



# RADIAL CEMENT BOND LOG

FILE NO: CH136074	COMPANY <b>LARAMIE ENERGY LLC</b>
API NO: 05077103890000	WELL <b>NICHOLS FEDERAL 0994-24-21E</b>
	FIELD <b>VEGA</b>
	COUNTY <b>MESA</b> STATE <b>COLORADO</b>

Ver. 4.10	LOCATION: SHL: 2332' FNL & 2789' FWL BHL: 212' FSL & 1538' FEL 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 <u>7212 FT</u> KB <u>24 FT</u> ABOVE P.D. KB <u>7236 FT</u> DF <u>7212 FT</u> GL <u>7212 FT</u>
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DATE	24-Jun-2018
RUN	1
TRIP	1
SERVICE ORDER	US136074
DEPTH DRILLER	8088 FT
DEPTH LOGGER	8016 FT
BOTTOM LOGGED INTERVAL	8016 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	52 FT
LOGGED CEMENT TOP	1604 FT
WELLHEAD PRESSURE	0 PSI
MAXIMUM HOLE DEVIATION	NA
NOMINAL LOGGING SPEED	95 FMIN
MAX. RECORDED TEMP.	226 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: 6270' - 6290'  
SJ: 7200' - 7220'

## EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	RAL	1426XA	11871500	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: 4

Plotted: Sun Jun 24 13:35:18 2018

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_NICHOLS\_FED\_0994\_24\_21E/p012g02.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 14.750 ft BOTTOM DEPTH: 8032.750 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*)	160	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	4	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	200.465	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-66	us	"	"
	TOOL DELAY (str2*)	-66	us	"	"
	TOOL DELAY (str3*)	-66	us	"	"
	TOOL DELAY (str4*)	-66	us	"	"
	TOOL DELAY (str5*)	-66	us	"	"
	TOOL DELAY (str6*)	-66	us	"	"
	TOOL DELAY (str7*)	-66	us	"	"
	TOOL DELAY (str8*)	-66	us	"	"
	TOOL DELAY (strn*)	-66	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	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	"	"

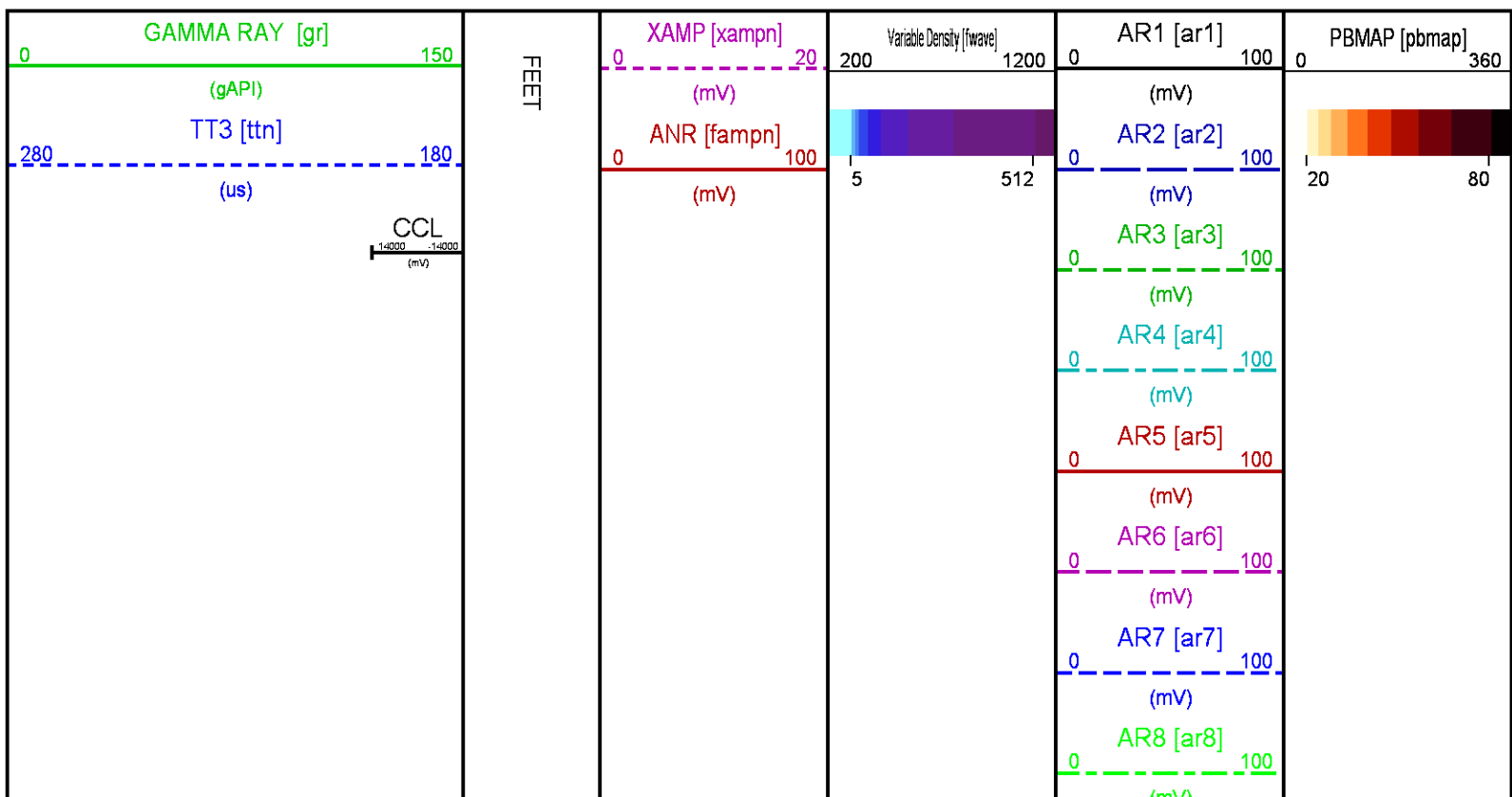
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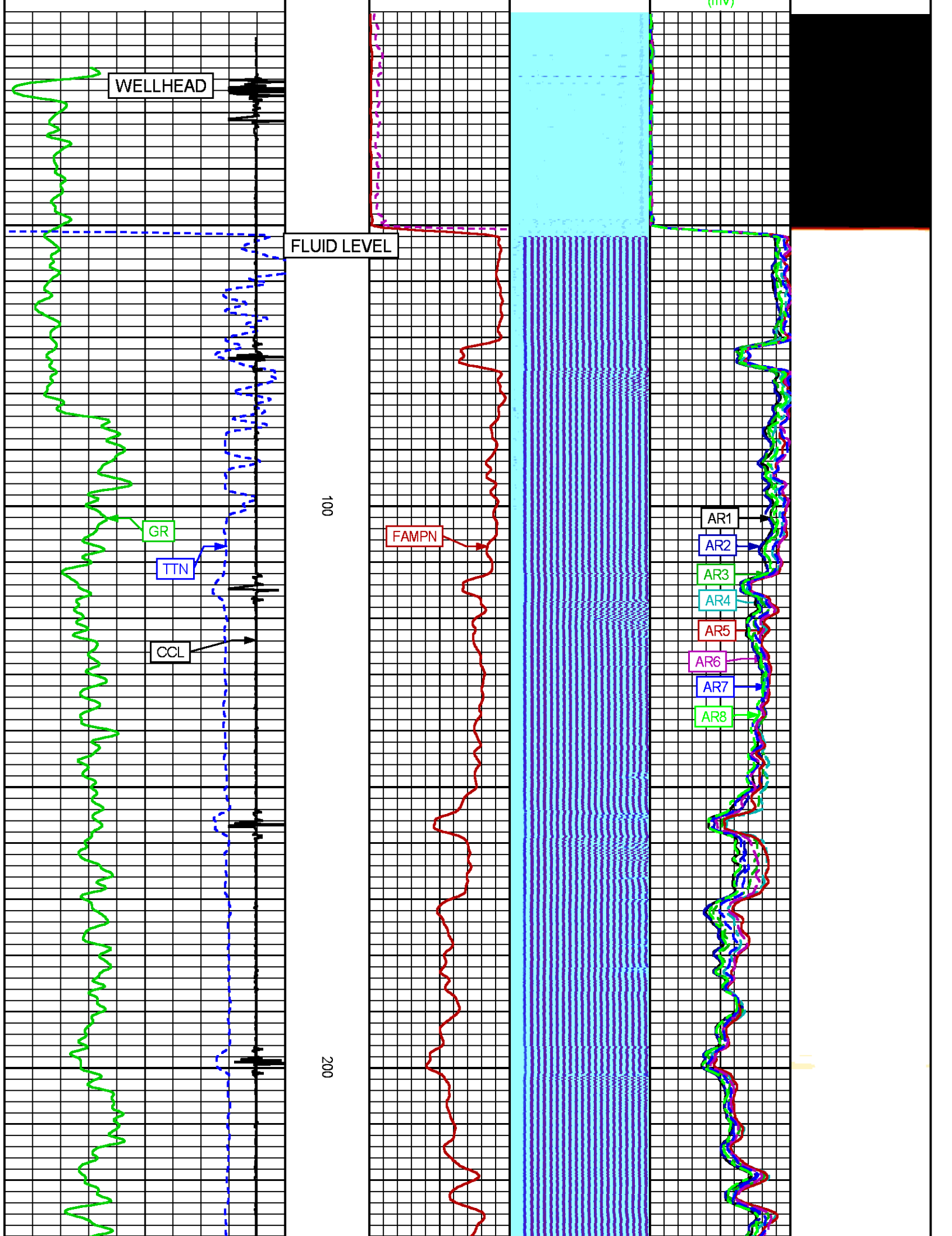
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	FIXED GATE AMPLITUDE T-R7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

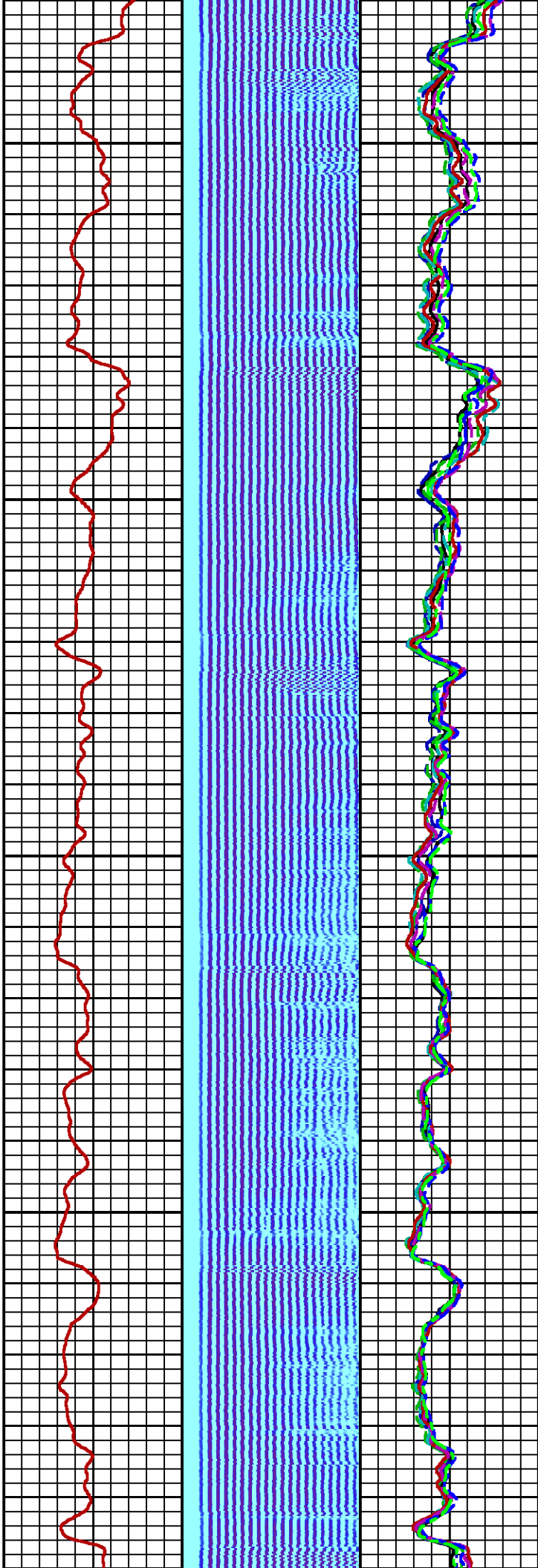
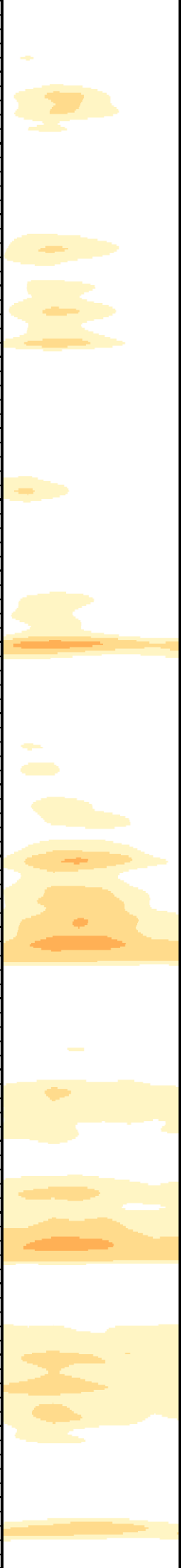
## CURVE MEASURE POINT OFFSET

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_FED_0994_24_21E/0994_24_21E_RAL_MAIN.fvpdf [5"/100' Scale]
<b>Plot Interval</b>	: 12.25 - 8039.25 Feet
<b>Data File 1</b>	: F1 : SysA:/dat1a/LARAMIE_NICHOLS_FED_0994_24_21E/0994_24_21E_RAL_MAIN.xtf
<b>Created On</b>	: N/A
<b>Company</b>	: LARAMIE ENERGY LLC
<b>Well</b>	: NICHOLS FEDERAL 0994-24-21E
<b>Field</b>	: VEGA
<b>File Interval</b>	: 11.25 - 8040.5 Feet
<b>OCT</b>	: p012g

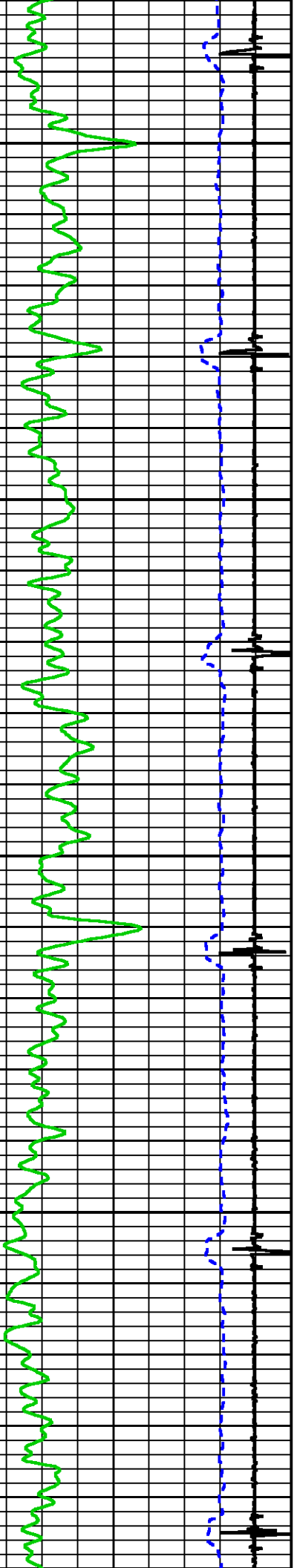


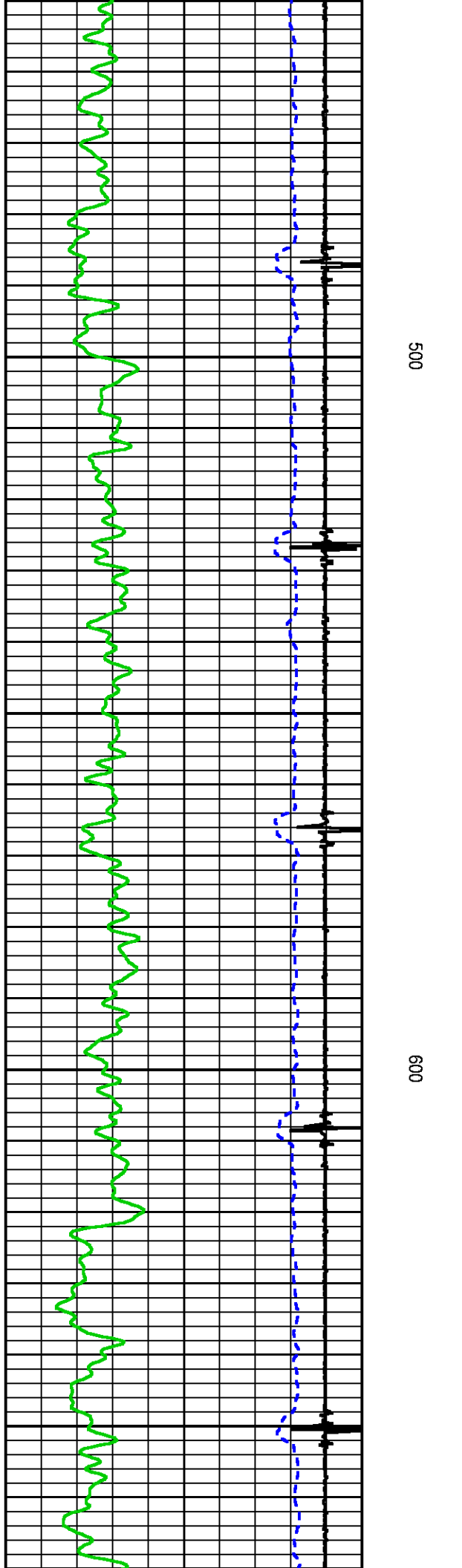
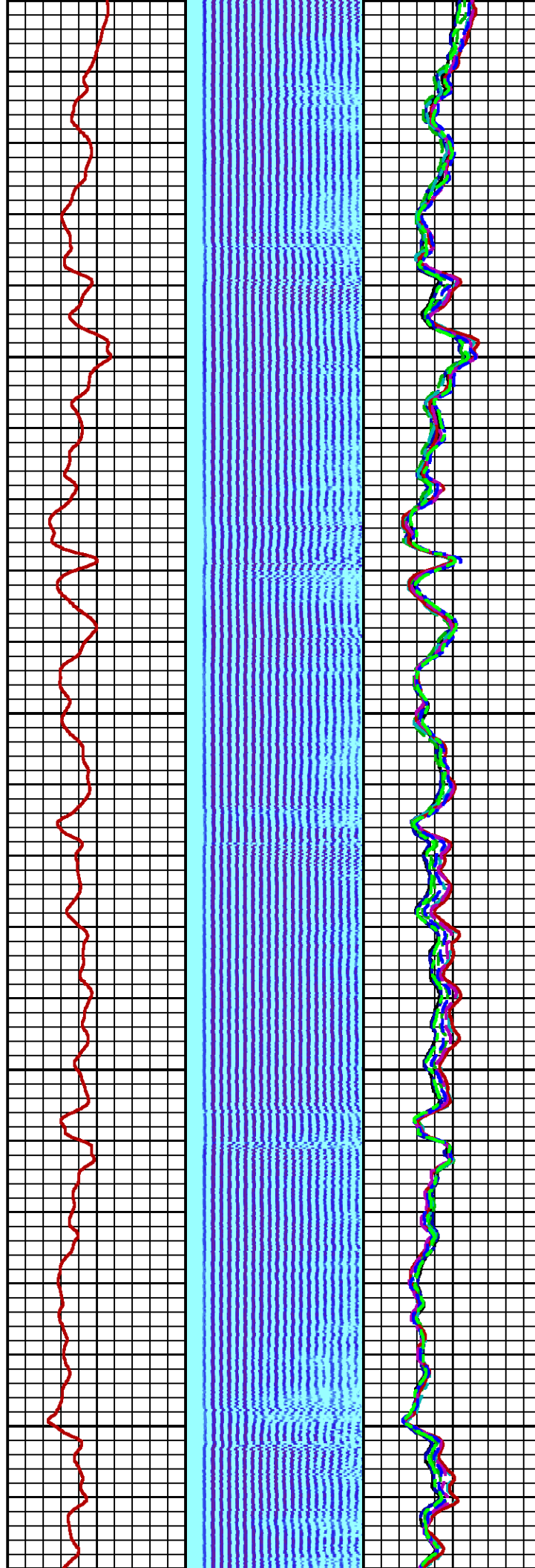
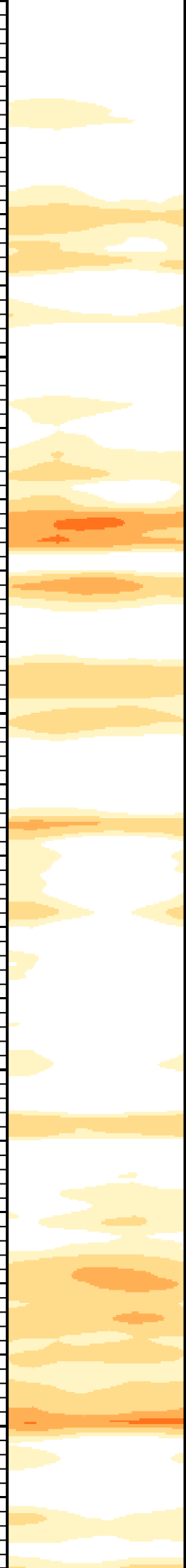




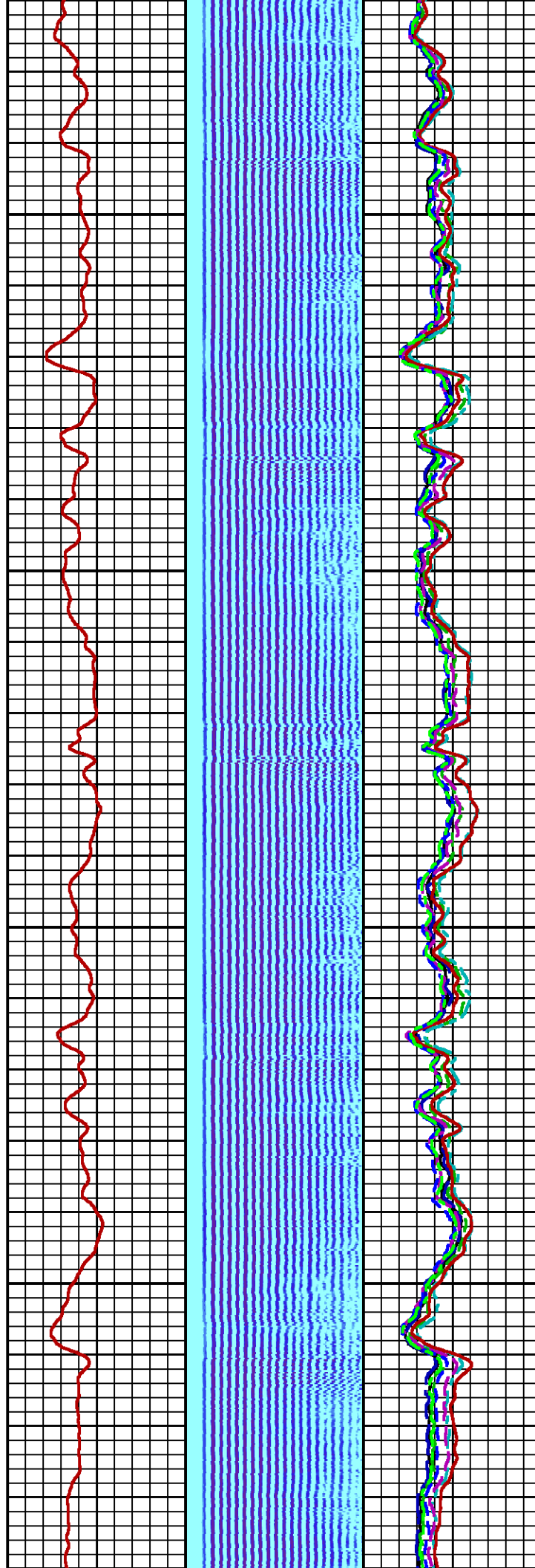
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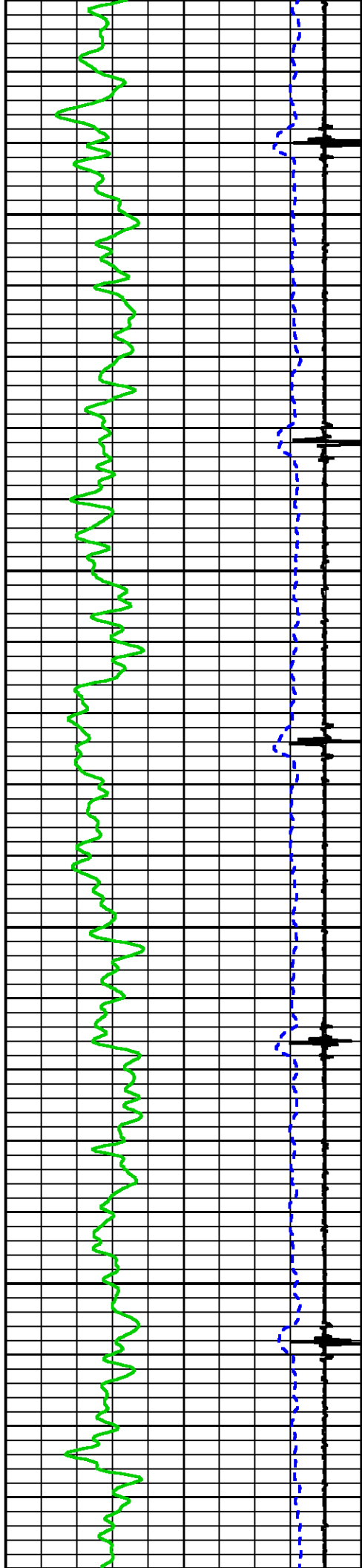


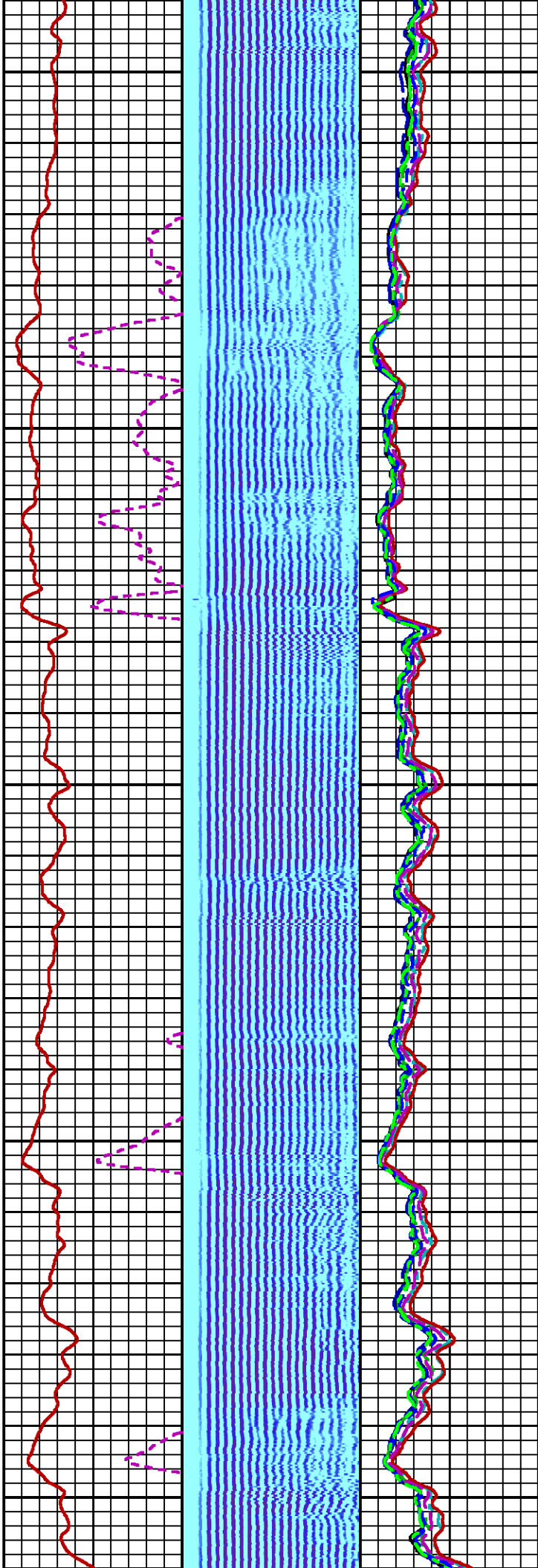
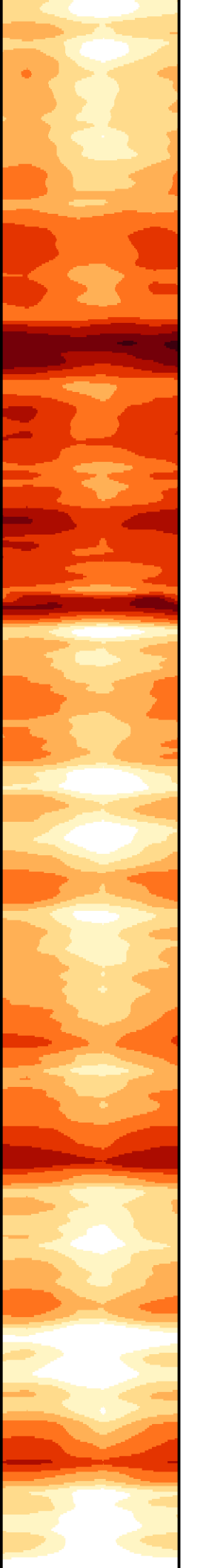




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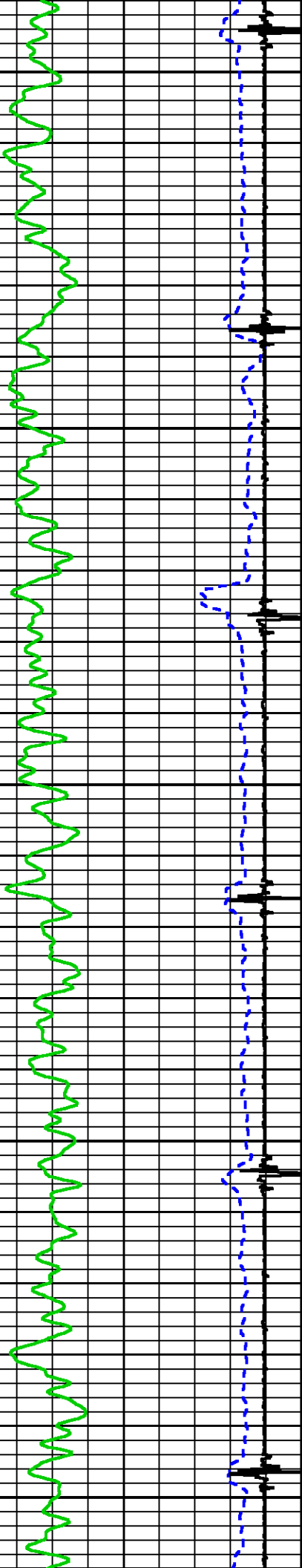




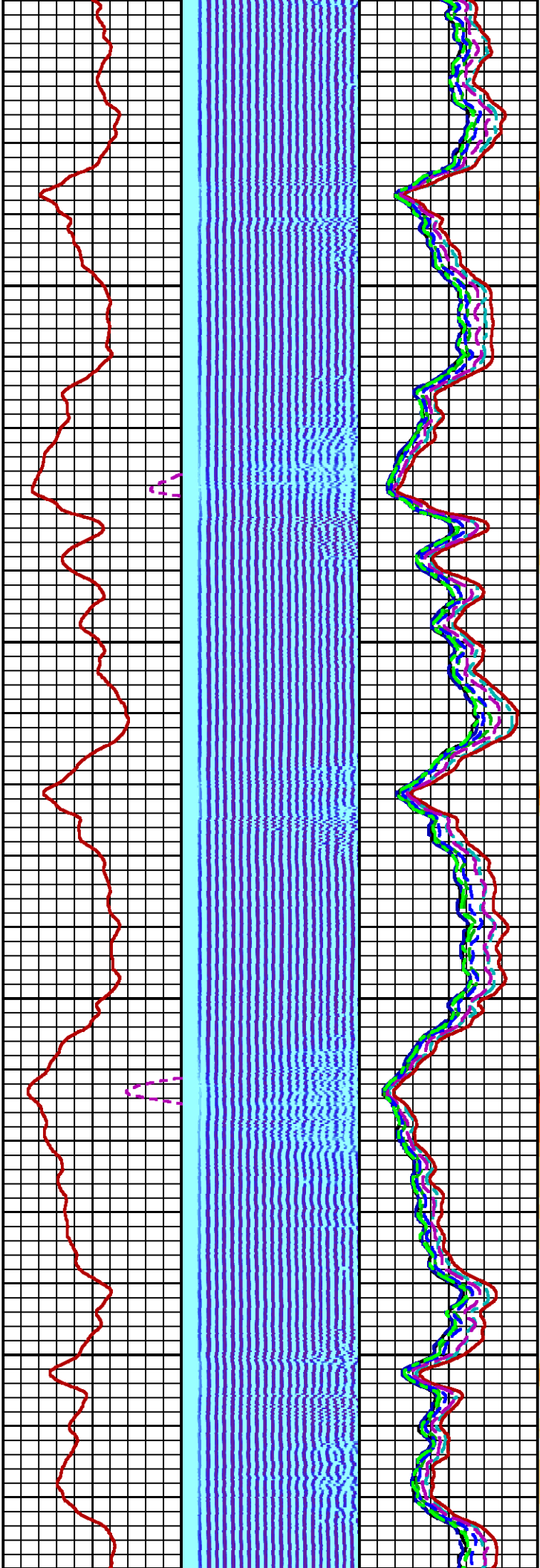
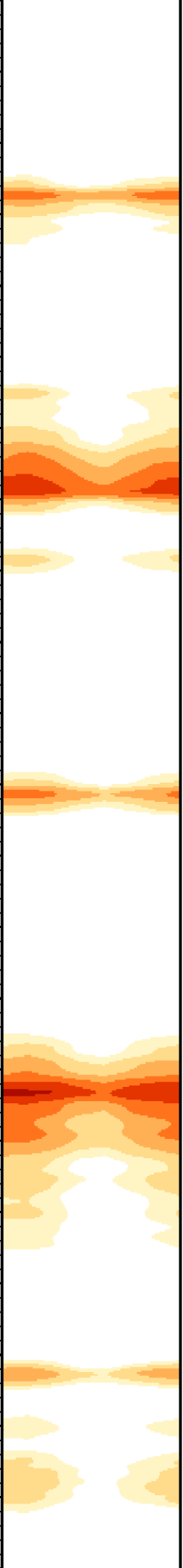
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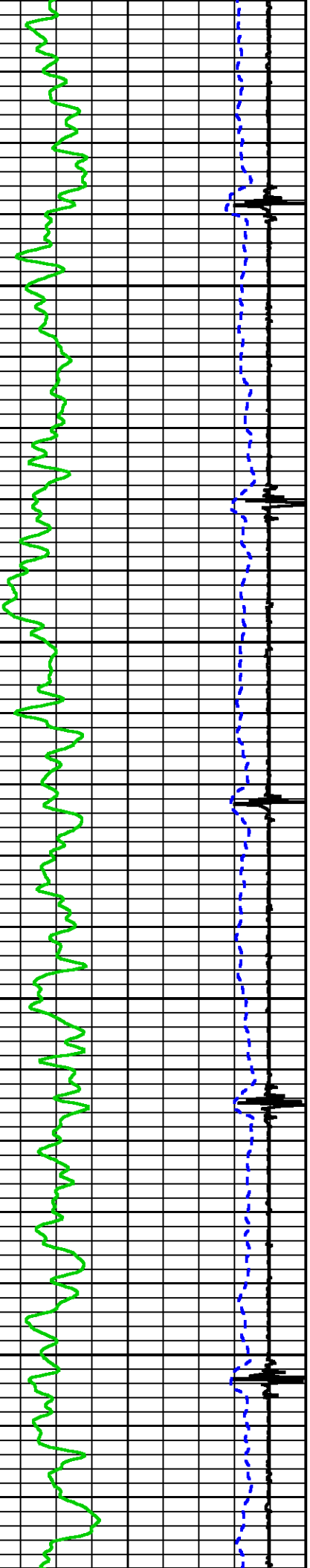


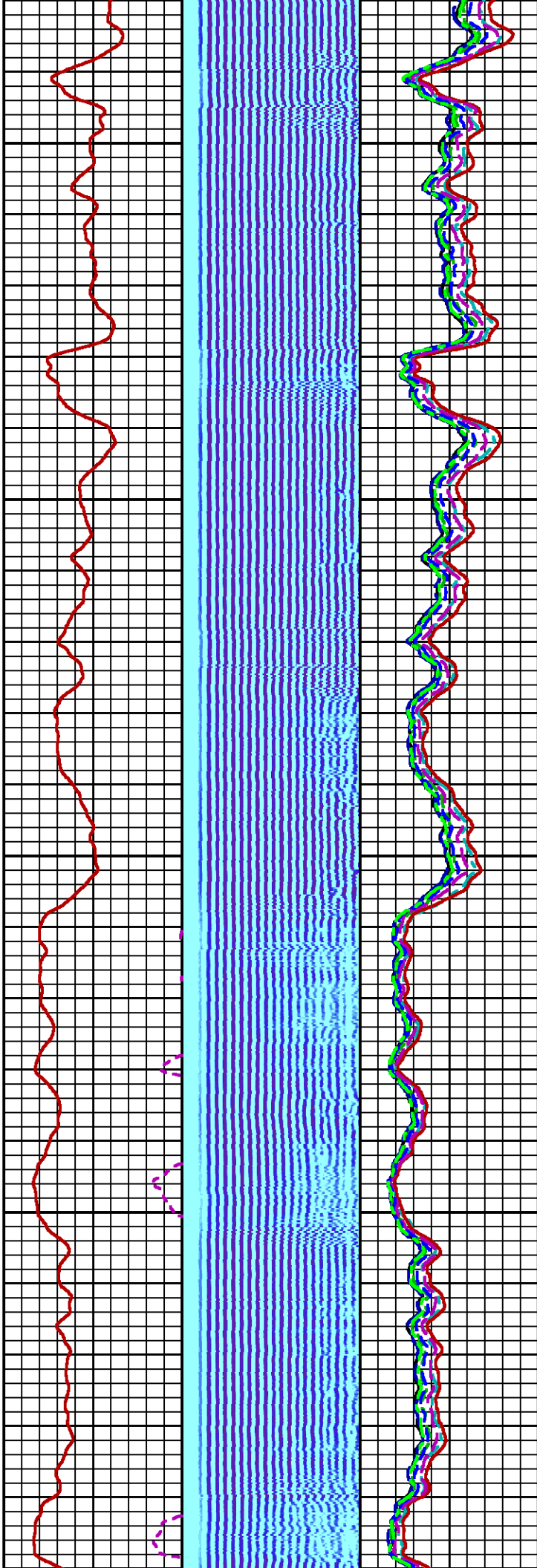
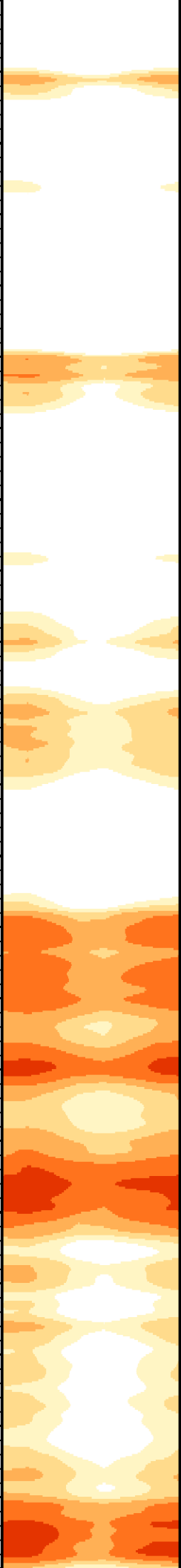




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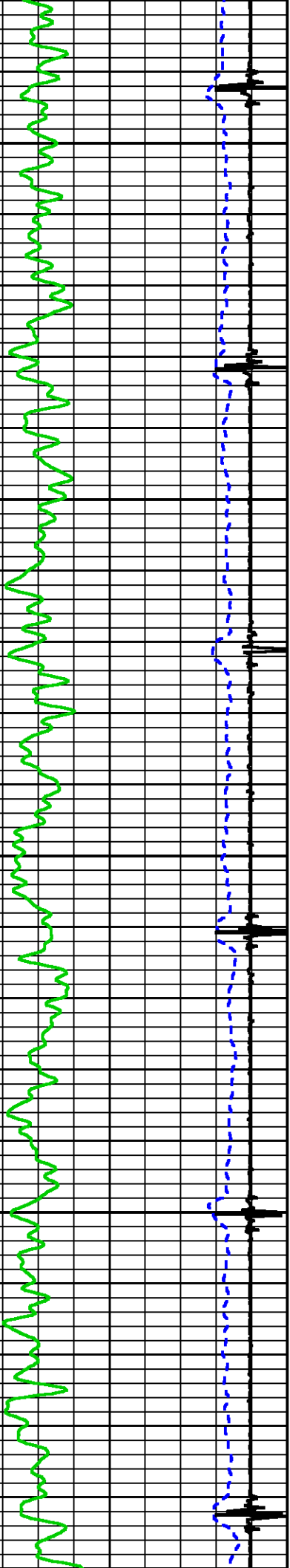
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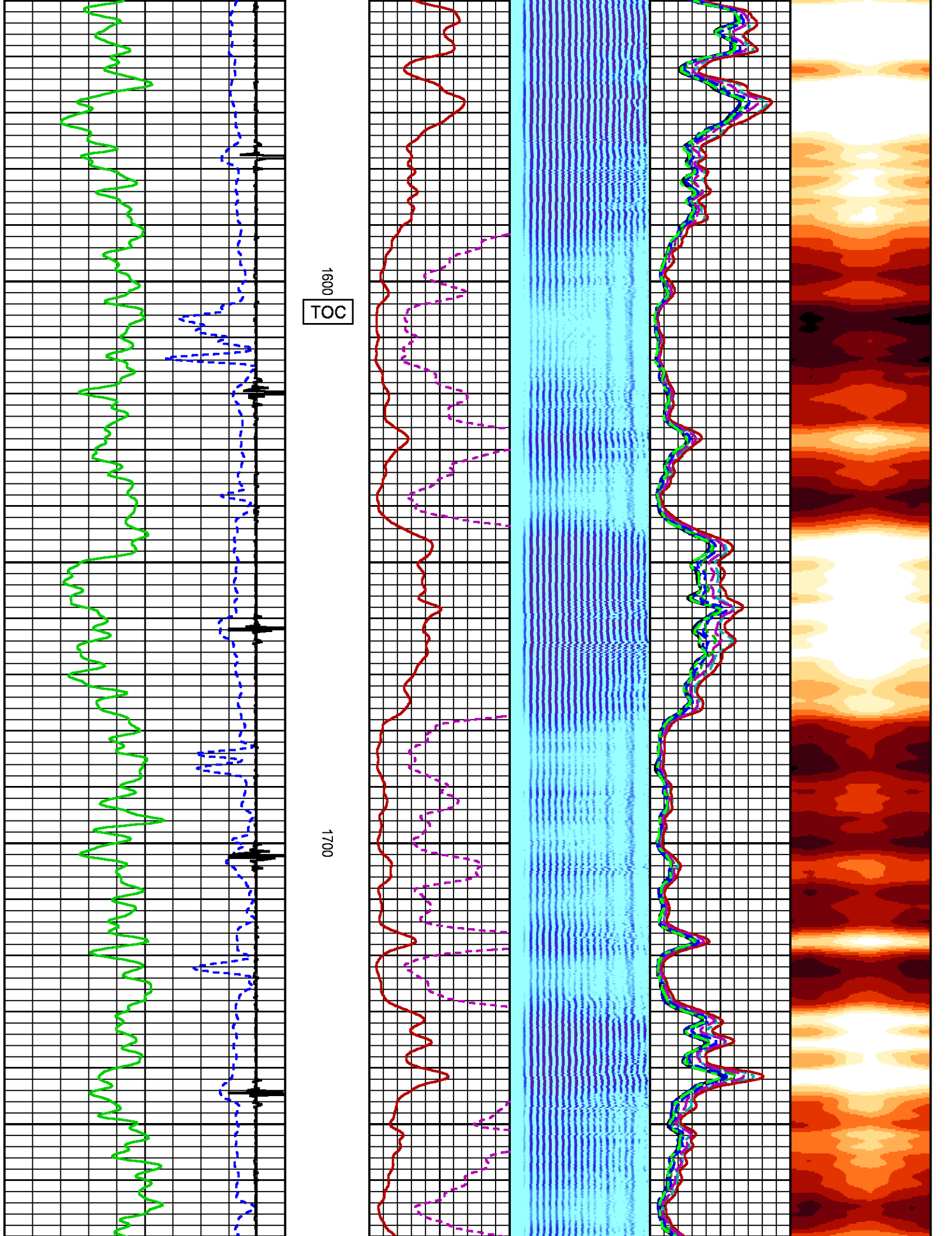


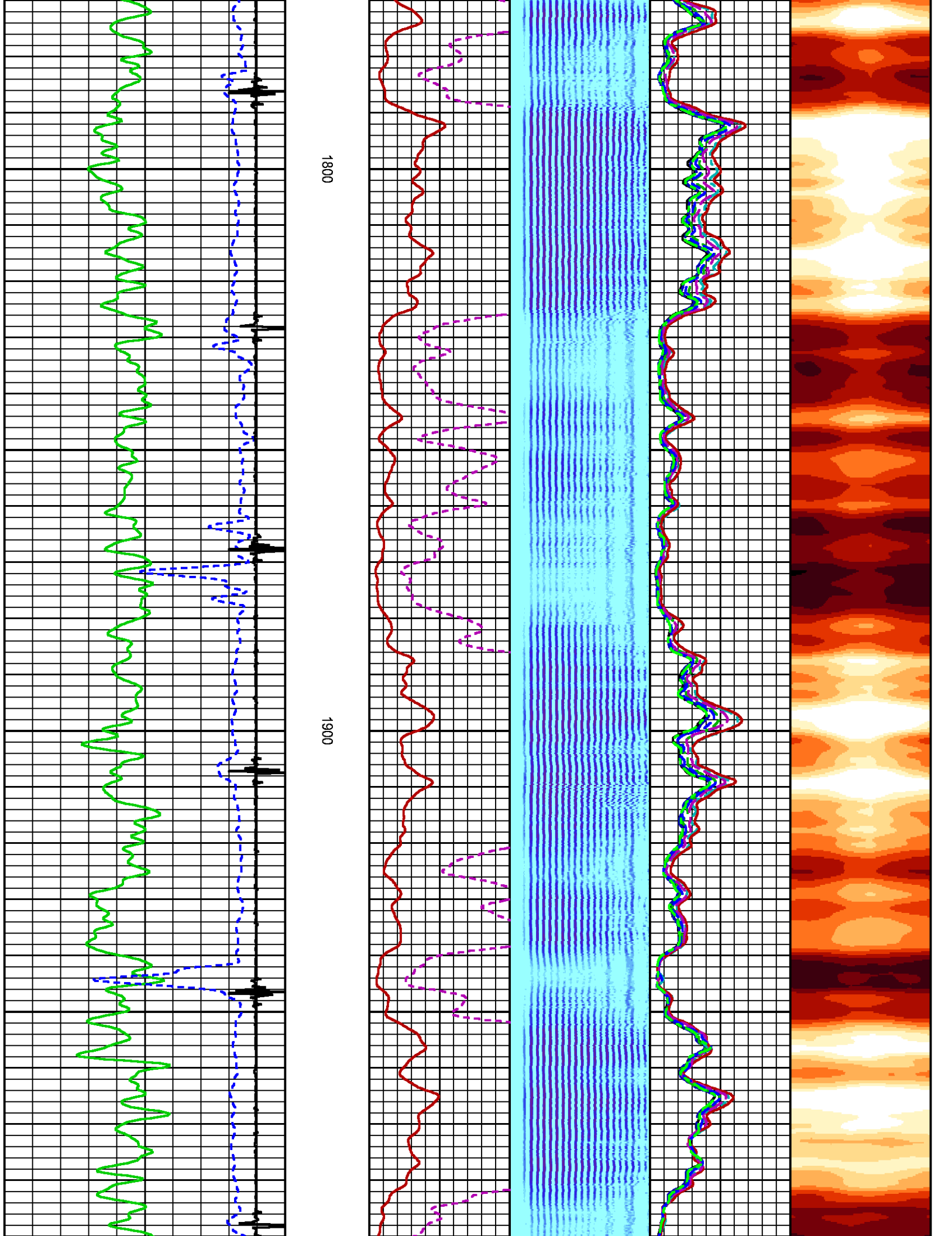


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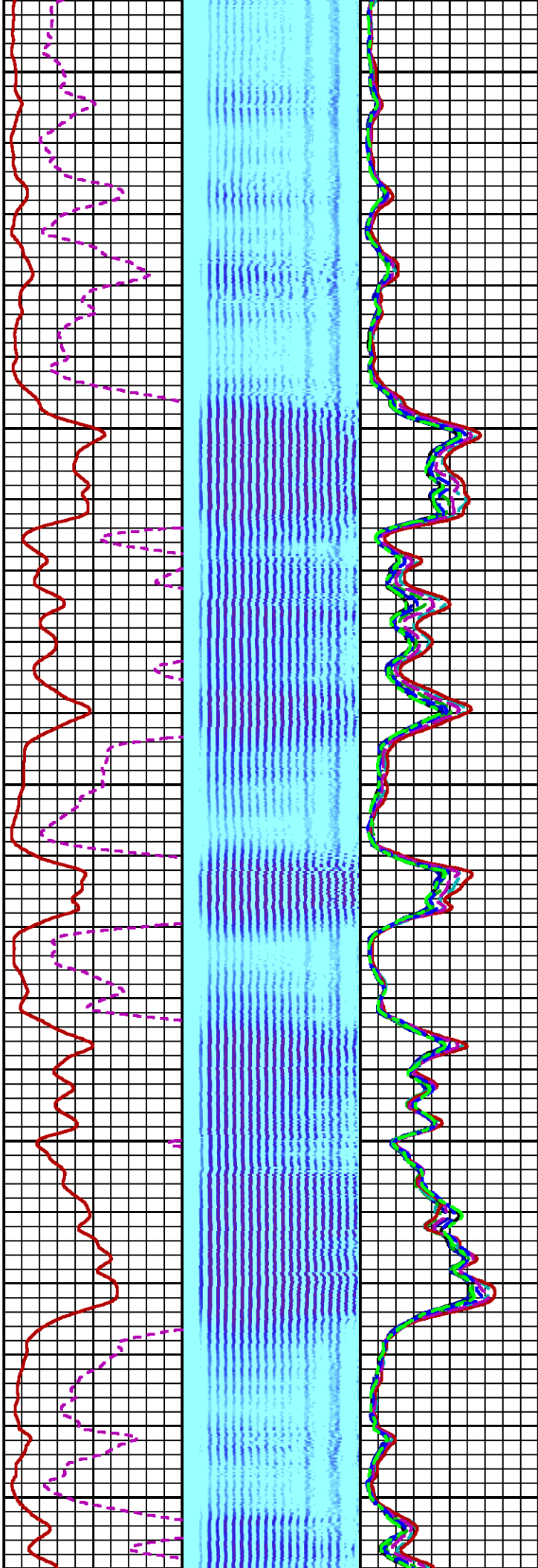
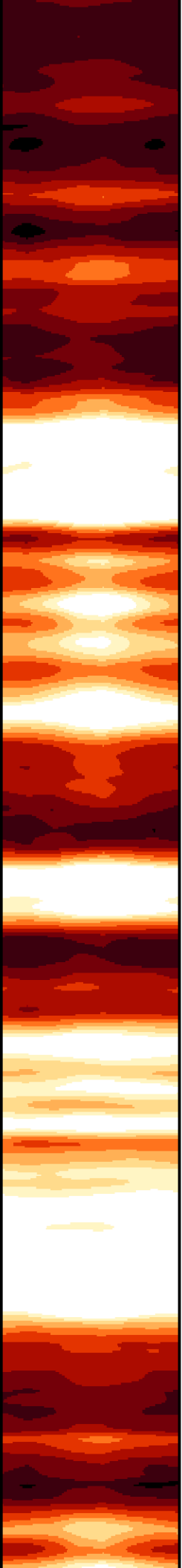
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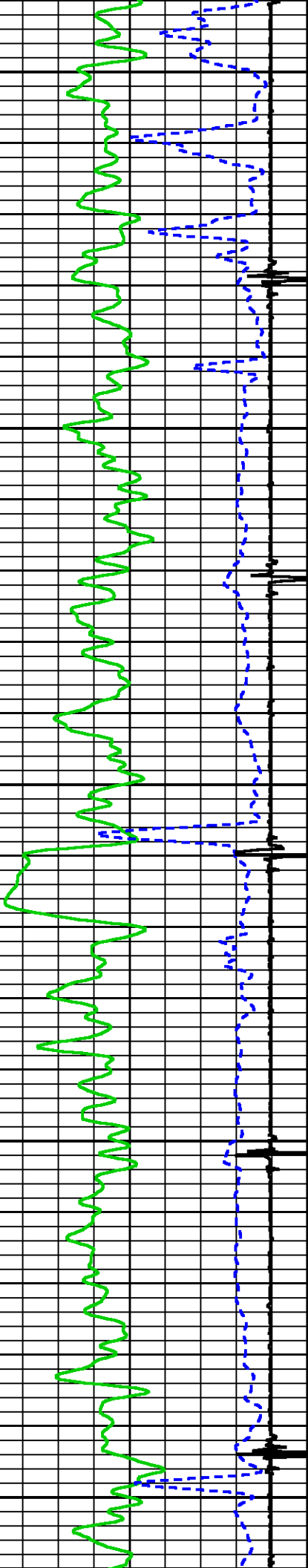




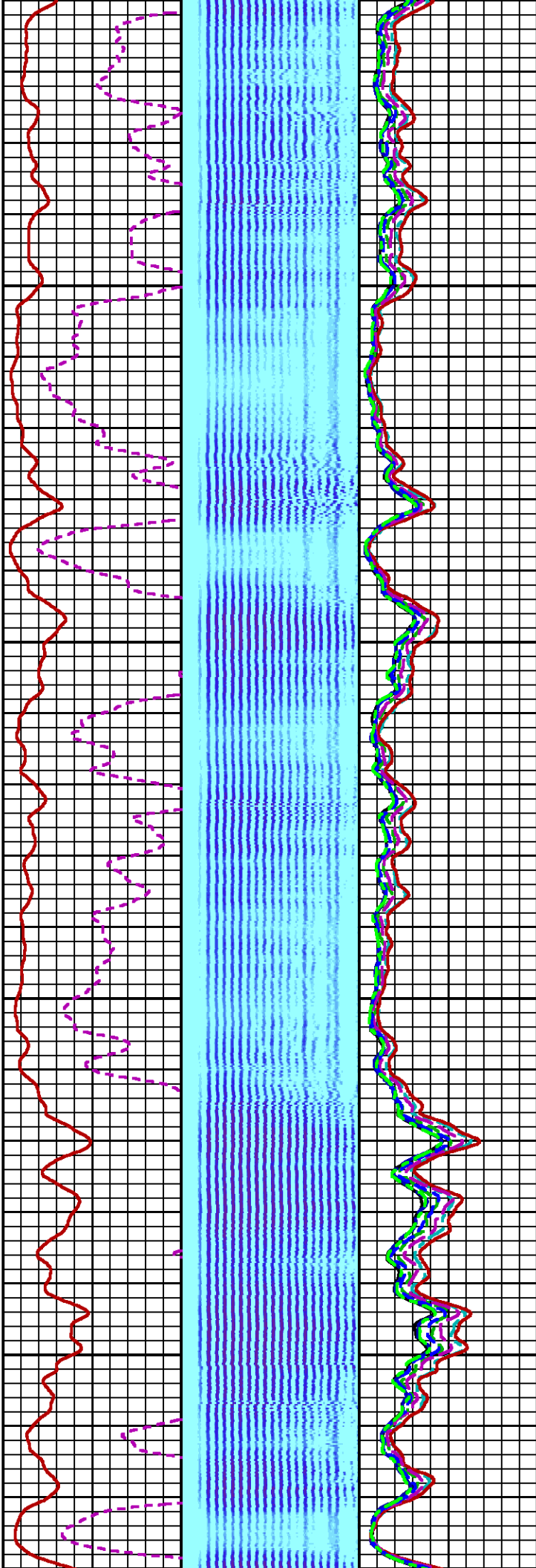
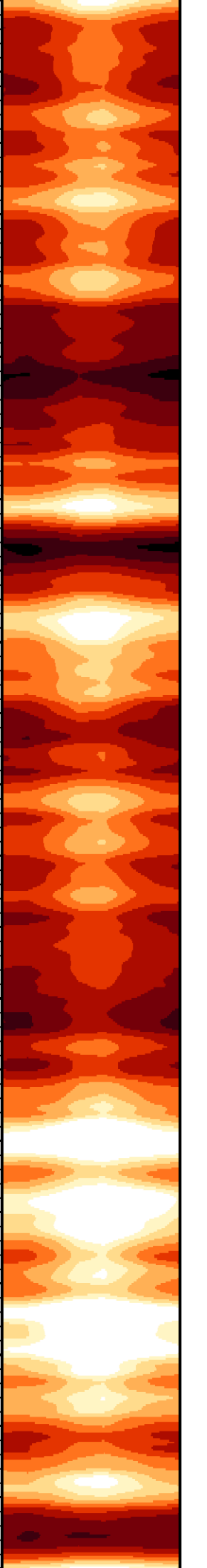
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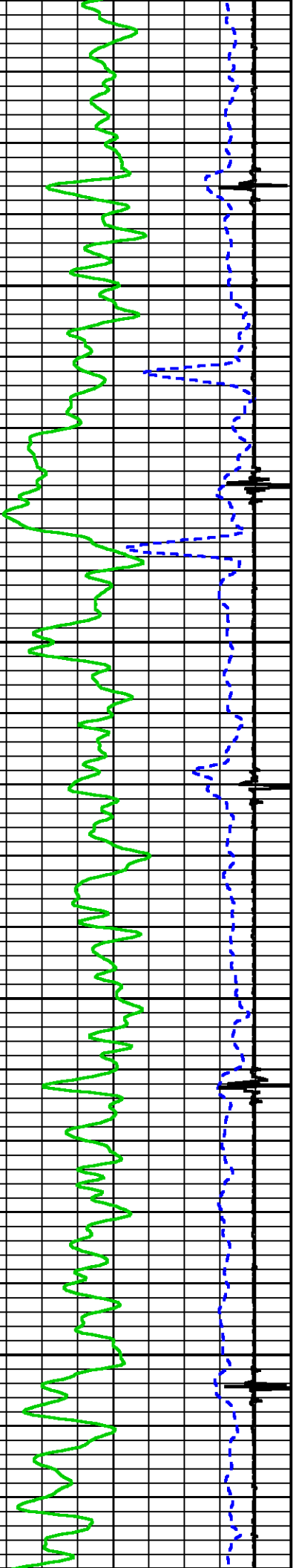


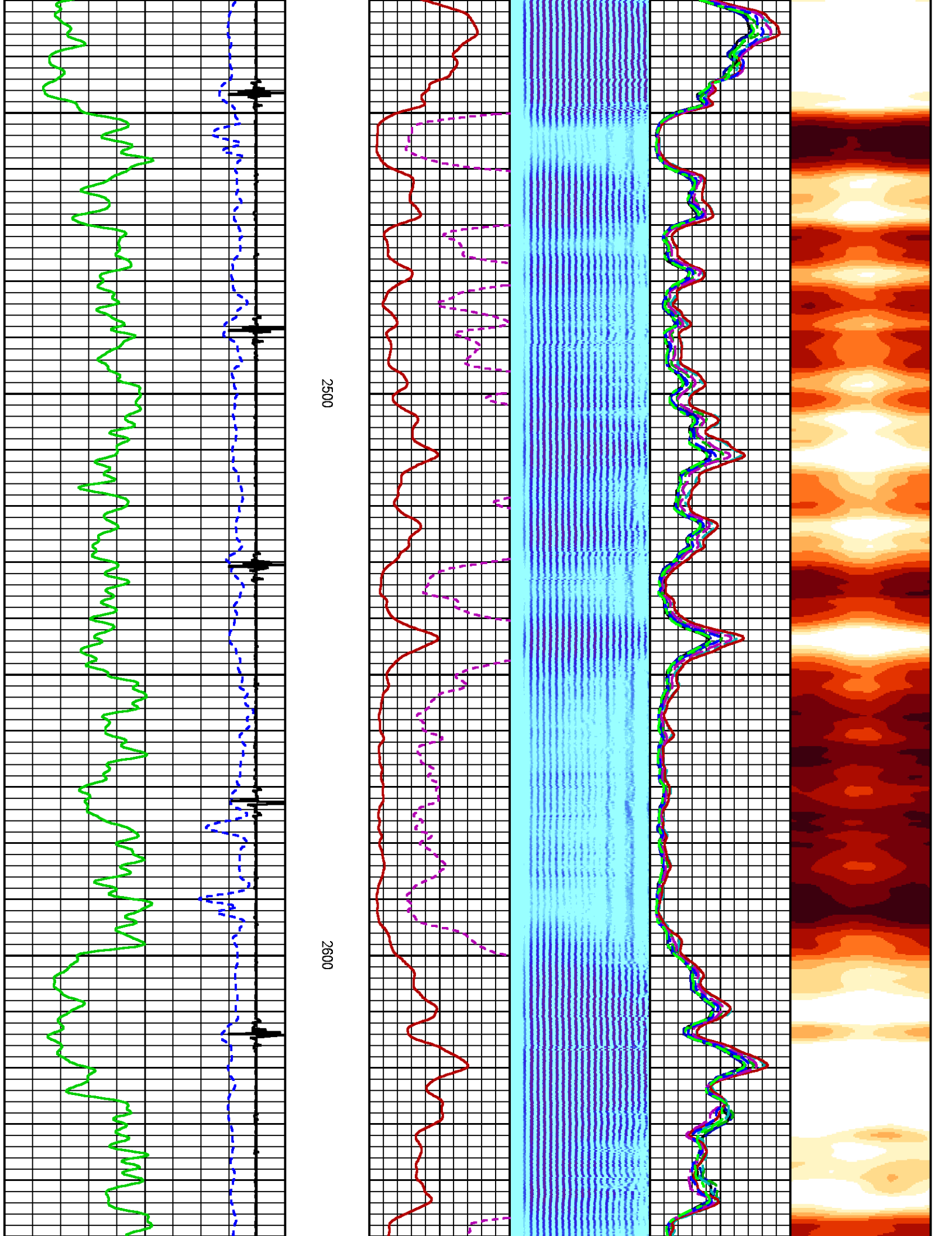


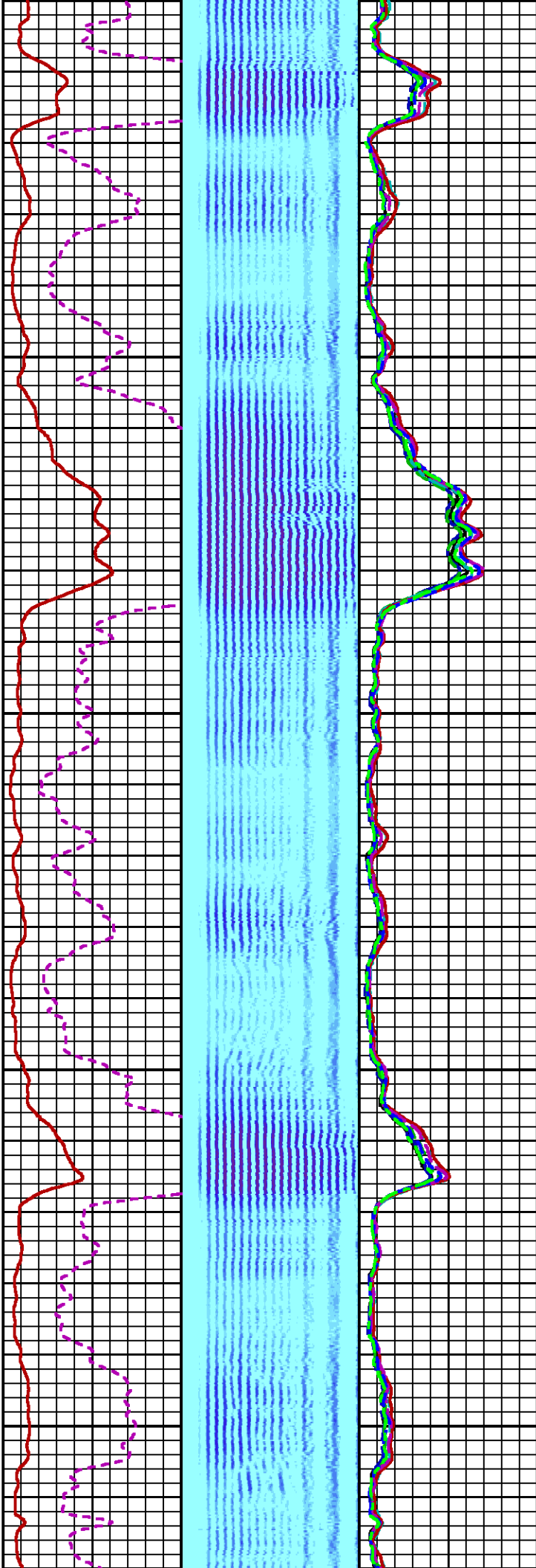


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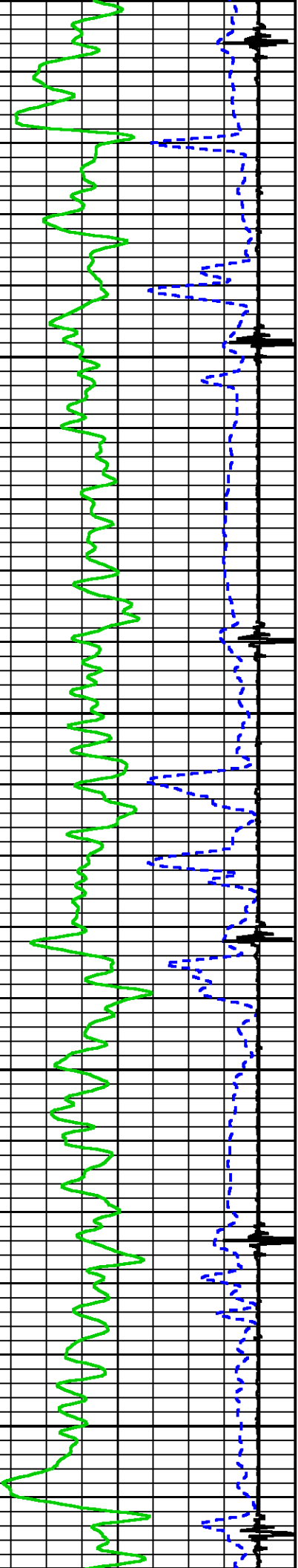


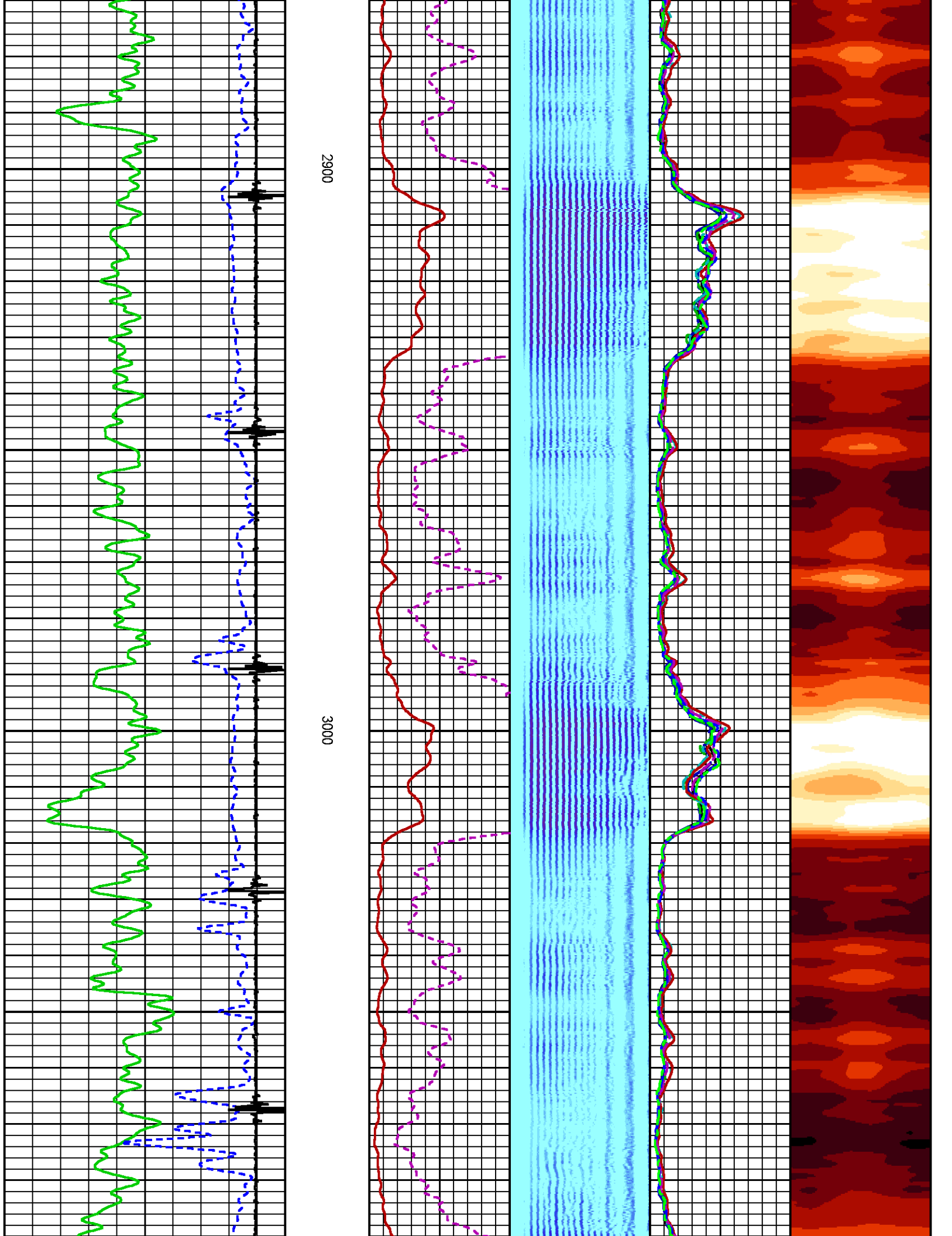




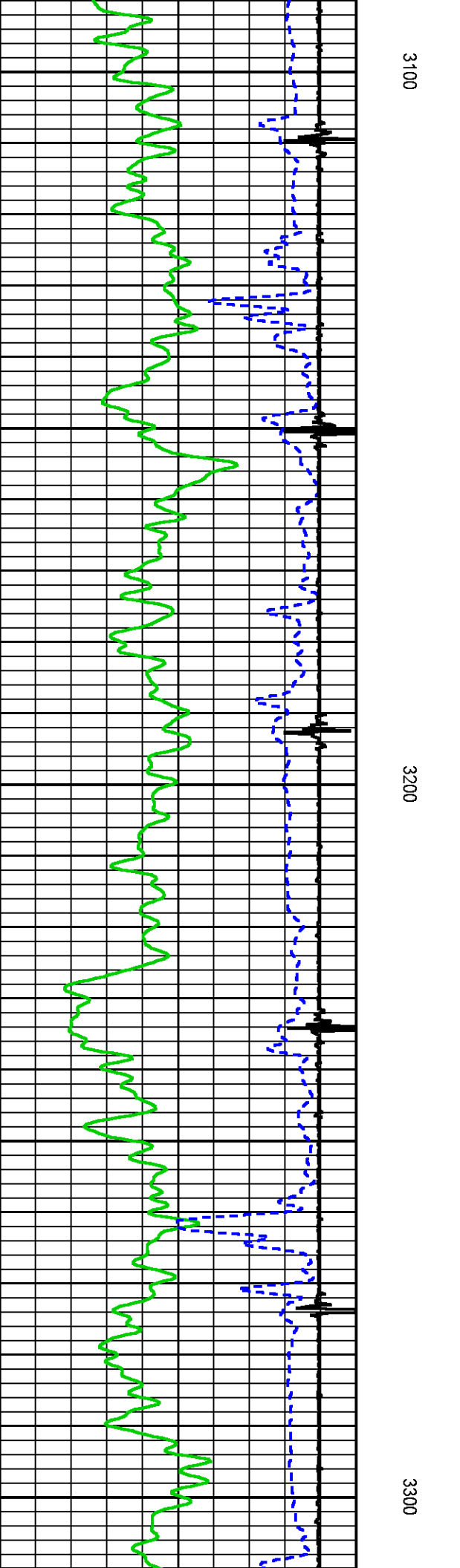
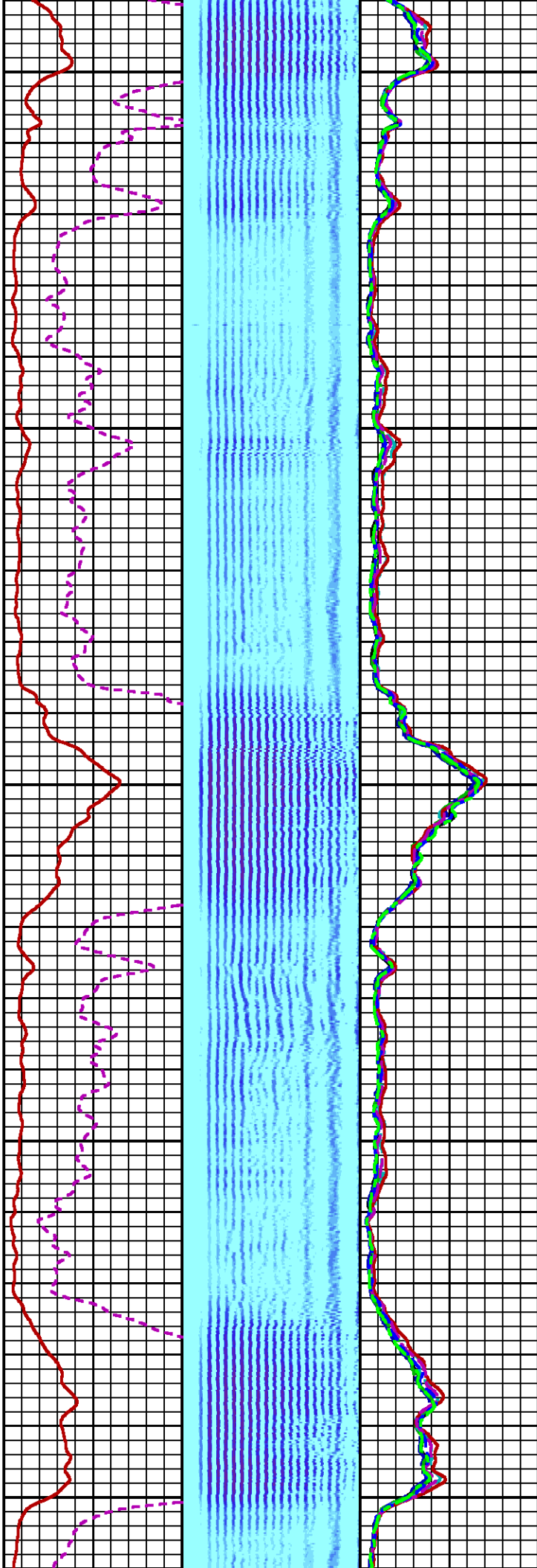
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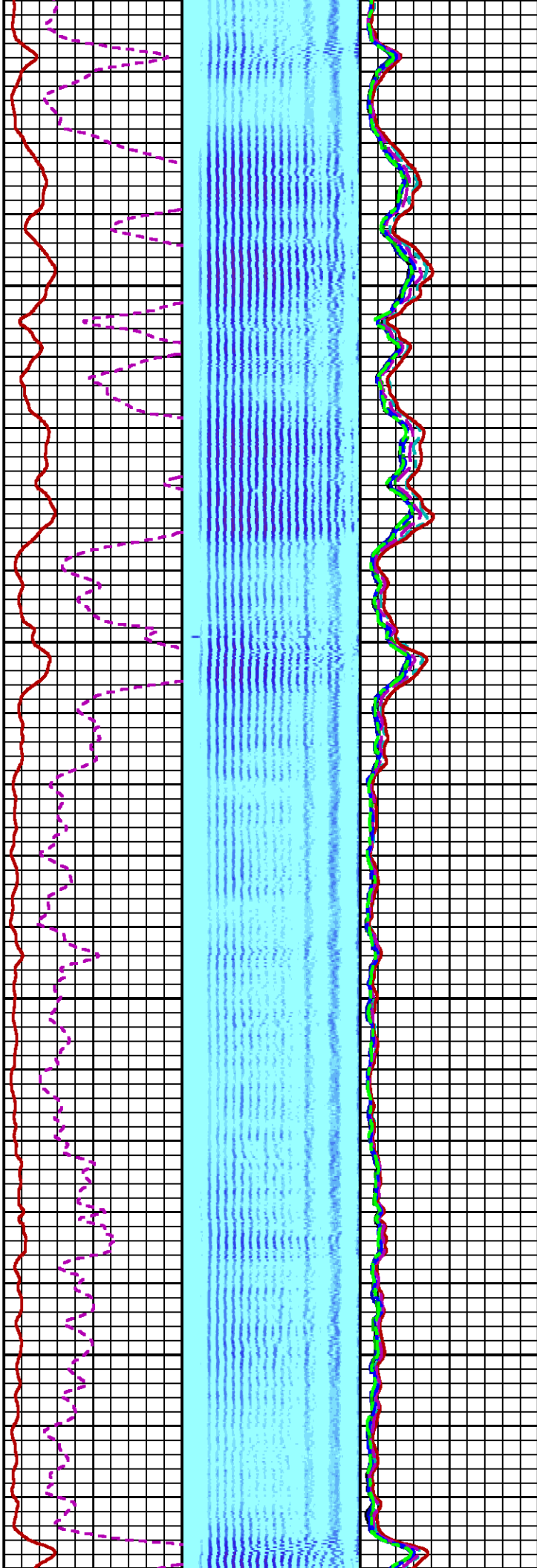






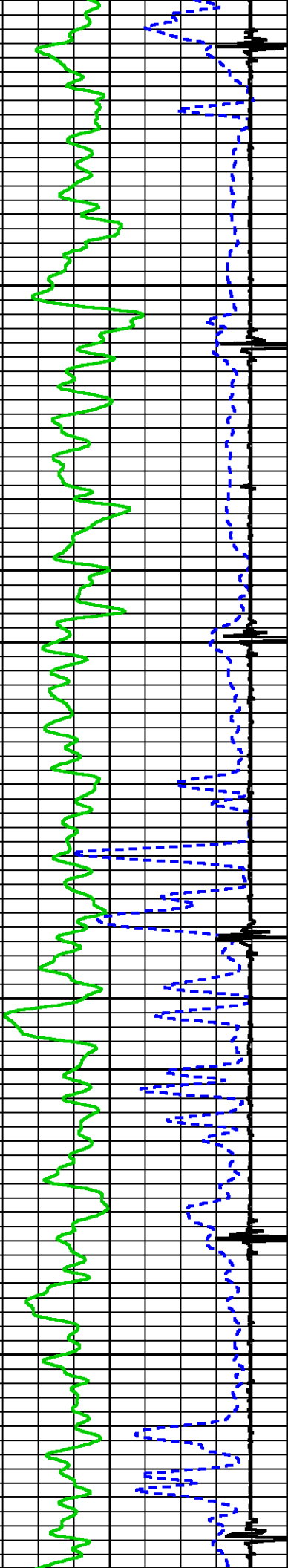


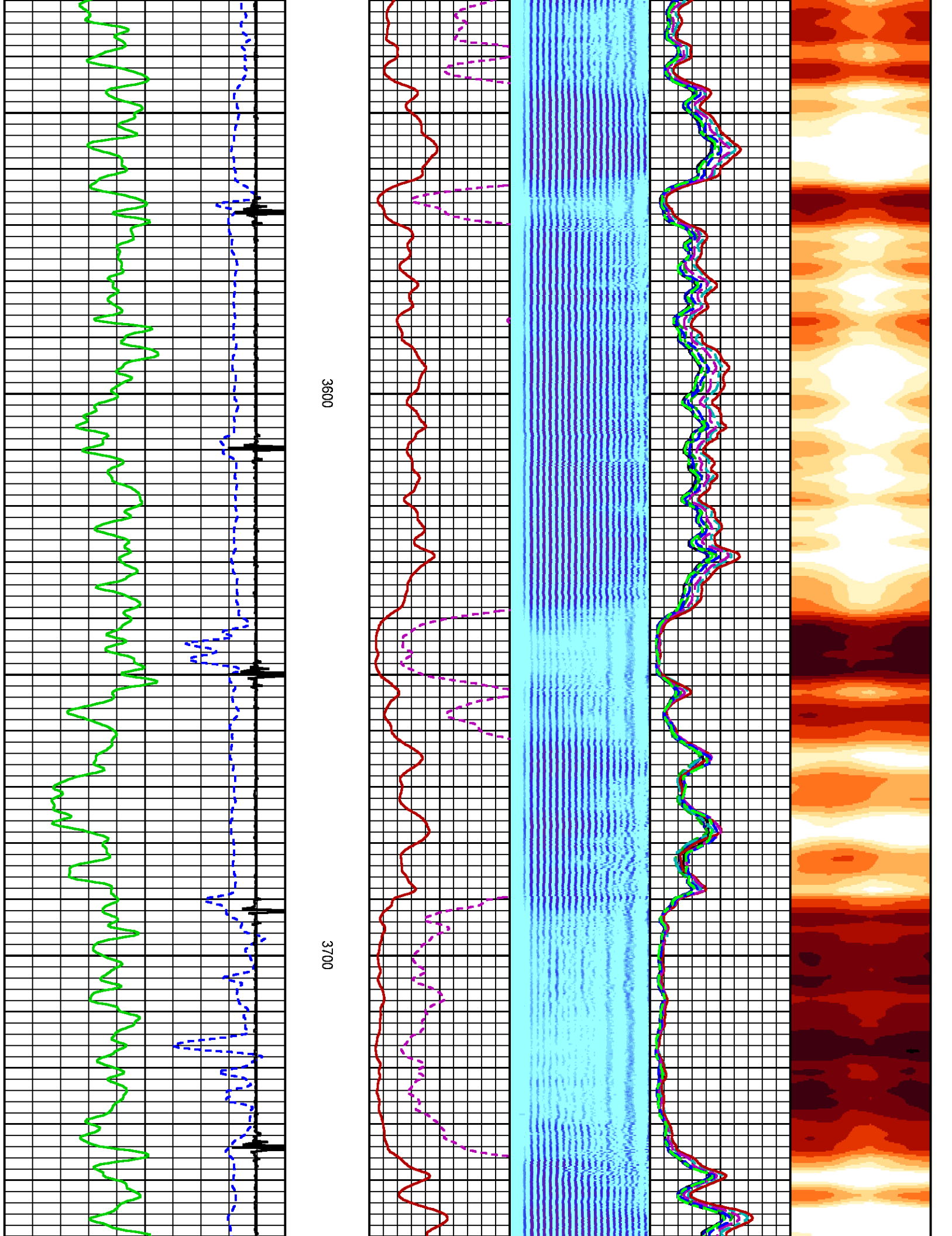


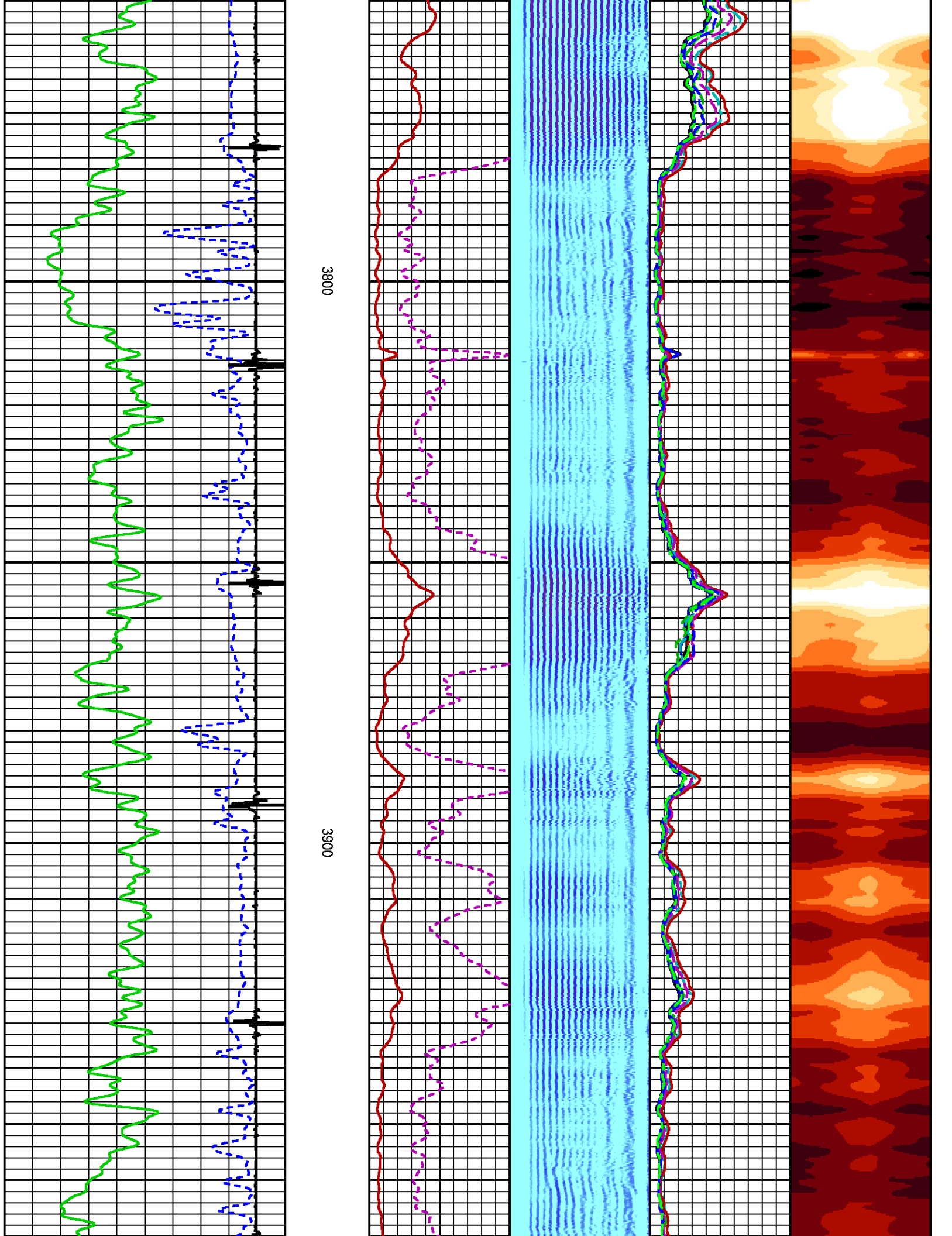


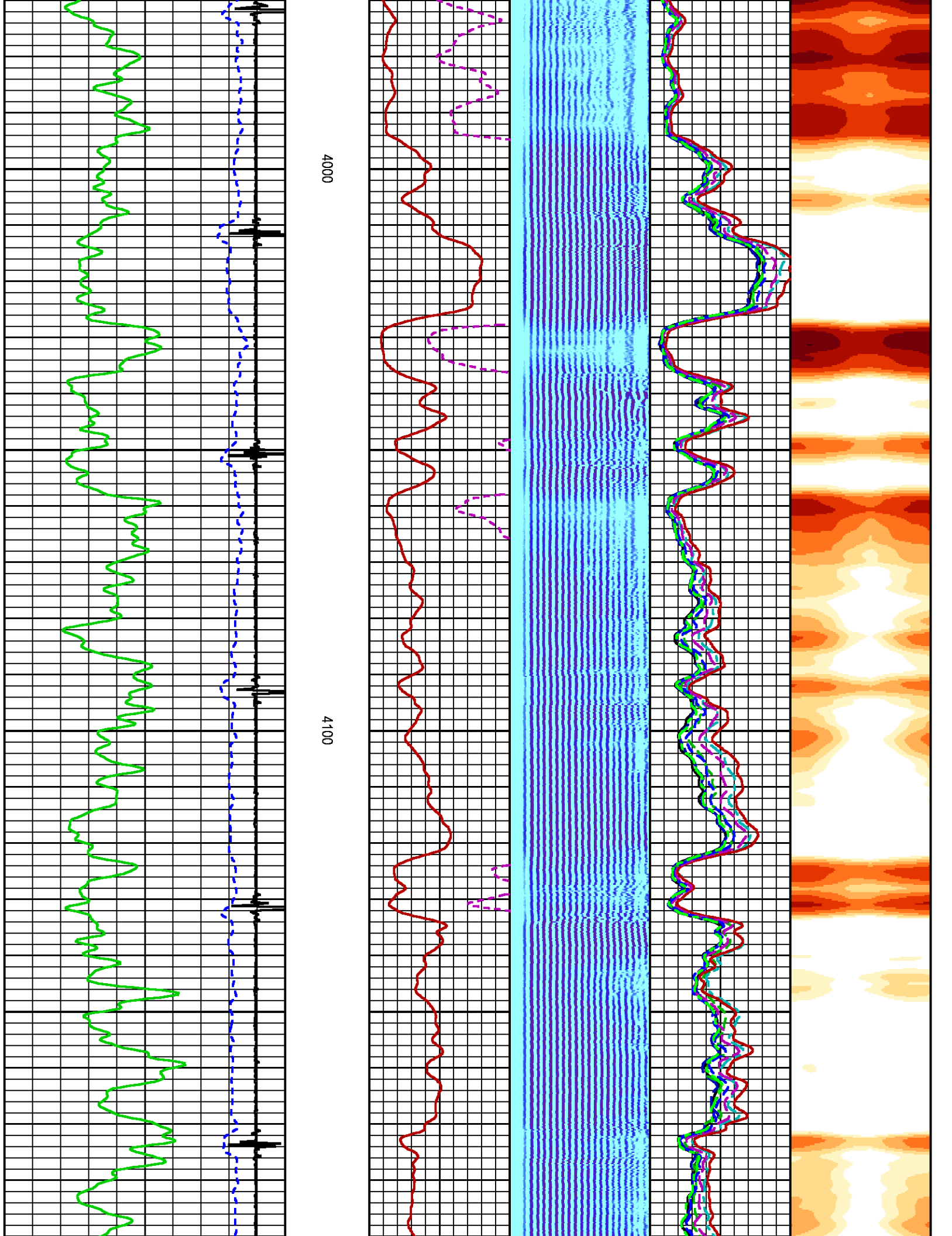
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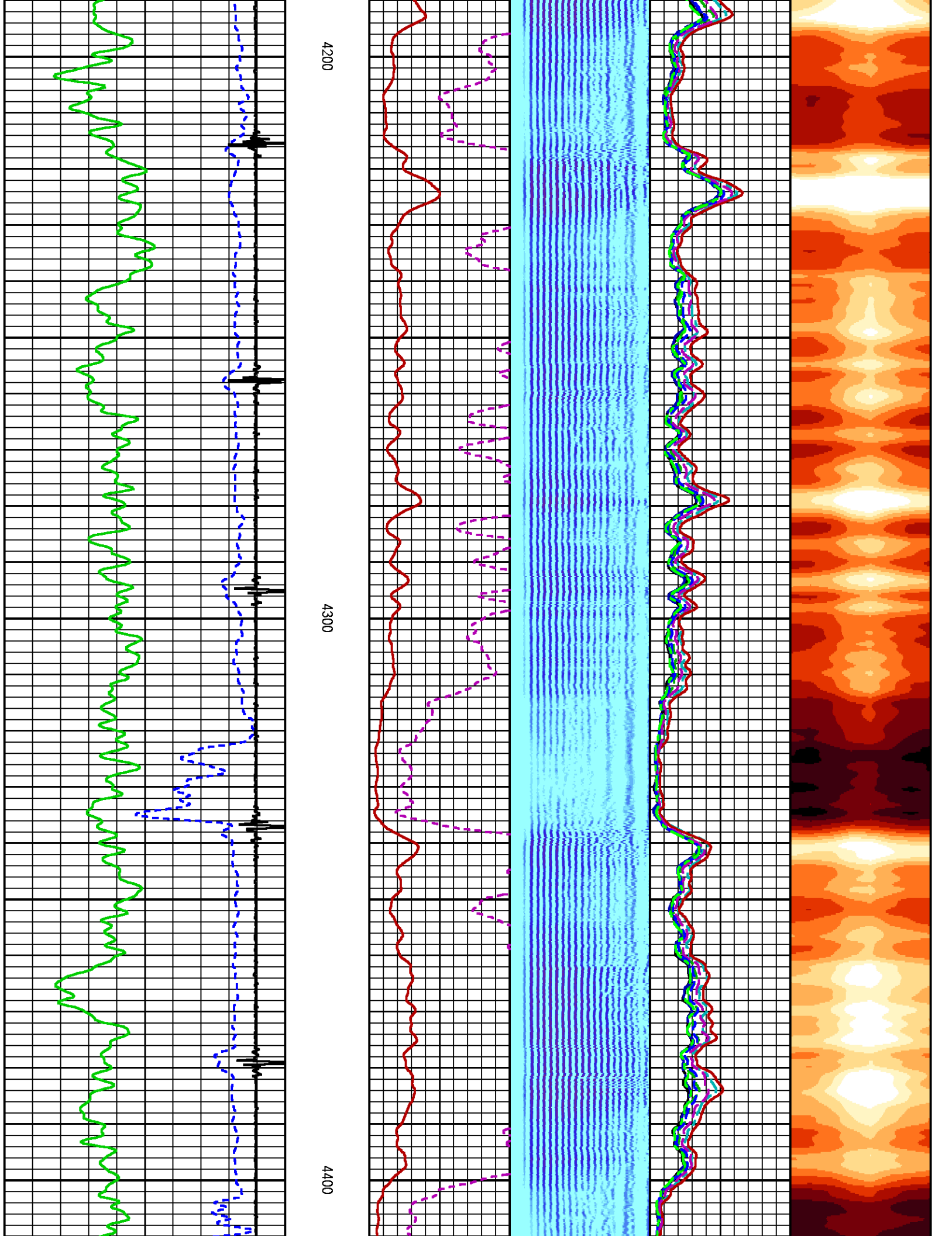




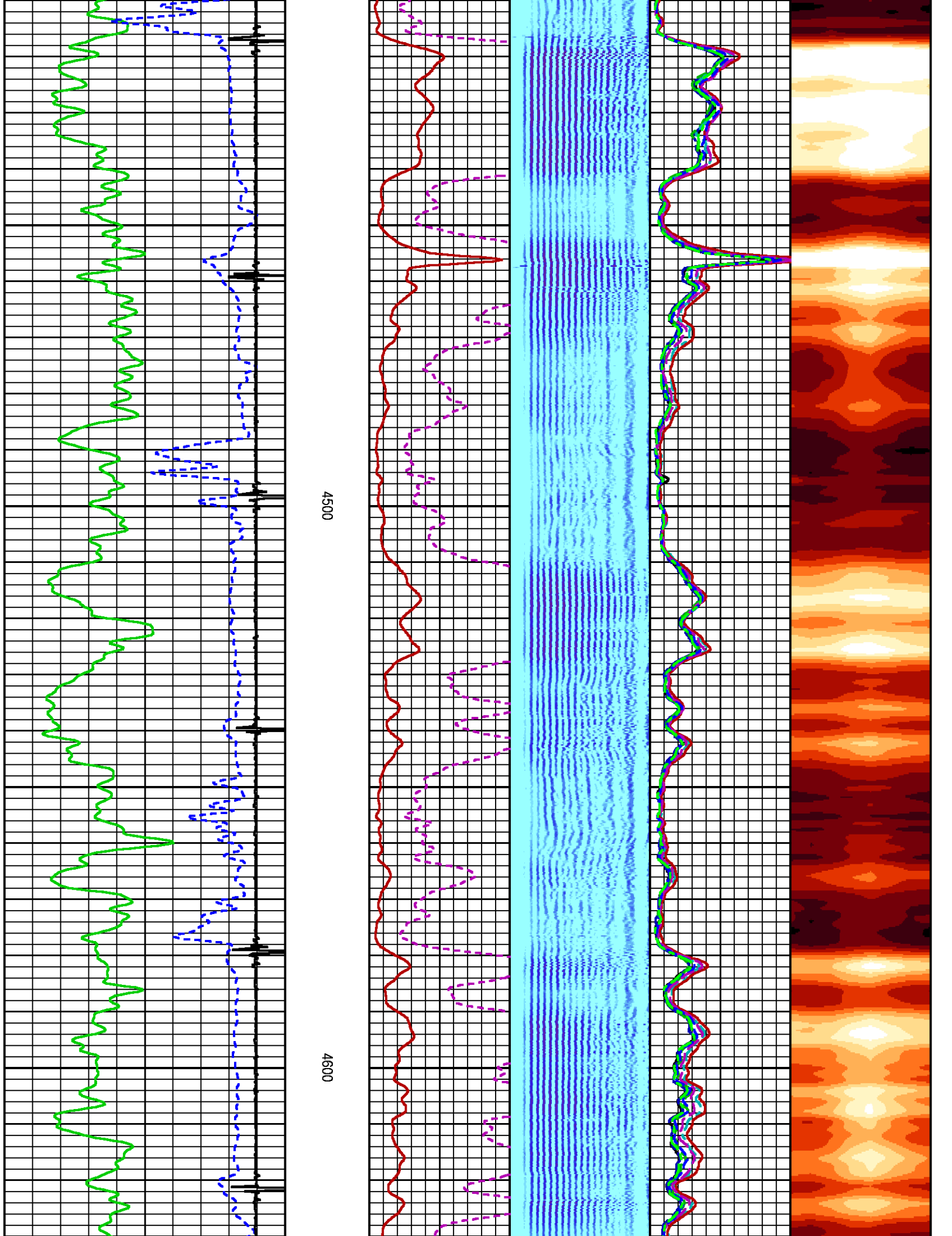


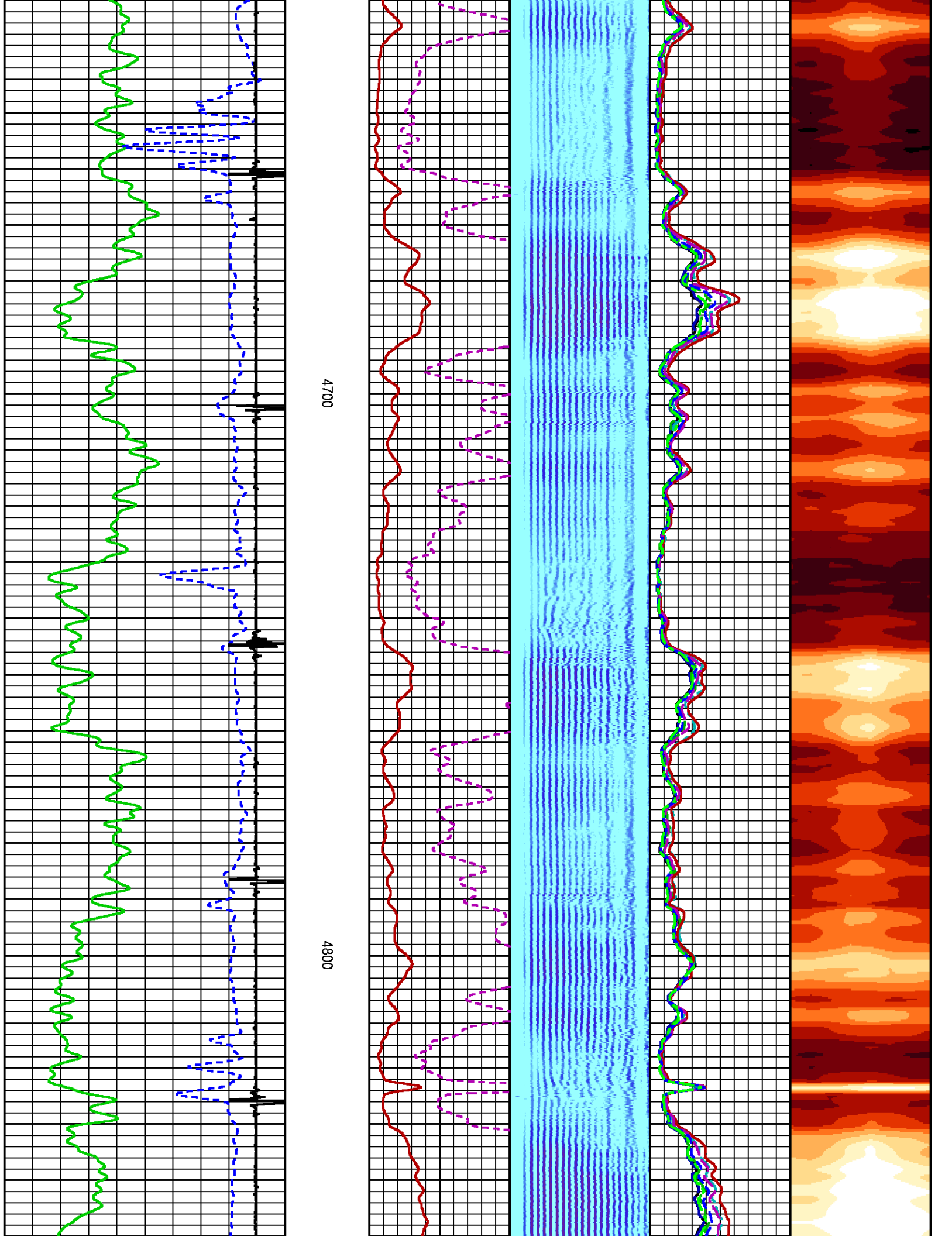


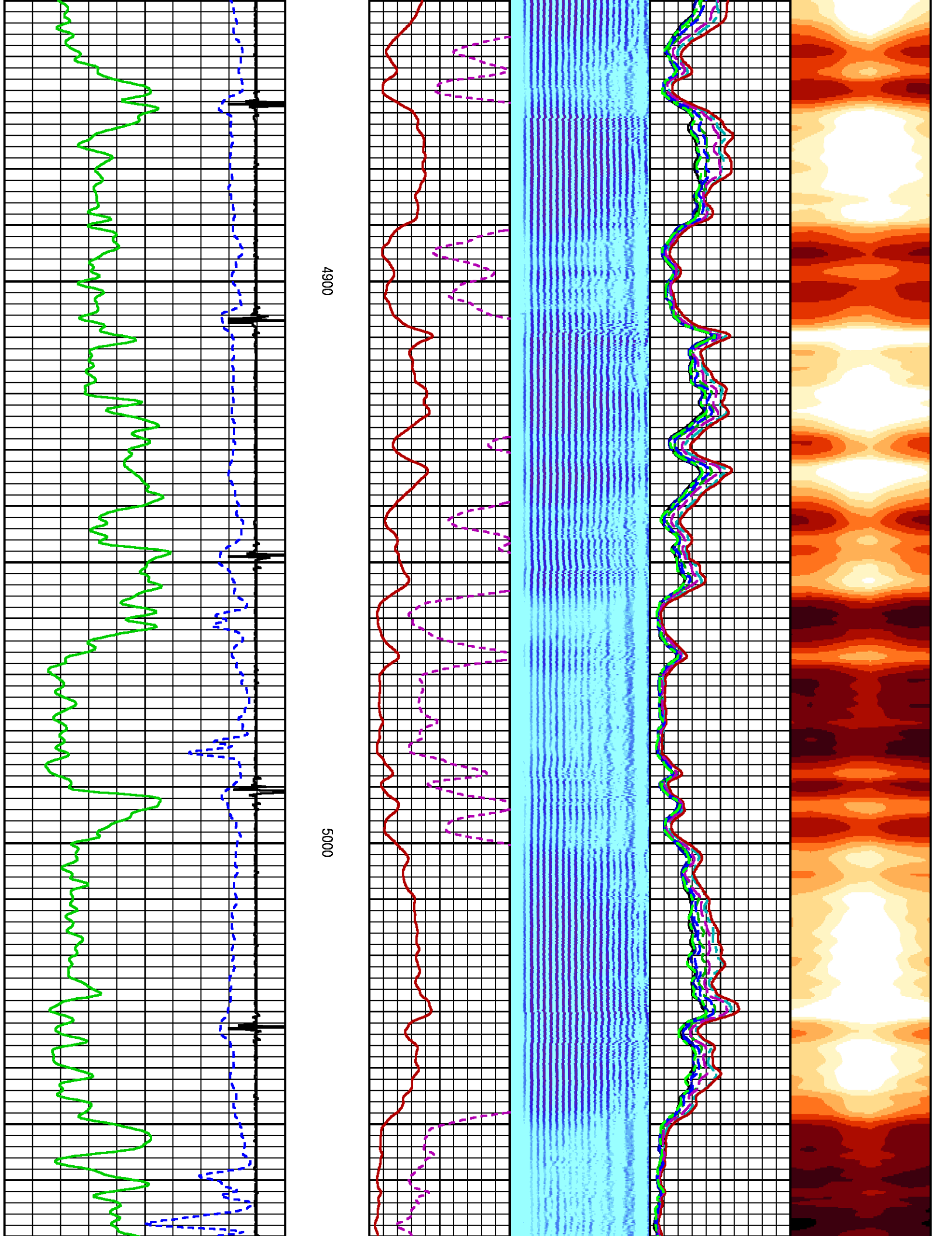


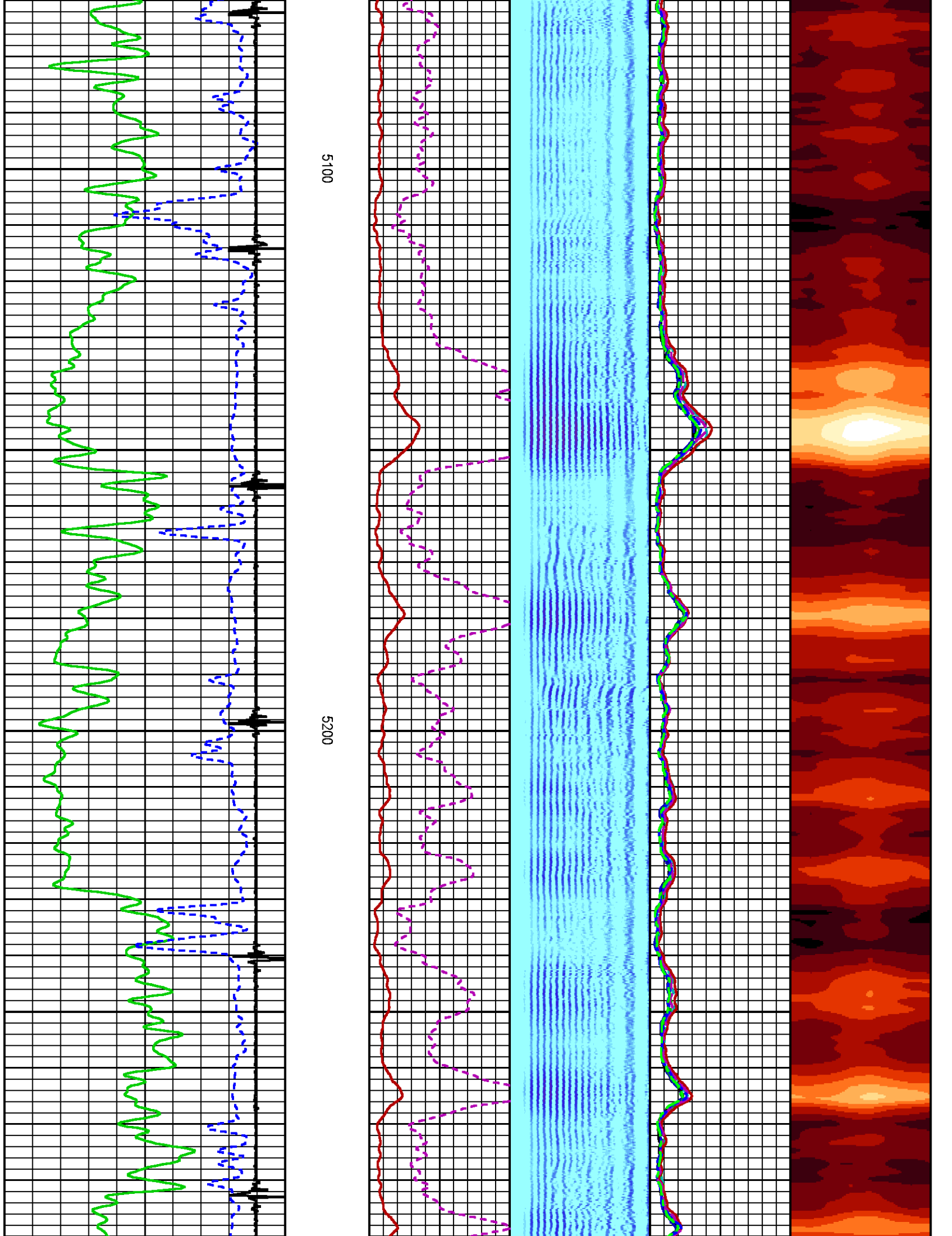




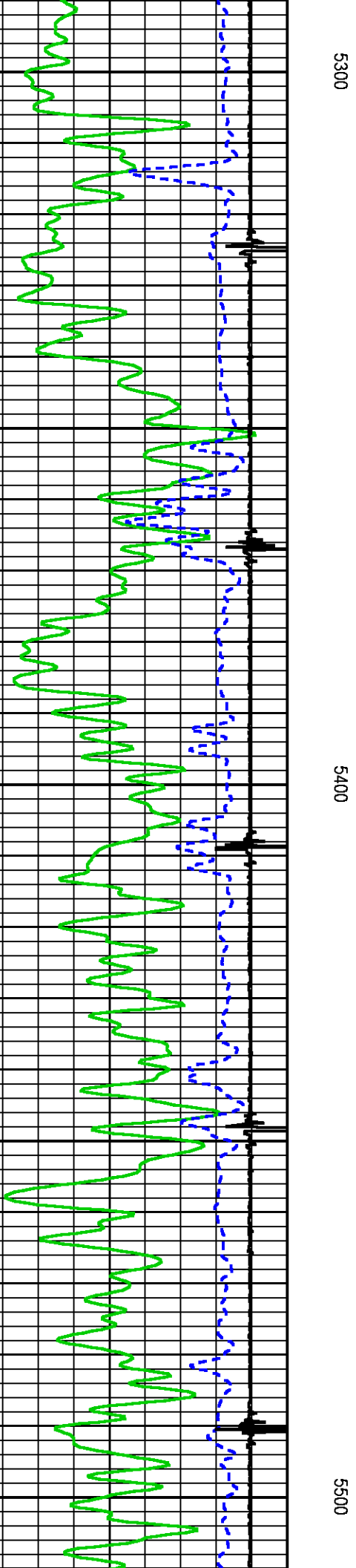
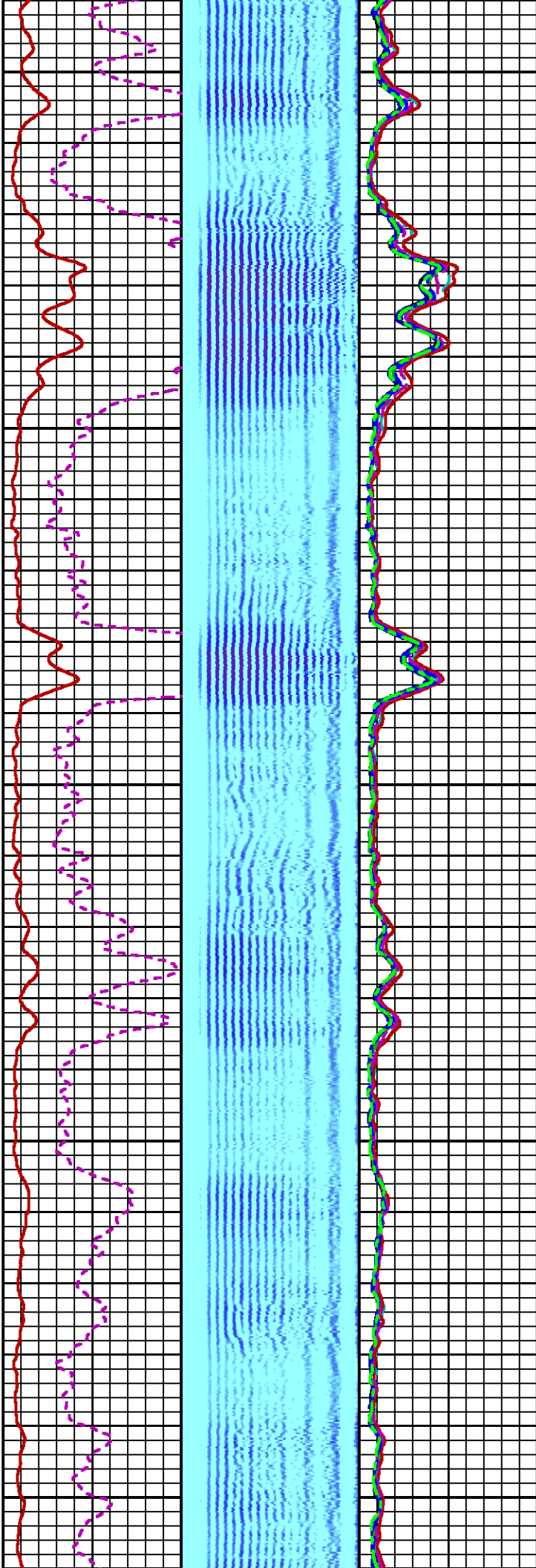




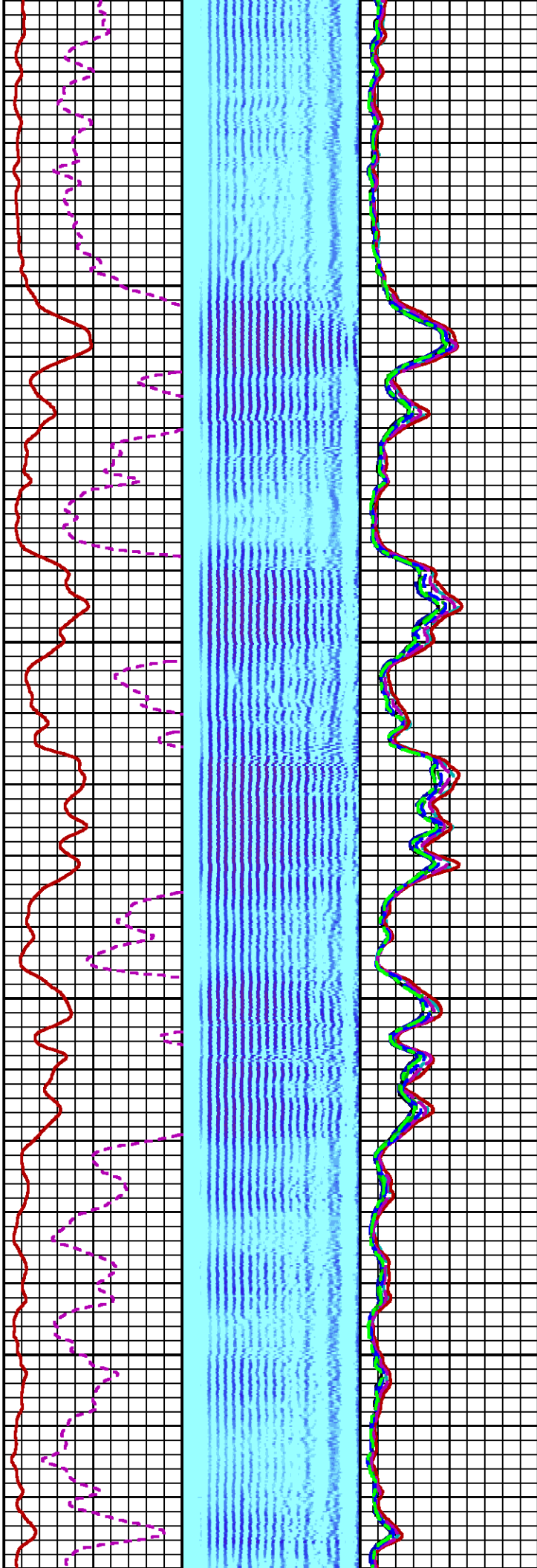
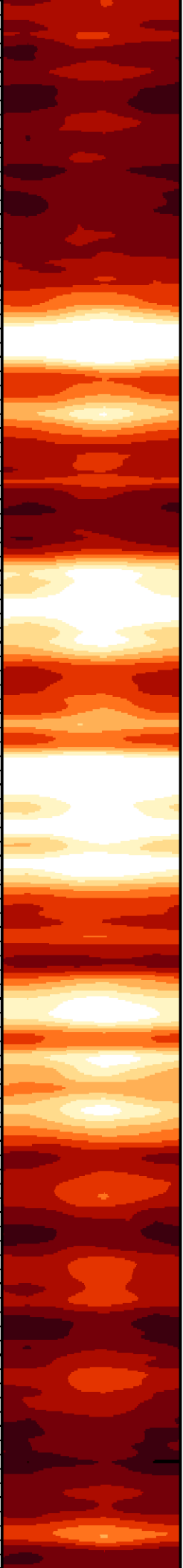






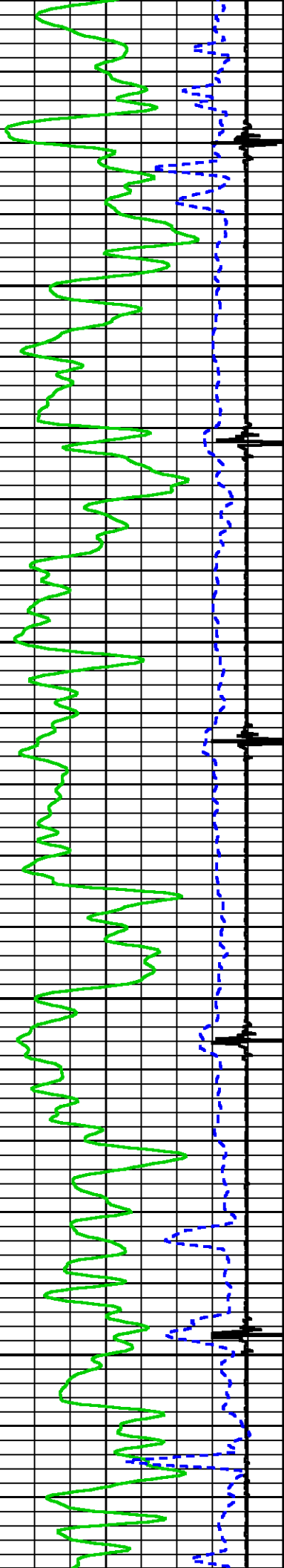


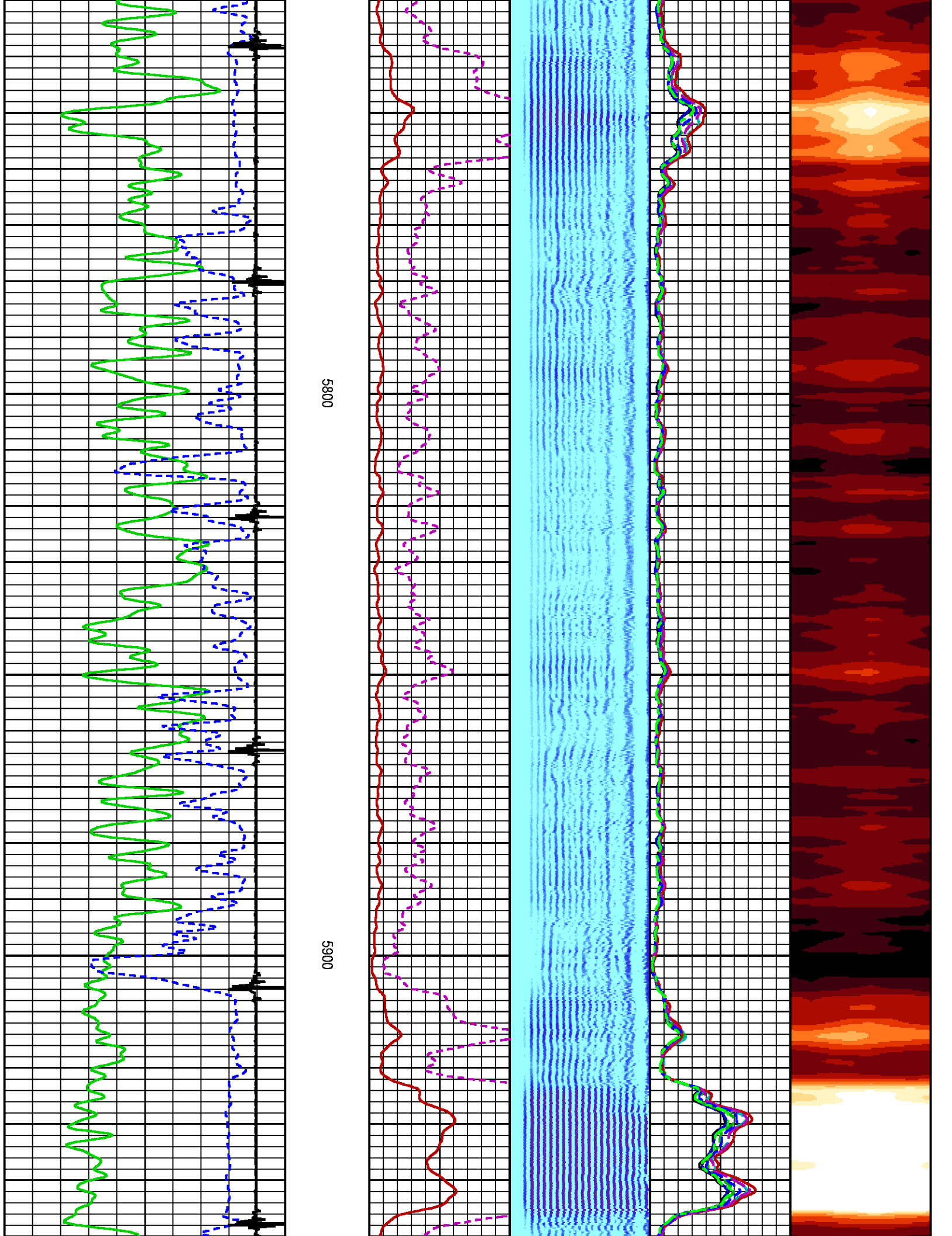


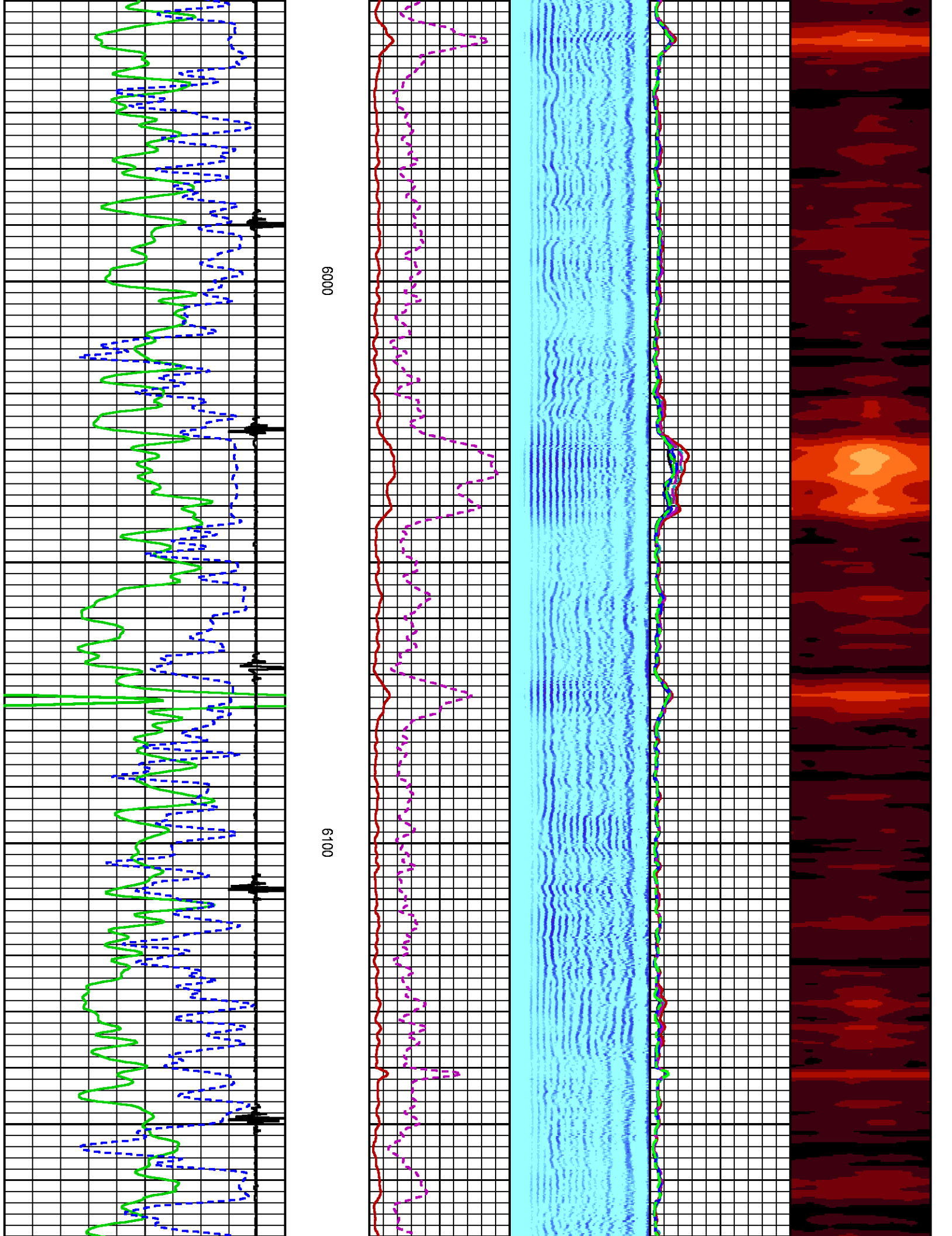


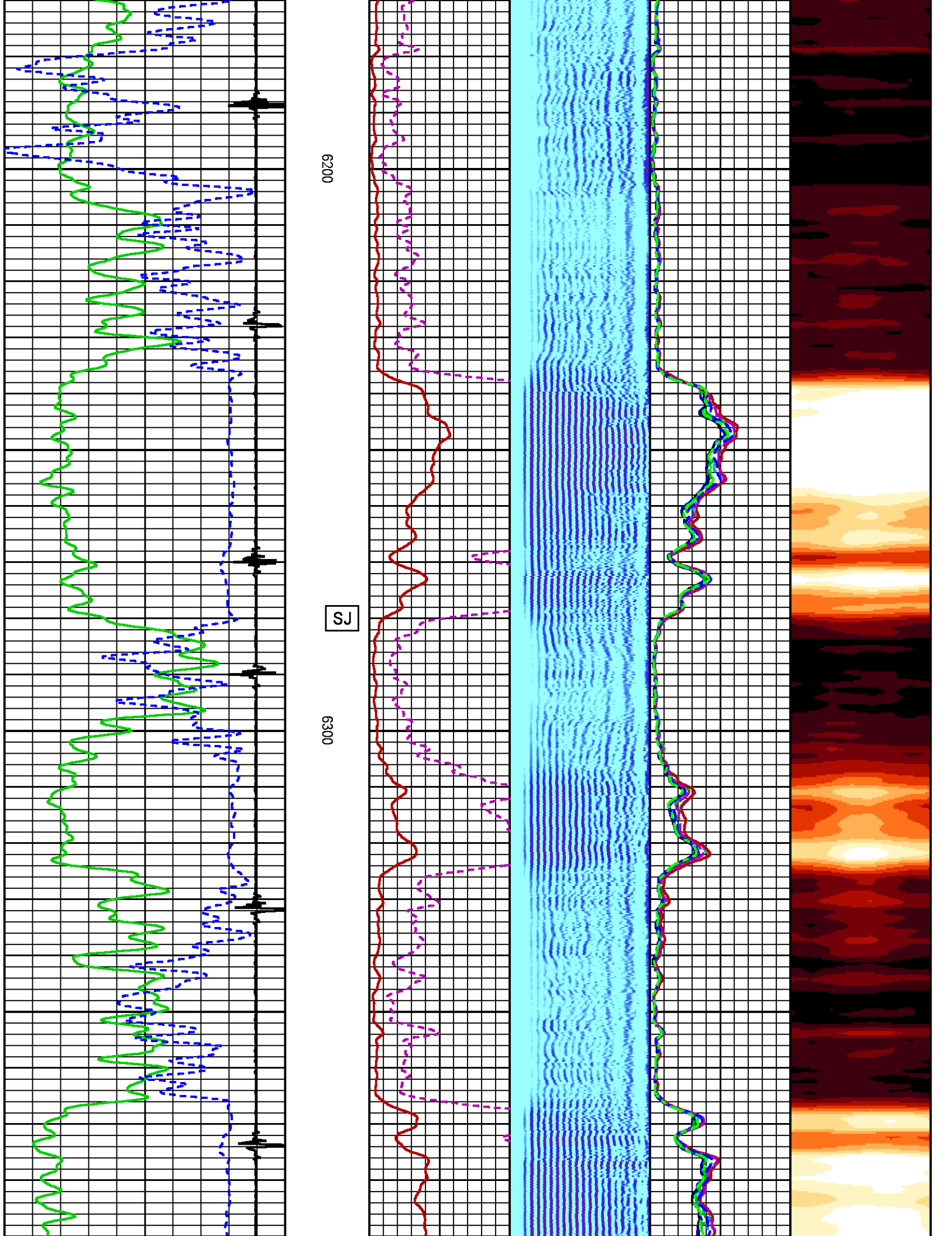
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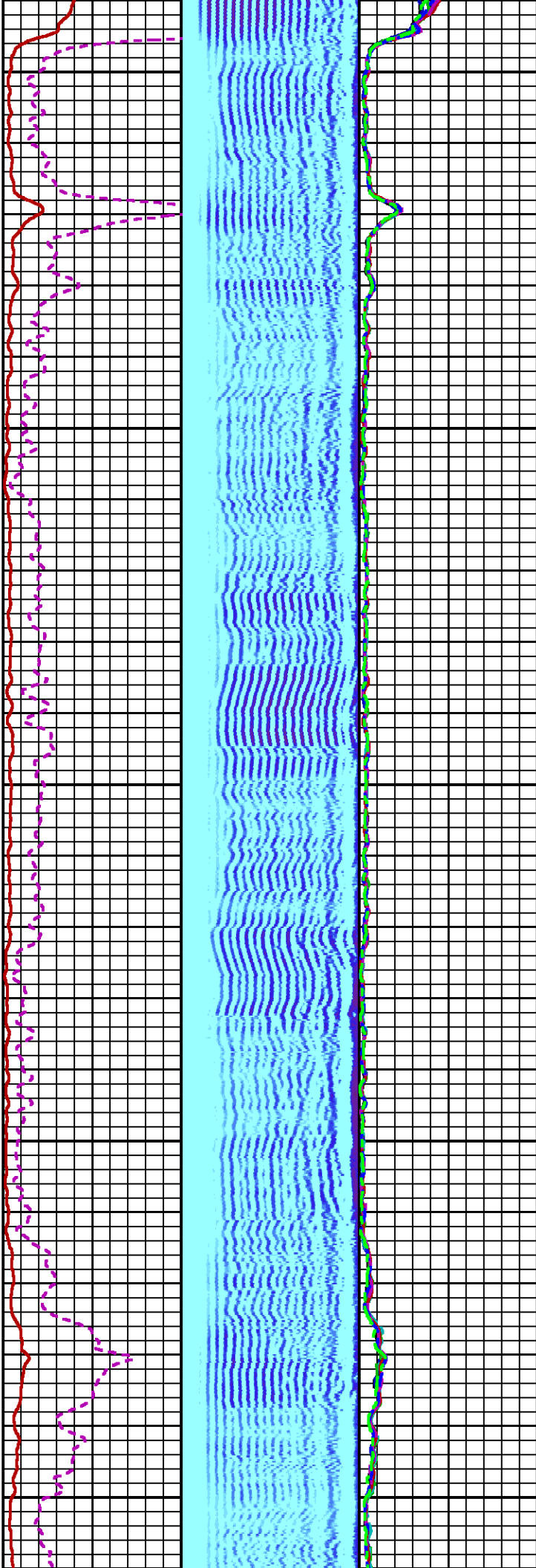








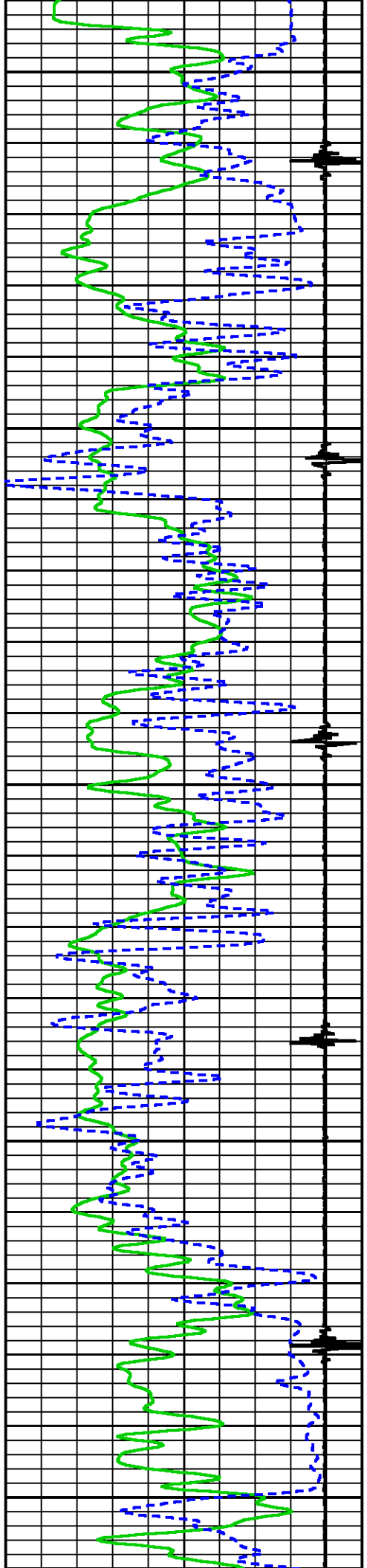




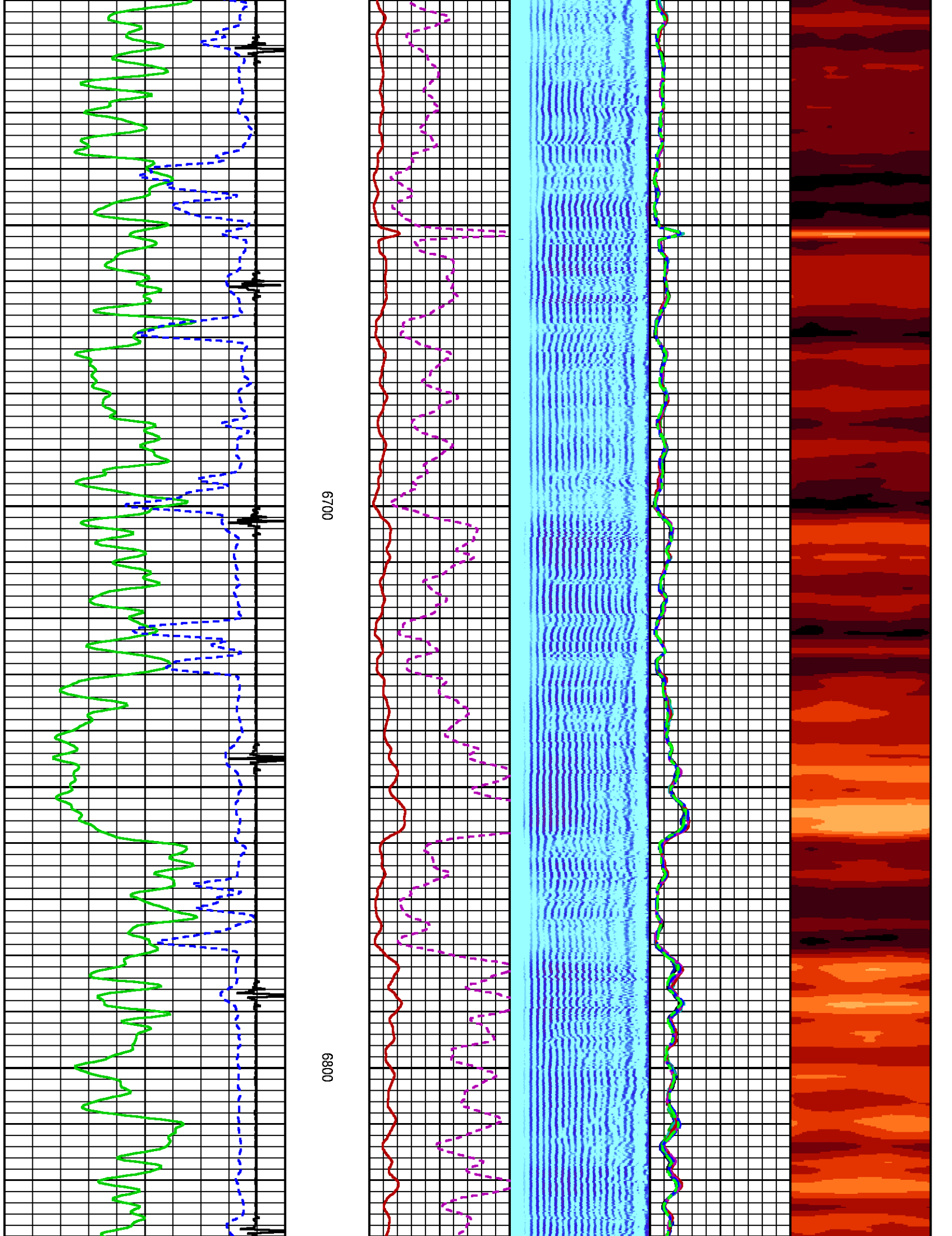
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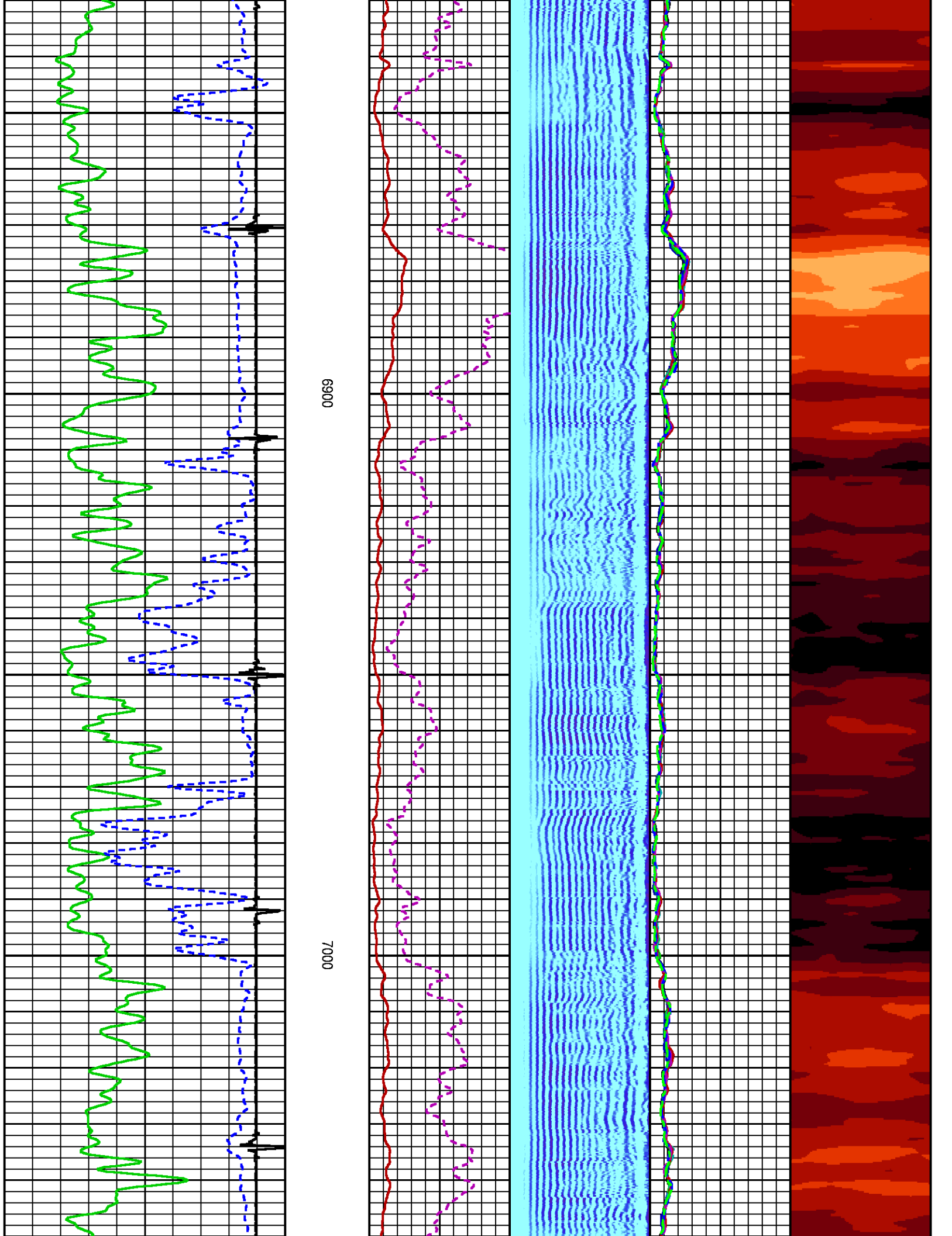
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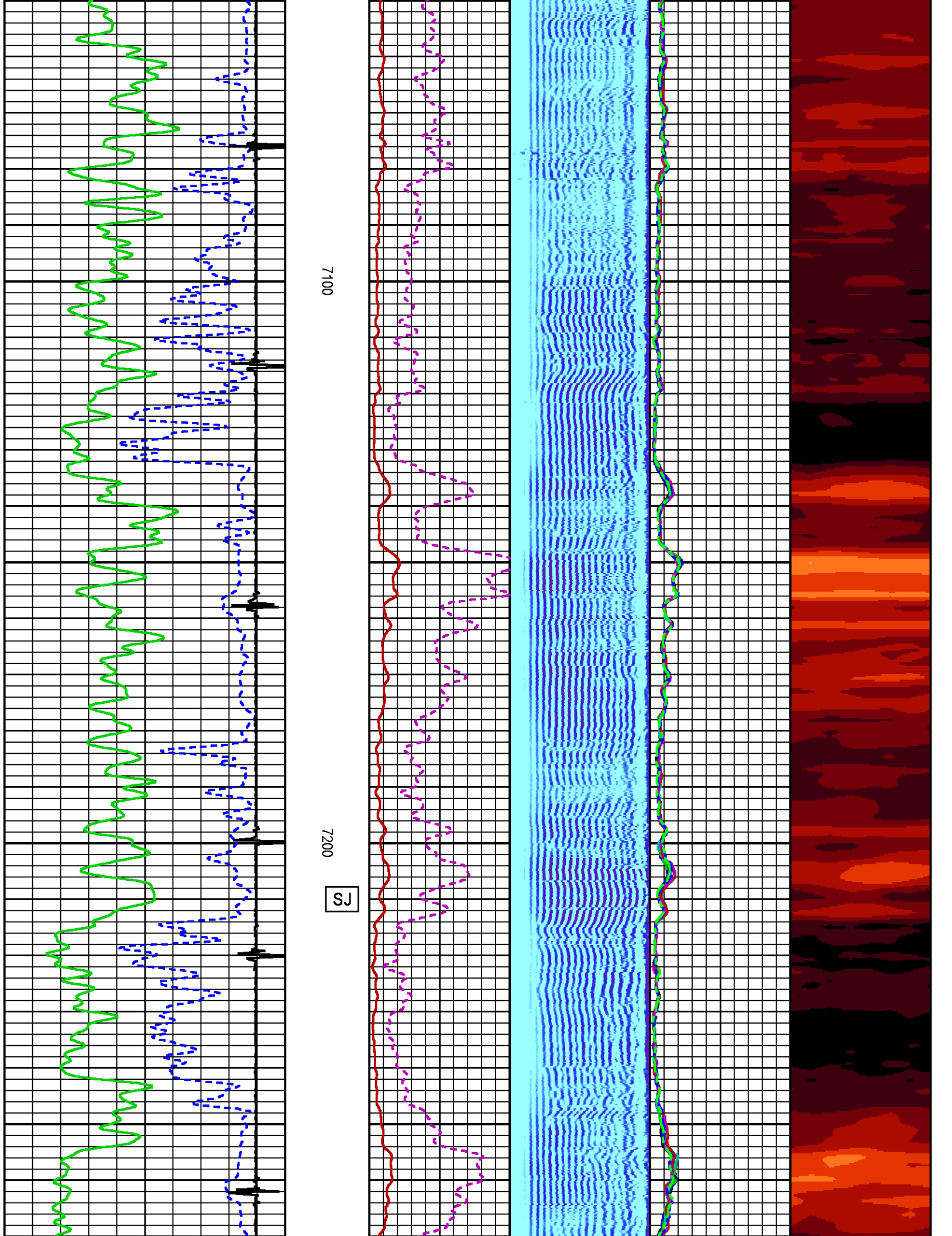
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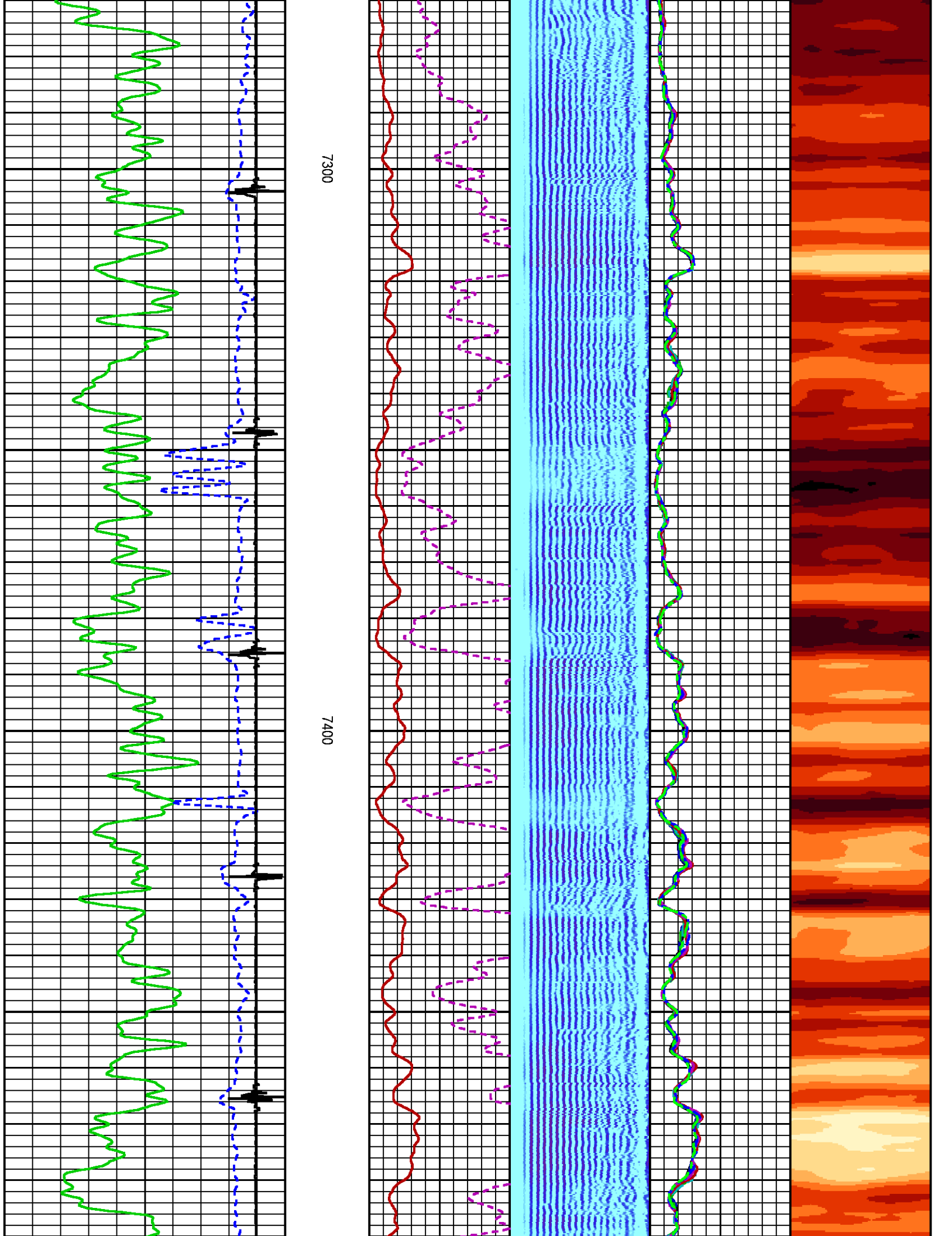




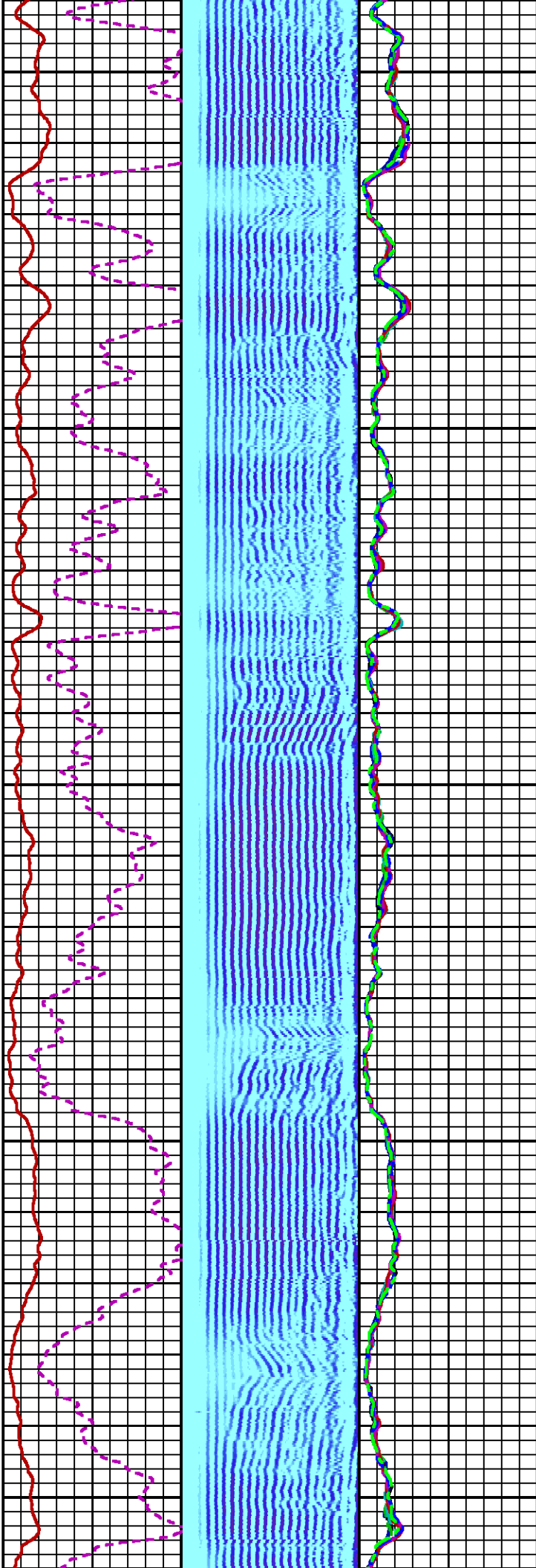








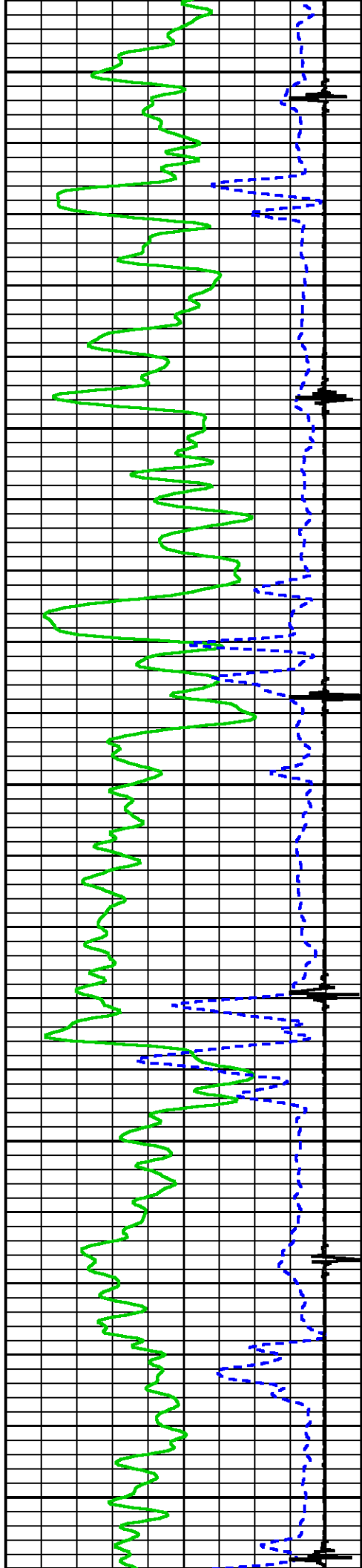




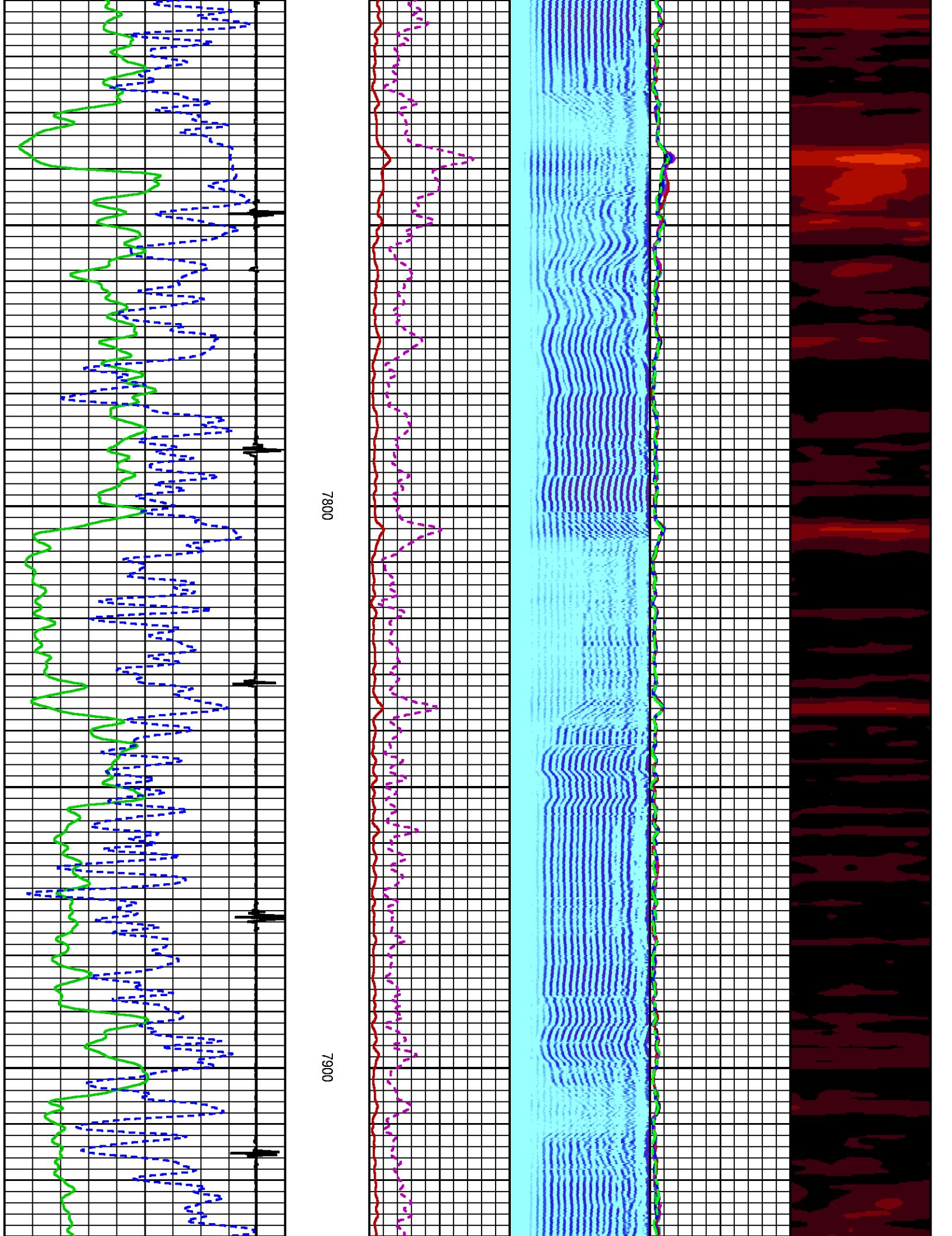
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7700









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

Patches: 4

Plotted: Sun Jun 24 13:38:49 2018

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_NICHOLS\_FED\_0994\_24\_21E/p012g01.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 7763.250 ft BOTTOM DEPTH: 7989.196 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*)	160	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	4	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	200.465	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-66	us	"	"
	TOOL DELAY (str2*)	-66	us	"	"
	TOOL DELAY (str3*)	-66	us	"	"
	TOOL DELAY (str4*)	-66	us	"	"
	TOOL DELAY (str5*)	-66	us	"	"
	TOOL DELAY (str6*)	-66	us	"	"
	TOOL DELAY (str7*)	-66	us	"	"
	TOOL DELAY (str8*)	-66	us	"	"
	TOOL DELAY (strn*)	-66	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	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)

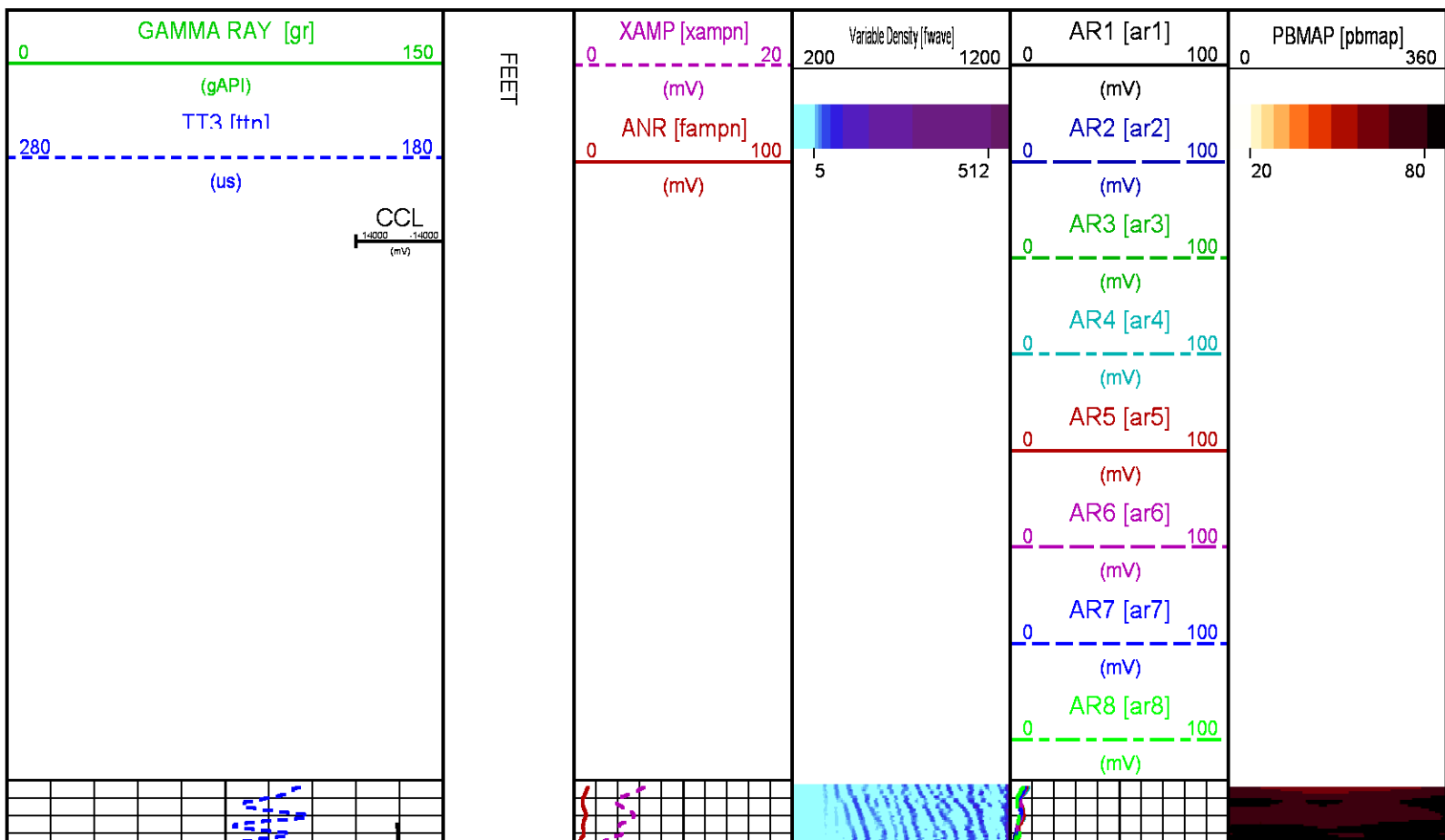
CURVE OFFSET (ft)

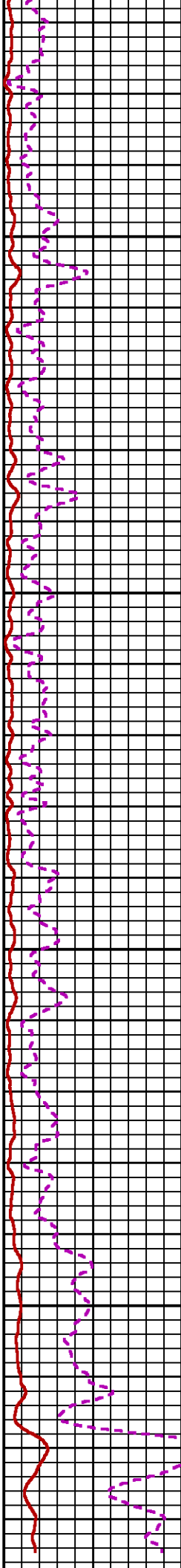
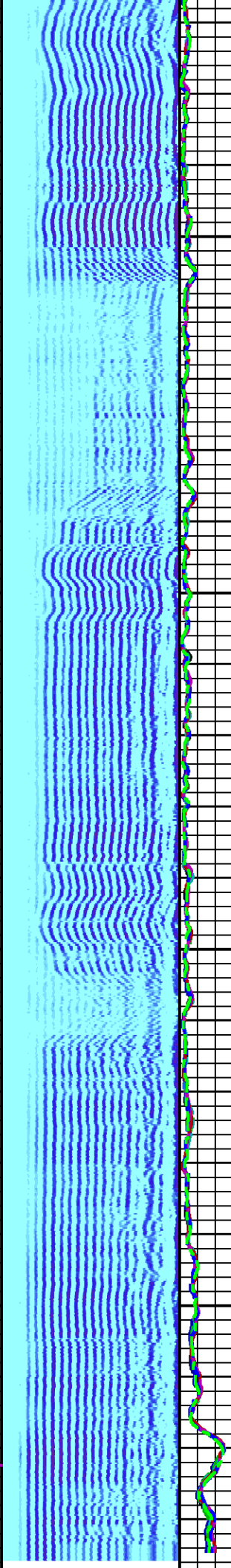
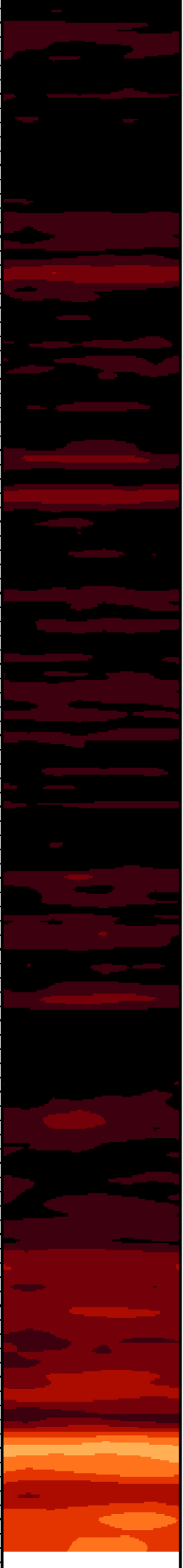
CURVE OFFSET (ft)

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\_NICHOLS\_FED\_0994\_24\_21E/0994\_24\_21E\_RAL\_REPEAT.fvpdf [5"/100' Scale]  
Plot Interval : 7760.5 - 7995.75 Feet

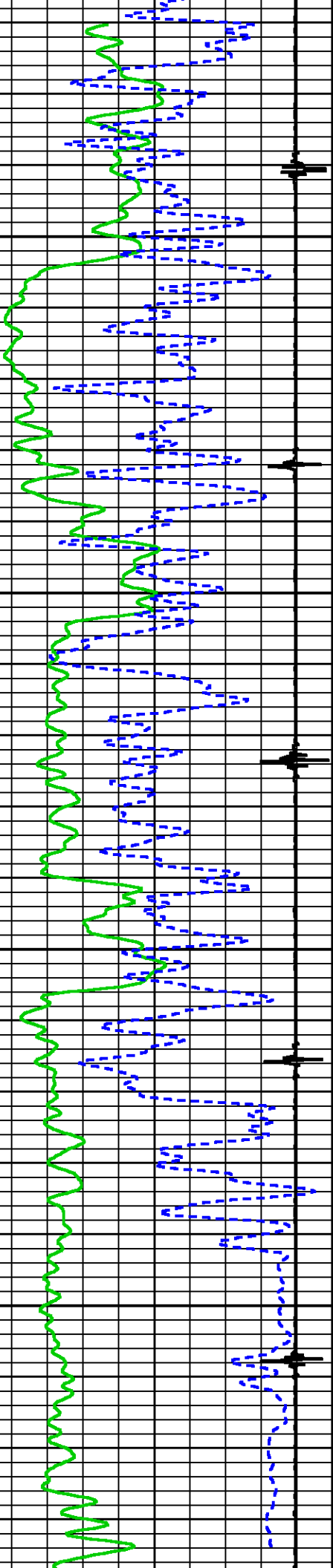
Data File 1 : F1 : SysA:/dat1a/LARAMIE\_NICHOLS\_FED\_0994\_24\_21E/0994\_24\_21E\_RAL\_REPEAT.xtf  
Created On : N/A  
Company : LARAMIE ENERGY LLC  
Well : NICHOLS FEDERAL 0994-24-21E  
Field : VEGA  
File Interval : 7759.5 - 7997 Feet  
OCT : p012g





7800

7900







ZERO	-1.05	-1.08	-0.67	-1.23	-1.36	-0.75	-0.88	-0.18	-0.30	-1.96	0.01
AMP AIR	1.21	1.10	0.68	1.27	1.34	0.76	1.04	1.13	0.50	1.59	100.15

SHOP M FACTOR	SHOP A FACTOR	WIRELINE FACTOR
2.49	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

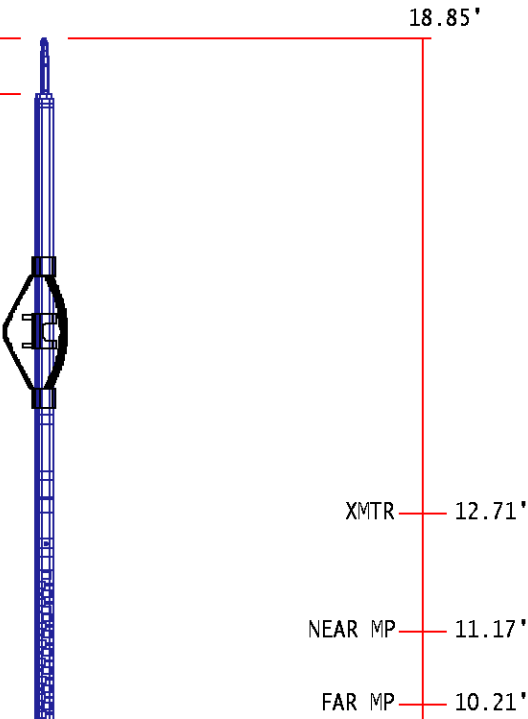
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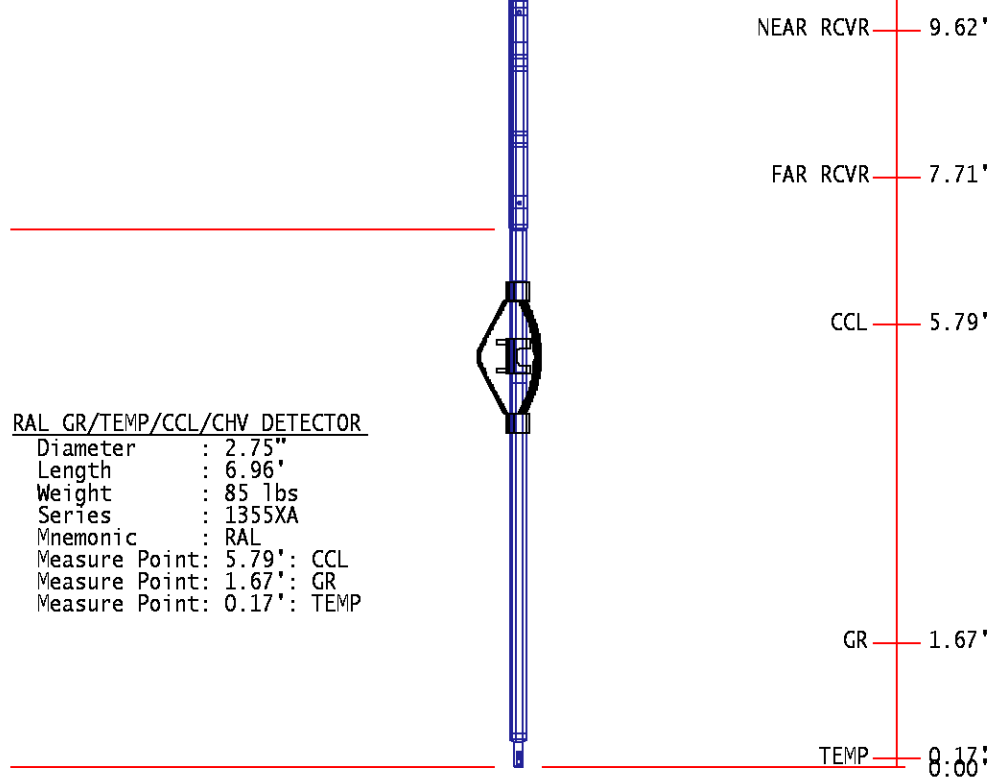
A3 CABLEHEAD

Diameter : 1.37"

RADIAL BOND TOOL

Diameter : 2.75"  
 Length : 11.17'  
 Weight : 126 lbs  
 Series : 1426XA  
 Mnemonic : RAL  
 Measure Point: 5.75': XMTR  
 Measure Point: 4.21': NEAR MP  
 Measure Point: 3.25': FAR MP  
 Measure Point: 2.67': NEAR RCVR  
 Measure Point: 0.75': FAR RCVR





**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

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

**BAKER  
HUGHES**  
a GE company



**ECLIPS**

**COMPANY** LARAMIE ENERGY LLC  
**WELL** NICHOLS FEDERAL 0994-24-21E  
**FIELD** VEGA  
**COUNTY** MESA **STATE** COLORADO

**FILE NO:**  
CH136074  
**API NO:**  
05077103890000

**LOCATION:**

SHL: 2332' FNL & 2789' FWL  
 BHL: 212' FSL & 1538' FEL

SEC 24 TWP 9 S RGE 94 W

**ELEVATIONS:**

KB 7236 FT  
 DF  
 GL 7212 FT

DATE 24-Jun-2018