

Company: Noble Energy INC

Well: Wells Ranch State AA36-622

Field: Wattenberg

County: Weld State: Colorado

UltraSonic Summary Print

County:	Weld
Field:	Wattenberg
Location:	SHL: 2009' FSL X 817' FWL
Well:	Wells Ranch State AA36-622
Company:	Noble Energy INC
Location:	
Permanent Datum:	SHL: 2009' FSL X 817' FWL
Log Measured From:	Ground Level
Drilling Measured From:	Kelly Bushing
API Serial No.	Section:
05-123-48188	32
	Township:
	6N
	Range:
	62W
Elev.:	K.B.
	G.L.
	D.F.
	4755.00 ft
	4725.00 ft
	4755.00 ft
	4725.00 f
	above Perm.Datum

Logging Date	06-Jun-2019
Run Number	One
Depth Driller	17000.00 ft
Schlumberger Depth	17000.00 ft
Bottom Log Interval	64 10.00 ft
Top Log Interval	100.00 ft
Casing Fluid Type	Water
Salinity	
Density	8.4 lbm/gal
Fluid Level	8.00 ft
BIT/CASING/TUBING STRING	
Bit Size	8.50 in
From	1935.00 ft
To	17000.00 ft
Casing/Tubing Size	5.5 in
Weight	17 lbm/ft
Grade	P110
From	0.00 ft
To	16978.00 ft
Max Recorded Temperatures	195 degF
Logger on Bottom	06-Jun-2019
Unit Number	9108
Recorded By	Avery Becker
Witnessed By	Bill Mansfield
	10:00:00
	Fort Morgan

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.

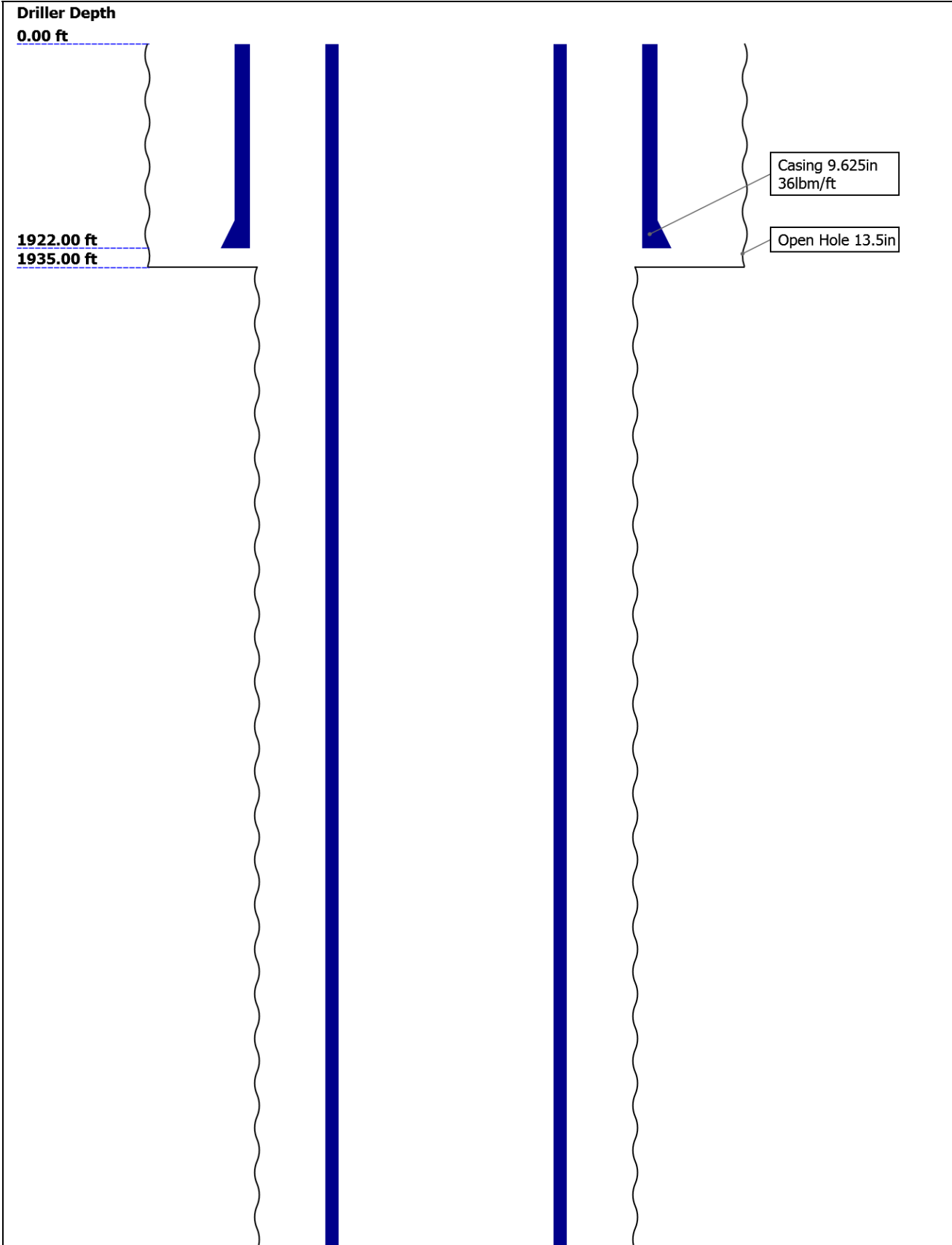
Contents

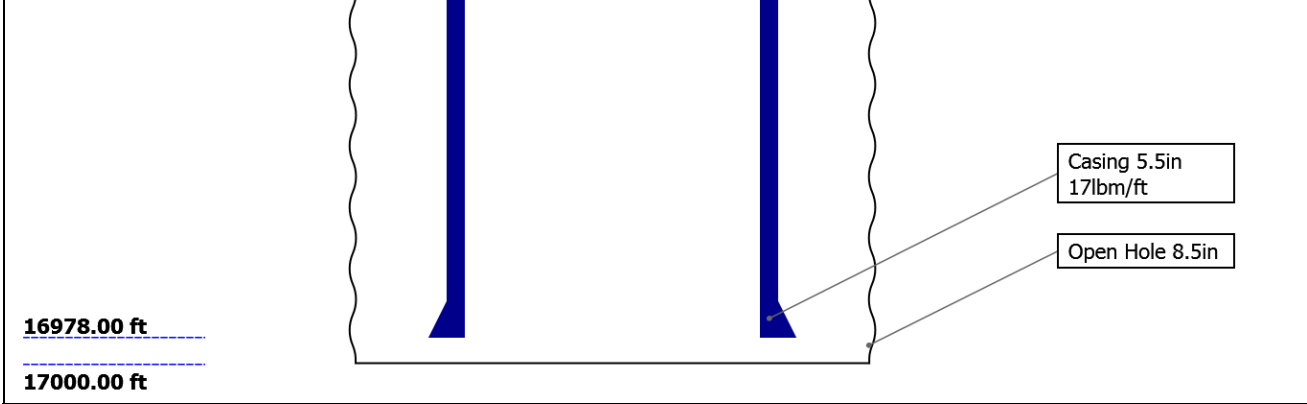
- Header
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Well Sketch





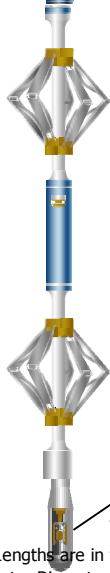
Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	13.5	8.5				
Top Driller (ft)	0	1935				
Top Logger (ft)	0	1935				
Bottom Driller (ft)	1935	17000				
Bottom Logger (ft)	1935	17000				
Casing						
Size (in)	9.625	5.5				
Weight (lbm/ft)	36	17				
Inner Diameter (in)	8.921	4.892				
Grade	J55	P110				
Top Driller (ft)	0	0				
Top Logger (ft)	0	0				
Bottom Driller (ft)	1922	16978				
Bottom Logger (ft)	1922	16978				

Remarks and Equipment Summary

One: Toolstring				One: Remarks	
<div><div><div>Equip nameLengthMP nameOffset</div><div>LEH-QT29.54LEH-QT</div><div>EDTC-B26.06EDTH-BEDTG-AEDTC-B</div><div>AH-107[2]19.56</div><div>AH-107[1]17.56</div><div>USIT-E15.56ECH-MFAUSAC-AUSIS-AUSSC-BUSRS-A:72</div></div><div><div>CTEM22.56ACCZ0.00HV0.00Gamma Ray20.69TelStatu s19.56</div></div></div>	Toolstring run as per tool sketch				
	USIT Resolution: 10 deg, 6 inch				
	Main pass: 2500 PSI surface induced				
	Repeat Pass: 0 PSI surface induced				

USI-SENS
OR
USI-TX



Lengths are in ft
Maximum Outer Diameter = 6.250 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

	One		
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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

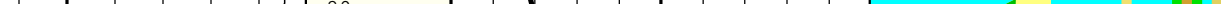
Type	7-46NT-XS		
Serial Number			
Length	24000.00 ft		
Conveyance Type	Wireline		
Rig Type			

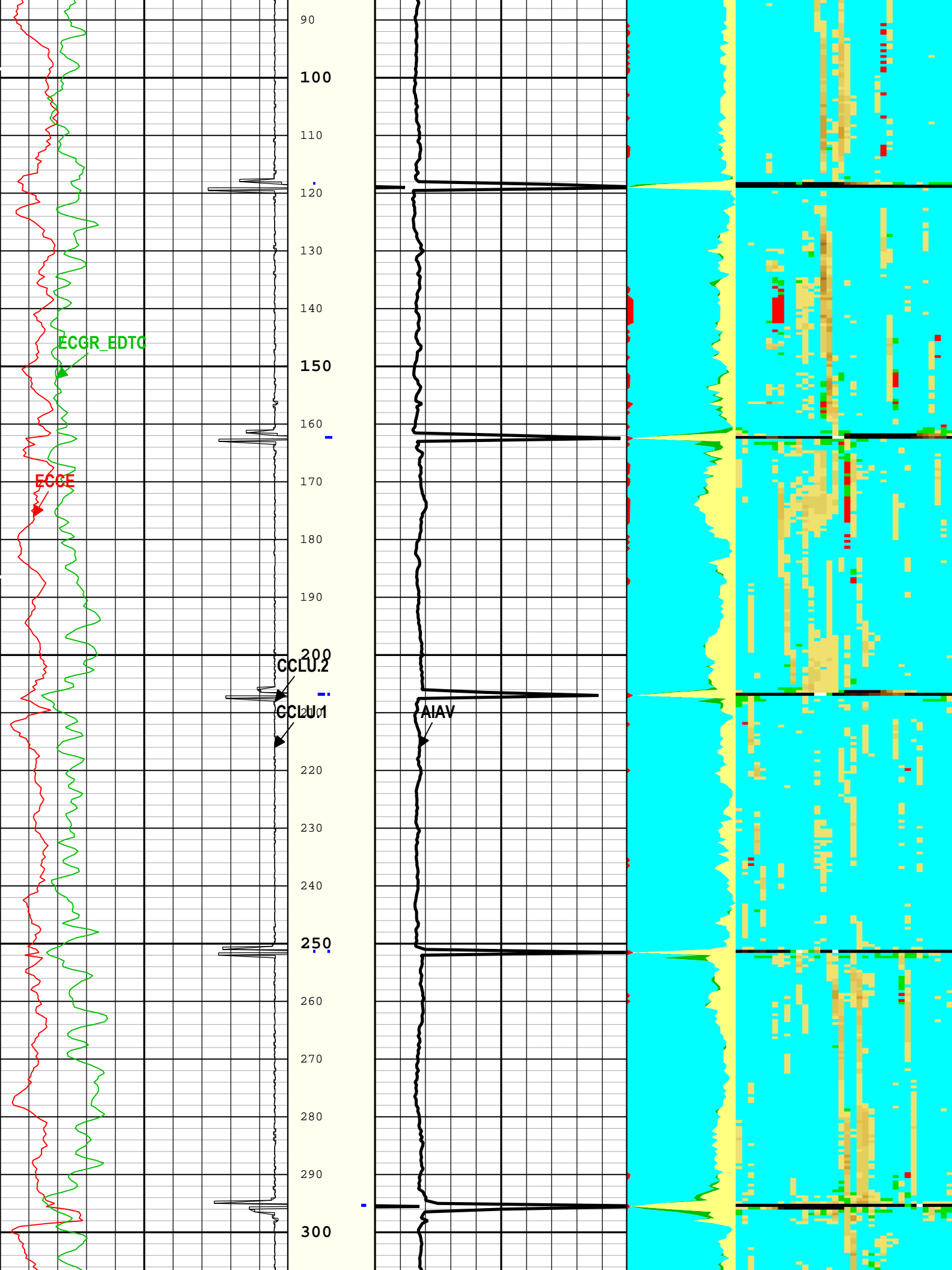
One:Depth Control Parameters

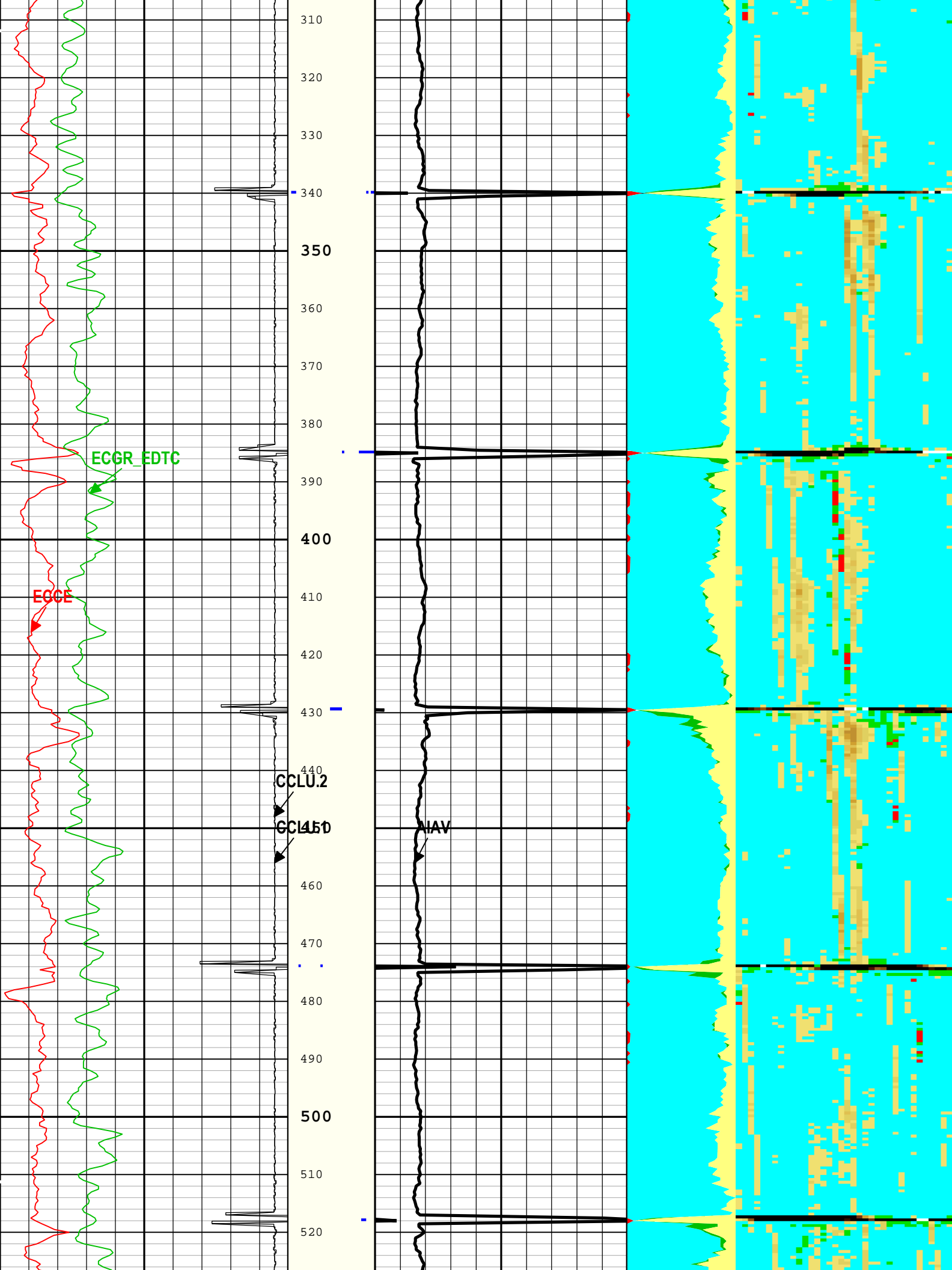
Log Sequence	First Log In the Well	Depth Control Remarks	
Rig Up Length At Surface		All Schlumberger Depth Control Procedures followed	
Rig Up Length At Bottom		IDW used as primary depth device, z-chart used as secondary	
Rig Up Length Correction		Uplog correlated to downlog	
Stretch Correction			
Tool Zero Check At Surface			

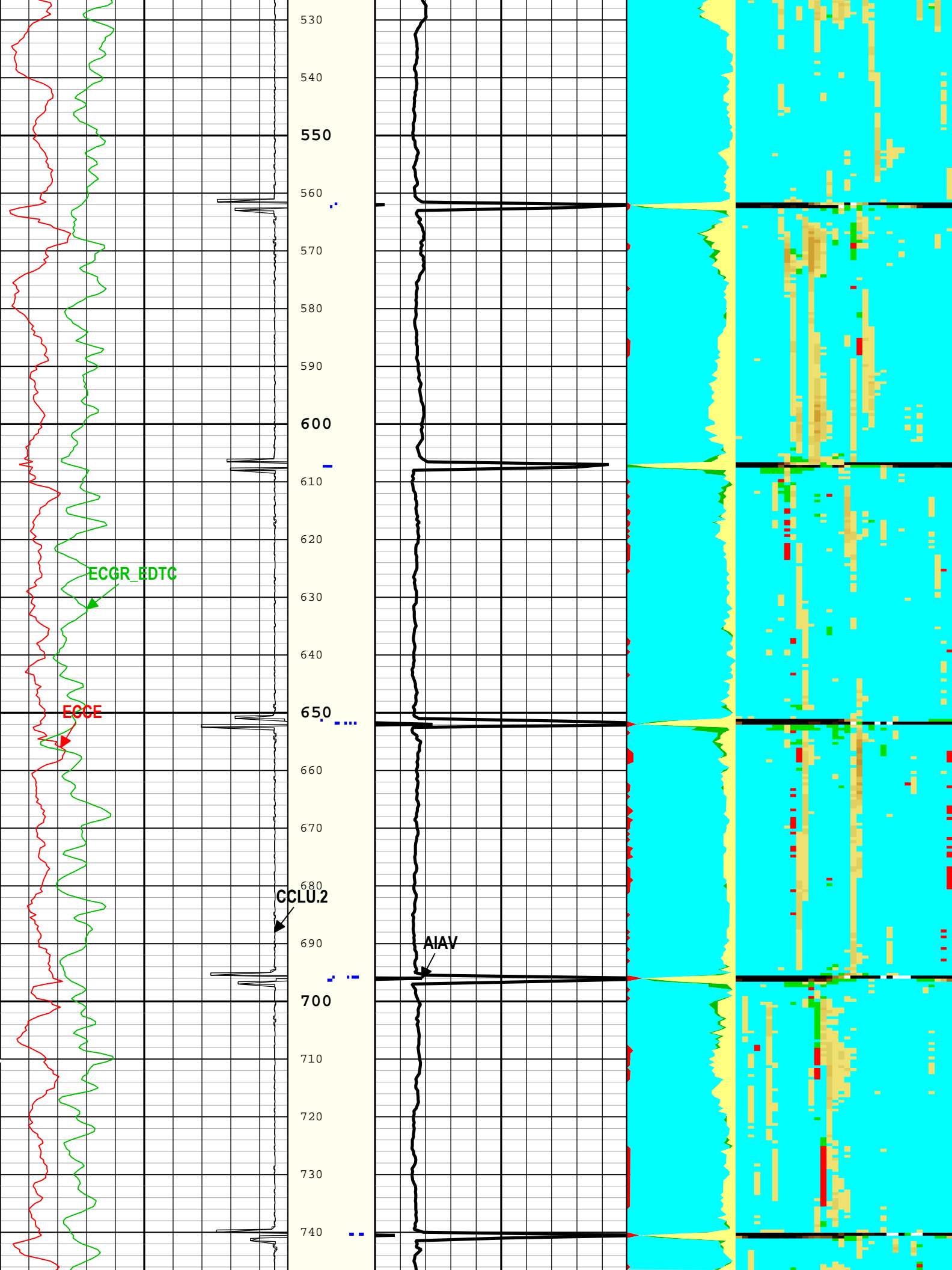
USIT - Fluid Properties Measurement

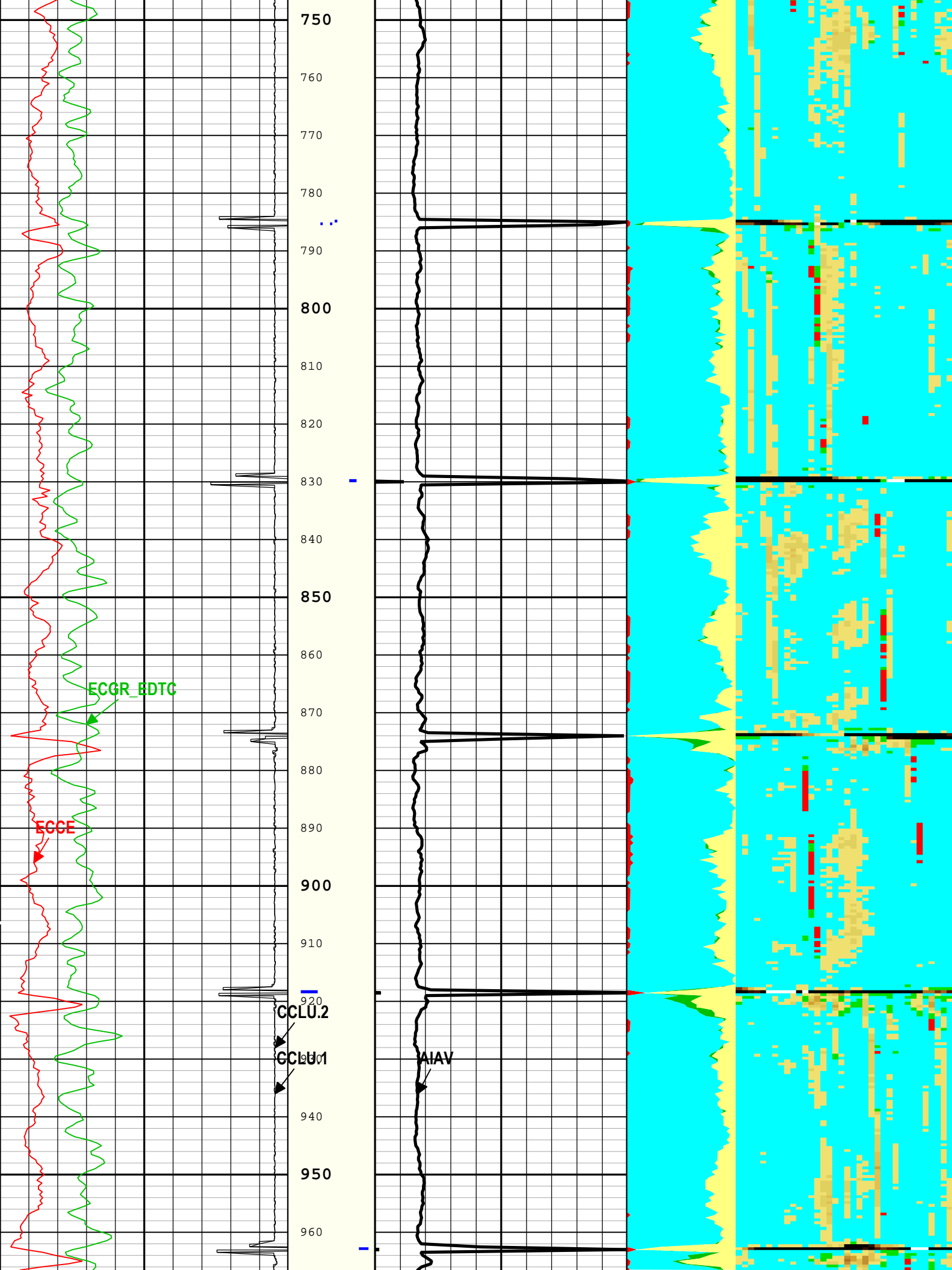
Core Name	Core Name	Core Depth - ft (m)	Core Depth - ft (m)
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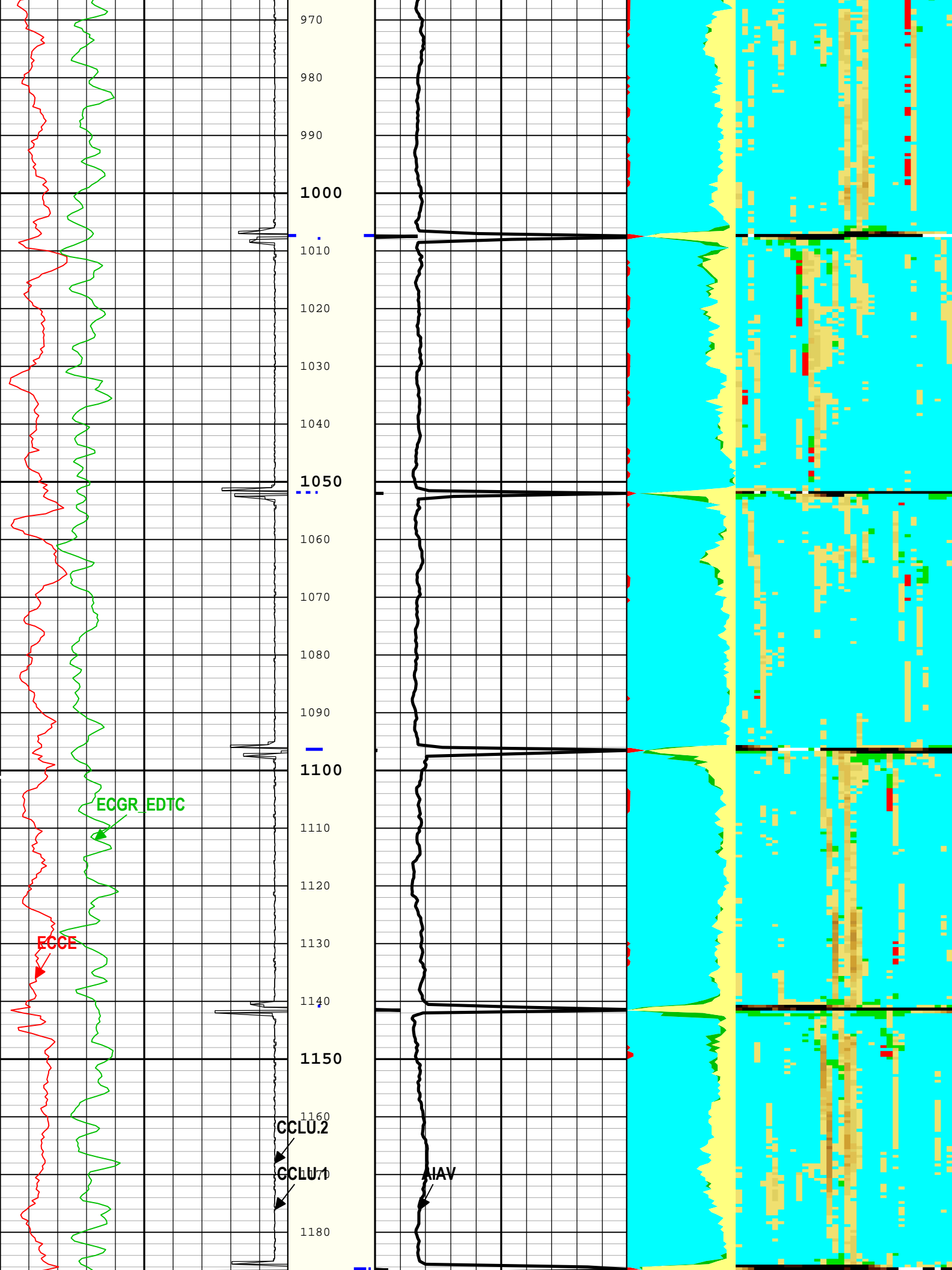


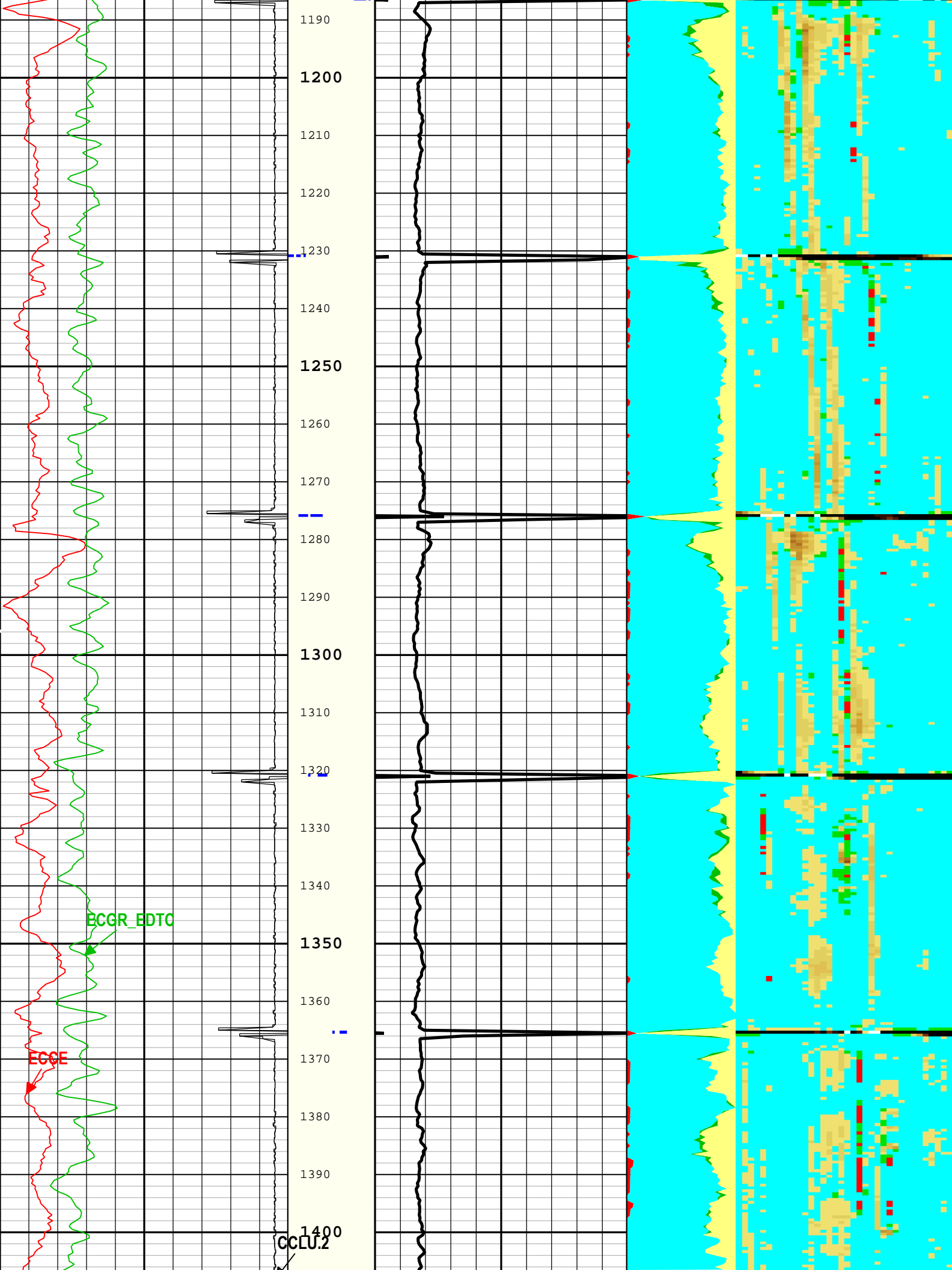


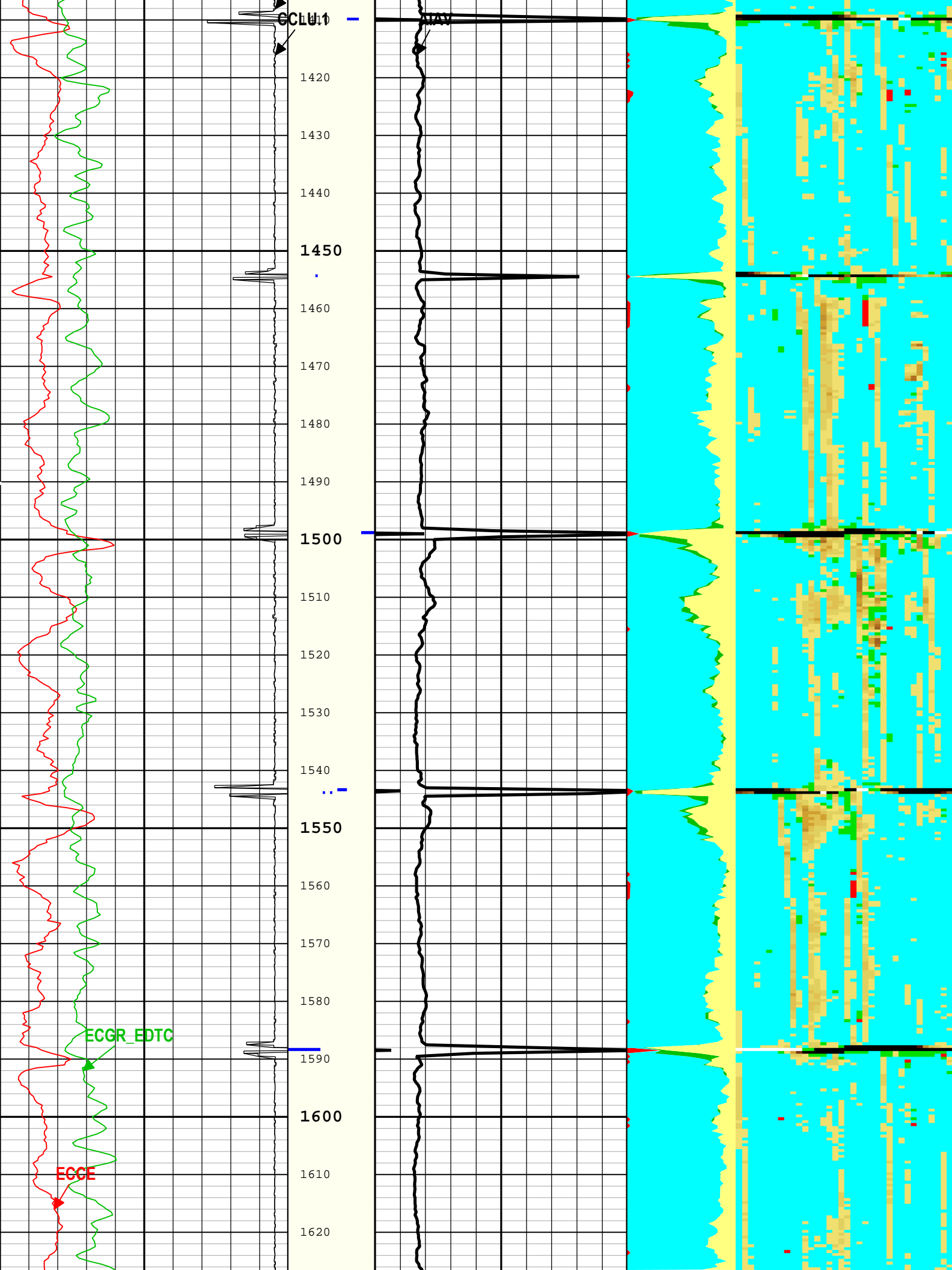


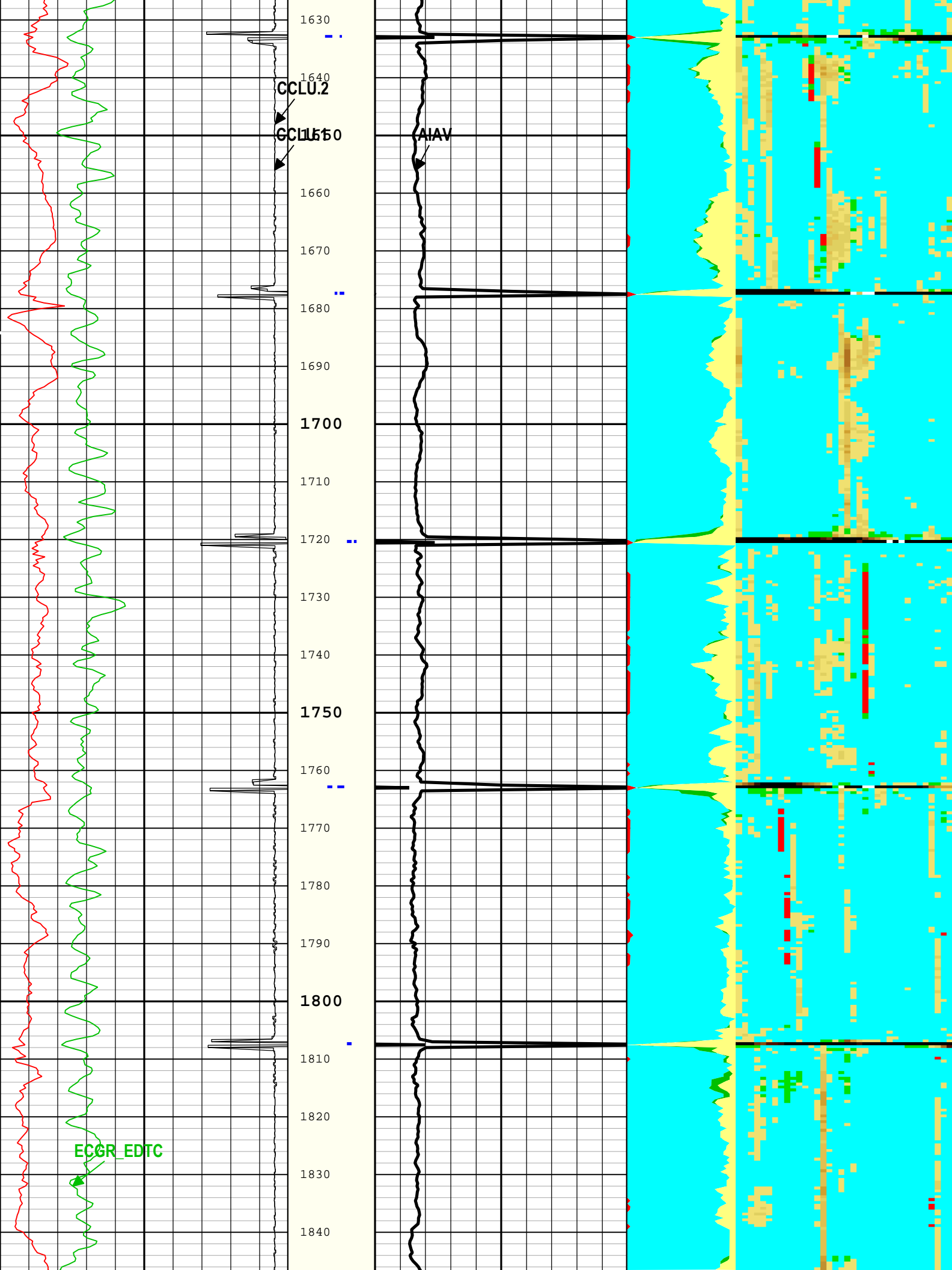


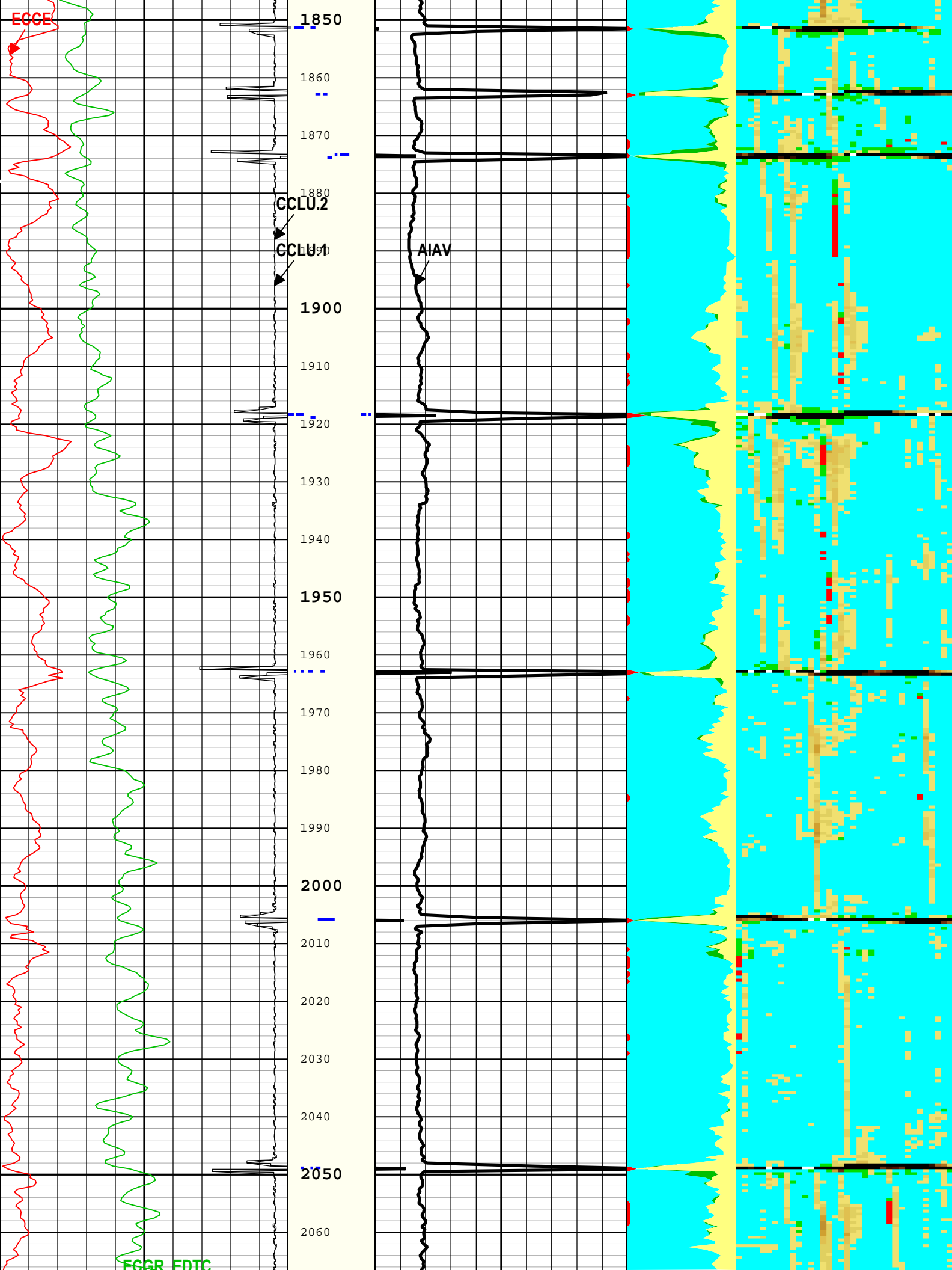


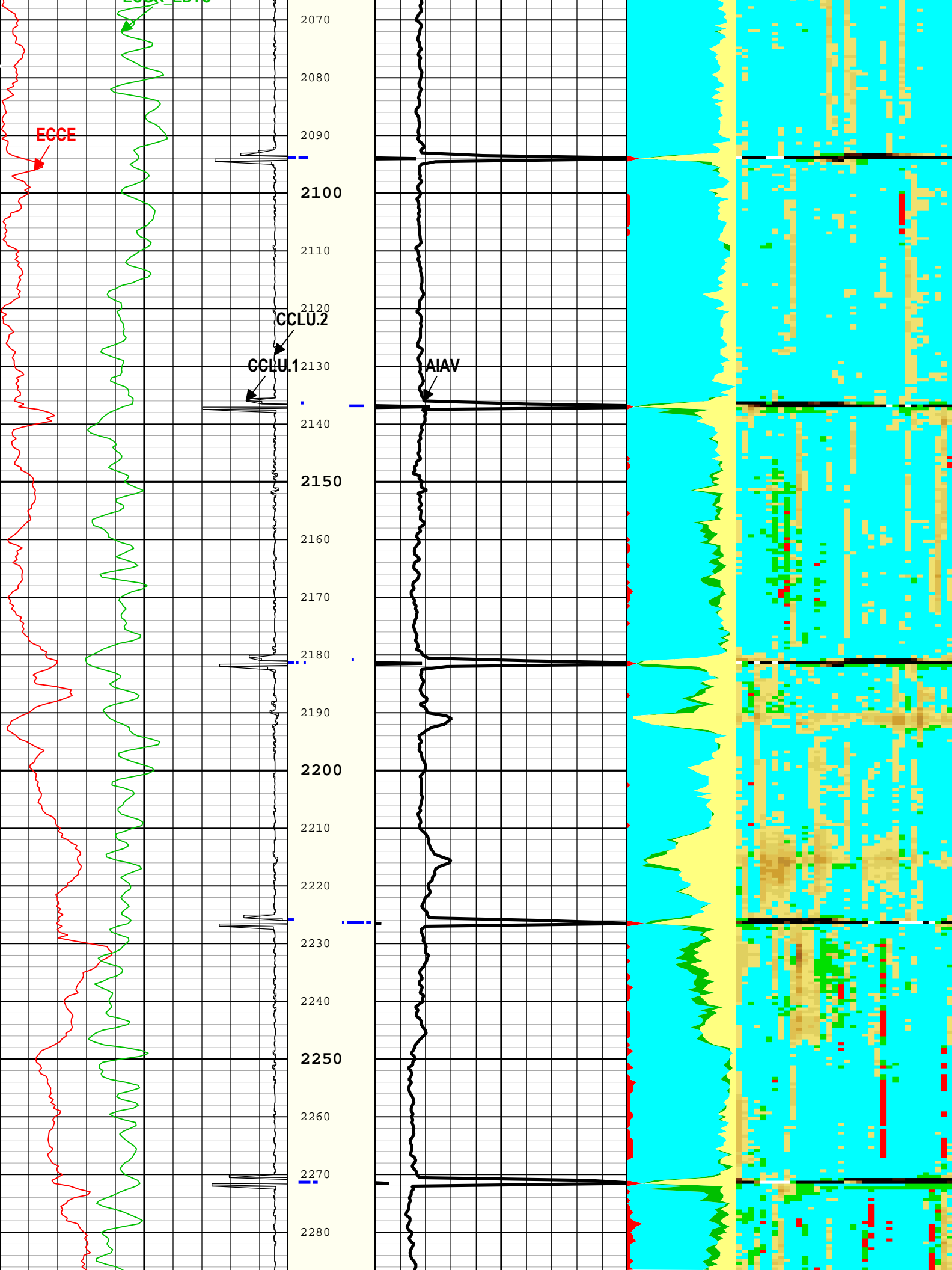


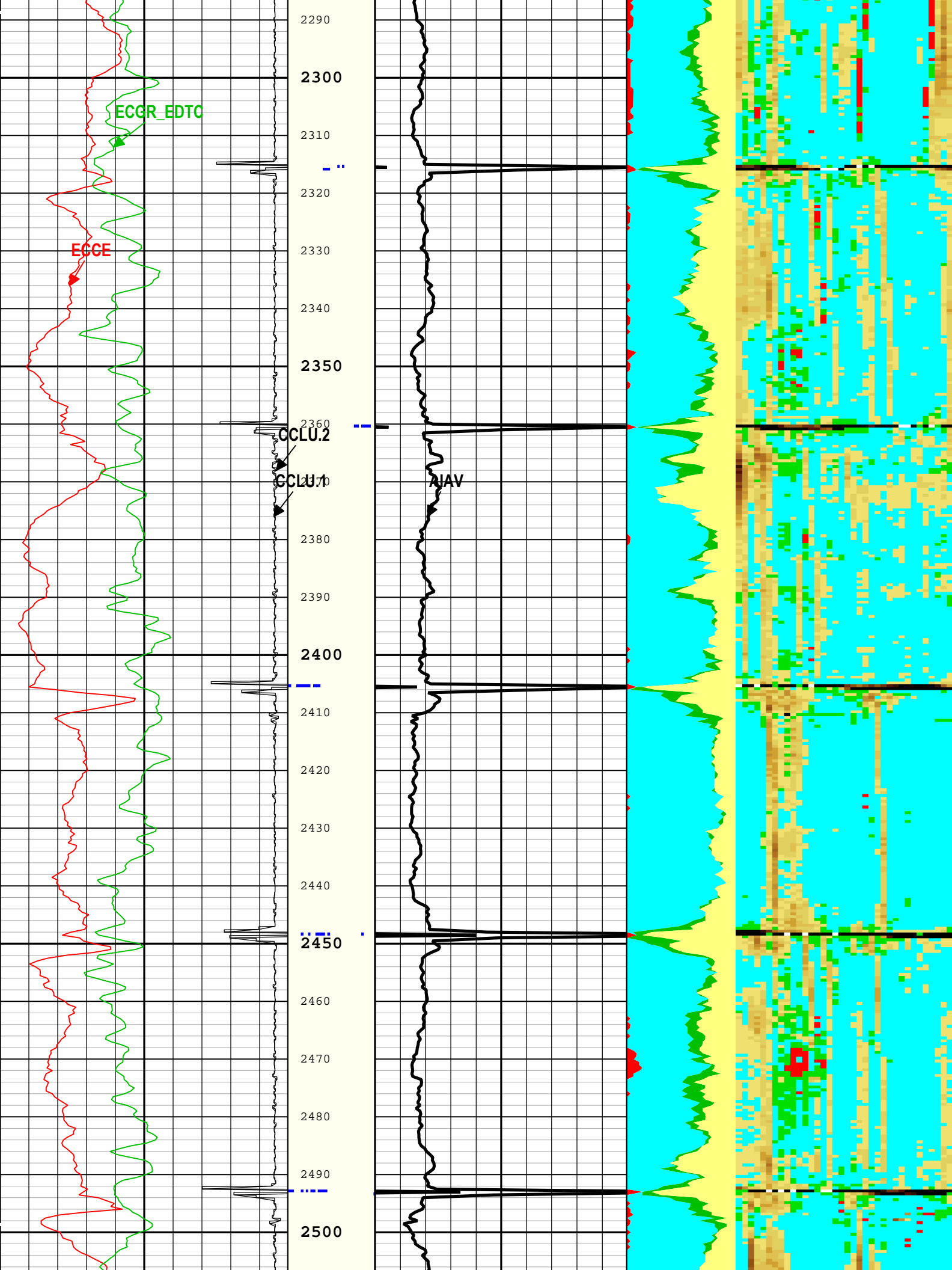


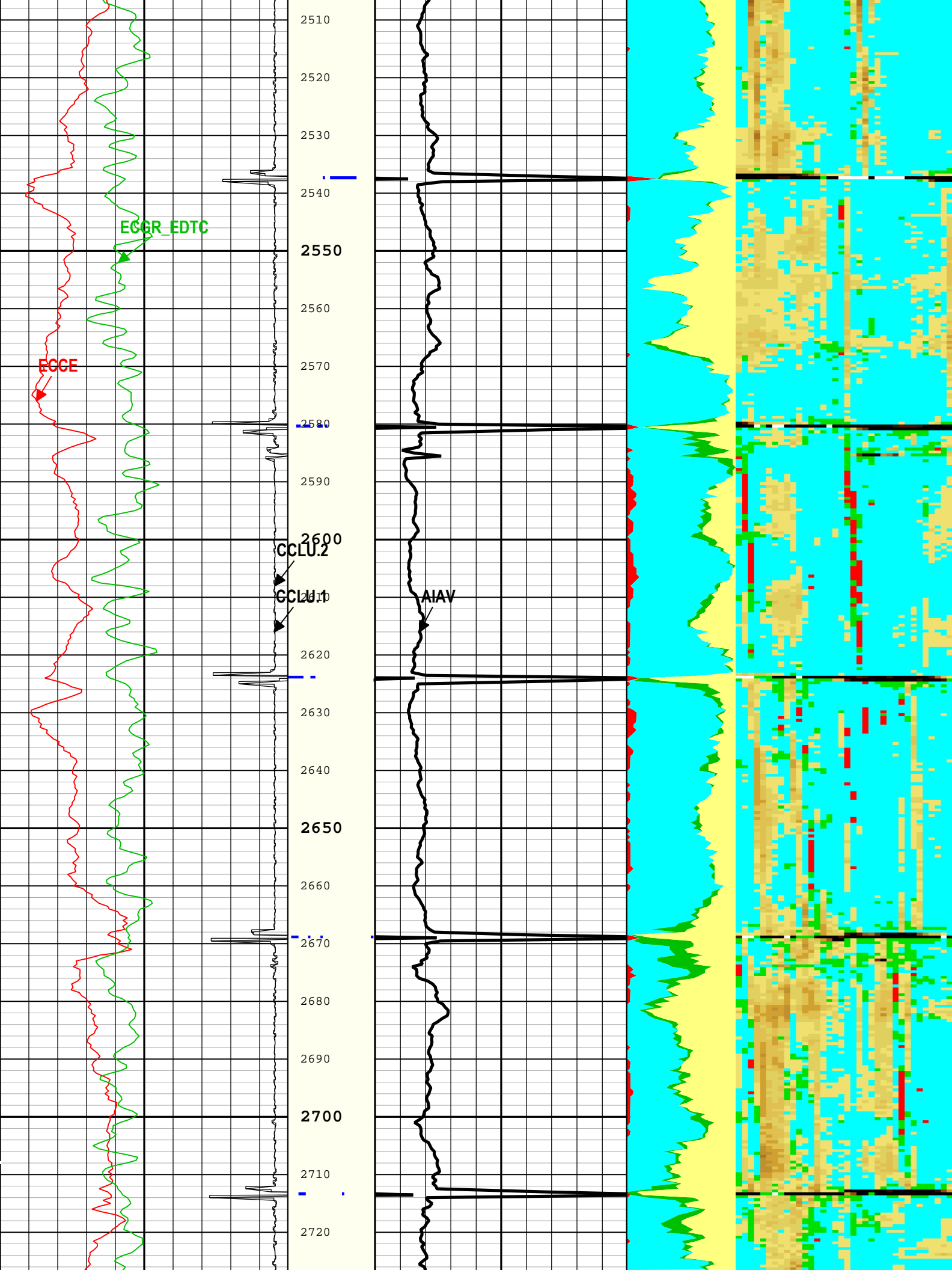


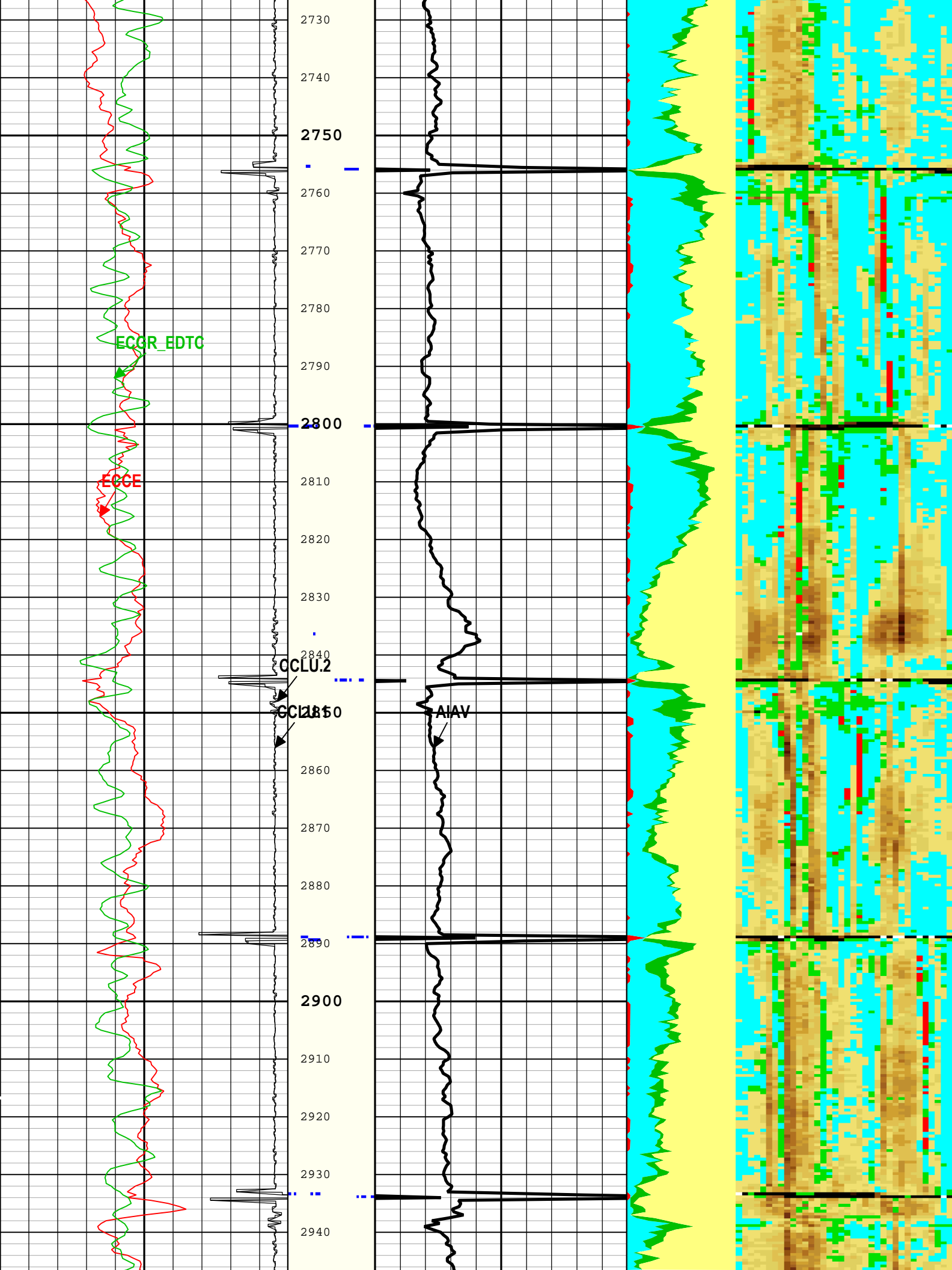


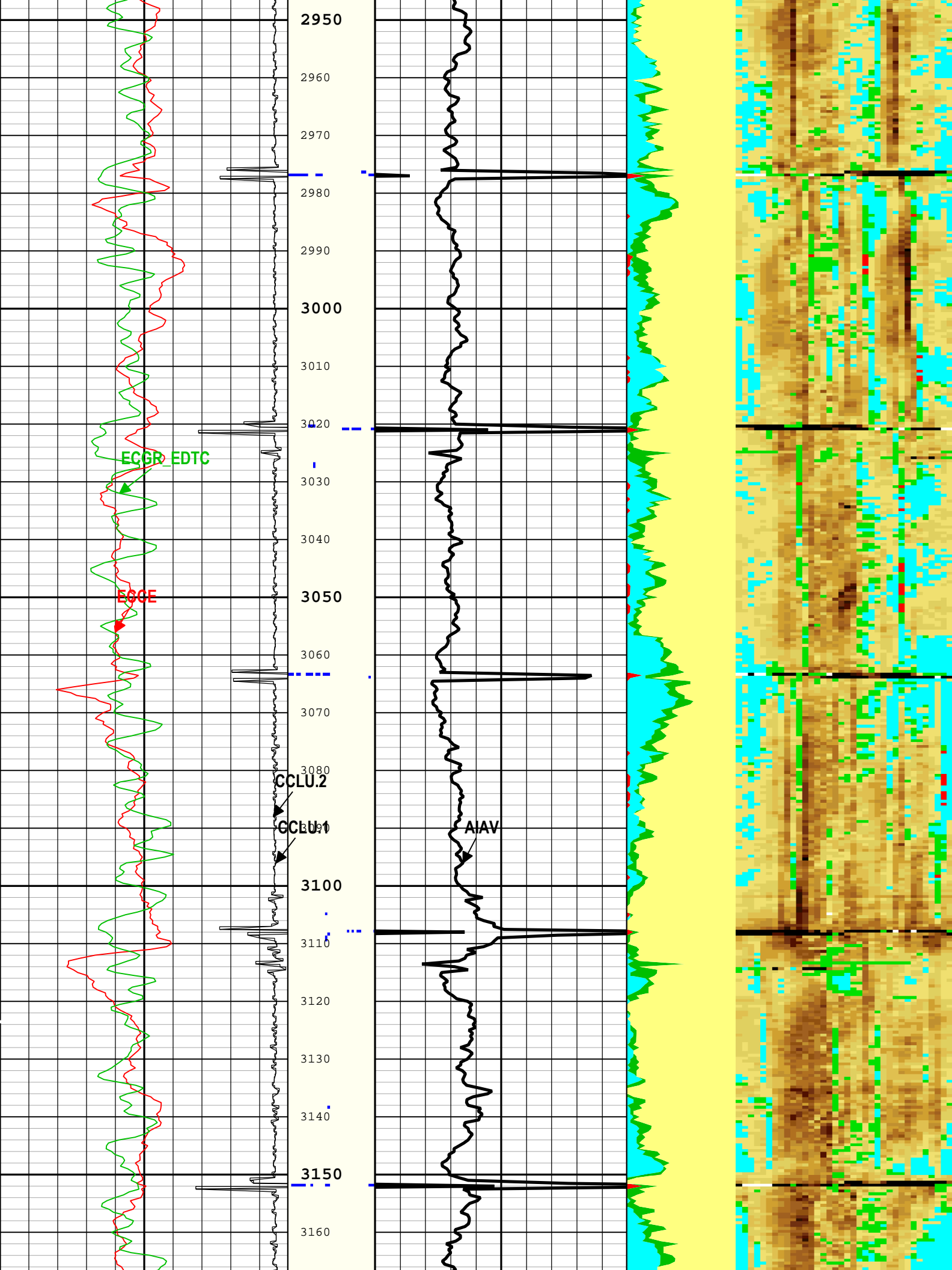


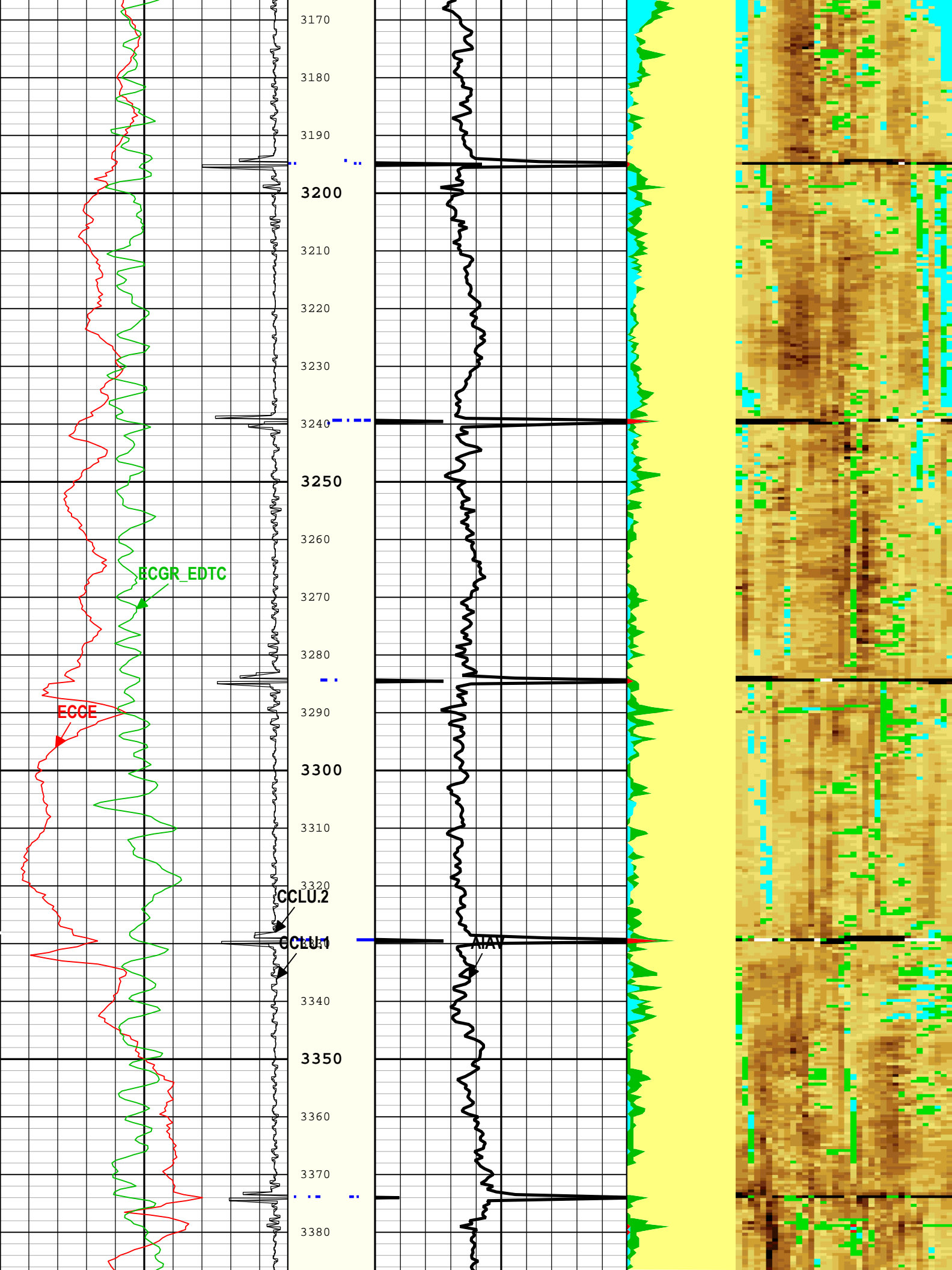


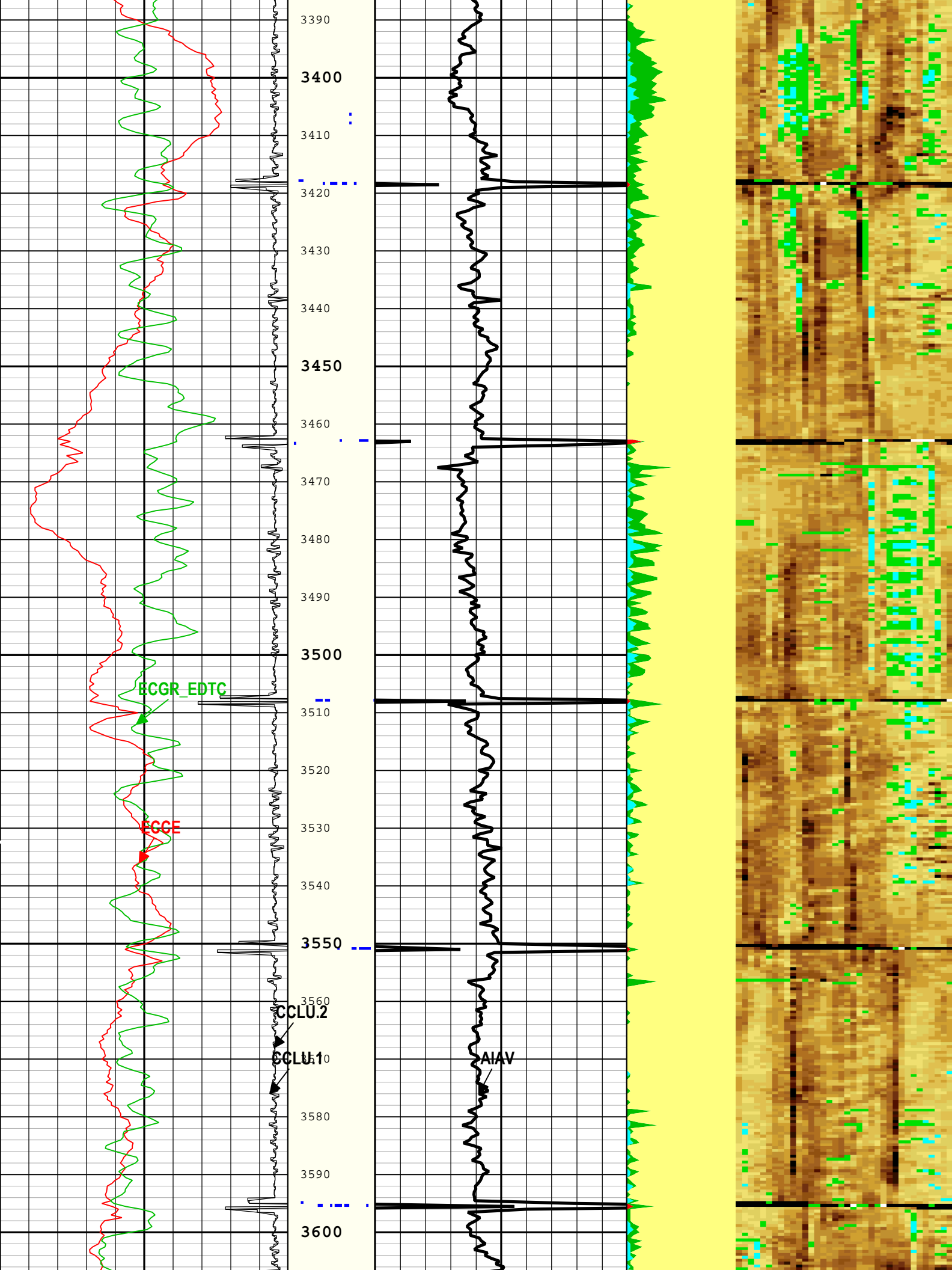


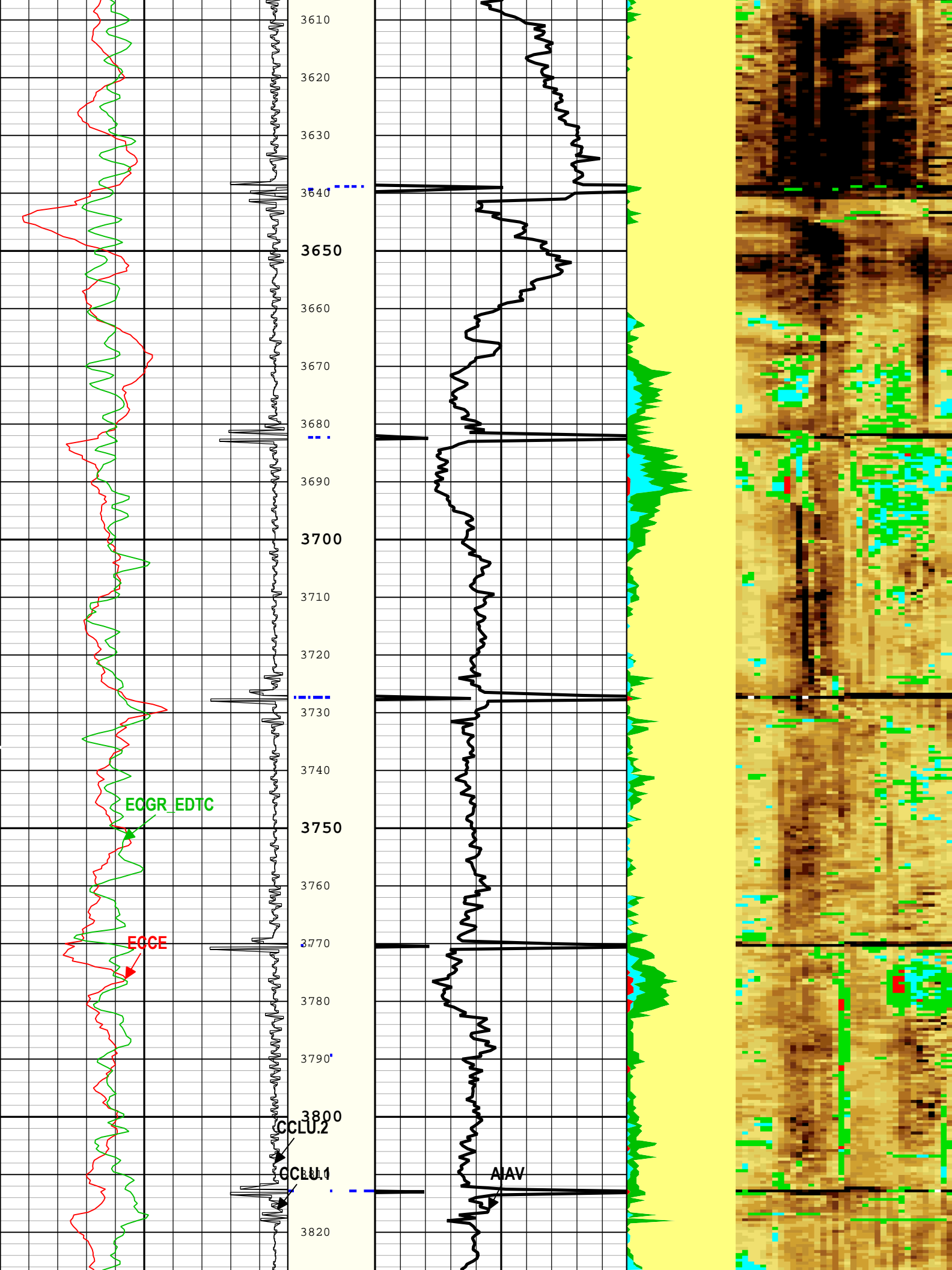


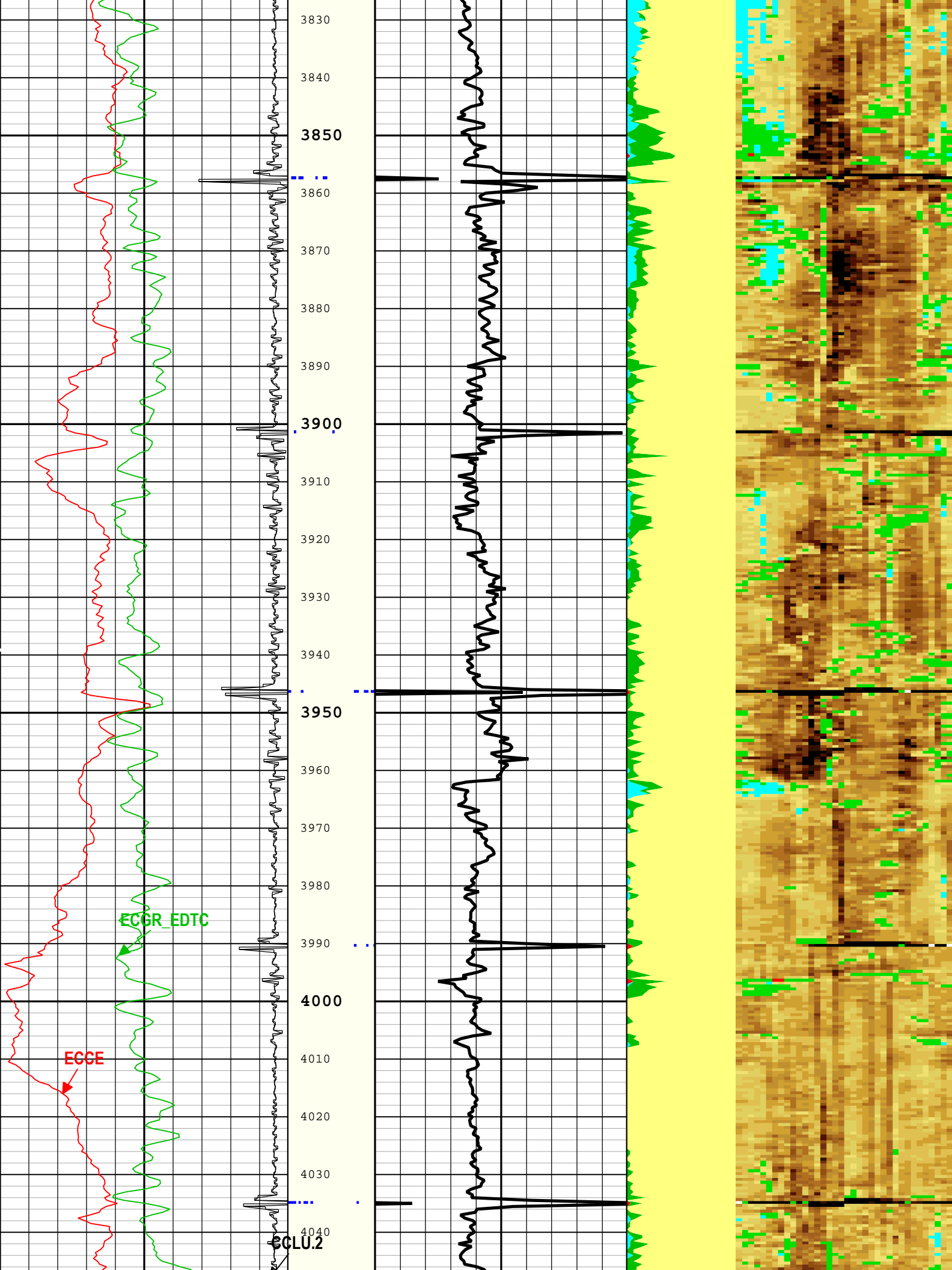


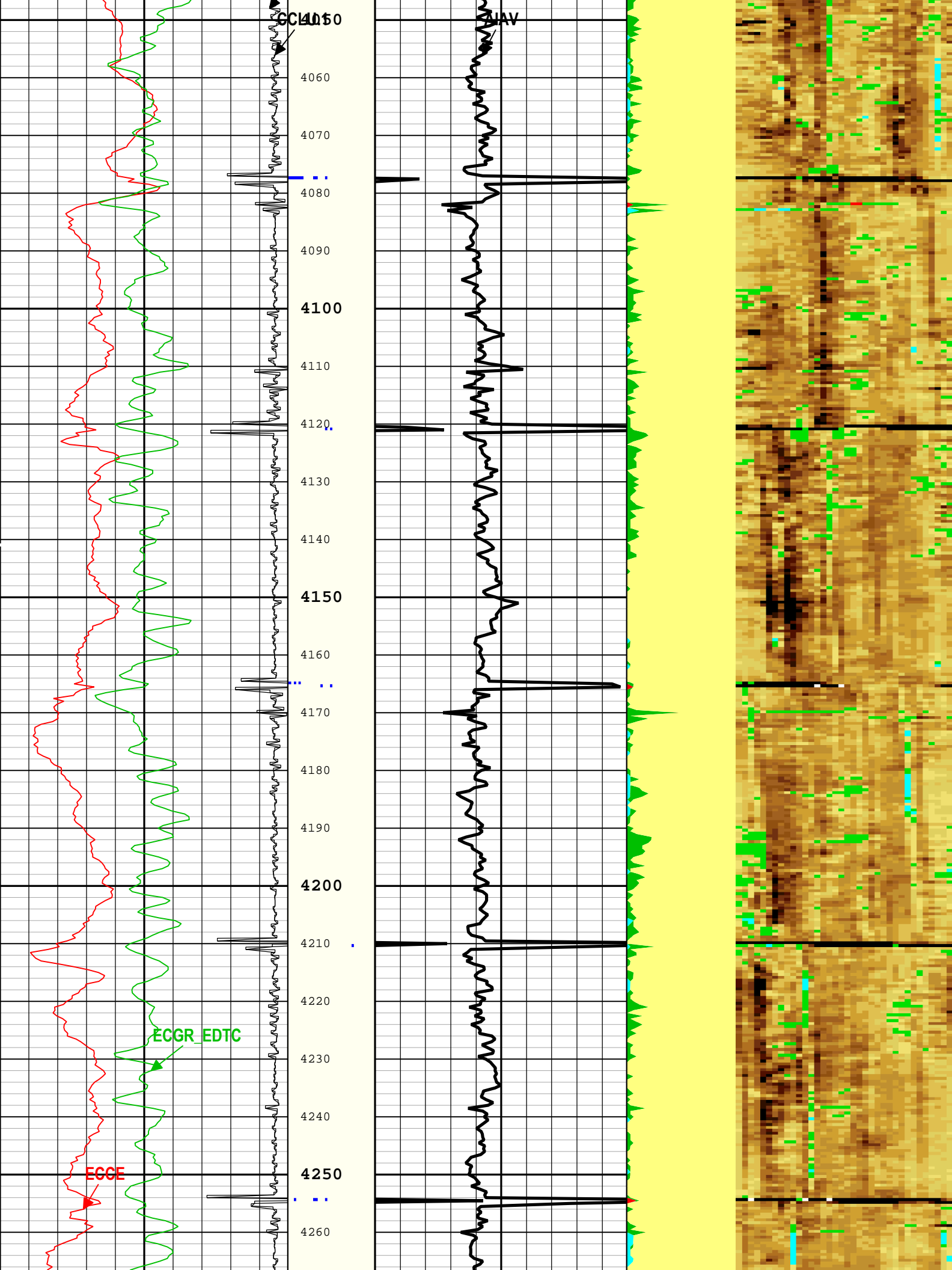


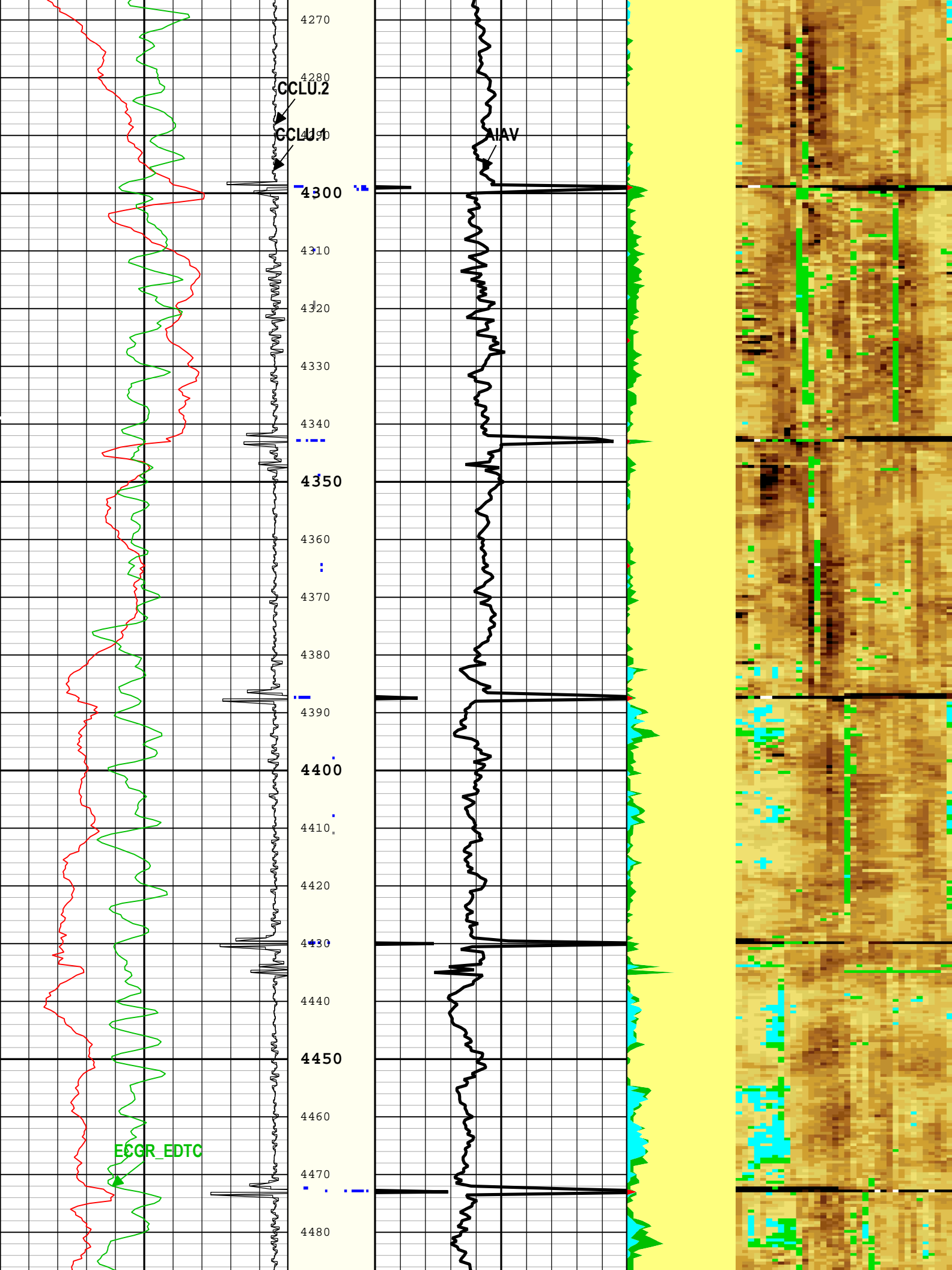


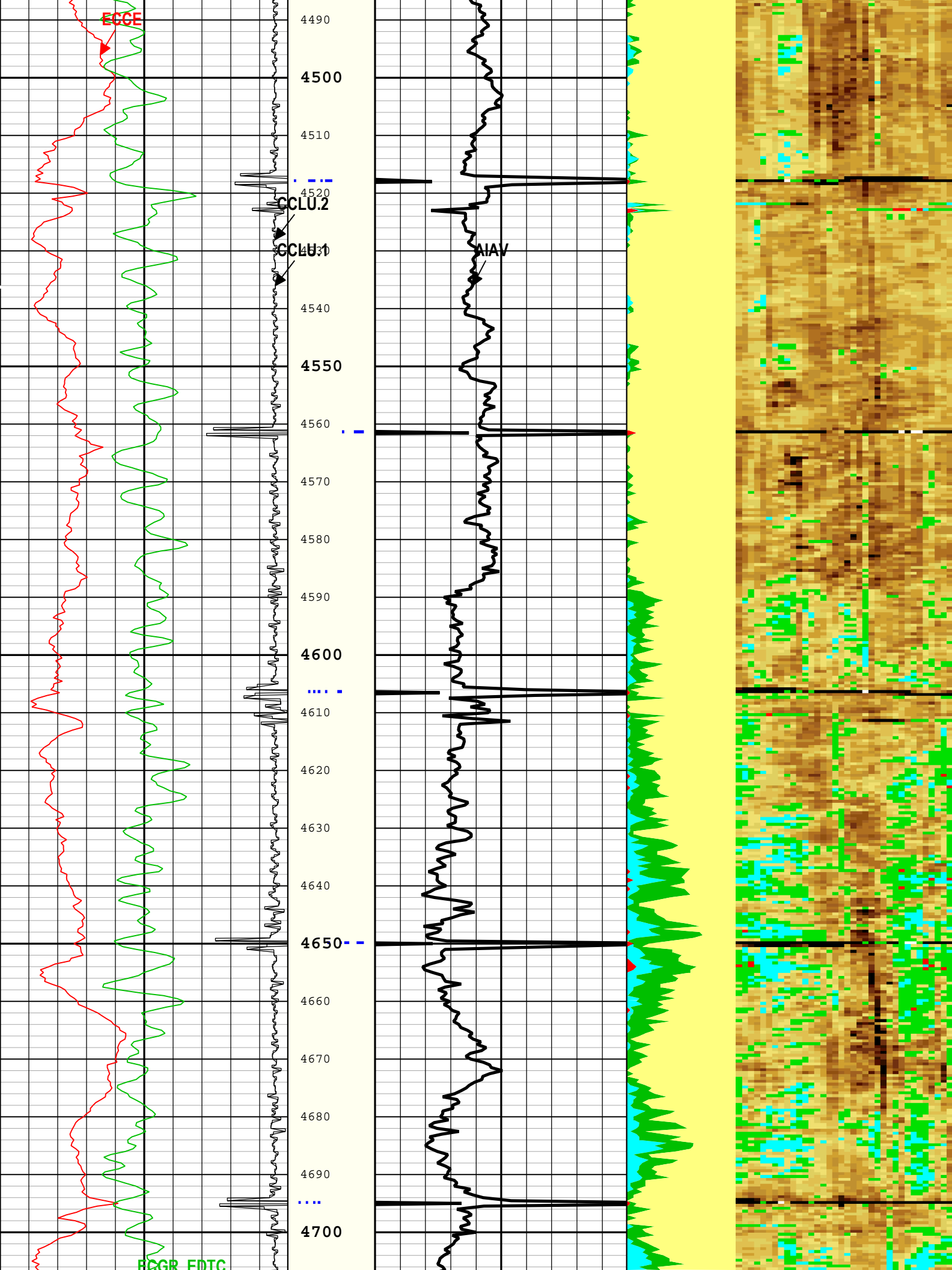


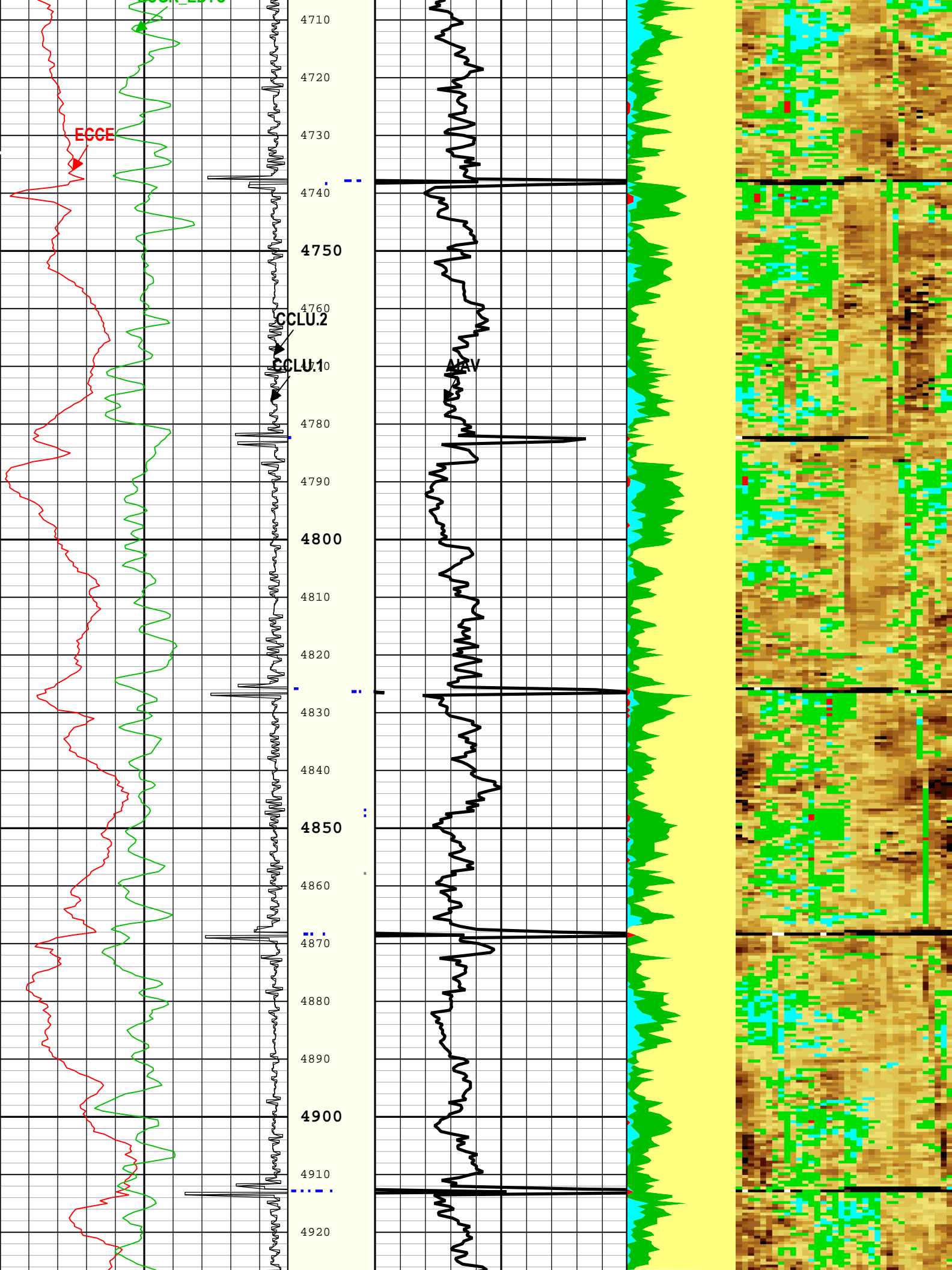


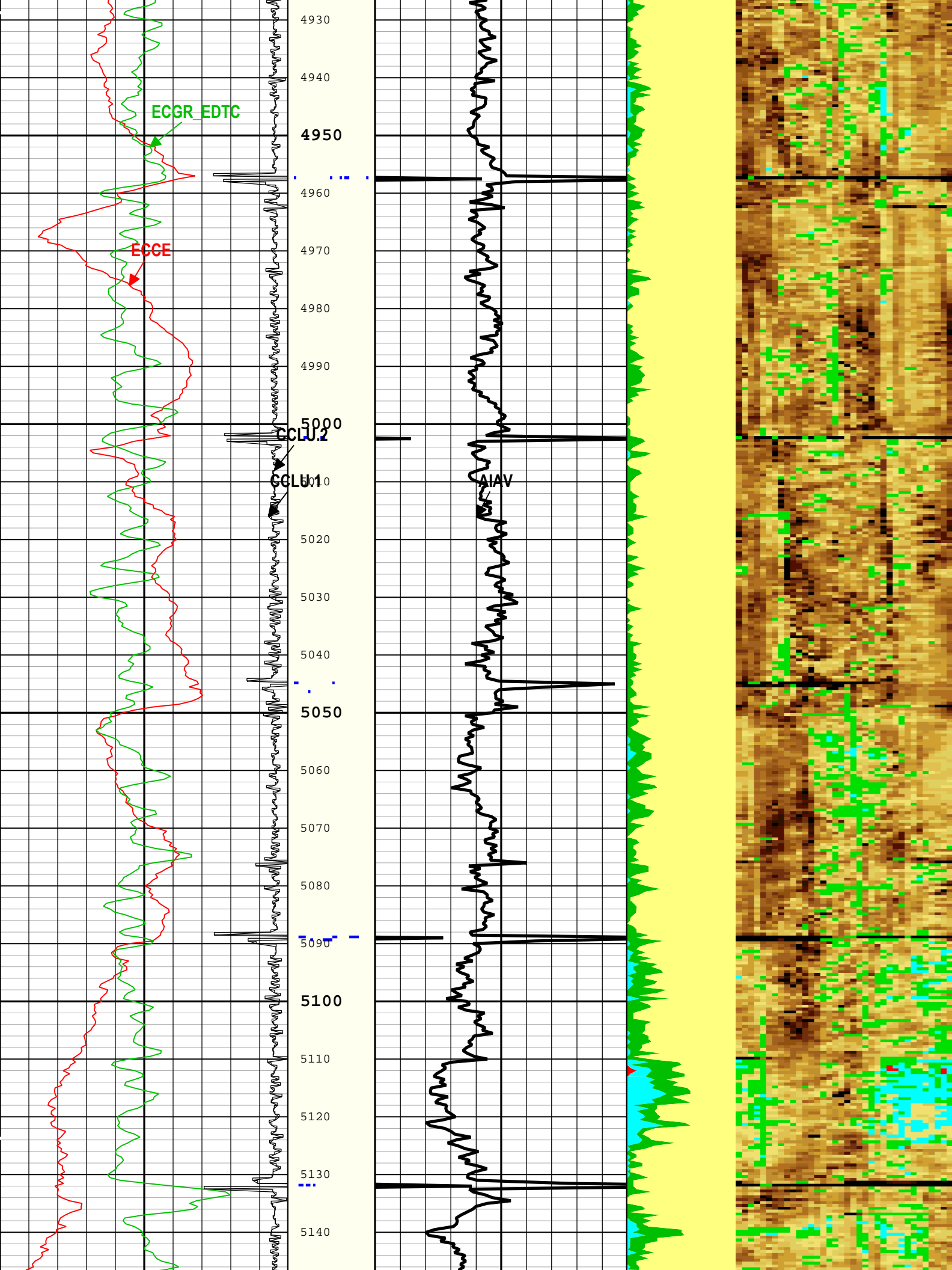


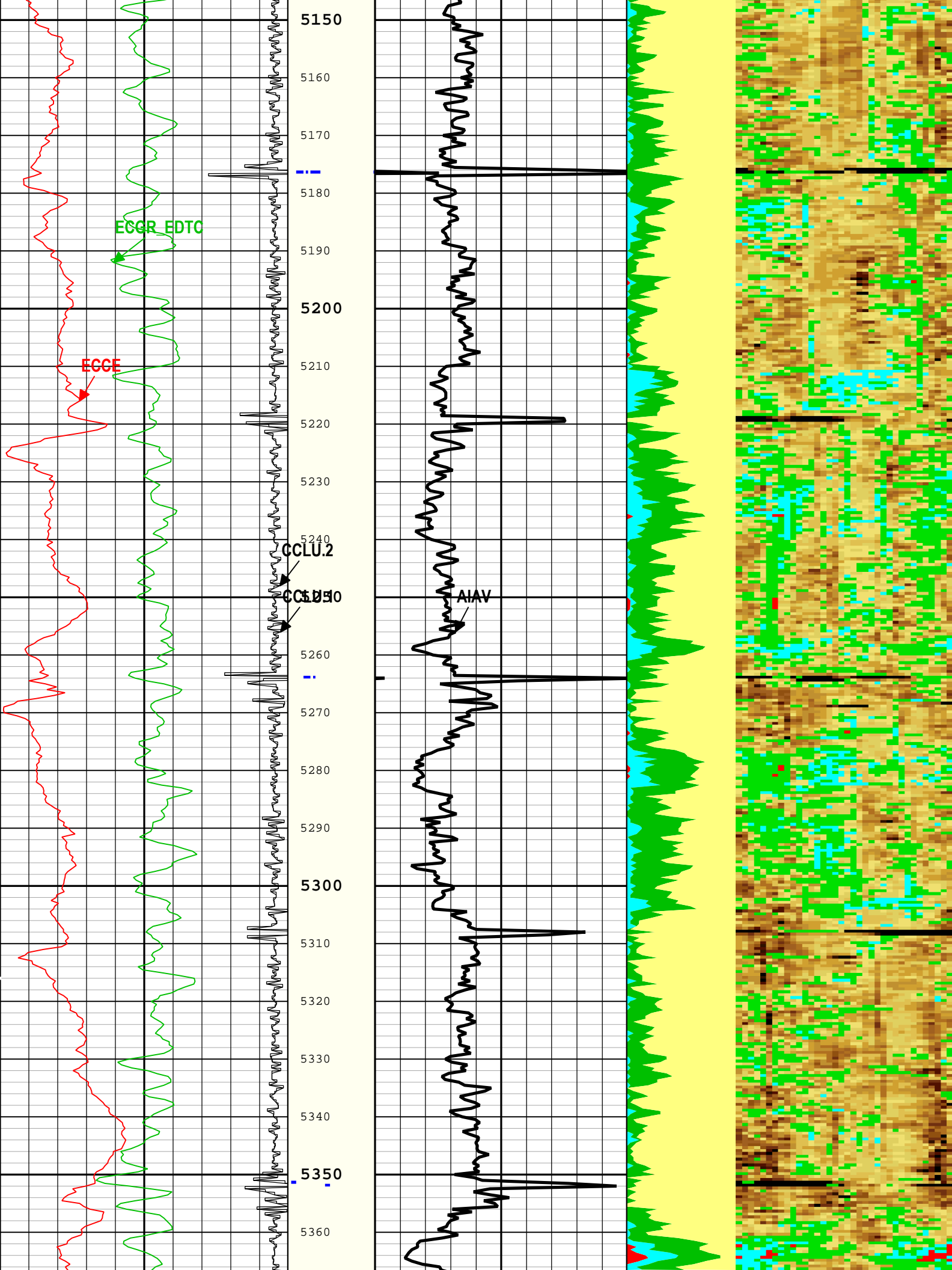


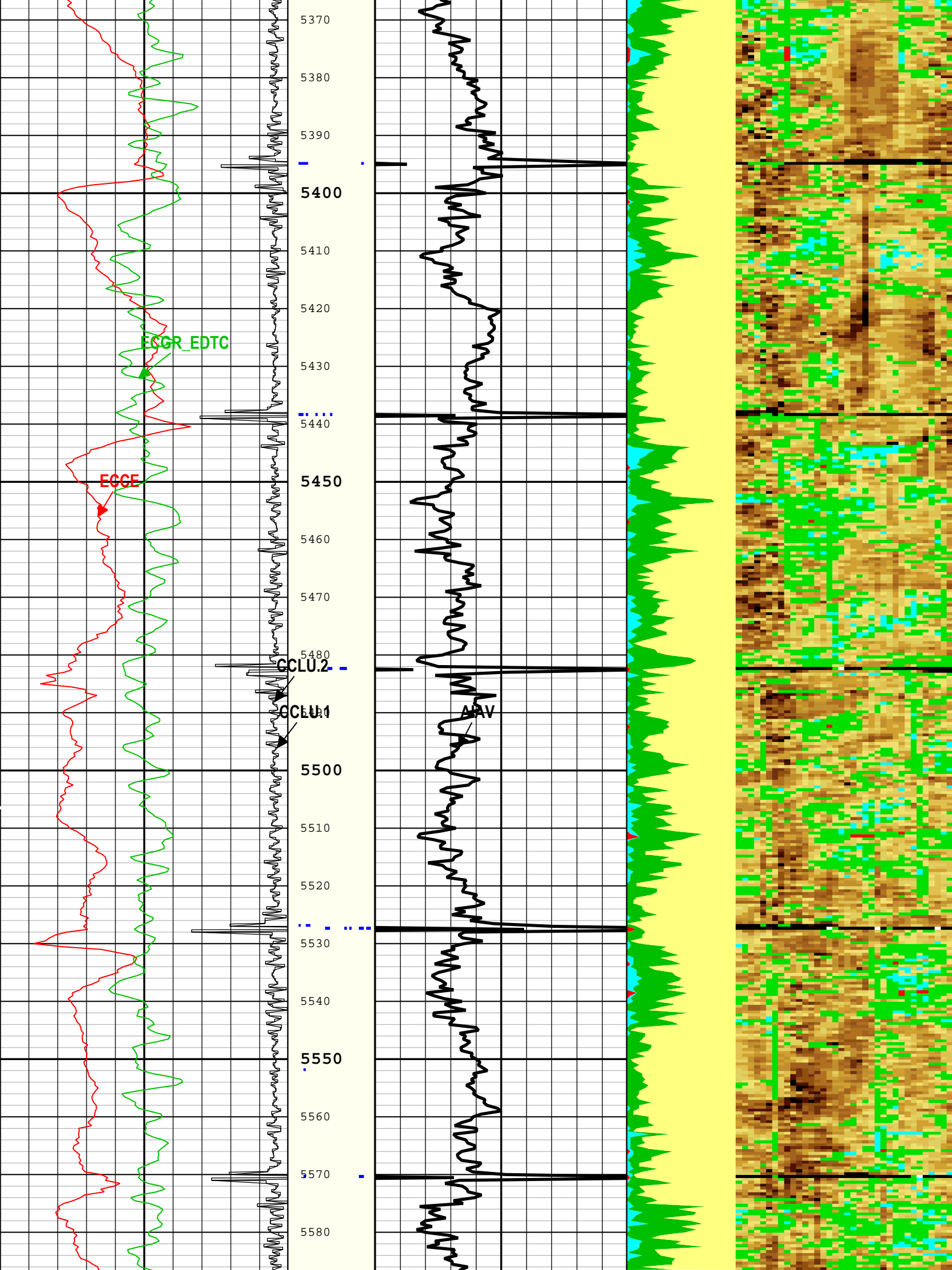


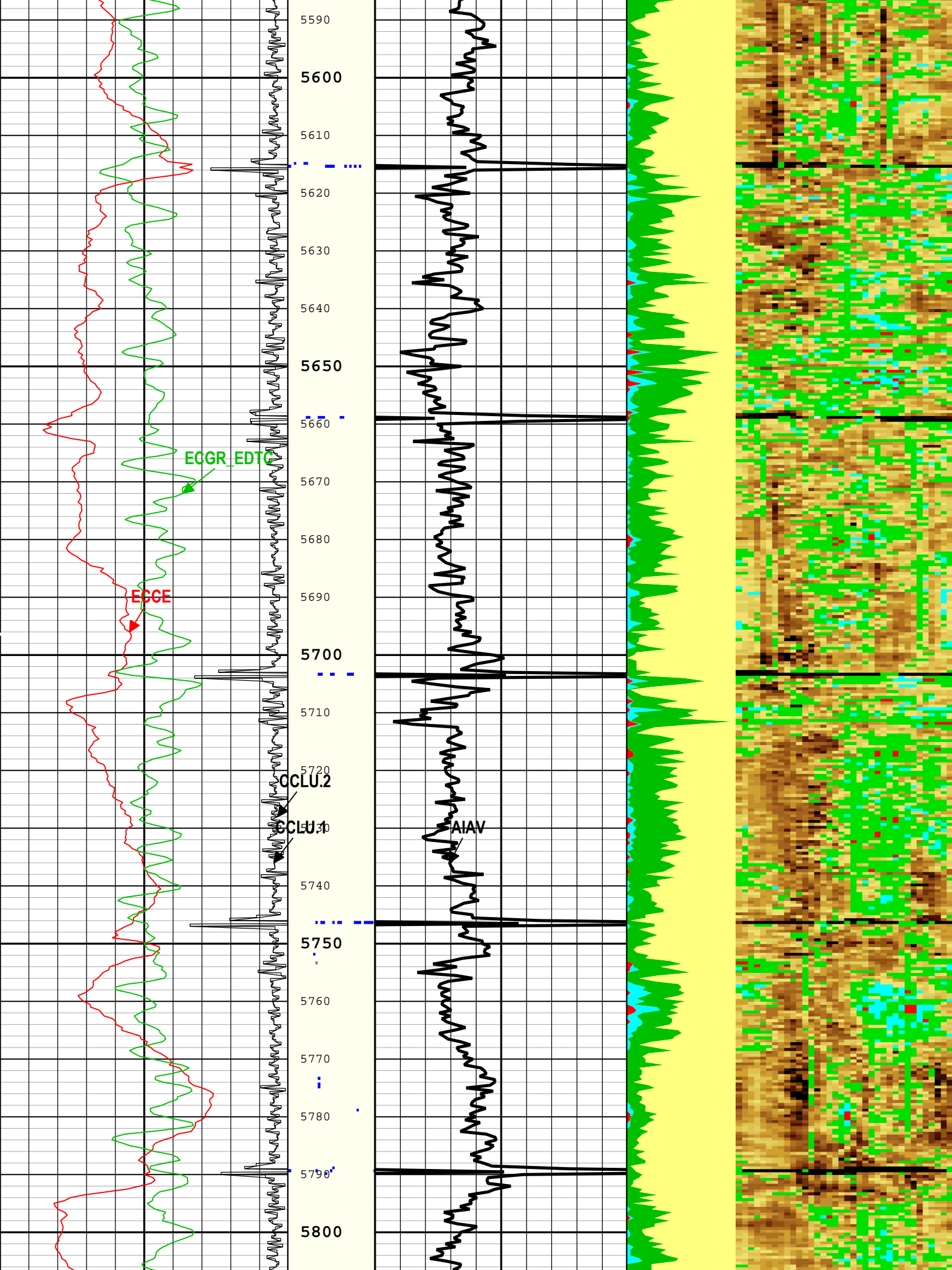


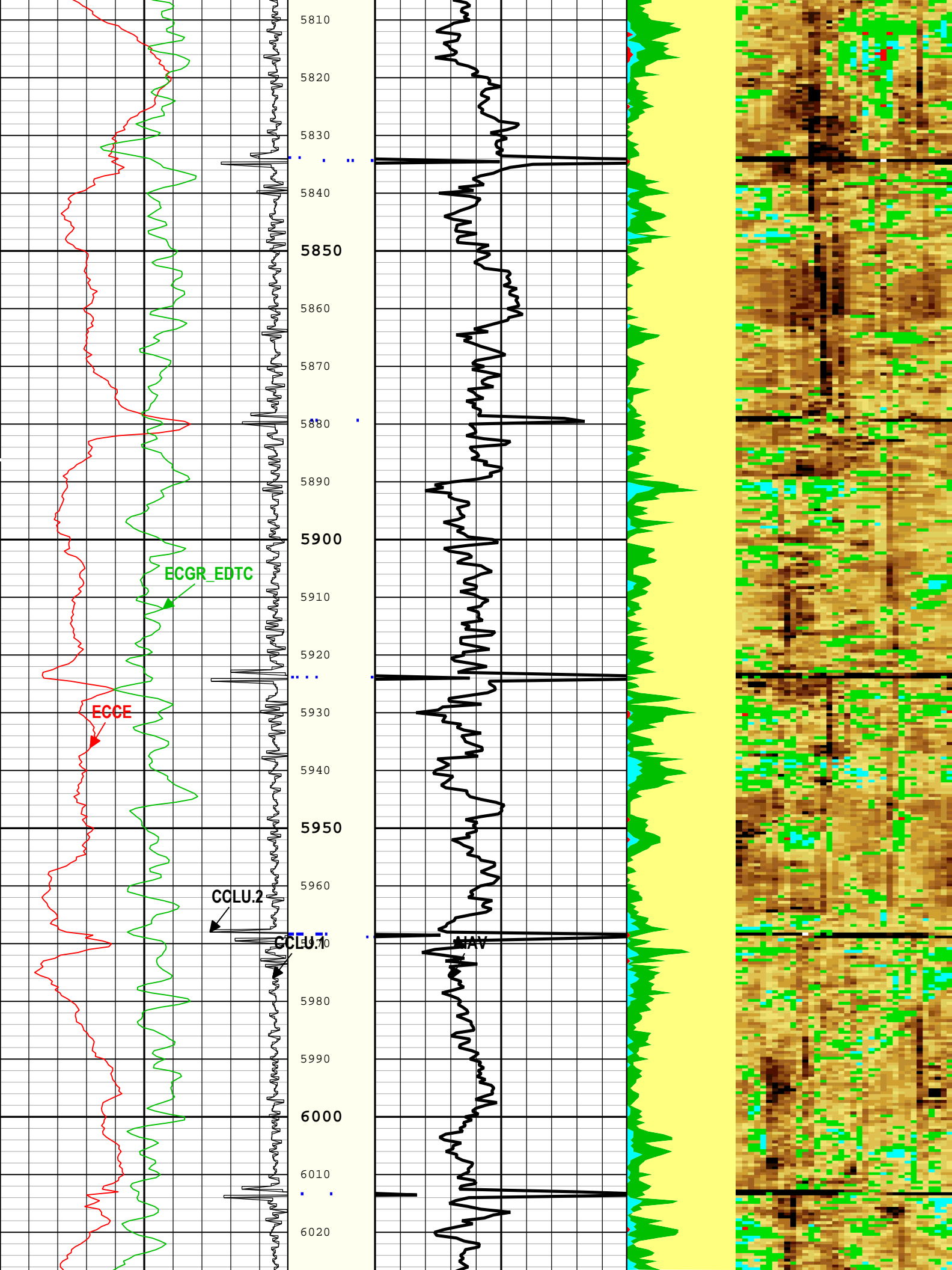


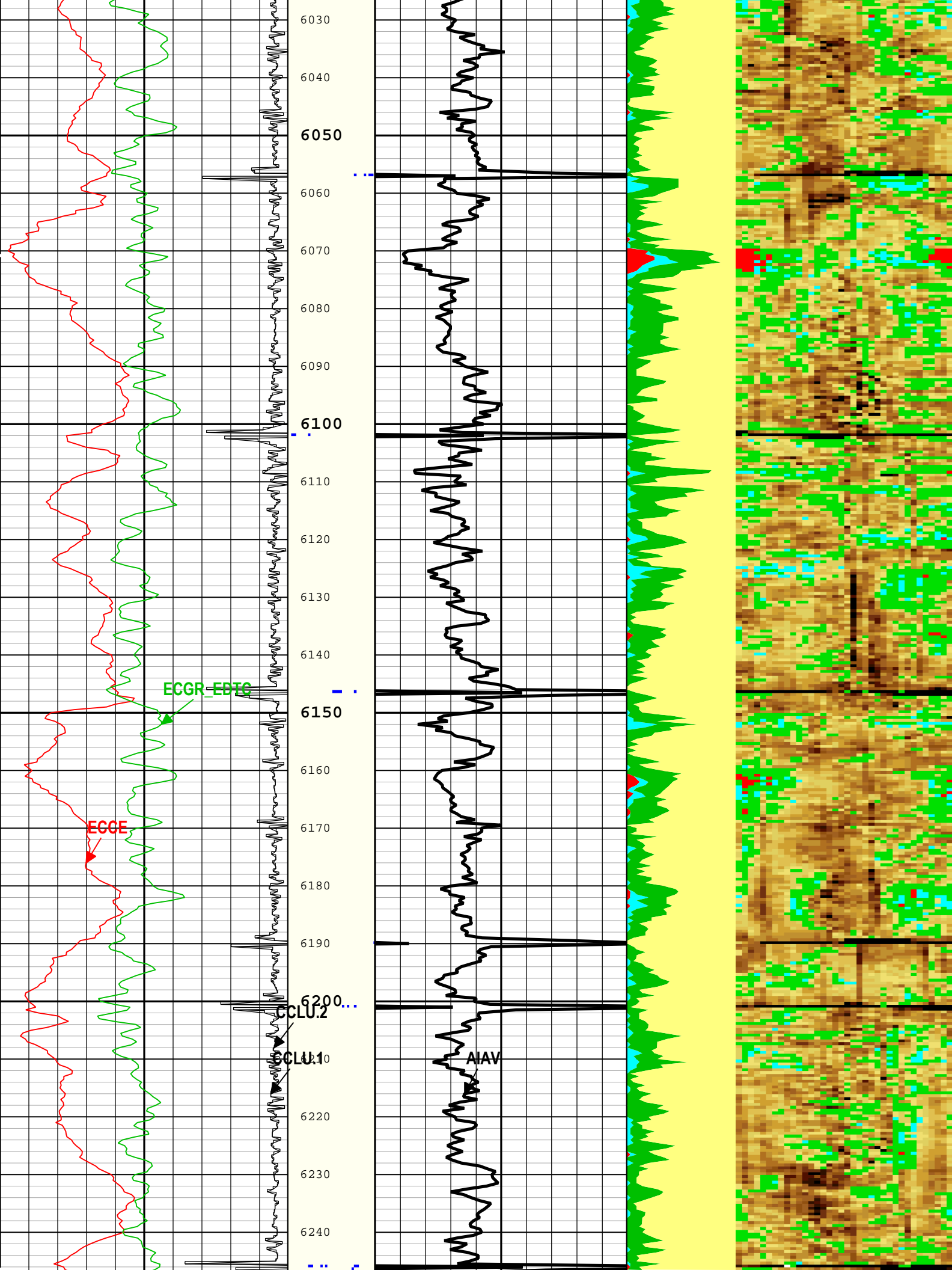


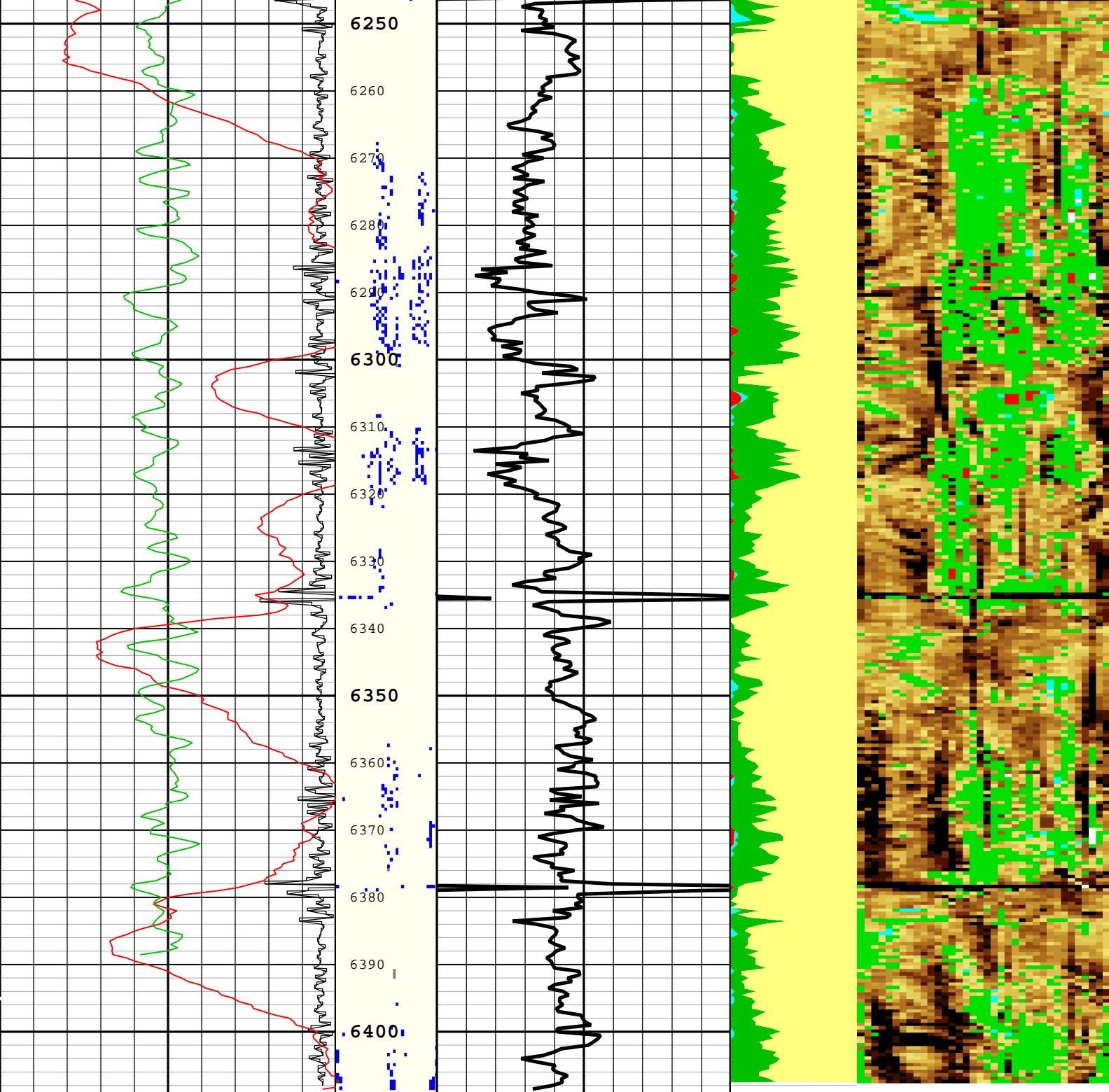












Casing Collar Locator Ultrasonic (CCLU).1 USIT-E	Absent 1.500 2.500 6.500	Acoustic Impedance Average (AIAV) USIT-E	Gas	Absent -500.000 2.200 3.254 4.309 5.363 6.418 7.472
-20 in 1	Explicit Normalization	0 Mrayl 10	Liquid	Custom Normalization
Casing Collar Locator Ultrasonic (CCLU).2 USIT-E	USIT - USIT Processing Flags (UFLG) USIT-E		Micro-Debonding	USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E (Mrayl)
-20 in 1			Bonded	
Amplitude of Eccentering (ECCE) USIT-E				
0 in 0.5				
Gamma Ray (ECGR_EDTC) EDTC-B				
0 gAPI 150				

TIME_1900 - Time Marked every 60.00 (s)

Description: Format: Log (D I Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth

Channel Processing Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
BAR(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	Depth Zoned	in
CBLO	Casing Bottom (Logger)	WLSESSION	16978	ft
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
HEMA	Hematite Presence Flag	Borehole	No	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	18.79	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.12	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.13	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.62	Mrayl
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	1.62	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	13.5	31	1935
BS	8.5	1935	6409.42

All depth are actual.

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	48	dB
EMXV	EMEX Voltage	USIT-E	60	V
HRES	Horizontal Resolution	USIT-E	10 deg	
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
USFR	Ultrasonic Sampling Frequency	USIT-E	666667	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 500 KHz	
UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 6.0 in	
WINB	Window Begin Time	USIT-E	30	us
WINE	Window End Time	USIT-E	73.04	us

0 PSI Repeat Pass

Software Version

Acquisition System

Maxwell 2018 SP2

Version

8.2.102758.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[5]:Up	Up	6012.32 ft	6415.06 ft	06-Jun-2019 10:00:11 AM	06-Jun-2019 10:02:47 AM	ON	5.21 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Noble Energy INC

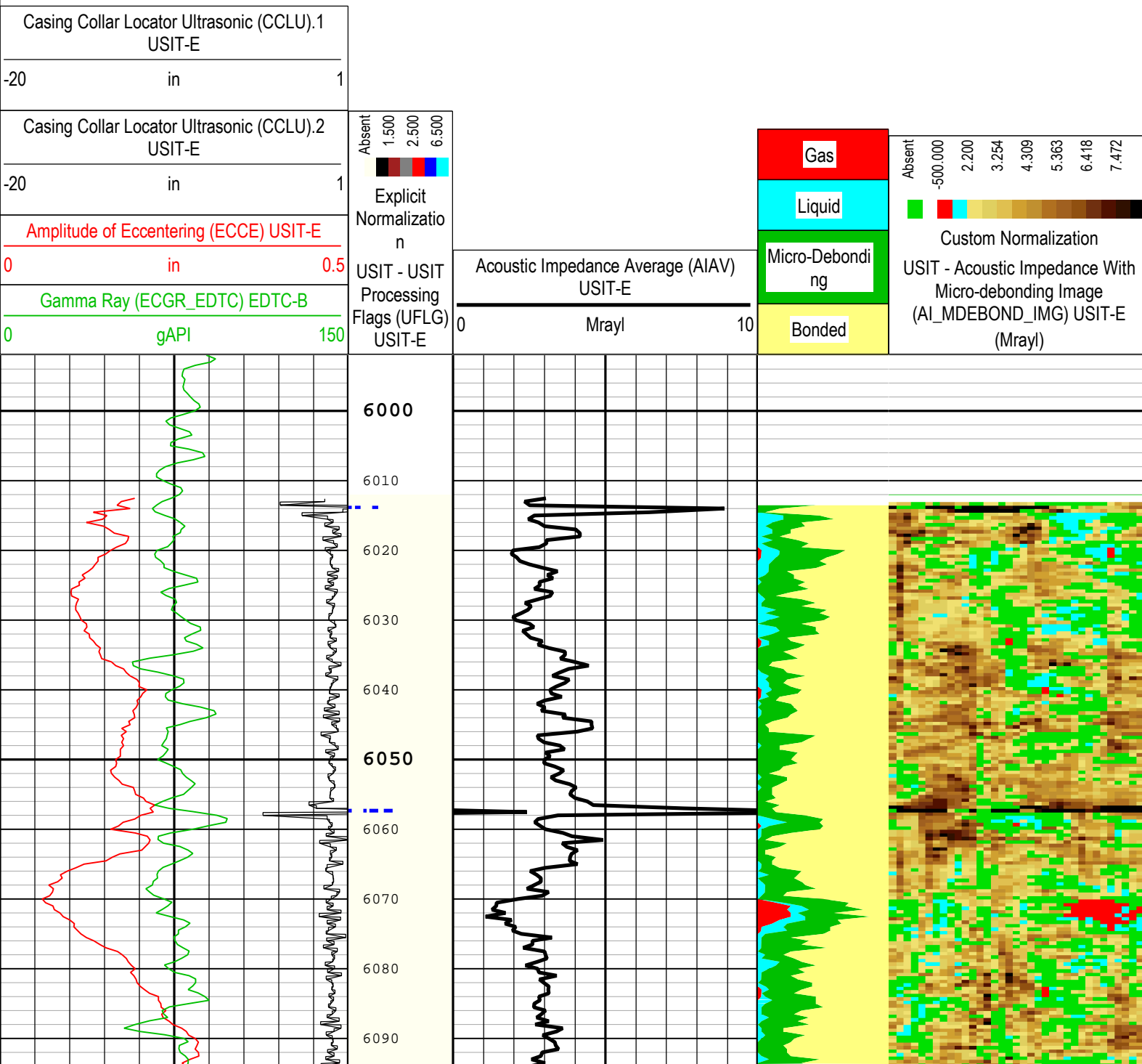
Well:Wells Ranch State AA36-622

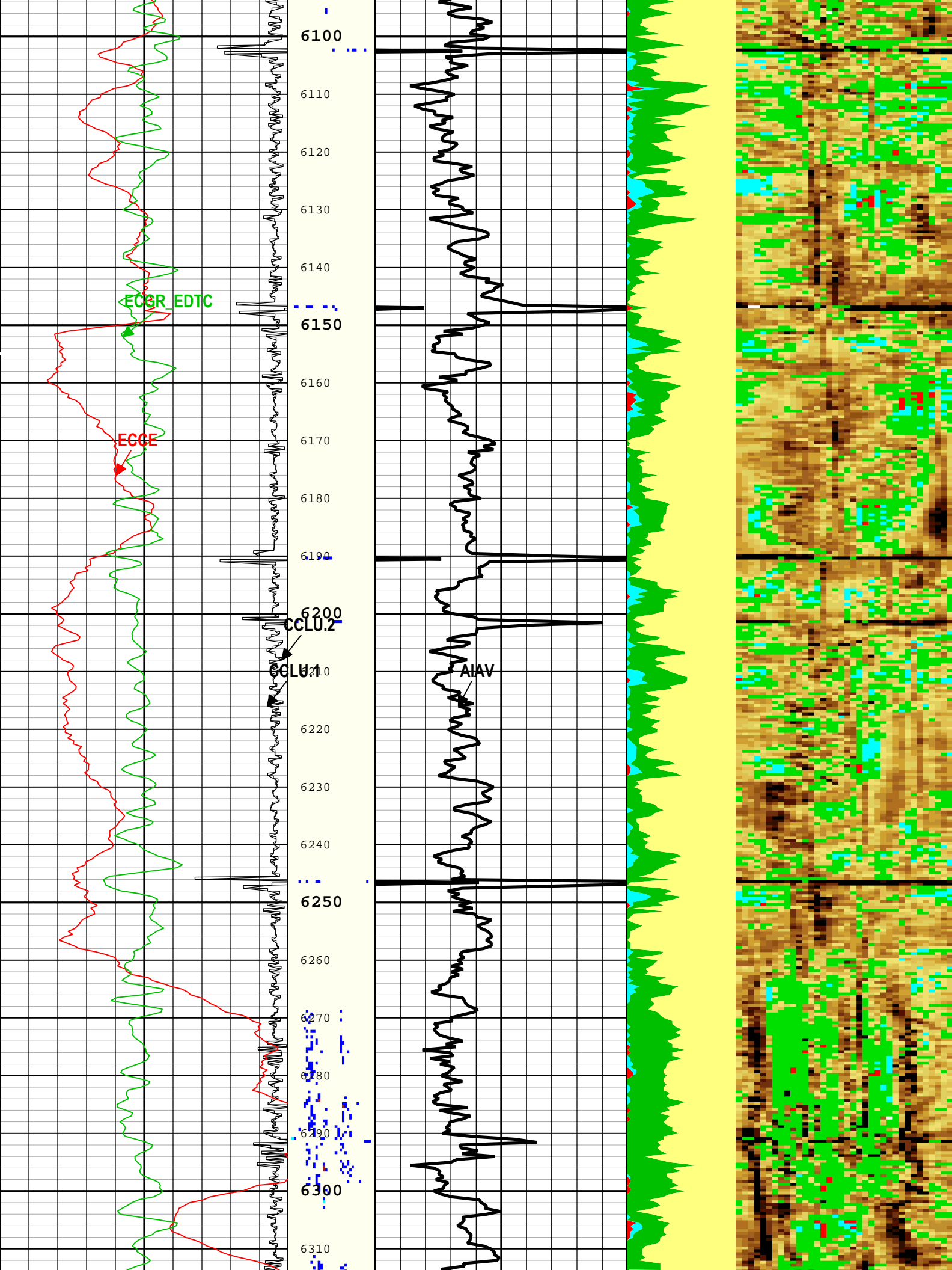
One: Log[5]:Up:S009

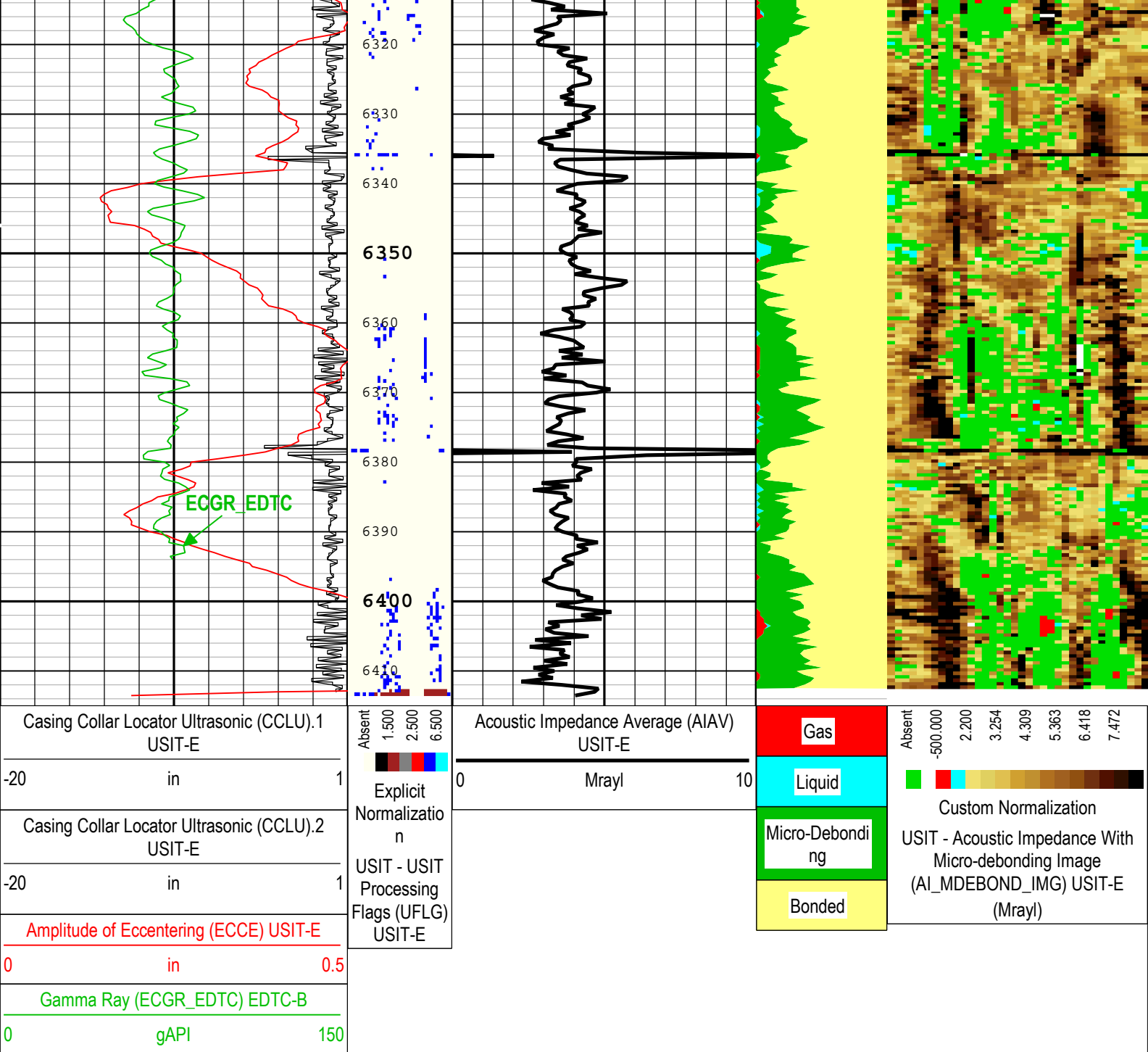
Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth

Creation Date: 06-Jun-2019 11:05:23

TIME_1900 - Time Marked every 60.00 (s)







Channel Processing Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
BARI(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	8.5	in
CBLO	Casing Bottom (Logger)	WLSESSION	16978	ft
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CENT)	Cement Type	USIT-E	Regular Cement	
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DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
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GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
HEMA	Hematite Presence Flag	Borehole	No	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	18.79	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.12	
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USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-E	Automatic	
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ZMUD	Acoustic Impedance of Mud	Borehole	1.62	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	48	dB
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ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
USFR	Ultrasonic Sampling Frequency	USIT-E	666667	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 500 KHz	
UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 6.0 in	
WINB	Window Begin Time	USIT-E	30	us
WINE	Window End Time	USIT-E	Time Zoned	us

Time Zone Parameters

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
WINE	78	06-Jun-2019 10:00:11	06-Jun-2019 10:00:36	6415.06	6394.09
WINE	78.14	06-Jun-2019 10:00:36	06-Jun-2019 10:00:41	6394.09	6388.74
WINE	73.04	06-Jun-2019 10:00:41	06-Jun-2019 10:02:47	6388.74	6012.32

All depth are at tool zero.

XYZ

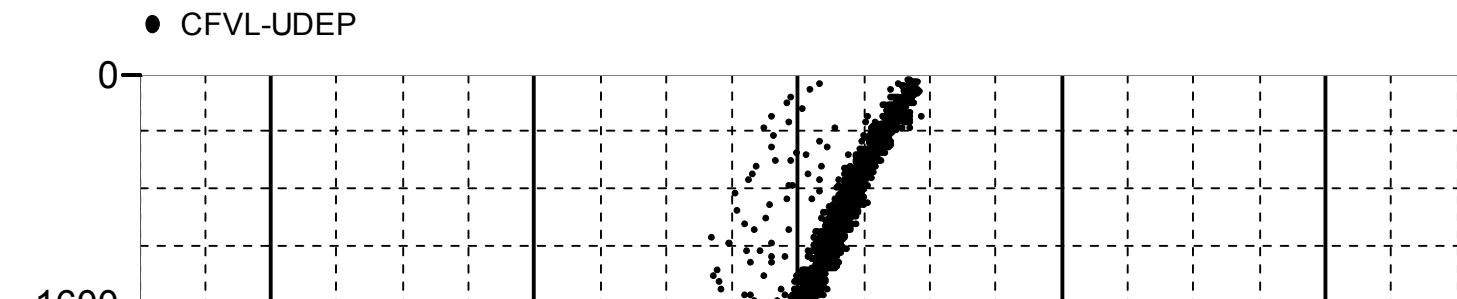
Company:Noble Energy INC Well:Wells Ranch State AA36-622

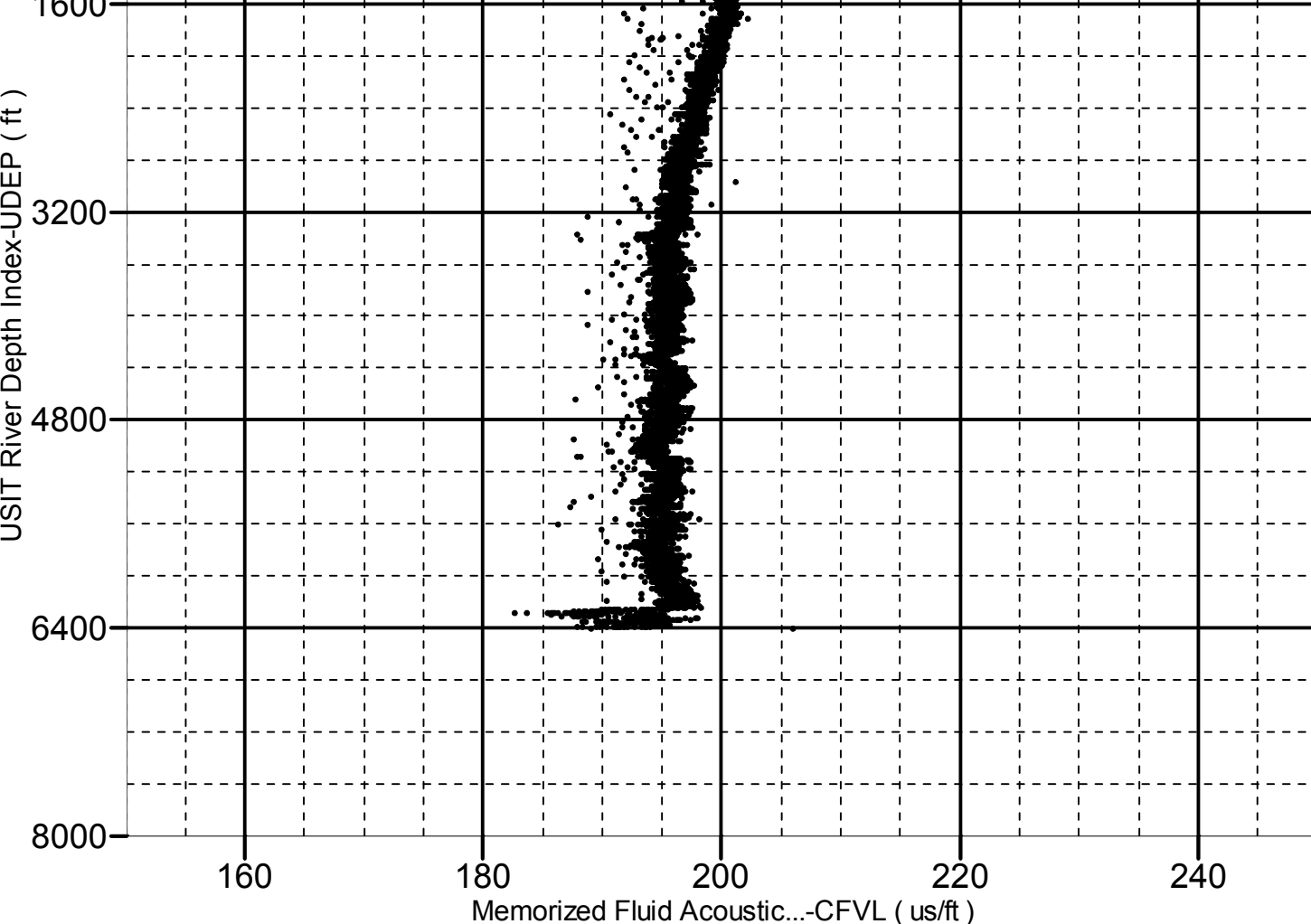
One: Main[6]:Up:S009

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6409.00 to 51.50 ft





XYZ

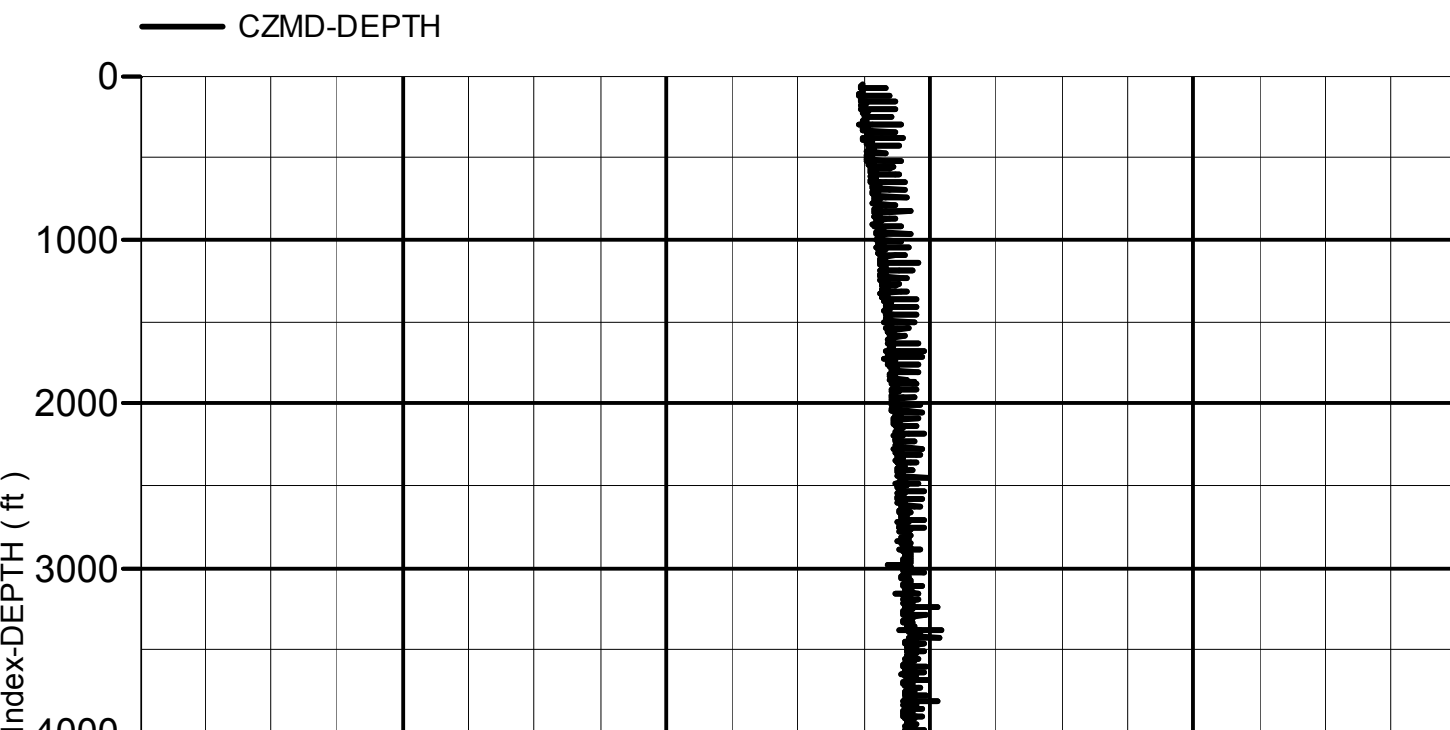
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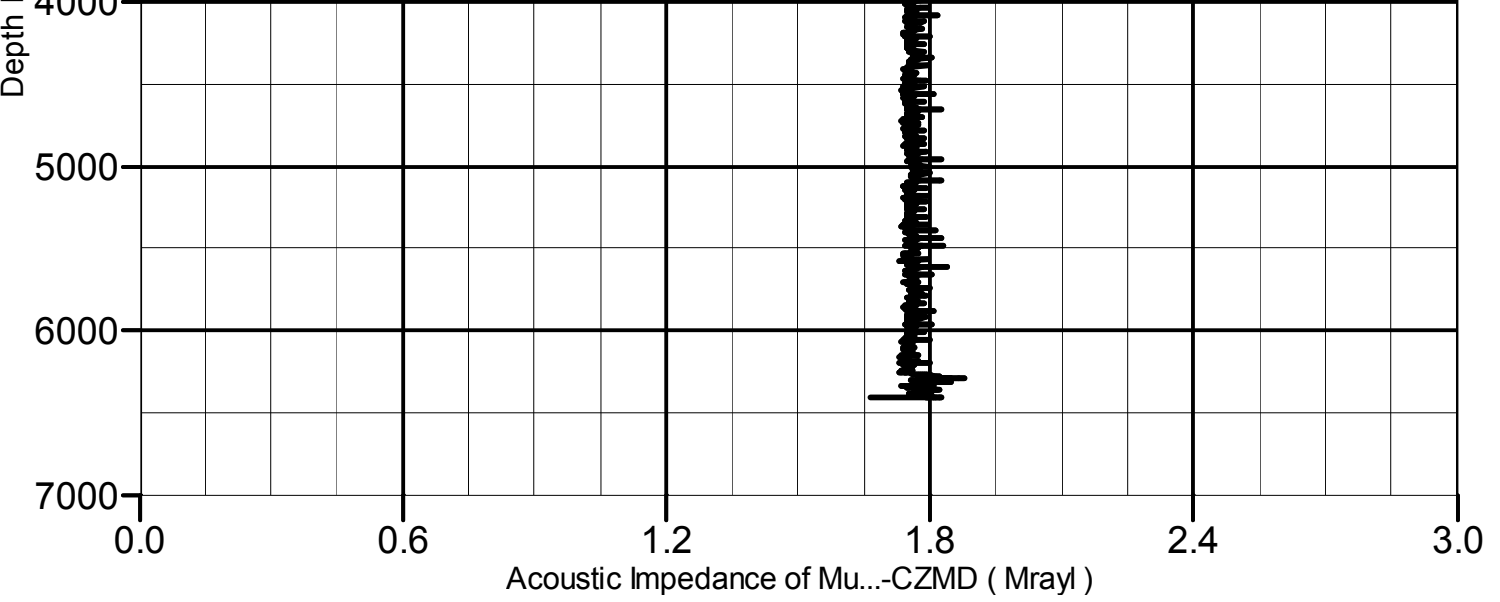
One: Main[6]:Up:S009

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6409.50 to 51.50 ft





Company:	Noble Energy INC	Schlumberger
Well:	Wells Ranch State AA36-622	
Field:	Wattenberg	
County:	Weld	
State:	Colorado	
UltraSonic Summary Print		