



RADIAL CEMENT BOND LOG

FILE NO: CH133067	COMPANY LARAMIE ENERGY LLC
API NO: 05077104670000	WELL BRUTON 30-20E
	FIELD VEGA
	COUNTY MESA STATE COLORADO

Ver. 4.10	LOCATION: SHL: 2627' FSL & 1849' FEL BHL: 373' FSL & 820' FEL SEC 30 TWP 9S RGE 93W	OTHER SERVICES RPM
-----------	---	-----------------------

PERMANENT DATUM LOG MEASURED FROM DRILL. MEAS. FROM	GL ELEVATION 7643 FT KB 30 FT ABOVE P.D. KB GL	ELEVATIONS: KB 7673 FT DF GL 7643 FT
---	--	---

DATE		07-Apr-2018	
RUN	TRIP	1	1
SERVICE ORDER	US133067		
DEPTH DRILLER	8257 FT		
DEPTH LOGGER	8171 FT		
BOTTOM LOGGED INTERVAL	8171 FT		
TOP LOGGED INTERVAL	30 FT		
TIME STARTED	10:30		
TIME FINISHED	12:30		
OPERATOR RIG TIME	2 HRS		
TYPE OF FLUID IN HOLE	WATER		
FLUID DENSITY	NA		
FLUID SALINITY	NA		
FLUID LEVEL	54 FT		
LOGGED CEMENT TOP	265 FT		
WELLHEAD PRESSURE	0 PSI		
MAXIMUM HOLE DEVIATION	NA		
NOMINAL LOGGING SPEED	100 F/MN		
MAX. RECORDED TEMP.	229 DEGF		
REFERENCE LOG	NA		
REFERENCE LOG DATE	NA		
EQUIP. NO.	LOCATION	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
<p>RUN 1 TRIP 1: *2 OPERATIONS IN WELLBORE*</p> <p>**OPERATION 1: RAL/GR/CCL RUN CENTRALIZED**</p> <p>LOGGED WITH 0 PSI ON WELLHEAD</p> <p>SJ: 6260' - 6278' SJ: 7312' - 7330'</p>

EQUIPMENT DATA					
RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	RAL	1426XA	10417451	CENTRALIZED
1	1	GR/CCL	1355XA	12670180	CENTRALIZED

MAIN PASS 0 PSI

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017
Patches: 3

Plotted: Sat Apr 7 13:38:08 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE_BRUTON_FEDERAL_30-20E/p012g02.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 14.000 ft BOTTOM DEPTH: 8170.740 ft

SYMMETRIC FILTER

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

RAL CCL PROCESSING

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

ANALOG RAL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
AMPLITUDE WINDOW (NEAR)	AMP WINDOW START (fgp1*)	187	us	TOP	BOTTOM
	AMP WINDOW START (fgp2*)	187	us	"	"
	AMP WINDOW START (fgp3*)	187	us	"	"
	AMP WINDOW START (fgp4*)	187	us	"	"
	AMP WINDOW START (fgp5*)	187	us	"	"
	AMP WINDOW START (fgp6*)	187	us	"	"
	AMP WINDOW START (fgp7*)	187	us	"	"
	AMP WINDOW START (fgp8*)	187	us	"	"
	AMP WINDOW START (fgpn*)	187	us	"	"
	AMP WINDOW LENGTH	25	us	"	"
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	198	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	6	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	200.391	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-63	us	"	"
	TOOL DELAY (str2*)	-63	us	"	"
	TOOL DELAY (str3*)	-63	us	"	"
	TOOL DELAY (str4*)	-63	us	"	"
	TOOL DELAY (str5*)	-63	us	"	"
	TOOL DELAY (str6*)	-63	us	"	"
	TOOL DELAY (str7*)	-63	us	"	"
	TOOL DELAY (str8*)	-63	us	"	"
	TOOL DELAY (strn*)	-63	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	4	mV	"	"
	FULL BOND AMP REC 2	4	mV	"	"
	FULL BOND AMP REC 3	4	mV	"	"

FULL BOND AMP REC 4	4	mV	"	"
FULL BOND AMP REC 5	4	mV	"	"
FULL BOND AMP REC 6	4	mV	"	"
FULL BOND AMP REC 7	4	mV	"	"
FULL BOND AMP REC 8	4	mV	"	"

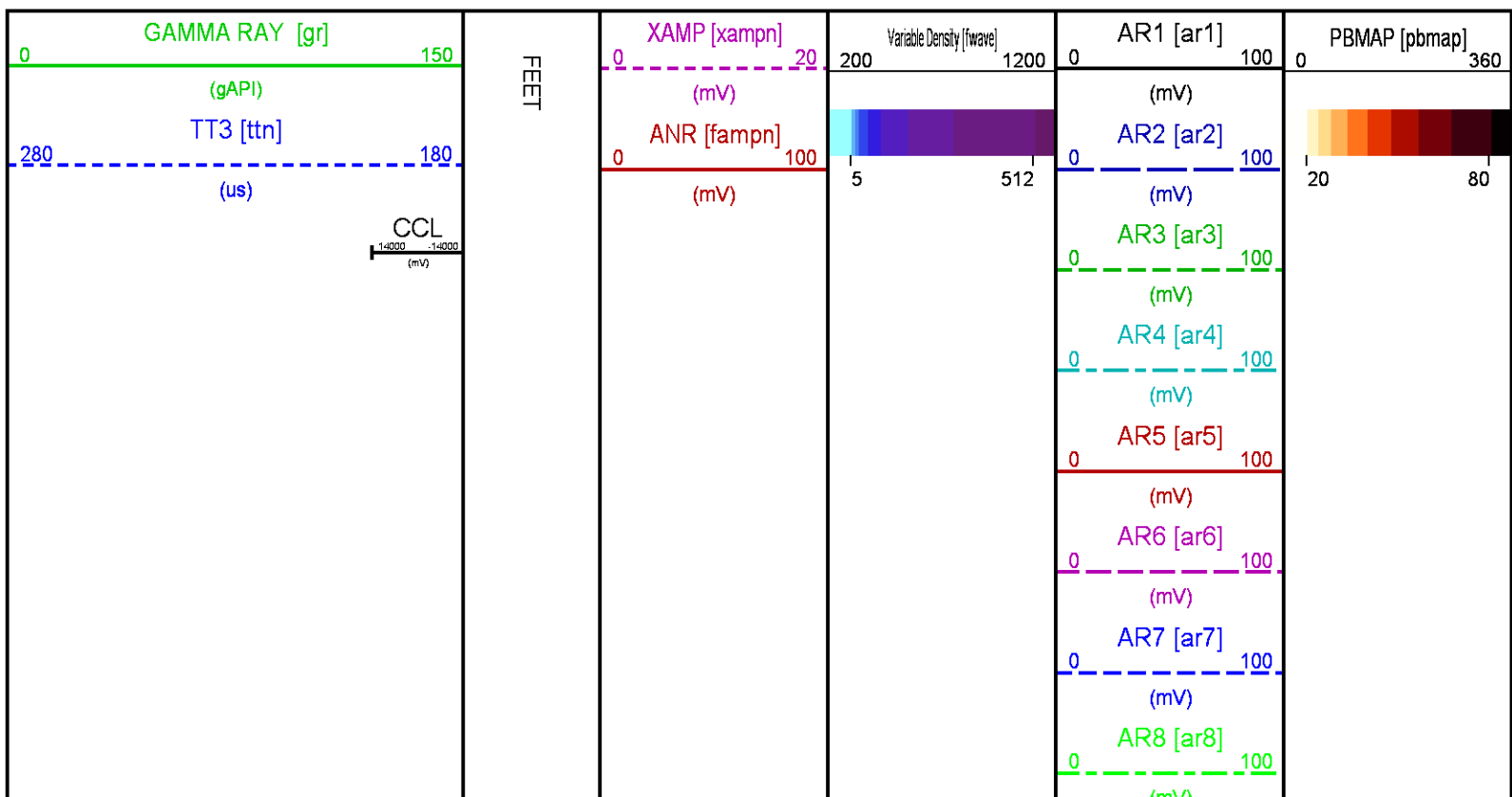
CURVE DESCRIPTION REPORT

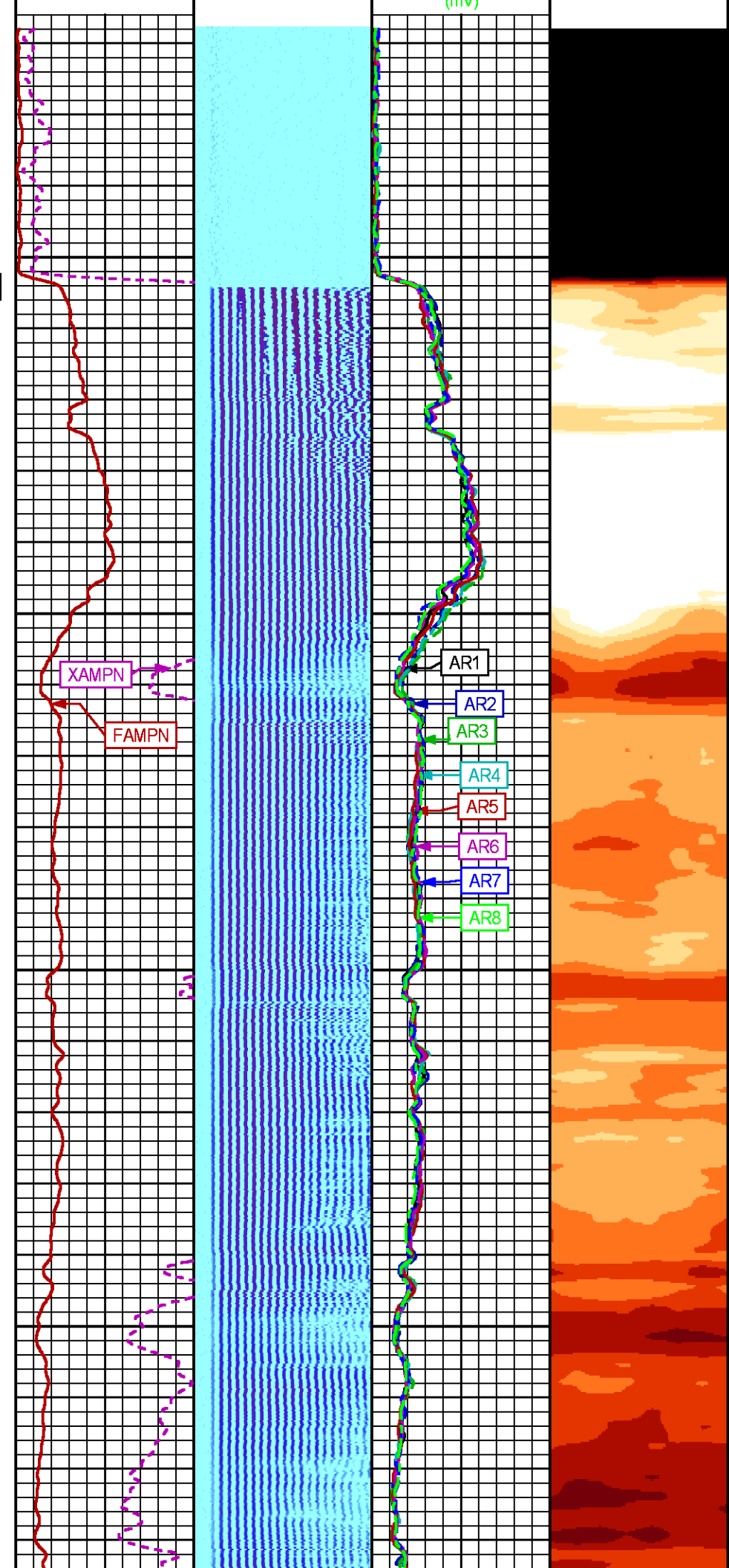
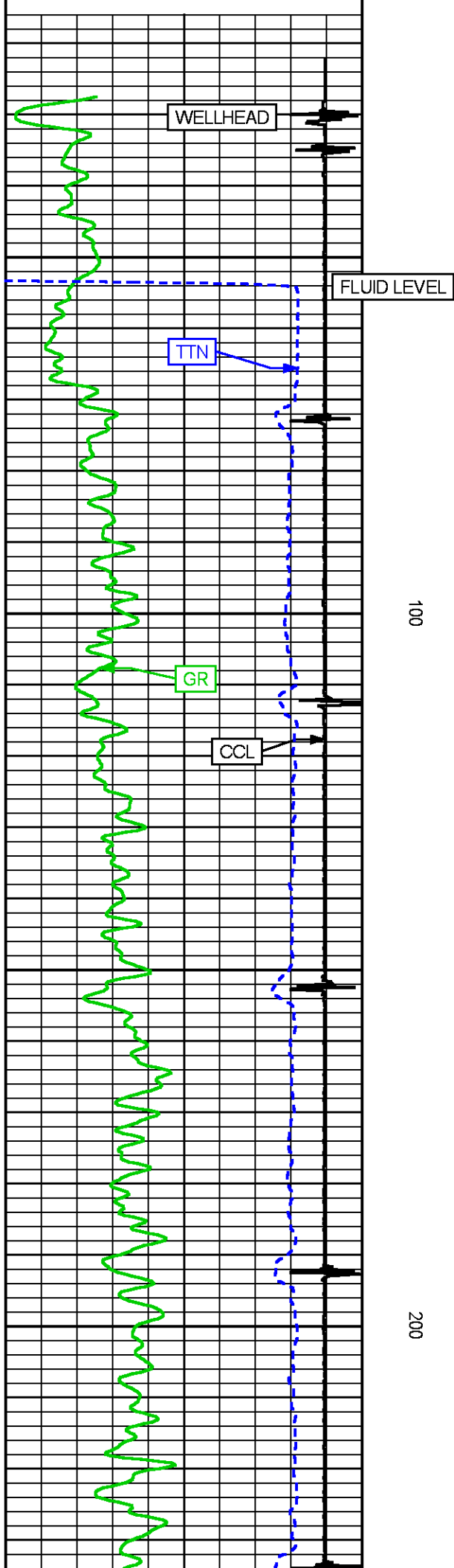
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	FIXED GATE AMPLITUDE T-R7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

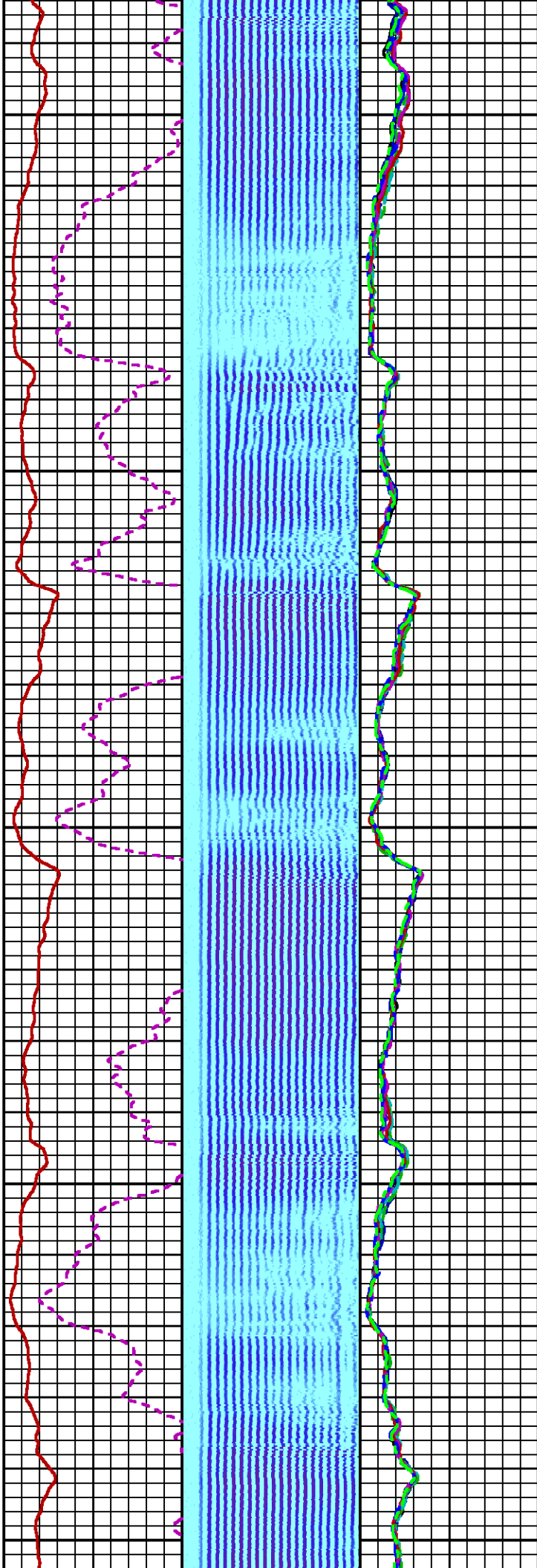
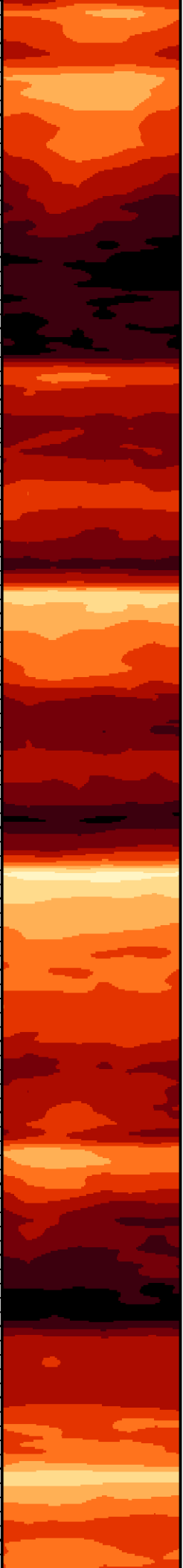
CURVE MEASURE POINT OFFSET

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_BRUTON_FEDERAL_30-20E/30-20E_RAL_MAIN.fvpdf [5"/100' Scale]
Plot Interval	: 17.75 - 8182 Feet
Data File 1	: F1 : SysA:/dat1a/LARAMIE_BRUTON_FEDERAL_30-20E/30-20E_RAL_MAIN.xtf
Created On	: N/A
Company	: LARAMIE ENERGY LLC
Well	: BRUTON 30-20E
Field	: VEGA
File Interval	: 14 - 8183.25 Feet
OCT	: p012g



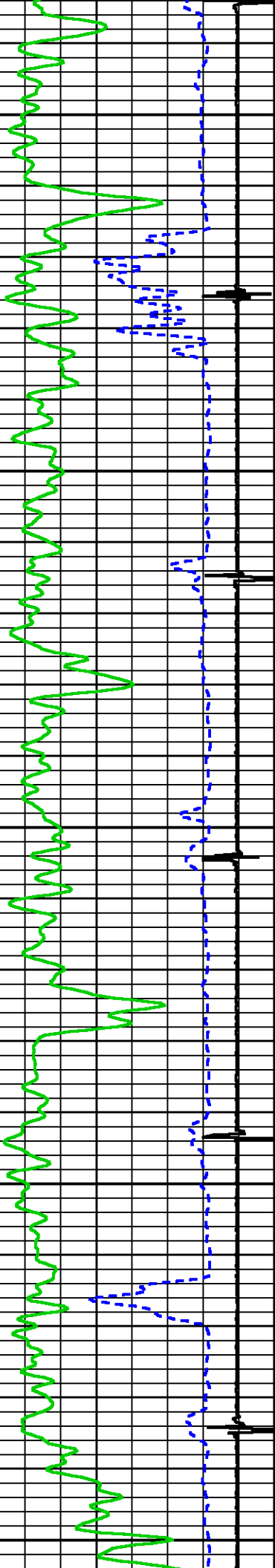


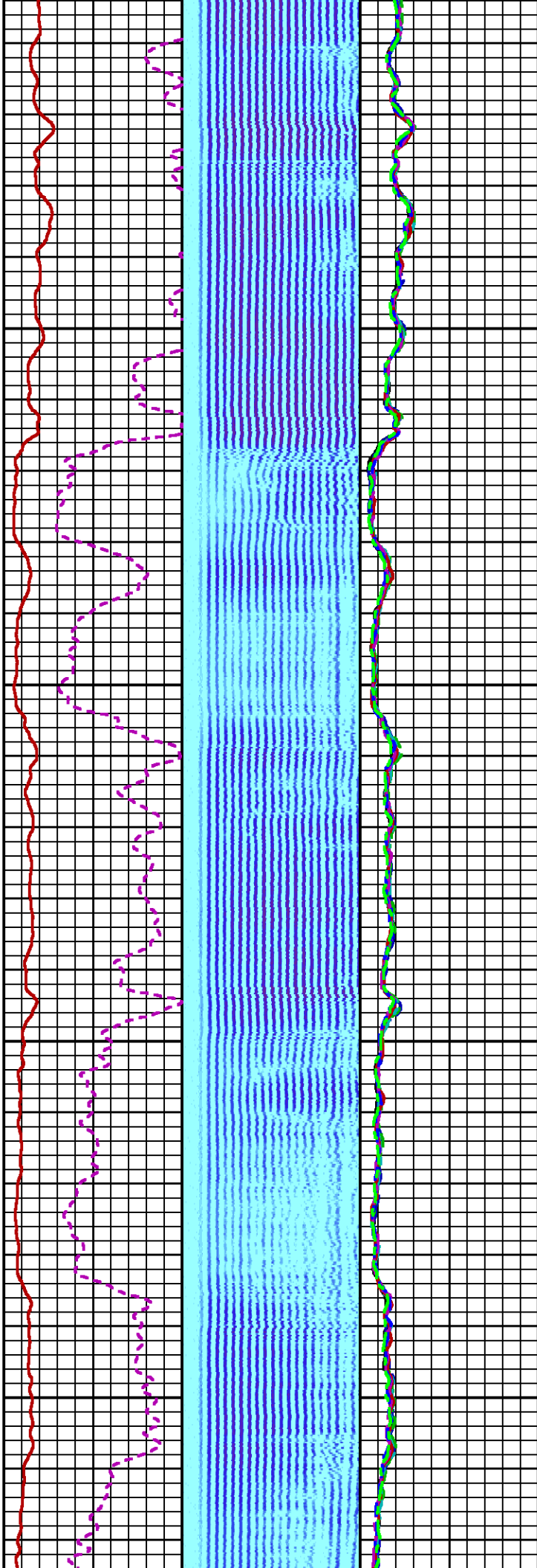
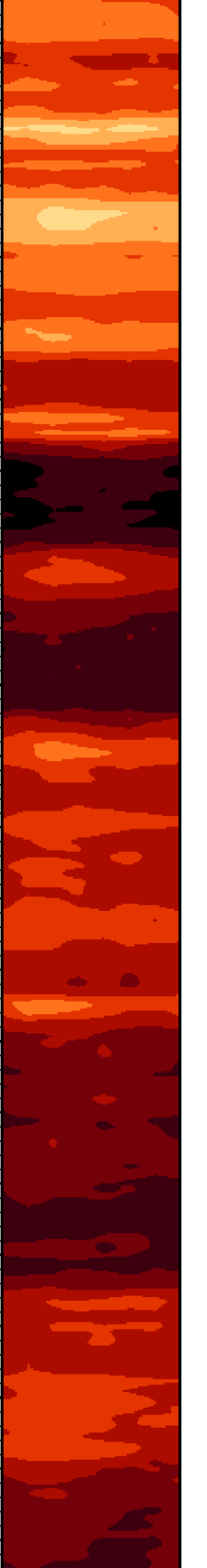


TOC

300

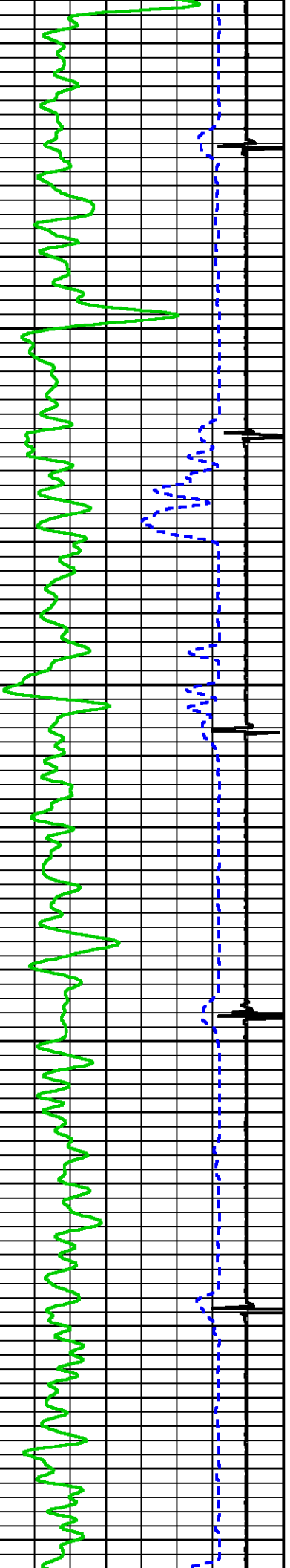
400

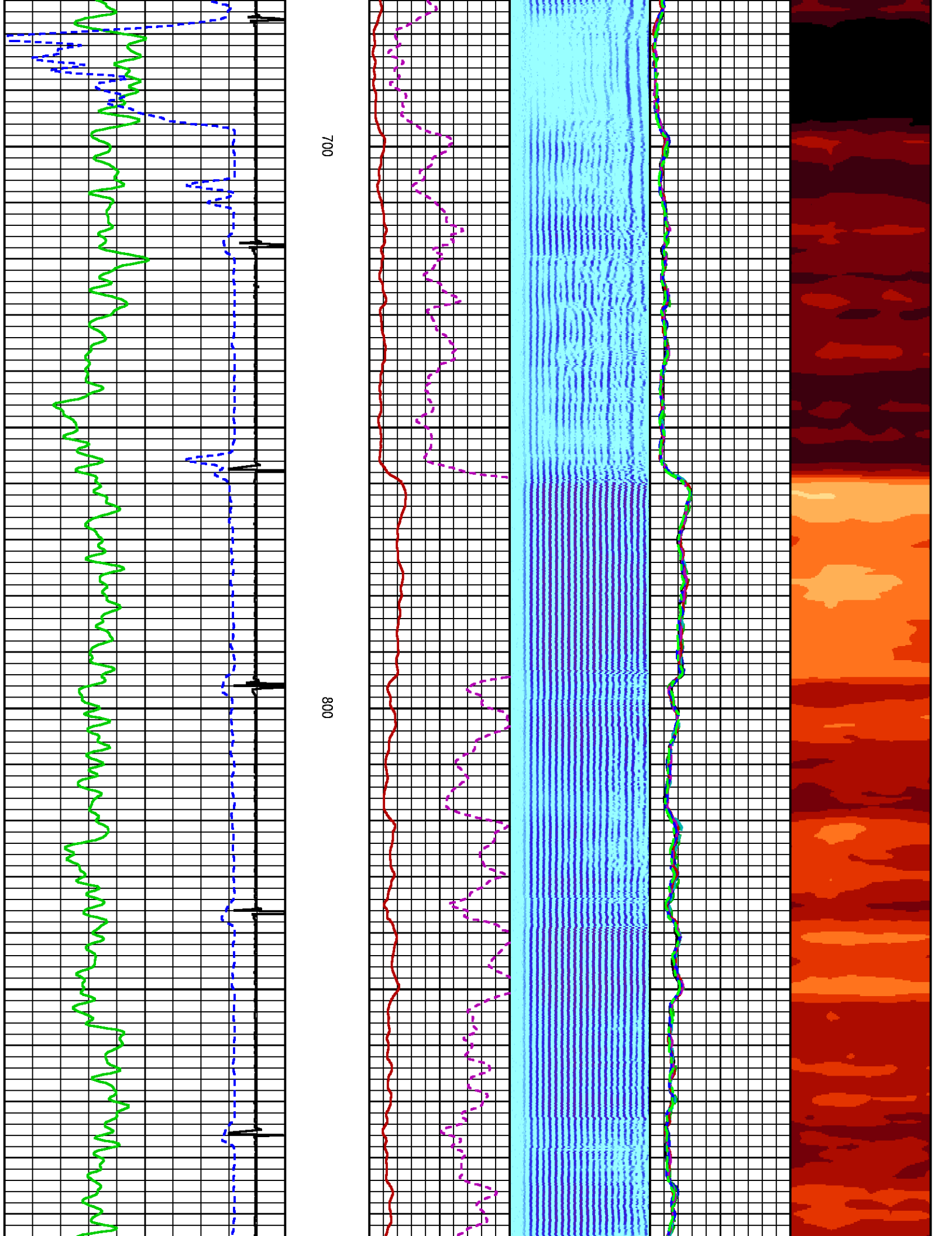


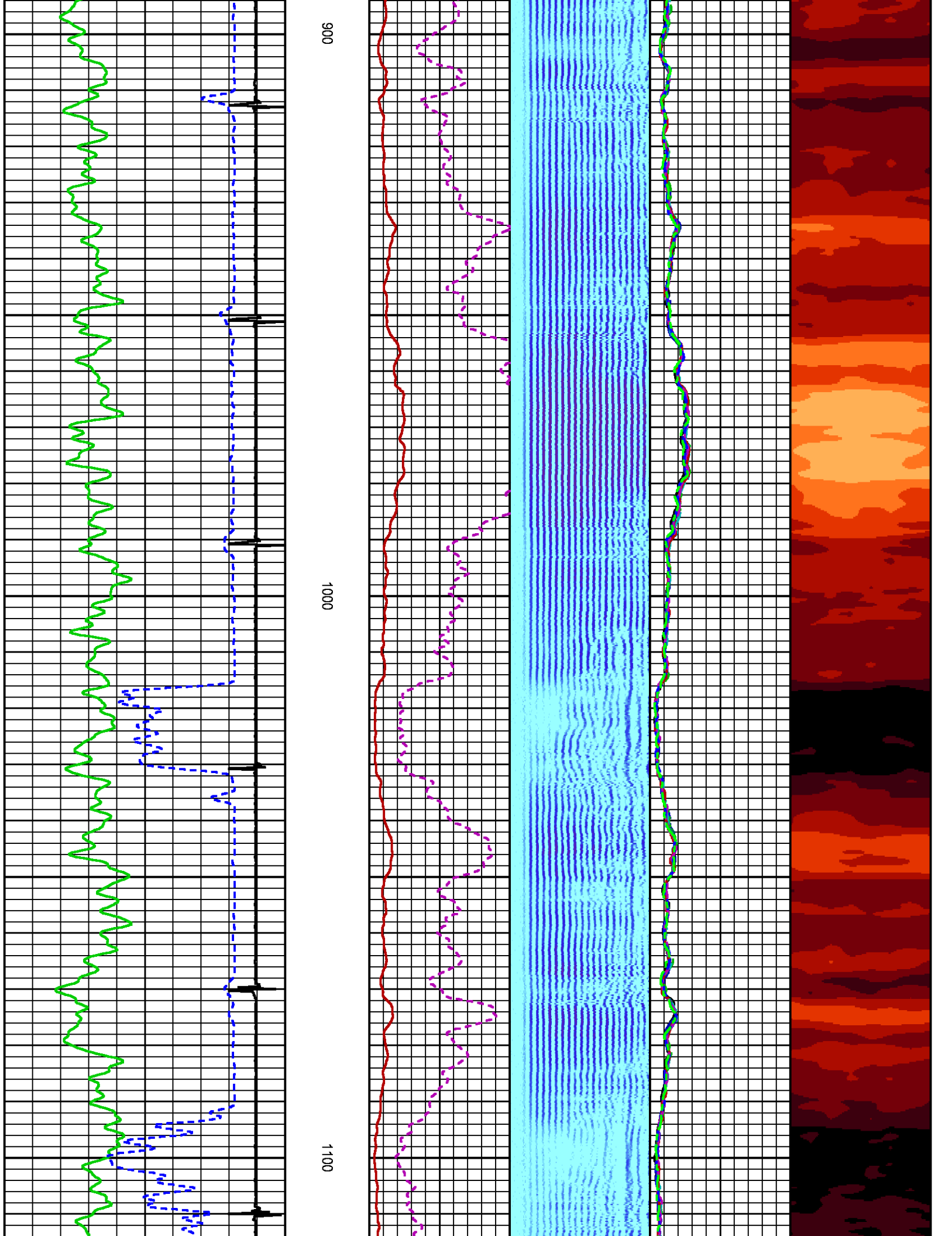


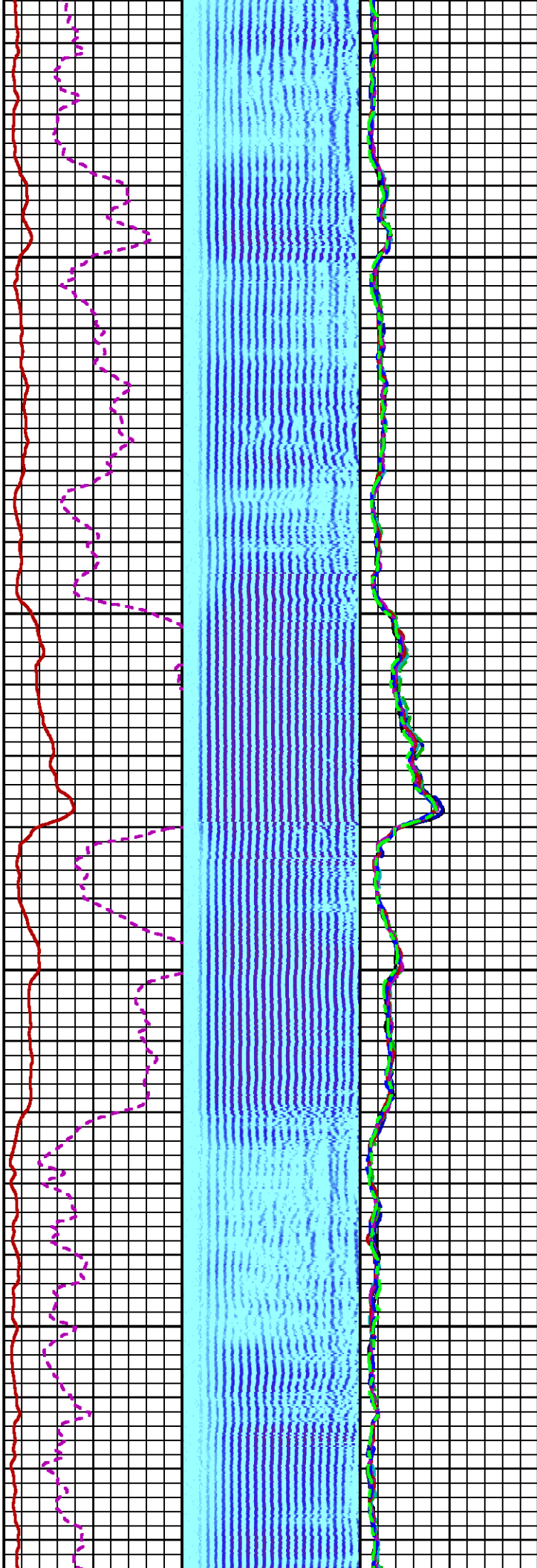
500

600



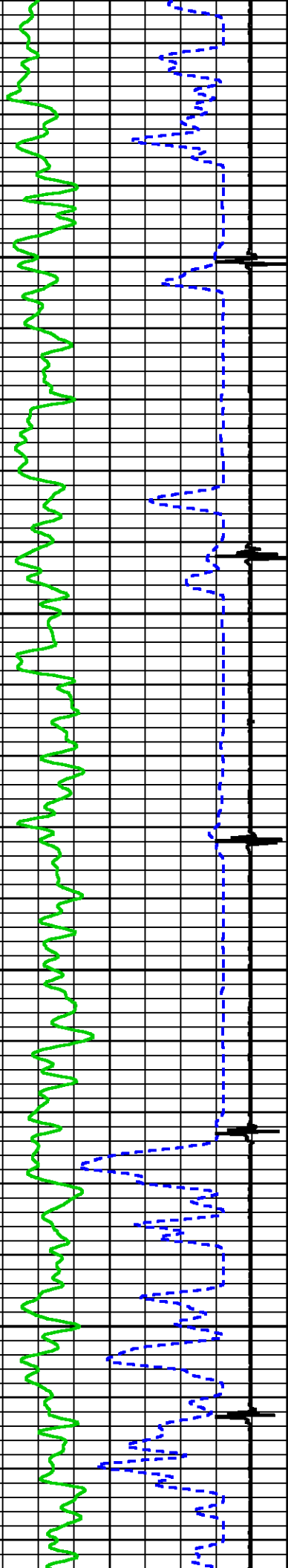


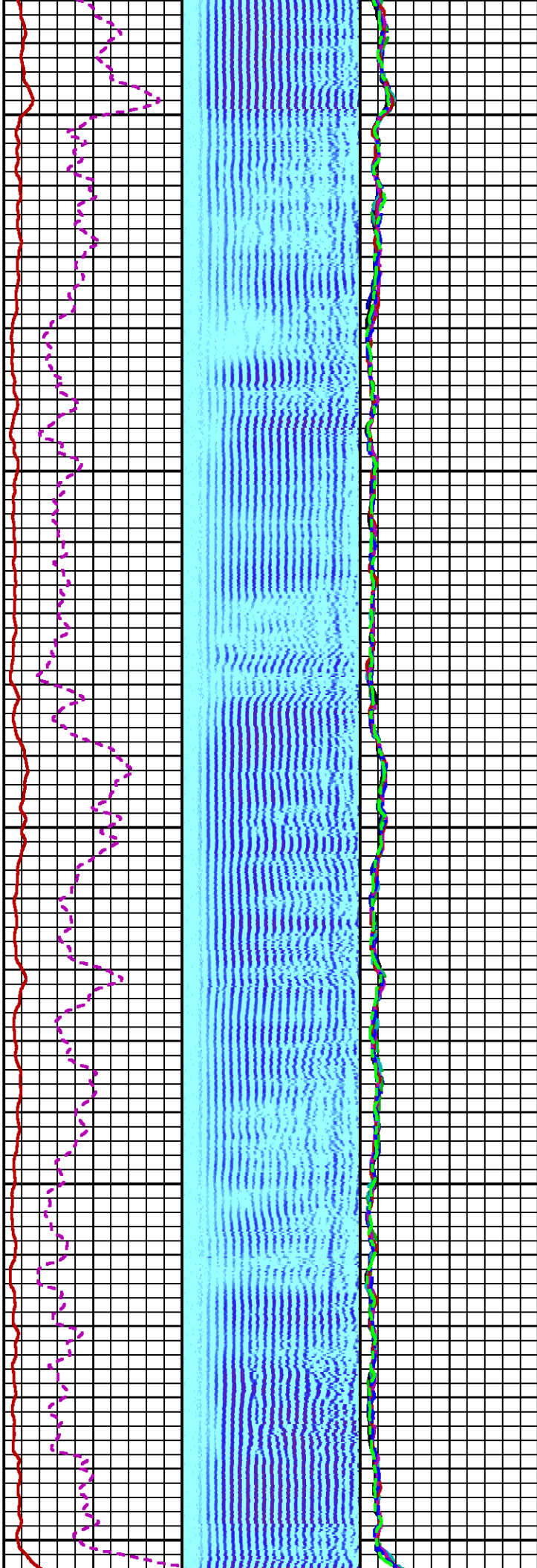
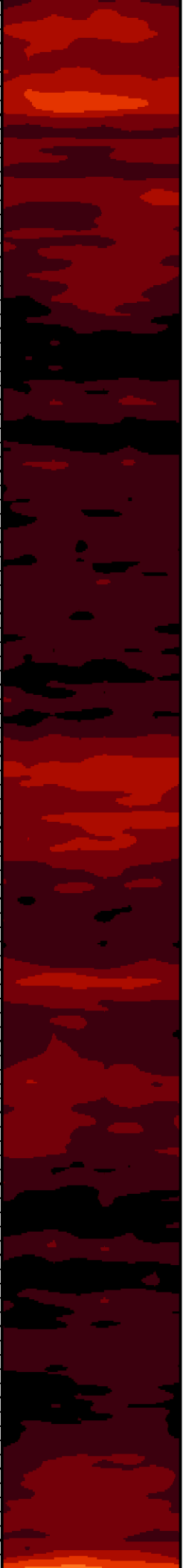




1200

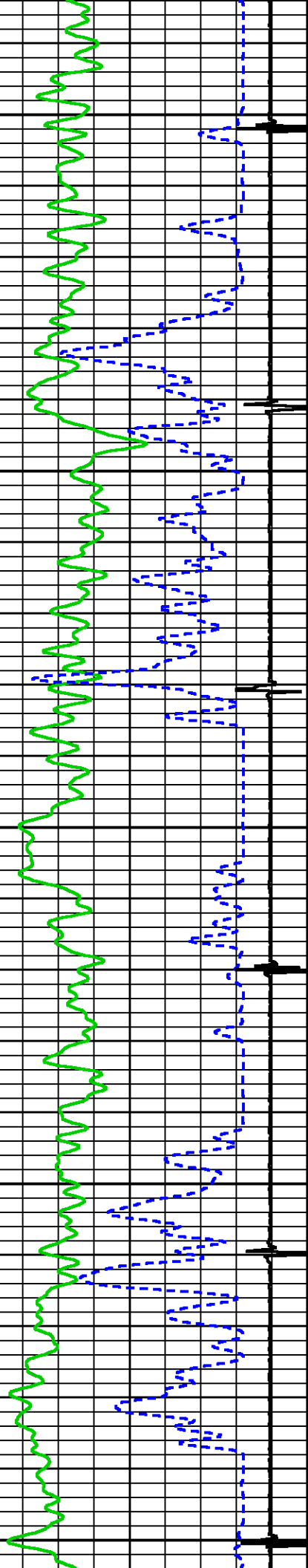
1300

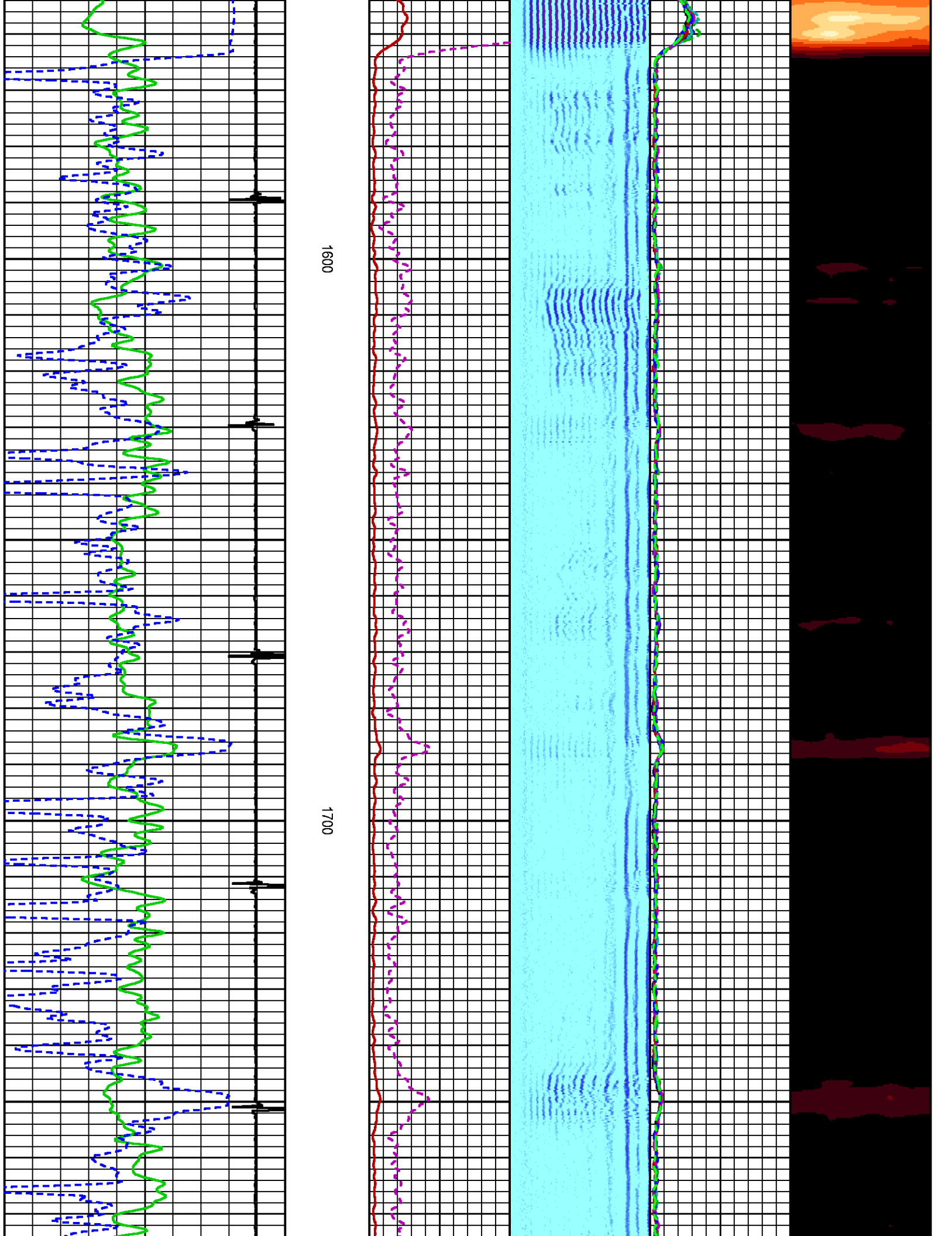


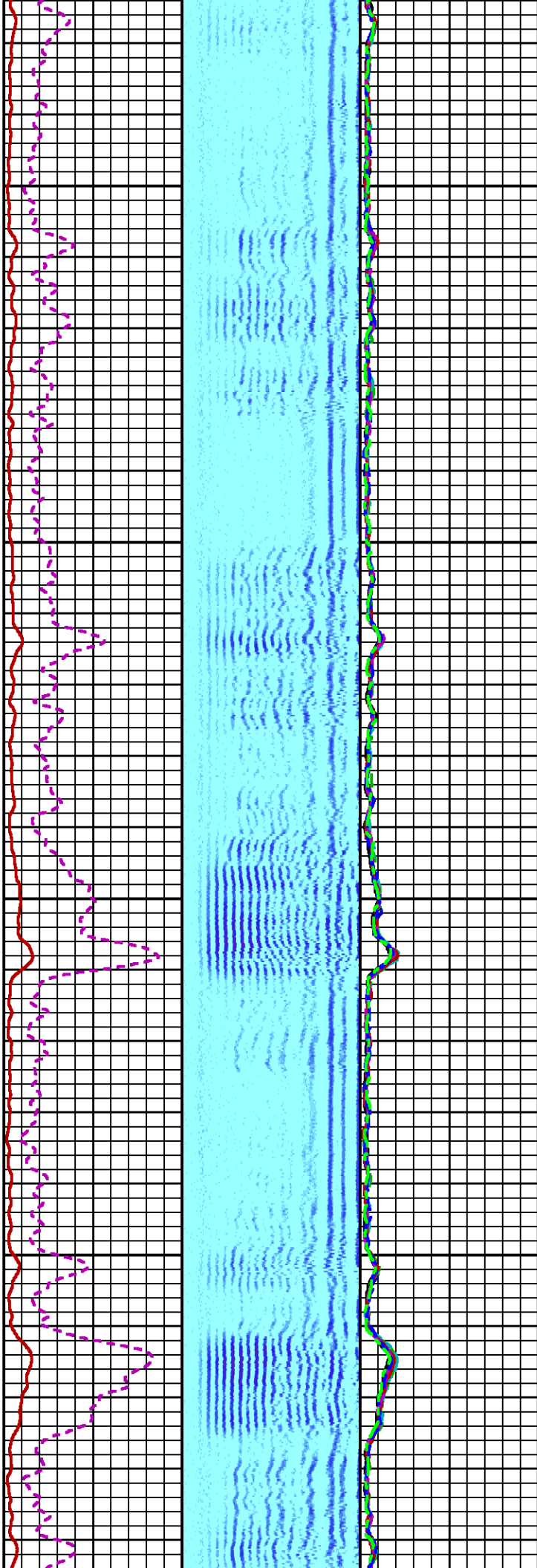


1400

1500

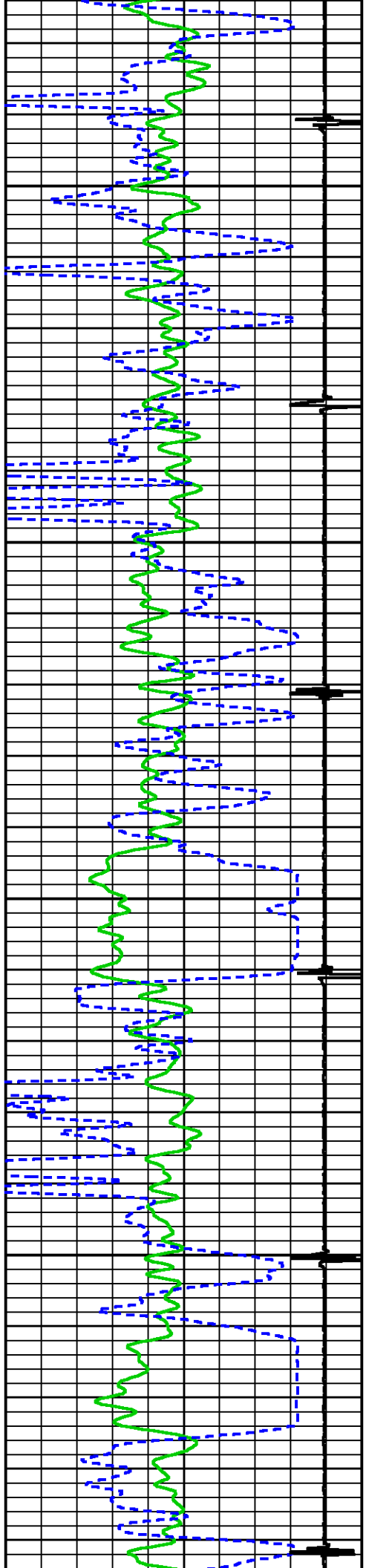


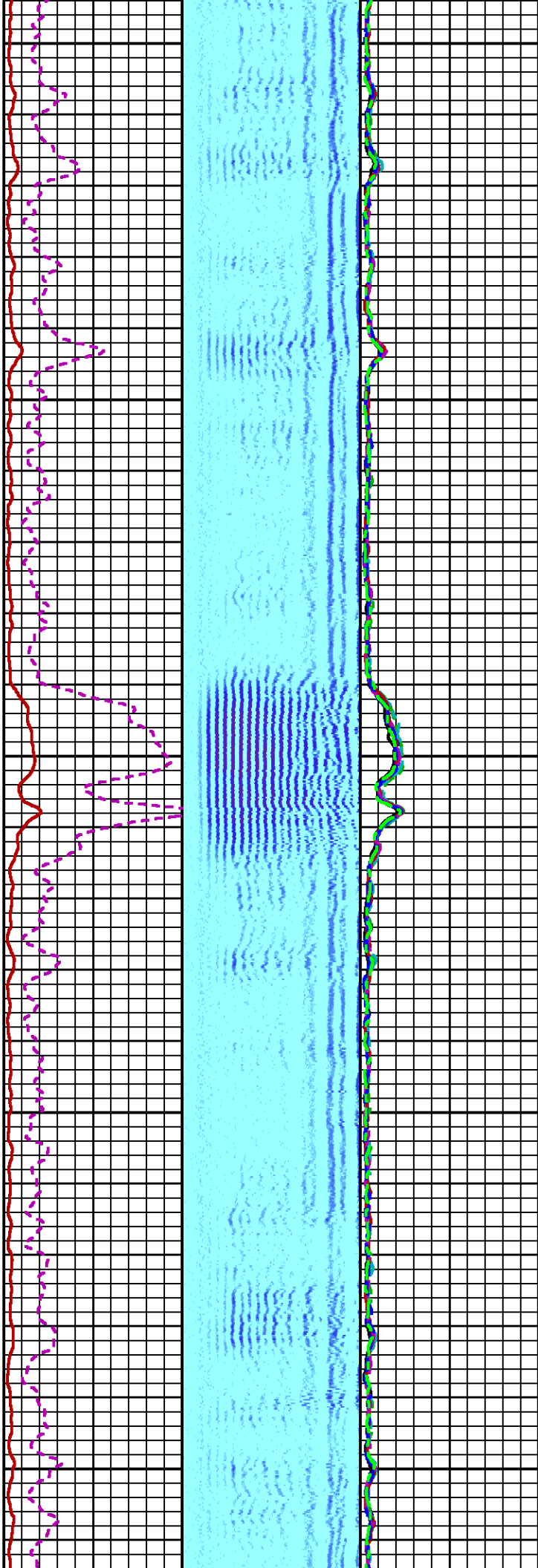




1800

1900

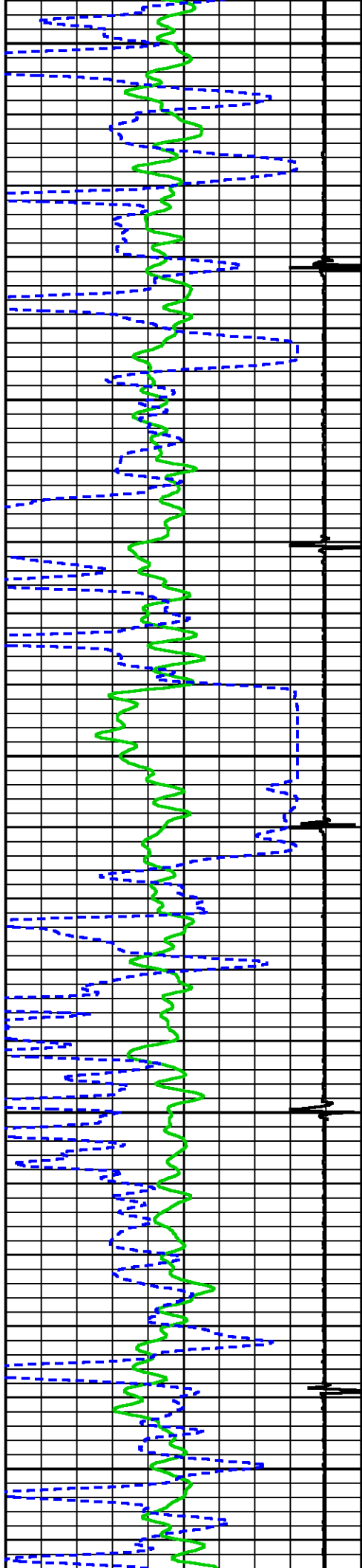


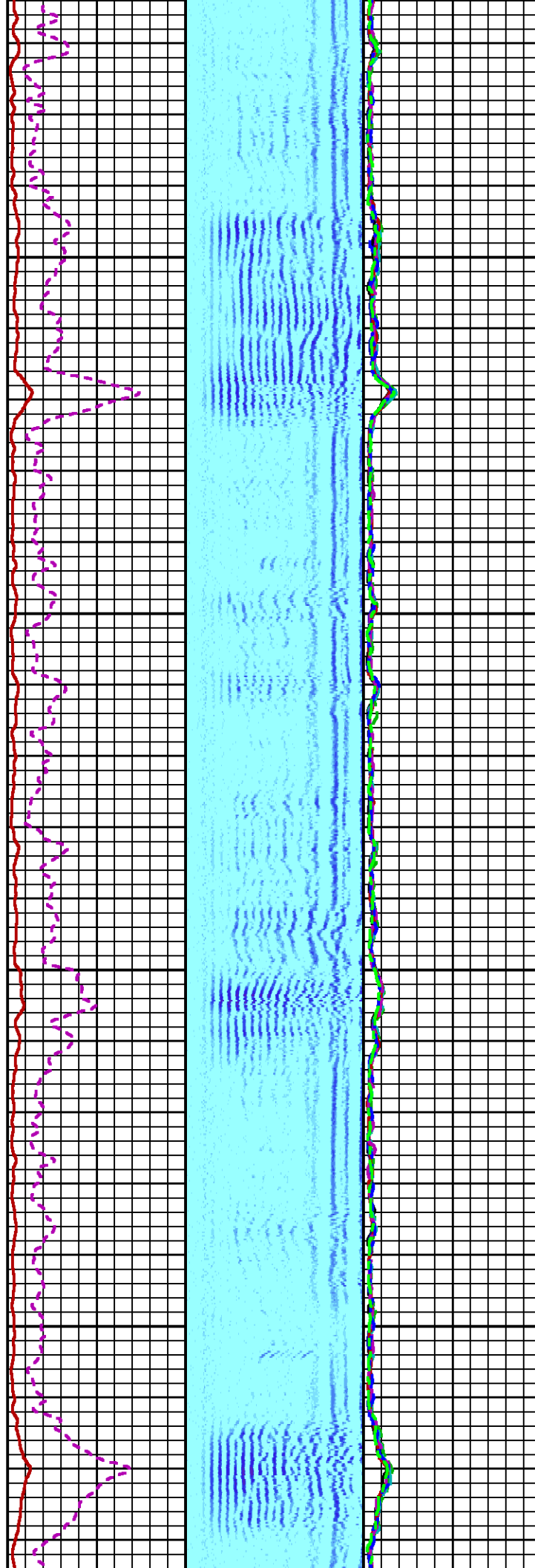
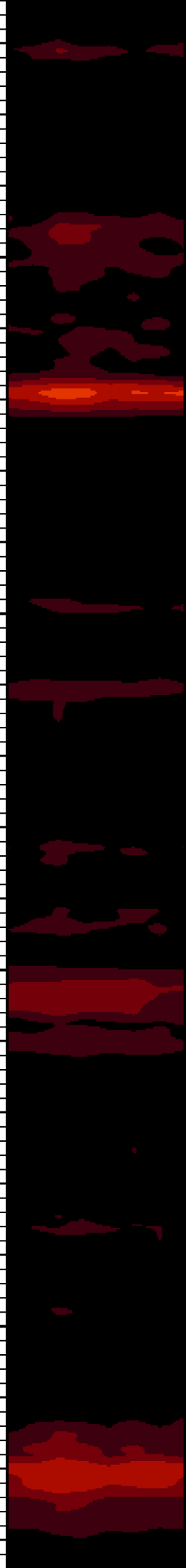


2000

2100

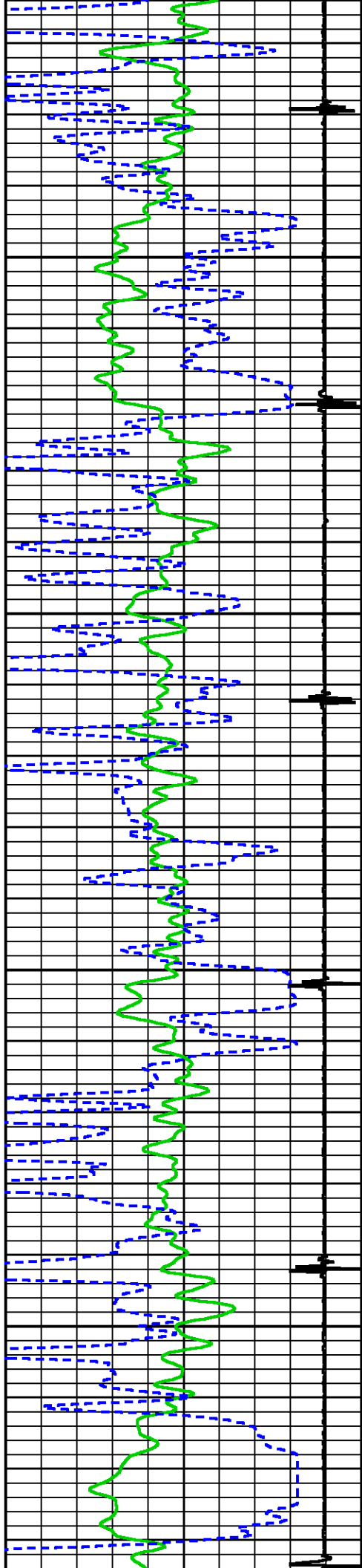
2200

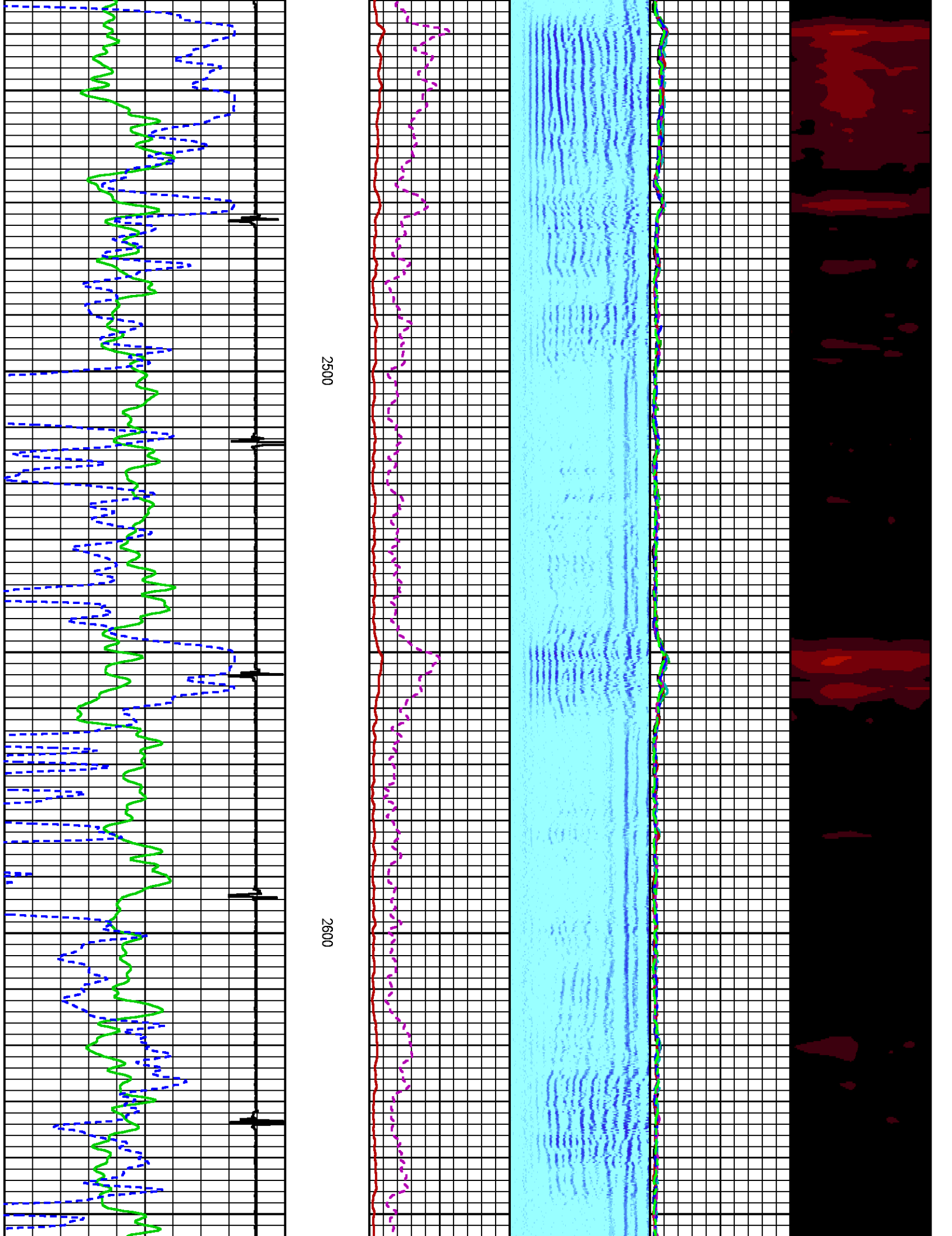




2300

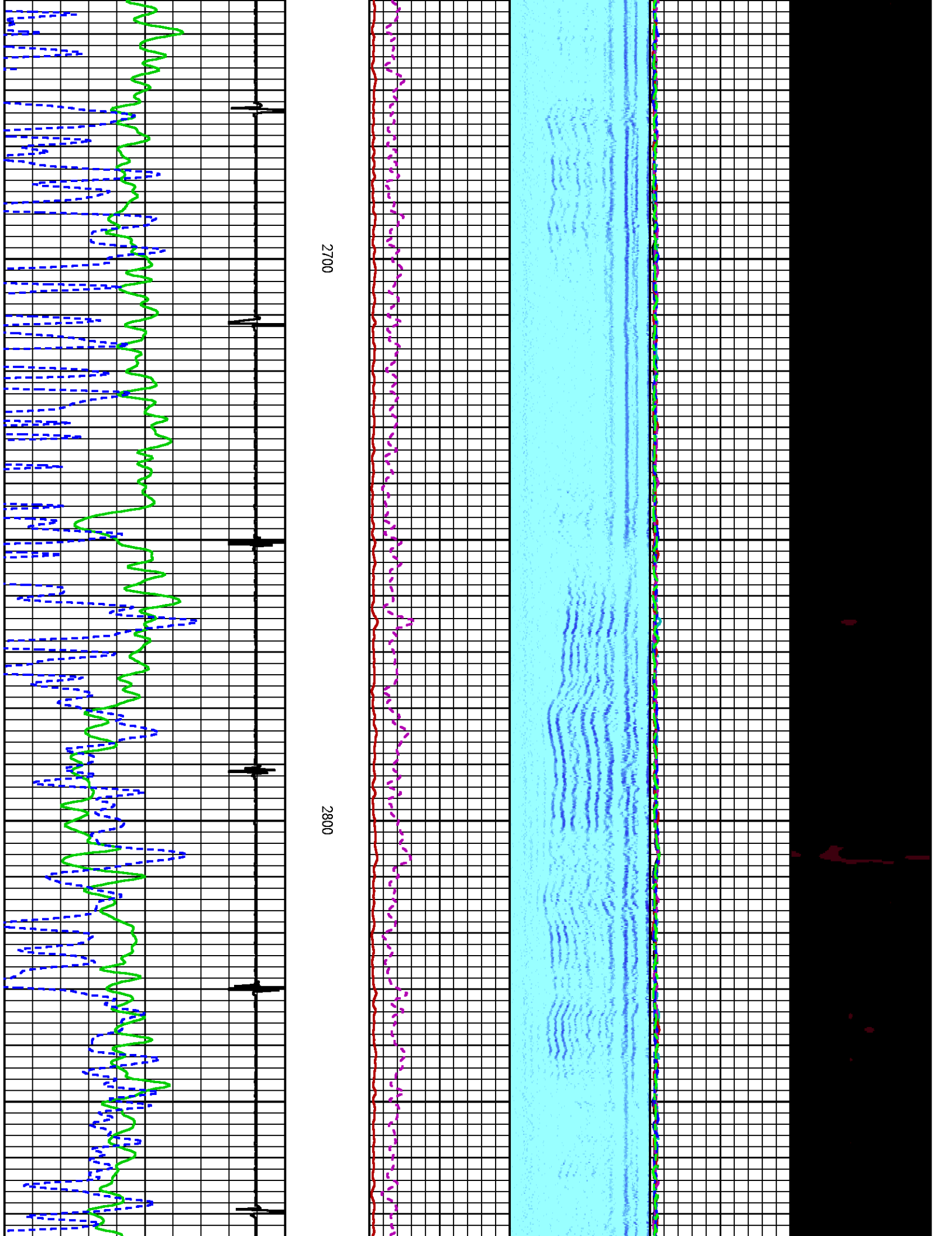
2400

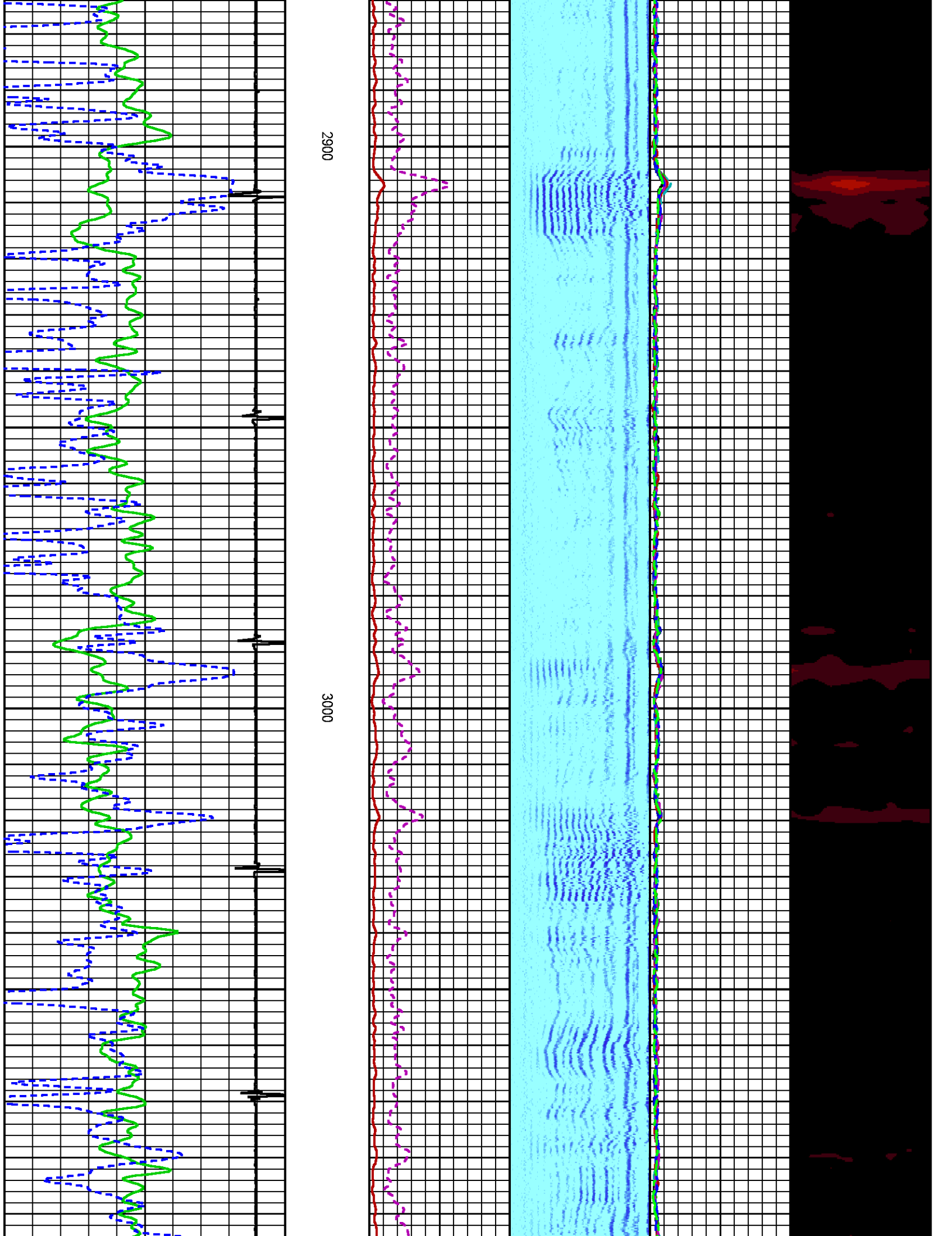


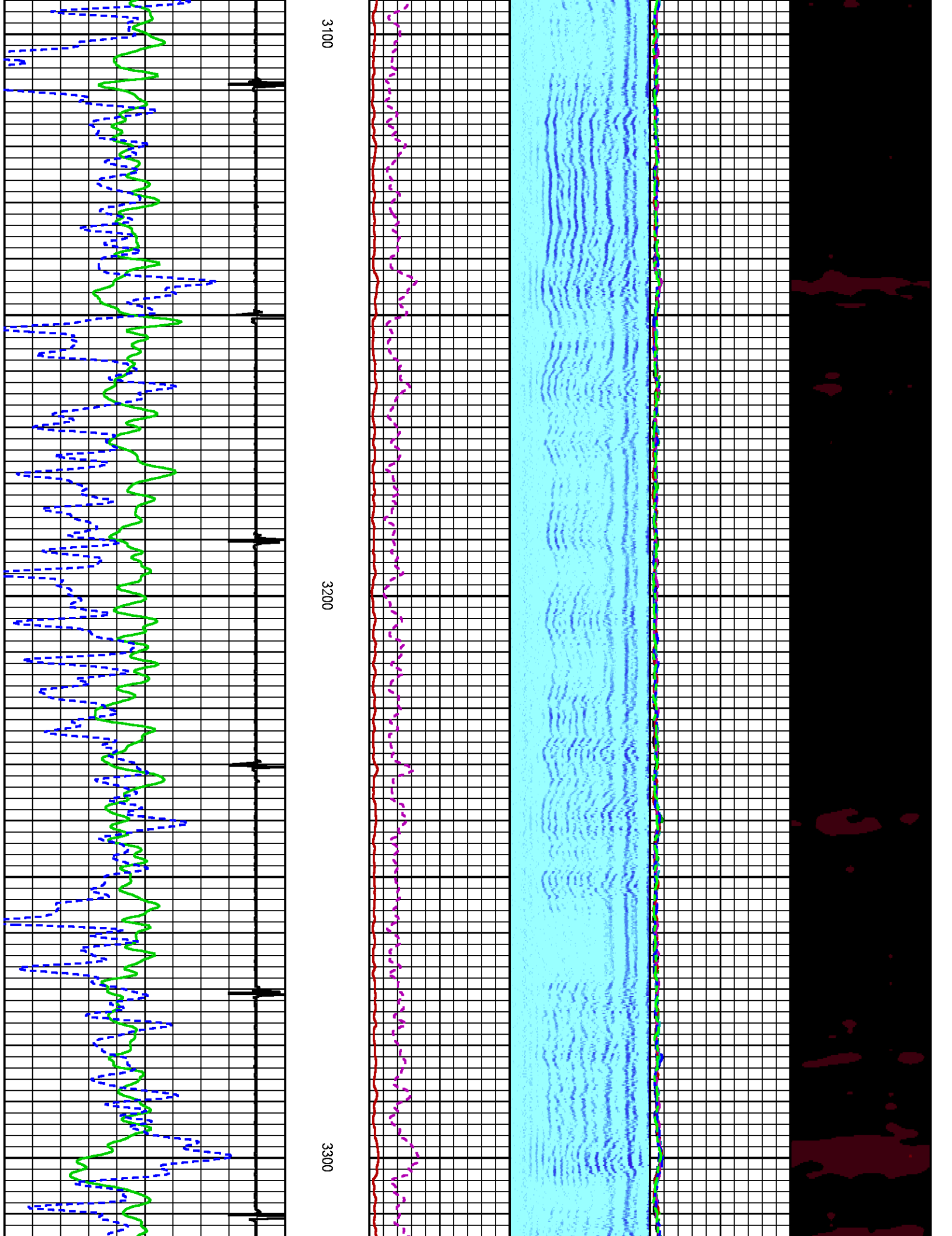


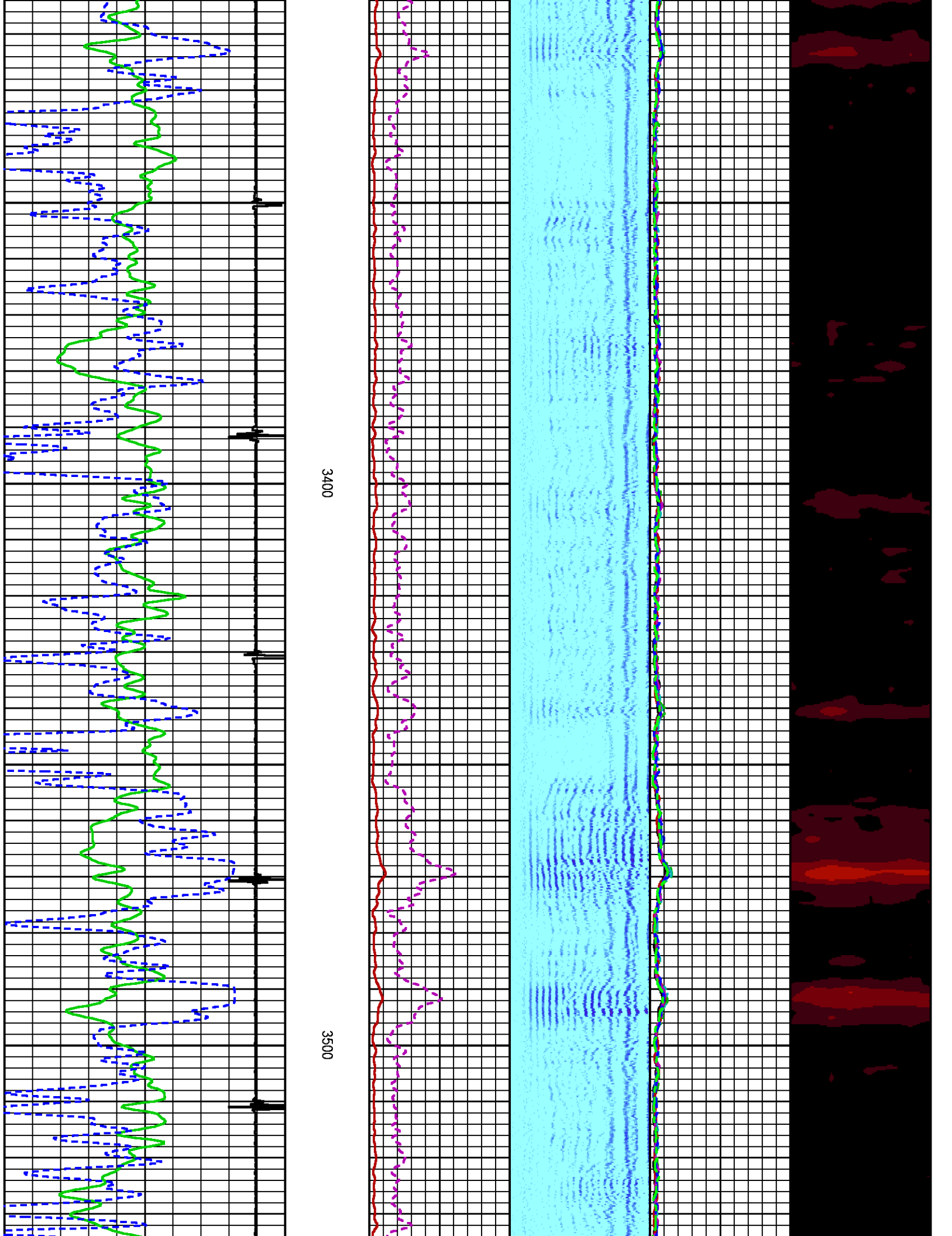
2500

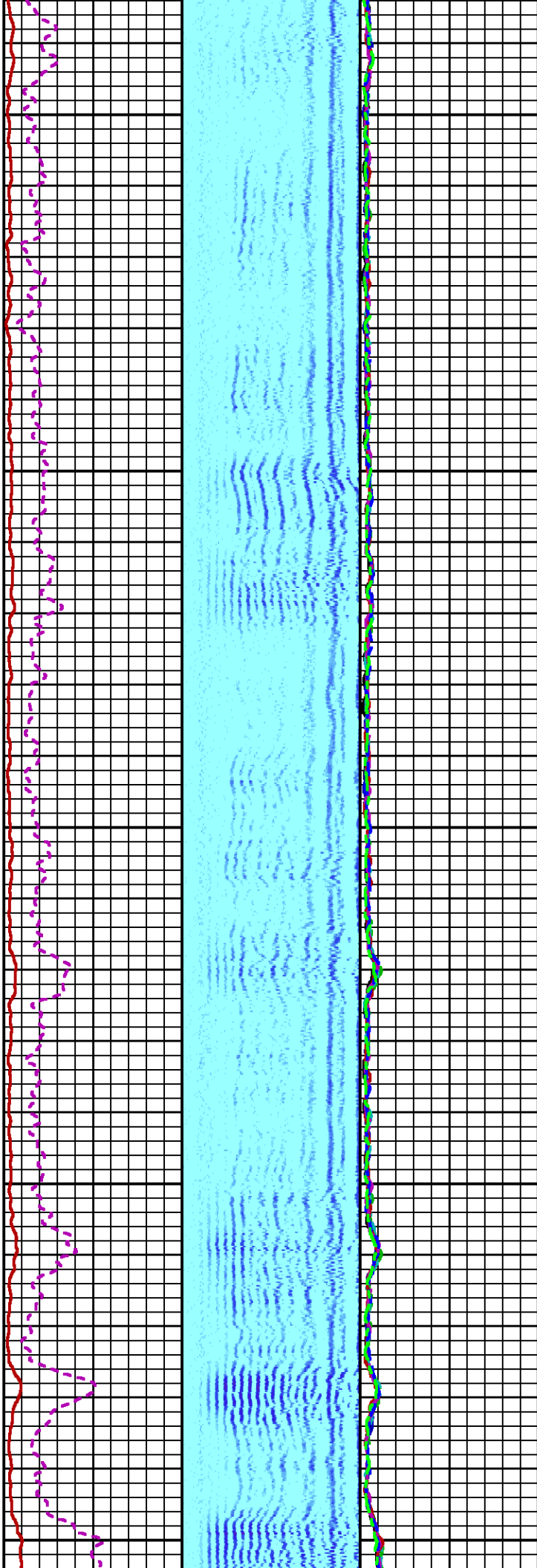
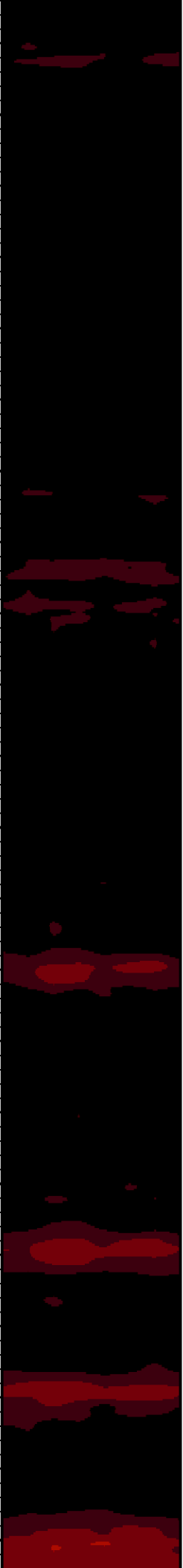
2600





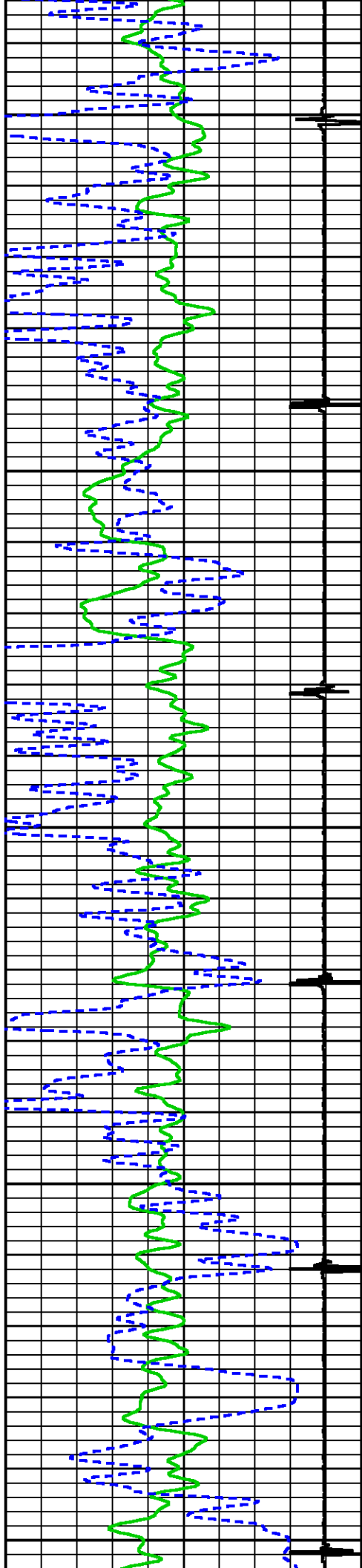


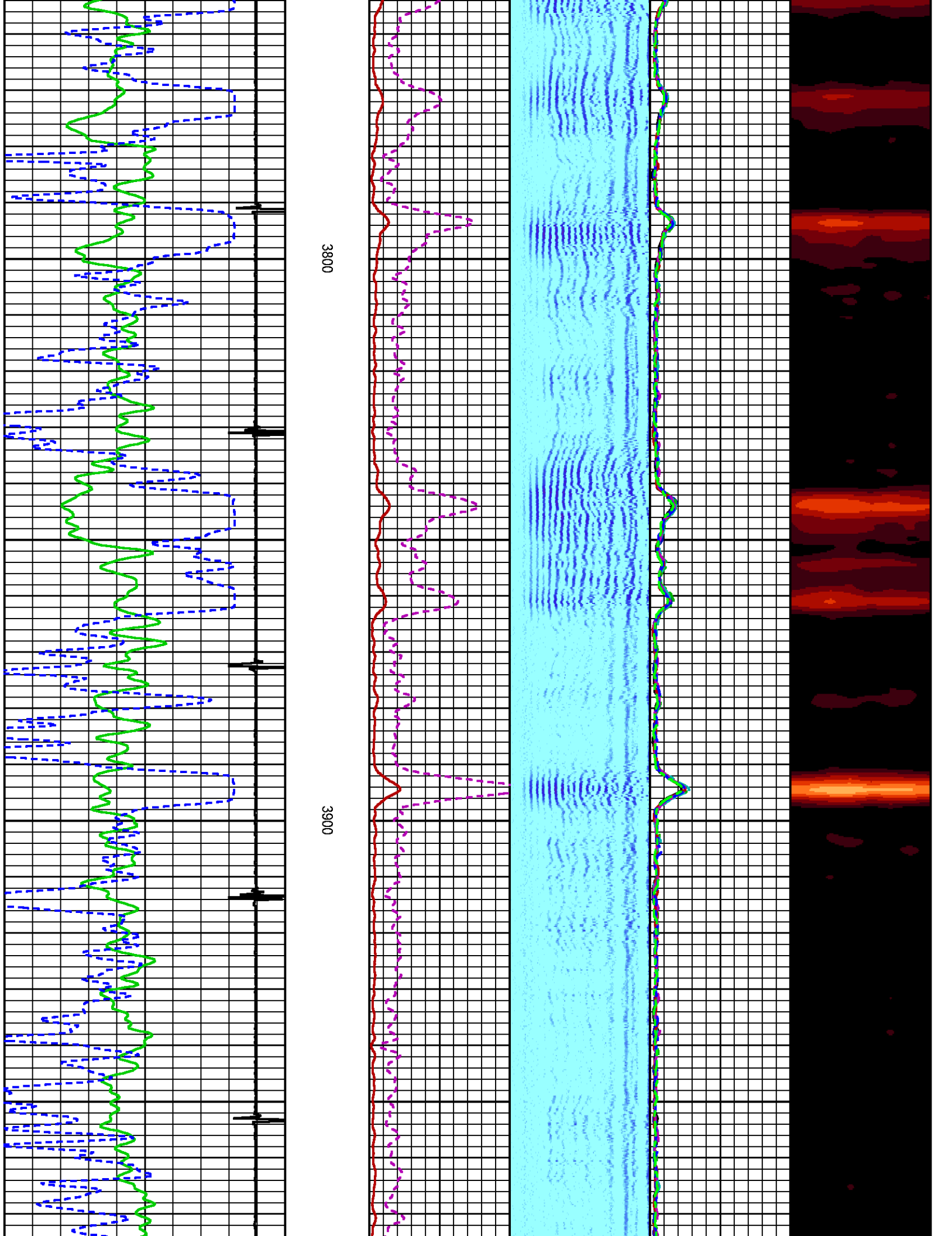


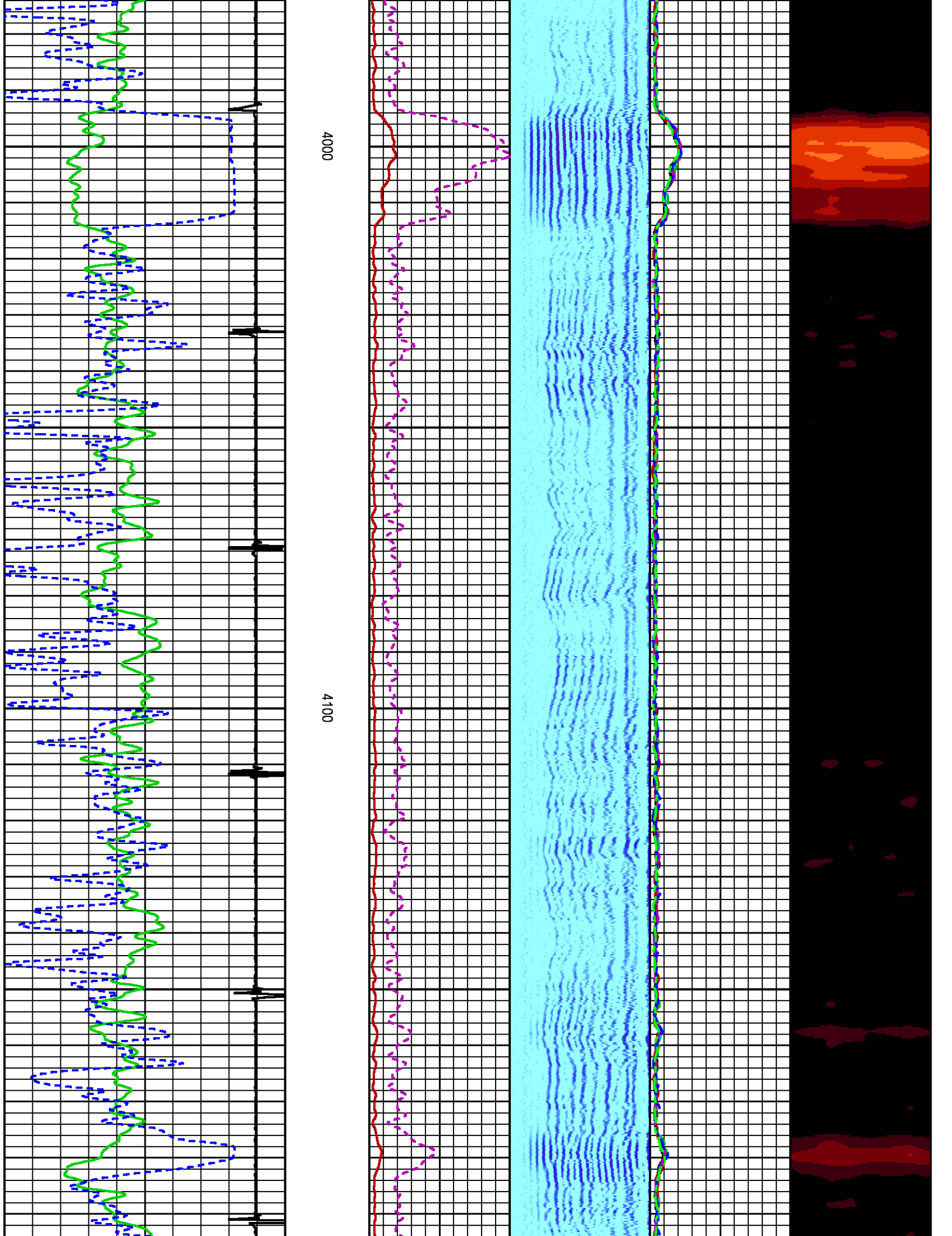


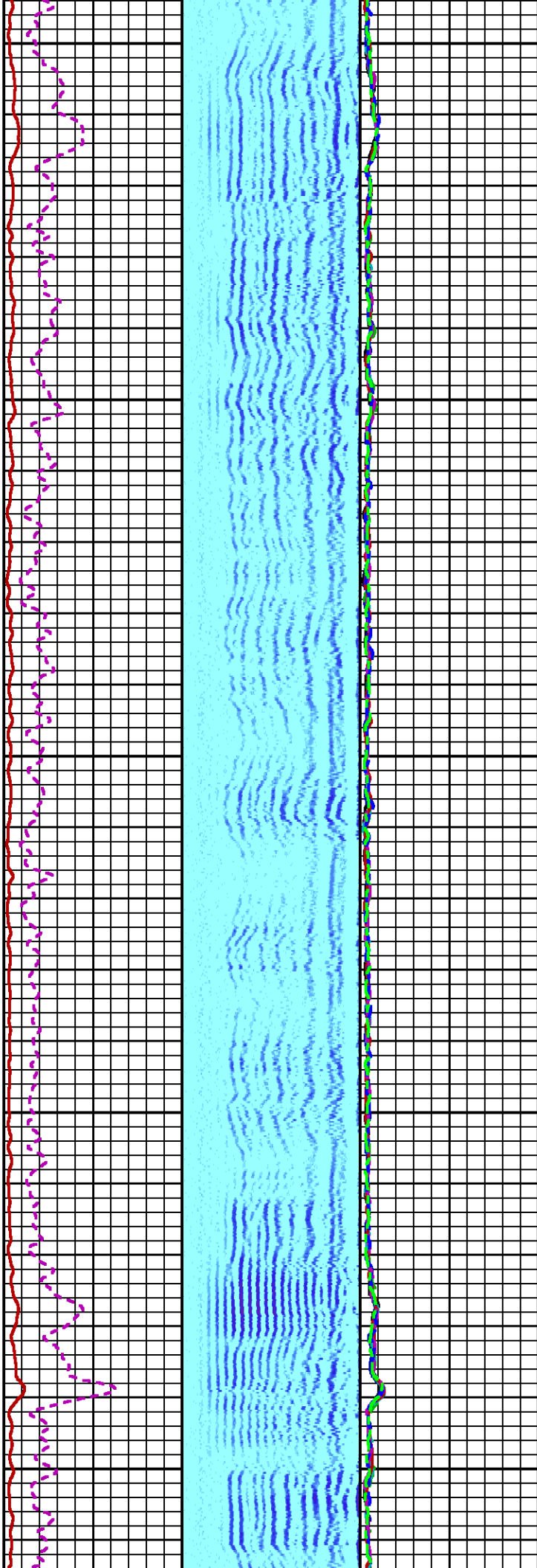
3600

3700





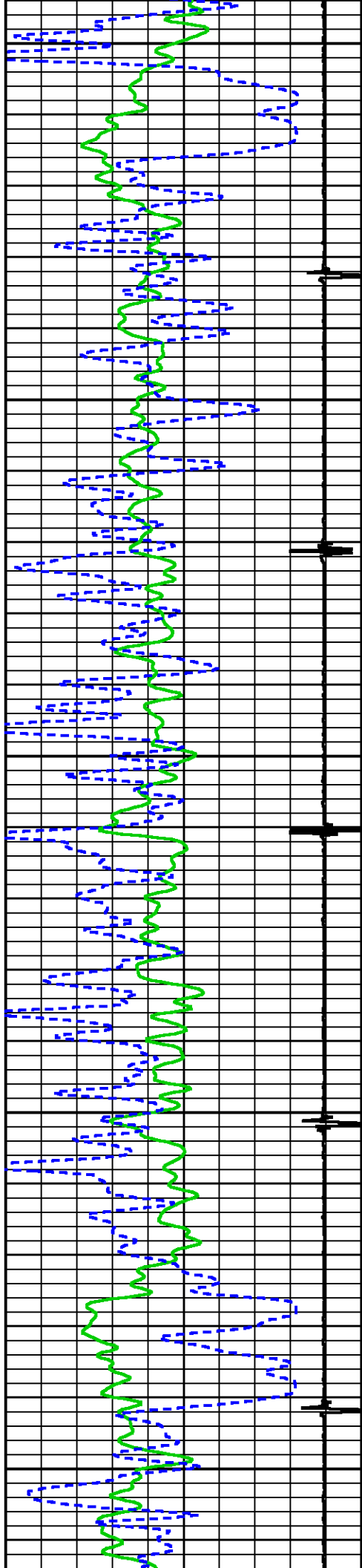


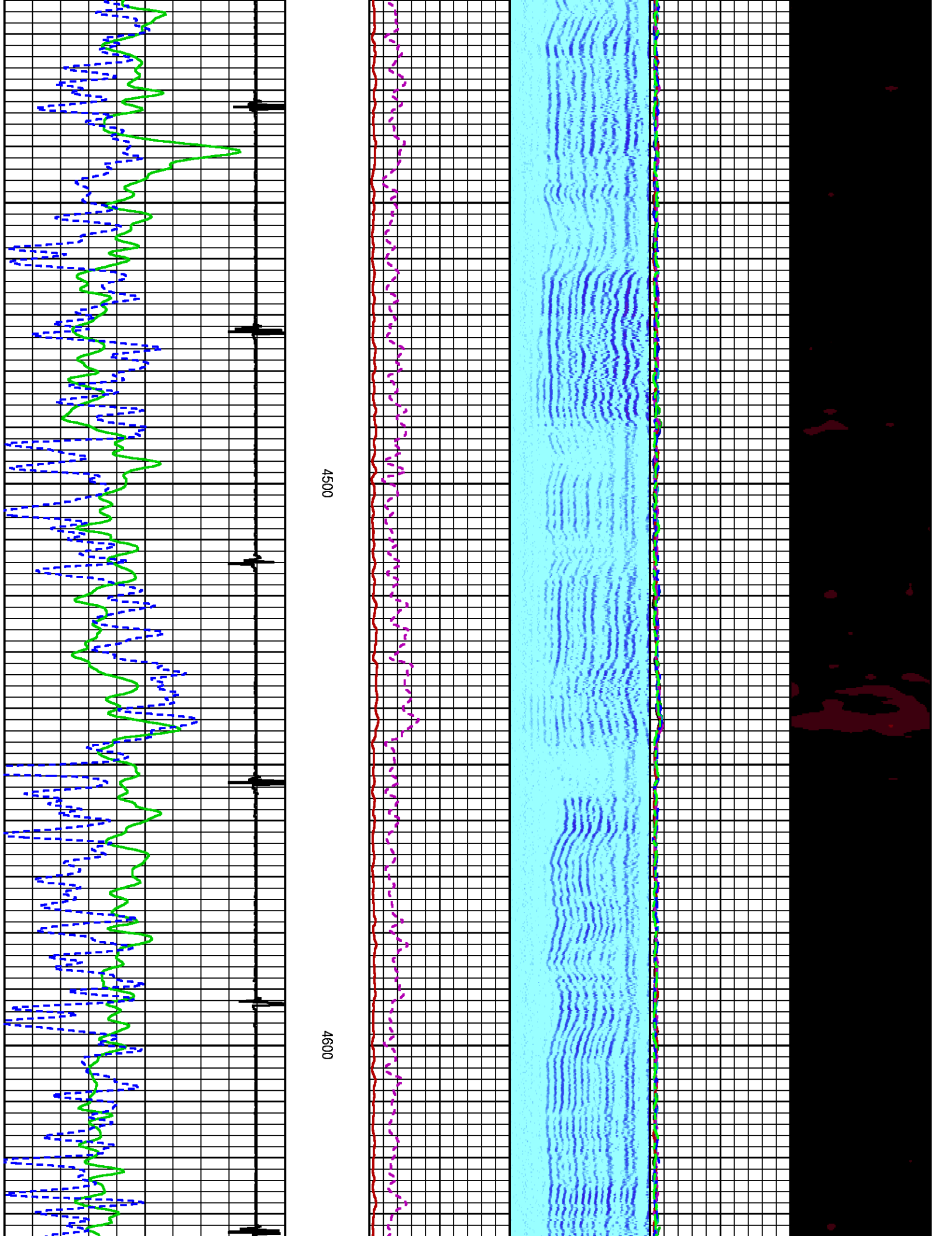


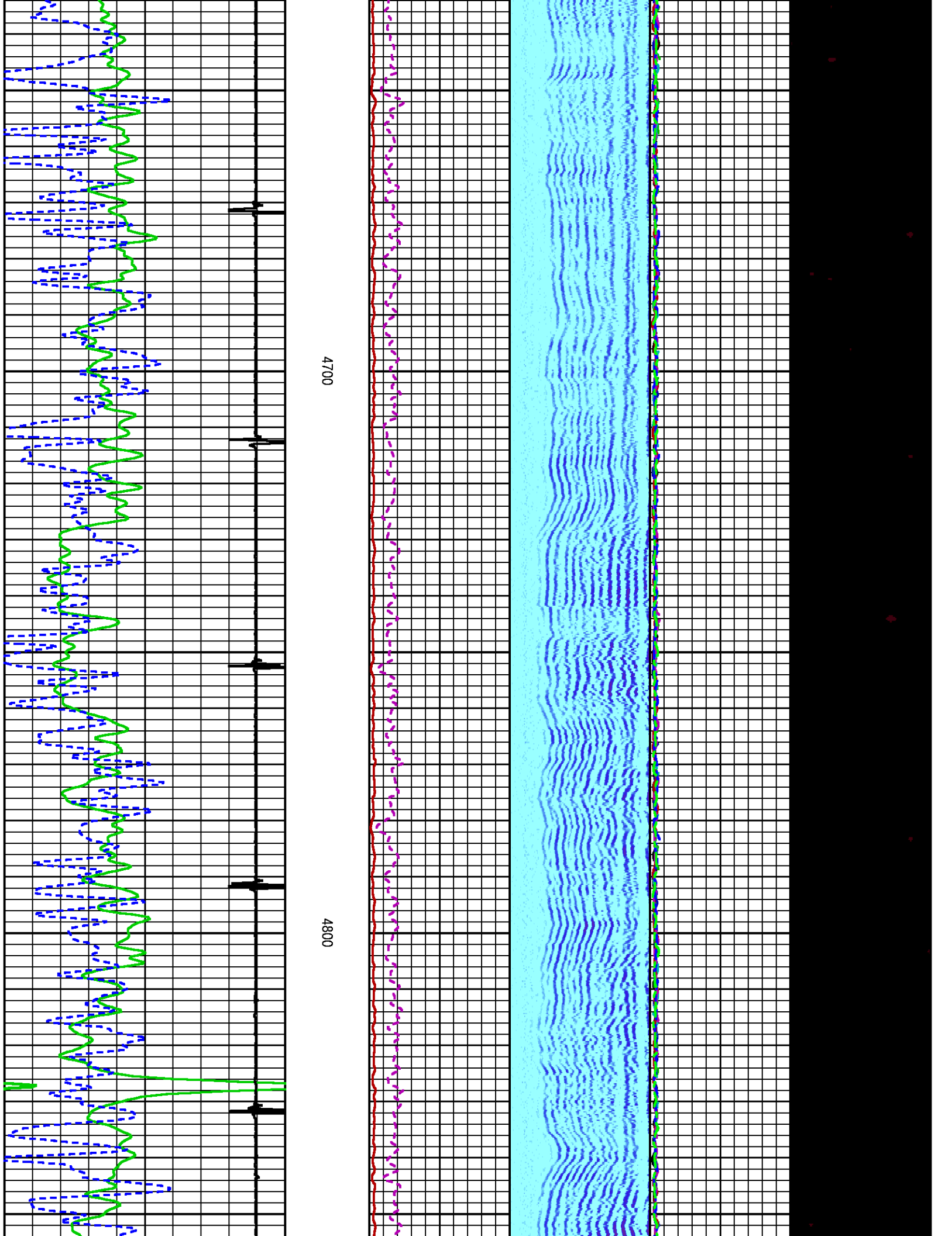
4200

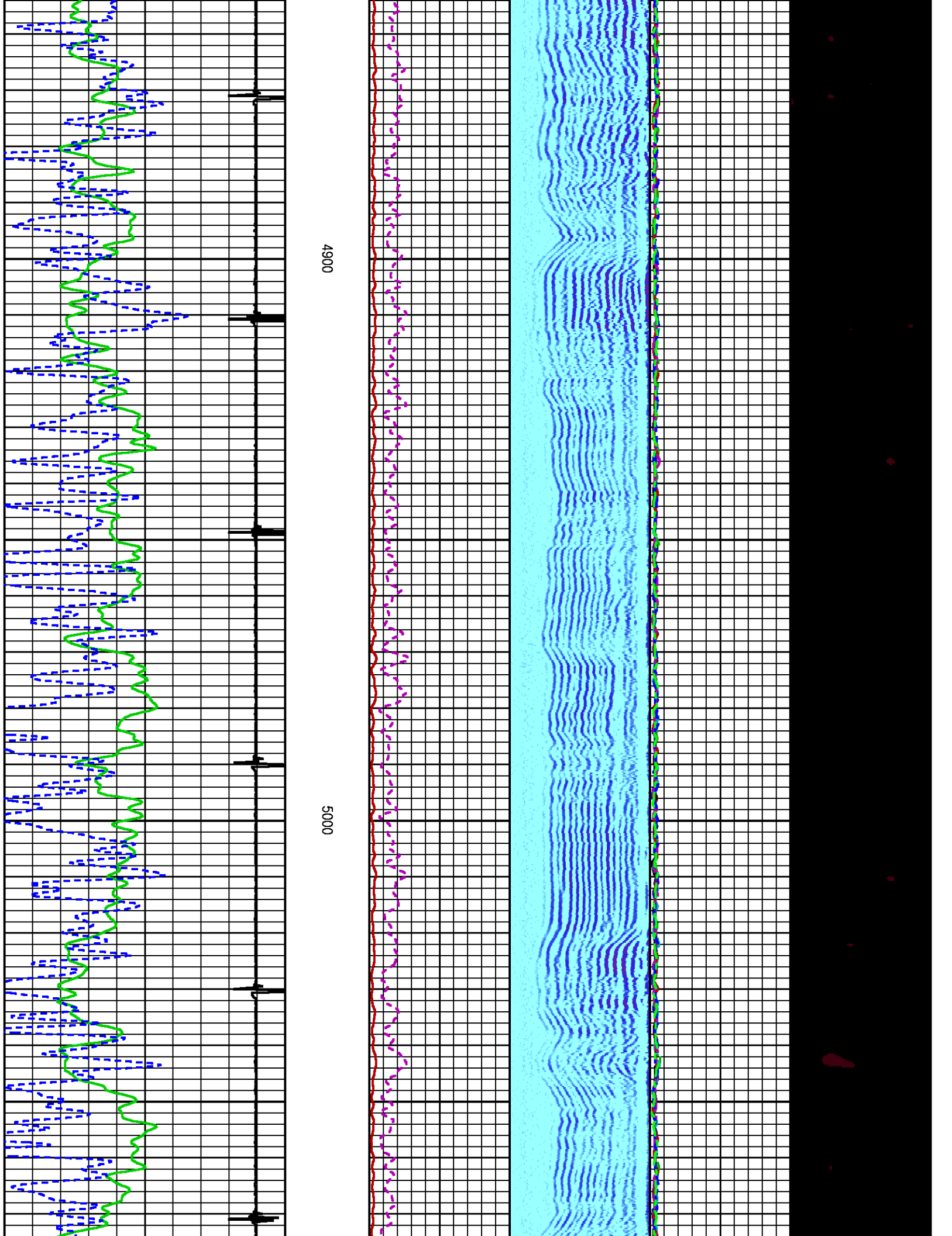
4300

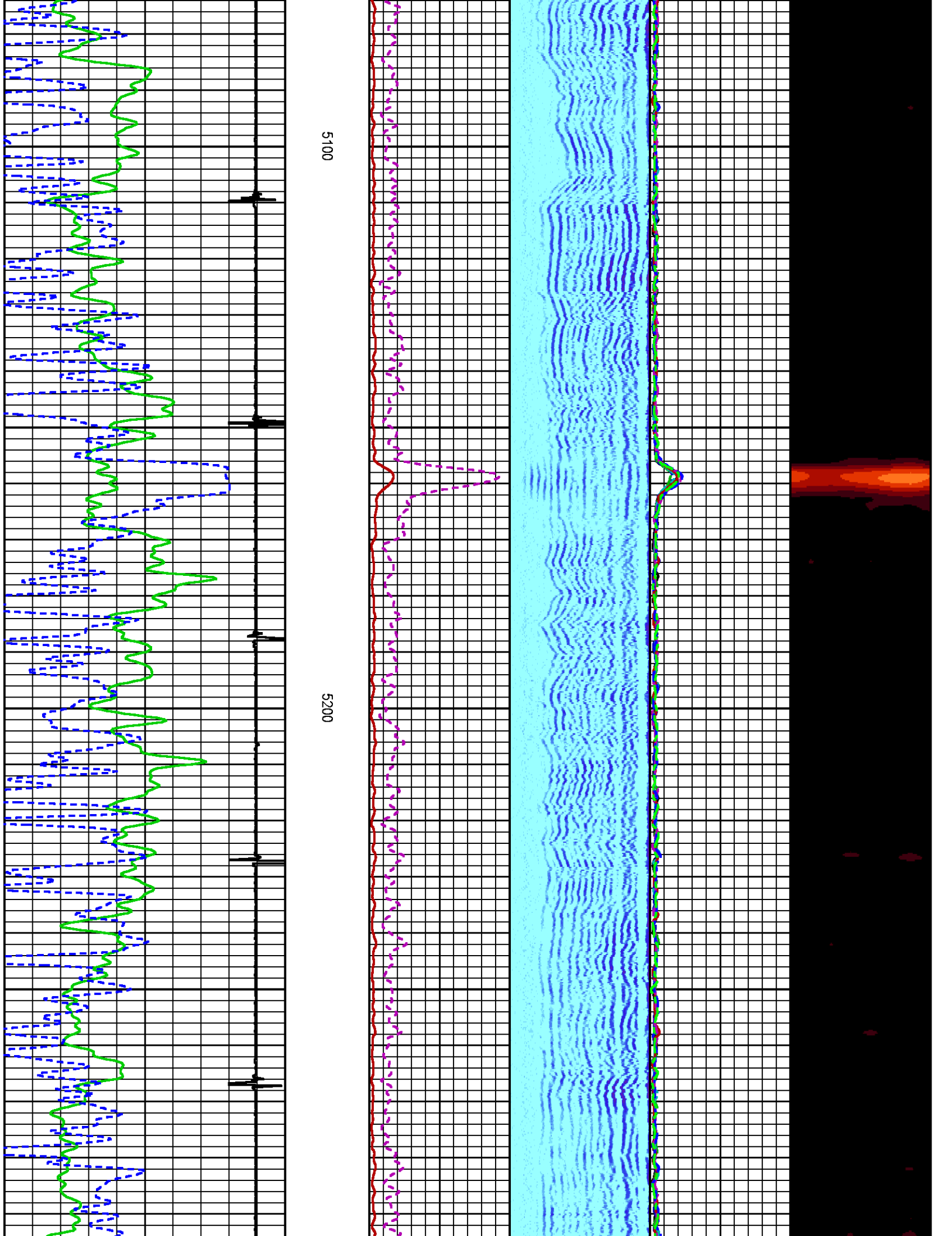
4400

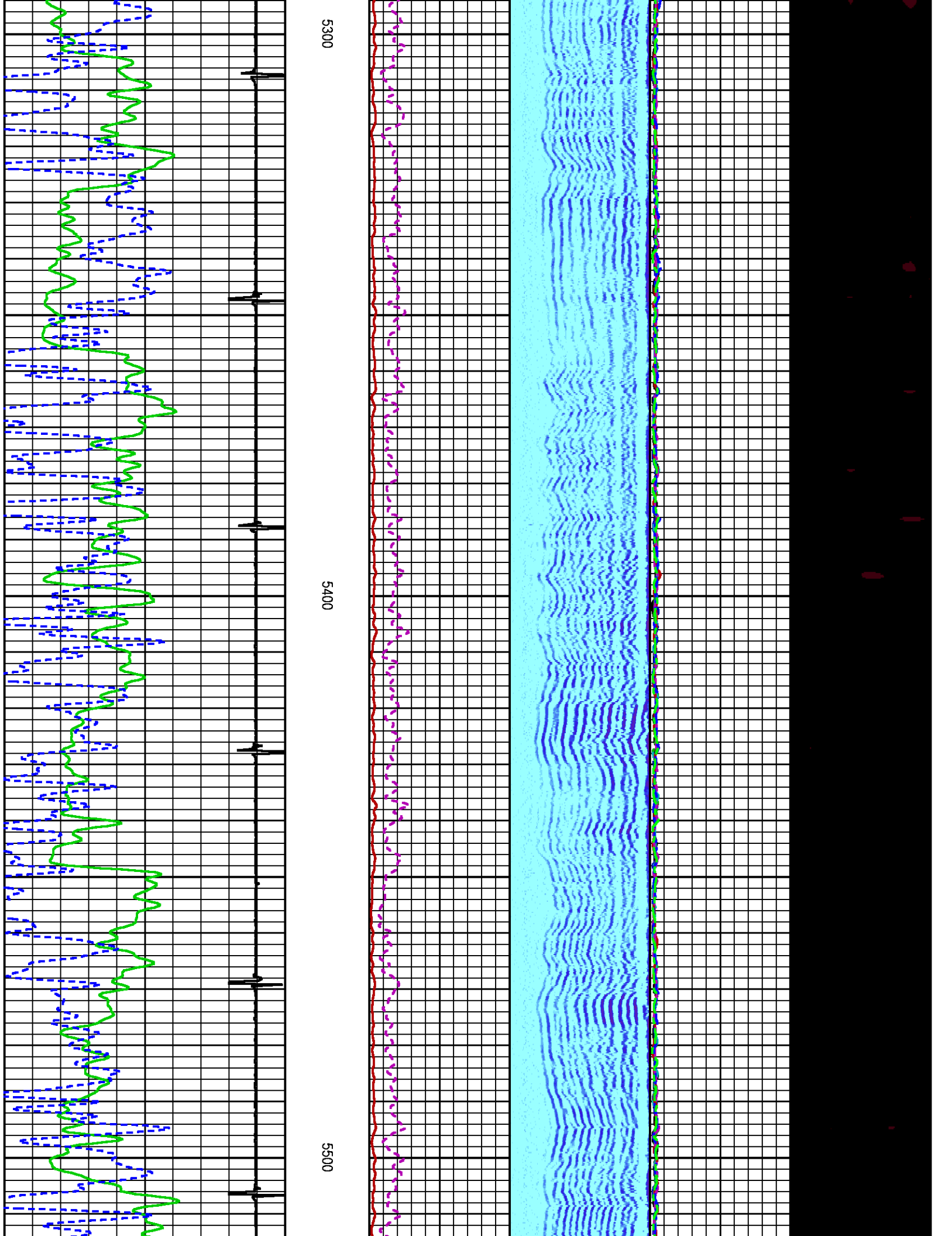


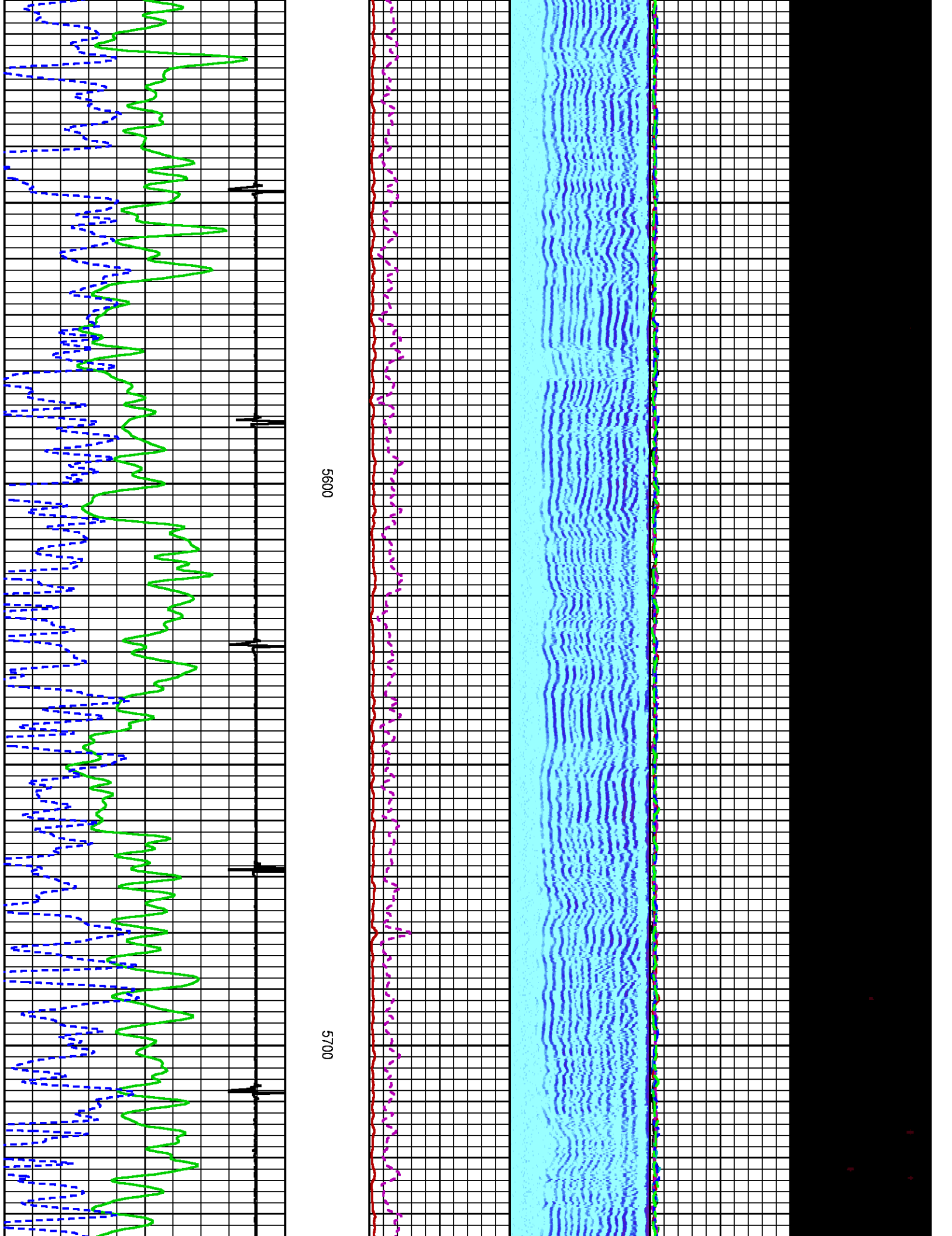


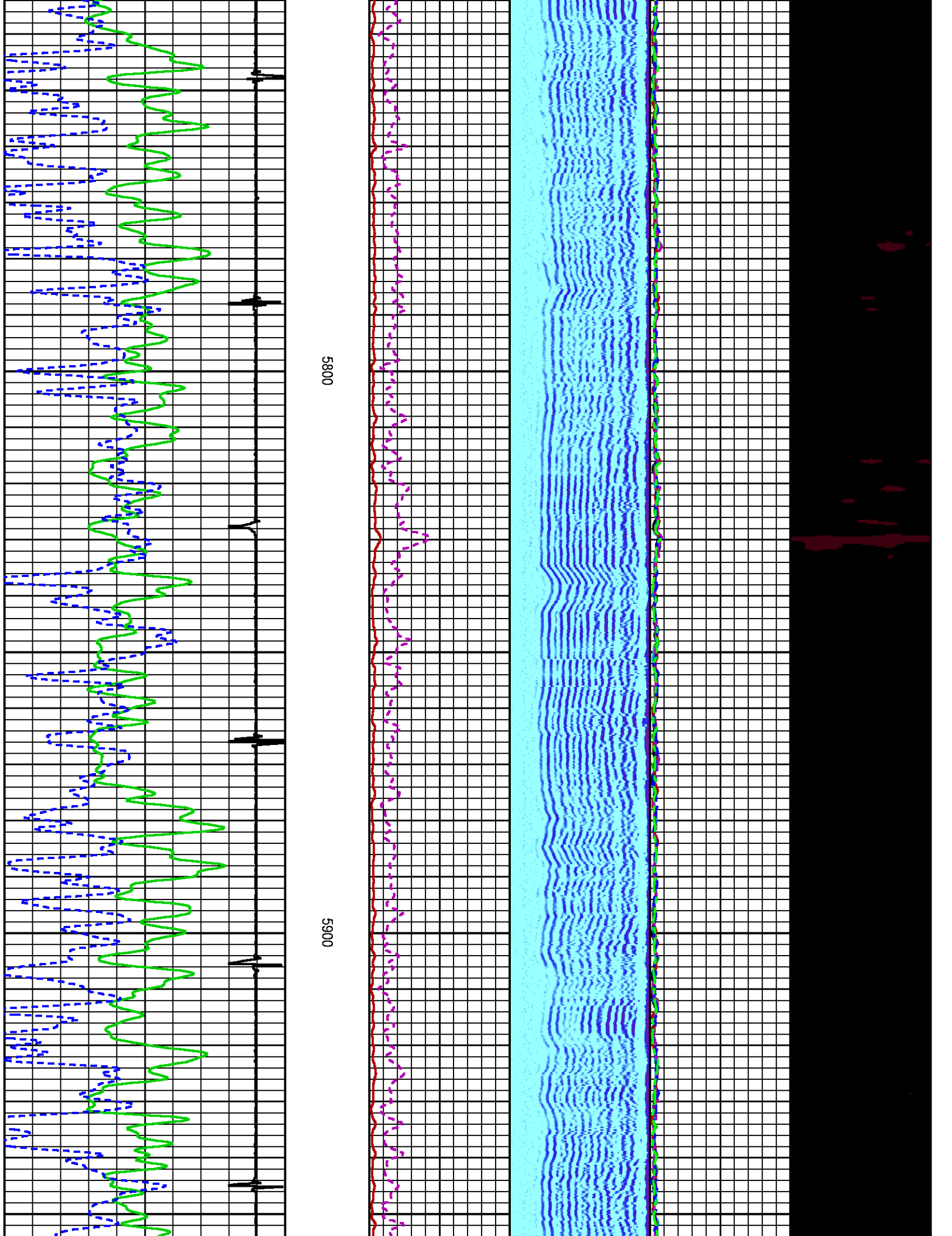


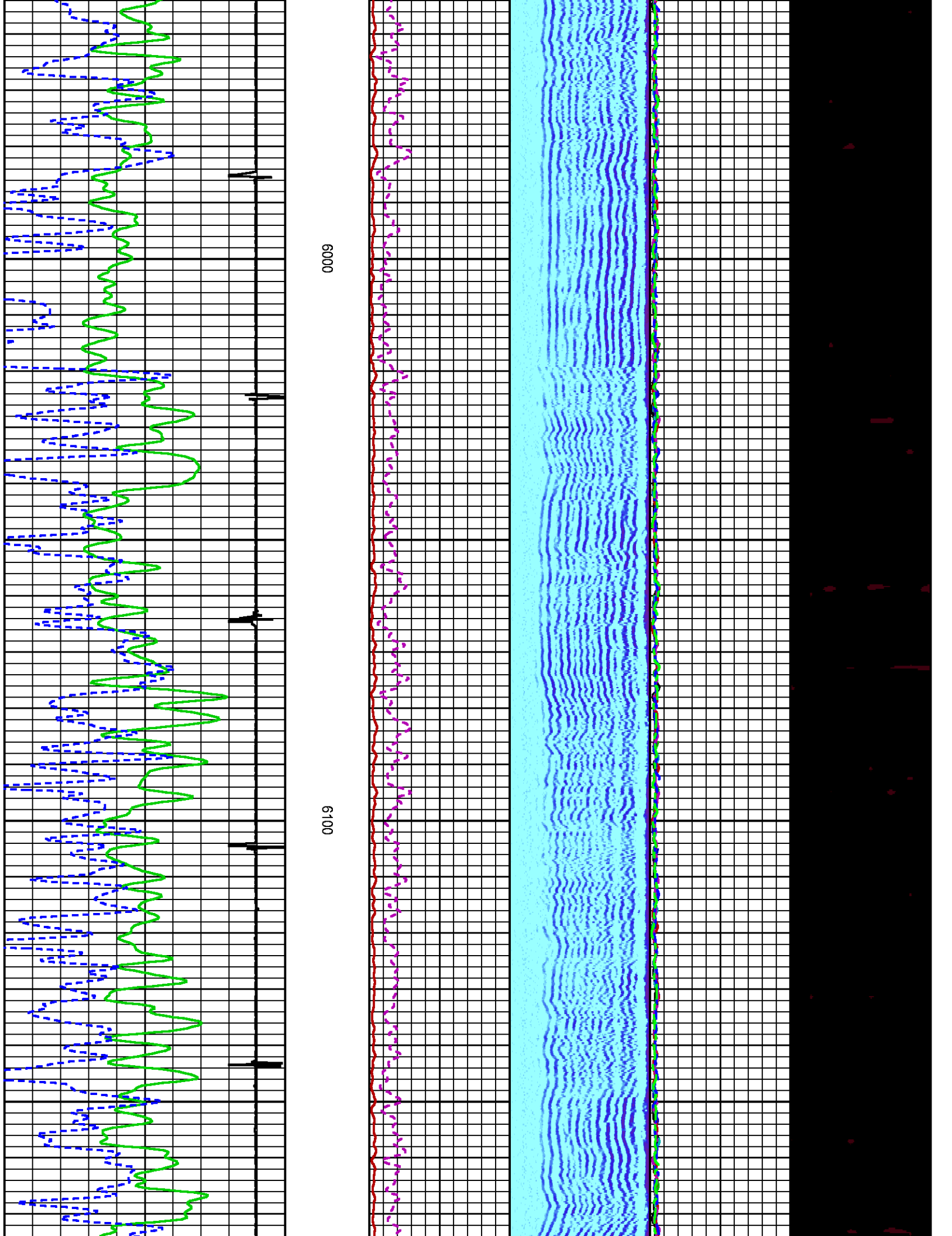


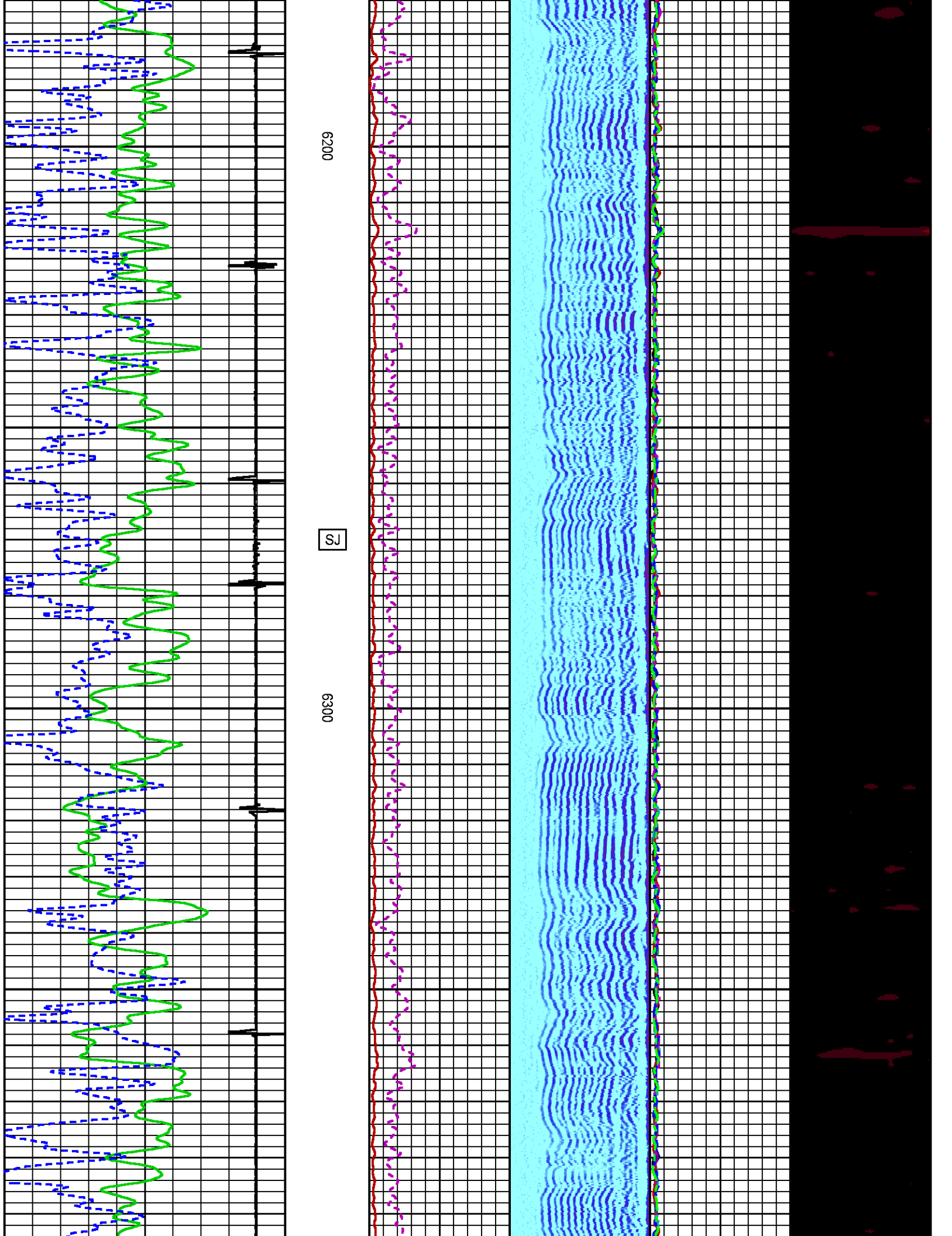


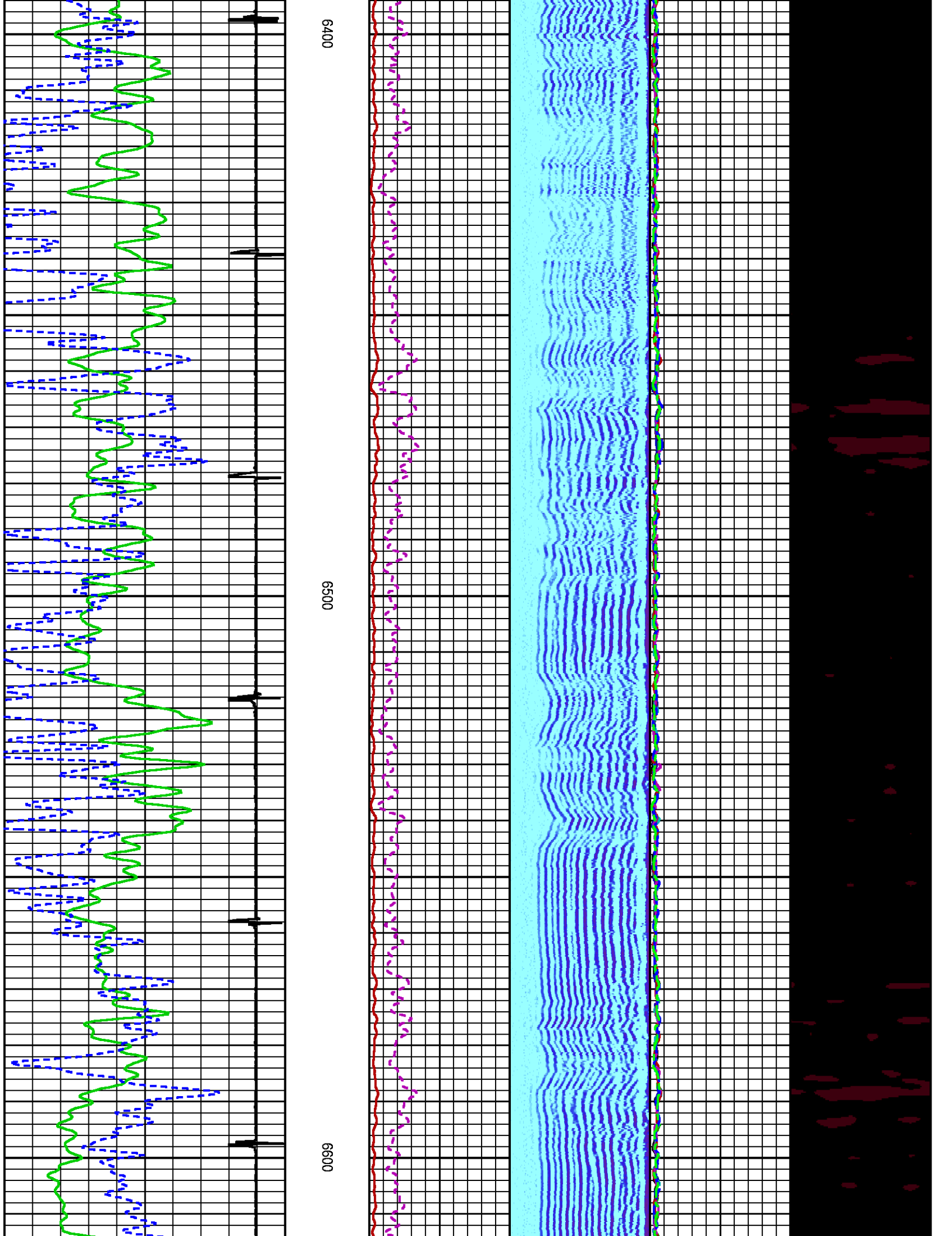


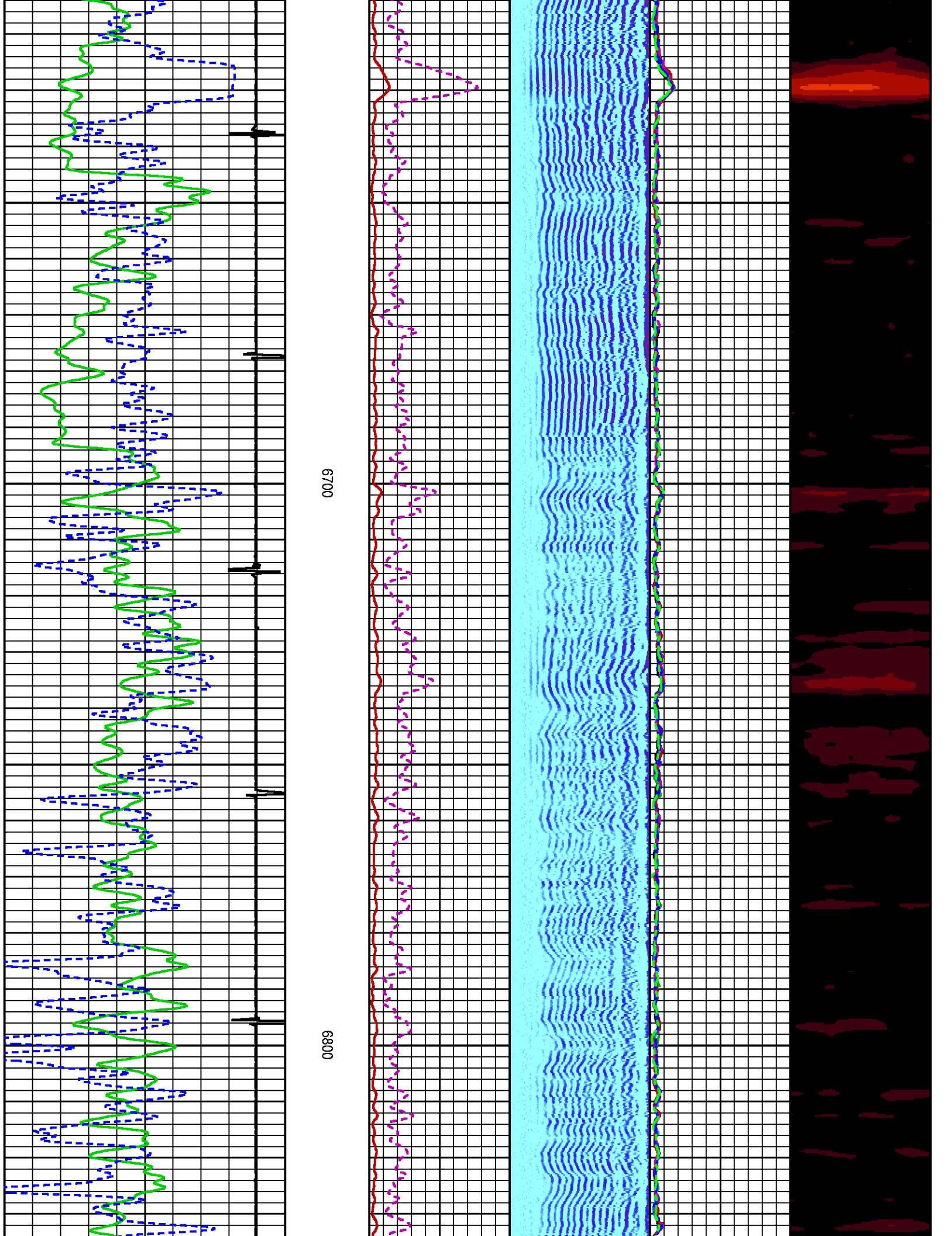


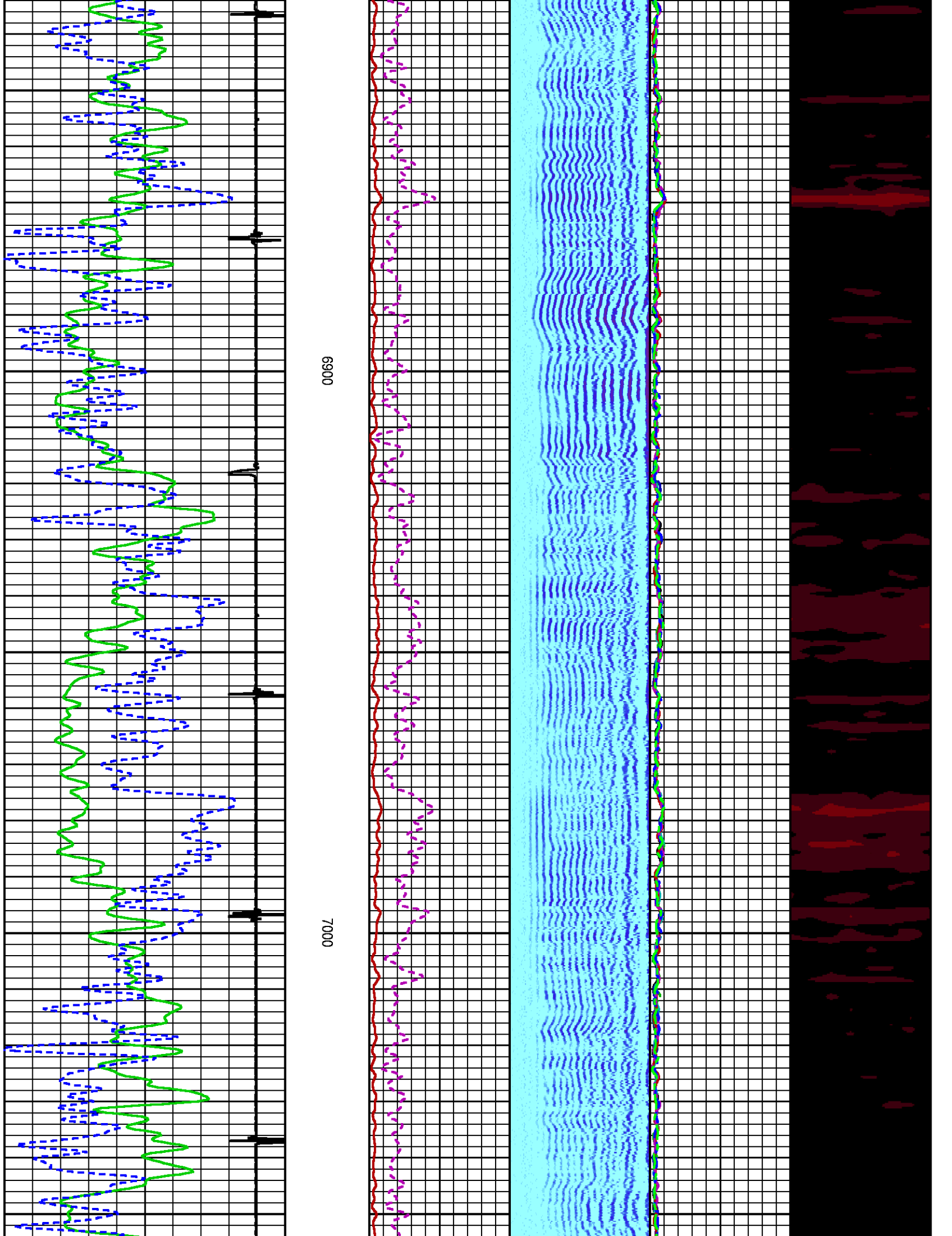






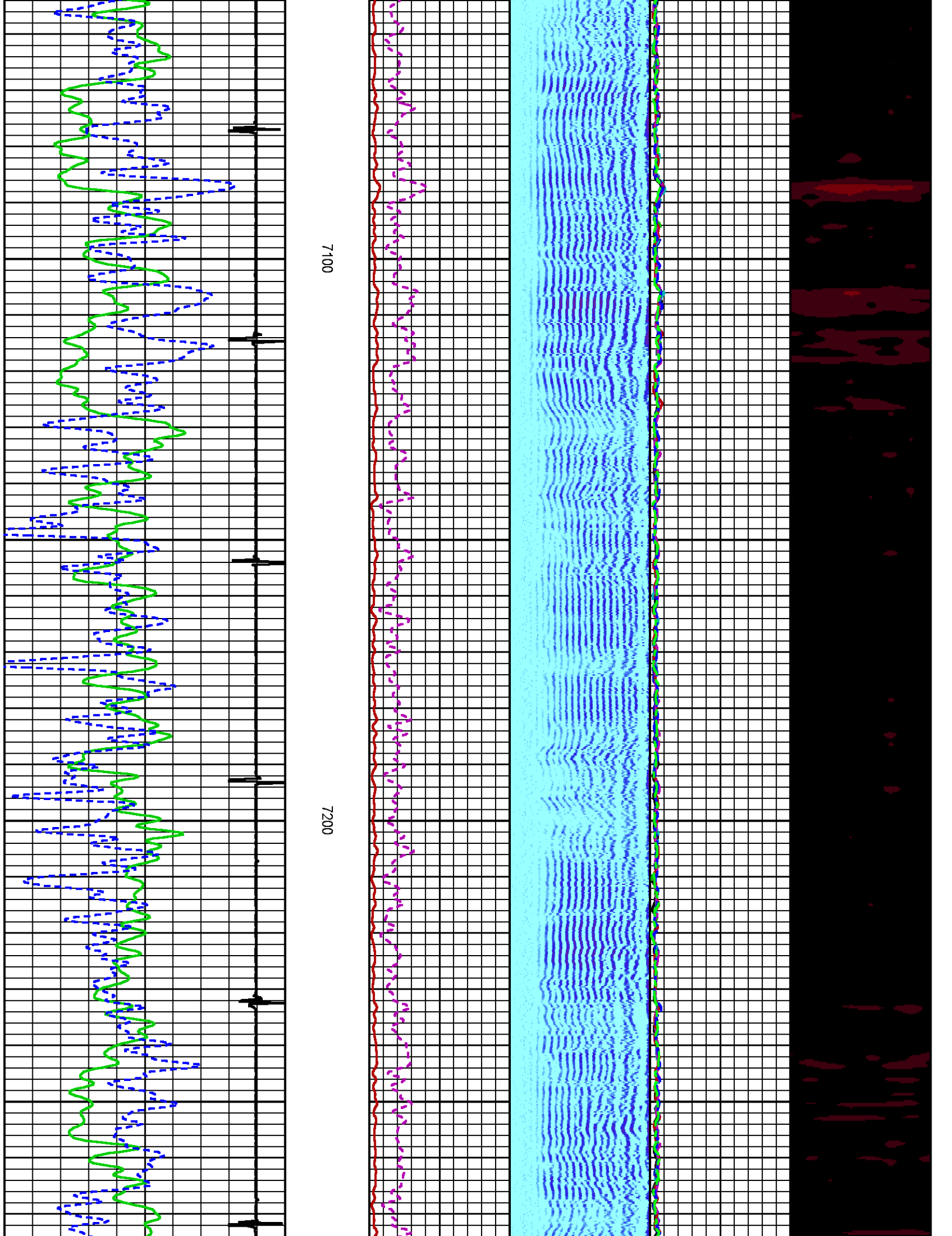


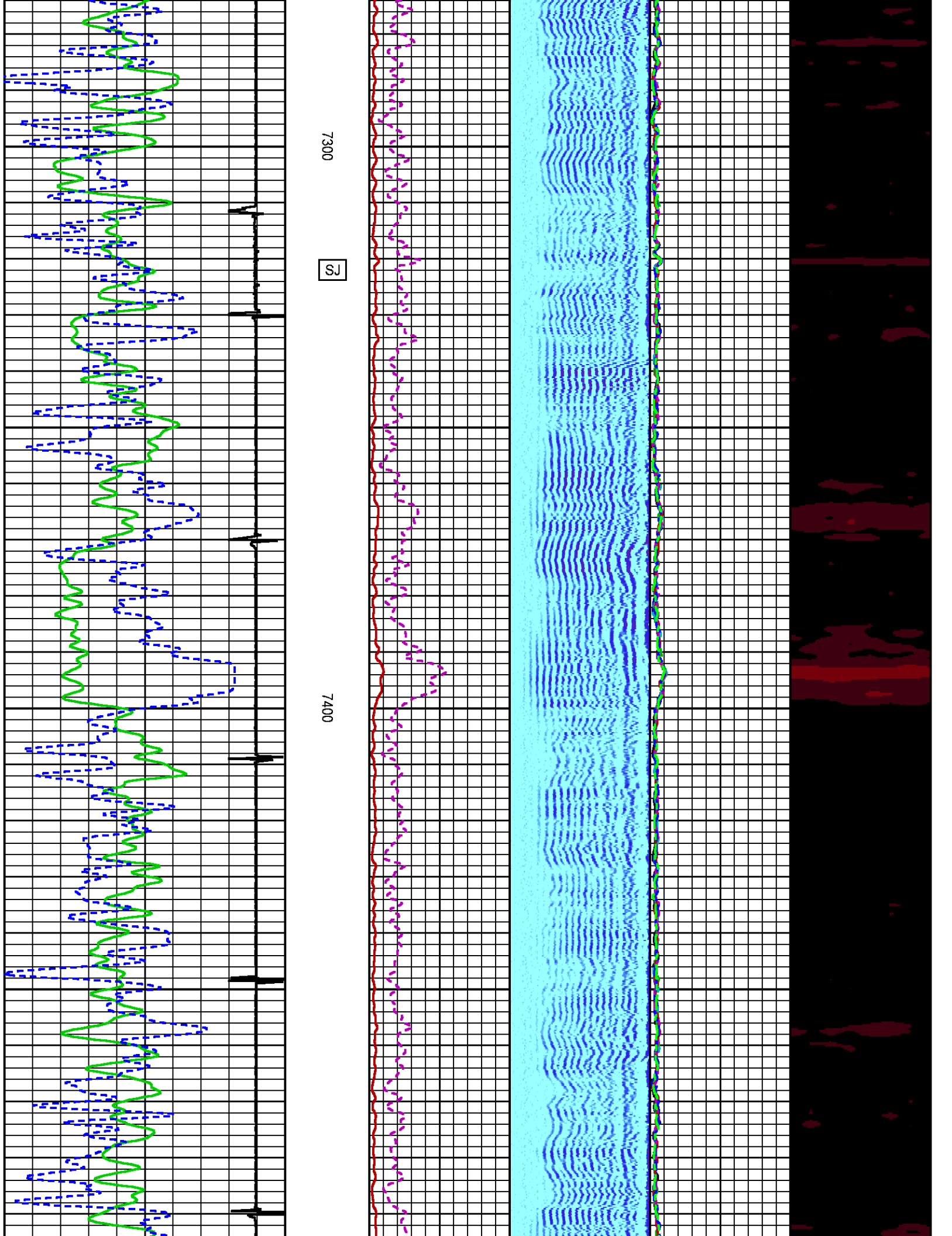


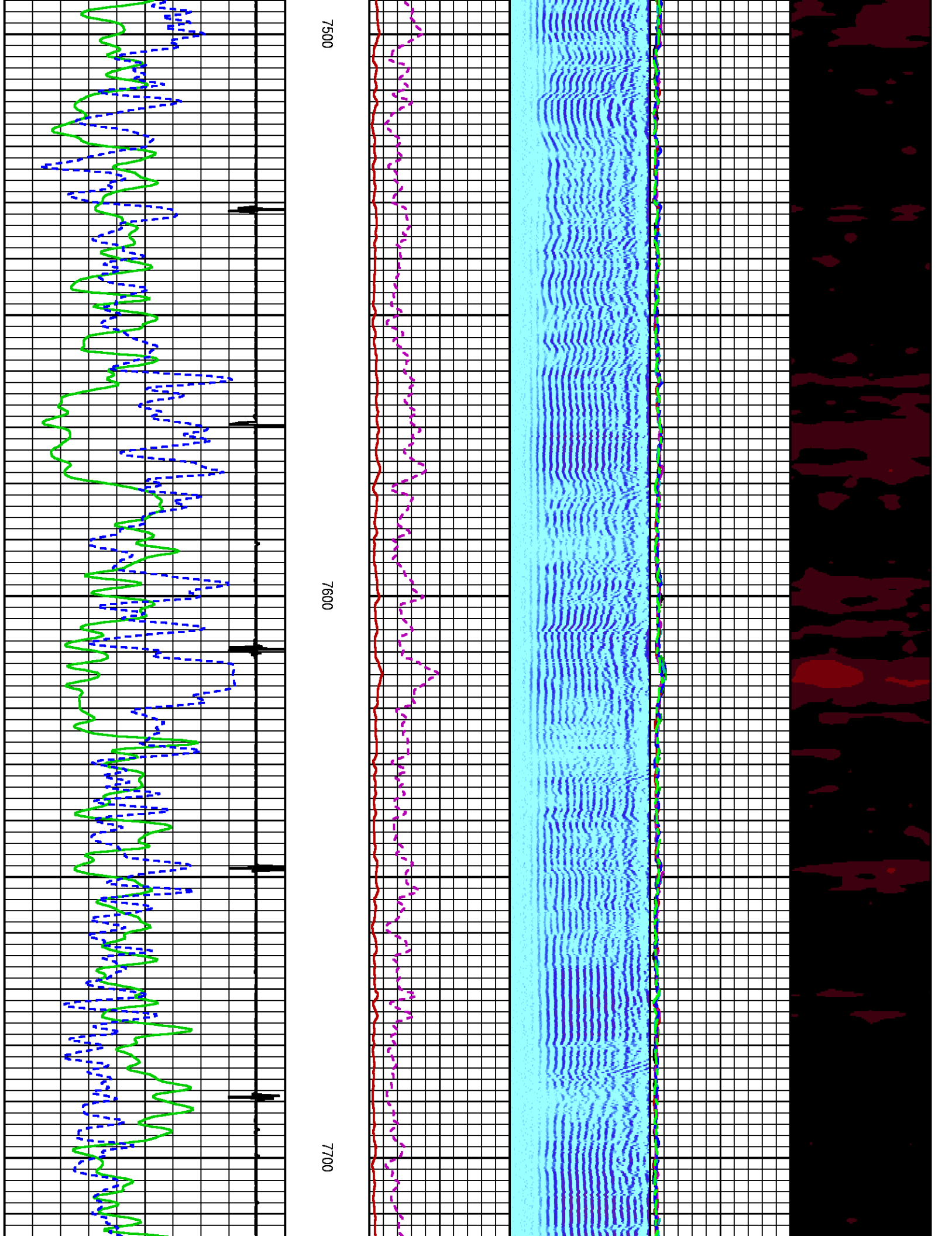


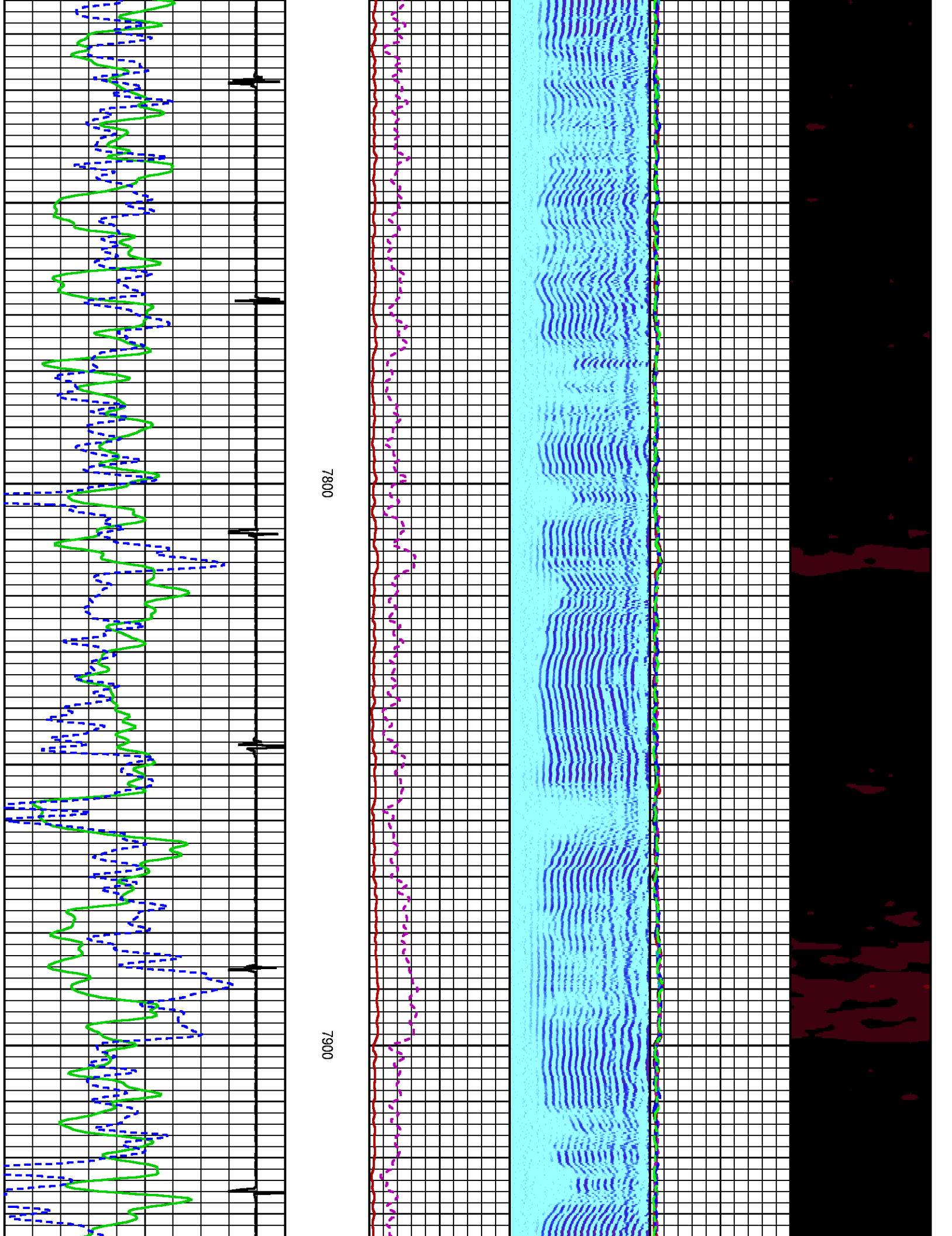
6900

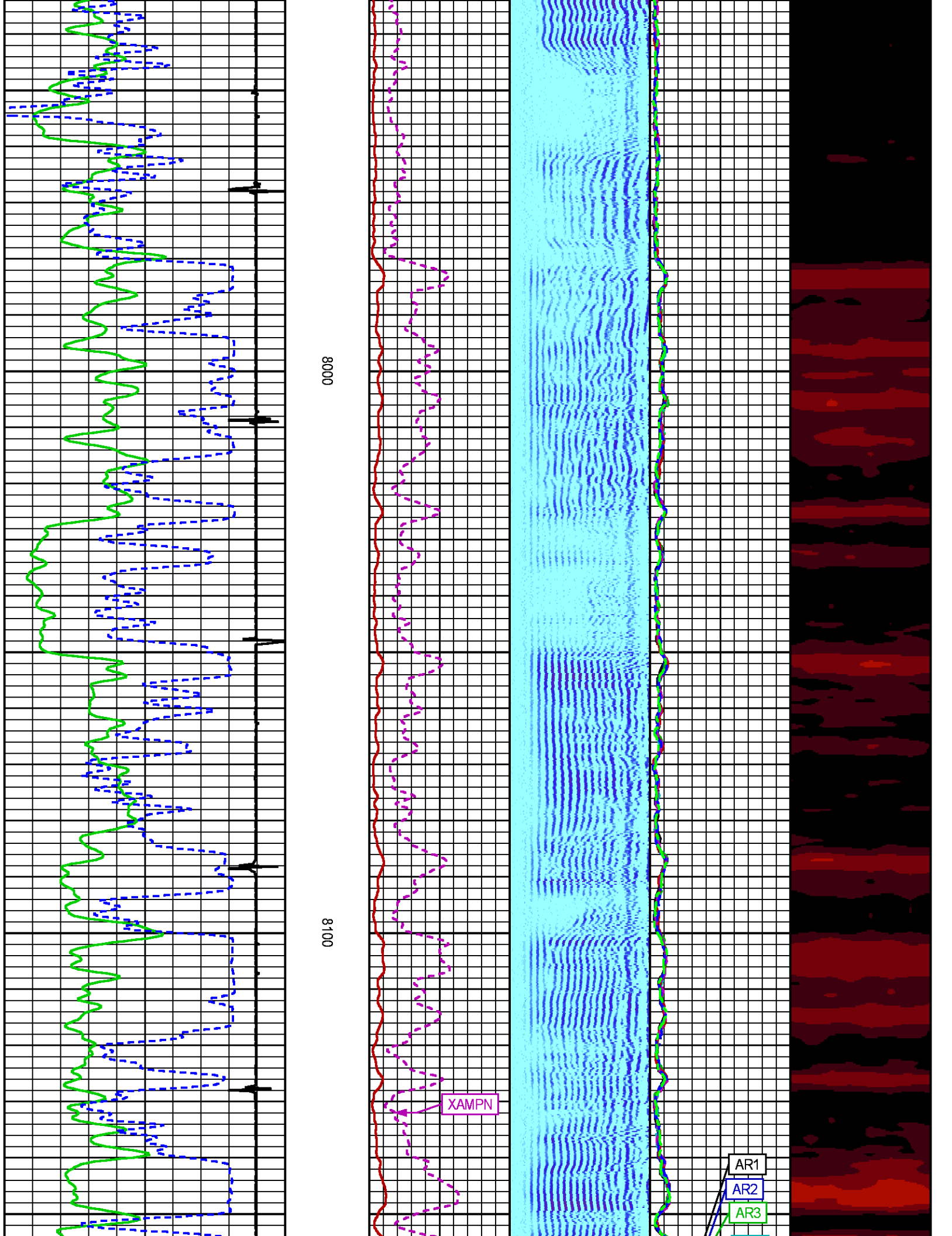
7000

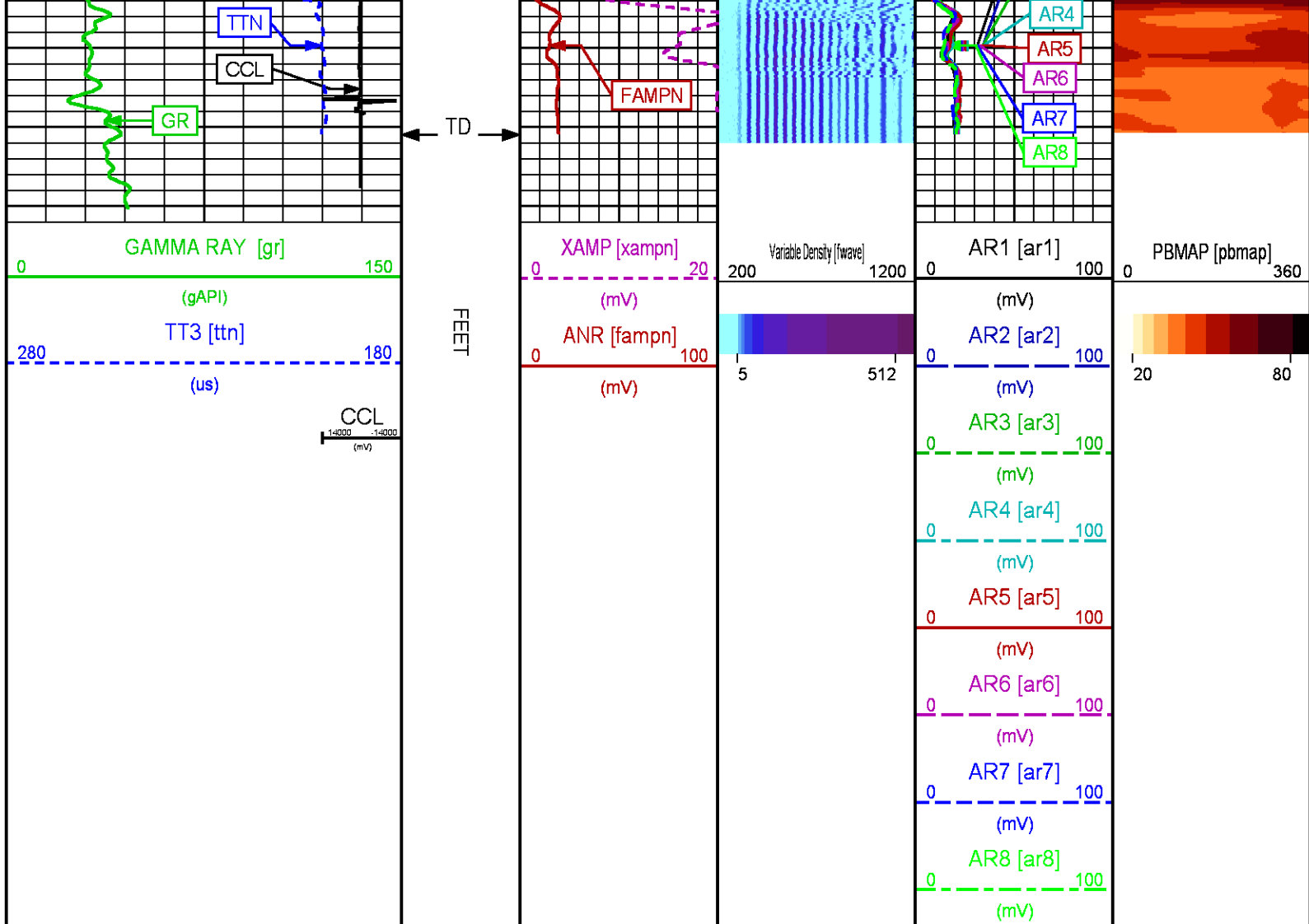












REPEAT PASS 0 PSI

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

Patches: 3

Plotted: Sat Apr 7 12:37:33 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE_BRUTON_FEDERAL_30-20E/p012g01.prm
 LOGGING MODE: DEPTH DIRECTION: UP
 TOP DEPTH: 7948.750 ft BOTTOM DEPTH: 8218.500 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

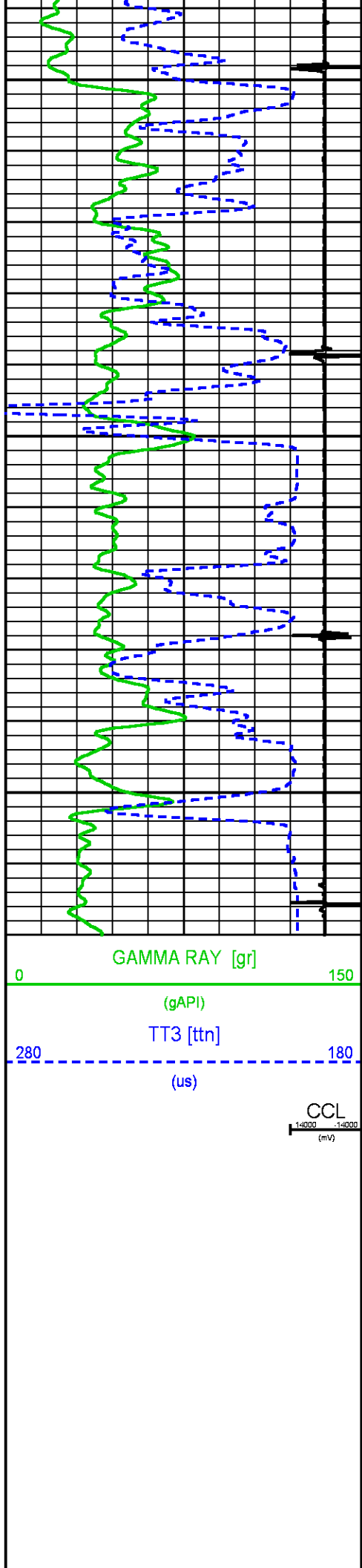
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
------------------	-----------	-------	-------	---------------

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*)	198	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	6	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	200.391	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-63	us	"	"
	TOOL DELAY (str2*)	-63	us	"	"
	TOOL DELAY (str3*)	-63	us	"	"
	TOOL DELAY (str4*)	-63	us	"	"
	TOOL DELAY (str5*)	-63	us	"	"
	TOOL DELAY (str6*)	-63	us	"	"
	TOOL DELAY (str7*)	-63	us	"	"
	TOOL DELAY (str8*)	-63	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	4	mV	"	"
	FULL BOND AMP REC 2	4	mV	"	"
	FULL BOND AMP REC 3	4	mV	"	"
	FULL BOND AMP REC 4	4	mV	"	"
	FULL BOND AMP REC 5	4	mV	"	"
	FULL BOND AMP REC 6	4	mV	"	"
	FULL BOND AMP REC 7	4	mV	"	"
	FULL BOND AMP REC 8	4	mV	"	"

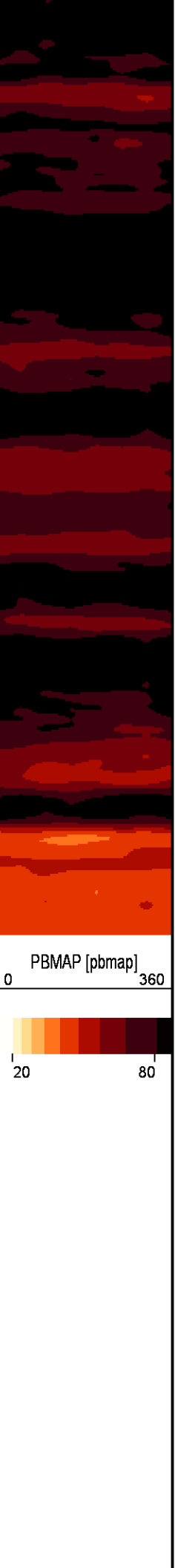
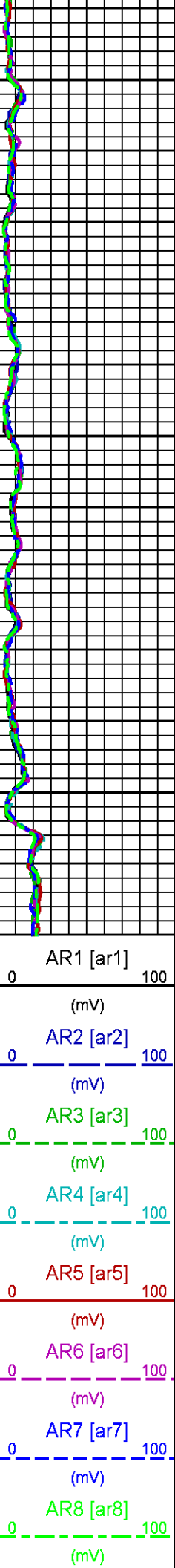
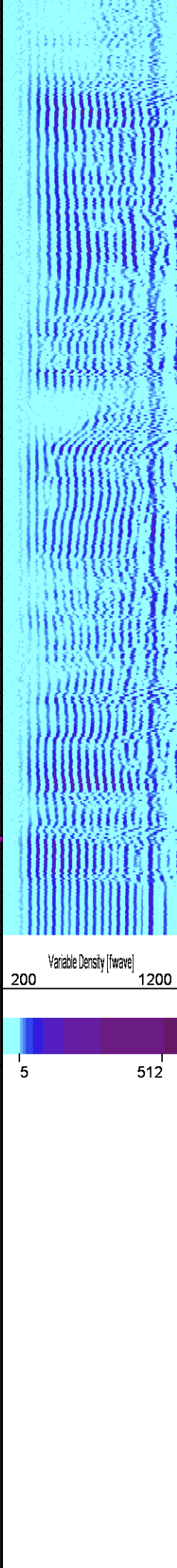
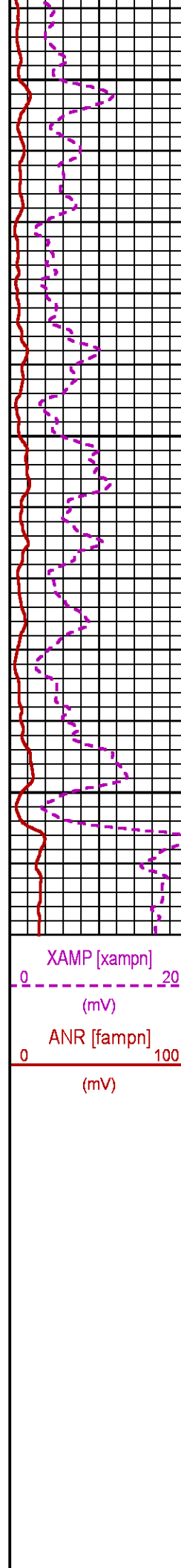
CURVE DESCRIPTION REPORT		
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	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)
AR1	11.25	AR5	11.25	CCL	5.75
				XAMPN	11.25



8100

FEET



CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/LARAMIE_BRUTON_FEDERAL_30-20E/p012g.lp1

RAL PRIMARY CALIBRATION SUMMARY

TOOL #: 1426XA 10417451

DATE/TIME PERFORMED: Sat Apr 7 11:11:14 2018

UNIT #: 5753XD 111111

	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)	0.02	-0.17	0.16	0.03	-0.11	0.16	-0.18	-0.09	0.30	0.07	-0.09
AMP FLUID (mV)	49	48	48	49	50	50	50	49	49	68	48
TT (us)	217	219	218	218	217	216	216	217	219	325	218
M FACTOR	2.02	2.06	2.08	2.03	2.01	2.01	2.00	2.02	2.05	2.22	2.06

RAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1426XA 10417451

DATE/TIME PERFORMED: Sat Apr 7 11:13:16 2018

DAYS SINCE CAL: 0

UNIT #: 5753XD 111111

CABLE #: 4291SM SMALL1

	NEAR (mV)	R1 (mV)	R2 (mV)	R3 (mV)	R4 (mV)	R5 (mV)	R6 (mV)	R7 (mV)	R8 (mV)	FAR (mV)	CAL (mV)
ZERO	-0.17	-0.13	0.27	0.26	-0.02	-0.24	-0.14	0.15	0.26	0.43	-0.35
AMP AIR	4.33	3.26	3.40	3.86	3.14	2.82	4.19	3.82	3.28	6.93	100.78

SHOP M FACTOR	SHOP A FACTOR	WIRELINE FACTOR
2.06	0.00	0.99

GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1355XA 12670180

DATE/TIME PERFORMED: Thu Mar 29 16:39:27 2018

UNIT #: 4352 ML4352

CALB JIG #: 4702NK DA_228

	BACKGROUND (cts)	CALBRTR ON (cts)	CR DIFF (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	CALBRTR (gAPI)
GR	41.51	221.16	179.6	0.557	23.11	123.11	100

GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1355XA 12670180

DATE/TIME PERFORMED: Thu Mar 29 16:50:56 2018

UNIT #: 4352 ML4352

VERI JIG #: 4702NK DA_228

	BACKGROUND (cts)	CALBRTR ON (cts)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	40.09	214.13	0.557	22.32	119.20	96.88

INSTRUMENT CONFIGURATION

Source File: /dat1a/LARAMIE_BRUTON_FEDERAL_30-20E/RAL-tdg

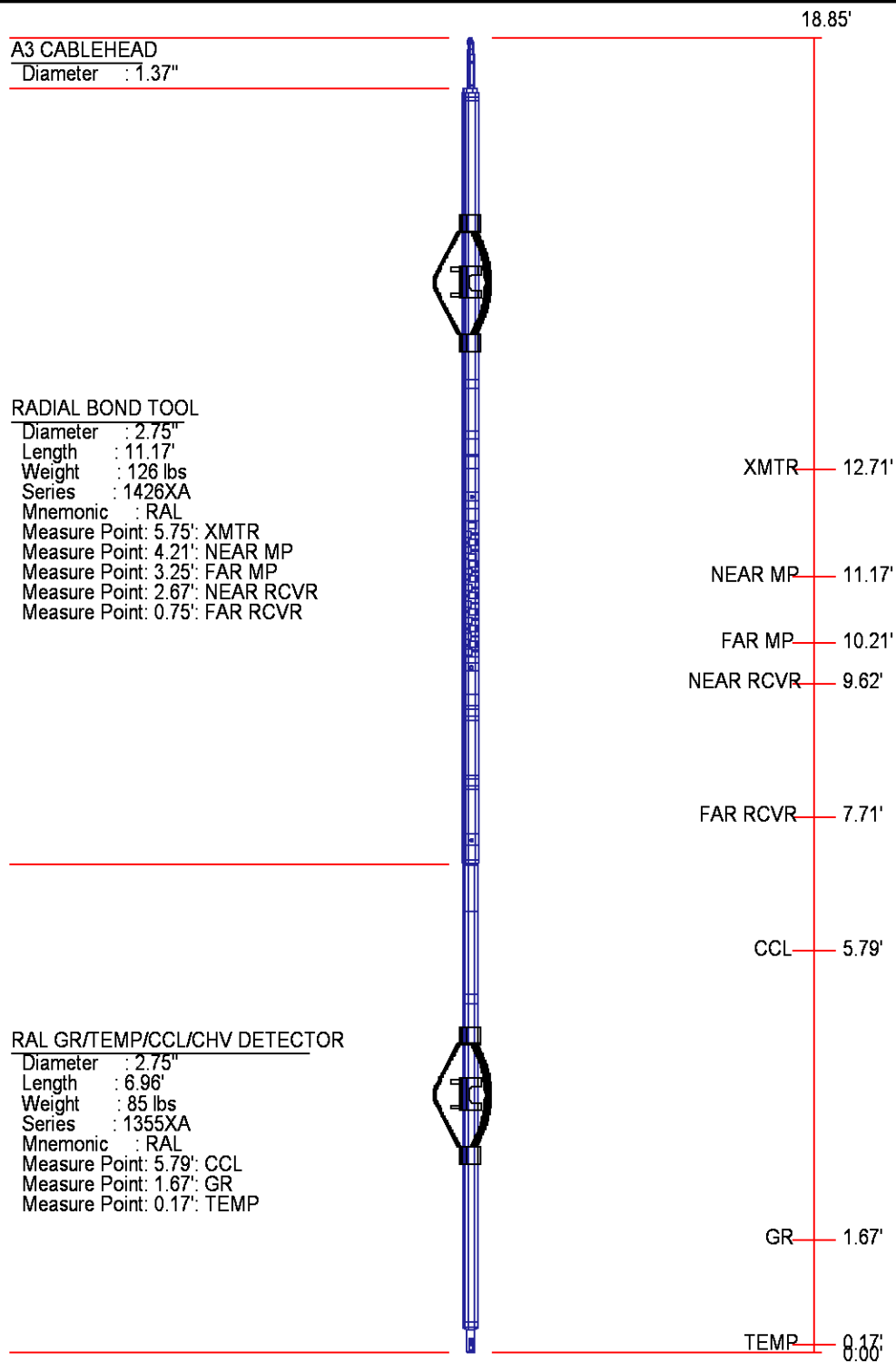
A3 CABLEHEAD
Diameter : 1.37"

RADIAL BOND TOOL

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

RAL GR/TEMP/CCL/CHV DETECTOR

Diameter : 2.75"
Length : 6.96'
Weight : 85 lbs
Series : 1355XA
Mnemonic : RAL
Measure Point: 5.79': CCL
Measure Point: 1.67': GR
Measure Point: 0.17': TEMP



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



COMPANY LARAMIE ENERGY LLC
WELL BRUTON 30-20E
FIELD VEGA
COUNTY MESA STATE COLORADO

FILE NO:
CH133067
API NO:
05077104670000

LOCATION:

SHL: 2627' FSL & 1849' FEL
BHL: 373' FSL & 820' FEL

SEC 30 TWP 9S RGE 93W

ELEVATIONS:

KB 7673 FT
DF
GL 7643 FT

DATE 07-Apr-2018