



RADIAL CEMENT BOND LOG

FILE NO: CH136907	COMPANY LARAMIE ENERGY LLC
API NO: 05077105360000	WELL GUNDERSON 0994-13-16W
	FIELD VEGA
	COUNTY MESA STATE COLORADO

Ver. 4.10	LOCATION: SHL: 1397' FSL & 1623' FWL BHL: 1397' FSL & 1623' 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 7302 FT DF 7272 FT GL
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DATE	RUN	TRIP	20-Jun-2018	1	1
SERVICE ORDER			US136907		
DEPTH DRILLER			8069 FT		
DEPTH LOGGER			8065 FT		
BOTTOM LOGGED INTERVAL			8065 FT		
TOP LOGGED INTERVAL			30 FT		
TIME STARTED			12:30		
TIME FINISHED			15:00		
OPERATOR RIG TIME			2.5 HOURS		
TYPE OF FLUID IN HOLE			WATER		
FLUID DENSITY			NA		
FLUID SALINITY			NA		
FLUID LEVEL			69 FT		
LOGGED CEMENT TOP			960 FT		
WELLHEAD PRESSURE			0 PSI		
MAXIMUM HOLE DEVIATION			NA		
NOMINAL LOGGING SPEED			100 F/MN		
MAX. RECORDED TEMP.			235 DEGF		
REFERENCE LOG			NA		
REFERENCE LOG DATE			NA		
EQUIP. NO.		LOCATION	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: 5729' - 5751'

SJ: 6909' - 6931'

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: Wed Jun 20 16:57:21 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE_GUNDERSON_0994-13-16W/p012g02.prm
 LOGGING MODE: DEPTH DIRECTION: UP
 TOP DEPTH: -7.750 ft BOTTOM DEPTH: 8054.250 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 (fgpn*)	189	us	"	"
	AMP WINDOW LENGTH	25	us	"	"
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	198	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*)	-71	us	"	"
	TOOL DELAY (str2*)	-71	us	"	"
	TOOL DELAY (str3*)	-71	us	"	"
	TOOL DELAY (str4*)	-71	us	"	"
	TOOL DELAY (str5*)	-71	us	"	"
	TOOL DELAY (str6*)	-71	us	"	"
	TOOL DELAY (str7*)	-71	us	"	"
	TOOL DELAY (str8*)	-71	us	"	"
	TOOL DELAY (strn*)	-71	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	"	"

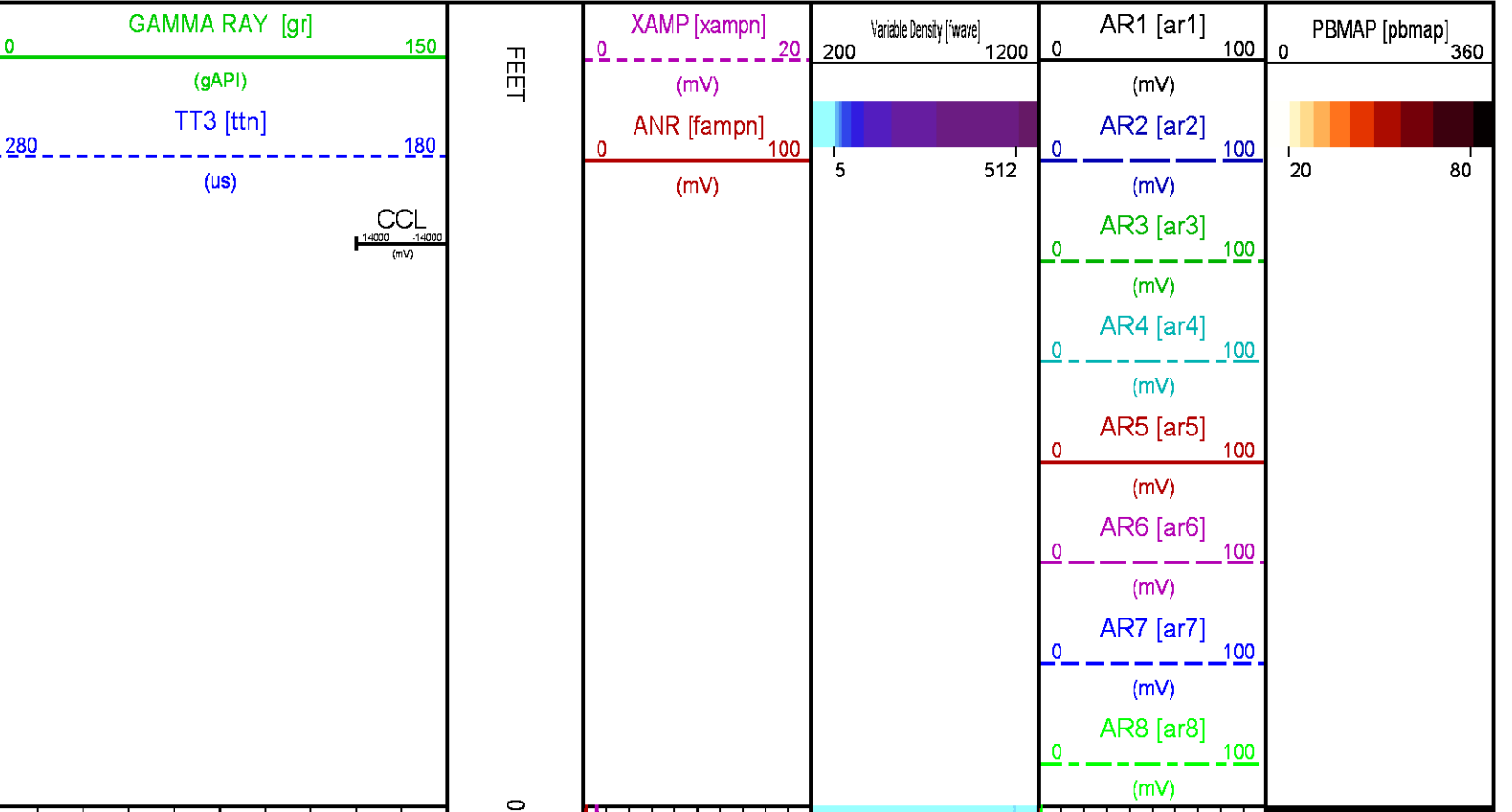
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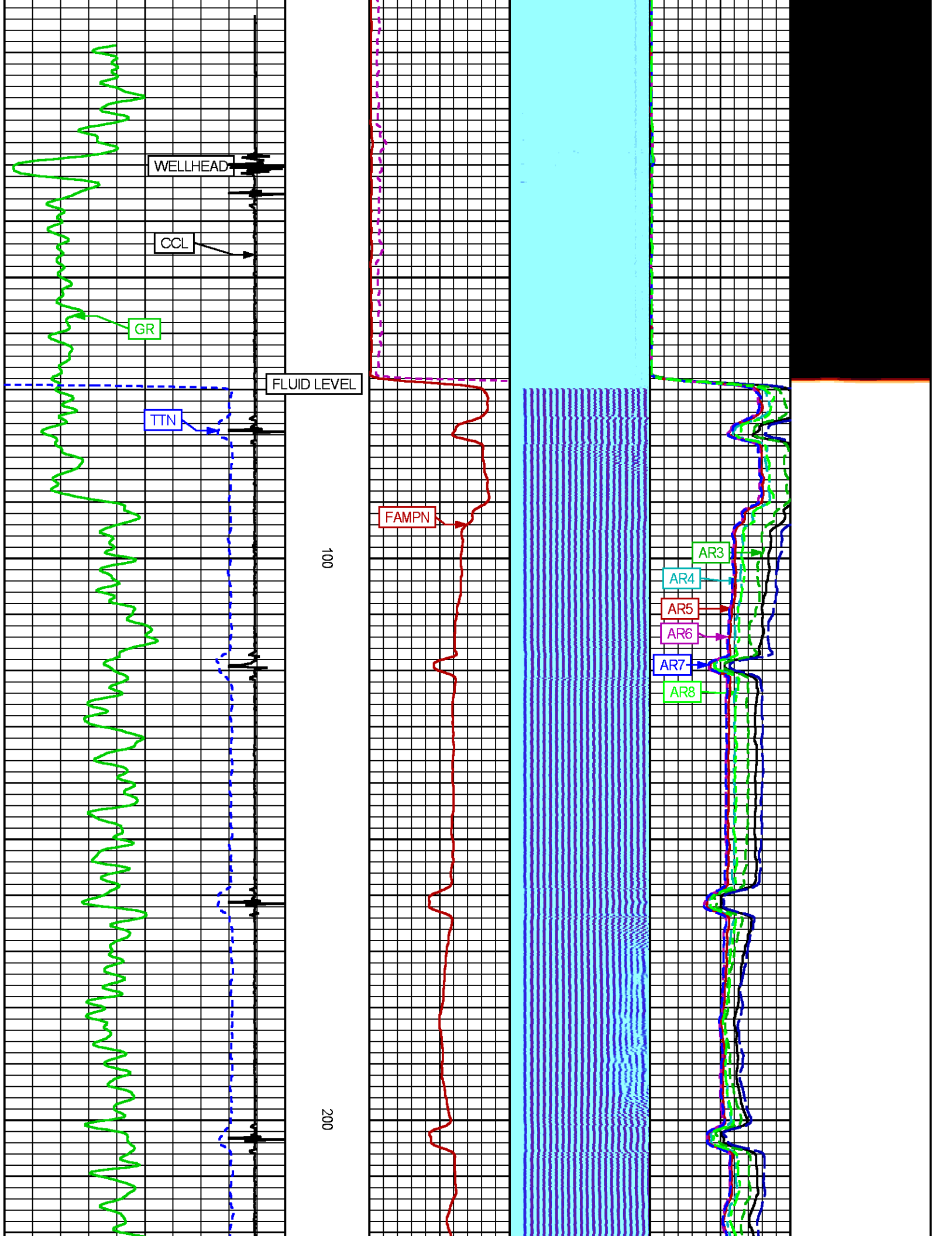
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	FIXED GATE AMPLITUDE T-R7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

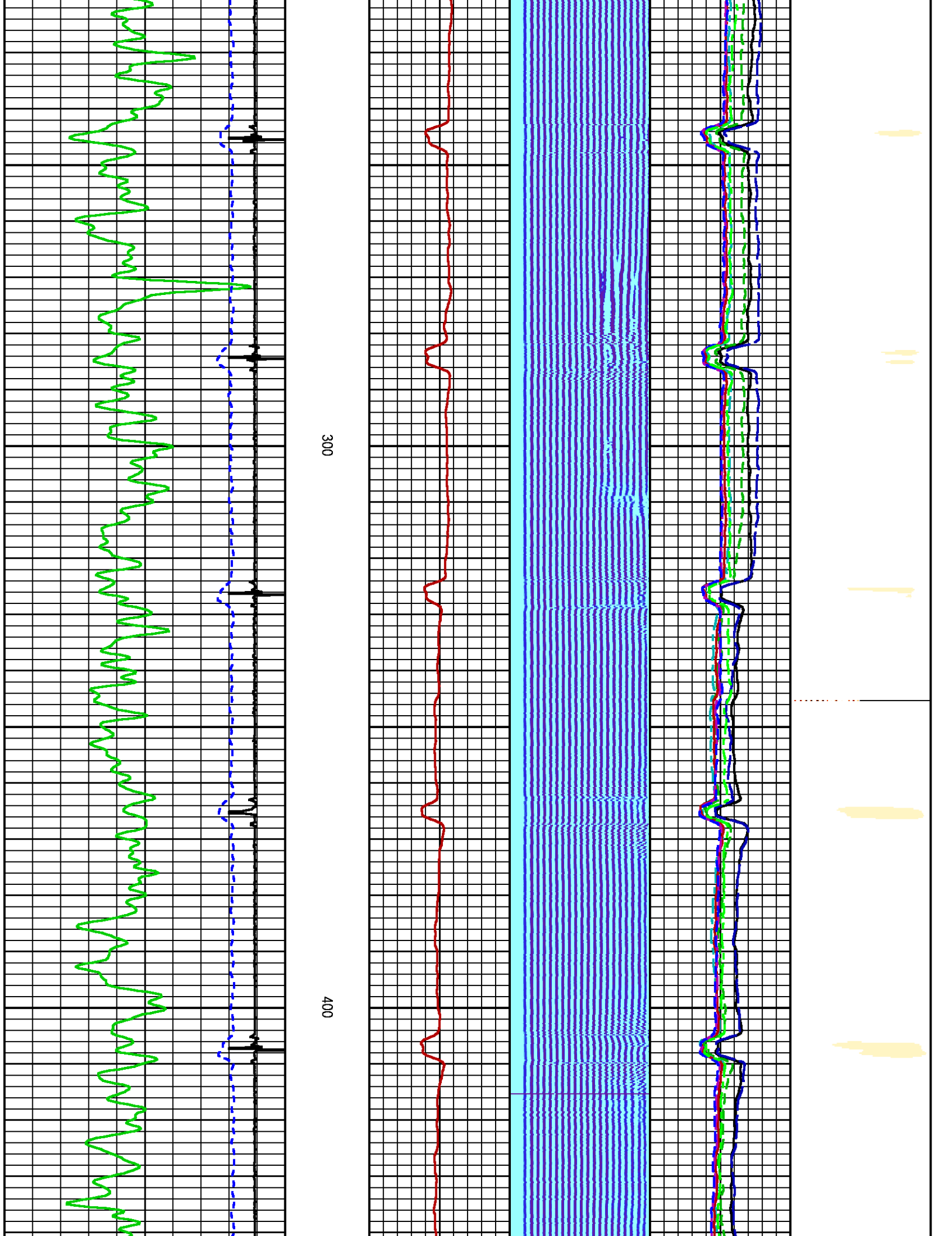
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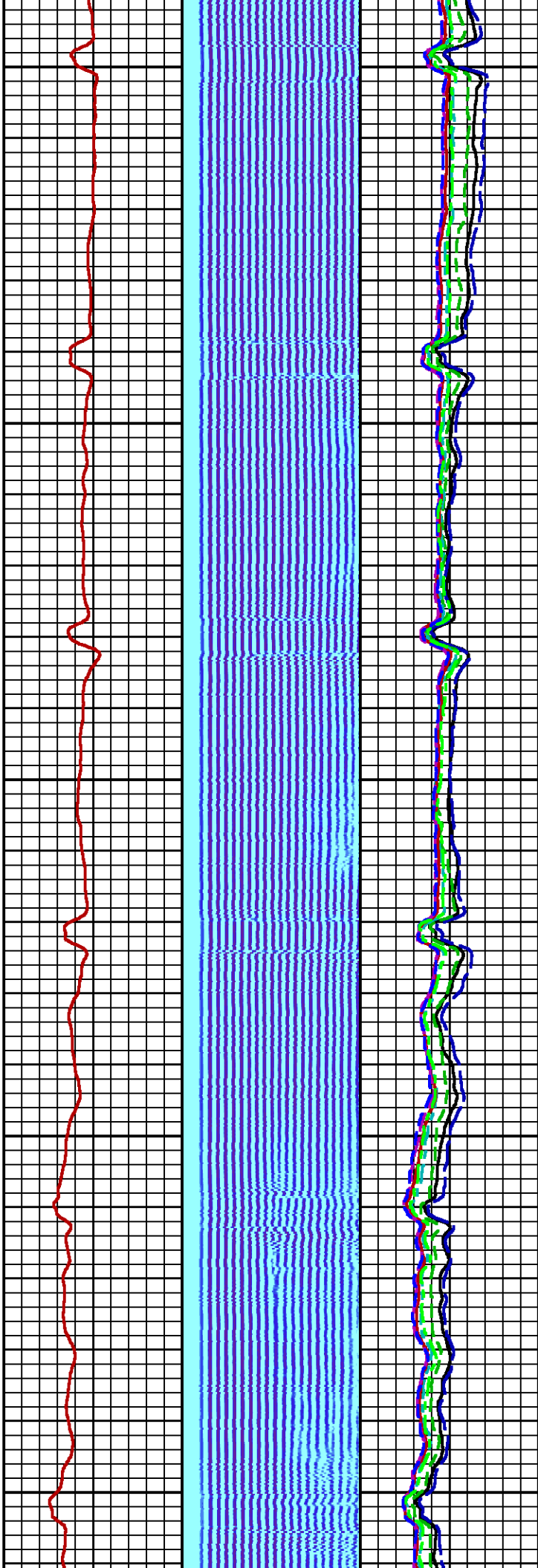
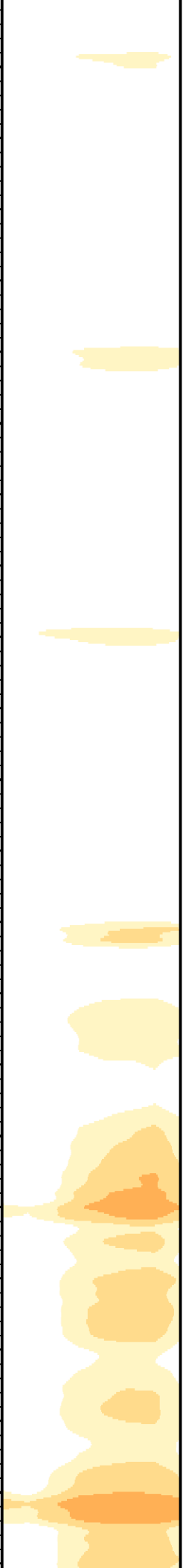
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
AR1	-11.25	AR5	-11.25	CCL	-5.75	XAMPN	-11.25
AR2	-11.25	AR6	-11.25	FAMPN	-11.25		
AR3	-11.25	AR7	-11.25	GR	-1.75		
AR4	-11.25	AR8	-11.25	TTN	-11.25		

Presentation	: SysA:/dat1a/LARAMIE_GUNDERSON_0994-13-16W/16W_RAL_MAIN.fvpdf [5"/100' Scale]
Plot Interval	: 0 - 8075 Feet
Data File 1	: F1 : SysA:/dat1a/LARAMIE_GUNDERSON_0994-13-16W/16W_RAL_MAIN.xtf
Created On	: N/A
Company	: LARAMIE ENERGY LLC
Well	: GUNDERSON 0994-13-16W
Field	: VEGA
File Interval	: -7.75 - 8071.5 Feet
OCT	: p012g



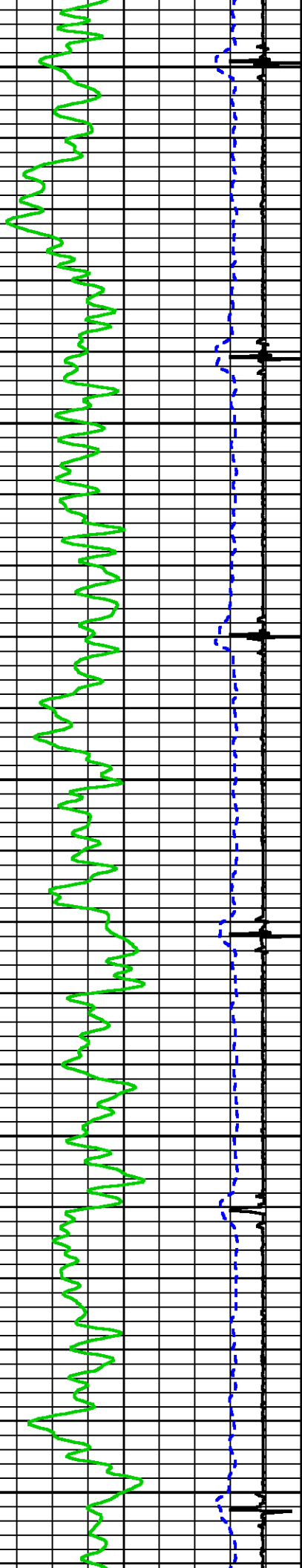


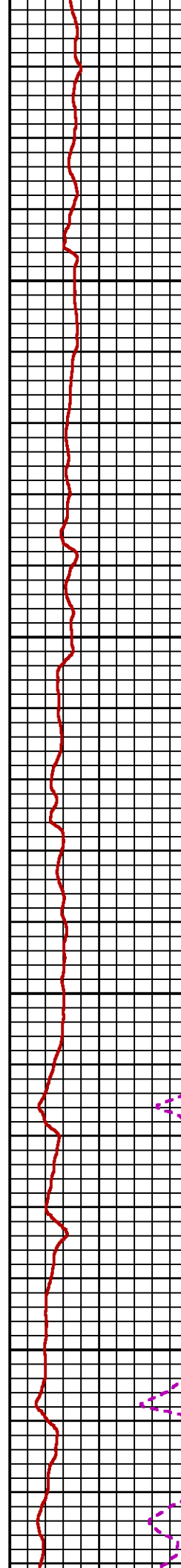
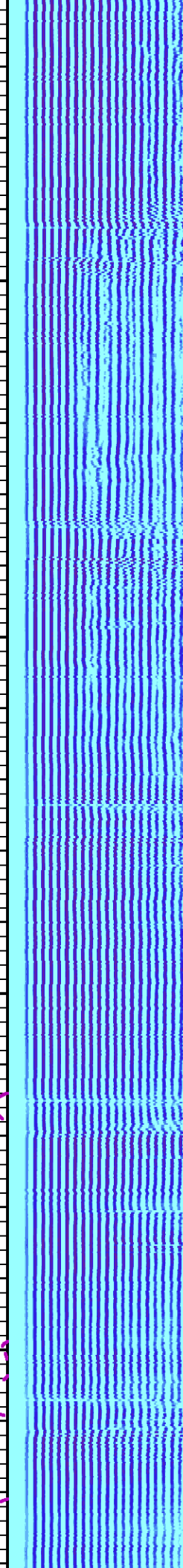
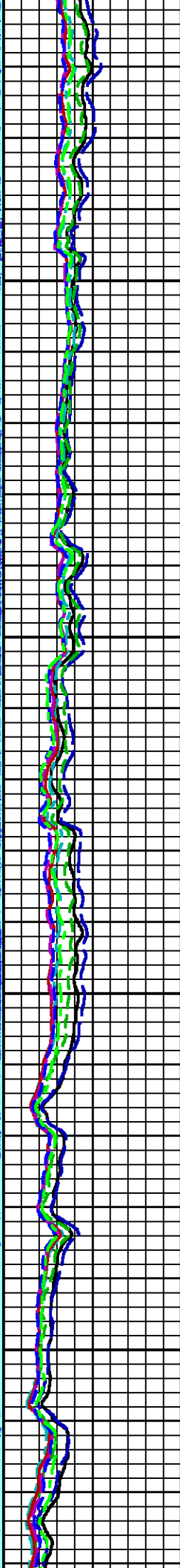
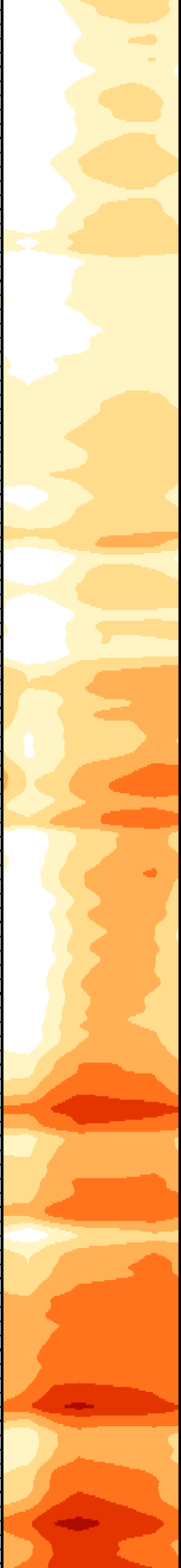




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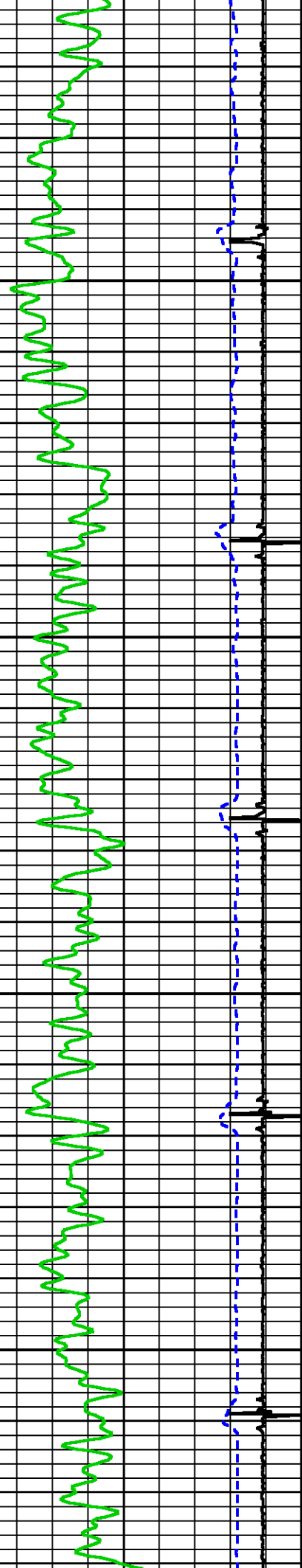
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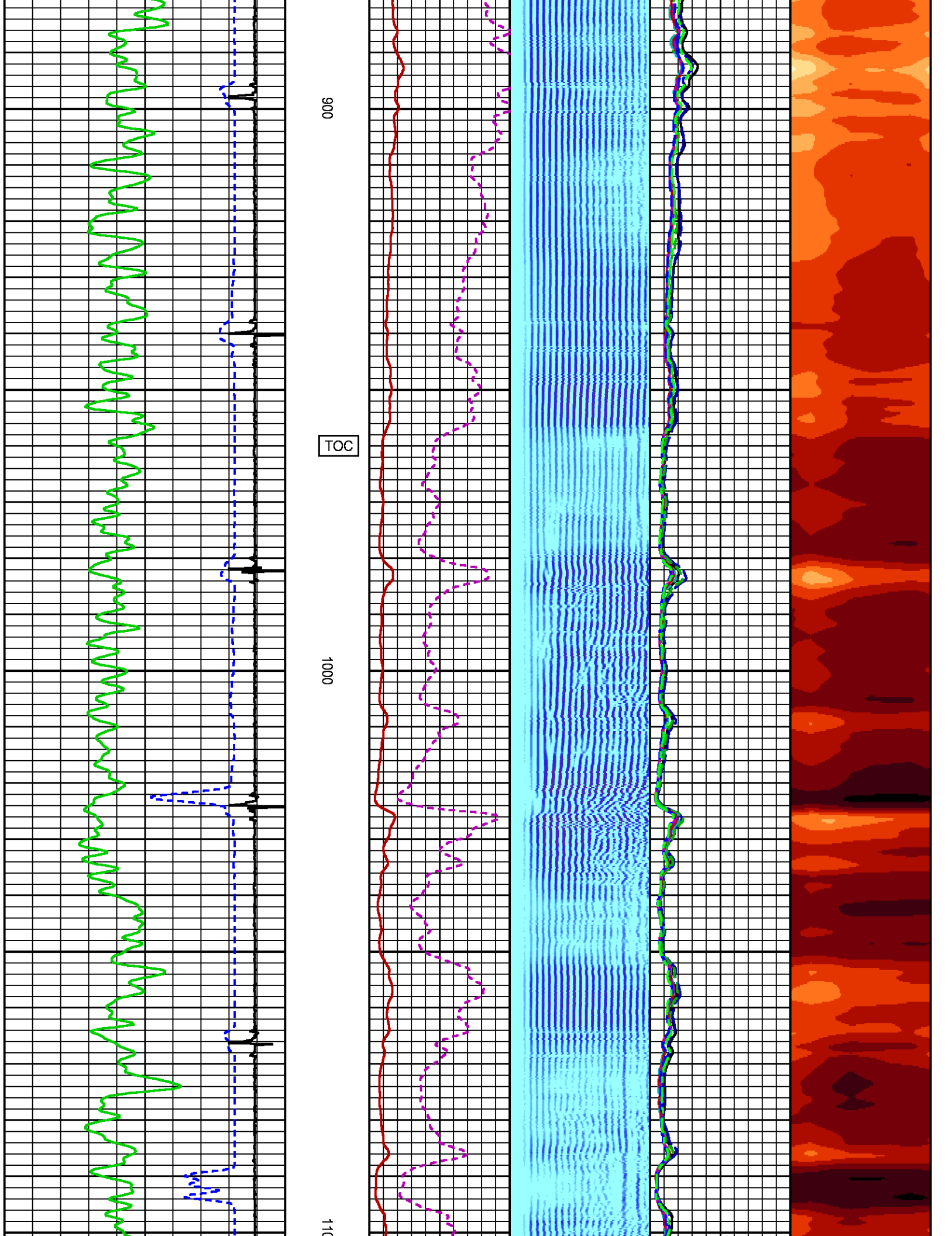


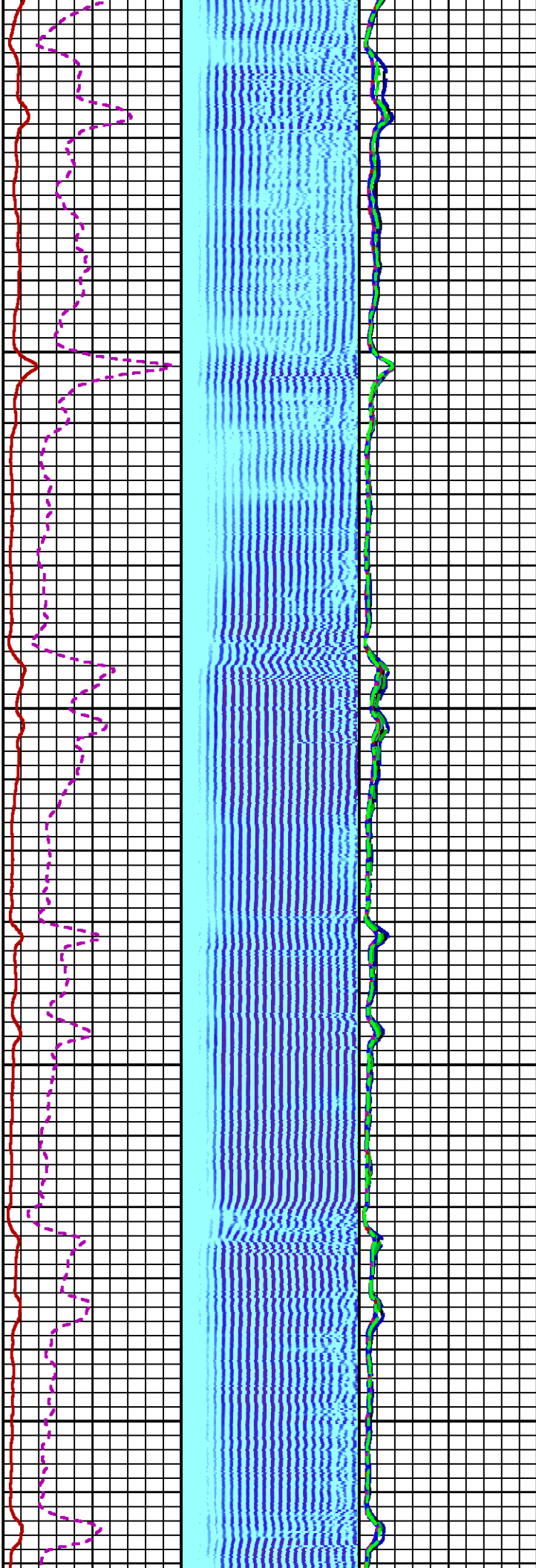
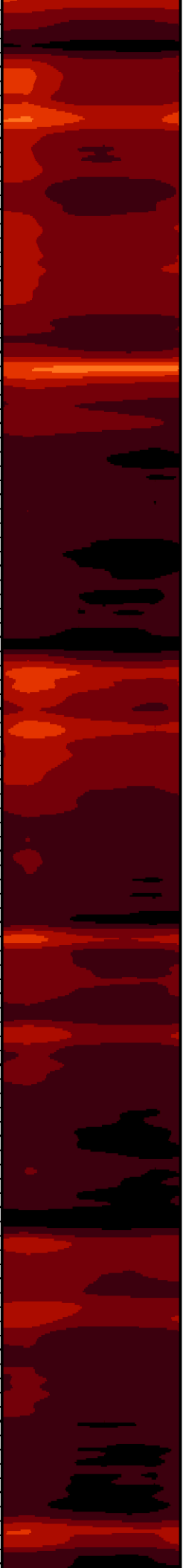


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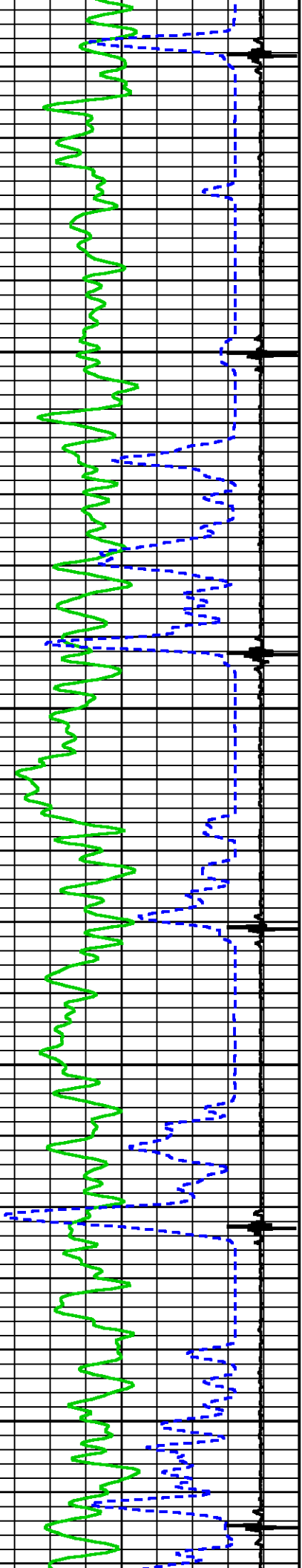
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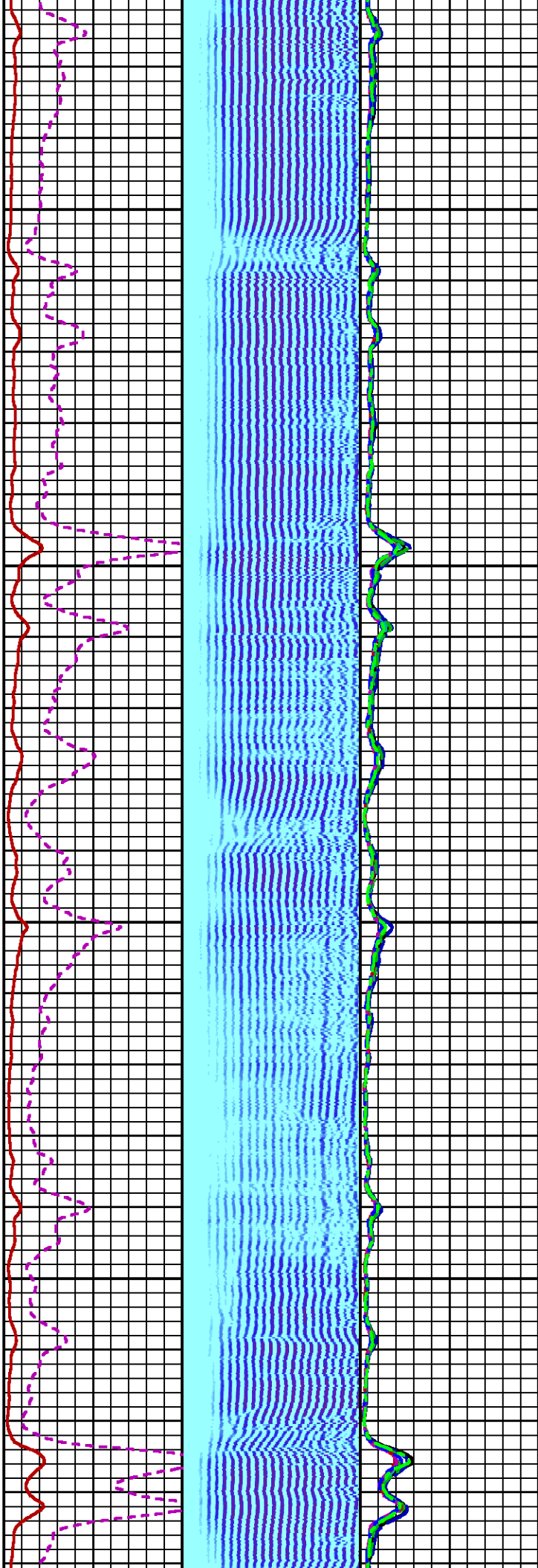
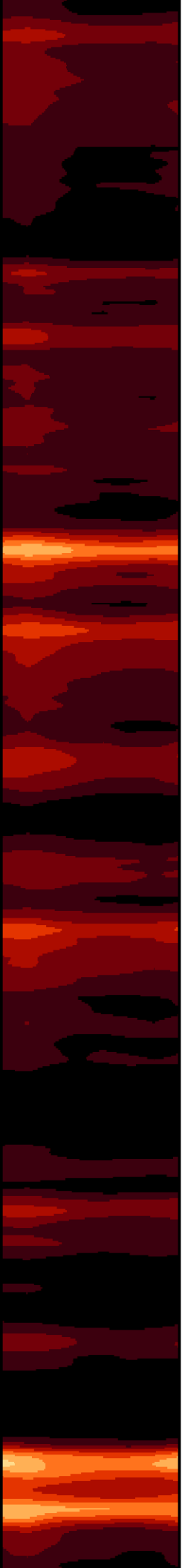






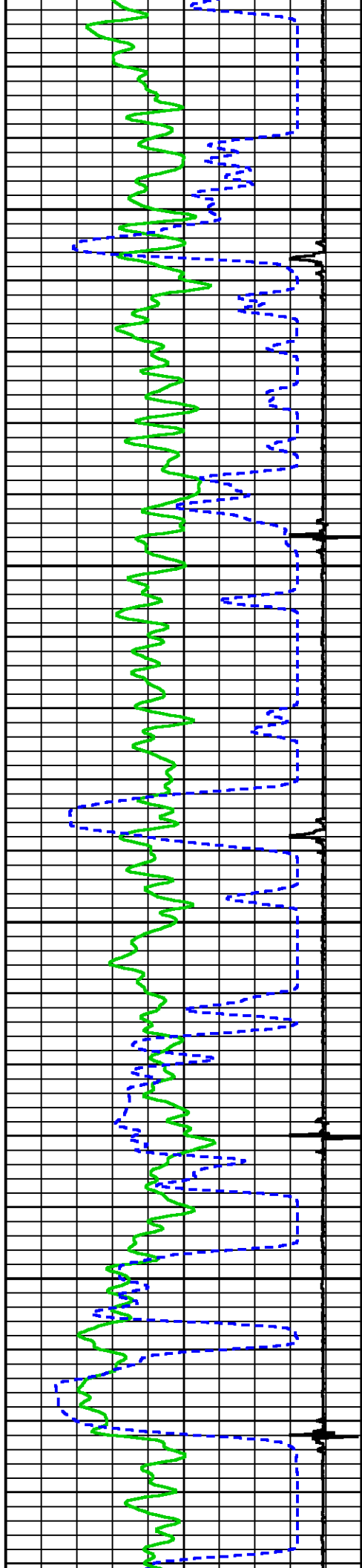
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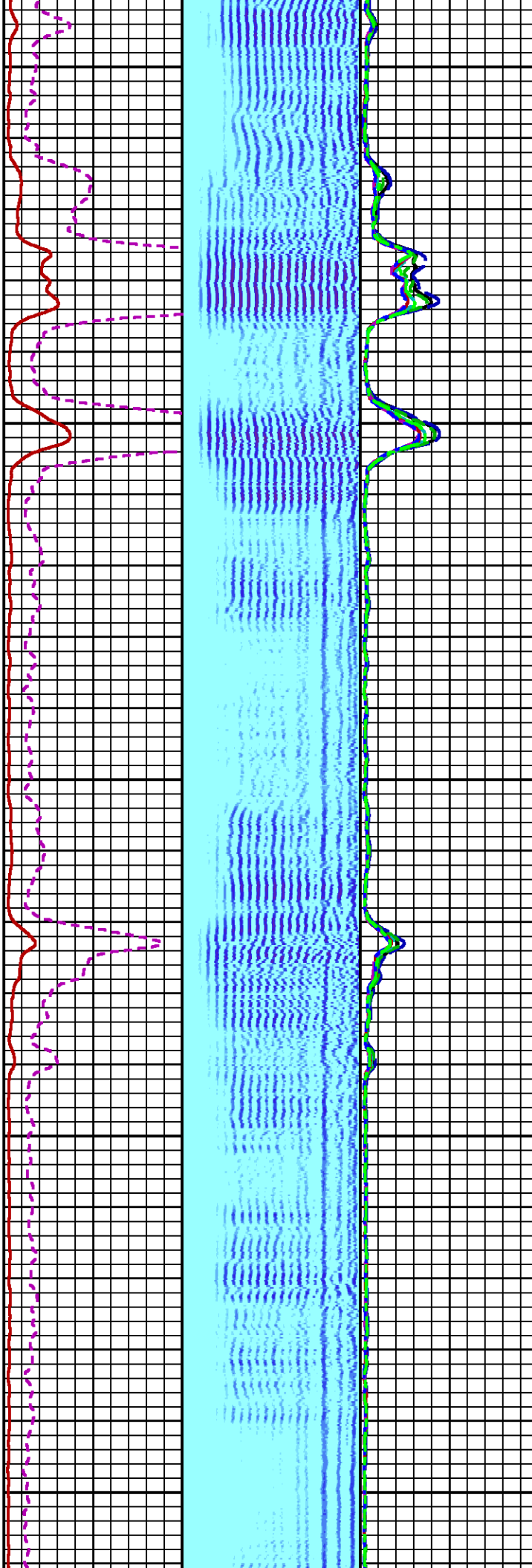
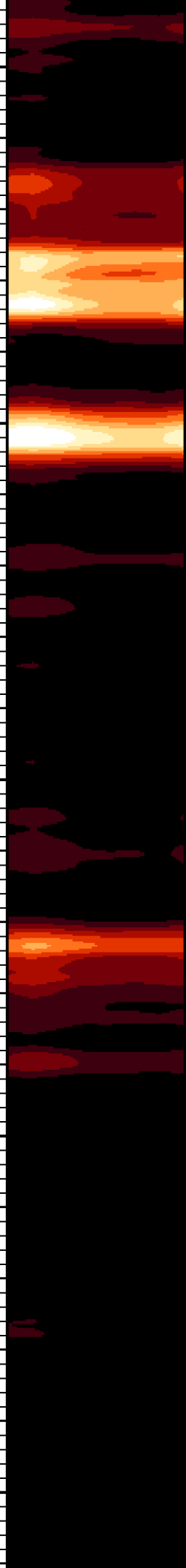




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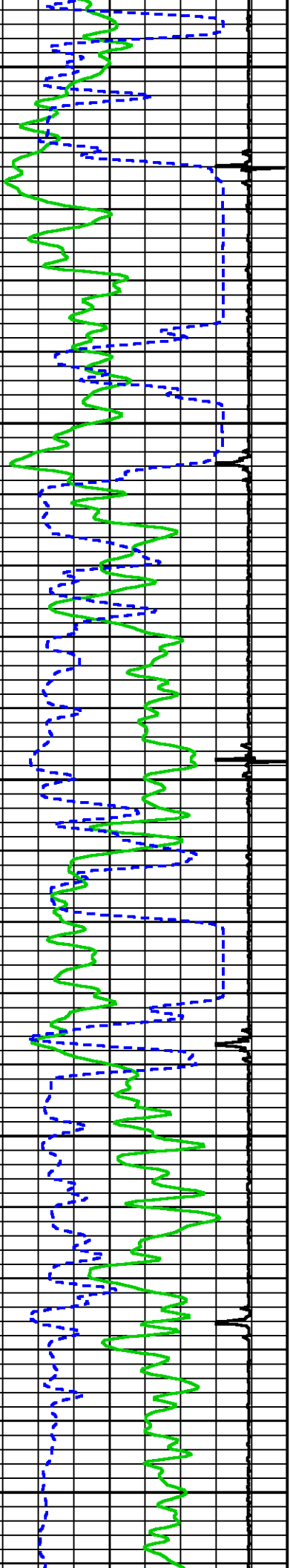
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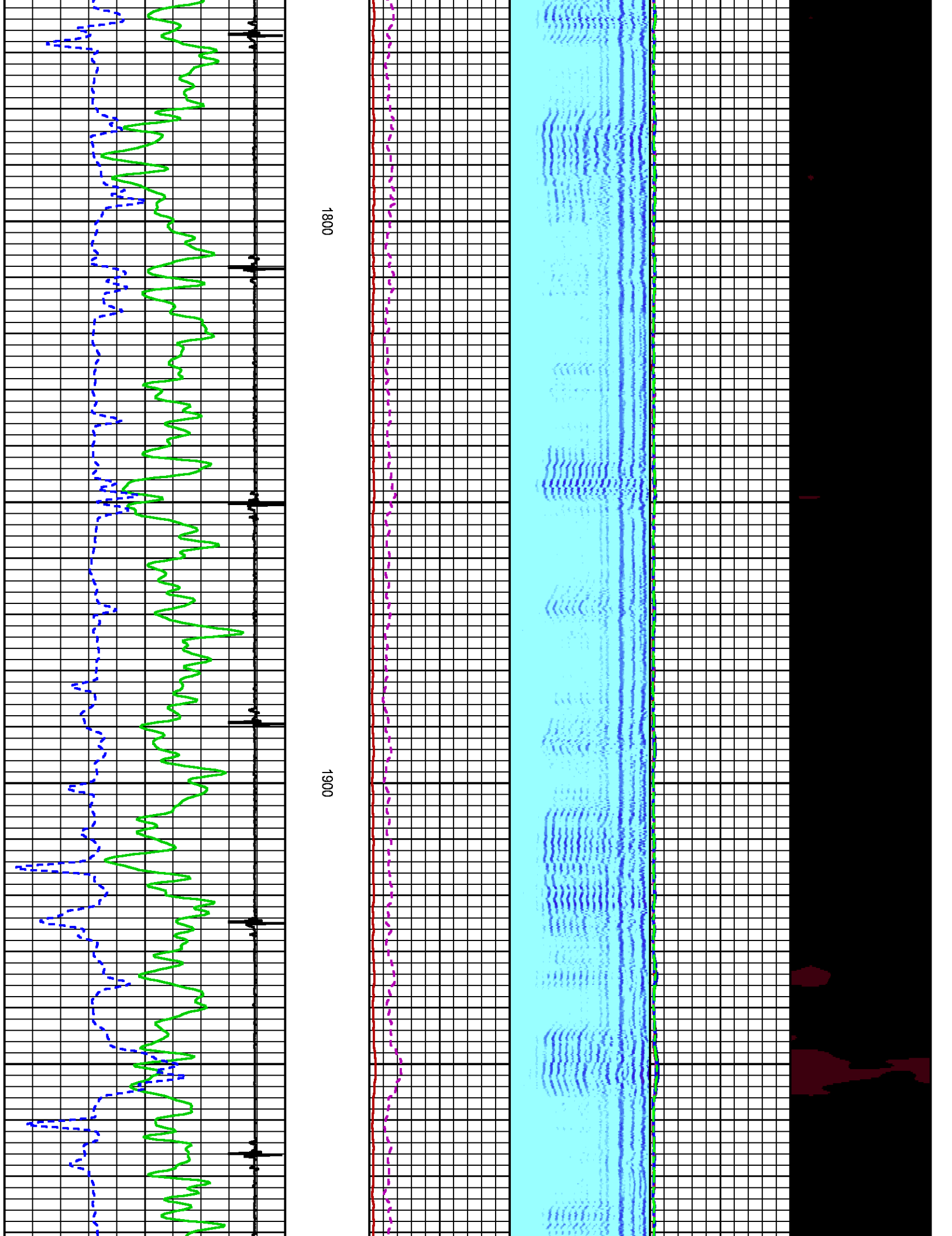


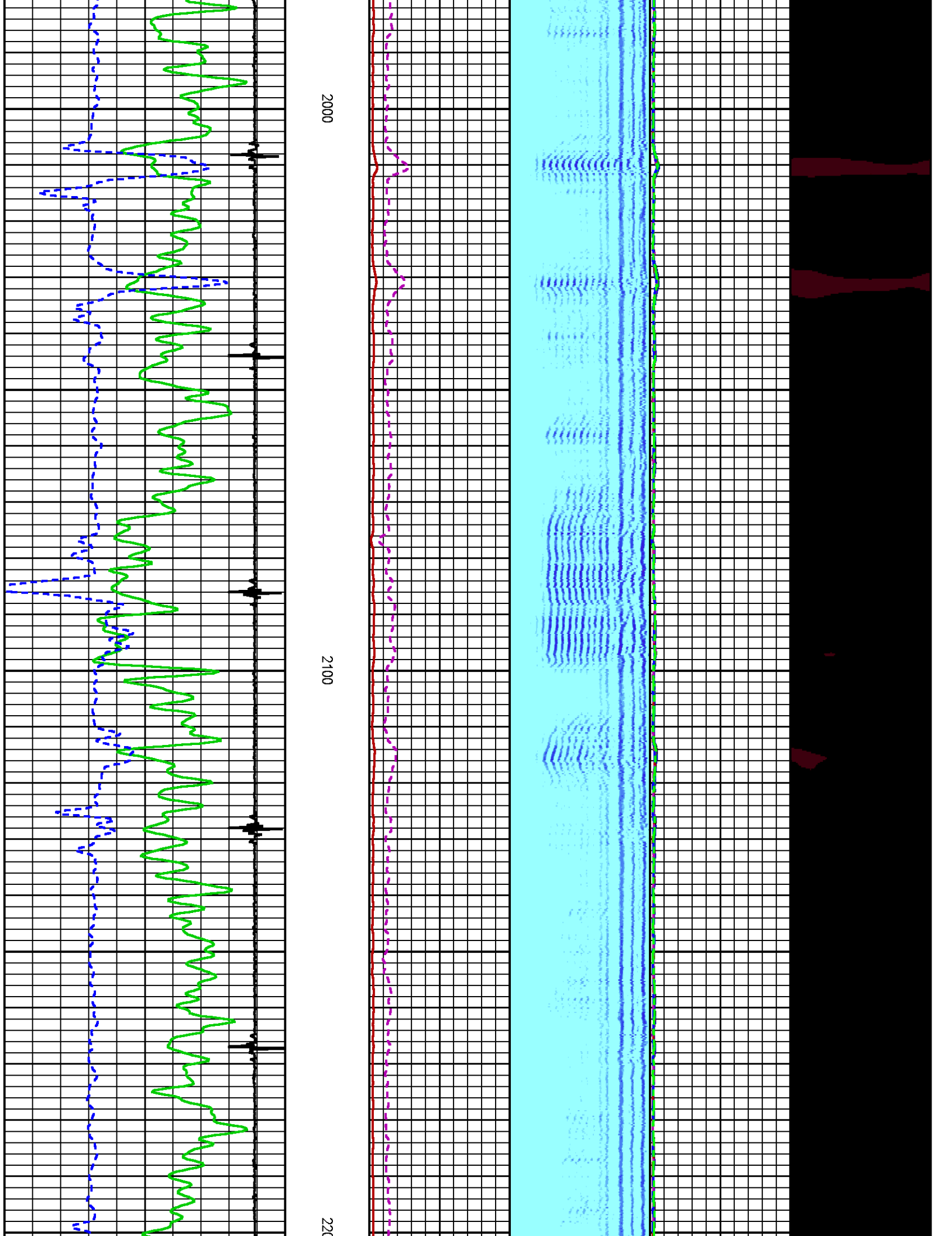


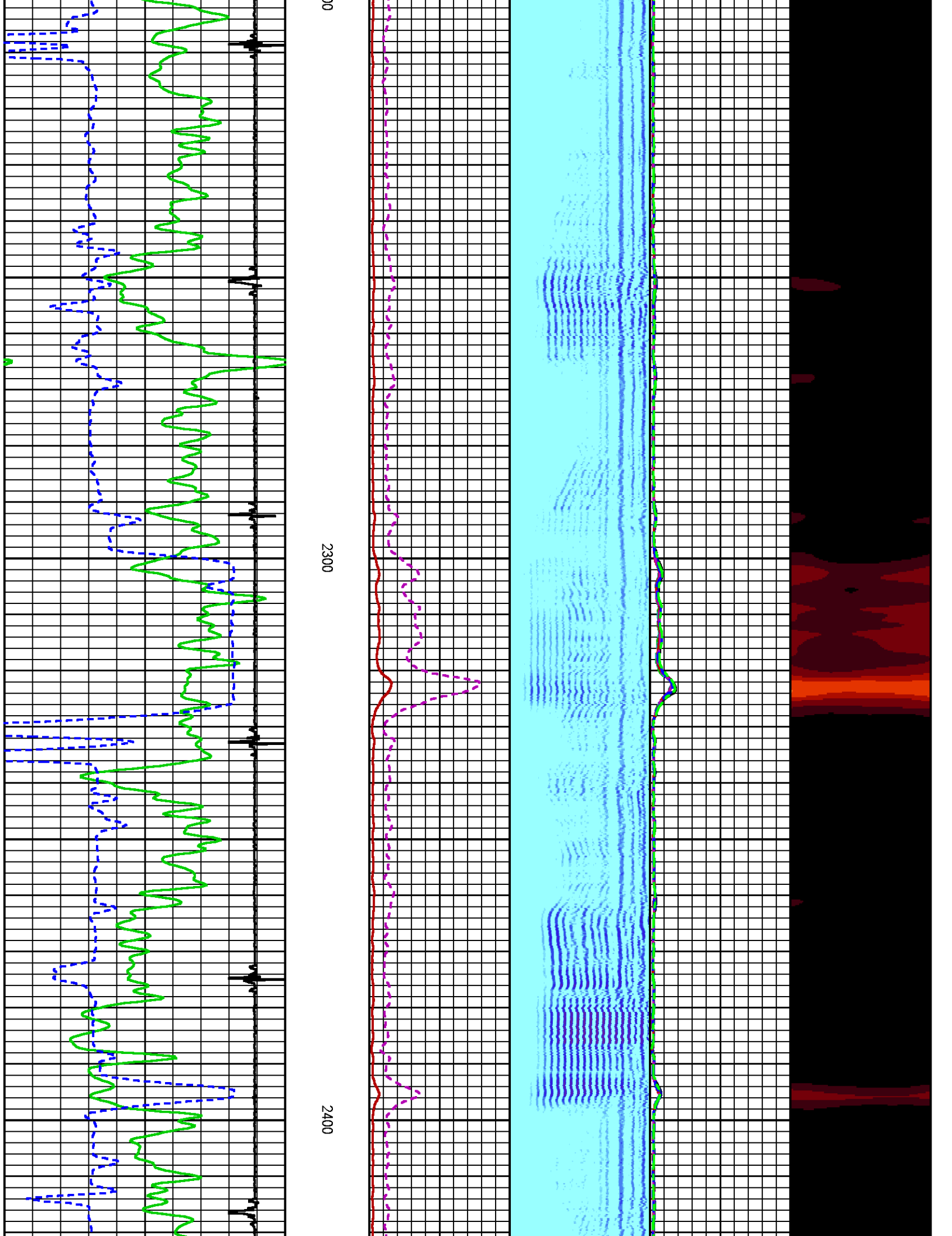
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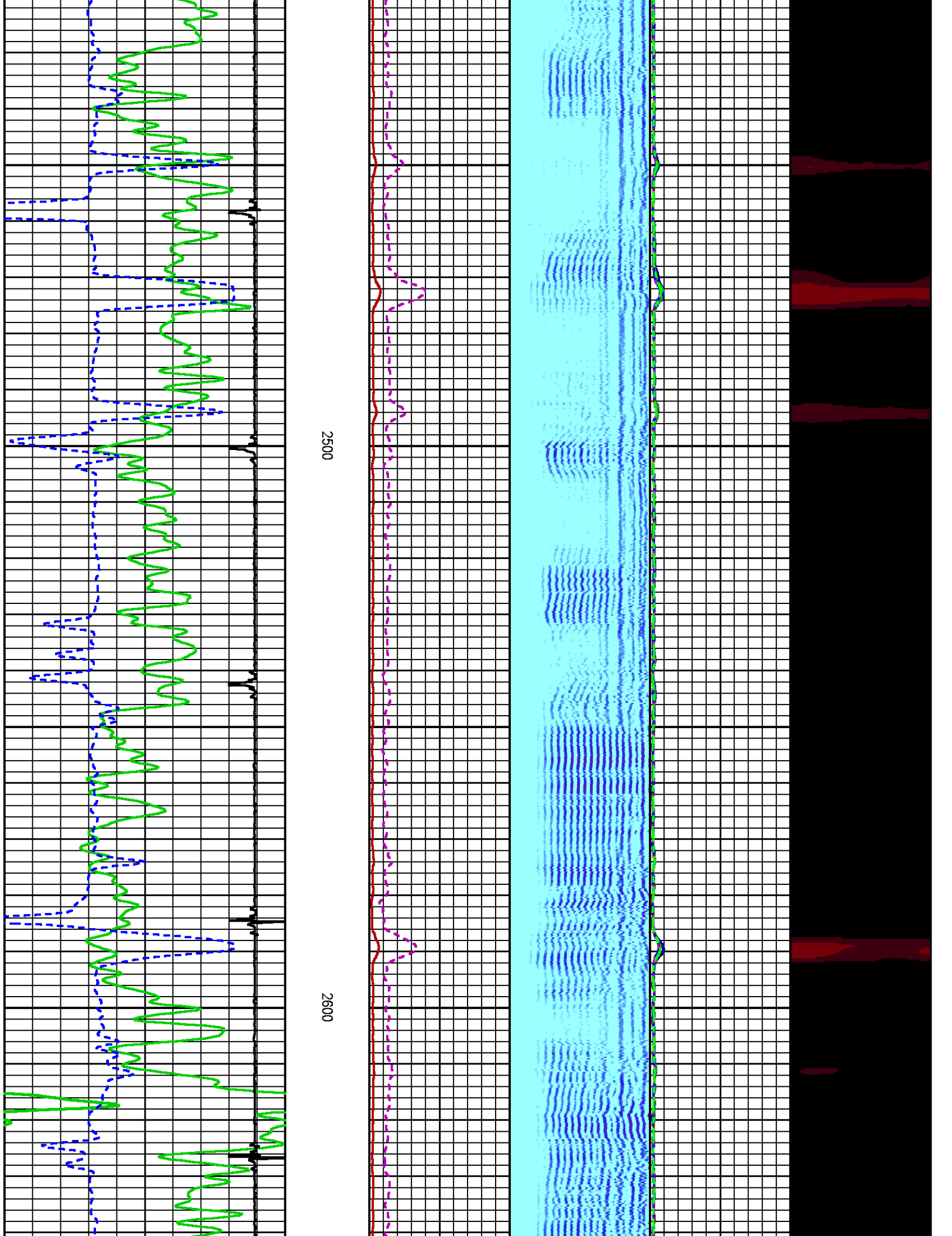
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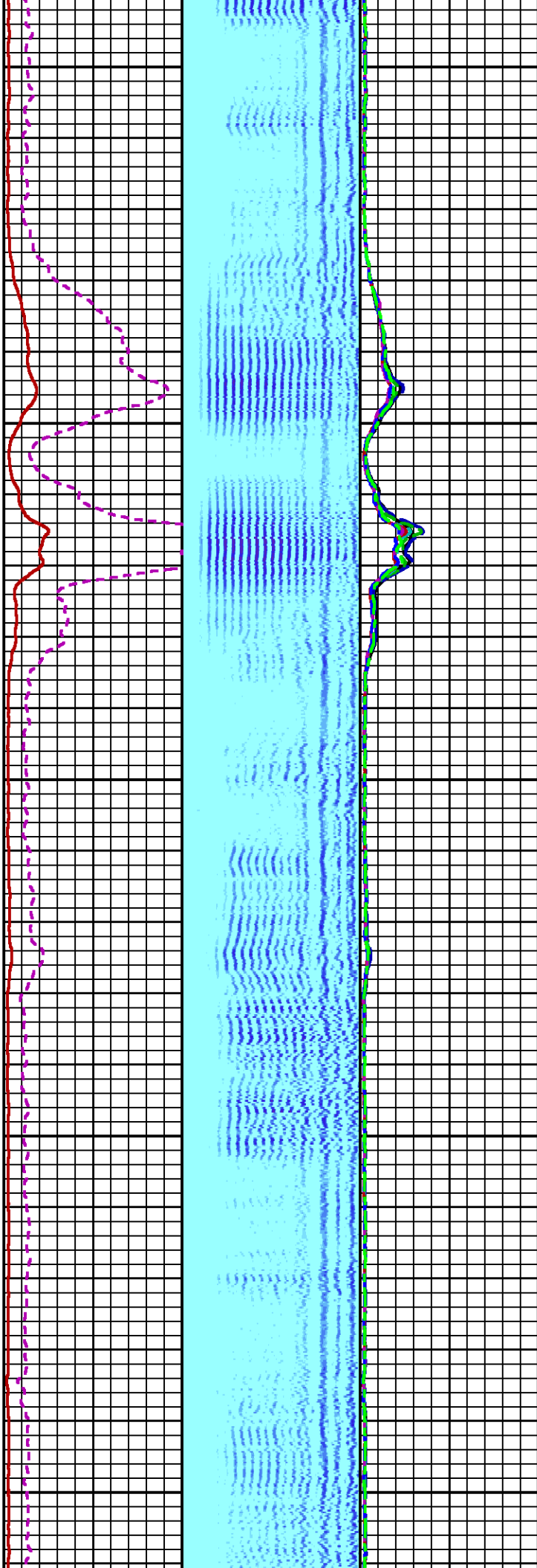
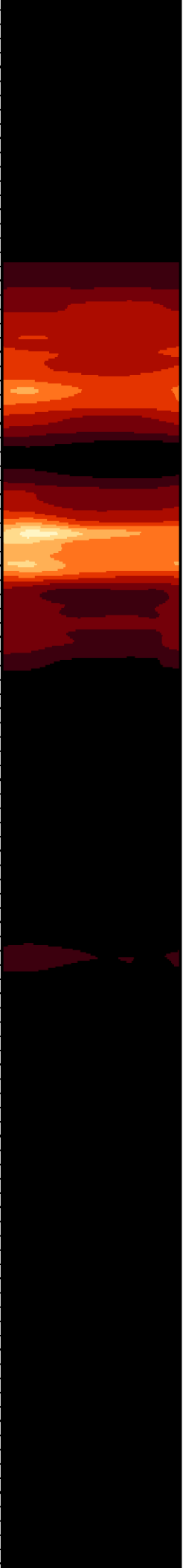






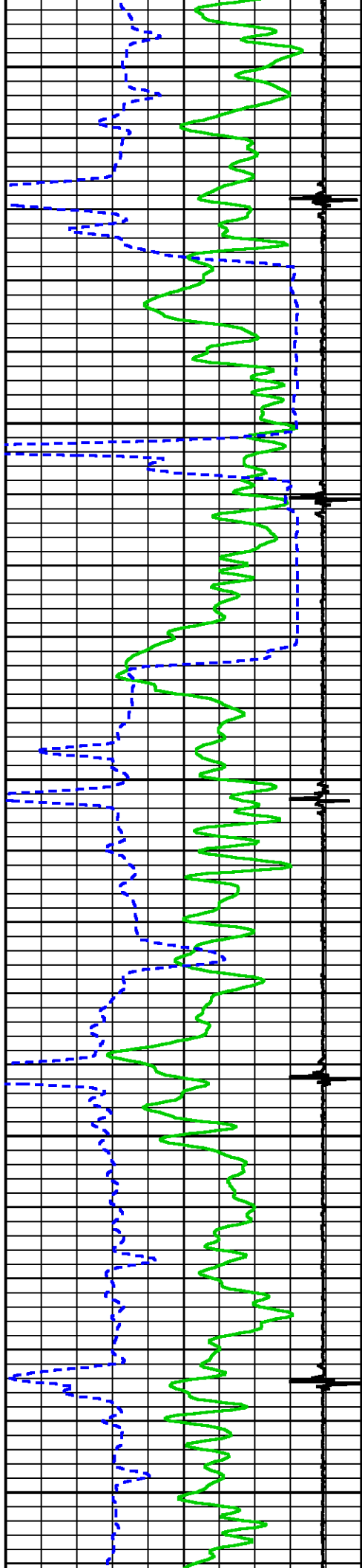


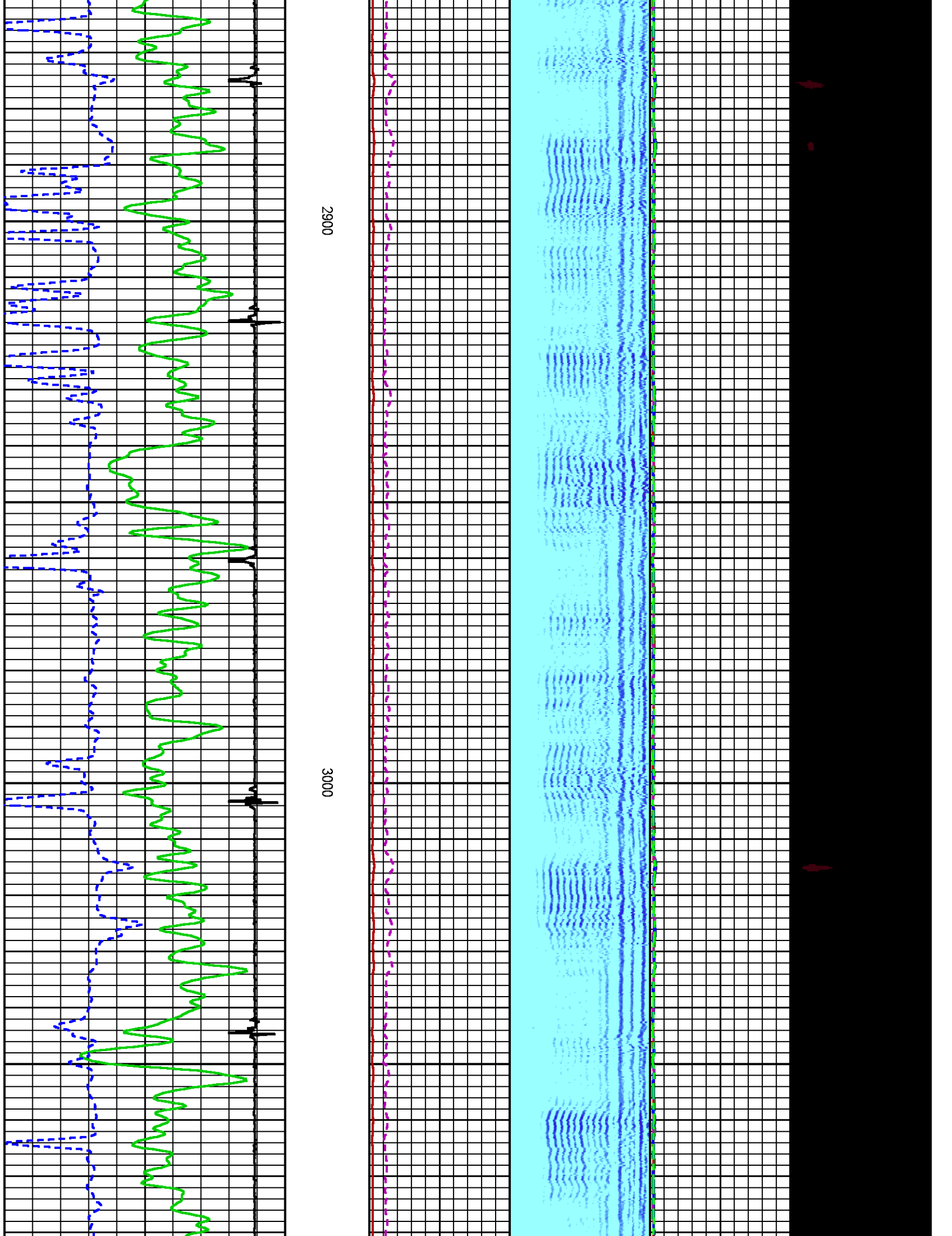


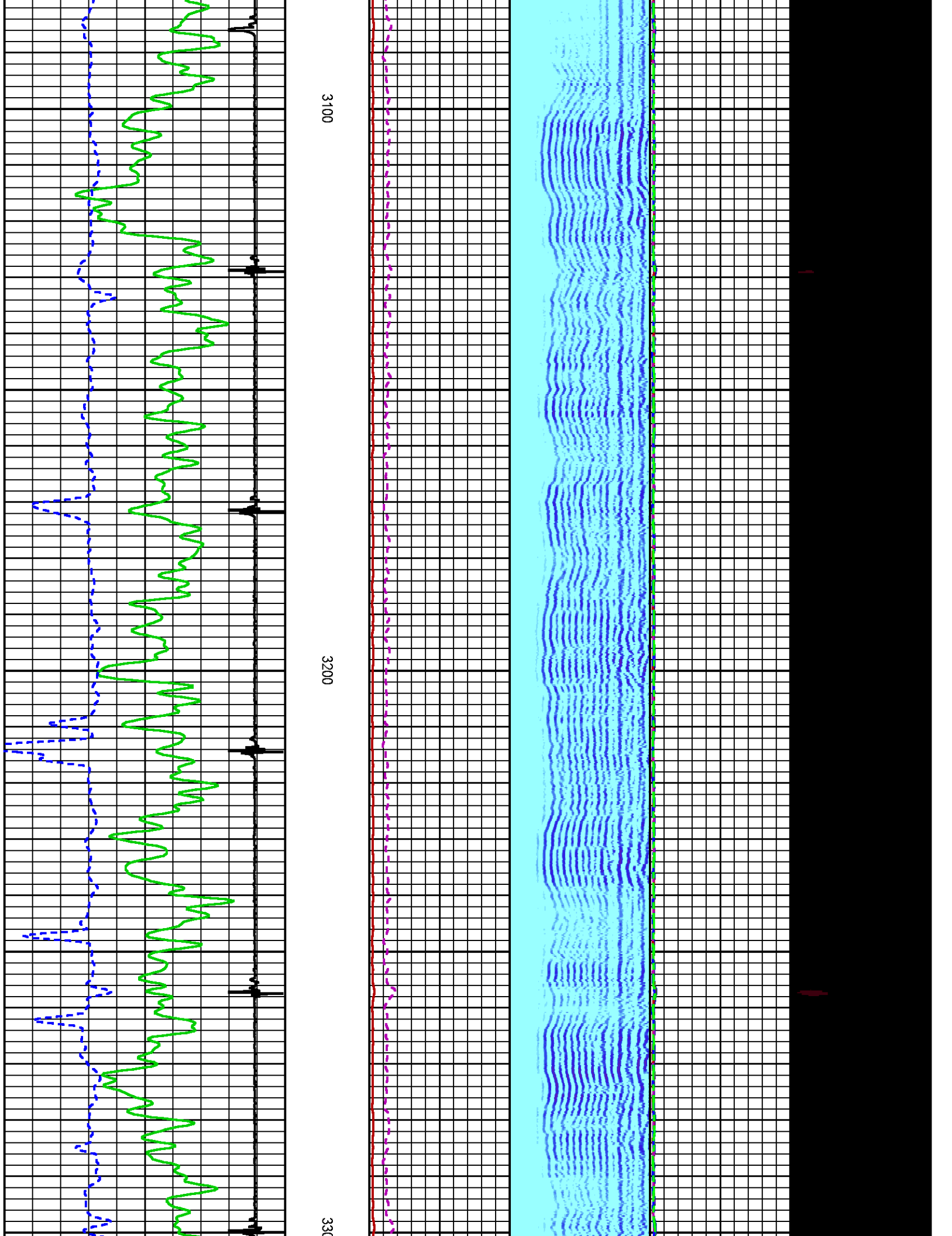


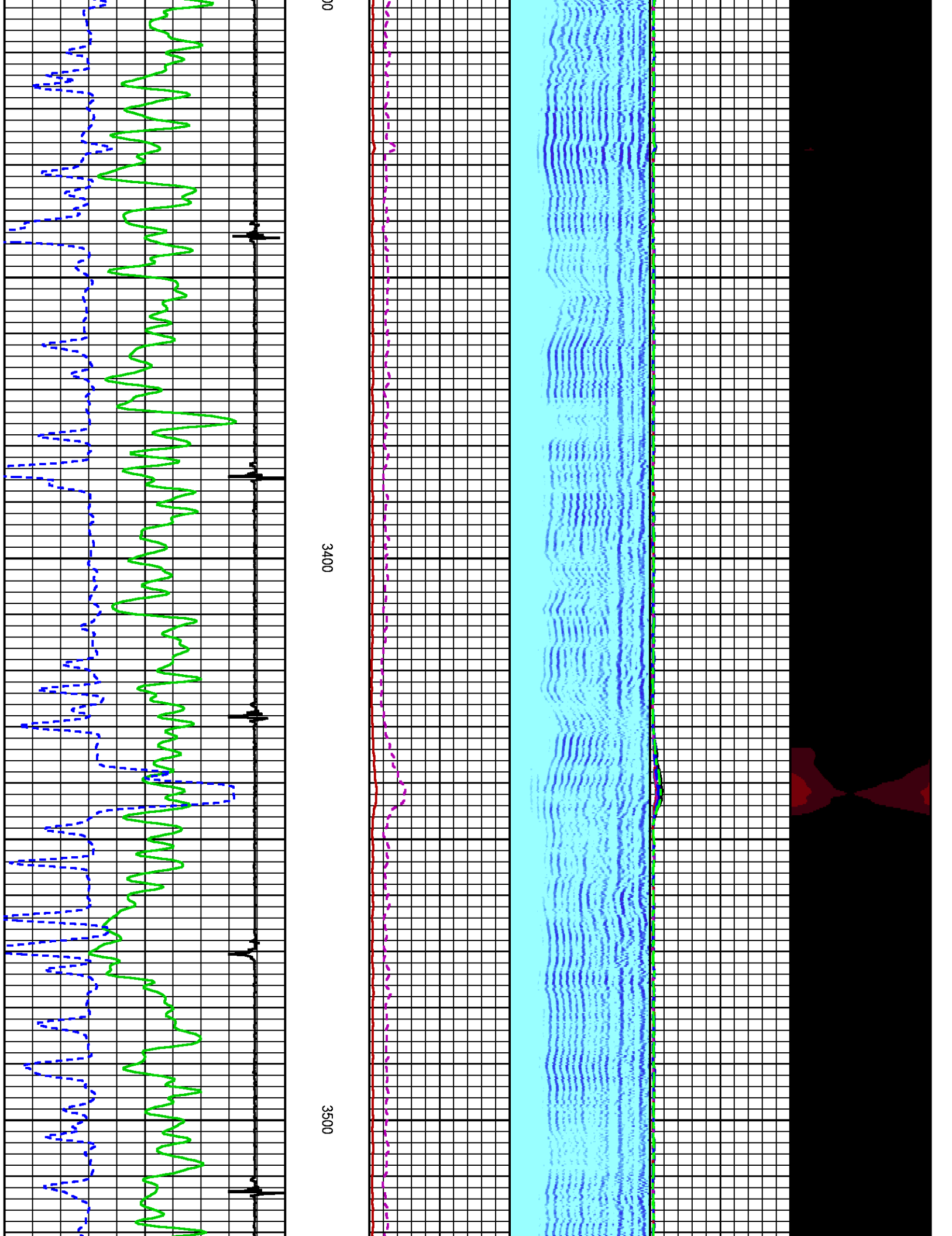
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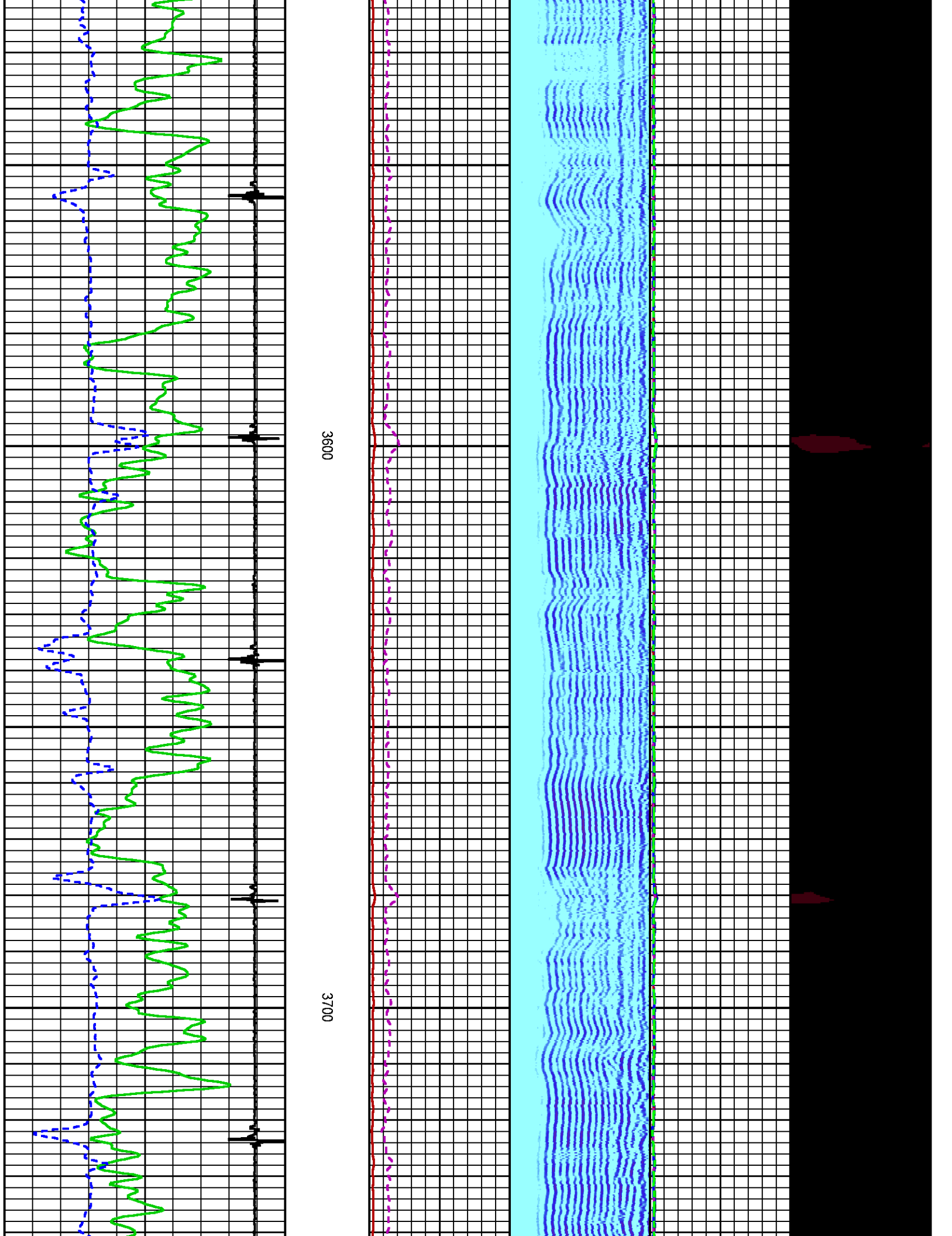
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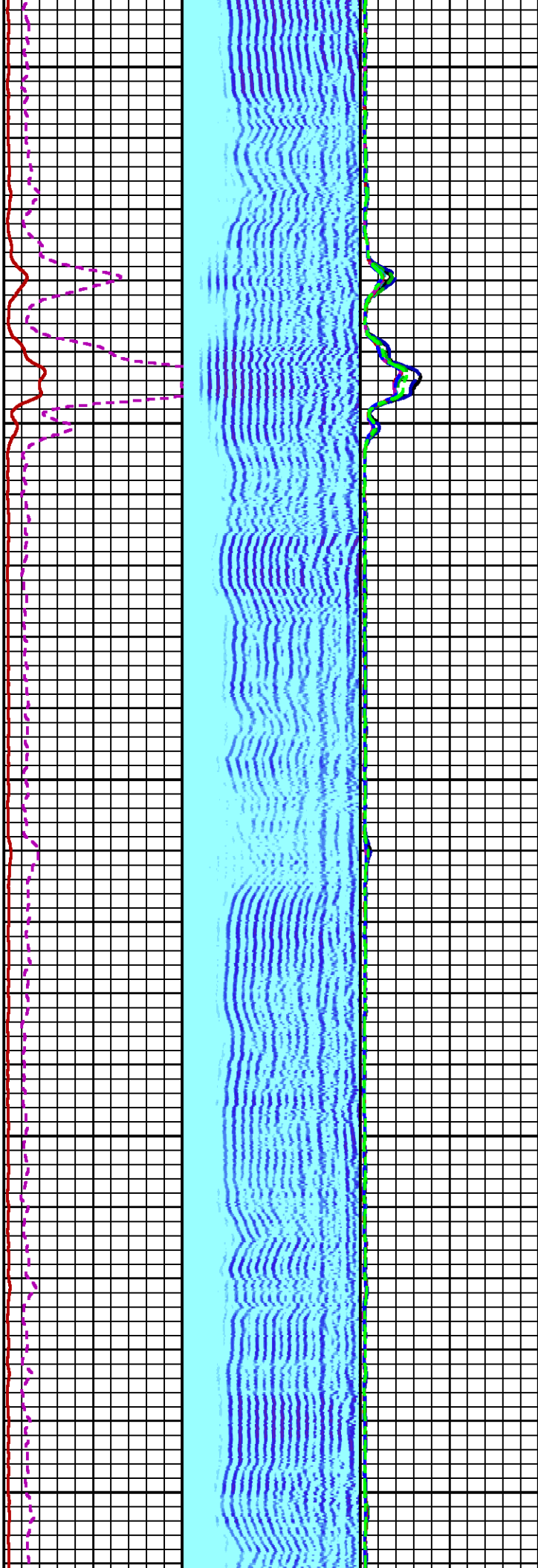






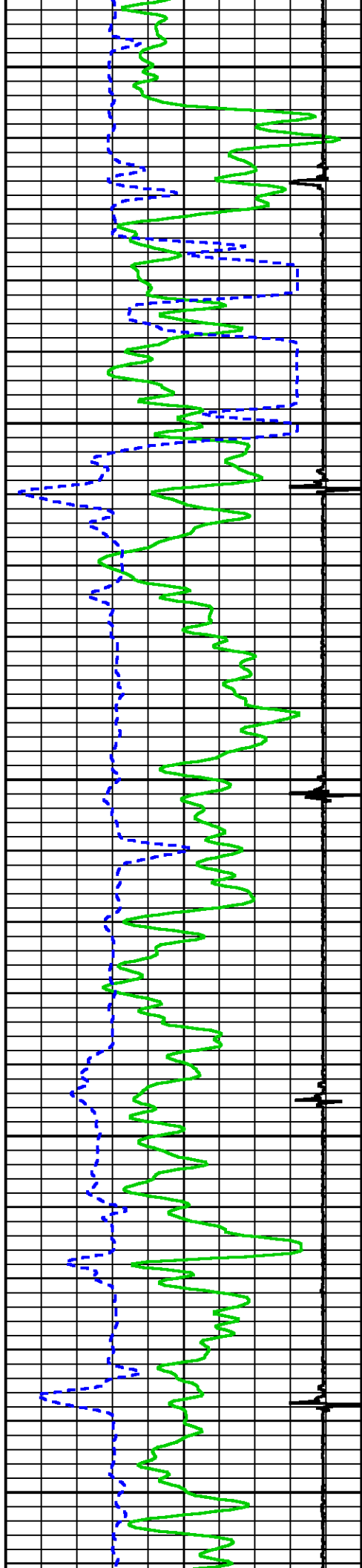


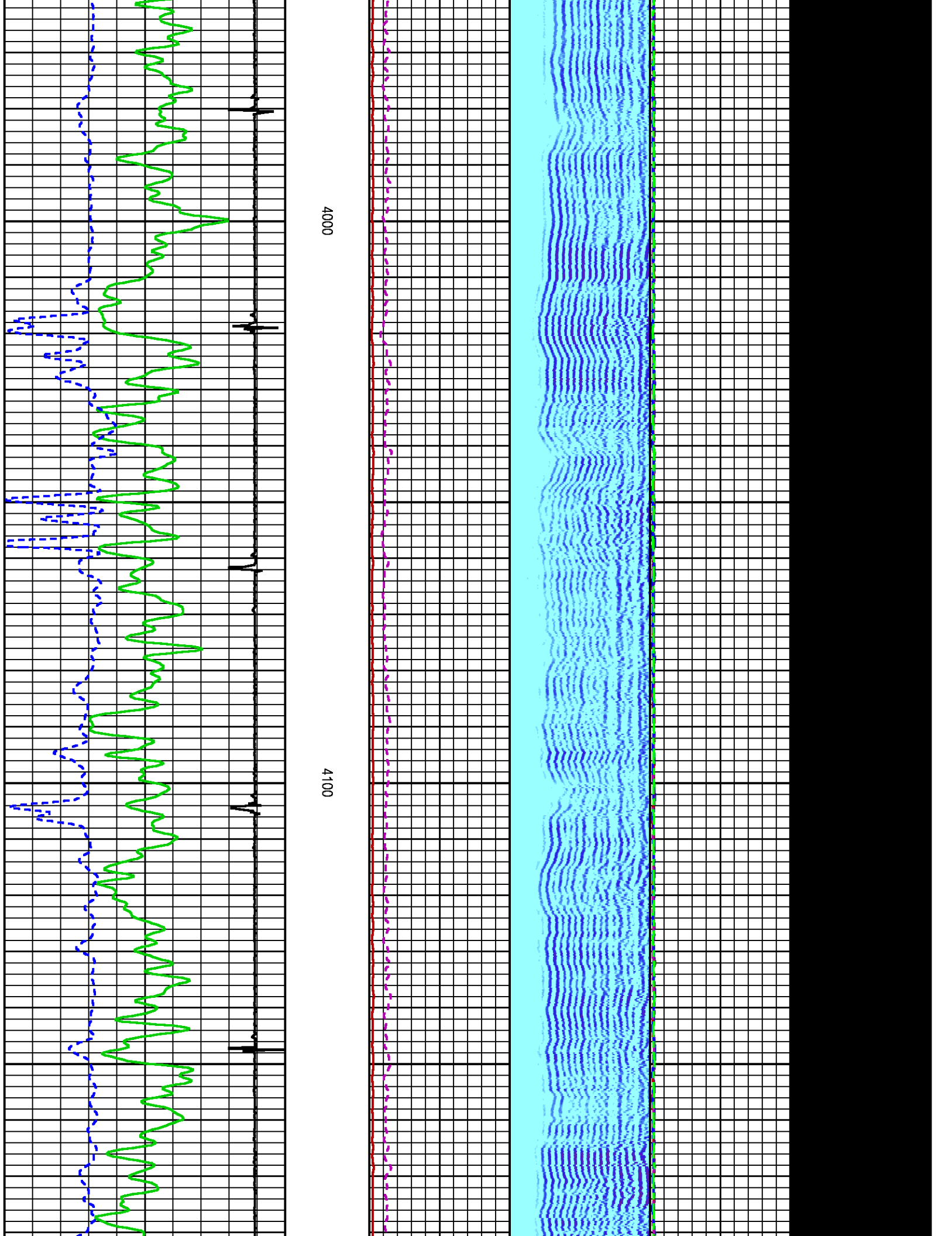


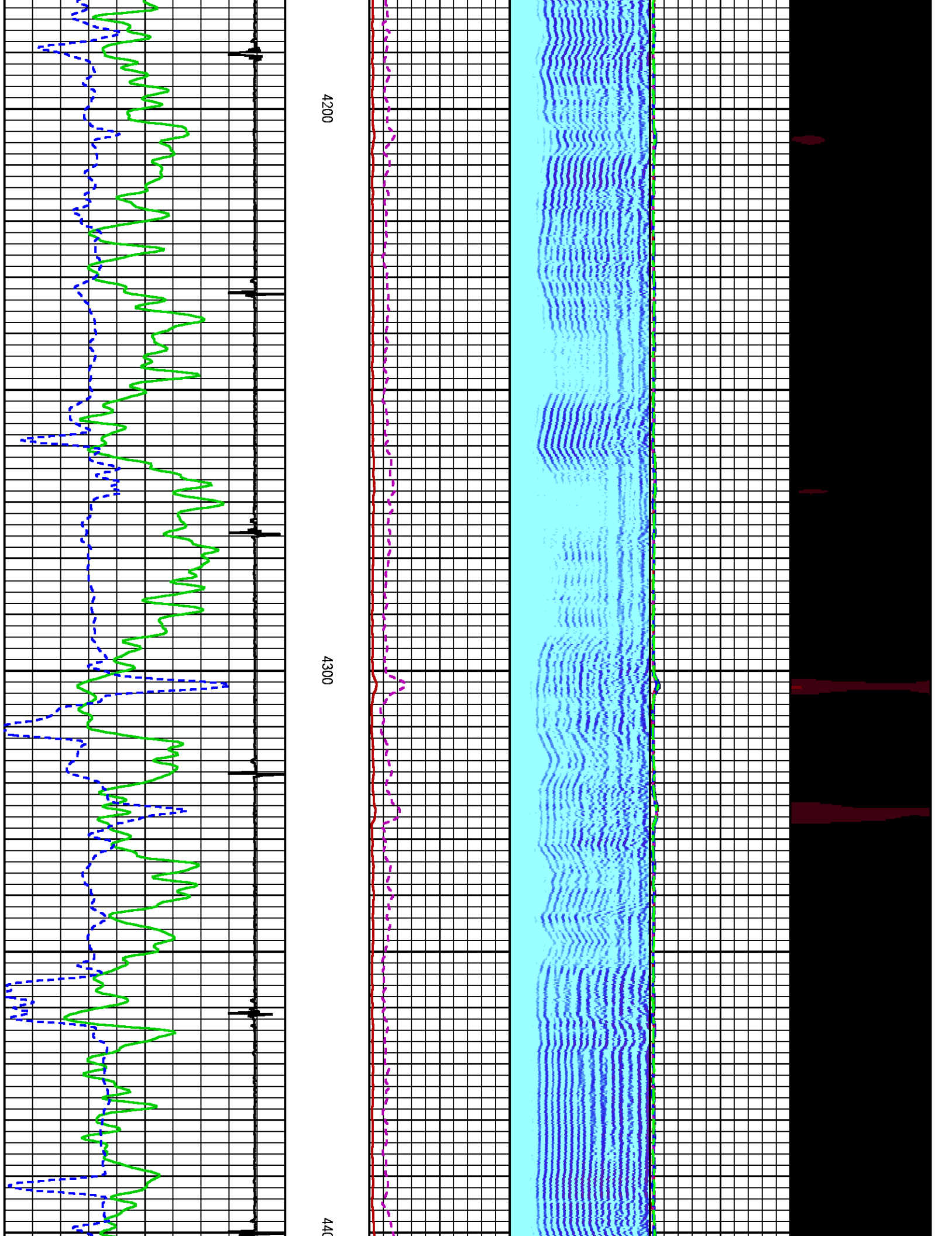


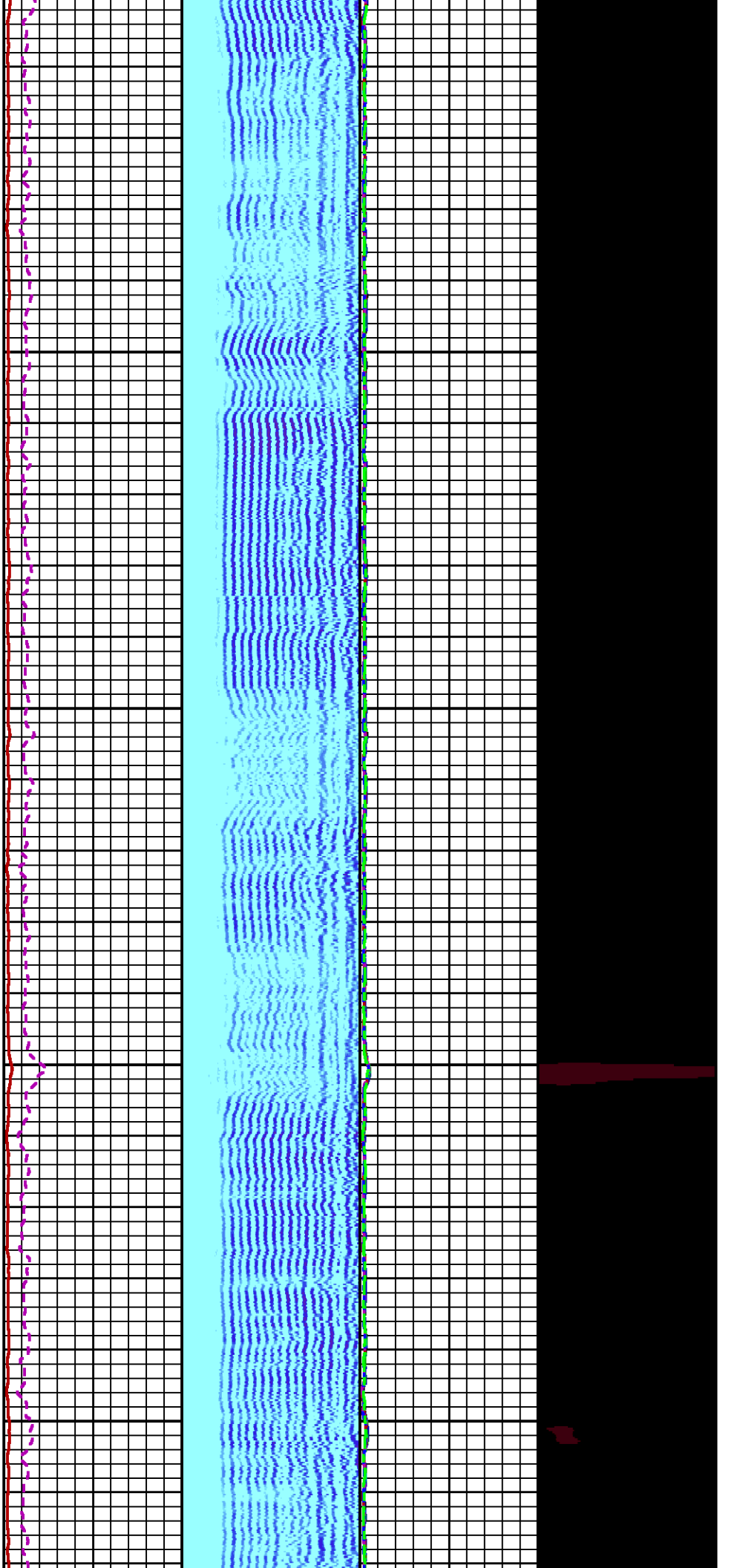
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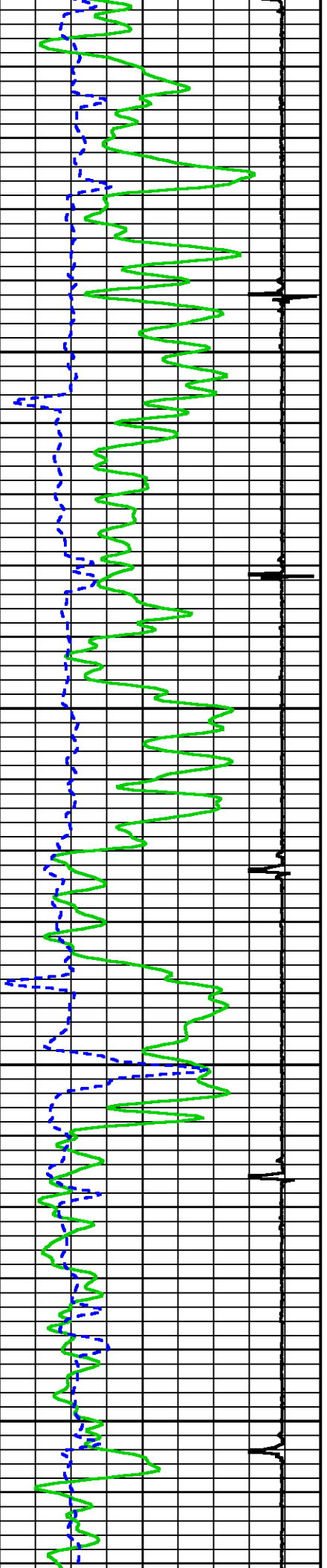


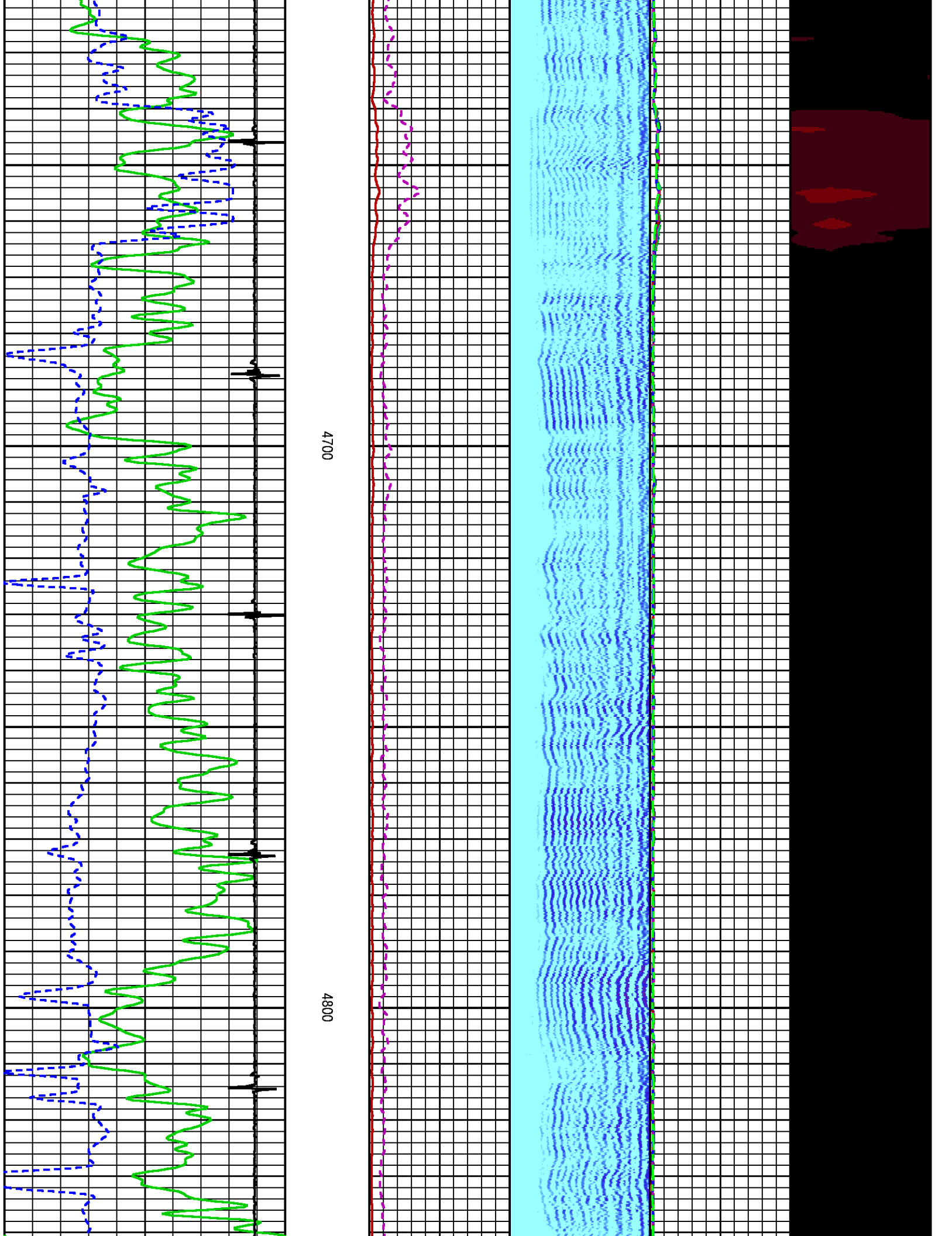


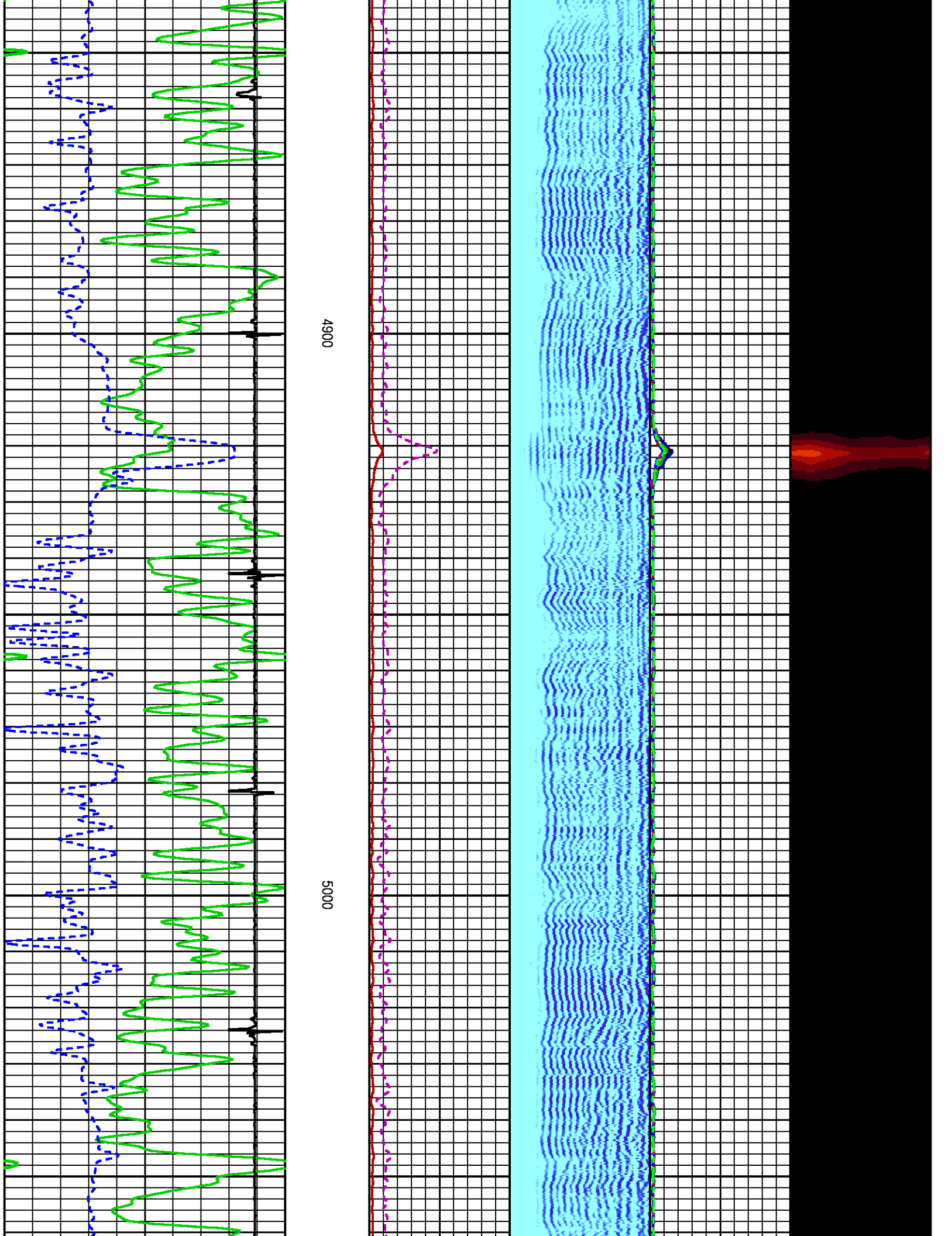
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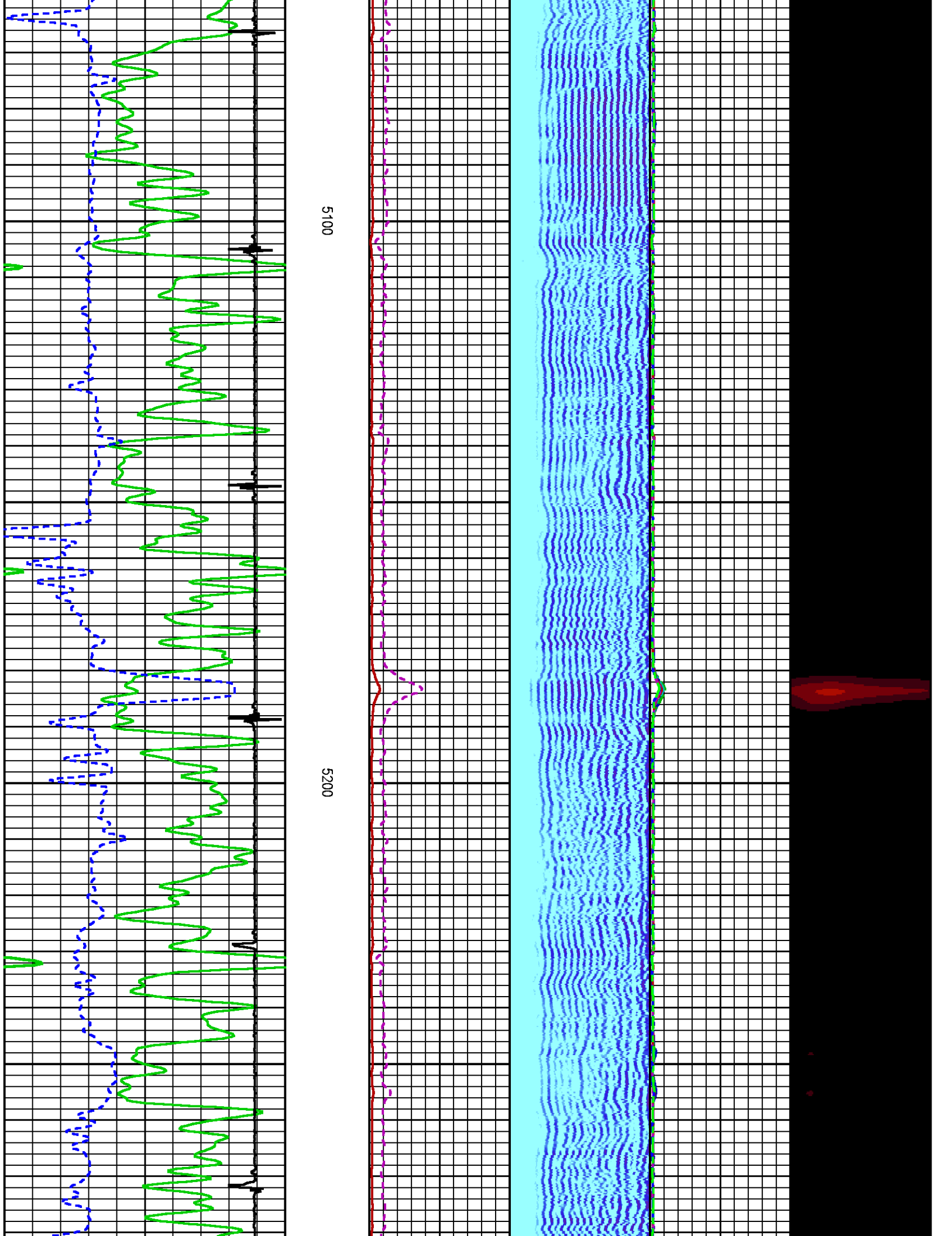
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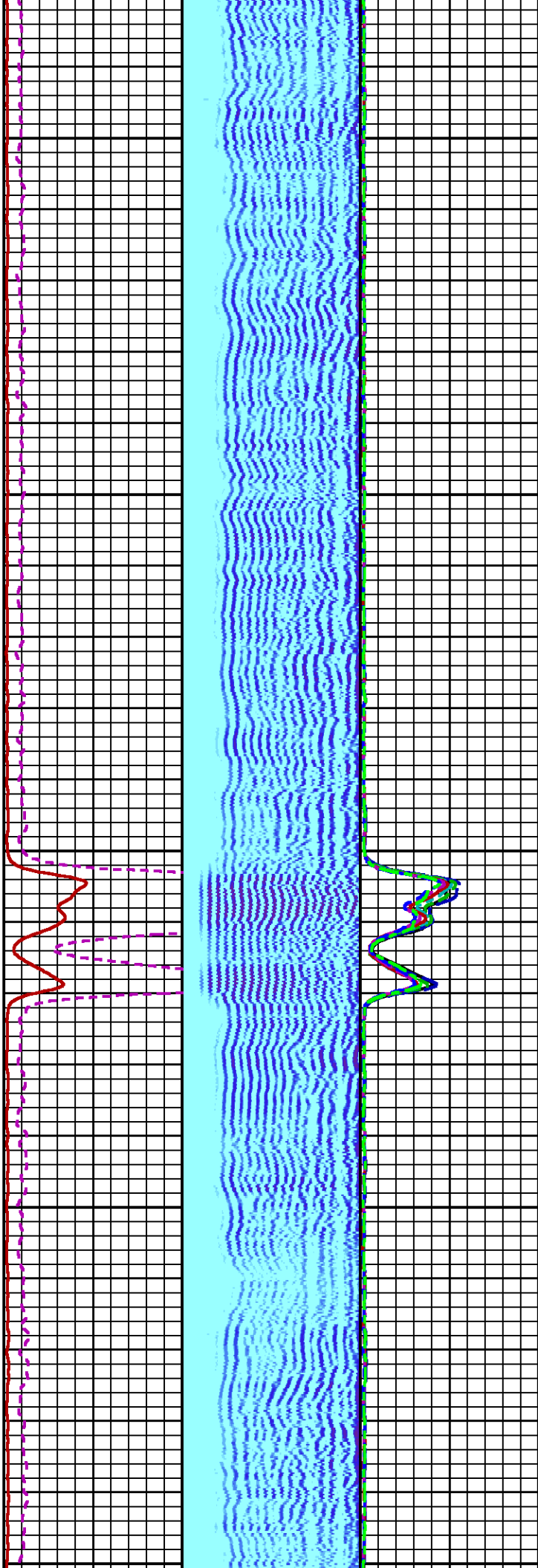
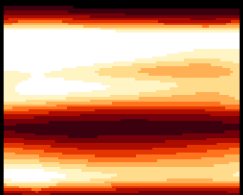
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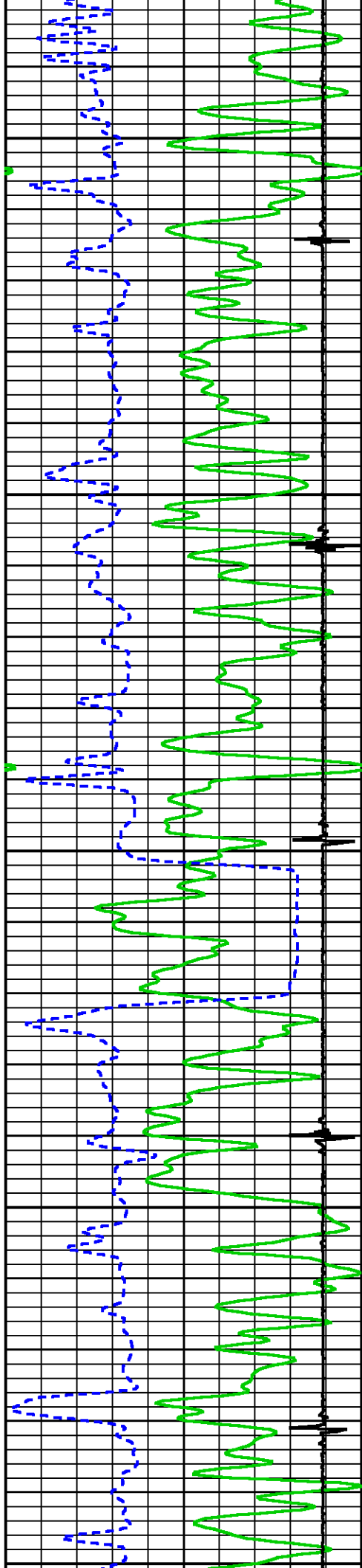


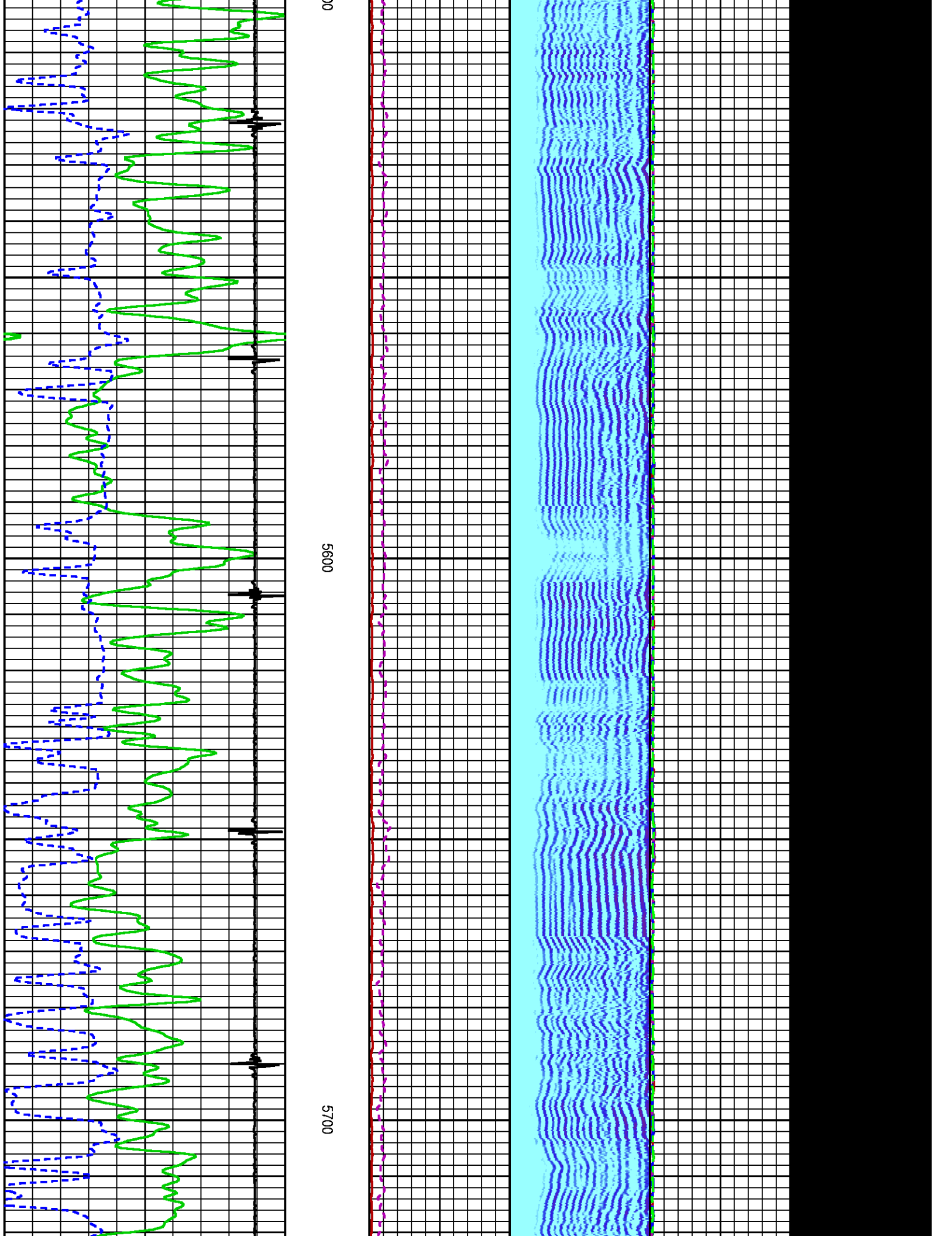


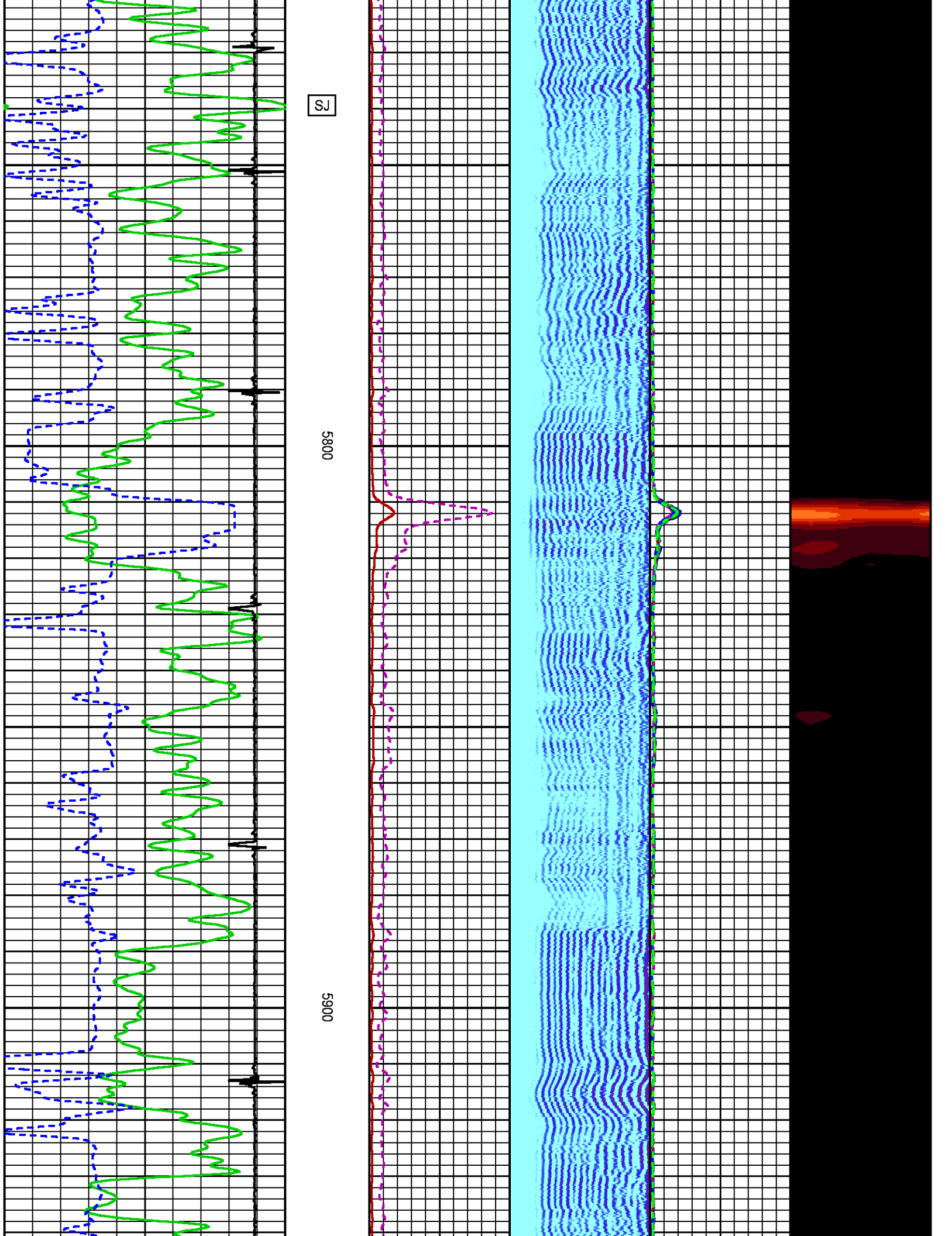
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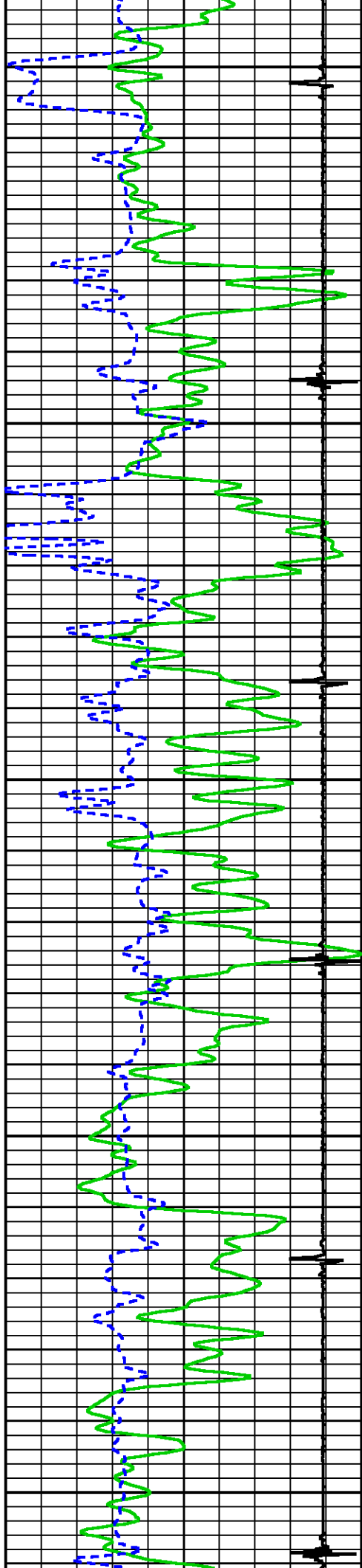
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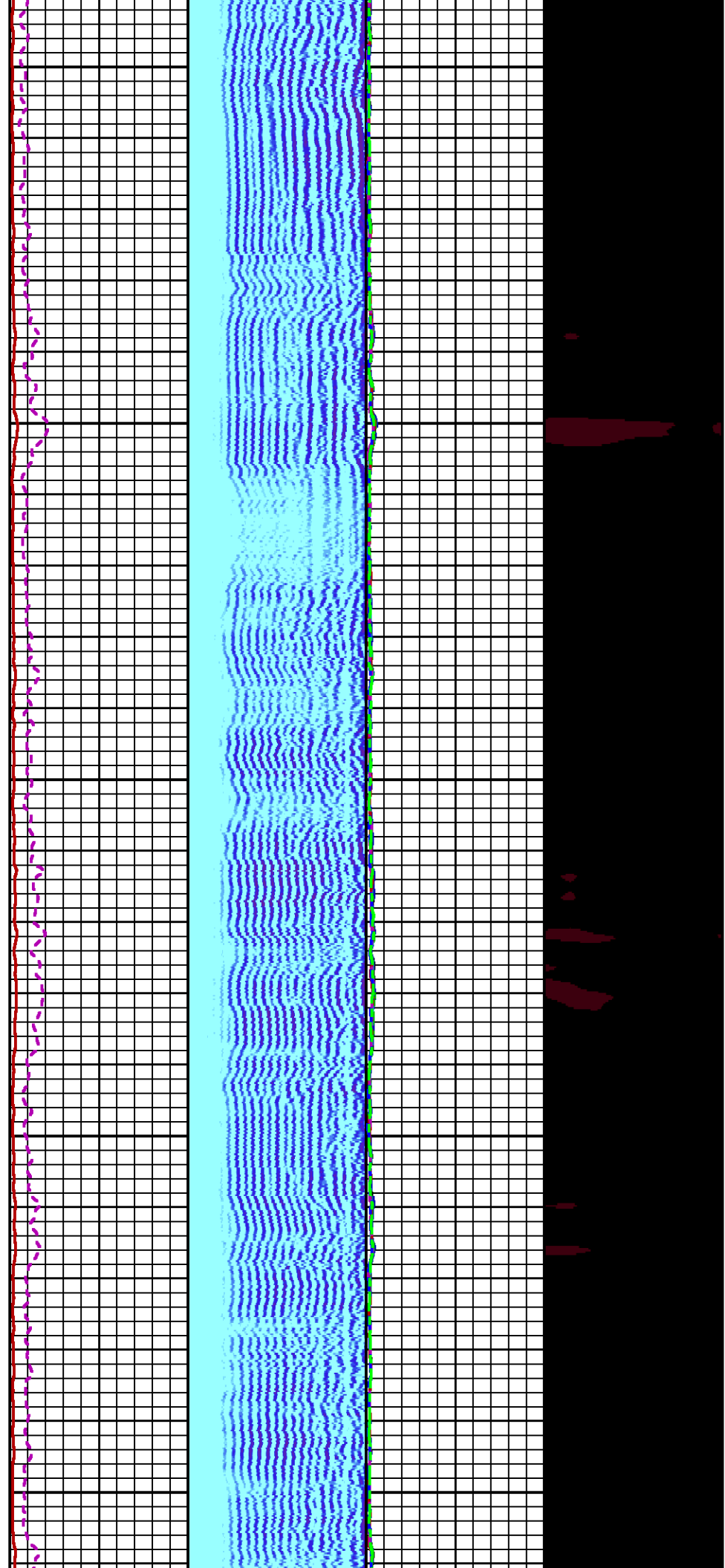


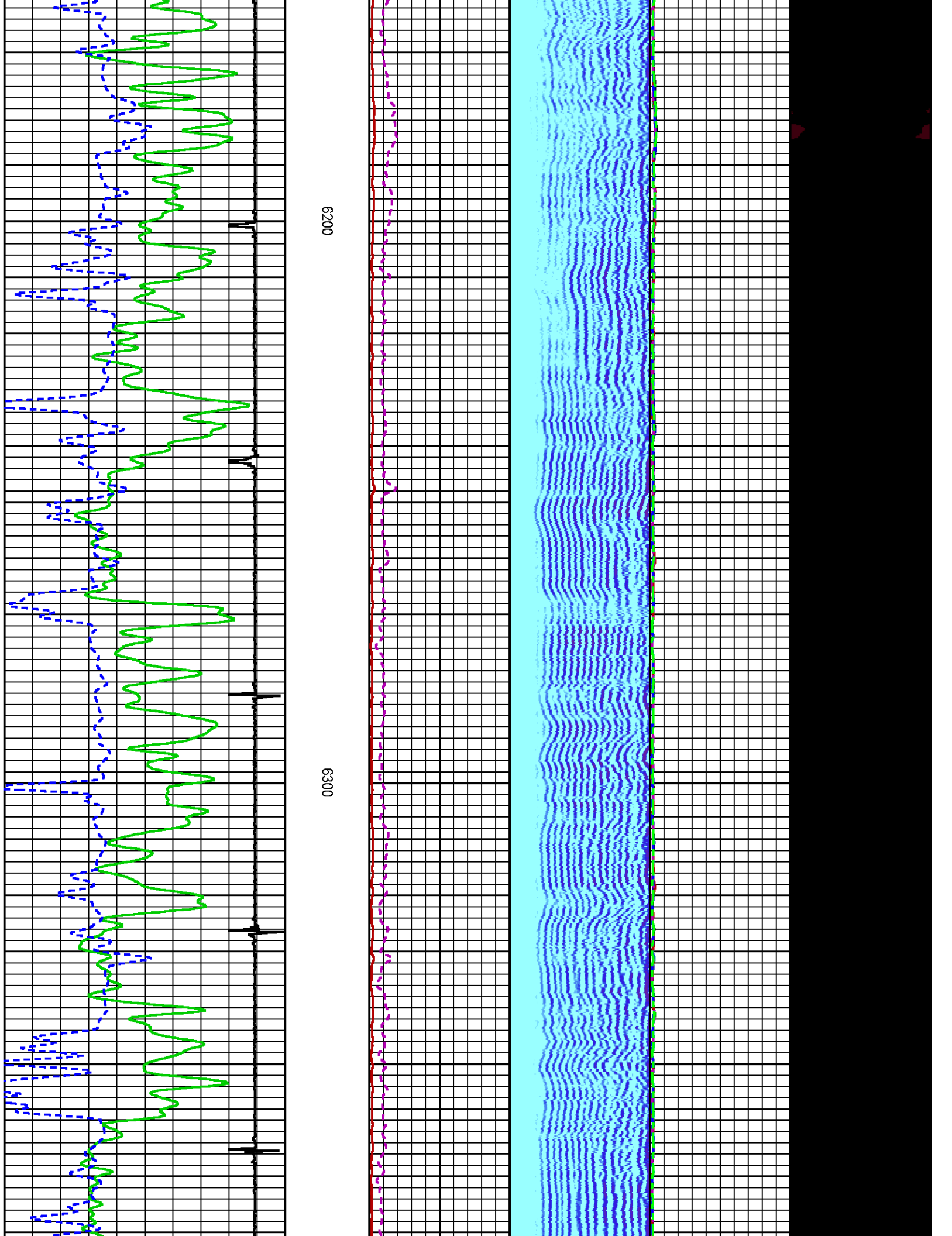


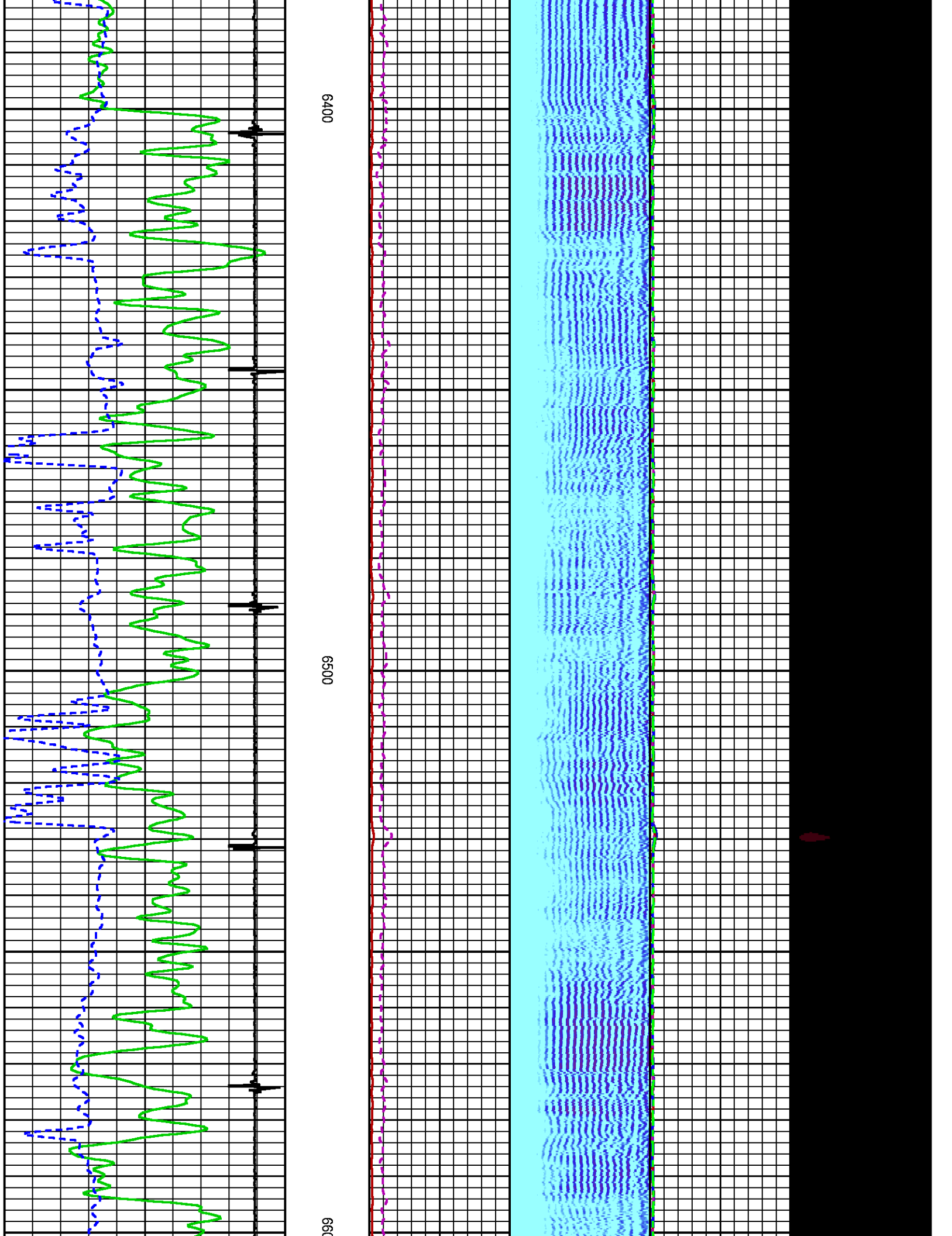


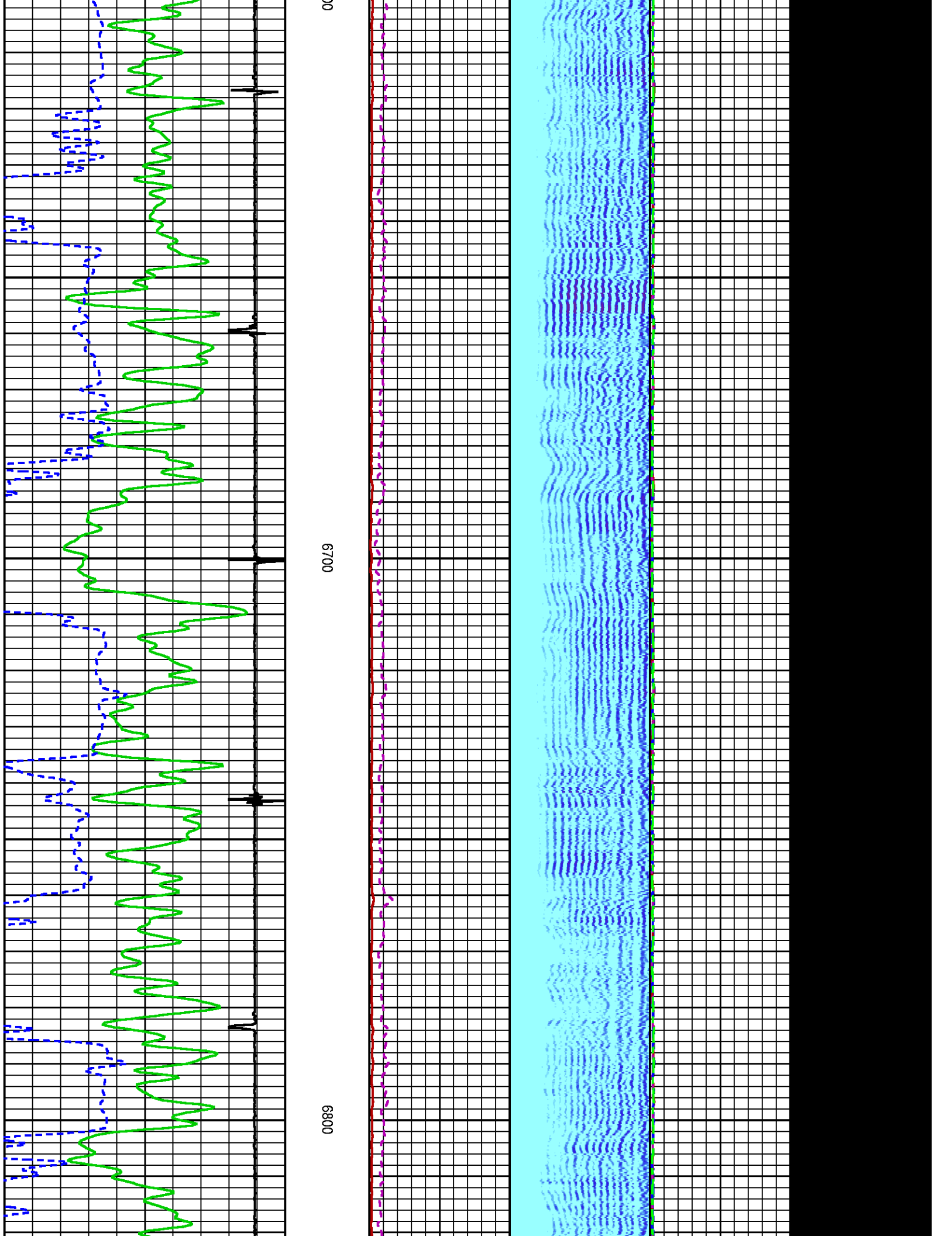
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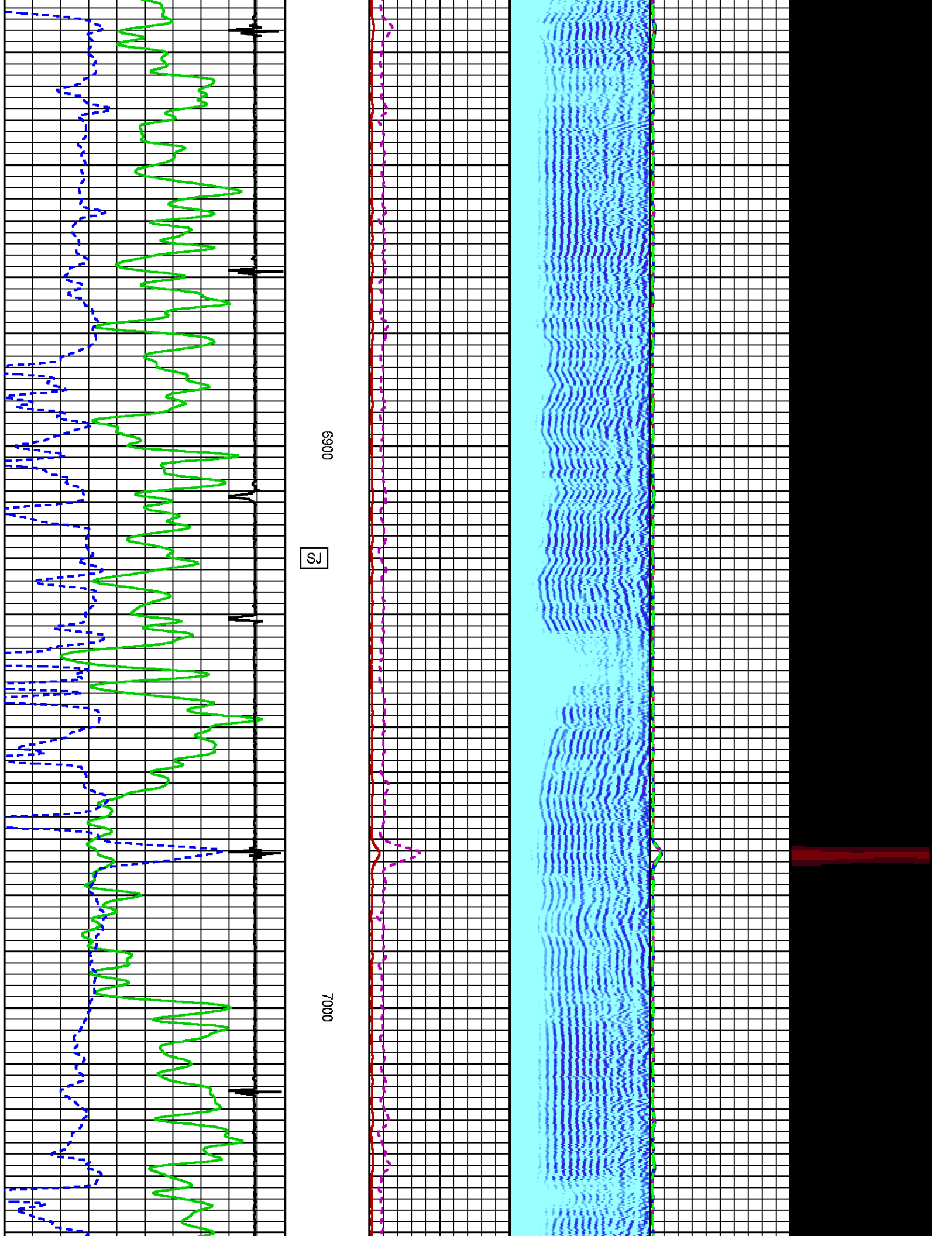
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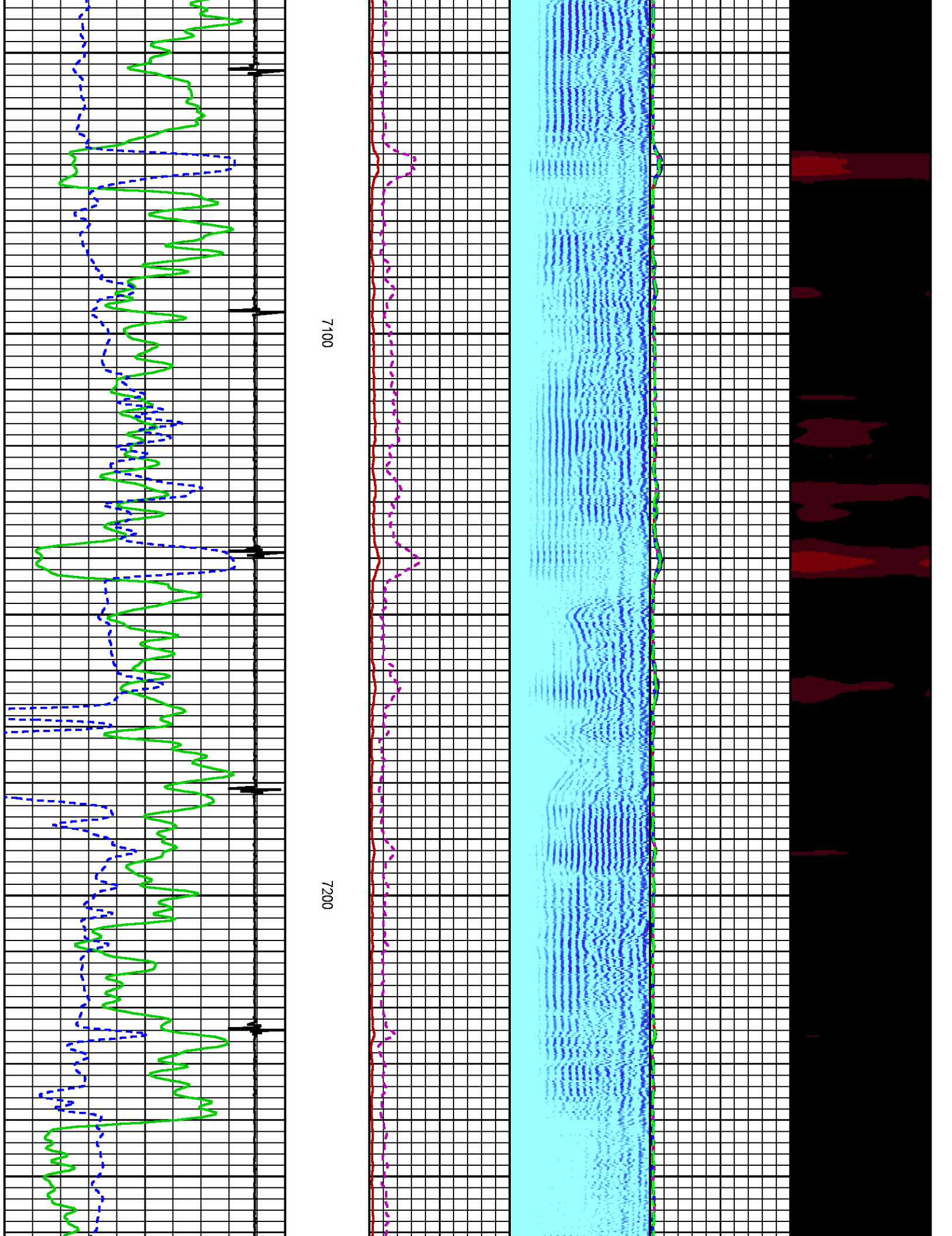


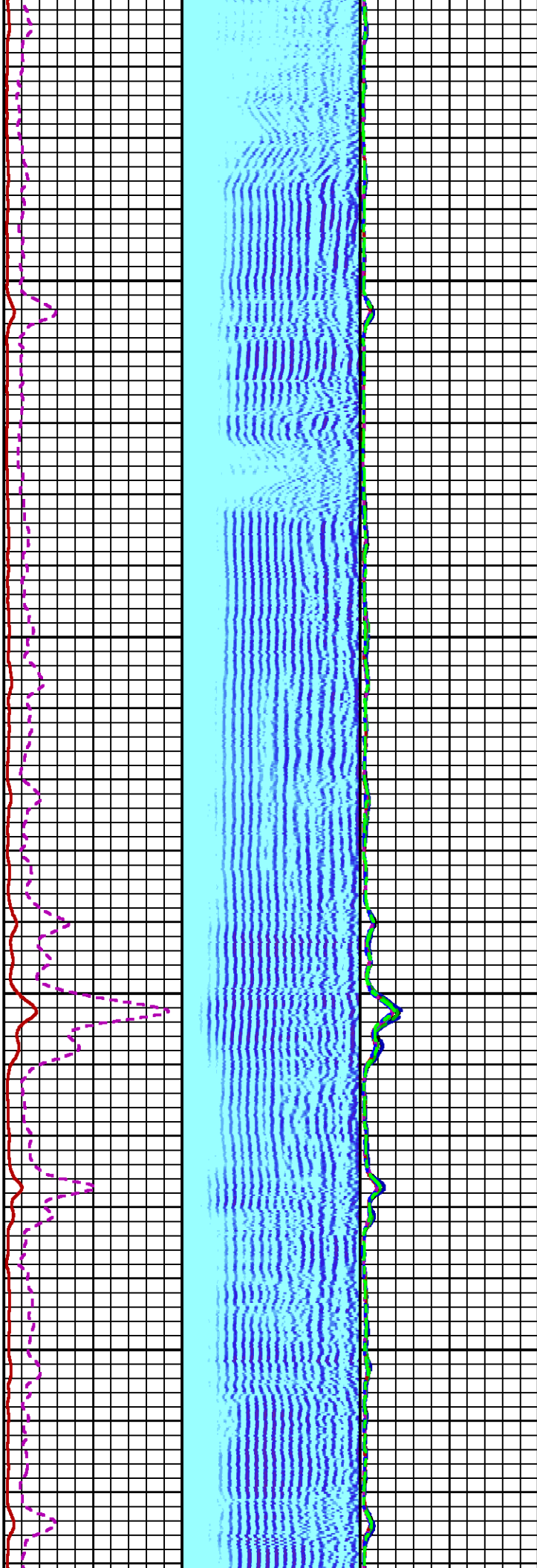






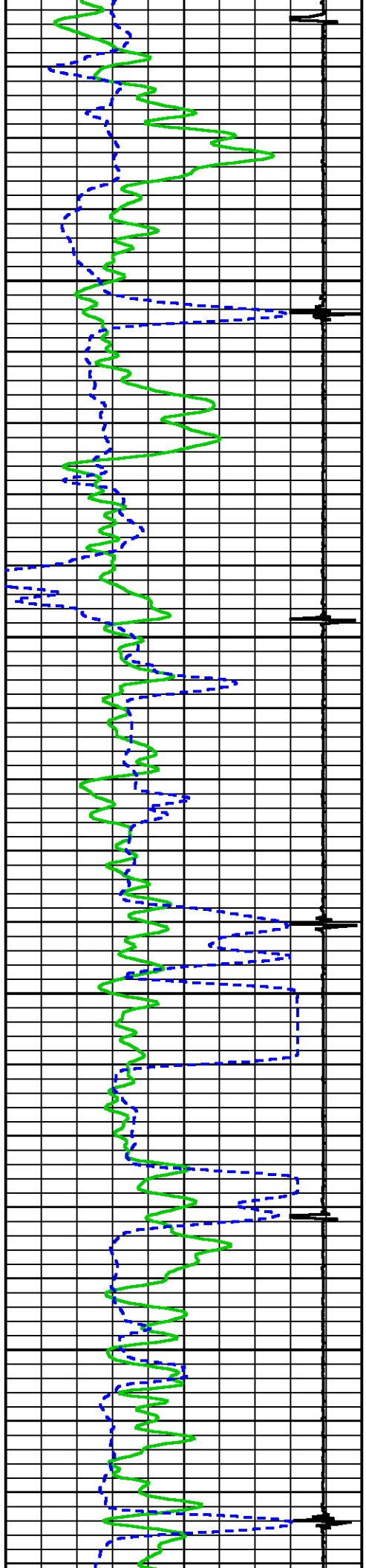


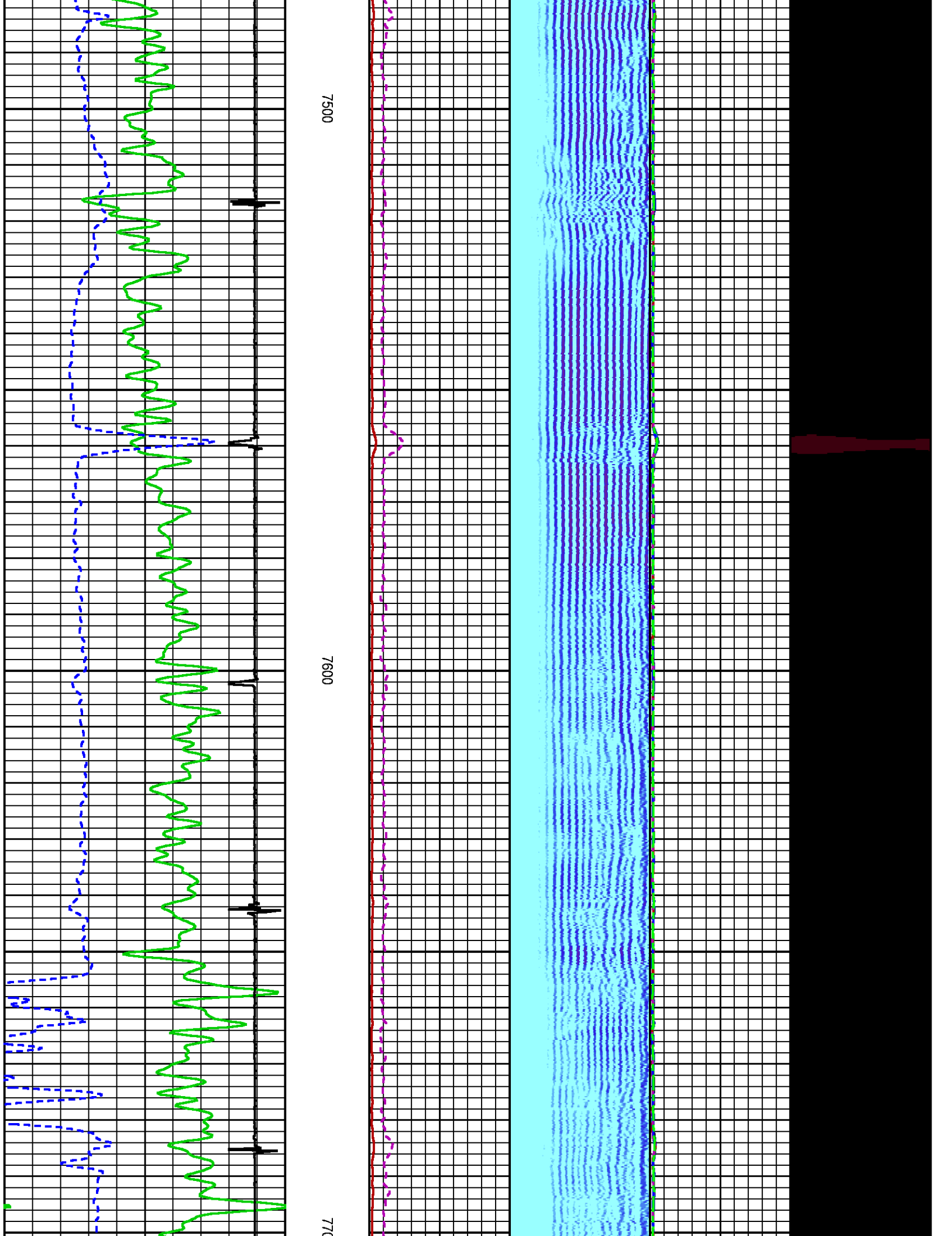


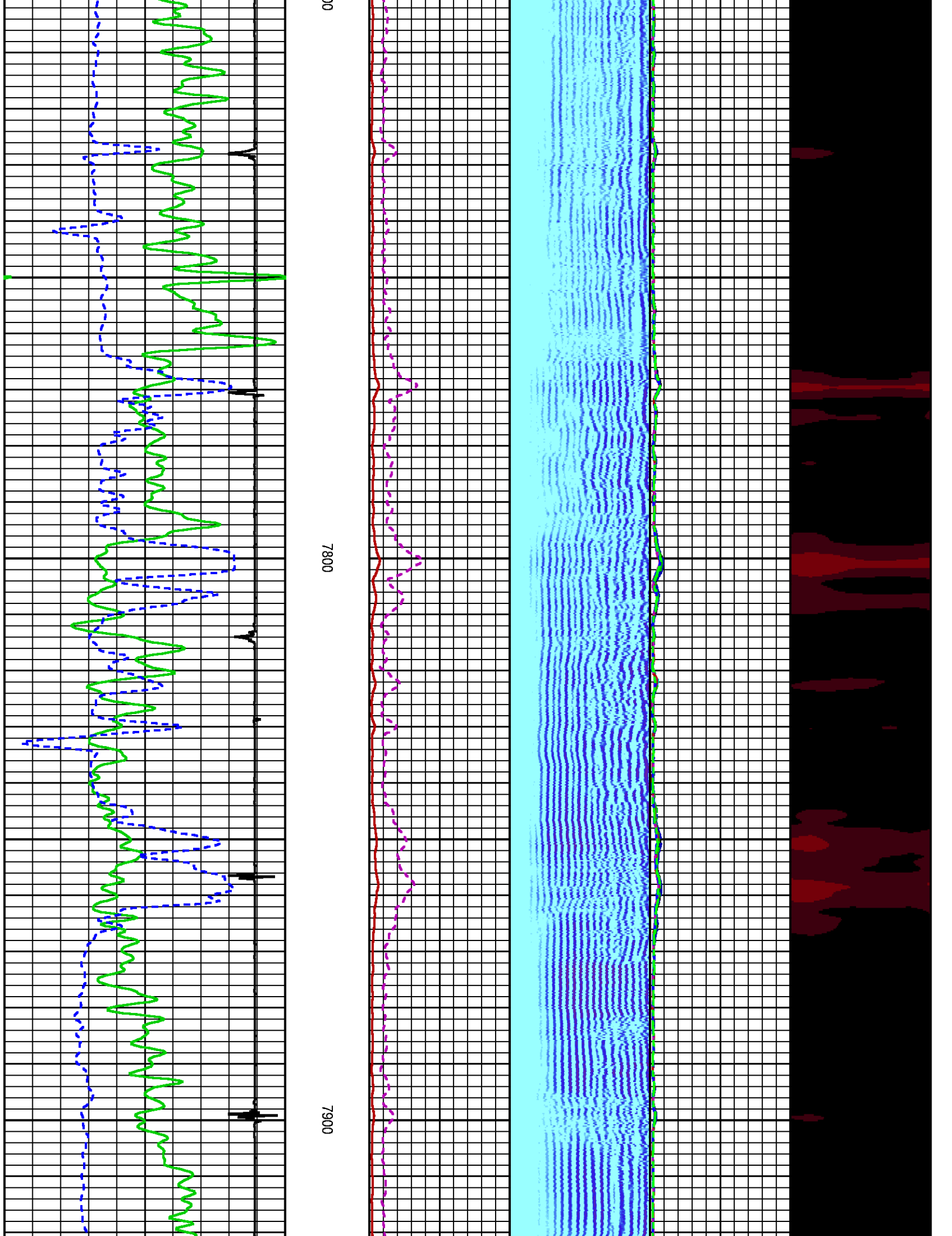


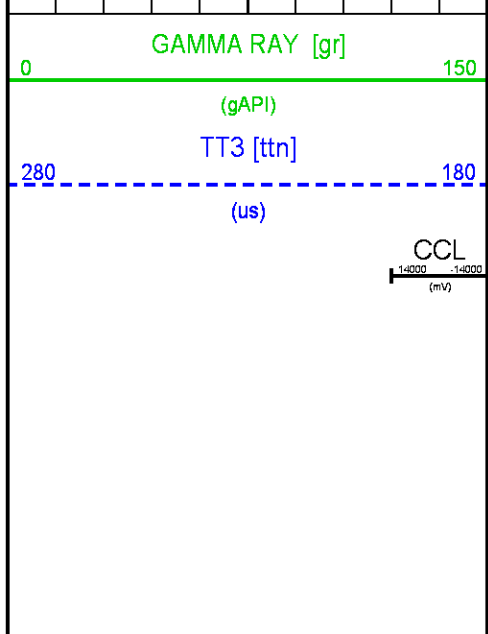
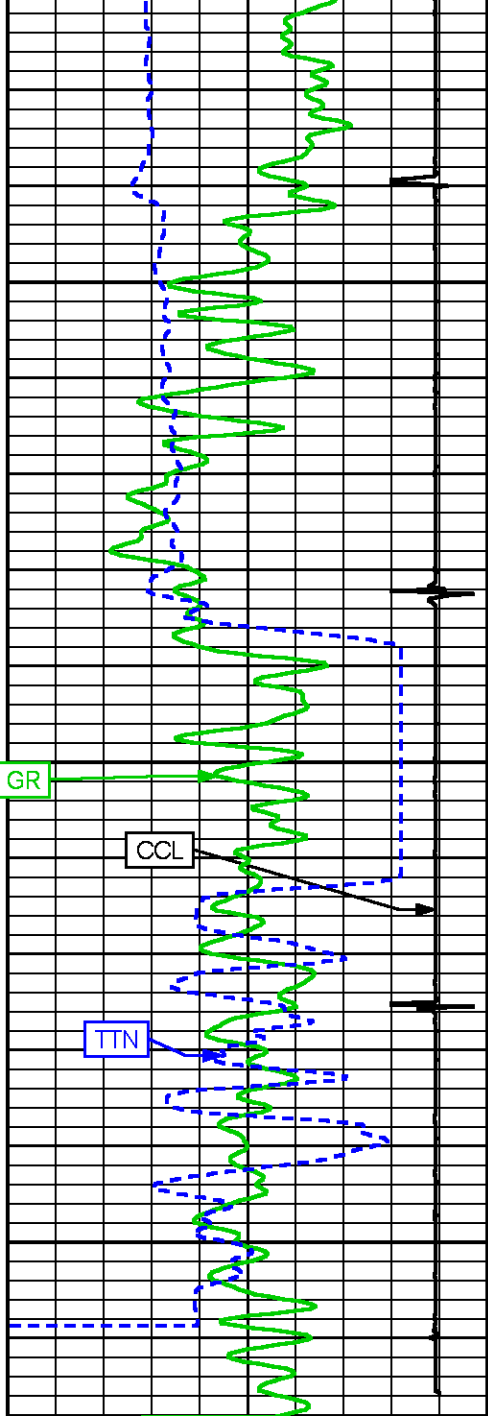
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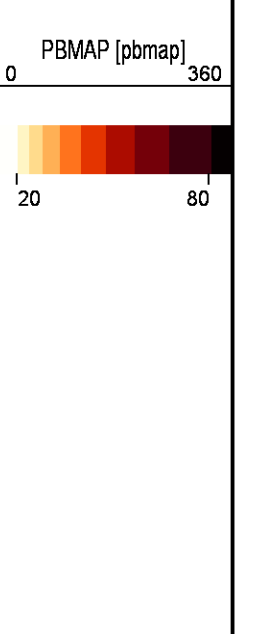
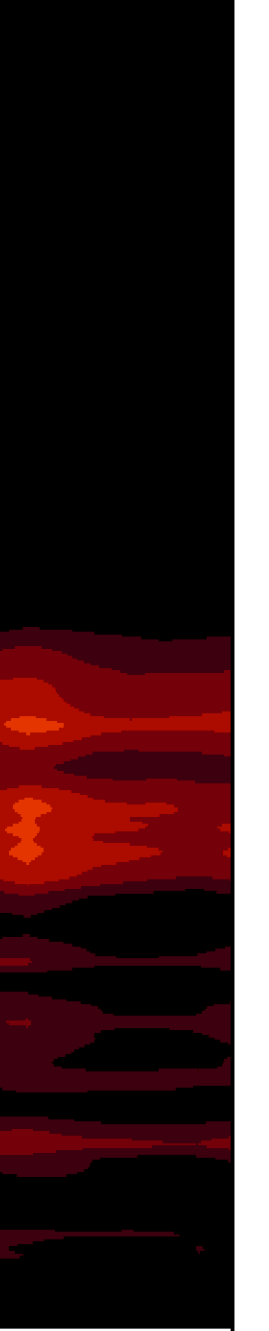
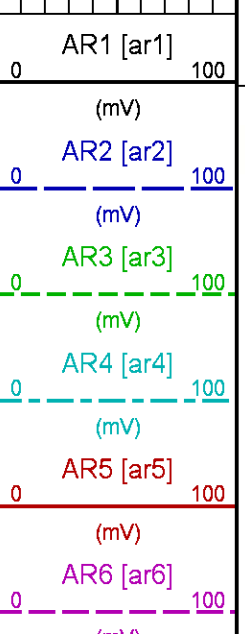
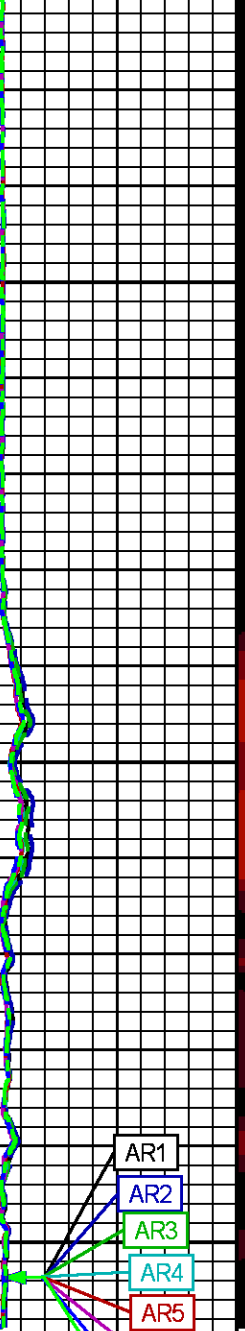
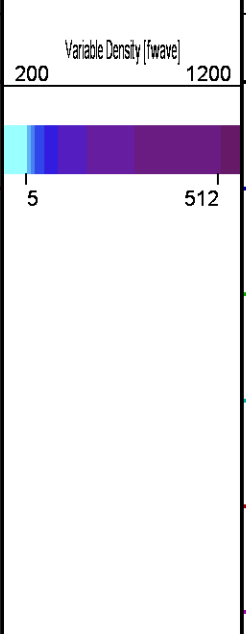
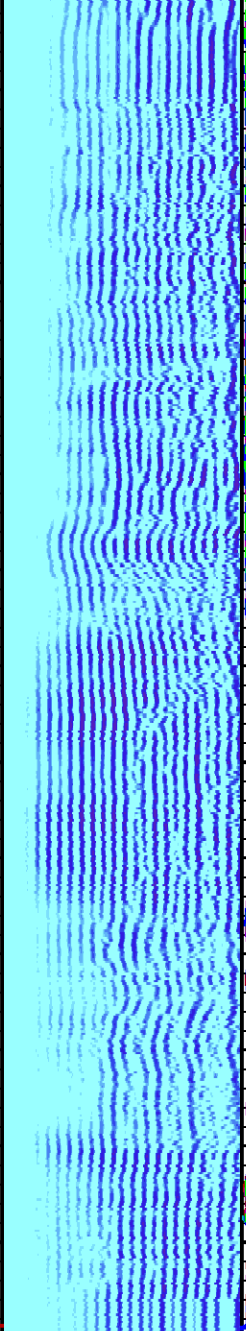
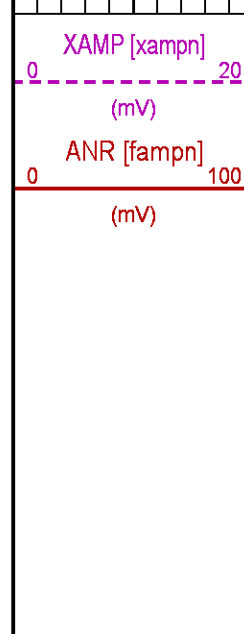
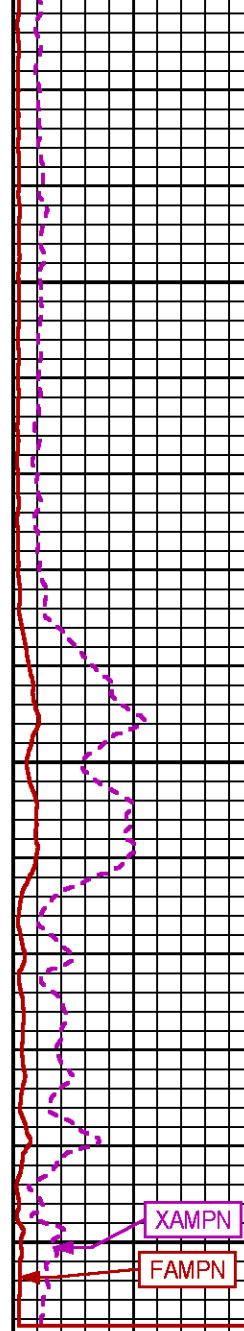


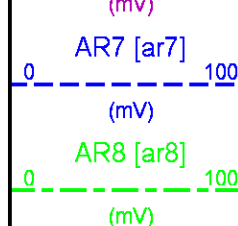


0008

TD

FEET





REPEAT PASS

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

Patches: 4

Plotted: Wed Jun 20 16:57:46 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE_GUNDERSON_0994-13-16W/p012g01.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 7819.000 ft BOTTOM DEPTH: 8054.500 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*)	198	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*)	-71	us	"	"
	TOOL DELAY (str2*)	-71	us	"	"
	TOOL DELAY (str3*)	-71	us	"	"
	TOOL DELAY (str4*)	-71	us	"	"
	TOOL DELAY (str5*)	-71	us	"	"
	TOOL DELAY (str6*)	-71	us	"	"
	TOOL DELAY (str7*)	-71	us	"	"
	TOOL DELAY (str8*)	-71	us	"	"
	TOOL DELAY (strn*)	-71	us	"	"
BASELINE NOISE (NEAR)	NOISE WINDOW START	140	us	"	"
	NOISE WINDOW LENGTH	25	us	"	"

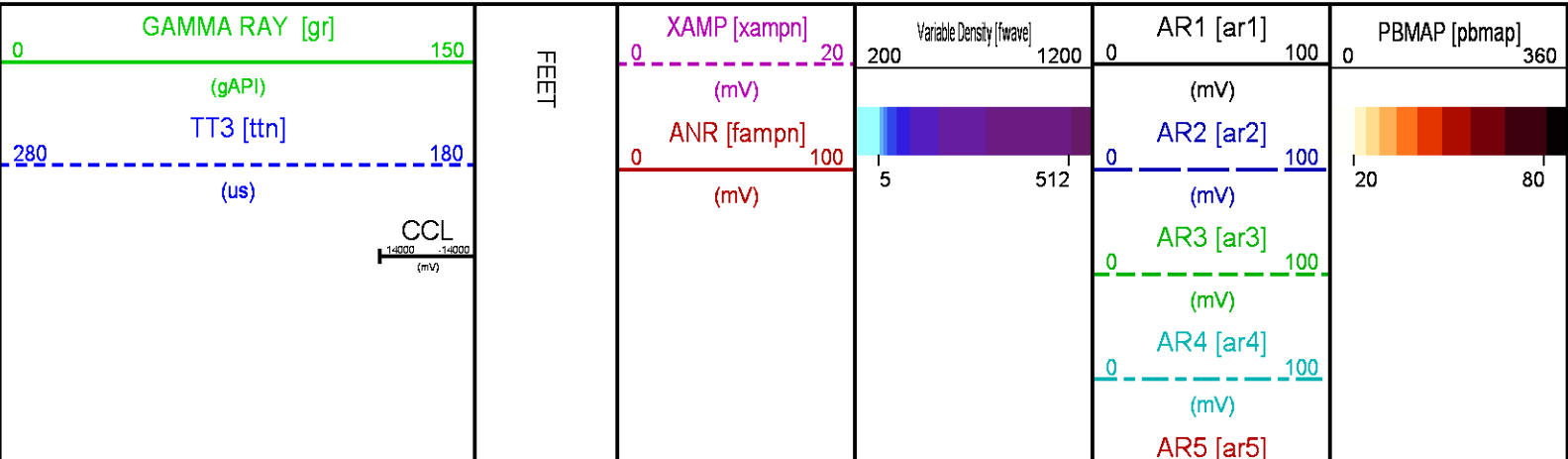
PERCENT BOND CEMENT MAP

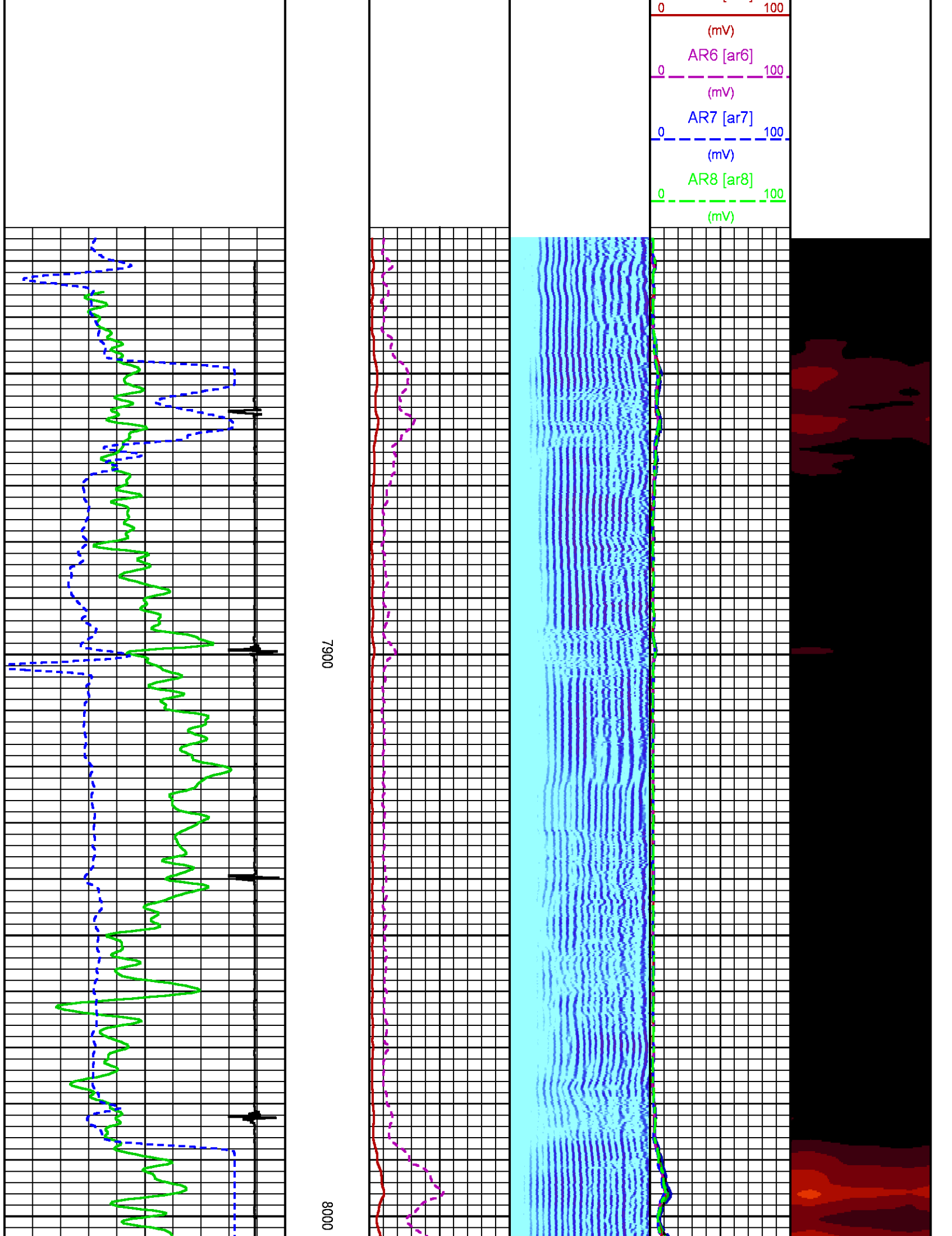
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
RAL FREE PIPE AMPLITUDE	FREE AMP REC 1	80	mV	TOP	BOTTOM
	FREE AMP REC 2	80	mV	"	"
	FREE AMP REC 3	80	mV	"	"
	FREE AMP REC 4	80	mV	"	"
	FREE AMP REC 5	80	mV	"	"
	FREE AMP REC 6	80	mV	"	"
	FREE AMP REC 7	80	mV	"	"
	FREE AMP REC 8	80	mV	"	"
RAL FULL 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	"	"

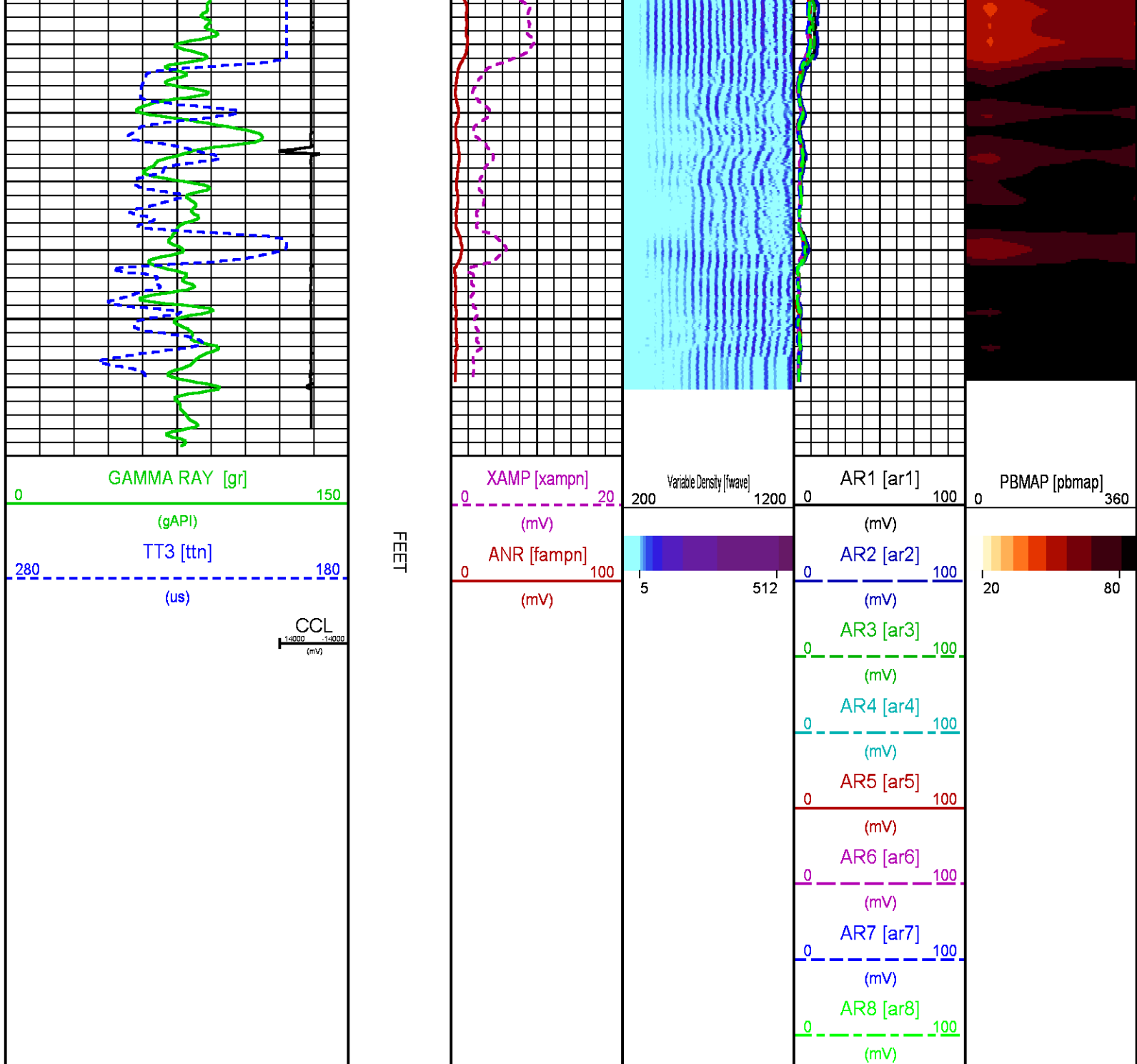
CURVE DESCRIPTION REPORT		
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	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_0994-13-16W/16W_RAL_REPEAT.fvpdf [5"/100' Scale]
Plot Interval	: 7825.75 - 8070.25 Feet
Data File 1	: F1 : SysA:/dat1a/LARAMIE_GUNDERSON_0994-13-16W/16W_RAL_REPEAT.xtf
Created On	: N/A
Company	: LARAMIE ENERGY LLC
Well	: GUNDERSON 0994-13-16W
Field	: VEGA
File Interval	: 7819 - 8071.5 Feet
OCT	: p012g







CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/LARAMIE_GUNDERSON_0994-13-16W/p012g.tp1

RAL PRIMARY CALIBRATION SUMMARY

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

	NEAR	R1	R2	R3	R4	R5	R6	R7	R8	FAR	CAL
ZERO (mV)	-0.06	-0.01	-0.05	-0.07	-0.06	0.01	0.09	0.07	-0.04	0.62	-0.08
AMP FLUID (mV)	292	296	296	294	293	292	291	293	292	407	292
TT (us)	218	217	217	217	217	218	217	217	218	327	217
M FACTOR	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.37	0.34

RAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1426XA 10124114 DATE/TIME PERFORMED: Wed Jun 20 14:36:38 2018 DAYS SINCE CAL: 0

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	-0.01	-0.00	-0.01	0.00	0.01	-0.01	-0.01	0.02	0.00	0.46	-0.00
AMP AIR	1.28	1.03	1.13	1.14	1.10	1.21	1.18	1.08	1.15	1.63	100.89

SHOP M FACTOR	SHOP A FACTOR	WIRELINE FACTOR
0.34	0.00	0.99

GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1355XA 11871507 DATE/TIME PERFORMED: Thu Mar 29 16:58:14 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	26.49	135.56	109.1	0.917	24.29	124.29	100

GR PRIMARY VERIFICATION SUMMARY

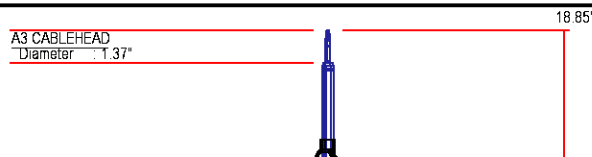
TOOL #: 1355XA 11871507 DATE/TIME PERFORMED: Thu Mar 29 17:00:00 2018

UNIT #: 4352 ML4352 VERI JIG #: 4702NK DA_228

	BACKGROUND (cts)	CALBRTR ON (cts)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (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_0994-13-16W/RAL-tdg



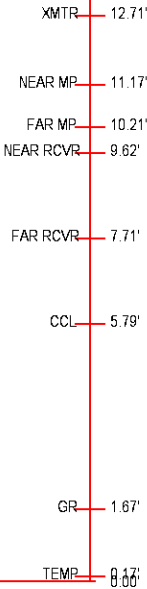
RADIAL BOND TOOL

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'





COMPANY

LARAMIE ENERGY LLC

WELL

GUNDERSON 0994-13-16W

FIELD

VEGA

COUNTY

MESA

STATE COLORADO

FILE NO:

CH136907

API NO:

05077105360000

LOCATION:

SHL: 1397' FSL & 1623' FWL

BHL: 1397' FSL & 1623' FWL

SEC 13 TWP 9S RGE 94W

ELEVATIONS:

KB 7302 FT

DF

GL 7272 FT

DATE 20-Jun-2018