

Company: Noble Energy Inc

Well: Hullabaloo State Y21-726

Field: Wattenberg

County: Weld State: Colorado

UltraSonic Summary Print			
County: Weld			
Field: Wattenberg			
Location: NENE Sec. 16, T2N, R64W			
Well: Hullabaloo State Y21-726			
Company: Noble Energy Inc			
Location:	NENE Sec. 16, T2N, R64W	Elev.: K.B. 5005.00 ft	
	SHL: 100' FSL & 1075' FEL	G.L. 4975.00 ft	
	Lat/Long: 40.14452 / -104.55031	D.F. 5005.00 ft	
	Permanent Datum:	Ground Level	Elev.: 4975.00 f
Log Measured From:		Kelly Bushing	30.00 ft
Drilling Measured From:		Kelly Bushing	above Perm.Datum
API Serial No.	Section:	Township:	Range:
05-123-45234	16	2N	64W

Logging Date	07-Nov-2017
Run Number	ONE
Depth Driller	17318.00 ft
Schlumberger Depth	6860.00 ft
Bottom Log Interval	6860.00 ft
Top Log Interval	60.00 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	2032.00 ft
To	6860.00 ft
Casing/Tubing Size	5.5 in
Weight	20 lbm/ft
Grade	P110
From	0.00 ft
To	6860.00 ft
Max Recorded Temperatures	227 degF
Logger on Bottom	07-Nov-2017 15:19:00
Unit Number	2161
Recorded By	A.BLOCHOWICZ
Witnessed By	BILL MANSFIELD

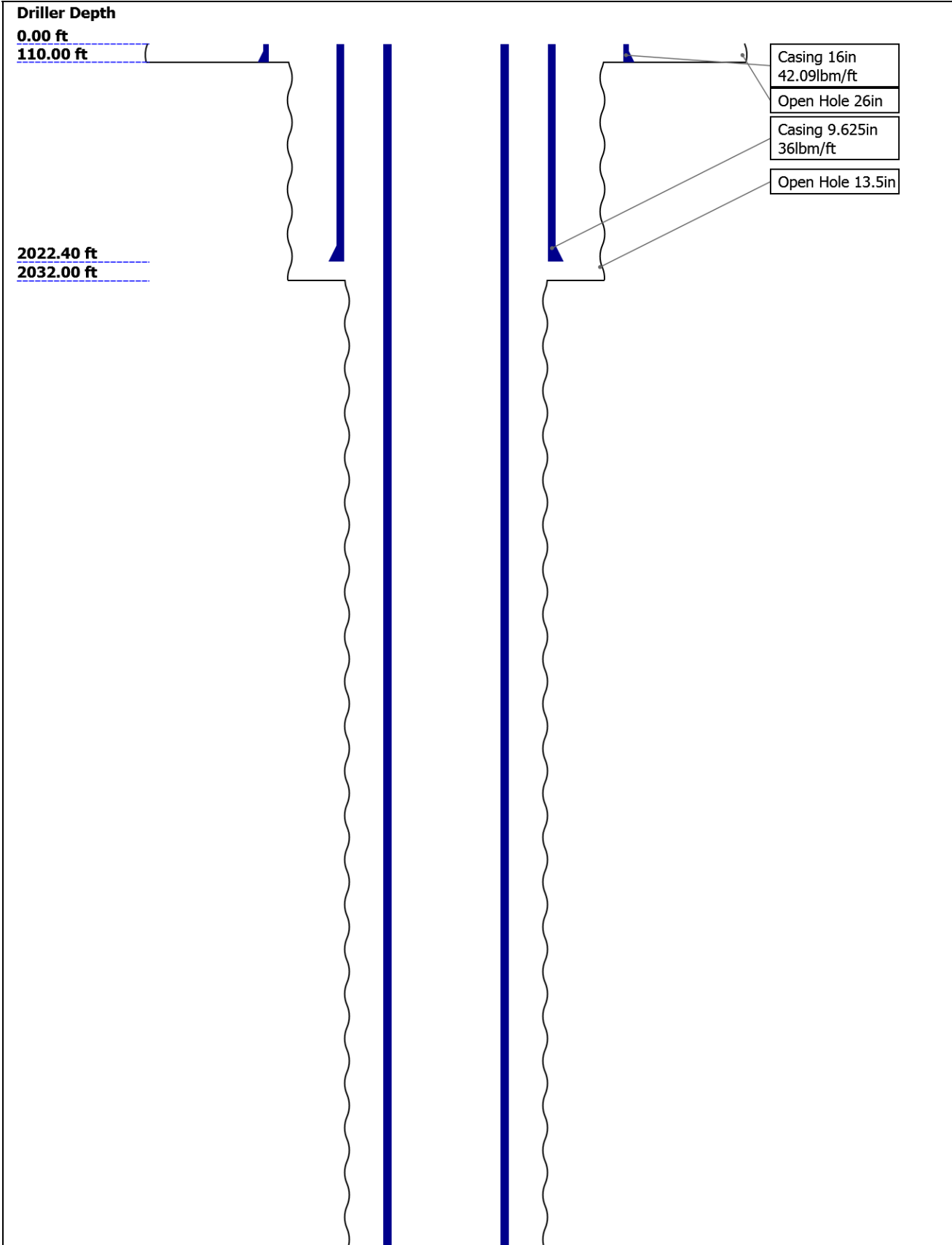
Disclaimer

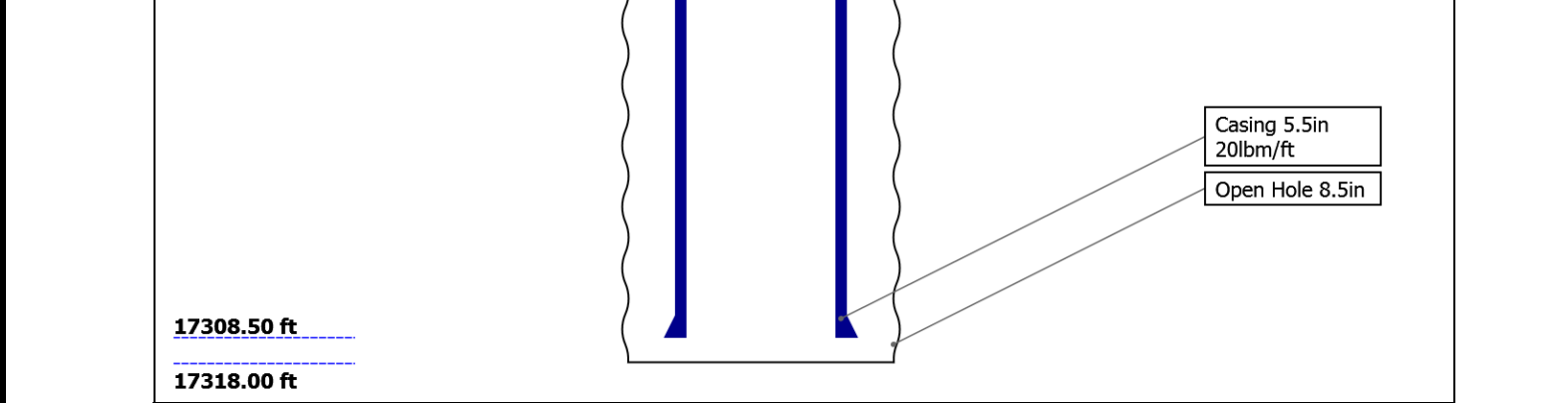
THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (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.

1. Header	13. XYZ (USI Acoustic Impedance of Mud vs Depth 3.0 in)
2. Disclaimer	14. Tail
3. Contents	
4. Well Sketch	
5. Borehole Size/Casing/Tubing Record	
6. Operational Run Summary	
7. Remarks and Equipment Summary	
8. Depth Summary	
9. USI Fluid Properties Measurement_1	
10. Composite 1 2500 PSI Main Pass	
10.1 Integration Summary	
10.2 Software Version	
10.3 Composite Summary	
10.4 Log (DJ Basin Ultrasonic Cement Summary Report)	
10.5 Parameter Listing	
11. ONE 0 PSI Repeat Pass	

- 11.1 Integration Summary
- 11.2 Software Version
- 11.3 Composite Summary
- 11.4 Log (DJ Basin Ultrasonic Cement Summary Report)
- 11.5 Parameter Listing
- 12. XYZ (USI Fluid Acoustic Slowness vs Depth 3.0 in)

Well Sketch





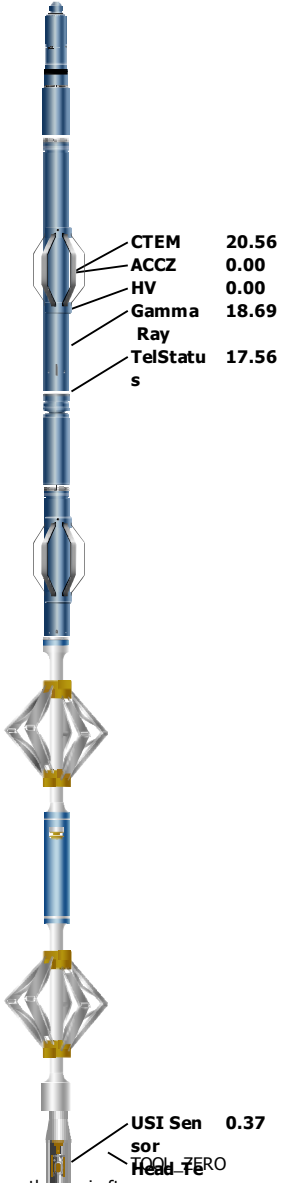
Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	0	110	2032			
Top Logger (ft)	0	110	2032			
Bottom Driller (ft)	110	2032	17318			
Bottom Logger (ft)	110	2032	6860			
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	J55	P110			
Top Driller (ft)	0	0	0			
Top Logger (ft)	0	0	0			
Bottom Driller (ft)	110	2022.4	17308.5			
Bottom Logger (ft)	110	2022.4	6860			

Operational Run Summary

Parameter (unit)	ONE					
Date Log Started	07-Nov-2017					
Time Log Started	12:46:16					
Date Log Finished	07-Nov-2017					
Time Log Finished	16:24:21					
Top Log Interval (ft)	60.00					
Bottom Log Interval (ft)	6860.00					
Total Depth (ft)	6860.00					
Max Hole Deviation (deg)	0.00					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	8.500					
Logging Unit Number	2161					
Logging Unit Location	Fort Morgan, CO					
Recorded By	A.BLOCHOWICZ					

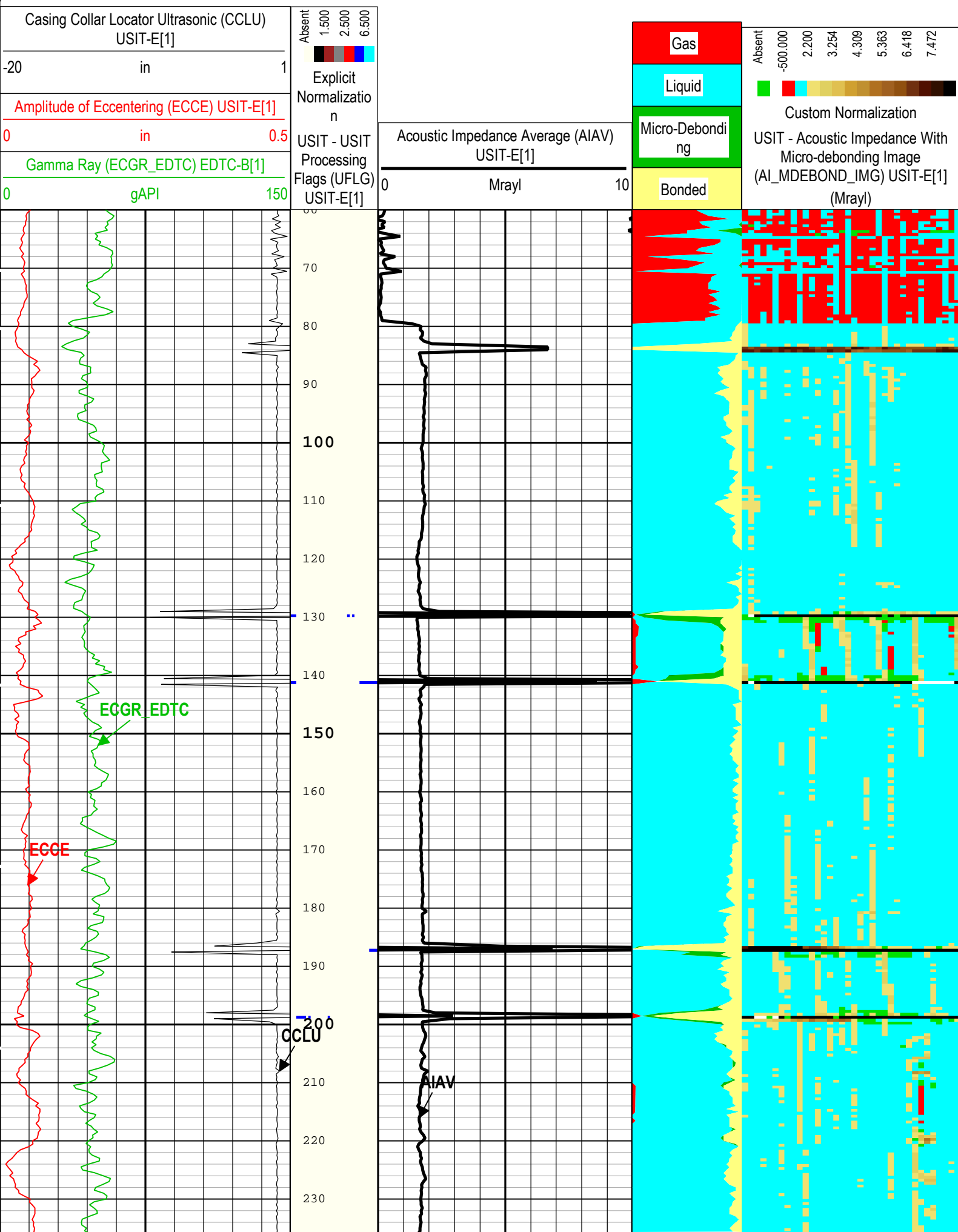
Witnessed By	BILL MANSFIELD					
Service Order Number	DXCR-00014					

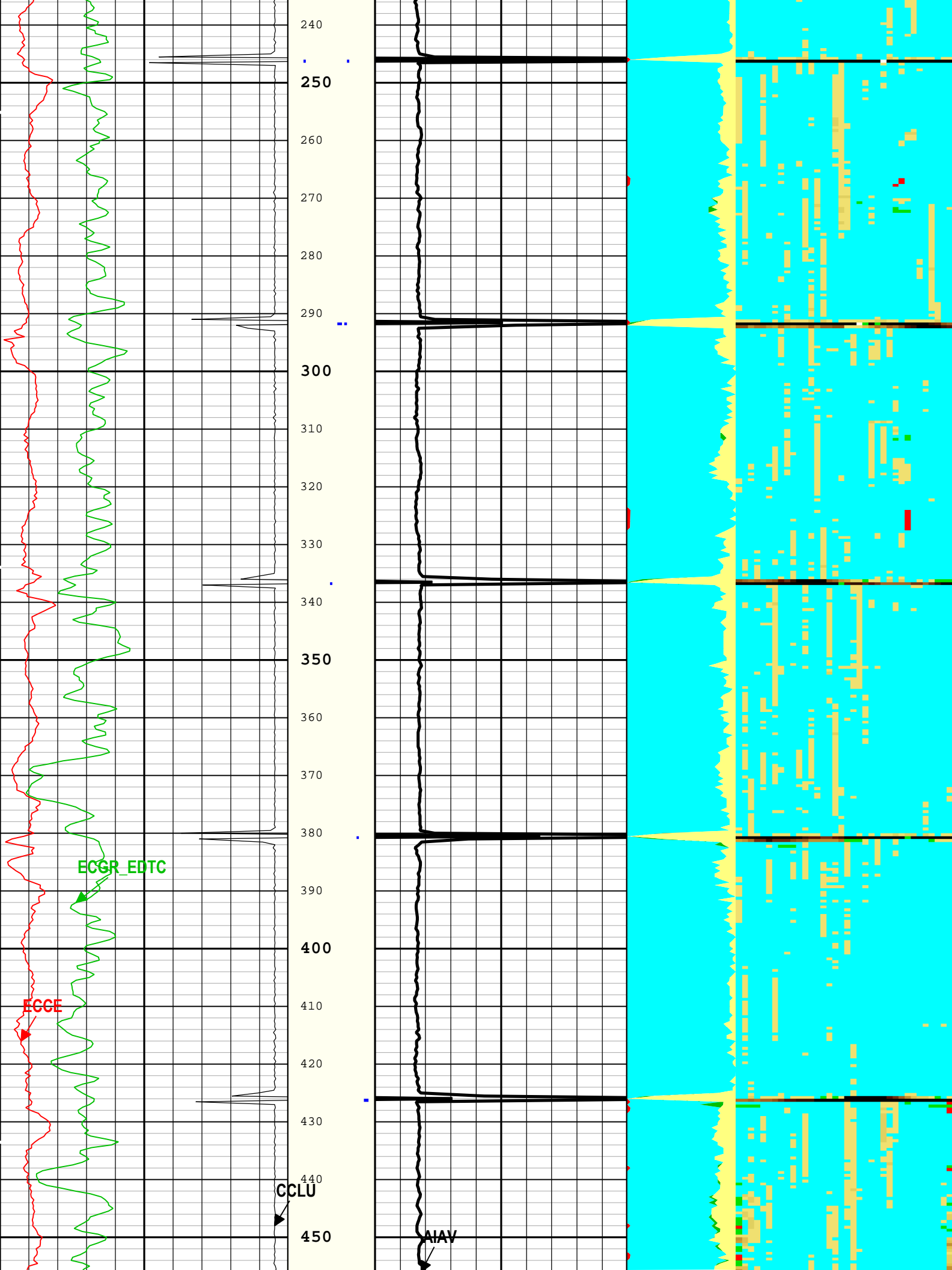
Remarks and Equipment Summary						
ONE: Toolstring			ONE: Remarks			
Equip name Length LEH-QT 26.97 LEH-QT EDTC-B:8 24.06 102 EDTH-B:92 45 EDTG-B:77 004 EDTC-B:81 02 AH-184:2 17.56 765 USIT-E:94 15.56 3 ECH-MFA: 1928 USAC-A:9 43 USIS-A:90 2 USSC-B:17 30 USRS-A USI-SENS OR:1383 USI-TX			Thank you for choosing Schlumberger!			
			Tool string run as per tool sketch and client logging program.			
			2 gemcos run on tool string for centralization.			
			Repeat Pass logged at 0 PSI. Main Pass logged at 2500 PSI.			

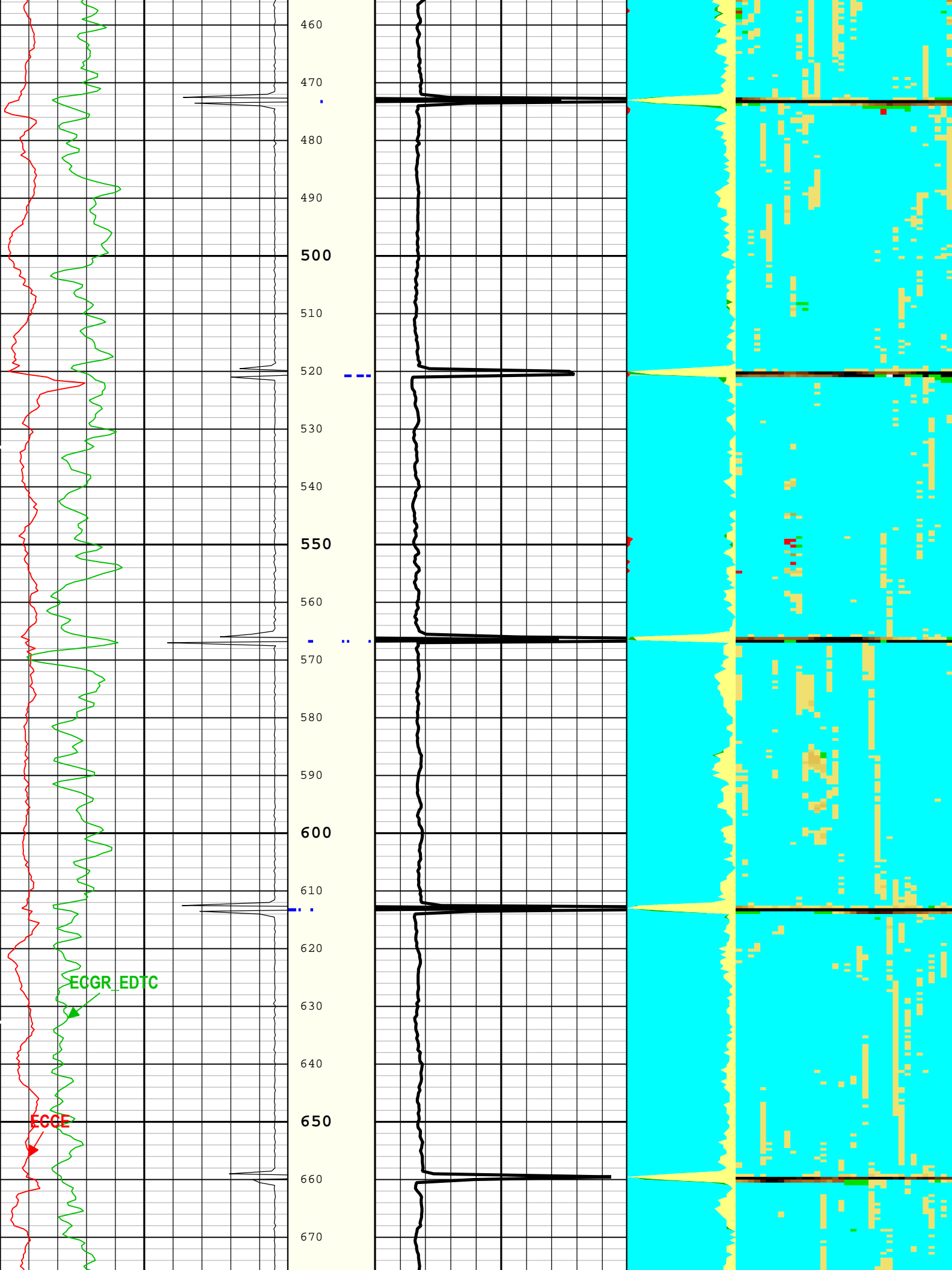
Depth Summary			
	ONE		
Depth Measuring Device			
Type	IDW-JA		
Serial Number	6483		
Calibration Date	28-SEP-2017		
Calibrator Serial Number	IDWC-C-57		
Calibration Cable Type	7-39PL XS		
Wheel Correction 1	-4		
Wheel Correction 2	-5		
Tension Device			
Type	CMTD-B/A		

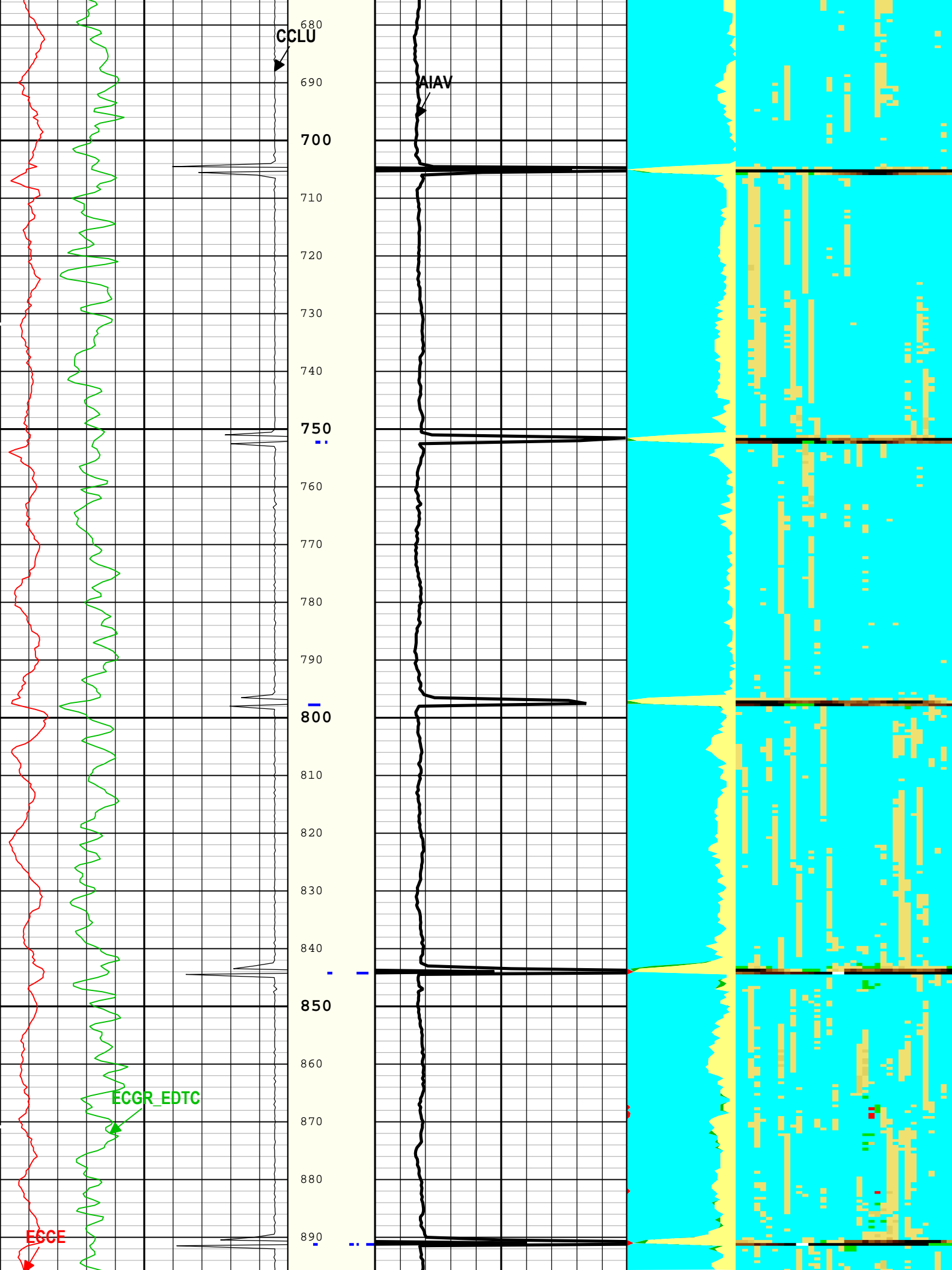
Serial Number	1109								
Calibration Date	12-Sep-2017								
Calibrator Serial Number	441345a								
Number of Calibration Points	10								
Calibration Root Mean Square Error	7								
Calibration Peak Error	11								
Logging Cable									
Type	7-39PI-XXS								
Serial Number	F716045								
Length	22000.00 ft								
Conveyance Type	Wireline								
Rig Type	Crane USA								
ONE:Depth Control Parameters		Depth Control Remarks							
Log Sequence	First Log In the Well	All Schlumberger depth control policies were followed. IDW used as a primary depth reference. Z-chart used as secondary depth reference.							
Rig Up Length At Surface									
Rig Up Length At Bottom									
Rig Up Length Correction									
Stretch Correction									
Tool Zero Check At Surface									
USIT - Fluid Properties Measurement									
Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)						
Run 1	Log[9]:Up	2945.49	58.92						
Fluid Velocity = "Automatic". CFVL equals DFSL channel									
Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)						
Mud Impedance = "FreePipe Norm." Free Pipe normalization zone is : 22.04m(72.33ft) to 23.63m(77.53ft) MUD_N_FRP = 1.16 DFD = 1.01g/cm3(8.40lbm/gal) CZMD median computed in free pipe normalization interval = 1.65 MRayl									
Start Depth(ft)	Stop Depth(ft)	Start Value(Mrayl)	End Value(Mrayl)						
Composite 1									
2500 PSI Main Pass									
Software Version									
Acquisition System		Version							
Maxwell 2017 SP3		7.3.92069.3100							
Application Patch		Wireline_NPD-ICE2-2017SP3_7.3.93033							
Composite Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[8]:Up	Up	2861.95 ft	6864.38 ft	07-Nov-2017 3:19:03 PM	07-Nov-2017 3:51:51 PM	ON	4.52 ft	Yes
ONE	Log[9]:Up	Up	58.93 ft	2945.49 ft	07-Nov-2017 3:55:39 PM	07-Nov-2017 4:24:05 PM	ON	0.00 ft	Yes
All depths are referenced to toolstring zero									
Log	Company:Noble Energy Inc			Well:Hullabaloo State Y21-726			Composite 1:S006		
Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Tyoe: Measured Depth									

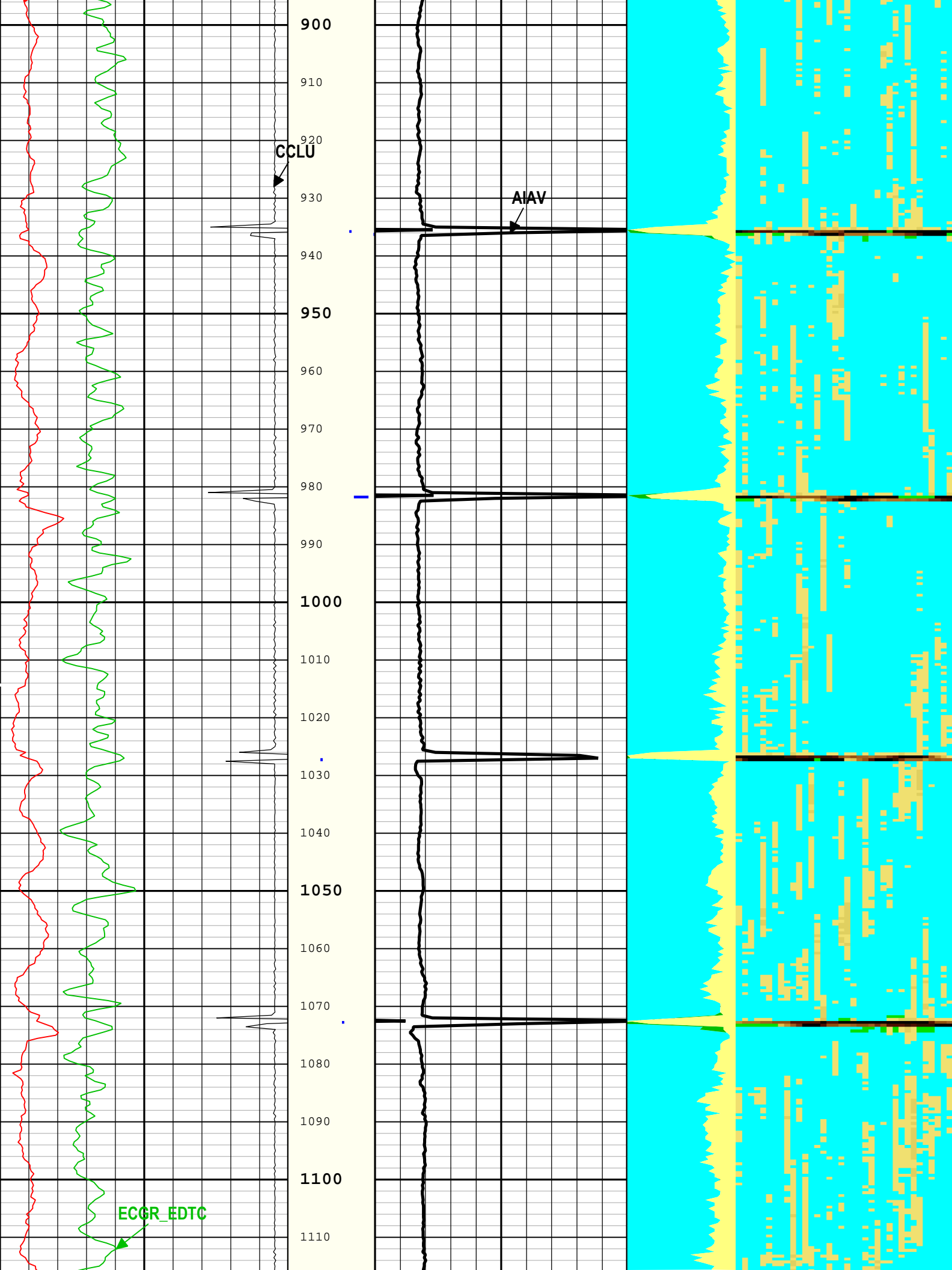
TIME_1900 - Time Marked every 60.00 (s)

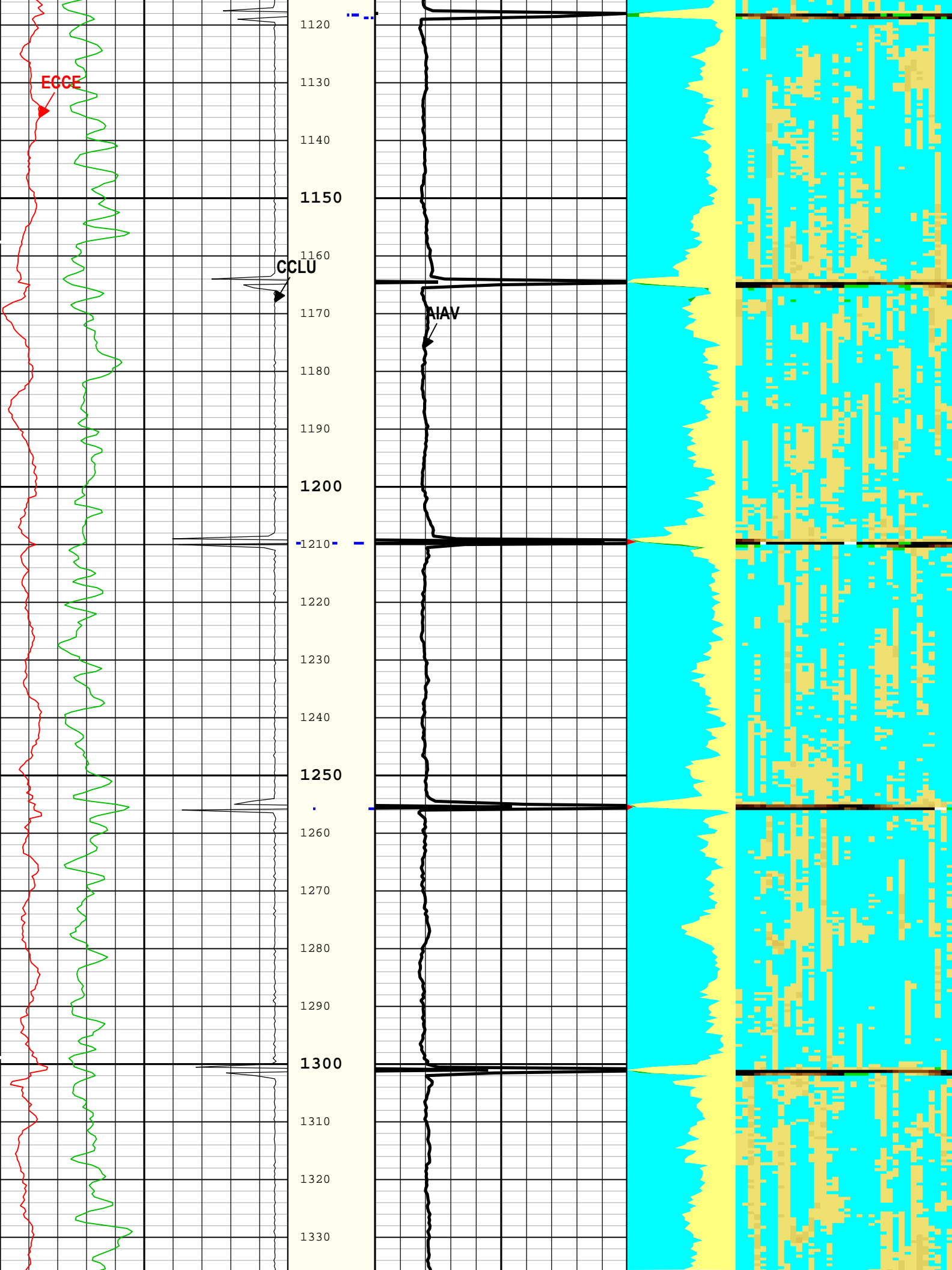


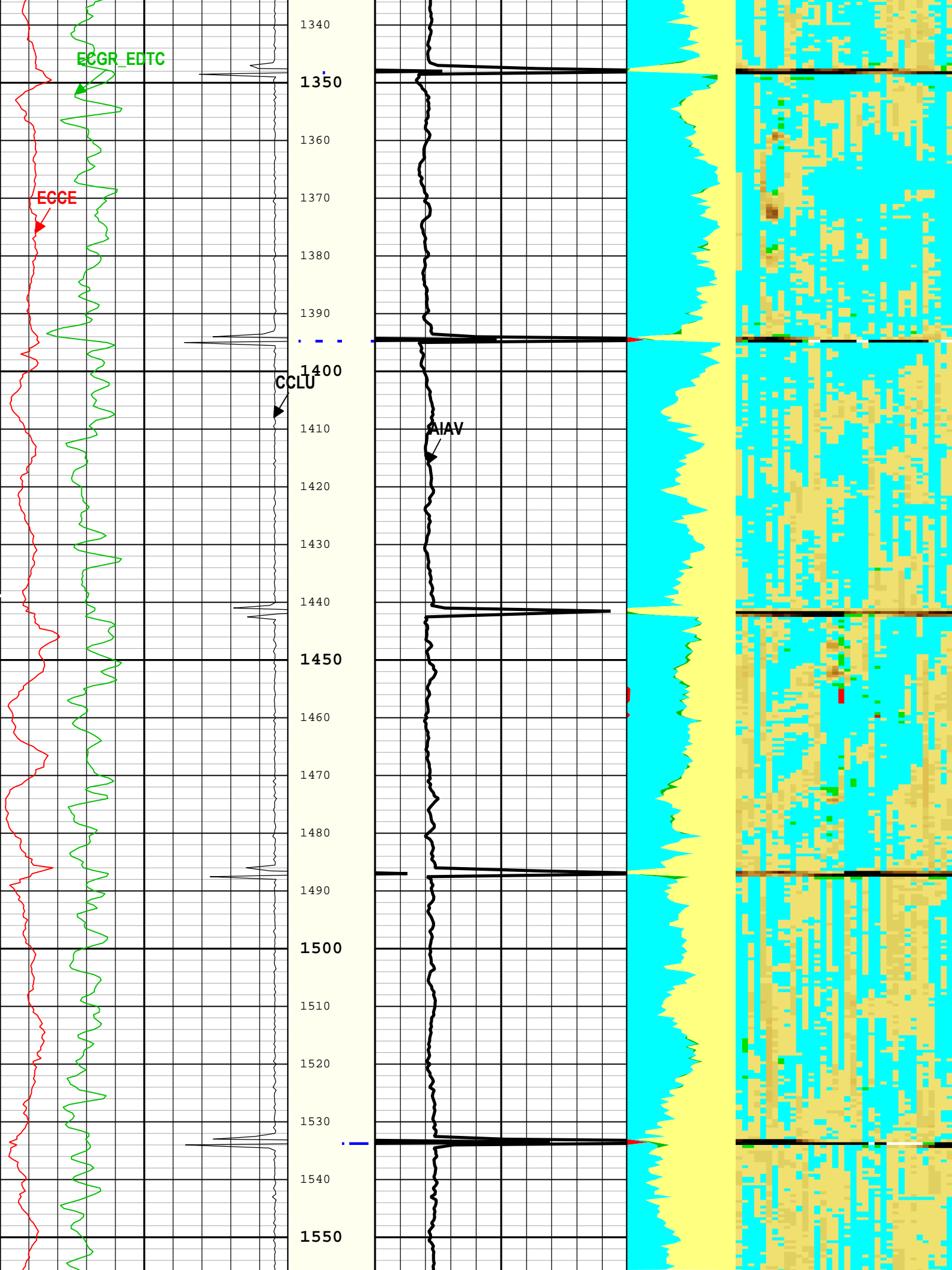


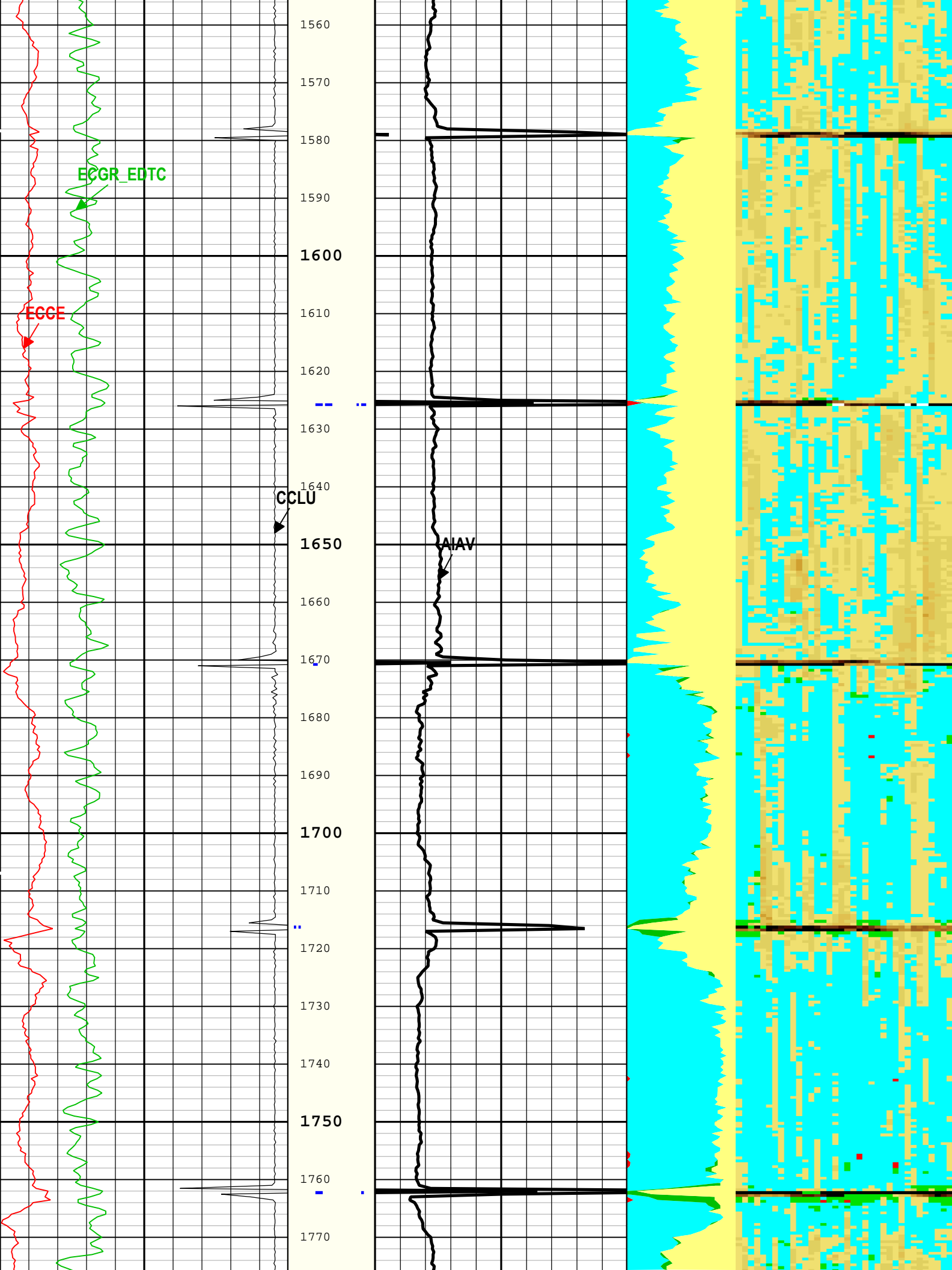


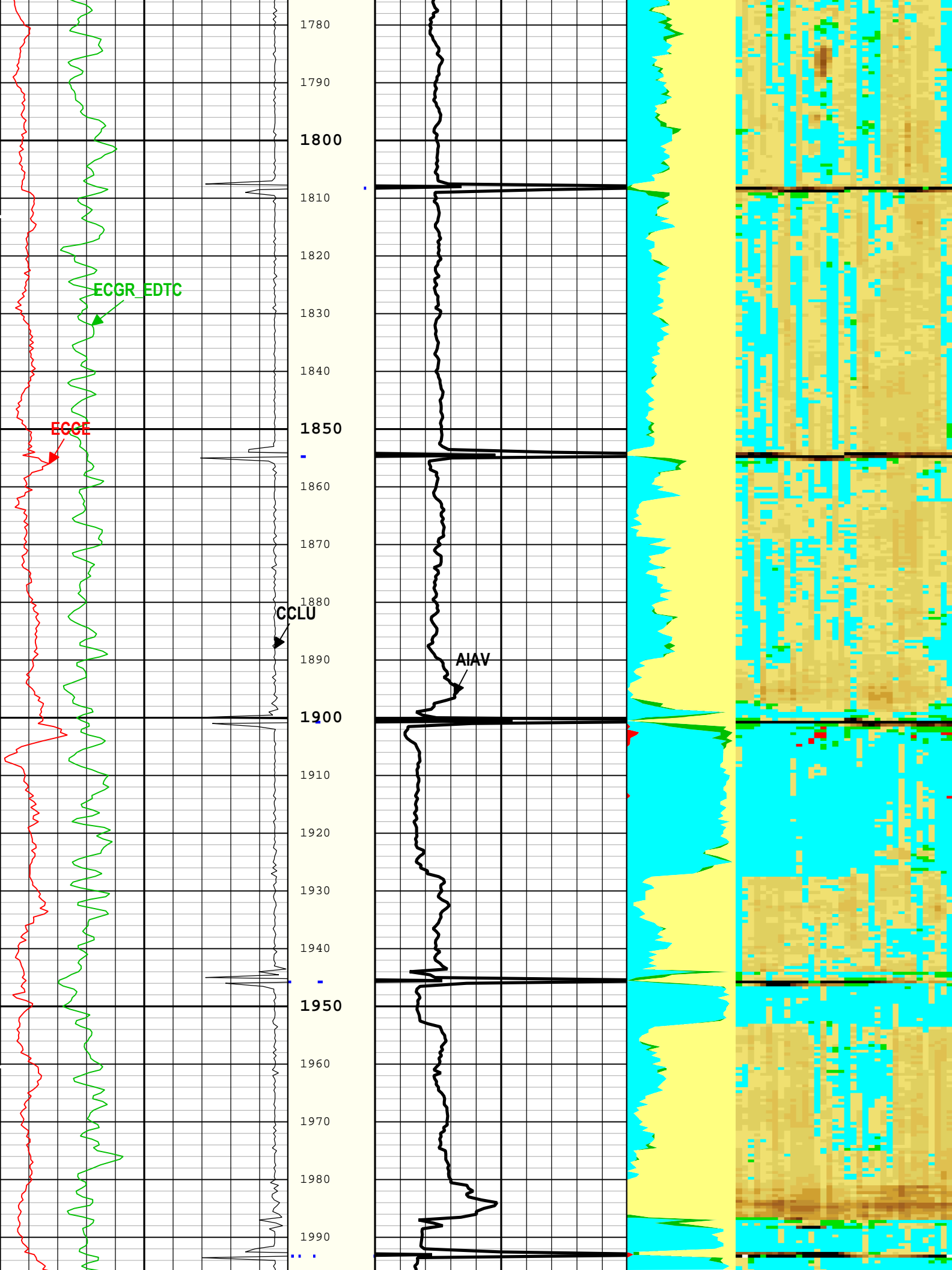


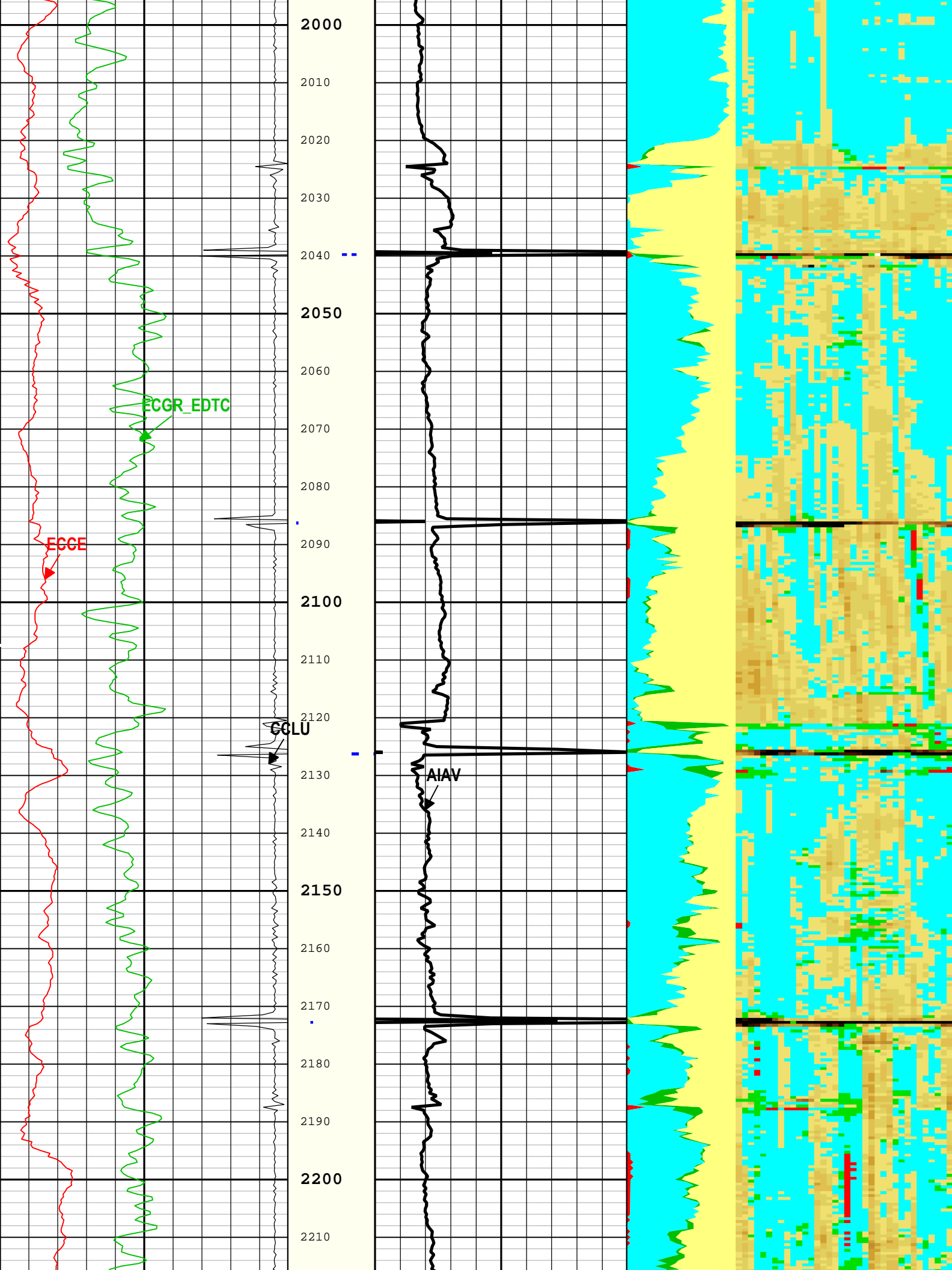


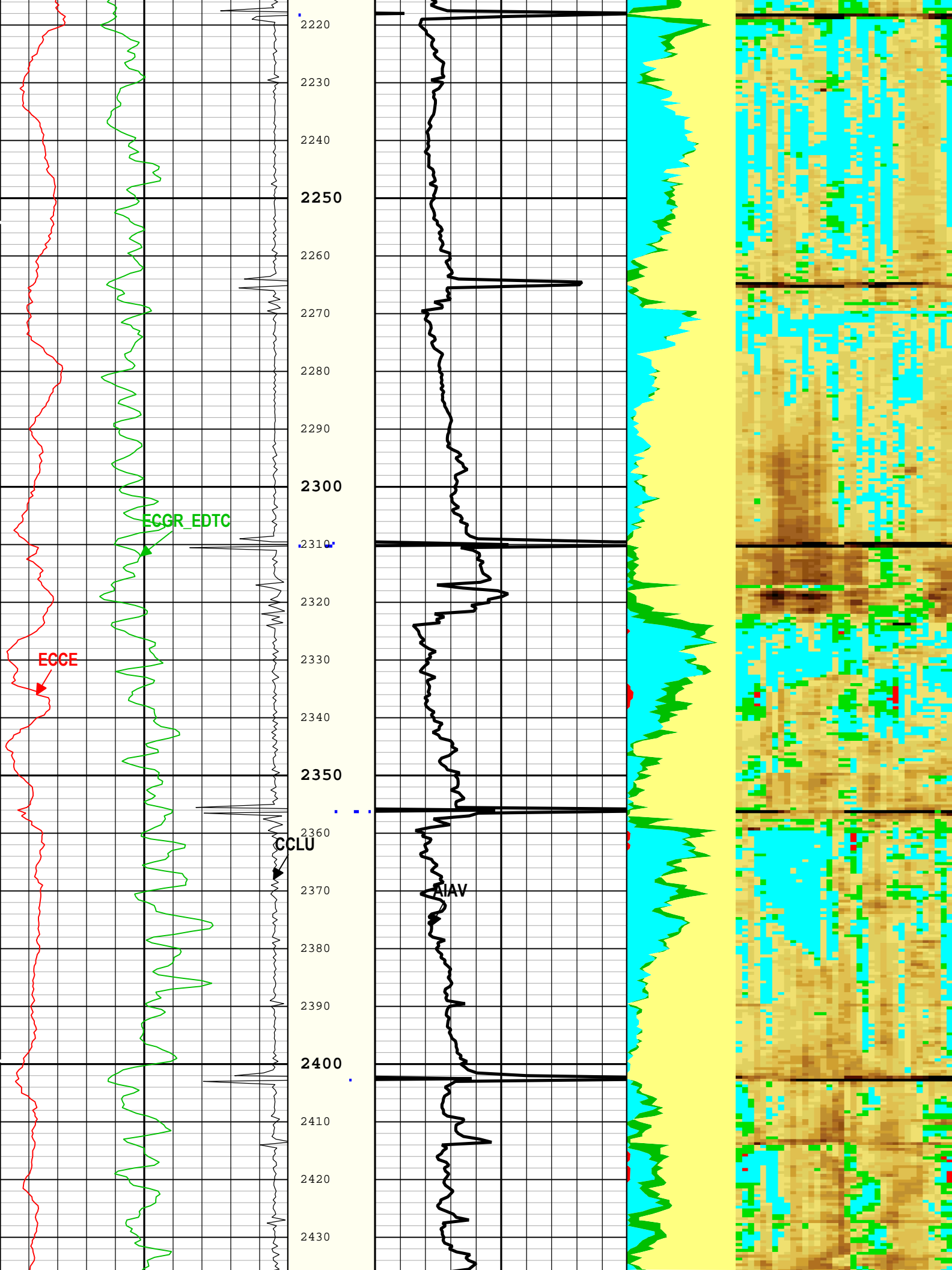


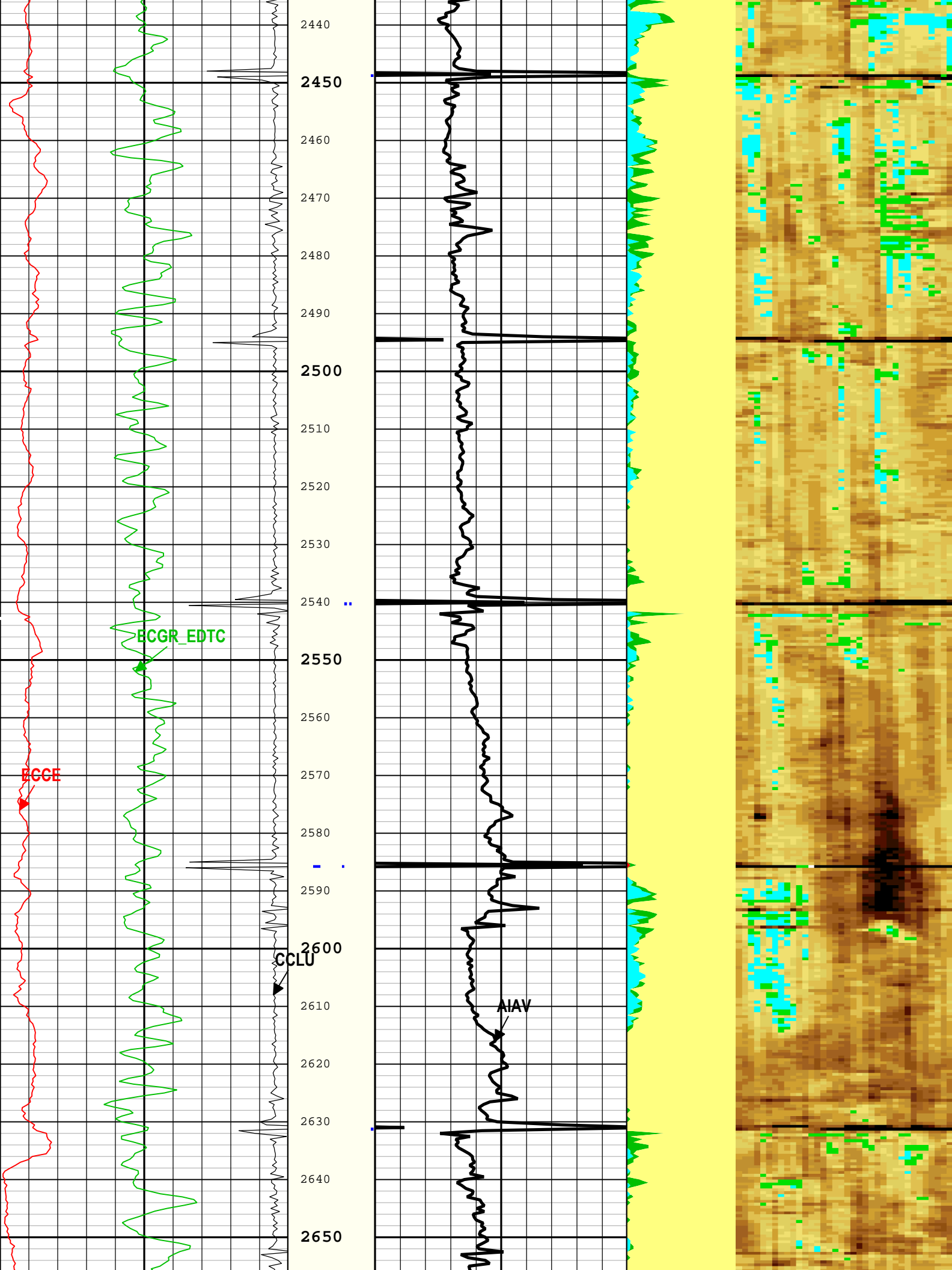


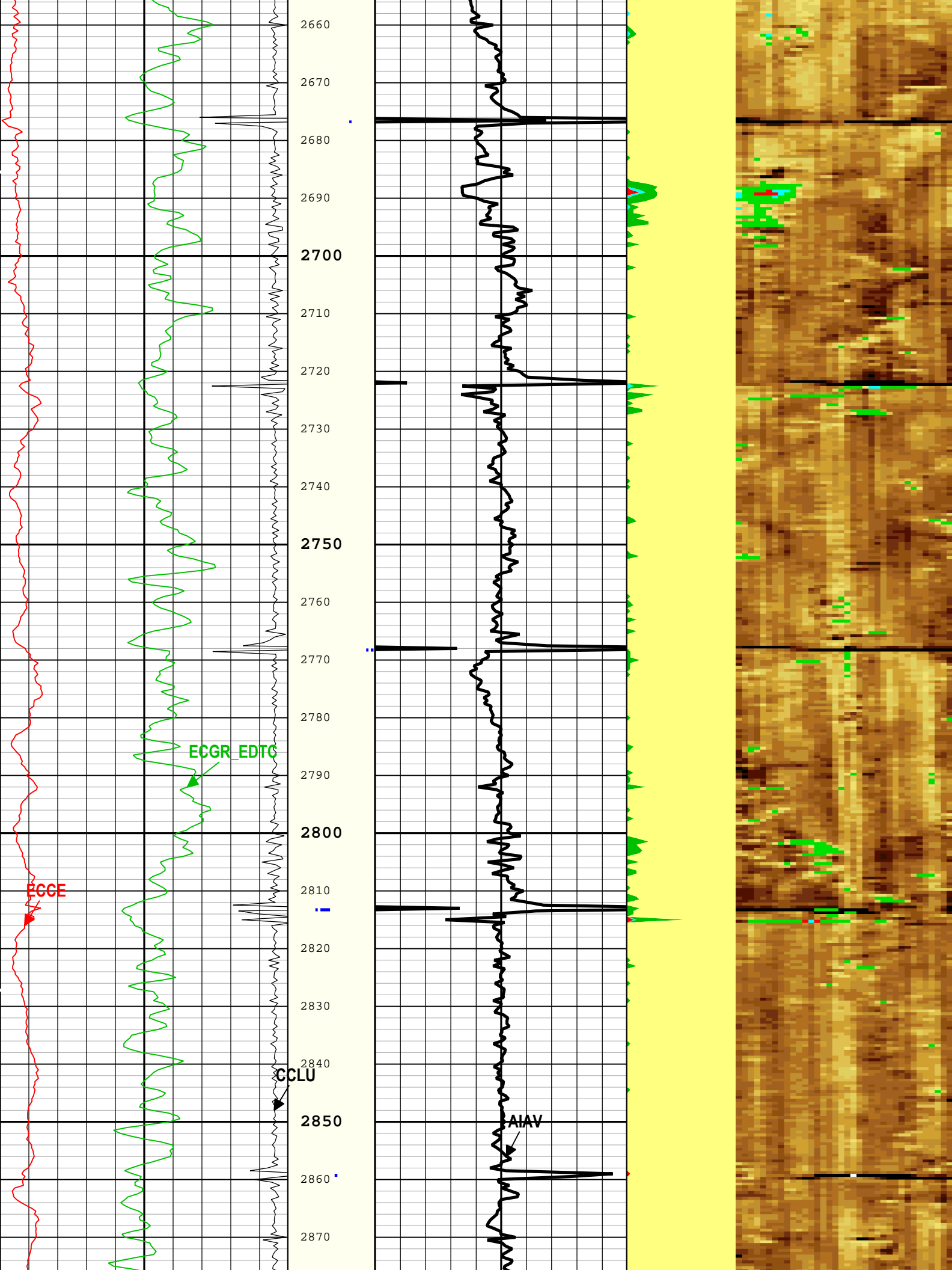


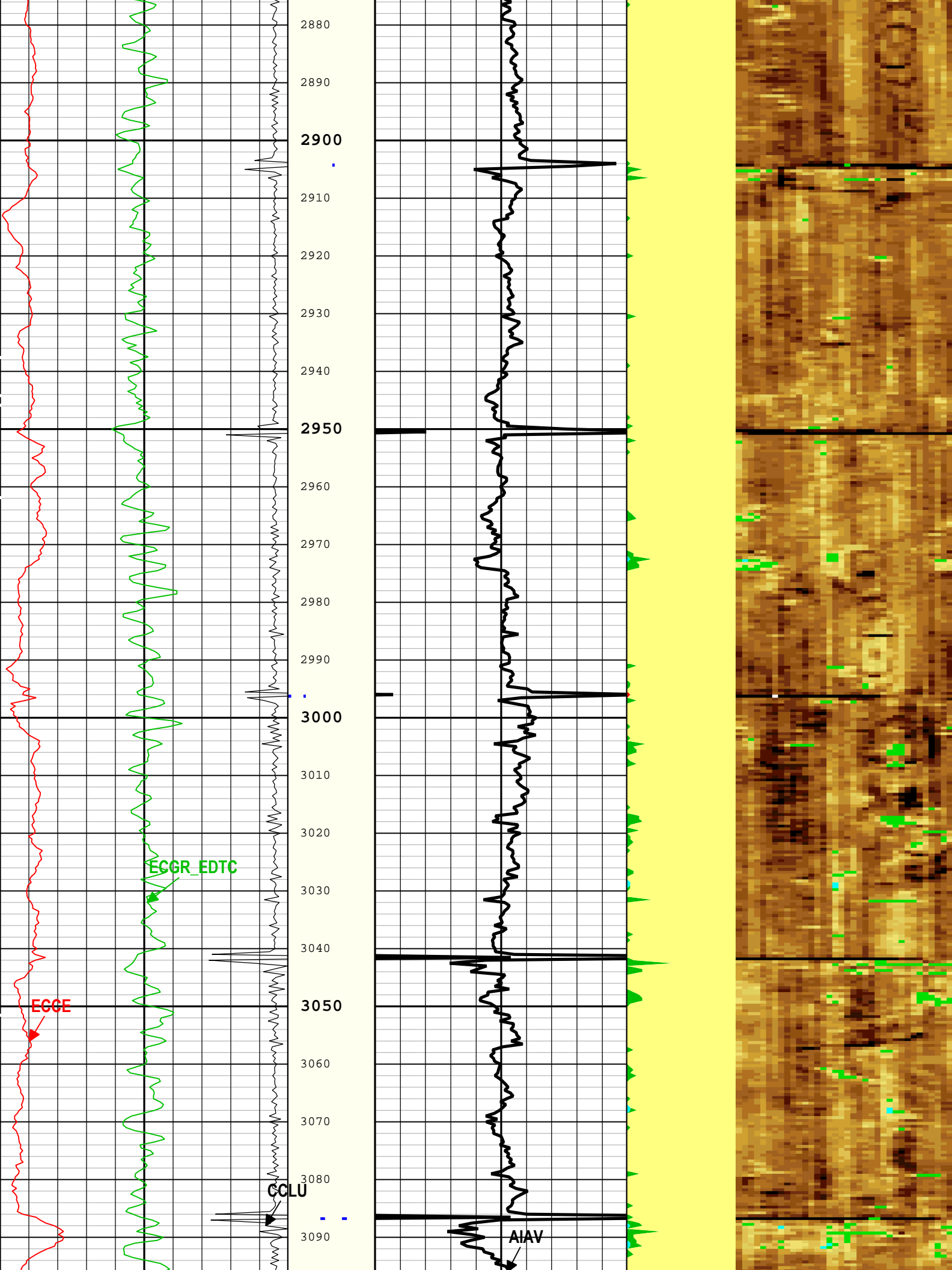


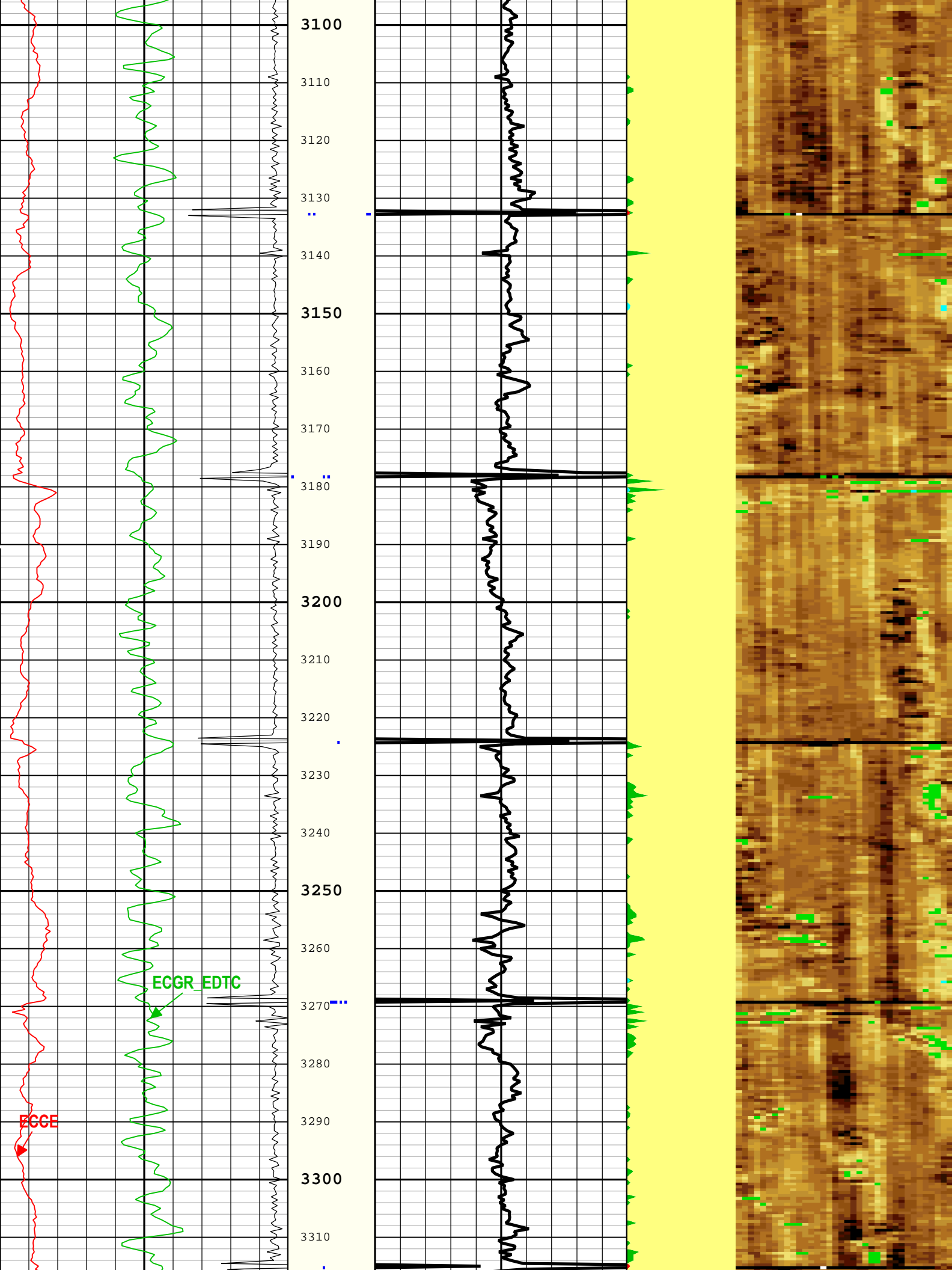


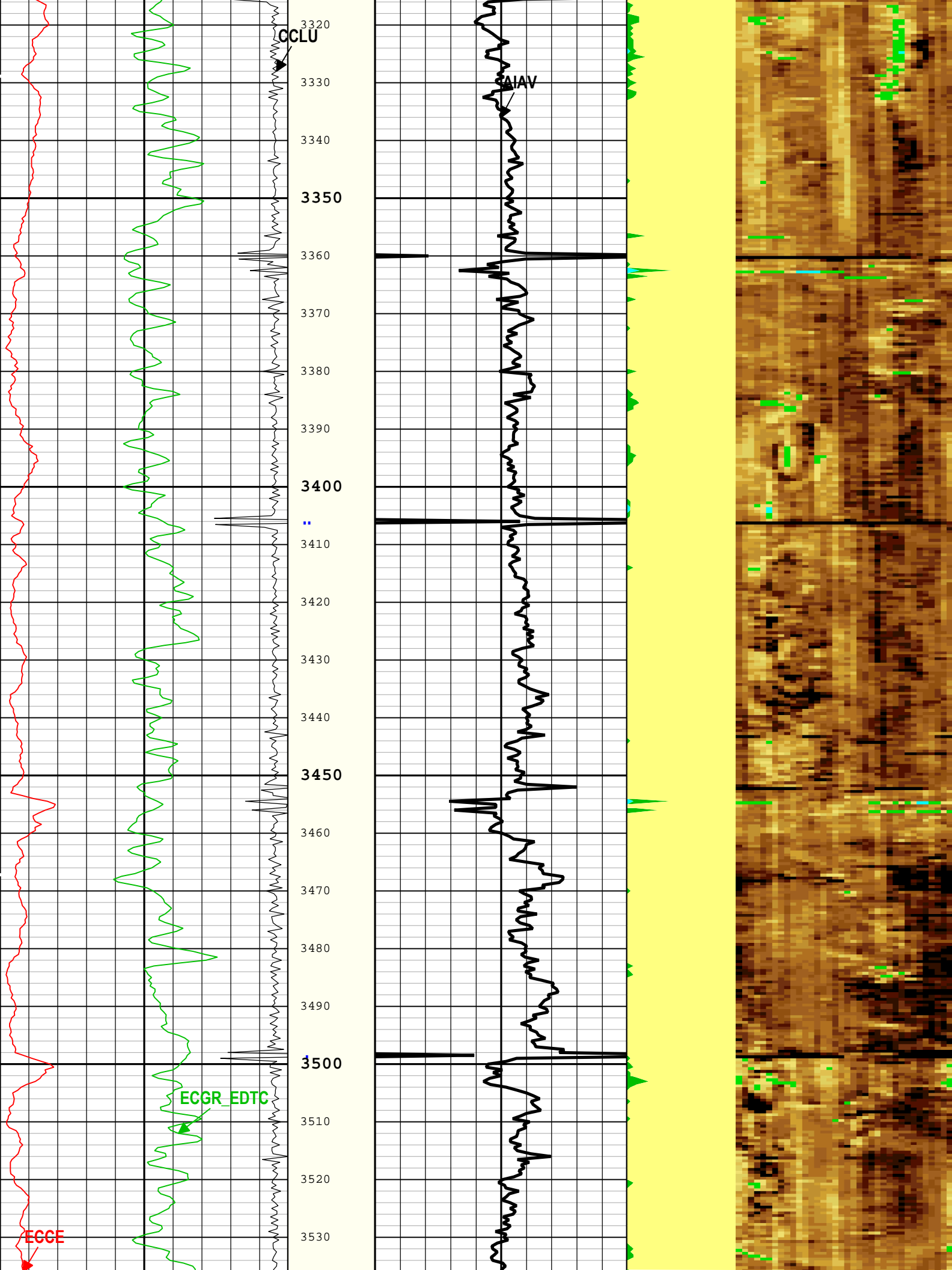


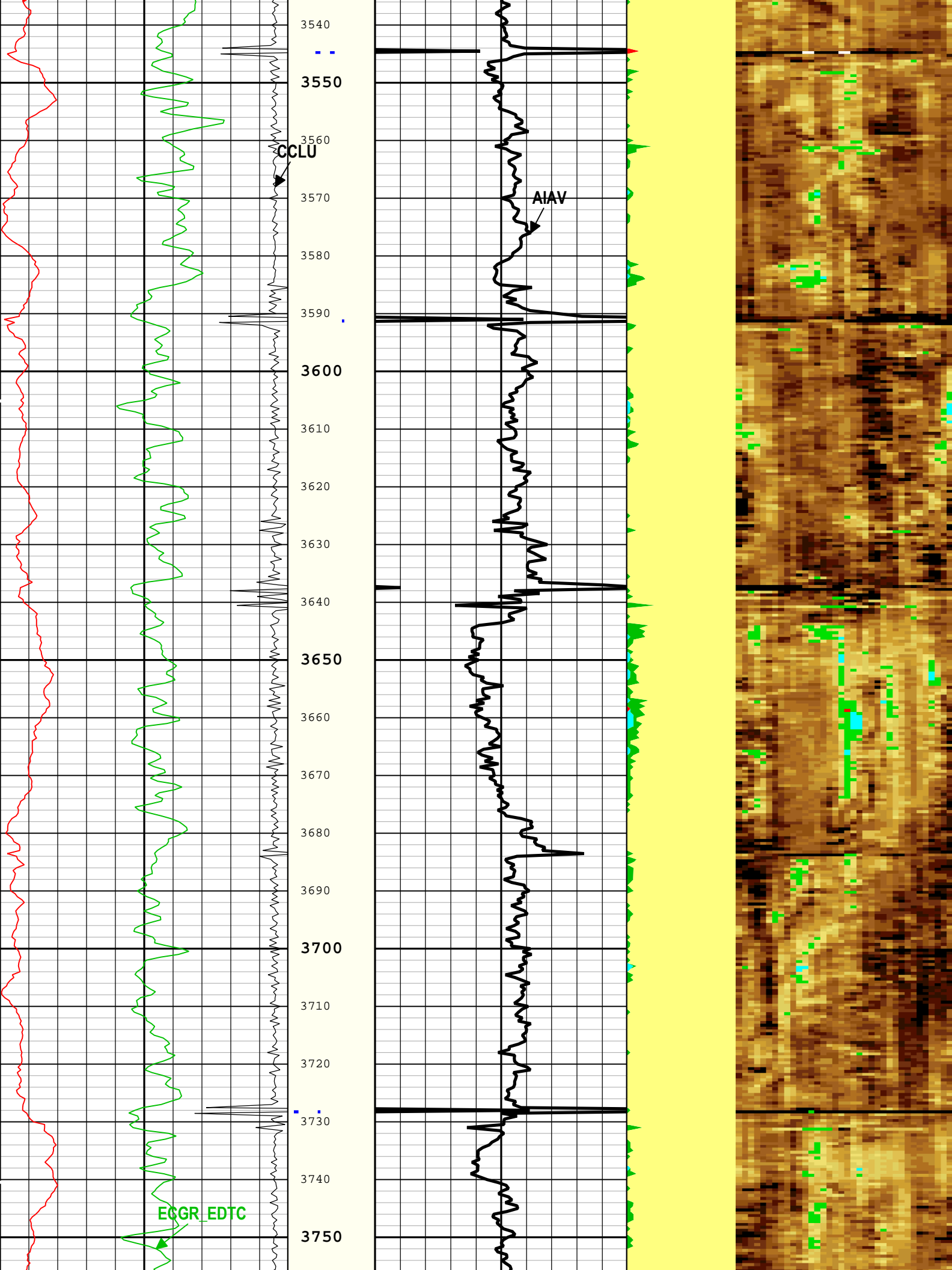


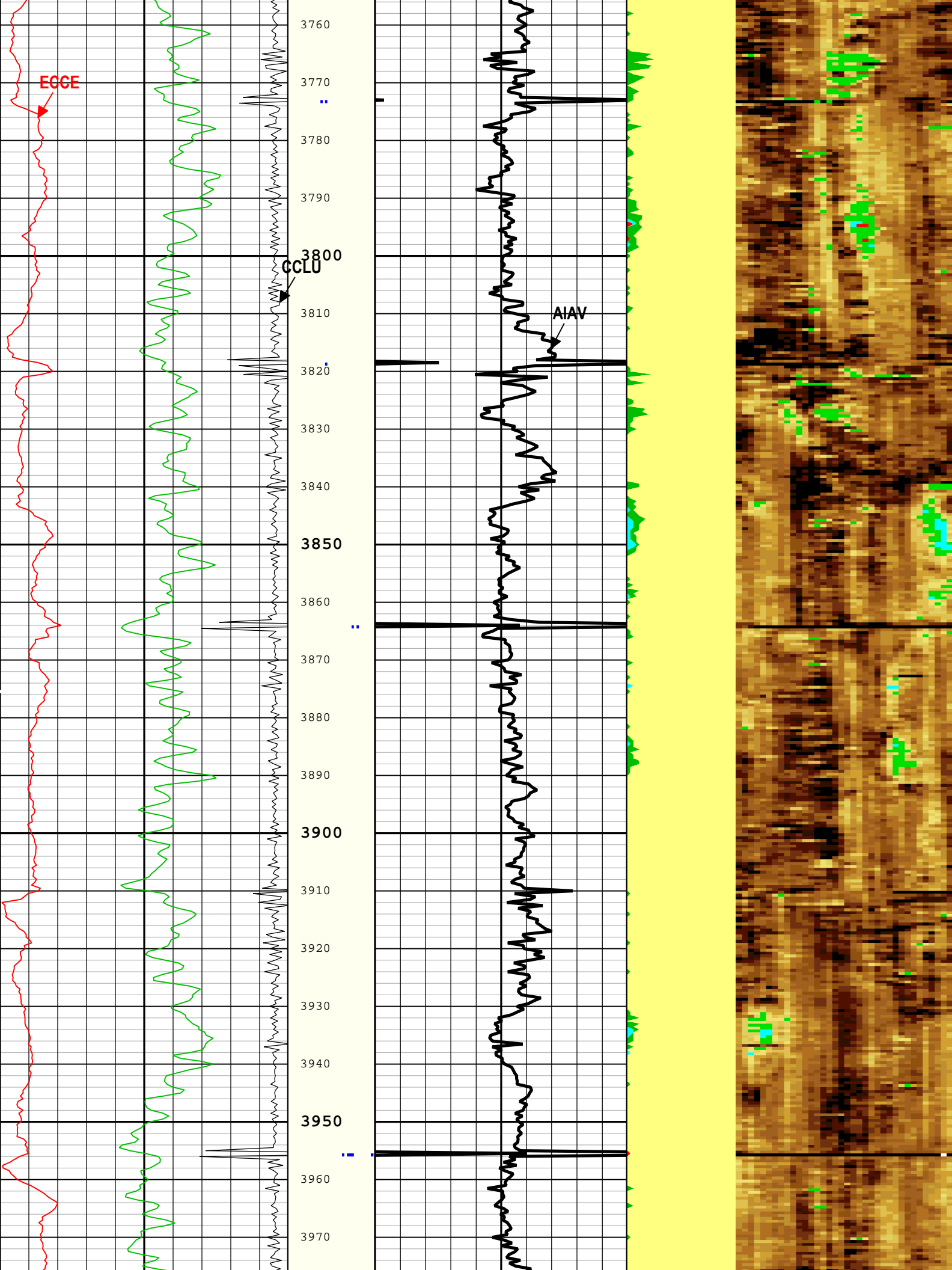


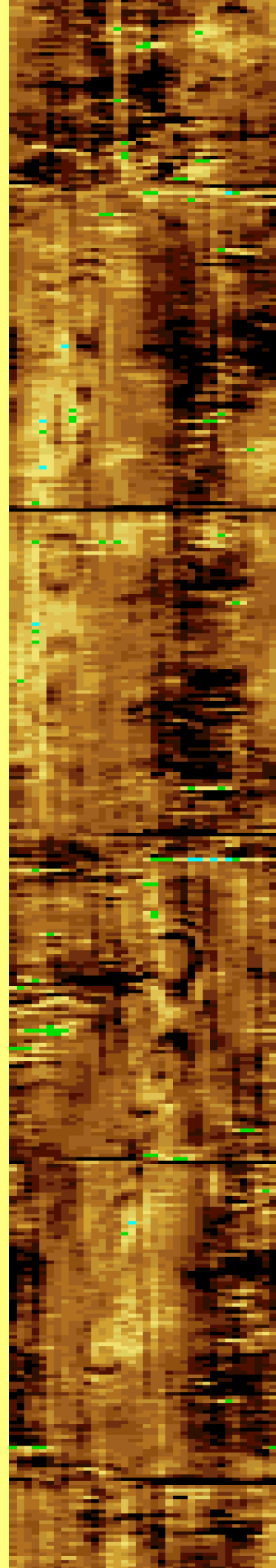
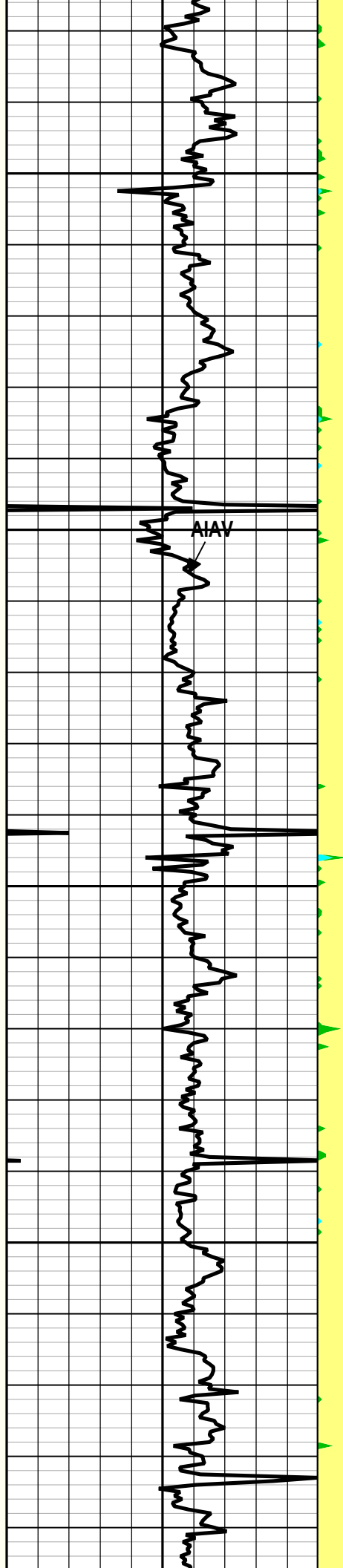
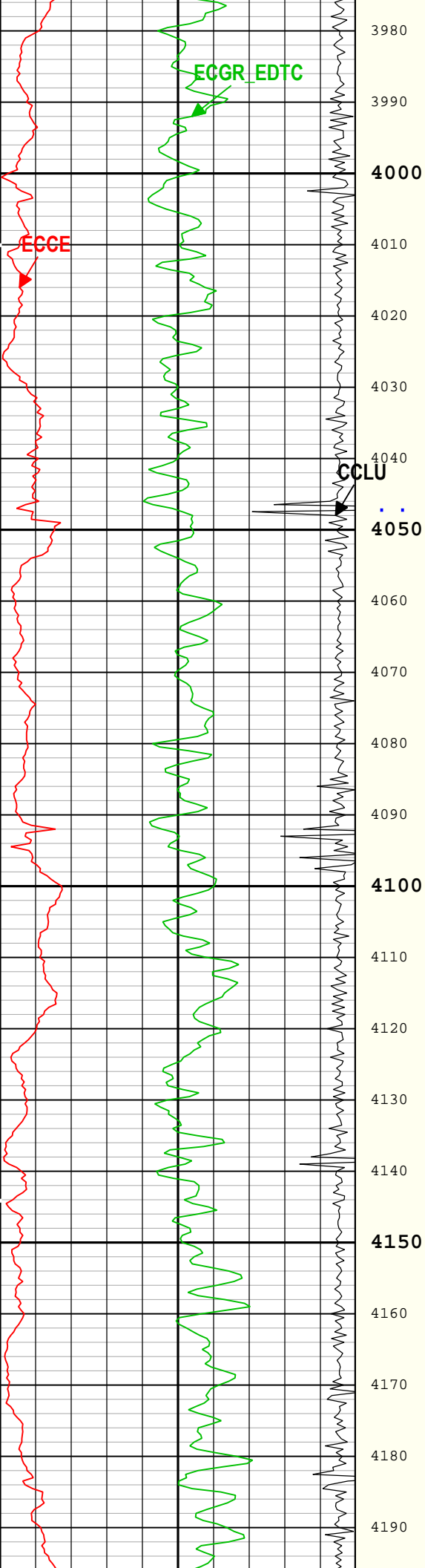


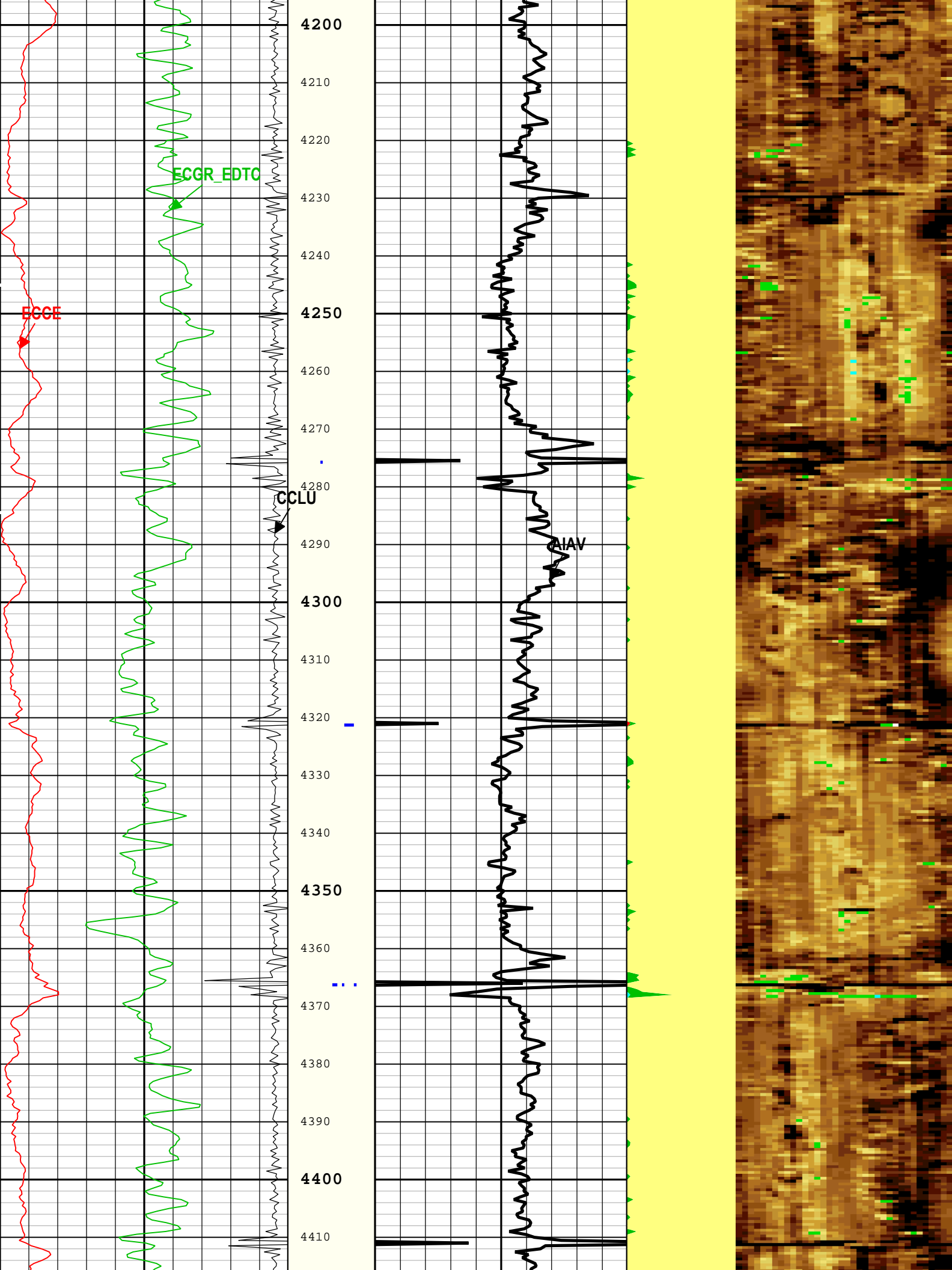


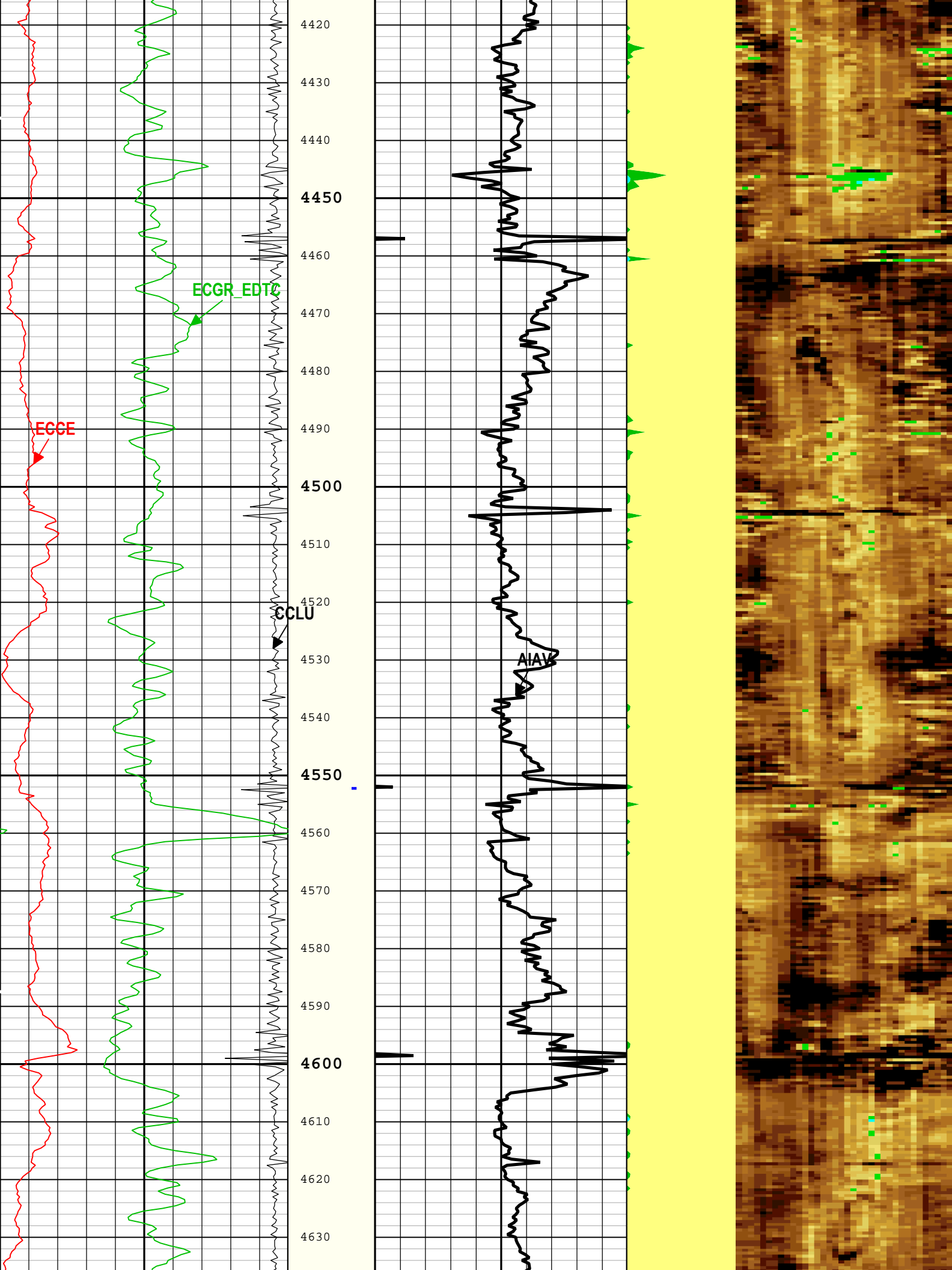


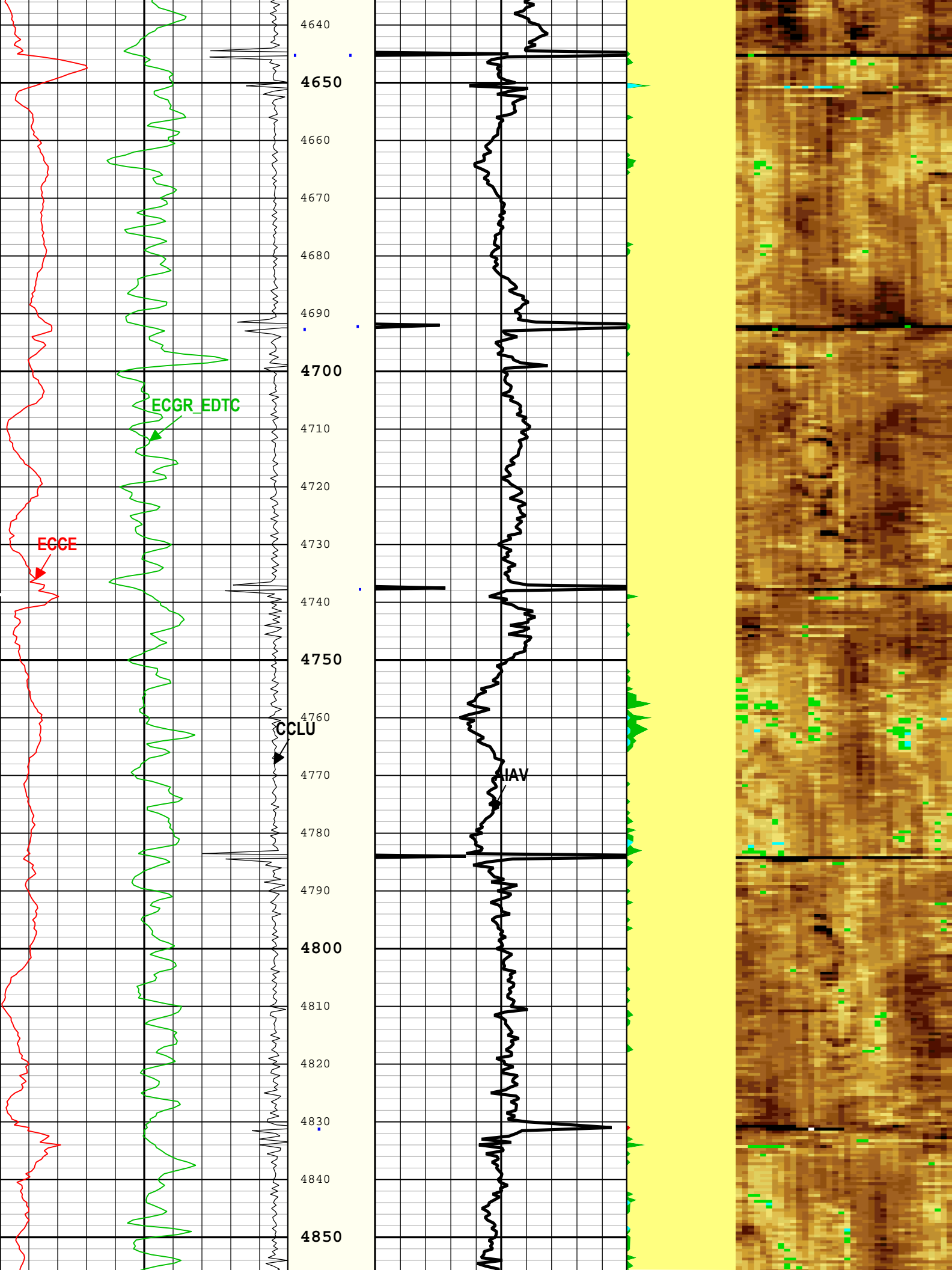


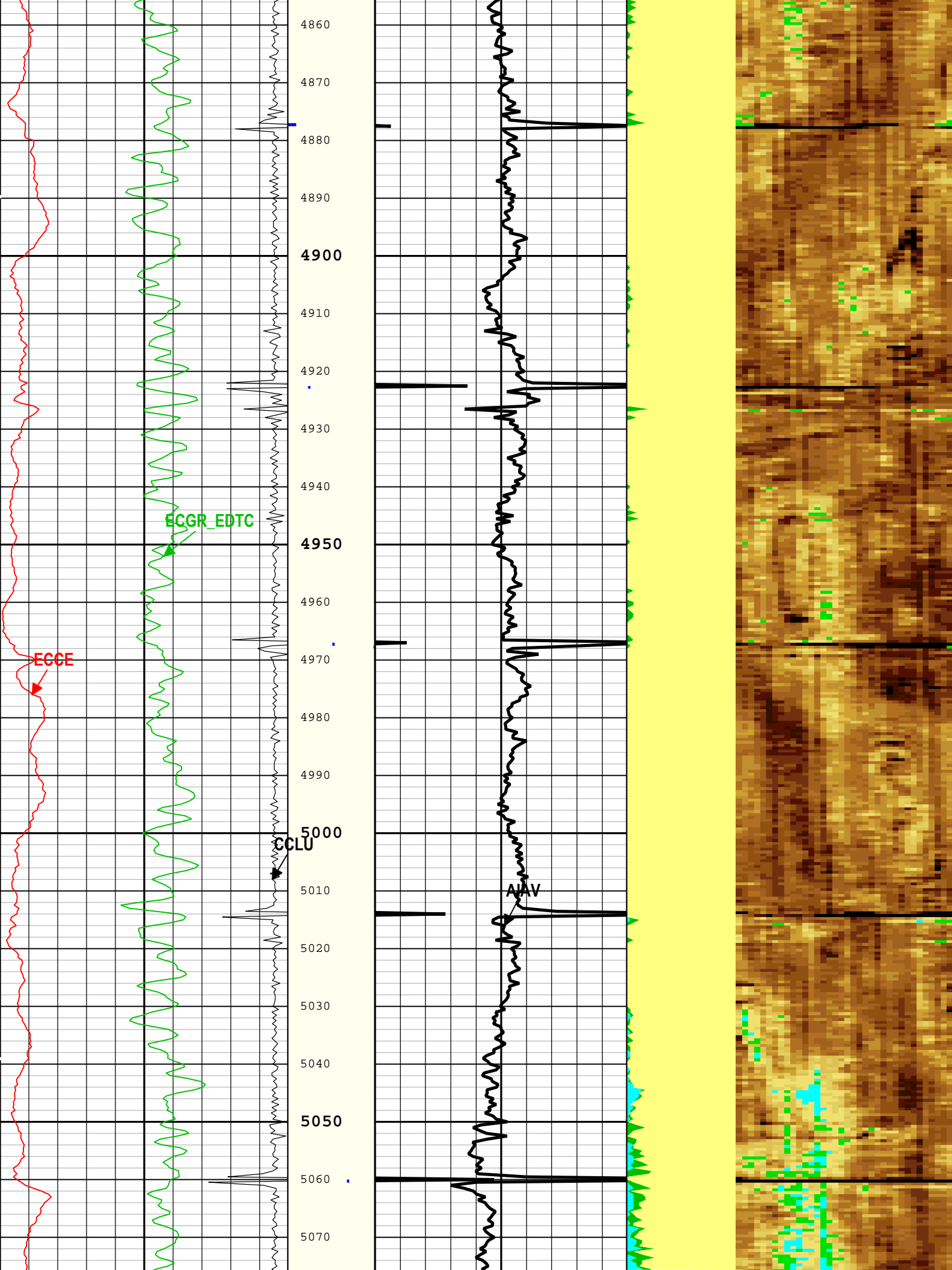


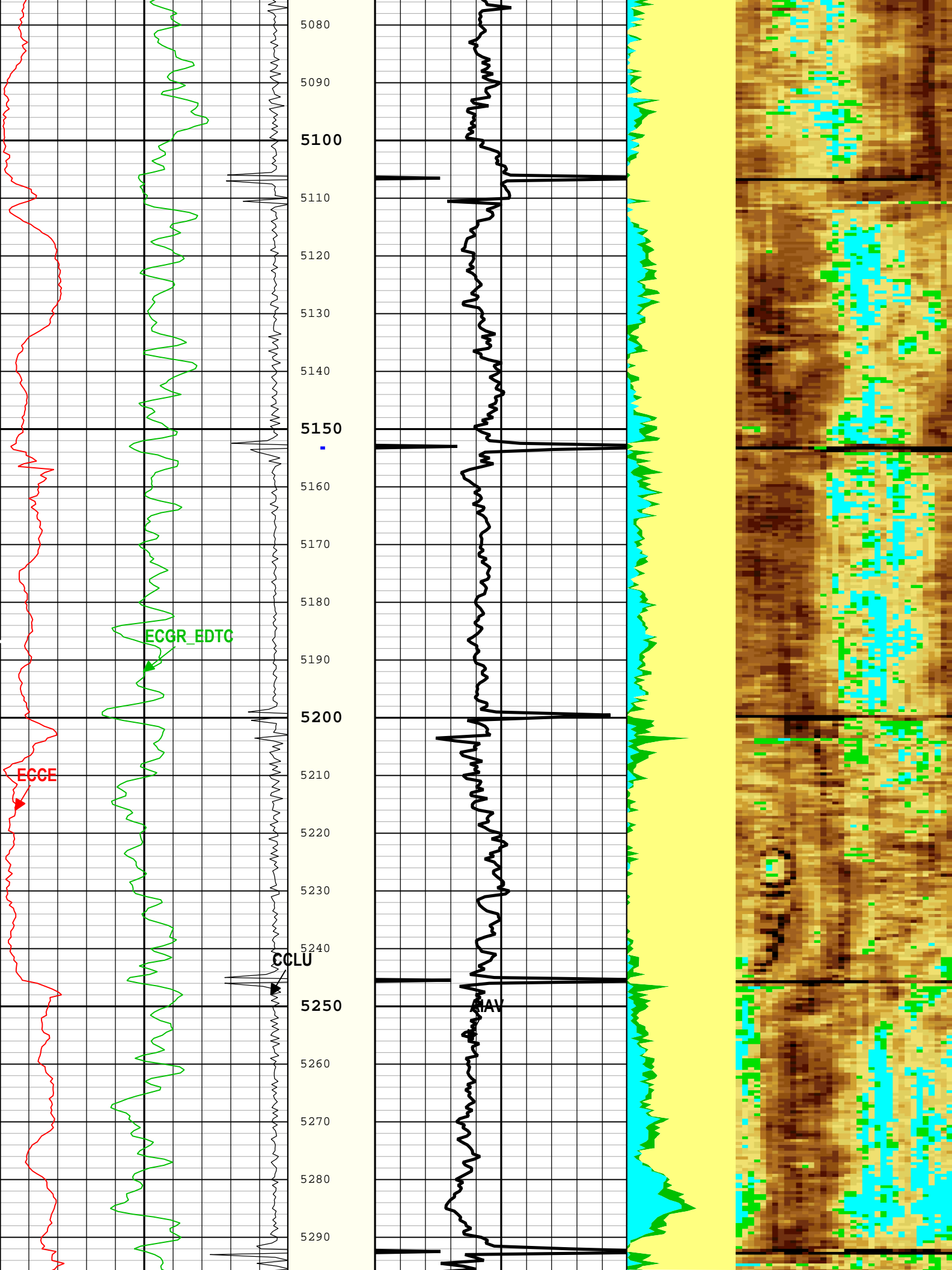


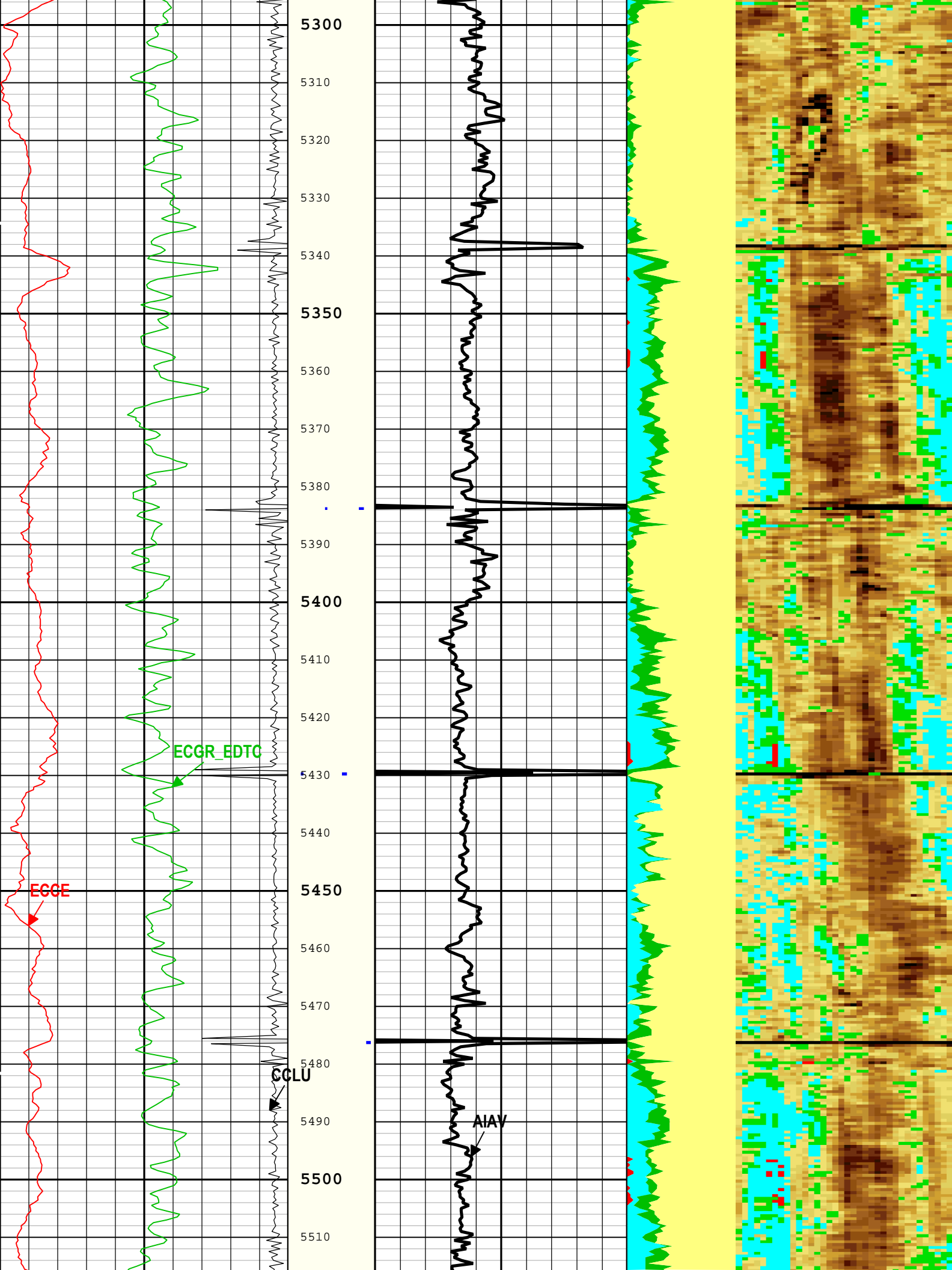


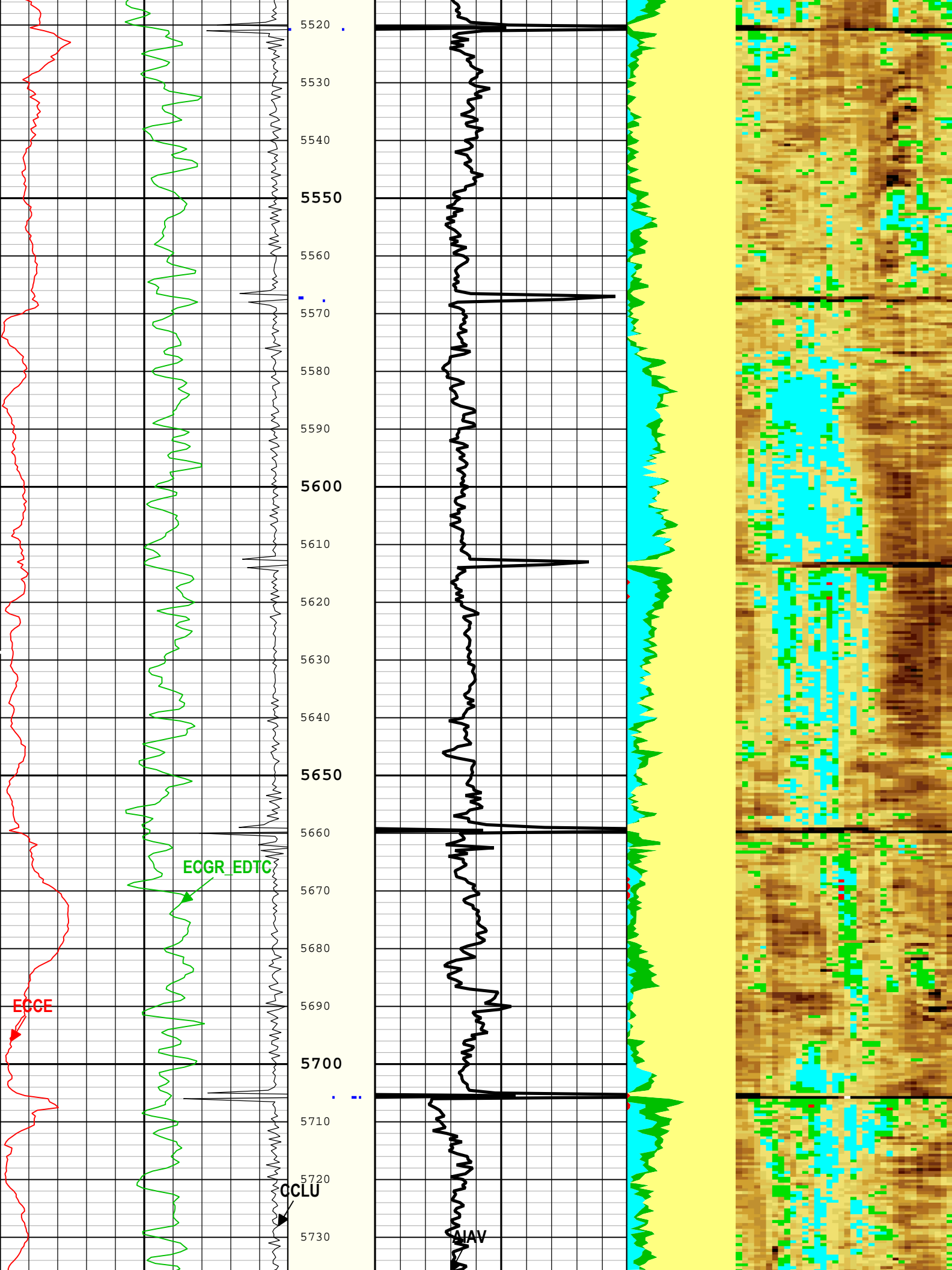


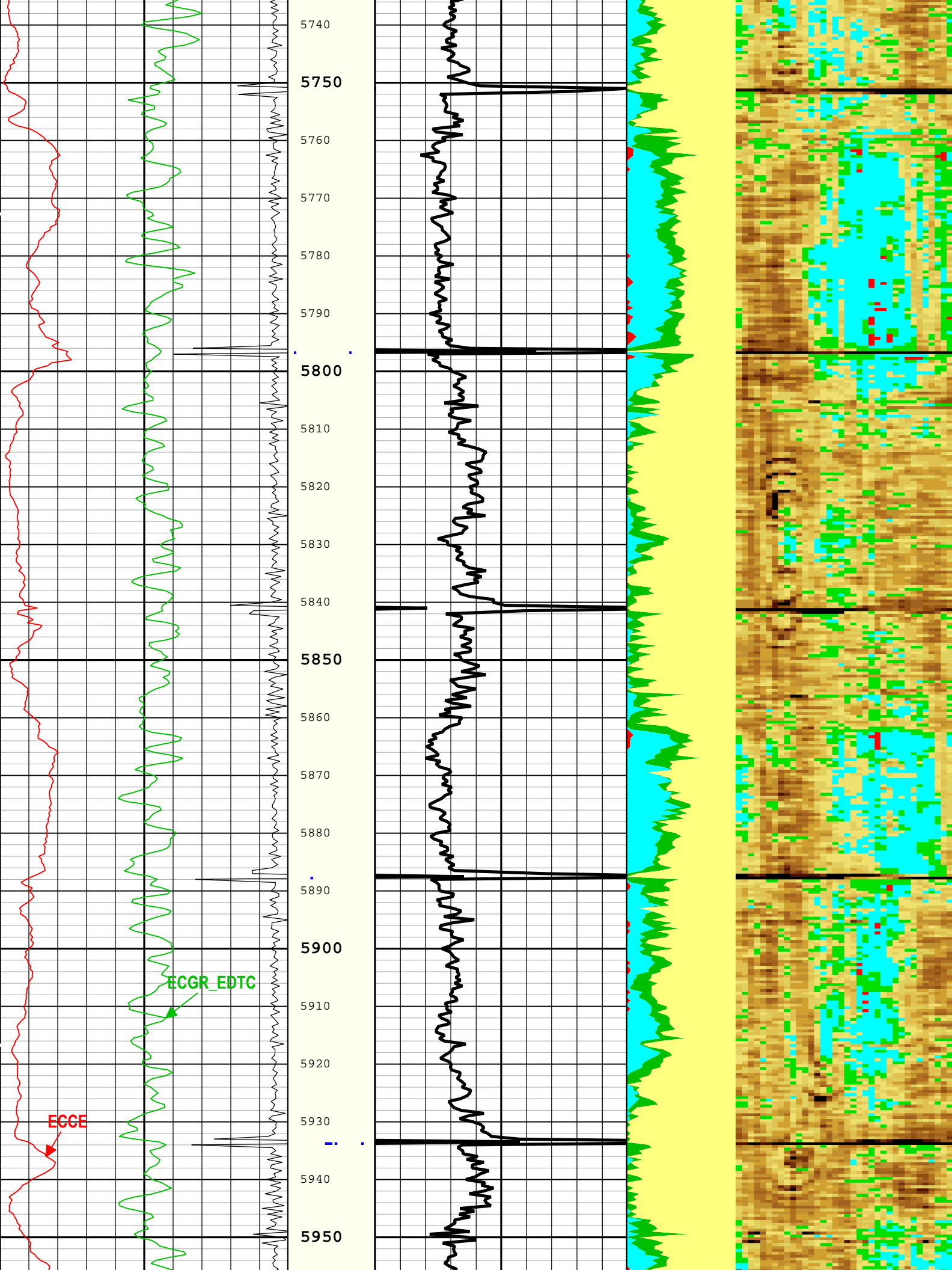


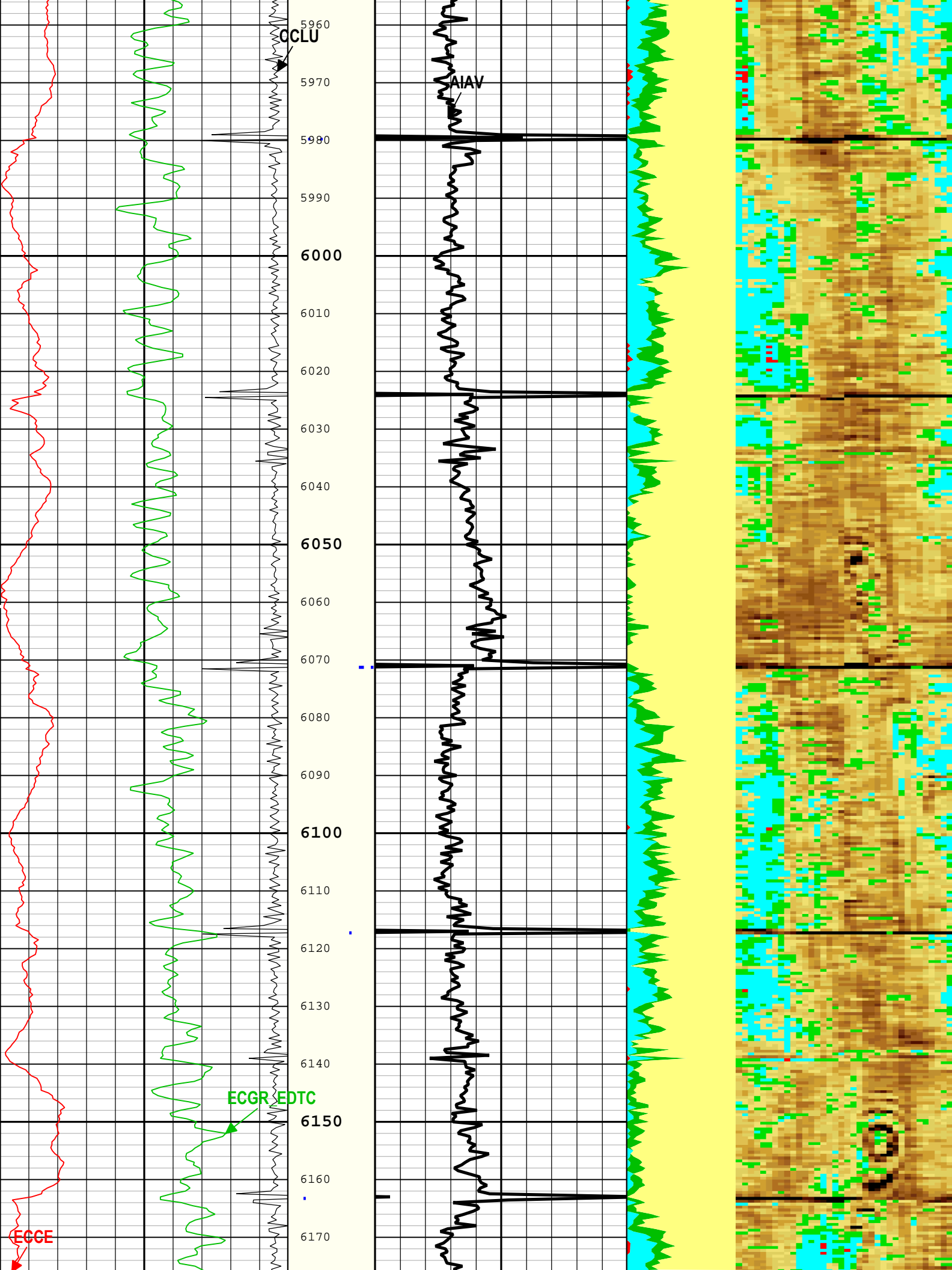


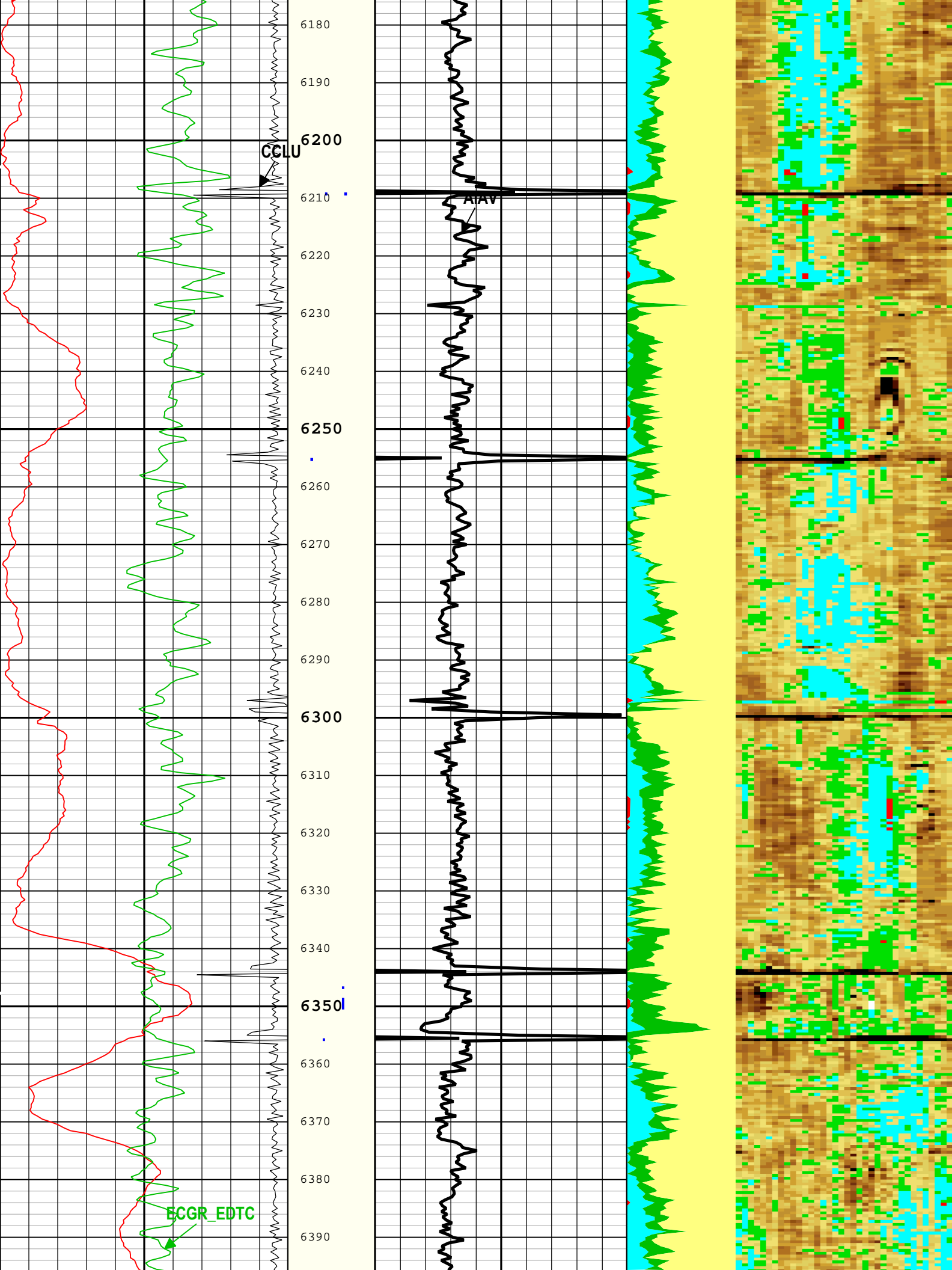


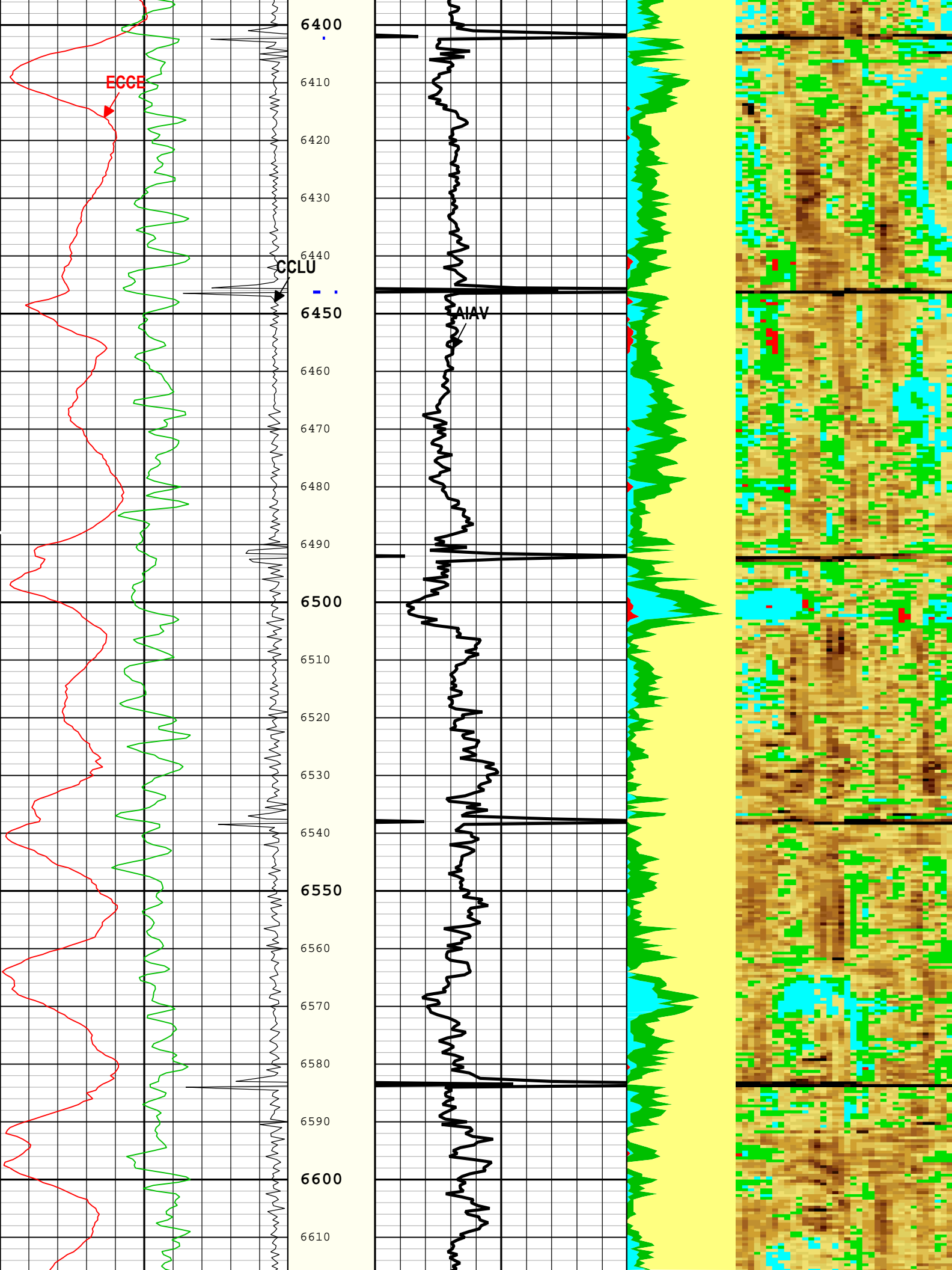


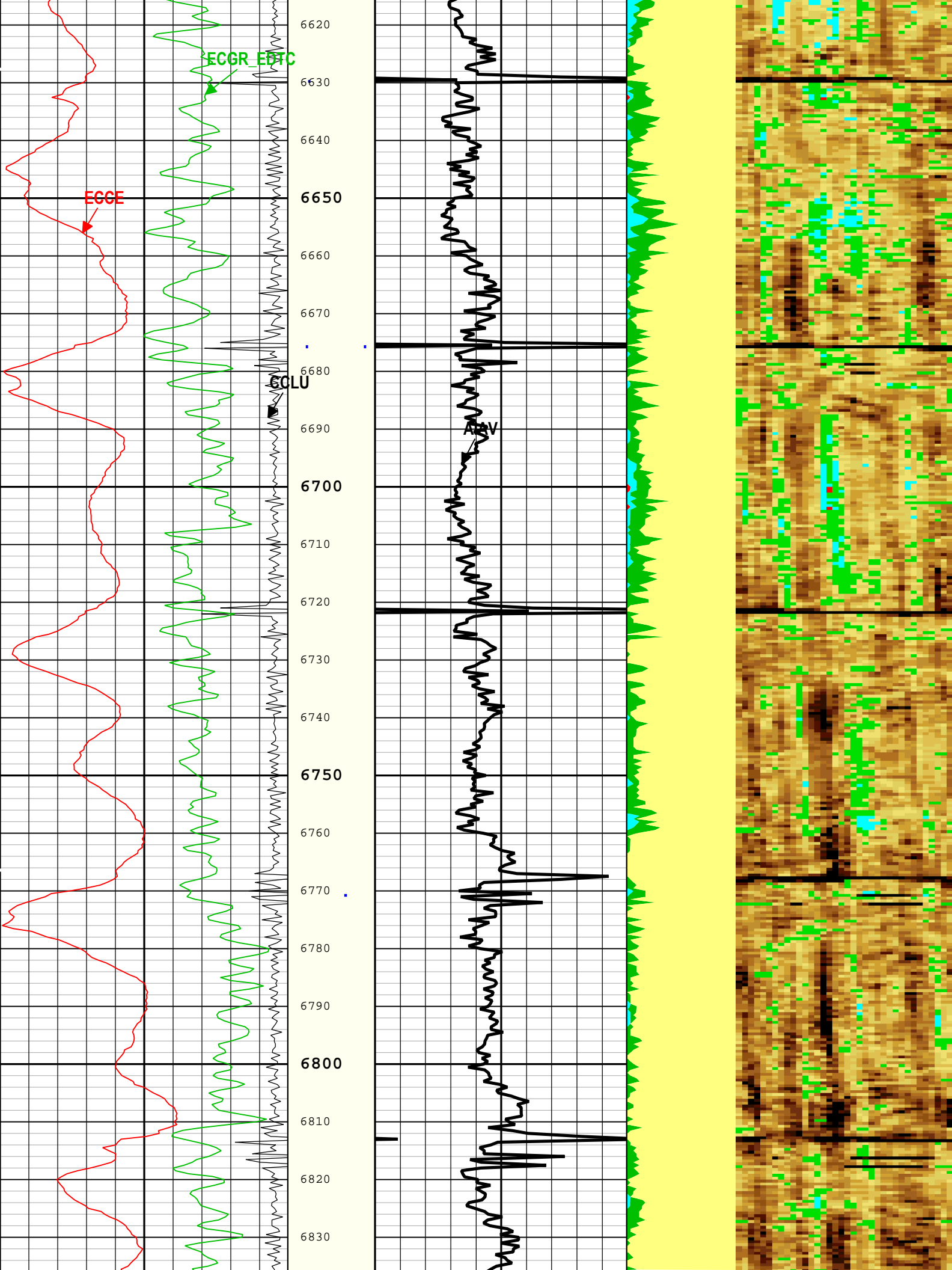


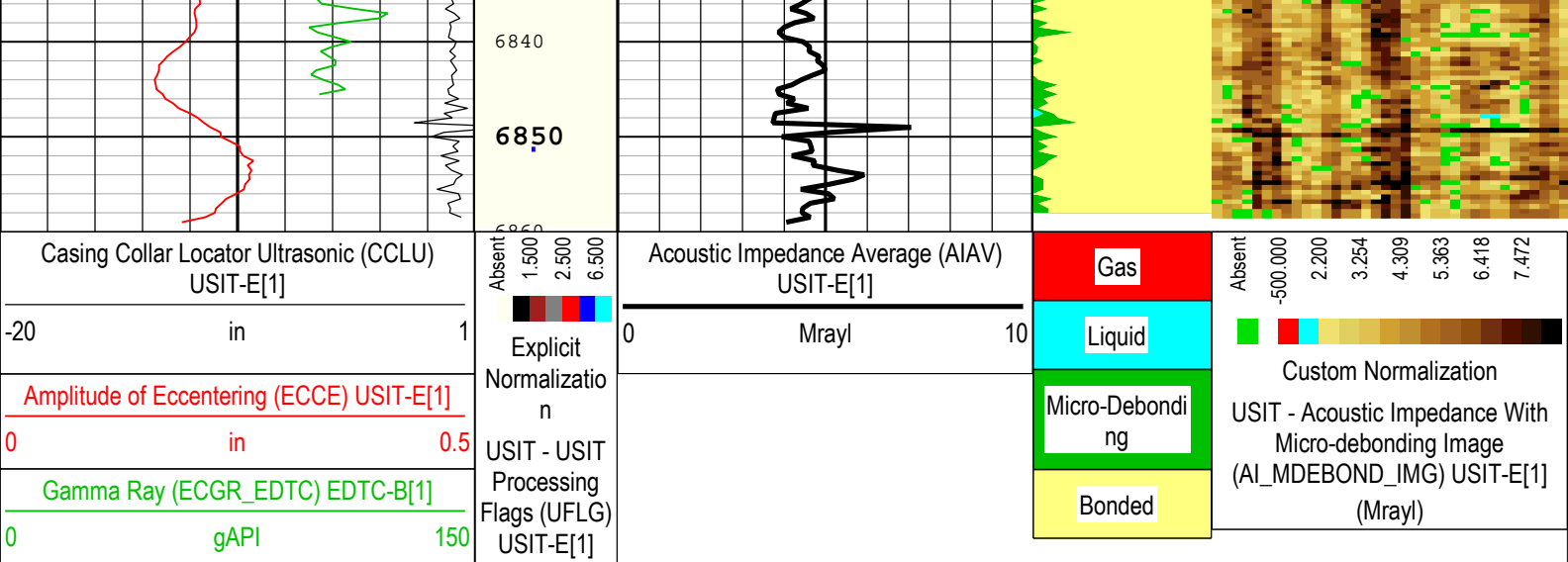












TIME_1900 - Time Marked every 60.00 (s)

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: 07-Nov-2017 20:47:20

Channel Processing Parameters

ONE: Parameters

Parameter	Description	Tool	Value	Unit
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	6860	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
FDII	FPM Data Interpolation Interval	USIT-E	0	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	
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	1.16	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0.1	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	1.48	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

ONEDepth Zoned Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	26	60	110
BS	13.5	110	2032
BS	8.5	2032	6860

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	18	dB
EMXV	EMEX Voltage	USIT-E	90	V
HRES	Horizontal Resolution	USIT-E	10 deg	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
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	
WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	71.88	us

ONE

0 PSI Repeat Pass

Software Version

Acquisition System	Version
Maxwell 2017 SP3	7.3.92069.3100
Application Patch	Wireline_NPD-ICE2-2017SP3_7.3.93033

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[3]:Up	Up	1987.43 ft	2527.22 ft	07-Nov-2017 1:20:38 PM	07-Nov-2017 1:25:15 PM	ON	1.39 ft	Yes

All depths are referenced to toolstring zero

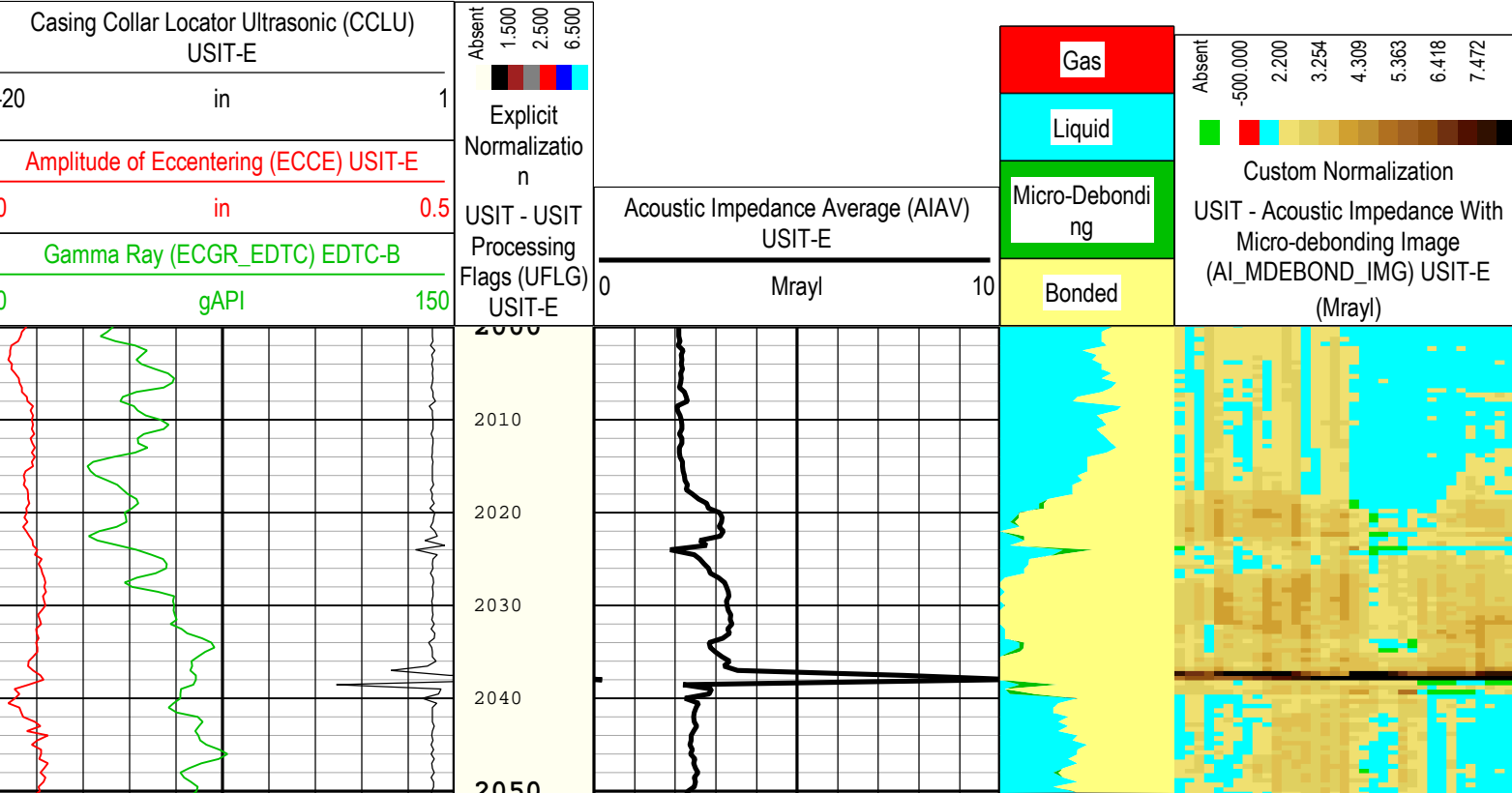
Log

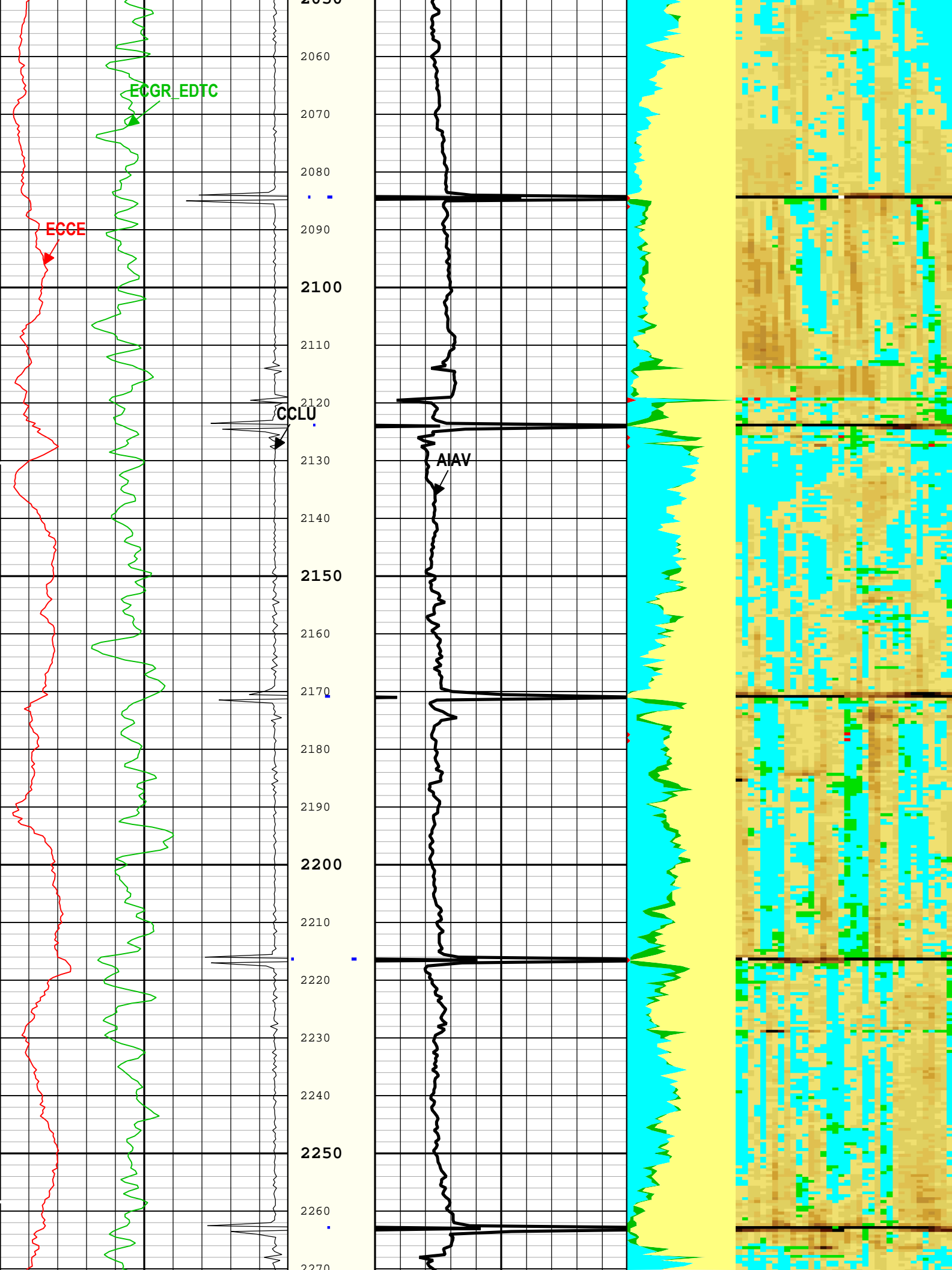
Company:Noble Energy Inc Well:Hullabaloo State Y21-726

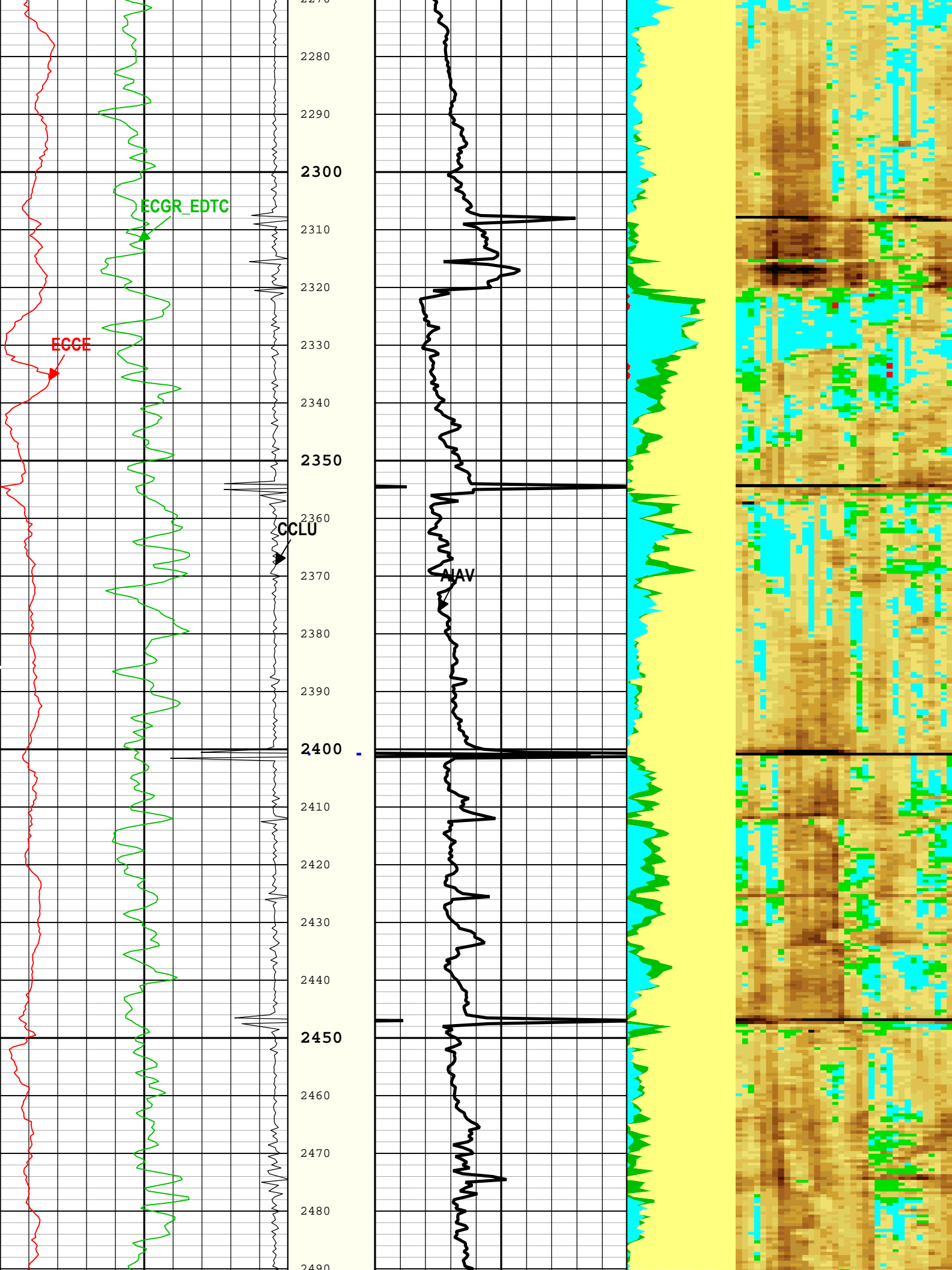
ONE: Log[3]:Up:S006

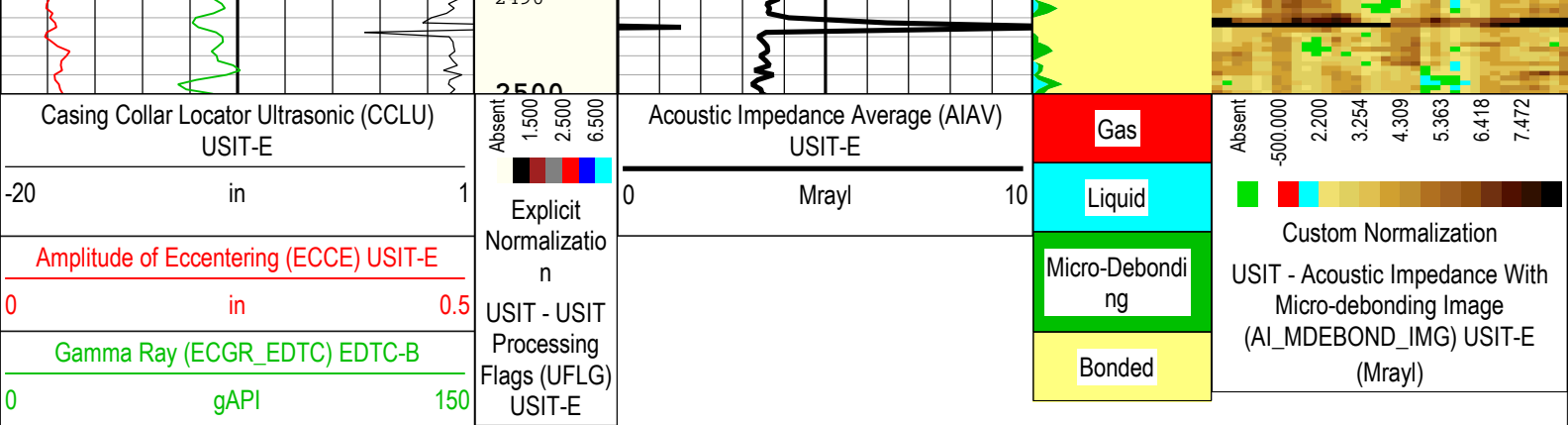
Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 07-Nov-2017 20:47:26

TIME_1900 - Time Marked every 60.00 (s)









EMXV	EMEX Voltage	USIT-E	70	V
HRES	Horizontal Resolution	USIT-E	10 deg	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
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	
WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	71.88	us

XYZ

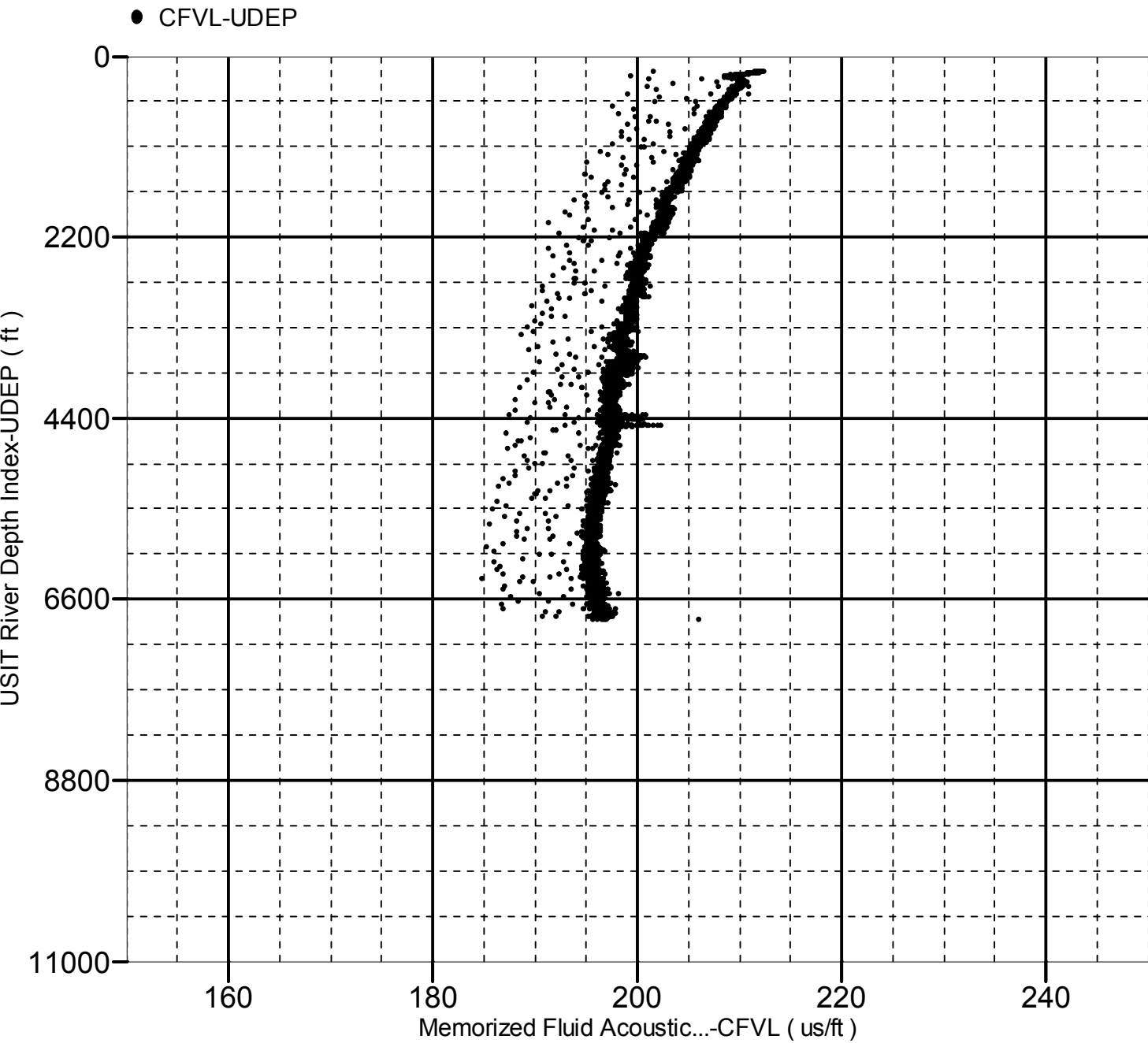
Company:Noble Energy Inc Well:Hullabaloo State Y21-726

Composite 1:S006

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 60.00 to 6860.00 ft



XYZ

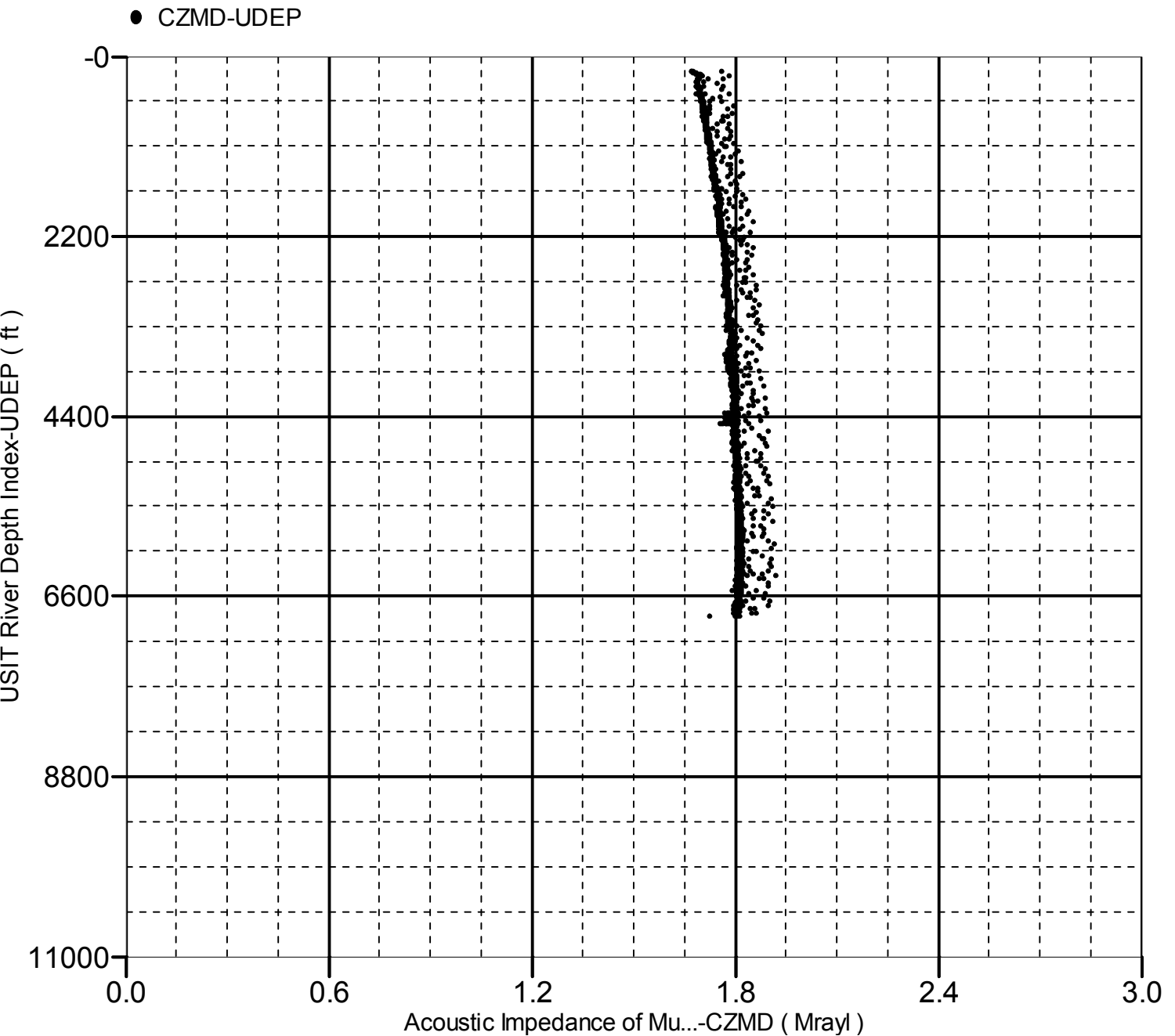
Company:Noble Energy Inc Well:Hullabaloo State Y21-726

Composite 1:S006

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 60.00 to 6860.00 ft



Company: Noble Energy Inc

Well: Hullabaloo State Y21-726

Field: Wattenberg

Schlumberger

County:	Weld
State:	Colorado
UltraSonic Summary Print	