

Company: Noble Energy Inc

Well: WASTE MANAGEMENT Y23-768

Field: WATTENBERG

County: WELD State: COLORADO

UltraSonic Summary Print

County:	WELD
Field:	WATTENBERG
Location:	NWNW 11-2N-64W
Well:	WASTE MANAGEMENT Y23-768
Company:	Noble Energy Inc
Location:	
Permanent Datum:	Ground Level
Log Measured From:	Kelly Bushing
Drilling Measured From:	Kelly Bushing
API Serial No.	Section:
05-123-44845	11
	Township:
	2N
	Range:
	64W

Logging Date	20-Nov-2017
Run Number	One
Depth Driller	19835.00 ft
Schlumberger Depth	19835.00 ft
Bottom Log Interval	6770.00 ft
Top Log Interval	200.00 ft
Casing Fluid Type	Salt Brine
Salinity	
Density	8.4 lbm/gal
Fluid Level	8.00 ft
BIT/CASING/TUBING STRING	
Bit Size	8.50 in
From	2065.00 ft
To	19835.00 ft
Casing/Tubing Size	5.5 in
Weight	20 lbm/ft
Grade	N/A
From	0.00 ft
To	19815.00 ft
Max Recorded Temperatures	165 degF
Logger on Bottom	20-Nov-2017
Unit Number	MSLC-AR1 2161
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.

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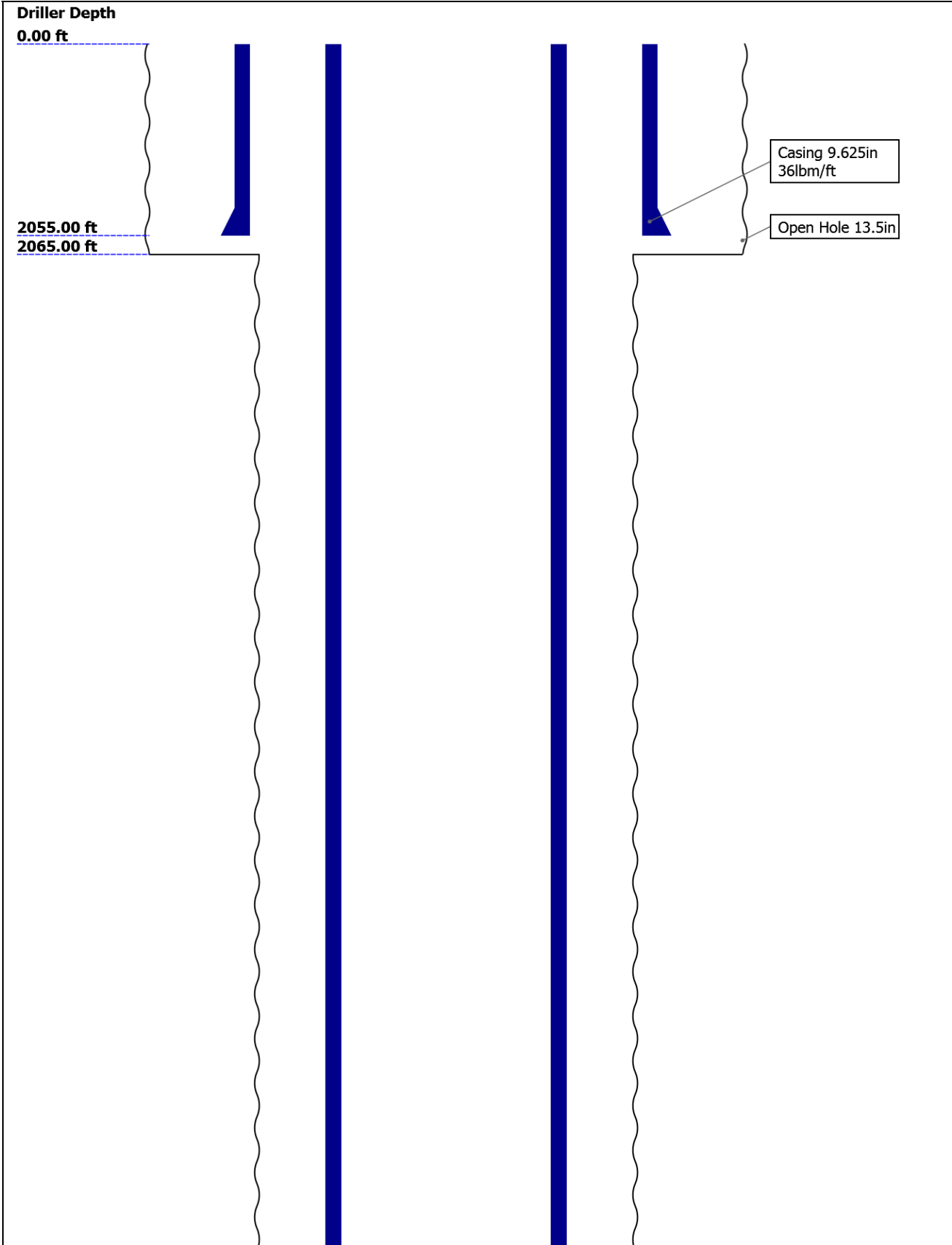
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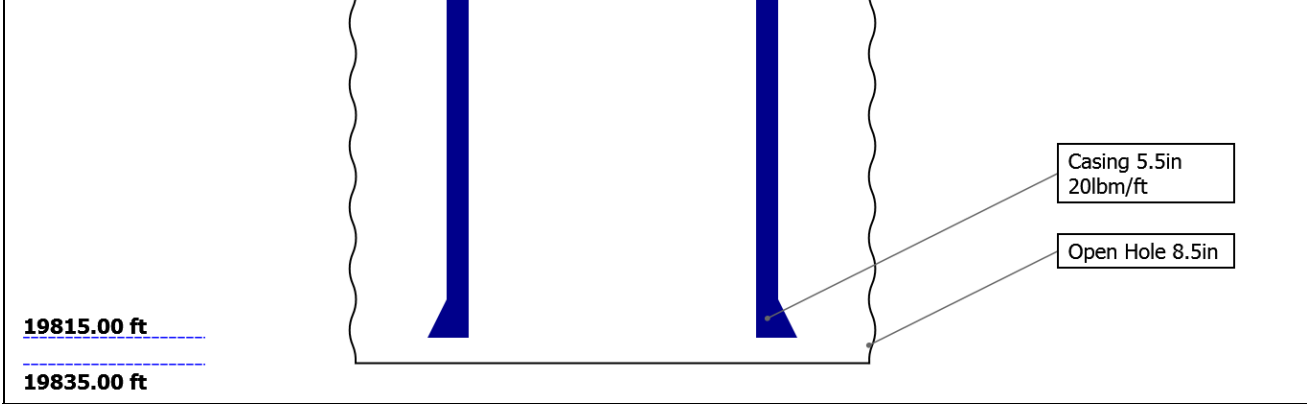
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13. Tail

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Well Sketch





19815.00 ft

19835.00 ft

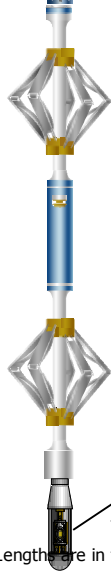
Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	13.5	8.5				
Top Driller (ft)	0	2065				
Top Logger (ft)	0	2065				
Bottom Driller (ft)	2065	19835				
Bottom Logger (ft)	2065	19835				
Casing						
Size (in)	9.625	5.5				
Weight (lbm/ft)	36	20				
Inner Diameter (in)	8.921	4.778				
Grade	N/A	N/A				
Top Driller (ft)	0	0				
Top Logger (ft)	0	0				
Bottom Driller (ft)	2055	19815				
Bottom Logger (ft)	2055	19815				

Remarks and Equipment Summary

One: Toolstring				One: Remarks	
<div><div><div>Equip nameLength</div><div>LEH-QT28.97</div><div>LEH-QT</div></div><div><div>EDTC-B26.06</div><div>EDTH-B</div><div>EDTG-A</div><div>EDTC-B</div></div><div><div>AH-184[2]19.56</div><div>AH-184[1]17.56</div><div>USIT-E:93515.56</div><div>ECH-MFA</div><div>USAC-A:935</div><div>USIS-A:861</div></div></div> <div></div> <div><div>MP nameOffset</div><div>CTEM22.56</div><div>ACCZ0.00</div><div>HV0.00</div><div>Gamma20.69</div><div>Ray</div><div>TelStatu19.56</div><div>s</div></div>	Thank you for choosing Schlumberger!				
	Log run for cement evaluation				
	Tool run centralzied as per tool sketch				
	Repeat pass done under 0 psi while RIH				
	Main pass done under 2500 psi				
	Crew: Rob Stelter, Gary Lapp				

USSC-B
USRS-AB:
873
USI-SENS
OR:1014
USI-TX



Length in ft
Maximum Outer Diameter = 3.625 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	Depth Control Remarks
------------------------------	-----------------------

Log Sequence	First Log In the Well	
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

Pressure	Pressure	Temperature	Temperature
----------	----------	-------------	-------------

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[4]:Up	6766.55	191.1

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 : 447.60m(1468.49ft) to 456.10m(1496.41ft)
MUD_N_FRP = 1.13
DFD = 1.01g/cm3(8.40lbm/gal)
CZMD median computed in free pipe normalization interval = 1.73 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 2017 SP3	7.3.92069.3100
Application Patch	Wireline_NPD-ICE2-2017SP3_7.3.93033

Pass Summary

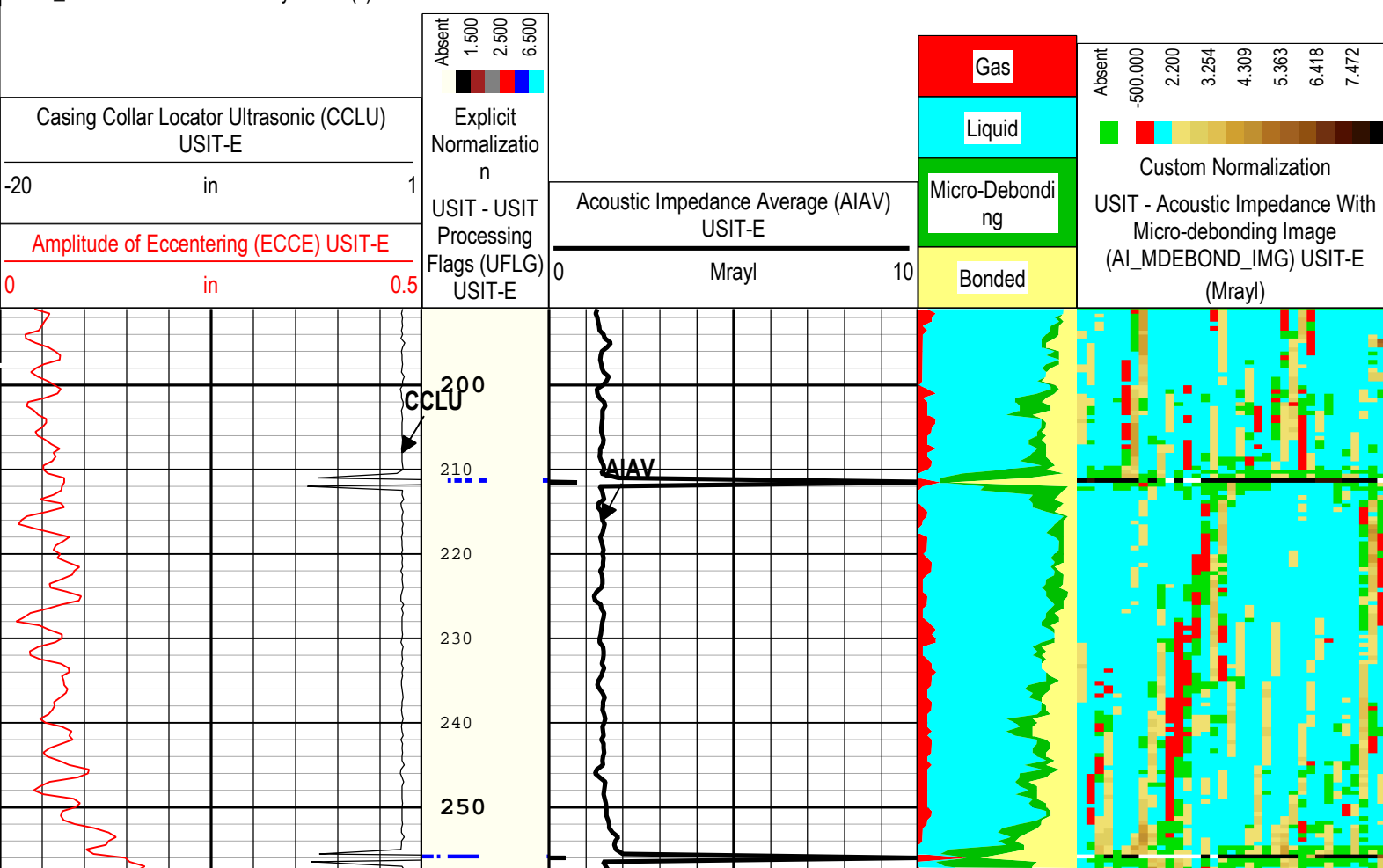
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[4]:Up	Up	191.10 ft	6766.55 ft	20-Nov-2017 1:11:03 PM	20-Nov-2017 1:59:27 PM	ON	-8.00 ft	Yes

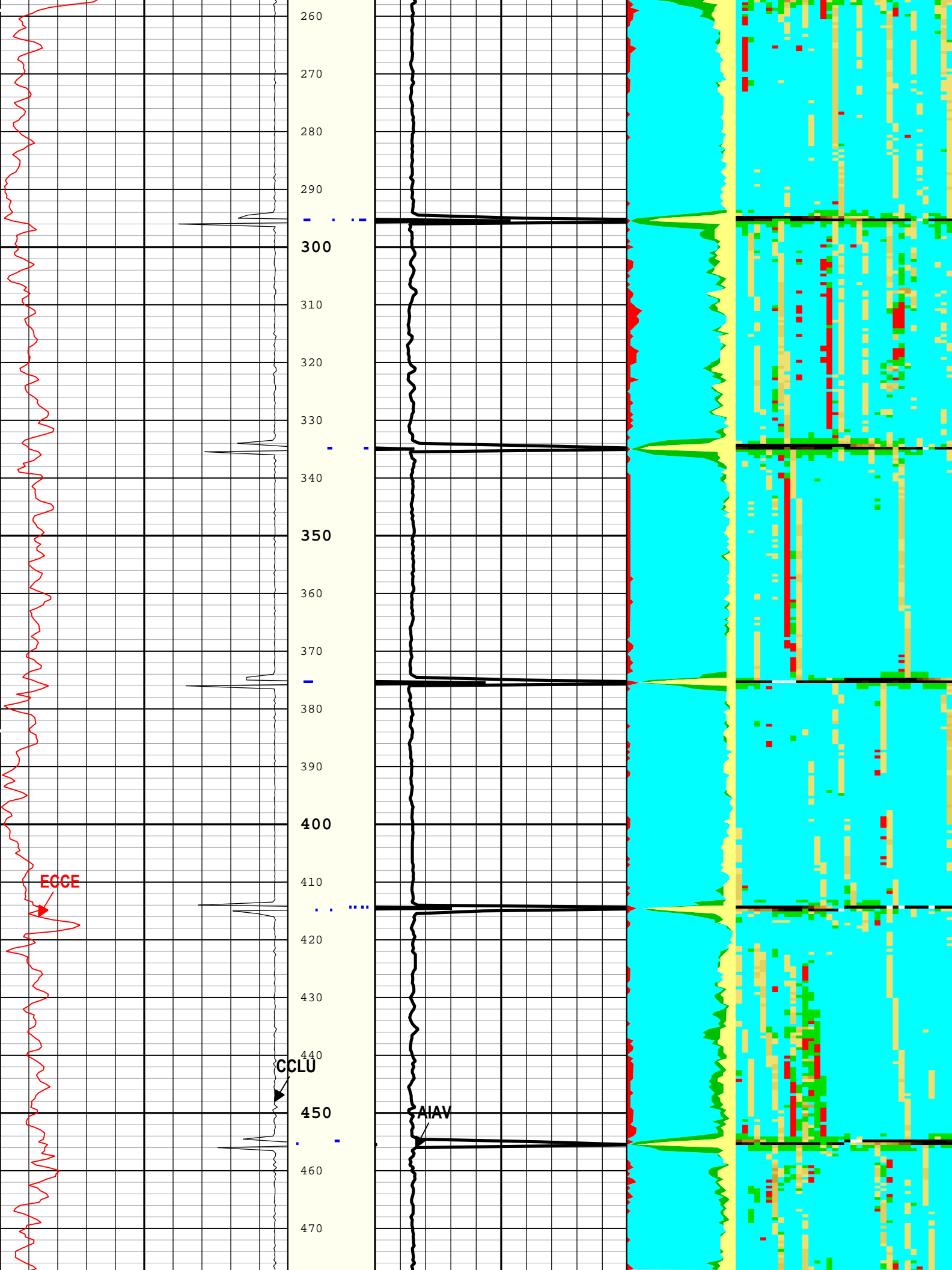
All depths are referenced to toolstring zero

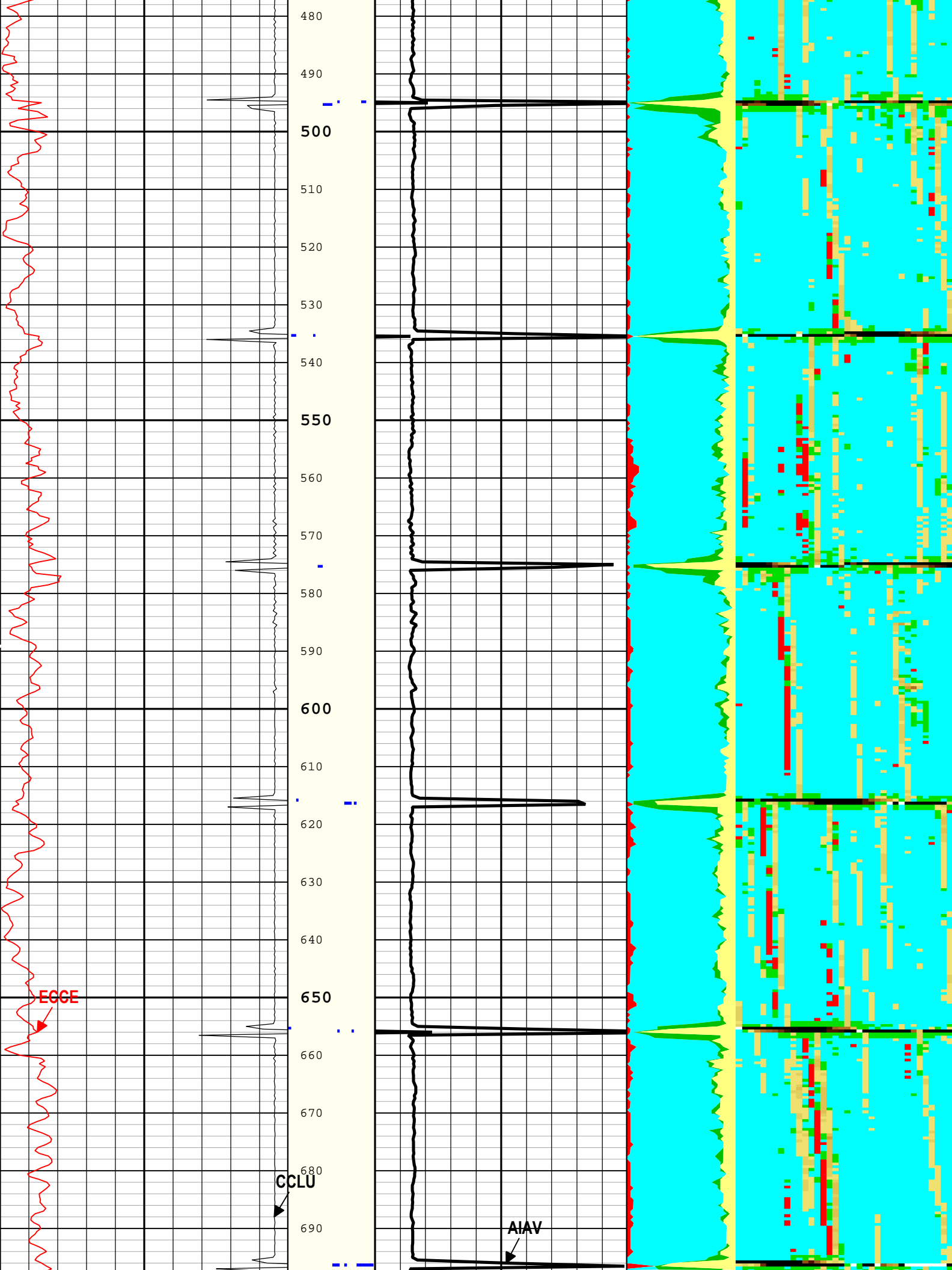
Log	Company:Noble Energy Inc	Well:WASTE MANAGEMENT Y23-768
		One: Log[4]:Up:S004

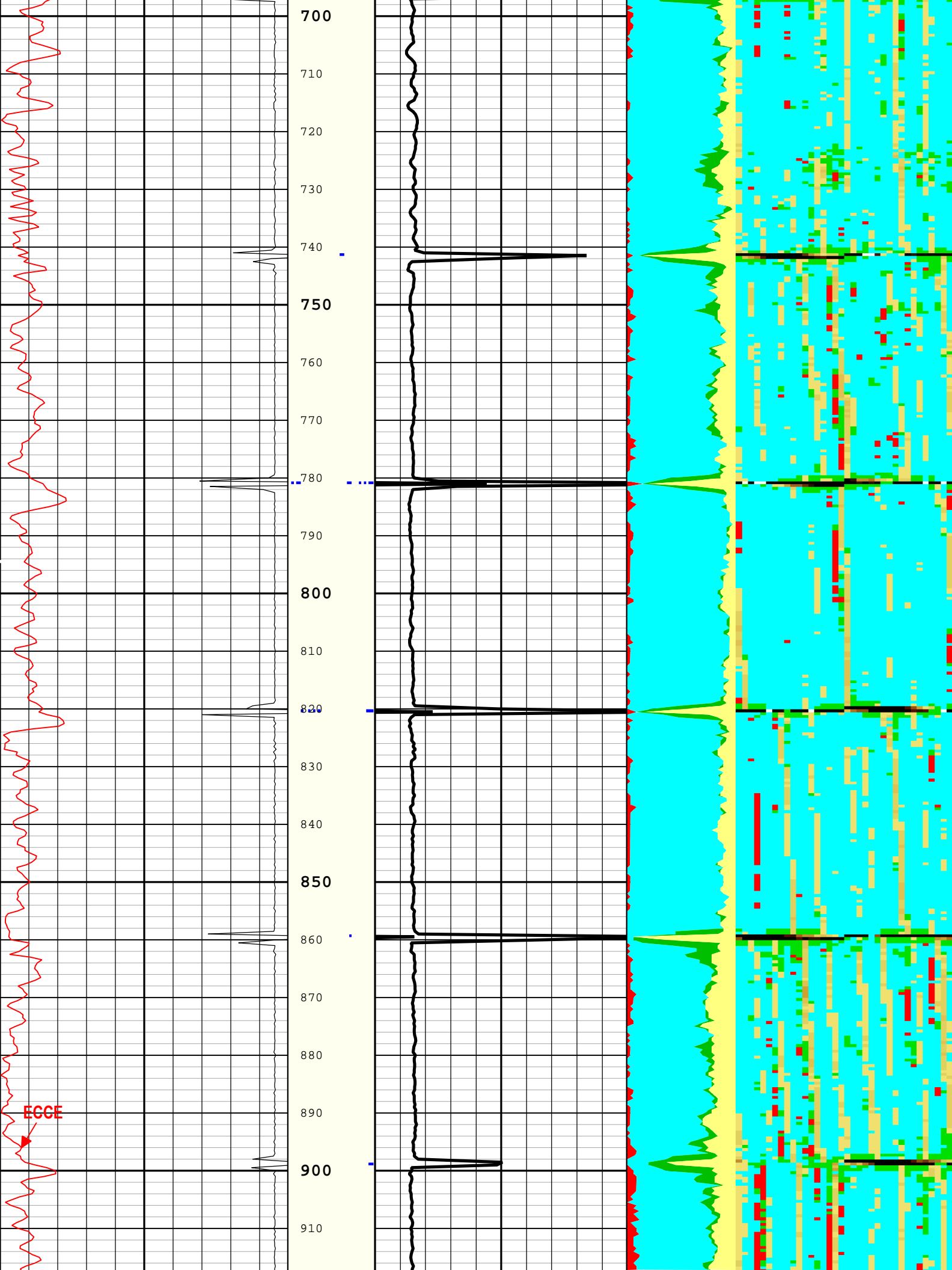
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Creation Date: 20-Nov-2017 16:01:30

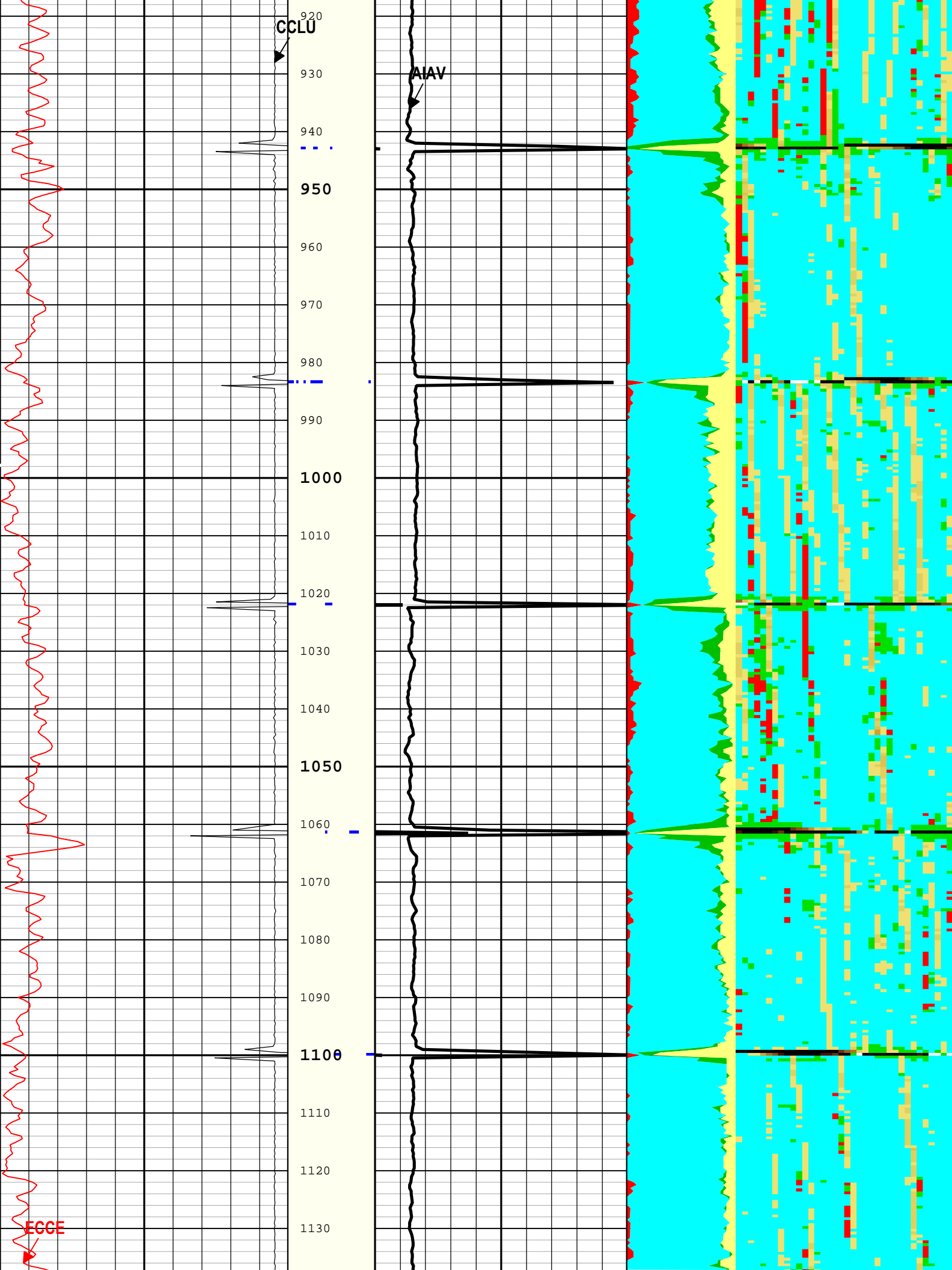
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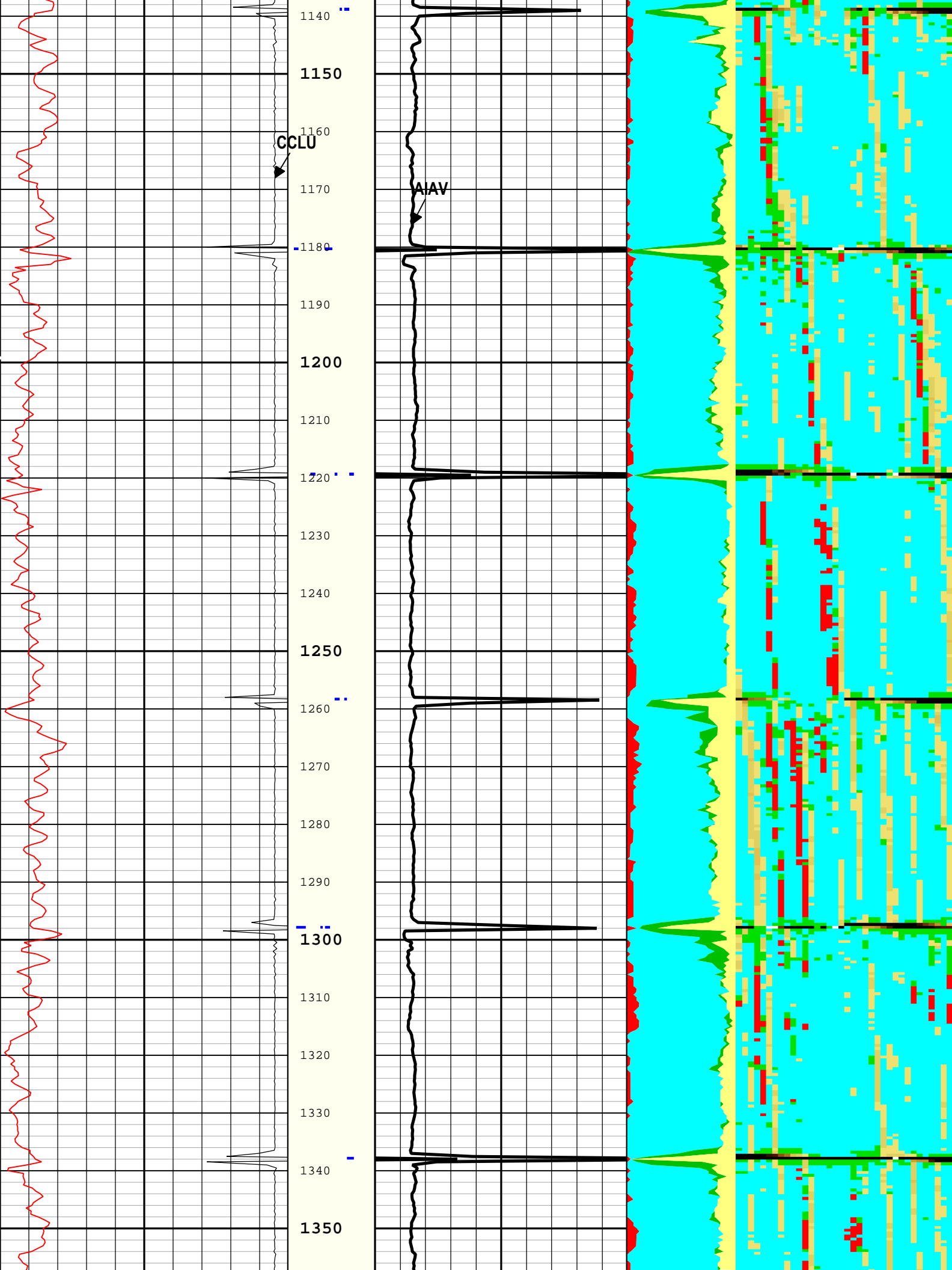


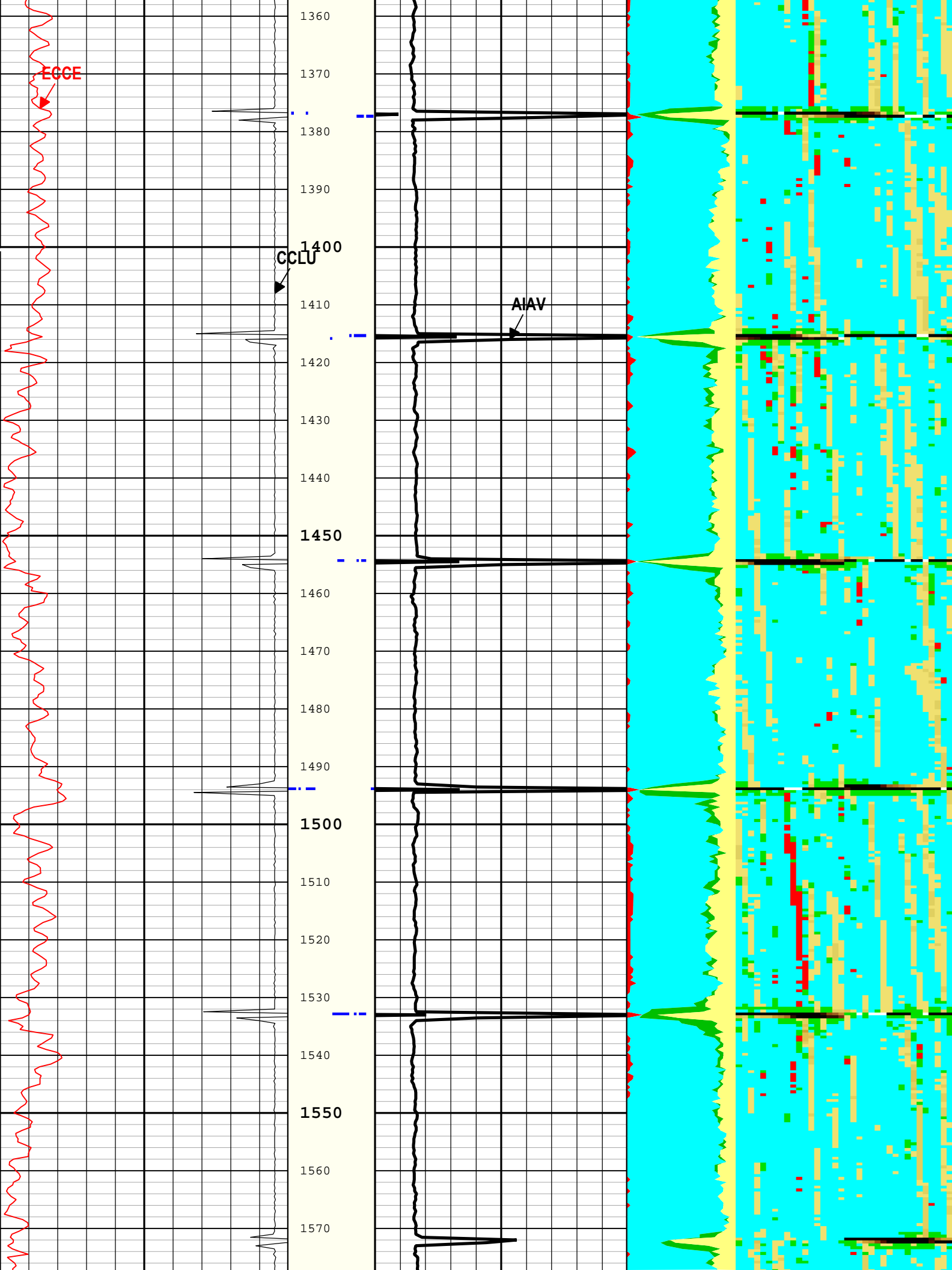


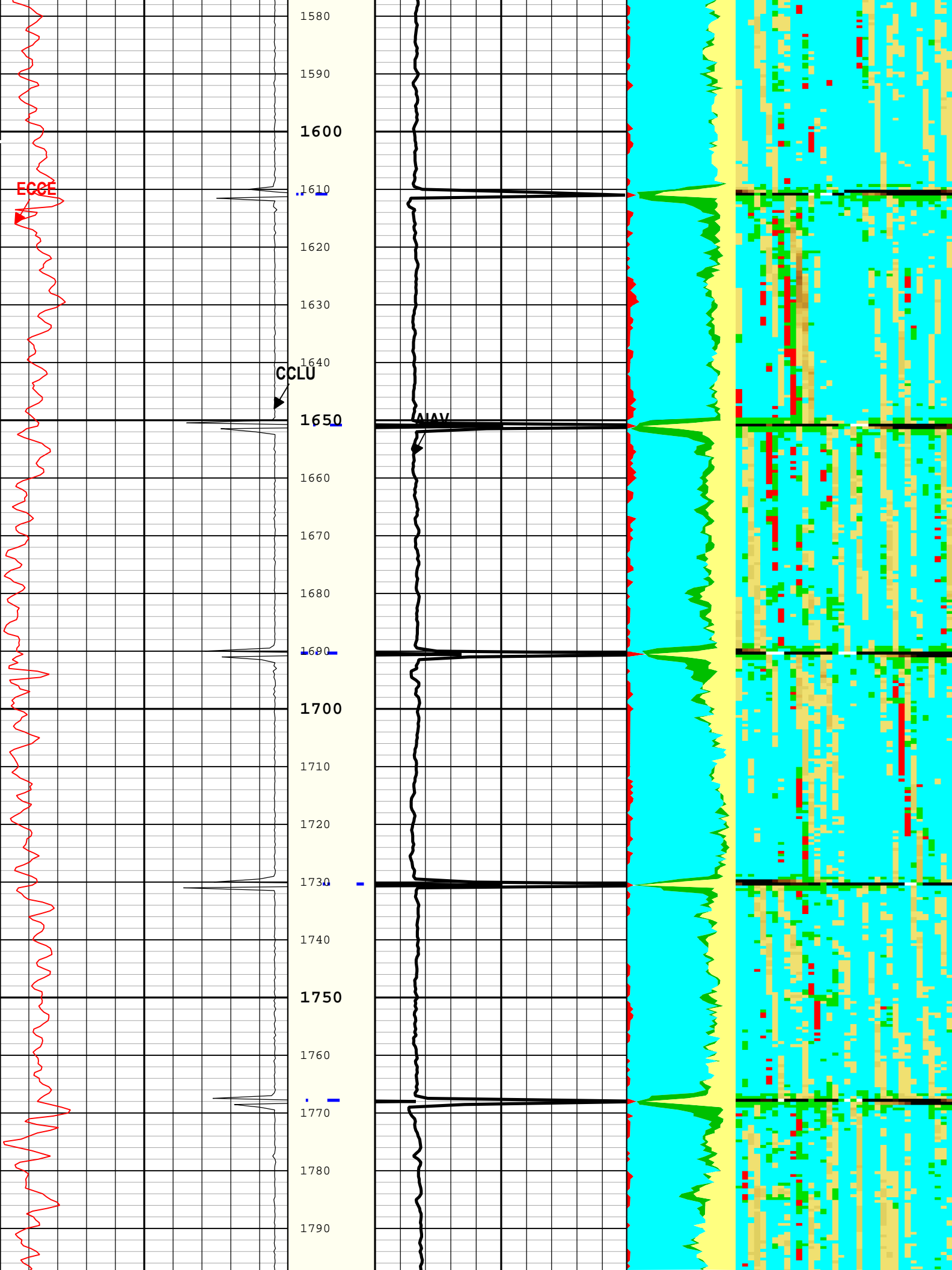


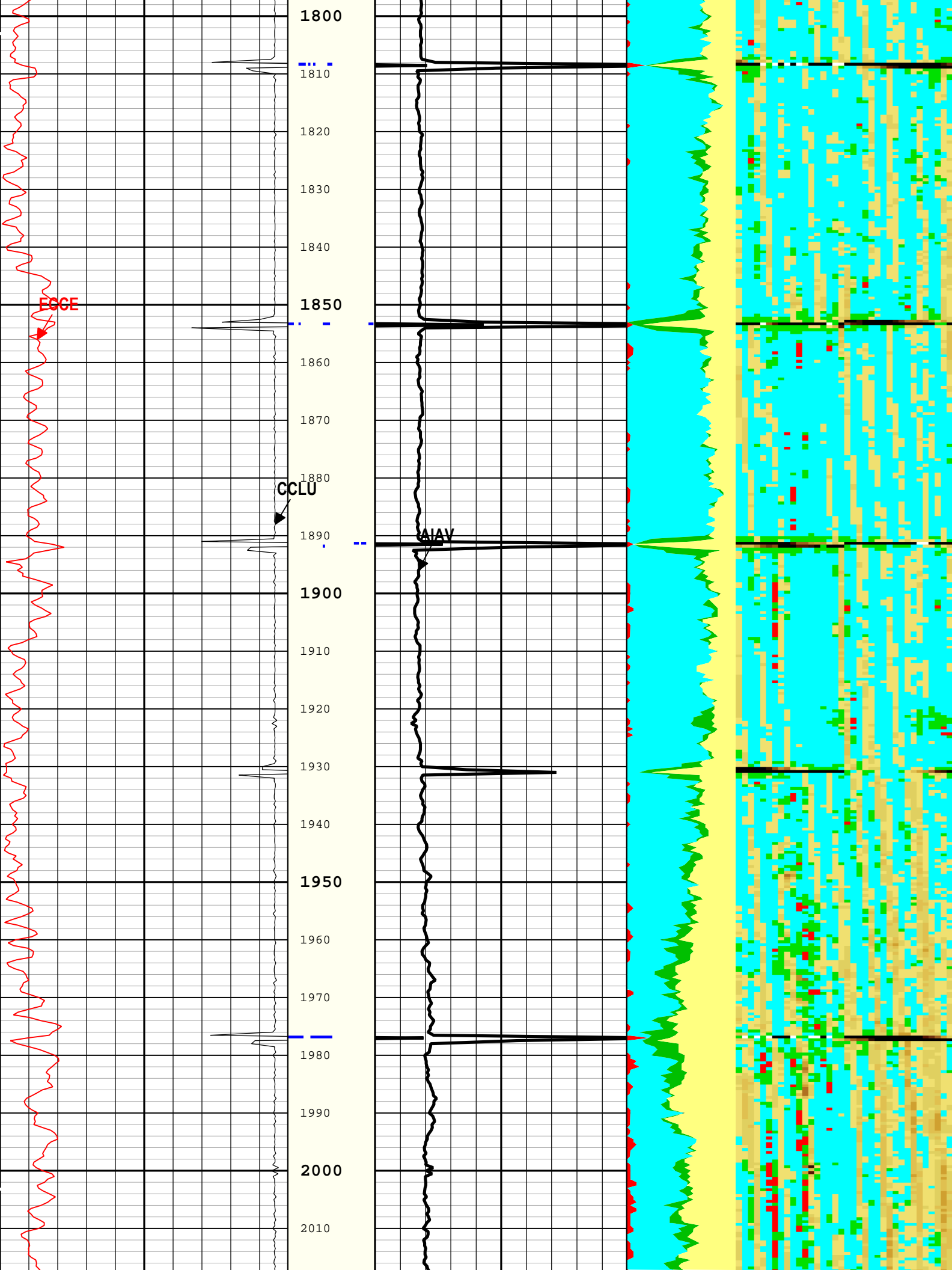


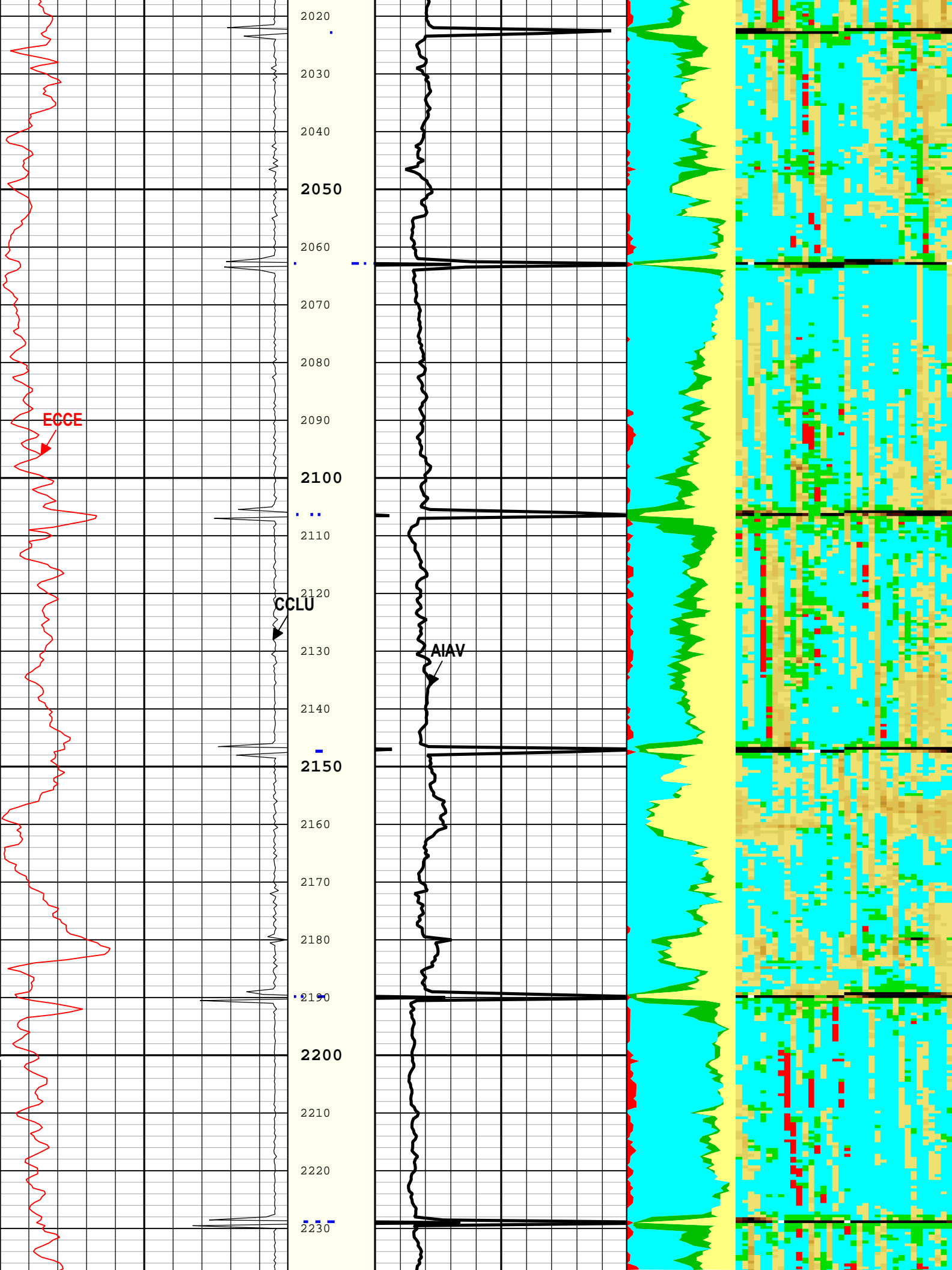


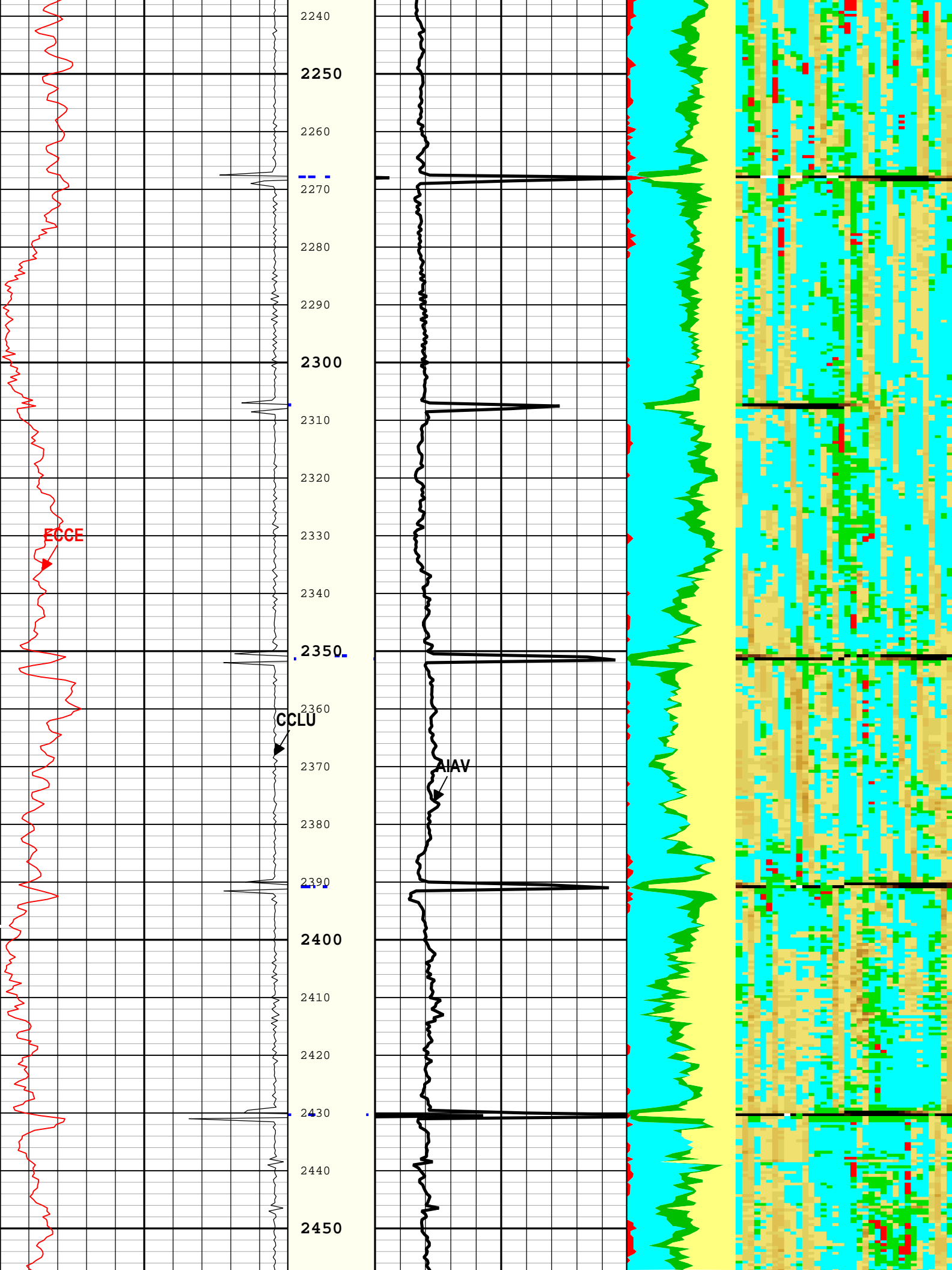


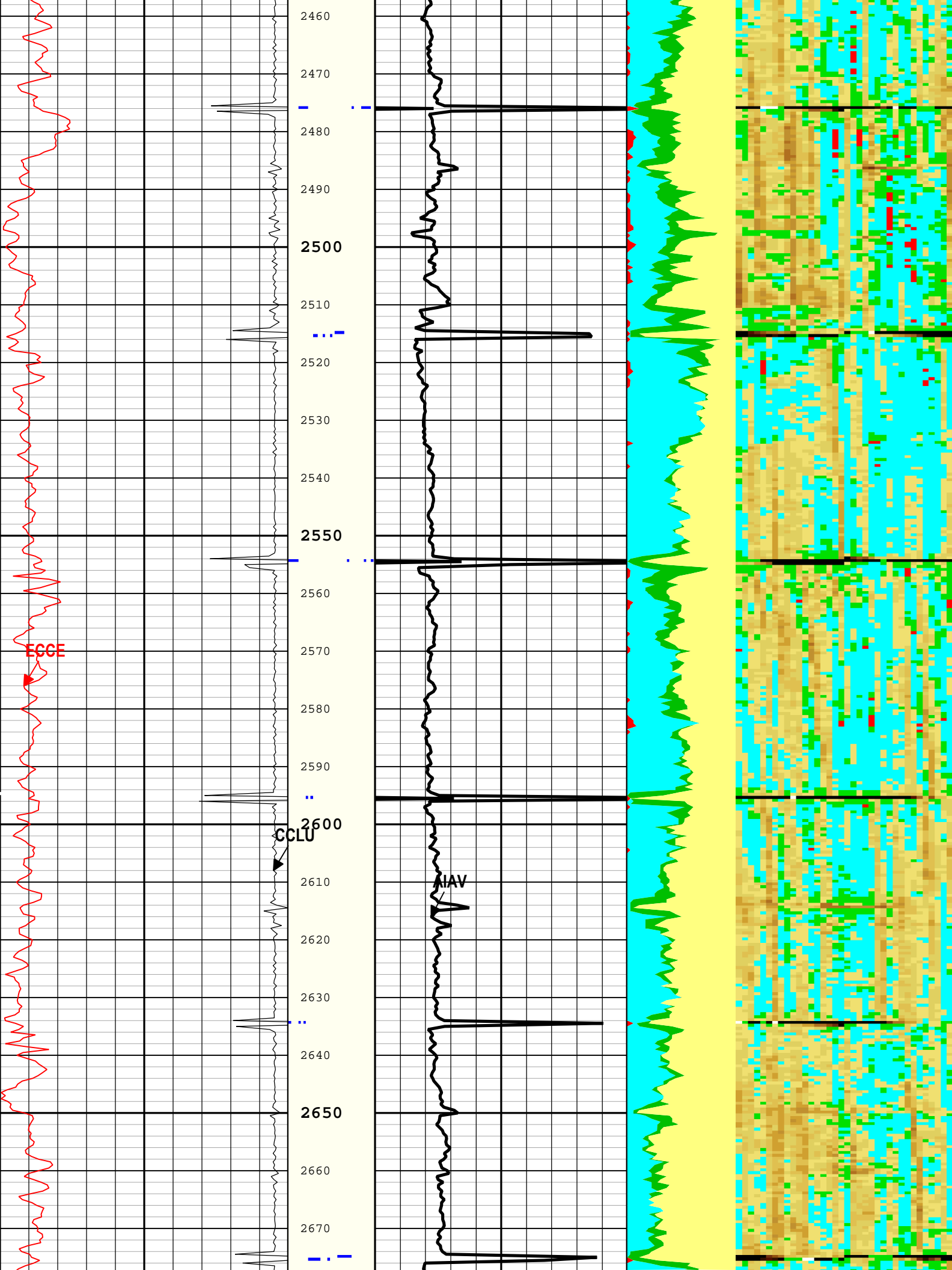


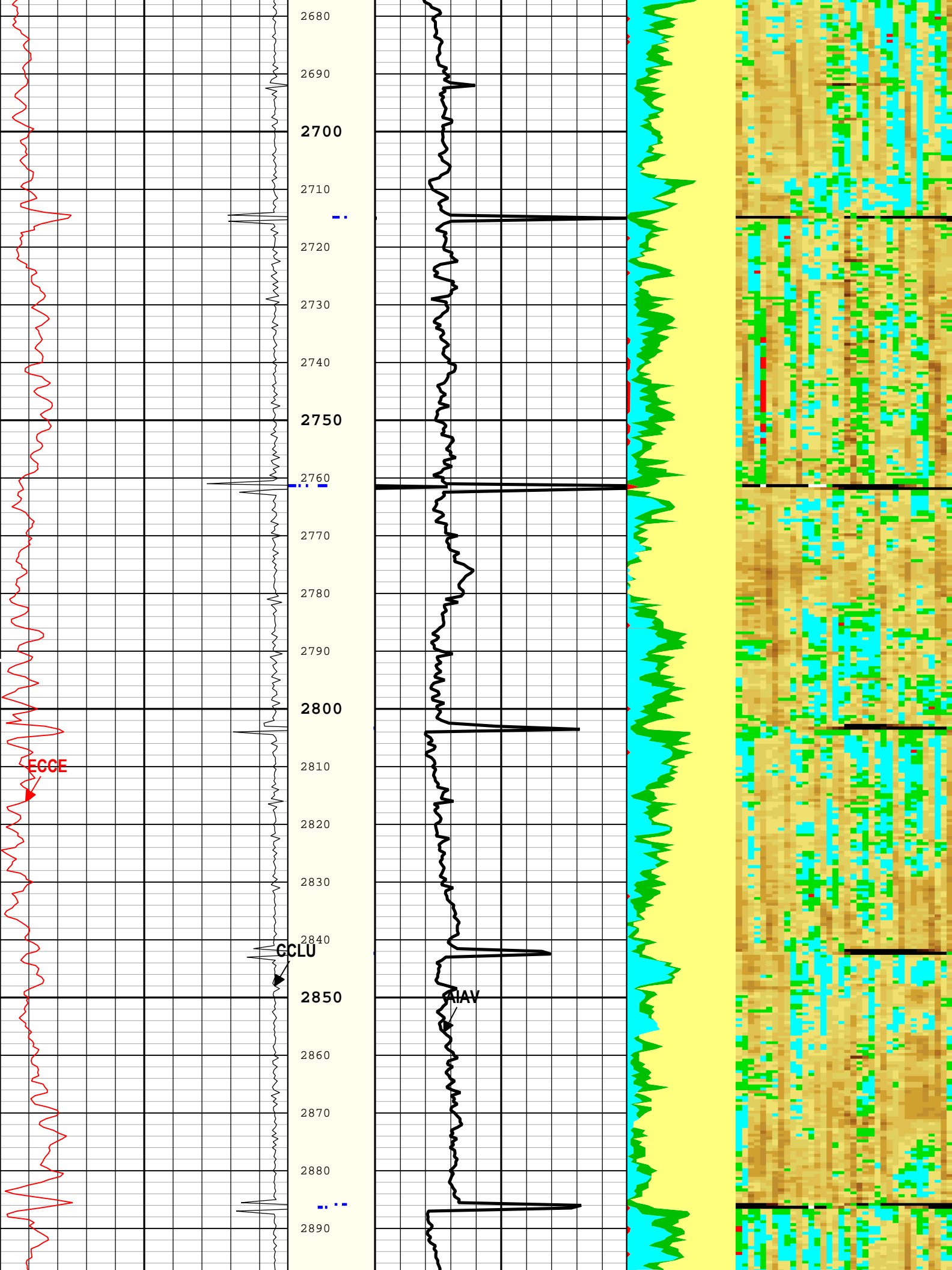


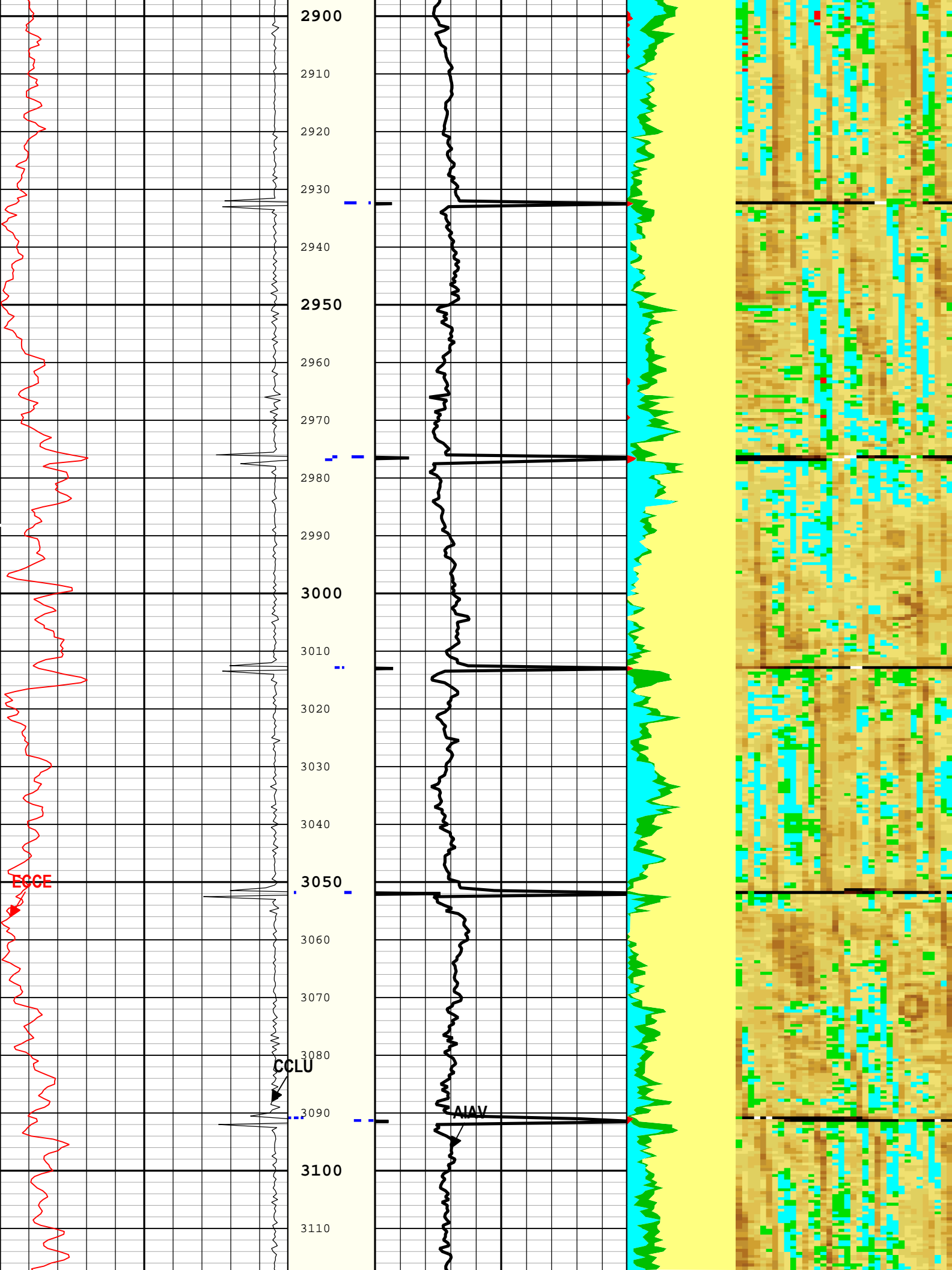


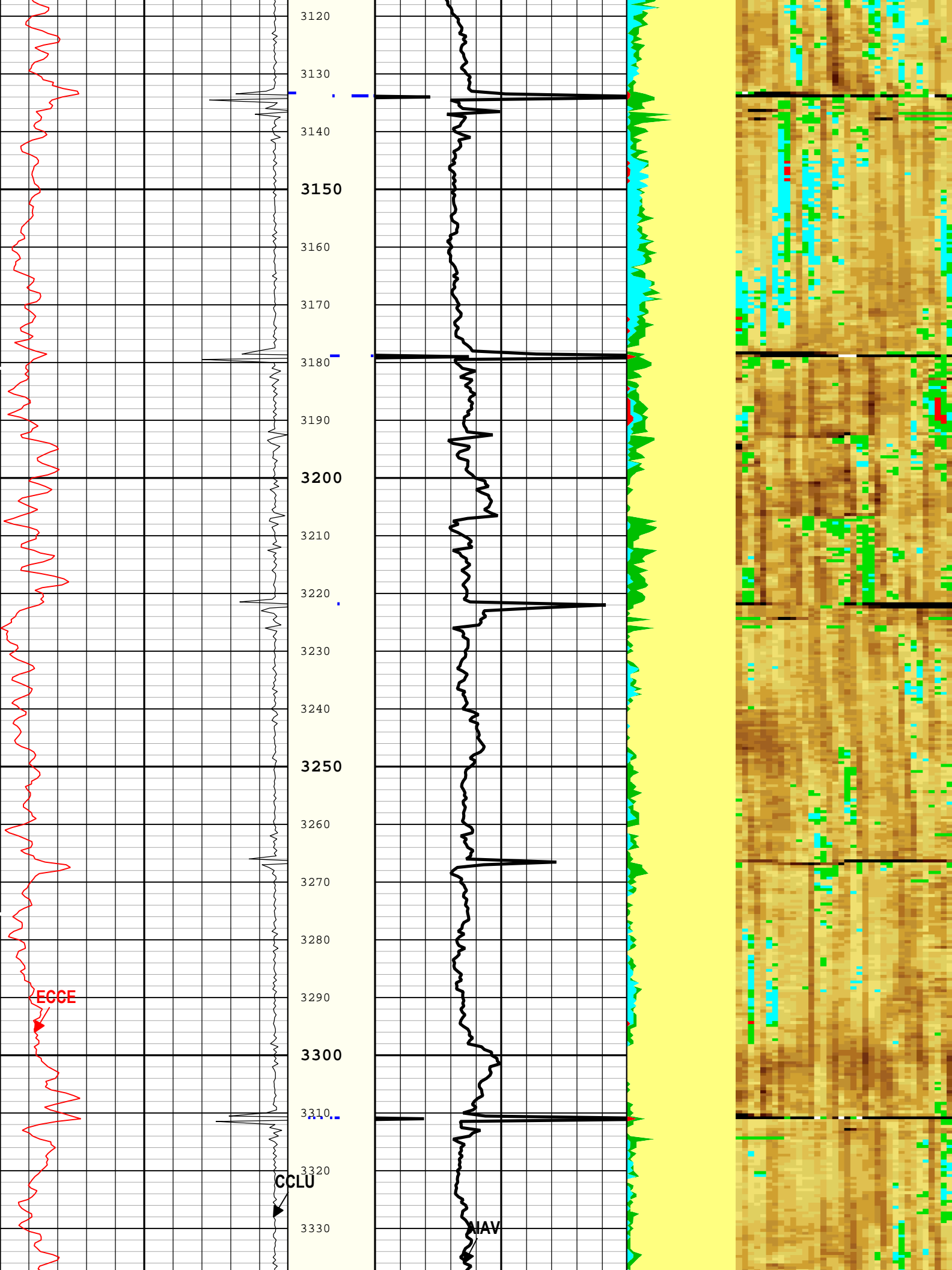


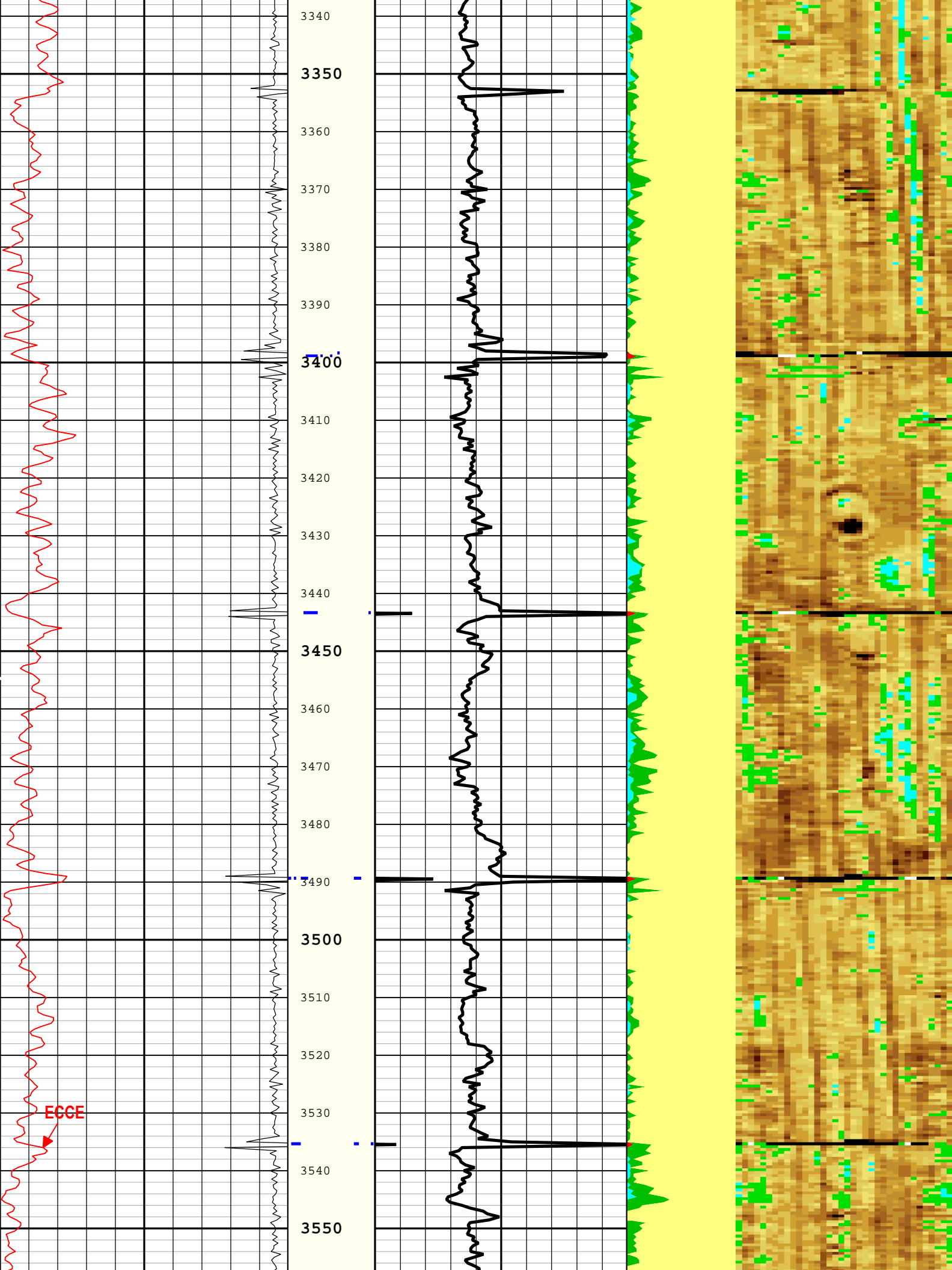


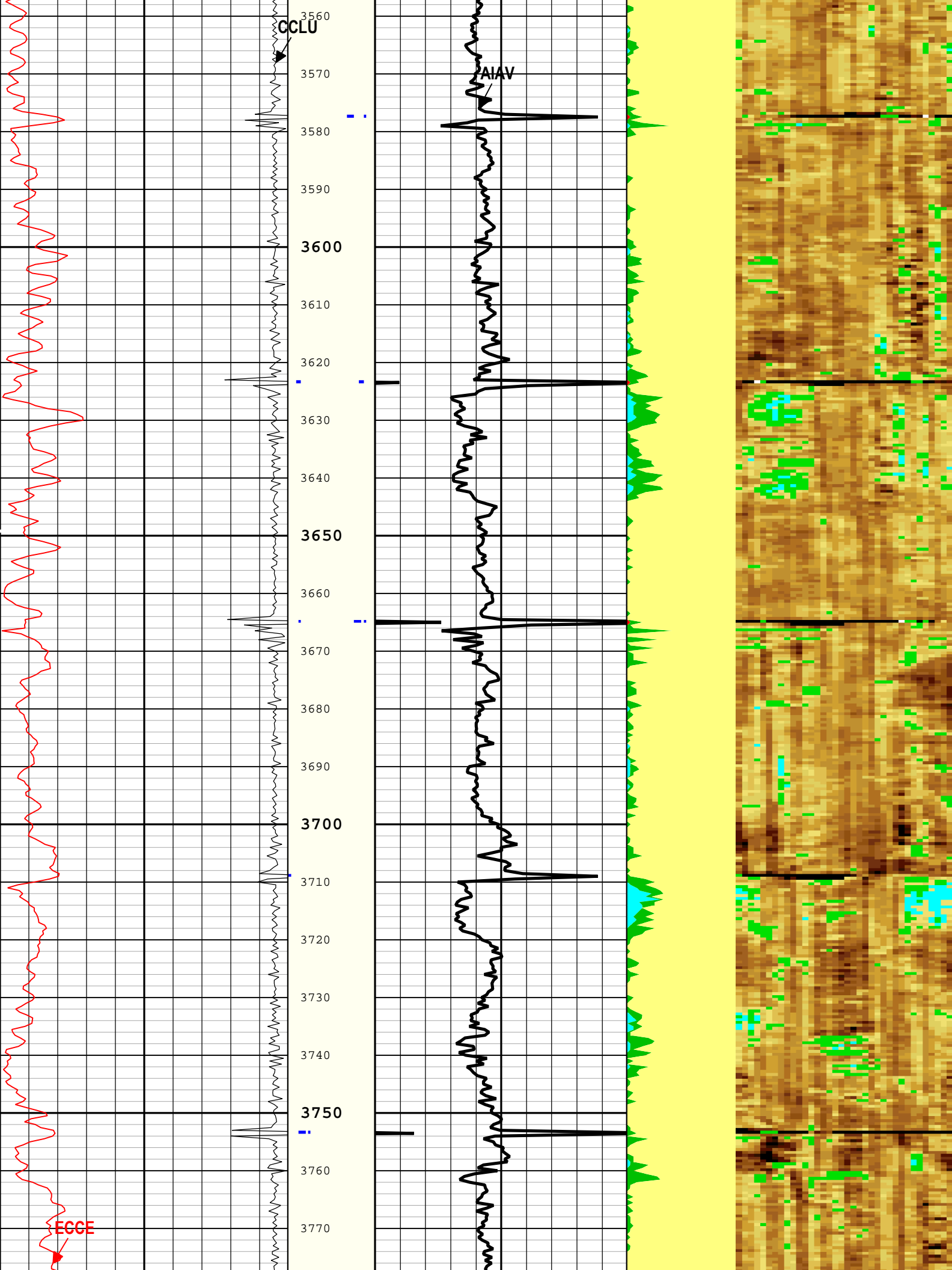


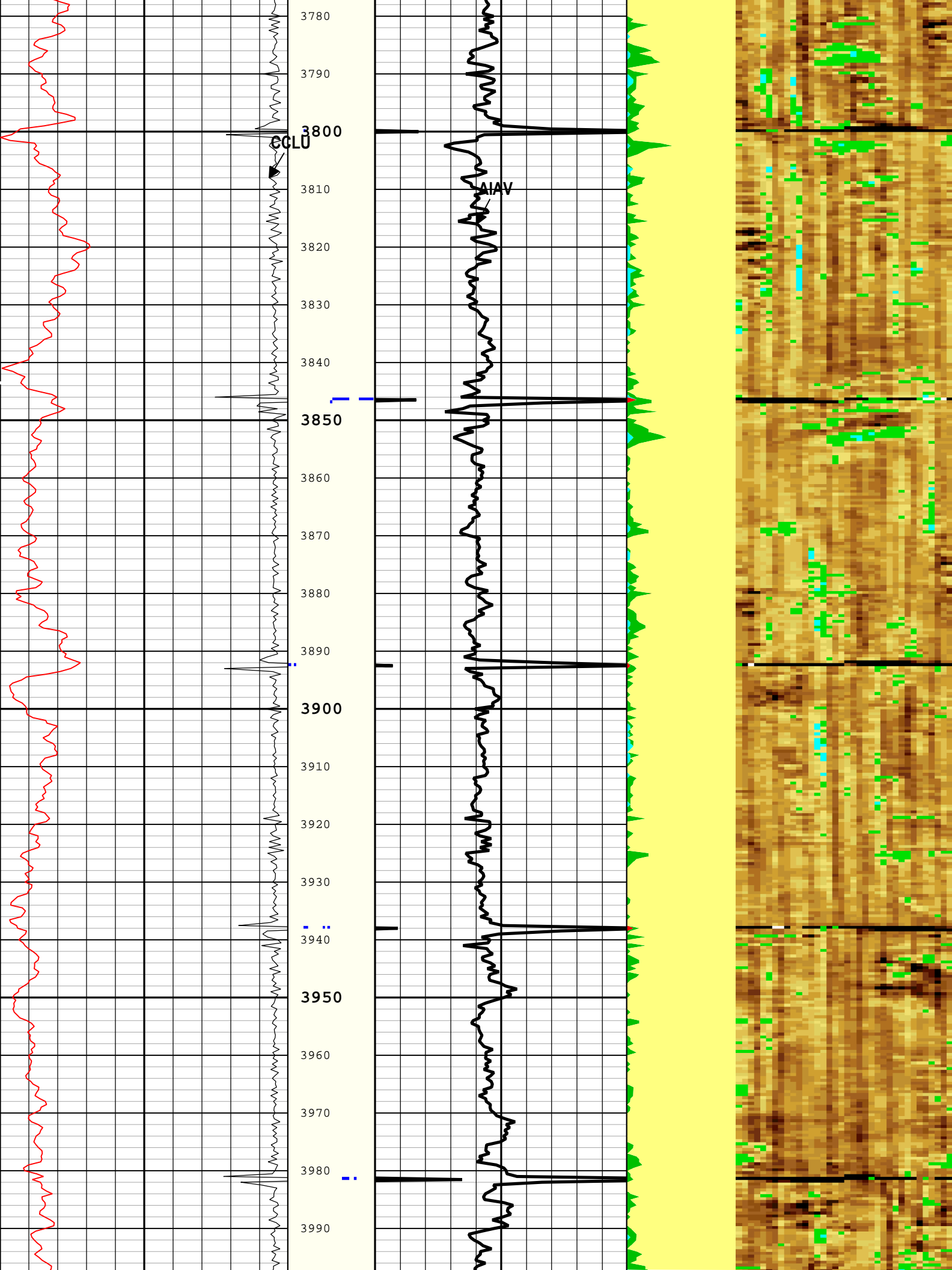


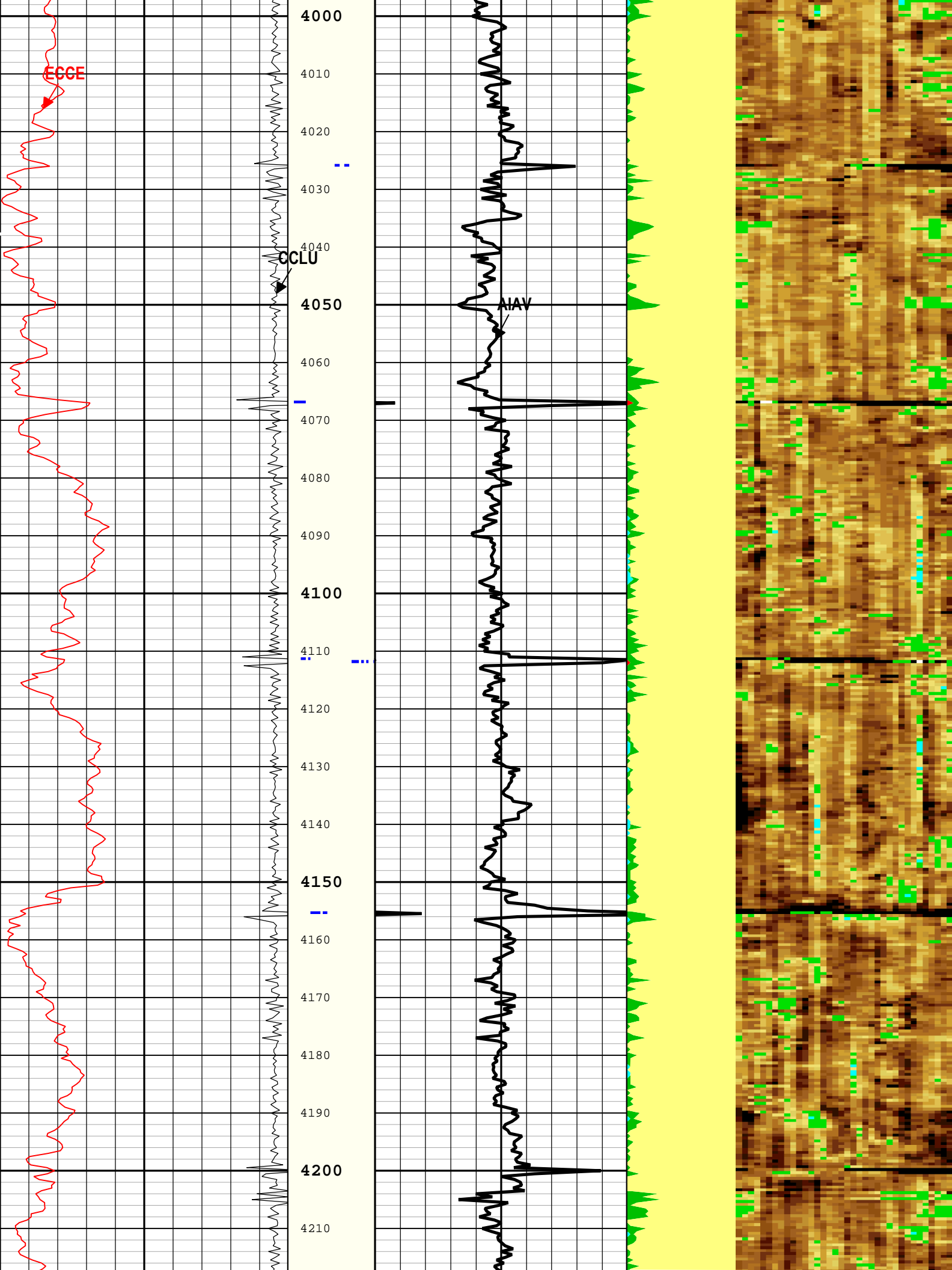


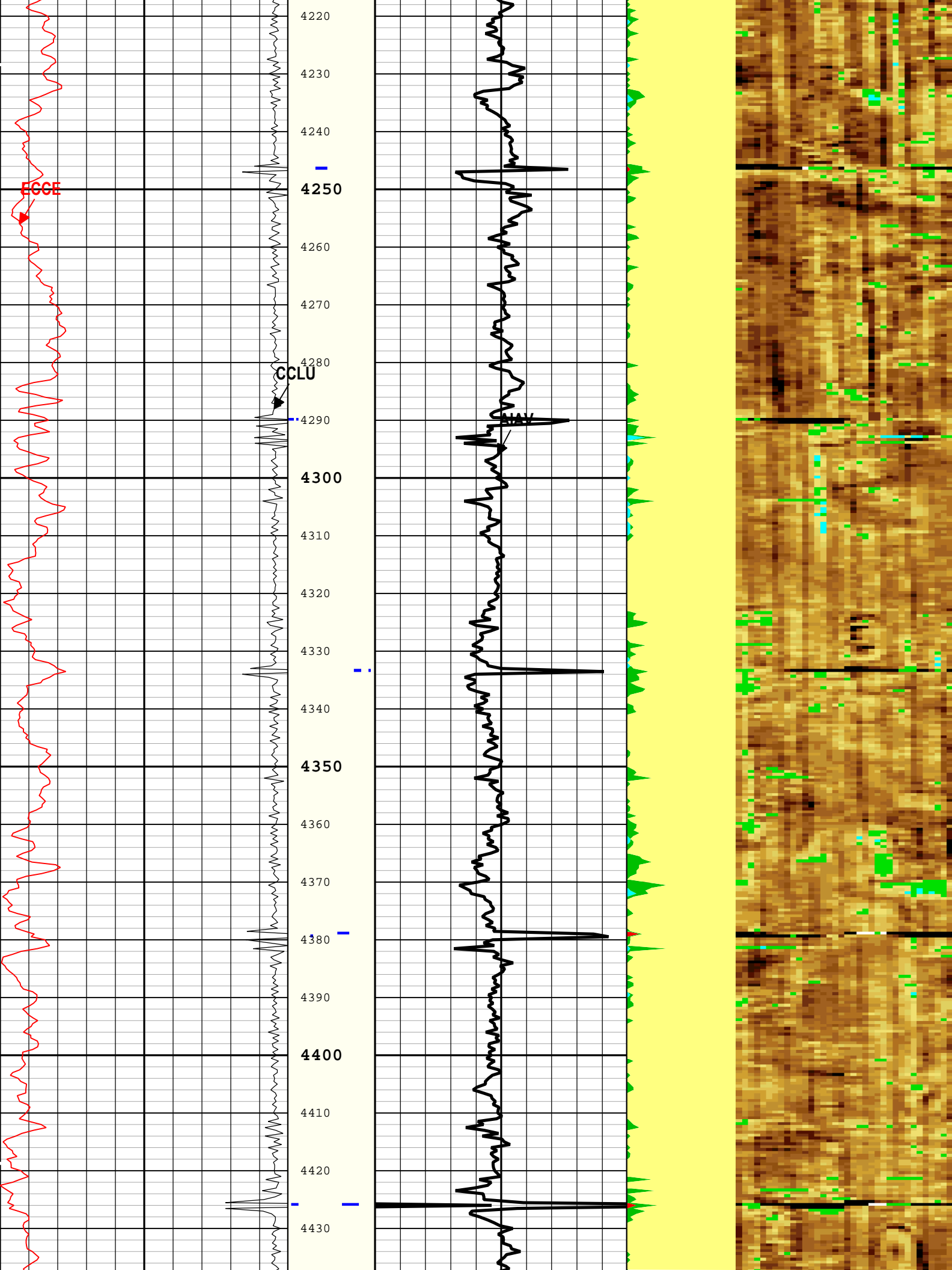


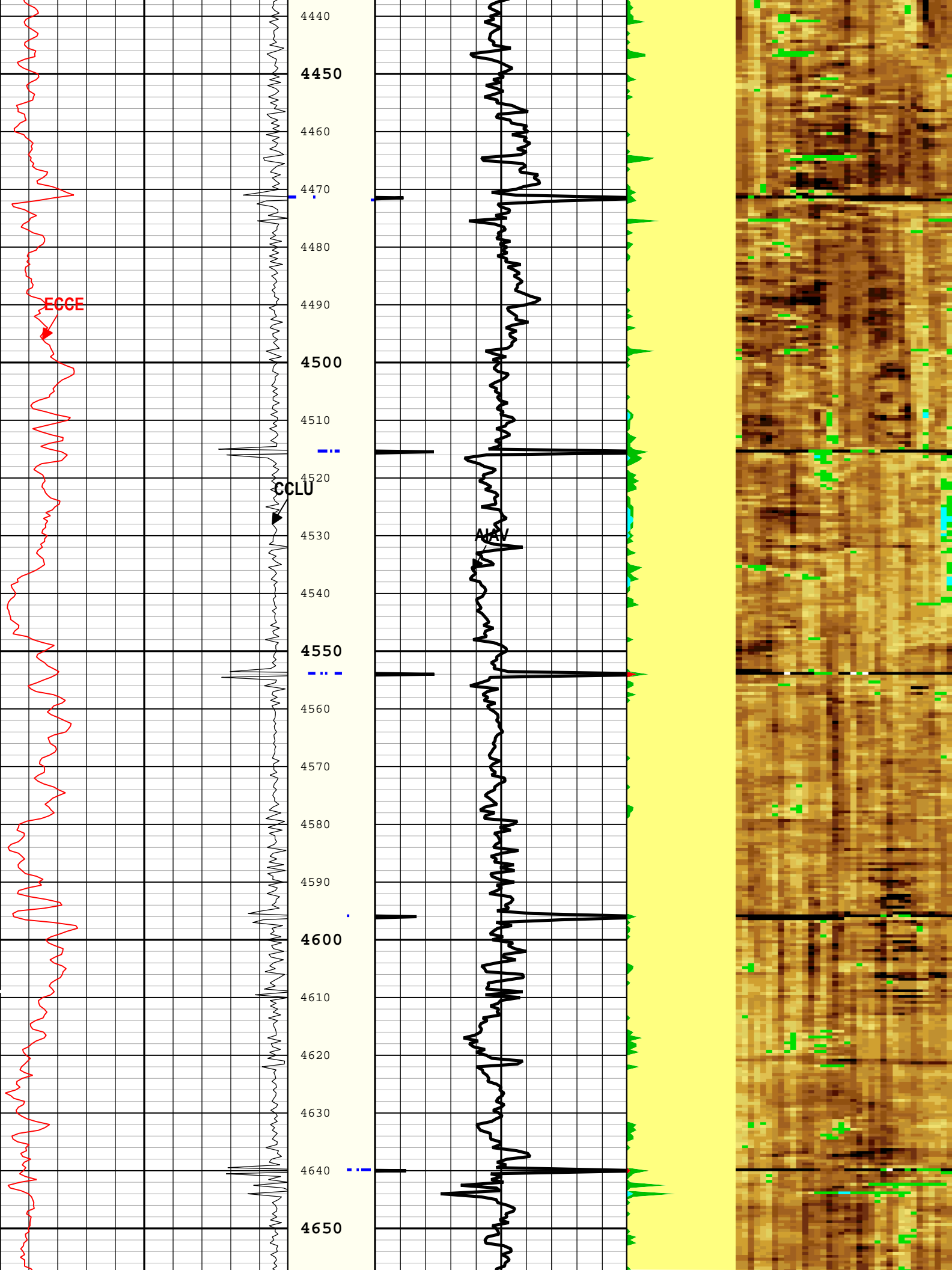


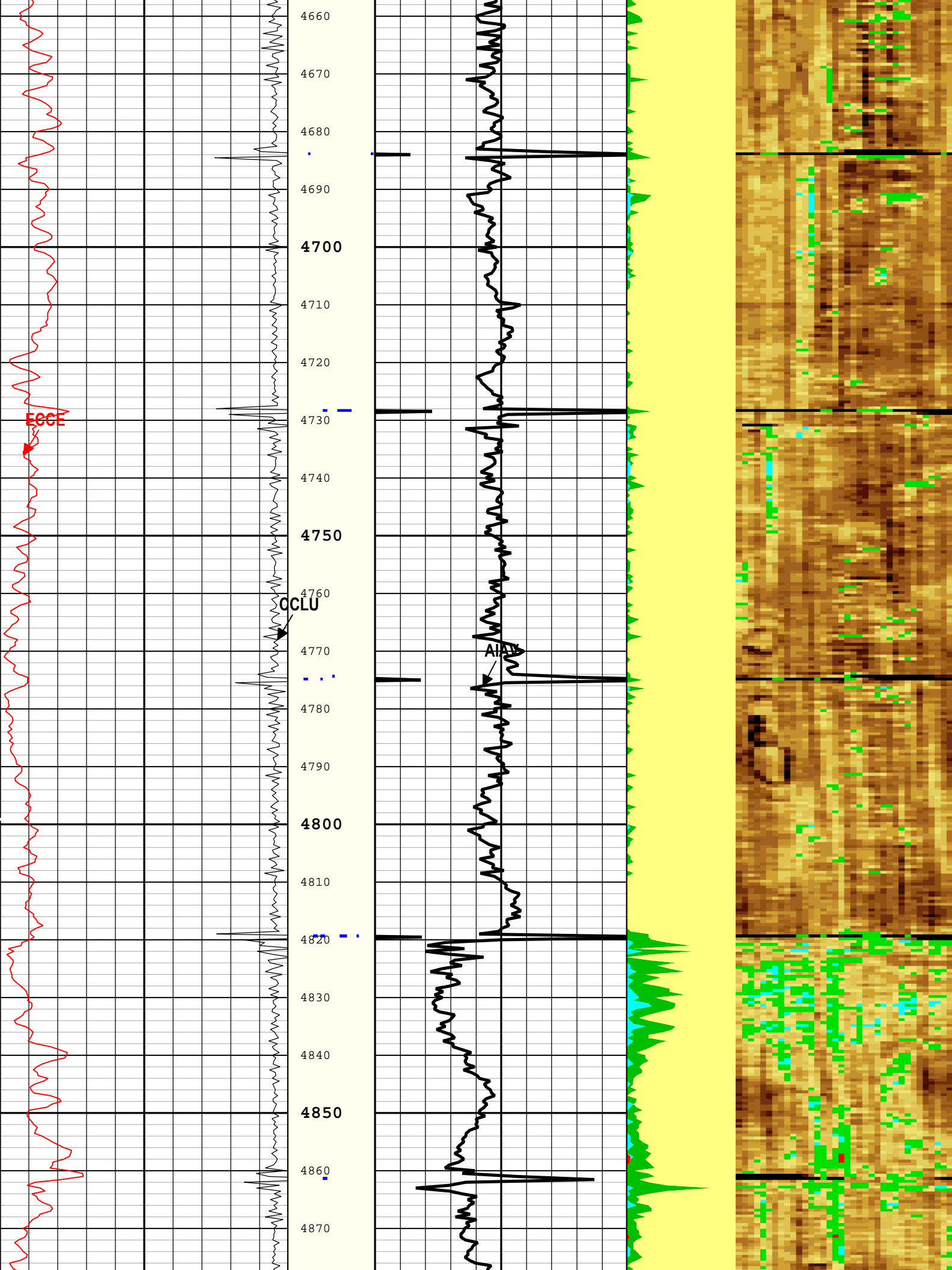


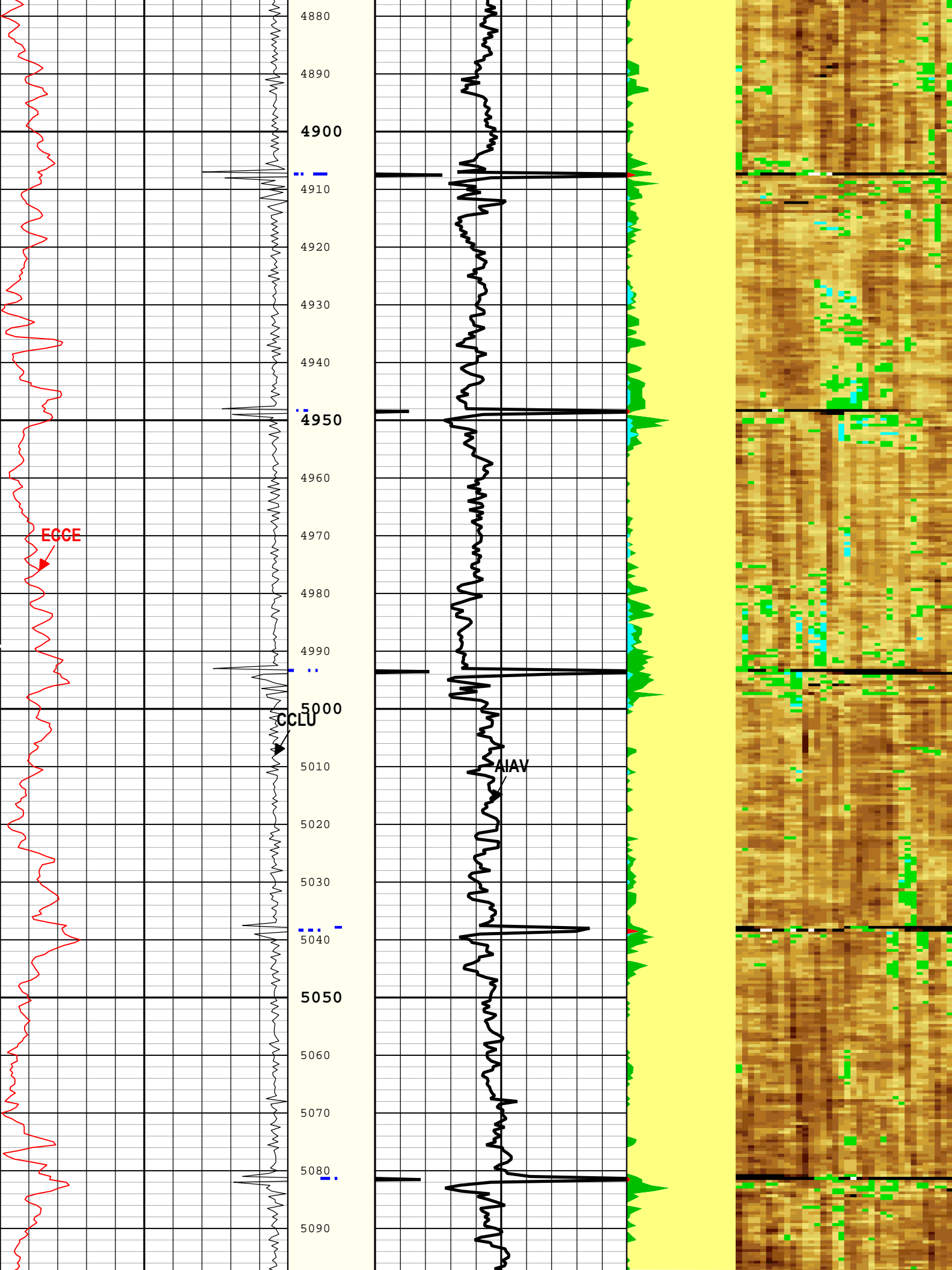


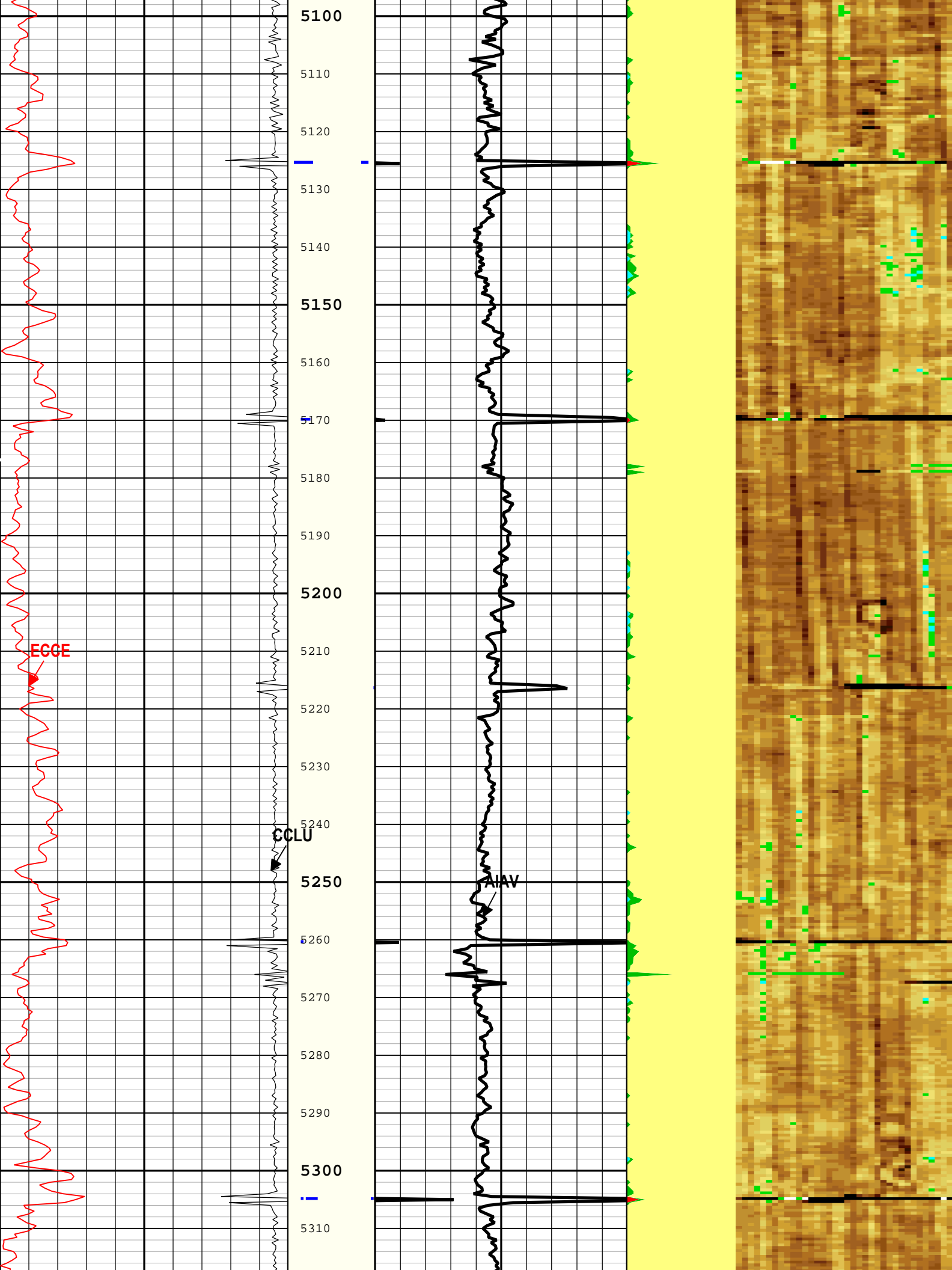


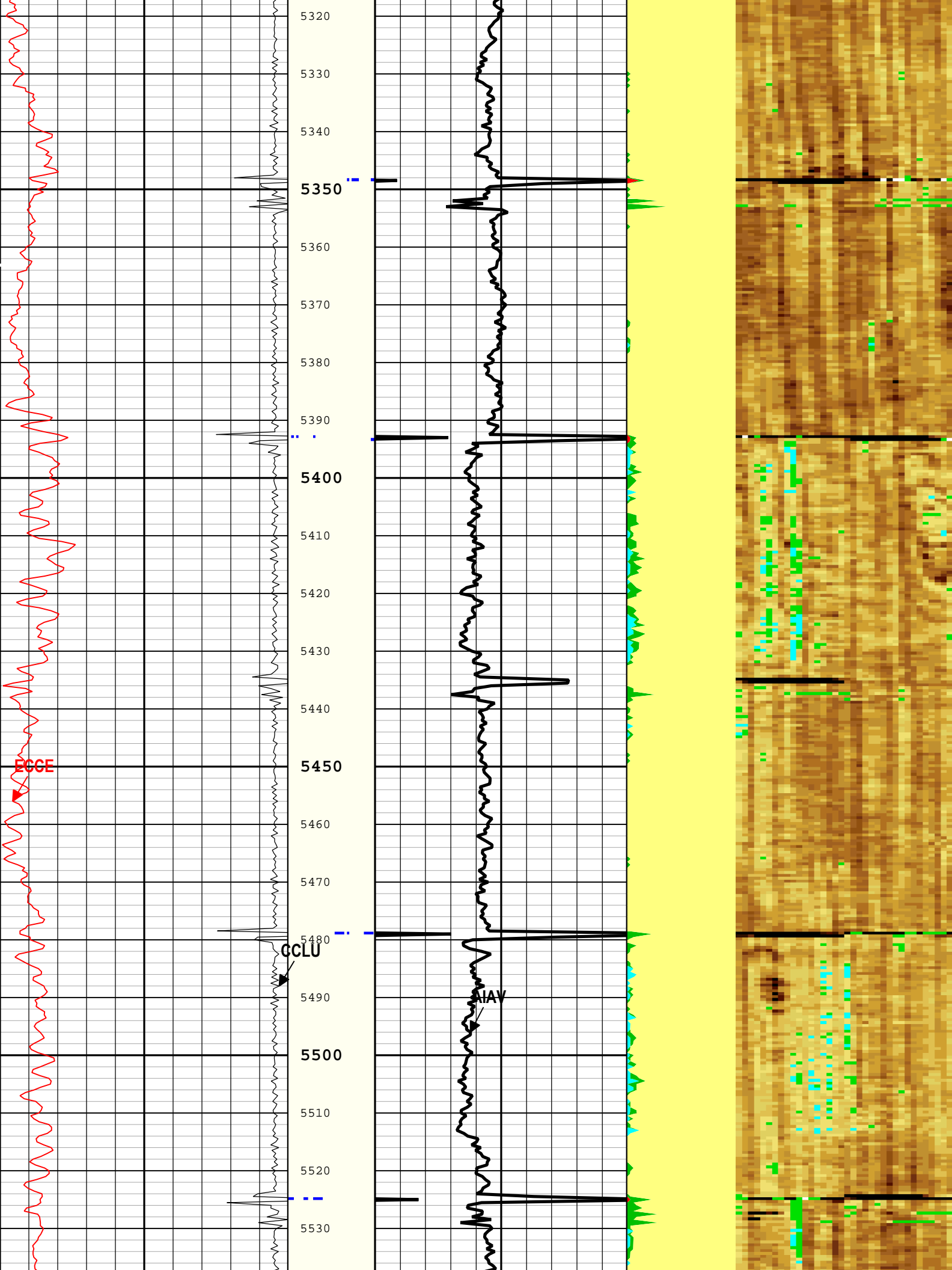


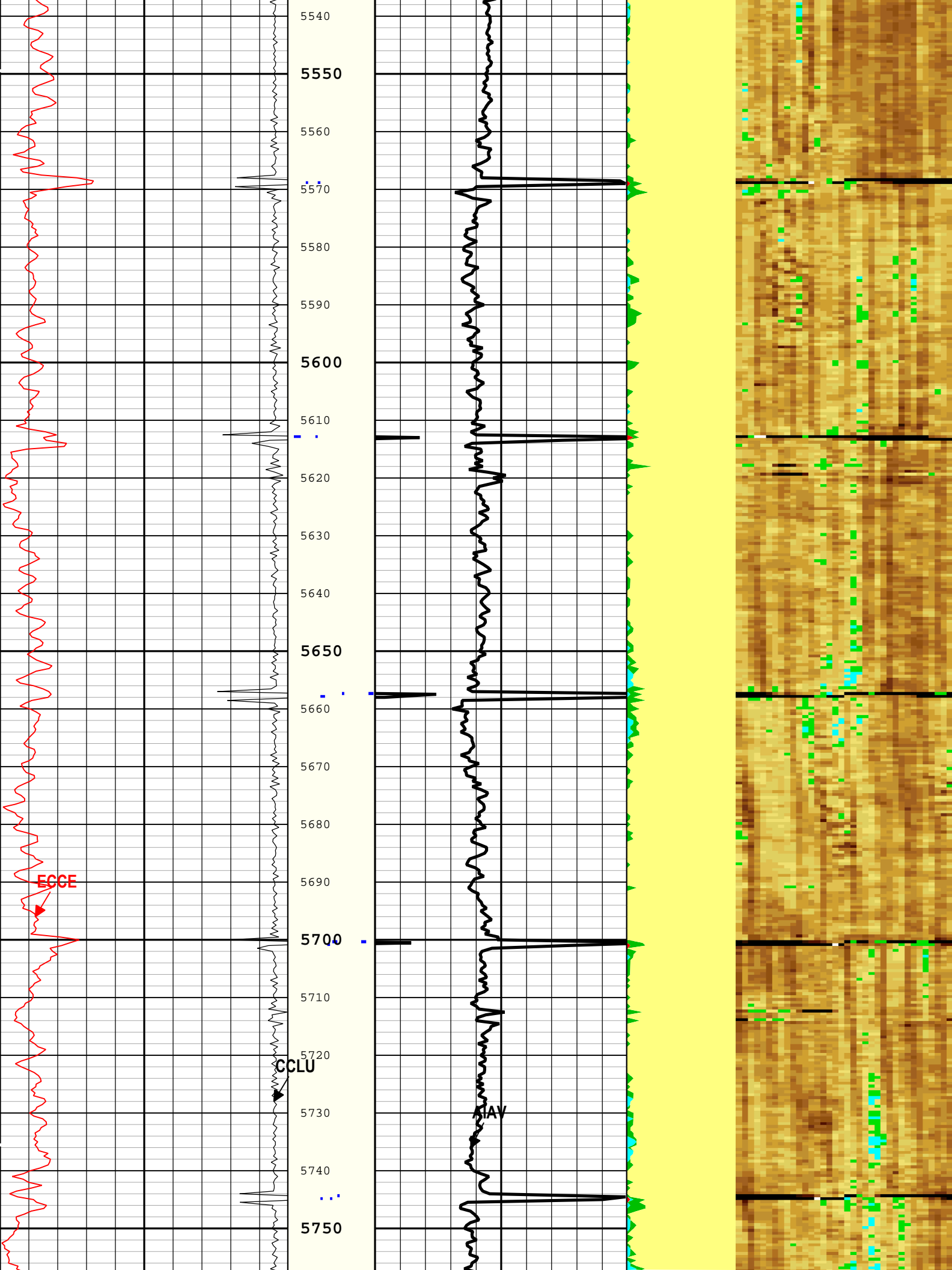


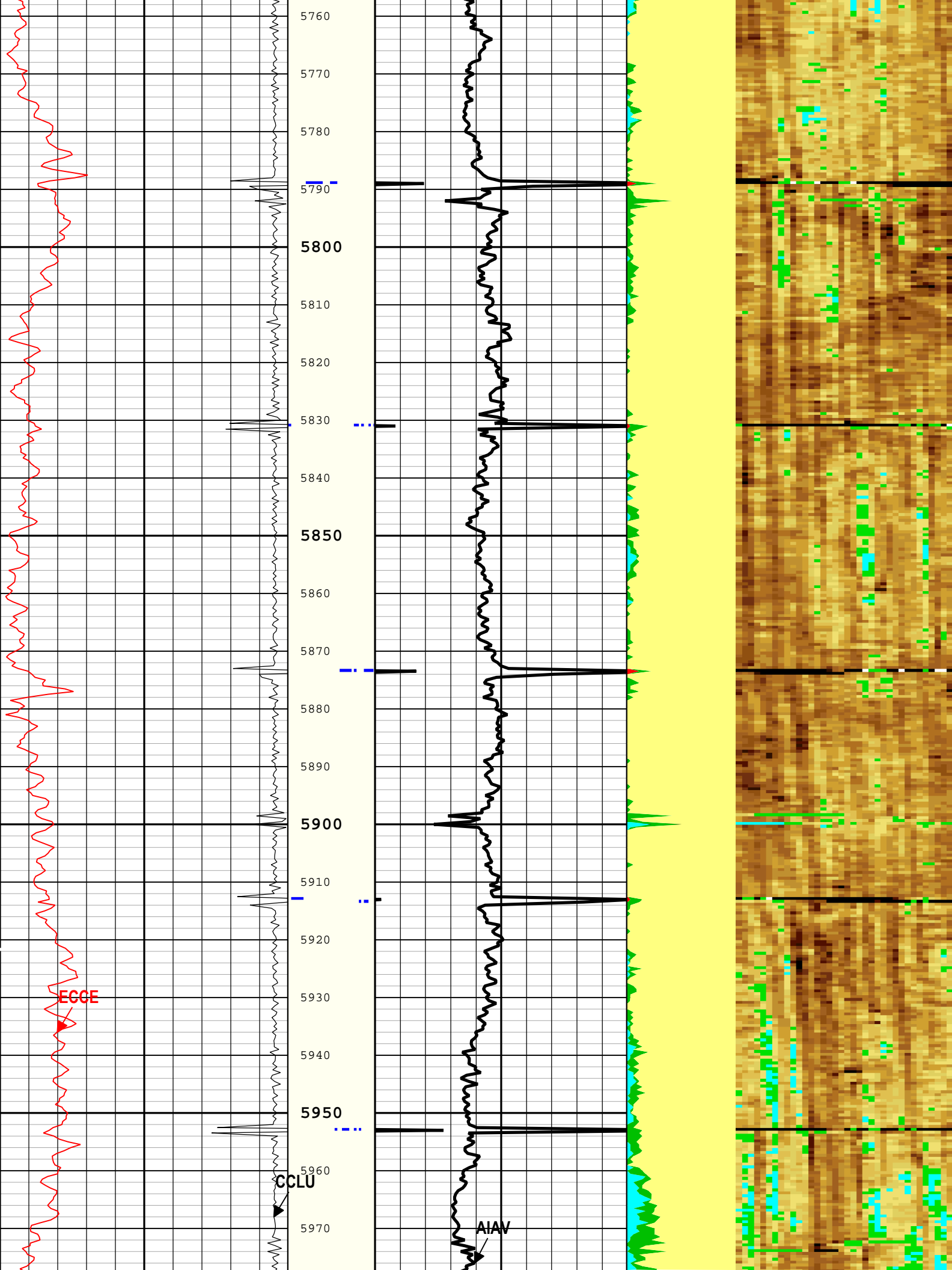


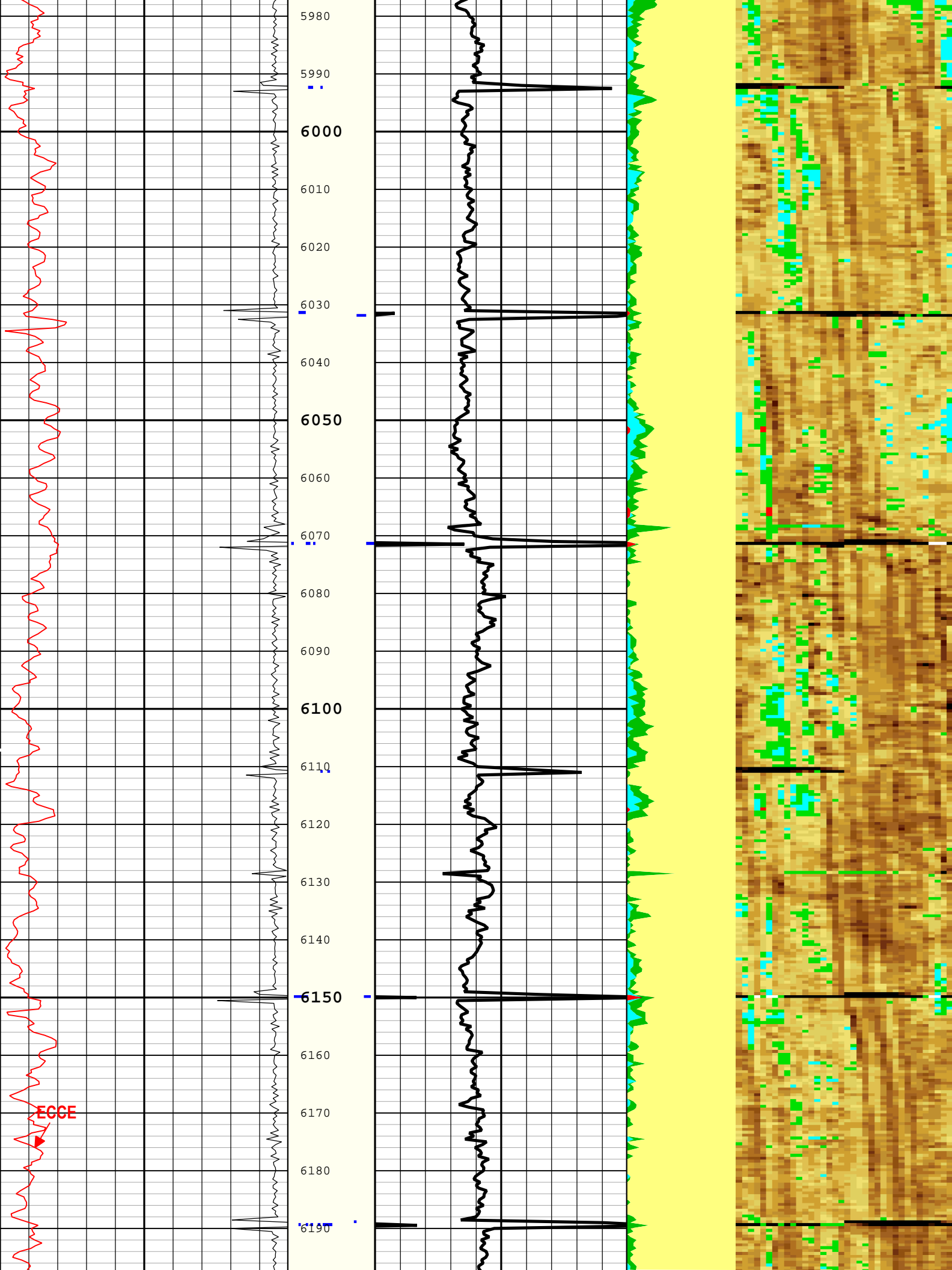


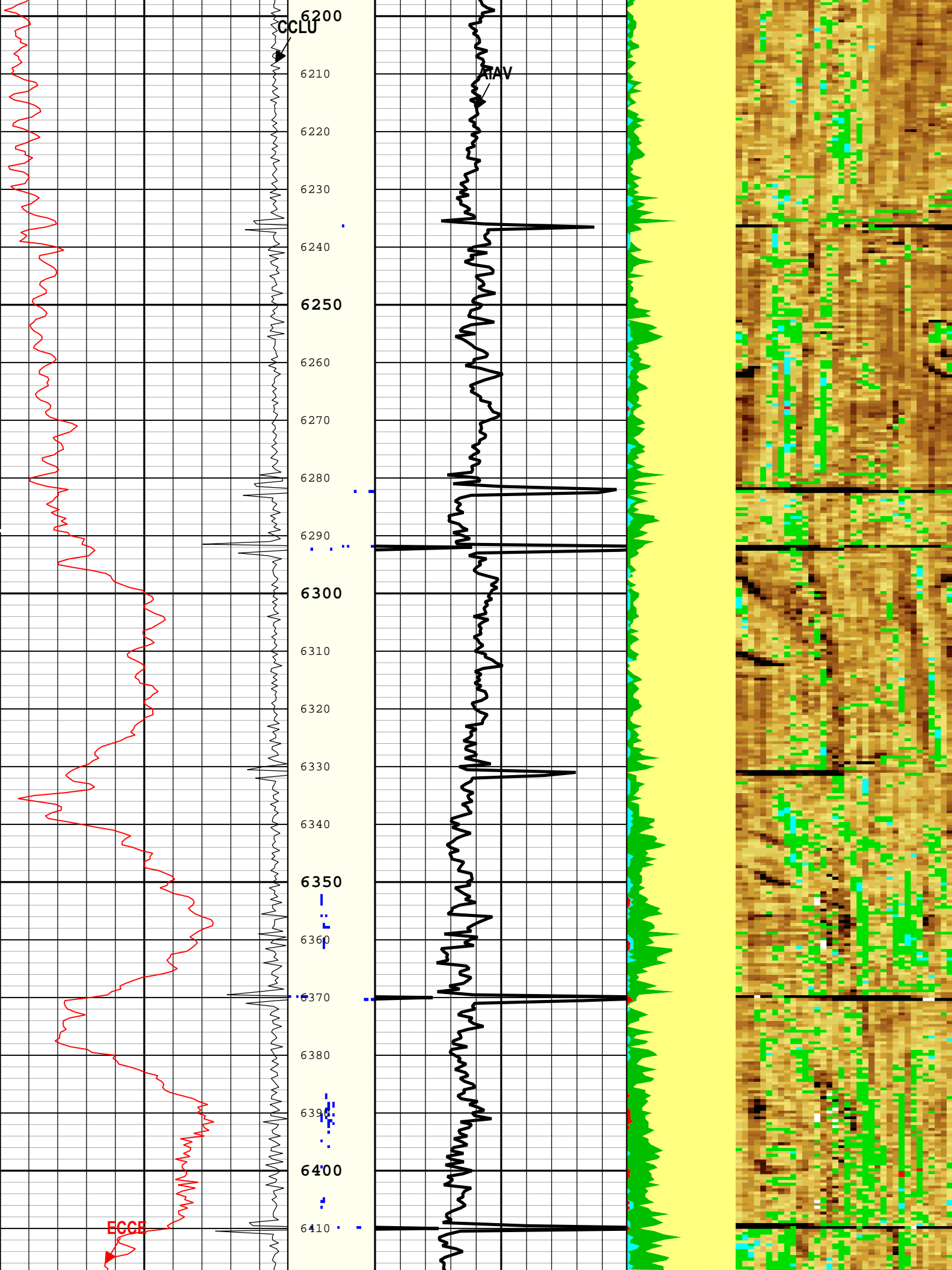


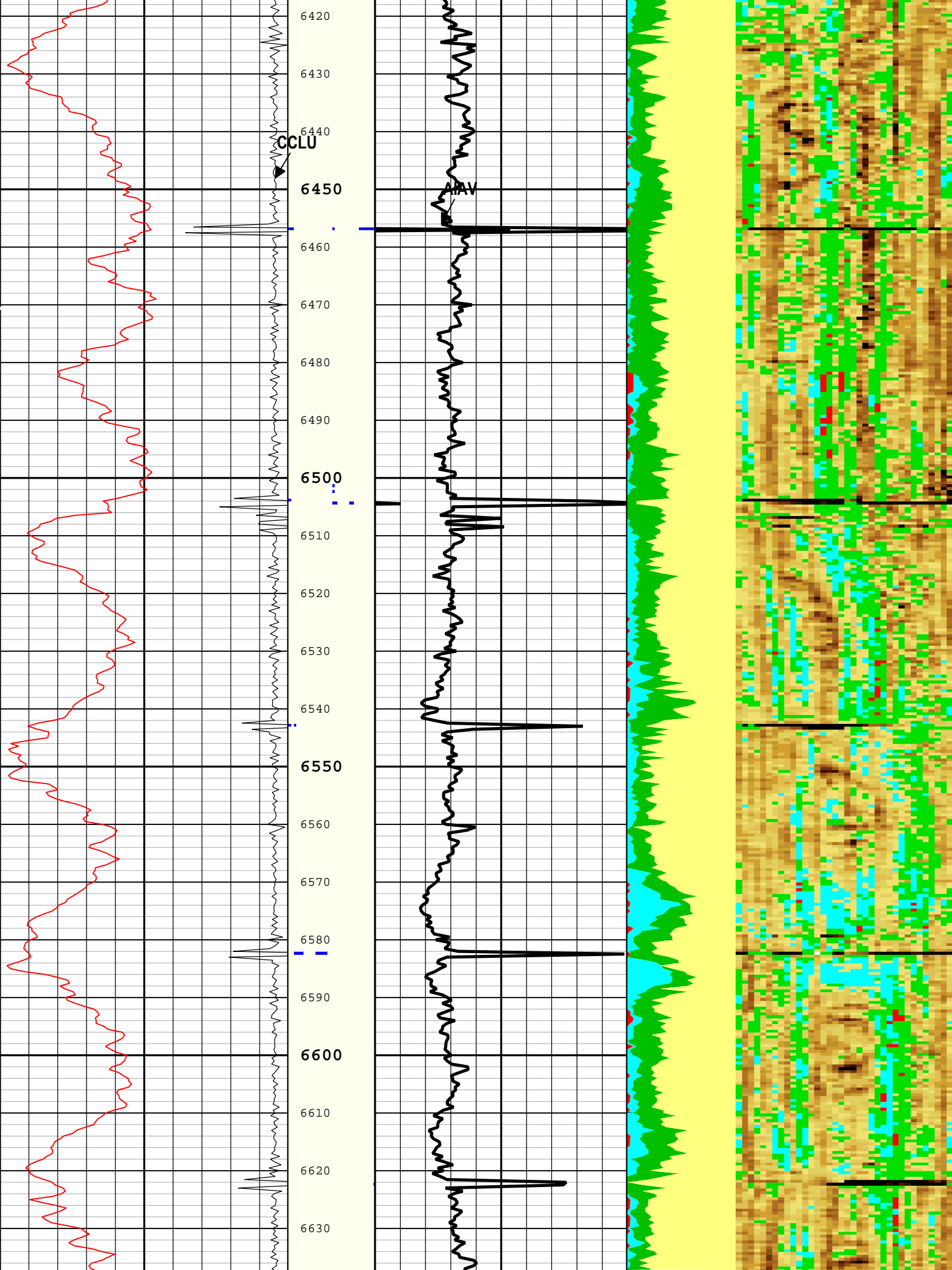


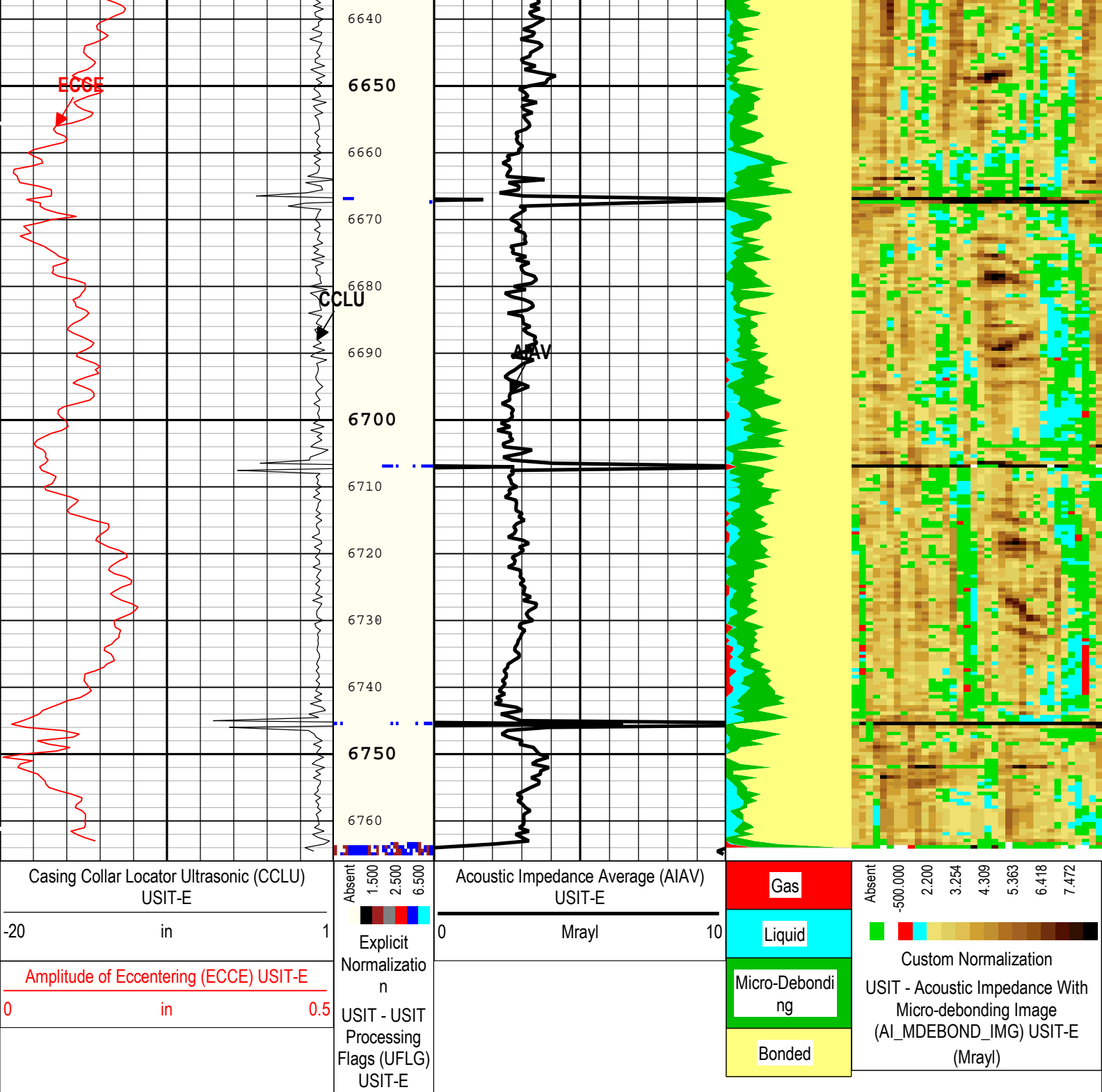












Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 20-Nov-2017 16:01:30

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-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
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	1.13	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.6	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	1.8	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	191	2065	
BS	8.5	2065	6766	
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	Time Zoned	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

Time Zone Parameters					
Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	65	20-Nov-2017 13:11:03	20-Nov-2017 13:23:02	6766.55	6648.82
EMXV	85	20-Nov-2017 13:23:02	20-Nov-2017 13:23:08	6648.82	6631.88
EMXV	100	20-Nov-2017 13:23:08	20-Nov-2017 13:51:15	6631.88	1549.05
EMXV	75	20-Nov-2017 13:51:15	20-Nov-2017 13:59:27	1549.05	191.1
All depth are at tool zero.					

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[2]:Up	Up	1972.81 ft	2503.26 ft	20-Nov-2017	20-Nov-2017	ON	-8.00 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Noble Energy Inc

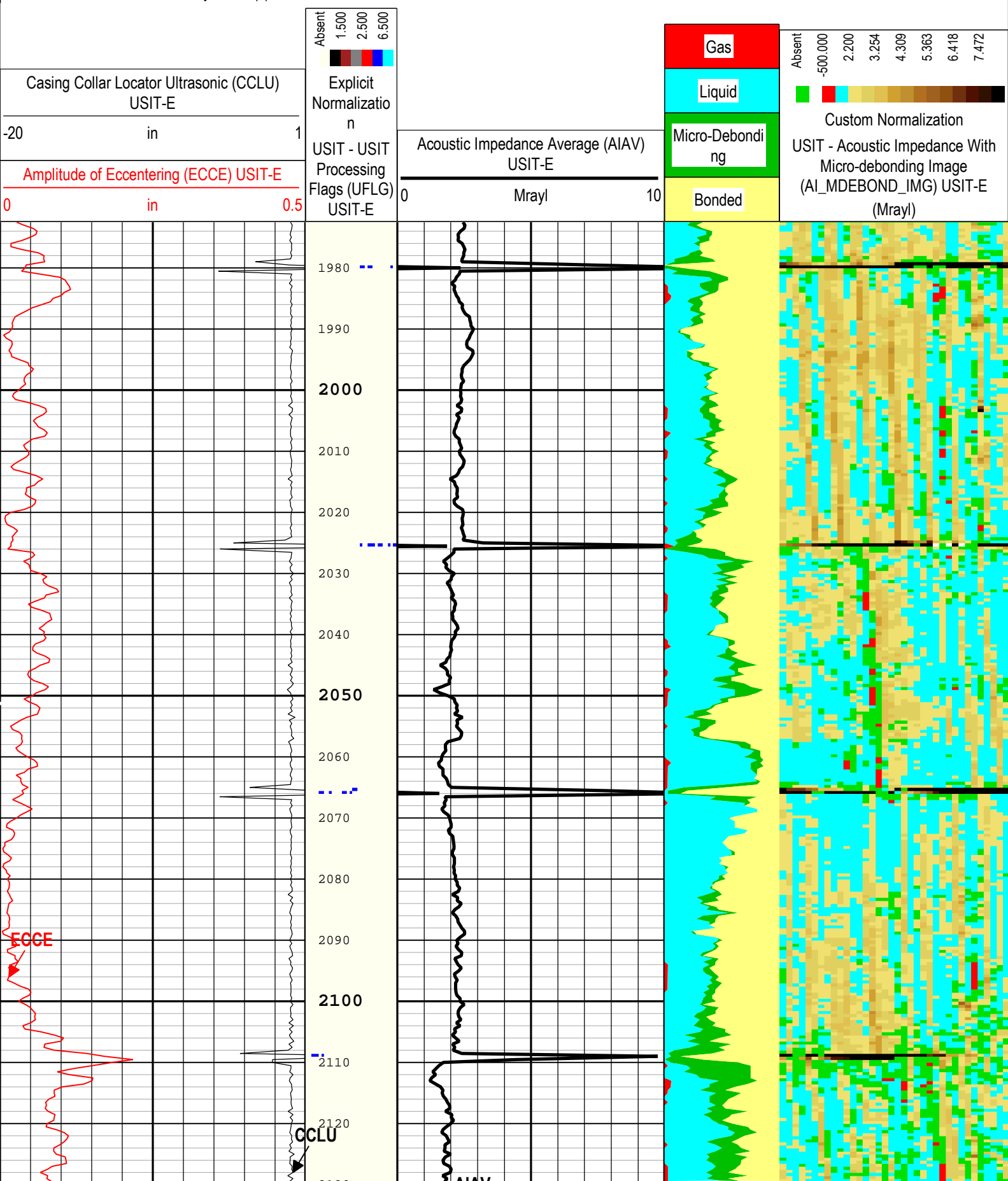
Well:WASTE MANAGEMENT Y23-768

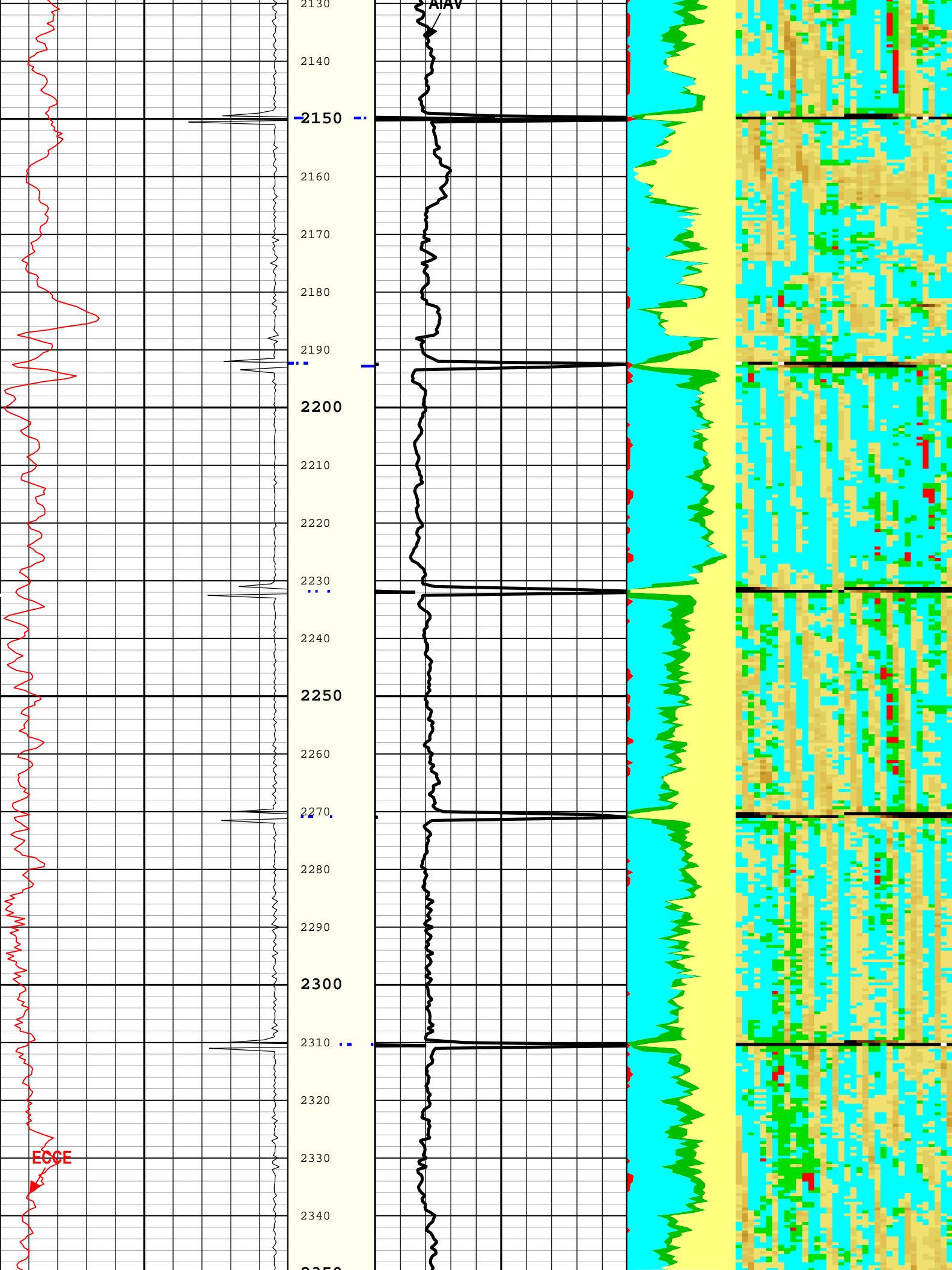
One: Log[2]:Up:S004

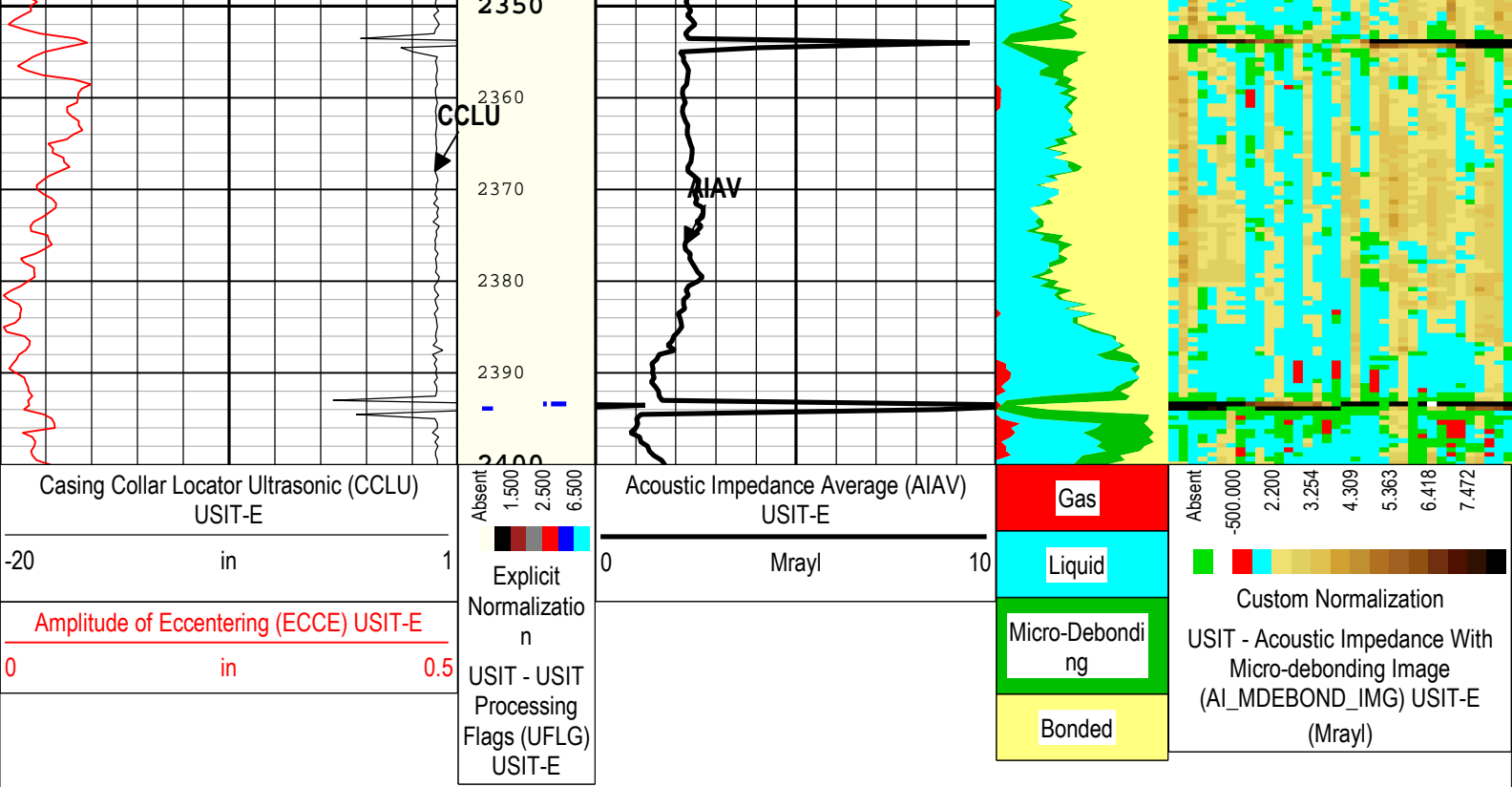
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Creation Date: 20-Nov-2017 16:01:40

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: 20-Nov-2017 16:01:40

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-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
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	1.13	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.6	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	1.8	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	1972.5	2065
BS	8.5	2065	2400

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	
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	45	20-Nov-2017 12:43:16	20-Nov-2017 12:43:45	2503.26	2453.6
EMXV	125	20-Nov-2017 12:43:45	20-Nov-2017 12:44:31	2453.6	2319.37
EMXV	80	20-Nov-2017 12:44:31	20-Nov-2017 12:44:39	2319.37	2294.56
EMXV	65	20-Nov-2017 12:44:39	20-Nov-2017 12:46:29	2294.56	1972.81

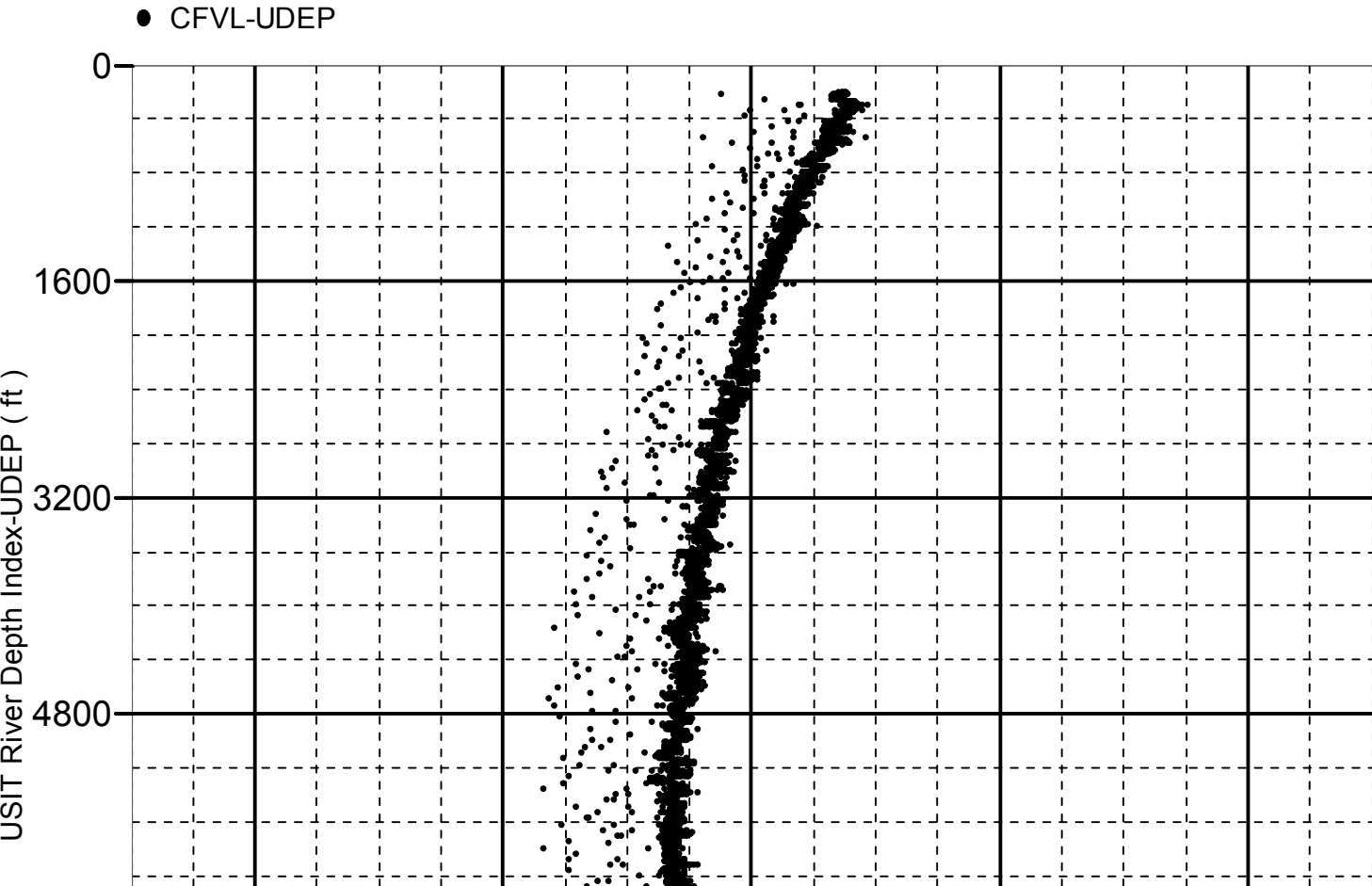
All depth are at tool zero.

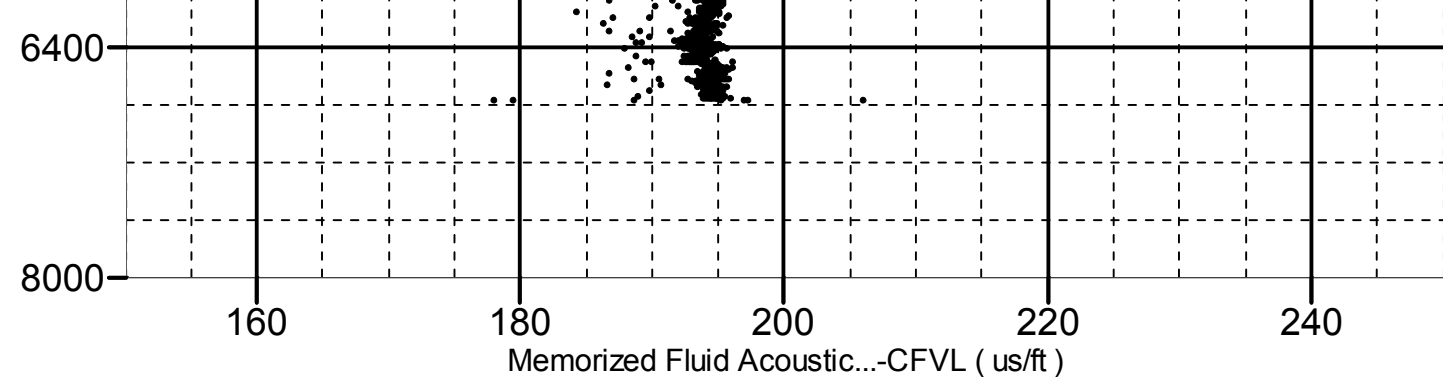
XYZ

Company:Noble Energy Inc Well:WASTE MANAGEMENT Y23-768
One: Log[4]:Up:S004

Fluid Acoustic Slowness vs Depth
2D Cross Plot

Index Range: From 6766.00 to 191.00 ft

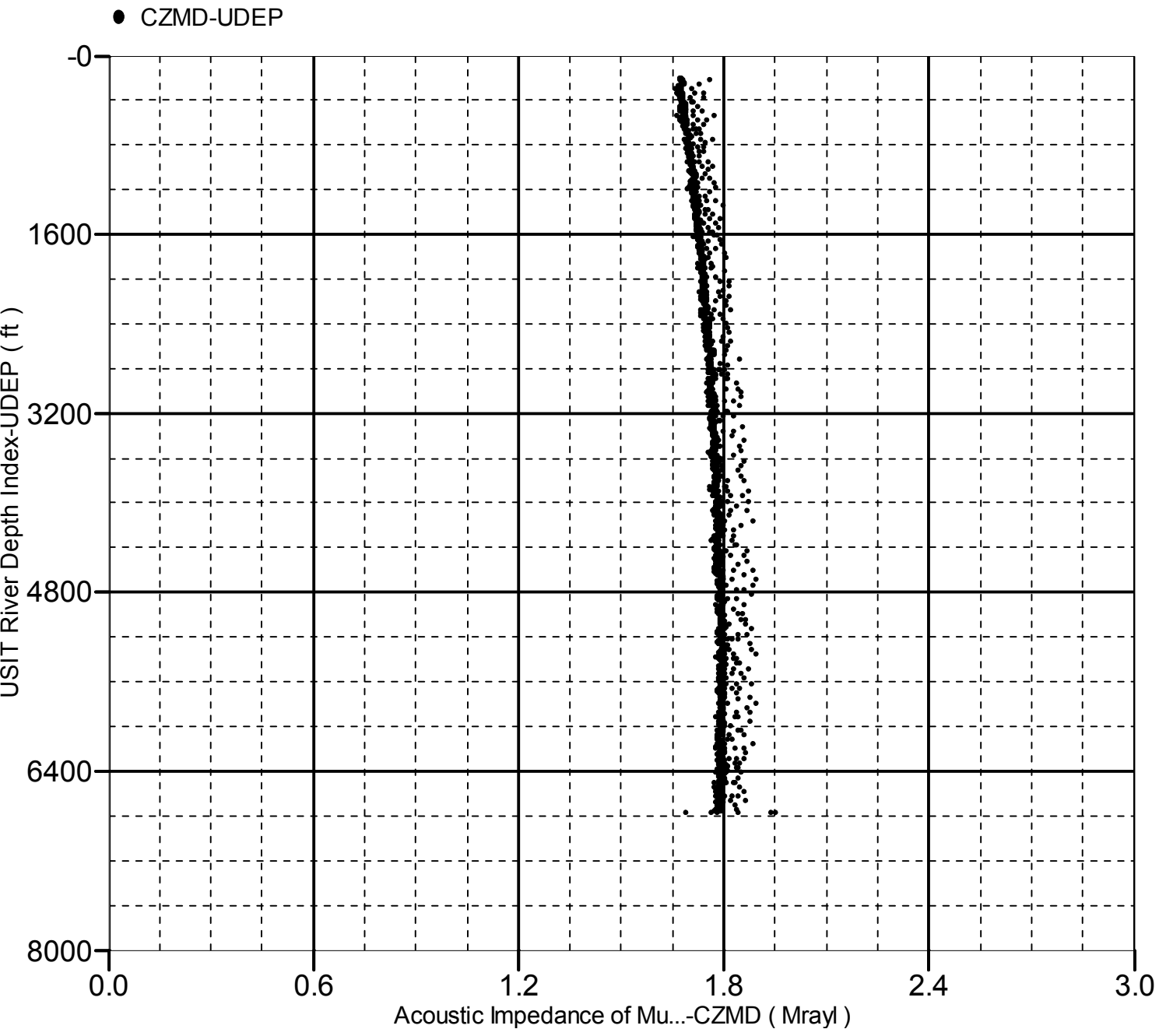




Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6766.00 to 191.00 ft



Company:	Noble Energy Inc	Schlumberger
Well:	WASTE MANAGEMENT Y23-768	
Field:	WATTENBERG	
County:	WELD	
State:	COLORADO	

UltraSonic Summary Print

