

Company: Noble Energy Inc.

Well: EMMY H25-711

Field: DJ BASIN

County: Weld State: Colorado

UltraSonic Summary Print

County: Weld
Field: DJ BASIN
Location: SW SE SEC:25 TWN:3N RNG: 65W
Well: EMMY H25-711
Company: Noble Energy Inc.

Location:		SW SE SEC:25 TWN:3N RNG: 65W	Elev.:	K.B.	4835.00 ft
Permanent Datum:				G.L.	4805.00 ft
Log Measured From:				D.F.	4835.00 ft
Drilling Measured From:					
API Serial No.	Section:	Township:	Range:		
05-123-46968	25	3N	65W		

Logging Date 01-Nov-2018

Run Number ONE

Depth Driller 17528.00 ft

Schlumberger Depth 17528.00 ft

Bottom Log Interval 6890.00 ft

Top Log Interval 58.00 ft

Casing Fluid Type BRINE

Salinity

Density 8.4 lbm/gal

Fluid Level 8.00 ft

BIT/CASING/TUBING STRING

Bit Size 8.50 in

From 1946.00 ft

To 17528.00 ft

Casing/Tubing Size 5.5 in

Weight 20 lbm/ft

Grade P110

From 0.00 ft

To 17513.00 ft

Max Recorded Temperatures 215 degF

Logger on Bottom 01-Nov-2018 11:15:00

Unit Number 2377

Location: Fort Morgan, CO

Recorded By Justin Ray

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.

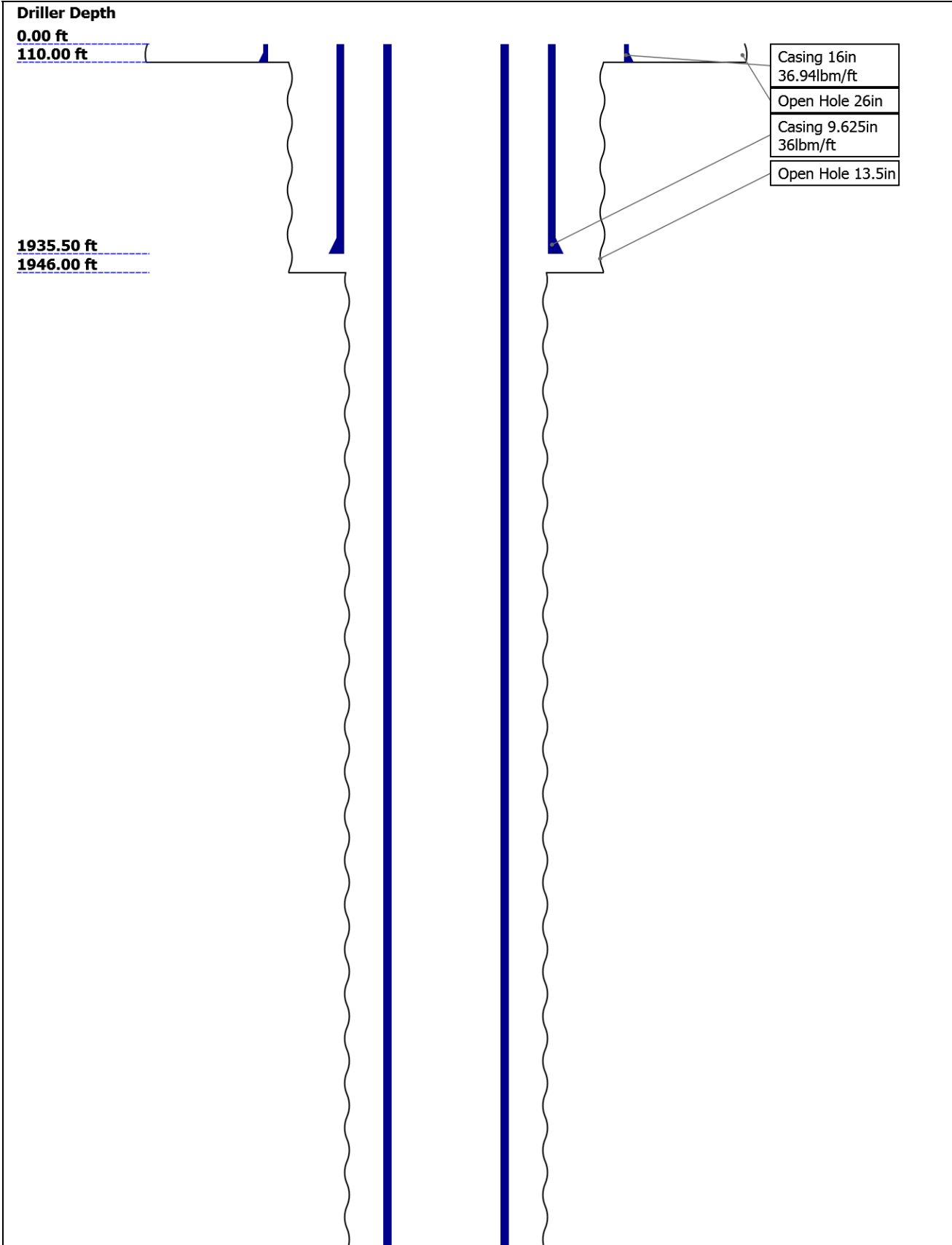
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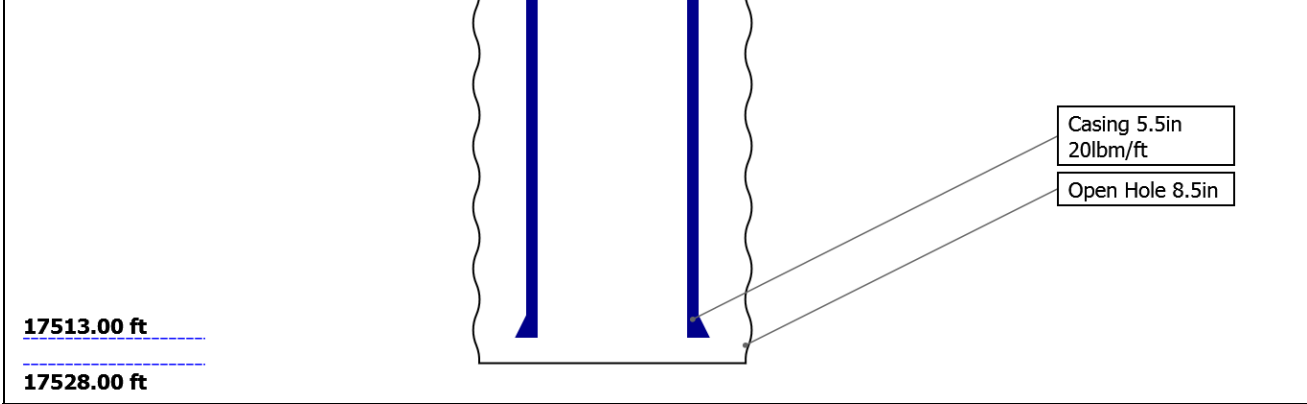
- 1. Header
- 2. Disclaimer
- 3. Contents
- 4. Well Sketch
- 5. Borehole Size/Casing/Tubing Record
- 6. Remarks and Equipment Summary
- 7. Depth Summary
- 8. USI Fluid Properties Measurement_1
- 9. ONE 2500 PSI Main Pass
 - 9.1 Integration Summary
 - 9.2 Software Version
 - 9.3 Composite Summary
 - 9.4 Log (DJ Basin Ultrasonic Cement Summary Report)
 - 9.5 Parameter Listing
- 10. ONE 0 PSI Repeat Pass
 - 10.1 Integration Summary

- in)
- 13. Tail

- 10.2 Software Version
- 10.3 Composite Summary
- 10.4 Log (DJ Basin Ultrasonic Cement Summary Report)
- 10.5 Parameter Listing
- 11. XYZ (USI Fluid Acoustic Slowness vs Depth 3.0 in)
- 12. XYZ (USI Acoustic Impedance of Mud vs Depth 3.0

Well Sketch

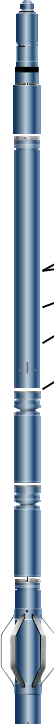




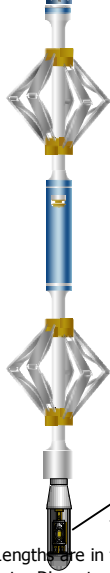
Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	0	110	1946			
Top Logger (ft)	0	110	1946			
Bottom Driller (ft)	110	1946	17528			
Bottom Logger (ft)	110	1946	17528			
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	1935.5	17513			
Bottom Logger (ft)	110	1935.5	17513			

Remarks and Equipment Summary

ONE: Toolstring				ONE: Remarks	
<div><div><div>Equip nameLengthMP nameOffset</div><div>LEH-QT29.54LEH-QT</div><div>EDTC-B:926.06316EDTH-B:9373EDTG-A:79527EDTC-B:9316</div><div>AH-184[2]19.56</div><div>AH-184[1]17.563763</div><div>USIT-E:1715.5625ECH-MFA:1991USAC-A:1725USIT-A:10</div></div><div></div></div>	Toolstring ran as per tool sketch			5" gemcos and boosters ran on USIT for tool centralization	
	Main pass logged with 2500 PSI surface induced. Repeat pass logged under 0 PSI.			BHT: 215 deg F	
	Thank you for choosing Schlumberger				

USIS-A:18
26
USSC-B:99
2
USRS-AB:
373
USI-SENS
OR:1064
USI-TX



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			
Length	24000.00 ft		
Conveyance Type	Wireline		
Rig Type	CRANE		
ONE:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well	All Schlumberger depth control procedures followed IDW used as primary depth control device Z-Chart used as secondary depth control device Log correlated to short joint at 6612.1-6623.5 FT	
Rig Up Length At Surface			
Rig Up Length At Bottom			
Rig Up Length Correction			
Stretch Correction	1.20 ft		
Tool Zero Check At Surface			

USIT - Fluid Properties Measurement

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[4]:Down	1990.52	6914.78

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 : 26.23m(86.06ft) to 38.10m(125.02ft)
MUD_N_FRP = 1.16
DFD = 1.01g/cm3(8.40lbm/gal)
CZMD median computed in free pipe normalization interval = 1.68 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 SP2	8.2.104493.3100

Pass Summary

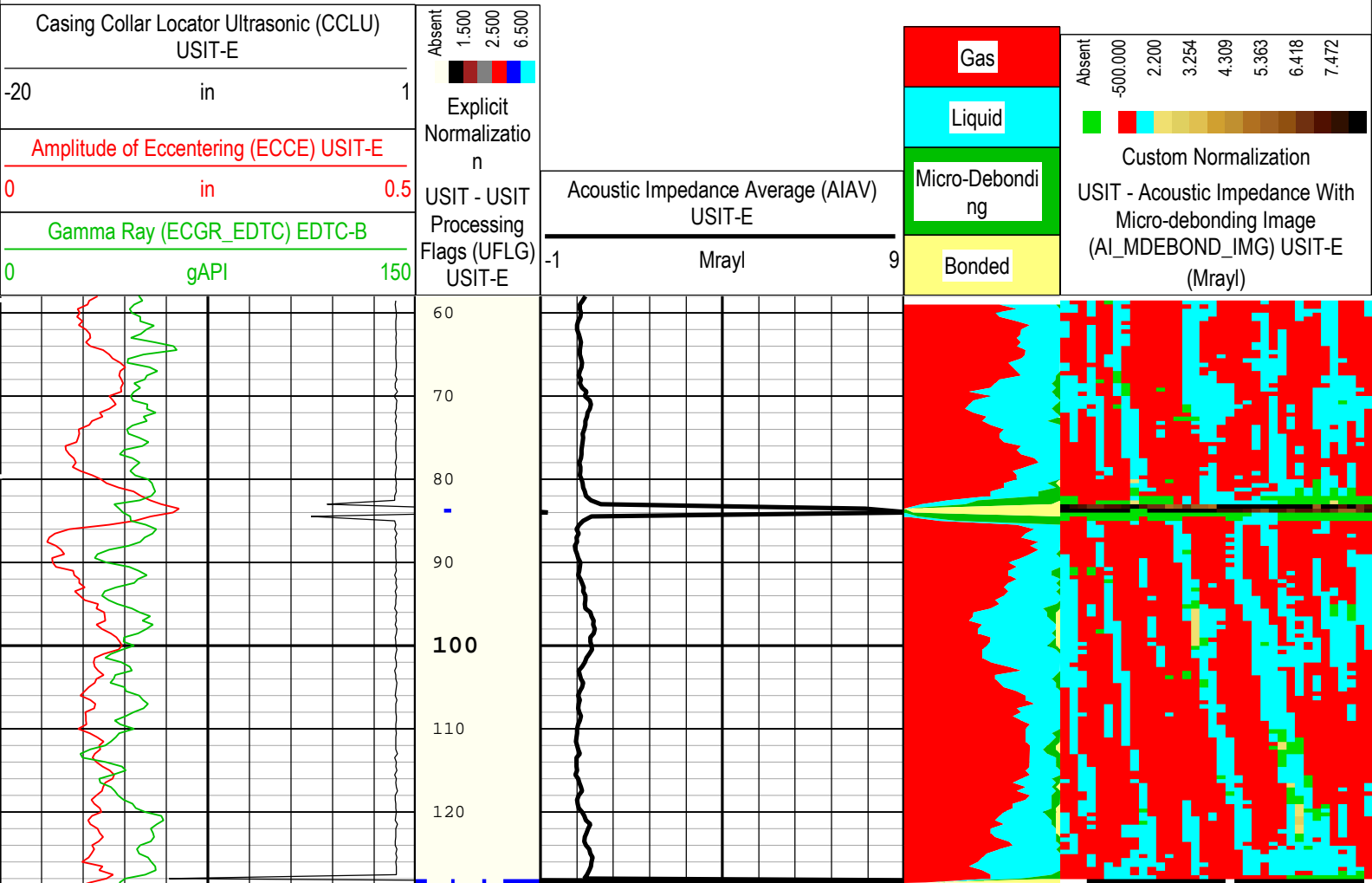
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Main[5]:Up	Up	57.83 ft	6922.43 ft	01-Nov-2018 11:40:54 AM	01-Nov-2018 12:48:32 PM	ON	7.66 ft	Yes

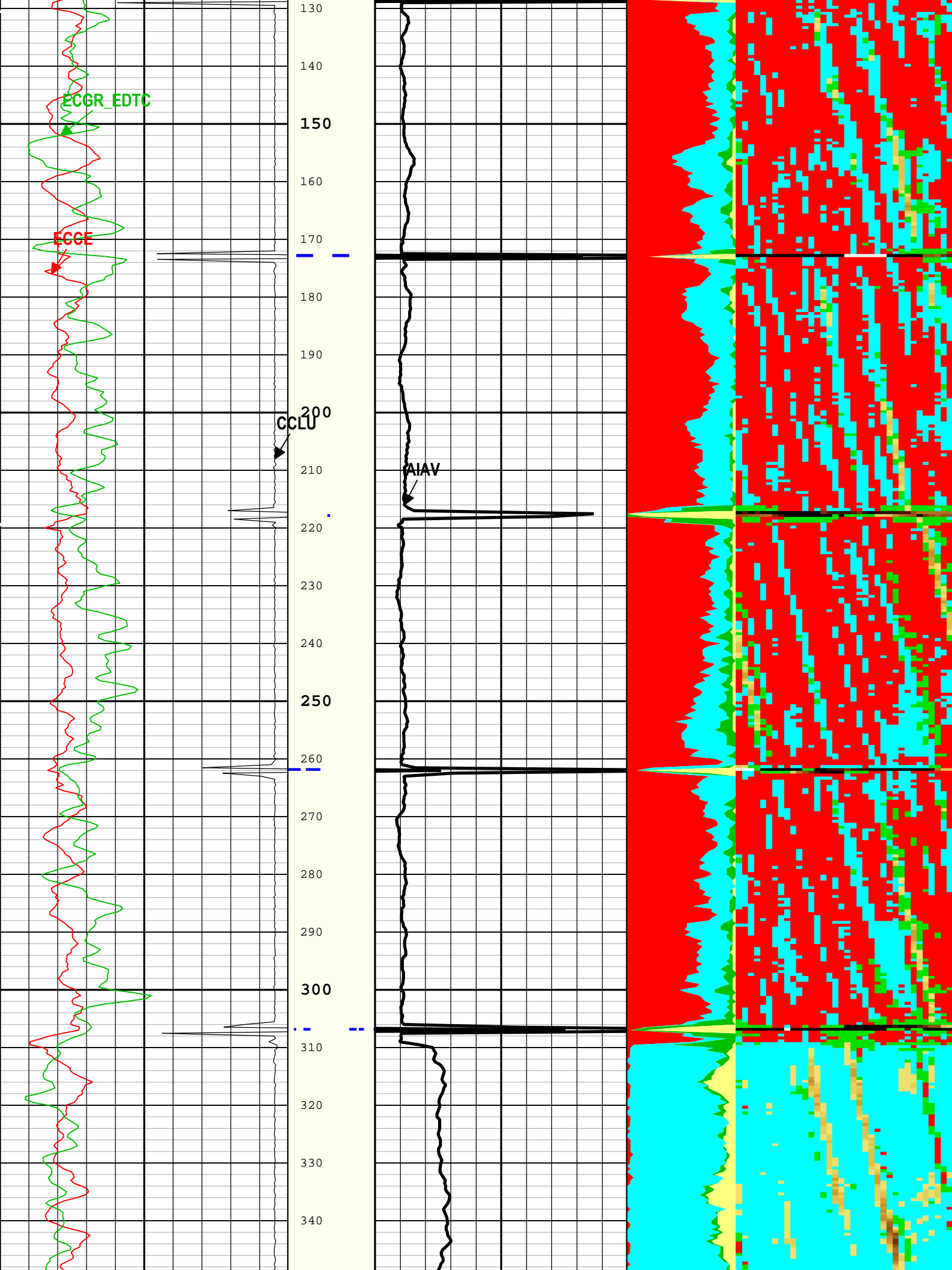
All depths are referenced to toolstring zero

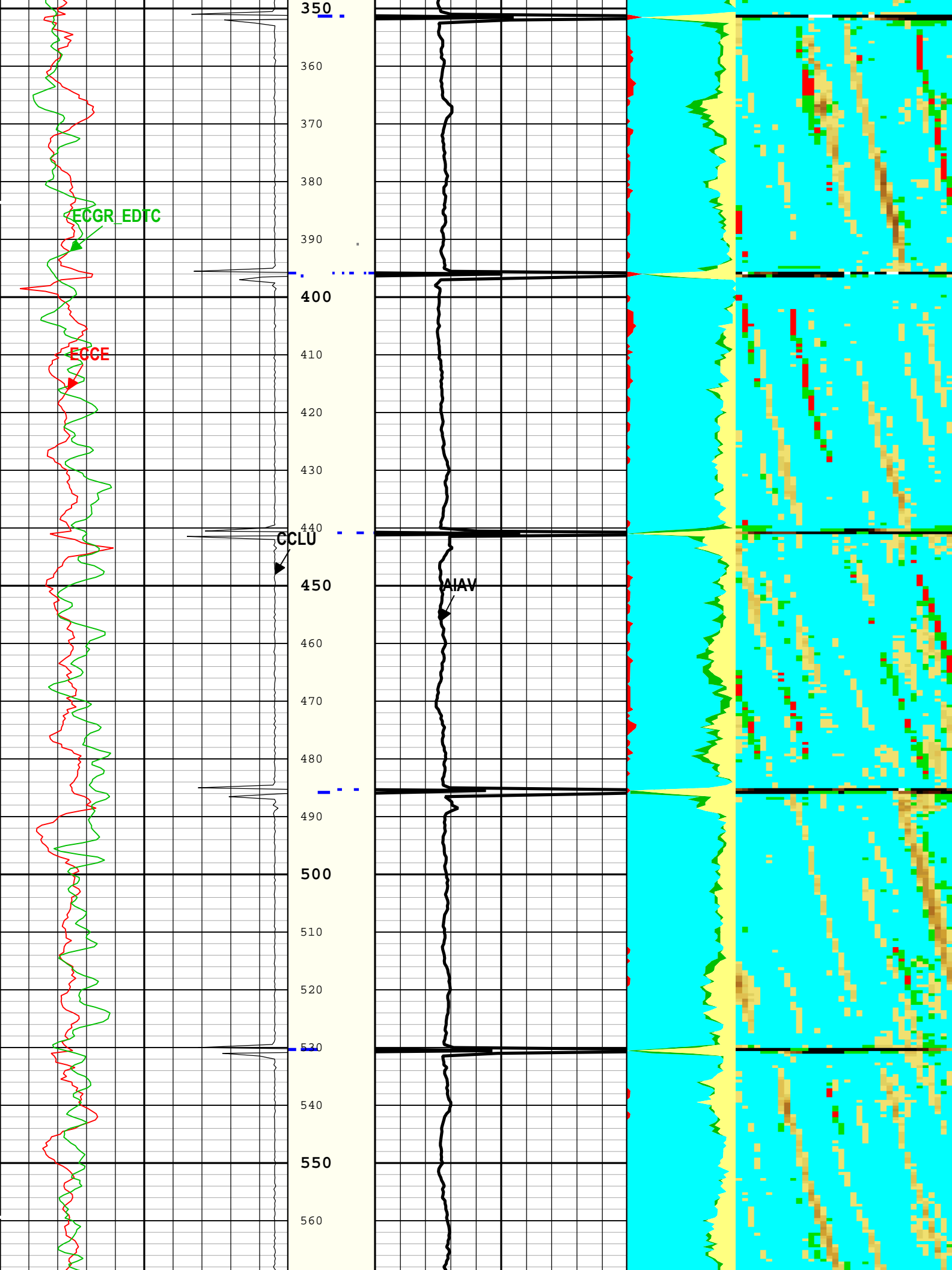
Log	Company:Noble Energy Inc. Well:EMMY H25-711 ONE: Main[5]:Up:S011
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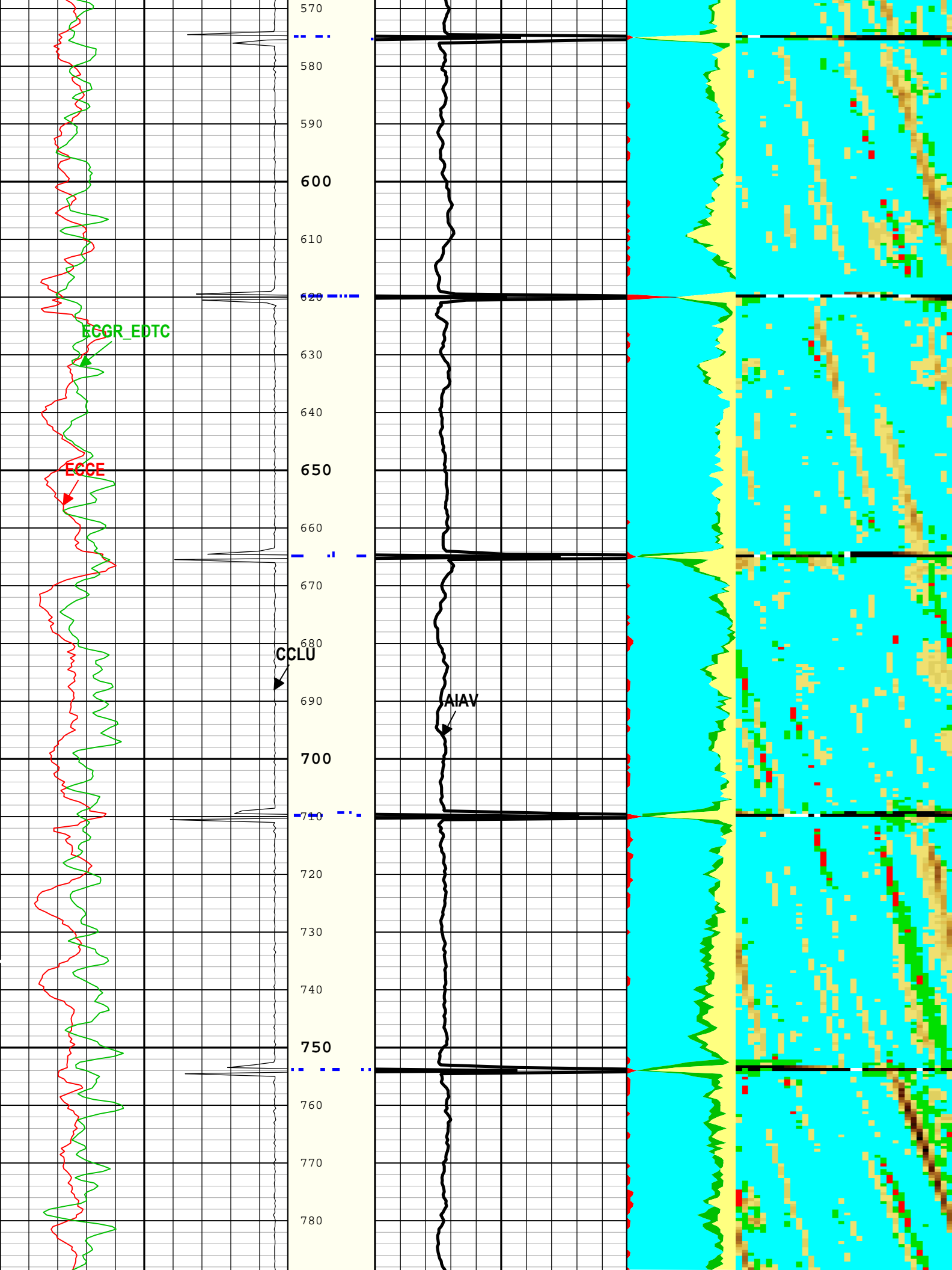
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Creation Date: 01-Nov-2018 15:05:30

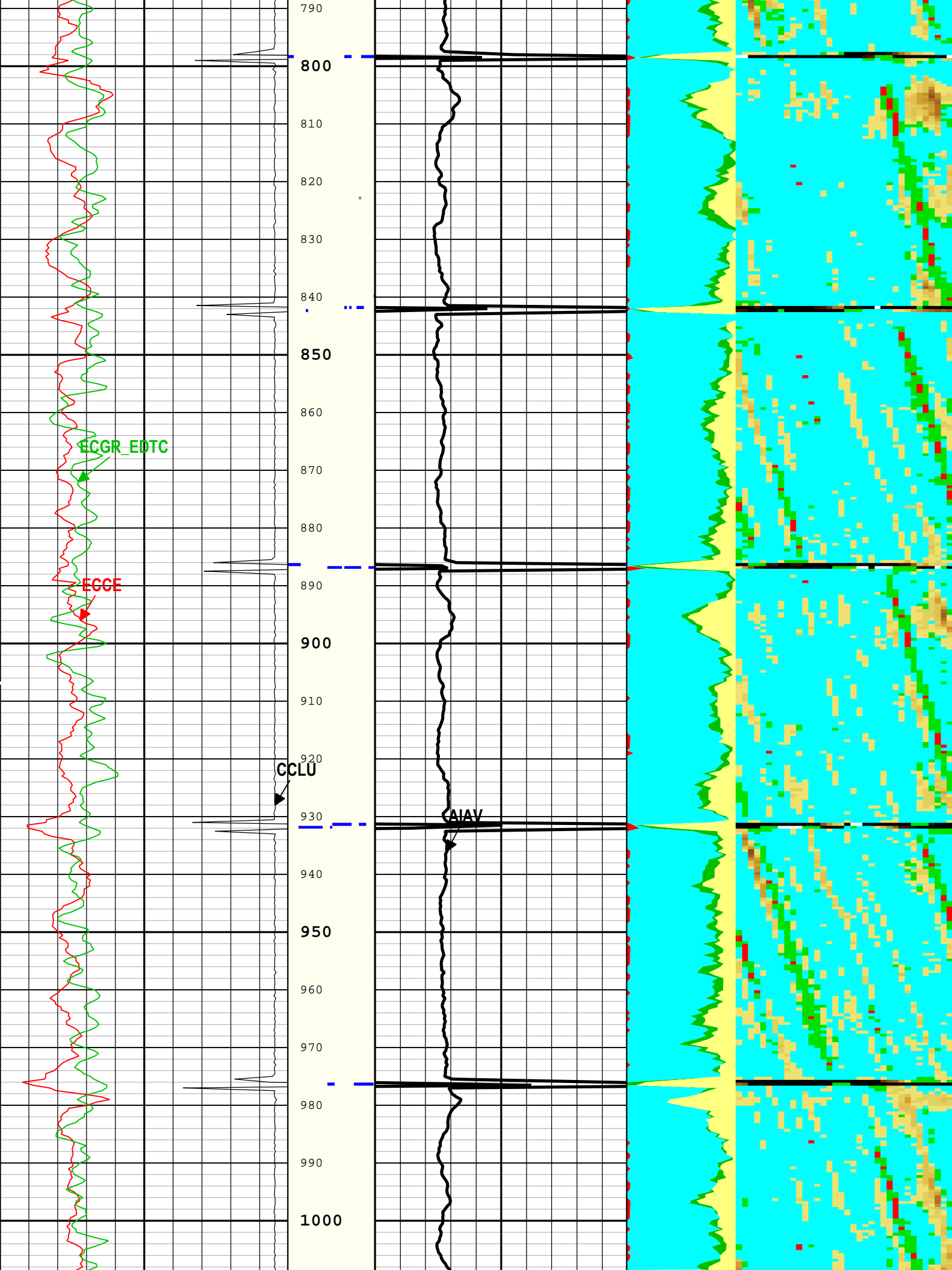
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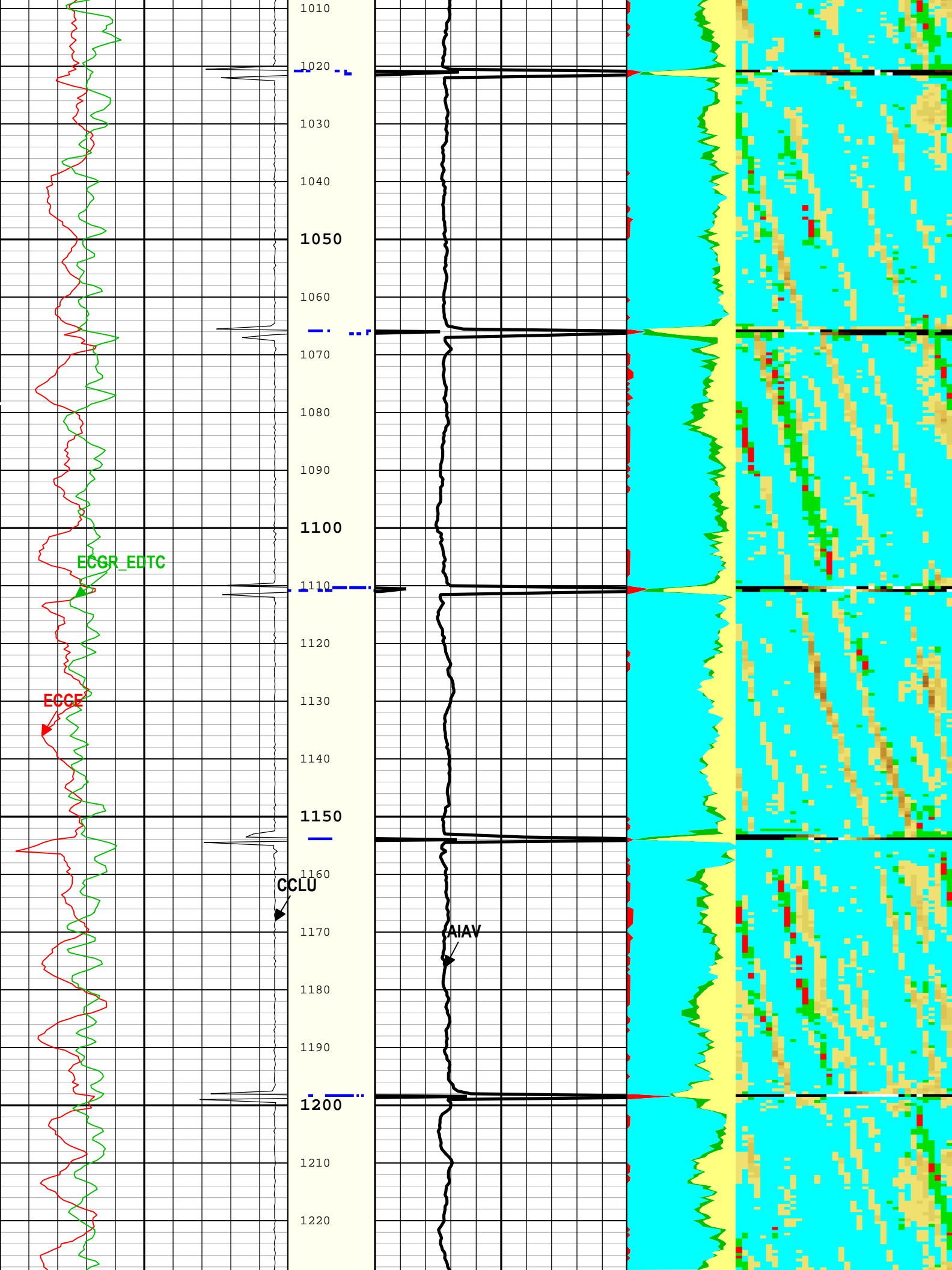


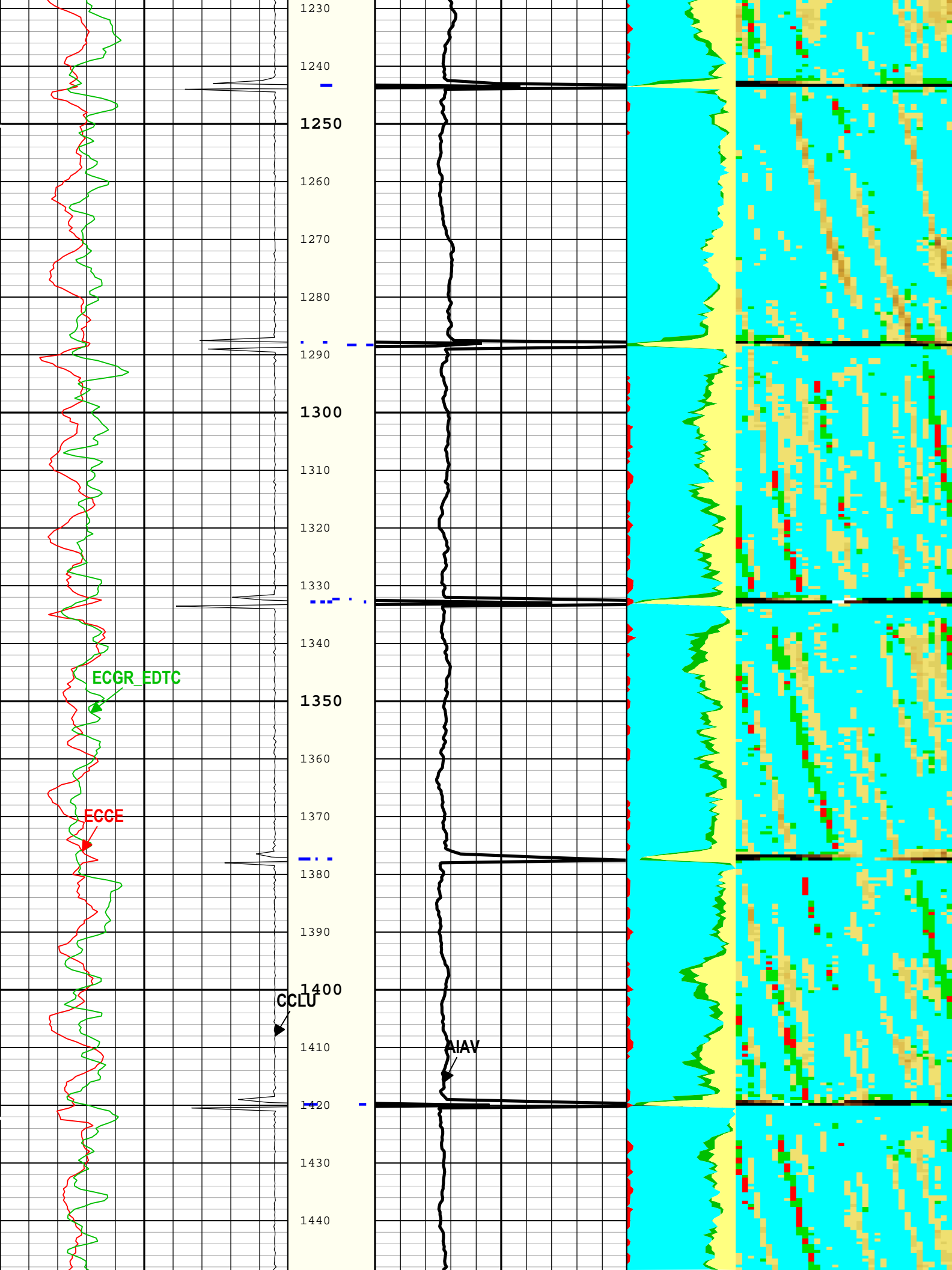


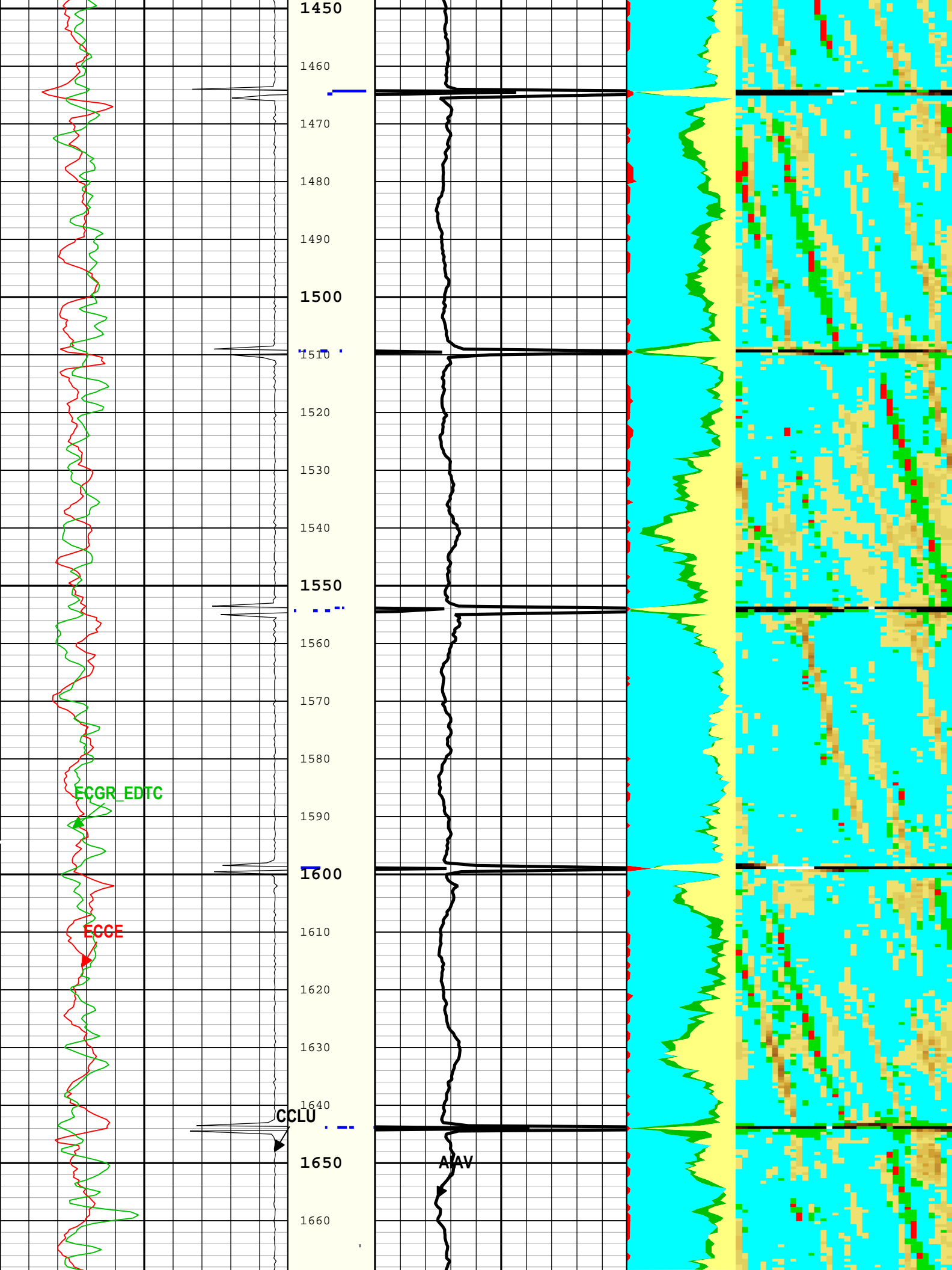


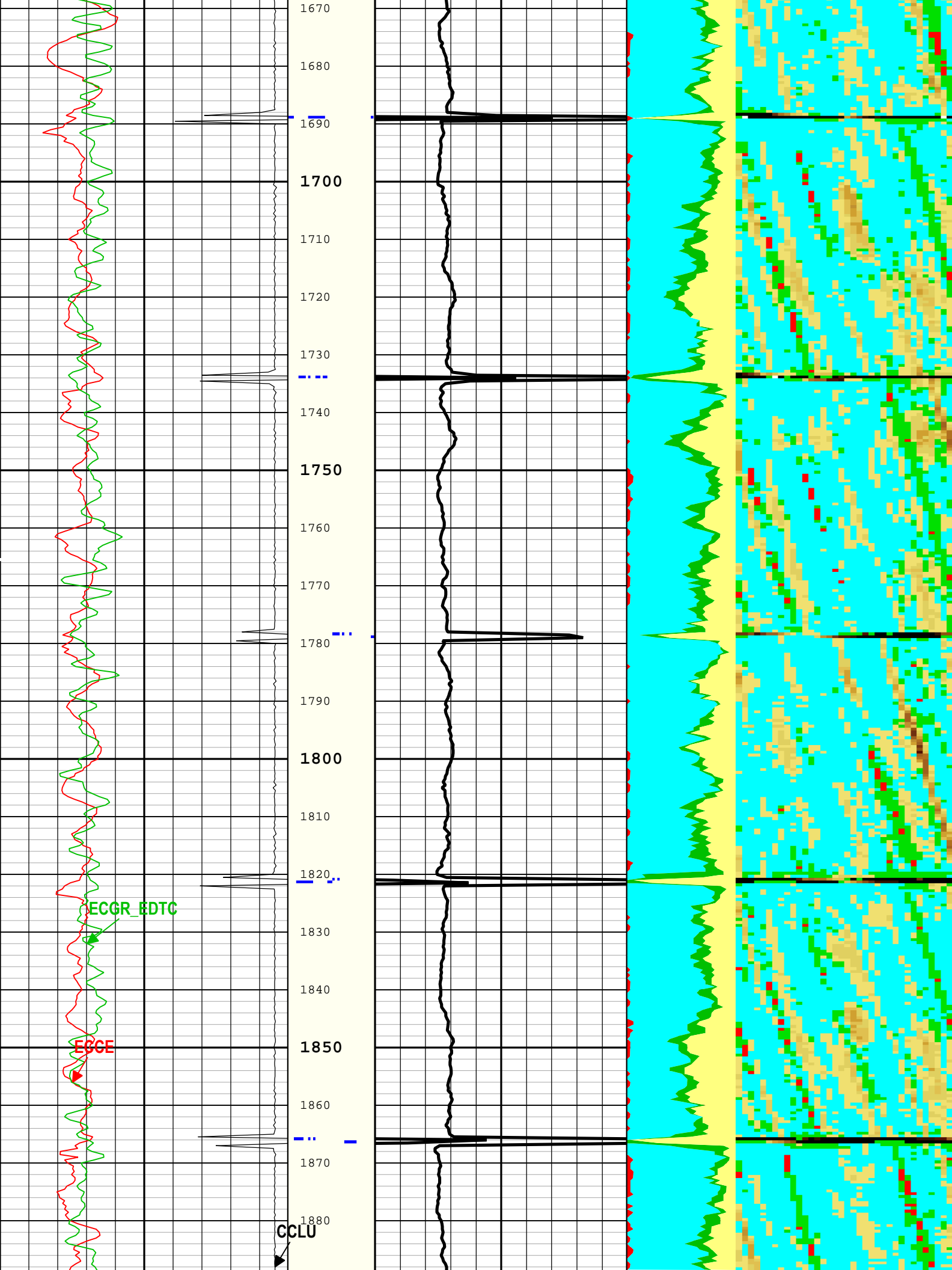


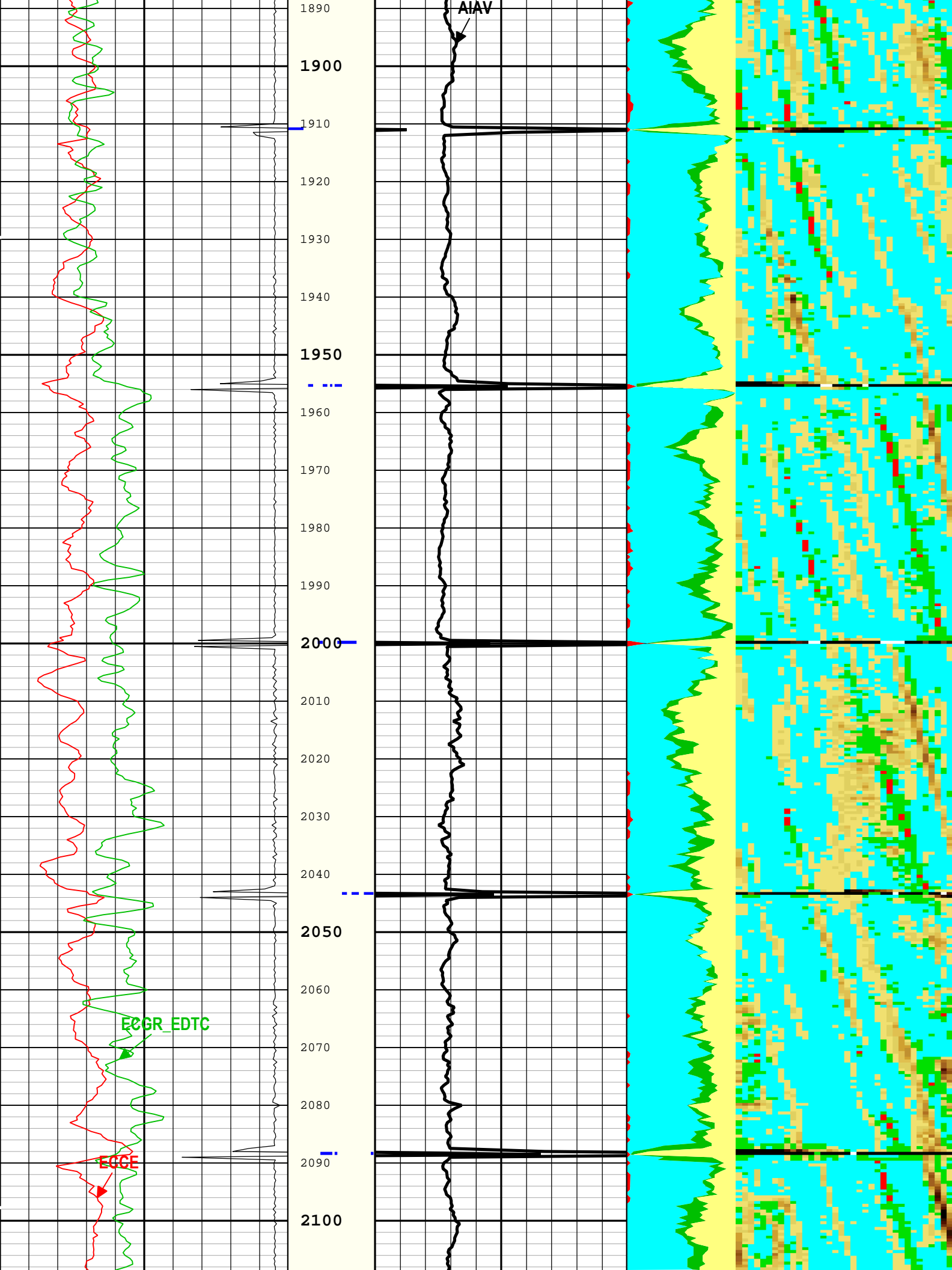


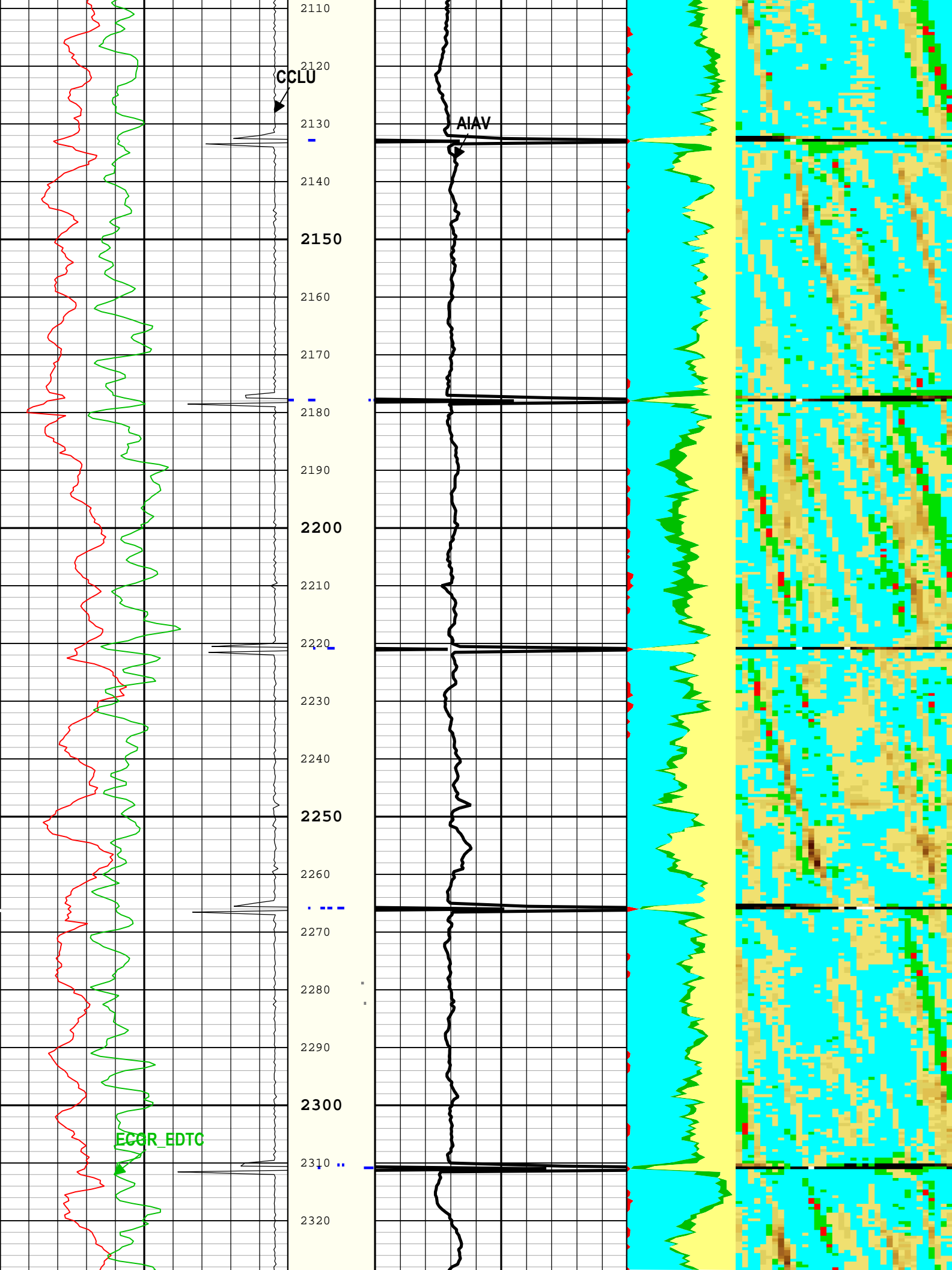


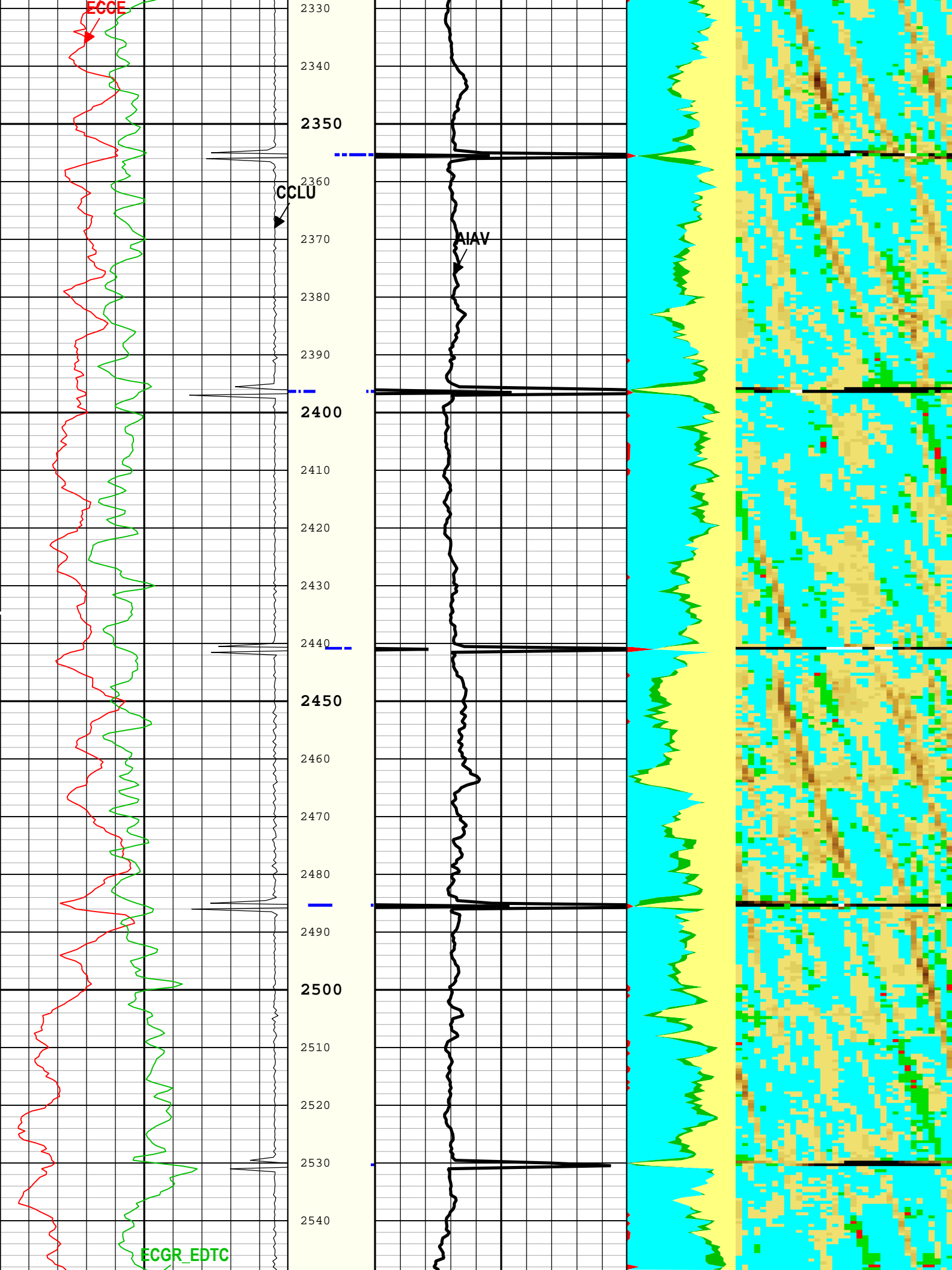


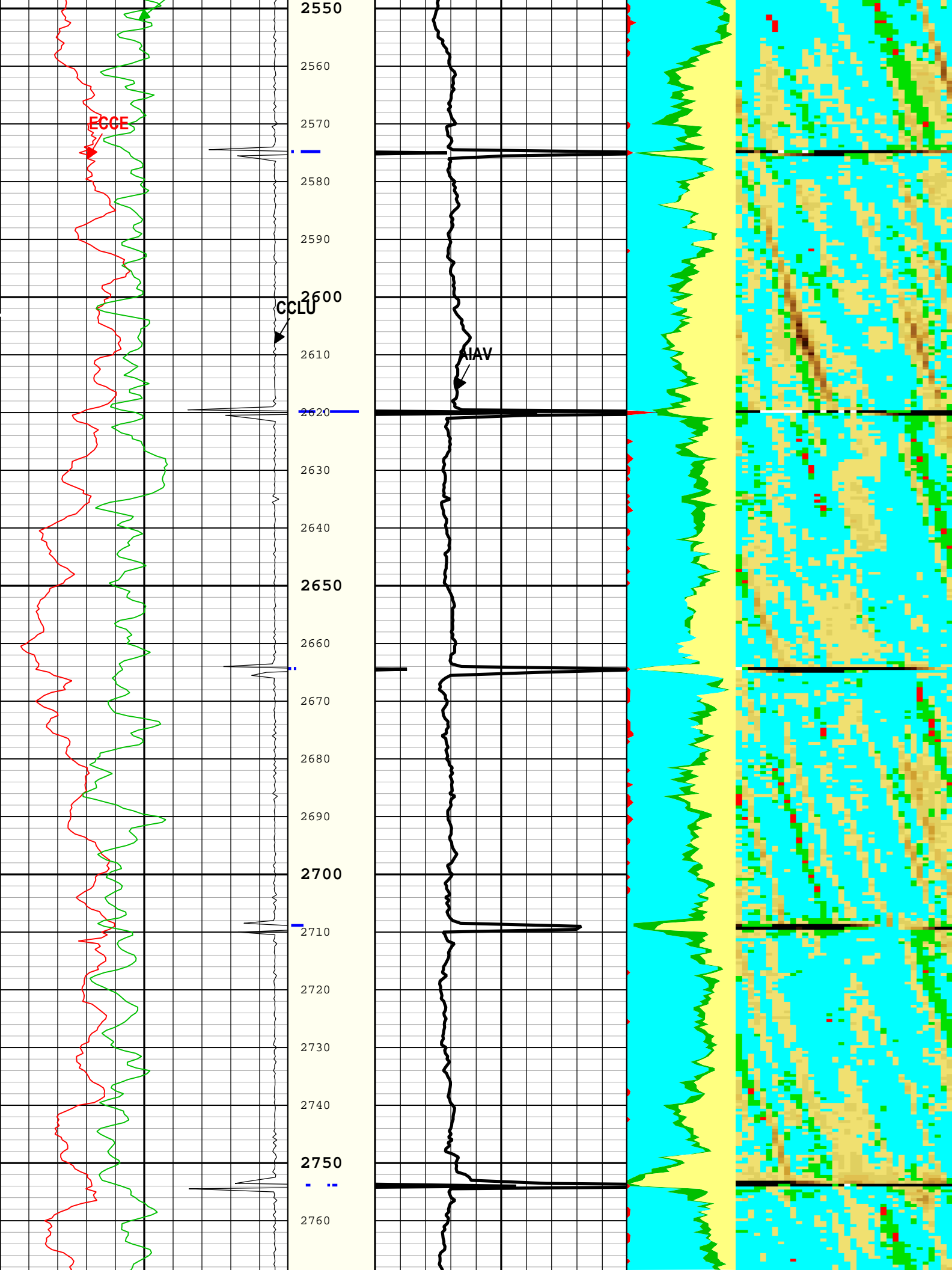


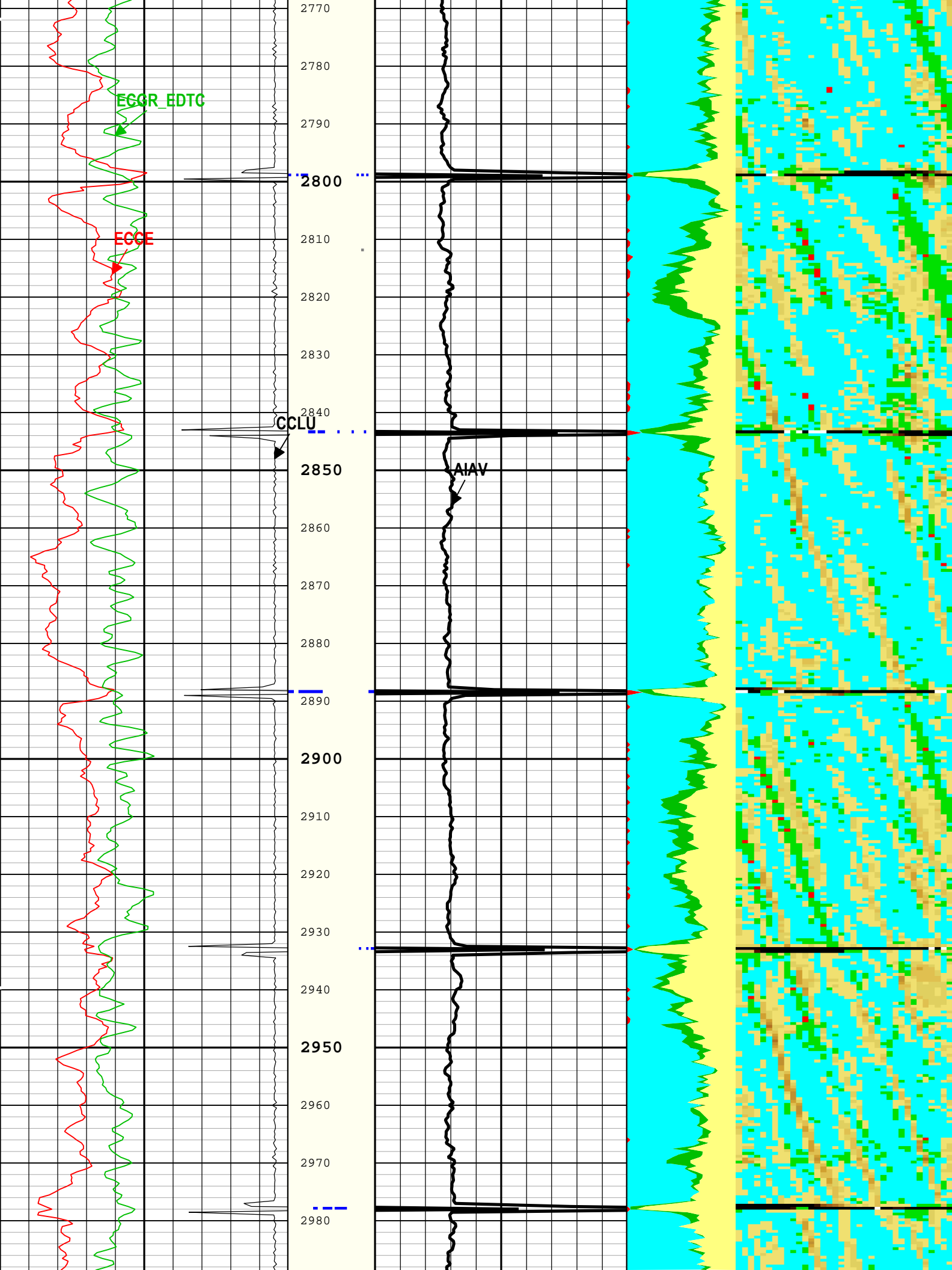


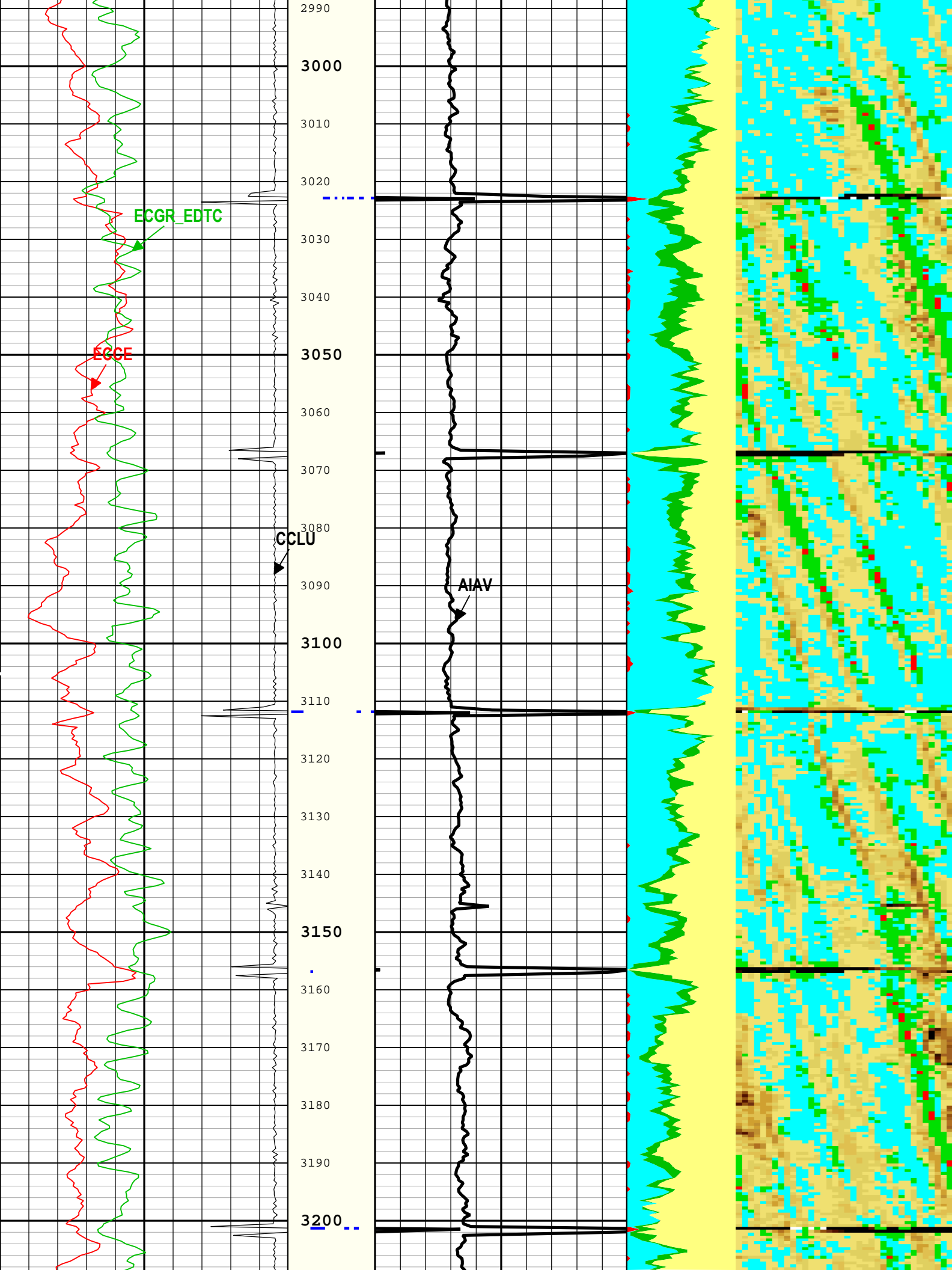


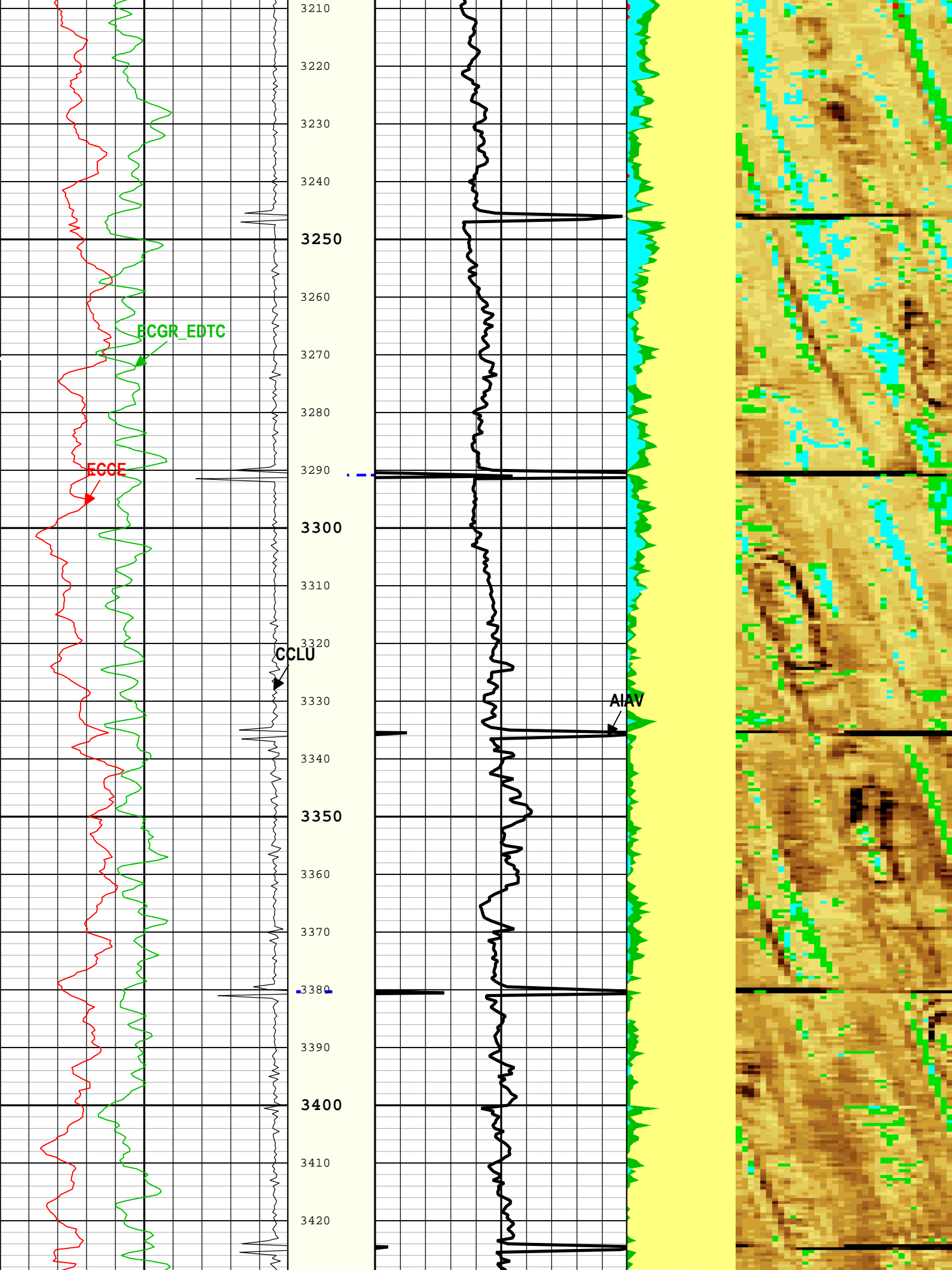


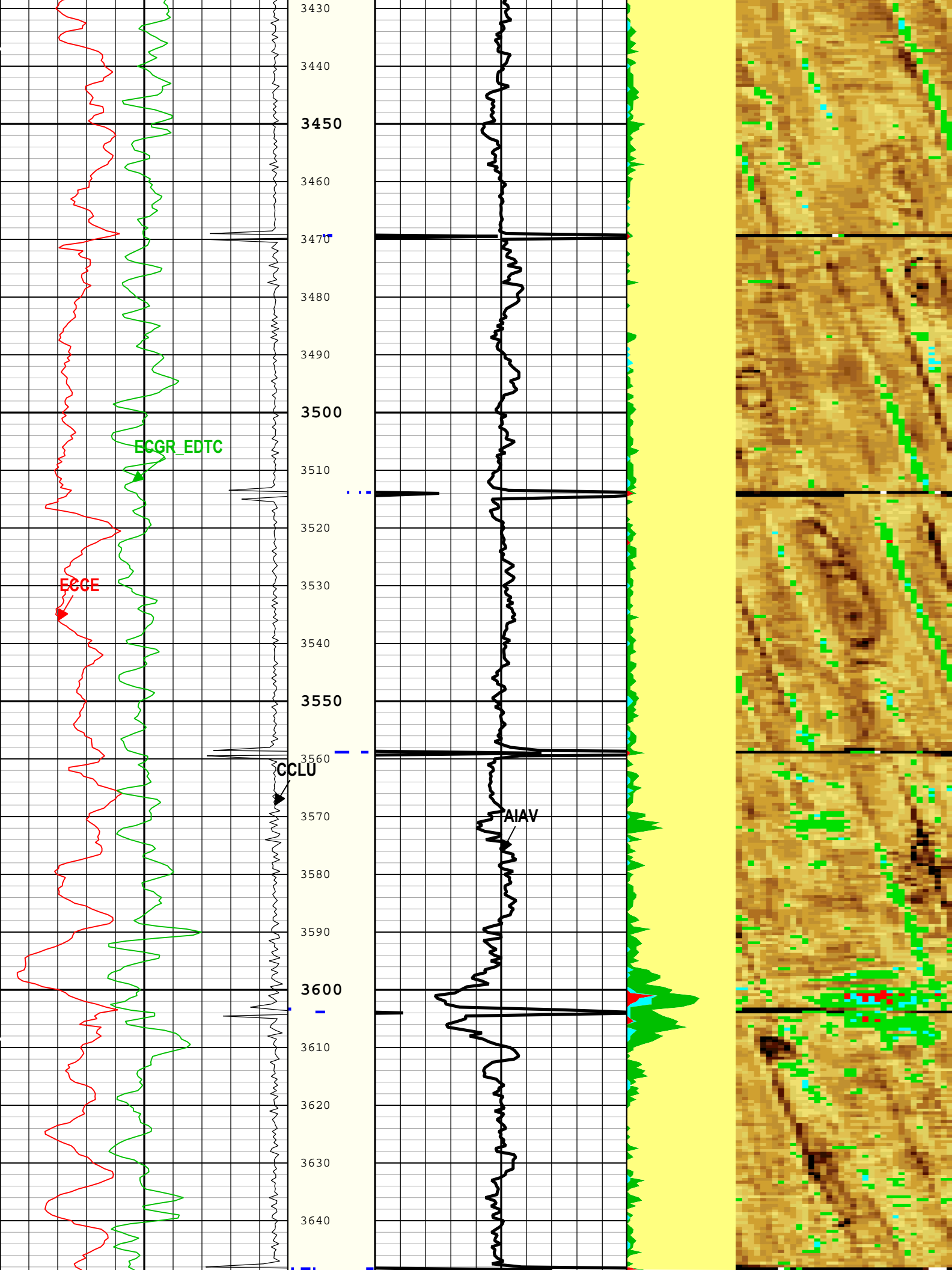


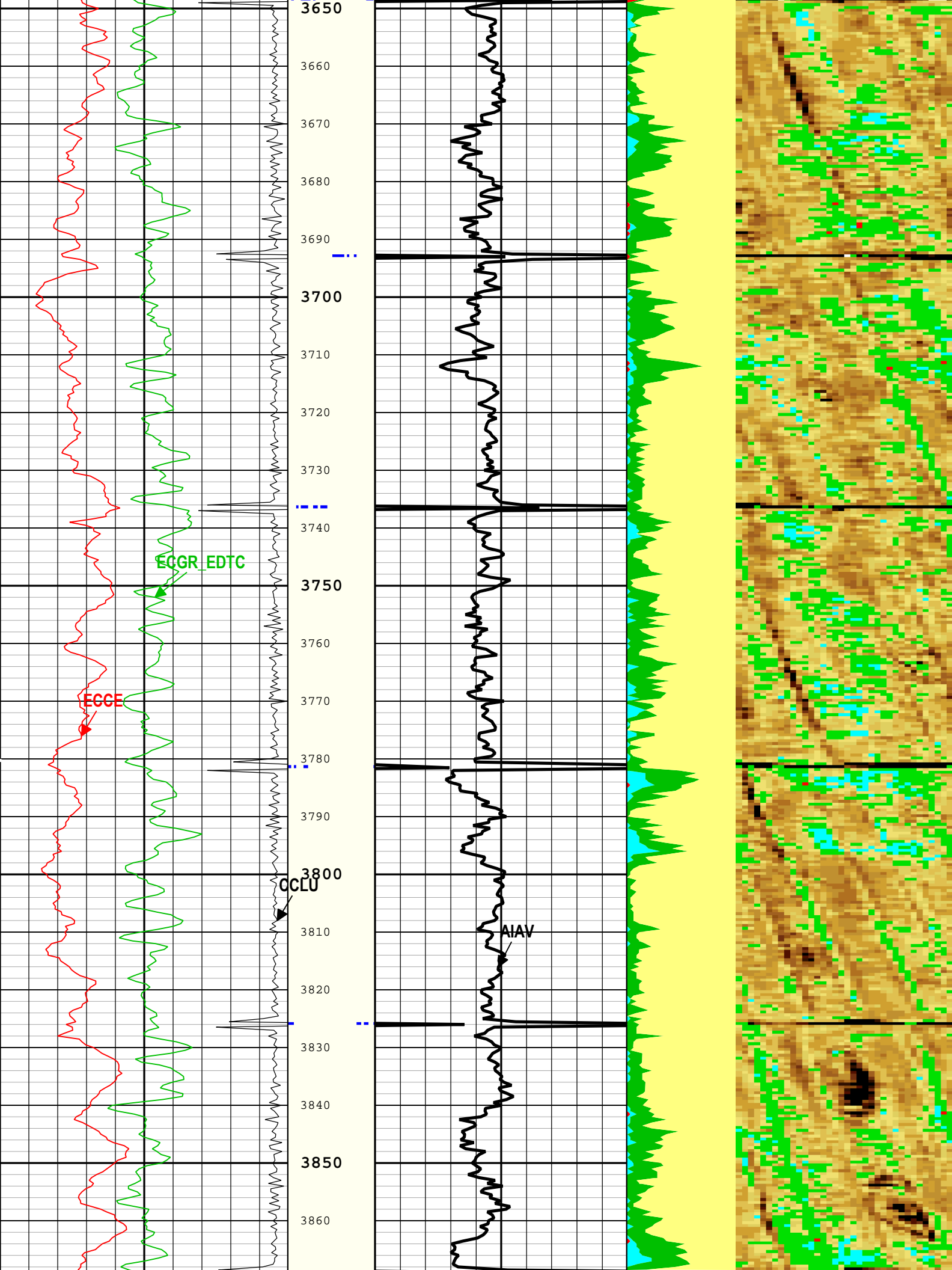


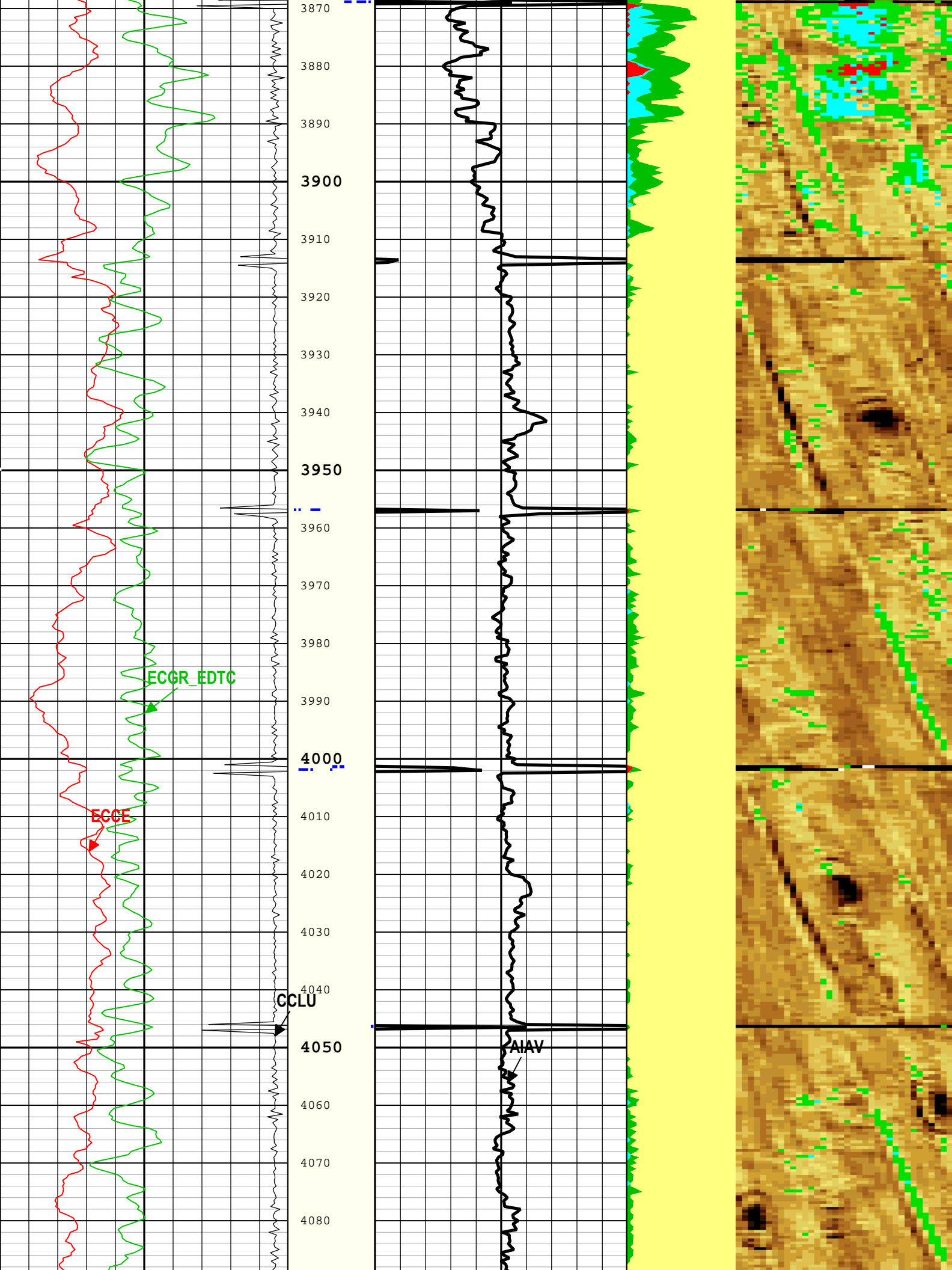


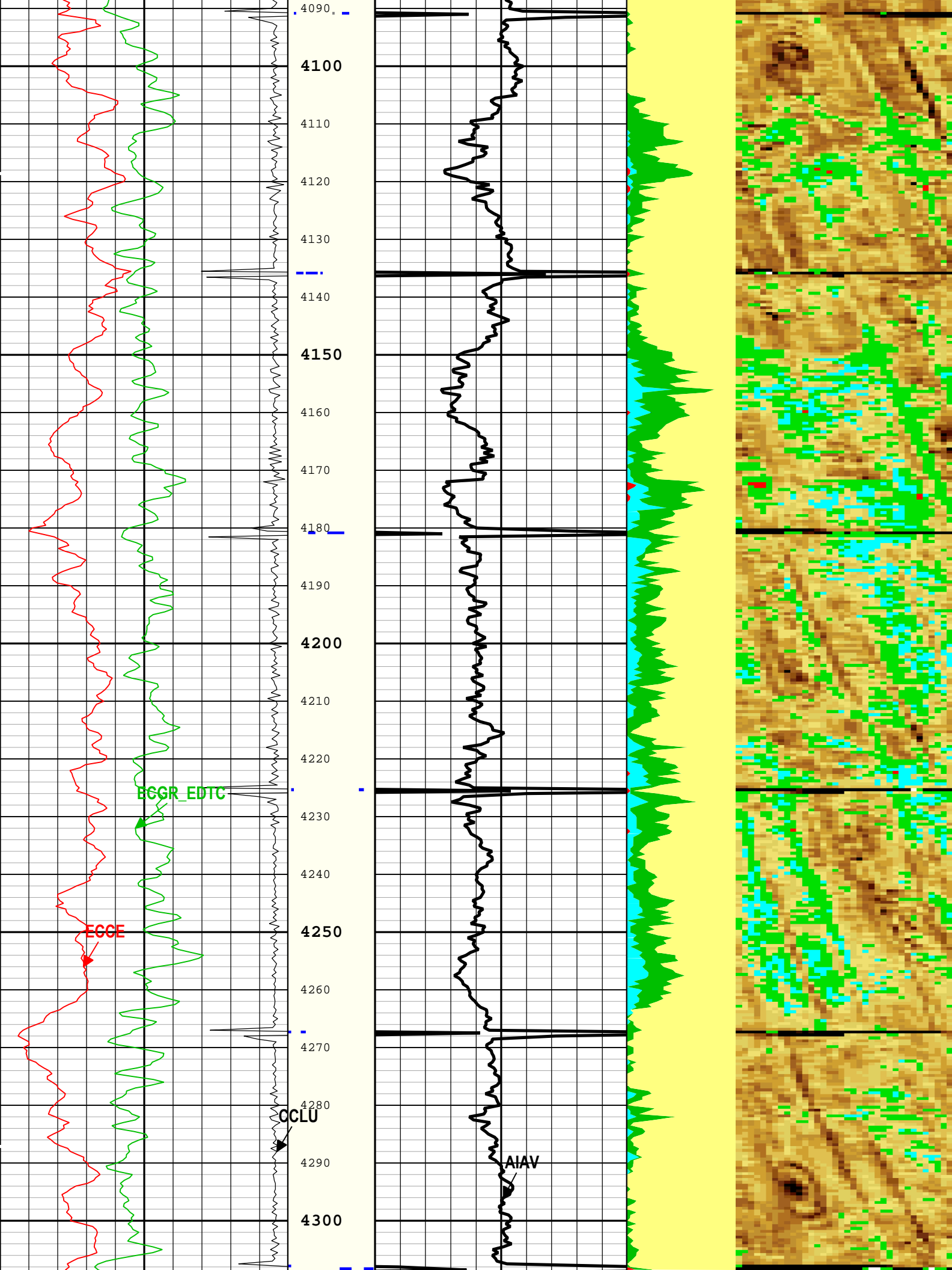


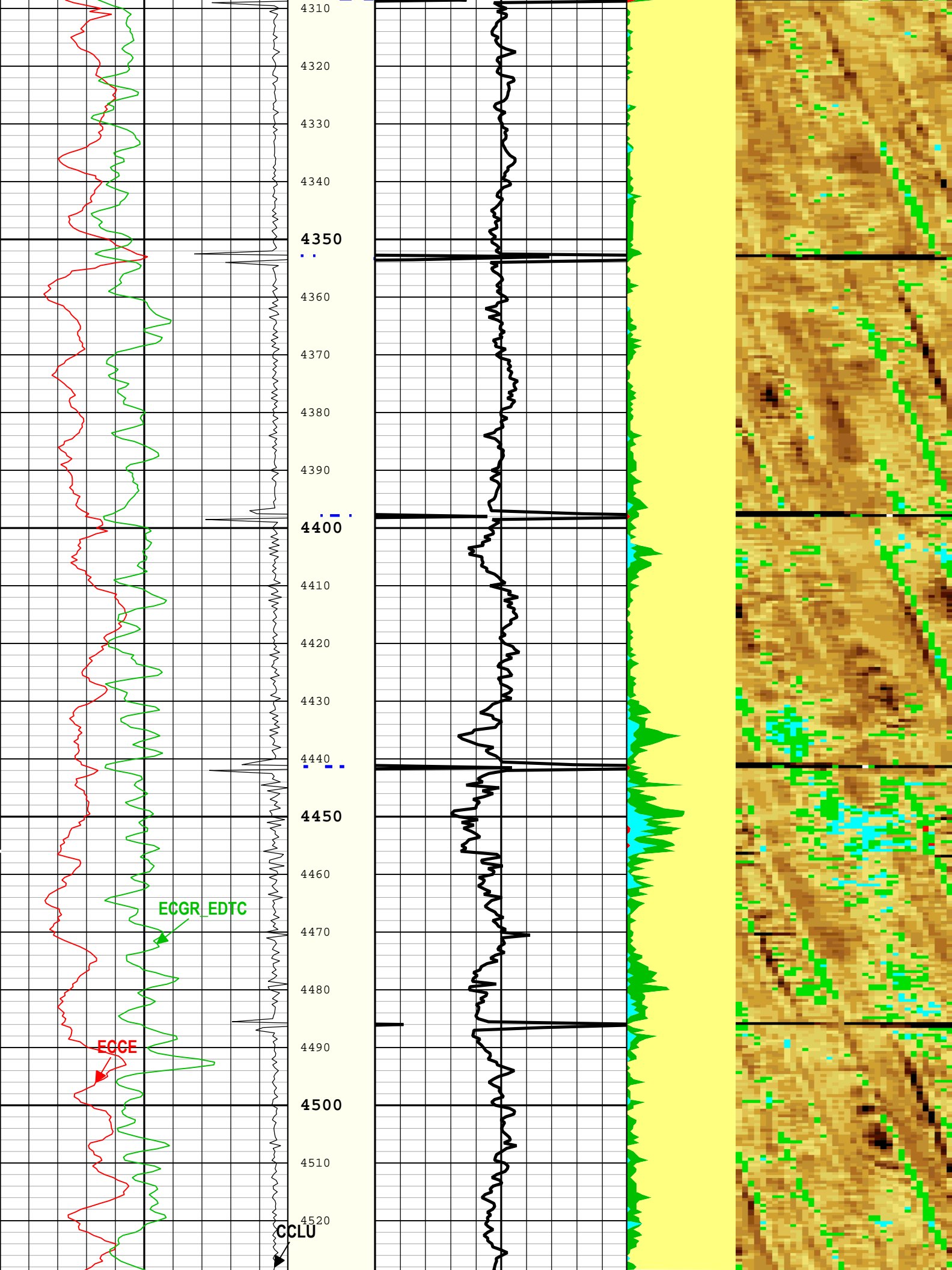


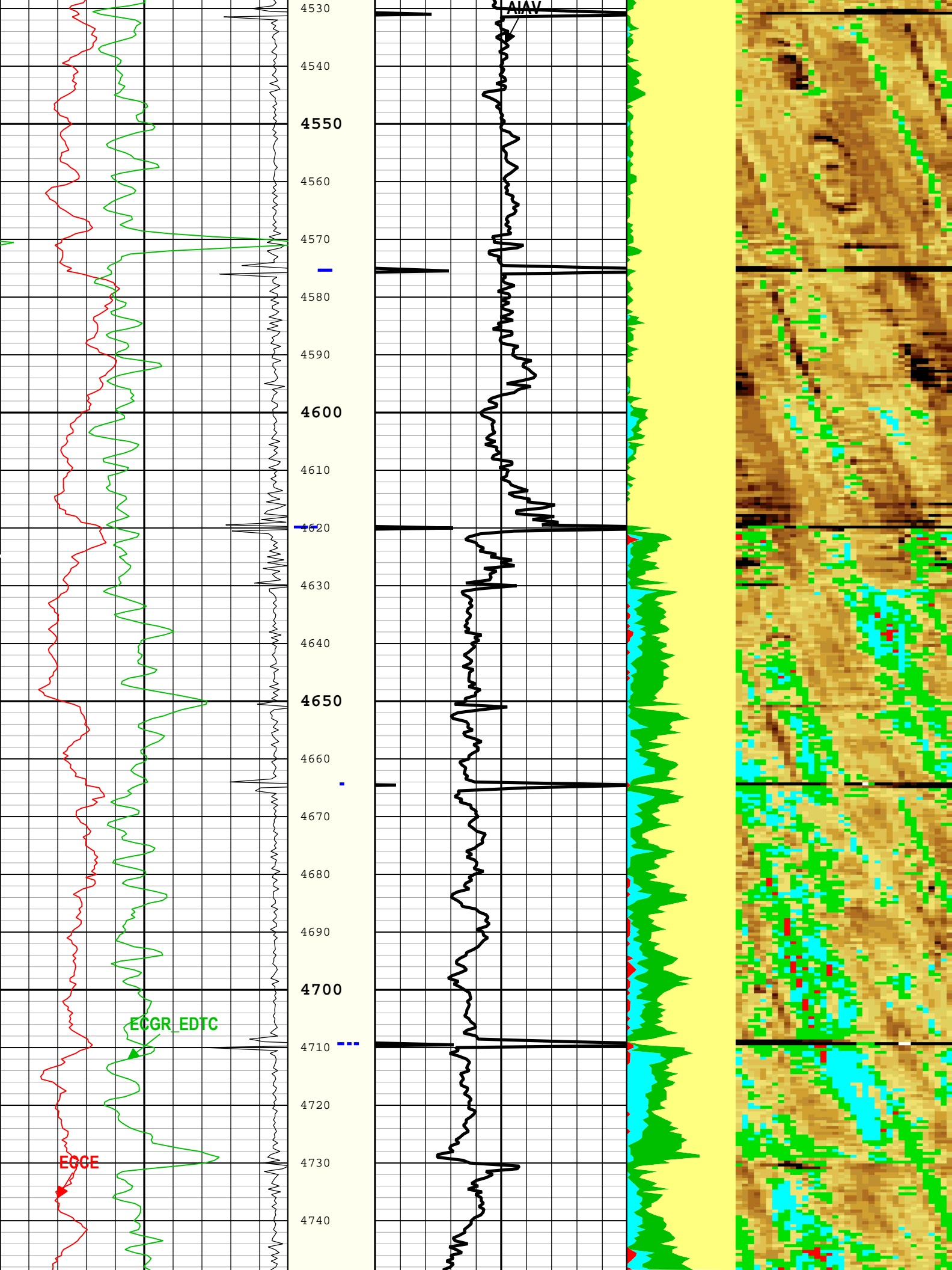


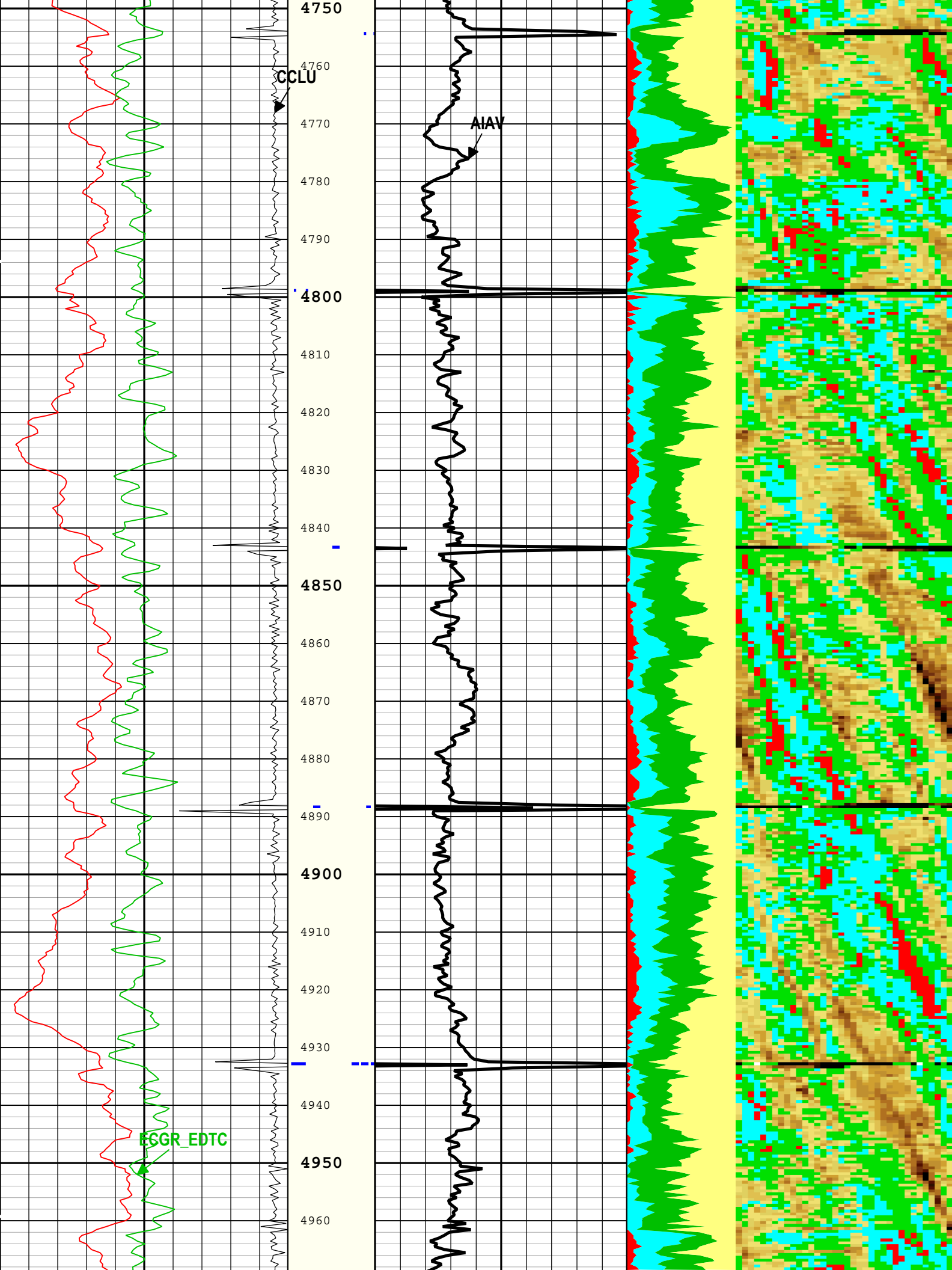


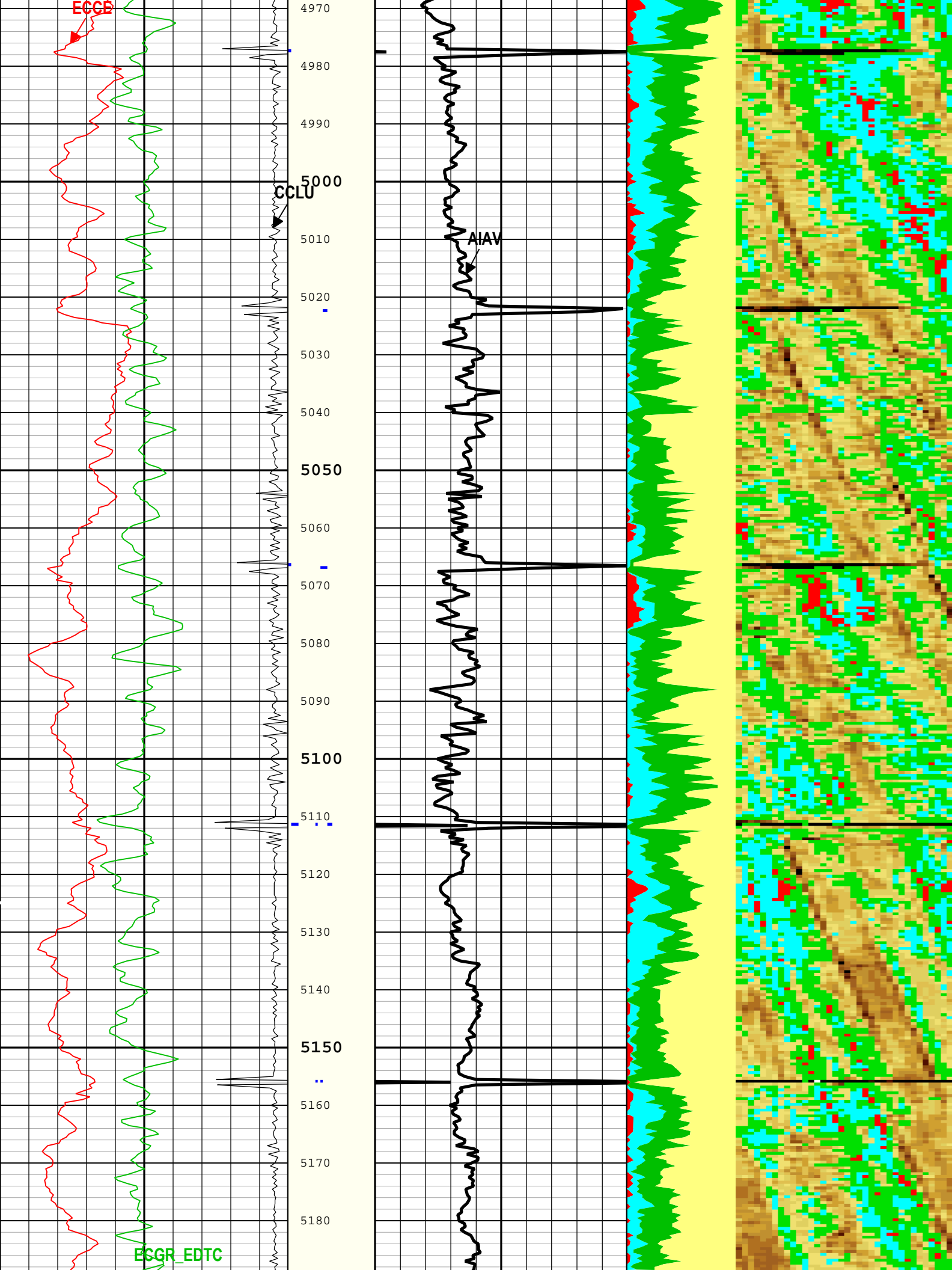


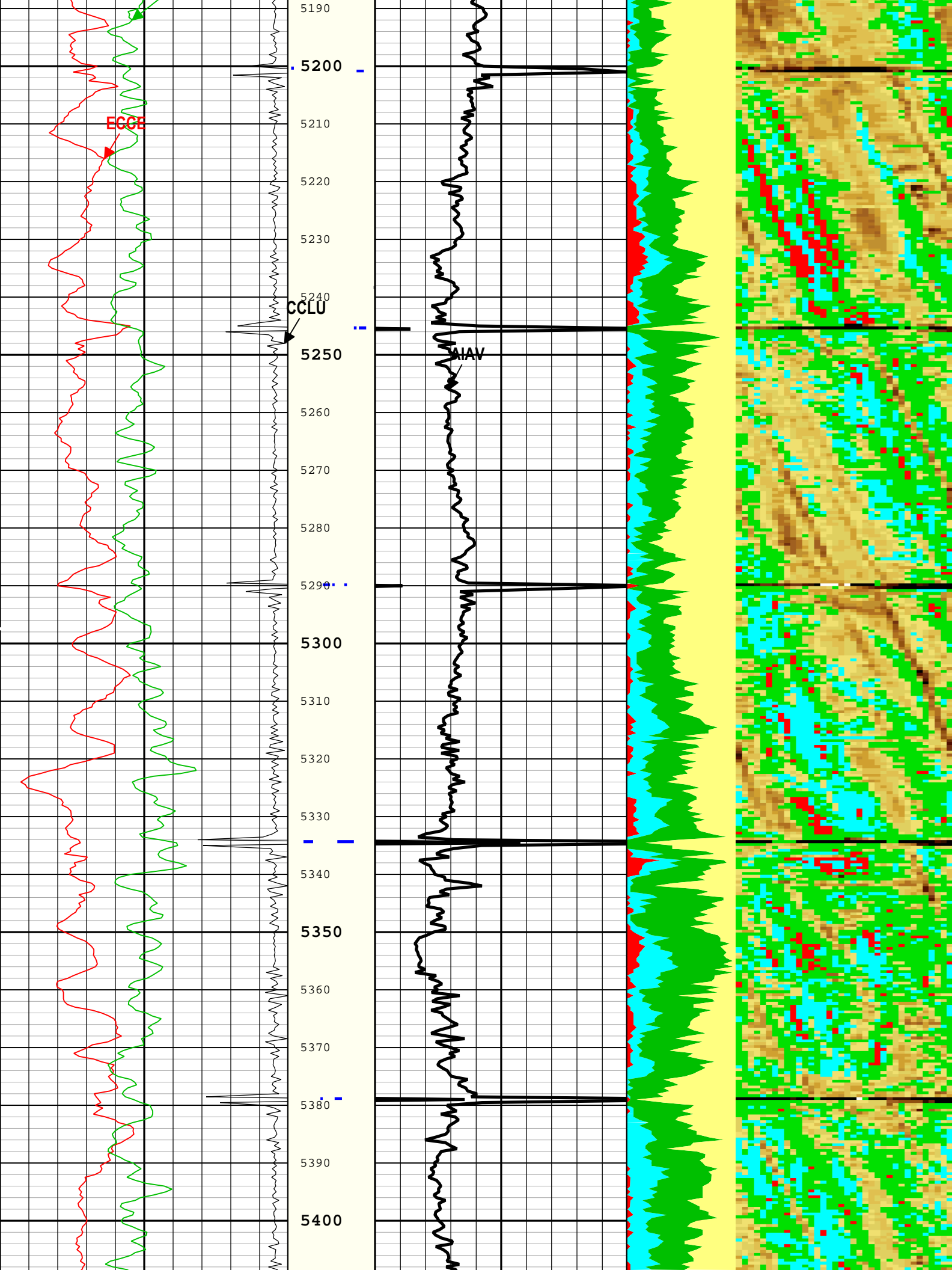


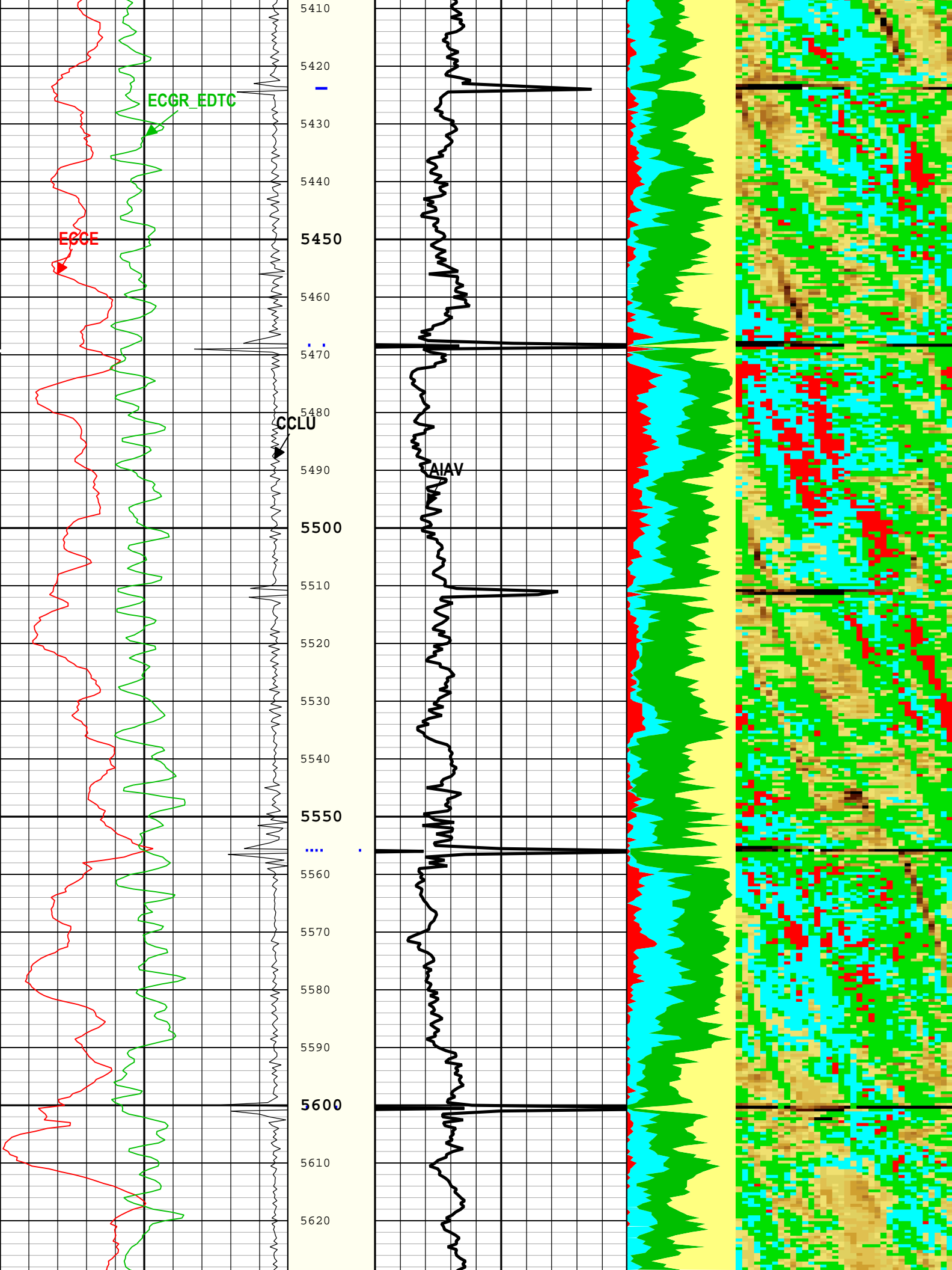


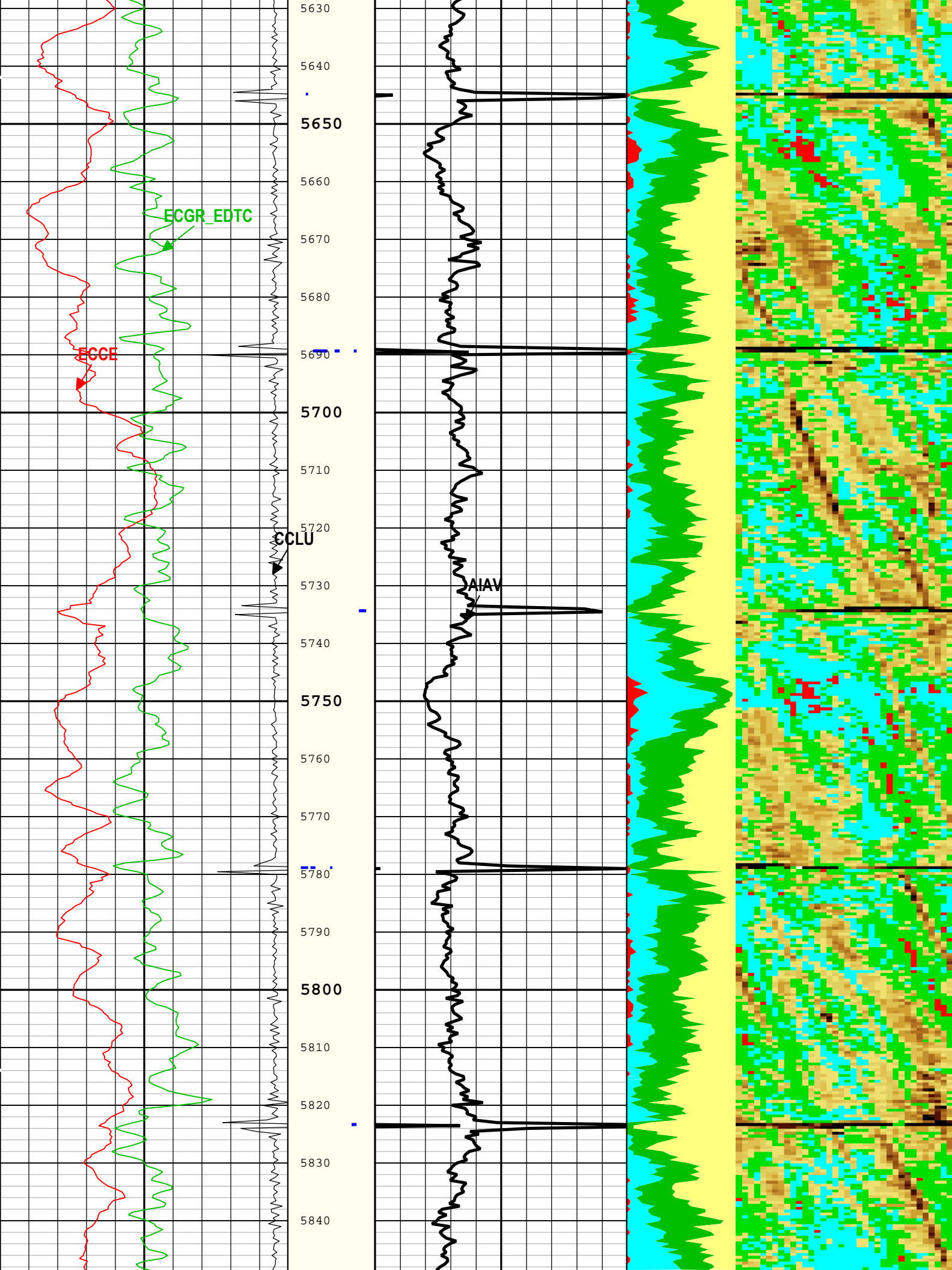


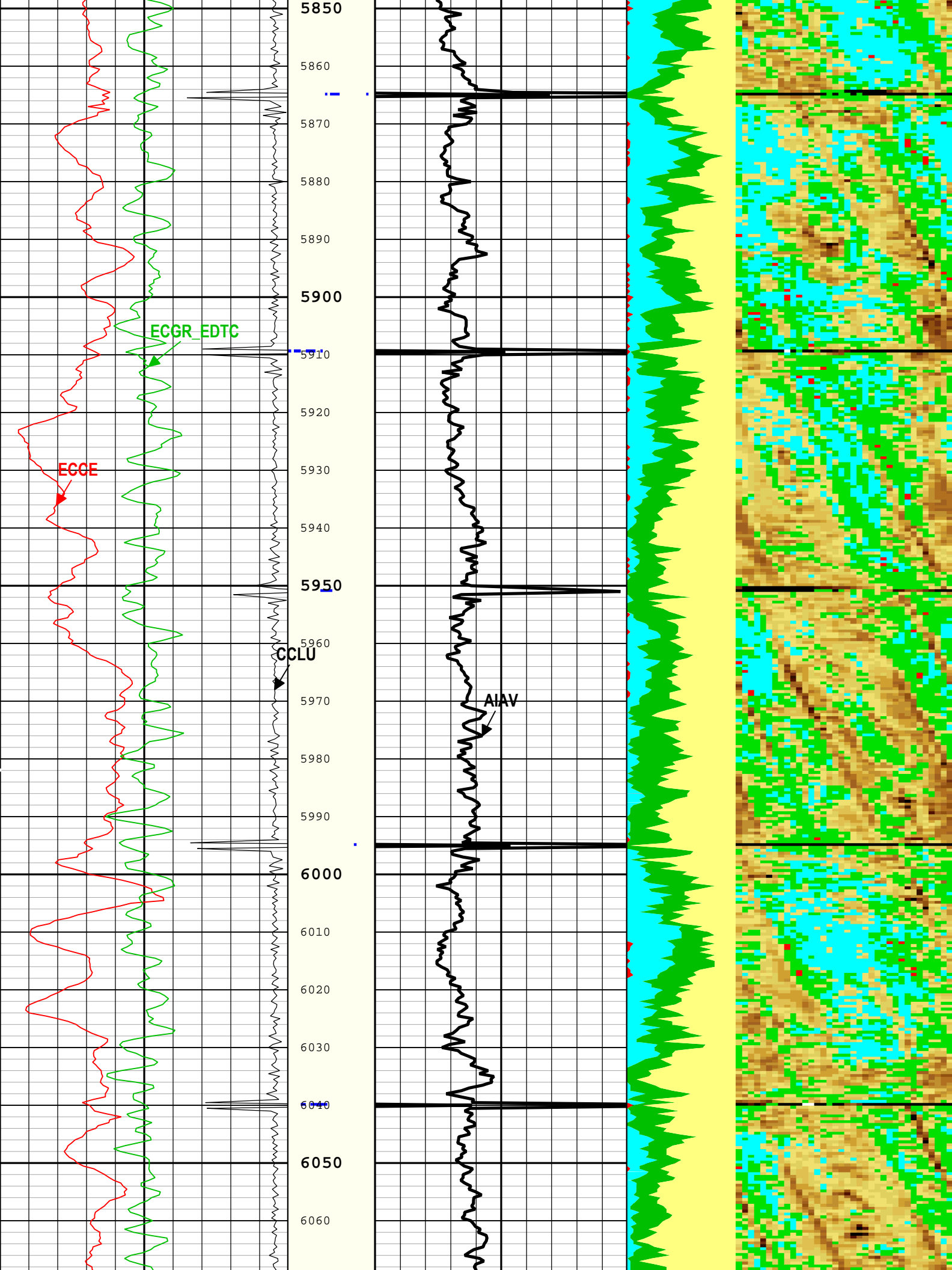


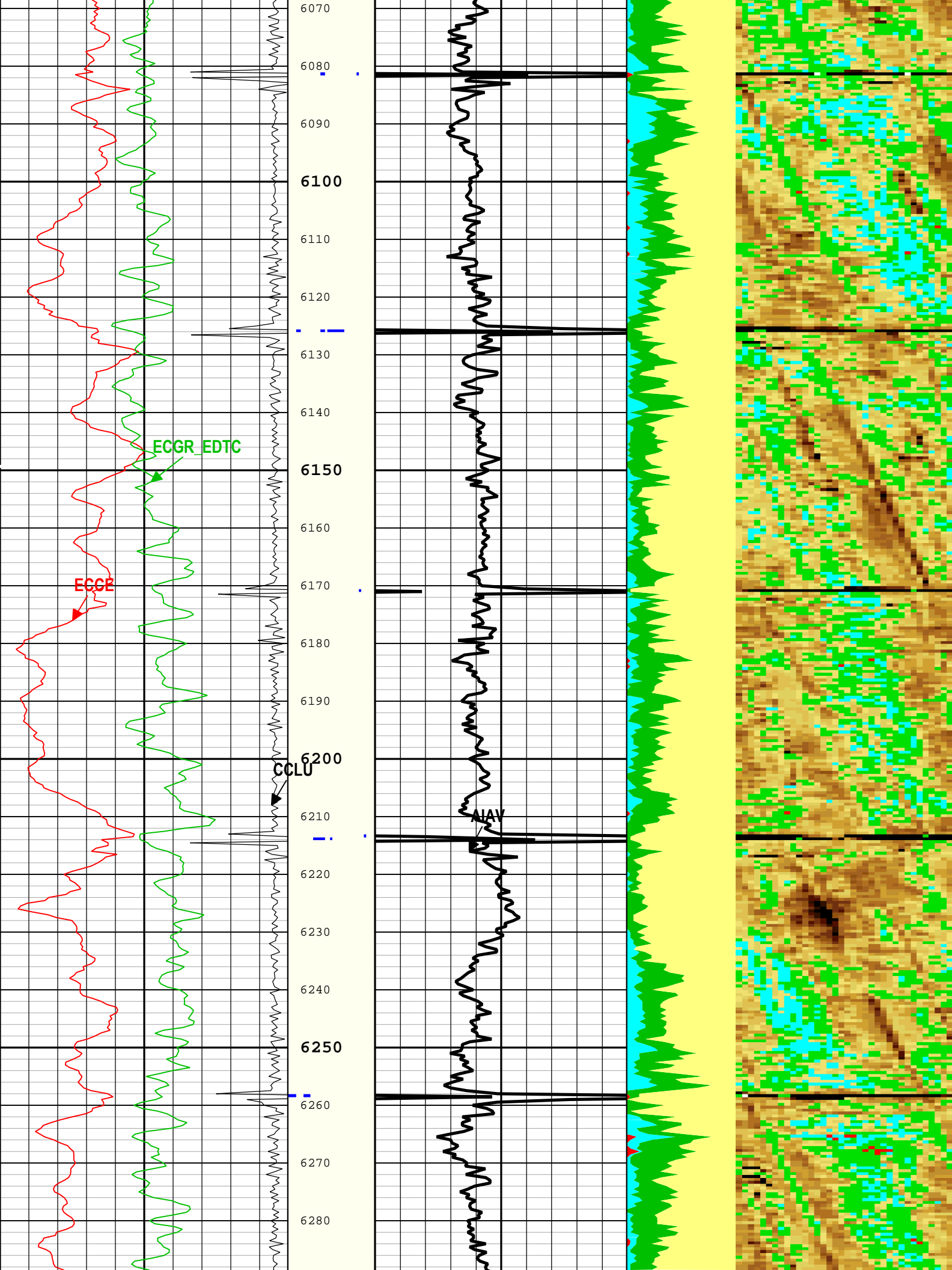


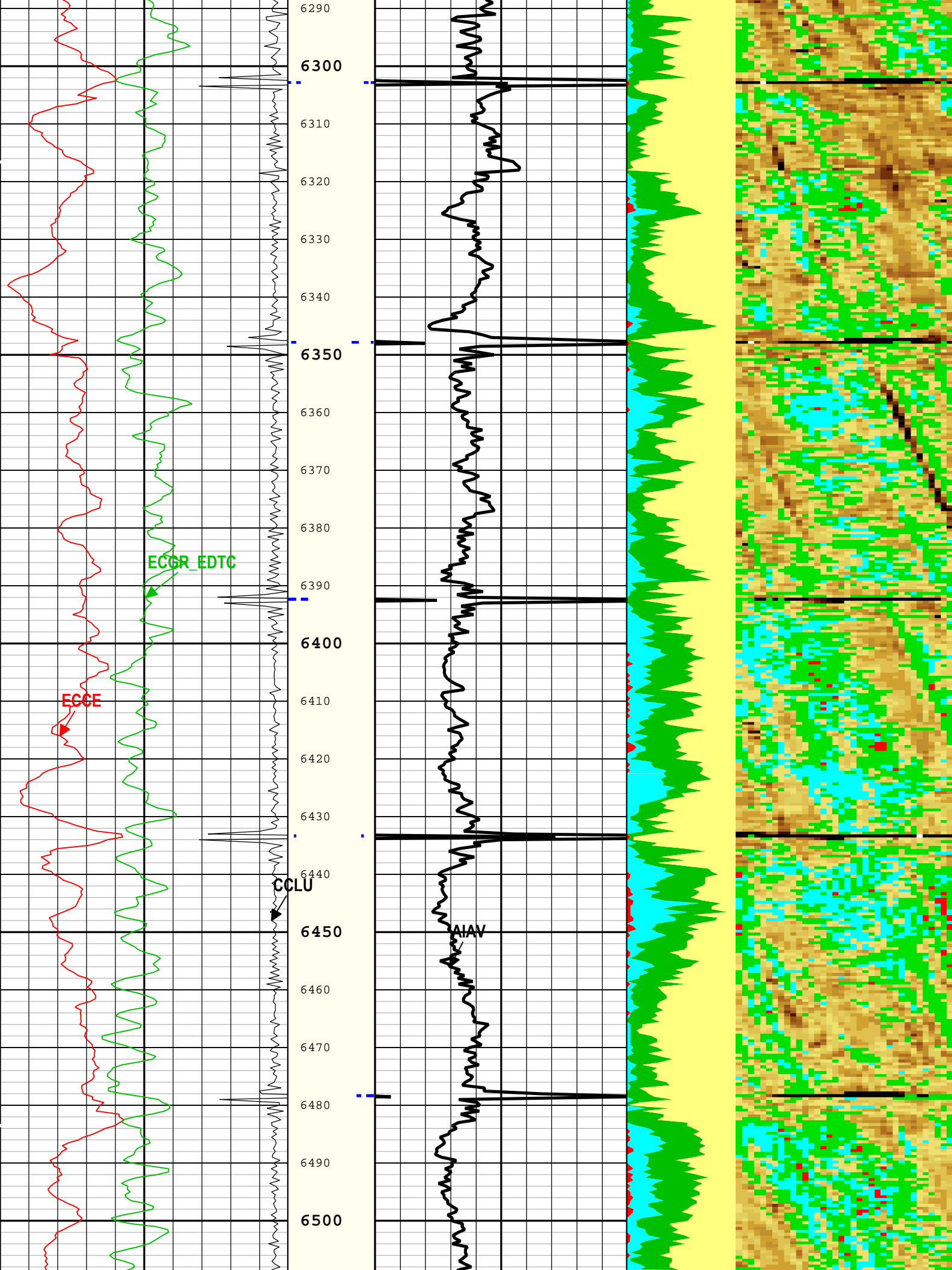


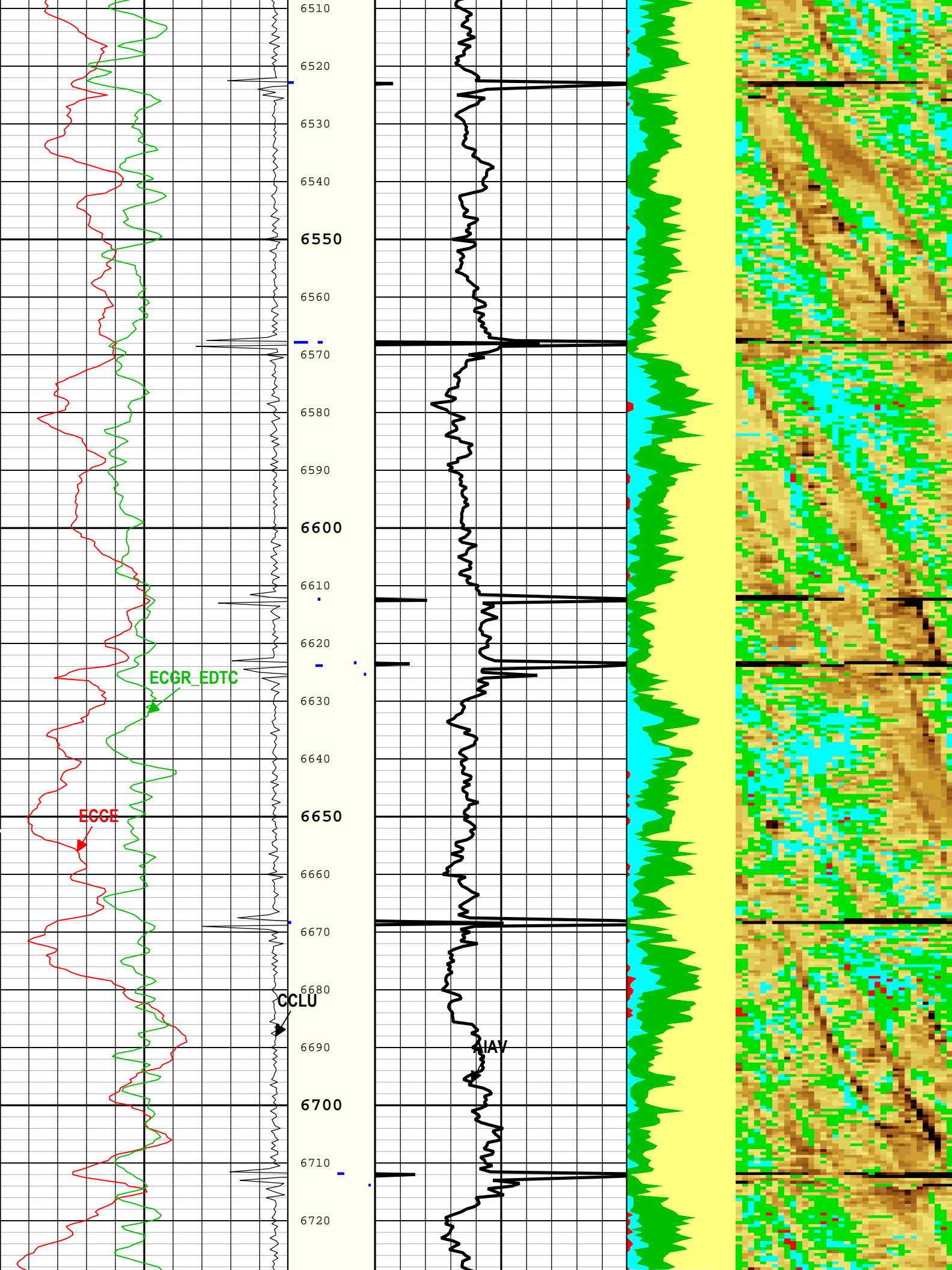


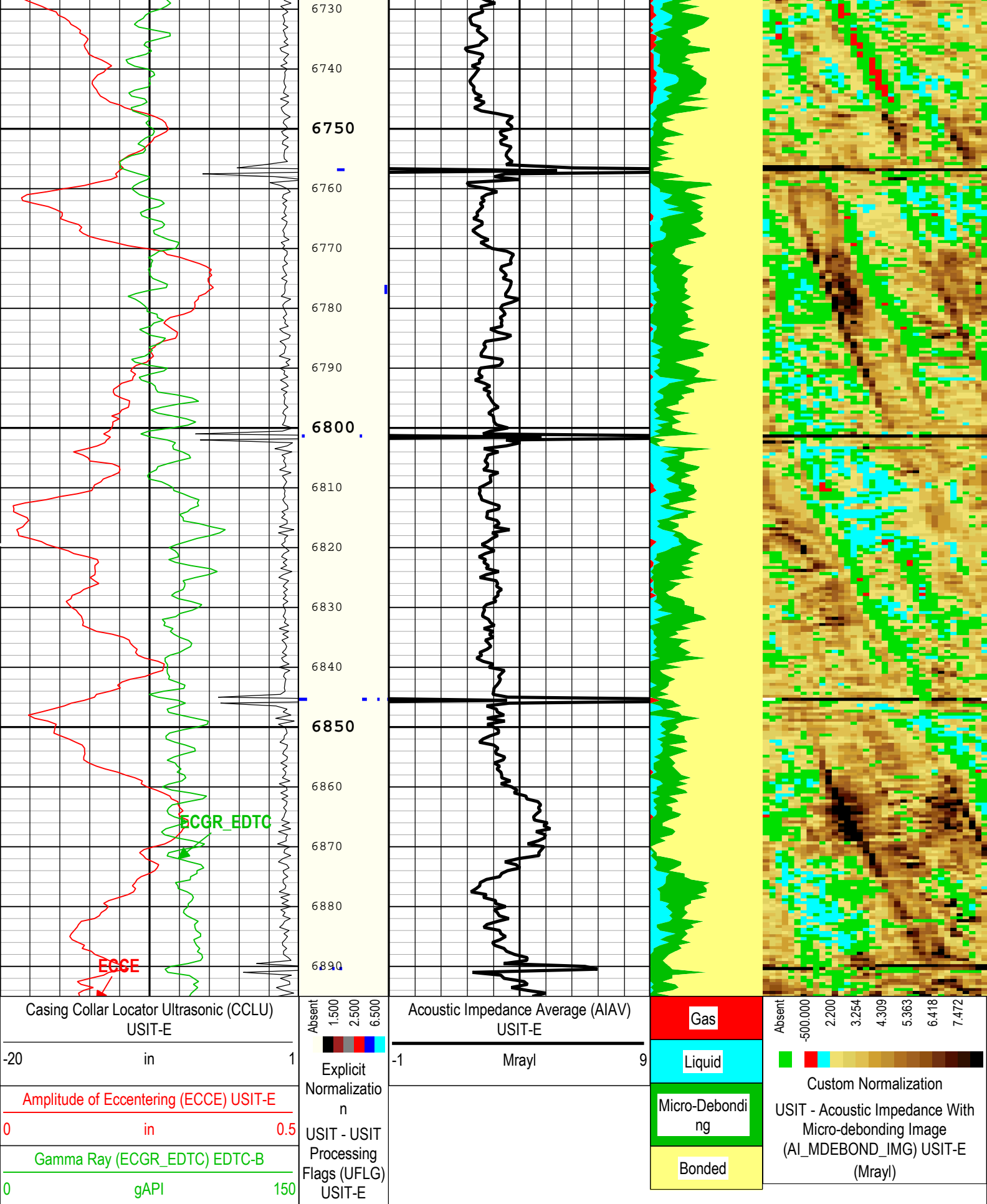












TIME_1900 - Time Marked every 60.00 (s)

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: 01-Nov-2018 15:05:30

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	Depth Zoned	in
CBLO	Casing Bottom (Logger)	WLSESSION	17513	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	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	1.55	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	26	58	110
BS	13.5	110	1946
BS	8.5	1946	6895
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	Time Zoned	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 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

Time Zone Parameters

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	50	01-Nov-2018 11:40:54	01-Nov-2018 11:54:19	6922.42	4905.89
EMXV	40	01-Nov-2018 11:54:19	01-Nov-2018 11:54:24	4905.89	4892.3

EMXV	40	01-Nov-2018 11:54:19	01-Nov-2018 11:54:24	4892.3	4892.3
EMXV	35	01-Nov-2018 11:54:24	01-Nov-2018 11:54:29	4892.3	4878.17
EMXV	30	01-Nov-2018 11:54:29	01-Nov-2018 12:48:32	4878.17	57.83

All depth are at tool zero.

ONE

0 PSI Repeat Pass

Software Version

Acquisition System	Version
Maxwell 2018 SP2	8.2.104493.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Repeat[2]:Up	Up	1997.03 ft	2508.58 ft	01-Nov-2018 10:29:23 AM	01-Nov-2018 10:35:13 AM	ON	6.61 ft	Yes

All depths are referenced to toolstring zero

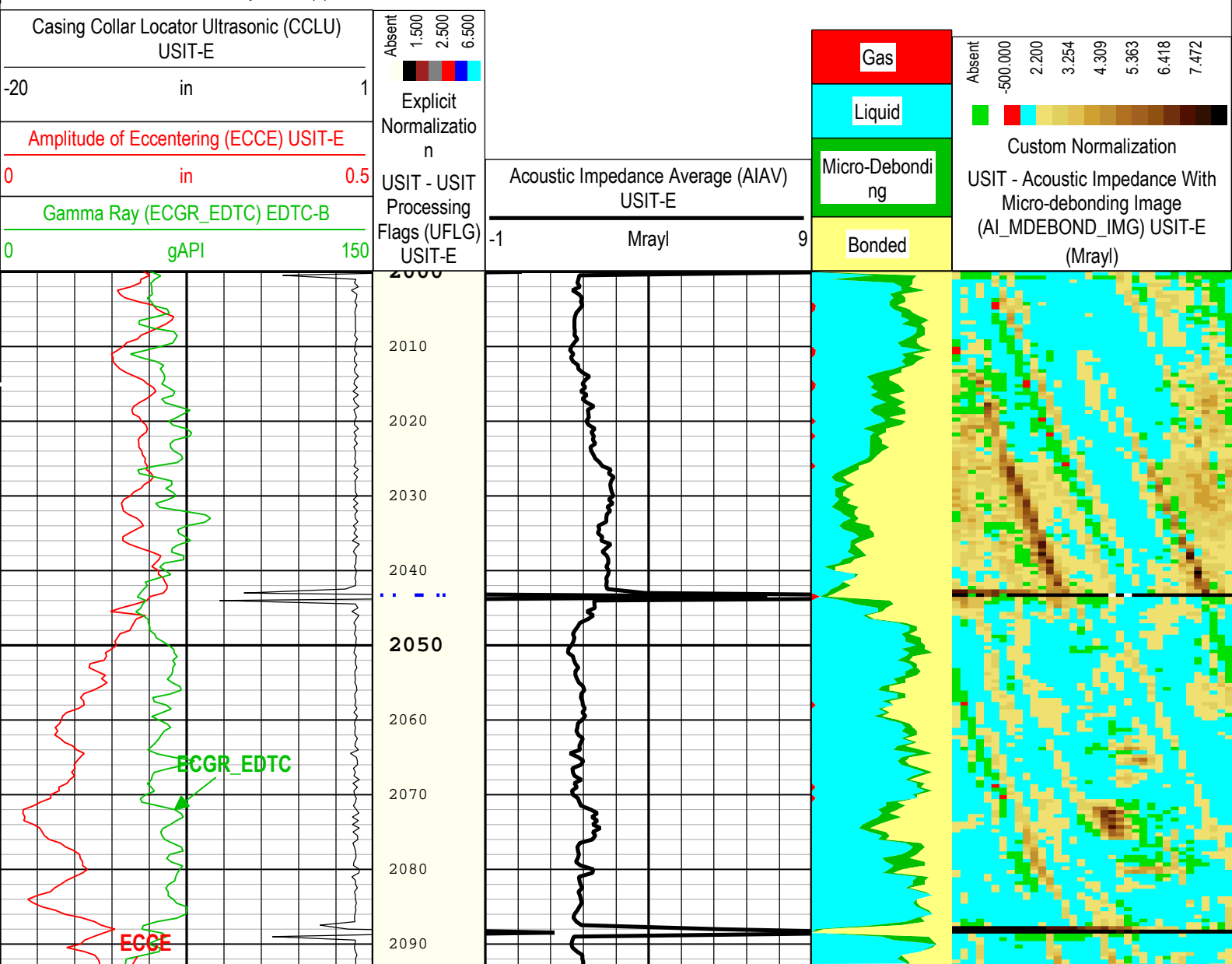
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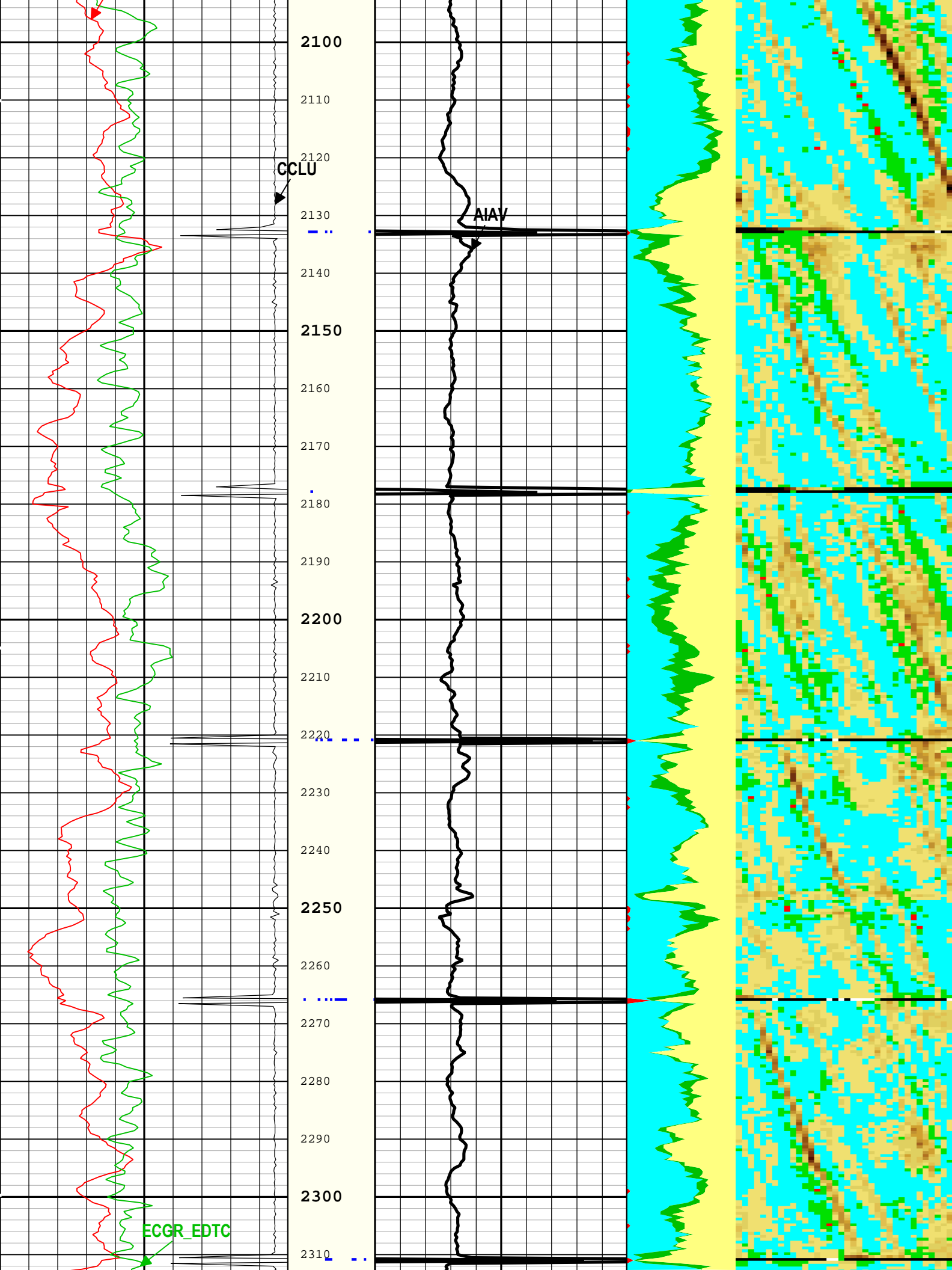
Company:Noble Energy Inc. Well:EMMY H25-711

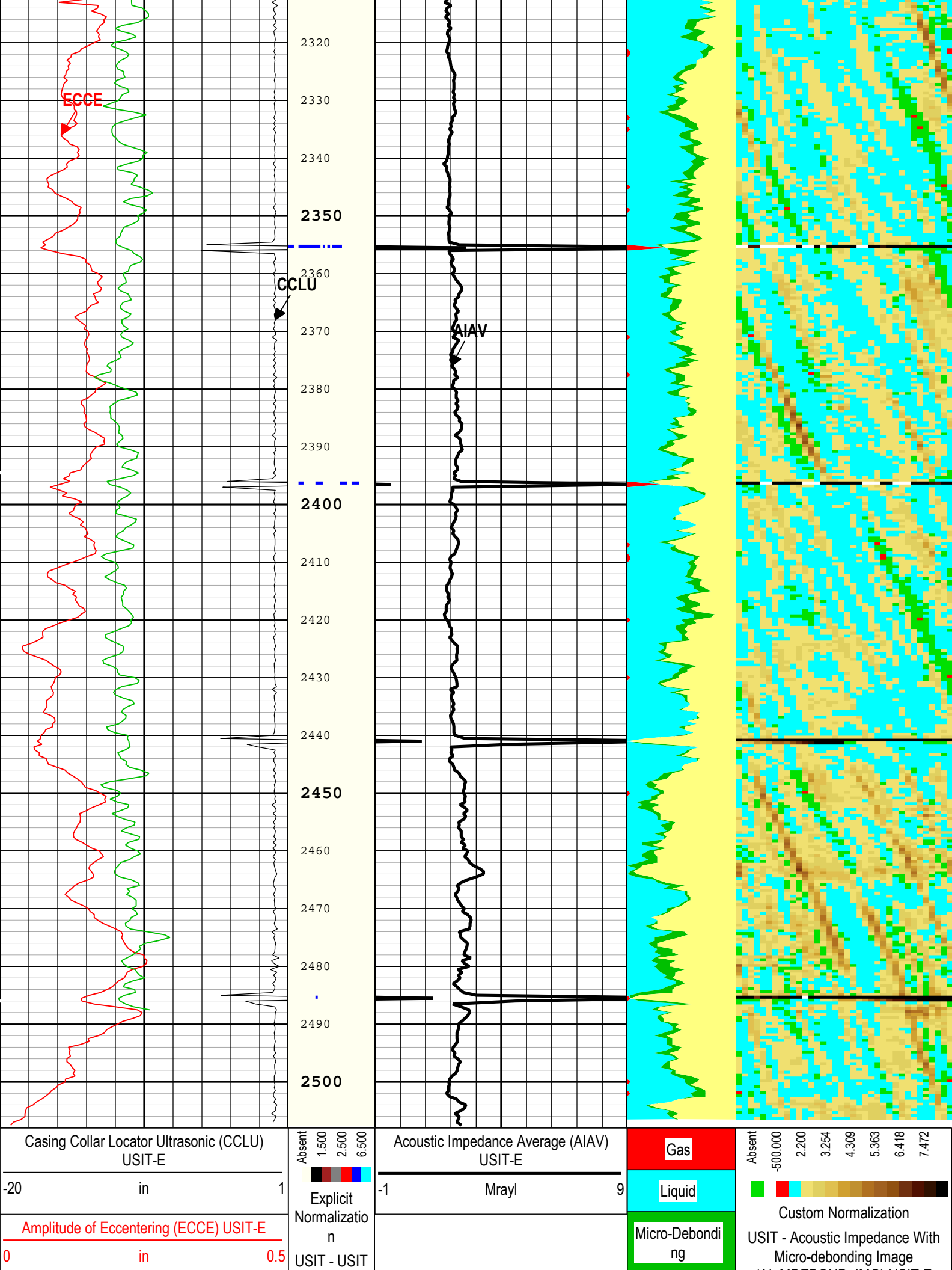
ONE: Repeat[2]:Up:S011

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: 01-Nov-2018 15:05:37

TIME_1900 - Time Marked every 60.00 (s)







Gamma Ray (ECGR_EDTC) EDTC-B			Processing Flags (UFLG) USIT-E	Bonded		(AI_MDEBOND_IMG) USIT-E (Mrayl)	
0	gAPI	150					
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: 01-Nov-2018 15:05:37							
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	17513	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	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			
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USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	FreePipe Norm.				
ZMUD	Acoustic Impedance of Mud	Borehole	1.55	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			
EMXV	EMEX Voltage	USIT-E	Time Zoned	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 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			
Time Zone Parameters							
Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)		
EMXV	50	01-Nov-2018 10:29:23	01-Nov-2018 10:30:55	2508.58	2401.39		
EMXV	40	01-Nov-2018 10:30:55	01-Nov-2018 10:31:00	2401.39	2322.10		

EMXV	40	01-Nov-2018 10:30:55	01-Nov-2018 10:31:00	2401.39	2393.19
EMXV	30	01-Nov-2018 10:31:00	01-Nov-2018 10:35:13	2393.19	1997.02

All depth are at tool zero.

XYZ

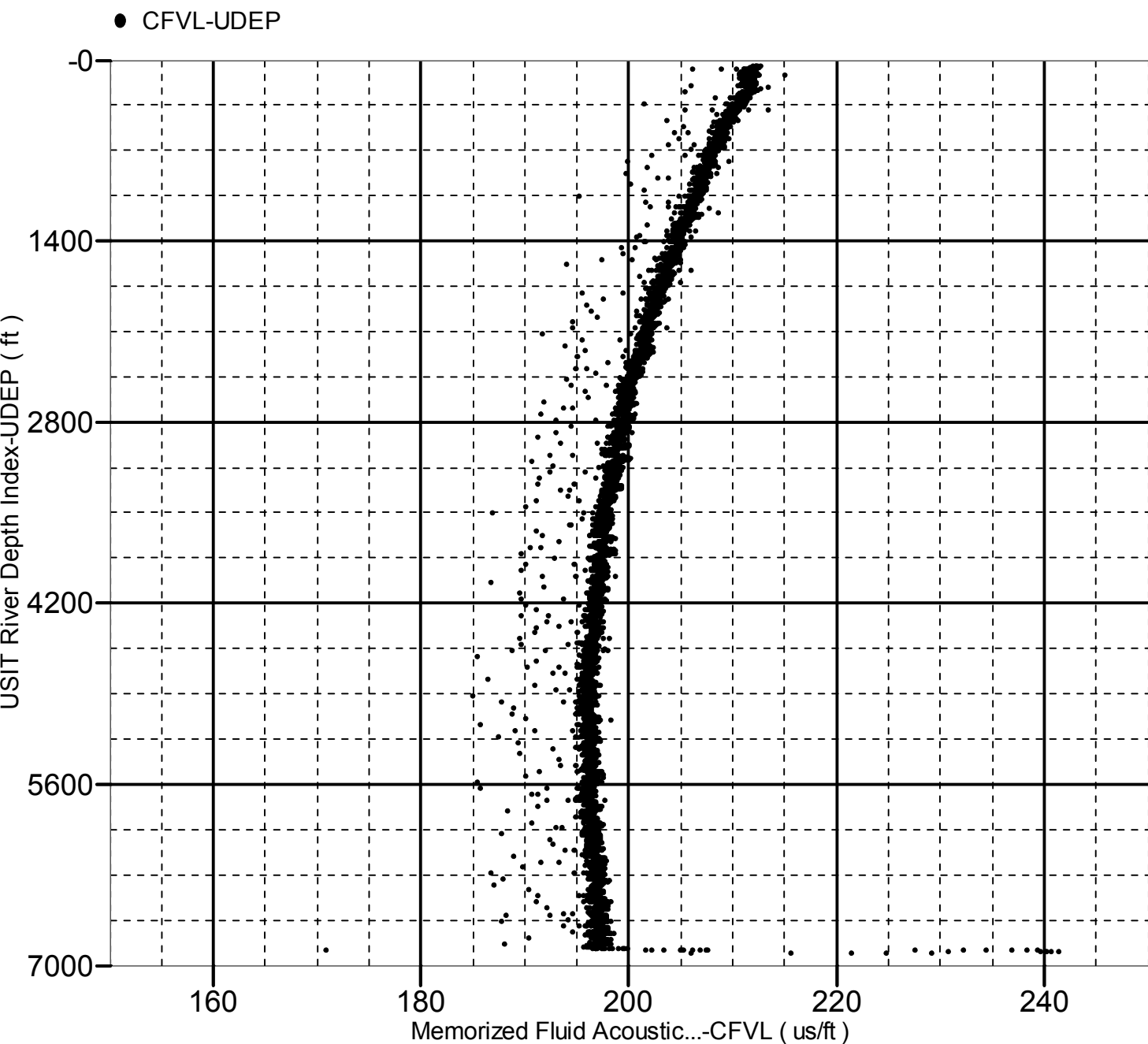
Company:Noble Energy Inc. Well:EMMY H25-711

ONE: Main[5]:Up:S011

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6922.00 to 57.50 ft



XYZ

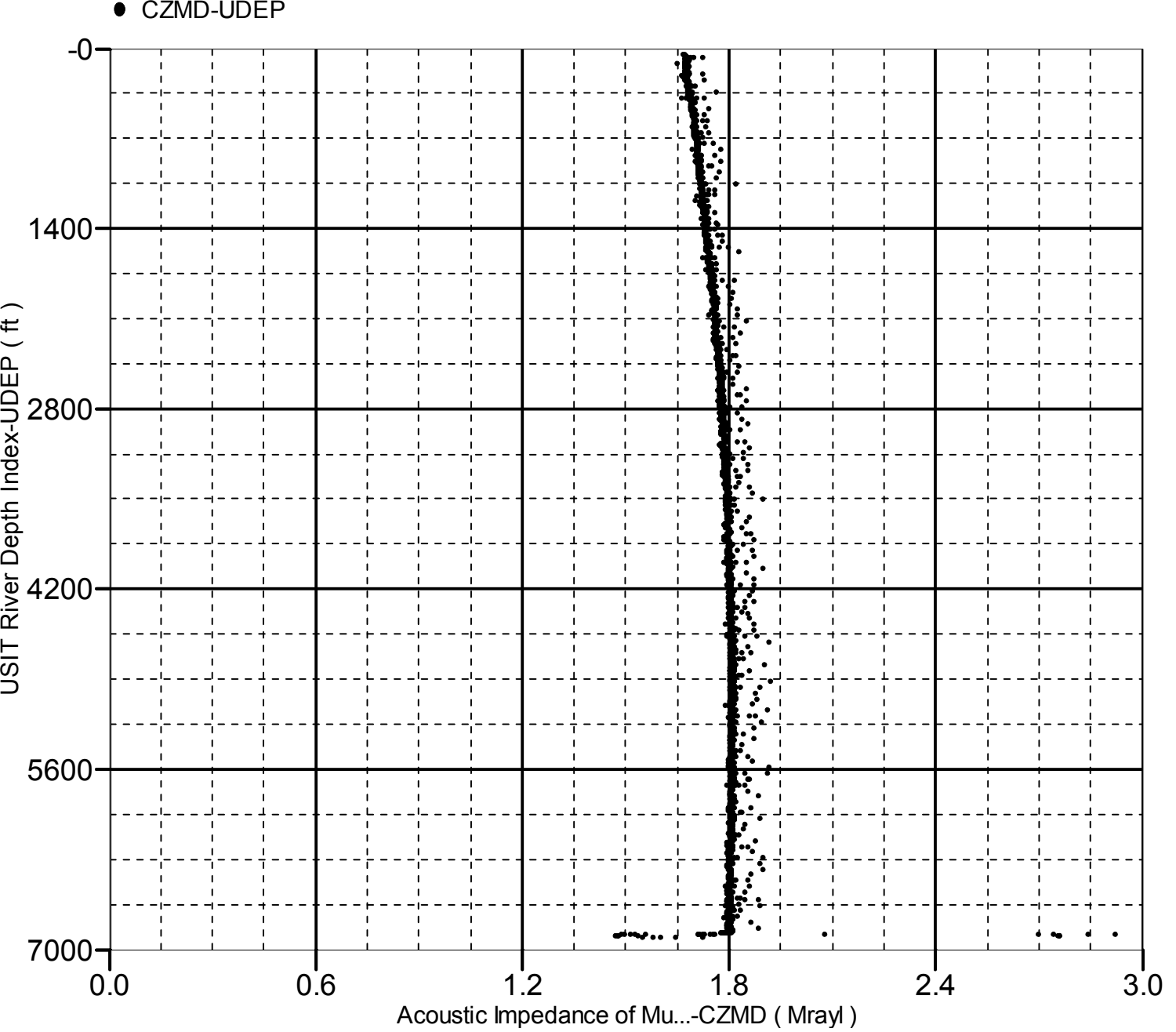
Company:Noble Energy Inc. Well:EMMY H25-711

ONE: Main[5]:Up:S011

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6922.00 to 57.50 ft



Company: Noble Energy Inc.

Schlumberger

Well: EMMY H25-711

Field: DJ BASIN

County:	Weld
State:	Colorado
UltraSonic Summary Print	