

Company: Noble Energy Inc.

Well: Emmy State-H25-777

Field: Wattenberg

County: Weld State: Colorado

UltraSonic Summary Print

County:	Weld
Field:	Wattenberg
Location:	SESW Sec. 25, T3N, R65W
Well:	Emmy State-H25-777
Company:	Noble Energy Inc.
Location:	
SESW Sec. 25, T3N, R65W	Elev.: K.B. 4877.00 ft
SHL: 285 FSL 1185 FWL	G.L. 4847.00 ft
Lat/Long: 40.18968/-104.61699	D.F. 4877.00 ft
Permanent Datum:	Ground Level
Log Measured From:	Kelly Bushing
Drilling Measured From:	Kelly Bushing
API Serial No.	Section: 26
05-123-46978	Township: 3N
	Range: 65W

Logging Date	11-Oct-2018
Run Number	ONE
Depth Driller	17444.00 ft
Schlumberger Depth	6612.00 ft
Bottom Log Interval	6612.00 ft
Top Log Interval	100.00 ft
Casing Fluid Type	BRINE
Salinity	
Density	8.4 lbm/gal
Fluid Level	0.00 ft
BIT/CASING/TUBING STRING	
Bit Size	8.50 in
From	1969.00 ft
To	17444.00 ft
Casing/Tubing Size	5.5 in
Weight	20 lbm/ft
Grade	P110
From	0.00 ft
To	17422.00 ft
Max Recorded Temperatures	238.68 degF
Logger on Bottom	11-Oct-2018
Unit Number	2377
Recorded By	Ali AlRamadhan
Witnessed By	Bill Mansfield

Disclaimer

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

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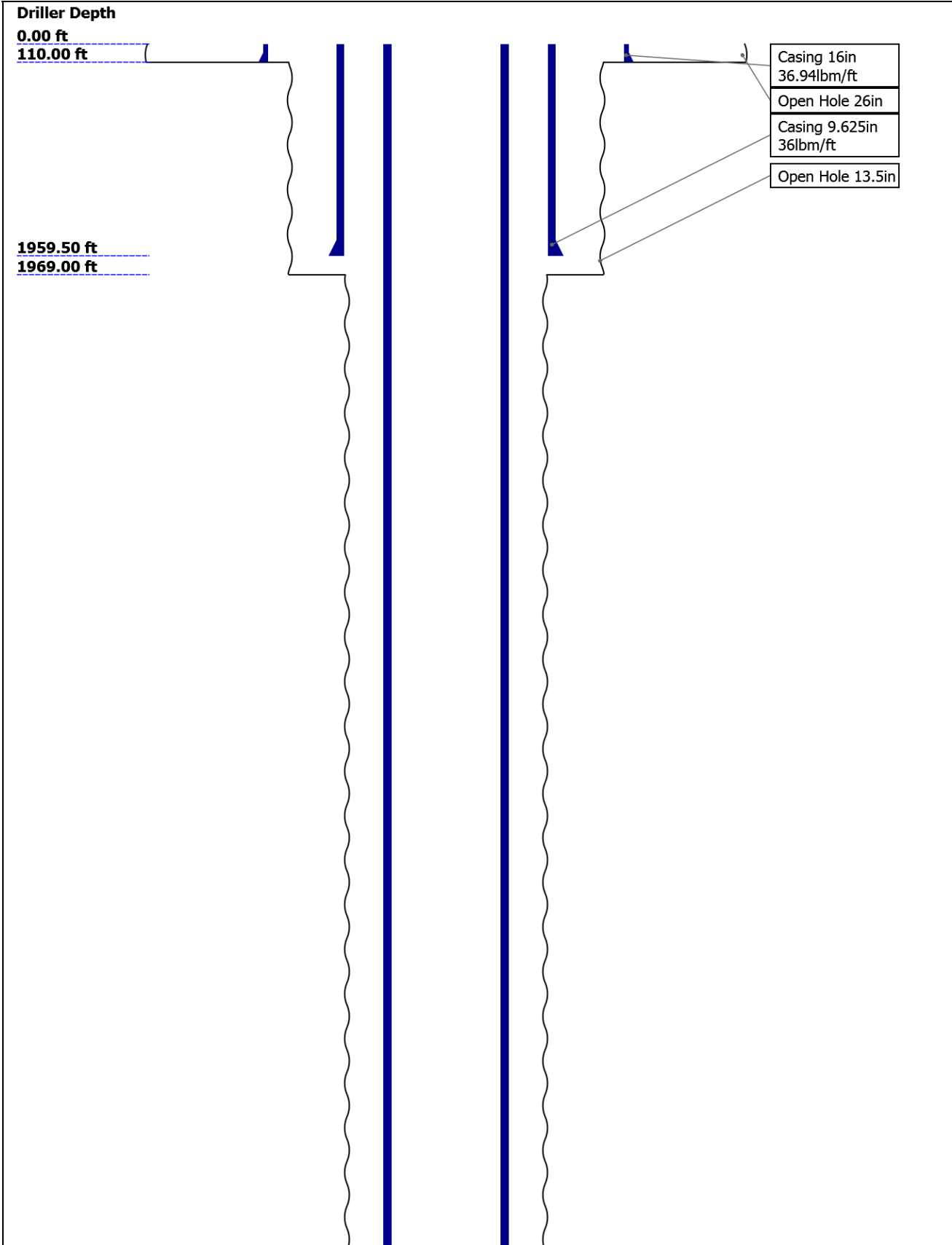
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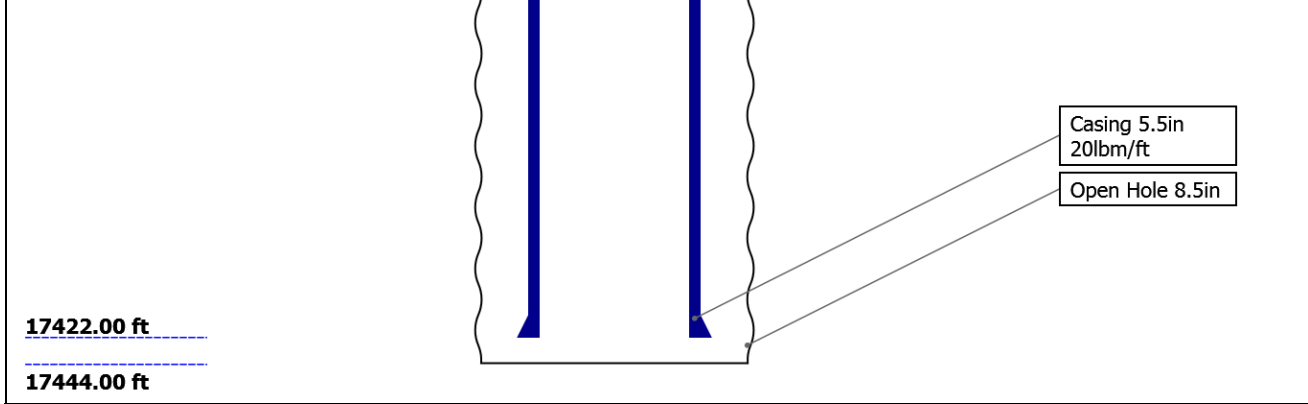
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Well Sketch





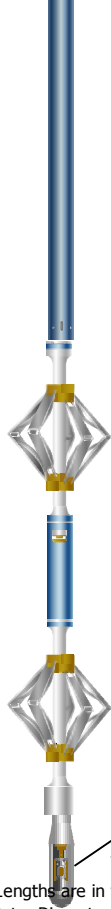
Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	0	110	1969			
Top Logger (ft)	0	110	1969			
Bottom Driller (ft)	110	1969	17444			
Bottom Logger (ft)	110	1969	17444			
Casing						
Size (in)	16	9.625	5.5			
Weight (lbm/ft)	36.94	36	20			
Inner Diameter (in)	15.572	8.921	4.778			
Grade	N/A	J55	P110			
Top Driller (ft)	0	0	0			
Top Logger (ft)	0	0	0			
Bottom Driller (ft)	110	1959.5	17422			
Bottom Logger (ft)	110	1959.5	17422			

Remarks and Equipment Summary

ONE: Toolstring				ONE: Remarks	
Equip name LEH-QT LEH-QT	Length 34.56	MP name Offset		Thank you for choosing Schlumberger!	
				Toolstring run as per tool sketch and client logging program.	
				5" gemcos run on DTC and USIT forcentralization.	
				This is the first log in well.	
				Main pass logged at 2500 PSI. Repeat pass logged at 0 PSI.	
				BHT: 238.68 degF	
Equip name DTC-H ECH-KC DTC-H	Length 31.07	MP name Offset			
Equip name SGT-N SGH-K SGC-TB SGD-TAA	Length 28.07	MP name Offset			
Equip name AH-184	Length 22.57	MP name Offset			
Equip name USIT-D ECH-MRA USIC-D USIS-A USCC-A	Length 20.57	MP name Offset			

USSC-A
USRS-A
USI-SENS
OR
USI-TX



USI Sensor 0.37
TOOL ZERO
Head Extension

Lengths are in ft
Maximum Outer Diameter = 3.560 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	7-46A-XS		
Serial Number			
Length	24000.00 ft		
Conveyance Type	Wireline		
Rig Type	Land		

ONE:Depth Control Parameters	Depth Control Remarks
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Log Sequence	First Log In the Well	All Schlumberger depth control policies followed.
Rig Up Length At Surface		IDW used as primary depth reference.
Rig Up Length At Bottom		Z-Chart used as secondary depth reference.
Rig Up Length Correction		Log depth shifted to marker joint at 6320.5 ft.
Stretch Correction		
Tool Zero Check At Surface		

USIT - Fluid Properties Measurement

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[4]:Up	6614.48	31.92

Fluid Velocity = "Automatic".
CFVL equals DFSL channel

Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)
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Mud Impedance = "FreePipe Norm".
Free Pipe normalization zone is : 46.58m(152.82ft) to 51.02m(167.40ft)
MUD_N_FRP = 1.09
DFD = 1.01g/cm3(8.40lbm/gal)
CZMD median computed in free pipe normalization interval = 1.66 MRayl

Start Depth(ft)	Stop Depth(ft)	Start Value(Mrayl)	End Value(Mrayl)
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ONE

2500 PSI Main Pass

Software Version

Acquisition System	Version
Maxwell 2018 SP1	8.1.99839.3100

Pass Summary

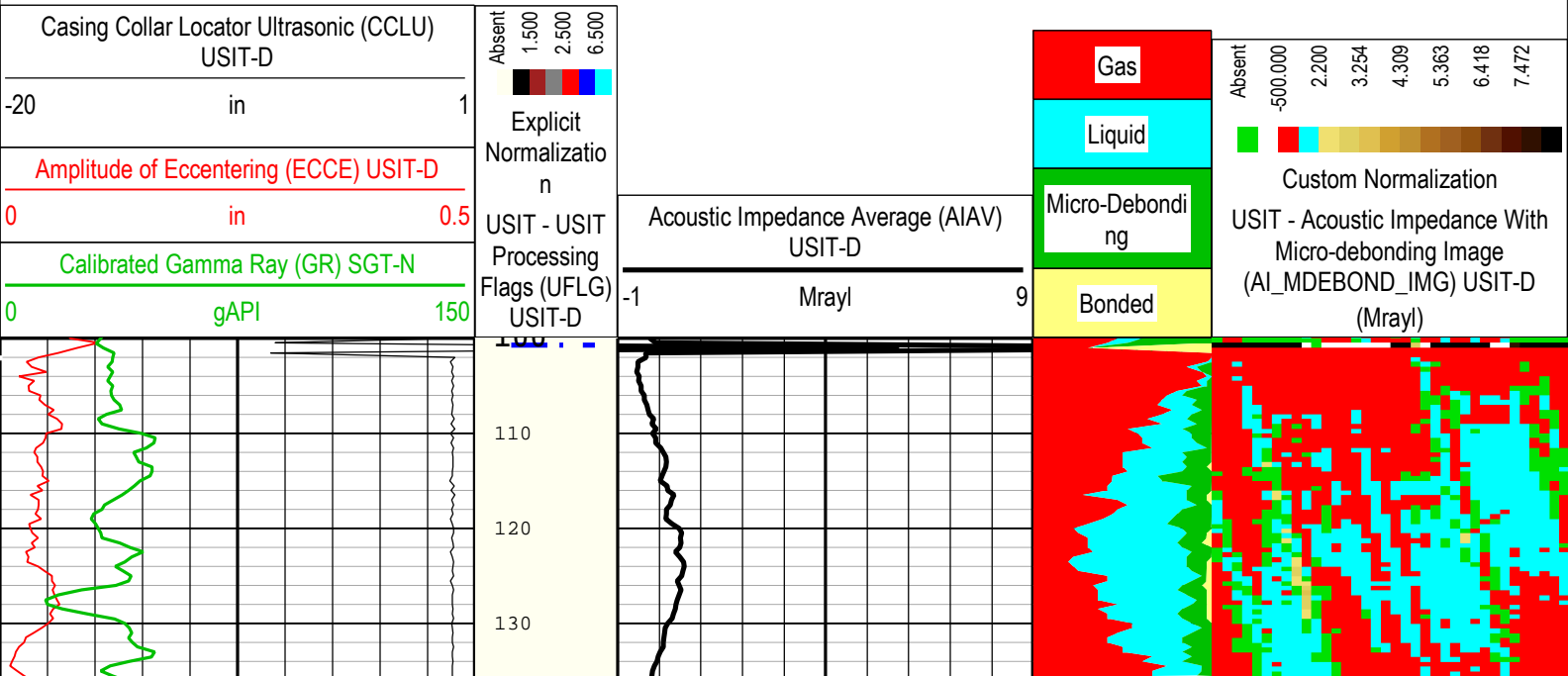
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[4]:Up	Up	31.92 ft	6614.48 ft	11-Oct-2018 10:23:31 AM	11-Oct-2018 11:26:30 AM	ON	4.06 ft	Yes

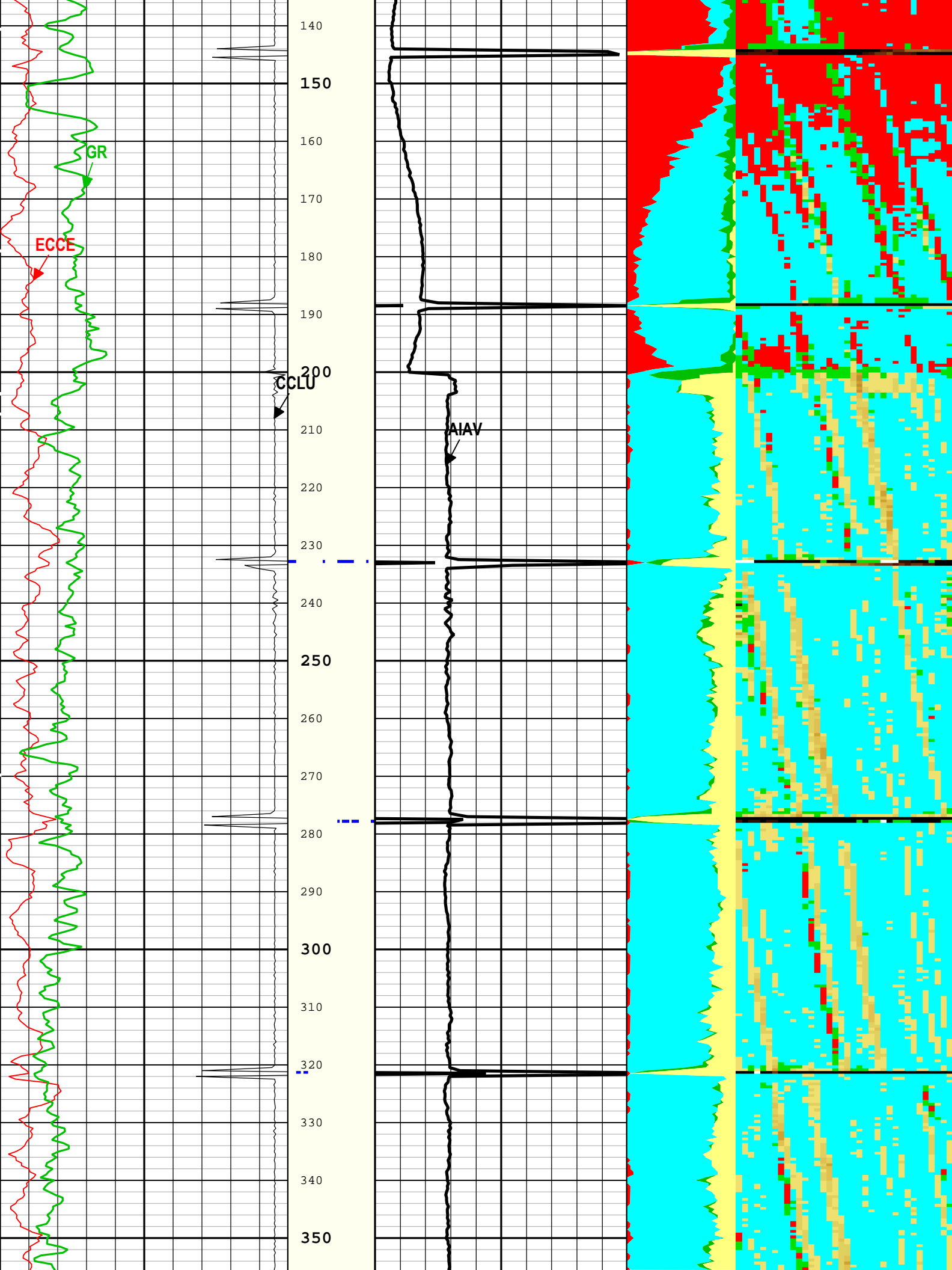
All depths are referenced to toolstring zero

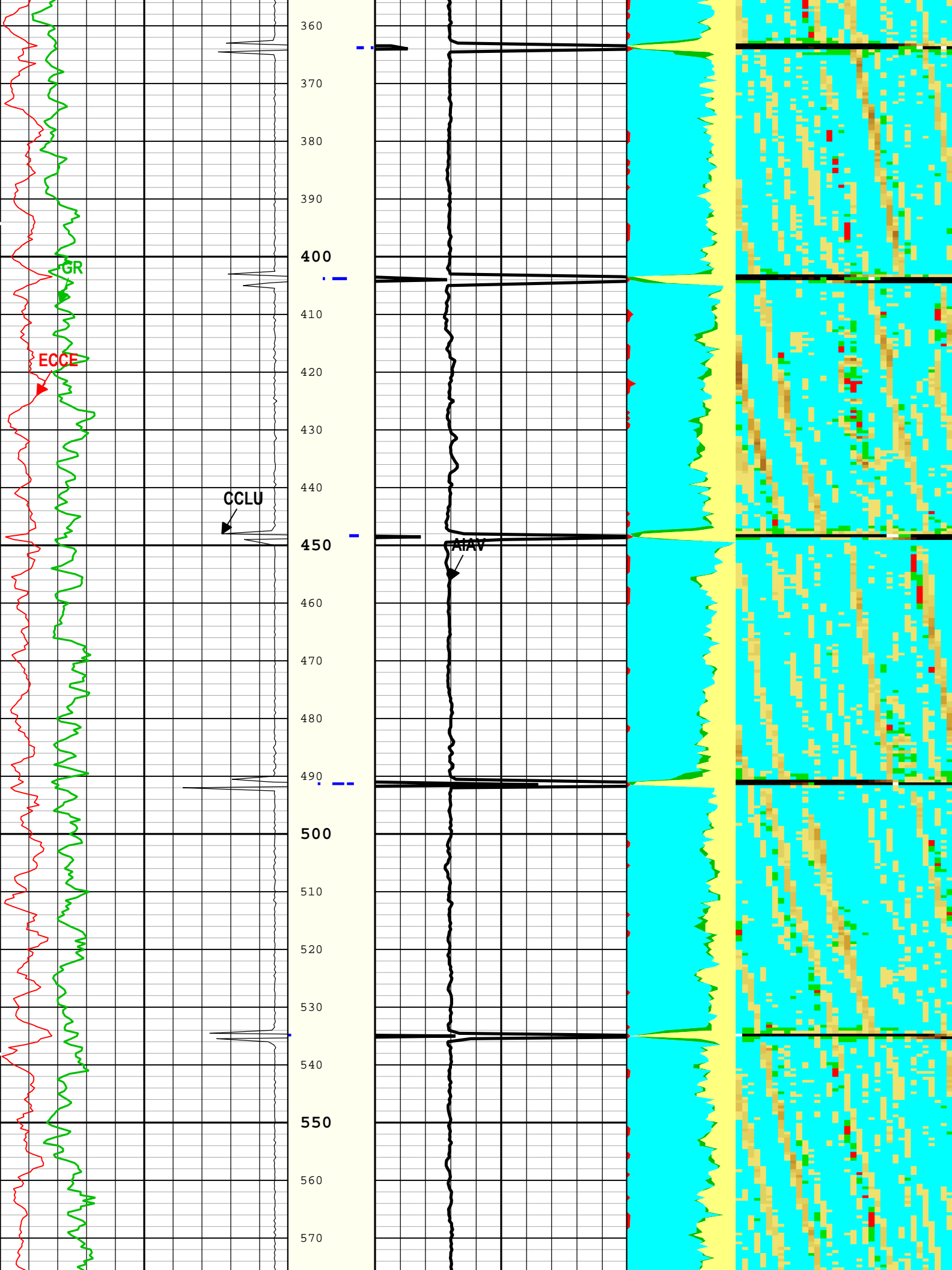
Log	Company:Noble Energy Inc. Well:Emmy State-H25-777 ONE: Log[4]:Up:S010
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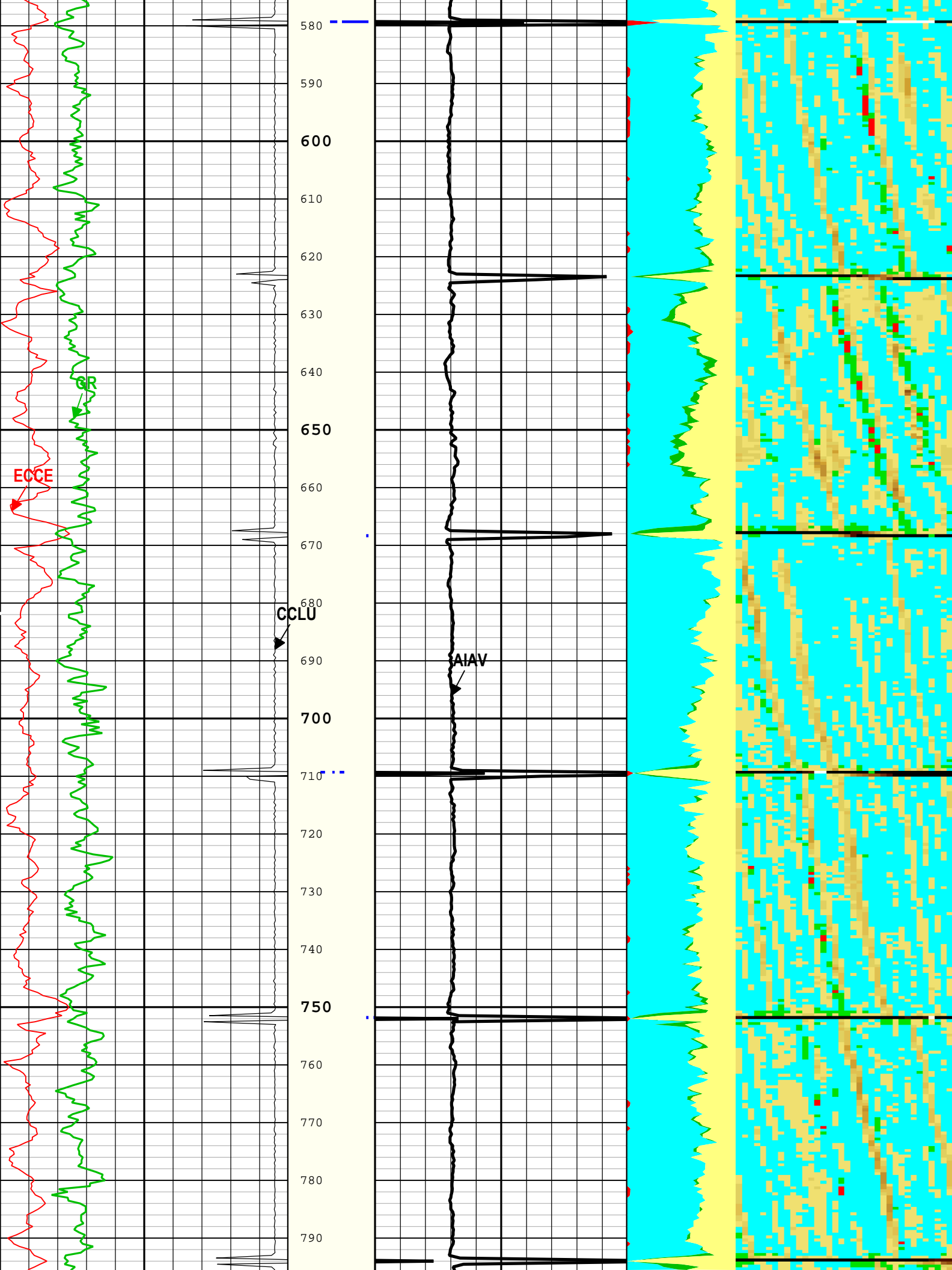
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Creation Date: 13-Oct-2018 23:06:45

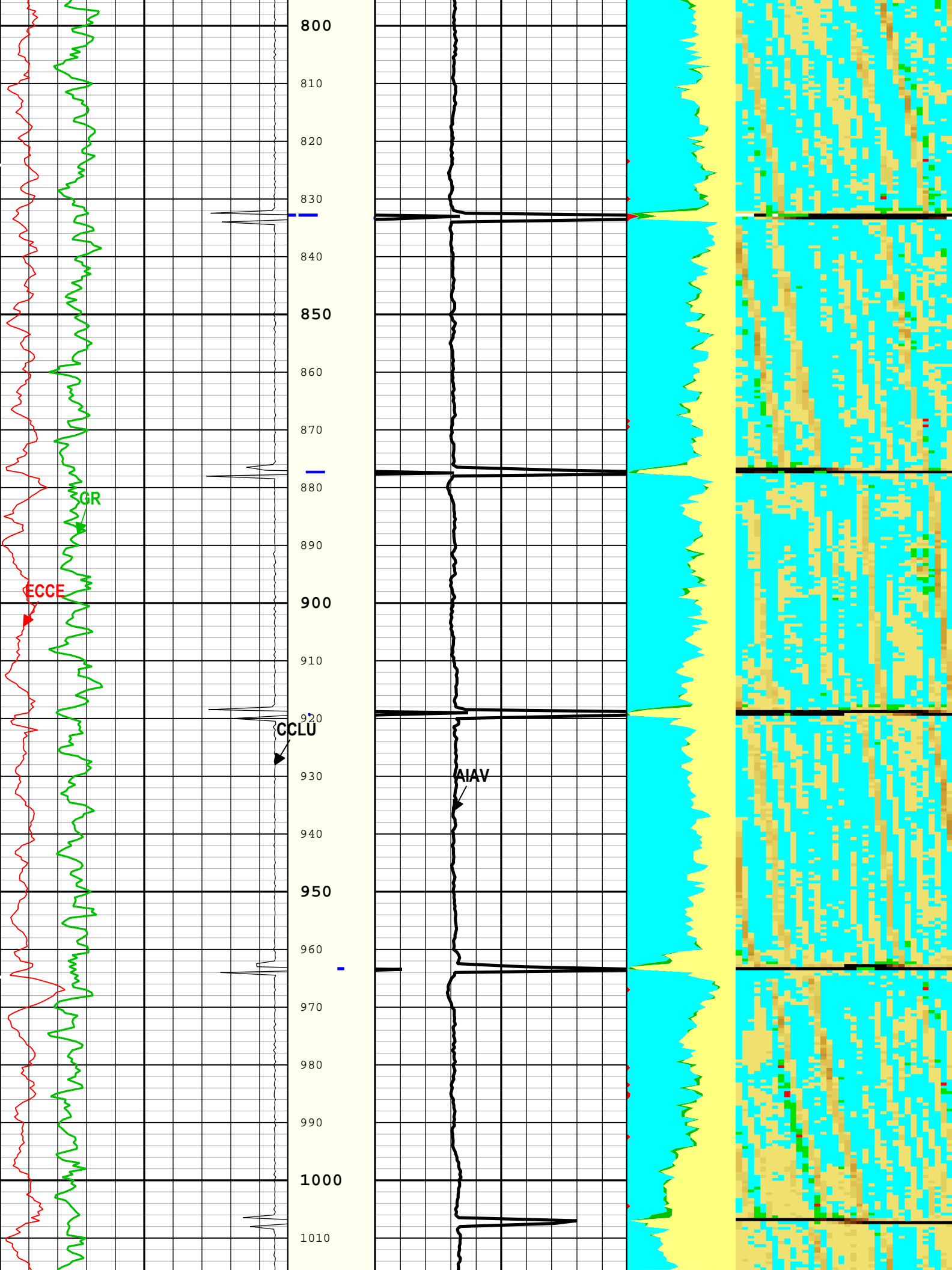
TIME_1900 - Time Marked every 60.00 (s)

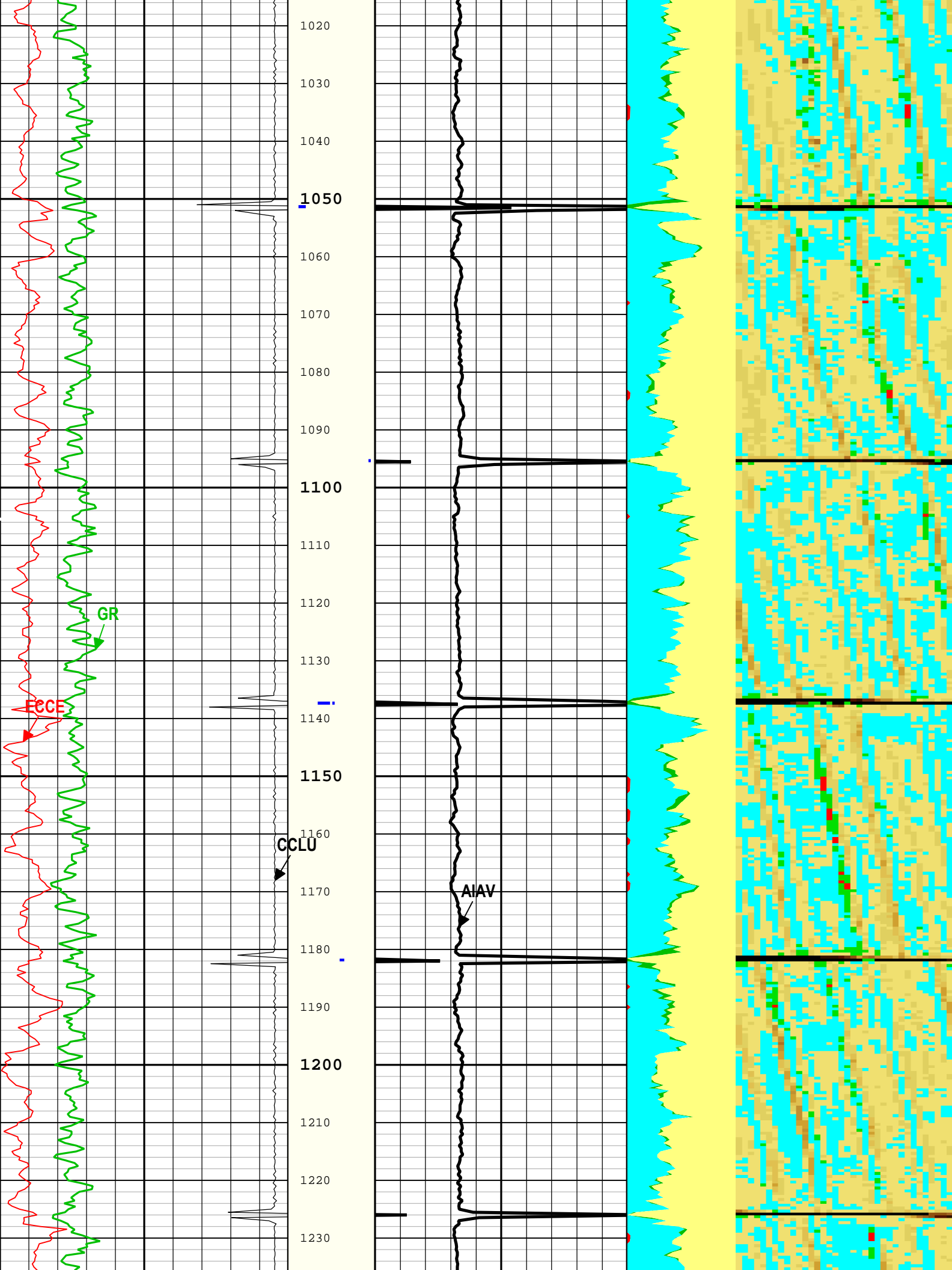


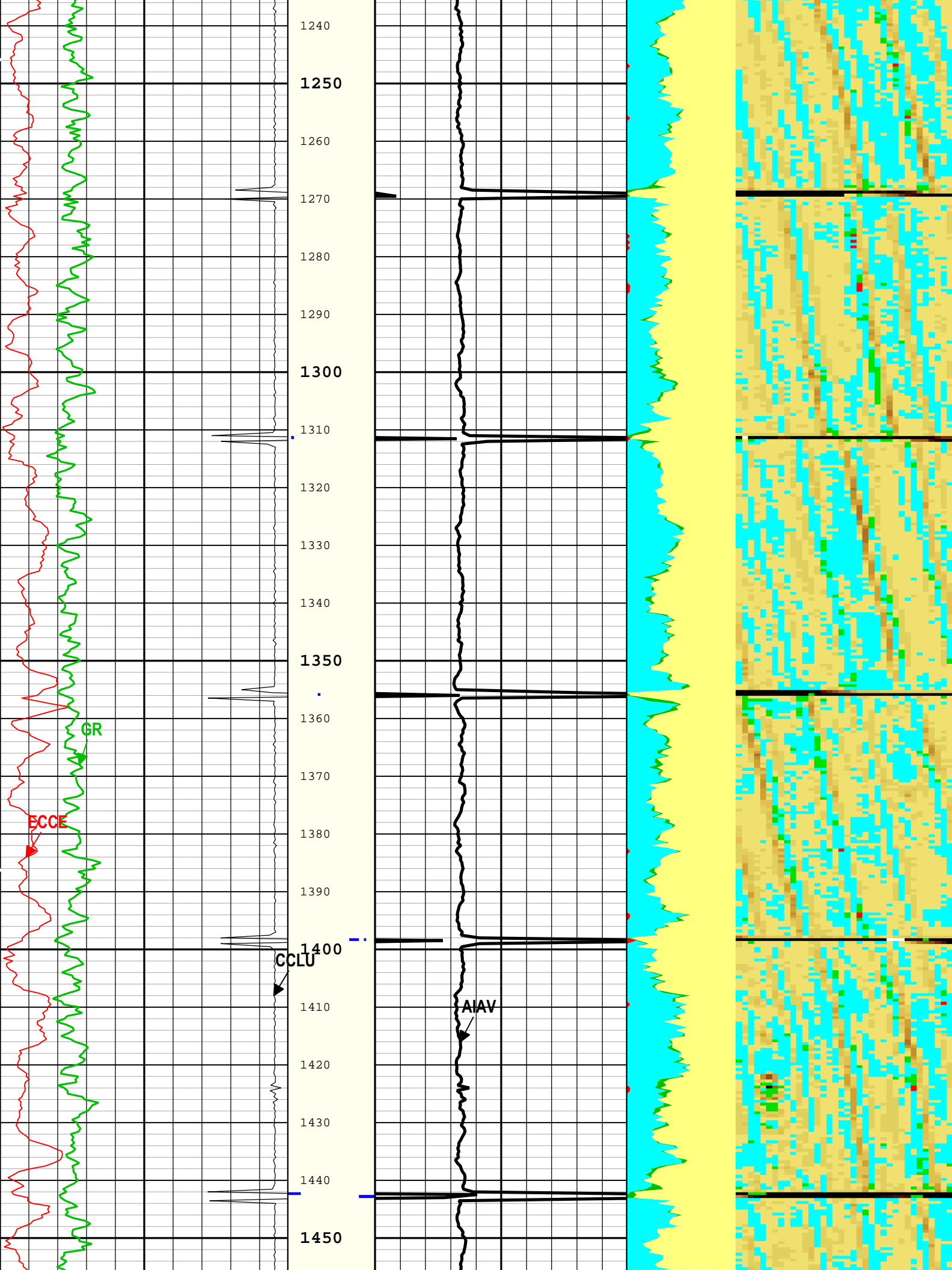


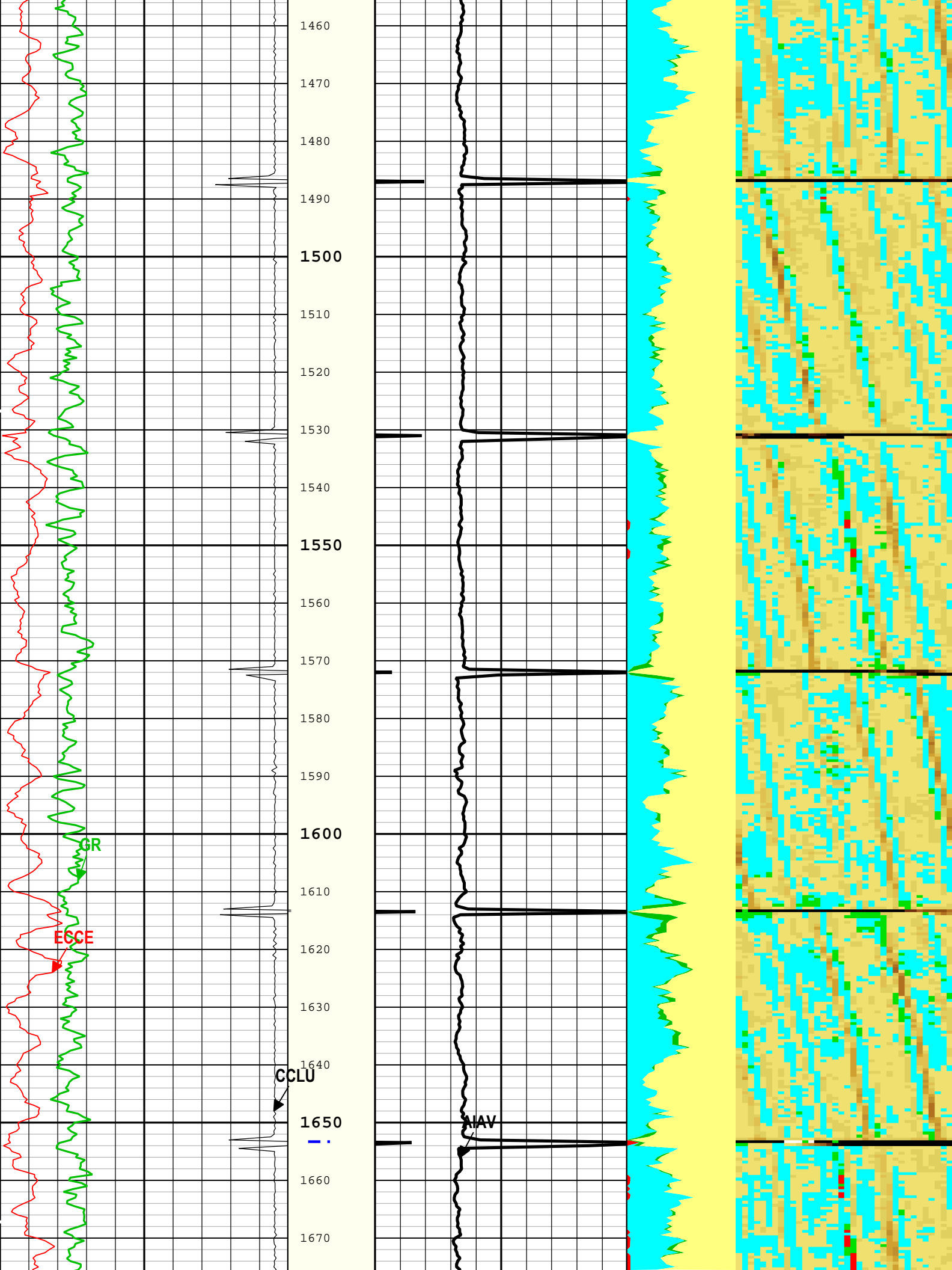


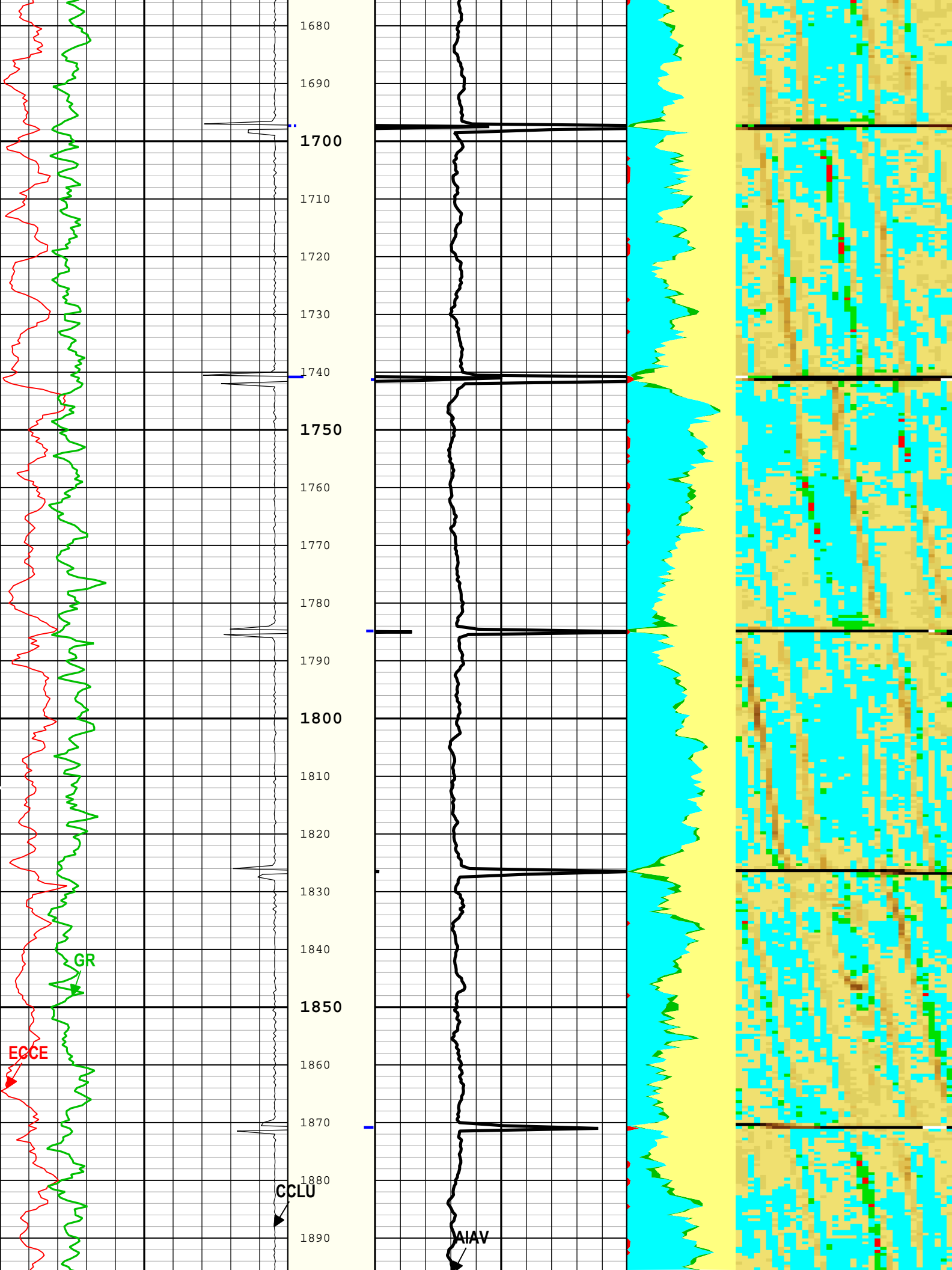


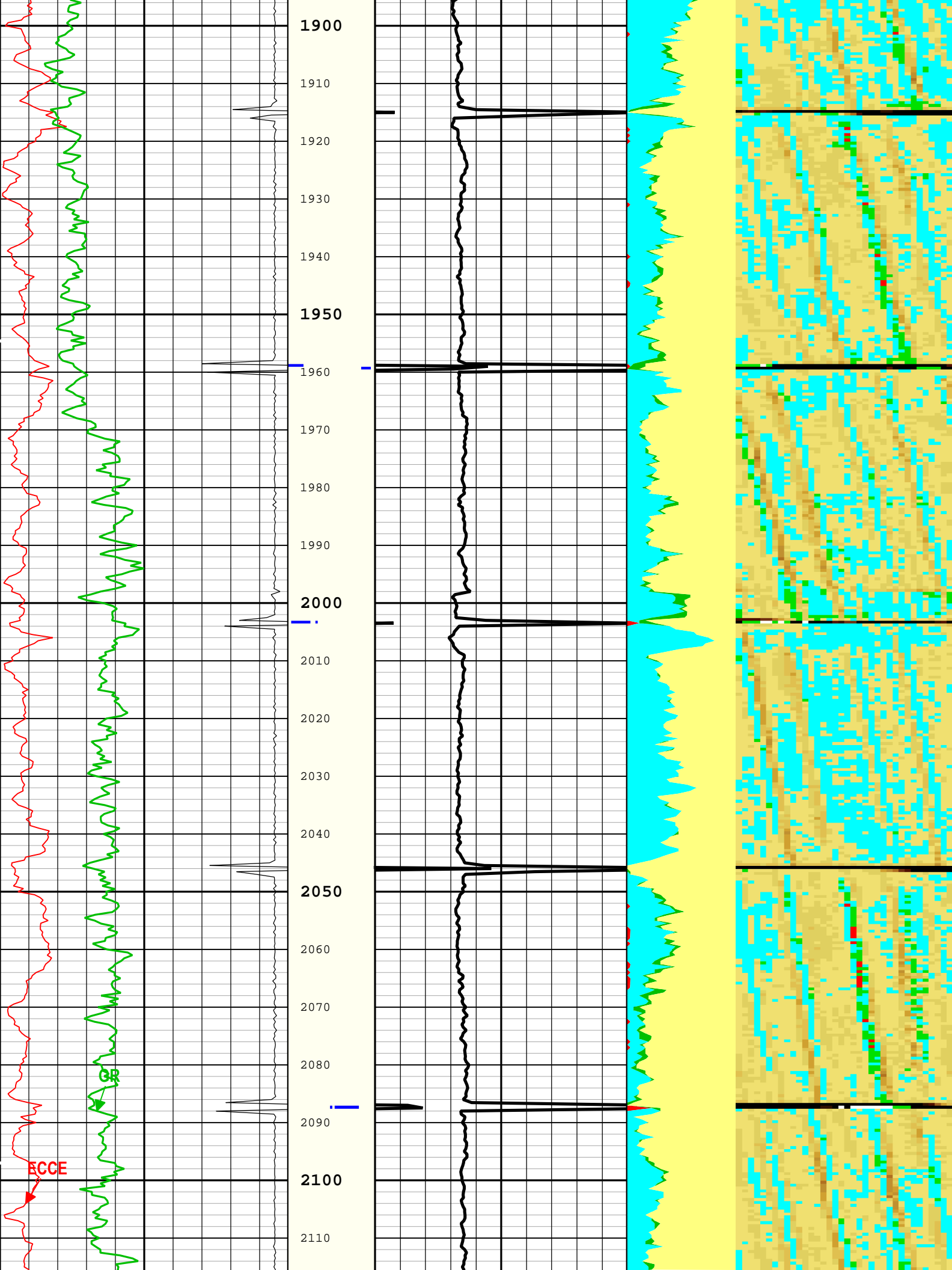


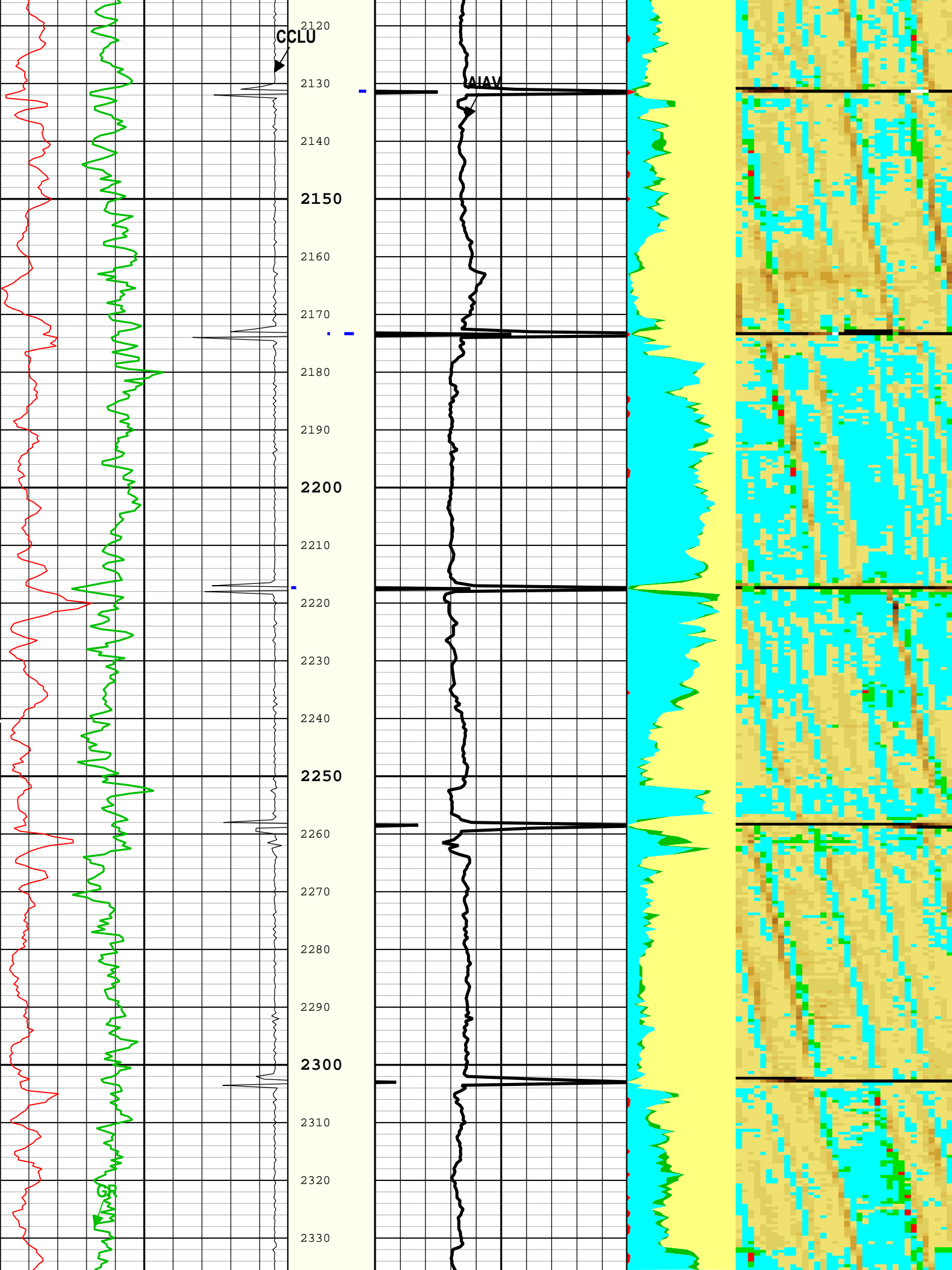


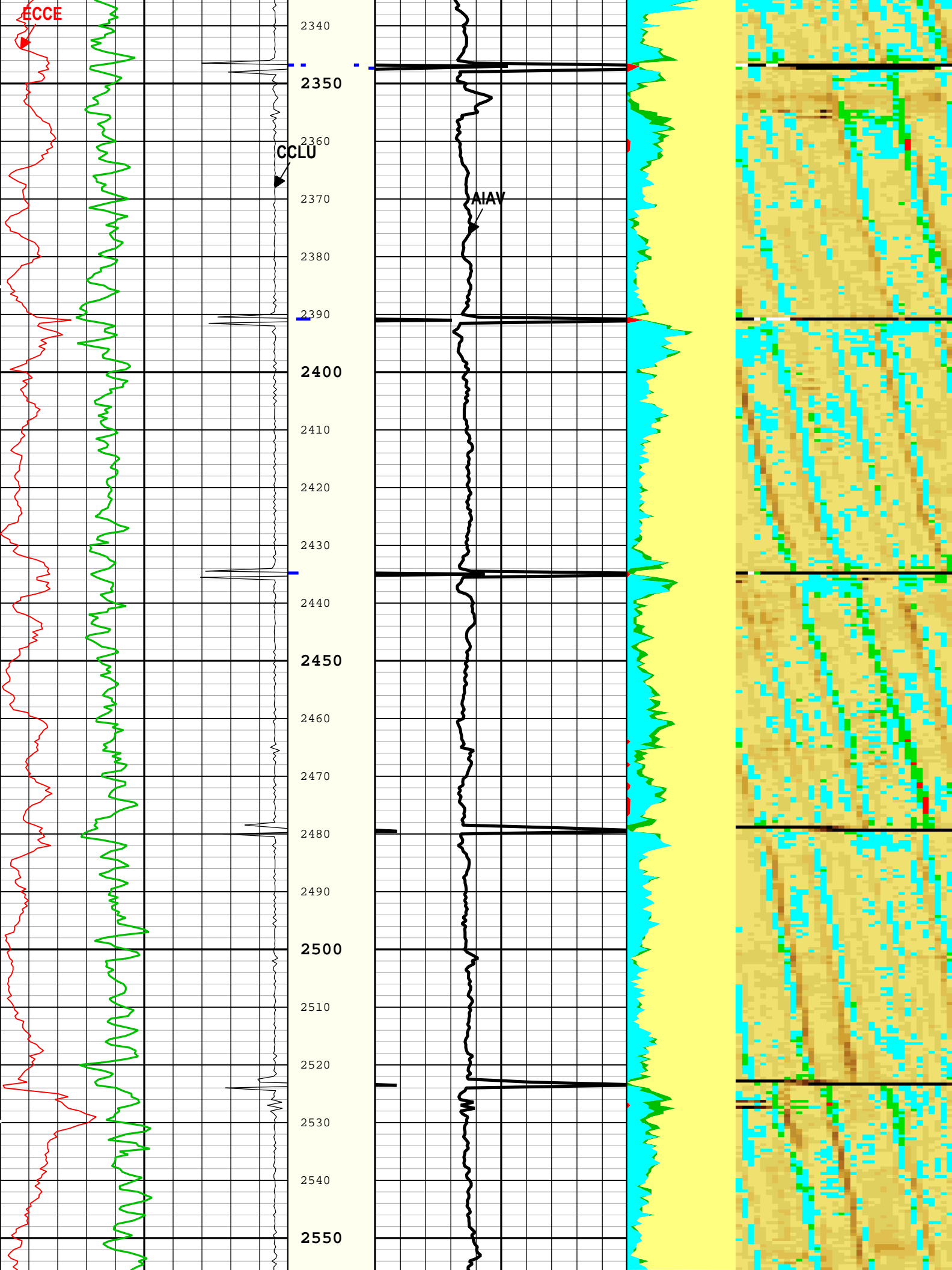


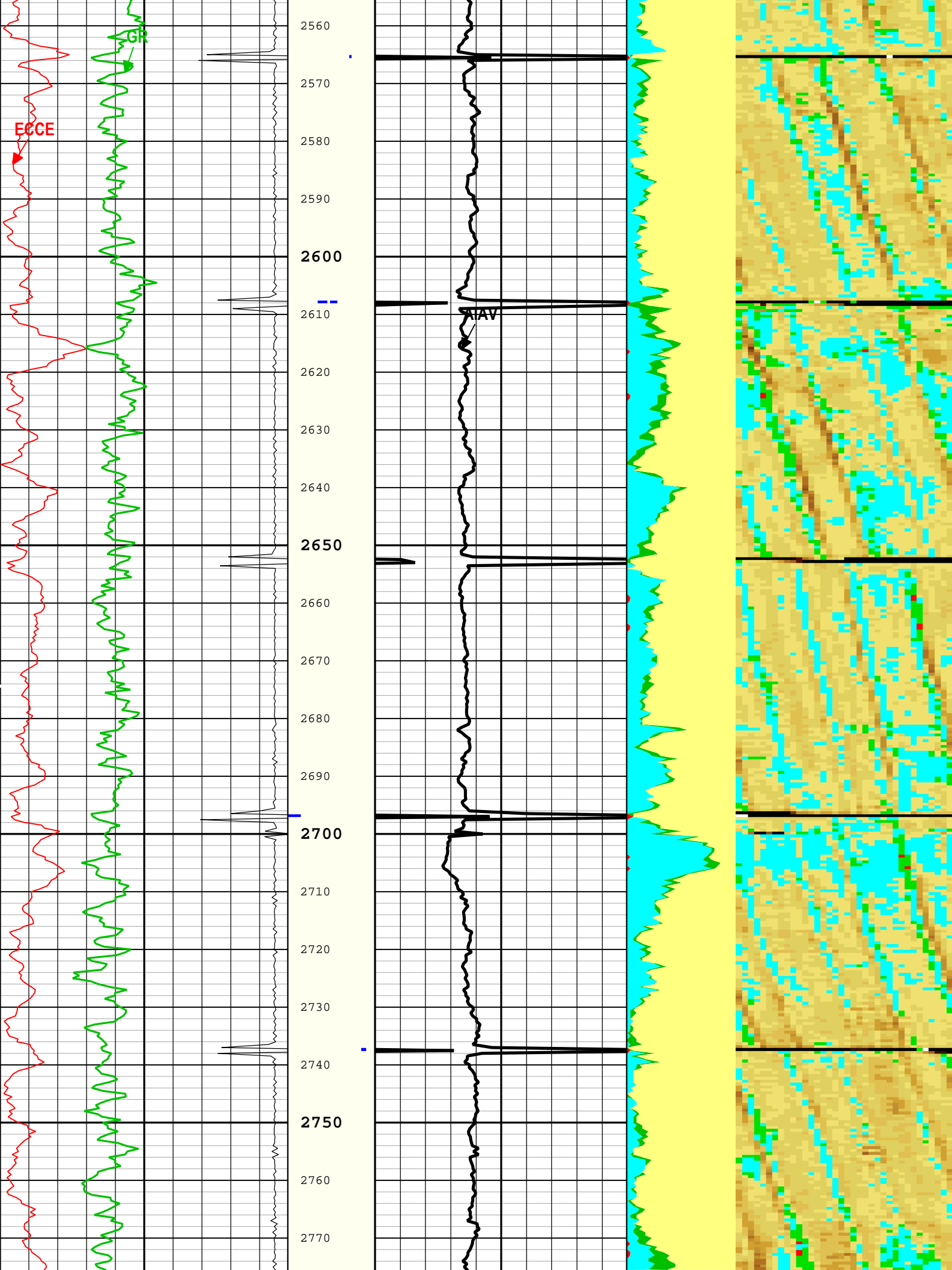


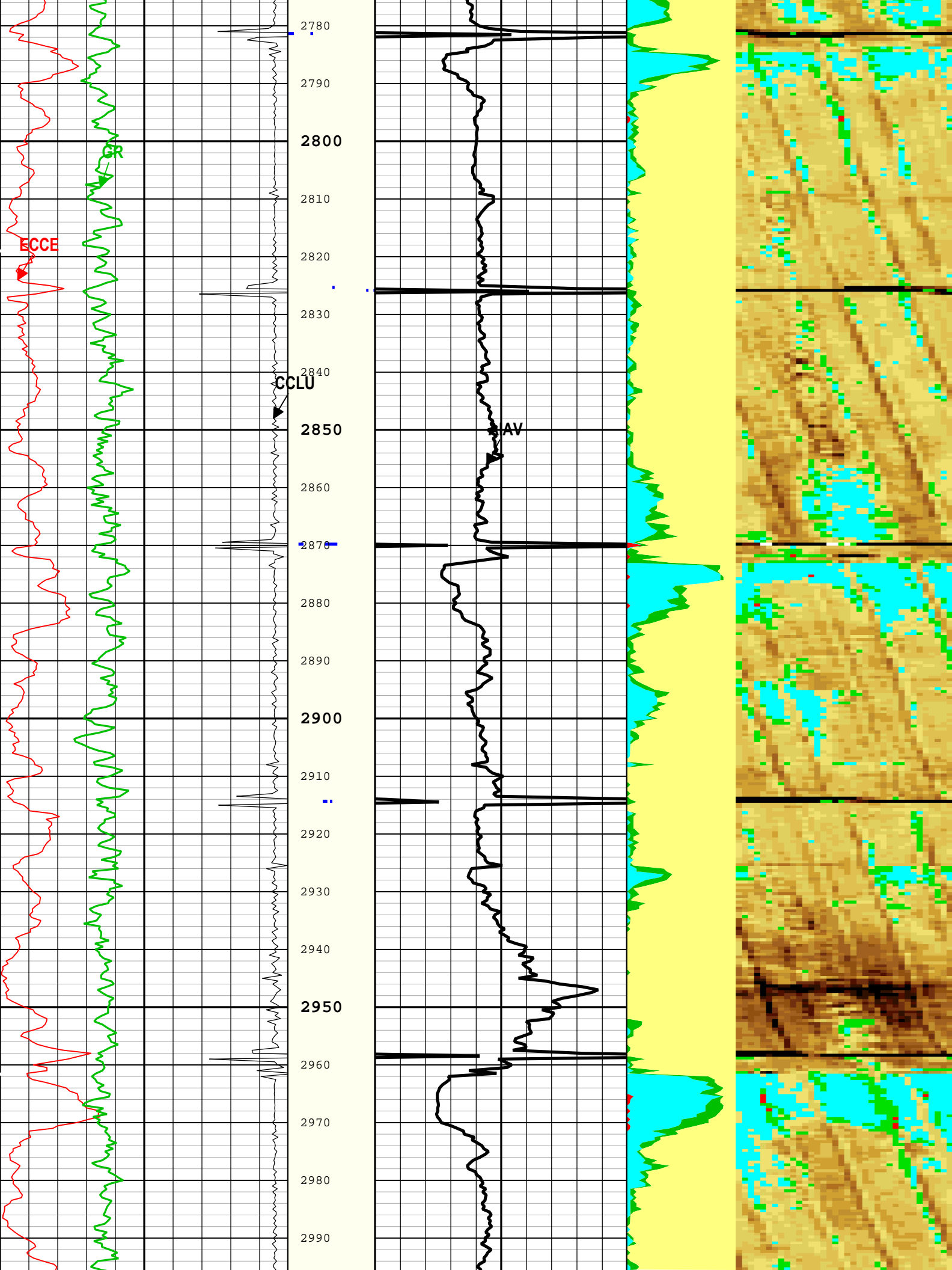


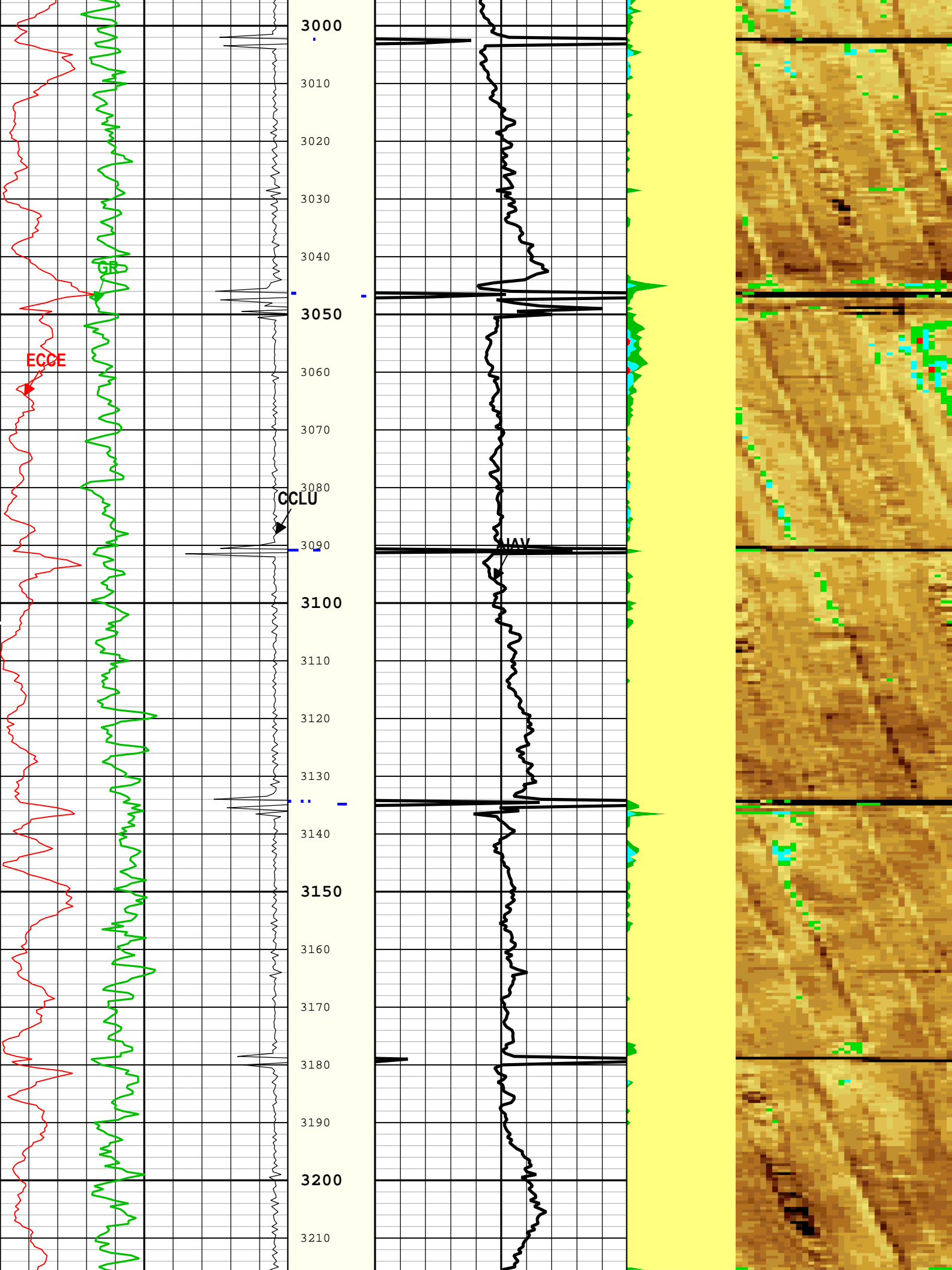


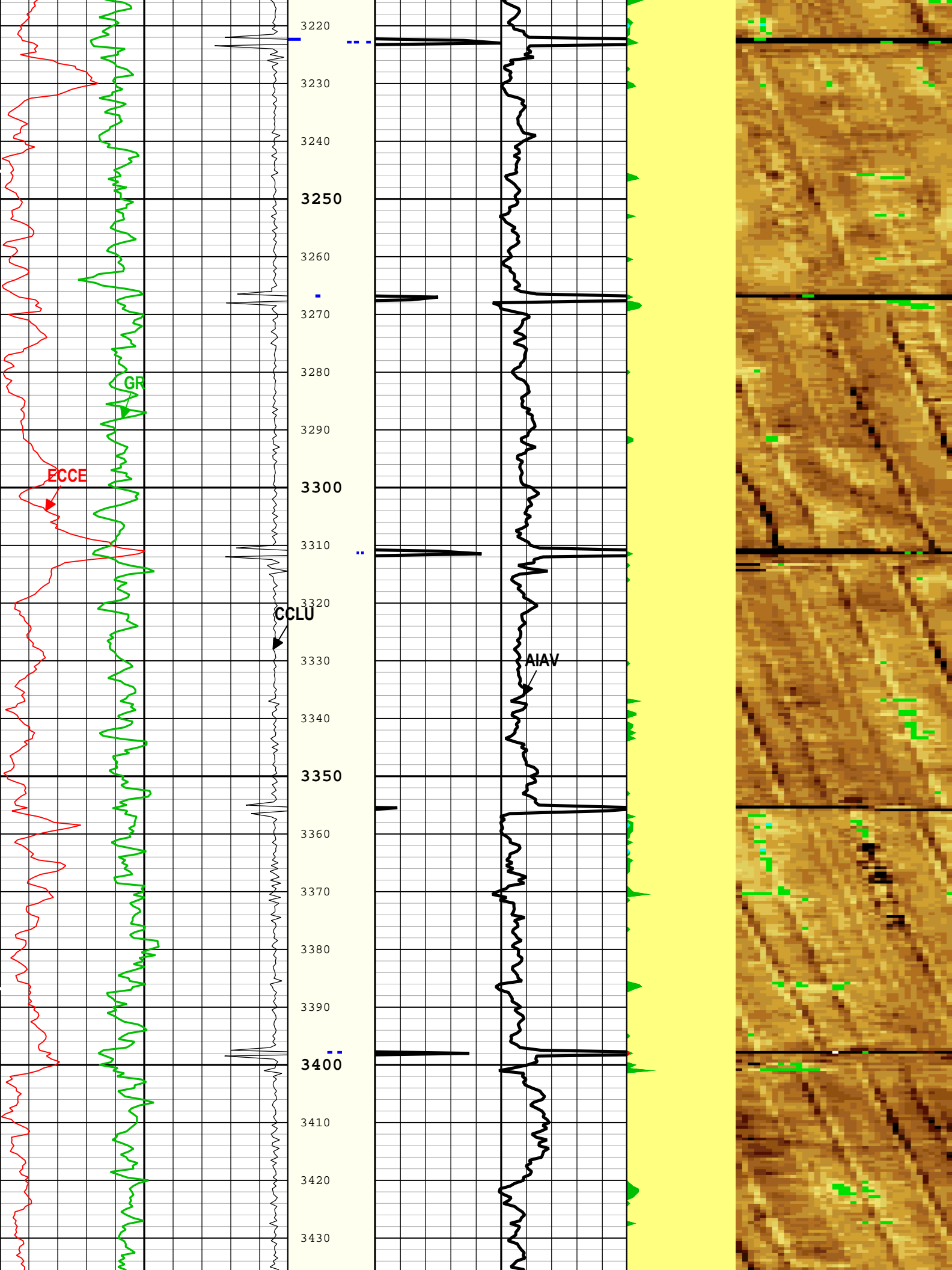


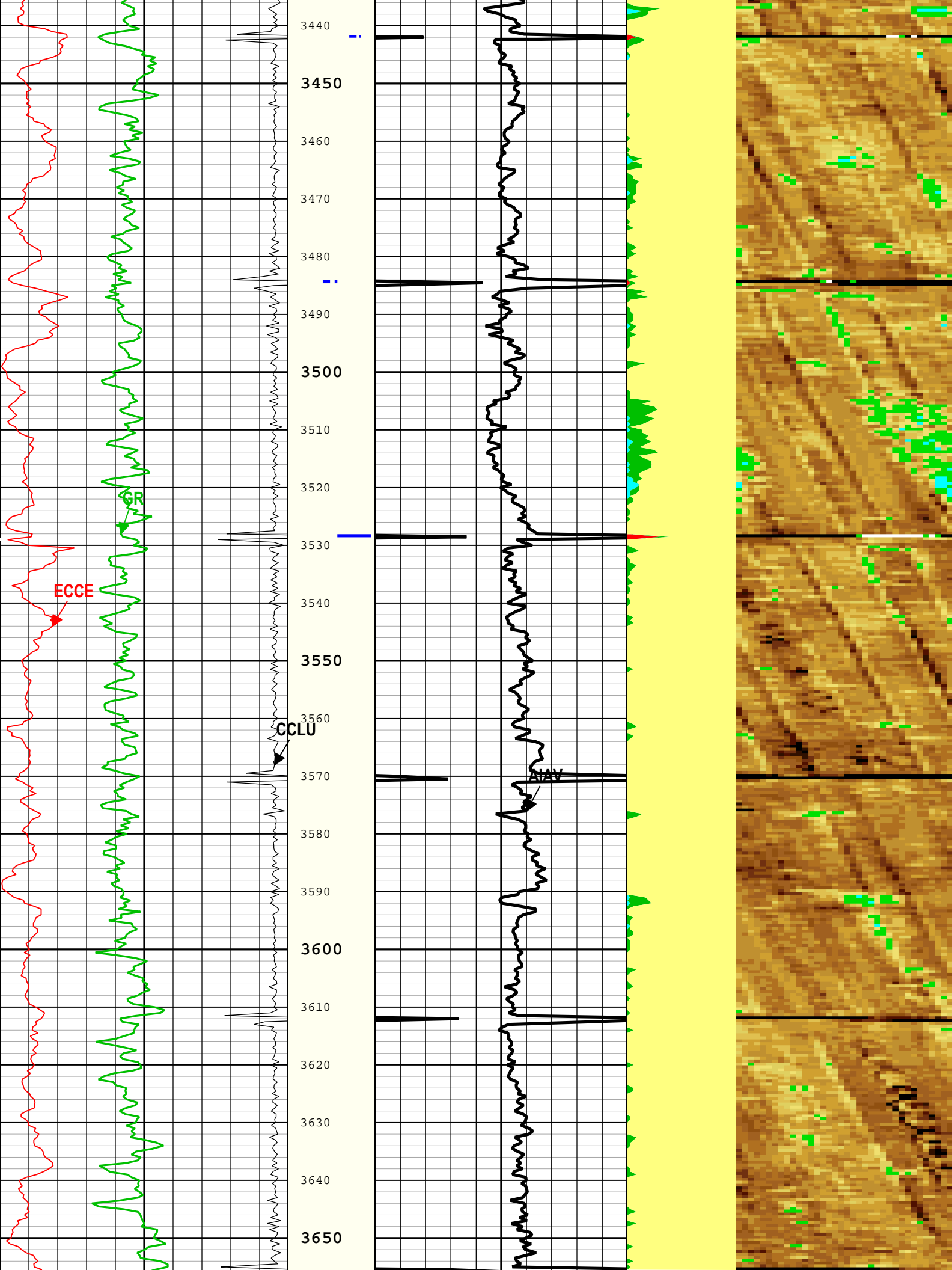


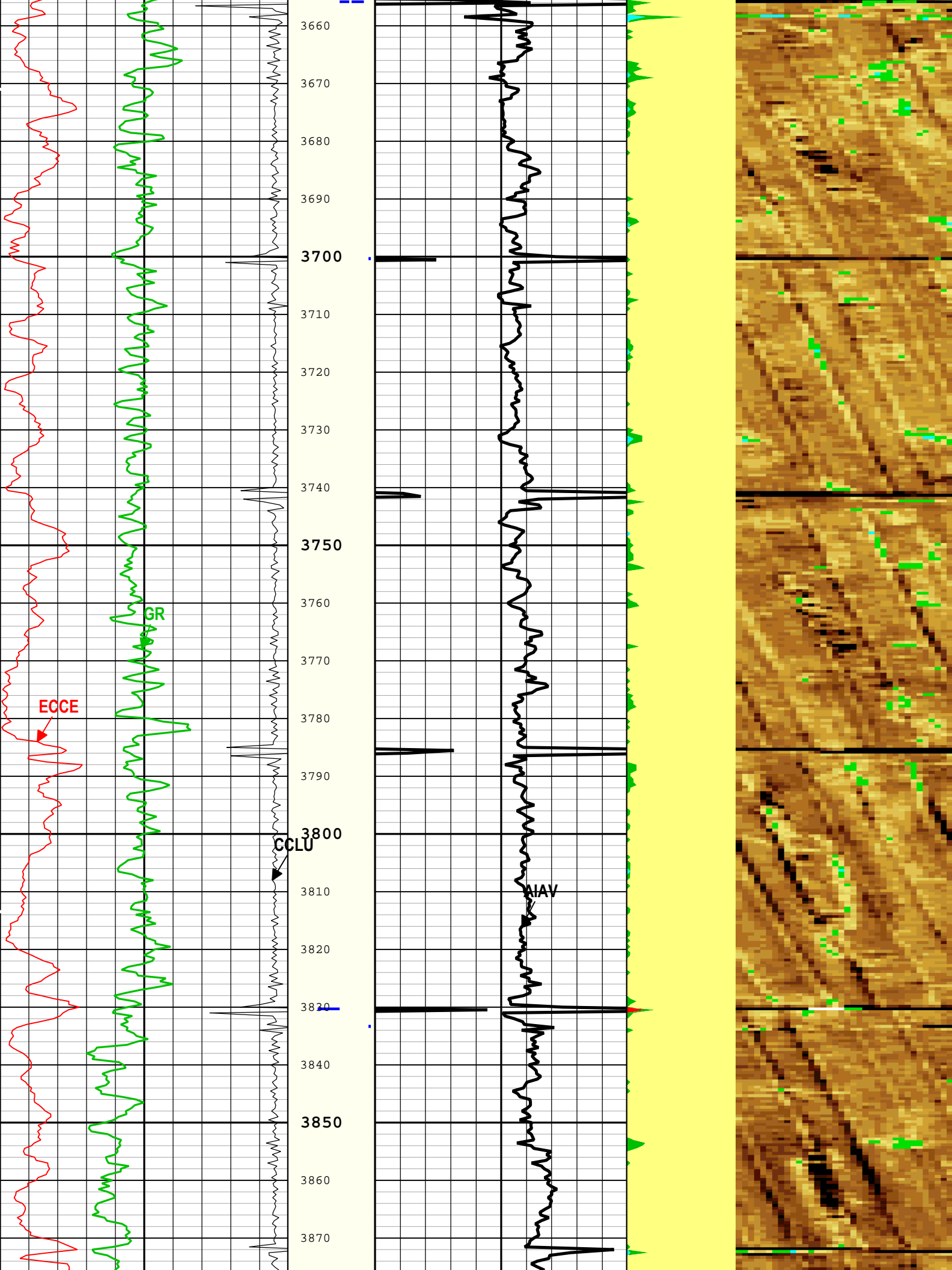


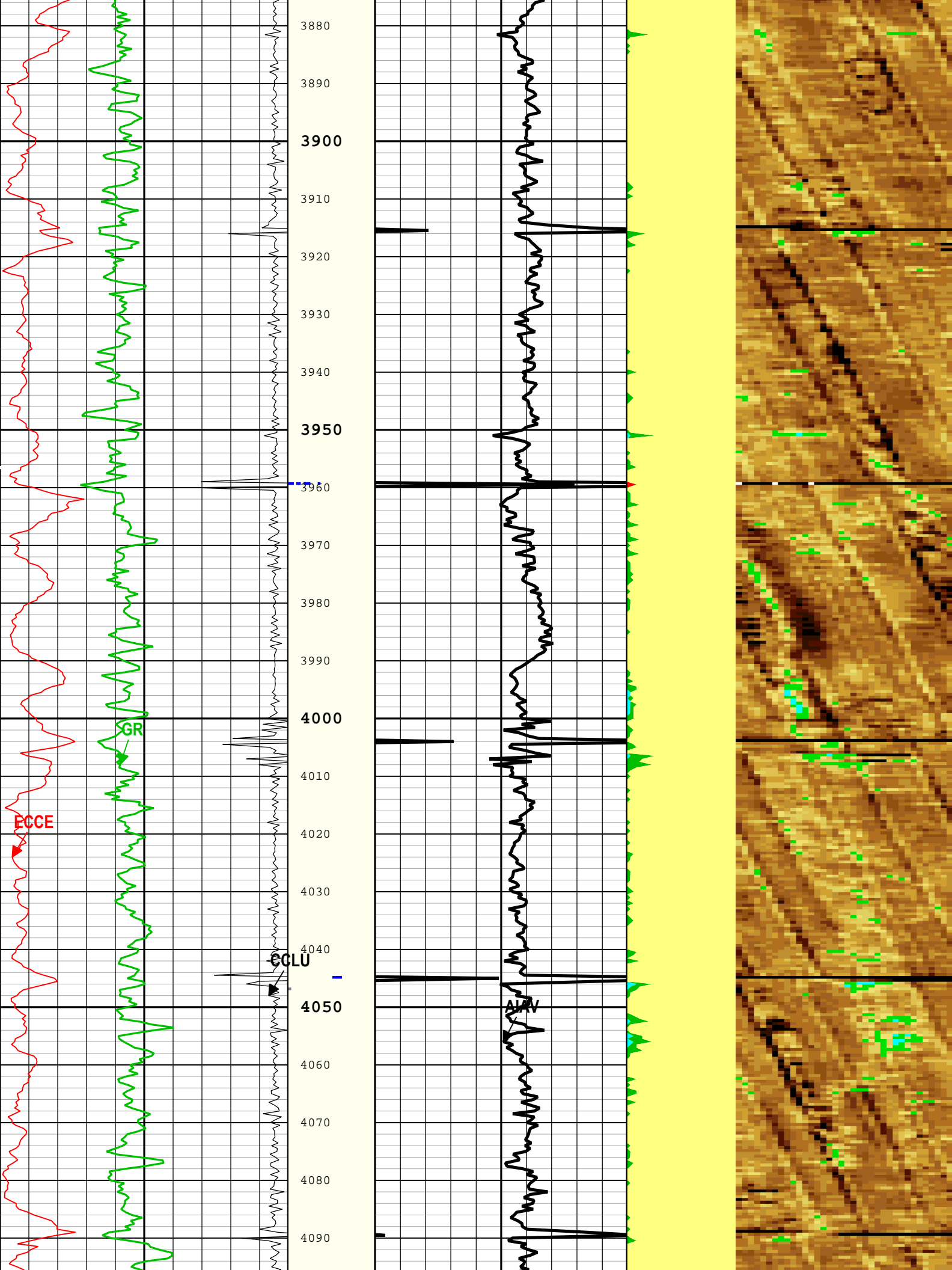


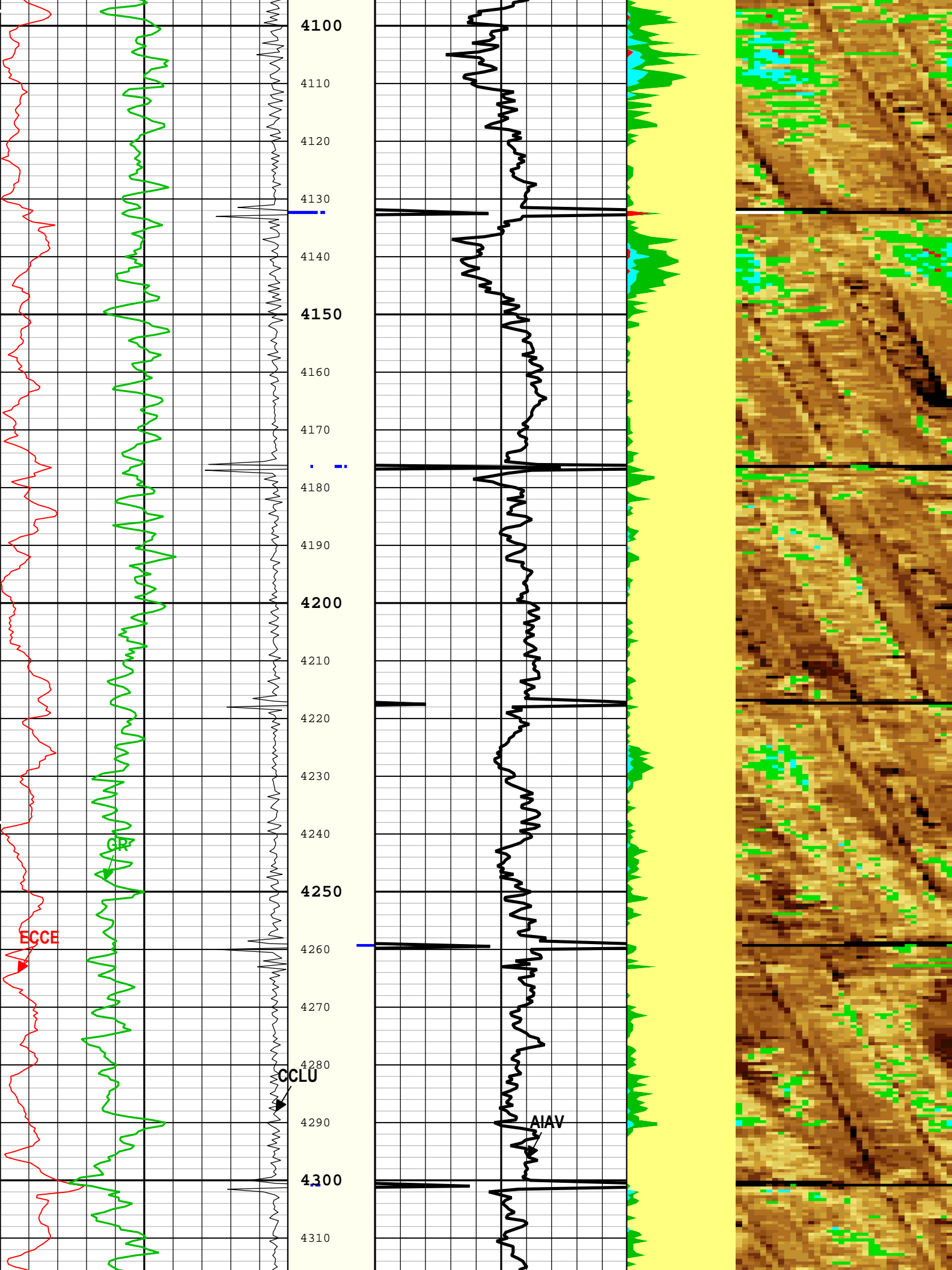


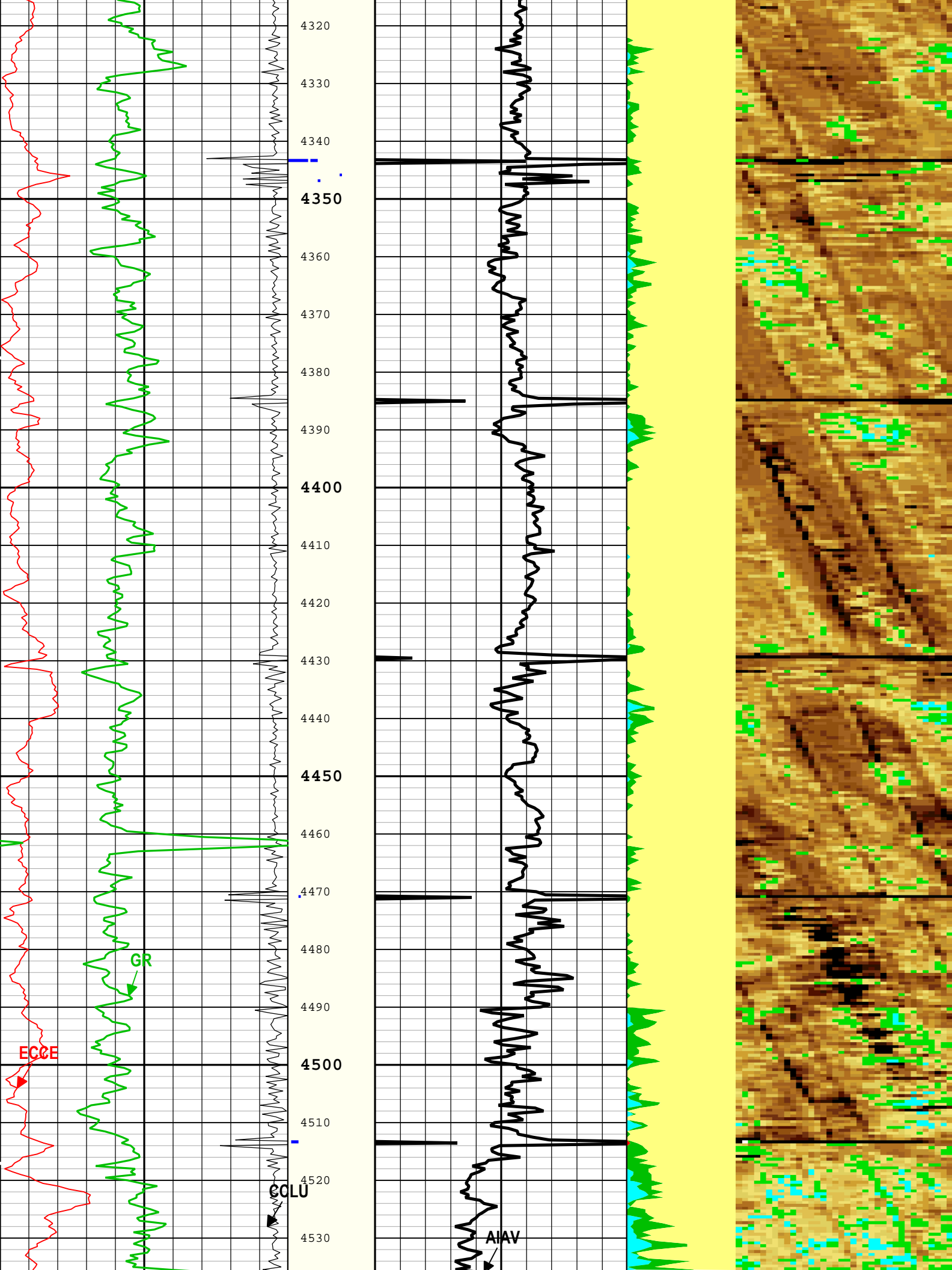


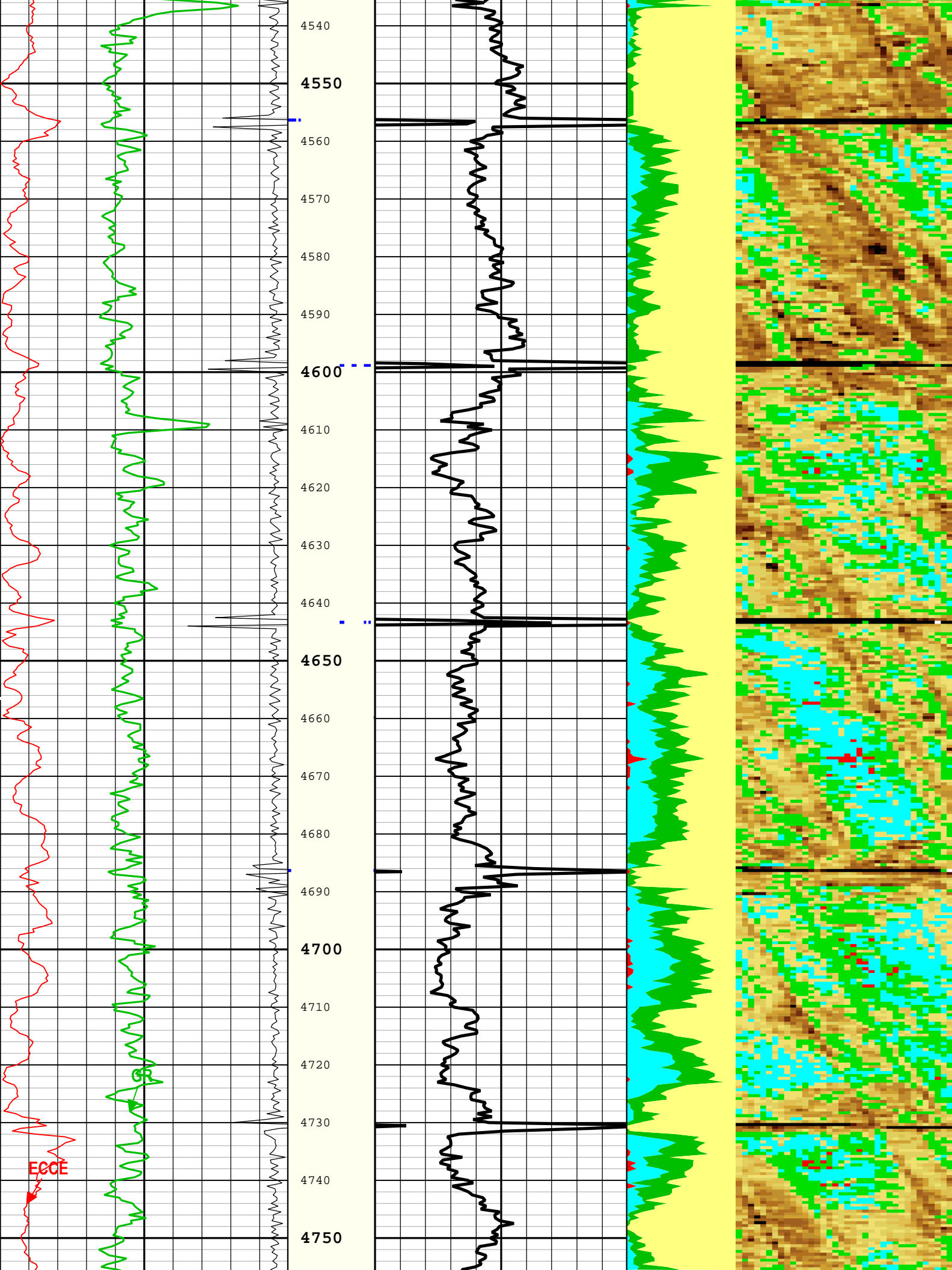


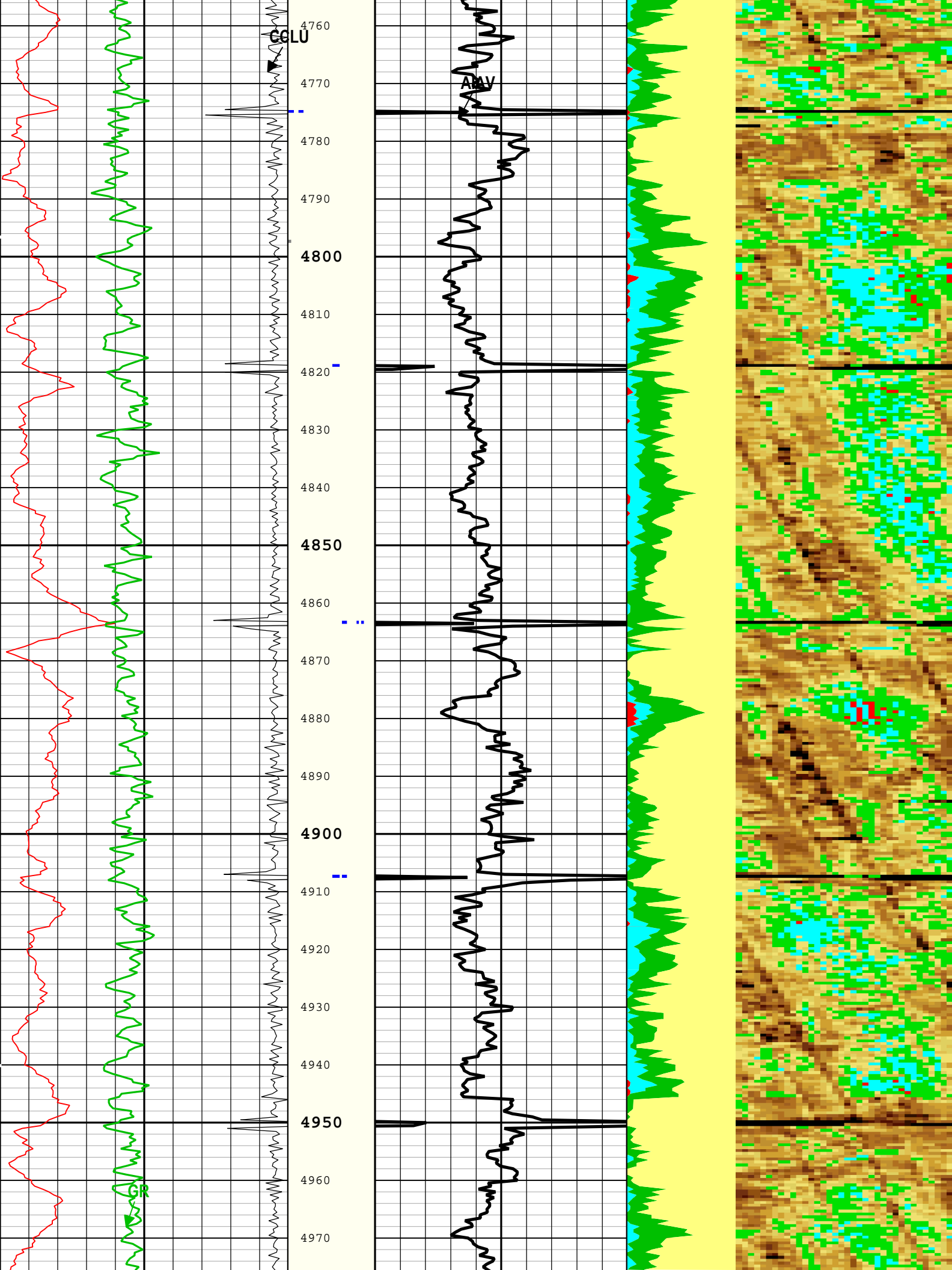


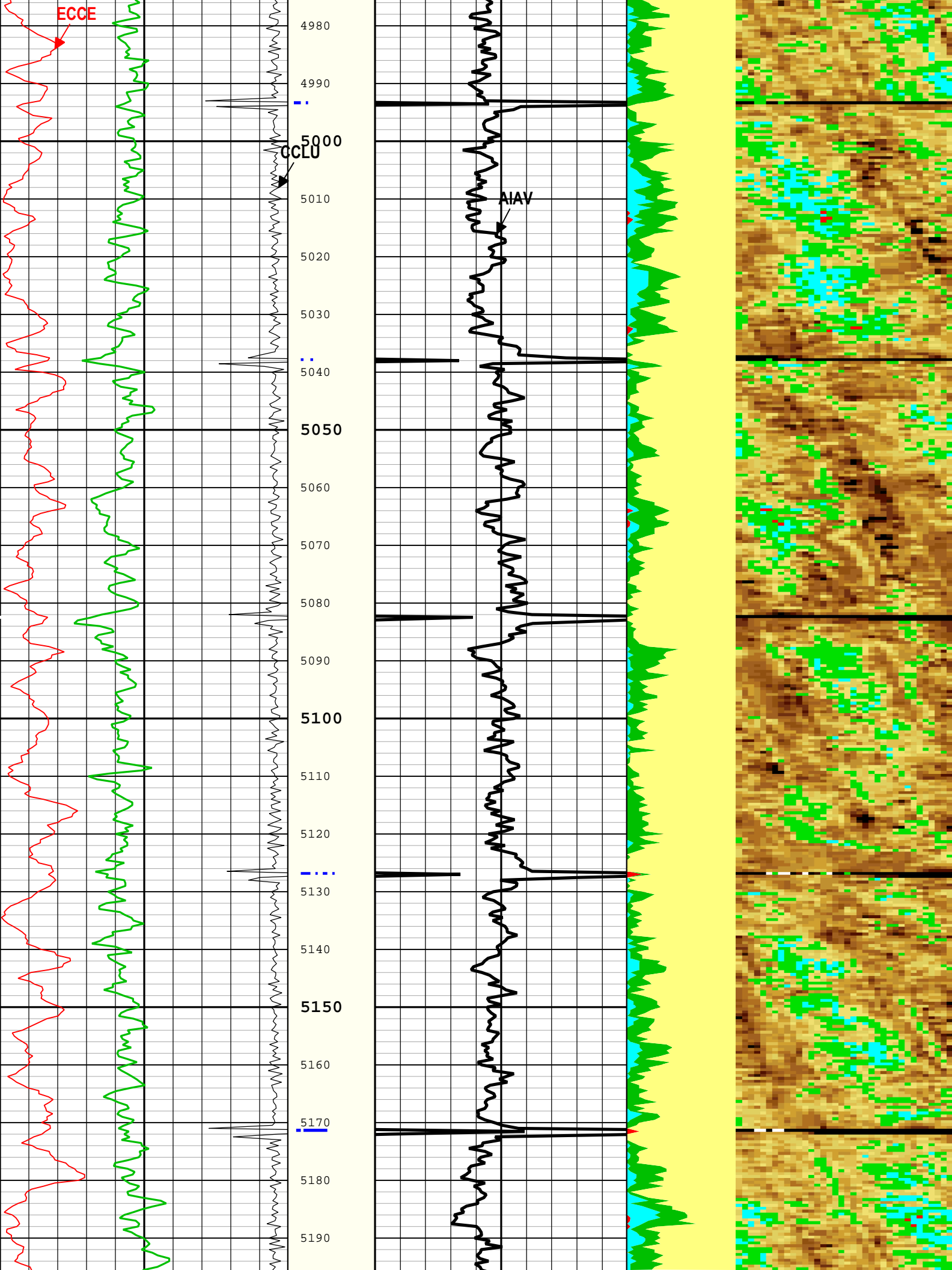


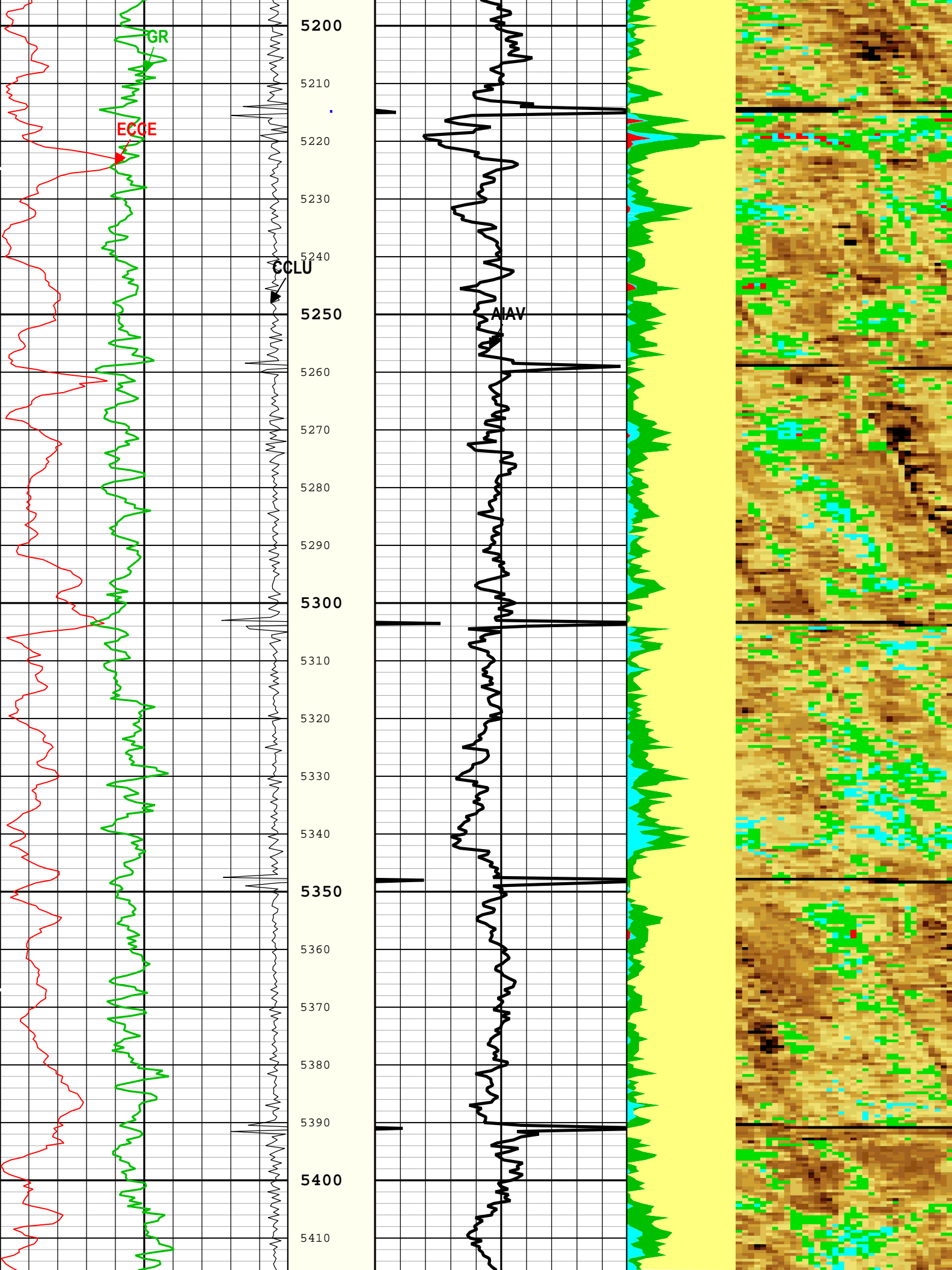


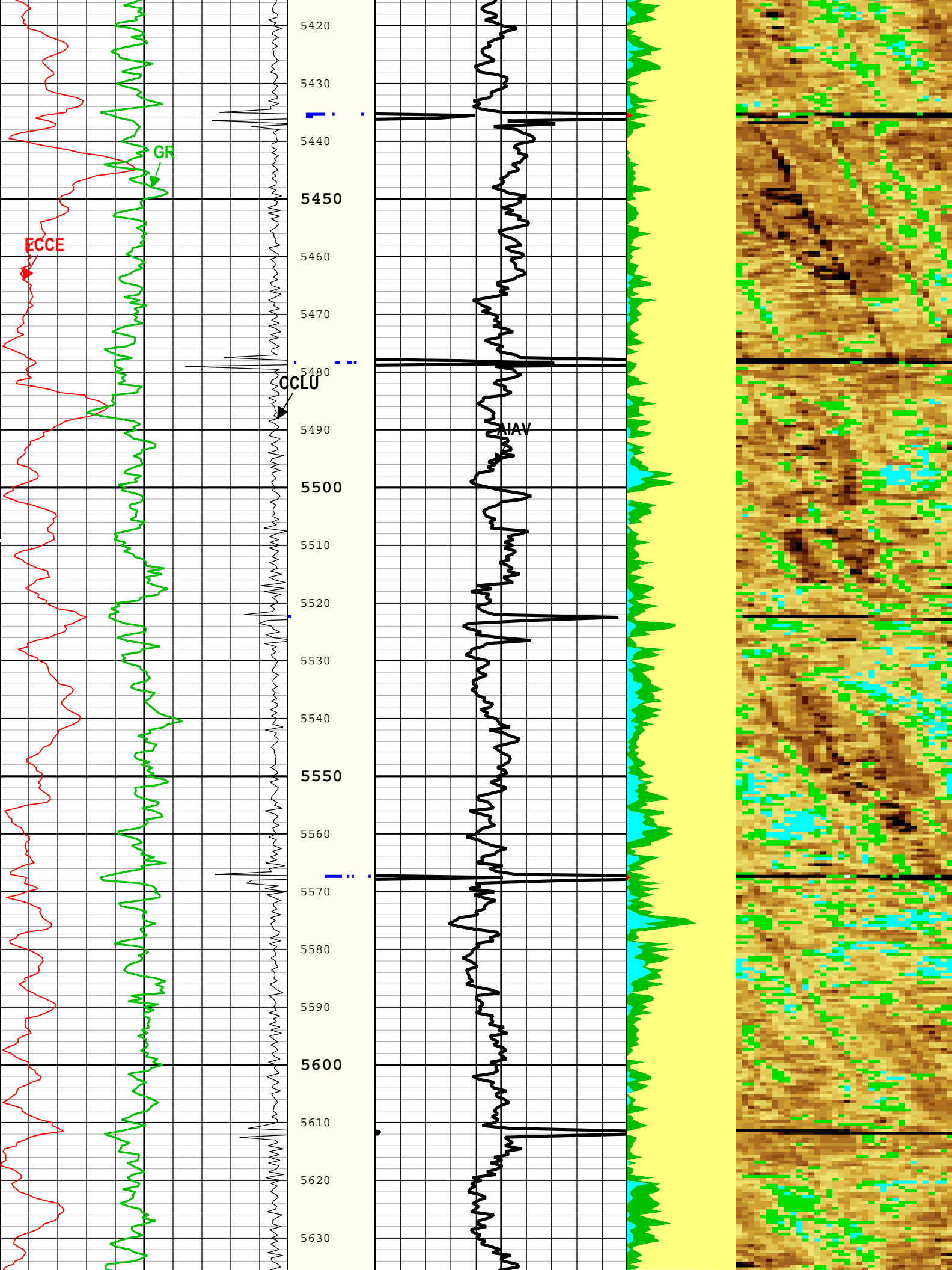


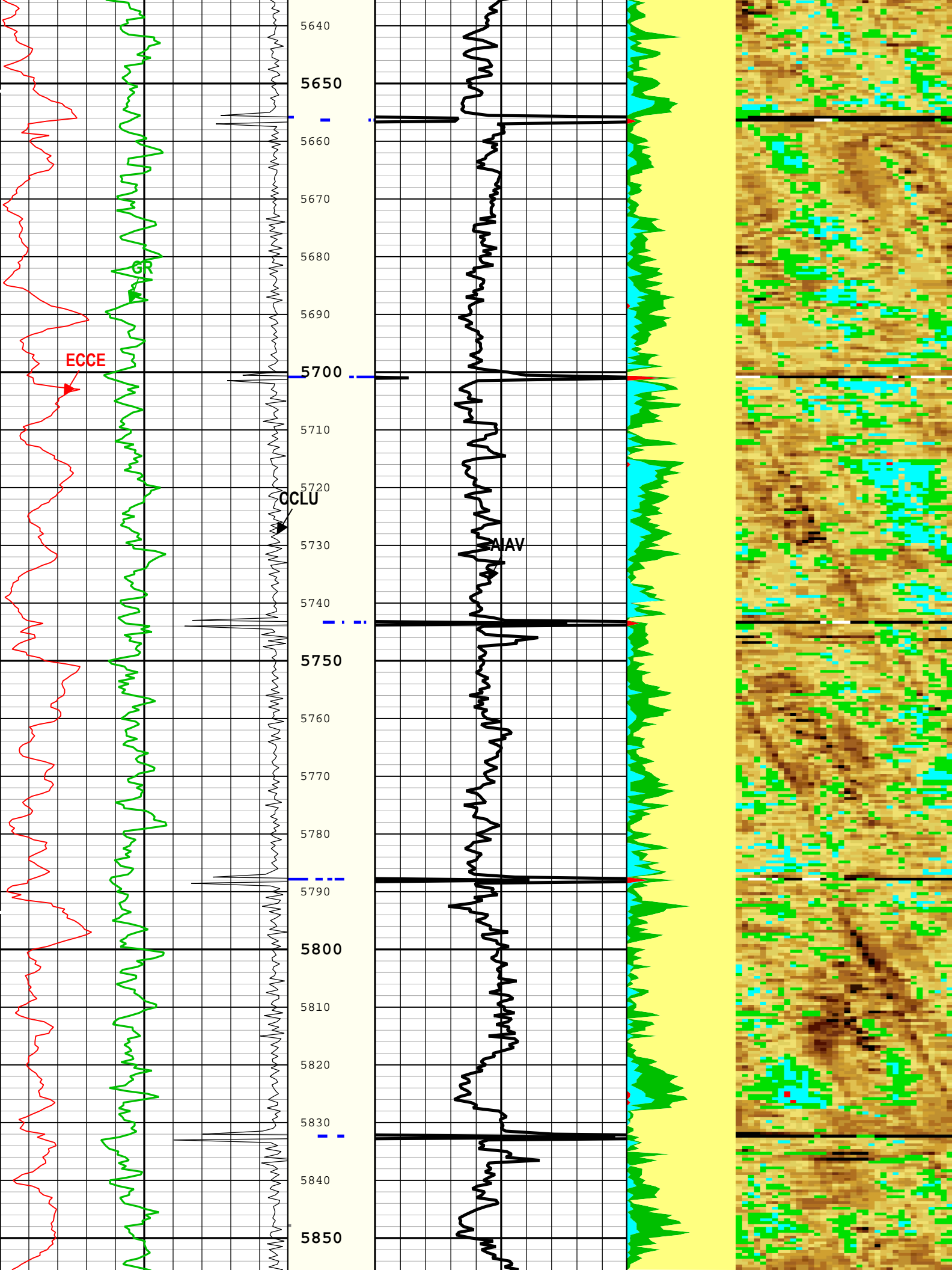


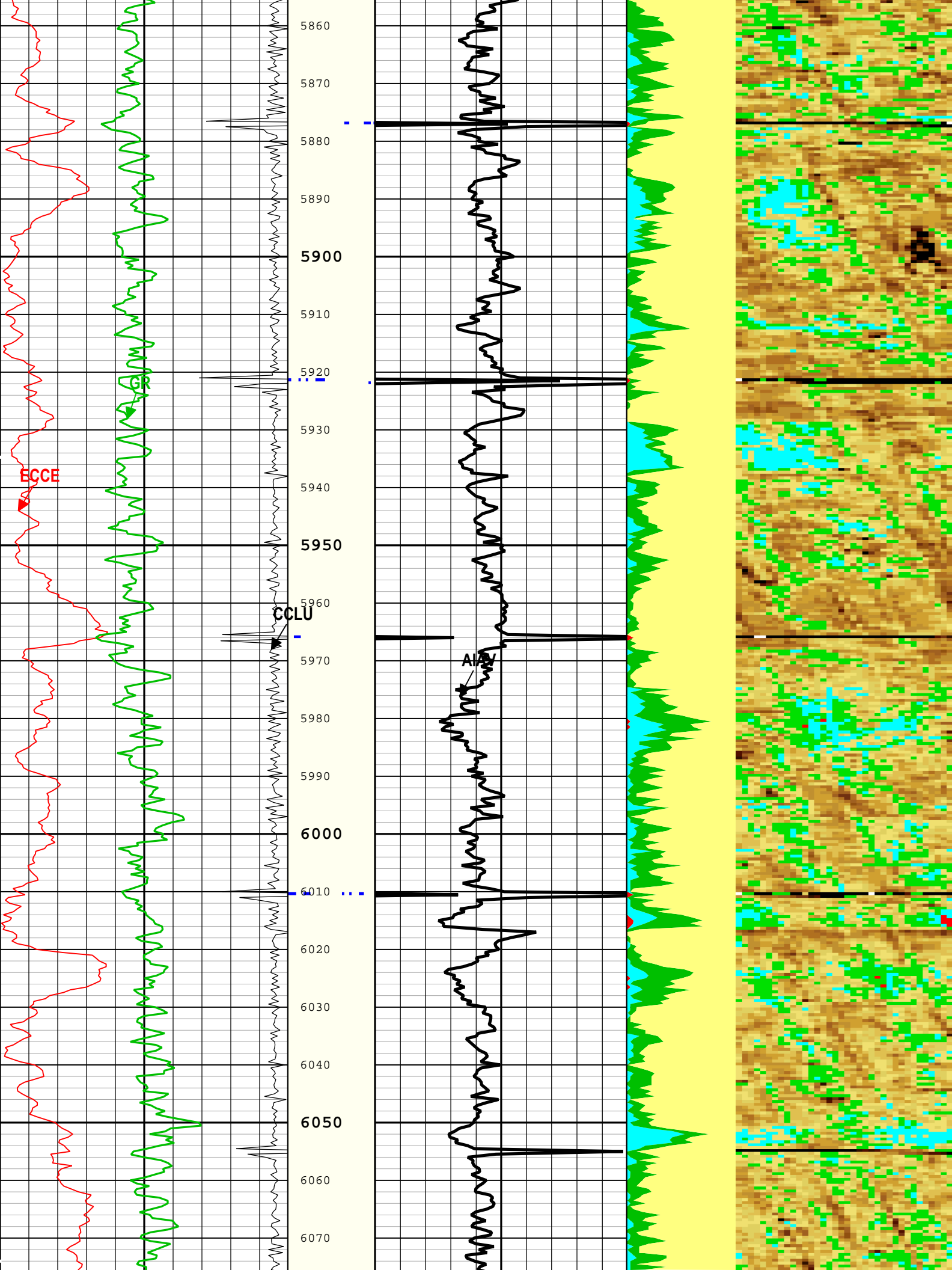


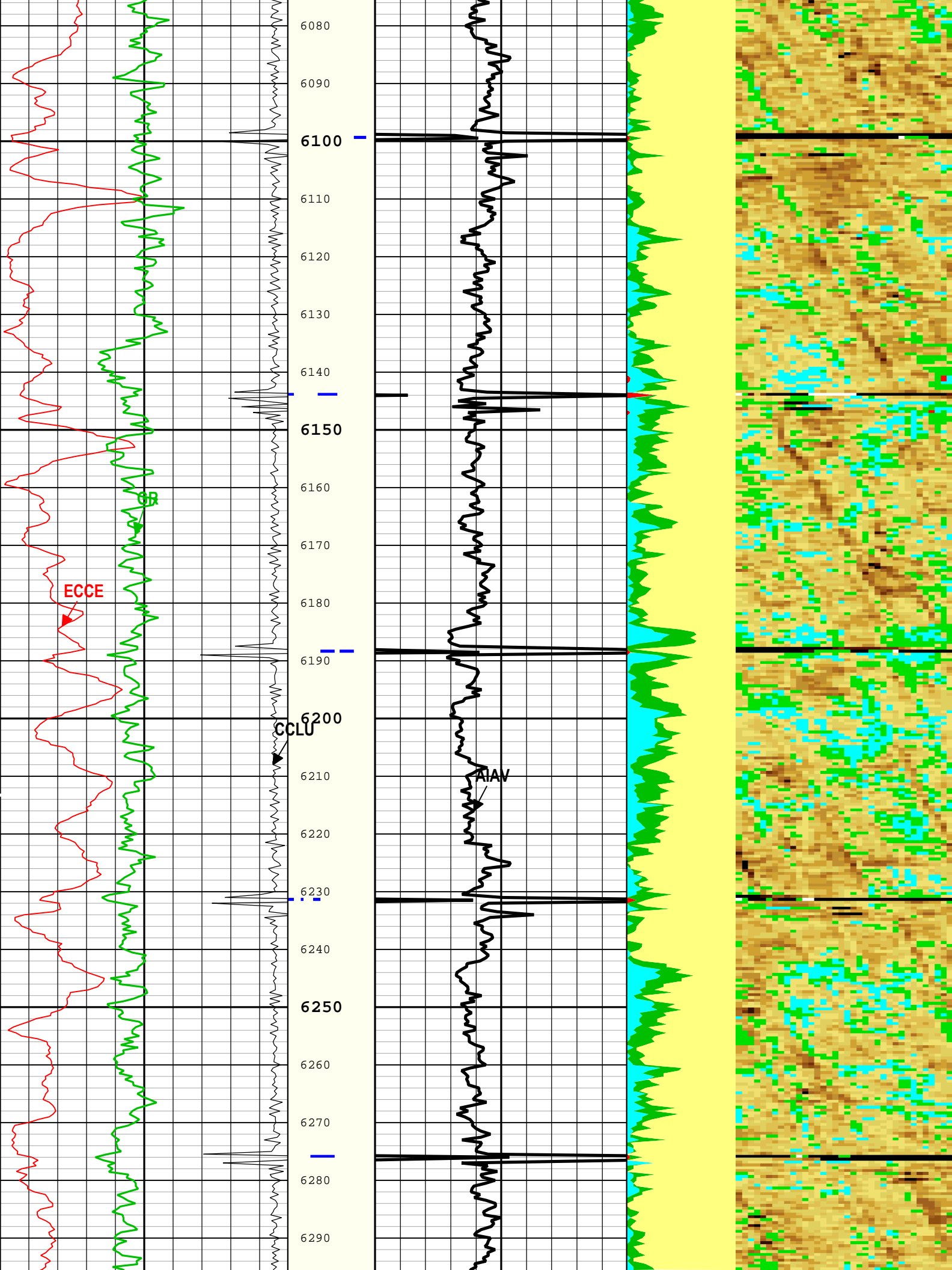


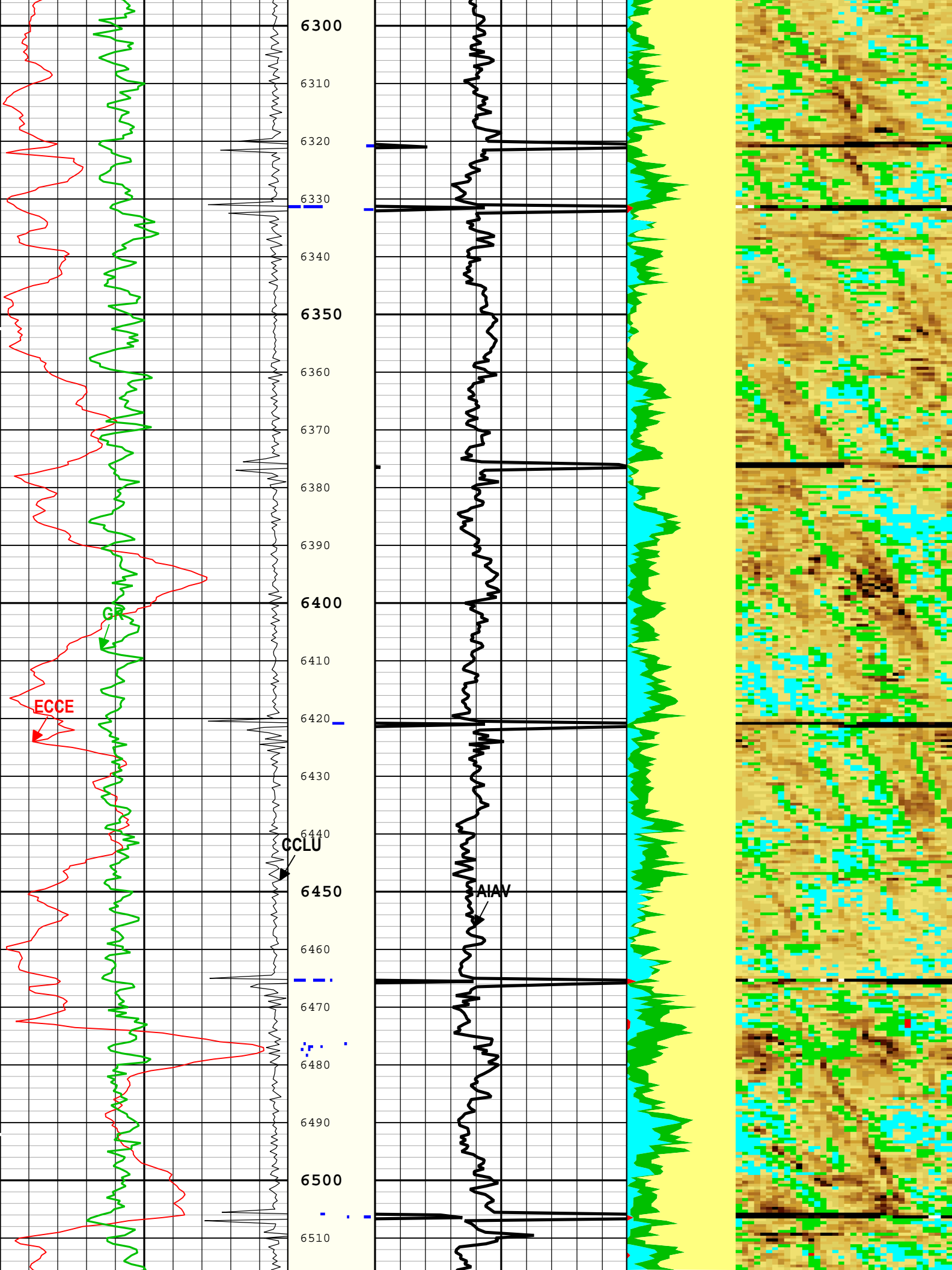


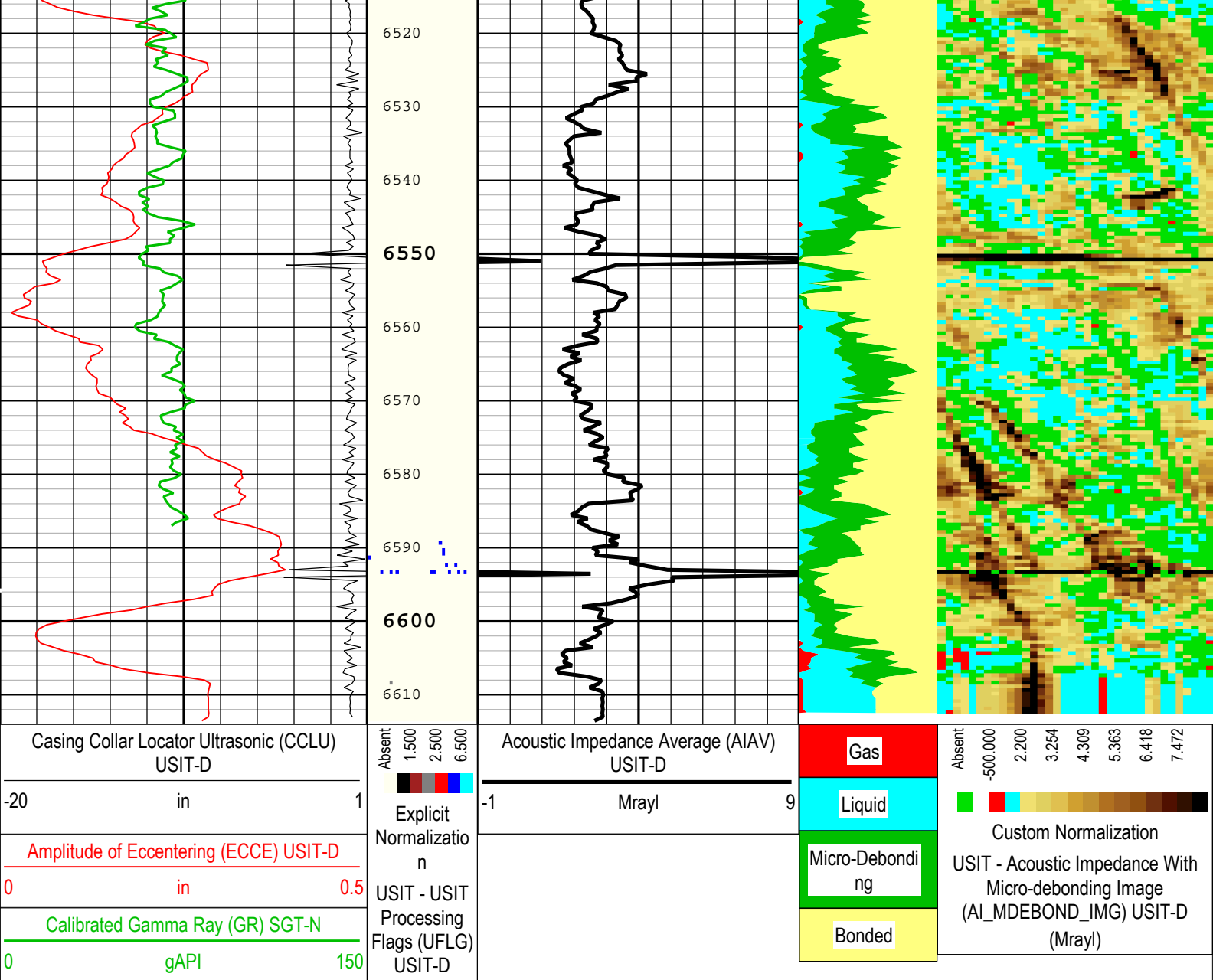












Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 13-Oct-2018 23:06:45

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-D	Regular Cement	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	191	us/ft
HEMA	Hematite Presence Flag	Borehole	No	
ICE_PROCESS	ICE Processing	USIT-D	Yes	
IMAR	Image Rotation	USIT-D	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-D	22.44	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-D	1.09	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-D	1.6	Mrayl
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-D	Automatic	

USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-D	FreePipe Norm.	
ZMUD	Acoustic Impedance of Mud	Borehole	1.16	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-D	2.2	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-D	0.3	Mrayl

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	26	100	110
BS	13.5	110	1969
BS	8.5	1969	6614

All depth are actual.

Tool Control Parameters

ONE: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-D	-4	dB
AGMX	Maximum Gain of Cartridge	USIT-D	20	dB
EMXV	EMEX Voltage	USIT-D	40	V
HRES	Horizontal Resolution	USIT-D	10 deg	
ULOG	Logging Objective	USIT-D	MEASUREMENT	
USFR	Ultrasonic Sampling Frequency	USIT-D	500000	Hz
UPAT	USIT Emission Pattern	USIT-D	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-D	Uncompressed 10 deg at 6.0 in LF	
WINB	Window Begin Time	USIT-D	28.1	us
WINE	Window End Time	USIT-D	68.1	us

ONE

0 PSI Repeat Pass

Software Version

Acquisition System	Version
Maxwell 2018 SP1	8.1.99839.3100

Pass Summary

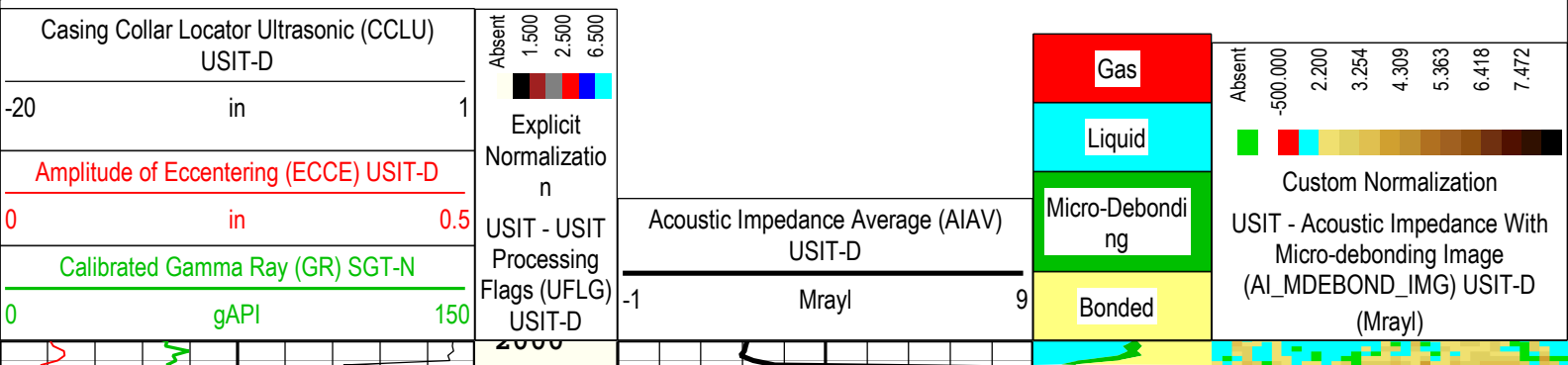
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[2]:Up	Up	1979.78 ft	2503.56 ft	11-Oct-2018 9:33:51 AM	11-Oct-2018 9:40:09 AM	ON	1.03 ft	Yes

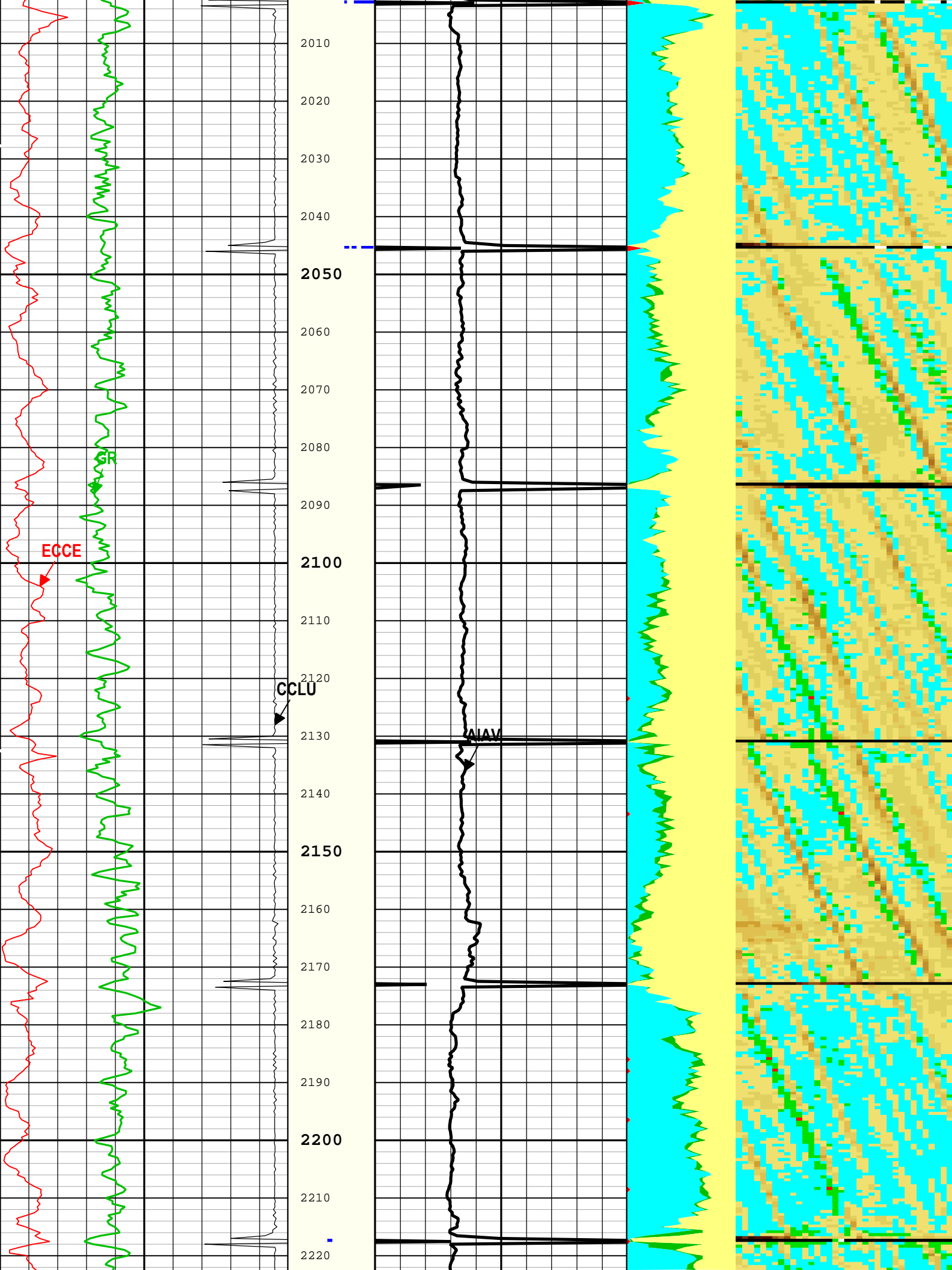
All depths are referenced to toolstring zero

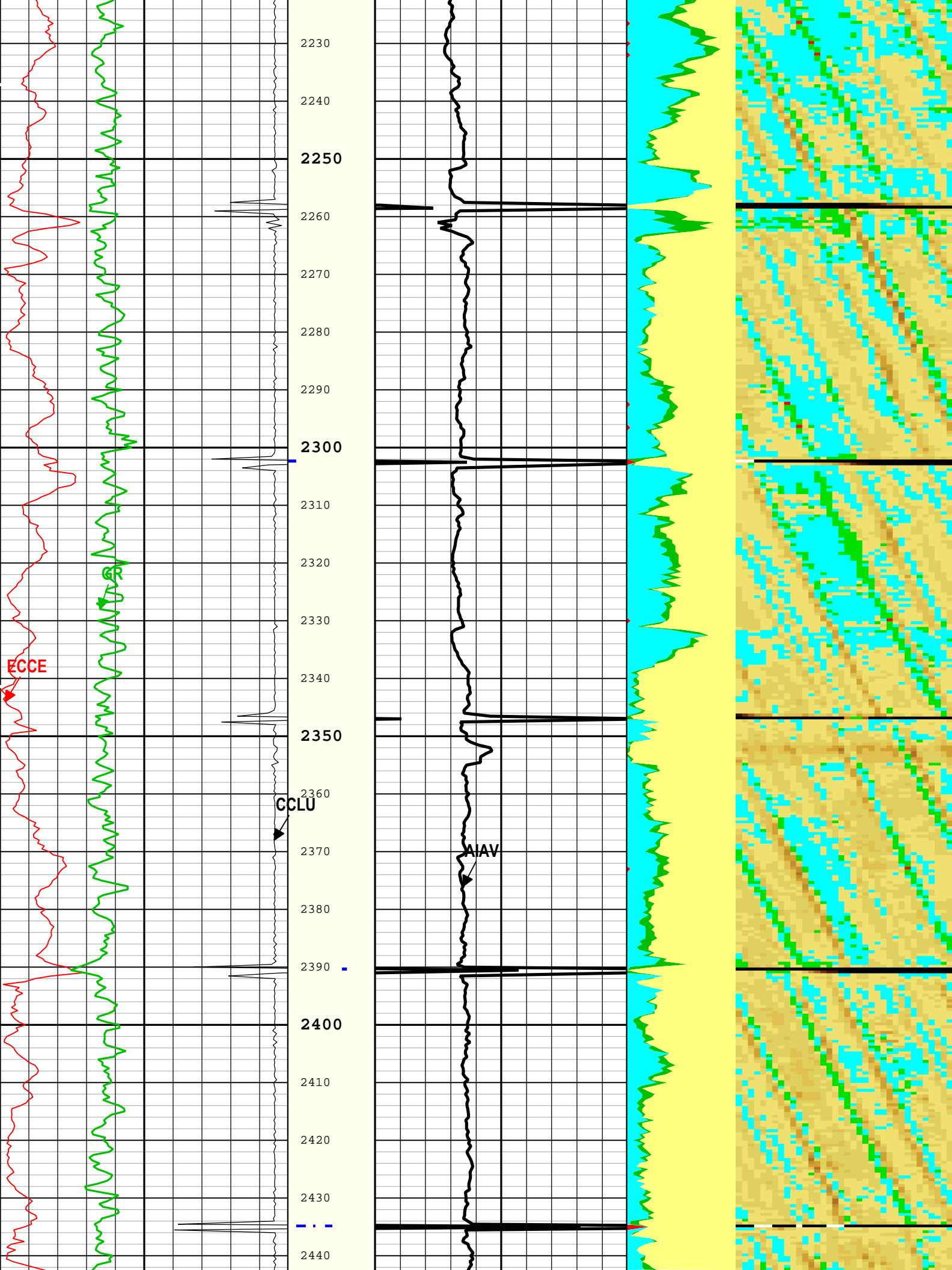
Log	Company:Noble Energy Inc. Well:Emmy State-H25-777 ONE: Log[2]:Up:S010
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Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 13-Oct-2018 23:07:04

TIME_1900 - Time Marked every 60.00 (s)

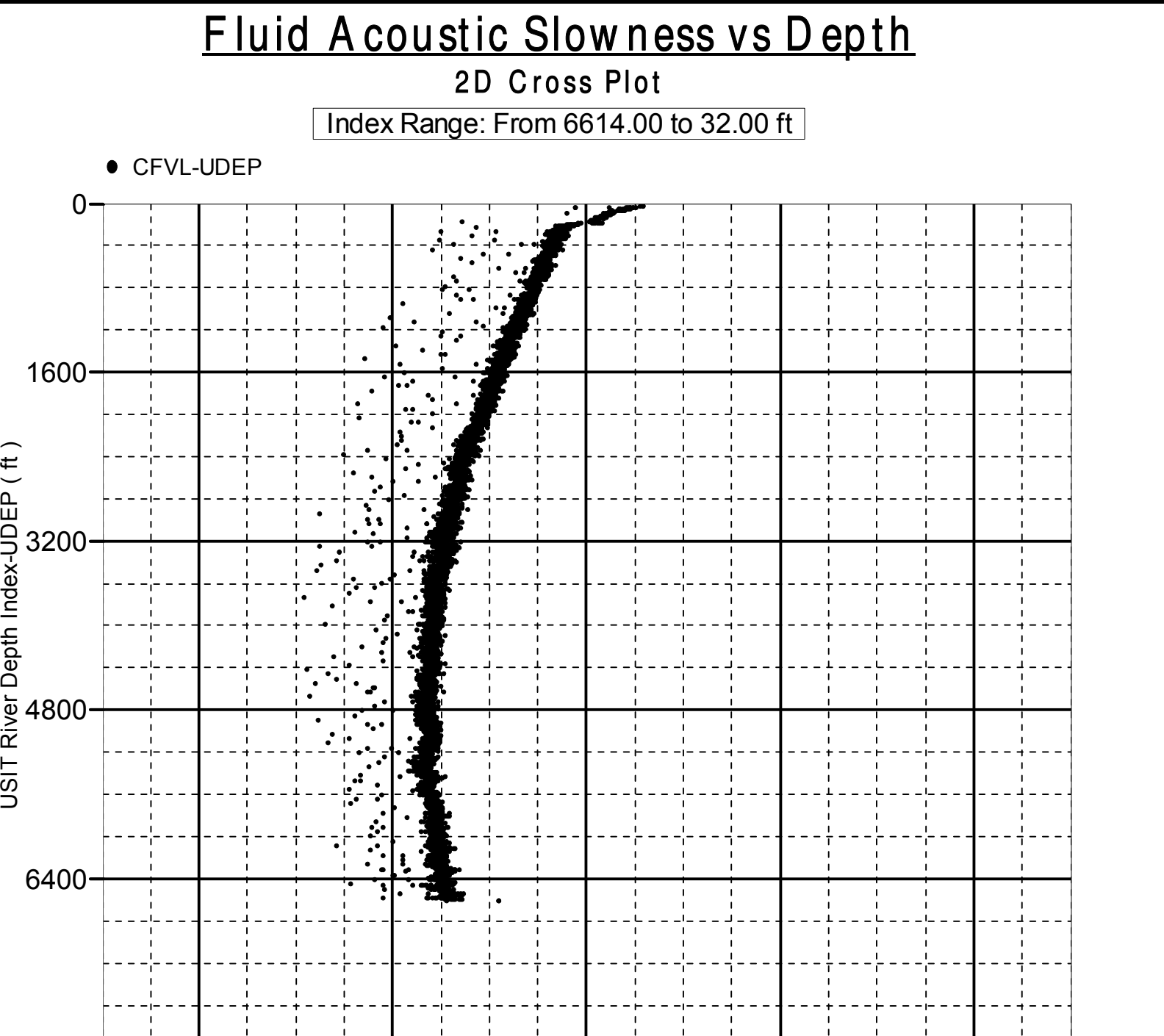






EMXV	EMEX Voltage	USIT-D	40	V
HRES	Horizontal Resolution	USIT-D	10 deg	
ULOG	Logging Objective	USIT-D	MEASUREMENT	
USFR	Ultrasonic Sampling Frequency	USIT-D	500000	Hz
UPAT	USIT Emission Pattern	USIT-D	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-D	Uncompressed 10 deg at 6.0 in LF	
WINB	Window Begin Time	USIT-D	28.1	us
WINE	Window End Time	USIT-D	Time Zoned	us

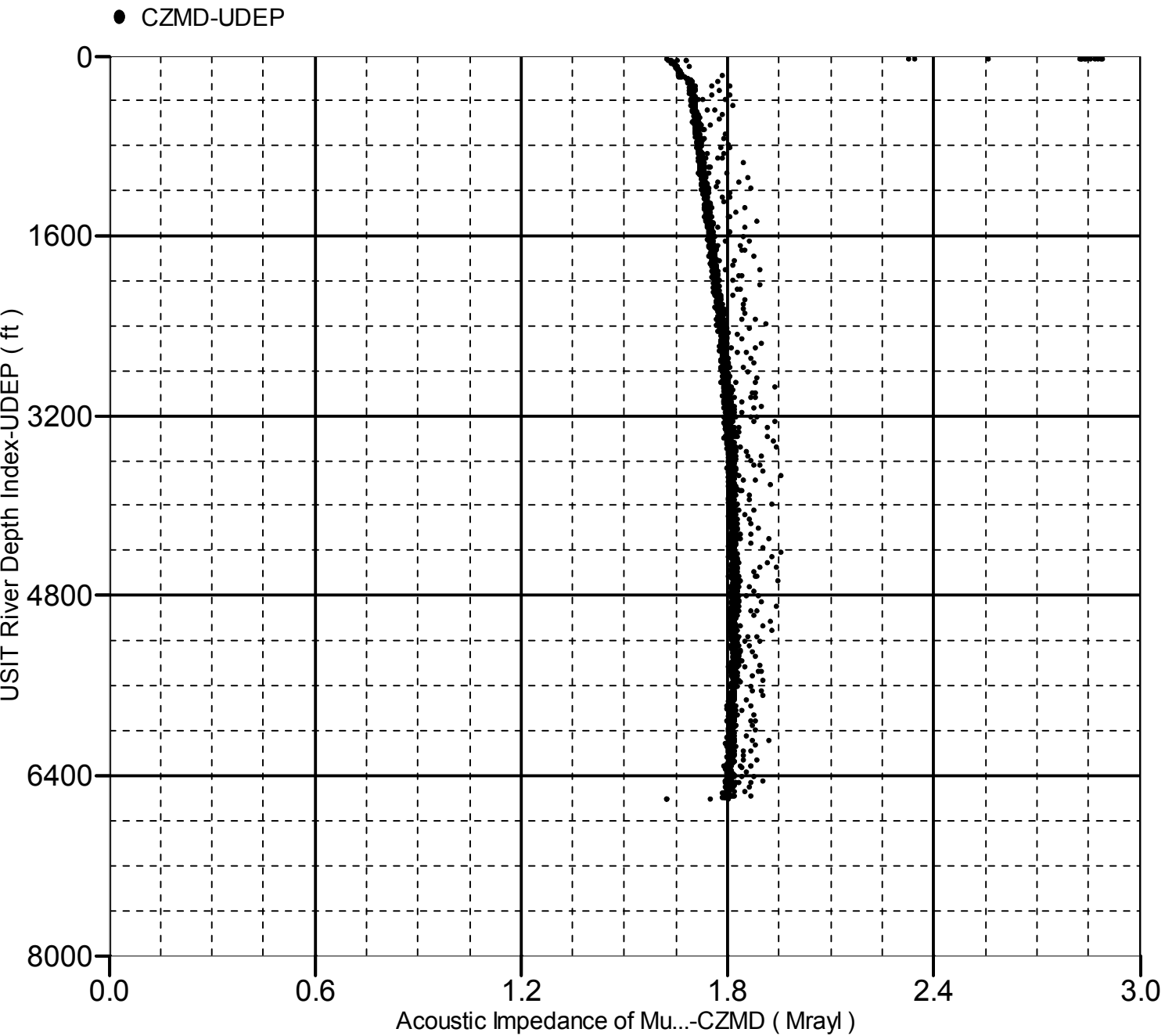
Time Zone Parameters					
Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
WINE	68.1	11-Oct-2018 09:33:51	11-Oct-2018 09:36:10	2503.56	2323.04
WINE	71.39	11-Oct-2018 09:36:10	11-Oct-2018 09:40:09	2323.04	1979.78
All depth are at tool zero.					
XYZ		Company:Noble Energy Inc. Well:Emmy State-H25-777 ONE: Log[4]:Up:S010			



Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6614.00 to 32.00 ft



Company:	Noble Energy Inc.	Schlumberger
Well:	Emmy State-H25-777	
Field:	Wattenberg	
County:	Weld	
State:	Colorado	

