

Company: Noble Energy Inc

Well: DIAMONDBACK FEDERAL LC22-770

Field: WILDCAT

County: WELD State: COLORADO

UltraSonic Summary Print

County:	WELD				
Field:	WILDCAT				
Location:	400' FNL & 1312' FWL				
Well:	DIAMONDBACK FEDERAL LC10-770				
Company:	Noble Energy Inc				
		Location:			
		400' FNL & 1312' FWL	Elev.:	K.B.	4975.00 ft
		NENW		G.L.	4945.00 ft
				D.F.	4975.00 ft
		Permanent Datum:	Ground Level		
		Log Measured From:	Kelly Bushing	30.00 ft	above Perm.Datum
		Drilling Measured From:	Kelly Bushing		
		API Serial No.	Section:	Township:	Range:
		05-123-42970	22	9N	59W
Logging Date	25-Jul-2017				

Run Number	ONE	
Depth Driller	10928.00 ft	
Schlumberger Depth	6254.00 ft	
Bottom Log Interval	6254.00 ft	
Top Log Interval	50.00 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	1958.00 ft	
To	6254.00 ft	
Casing/Tubing Size	5.5 in	
Weight	20 lbm/ft	
Grade	P110	
From	0.00 ft	
To	6254.00 ft	
Max Recorded Temperatures	214 degF	
Logger on Bottom	25-Jul-2017	14:00:00
Unit Number	Location:	Time
Recorded By	2132	MEGAN LEONE
Witnessed By	BILL MANSFIELD	MOORE

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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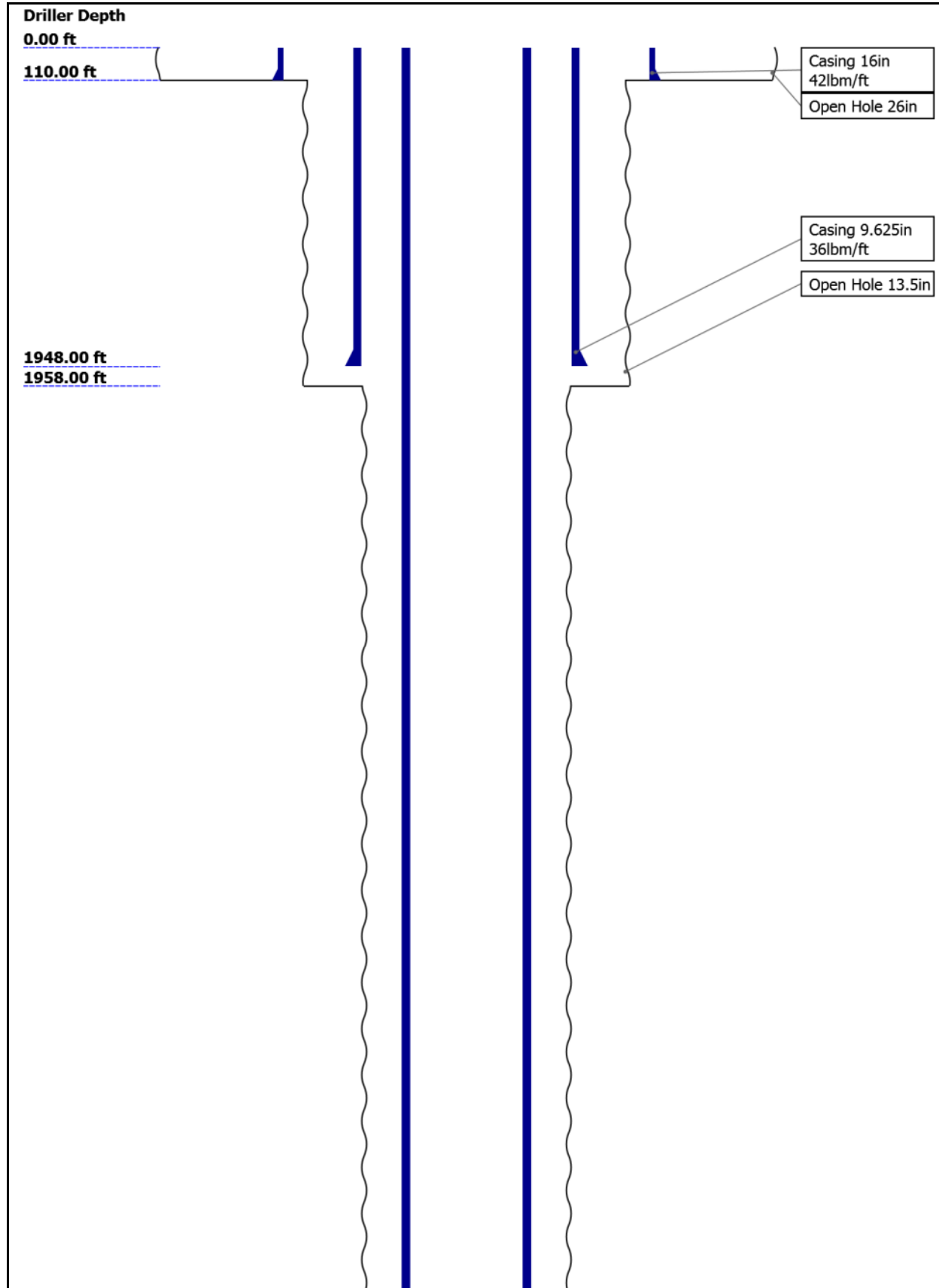
9.4 Log (DJ Basin Ultrasonic Cement Summary
Report)

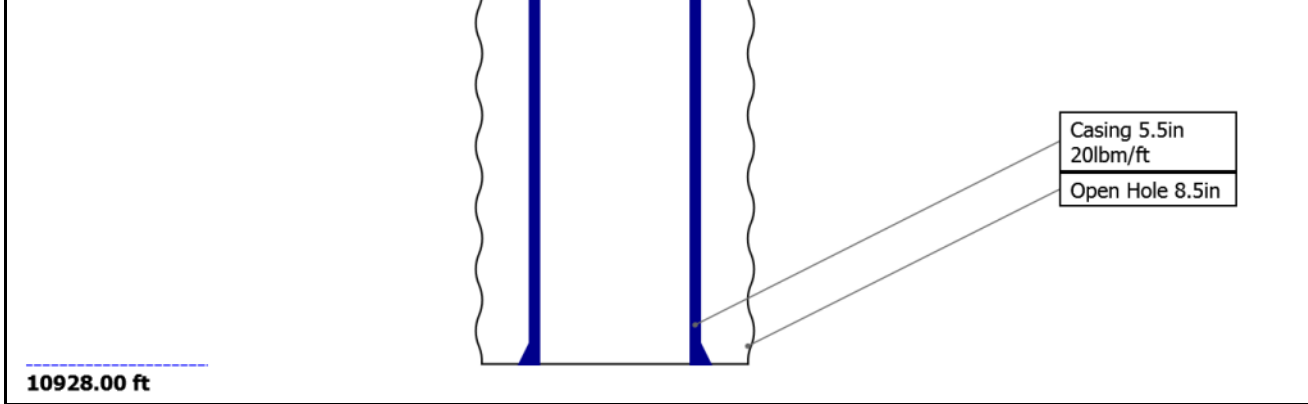
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in)

Well Sketch



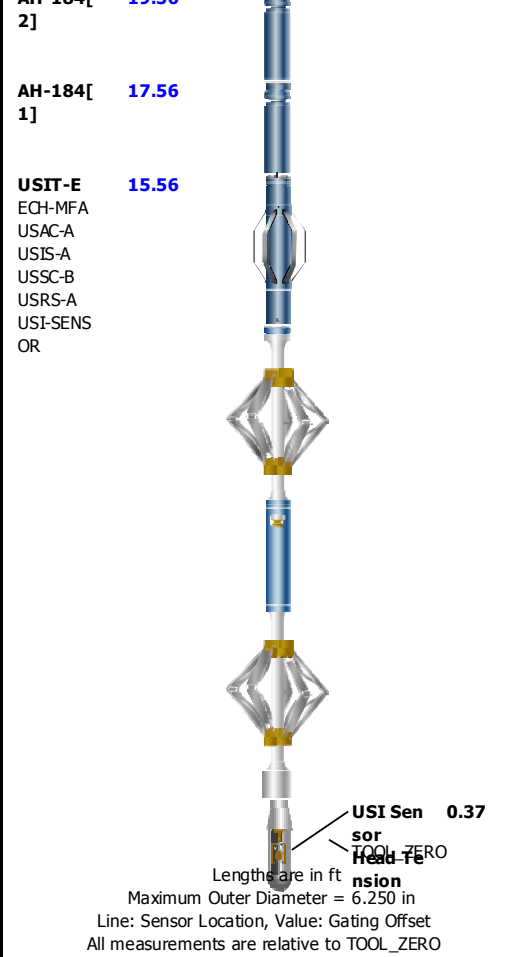


Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	0	110	1958			
Top Logger (ft)	0	110	1958			
Bottom Driller (ft)	110	1958	10928			
Bottom Logger (ft)	110	1958	6254			
Casing						
Size (in)	16	9.625	5.5			
Weight (lbm/ft)	42	36	20			
Inner Diameter (in)	15.512	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	1948	10928			
Bottom Logger (ft)	110	1948	6254			

Remarks and Equipment Summary

ONE: Toolstring			ONE: Remarks		
<div><div><div>Equip nameLength</div><div>LEH-QT34.88</div><div>LEH-QT</div></div><div><div><div>DTC-H31.97</div><div>ECH-KC</div><div>DTC-H</div></div><div><div><div>HGNS-H28.97</div><div>HGNH</div><div>NPV-N</div><div>NSR-F:5010</div><div>HGNS-H</div><div>HACCZ-H:4626</div><div>HMCA-H</div></div><div><div><div>AH-184T19.56</div></div></div></div><div><div><div>CNL Porosity</div><div>HMCA</div><div>HGNS</div><div>Accelerometer</div></div><div><div>CTEM</div><div>HV</div><div>TelStatus</div><div>ToolStatus</div><div>Temperature</div><div>GR</div></div></div><div><div>MP name</div><div>Offset</div></div></div></div>	THANK YOU FOR CHOOSING SCHLUMBERGER!				
	TOOLSTRING RUN AS PER TOOLSKETCH				
	BOTTOM HOLE TEMPERATURE 214 DEG F				
	REPEAT PASS RUN UNDER 0 PSI				
	MAIN PASS RUN UNDER 2500 PSI				



USIT - Fluid Properties Measurement

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[6]:Up	6265.22	59.08

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 : 430.37m(1411.98ft) to 439.78m(1442.86ft)
 MUD_N_FRP = 1.05
 DFD = 1.01g/cm3(8.40lbm/gal)
 CZMD median computed in free pipe normalization interval = 1.61 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	7.0.78557.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[6]:Up	Up	59.08 ft	6265.23 ft	25-Jul-2017 2:07:06 PM	25-Jul-2017 2:45:47 PM	ON	6.50 ft	Yes

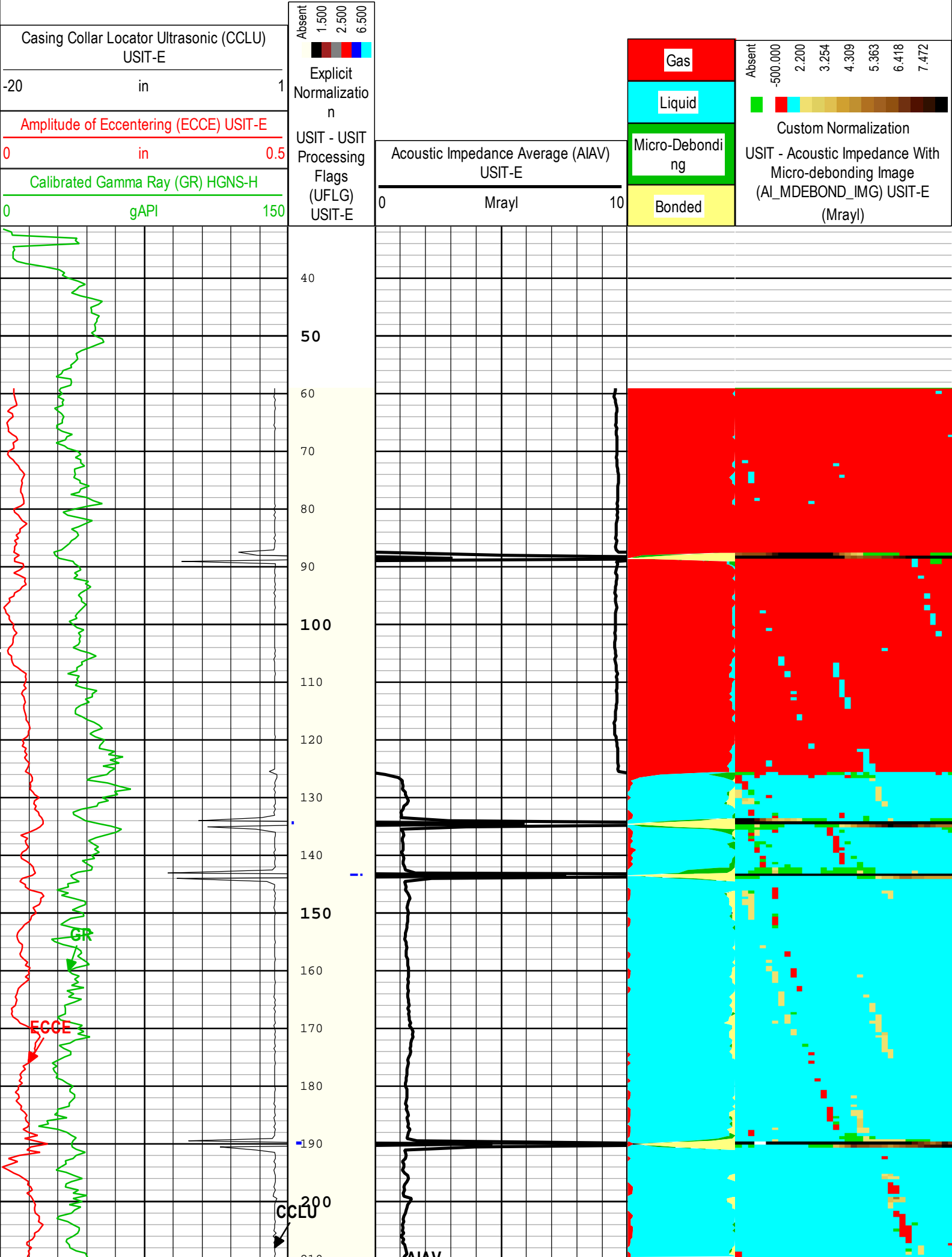
All depths are referenced to toolstring zero

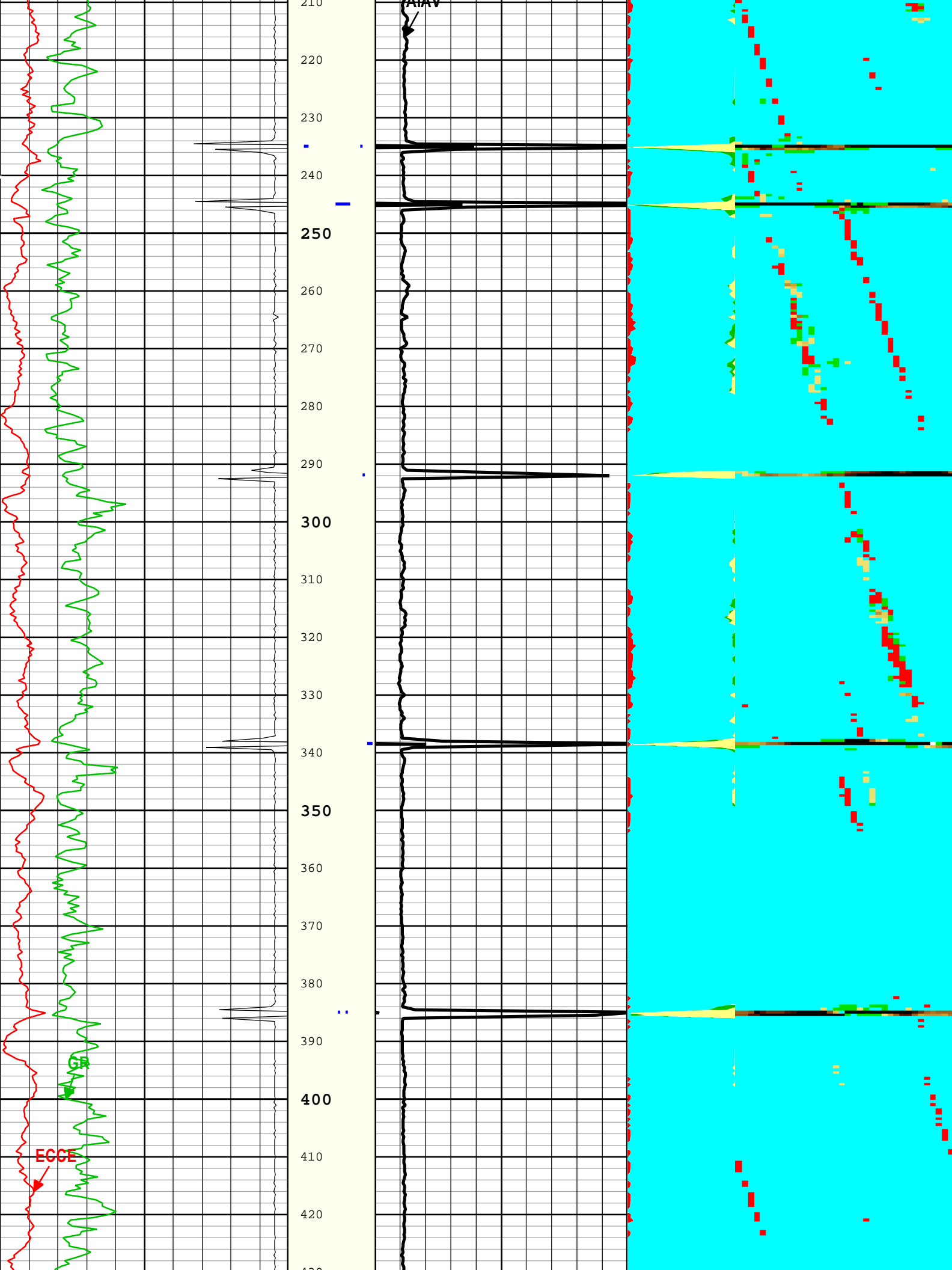
Log	Company:Noble Energy Inc	Well:DIAMONDBACK FEDERAL LC10-770
		ONE: Log[6]:Up:S004

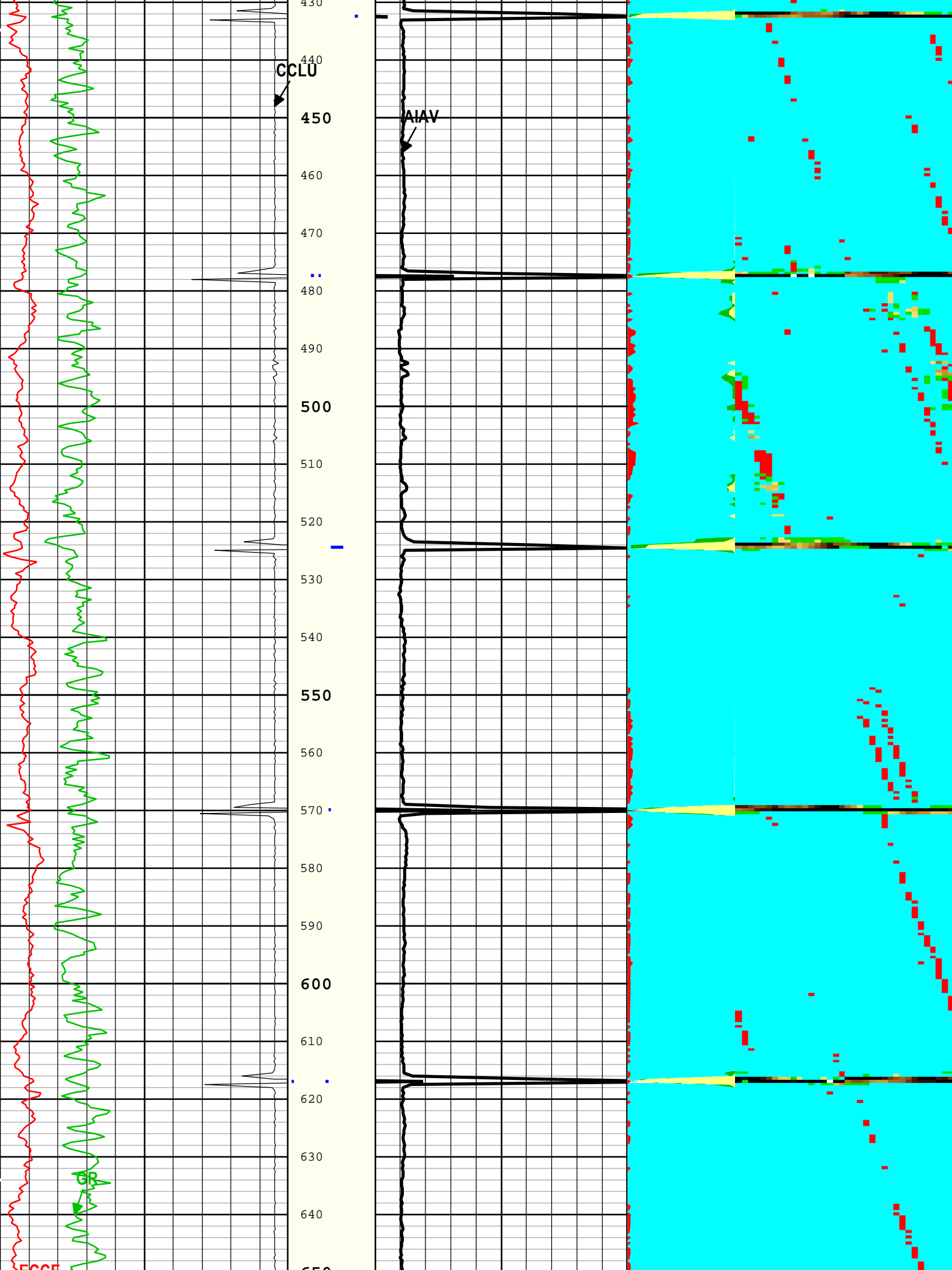
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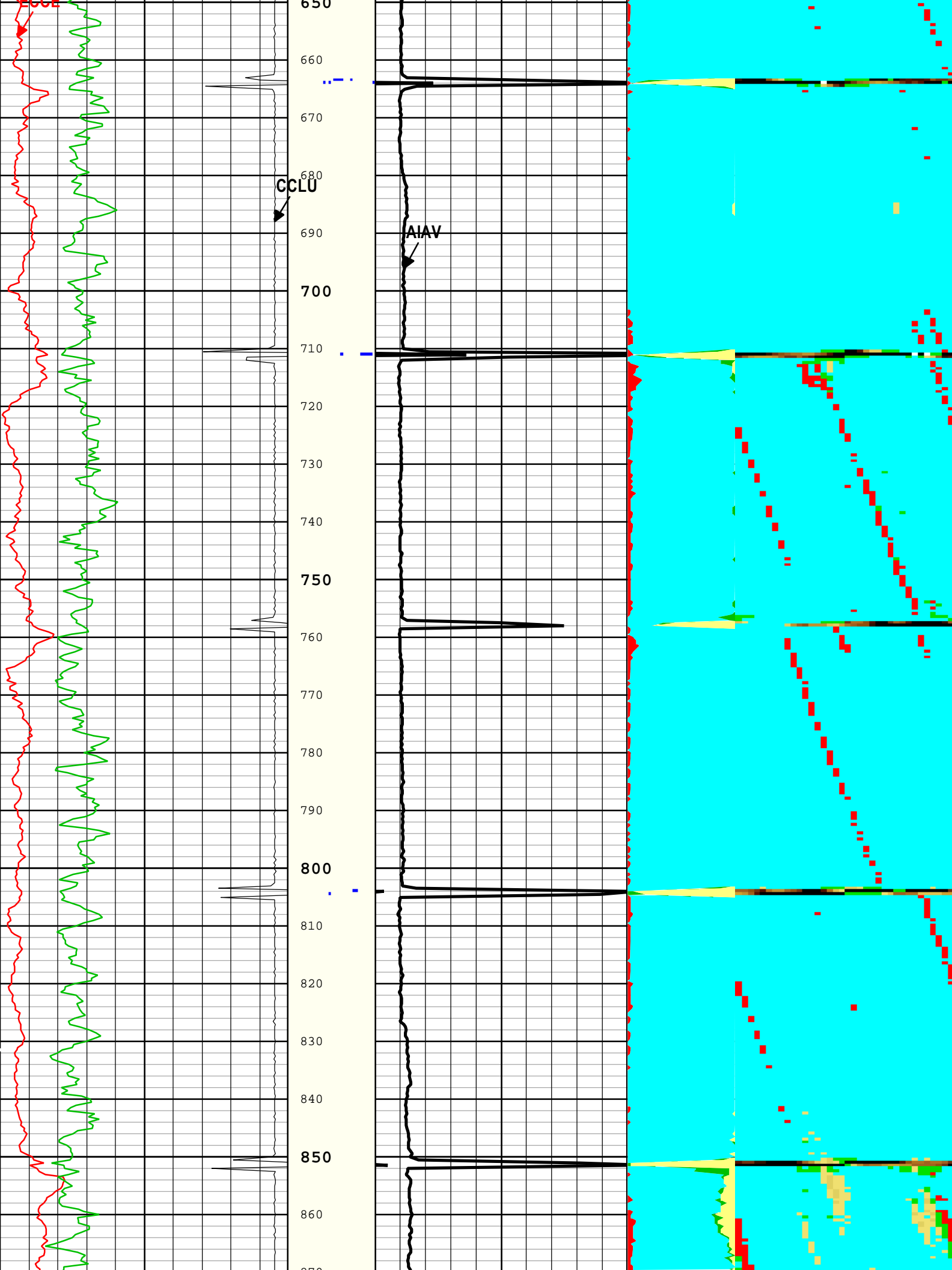
TIME 1900 - Time Marked every 60.00 (s)

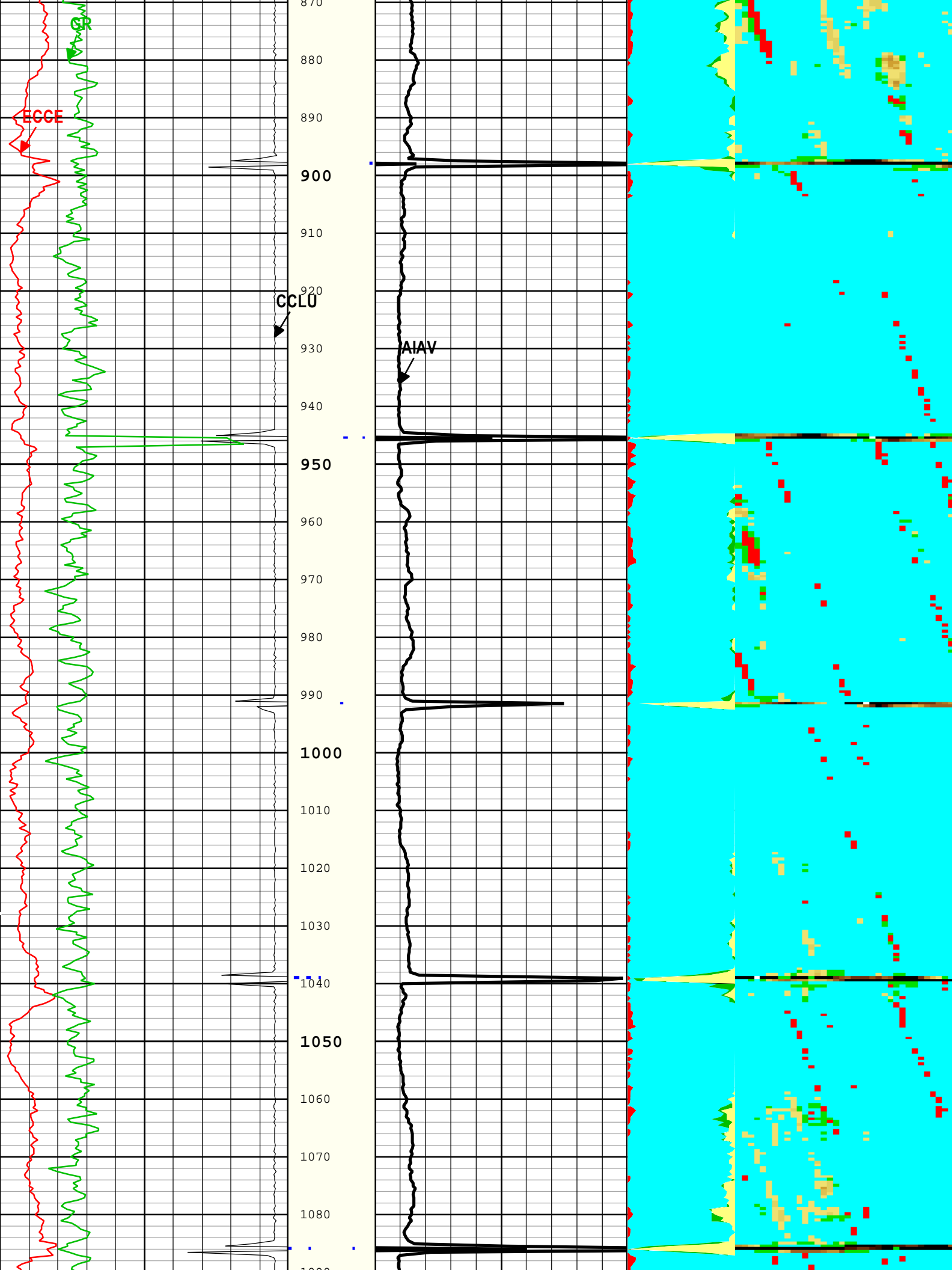
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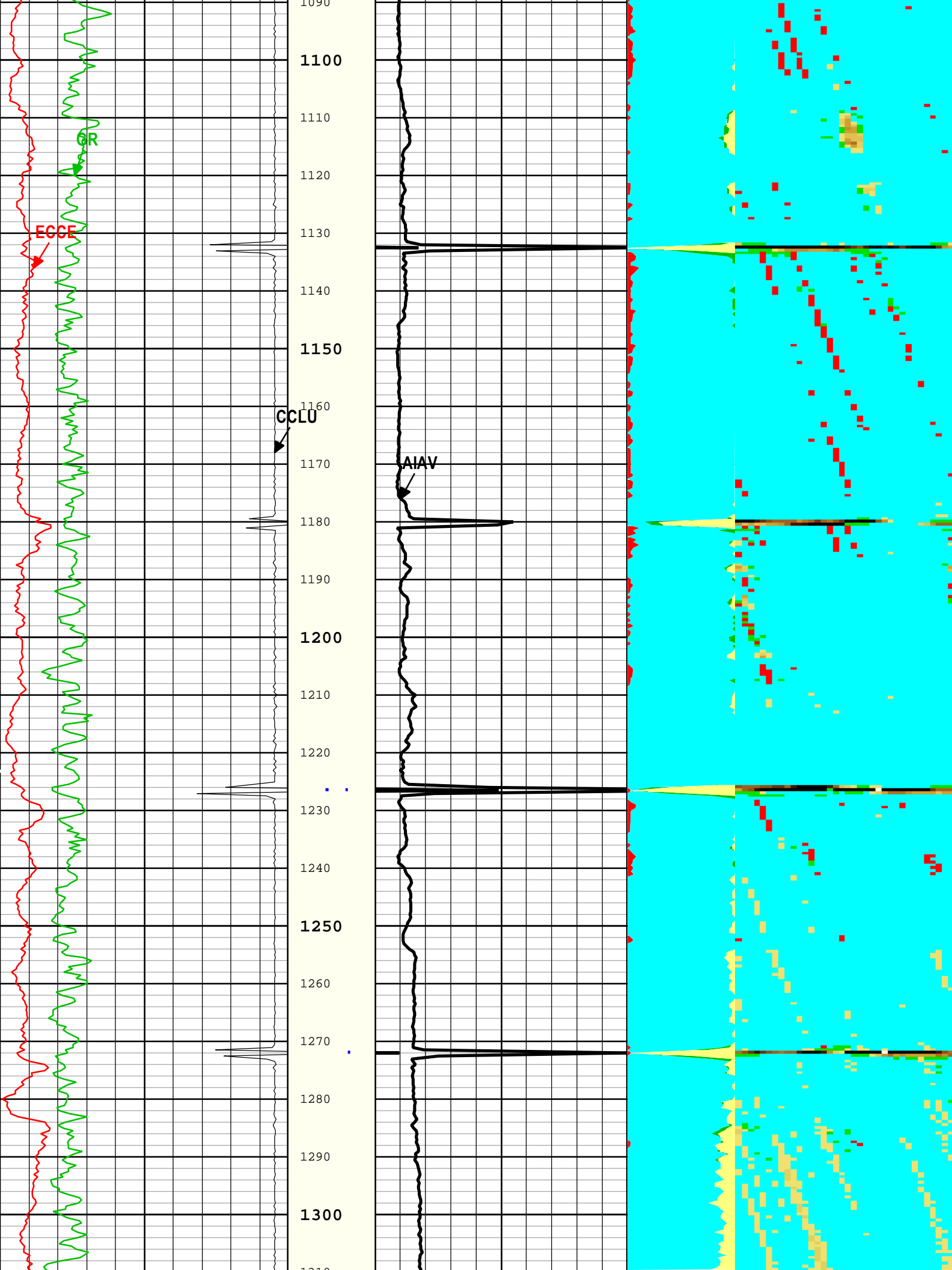


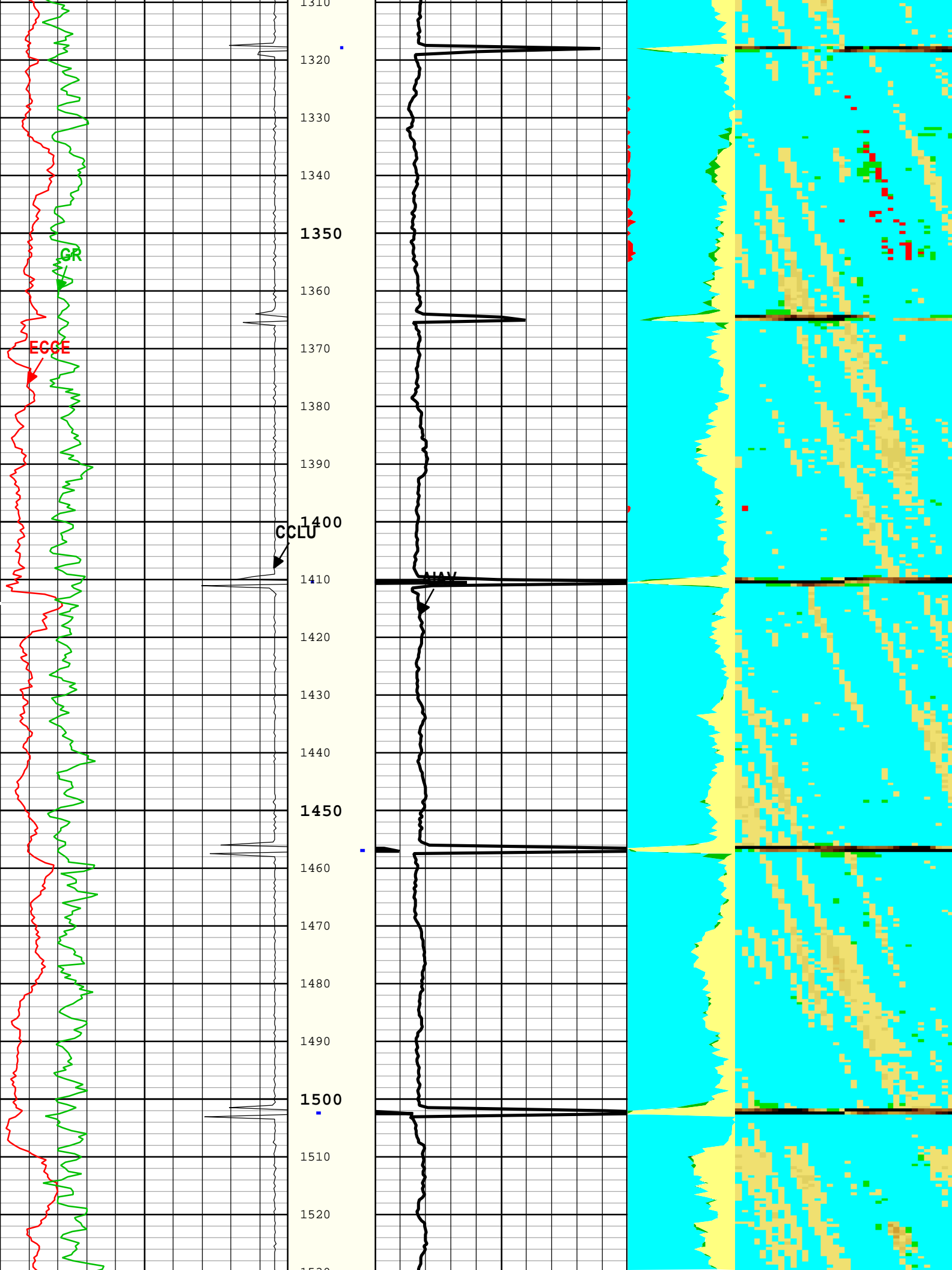


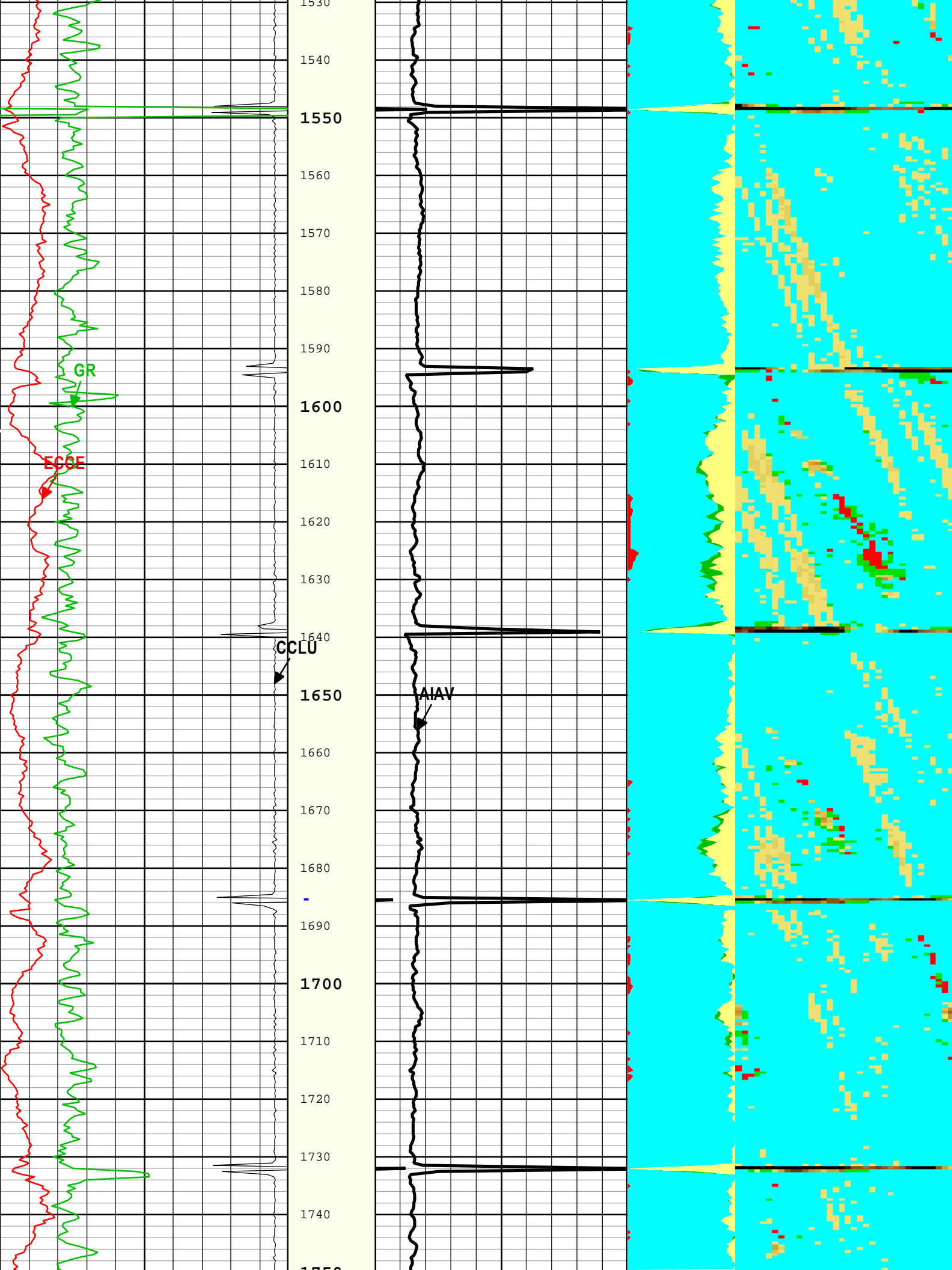


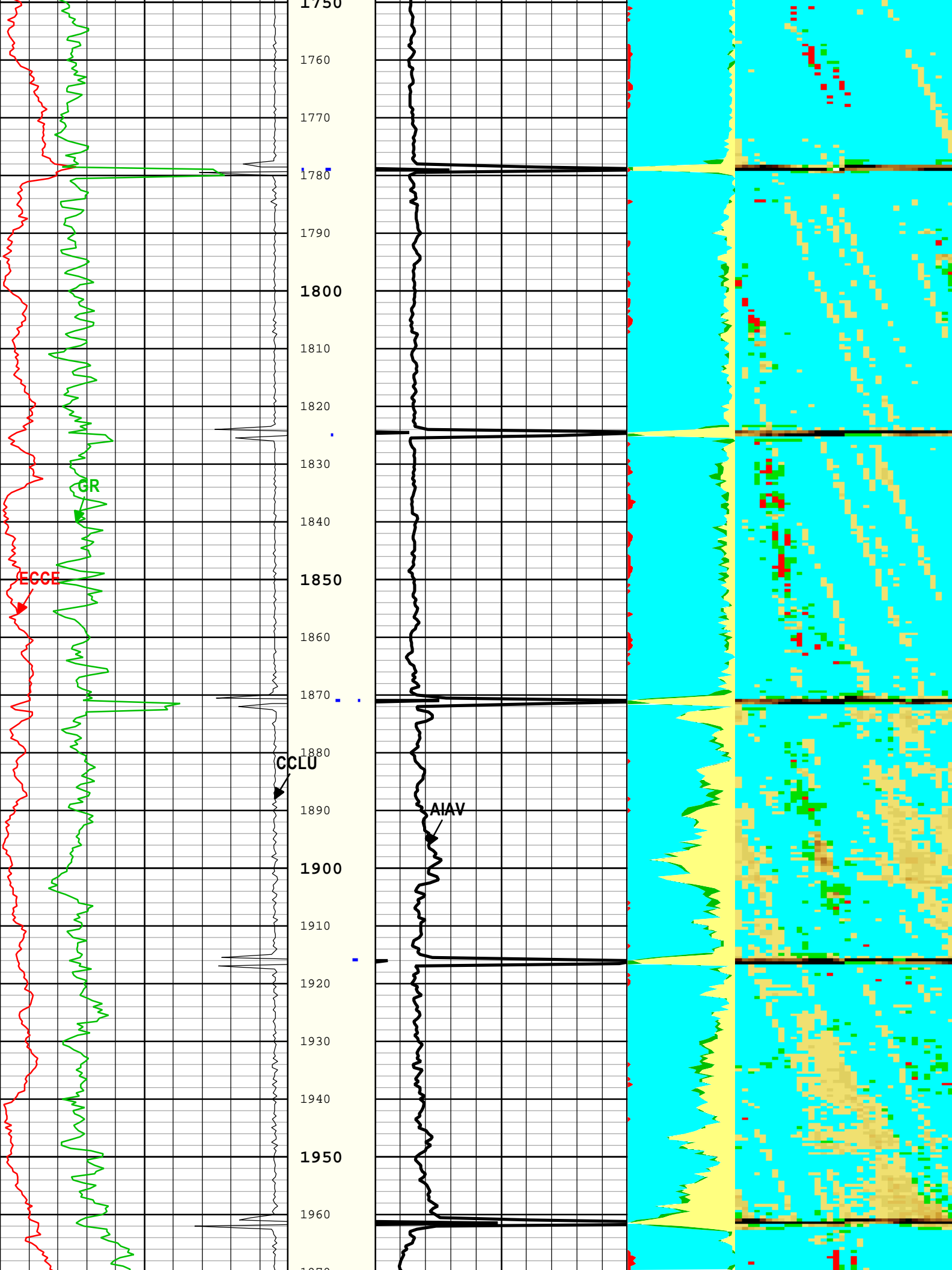


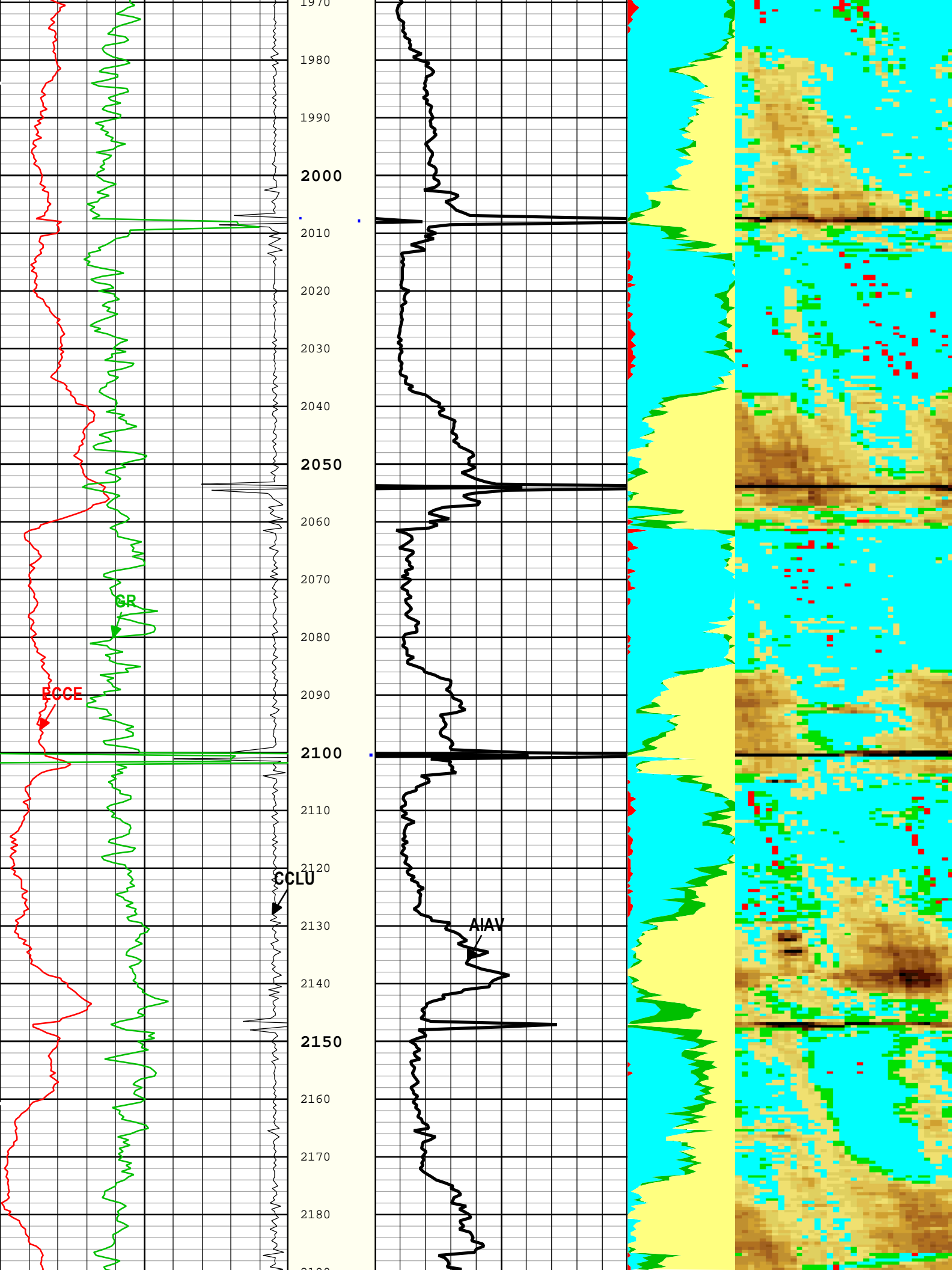


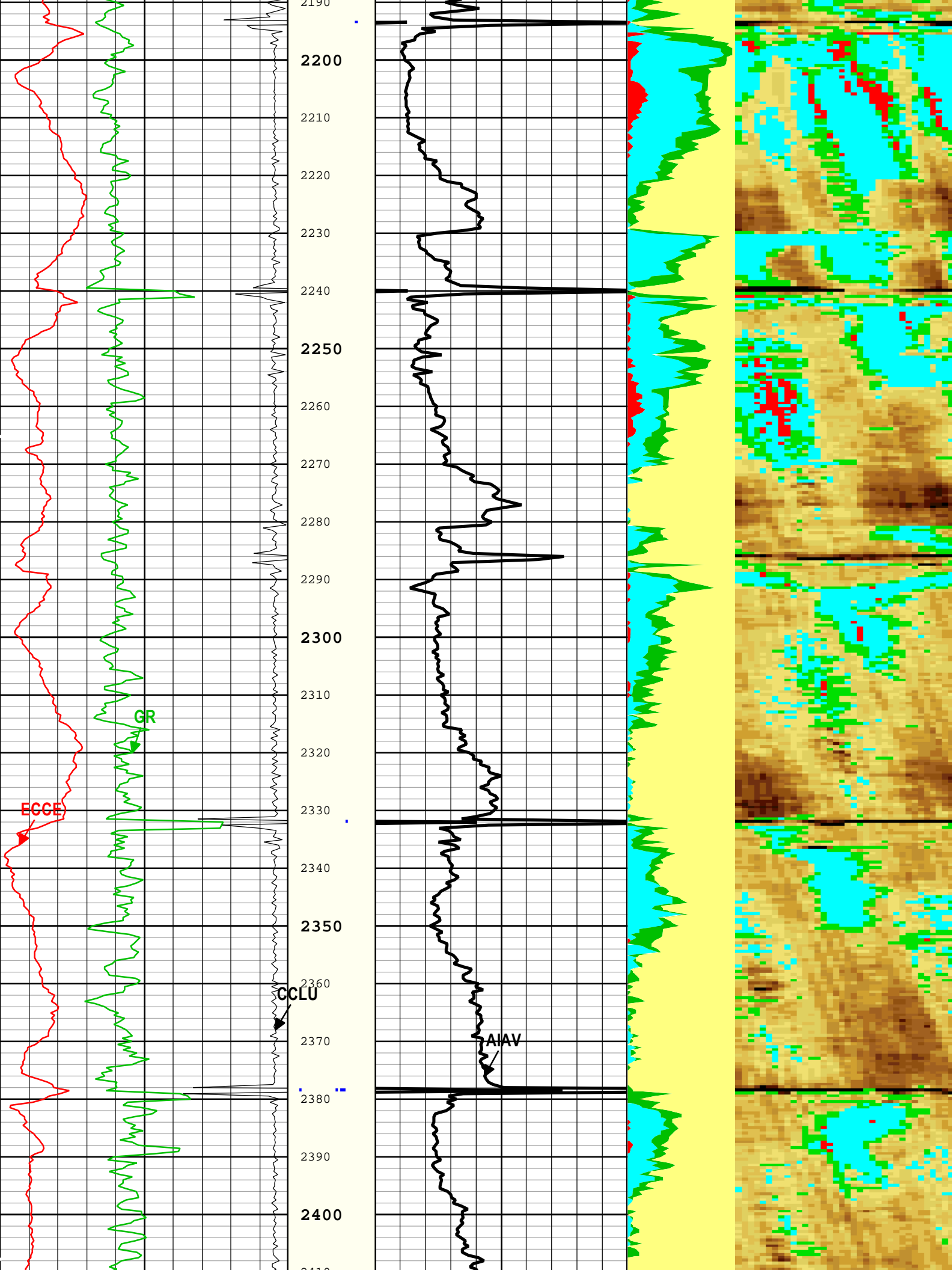


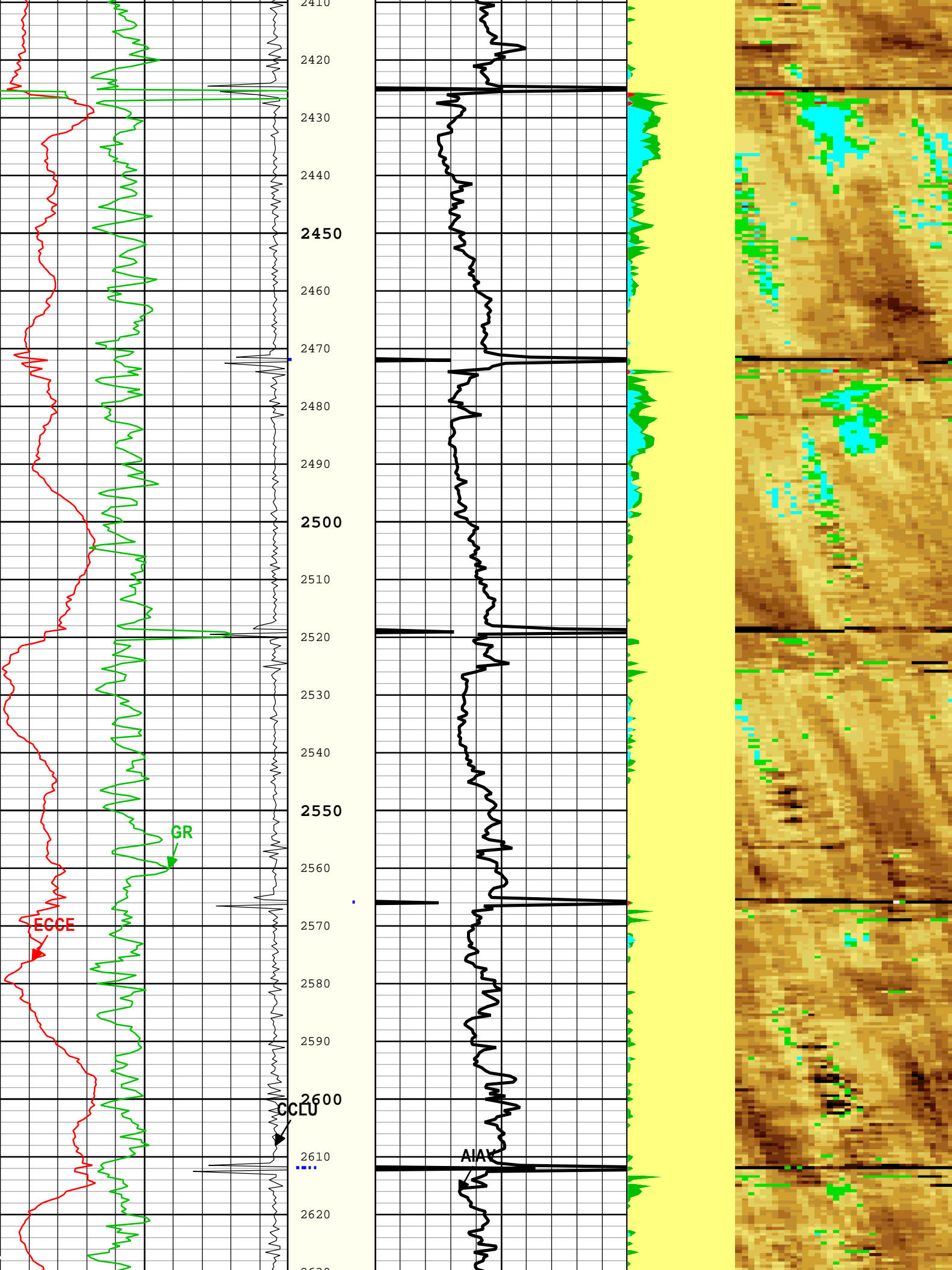


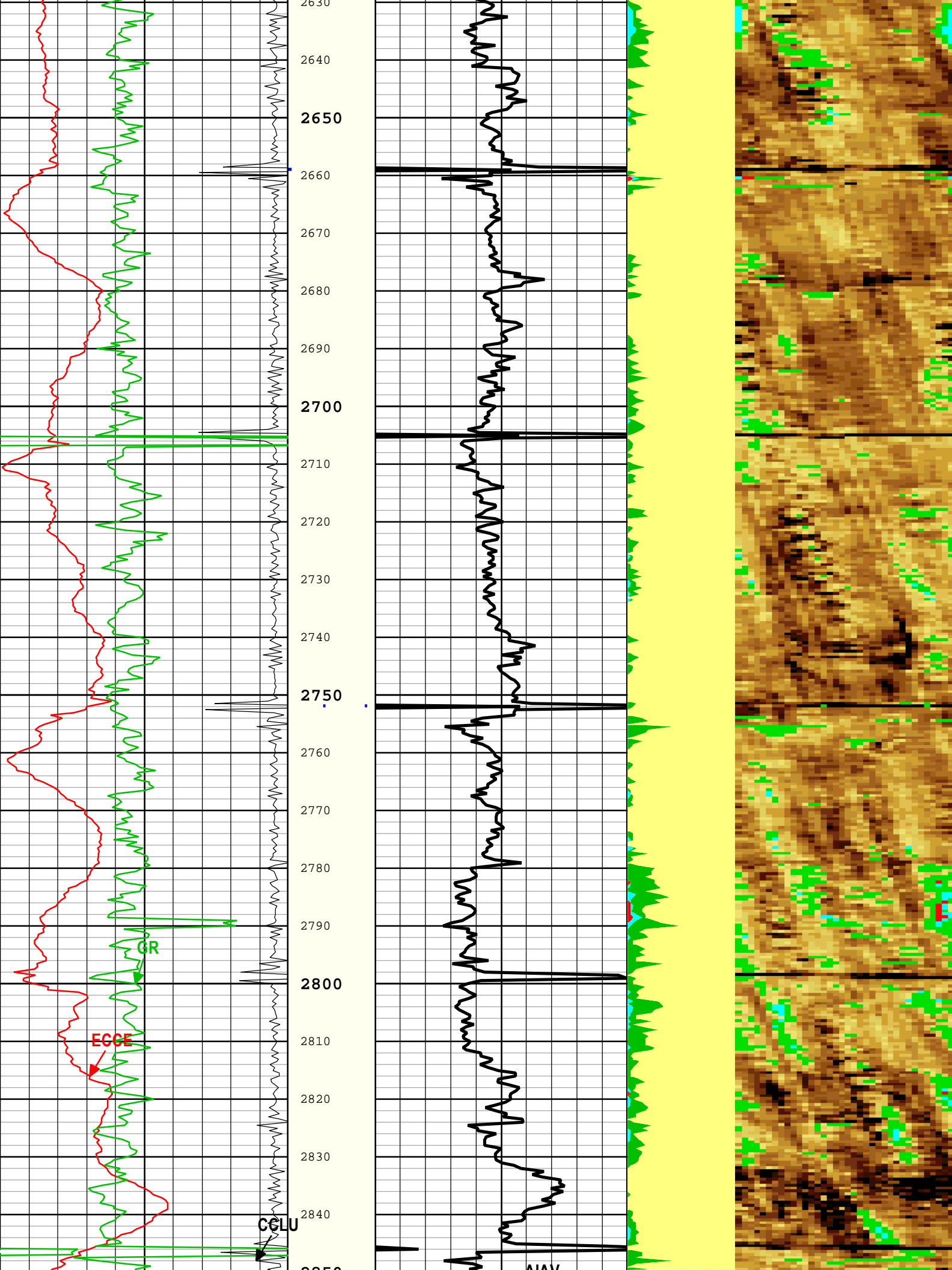


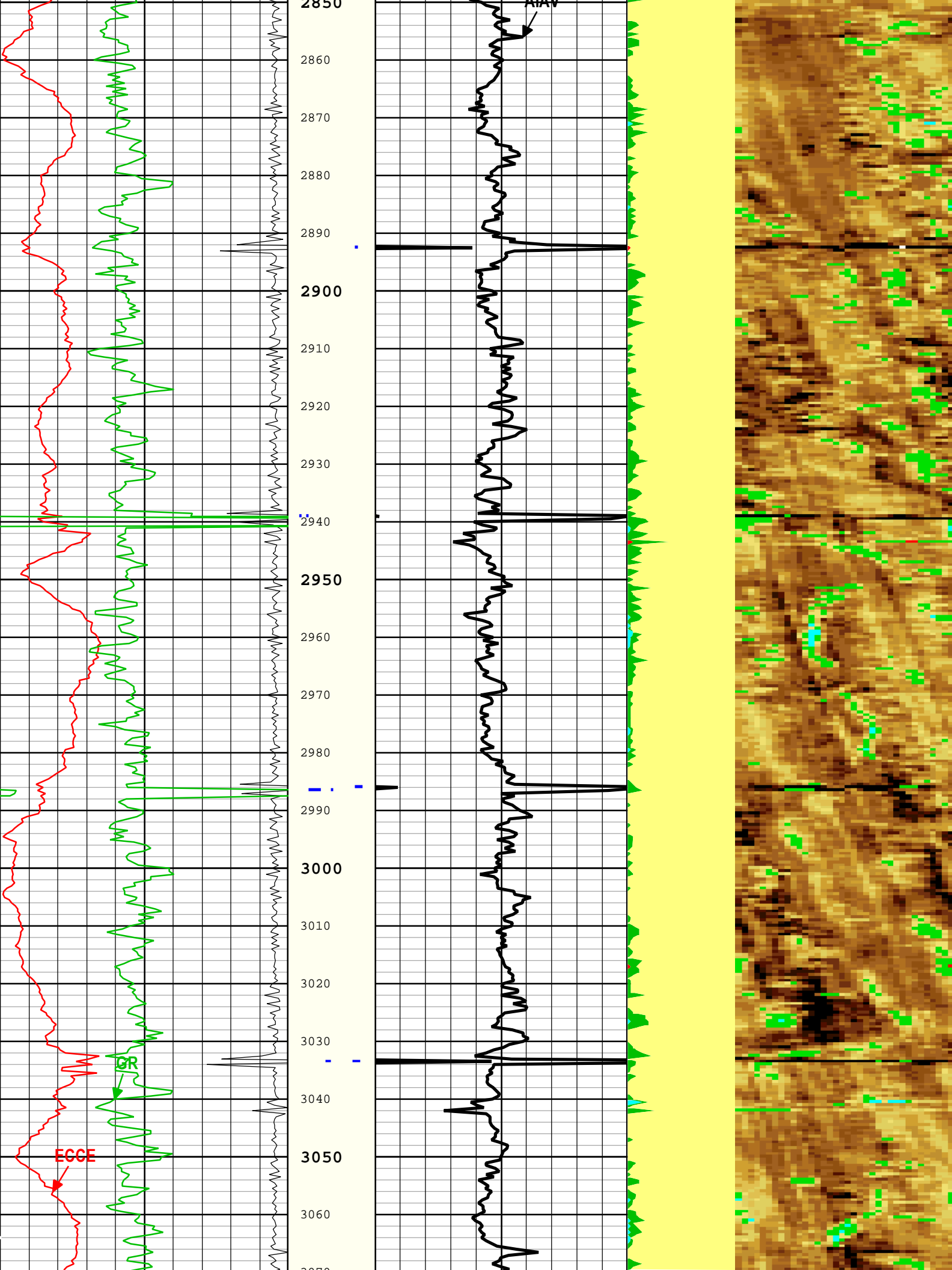


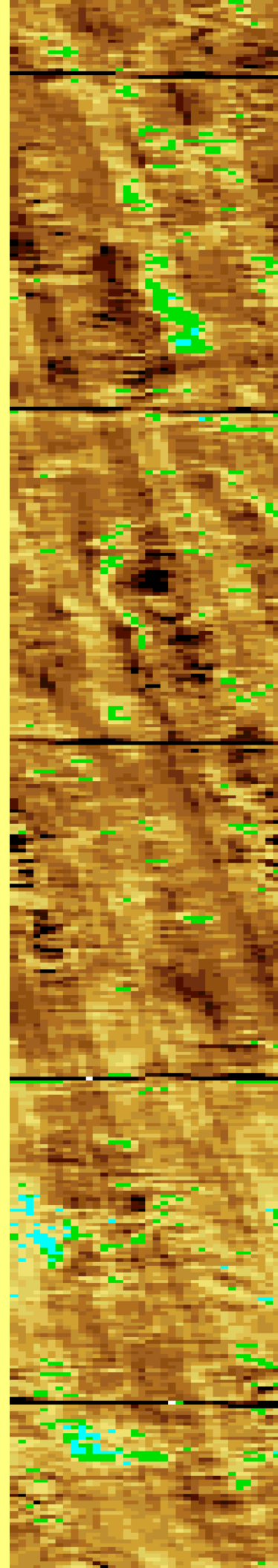
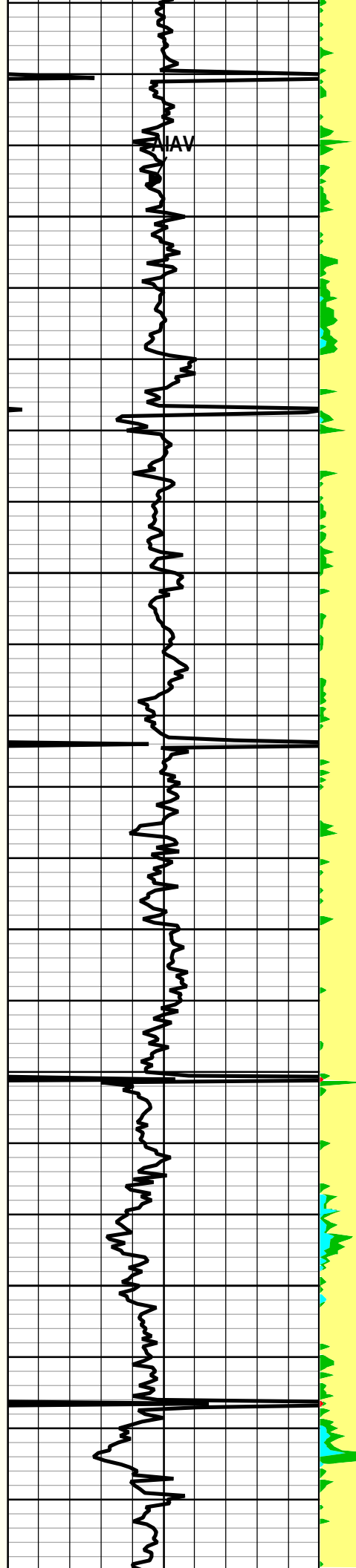
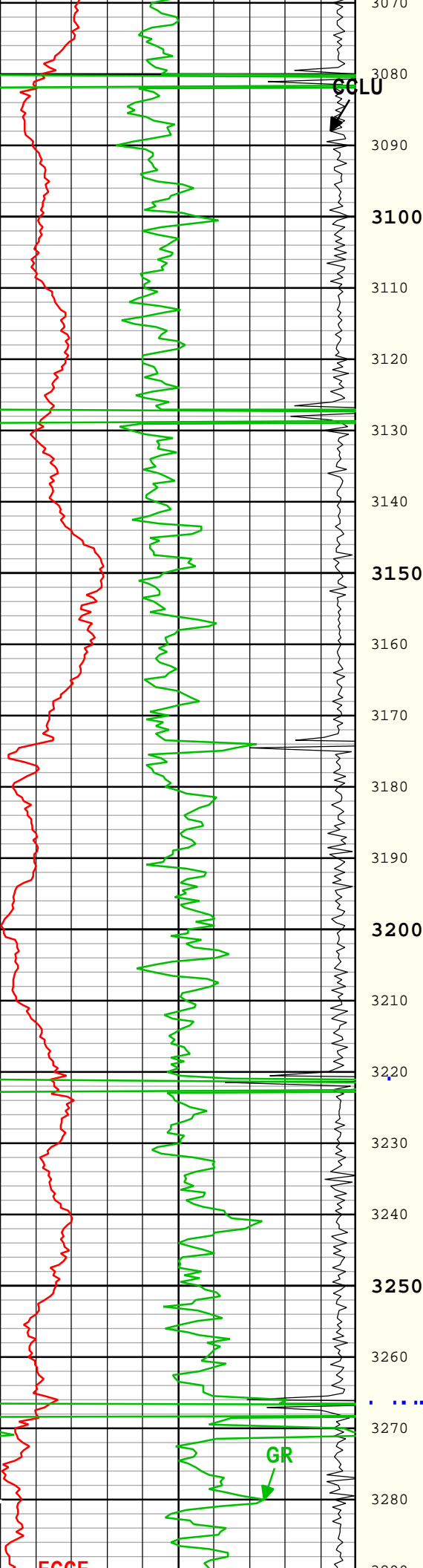


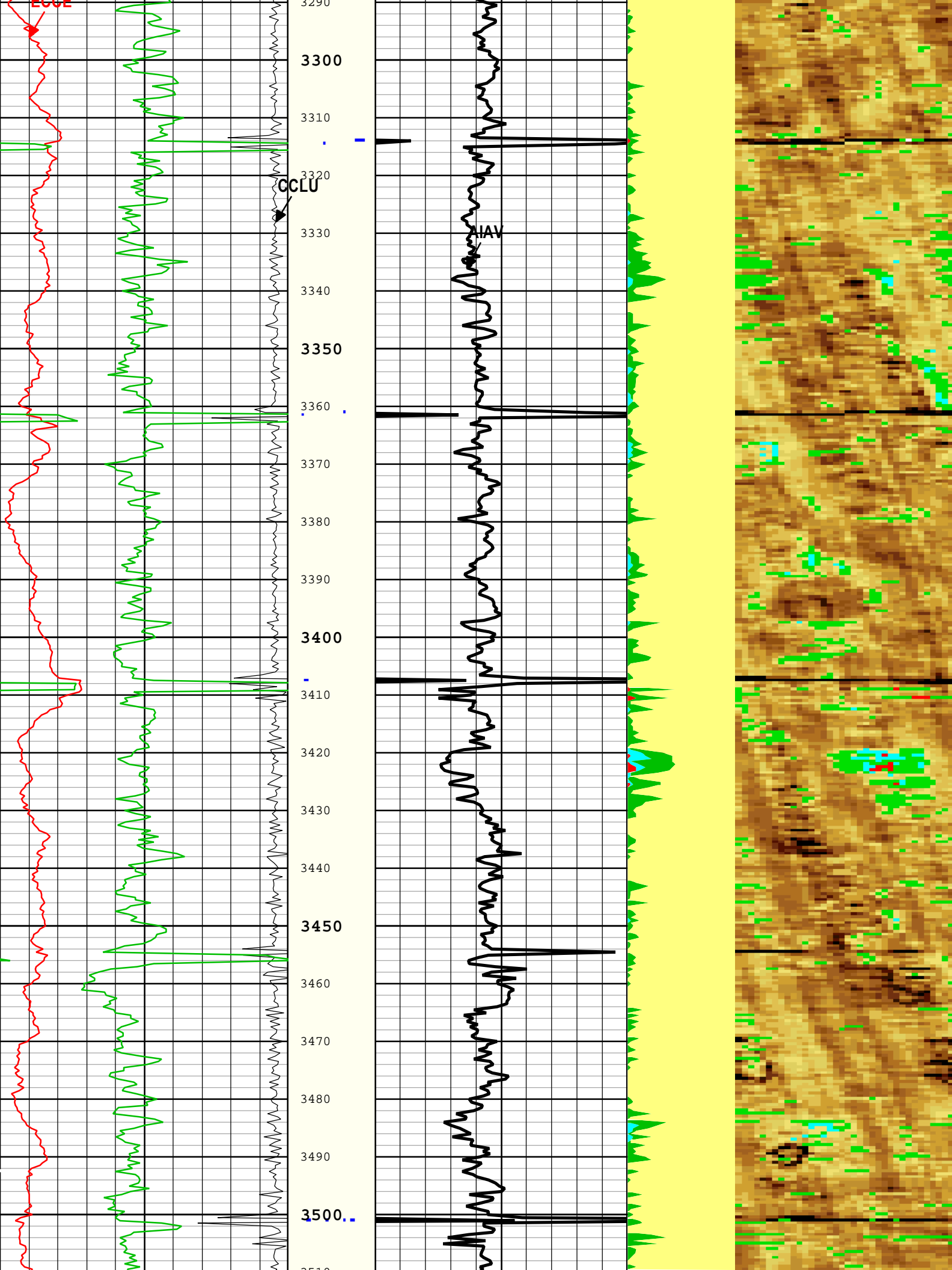


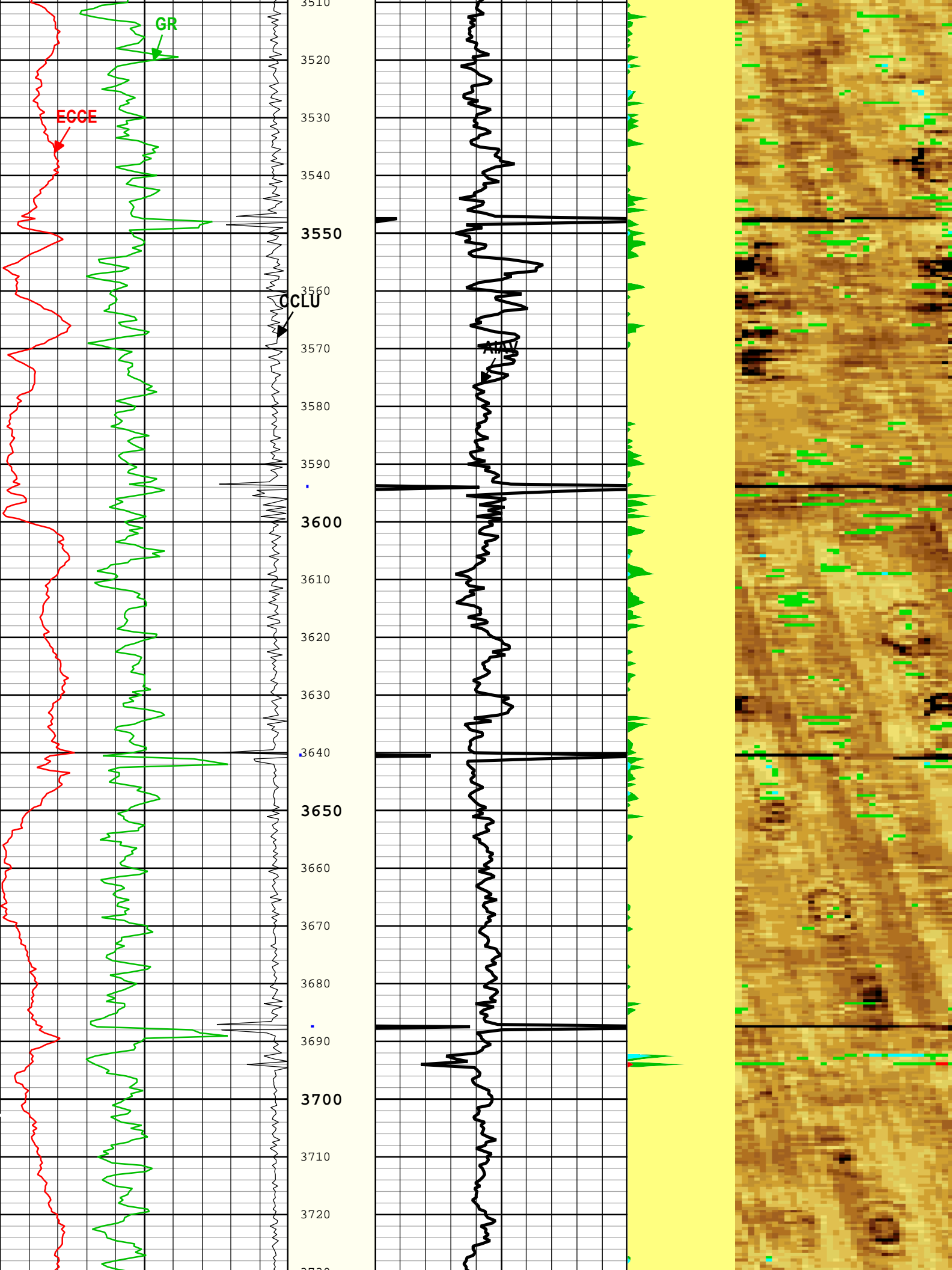


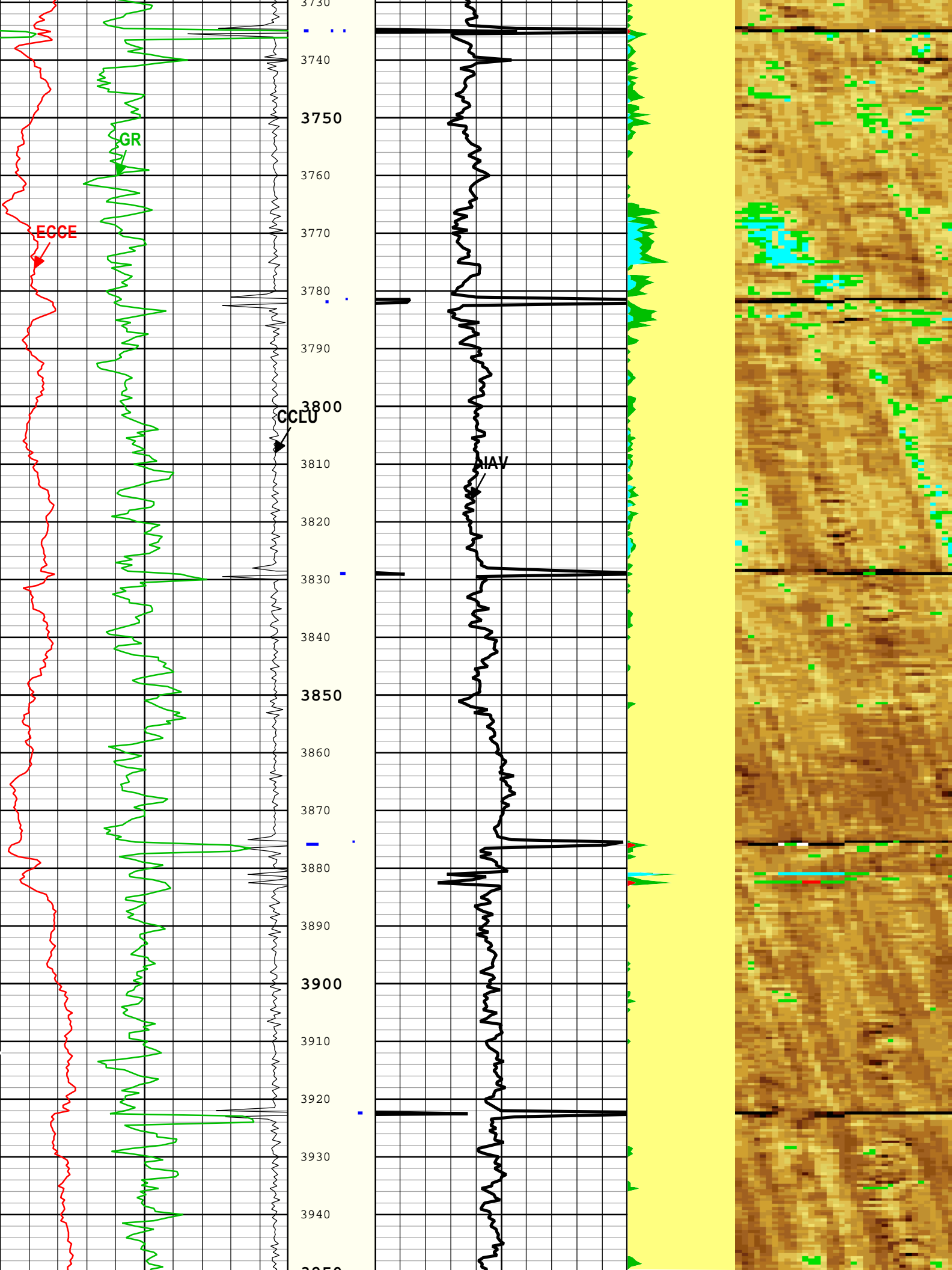


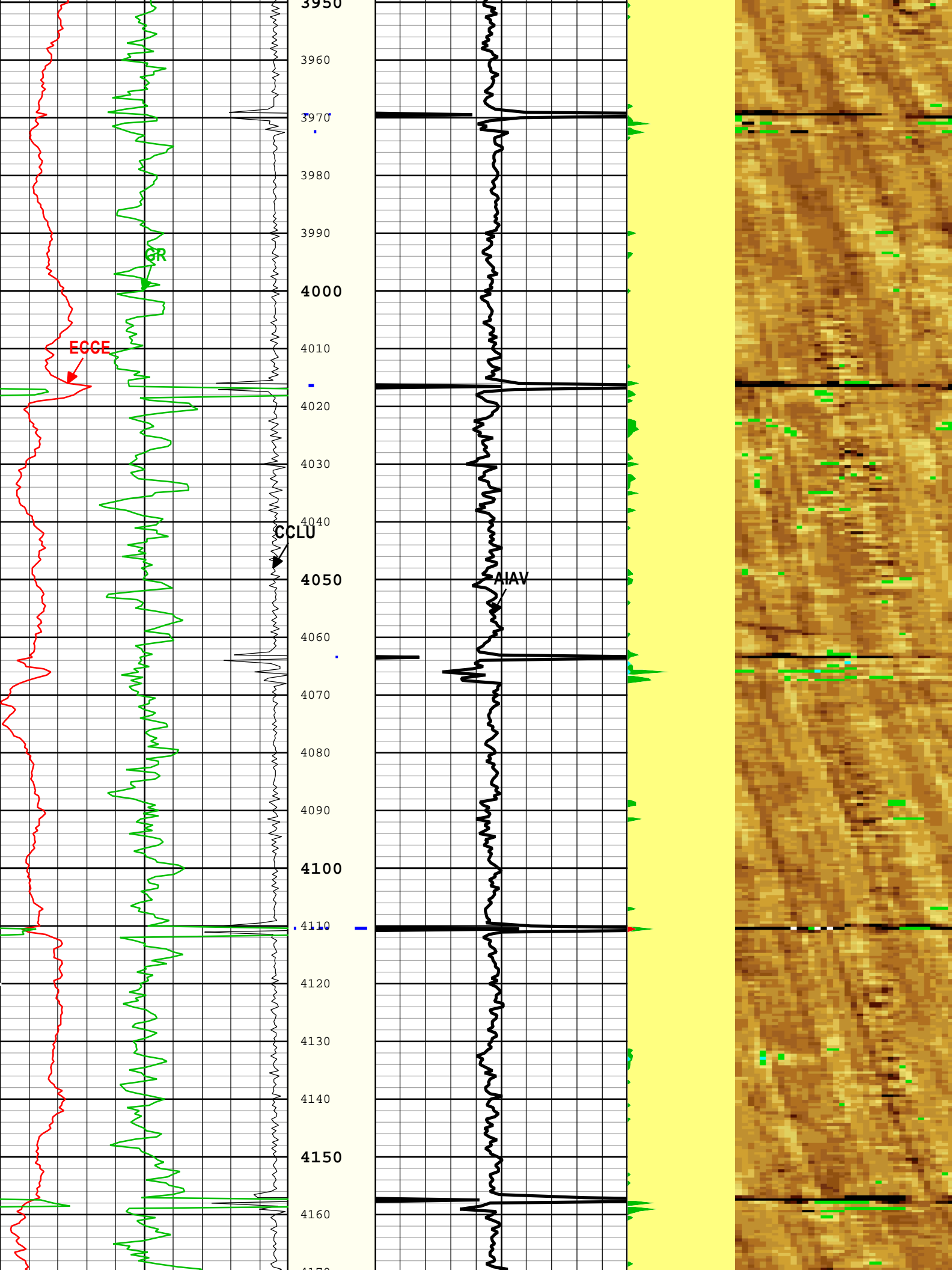


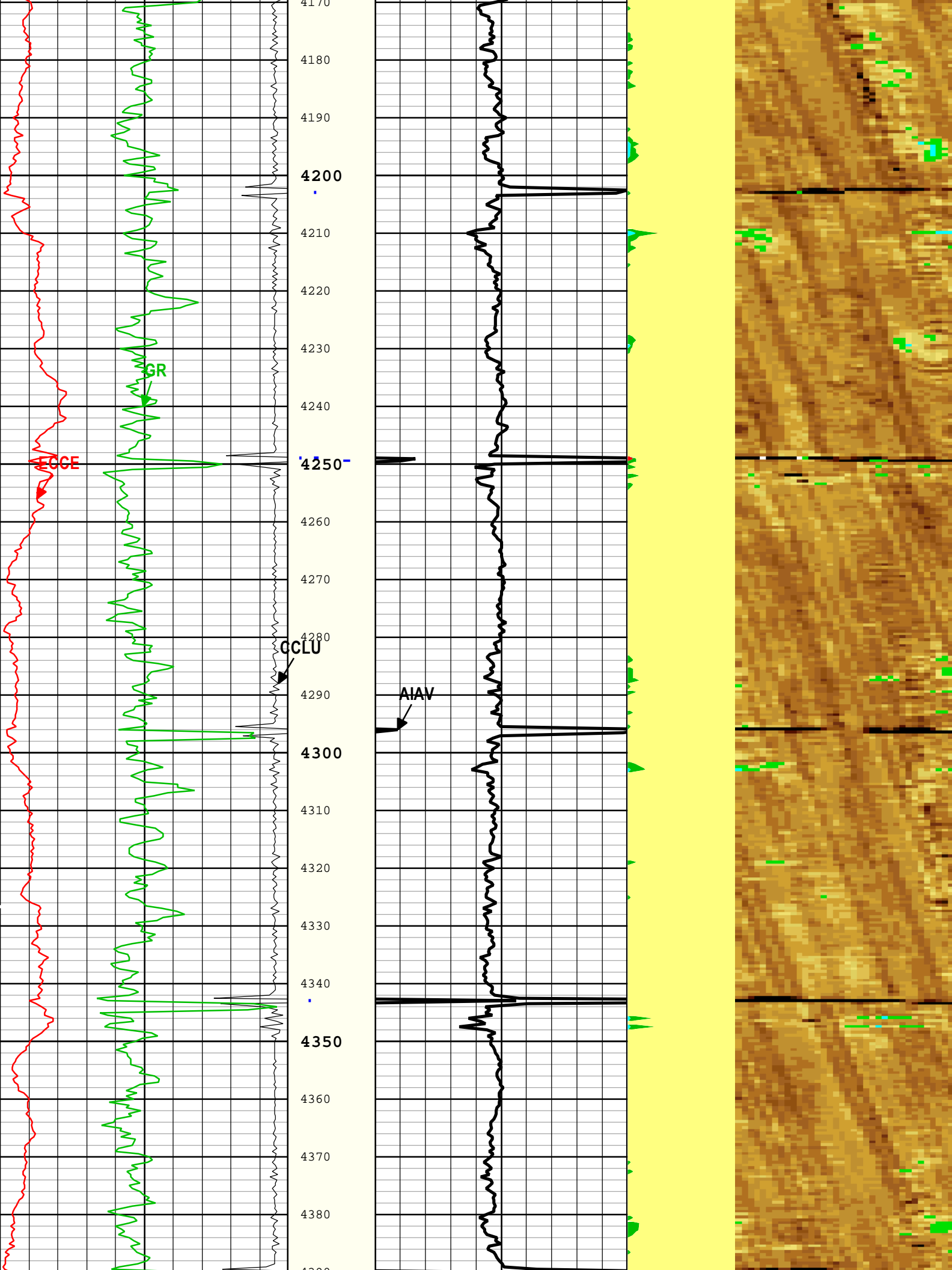


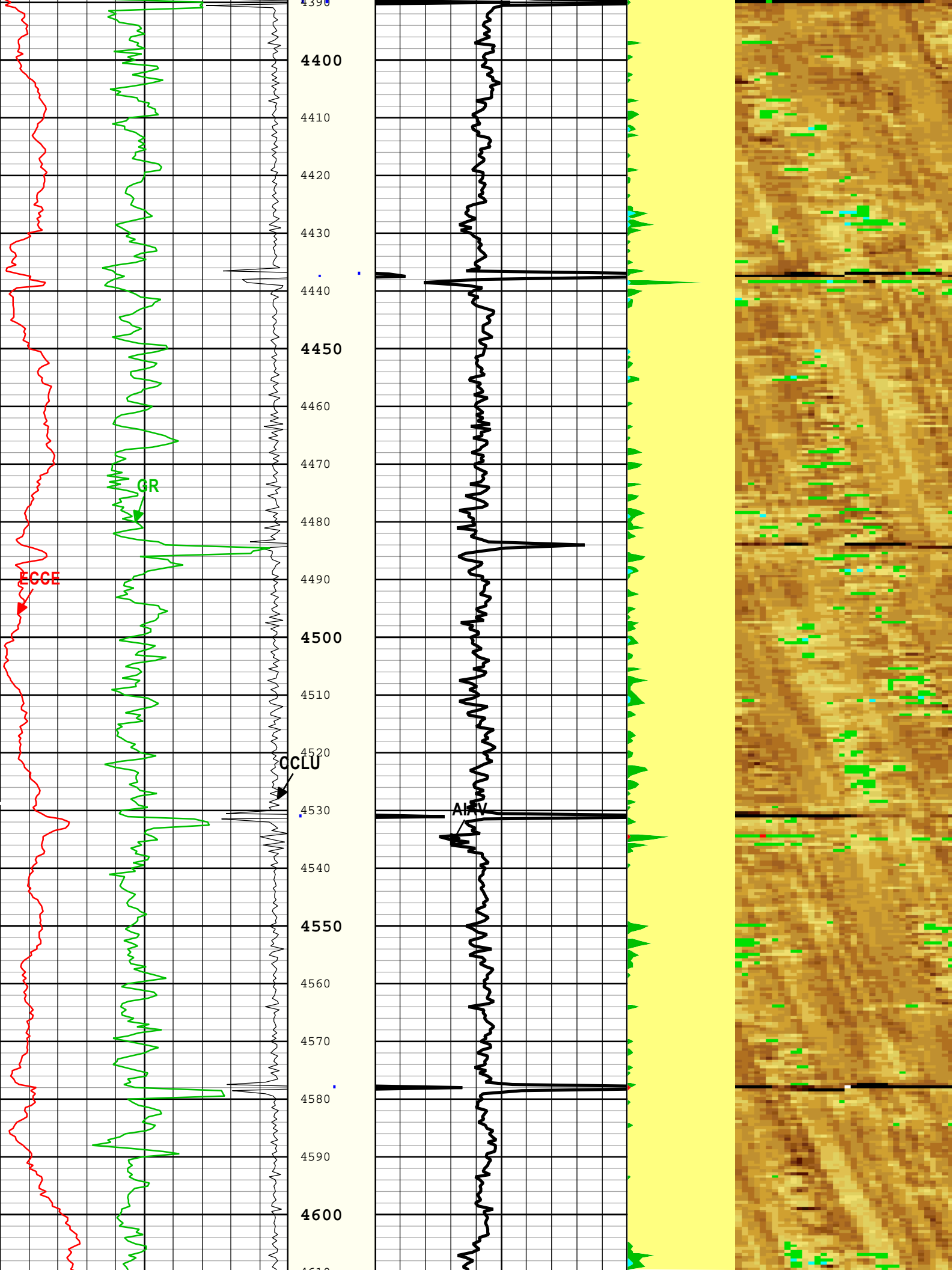


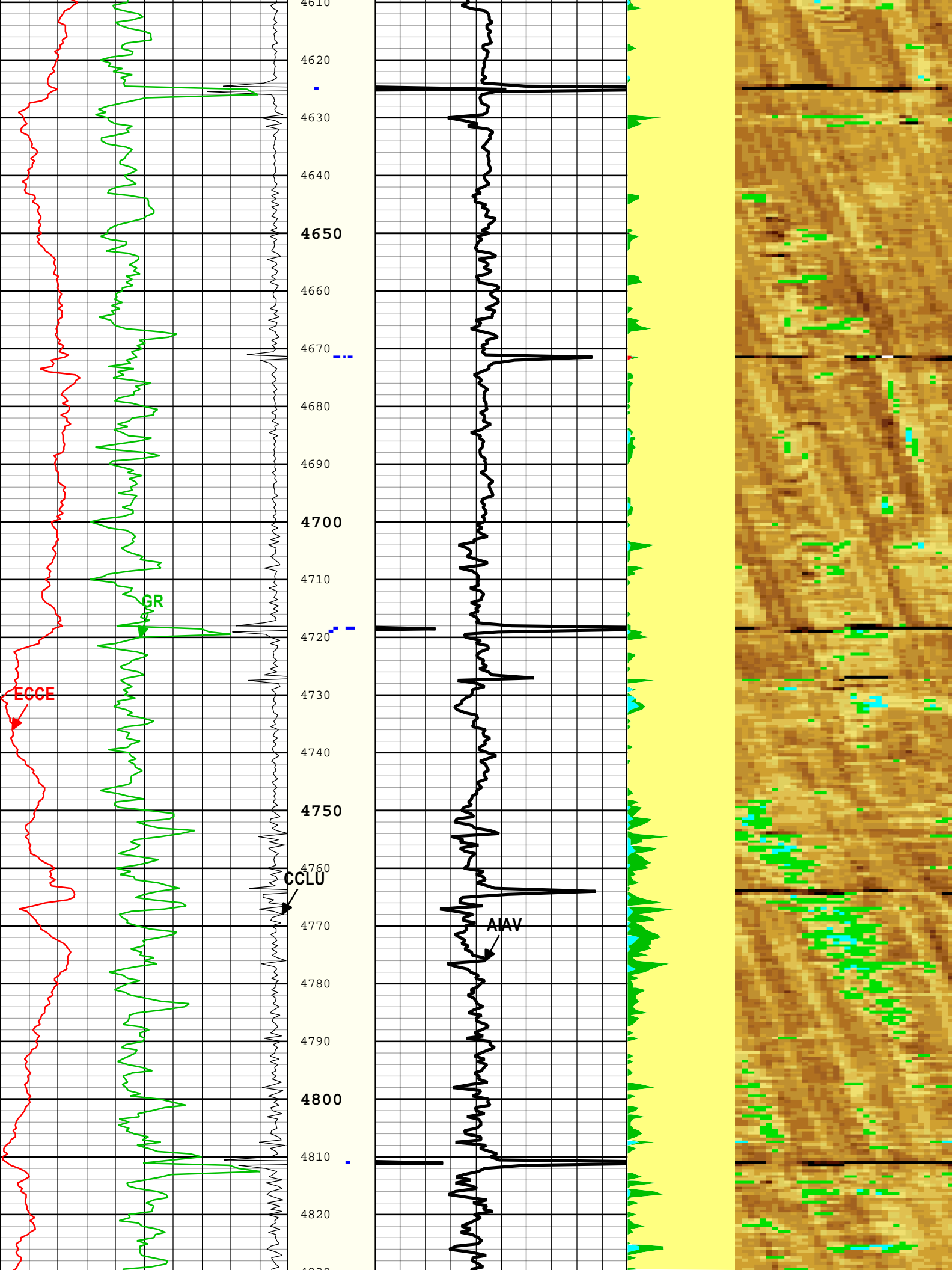


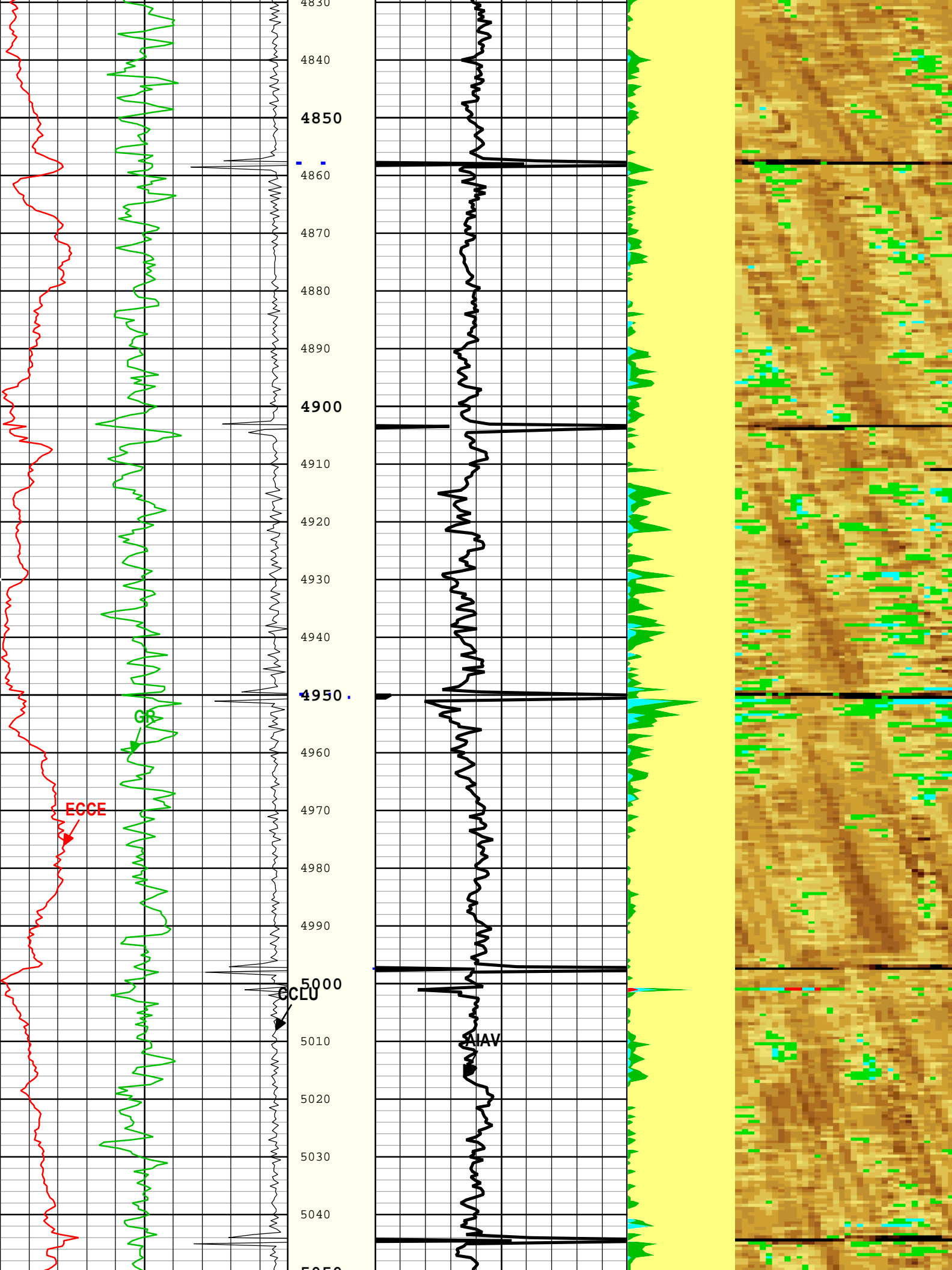


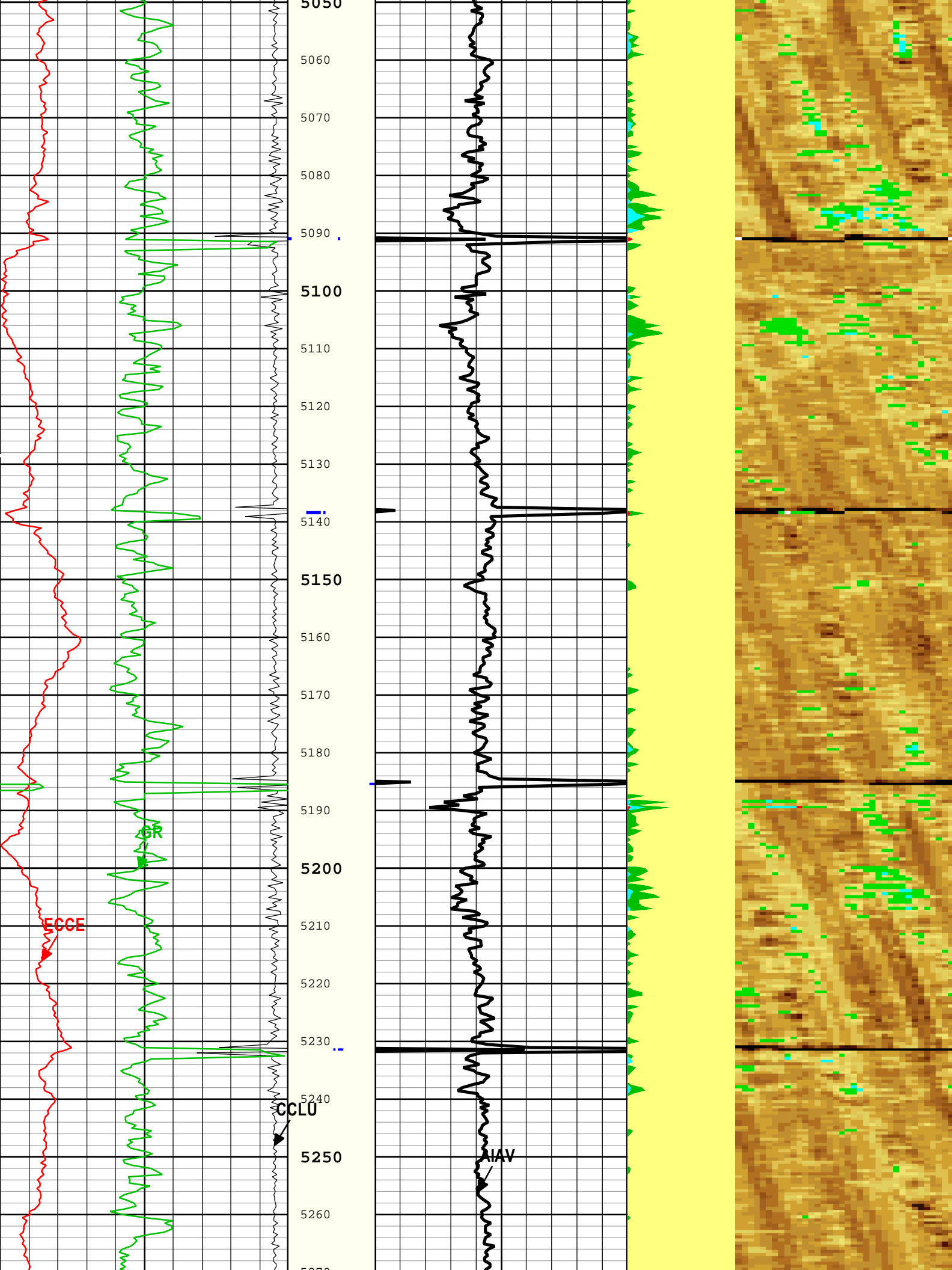


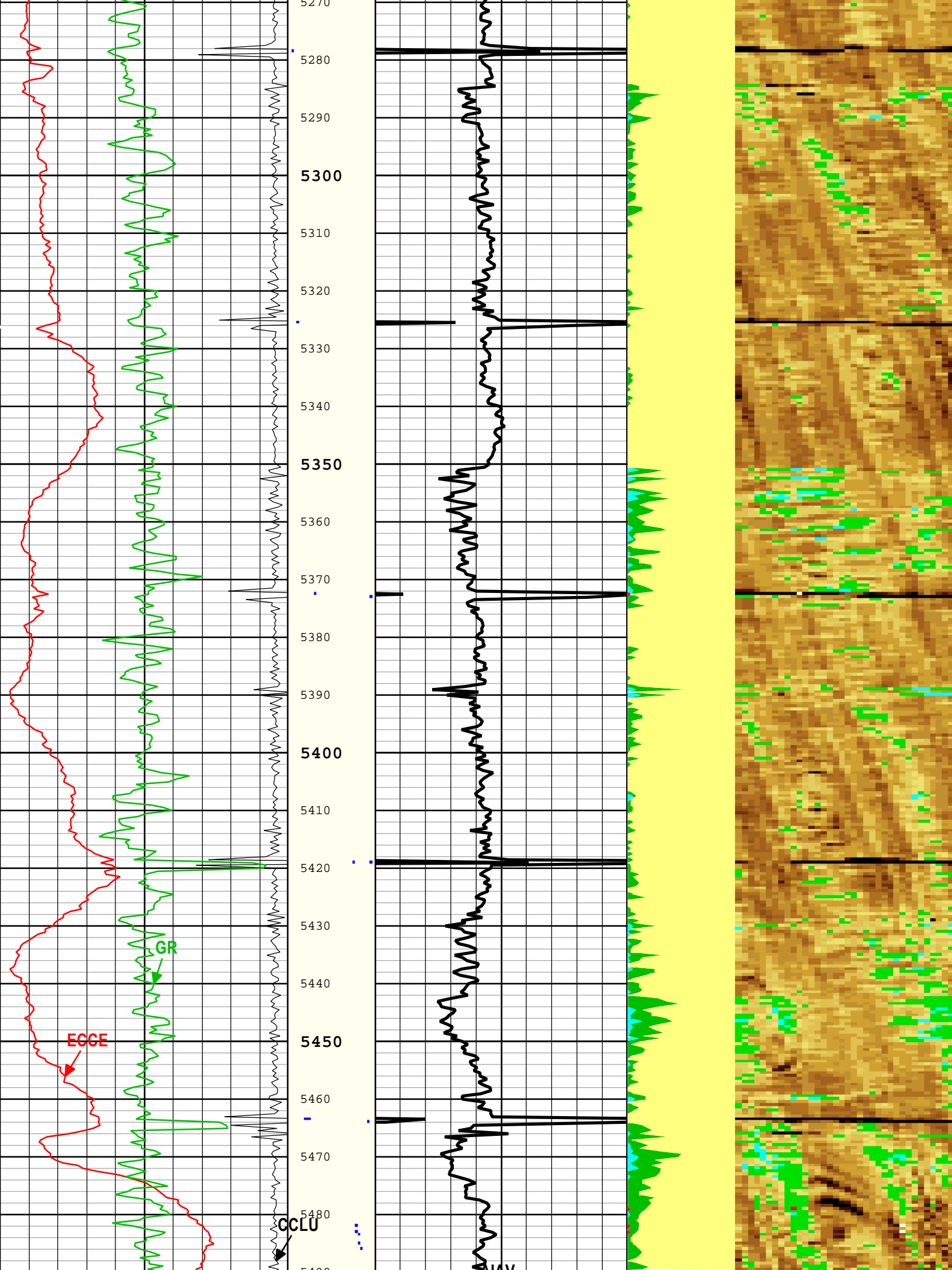


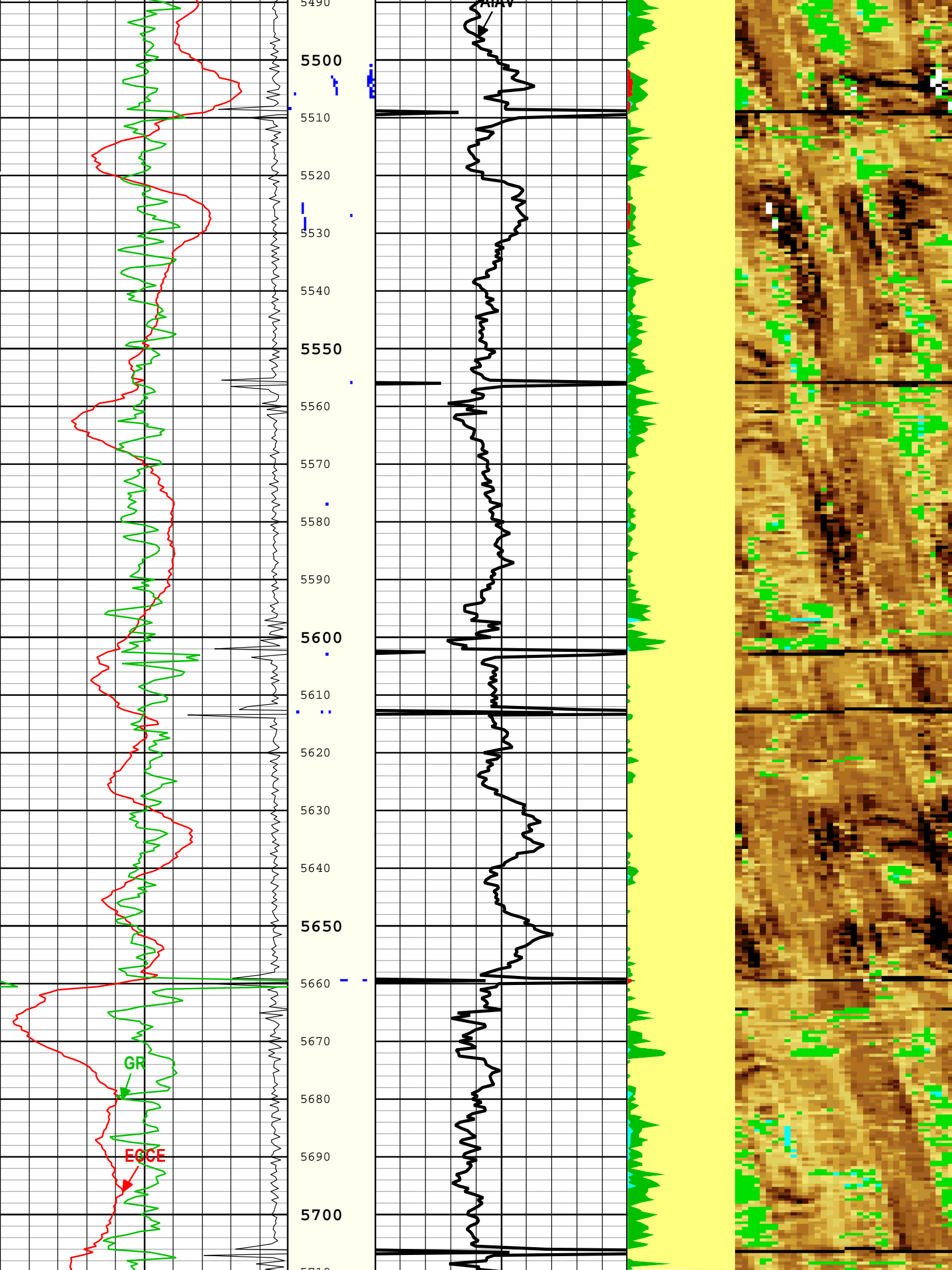


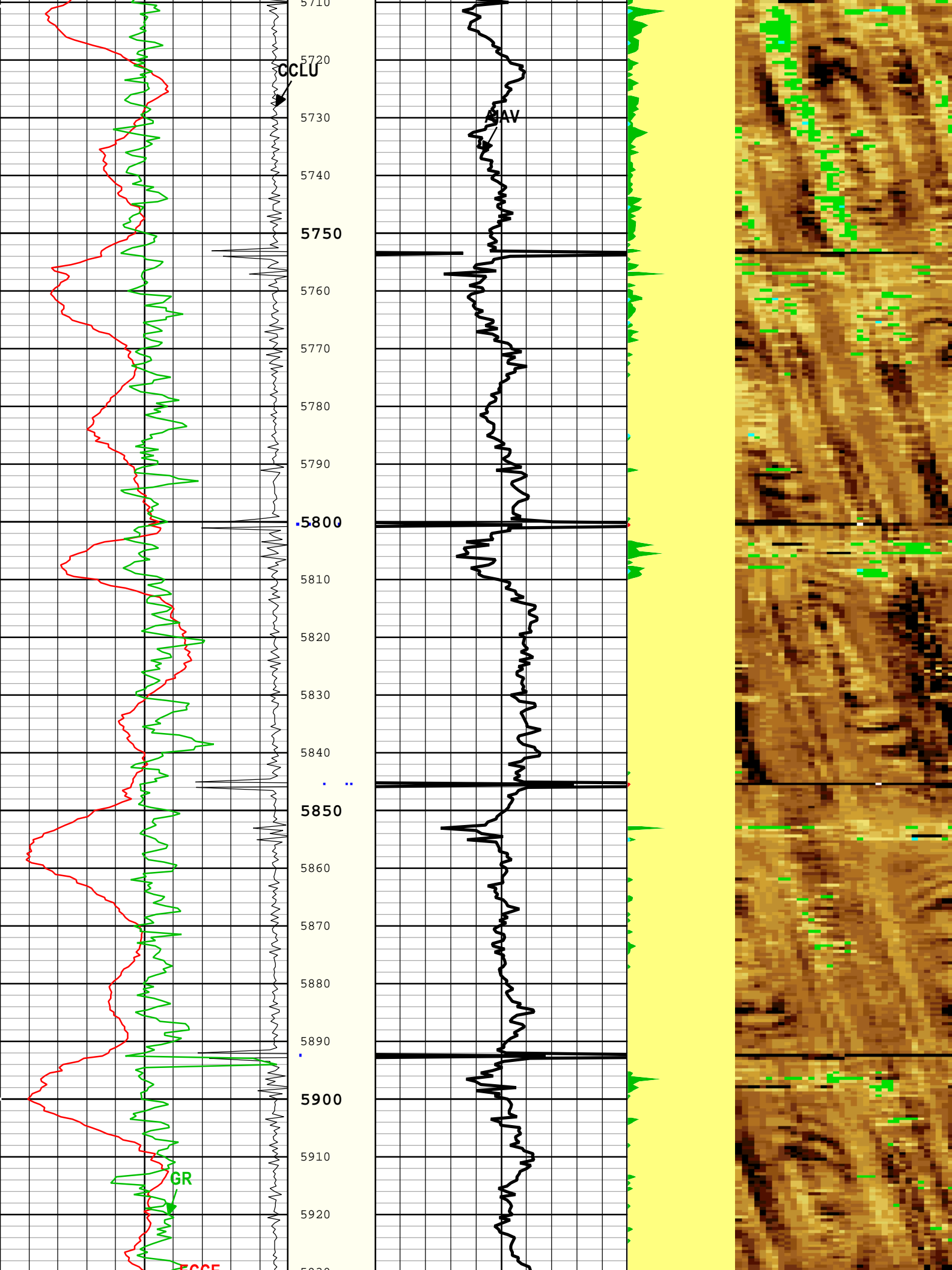


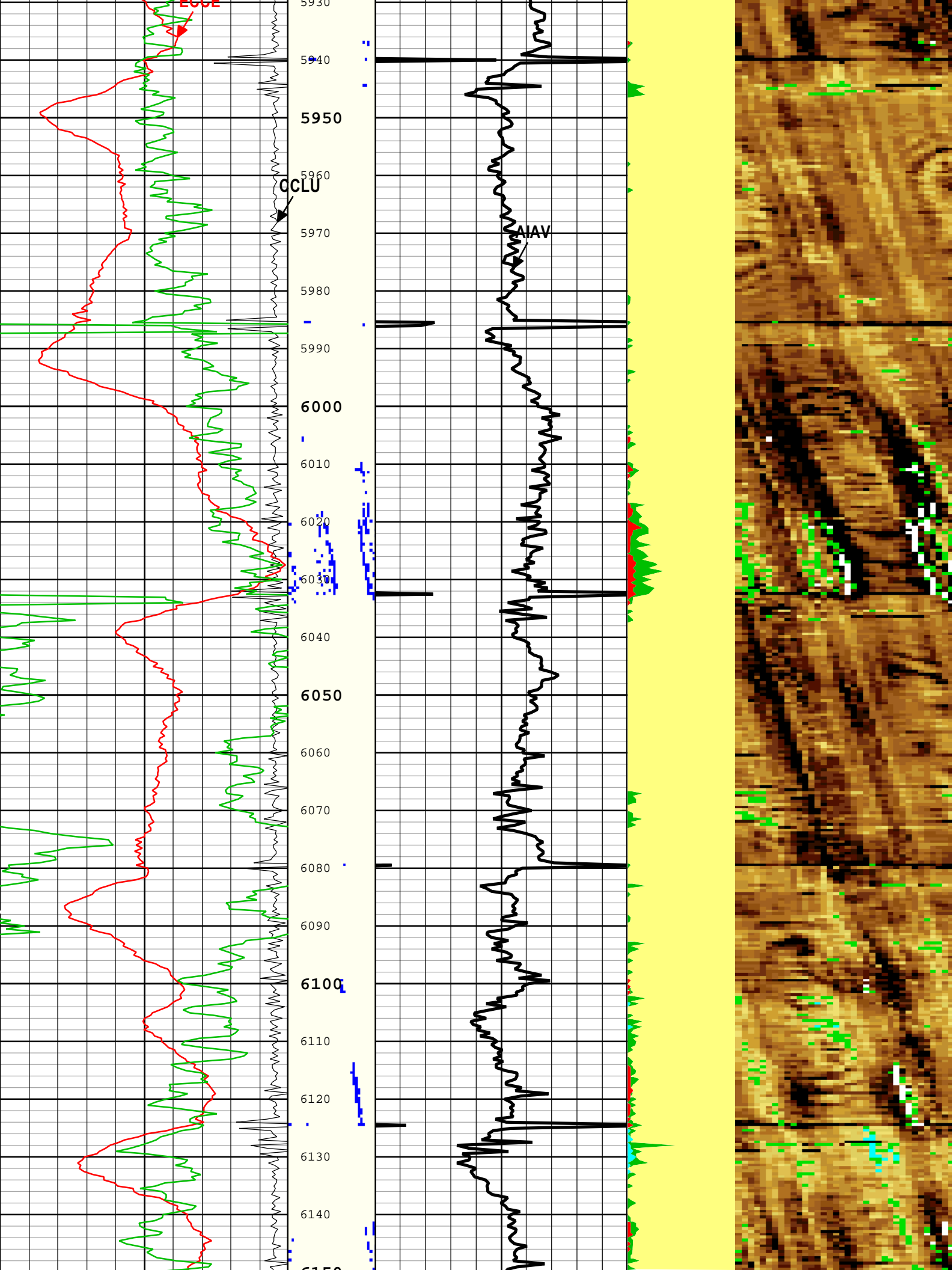


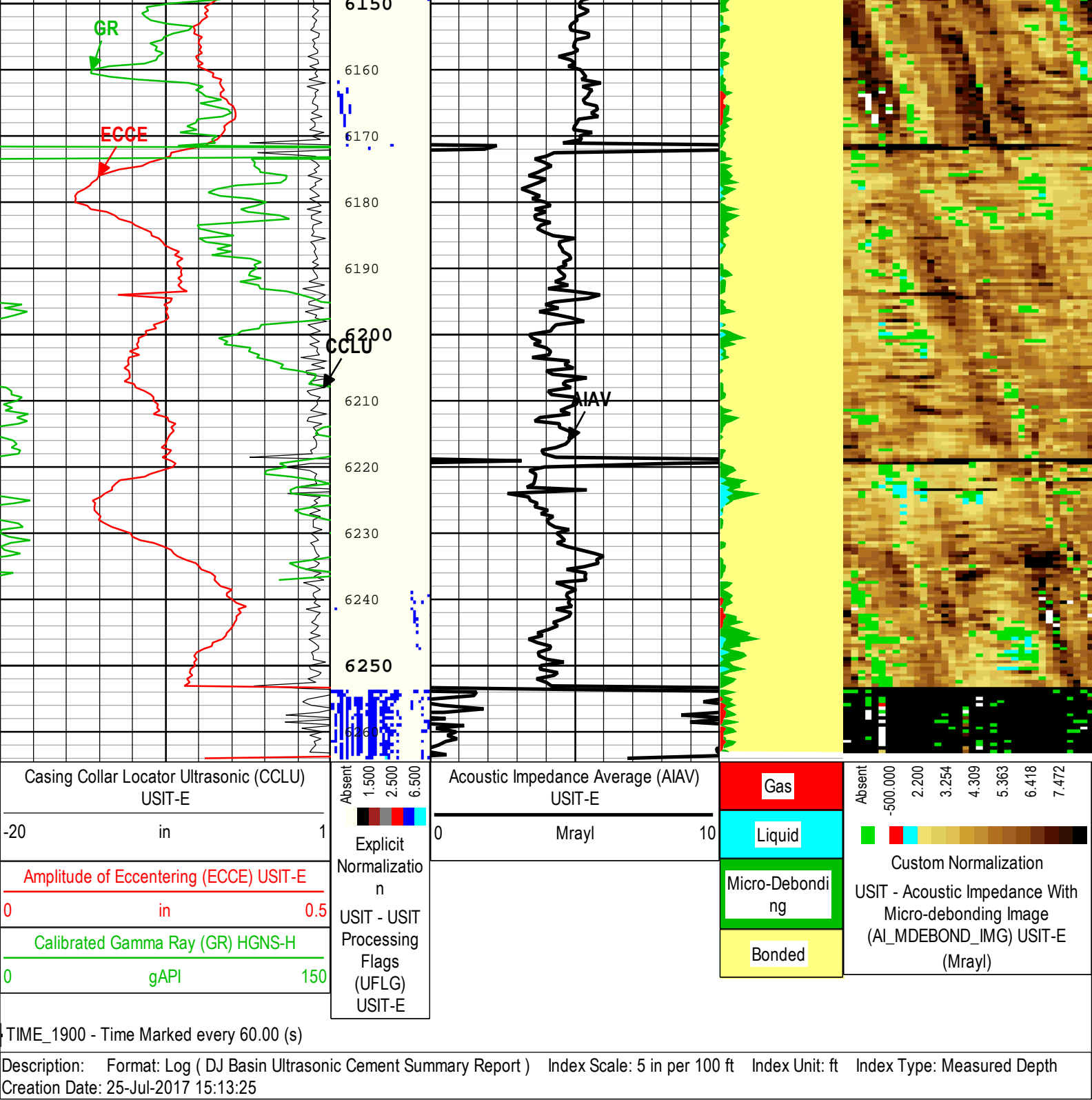












Channel Processing Parameters				
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BS	Bit Size	WLSESSION	Depth Zoned	in
CMTY(U-USIT_CENT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid 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	

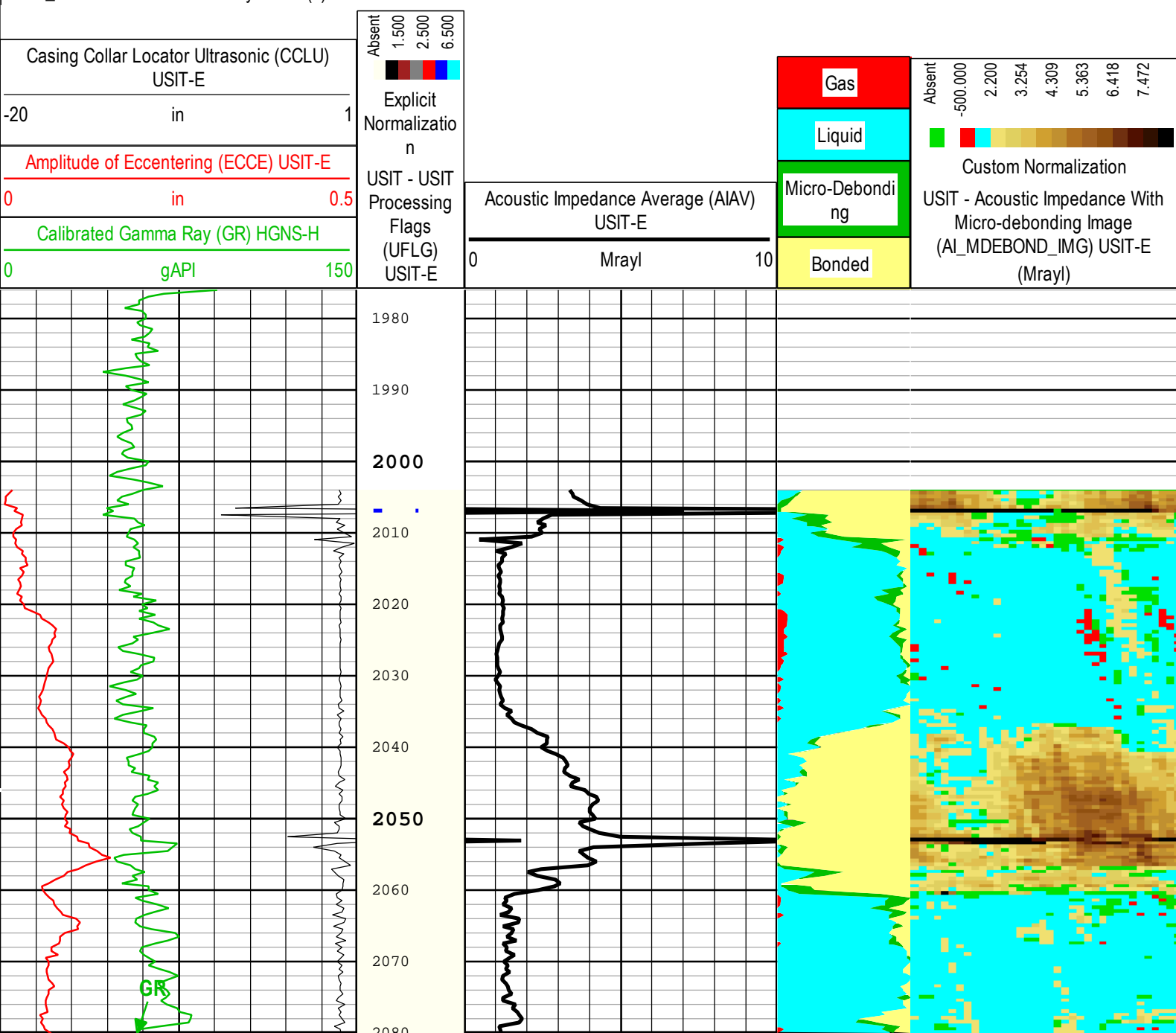
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	Depth Zoned	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.05	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.8	Mrayl
UFGDE	Fiberglass 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	1.7	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

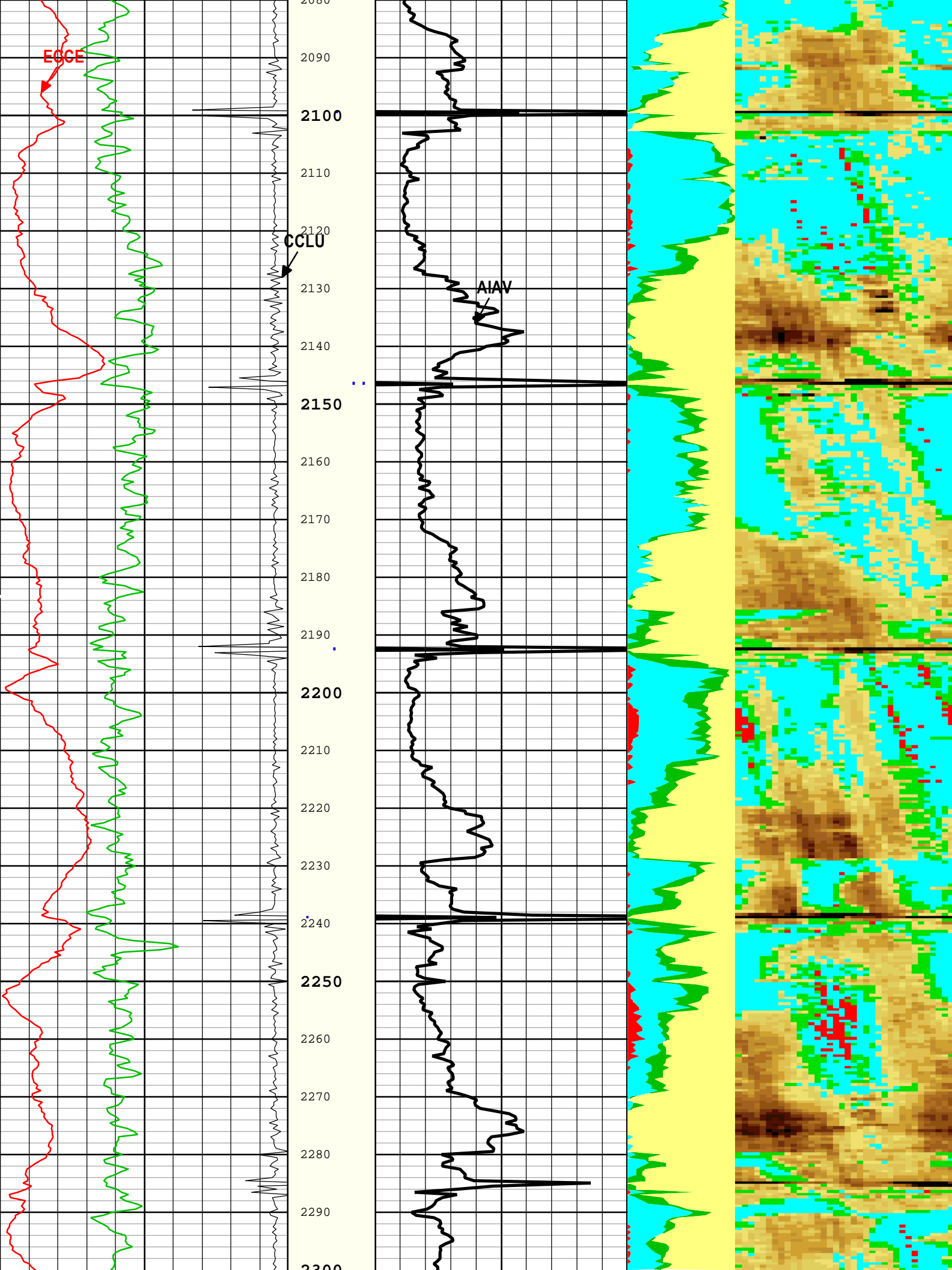
Depth Zone Parameters			
Parameter	Value	Start (ft)	Stop (ft)
BS	26	31	110
BS	13.5	110	1958
BS	8.5	1958	6254
MEAS_WLEN	22.44	31	6254
MEAS_WLEN	20	6254	6264.5
All depth are actual.			

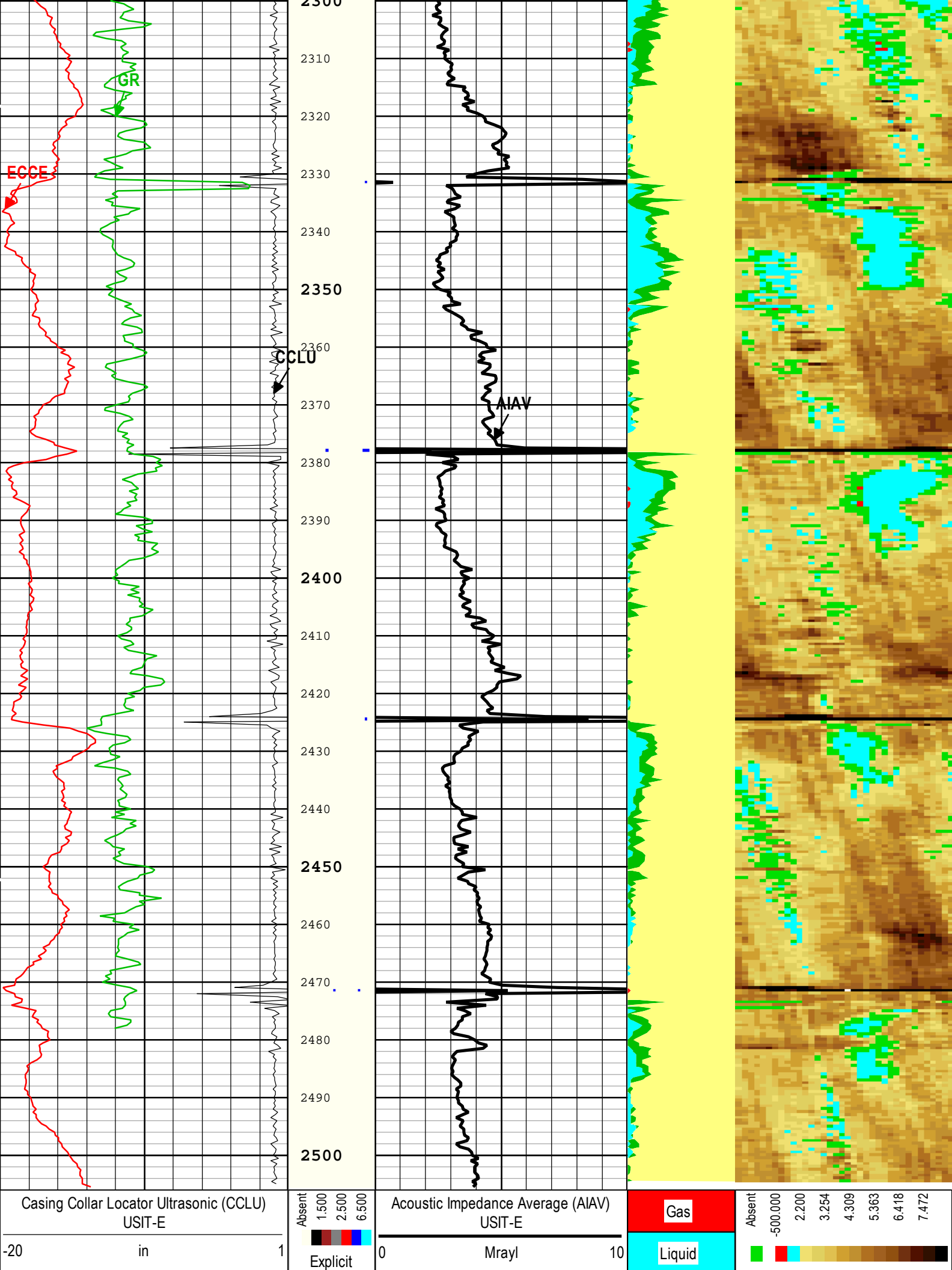
Tool Control Parameters	
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ONE: Parameters				
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
EMXV	EMEX Voltage	USIT-E	Time Zoned	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	6300	ft
WINB	Window Begin Time	USIT-E	Time Zoned	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)
EMXV	40	25-Jul-2017 14:07:06	25-Jul-2017 14:36:32	6265.22	1689.96
EMXV	35	25-Jul-2017 14:36:32	25-Jul-2017 14:45:47	1689.96	59.08
WINB	31.88	25-Jul-2017 14:07:06	25-Jul-2017 14:13:25	6265.22	6195.42
WINB	26.6	25-Jul-2017 14:13:25	25-Jul-2017 14:45:47	6195.42	59.08
WINE	71.88	25-Jul-2017 14:07:06	25-Jul-2017 14:13:19	6265.22	6215.53
WINE	78.78	25-Jul-2017 14:13:19	25-Jul-2017 14:45:47	6215.53	59.08
All depth are at tool zone					







<div>Amplitude of Eccentering (ECCE) USIT-E</div> <div>0in0.5</div>		Normalization n USIT - USIT Processing Flags (UFLG) USIT-E	<div>Micro-Debonding</div> <div>Bonded</div>		Custom Normalization USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E (Mrayl)
<div>Calibrated Gamma Ray (GR) HGNS-H</div> <div>0gAPI150</div>					
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: 25-Jul-2017 15:13:31					

Channel Processing Parameters				
ONE: 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	
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	1.05	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.8	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	1.7	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
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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	40	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	2500	ft

WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	71.88	us

XYZ

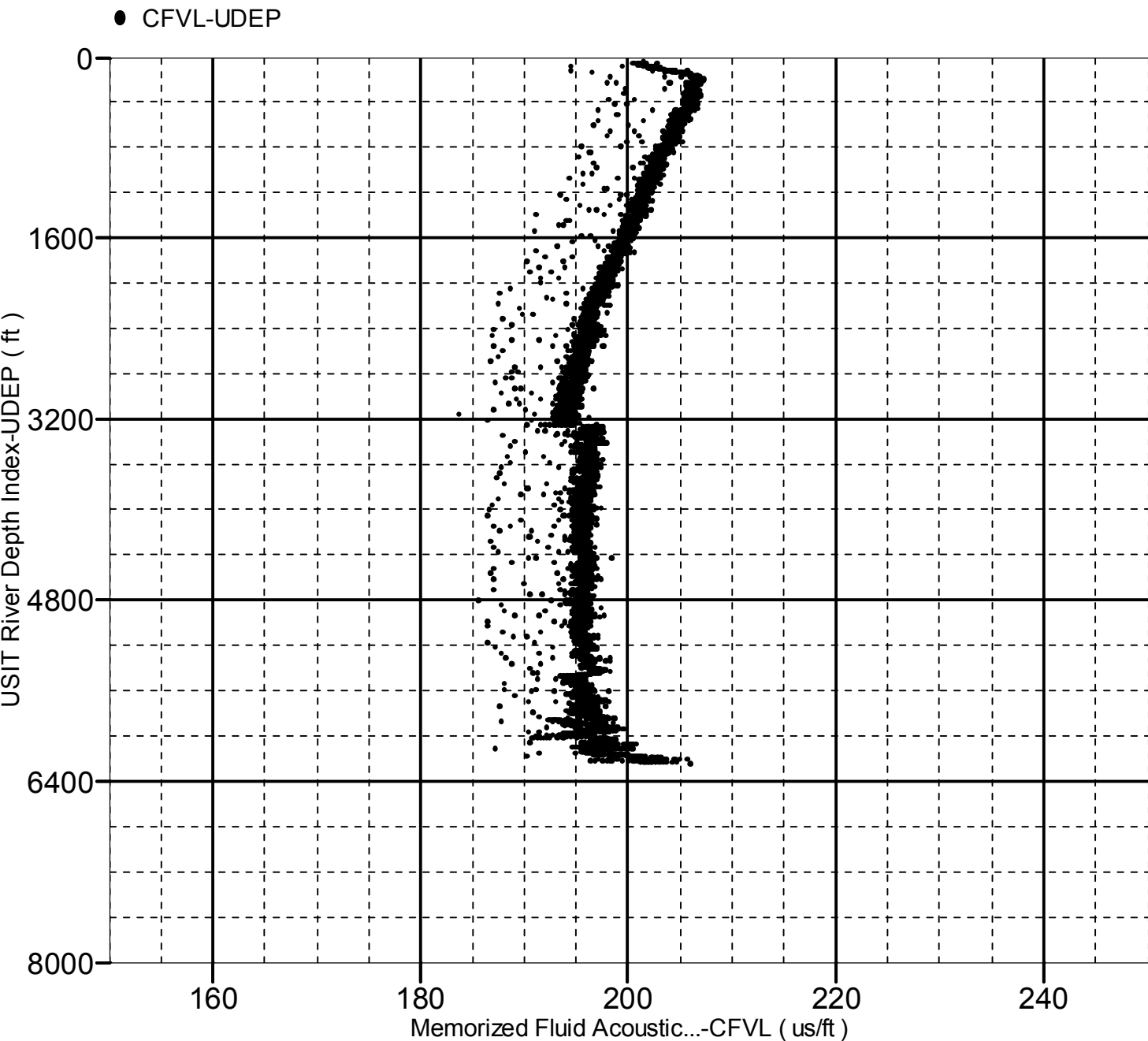
Company:Noble Energy Inc Well:DIAMONDBACK FEDERAL LC10-770

ONE: Log[6]:Up:S004

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6265.00 to 59.00 ft



XYZ

Company:Noble Energy Inc Well:DIAMONDBACK FEDERAL LC10-770

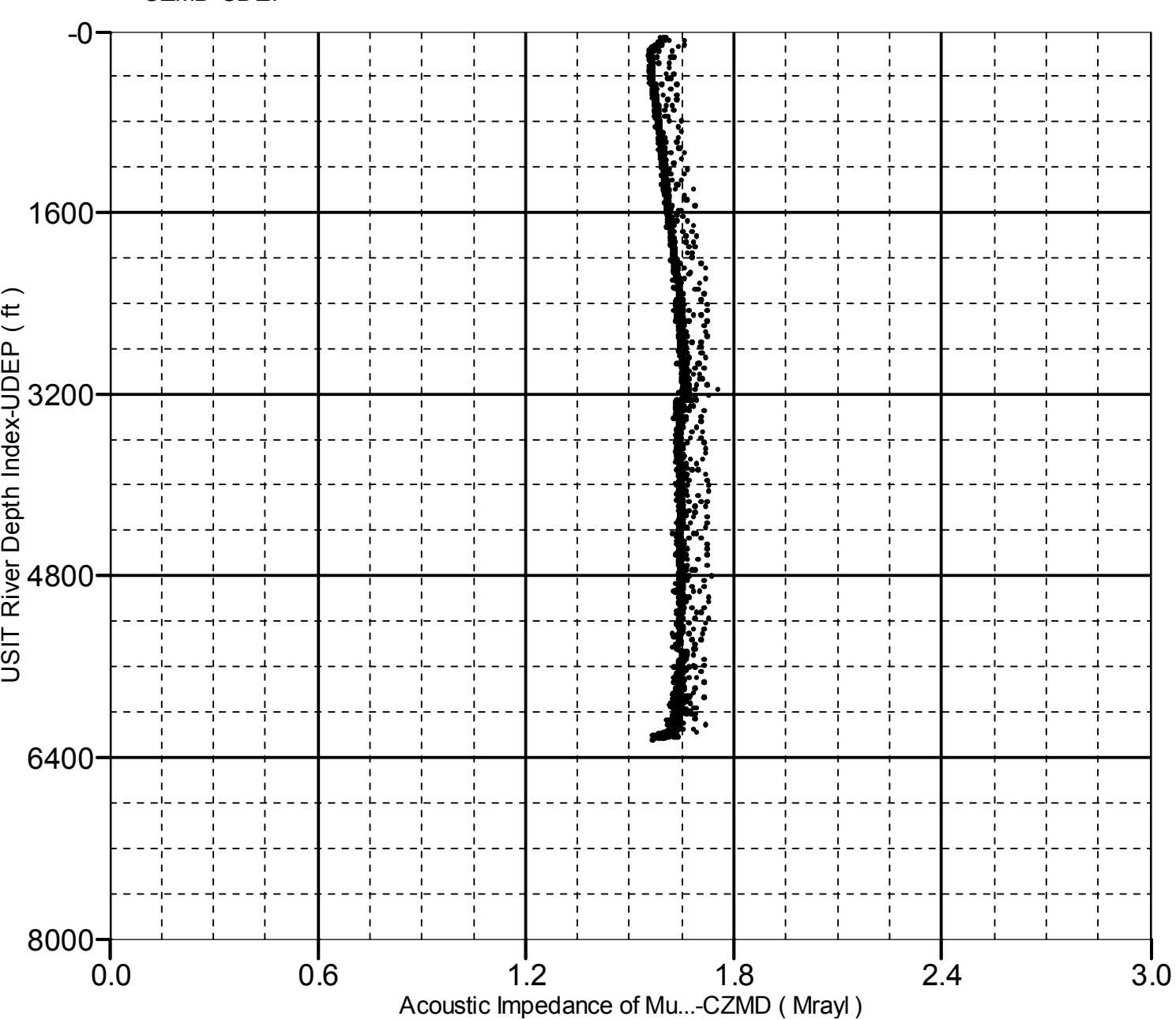
ONE: Log[6]:Up:S004

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6265.00 to 59.00 ft

● CZMD-UDEP



Company:	Noble Energy Inc	Schlumberger
Well:	DIAMONDBACK FEDERAL LC22-770	
Field:	WILDCAT	
County:	WELD	
State:	COLORADO	
UltraSonic Summary Print		