



# RADIAL CEMENT BOND LOG

FILE NO: CH136906	COMPANY <b>LARAMIE ENERGY LLC</b>
API NO: 05077105470000	WELL <b>GUNDERSON 0994-13-17W</b>
	FIELD <b>VEGA</b>
	COUNTY <b>MESA</b> STATE <b>COLORADO</b>

Ver. 4.10	LOCATION: SHL: 1208' FSL & 1617' FWL BHL: 1208' FSL & 1617' FWL SEC <u>13</u> TWP <u>9S</u> RGE <u>94W</u>	OTHER SERVICES RPM
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PERMANENT DATUM LOG MEASURED FROM DRILL. MEAS. FROM	GL ELEVATION 7272 FT KB 30 FT ABOVE P.D. KB GL 7272 FT	ELEVATIONS: KB 7302 FT DF GL 7272 FT
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DATE	20-Jun-2018	
RUN	TRIP	1
SERVICE ORDER	US136906	
DEPTH DRILLER	7501 FT	
DEPTH LOGGER	7462 FT	
BOTTOM LOGGED INTERVAL	7462 FT	
TOP LOGGED INTERVAL	30 FT	
TIME STARTED	15:00	
TIME FINISHED	17:00	
OPERATOR RIG TIME	2 HOURS	
TYPE OF FLUID IN HOLE	WATER	
FLUID DENSITY	NA	
FLUID SALINITY	NA	
FLUID LEVEL	66 FT	
LOGGED CEMENT TOP	1100 FT	
WELLHEAD PRESSURE	0 PSI	
MAXIMUM HOLE DEVIATION	NA	
NOMINAL LOGGING SPEED	100 F/MN	
MAX. RECORDED TEMP.	231 DEGF	
REFERENCE LOG	NA	
REFERENCE LOG DATE	NA	
EQUIP. NO.	ML-4268	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 RUN IN THE WELL

\*OPERATION 1: RAL/GR/CCL RUN CENTRALIZED\*

\*\*OPERATION 2: RPM/GR/CCL RUN IN PNC-3D MODE\*\*

SJ: 5671' - 5693'

SJ: 6895' - 6917'

## EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	RAL	1426XA	10124114	CENTRALIZED
1	1	GR/CCL	1355XA	12568544	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: Fri Jun 22 13:57:41 2018

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_GUNDERSON\_0994-13-17W/p012g02.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 1.250 ft BOTTOM DEPTH: 7454.000 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*)	189	us	TOP	BOTTOM
	AMP WINDOW START (fgp2*)	189	us	"	"
	AMP WINDOW START (fgp3*)	189	us	"	"
	AMP WINDOW START (fgp4*)	189	us	"	"
	AMP WINDOW START (fgp5*)	189	us	"	"
	AMP WINDOW START (fgp6*)	189	us	"	"
	AMP WINDOW START (fgp7*)	189	us	"	"
	AMP WINDOW START (fgp8*)	189	us	"	"
	AMP WINDOW START (fgpn*)	189	us	"	"
	AMP WINDOW LENGTH	25	us	"	"
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	199	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	4	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	215.678	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-70	us	"	"
	TOOL DELAY (str2*)	-70	us	"	"
	TOOL DELAY (str3*)	-70	us	"	"
	TOOL DELAY (str4*)	-70	us	"	"
	TOOL DELAY (str5*)	-70	us	"	"
	TOOL DELAY (str6*)	-70	us	"	"
	TOOL DELAY (str7*)	-70	us	"	"
	TOOL DELAY (str8*)	-70	us	"	"
	TOOL DELAY (strn*)	-70	us	"	"
BASELINE NOISE (NEAR)	NOISE WINDOW START	140	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	"	"

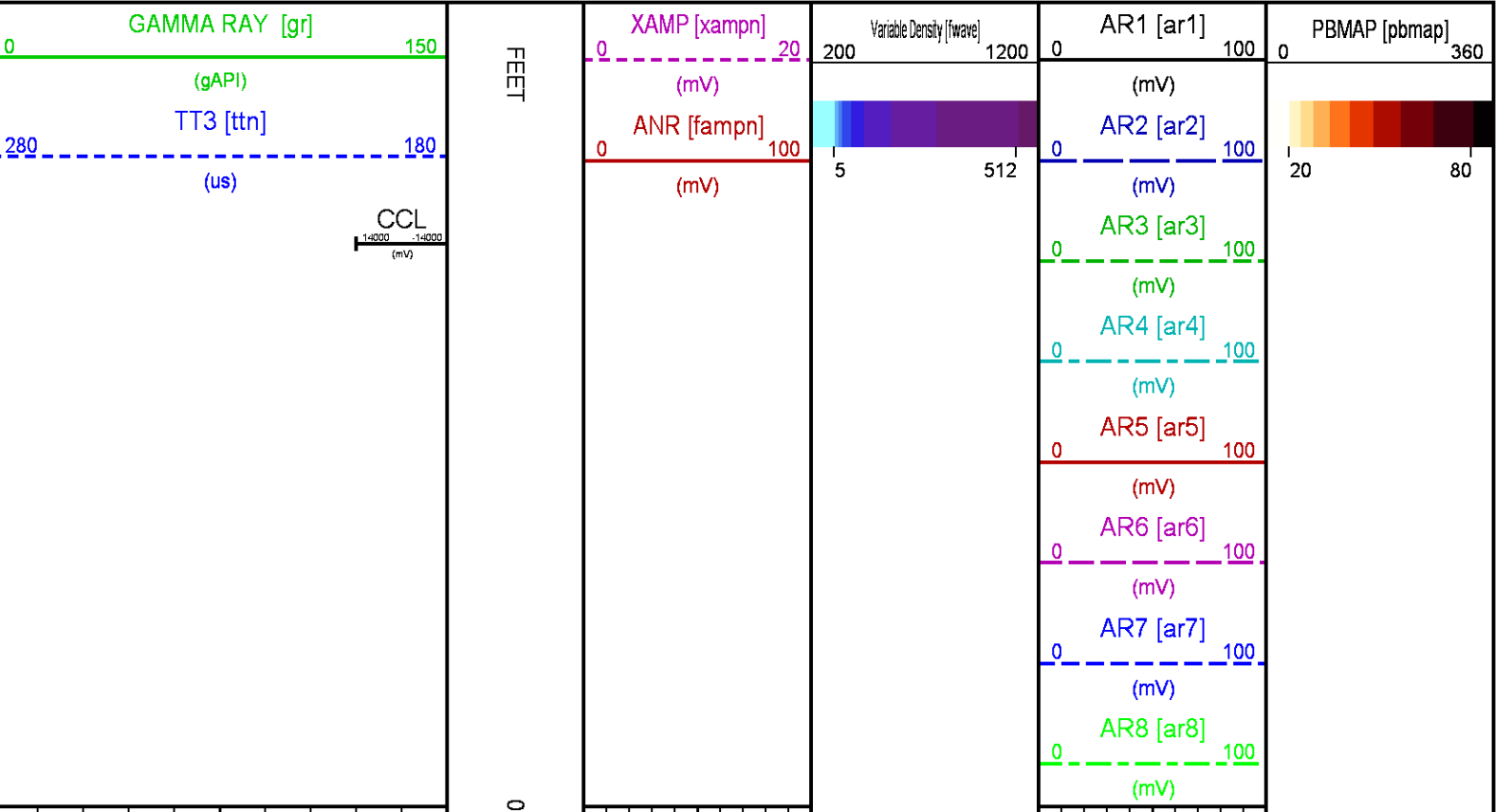
CURVE DESCRIPTION REPORT

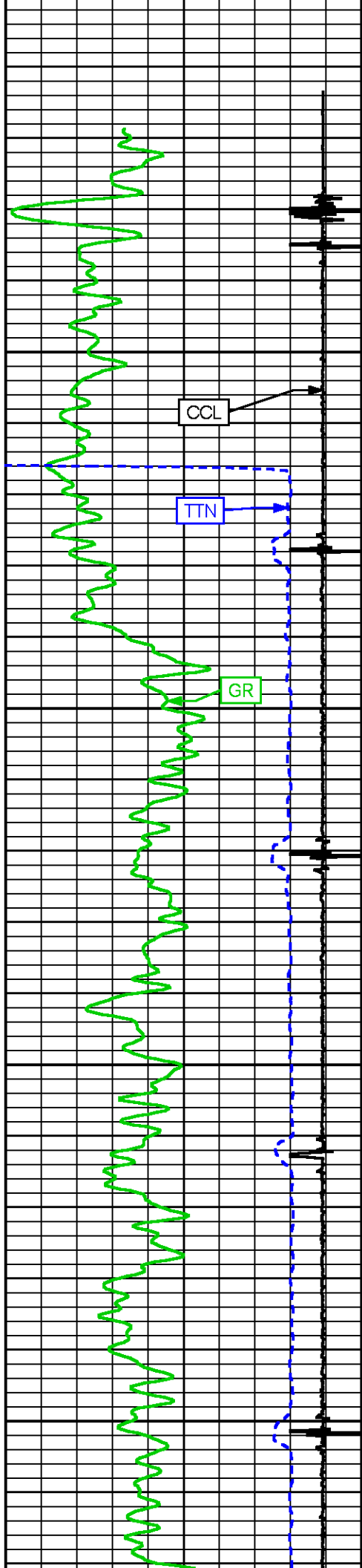
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	FIXED GATE AMPLITUDE T-R7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

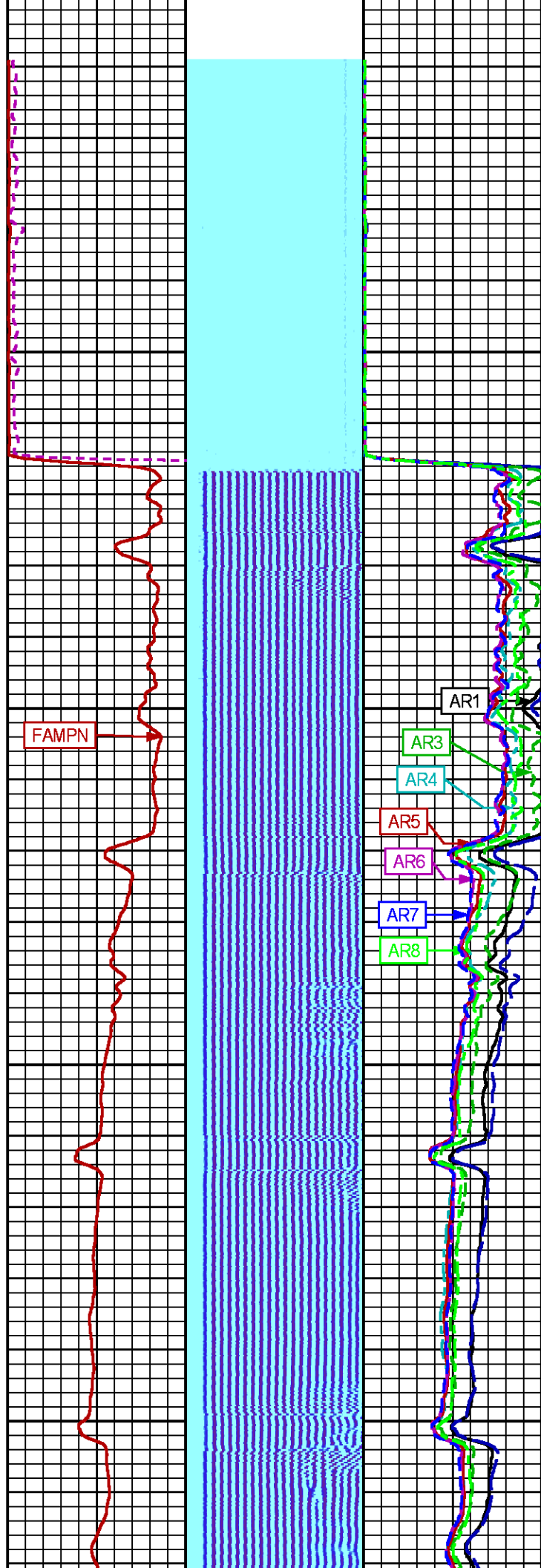
Presentation	: SysA:/dat1a/LARAMIE_GUNDERSON_0994-13-17W/17W_RAL_MAIN.fvpdf [5"/100' Scale]
Plot Interval	: 0 - 7470.75 Feet
Data File 1	: F1 : SysA:/dat1a/LARAMIE_GUNDERSON_0994-13-17W/17W_RAL_MAIN.xtf
Created On	: N/A
Company	: LARAMIE ENERGY LLC
Well	: GUNDERSON 0994_13_17W
Field	: VEGA-
File Interval	: 1.25 - 7472 Feet
OCT	: p012g

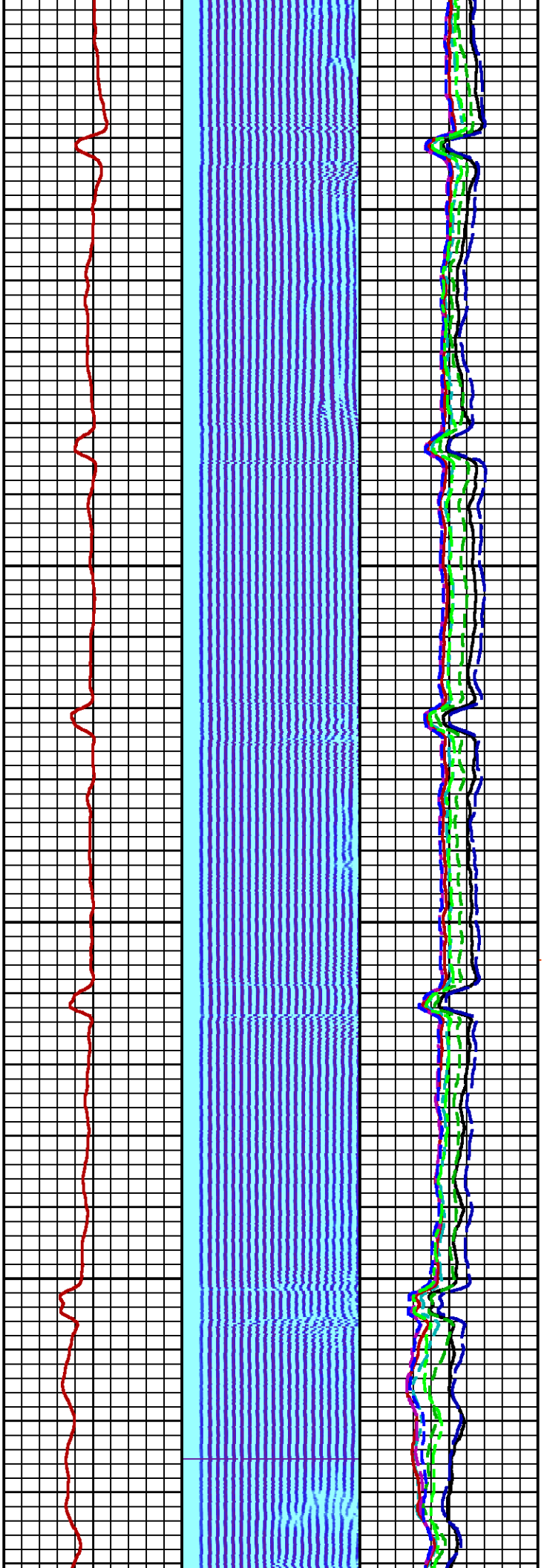




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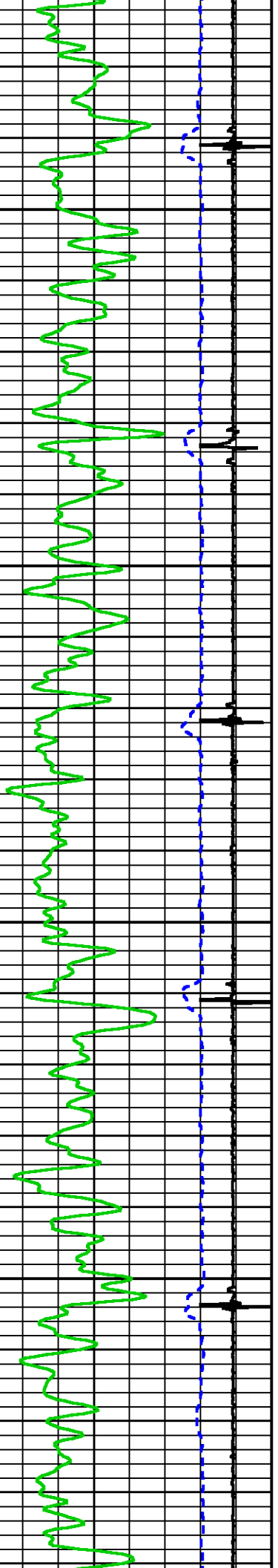
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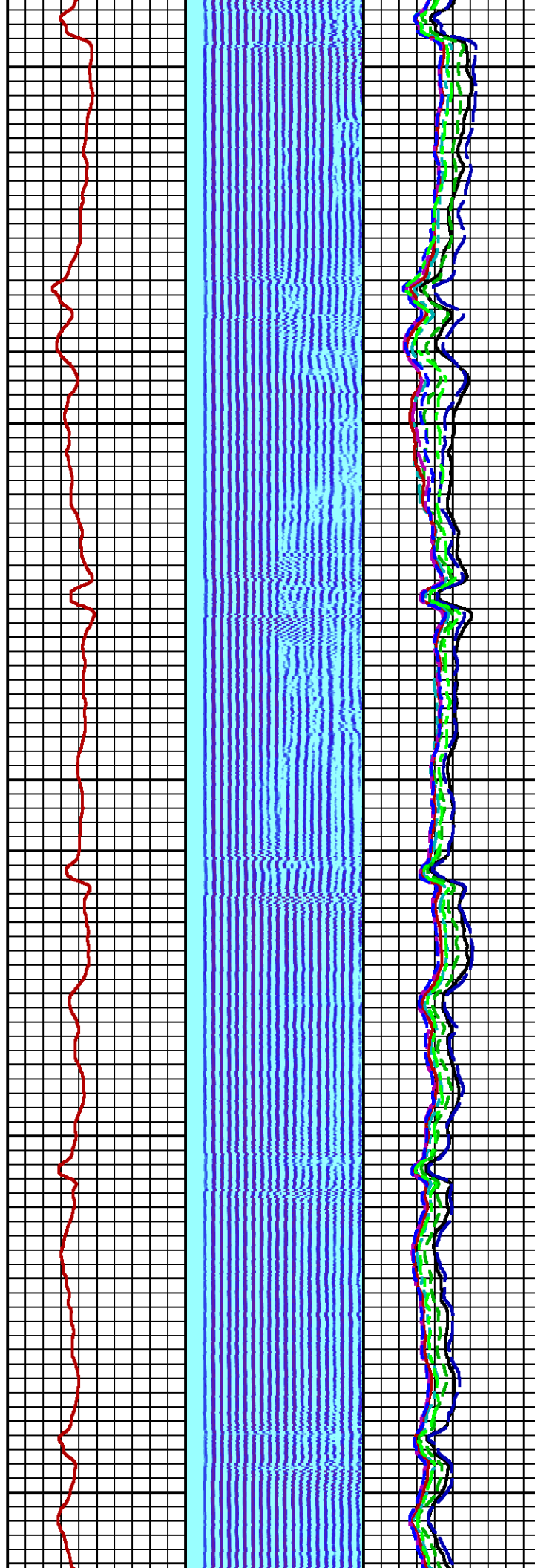
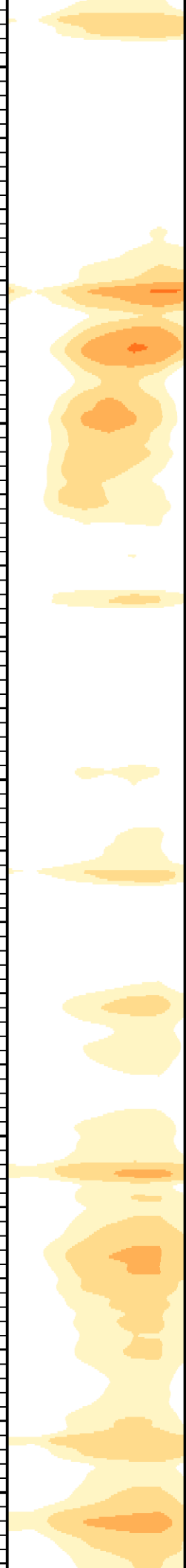




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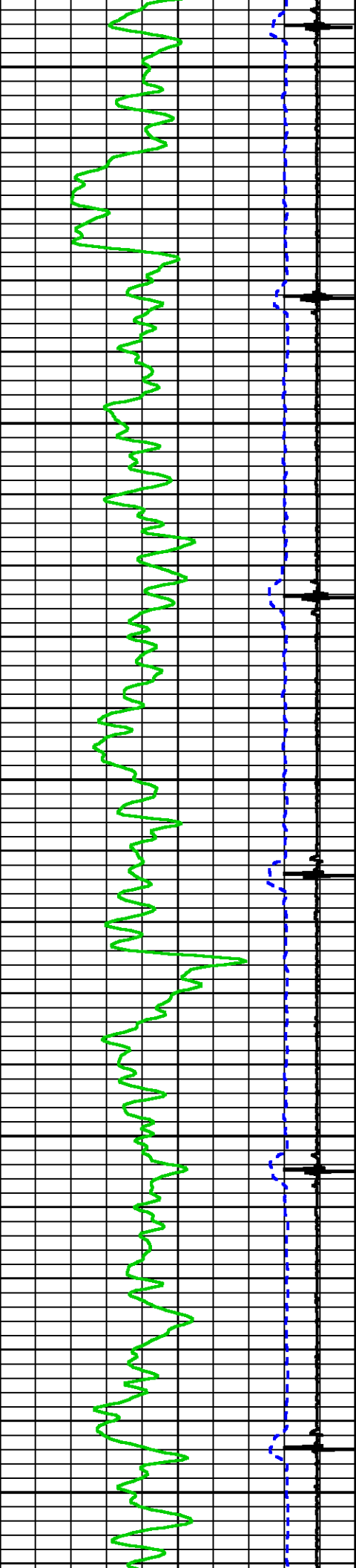
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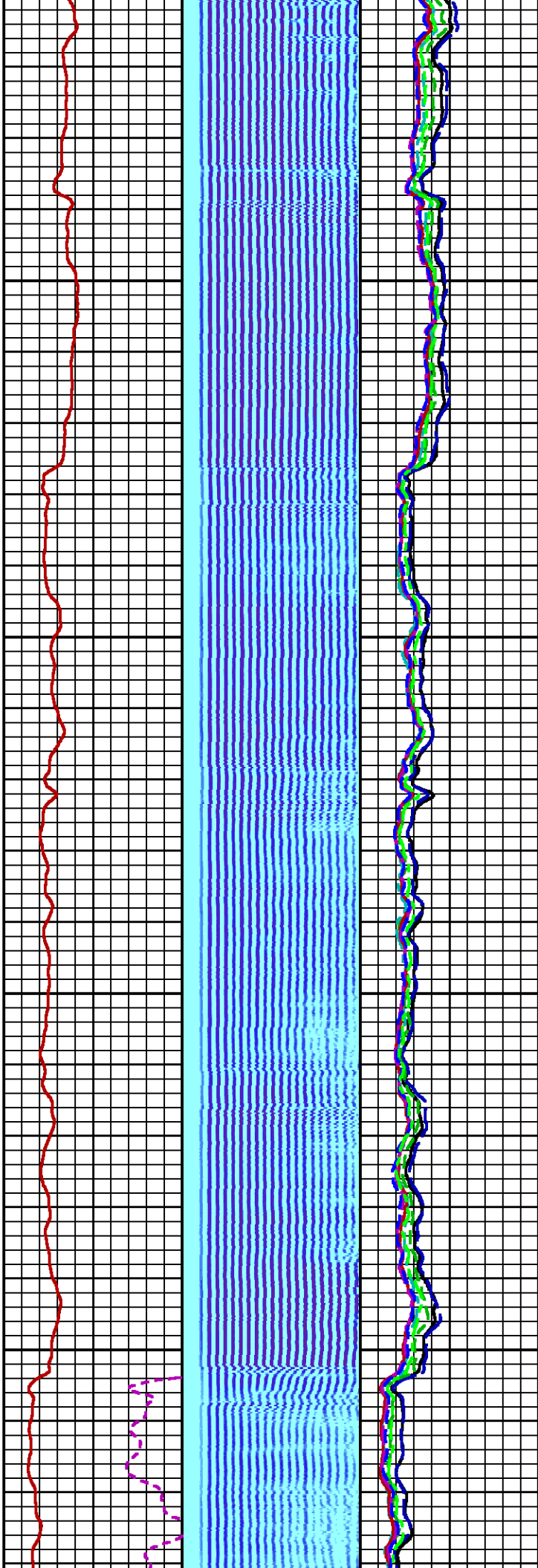
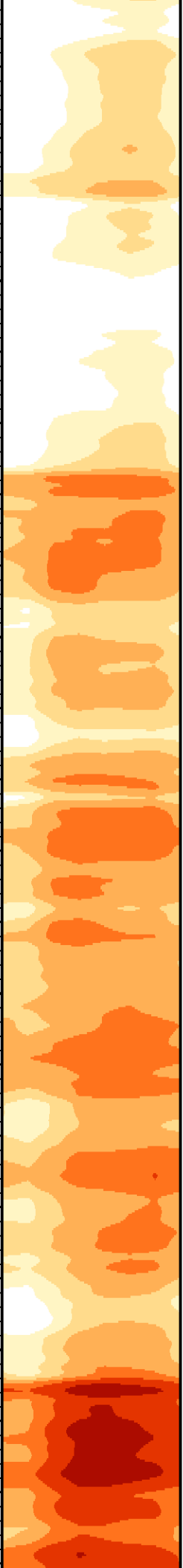


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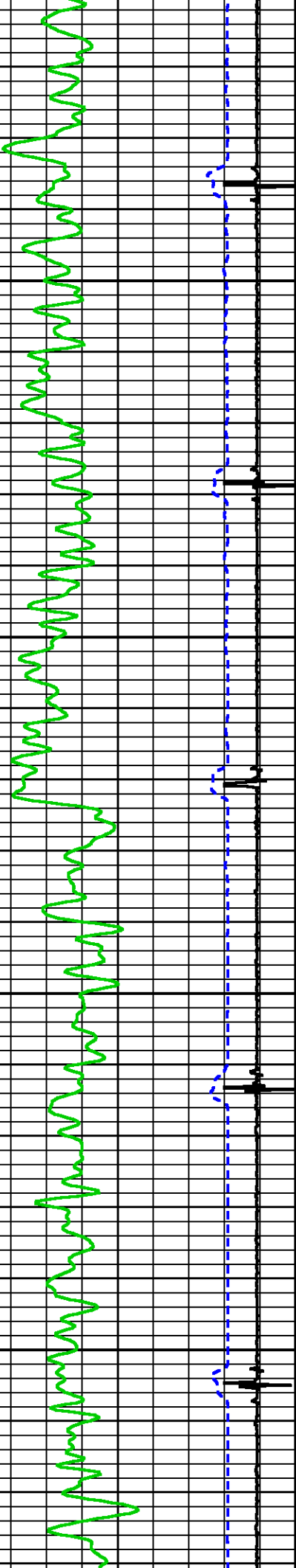


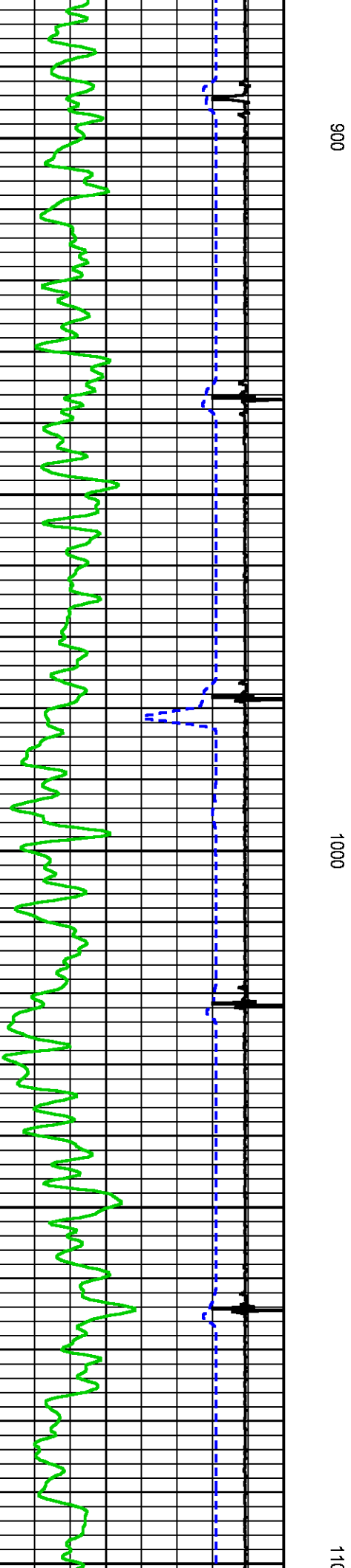
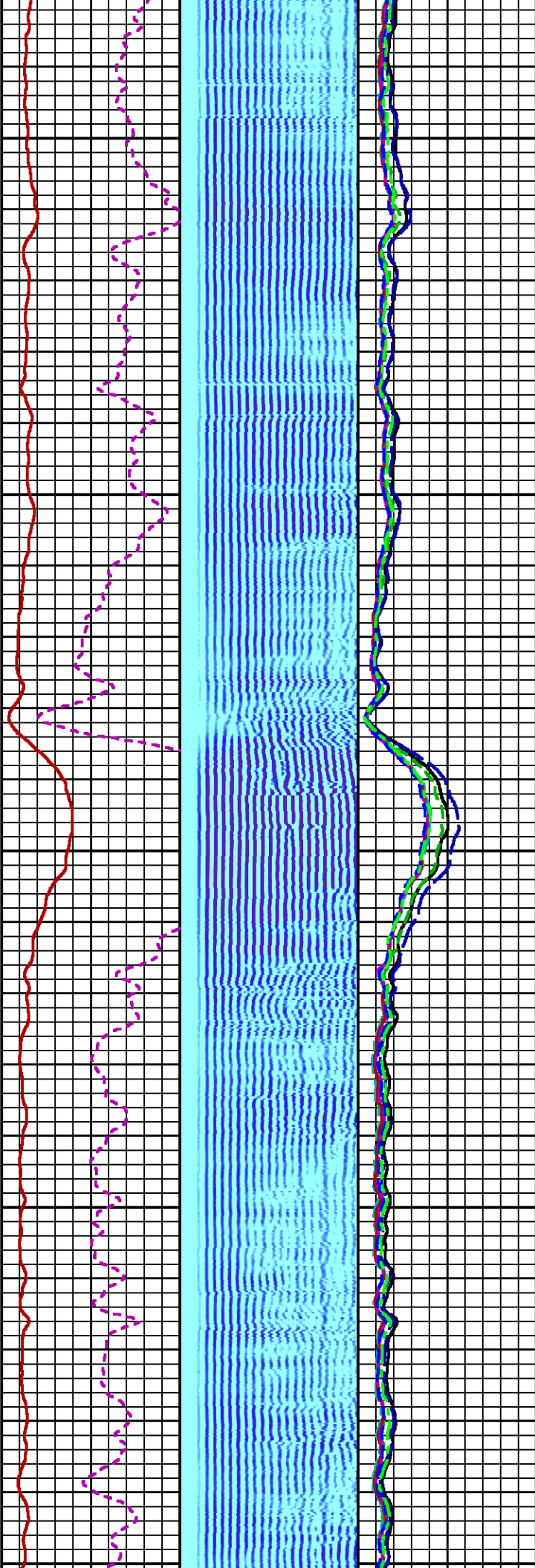
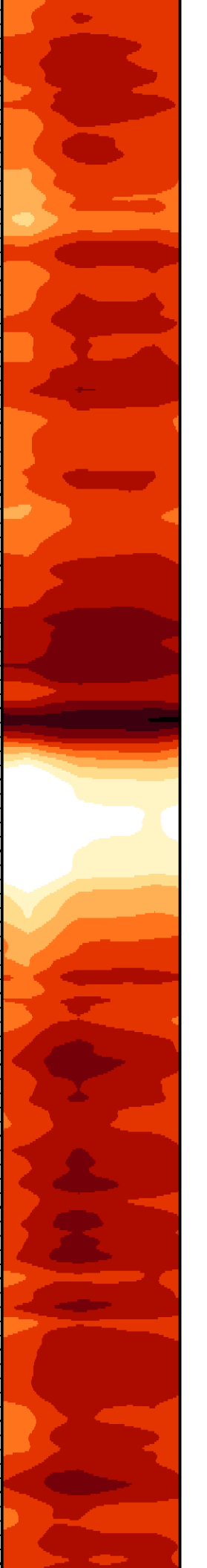




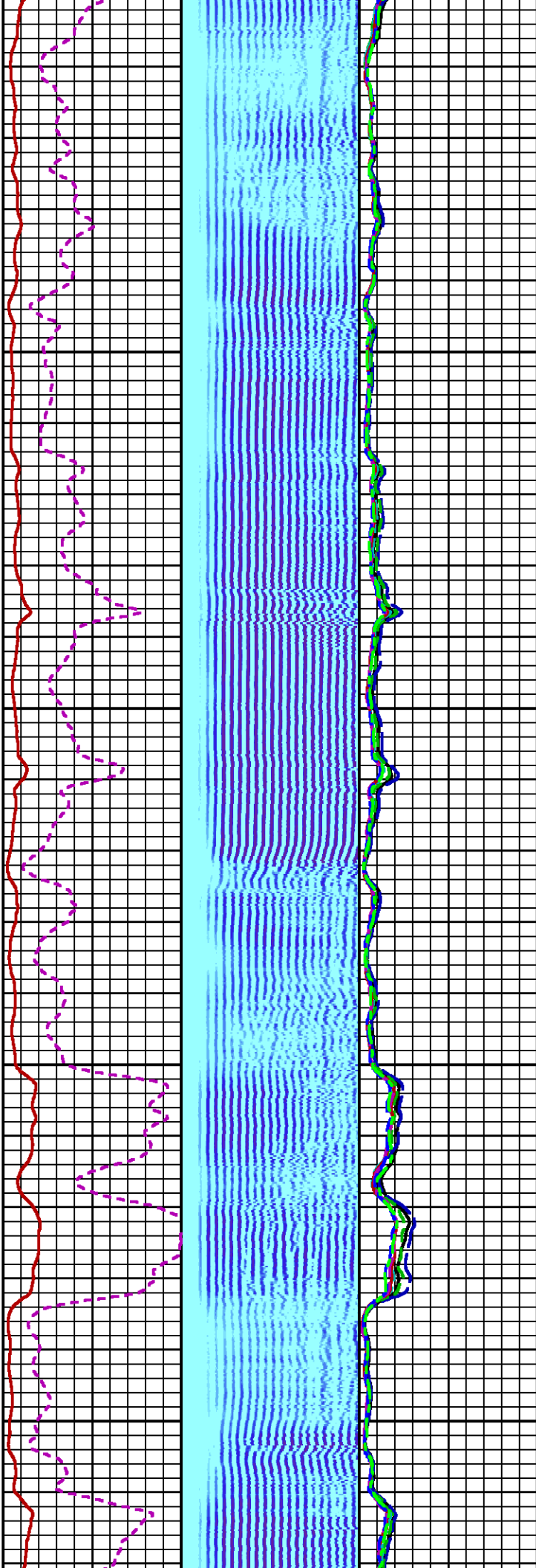
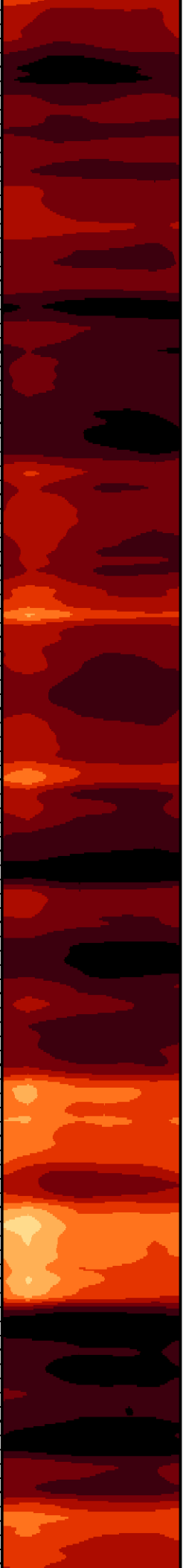
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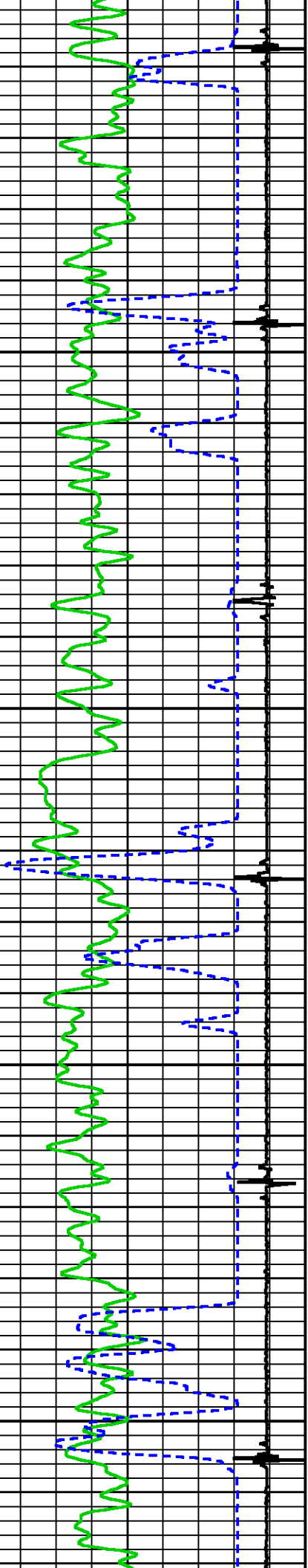


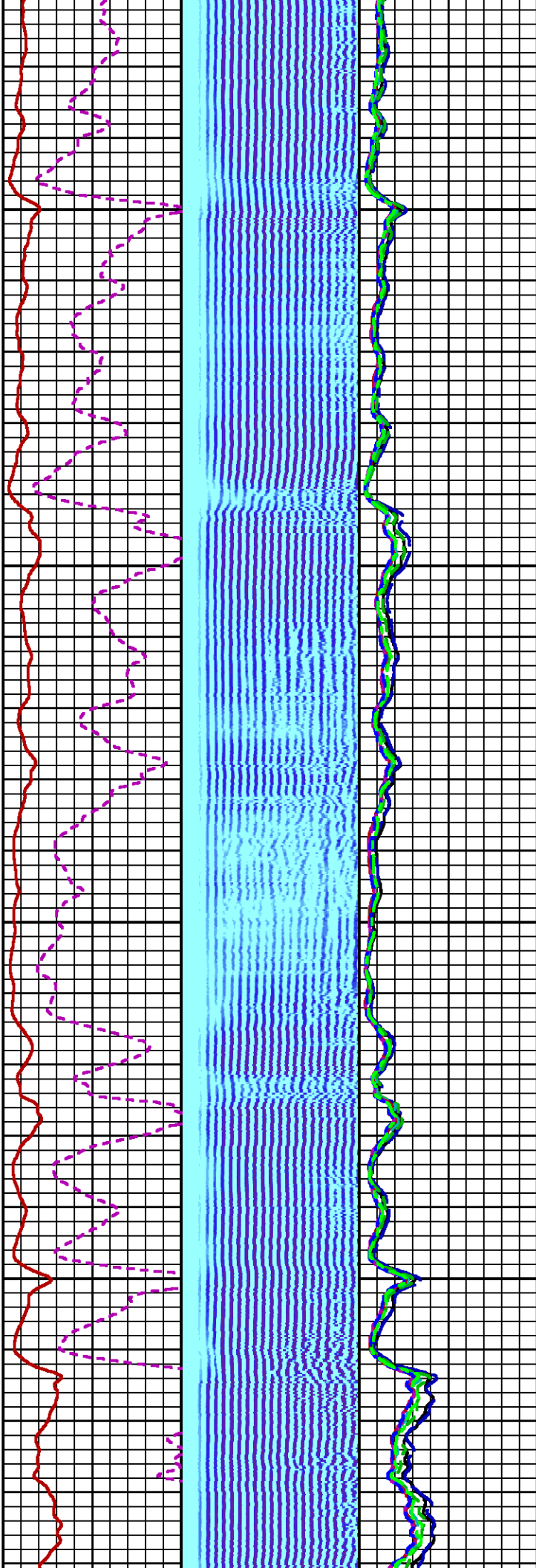
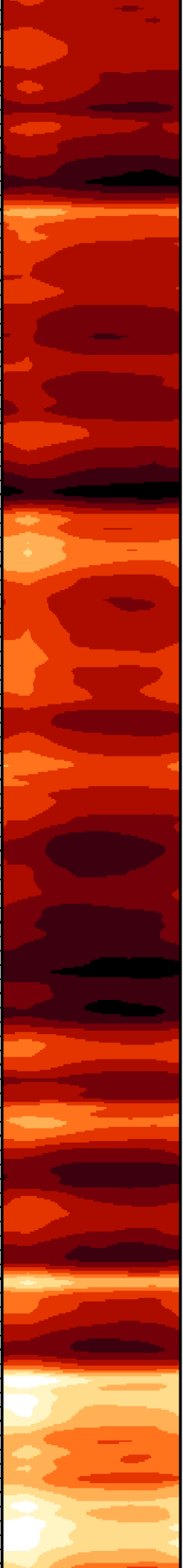






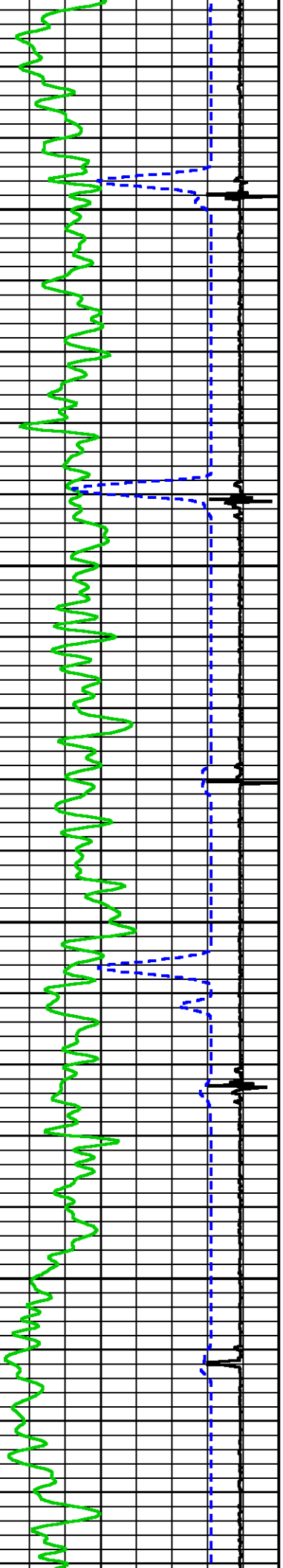
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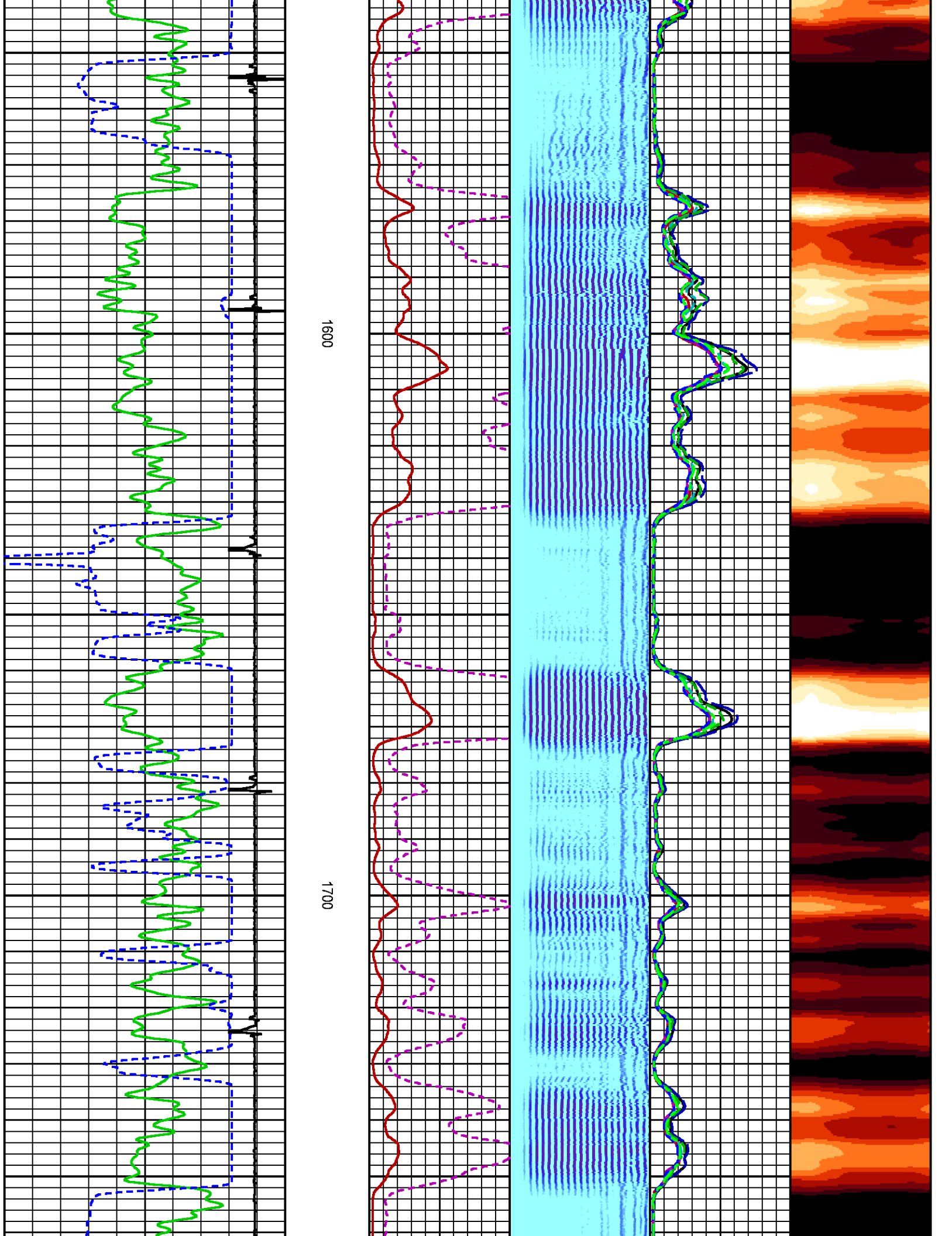


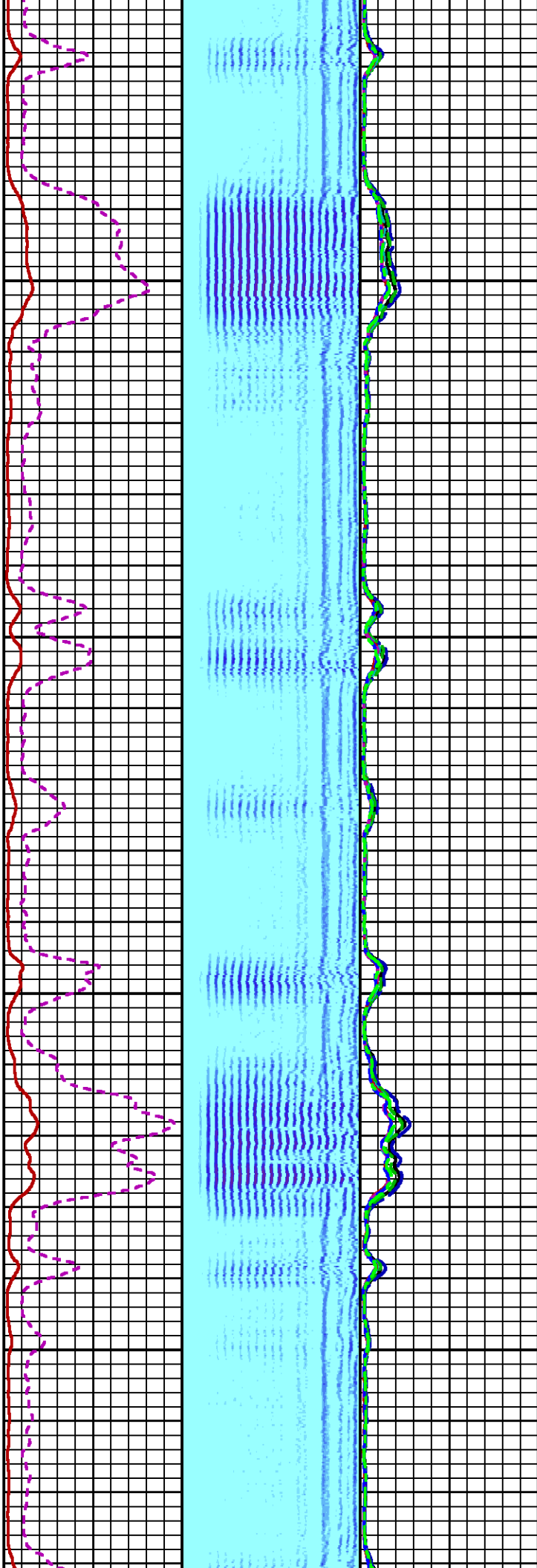
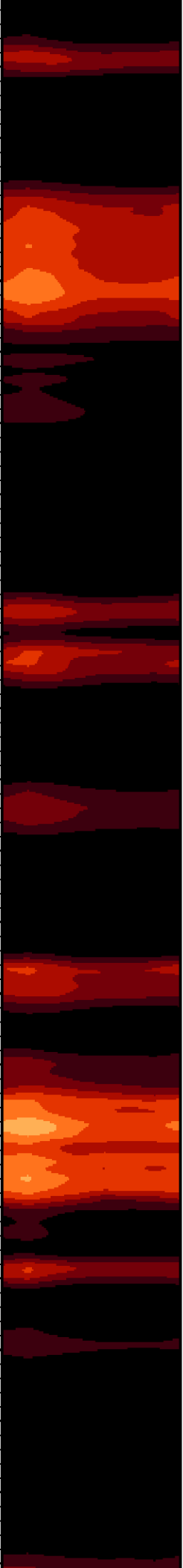


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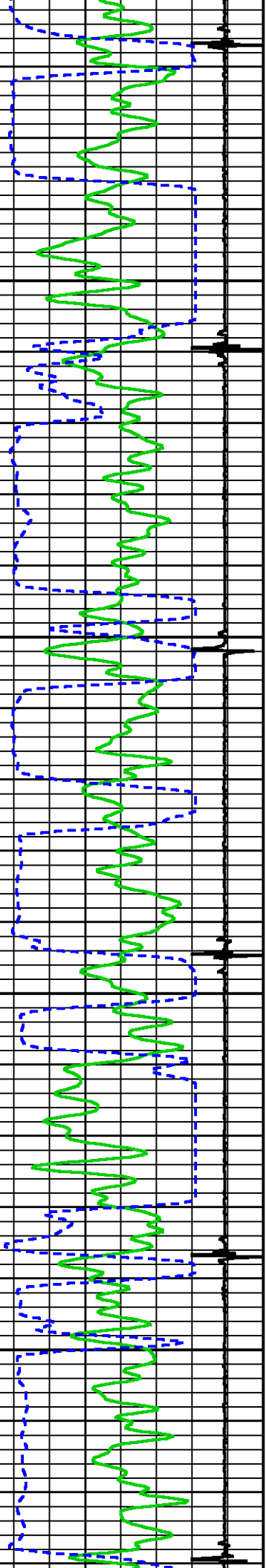


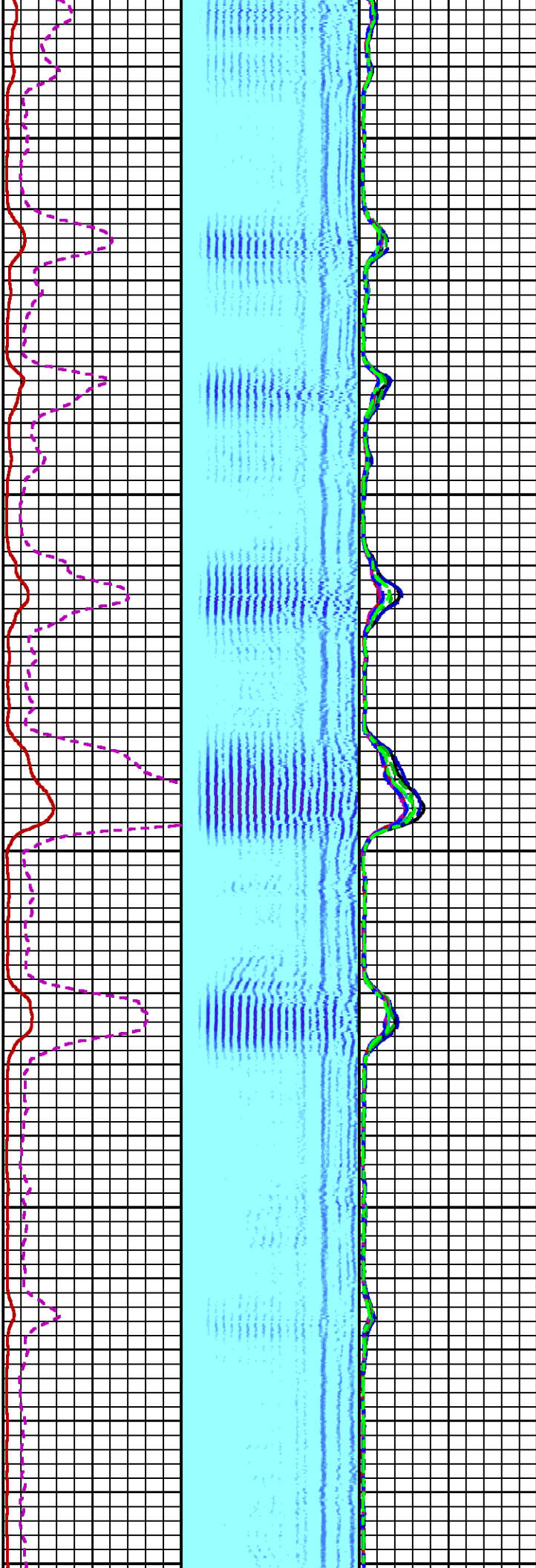
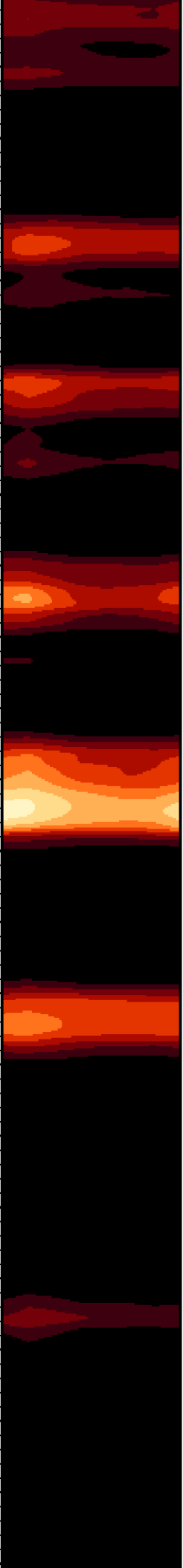




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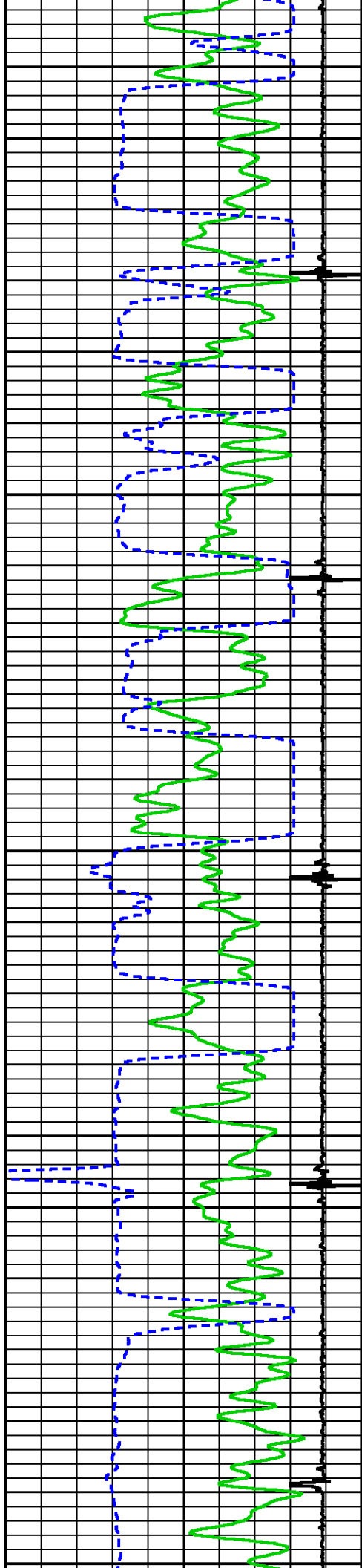




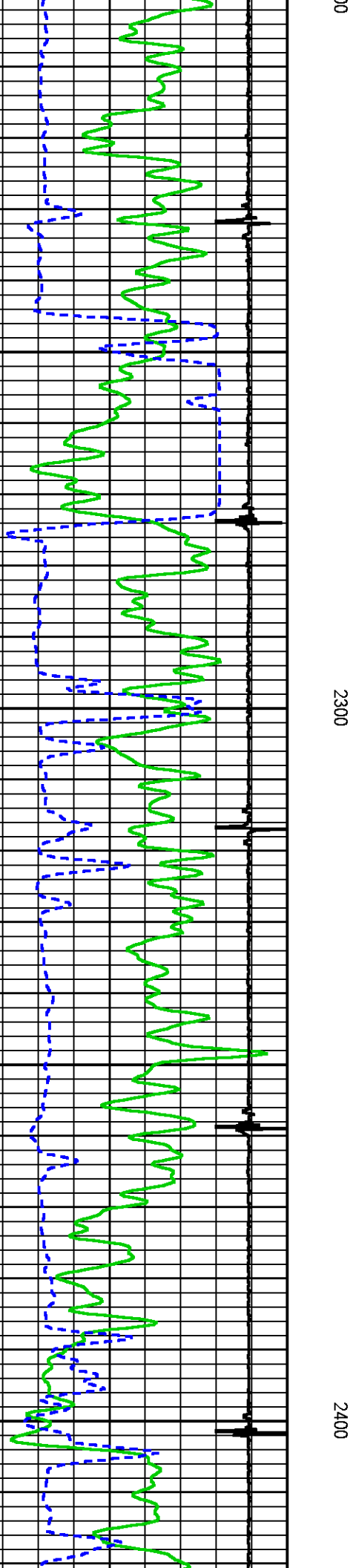
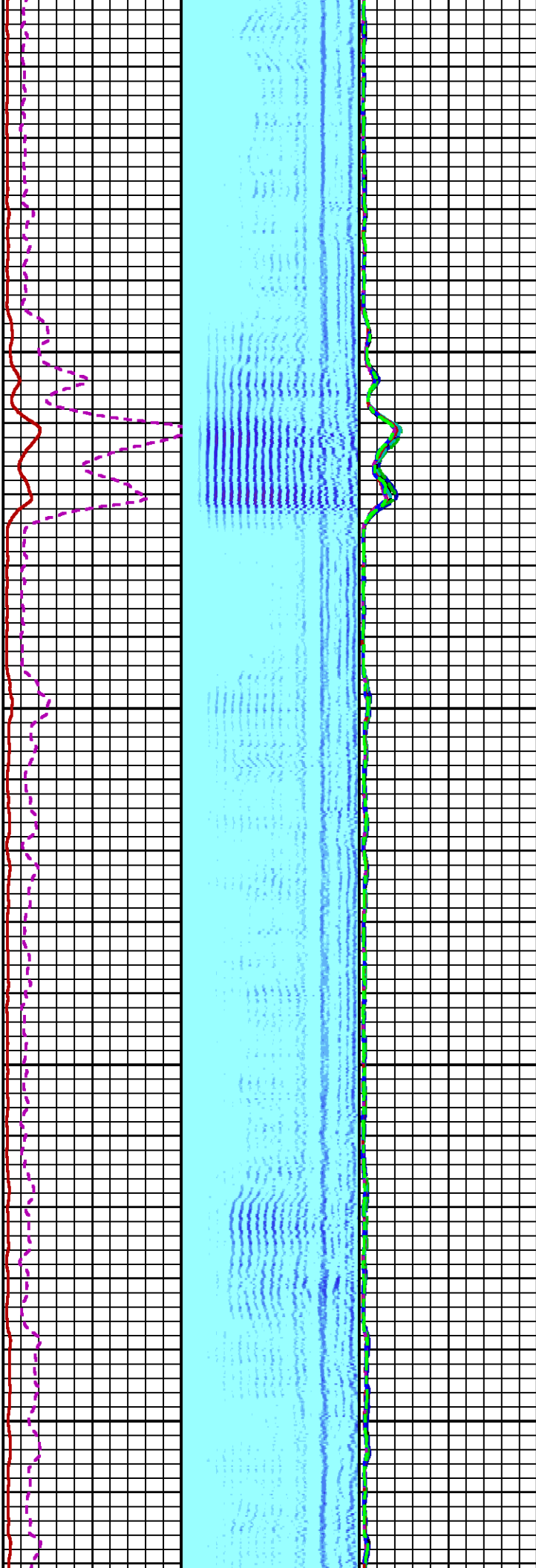
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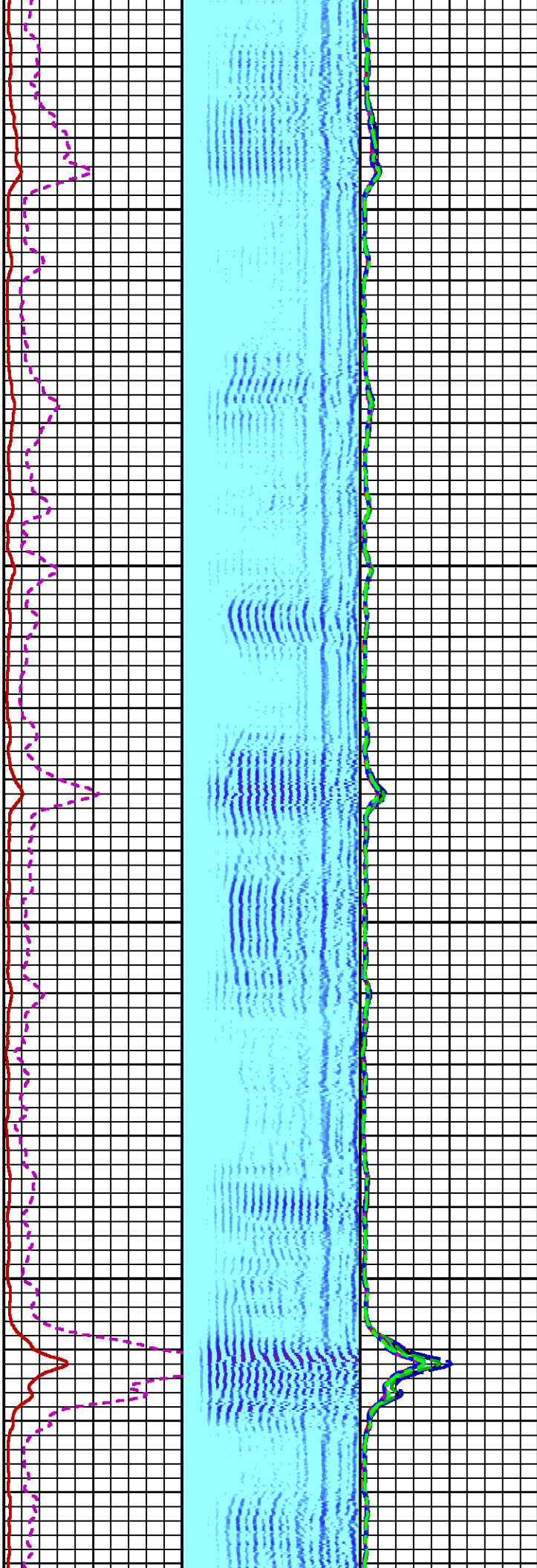
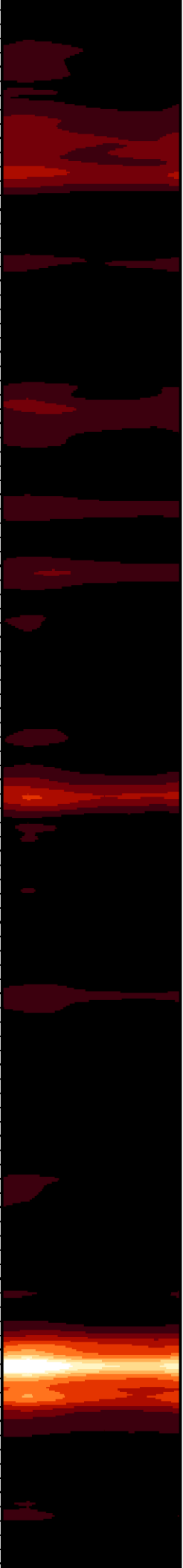
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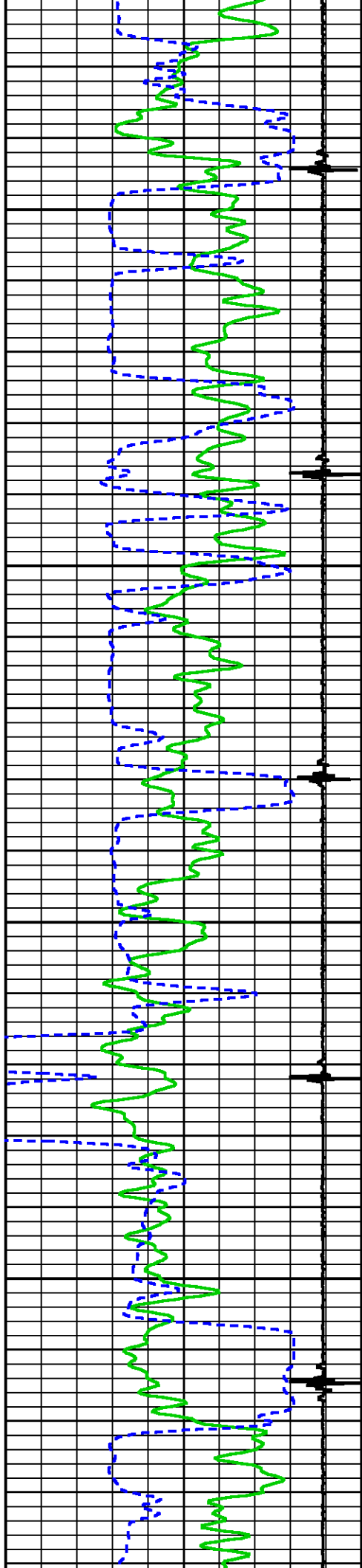


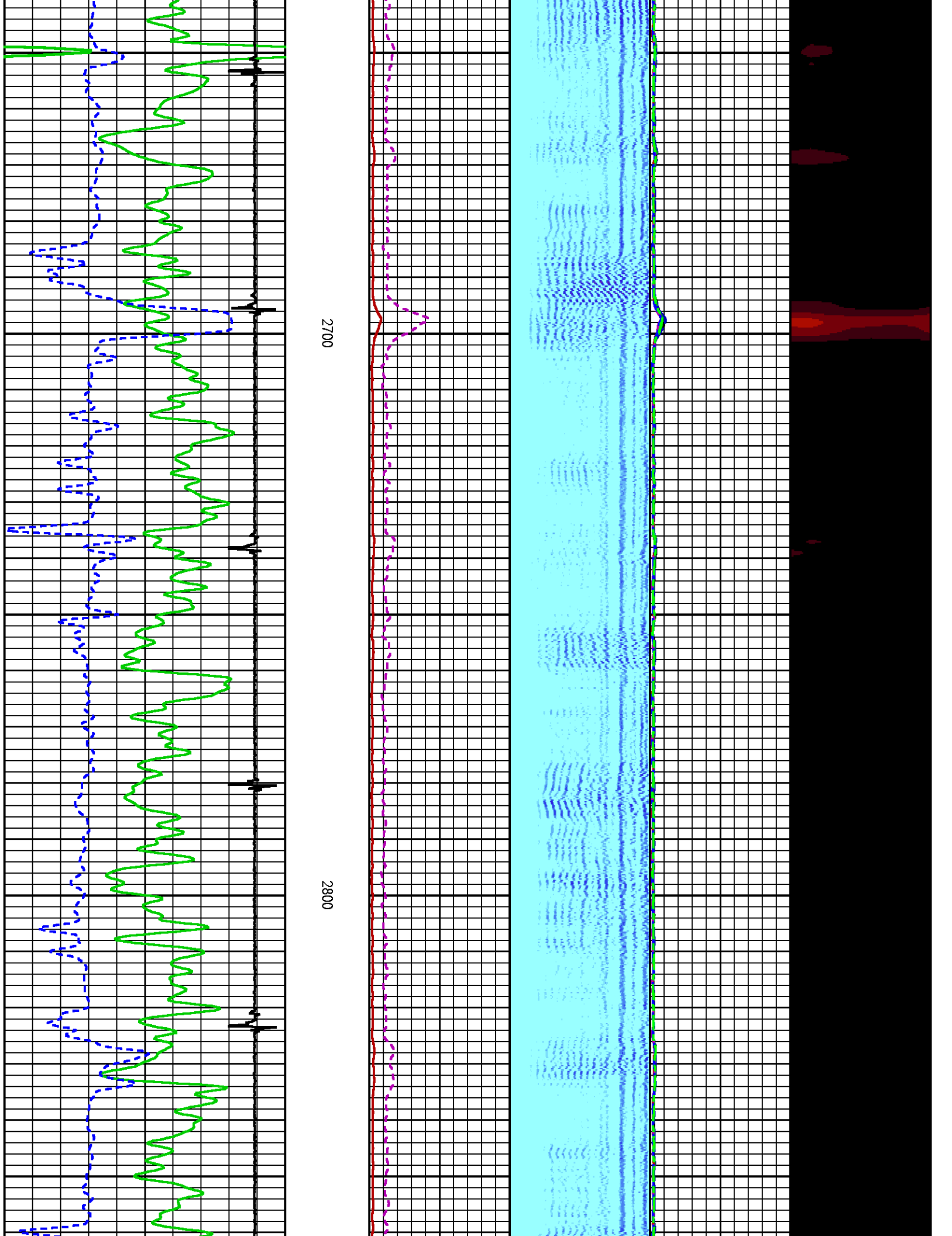


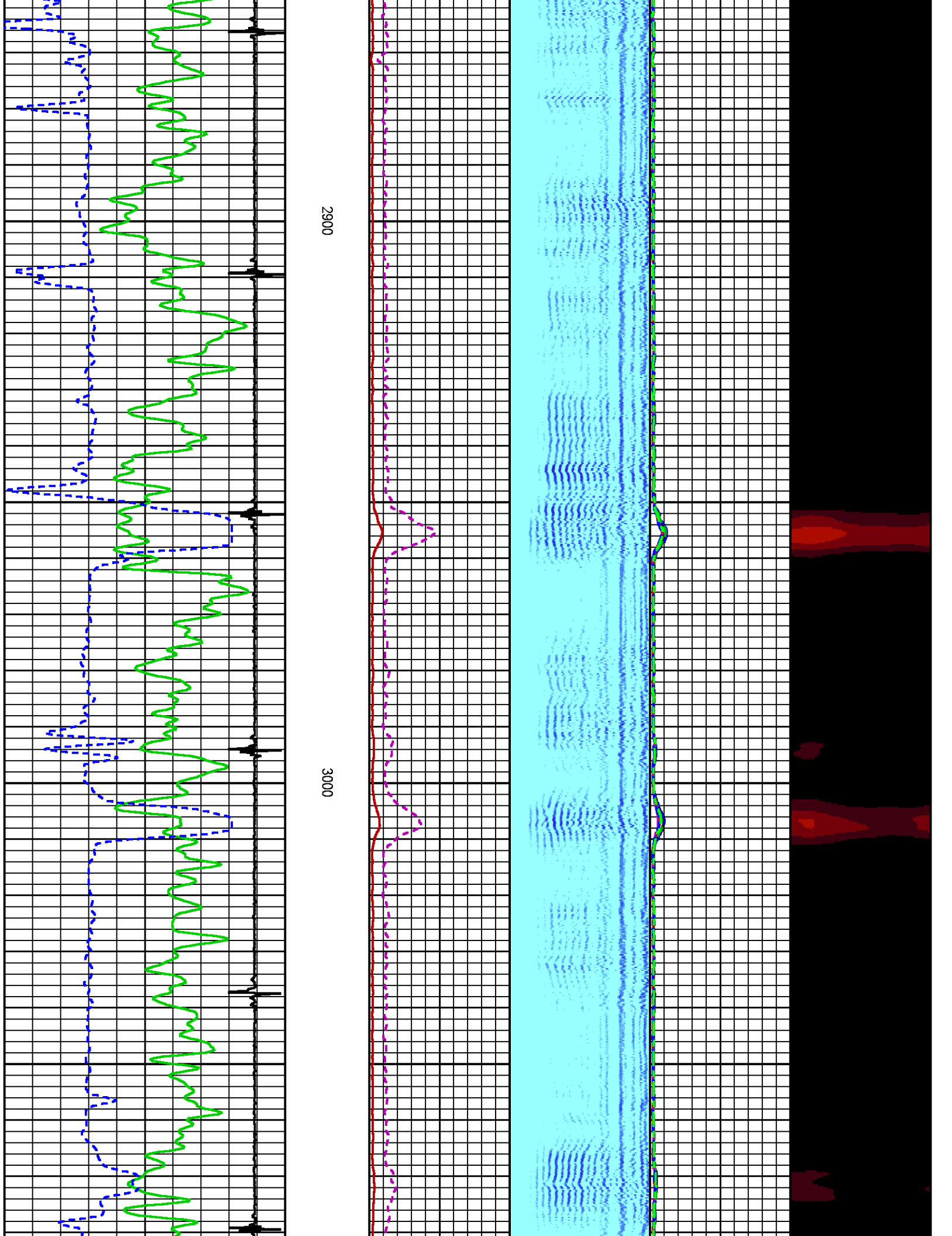


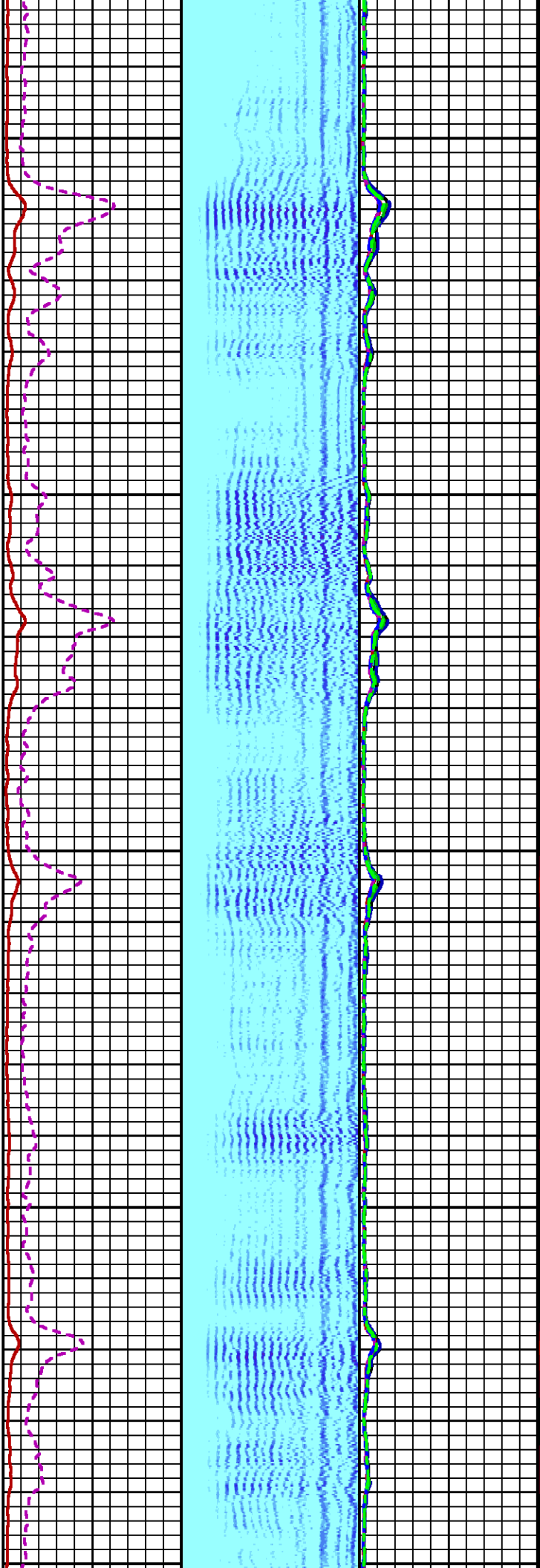
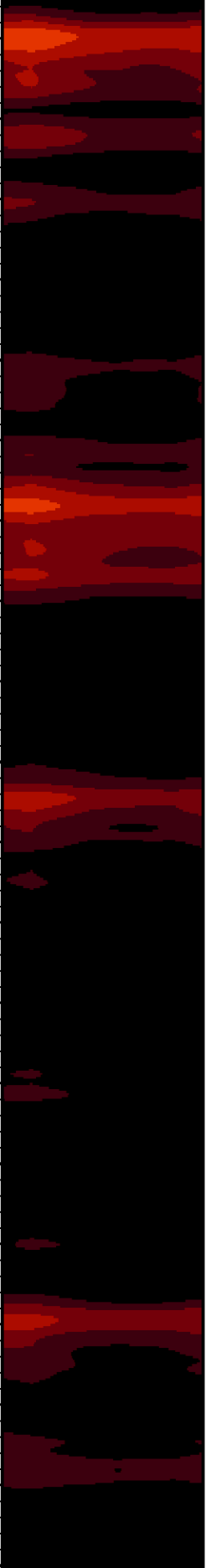
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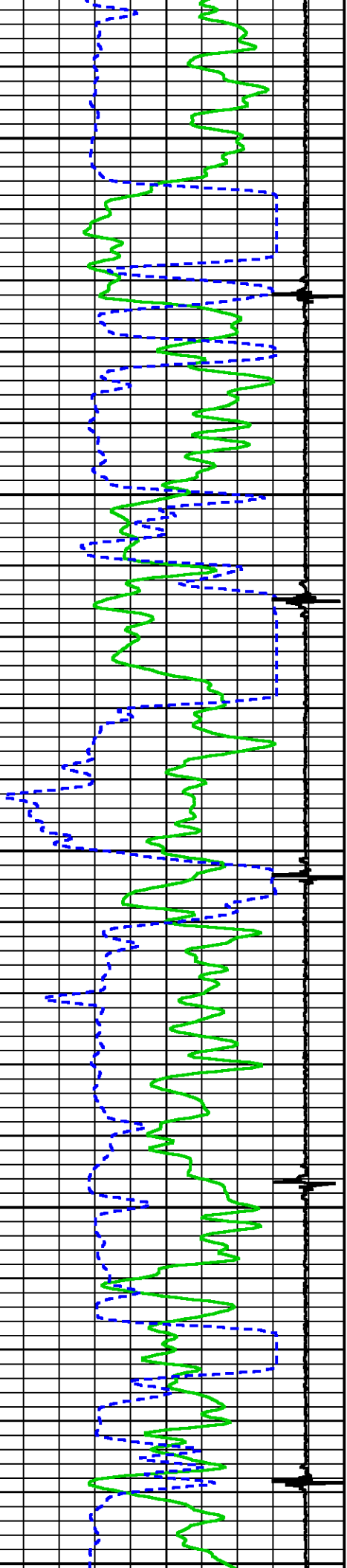


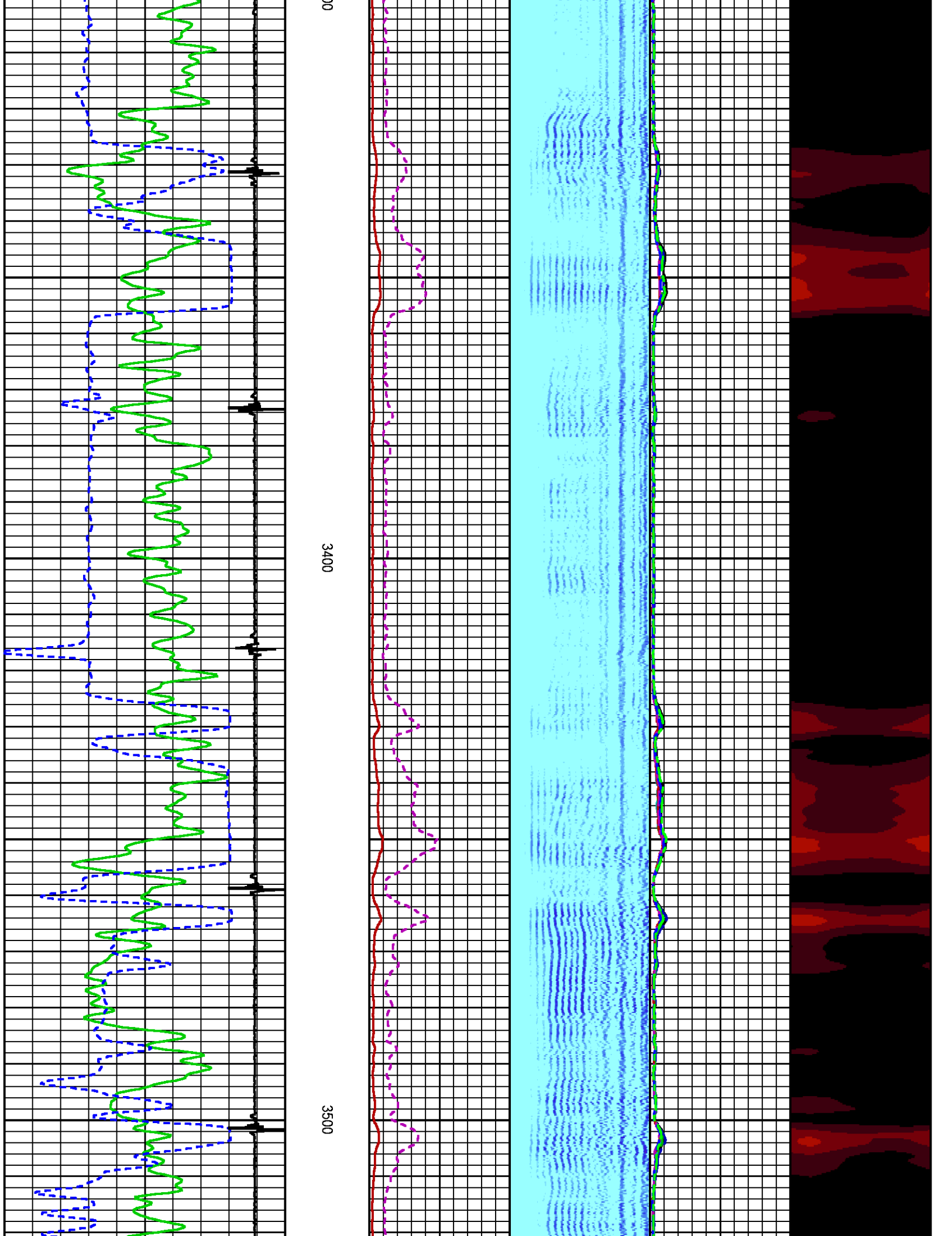


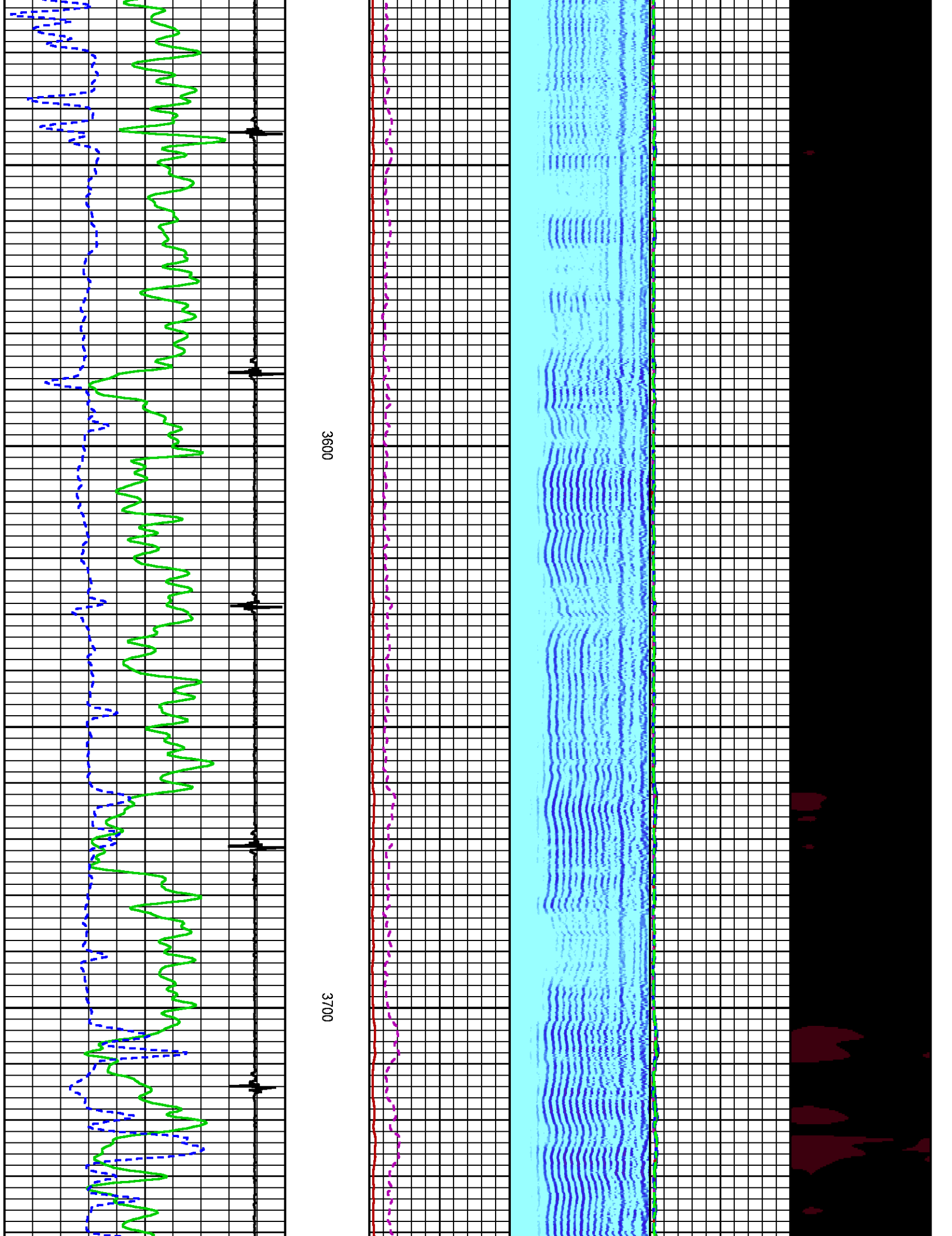
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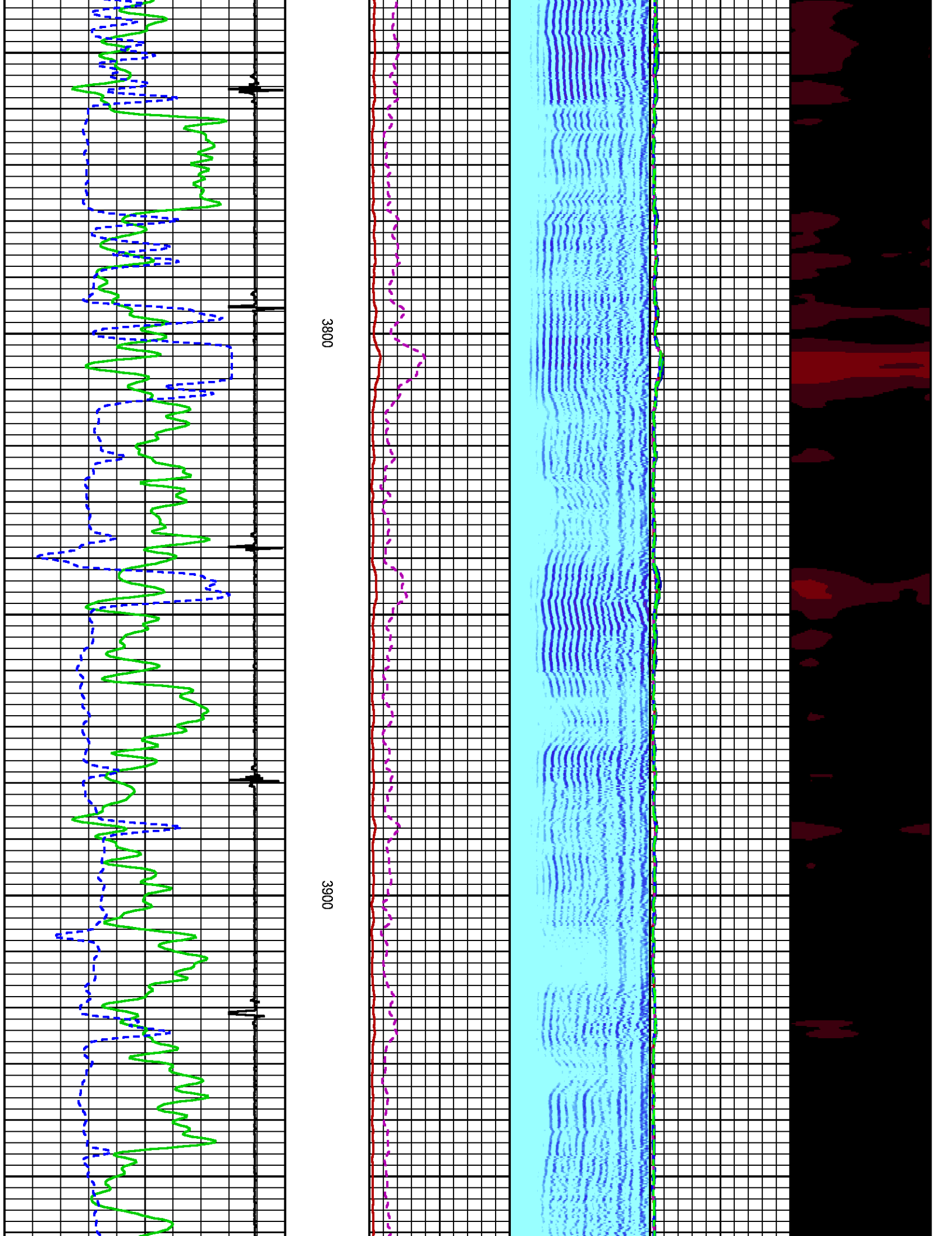
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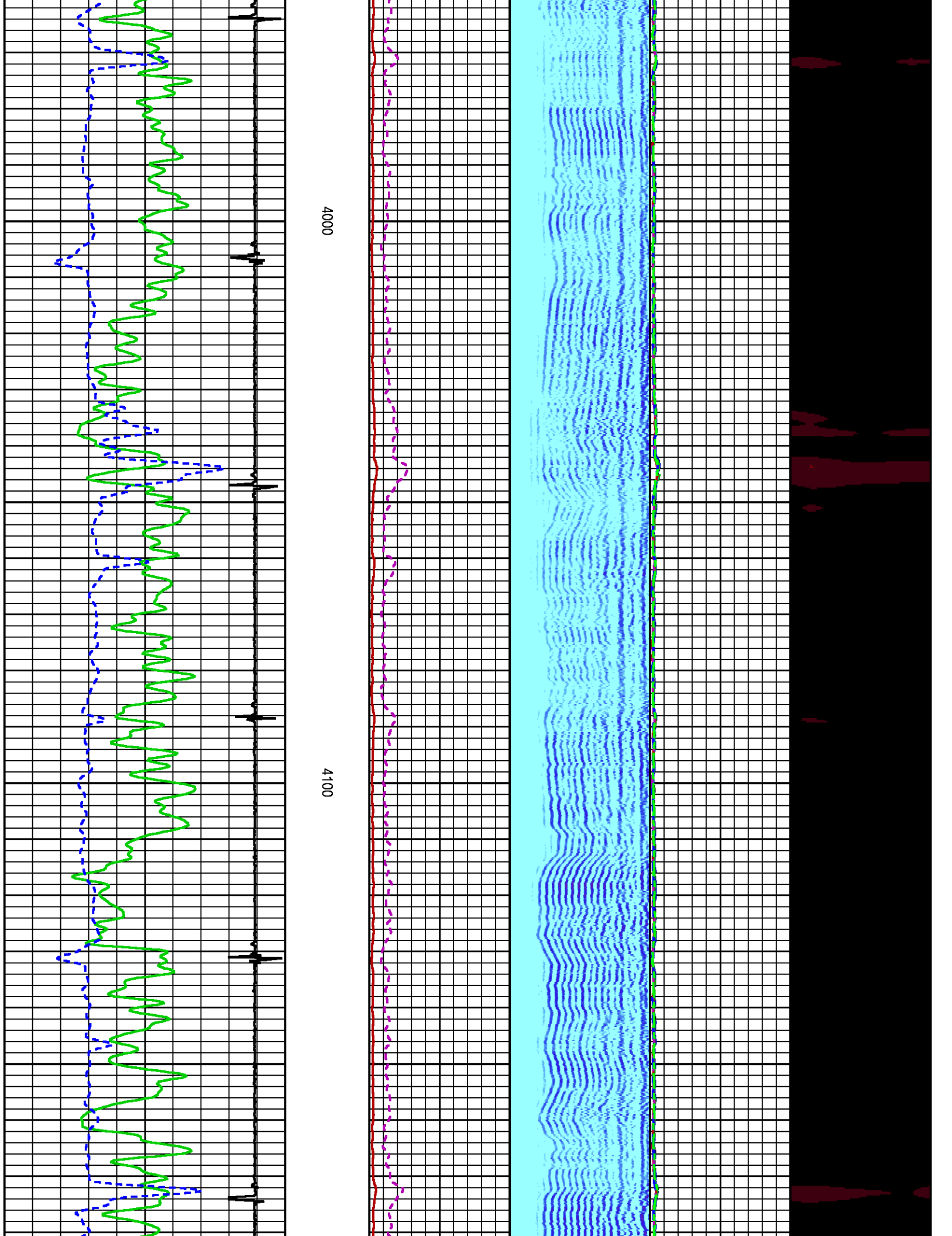






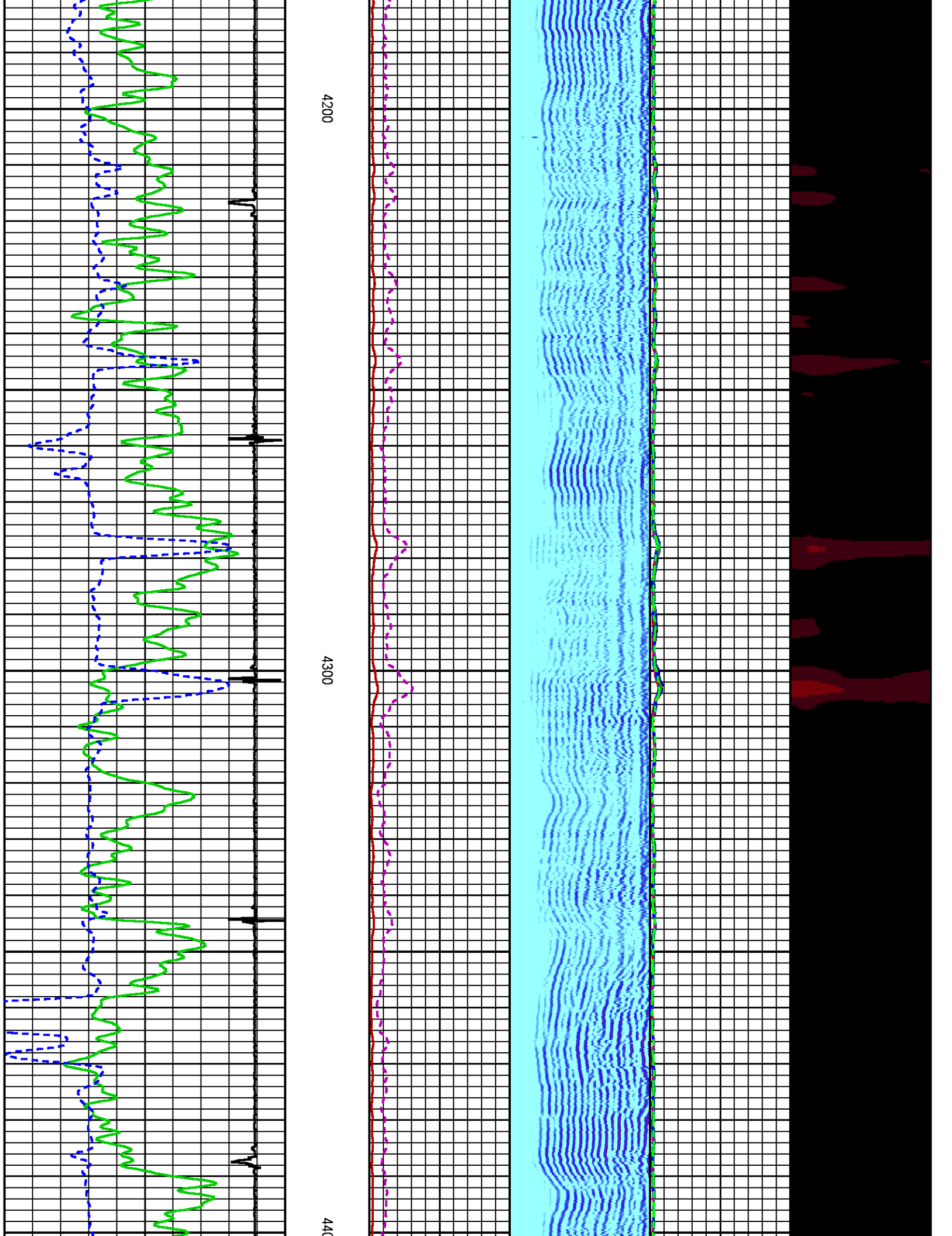


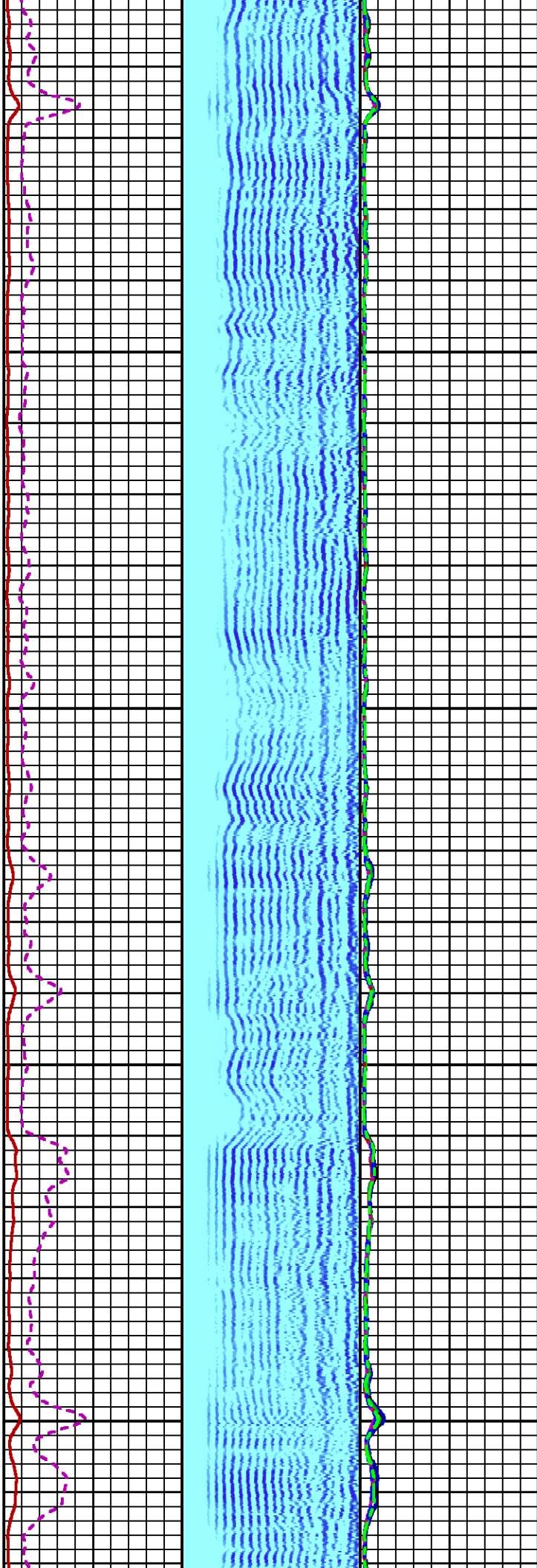
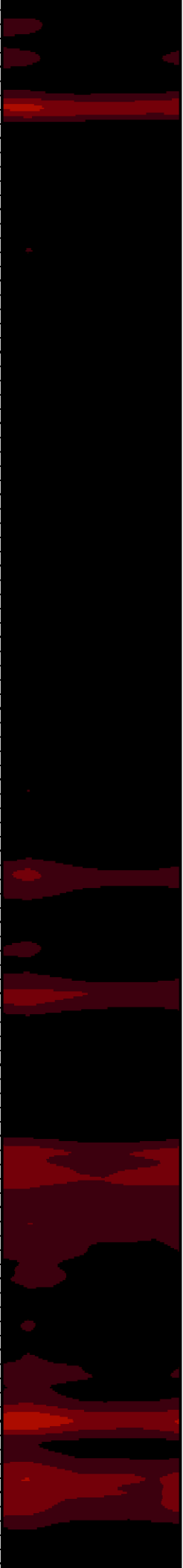




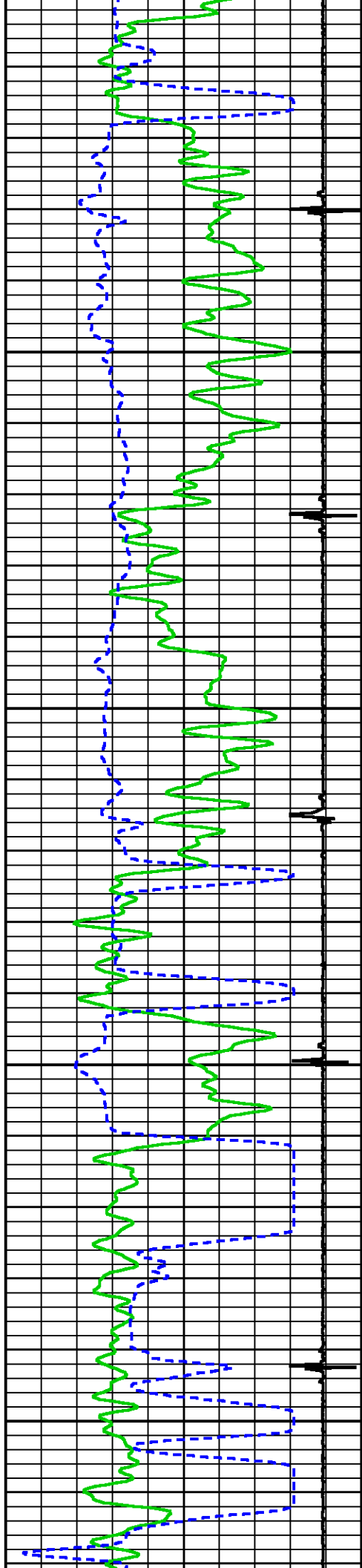
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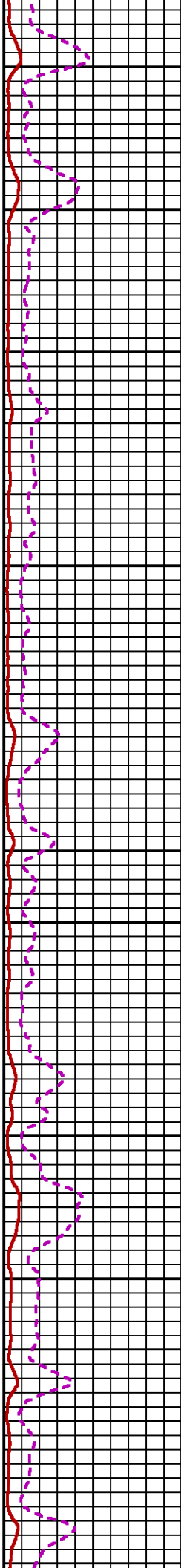
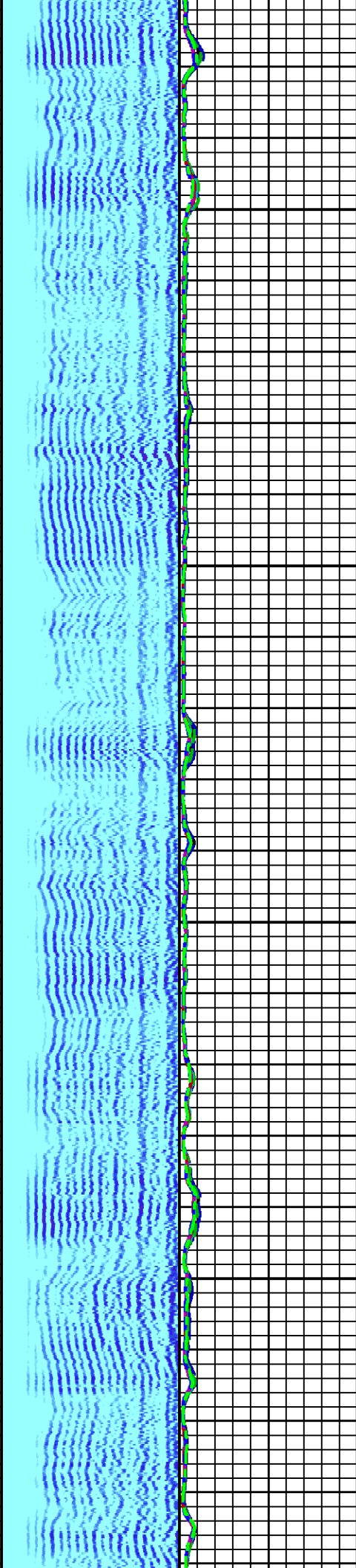
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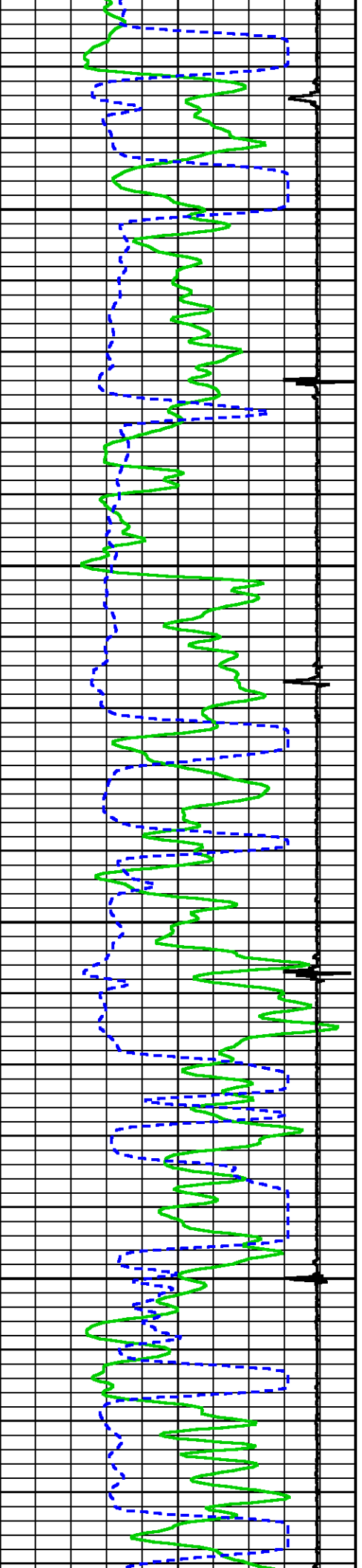
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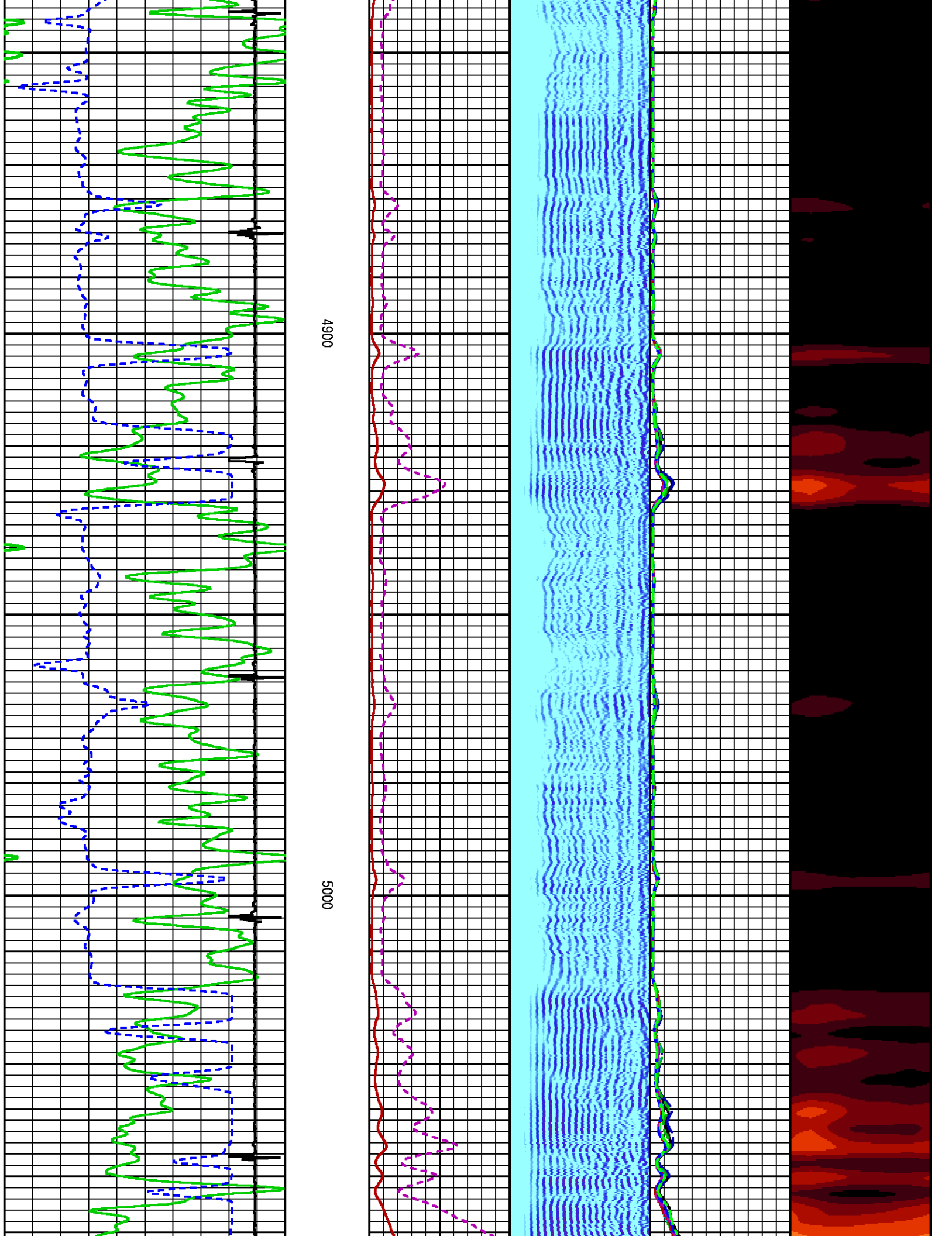


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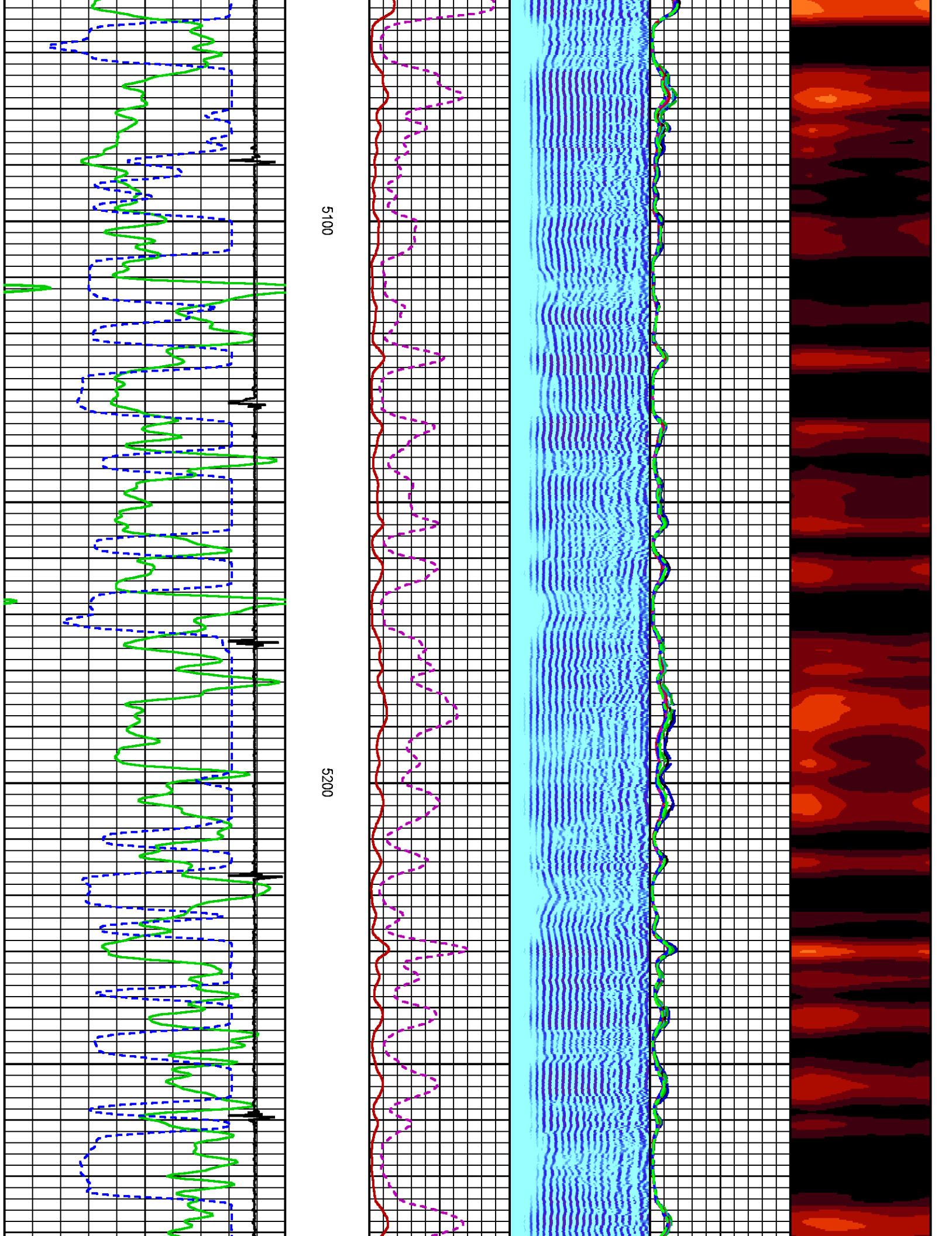
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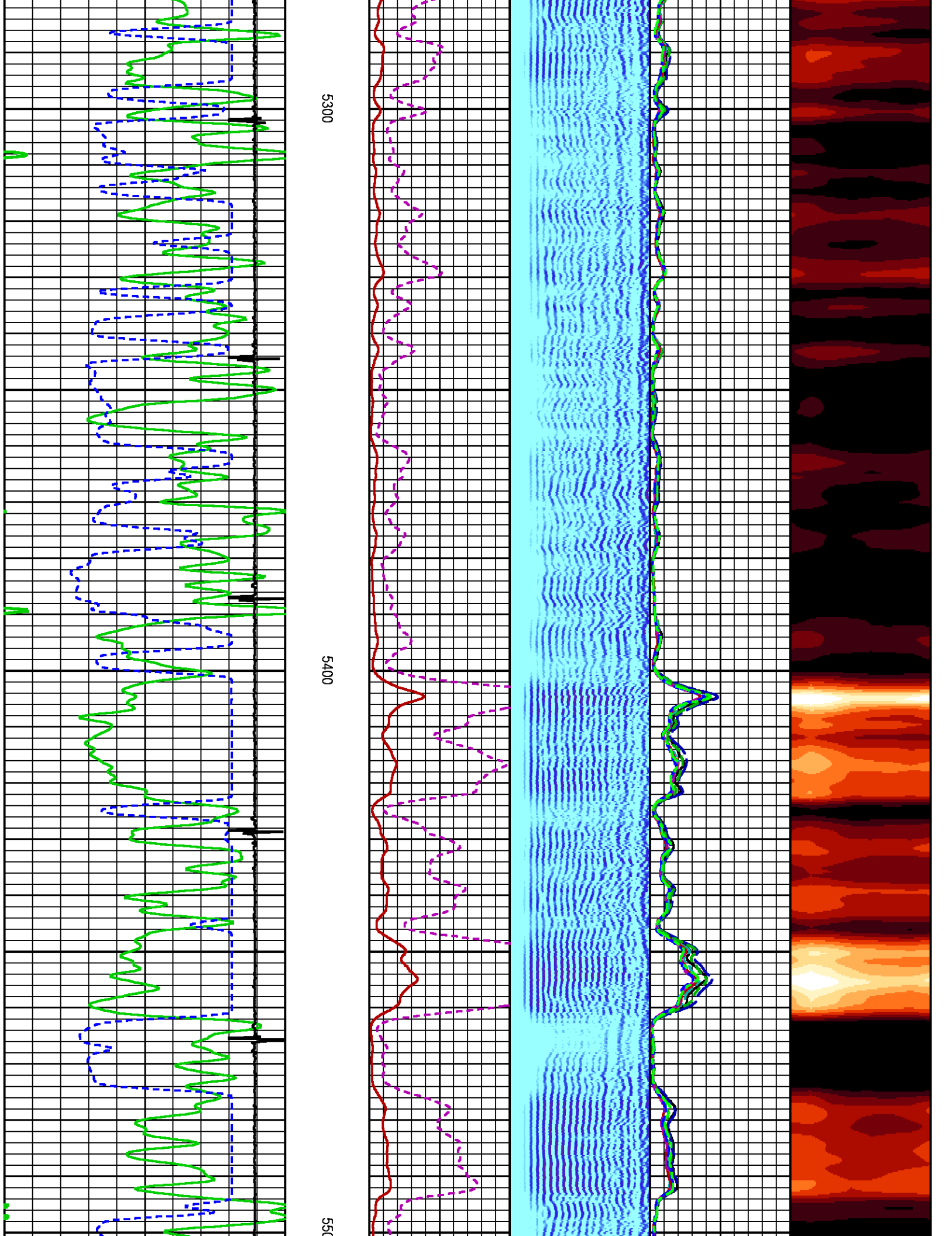


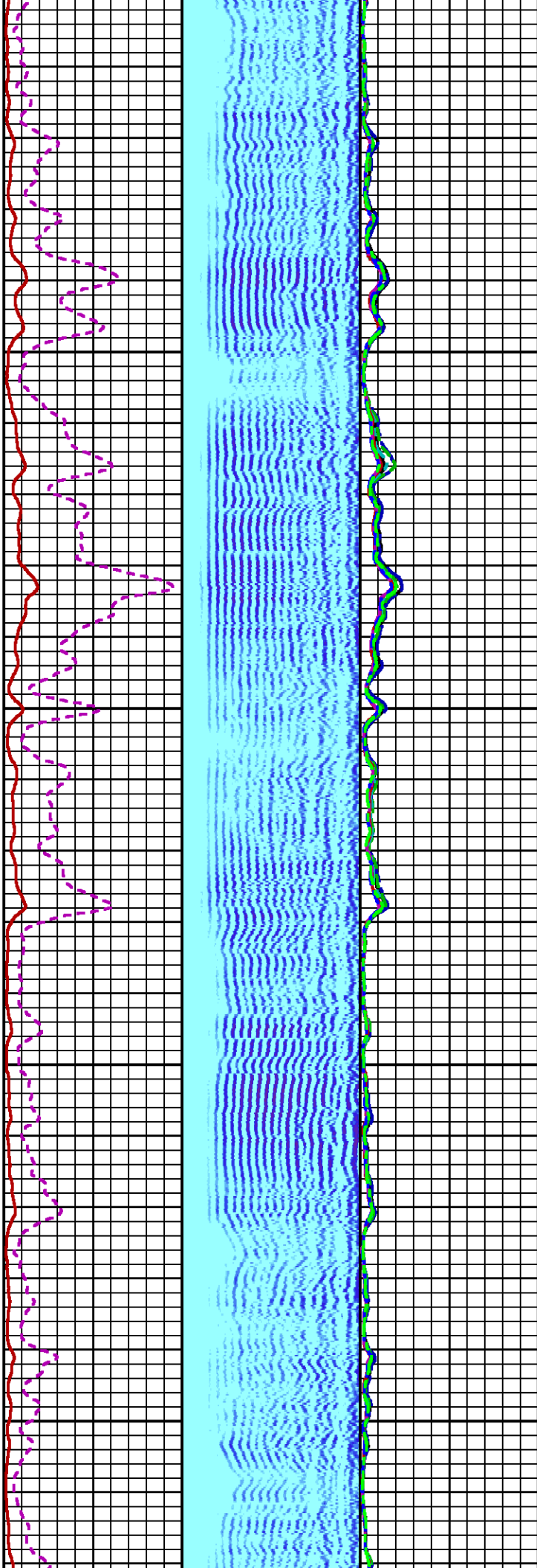
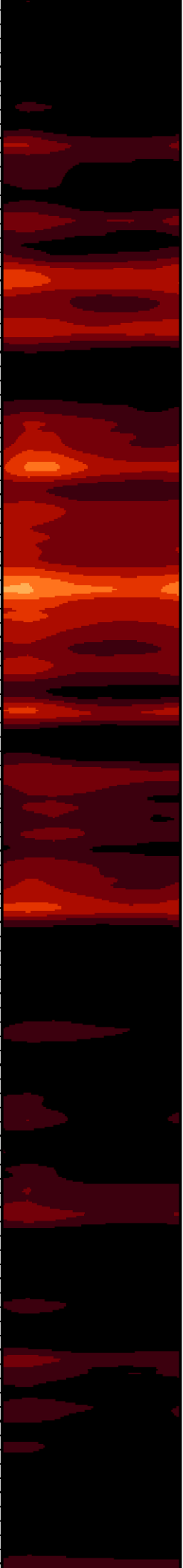








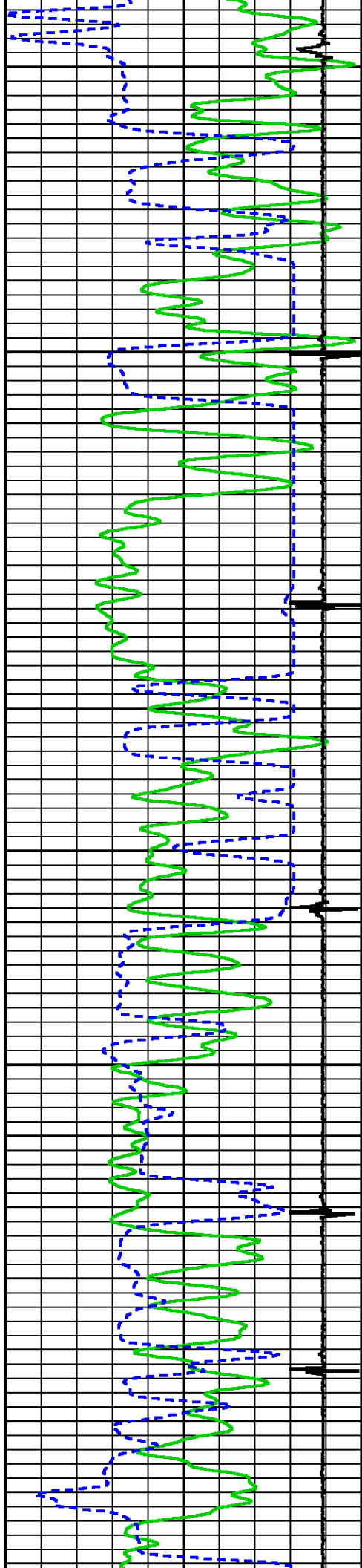


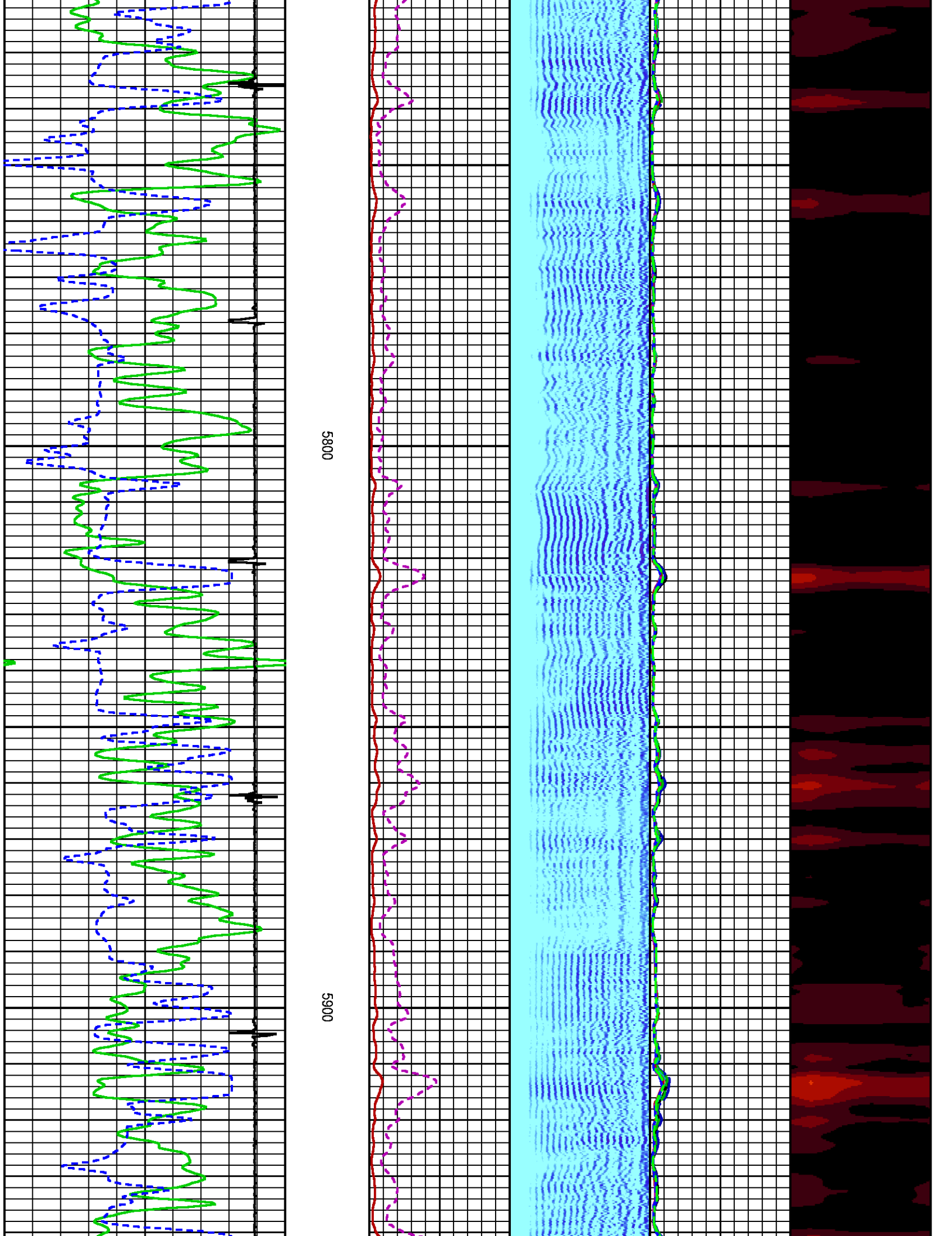


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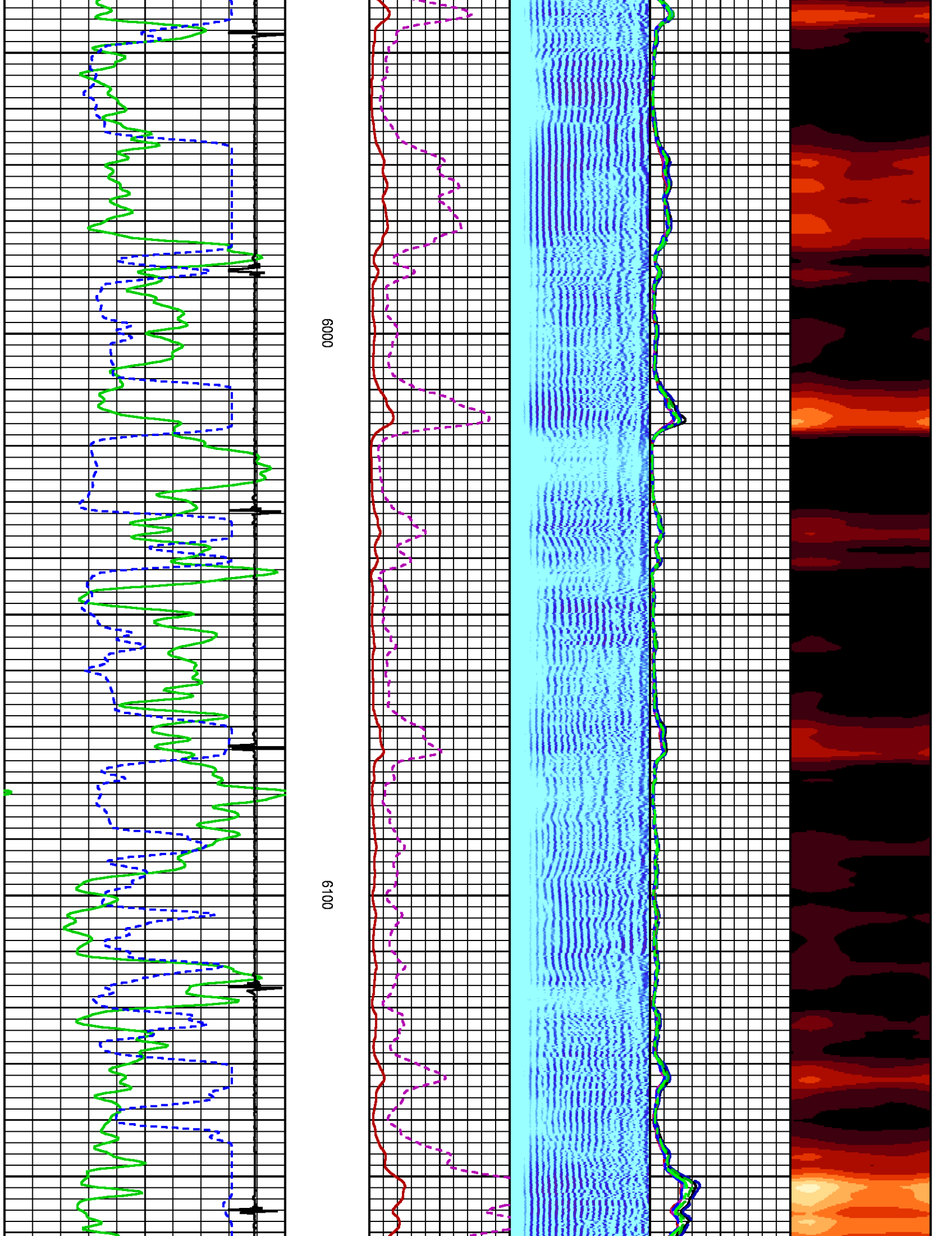
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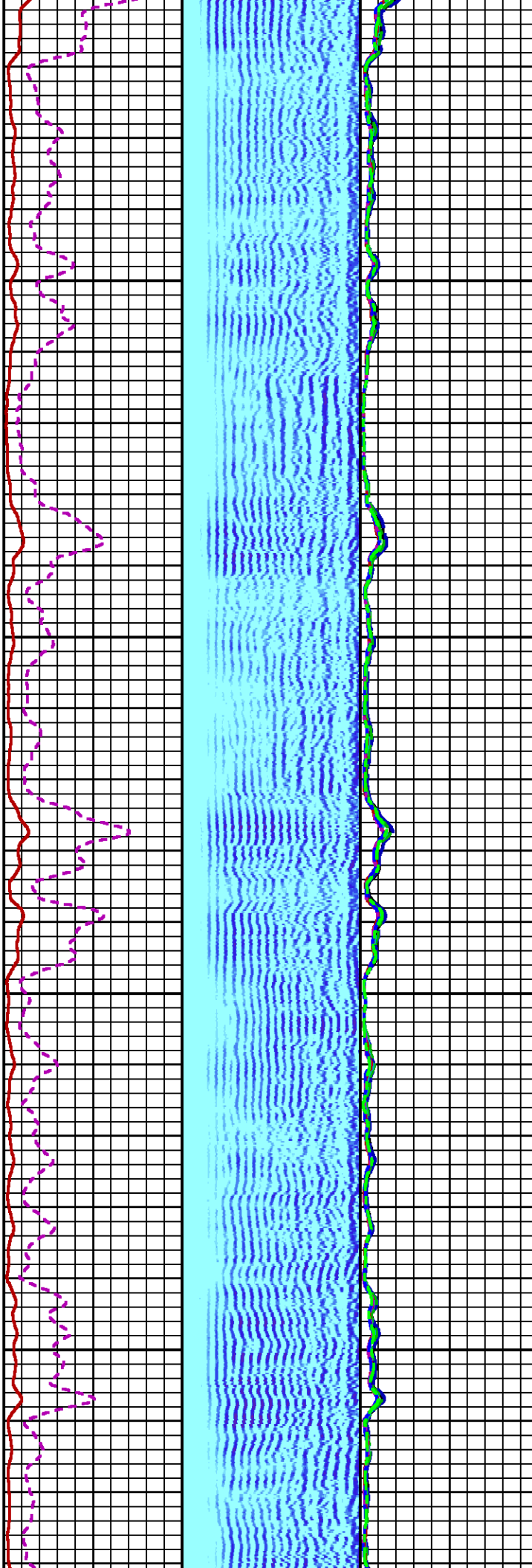
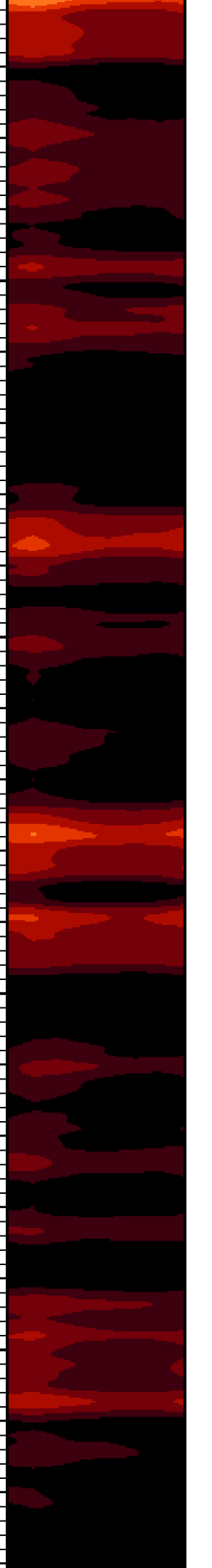
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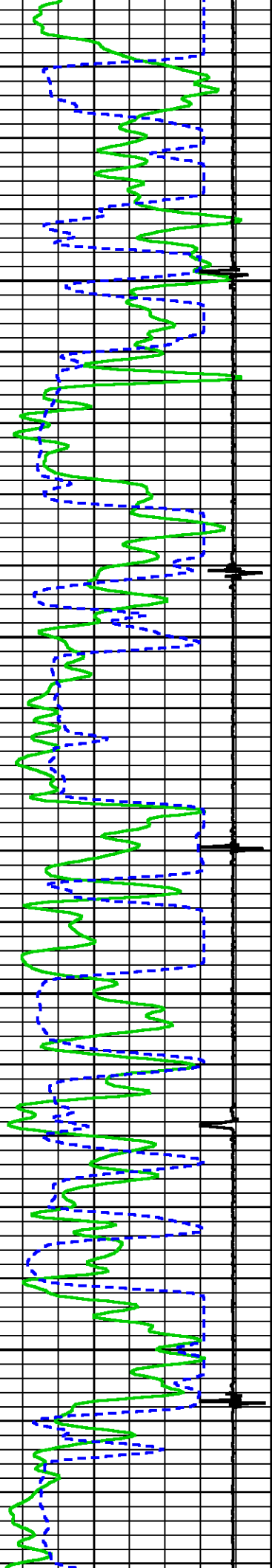




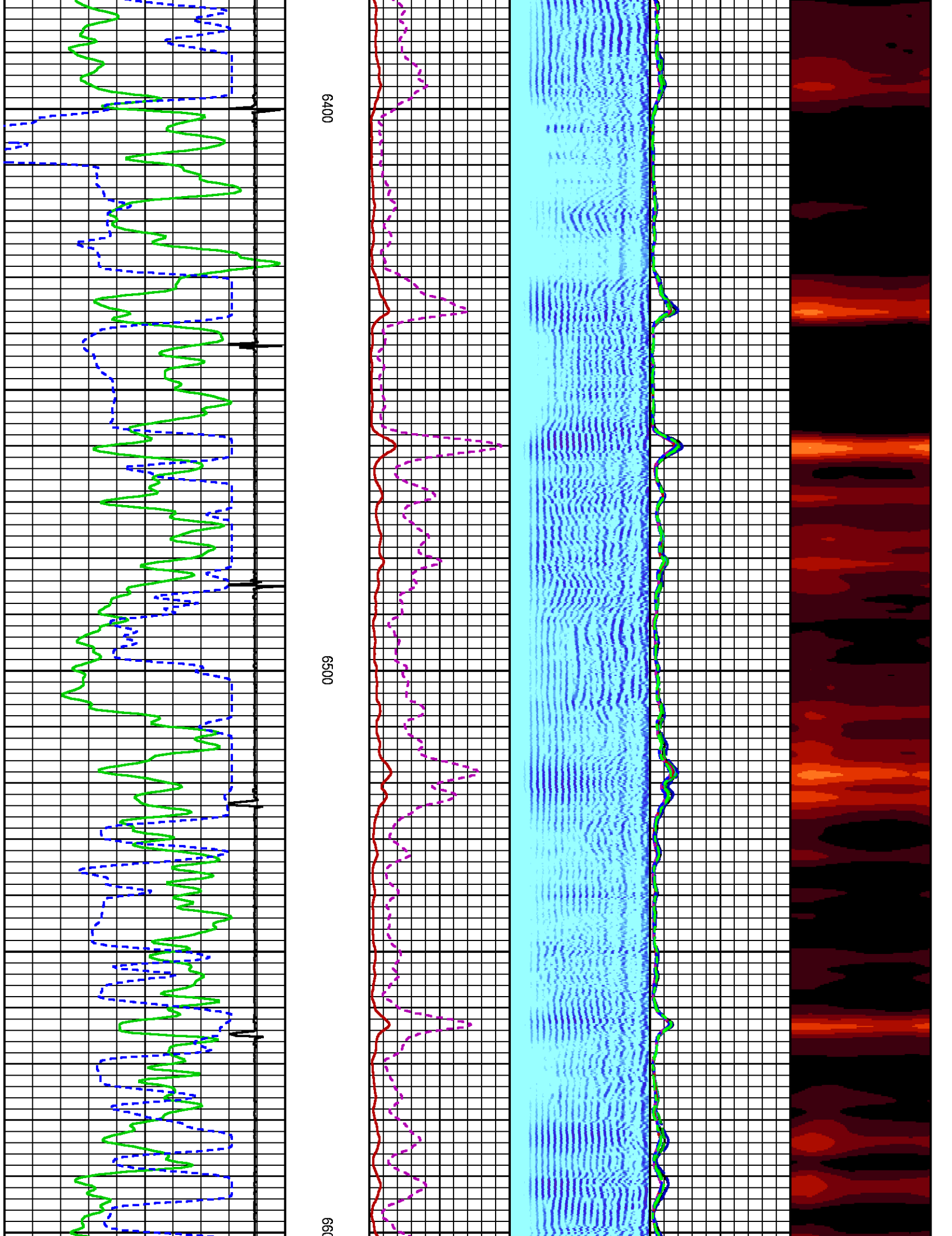


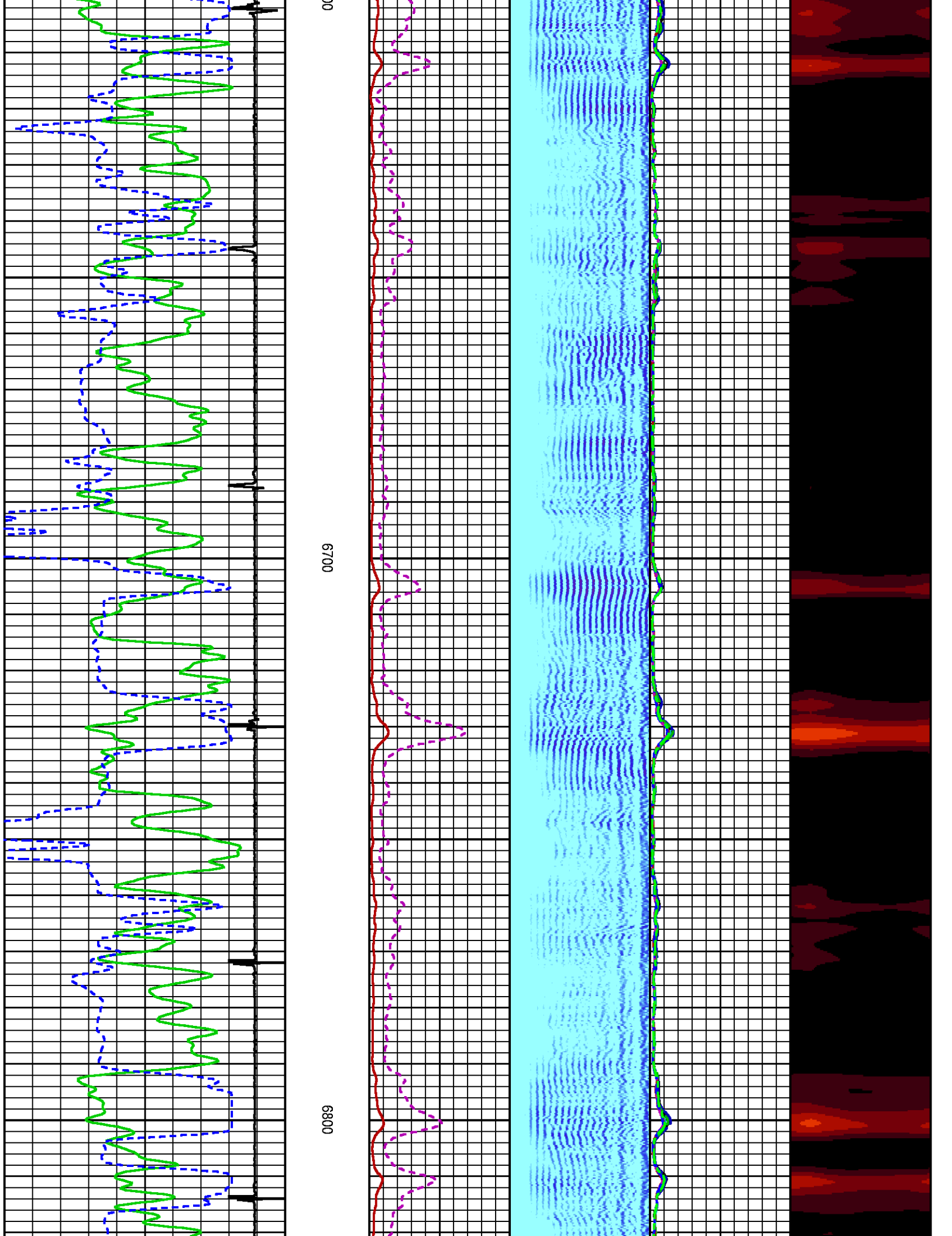
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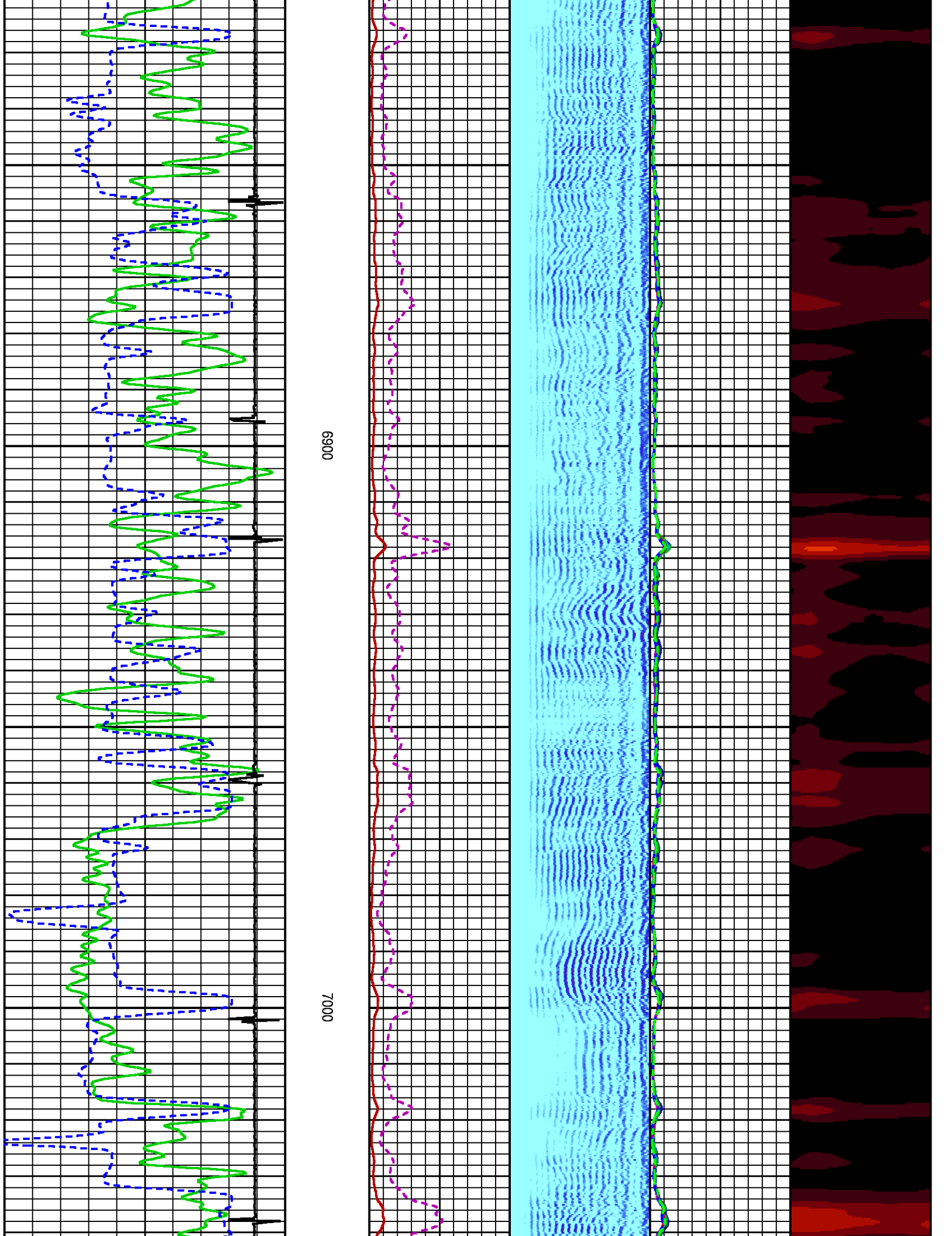
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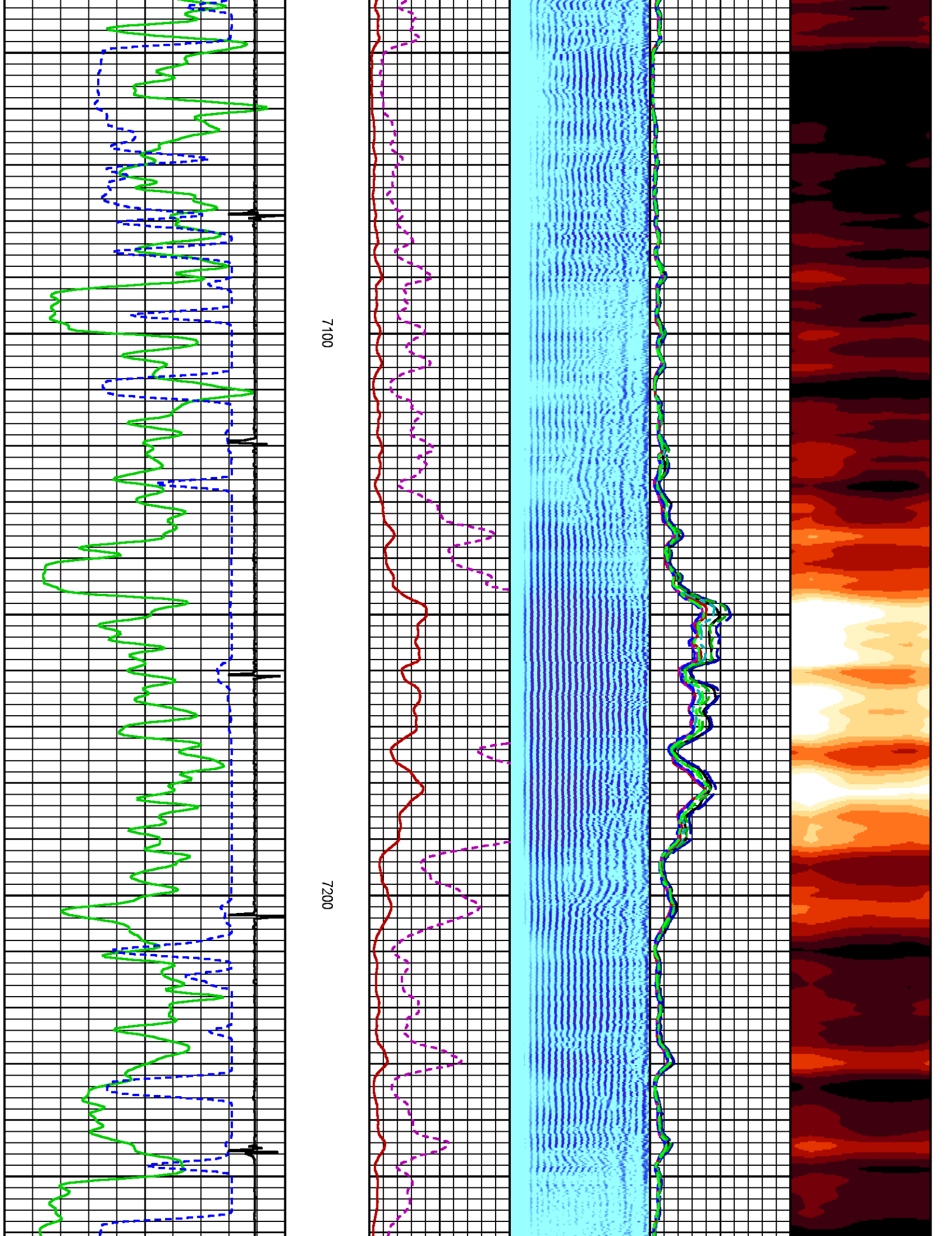




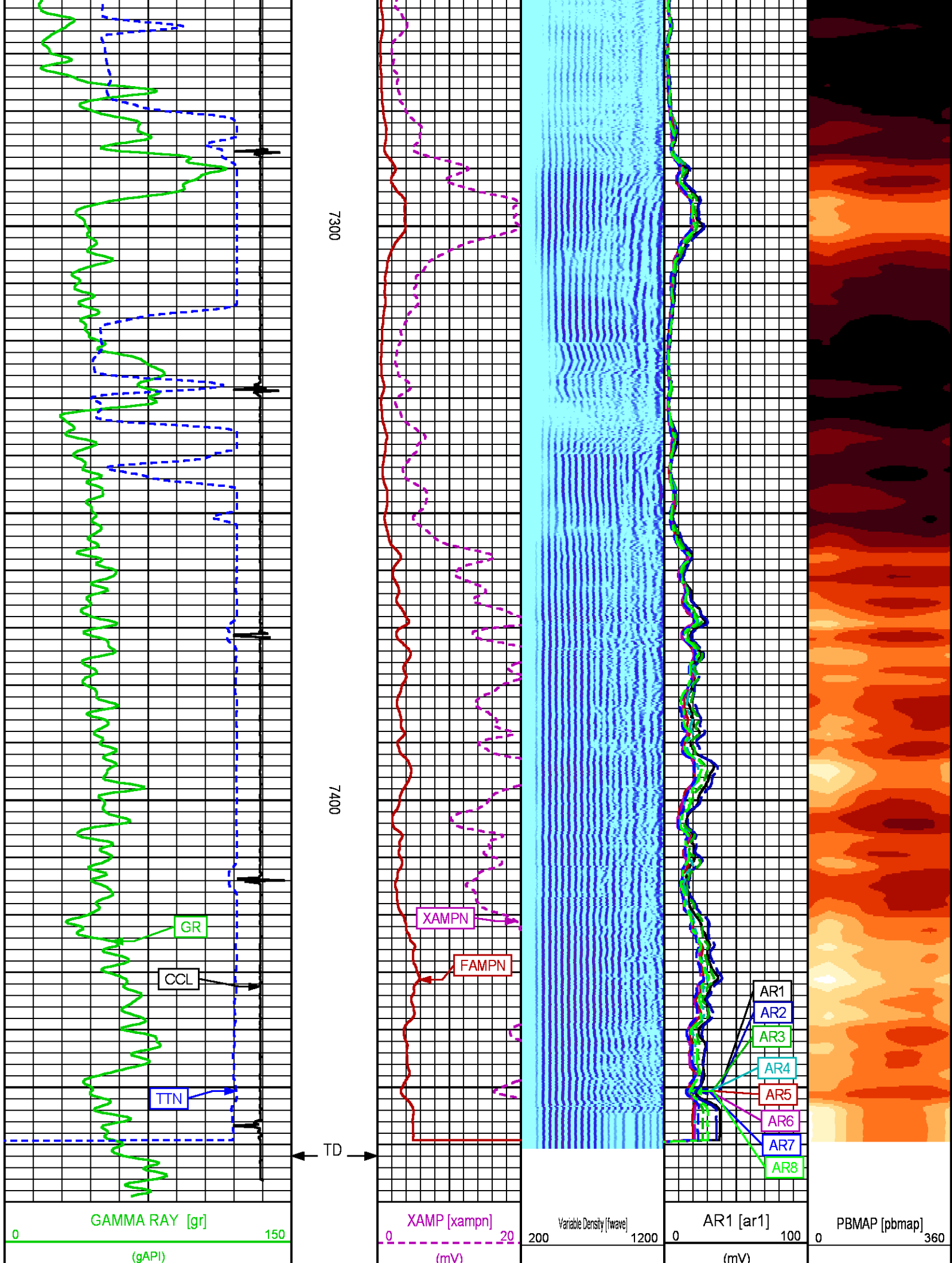




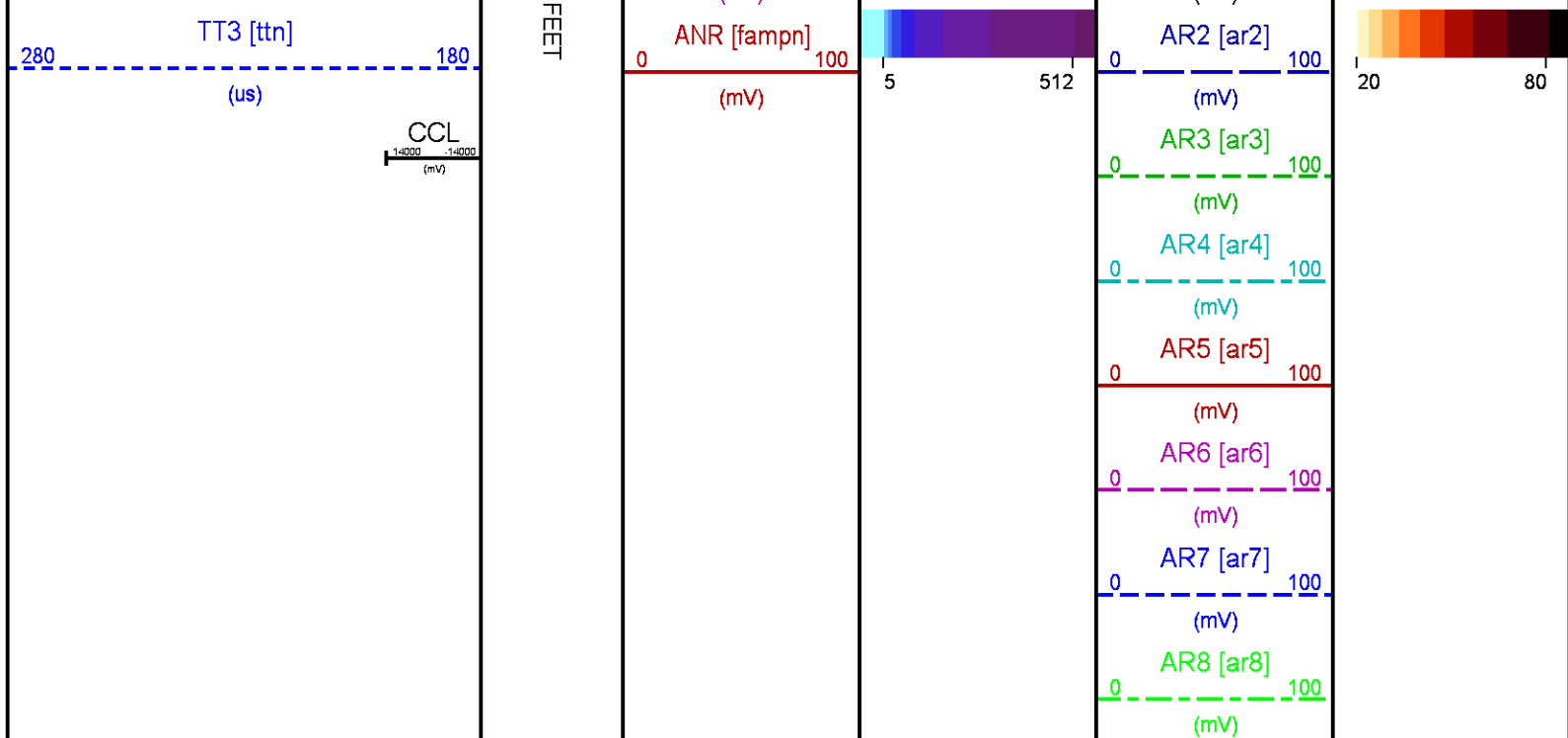












REPEAT PASS

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017  
Patches: 4

Plotted: Fri Jun 22 13:58:23 2018

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_GUNDERSON\_0994-13-17W/p012g01.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 7228.500 ft BOTTOM DEPTH: 7450.250 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*)	189	us	TOP	BOTTOM
	AMP WINDOW START (fgp2*)	189	us	"	"
	AMP WINDOW START (fgp3*)	189	us	"	"
	AMP WINDOW START (fgp4*)	189	us	"	"
	AMP WINDOW START (fgp5*)	189	us	"	"
	AMP WINDOW START (fgp6*)	189	us	"	"
	AMP WINDOW START (fgp7*)	189	us	"	"
	AMP WINDOW START (fgp8*)	189	us	"	"
	AMP WINDOW START (fgp9*)	189	us	"	"

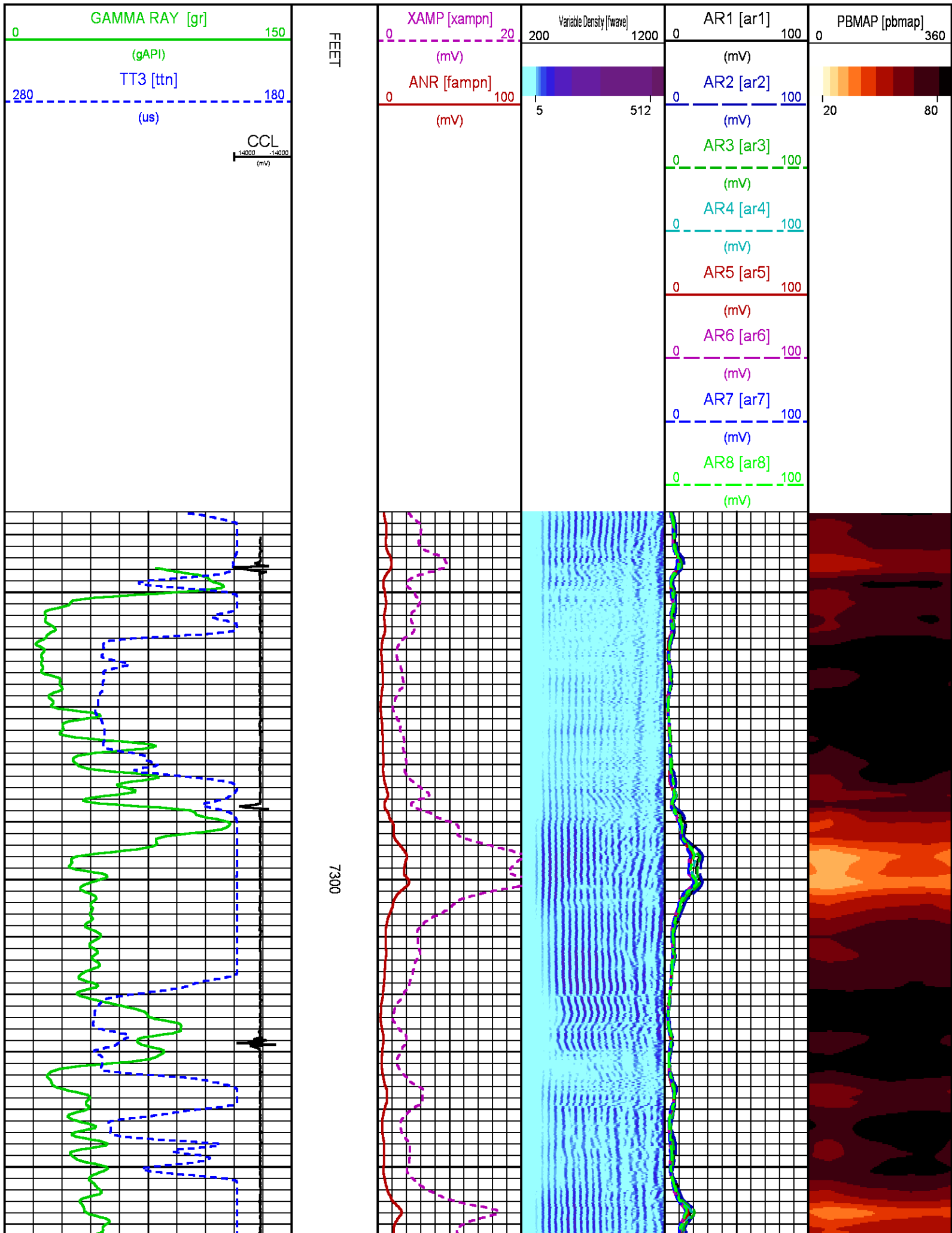
	AMP WINDOW START (rgph)	189	us	"	"
	AMP WINDOW LENGTH	25	us	"	"
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	199	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	4	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	215.678	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-70	us	"	"
	TOOL DELAY (str2*)	-70	us	"	"
	TOOL DELAY (str3*)	-70	us	"	"
	TOOL DELAY (str4*)	-70	us	"	"
	TOOL DELAY (str5*)	-70	us	"	"
	TOOL DELAY (str6*)	-70	us	"	"
	TOOL DELAY (str7*)	-70	us	"	"
	TOOL DELAY (str8*)	-70	us	"	"
	TOOL DELAY (strn*)	-70	us	"	"
BASELINE NOISE (NEAR)	NOISE WINDOW START	140	us	"	"
	NOISE WINDOW LENGTH	25	us	"	"

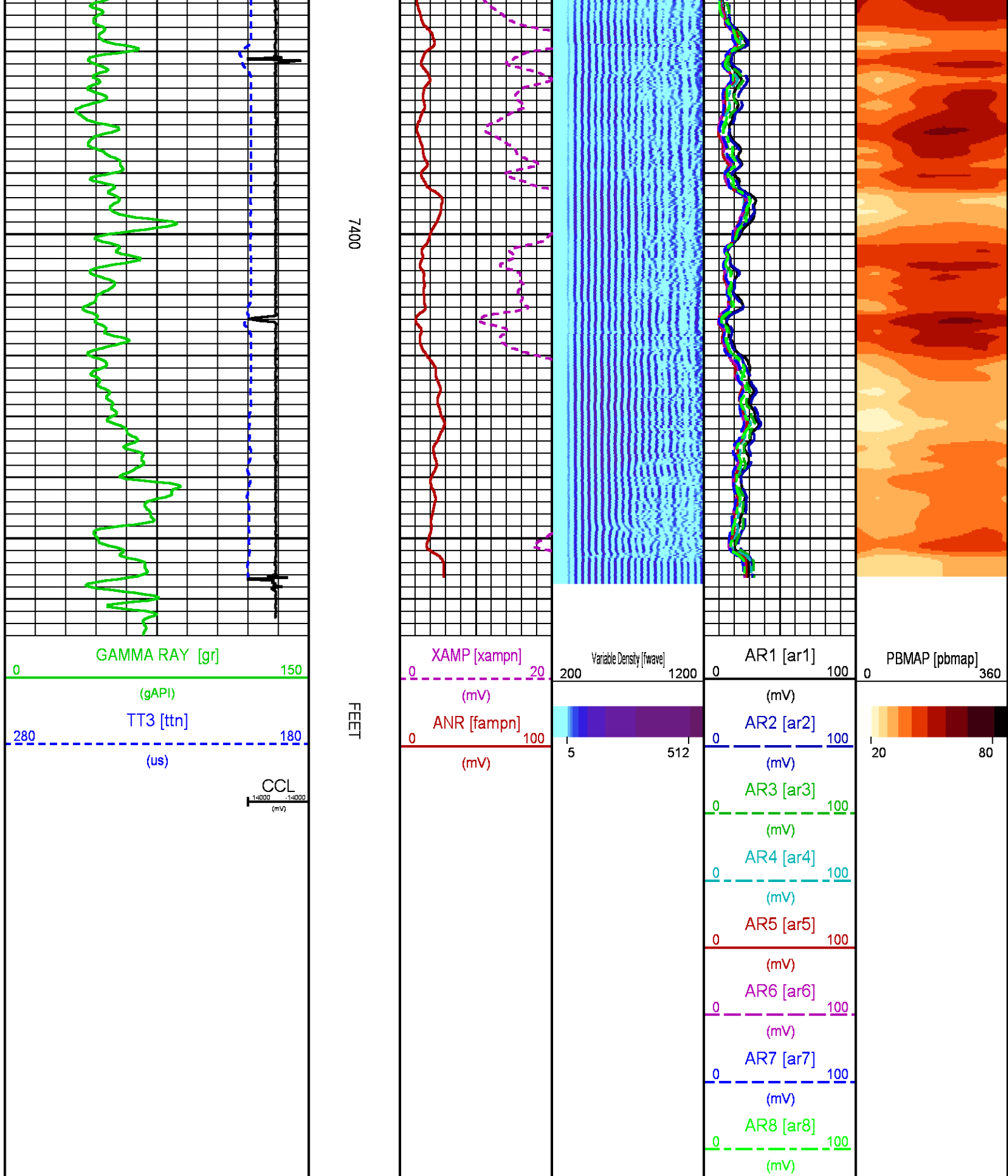
PERCENT BOND CEMENT MAP					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
RAL FREE PIPE AMPLITUDE	FREE AMP REC 1	80	mV	TOP	BOTTOM
	FREE AMP REC 2	80	mV	"	"
	FREE AMP REC 3	80	mV	"	"
	FREE AMP REC 4	80	mV	"	"
	FREE AMP REC 5	80	mV	"	"
	FREE AMP REC 6	80	mV	"	"
	FREE AMP REC 7	80	mV	"	"
	FREE 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_GUNDERSON_0994-13-17W/17W_RAL_REPEAT.fvpdf [5"/100' Scale]
Plot Interval	: 7236 - 7467.5 Feet
Data File 1	: F1 : SysA:/dat1a/LARAMIE_GUNDERSON_0994-13-17W/17W_RAL_REPEAT.xtf
Created On	: N/A
Company	: LARAMIE ENERGY LLC
Well	: GUNDERSON 0994_13_17W
Field	: VEGA-
File Interval	: 7228.25 - 7468.75 Feet





CALIBRATION / VERIFICATION SUMMARY

## RAL PRIMARY CALIBRATION SUMMARY

TOOL #: 1426XA 10124114 DATE/TIME PERFORMED: Wed Jun 20 12:21:38 2018

TOOL #: 1426XA 10124114 DATE/TIME PERFORMED: Wed Jun 20 12:21:38 2018

UNIT #: 5753XD 10412898

	NEAR (mV)	RADIAL (mV)	FAR (mV)
TARGETS	100.00	100.00	150.00

[illegible]

## RAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1426XA 10124114      DATE/TIME PERFORMED: Wed Jun 20 16:43:12 2018      DAYS SINCE CAL: 0

TOOL #: 1426XA 10124114      DATE/TIME PERFORMED: Wed Jun 20 16:43:12 2018      DAYS SINCE CAL: 0

TOOL #: 1426XA 10124114      DATE/TIME PERFORMED: Wed Jun 20 16:43:12 2018      DAYS SINCE CAL: 0

UNIT #: 5753XD 10412898 CABLE #: 4268SM SMALL1

UNIT #: 5753XD 10412898 CABLE #: 4268SM SMALL1

	NEAR (mV)	R1 (mV)	R2 (mV)	R3 (mV)	R4 (mV)	R5 (mV)	R6 (mV)	R7 (mV)	R8 (mV)	FAR (mV)	CAL (mV)
ZERO	-0.02	0.00	-0.00	-0.00	-0.00	-0.02	-0.03	0.02	-0.00	0.36	0.00
AMP AIR	0.76	0.45	0.59	0.61	0.51	0.53	0.62	0.63	0.68	1.70	101.13

	SHOP M FACTOR	SHOP A FACTOR	WIRELINER FACTOR
	0.34	0.00	0.99

## GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1355XA 11871507 DATE/TIME PERFORMED: Thu Mar 29 16:58:14 2018

TOOL #: 1355XA 11871507 DATE/TIME PERFORMED: Thu Mar 29 16:58:14 2018

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

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

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

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

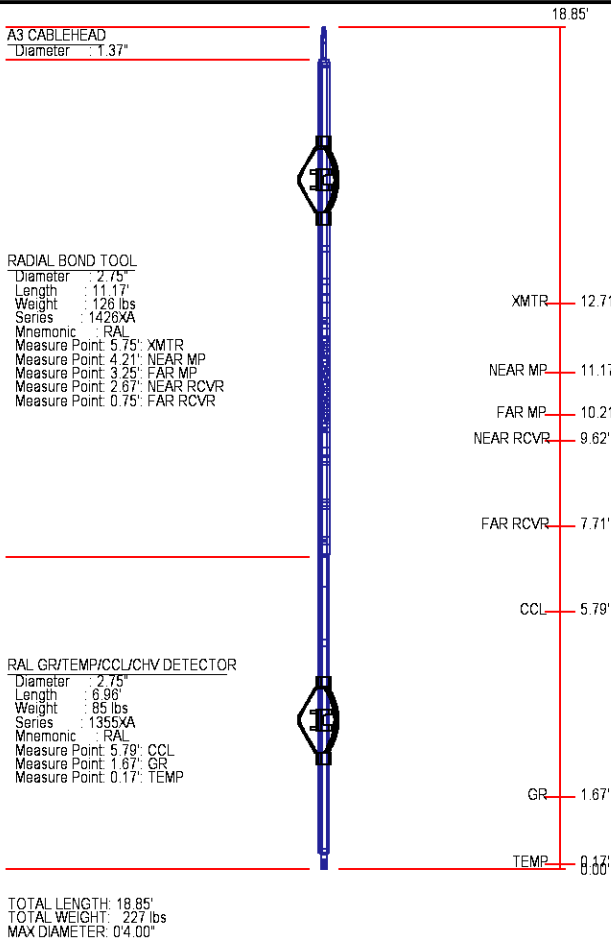
UNIT #: 4352 ML4352 VERI JIG #: 4702NK DA\_228

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



# INSTRUMENT CONFIGURATION

Source File: /dat1a/LARAMIE\_GUNDERSON\_0994-13-17W/RAL-tdg



**BAKER  
HUGHES**  
a GE company



**ECLIPS**

**COMPANY** LARAMIE ENERGY LLC  
**WELL** GUNDERSON 0994-13-17W  
**FIELD** VEGA  
**COUNTY** MESA **STATE** COLORADO

**FILE NO:**  
CH136906  
**API NO:**  
05077105470000

**LOCATION:**

SHL: 1208' FSL & 1617' FWL  
BHL: 1208' FSL & 1617' FWL

**SEC** 13 **TWP** 9S **RGE** 94W

**ELEVATIONS:**

**KB** 7302 FT  
**DF**  
**GL** 7272 FT

**DATE** 20-Jun-2018