

Company: Noble Energy Inc

Well: Bison Ridge Y22-779

Field: Wattenberg

County: Weld State: CO

UltraSonic Summary Print

County:	Weld				
Field:	Wattenberg				
Location:	NESW Sec. 10, T2N, R64W				
Well:	Bison Ridge Y22-779				
Company:	Noble Energy Inc				
		Location:			
		NESW Sec. 10, T2N, R64W	Elev.:	K.B.	4960.00 ft
		SHL: 2230' FSL & 2017' FEL		G.L.	4930.00 ft
		Lat/Long: 40.151830/-104.539850		D.F.	4960.00 ft
		Permanent Datum:	Ground Level	Elev.:	4930.00 f
		Log Measured From:	Kelly Bushing	30.00 ft	above Perm.Datum
		Drilling Measured From:	Kelly Bushing		
		API Serial No.	Section:	Township:	Range:
		05-123-45378	10	2N	64W
Logging Date	03-Feb-2018				

Run Number	ONE	
Depth Driller	17191.00 ft	
Schlumberger Depth	6695.00 ft	
Bottom Log Interval	6695.00 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	2066.00 ft	
To	6695.00 ft	
Casing/Tubing Size	5.5 in	
Weight	20 lbm/ft	
Grade	P110	
From	0.00 ft	
To	17181.00 ft	
Max Recorded Temperatures	212.99 degF	
Logger on Bottom	03-Feb-2018	12:34:00
Unit Number	Location:	Time
Recorded By	A. Rosacker/T. Savoe	Fort Morgan
Witnessed By	Bill Mansfield	

Disclaimer

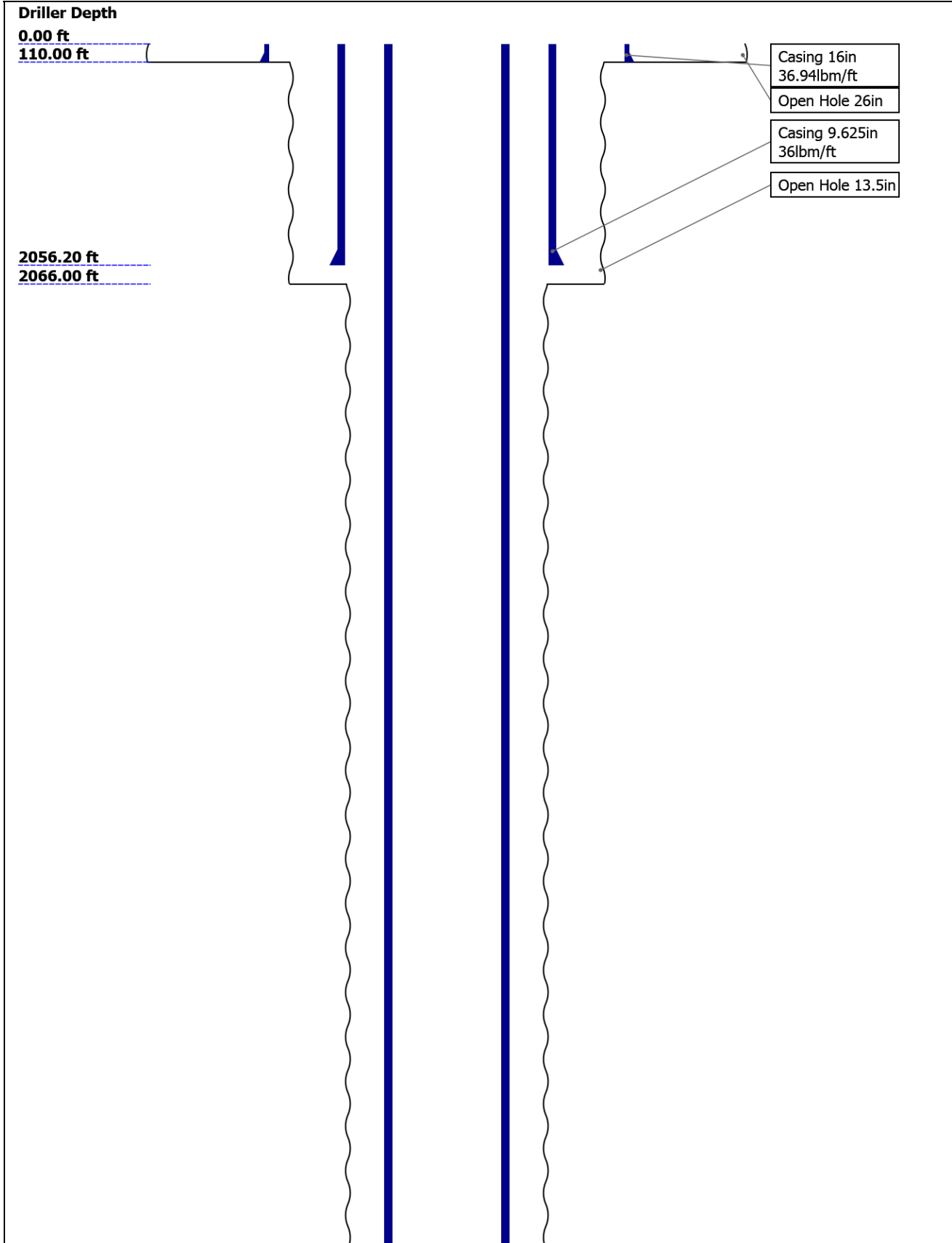
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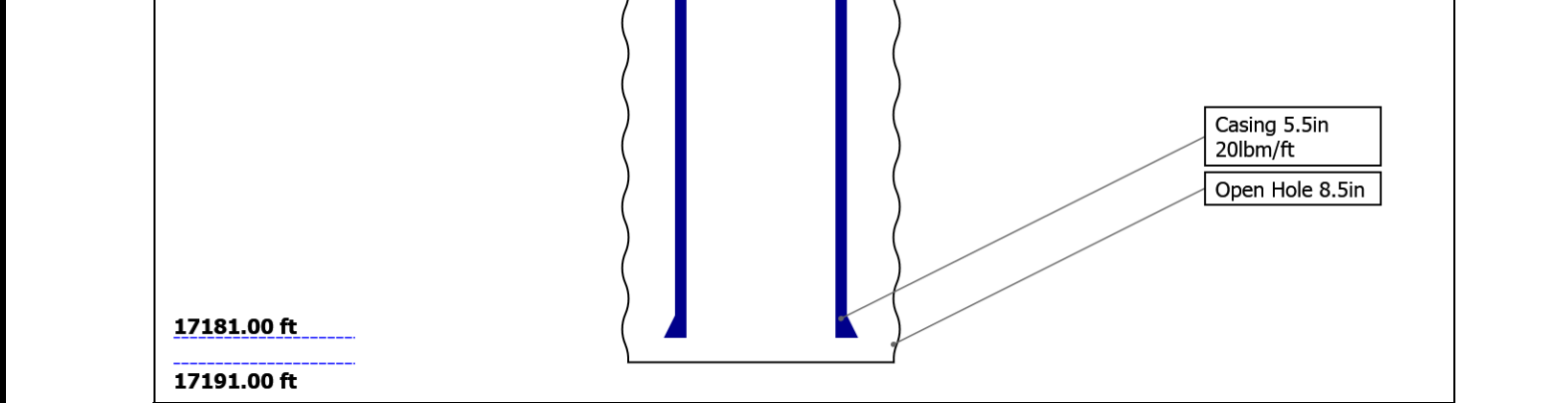
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Well Sketch






Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	0	110	2066			
Top Logger (ft)	0	110	2066			
Bottom Driller (ft)	110	2066	17191			
Bottom Logger (ft)	110	2066	6695			
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	2056.2	17181			
Bottom Logger (ft)	110	2056.2	17181			

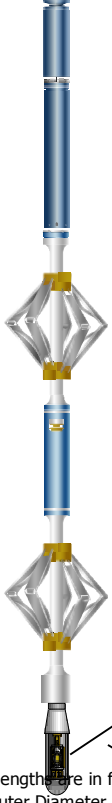
Remarks and Equipment Summary

ONE: Toolstring				ONE: Remarks	
<div><div><div>Equip name Length</div><div>LEH-QT:2 33.83</div><div>353</div><div>LEH-QT:23</div><div>53</div></div><div><div>SAH-F:18 30.91</div><div>17</div></div><div><div>EDTC-B:8 26.06</div><div>424</div><div>EDTH-B:84</div><div>32</div><div>EDTG-B</div><div>EDTC-B:84</div><div>24</div></div><div><div>AH-184[2]:2765 19.56</div></div><div><div>AH-184[2]:2765 17.56</div></div></div> <div></div>	MP name Offset			Thank you for choosing Schlumberger!	
				Toolstring ran as per tool sketch and client logging program	
				4.75" Gemcos ran on USAC and EDTC for centralization	
				This is the first log in well	
				Main Pass logged at 2500 PSI; Repeat Pass logged at 0 PSI	
				BHT: 212.99 deg F	
				Estimated Top of Cement is 2000 ft	

1J:2826

USIT-E:94 15.56
3

ECH-MFA:
1928
USAC-A:9
43
USIS-A:27
20
USSC-B:75
8
USRS-AB:
873
USI-SENS
OR
USI-TX



USI Sen 0.37
sor Head Fe nsion
Length here in ft
Maximum Outer Diameter = 3.875 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

ONE

Depth Measuring Device

Type IDW-JA
Serial Number 6483
Calibration Date
Calibrator Serial Number
Calibration Cable Type 7-46 PI-XXS
Wheel Correction 1 -4
Wheel Correction 2 -5

Tension Device

Type CMTD-B/A
Serial Number 466
Calibration Date 11-Jan-2018
Calibrator Serial Number 84749A
Number of Calibration Points 10
Calibration Root Mean Square Error 15
Calibration Peak Error 24

Logging Cable

Type 7-46PI-XXS
Serial Number F716045
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 policies followed.
Rig Up Length At Surface		IDW used as primary depth reference.
Rig Up Length At Bottom		Z-Chart used as secondary depth reference
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[5]:Up	6695.81	78.59

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 : 24.48m(80.33ft) to 30.14m(98.87ft)
MUD_N_FRP = 1.10
DFD = 1.01g/cm3(8.40lbm/gal)
CZMD median computed in free pipe normalization interval = 1.67 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

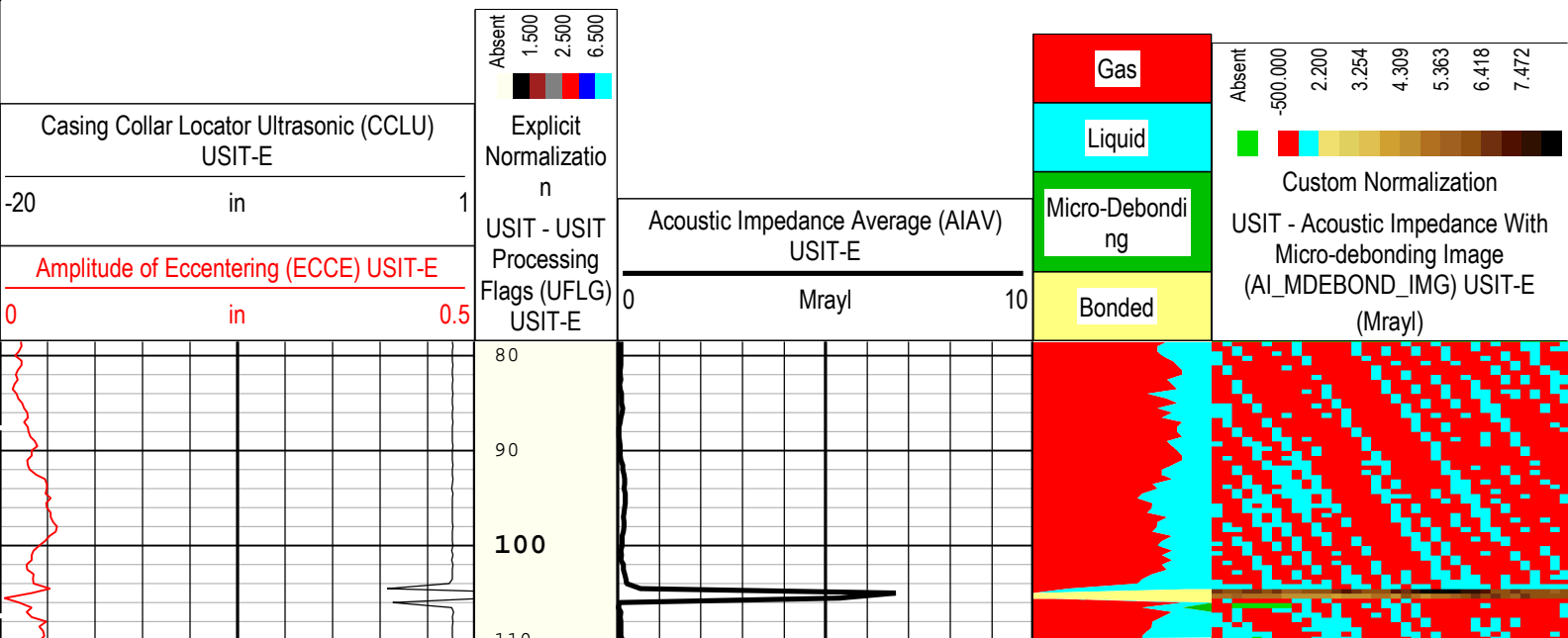
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[5]:Up	Up	78.59 ft	6695.81 ft	03-Feb-2018 12:39:30 PM	03-Feb-2018 1:29:36 PM	ON	7.81 ft	Yes

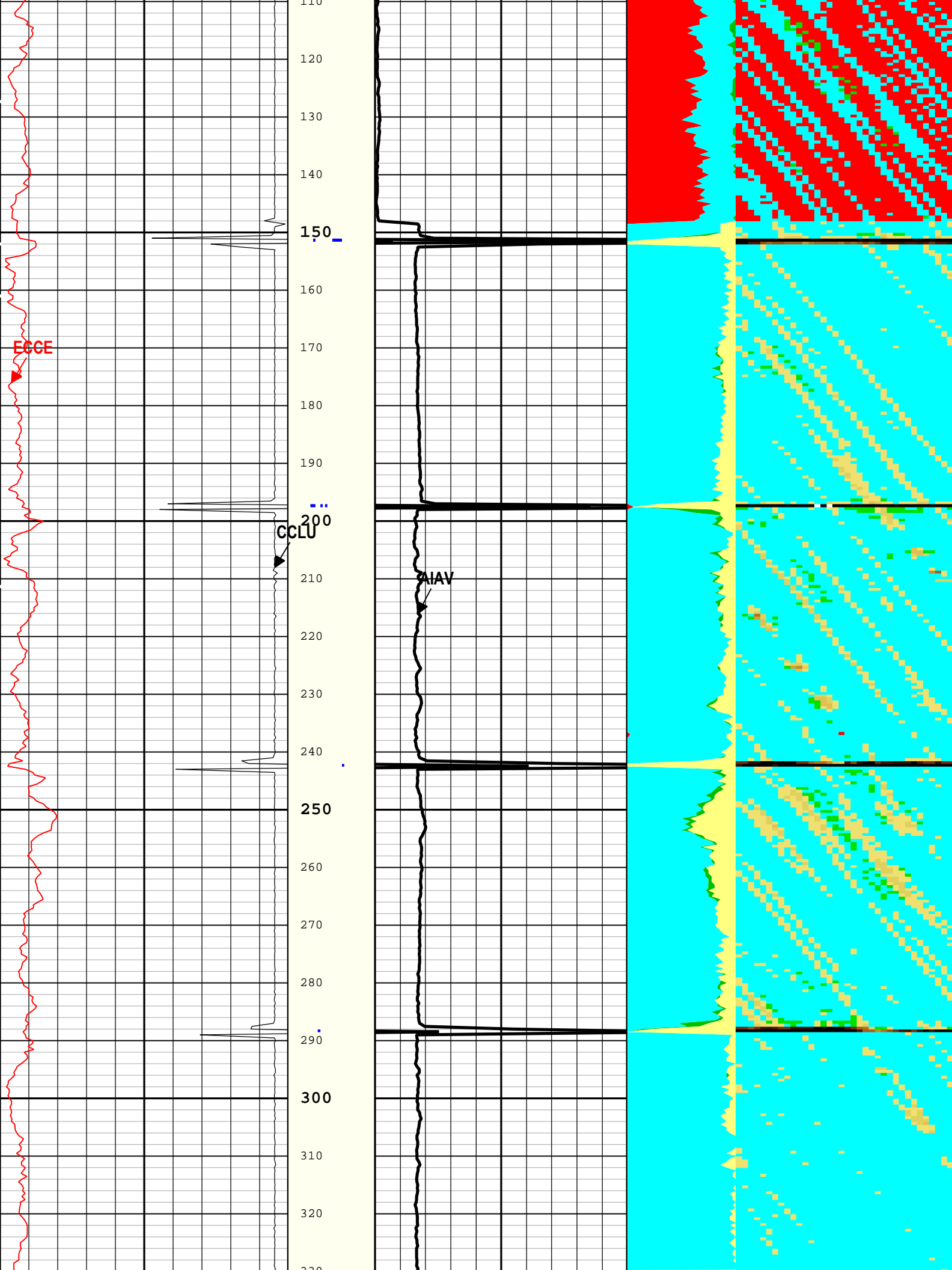
All depths are referenced to toolstring zero

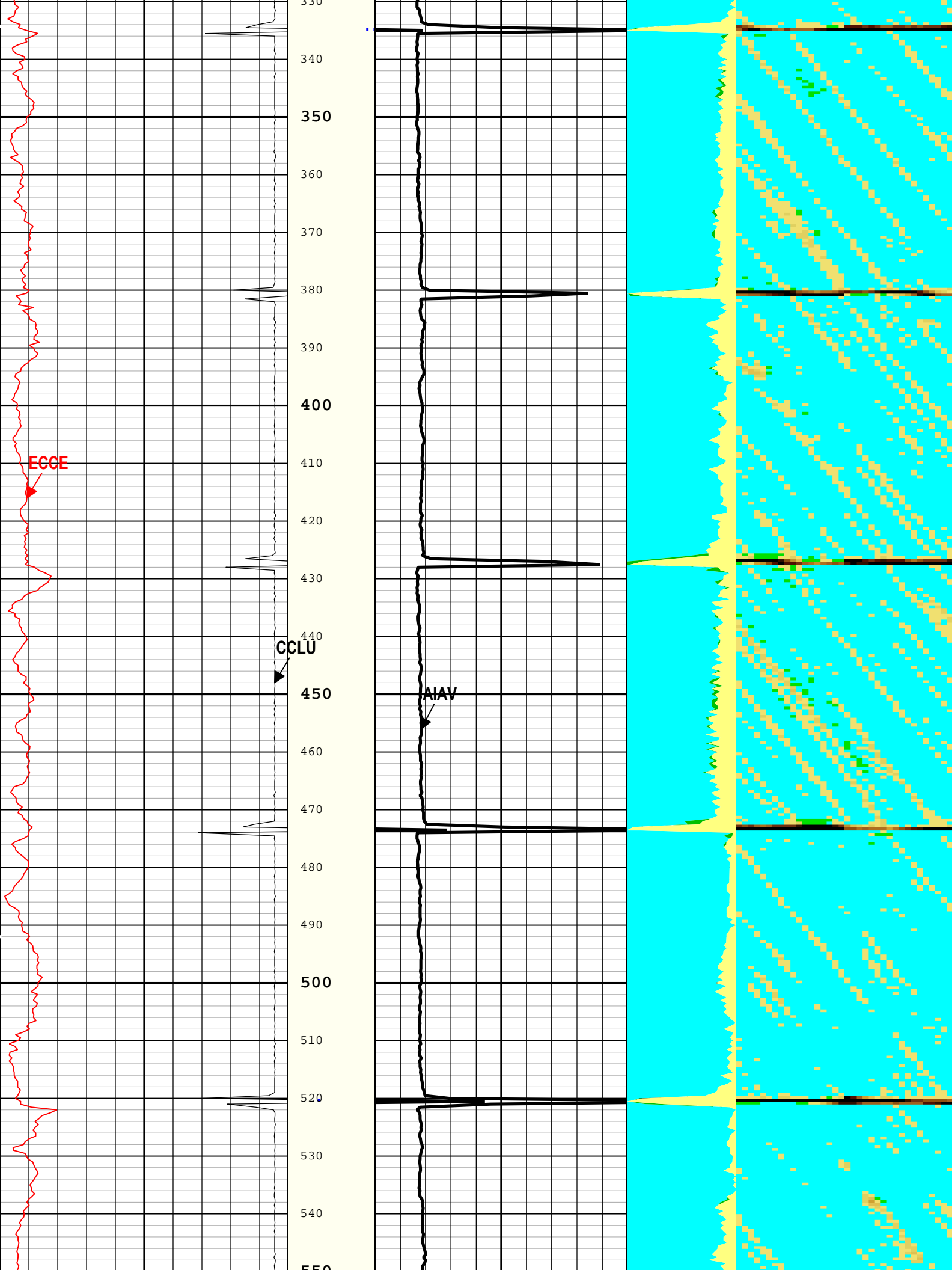
Log	Company:Noble Energy Inc	Well:Bison Ridge Y22-779
		ONE: Log[5]:Up:S003

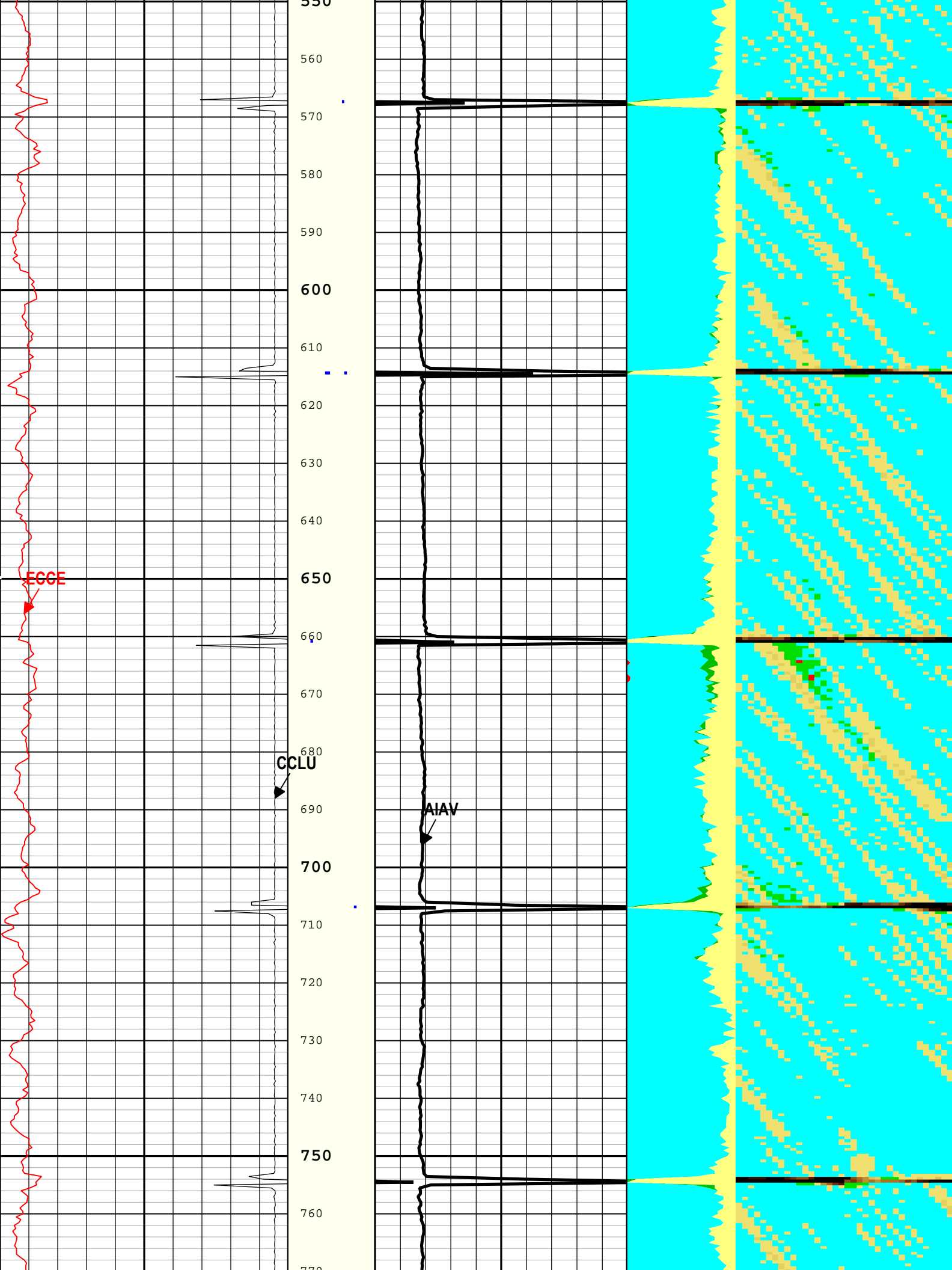
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Creation Date: 03-Feb-2018 13:54:54

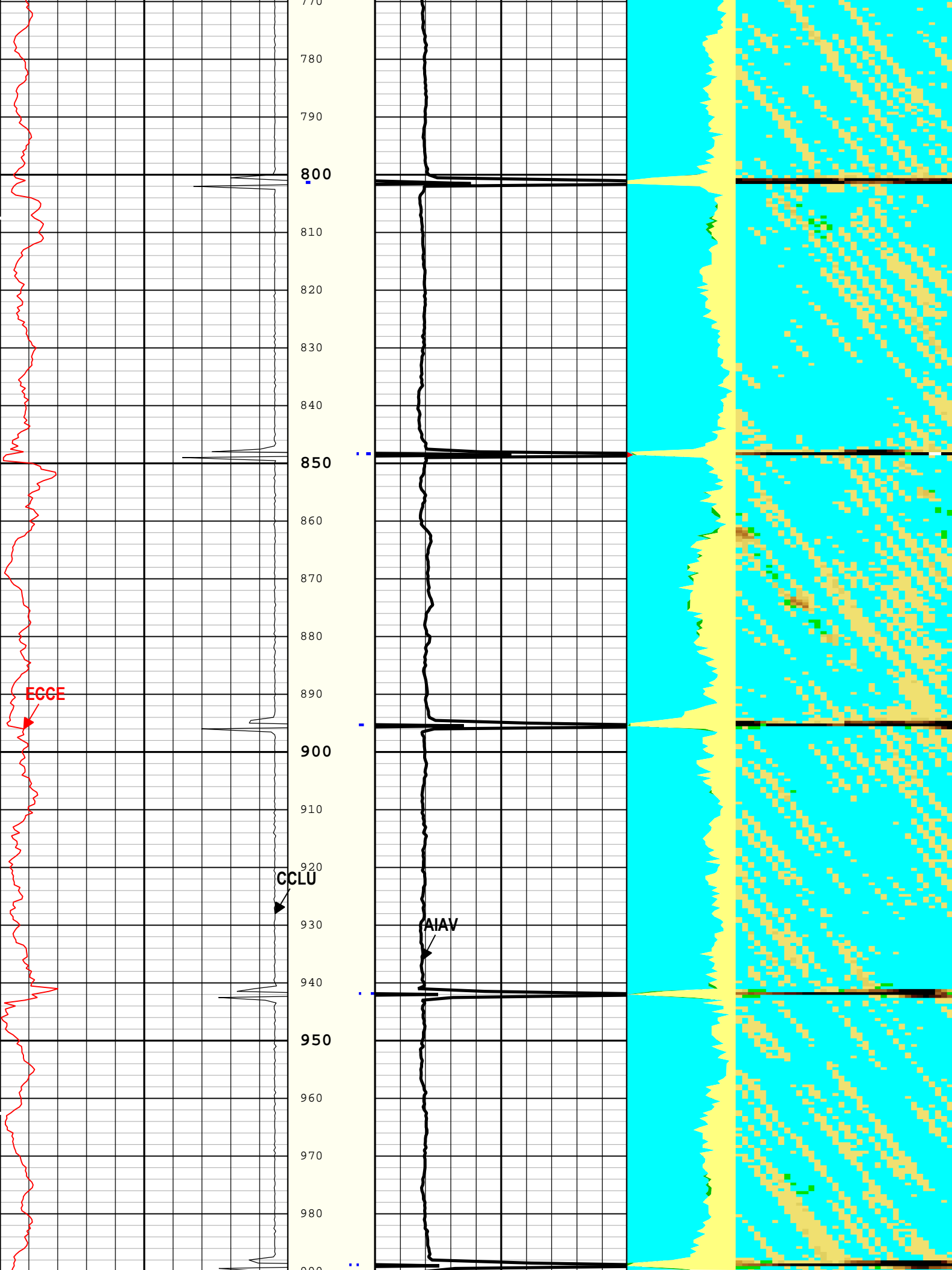
TIME_1900 - Time Marked every 60.00 (s)

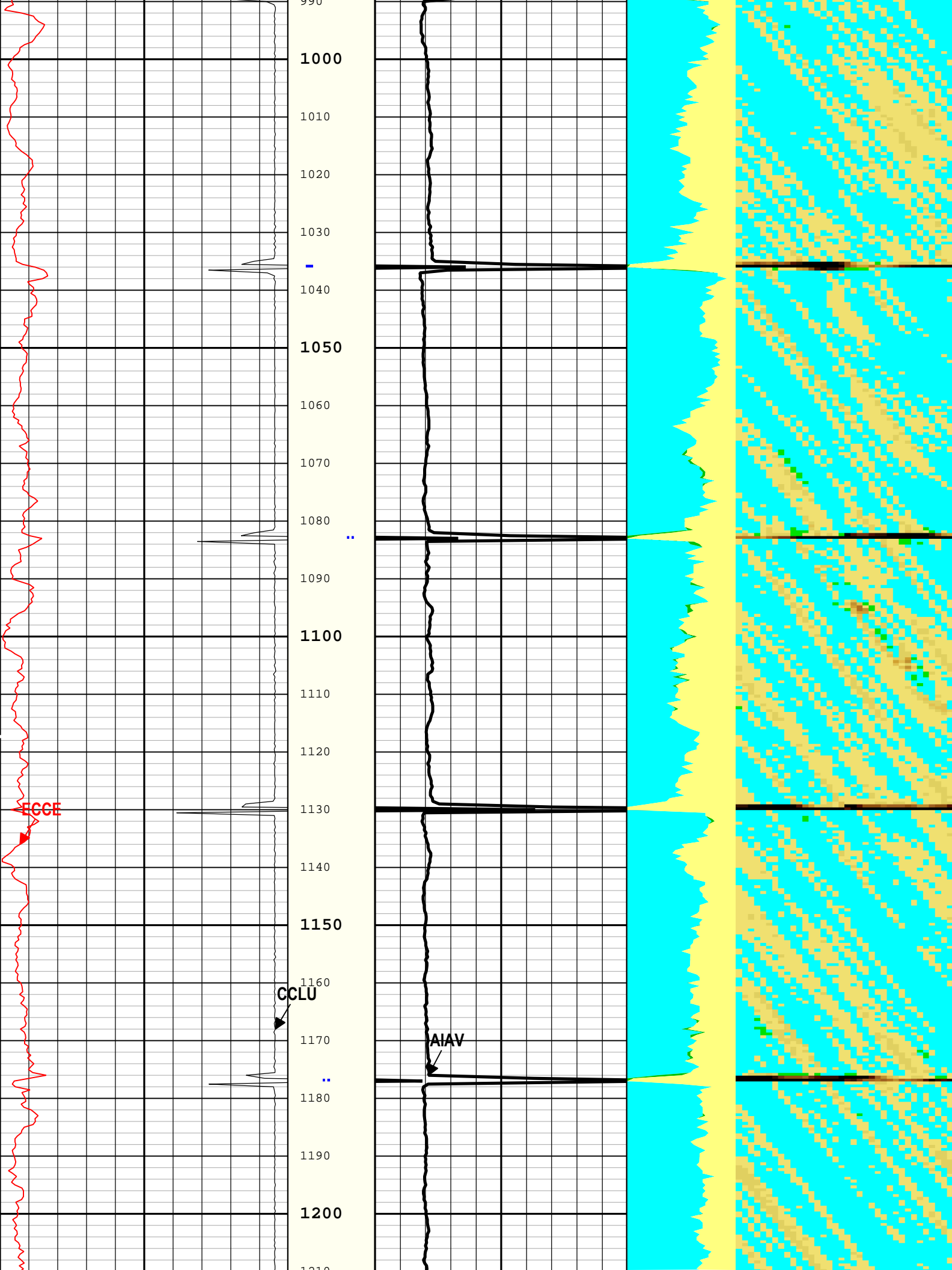


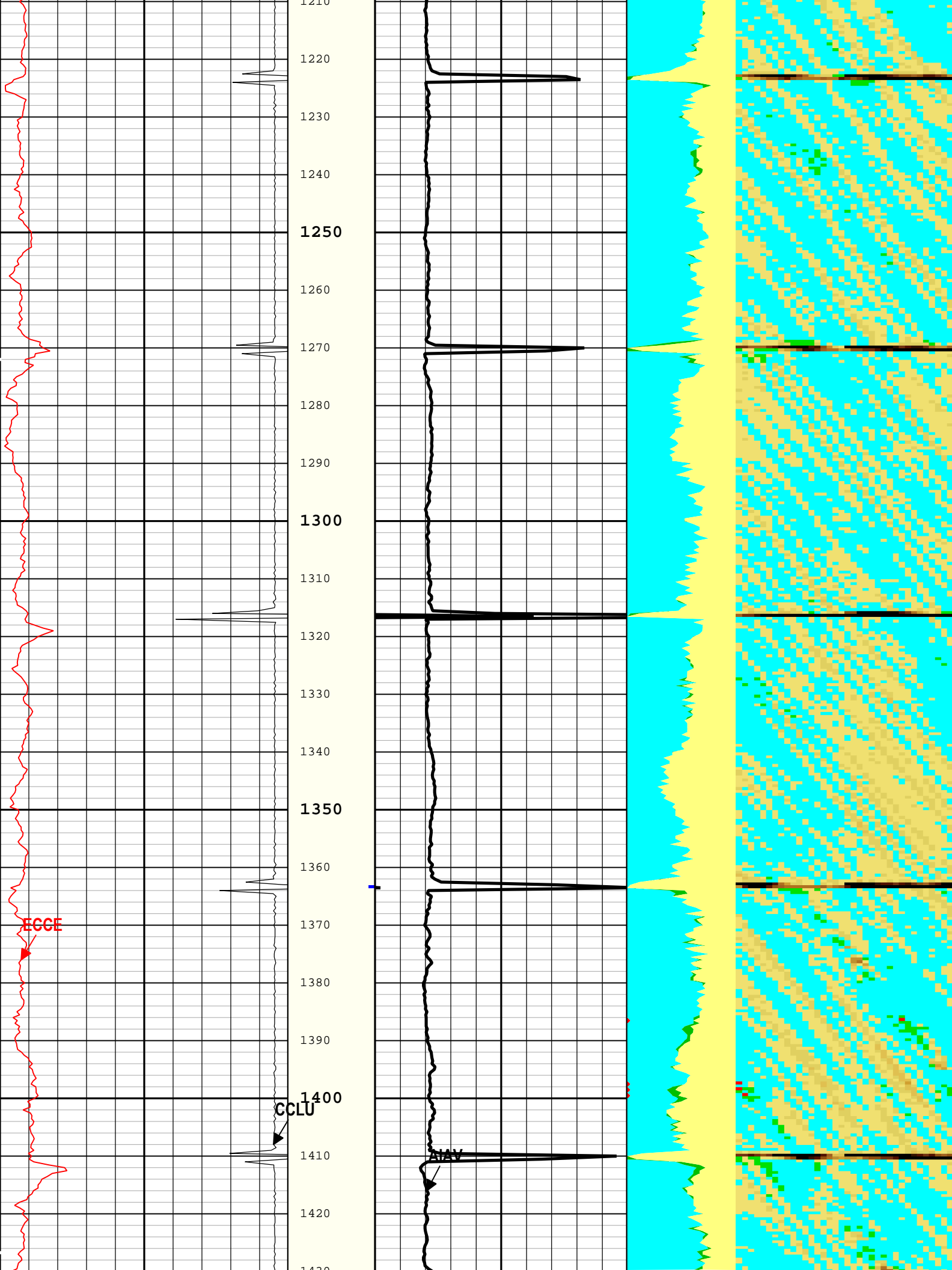


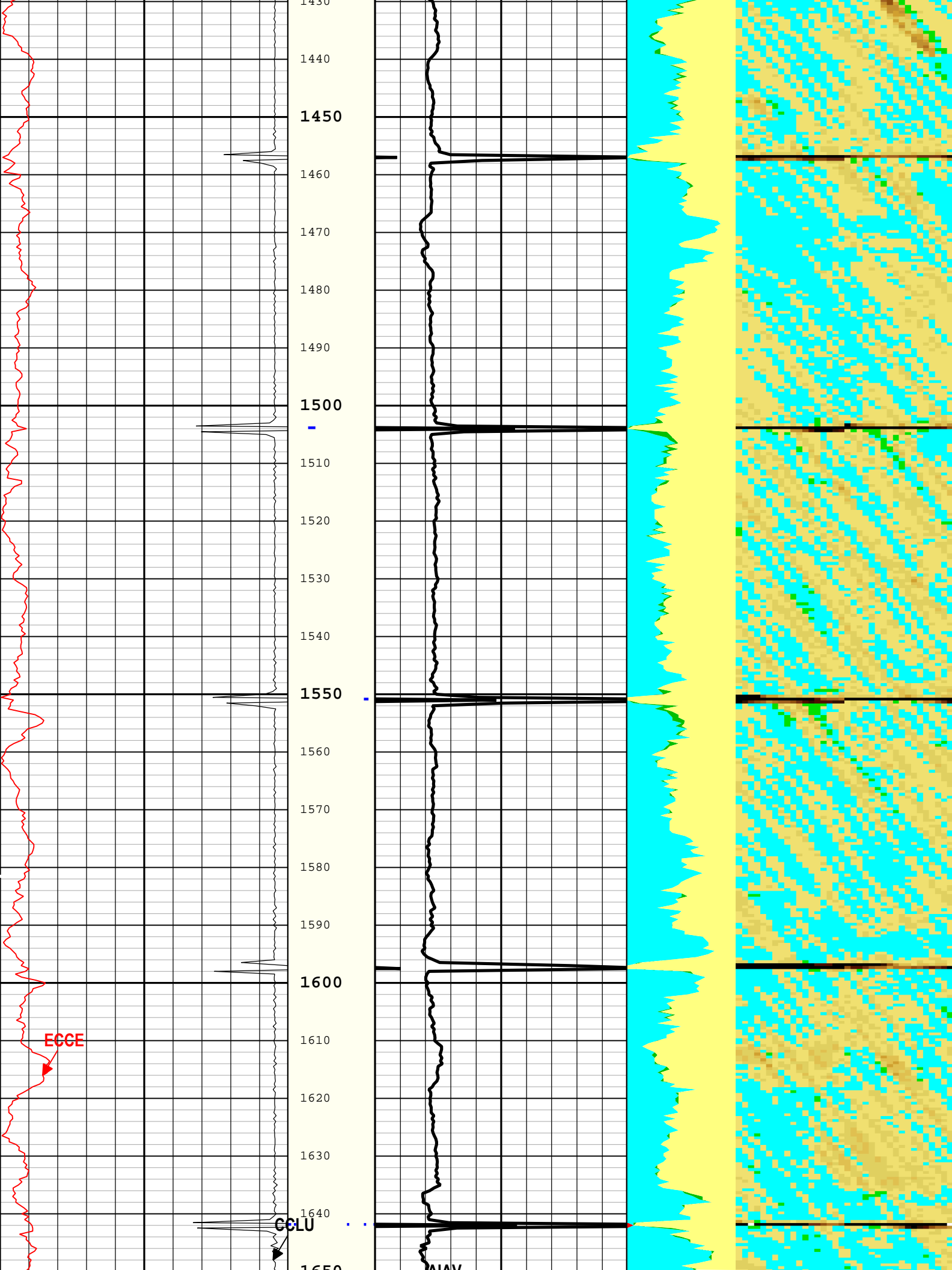


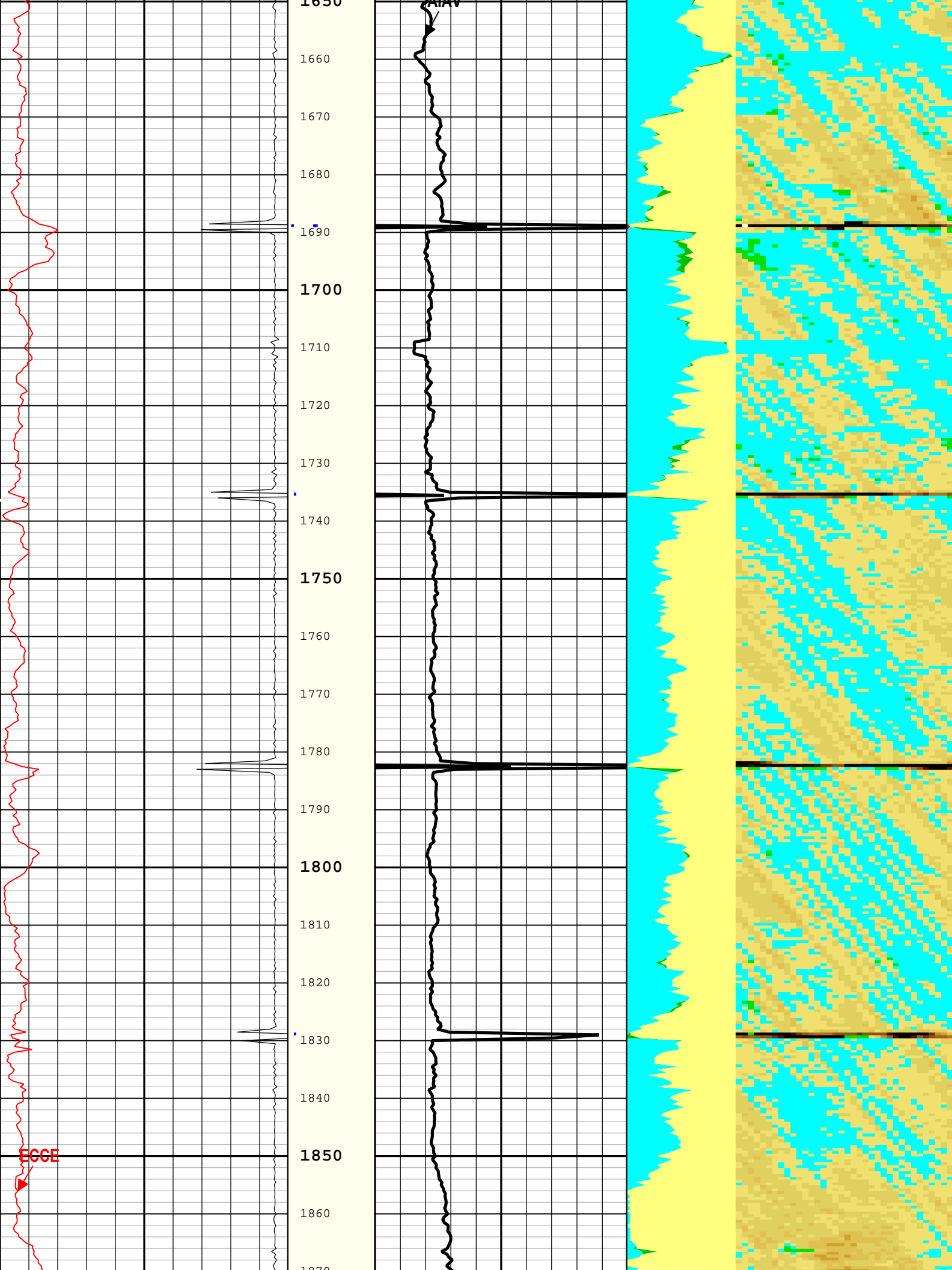


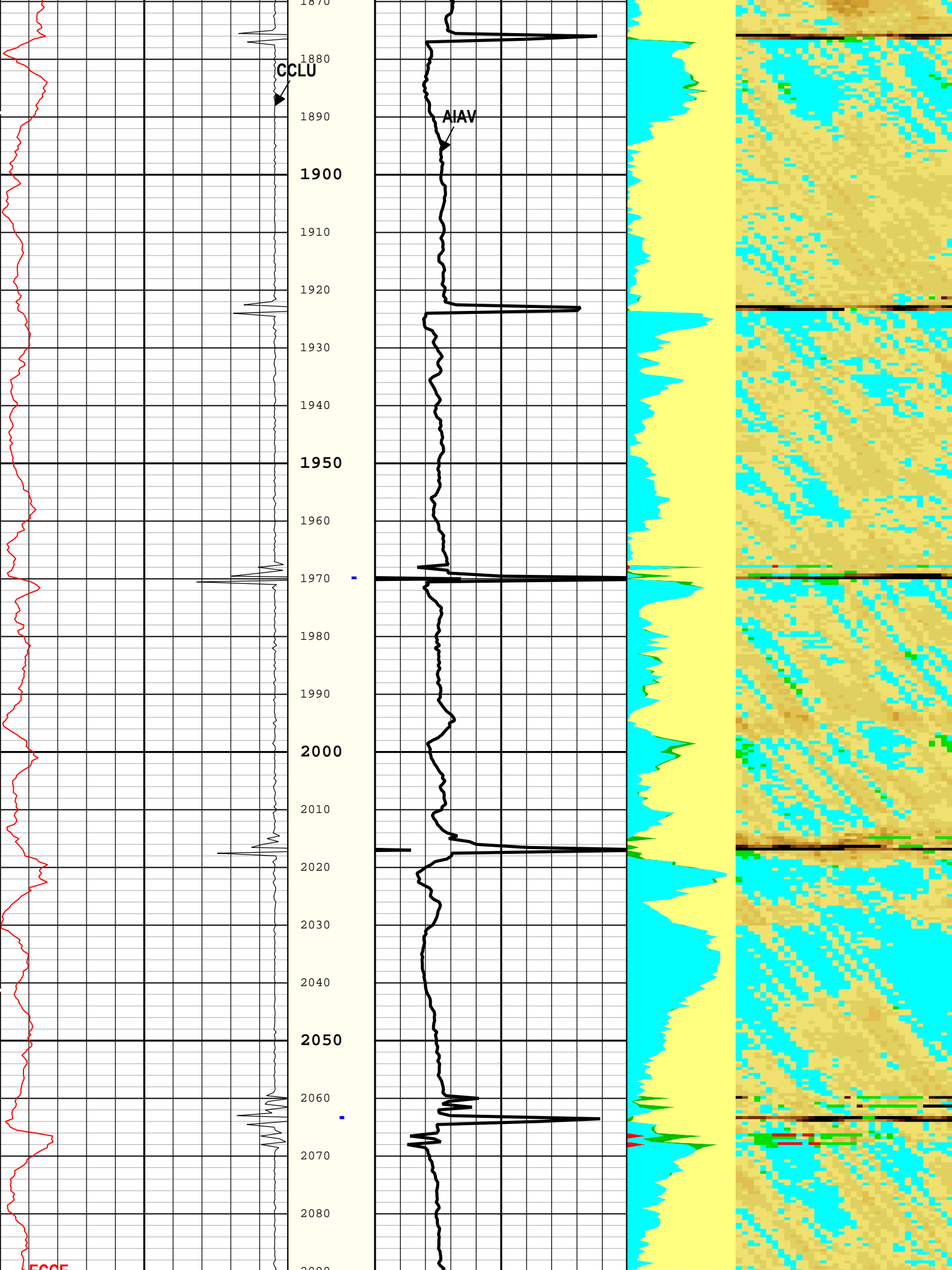


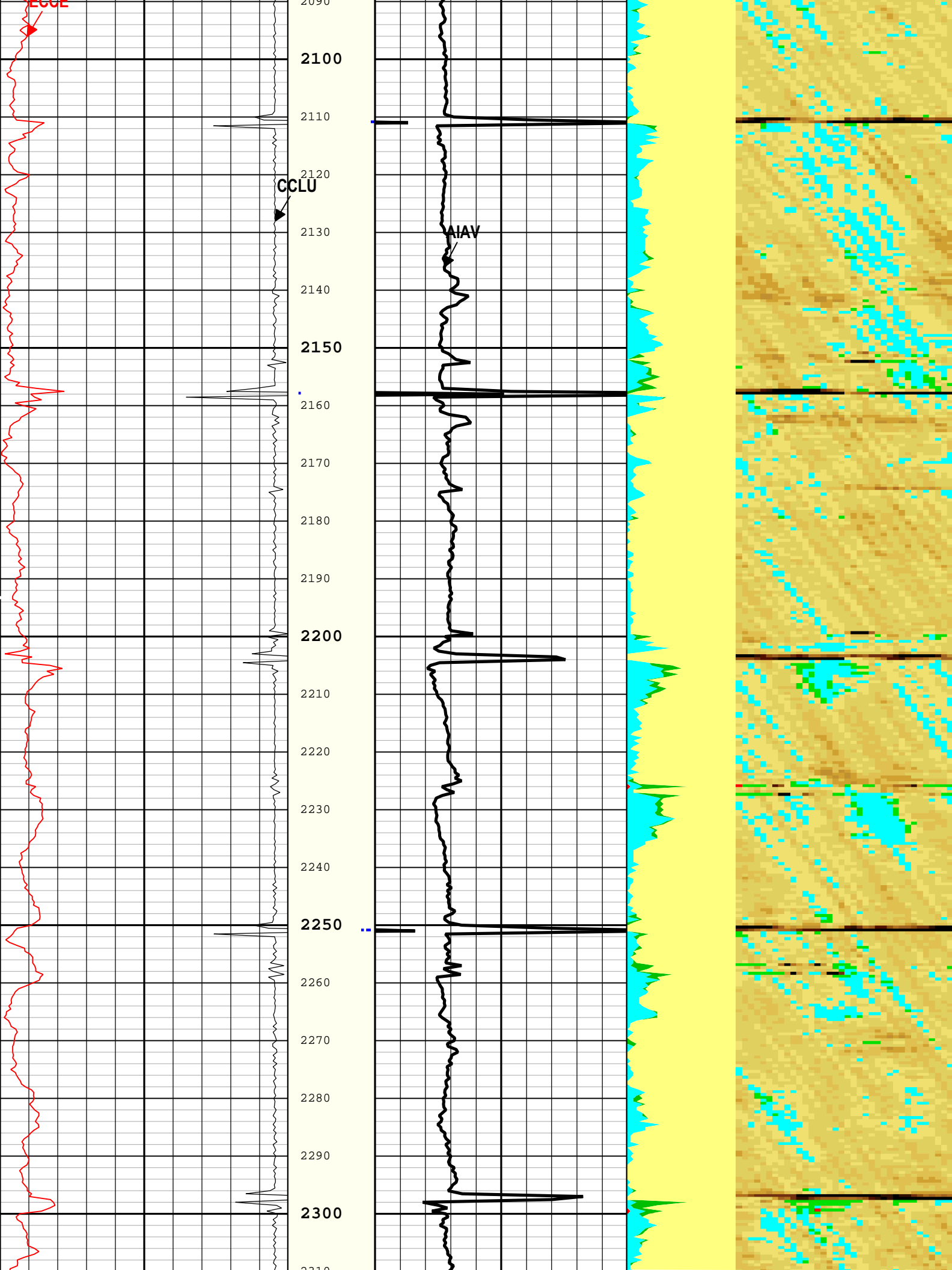


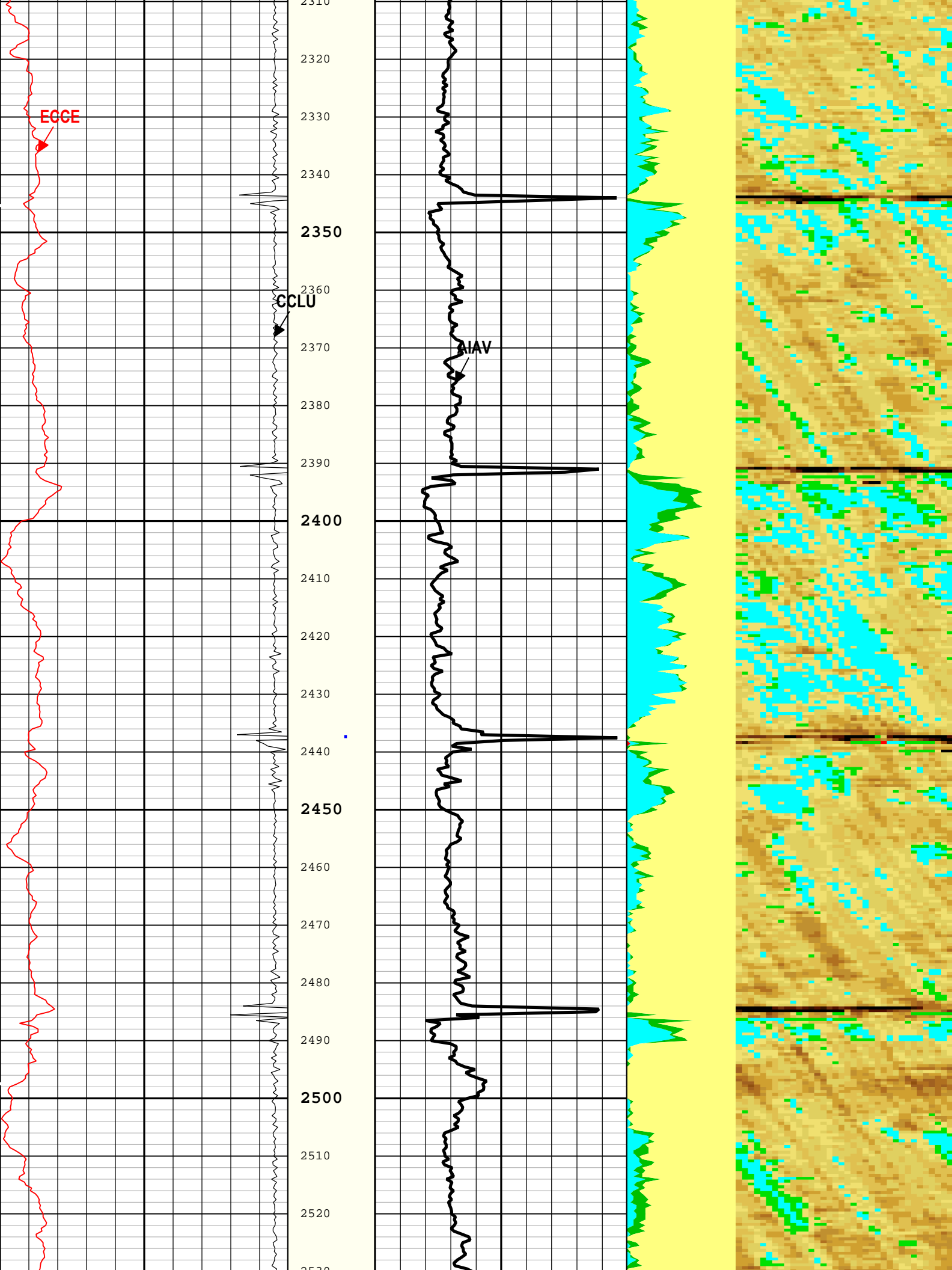


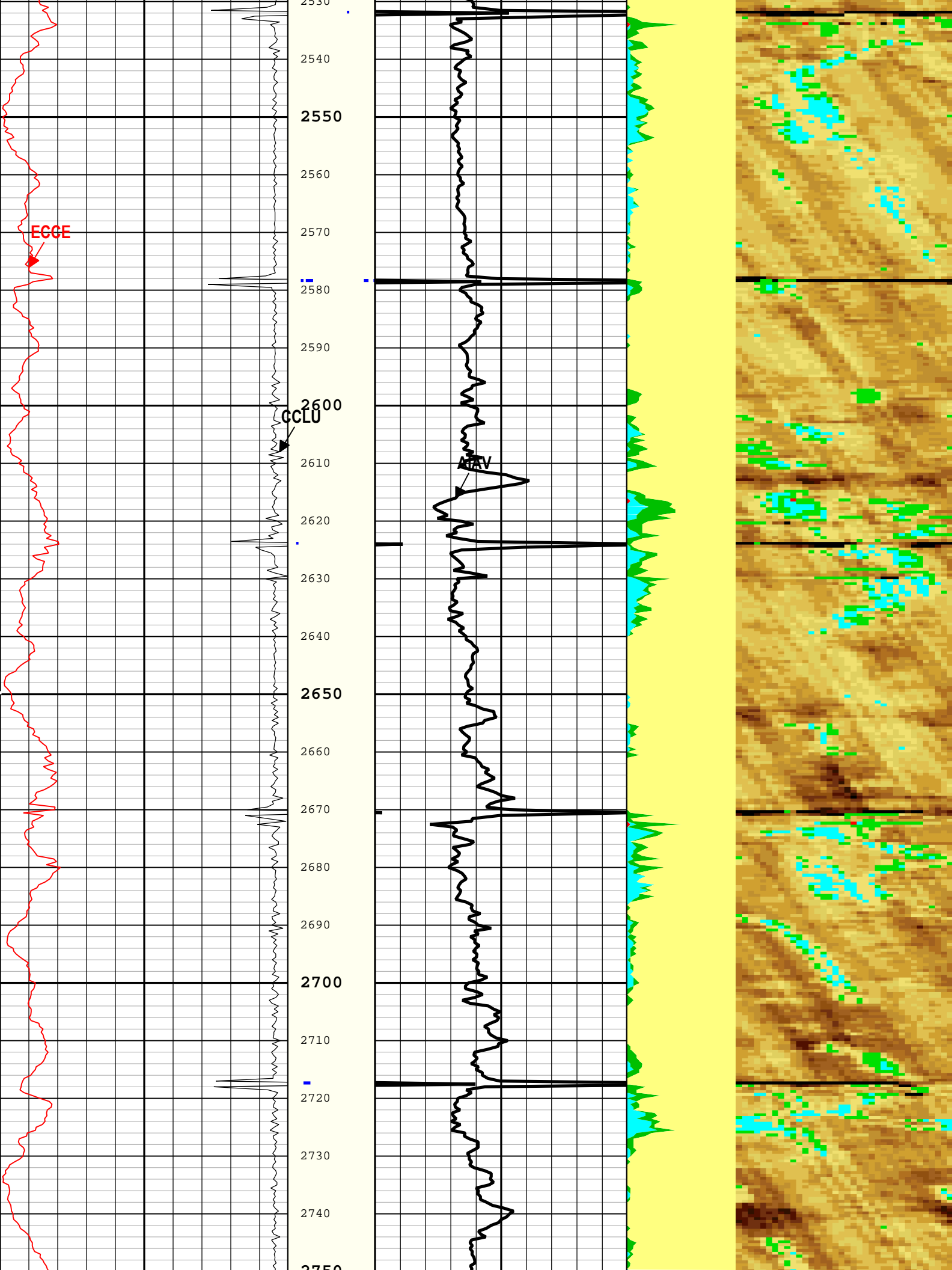


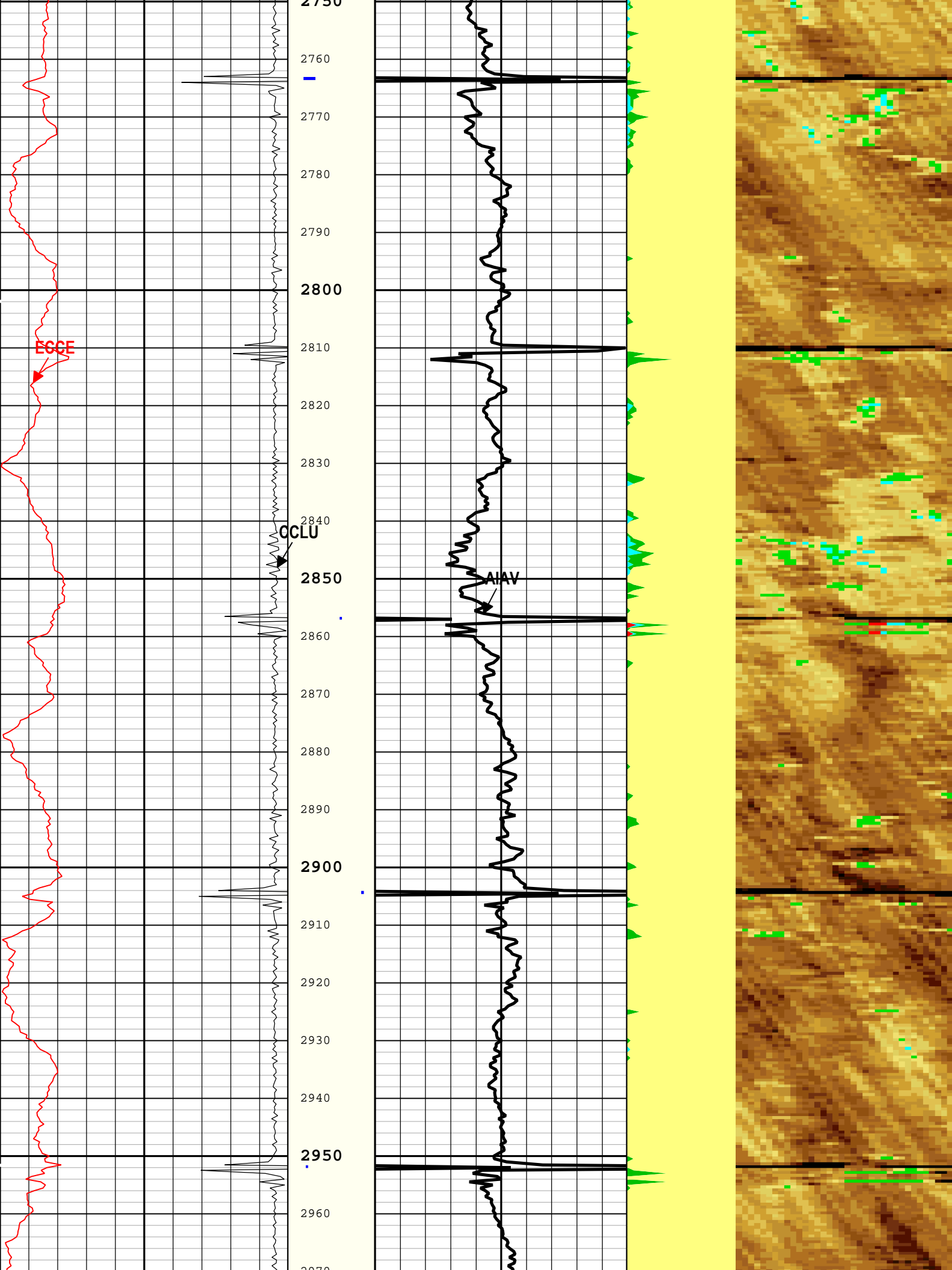


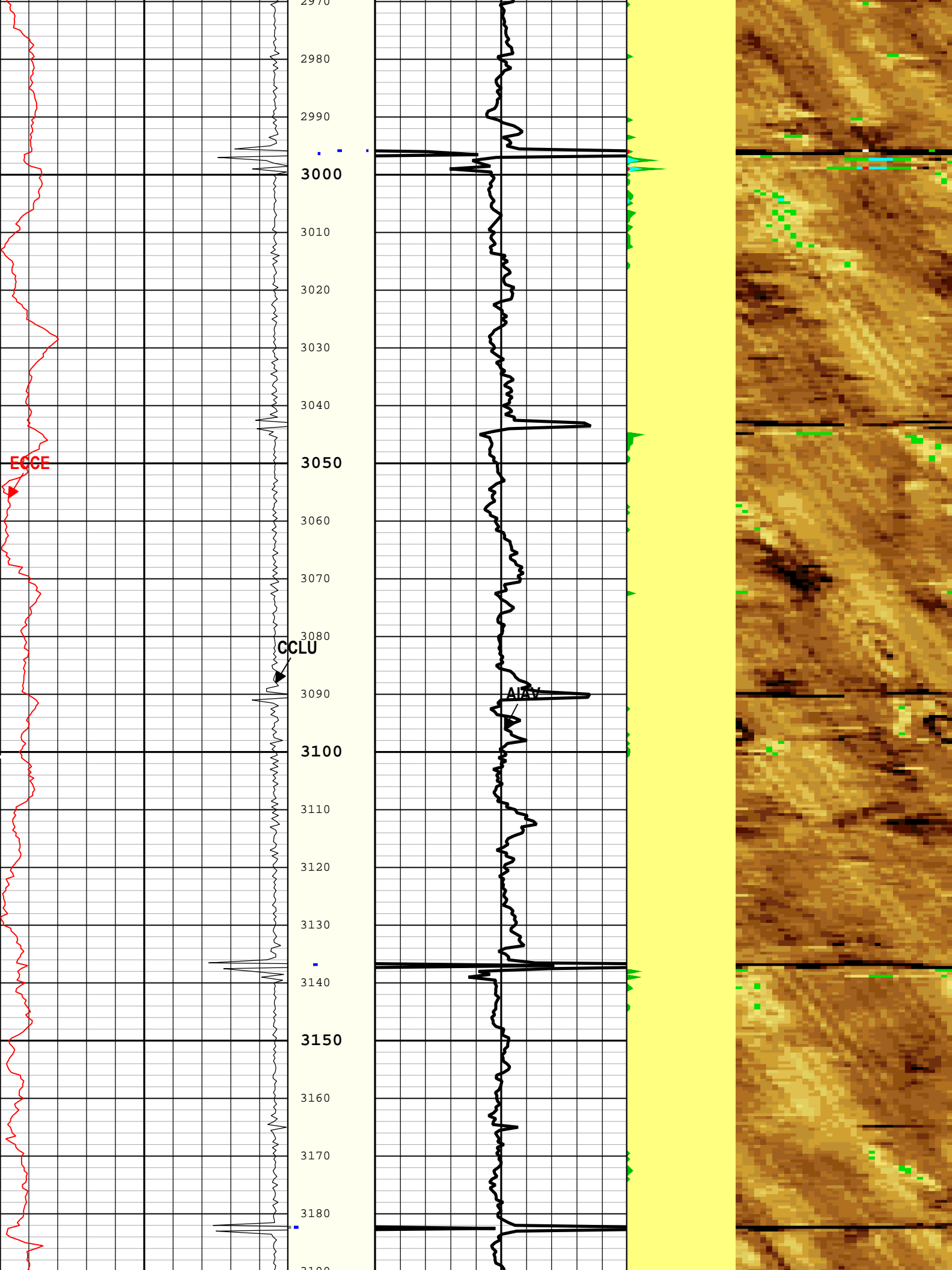


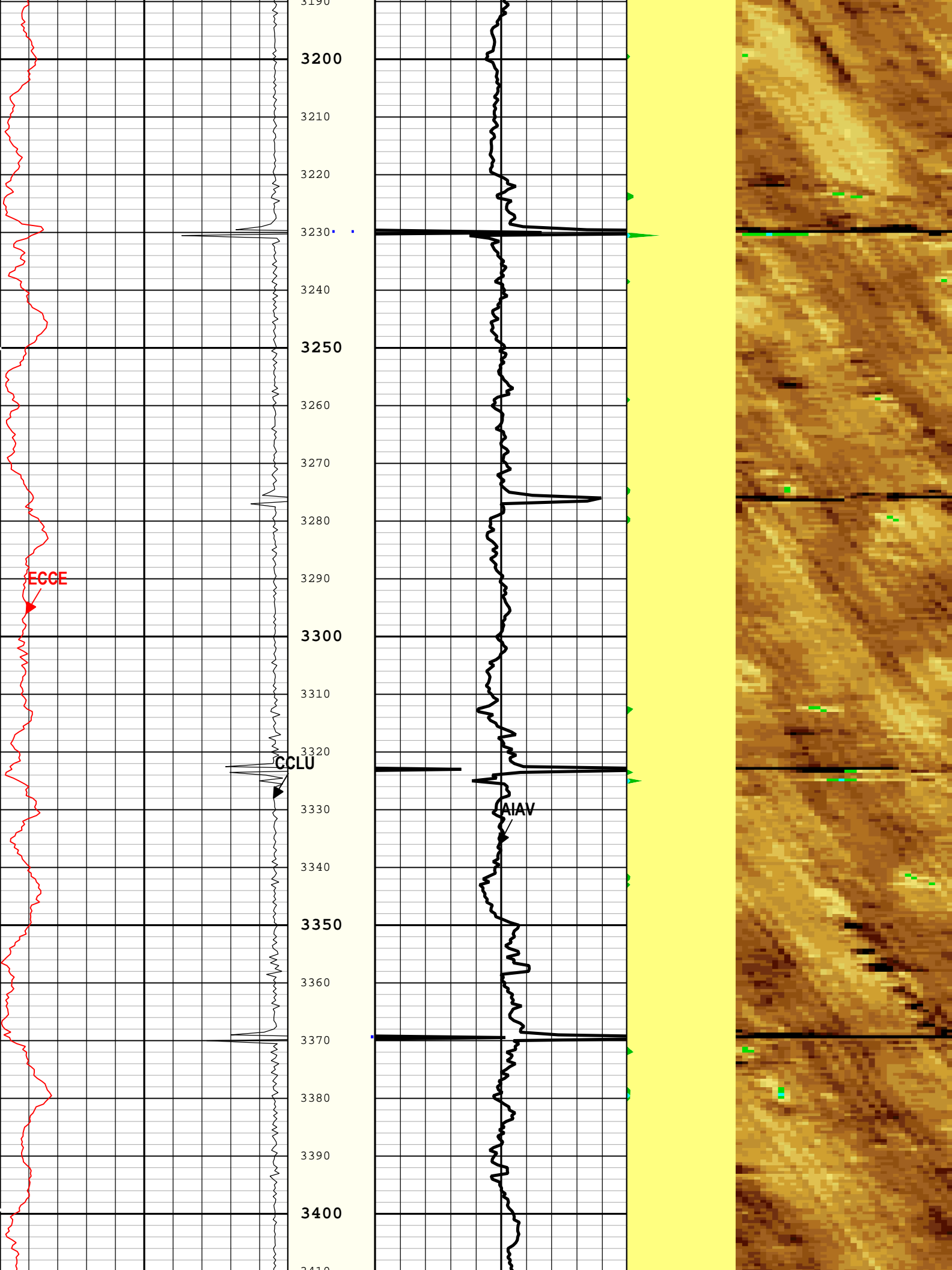


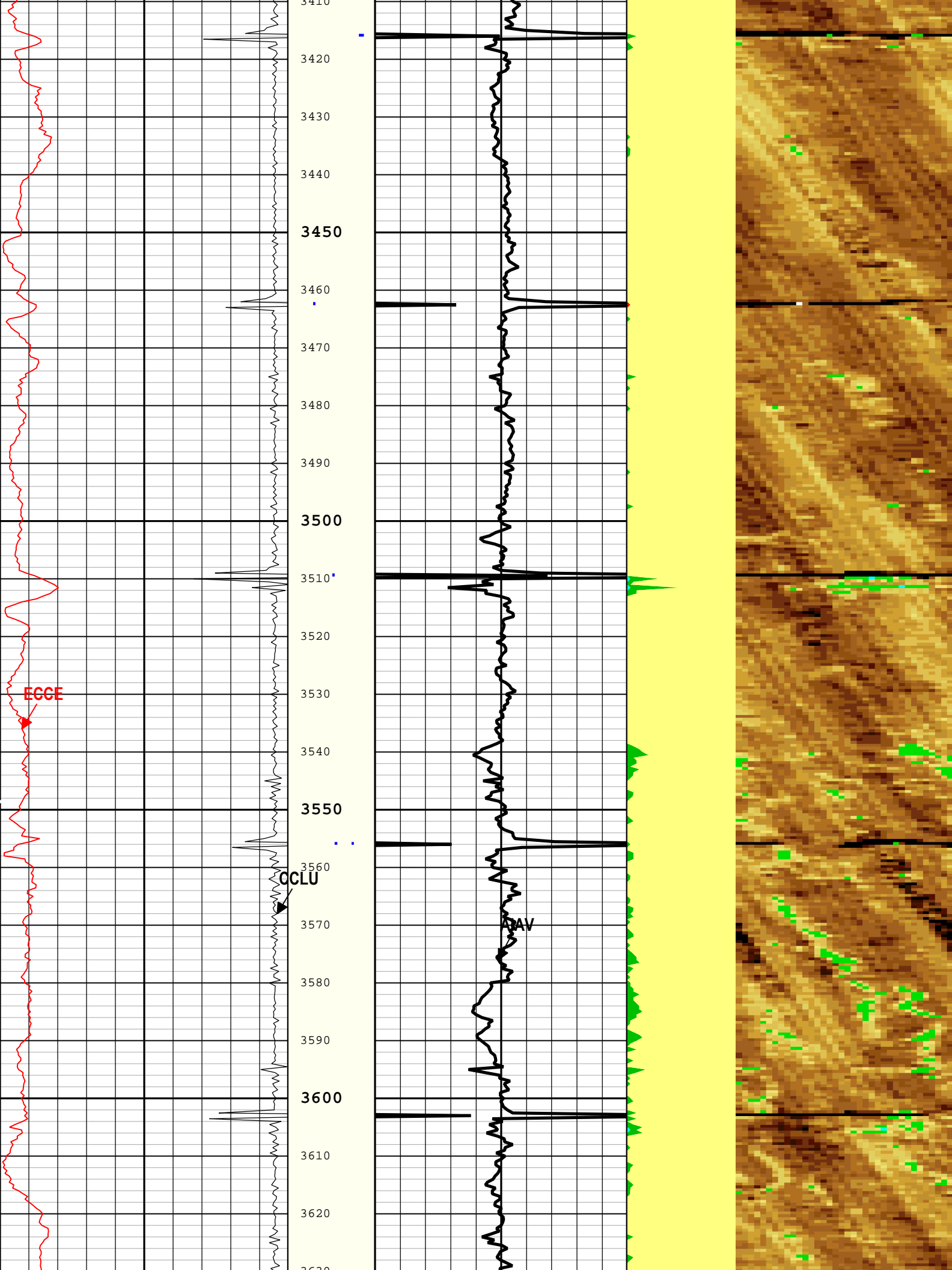


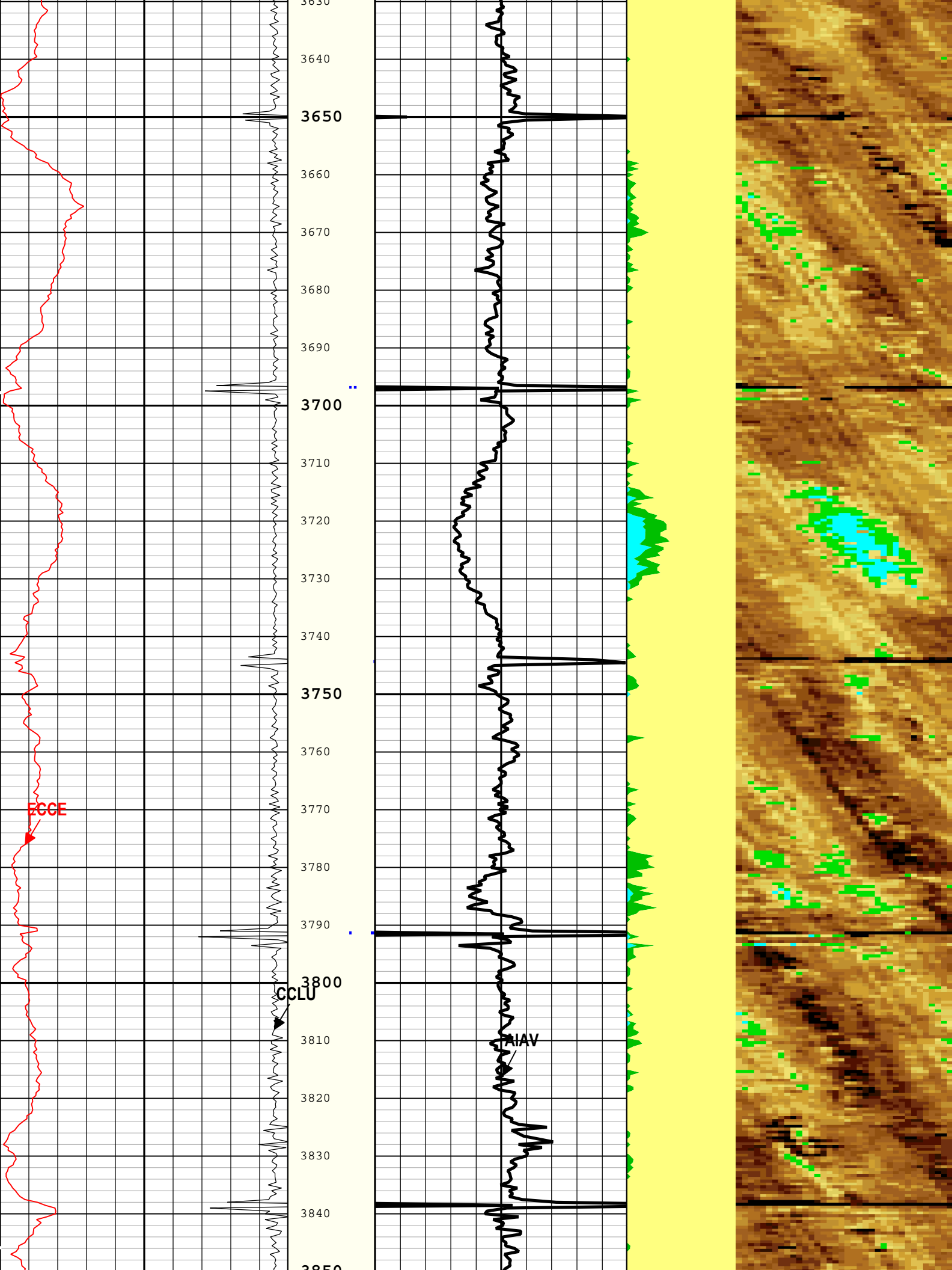


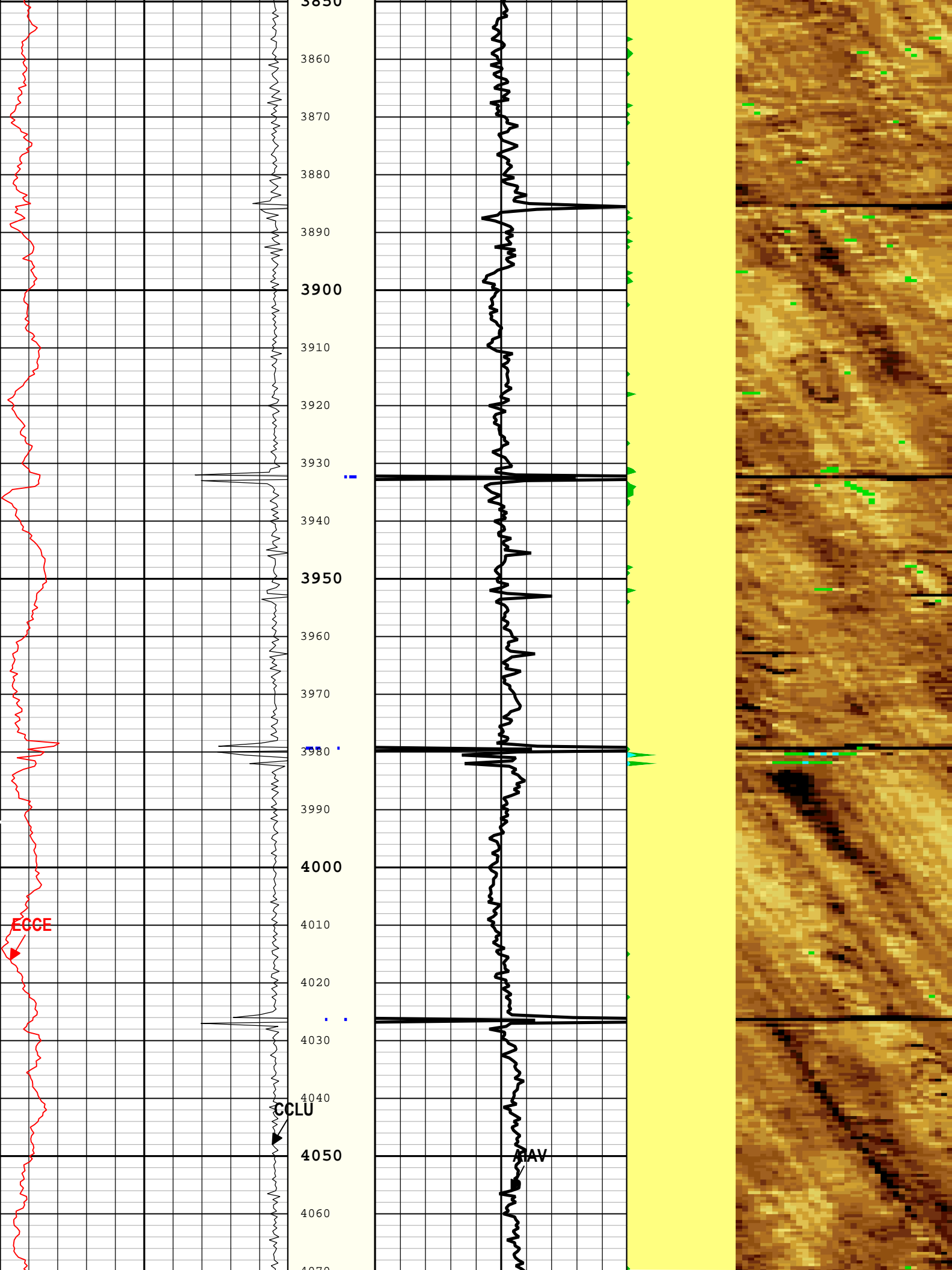


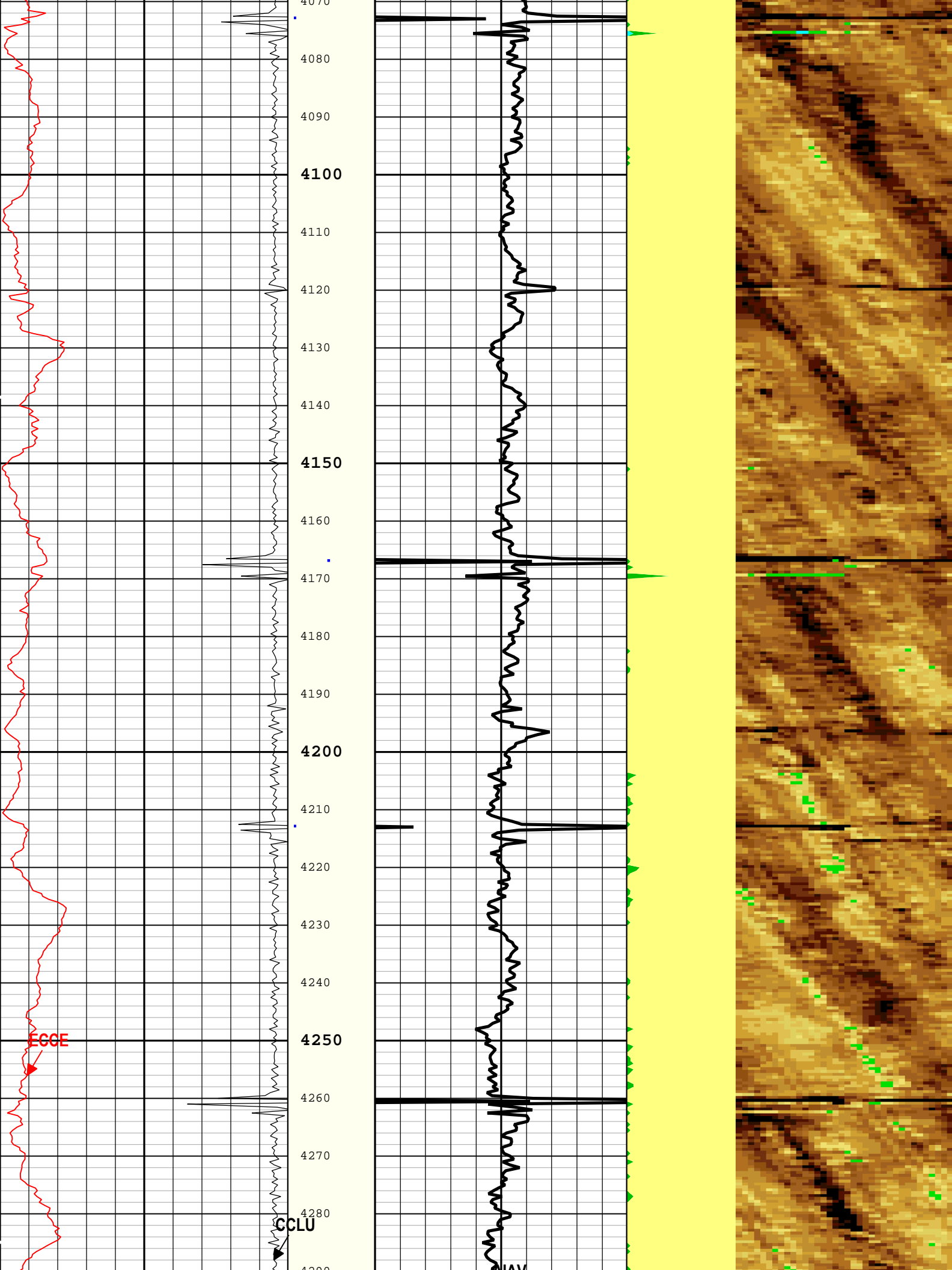


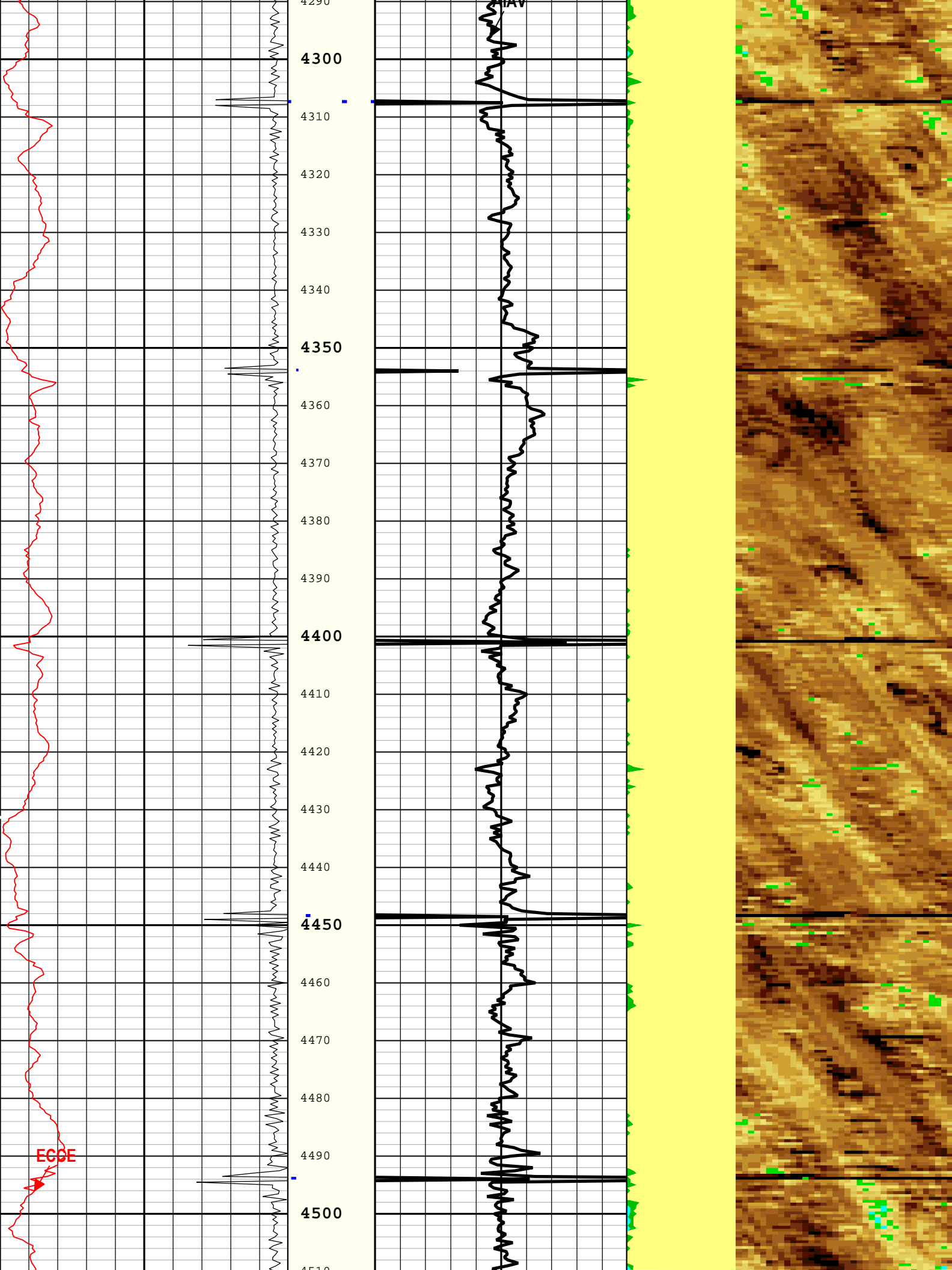


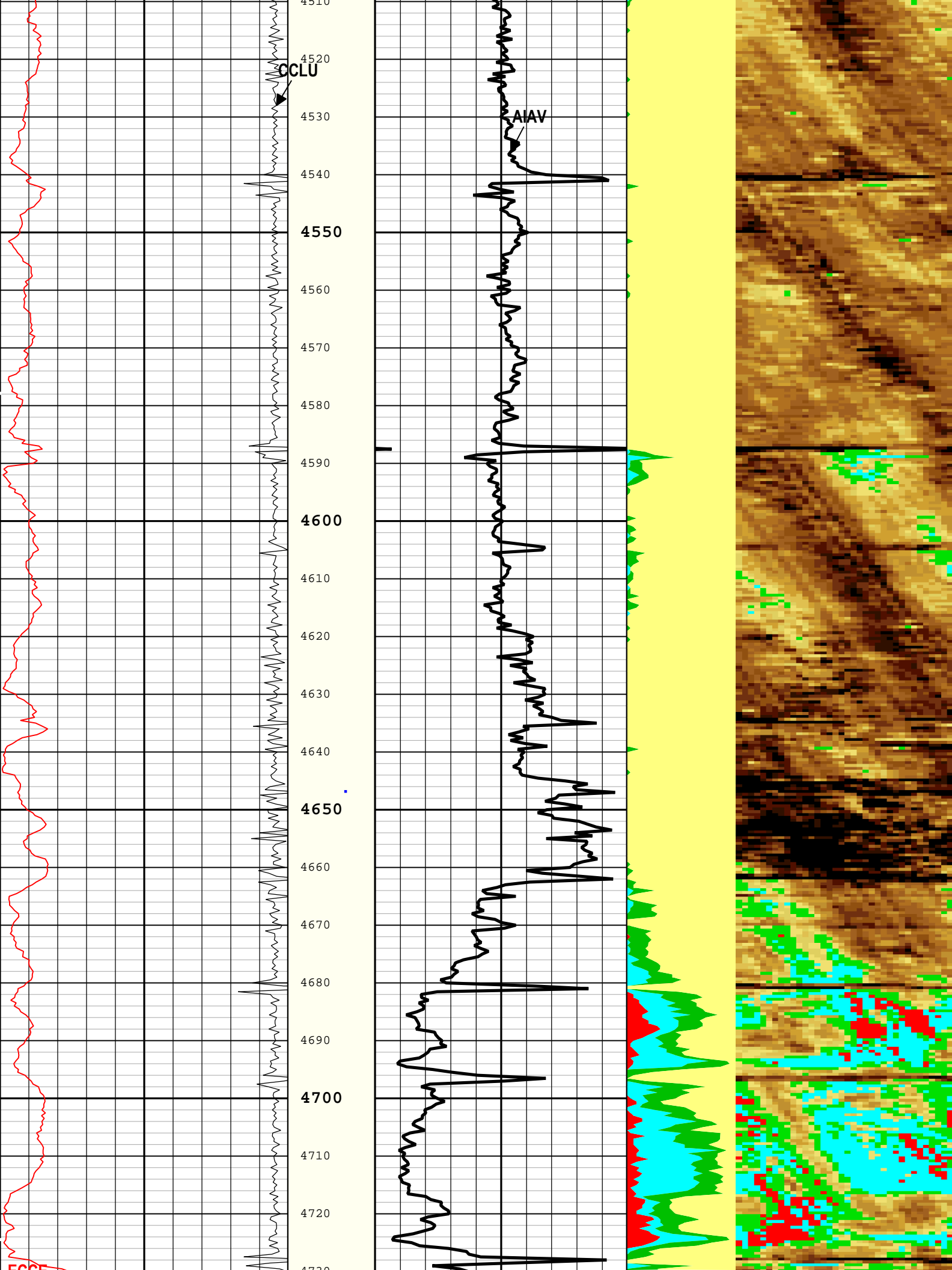


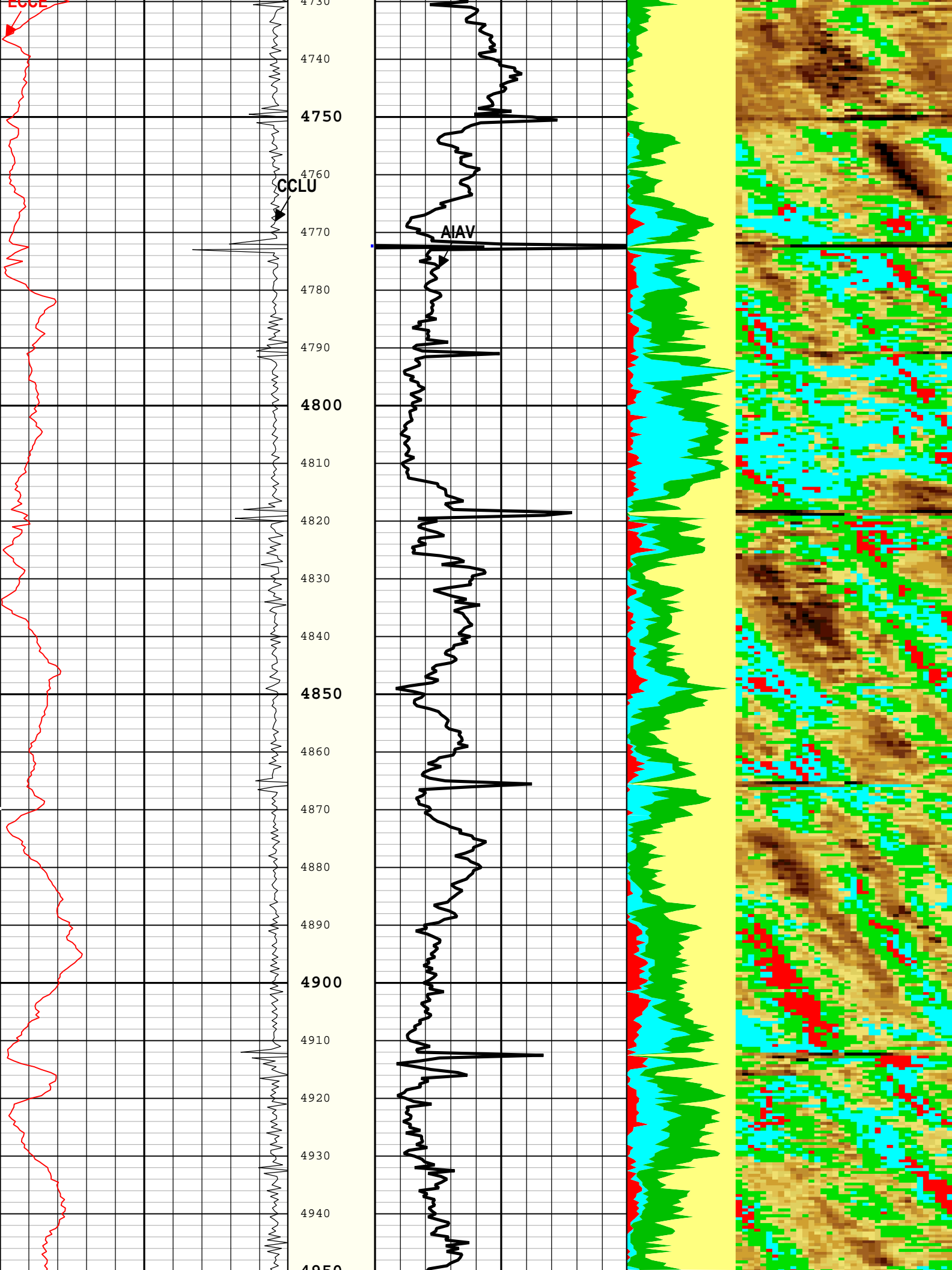


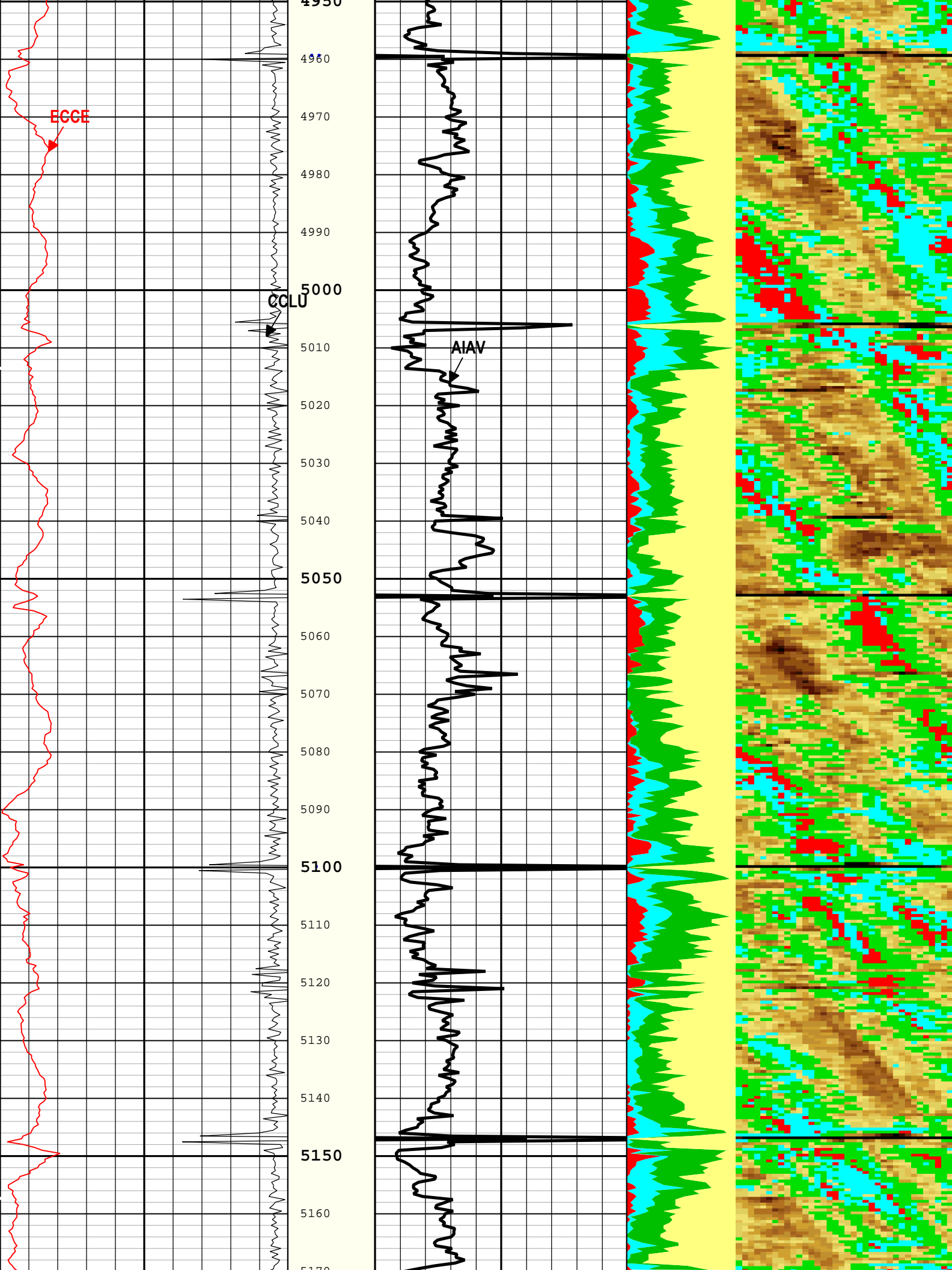


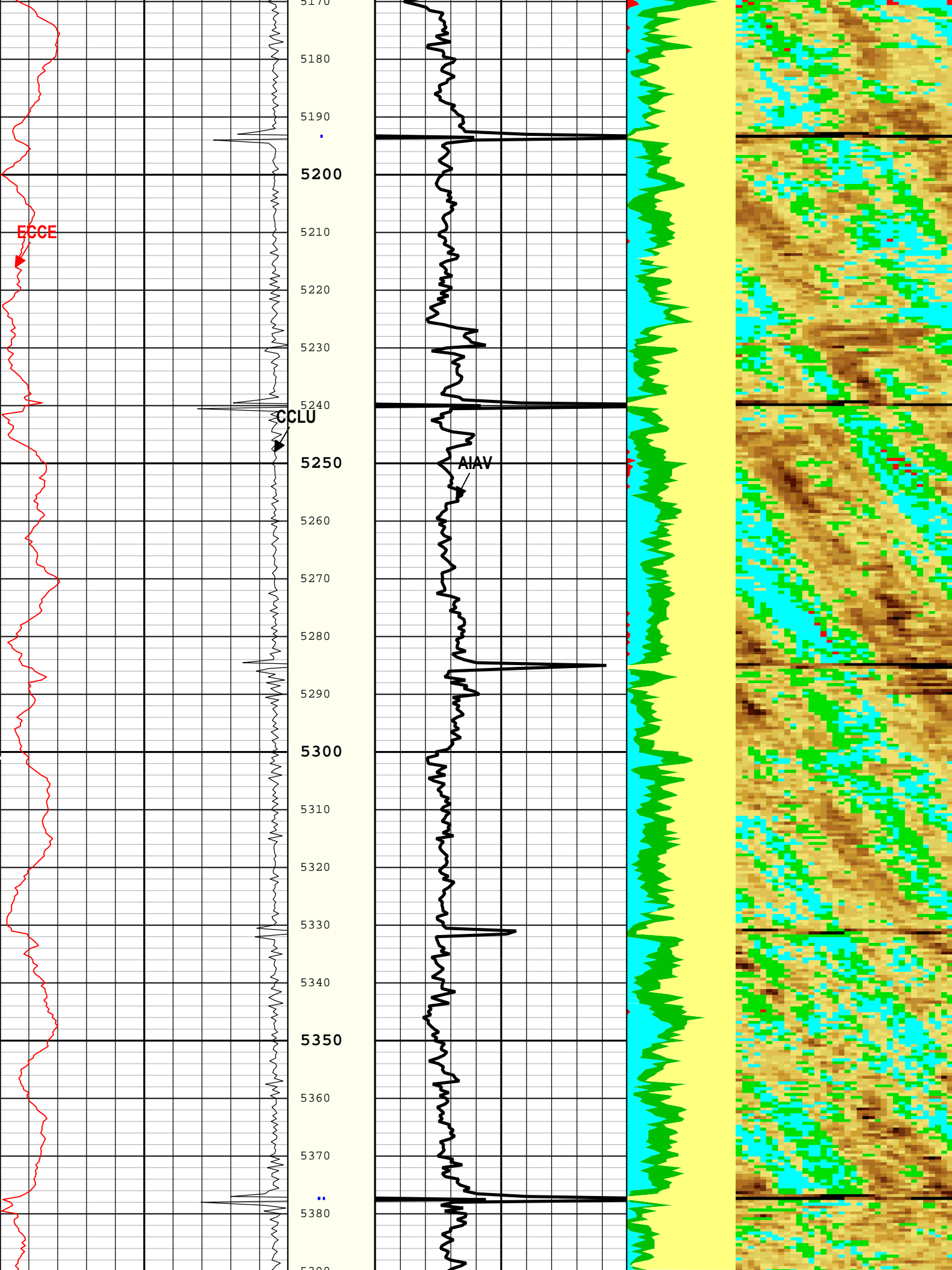


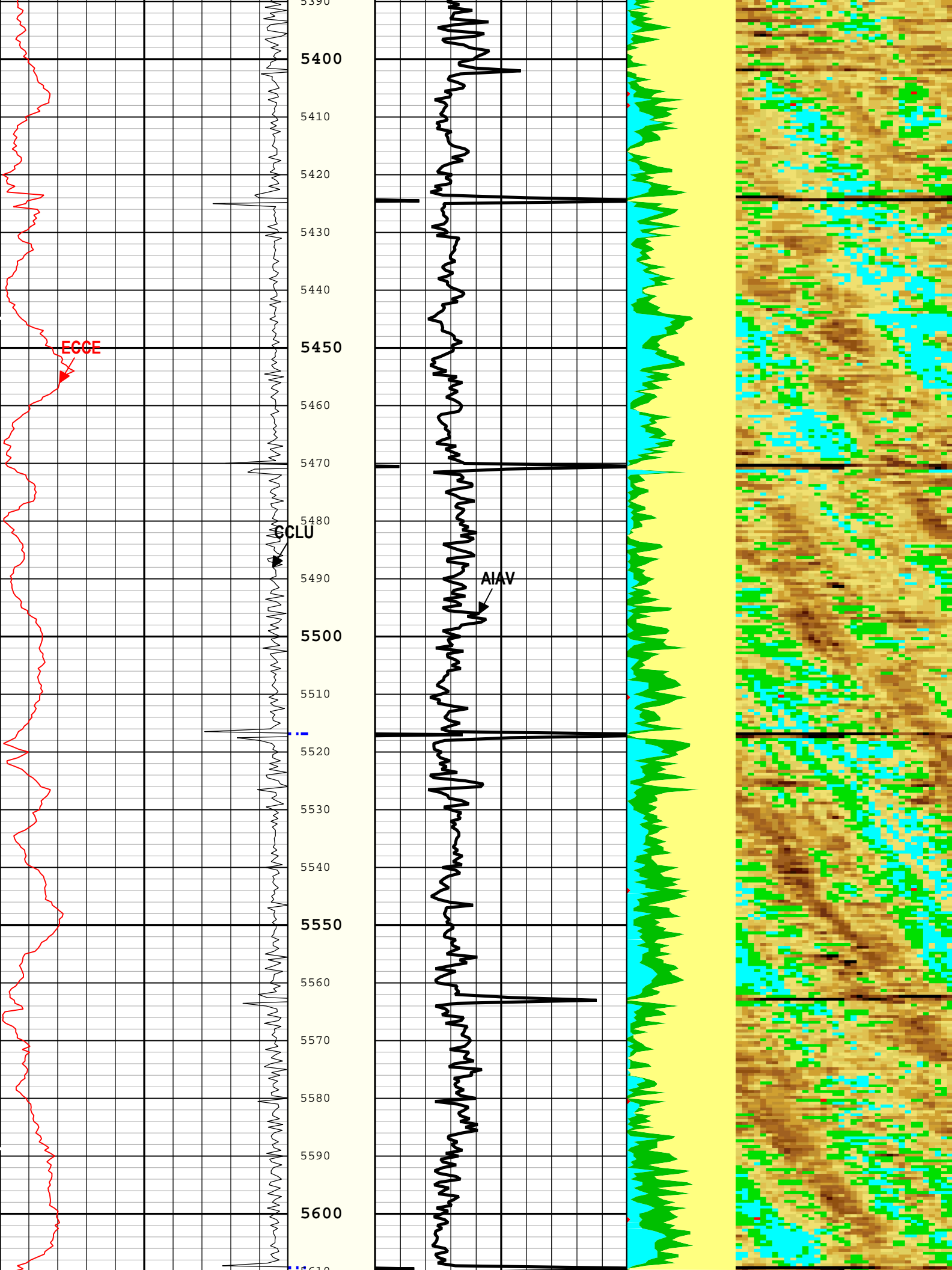


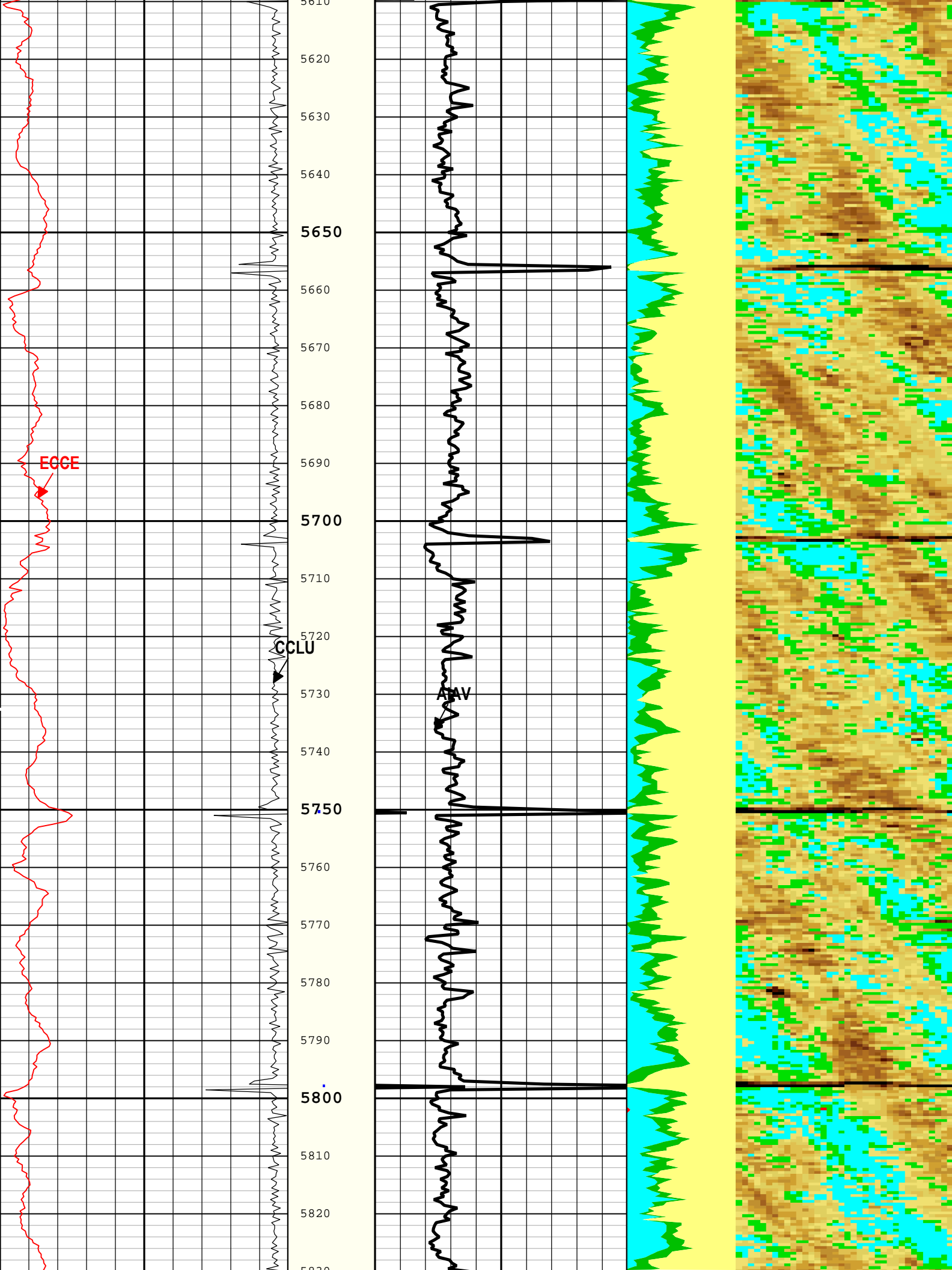


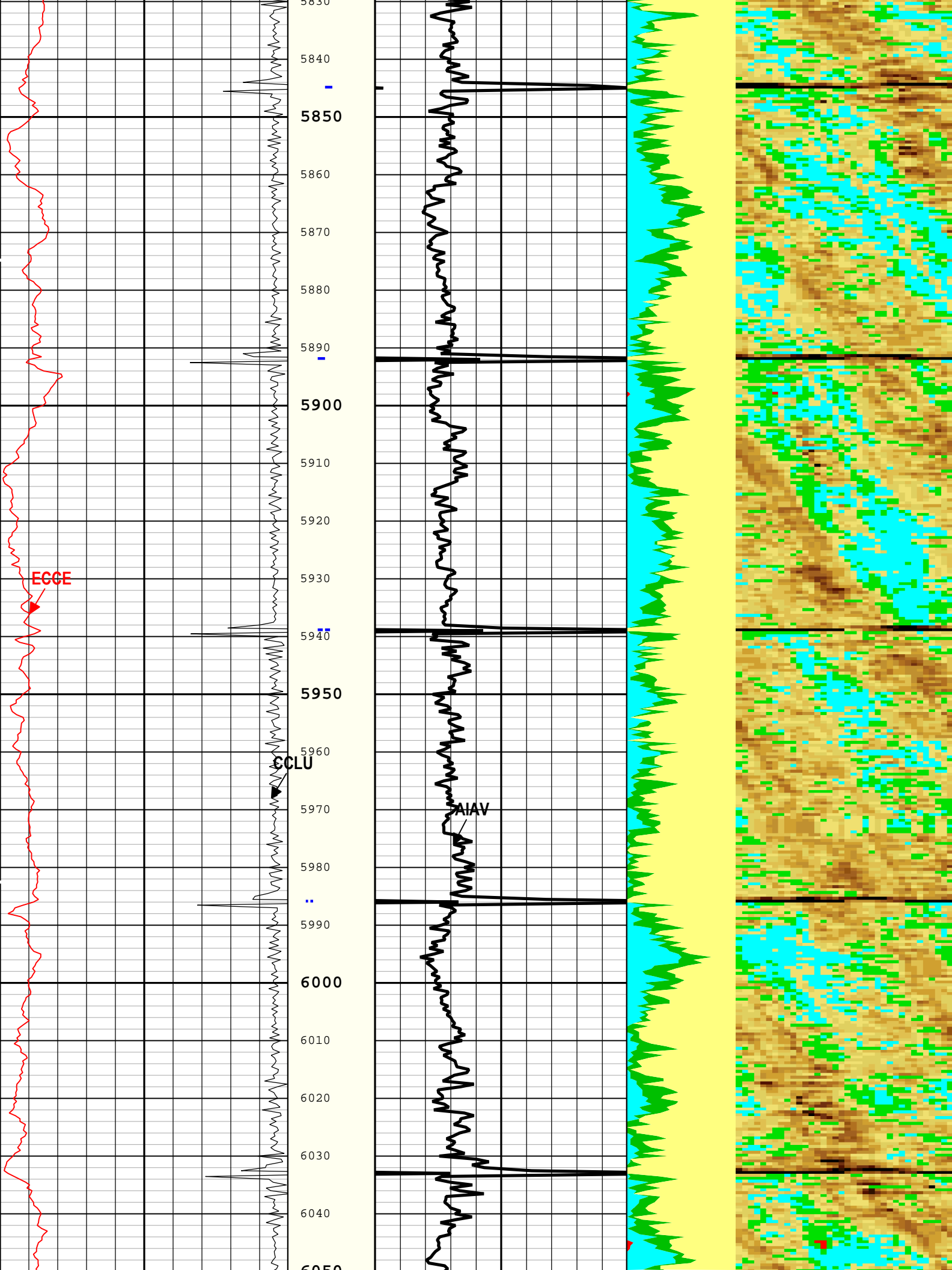


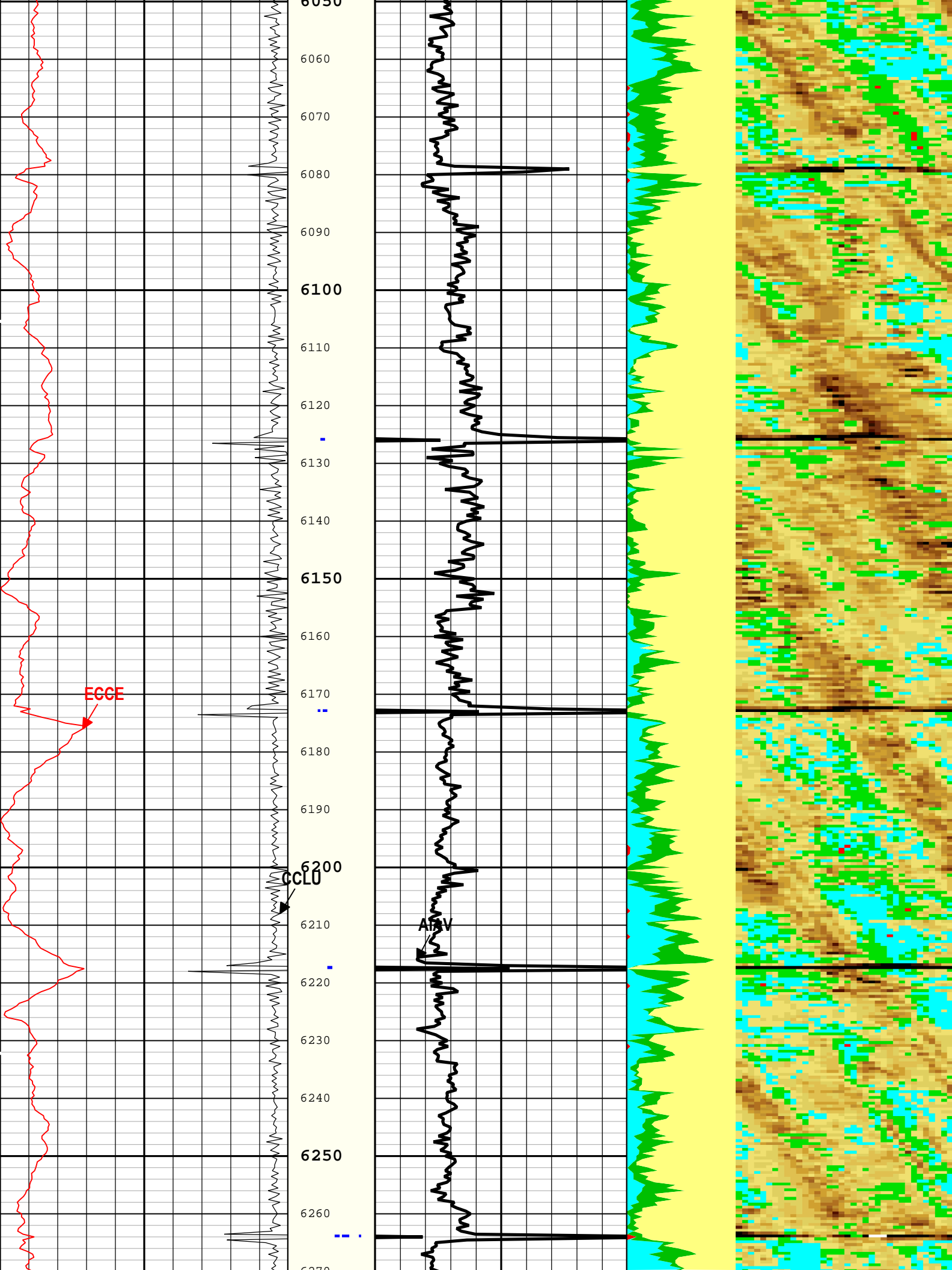


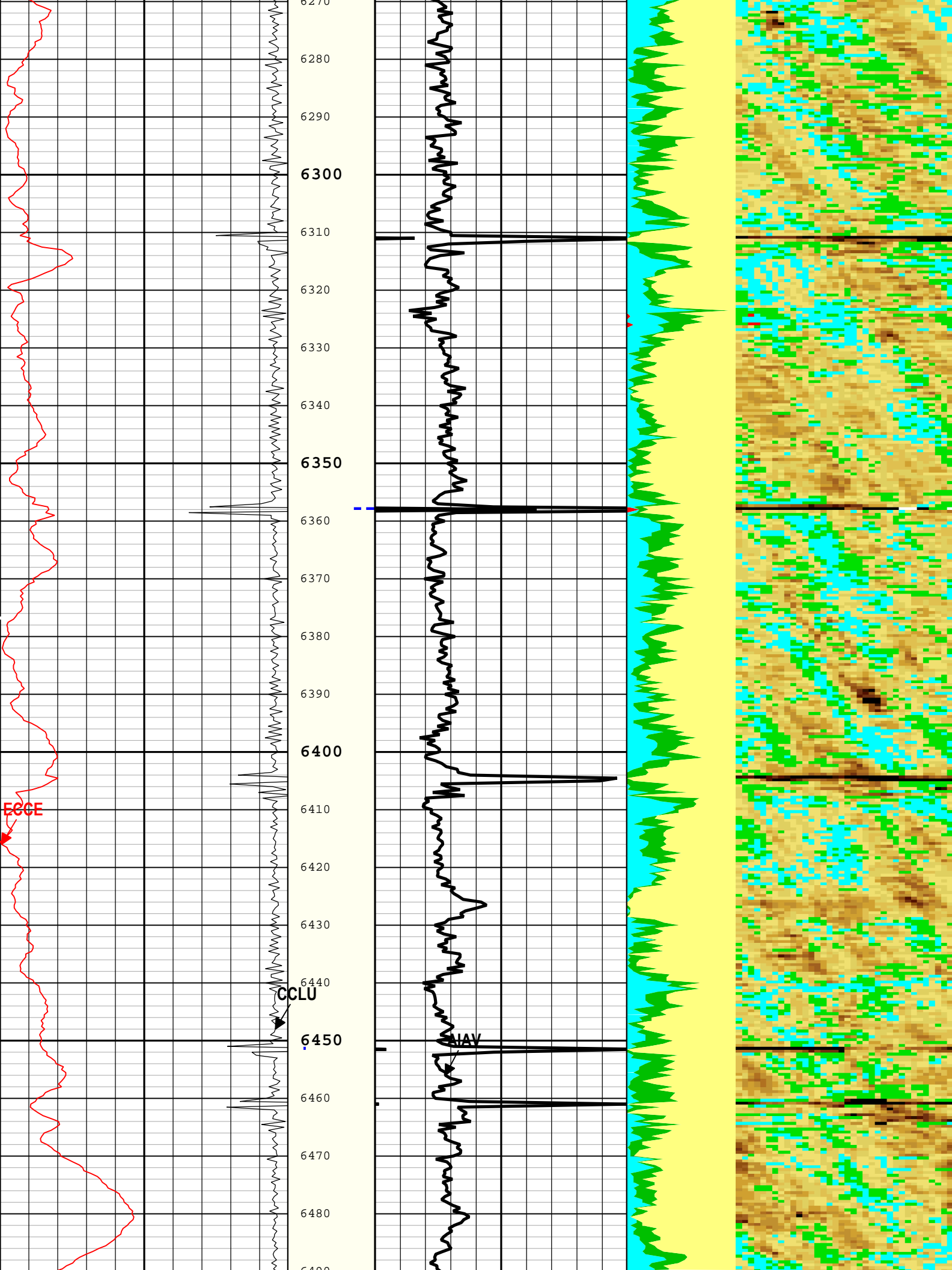


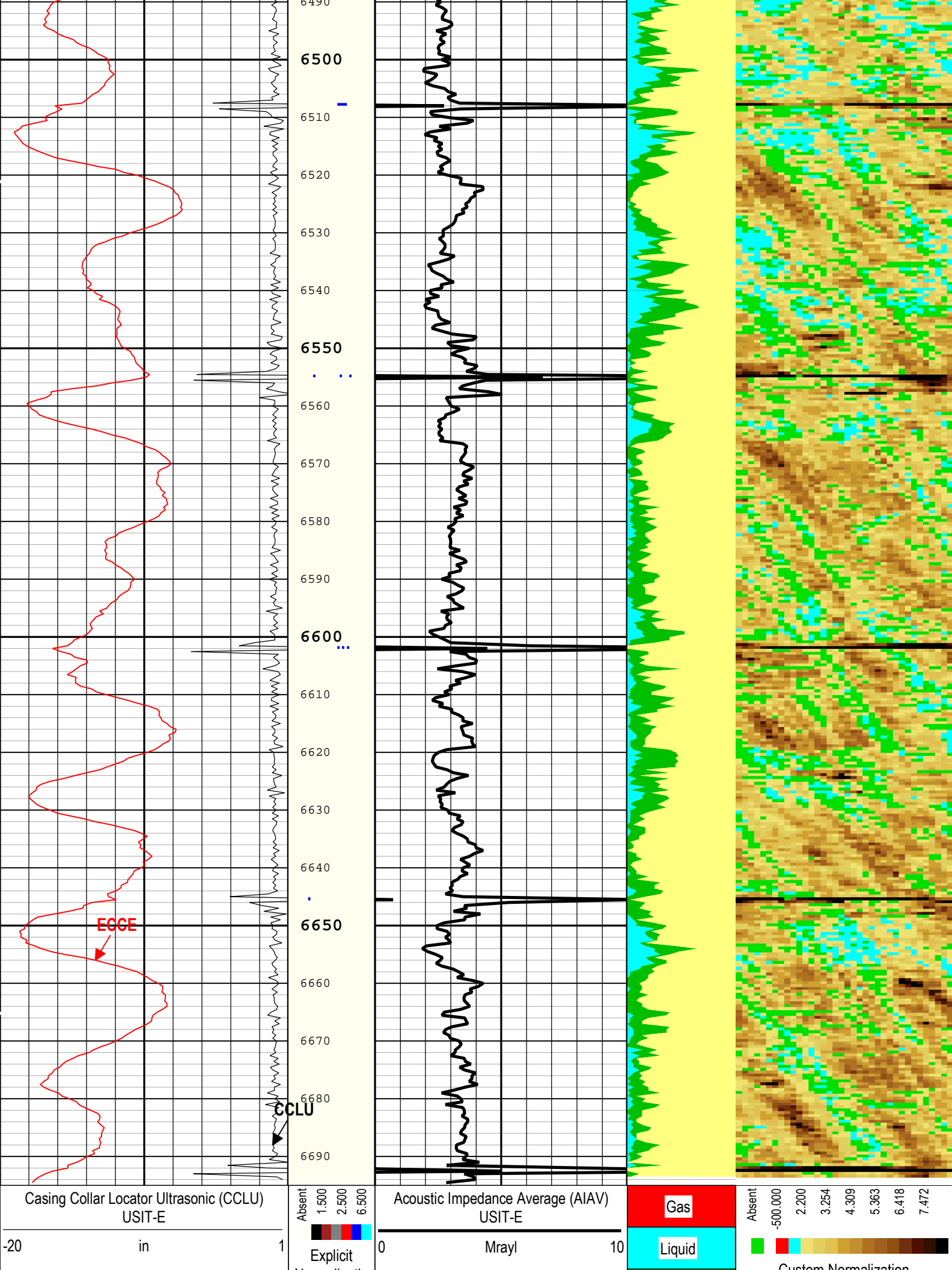












Channel Processing Parameters

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	1.1	
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

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	26	78.5	110
BS	13.5	110	2066
BS	8.5	2066	6695

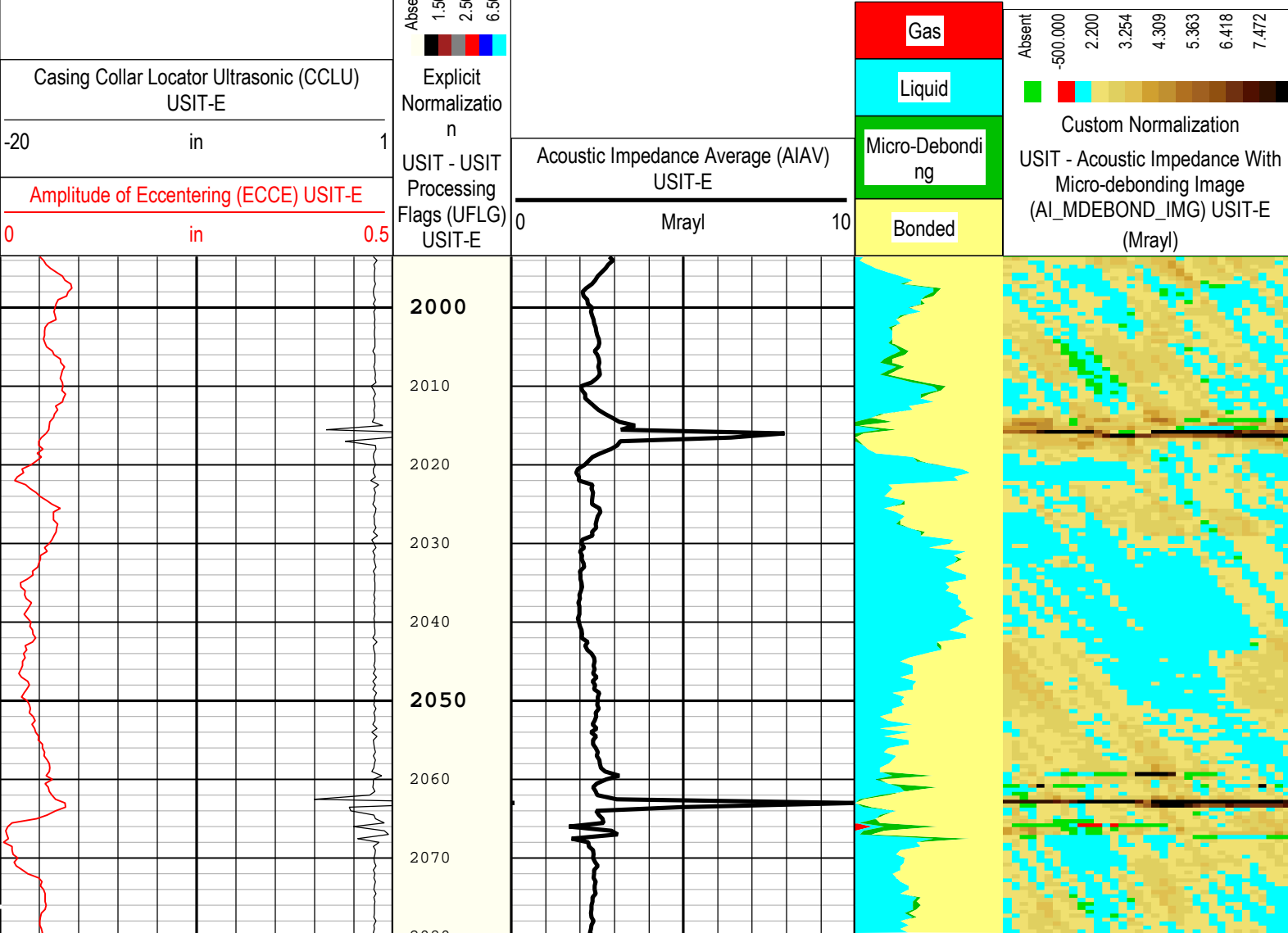
All depth are actual.

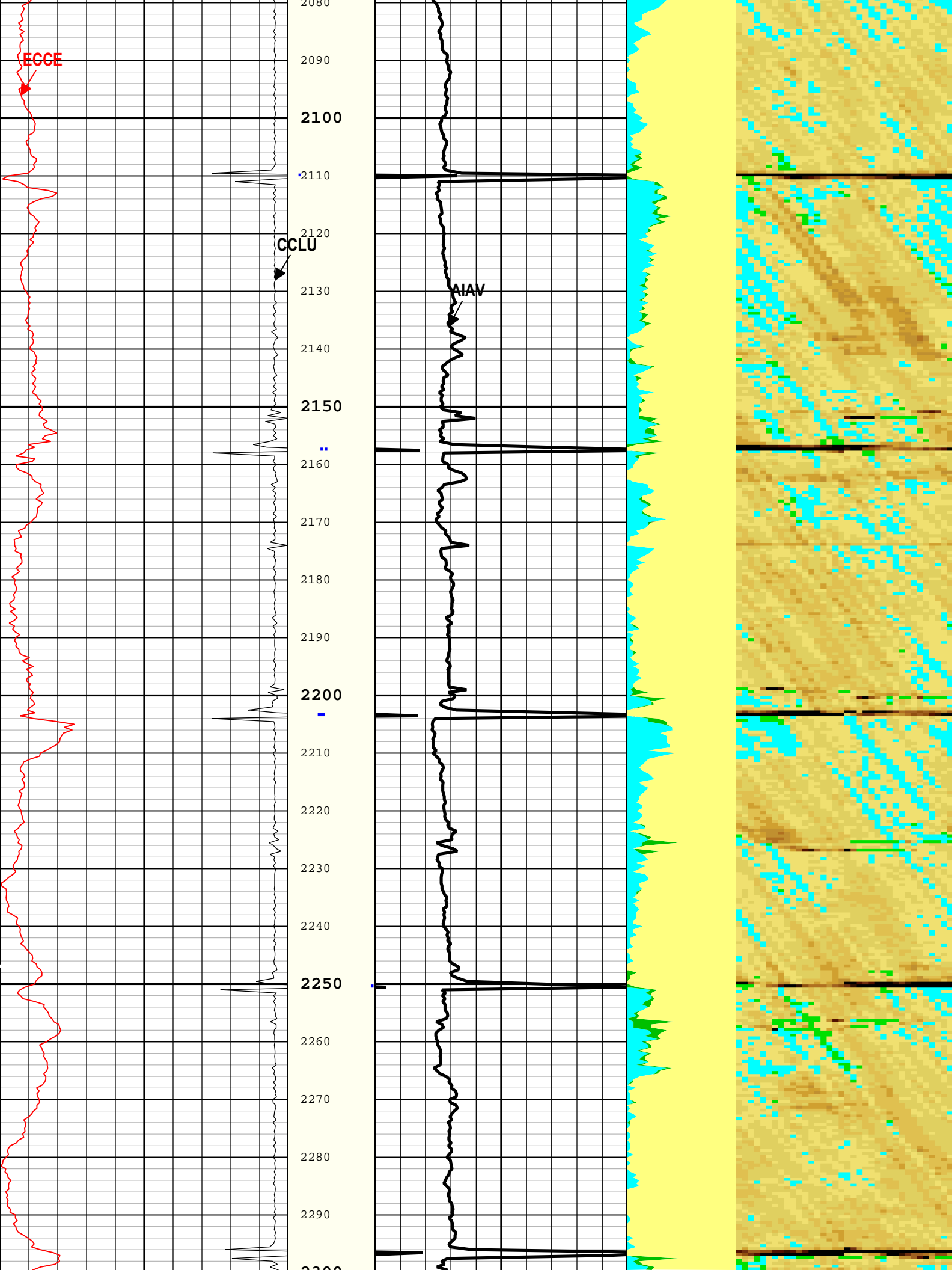
Tool Control Parameters

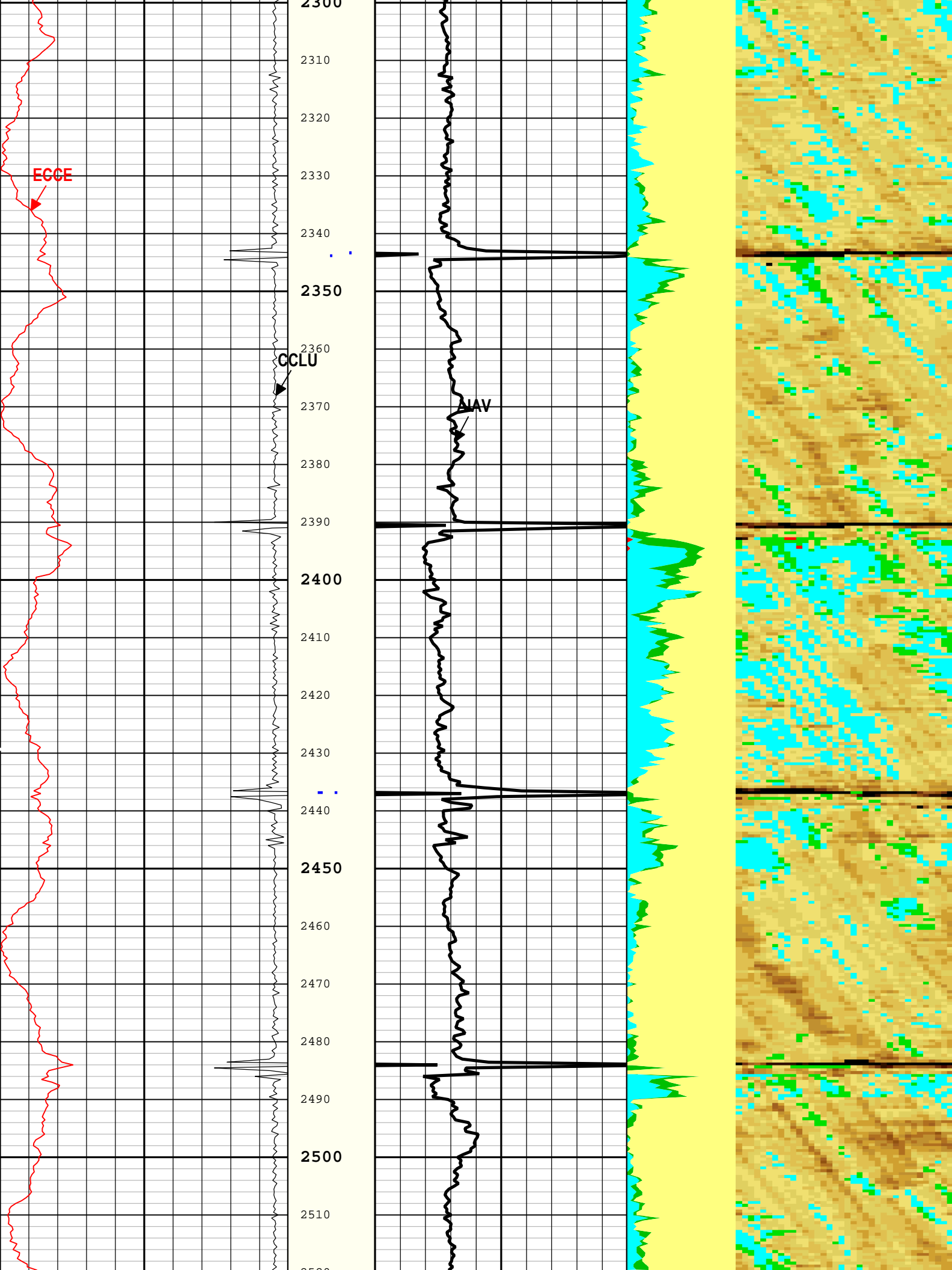
ONE: Parameters

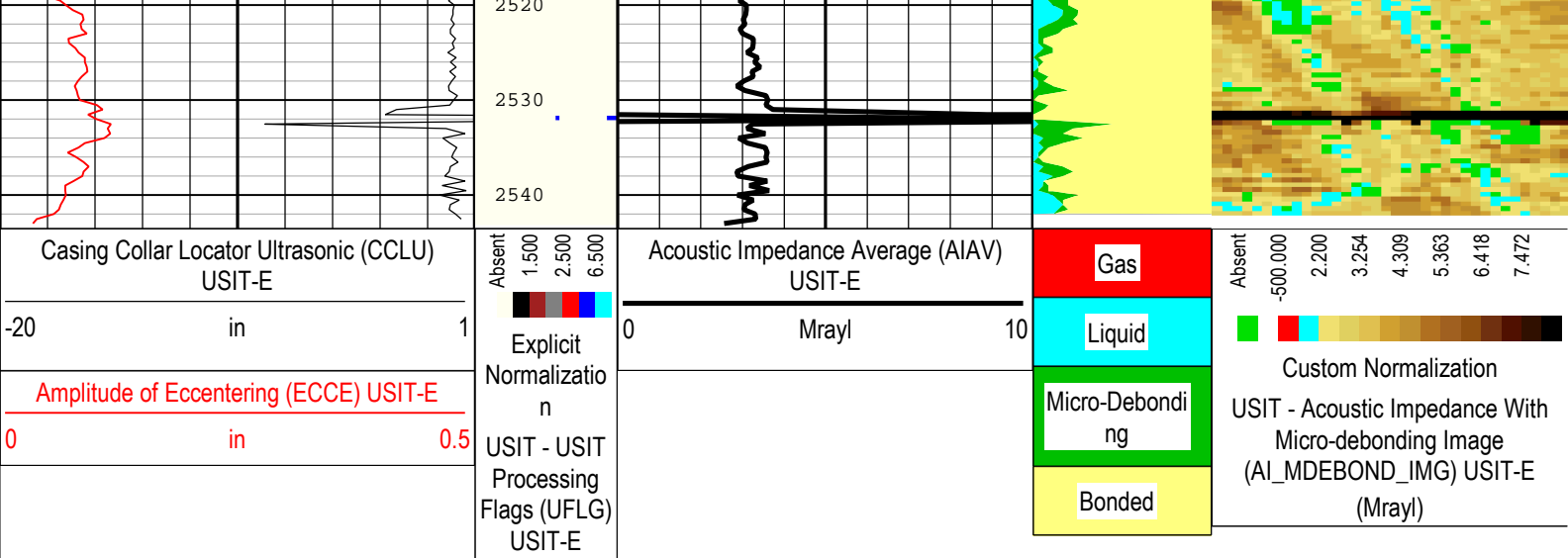
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
EMXV	EMEX Voltage	USIT-E	55	V
HRES	Horizontal Resolution	USIT-E	10 deg	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
USFR	Ultrasonic Sampling Frequency	USIT-E	666667	Hz
UPAT	USIT 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	Time Zoned	us
WINE	Window End Time	USIT-E	71.88	us

Time Zone Parameters









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: 03-Feb-2018 13:55:00

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	1.1	
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

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	13.5	1993.5	2066
BS	8.5	2066	2543.5

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	55	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

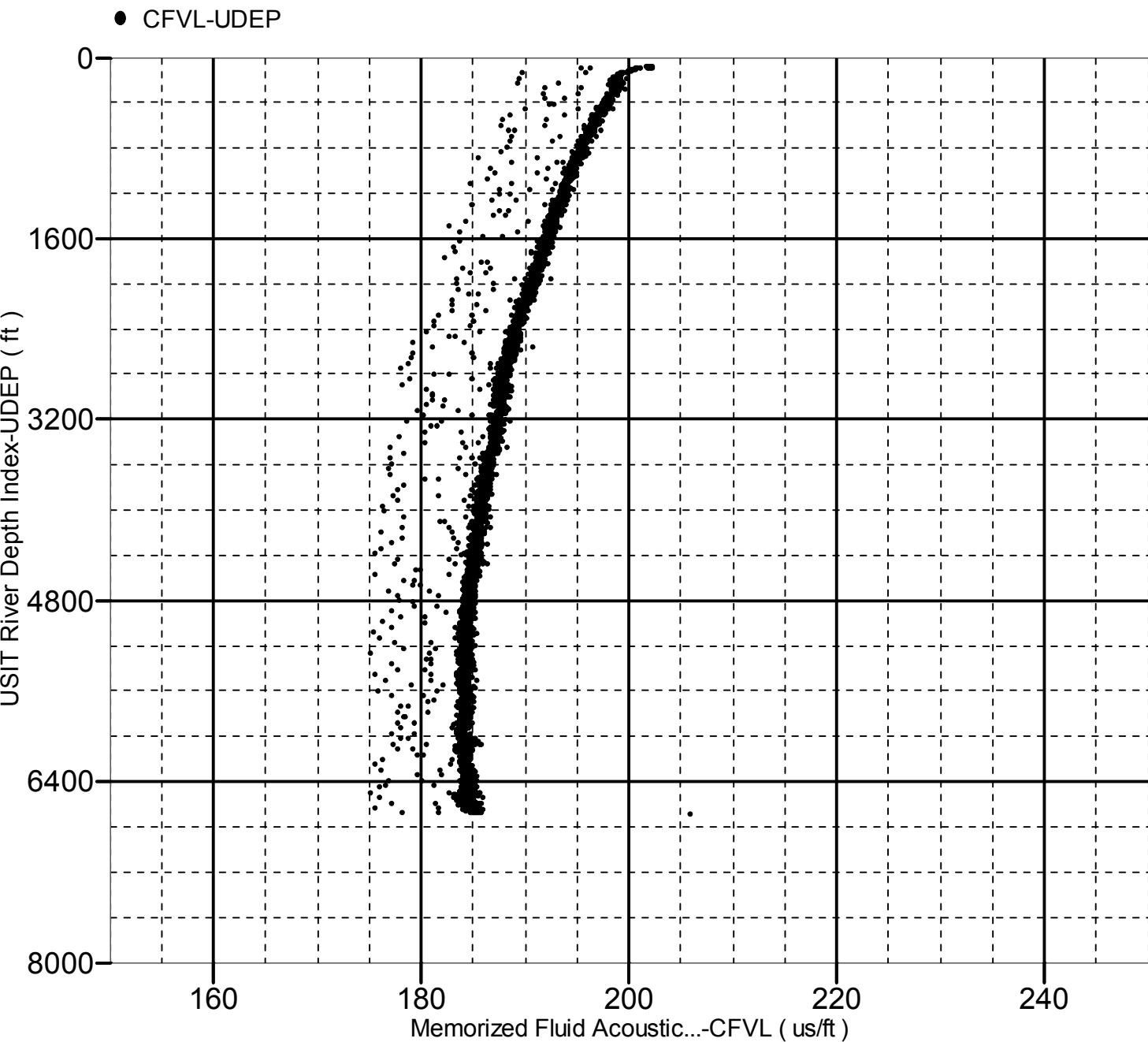
Company:Noble Energy Inc Well:Bison Ridge Y22-779

ONE: Log[5]:Up:S003

Fluid Acoustic Slow ness vs Depth

2D Cross Plot

Index Range: From 6695.50 to 78.50 ft



XYZ

Company:Noble Energy Inc Well:Bison Ridge Y22-779

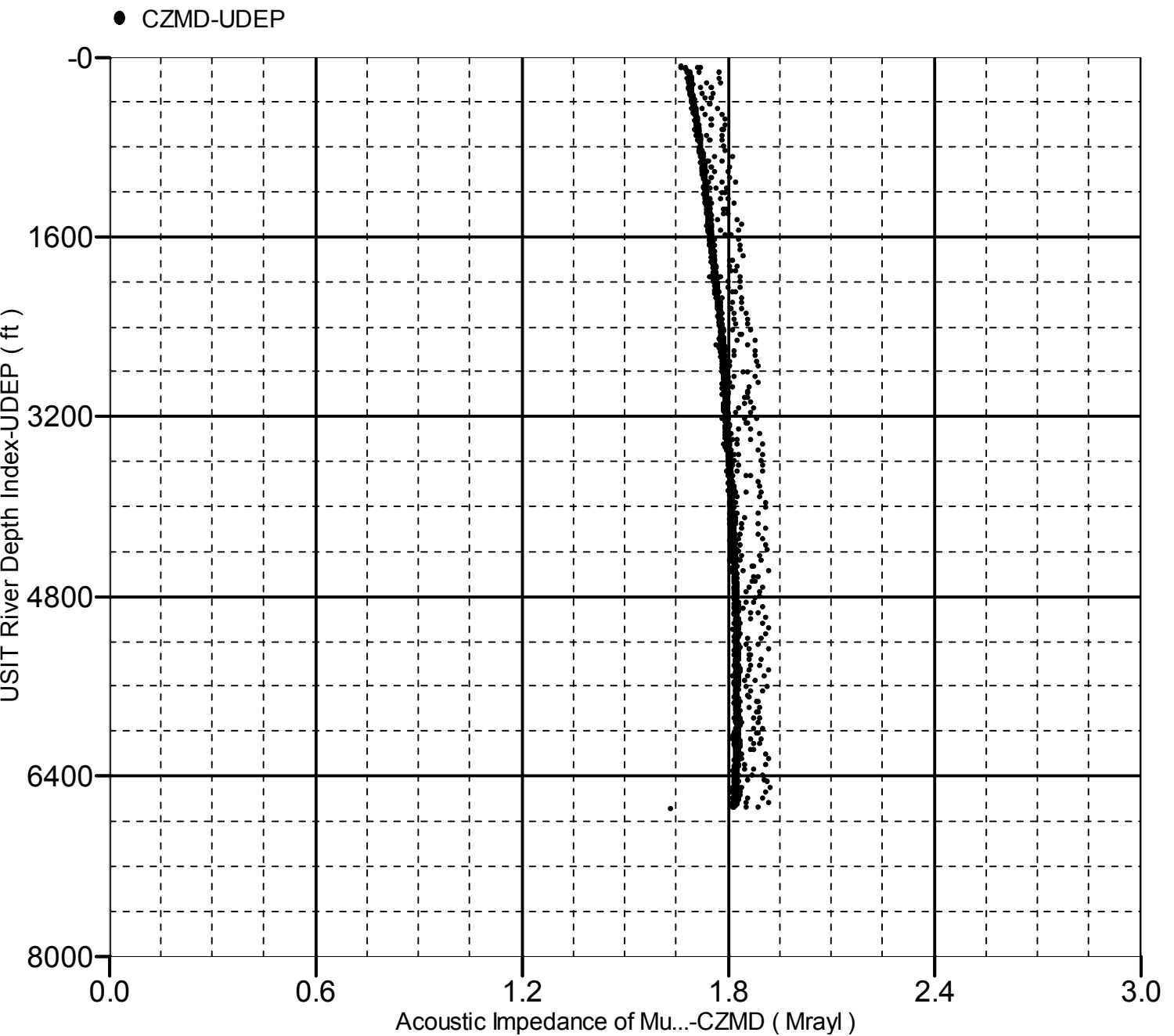
ONE: Log[5]:Up:S003

Acoustic Impedance of Mud vs Depth

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6695.50 to 78.50 ft



Company: Noble Energy Inc

Schlumberger

Well: Bison Ridge Y22-779

Field: Wattenberg

County: Weld

State: CO

UltraSonic Summary Print

