



# RADIAL CEMENT BOND LOG

FILE NO: \_\_\_\_\_ COMPANY **LARAMIE ENERGY LLC**

WELL **NICHOLS 0994-24-09E**

API NO: \_\_\_\_\_ FIELD **VEGA**

05077104100000 COUNTY **MESA** STATE **COLORADO**

Ver. 4.10 LOCATION: SHL: 39.264445 N; 107.830731 W OTHER SERVICES  
BHL: 39.264072 N; 107.826023 W RPM

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

PERMANENT DATUM **GL** ELEVATION **7137 FT**  
LOG MEASURED FROM **KB** **24 FT** ABOVE P.D.  
DRILL. MEAS. FROM **KB** ELEVATIONS:  
**KB 7161 FT**  
**DF 7160 FT**  
**GL 7137 FT**

DATE	22-Jan-2018
RUN	1
TRIP	1
SERVICE ORDER	US131991
DEPTH DRILLER	7621 FT
DEPTH LOGGER	7378 FT
BOTTOM LOGGED INTERVAL	7378 FT
TOP LOGGED INTERVAL	24 FT
TIME STARTED	13:30
TIME FINISHED	16:30
OPERATOR RIG TIME	3 HRS
TYPE OF FLUID IN HOLE	FRESH WATER
FLUID DENSITY	NA
FLUID SALINITY	NA
FLUID LEVEL	48 FT
LOGGED CEMENT TOP	2233 FT
WELLHEAD PRESSURE	0 PSI
MAXIMUM HOLE DEVIATION	NA
NOMINAL LOGGING SPEED	90 FMIN
MAX. RECORDED TEMP.	235 DEGF
REFERENCE LOG	NA
REFERENCE LOG DATE	NA
EQUIP. NO.	ML-4291
LOCATION	GRAND JUNCT
RECORDED BY	M.MENTZER
WITNESSED BY	MR. MATT SETTLES

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: 5723' - 5746'  
SJ: 6647' - 6668'

CREW: J.PENA, C.GOLBY, A.SHAHNOOSHI

## EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	RAL	1426 XA	10417452	CENTRALIZED
1	1	GR/CCL	1355 XA	11871507	CENTRALIZED

# MAIN PASS 0 PSI

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

Patches: 2

Plotted: Tue Jan 23 18:21:33 2018

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_NICHOLAS\_0994\_24\_09E/p012gR01.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 11.250 ft BOTTOM DEPTH: 7372.000 ft

### SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
GR	FILTER ( )	medium (1)		TOP	BOTTOM
AMPLITUDE	FILTER ( )	light (2a)		"	"
TRAVEL TIME	FILTER ( )	medium (1)		"	"

### RAL CCL PROCESSING

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

### ANALOG RAL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
AMPLITUDE WINDOW (NEAR)	AMP WINDOW START (fgp1*)	185	us	TOP	BOTTOM
	AMP WINDOW START (fgp2*)	185	us	"	"
	AMP WINDOW START (fgp3*)	185	us	"	"
	AMP WINDOW START (fgp4*)	185	us	"	"
	AMP WINDOW START (fgp5*)	185	us	"	"
	AMP WINDOW START (fgp6*)	185	us	"	"
	AMP WINDOW START (fgp7*)	185	us	"	"
	AMP WINDOW START (fgp8*)	185	us	"	"
	AMP WINDOW START (fgpn*)	185	us	"	"
	AMP WINDOW LENGTH	30	us	"	"
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	160	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	4	mV	TOP	7360.500
		2	mV	7360.500	BOTTOM
RAL CASING PARAMETERS	PPT NEAR	200.391	us	TOP	BOTTOM
RAL TOOL DELAY	TOOL DELAY (str1*)	-62	us	"	"
	TOOL DELAY (str2*)	-62	us	"	"
	TOOL DELAY (str3*)	-62	us	"	"
	TOOL DELAY (str4*)	-62	us	"	"
	TOOL DELAY (str5*)	-62	us	"	"
	TOOL DELAY (str6*)	-62	us	"	"
	TOOL DELAY (str7*)	-62	us	"	"
	TOOL DELAY (str8*)	-62	us	"	"
	TOOL DELAY (strn*)	-62	us	"	"
	NOISE WINDOW START	125	us	"	"
BASELINE NOISE (NEAR)	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 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

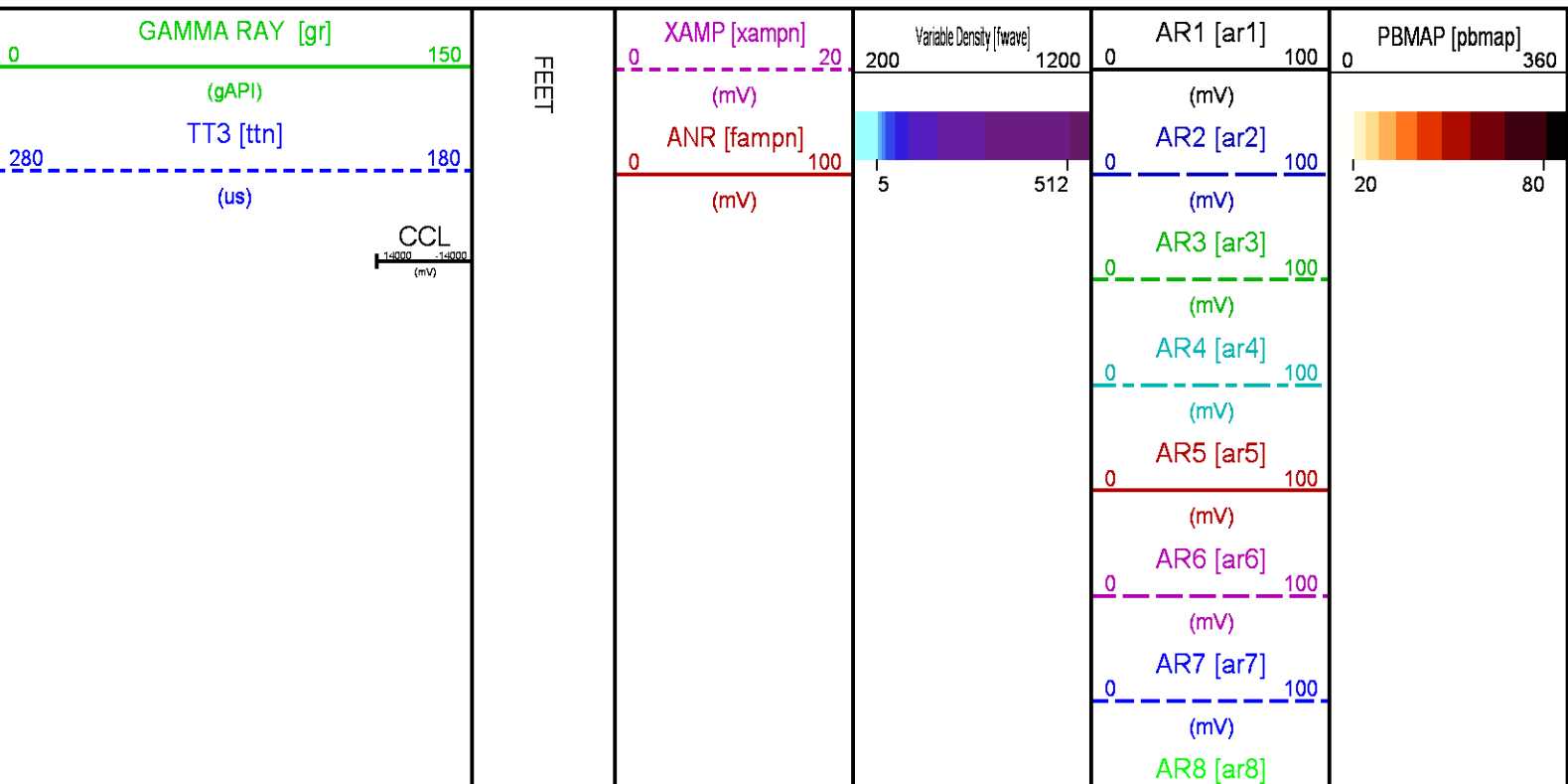
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	FIXED GATE AMPLITUDE T-R7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

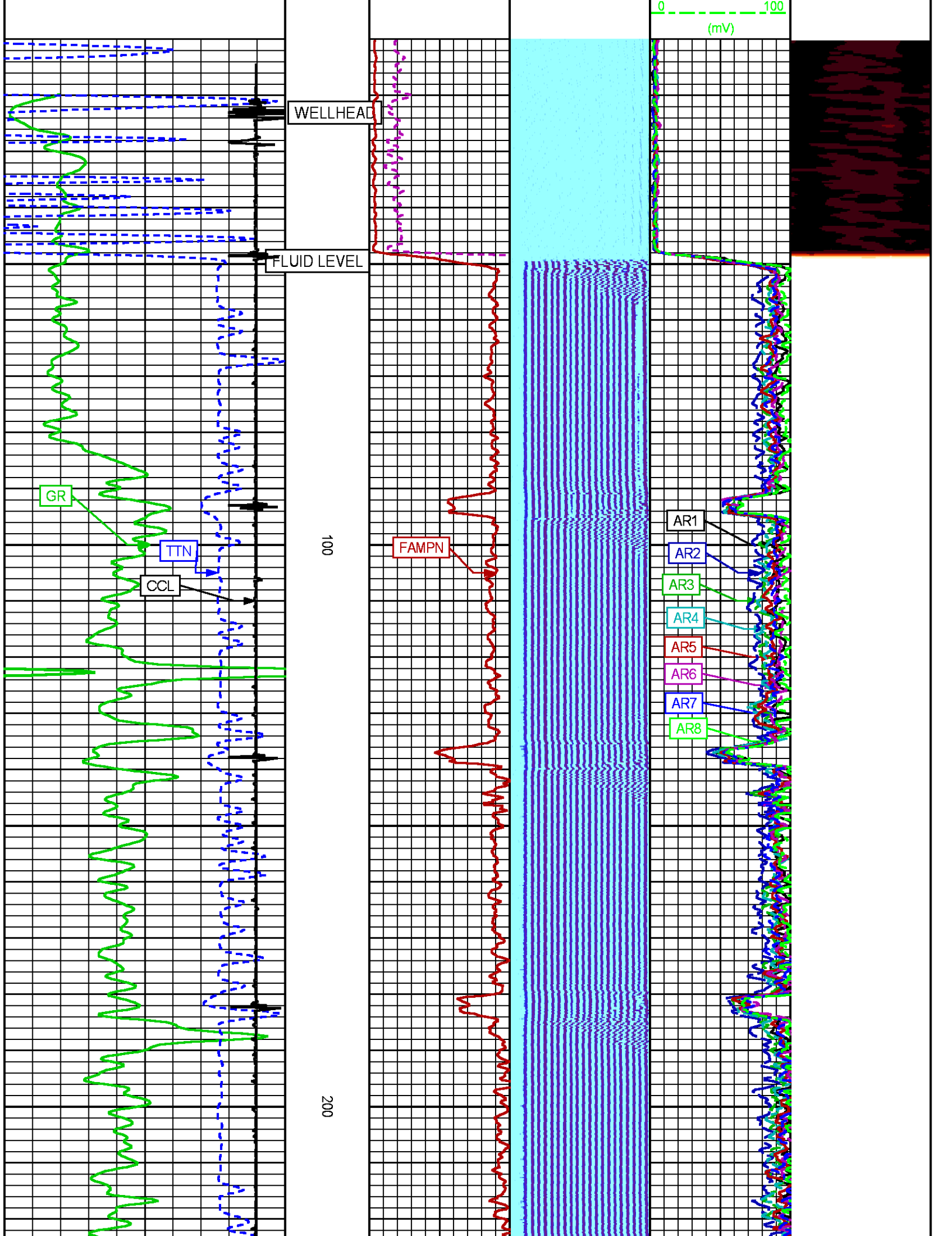
## CURVE MEASURE POINT OFFSET

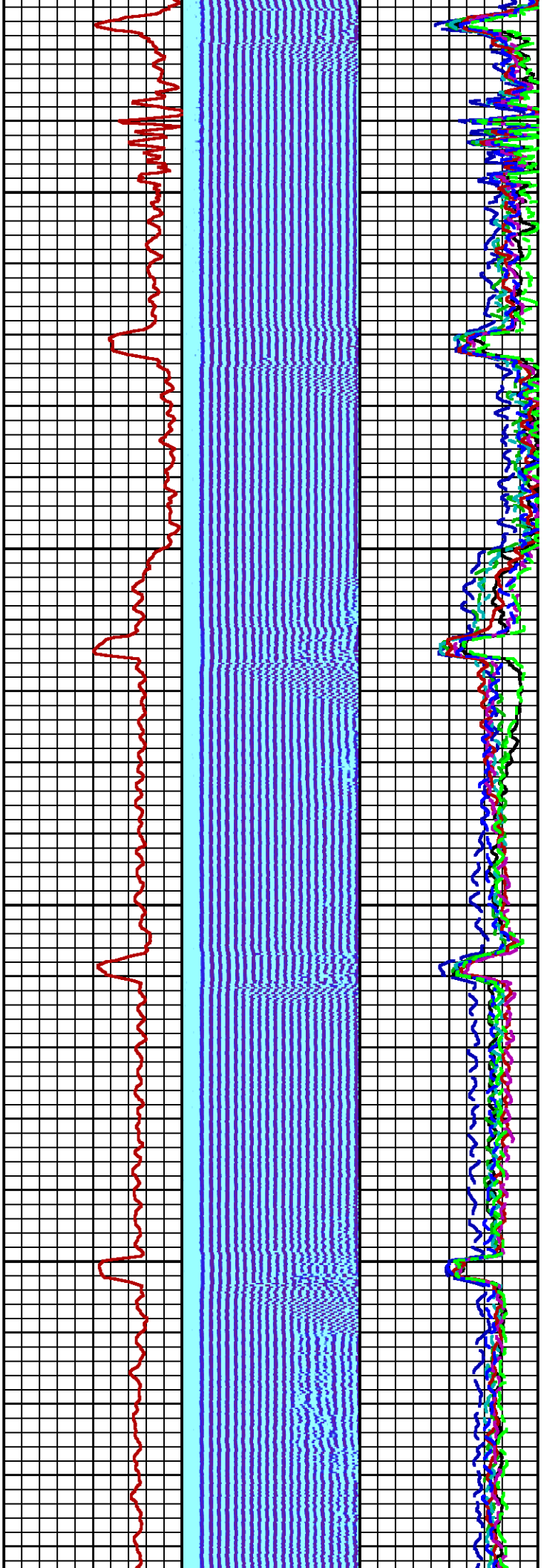
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
AR1	-11.25	AR5	-11.25	CCL	-5.75	XAMPN	-11.25
AR2	-11.25	AR6	-11.25	FAMPN	-11.25		
AR3	-11.25	AR7	-11.25	GR	-1.75		
AR4	-11.25	AR8	-11.25	TTN	-11.25		

**Presentation** : SysA:/dat1a/LARAMIE\_NICHOLAS\_0994\_24\_09E/LARAMIE\_RAL+01-MAIN-MN\_RAL\_09E-5.fvpdf [5"/100' Scale]  
**Plot Interval** : 10 - 7379.75 Feet

**Data File 1** : F1 : SysA:/dat1a/LARAMIE\_NICHOLAS\_0994\_24\_09E/MN\_RAL\_09E.xtf  
**Created On** : N/A  
**Company** : LARAMIE ENERGY LLC  
**Well** : NICHOLS 0994-24-09E  
**Field** : VEGA  
**File Interval** : 9 - 7381 Feet  
**OCT** : p012g

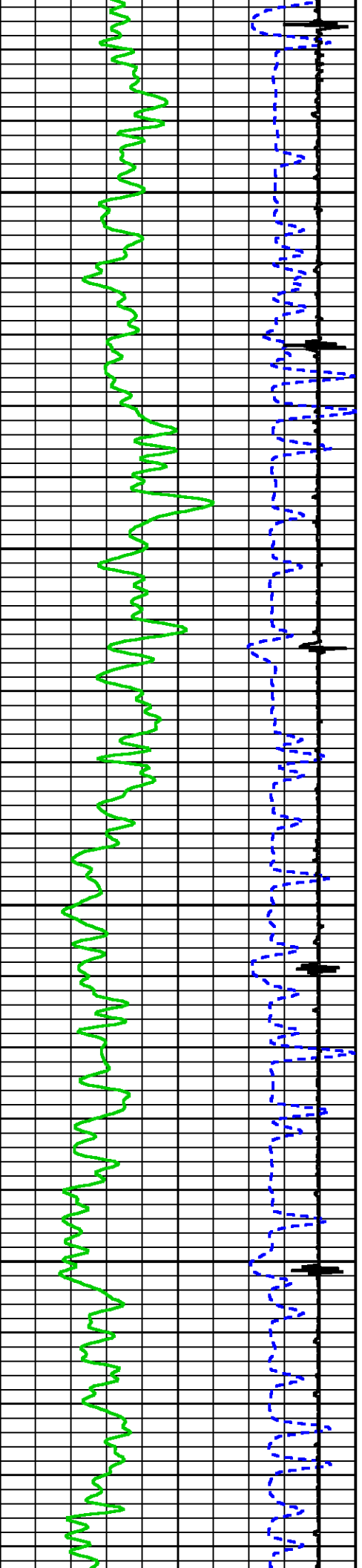


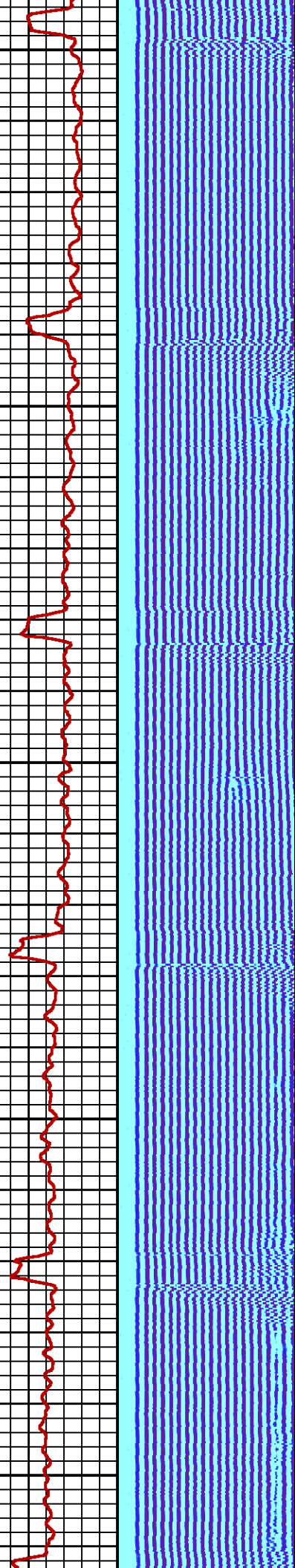
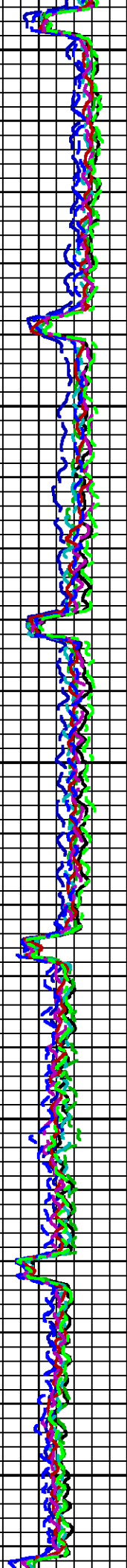




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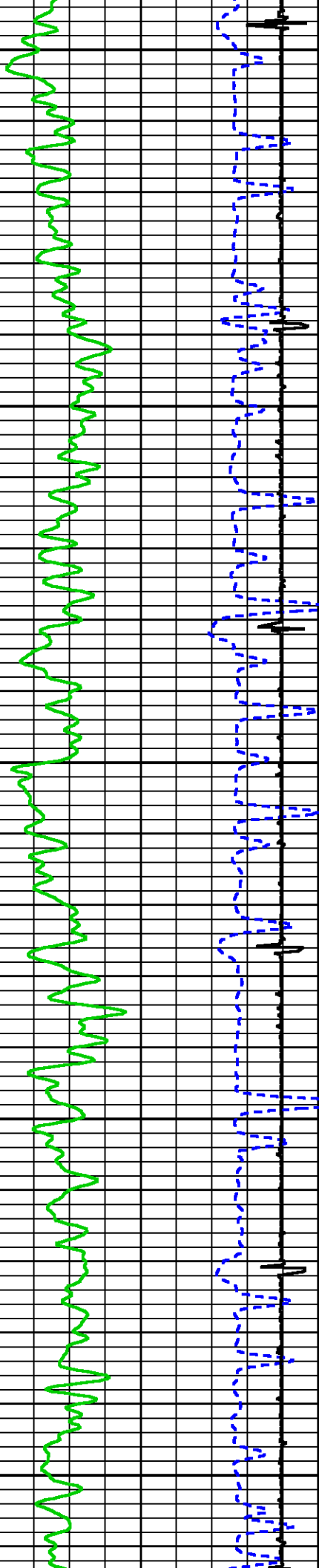
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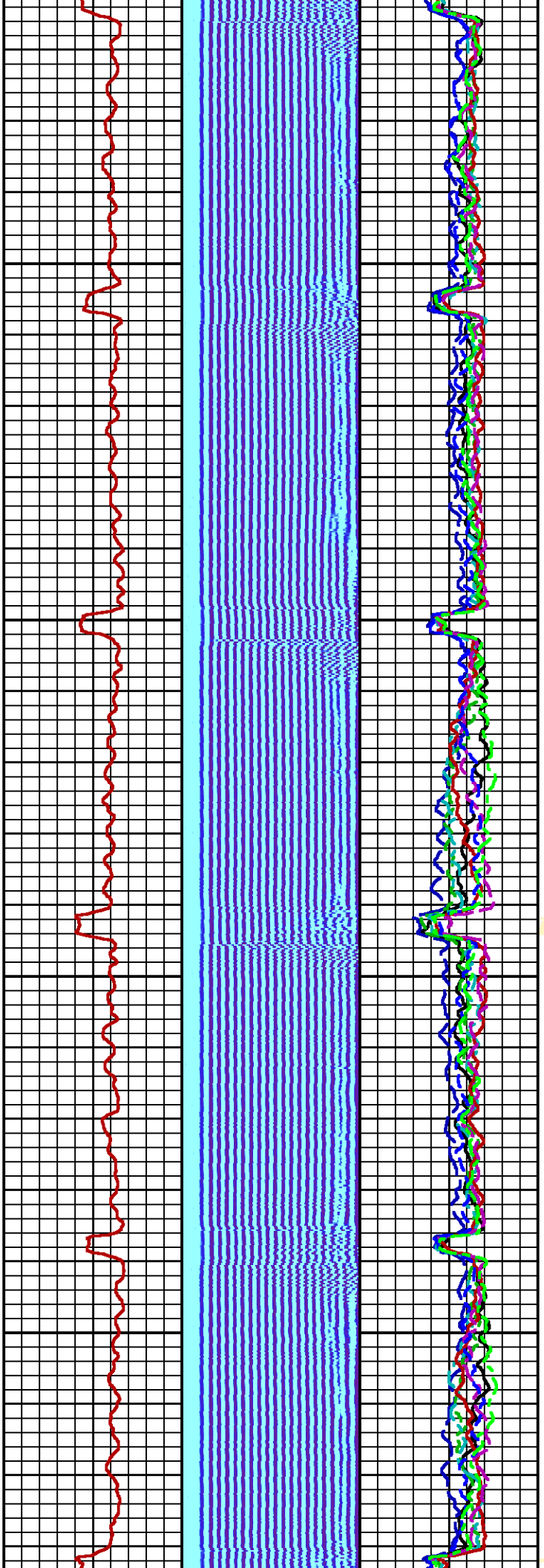


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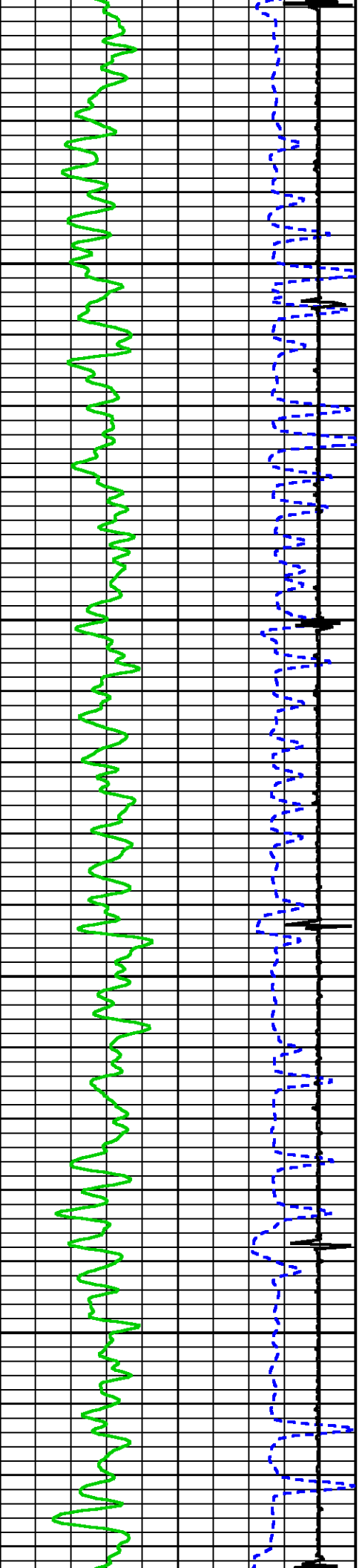


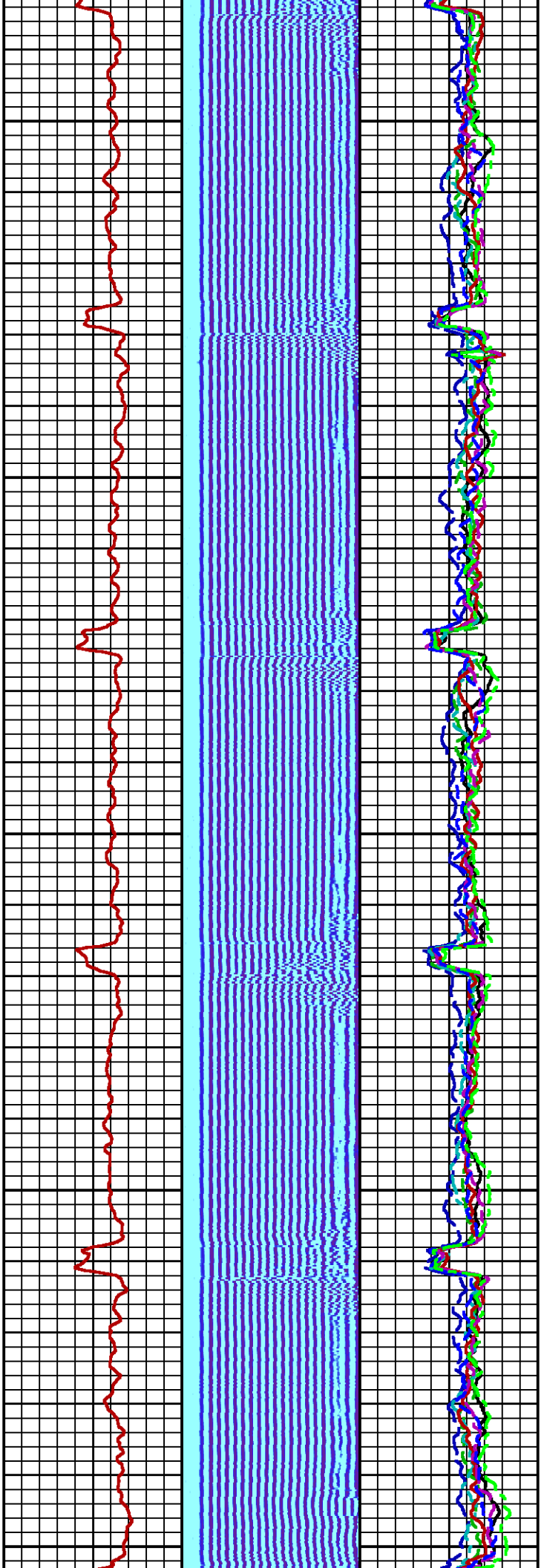




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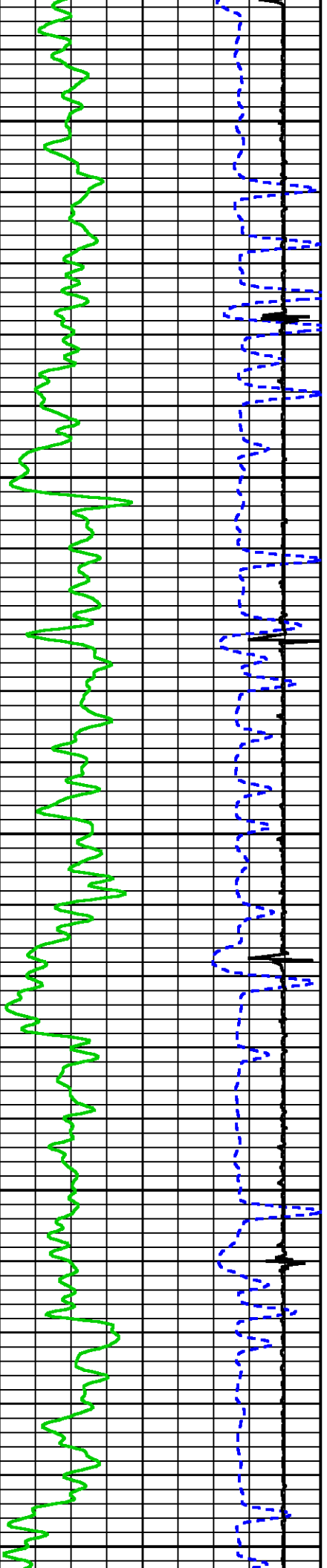




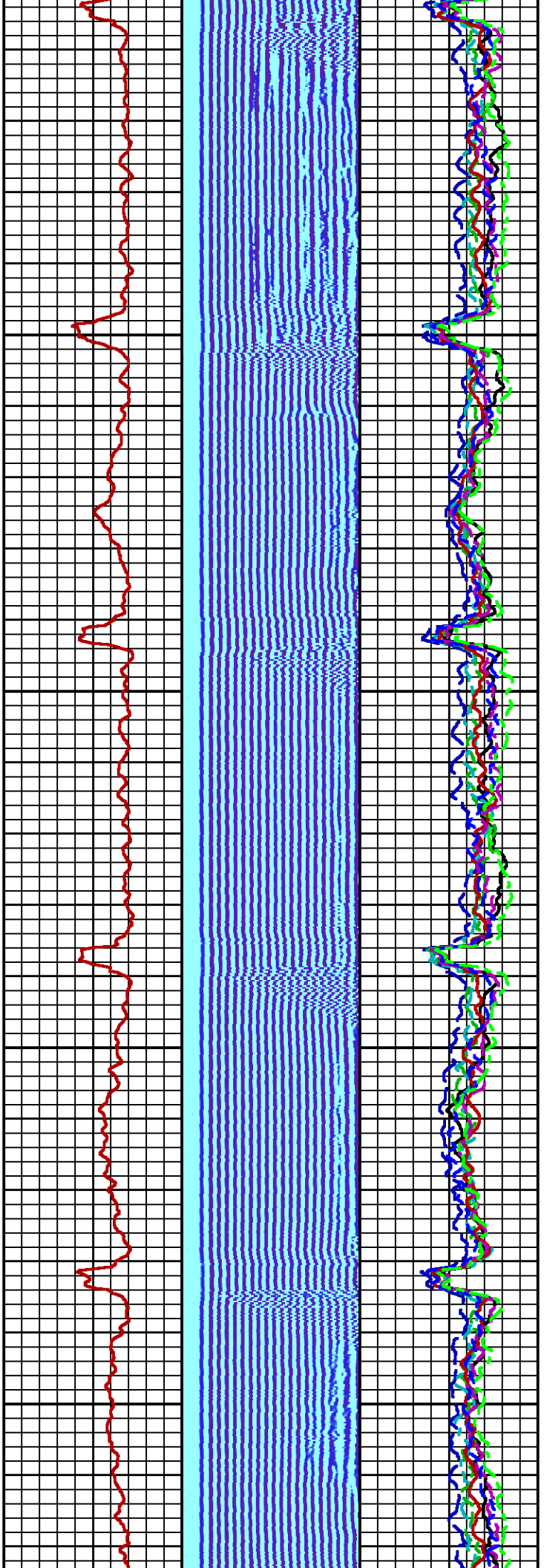
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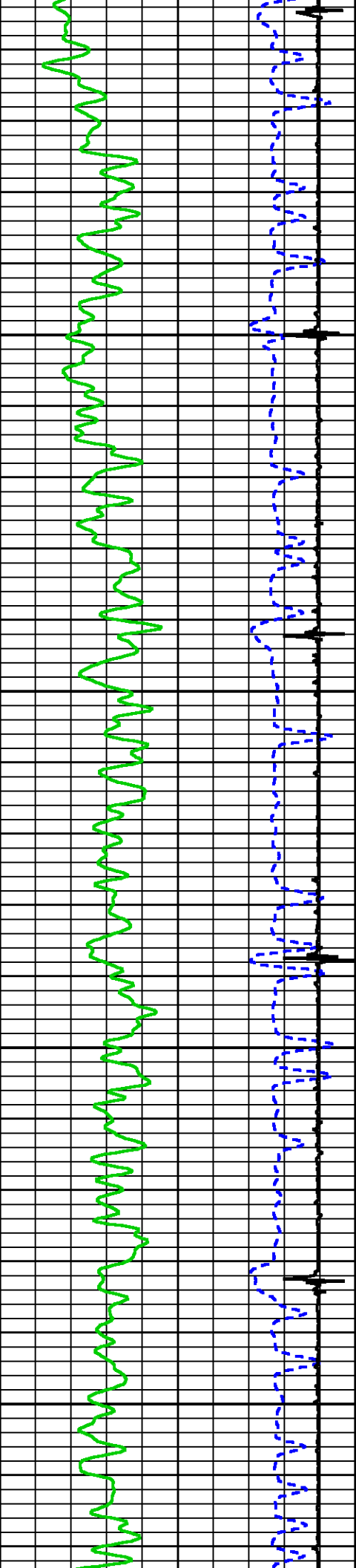


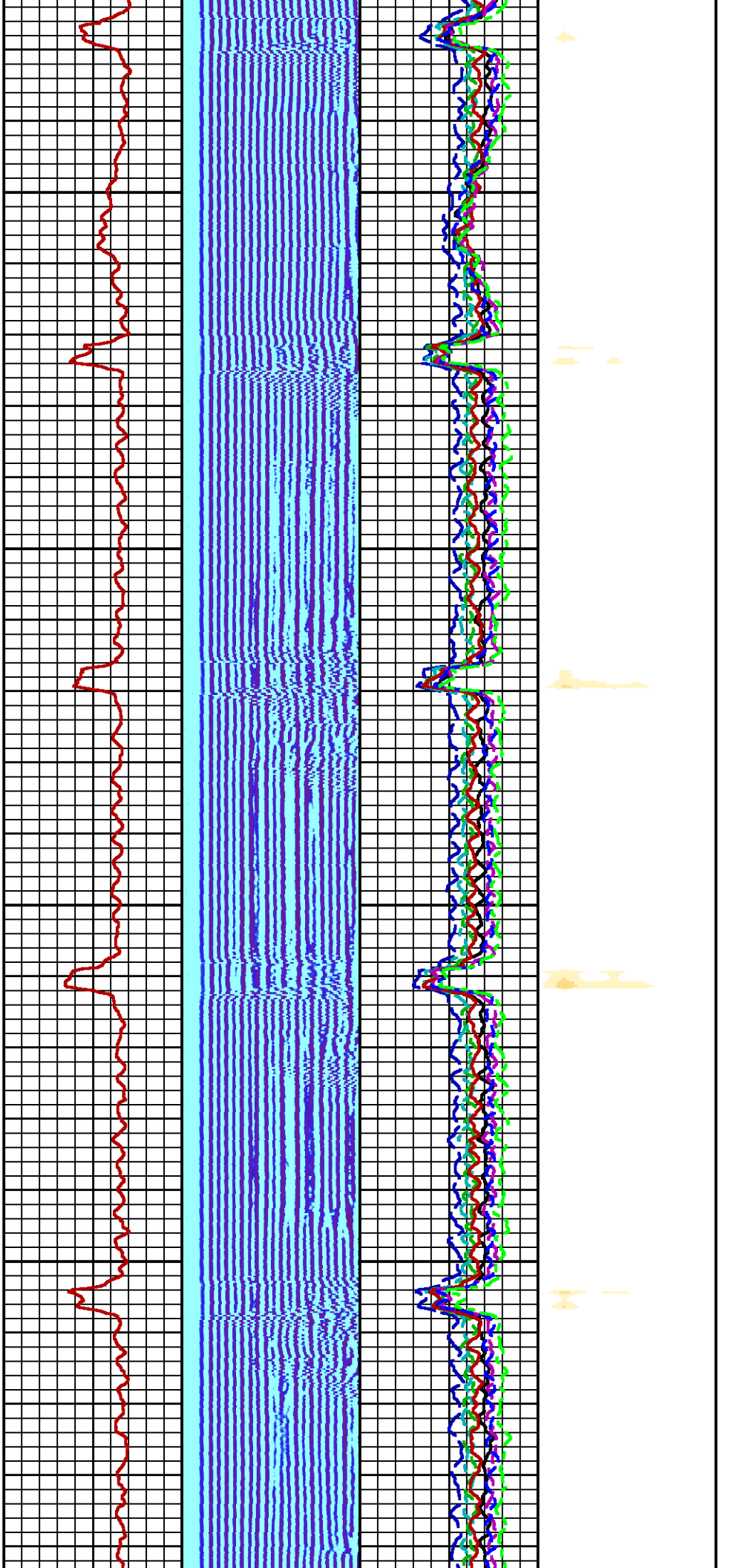




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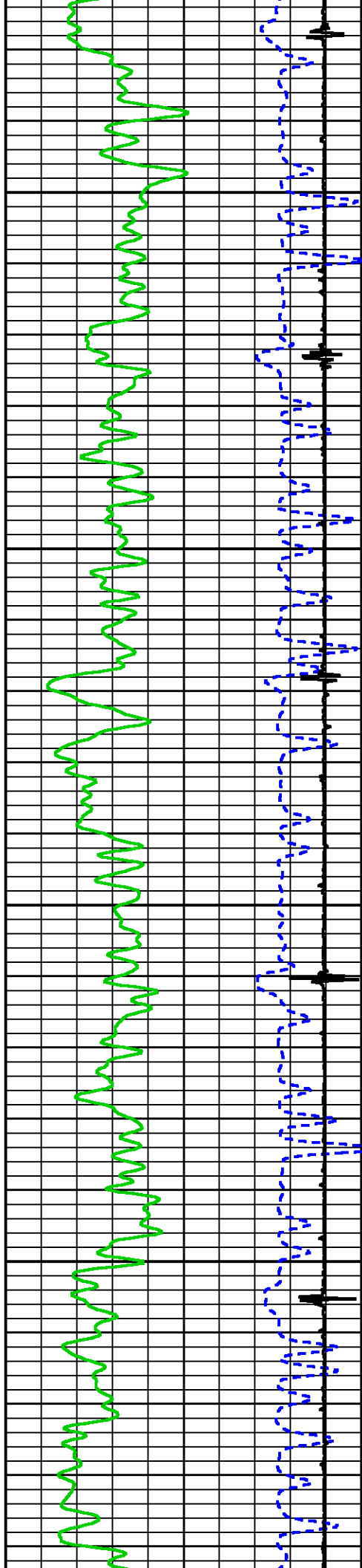
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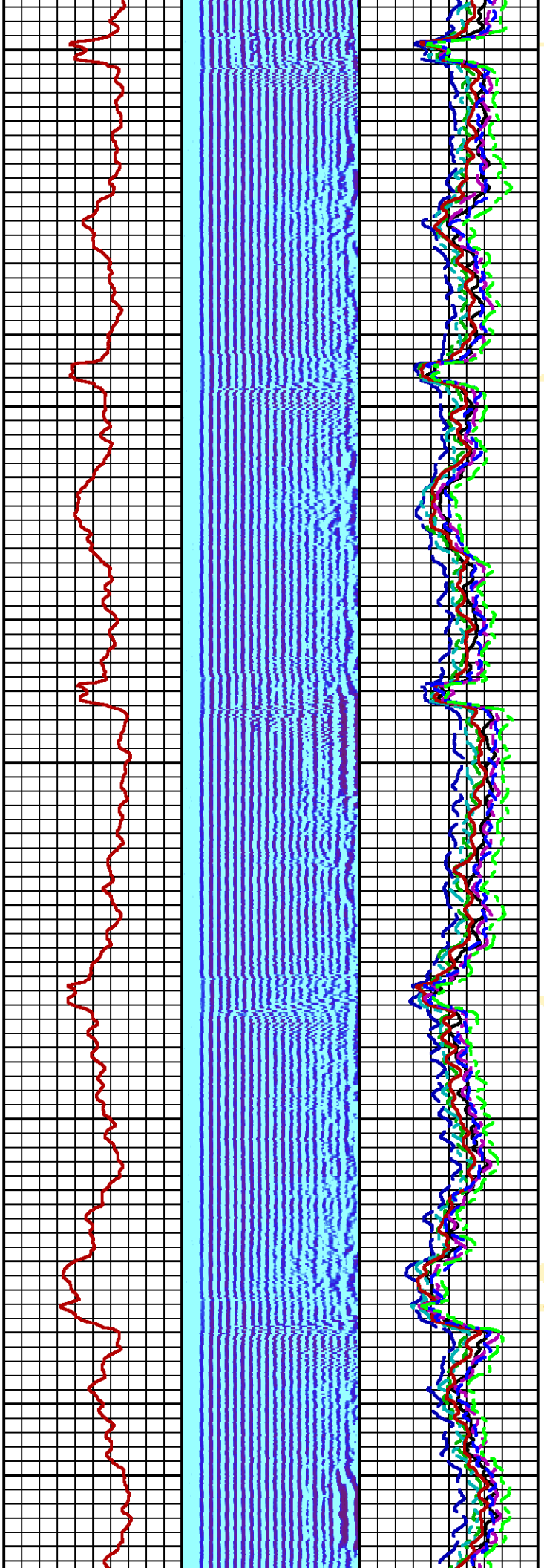




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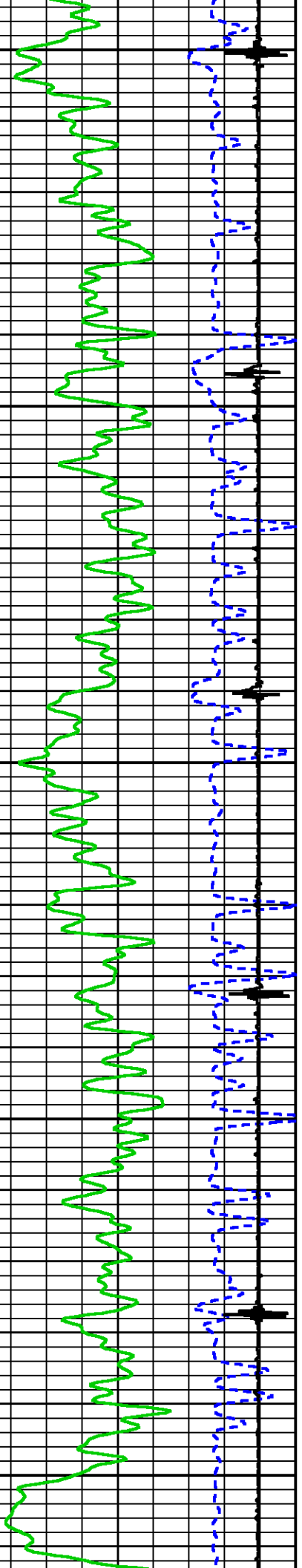
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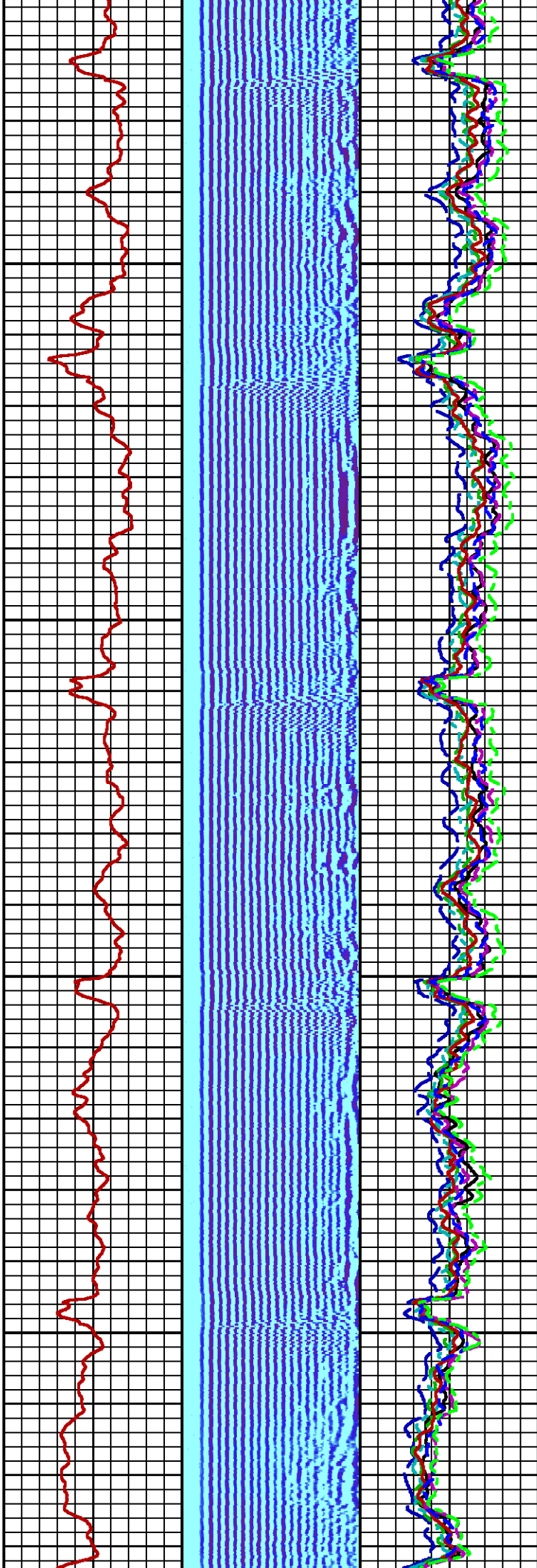
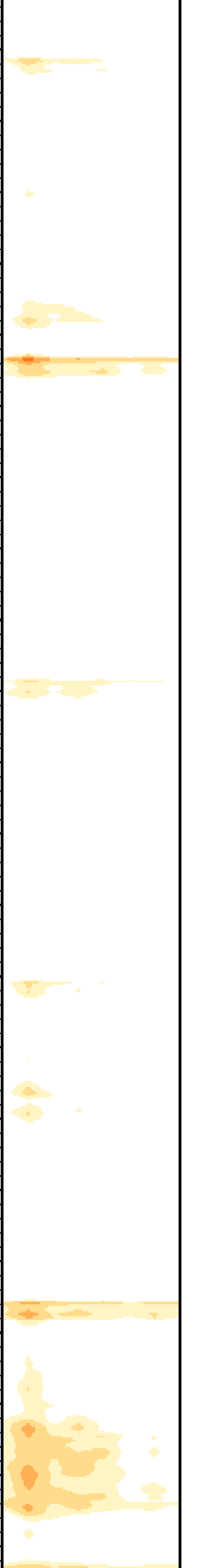




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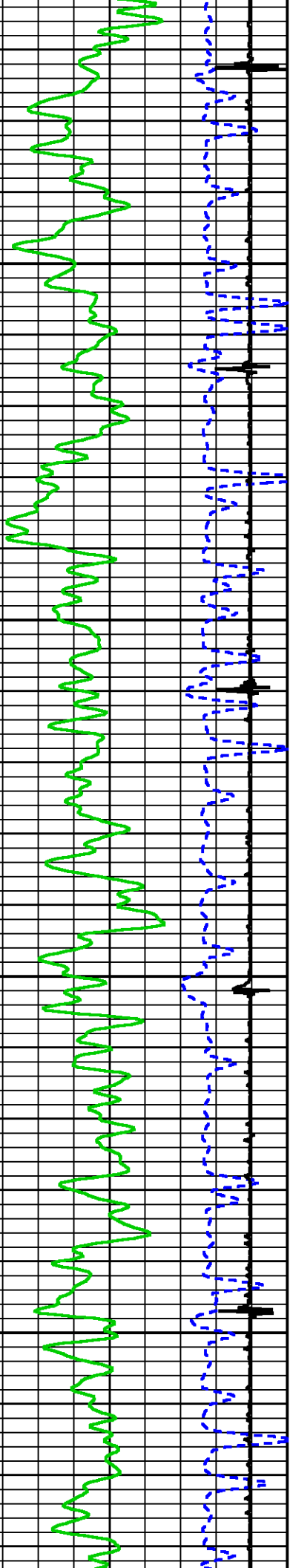
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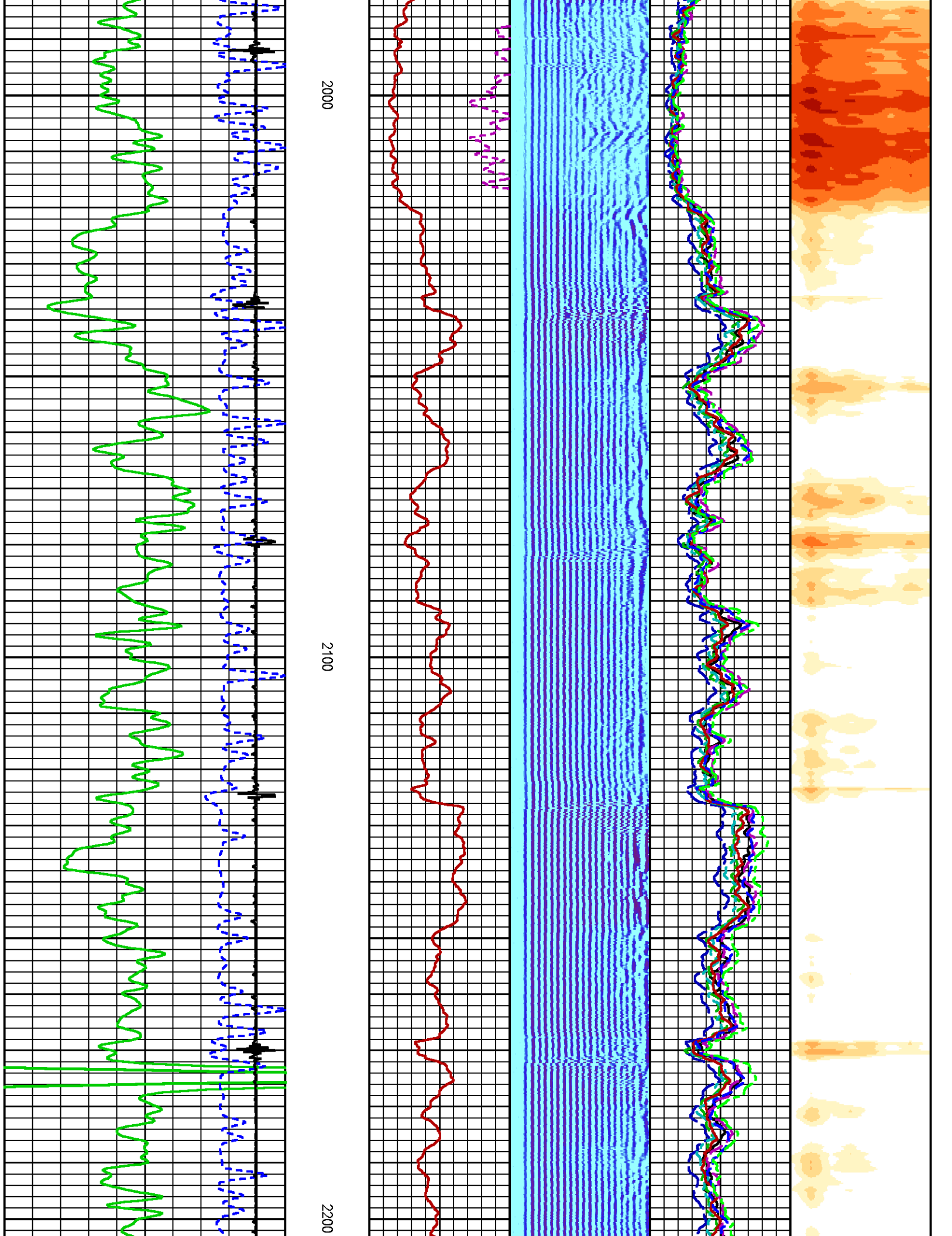


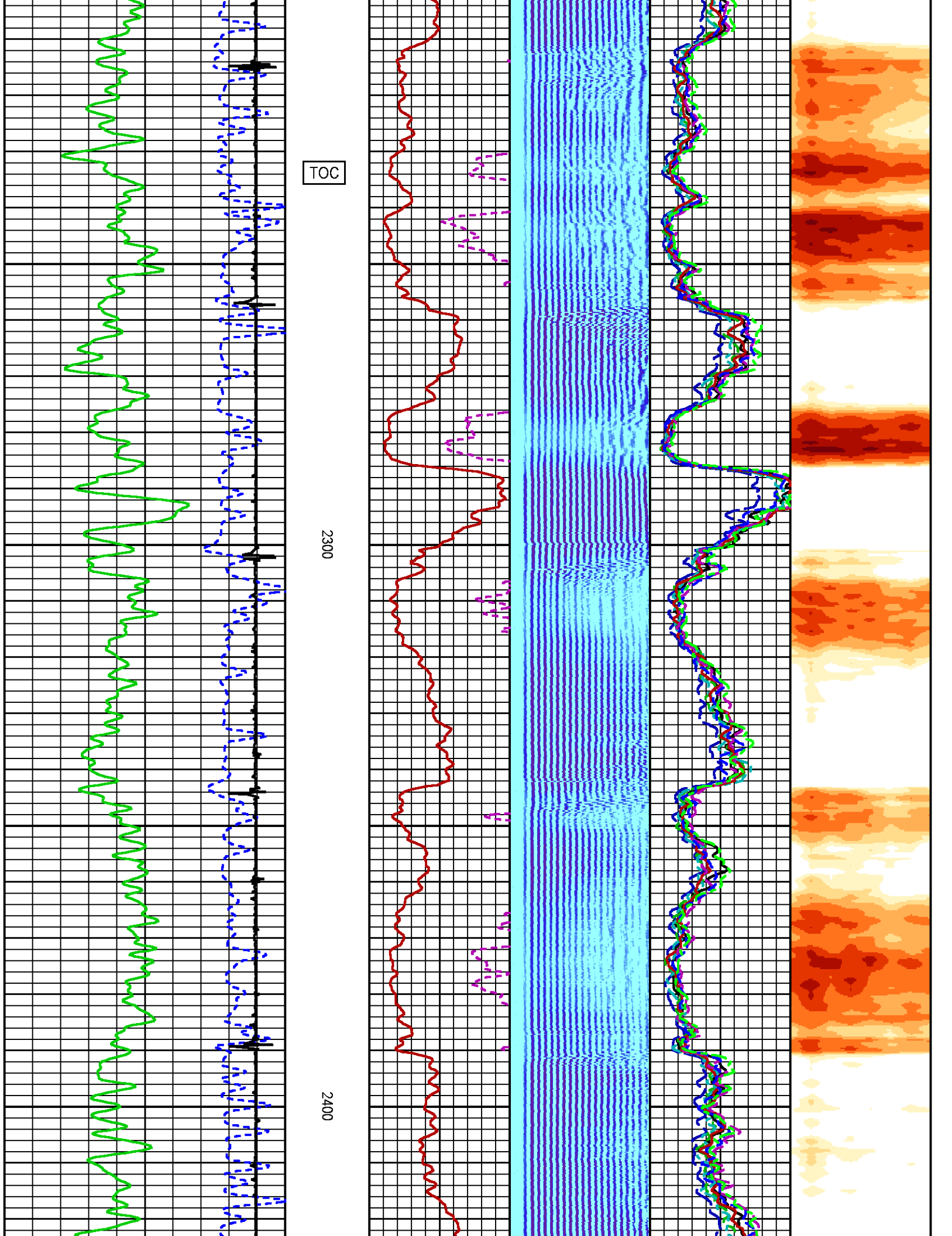
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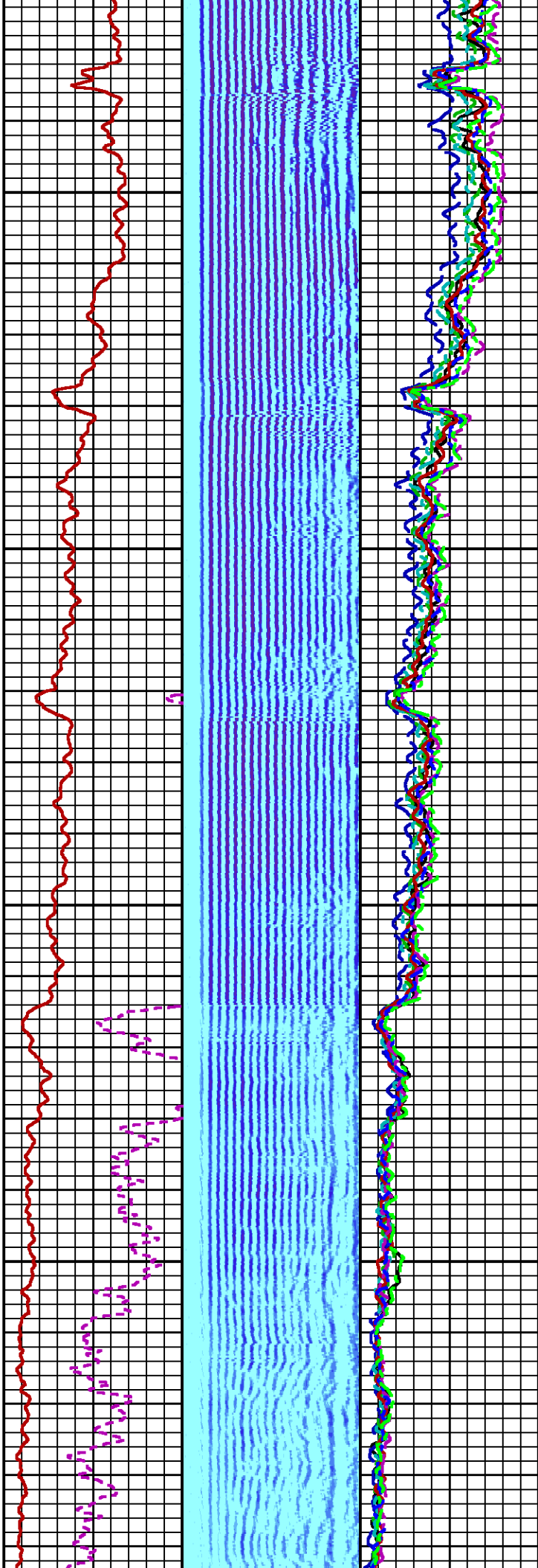
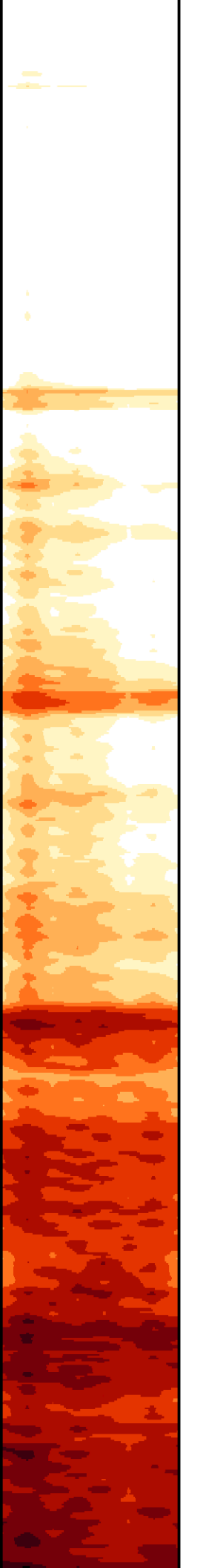






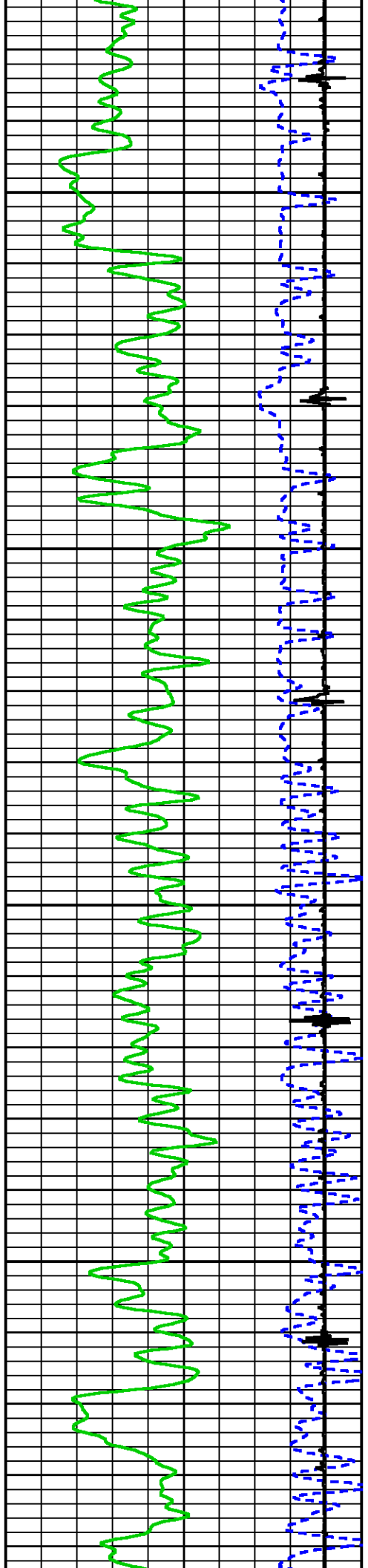


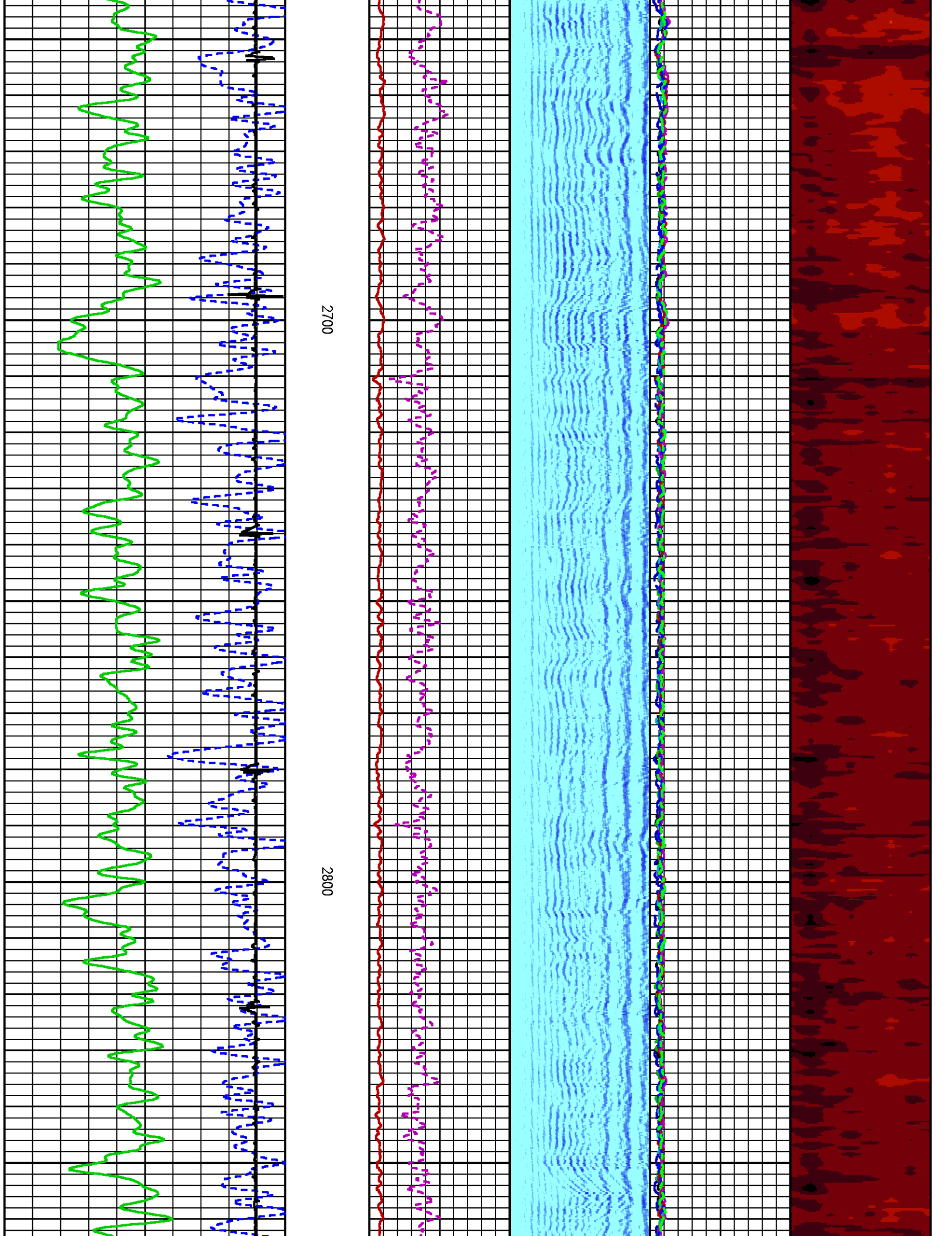


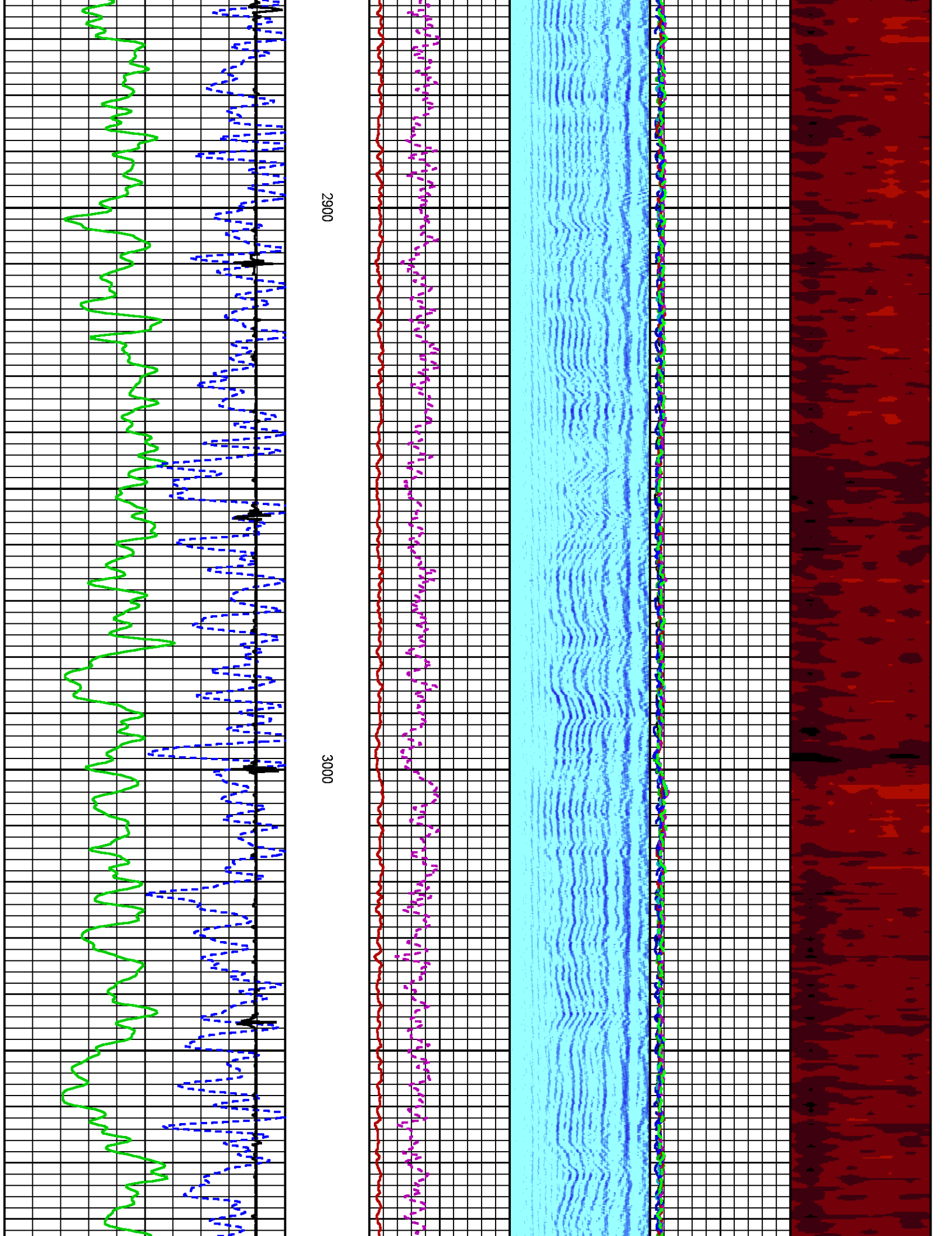


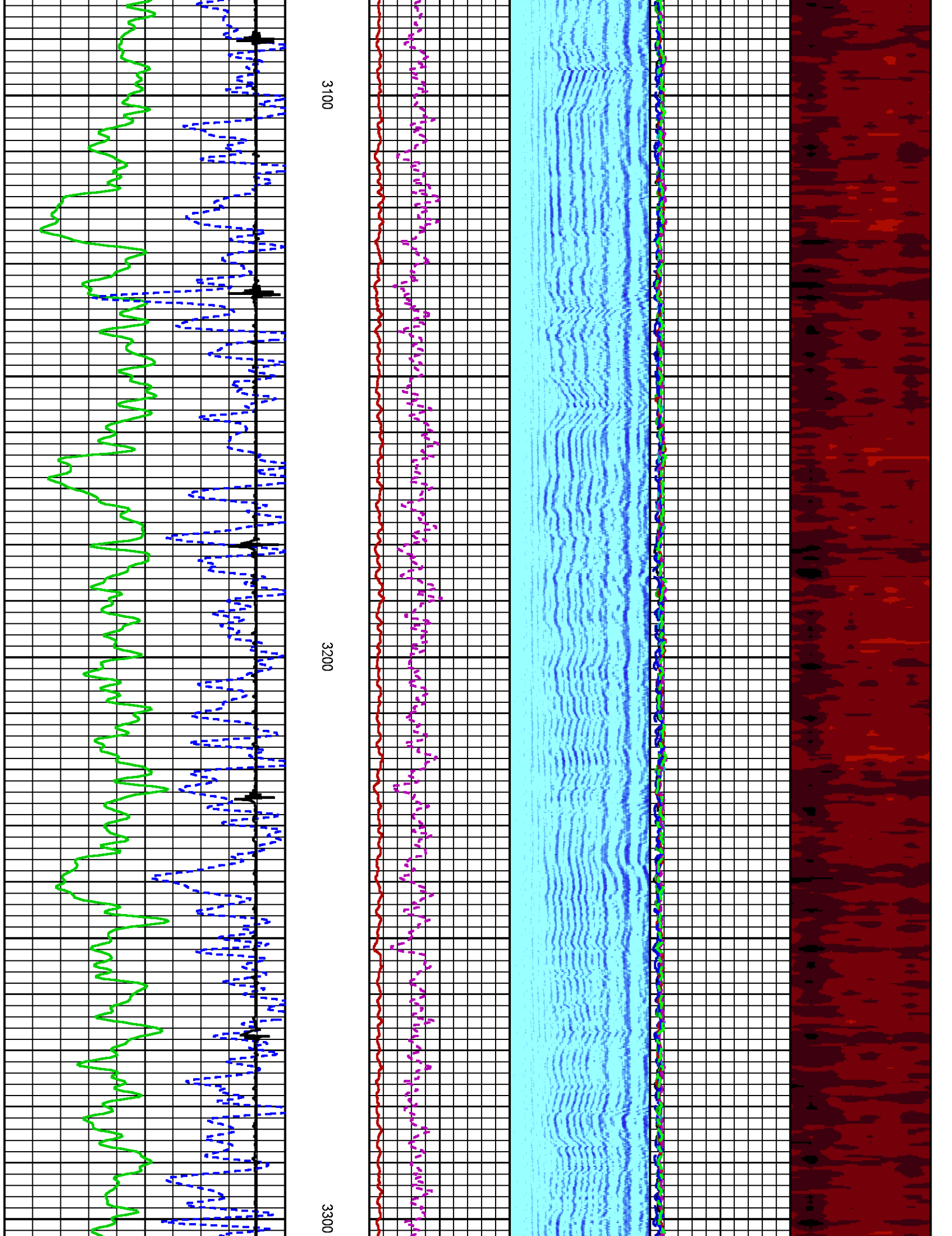
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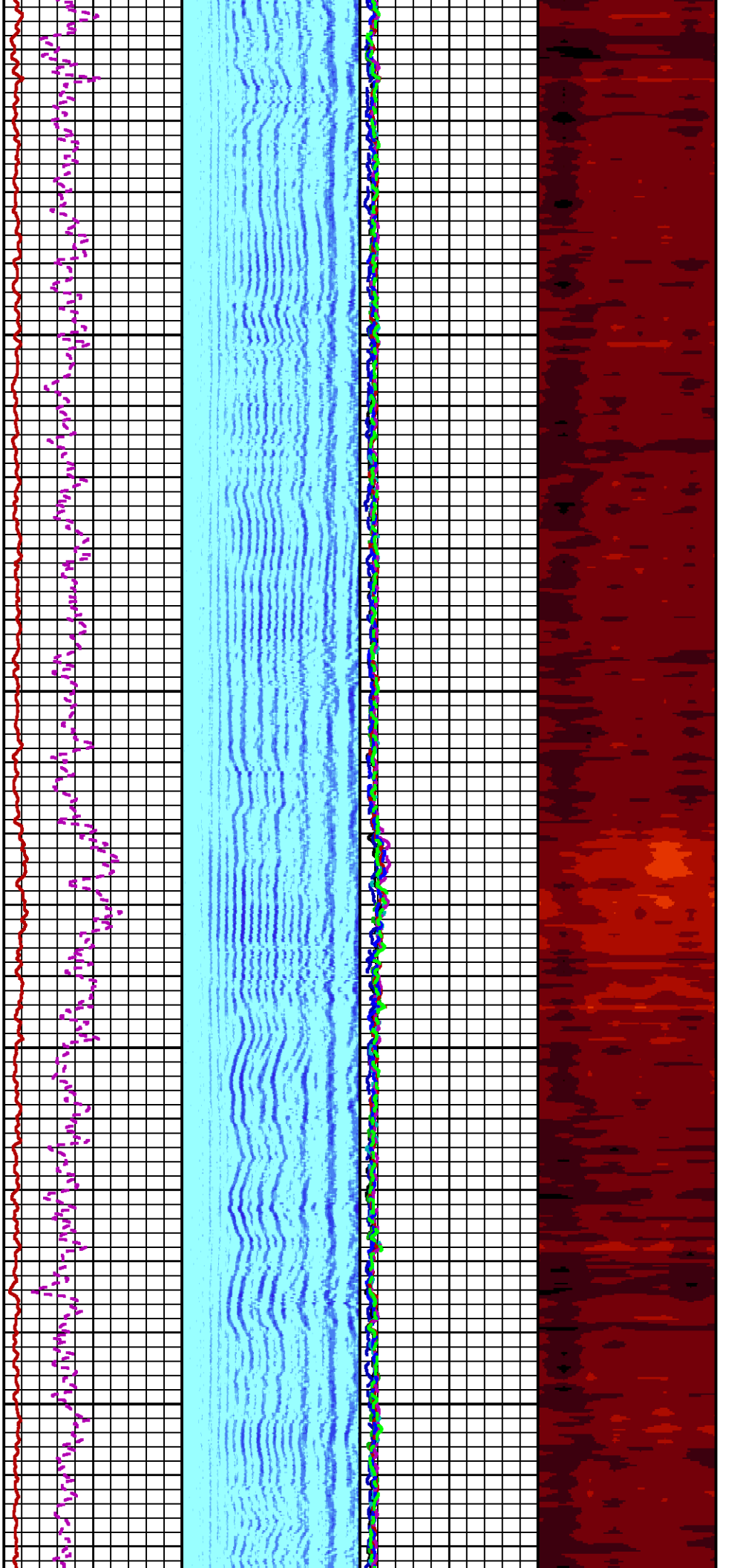






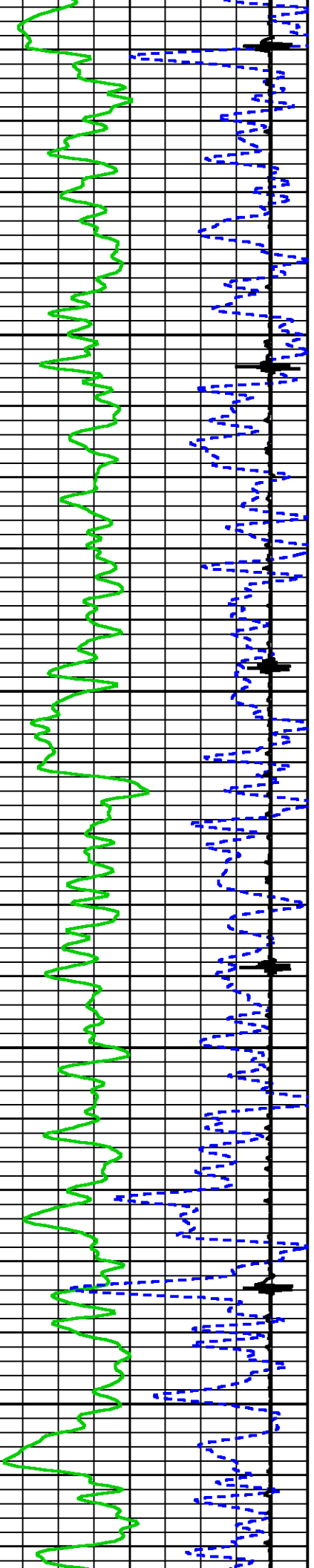


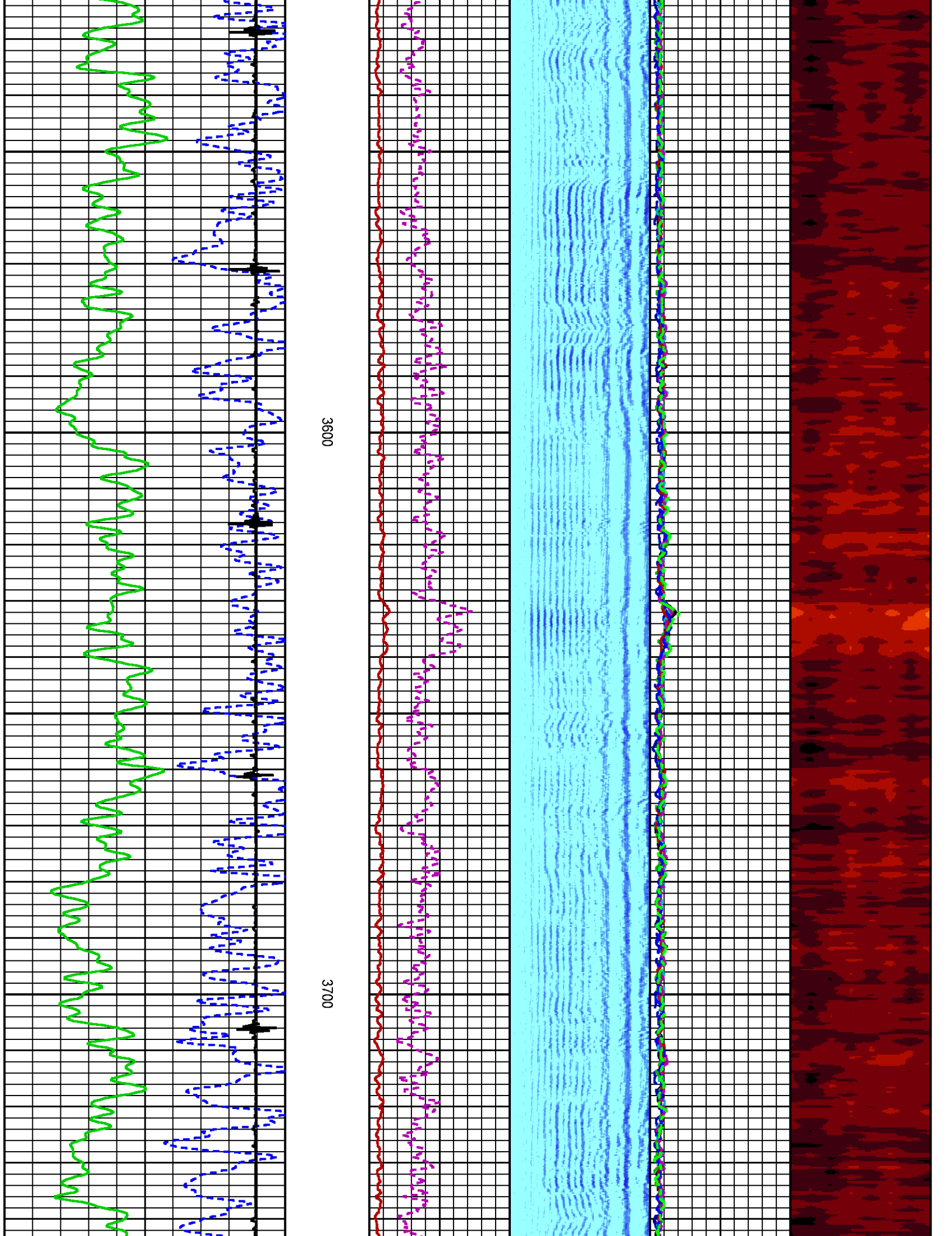




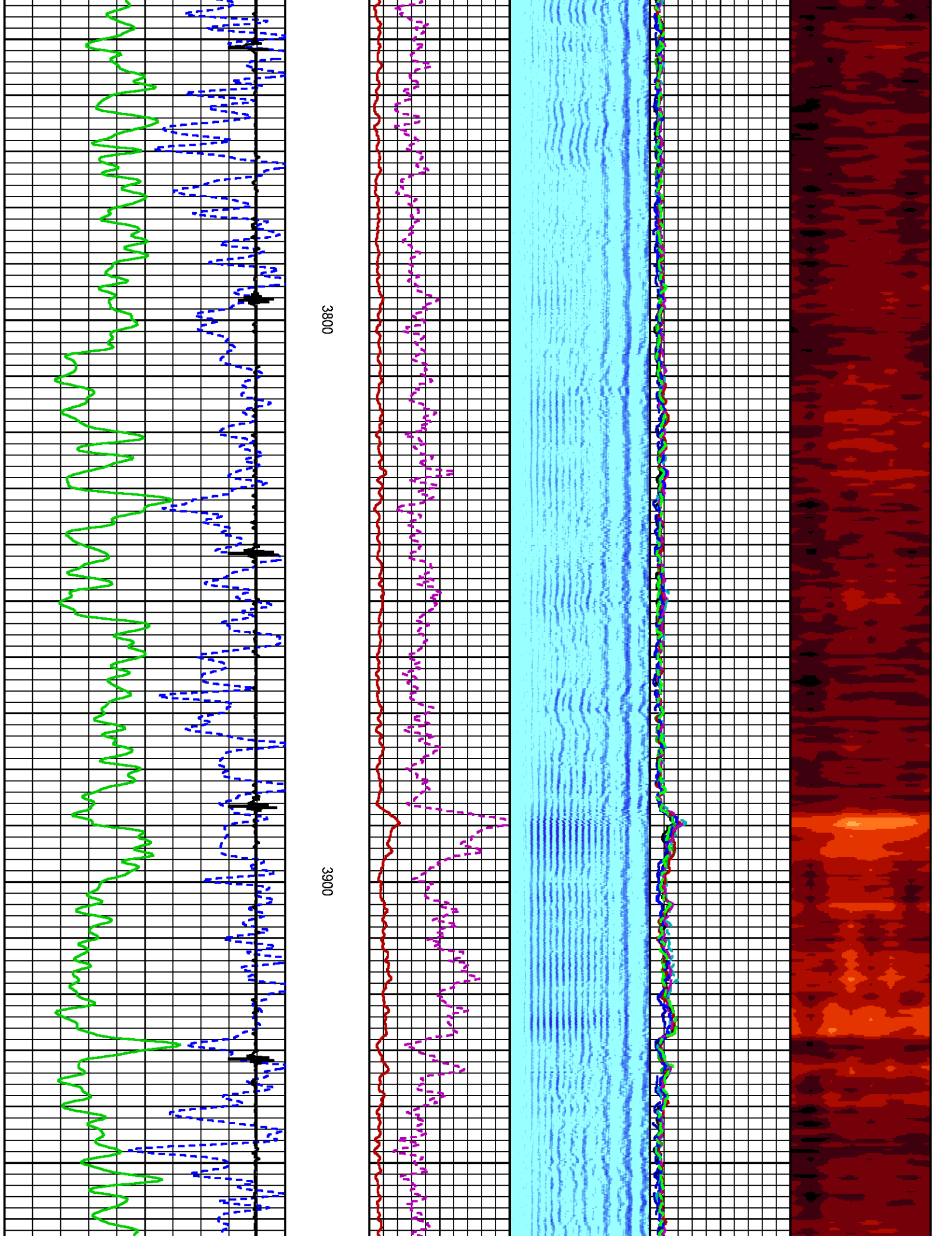
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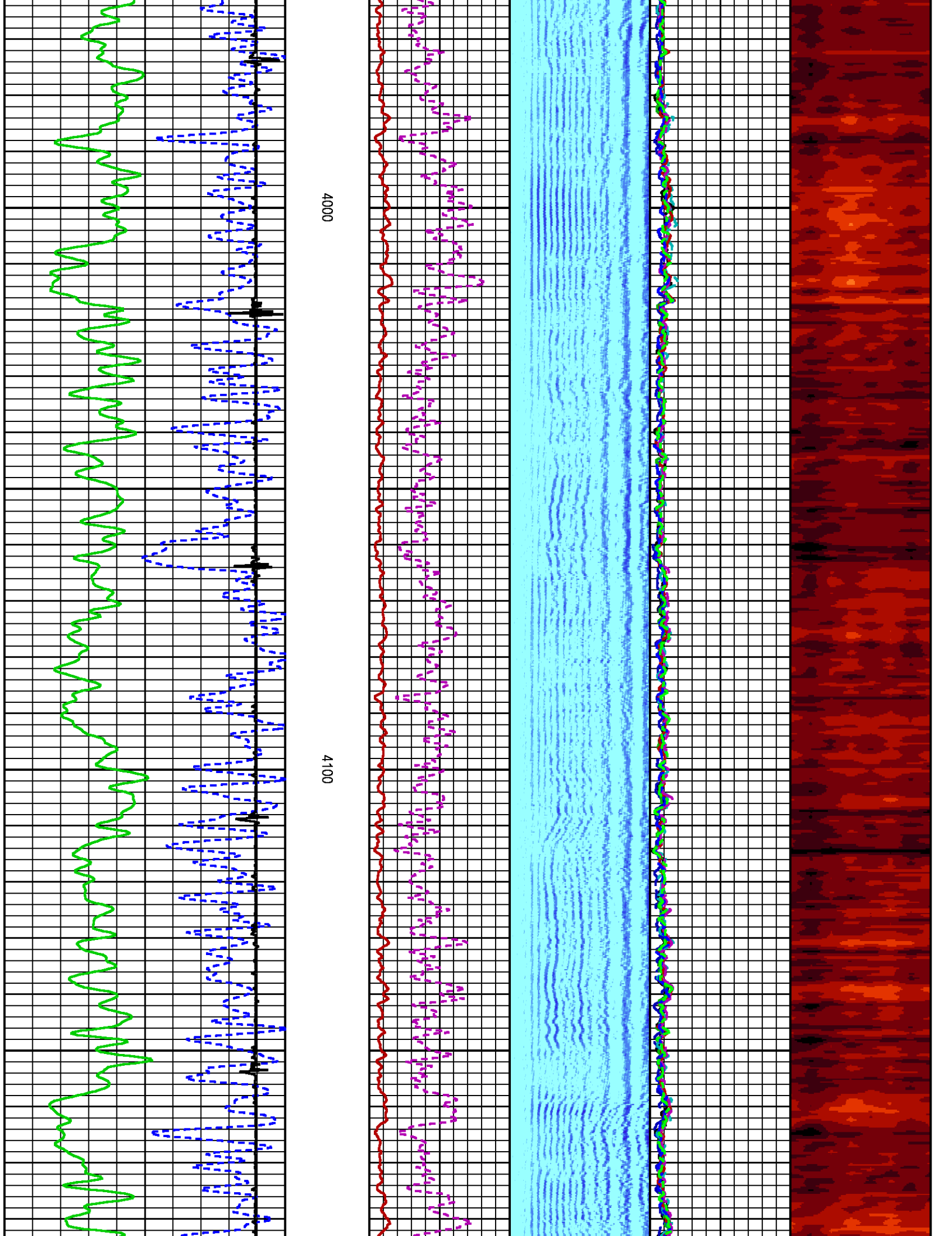
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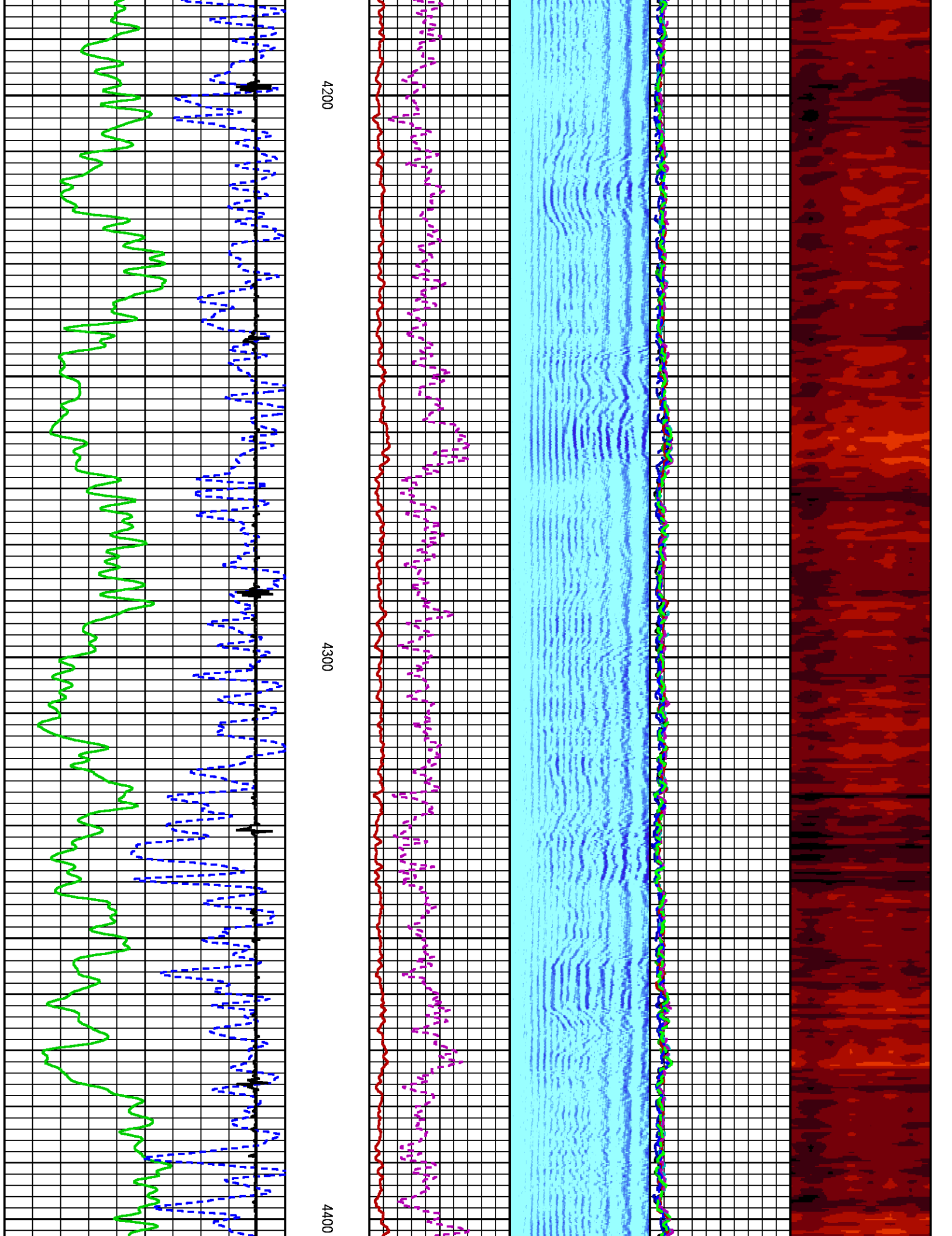


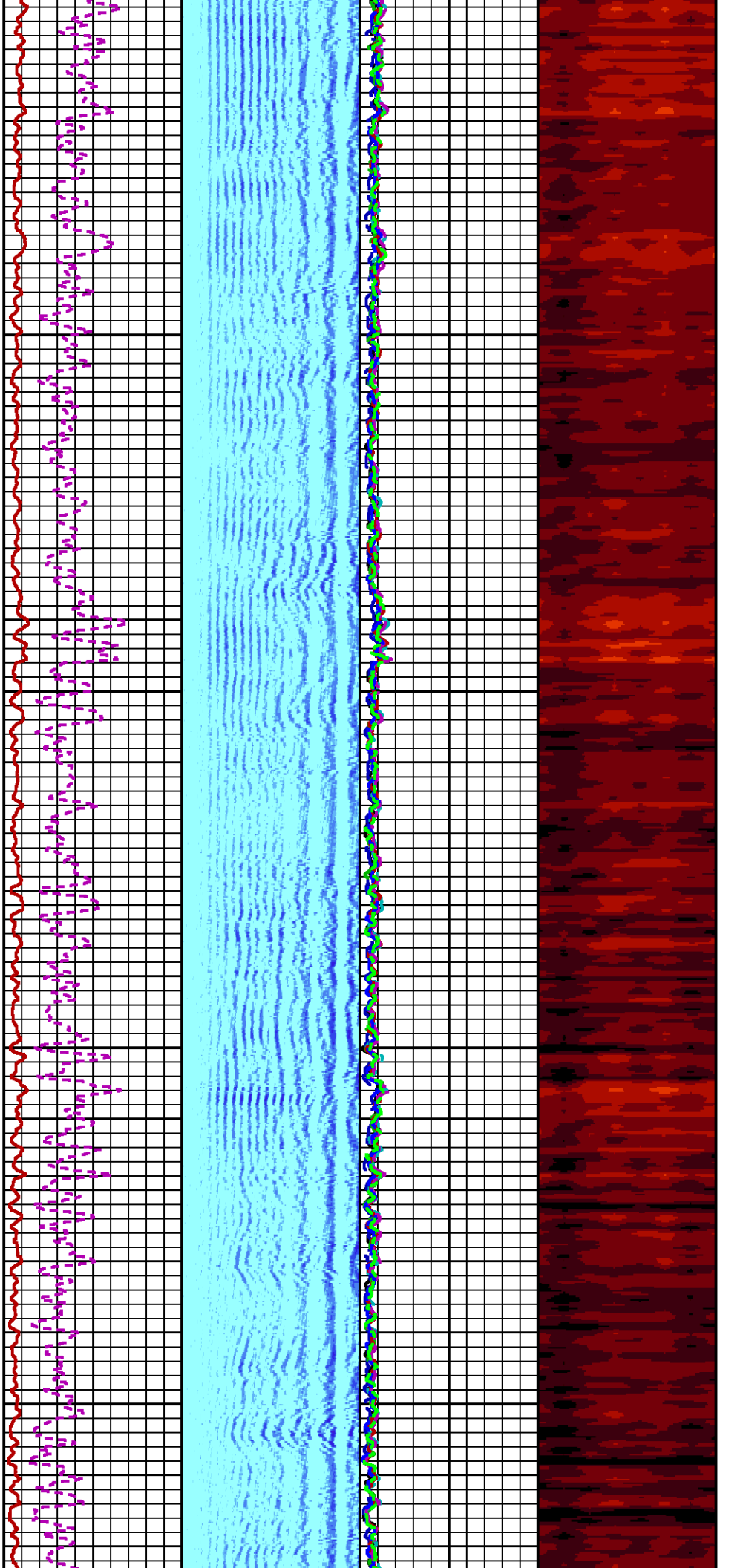






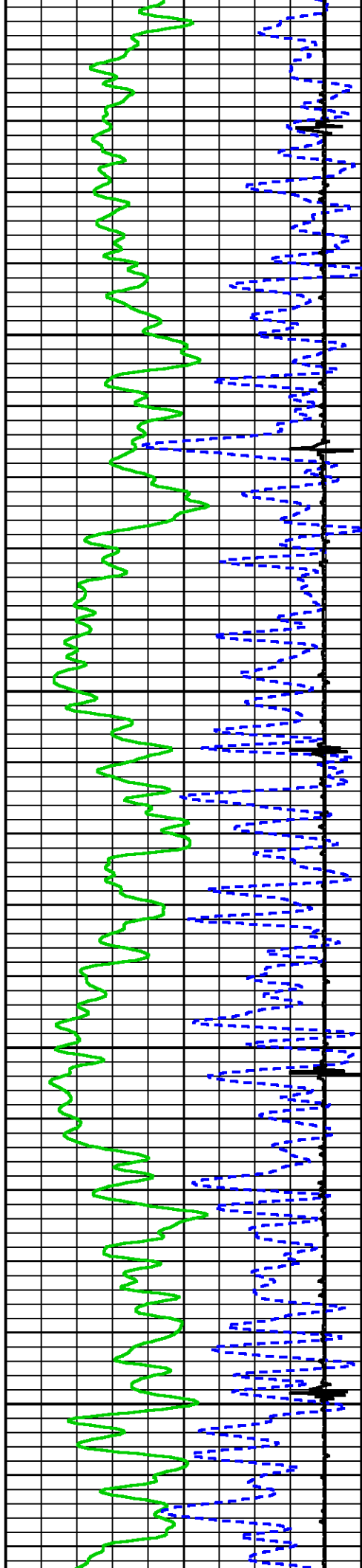




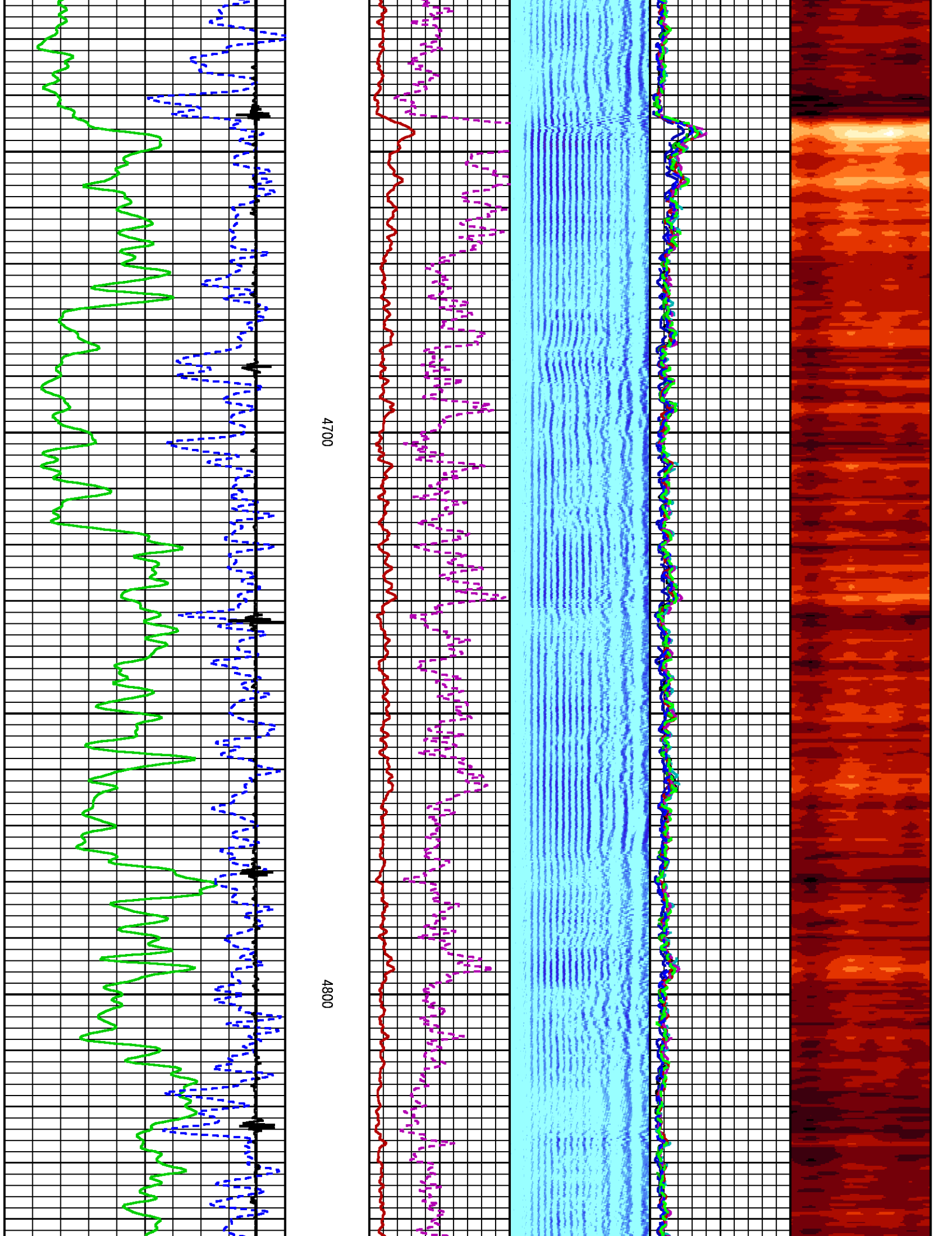


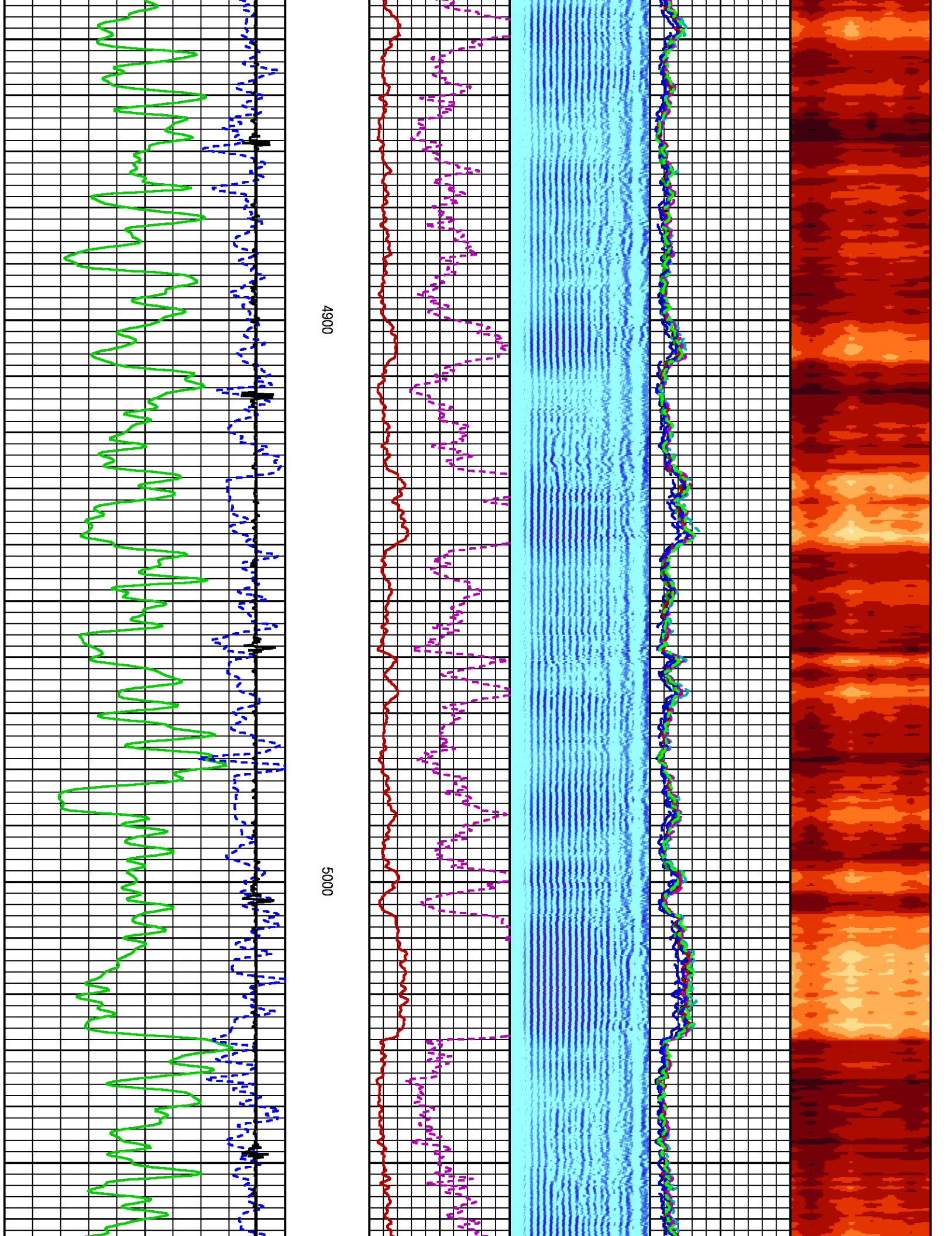
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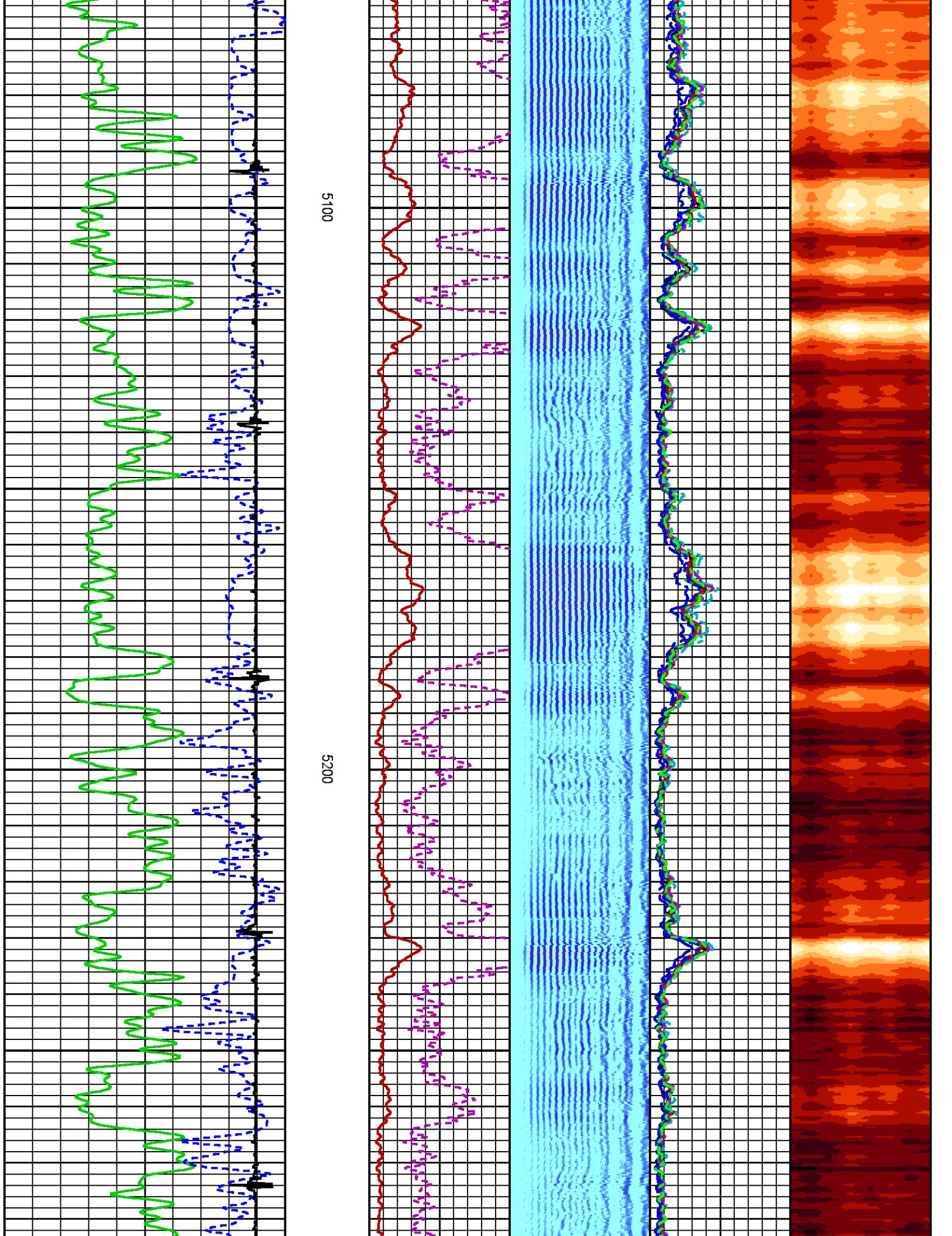


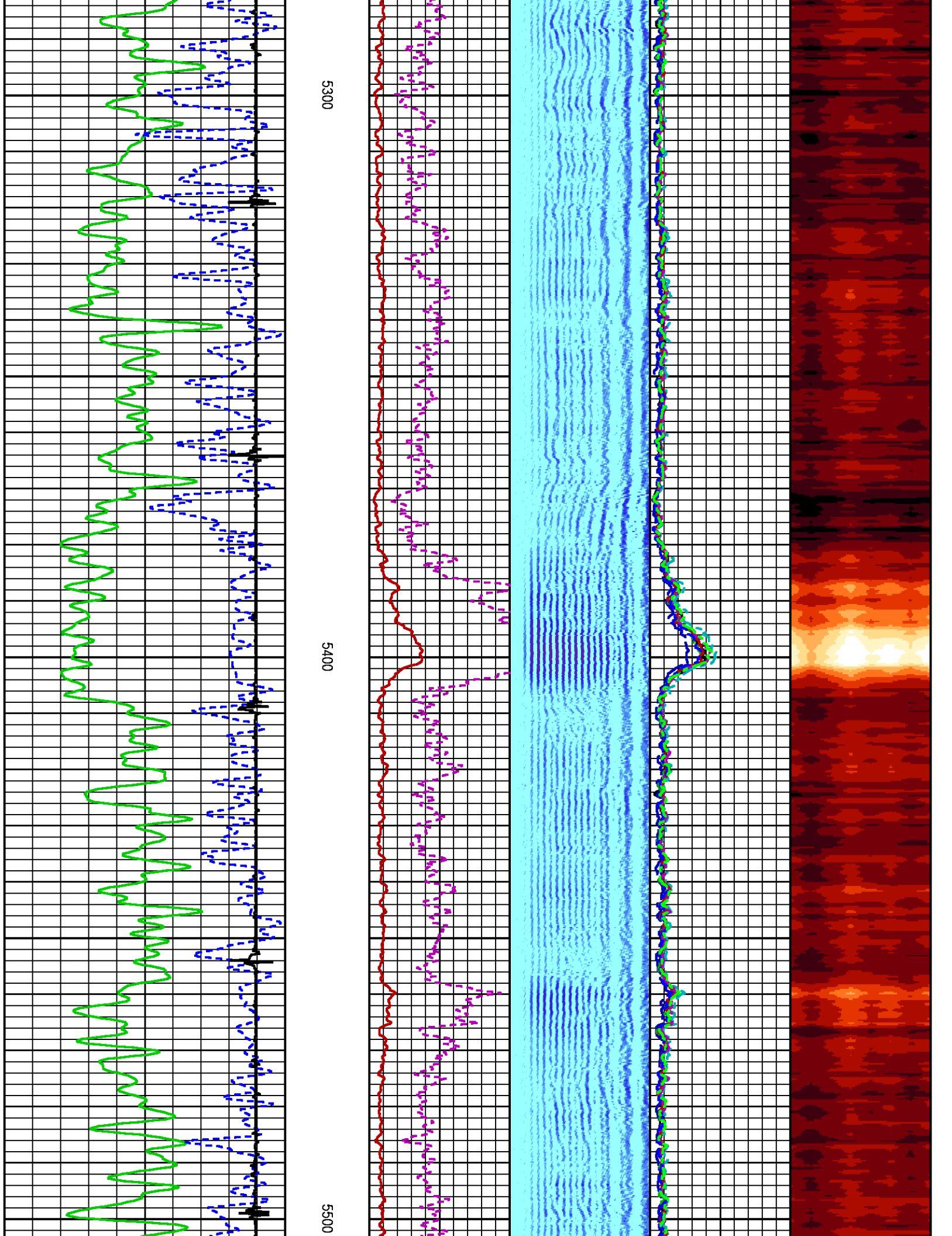


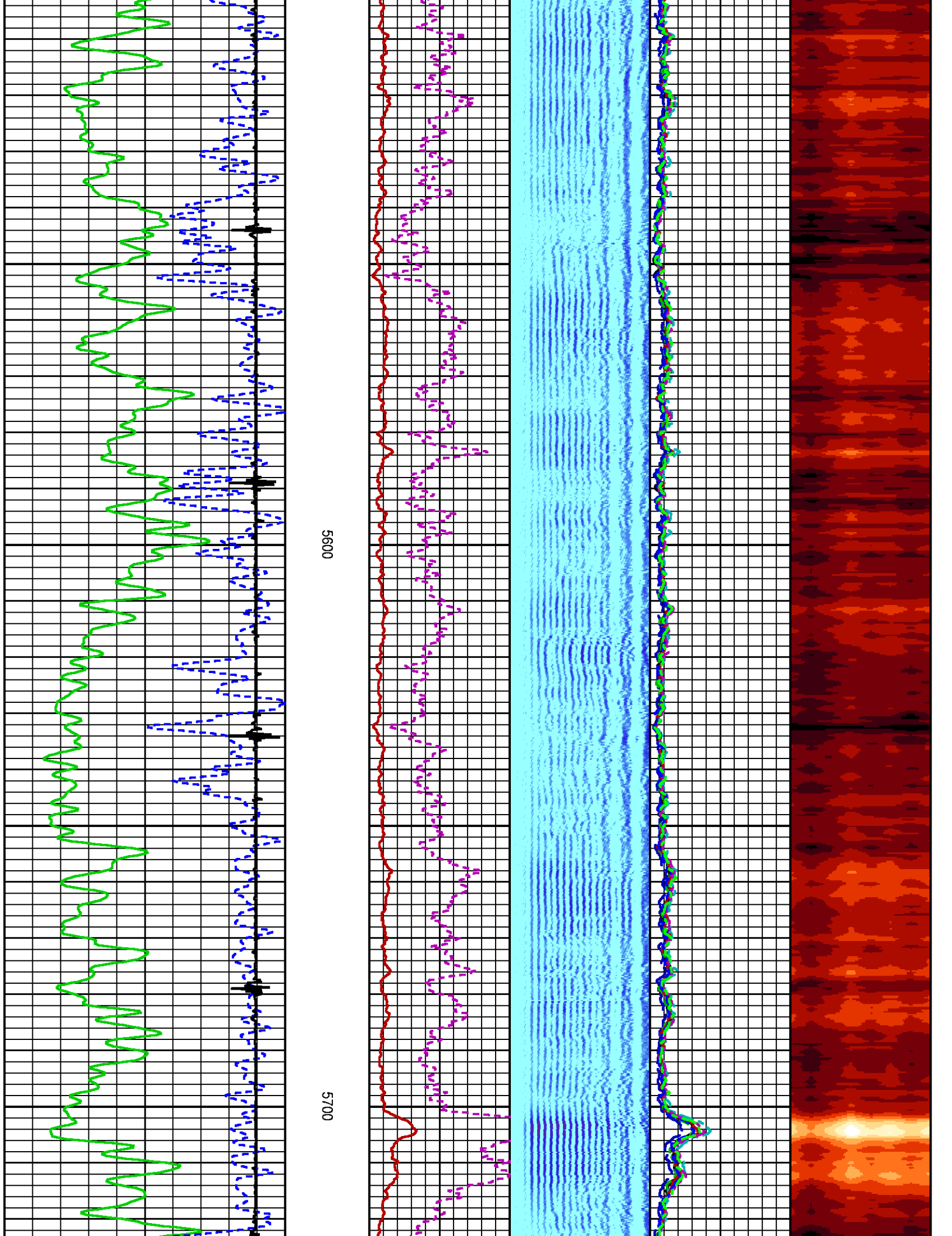


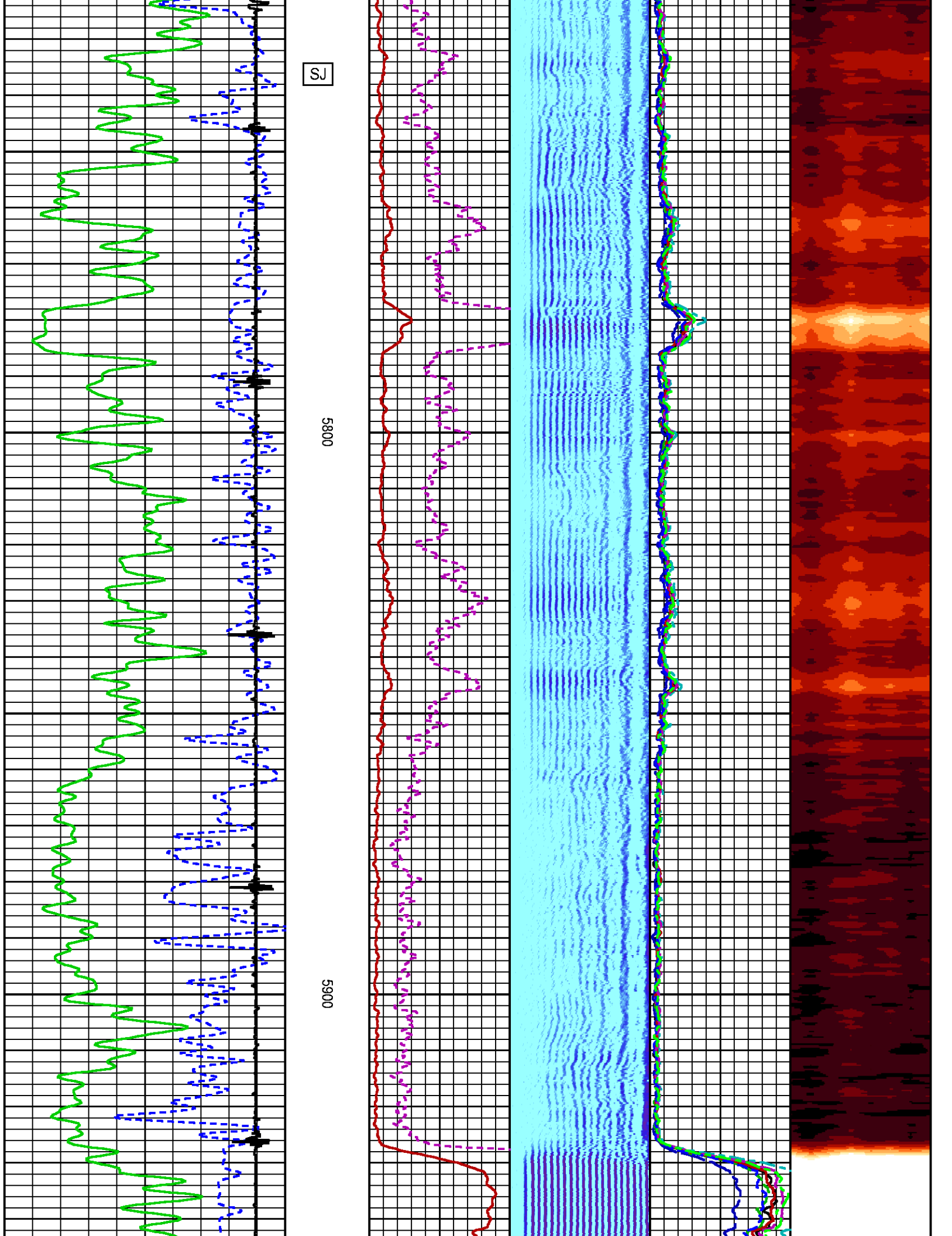




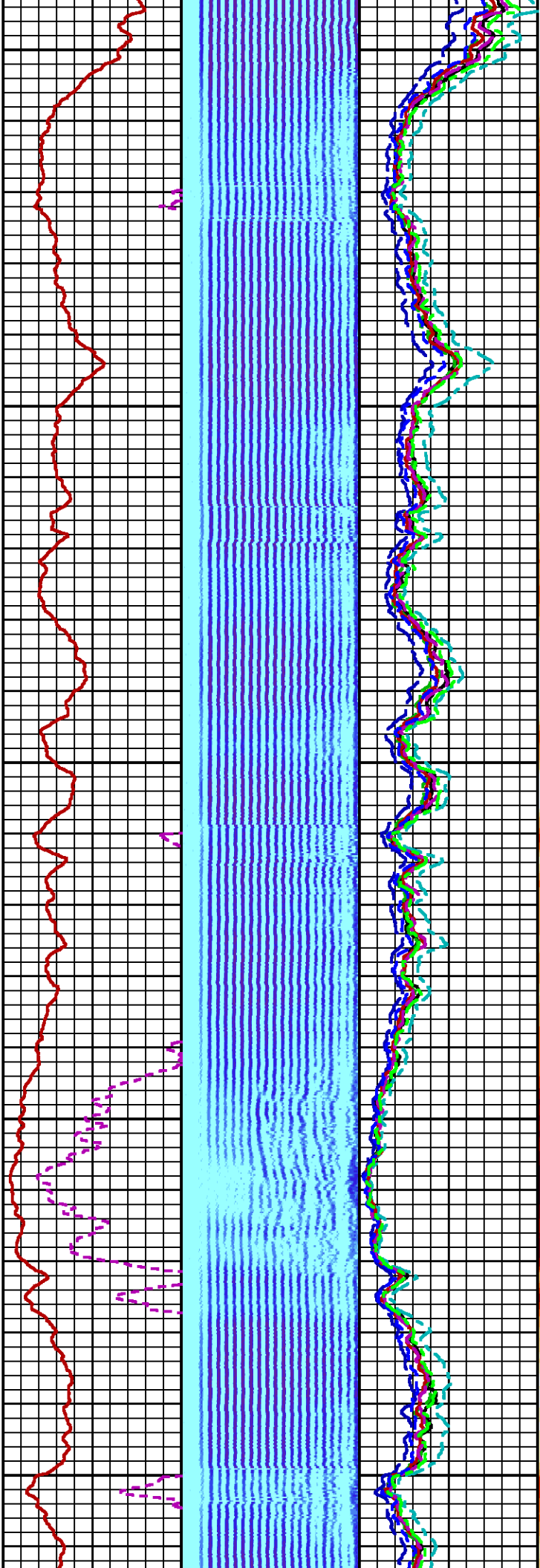
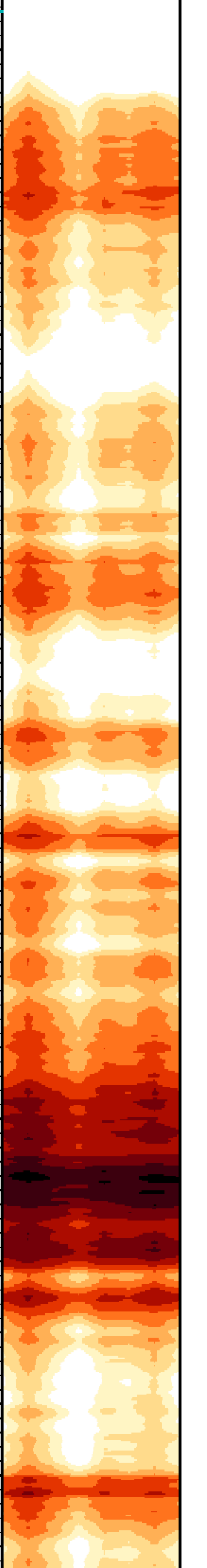






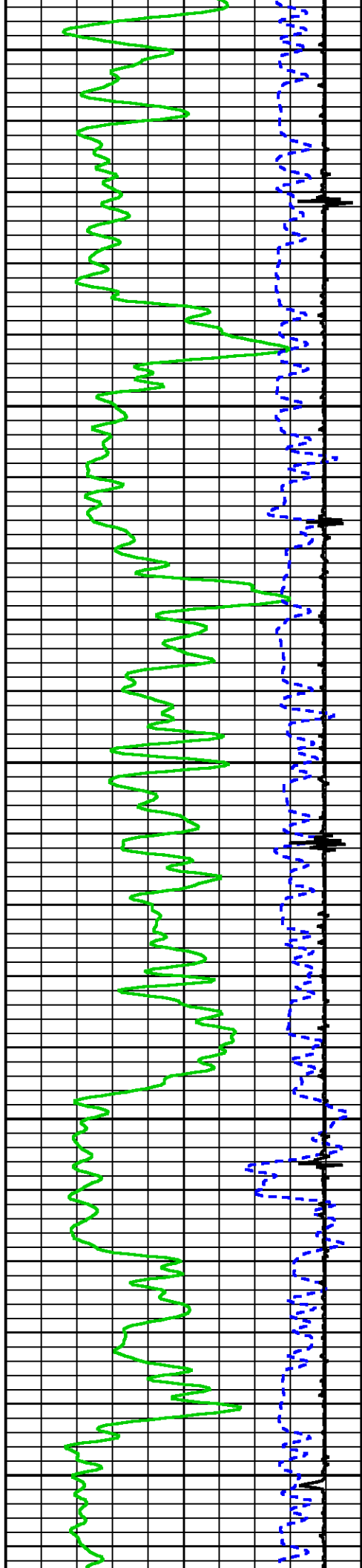


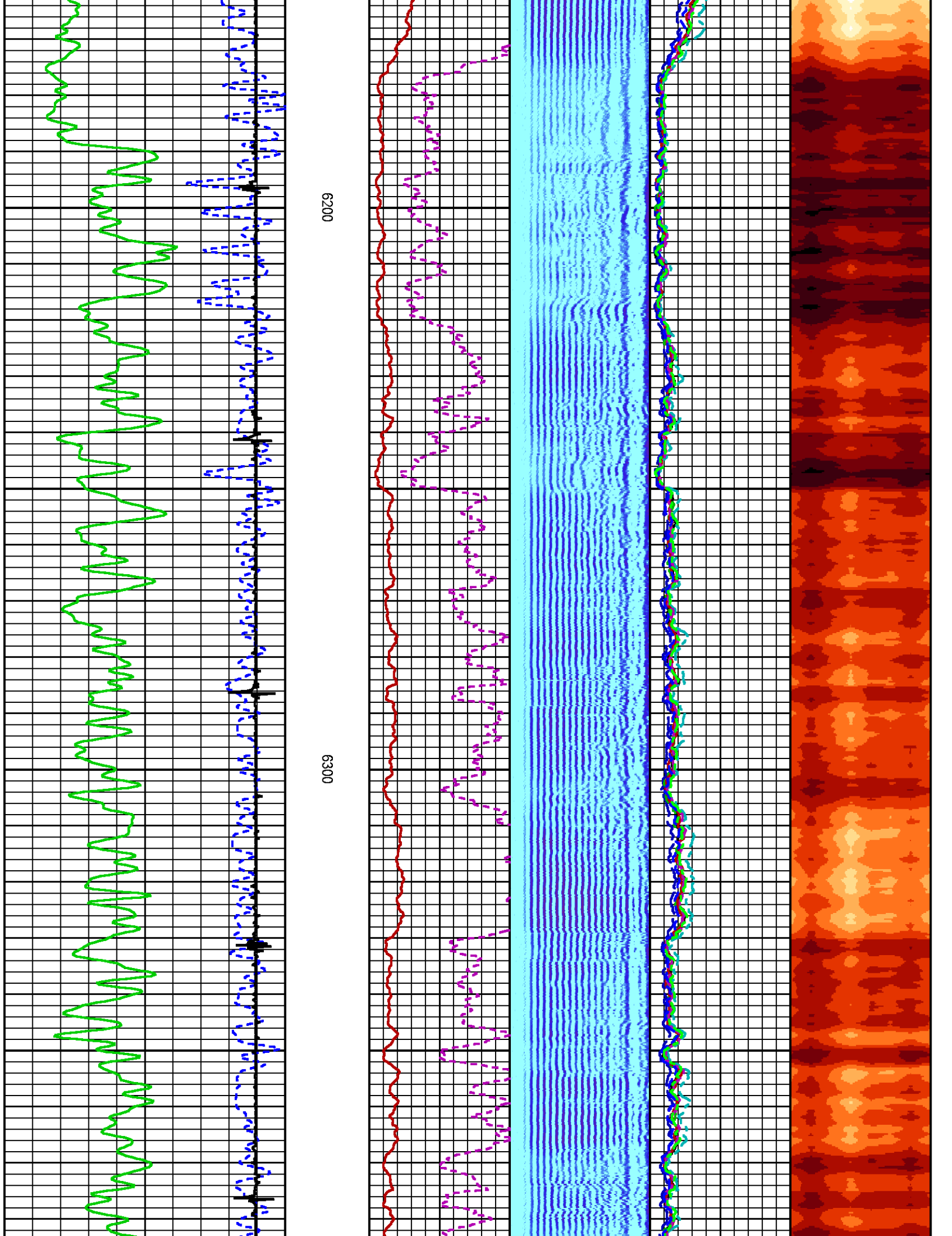


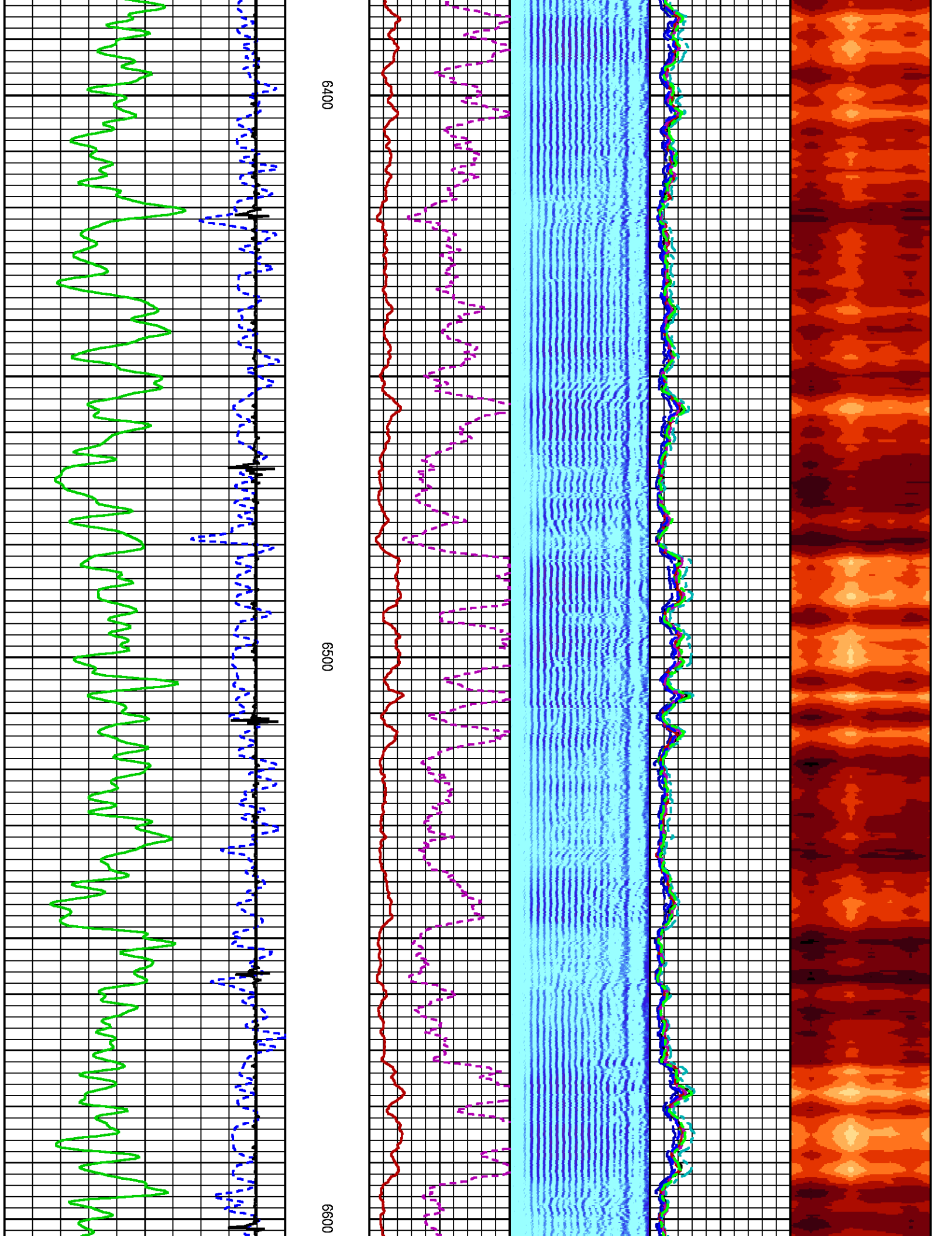


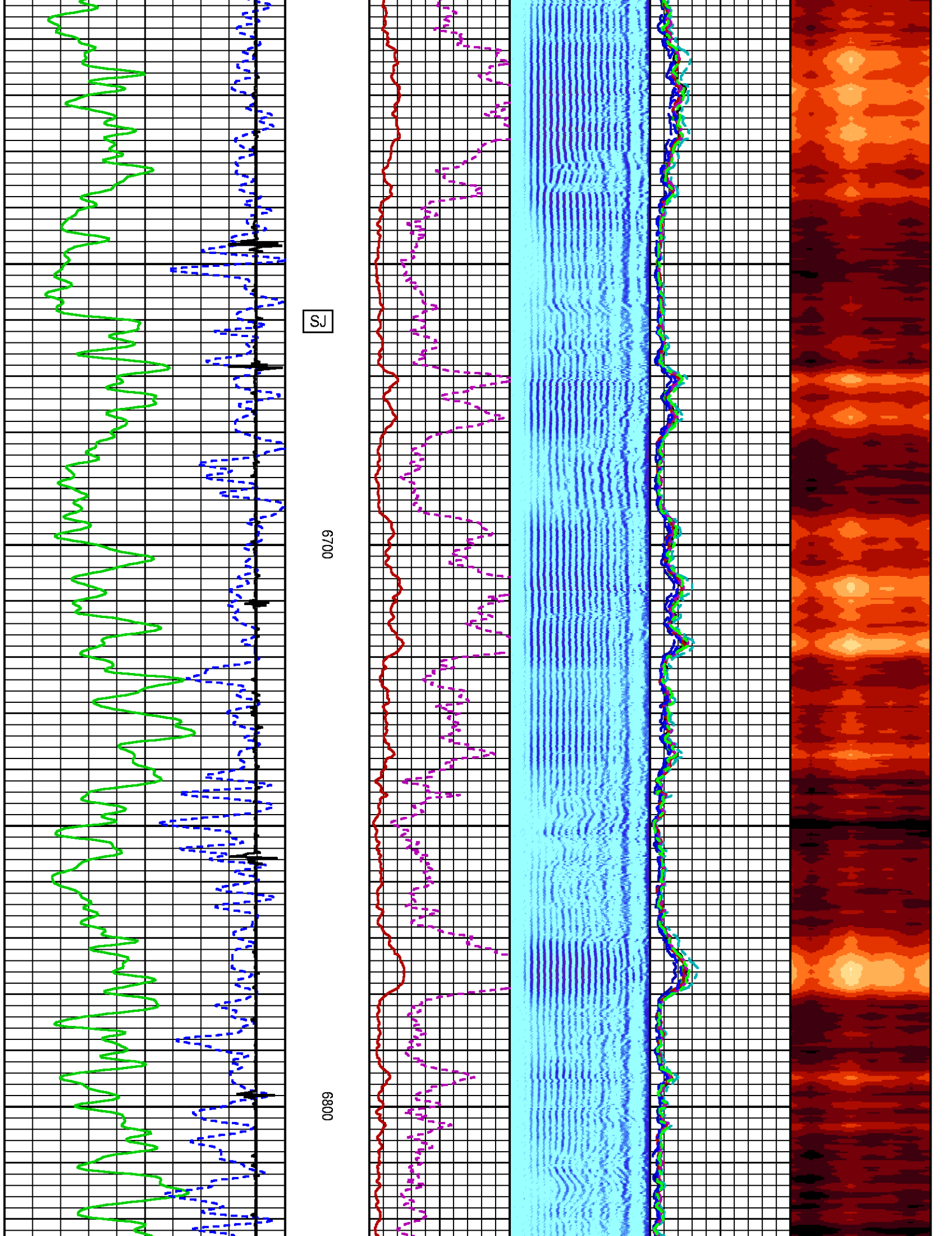
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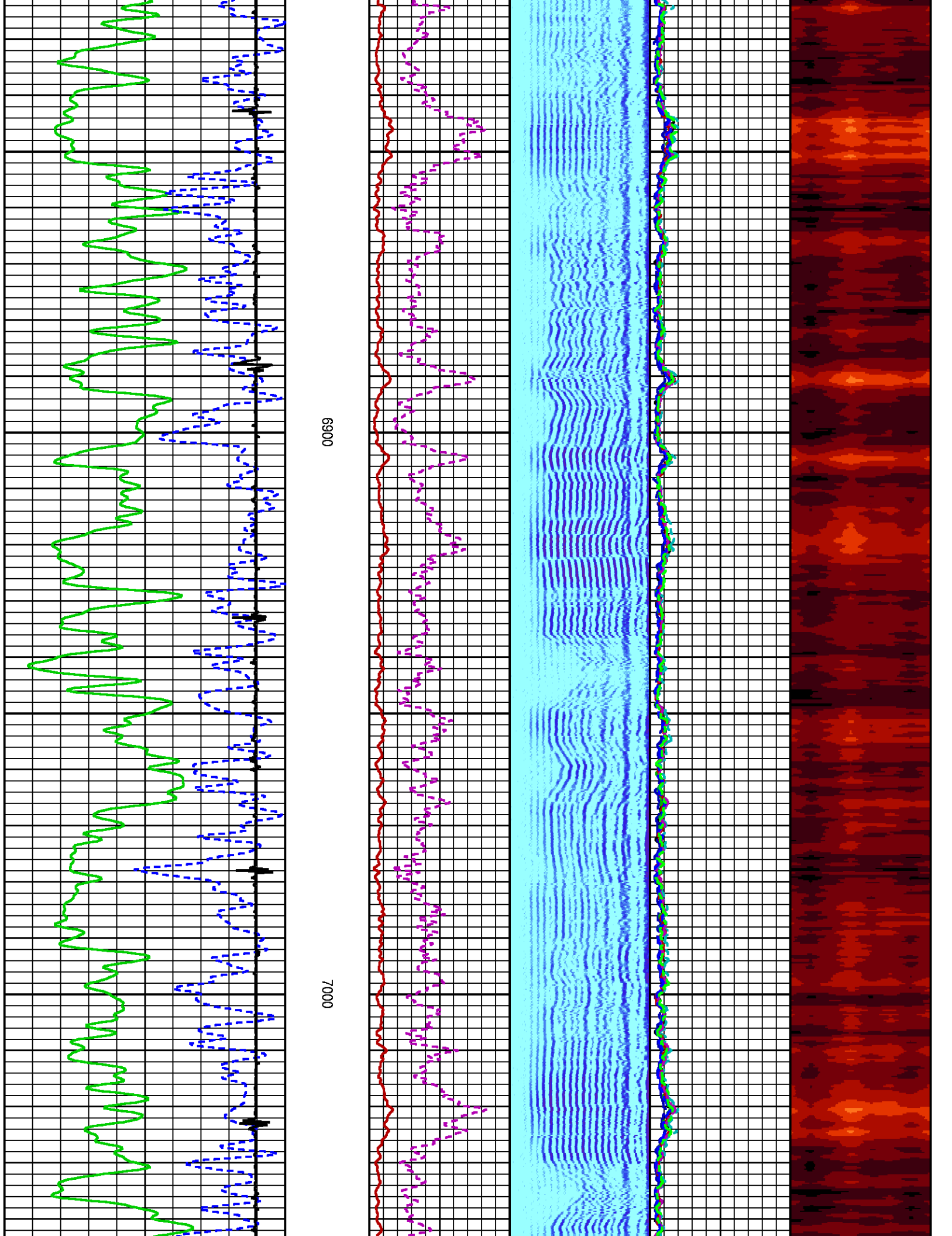


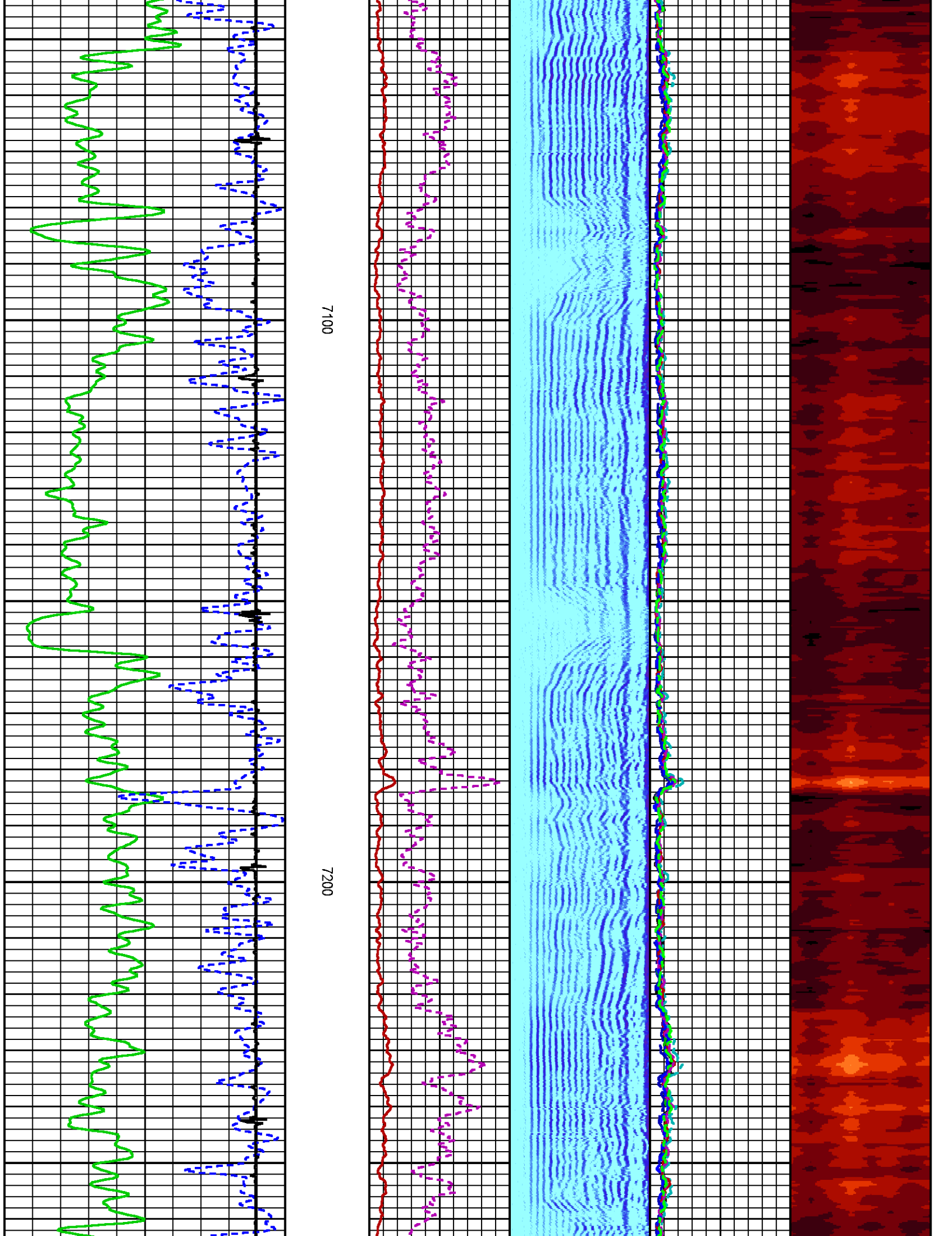


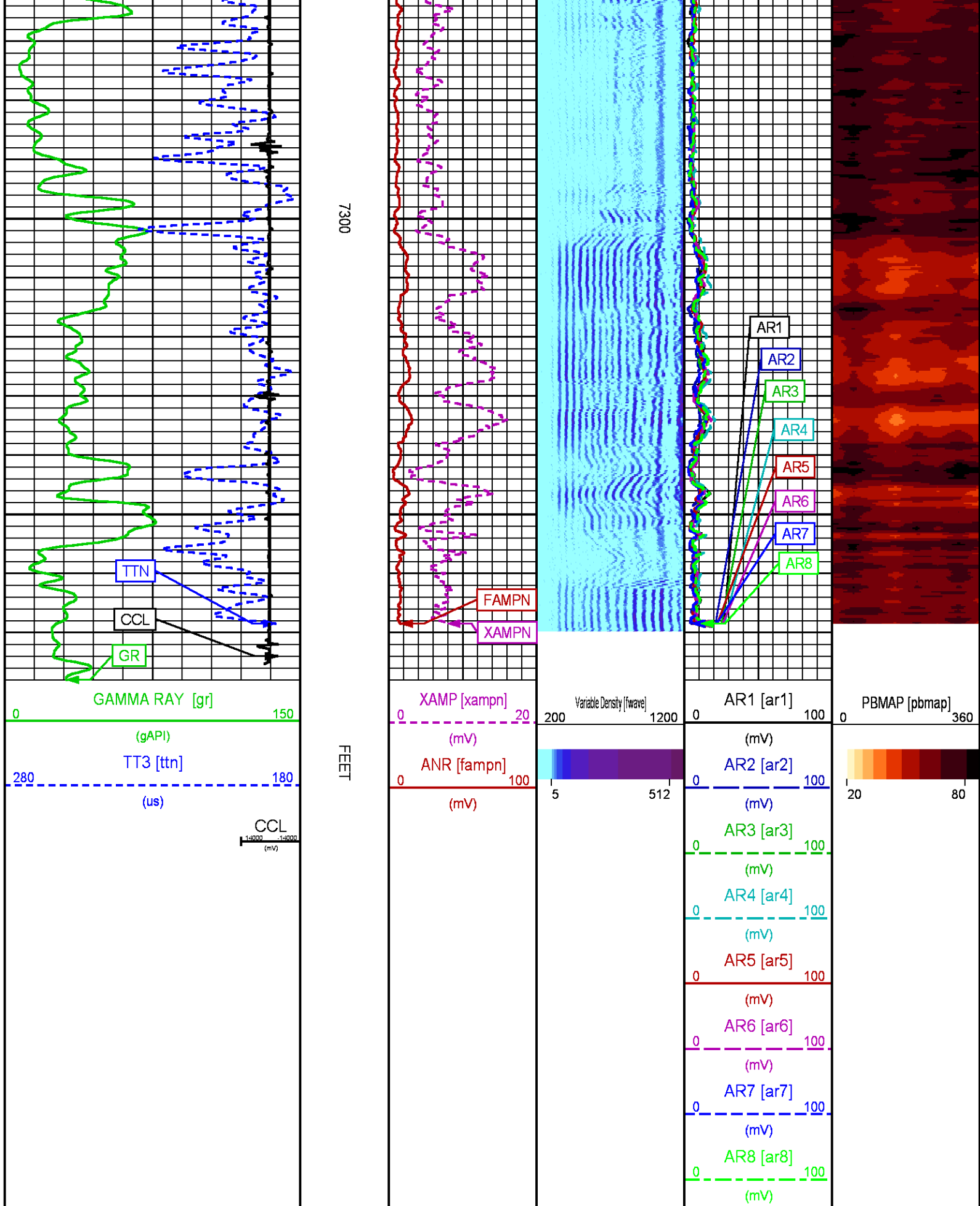












# REPEAT PASS 0 PSI

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017  
Patches: 2

Plotted: Tue Jan 23 18:24:51 2018

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_NICHOLAS\_0994\_24\_09E/p012gR02.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 7144.250 ft BOTTOM DEPTH: 7378.500 ft

### SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
GR	FILTER ()	medium (1)		TOP	BOTTOM
AMPLITUDE	FILTER ()	light (2a)		"	"
TRAVEL TIME	FILTER ()	medium (1)		"	"

### RAL CCL PROCESSING

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

### ANALOG RAL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
AMPLITUDE WINDOW (NEAR)	AMP WINDOW START (fgp1*)	185	us	TOP	BOTTOM
	AMP WINDOW START (fgp2*)	185	us	"	"
	AMP WINDOW START (fgp3*)	185	us	"	"
	AMP WINDOW START (fgp4*)	185	us	"	"
	AMP WINDOW START (fgp5*)	185	us	"	"
	AMP WINDOW START (fgp6*)	185	us	"	"
	AMP WINDOW START (fgp7*)	185	us	"	"
	AMP WINDOW START (fgp8*)	185	us	"	"
	AMP WINDOW START (fgpn*)	185	us	"	"
TRAVEL TIME WINDOW (NEAR)	AMP WINDOW LENGTH	30	us	"	"
	TT WINDOW START (ttn*)	160	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	4	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	200.391	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-62	us	"	"
	TOOL DELAY (str2*)	-62	us	"	"
	TOOL DELAY (str3*)	-62	us	"	"
	TOOL DELAY (str4*)	-62	us	"	"
	TOOL DELAY (str5*)	-62	us	"	"
	TOOL DELAY (str6*)	-62	us	"	"
	TOOL DELAY (str7*)	-62	us	"	"
	TOOL DELAY (str8*)	-62	us	"	"
BASELINE NOISE (NEAR)	TOOL DELAY (strn*)	-62	us	"	"
	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	"	"

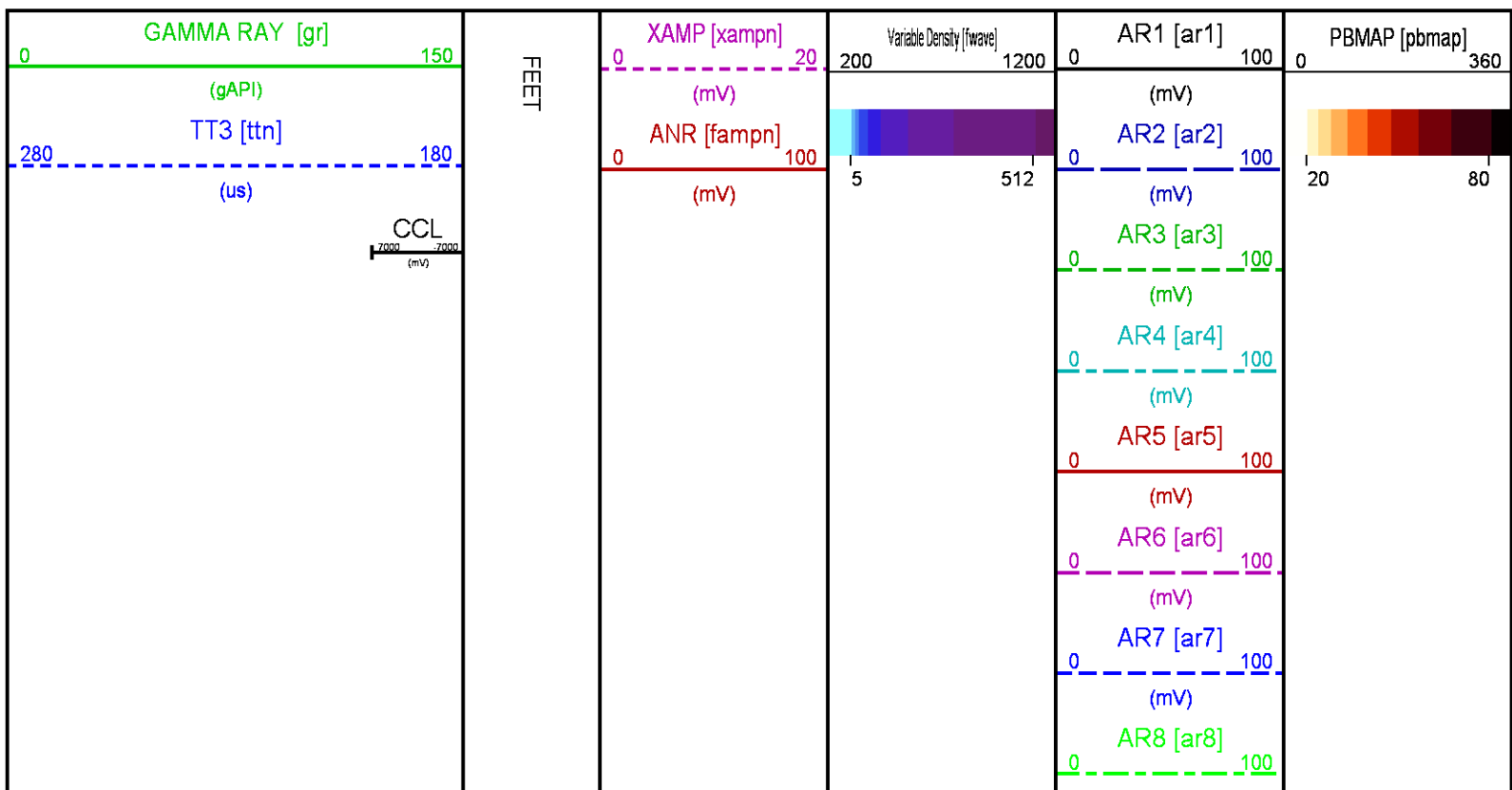
## CURVE DESCRIPTION REPORT

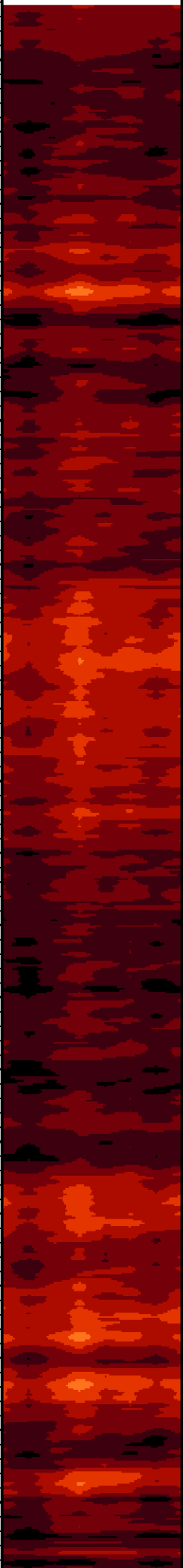
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	FIXED GATE AMPLITUDE T-R7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

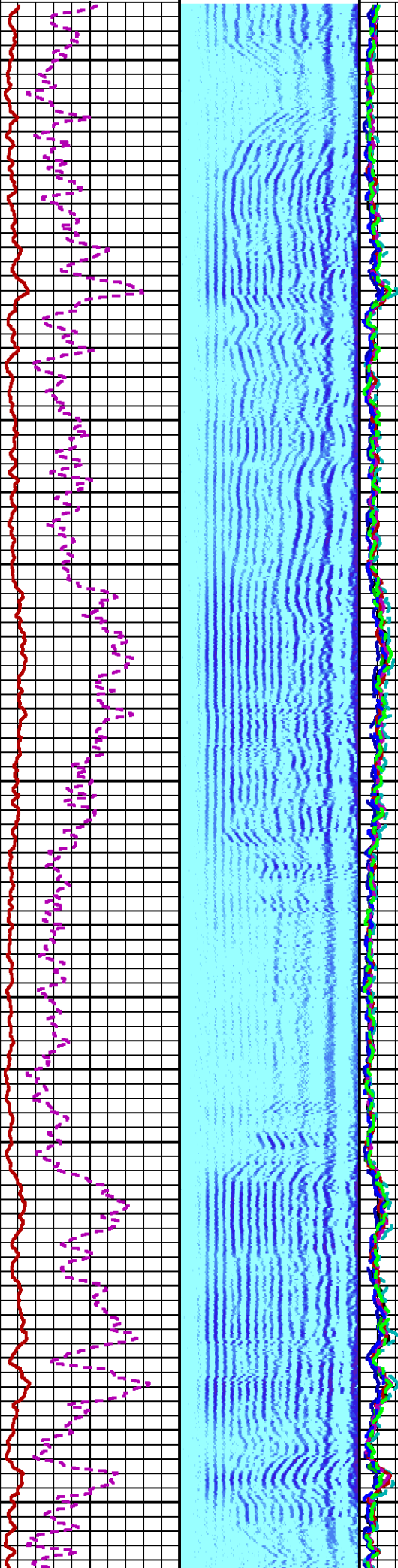
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
AR1	-11.25	AR5	-11.25	CCL	-5.75	XAMPN	-11.25
AR2	-11.25	AR6	-11.25	FAMPN	-11.25		
AR3	-11.25	AR7	-11.25	GR	-1.75		
AR4	-11.25	AR8	-11.25	TTN	-11.25		

<b>Presentation</b>	: SysA:/dat1a/LARAMIE_NICHOLAS_0994_24_09E/ LARAMIE_RAL+01-REPEAT-RAL_RPT_09E-5.fvpdf [5"/100' Scale]
<b>Plot Interval</b>	: 7142.25 - 7386.25 Feet
<b>Data File 1</b>	: F1 : SysA:/dat1a/LARAMIE_NICHOLAS_0994_24_09E/RPT_RAL_09E.xtf
<b>Created On</b>	: N/A
<b>Company</b>	: LARAMIE ENERGY LLC
<b>Well</b>	: NICHOLS 0994-24-09E
<b>Field</b>	: VEGA
<b>File Interval</b>	: 7141.25 - 7387.5 Feet
<b>OCT</b>	: p012g



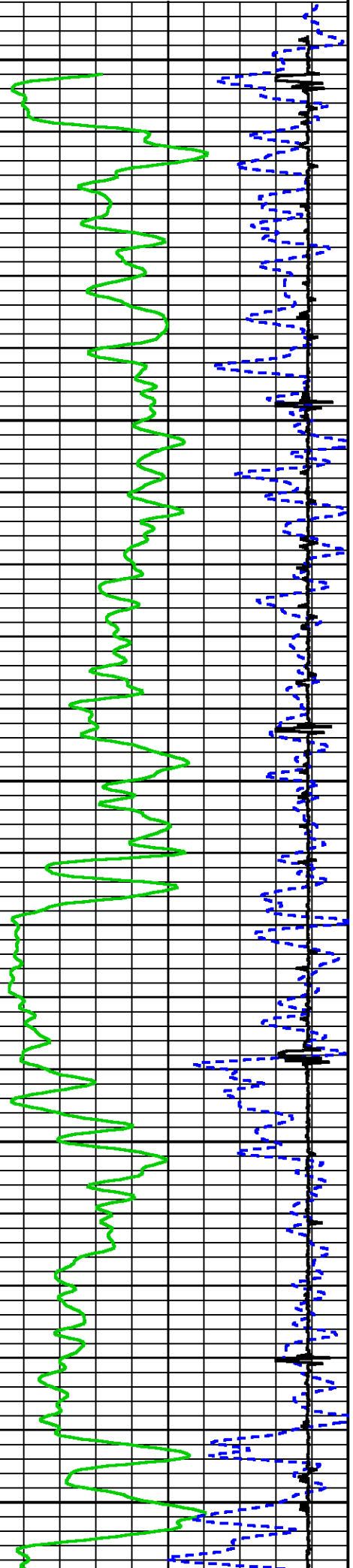


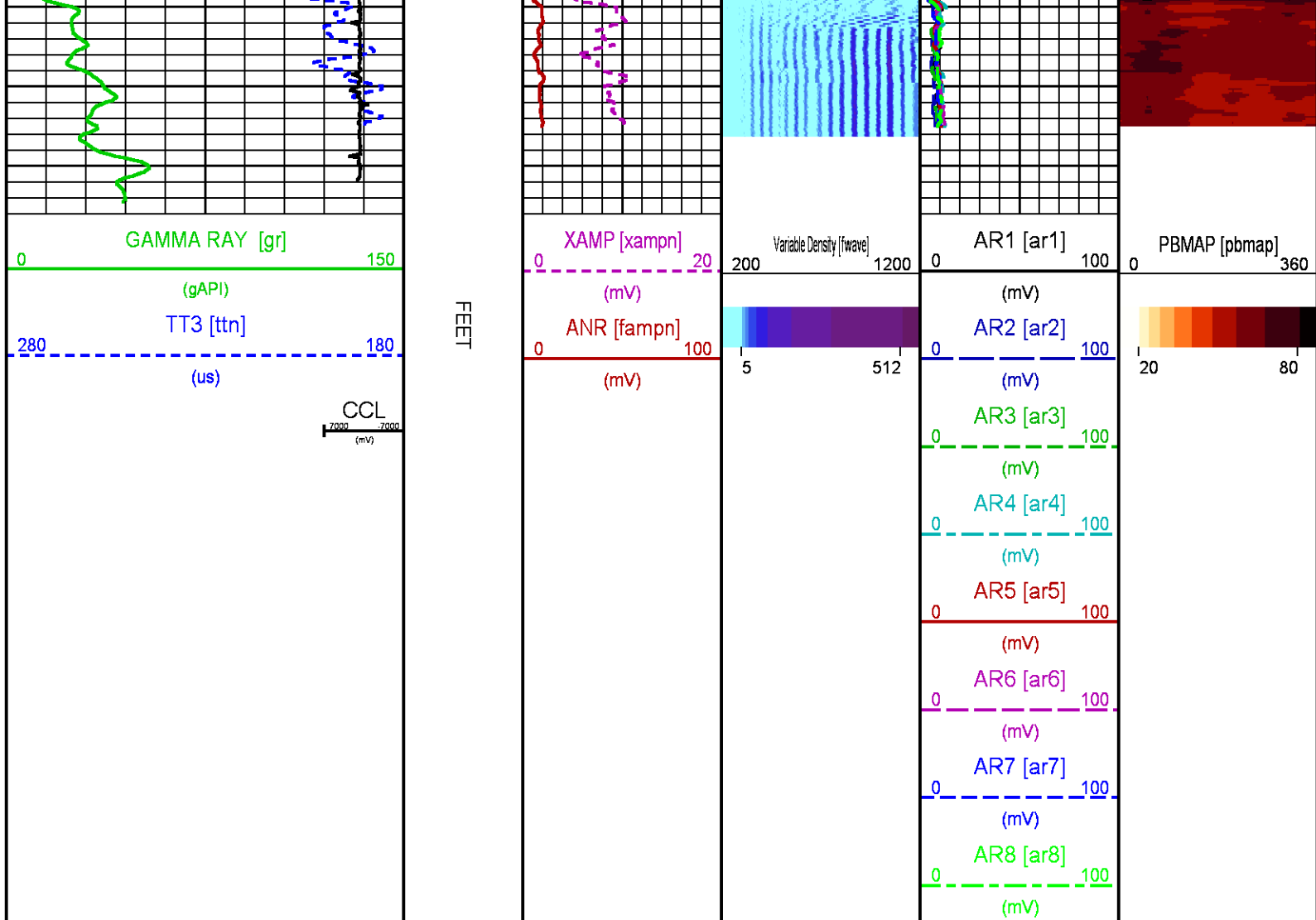
(mV)



7200

7300





CALIBRATION / VERIFICATION SUMMARY											
Source File: \data\at\ARAME_NICHOLAS_0994_24_09Eap012g1p1											
RAL PRIMARY CALIBRATION SUMMARY											
TOOL #: 1426XA10417452				DATE/TIME PERFORMED: Mon Jan 22 15:28:23 2018							
UNIT #: 5753KD111111											
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)	-0.03	0.00	-0.02	0.00	-0.00	-0.05	-0.01	-0.02	-0.01	0.02	-0.05
AMP FLUID (mV)	50	50	50	50	48	49	50	50	51	65	50
TT (us)	200	197	199	198	197	202	200	199	200	310	202
M FACTOR	1.99	1.99	1.99	2.00	2.07	2.04	2.02	1.99	1.97	2.32	2.00
RAL BEFORE LOG VERIFICATION SUMMARY											
TOOL #: 1426XA10417452				DATE/TIME PERFORMED: Mon Jan 22 15:29:39 2018				DAYS SINCE CAL: 0			
UNIT #: 5753KD111111 CABLE #: 4291CH SMALLINE											
NEAR	R1	R2	R3	R4	R5	R6	R7	R8	FAR	CAL	
ZERO (mV)	0.01	0.05	0.08	0.09	0.08	0.06	-0.09	0.05	0.06	0.24	0.01
AMP AIR	5.43	4.92	4.09	5.67	6.92	4.79	5.10	5.00	5.38	5.64	99.92
SHOP SHOP WIRELINE											
M FACTOR A FACTOR FACTOR											

2.00 0.00 1.00

### GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1355XA11871507 DATE/TIME PERFORMED: Fri Nov 17 14:10:53 2017  
UNIT #: 3882TD HL6728 CALB JIG #: 4702NK DA\_228

	BACKGROUND (cts)	CALBRTR ON (cts)	CR DIFF (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	CALBRTR (gAPI)
GR	59.07	162.98	103.9	0.962	56.84	156.84	100

### GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1355XA11871507 DATE/TIME PERFORMED: Fri Nov 17 14:12:49 2017  
UNIT #: 3882TD HL6728 VERI JIG #: 4702NK DA\_228

	BACKGROUND (cts)	CALBRTR ON (cts)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	59.73	170.53	0.962	57.49	164.11	106.63

### INSTRUMENT CONFIGURATION

Source File: Atst1a1.ARAMIE\_NICHOLAS\_0994\_24\_09ERAL55-1dg

CABLEHEAD  
Diameter : 2.75"  
Length : 2.25"  
Weight : 10 lbs  
Series : CABL234  
Mnemonic : CBLH

RADIAL BOND TOOL  
Diameter : 2.75"  
Length : 11.12"  
Weight : 126 lbs  
Series : 1426XA  
Mnemonic : RAL  
Measure Point: 4.21' : NEAR RCVR  
Measure Point: 3.25' : 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: 20.38'  
TOTAL WEIGHT: 235 lbs  
MAX DIAMETER: 0' 4.00"

20.38'  
NEAR RCVR : 11.17'  
FAR RCVR : 10.21'  
CCL : 5.79'  
GR : 1.67'  
TEMP : 0.17'

**BAKER  
HUGHES**  
a GE company



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

**LARAMIE ENERGY LLC**  
**NICHOLS 0994-24-09E**  
**VEGA**  
**MESA**

**STATE** **COLORADO**

**FILE NO:**

**API NO:**

**05077104100000**

**LOCATION:**

SHL: 39.264445 N; 107.830731 W  
BHL: 39.264072 N; 107.826023 W

**ELEVATIONS:**

KB 7161 FT  
DF 7160 FT  
GL 7137 FT

**EOLIPS**



	SEC <u>24</u>	TWP <u>9 S</u>	RGE <u>94 W</u>	DATE <u>22-Jan-2018</u>
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