



FILE NO: COMPANY LARAMIE ENERGY

WELL GUNDERSON 20-04W

API NO: FIELD VEGA

05077103370000 COUNTY MESA STATE COLORADO

Ver. 4.06 LOCATION: OTHER SERVICES

SHL: LAT:39.266919N; LONG:107.795317W

BHL: LAT:39.267151N; LONG:107.797721W

SEC 20 TWP 9S RGE 93W

PERMANENT DATUM GL ELEVATION 7144 FT

LOG MEASURED FROM KB 30 FT ABOVE P.D.

DRILL. MEAS. FROM KB ELEVATIONS: KB 7174 FT DF 7173 FT GL 7144 FT

DATE 21-JUL-2017

RUN 2 TRIP 1

SERVICE ORDER US125133

DEPTH DRILLER 7480 FT

DEPTH LOGGER 7430 FT

BOTTOM LOGGED INTERVAL 7430 FT

TOP LOGGED INTERVAL 30 FT

TIME STARTED 11:00

TIME FINISHED 13:30

OPERATOR RIG TIME 2.5 HRS

TYPE OF FLUID IN HOLE WATER

FLUID DENSITY NA

FLUID SALINITY NA

FLUID LEVEL 55 FT

LOGGED CEMENT TOP 1057 FT

WELLHEAD PRESSURE 0 PSI

MAXIMUM HOLE DEVIATION NA

NOMINAL LOGGING SPEED 100 F/MN

MAX. RECORDED TEMP. 242 DEGF

REFERENCE LOG BAKER OPEN HOLE

REFERENCE LOG DATE 21-JUN-2017

EQUIP. NO. LOCATION HL-6670 WOODWARD

RECORDED BY M.MENTZER

WITNESSED BY MR. CHUCK MALLARY

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 2 TRIP 1: \*2 OPERATION IN WELL\*

\*\*OPERATION 1: RAL/GR/CCL RUN IN COMBINATION\*\*

LOGGED WITH 0 PSI ON WELLHEAD

SJ: 5655' - 5678'

SJ: 6610' - 6631'

CREW: J.PENA, D.HUTCHISON

### EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
2	1	RAL	1426 XA	10218497	CENTRALIZED
2	1	GR/CCL	1355 XA	1260180	CENTRALIZED

# MAIN PASS 0 PSI

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013

Updates: 1 Patches: 9

Plotted: Fri Jul 21 15:01:14 2017

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LAREME\_GUNDERSON\_20\_04W/n012g02.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 29.750 ft BOTTOM DEPTH: 7475.000 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		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	200.391	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-67	us	"	"
	TOOL DELAY (str2*)	-67	us	"	"
	TOOL DELAY (str3*)	-67	us	"	"
	TOOL DELAY (str4*)	-67	us	"	"
	TOOL DELAY (str5*)	-67	us	"	"
	TOOL DELAY (str6*)	-67	us	"	"
	TOOL DELAY (str7*)	-67	us	"	"
	TOOL DELAY (str8*)	-67	us	"	"
	TOOL DELAY (strn*)	-67	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	"	"

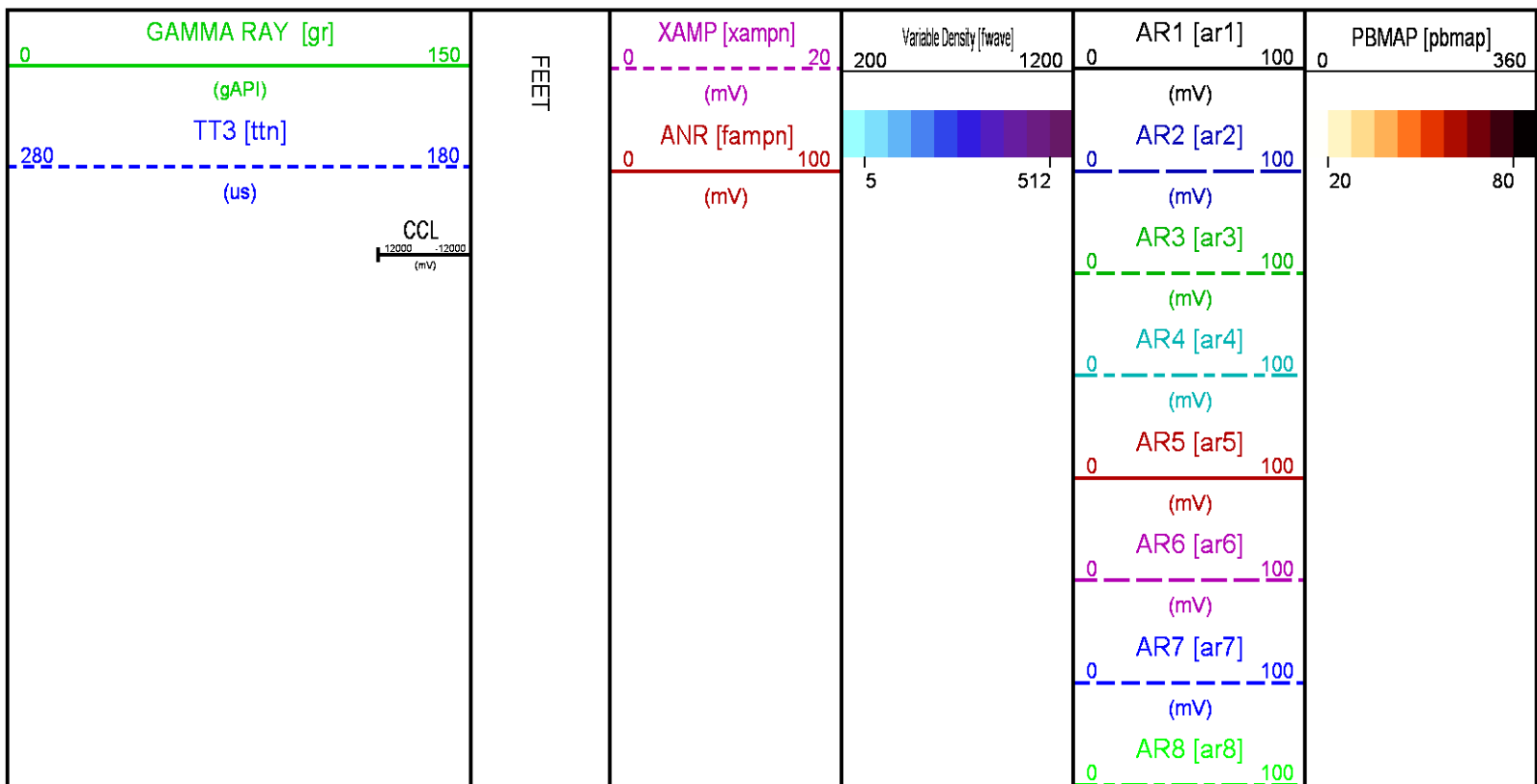
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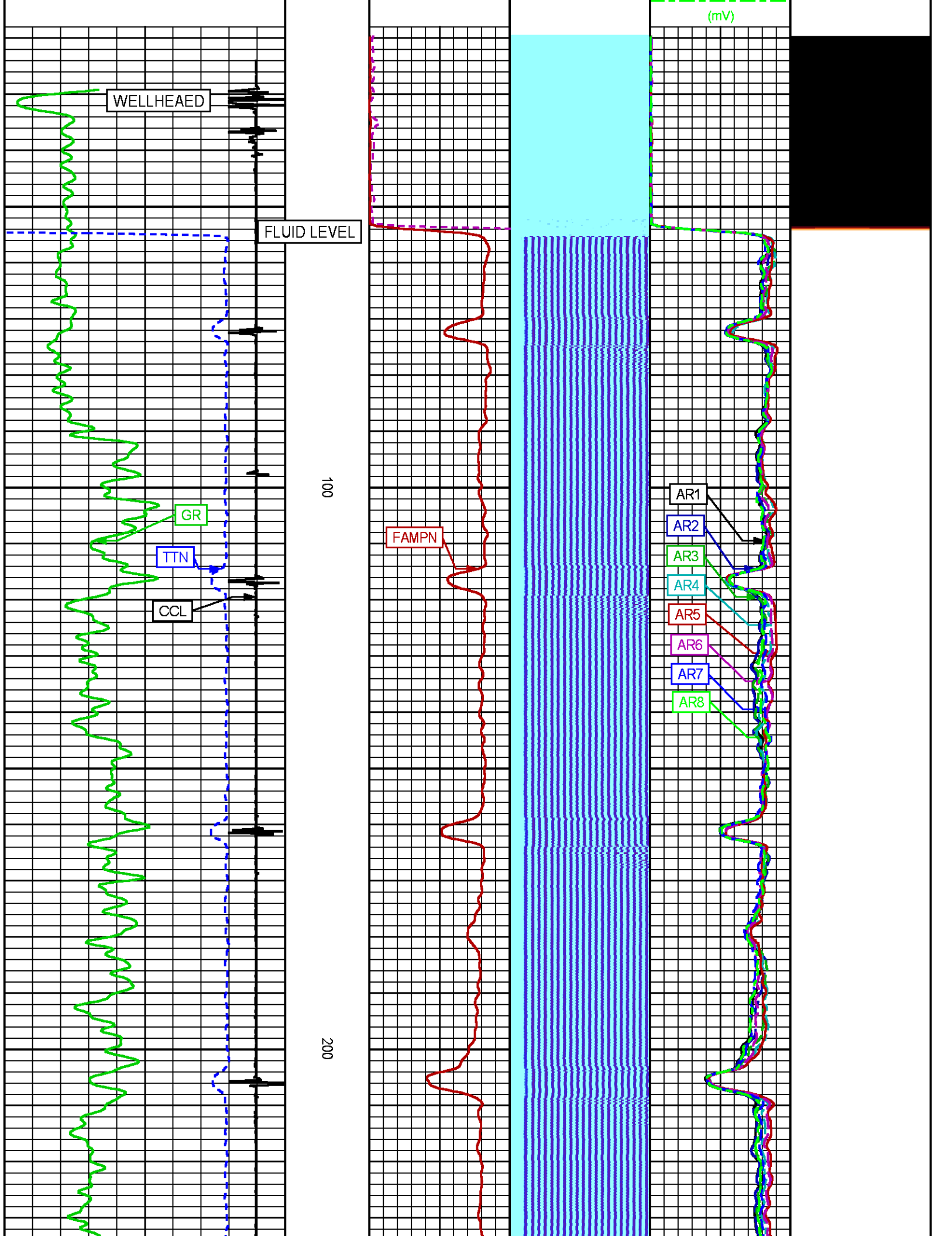
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	Jul 21 12:37:14 2017	FIXED GATE AMPLITUDE T-R1
F1:AR2	Jul 21 12:37:14 2017	FIXED GATE AMPLITUDE T-R2
F1:AR3	Jul 21 12:37:14 2017	FIXED GATE AMPLITUDE T-R3
F1:AR4	Jul 21 12:37:14 2017	FIXED GATE AMPLITUDE T-R4
F1:AR5	Jul 21 12:37:14 2017	FIXED GATE AMPLITUDE T-R5
F1:AR6	Jul 21 12:37:14 2017	FIXED GATE AMPLITUDE T-R6
F1:AR7	Jul 21 12:37:14 2017	FIXED GATE AMPLITUDE T-R7
F1:AR8	Jul 21 12:37:14 2017	FIXED GATE AMPLITUDE T-R8
F1:CCL	Jul 21 12:37:14 2017	CASING COLLAR LOCATOR
F1:FAMPN	Jul 21 12:37:14 2017	FIXED GATE AMPLITUDE NEAR RECEIVER
F1:FWAVE	Jul 21 12:37:14 2017	FAR WAVE FORM
F1:GR	Jul 21 12:37:14 2017	GAMMA RAY
F1:PBMAP	Jul 21 12:37:14 2017	PERCENT BOND CEMENT MAP
F1:TTN	Jul 21 12:37:14 2017	TRAVELTIME FROM NEAR TRANSMITTER-RECEIVER
F1:XAMPN	Jul 21 12:37:14 2017	FIXED GATE AMPLITUDE NEAR RECEIVER TIMES FIVE

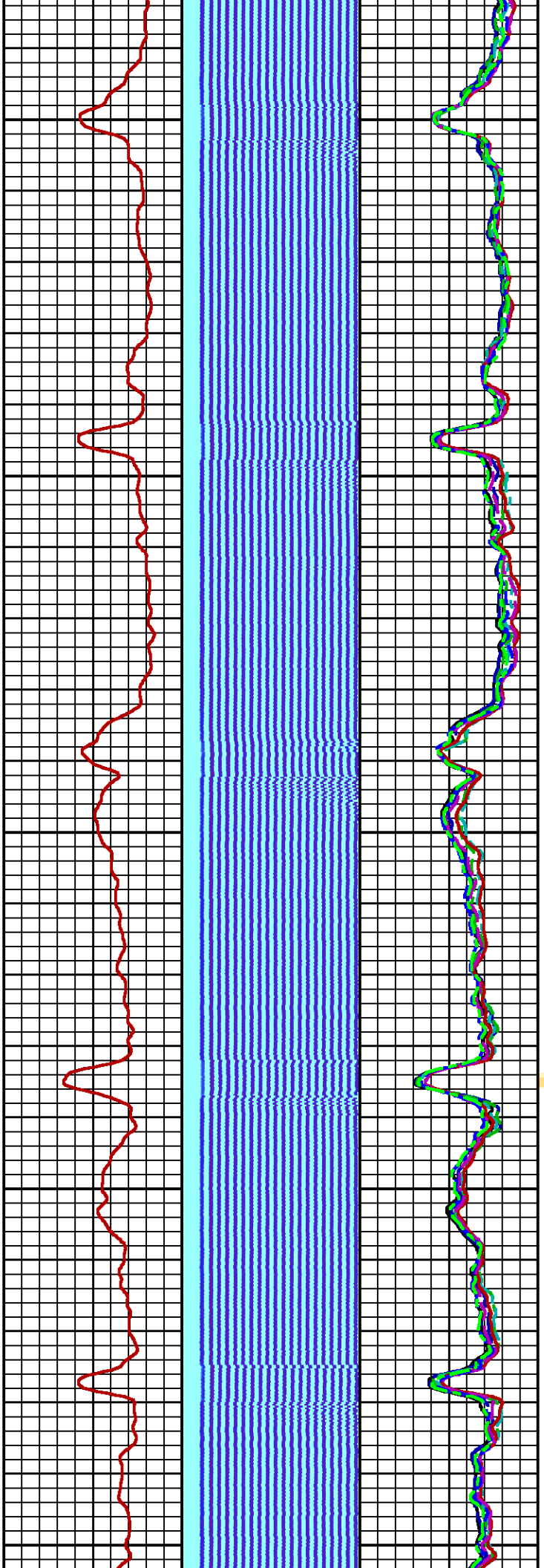
## CURVE MEASURE POINT OFFSET

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>	: cpu100:ral_all+01-MAIN-GUNDERSON_20_04W_RAL_MN-5.fvpdf [5"/100' Scale]
<b>Plot Interval</b>	: 19.5 - 7473.75 Feet
<b>Data File 1</b>	: F1 : cpu100:/dat1a/LAREME_GUNDERSON_20_04W/GUNDERSON_20_04W_RAL_MN.xtf
<b>Created On</b>	: Jul 21 12:37:14 2017
<b>Company</b>	: LARAMIE ENERGY
<b>Well</b>	: GUNDERSON 20-04W
<b>Field</b>	: VEGA
<b>File Interval</b>	: 18.5 - 7475 Feet
<b>OCT</b>	: n012g

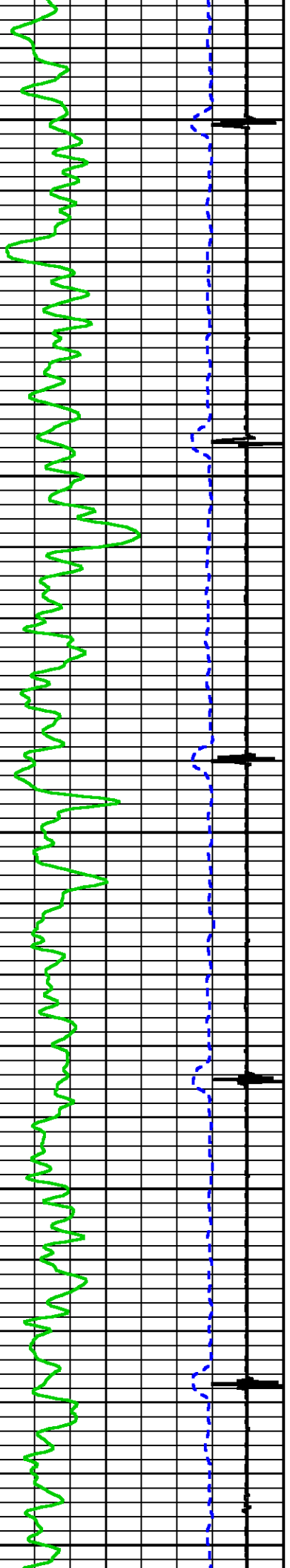


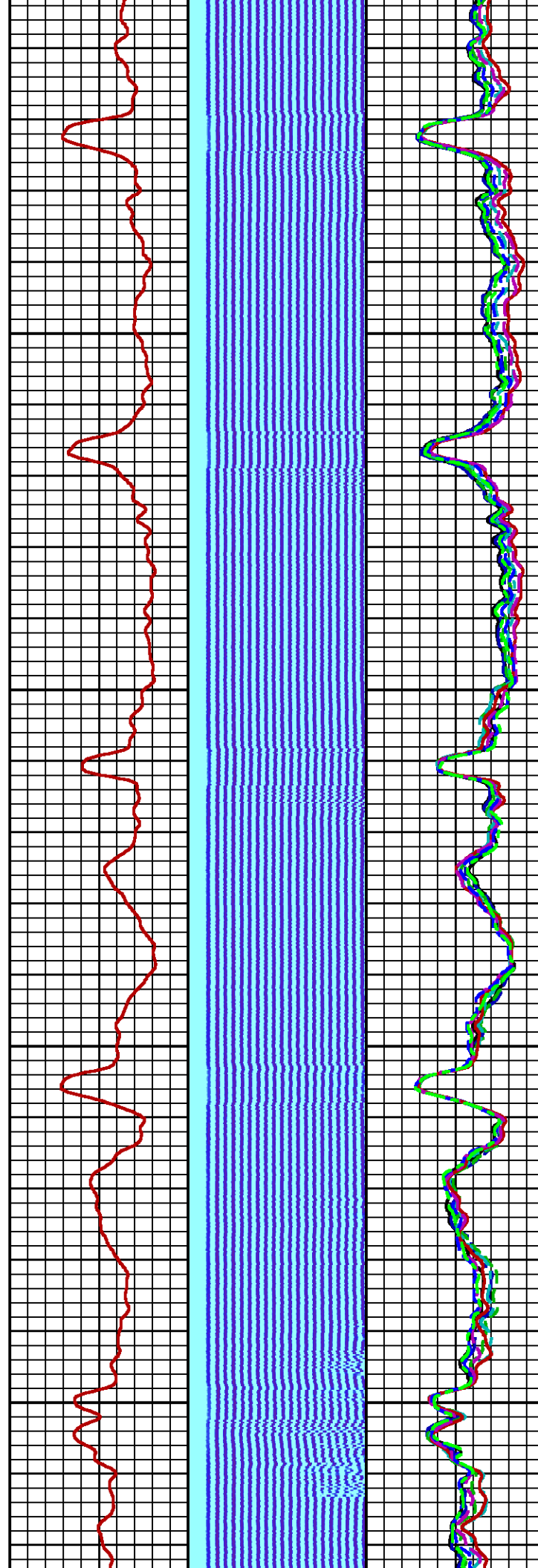
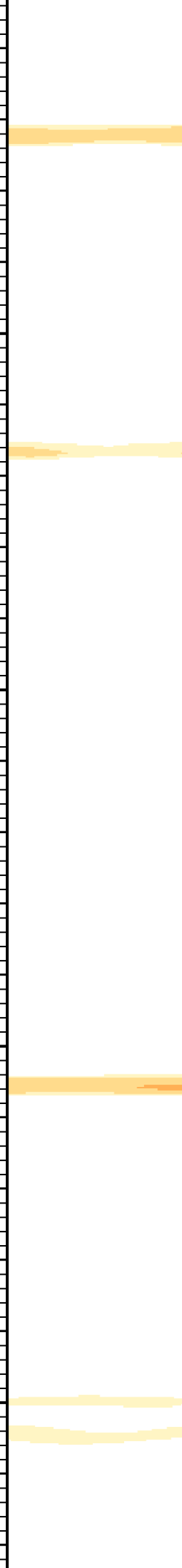




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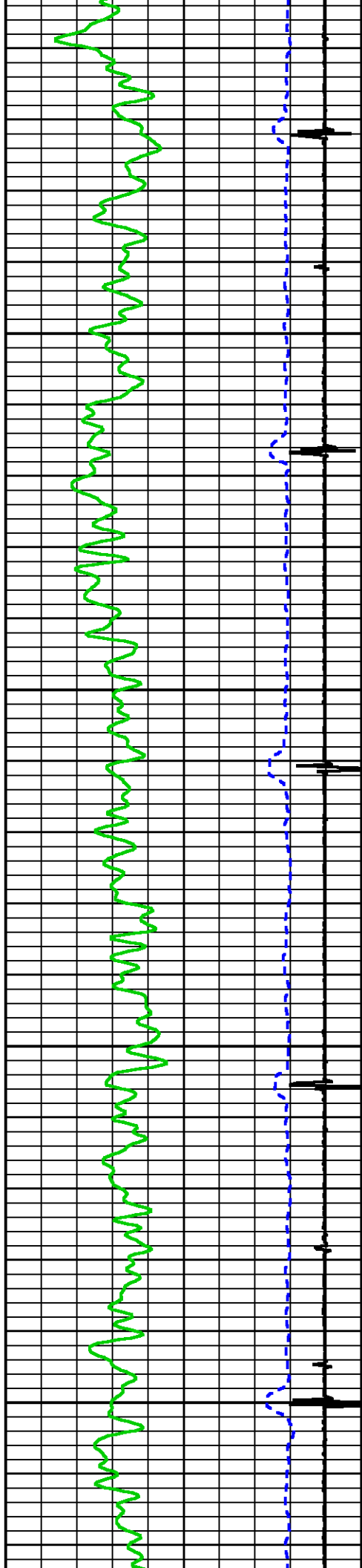
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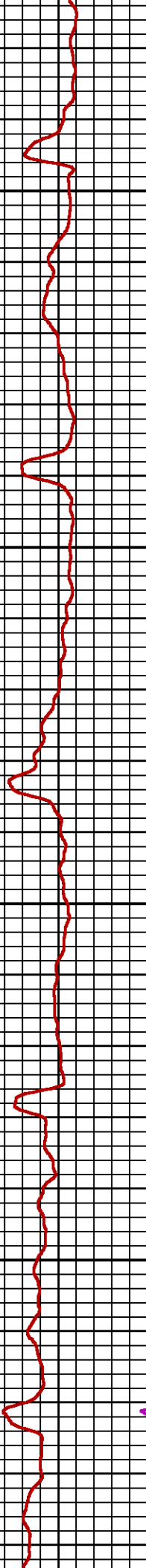
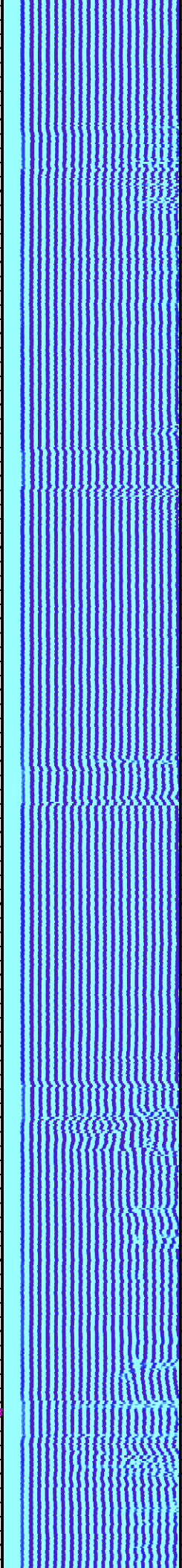
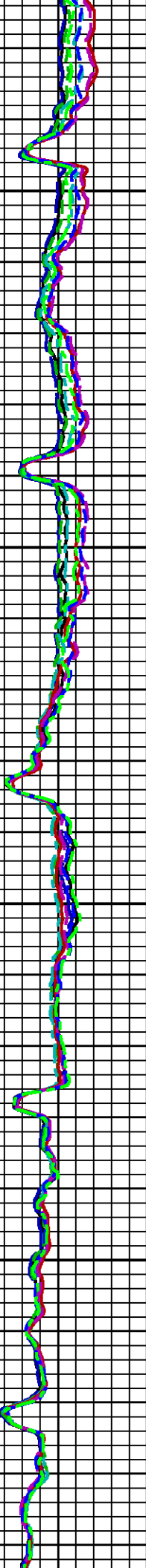
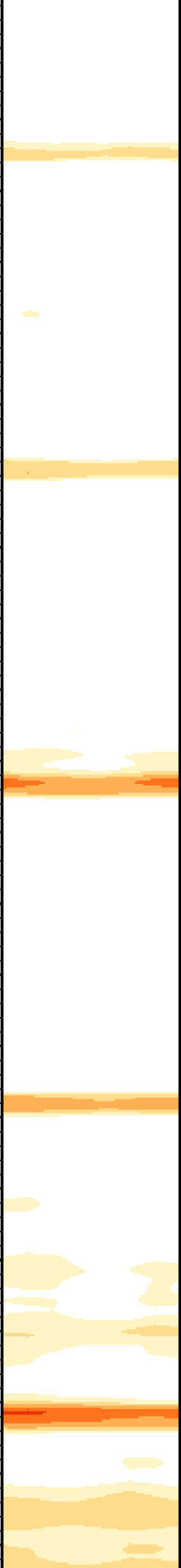




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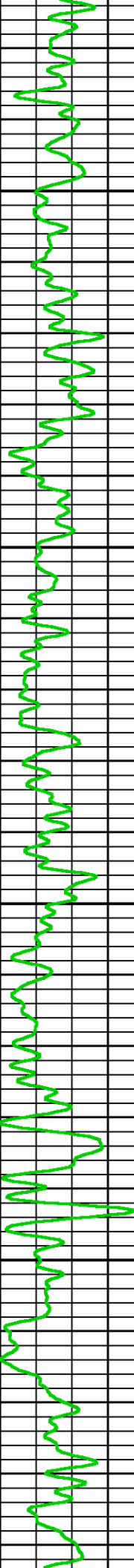
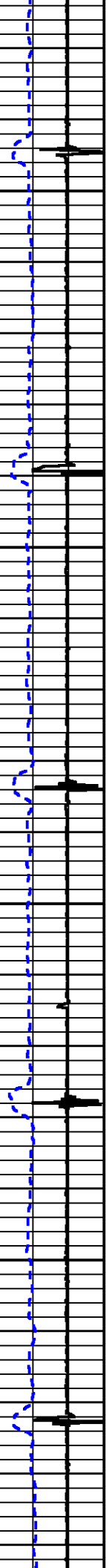
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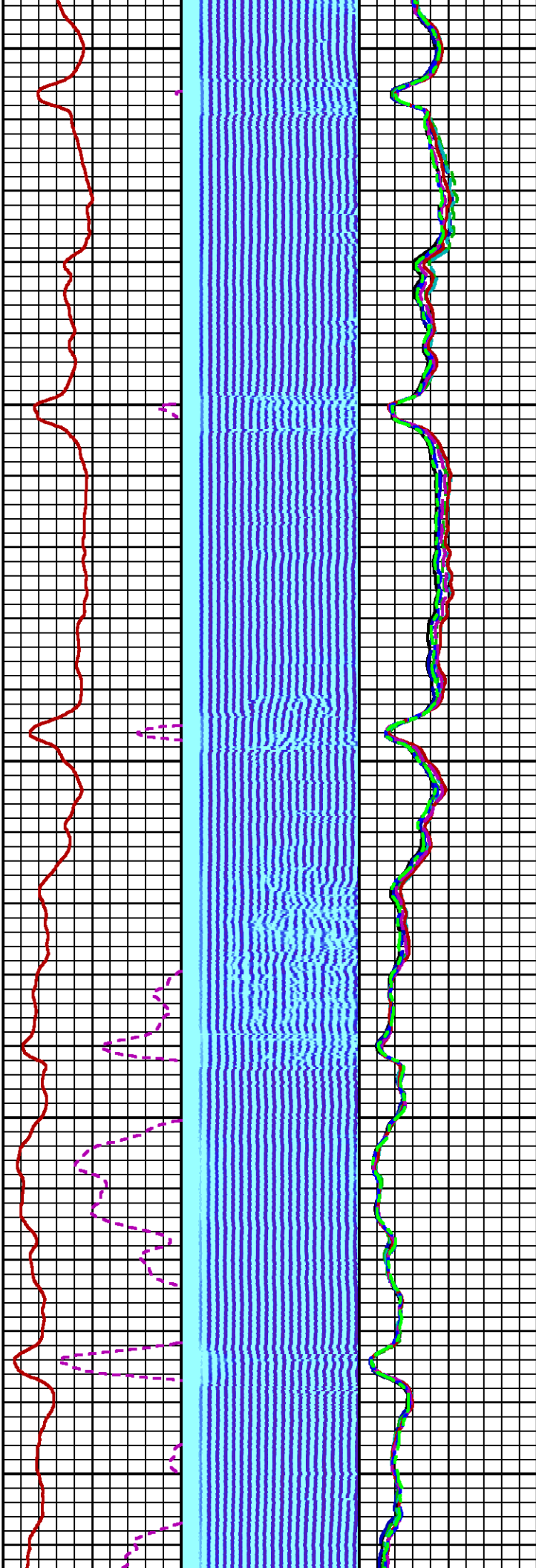
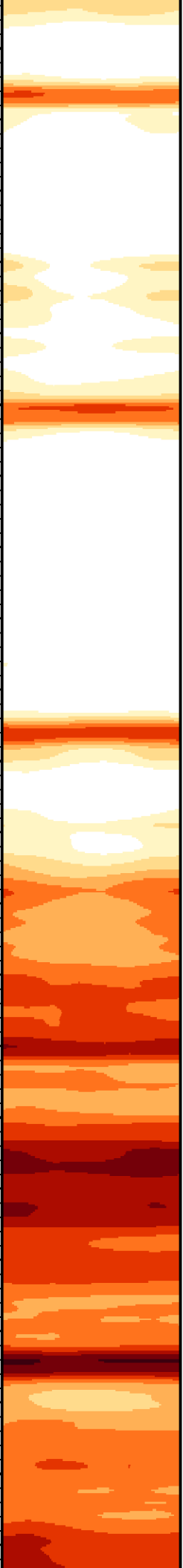




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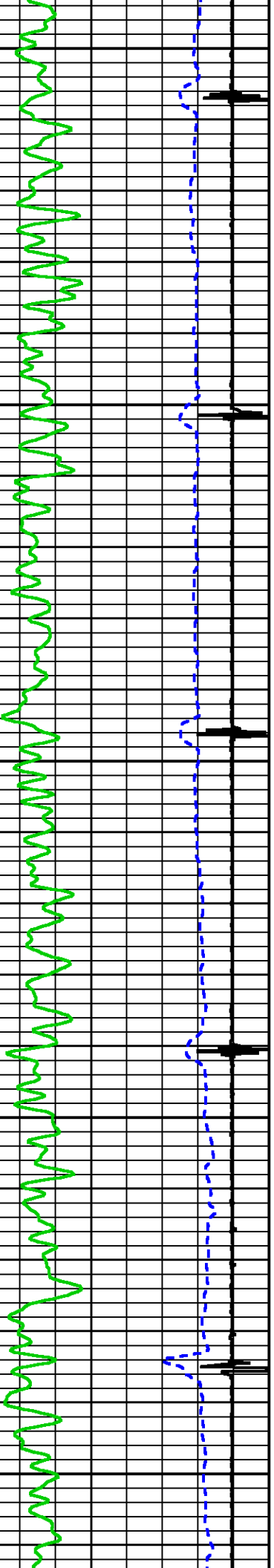


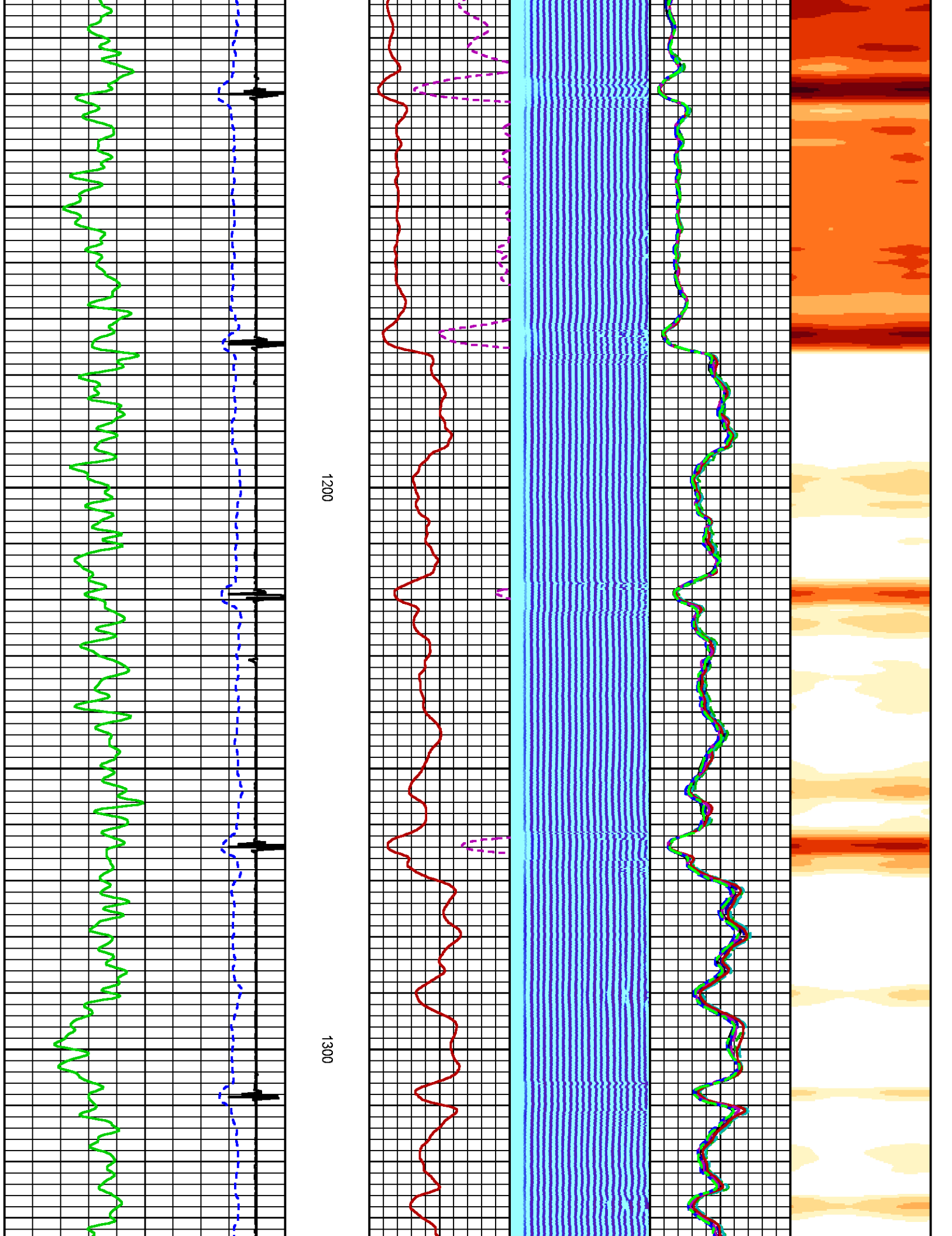


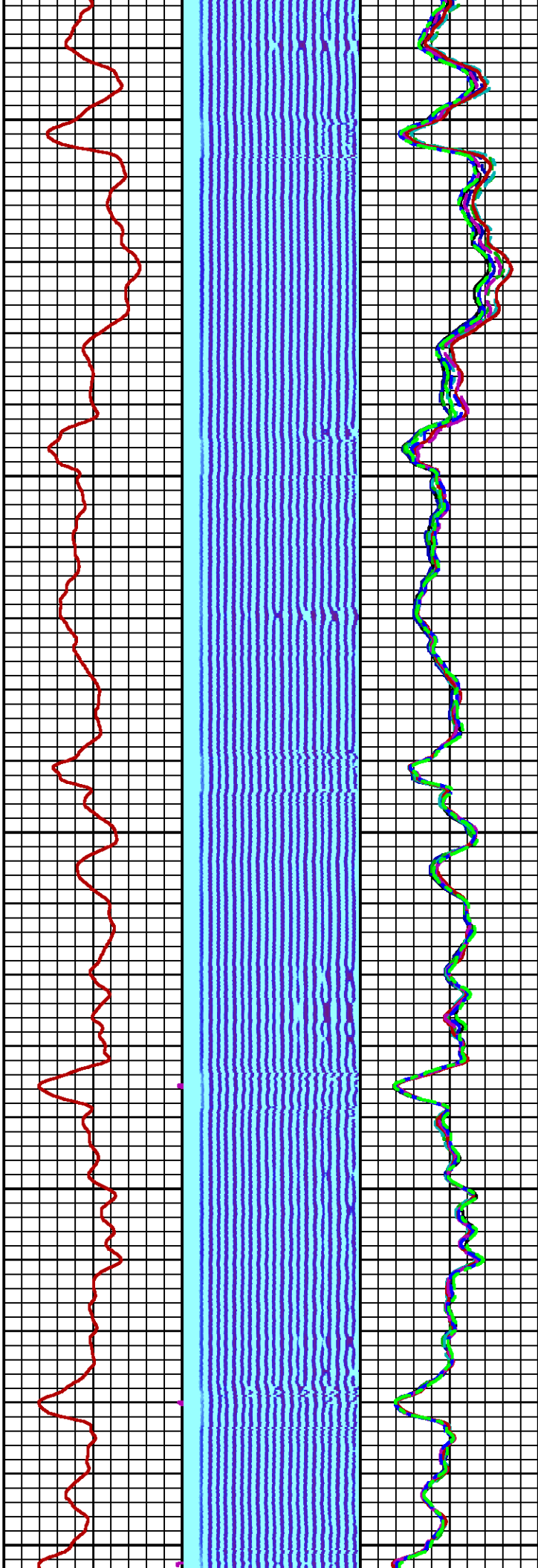
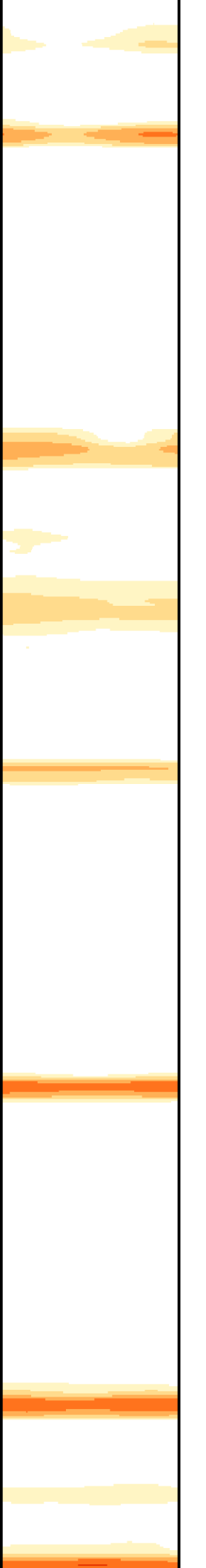
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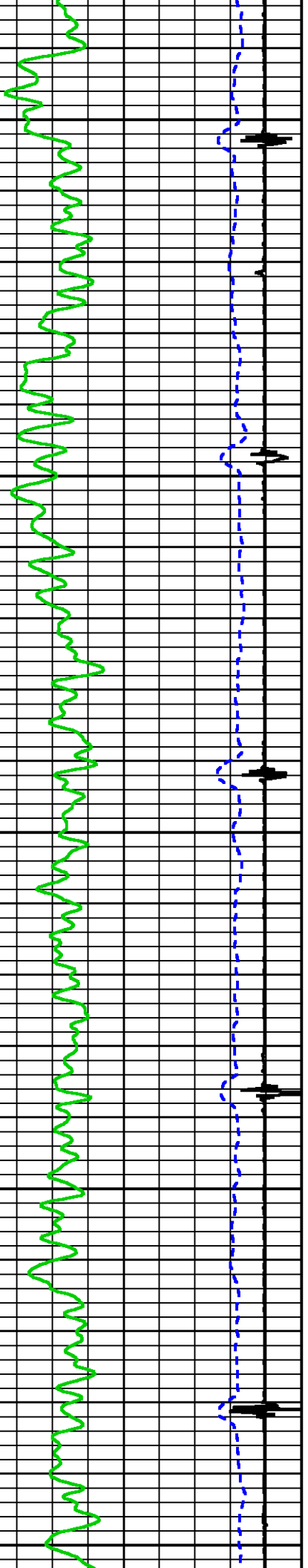


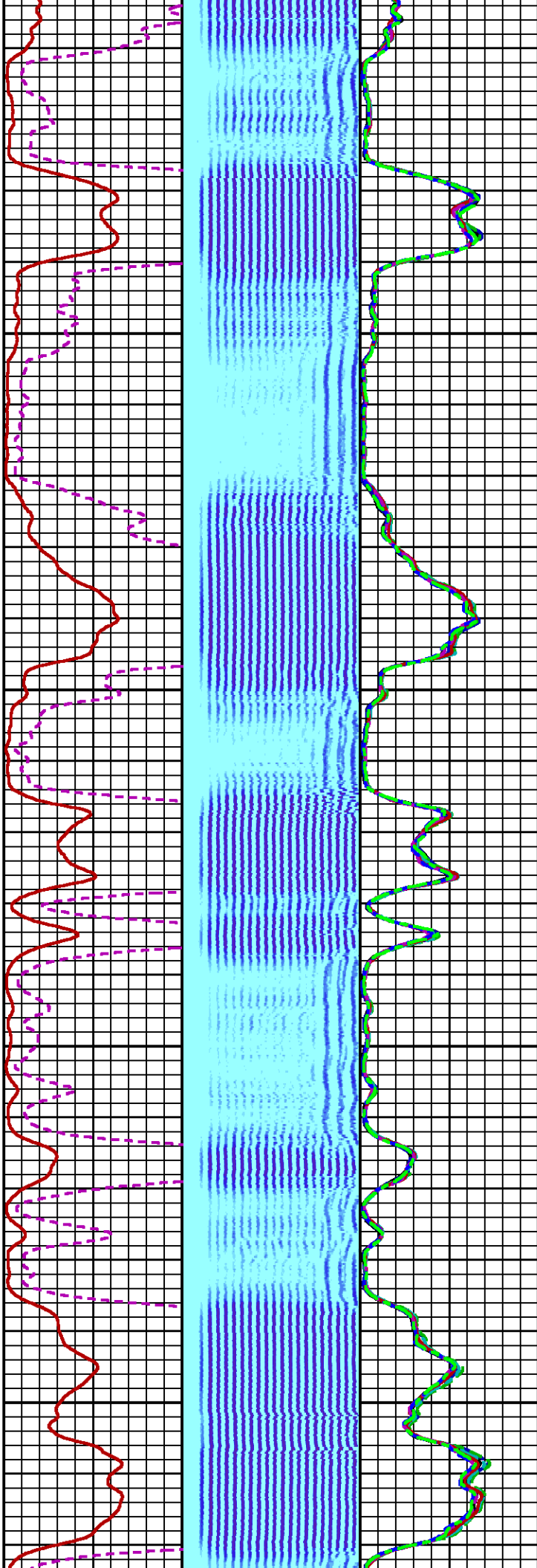




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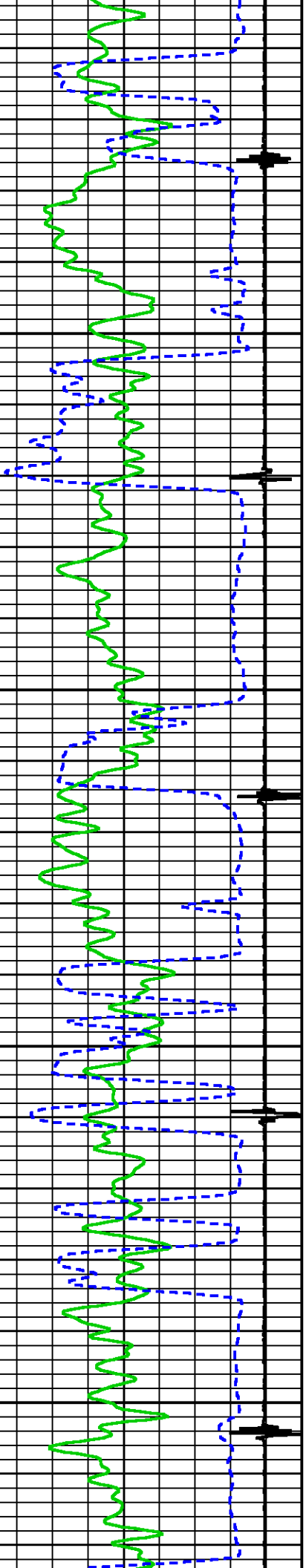
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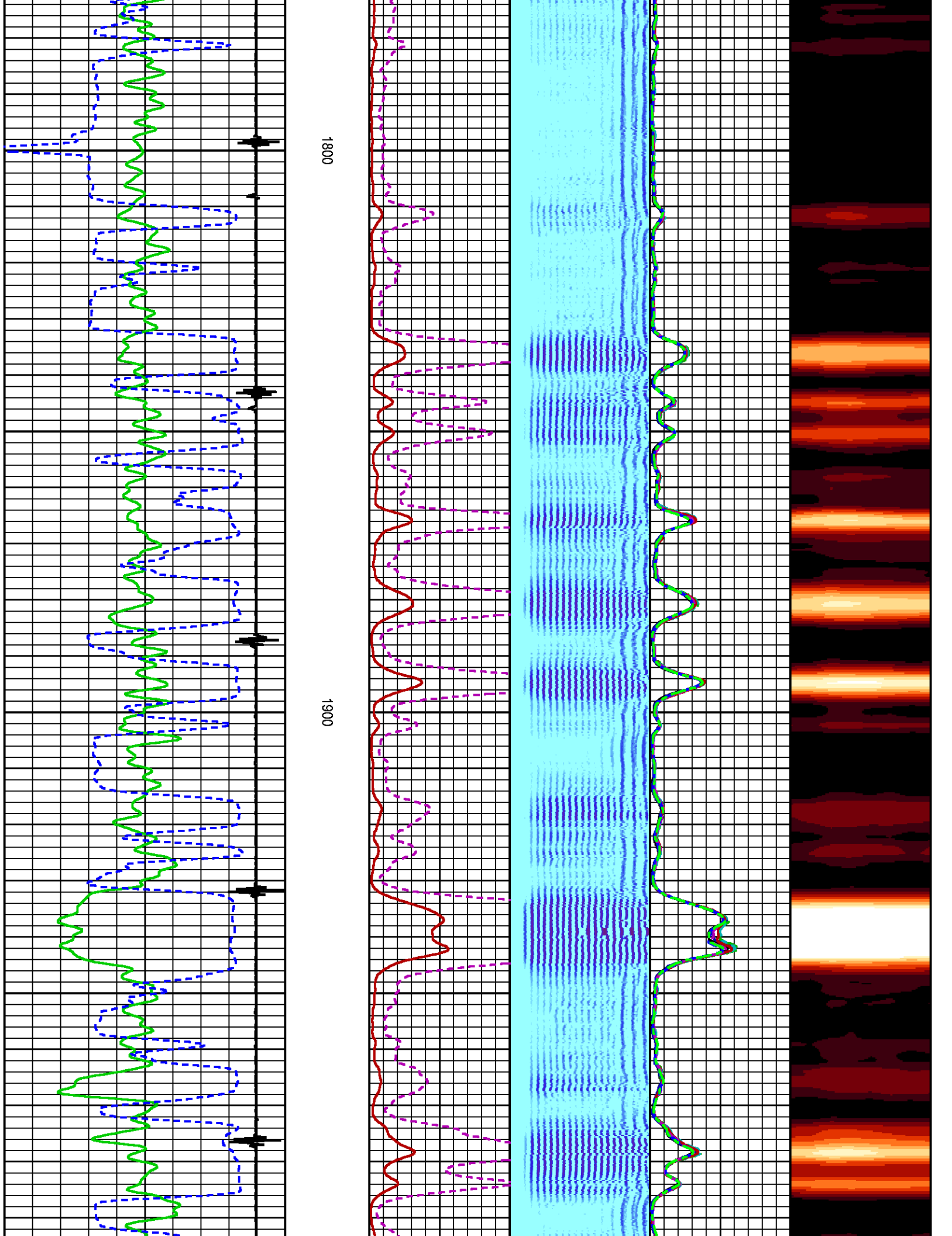


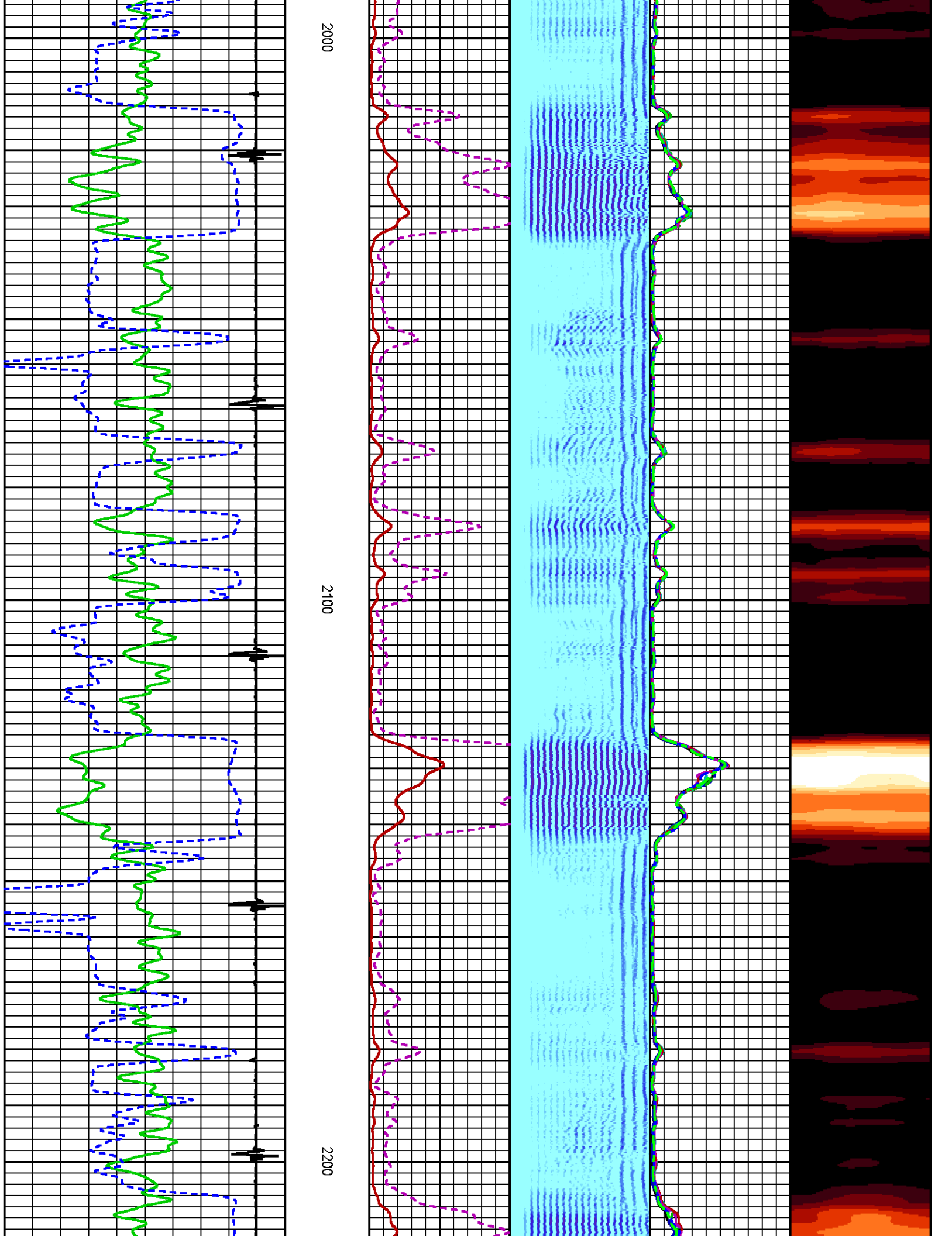


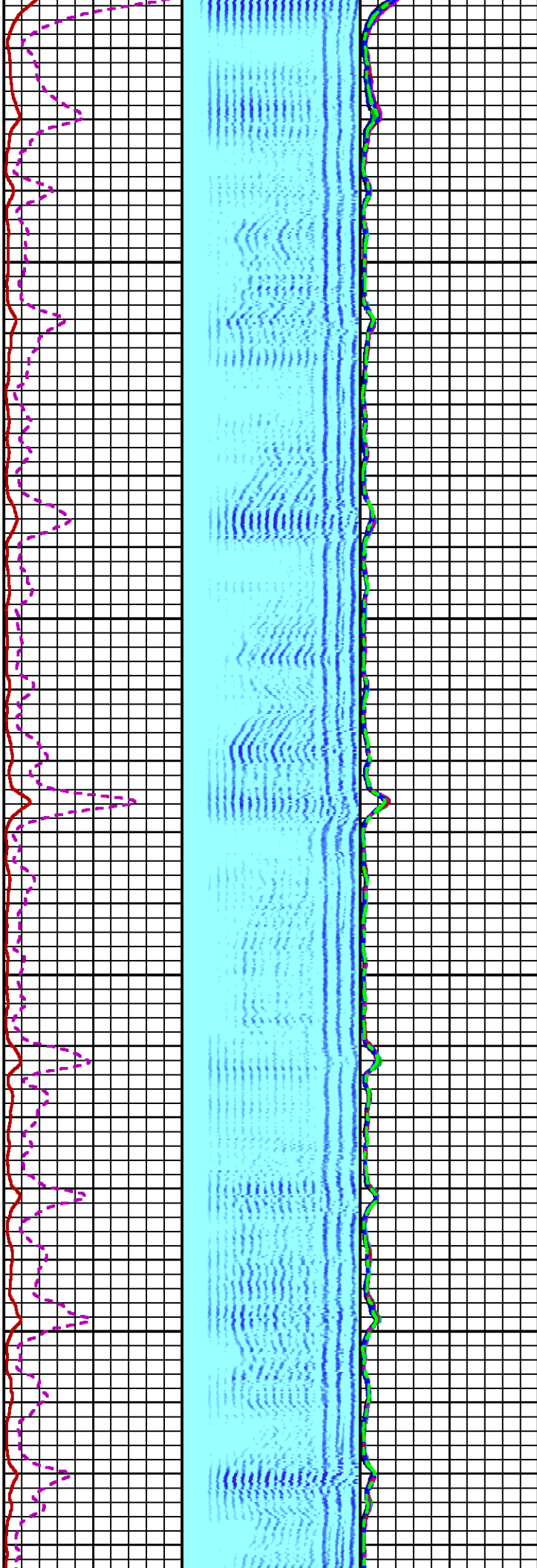
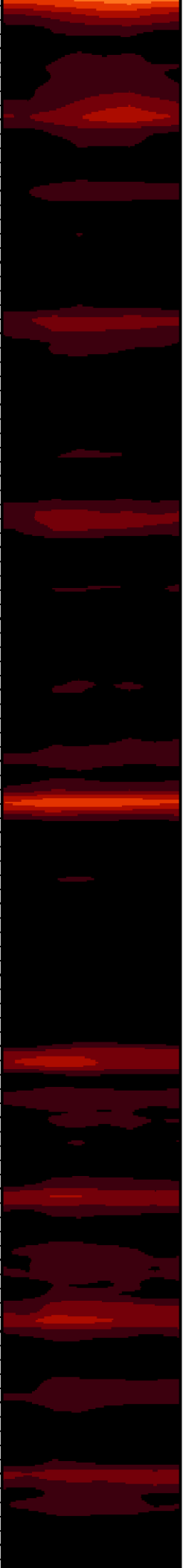
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1700



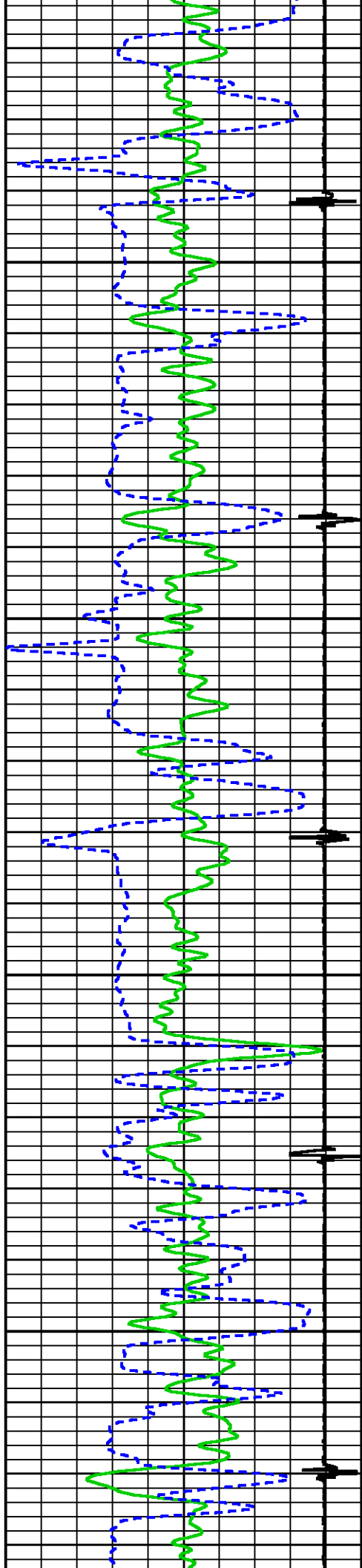


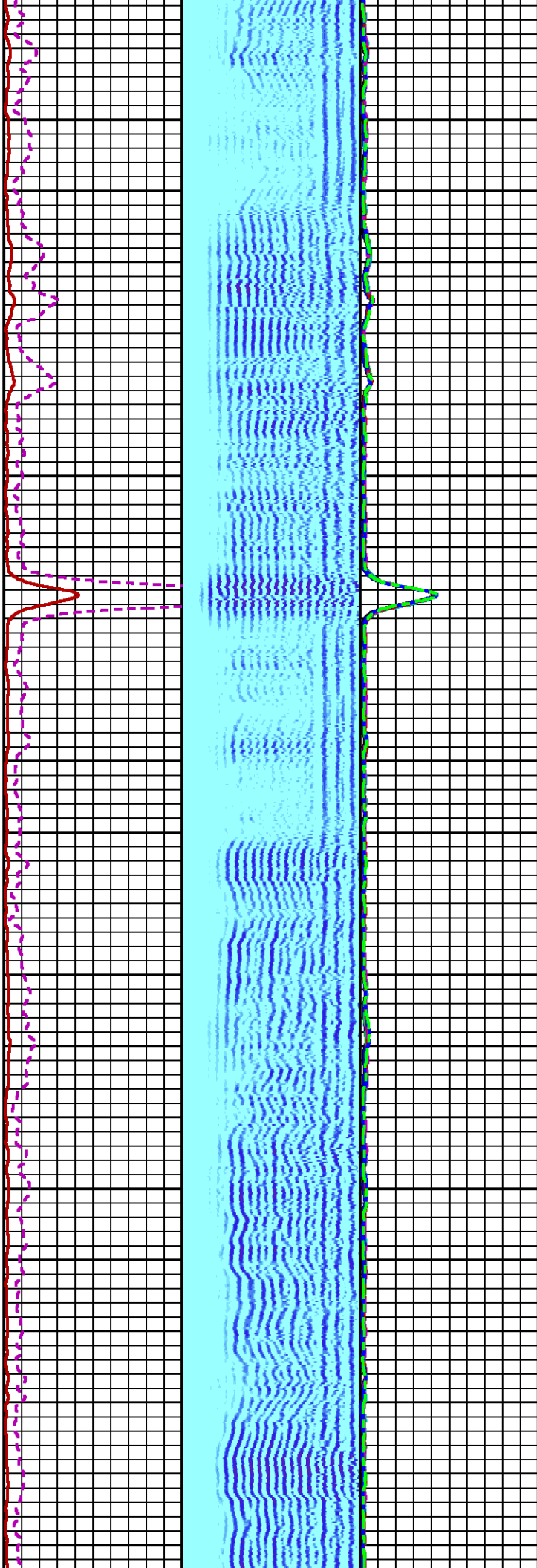




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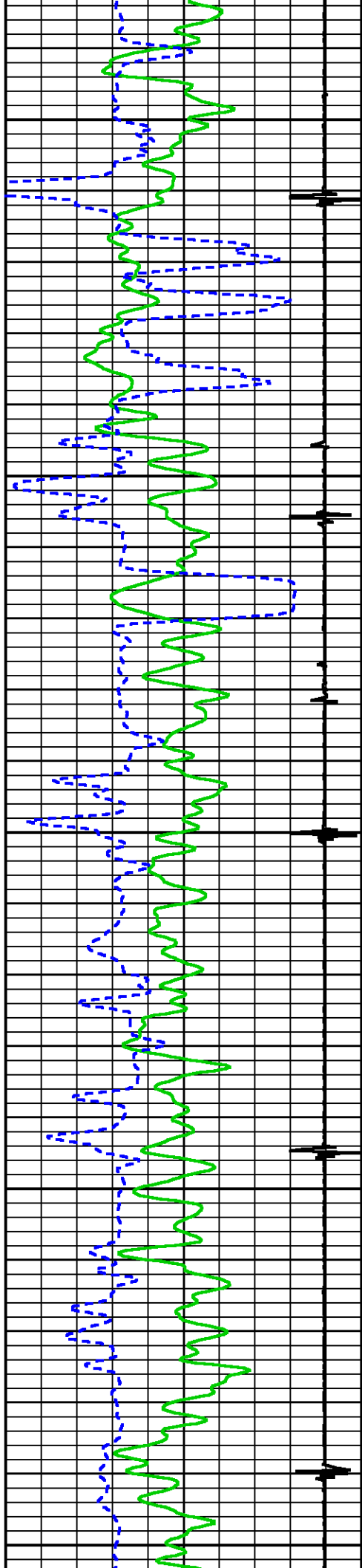
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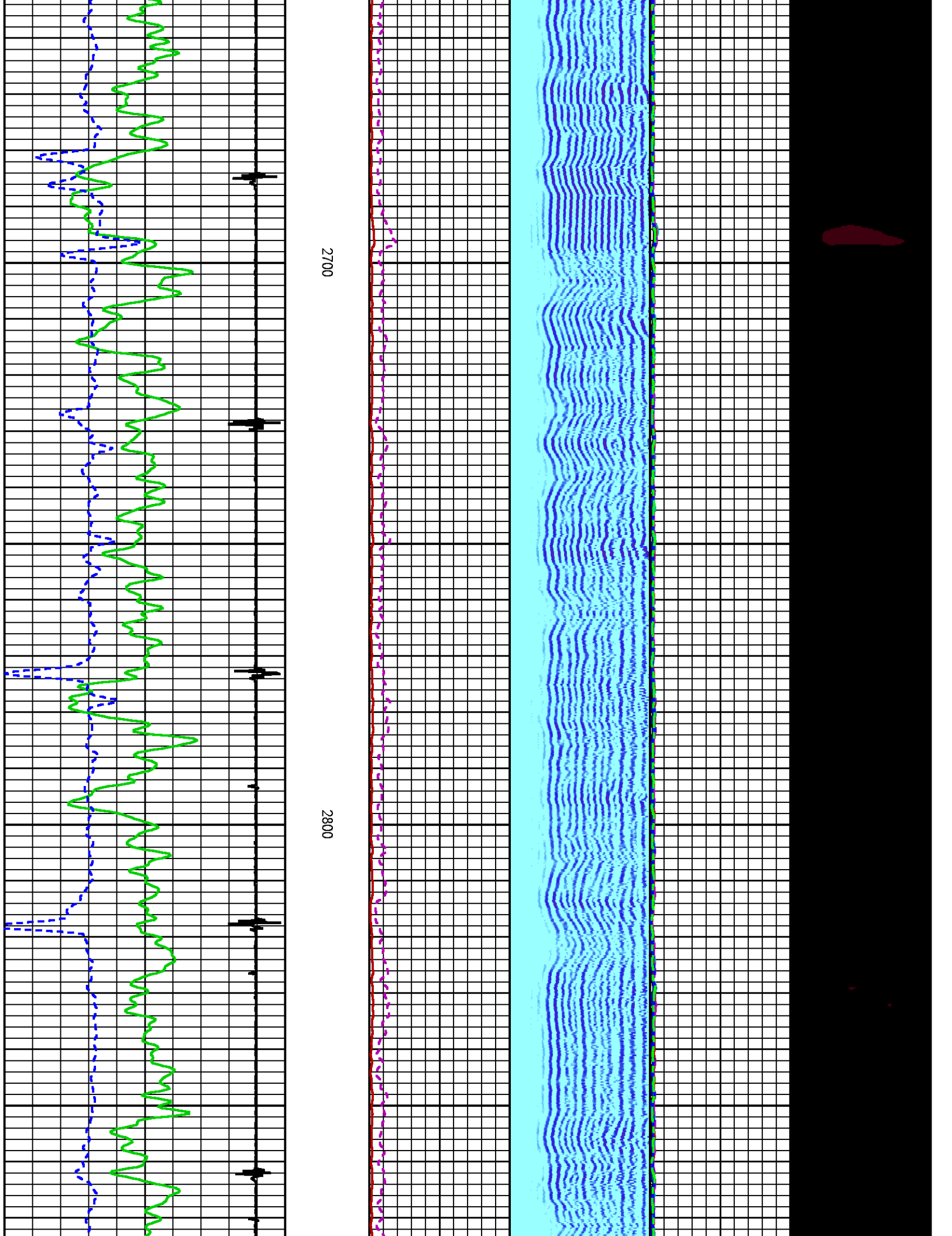


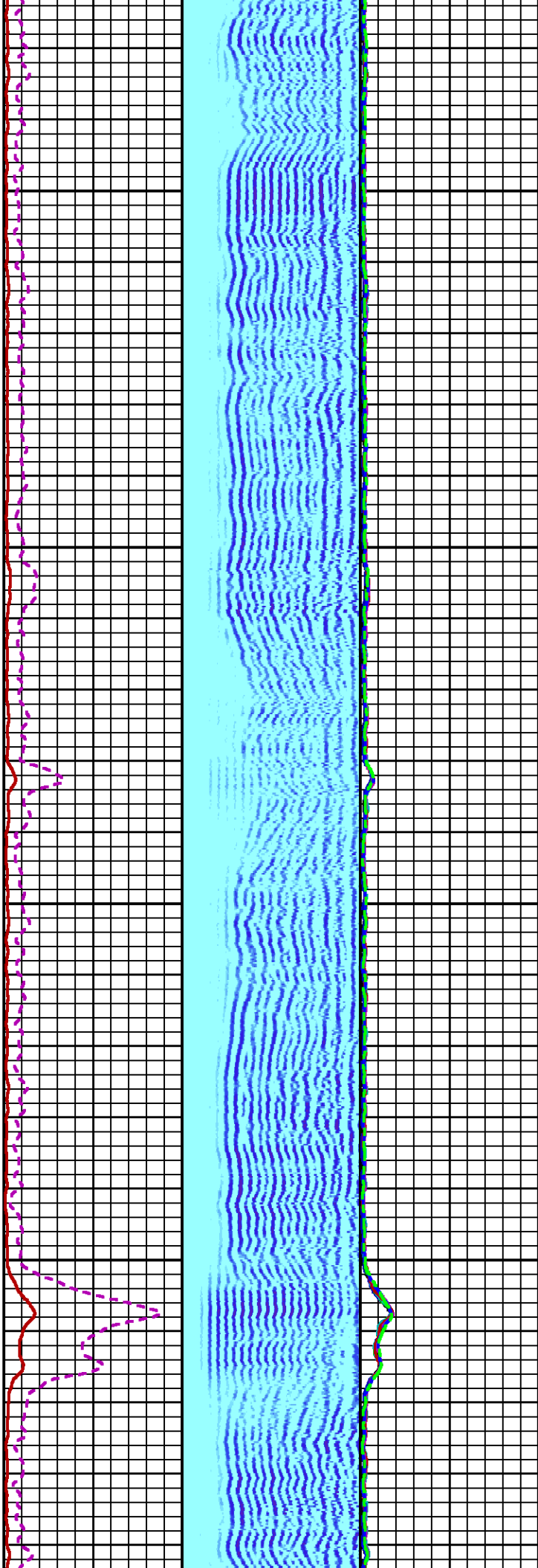


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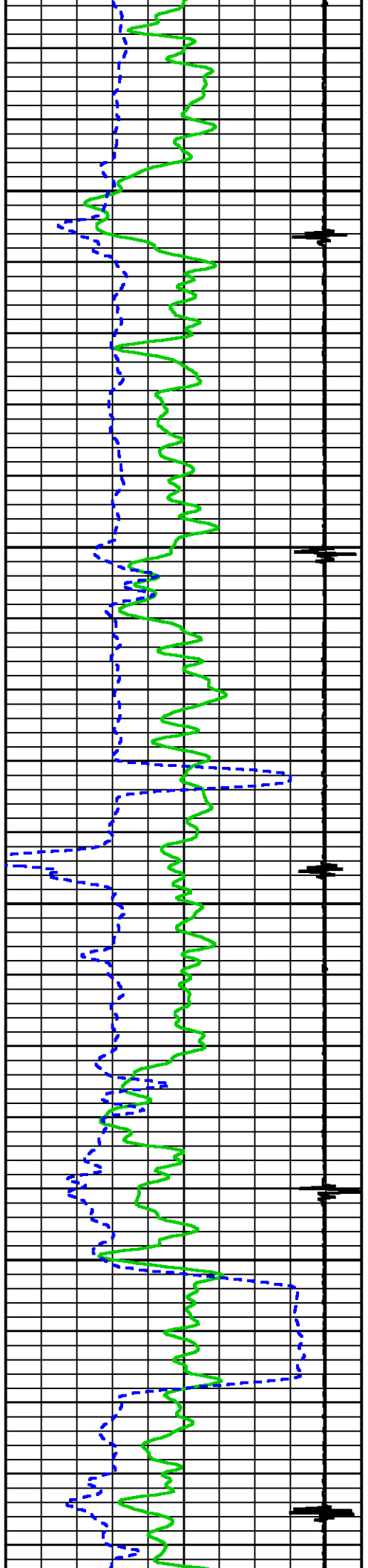


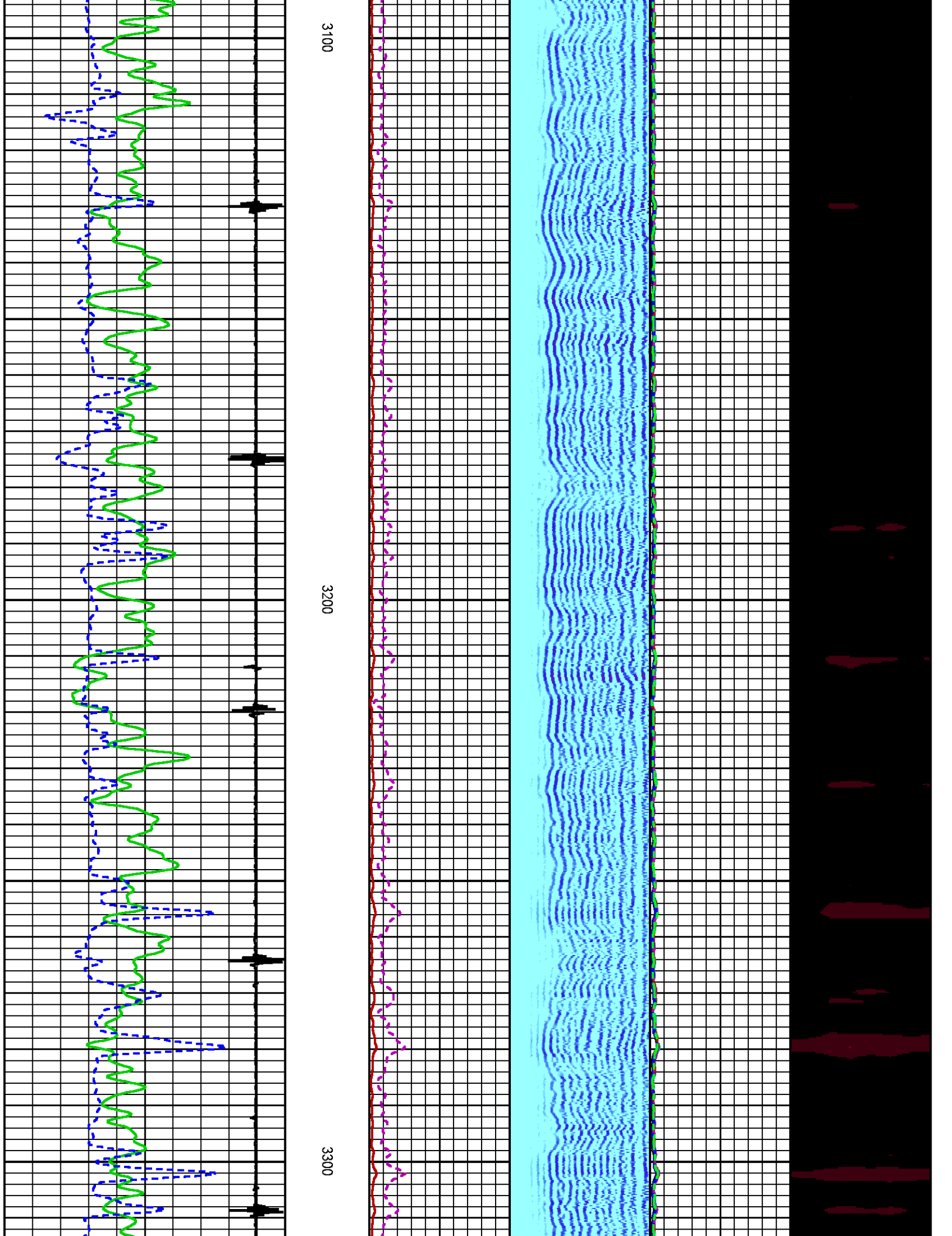


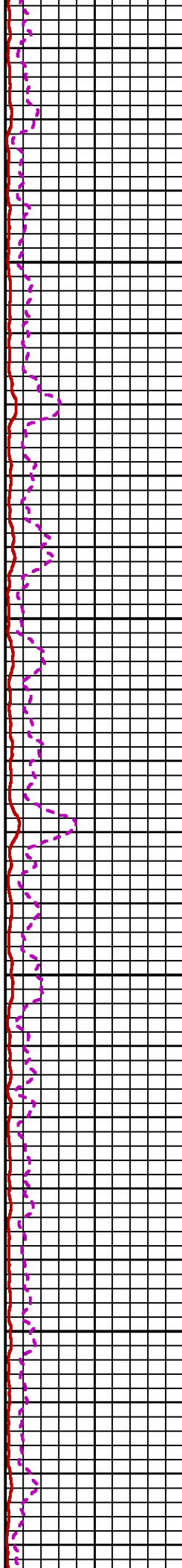
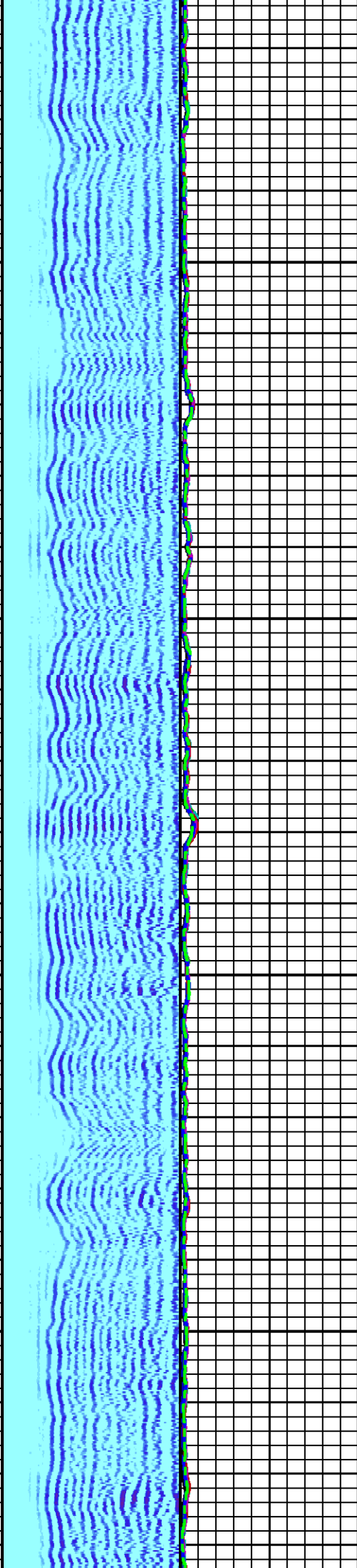


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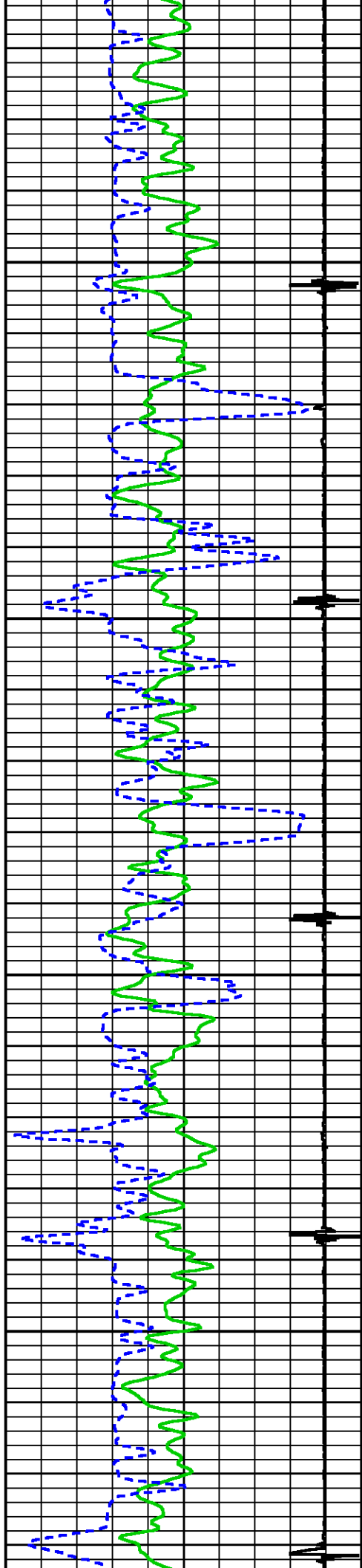


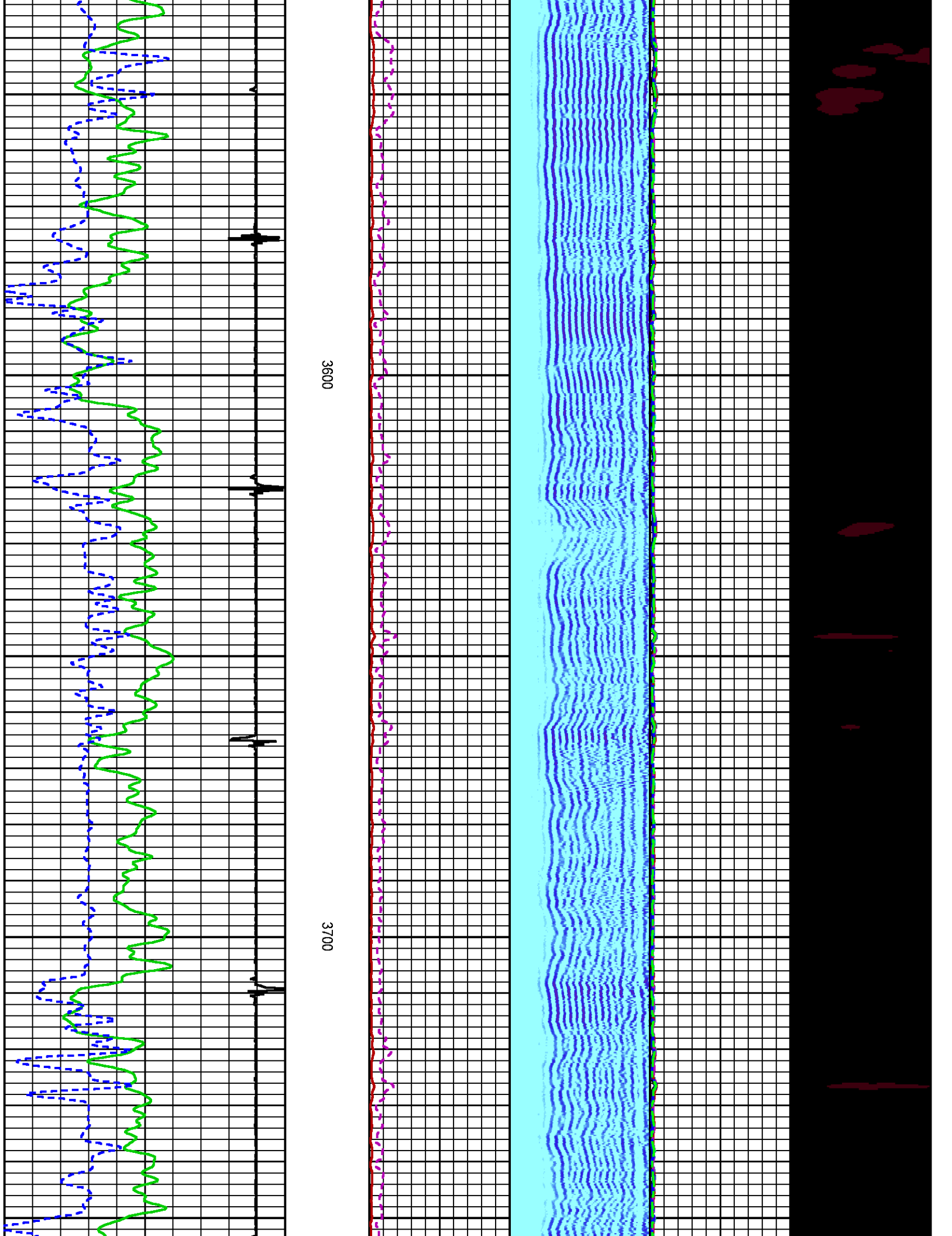


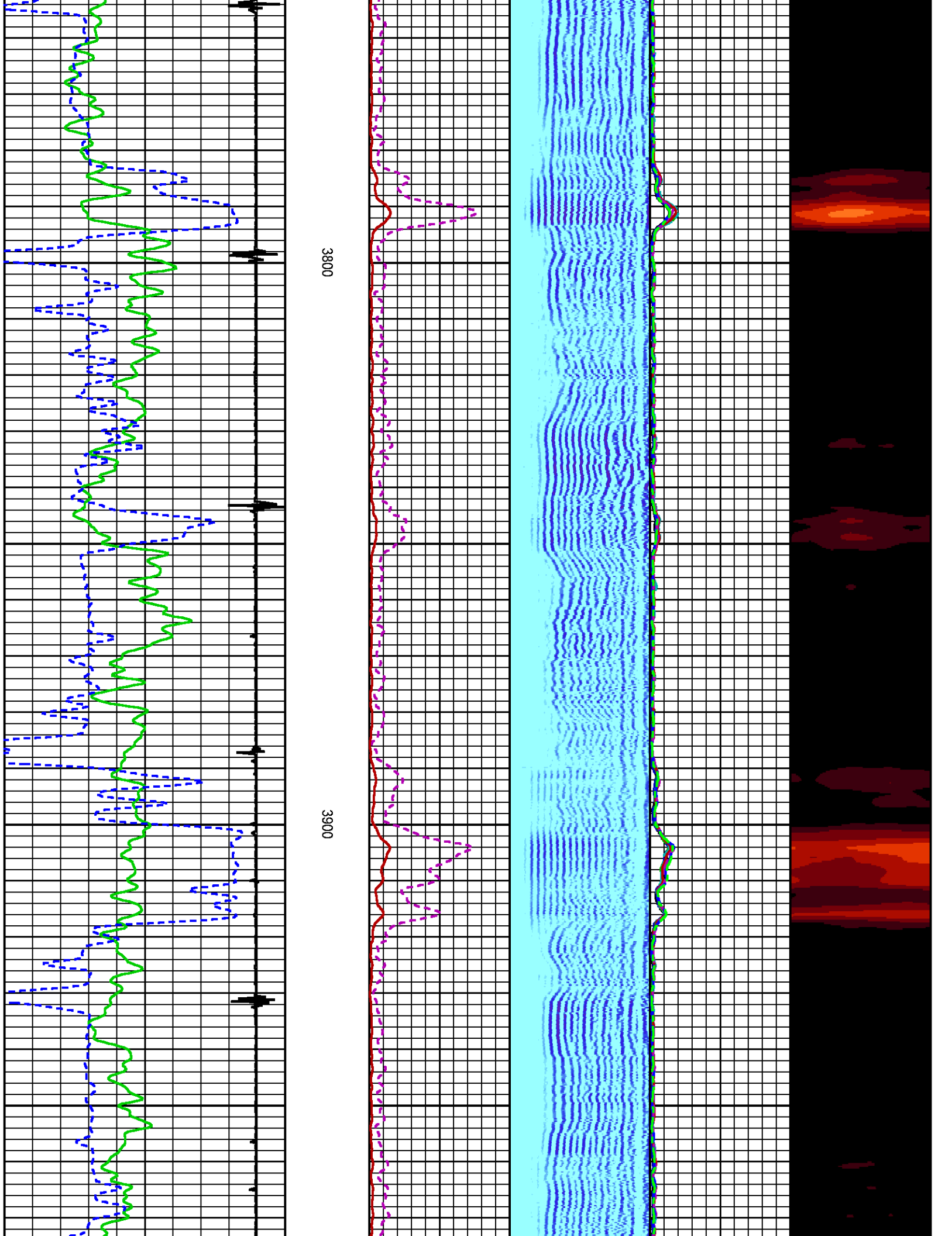


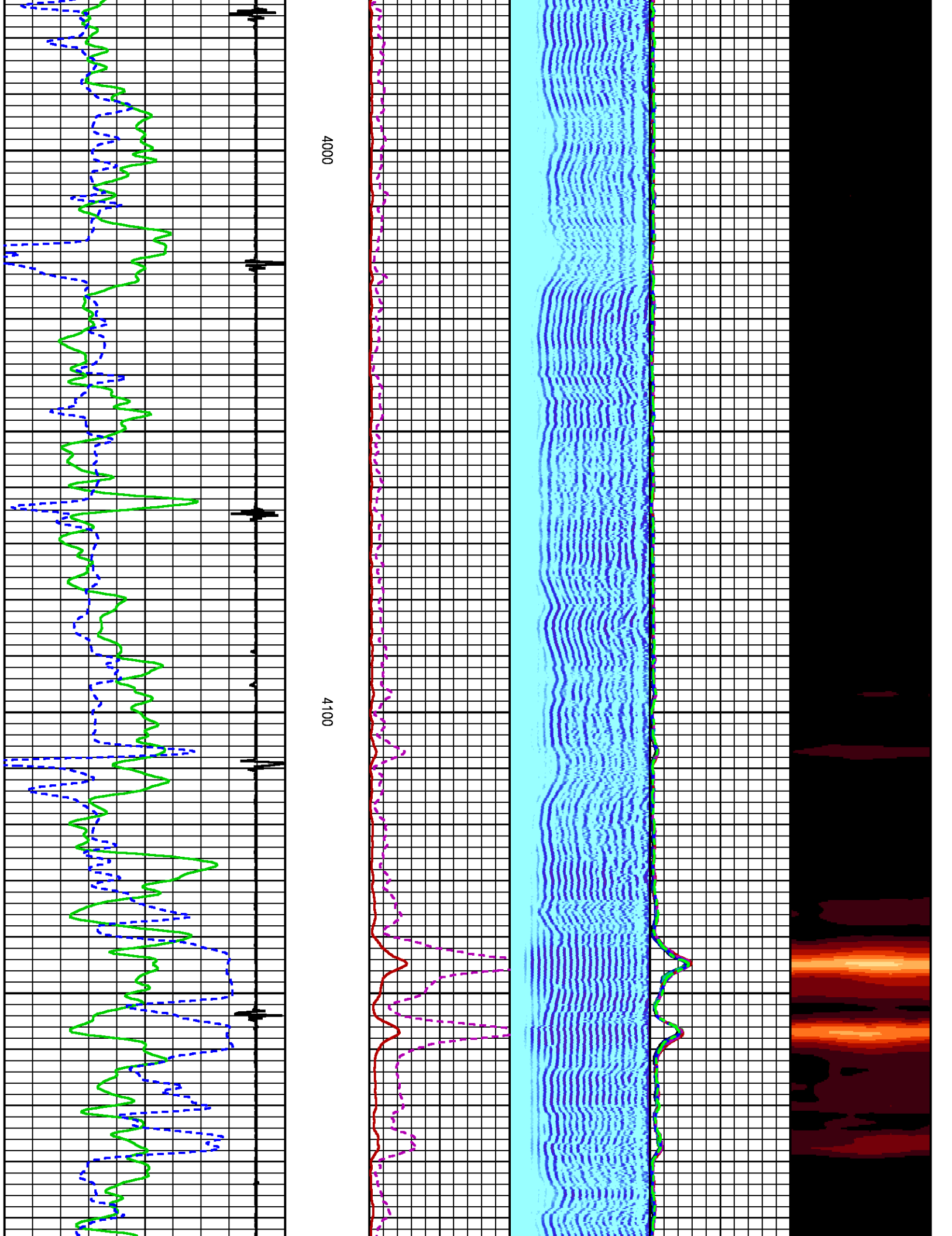
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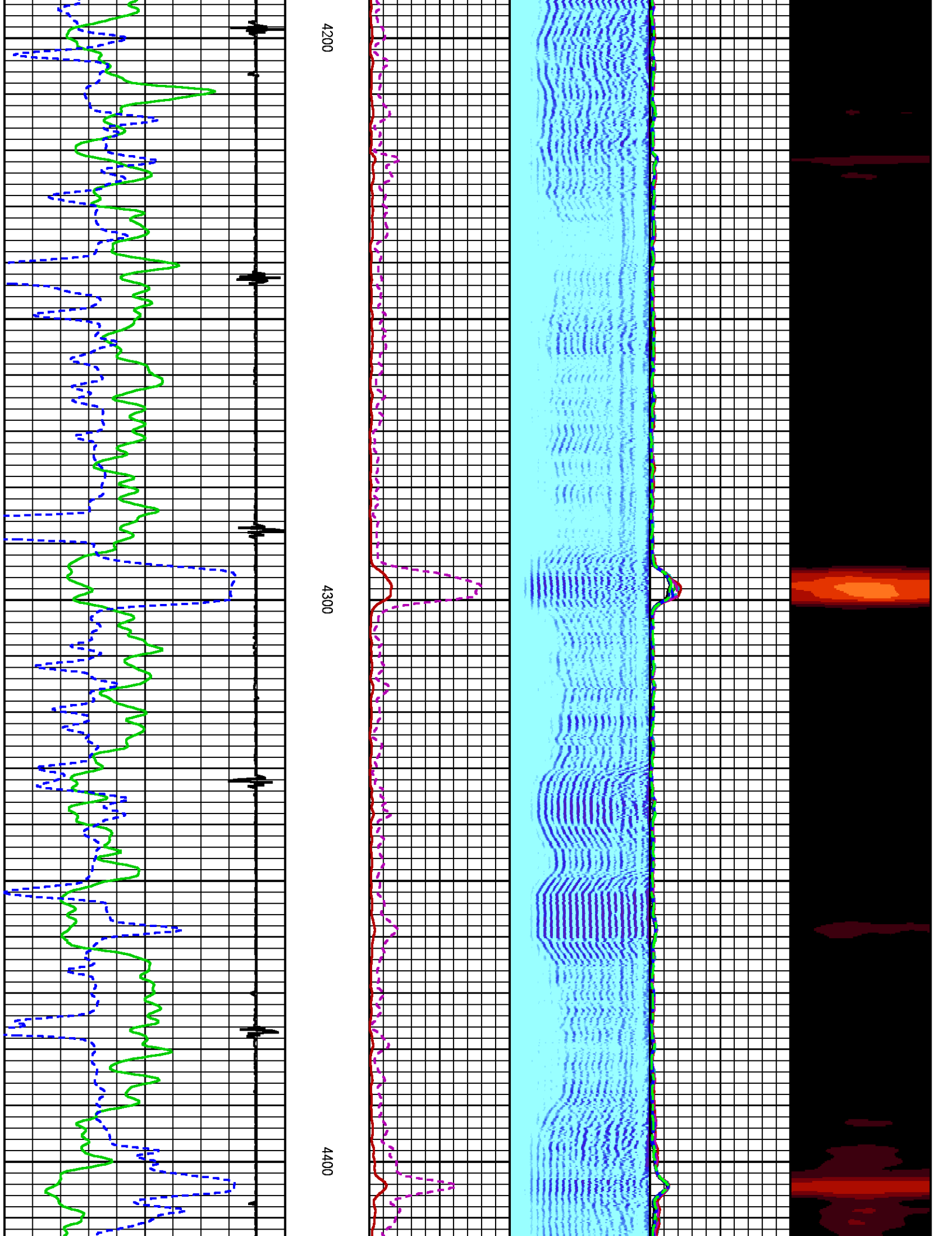
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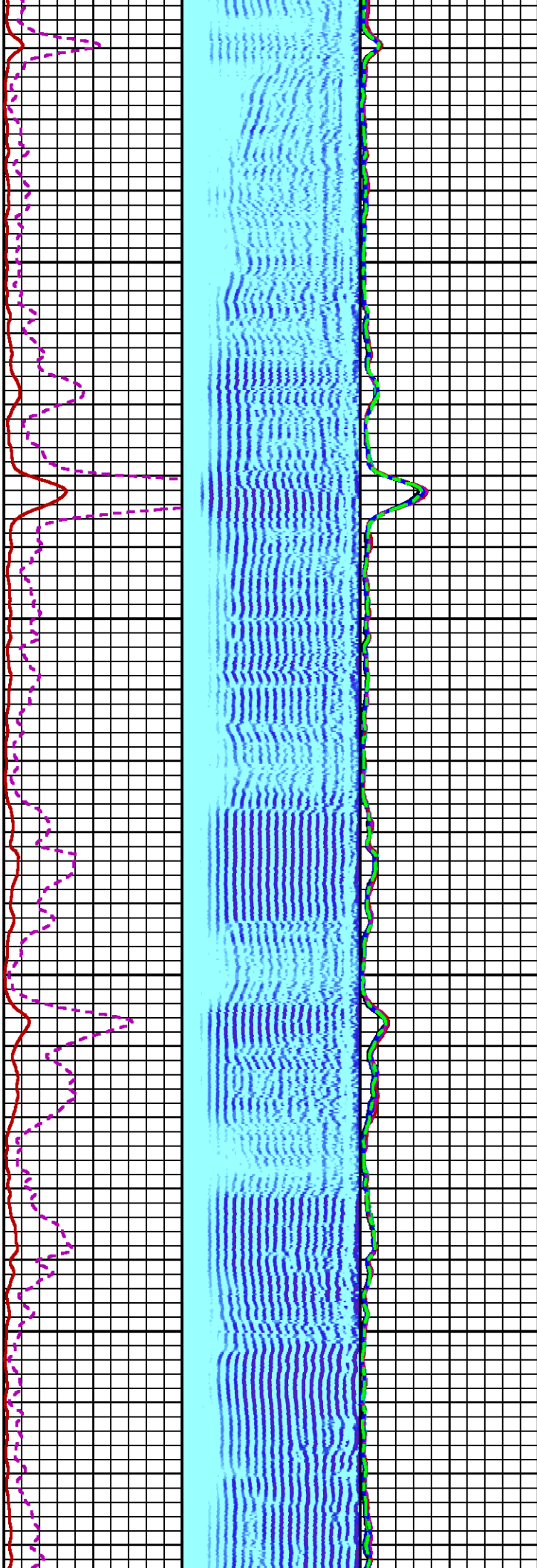






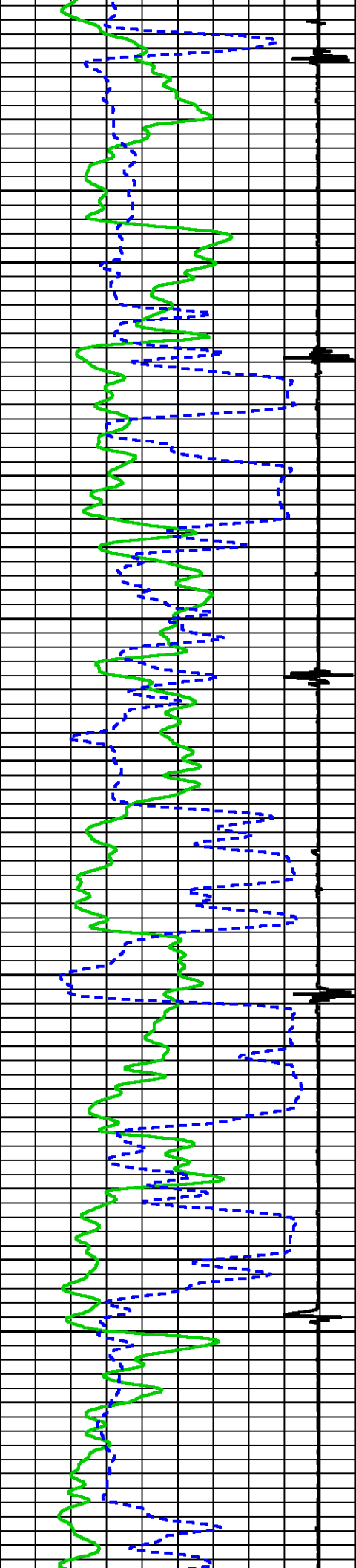


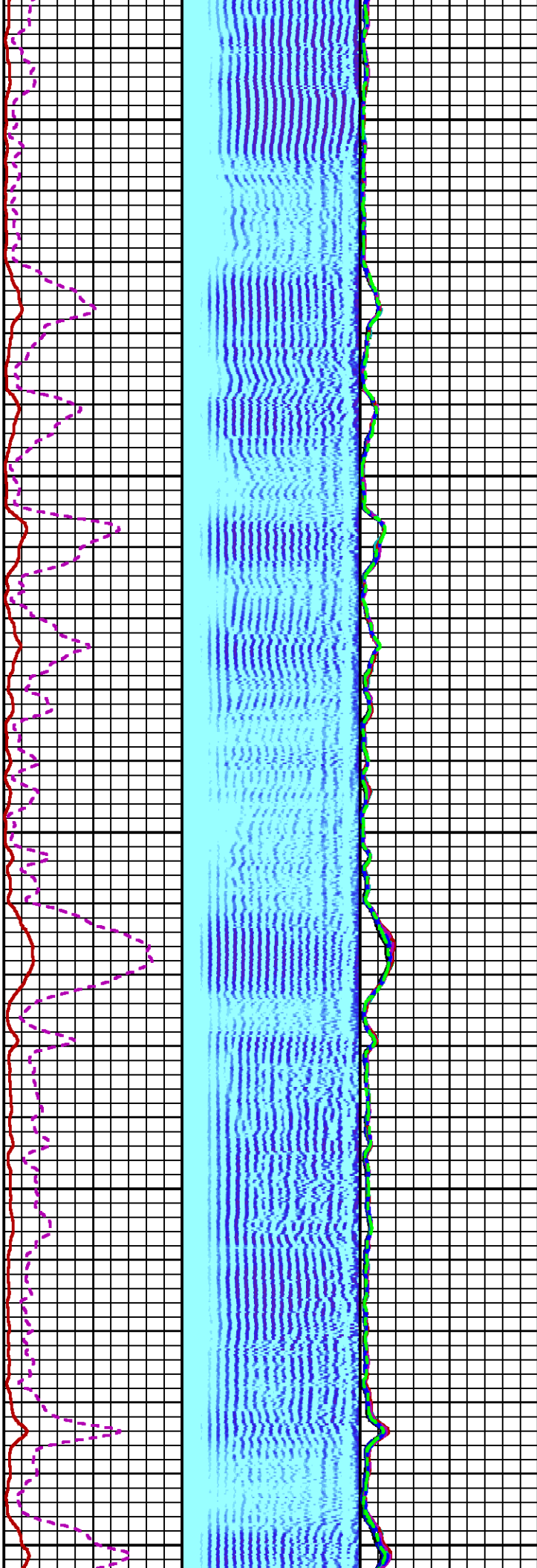




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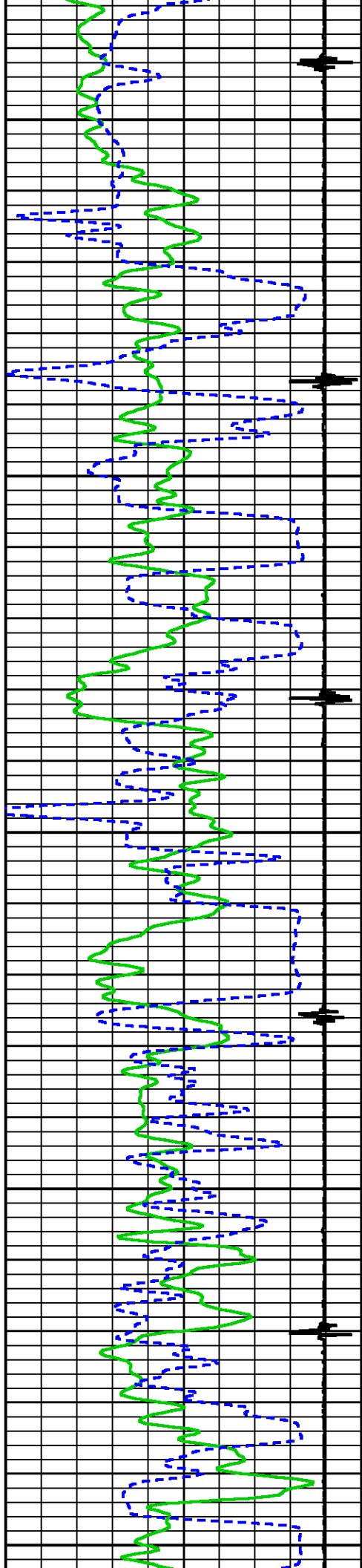
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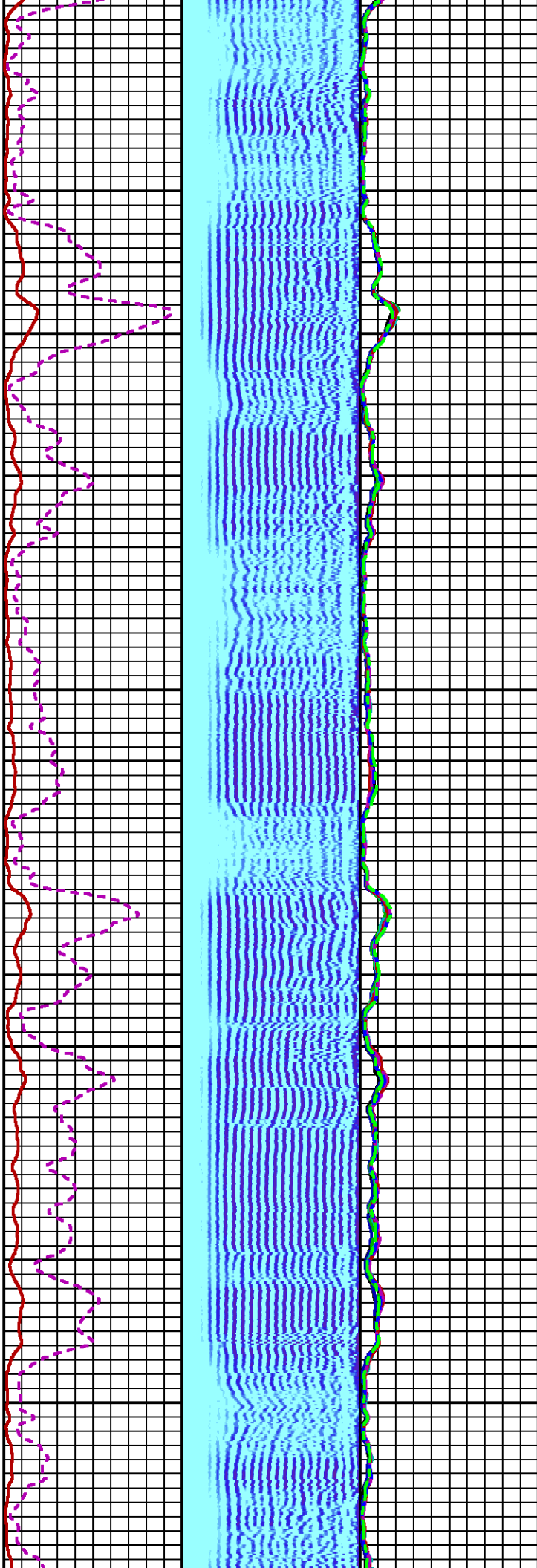




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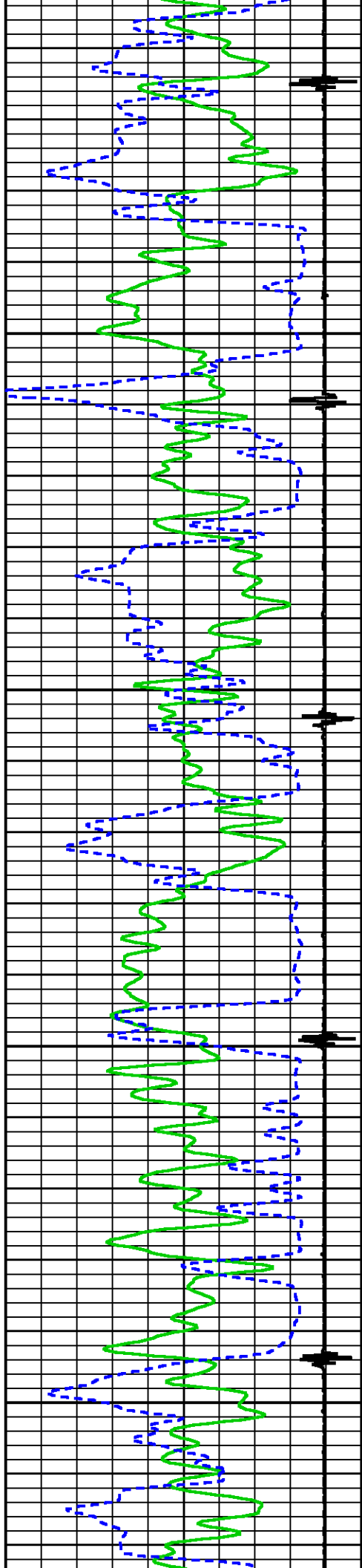
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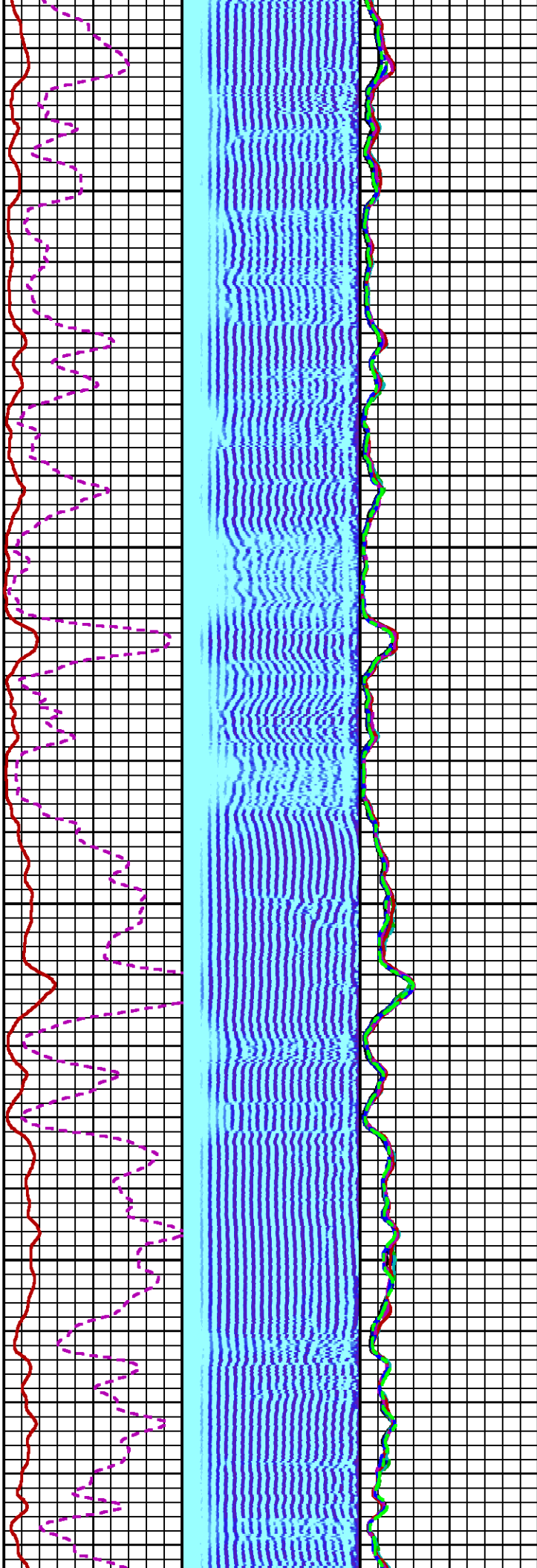




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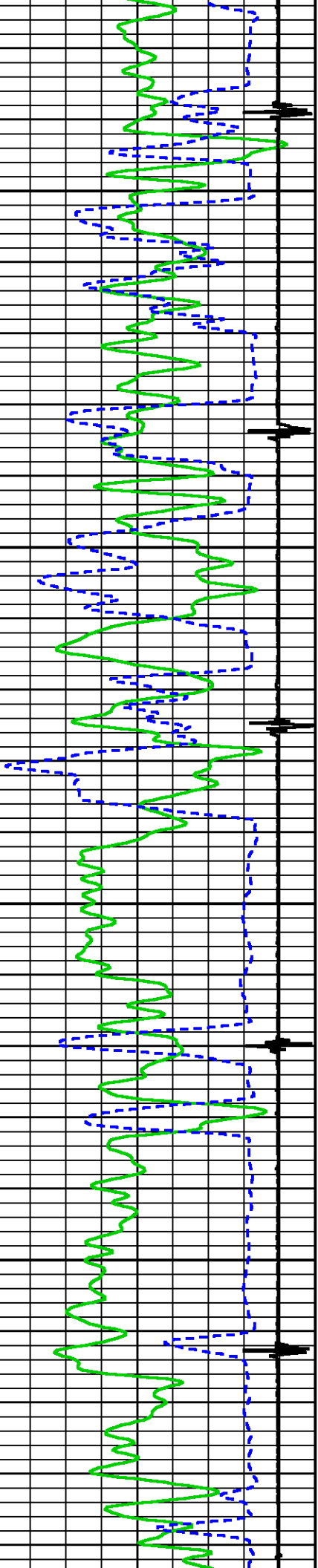
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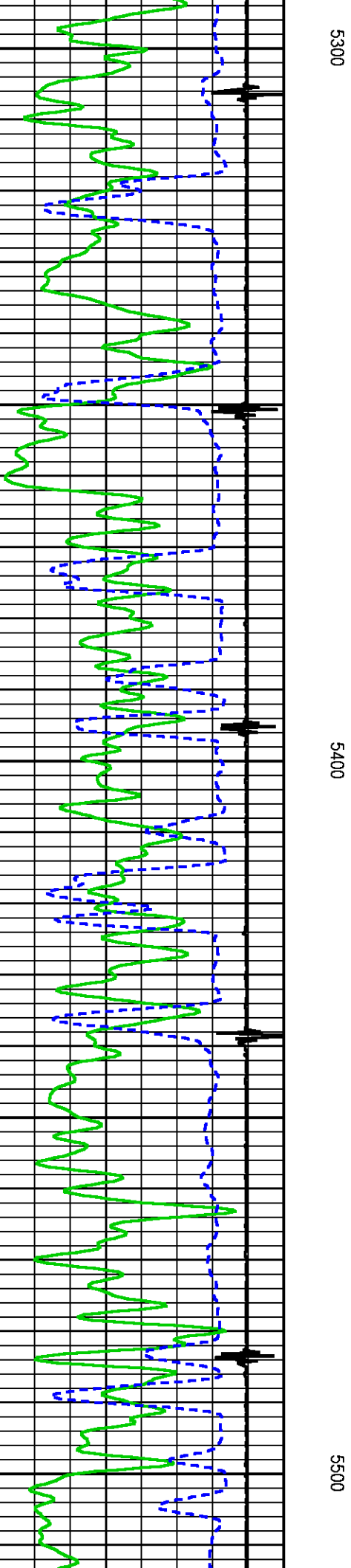
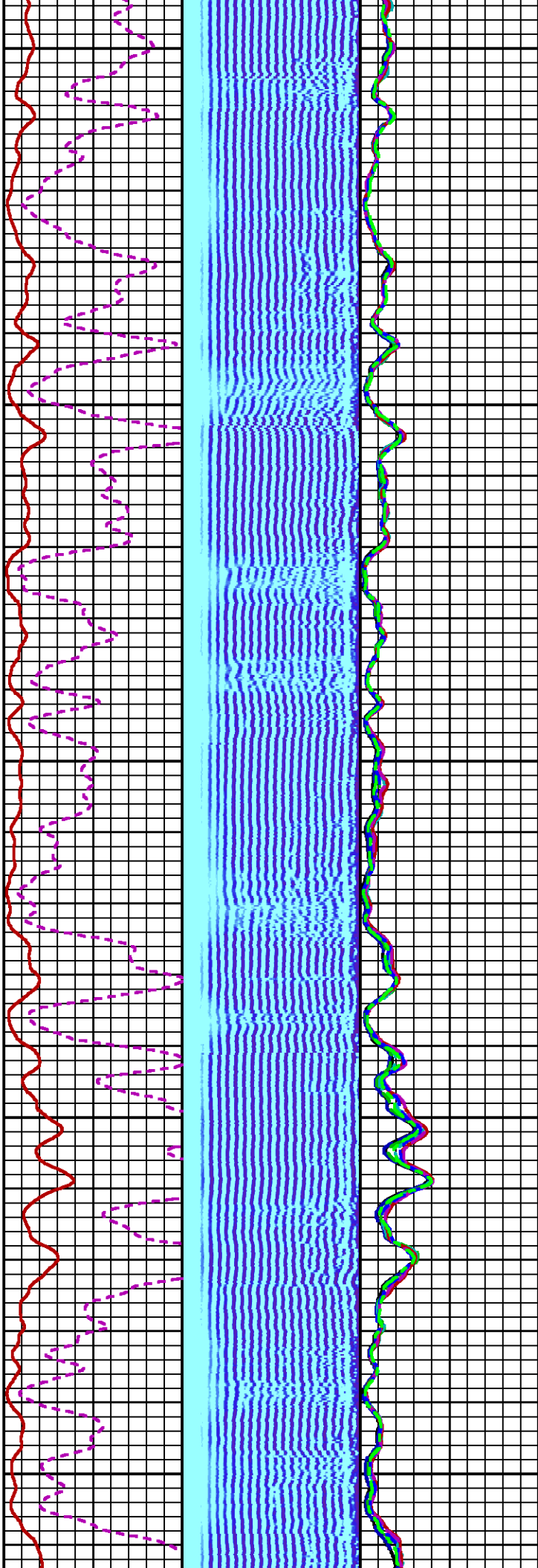


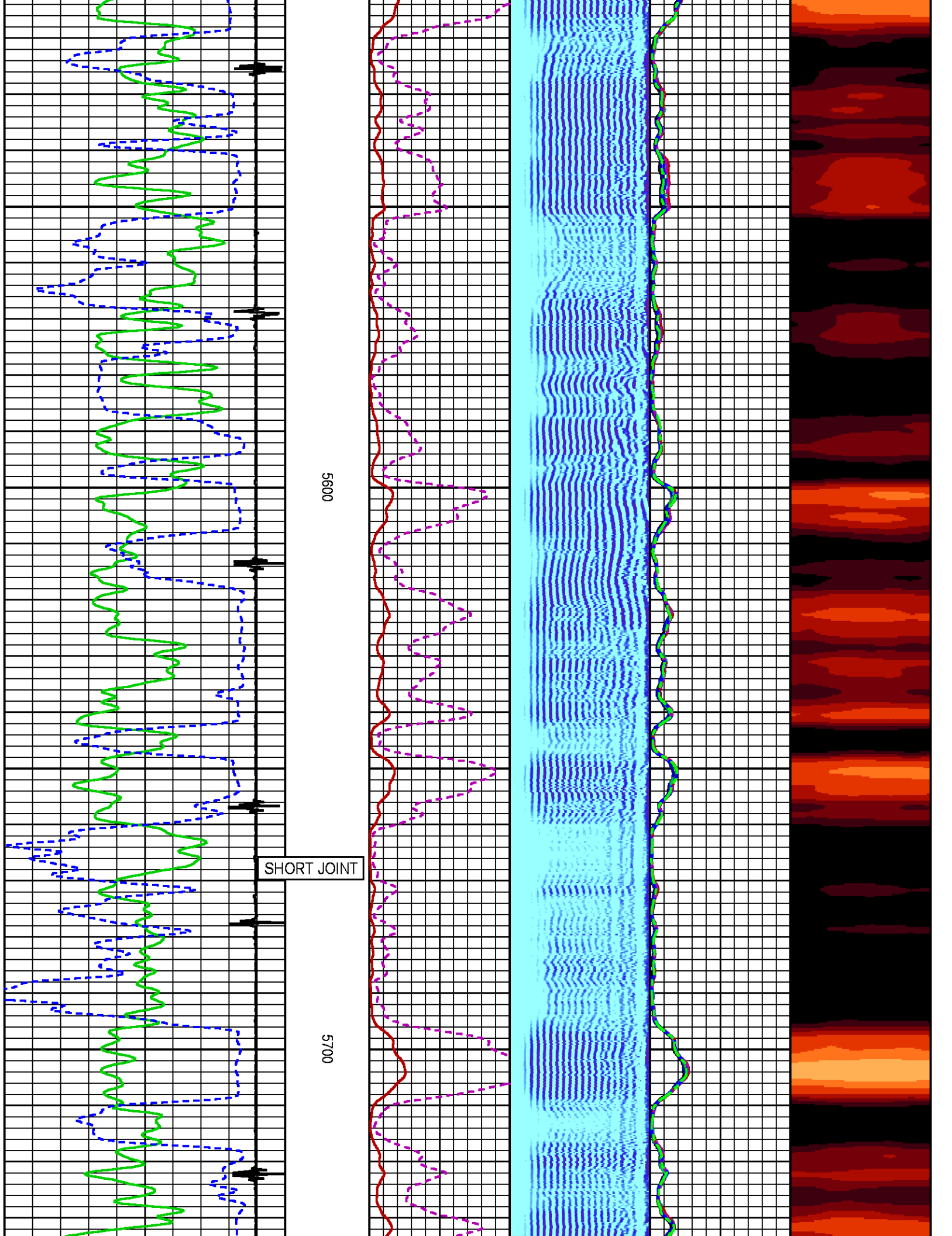


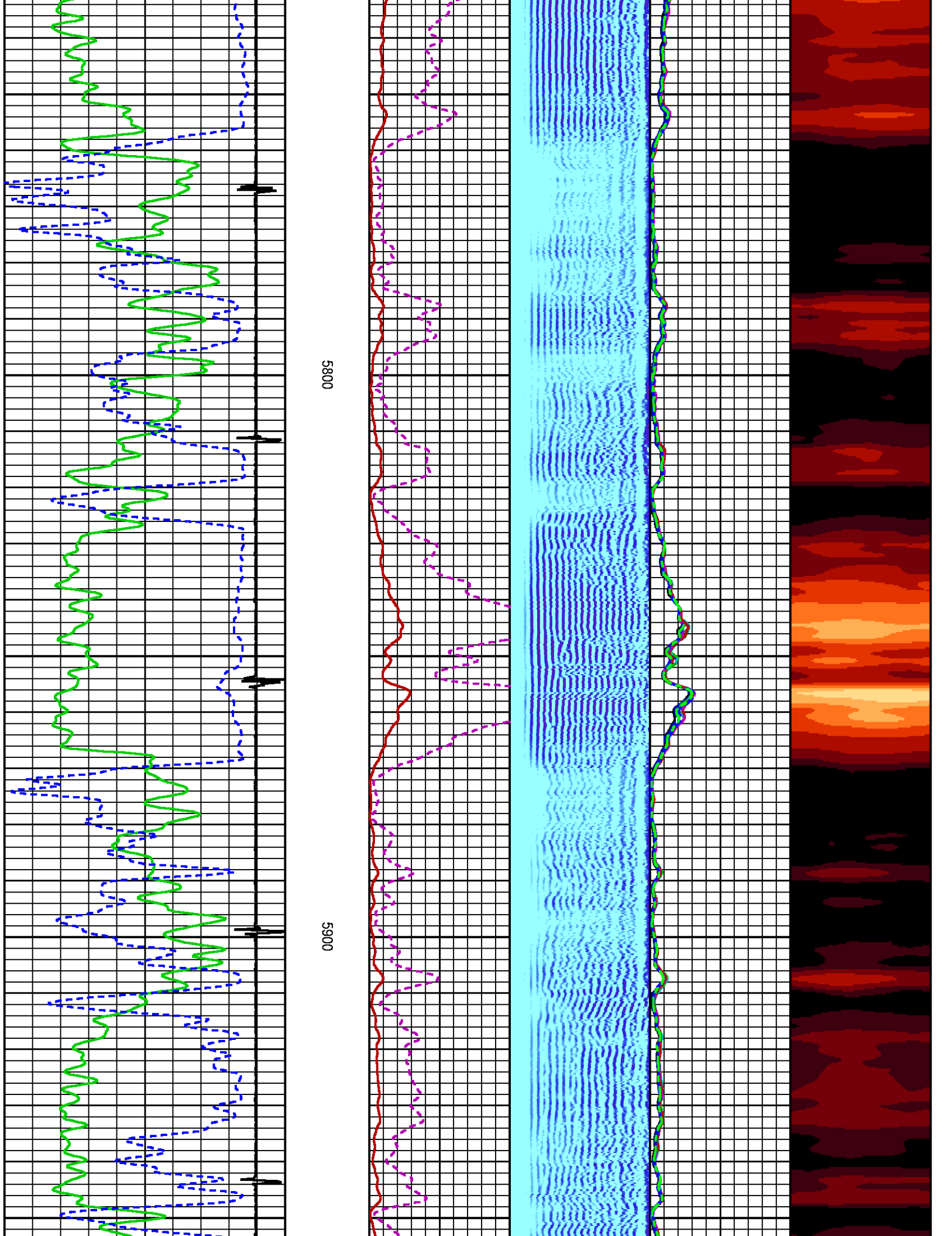
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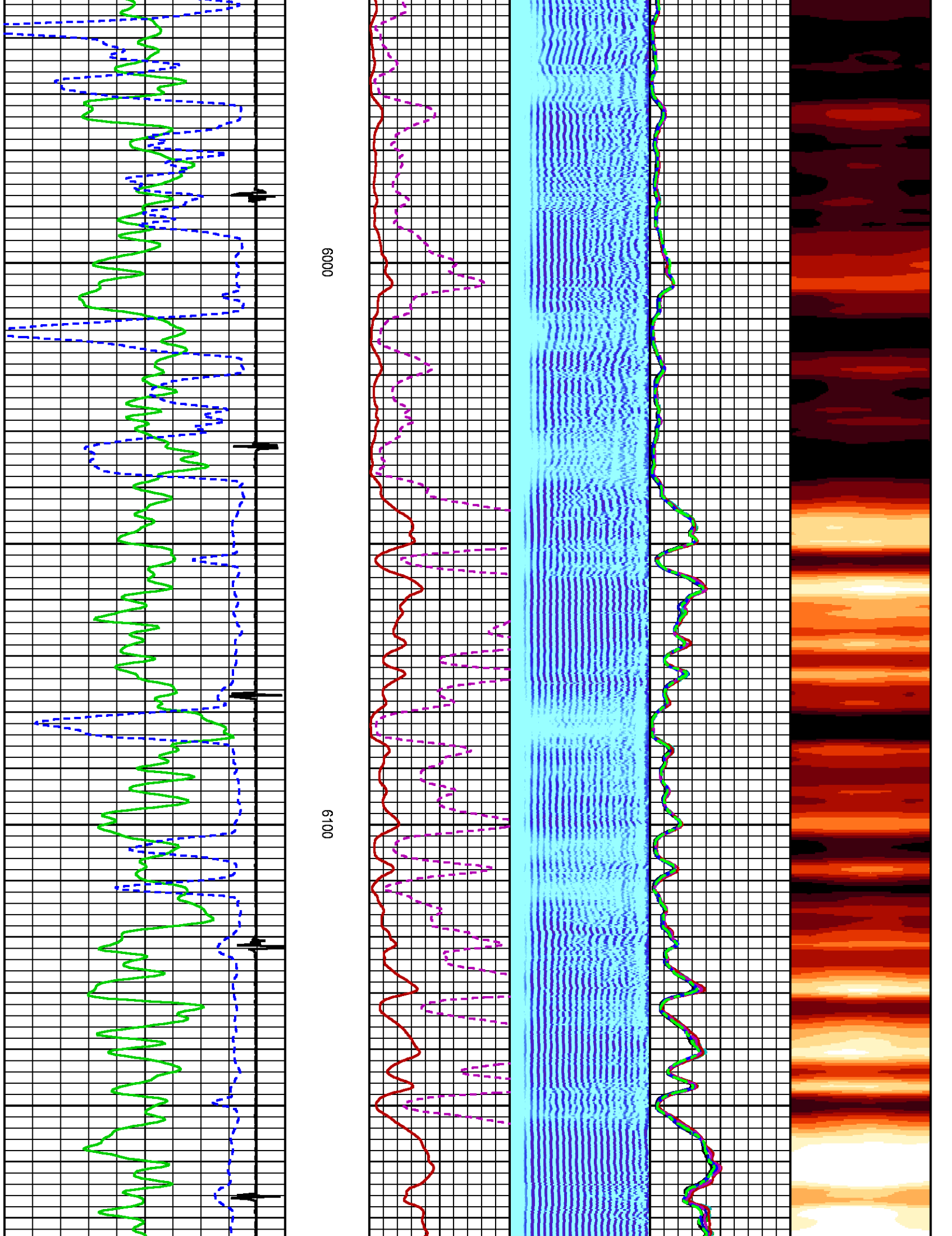
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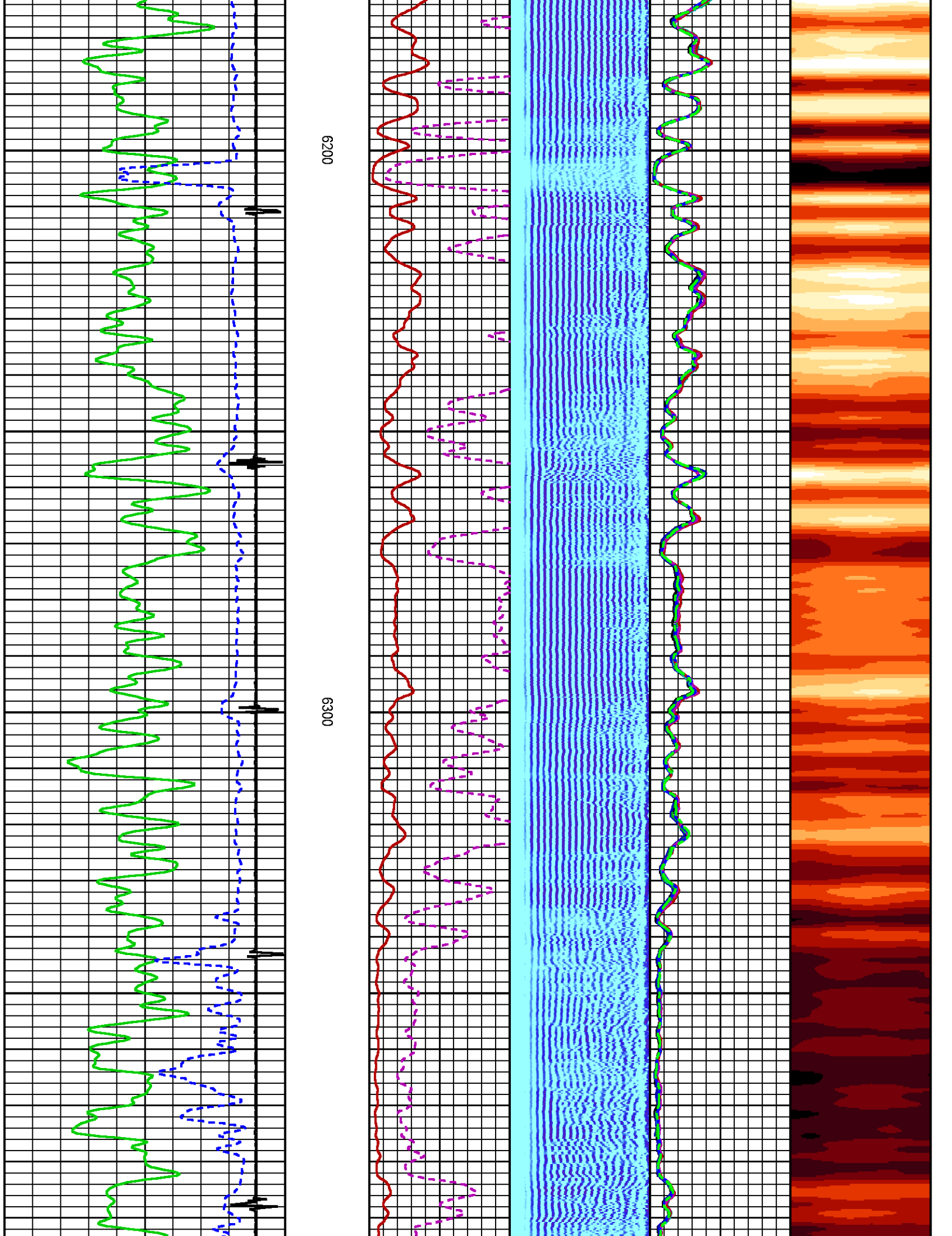


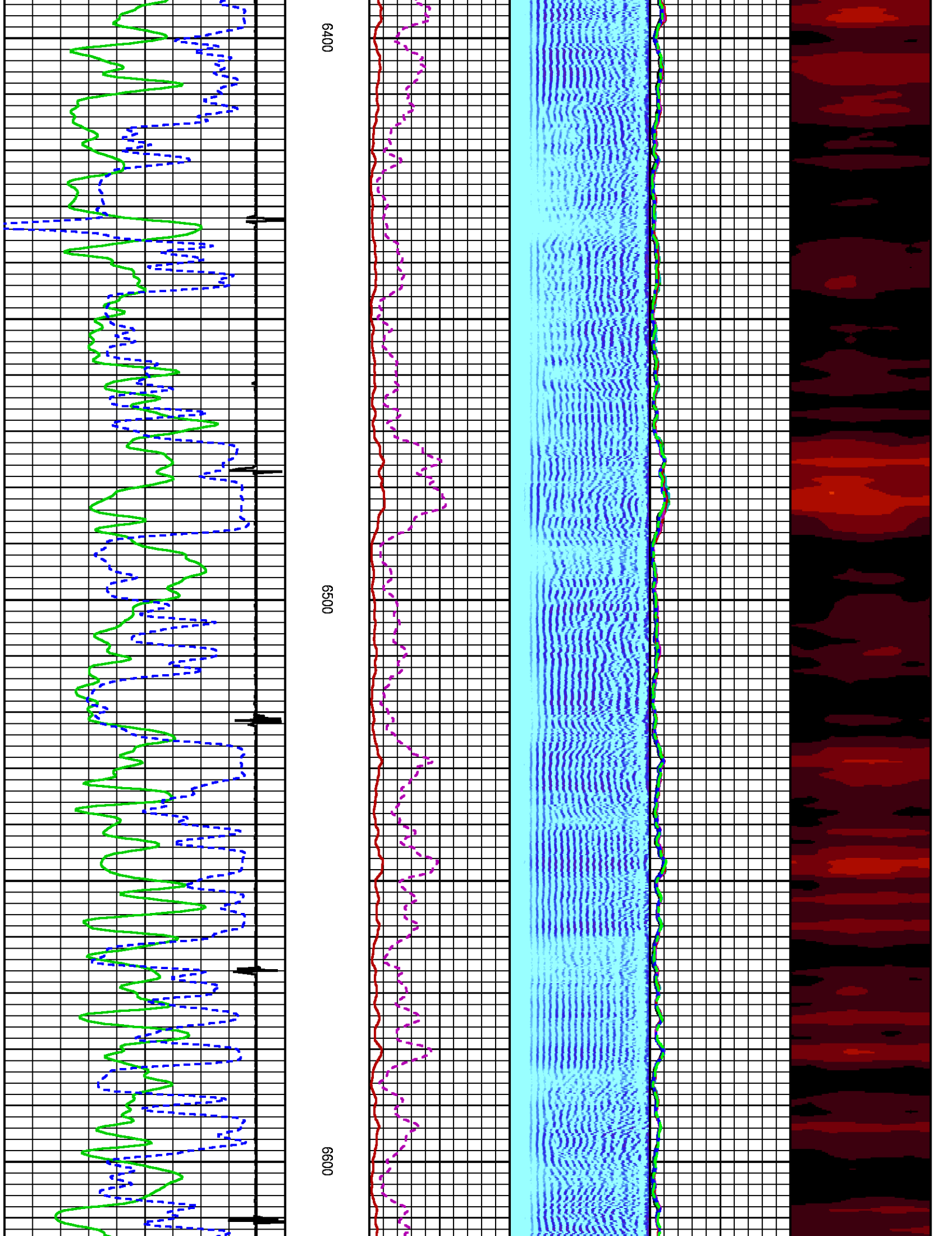


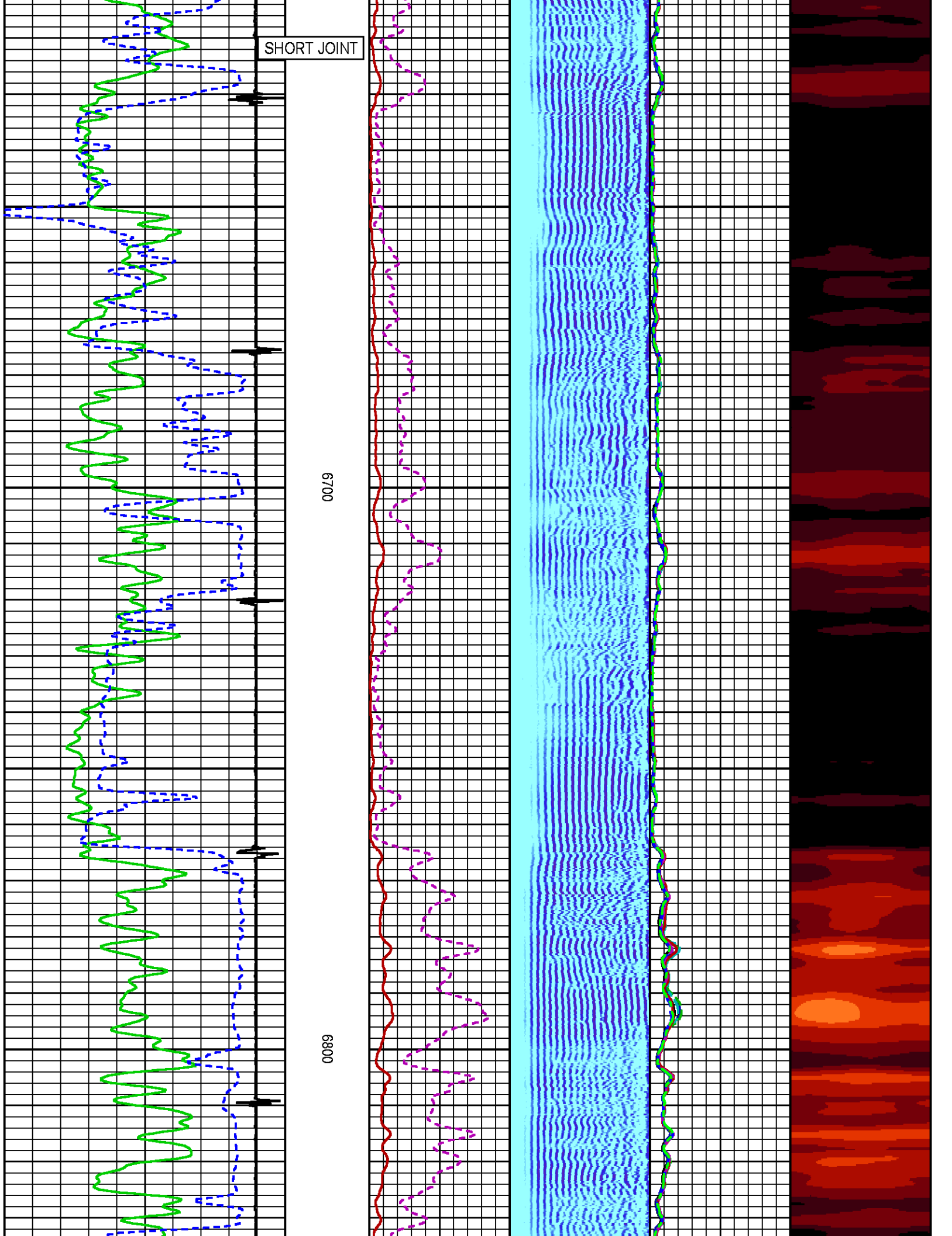


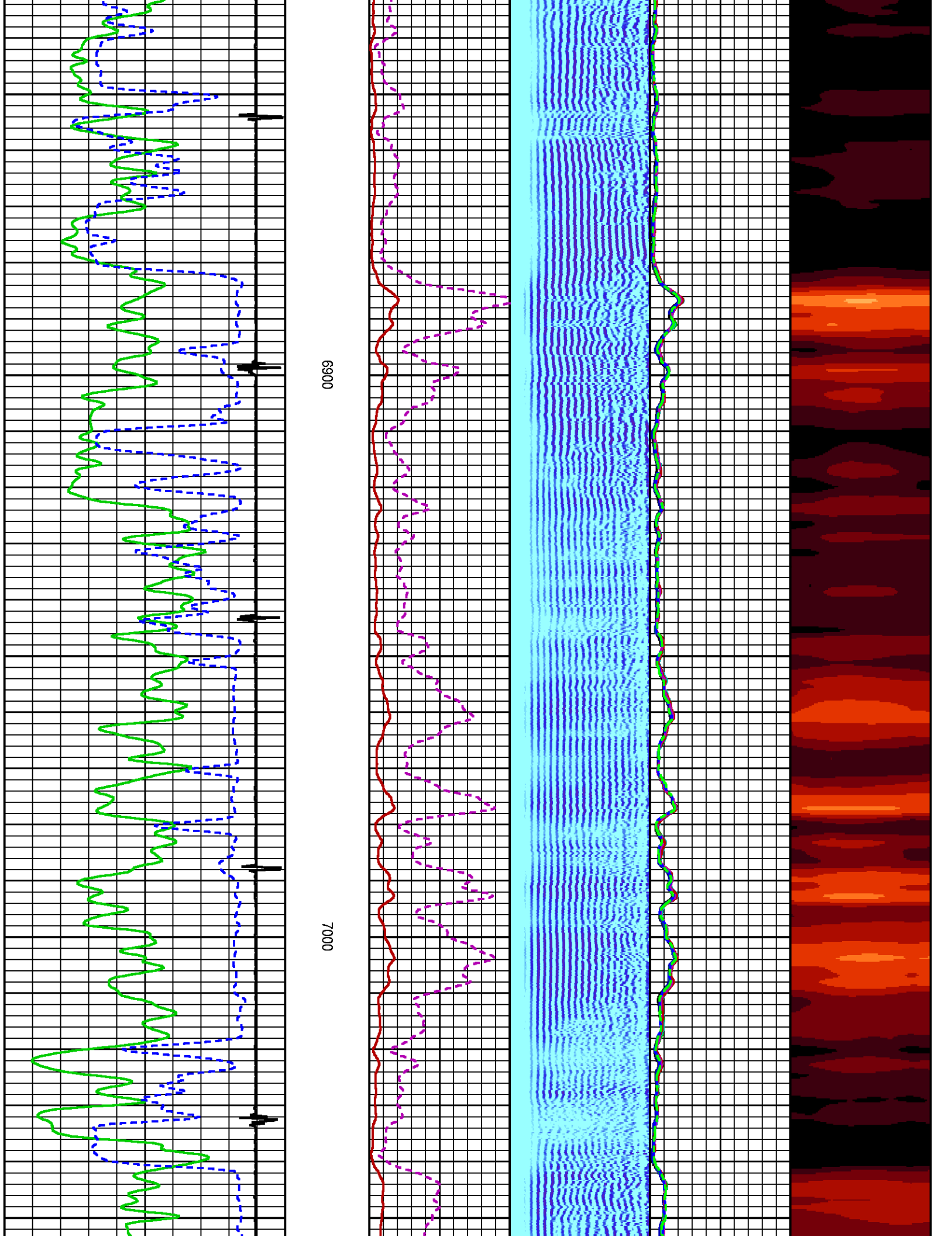


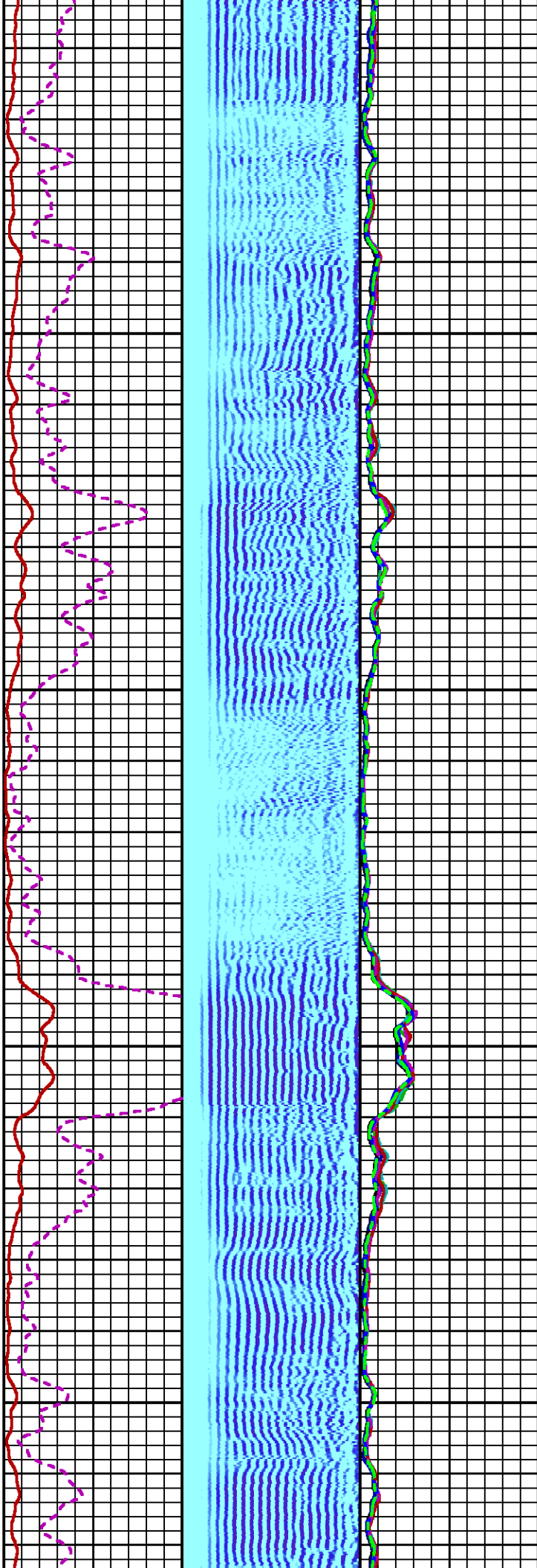






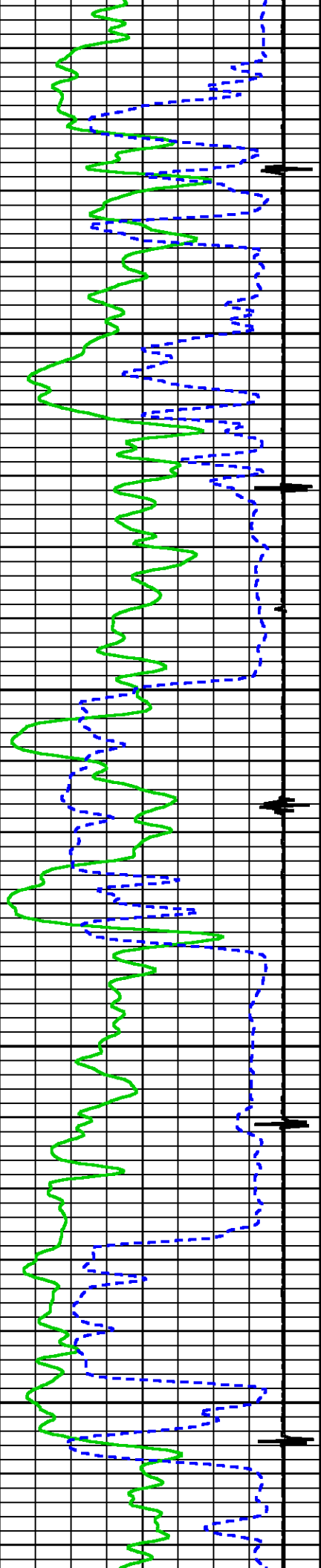


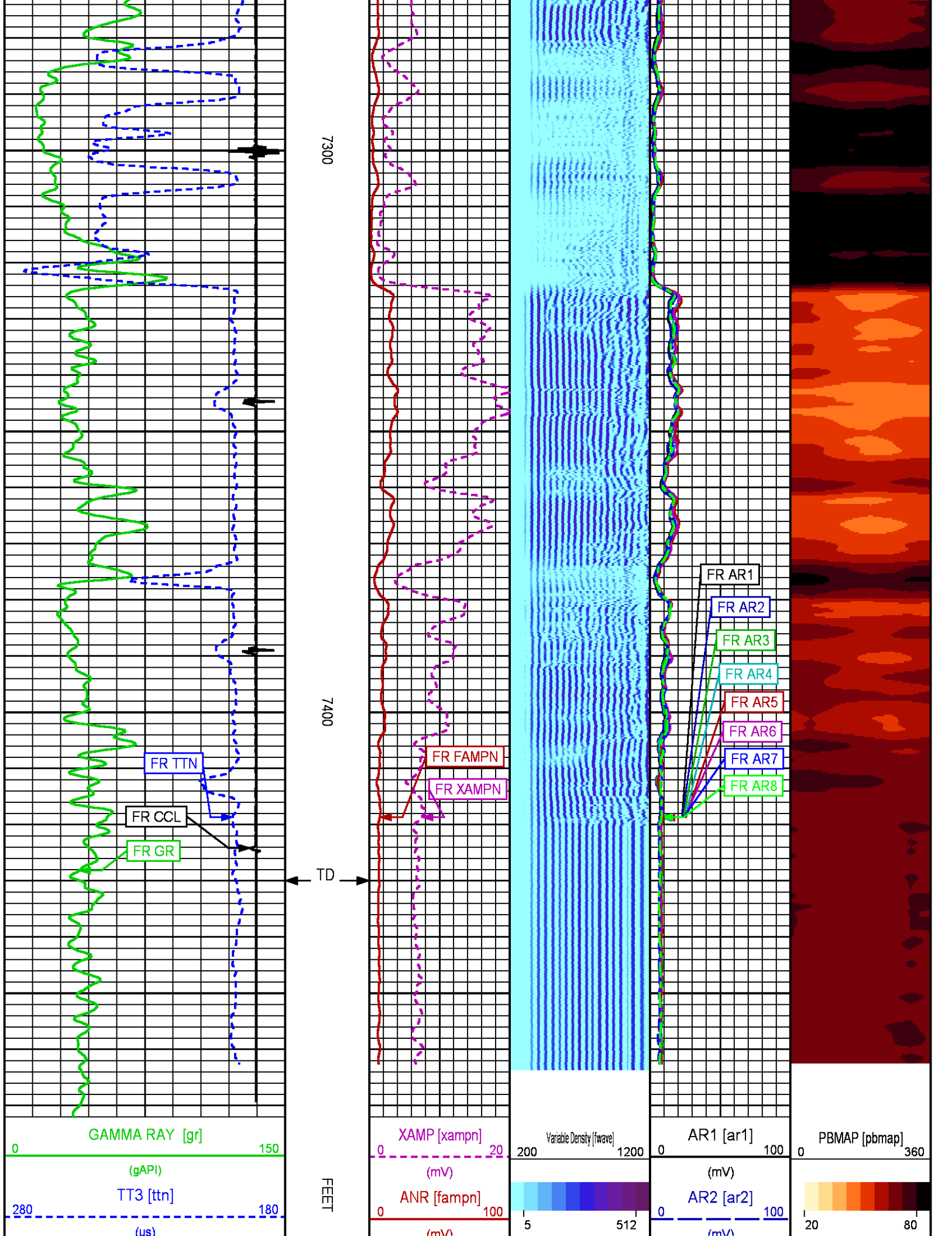


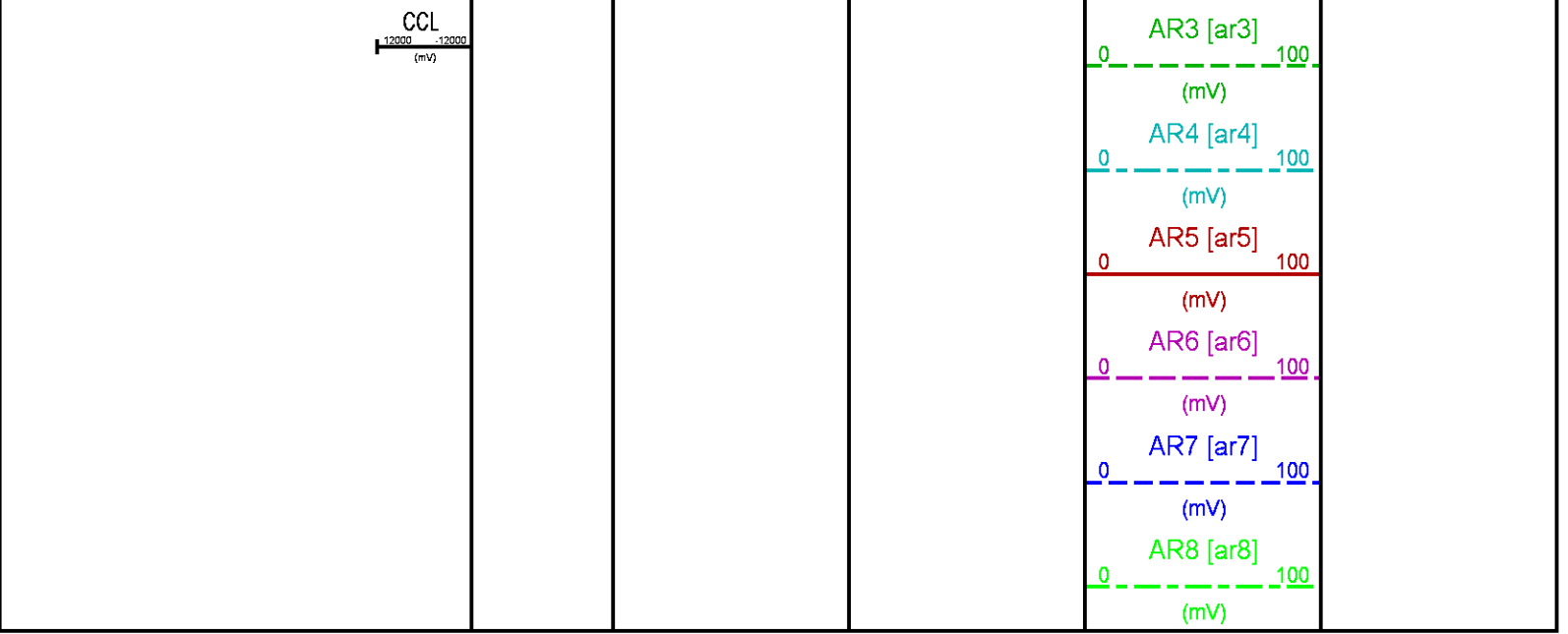


7100

7200







REPEAT PASS 0 PSI

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013  
Updates: 1 Patches: 9

Plotted: Fri Jul 21 12:50:21 2017

PARAMETER AND FILTER SUMMARY REPORT					
FILE: /dat1a/LAREME_GUNDERSON_20_04W/n012g01.prm LOGGING MODE: DEPTH DIRECTION: UP TOP DEPTH: 7124.500 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		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	200.391	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-67	us	"	"
	TOOL DELAY (str2*)	-67	us	"	"
	TOOL DELAY (str3*)	-67	us	"	"
	TOOL DELAY (str4*)	-67	us	"	"
	TOOL DELAY (str5*)	-67	us	"	"
	TOOL DELAY (str6*)	-67	us	"	"
	TOOL DELAY (str7*)	-67	us	"	"
	TOOL DELAY (str8*)	-67	us	"	"
	TOOL DELAY (strn*)	-67	us	"	"
BASELINE NOISE (NEAR)	NOISE WINDOW START	125	us	"	"
	NOISE WINDOW LENGTH	25	us	"	"

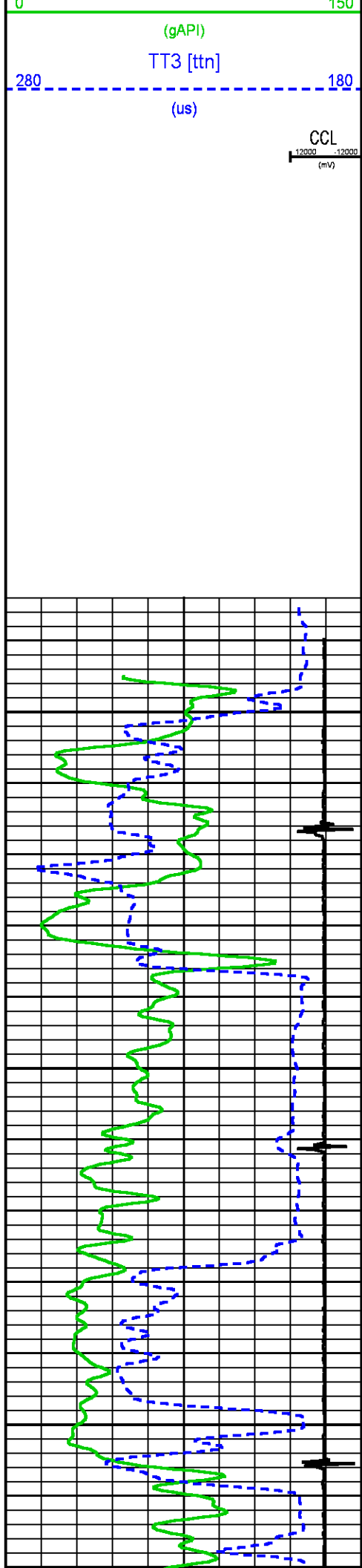
PERCENT BOND CEMENT MAP					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
RAL FREE PIPE AMPLITUDE	FREE AMP REC 1	80	mV	TOP	BOTTOM
	FREE AMP REC 2	80	mV	"	"
	FREE AMP REC 3	80	mV	"	"
	FREE AMP REC 4	80	mV	"	"
	FREE AMP REC 5	80	mV	"	"
	FREE AMP REC 6	80	mV	"	"
	FREE AMP REC 7	80	mV	"	"
	FREE 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	Jul 21 12:28:00 2017	FIXED GATE AMPLITUDE T-R1
F1:AR2	Jul 21 12:28:00 2017	FIXED GATE AMPLITUDE T-R2
F1:AR3	Jul 21 12:28:00 2017	FIXED GATE AMPLITUDE T-R3
F1:AR4	Jul 21 12:28:00 2017	FIXED GATE AMPLITUDE T-R4
F1:AR5	Jul 21 12:28:00 2017	FIXED GATE AMPLITUDE T-R5
F1:AR6	Jul 21 12:28:00 2017	FIXED GATE AMPLITUDE T-R6
F1:AR7	Jul 21 12:28:00 2017	FIXED GATE AMPLITUDE T-R7
F1:AR8	Jul 21 12:28:00 2017	FIXED GATE AMPLITUDE T-R8
F1:CCL	Jul 21 12:28:00 2017	CASING COLLAR LOCATOR
F1:FAMPN	Jul 21 12:28:00 2017	FIXED GATE AMPLITUDE NEAR RECEIVER
F1:FWAVE	Jul 21 12:28:00 2017	FAR WAVE FORM
F1:GR	Jul 21 12:28:00 2017	GAMMA RAY
F1:PBMAP	Jul 21 12:28:00 2017	PERCENT BOND CEMENT MAP
F1:TTN	Jul 21 12:28:00 2017	TRAVELTIME FROM NEAR TRANSMITTER-RECEIVER
F1:XAMPN	Jul 21 12:28:00 2017	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		

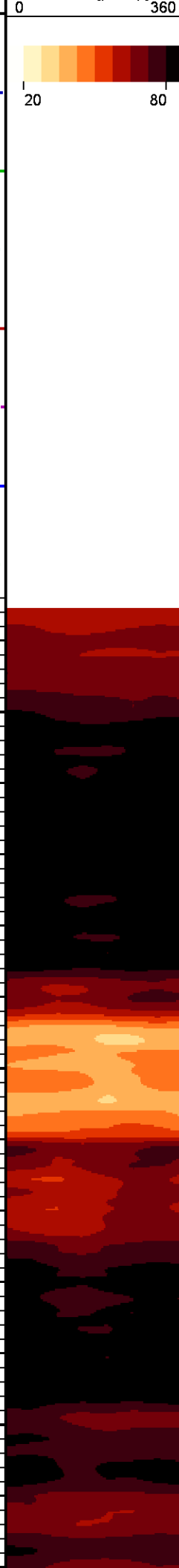
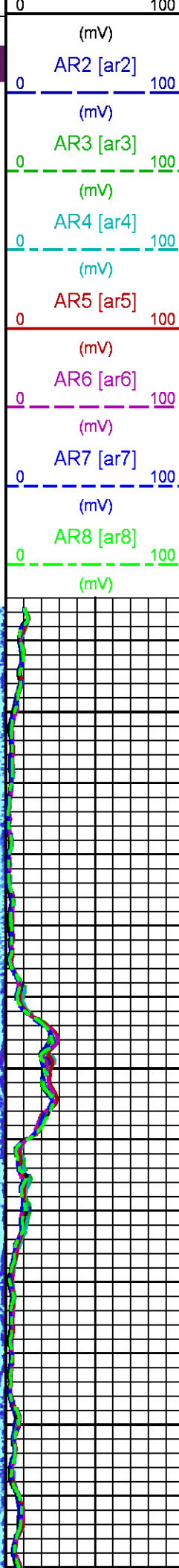
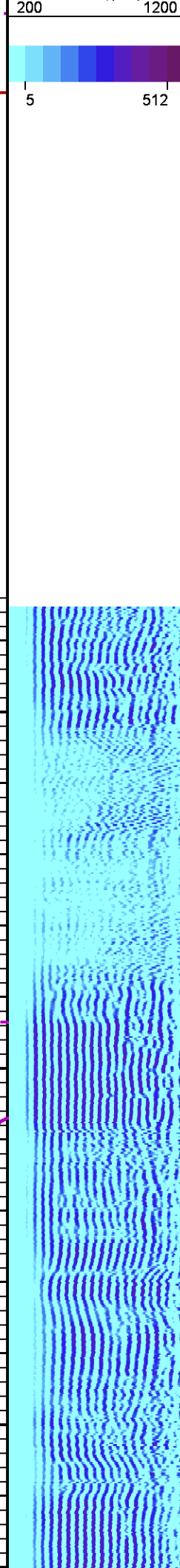
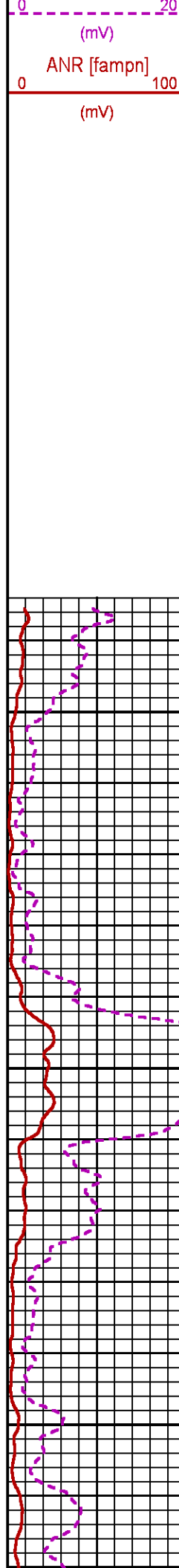
Presentation	: cpu100:ral_all+01-REPEAT-GUNDERSON_20_04W_RAL_RPT-5.fvpdf [5"/100' Scale]
Plot Interval	: 7135.25 - 7473.75 Feet
Data File 1	: F1 : cpu100:/dat1a/LAREME_GUNDERSON_20_04W/GUNDERSON_20_04W_RAL_RPT.xtf
Created On	: Jul 21 12:28:00 2017
Company	: LARAMIE ENERGY
Well	: GUNDERSON 20-04W
Field	: VEGA
File Interval	: 7134.25 - 7475 Feet
OCT	: n012g

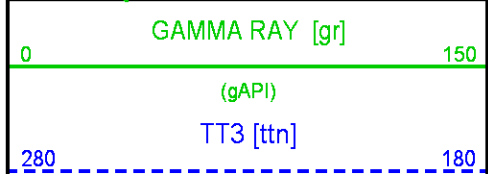
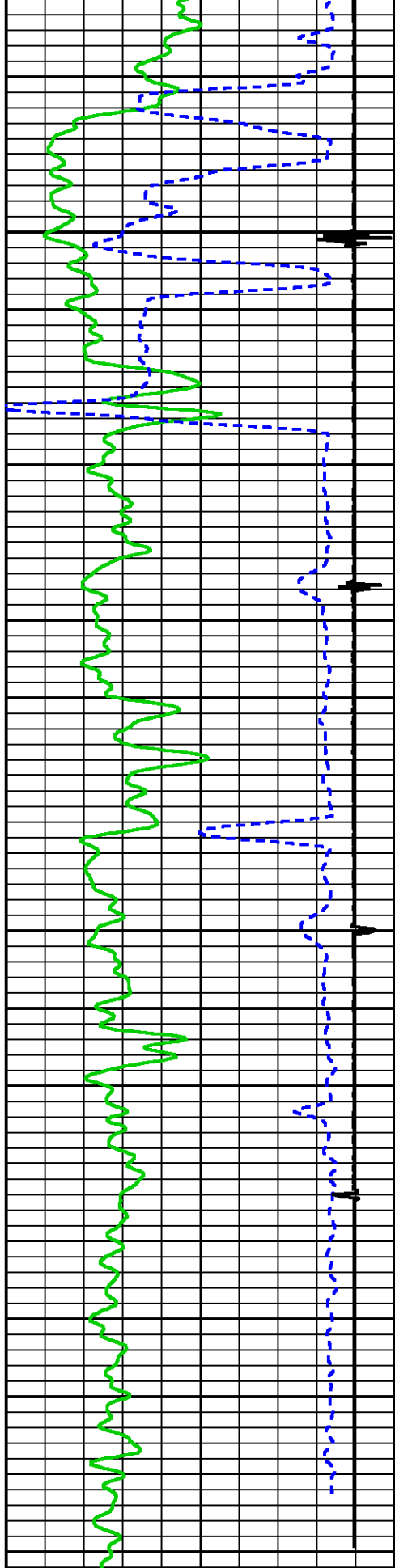
GAMMA RAY [gr]	XAMP [xampn]	Variable Density [fwave]	AR1 [ar1]	PBMAP [pbmap]
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FEET

7200

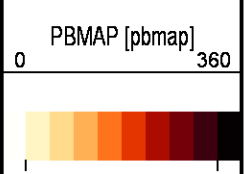
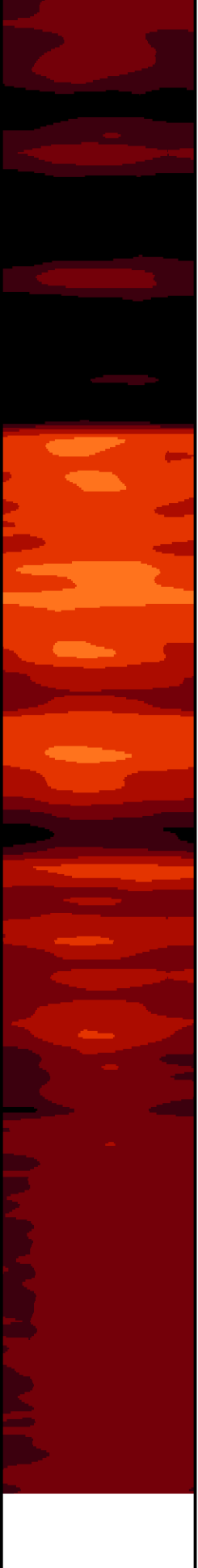
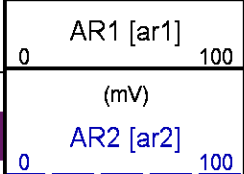
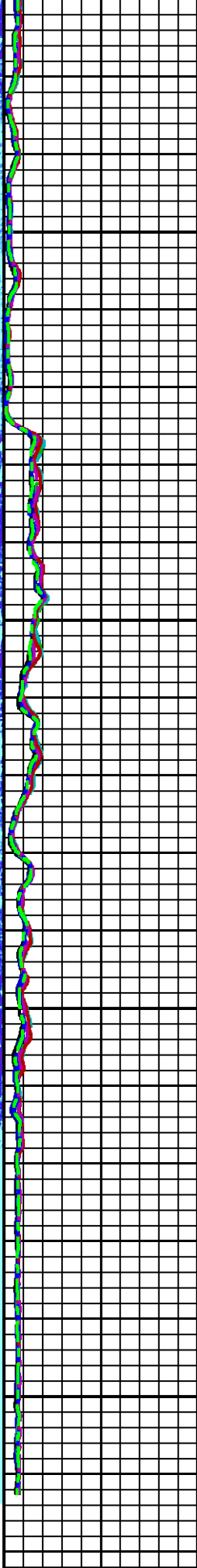
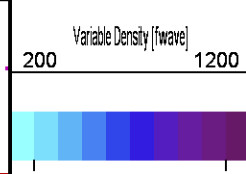
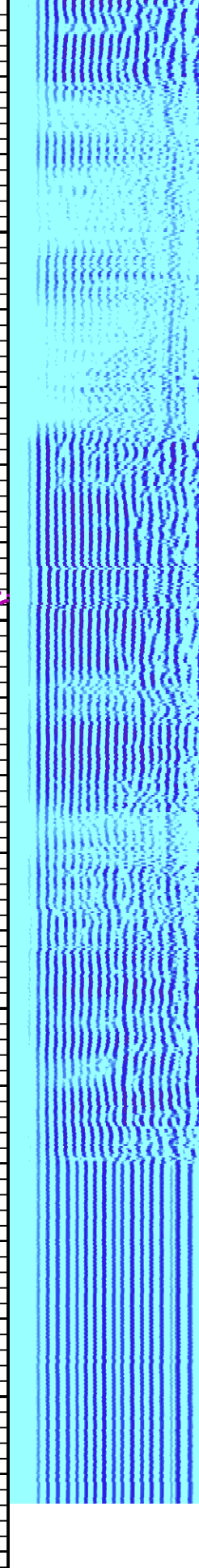
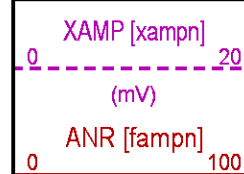
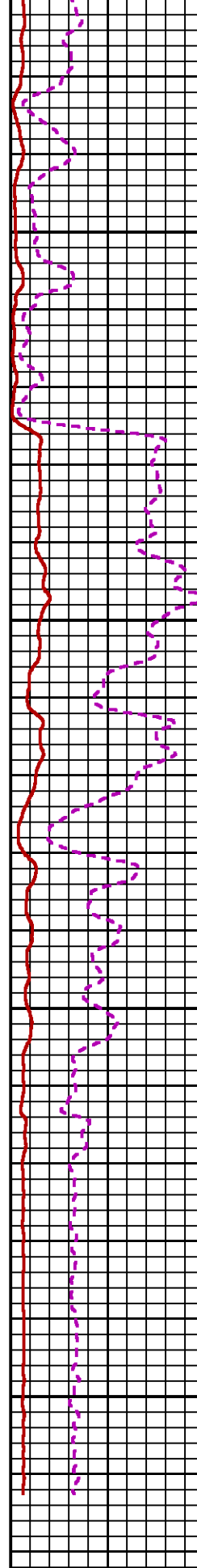




7300

7400

FEET



(us)

CCL  
12000 -12000  
(mV)

(mV)

5

512

(mV)

20

80

AR3 [ar3]

(mV)

AR4 [ar4]

(mV)

AR5 [ar5]

(mV)

AR6 [ar6]

(mV)

AR7 [ar7]

(mV)

AR8 [ar8]

(mV)

CALIBRATION / VERIFICATION SUMMARY

Source File: \dat1a\AREME\_GUNDERSON\_20\_04Wm012g1p1

RAL PRIMARY CALIBRATION SUMMARY

TOOL #: 1426XA10218497 DATE/TIME PERFORMED: Fri Jul 21 09:43:13 2017

UNIT #: 3880TA HL6670

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

	NEAR	R1	R2	R3	R4	R5	R6	R7	R8	FAR	CAL
ZERO (mV)	-0.10	-0.10	-0.08	-0.03	0.01	0.00	-0.07	-0.07	-0.03	-0.30	-0.03
AMP FLUID (mV)	95	95	95	93	94	93	95	95	95	149	93
TT (us)	199	200	199	198	198	199	199	199	200	311	200
M FACTOR	1.06	1.05	1.06	1.07	1.07	1.07	1.05	1.05	1.05	1.01	1.07

RAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1426XA10218497 DATE/TIME PERFORMED: Fri Jul 21 12:02:57 2017 DAYS SINCE CAL: 0

UNIT #: 3880TA HL6670 CABLE #: 6670SM SMALL6670

	NEAR	R1	R2	R3	R4	R5	R6	R7	R8	FAR	CAL
ZERO	(mV)	(mV)	(mV)	(mV)	(mV)	(mV)	(mV)	(mV)	(mV)	(mV)	(mV)
	-0.16	-0.05	-0.07	-0.02	-0.09	0.01	-0.02	-0.07	-0.07	0.22	-0.01
AMP AIR	0.64	0.10	0.19	0.80	0.94	0.73	0.66	0.70	0.43	1.21	99.60

SHOP SHOP WIRELINE  
M FACTOR A FACTOR FACTOR  
1.07 0.00 1.00

GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1355XA12670180 DATE/TIME PERFORMED: Fri Dec 23 11:53:22 2016

UNIT #: 3880TA HL6670 CALB JIG #: 4702NKA\_228

	BACKGROUND	CALBRTR ON	CR DIFF	MULT	BACKGROUND	CALBRTR ON	CALBRTR
	(cts)	(cts)	(cts/s)		(gAPI)	(gAPI)	(gAPI)
GR	75.82	247.07	171.2	0.584	44.28	144.28	100

GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1355XA12670180 DATE/TIME PERFORMED: Fri Dec 23 11:54:47 2016

**INSTRUMENT CONFIGURATION**

Source File: d:\data\AREME\_GUNDERSON\_20\_02\WRA155-10g

**CALIBRATION**

Diameter	2.75"
Length	12.75'
Weight	12.80 lbs
Volume	0.00004
Buoyancy	0.000

**DIGITAL NEW TOOL**


Diameter	2.75"
Length	11.12'
Weight	12.80 lbs
Volume	0.00004
Buoyancy	0.000
Reservoir Pctat	0.21
Reservoir Pctat	0.23

**INL CABLE/ACCU/LOW DISTANCE**

Diameter	2.75"
Length	8.84'
Weight	12.80 lbs
Volume	0.00004
Buoyancy	0.000
Reservoir Pctat	0.21
Reservoir Pctat	0.23

**Measurements:**

- 28.58'
- BHA DEPT = 11.12'
- IAT DEPT = 12.21'
- CCL = 5.79'
- CT = 1.47'
- TBM = 0.22'
- TOTAL LENGTH: 28.58'
- TOTAL WEIGHT: 12.80 lbs
- MAX DIAMETER: 2.75"

	COMPANY <u>LARAMIE ENERGY</u> WELL <u>GUNDERSON 20-04W</u> FIELD <u>VEGA</u> COUNTY <u>MESA</u> STATE <u>COLORADO</u>	FILE NO: _____  API NO: <u>05077103370000</u>
	LOCATION:  SHL: LAT:39.266919N; LONG:107.795317W  BHL: LAT:39.267151N; LONG:107.797721W SEC <u>20</u> TWP <u>9S</u> RGE <u>93W</u>	ELEVATIONS:  KB <u>7174 FT</u> DF <u>7174 FT</u> GL <u>7144 FT</u>
	DATE <u>21-JUL-2017</u>	