

Radial Cement Bond Log Gamma Ray / CCL Temperature

Company Antero Resources
Well Jack 1H
Field Marcellus
County Tyler
State West Virginia

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Location: API #: 4709502461
Latitude:
Longitude:
SEC TWP RGE
Permanent Datum Log Measured From
Drilling Measured From
Ground Level
Ground Level
Kelly Bushing
Elevation
Other Services

Date	13 - December - 2018	
Run Number	One	
Depth Driller	21,706 ft	
Depth Logger	6,571 ft	
Bottom Logged Interval	6,561 ft	
Top Log Interval	Surface	
Open Hole Size	N/A	
Type Fluid	Fresh Water	
Density / Viscosity	8.3 lbs/gal	
Max. Recorded Temp.	136 °F	
Estimated Cement Top	3,310 ft	
Time Well Ready	13:50	
Time Logger on Bottom	14:25	
Equipment Number	2612	
Location	Irwin, PA	
Recorded By	Jim Cleland	
Witnessed By	Curt Anderson	

Borehole Record		Tubing Record				
Run Number	Bit From	To	Size	Weight	From	To
Casing Record	Size	Wg/ft	Top	Bottom		
Surface String	13-3/8"	-	-	-		
Prot. String	9-5/8"	-	-	-		
Production String	5 1/2 in	20#	-	-	21,706 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 6,561 ft to Surface with a maximum temperature of 136° F
 Tool zeroed at ground level and corrected 24 ft to KB
 Estimated top of cement bond detected at 3,310 ft
 Free pipe calibration taken from previous log
 Marker joint detected from 5,342 ft to 5,352 ft then corrected to match casing tally
 Casing tally denotes marker joint at 5,341 - 5,351
 1,500 psi applied

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Office of Oil and Gas

JUN 14 2019

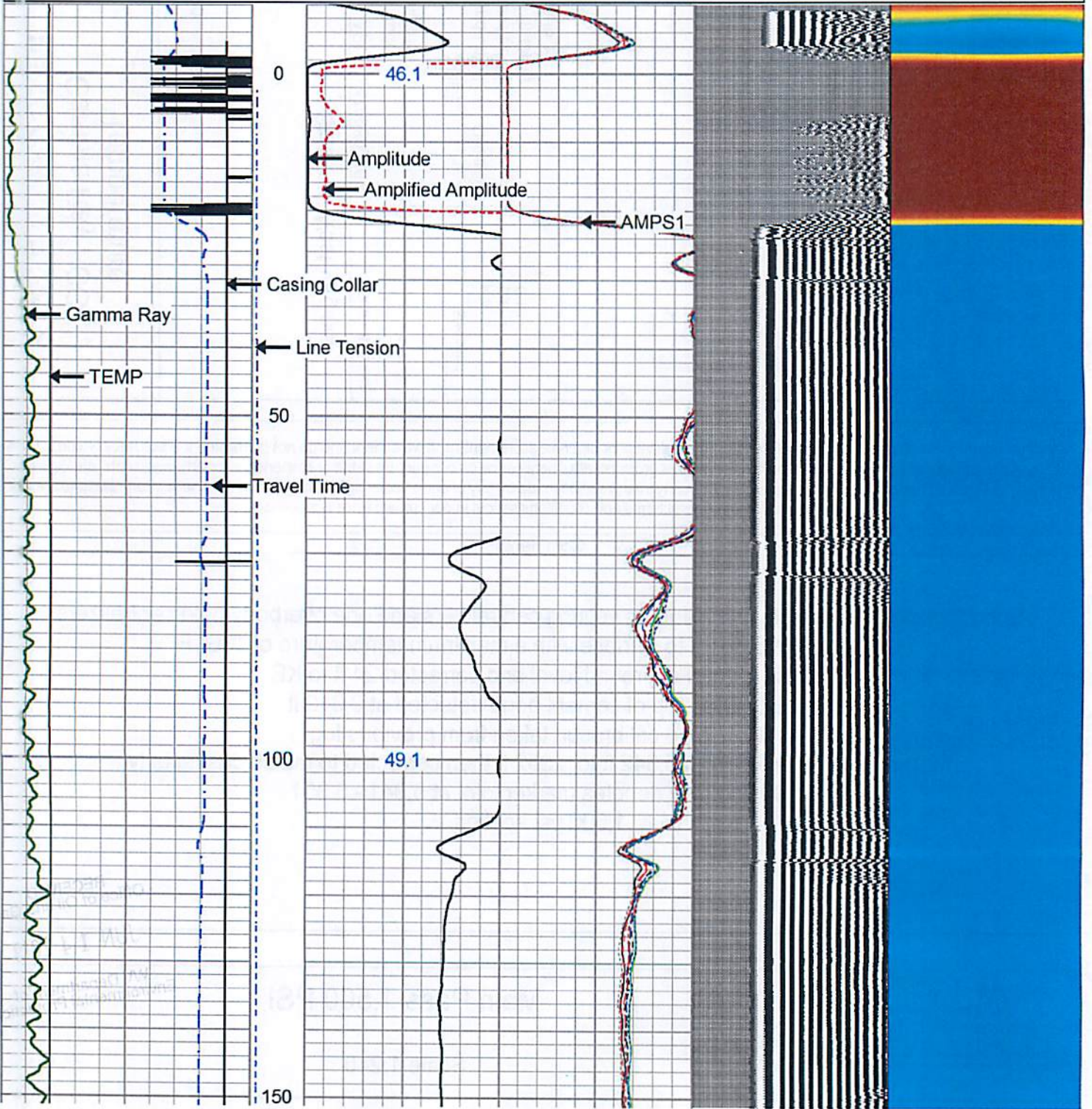
WV Department of
Environmental Protection

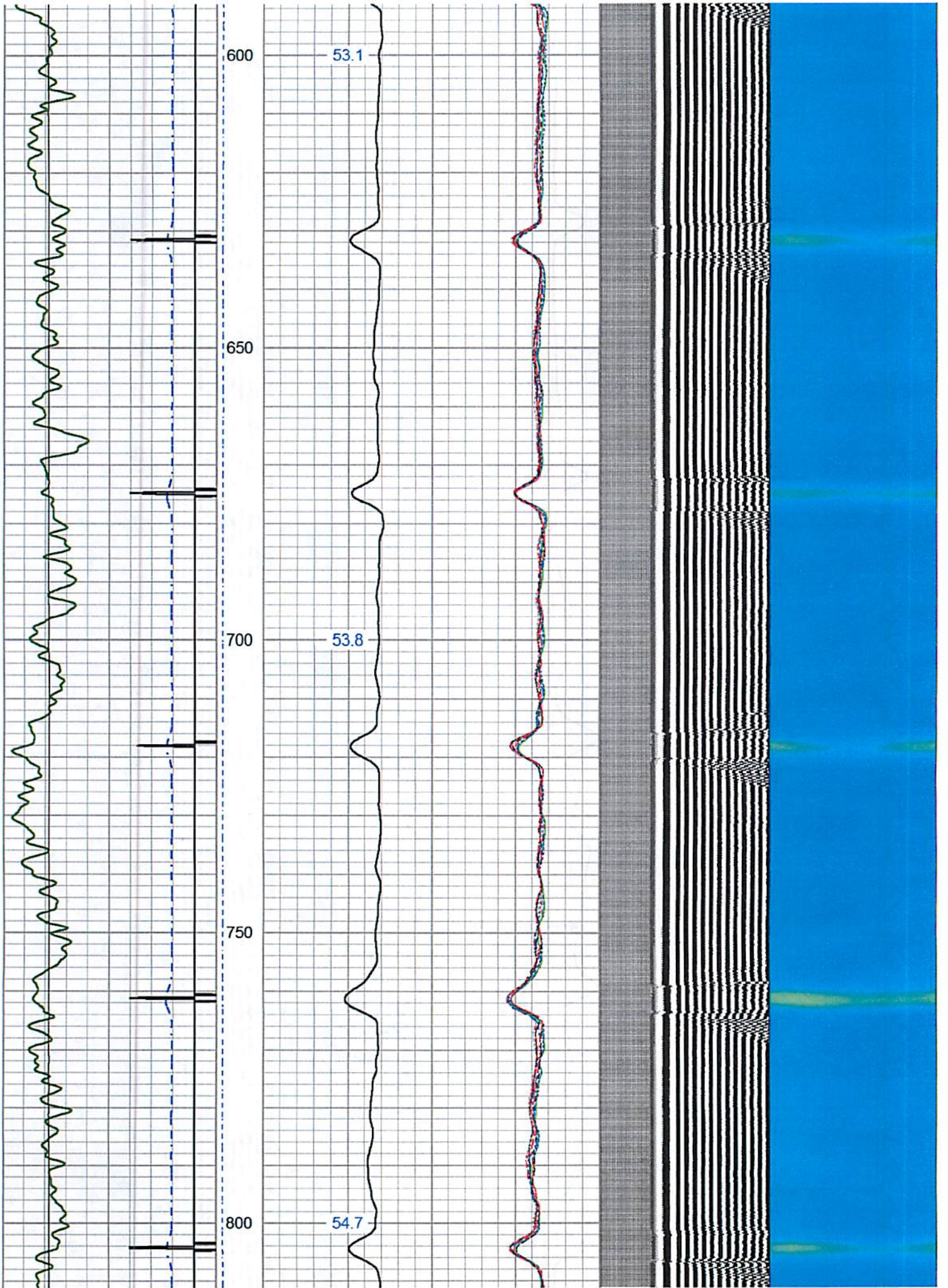
Main Pass 1,500 PSI

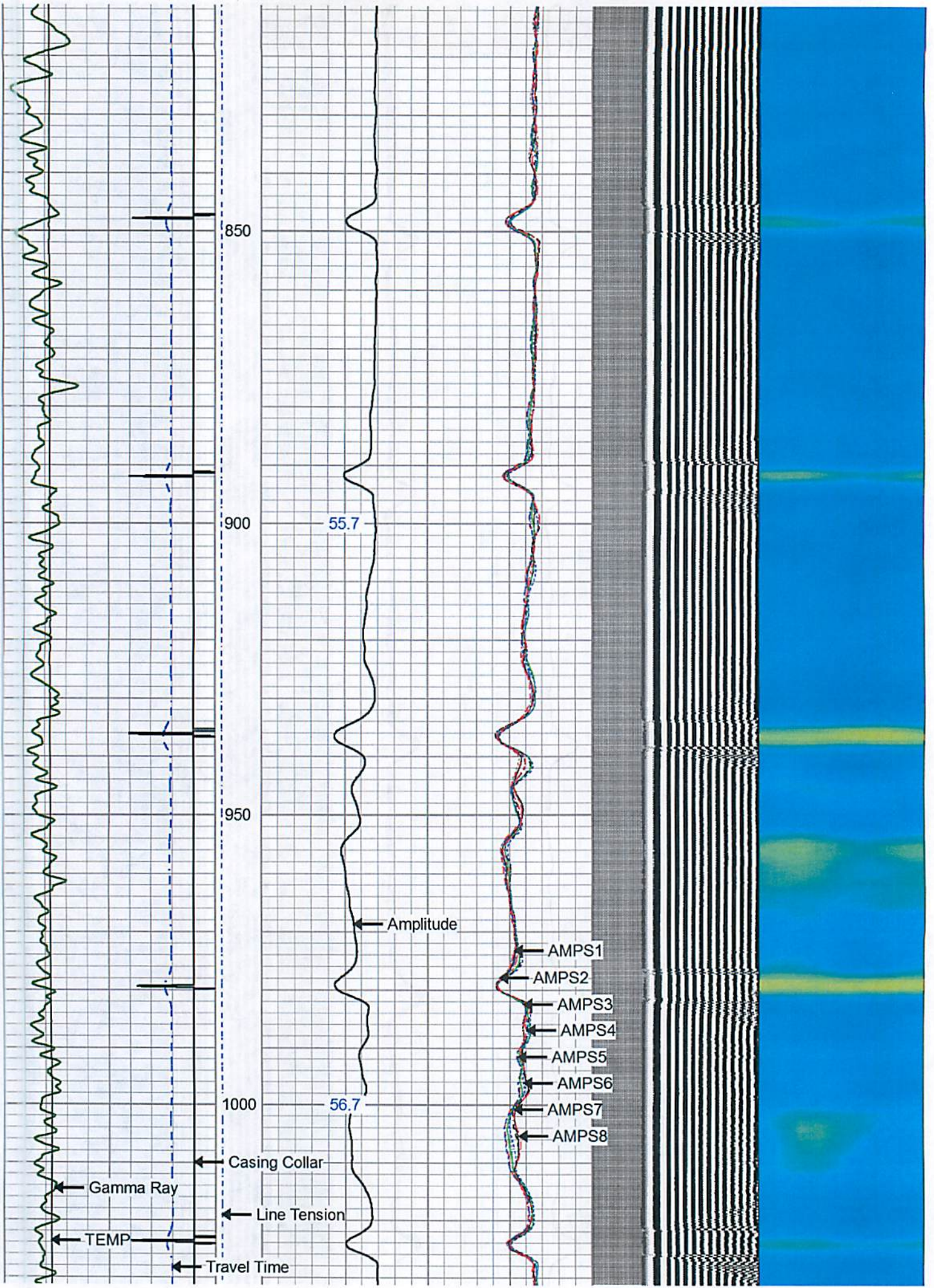
Scale 1:240

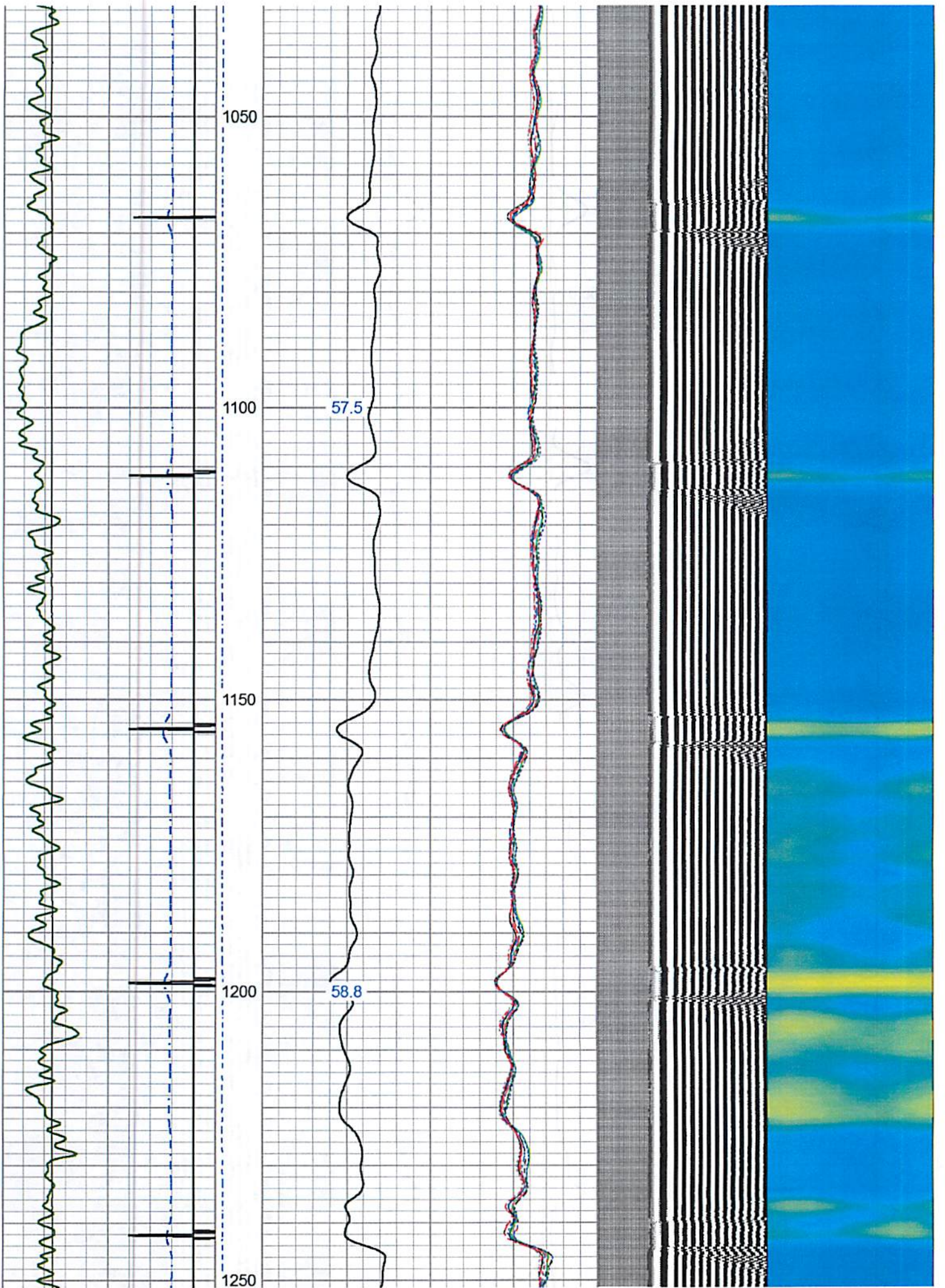
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 Dataset Pathname Main Pass
 Presentation Format ahws_rcbl_jc
 Dataset Creation Thu Dec 13 17:21:25 2018
 Charted by Depth in Feet scaled 1:240

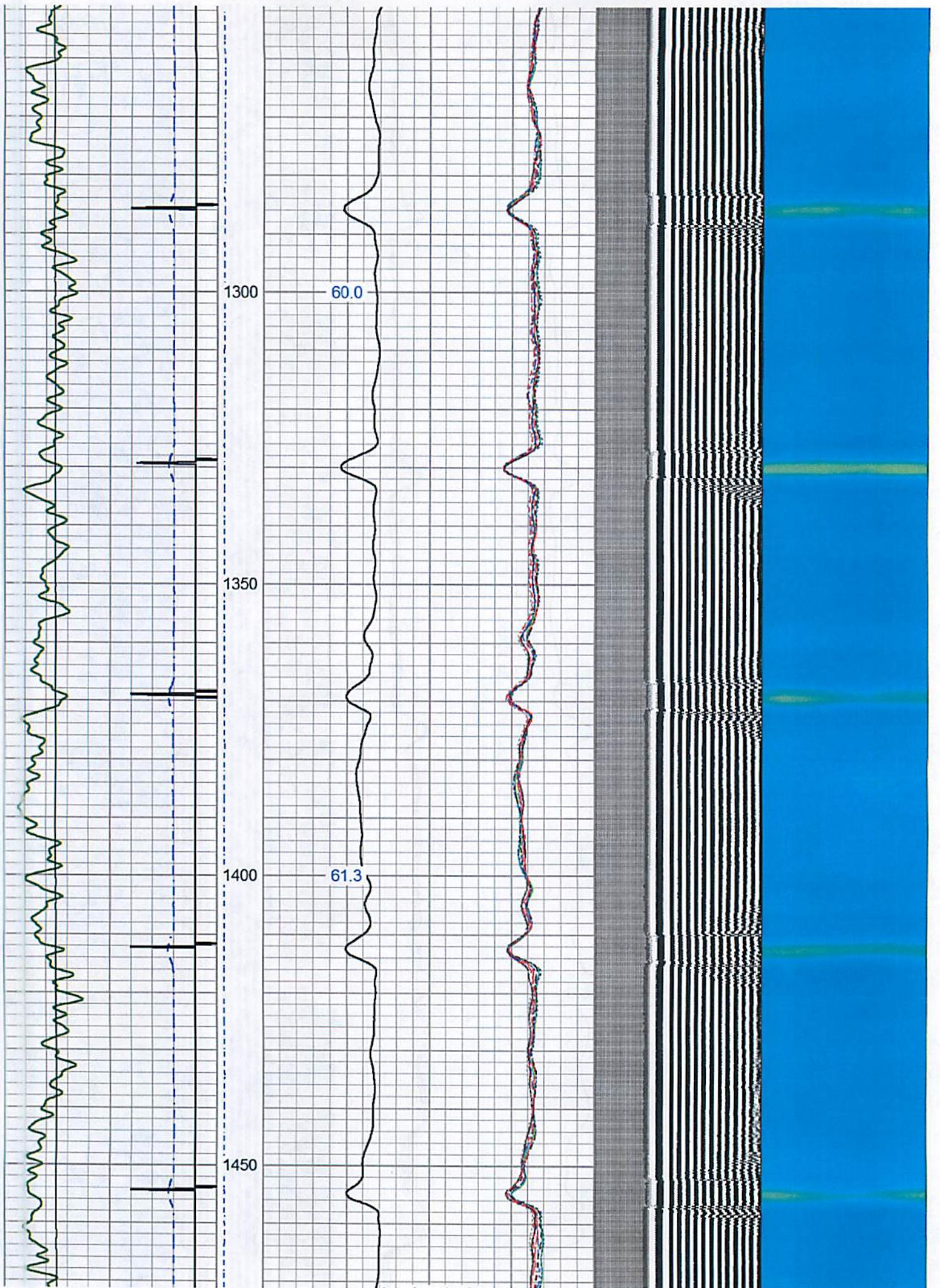
420	Travel Time (usec)	220	e Tens	0	Amplitude (mV)	100	-5	AMPS1	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	(lb)	0	Amplified Amplitude	10	-5	AMPS2	150	200	1200	0	100
0	Gamma Ray (GAPI)	300	(2500)	0	(mV)	10	-5	AMPS3	150				
0	TEMP (degF)	250			TEMP		-5	AMPS4	150				
					(degF)		-5	AMPS5	150				
							-5	AMPS6	150				
							-5	AMPS7	150				
							-5	AMPS8	150				

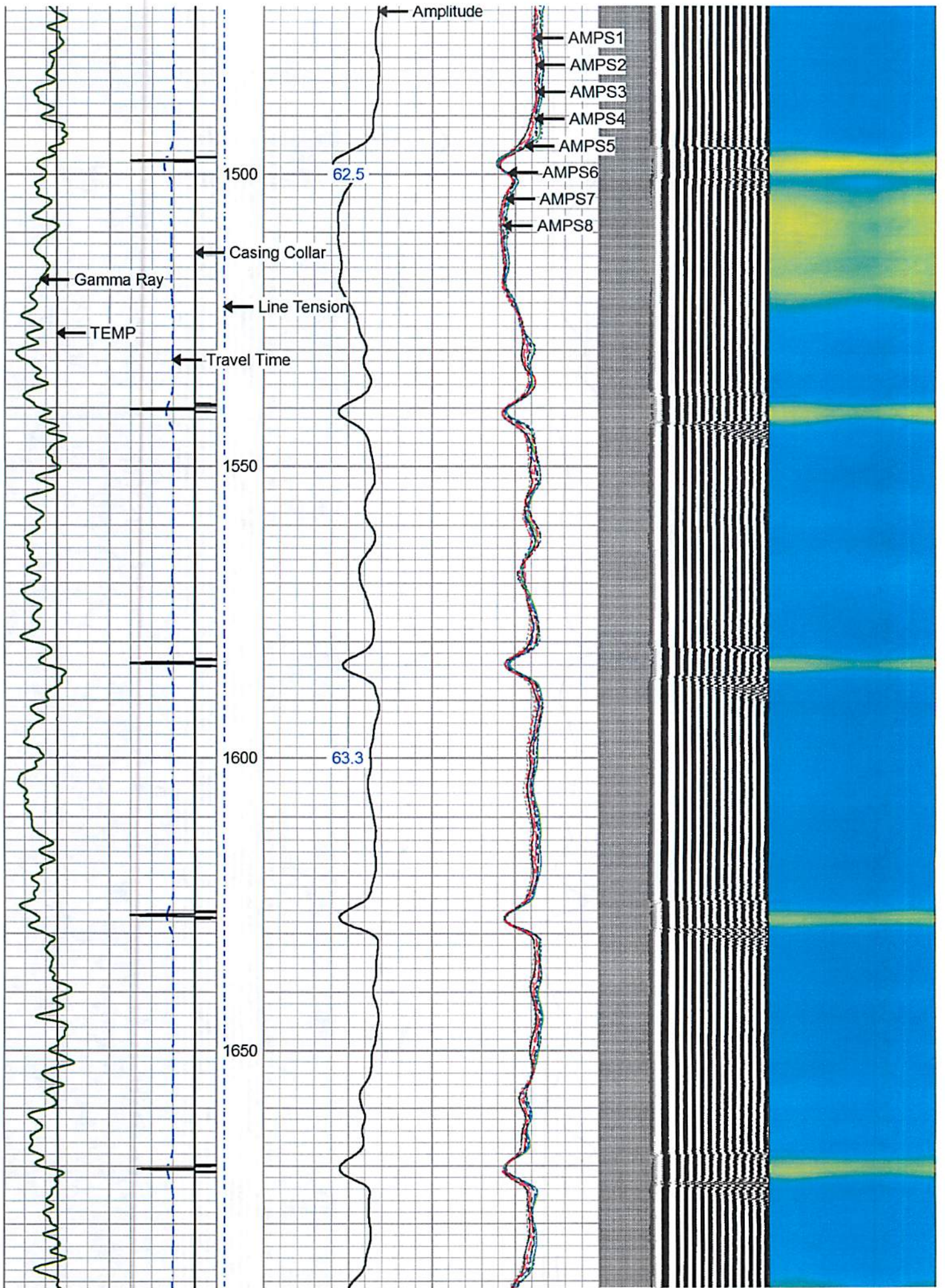


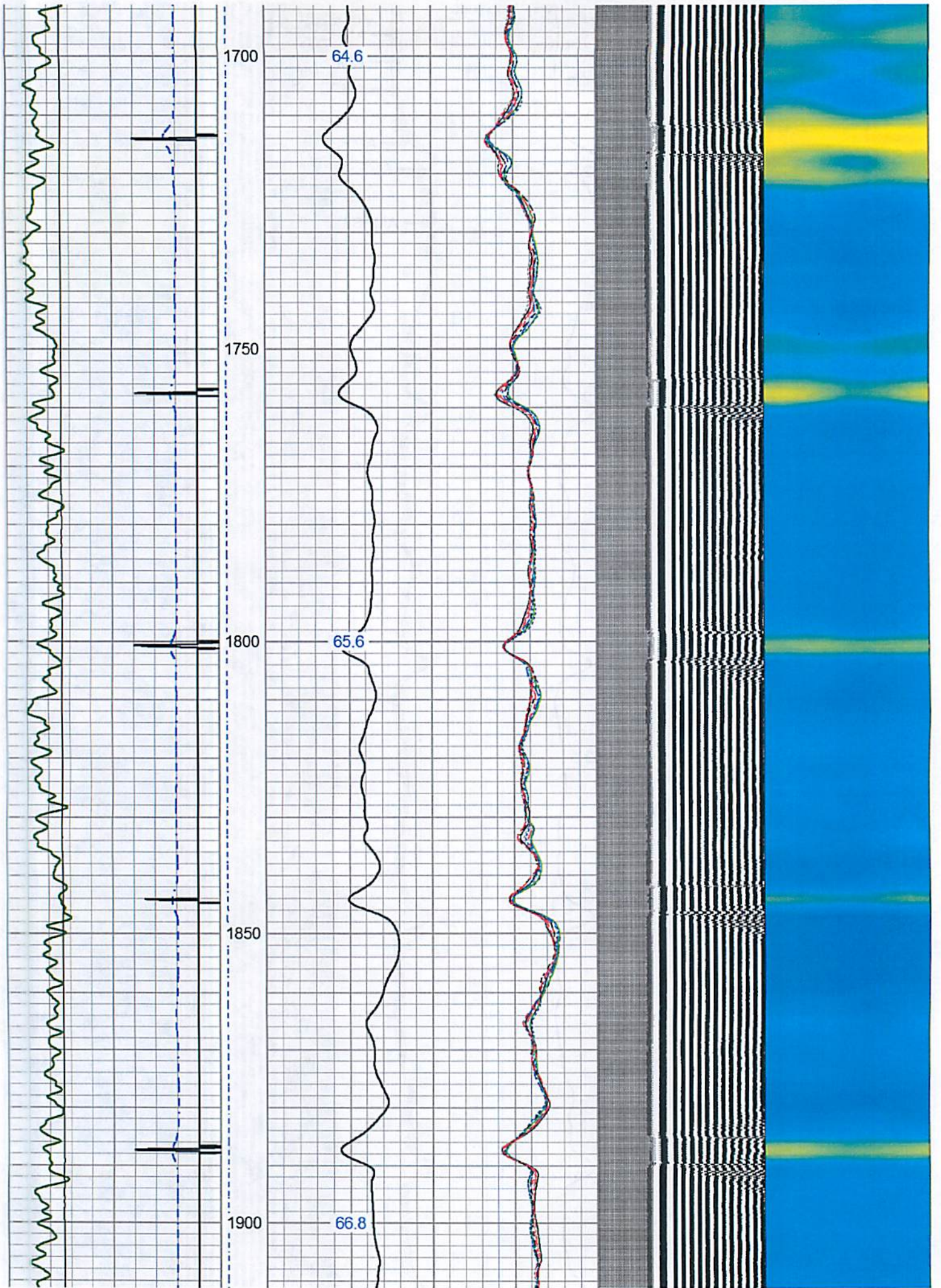


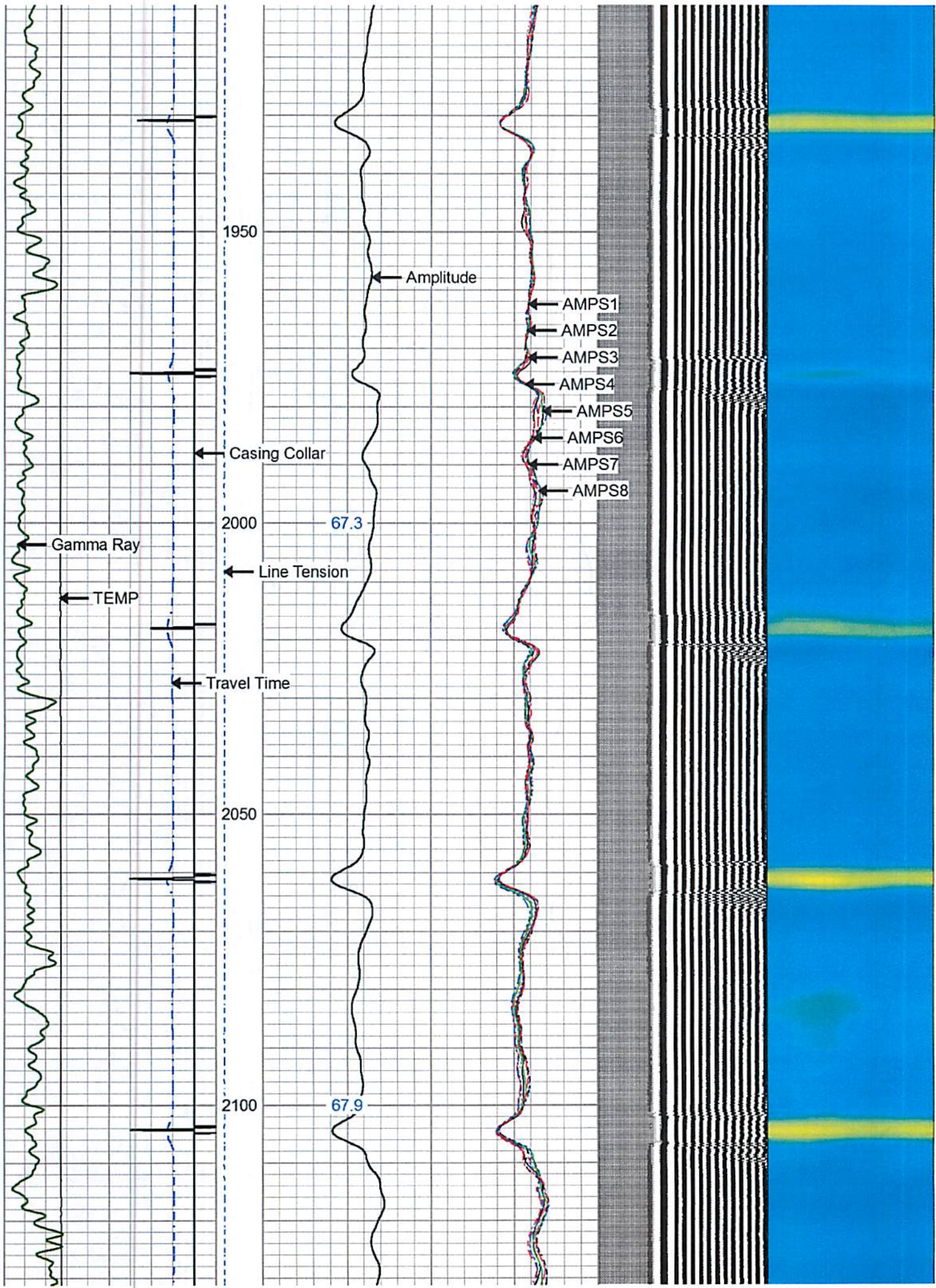


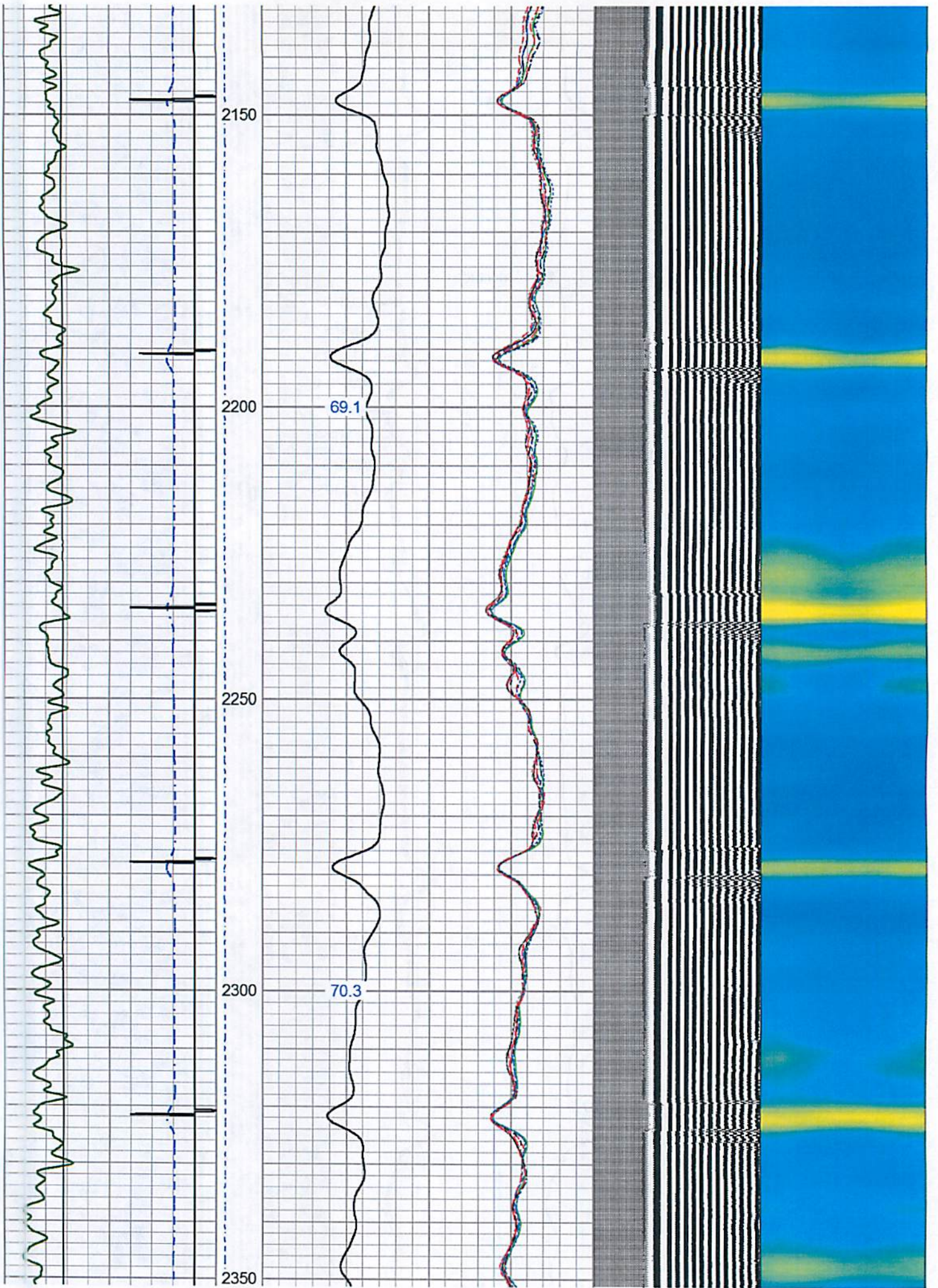


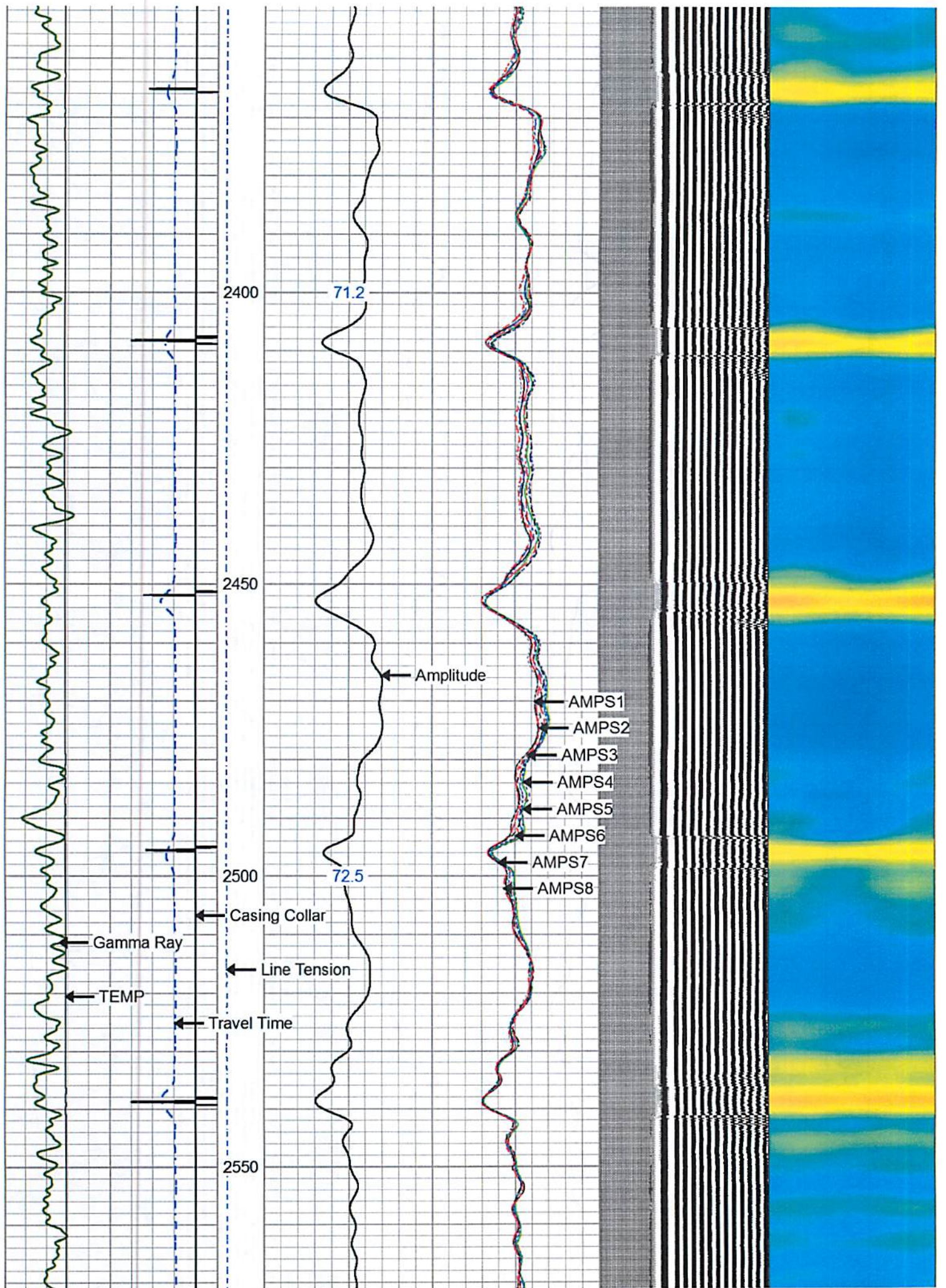


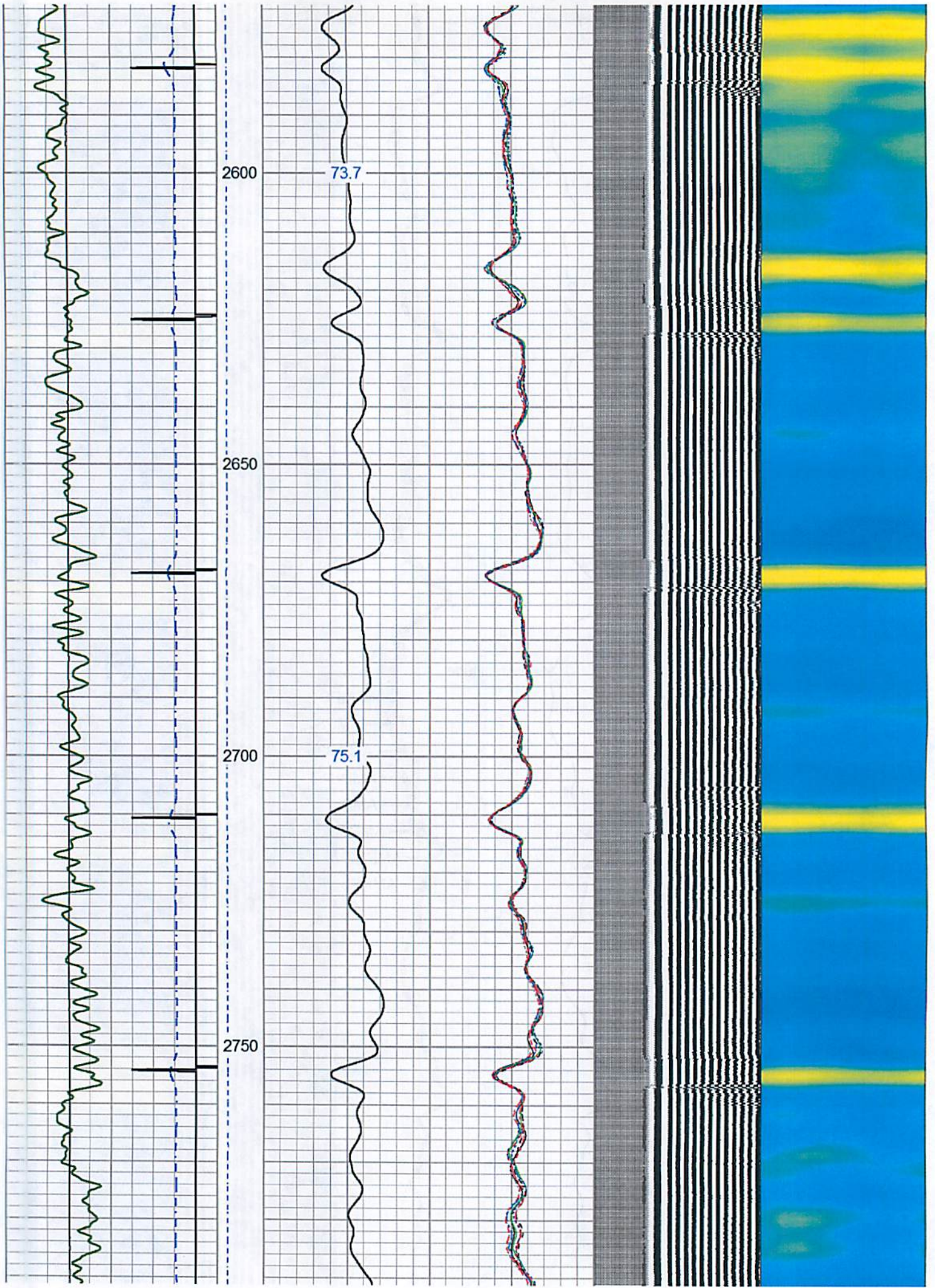


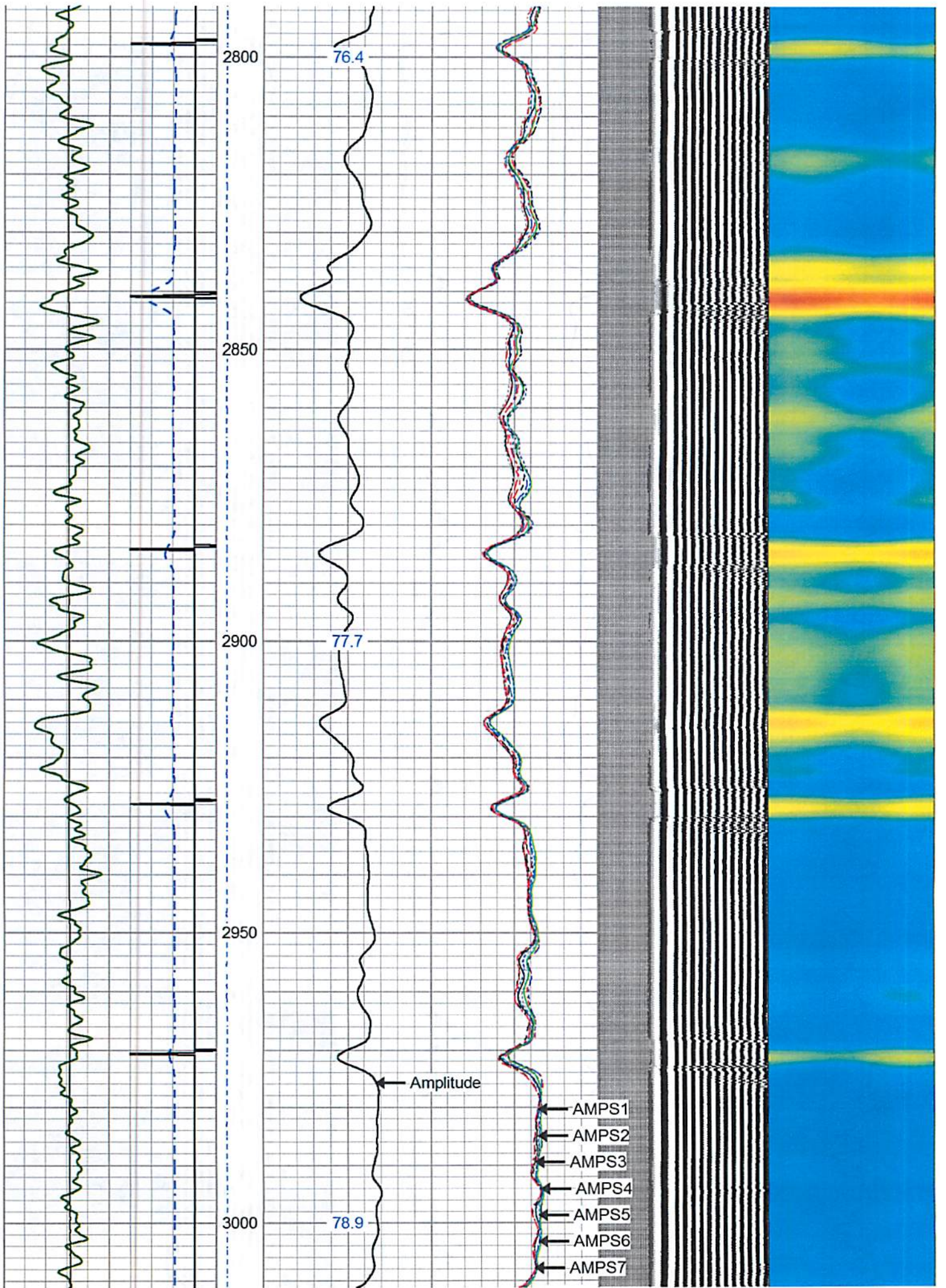


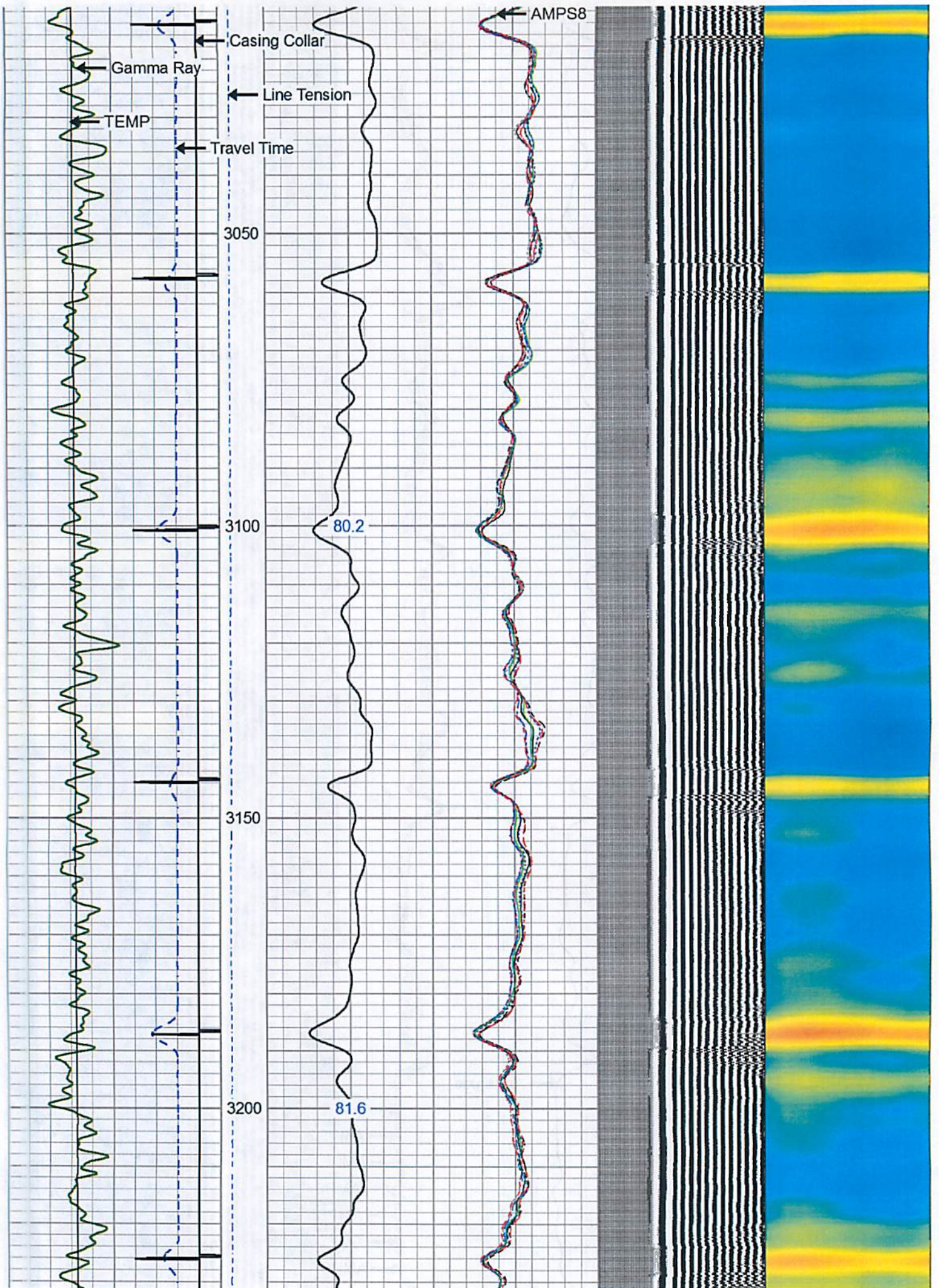


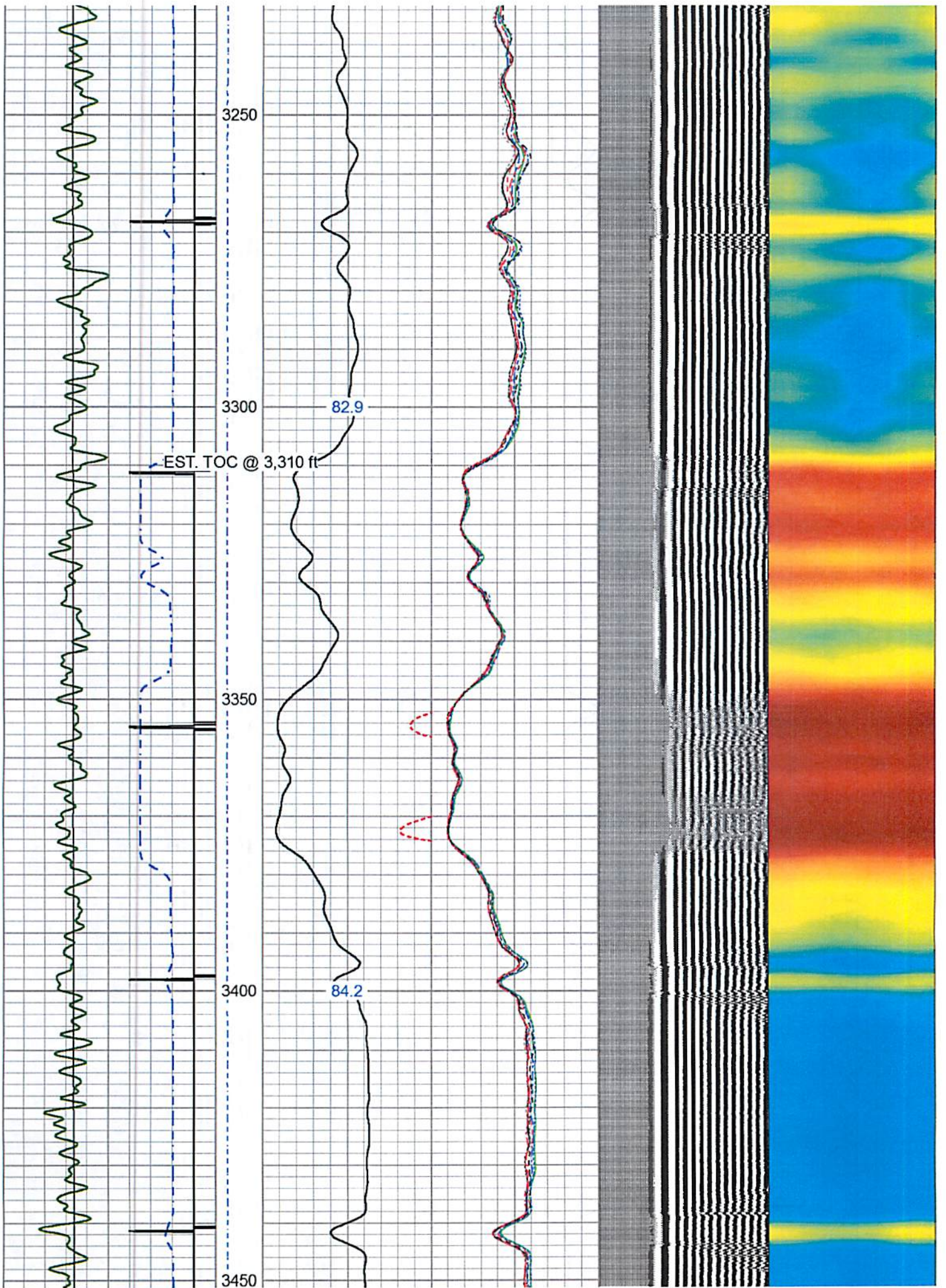


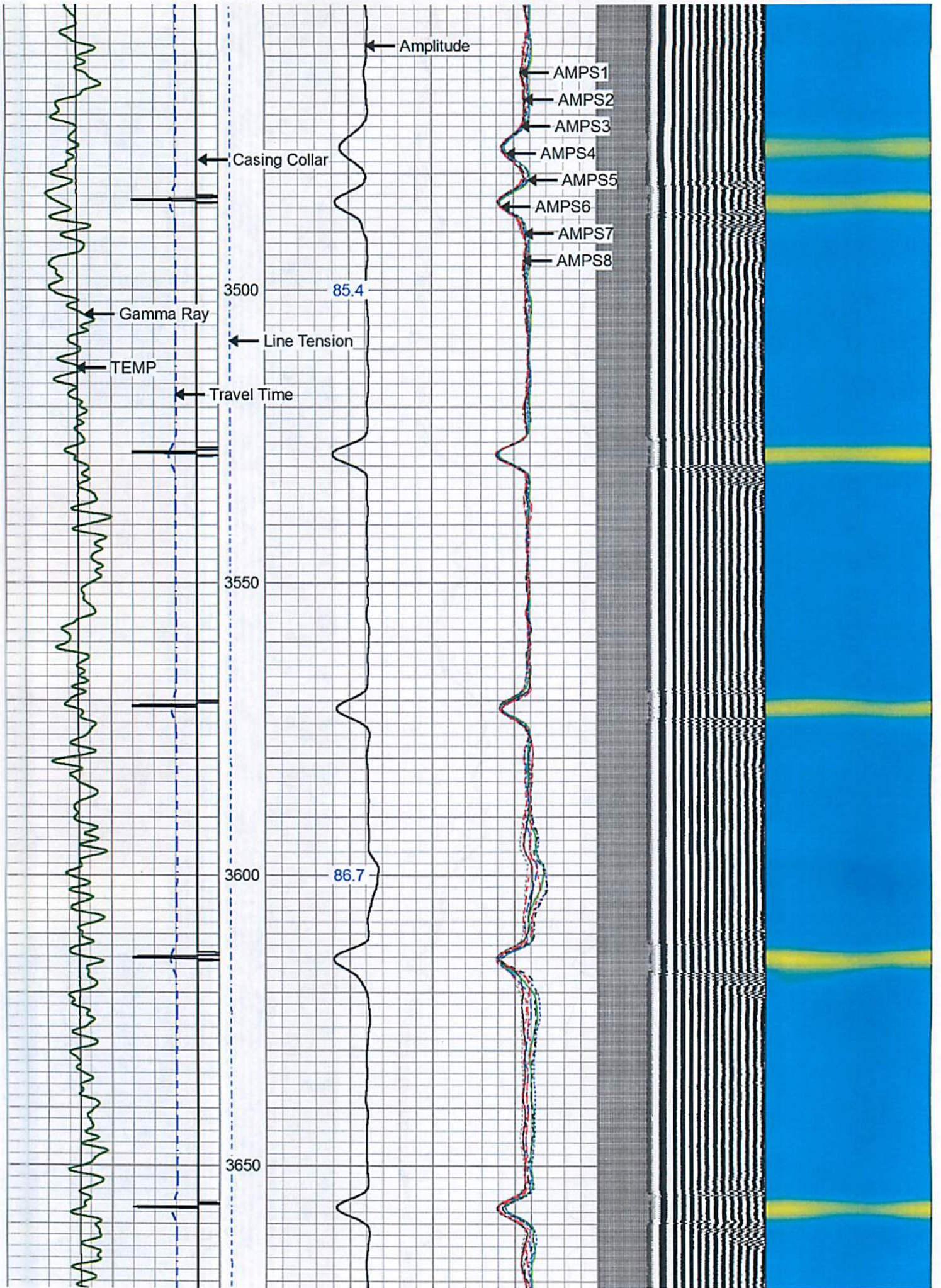


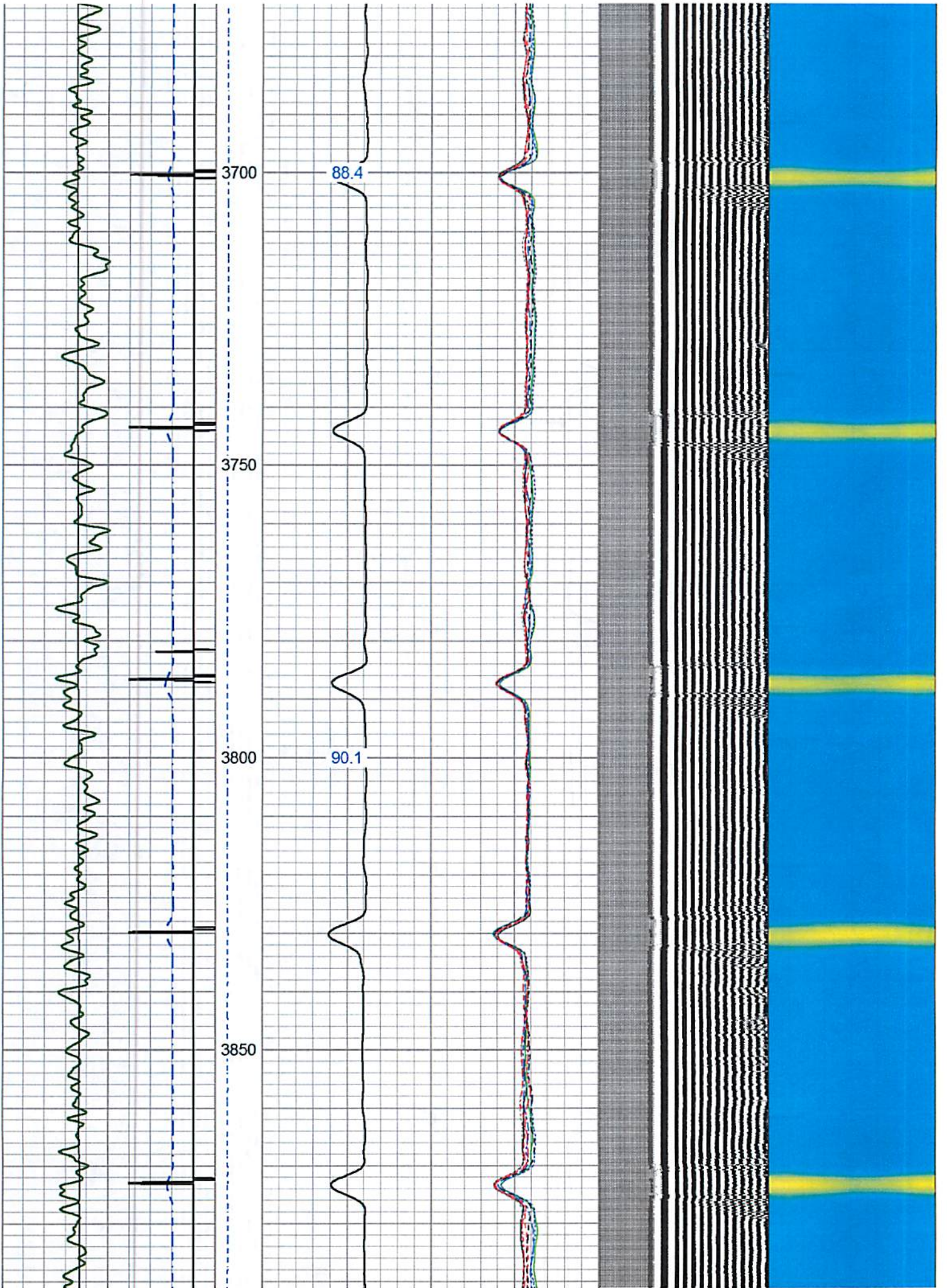


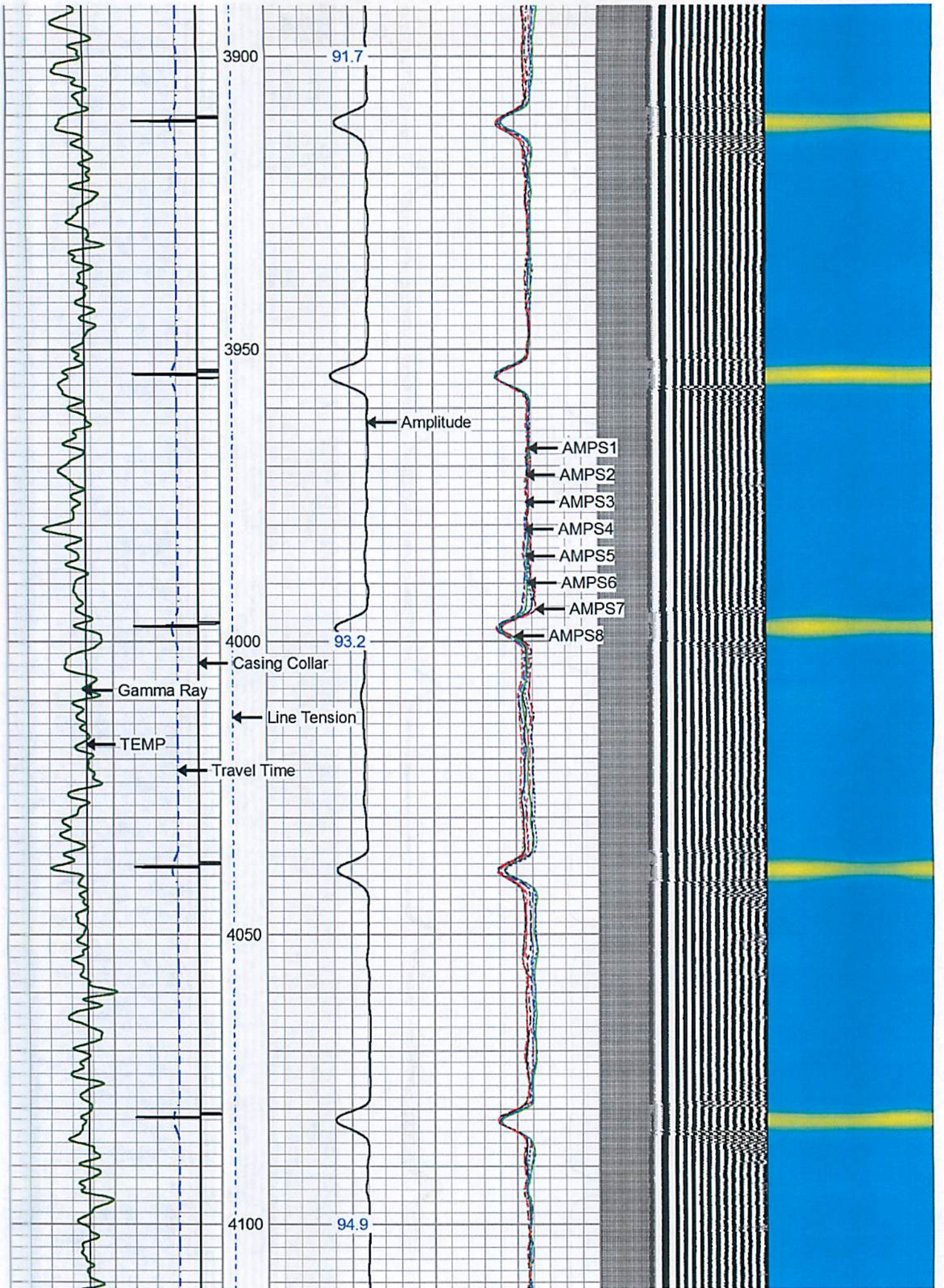


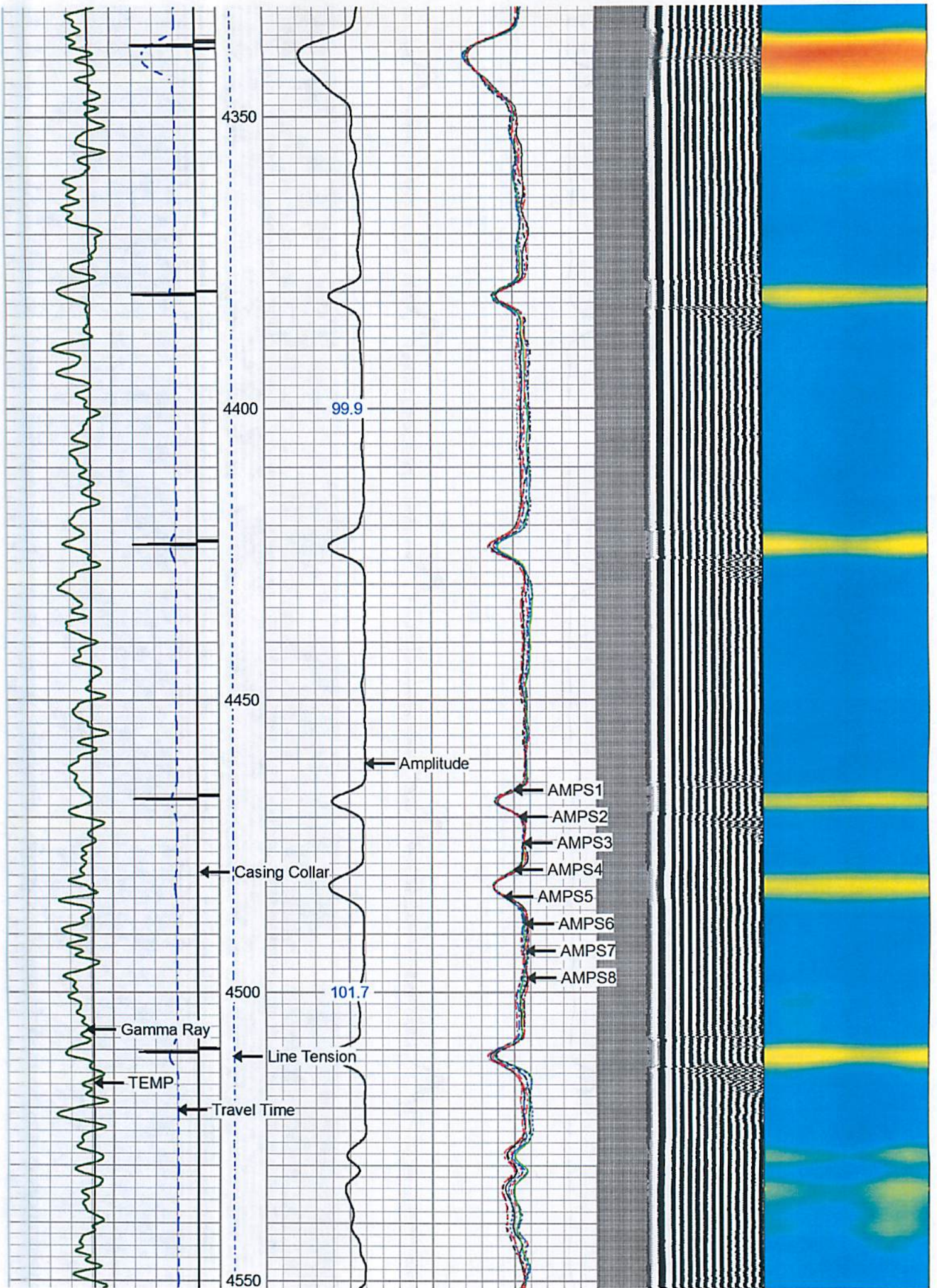


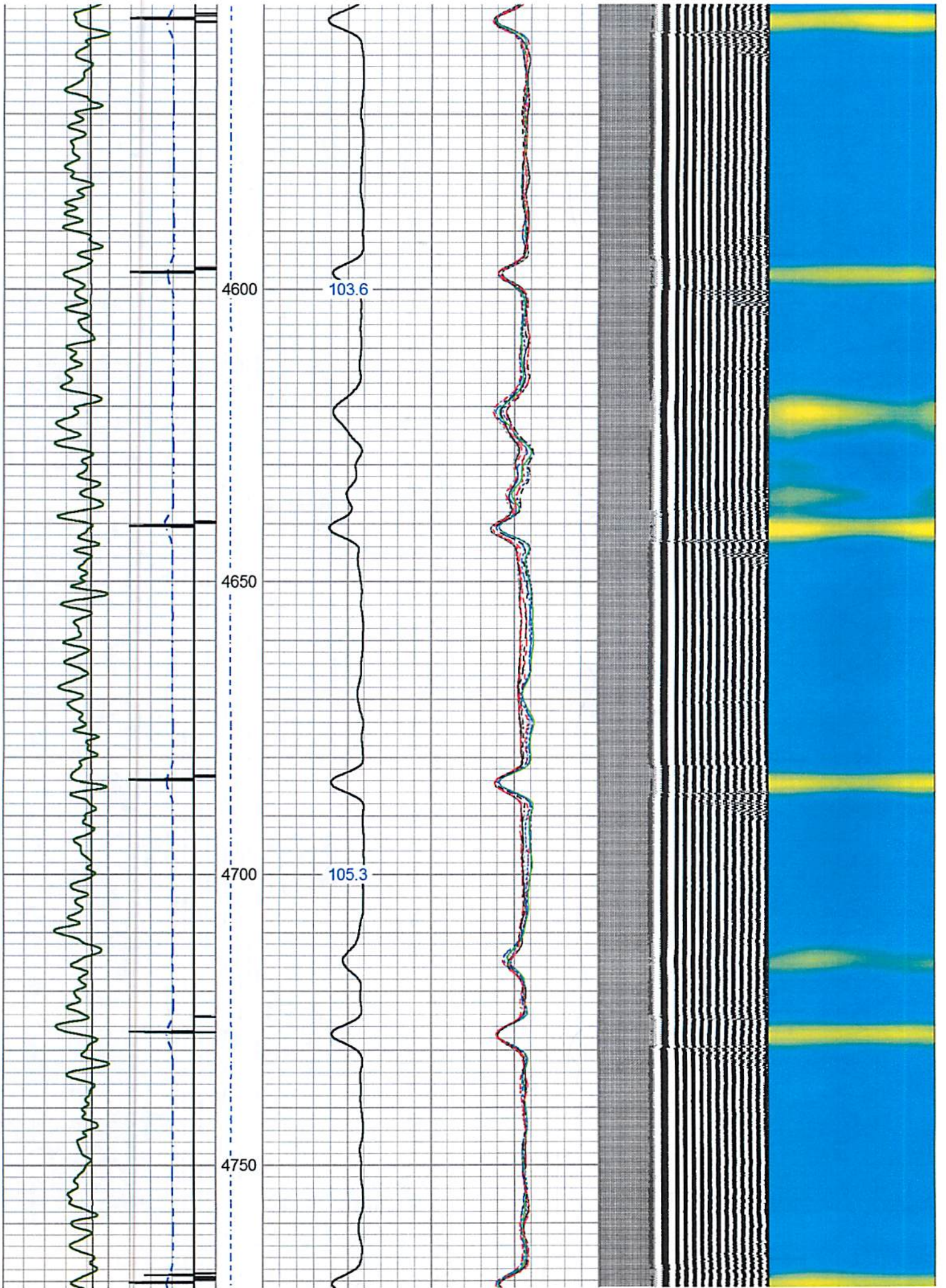


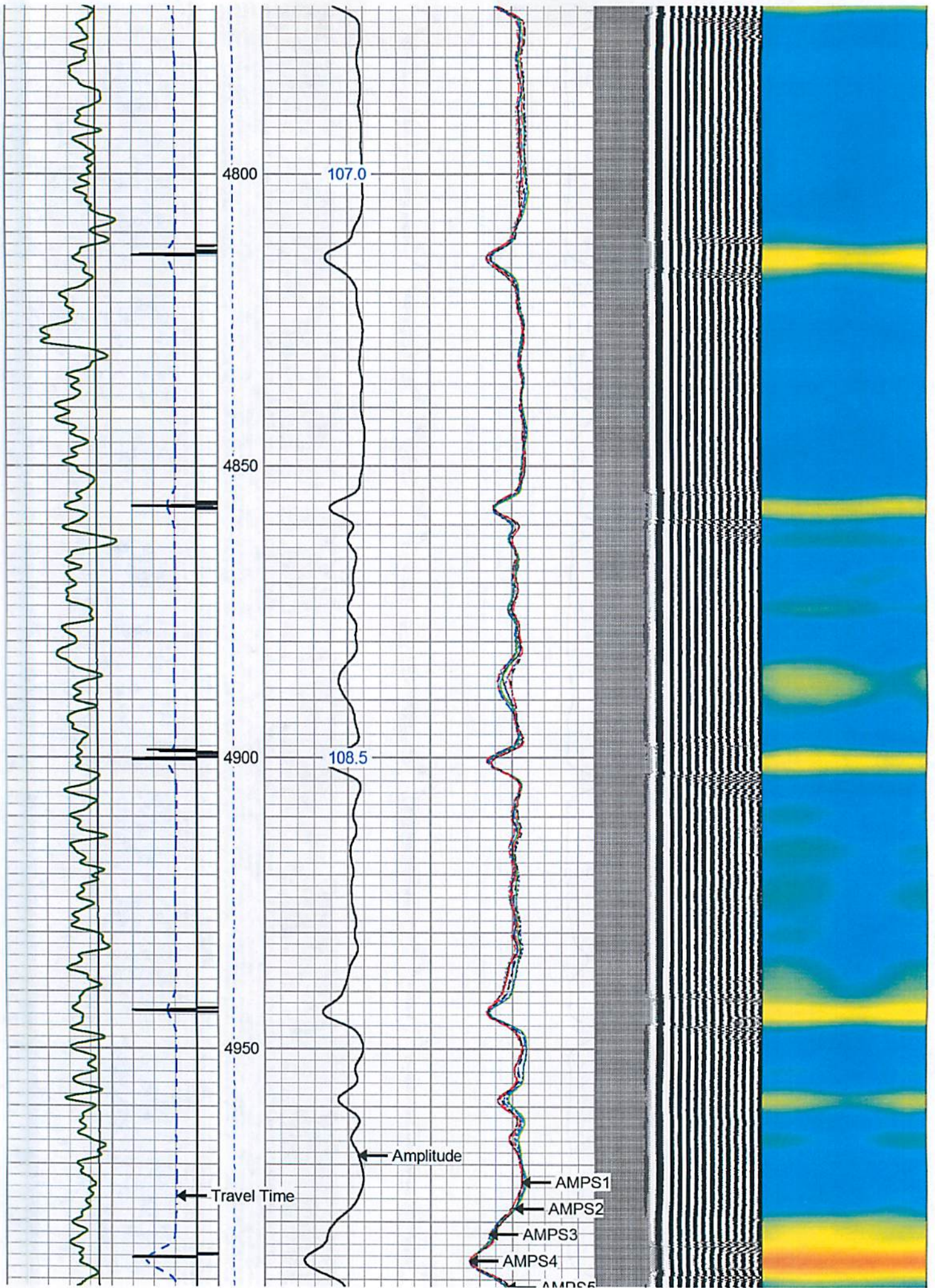


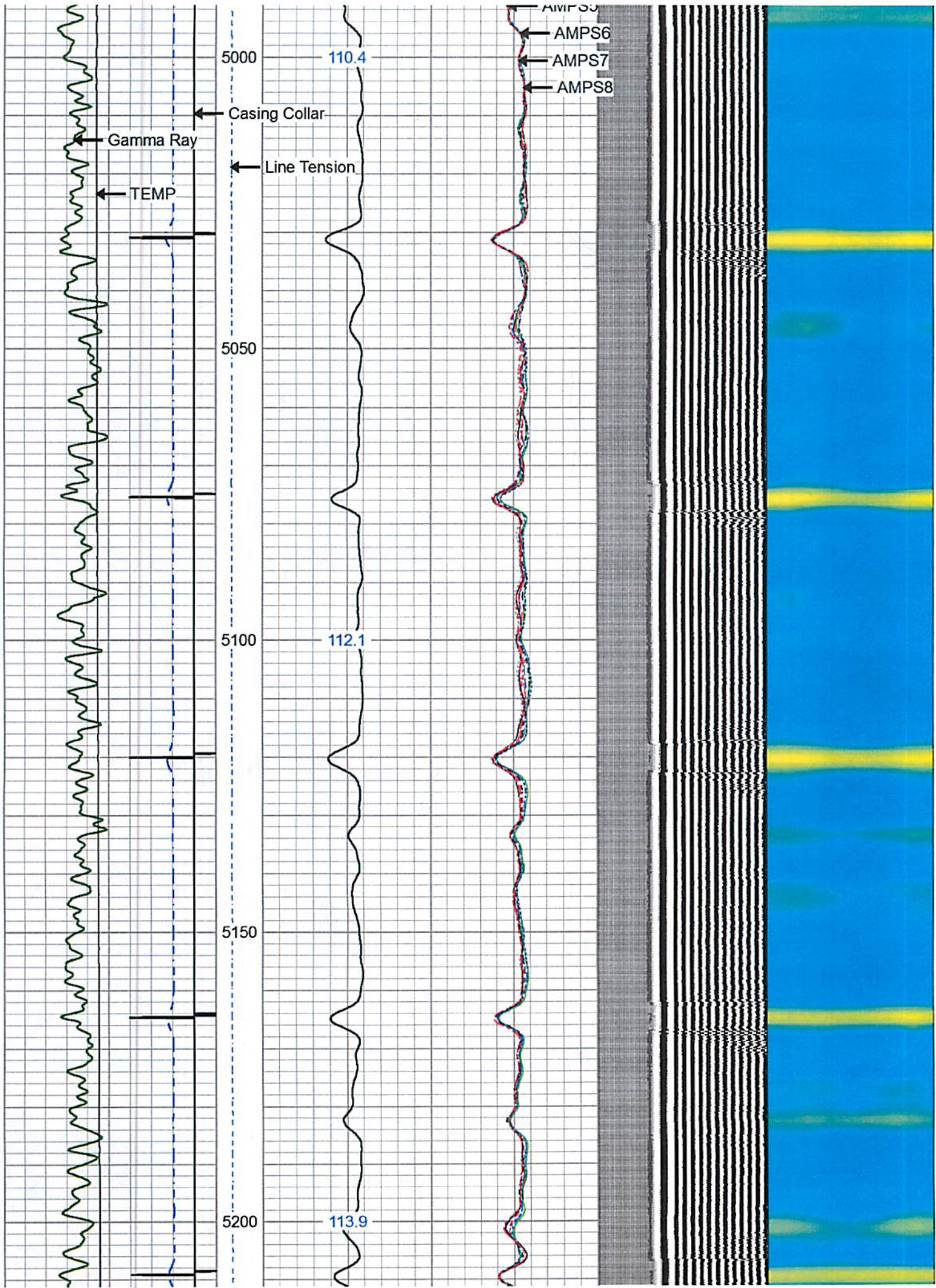


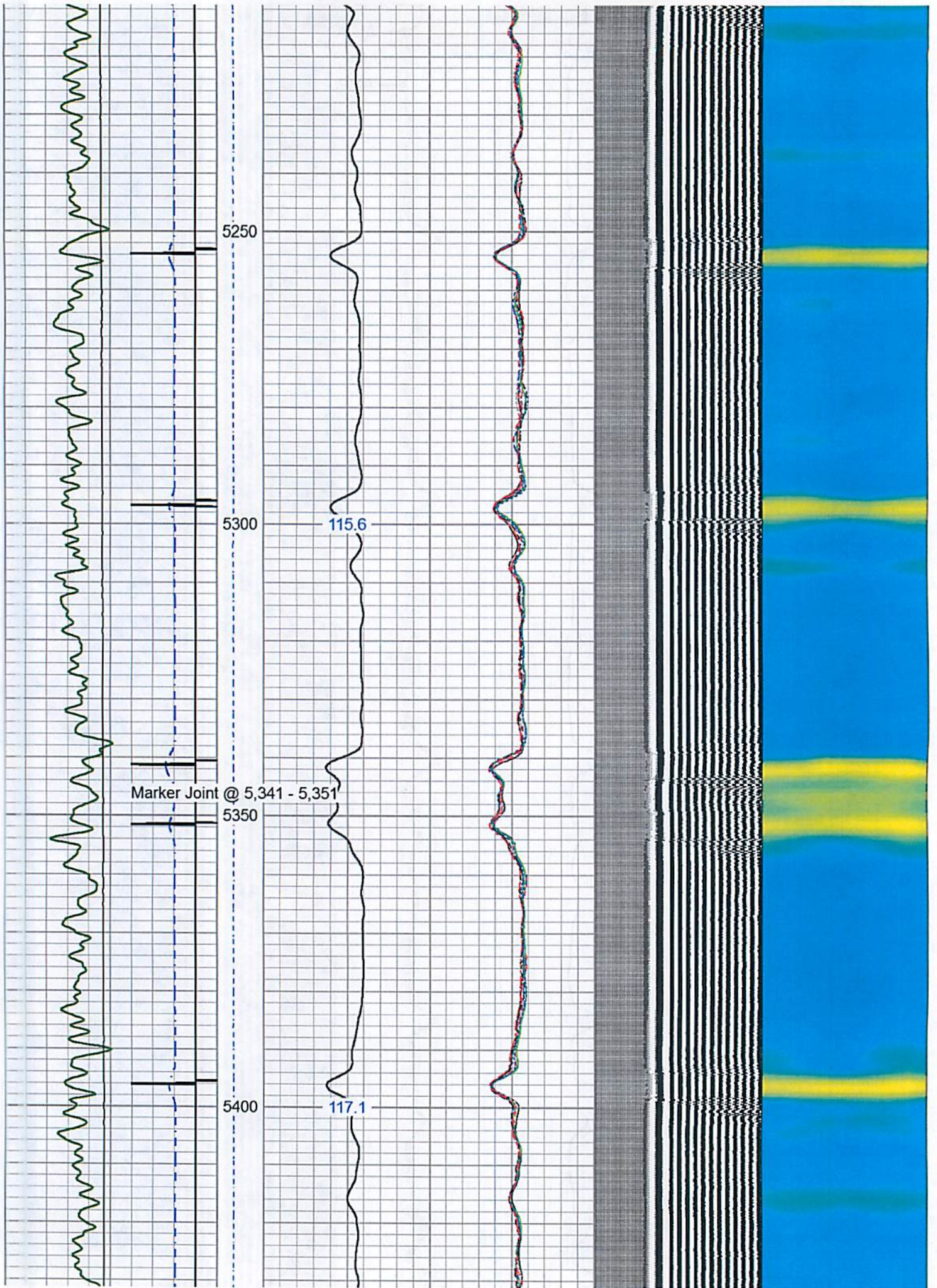


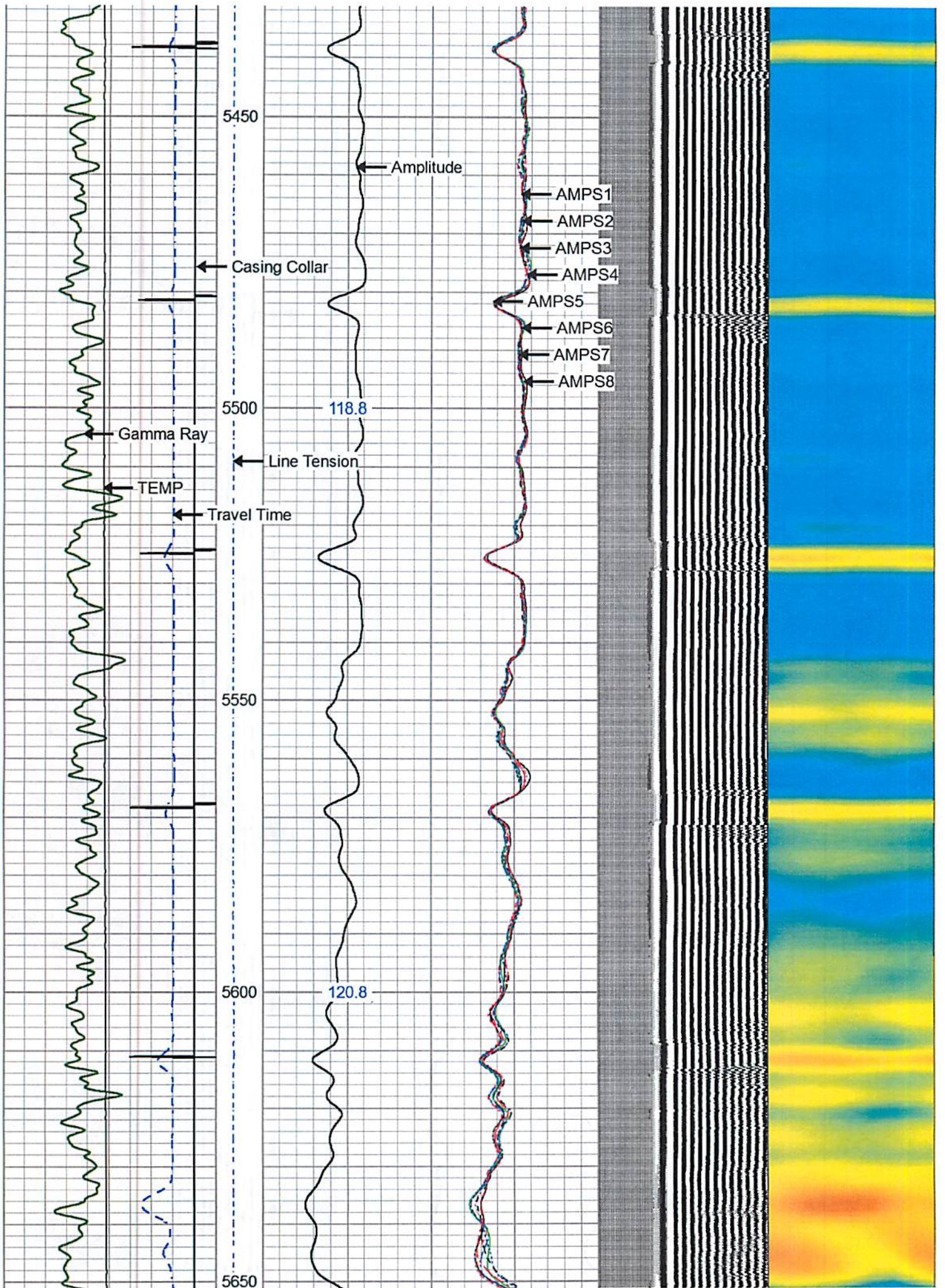


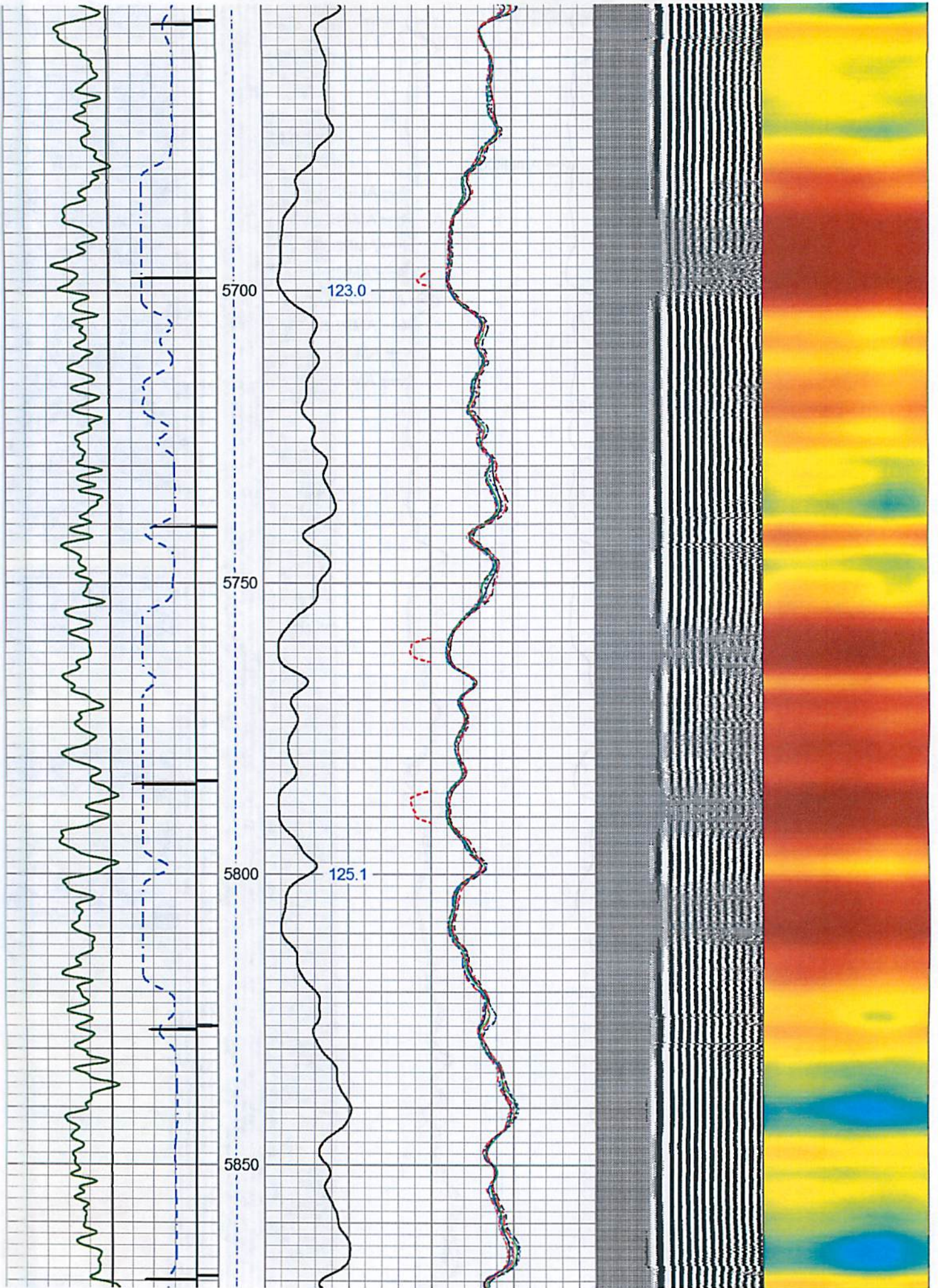


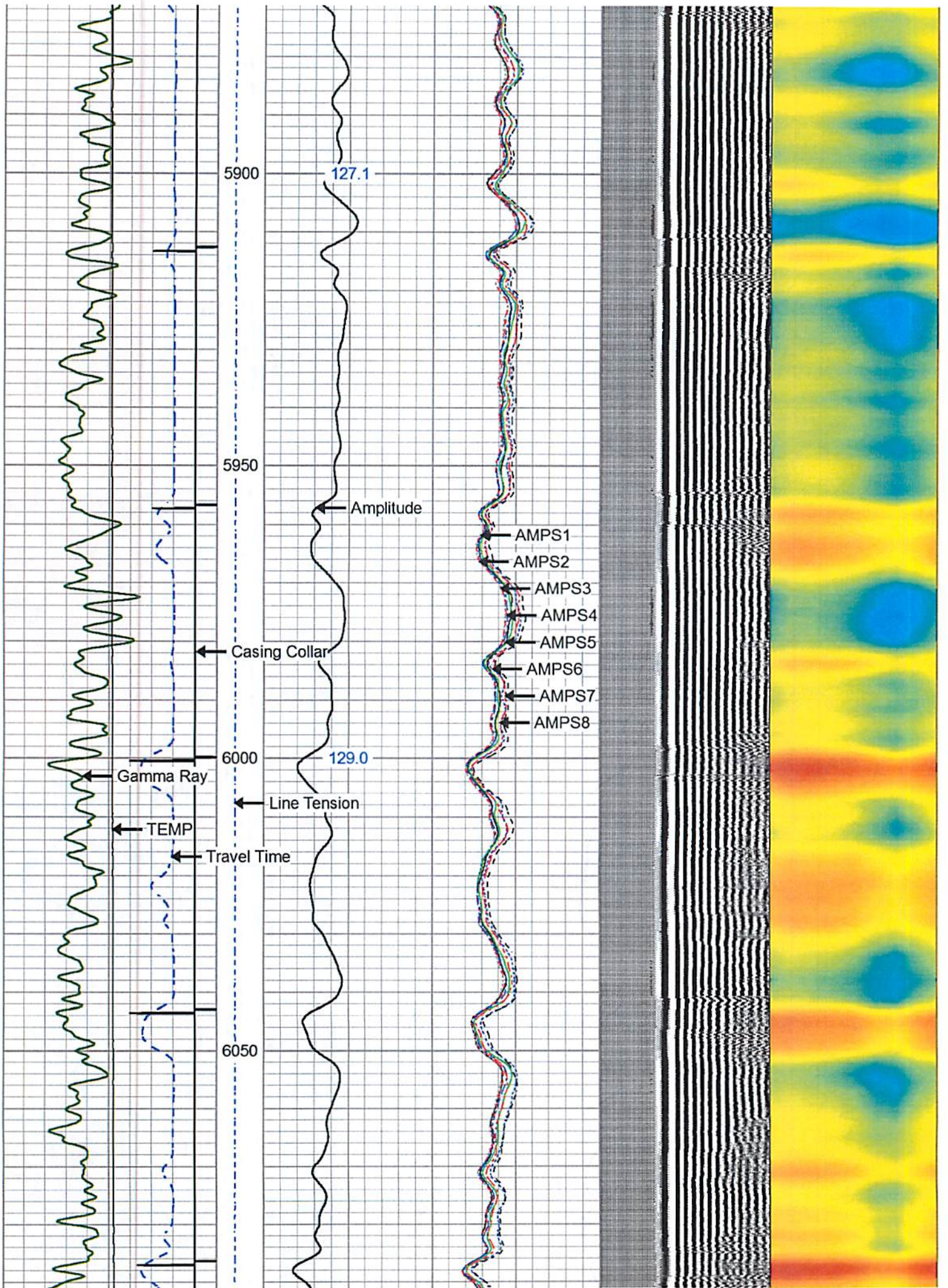


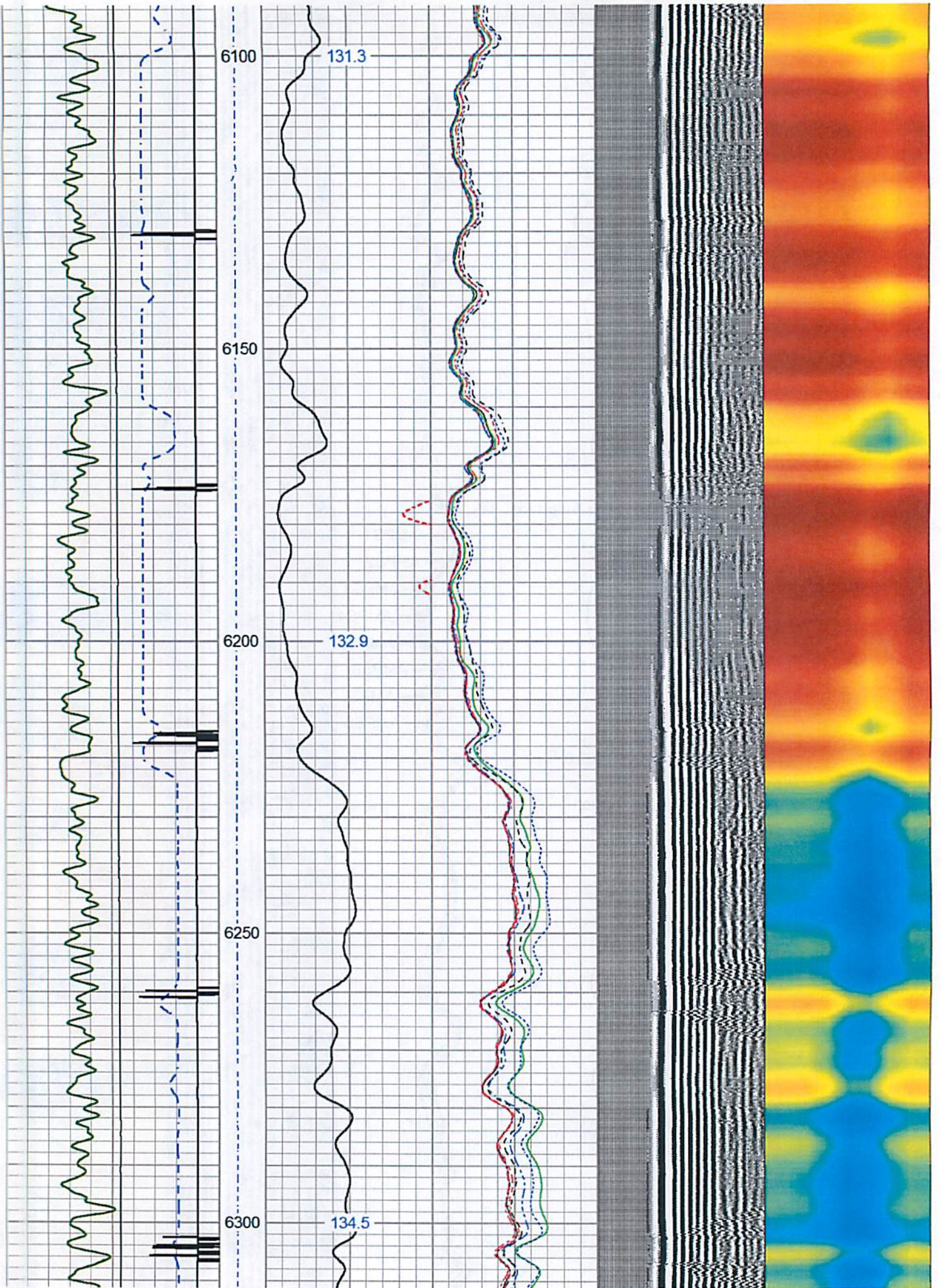


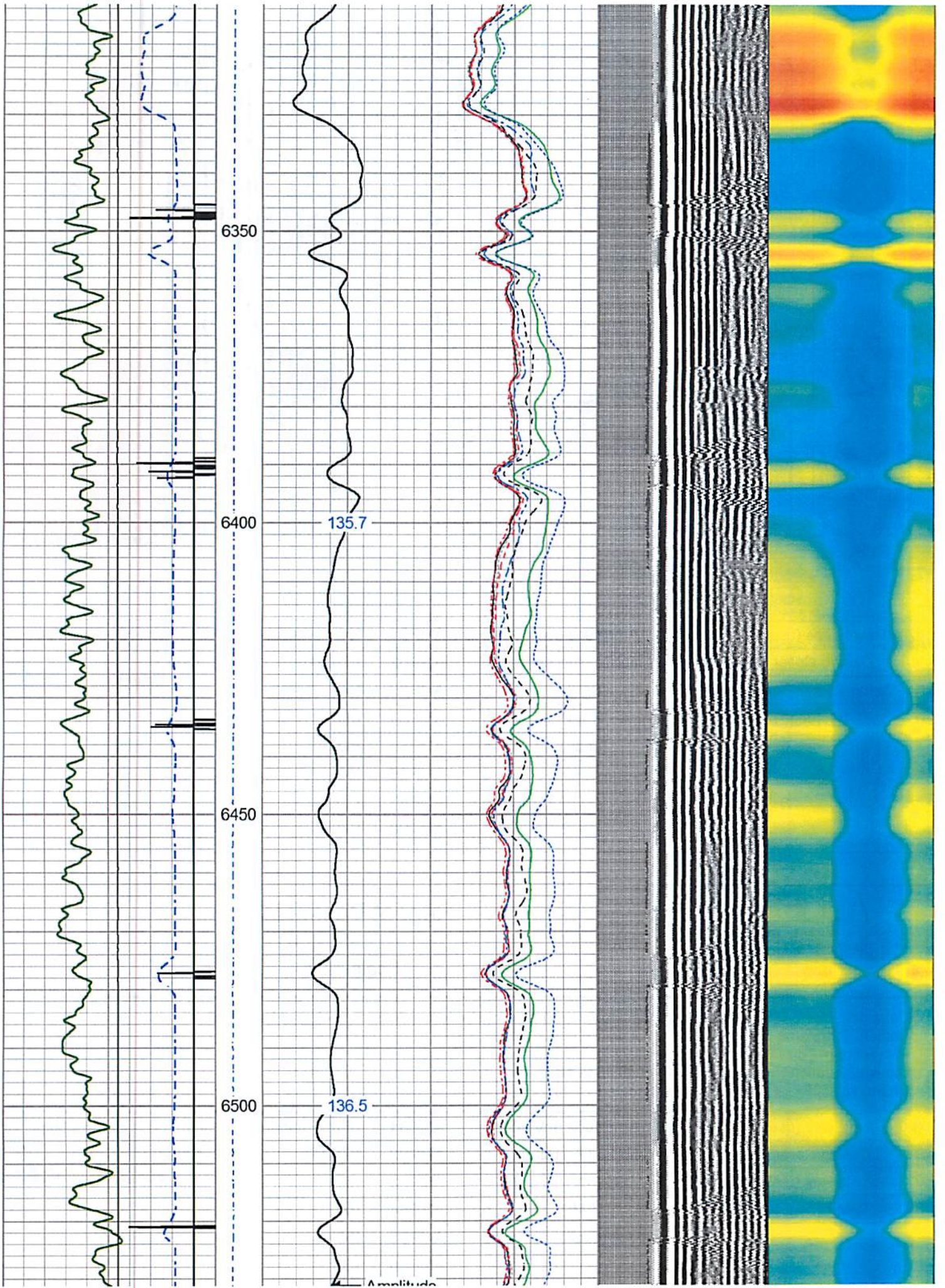


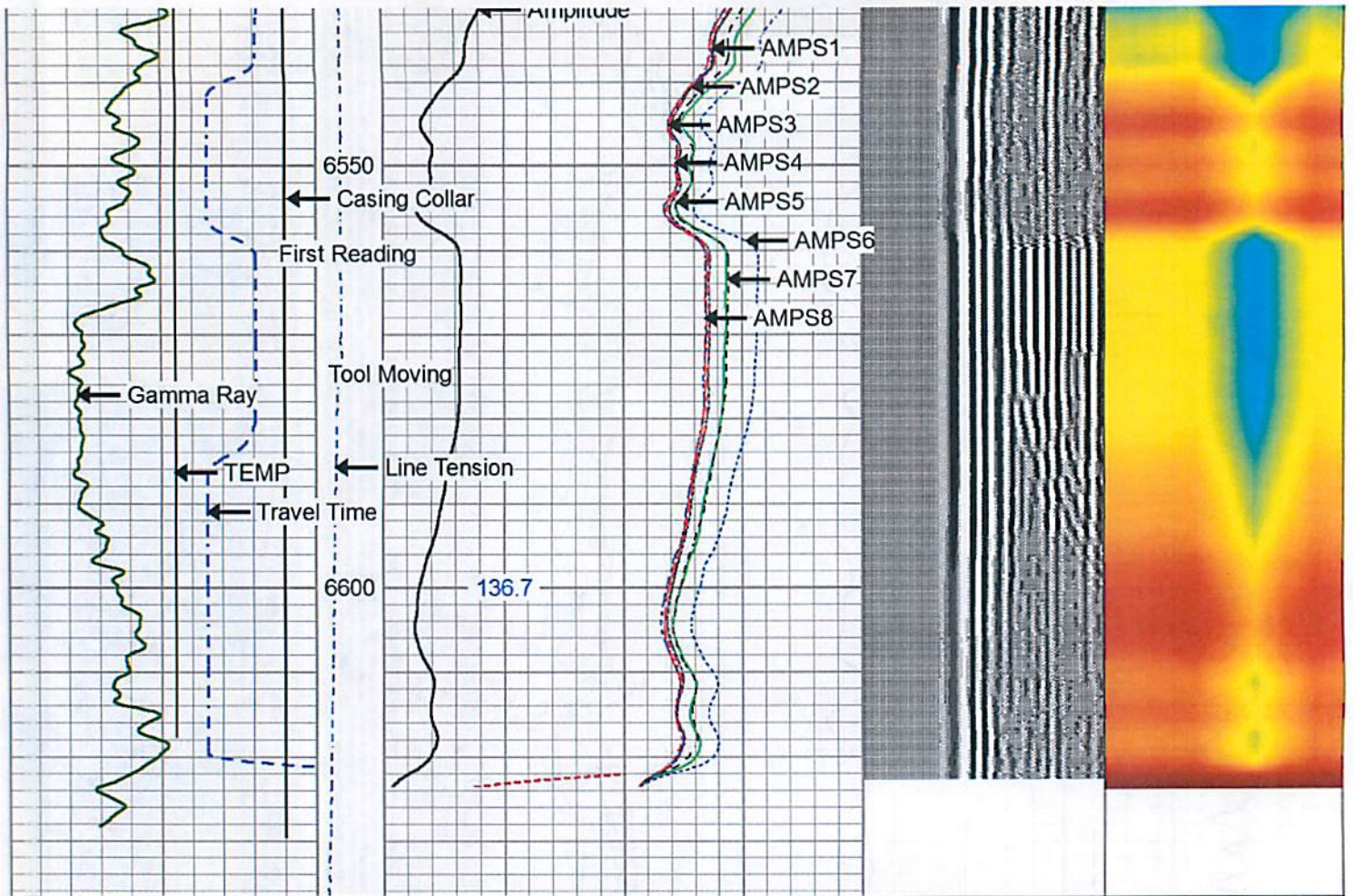












420	Travel Time (usec)	220	e Tens	0	Amplitude (mV)	100	-5	AMPS1	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	(lb)	0	Amplified Amplitude	-5	AMPS2	150	200	1200	0	100	
0	Gamma Ray (GAPI)	300	(2500)	0	(mV)	10	-5	AMPS3	150				
0	TEMP (degF)	250			TEMP		-5	AMPS4	150				
					(degF)		-5	AMPS5	150				
							-5	AMPS6	150				
							-5	AMPS7	150				
							-5	AMPS8	150				



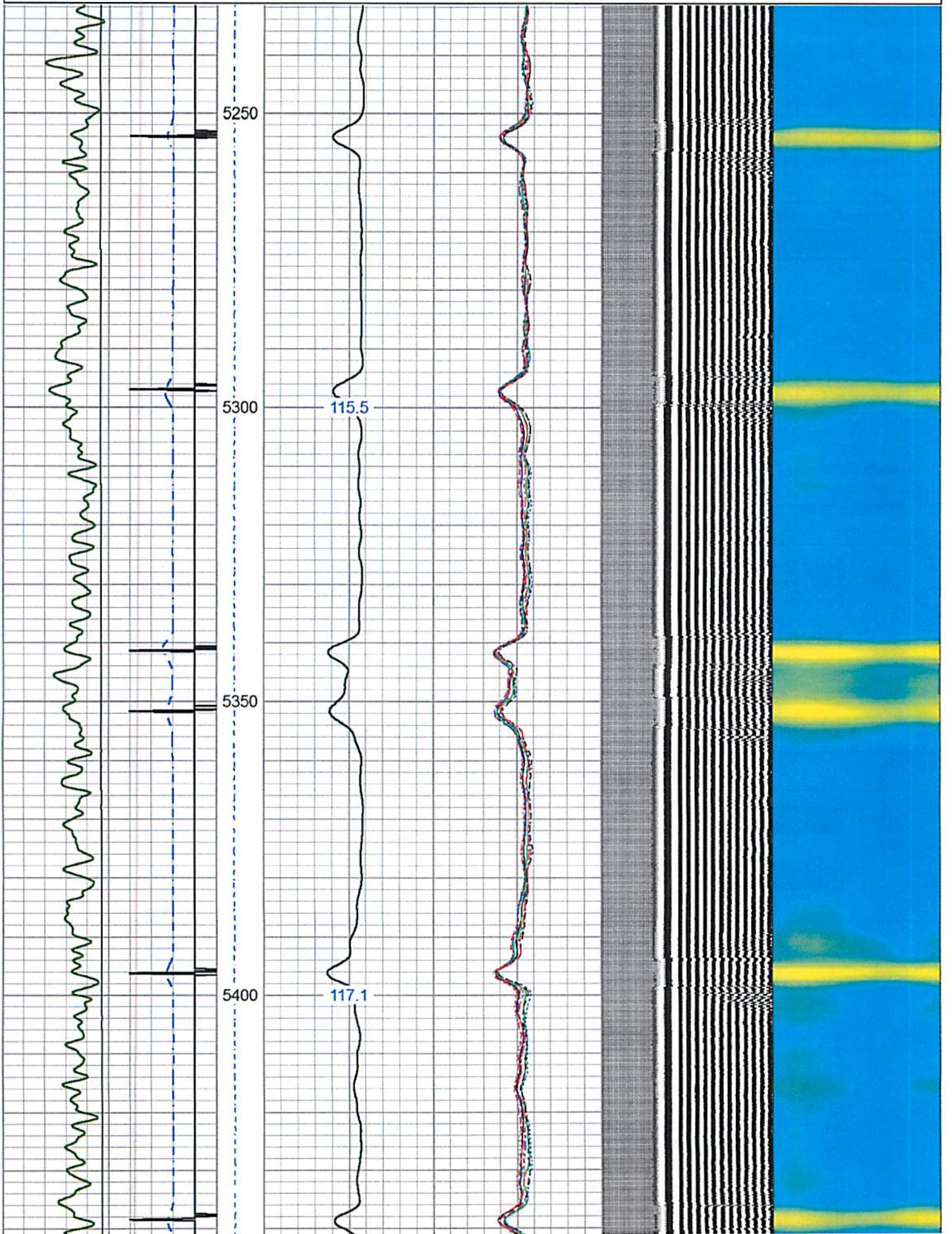
Repeat Pass 0 PSI

Scale 1:240

Database File c:\users\user\desktop\antero neat logs\antero resources_jack_unit1h_rcbl.db
 Dataset Pathname Repeat.1
 Presentation Format ahws_rcbl_jc
 Dataset Creation Thu Dec 13 18:49:18 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	1200	0	100	
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



S7	-0.008	0.209	0.000	100.000	461.872	3.579
S8	-0.007	0.219	0.000	100.000	442.257	3.280

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	-0.010	0.383	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 resources_jack_unit1h_rcbl.db

Dataset field/well/run1/Main Pass/_vars_

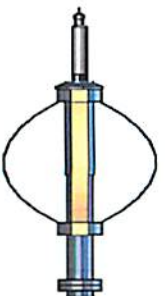
Top - Bottom

BHTEMP_Src	BOREID	BOTTEMP	CASEOD	CASETHCK	CASEWGHT	MAXAMPL	MINAMPL
TEMP	in	degF	in	in	lb/ft	mV	mV
	8.625	100	5.5	0.415	23	72	1
MINATTN	PERFS	PPT	SRFTEMP	TDEPTH			
db/ft		usec	degF	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

