

County: Weld State: Colorado

UltraSonic Summary Print

County:	Weld				
Field:	Wattenberg				
Location:	SWSE				
Well:	Vogler State D21-740				
Company:	Noble Energy Inc				
Location: API Serial No. 05-123-48573		SWSE		Elev.:	K.B. 4855.00 ft
		SHL: 930' FSL & 2482' FEL			G.L. 4825.00 ft
		Lat/long: 40.20623/-104.55592			D.F.
		Permanent Datum:	Ground Level	Elev.:	4825.00 f
Log Measured From:		Kelly Bushing	30.00 ft	above Perm.Datum	
Drilling Measured From:		Kelly Bushing			
Section: 21		Township: 3N		Range: 64W	

Logging Date	27-Apr-2019			
Run Number	ONE			
Depth Driller	17755.00 ft			
Schlumberger Depth	17755.00 ft			
Bottom Log Interval	6260.00 ft			
Top Log Interval	100.00 ft			
Casing Fluid Type	Brine			
Salinity				
Density	8.4 lbm/gal			
Fluid Level	8.00 ft			
BIT/CASING/TUBING STRING				
Bit Size	8.50 in			
From	1941.00 ft			
To	17755.00 ft			
Casing/Tubing Size	5.5 in			
Weight	20 lbm/ft			
Grade	P110			
From	0.00 ft			
To	17746.40 ft			
Max Recorded Temperatures	205.7 degF			
Logger on Bottom	Time		14:25:00	
Unit Number	Location:			
Recorded By	A. Voyage		Fort Morgan, CO	
Witnessed By	B. 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.

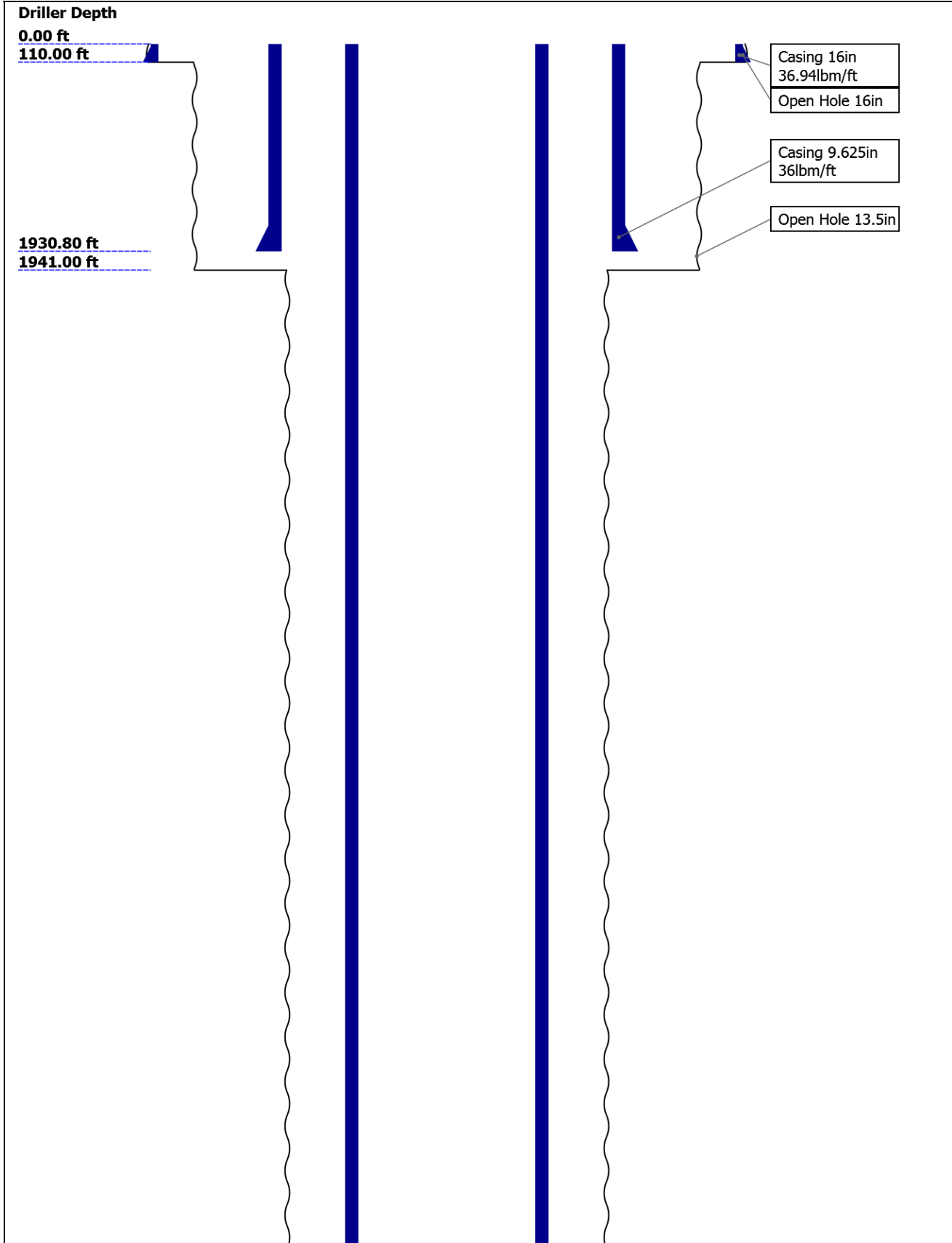
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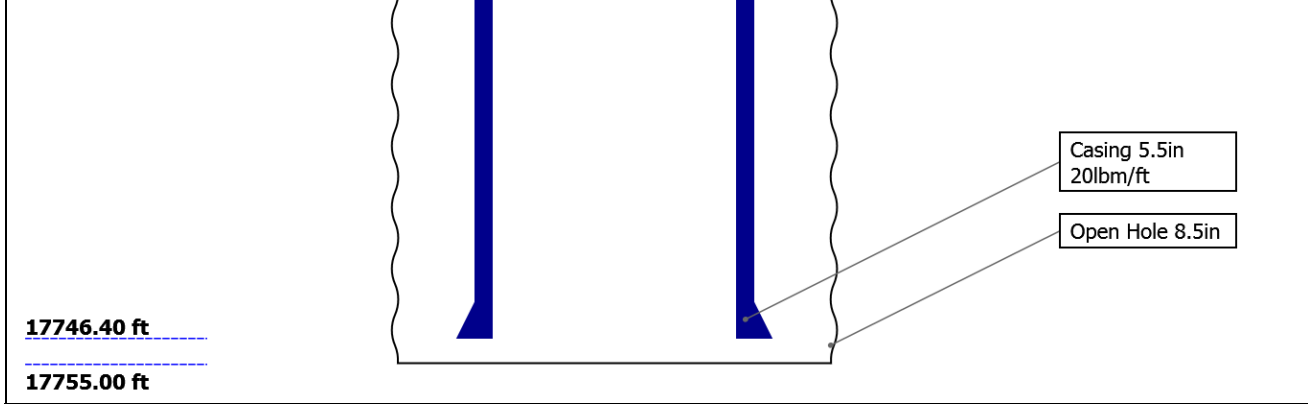
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Well Sketch



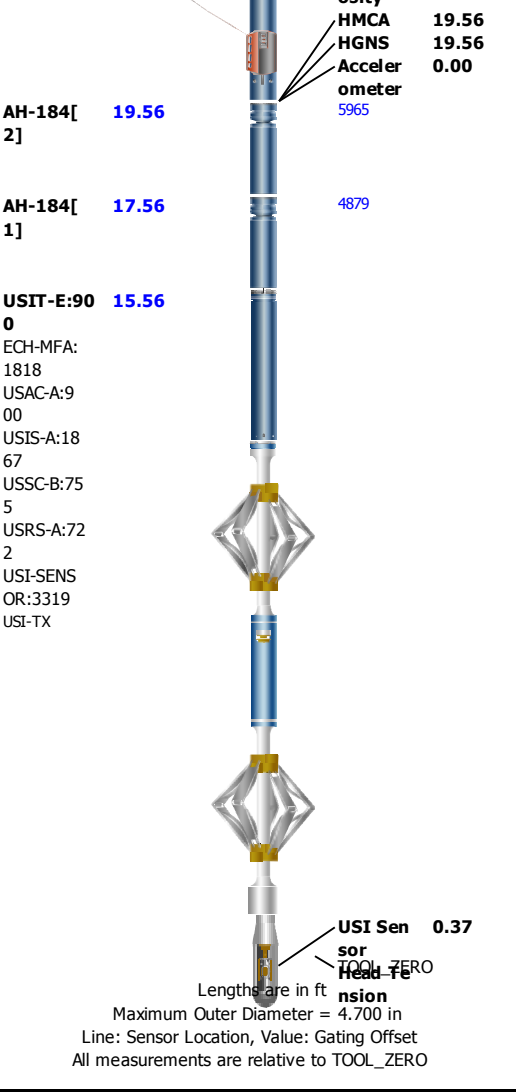


Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	16	13.5	8.5			
Top Driller (ft)	0	110	1941			
Top Logger (ft)	0	110	1941			
Bottom Driller (ft)	110	1941	17755			
Bottom Logger (ft)	110	1941	17755			
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	1930.8	17746.4			
Bottom Logger (ft)	110	1930.8	17746.4			

Remarks and Equipment Summary

ONE: Toolstring				ONE: Remarks	
Equip name	Length	MP name	Offset	Thank you for choosing Schlumberger Wireline!	
LEH-QT	38.95			Log objective: cement evaluation.	
LEH-QT				Toolstring ran as per tool sketch.	
EDTC-B:9	35.47			Tool centralized using small-hole kit, booster kit and GEMCO on USAC.	
EDTH-B:90				USRS-A sub run with USI-TX transducer	
EDTG-B:79				Main pass logged under 2500 psi surface-induced pressure. Repeat pass logged under 0 psi surface-induced pressure.	
215					
EDTC-B:90					
38					
HGNS-B:1	28.97				
HGNH:187					
0					
NPV-N					
NSR-F:507					
0					
HGNS-B:1					
855					
HACCZ-B:					
659					
HMCA-B					



Depth Summary

	ONE		
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Depth Measuring Device

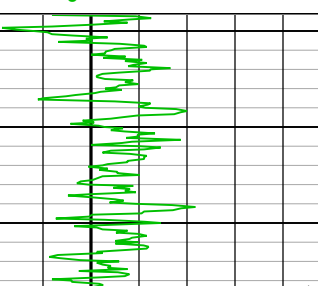
Type	IDW-JA		
Serial Number	6455		
Calibration Date	26-JUL-2018		
Calibrator Serial Number	57		
Calibration Cable Type	7-32AS-XS		
Wheel Correction 1	-1		
Wheel Correction 2	1		

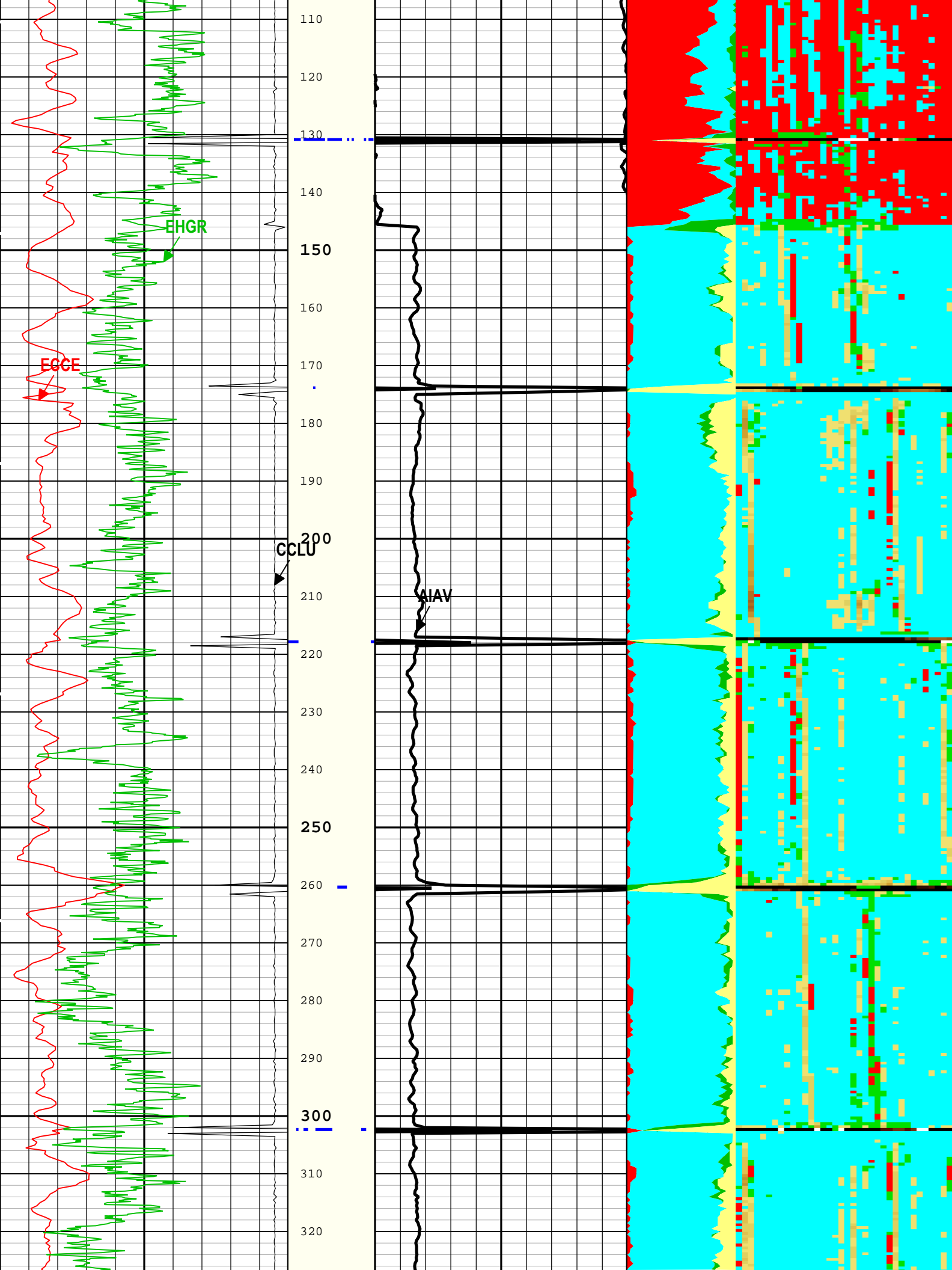
Tension Device

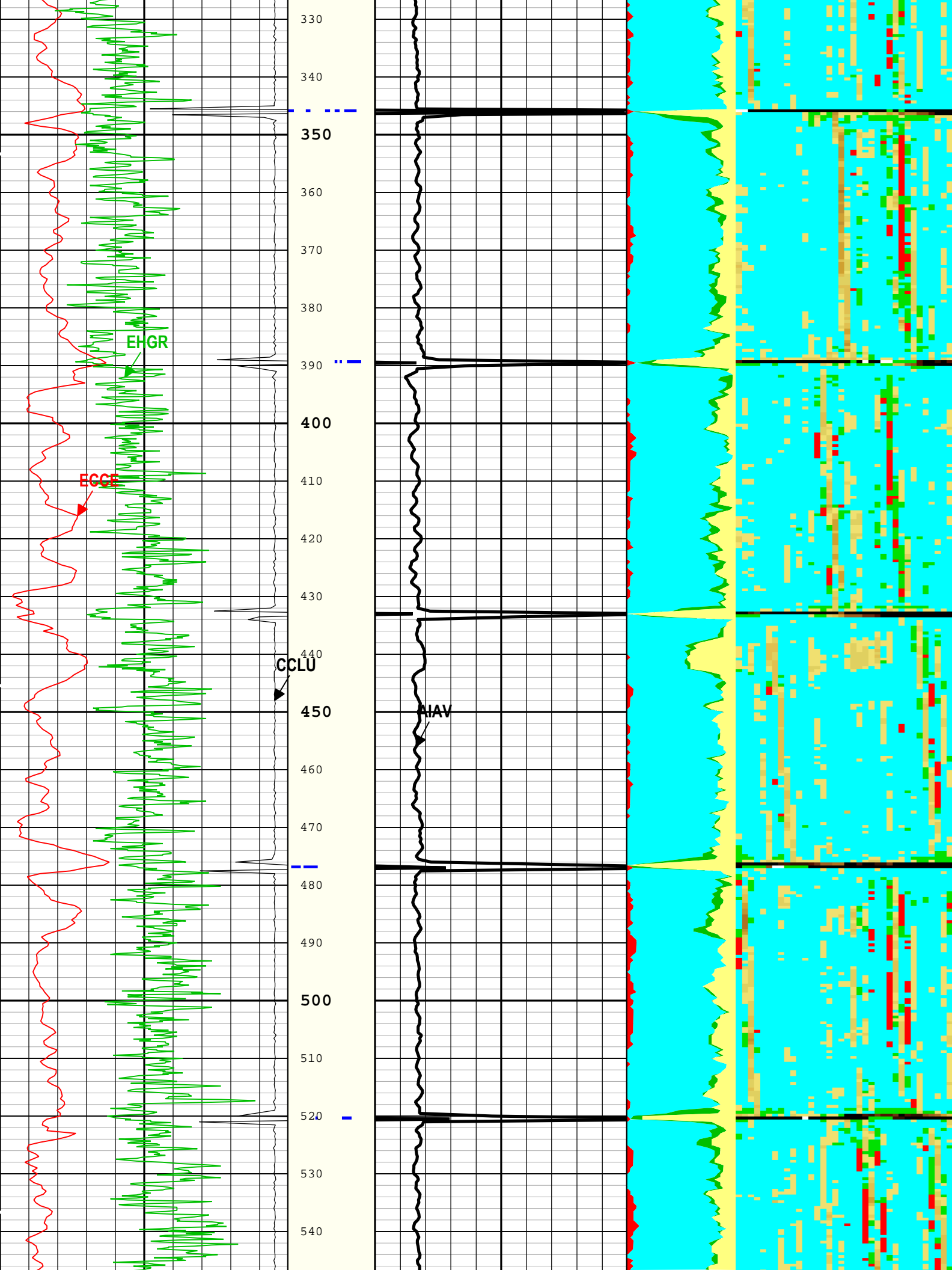
Type	CMTD-B/A		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0		

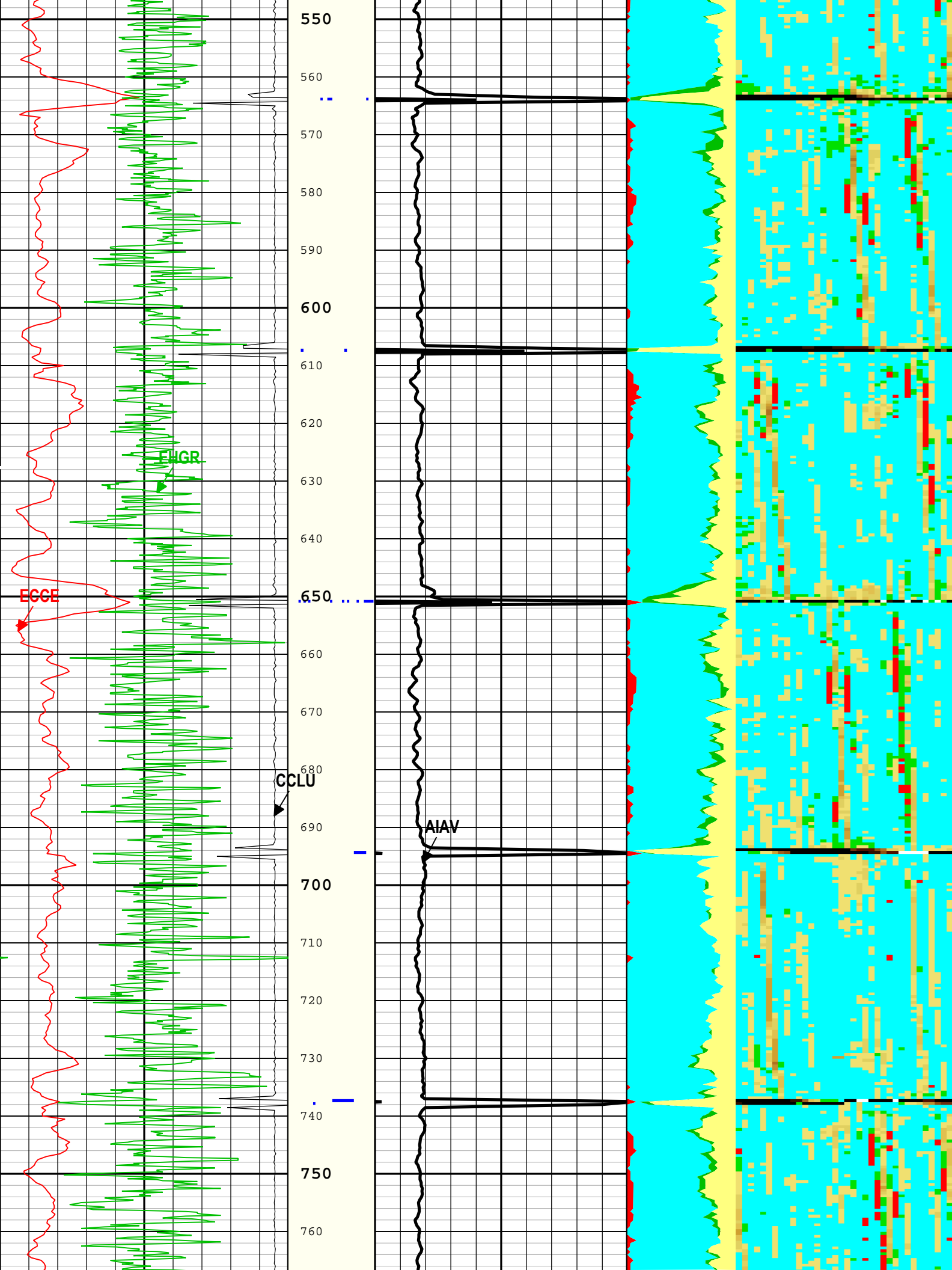
Logging Cable

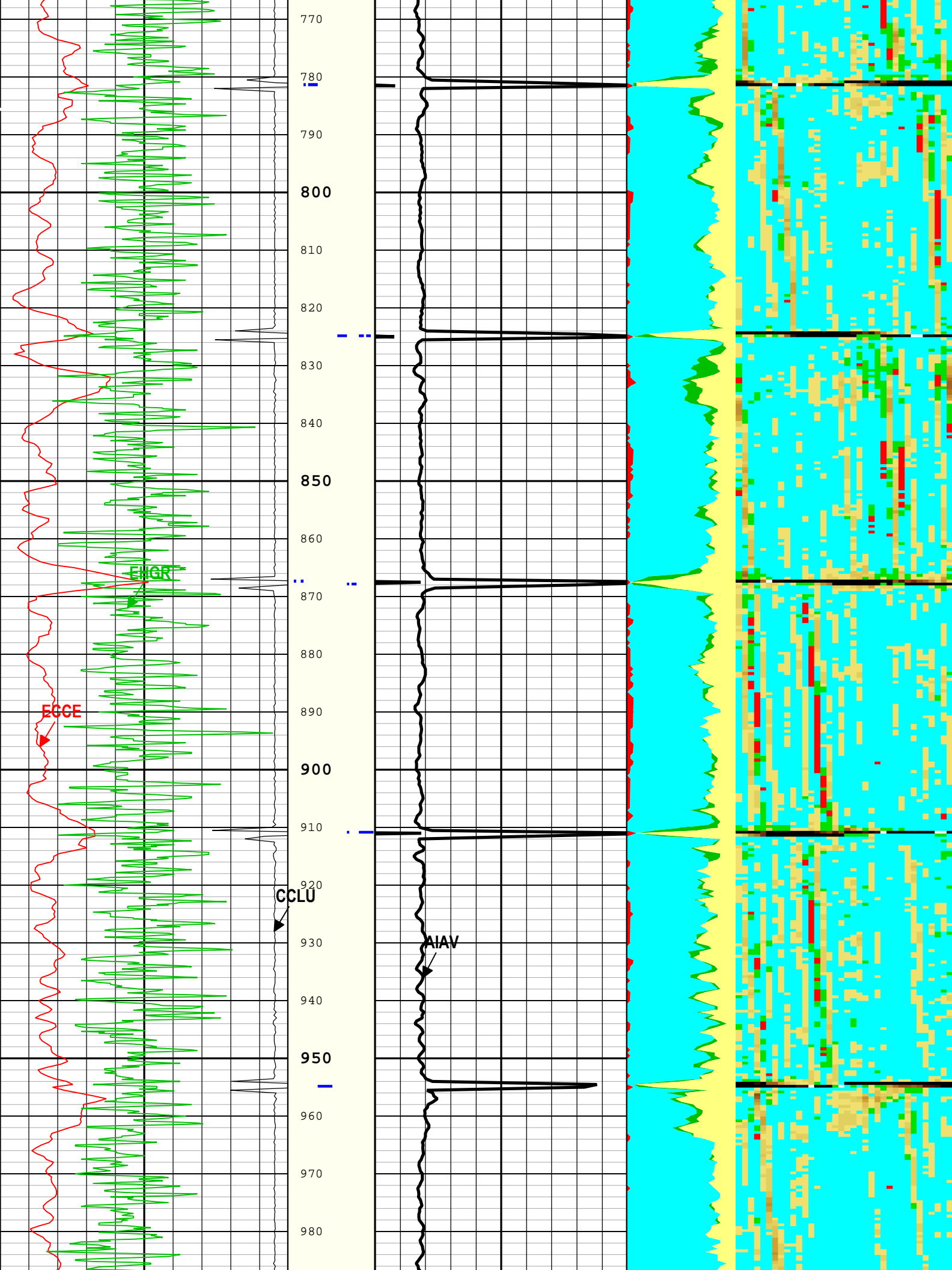
Type	7-32AS-XS		
Serial Number			
Length	24000.00 ft		
Conveyance Type	Wireline		

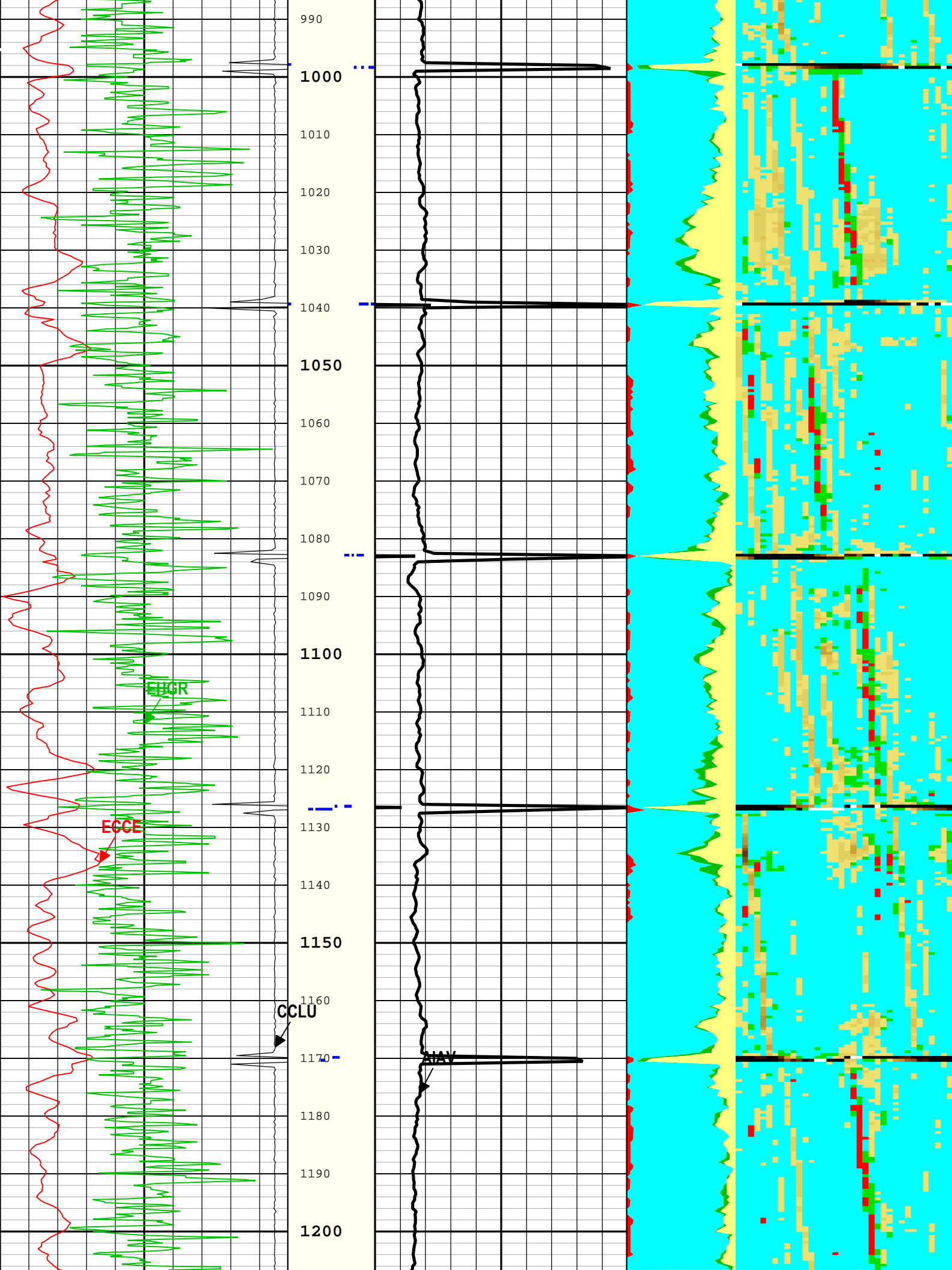
Rig Type		MAST							
ONE:Depth Control Parameters						Depth Control Remarks			
Log Sequence		First Log In the Well				All Schlumberger depth control standards and guidelines followed. IDW used as primary depth control device. Z-chart used as secondary depth control device. All logs correlated to down pass.			
Rig Up Length At Surface									
Rig Up Length At Bottom									
Rig Up Length Correction									
Stretch Correction		4.53 ft							
Tool Zero Check At Surface									
USIT - Fluid Properties Measurement									
Run Name		Pass Name		Start Depth(ft)		Stop Depth(ft)			
Run 1		Log[3]:Up		2523.43		1989.22			
Fluid Velocity = "Automatic". CFVL equals DFSL channel									
Start Depth(ft)		Stop Depth(ft)		Start Value(us/ft)		End Value(us/ft)			
Mud Impedance = "Theoretical". CZMD uses theoretical results. MUD_N_THE=1.11 DFD=1.01g/cm3(8.40lbm/gal)									
Start Depth(ft)		Stop Depth(ft)		Start Value(Mrayl)		End Value(Mrayl)			
ONE									
2500 PSI Main Pass									
Software Version									
Acquisition System						Version			
Maxwell 2018 SP2						8.2.104493.3100			
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[5]:Up	Up	106.53 ft	6264.83 ft	27-Apr-2019 2:26:42 PM	27-Apr-2019 3:12:07 PM	ON	4.53 ft	Yes
All depths are referenced to toolstring zero									
Log					Company:Noble Energy Inc		Well:Vogler State D21-740		
ONE: Log[5]:Up:S007									
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: 29-Apr-2019 09:50:25									
TIME_1900 - Time Marked every 60.00 (s)									
Casing Collar Locator Ultrasonic (CCLU) USIT-E			Explicit Normalization		Acoustic Impedance Average (AIAV) USIT-E		Gas		
-20 in 1			USIT - USIT Processing Flags (UFLG) USIT-E		0 Mrayl 10		Liquid		
Amplitude of Eccentering (ECCE) USIT-E							Micro-Debonding		
0 in 0.5							Bonded		
Gamma Ray (EHGR) HGNS-B									
0 gAPI 150									
			80						
			90						
			100						

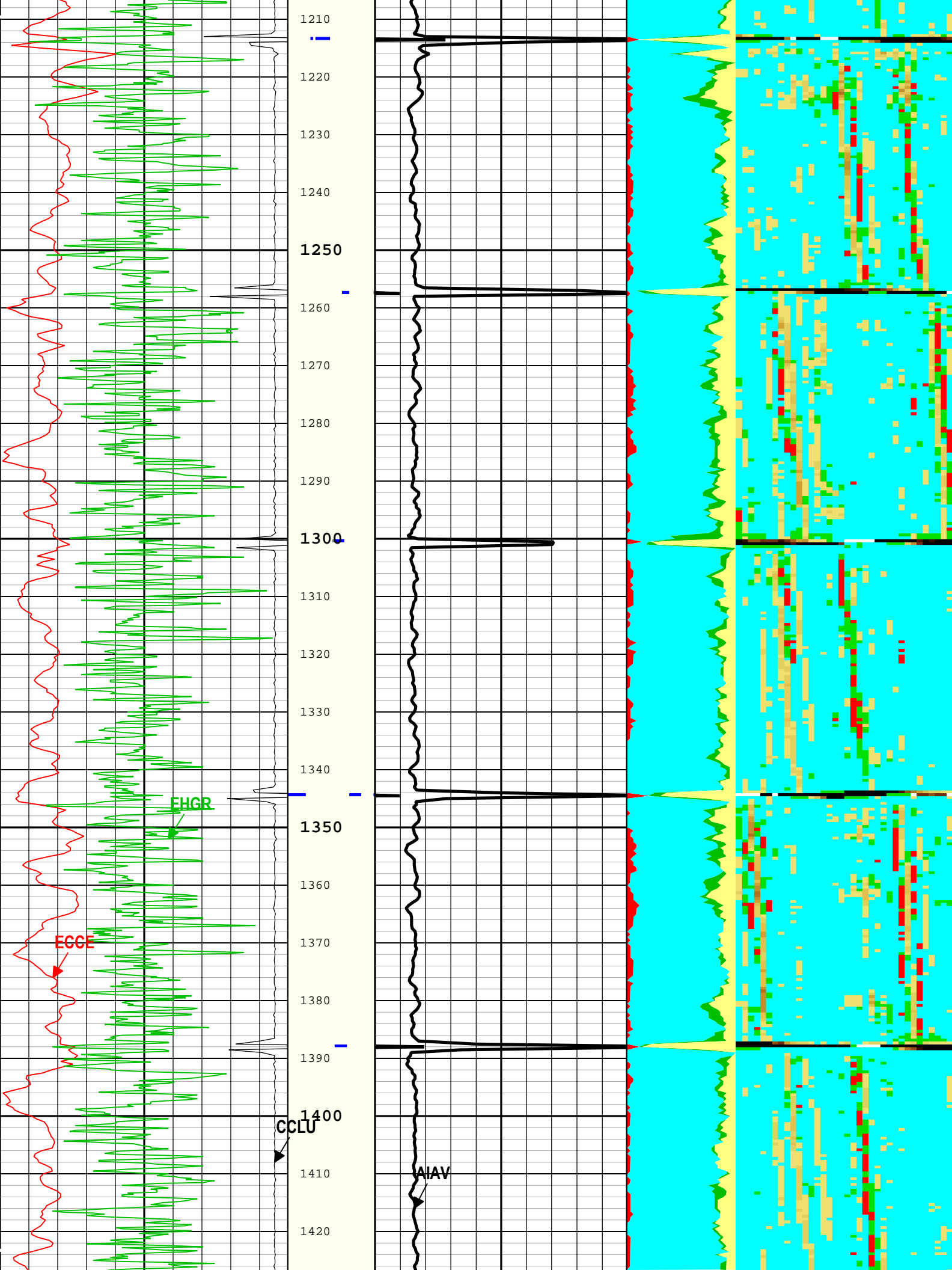


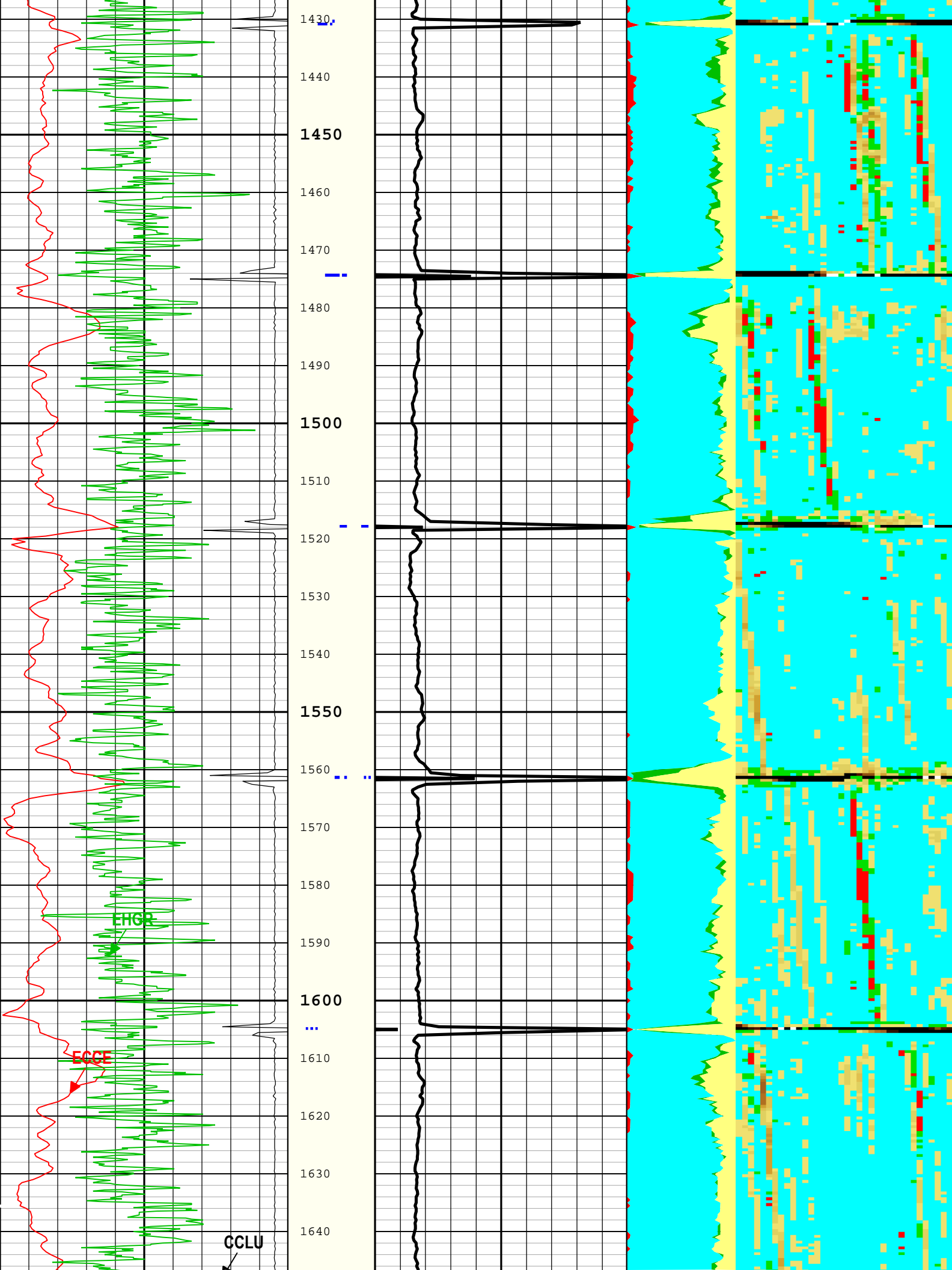


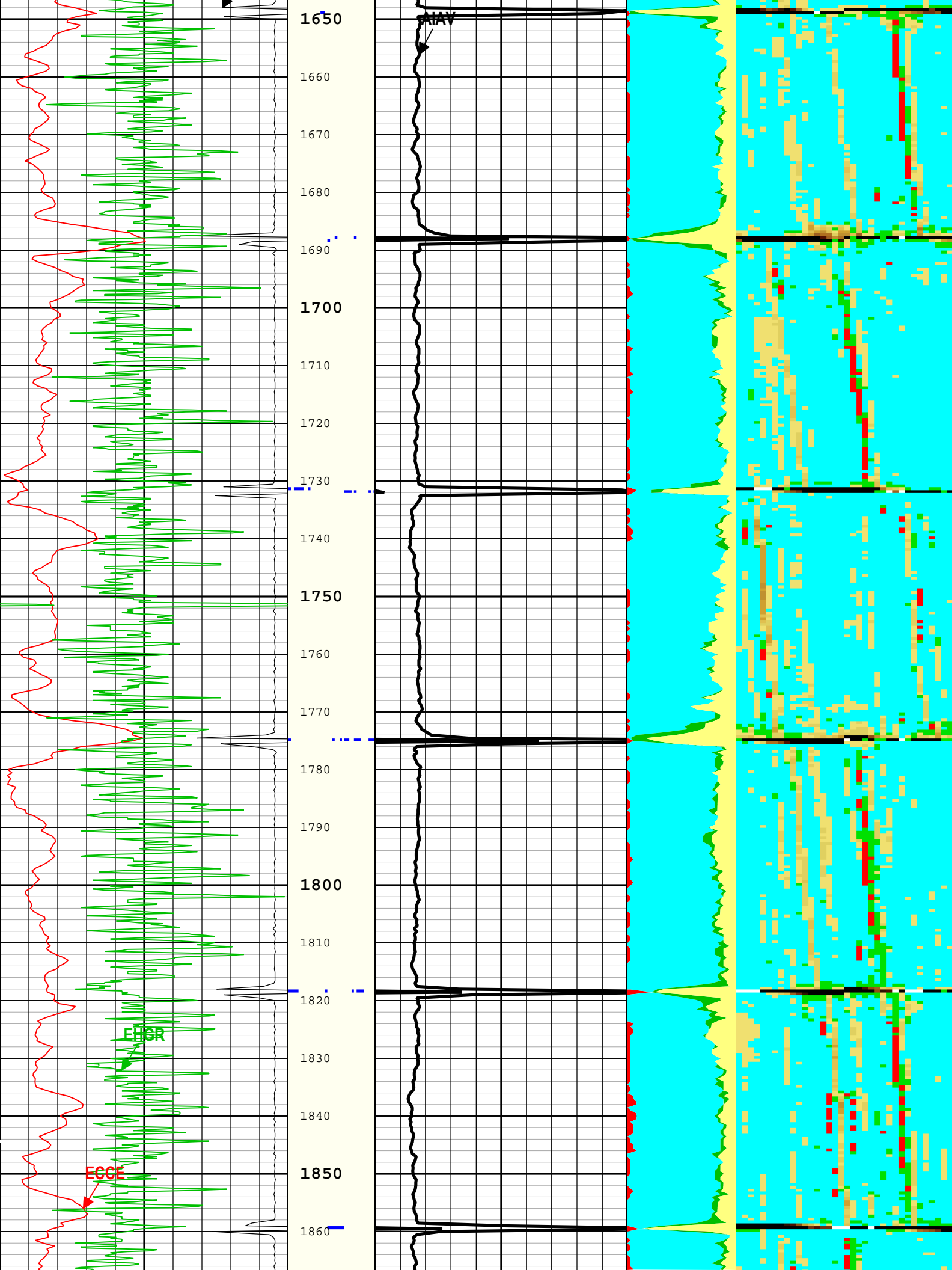


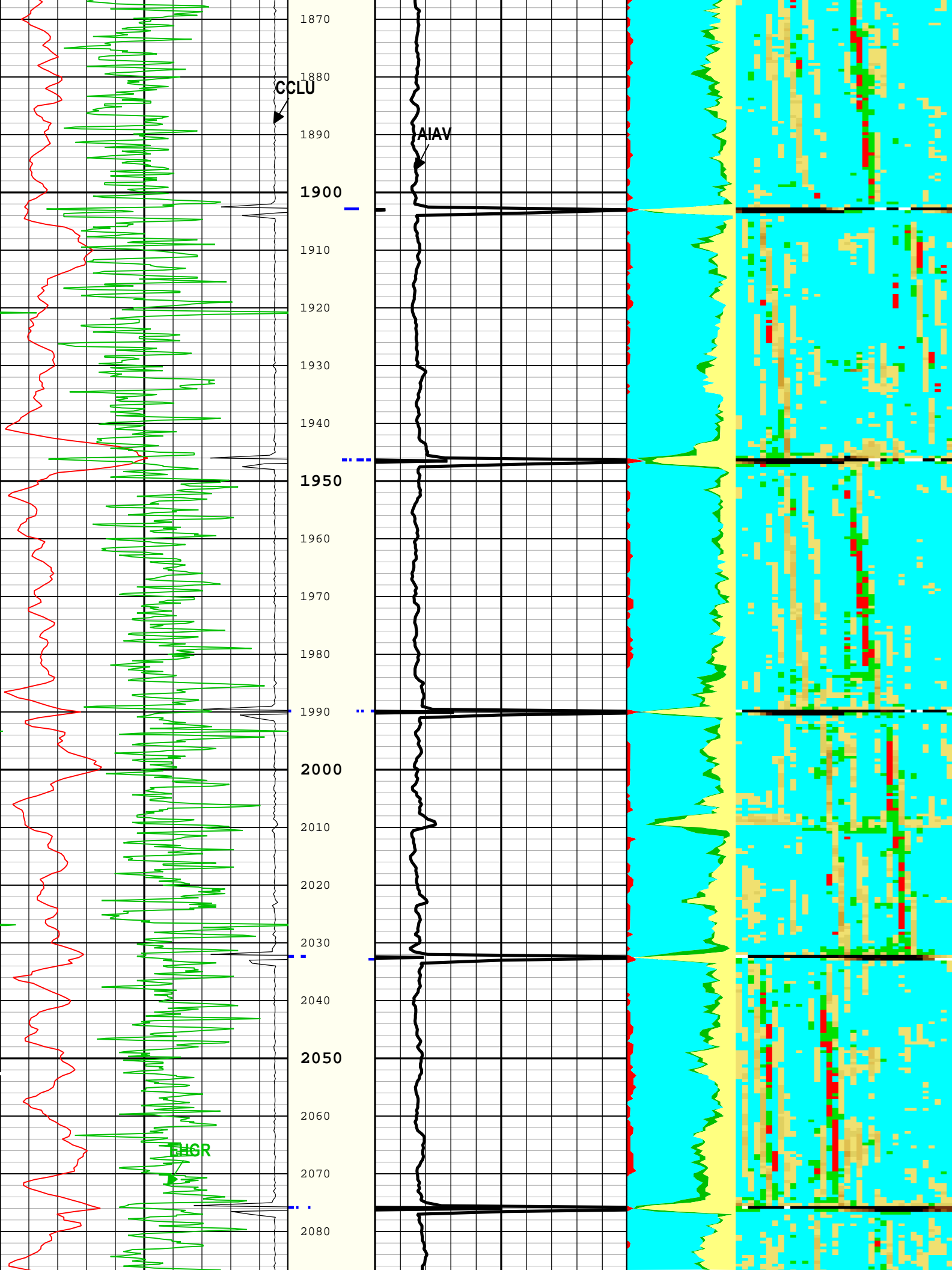


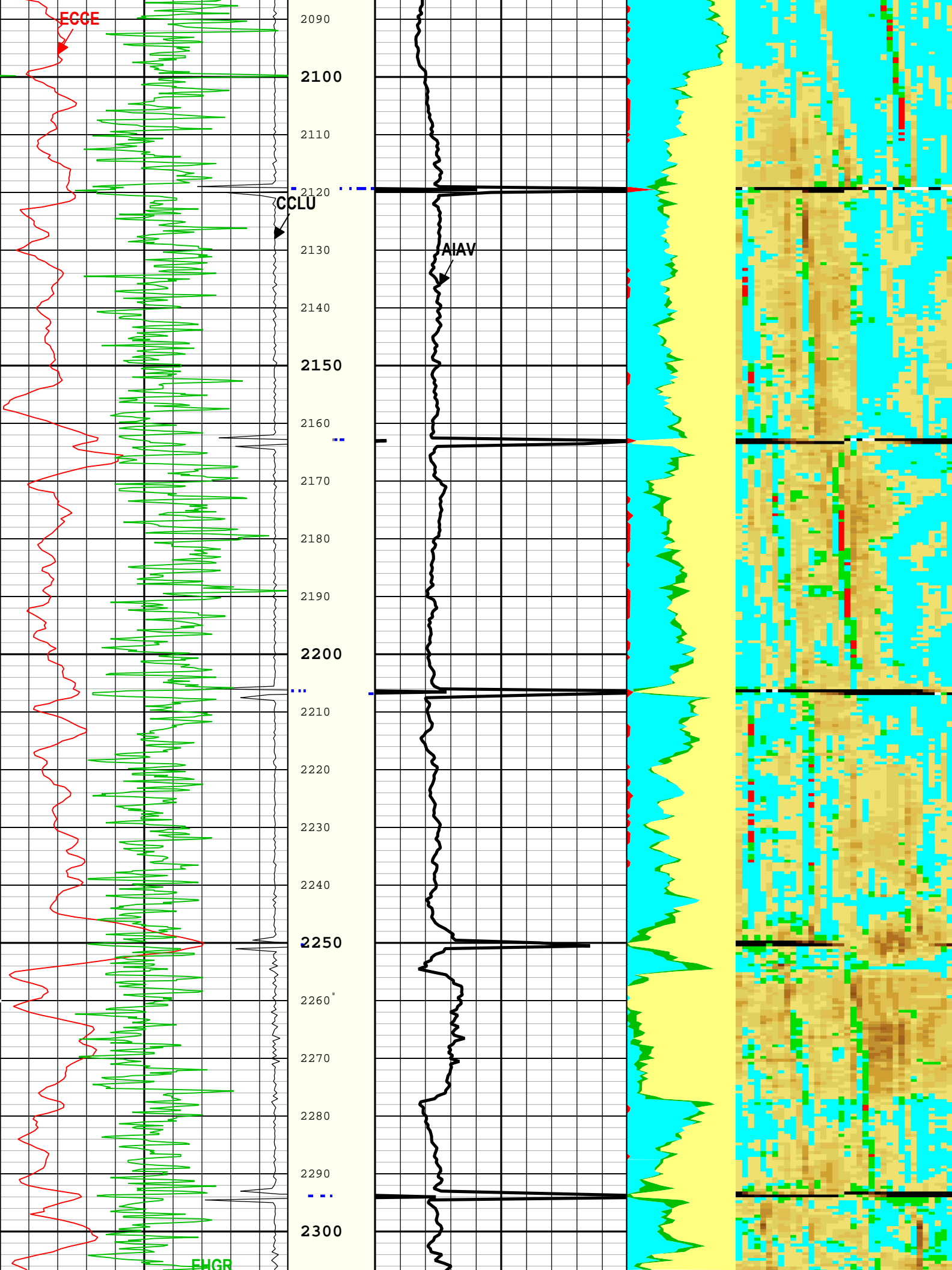


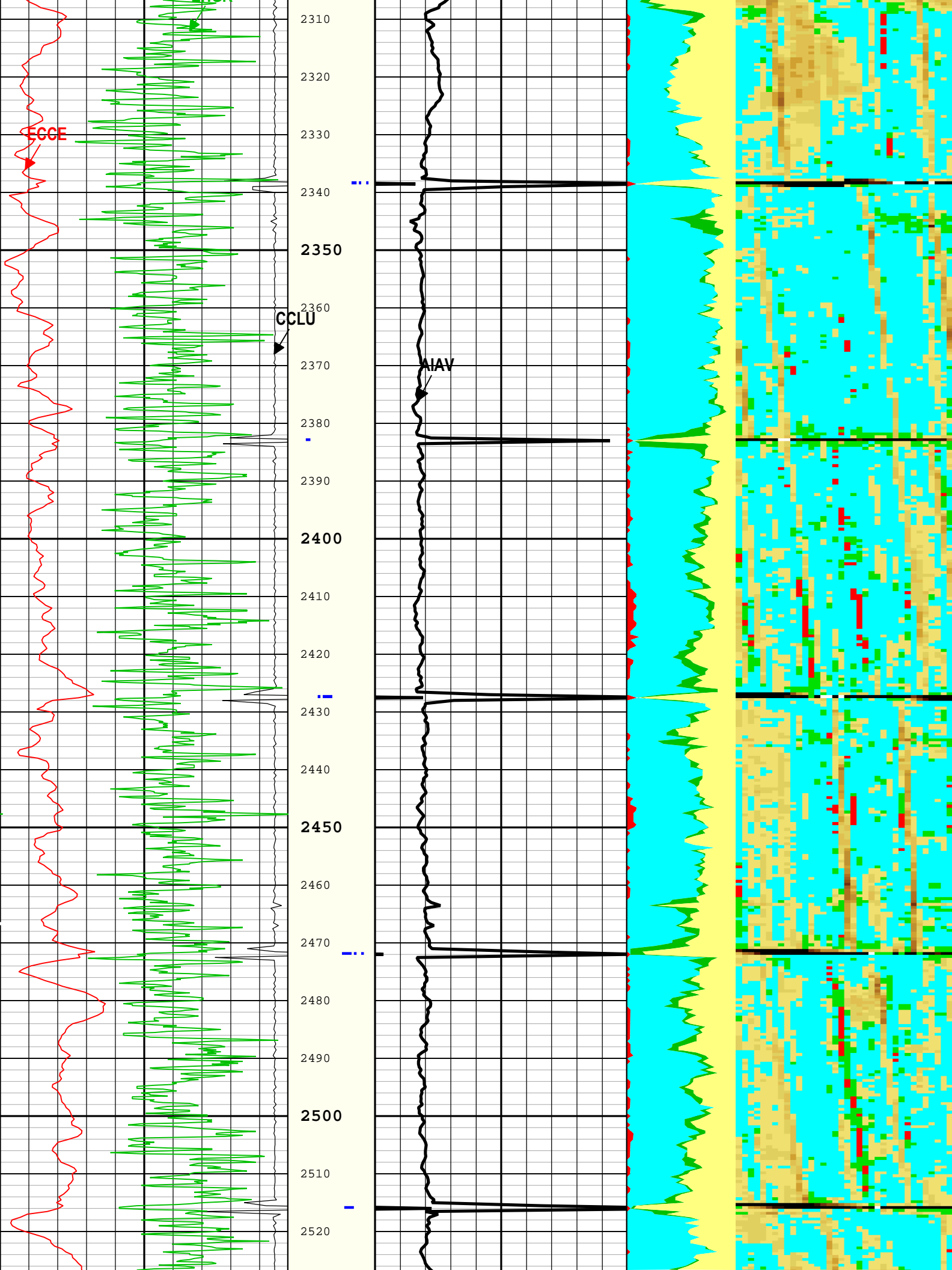


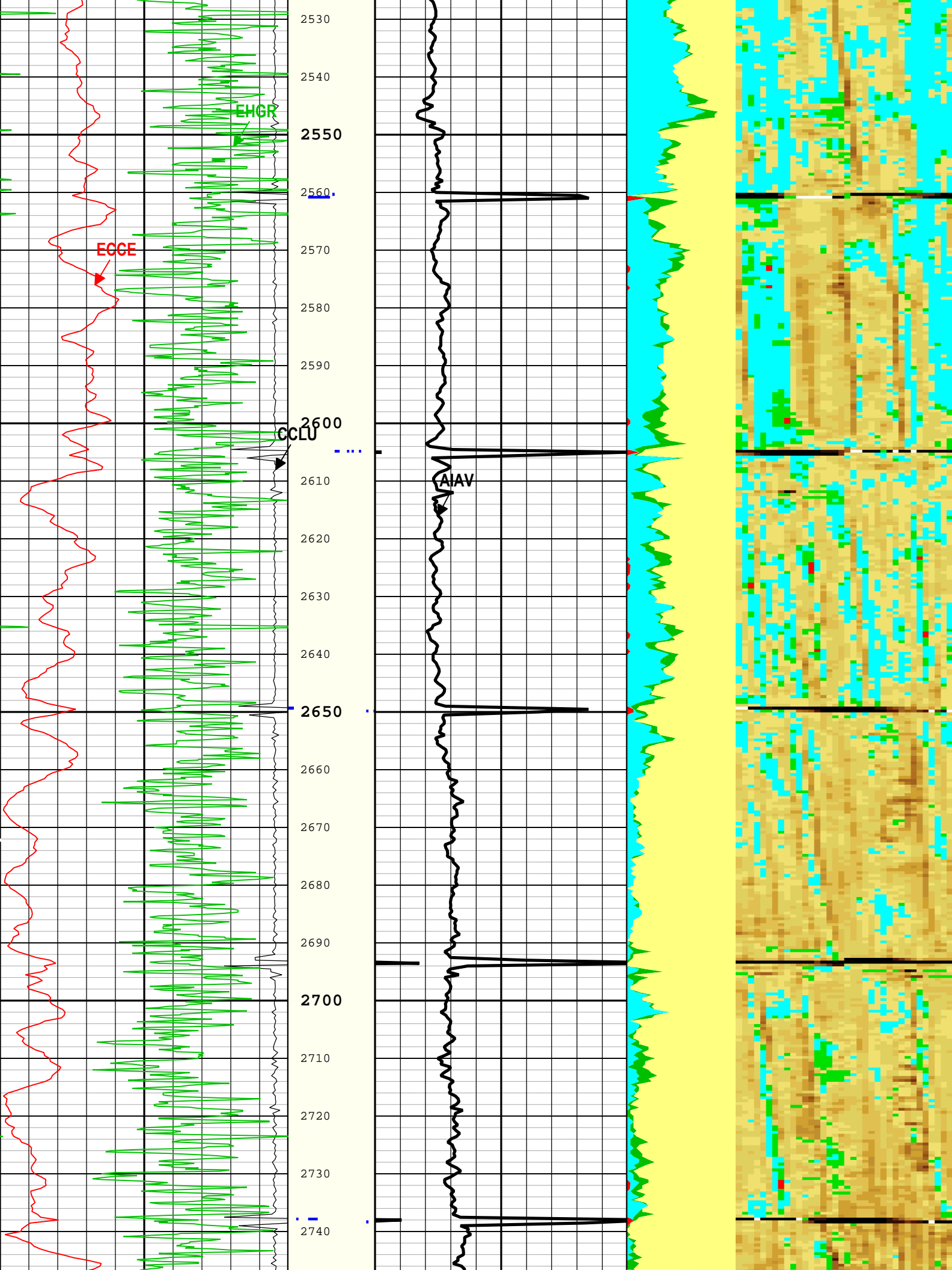


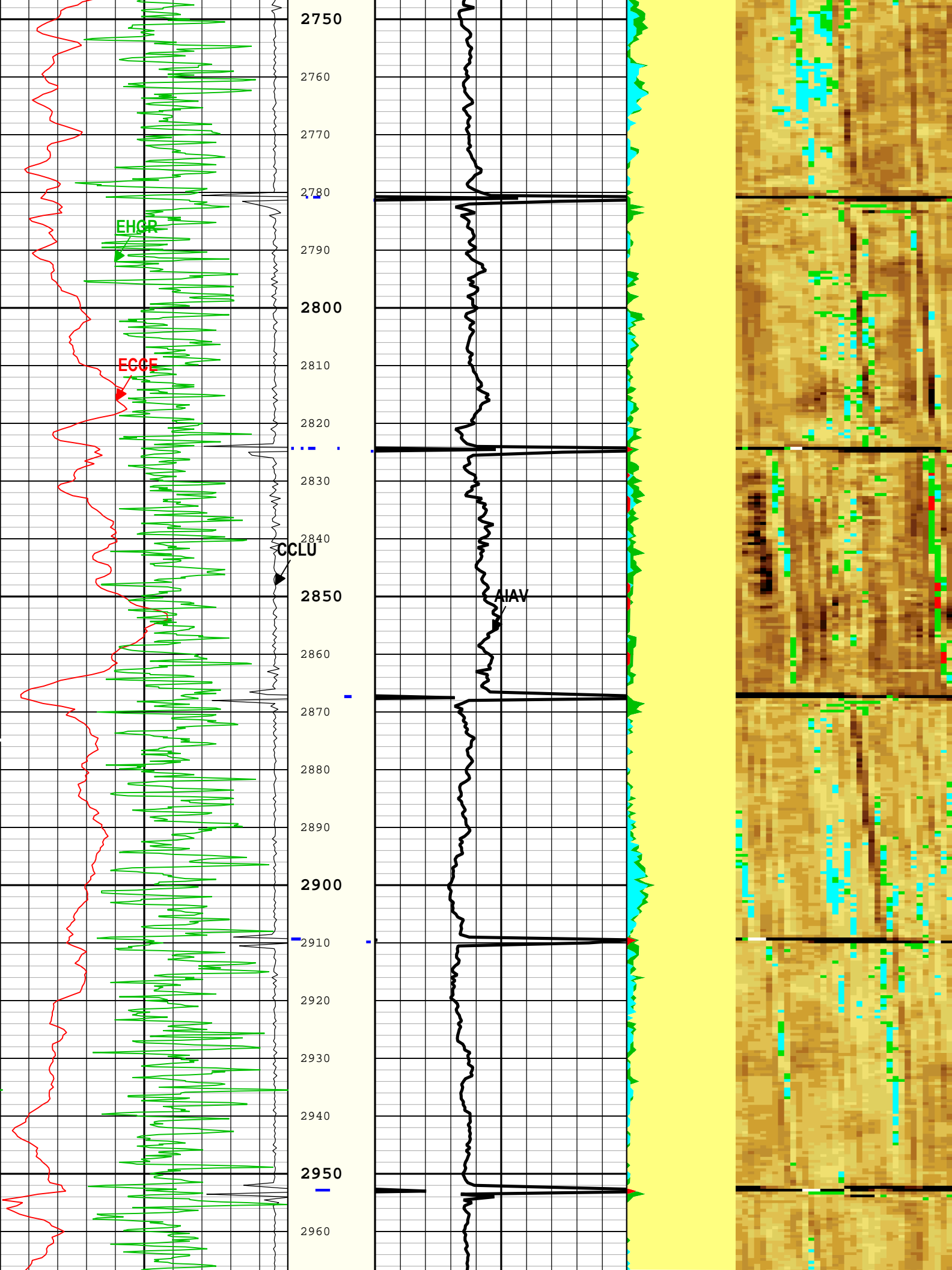


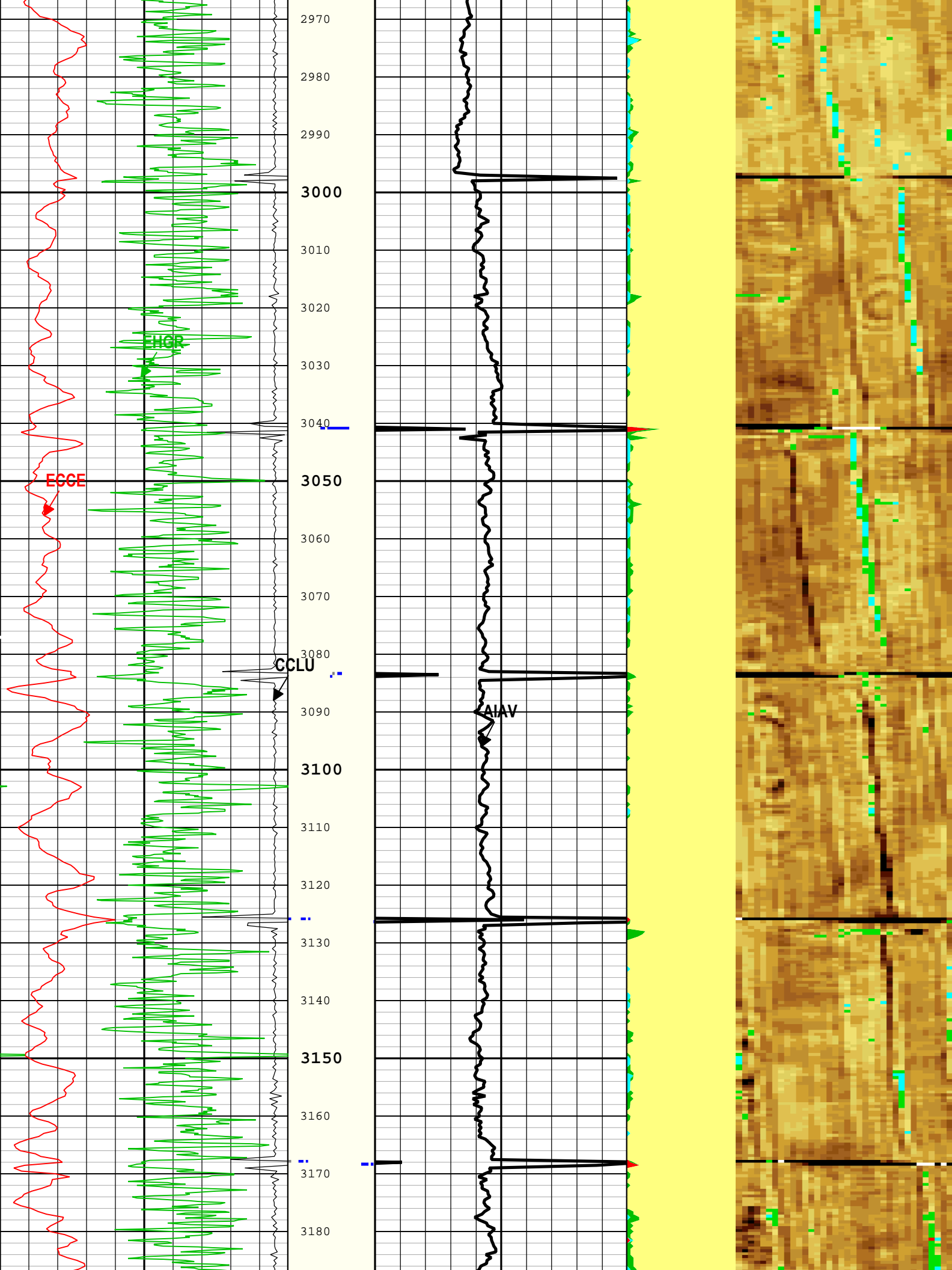


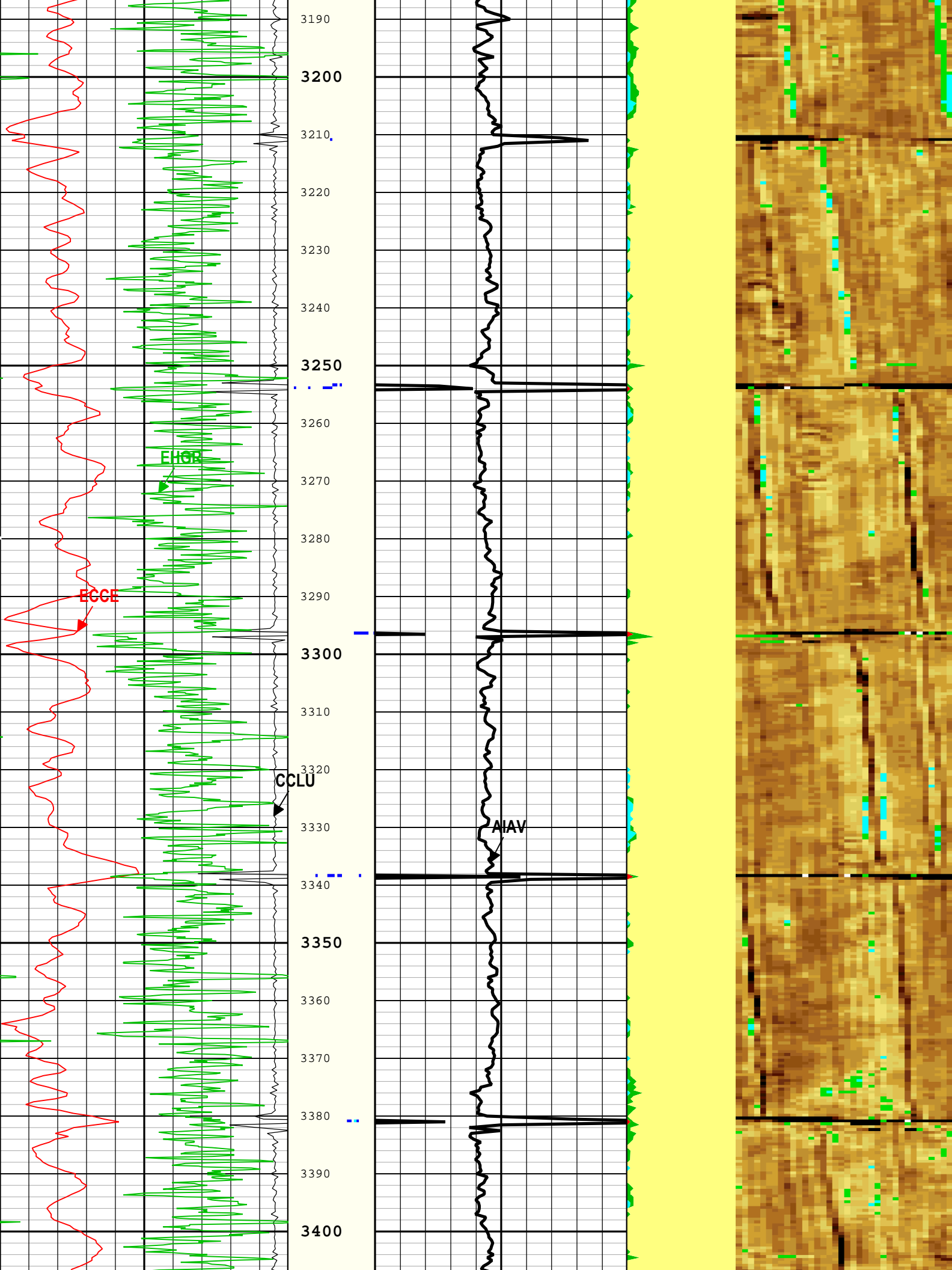


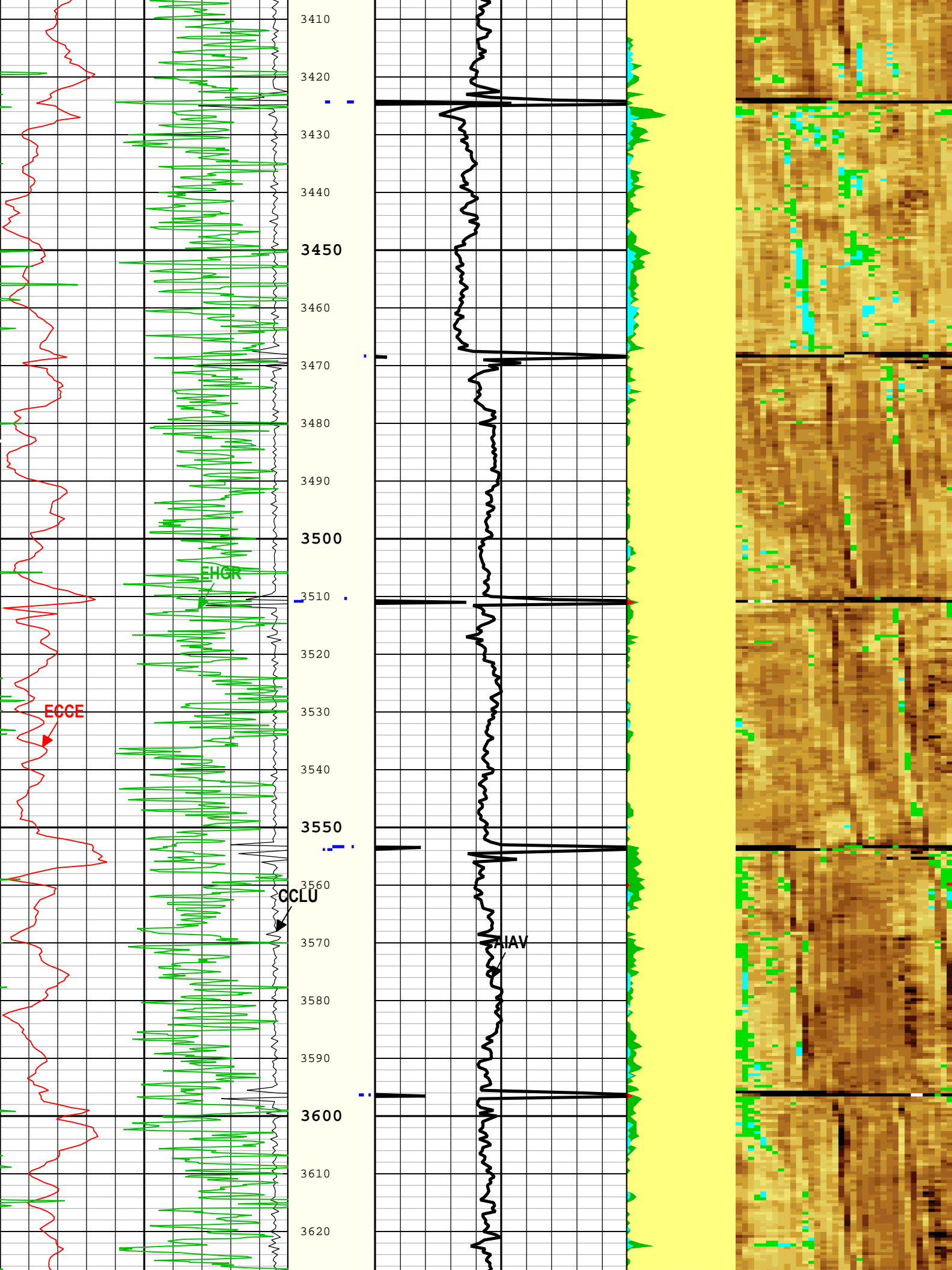


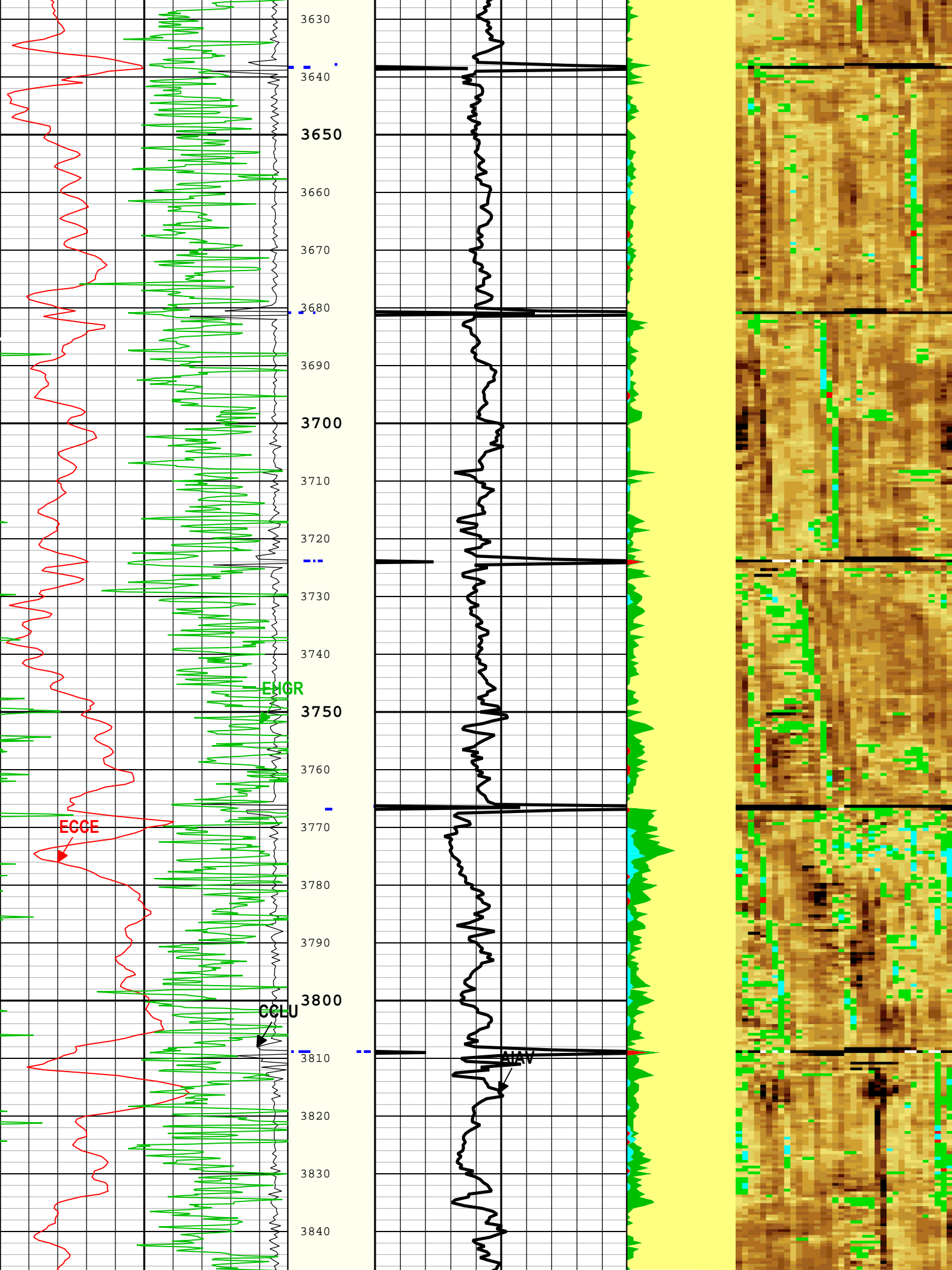


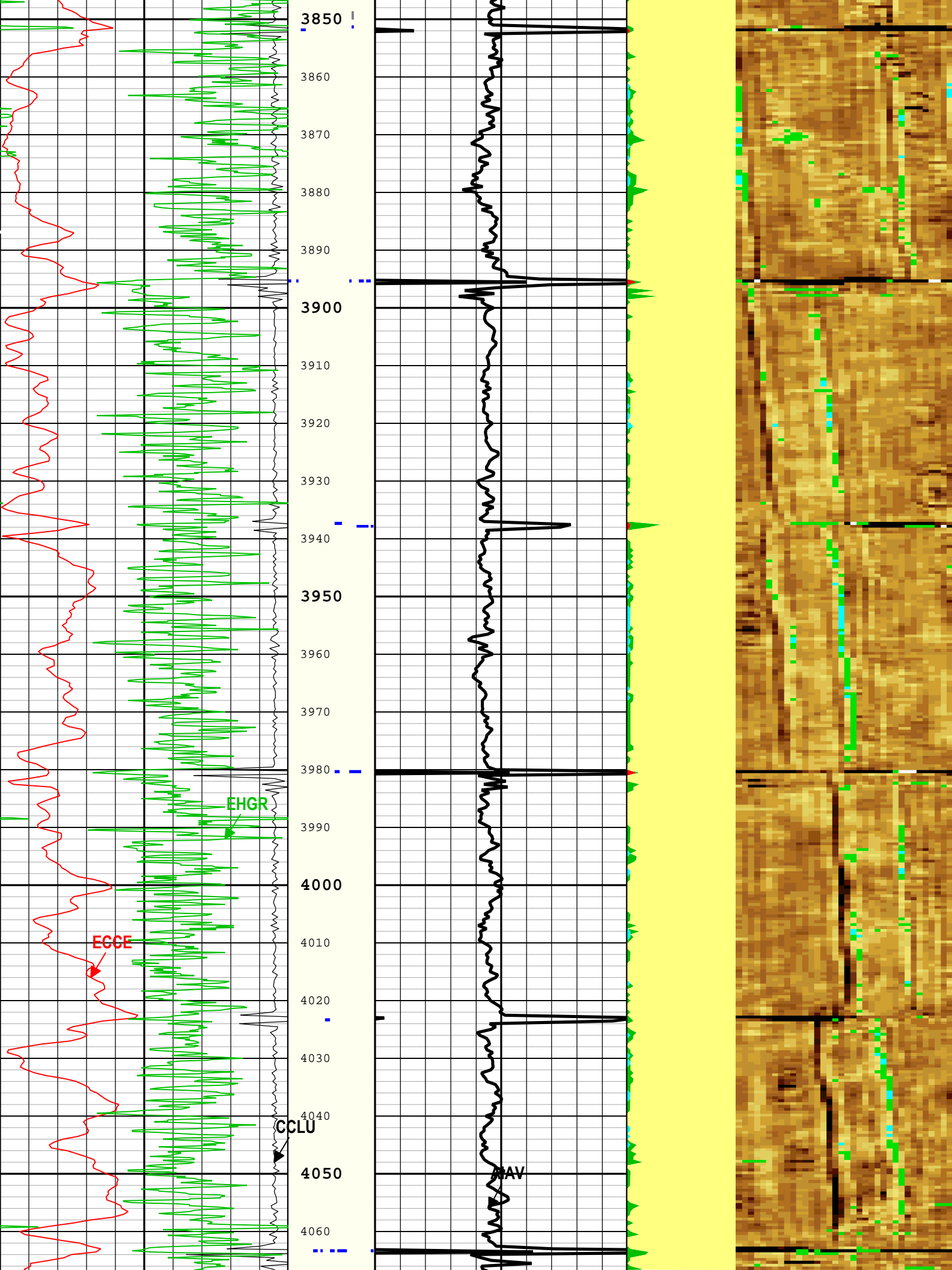


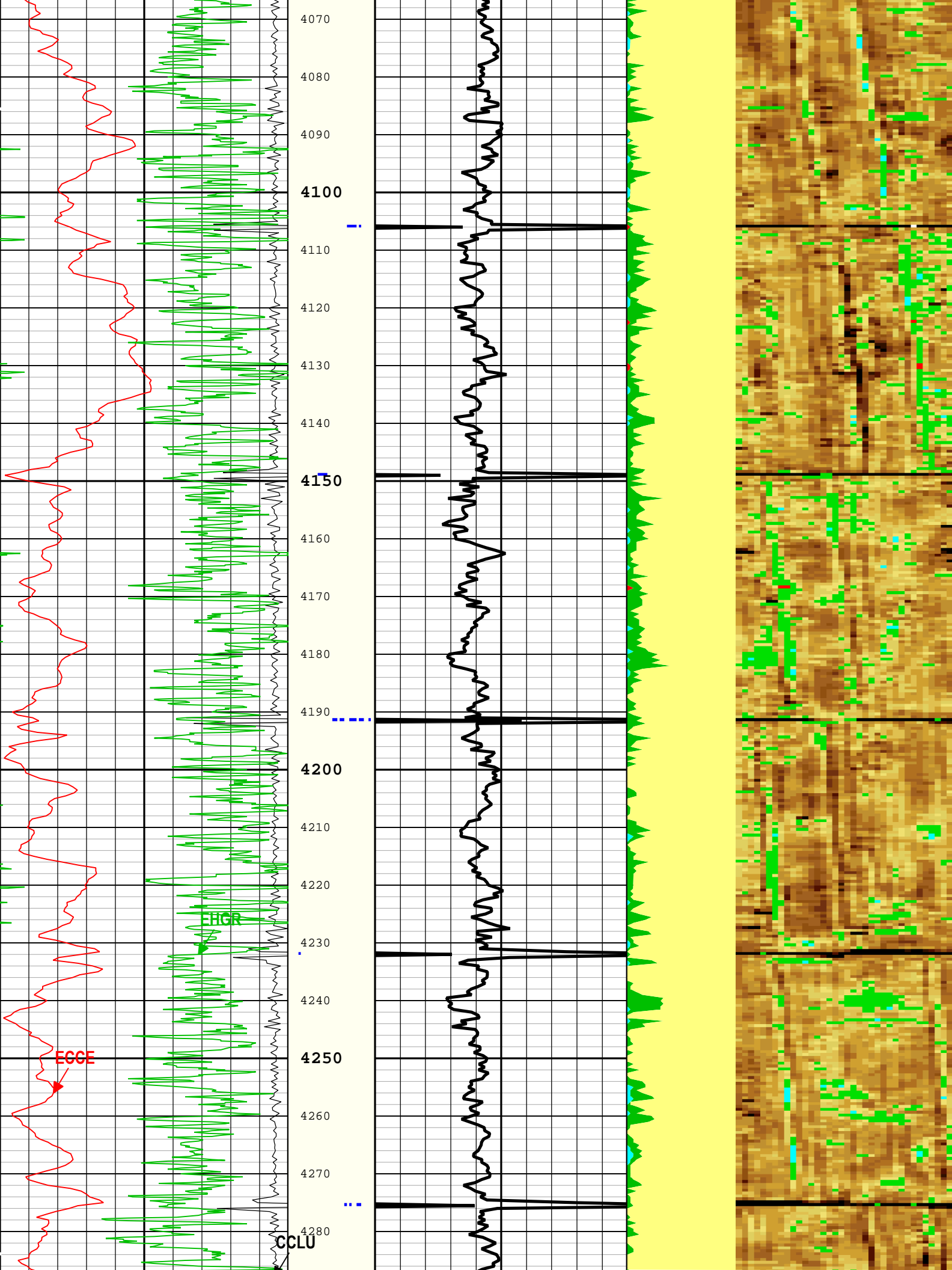


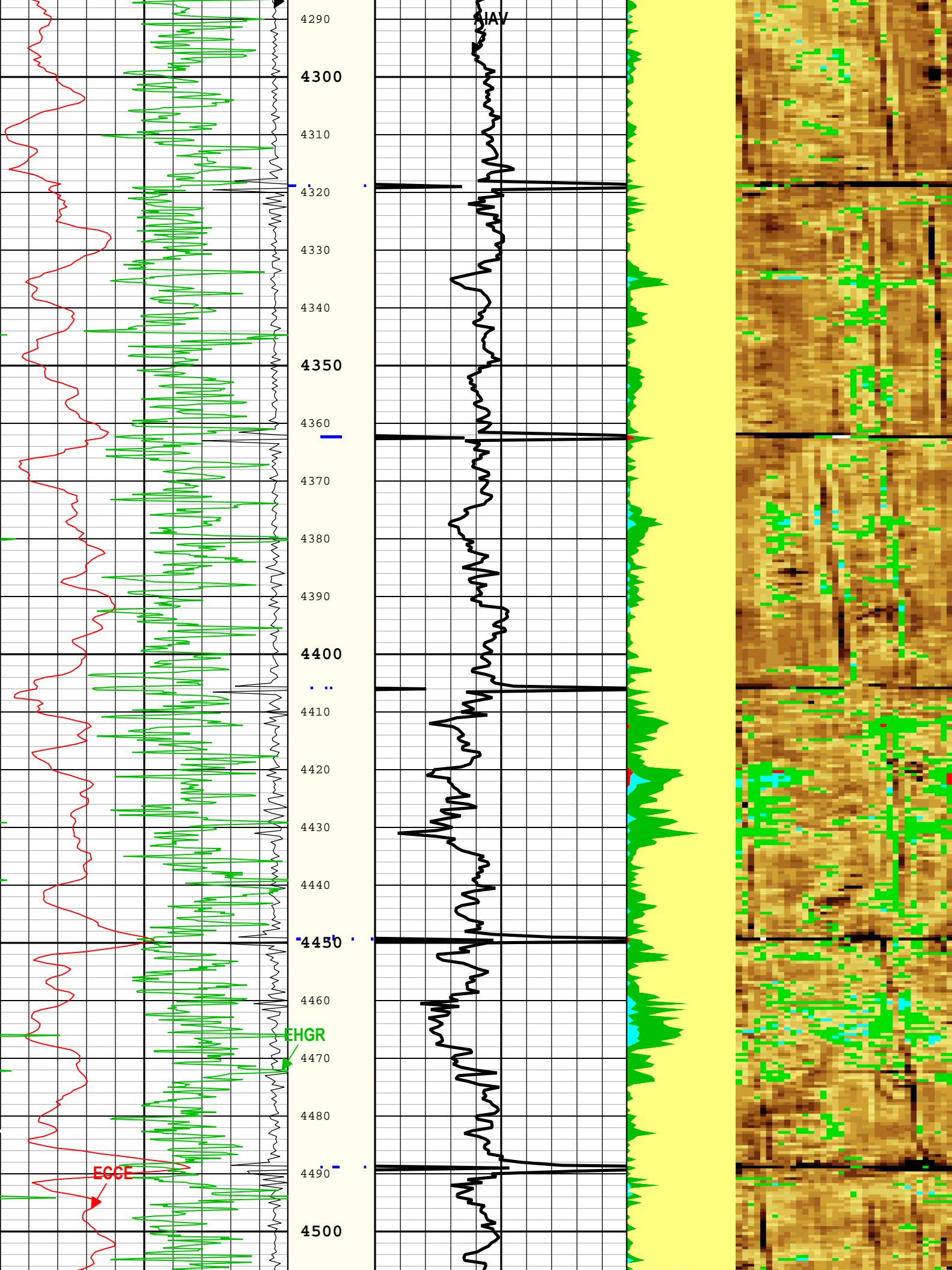


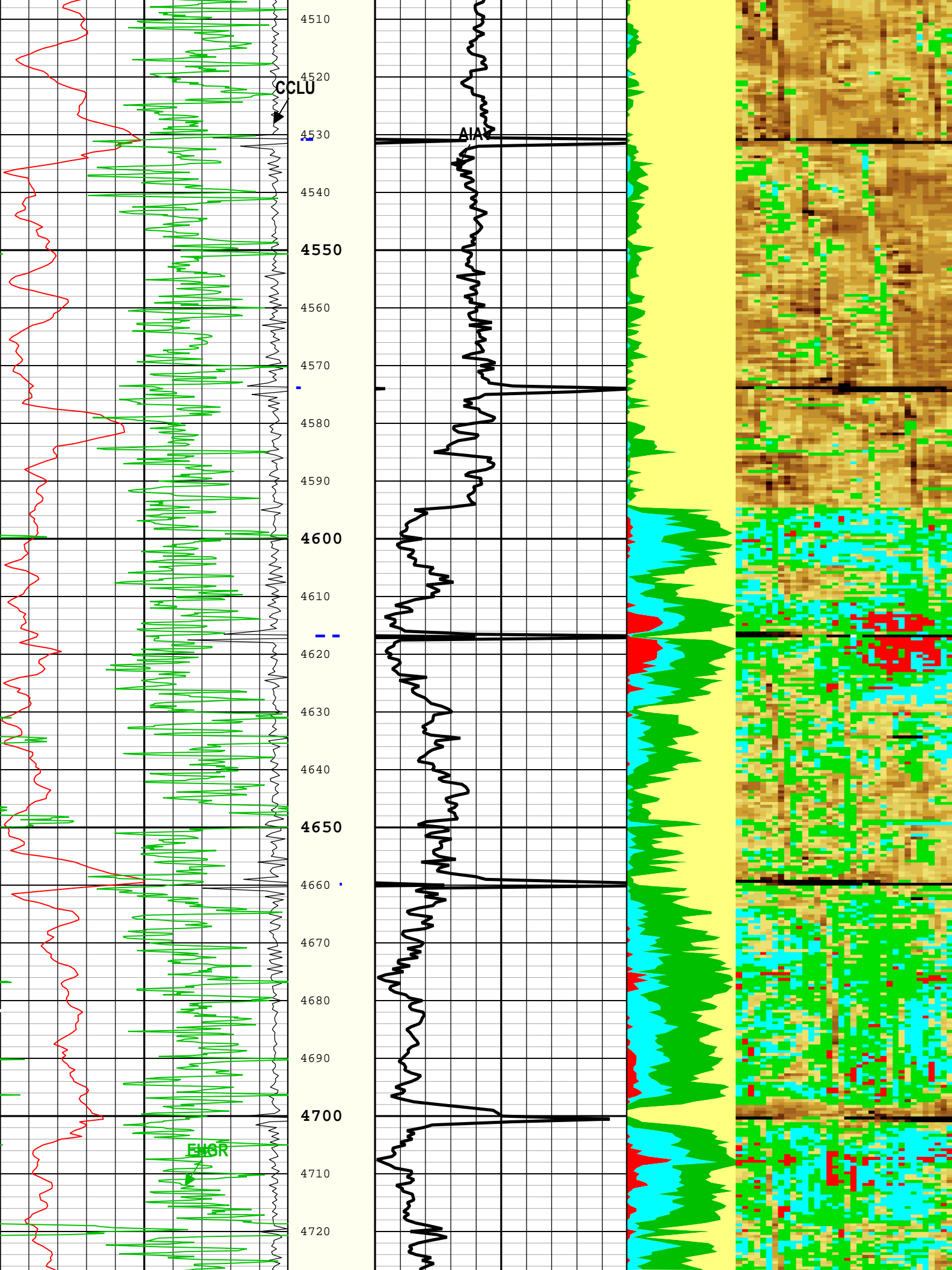


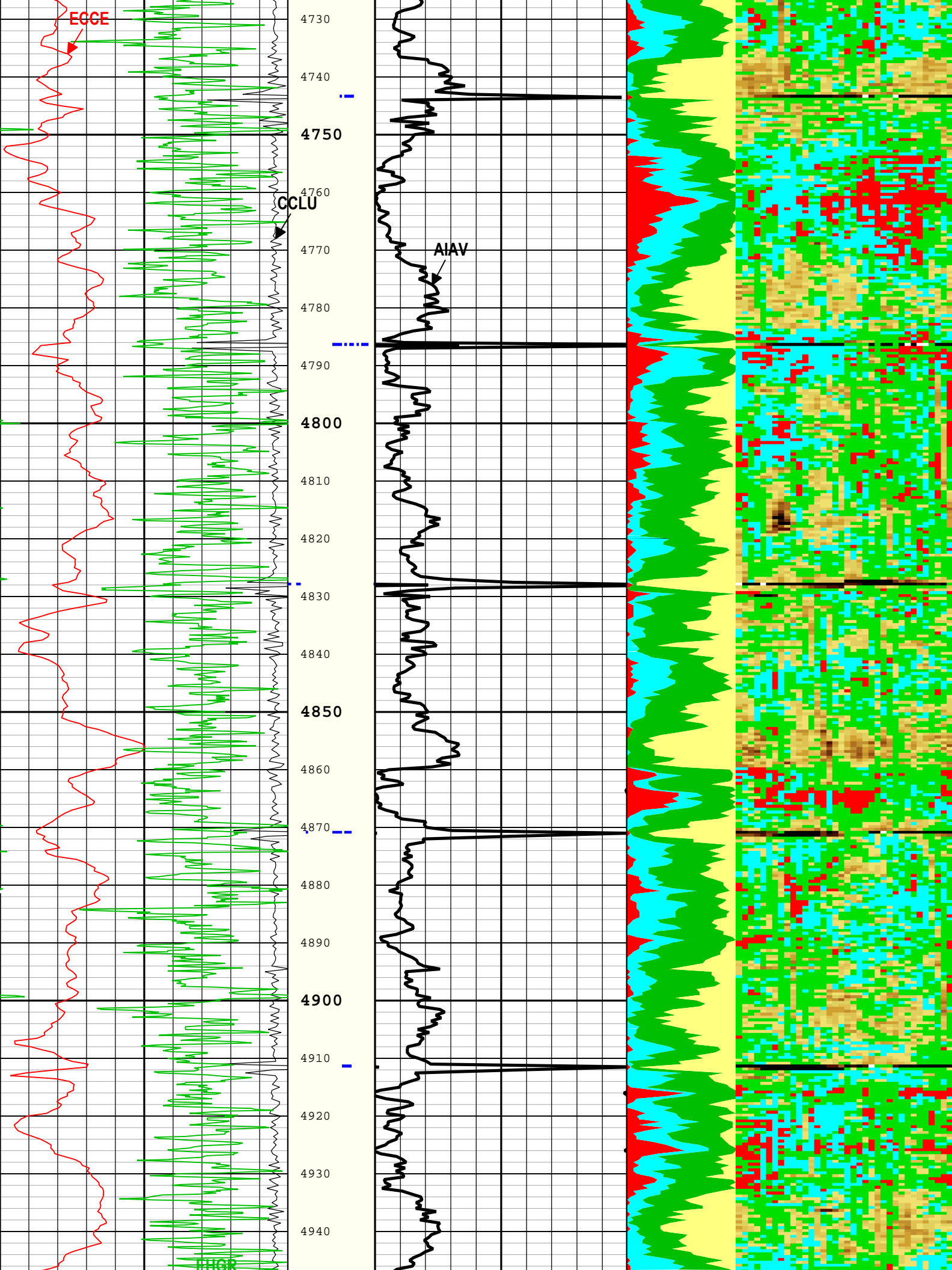


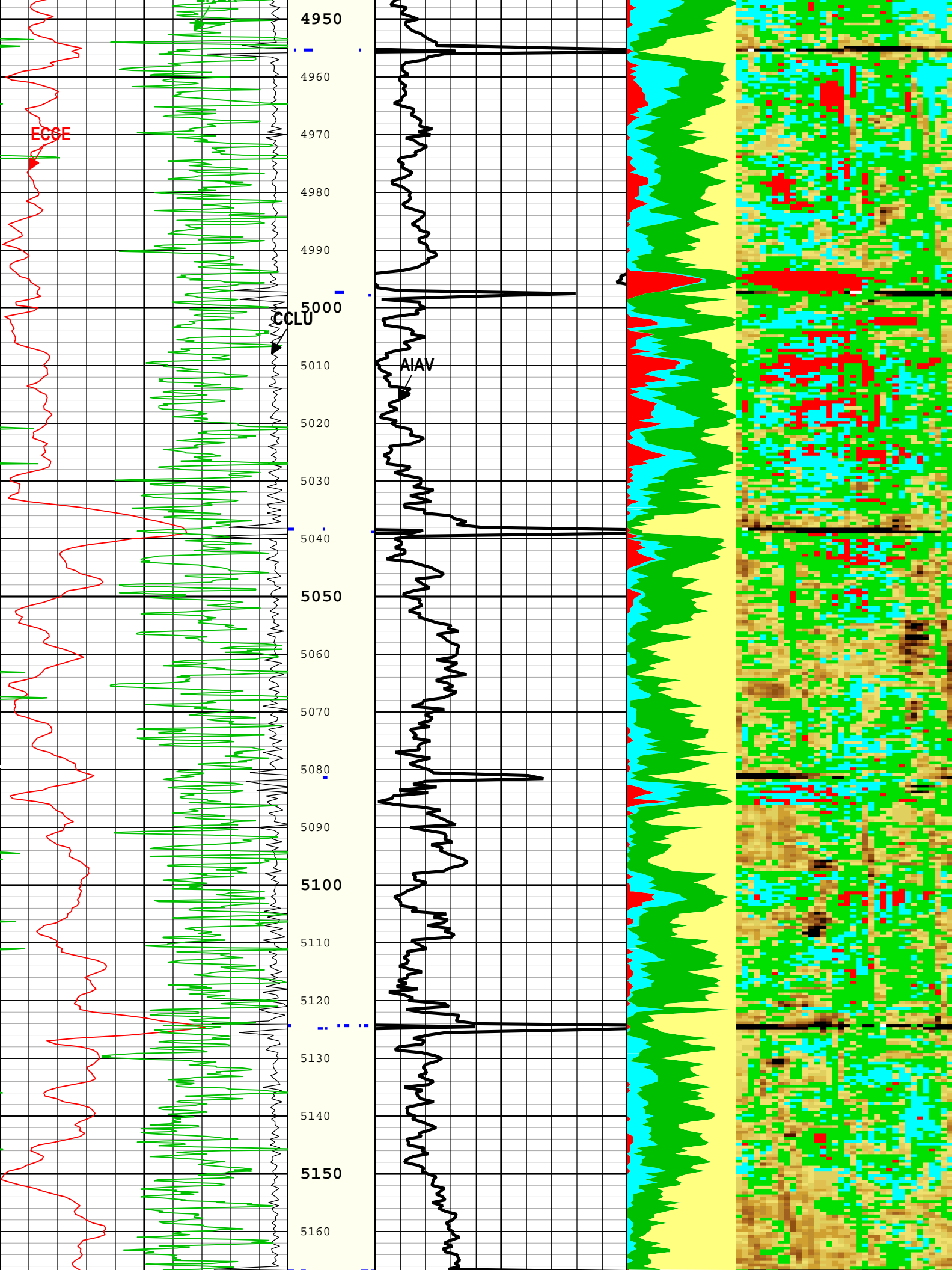


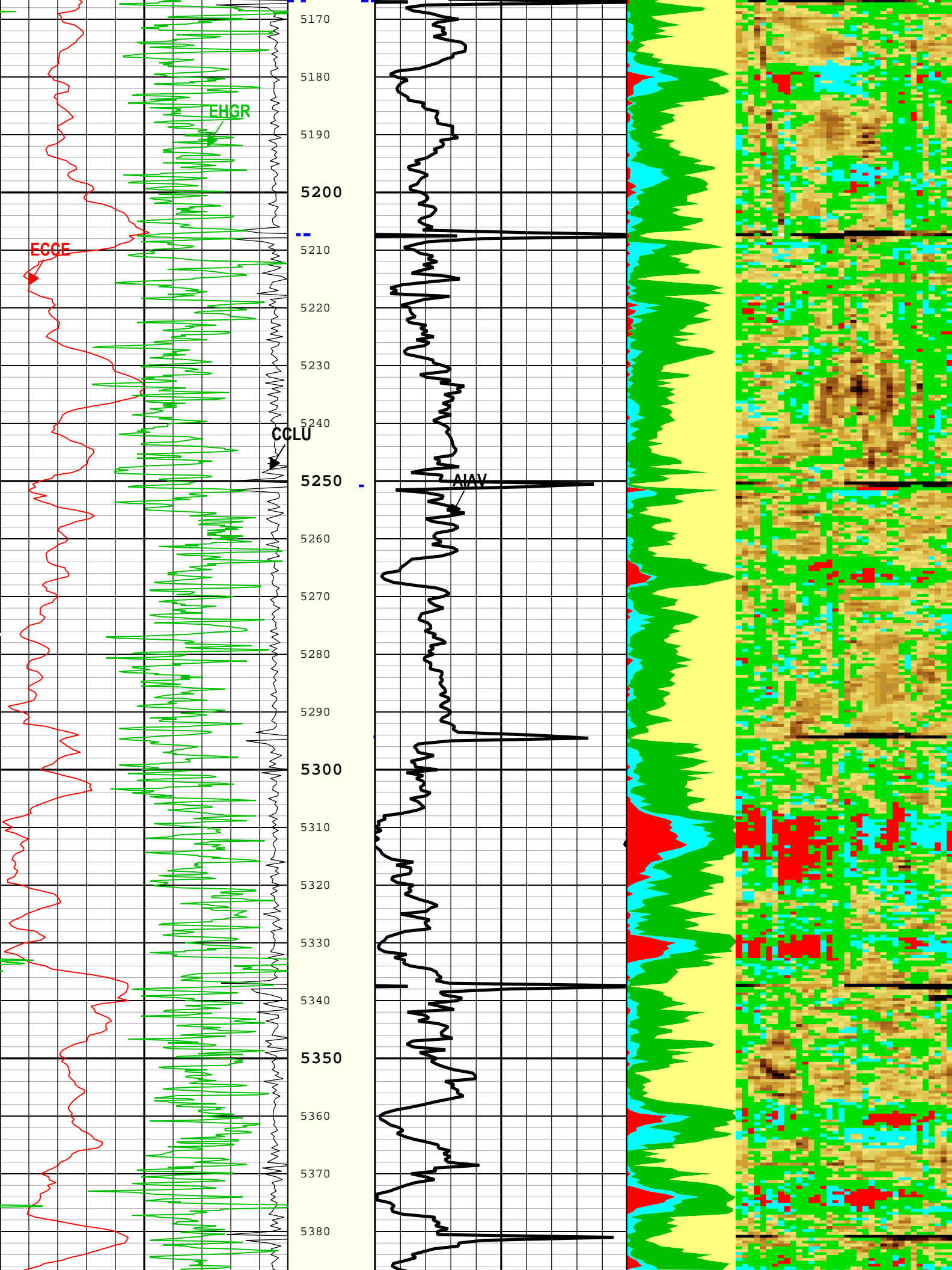


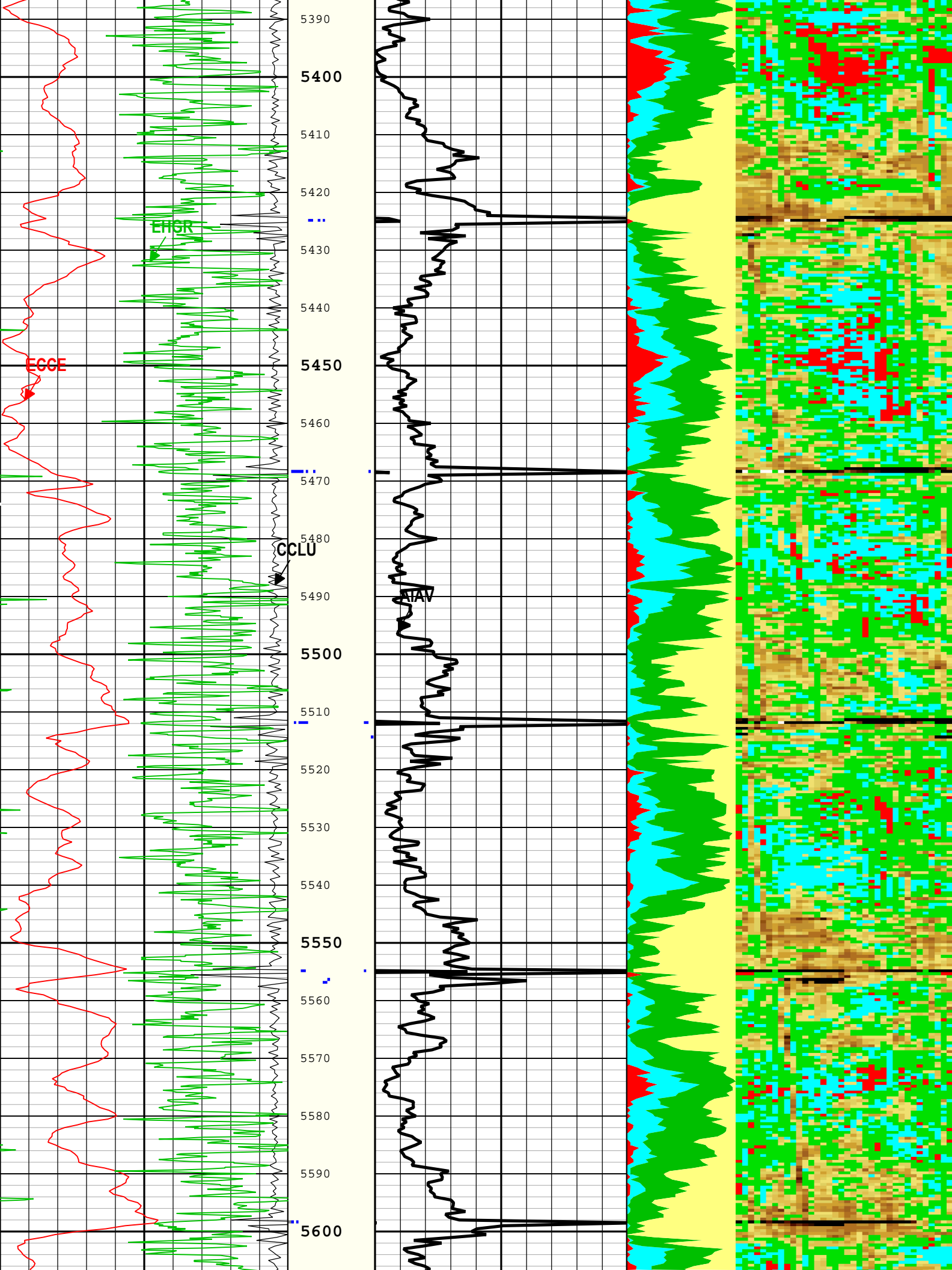


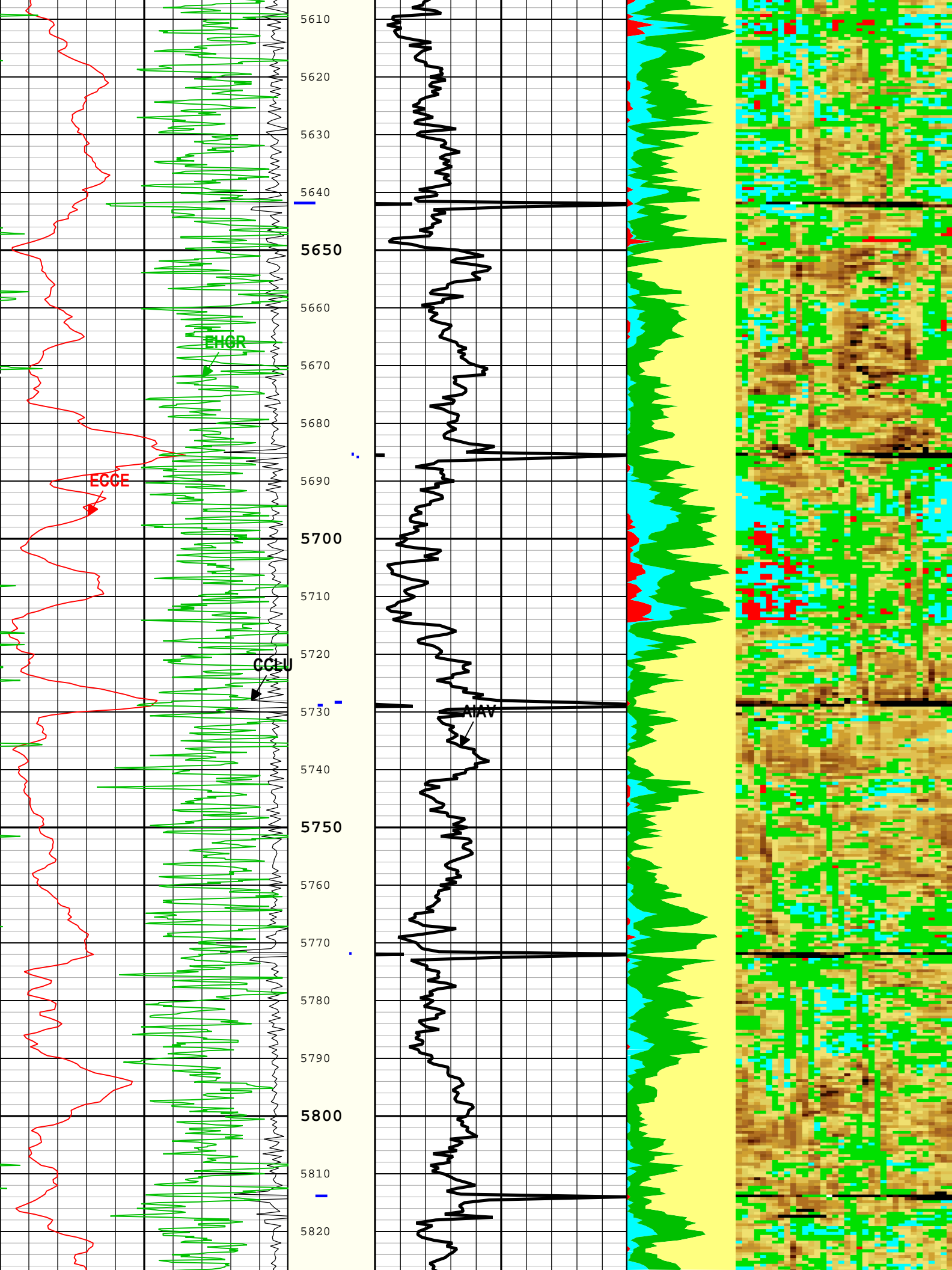


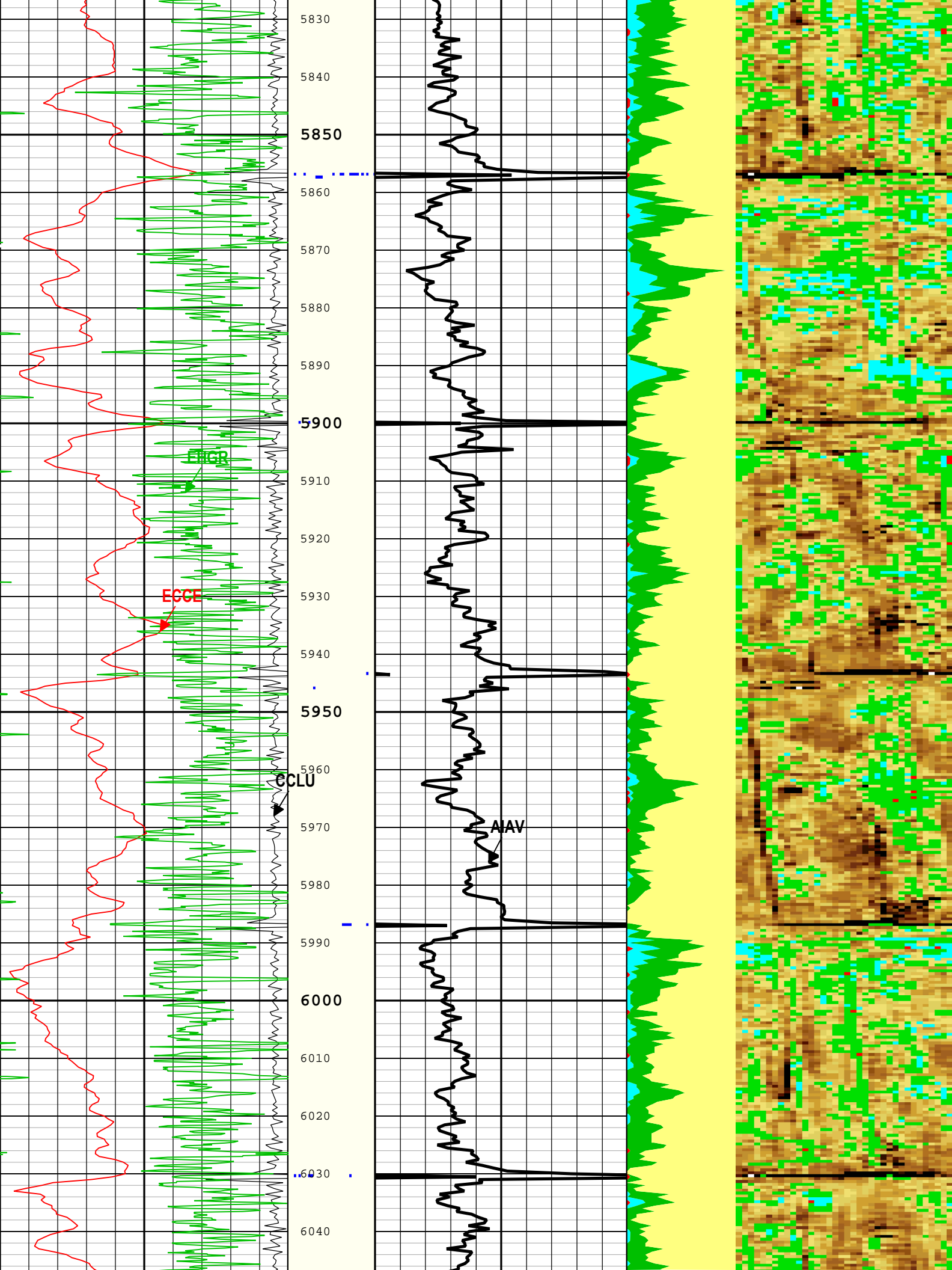


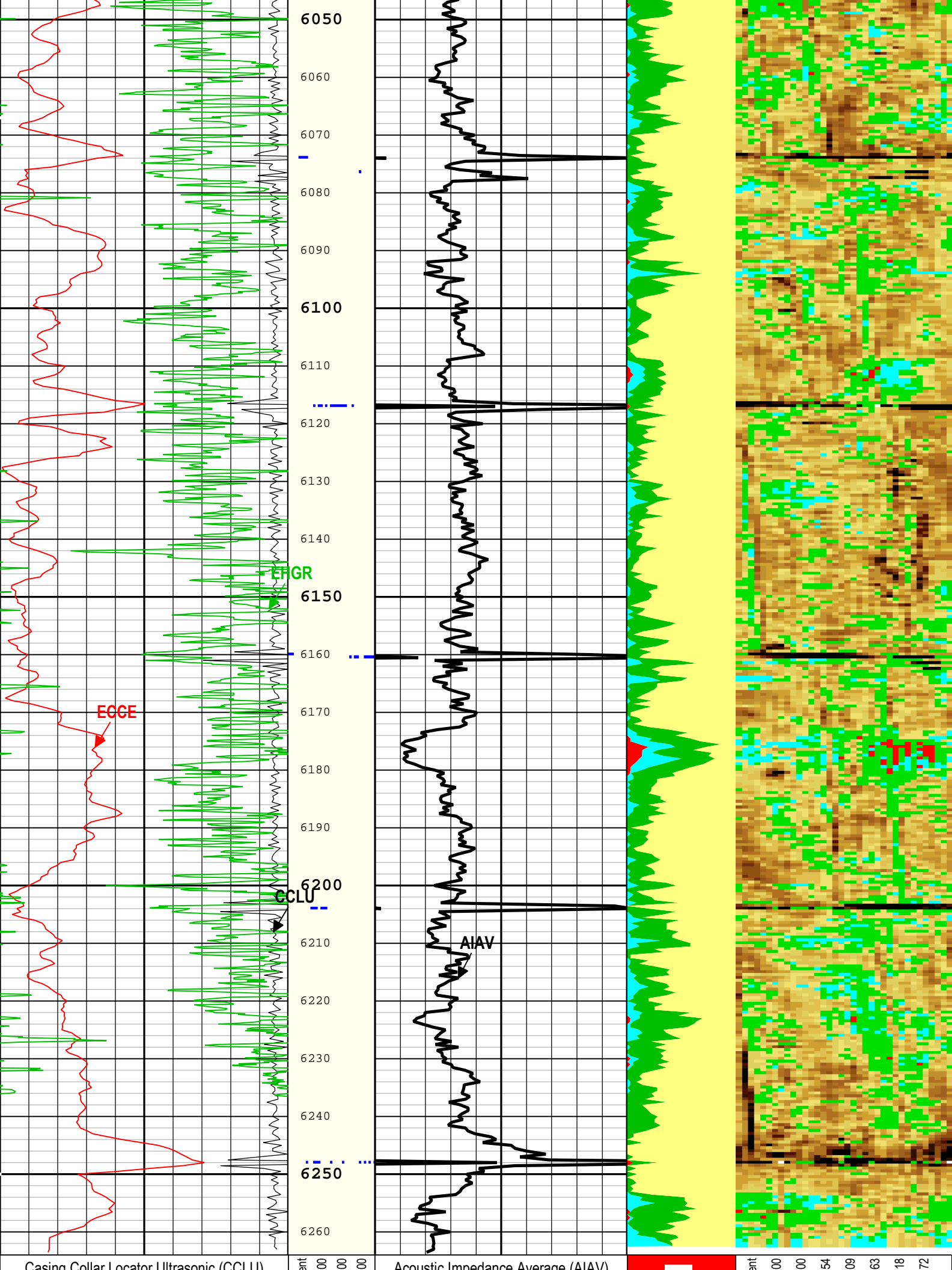


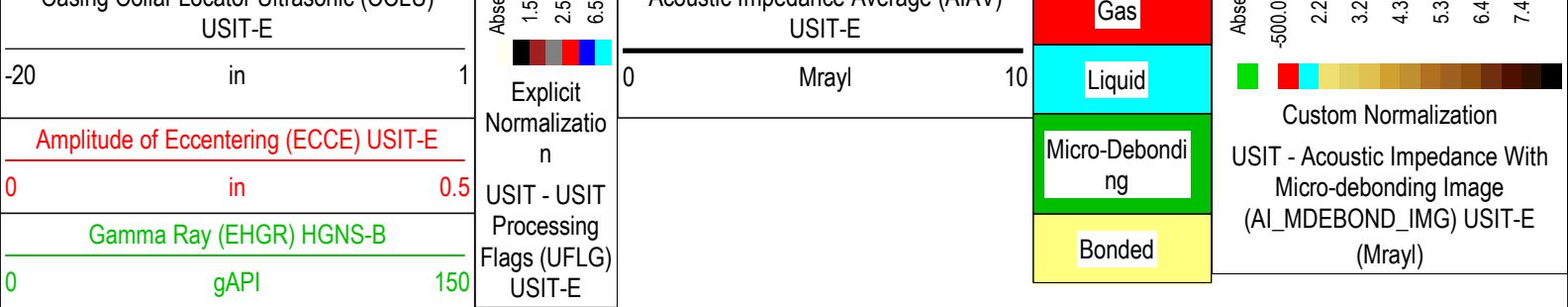












TIME_1900 - Time Marked every 60.00 (s)

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: 29-Apr-2019 09:50:25

Channel Processing Parameters

ONE: Parameters

Parameter	Description	Tool	Value	Unit
BARI(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	Depth Zoned	in
CBLO	Casing Bottom (Logger)	WLSESSION	17746.4	ft
CDEN	Cement Density	HGNS-B	11.5	lbm/gal
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	201	us/ft
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
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	1.12	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.11	
SOCO	Standoff Correction Option	HGNS-B	Yes	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.54	Mrayl
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-E	Automatic	
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	Theoretical	
ZMUD	Acoustic Impedance of Mud	Borehole	1.52	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	78.33	110
BS	13.5	110	1941
BS	8.5	1941	6264

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	40	V
HRES	Horizontal Resolution	USIT-E	10 deg	
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
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	30.62	us
WINE	Window End Time	USIT-E	70.62	us

ONE

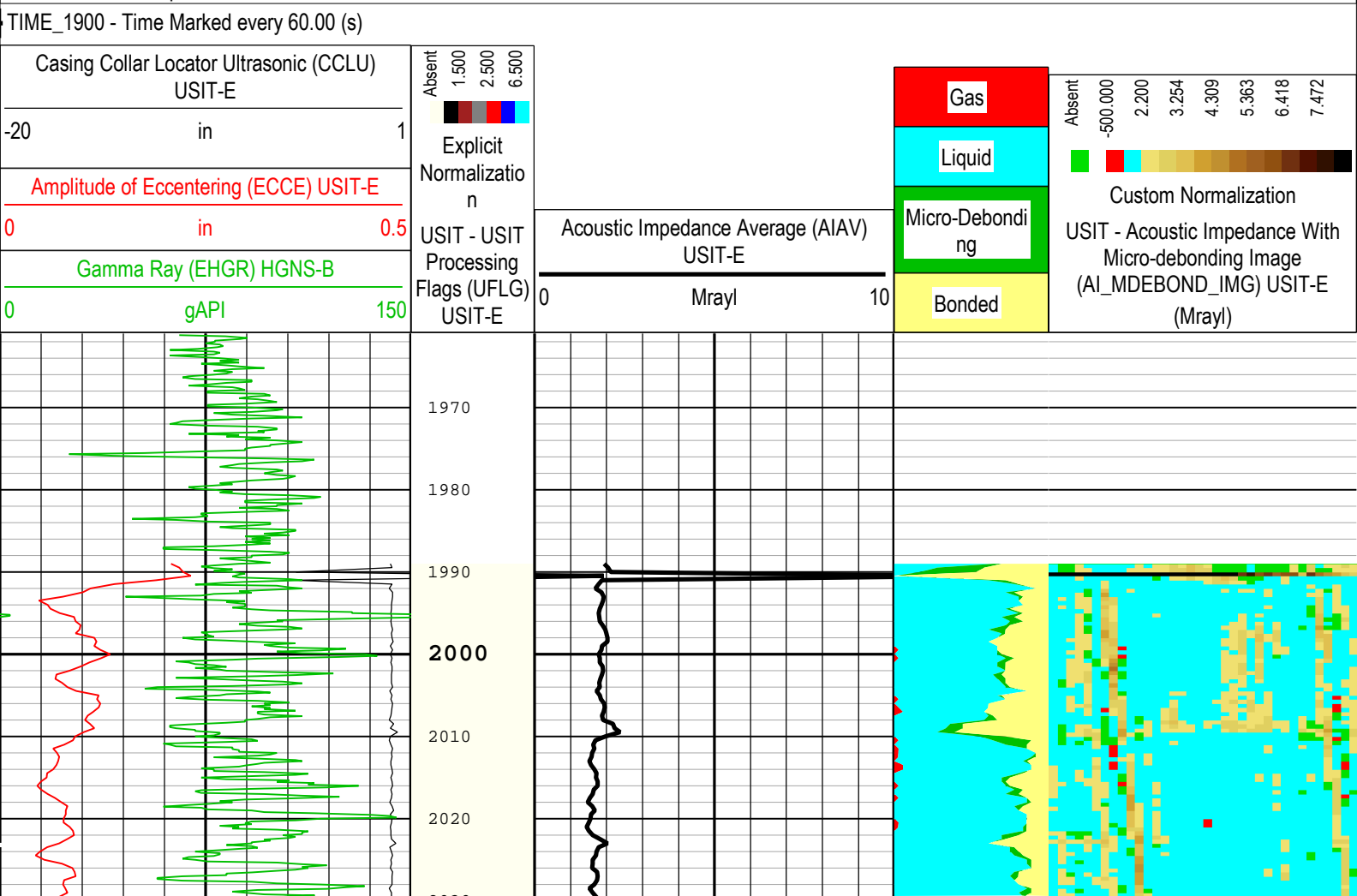
0 PSI Repeat Pass

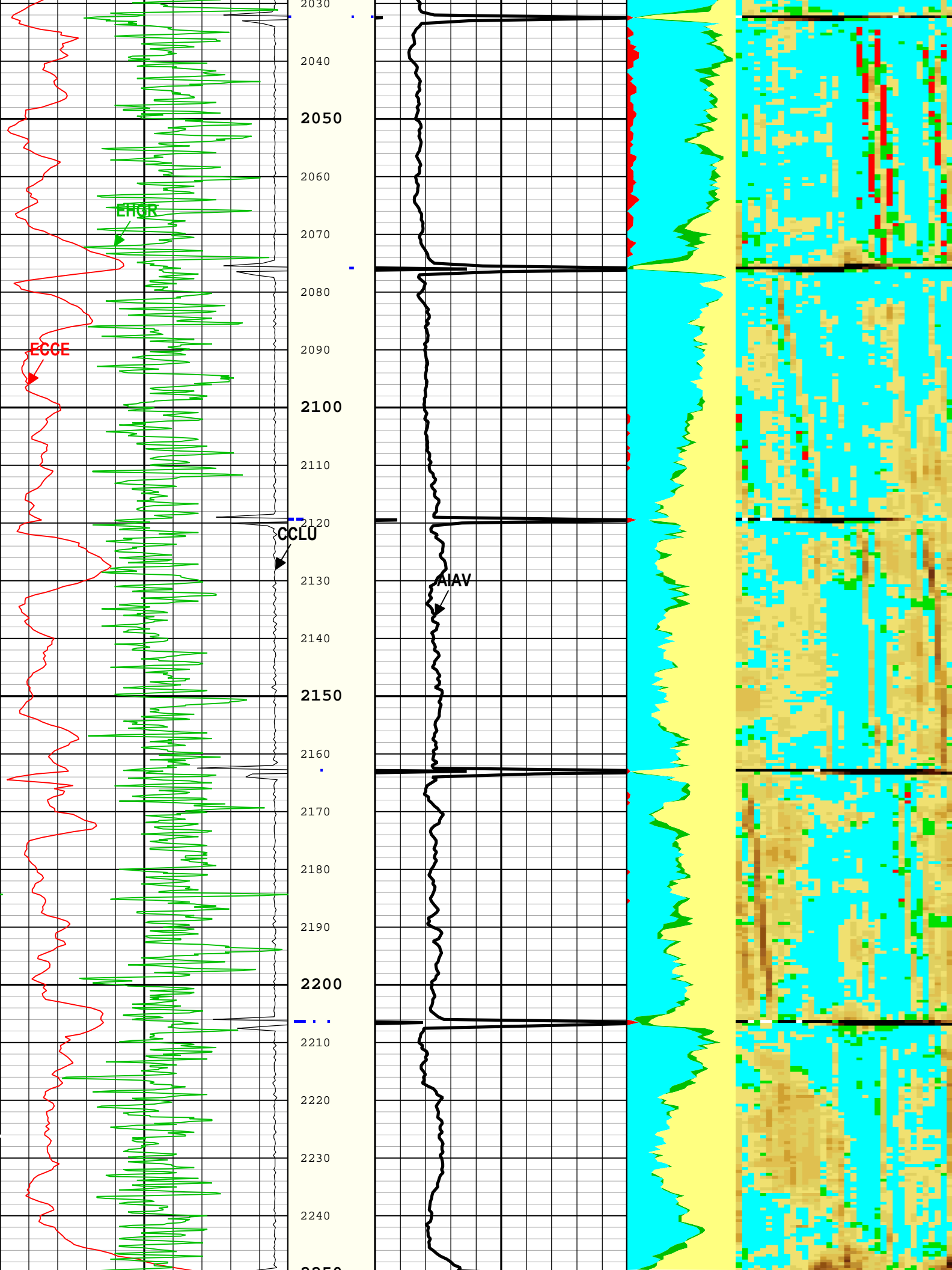
Software Version	
Acquisition System	Version
Maxwell 2018 SP2	8.2.104493.3100

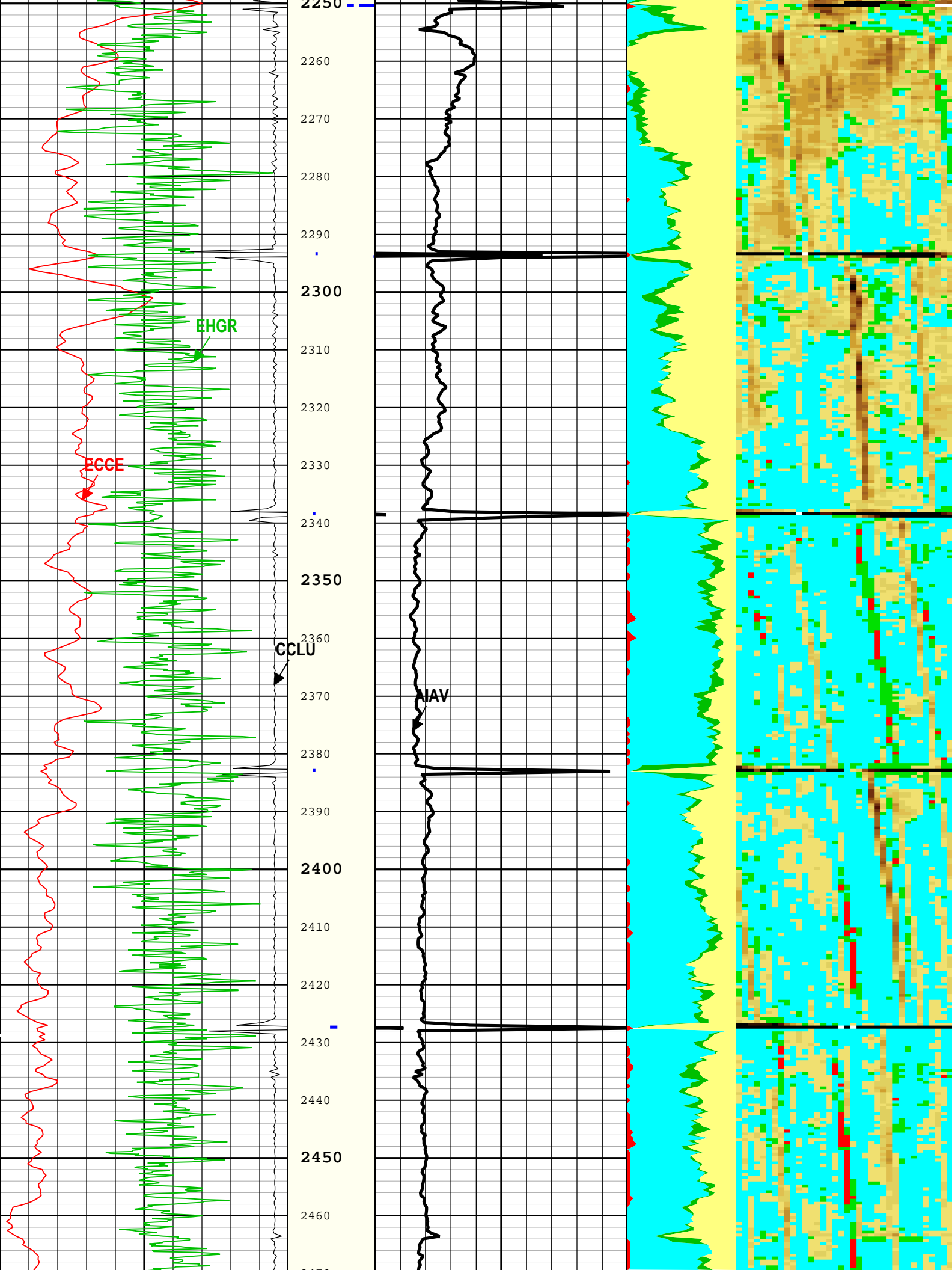
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[3]:Up	Up	1989.22 ft	2523.43 ft	27-Apr-2019 1:56:48 PM	27-Apr-2019 2:00:17 PM	ON	1.98 ft	Yes

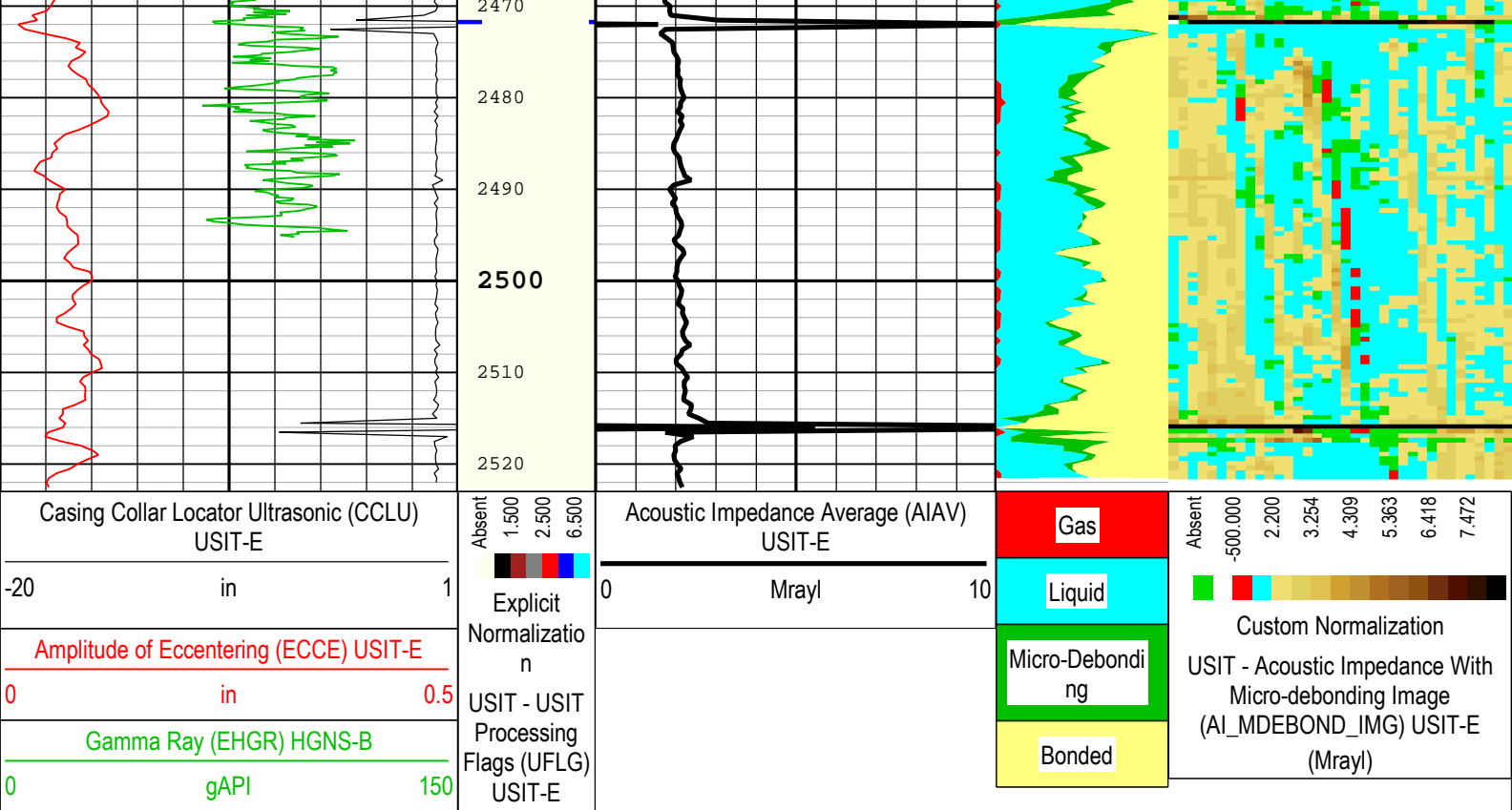
All depths are referenced to toolstring zero									
Log	Company:Noble Energy Inc Well:Vogler State D21-740 ONE: Log[3]:Up:S007								

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: 29-Apr-2019 09:50:31









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: 29-Apr-2019 09:50:31

Channel Processing Parameters				
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
BARI(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	8.5	in
CBLO	Casing Bottom (Logger)	WLSESSION	17746.4	ft
CDEN	Cement Density	HGNS-B	11.5	lbm/gal
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	201	us/ft
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
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	1.12	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.11	
SOCO	Standoff Correction Option	HGNS-B	Yes	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.54	Mrayl
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-E	Automatic	
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	Theoretical	
ZMUD	Acoustic Impedance of Mud	Borehole	1.52	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl

ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl
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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	
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
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	30.62	us
WINE	Window End Time	USIT-E	Time Zoned	us

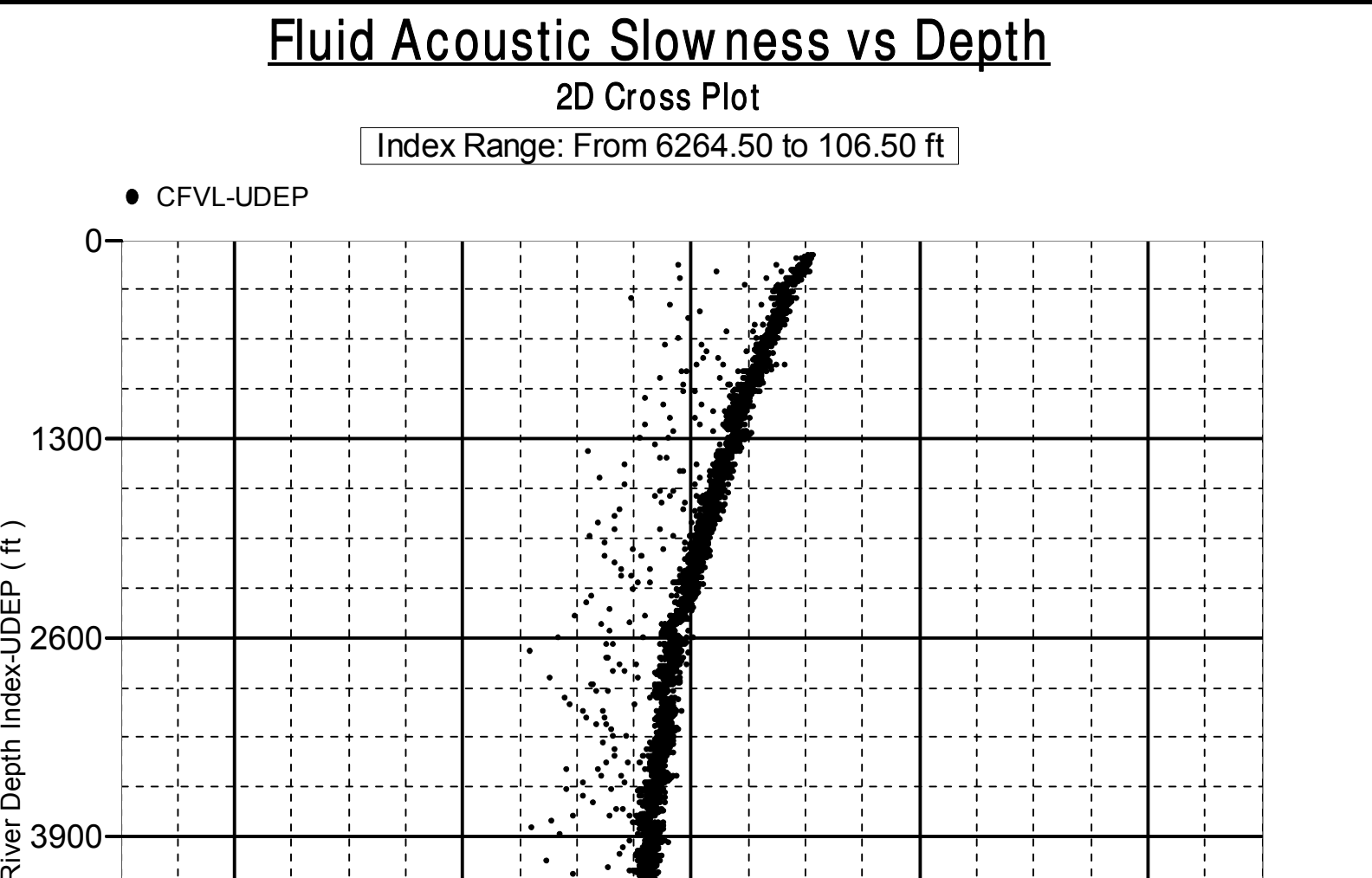
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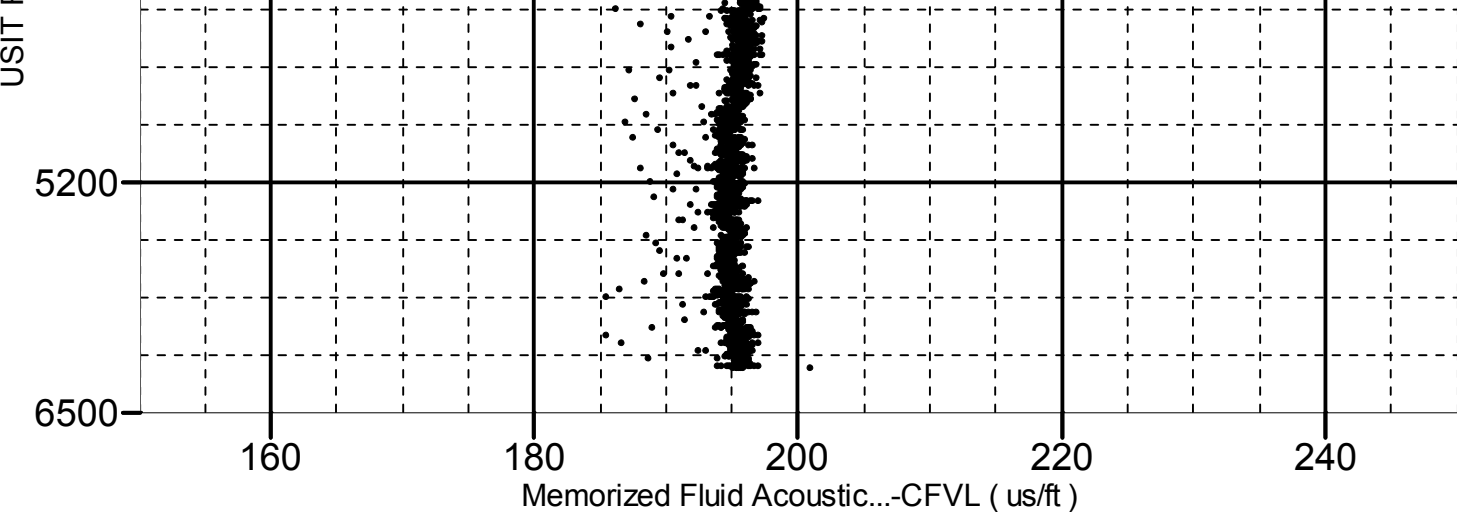
Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	40	27-Apr-2019 13:56:48	27-Apr-2019 13:58:37	2523.43	2302.66
EMXV	50	27-Apr-2019 13:58:37	27-Apr-2019 14:00:17	2302.66	1989.22
WINE	70.62	27-Apr-2019 13:56:48	27-Apr-2019 13:59:31	2523.43	2119.88
WINE	72.33	27-Apr-2019 13:59:31	27-Apr-2019 14:00:17	2119.88	1989.22

All depth are at tool zero.

XYZ

Company:Noble Energy Inc Well:Vogler State D21-740
ONE: Log[5]:Up:S007

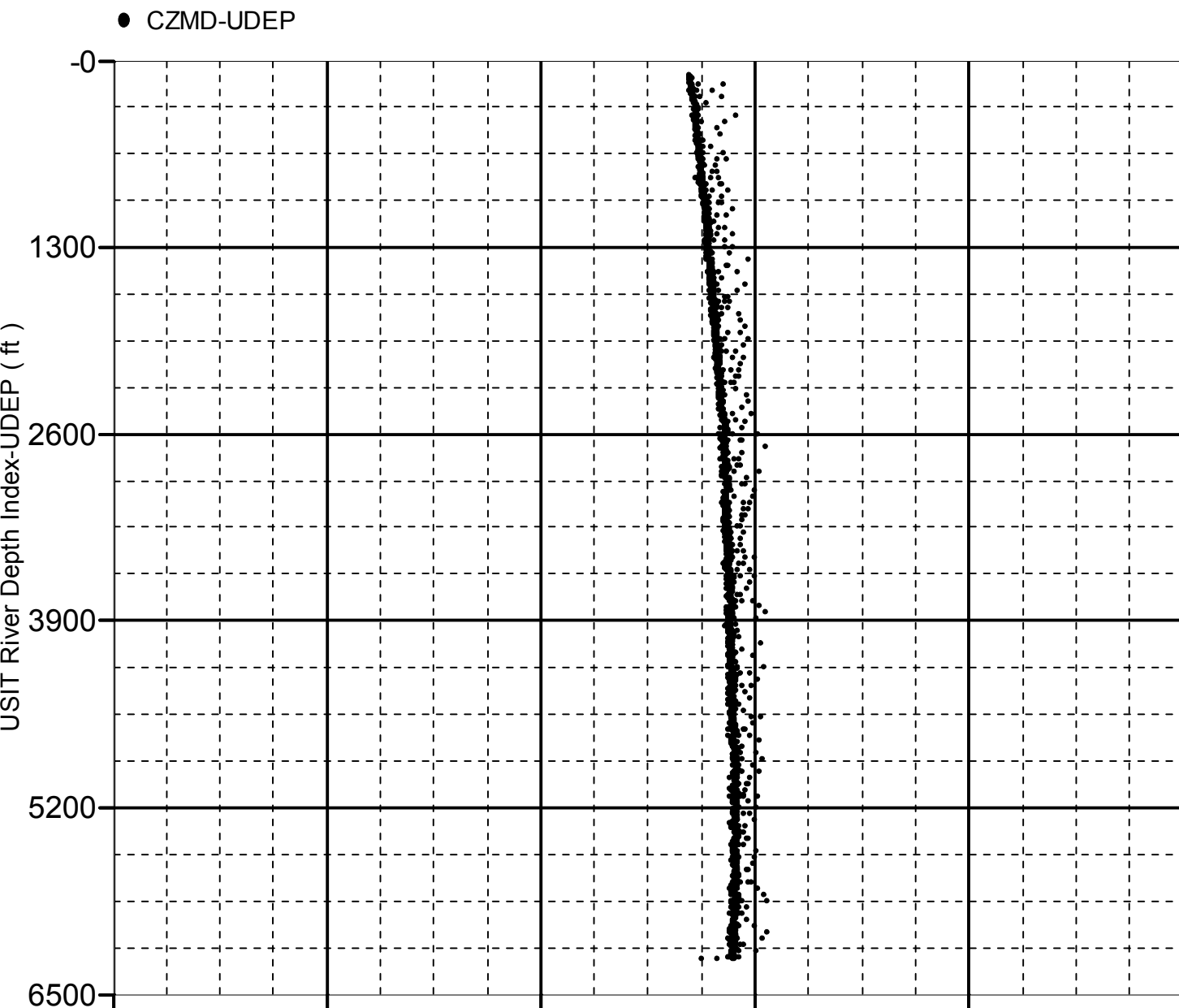




Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6264.50 to 106.50 ft



0.0

0.6

1.2

1.8

2.4

3.0

Acoustic Impedance of Mu...-CZMD (Mrayl)

Company:	Noble Energy Inc	Schlumberger
Well:	Vogler State D21-740	
Field:	Wattenberg	
County:	Weld	
State:	Colorado	
UltraSonic Summary Print		