

Company: Noble Energy Inc

Well: GUTTERSEN STATE D23-731

Field: Wattenberg

County: Weld State: Colorado

UltraSonic Summary Print

County:	Weld					
Field:	Wattenberg					
Location:	NWNE 23-3N-64W					
Well:	GUTTERSEN STATE D23-731					
Company:	Noble Energy Inc					
Location:		NWNE 23-3N-64W		Elev.:	K.B.	4839.00 ft
					G.L.	4809.00 ft
					D.F.	4839.00 ft
Permanent Datum:		Ground Level		Elev.:	4809.00 f	
Log Measured From:		Kelly Bushing		30.00 ft		
Drilling Measured From:		Kelly Bushing		above Perm.Datum		
API Serial No.		Section:		Township:		Range:
05-123-48623		23		3N		64W

Logging Date	11-Nov-2019		
Run Number	1A		
Depth Driller	17538.00 ft		
Schlumberger Depth	17538.00 ft		
Bottom Log Interval	6200.00 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	1947.00 ft		
To	17538.00 ft		
Casing/Tubing Size	5.5 in		
Weight	17 lbm/ft		
Grade	N/A		
From	0.00 ft		
To	17525.00 ft		
Max Recorded Temperatures	175 degF		
Logger on Bottom	Time	16:57:00	
Unit Number	Location:	Ft Morgan	
Recorded By	L. Awalt		
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.

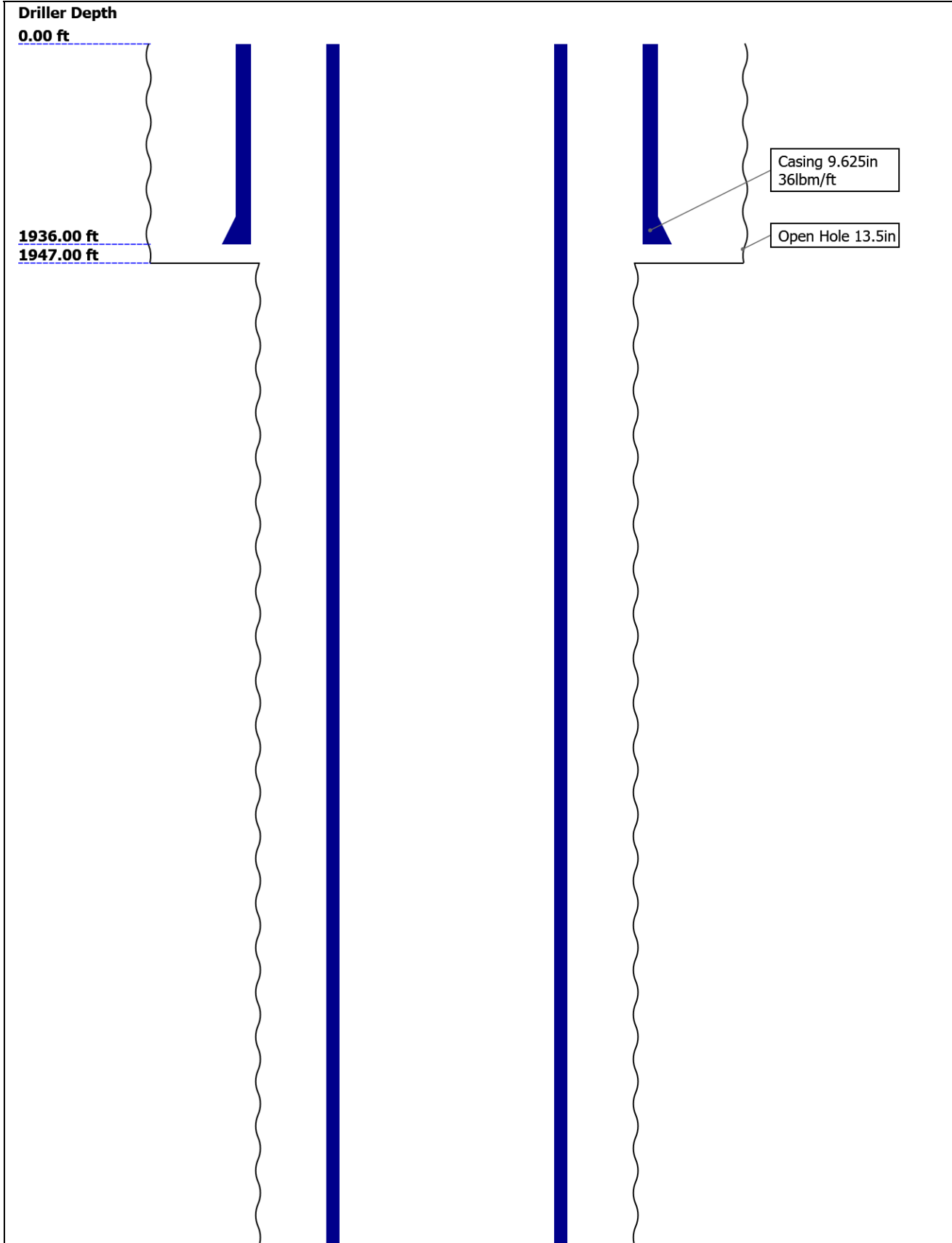
Contents

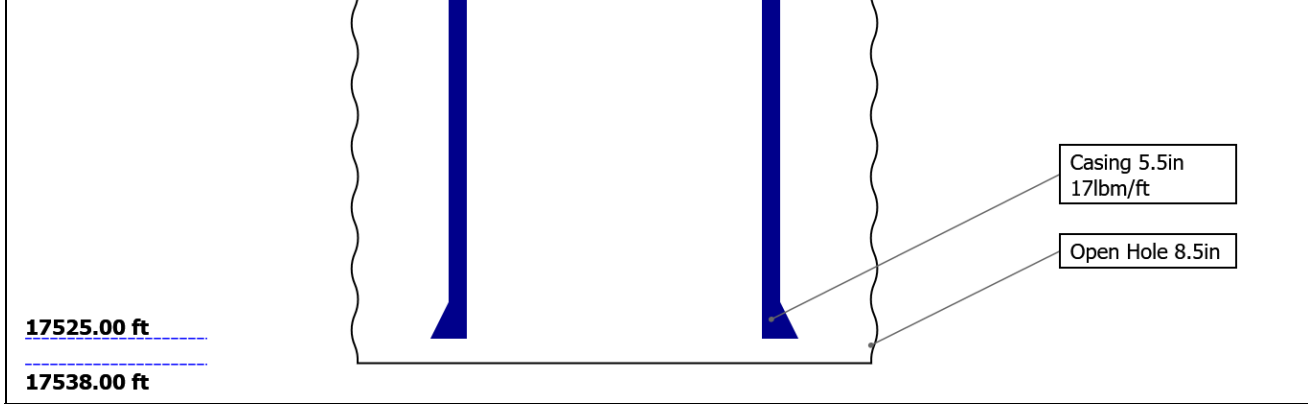
- Header
- Disclaimer
- Contents
- Well Sketch
- Borehole Size/Casing/Tubing Record
- Remarks and Equipment Summary
- USI Fluid Properties Measurement_1
- 1A 2500 PSI Main Pass
 - Integration Summary
 - Software Version
 - Composite Summary
 - Log (DJ Basin Ultrasonic Cement Summary Report)
 - Parameter Listing
- 1A 0 PSI Repeat Pass
 - Integration Summary
 - Software Version

- Tail

- 9.3 Composite Summary
- 9.4 Log (DJ Basin Ultrasonic Cement Summary Report)
- 9.5 Parameter Listing
- 10. XYZ (USI Fluid Acoustic Slowness vs Depth 3.0 in)
- 11. XYZ (USI Acoustic Impedance of Mud vs Depth 3.0 in)

Well Sketch





Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	13.5	8.5				
Top Driller (ft)	0	1947				
Top Logger (ft)	0	1947				
Bottom Driller (ft)	1947	17538				
Bottom Logger (ft)	1947	17538				
Casing						
Size (in)	9.625	5.5				
Weight (lbm/ft)	36	17				
Inner Diameter (in)	8.921	4.892				
Grade	N/A	N/A				
Top Driller (ft)	0	0				
Top Logger (ft)	0	0				
Bottom Driller (ft)	1936	17525				
Bottom Logger (ft)	1936	17525				

Remarks and Equipment Summary

1A: Toolstring			1A: Remarks
<div><div><div>Equip name</div><div>Length</div></div><div>LEH-QT</div><div>27.93</div><div>LEH-QT</div></div> <div><div><div>MP name</div><div>Offset</div></div><div>CTEM</div><div>20.95</div><div>ACCZ</div><div>0.00</div><div>HV</div><div>0.00</div><div>Gamma</div><div>19.08</div><div>Ray</div><div>TelStatu</div><div>17.95</div><div>s</div><div>GP14</div></div>	<div><div><div>EDTC-B:9</div><div>24.45</div><div>296</div><div>EDTH-B:84</div><div>33-19k</div><div>EDTG-A:7</div><div>9498</div><div>EDTC-B:92</div><div>96</div></div><div><div><div>AH-184</div><div>17.95</div></div></div><div><div><div>Adaptor_</div><div>Head</div><div>15.95</div></div></div><div><div><div>USIT-E:90</div><div>15.46</div><div>0</div><div>SQL MEA</div></div></div></div>	<div><div><div>Thank you for choosing Schlumberger!</div><div>Log run as per tool sketch</div><div>IBCS-A sub run for USI</div><div>Crew: Derrick Hunter, Jake Quinn</div></div></div>	

AH-184

17.95

Adaptor_

Head

15.95

USIT-E:90

15.46

0

ESUMEA



ECH-MFA:
1818
USAC-A:9
00
USIS-A:18
26
USSC-B:79
9
USRS-A:IB
CS-A 800
USI-SENS
OR
USI-TX



USI Sen 0.37
TOOL_ZERO
Head Fe
nsion
Lengths are in ft
Maximum Outer Diameter = 3.625 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

USIT - Fluid Properties Measurement

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[4]:Up	6203.17	74.12

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 : 26.27m(86.19ft) to 26.91m(88.28ft)
MUD_N_FRP = 1.23
DFD = 1.01g/cm3(8.40lbm/gal)
CZMD median computed in free pipe normalization interval = 1.78 MRayl

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

1A

2500 PSI Main Pass

Software Version

Acquisition System	Version
Maxwell 2019.1	9.1.110979.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
1A	Log[4]:Up	Up	74.12 ft	6203.17 ft	11-Nov-2019 6:27:48 PM	11-Nov-2019 7:17:35 PM	ON	0.00 ft	No

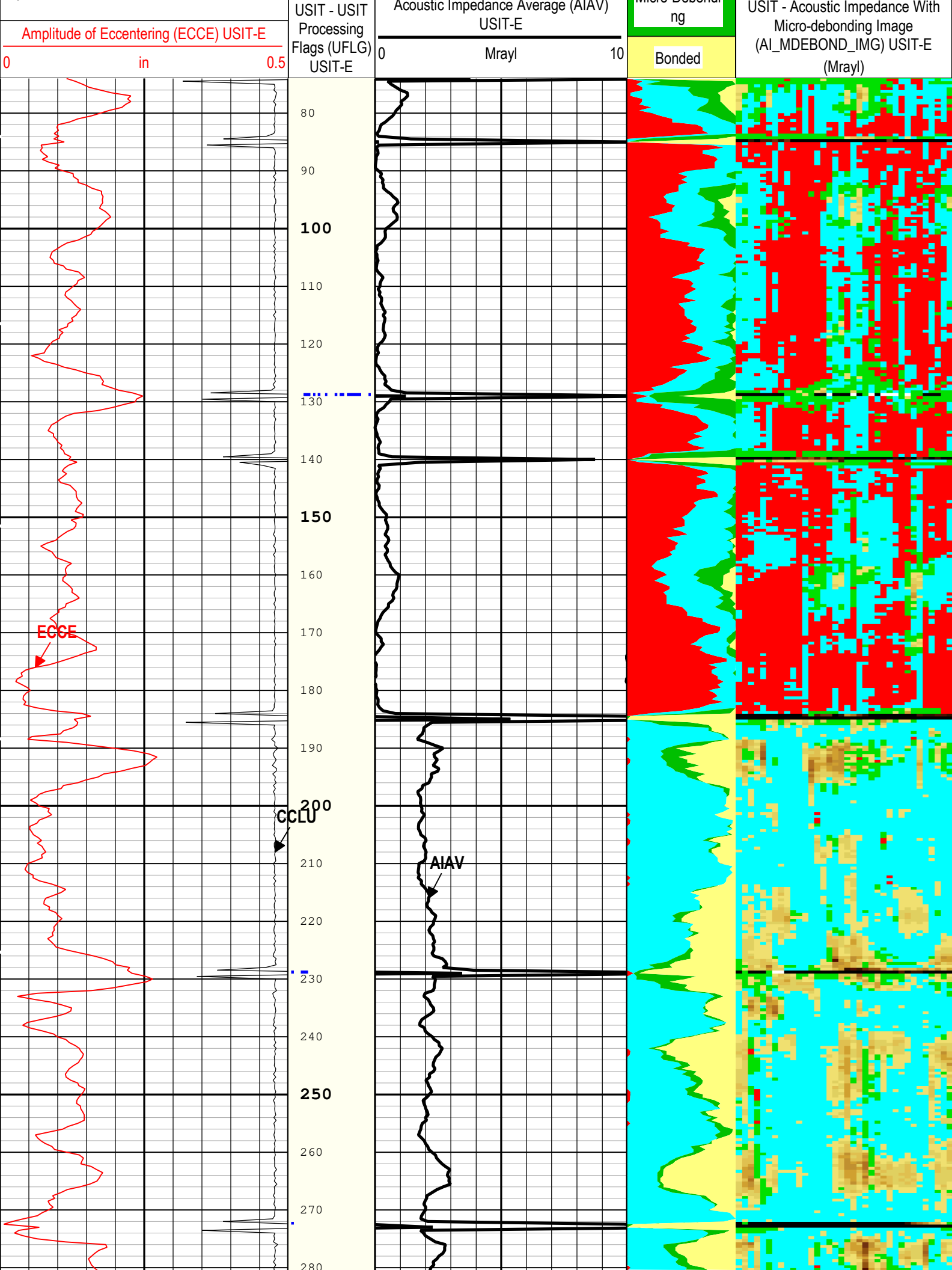
All depths are referenced to toolstring zero

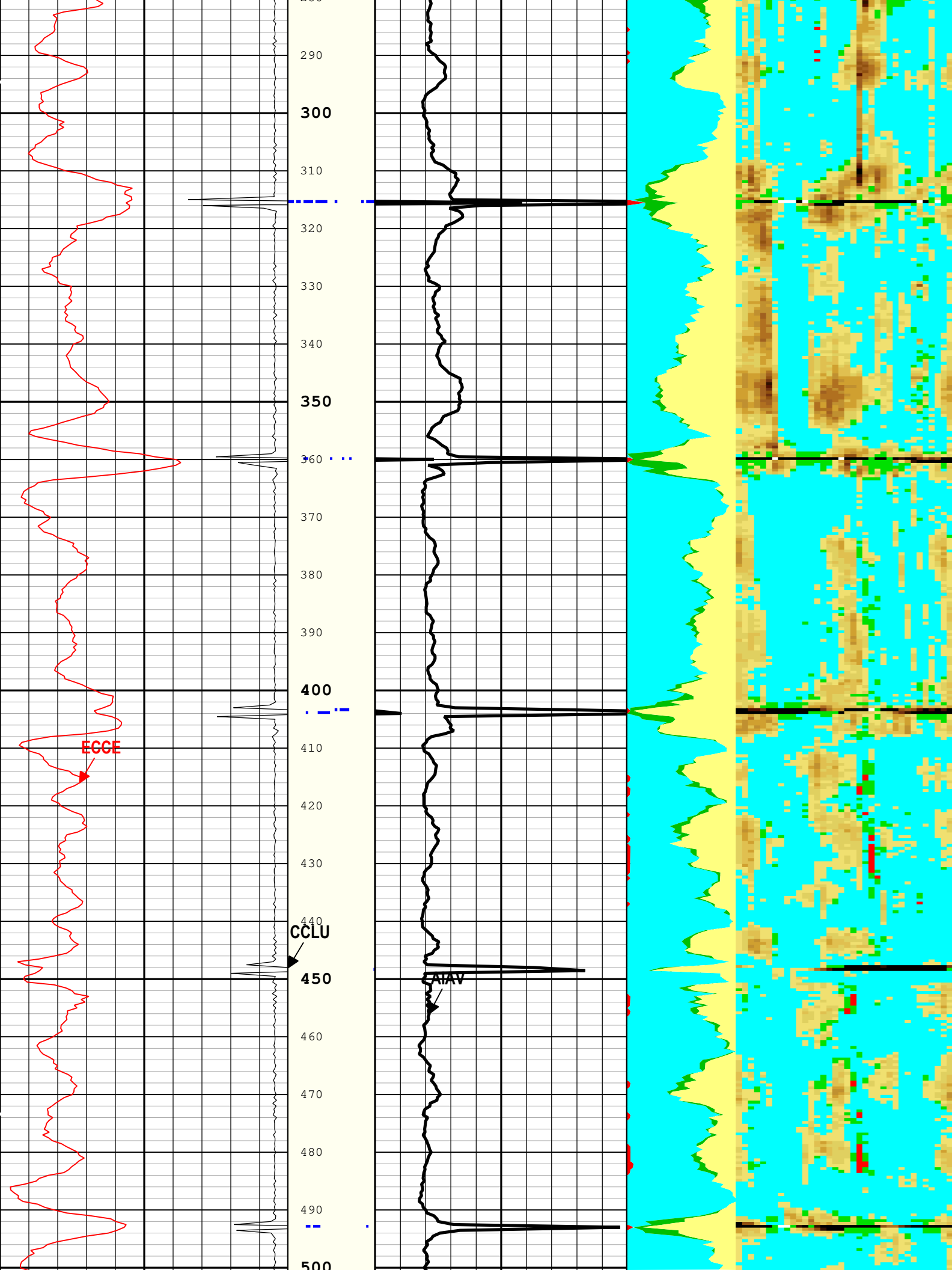
Log	Company:Noble Energy Inc Well:GUTTERSEN STATE D23-731 1A: Log[4]:Up:S004
-----	--

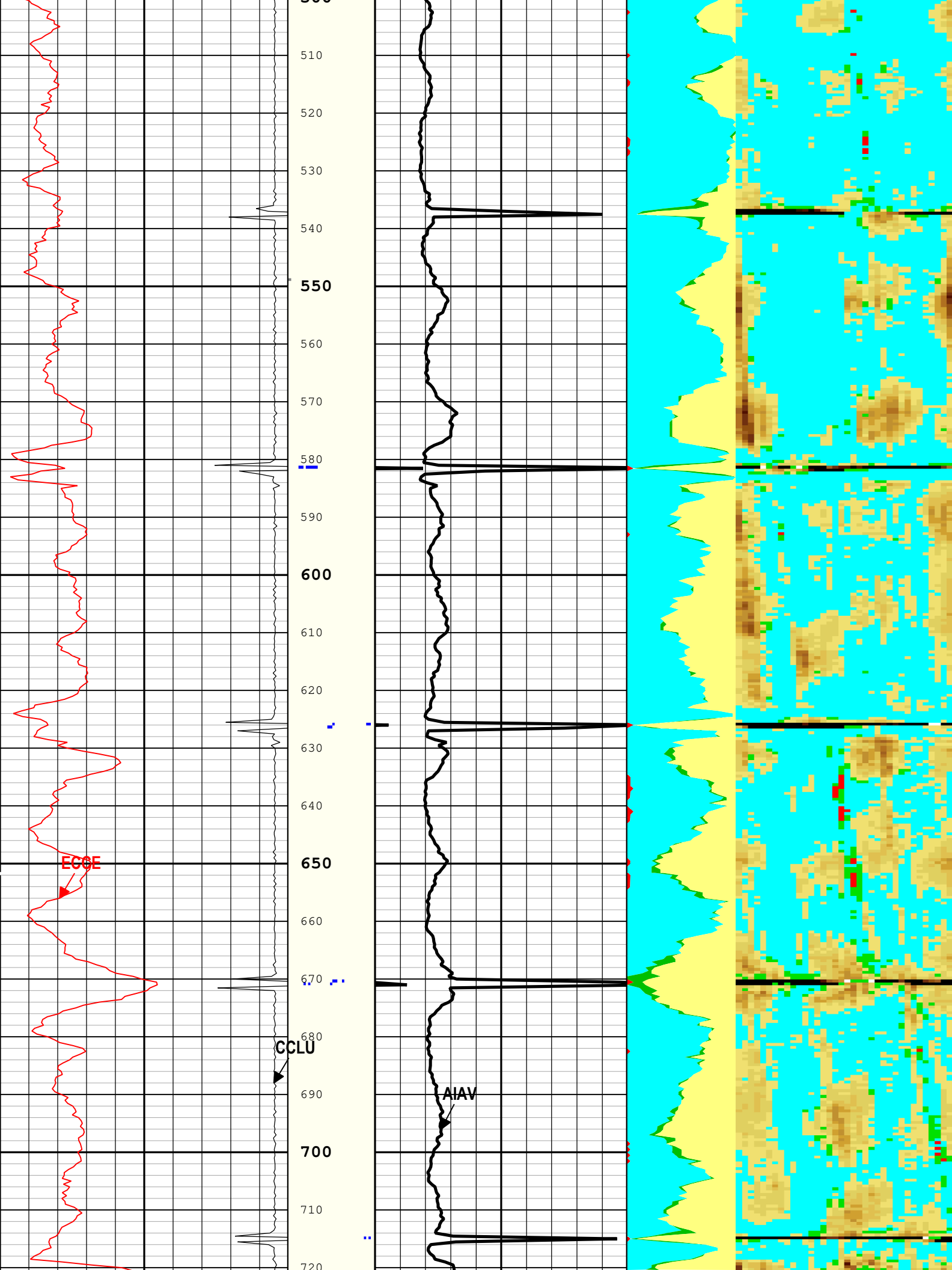
Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 11-Nov-2019 22:43:32

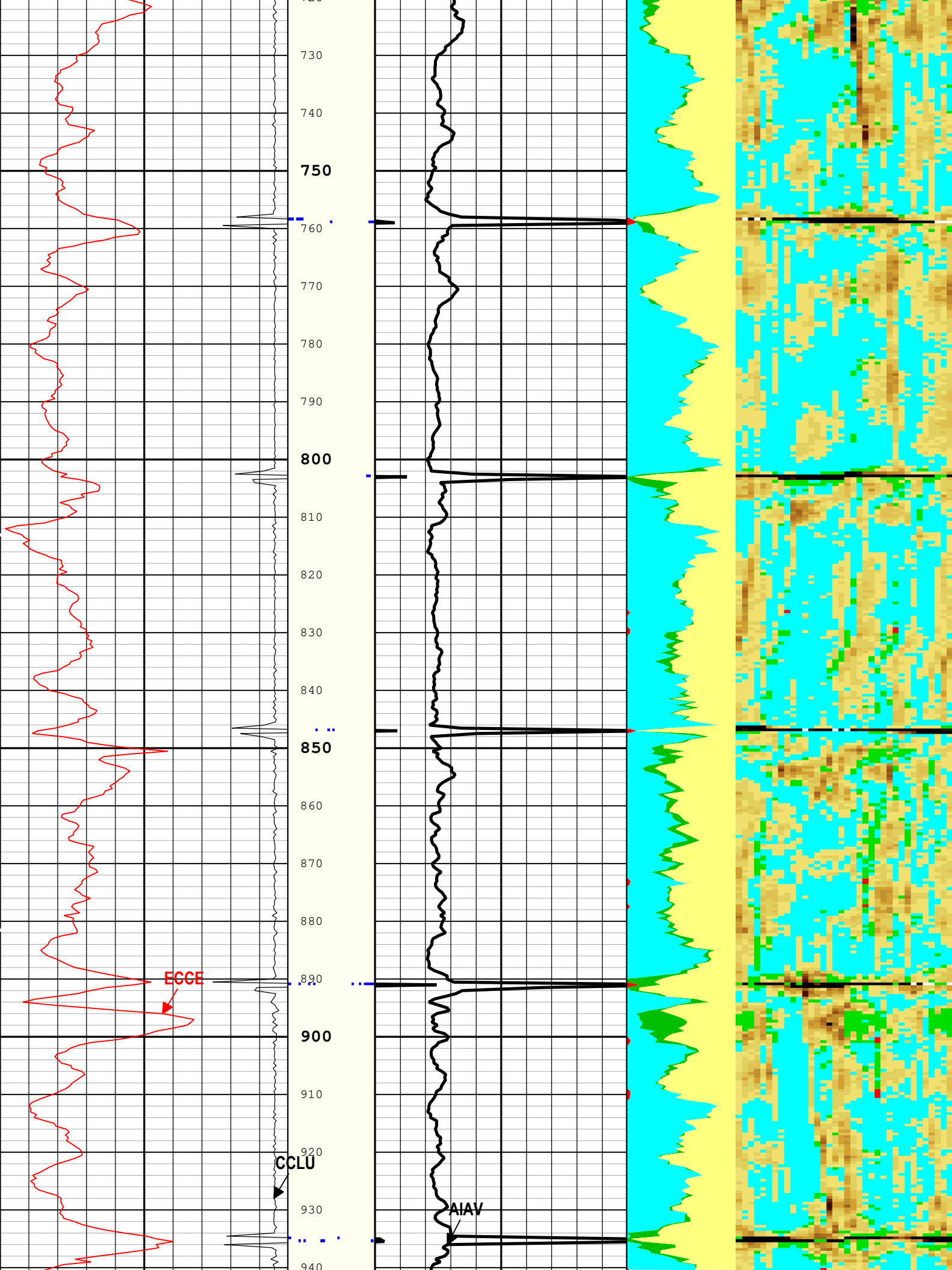
TIME_1900 - Time Marked every 60.00 (s)

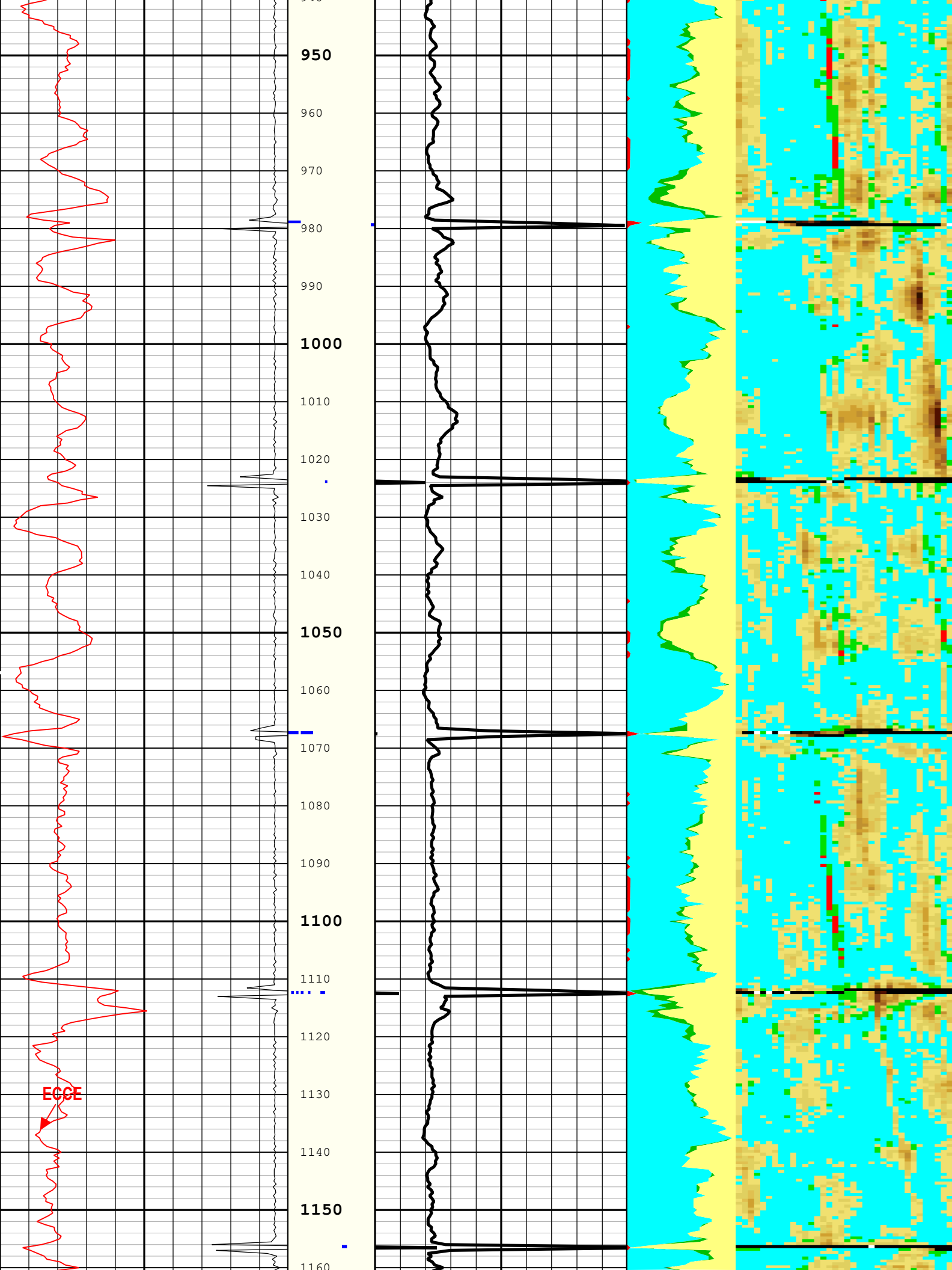


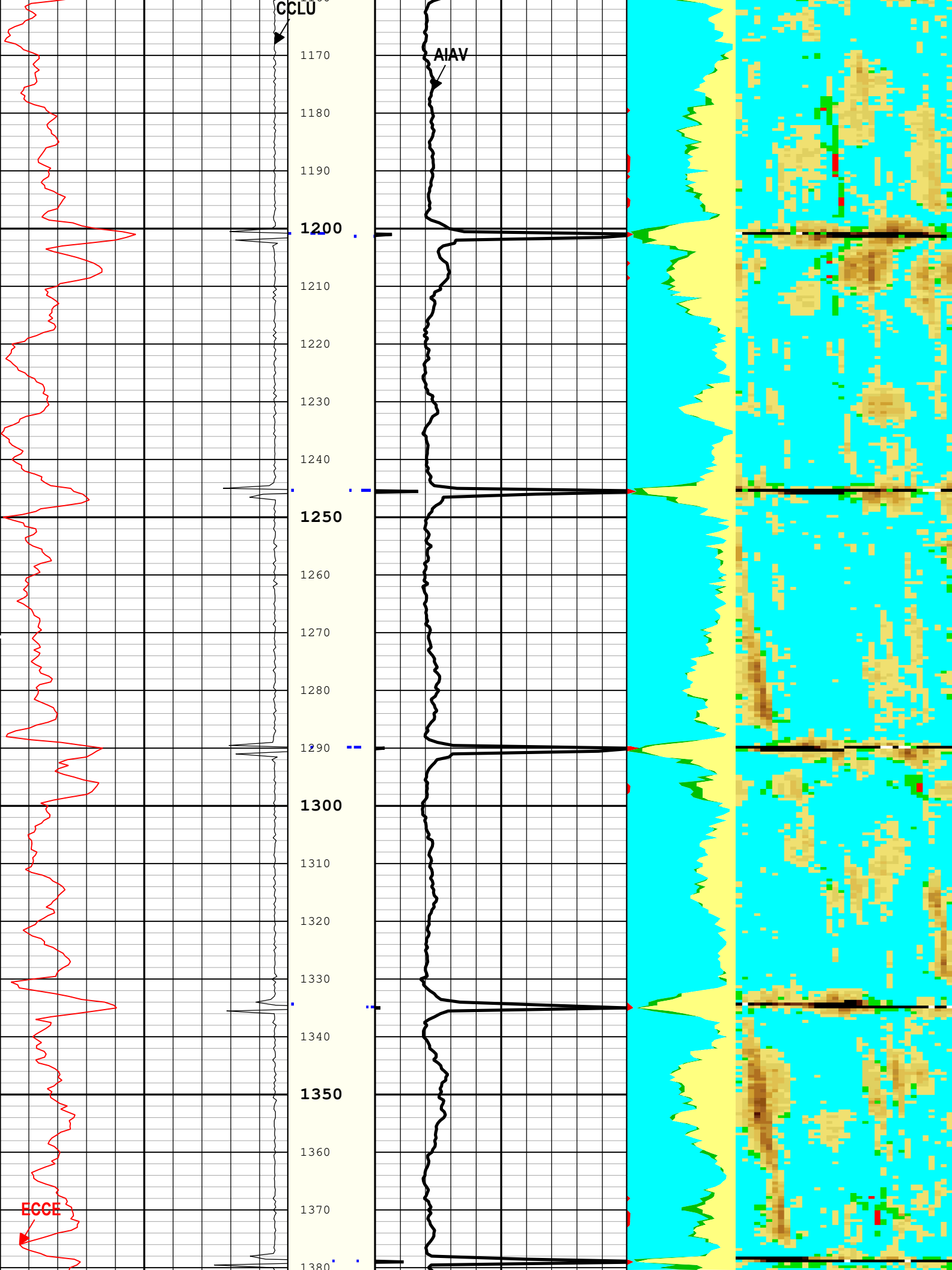


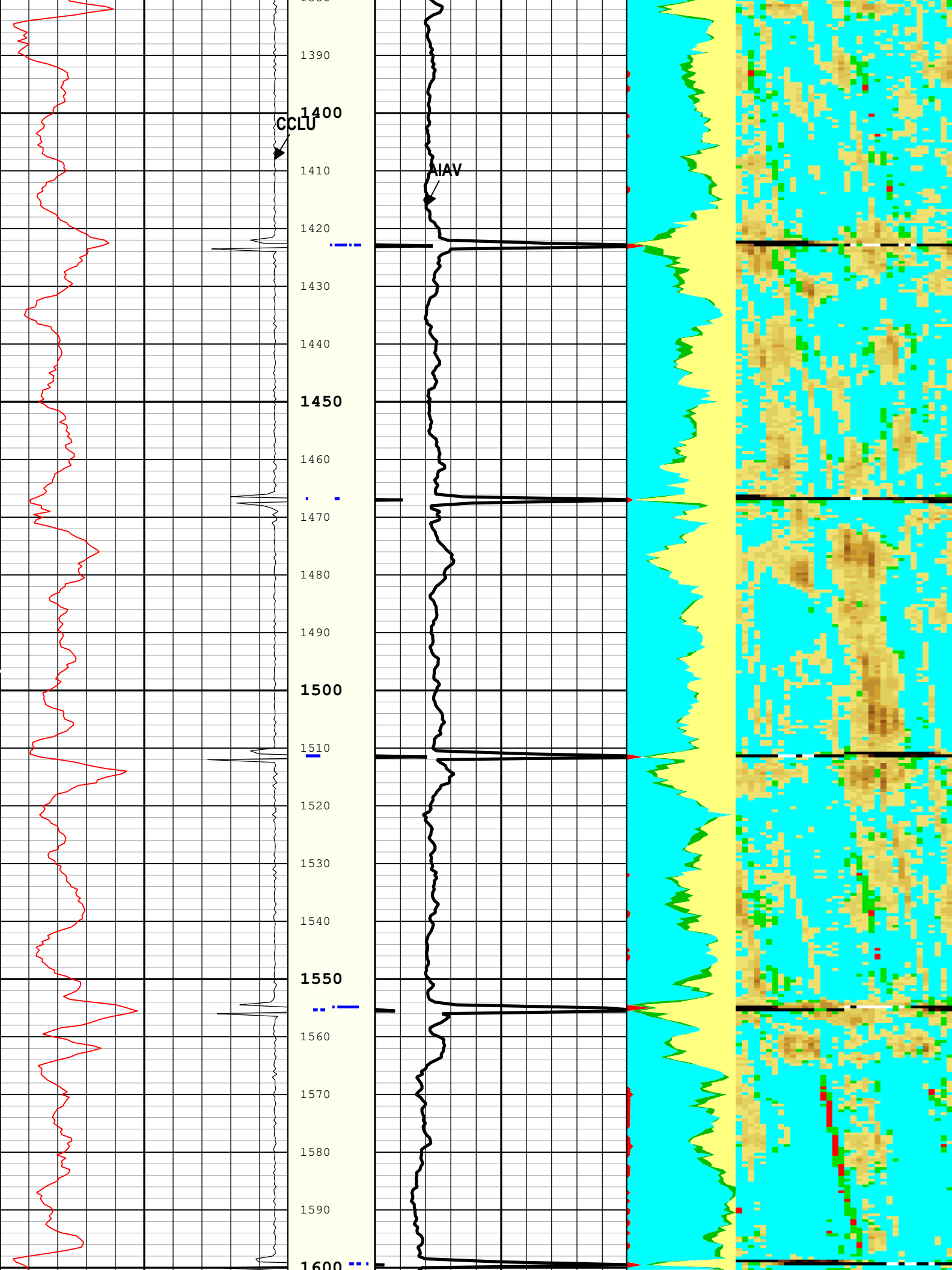


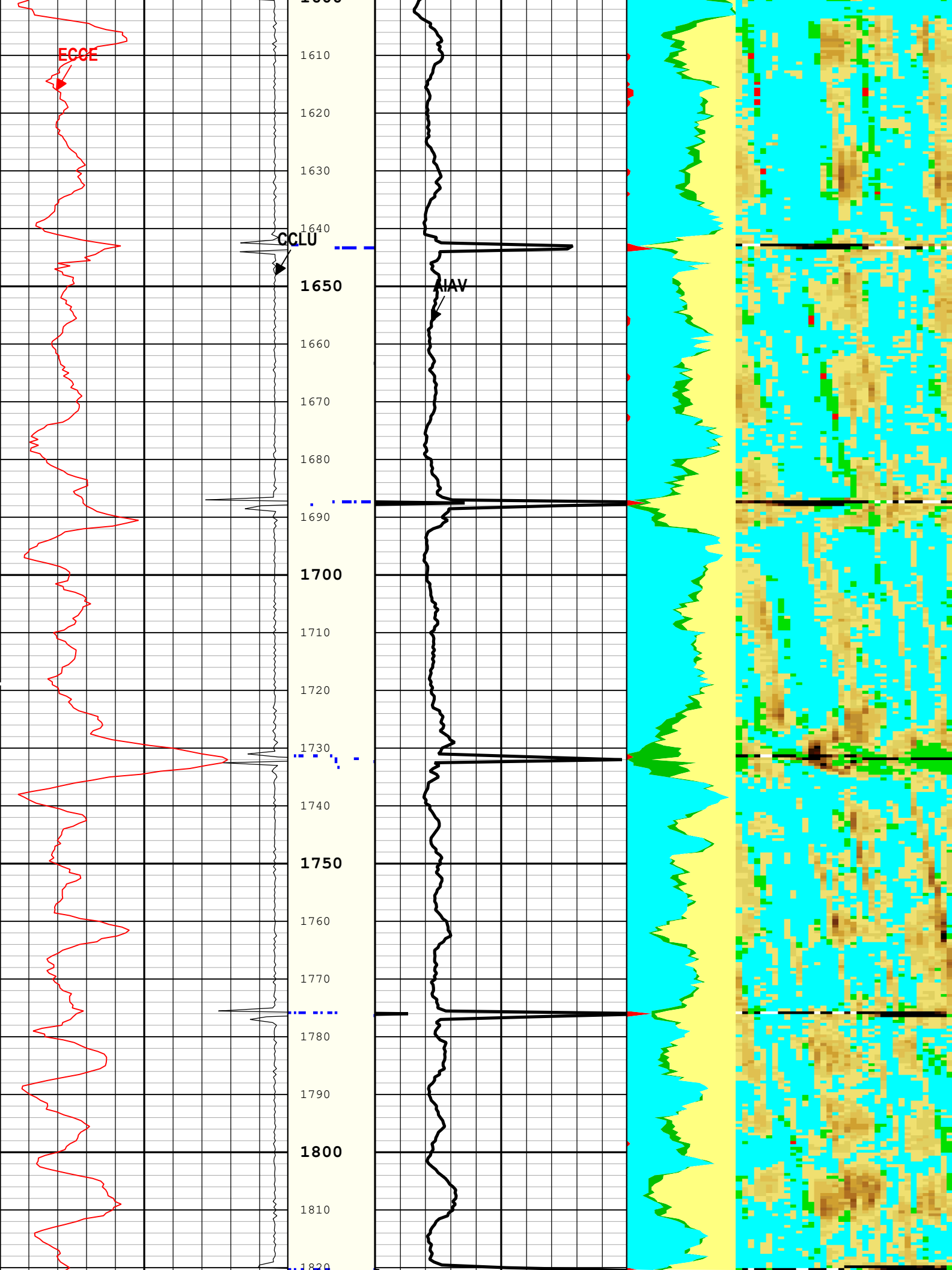


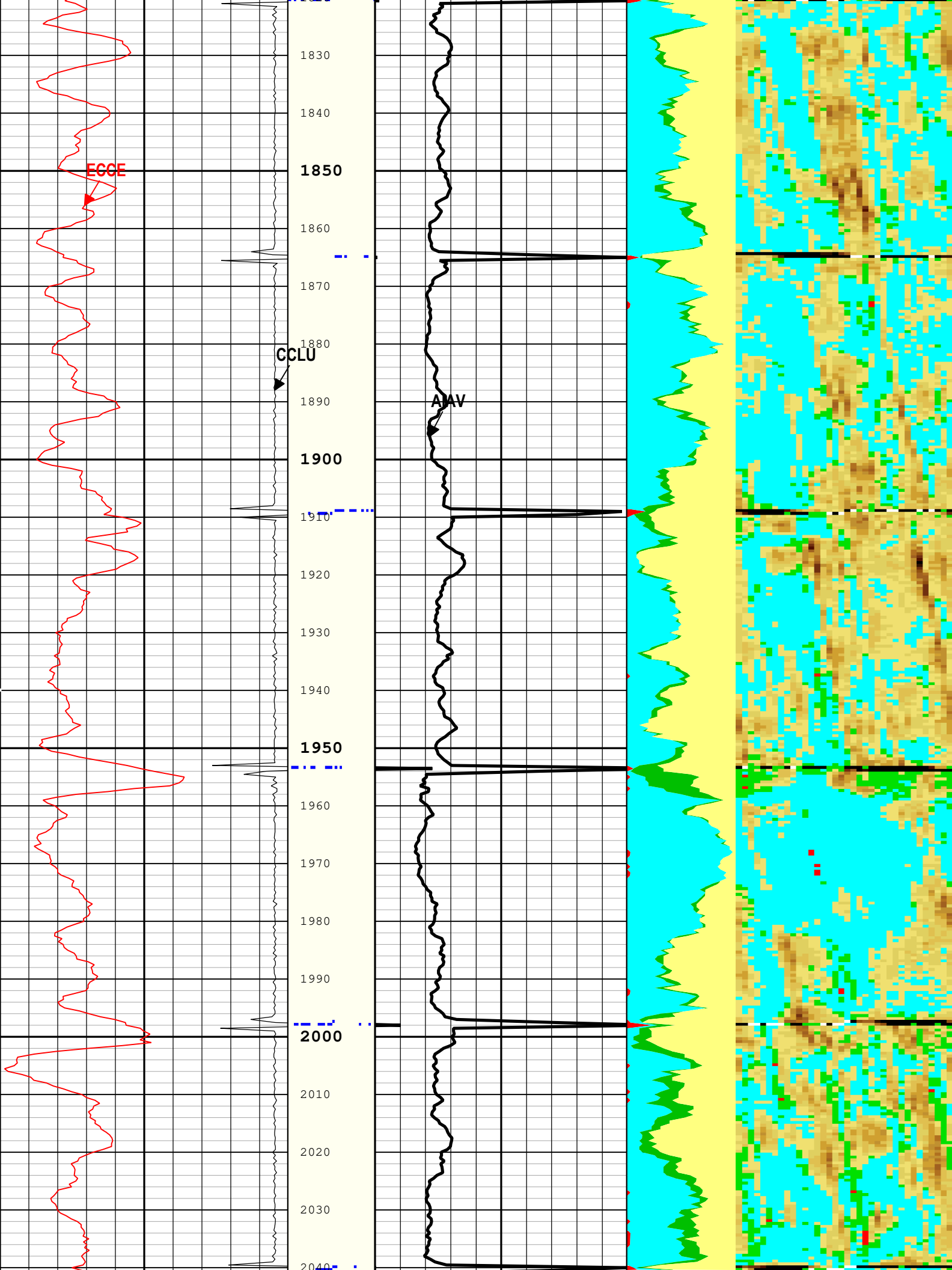


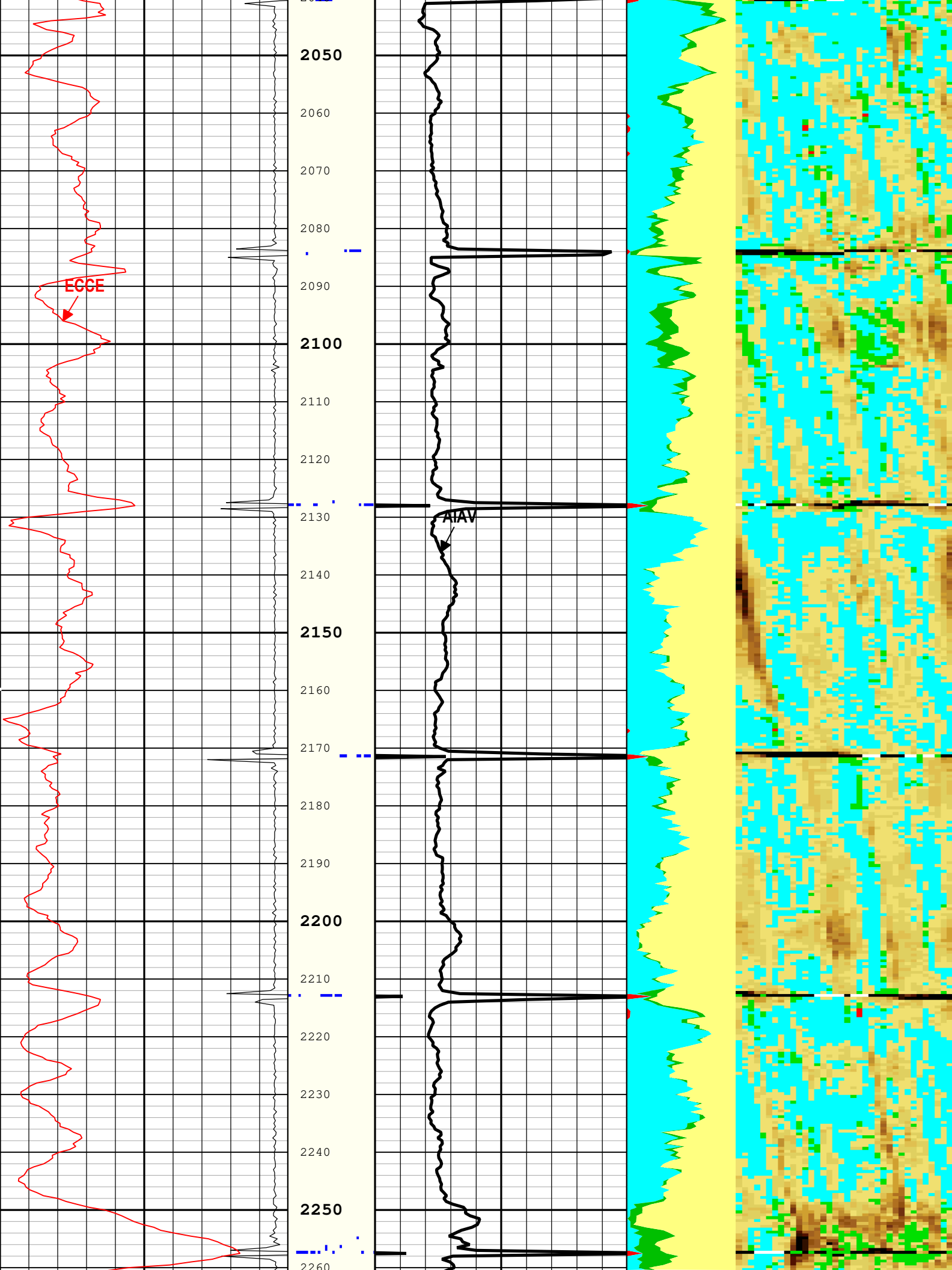


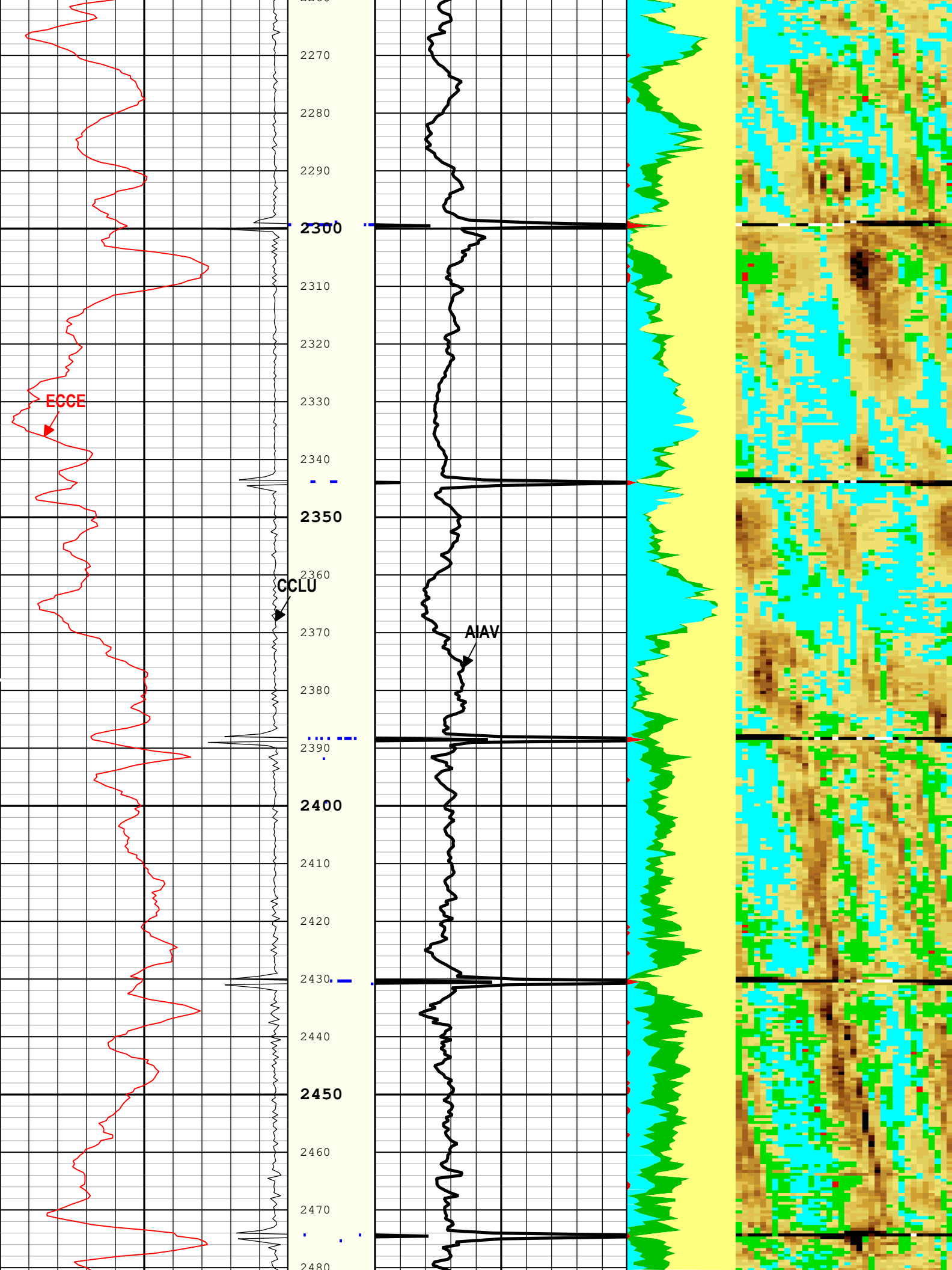


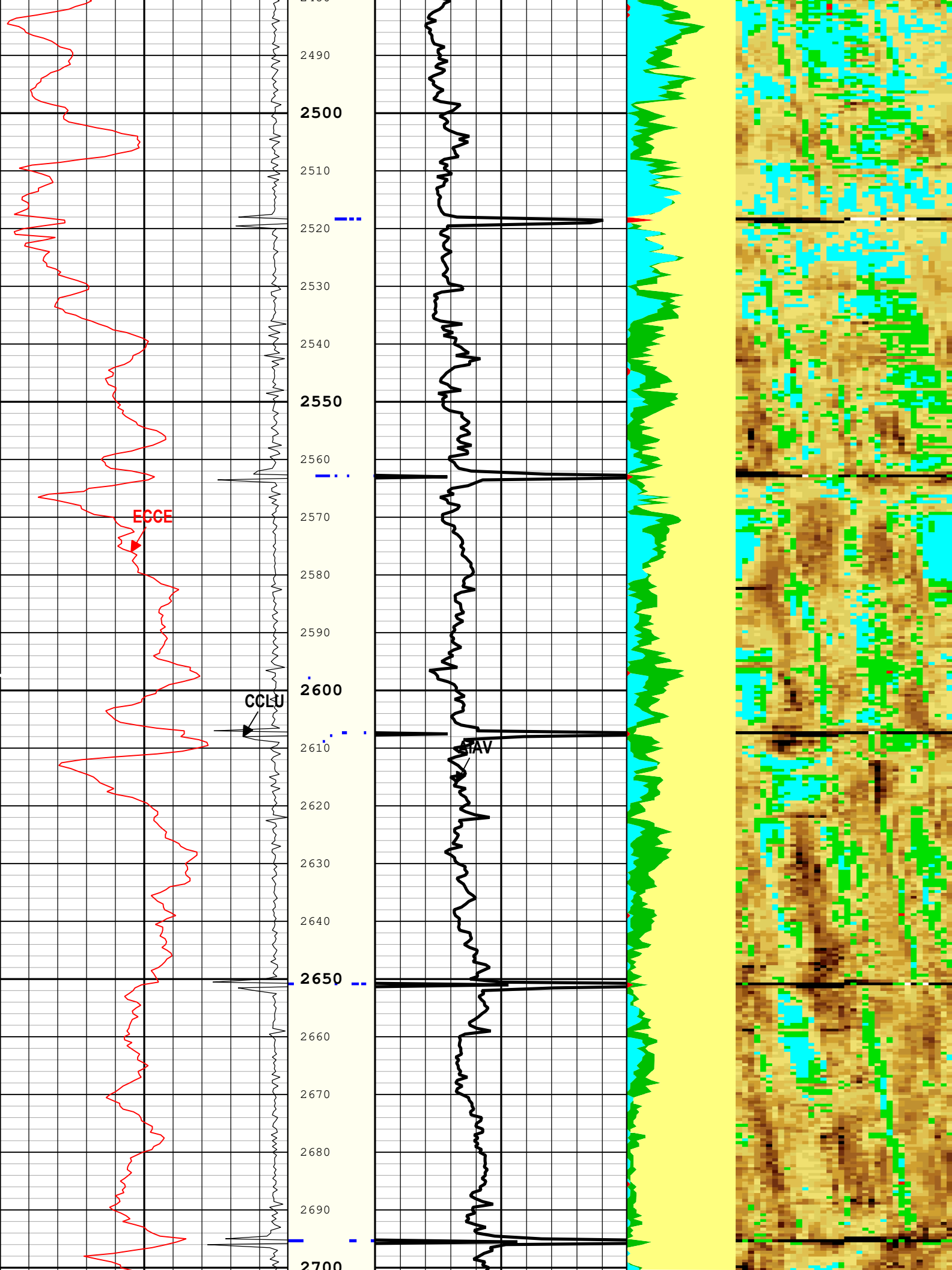


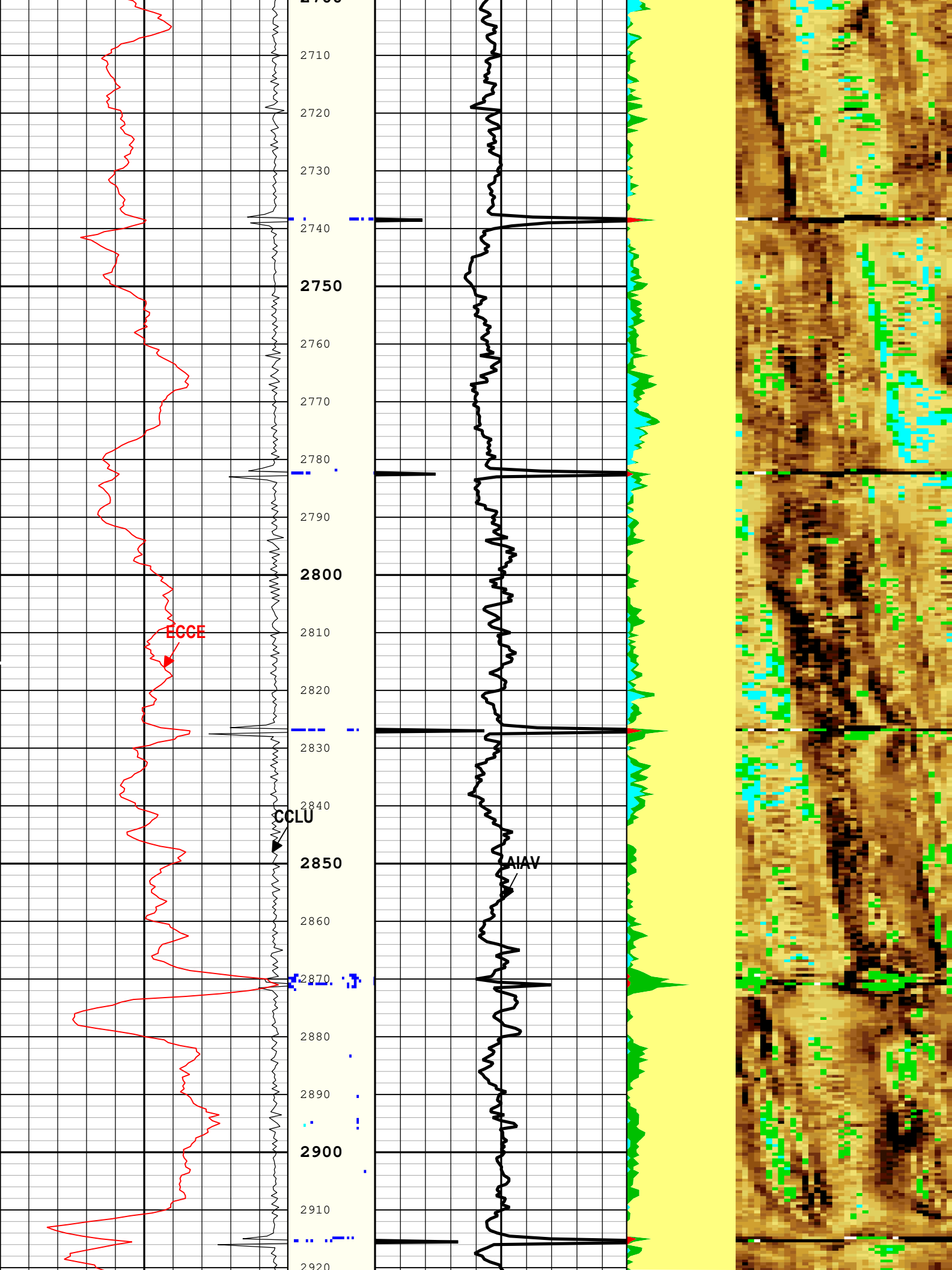


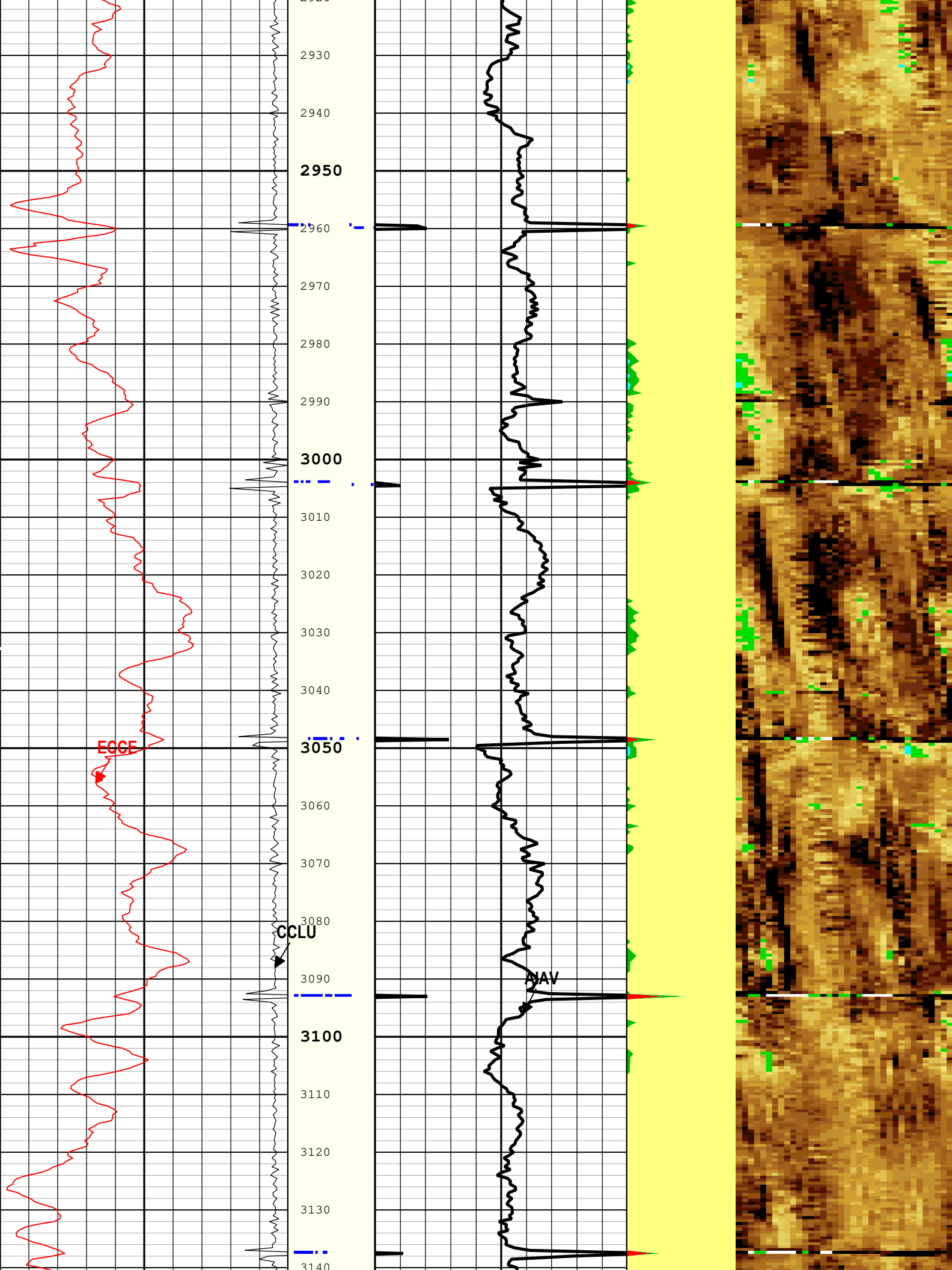


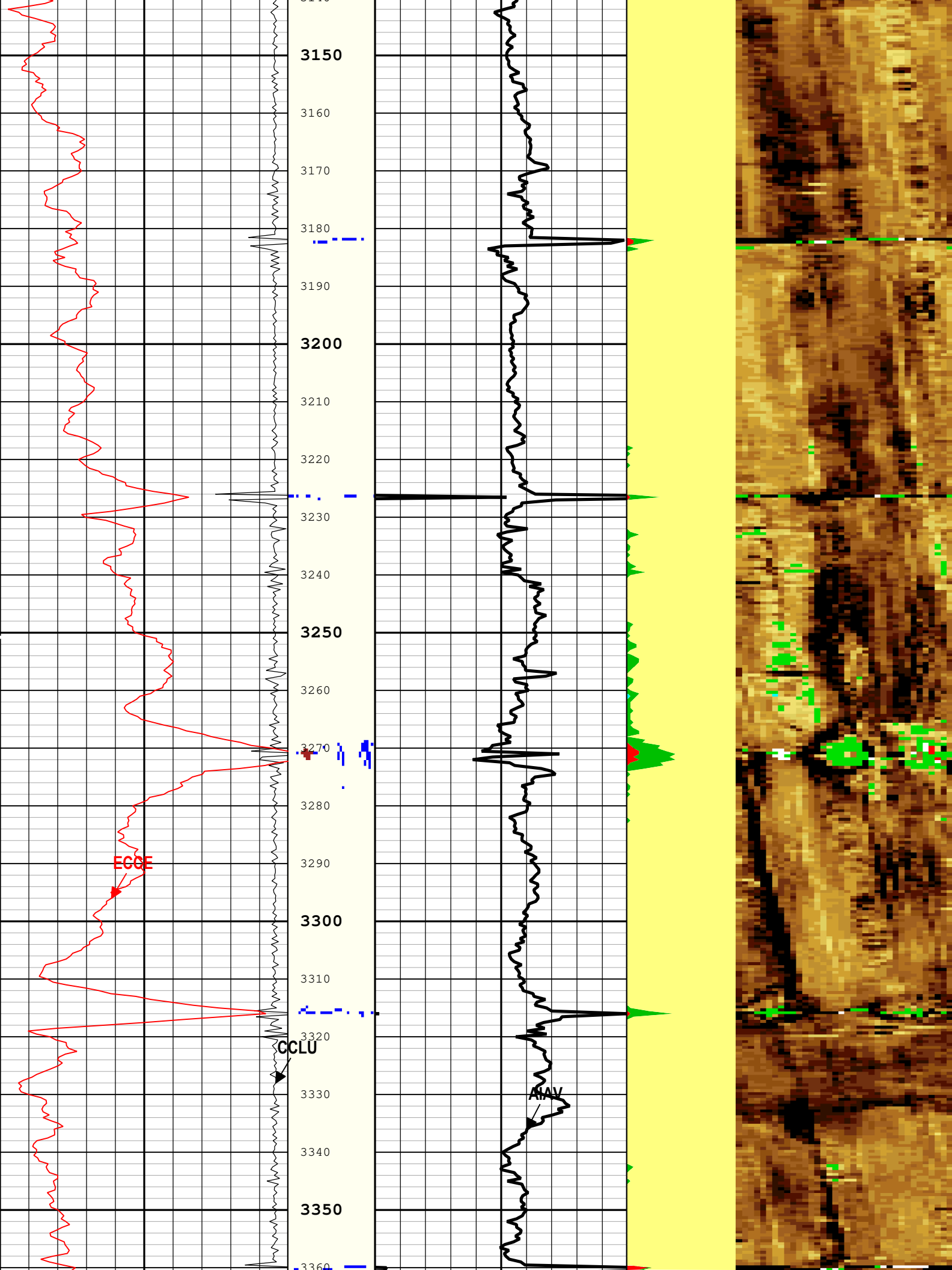


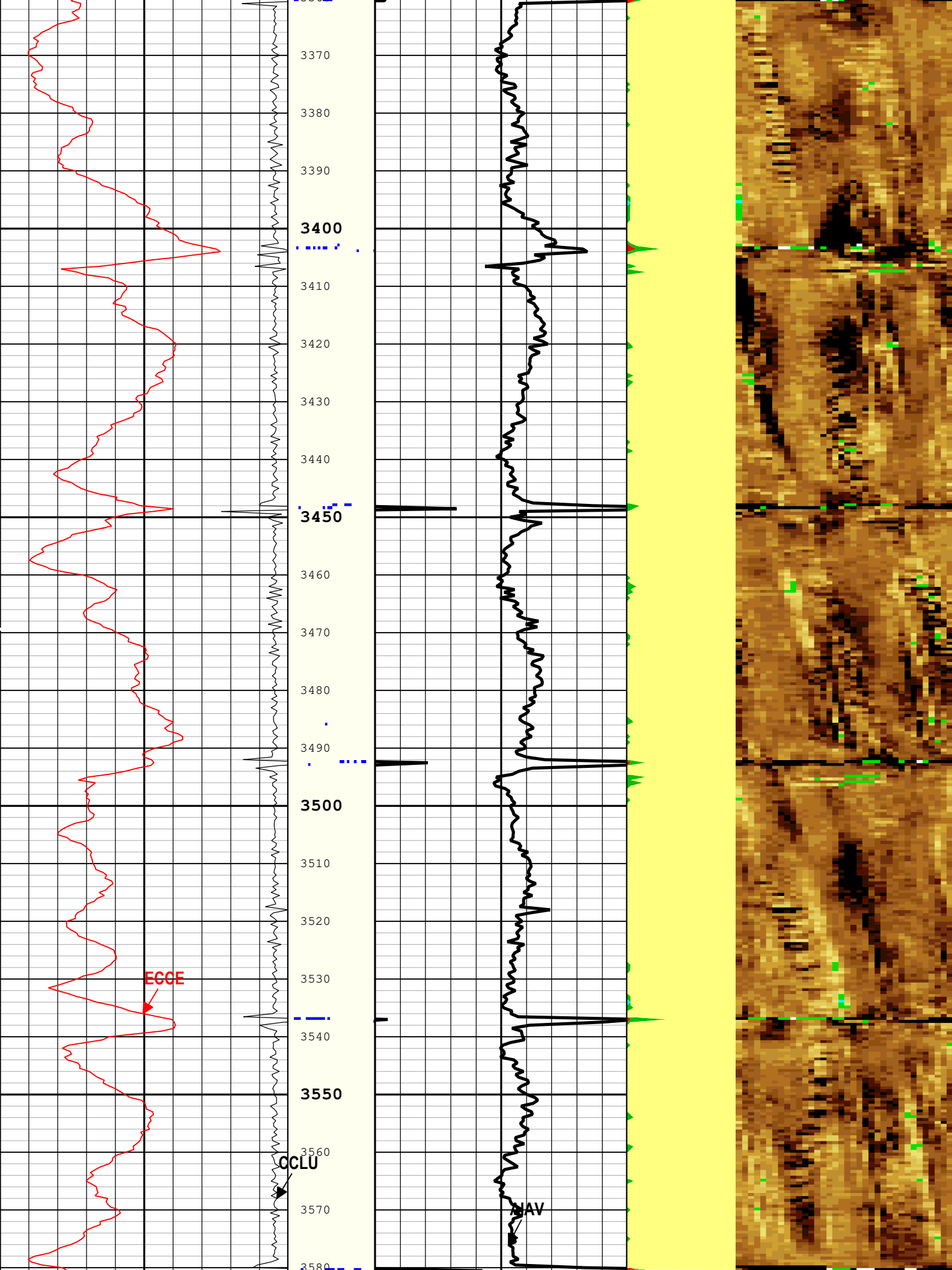


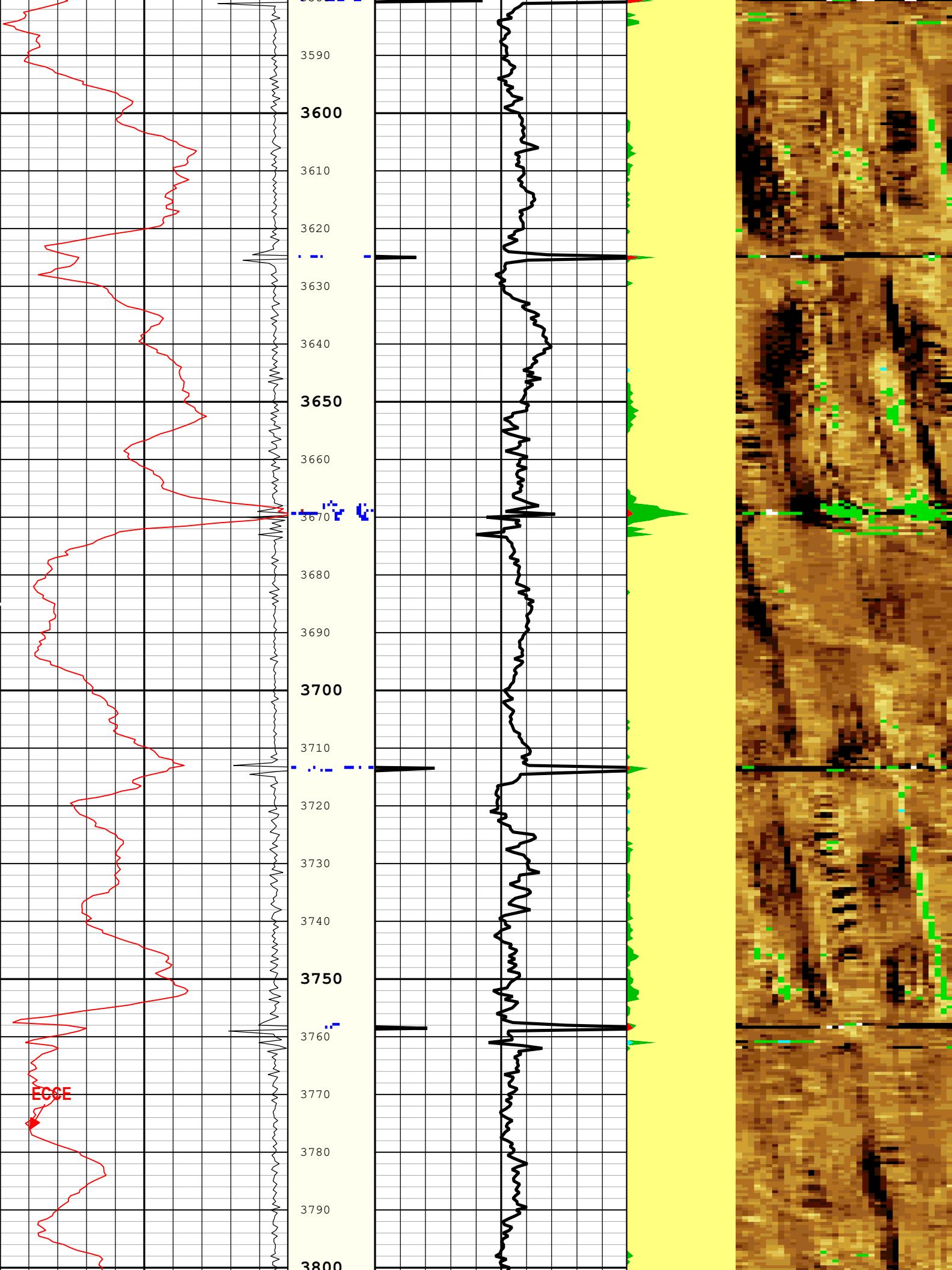


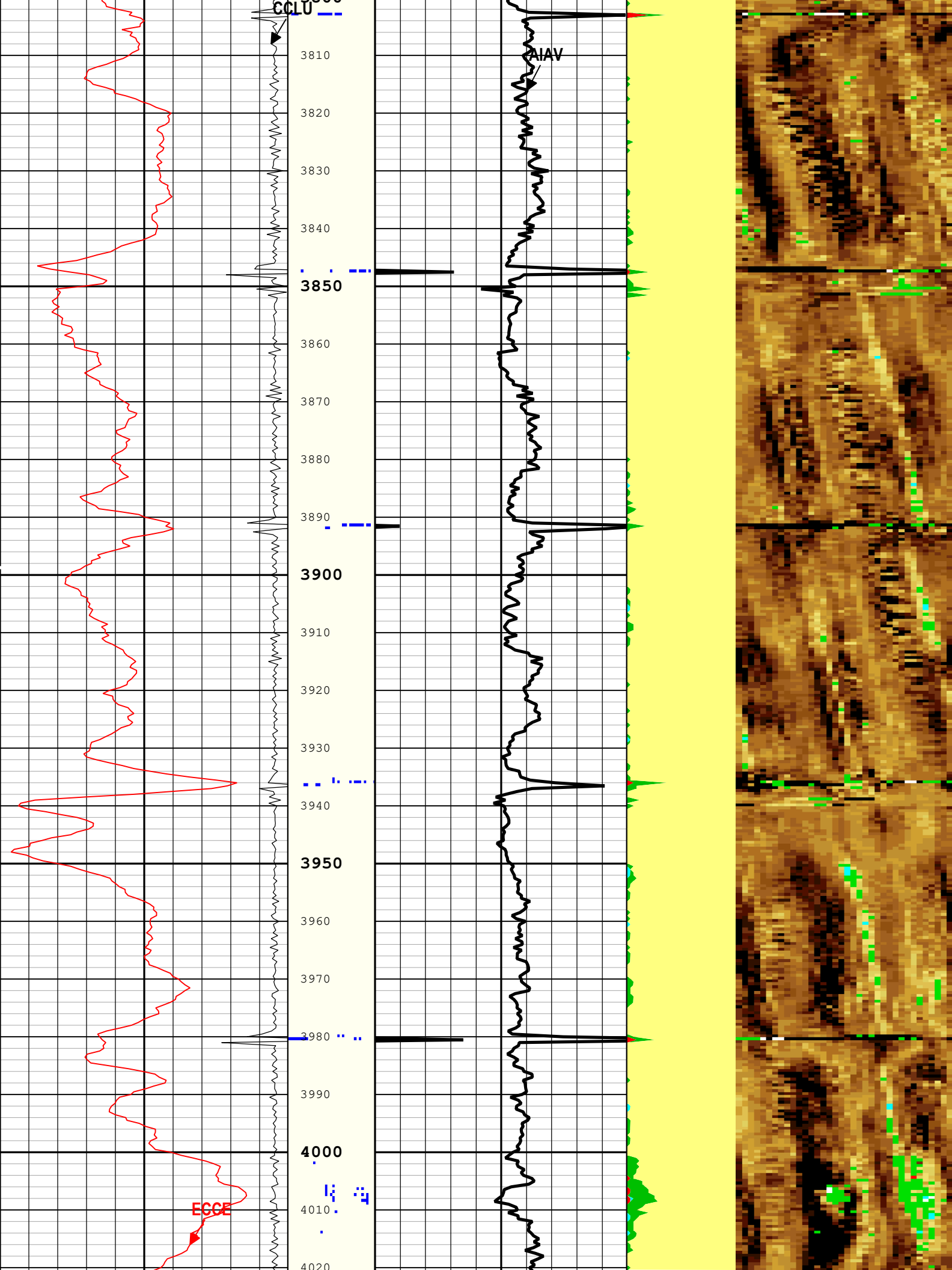


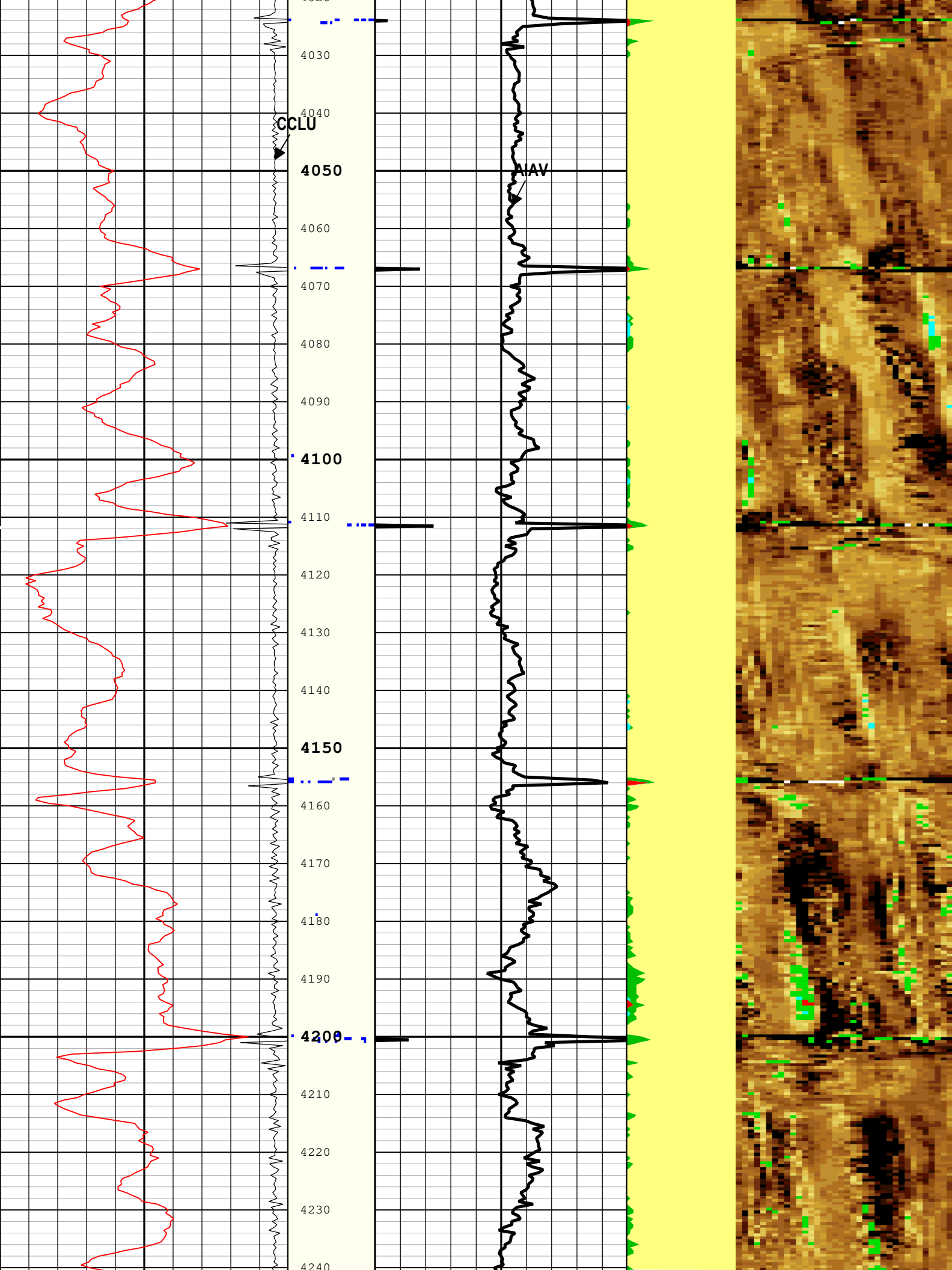


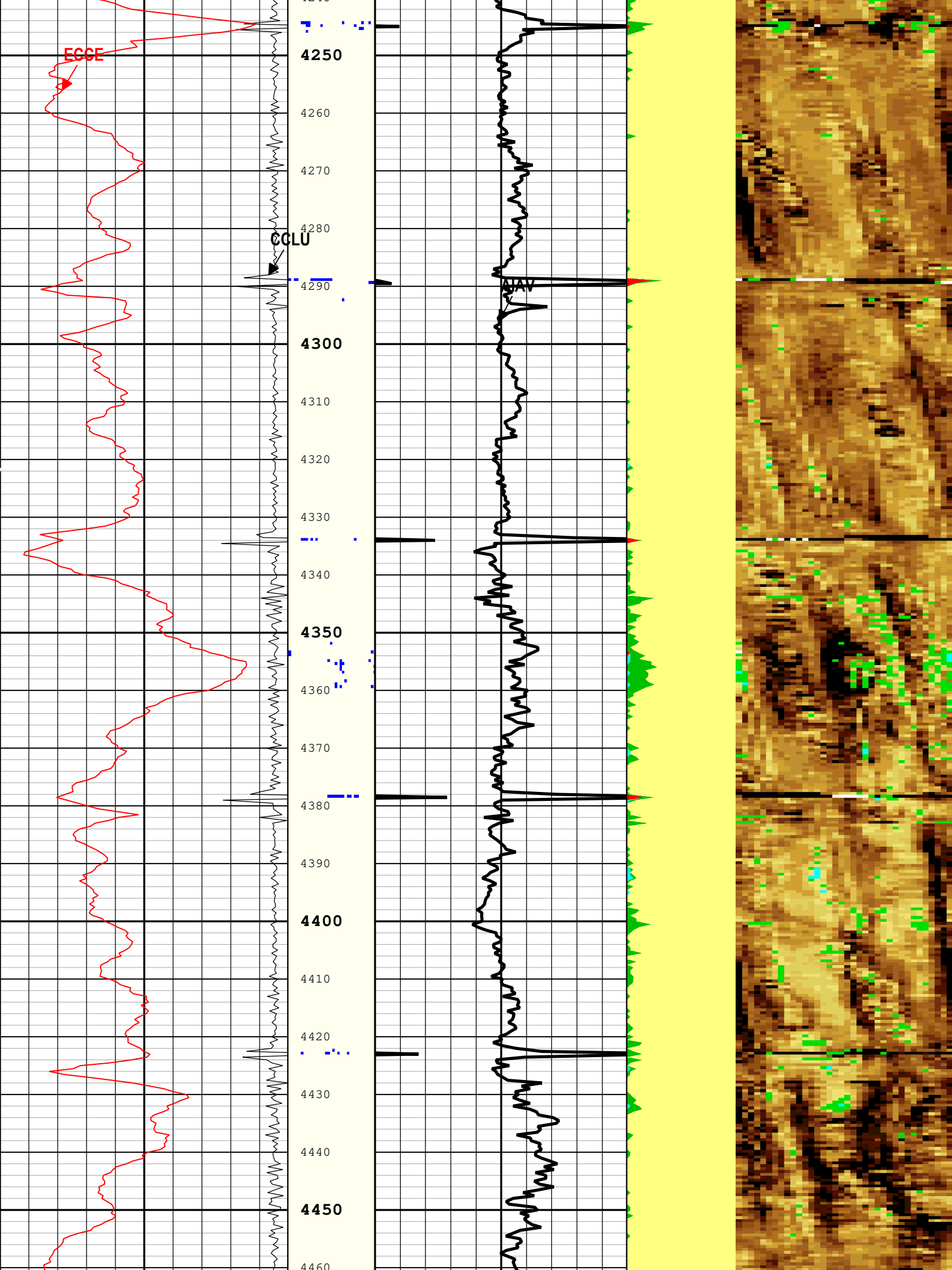


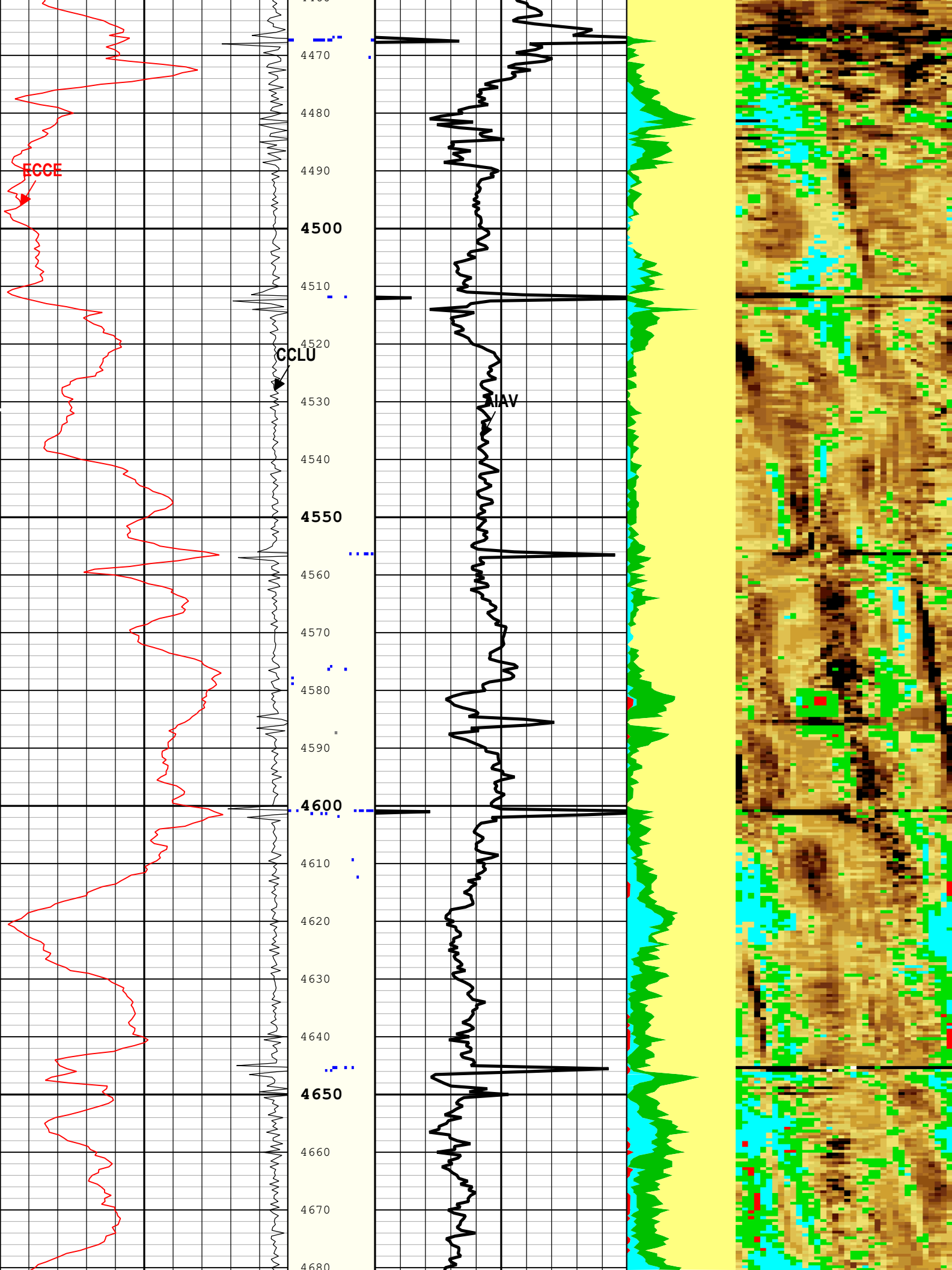


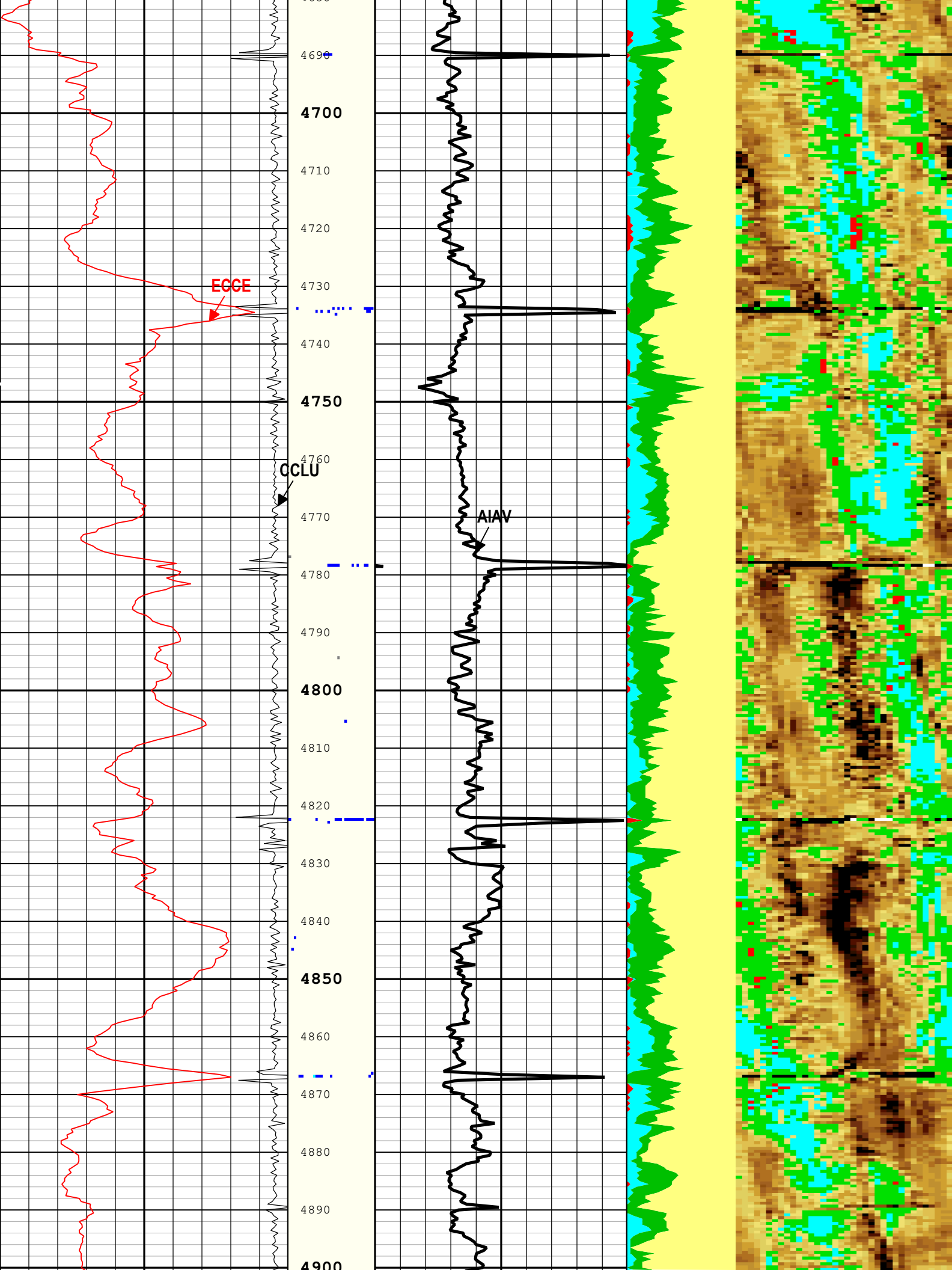


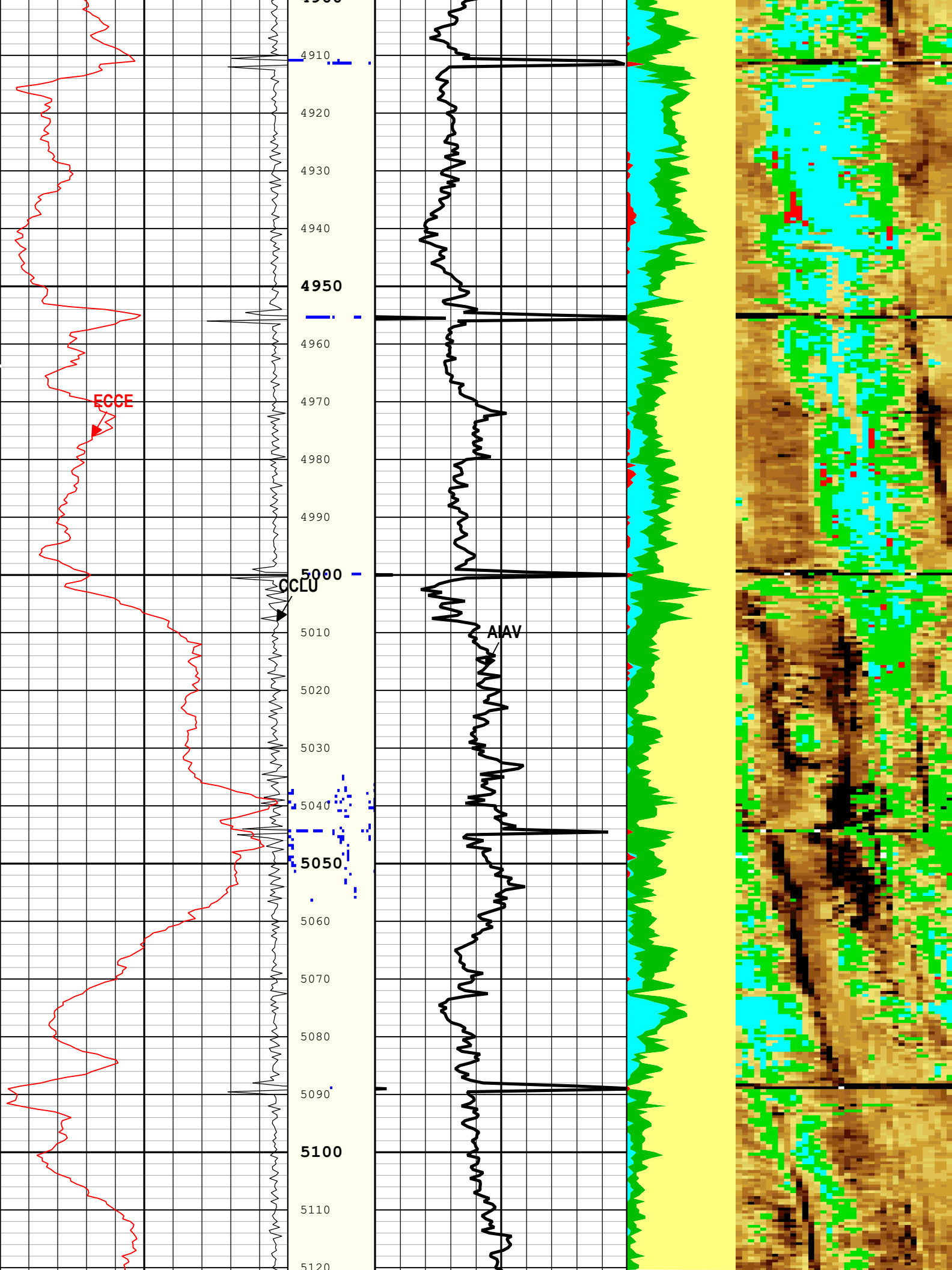


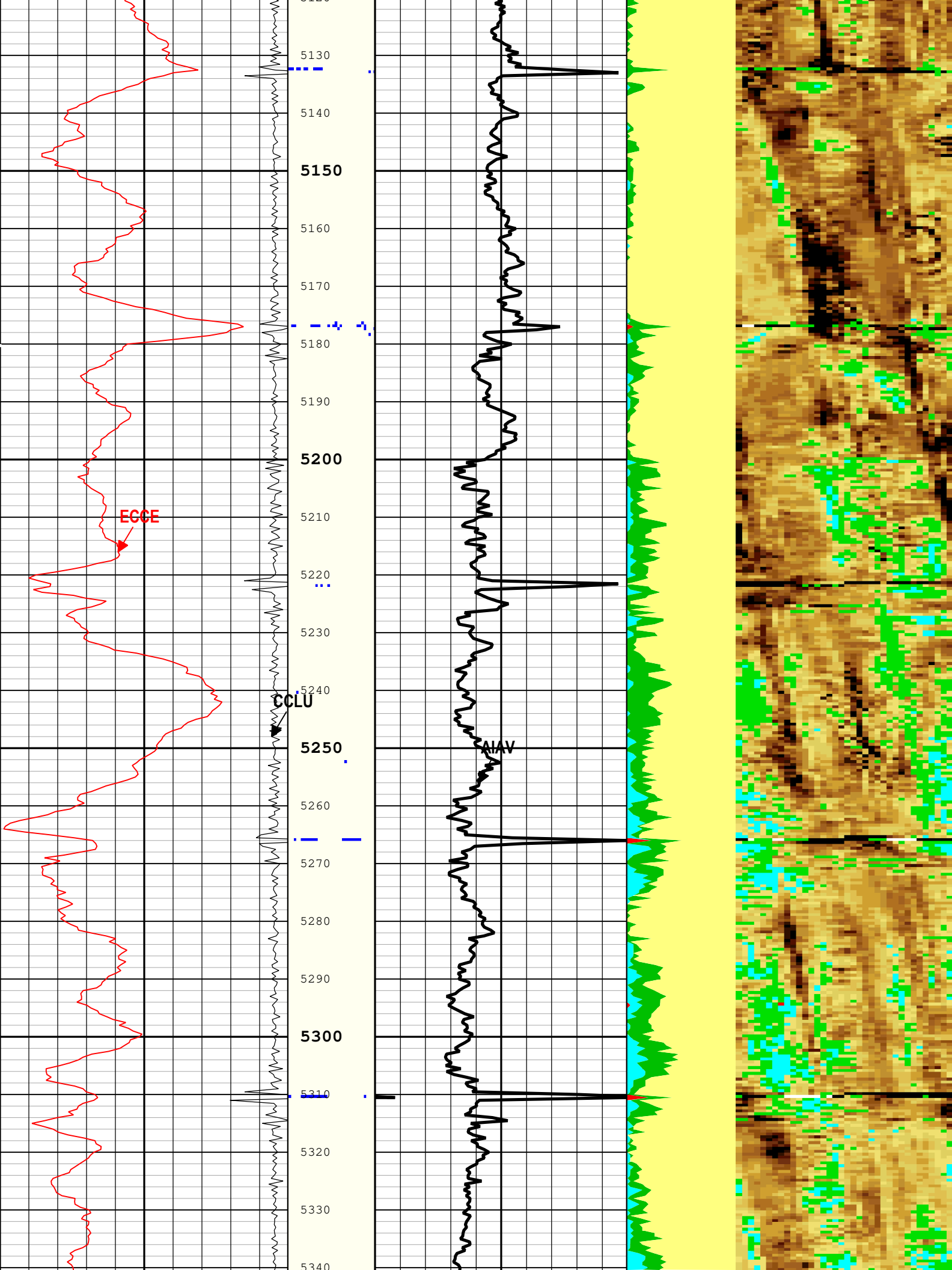


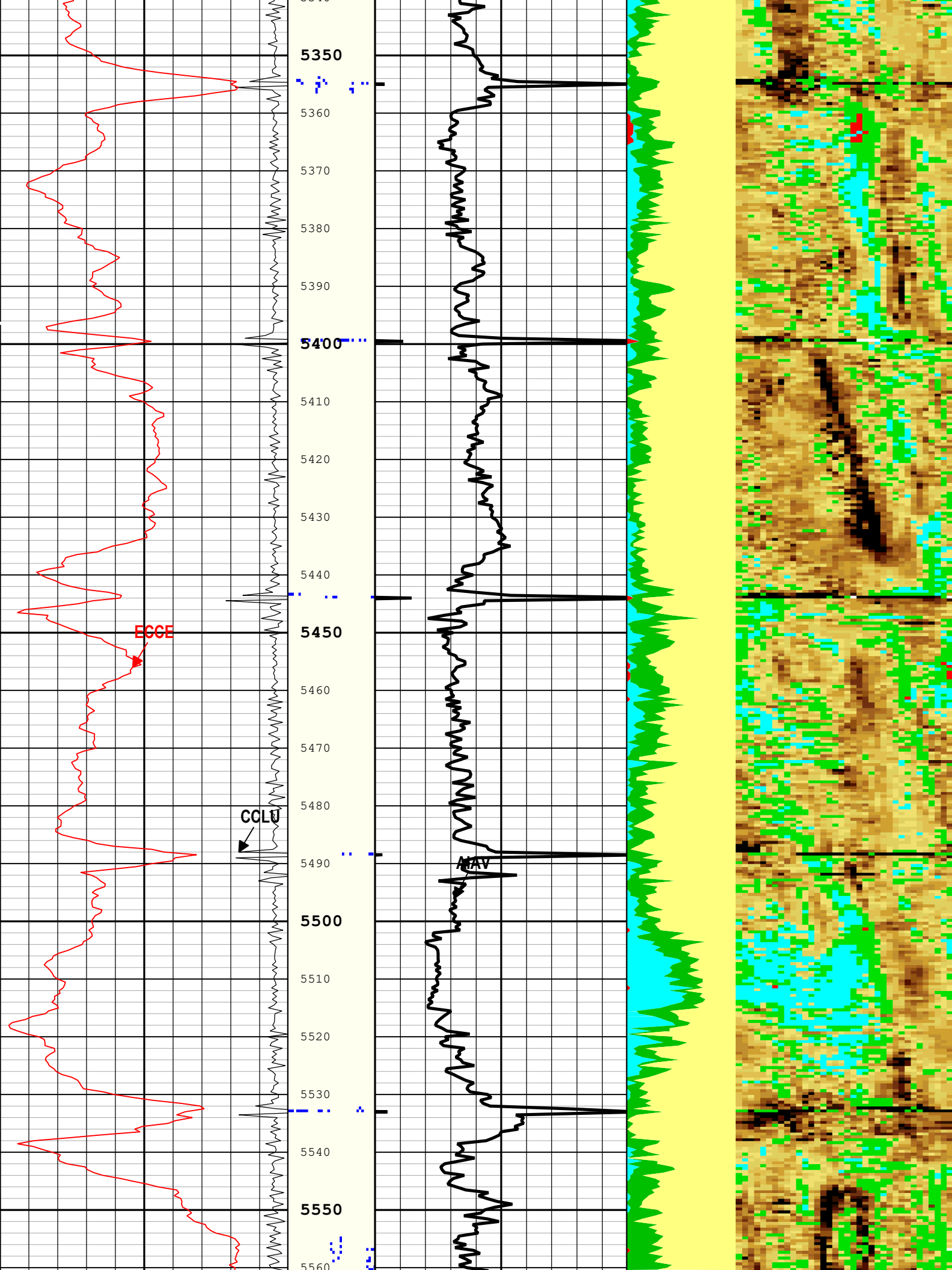


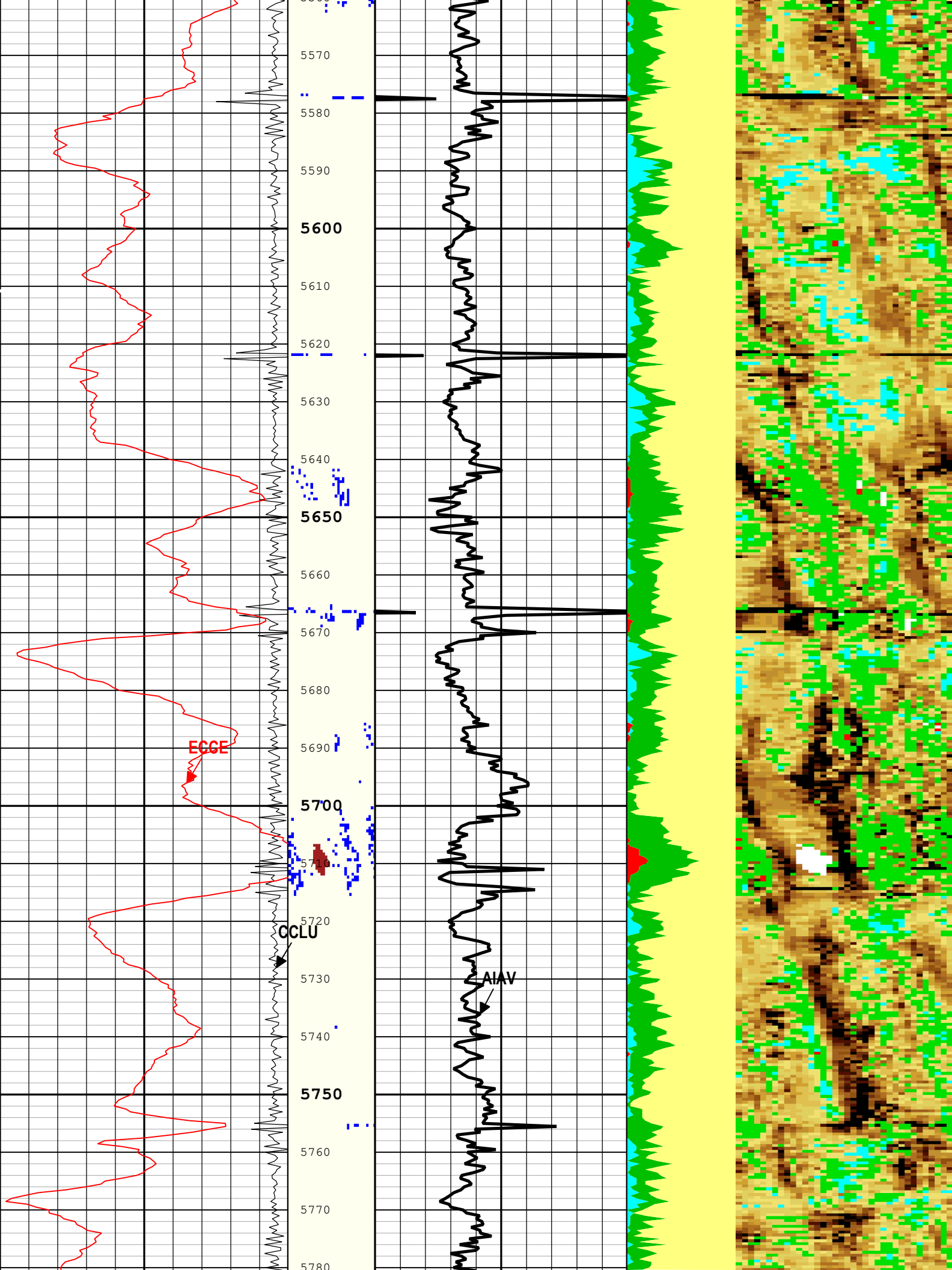


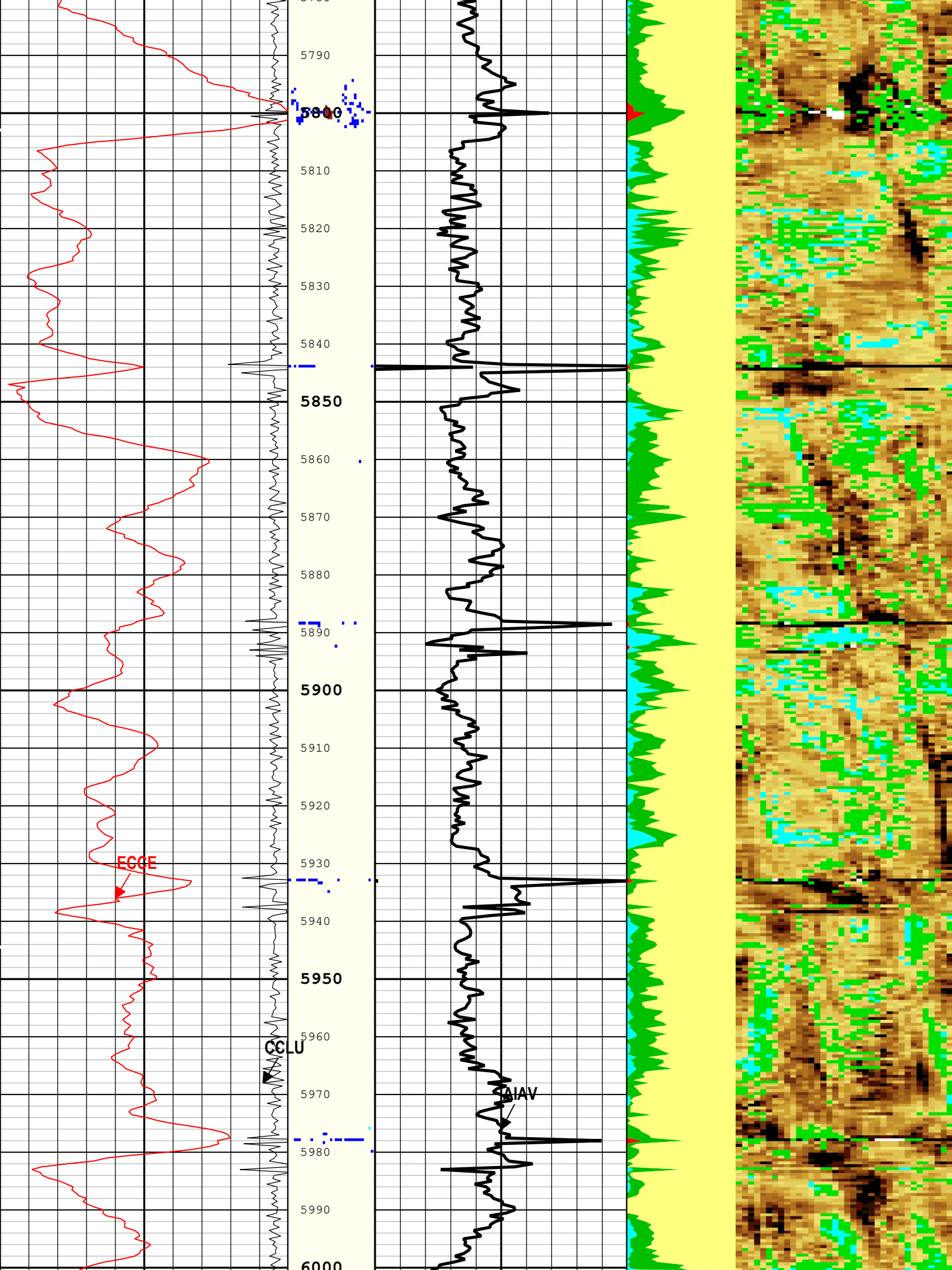


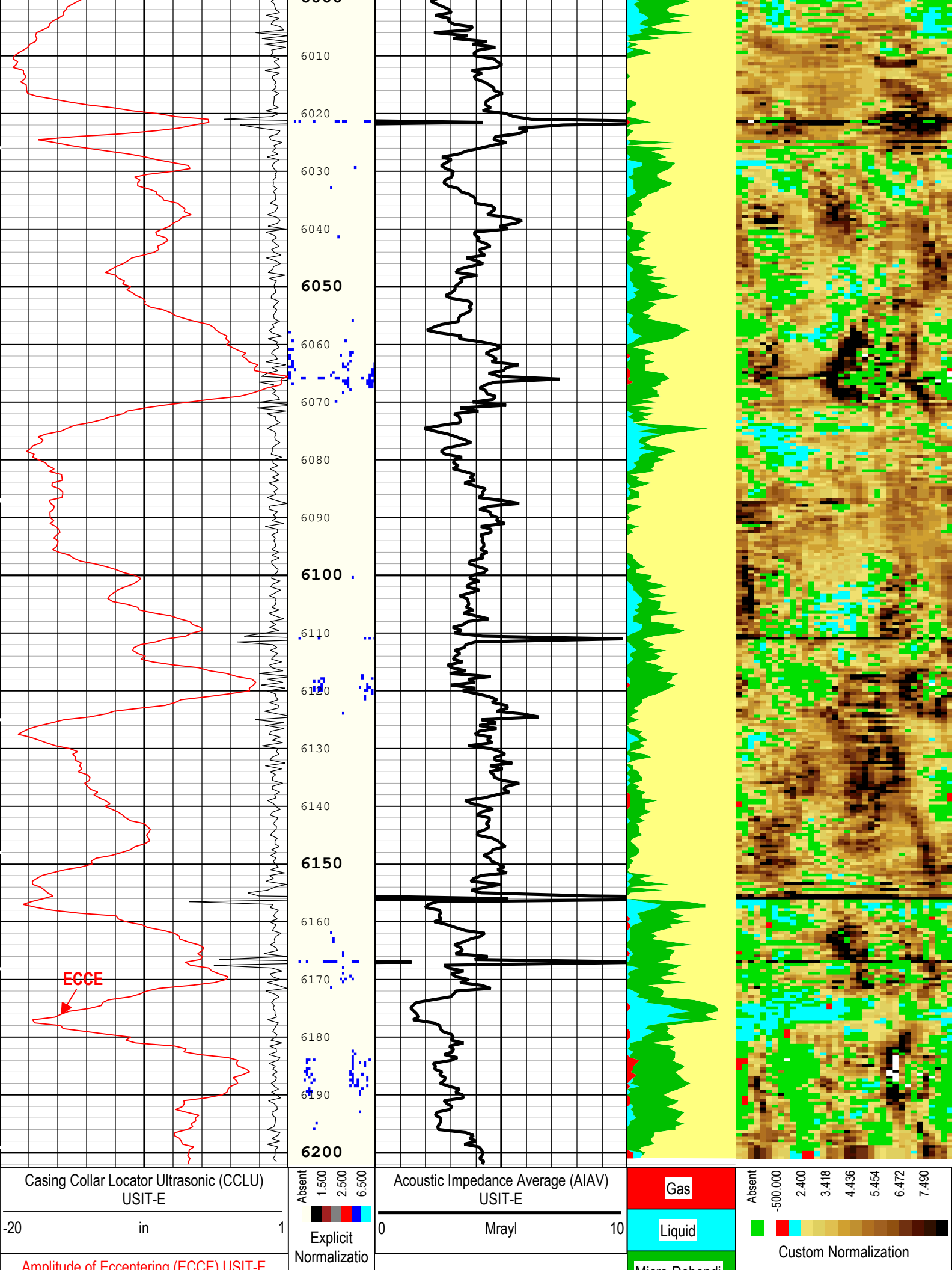












Channel Processing Parameters

1A: Parameters				
Parameter	Description	Tool	Value	Unit
BARI(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	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
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	1.23	
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	2.4	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	13.5	74	1947
BS	8.5	1947	6202.5

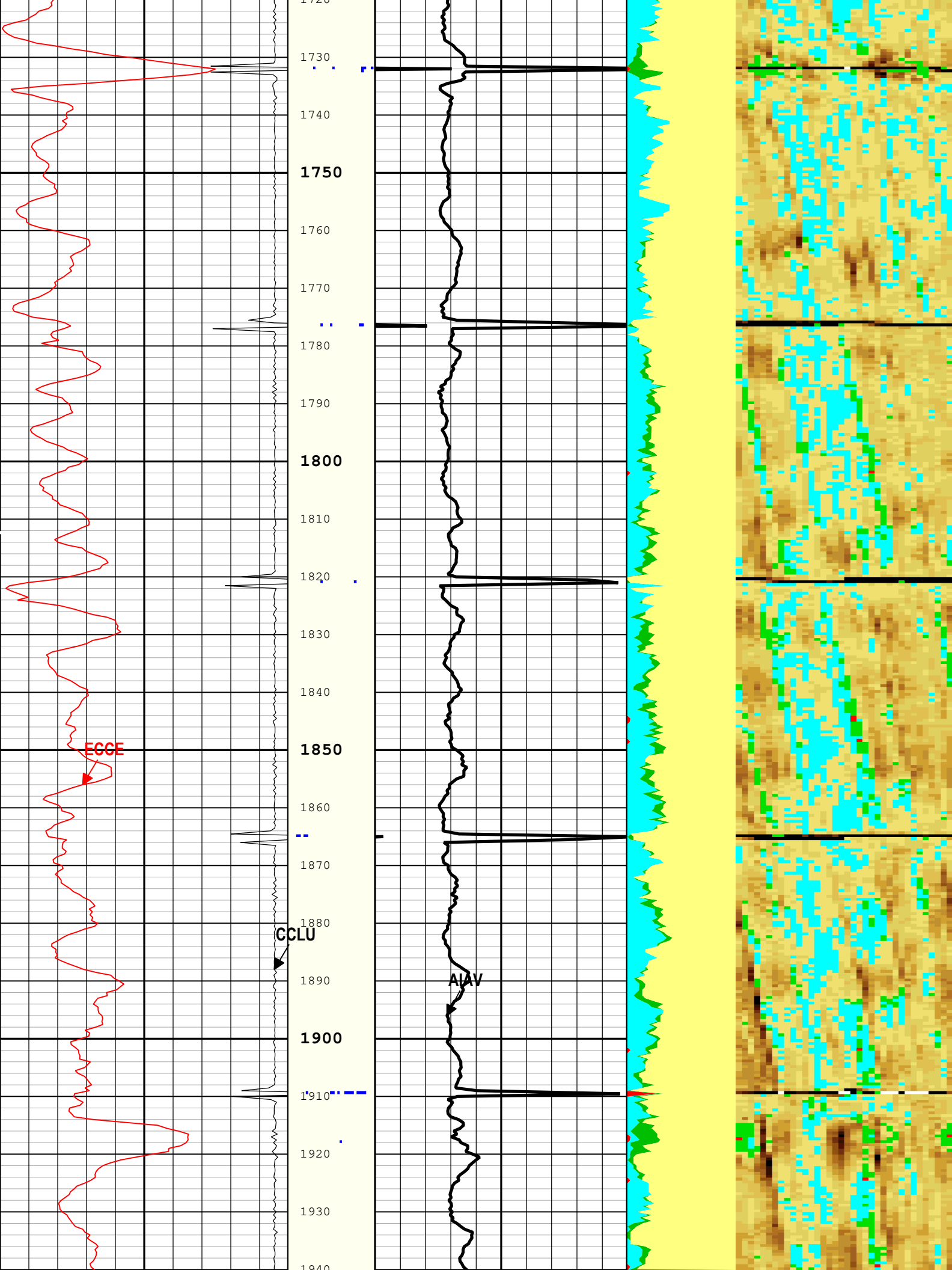
All depth are actual.

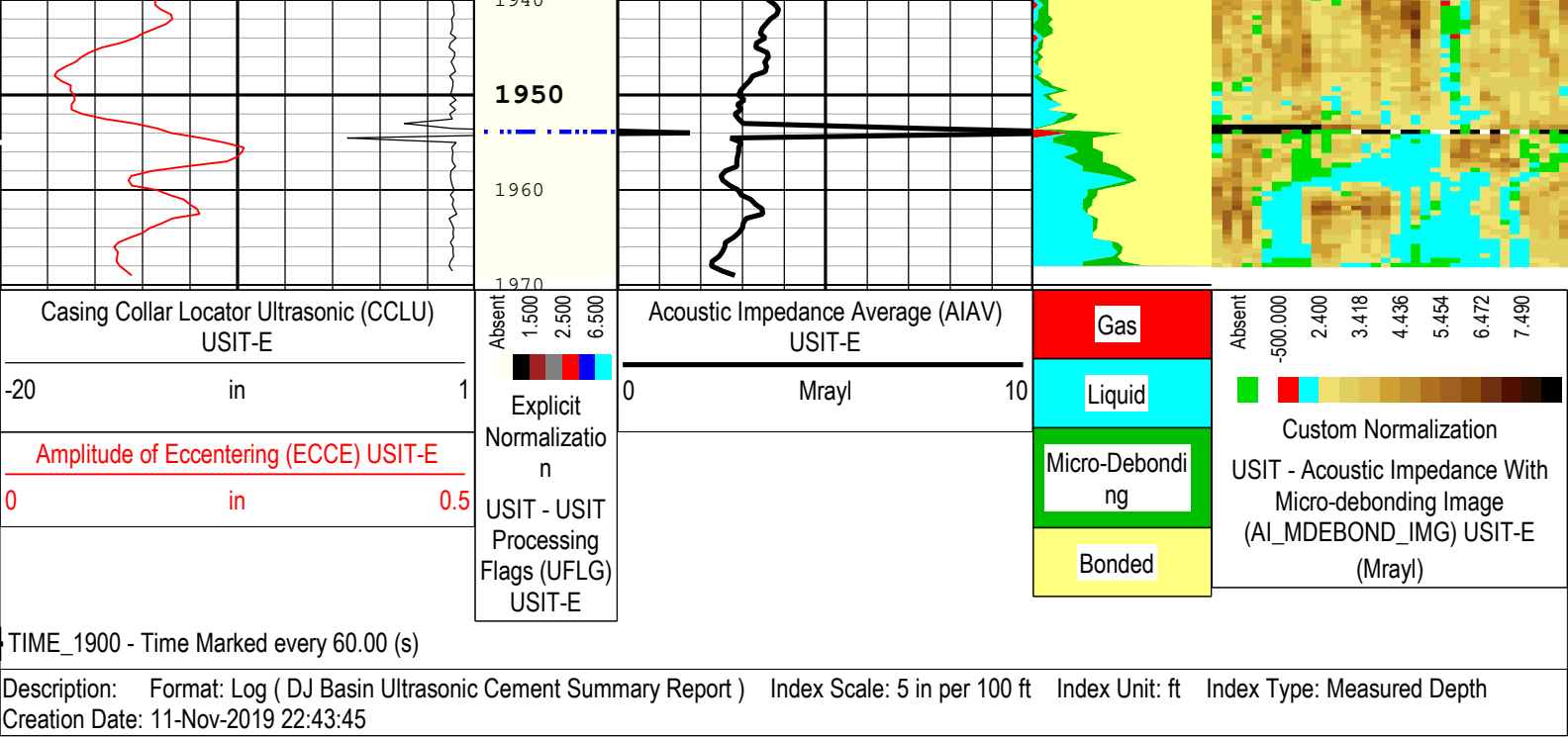
Tool Control Parameters

1A: 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	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 500 KHz	
UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 6.0 in	
WINB	Window Begin Time	USIT-E	33.83	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)
-----------	-------	------------	-----------	--------------------	-------------------





Channel Processing Parameters

1A: Parameters				
Parameter	Description	Tool	Value	Unit
BARI(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	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
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	1.23	
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	2.4	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	13.5	1641.5	1947
BS	8.5	1947	1970.5

All depth are actual.

Tool Control Parameters

1A: 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	65	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	33.83	us
WINE	Window End Time	USIT-E	73.83	us

XYZ

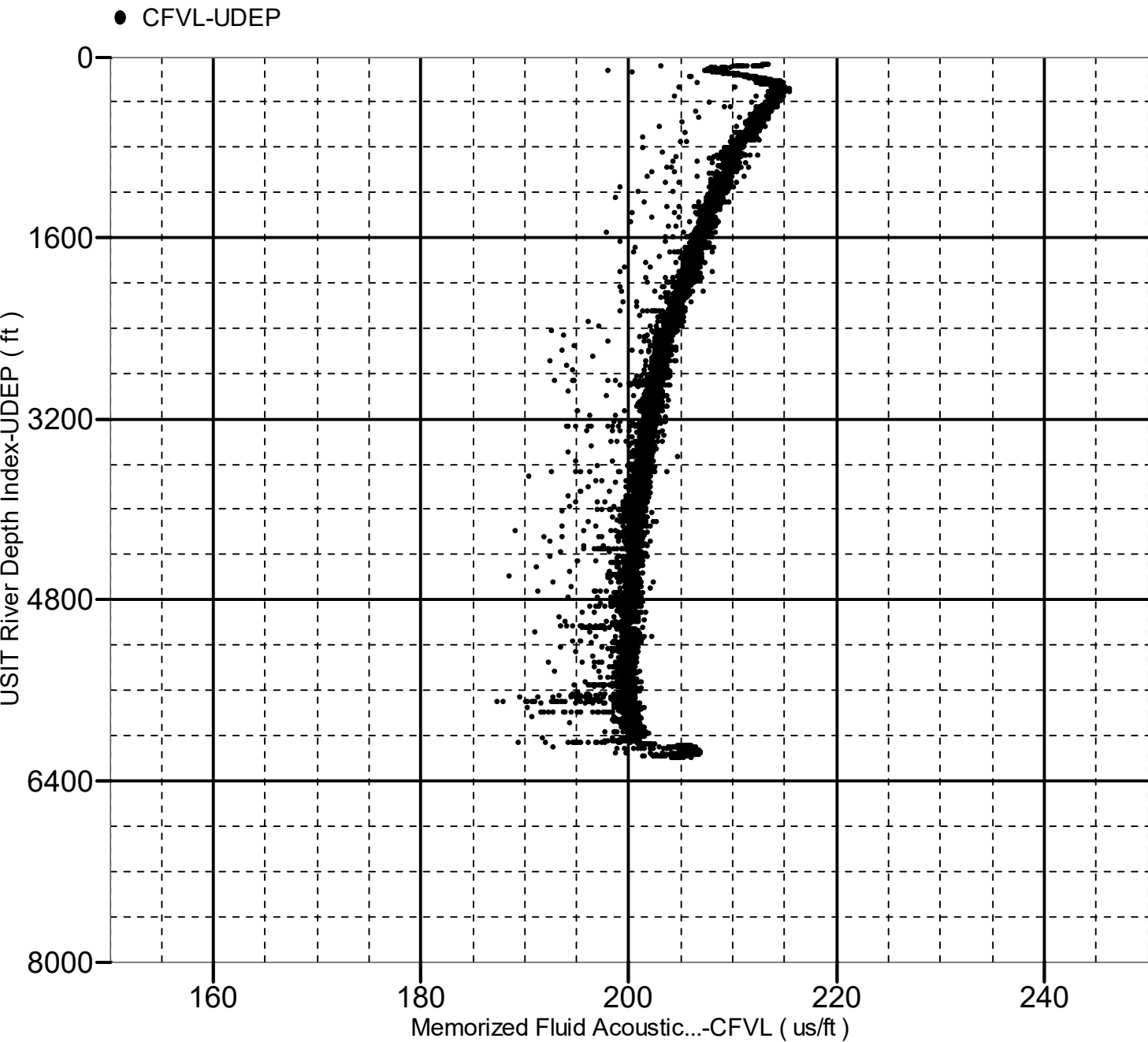
Company:Noble Energy Inc Well:GUTTERSEN STATE D23-731

1A: Log[4]:Up:S004

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6203.00 to 74.00 ft



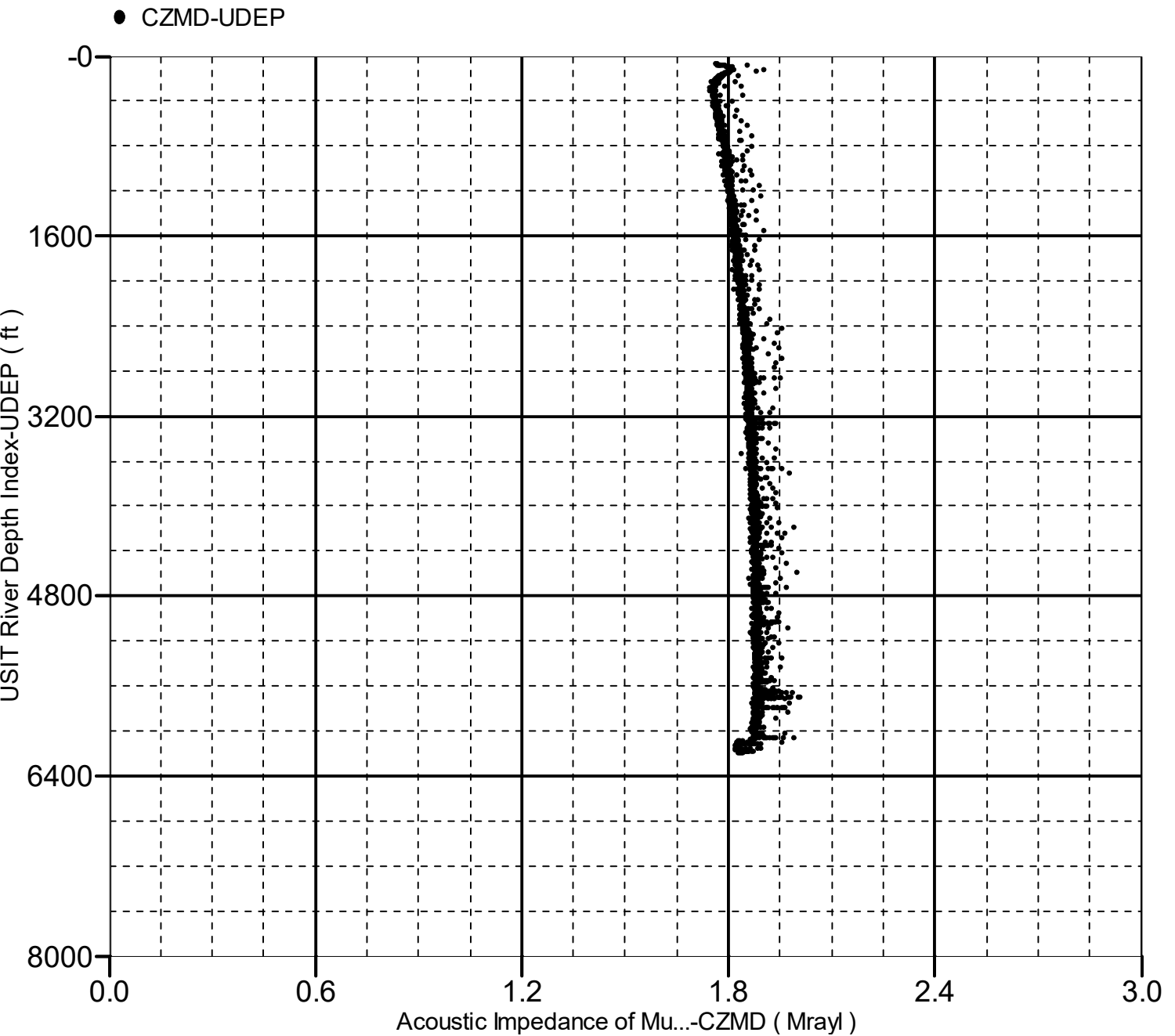
XYZ

Company:Noble Energy Inc Well:GUTTERSEN STATE D23-731

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6203.00 to 74.00 ft



Company:	Noble Energy Inc	Schlumberger
Well:	GUTTERSEN STATE D23-731	
Field:	Wattenberg	
County:	Weld	
State:	Colorado	

UltraSonic Summary Print