

Company: Noble Energy, Inc.

Well: Minutemen Federal #LC21-625

Field: Wildcat

County: Weld State: Colorado

UltraSonic Summary Print

County:	Weld				
Field:	Wildcat				
Location:	SWSW Sec 22 T9N R59W				
Well:	Minutemen Federal #LC21-625				
Company:	Noble Energy, Inc.				
		Location:			
		SWSW Sec 22 T9N R59W	Elev.:	K.B.	4907.00 ft
		SHL: 900 FSL 399 FWL		G.L.	4877.00 ft
		Latitude: 40.73134 Longitude: -103.97204		D.F.	4906.00 ft
		Permanent Datum:	Ground Level	Elev.:	4877.00 f
		Log Measured From:	Kelly Bushing	30.00 ft	above Perm.Datum
		Drilling Measured From:	Kelly Bushing		
		API Serial No.	Section:	Township:	Range:
		05-123-42788	22	9N	59W
Logging Date	26-Aug-2017				

Run Number	One	
Depth Driller	11083.00 ft	
Schlumberger Depth	11083.00 ft	
Bottom Log Interval	6350.00 ft	
Top Log Interval	0.00 ft	
Casing Fluid Type	Brine	
Salinity		
Density	9.3 lbm/gal	
Fluid Level	8.00 ft	
BIT/CASING/TUBING STRING		
Bit Size	8.50 in	
From	1943.00 ft	
To	11083.00 ft	
Casing/Tubing Size	5.5 in	
Weight	20 lbm/ft	
Grade	N/A	
From	0.00 ft	
To	11073.00 ft	
Max Recorded Temperatures	225 degF	
Logger on Bottom	26-Aug-2017	11:43:00
Unit Number	9108	Fort Morgan
Recorded By	Stephen Tang	
Witnessed By	Bill Mansfield	

Disclaimer

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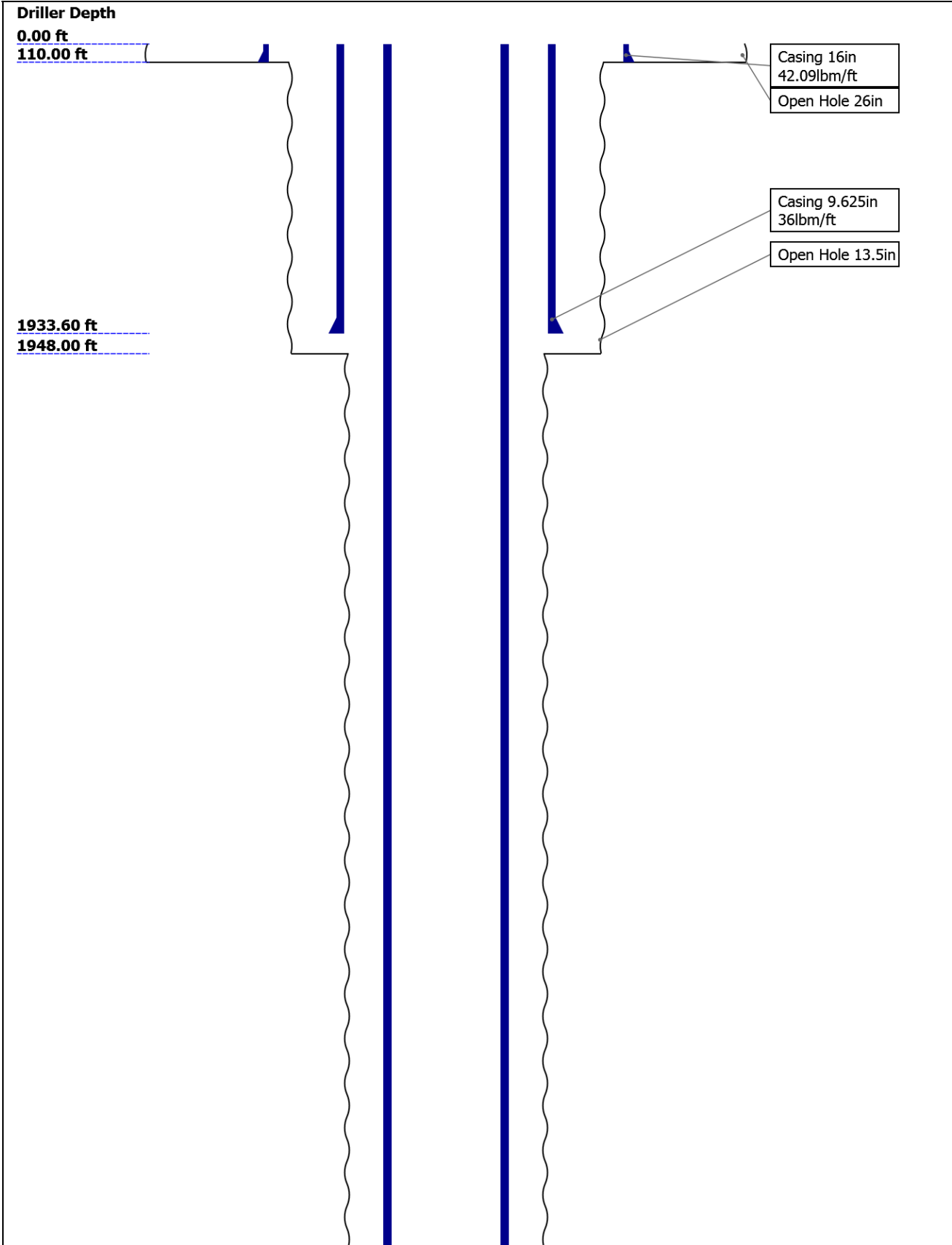
Contents

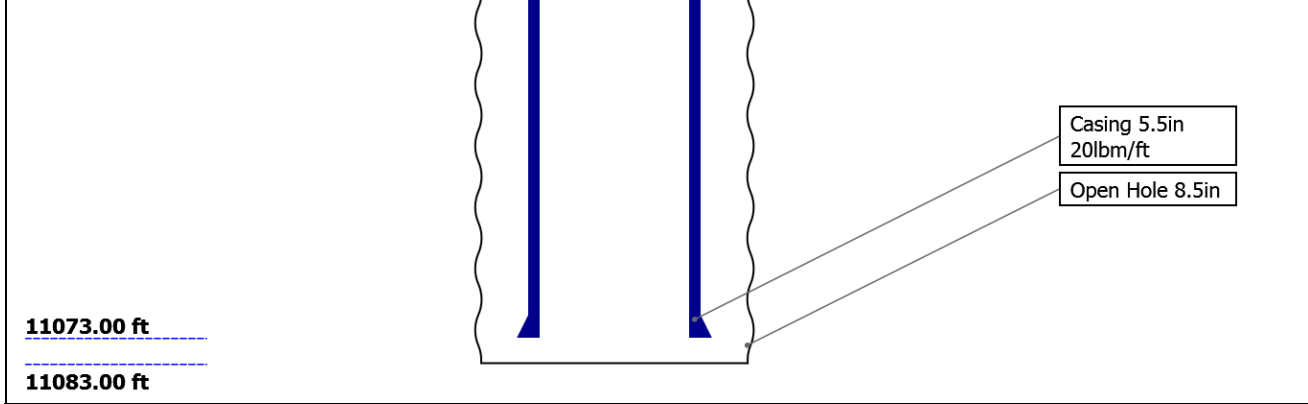
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Well Sketch





11073.00 ft

11083.00 ft

Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	0	110	1948			
Top Logger (ft)	0	110	1943			
Bottom Driller (ft)	110	1948	11083			
Bottom Logger (ft)	110	1943	11083			
Casing						
Size (in)	16	9.625	5.5			
Weight (lbm/ft)	42.09	36	20			
Inner Diameter (in)	15.511	8.921	4.778			
Grade	N/A	N/A	N/A			
Top Driller (ft)	0	0	0			
Top Logger (ft)	0	0	0			
Bottom Driller (ft)	110	1933.6	11073			
Bottom Logger (ft)	110	1933.6	11073			

Remarks and Equipment Summary

One: Toolstring			One: Remarks	
<div><div><div>Equip nameLengthMP nameOffset</div><div>LEH-QT38.38LEH-QT</div><div>EDTC-B:835.47102</div><div>EDTH-B:9245</div><div>EDTG-B:77004</div><div>EDTC-B:8102</div><div>HGNS-H:428.97779</div><div>HGNH:3826</div><div>NPV-N</div><div>NSR-F:5068</div><div>HGNS-H:4779</div><div>HACCZ-H:6305</div><div>HMCA-H</div></div><div></div></div> <div><div>CTEM31.97</div><div>ACCZ0.00</div><div>HV0.00</div><div>Gamma30.1</div><div>Ray</div><div>TelStatu28.97</div><div>s</div><div>Temper28.94</div><div>ature</div><div>GR28.23</div><div>CNL Por21.89</div><div>osity</div></div>	Toolstring ran as per tool sketch.			
	Well logged at 10 degree 6 inch.			
	Main pass logged with 2500 psi.			
	Repeat pass logged with 0 psi.			
	Thank you for choosing Schlumberger!			

AH-107

19.56

AH-184

17.56

USIT-E:92

15.56

1

ECH-MFA

USAC-A:9

21

USIS-A:98

8

USSC-B:17

27

USRS-A:84

0

USI-SENS

OR:3306

USI-TX

HMCA

19.56

HGNS

19.56

Accelerometer

0.00

14

USI Sen

0.37

sensor Head Extension

TOOL_ZERO

Lengths are in ft

Maximum Outer Diameter = 4.700 in

Line: Sensor Location, Value: Gating Offset

All measurements are relative to TOOL_ZERO

Depth Summary			
		One	
Depth Measuring Device			
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		
Tension Device			
Type	CMTD-B/A		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0		
Logging Cable			
Type	7-46NT-XS		
Serial Number	4714071		
Length	24000.00 ft		
Conveyance Type	Wireline		

Rig Type		
One:Depth Control Parameters		Depth Control Remarks
Log Sequence	First Log In the Well	All Schlumberger depth procedures followed.
Rig Up Length At Surface		IDW used as primary depth device.
Rig Up Length At Bottom		Z-chart used as secondary depth device.
Rig Up Length Correction		
Stretch Correction		
Tool Zero Check At Surface		

One

2500 PSI Main Pass

Software Version

Acquisition System	Version
Maxwell 2017 SP1	7.1.82245.3100
Application Patch	Wireline_NPD-ICE2-2017SP1_7.1.87324

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[11]:Up	Up	68.19 ft	6353.11 ft	26-Aug-2017 9:56:51 AM	26-Aug-2017 11:13:14 AM	ON	3.65 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Noble Energy, Inc.

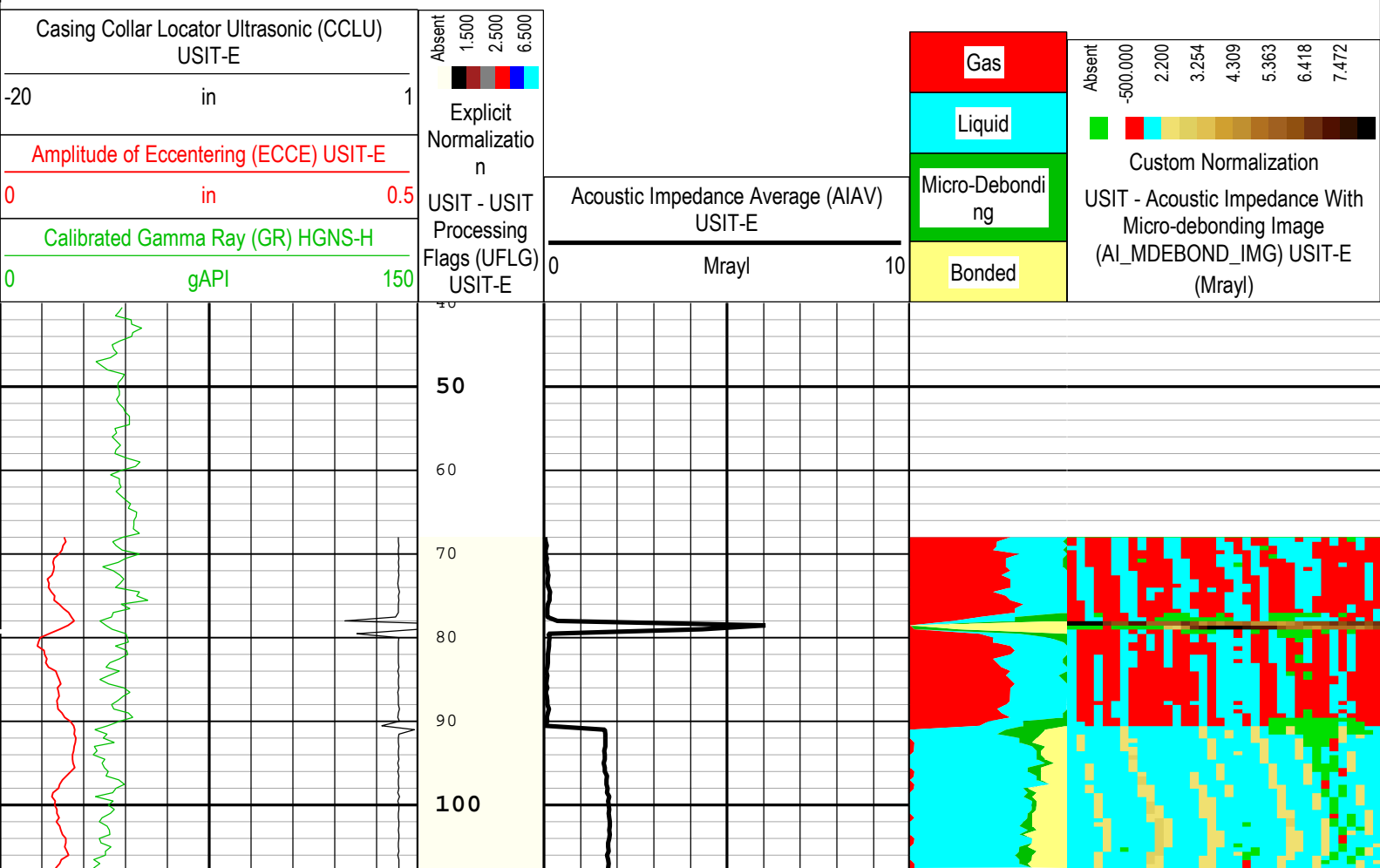
Well:Minutemen Federal #LC21-625

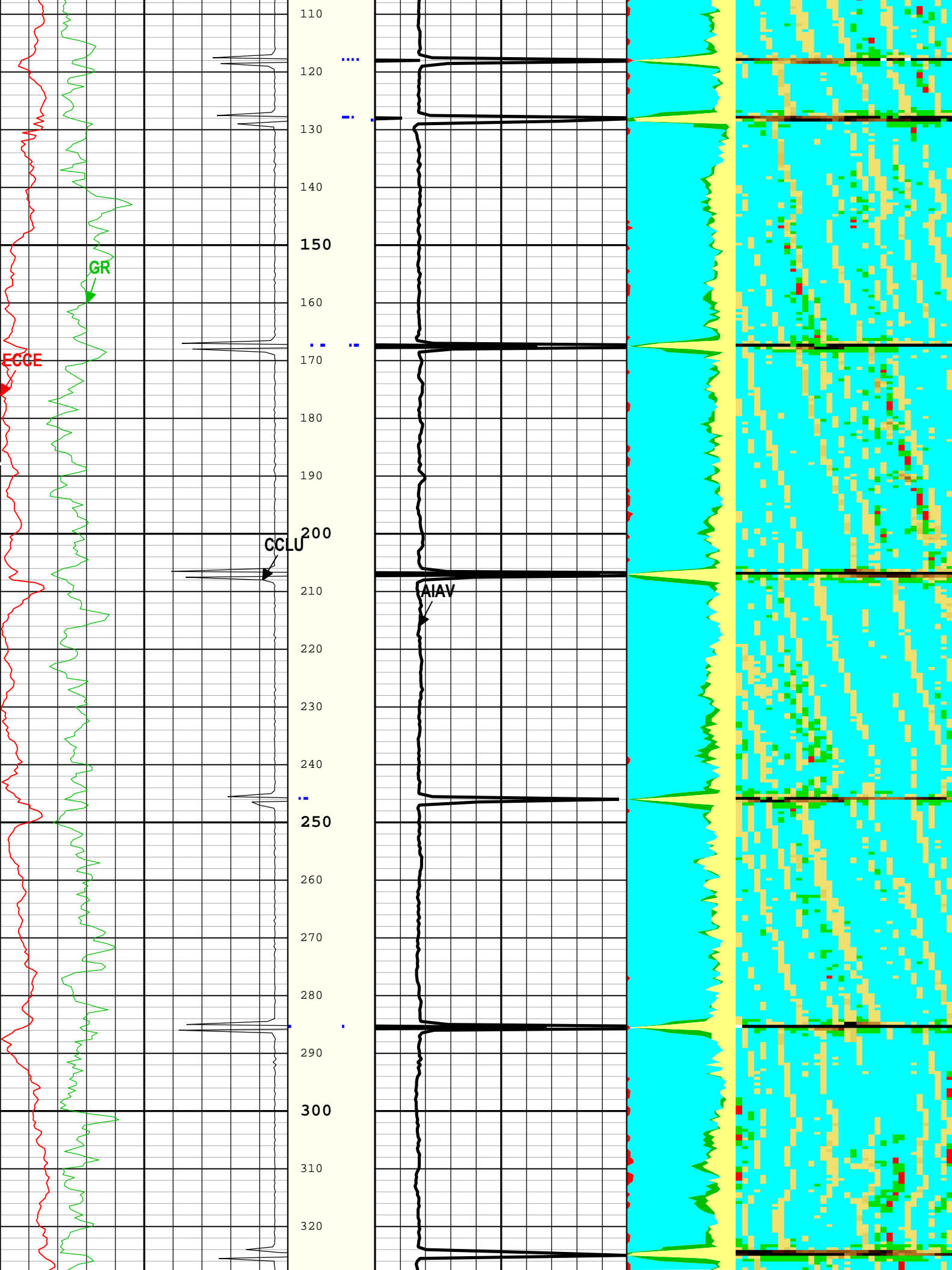
One: Log[11]:Up:S005

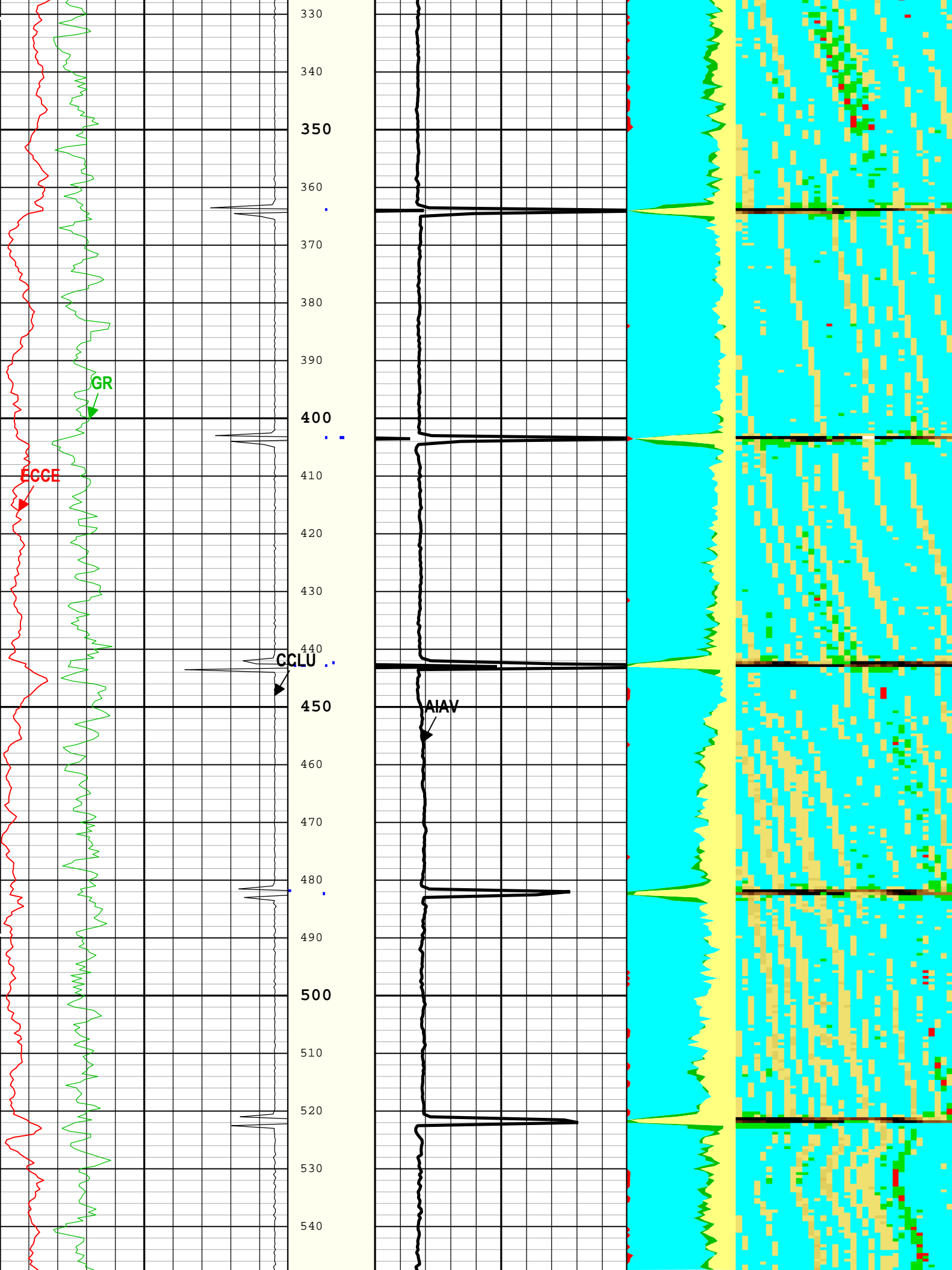
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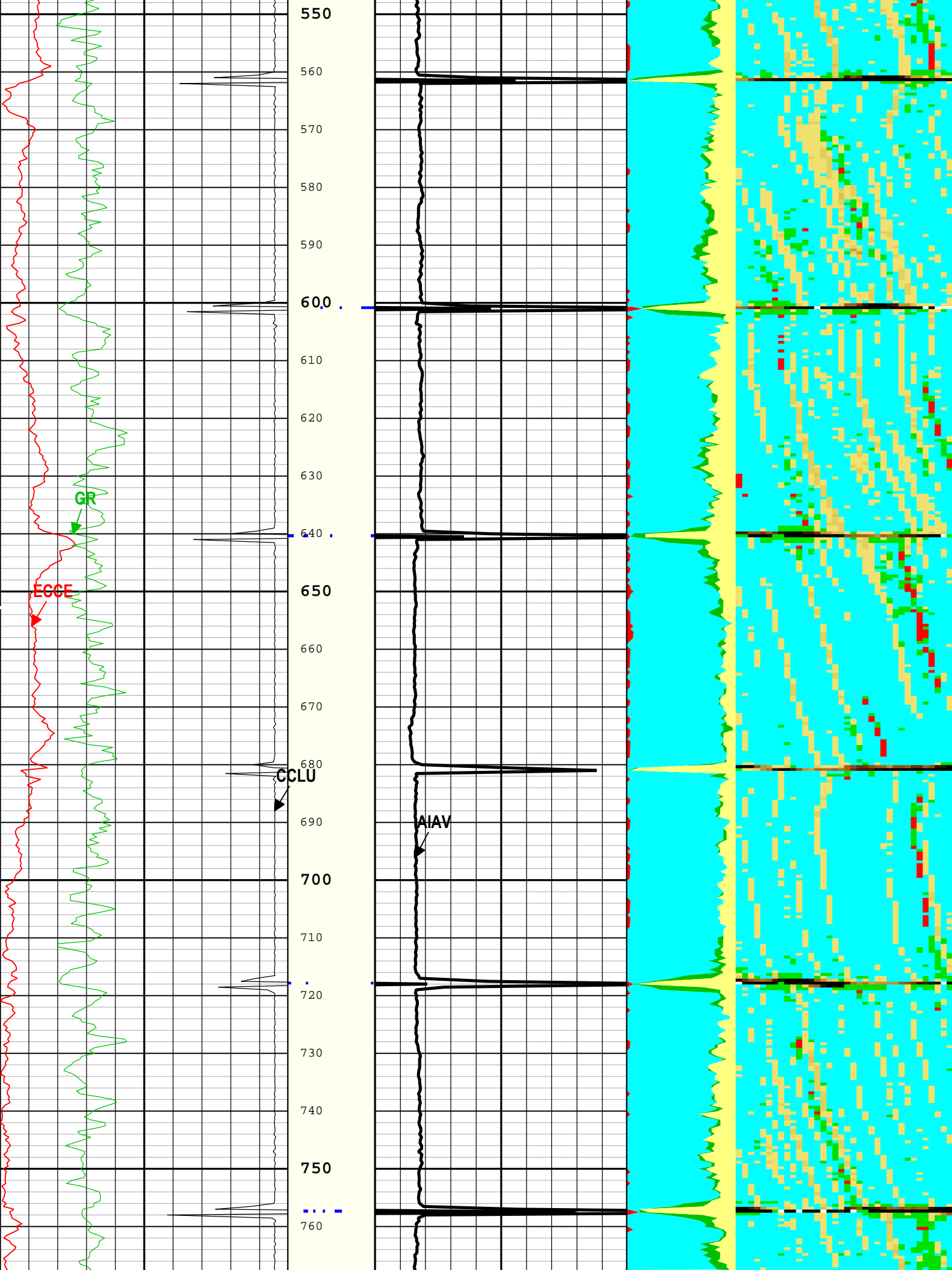
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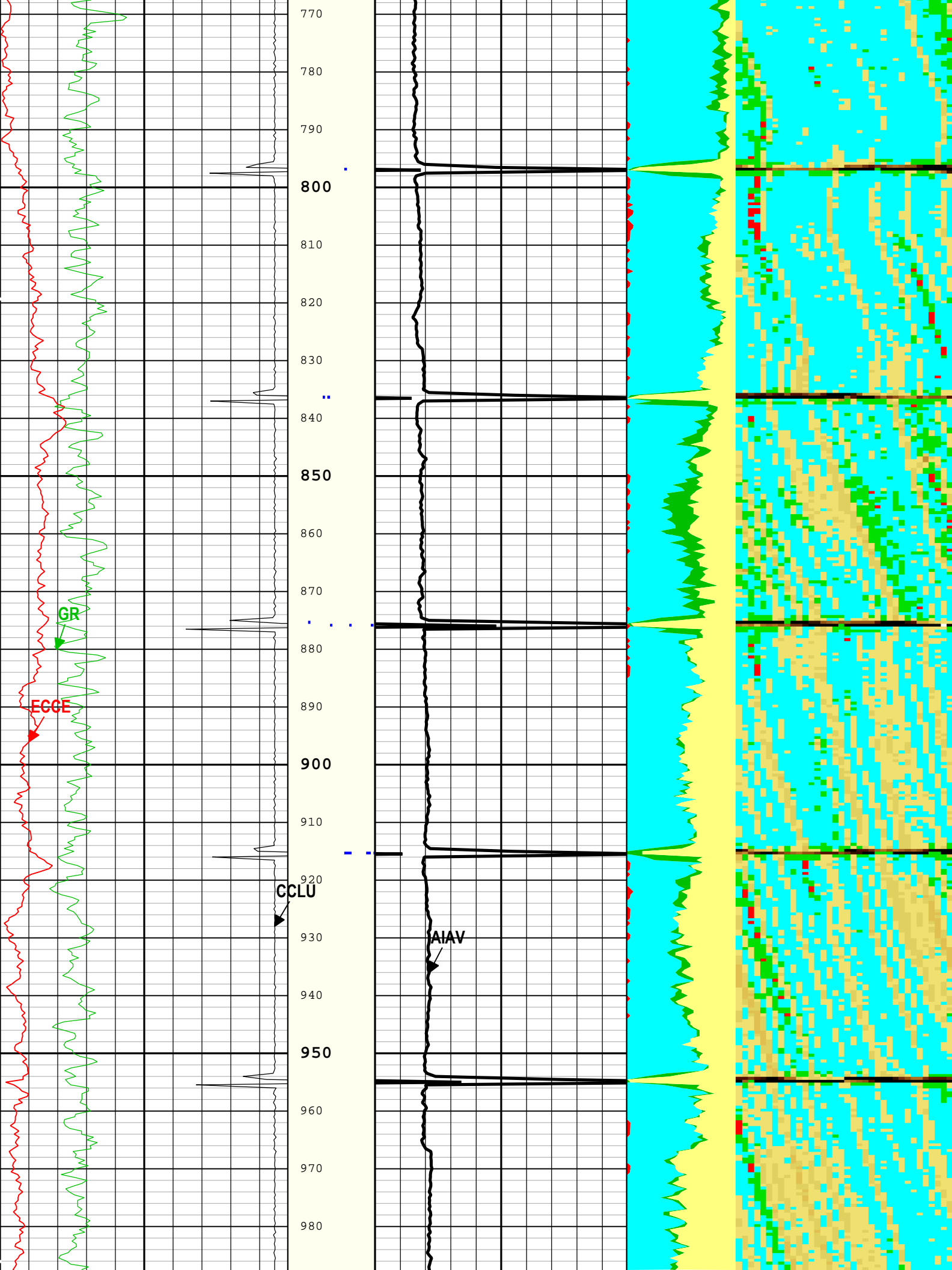
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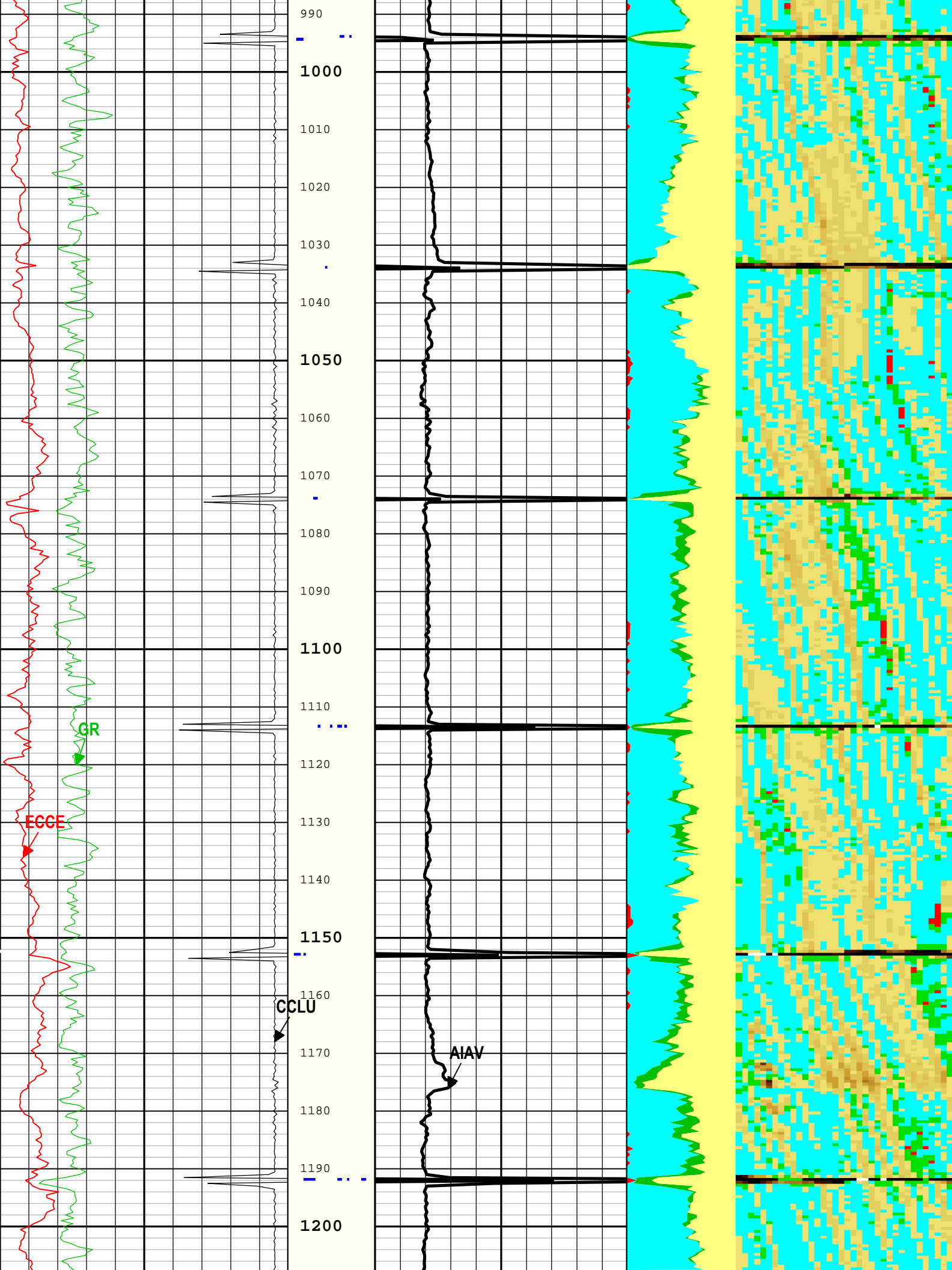


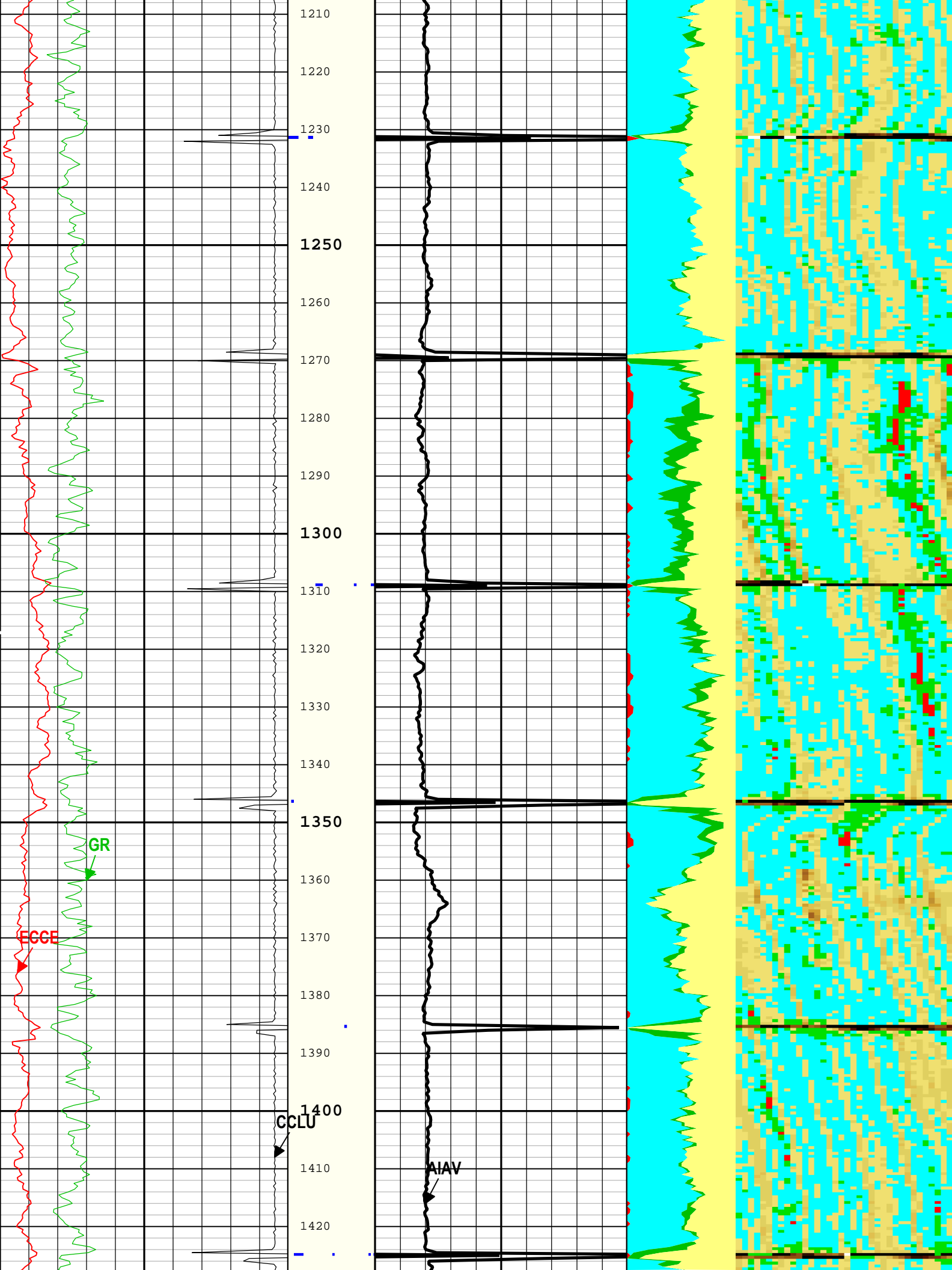


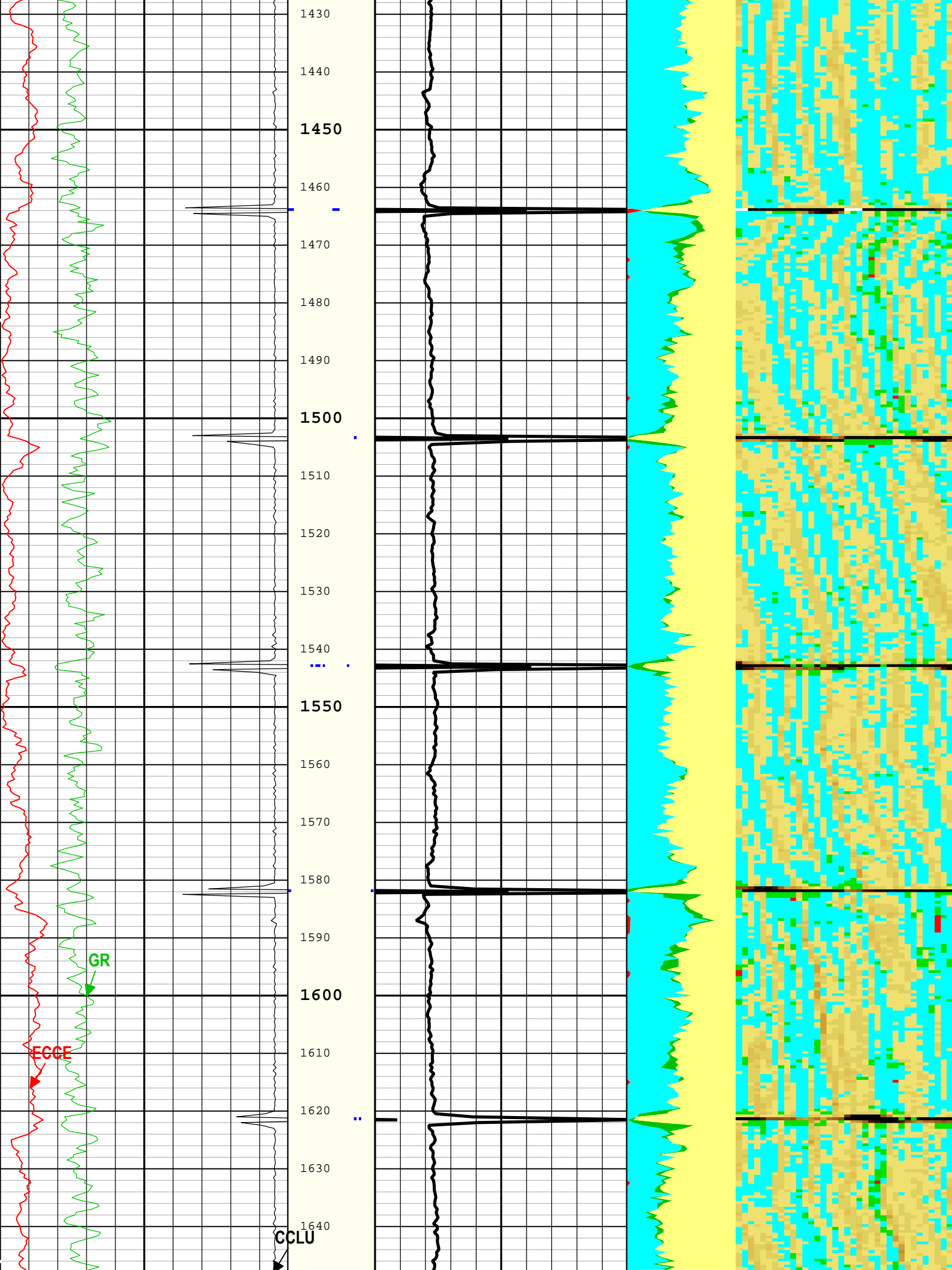


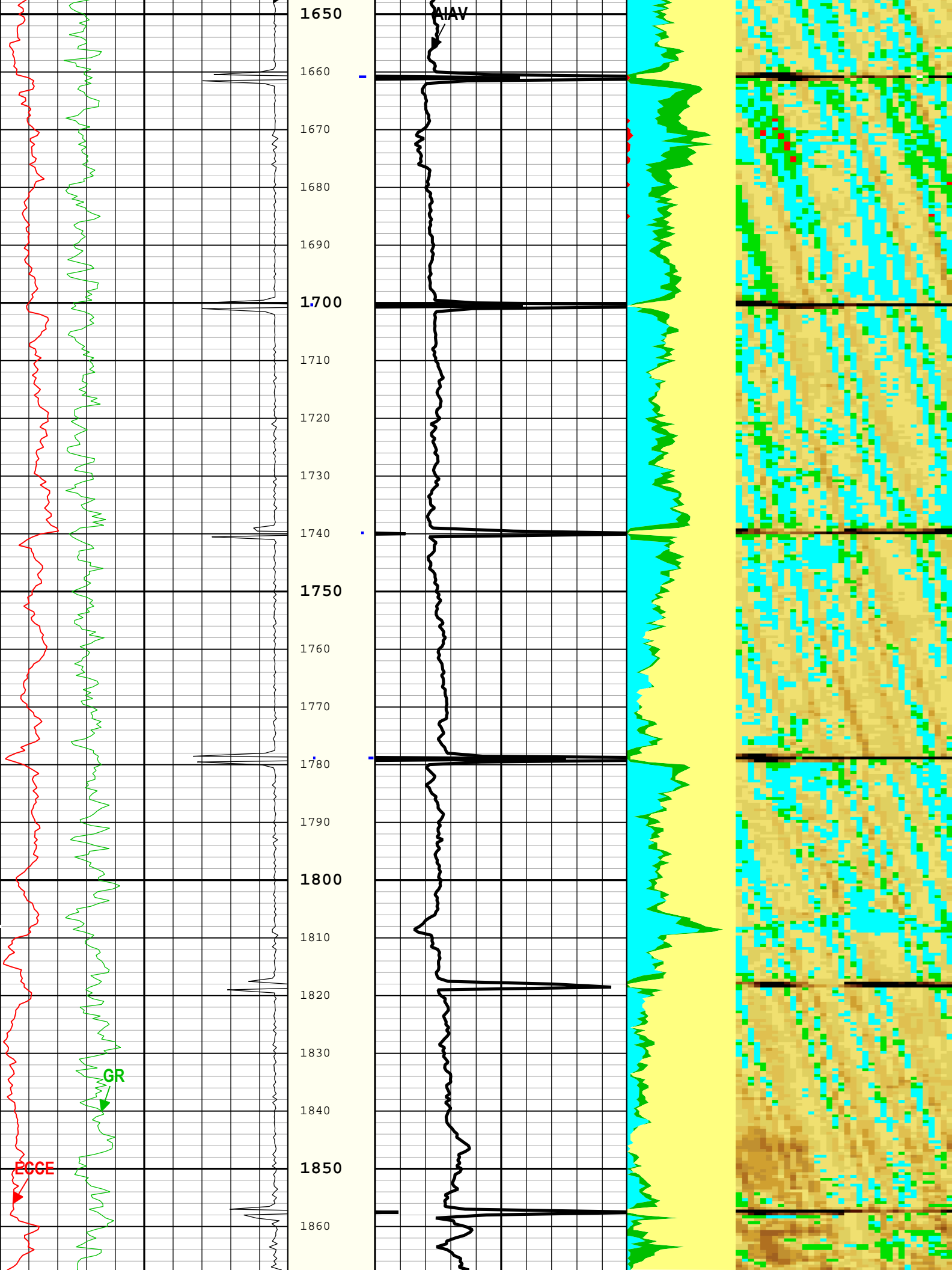


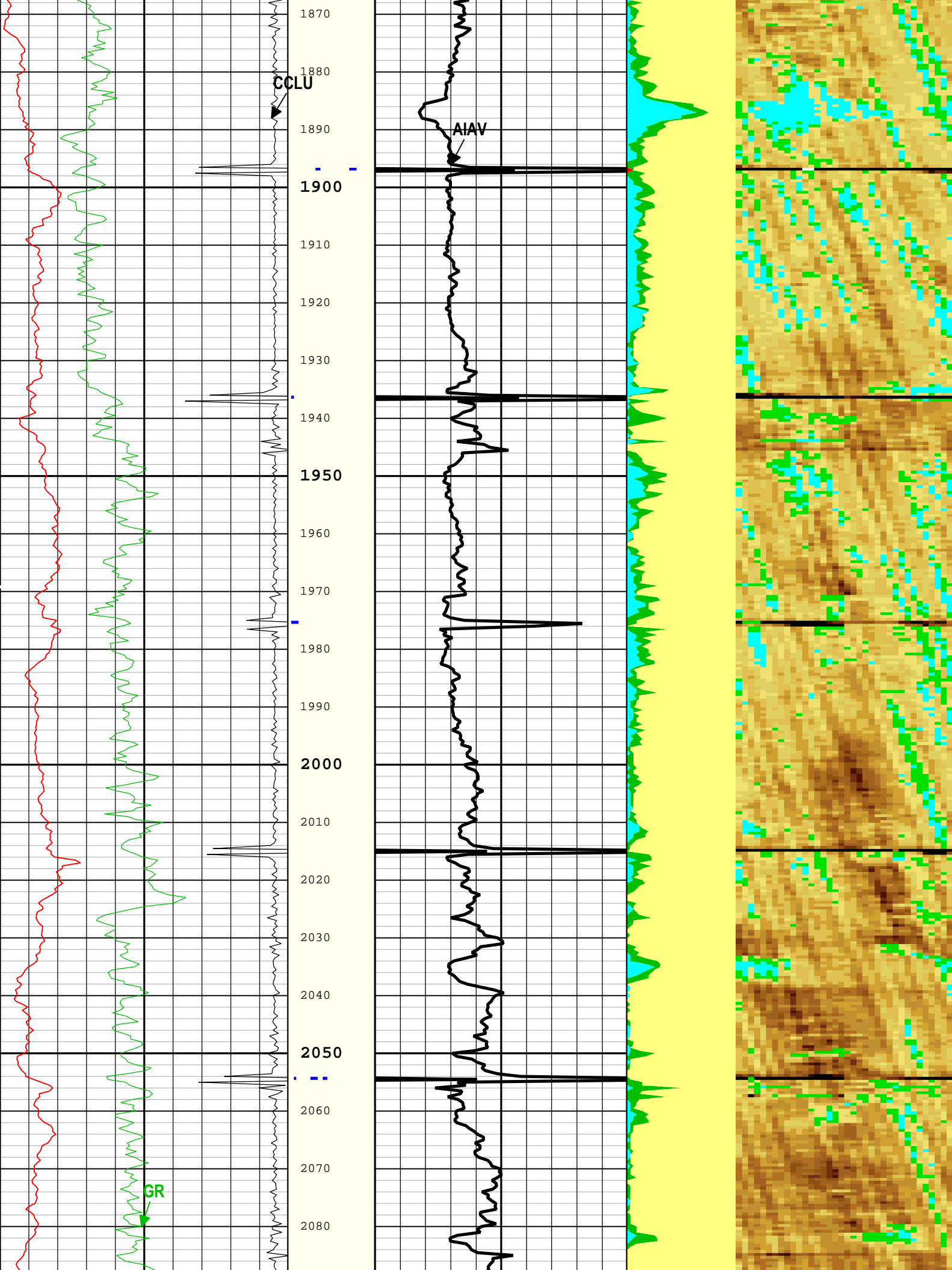


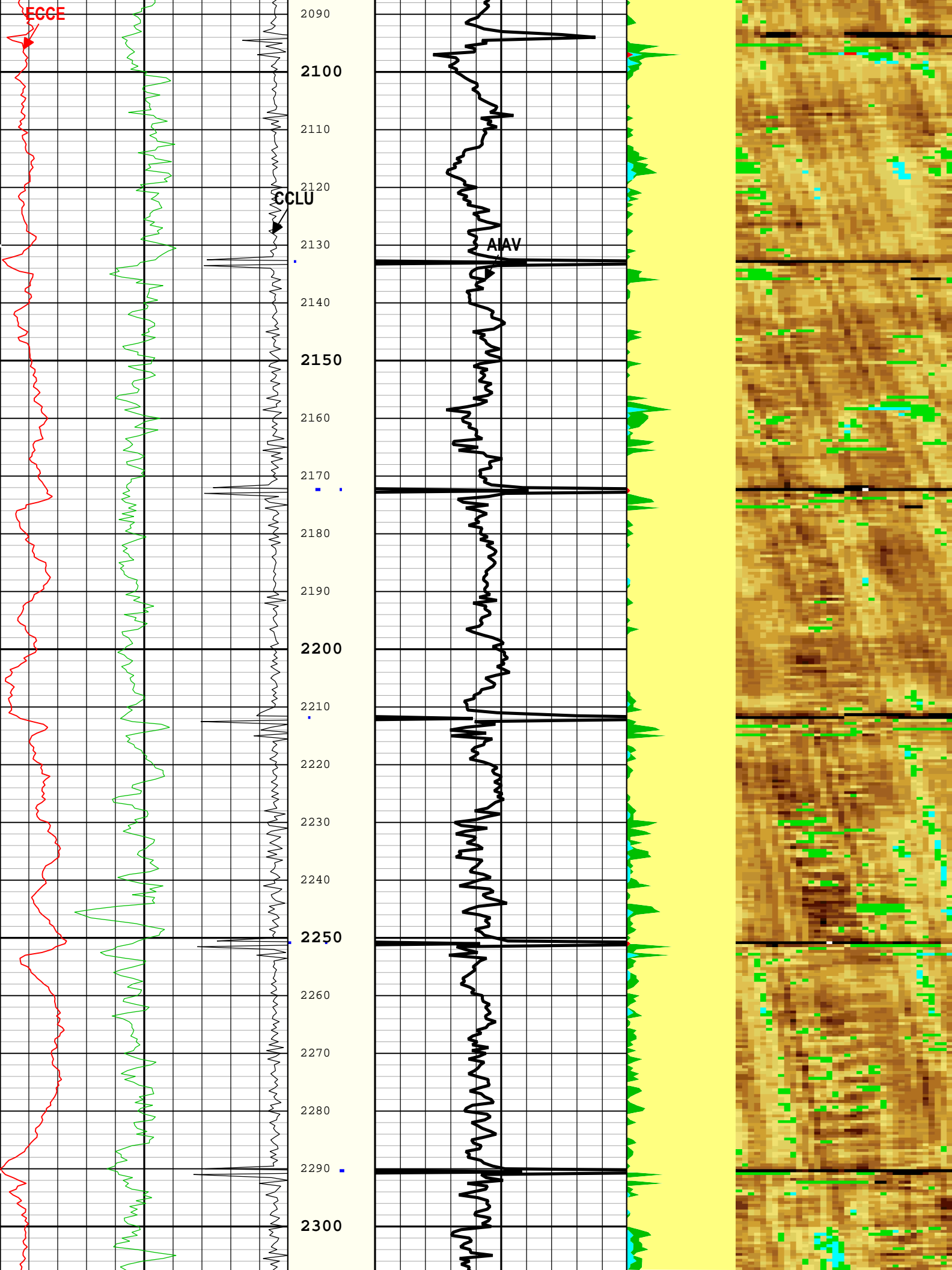


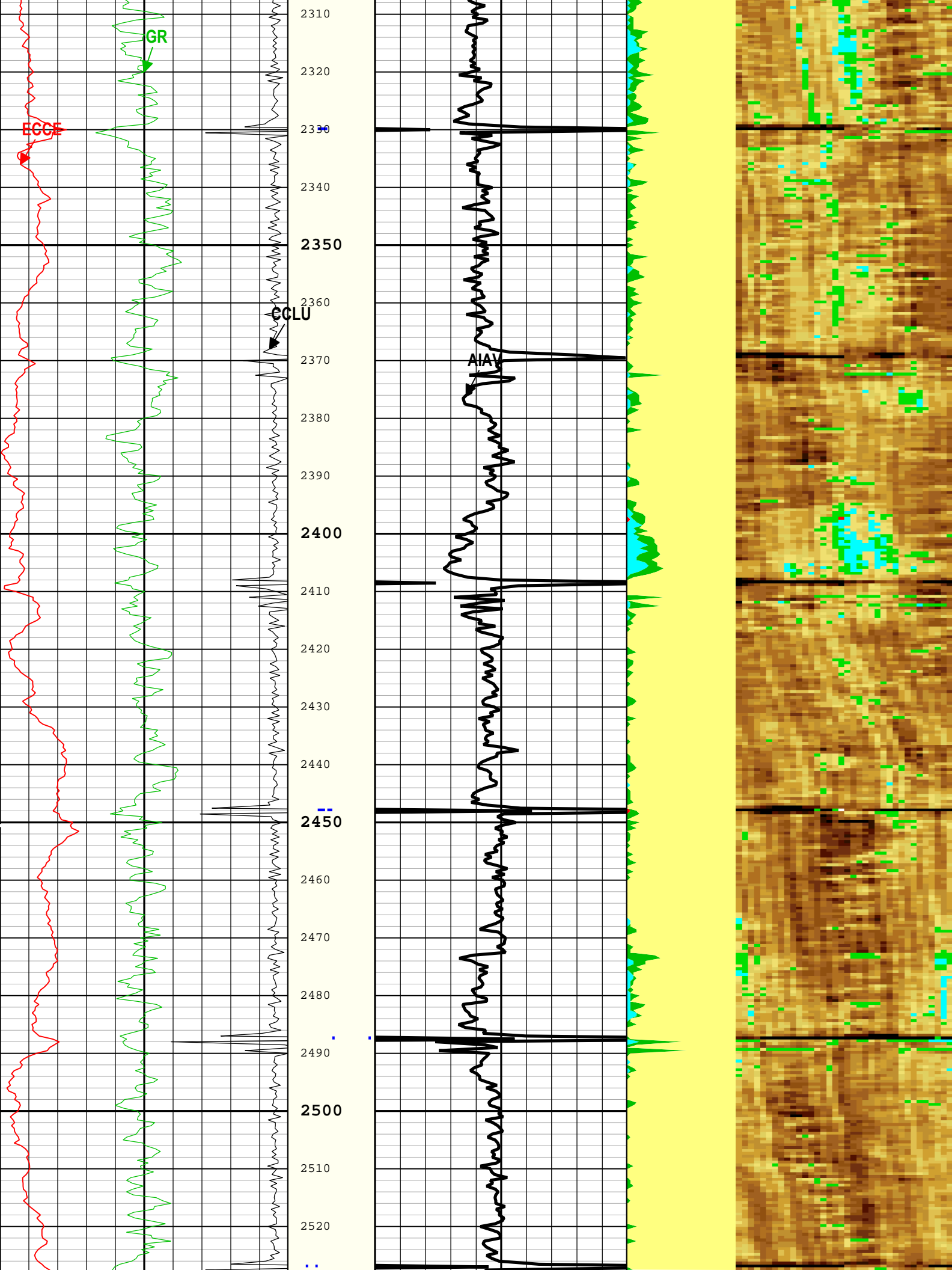


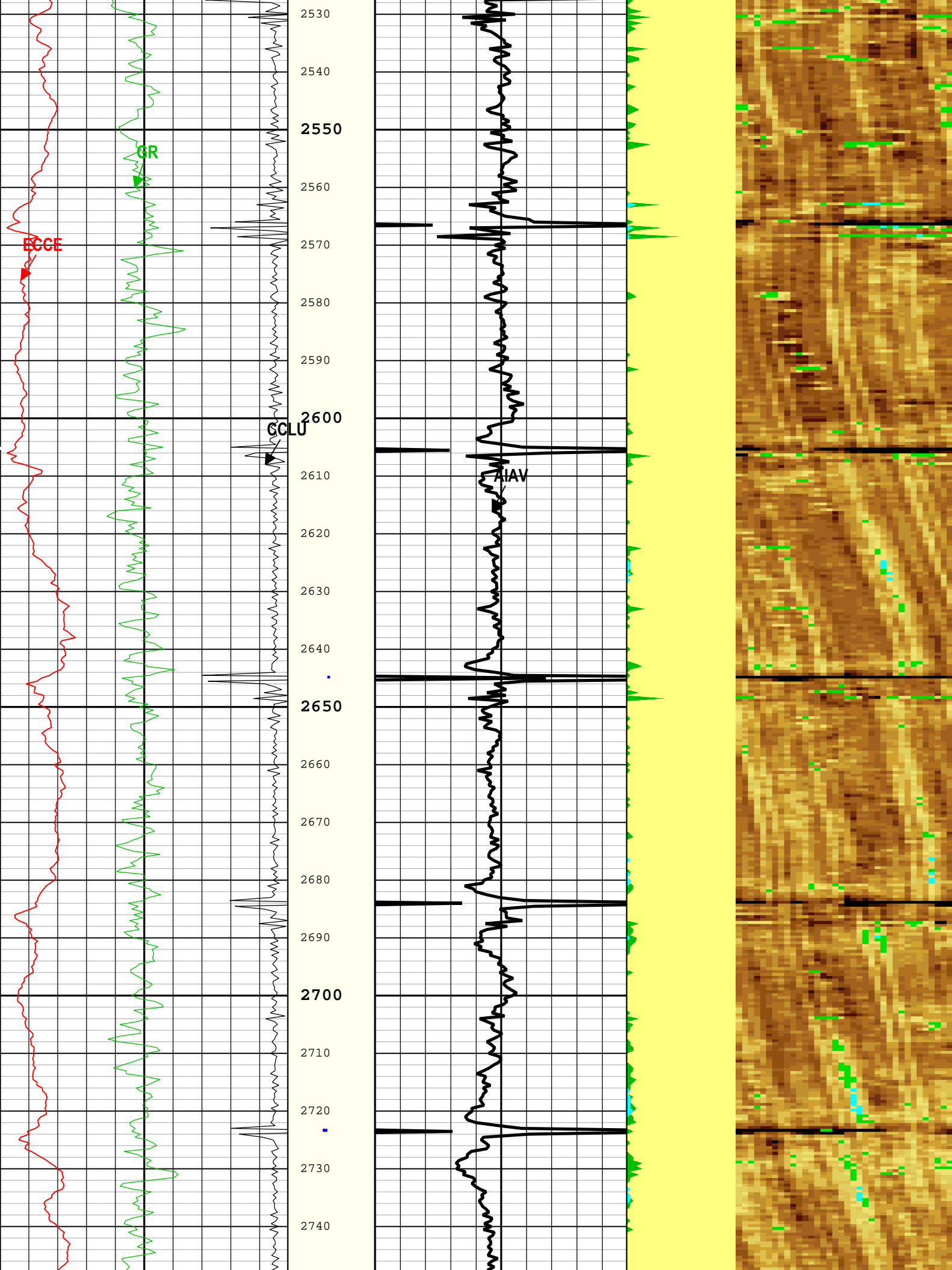


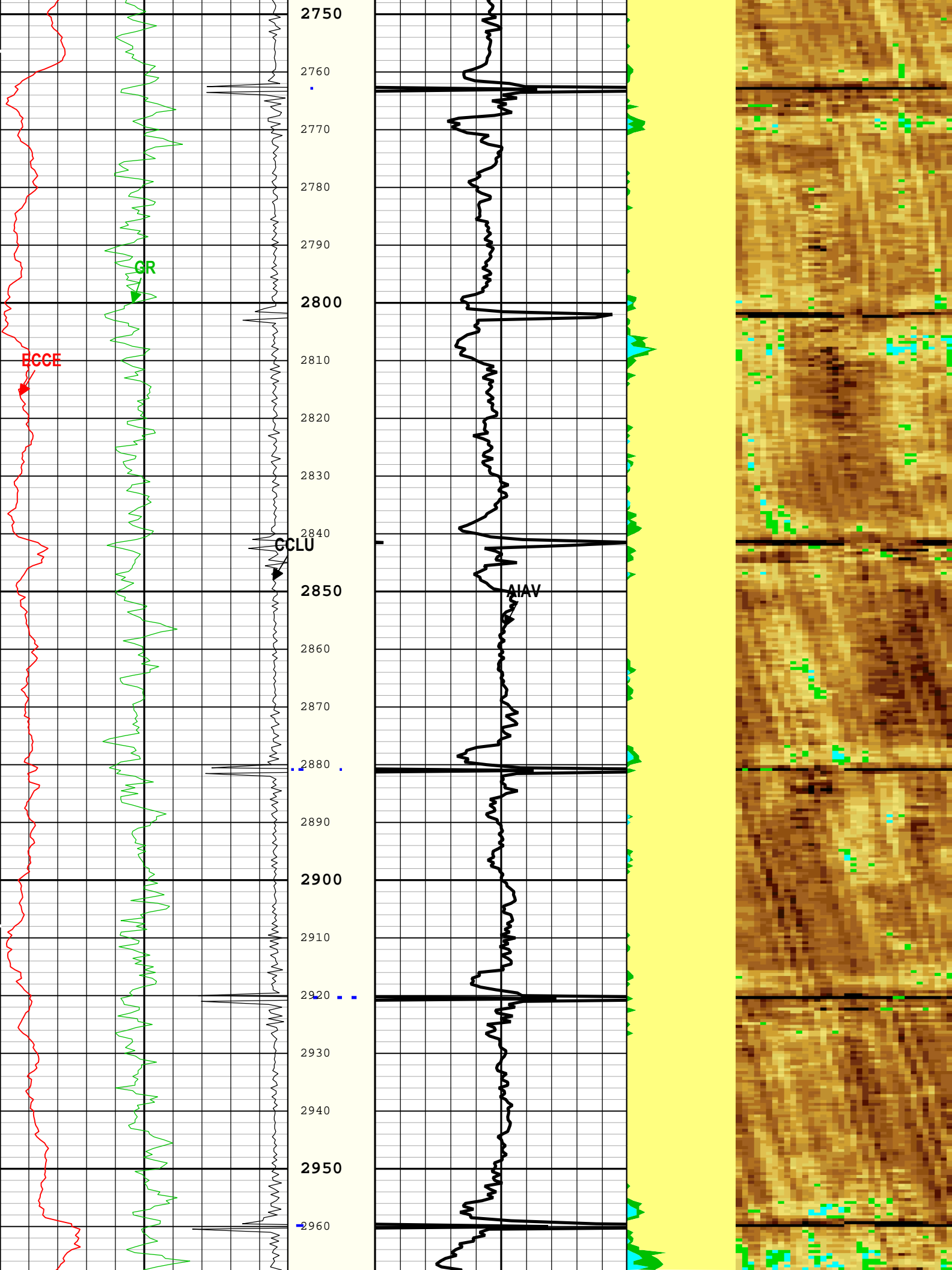


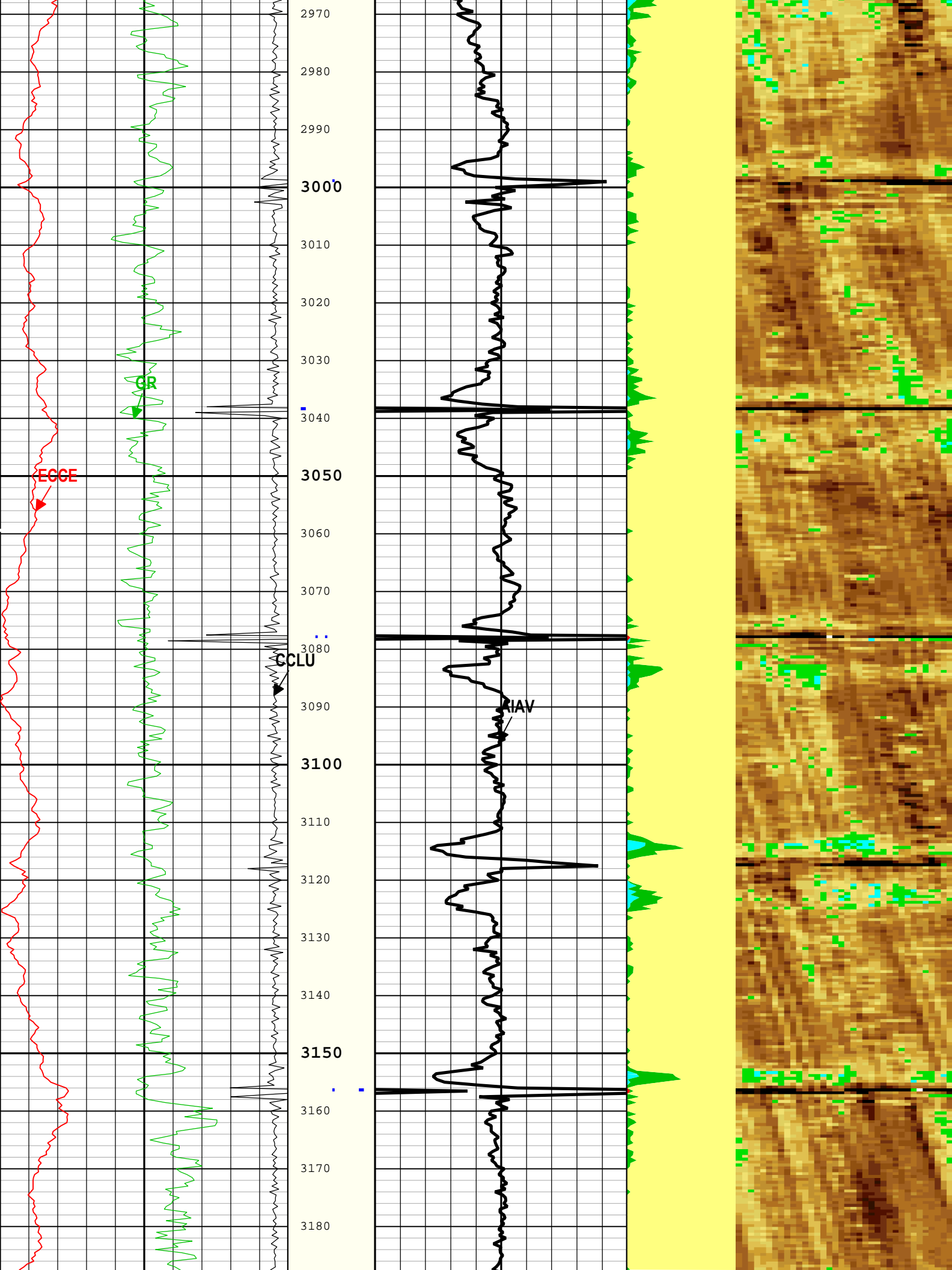


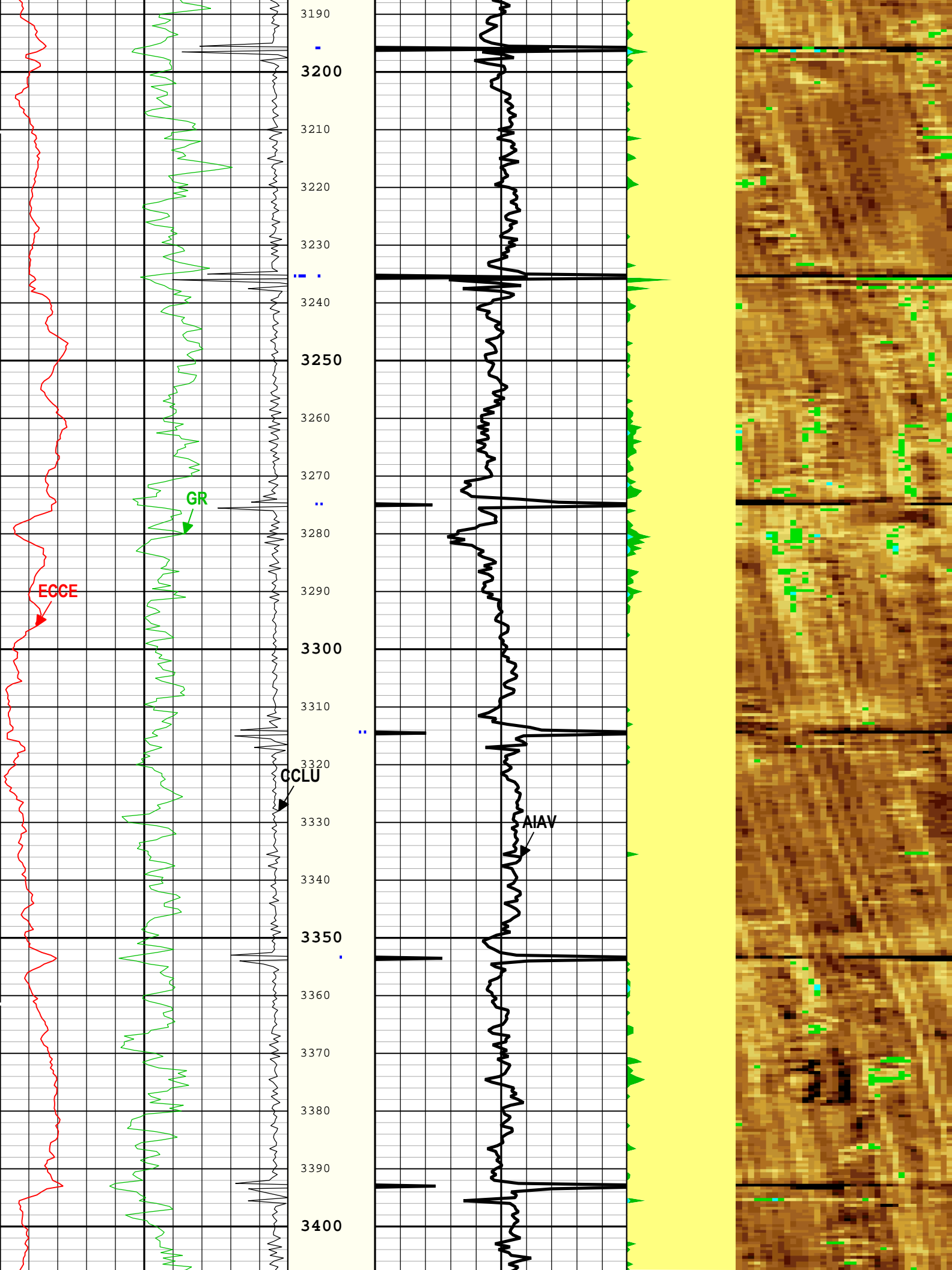


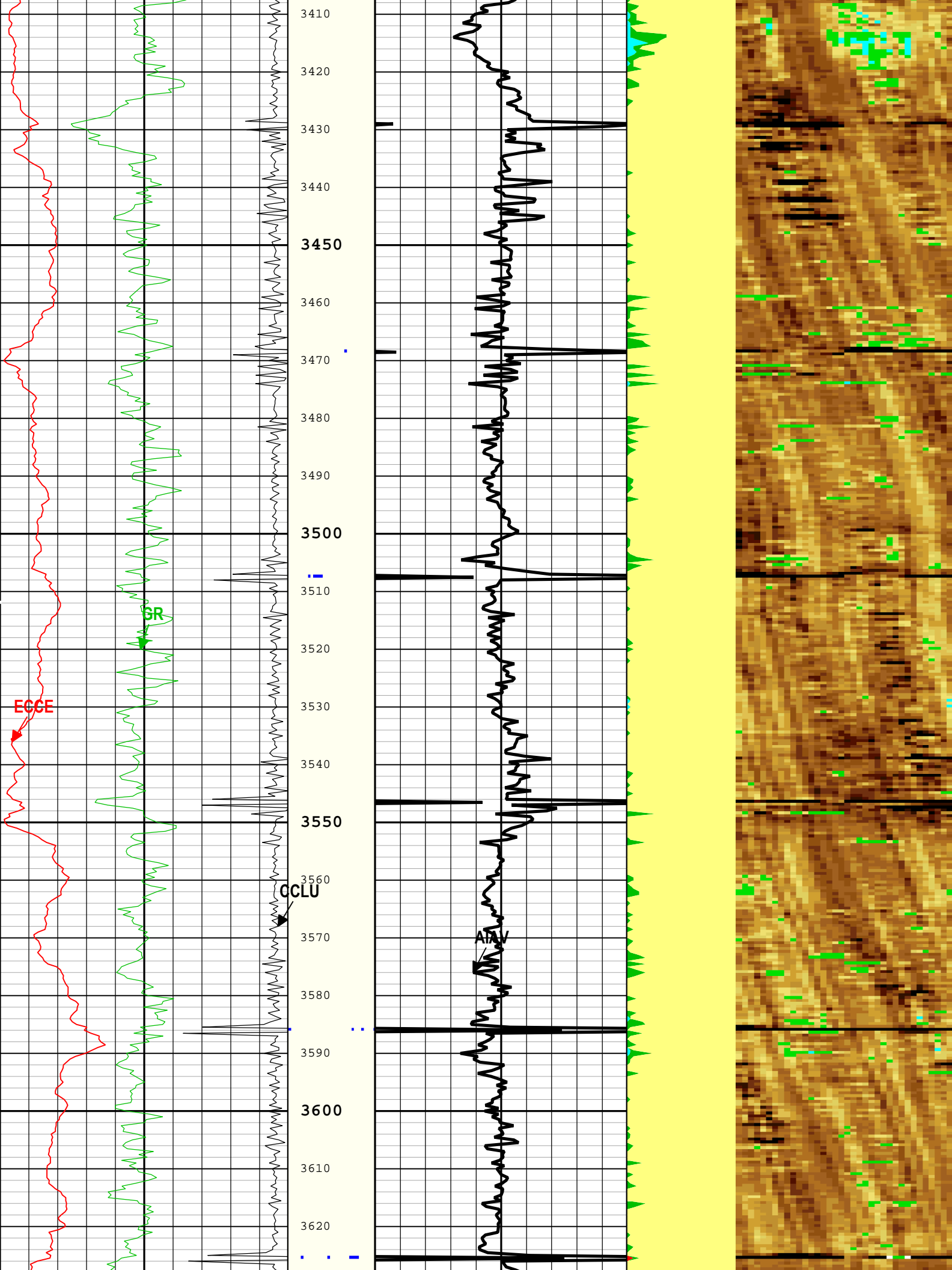


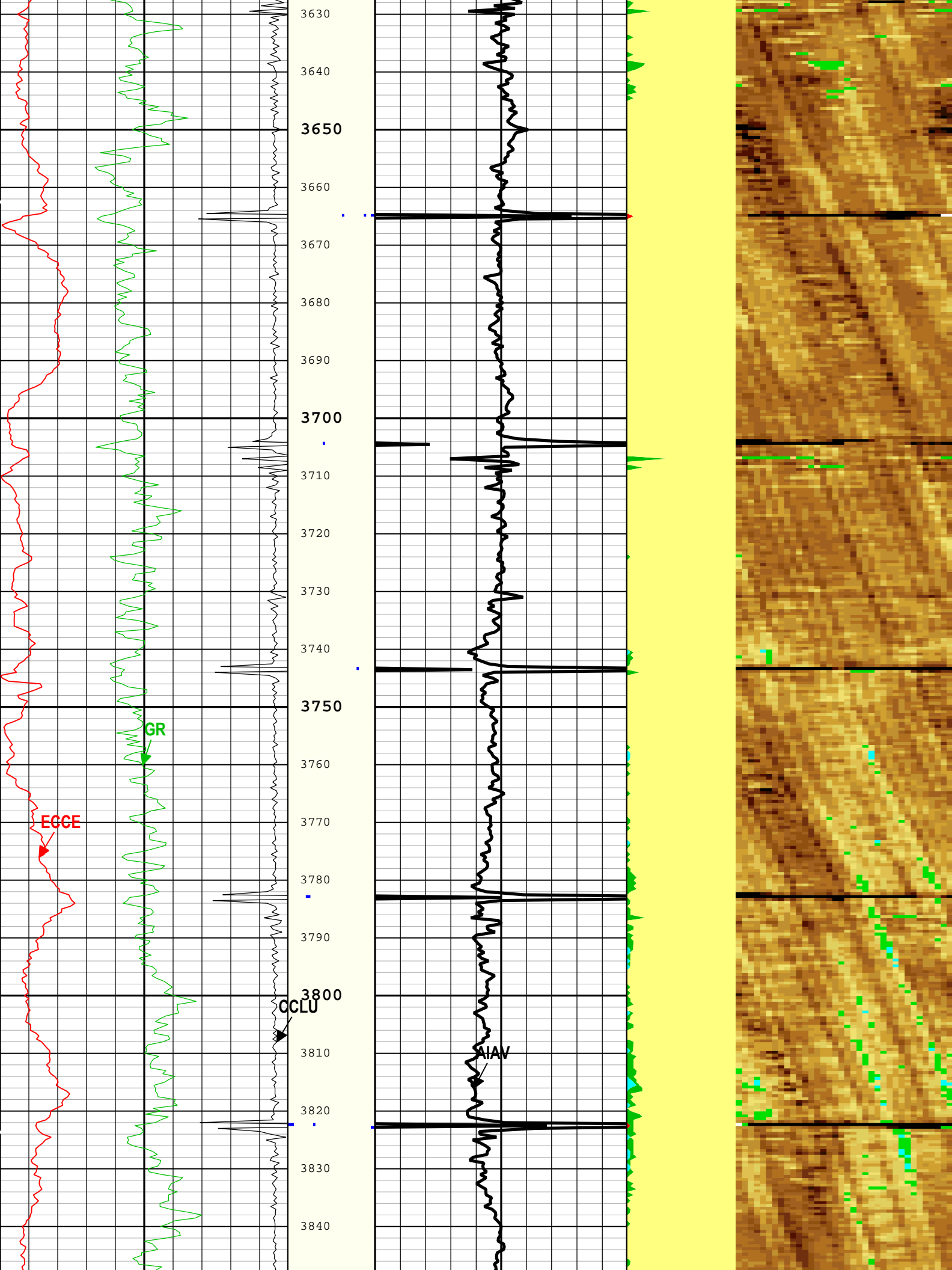


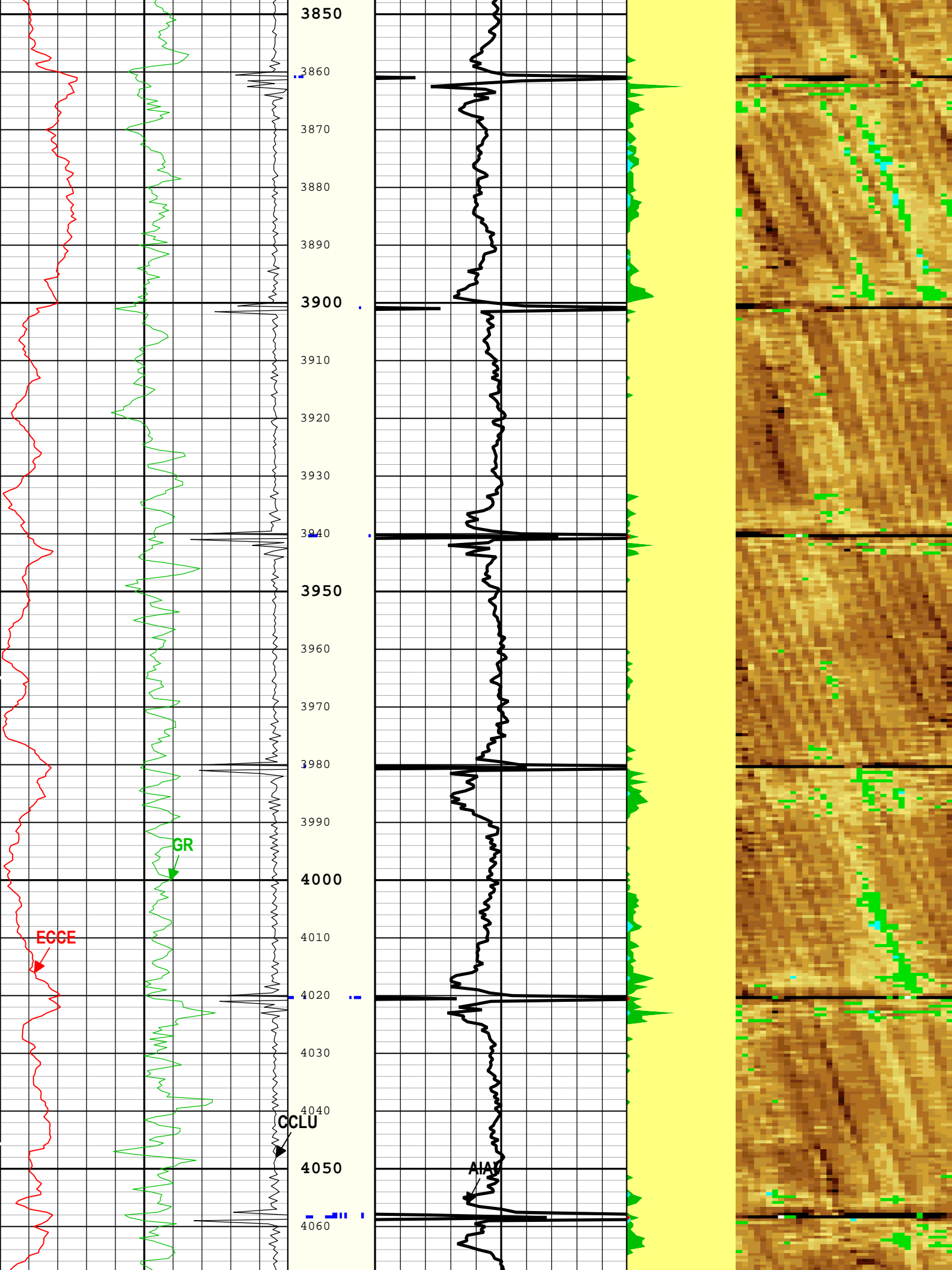


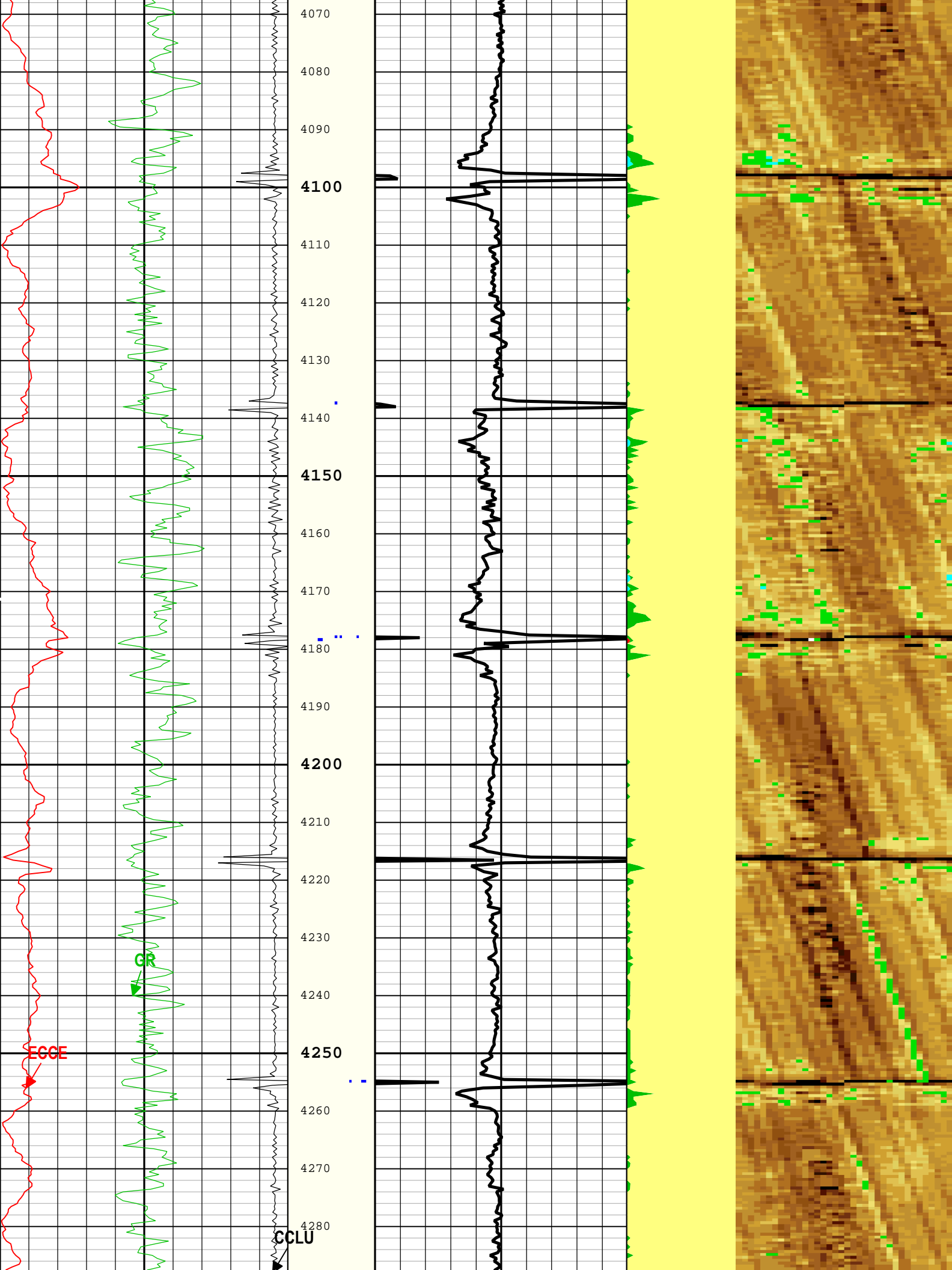


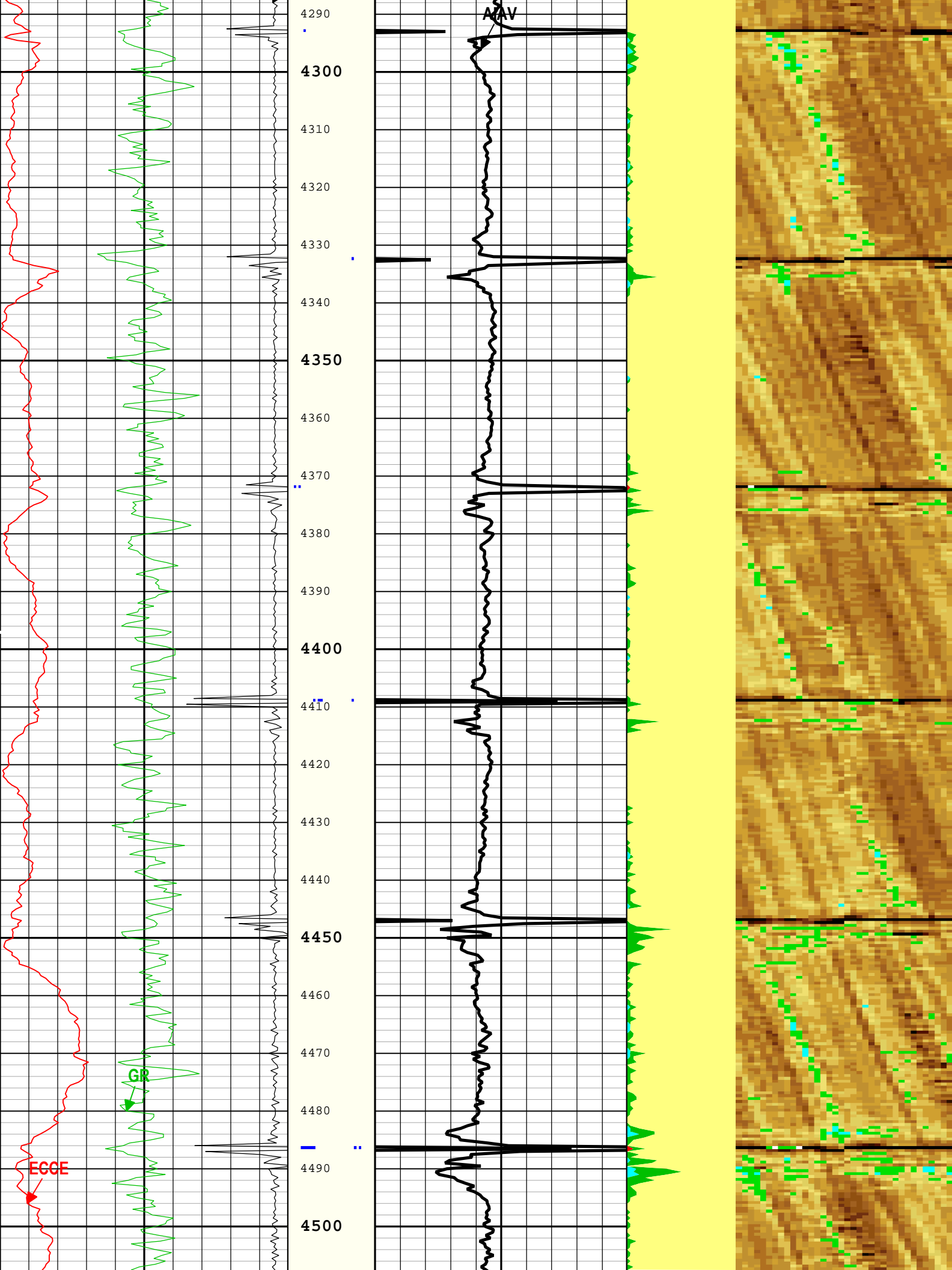


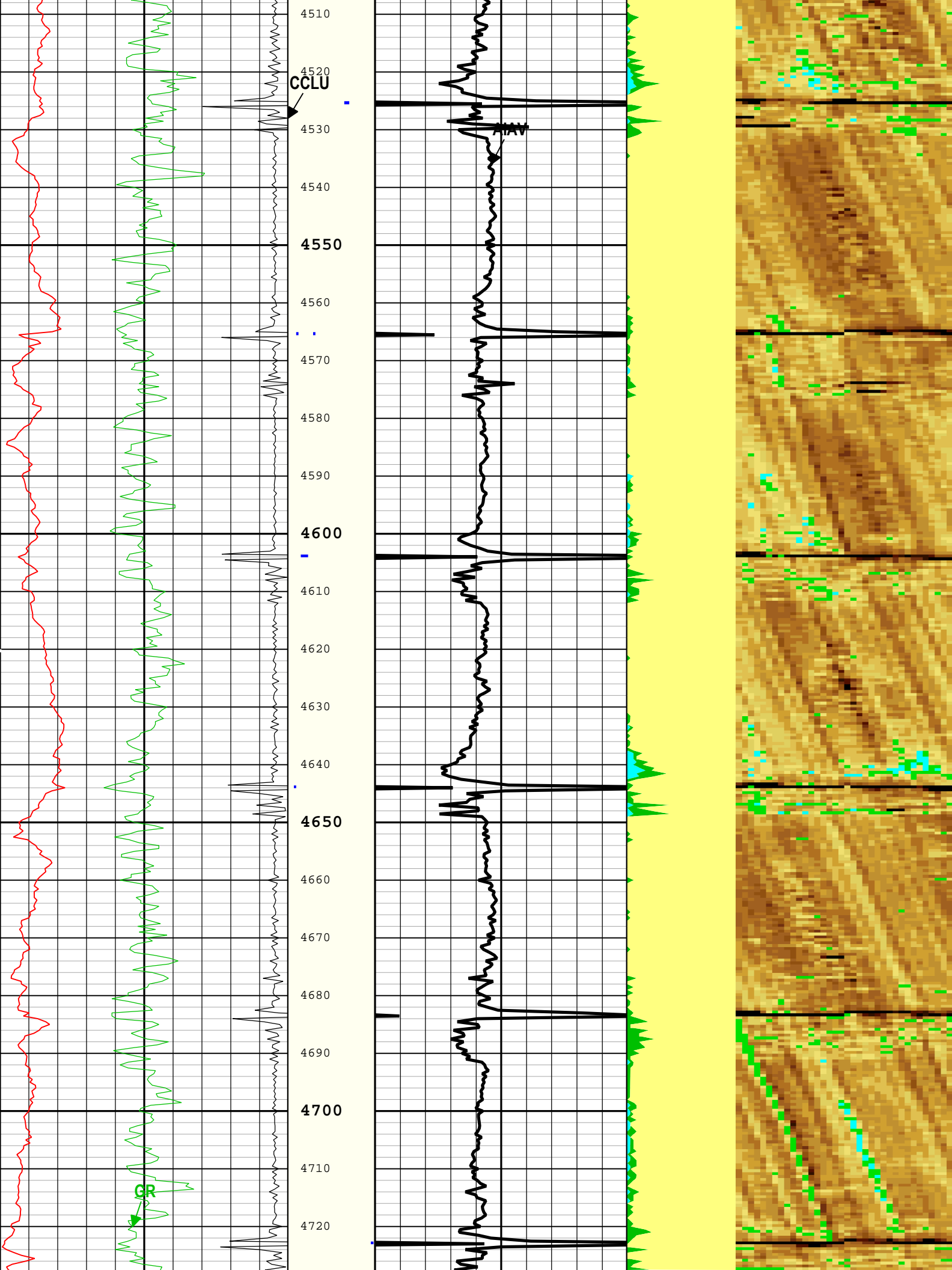


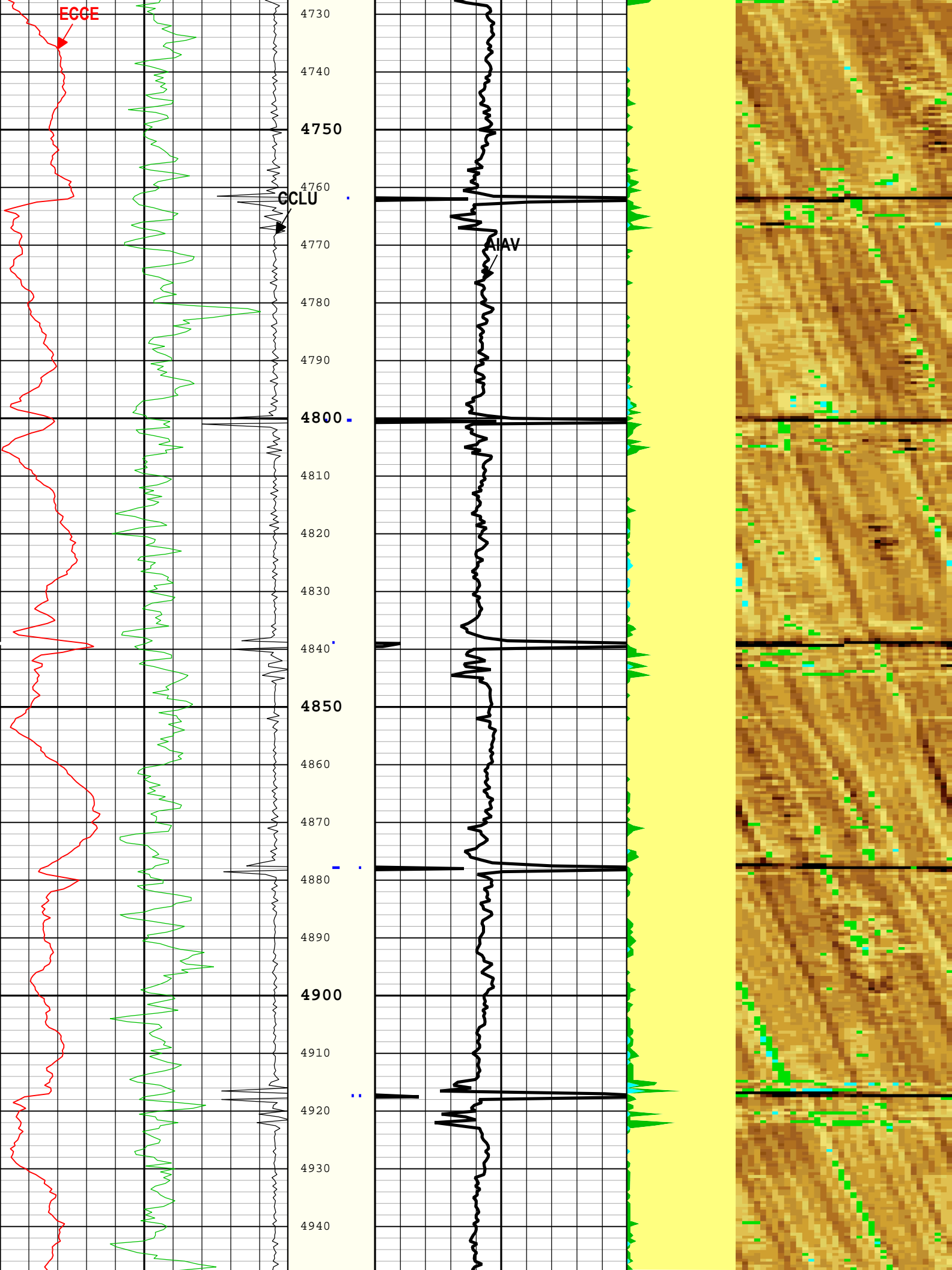


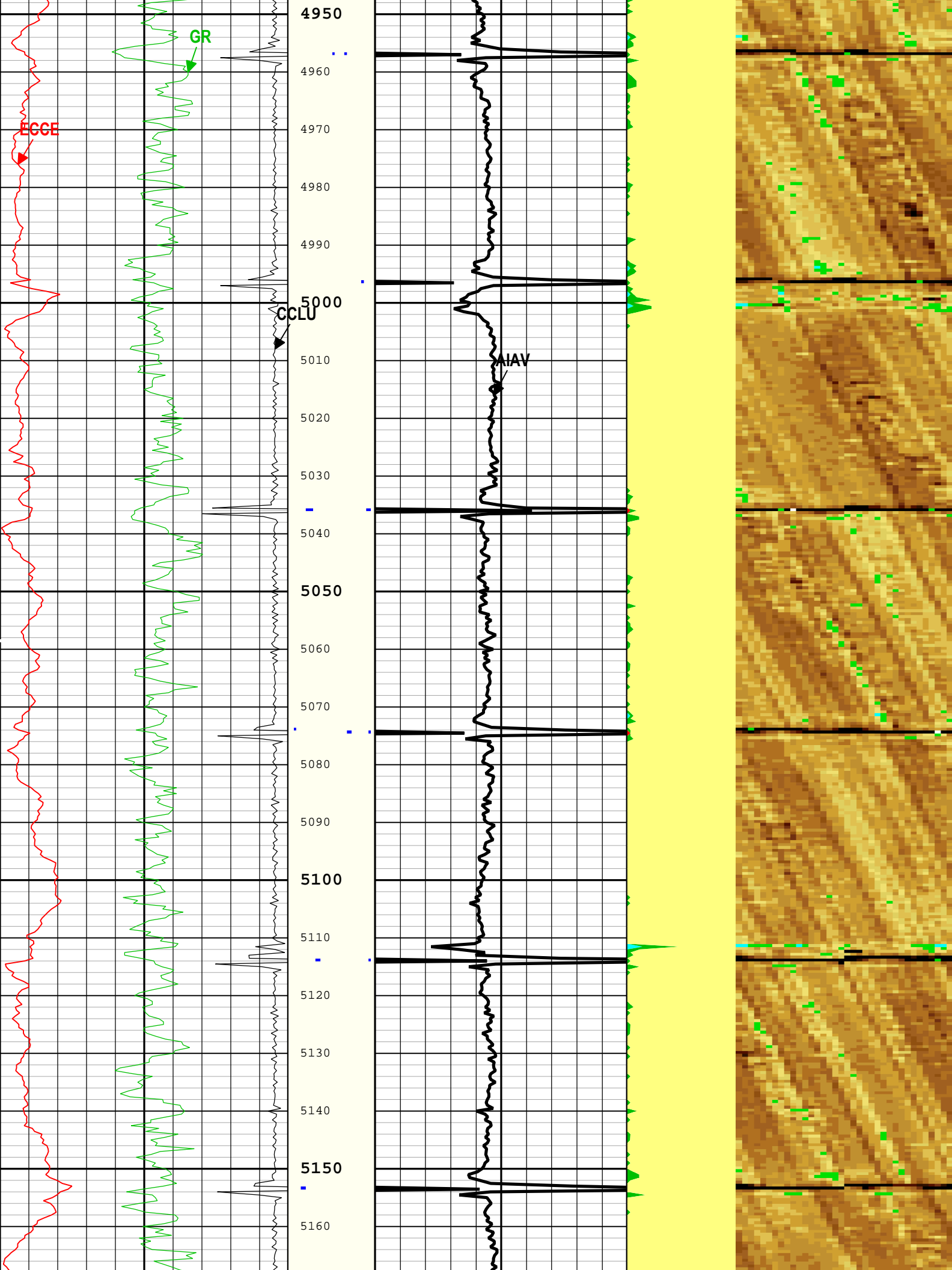


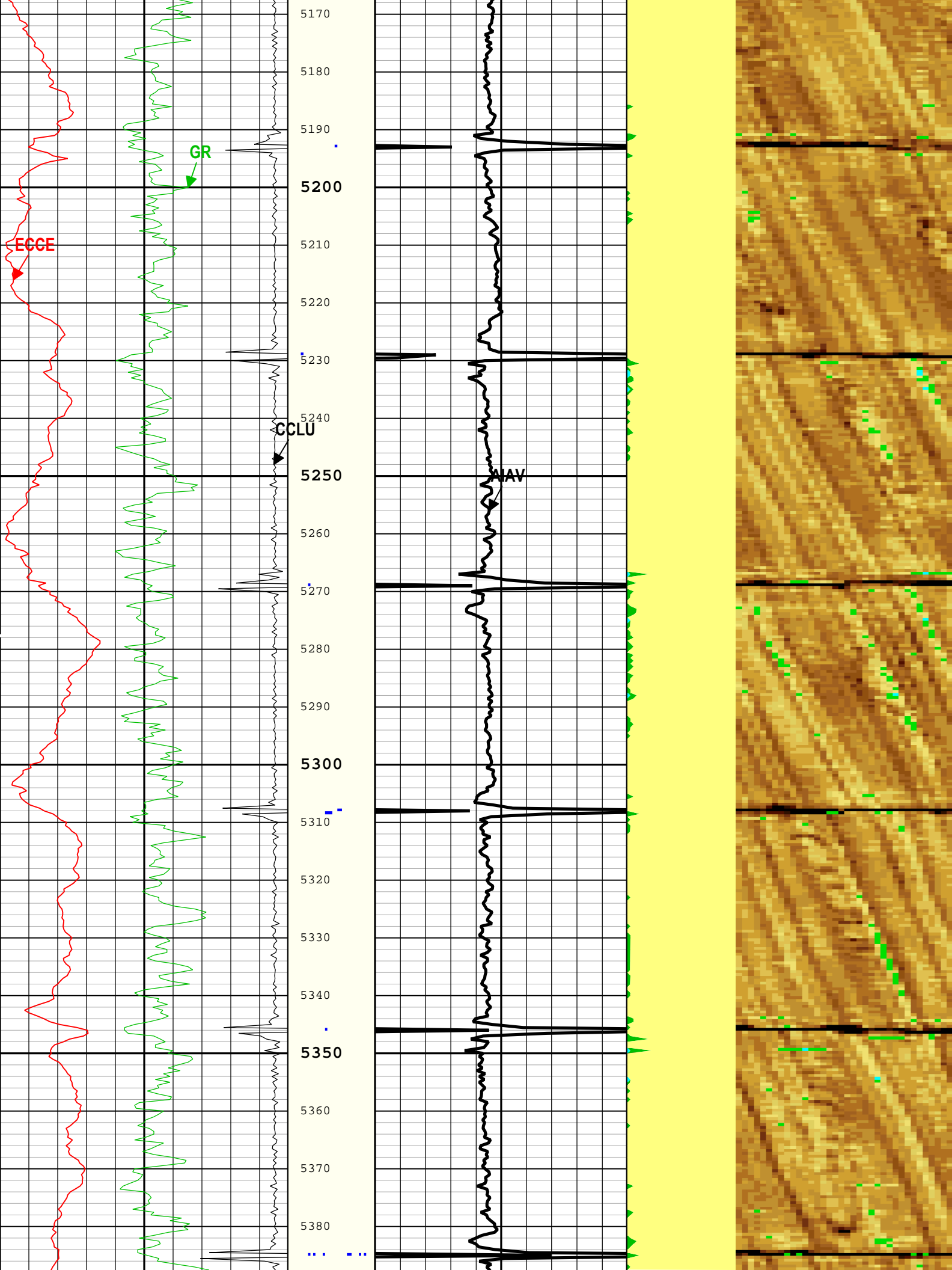


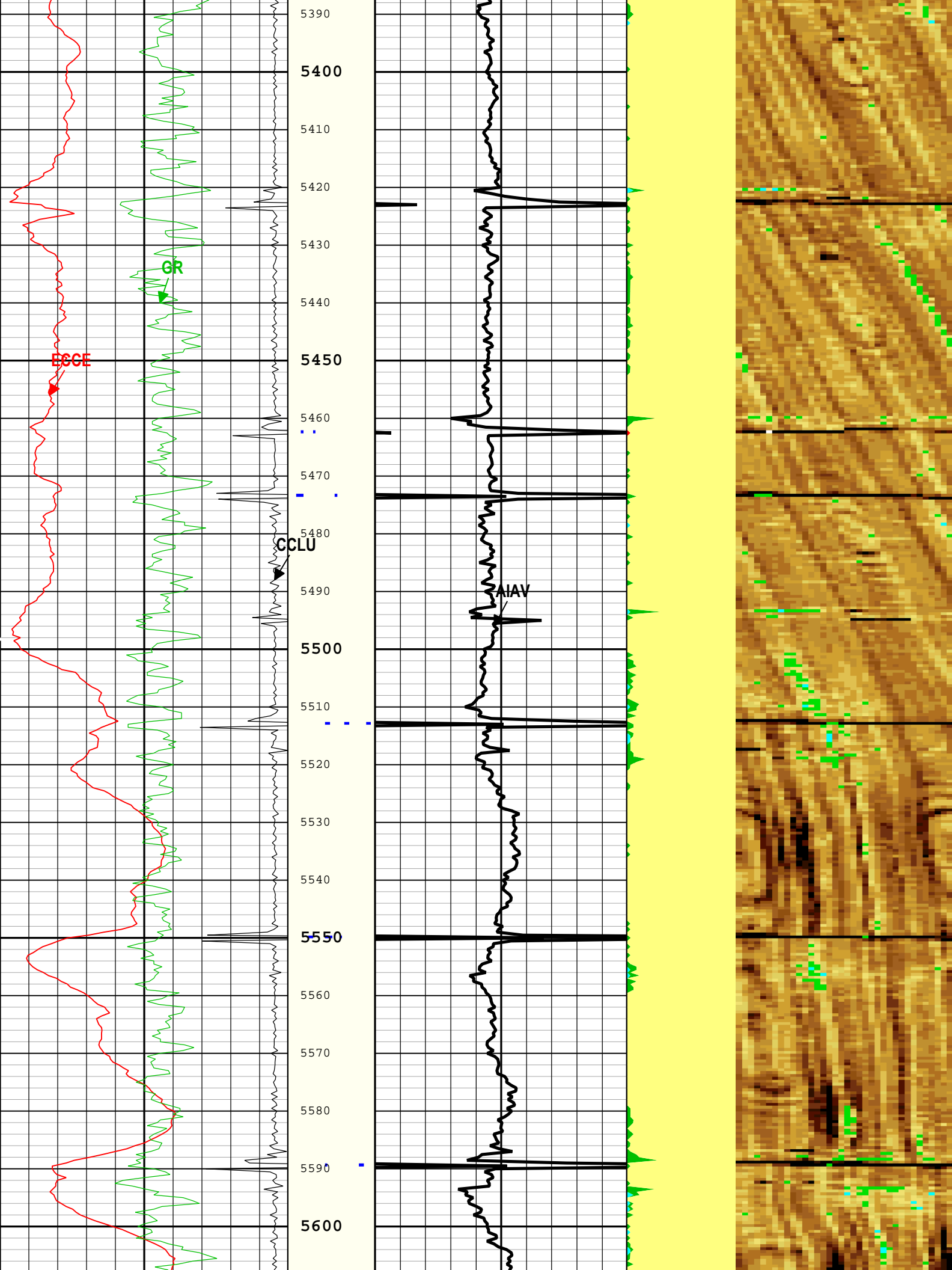


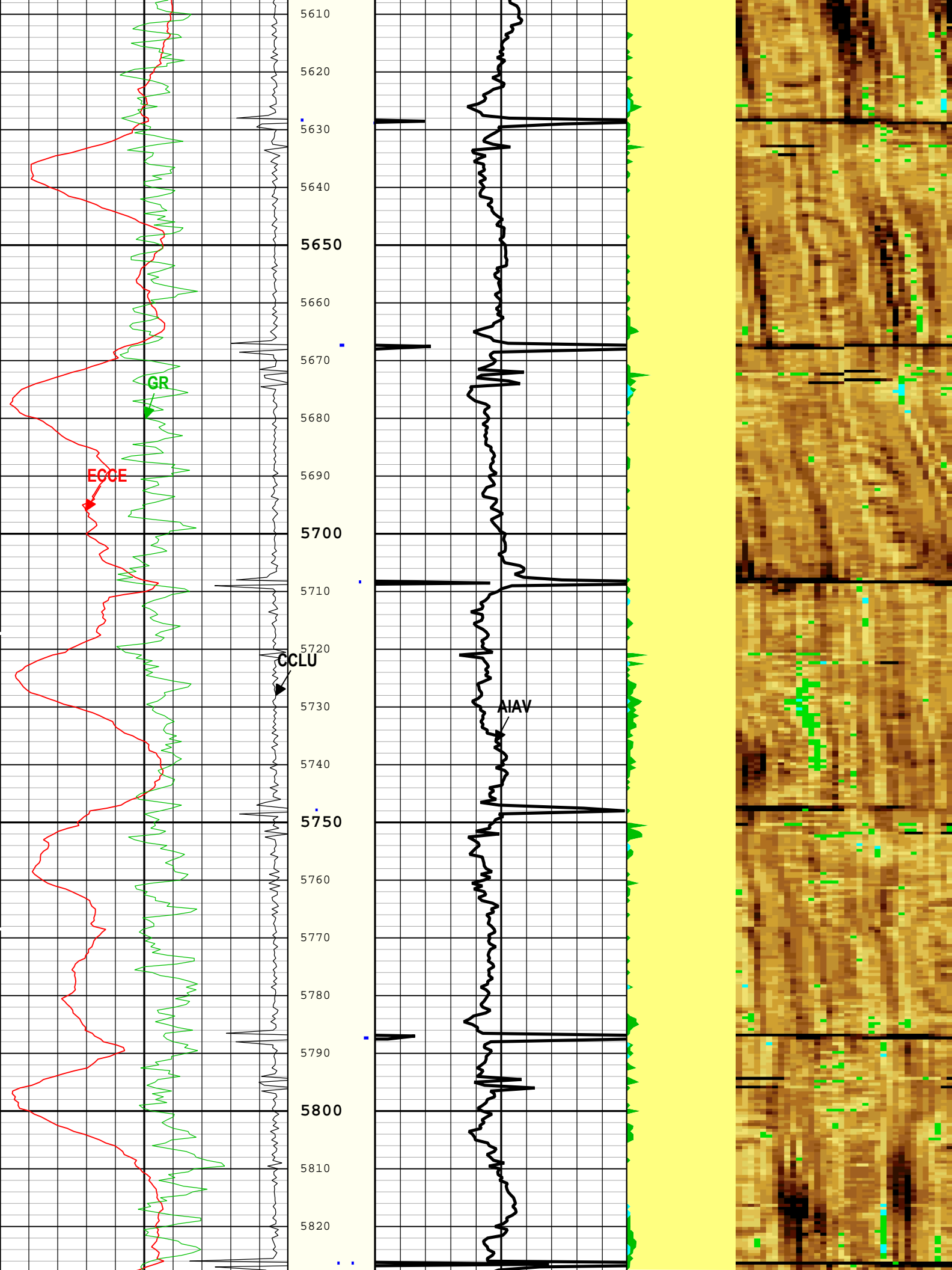


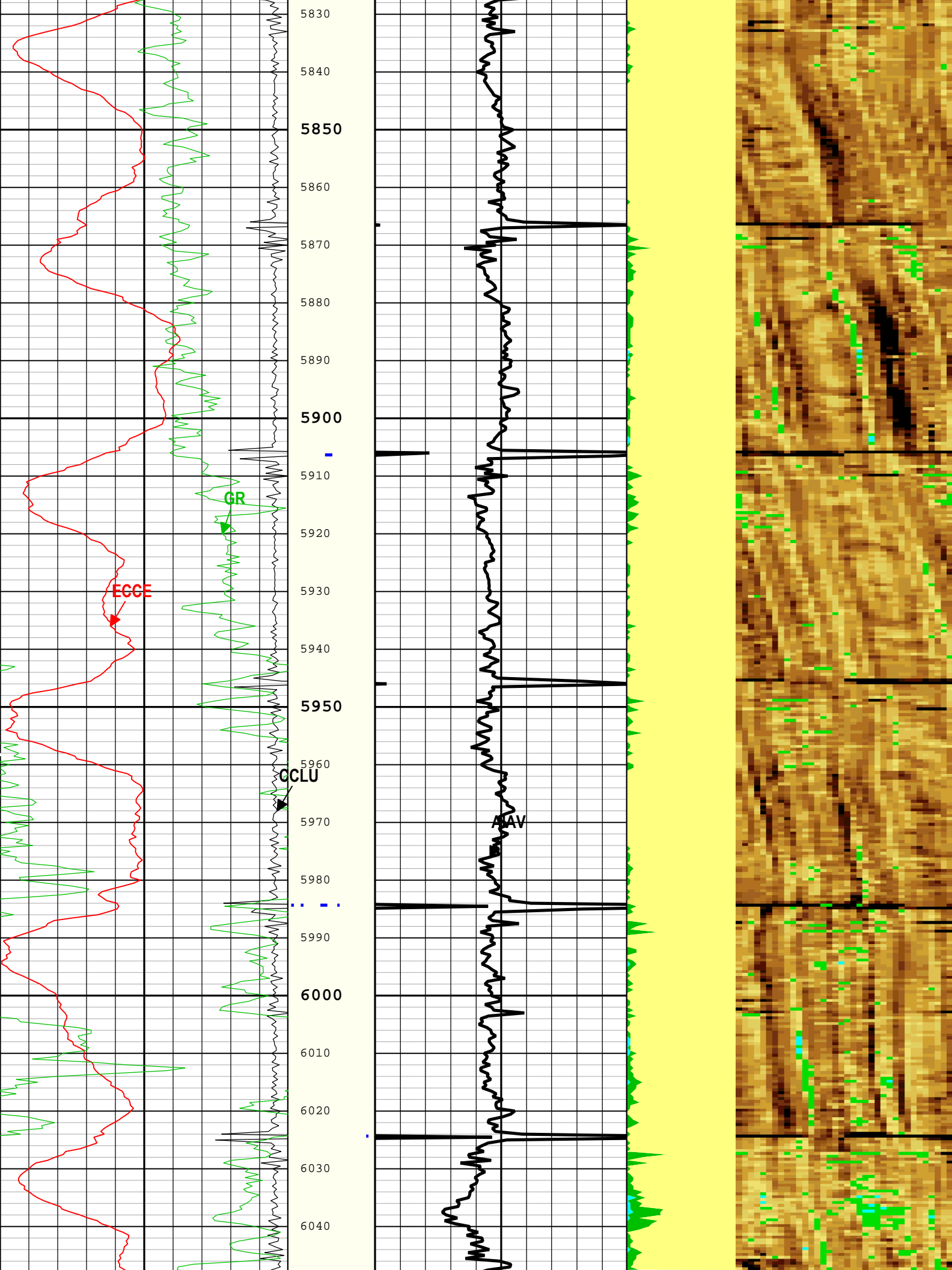


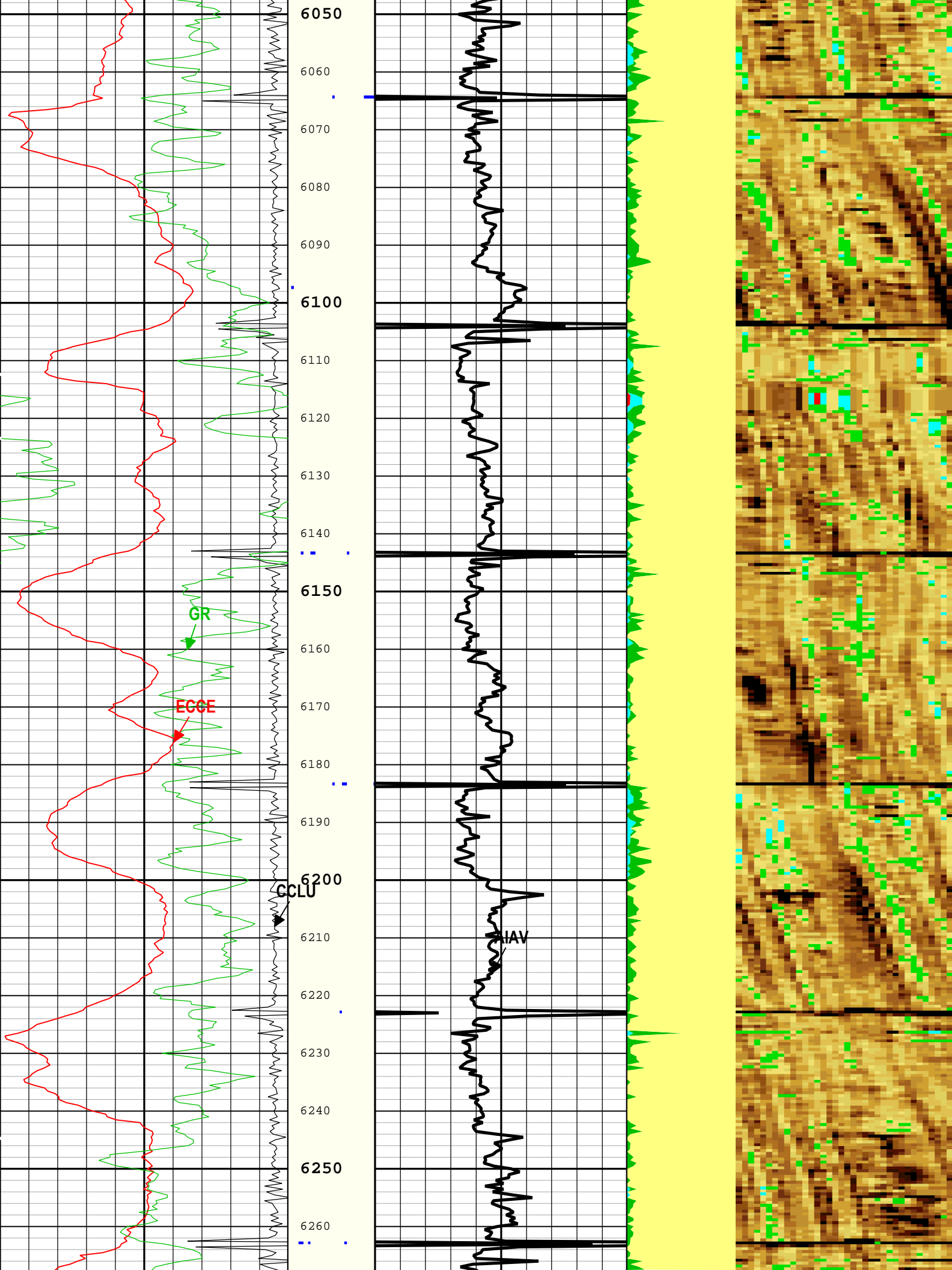


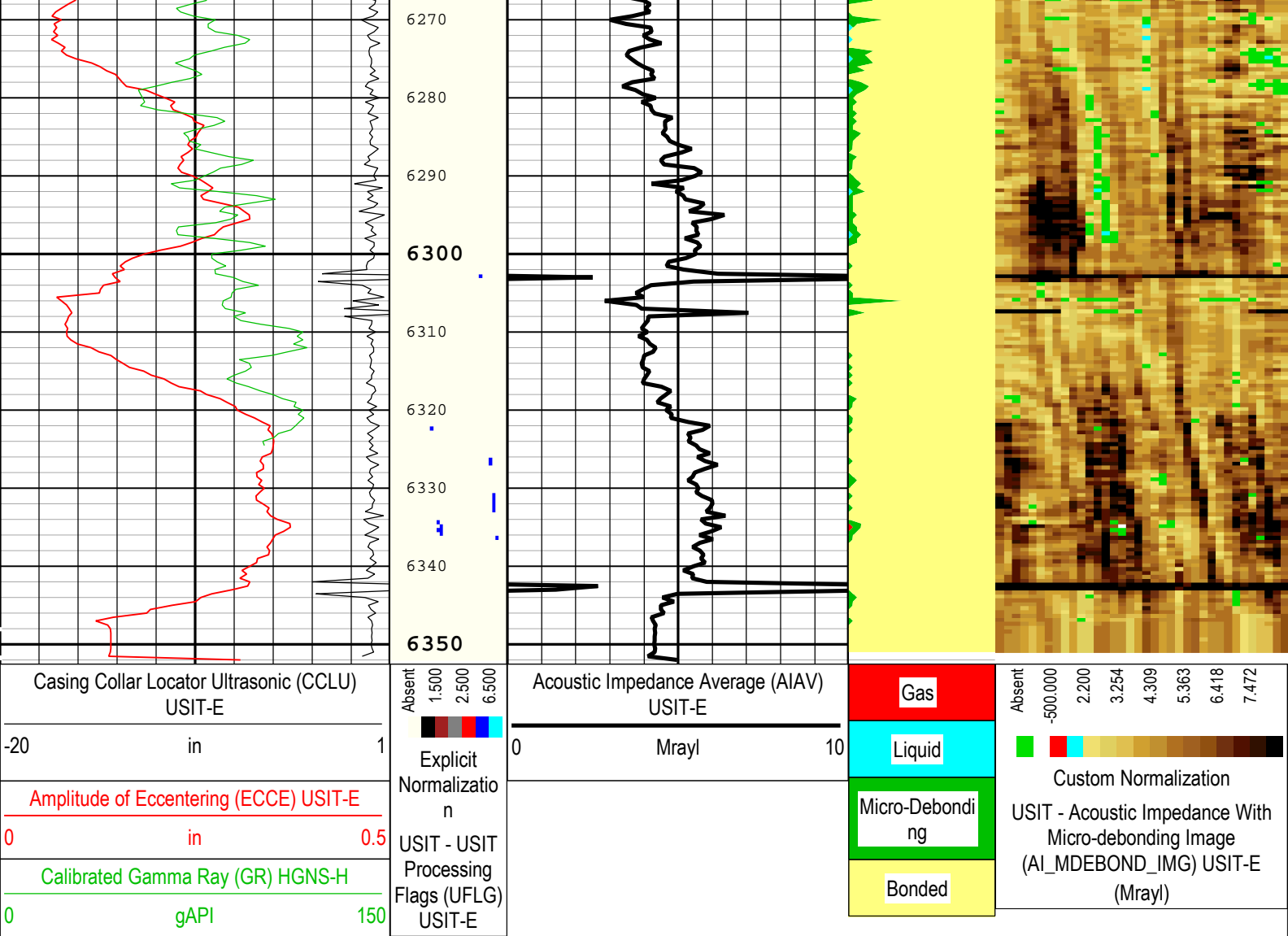










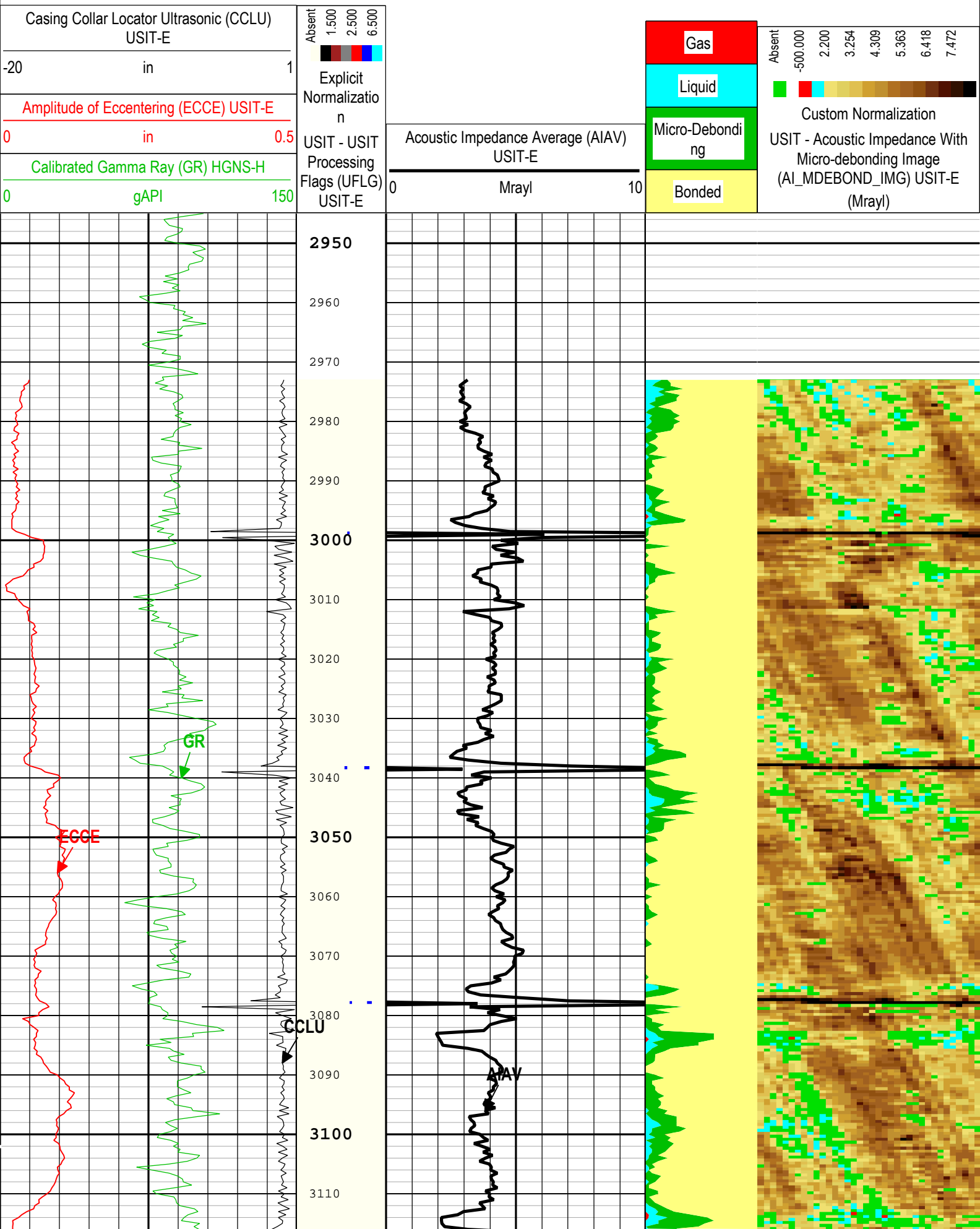


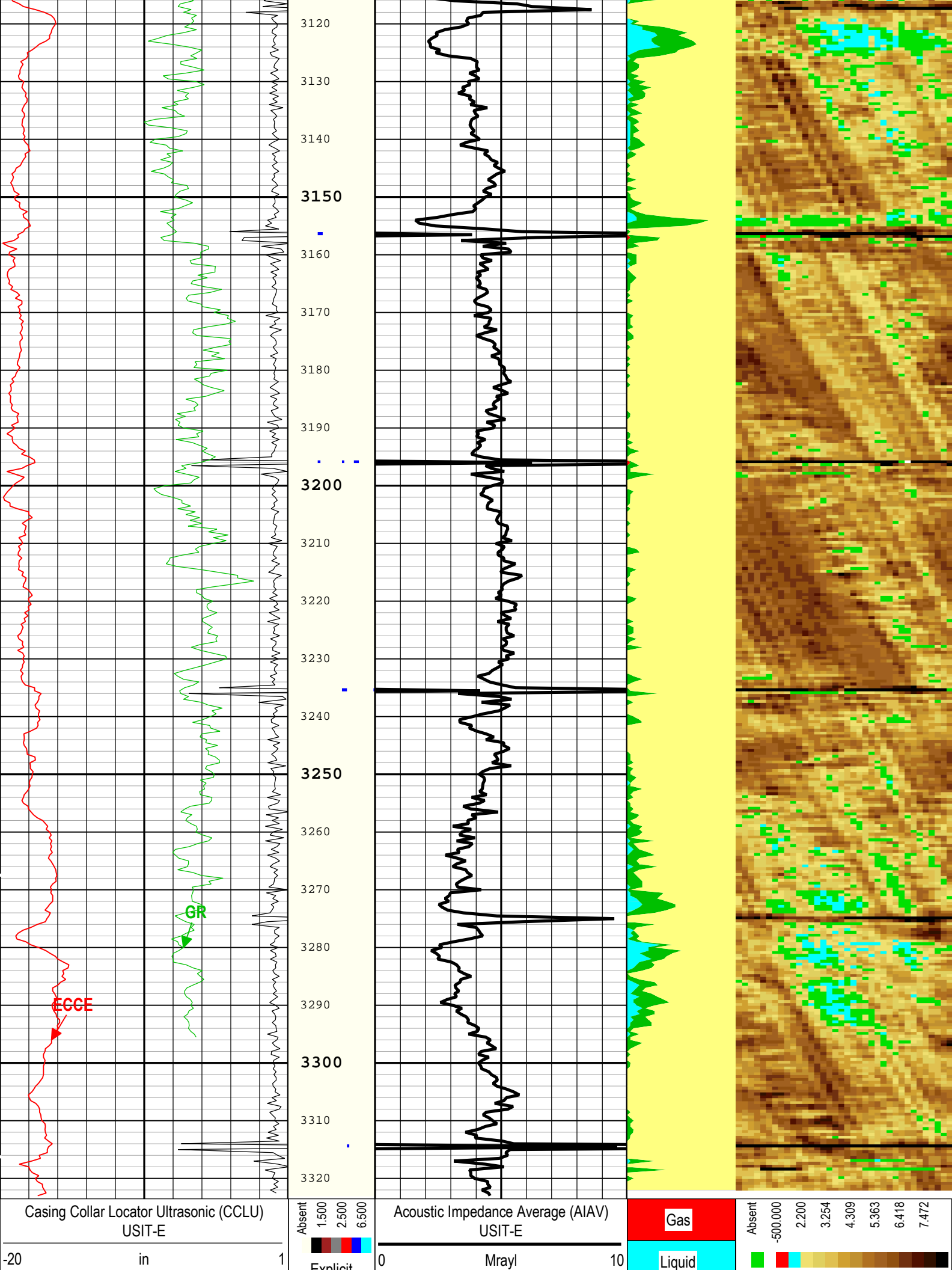
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Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 26-Aug-2017 11:45:57

Channel Processing Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BS	Bit Size	WLSESSION	Depth Zoned	in
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	9.3	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
HEMA	Hematite Presence Flag	Borehole	No	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.07	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0.1	Mrayl
UFGDE	Fiberglass Density	USIT-E	16.27	lbm/gal
UFGPS	Fiberglass Processing Selection	USIT-E	No	
UFGVL	Fiberglass Velocity	USIT-E	9678.48	ft/s
USI_FSOD	USIT USI Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF	

TIME_1900 - Time Marked every 60.00 (s)



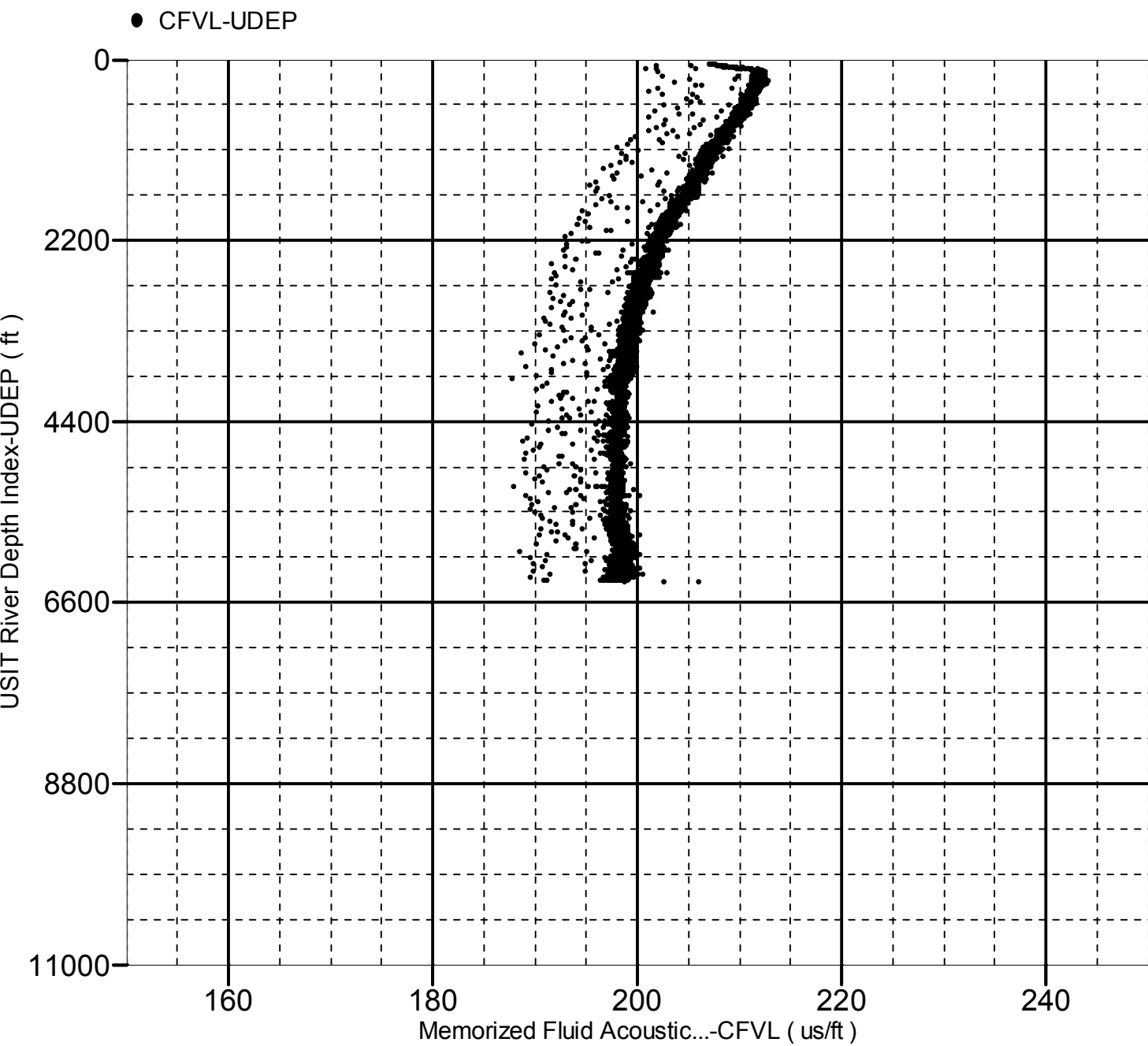


Amplitude of Eccentering (ECCE) USIT-E		Explicit Normalization USIT - USIT Processing Flags (UFLG) USIT-E	Micro-Debonding		Custom Normalization USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E (Mrayl)
0 in 0.5					
Calibrated Gamma Ray (GR) HGNS-H					
0 gAPI 150			Bonded		
TIME_1900 - Time Marked every 60.00 (s)					
Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 26-Aug-2017 11:46:04					
Channel Processing Parameters					
One: Parameters					
Parameter	Description	Tool	Value	Unit	
ISSBAR	Barite Mud Presence Flag	Borehole	No		
BS	Bit Size	WLSESSION	8.5	in	
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement		
DFD	Drilling Fluid Density	Borehole	9.3	lbm/gal	
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water		
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft	
FDII	FPM Data Interpolation Interval	USIT-E	0	ft	
HEMA	Hematite Presence Flag	Borehole	No		
IMAR	Image Rotation	USIT-E	Off		
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us	
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.07		
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0.1	Mrayl	
UFGDE	Fiberglass Density	USIT-E	16.27	lbm/gal	
UFGPS	Fiberglass Processing Selection	USIT-E	No		
UFGVL	Fiberglass Velocity	USIT-E	9678.48	ft/s	
USI_FSOD	USIT USI Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF		
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-E	Automatic		
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	FreePipe Norm.		
ZMUD	Acoustic Impedance of Mud	Borehole	1.48	Mrayl	
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl	
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl	
Tool Control Parameters					
One: Parameters					
Parameter	Description	Tool	Value	Unit	
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB	
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB	
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE		
EMXV	EMEX Voltage	USIT-E	55	V	
HRES	Horizontal Resolution	USIT-E	10 deg		
TMUC	Type of Mud	USIT-E	BRI		
ULOG	Logging Objective	USIT-E	MEASUREMENT		
UPLIHT	Ultrasonic Pulse Echo Large Inhibit Time	USIT-E	Off		
USFR	Ultrasonic Sampling Frequency	USIT-E	666667	Hz	
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz		
UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 6.0 in		
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	3000	ft	
WINB	Window Begin Time	USIT-E	31.88	us	

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6352.50 to 68.00 ft

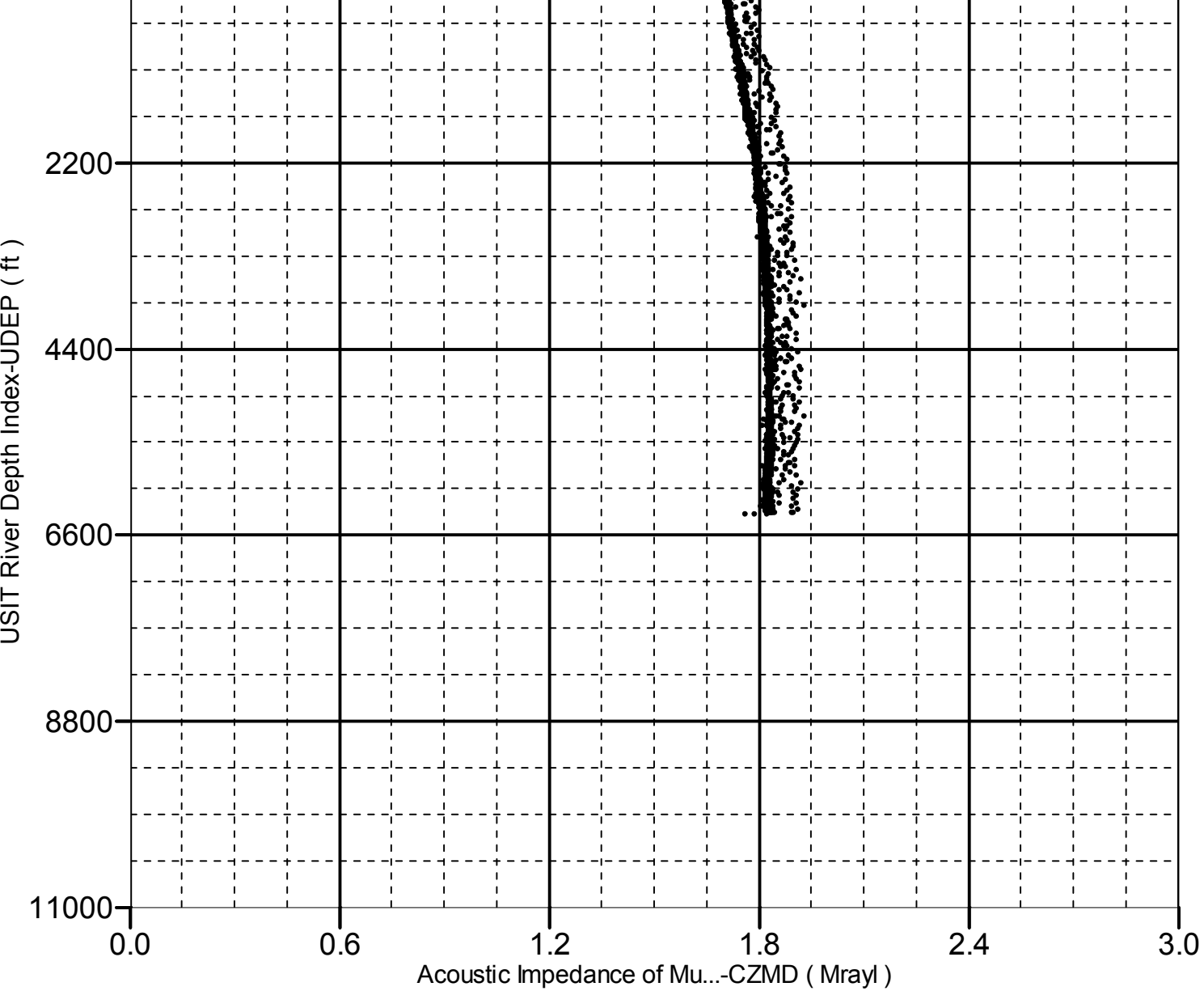


Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6352.50 to 68.00 ft





Company:	Noble Energy, Inc.	Schlumberger
Well:	Minutemen Federal #LC21-625	
Field:	Wildcat	
County:	Weld	
State:	Colorado	
UltraSonic Summary Print		