

Company	Antero Resources	Location:	API # : 4709502455	Other Services
Well	Crown 3H	Latitude:		
Field	Marcellus	Longitude:		
County	Tyler	SEC	TWP	RGE
State	West Virginia	Permanent Datum	Ground Level	Elevation
		Log Measured From	Ground Level	-
		Drilling Measured From	Kelly Bushing	
				Elevation
				KB. -
				DF. -
				G.L. -

Date	13 - December - 2018			
Run Number	One			
Depth Driller	17,658 ft			
Depth Logger	6,489 ft			
Bottom Logged Interval	6,479 ft			
Top Log Interval	Surface			
Open Hole Size	N/A			
Type Fluid	Fresh Water			
Density / Viscosity	8.3 lbs/gal			
Max. Recorded Temp.	134 °F			
Estimated Cement Top	5,572 ft			
Time Well Ready	22:00			
Time Logger on Bottom	22:40			
Equipment Number	2612			
Location	Irwin, PA			
Recorded By	Z. Gregory			
Witnessed By	Curt Anderson			
Borehole Record				
Run Number	Bit	From	To	Size
				Weight
				From
				To
Tubing Record				
Casing Record	Size	Wgt/ft	Top	Bottom
Surface String	13-3/8"	-	-	-
Prot. String	9-5/8"	-	-	-
Production String	5 1/2 in	20#	-	17,658 ft
Liner				

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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.

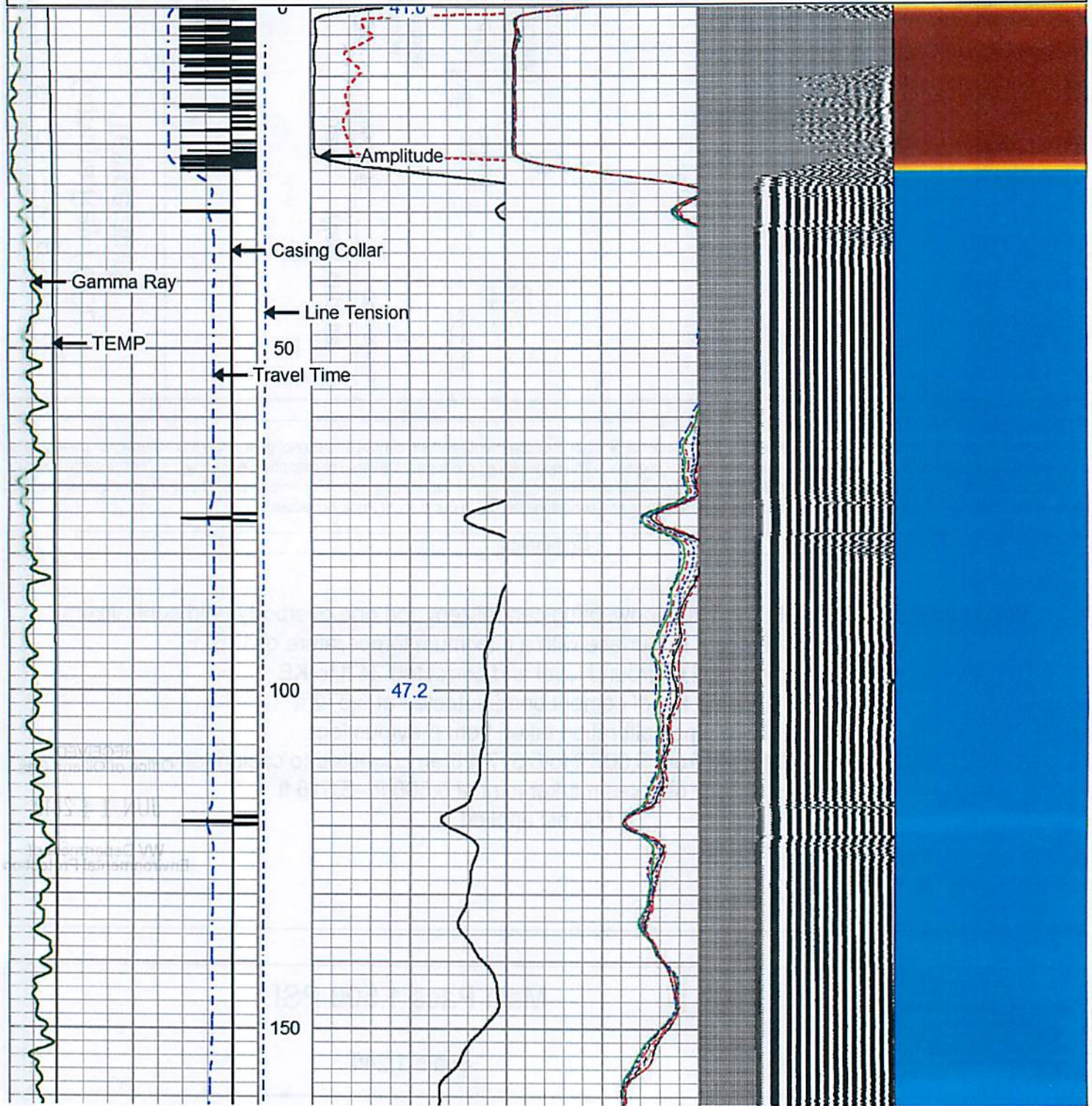
Comments

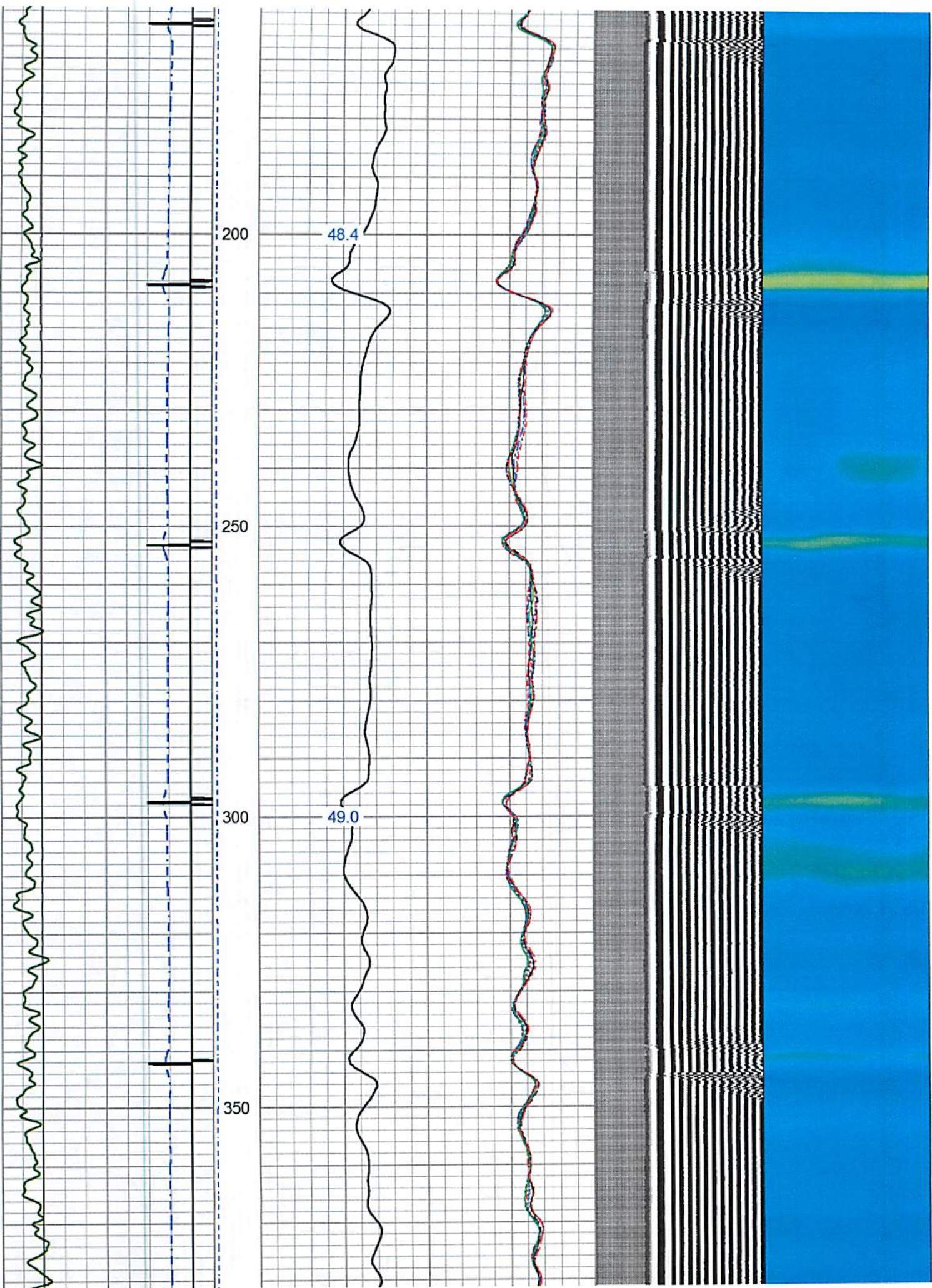
Bond tool centralized with two inline bowspring centralizers and one overbody rigid centralizers
 Logged from 6,479 ft to Surface with a maximum temperature of 135° F
 Tool zeroed at ground level and corrected 24 ft to KB
 Estimated top of cement bond detected at 5,572 ft
 Free pipe calibration taken from previous log
 Marker joint detected from 5,507 ft to 5,517 ft then corrected to casing tally
 Casing tally denotes marker joint at 5,506 ft - 5,516 ft
 1,500 psi applied

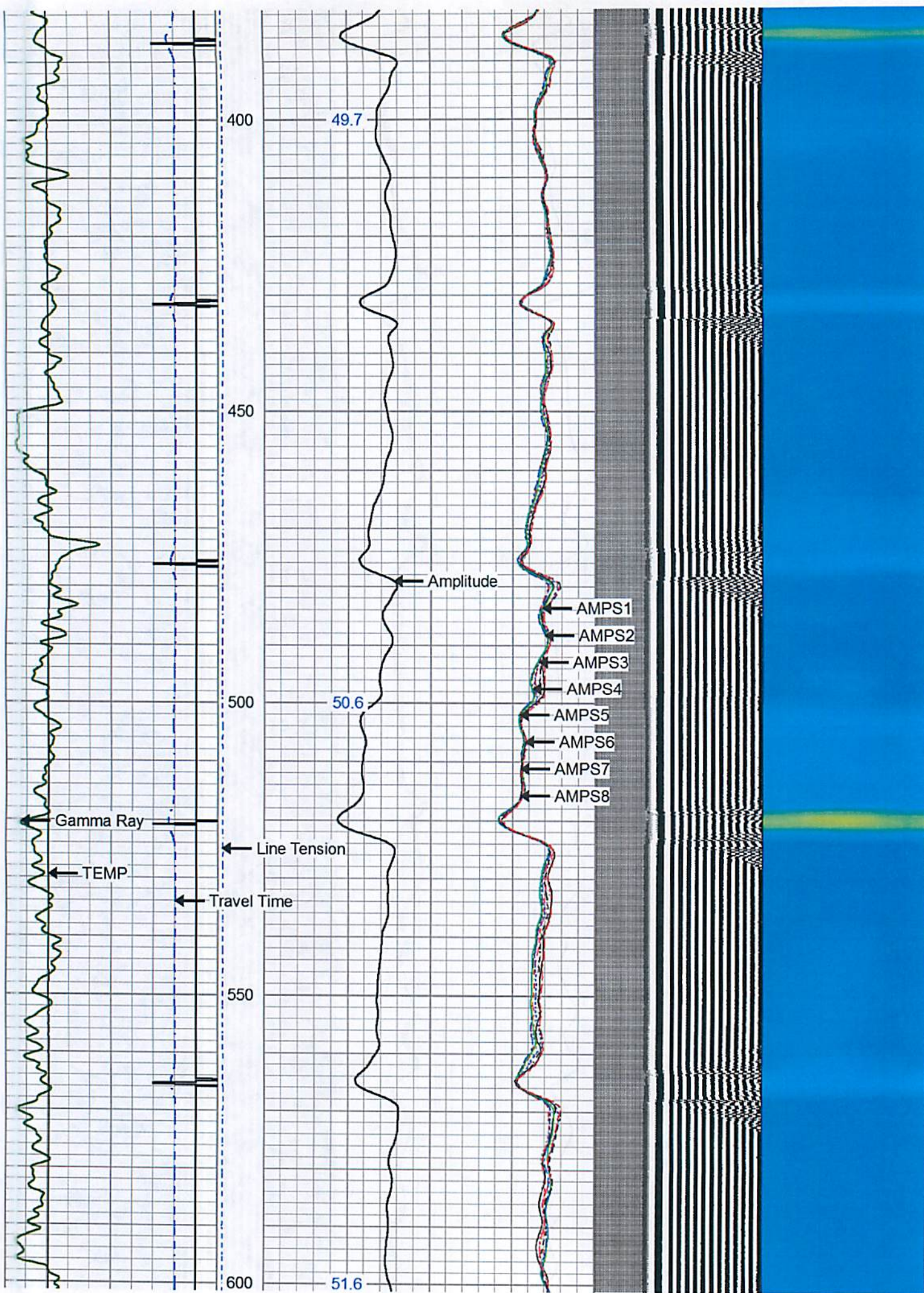
RECEIVED
Office of Oil and Gas
JUN 14 2019
WV Department of
Environmental Protection

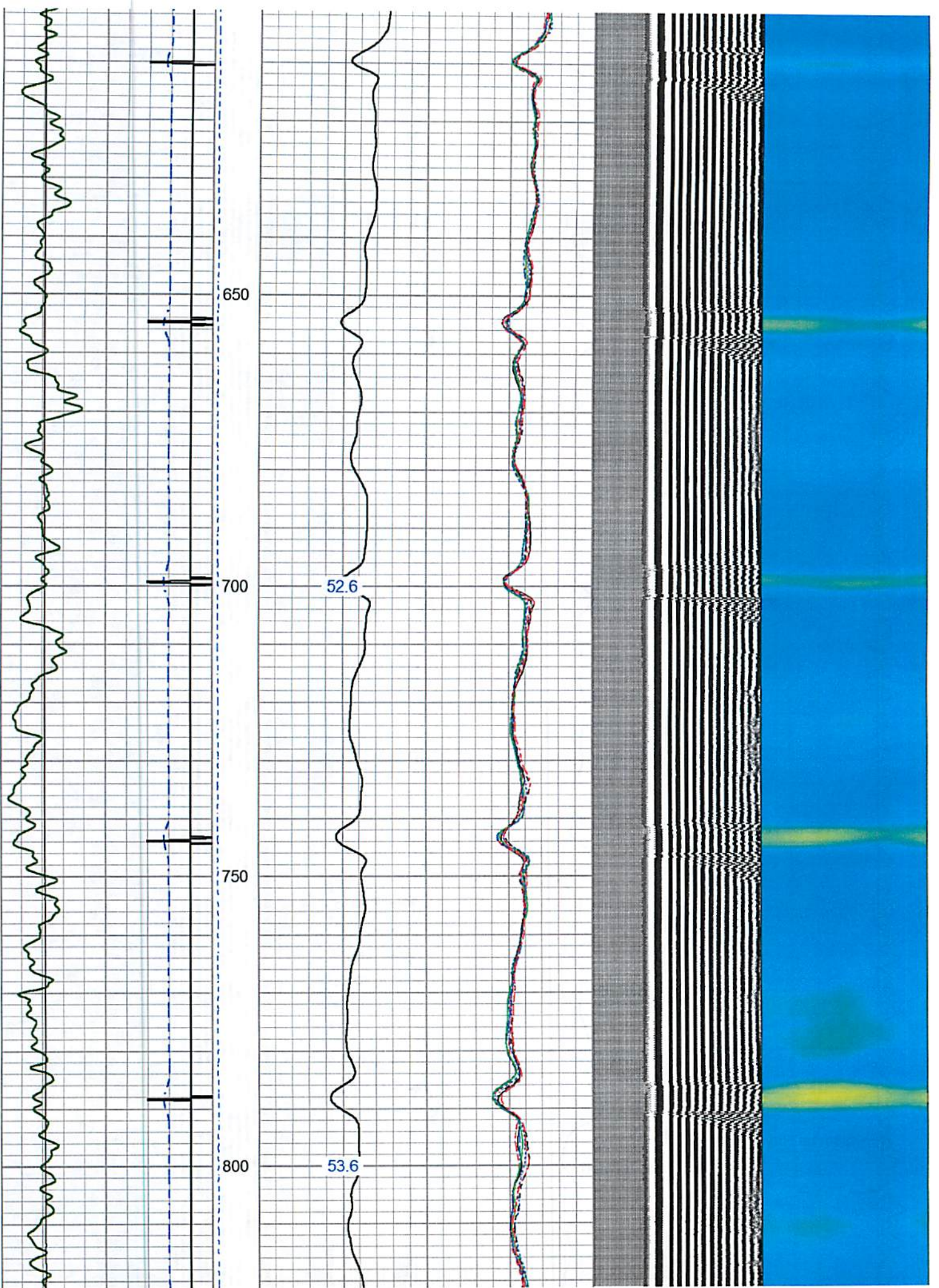
Database File c:\users\user\desktop\lantero neat logs\lantero_neat_crown_unit3h_rcbl_12132018.db
 Dataset Pathname pass3
 Presentation Format ahws_rcbl_jc
 Dataset Creation Thu Dec 13 22:39:27 2018
 Charted by Depth in Feet scaled 1:240

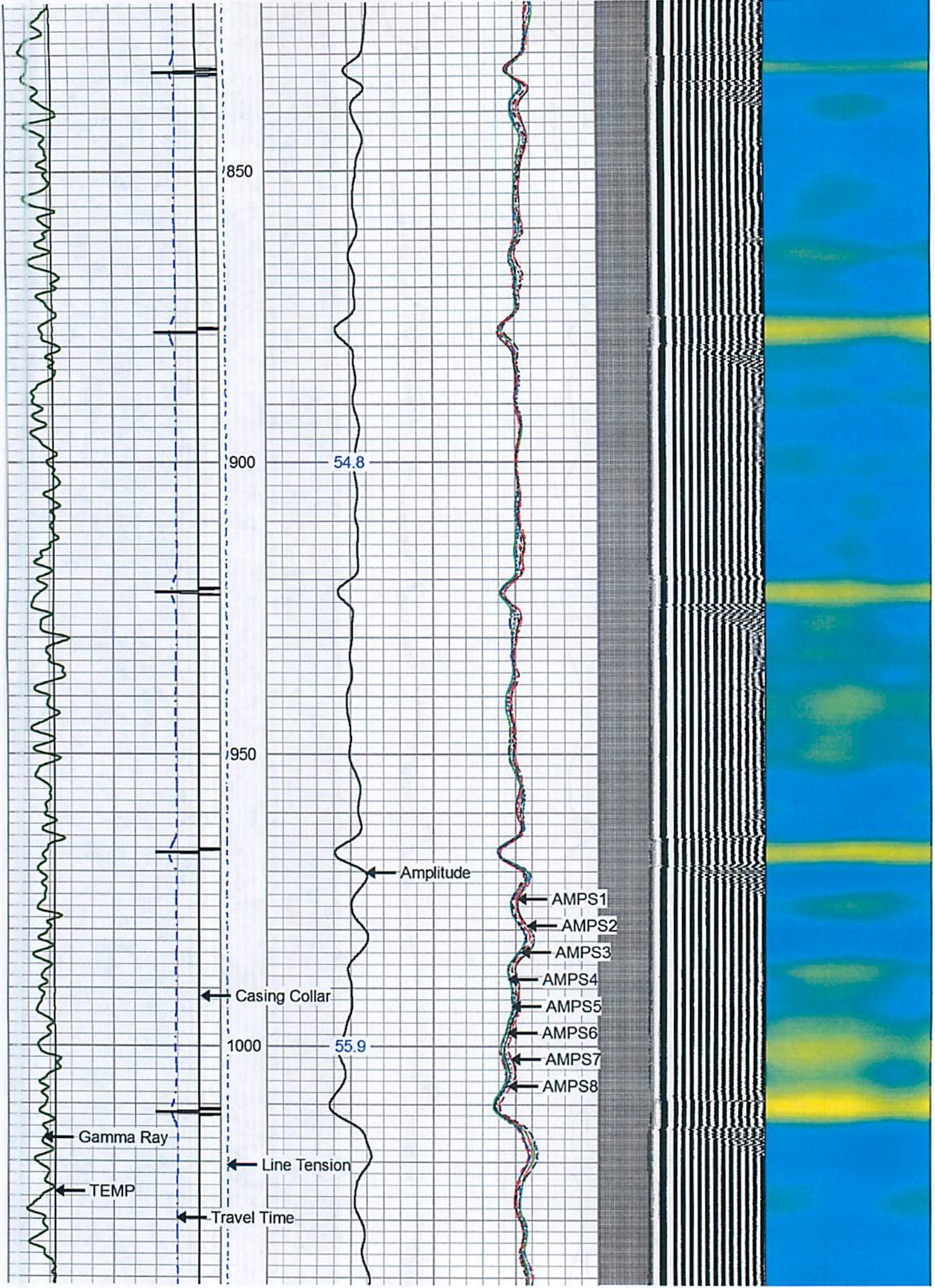
420	Travel Time (usec)	220	e Tens	0	Amplitude (mV)	100	-5	AMPS1	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	(lb)	0	Amplified Amplitude	-5	AMPS2	150	200				
0	Gamma Ray (GAPI)	300	(2500)	0	(mV)	10	-5	AMPS3	150				
0	TEMP (degF)	250			TEMP		-5	AMPS4	150				
					(degF)		-5	AMPS5	150				
							-5	AMPS6	150				
							-5	AMPS7	150				
							-5	AMPS8	150				

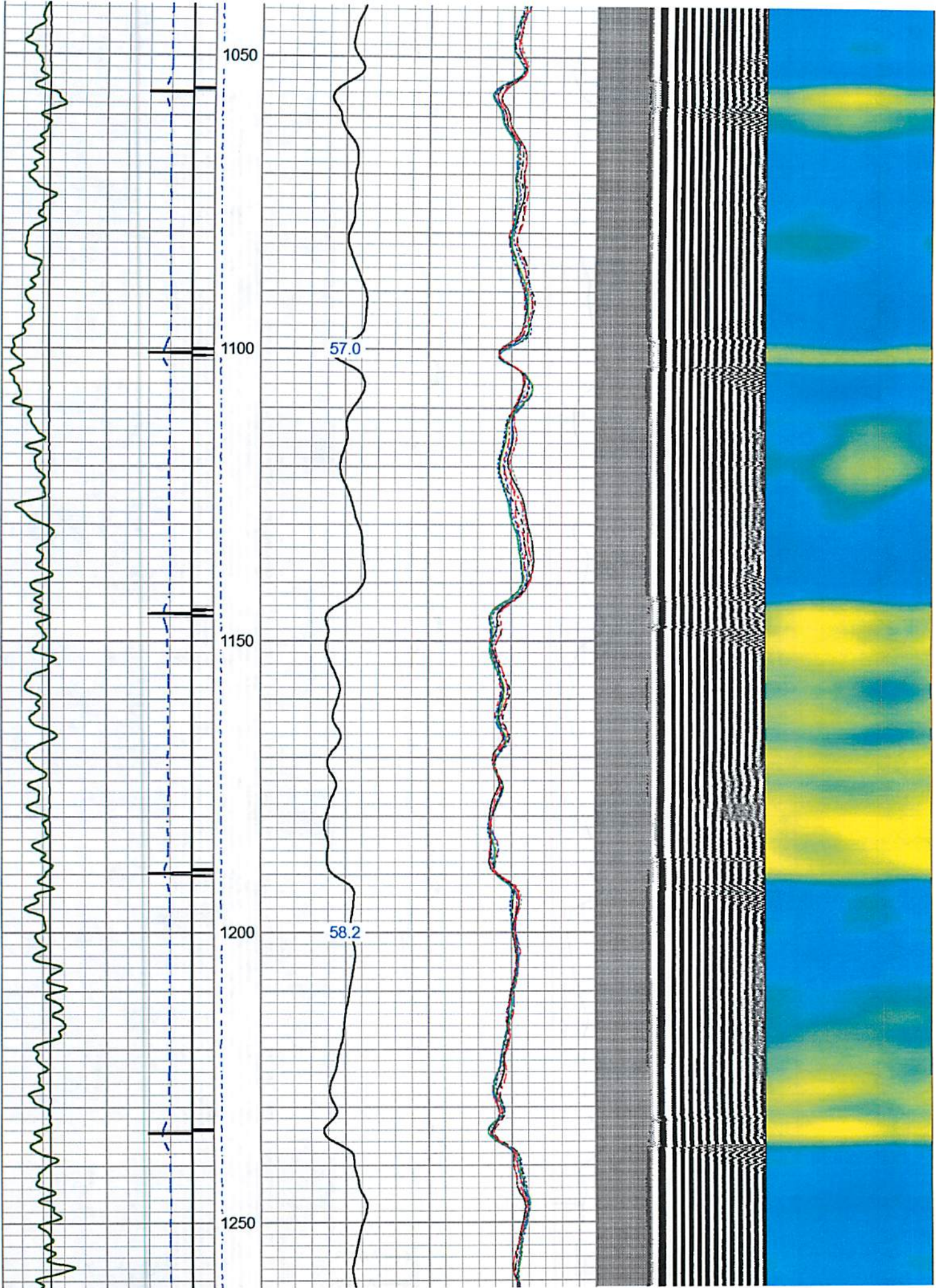


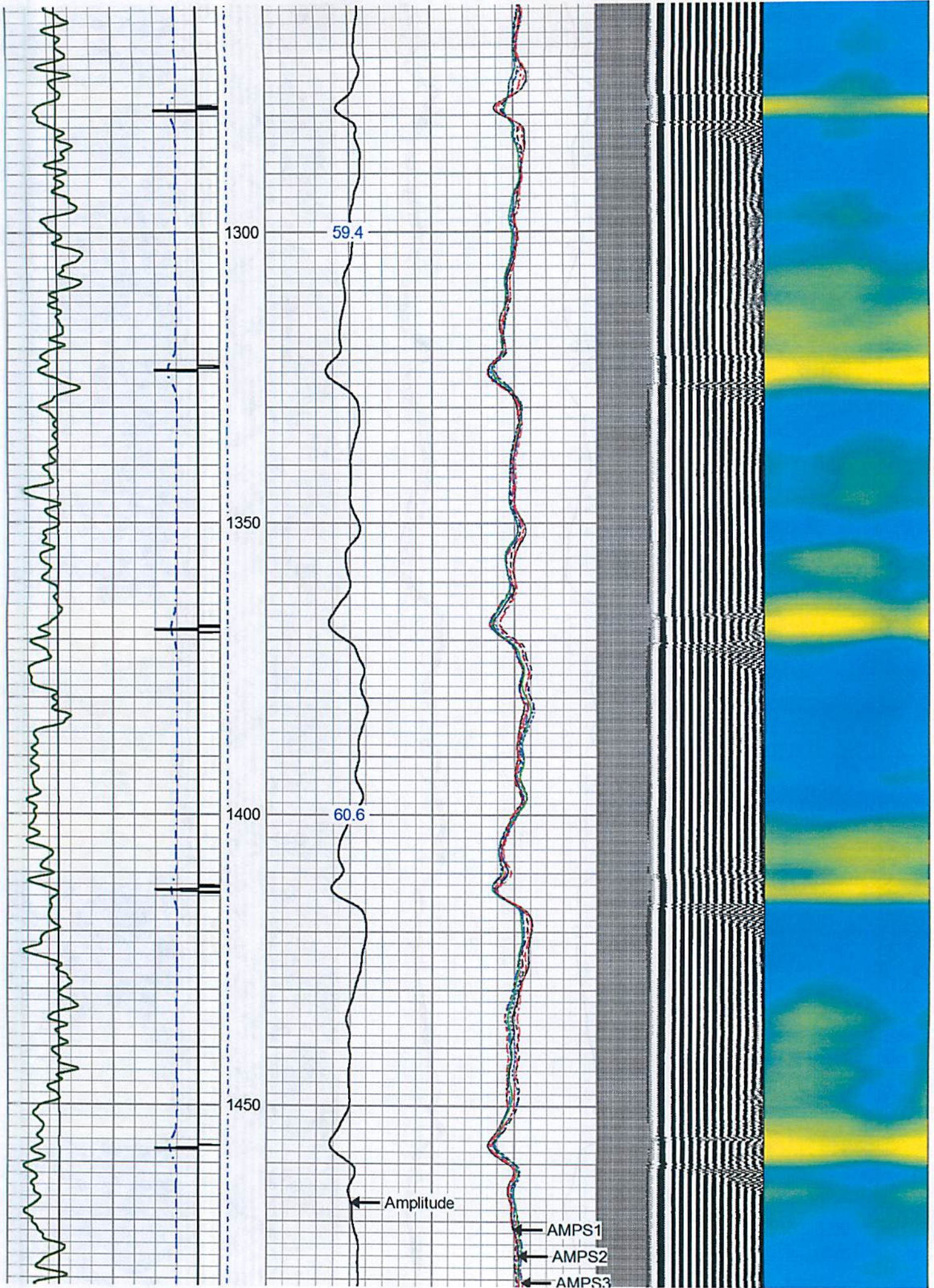


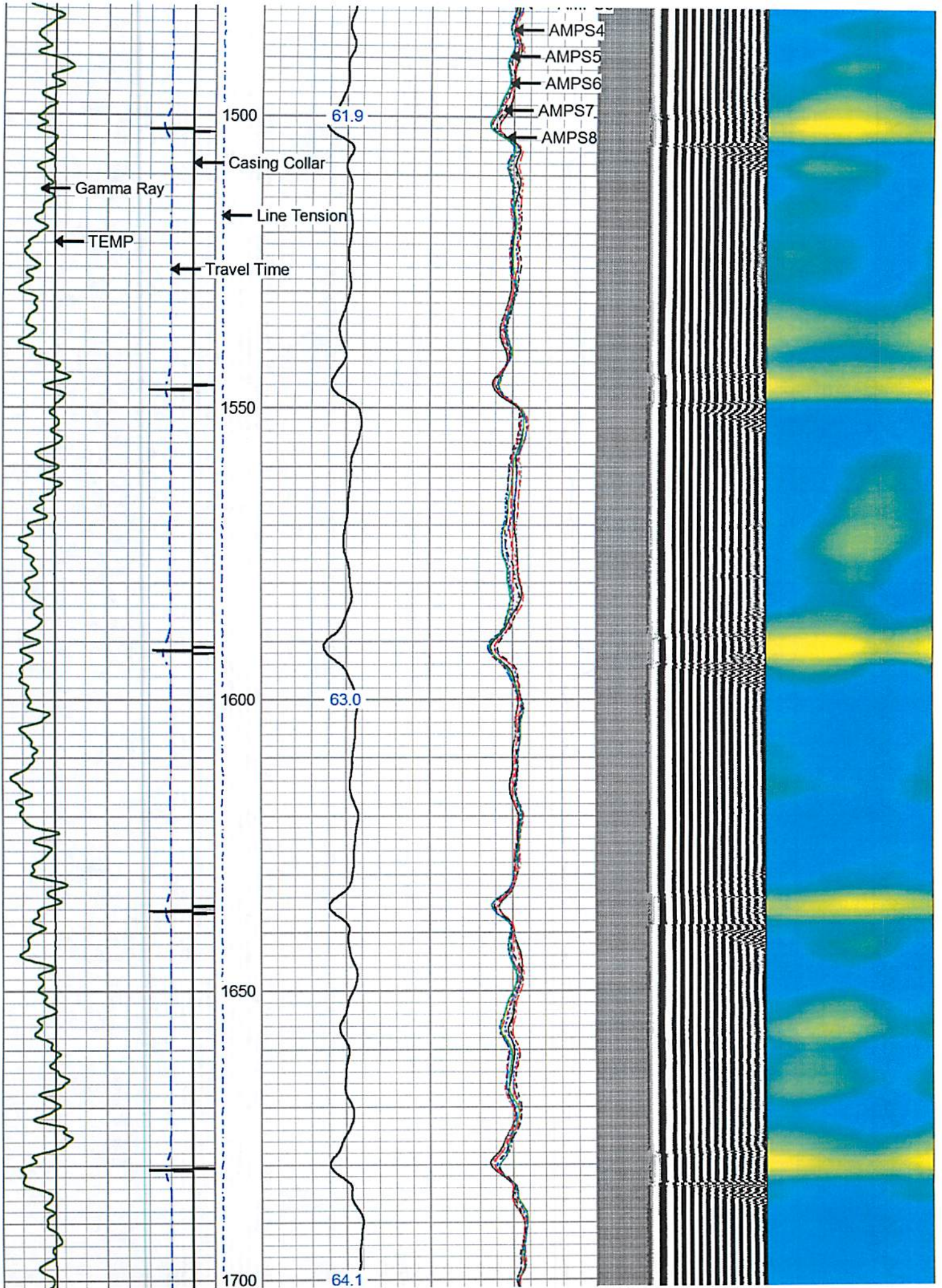


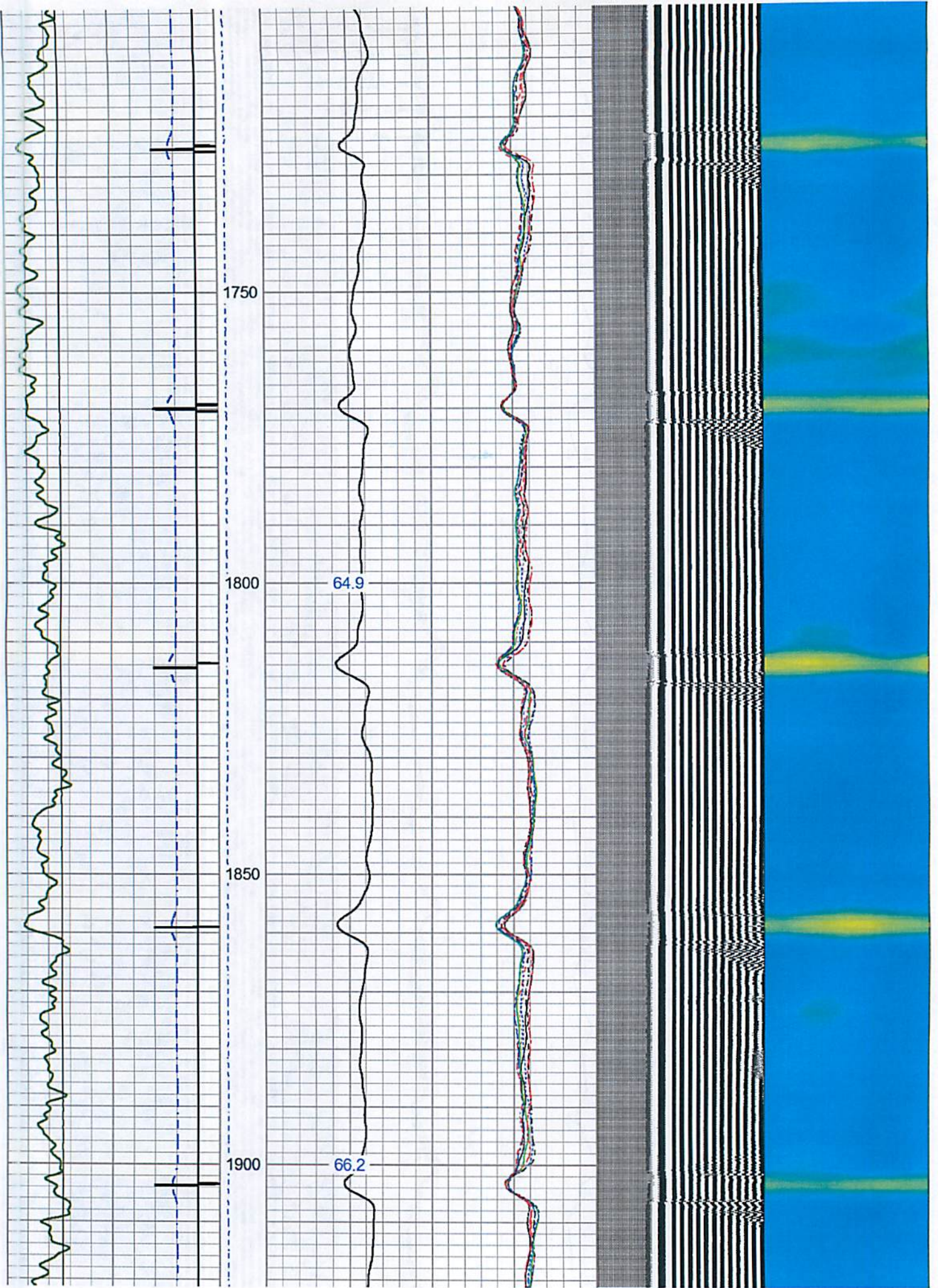


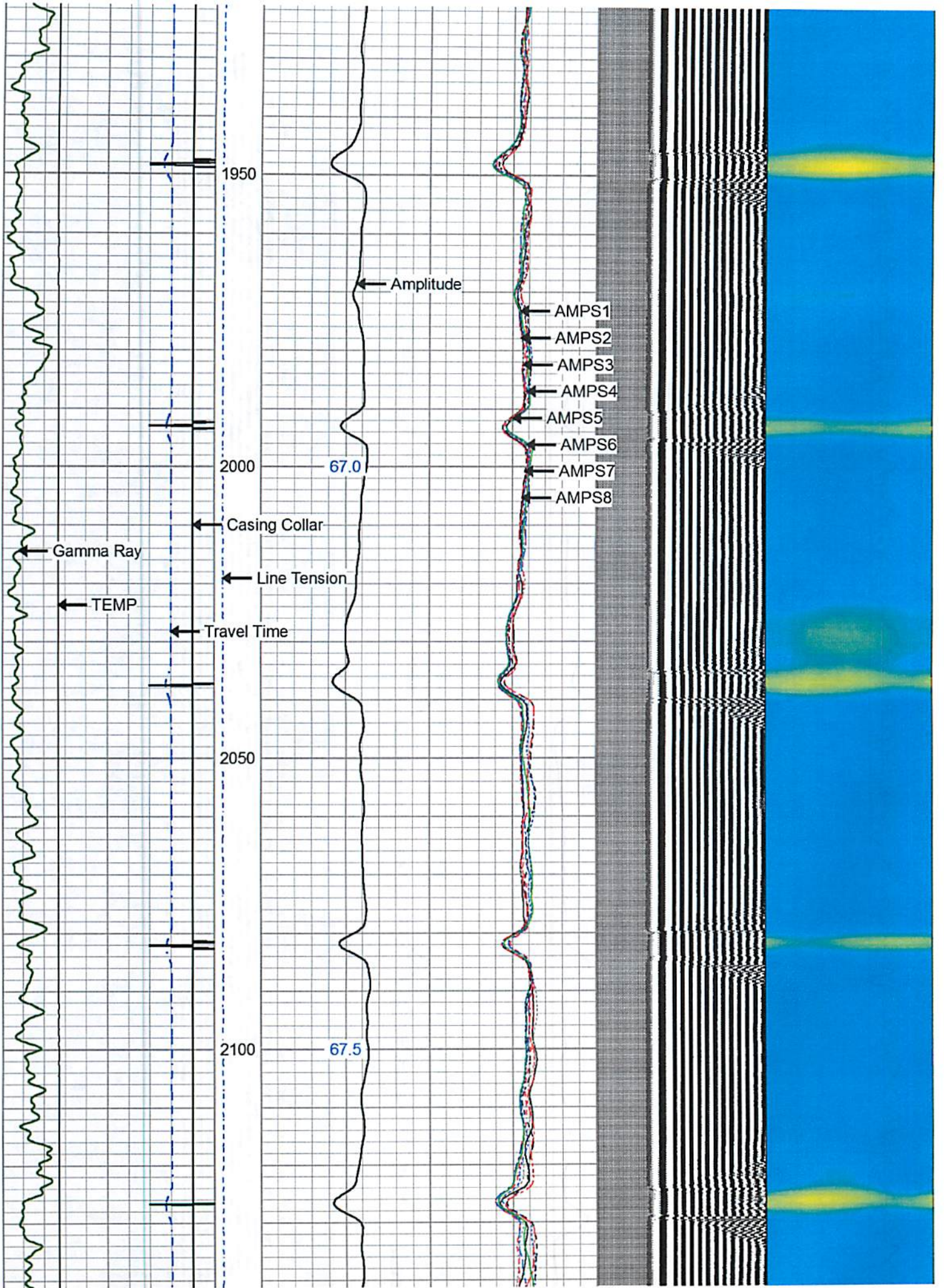


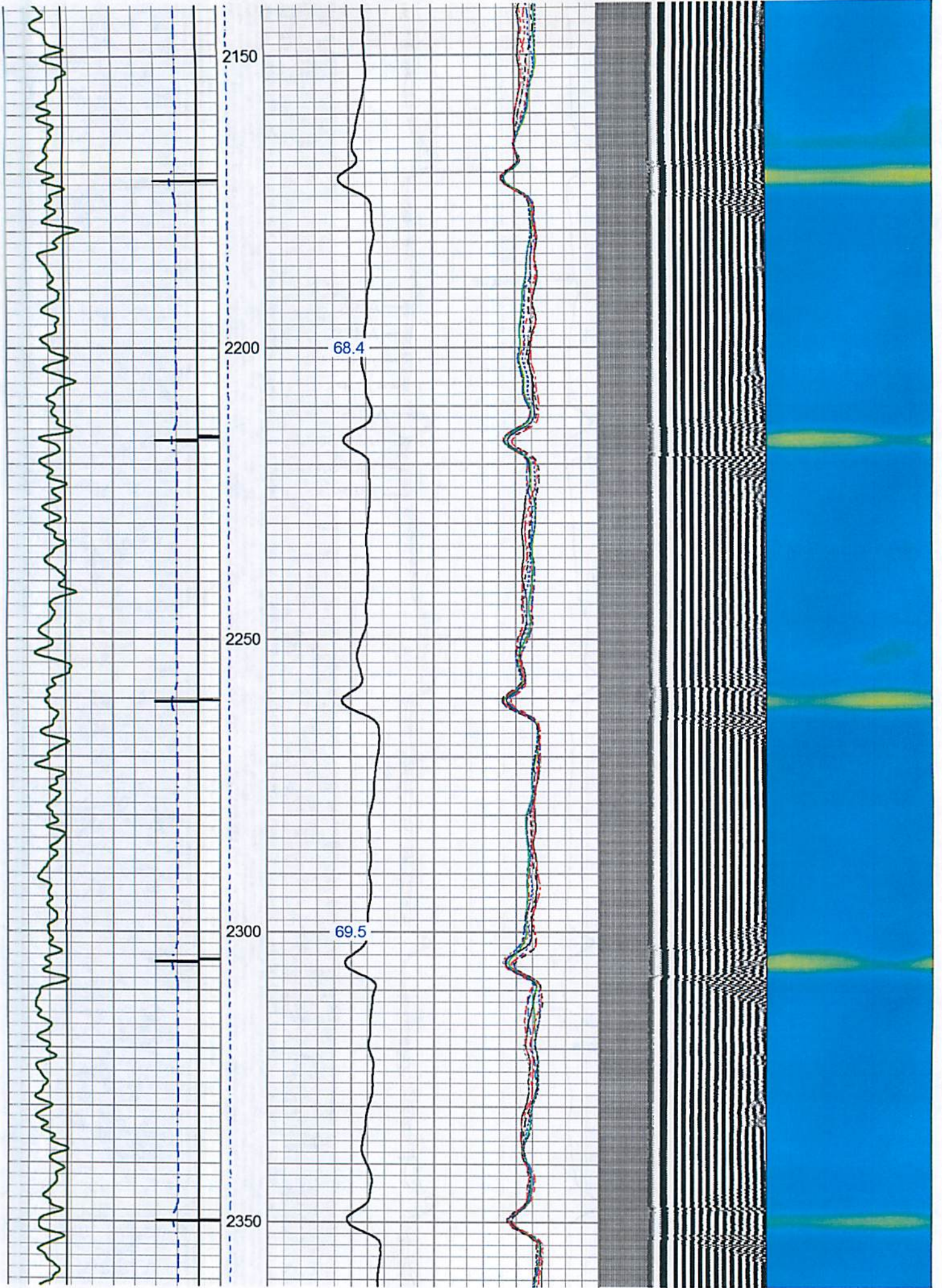


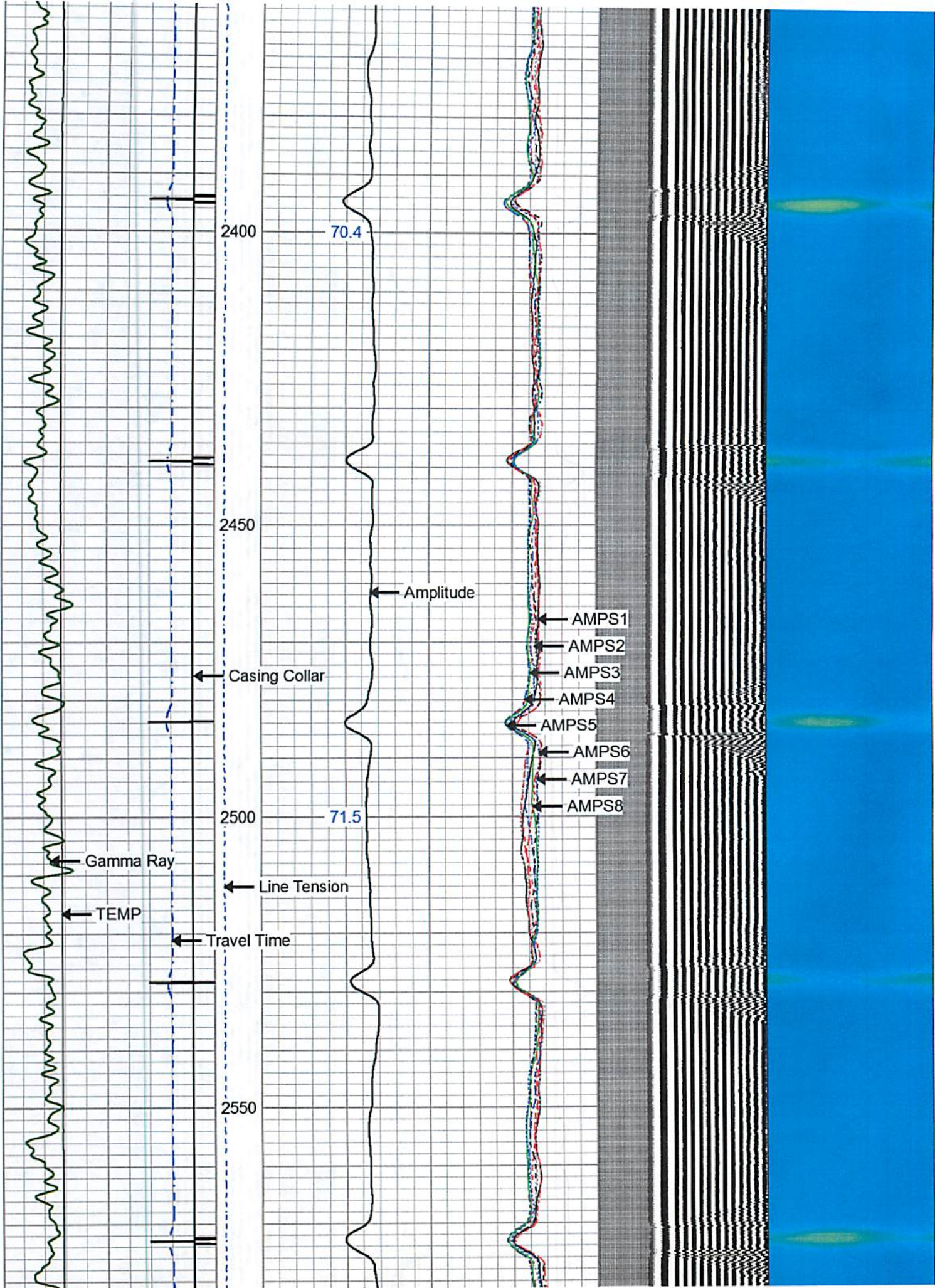


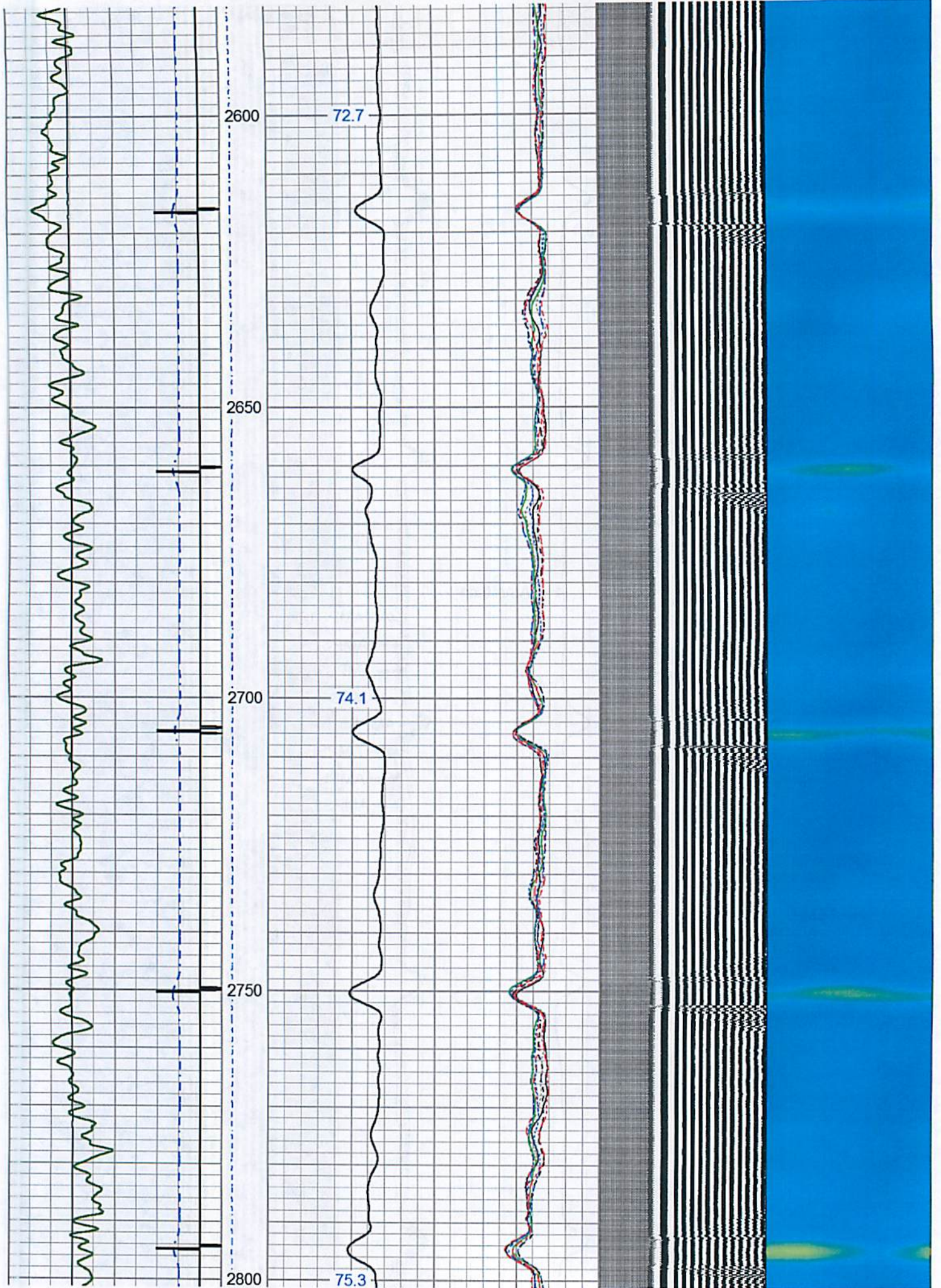


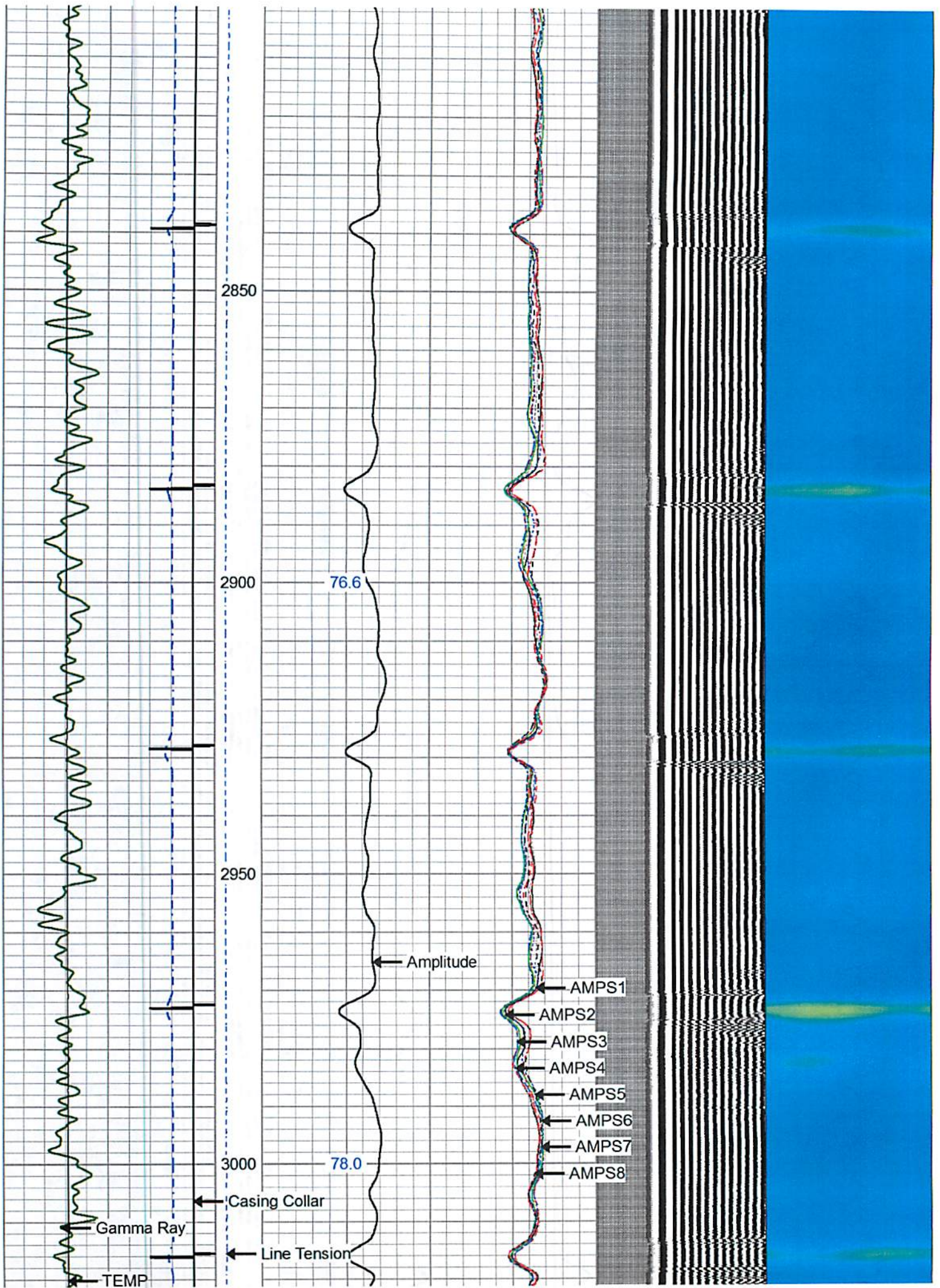


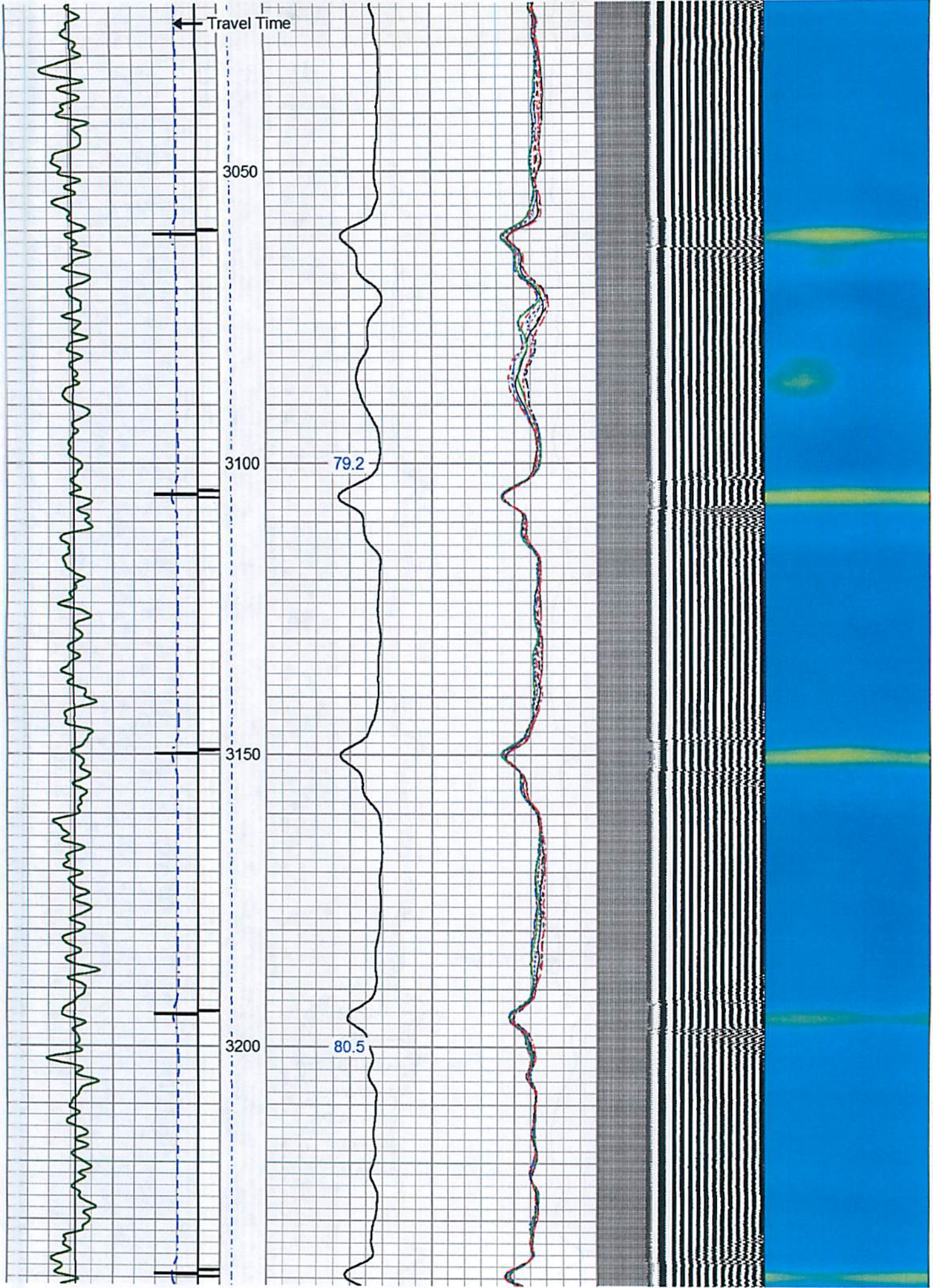


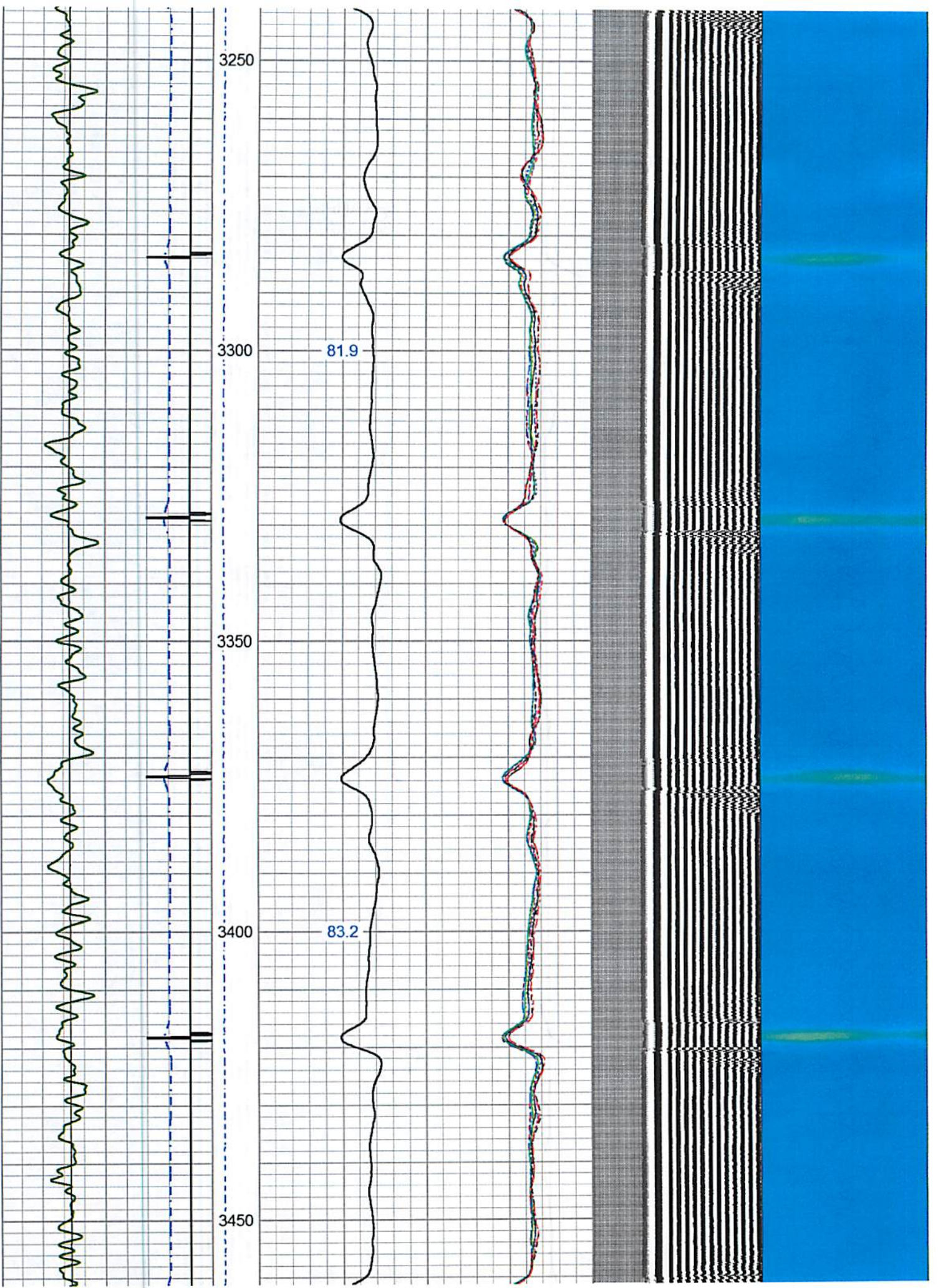


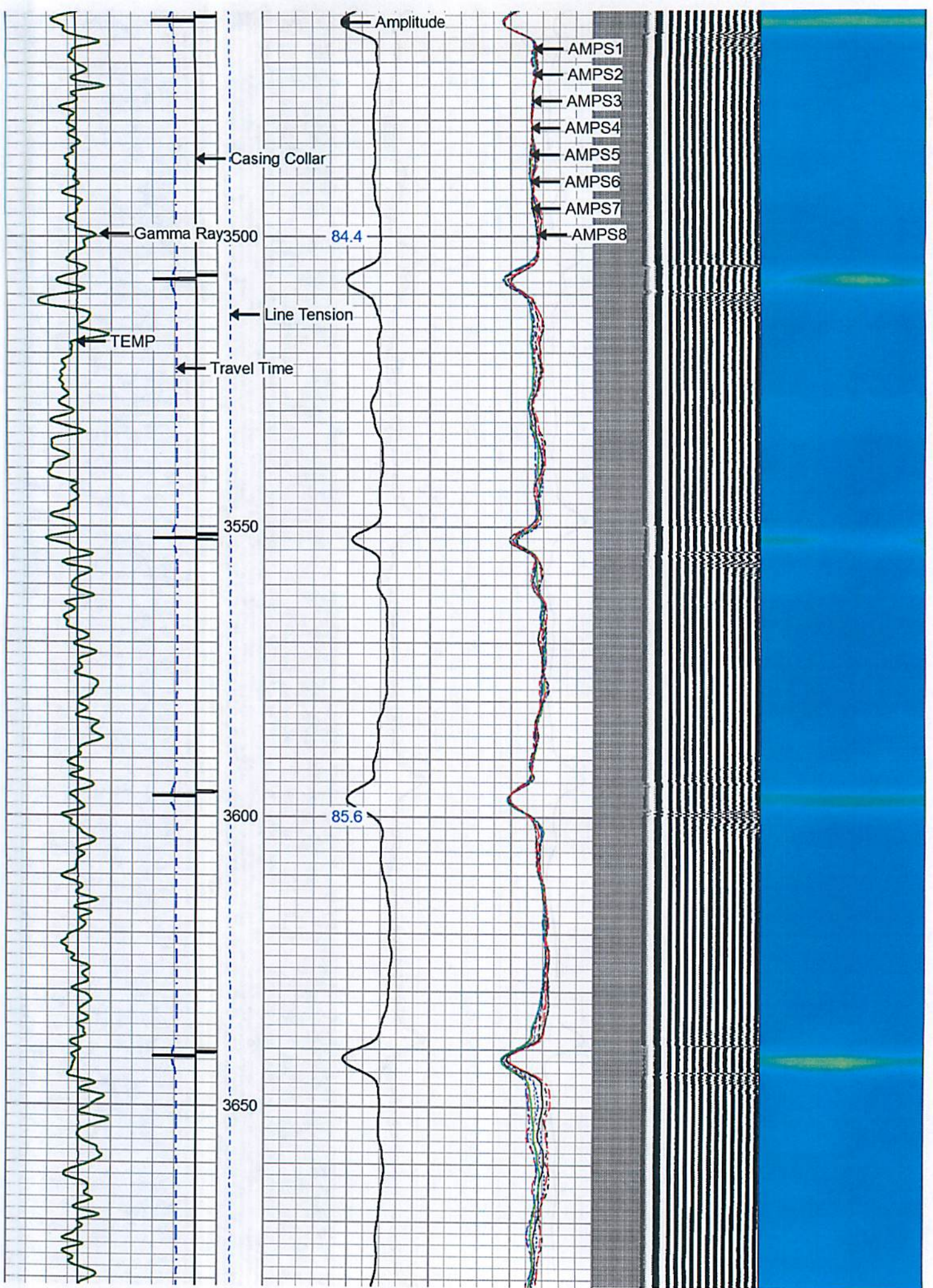


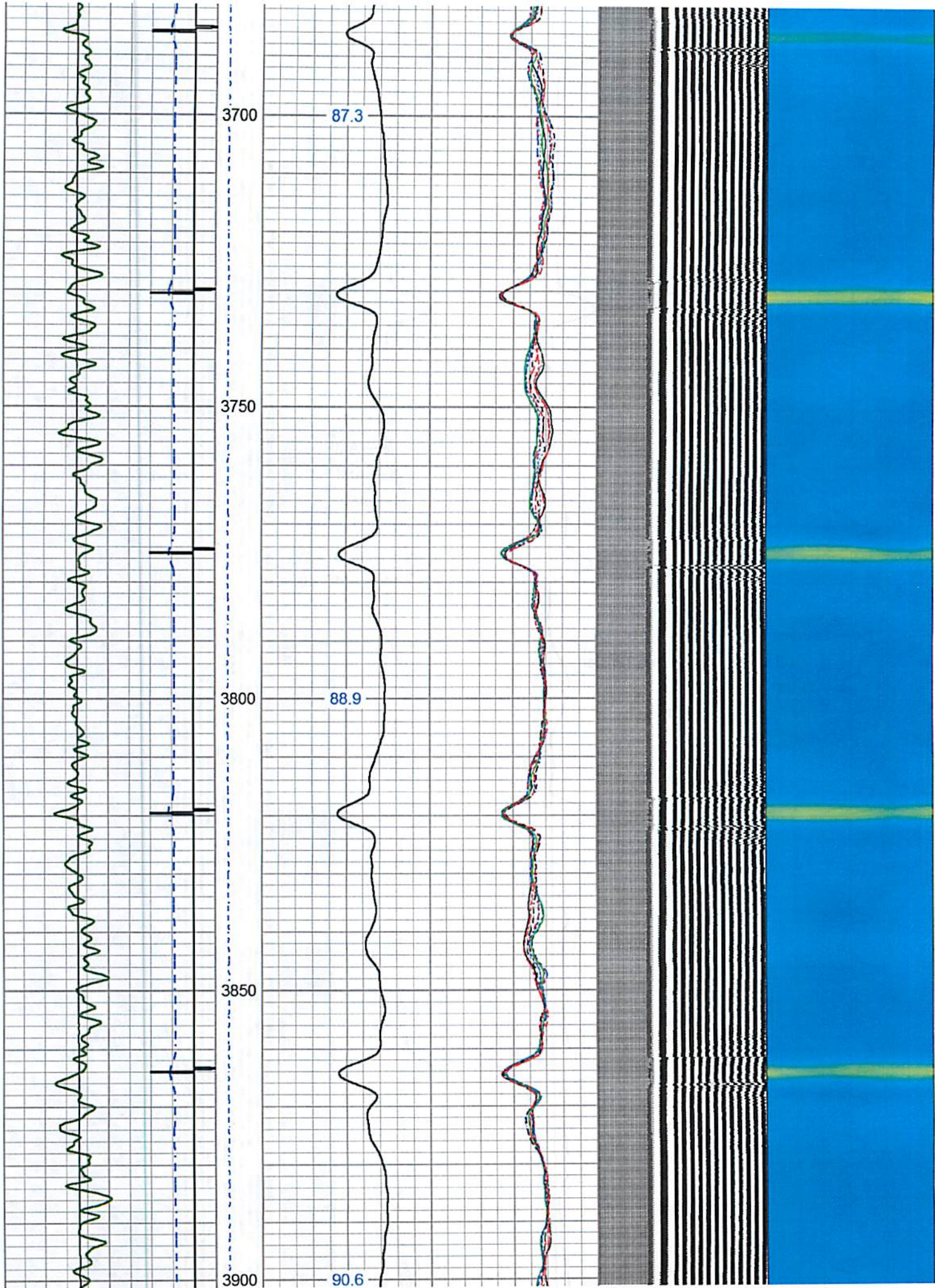


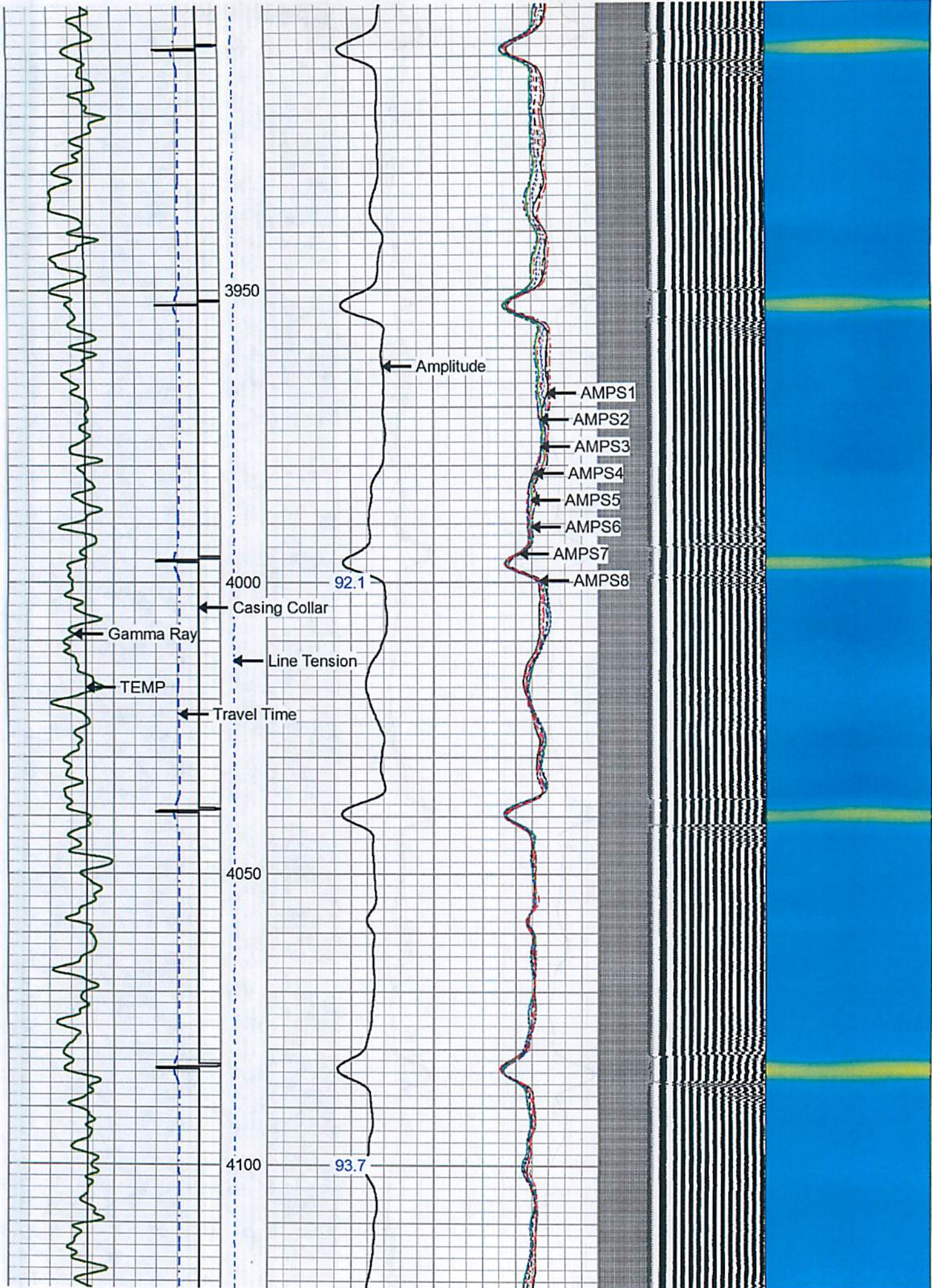


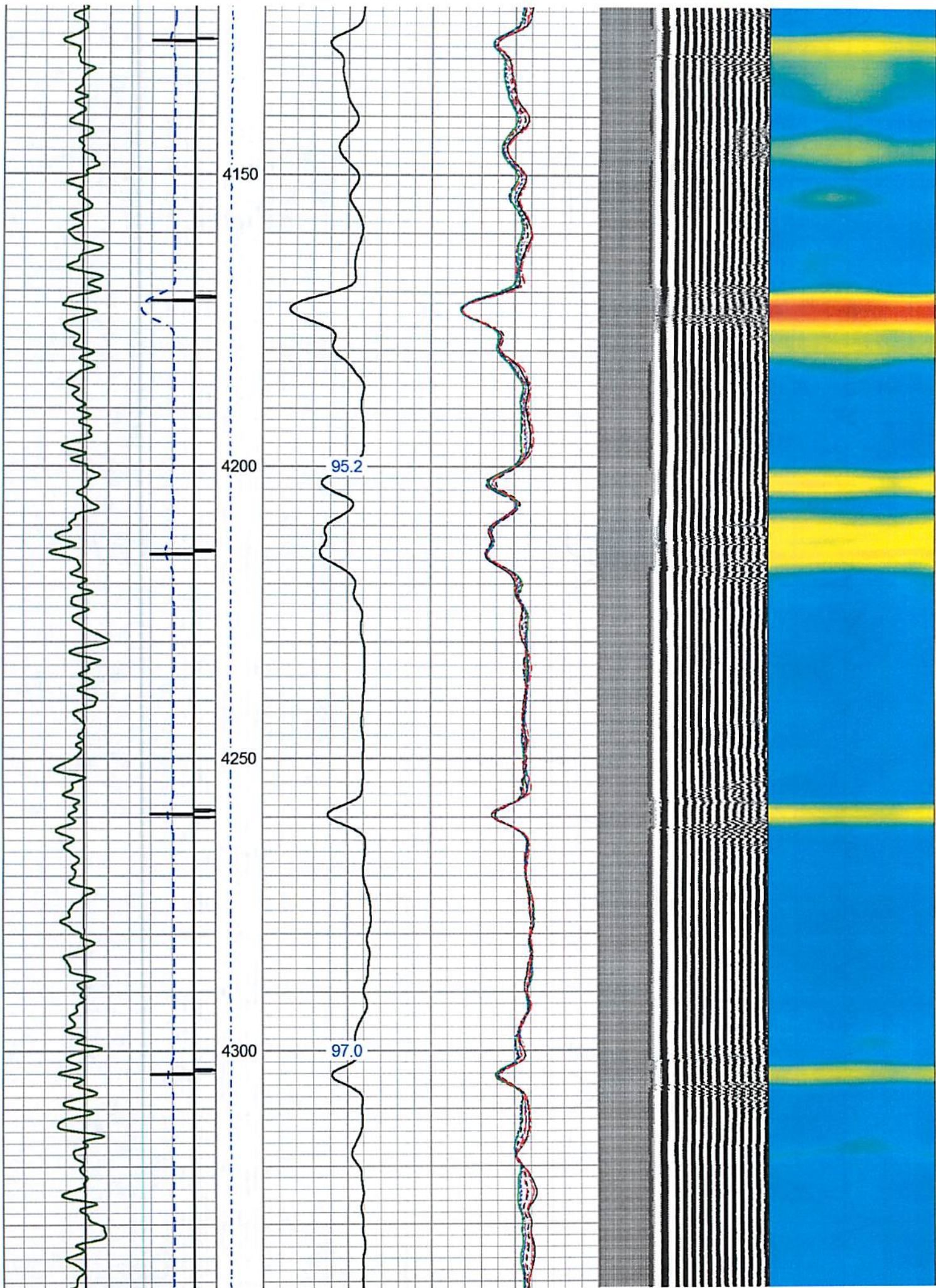


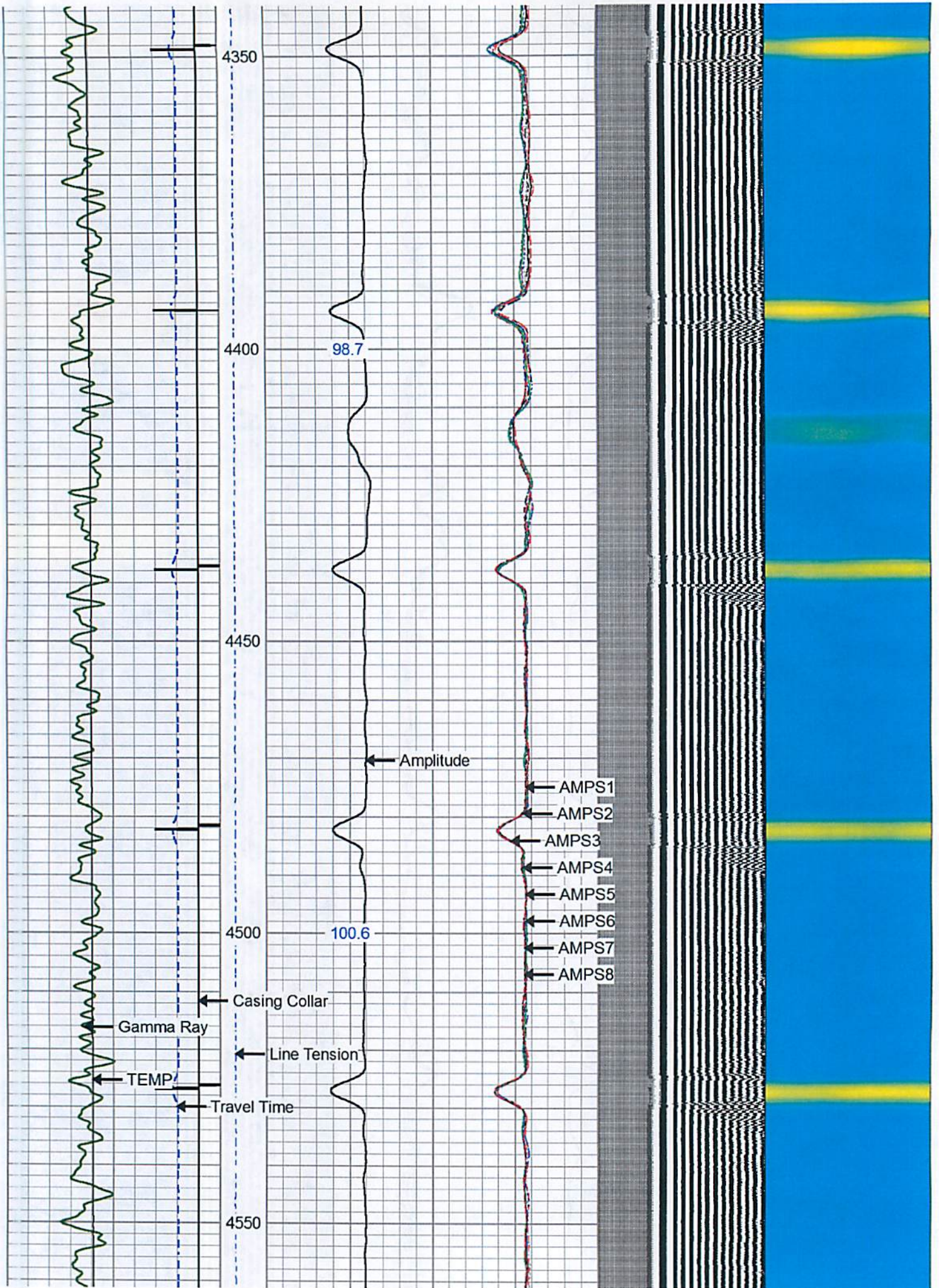


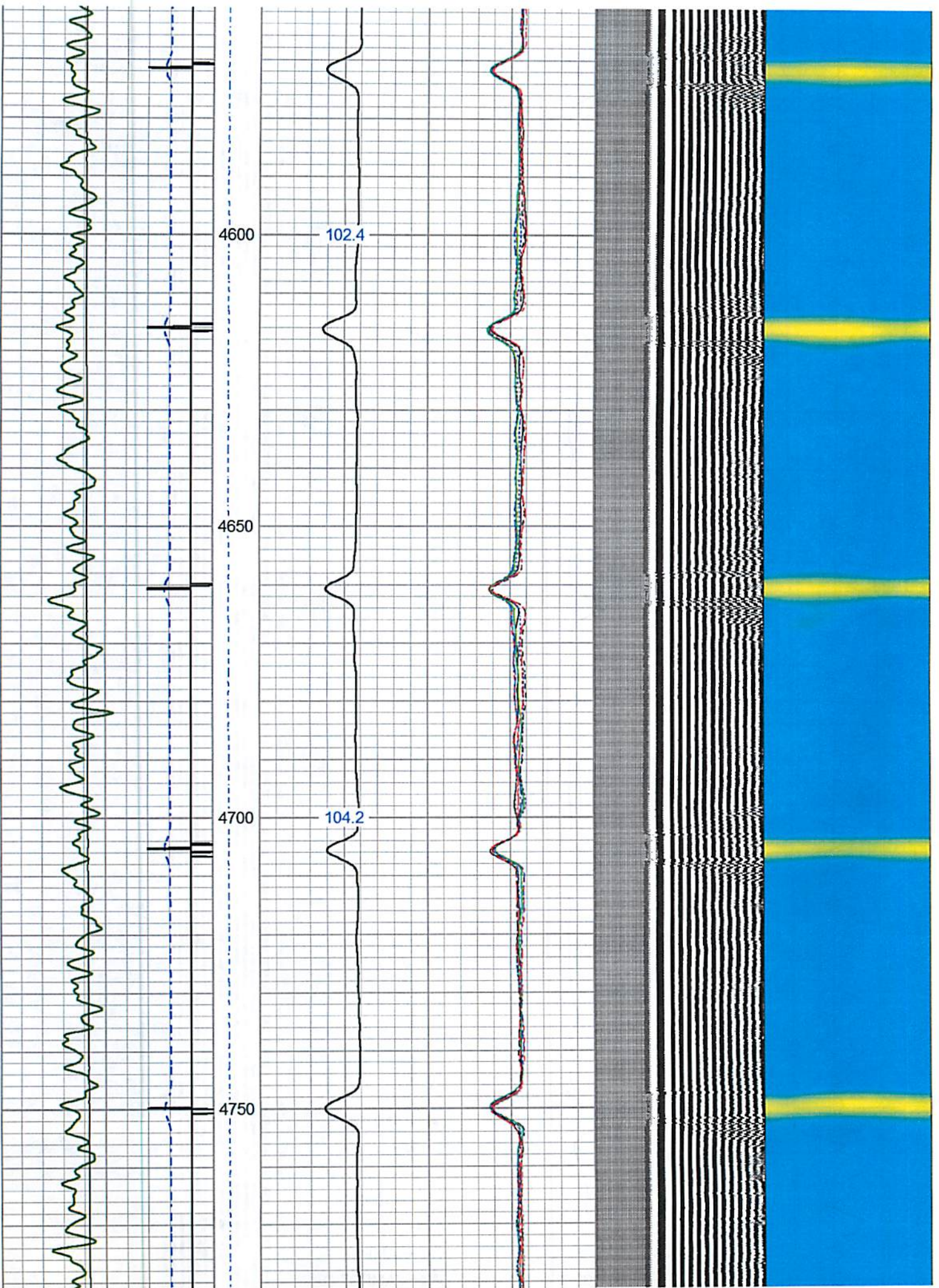


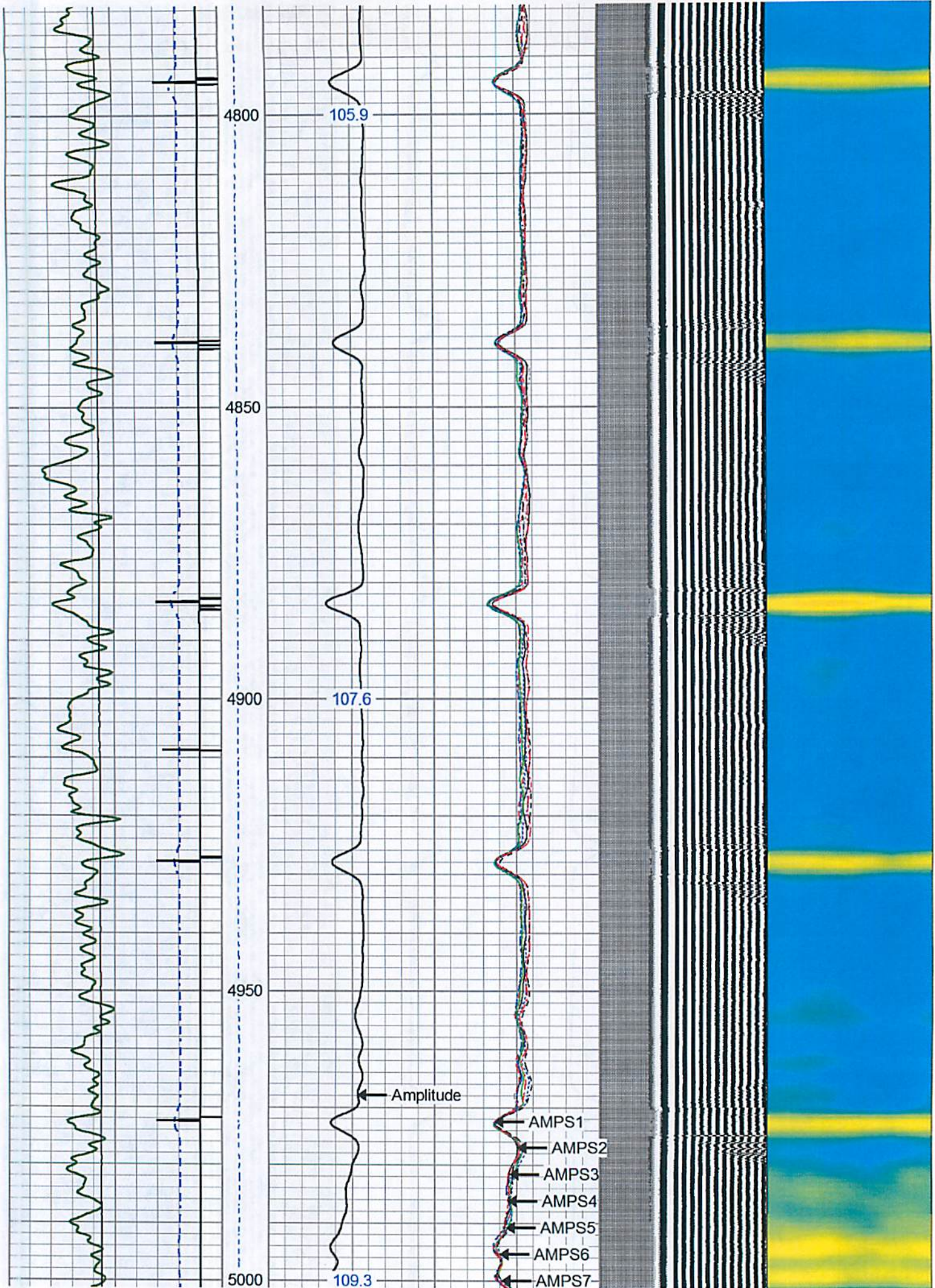


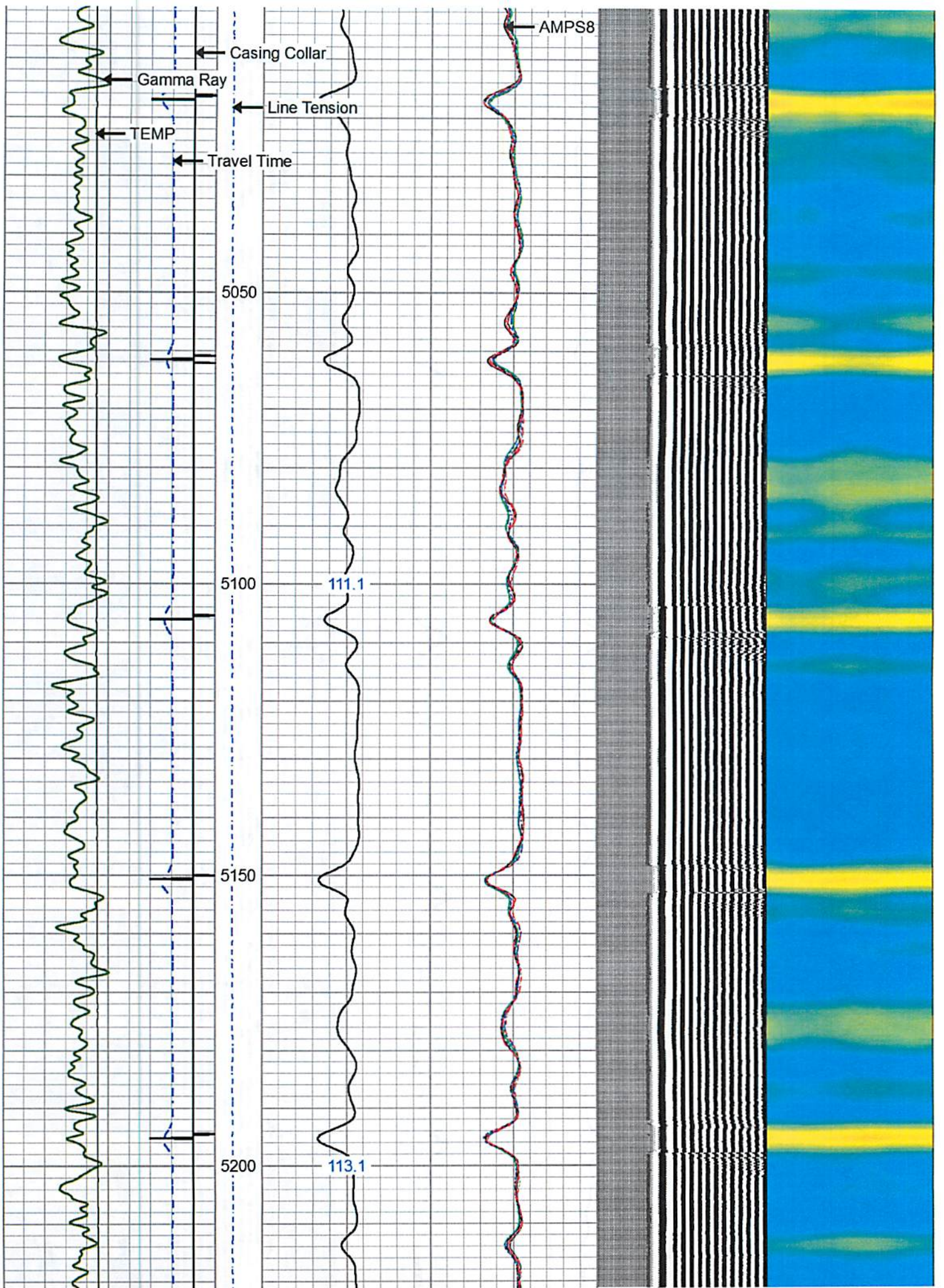


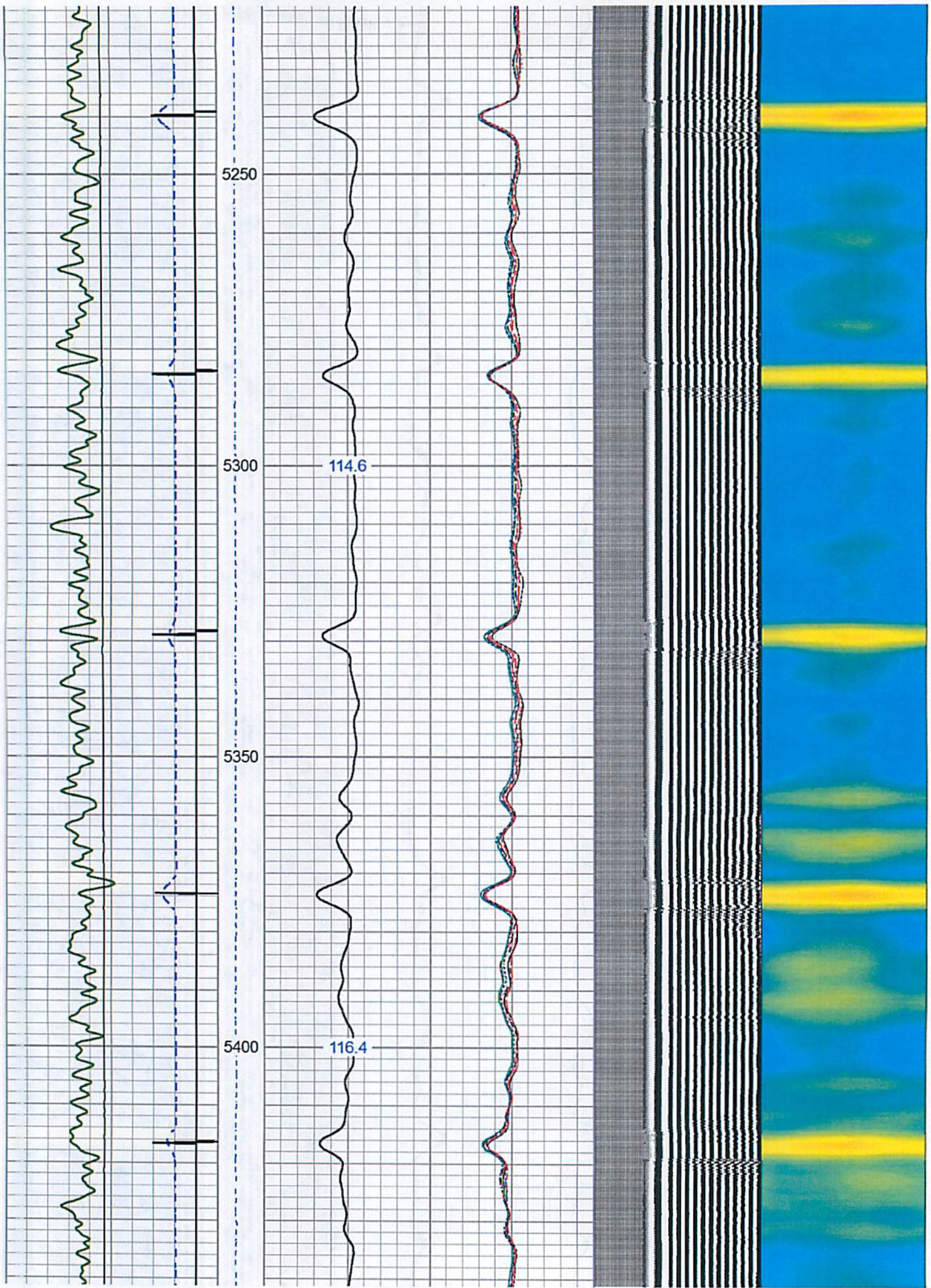


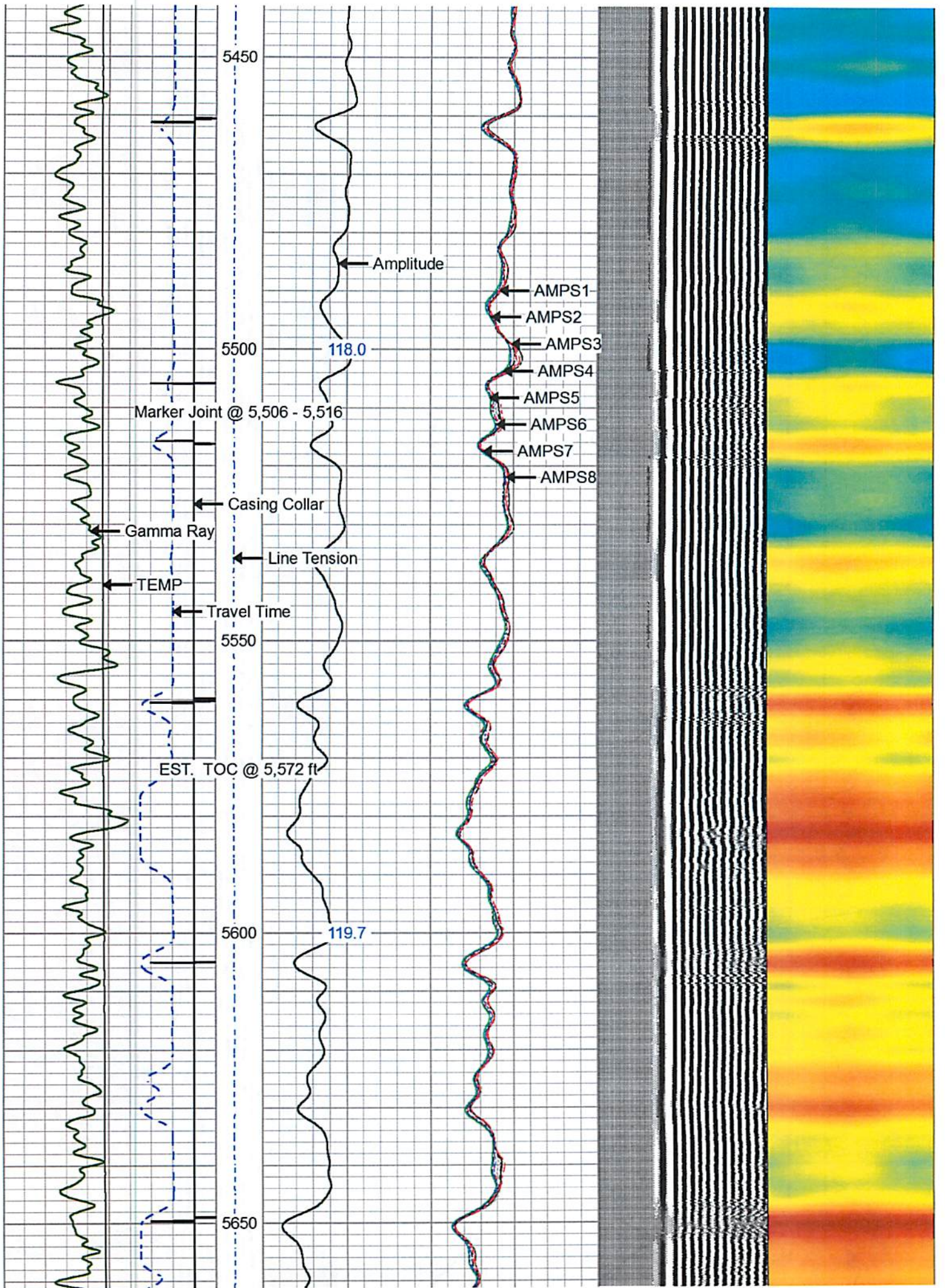


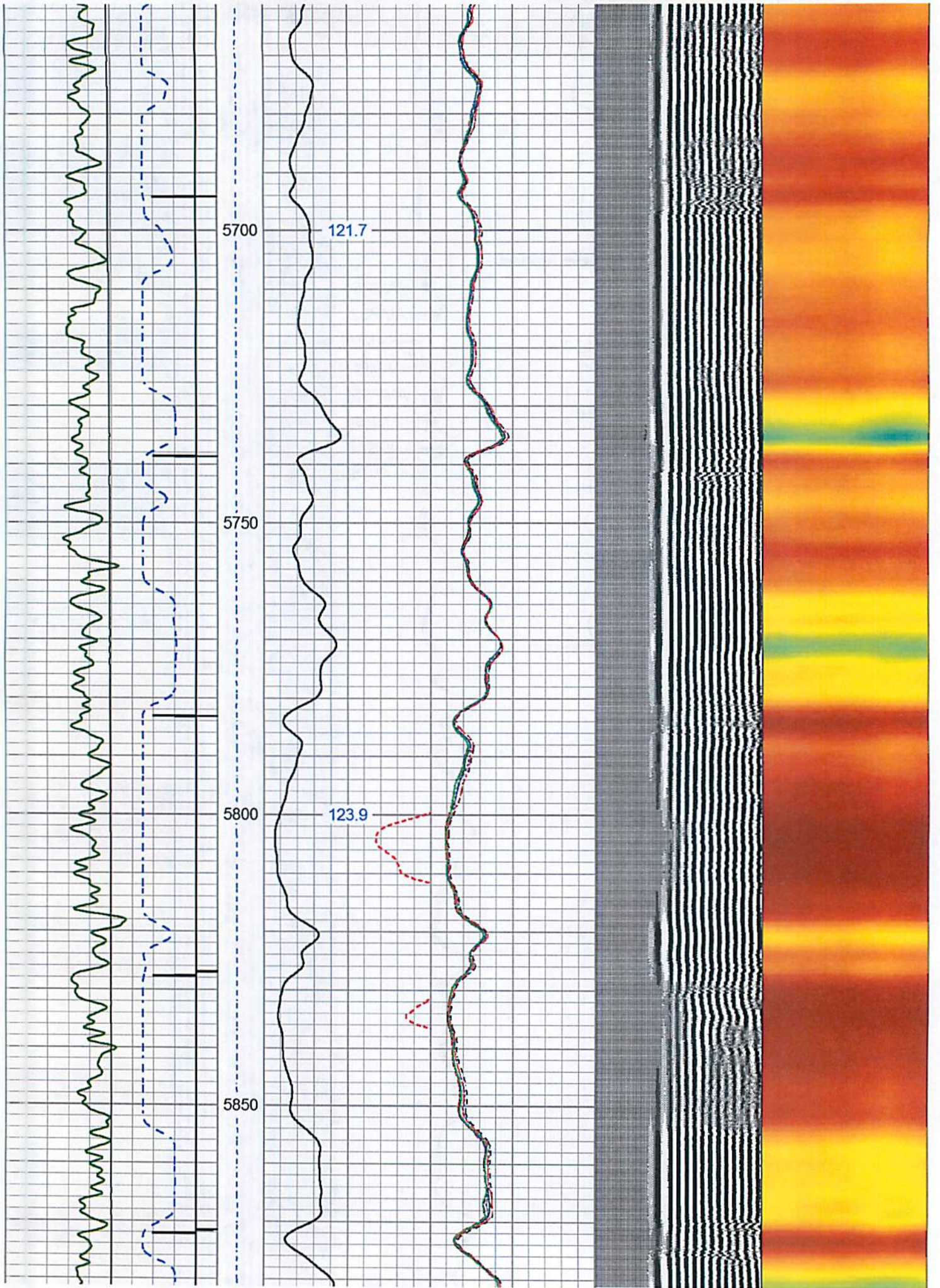


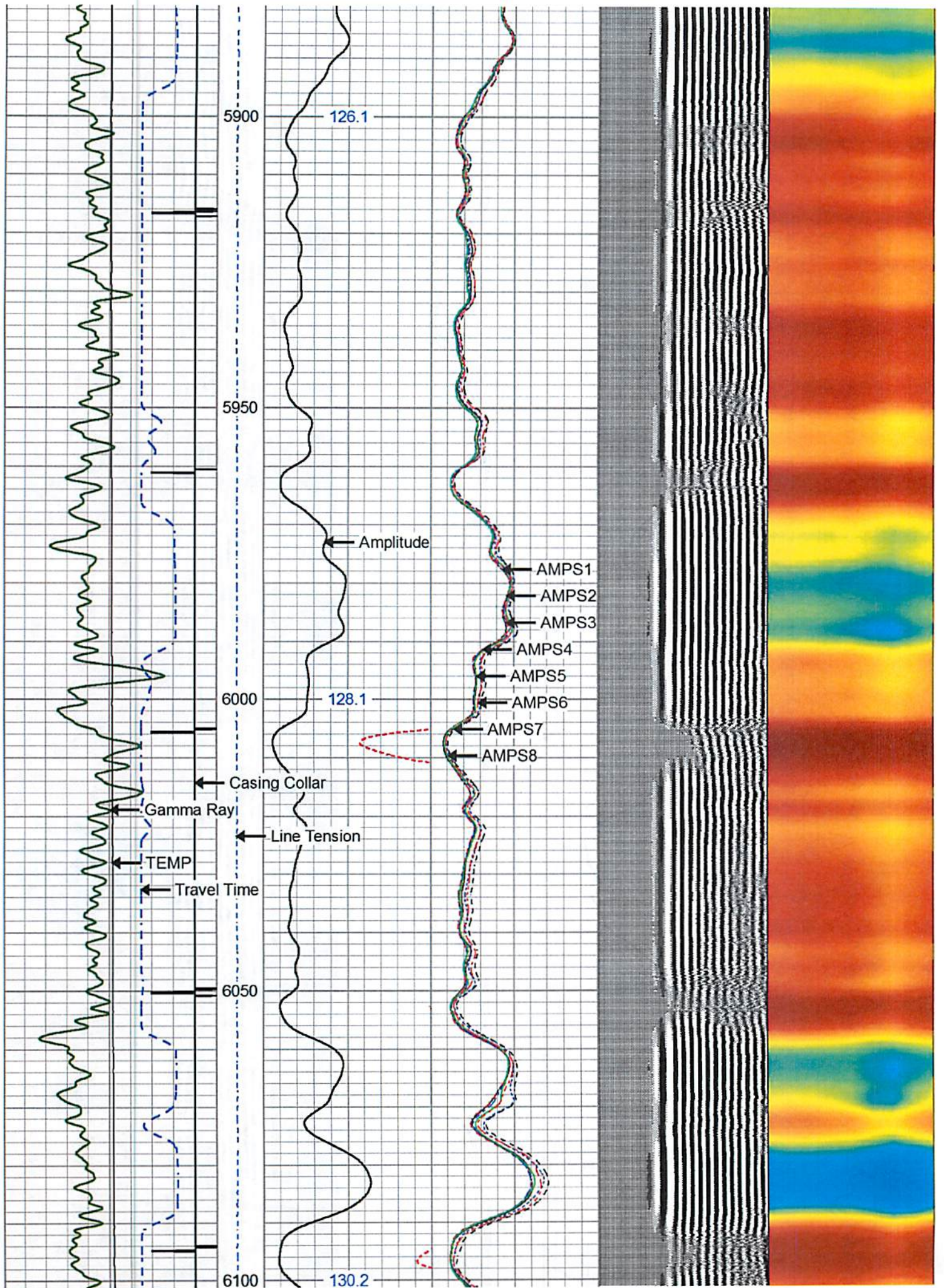


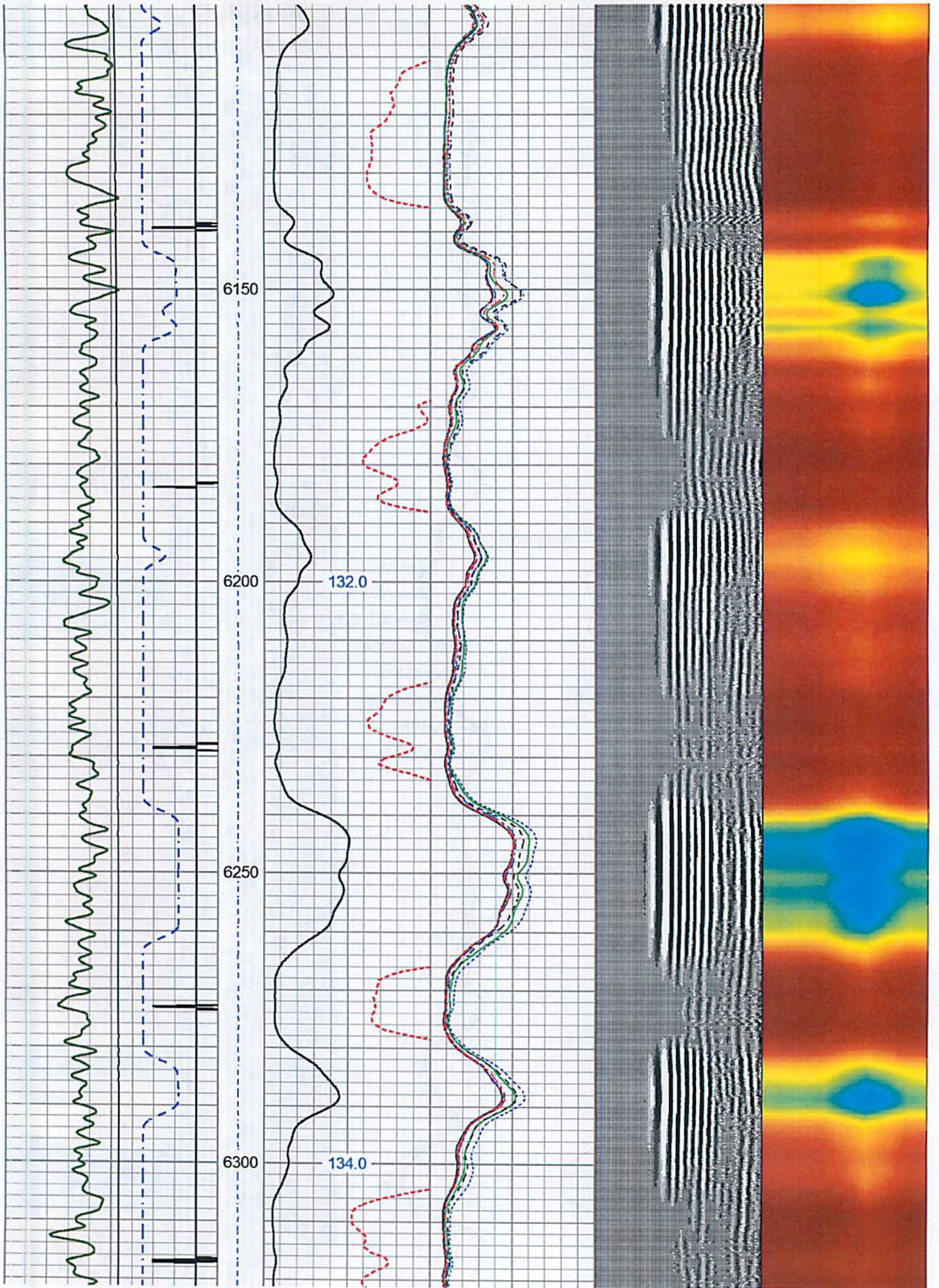


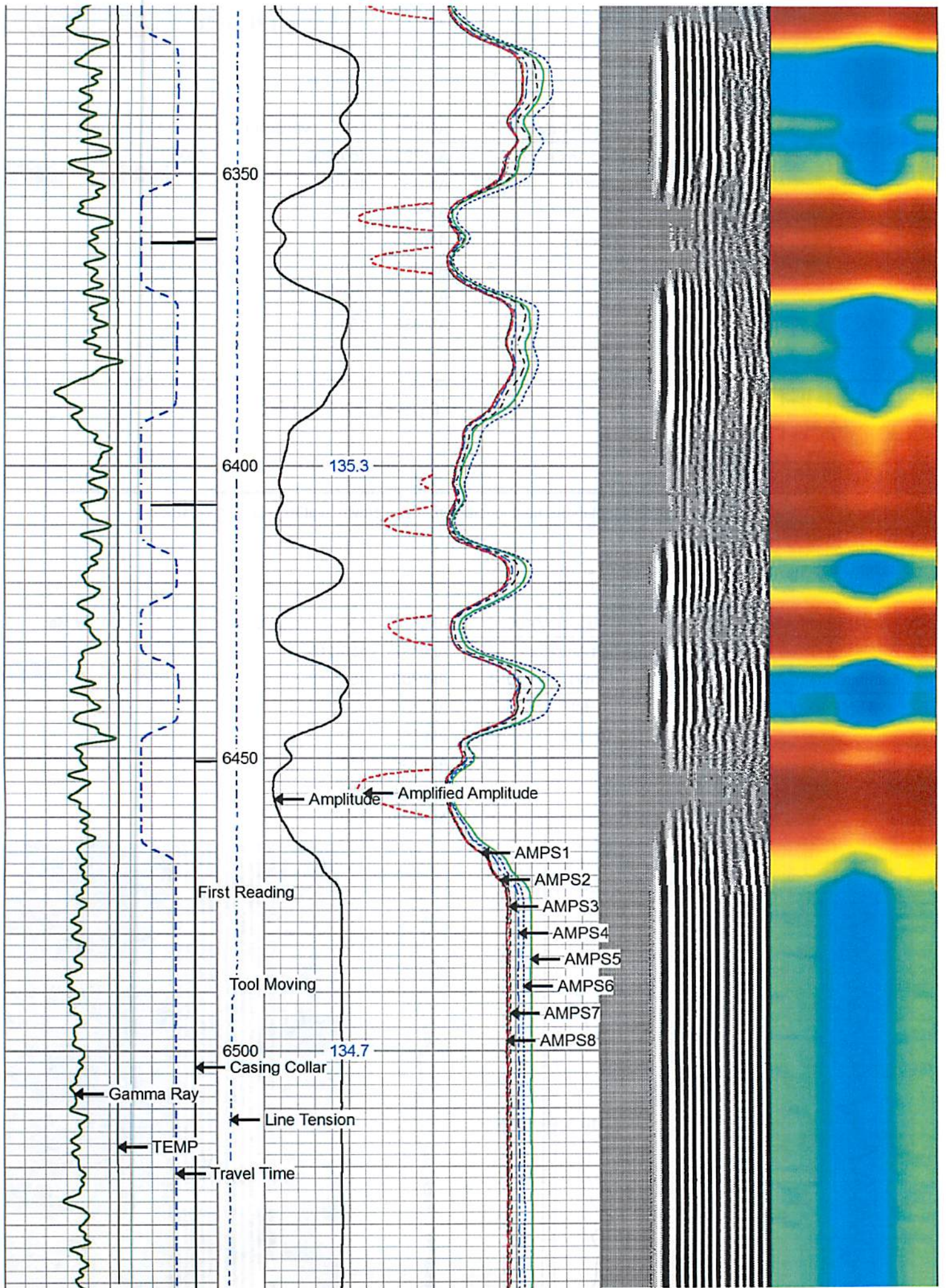


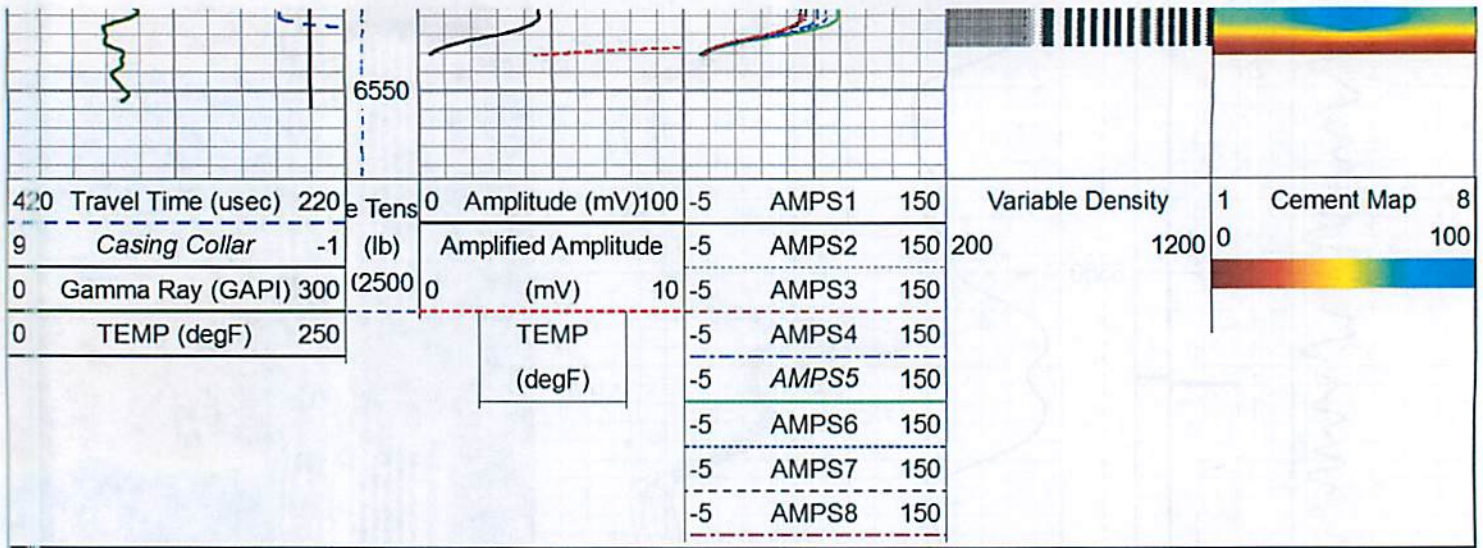










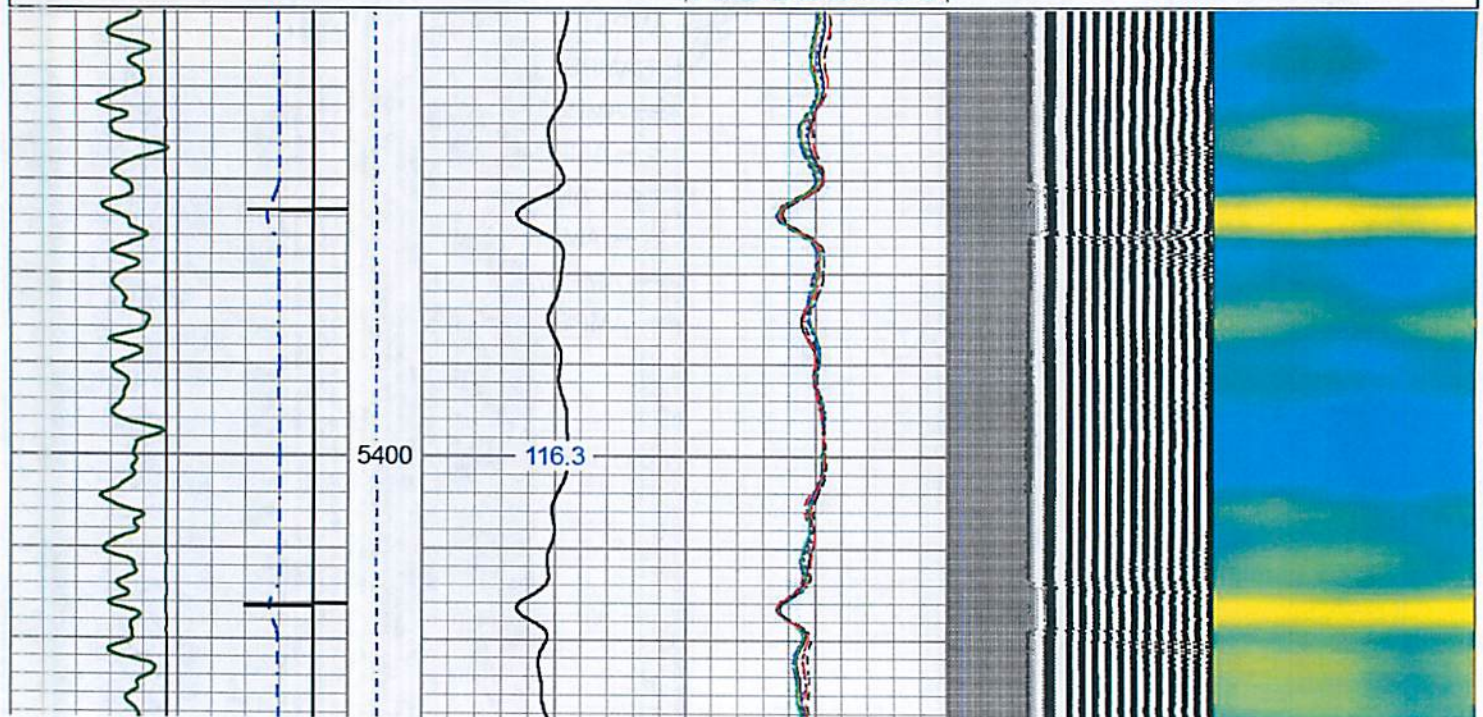
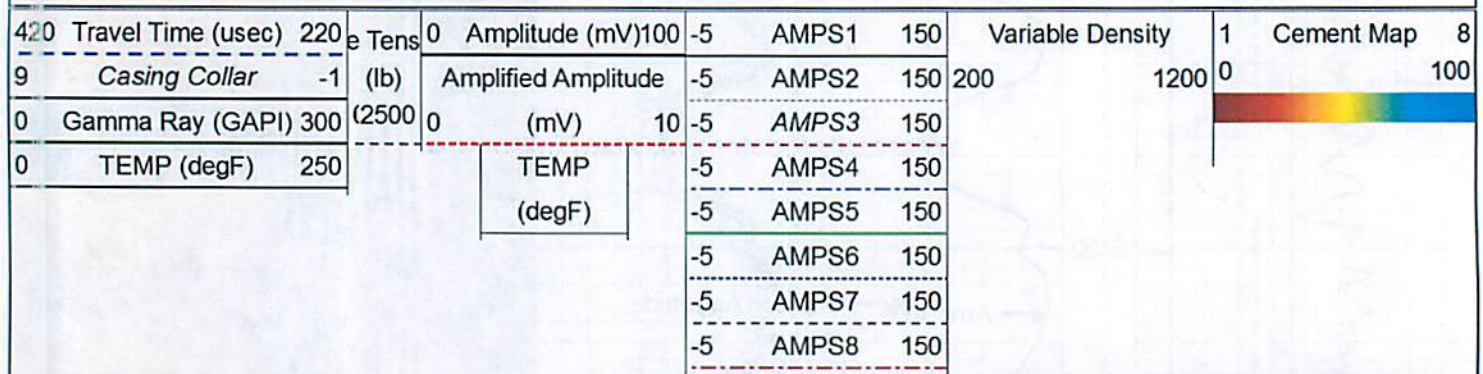


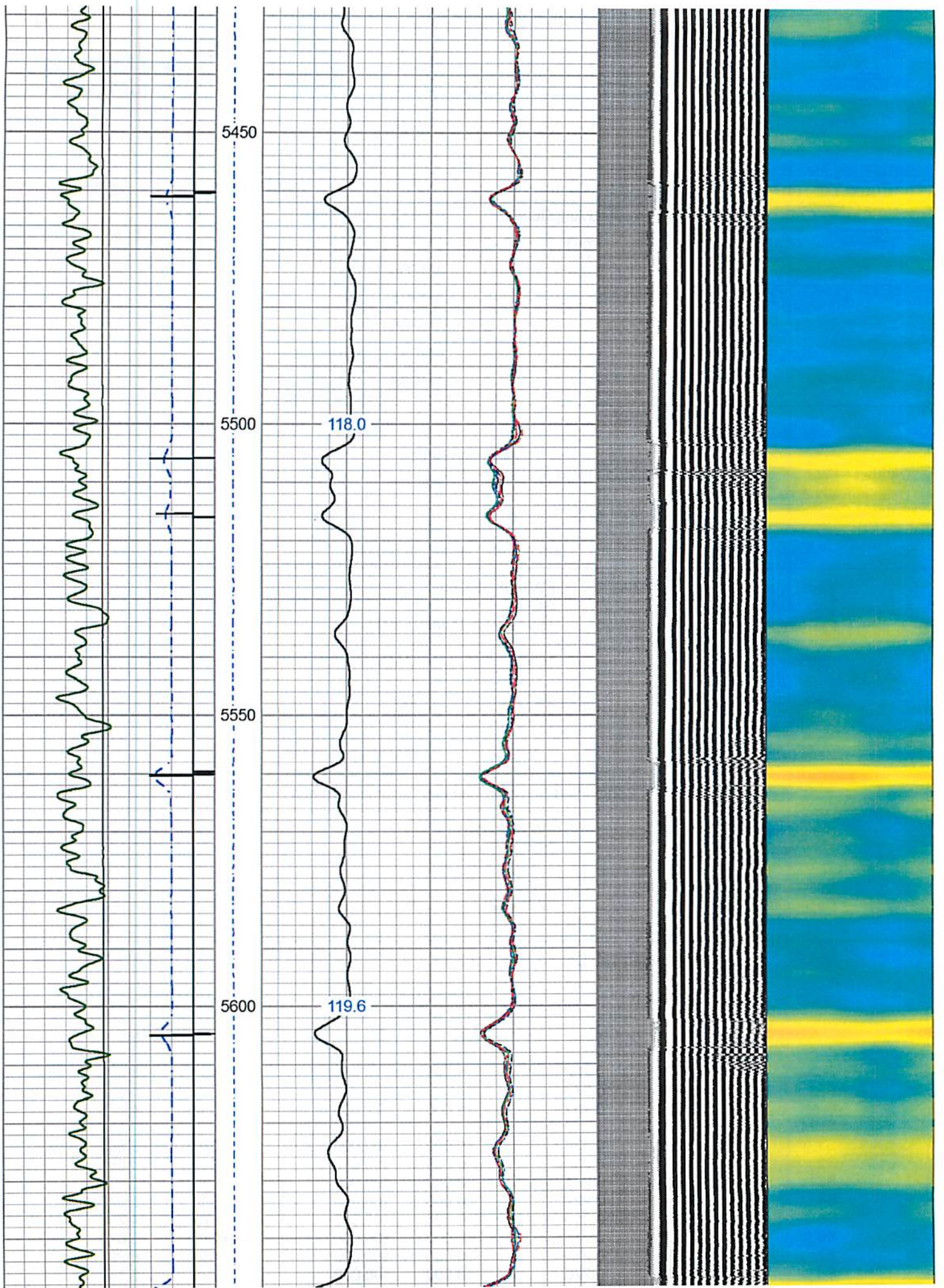
ALLIED HORIZONTAL WIRELINE SERVICES

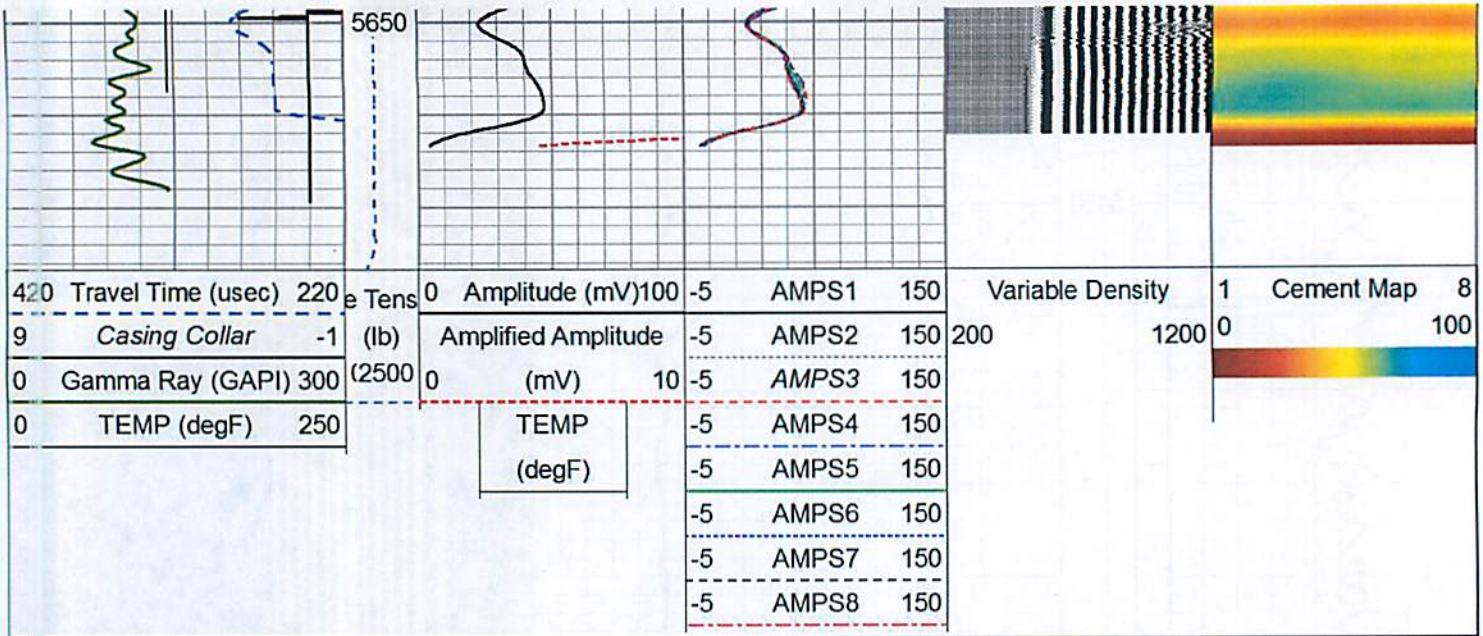
Repeat Pass 0 PSI

Scale 1:240

Database File c:\users\user\desktop\antero neat logs\antero_neat_crown_unit3h_rcbl_12132018.db
 Dataset Pathname pass1
 Presentation Format ahws_rcbl_jc
 Dataset Creation Thu Dec 13 22:30:20 2018
 Charted by Depth in Feet scaled 1:240







Calibration Report

Database File c:\users\user\desktop\lantero neat logs\lantero_neat_crown_unit3h_rcbl_12132018.db
 Dataset Pathname pass3
 Dataset Creation Thu Dec 13 22:39:27 2018

Gamma Ray Calibration Report

Serial Number: FW1408-38 Corr
 Tool Model: GC_C3
 Performed: Thu May 25 15:00:07 2017

Calibrator Value: 1636.0 GAPI

Background Reading: 40.1 cps
 Calibrator Reading: 1964.2 cps

Sensitivity: 0.8503 GAPI/cps

Segmented Cement Bond Log Calibration Report

Serial Number: FW1406-126
 Tool Model: RBTC3 Temp

Calibration Casing Diameter: 5.500 in
 Calibration Depth: 3771.042 ft

Master Calibration, performed Thu Dec 13 19:57:22 2018:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.009	0.222	1.000	72.000	306.461	3.836
CAL	-0.010	0.372				
5'	-0.009	0.182	1.000	72.000	373.032	4.215
SUM						
S1	-0.009	0.234	0.000	100.000	412.010	3.596
S2	-0.012	0.235	0.000	100.000	404.344	4.985
S3	-0.013	0.231	0.000	100.000	410.133	5.132
S4	-0.014	0.227	0.000	100.000	414.638	5.942
S5	-0.011	0.219	0.000	100.000	435.675	4.760
S6	-0.011	0.211	0.000	100.000	449.271	5.073
S7	-0.014	0.214	0.000	100.000	438.450	6.294
S8	-0.012	0.220	0.000	100.000	430.795	5.374

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	-0.010	0.372	1.000	0.000

Air Zero Calibration, performed Thu Feb 15 08:40:59 2018:

	Raw (v)		Calibrated (v)		Results	
	Zero		Zero		Offset	
3'	0.000		0.000		0.000	
5'	0.000		0.000		0.000	
SUM						
S1	0.000		0.000		0.000	
S2	0.000		0.000		0.000	
S3	0.000		0.000		0.000	
S4	0.000		0.000		0.000	
S5	0.000		0.000		0.000	
S6	0.000		0.000		0.000	
S7	0.000		0.000		0.000	
S8	0.000		0.000		0.000	

Log Variables

Database:\users\user\desktop\antero neat logs\antero_neat_crown_unit3h_rcbl_12132018.db
Dataset field/well/run1/pass3/_vars_

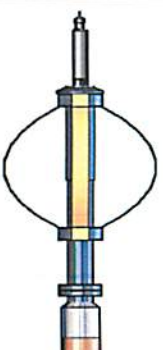
Top - Bottom

BHTEMP_Src	BOREID in	BOTTEMP degF	CASEOD in	CASETHCK in	CASEWGHT lb/ft	MAXAMPL mV	MINAMPL mV
TEMP	8.625	135	5.5	0.415	23	72	1
MINATTN db/ft	PERFS	PPT usec	SRFTEMP degF	TDEPTH ft			
0.8	0	260	0	0			

Variable Description

BHTEMP_Src : BHTEMP Input Source Selector
BOREID : Borehole I.D.
BOTTEMP : Bottom Hole Temperature
CASEOD : Casing O.D.
CASETHCK : Casing Thickness
CASEWGHT : Casing Weight
MAXAMPL : Maximum Amplitude

MINAMPL : Minimum Amplitude
MINATTN : Minimum Attenuation
PERFS : Perforation Flag
PPT : Predicted Pipe Time
SRFTEMP : Surface Temperature
TDEPTH : Total Depth

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
			CHD-STNDRD (GOI) Standard Cable Head	1.00	1.69	10.00
			CENT-Probe275 Probe 2.75" 4 Arm Bow Spring Centralizer	2.88	1.69	36.00

Temp	17.35					
WVFS8	15.12		RBT-RBTC3 Temp (FW1406-126) Probe 2.75" Corrosion RCBL With Integral Temp Sub	9.39	2.75	90.00
WVFS7	15.12					
WVFS6	15.12					
WVFS5	15.12					
WVFS4	15.12					
WVFS3	15.12					
WVFS2	15.12					
WVFS1	15.12					
WVFCAL	15.12					
WV3FT	15.12					
WV5FT	14.12					
			CENT-Probe275 Probe 2.75" 4 Arm Bow Spring Centralizer	2.88	1.69	36.00
CCL	7.09					
GR	6.01		GR-GC_C3 (FW1408-38 Corr) Probe 2.75" Gamma Ray-CCL Corrosion Modified	5.10	2.75	55.00
			CENT-Probe275 Probe 2.75" 4 Arm Bow Spring Centralizer	2.88	1.69	36.00

Dataset: antero_neat_crown_unit3h_rcbl_12132018.db: field/well/run1/pass3
 Total length: 24.15 ft
 Total weight: 263.00 lb
 O.D.: 2.75 in

	Company	Antero Resources	
	Well	Crown 3H	
	Field	Marcellus	
	County	Tyler	
	State	West Virginia	Country