



**RADIAL CEMENT BOND LOG  
GAMMA RAY / CCL / VDL**

Company ANTERO RESOURCES CORPORATION  
 Well MONDEO UNIT 3H  
 Field MARCELLUS  
 County DODDRIDGE  
 State W.V. Country USA

Company ANTERO RESOURCES CORPORATION  
 Well MONDEO UNIT 3H  
 Field MARCELLUS  
 County DODDRIDGE  
 State W.V. Country USA

Location: API #: 47017068780000 Other Services

AFEE#A08796-D

SEC TWP RGE

Elevation

Permanent Datum GROUND LEVEL Elevation

Log Measured From R.K.B. 25'

Drilling Measured From R.K.B.

K.B.  
D.F.  
G.L.

Date 10/25/19

Run Number ONE

Depth Driller 22809

Depth Logger 7400'

Bottom Logged Interval 7400'

Top Log Interval SURFACE

Open Hole Size 8.25

Type Fluid F/W

Density / Viscosity 8.6

Max. Recorded Temp. 147 degF

Estimated Cement Top 2640'

Time Well Ready N/A

Time Logger on Bottom N/A

Equipment Number 214181

Location BRIDGEPORT W.V.

Recorded By S.BUTLER

Witnessed By JAYSON LUKES

Borehole Record		Tubing Record				
Run Number	Bit Size	From	To	Weight	From	To
ONE	24"	SURFACE	105'			
TWO	17.5"	105'	388'			
THREE	12.25"	388'	2589'			
FOUR	8.25"	2589'	22809'			
Casing Record		Size	Wgt/Ft	Top	Bottom	
Surface String		13.375	54.5	SURFACE	388'	
Prot. String		9.625	36	SURFACE	2589'	
Production String		5.5	20	SURFACE	22809'	
Liner						

<<< Fold Here >>>

All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

**Comments**

THANK YOU FOR USING KLX ENERGY SERVICES  
 LOG WAS RAN ON 5.5" CASING  
 LOG WAS RAN WITH 1500 PSI ON WELL  
 LOG T.D 7400"  
 MARKER JOINT @ 5947' TO 5958'



**MAIN LOG**

Database File e:\antero10-25-19\antero\_mondeo\_unit\_3h.db  
 Dataset Pathname pass2.2  
 Presentation Format antero1  
 Dataset Creation Mon Oct 28 15:26:03 2019  
 Charted by Depth in Feet scaled 1:240

280	Travel Time (usec)	180
9	Casing Collar	-1
0	Gamma Ray (GAPI)	180
0	TEMP (degF)	200
180	GR (GAPI)	360

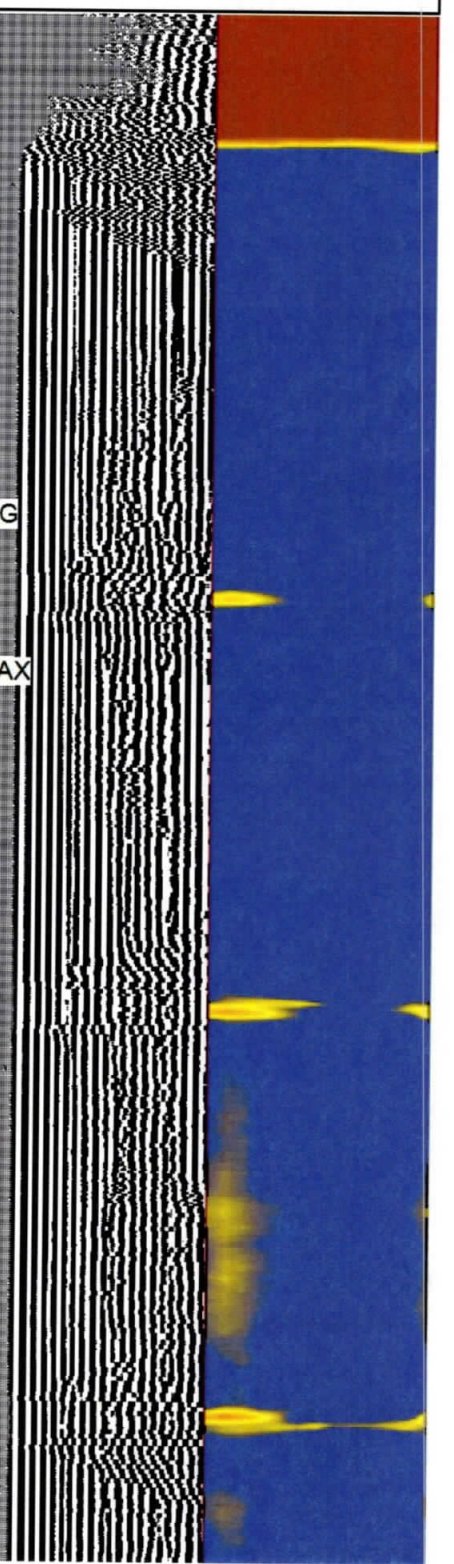
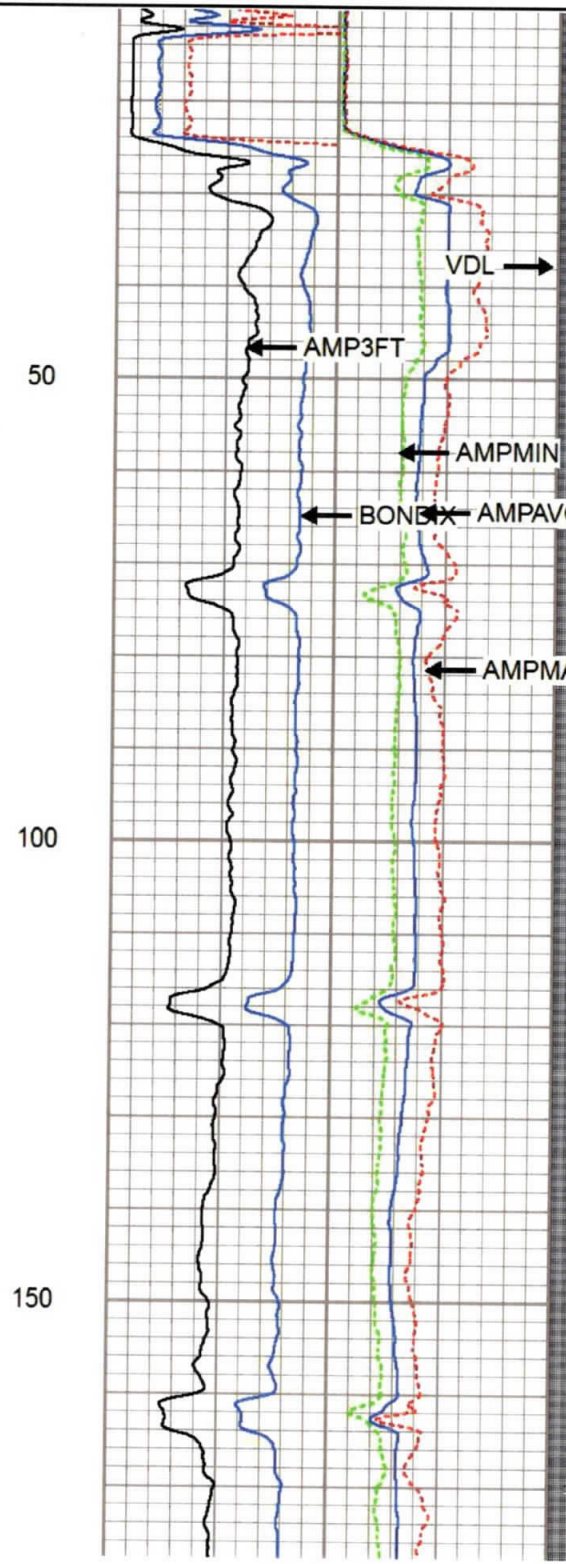
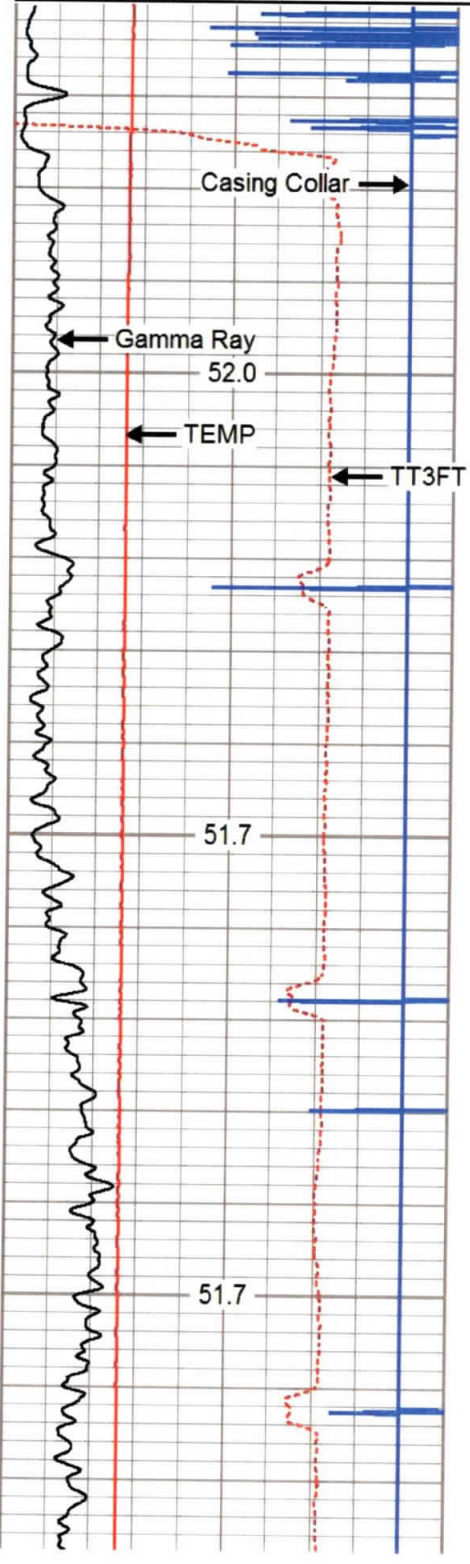
0	Amplitude (mV)	100
0	Amp X5 (mV)	20
1	BONDIX	0

Sector Amp AVG	VDL
Sector Amp MAX	200 (usec) 1200
Sector Amp MIN	

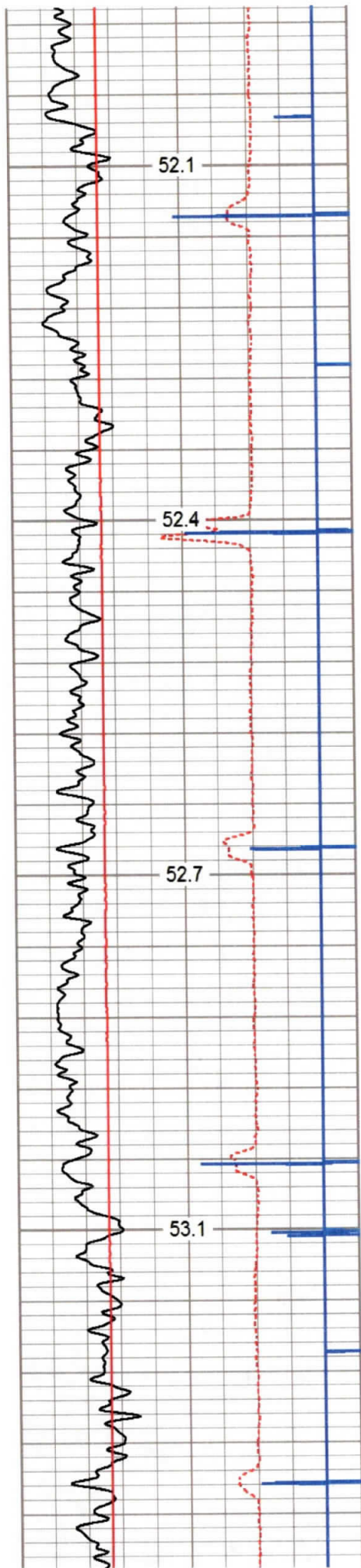
1 Sector Map 12



TEMP (degF)





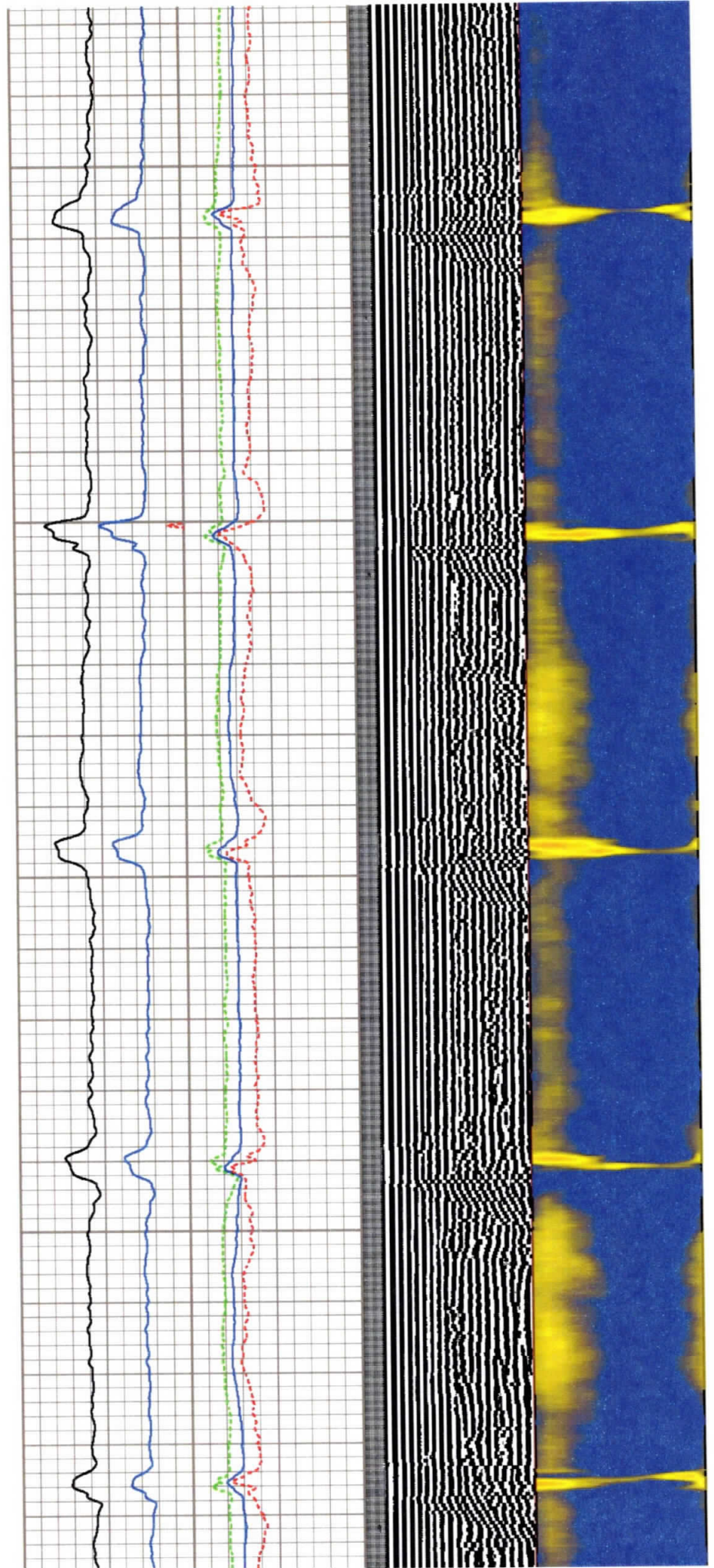


200

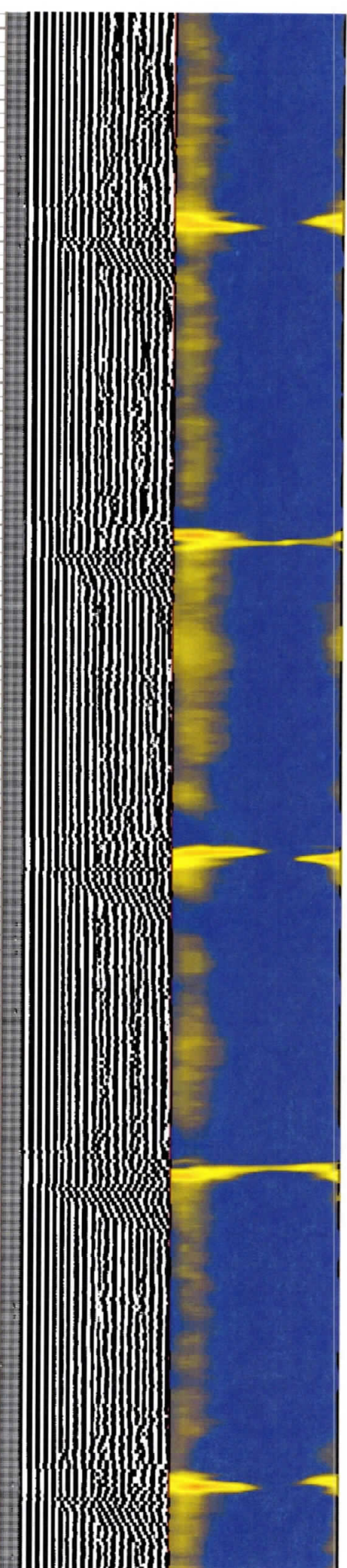
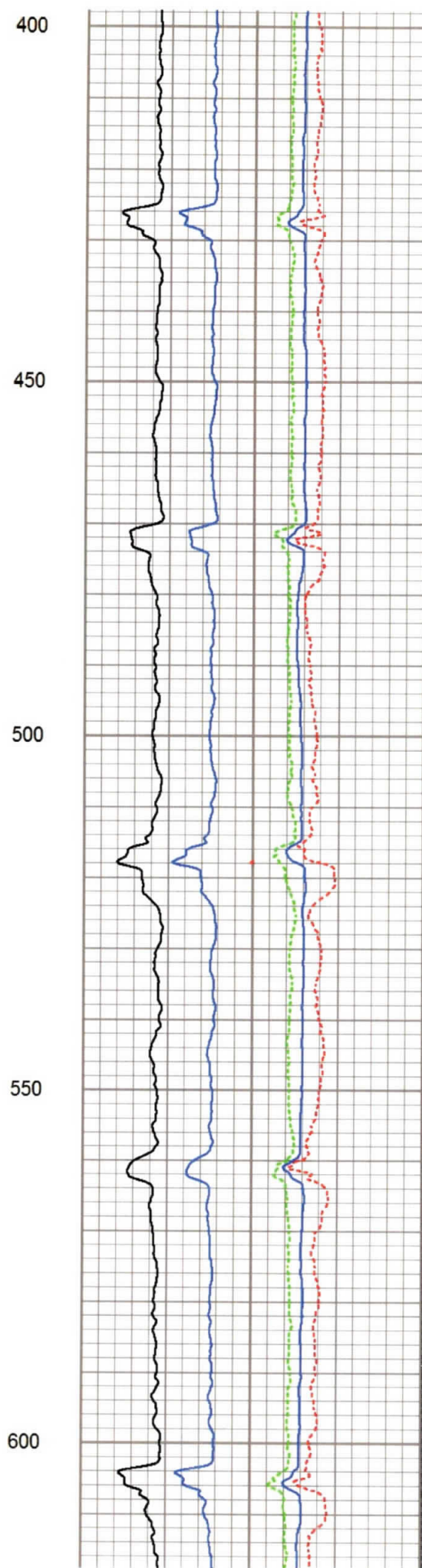
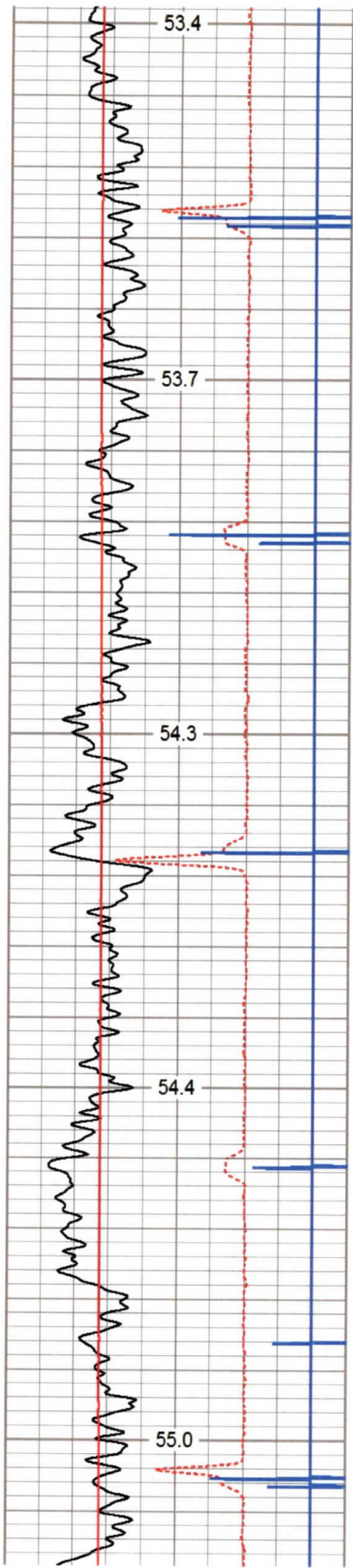
250

300

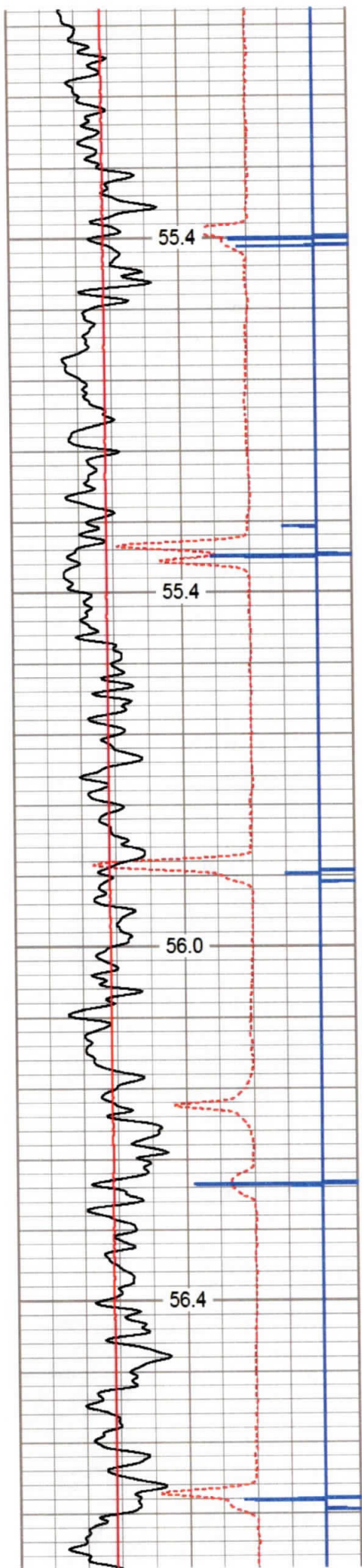
350









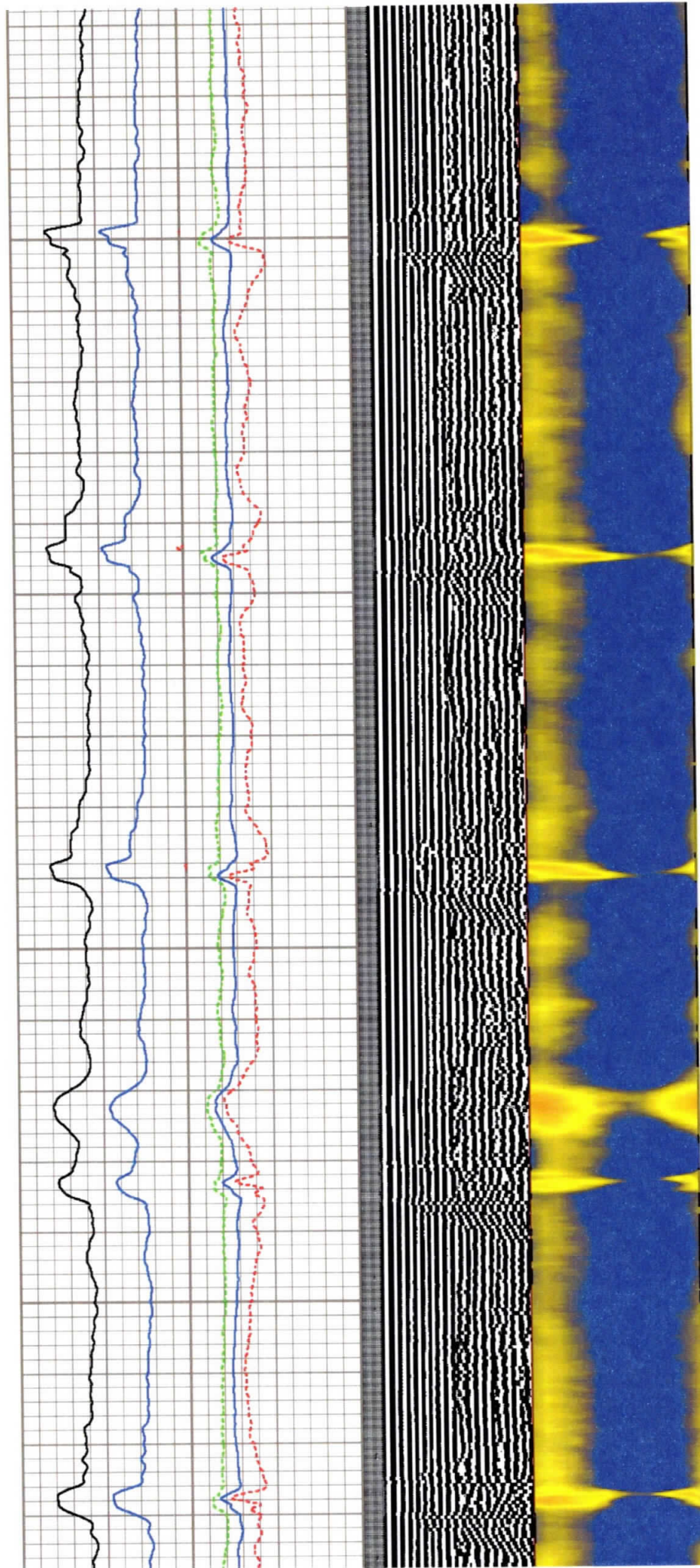


650

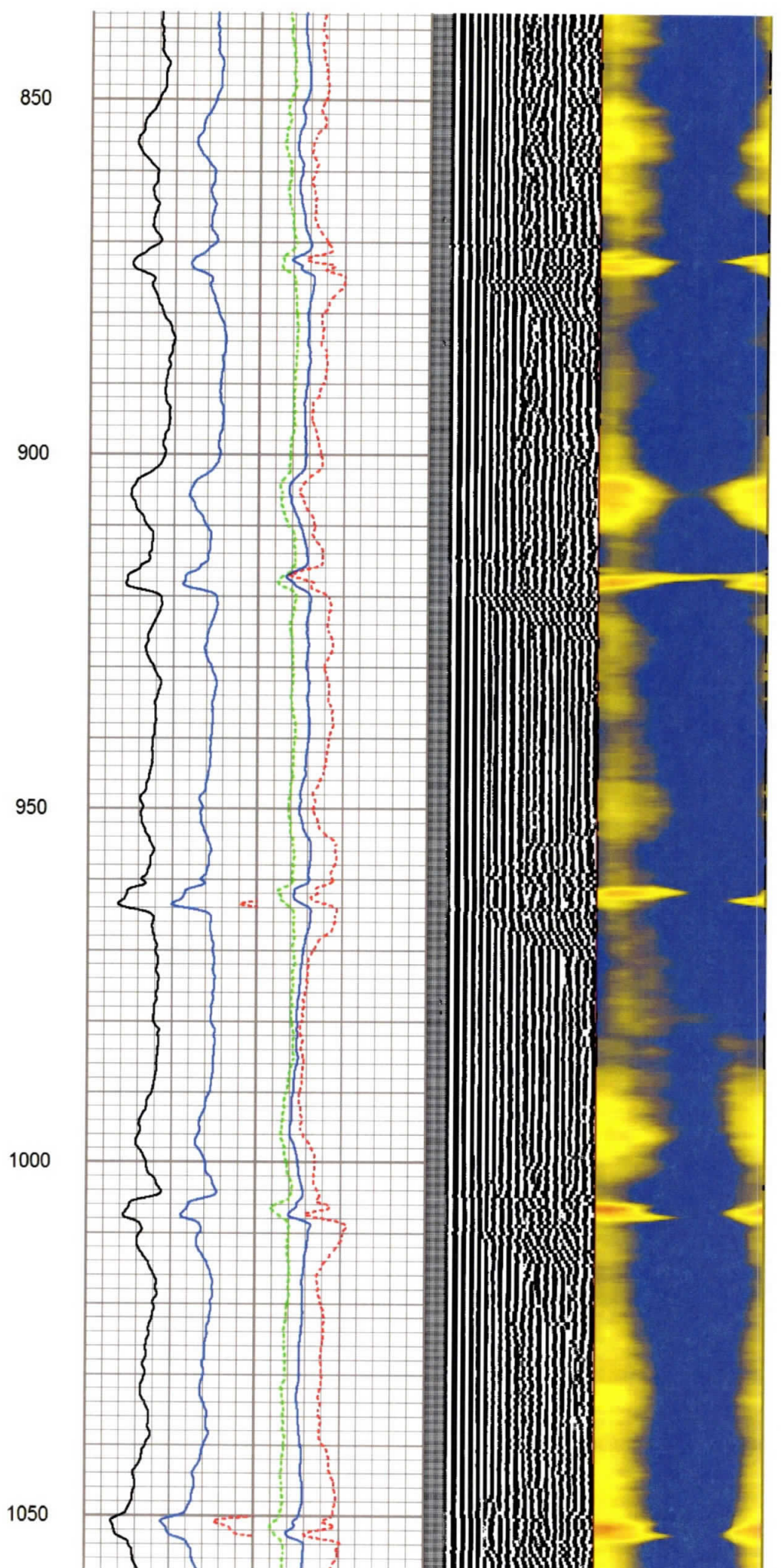
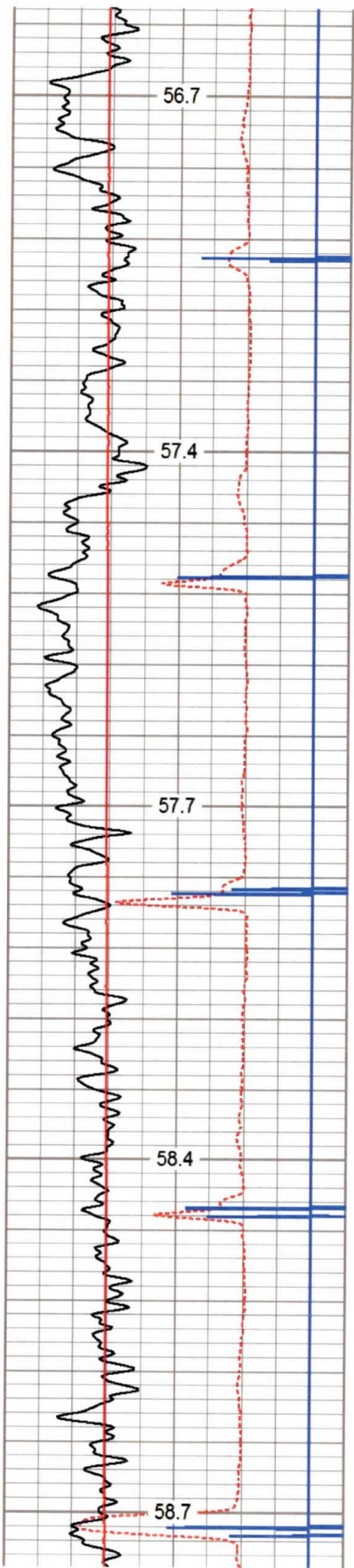
700

750

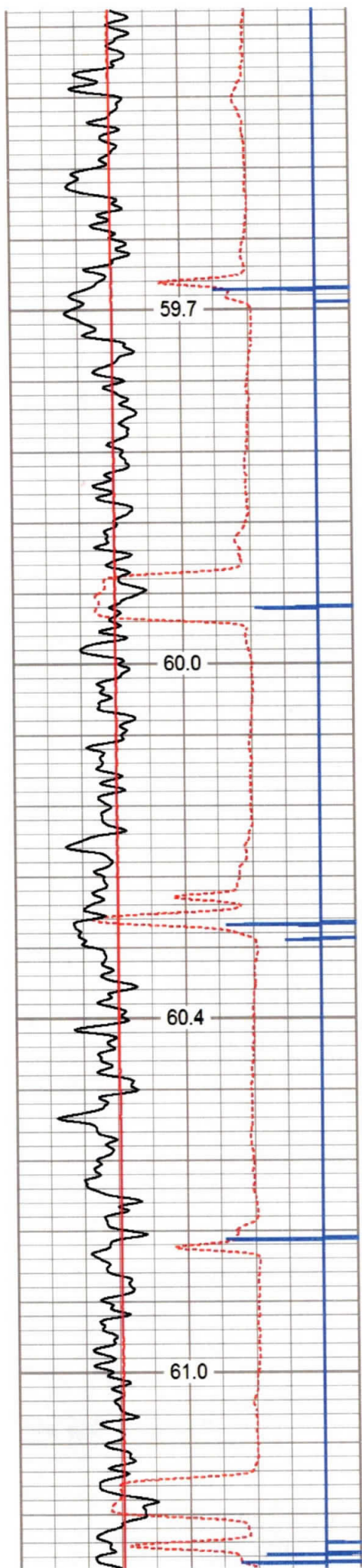
800









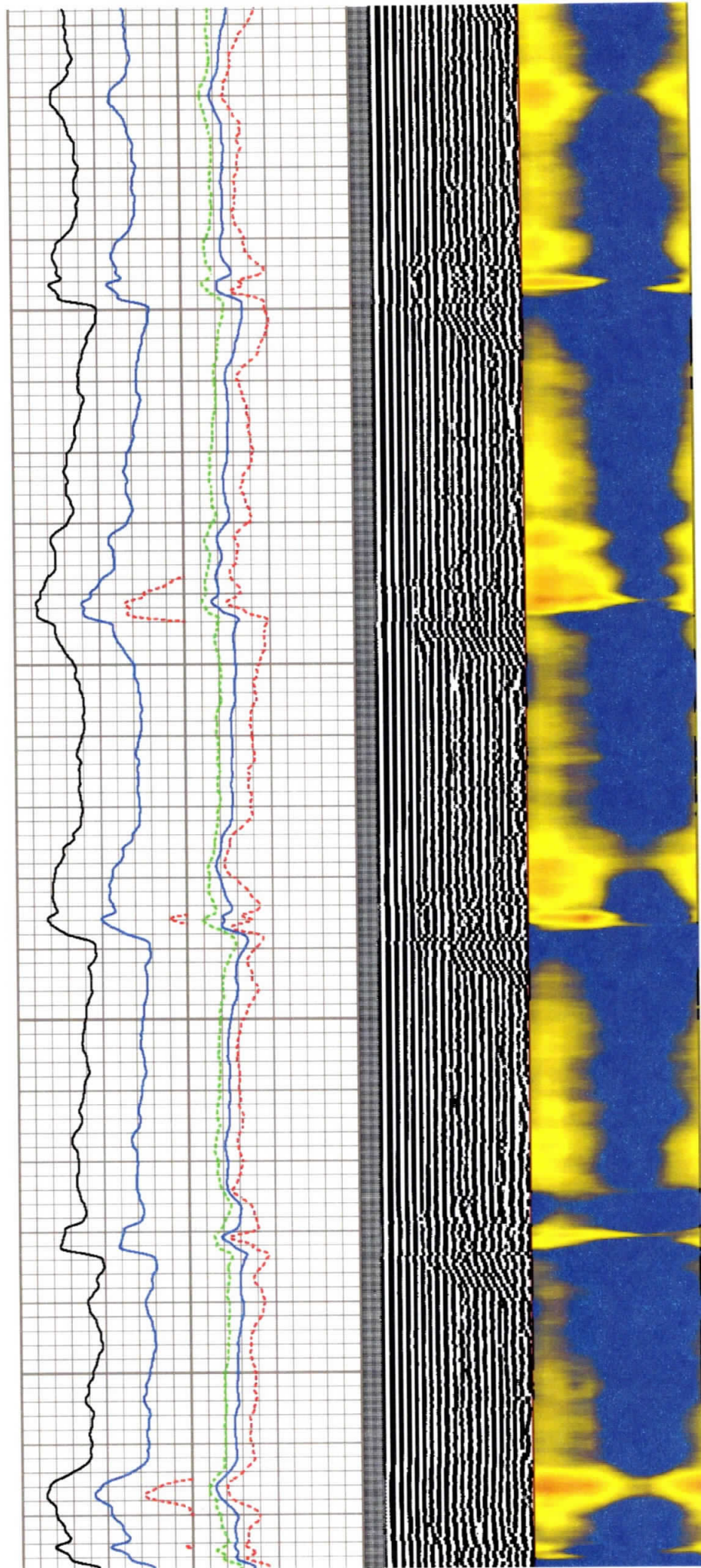


1100

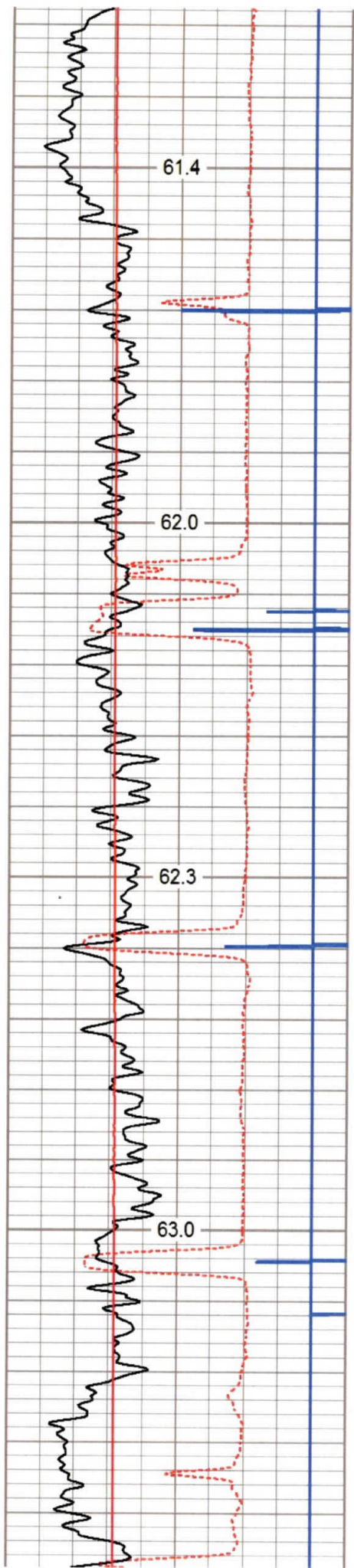
1150

1200

1250





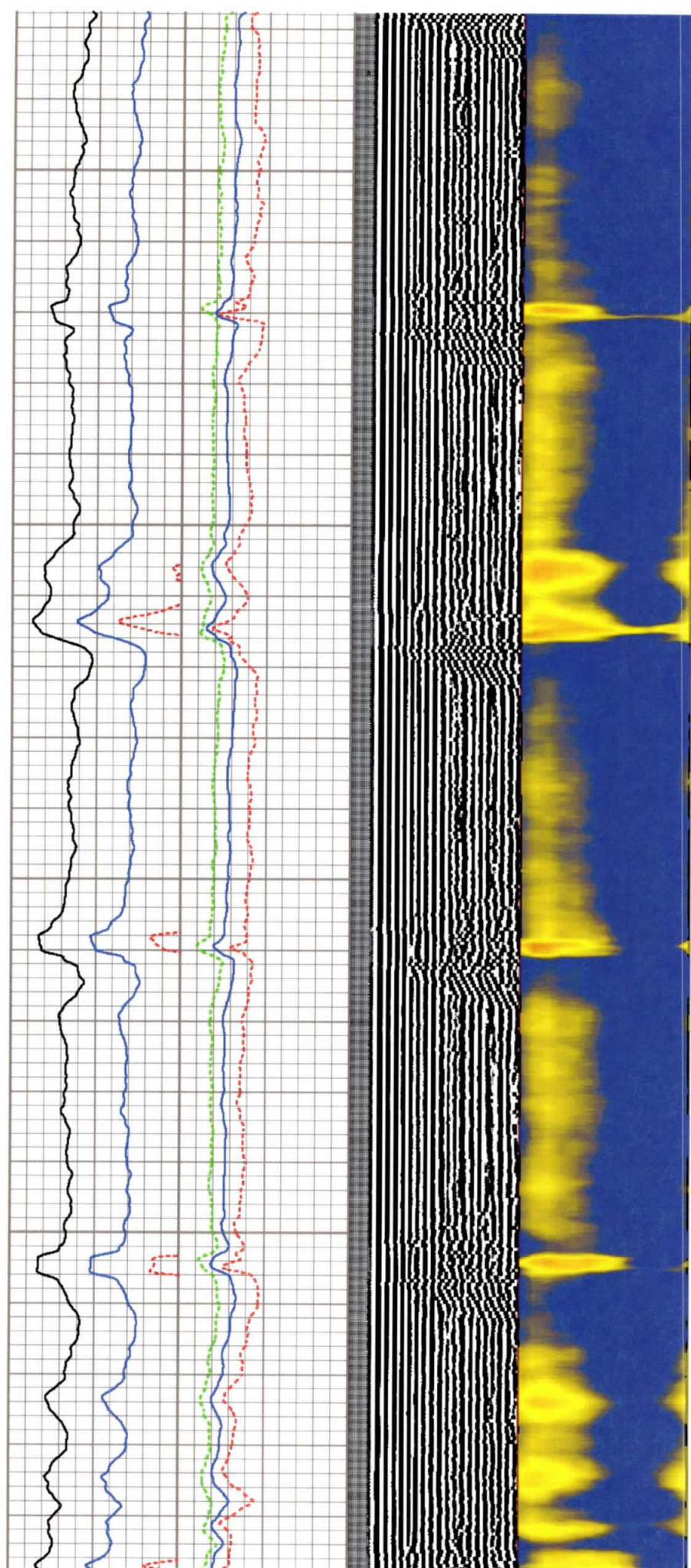


1300

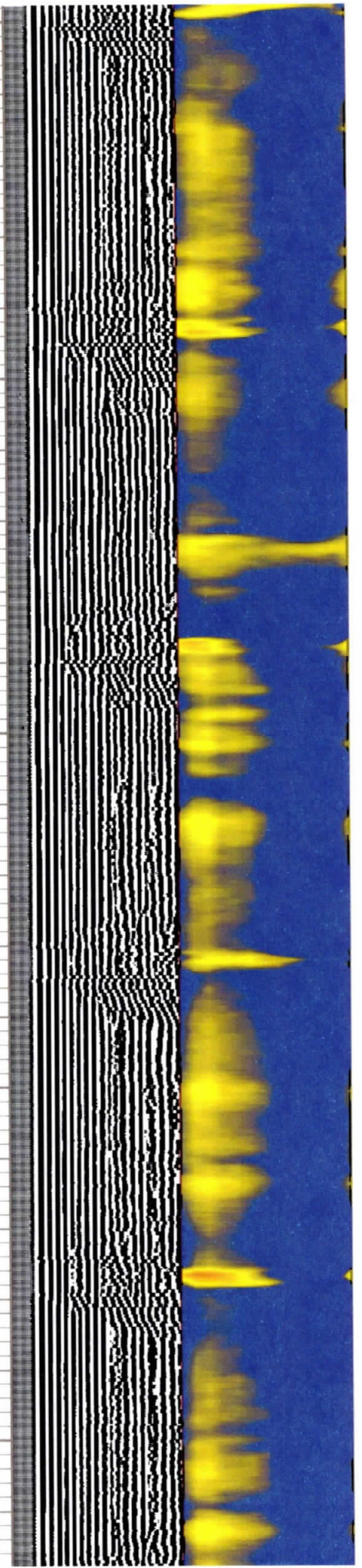
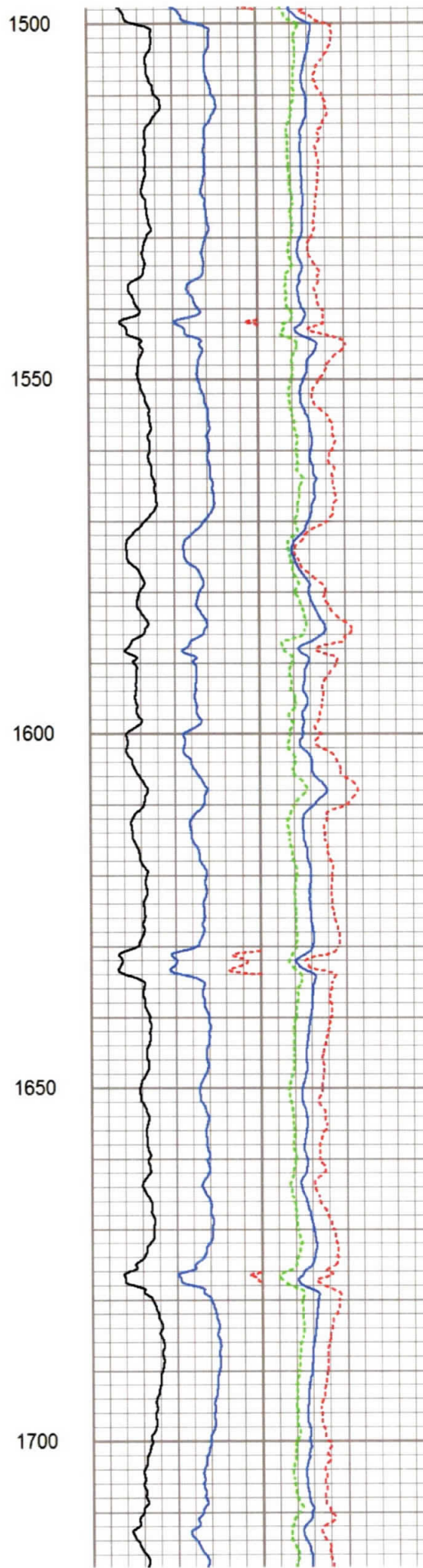
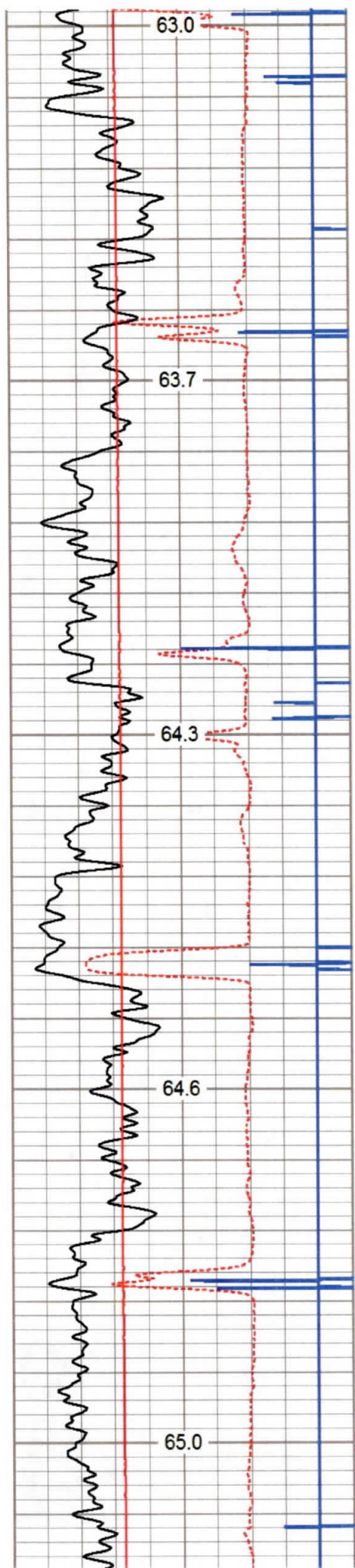
1350

1400

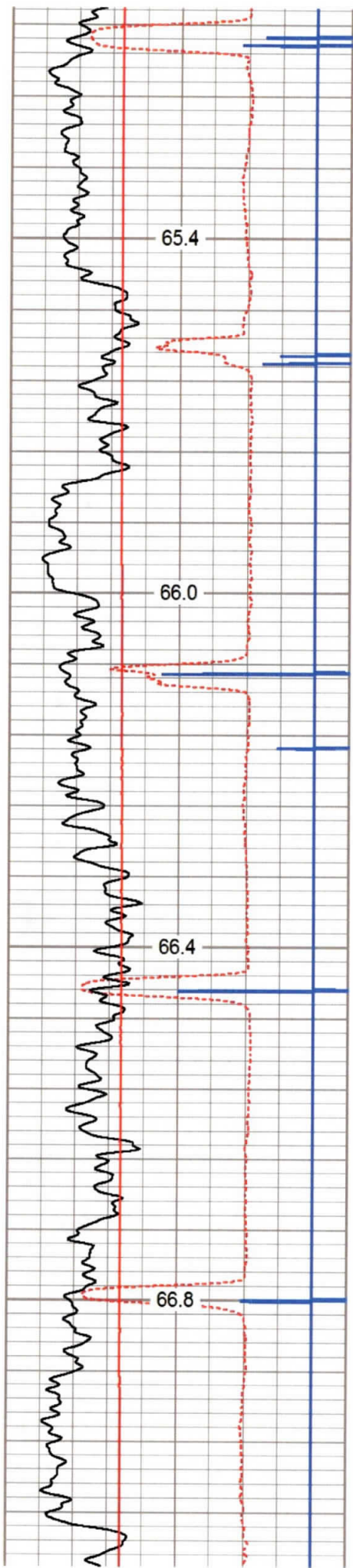
1450









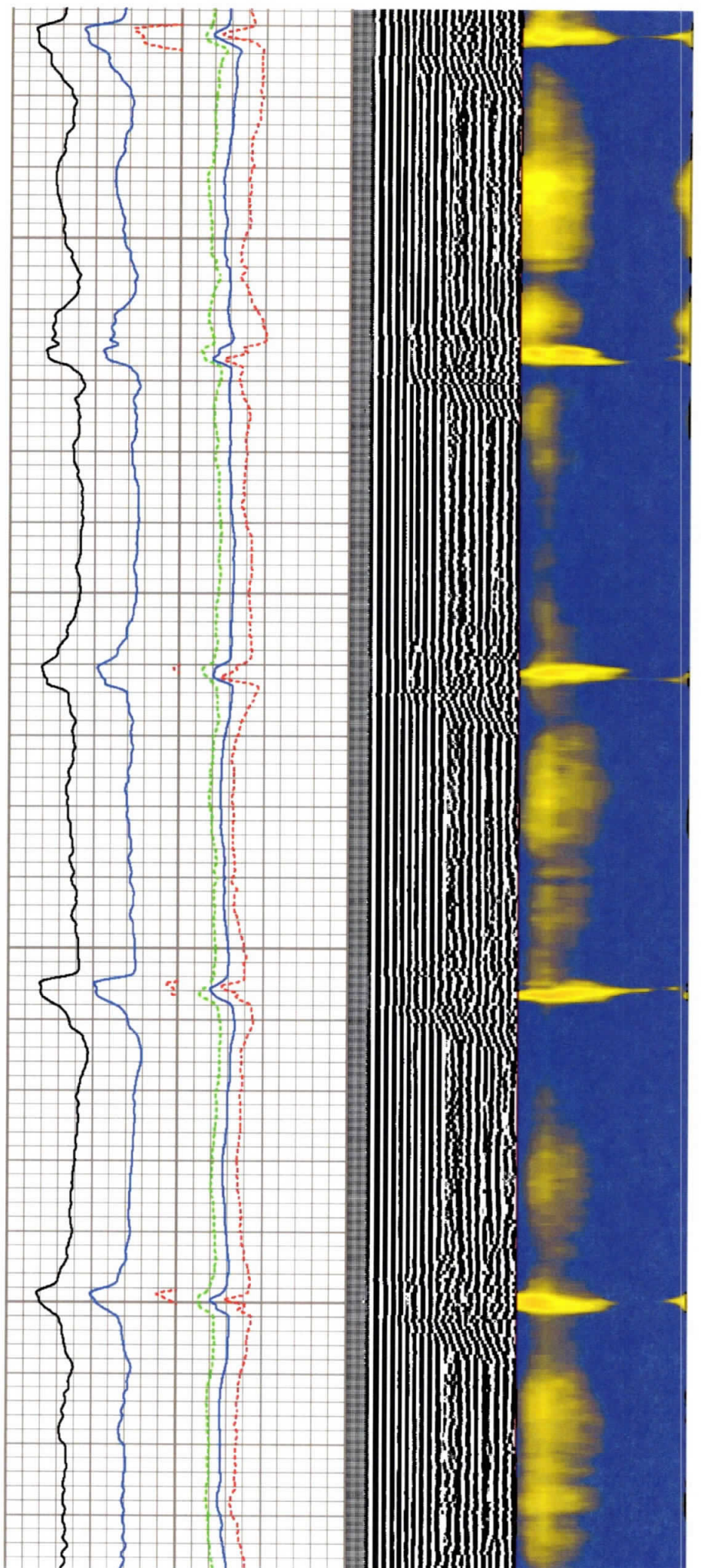


1750

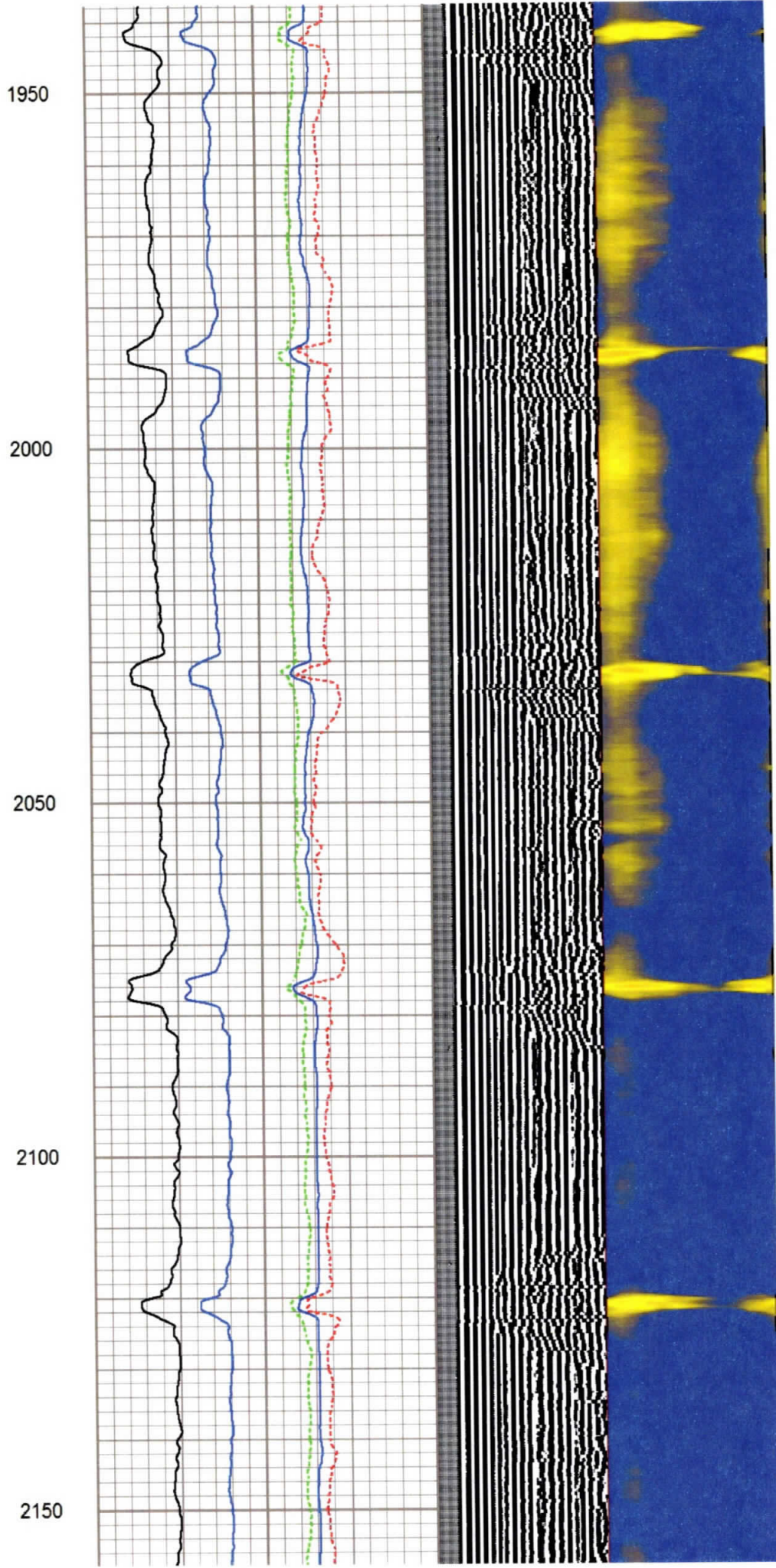
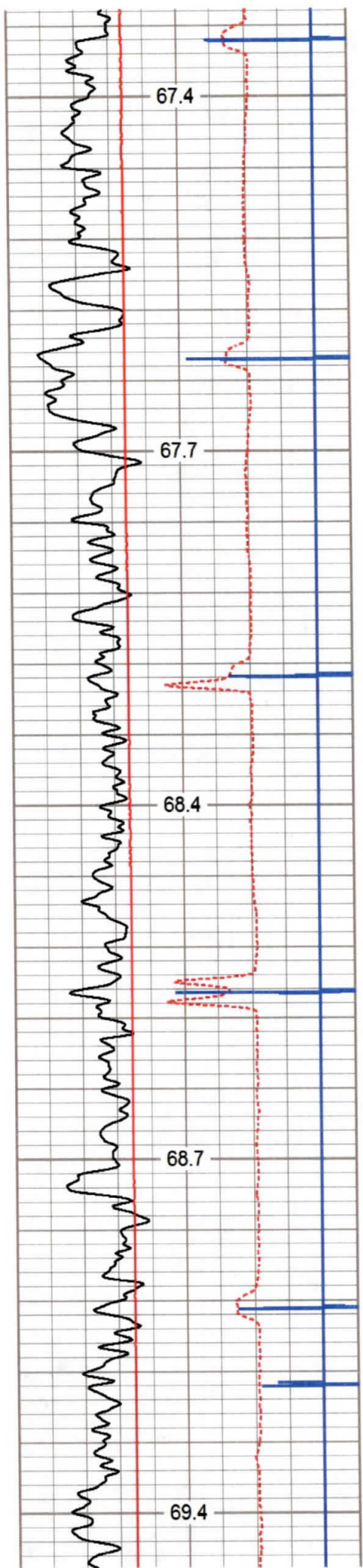
1800

1850

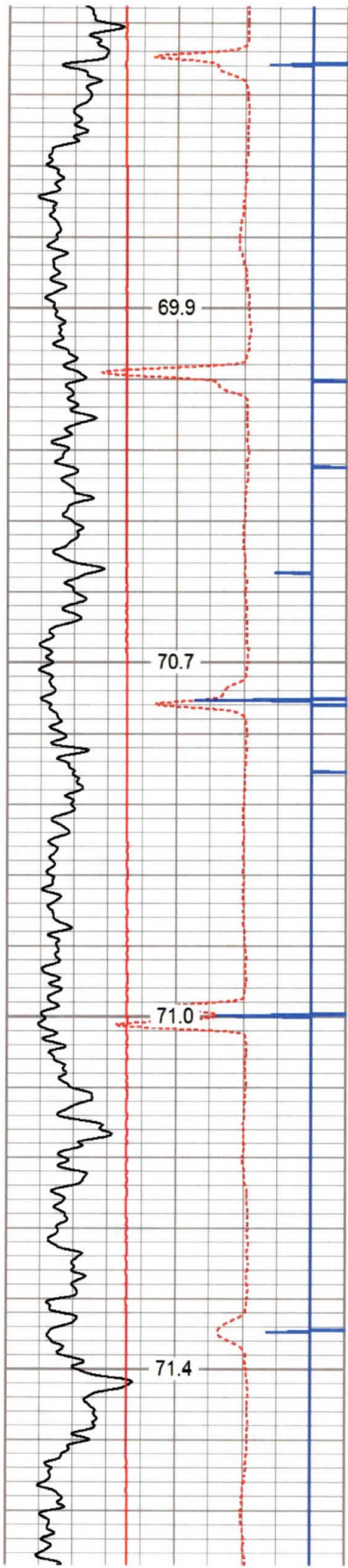
1900









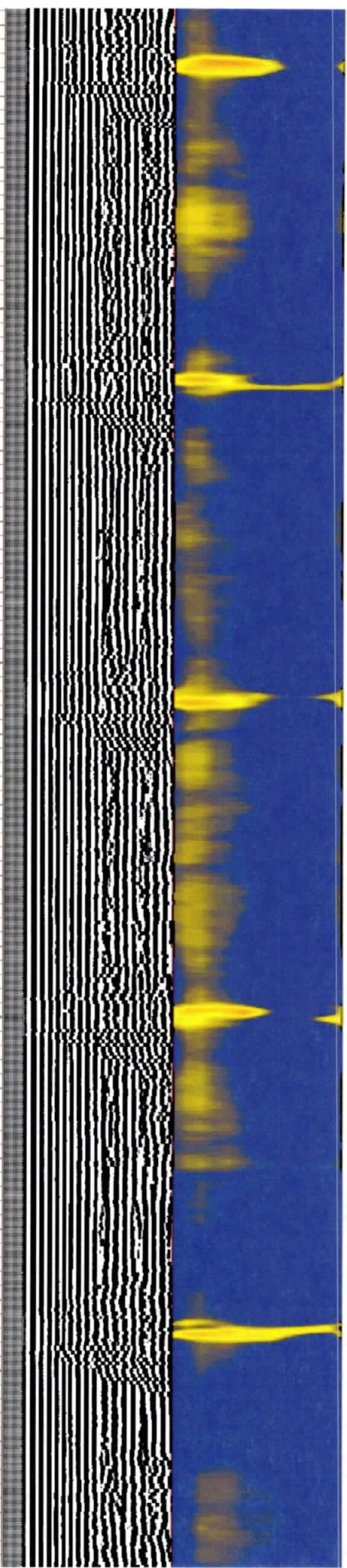


2200

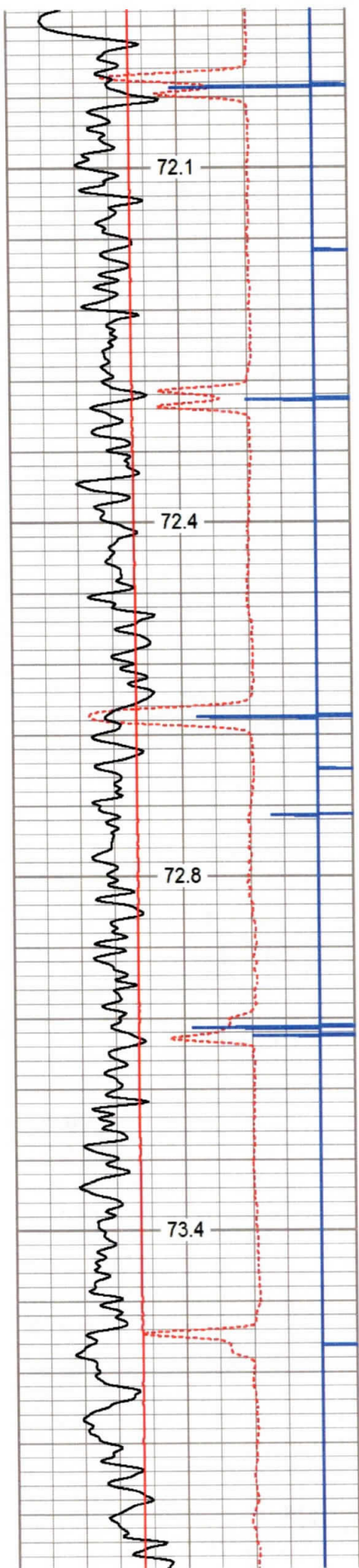
2250

2300

2350





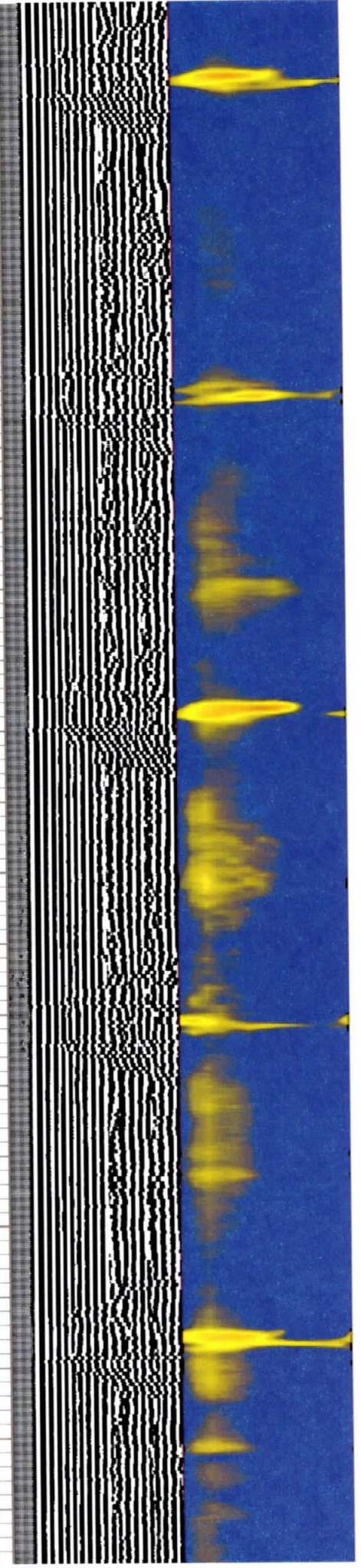
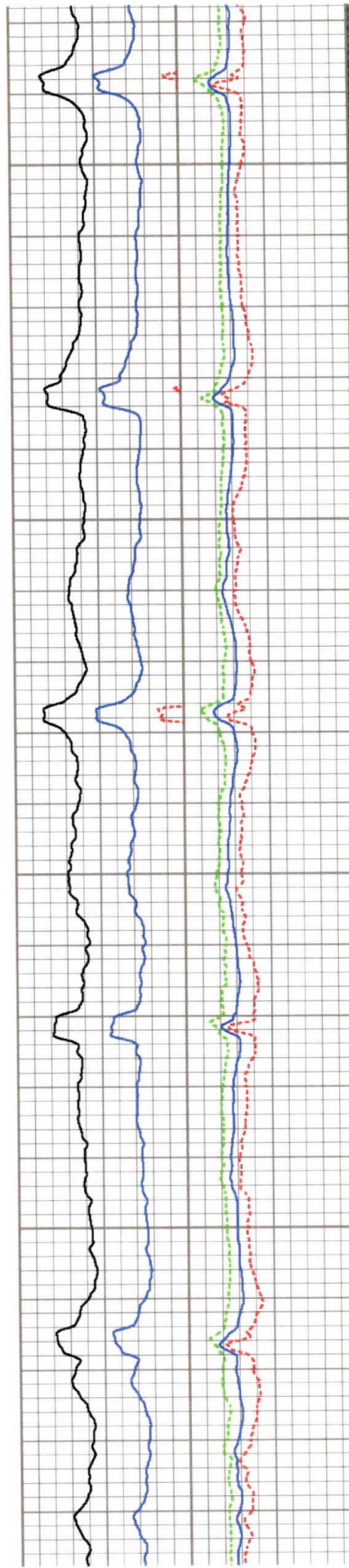


2400

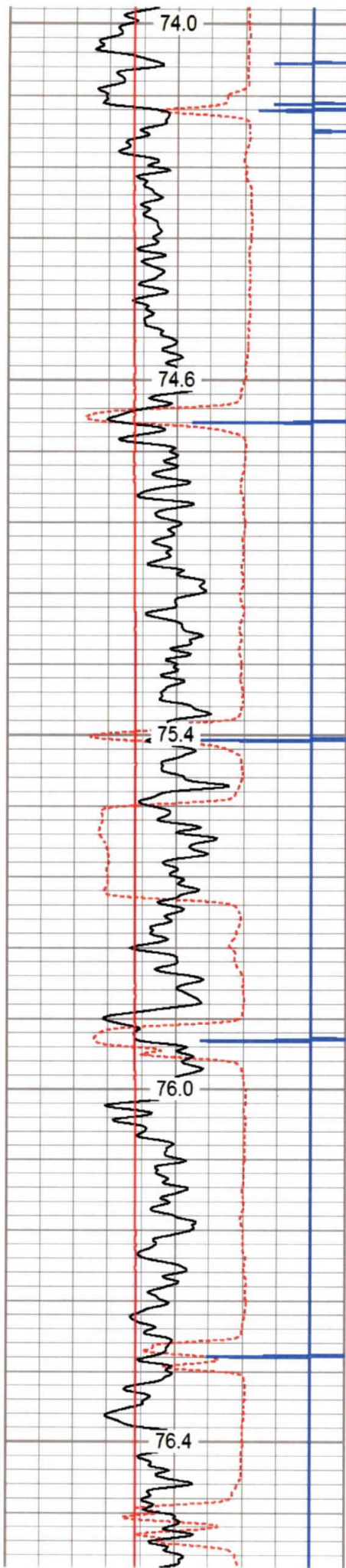
2450

2500

2550







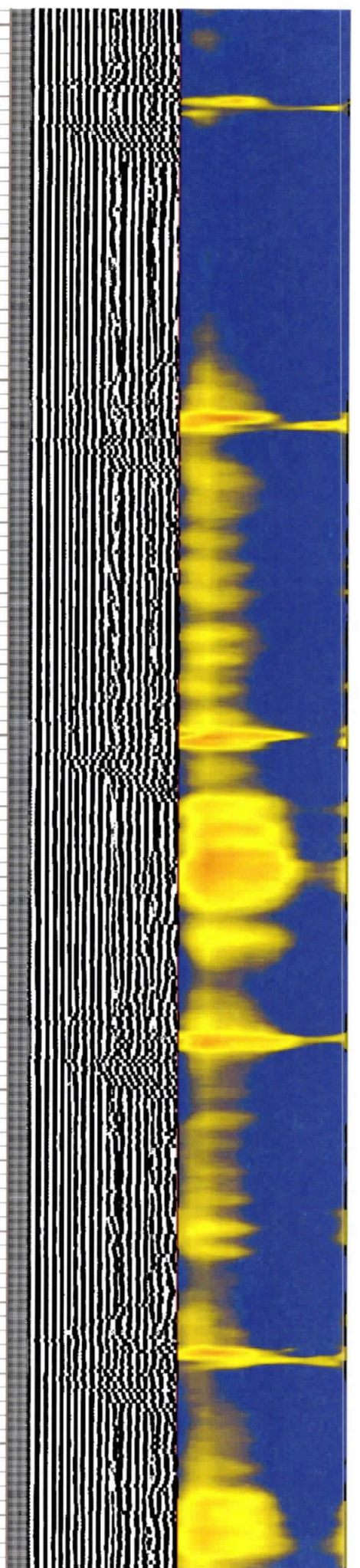
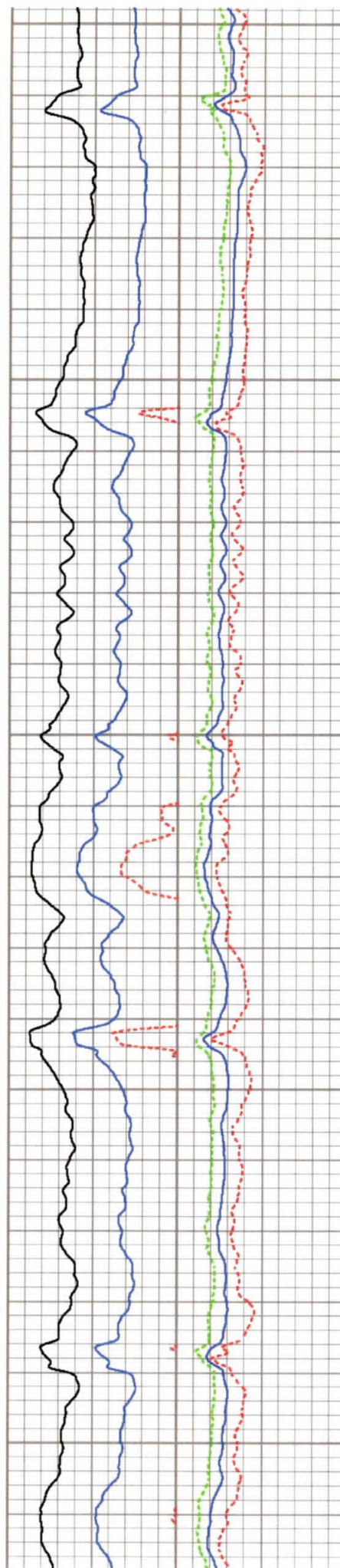
2600

2650

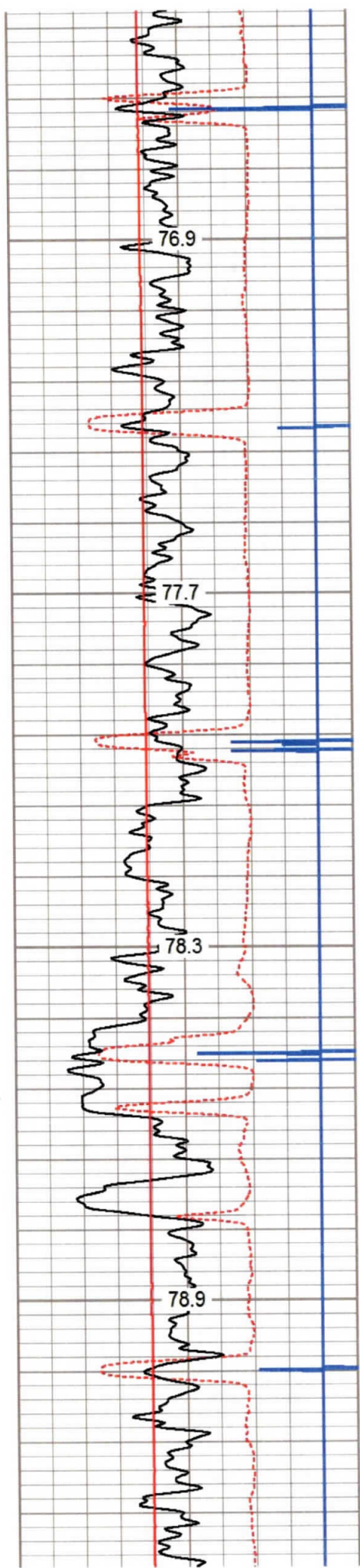
2700

2750

2800





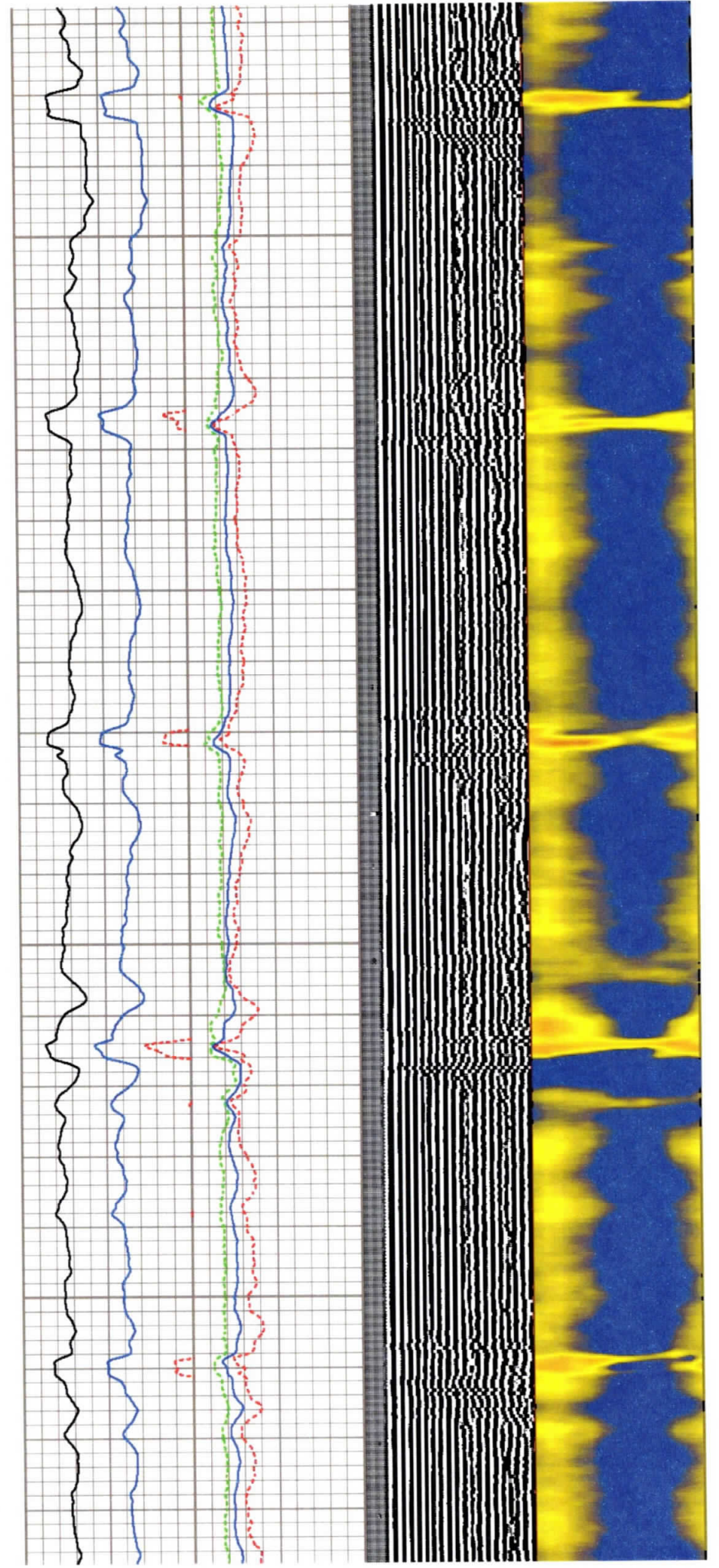


2850

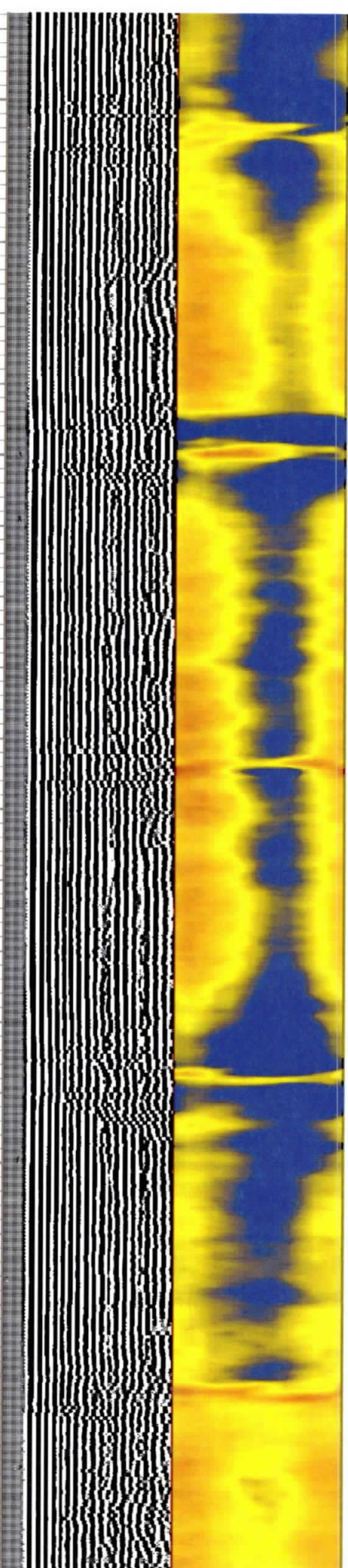
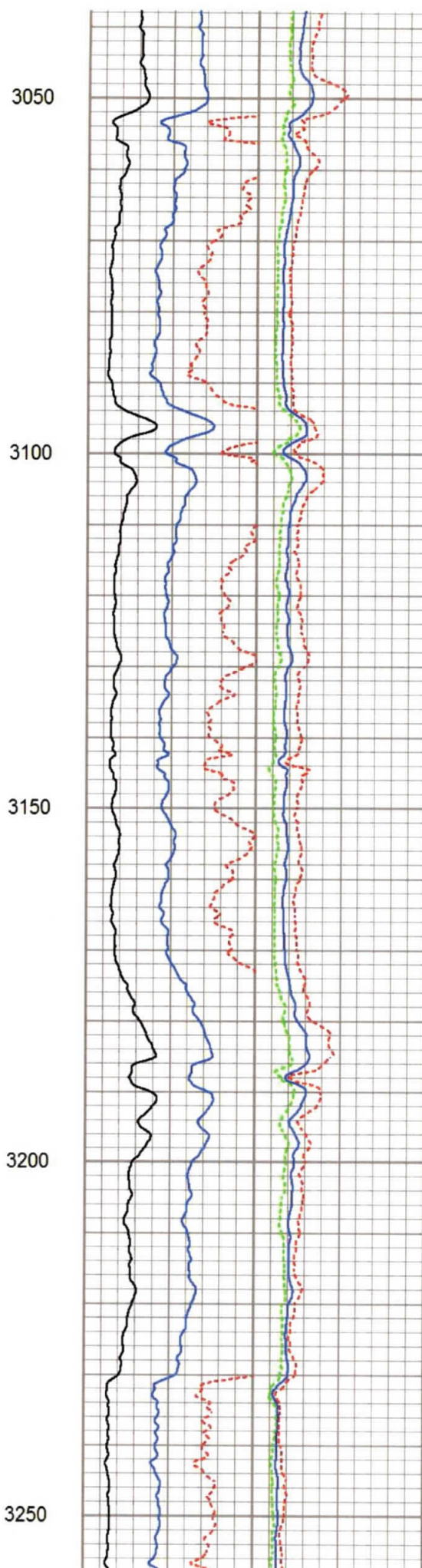
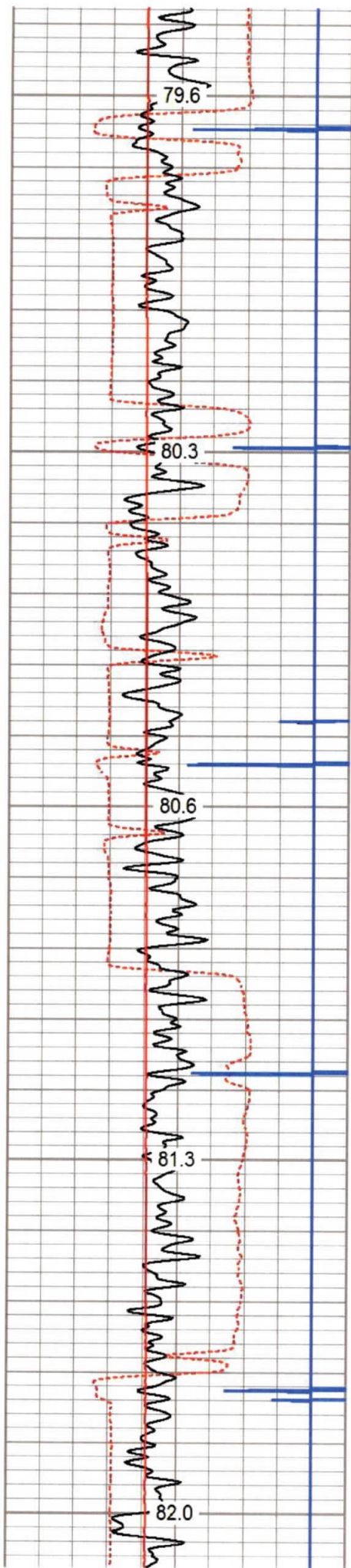
2900

2950

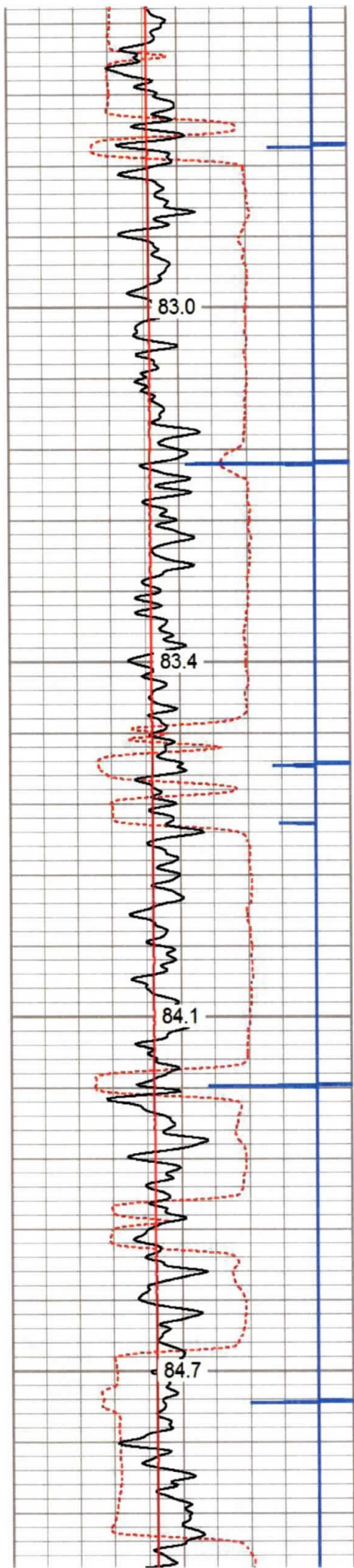
3000









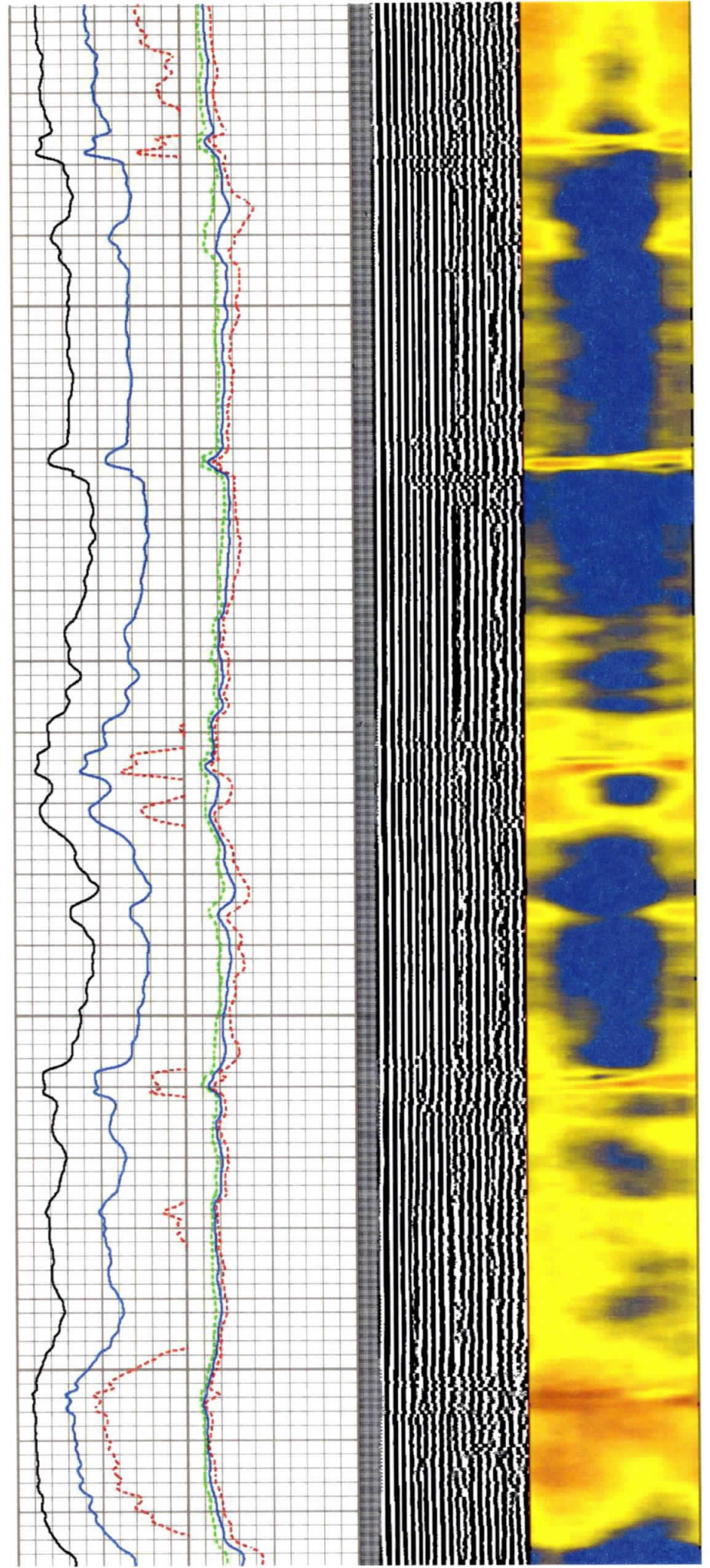


3300

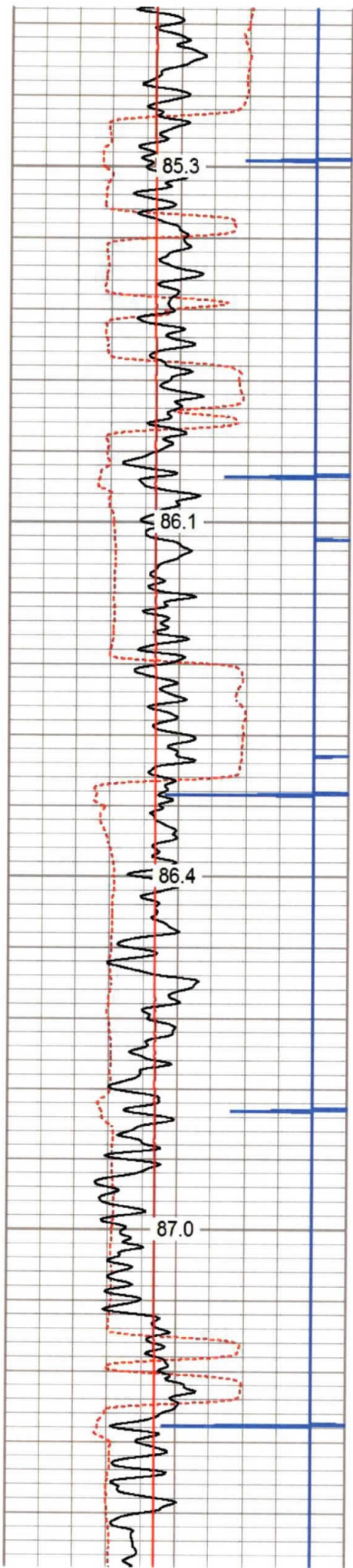
3350

3400

3450





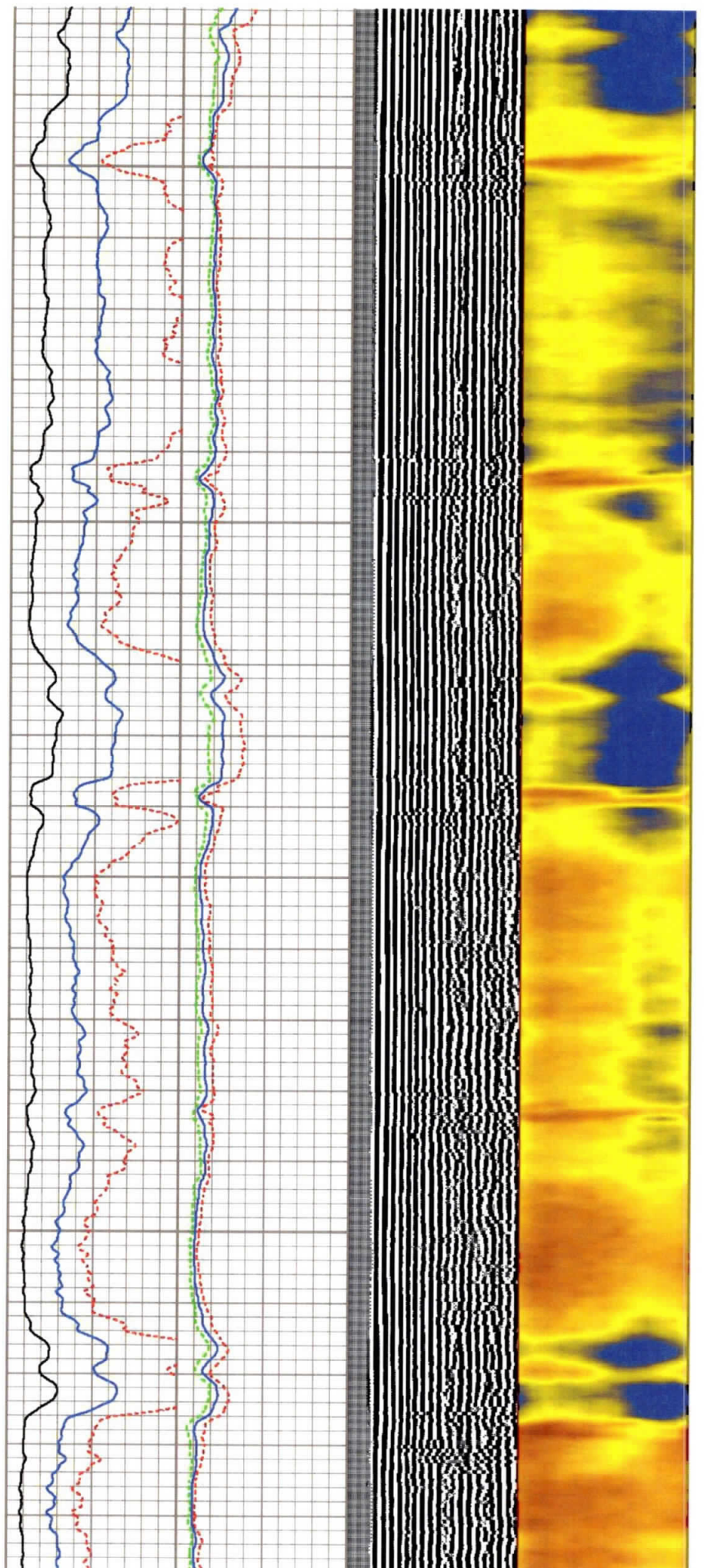


3500

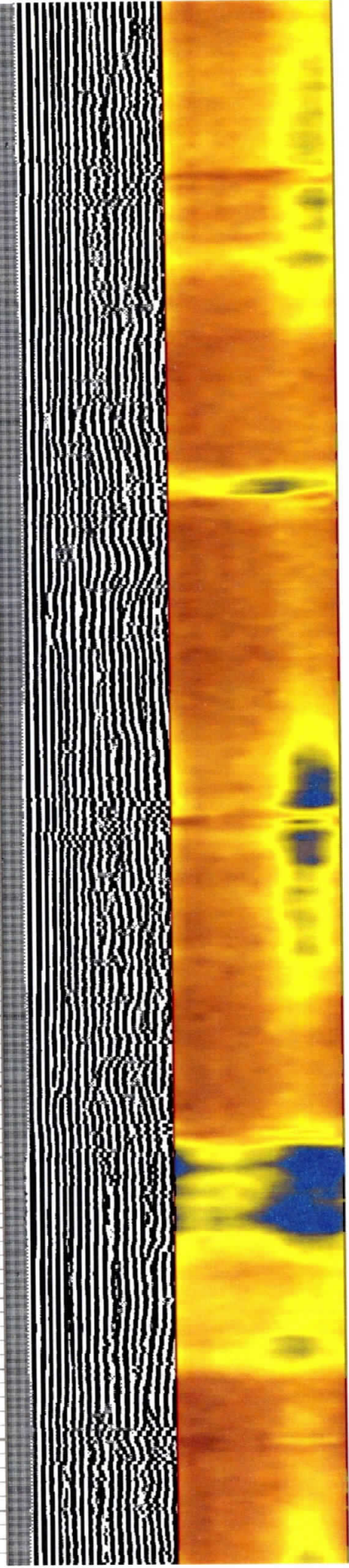
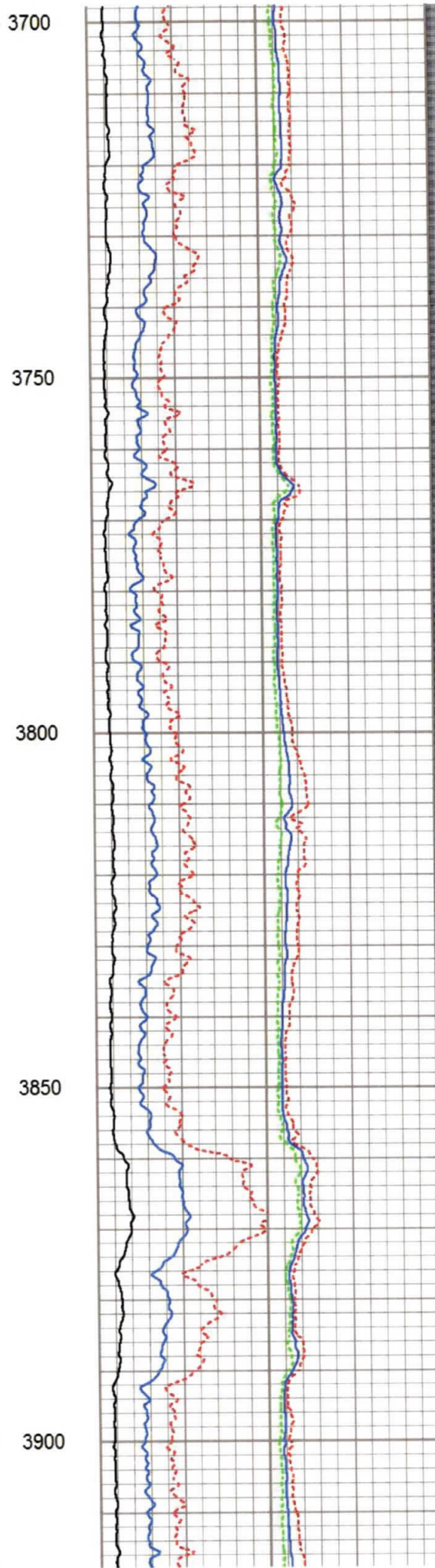
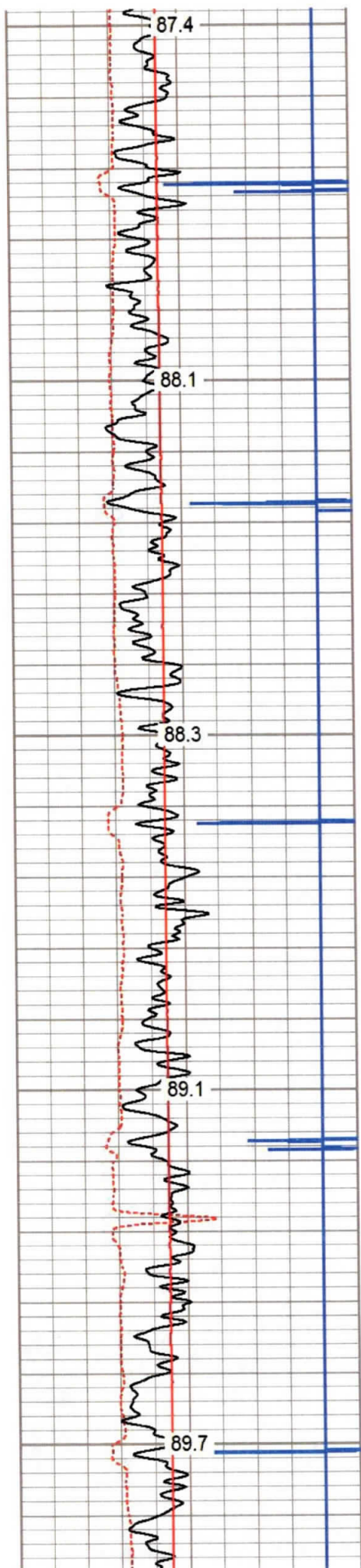
3550

3600

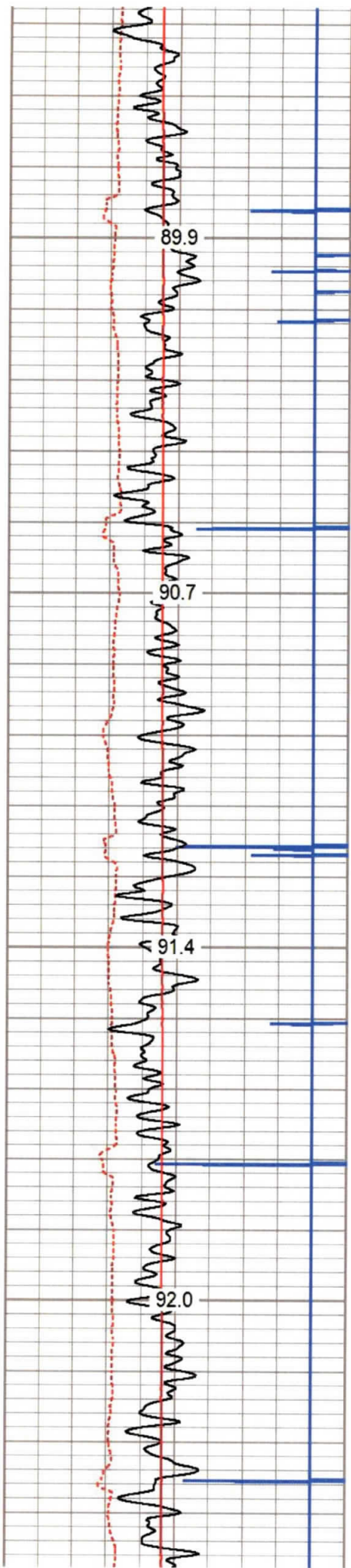
3650









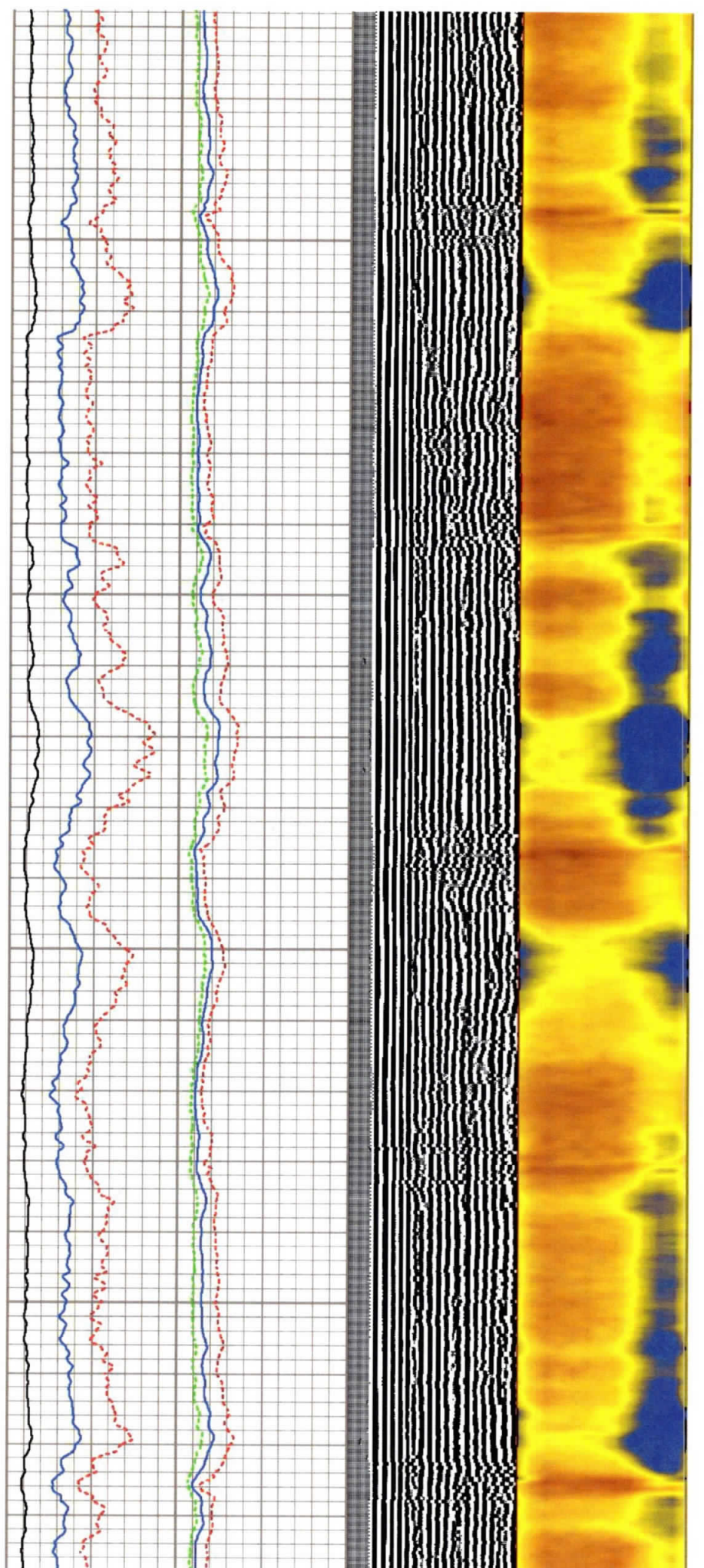


3950

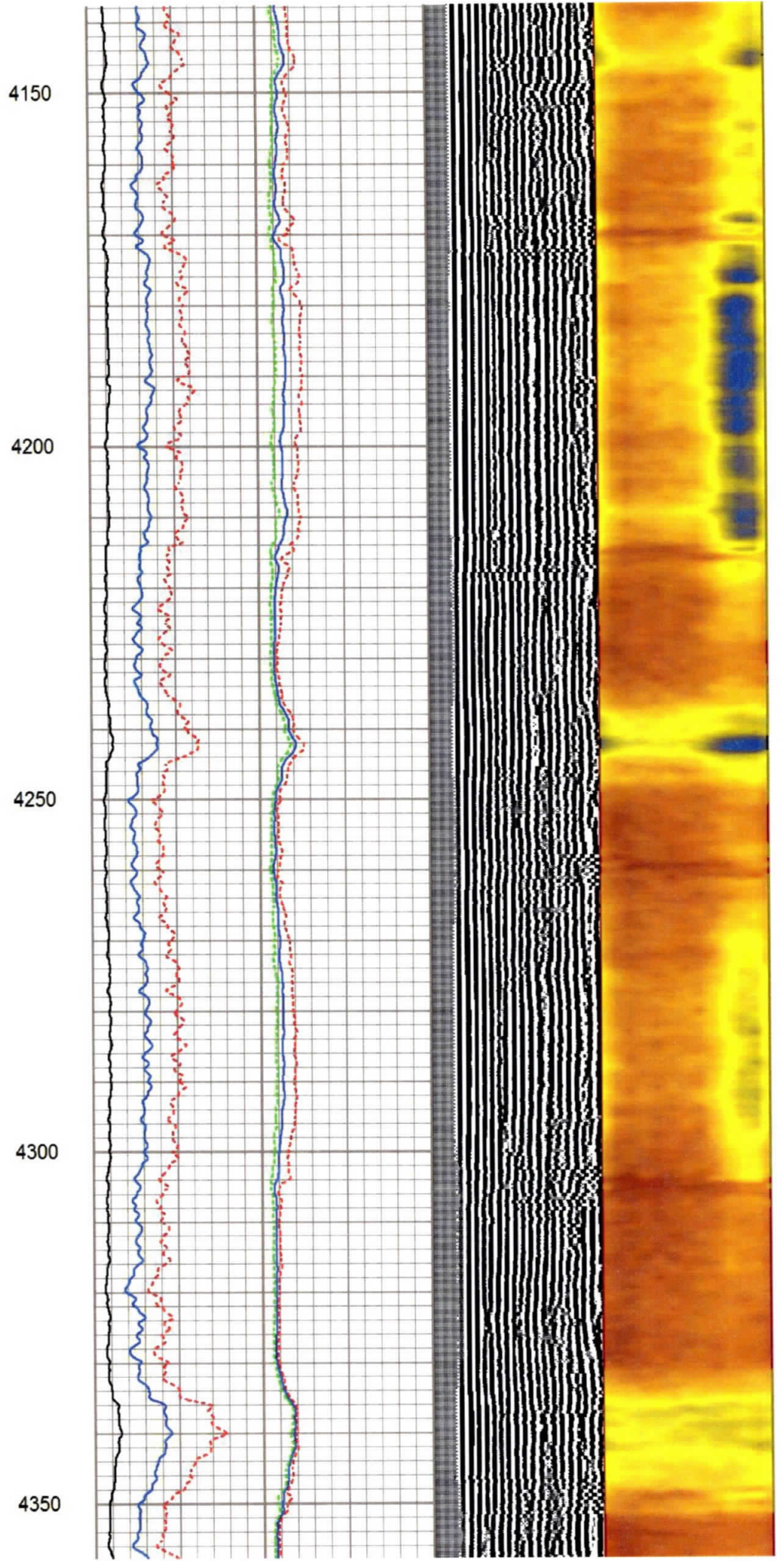
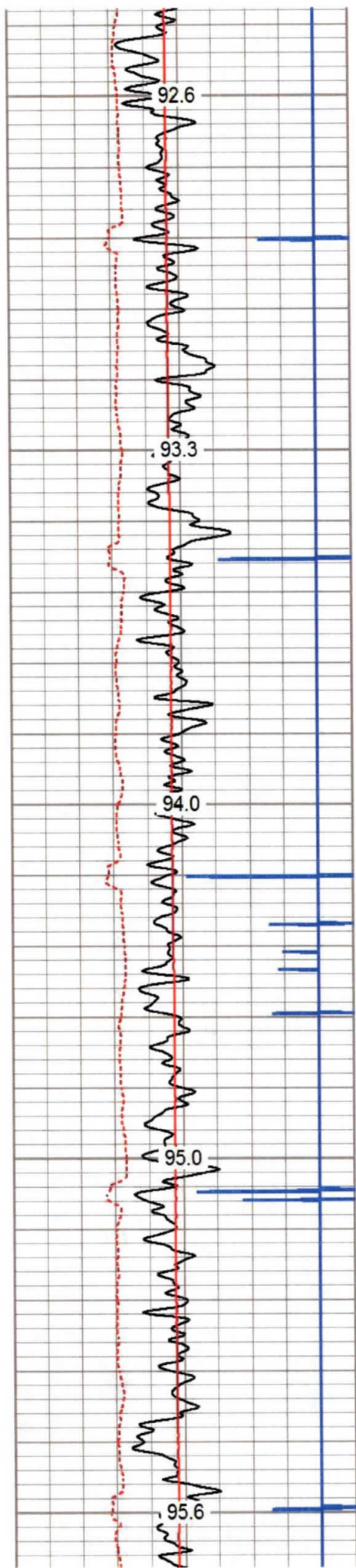
4000

4050

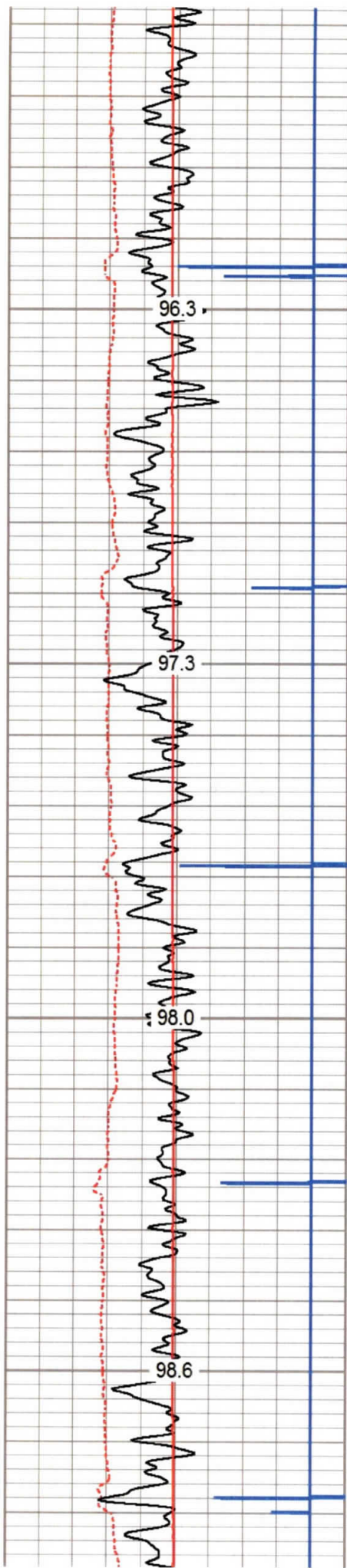
4100









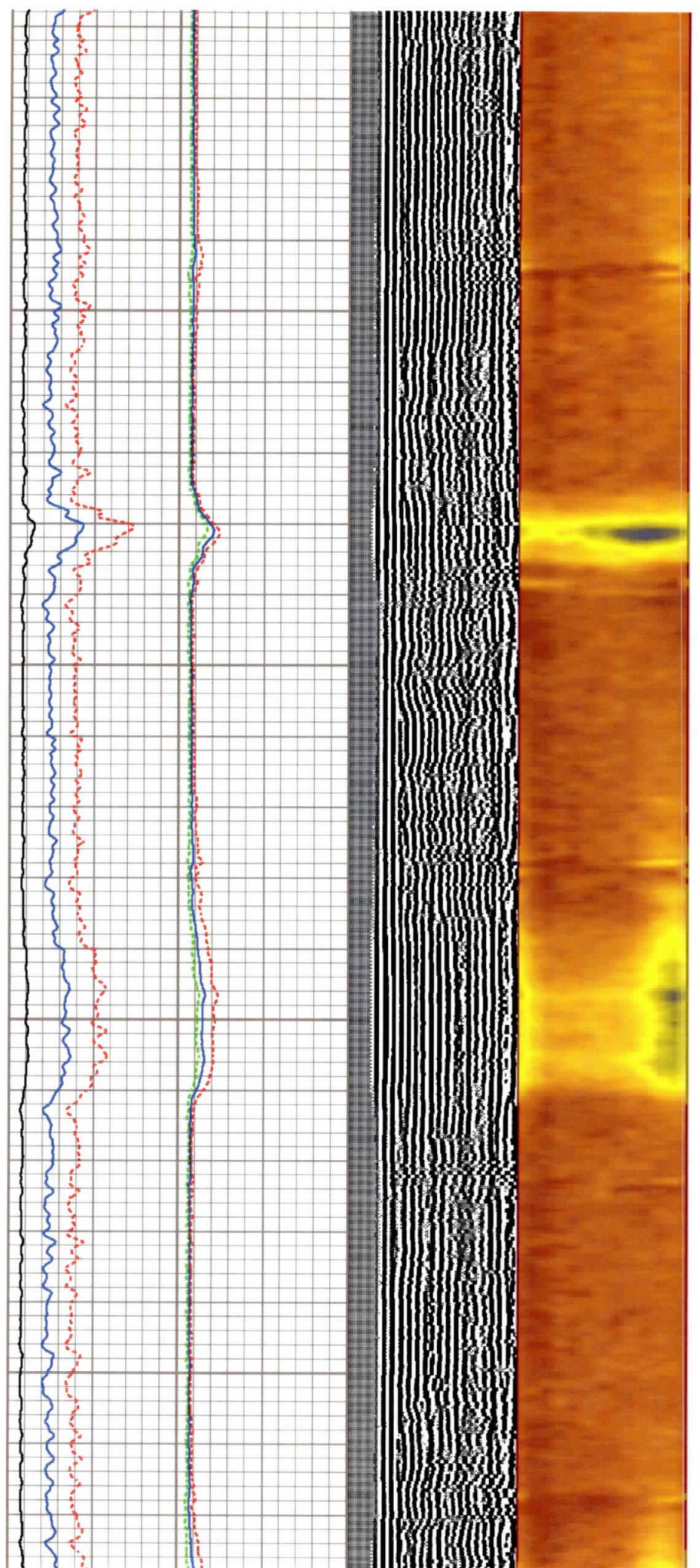


4400

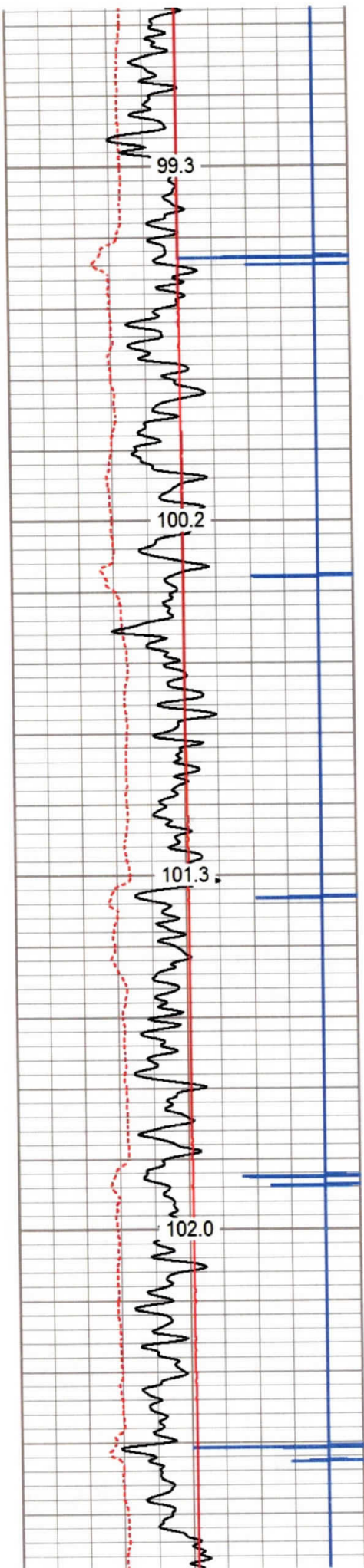
4450

4500

4550





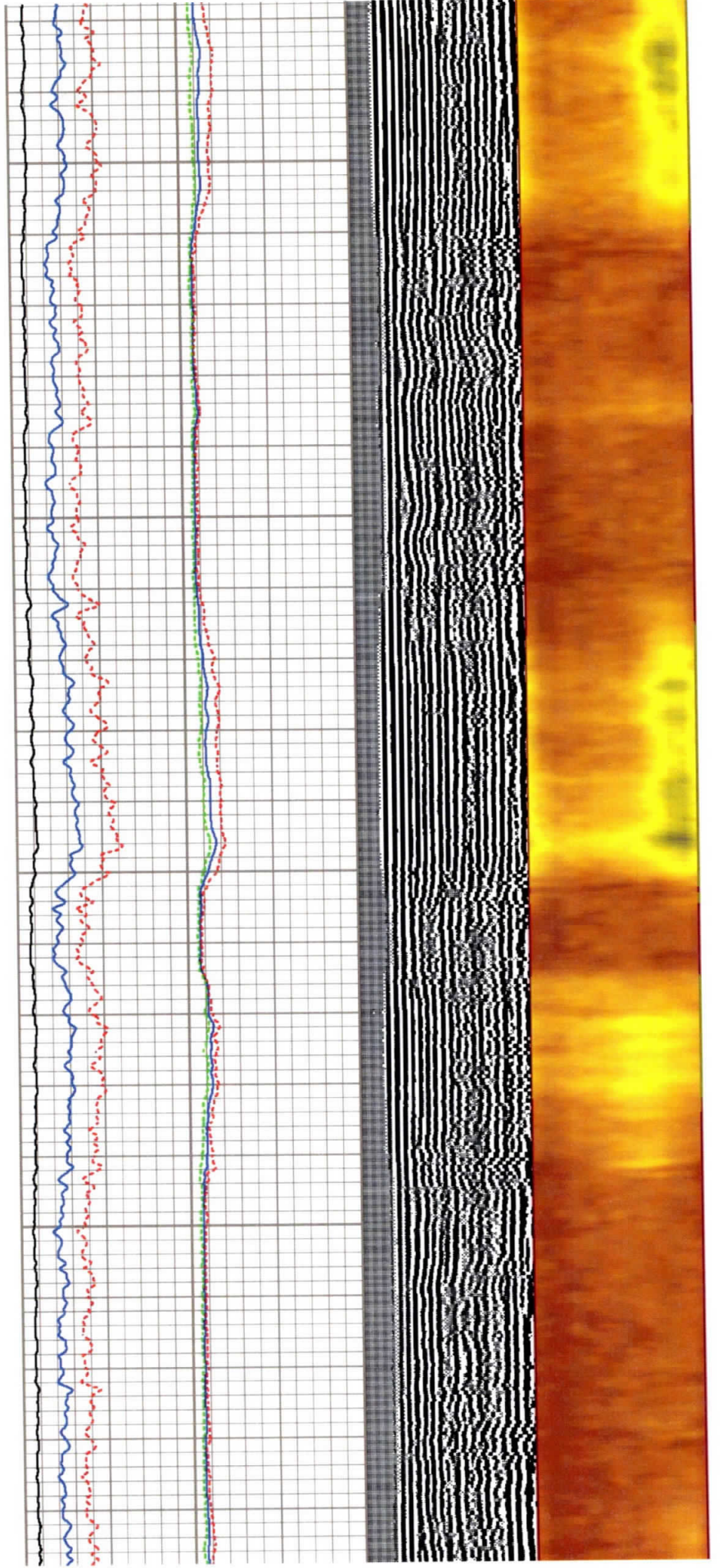


4600

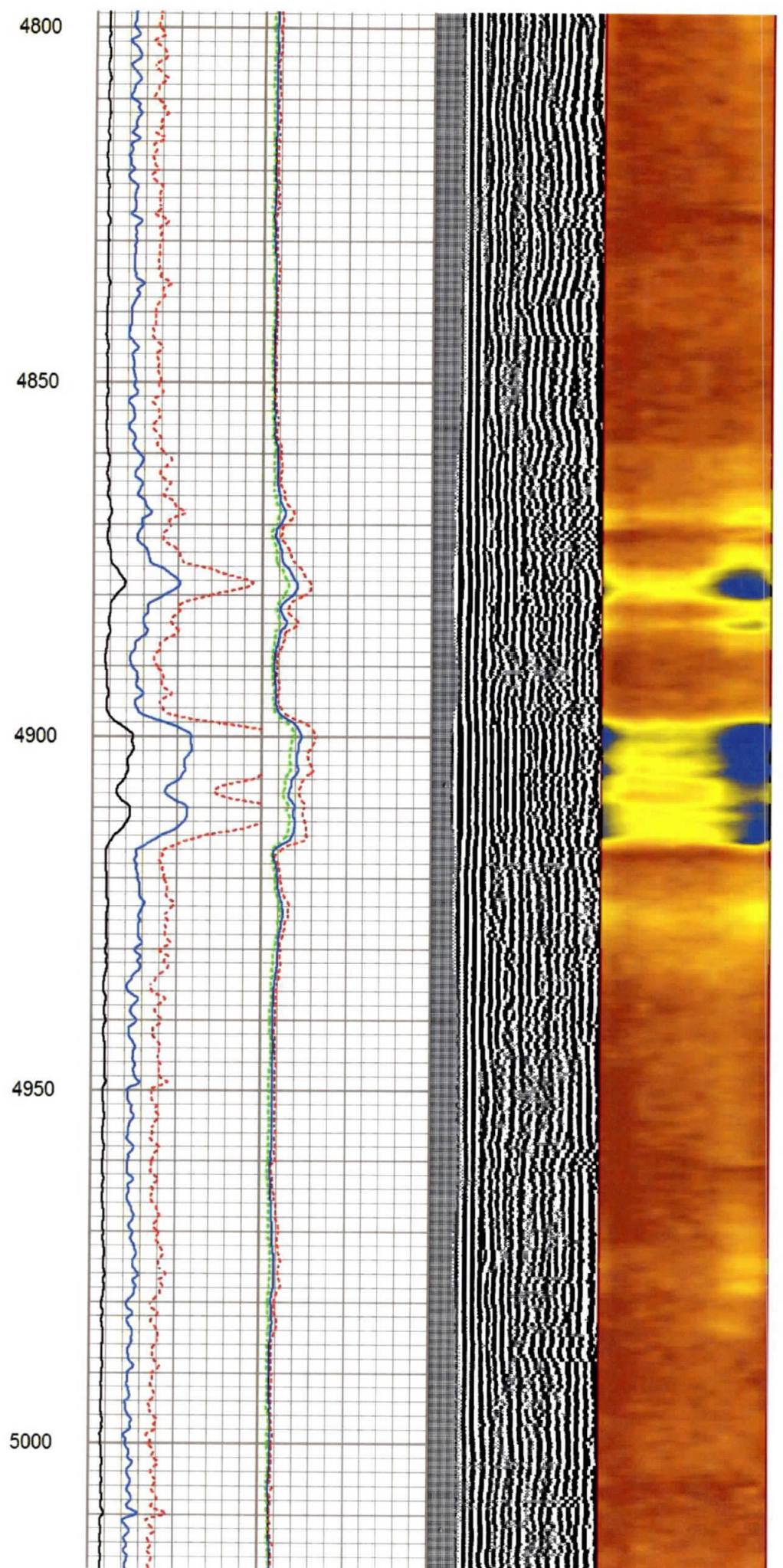
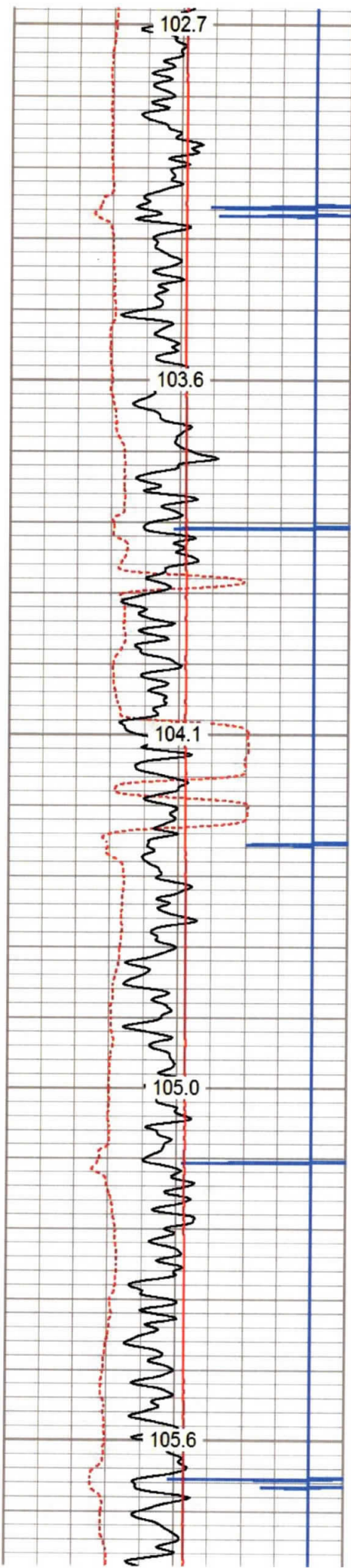
4650

4700

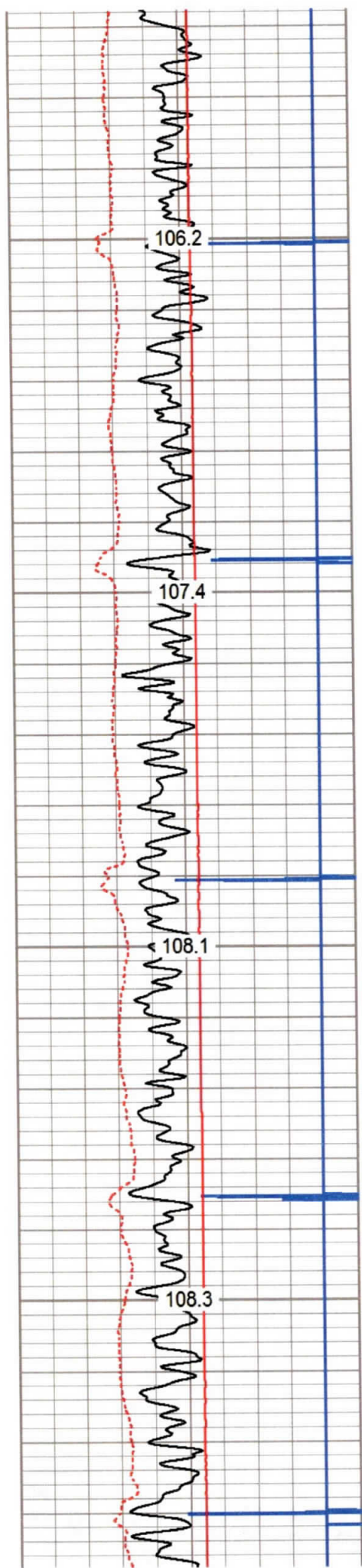
4750









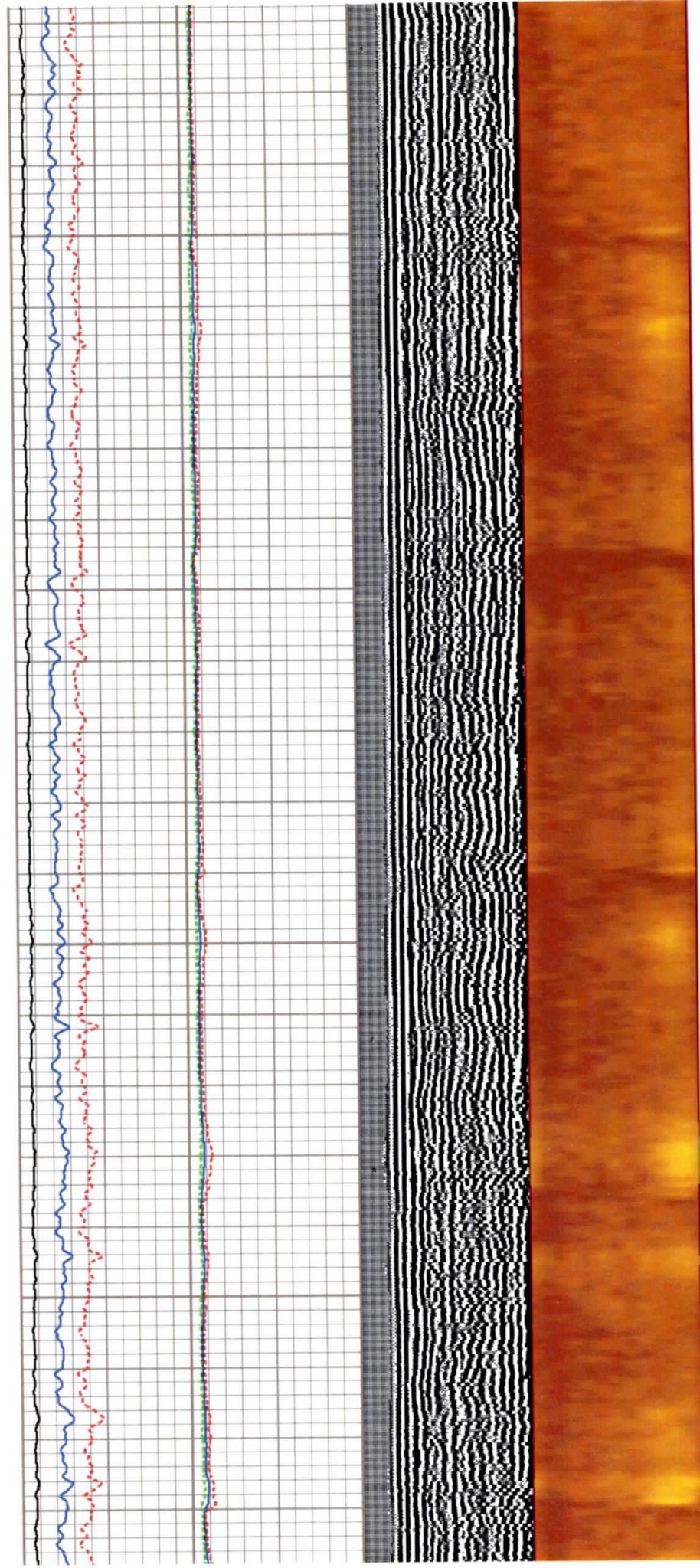


5050

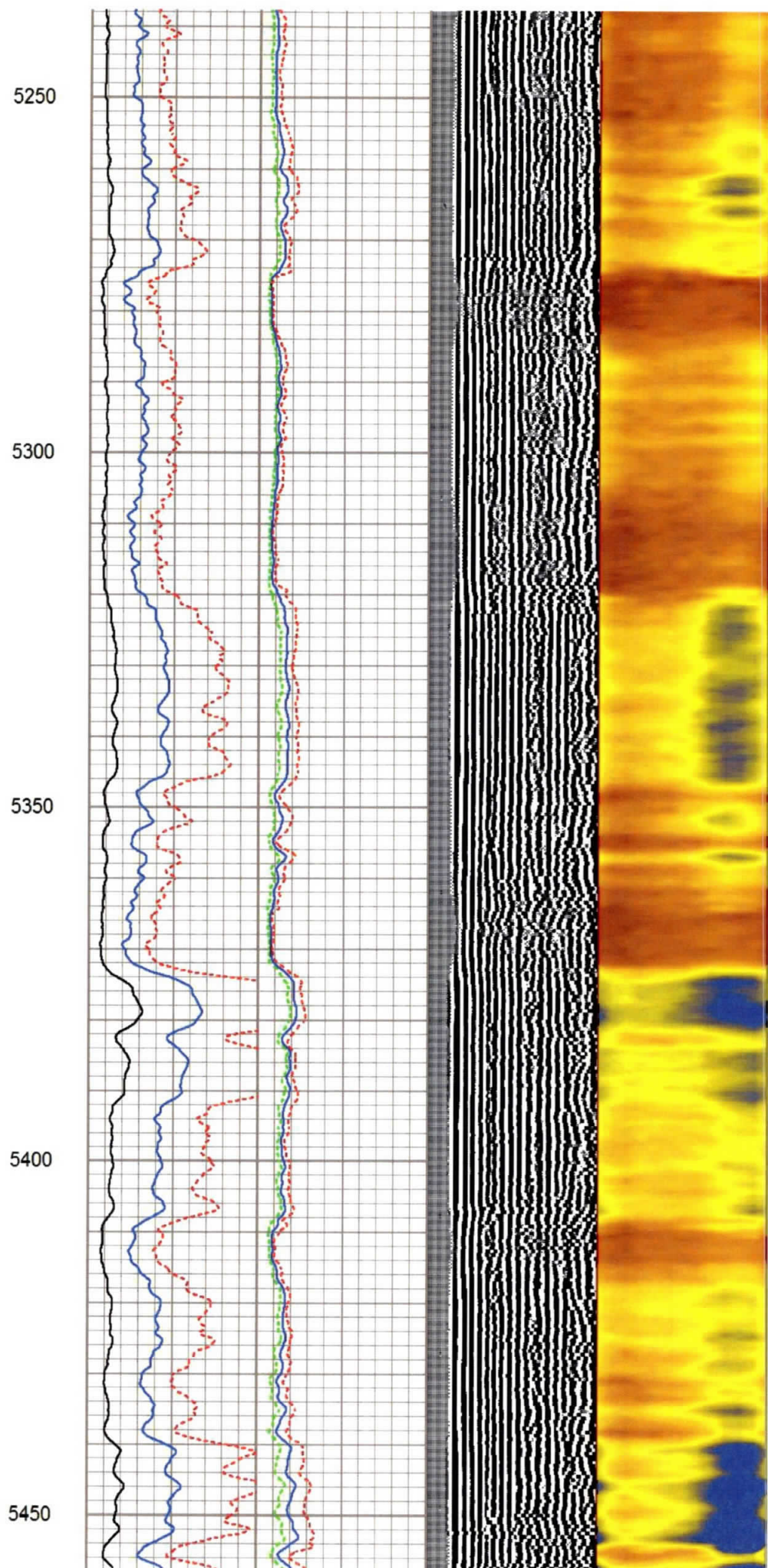
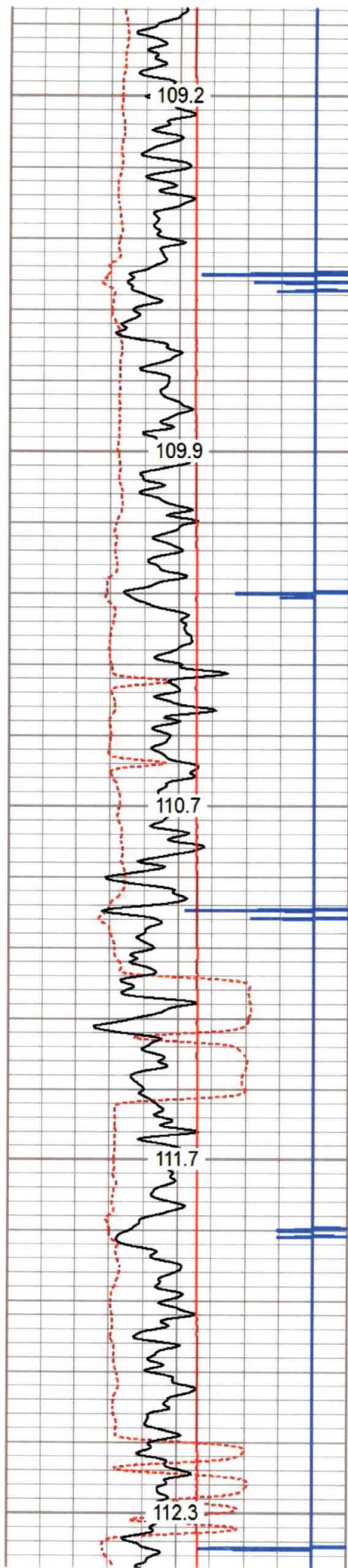
5100

5150

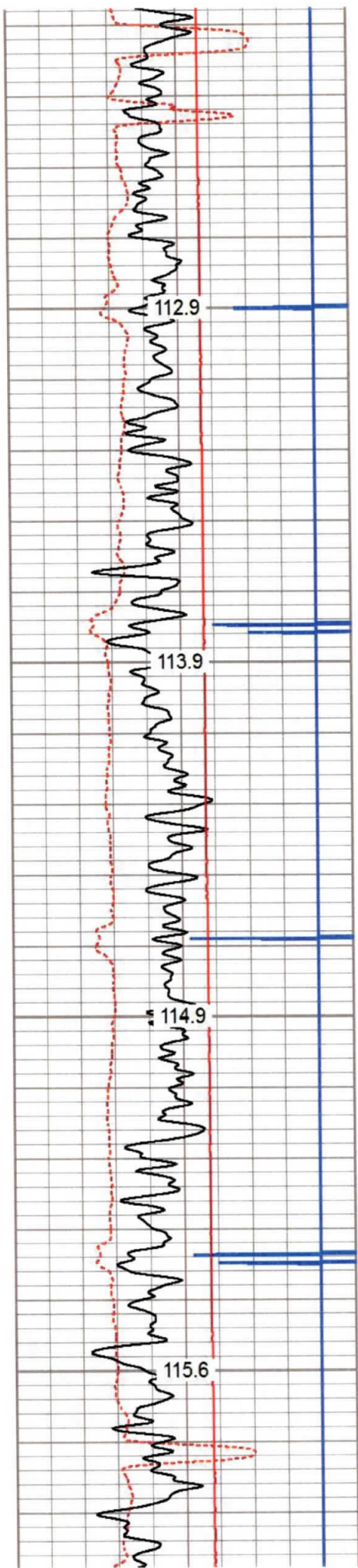
5200









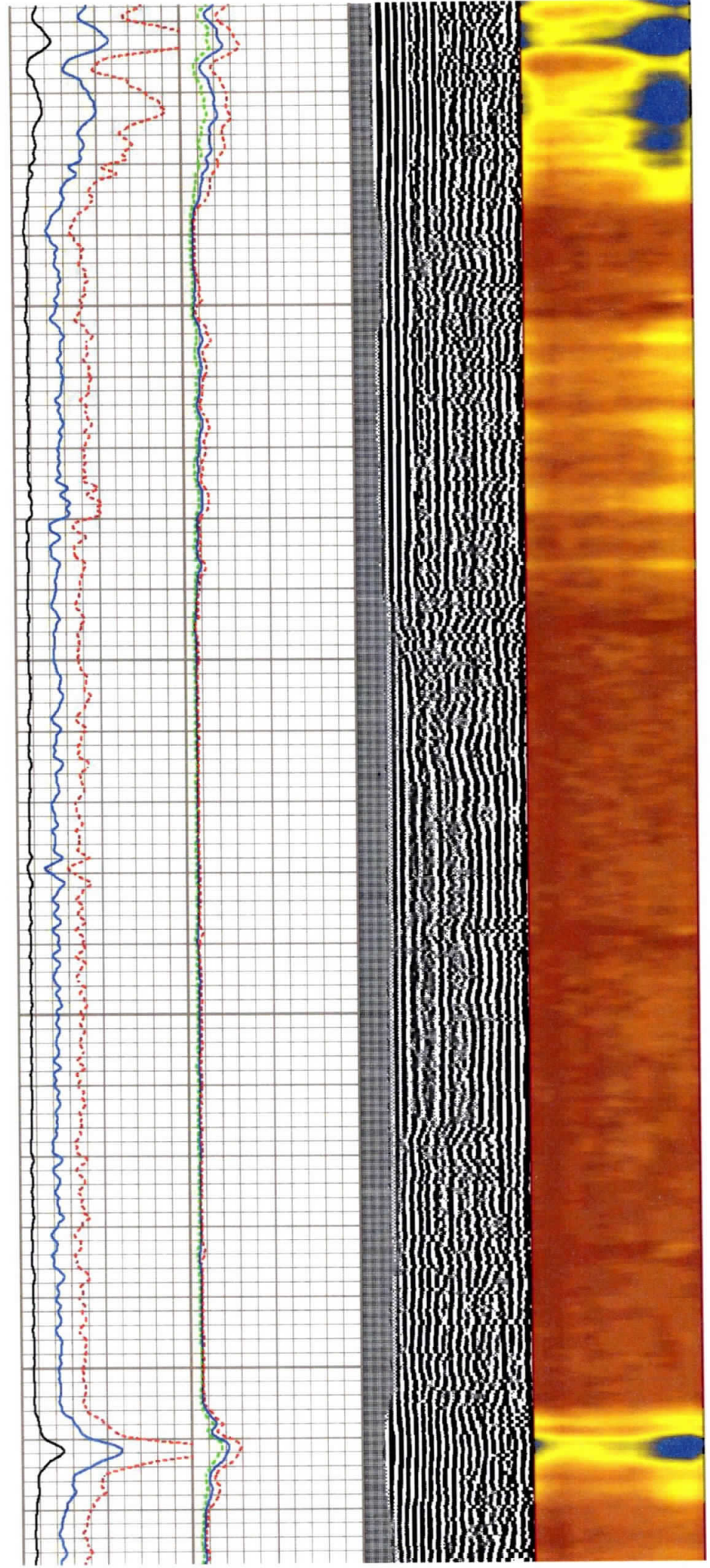


5500

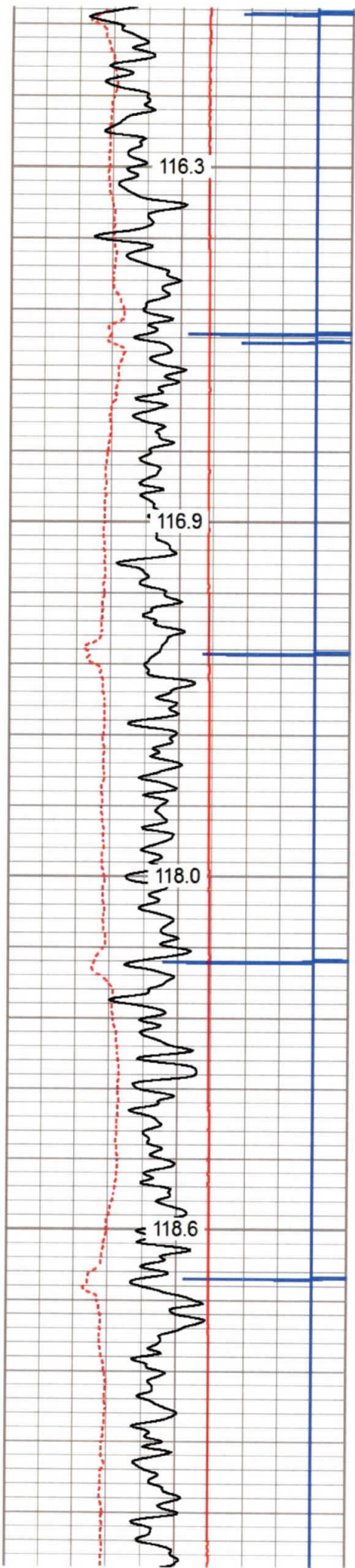
5550

5600

5650





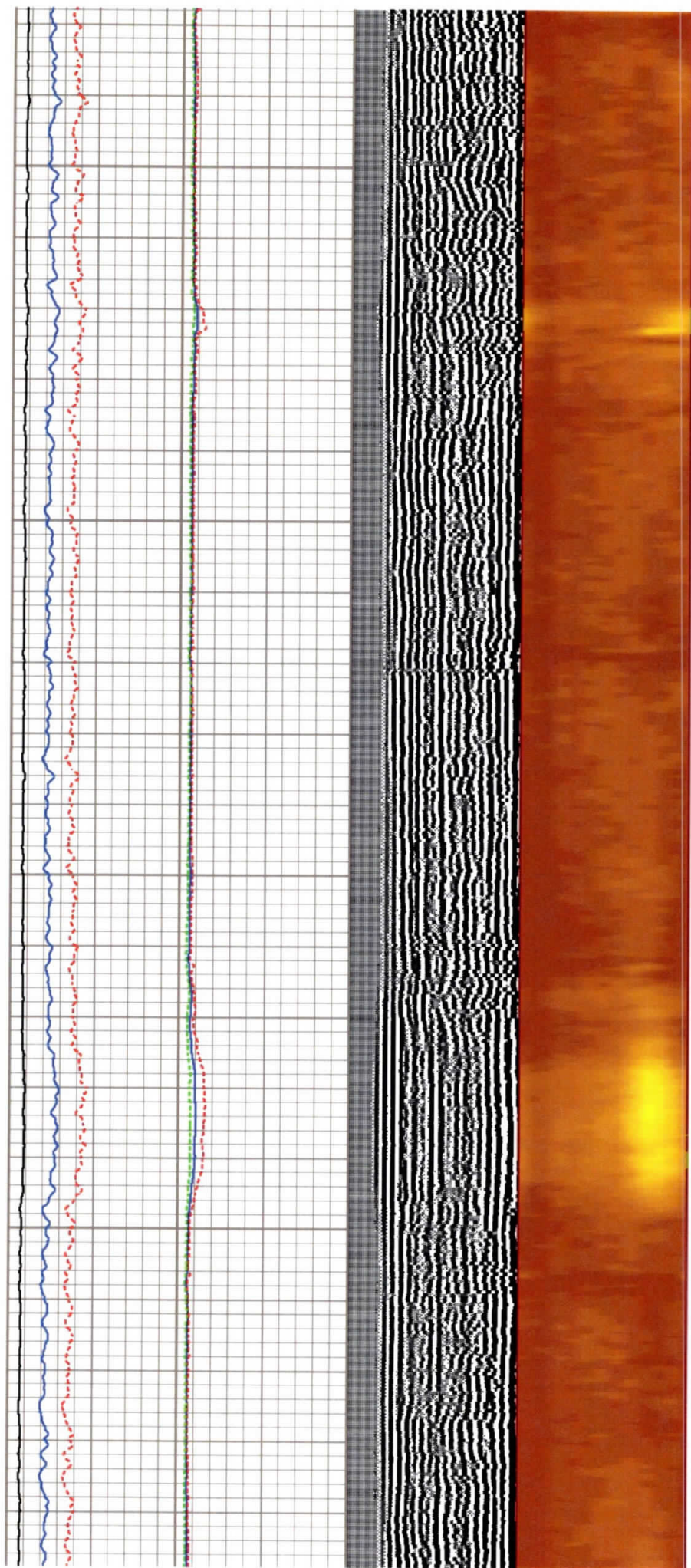


5700

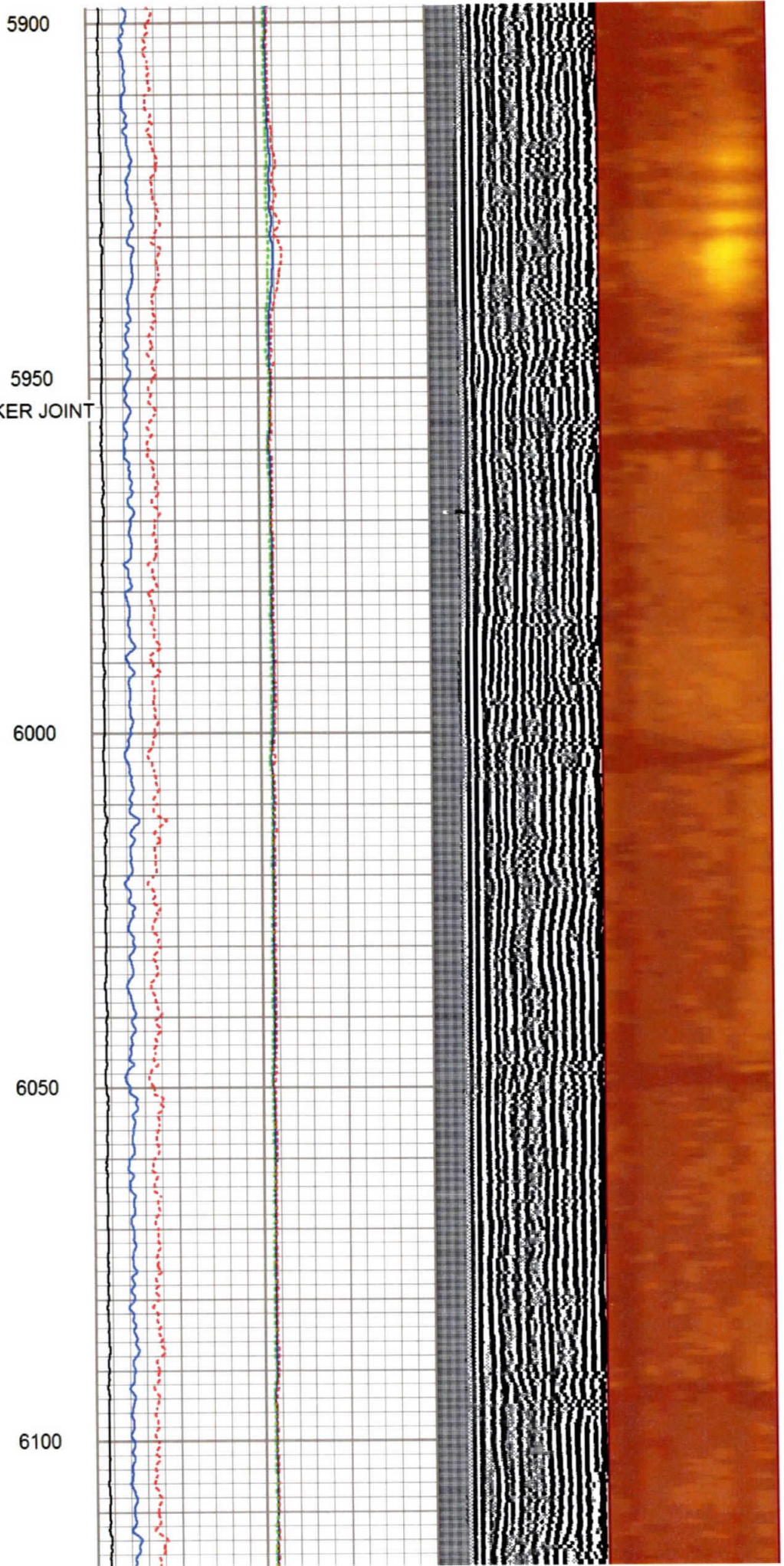
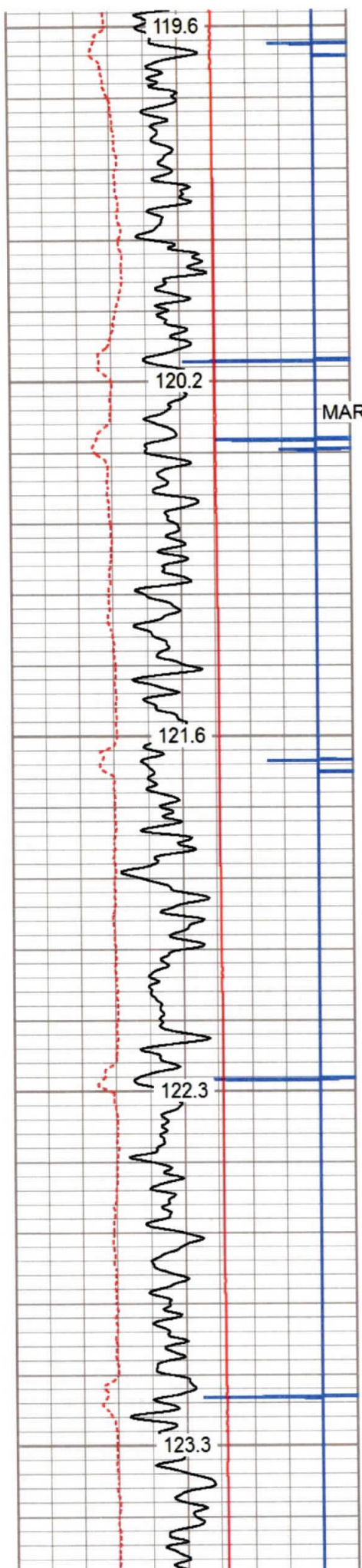
5750

5800

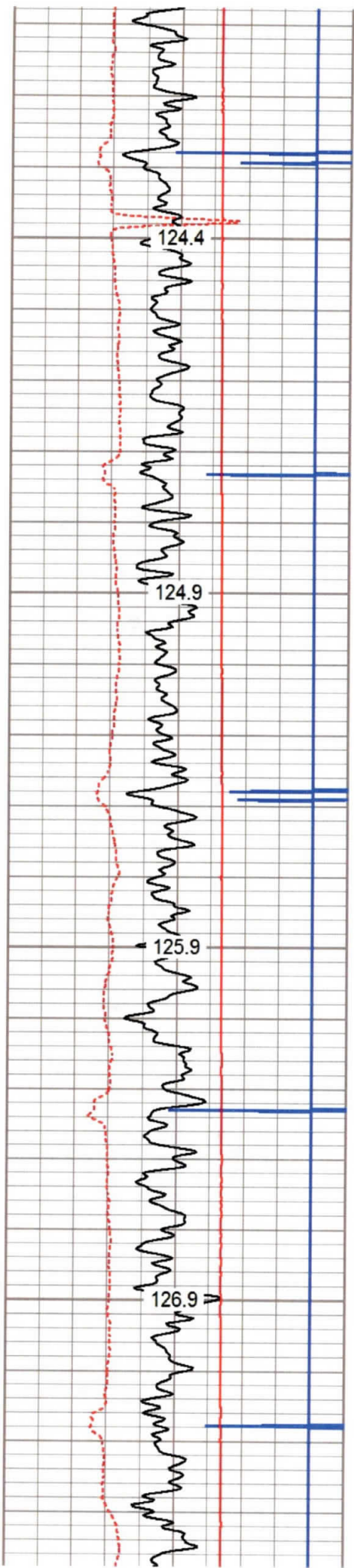
5850









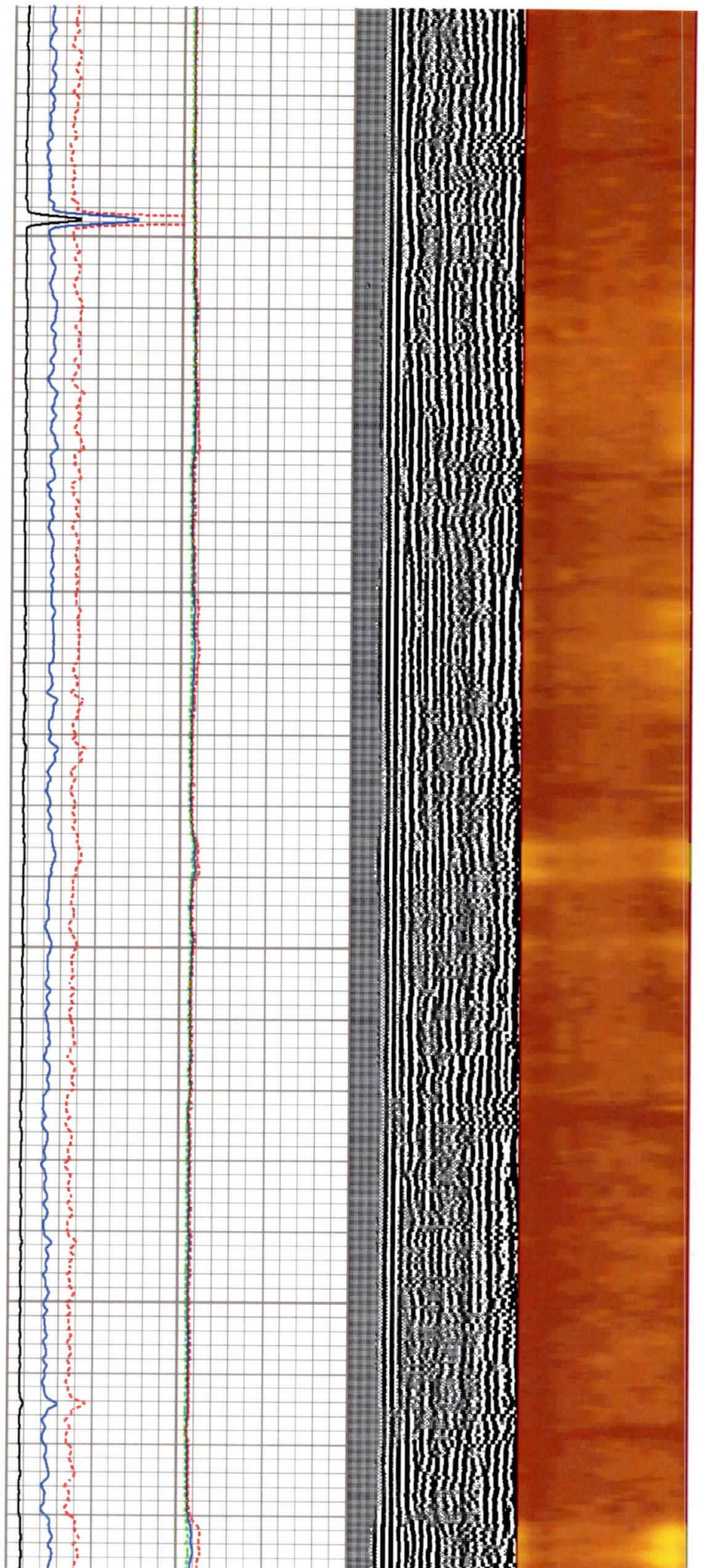


6150

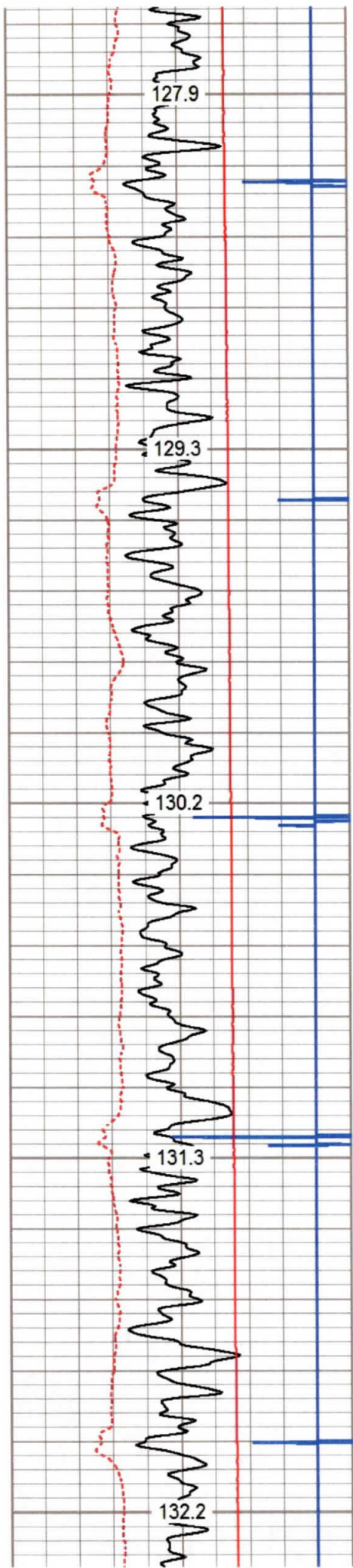
6200

6250

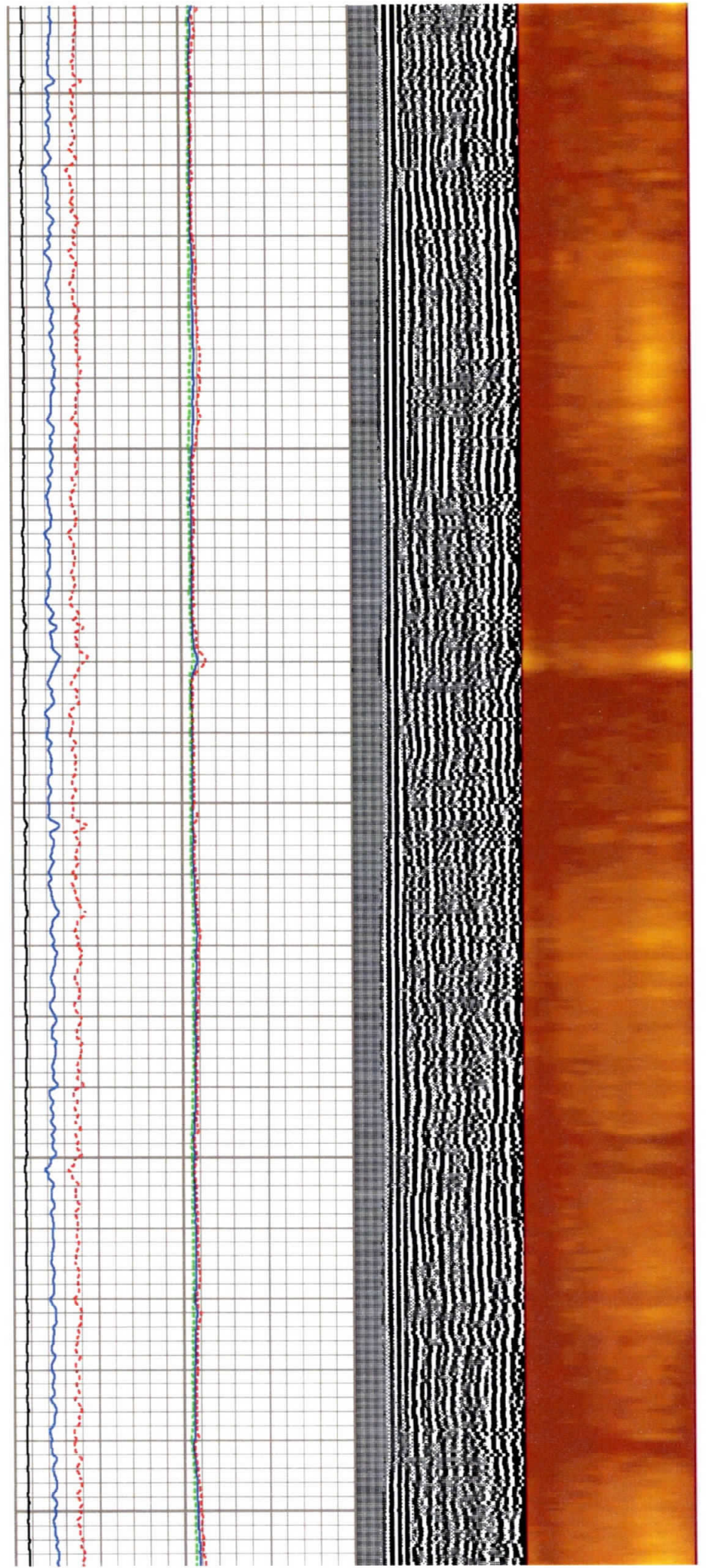
6300



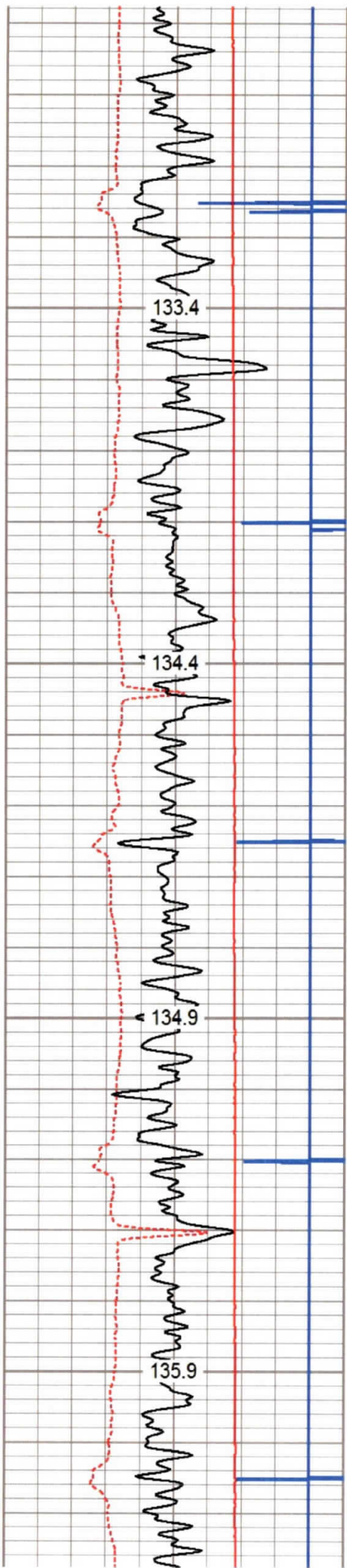




6350  
6400  
6450  
6500  
6550





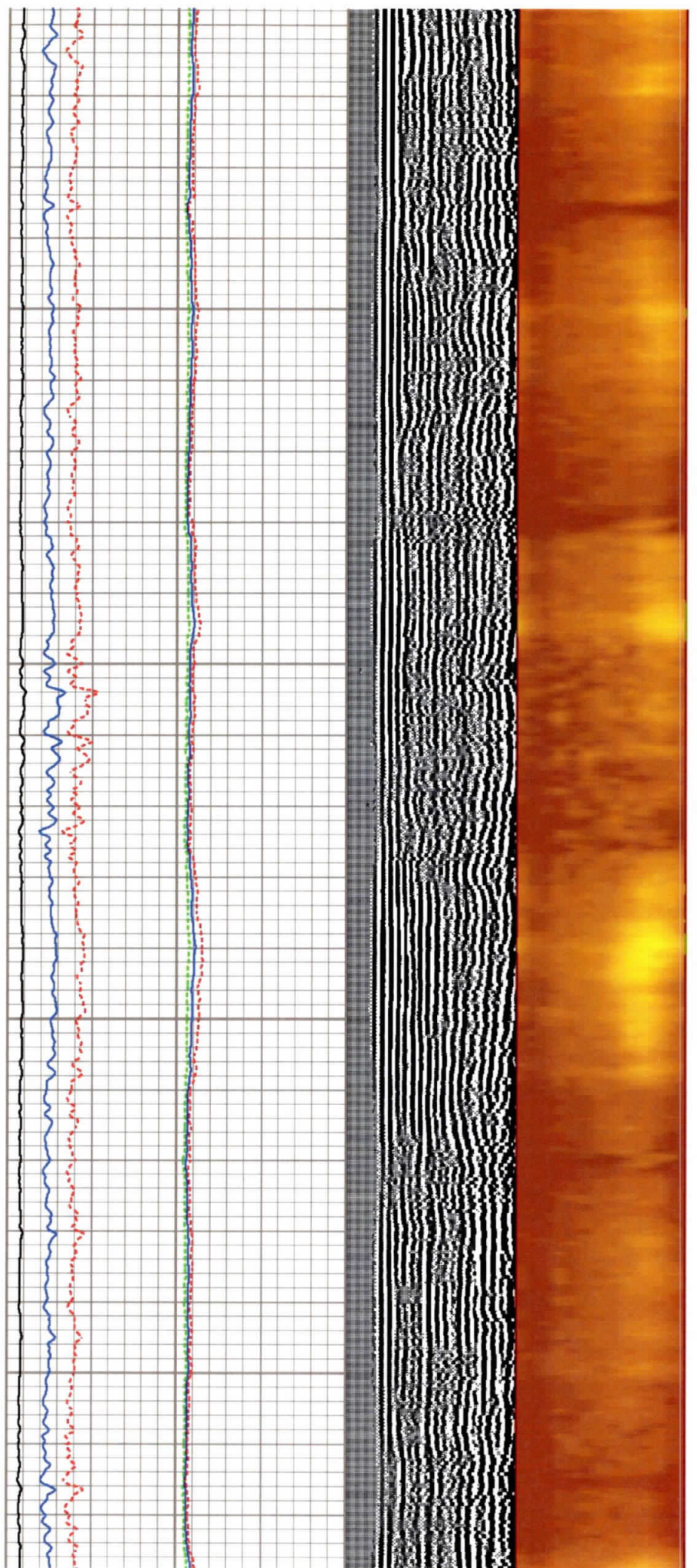


6600

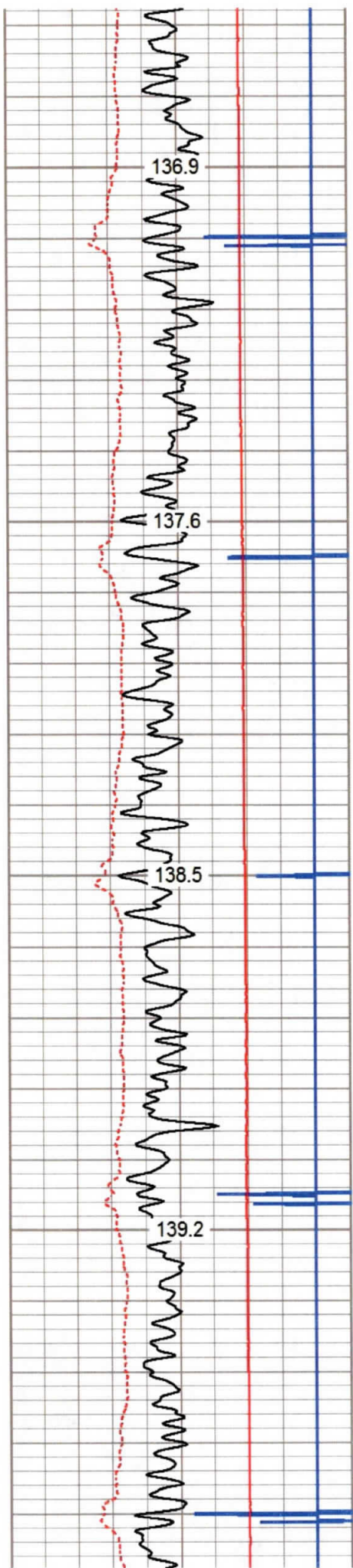
6650

6700

6750





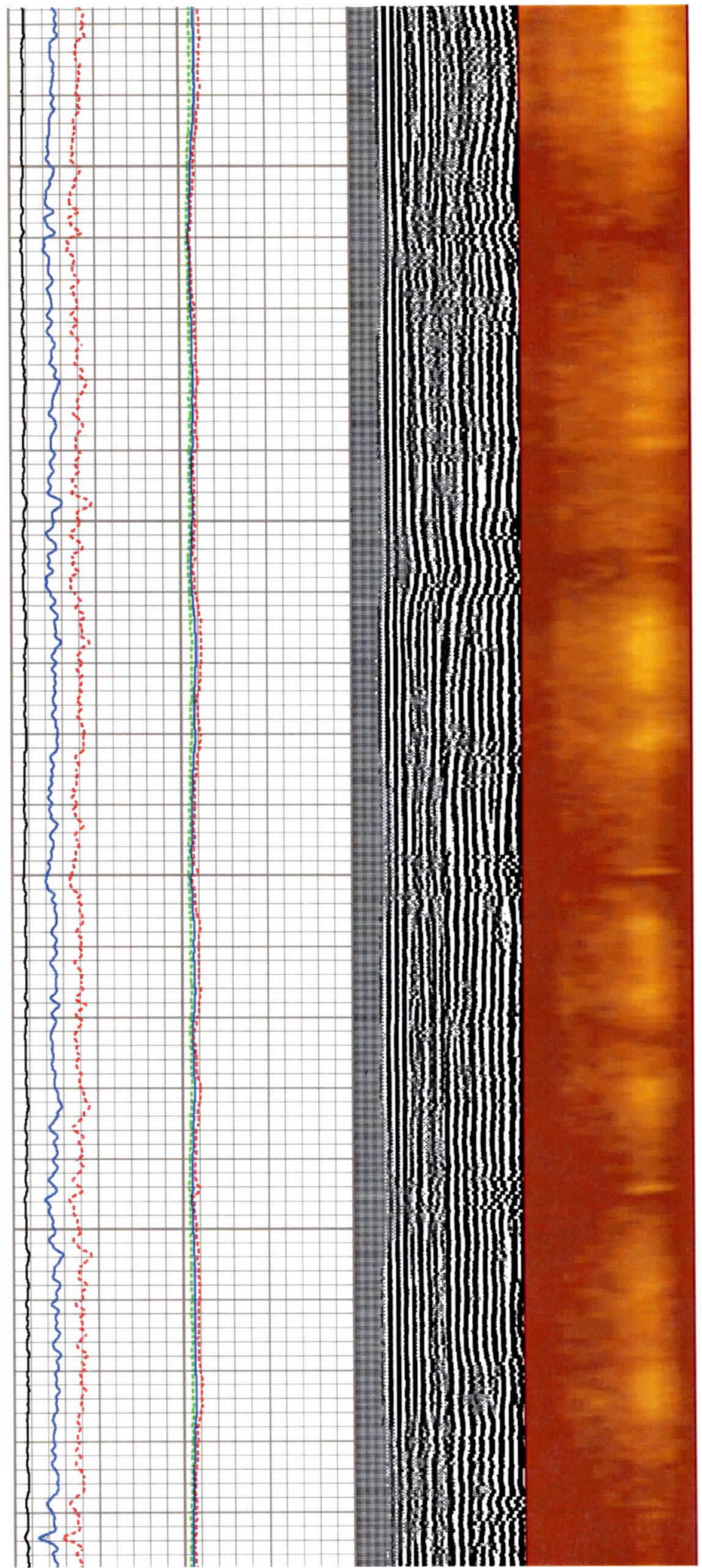


6800

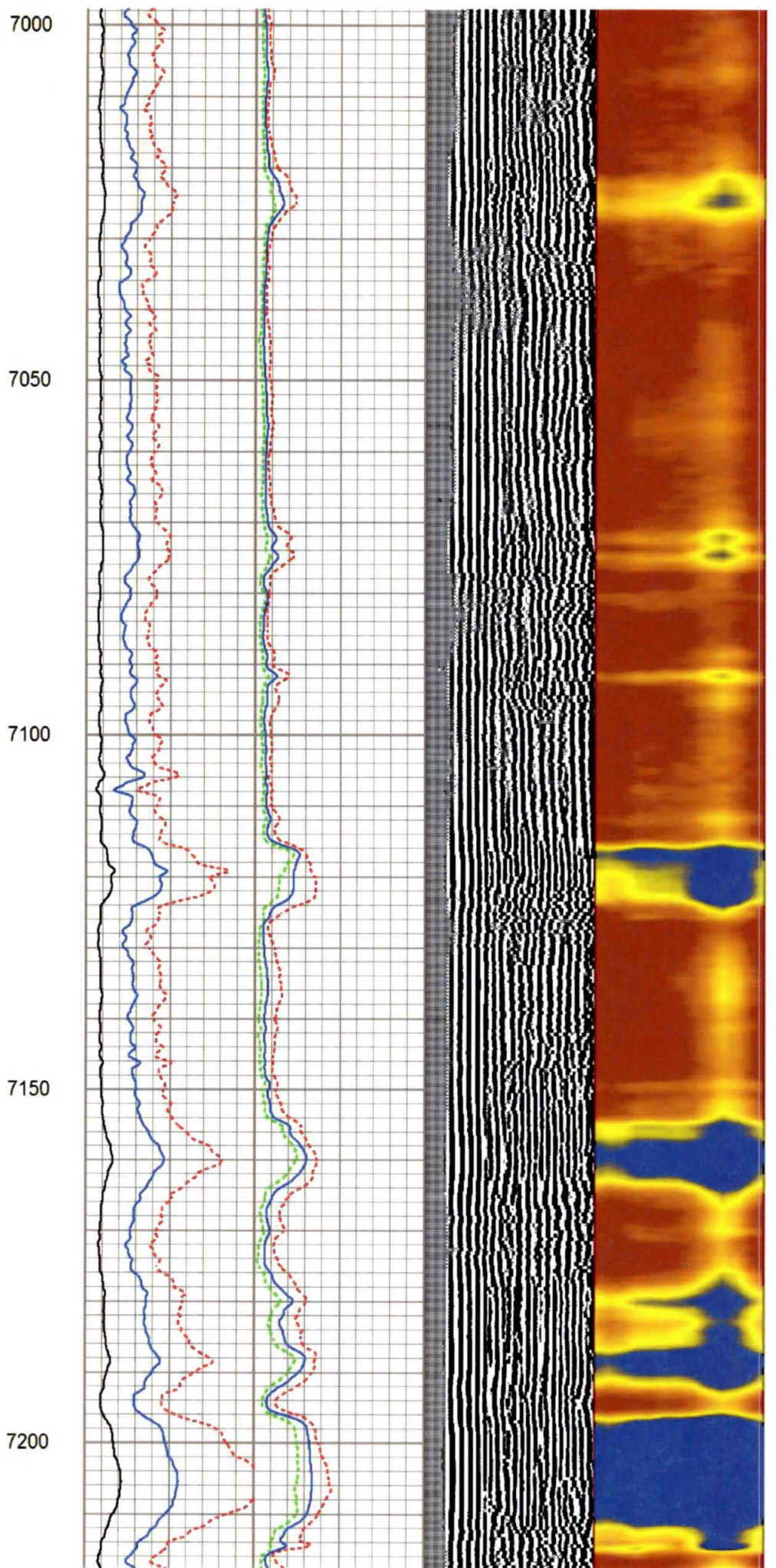
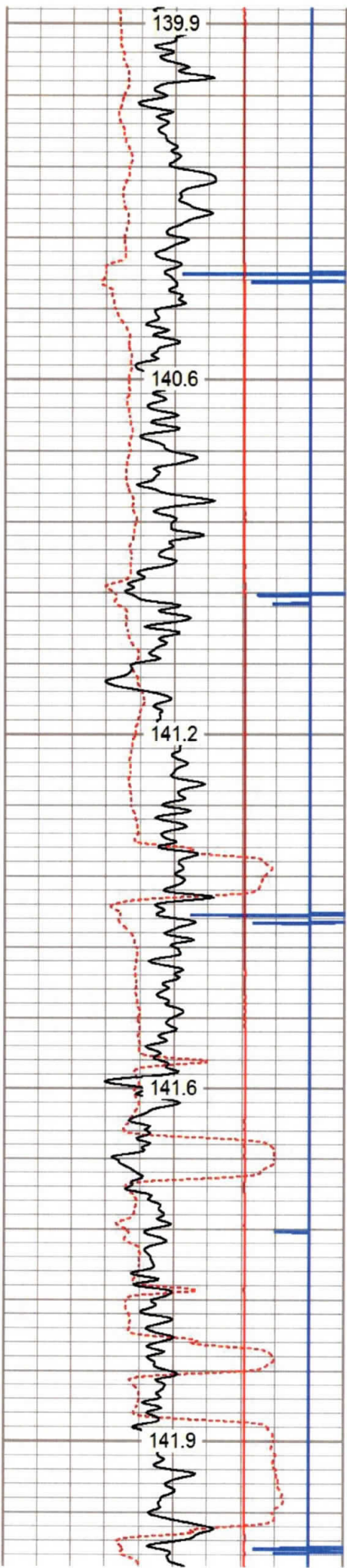
6850

6900

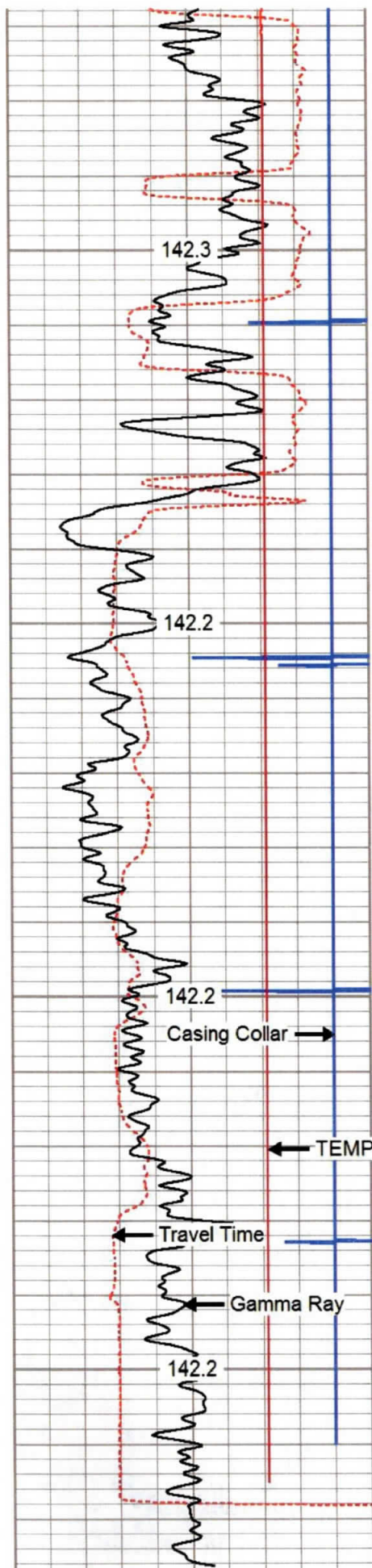
6950











7250

7300

7350

7400

142.3

142.2

142.2

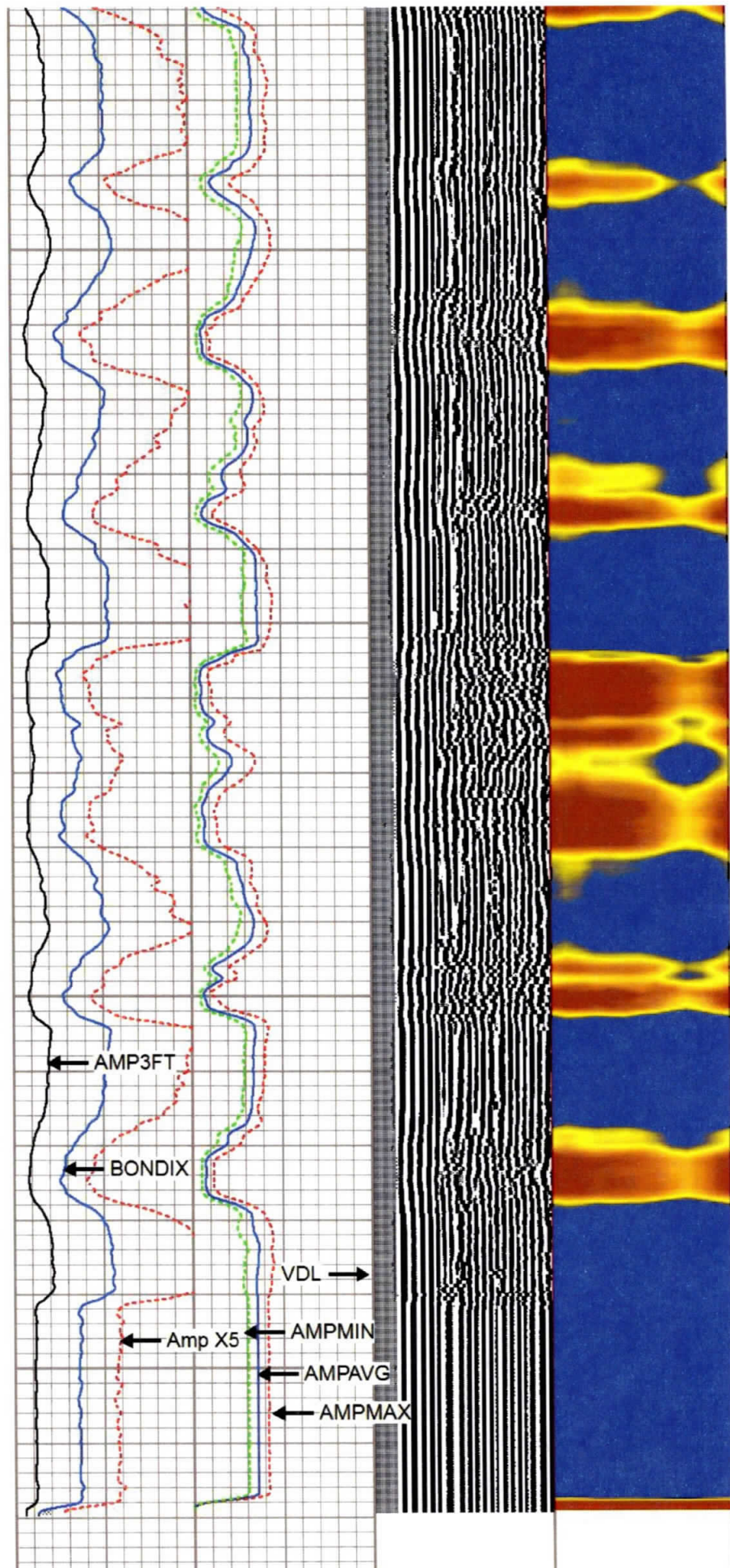
Casing Collar →

← TEMP

← Travel Time

← Gamma Ray

142.2



← AMP3FT

← BONDIX

VDL →

← Amp X5

← AMPMIN

← AMPAVG

← AMPMAX

280 Travel Time (usec) 180  
9 Casing Collar -1

Amplitude Sector Amp AVG VDL  
(mV) 100 Sector Amp MAX 200 (usec) 1200  
1 Sector Map 12



0	Gamma Ray (GAPI)	180
0	TEMP (degF)	200
180	GR (GAPI)	360
	TEMP (degF)	

Amp X5		Sector Amp MIN
0	(mV)	20
1	BONDIX	0



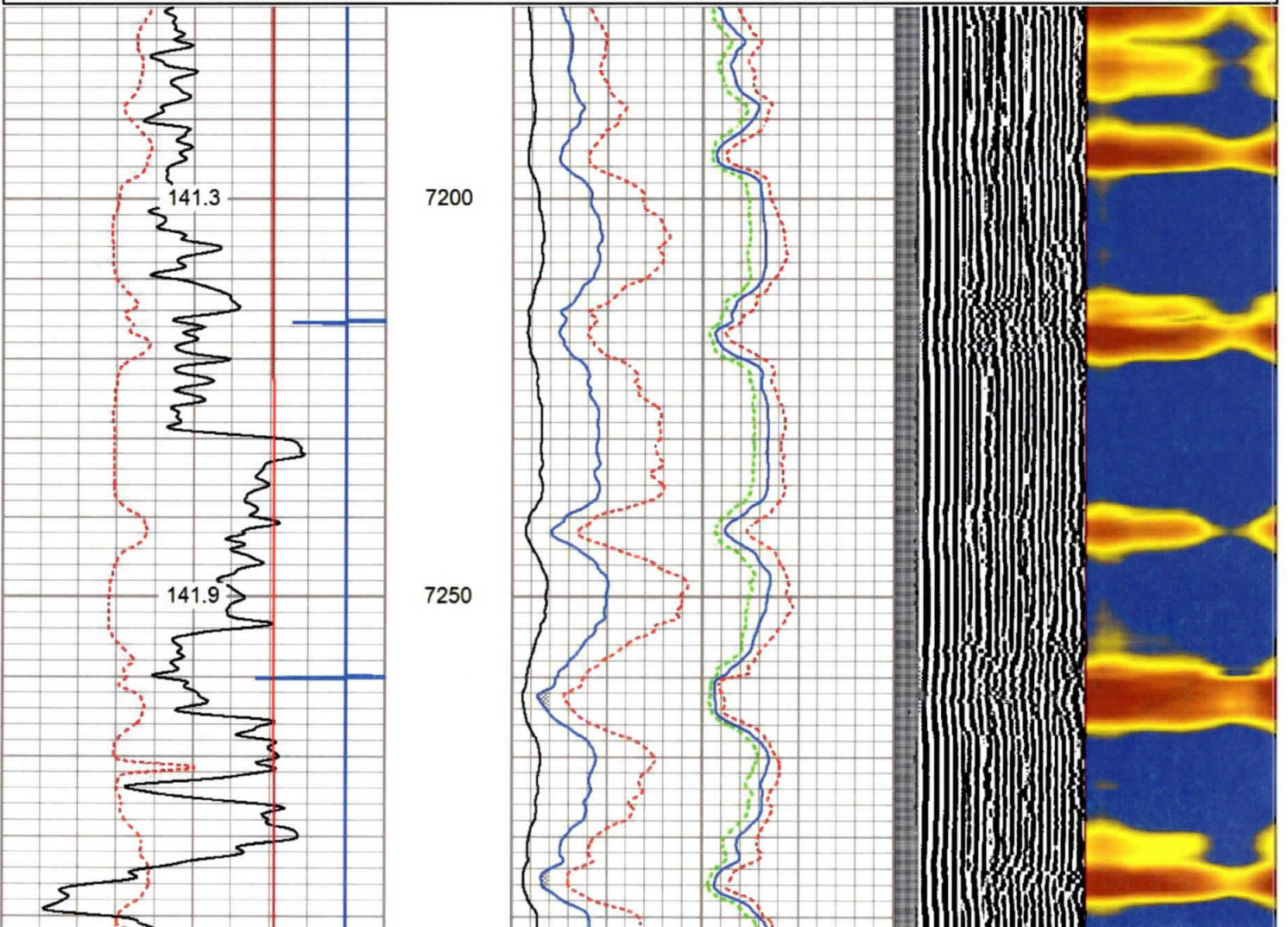
## Repeat Pass

Database File e:\antero10-25-19\antero\_mondeo\_unit\_3h.db  
 Dataset Pathname pass1  
 Presentation Format antero1  
 Dataset Creation Fri Oct 25 12:06:45 2019  
 Charted by Depth in Feet scaled 1:240

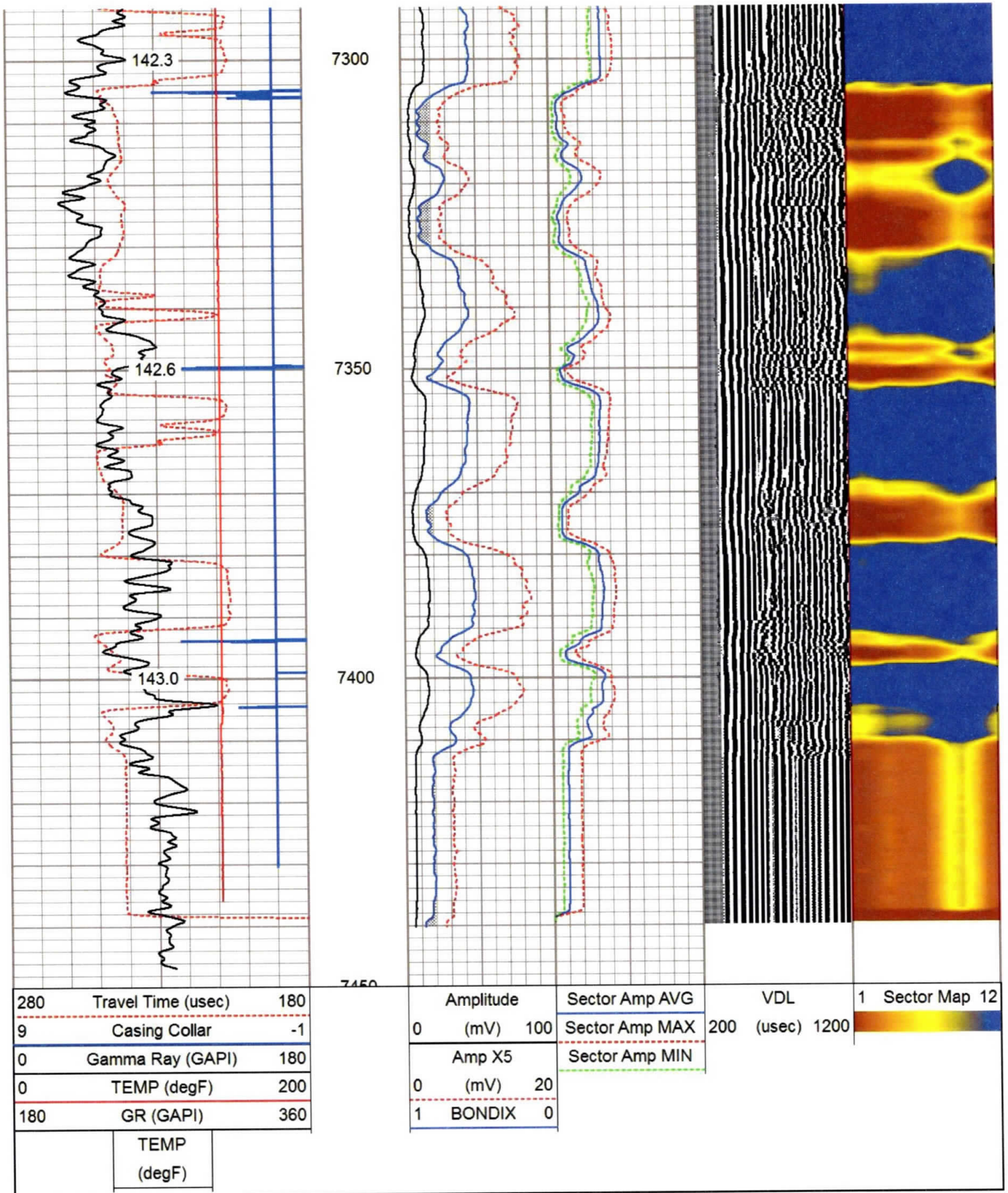
280	Travel Time (usec)	180
9	Casing Collar	-1
0	Gamma Ray (GAPI)	180
0	TEMP (degF)	200
180	GR (GAPI)	360
	TEMP (degF)	

Amplitude		Sector Amp AVG
0	(mV)	100
Amp X5		Sector Amp MAX
0	(mV)	20
1	BONDIX	0

VDL	1	Sector Map	12
200	(usec)	1200	







### Log Variables

Database: E:\VANTERO10-25-19\antero\_mondeo\_unit\_3h.db  
 Dataset: field/well/run1/pass3/\_vars\_

#### Top - Bottom

BHTEMP_Src	BOREID in	BOTTEMP degF	CASEOD in	CASETHCK in	CASEWGHT lb/ft	MAXAMPL mV
------------	--------------	-----------------	--------------	----------------	-------------------	---------------



TEMP	8.25	100	5.5	0	23	71.9
MINAMPL mV	MINATTN db/ft	PERFS	PPT usec	SRFTEMP degF	TDEPTH ft	
3.5	0.8	No	219	0	0	

**Variable Description**

BHTEMP_Src : BHTEMP Input Source Selector	MINAMPL : Minimum Amplitude
BOREID : Borehole I.D.	MINATTN : Minimum Attenuation
BOTTEMP : Bottom Hole Temperature	PERFS : Perforation Flag
CASEOD : Casing O.D.	PPT : Predicted Pipe Time
CASETHCK : Casing Thickness	SRFTEMP : Surface Temperature
CASEWGHT : Casing Weight	TDEPTH : Total Depth
MAXAMPL : Maximum Amplitude	

**Calibration Report**

Database File E:\ANTERO10-25-19\antero\_mondeo\_unit\_3h.db  
Dataset Pathname pass2  
Dataset Creation Fri Oct 25 12:54:28 2019

**Gamma Ray Calibration Report**

Serial Number: 0111  
Tool Model: Tek-Co 2 3/4  
Performed: Thu Oct 24 08:41:06 2019

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps  
Calibrator Reading: 1.0 cps

Sensitivity: 0.5000 GAPI/cps

**Segmented Cement Bond Log Calibration Report**

Serial Number: T12\_01  
Tool Model: Tek12

Calibration Casing Diameter: 5.500 in  
Calibration Depth: 57.275 ft

**Master Calibration, performed Thu Oct 24 13:31:44 2019:**

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.006	0.919	3.500	71.921	50.880	5.245
CAL	0.630	0.627				
5'	-0.001	1.035	3.500	71.921	40.761	4.381
SUM						
S1	0.000	1.103	0.000	100.000	56.543	-0.001
S2	0.000	1.088	0.000	100.000	61.007	-0.001
S3	0.000	1.122	0.000	100.000	64.737	-0.001
S4	0.000	1.089	0.000	100.000	72.448	-0.001
S5	0.000	1.045	0.000	100.000	71.838	-0.001
S6	0.000	0.965	0.000	100.000	74.574	-0.001
S7	0.000	0.897	0.000	100.000	76.604	-0.001
S8	0.000	0.821	0.000	100.000	77.230	-0.001
S9	0.000	0.802	0.000	100.000	76.037	-0.001
S10	0.000	0.932	0.000	100.000	63.640	-0.001
S11	0.000	1.003	0.000	100.000	56.910	-0.001
S12	0.000	1.091	0.000	100.000	55.333	-0.001

**Temperature Calibration Report**





Serial Number: T12\_01  
 Tool Model: Tek12  
 Performed: Fri Oct 22 17:21:06 2010

	Reference	Reading
Low Reference:	0.00 degF	0.00 usec
High Reference:	1.00 degF	1.00 usec
Gain:	0.33	
Offset:	0.00	
Delta Spacing	2	

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
			Titan-1.4375 1 7/16 Titan Type II Cable Head	1.03	1.44	5.00
CCL	19.20		CCL-312tekco (101) Tekco 3 1/8" 450 Deg. "F" SmCo Logging CCL	1.82	3.12	25.00
			Tek-2.75 2 3/4" Tekco Adjustable Centralizer	2.73	2.75	25.00
TEMP	13.04					
WVFSYNC	13.04					
WVFCAL	13.04					
WVFS12	11.75					
WVFS11	11.75					
WVFS10	11.75		SCBL-Tek12 (T12_01) Tekco 400 Deg F 12 Sector RIB with Temp	9.13	3.25	135.00
WVFS9	11.75					
WVFS8	11.75					
WVFS7	11.75					
WVFS6	11.75					
WVFS5	11.75					
WVFS4	11.75					
WVFS3	11.75					
WVFS2	11.75					
WVFS1	11.75					
WVF3FT	11.00					
WVF5FT	10.00					
WVFTEMP	6.67					
			Tek-2.75 2 3/4" Tekco Adjustable Centralizer	2.73	2.75	25.00



GR	1.31		GR-Tek-Co 2 3/4 (0111) Tekco 2 3/4" 400 Deg. F Logging Gamma Ray	3.67	2.75	40.00
			Titan-1.4375_Cap Titan 1 7/16" Cap	0.27	1.44	1.00
		Dataset: antero_mondeo_unit_3h.db: field/well/run1/pass2 Total length: 21.37 ft Total weight: 256.00 lb O.D.: 3.25 in				

	Company	ANTERO RESOURCES CORPORATION					
	Well	MONDEO UNIT 3H					
	Field	MARCELLUS					
	County	DODDRIDGE					
	State	W.V.				Country	USA