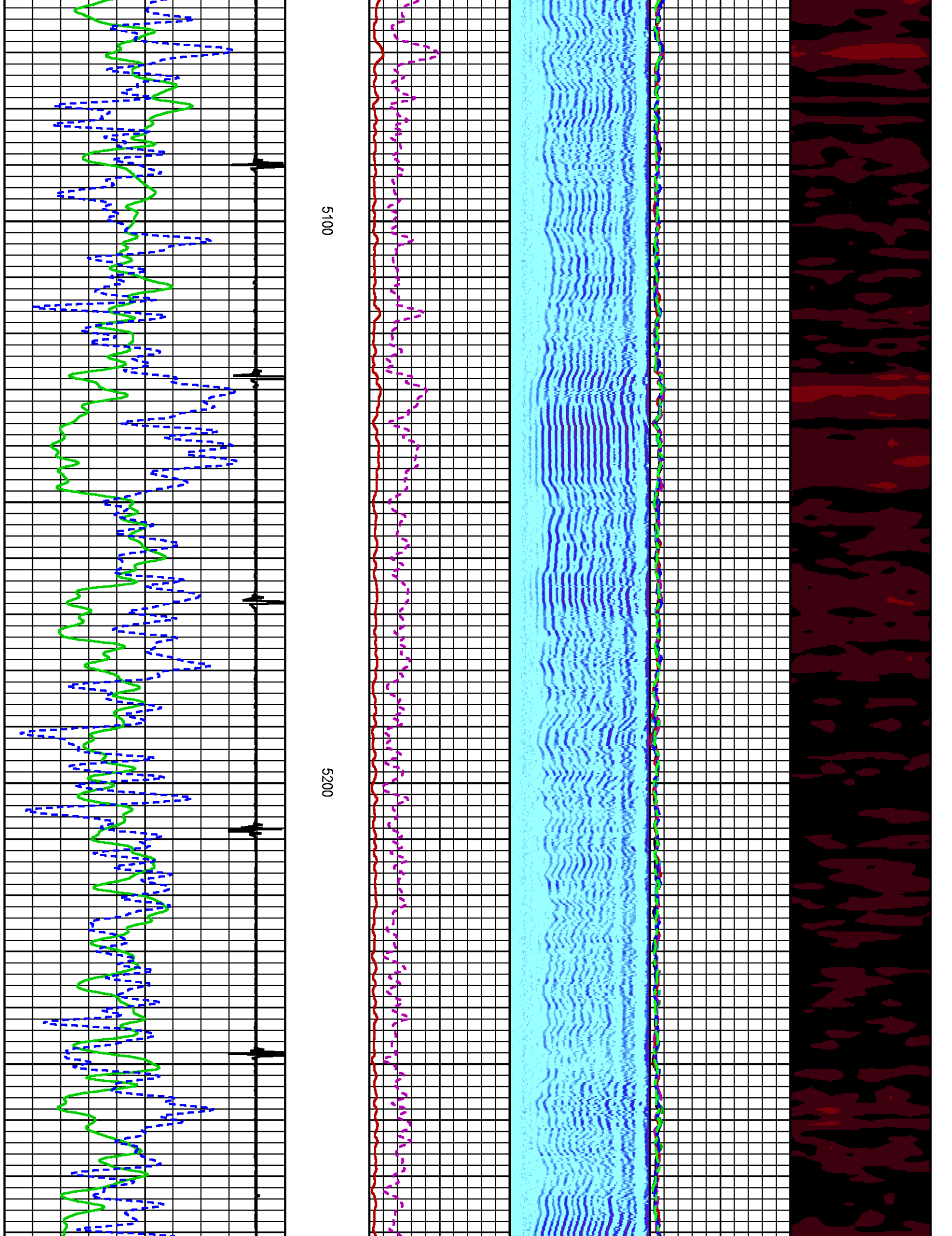


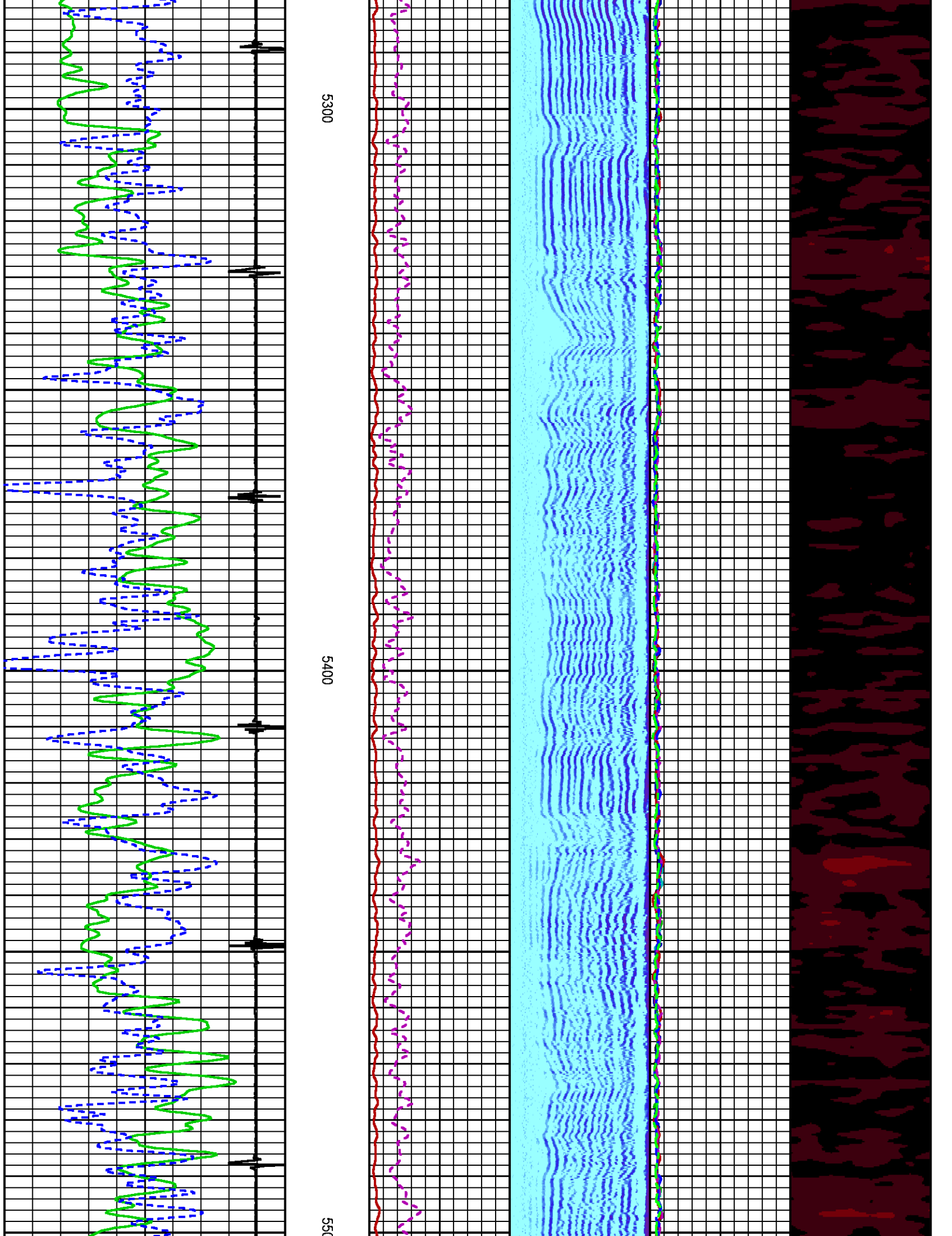


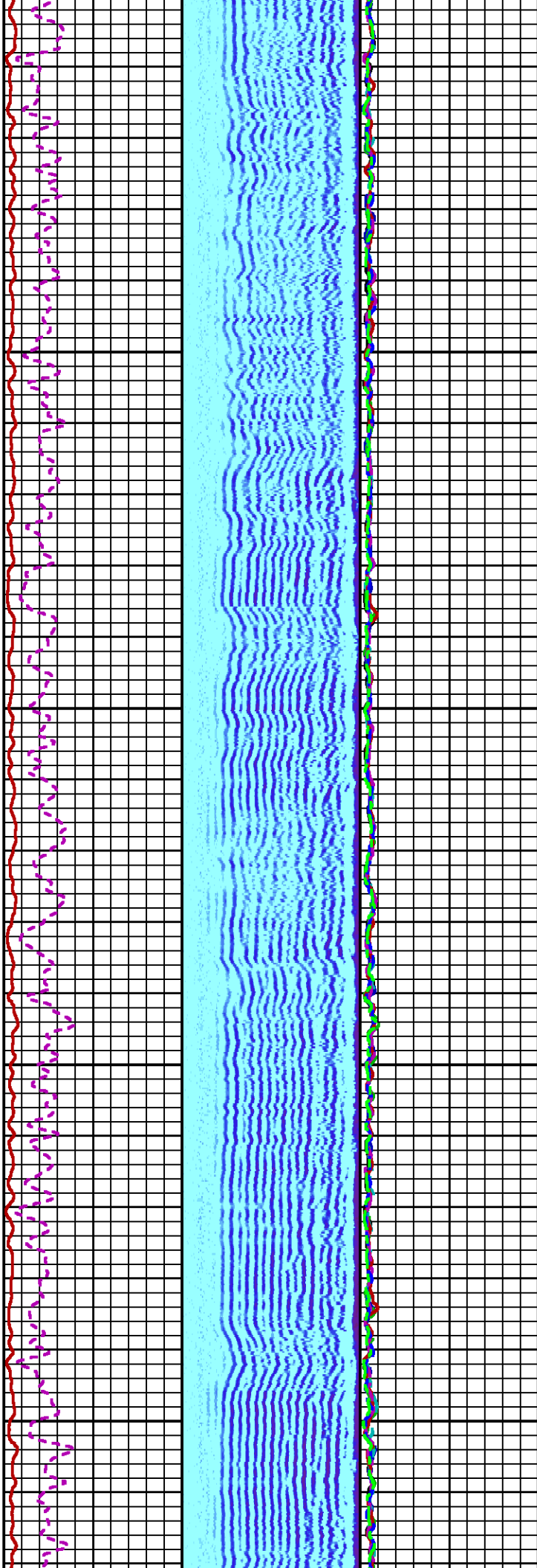




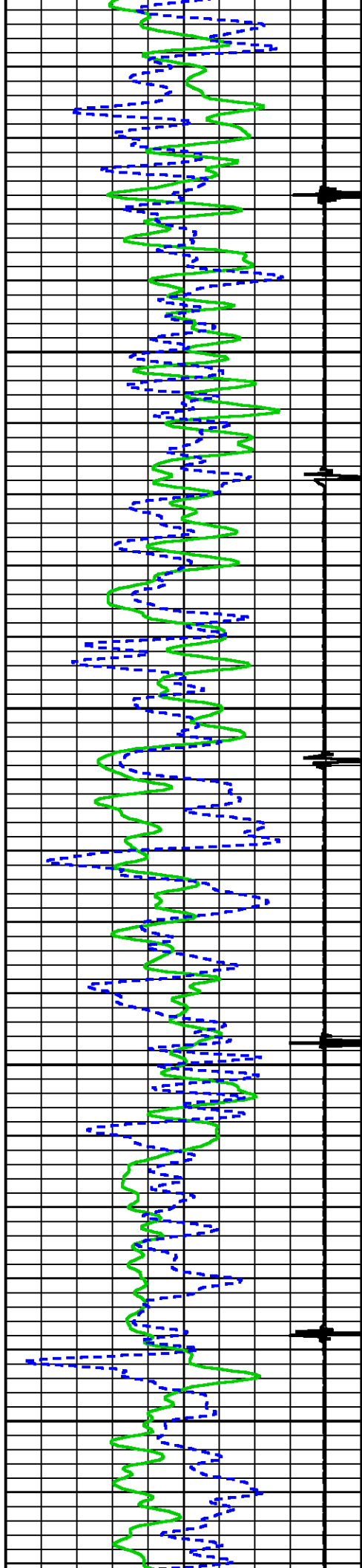


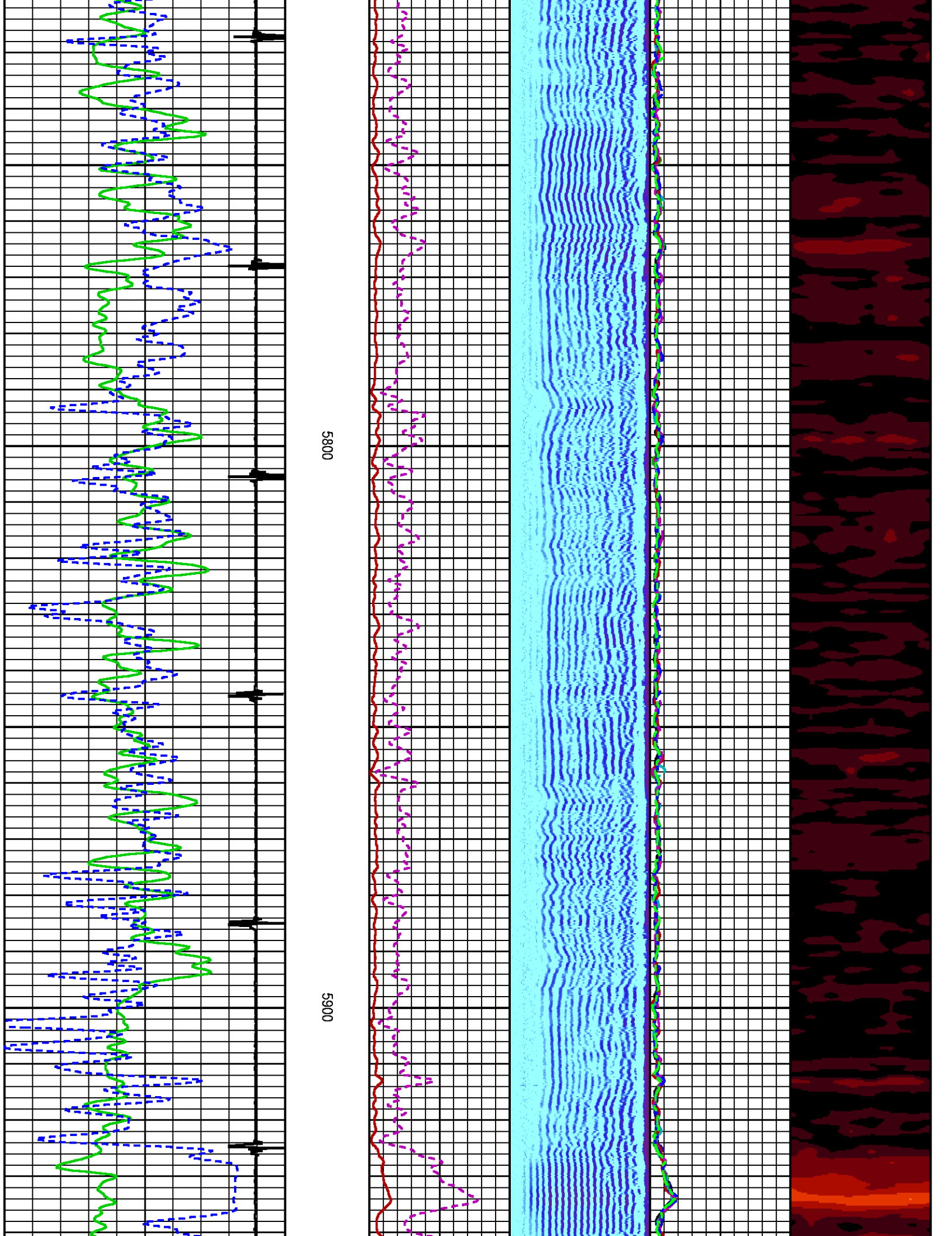




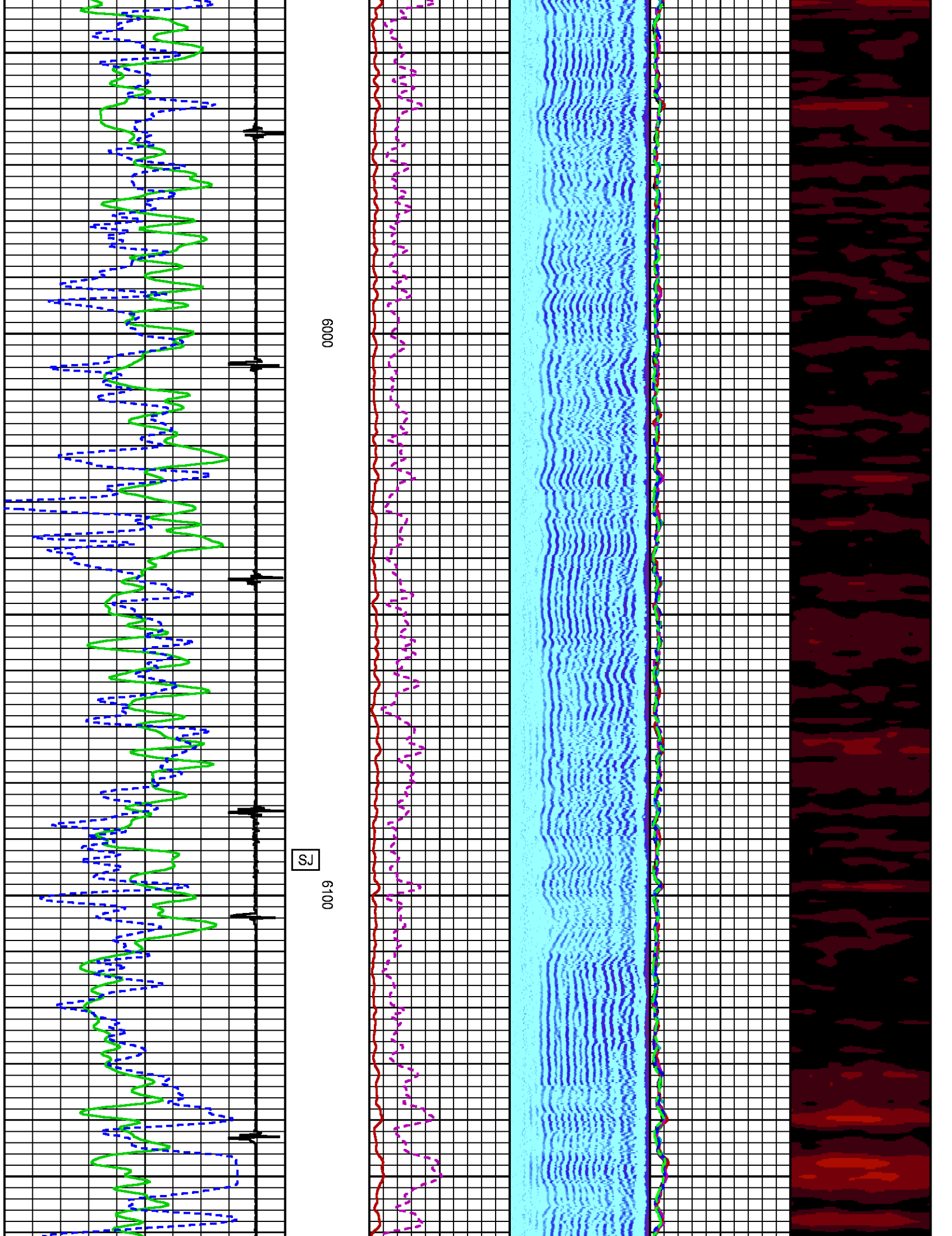


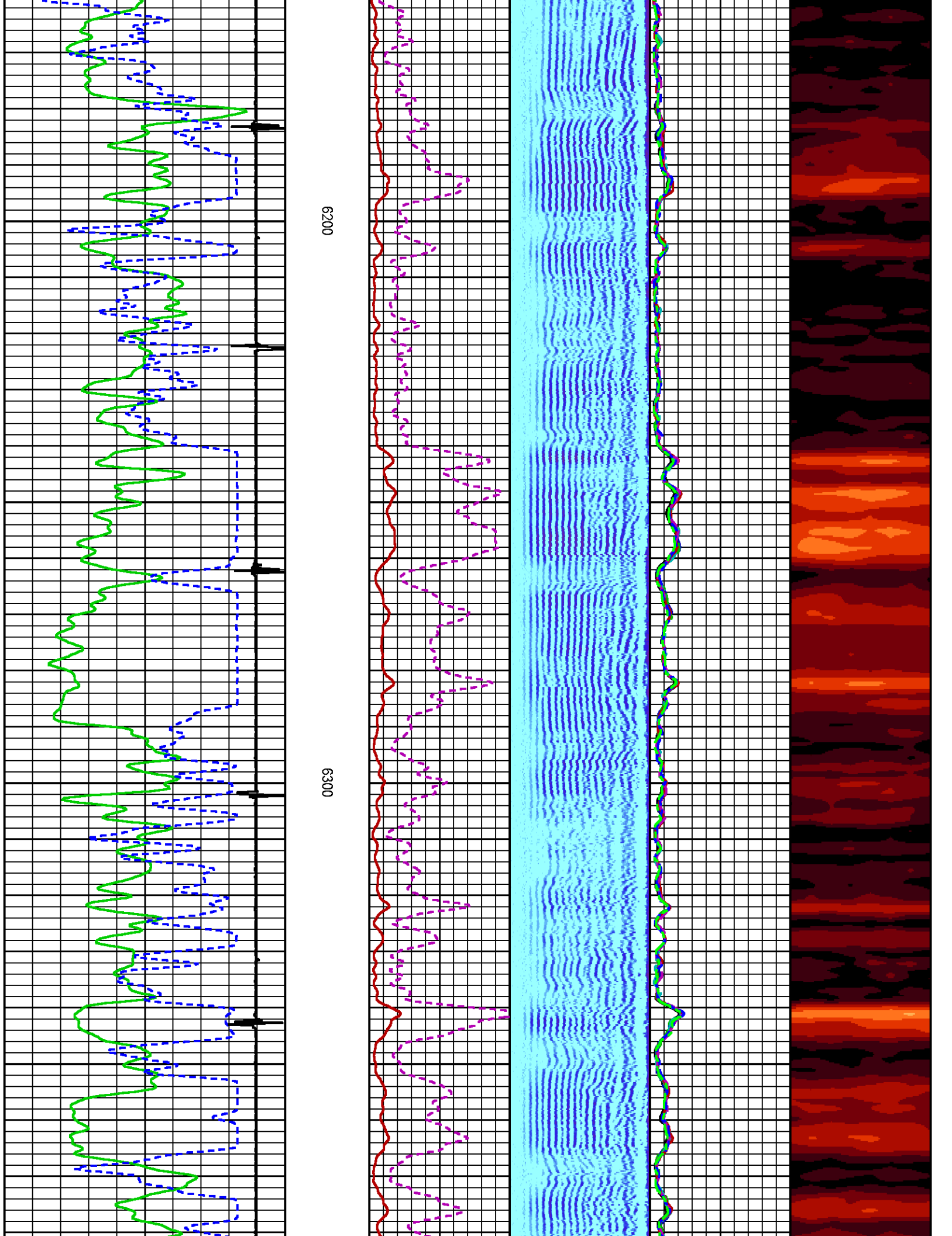
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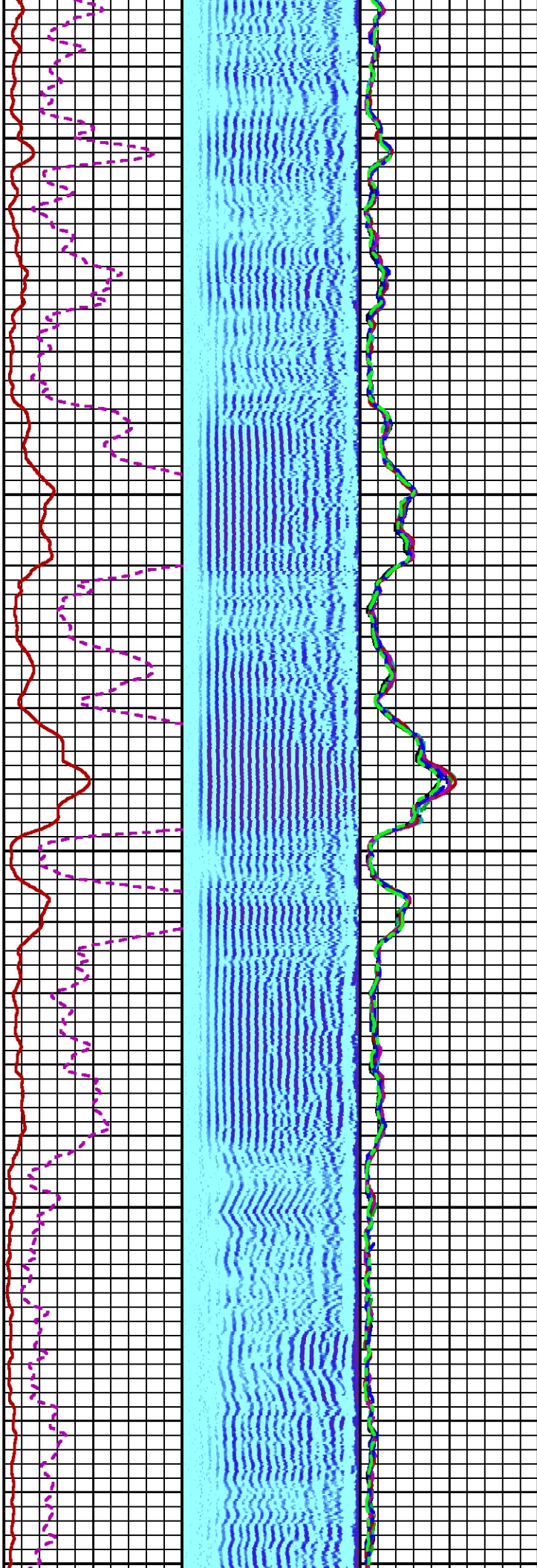








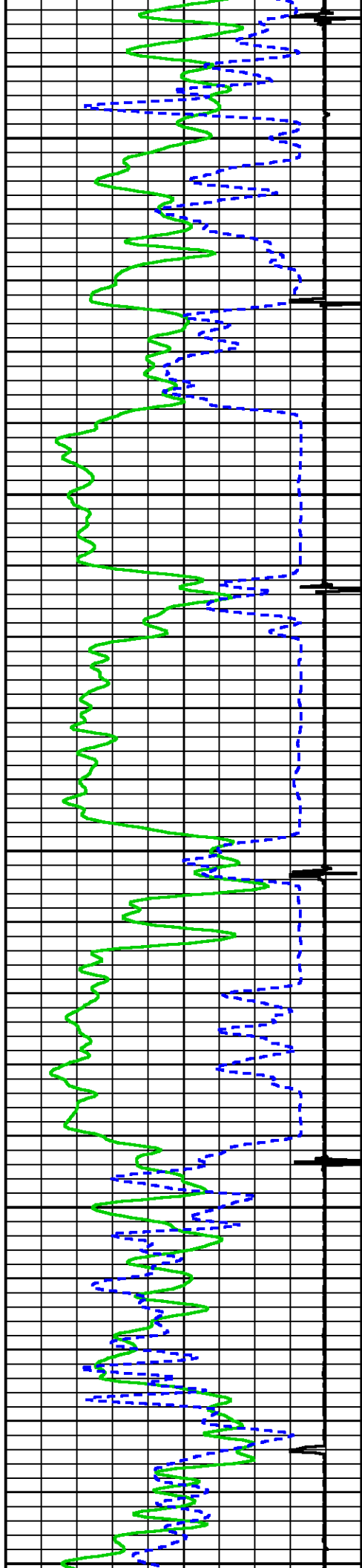


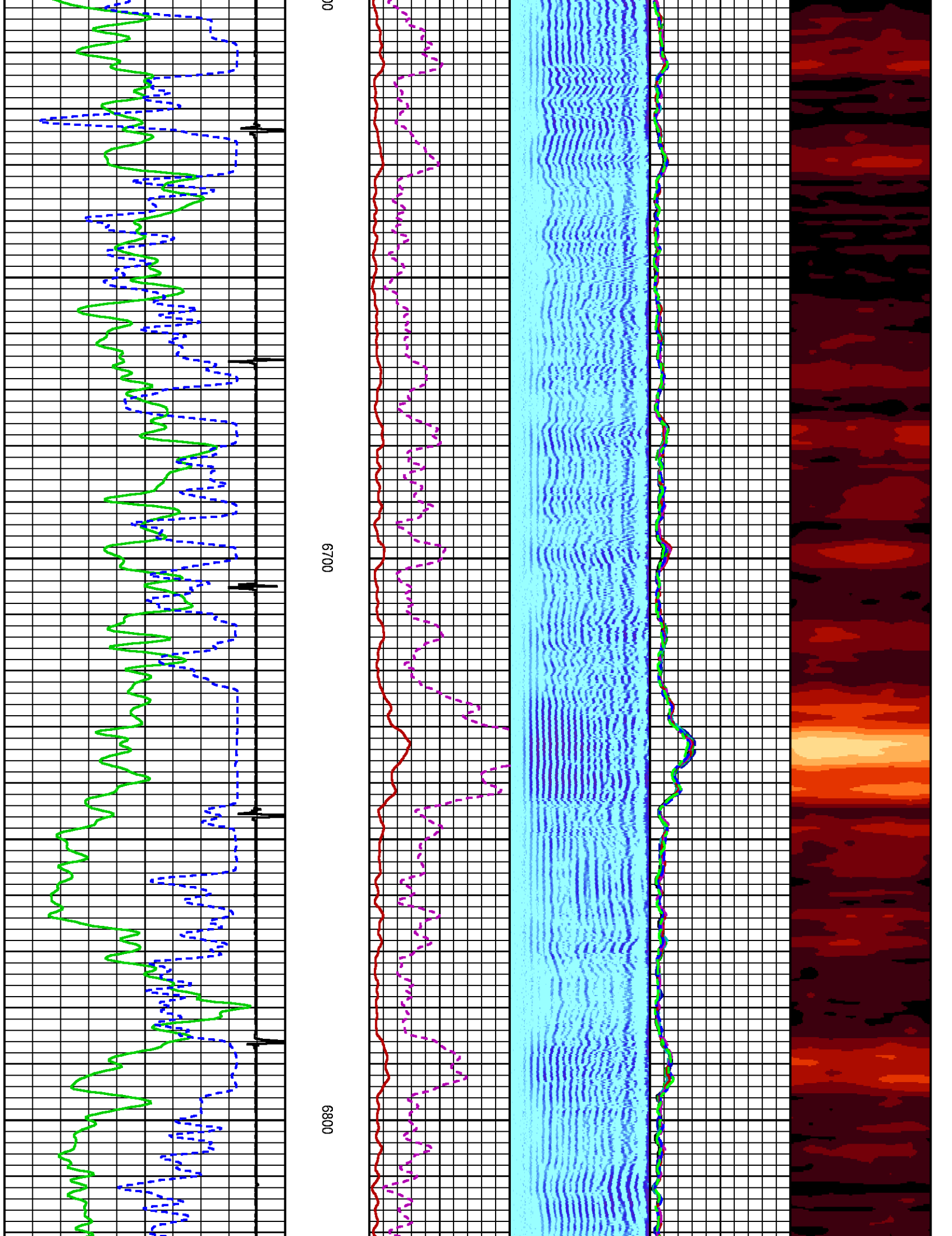


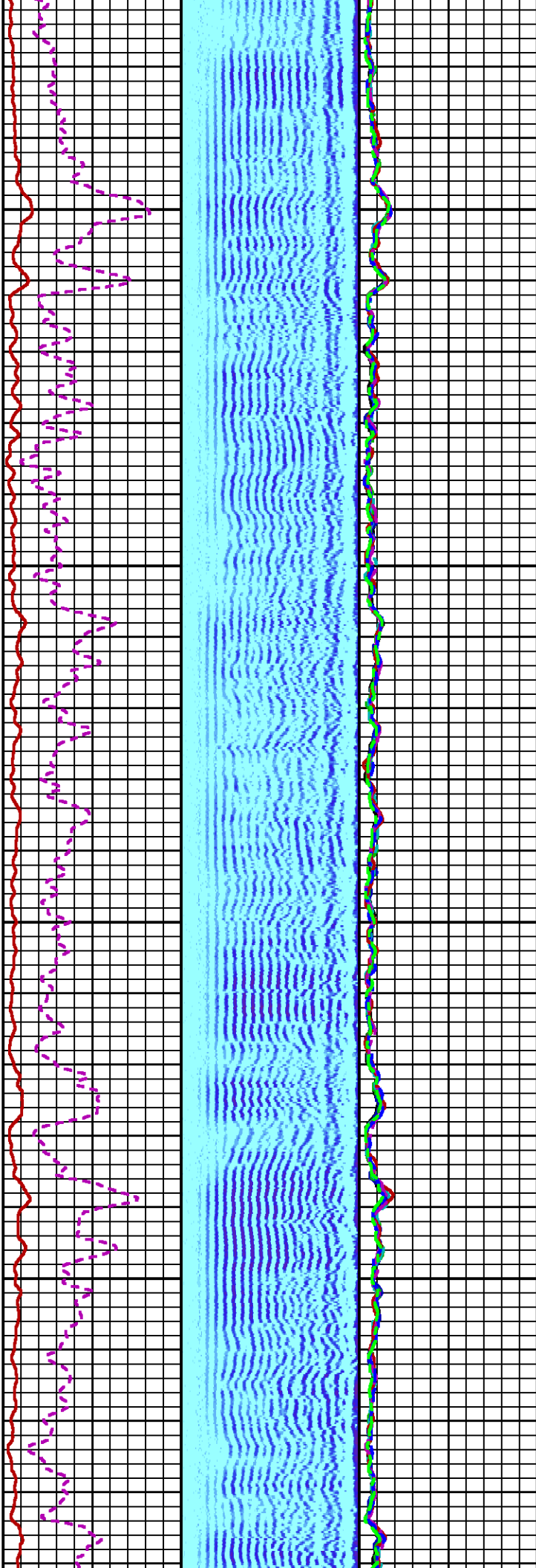
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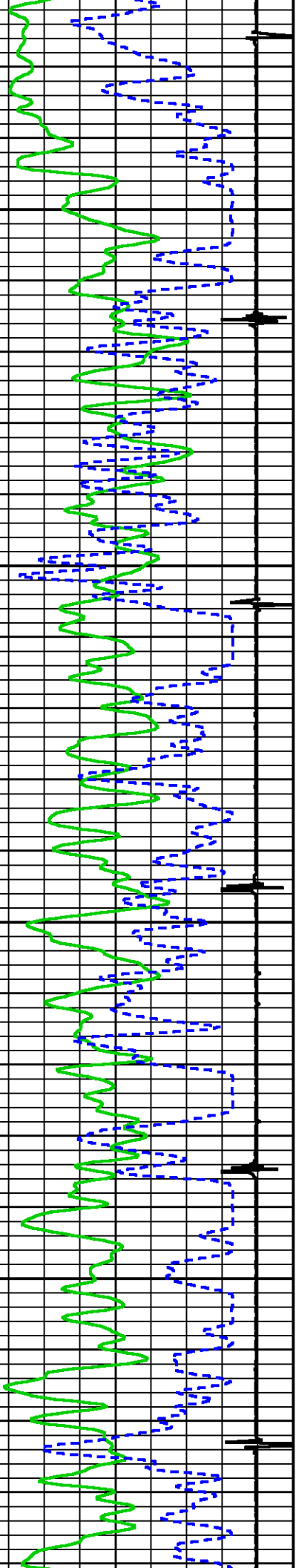


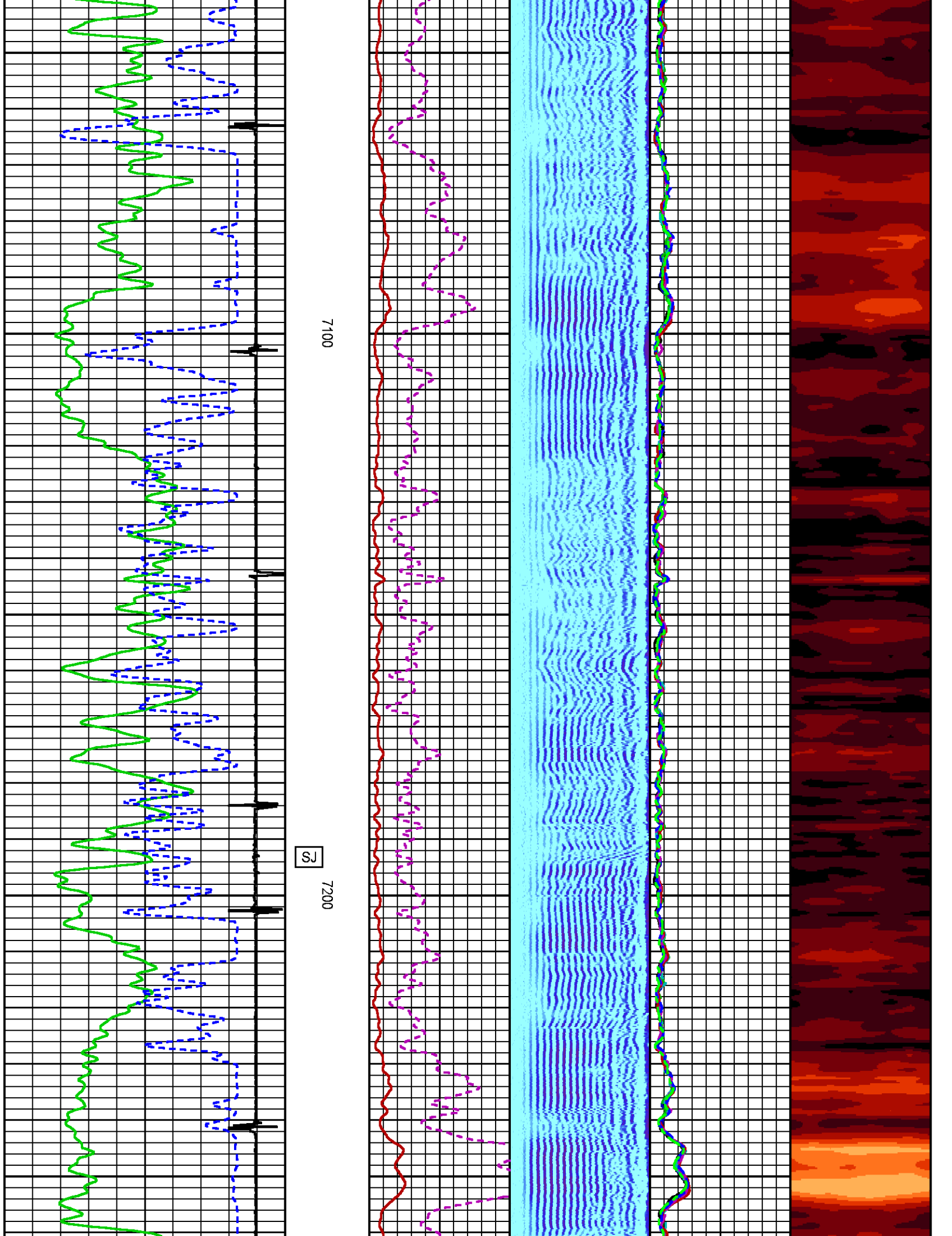




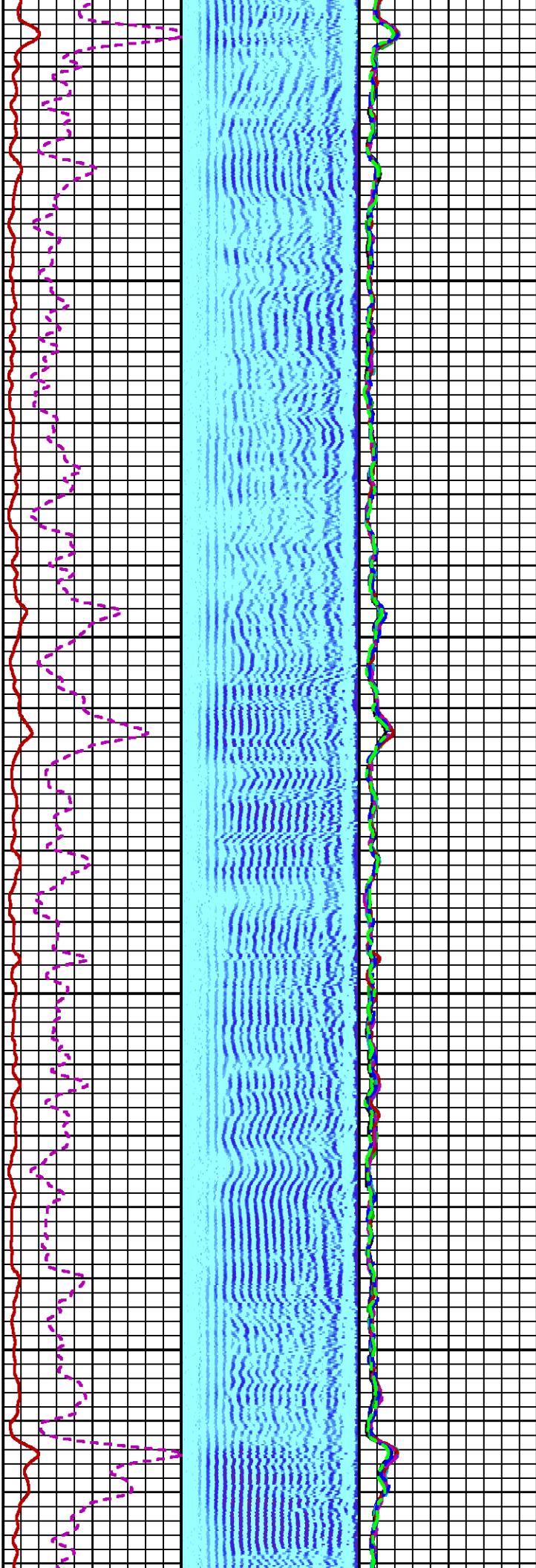
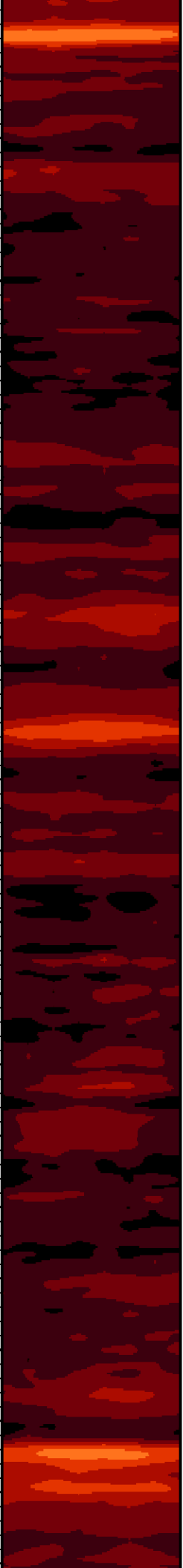
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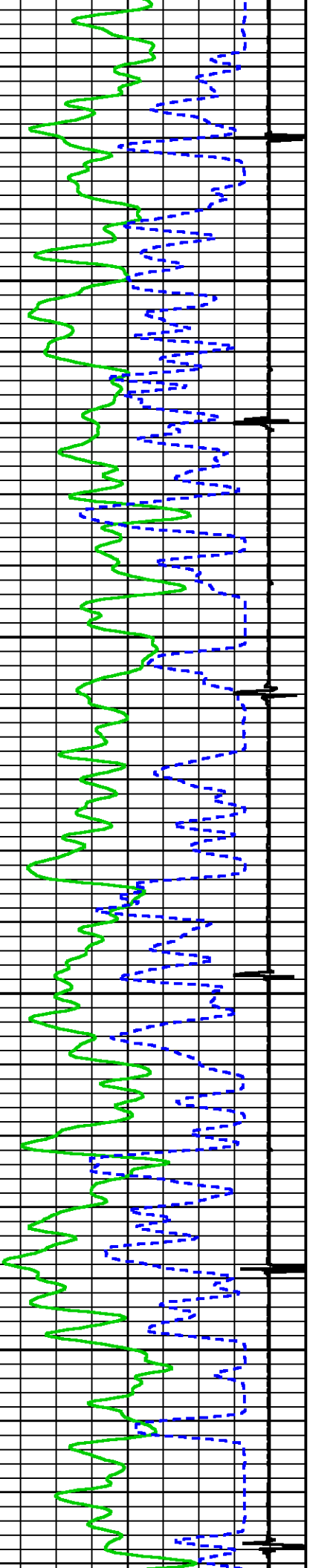




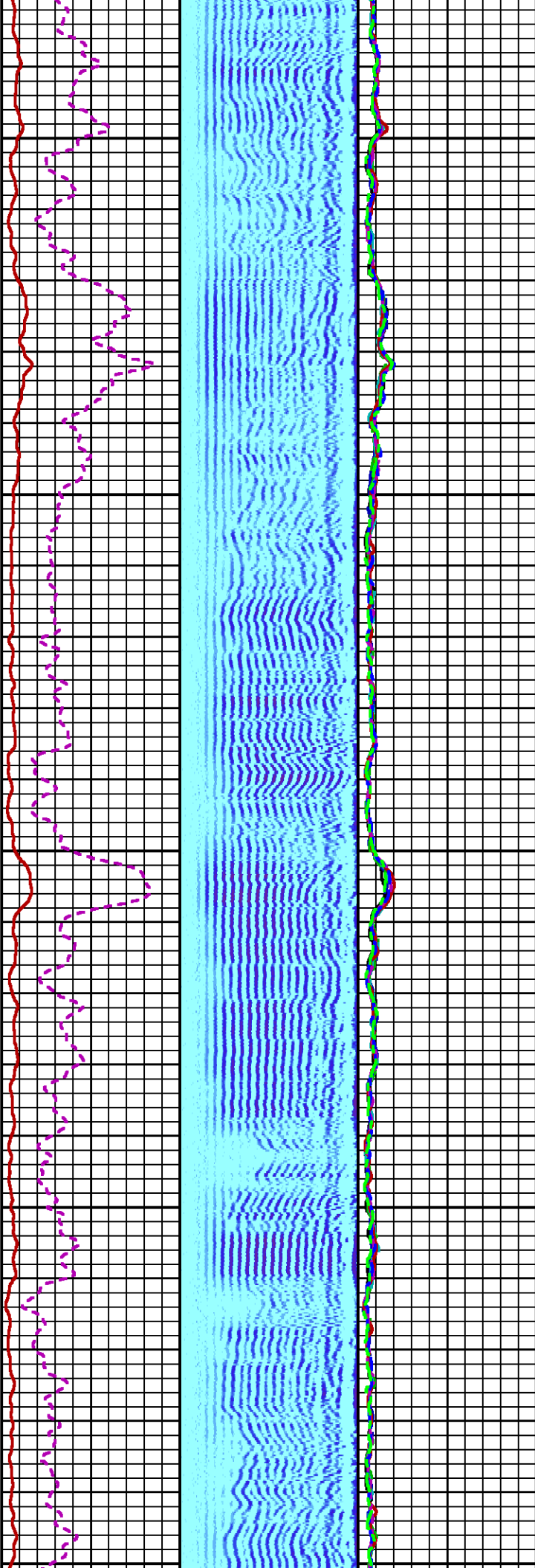


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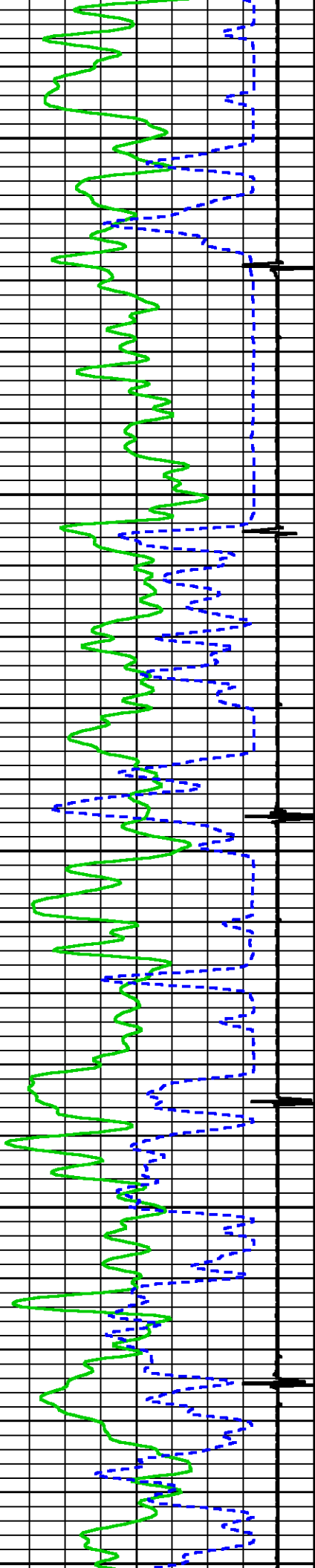


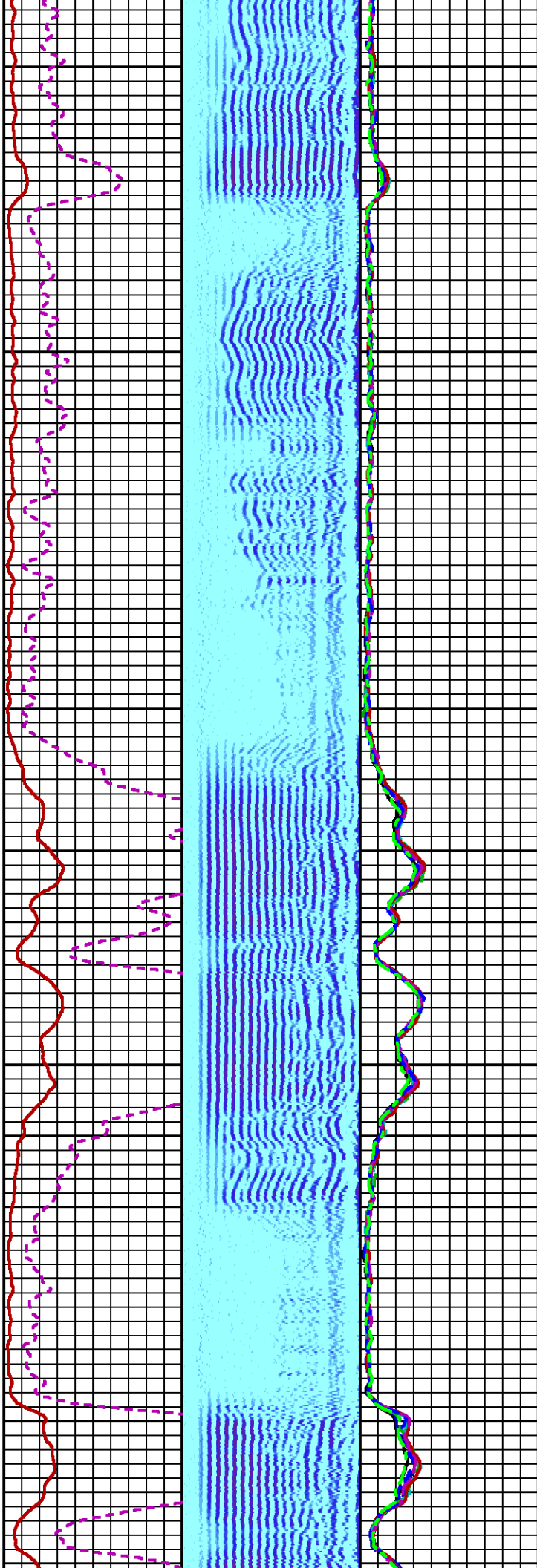
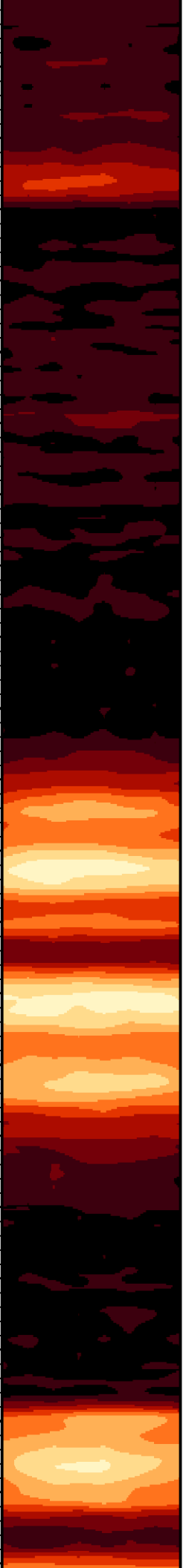


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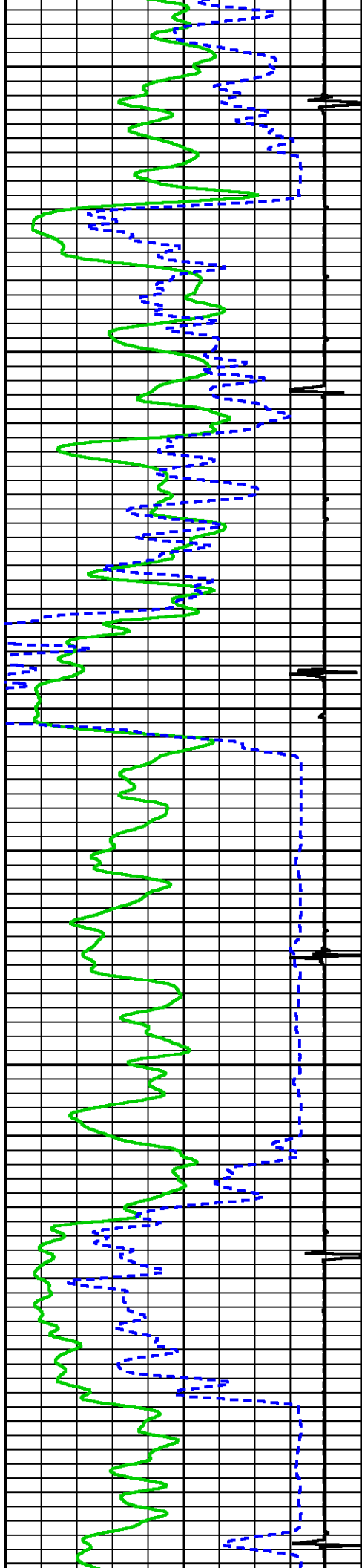
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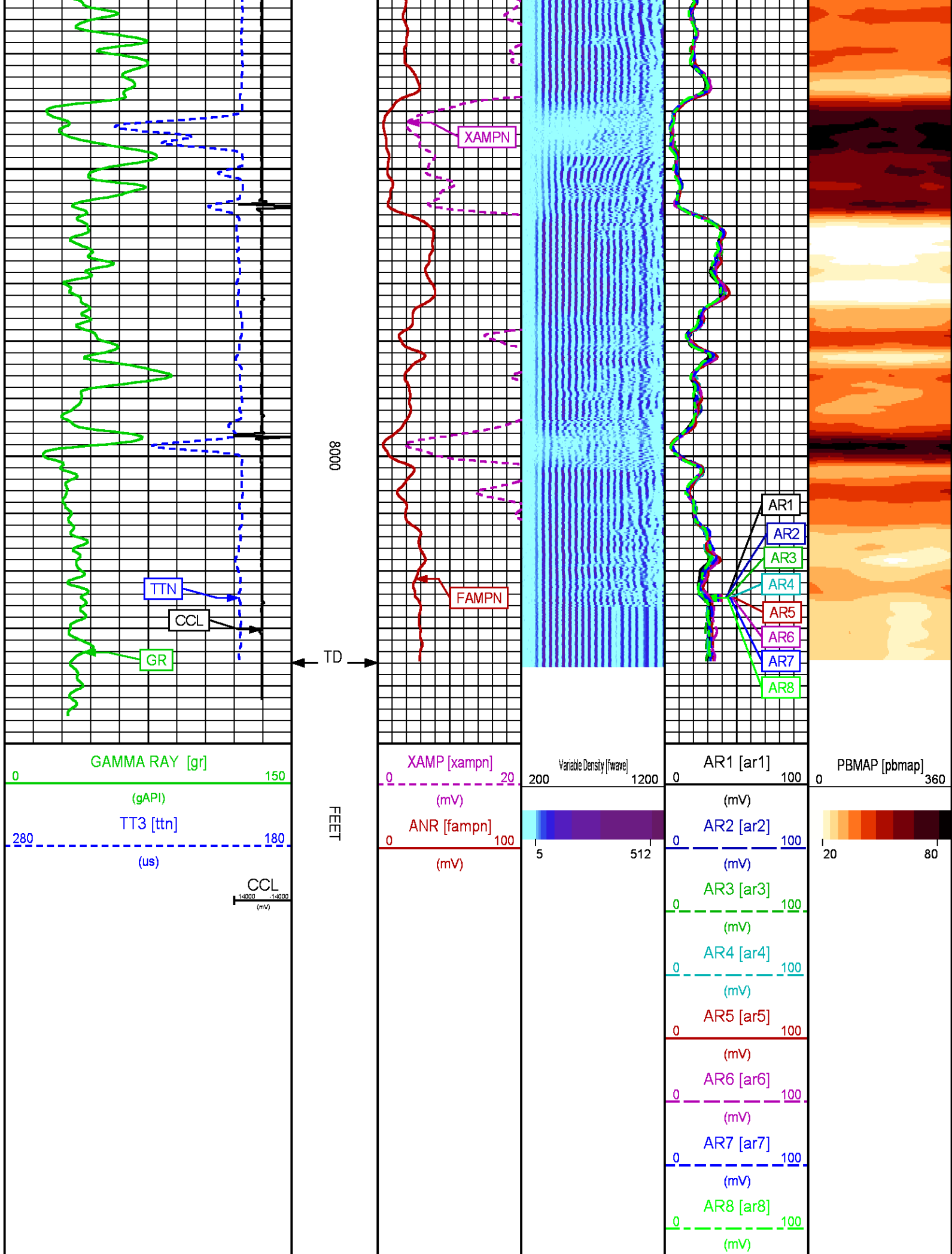
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7800 7900





# REPEAT PASS

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

Patches: 3

Plotted: Tue Apr 3 14:54:19 2018

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_BRUTON\_30\_19E/p012g01.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 7798.750 ft BOTTOM DEPTH: 8080.750 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*)	187	us	TOP	BOTTOM
	AMP WINDOW START (fgp2*)	187	us	"	"
	AMP WINDOW START (fgp3*)	187	us	"	"
	AMP WINDOW START (fgp4*)	187	us	"	"
	AMP WINDOW START (fgp5*)	187	us	"	"
	AMP WINDOW START (fgp6*)	187	us	"	"
	AMP WINDOW START (fgp7*)	187	us	"	"
	AMP WINDOW START (fgp8*)	187	us	"	"
	AMP WINDOW START (fgpn*)	187	us	"	"
	AMP WINDOW LENGTH	25	us	"	"
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	197	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	"	"

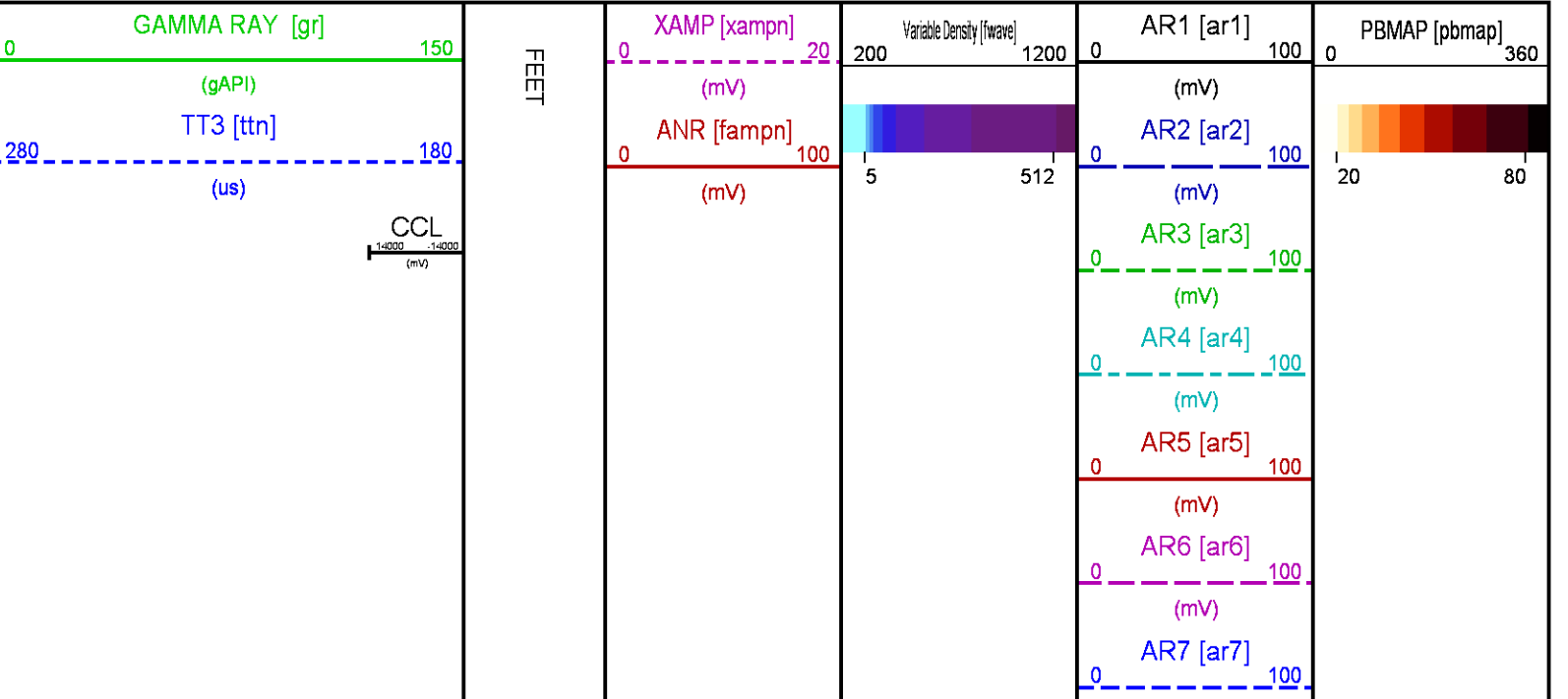
### CURVE DESCRIPTION REPORT

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

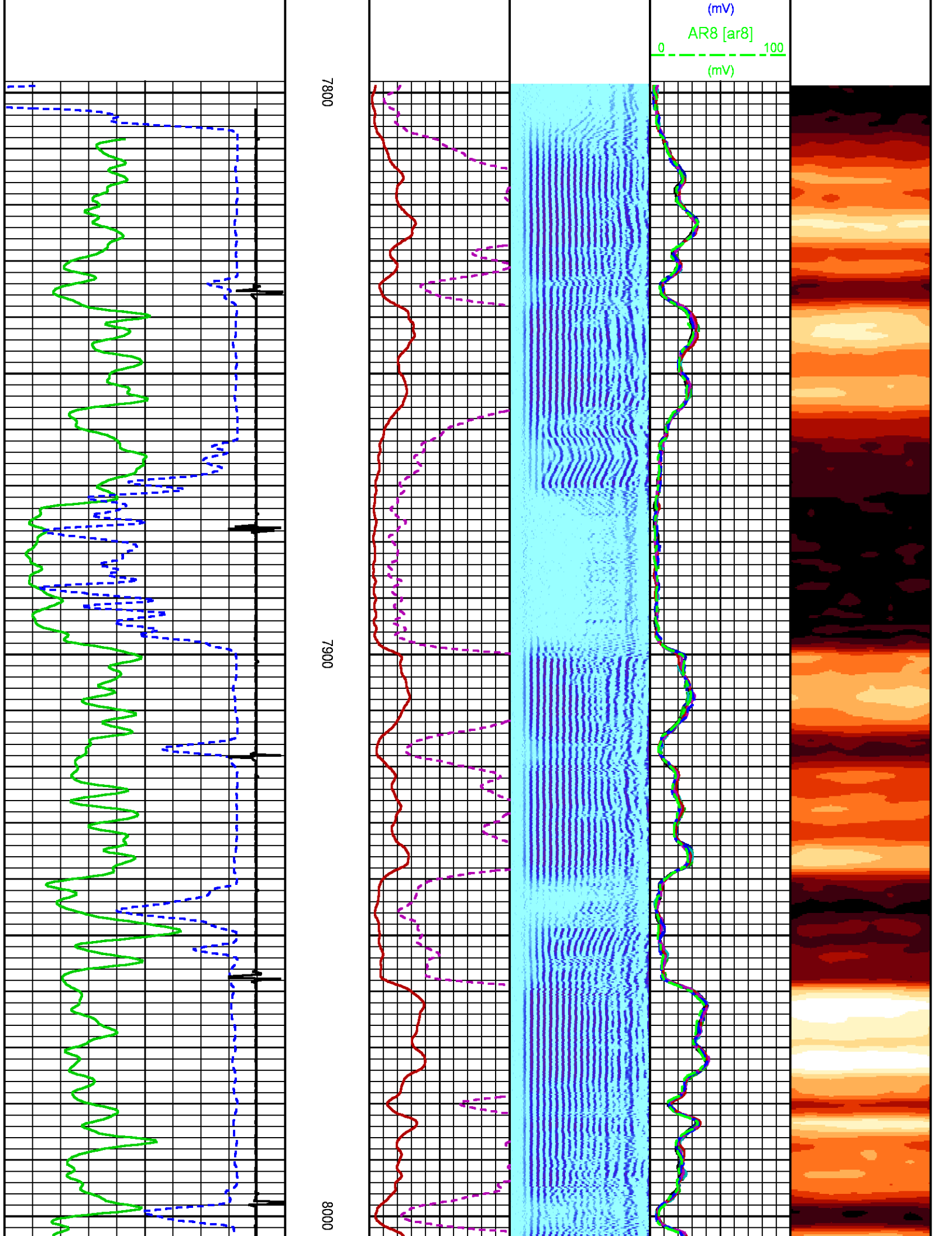
### CURVE MEASURE POINT OFFSET

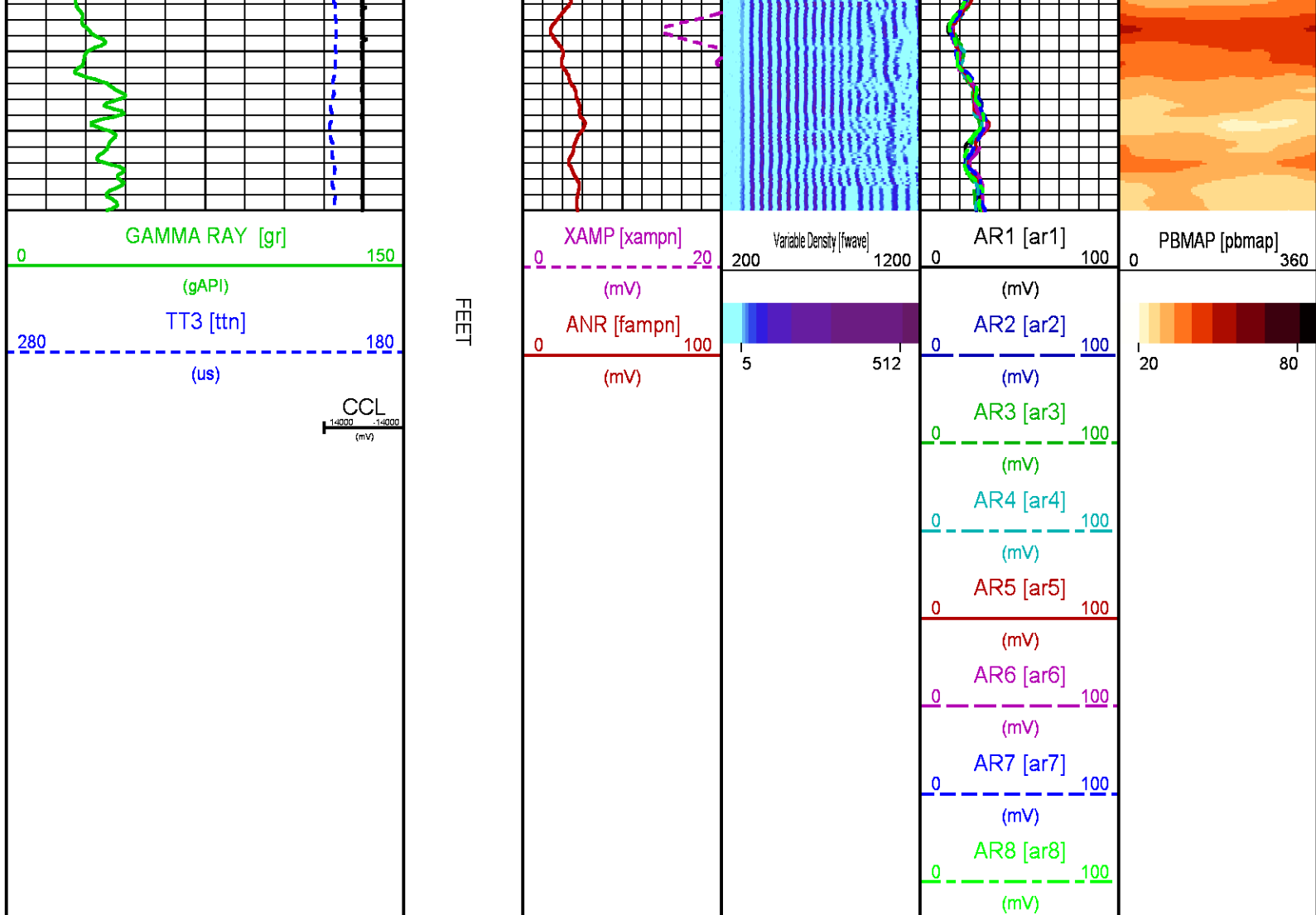
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
AR1	-11.25	AR5	-11.25	CCL	-5.75	XAMPN	-11.25
AR2	-11.25	AR6	-11.25	FAMPN	-11.25		
AR3	-11.25	AR7	-11.25	GR	-1.75		
AR4	-11.25	AR8	-11.25	TTN	-11.25		

<b>Presentation</b>	: SysA:/dat1a/LARAMIE_BRUTON_30_19E/30-19E_RAL_REPEAT.fvpdf [5"/100' Scale]
<b>Plot Interval</b>	: 7798.5 - 8030 Feet
<b>Data File 1</b>	: F1 : SysA:/dat1a/LARAMIE_BRUTON_30_19E/30-19E_RAL_REPEAT.xtf
<b>Created On</b>	: N/A
<b>Company</b>	: LARAMIE ENERGY LLC
<b>Well</b>	: BRUTON 30-19E
<b>Field</b>	: VEGA
<b>File Interval</b>	: 7797.5 - 8090.75 Feet
<b>OCT</b>	: p012g









## CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/LARAMIE\_BRUTON\_30\_19E/p012g.tp1

### RAL PRIMARY CALIBRATION SUMMARY

TOOL #: 1426XA 10417451

DATE/TIME PERFORMED: Tue Apr 3 09:32:39 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)	-0.11	-0.30	0.38	-0.12	0.05	0.23	-0.14	0.20	-0.10	0.08	0.12
AMP FLUID (mV)	48	47	47	48	48	48	48	48	48	66	48
TT (us)	217	219	218	217	216	216	216	216	218	325	218
M FACTOR	2.08	2.10	2.14	2.09	2.07	2.09	2.07	2.10	2.09	2.28	2.11

### RAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1426XA 10417451 DATE/TIME PERFORMED: Tue Apr 3 11:29:38 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	0.22	-0.02	0.00	0.10	-0.07	0.14	0.10	0.12	0.13	0.35	0.06
AMP AIR	2.66	3.26	2.82	3.70	3.61	2.87	3.26	3.48	2.64	6.85	100.87

SHOP M FACTOR	SHOP A FACTOR	WIRELINE FACTOR
2.11	0.00	0.99

## 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\_NICHOLS\_0994\_24\_06W/RAL-tdg

A3 CABLEHEAD  
Diameter : 1.37"



18.85'

RADIAL BOND TOOL

Diameter : 2.75"  
Length : 11.17'  
Weight : 126 lbs  
C : 142000

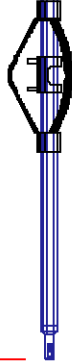
Series : 1426XA  
Mnemonic : RAL  
Measure Point: 4.21': NEAR RCVR  
Measure Point: 3.25': FAR RCVR

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



**ECLIPS**

**COMPANY**

LARAMIE ERNGY LLC

**WELL**

BRUTON FEDERAL 30-19W

**FIELD**

VEGA

**COUNTY**

MESA

**STATE** COLORADO

**FILE NO:**

CH133068

**API NO:**

05077104690000

**LOCATION:**

SHL: 2622' FSL & 1858' FEL

BHL: 658' FSL & 1306' FWL

**ELEVATIONS:**

KB 7673 FT

DF

GL 7643 FT

SEC 30 TWP 9S RGE 93W

DATE 01-Apr-2018