

Company: Noble Energy Inc

Well: ELLIE LD26-625

Field: Wildcat

County: Weld Country: US

## UltraSonic Summary Print

County: Weld Field: Wildcat Location: SHL: SESE S28, T9N, R58W Well: ELLIE LD26-625 Company: Noble Energy Inc	Location:	SHL: SESE S28, T9N, R58W		Elev.:	K.B.	4856.00 ft		
		Lat: 40.71829, Long: -103.86054			G.L.	4826.00 ft		
					D.F.	4856.00 ft		
		Permanent Datum:		Ground Level	Elev.:	4826.00 f		
		Log Measured From:		Kelly Bushing		30.00 ft	above Perm.Datum	
		Drilling Measured From:		Kelly Bushing				
		API Serial No.		Max.Hole Deviation	Longitude:		Latitude:	
		05-123-43322		0 deg	-103.86054 degrees		40.718290 degrees	

Logging Date			20-Oct-2016			
Run Number			One			
Depth Driller			16969.00 ft			
Schlumberger Depth			16969.00 ft			
Bottom Log Interval			5500.00 ft			
Top Log Interval			60.00 ft			
Casing Driller Size @ Depth			5.5 in	@	15969.70 ft	
Casing Schlumberger			15969.7 ft			
Bit Size			8.5 in			
Type Fluid In Hole			Water			
MUD	Density	Viscosity	9.3 lbm/gal	26 s		
	Fluid Loss	PH				
	Source of Sample		Active Tank			
RM @ Meas Temp			0.2 ohm.m	@	68 degF	
RMF @ Meas Temp			0.15 ohm.m	@	68 degF	
RMC @ Meas Temp						
Source RMF		RMC		Pressed		
RM @ BHT		RMF @ BHT	0.08 @ 171	0.06 @ 171		
Max Recorded Temperatures			170 degF			
Circulation Stopped Time						
Logger on Bottom Time						
Unit Number		Location:	9108	Fort Morgan, CO		
Recorded By			Benjamin Marmon			
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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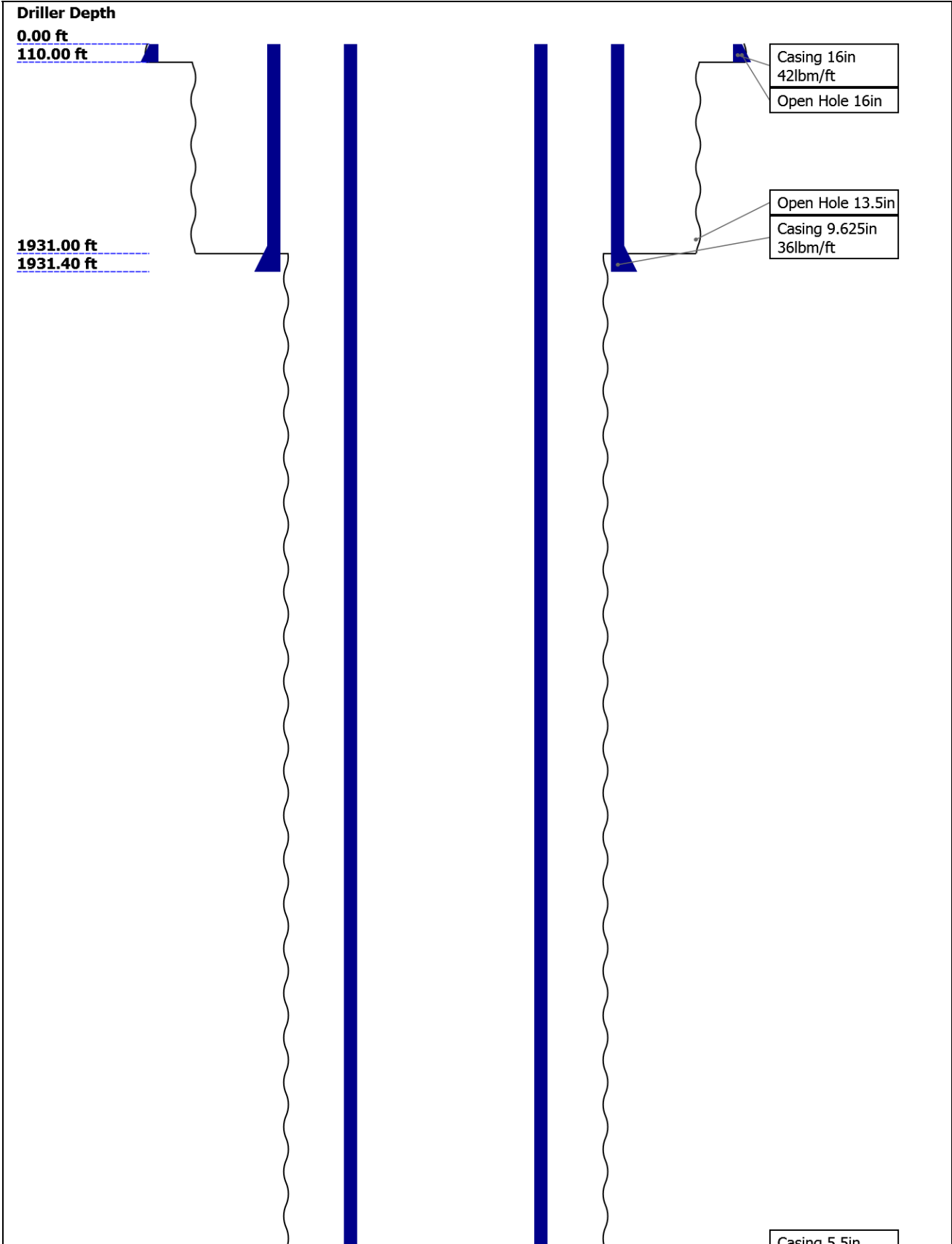
13. XYZ ( USI Acoustic Impedance of Mud vs Depth 3.0

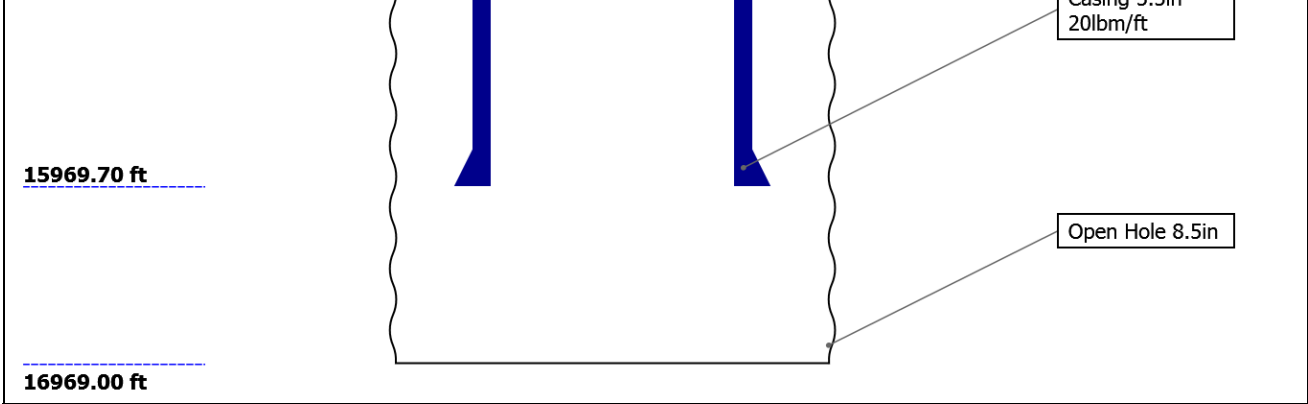
in )

14. Tail

- 11.1 Integration Summary
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Well Sketch





Borehole Size/Casing/Tubing Record

Bit						
Bit Size ( in )	16	13.5	8.5			
Top Driller ( ft )	0	110	1931			
Top Logger ( ft )	0	110	1931			
Bottom Driller ( ft )	110	1931	16969			
Bottom Logger ( ft )	110	1931	16969			
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	N/A	N/A			
Top Driller ( ft )	0	0	0			
Top Logger ( ft )	0	0	0			
Bottom Driller ( ft )	110	1931.4	15969.7			
Bottom Logger ( ft )	110	1931.4	15969.7			

Operational Run Summary

Parameter ( unit )	One					
Date Log Started	20-Oct-2016					
Time Log Started	06:35:57					
Date Log Finished	20-Oct-2016					
Time Log Finished	07:49:23					
Top Log Interval ( ft )	60.00					
Bottom Log Interval ( ft )	5500.00					
Total Depth ( ft )						
Max Hole Deviation ( deg )	0.00					
Azimuth of Max Deviation ( deg )	0.00					
Bit Size ( in )	8.500					
Logging Unit Number	9108					
Logging Unit Location	Fort Morgan, CO					
Recorded By	Benjamin Marmon					

Witnessed By	Bill Mansfield					
Service Order Number	D5ND-00133					

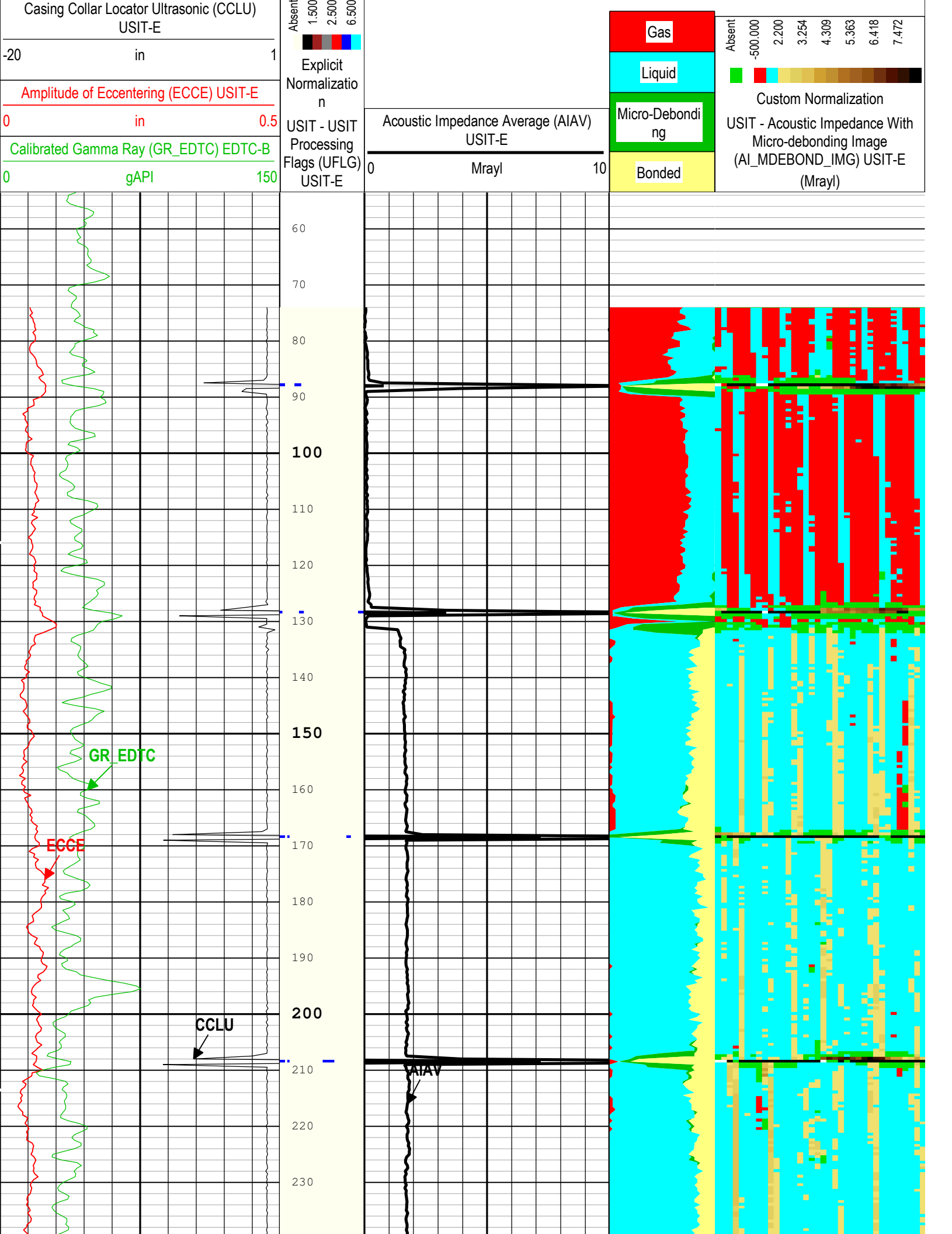
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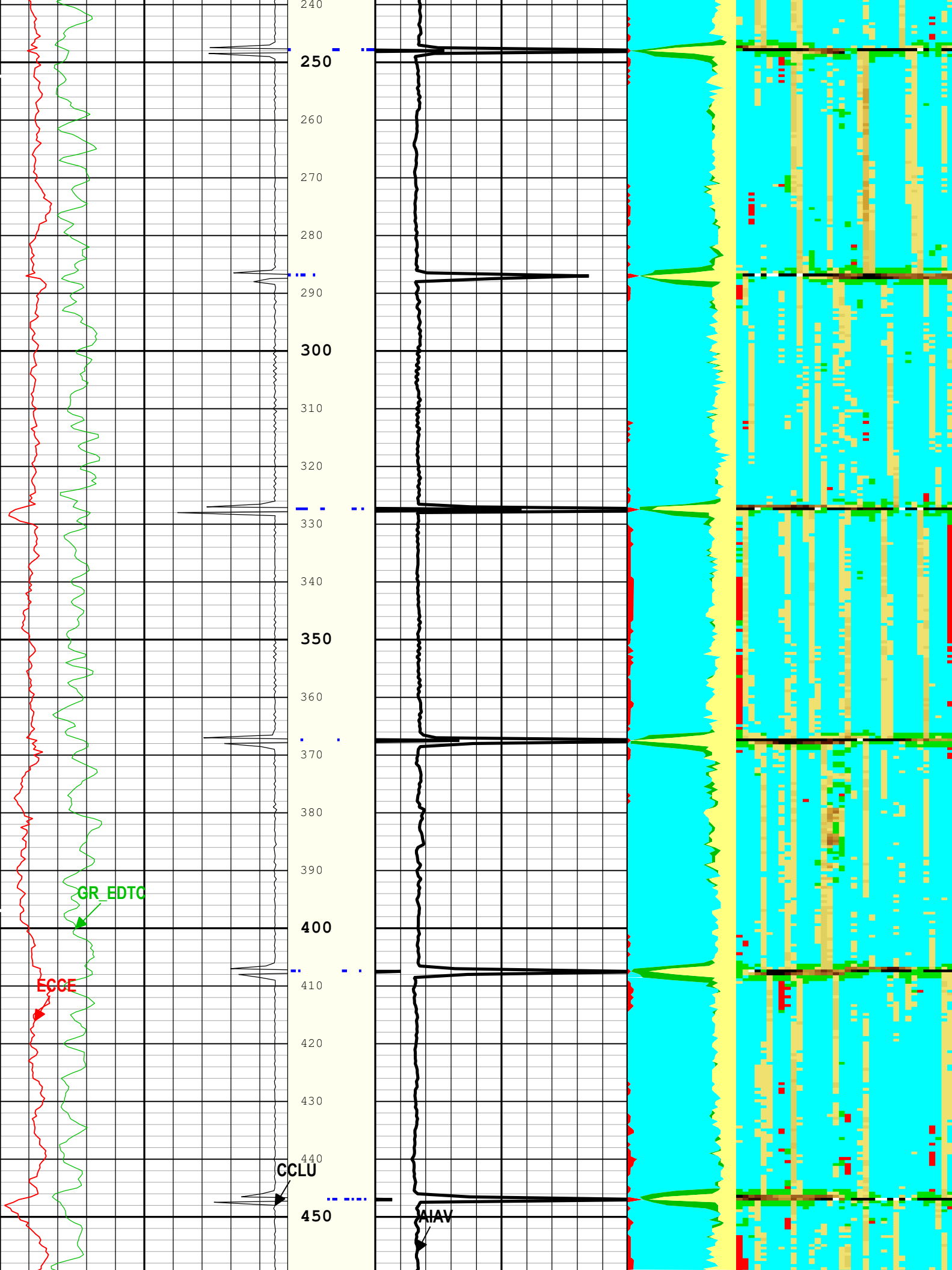
One: Toolstring			One: Remarks
<b>Equip name</b> <b>LEH-Q</b>	<b>Length</b> <b>33.11</b>	<b>MP name</b> <b>Offset</b>	This is the first log in the well.
			Tool string ran as per tool sketch.
			BHT: 171 degF.
			Expected TOC: 2500'
			Main Pass recorded at 2500 psi.
			Repeat Pass recorded at 0 PSI.
<b>SAH-F</b>	<b>30.91</b>		
<b>EDTC-B</b>	<b>26.06</b>		
EDTH-B			
EDTG-A			
EDTC-B			
		<b>CTEM</b> <b>22.56</b>	
		<b>ACCZ</b> <b>0.00</b>	
		<b>HV</b> <b>0.00</b>	
		<b>Gamma</b> <b>20.69</b>	
		<b>Ray</b>	
		<b>TelStatu</b> <b>19.56</b>	
		<b>s</b>	
<b>AH-184[2]</b>	<b>19.56</b>		
<b>AH-184[1]</b>	<b>17.56</b>		
<b>USIT-E</b>	<b>15.56</b>		
ECH-MFA			
USAC-A			
USIS-A			
USSC-B			
USRS-A			
USI-SENS			
OR			
		<b>USI Sen</b> <b>0.37</b>	
		<b>sor</b>	
		<b>TOOL_ZERO</b>	
<p>Lengths are in ft</p> <p>Maximum Outer Diameter = 3.875 in</p> <p>Line: Sensor Location, Value: Gating Offset</p> <p>All measurements are relative to TOOL_ZERO</p>			

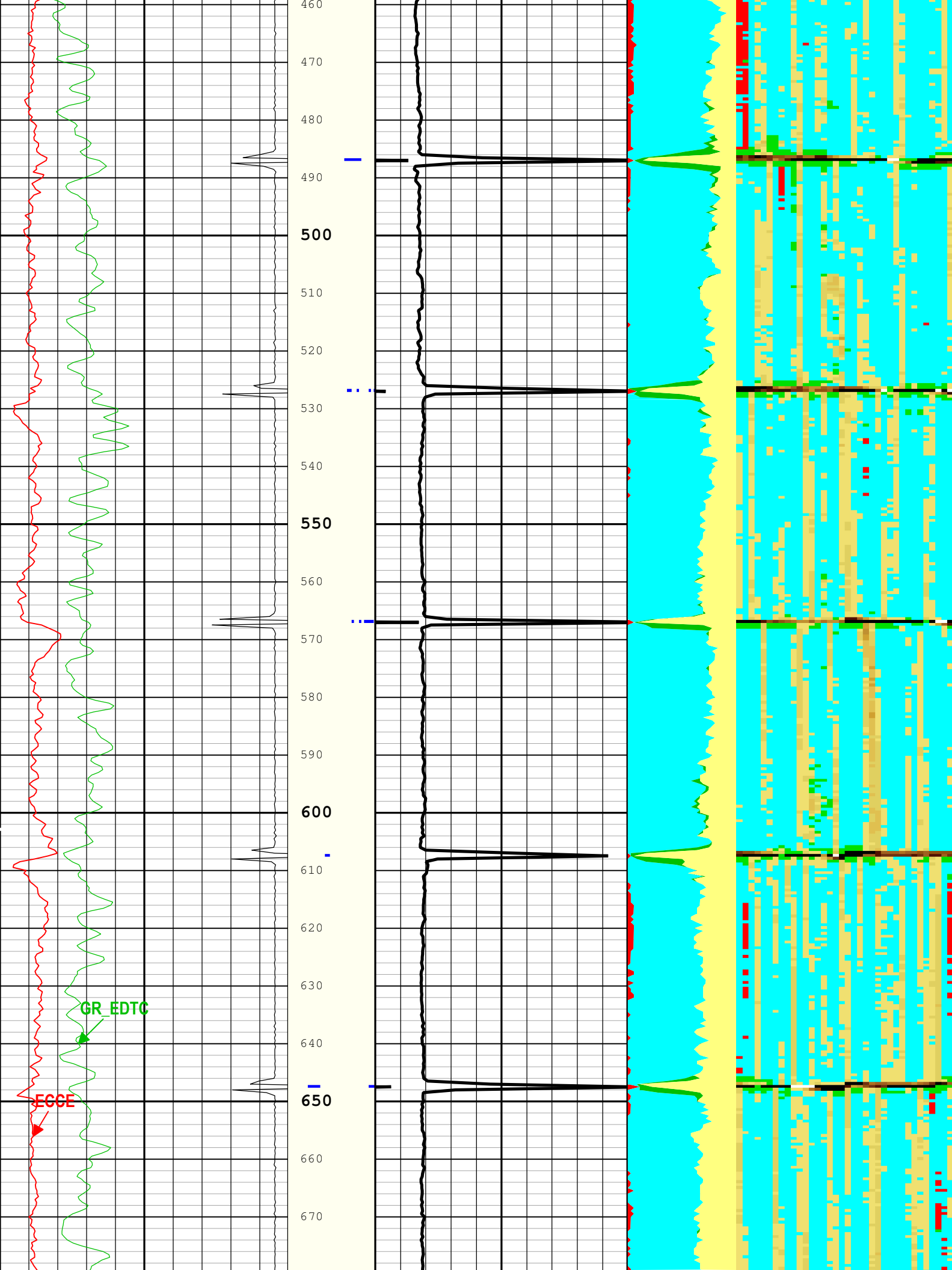
## Depth Summary

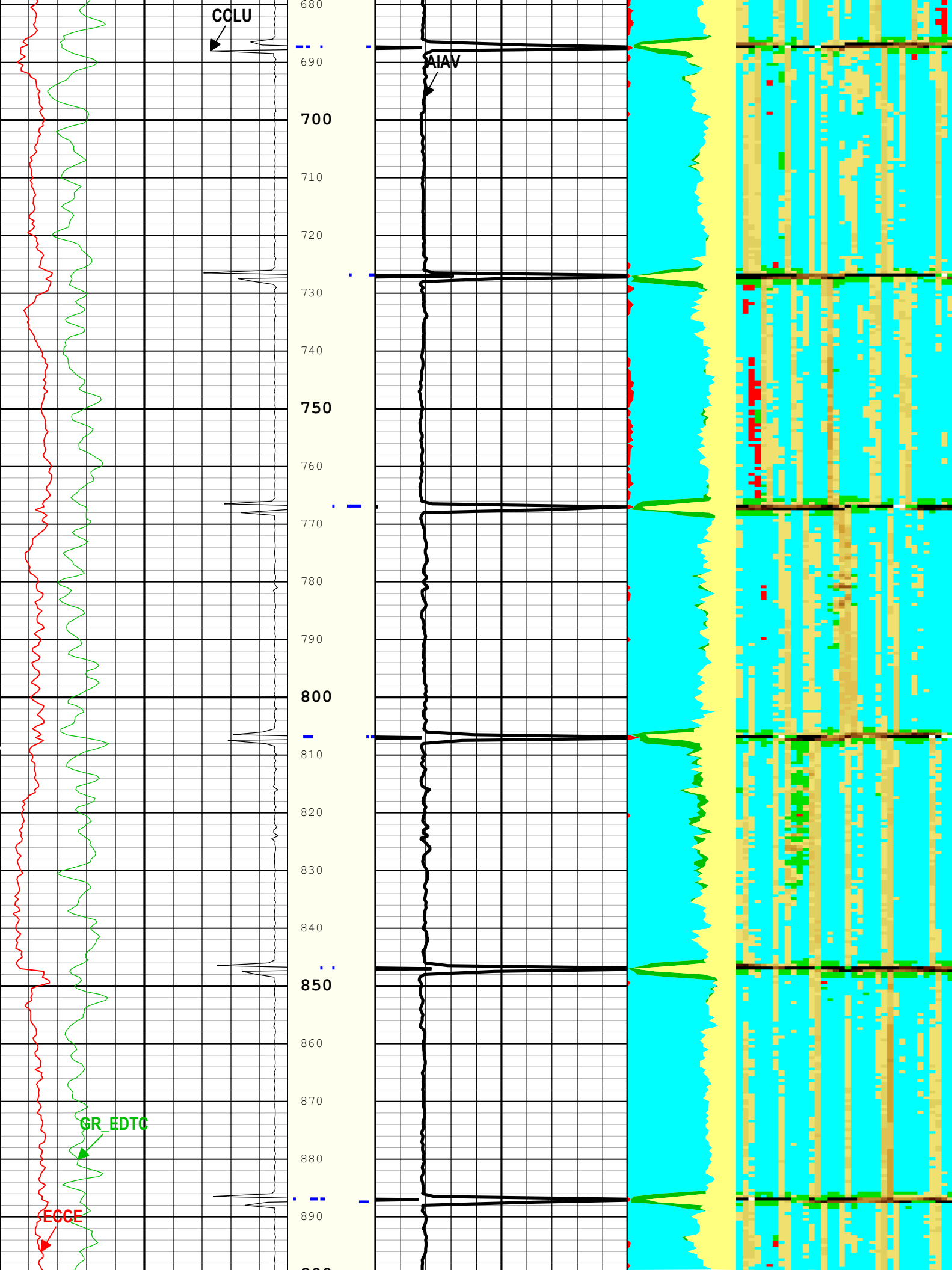
	One		
Depth Measuring Device			
Type	IDW-B		
Serial Number			
Calibration Date			

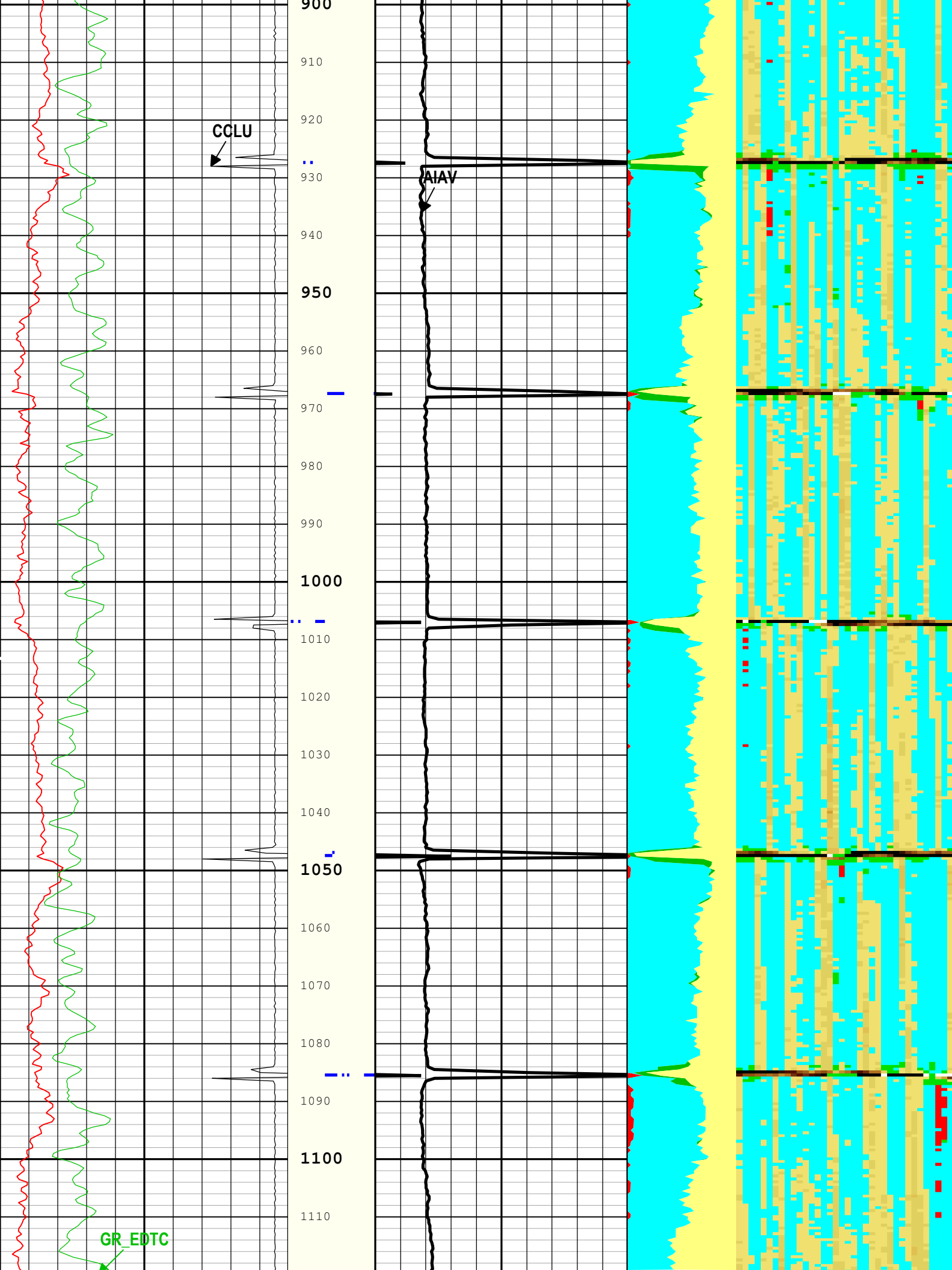
Calibrator Serial Number									
Calibration Cable Type									
Wheel Correction 1	0								
Wheel Correction 2	0								
Tension Device									
Type	CMTD-B/A								
Serial Number									
Calibration Date									
Calibrator Serial Number									
Number of Calibration Points	0								
Logging Cable									
Type	7-46NT-XS								
Serial Number									
Length	24000.00 ft								
Conveyance Type	Wireline								
Rig Type	Crane								
One:Depth Control Parameters		Depth Control Remarks							
Log Sequence	First Log In the Well	All Schlumberger depth control procedures followed during logging operations.							
Rig Up Length At Surface		IWI used as primary depth control device.							
Rig Up Length At Bottom		ZChart used as secondary depth control device.							
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)						
Fluid Velocity									
Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)						
Mud Impedance									
Start Depth(ft)	Stop Depth(ft)	Start Value(Mrayl)	End Value(Mrayl)						
One									
2500 PSI Main Pass									
Software Version									
Acquisition System		Version							
Maxwell 2016		6.0.53731.3100							
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[4]:Up	Up	74.08 ft	5985.88 ft	20-Oct-2016 7:11:04 AM	20-Oct-2016 7:48:47 AM	ON	14.51 ft	Yes
All depths are referenced to toolstring zero									
Log	Company:Noble Energy Inc			Well:ELLIE LD26-625			One: Log[4]:Up:S006		
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: 24-Oct-2016 00:19:54									
TIME_1900 - Time Marked every 60.00 (s)									

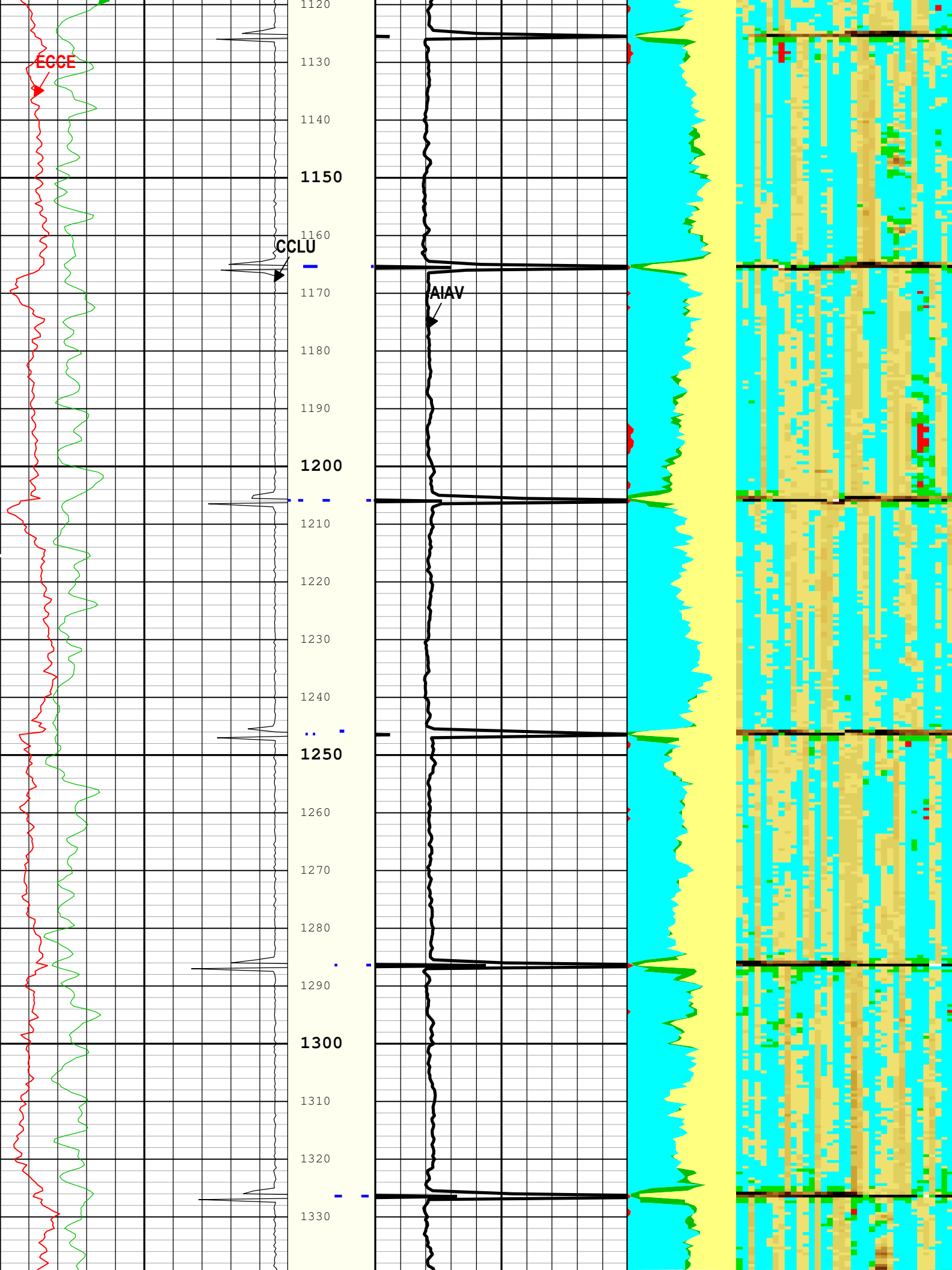


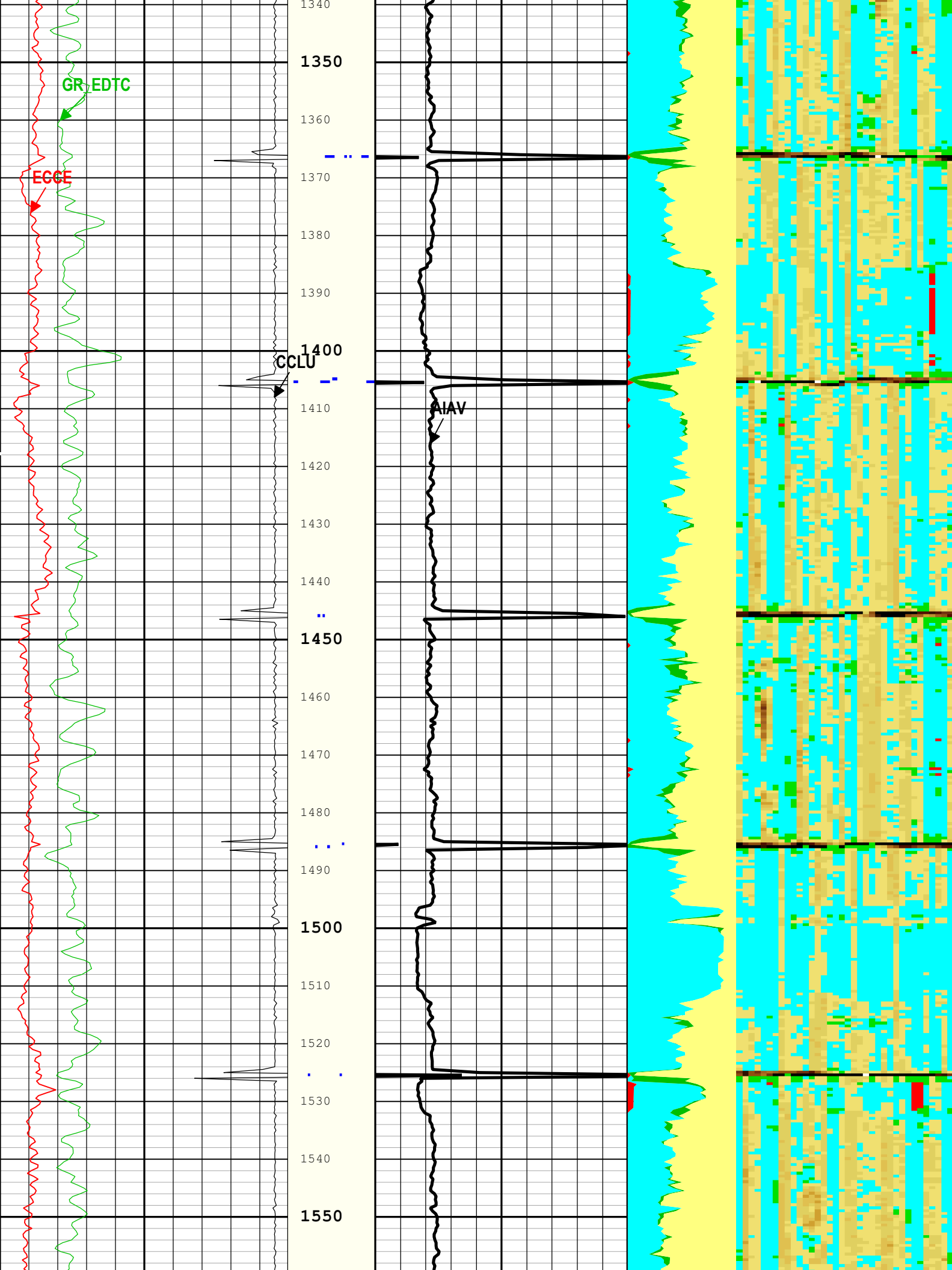


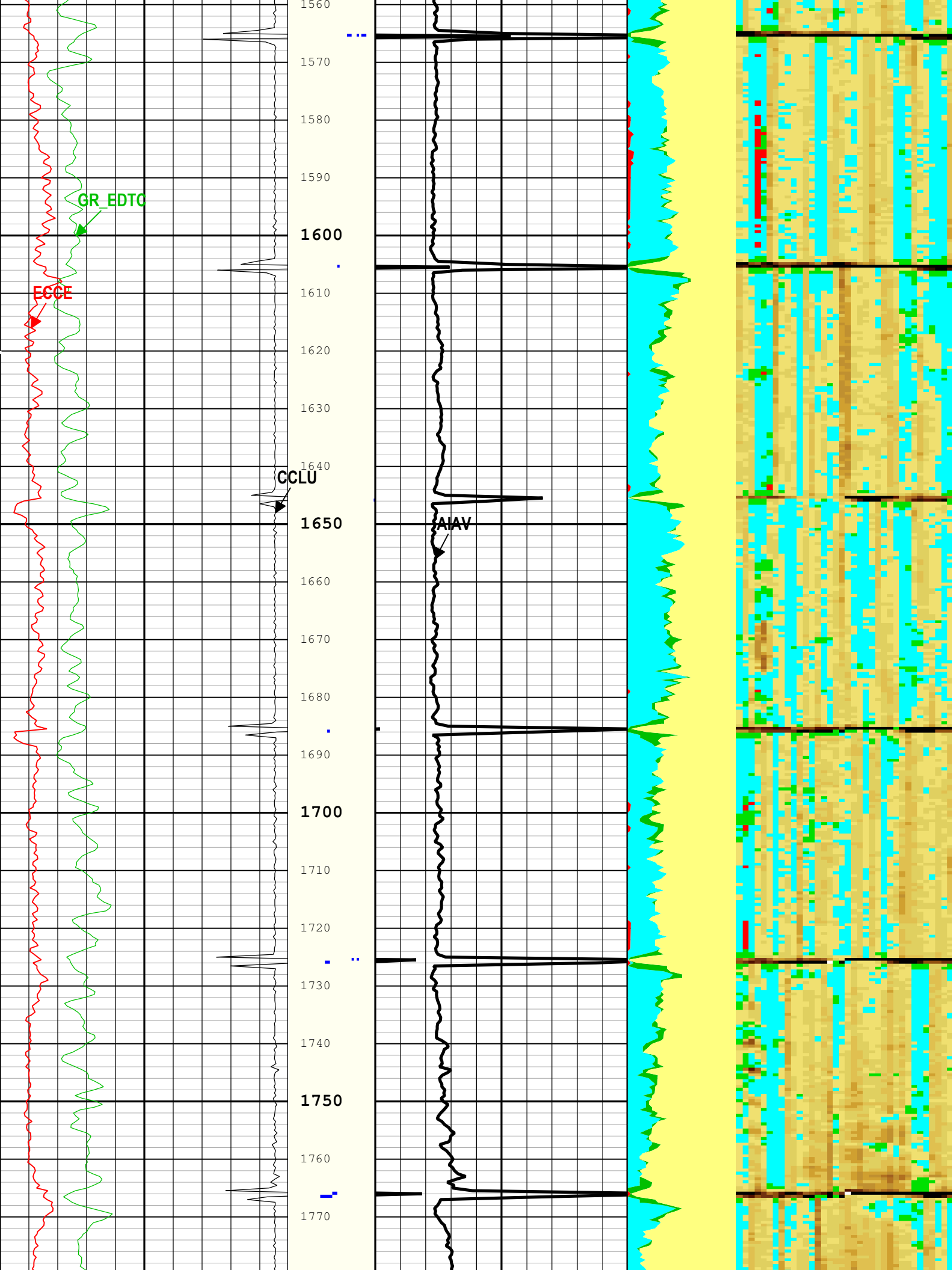


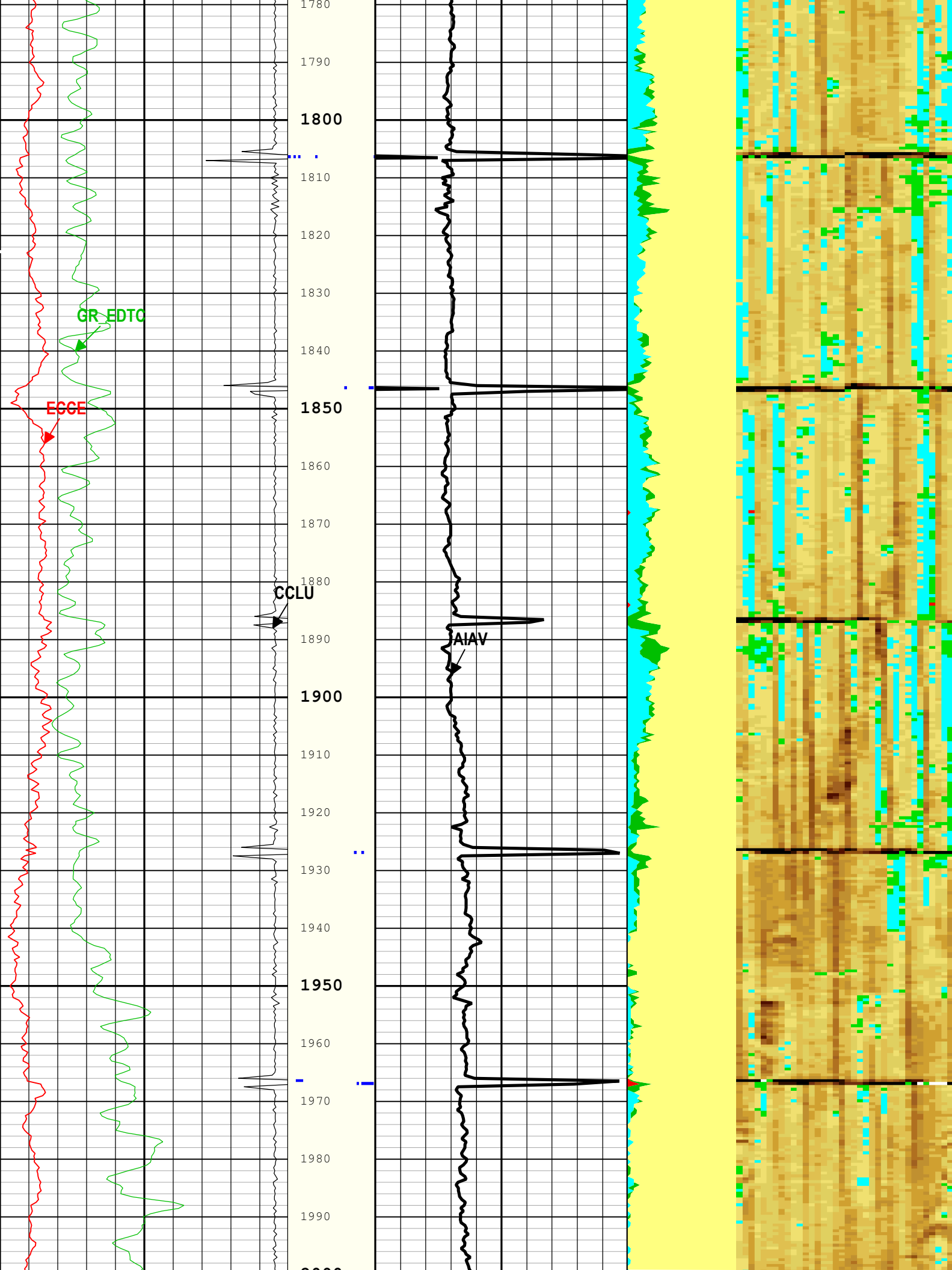


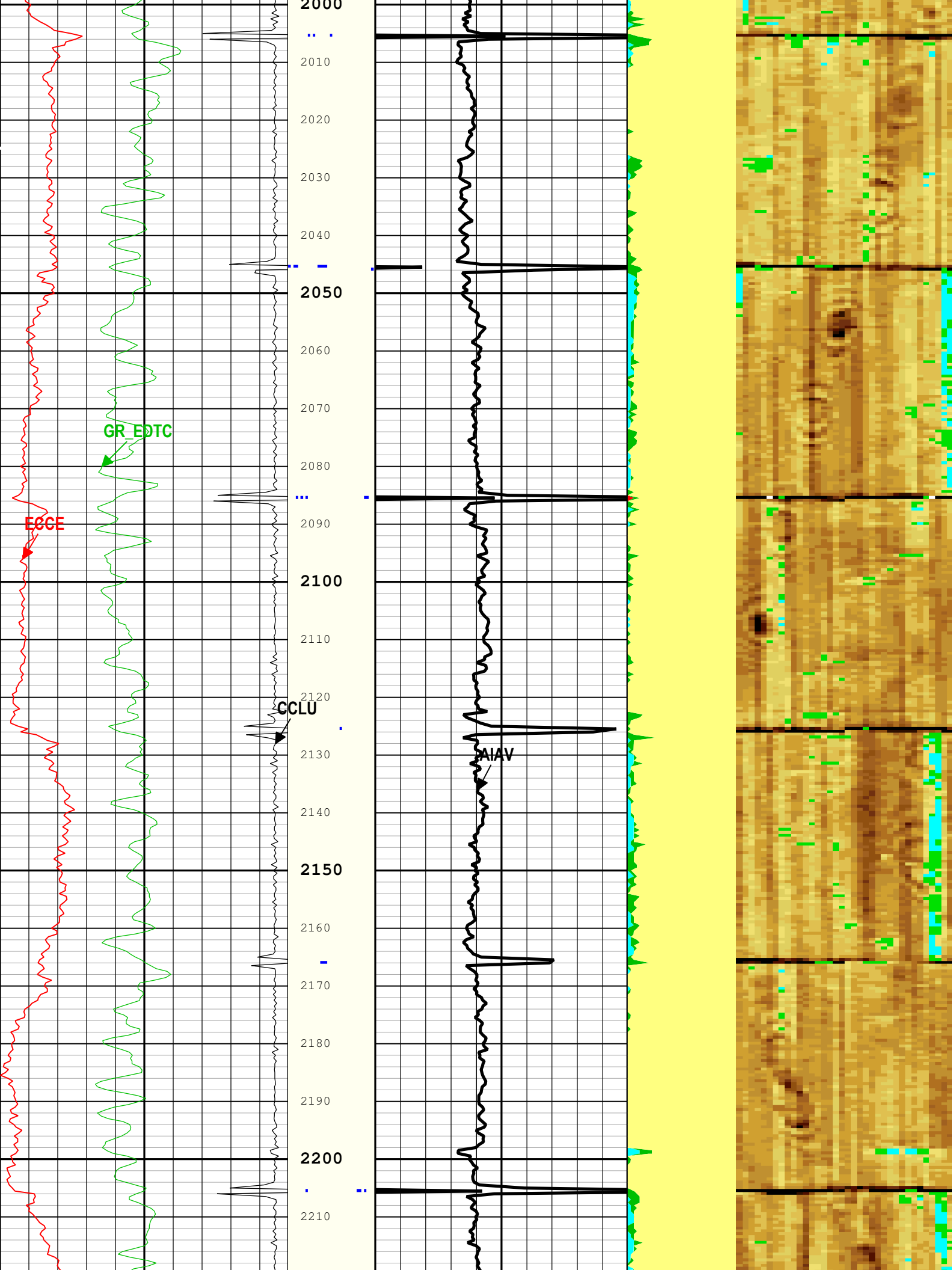


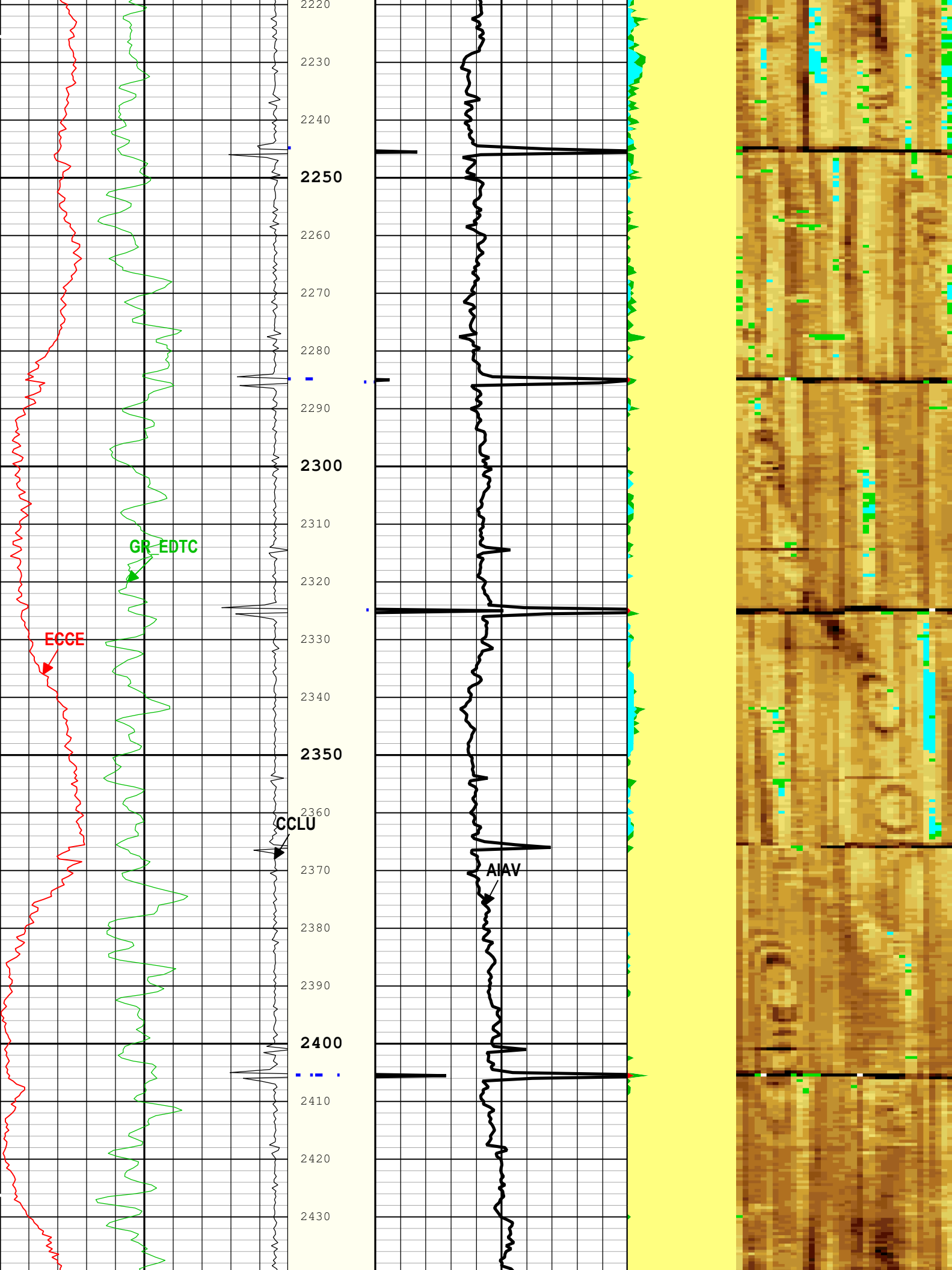


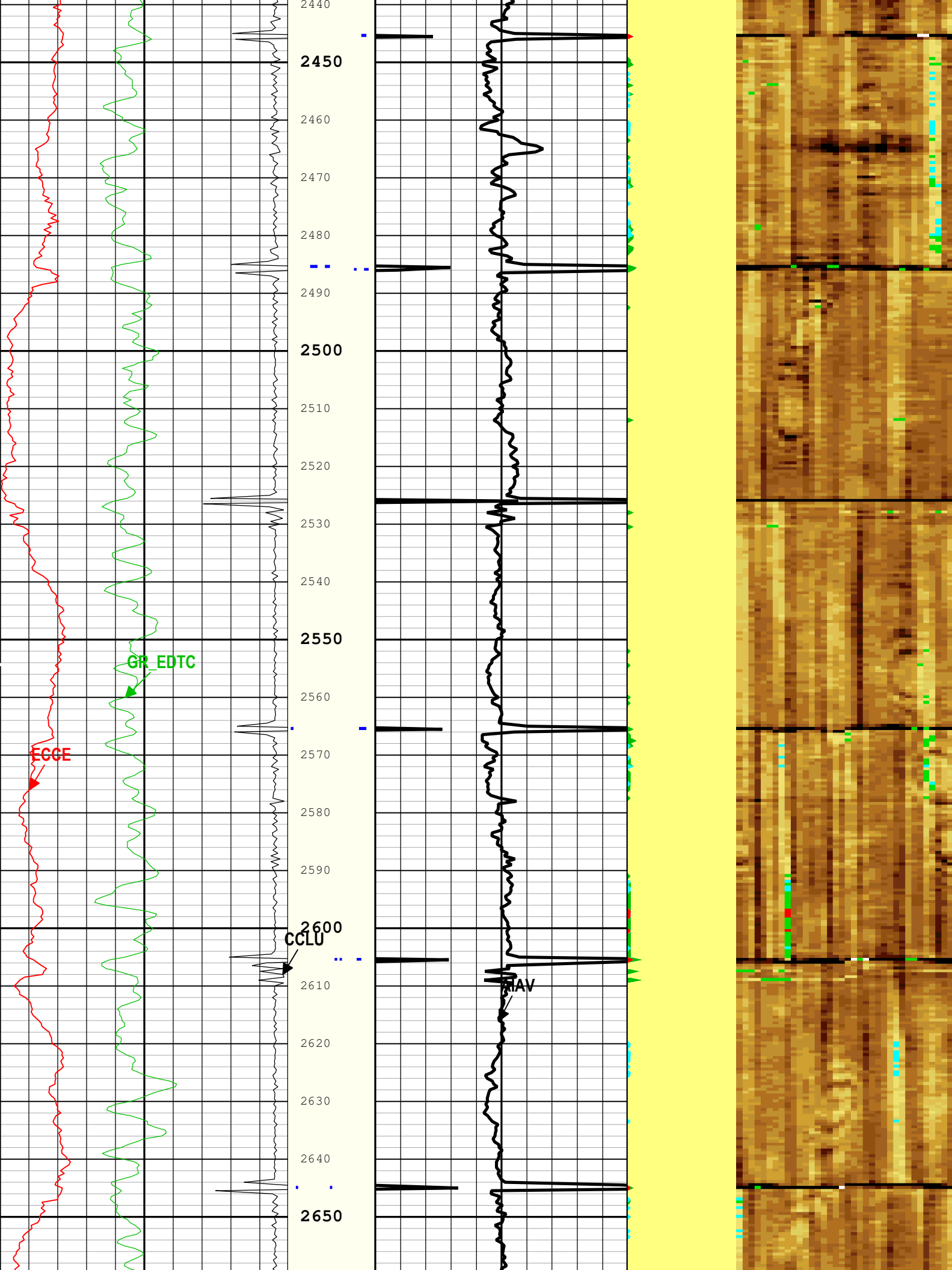


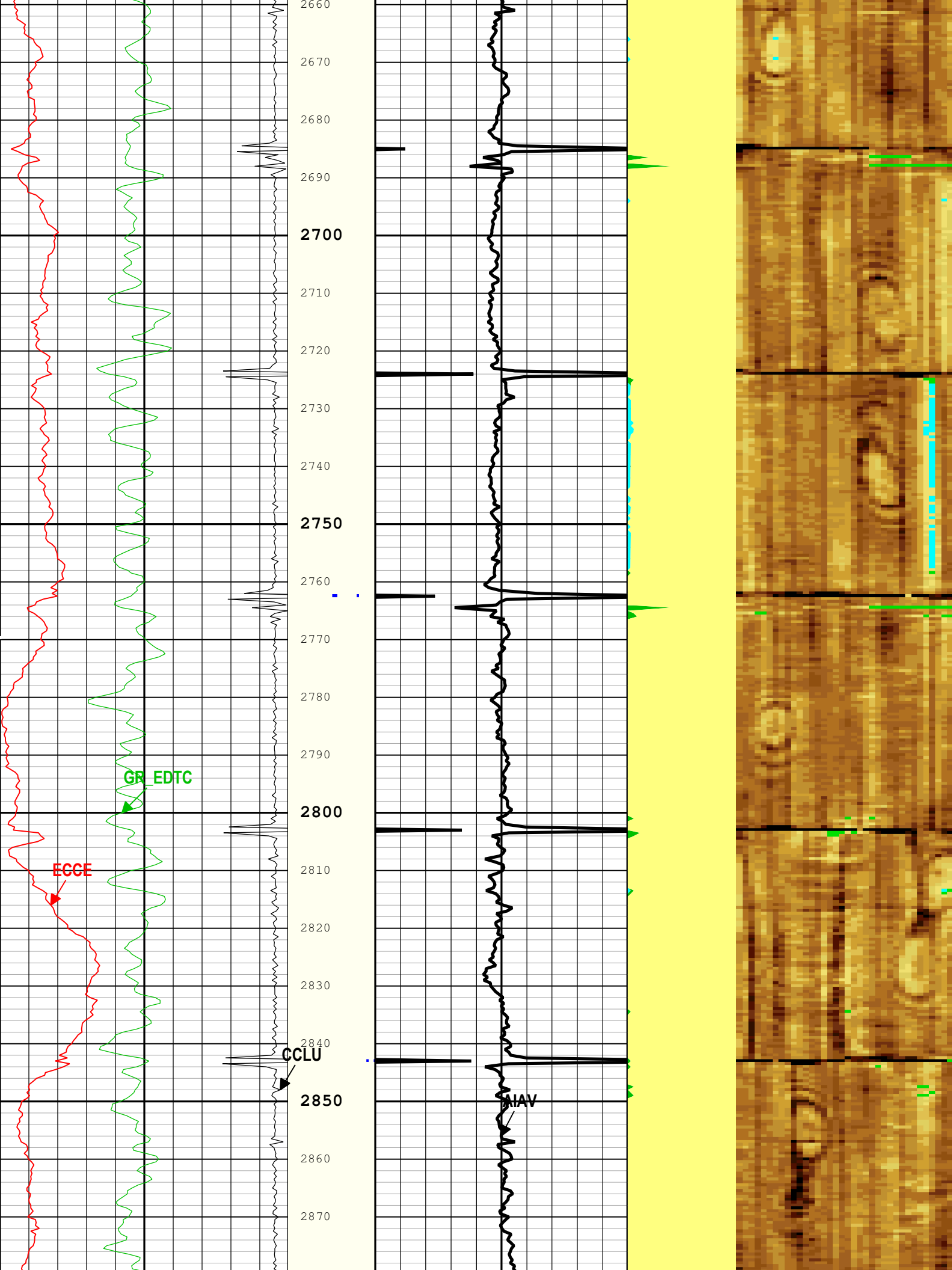


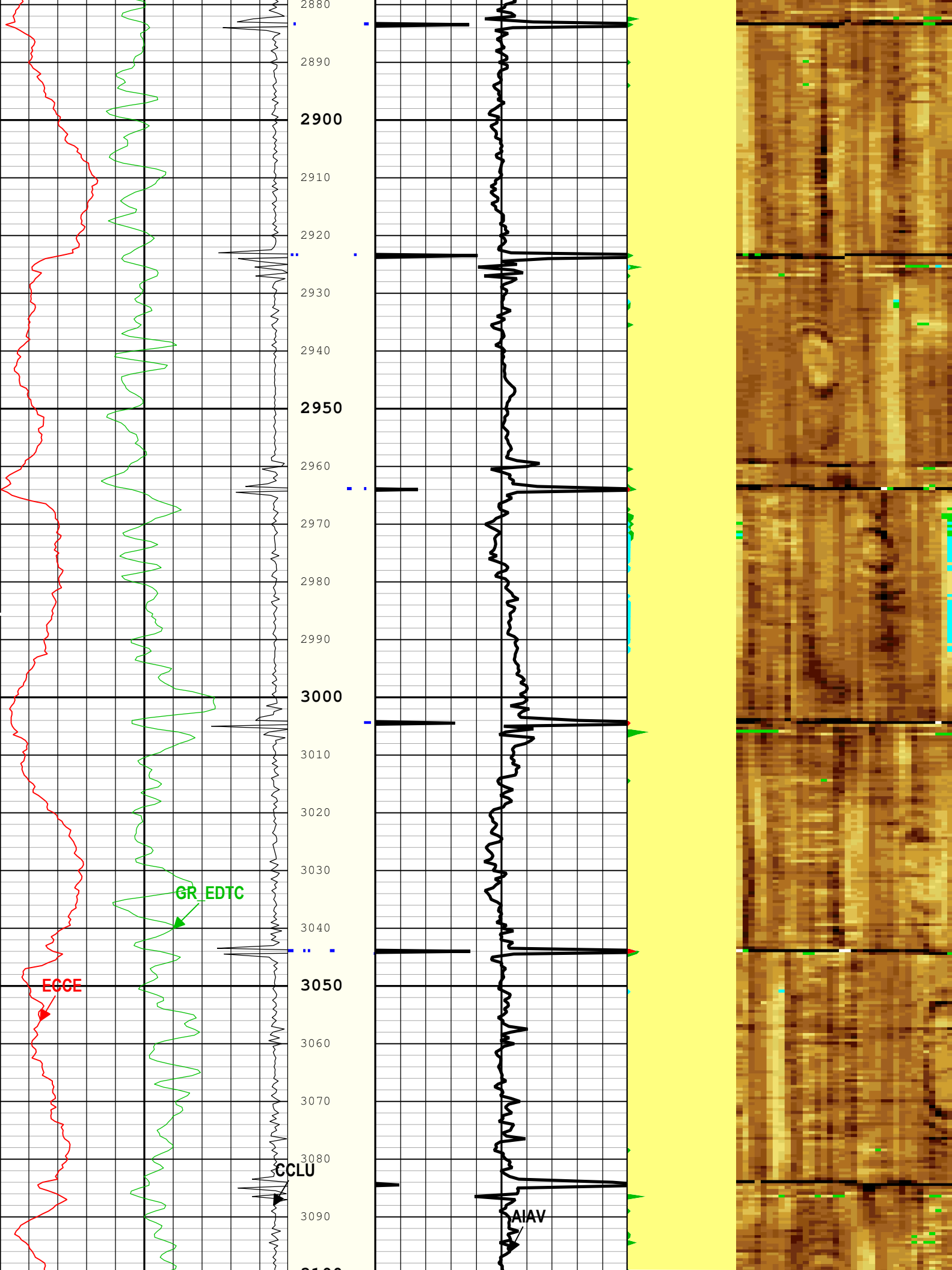


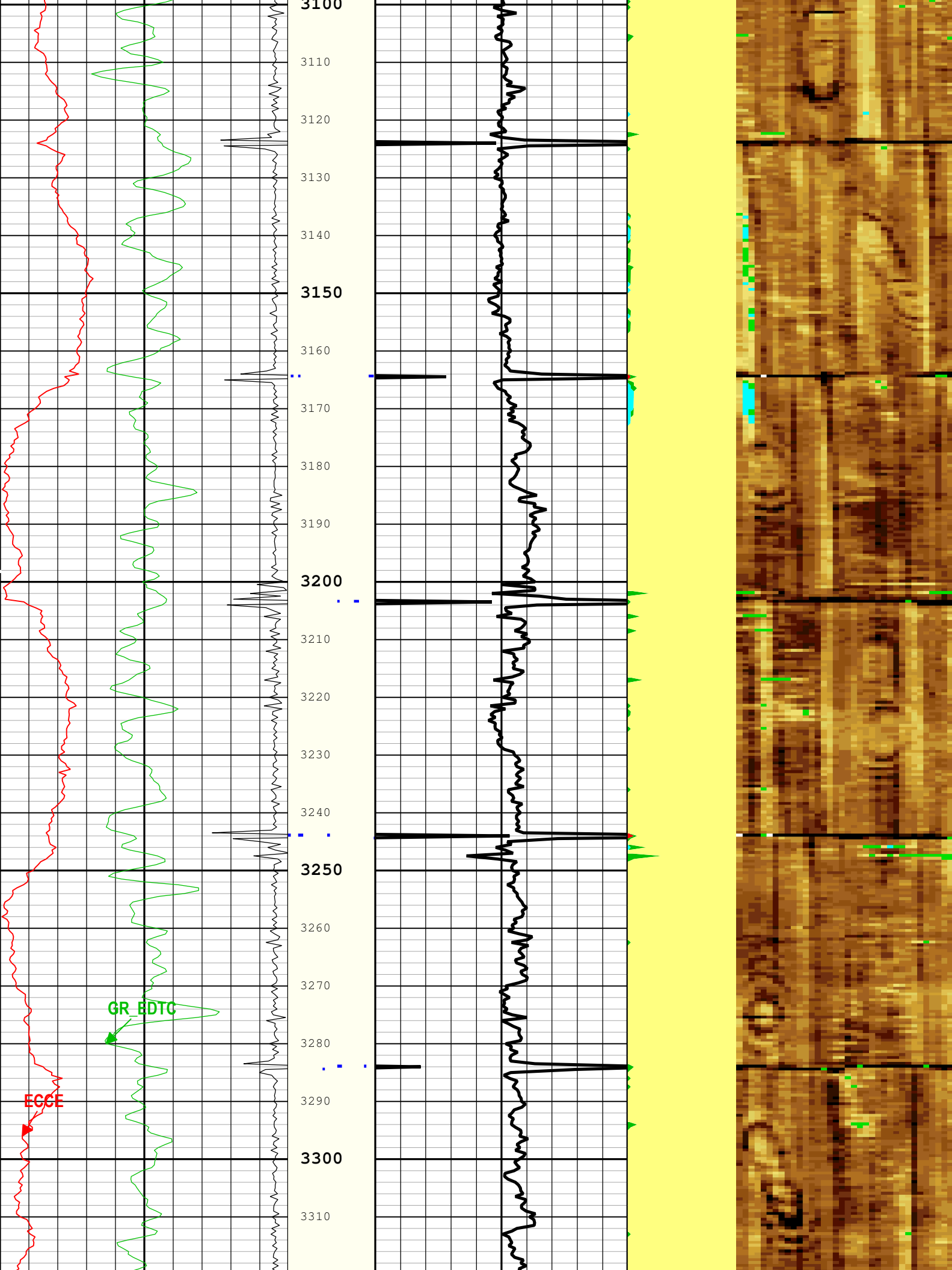


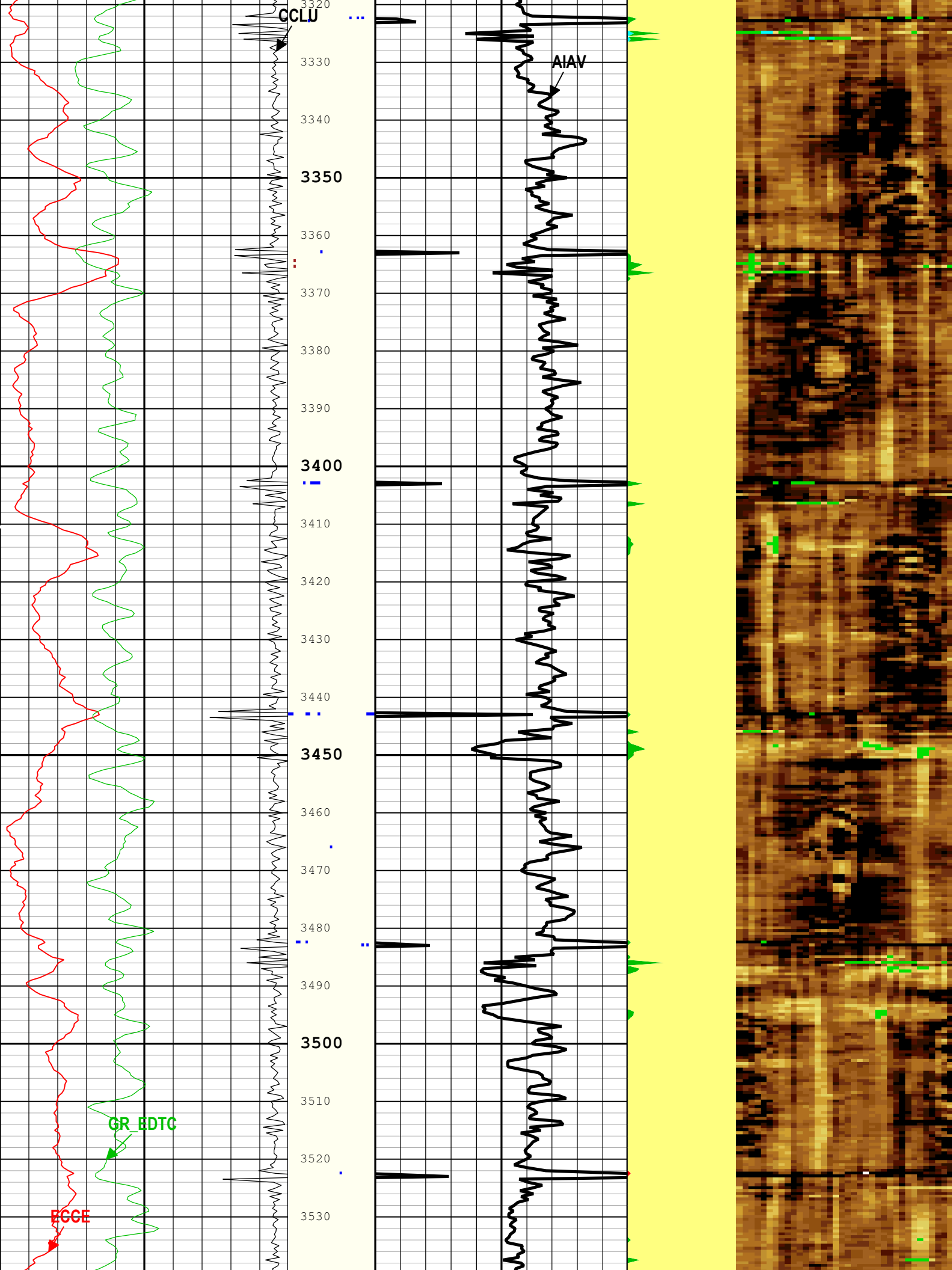


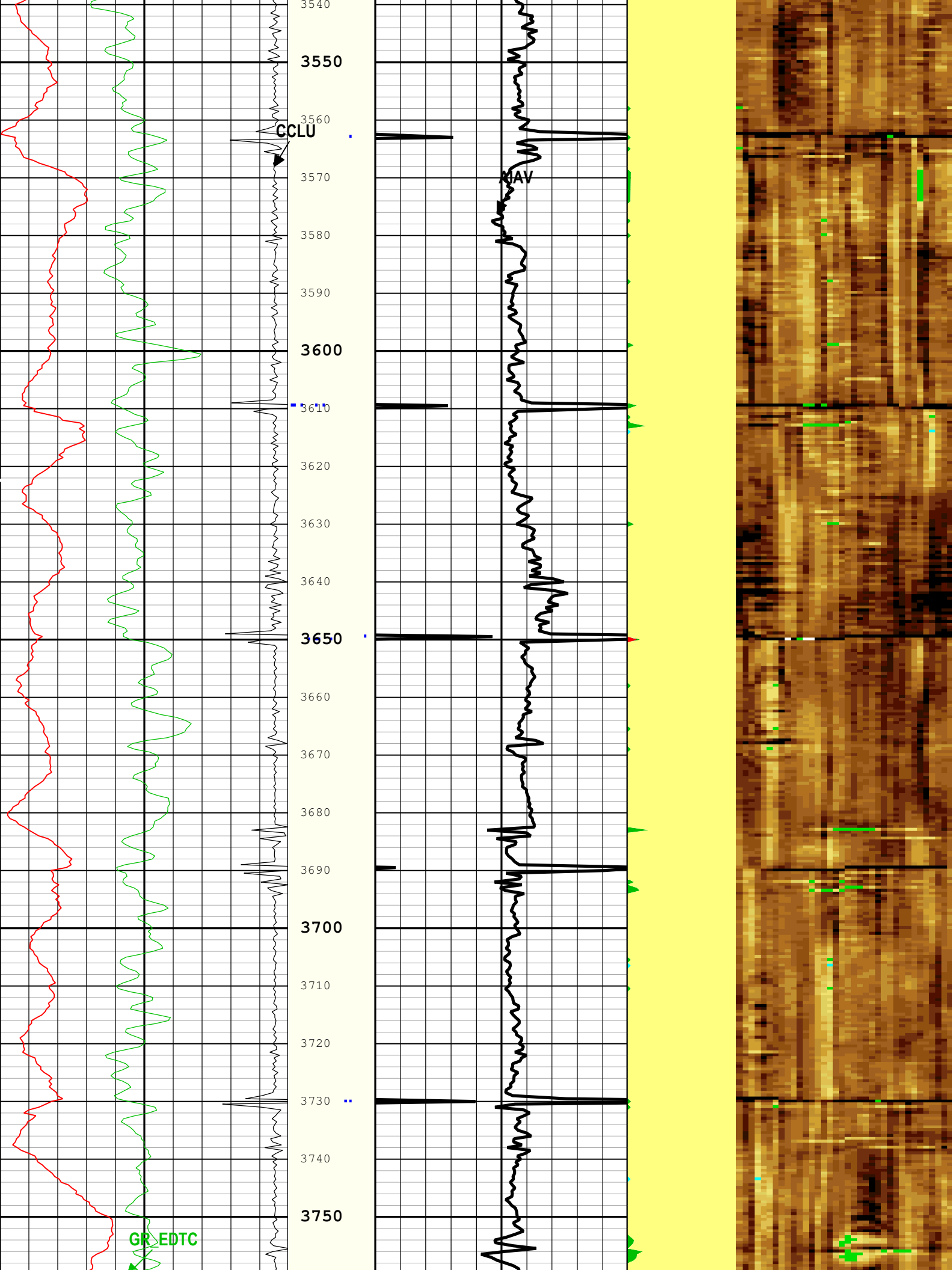


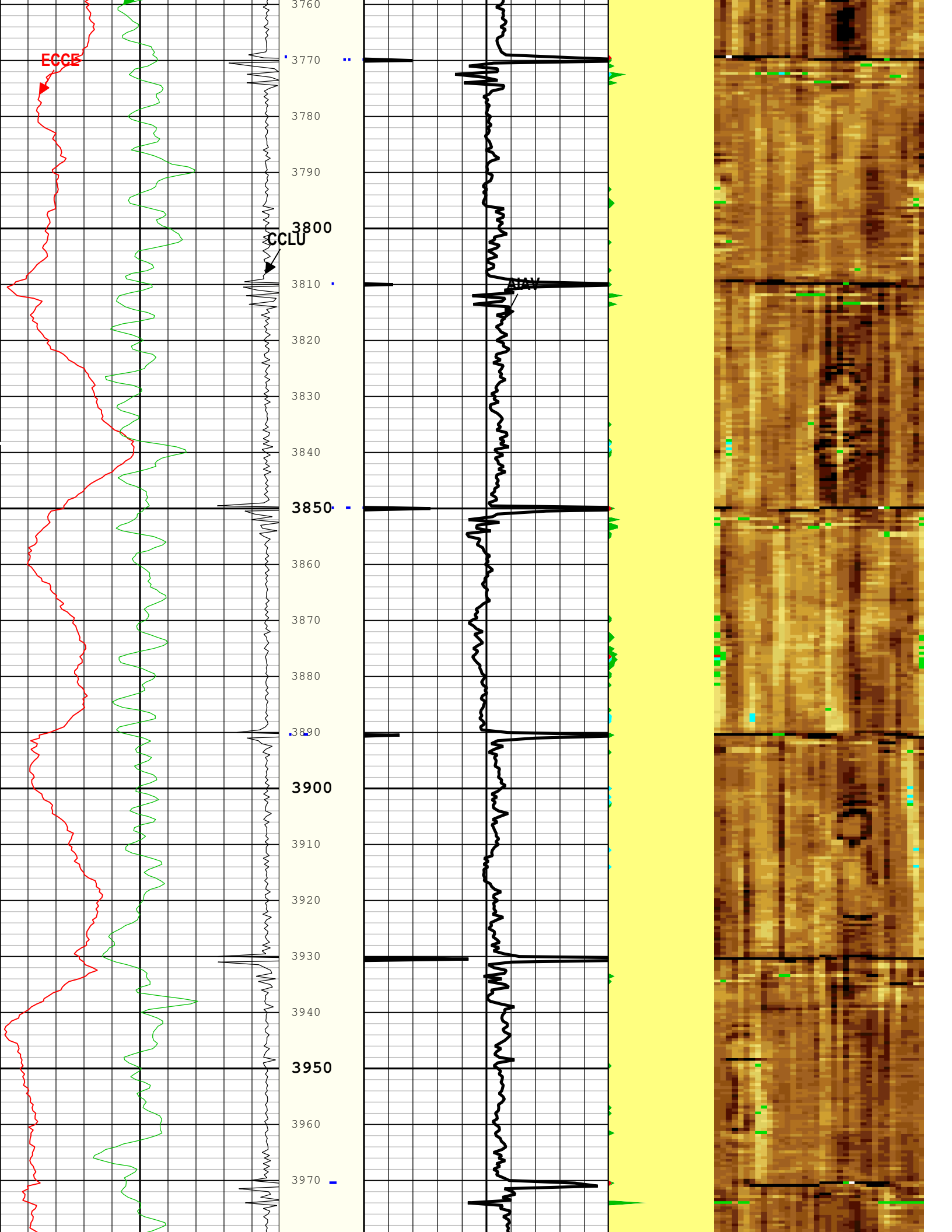


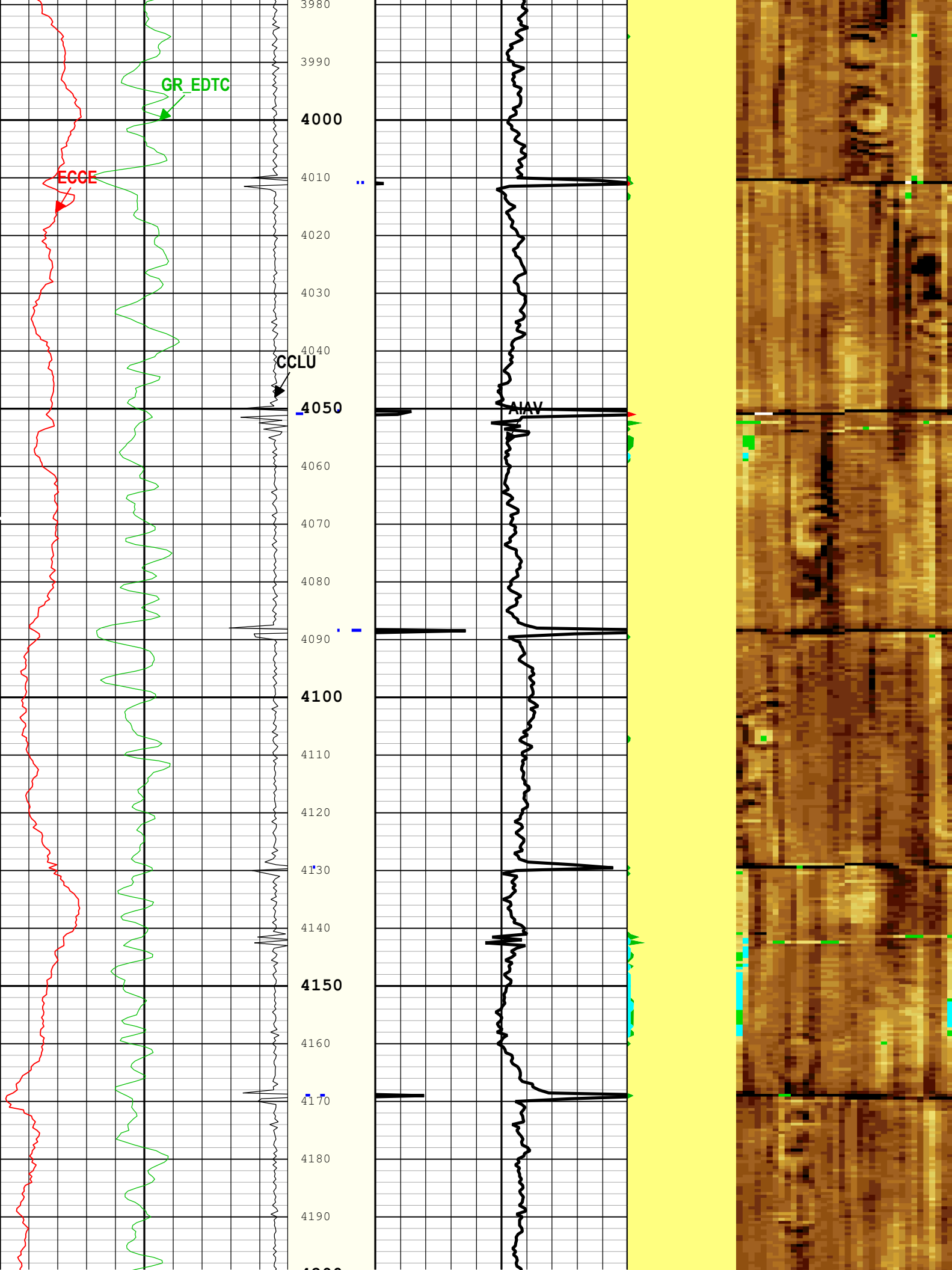


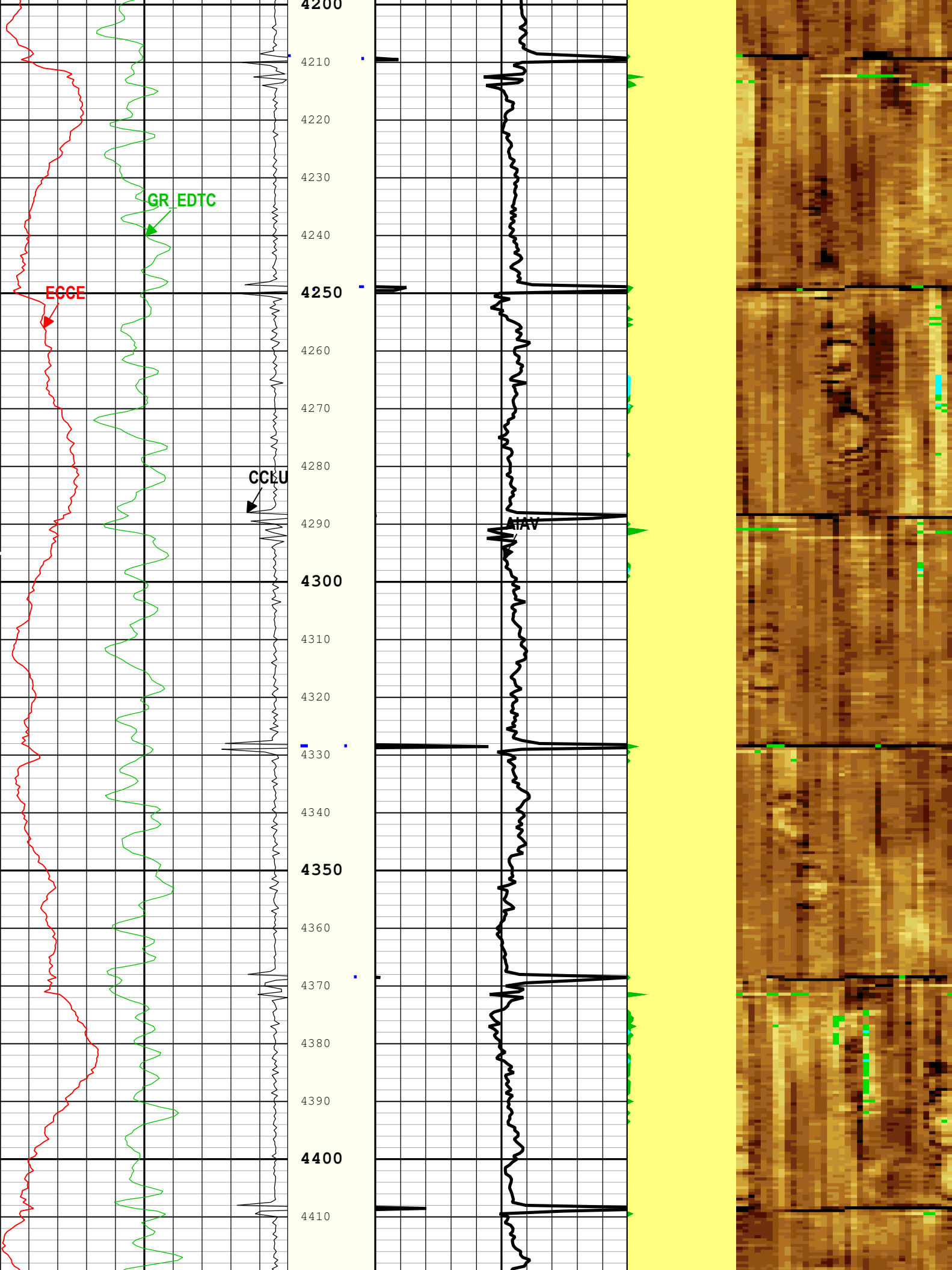


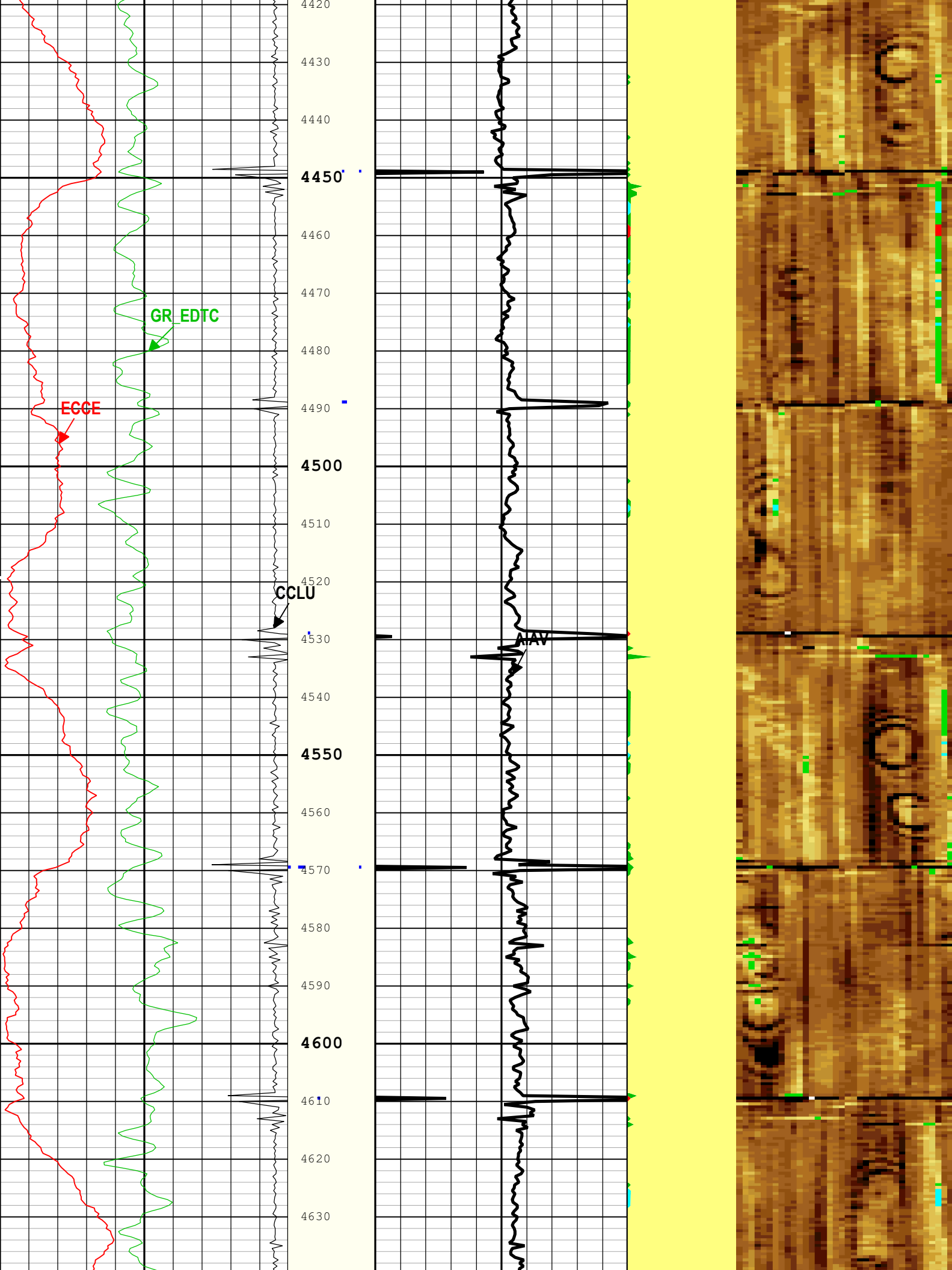


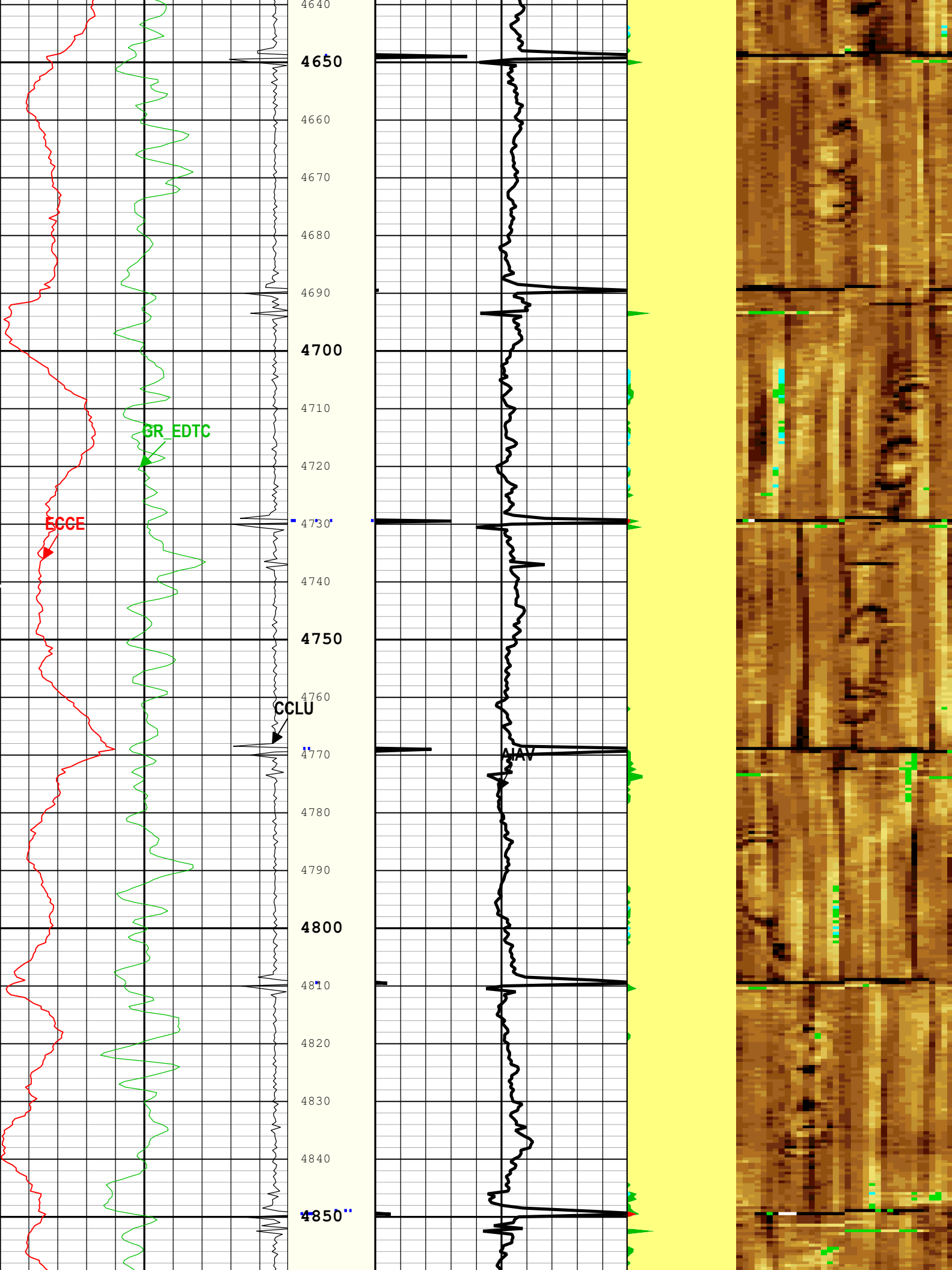


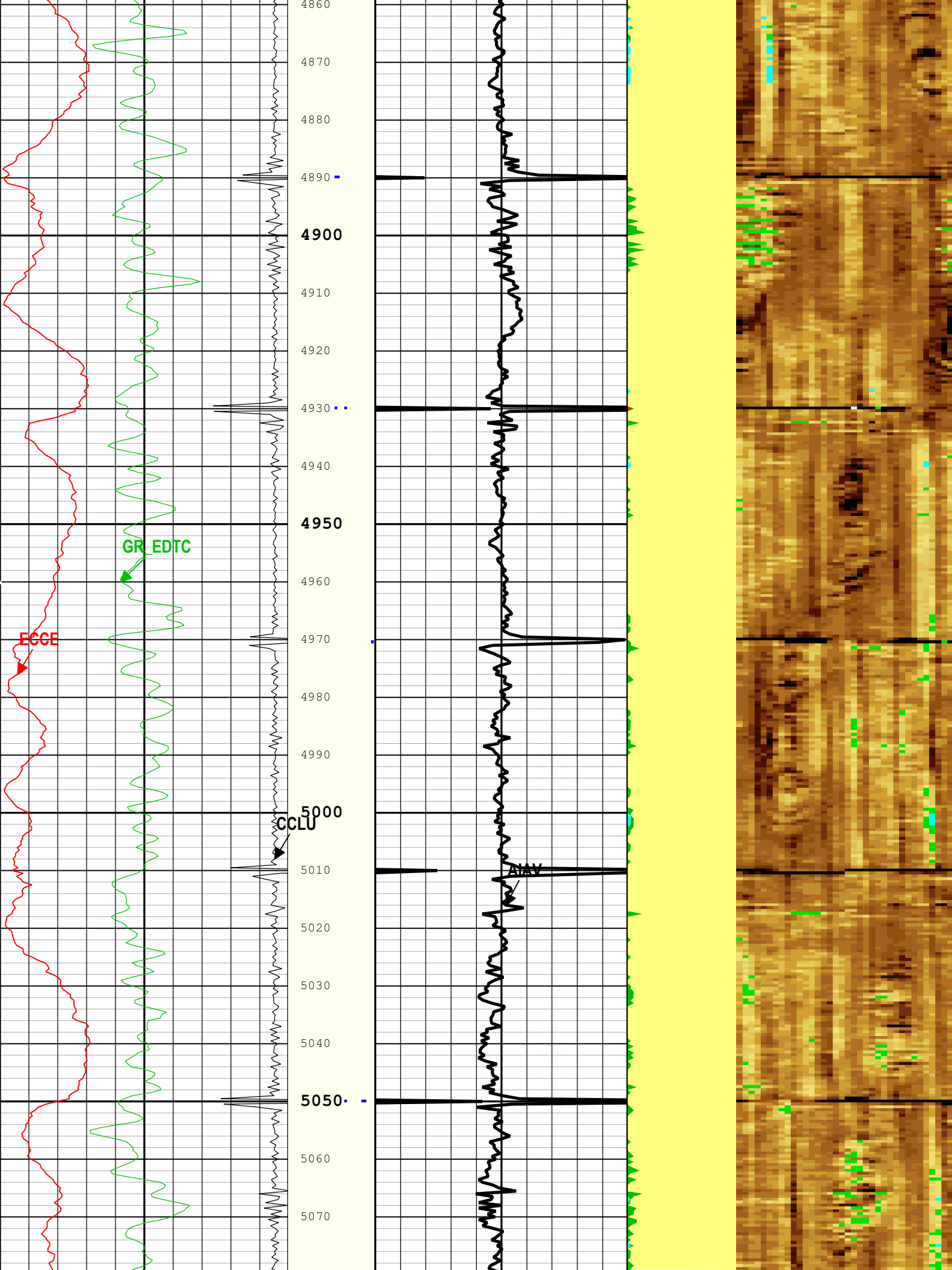


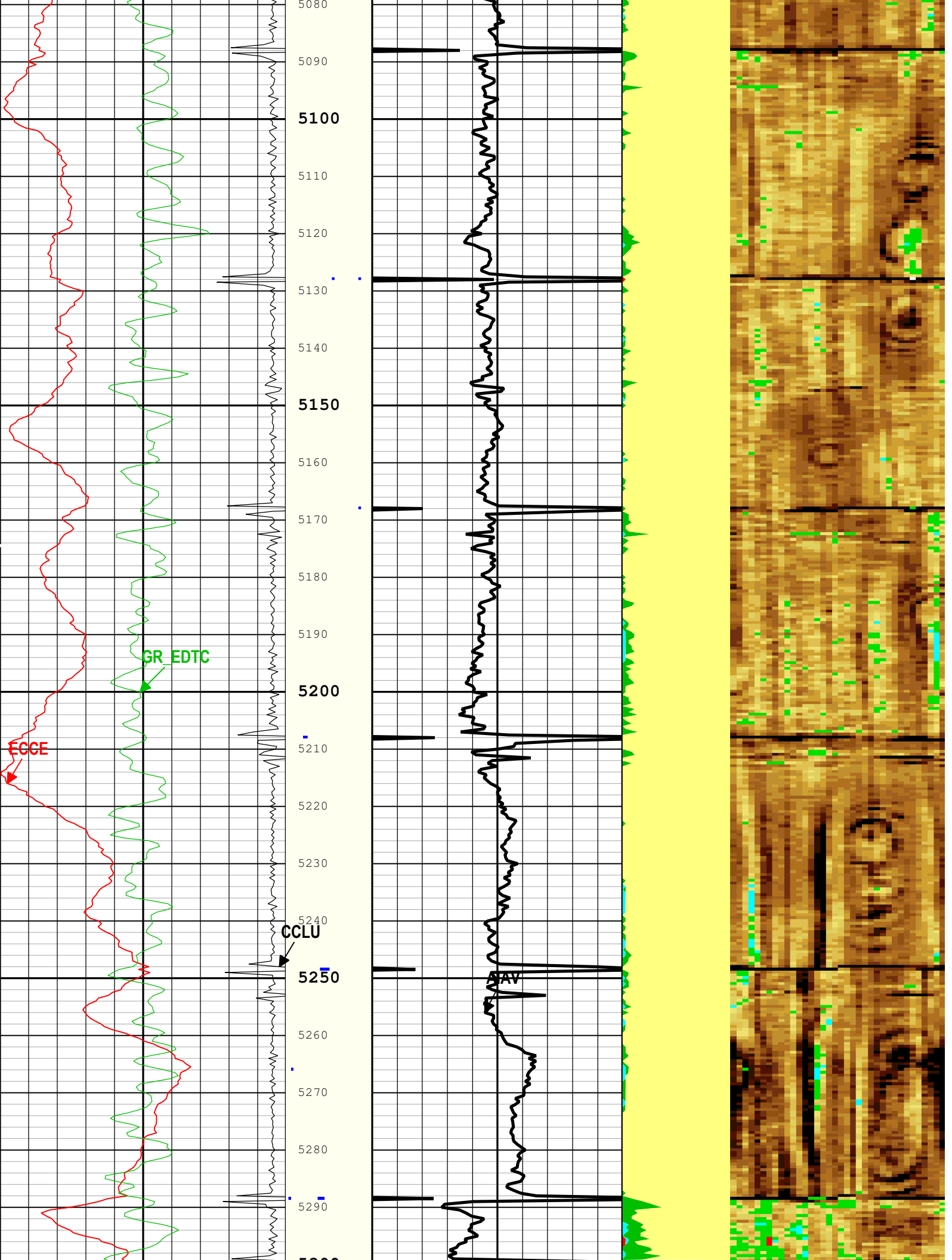


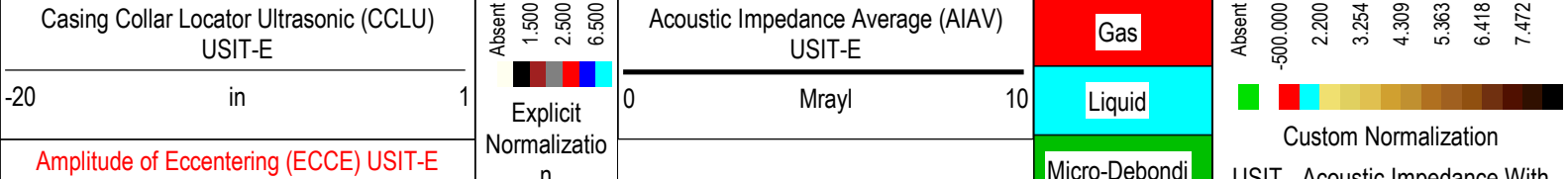
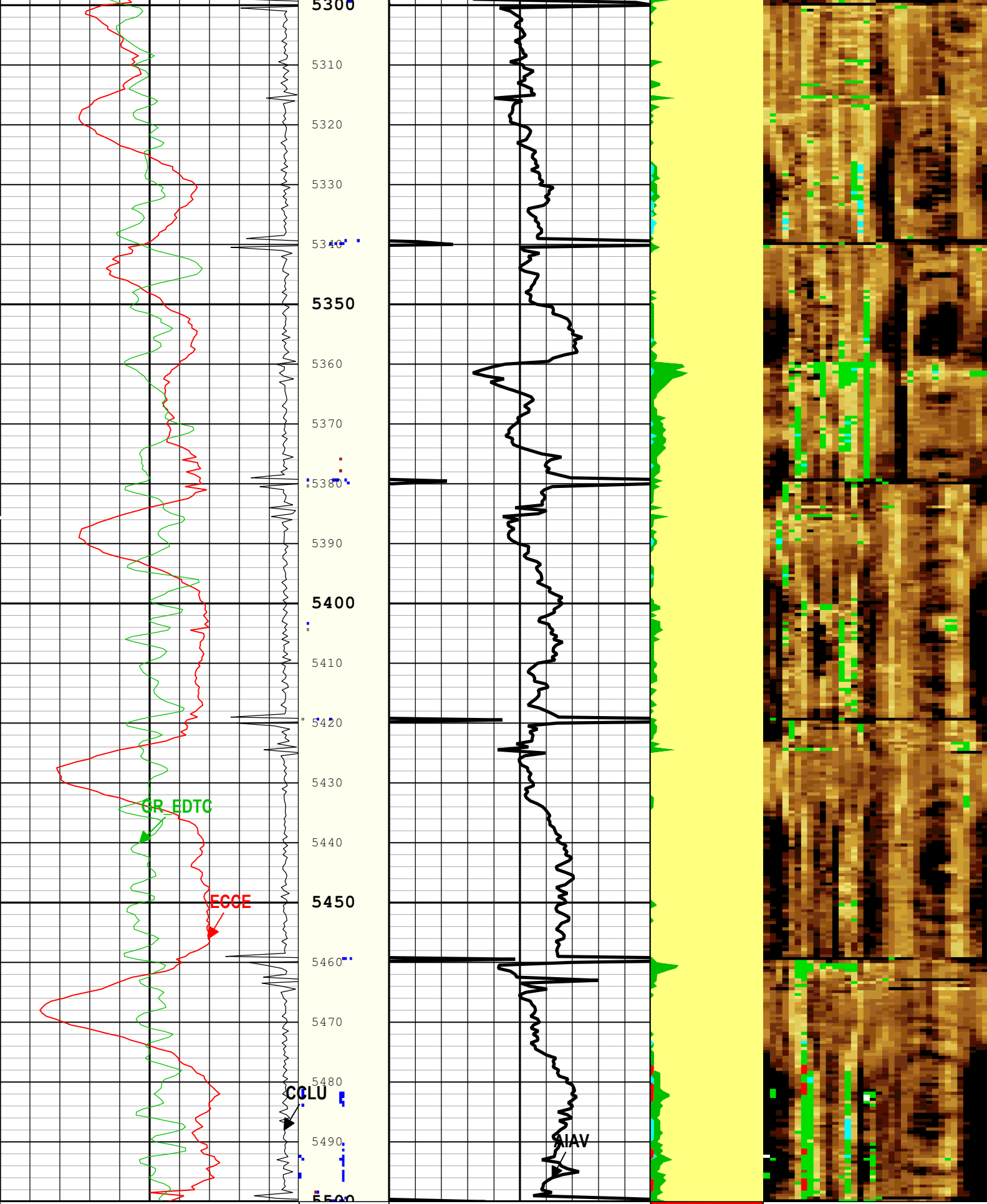












0	in	0.5	USIT - USIT Processing Flags (UFLG) USIT-E	Micro-debonding	Micro-debonding Image (AI_MDEBOND_IMG) USIT-E (Mrayl)
Calibrated Gamma Ray (GR_EDTC) EDTC-B				Bonded	
0	gAPI	150			
TIME_1900 - Time Marked every 60.00 (s)					
Description:    Format: Log ( DJ Basin Ultrasonic Cement Summary Report )    Index Scale: 5 in per 100 ft    Index Unit: ft    Index Type: Measured Depth					
Creation Date: 24-Oct-2016 00:19:54					

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	9.3	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	198	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	1.07	
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	1.48	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	16	53.5	110
BS	13.5	110	1931
BS	8.5	1931	5500

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
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	
UMER	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	5971	ft
WINB	Window Begin Time	USIT-E	15	us
WINE	Window End Time	USIT-E	80	us

One

0 PSI Repeat Pass

Software Version

Acquisition System	Version
Maxwell 2016	6.0.53731.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[2]:Up	Up	2002.80 ft	2618.89 ft	20-Oct-2016 6:53:30 AM	20-Oct-2016 6:56:48 AM	ON	12.31 ft	Yes

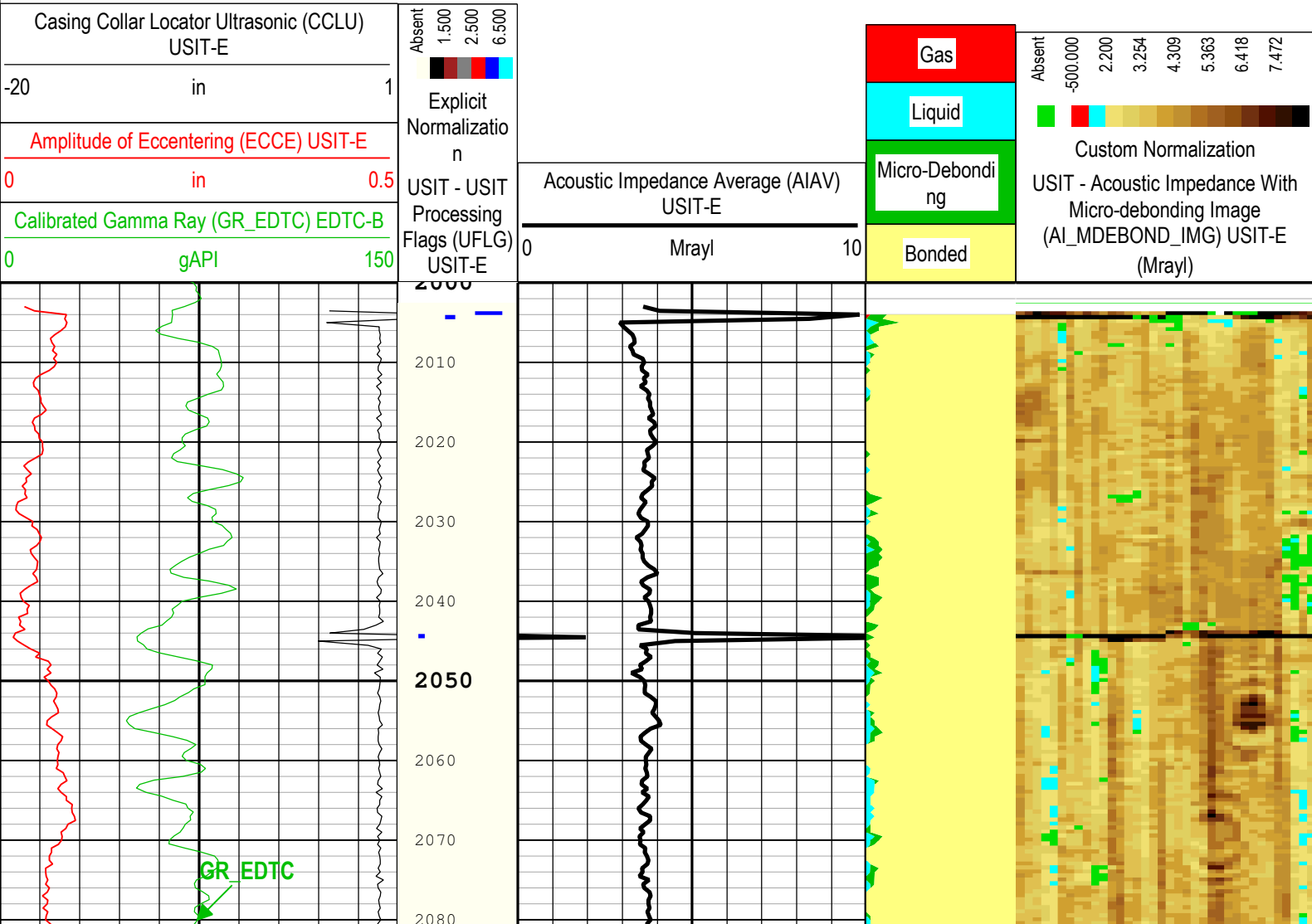
All depths are referenced to toolstring zero

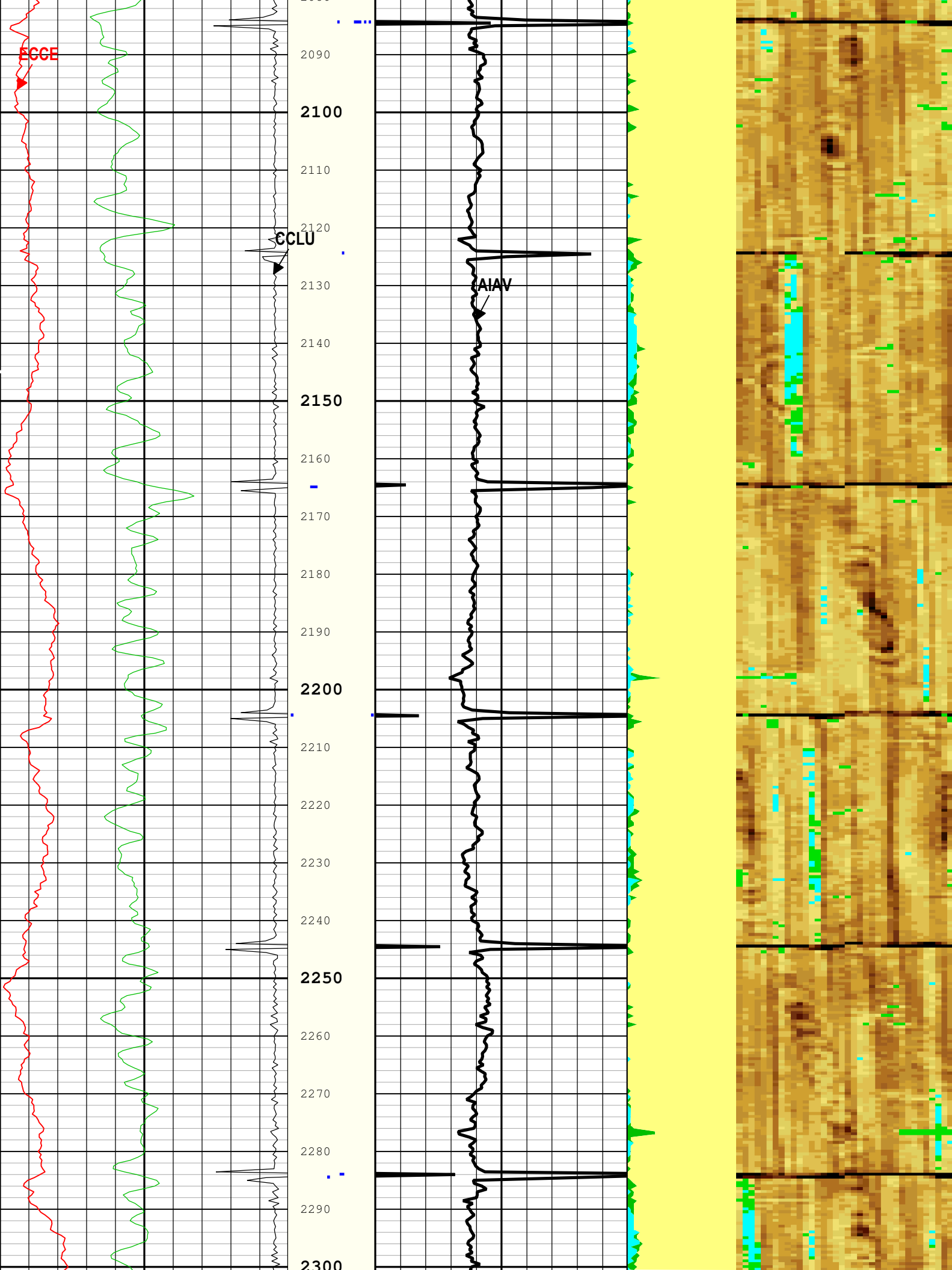
Log

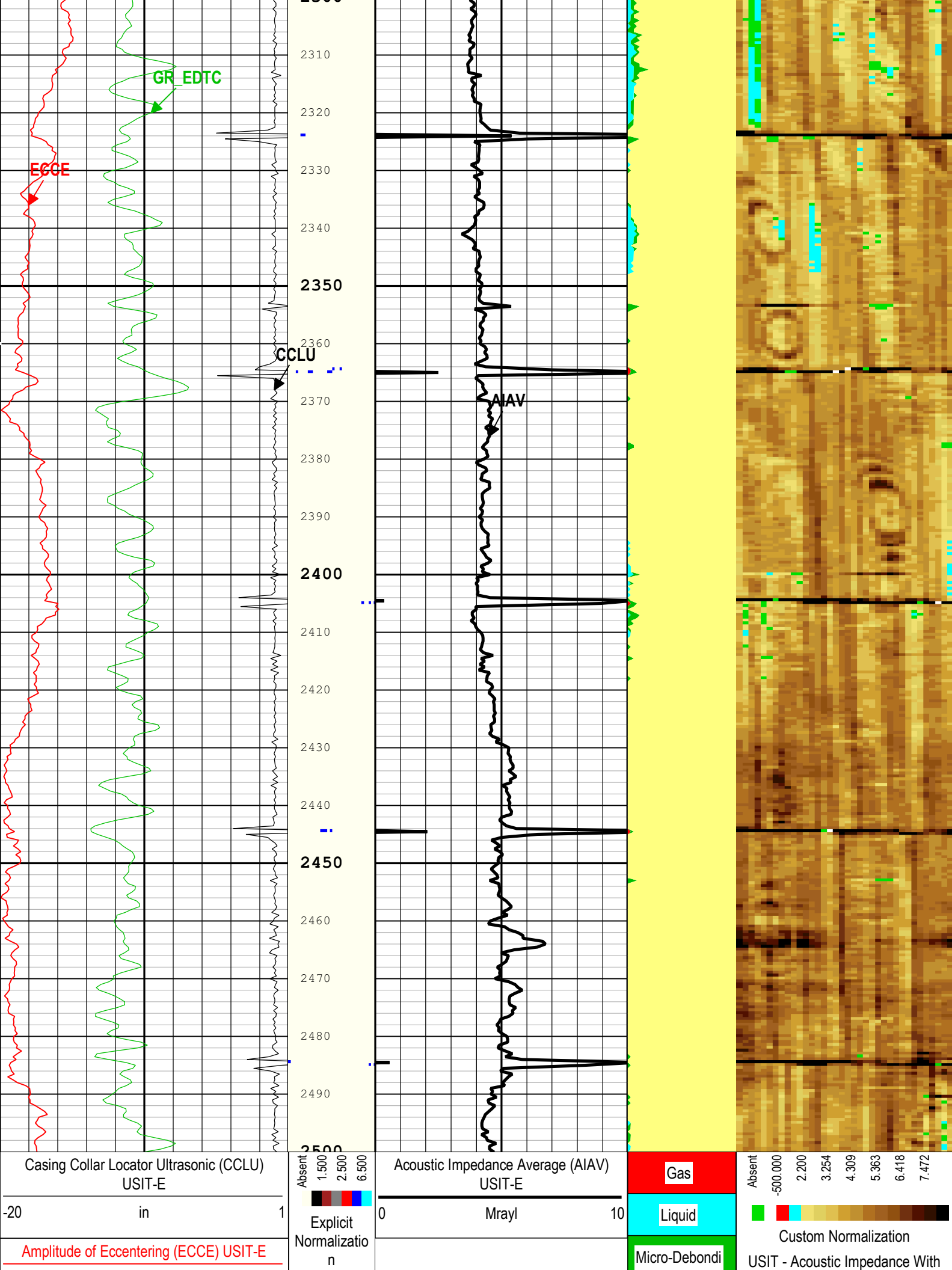
Company:Noble Energy Inc      Well:ELLIE LD26-625  
One: Log[2]:Up:S006

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: 24-Oct-2016 00:19:59

TIME\_1900 - Time Marked every 60.00 (s)







0	in	0.5	USIT - USIT Processing Flags (UFLG) USIT-E	ng	Micro-debonding Image (AI_MDEBOND_IMG) USIT-E (Mrayl)
Calibrated Gamma Ray (GR_EDTC) EDTC-B				Bonded	
0	gAPI	150			
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: 24-Oct-2016 00:19:59					

Channel Processing Parameters	
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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	9.3	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	198	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	1.07	
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	1.48	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

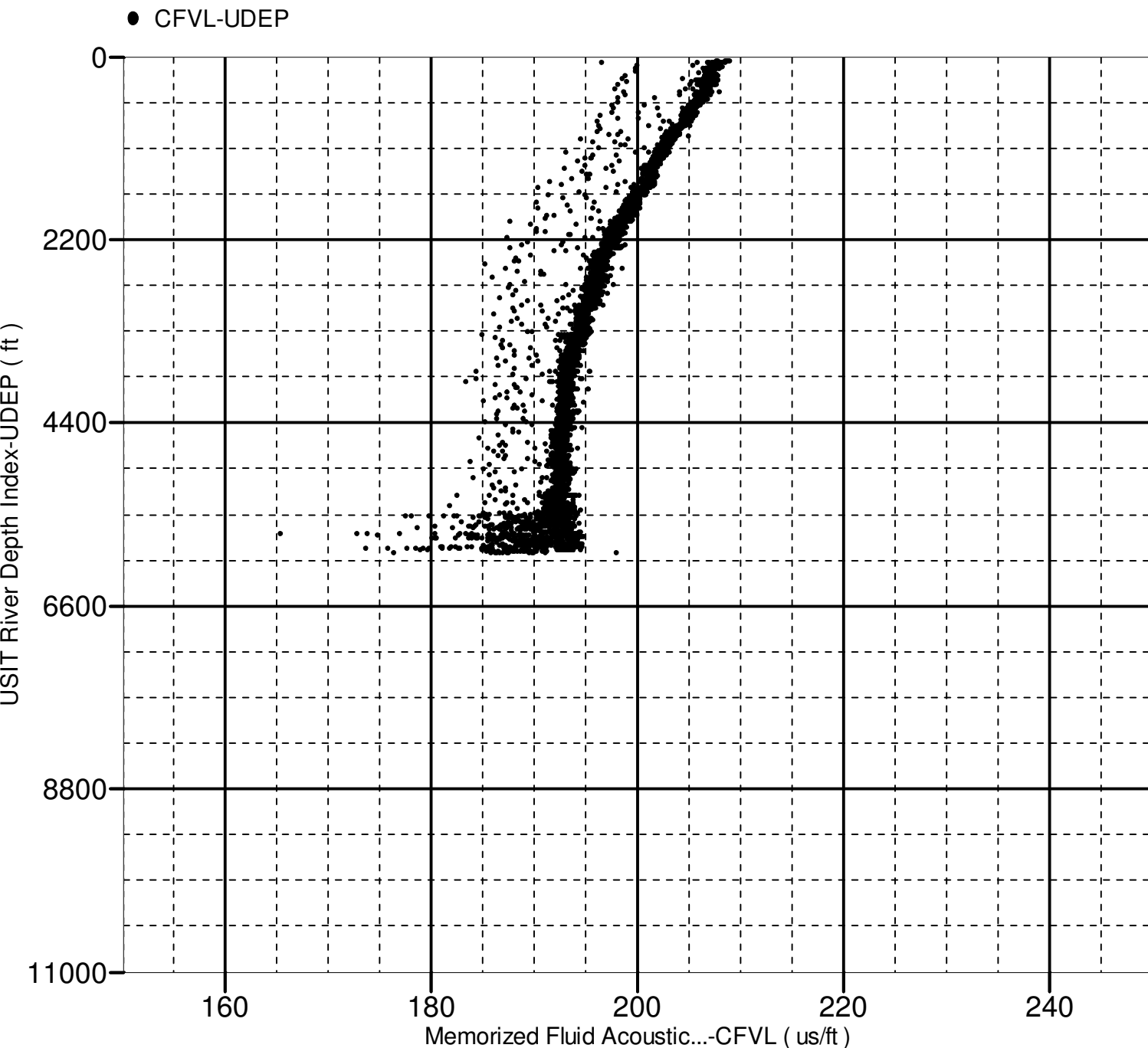
Tool Control Parameters	
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One: Parameters				
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	48	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
EMXV	EMEX Voltage	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	2606	ft
WINB	Window Begin Time	USIT-E	29.86	us
WINE	Window End Time	USIT-E	69.86	us

# Fluid Acoustic Slowness vs Depth

## 2D Cross Plot

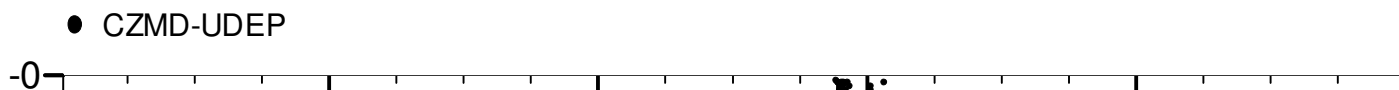
Index Range: From 5985.50 to 74.00 ft

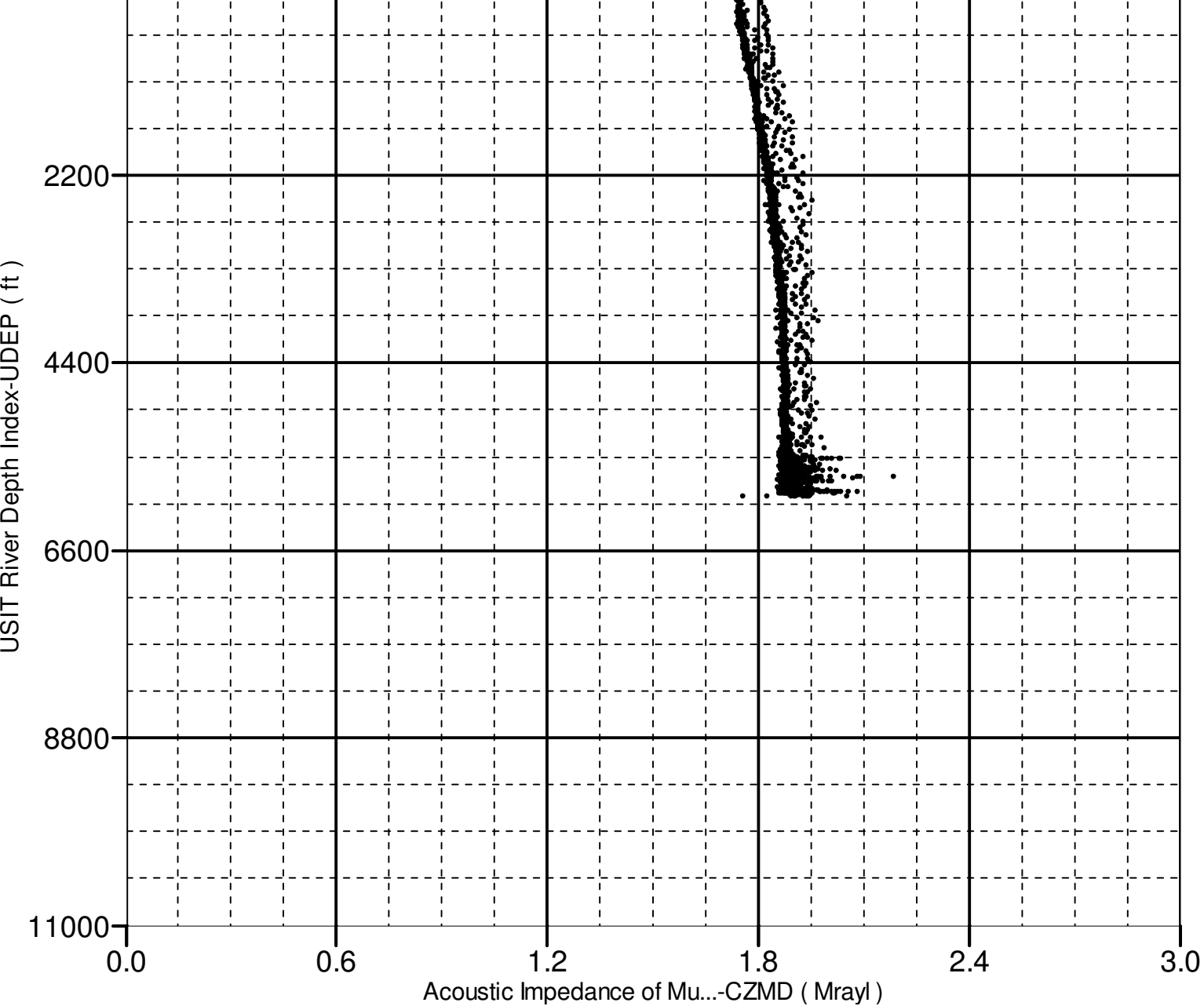


# Acoustic Impedance of Mud vs Depth

## 2D Cross Plot

Index Range: From 5985.50 to 74.00 ft





Company:	Noble Energy Inc	Schlumberger
Well:	ELLIE LD26-625	
Field:	Wildcat	
County:	Weld	
Country:	US	
UltraSonic Summary Print		