

Company: Noble Energy Inc

Well: Centennial State #G34-675

Field: Wattenberg

County: Weld State: Colorado

UltraSonic Summary Print

County:		Weld					
Field:		Wattenberg					
Location:		SENE 35-4N-65W					
Well:		Centennial State #G34-675					
Company:		Noble Energy Inc					
Location:		SENE 35-4N-65W					
		1160 FNL & 110 FEL					
		Permanent Datum:					
		Log Measured From:					
		Drilling Measured From:					
API Serial No.		Section:		Township:		Range:	
05-123-44604		35		4N		65W	
		Kelly Bushing		30.00 ft		above Perm.Datum	
		Kelly Bushing					
		Ground Level		Elev.:		4784.00 f	

Logging Date	31-Mar-2018		
Run Number	USIT		
Depth Driller	12297.00 ft		
Schlumberger Depth	12297.00 ft		
Bottom Log Interval	6500.00 ft		
Top Log Interval	50.00 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	1957.00 ft		
To	12297.00 ft		
Casing/Tubing Size	5.5 in		
Weight	20 lbm/ft		
Grade	N/A		
From	0.00 ft		
To	12285.00 ft		
Max Recorded Temperatures			
Logger on Bottom			
Unit Number	Time		
Recorded By	Location:		
	L. Awalt	31-Mar-2018	12:21:00
		OSL C-EA 2377	Ft. Morgan
Witnessed By	Mike Stenger		

Disclaimer

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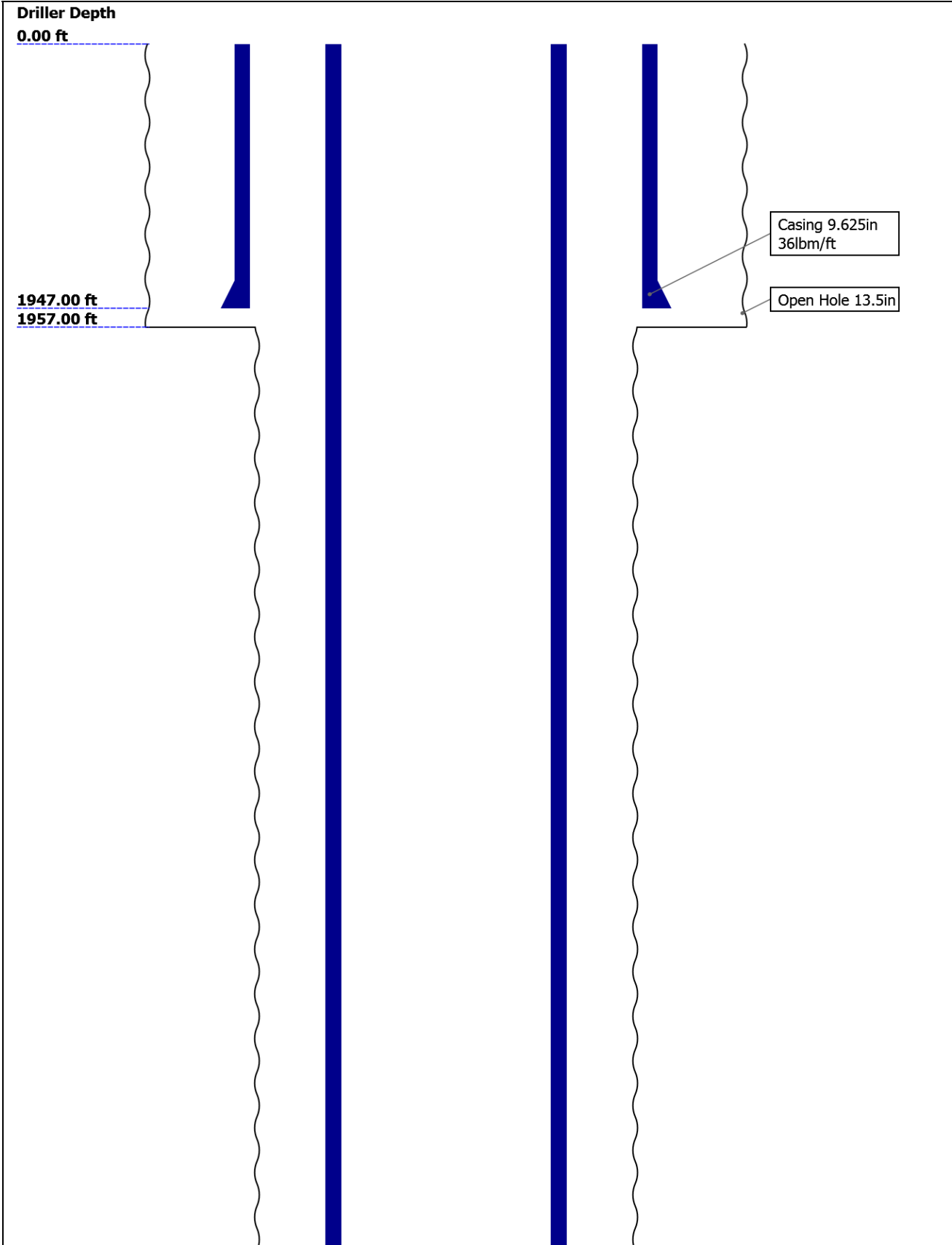
Contents

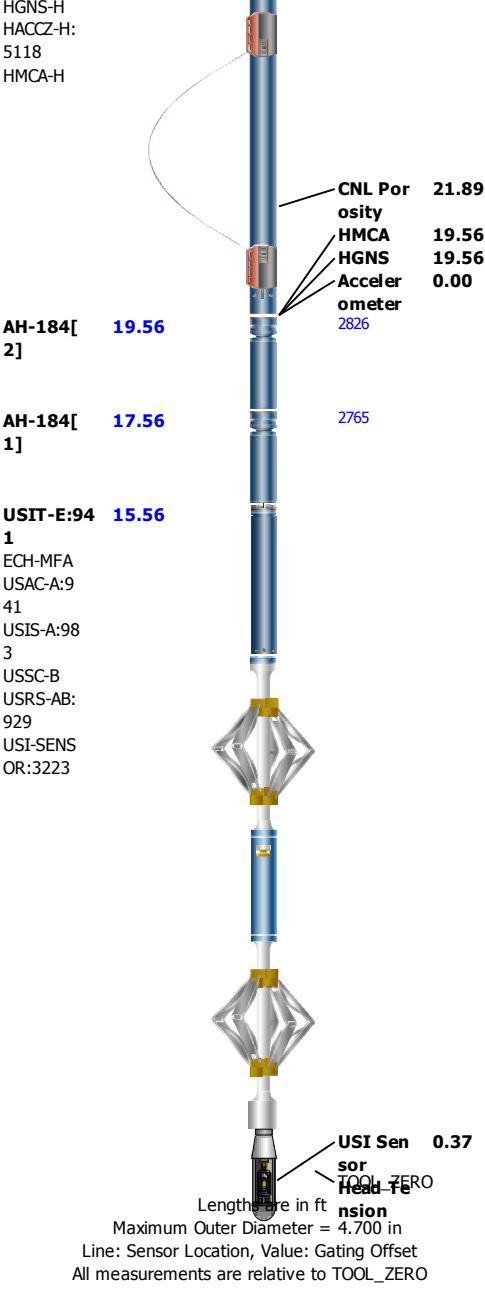
- 1. Header
- 2. Disclaimer
- 3. Contents
- 4. Well Sketch
- 5. Borehole Size/Casing/Tubing Record
- 6. Remarks and Equipment Summary
- 7. Depth Summary
- 8. USI Fluid Properties Measurement_1
- 9. USIT 2500 PSI Main Pass
 - 9.1 Integration Summary
 - 9.2 Software Version
 - 9.3 Composite Summary
 -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





Depth Summary

	USIT		
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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	Crane		

USIT: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

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[4]:Up	6509.6	42.93

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 : 23.64m(77.55ft) to 25.42m(83.39ft)
MUD_N_FRP = 1.17
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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USIT

2500 PSI Main Pass

Software Version

Acquisition System	Version
Maxwell 2017 SP3	7.3.92069.3100

Pass Summary

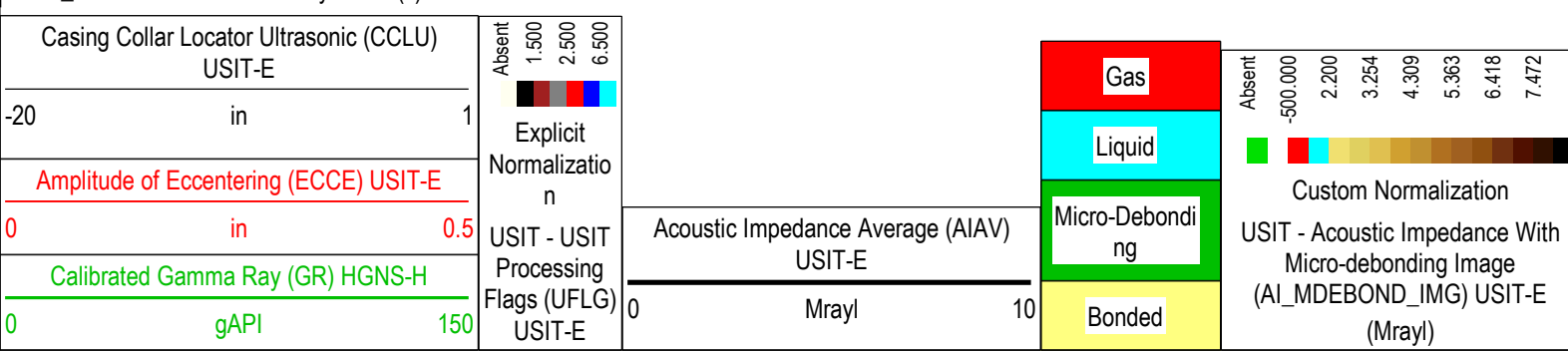
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
USIT	Log[4]:Up	Up	42.93 ft	6509.60 ft	31-Mar-2018 1:05:33 PM	31-Mar-2018 2:21:53 PM	ON	8.07 ft	Yes

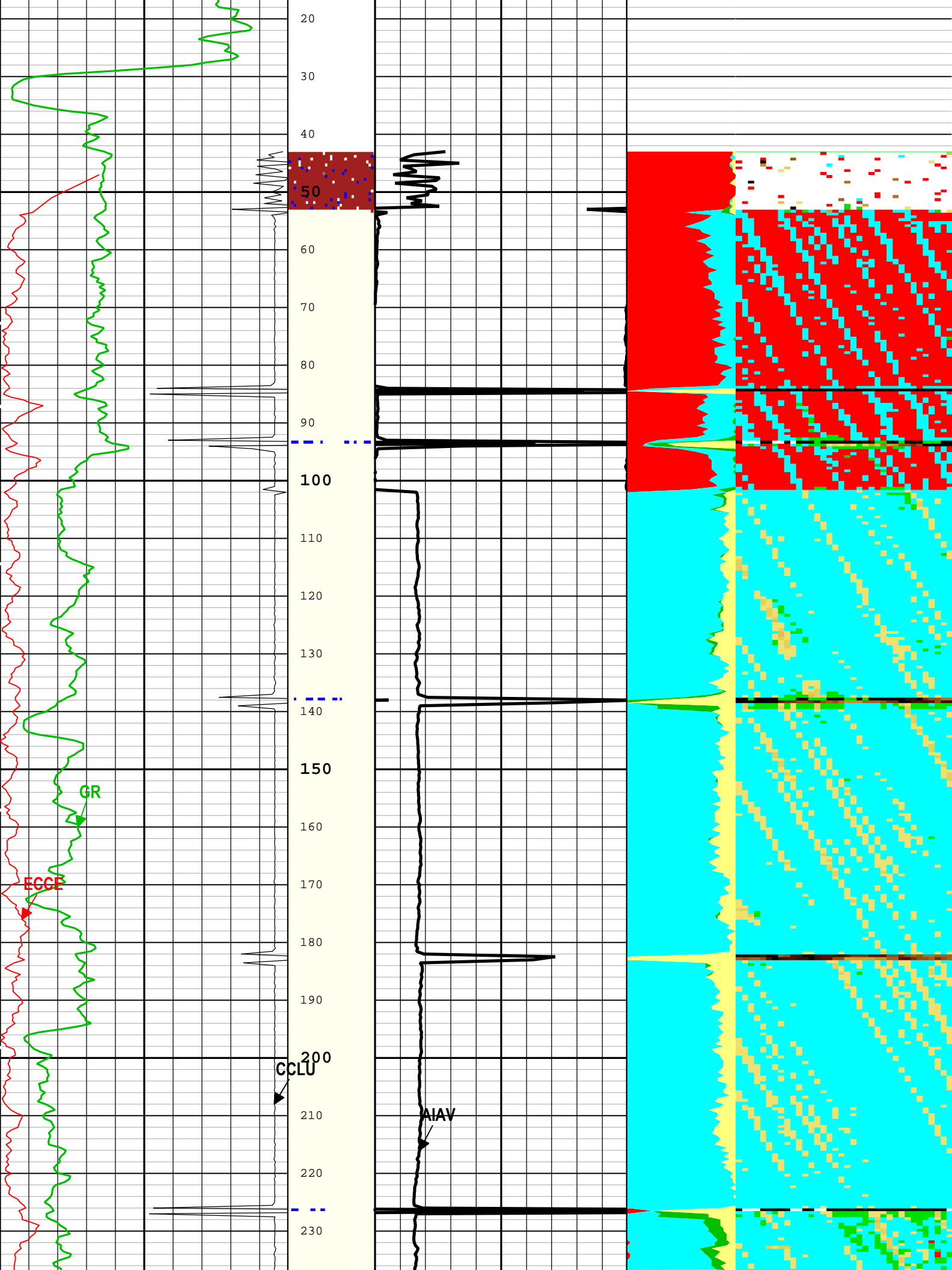
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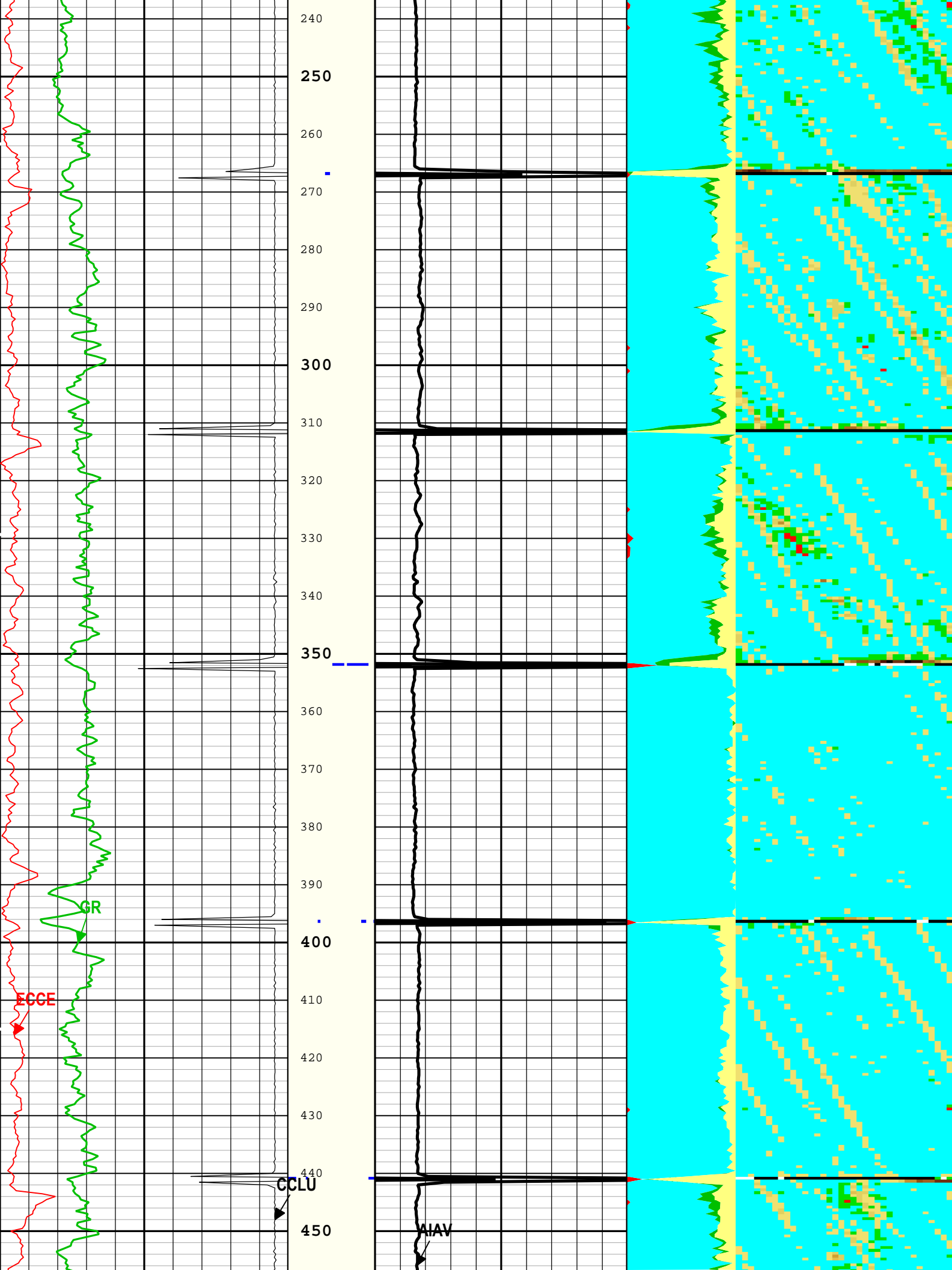
Log	Company:Noble Energy Inc Well:Centennial State #G34-675 USIT: Log[4]:Up:S005
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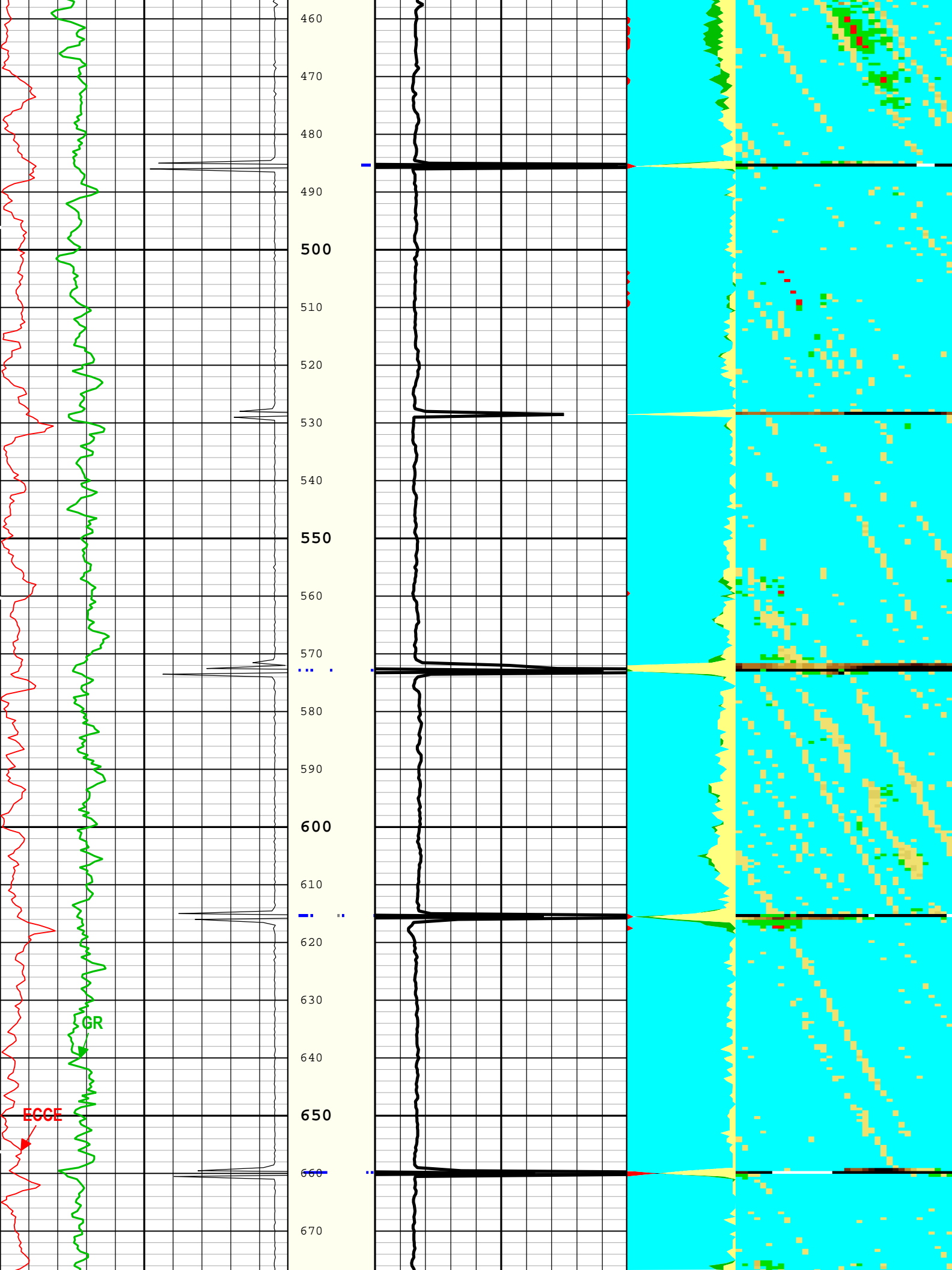
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Creation Date: 31-Mar-2018 15:31:37

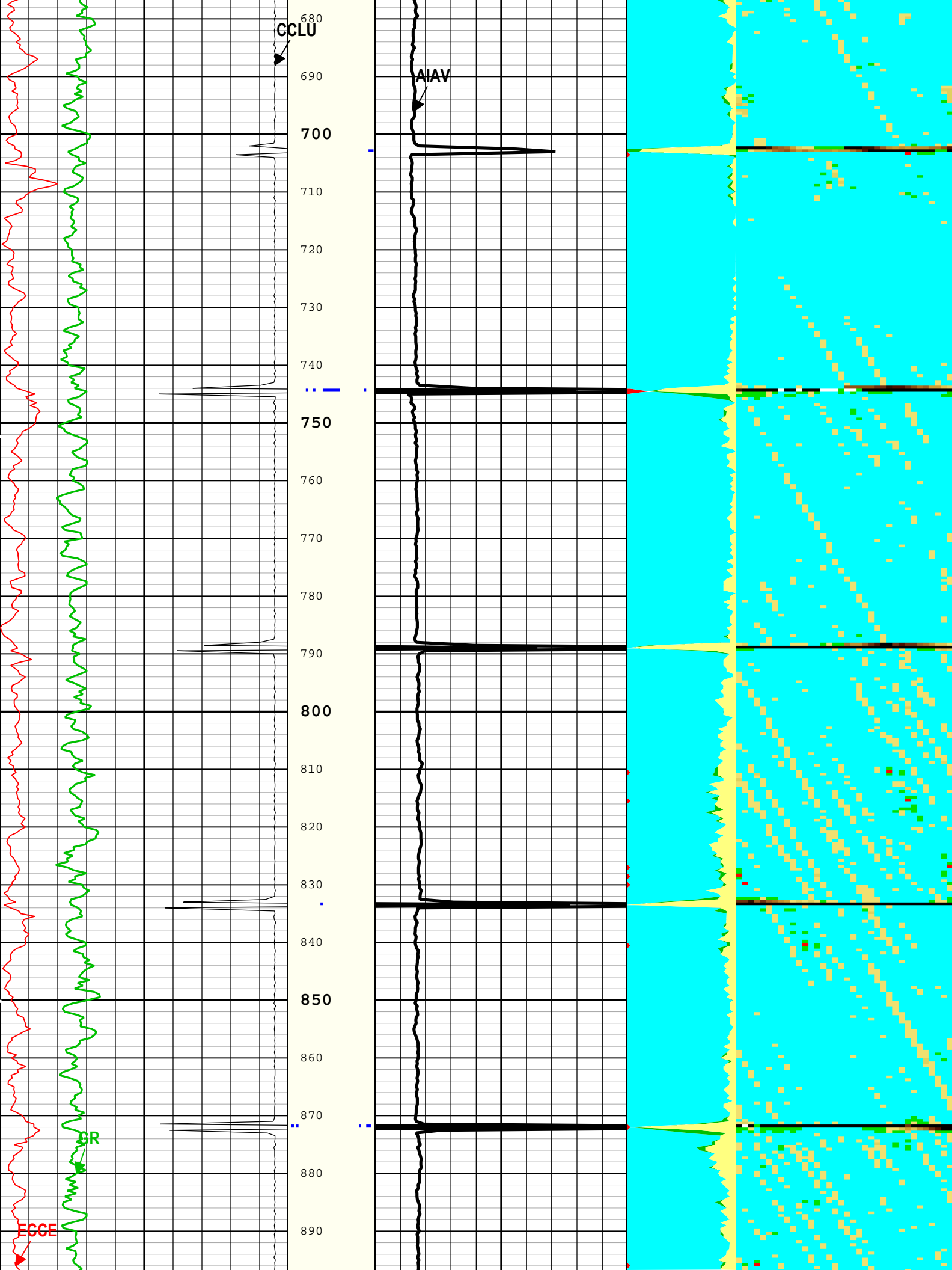
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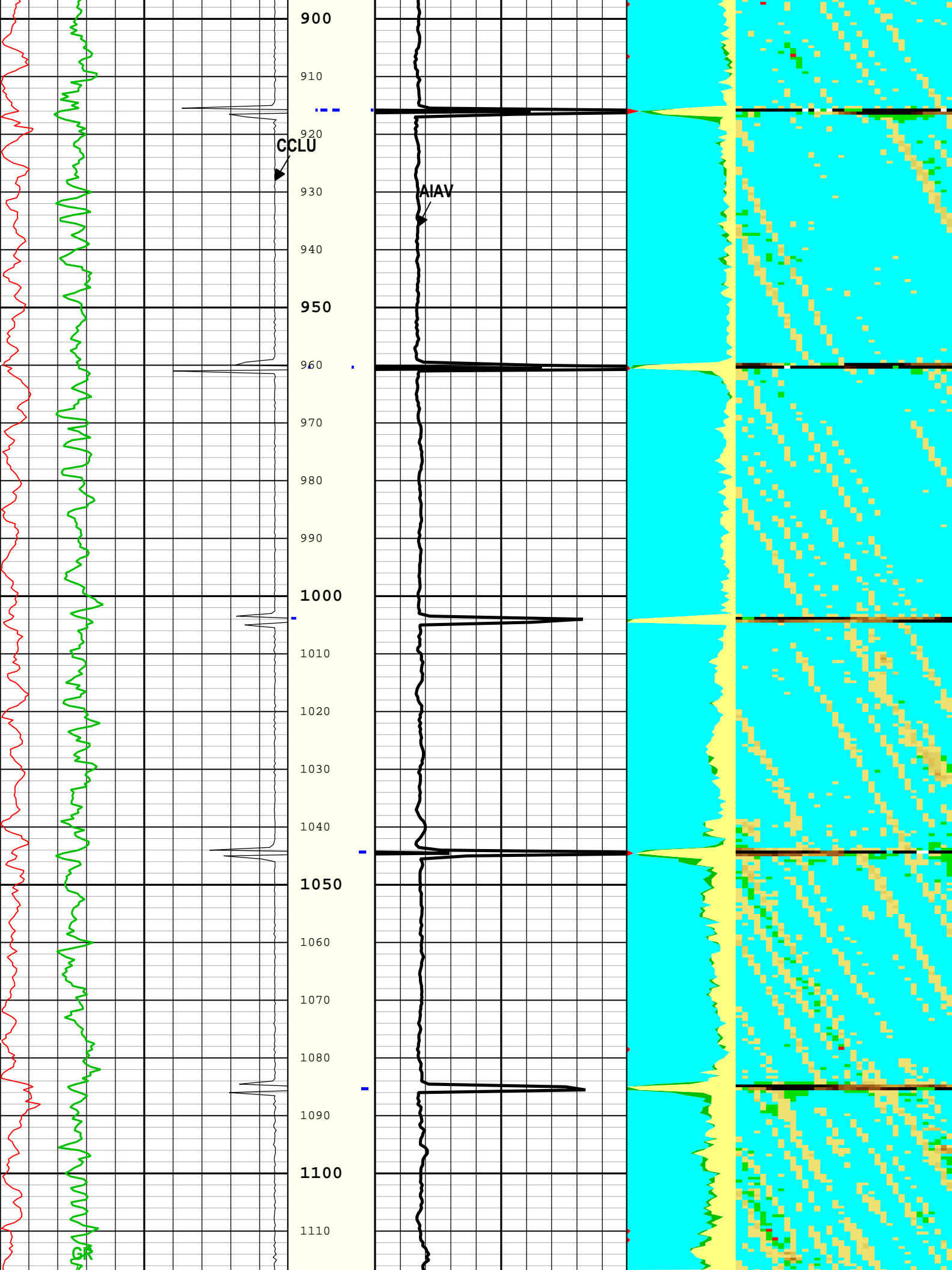


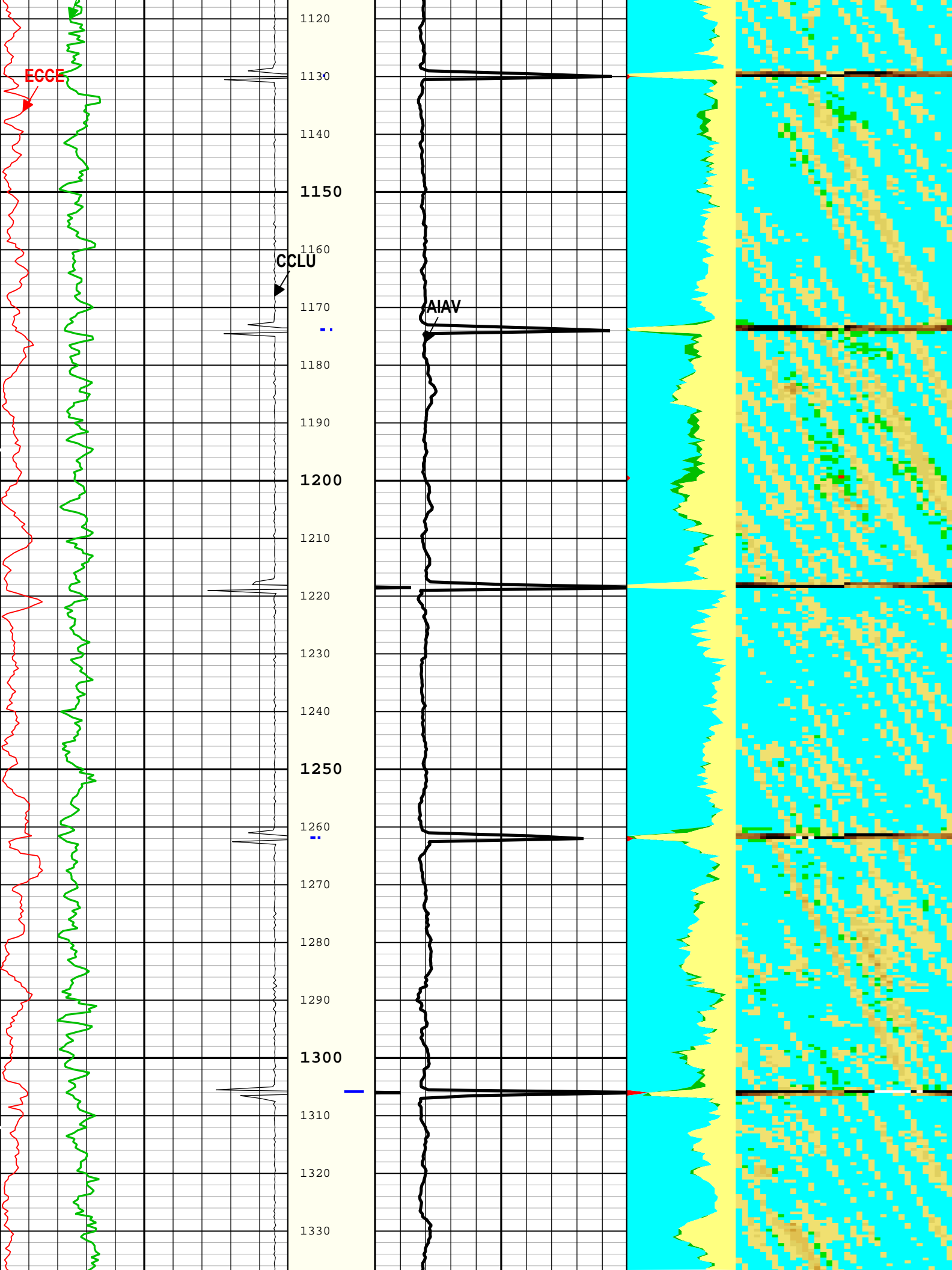


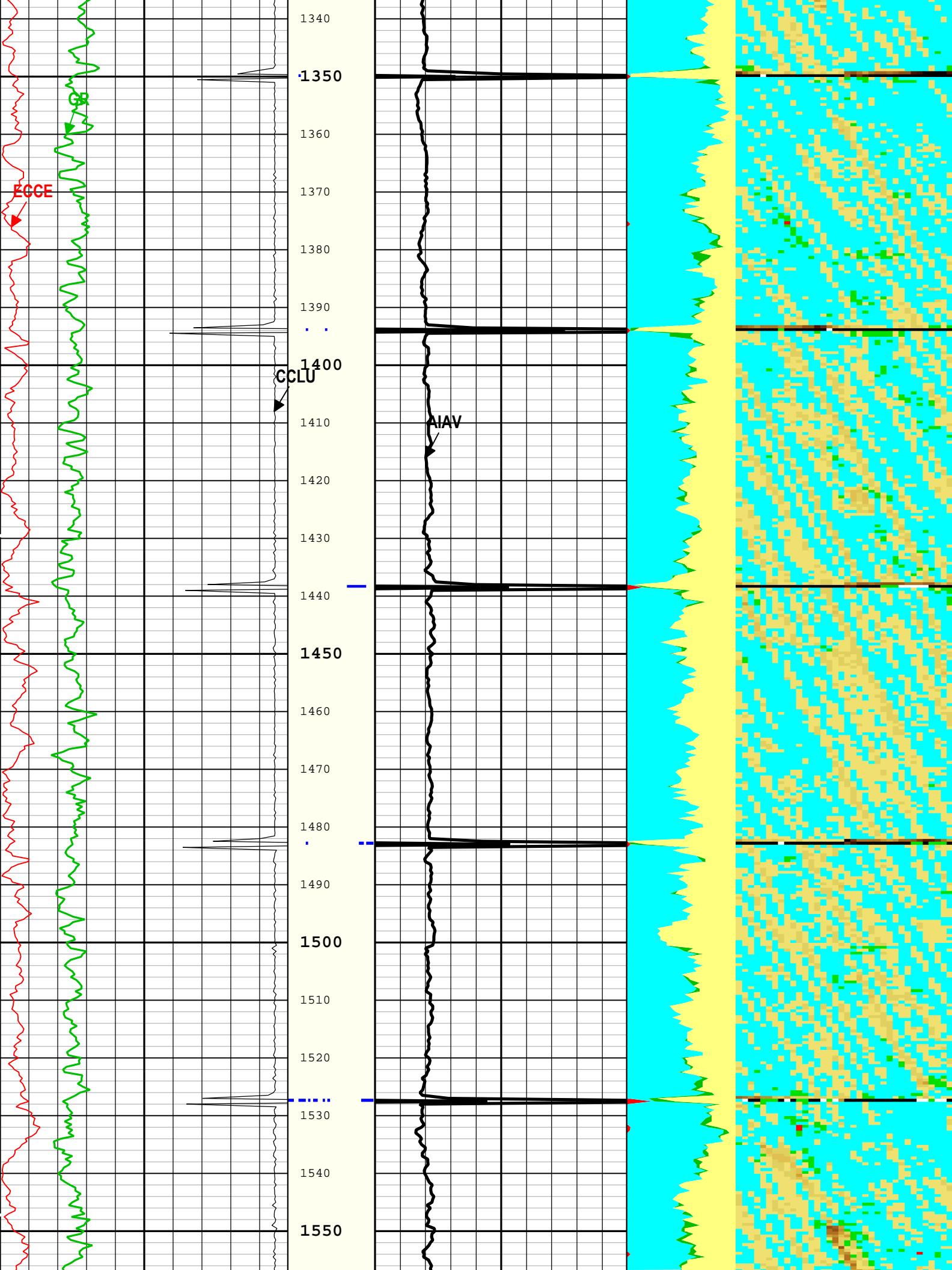


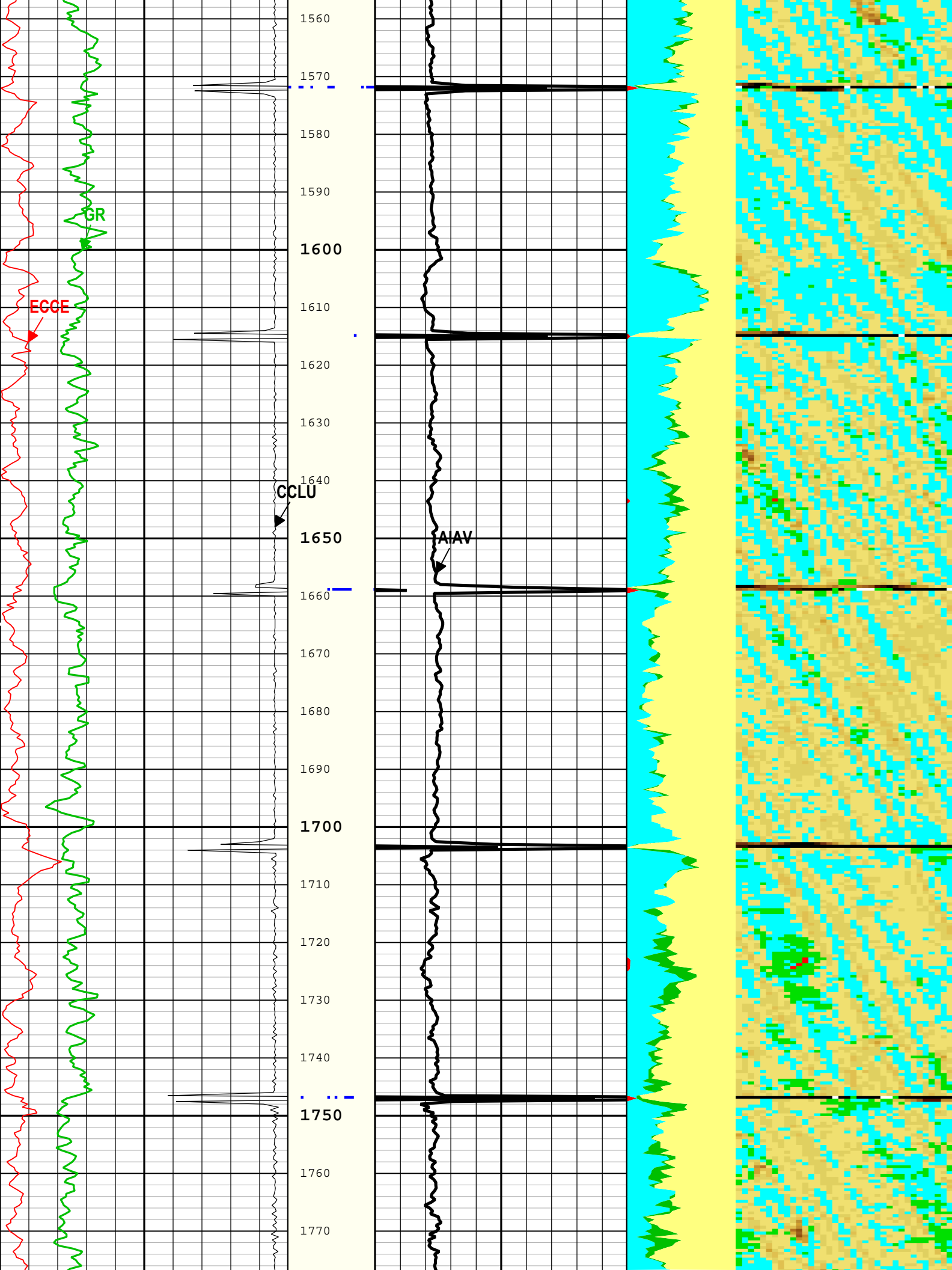


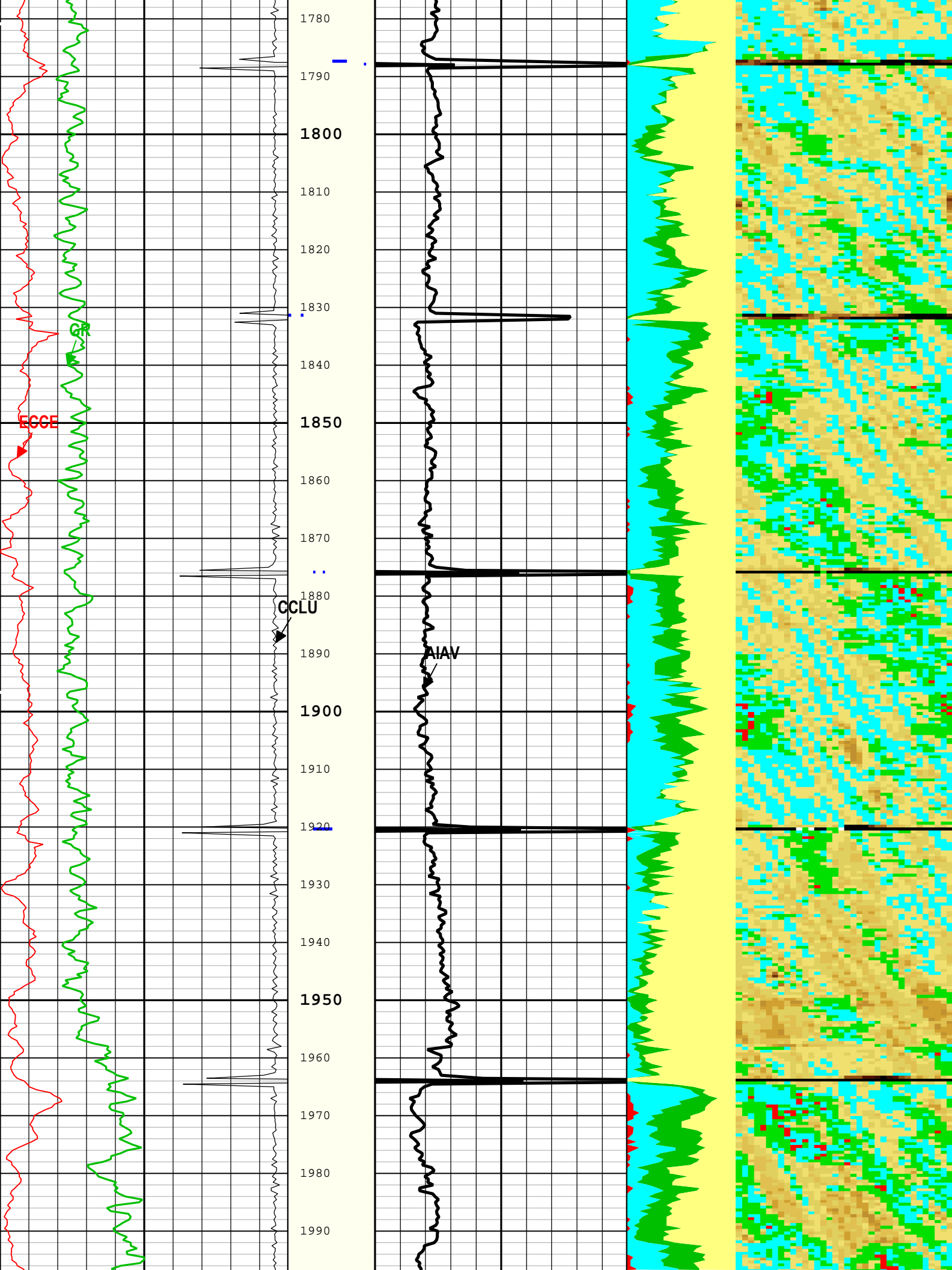


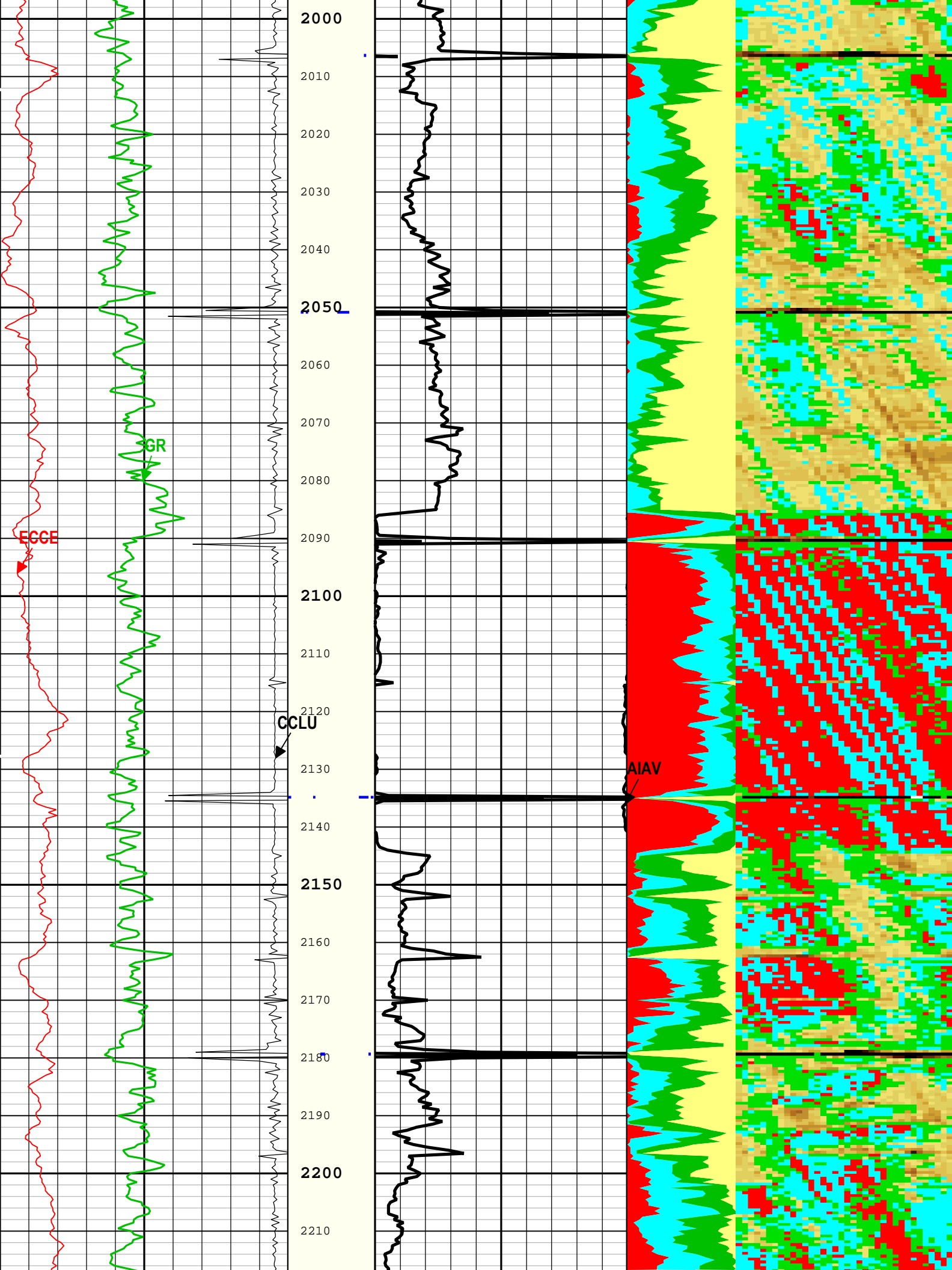


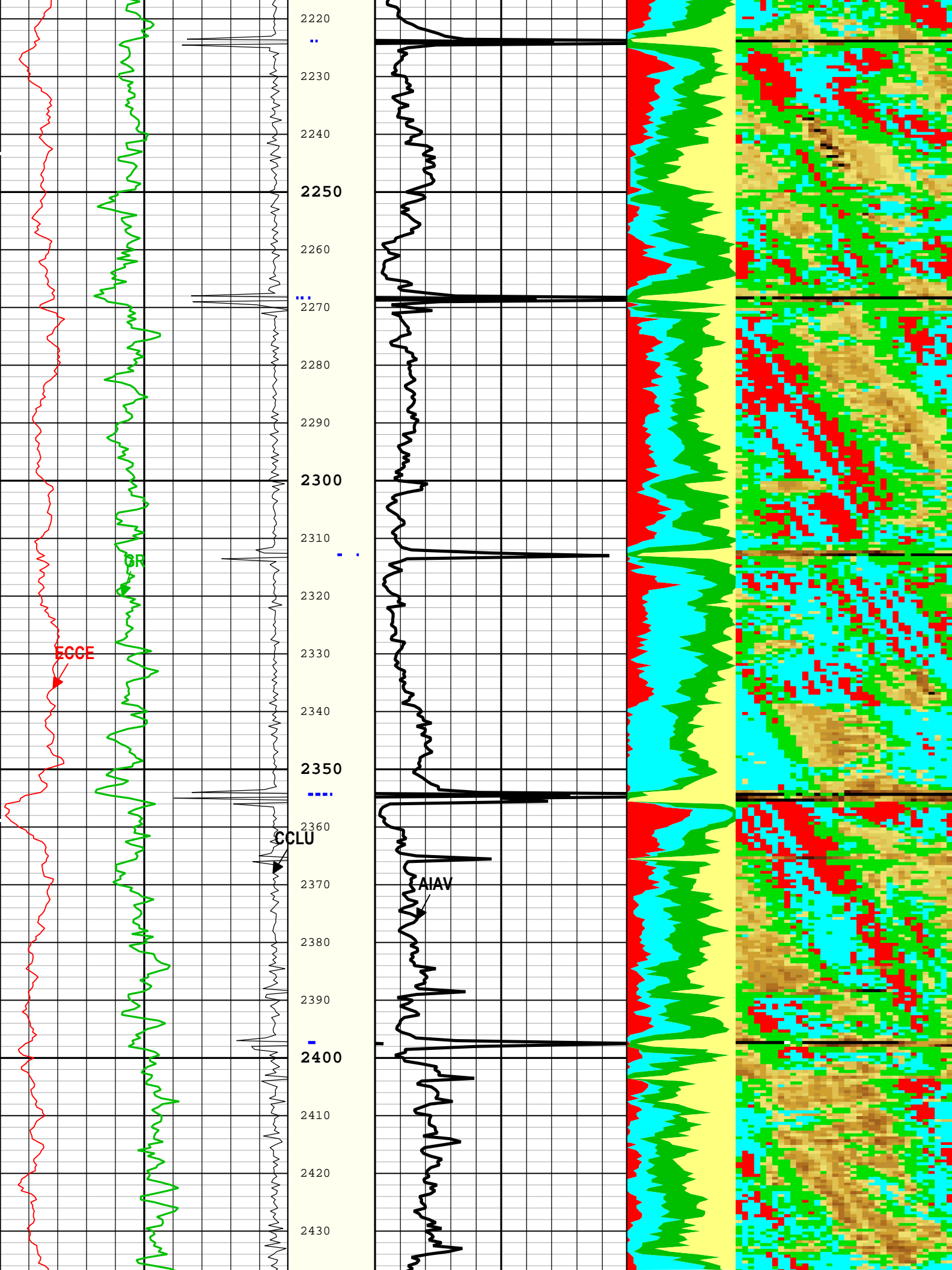


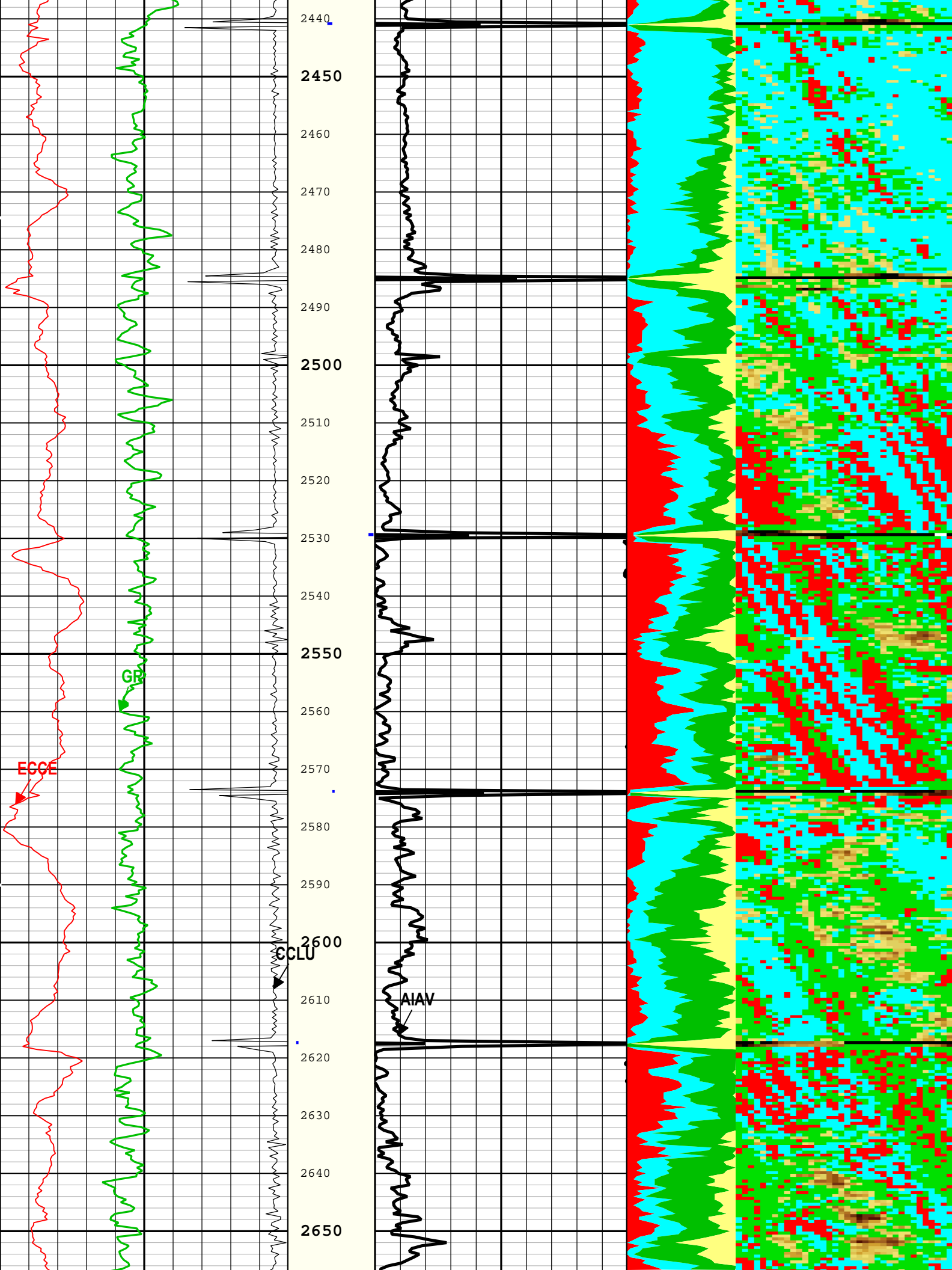


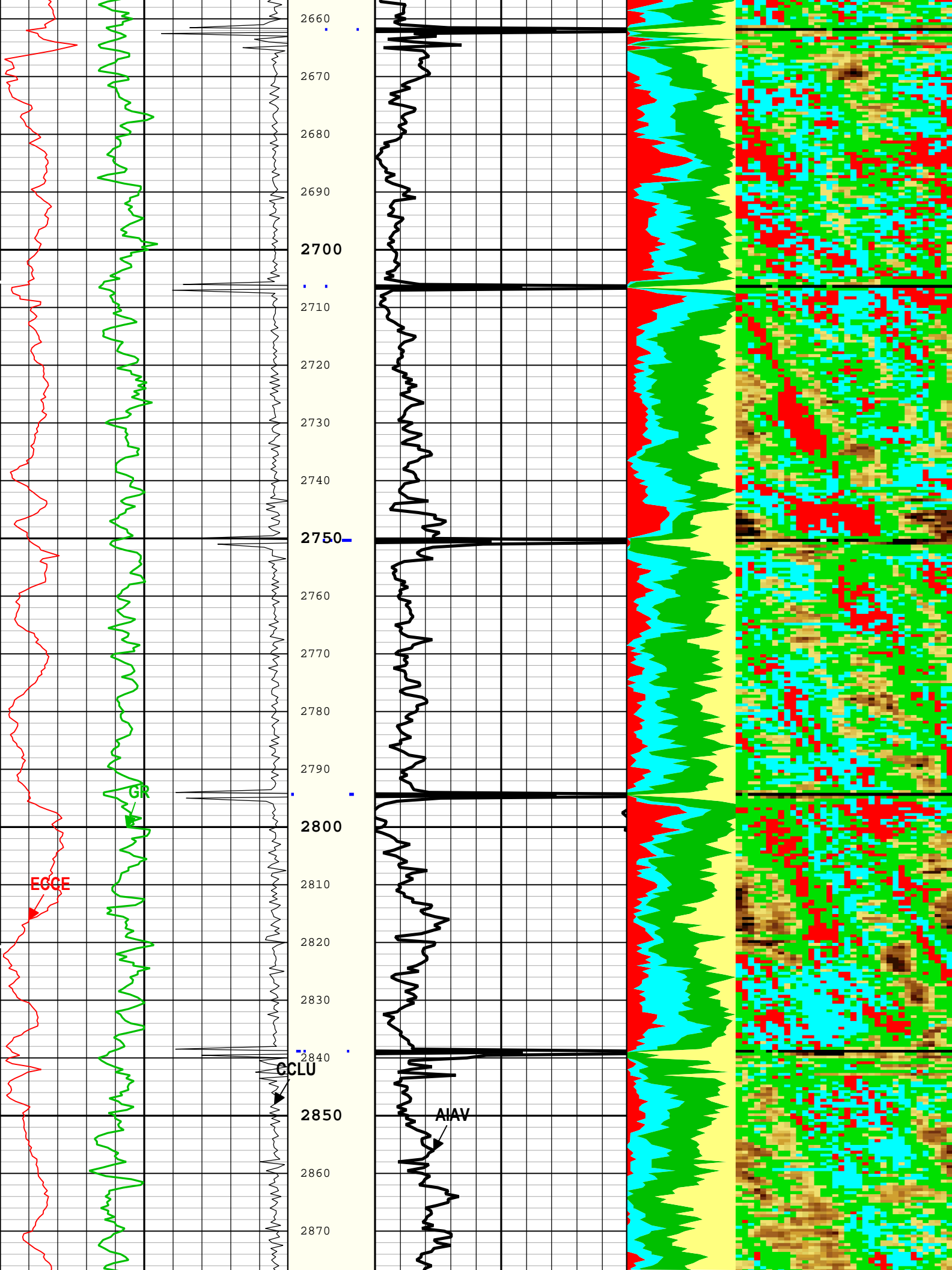


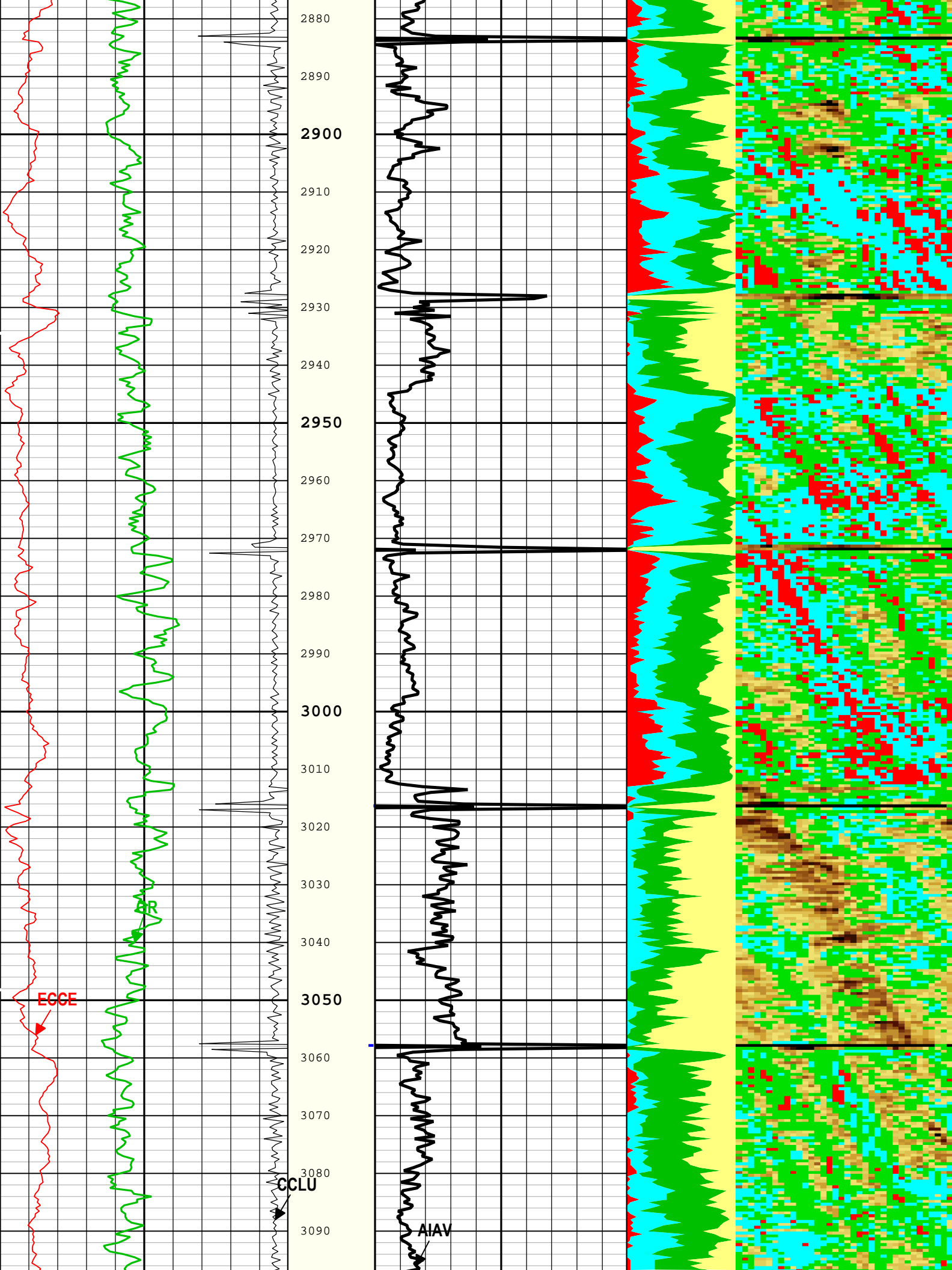


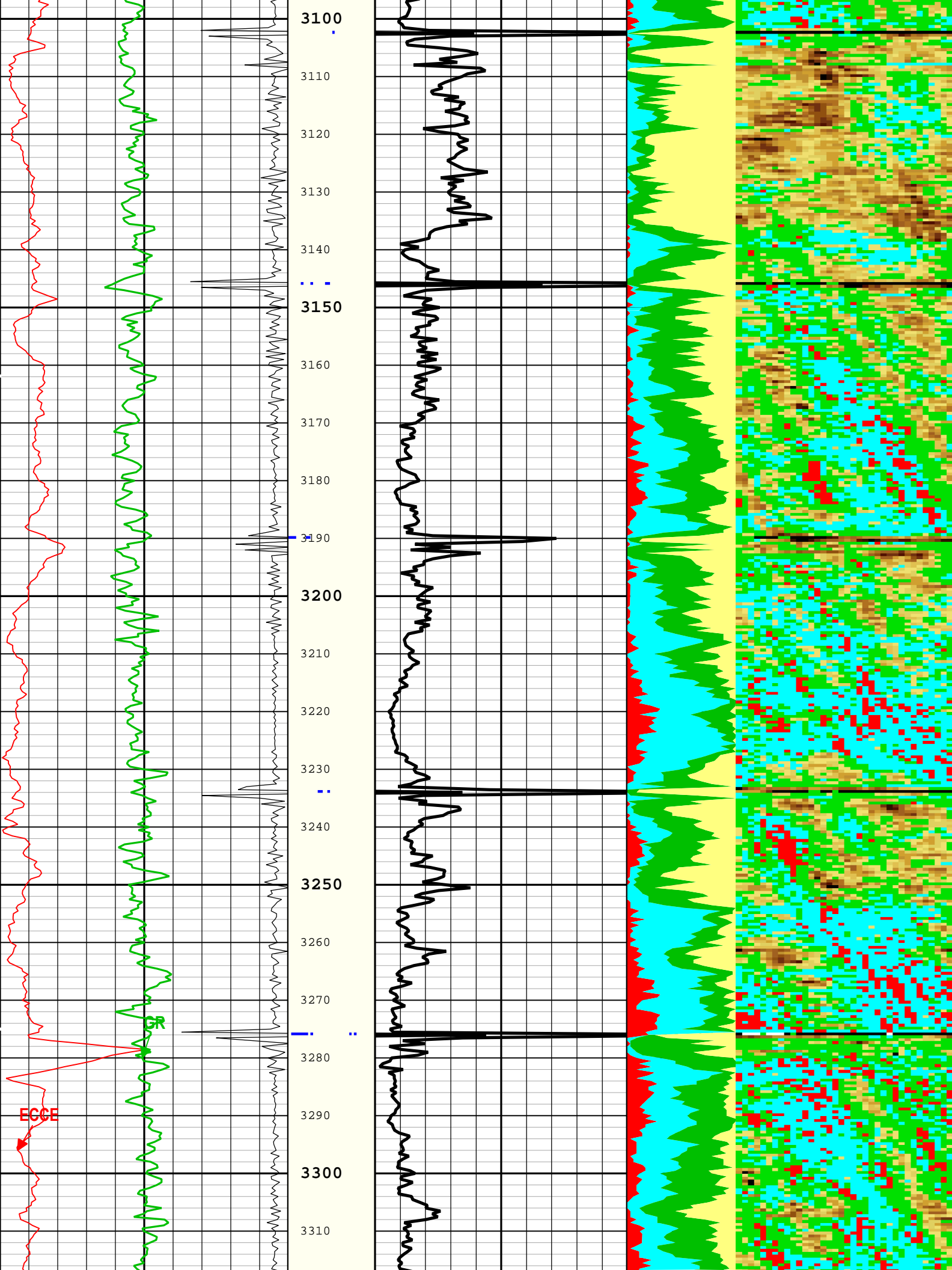


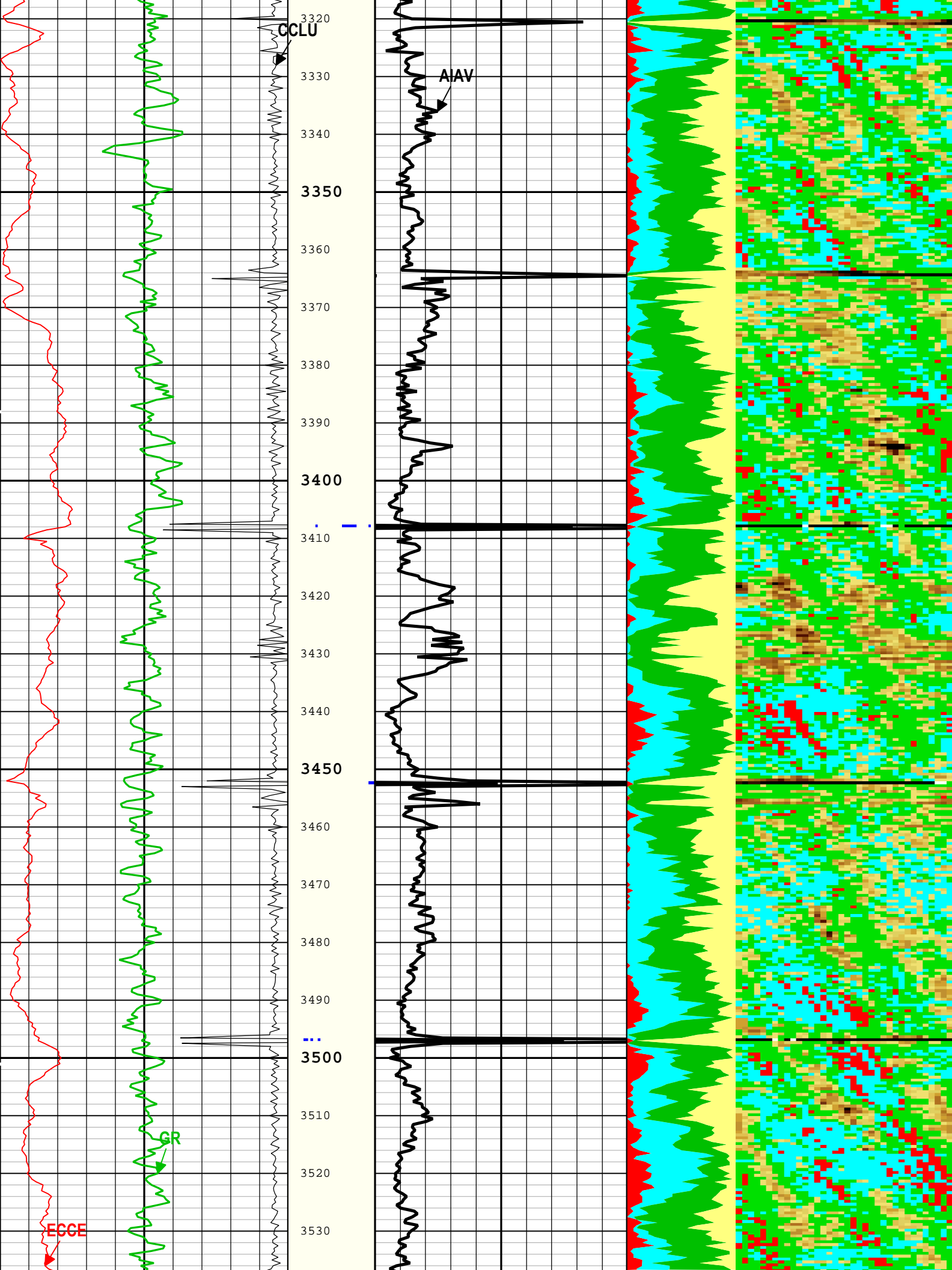


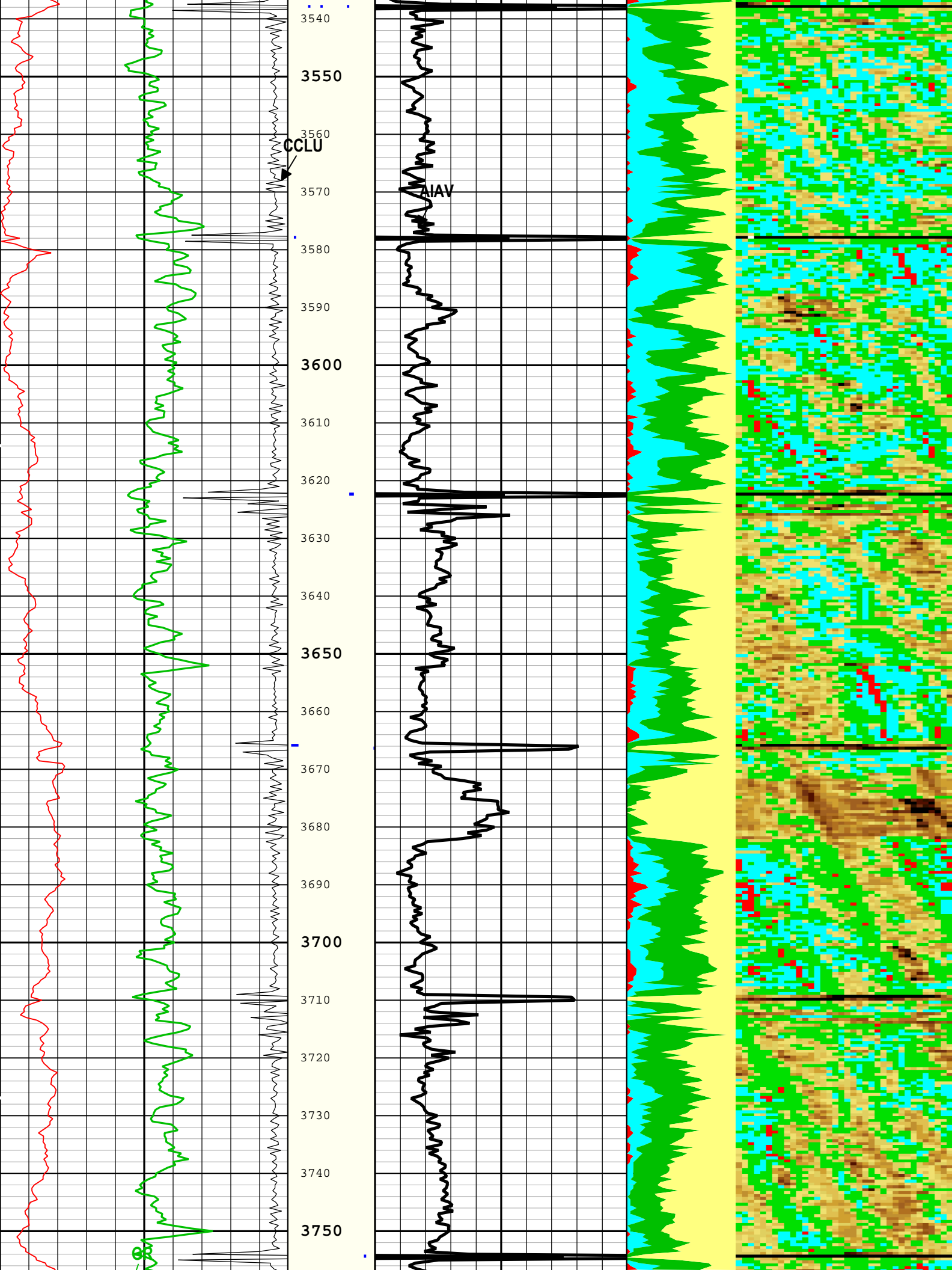


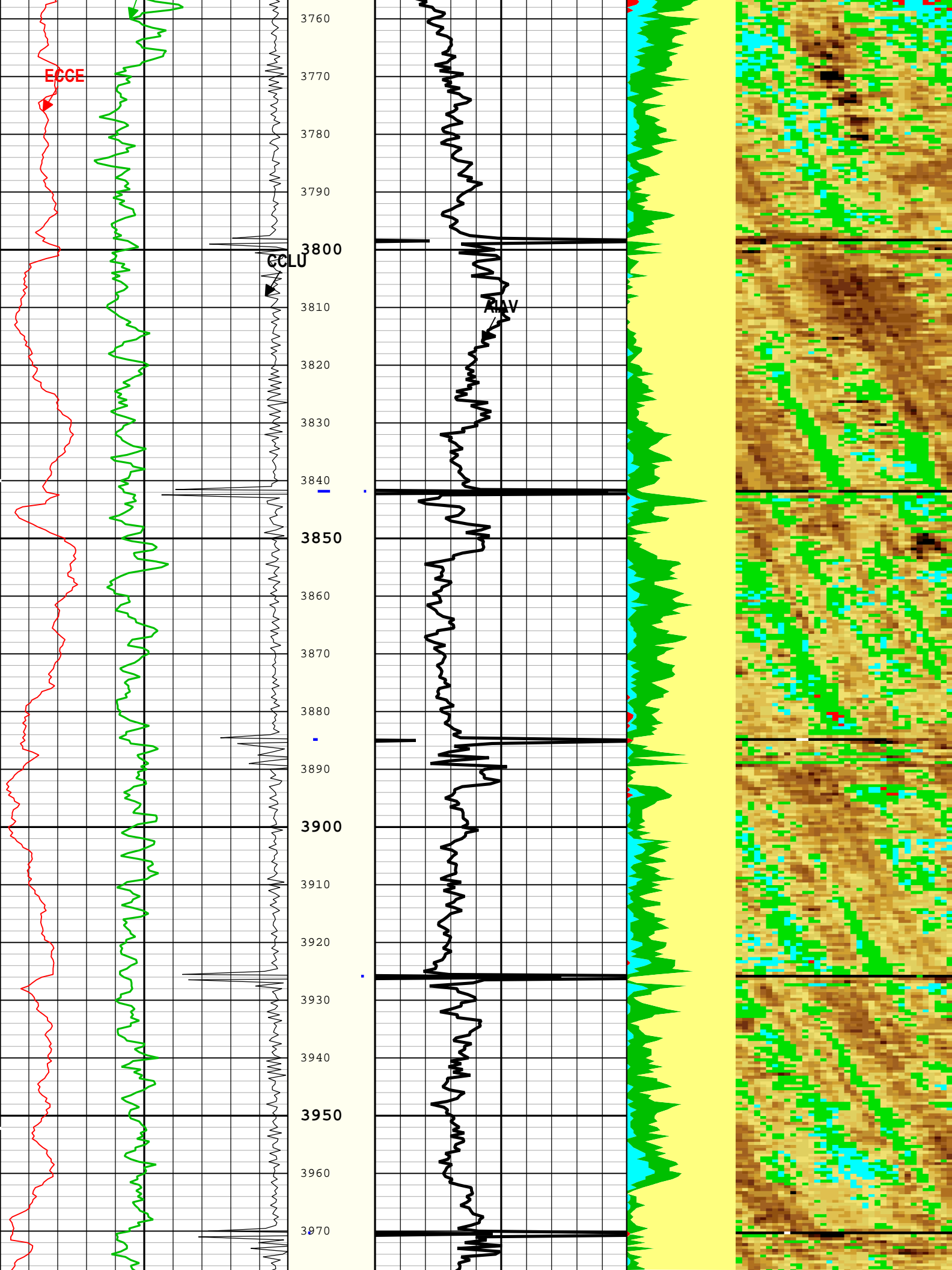


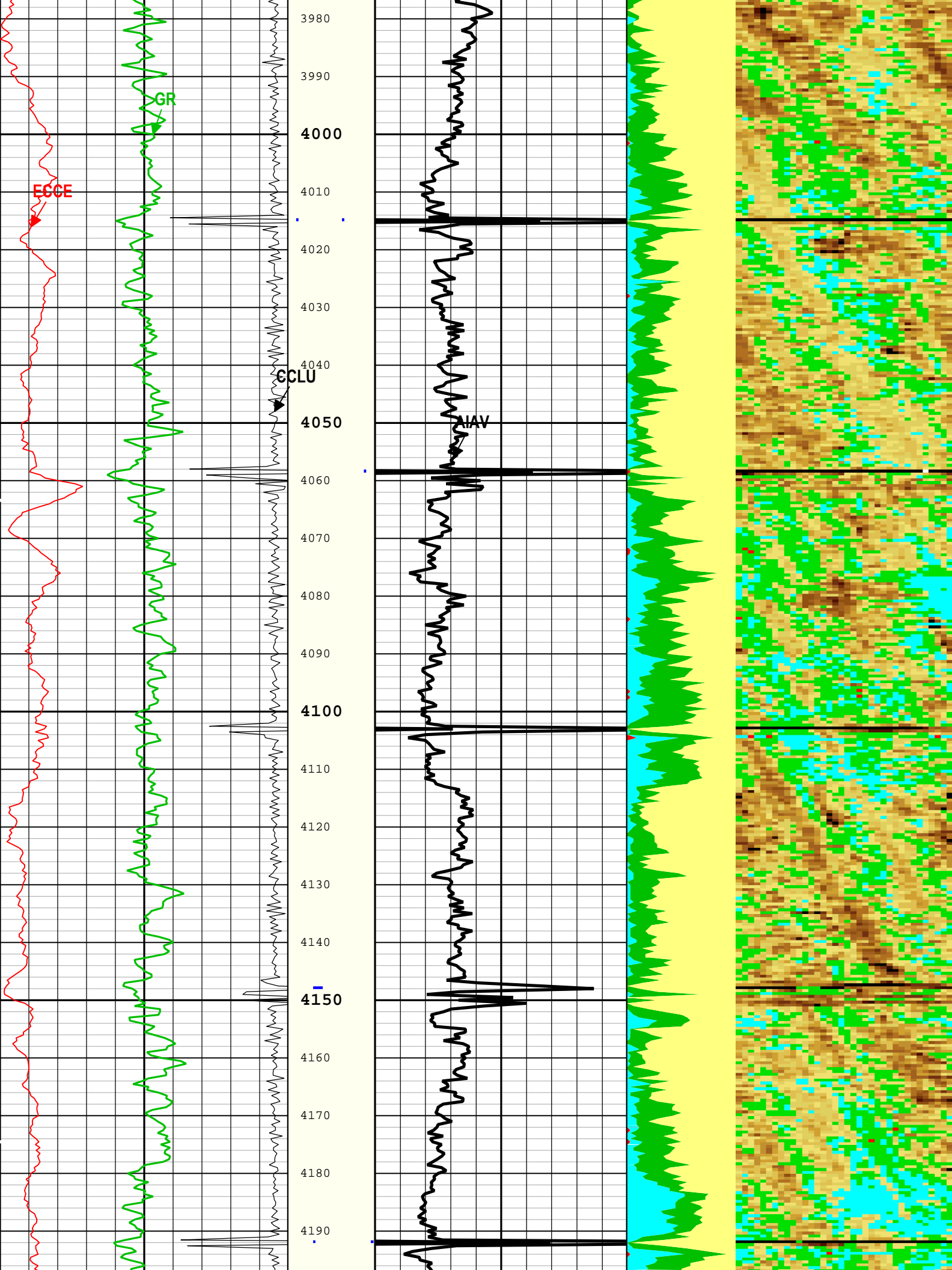


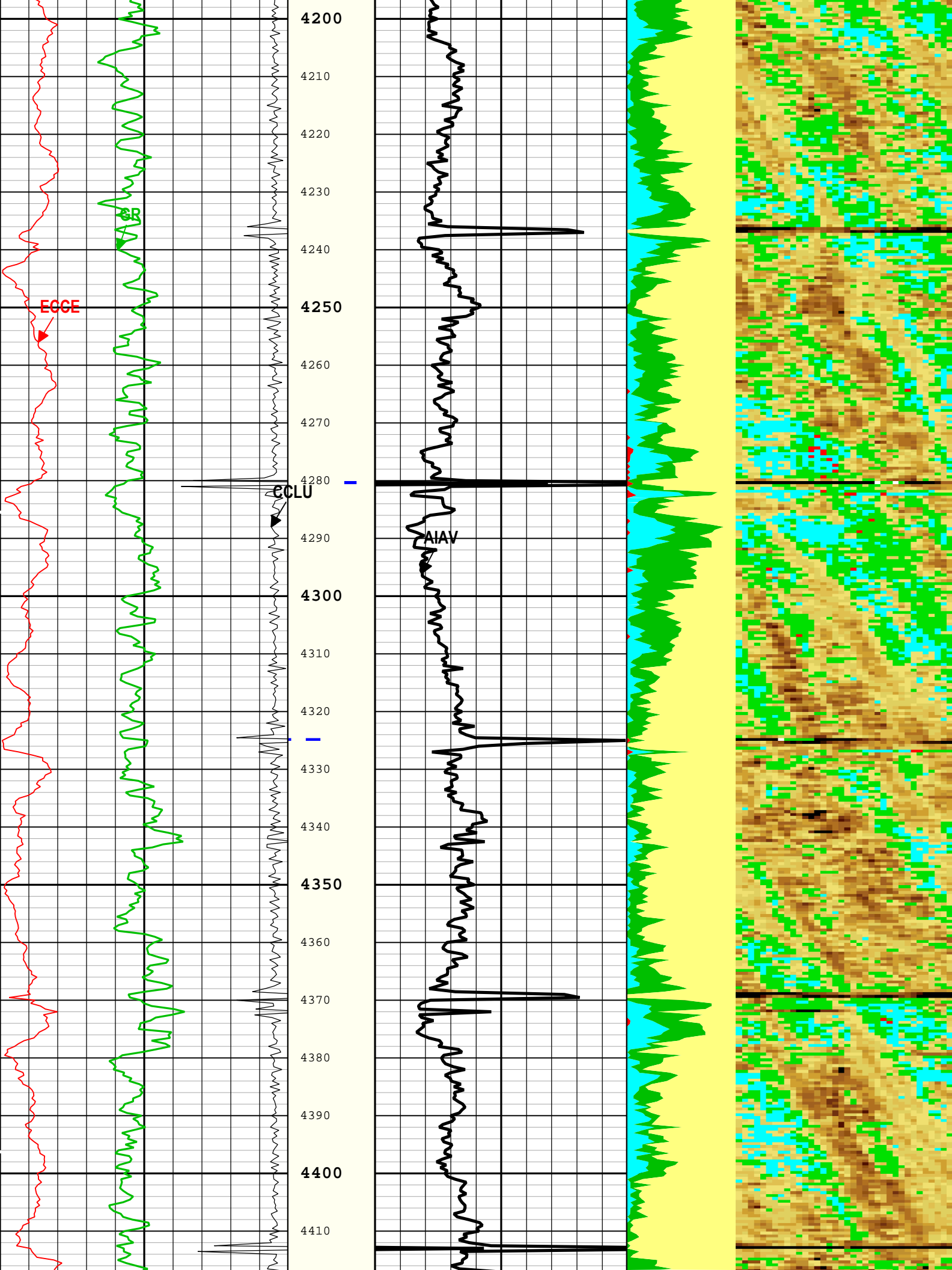


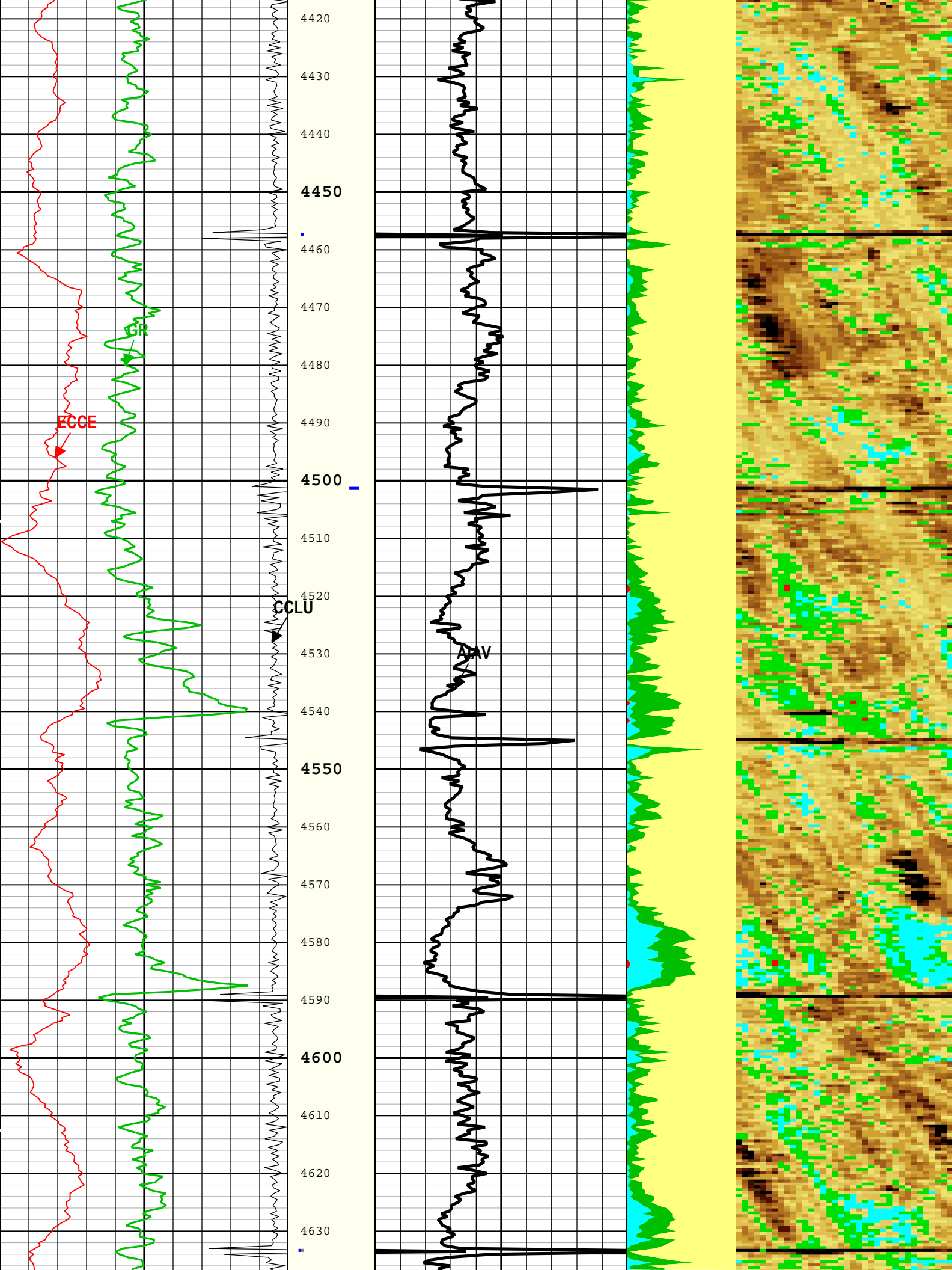


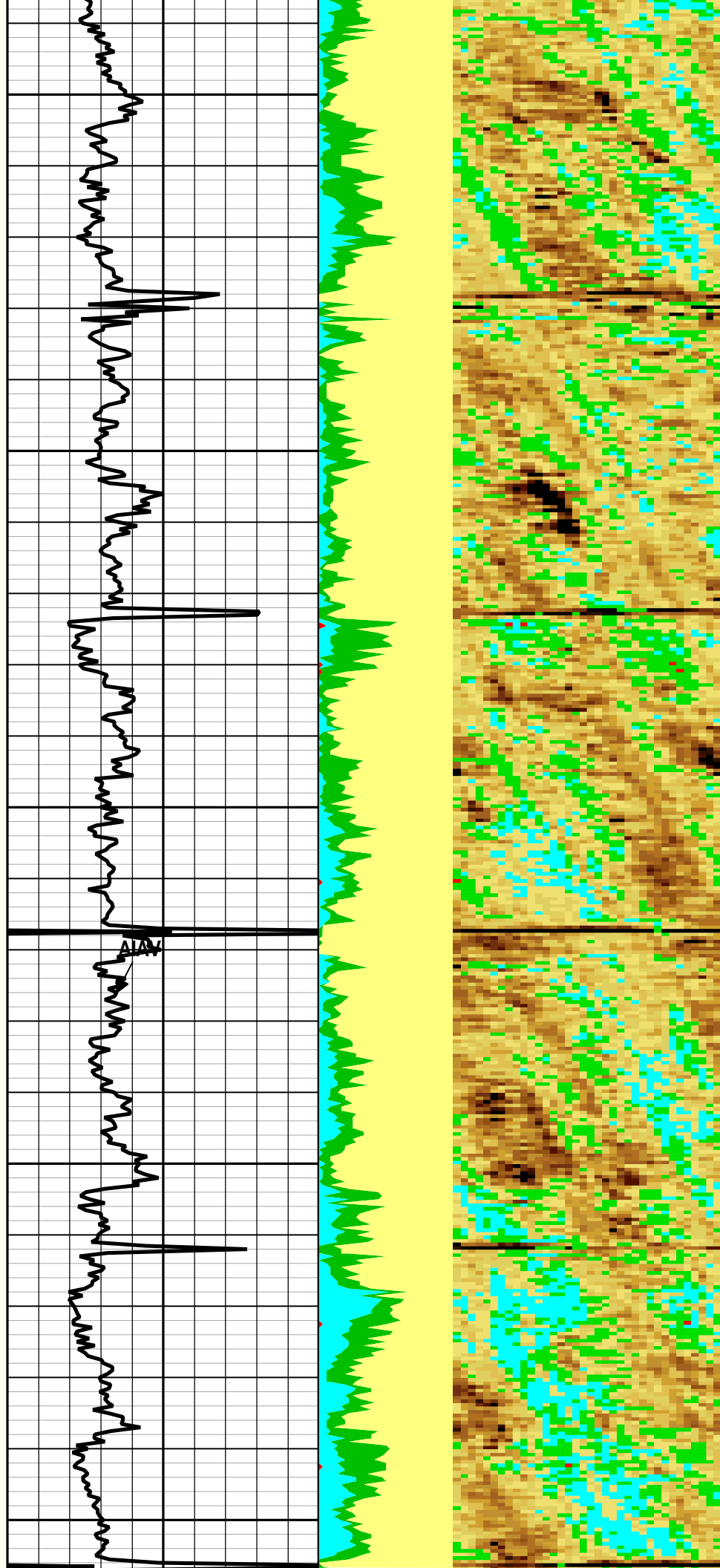
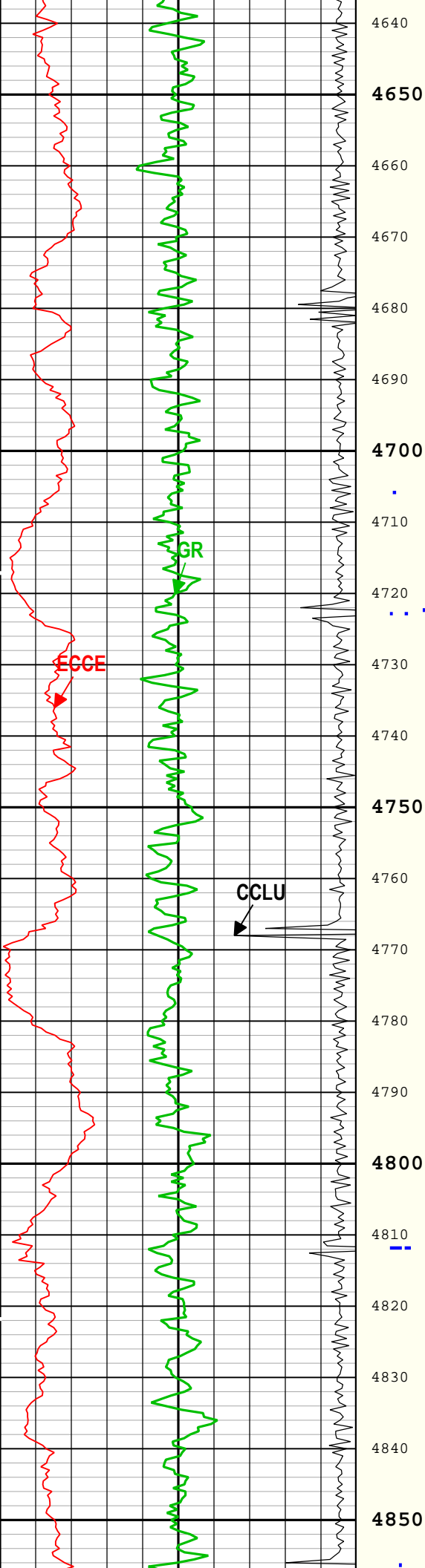


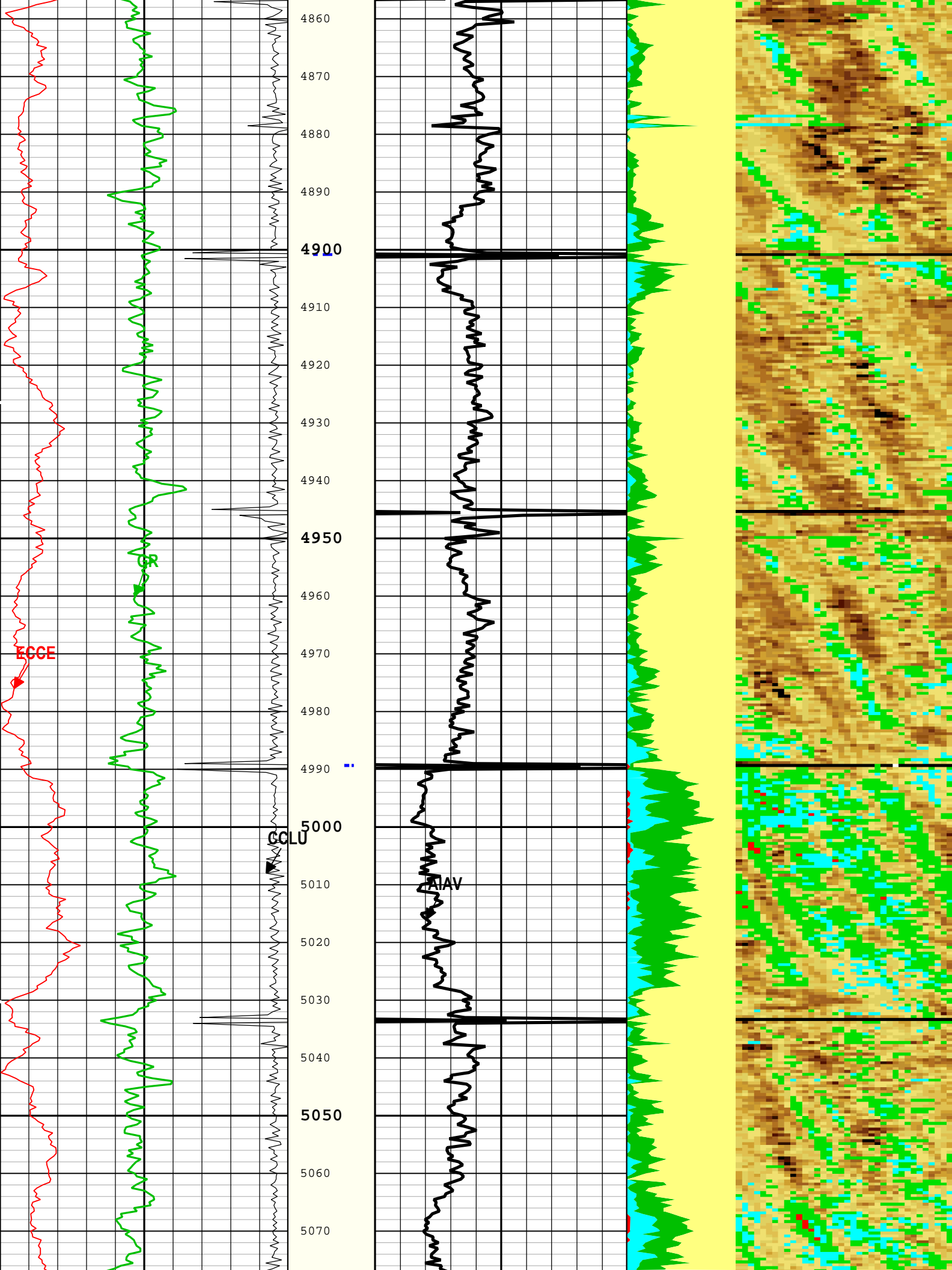


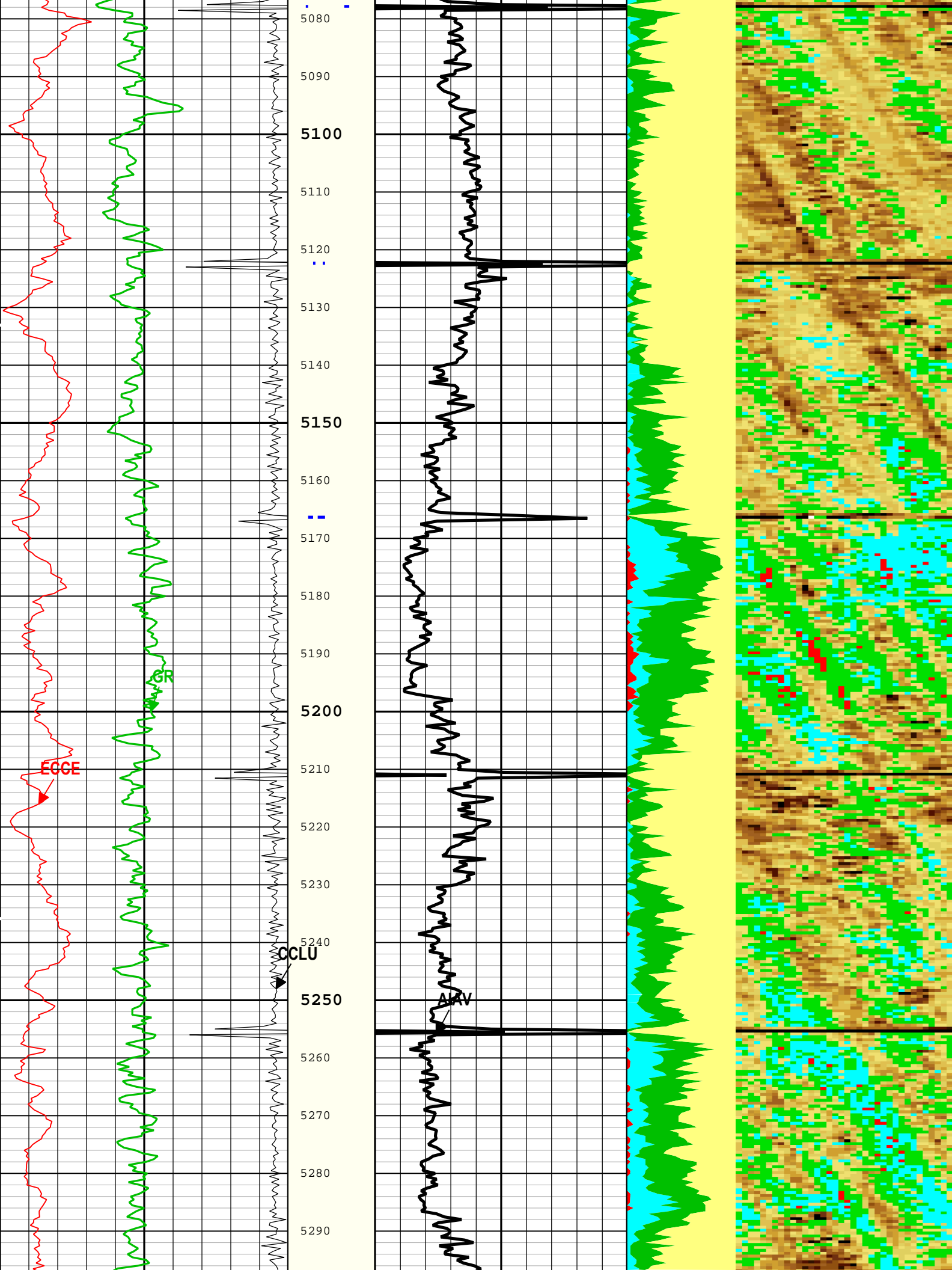


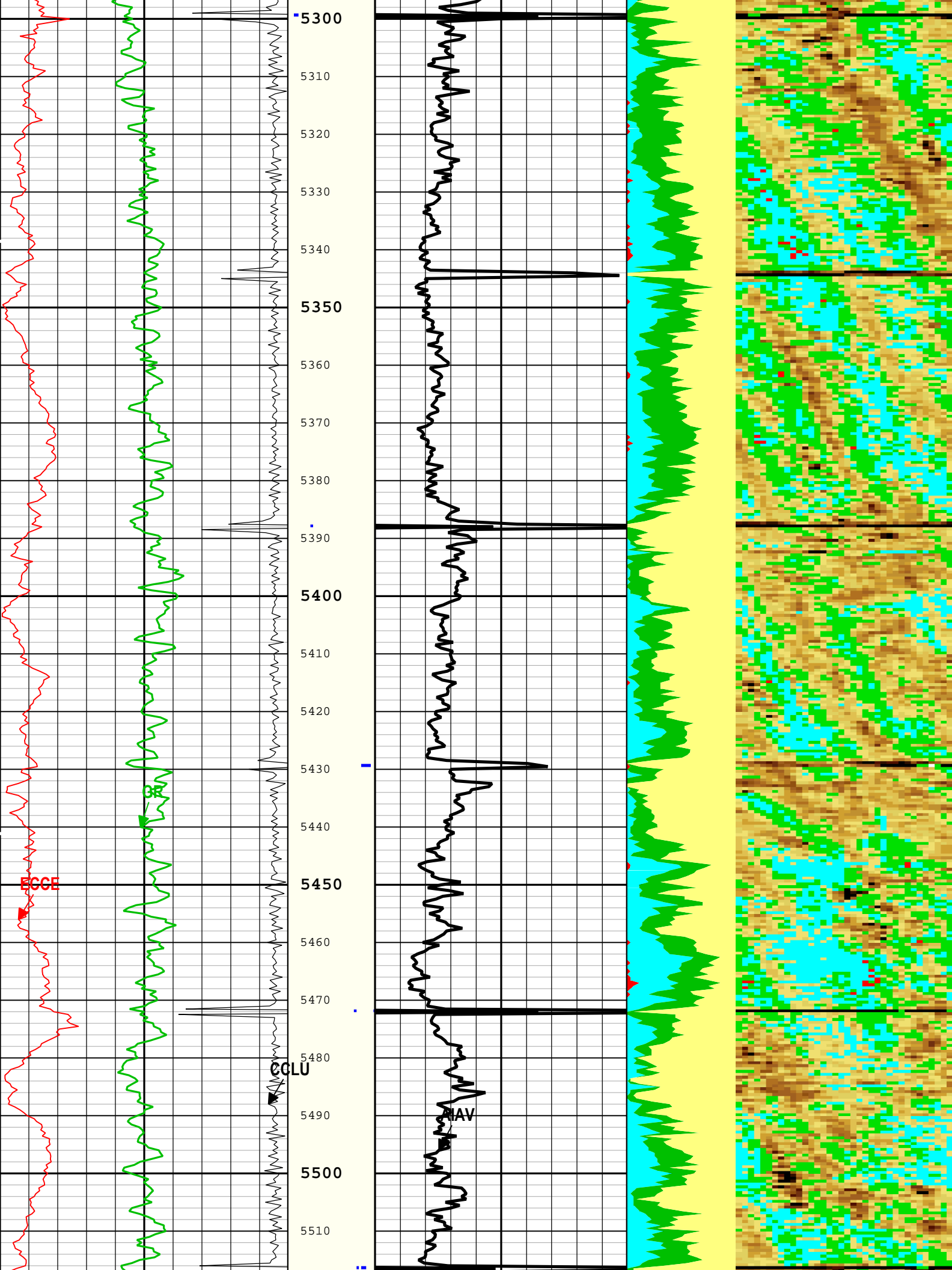


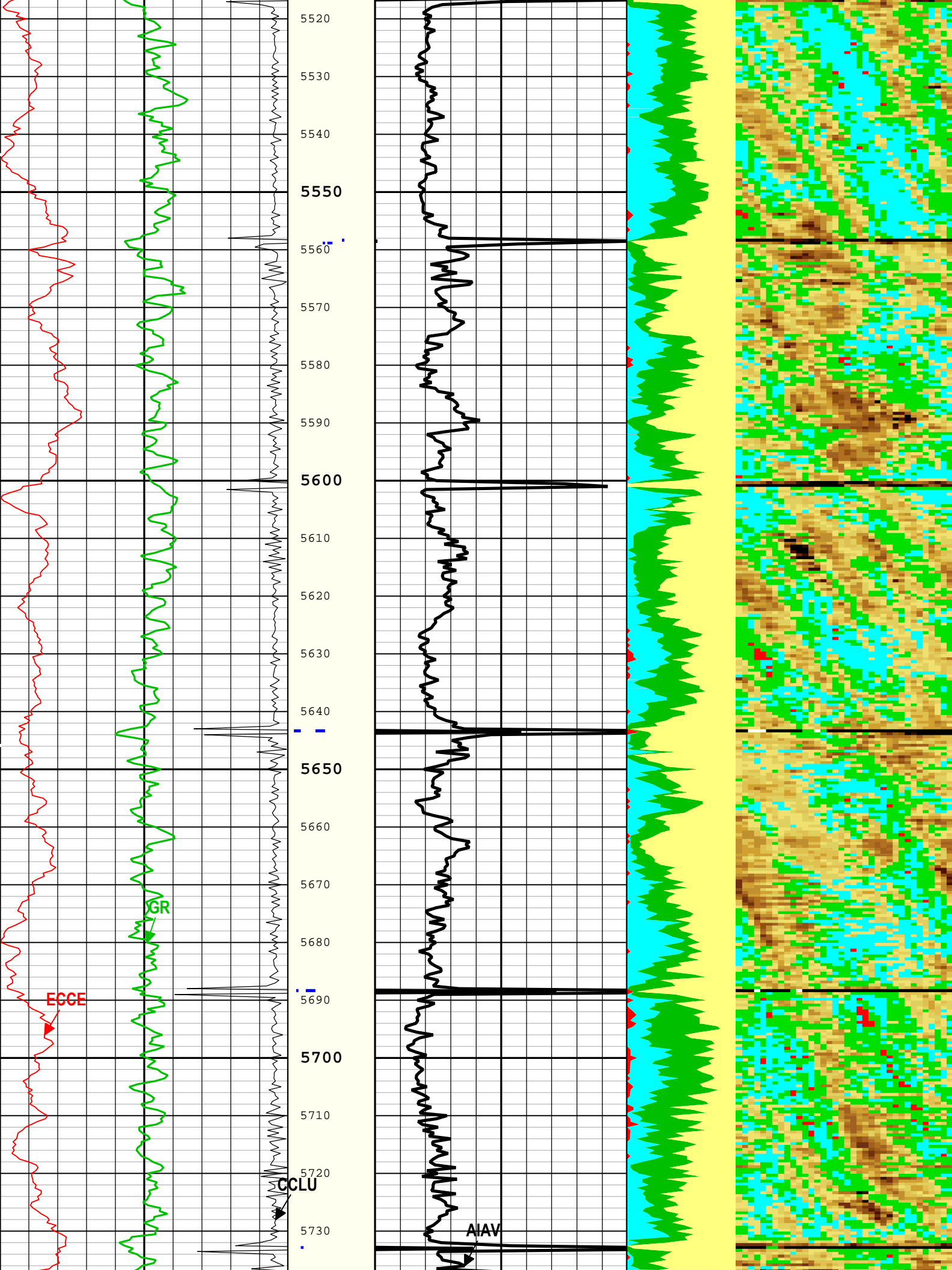


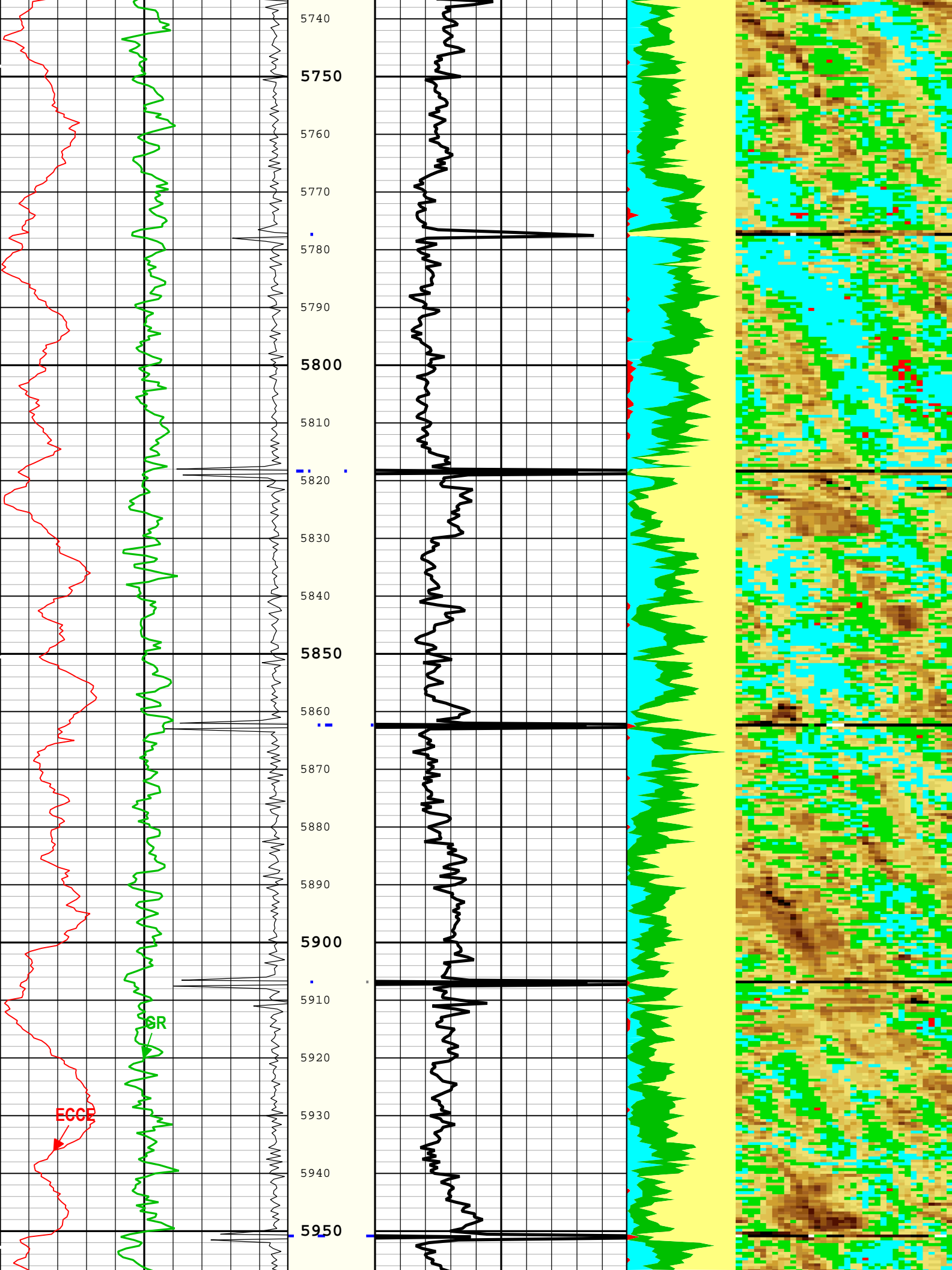


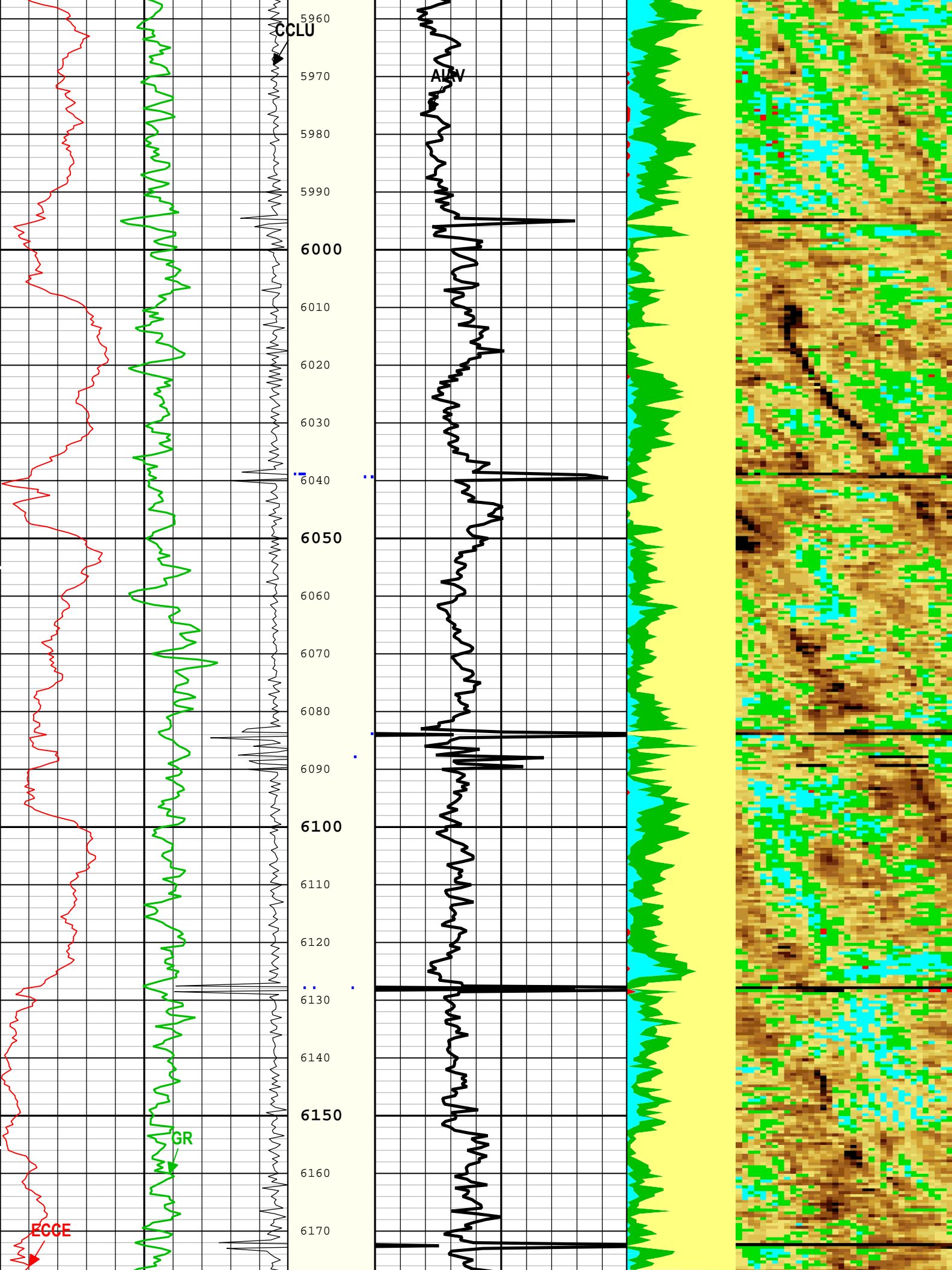


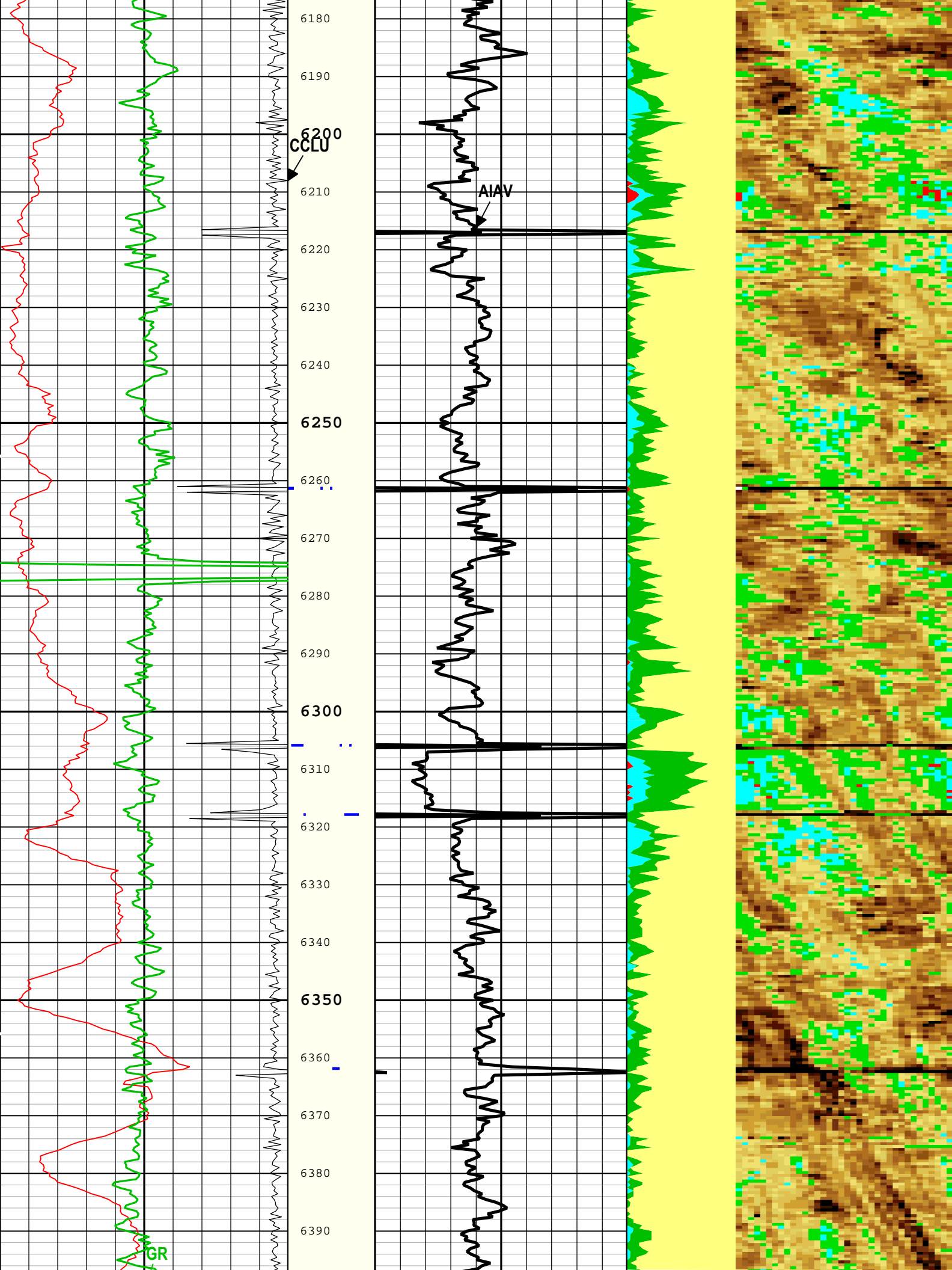


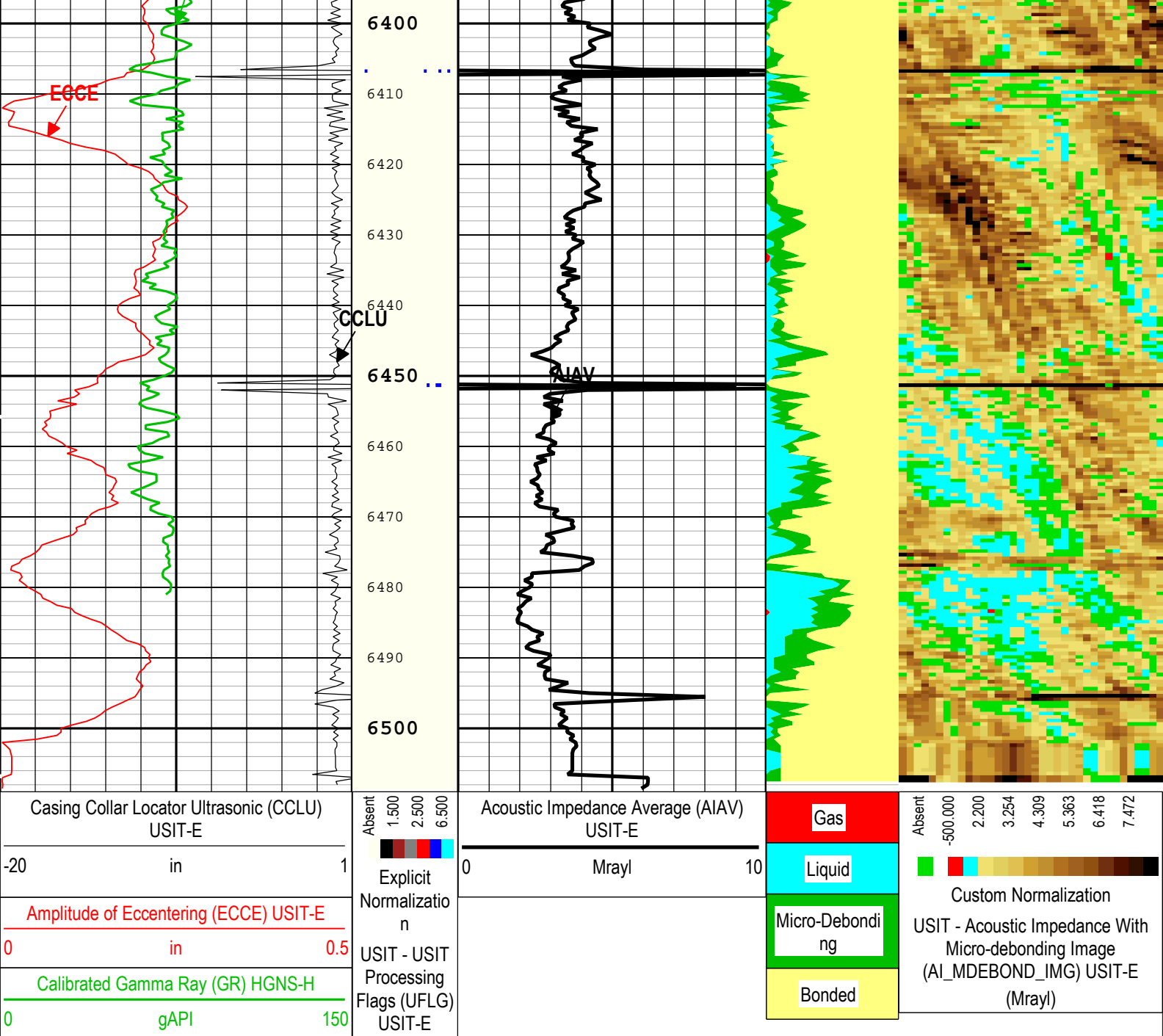












TIME_1900 - Time Marked every 60.00 (s)

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: 31-Mar-2018 15:31:37

Channel Processing Parameters

USIT: 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	
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	1.17	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.15	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0.1	Mrayl
UFGDE	Fiberglass Density	USIT-E	16.27	lbm/gal
UFGPS	Fiberglass Processing Selection	USIT-E	No	
UFGVL	Fiberglass Velocity	USIT-E	9678.48	ft/s
USI_FSOD	USIT USI Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF	
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	1.6	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	15	1957
BS	8.5	1957	6509
All depth are actual.			

Tool Control Parameters	
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USIT: Parameters				
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	48	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
EMXV	EMEX Voltage	USIT-E	45	V
HRES	Horizontal Resolution	USIT-E	10 deg	
TMUC	Type of Mud	USIT-E	BRI	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UMFR	Modulation Frequency	USIT-E	333333	Hz
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 6.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	7000	ft
WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	71.88	us

USIT

0 PSI Repeat Pass

Software Version	
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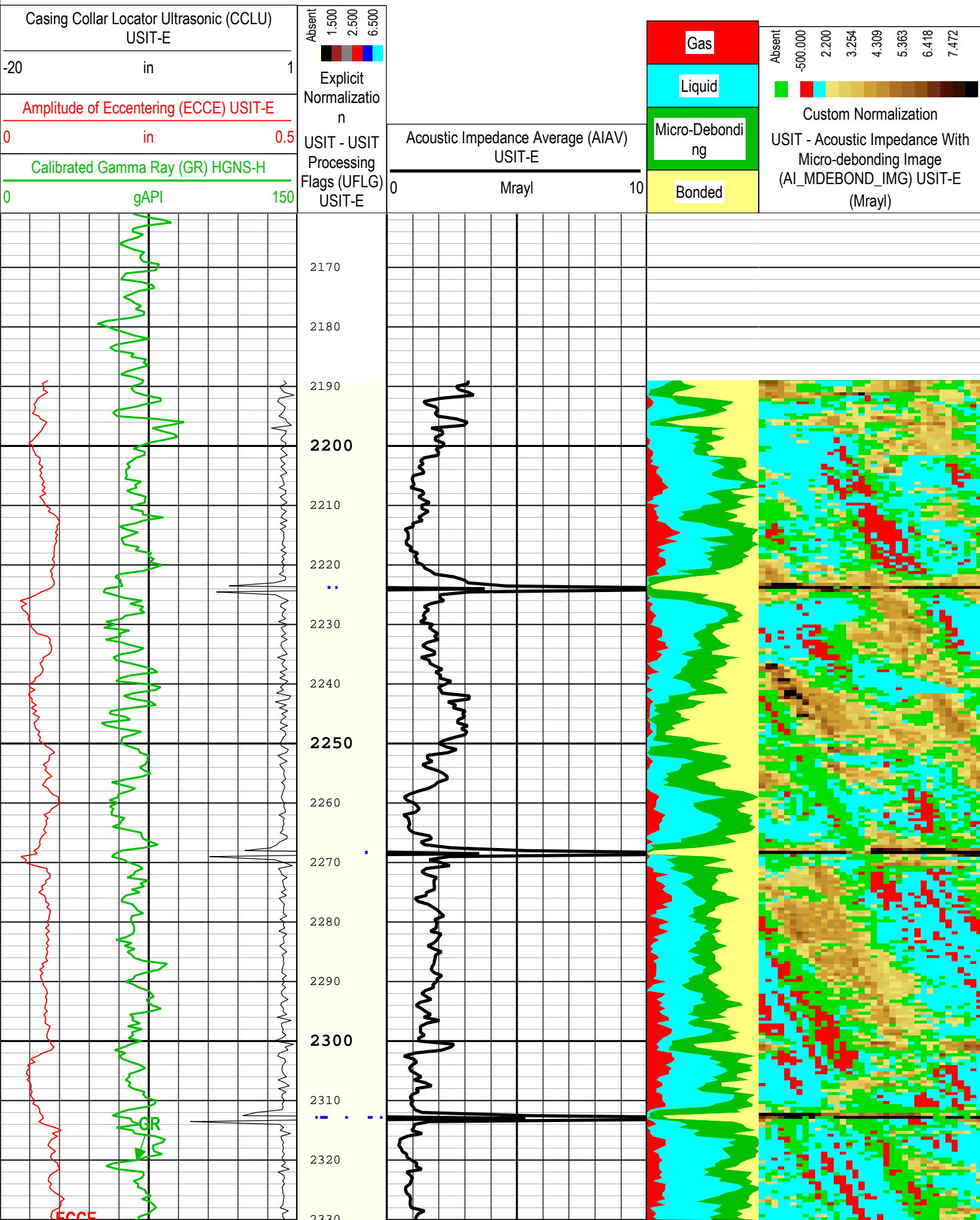
Acquisition System	Version
Maxwell 2017 SP3	7.3.92069.3100

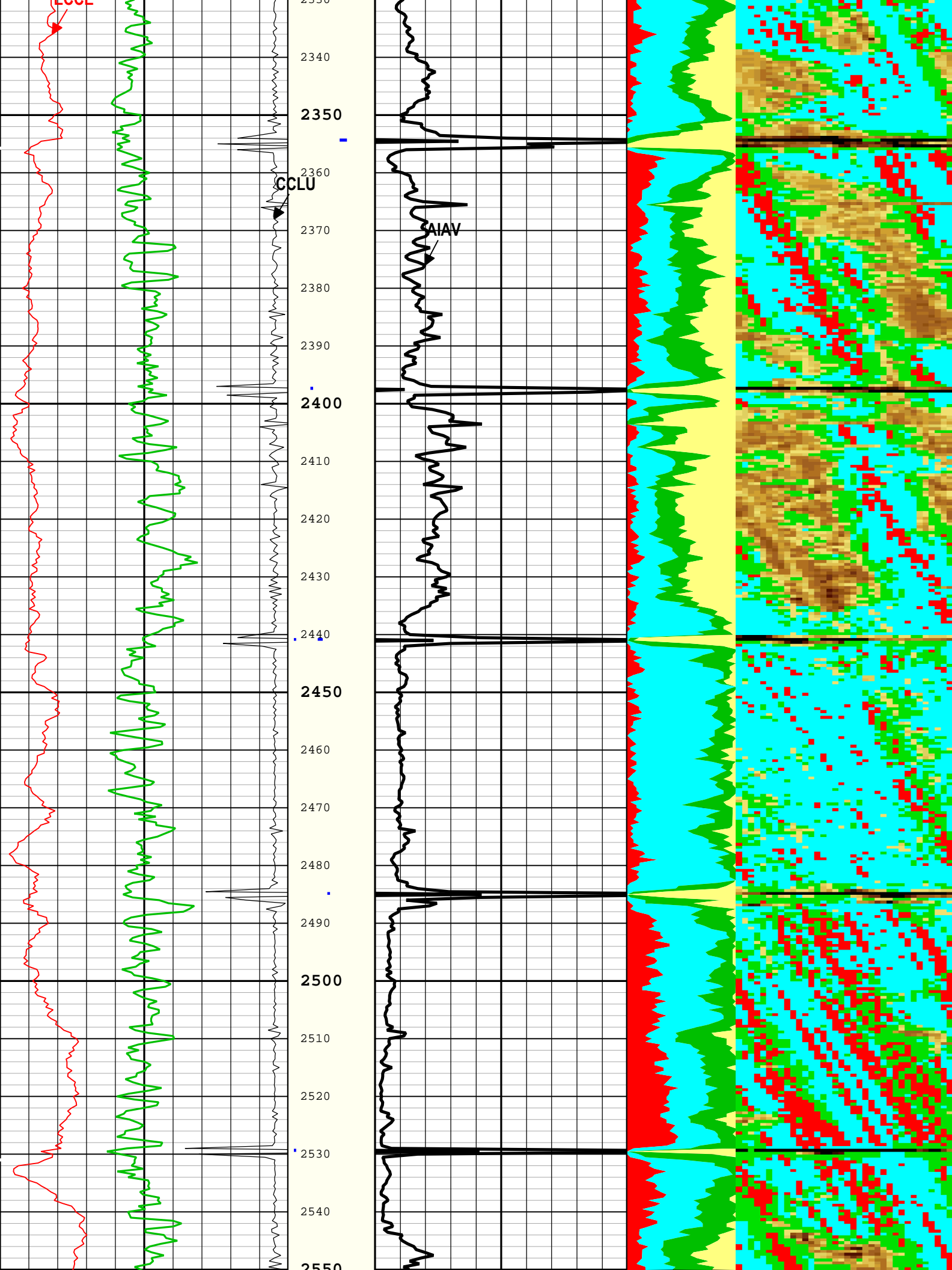
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
USIT	Log[2]:Up	Up	2189.11 ft	2618.37 ft	31-Mar-2018 12:46:18 PM	31-Mar-2018 12:48:56 PM	ON	4.43 ft	Yes
All depths are referenced to toolstring zero									

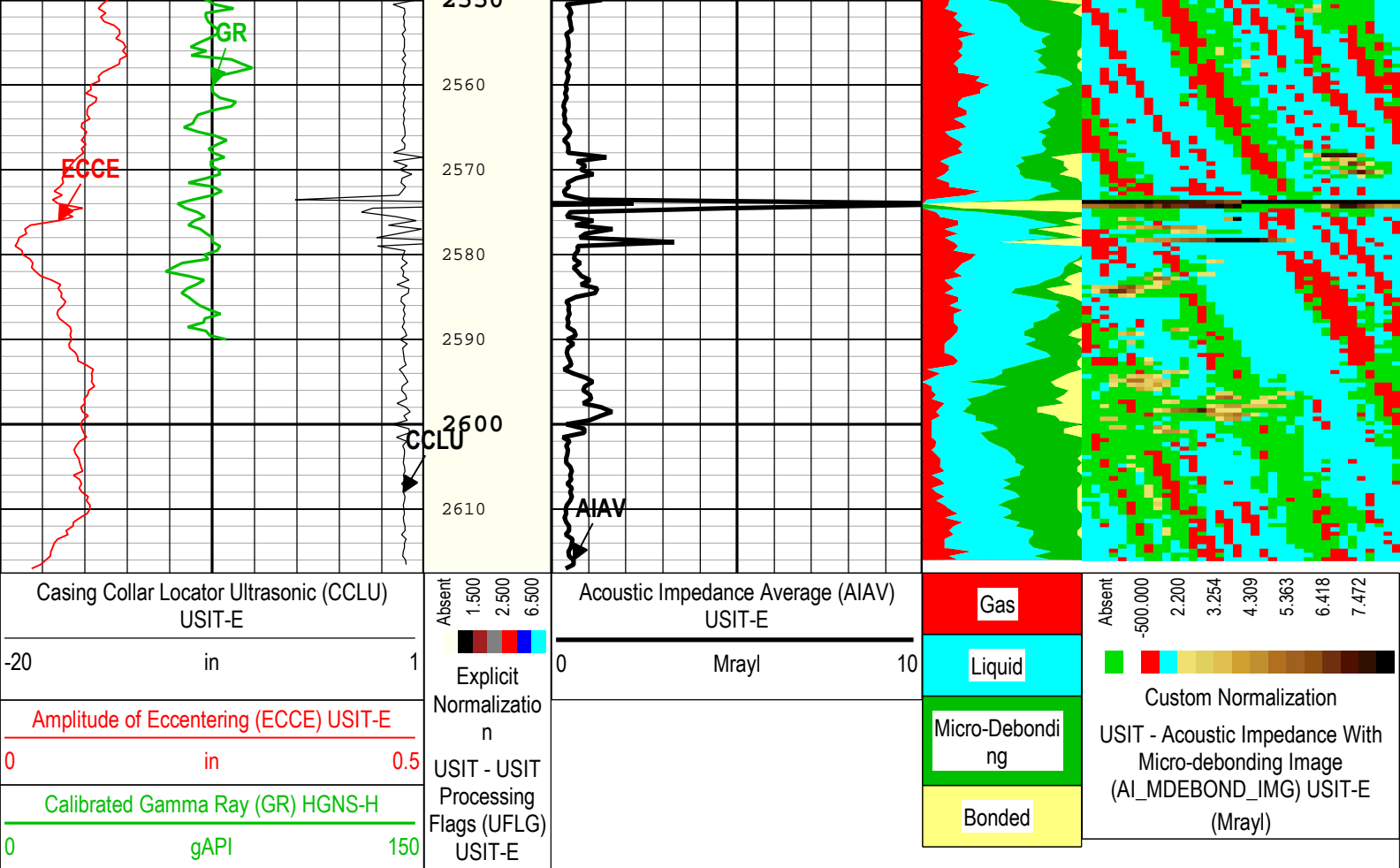
Log	Company:Noble Energy Inc	Well:Centennial State #G34-675
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Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 31-Mar-2018 15:31:55

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: 31-Mar-2018 15:31:55

Channel Processing Parameters				
USIT: Parameters				
Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BS	Bit Size	WLSESSION	8.5	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	
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FDII	FPM Data Interpolation Interval	USIT-E	0	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	22.44	us
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UFGDE	Fiberglass Density	USIT-E	16.27	lbm/gal
UFGPS	Fiberglass Processing Selection	USIT-E	No	
UFGVL	Fiberglass Velocity	USIT-E	9678.48	ft/s
USI_FSOD	USIT USI Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF	
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	1.6	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

USIT: Parameters

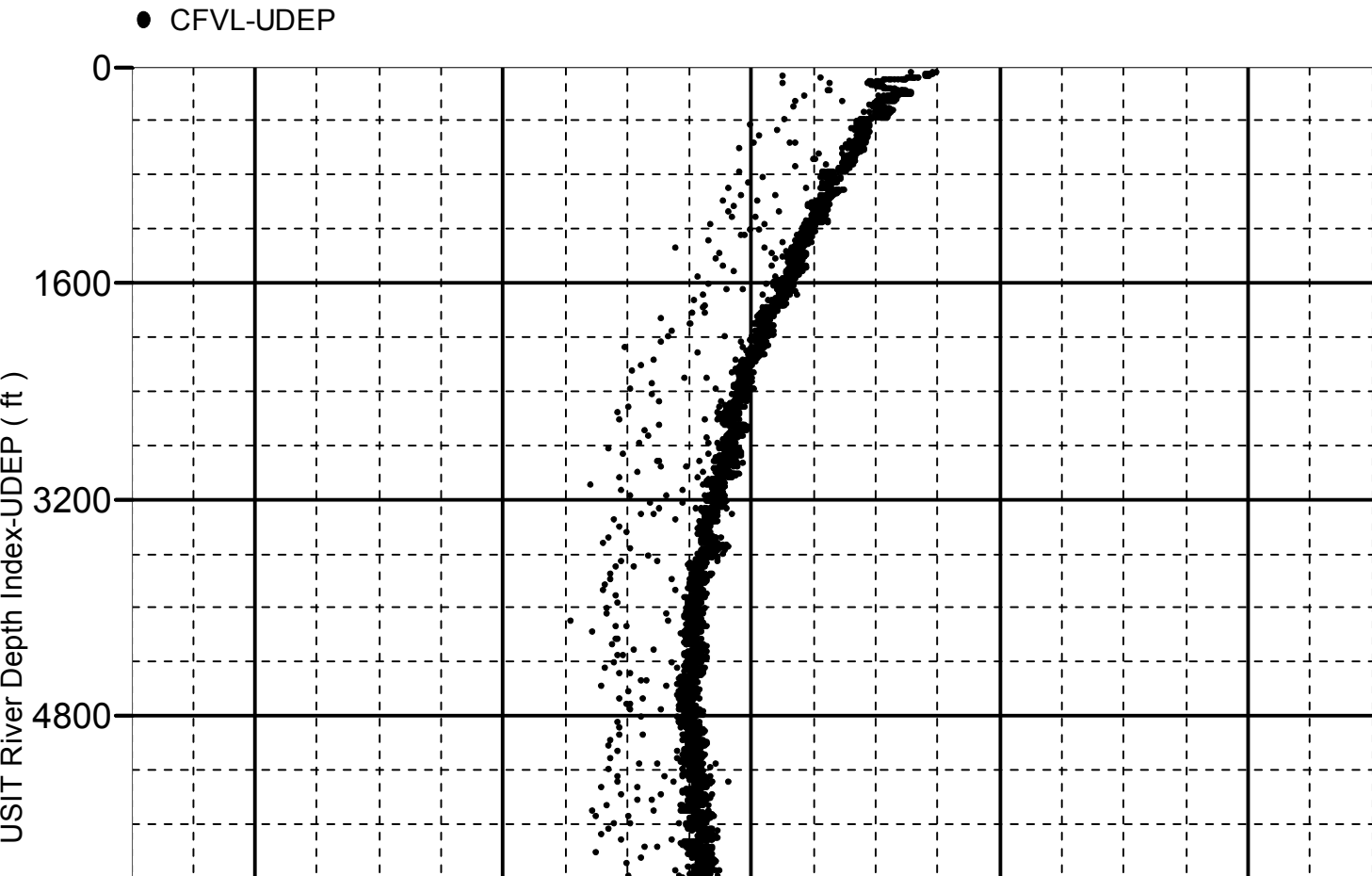
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
EMXV	EMEX Voltage	USIT-E	45	V
HRES	Horizontal Resolution	USIT-E	10 deg	
TMUC	Type of Mud	USIT-E	BRI	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UMFR	Modulation Frequency	USIT-E	333333	Hz
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 6.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	7000	ft
WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	71.88	us

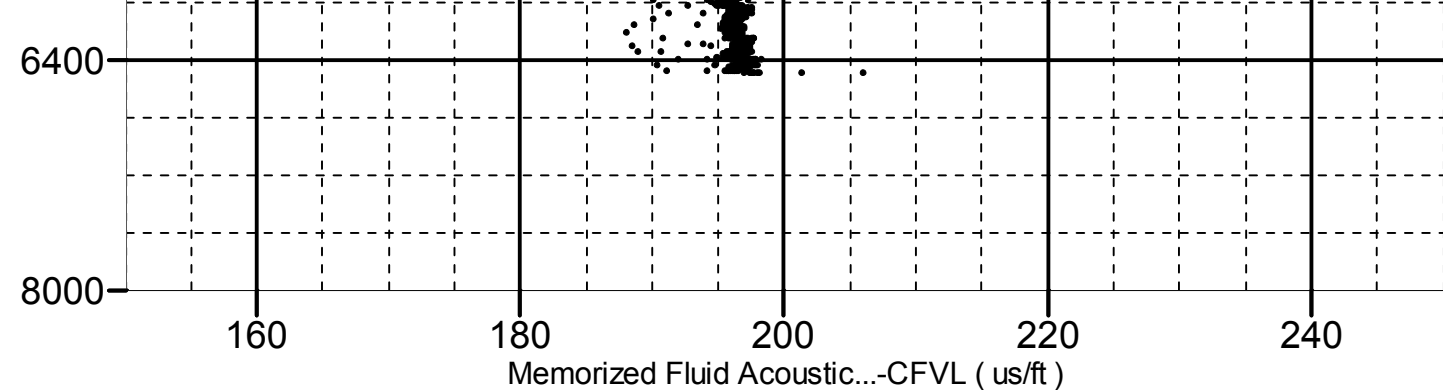
XYZ

Company:Noble Energy Inc Well:Centennial State #G34-675
USIT: Log[4]:Up:S005

Fluid Acoustic Slowness vs Depth
2D Cross Plot

Index Range: From 6509.00 to 43.00 ft

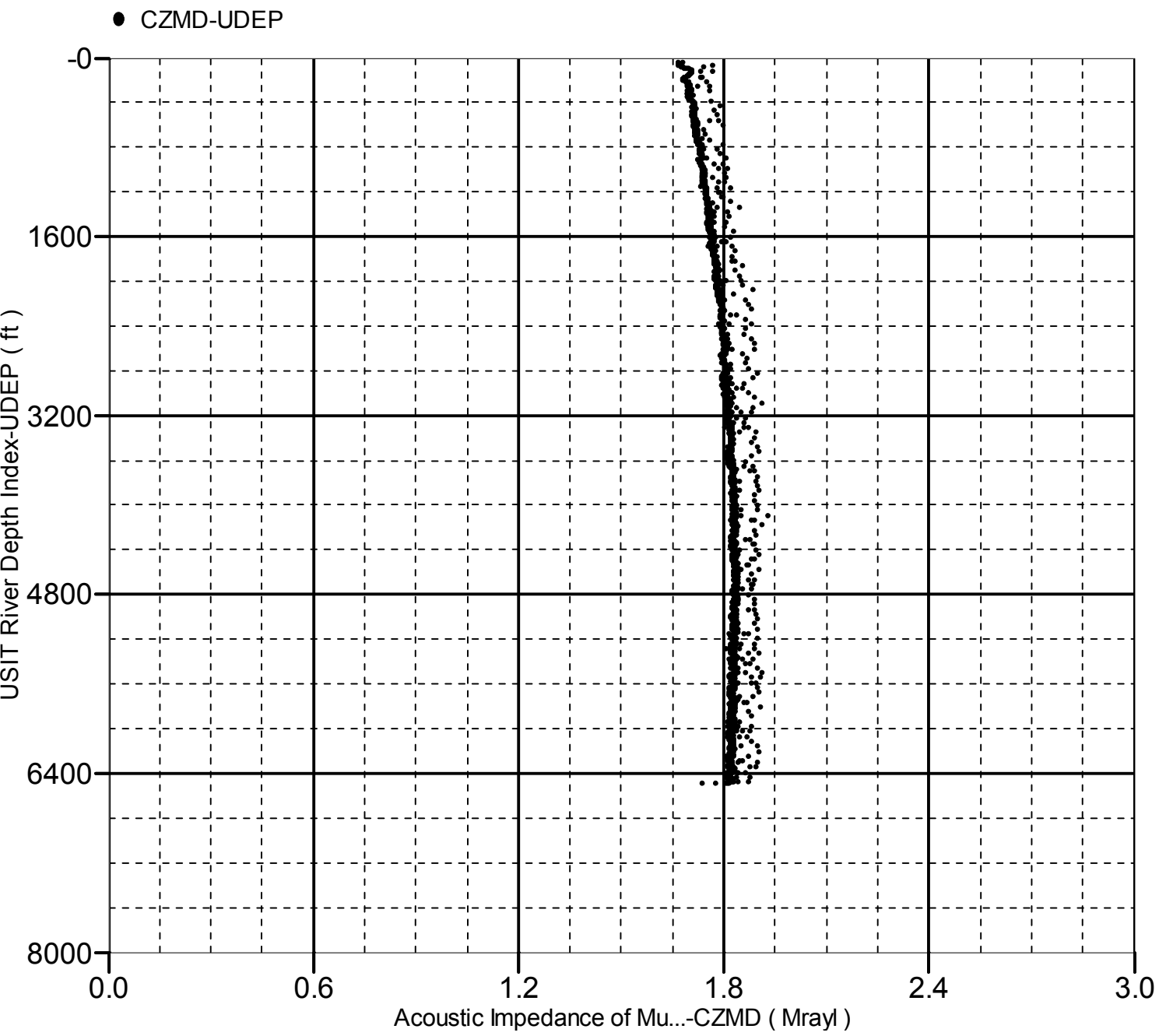




Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6509.00 to 43.00 ft



Company:	Noble Energy Inc	Schlumberger
Well:	Centennial State #G34-675	
Field:	Wattenberg	
County:	Weld	
State:	Colorado	

UltraSonic Summary Print

