

Company: NOBLE ENERGY INC

Well: BROWNING FEDERAL LC24-780

Field: WILDCAT

County: WELD State: COLORADO

UltraSonic Summary Print

County:	WELD								
Field:	WILDCAT								
Location:	330' FNL & 770' FWL								
Well:	BROWNING FEDERAL LC24-780								
Company:	NOBLE ENERGY INC								
					Location:				
					330' FNL & 770' FWL		Elev.:	K.B.	4962.00 ft
								G.L.	4932.00 ft
								D.F.	4962.00 ft
Permanent Datum:	Ground Level	Elev.:	4932.00 f						
Log Measured From:	Kelly Bushing	30.00 ft	above Perm.Datum						
Drilling Measured From:	Kelly Bushing								
API Serial No.	Section:	Township:	Range:						
05-123-42967	24	9N	59W						

Logging Date	09-Jan-2017			
Run Number	ONE			
Depth Driller	10852.00 ft			
Schlumberger Depth	10852.00 ft			
Bottom Log Interval	6320.00 ft			
Top Log Interval	60.00 ft			
Casing Fluid Type	Water			
Salinity				
Density	9.4 lbm/gal			
Fluid Level	8.00 ft			
BIT/CASING/TUBING STRING				
Bit Size	8.50 in			
From	1925.00 ft			
To	10852.00 ft			
Casing/Tubing Size	5.5 in			
Weight	20 lbm/ft			
Grade	N/A			
From	0.00 ft			
To	10840.50 ft			
Max Recorded Temperatures	211.01 degF			
Logger on Bottom	Time	09-Jan-2017	12:20:00	
Unit Number	Location:	2161	FORT MORGAN, C	
Recorded By	D. Mitsch			
Witnessed By	E. Hall			

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.

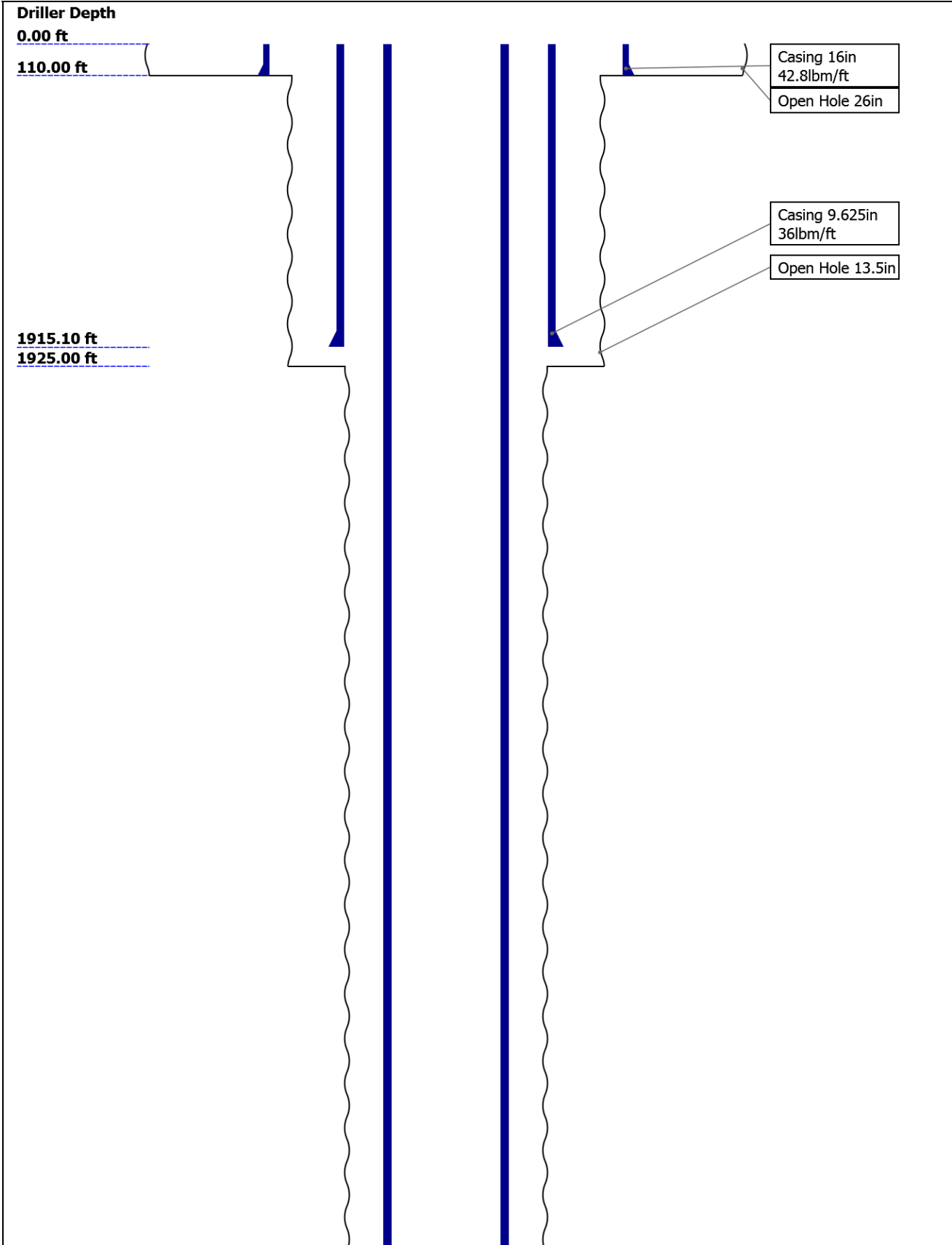
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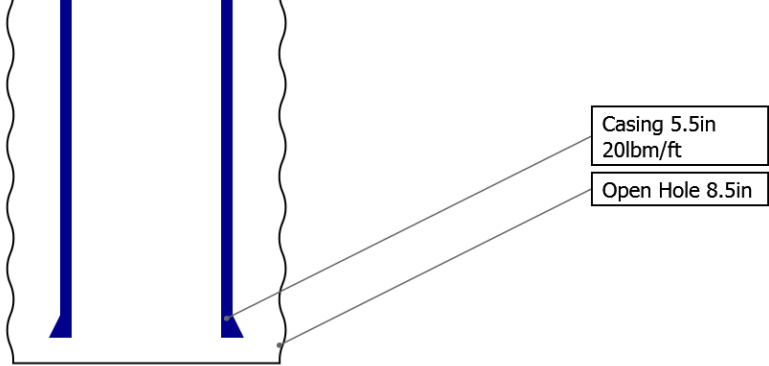
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Well Sketch



10840.50 ft

10852.00 ft



Borehole Size/Casing/Tubing Record

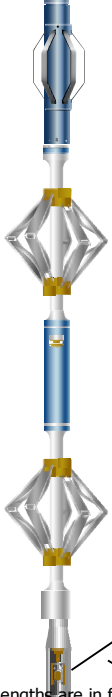
Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	0	110	1925			
Top Logger (ft)	0	110	1925			
Bottom Driller (ft)	110	1925	10852			
Bottom Logger (ft)	110	1925	10852			
Casing						
Size (in)	16	9.625	5.5			
Weight (lbm/ft)	42.8	36	20			
Inner Diameter (in)	15.502	8.921	4.778			
Grade	N/A	N/A	N/A			
Top Driller (ft)	0	0	0			
Top Logger (ft)	0	0	0			
Bottom Driller (ft)	110	1915.1	10840.5			
Bottom Logger (ft)	110	1915.1	10840.5			

Remarks and Equipment Summary

ONE: Toolstring			ONE: Remarks	
<div><div><div>Equip nameLength</div><div>LEH-QT30.97</div><div>LEH-QT</div></div><div><div>DTC-H:8928.06</div><div>80</div><div>ECH-KC:10053</div><div>DTC-H:8980</div><div>SGT-N25.06</div><div>SGH-K:3164</div><div>SGD-TAA</div><div>SGC-TB</div></div><div><div>AH-107[2]19.56</div><div>AH-107[1]17.56</div><div>SGT-N15.56</div></div></div> <div><p>The diagram shows a vertical toolstring with various components. Labels point to specific parts: CTEM (27.16), HV (0.00), TelStatu (25.06), ToolSta (25.06), and GR (24.14). The toolstring is shown in a blue color with a textured surface.</p></div> <div><div>MP nameOffset</div><div>3855</div><div>925</div></div>	Toolstring ran as per toolsketch			
	Main pass logged with 2500 psi			
	Repeat pass logged with 0 psi			
	Your crew today: Dave, Derrick and Dennis			
	Thank you for choosing Schlumberger of Fort Morgan!			

USIT-E:92 15.56

1
ECH-MFA:
1908
USAC-A:9
21
USIS-A:27
75
USSC-B
USRS-A:02
06
USI-SENS
OR:3306



Depth Summary

	ONE		
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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			

ONE:Depth Control Parameters	Depth Control Remarks
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Log Sequence	First Log In the Well	All Schlumberger depth policies and procedures followed
Rig Up Length At Surface		IDW used as primary depth device
Rig Up Length At Bottom		Z-Chart used as secondary depth 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)
Run 1	Log[4]:Up	6323.02	57.79

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 : 25.04m(82.15ft) to 34.96m(114.69ft)
MUD_N_FRP = 1.04
DFD = 1.13g/cm3(9.40lbm/gal)
CZMD median computed in free pipe normalization interval = 1.73 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 2016 SP2	6.2.68624.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[4]:Up	Up	57.79 ft	6323.03 ft	09-Jan-2017 12:19:11 PM	09-Jan-2017 12:57:55 PM	ON	3.13 ft	Yes

All depths are referenced to toolstring zero

Log

Company:NOBLE ENERGY INC

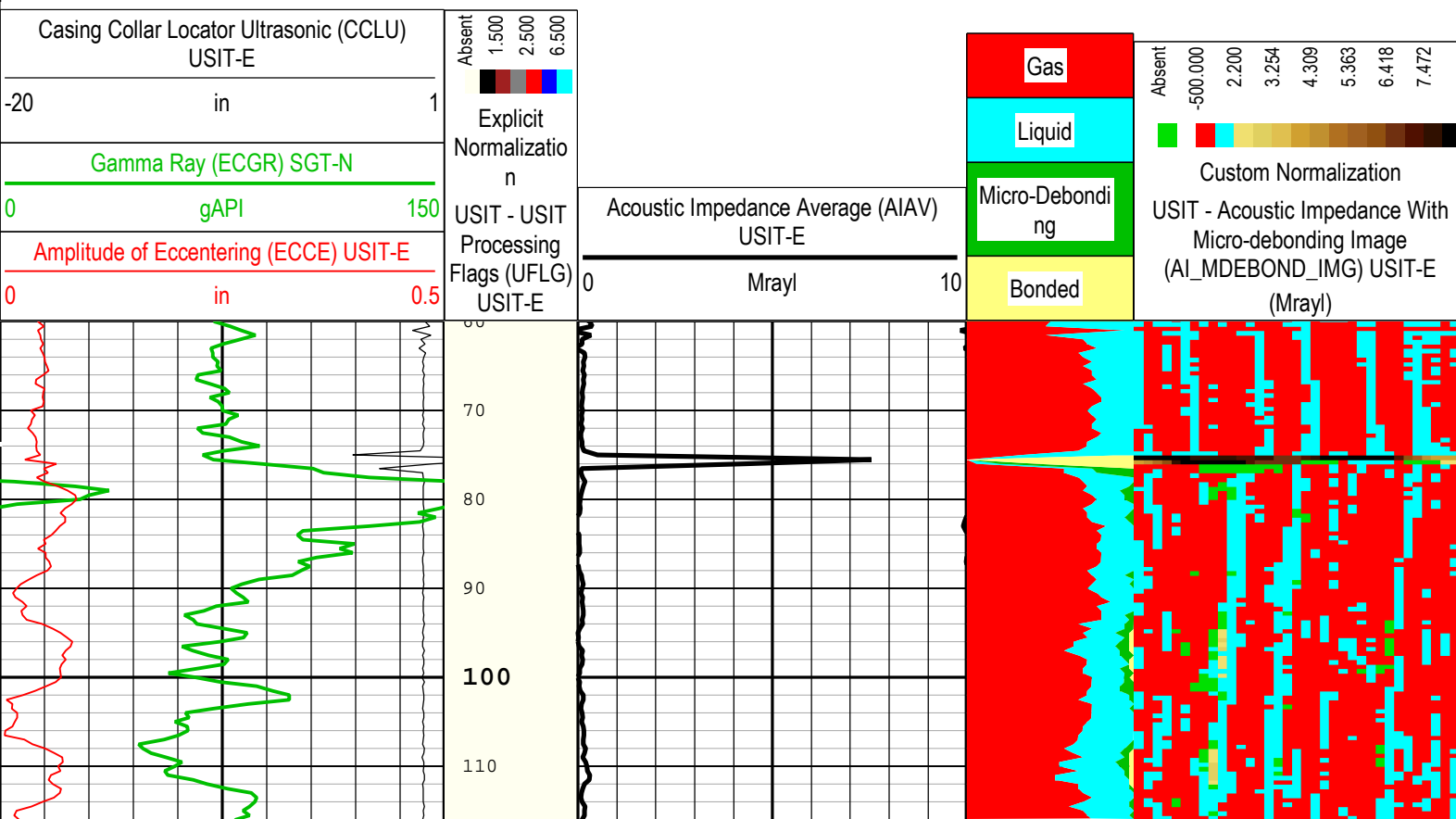
Well:BROWNING FEDERAL LC24-780

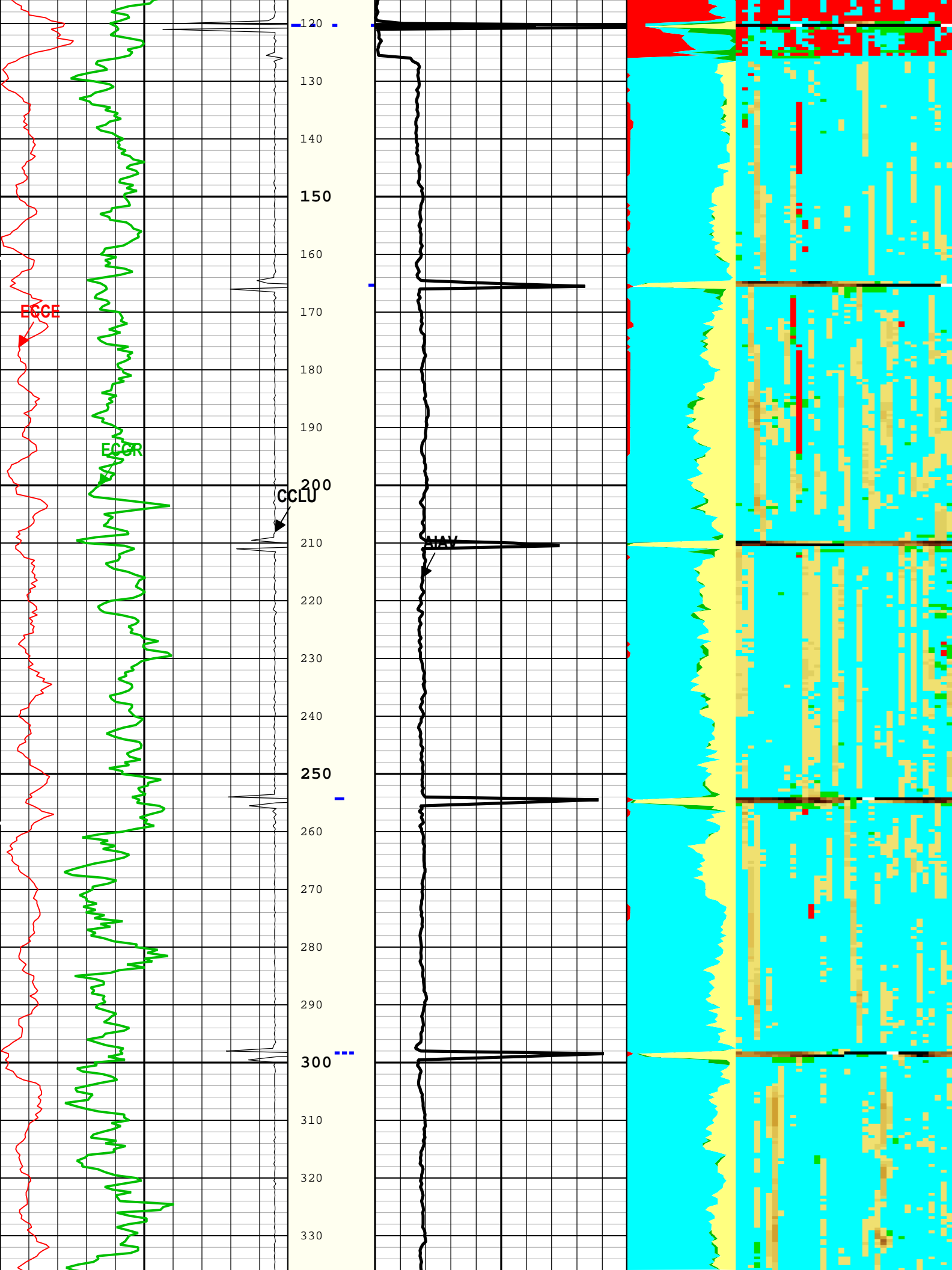
ONE: Log[4]:Up:S003

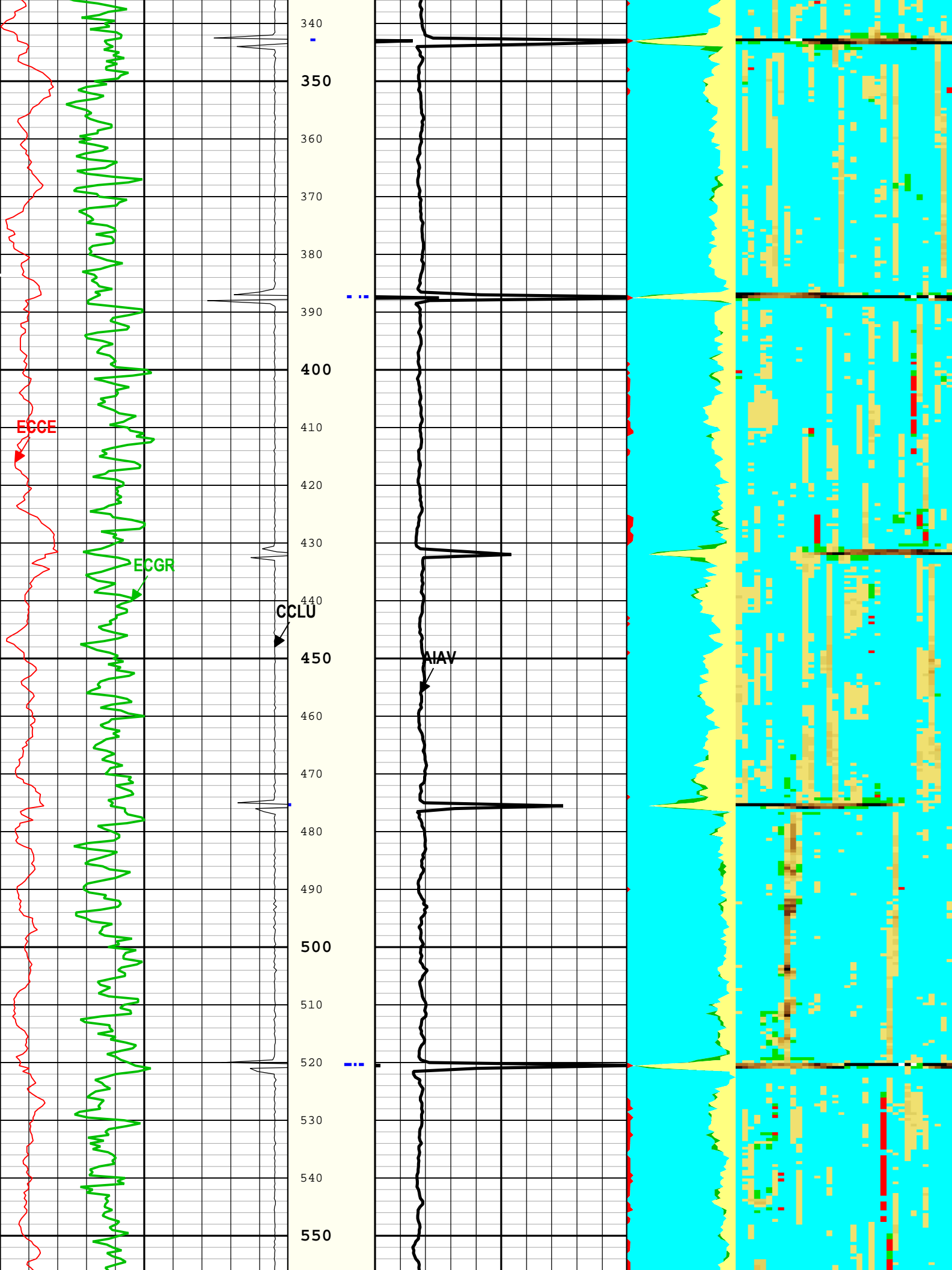
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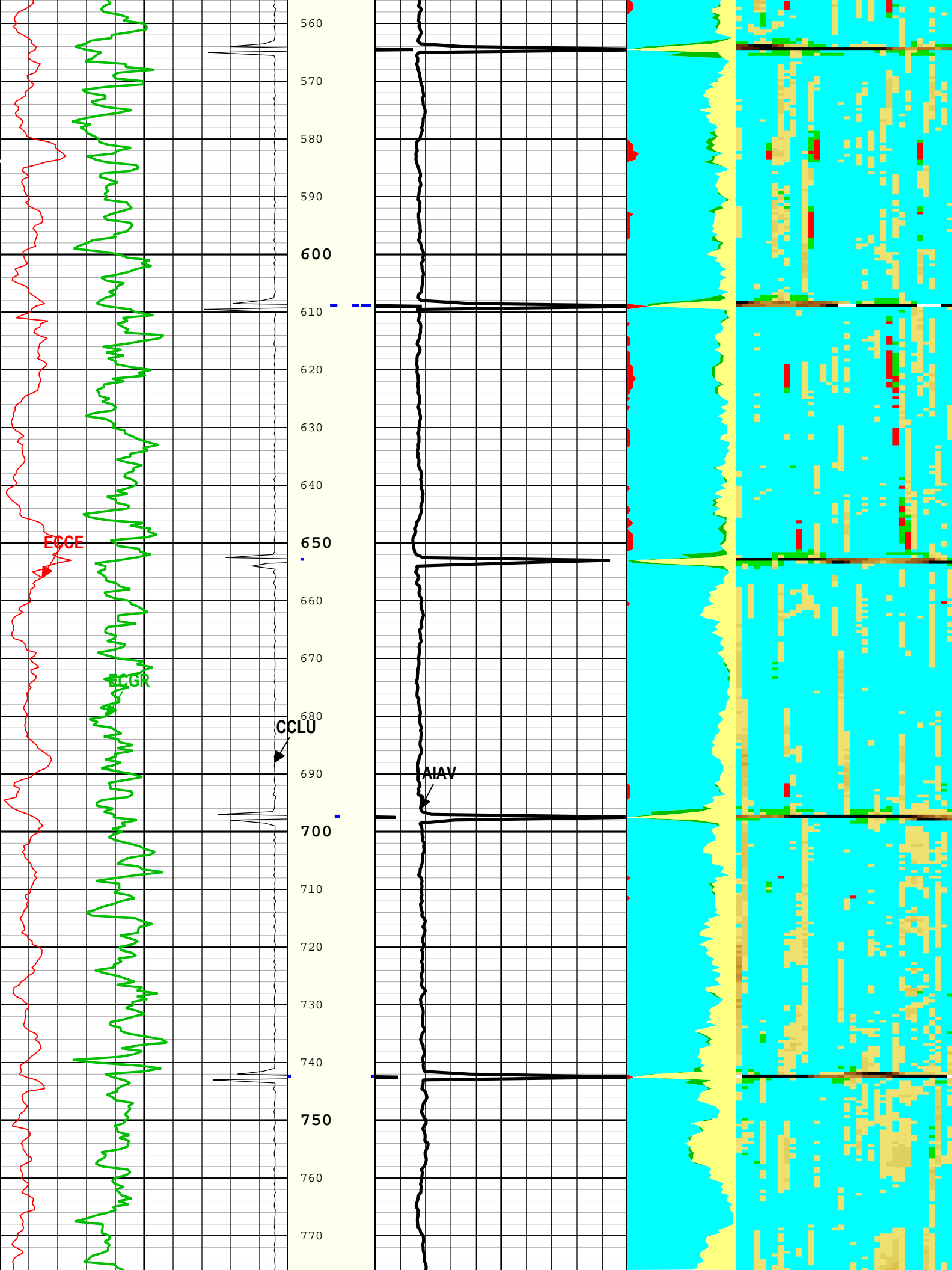
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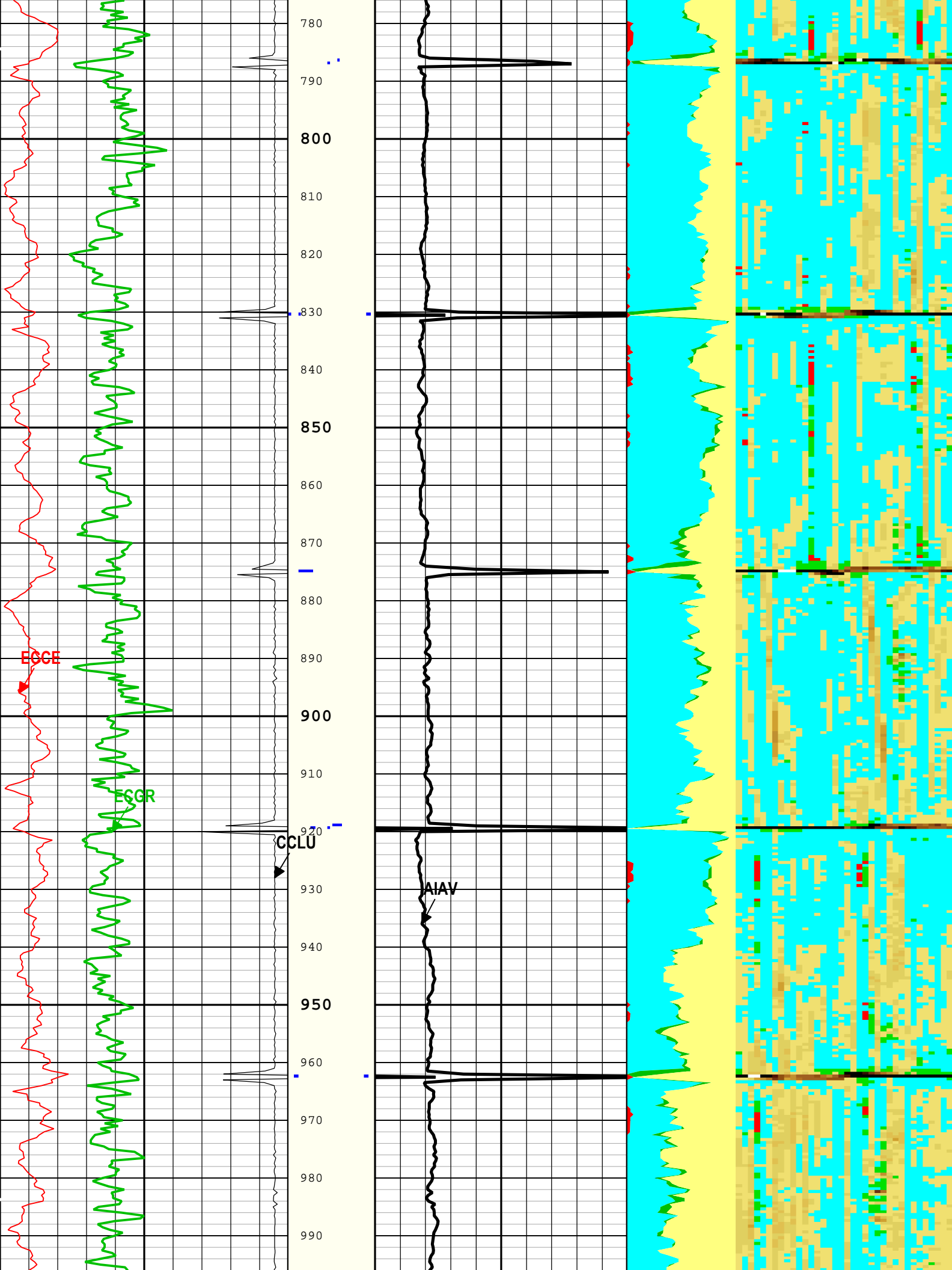
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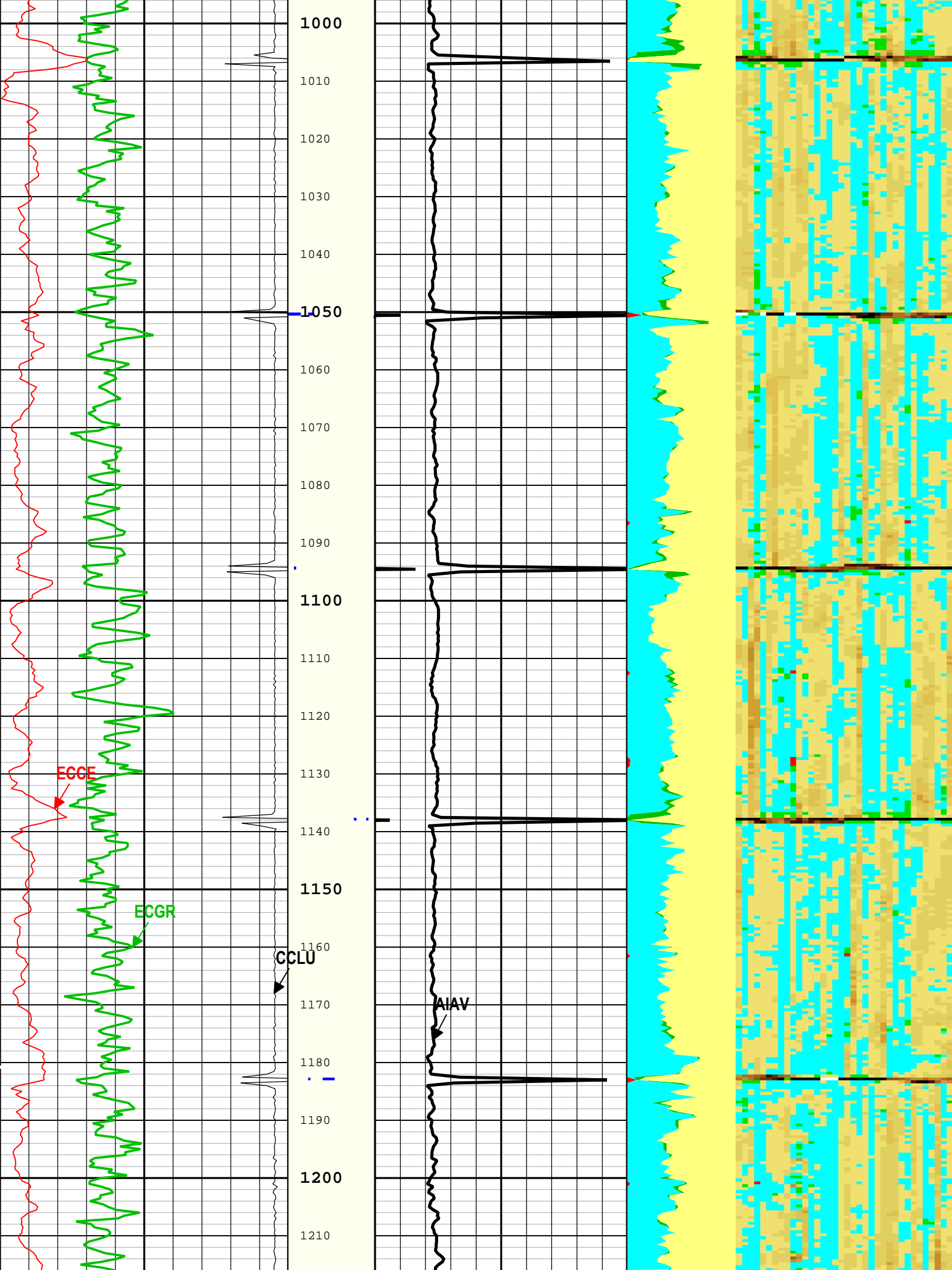


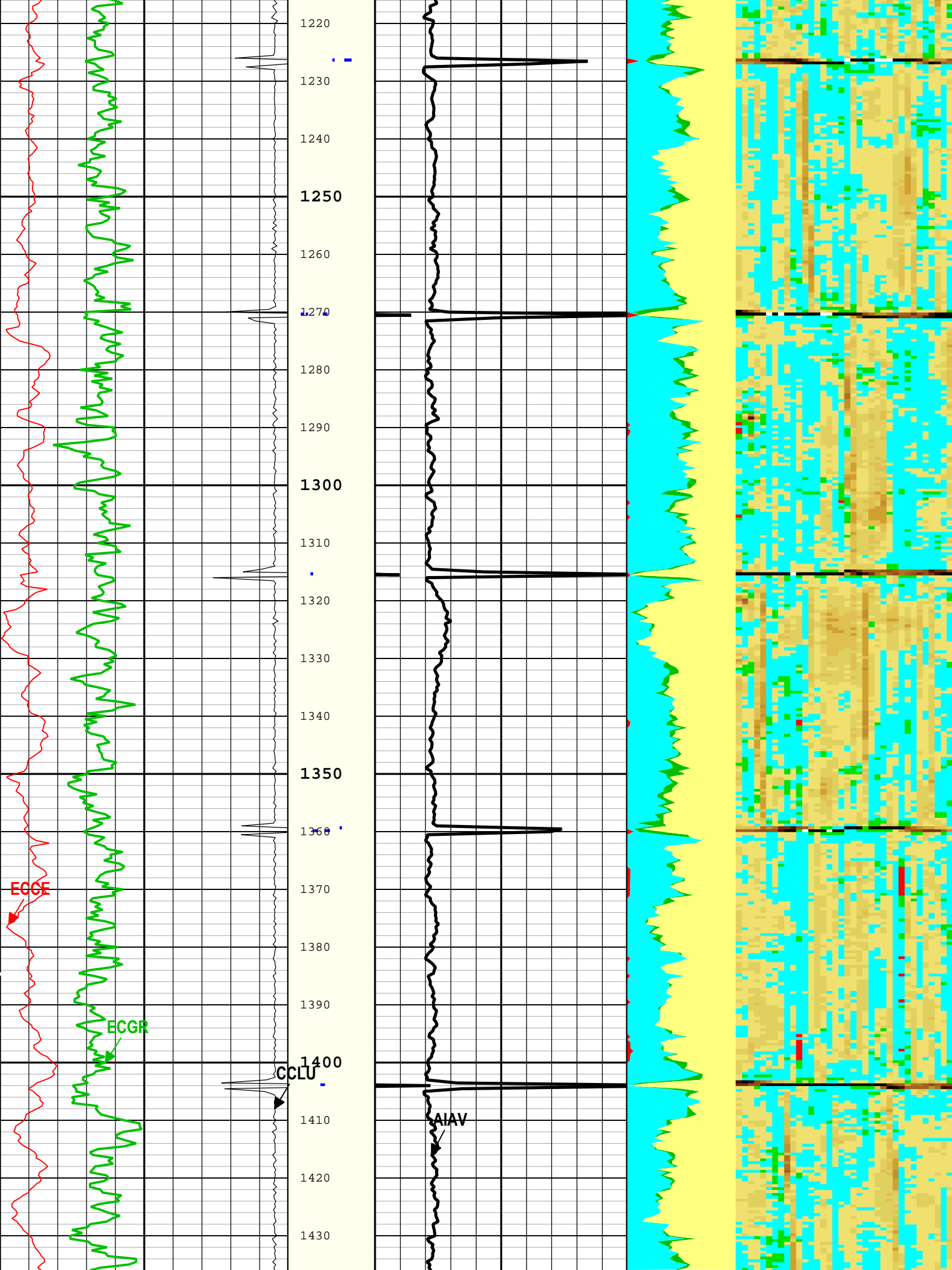


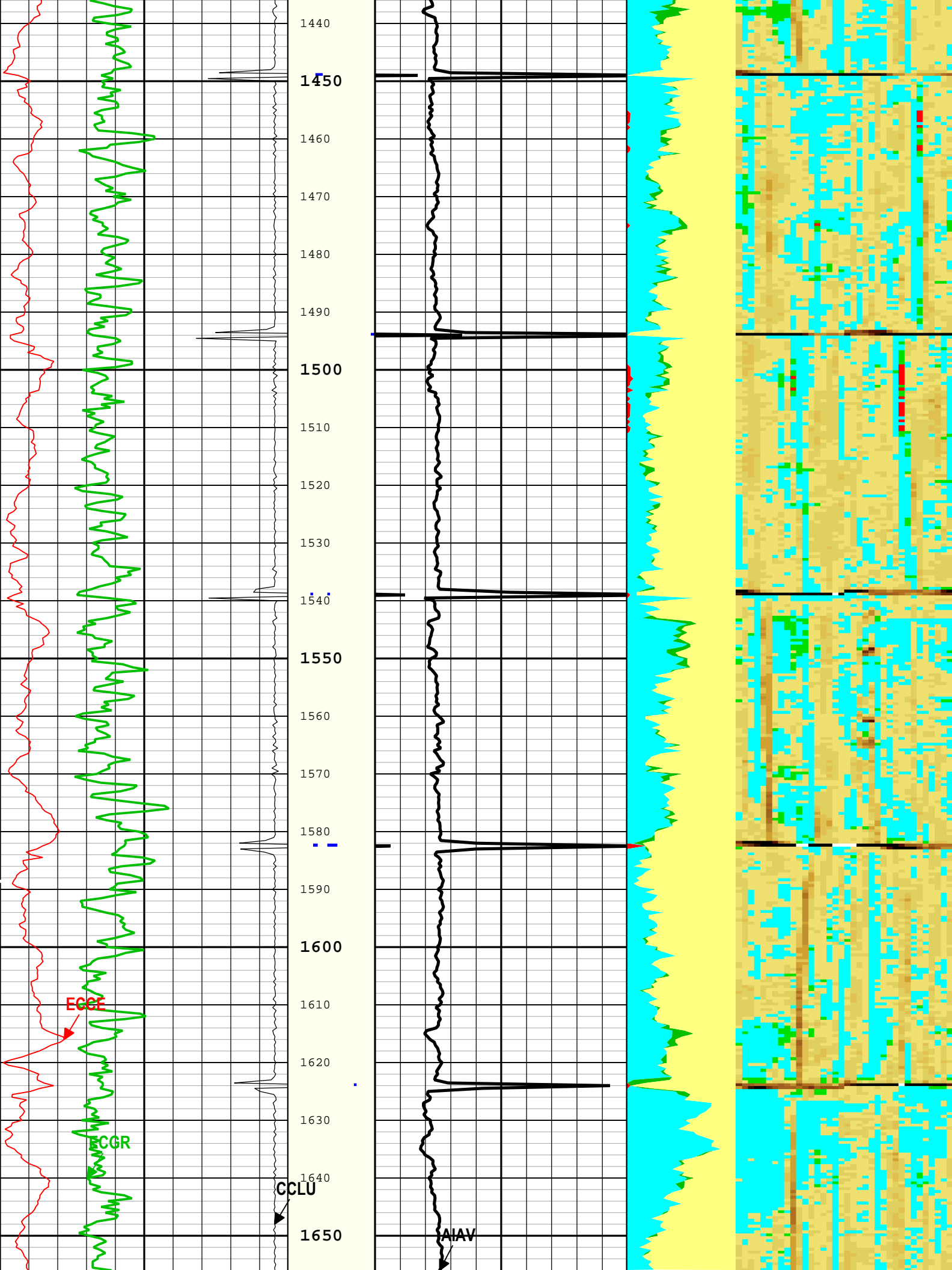


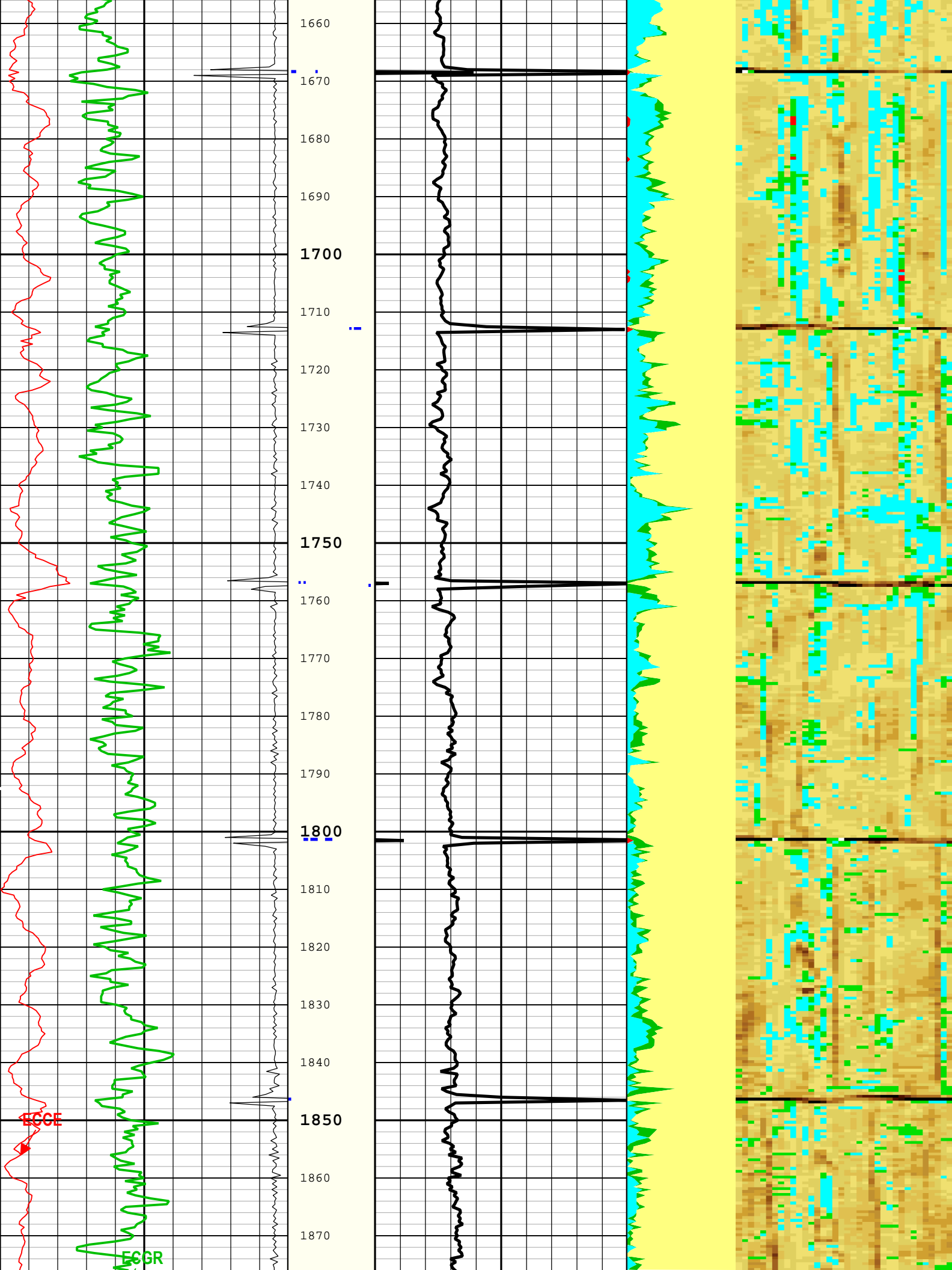


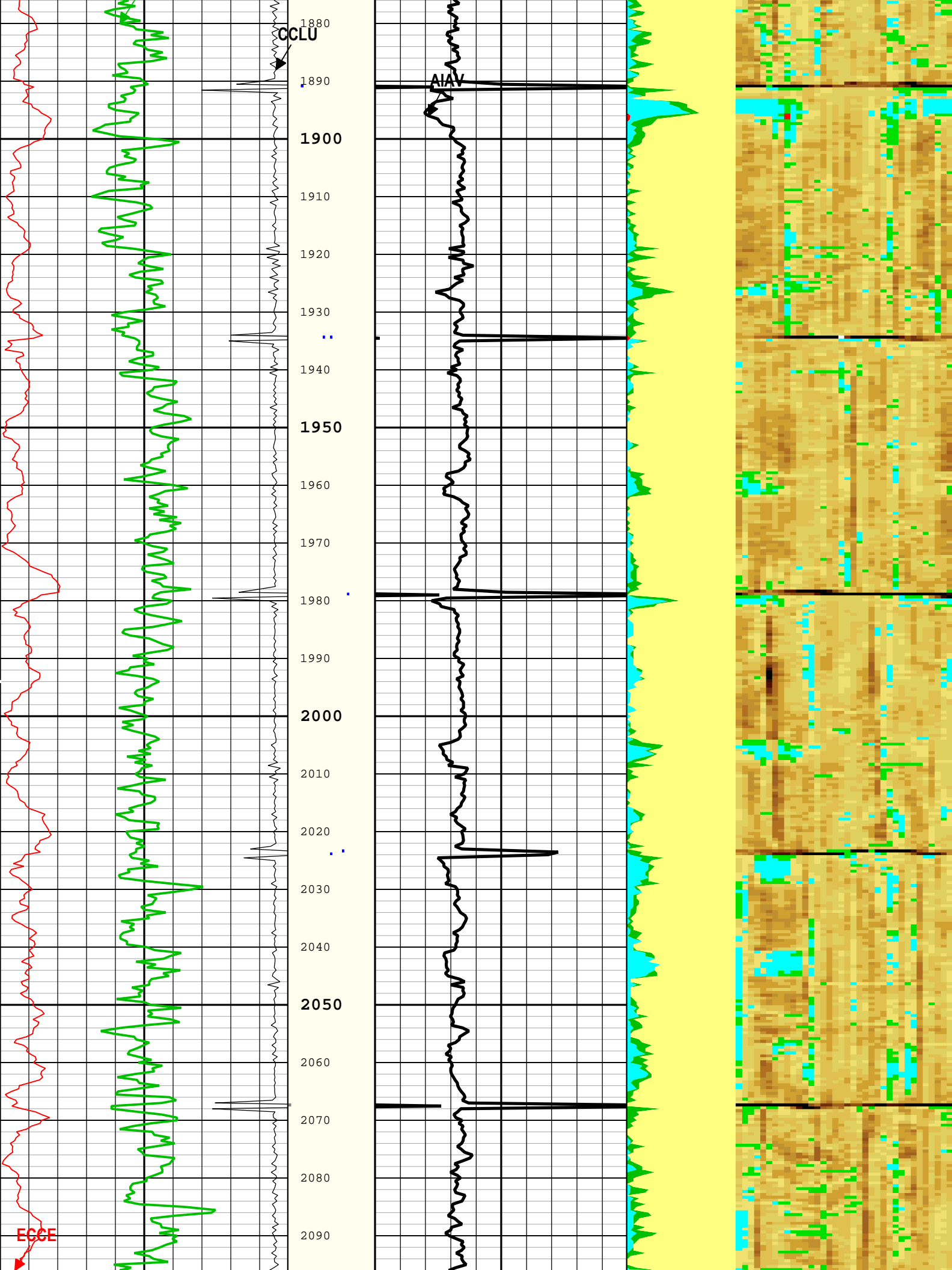


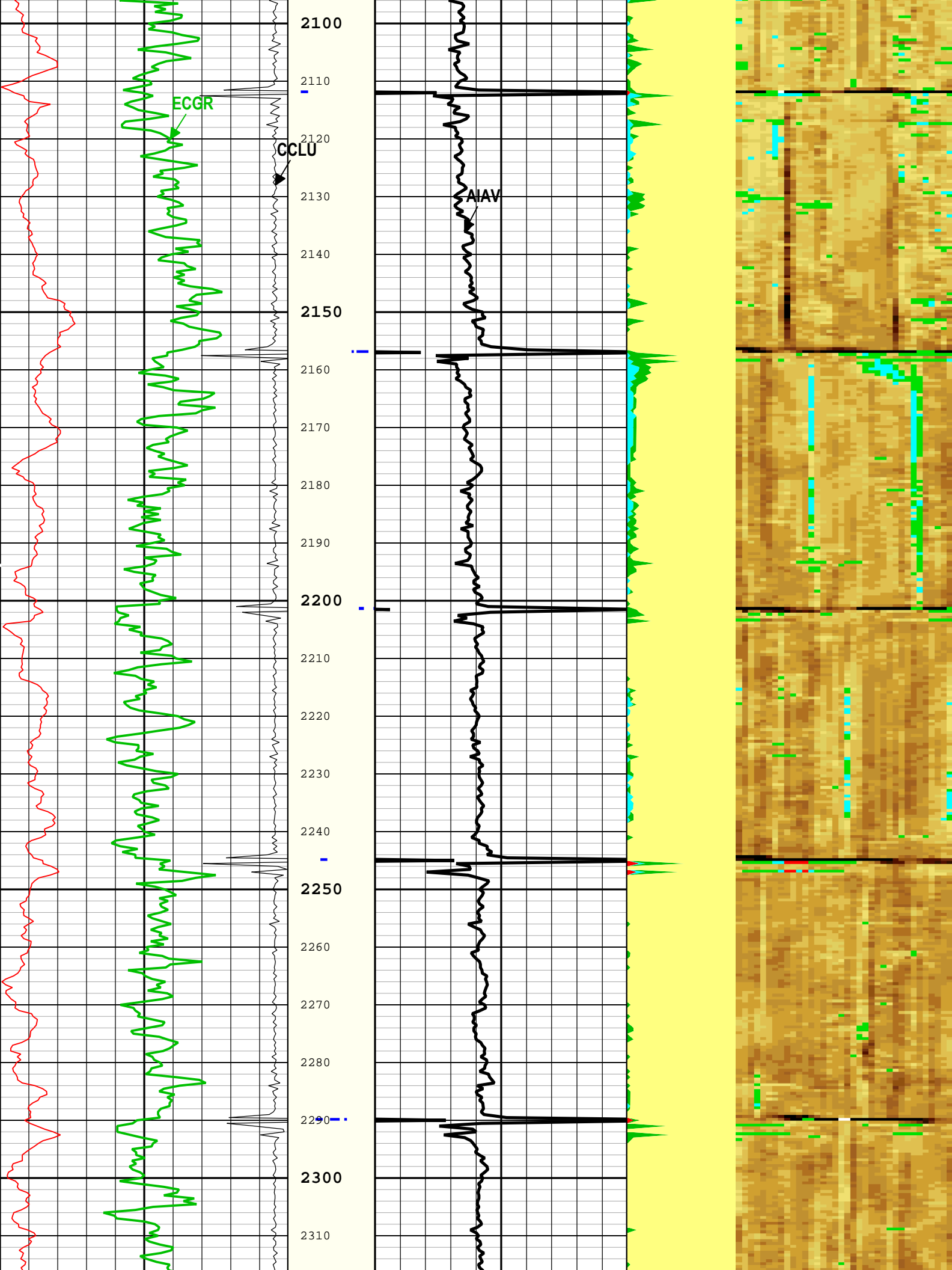


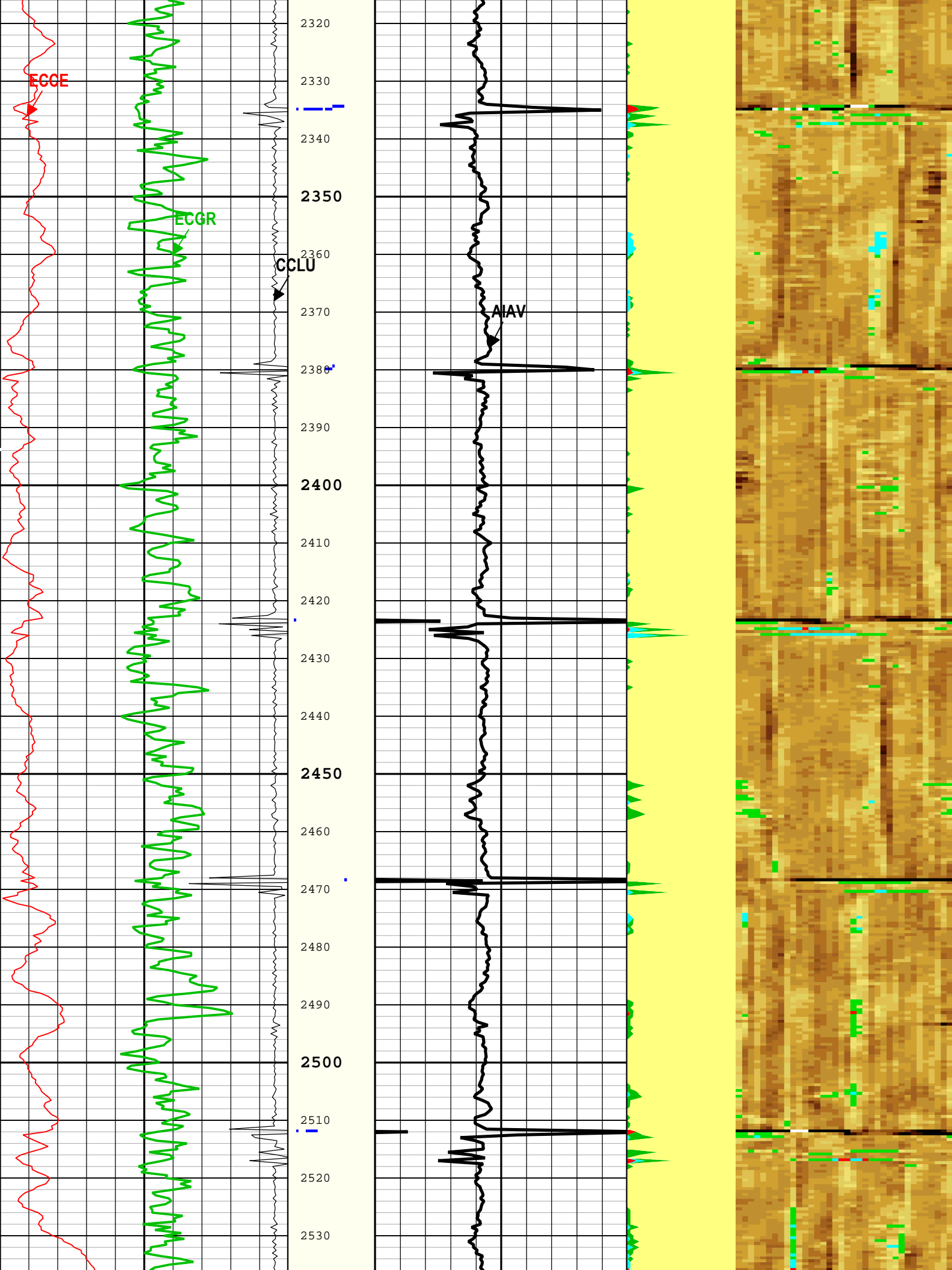


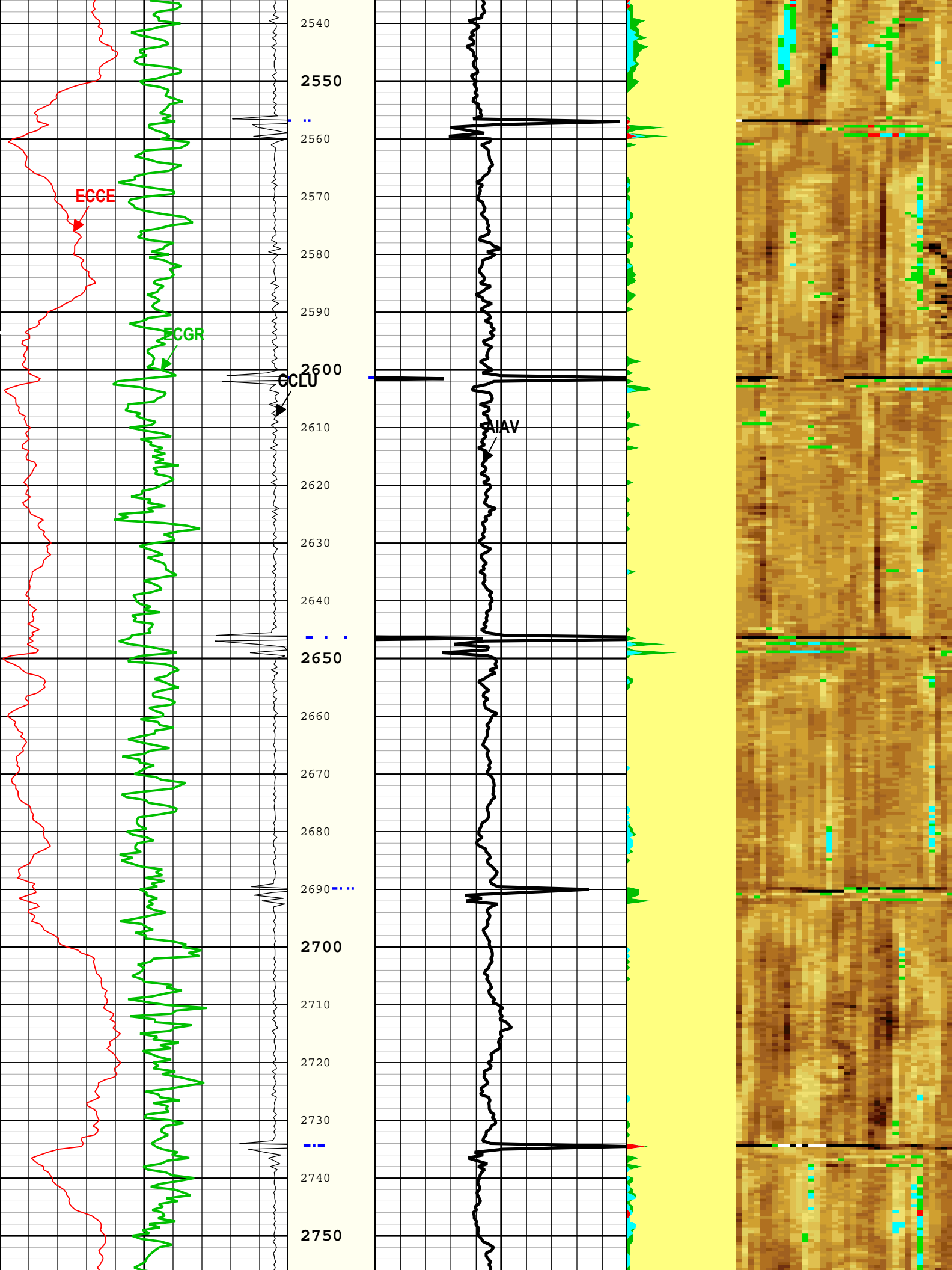


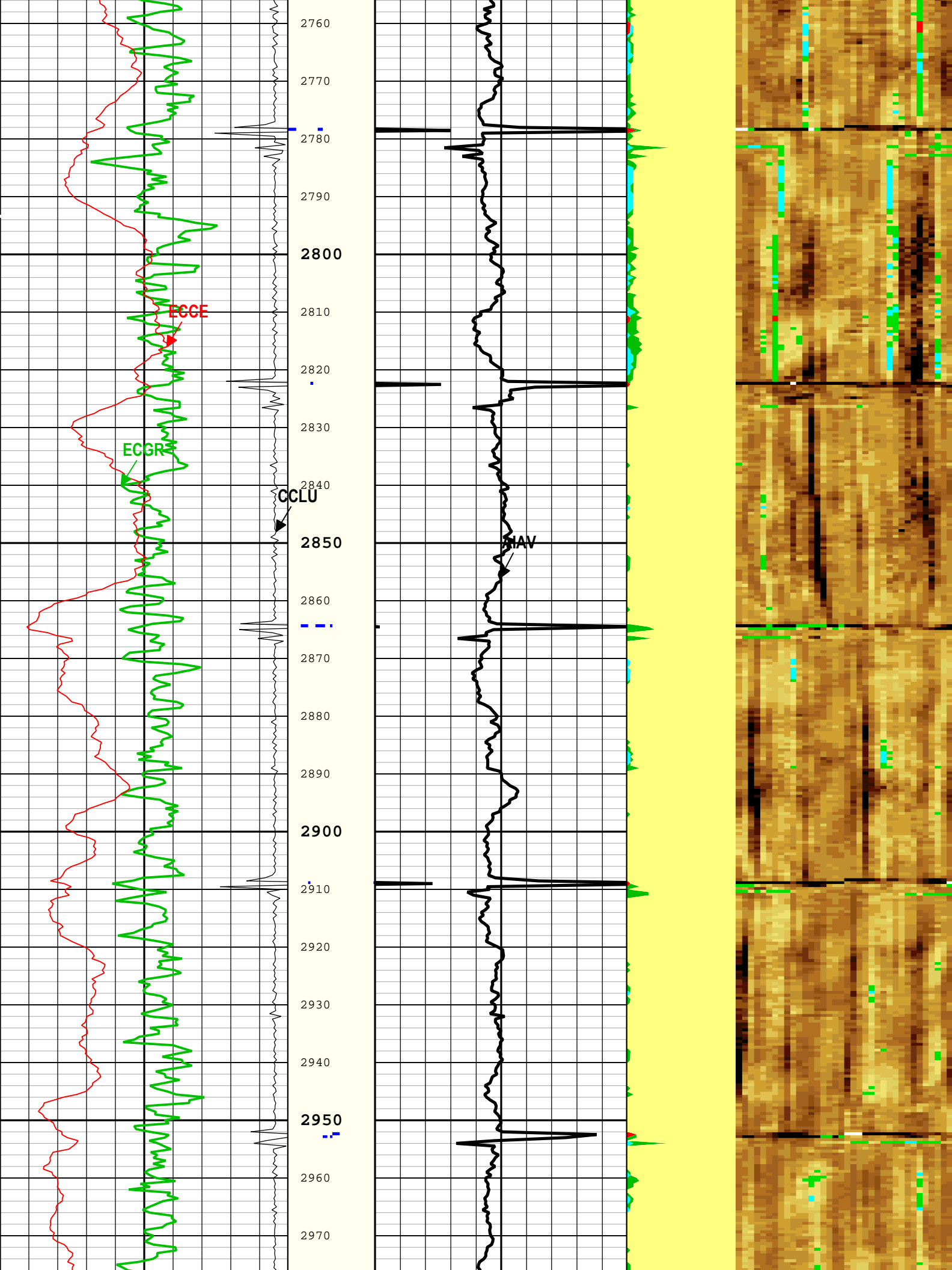


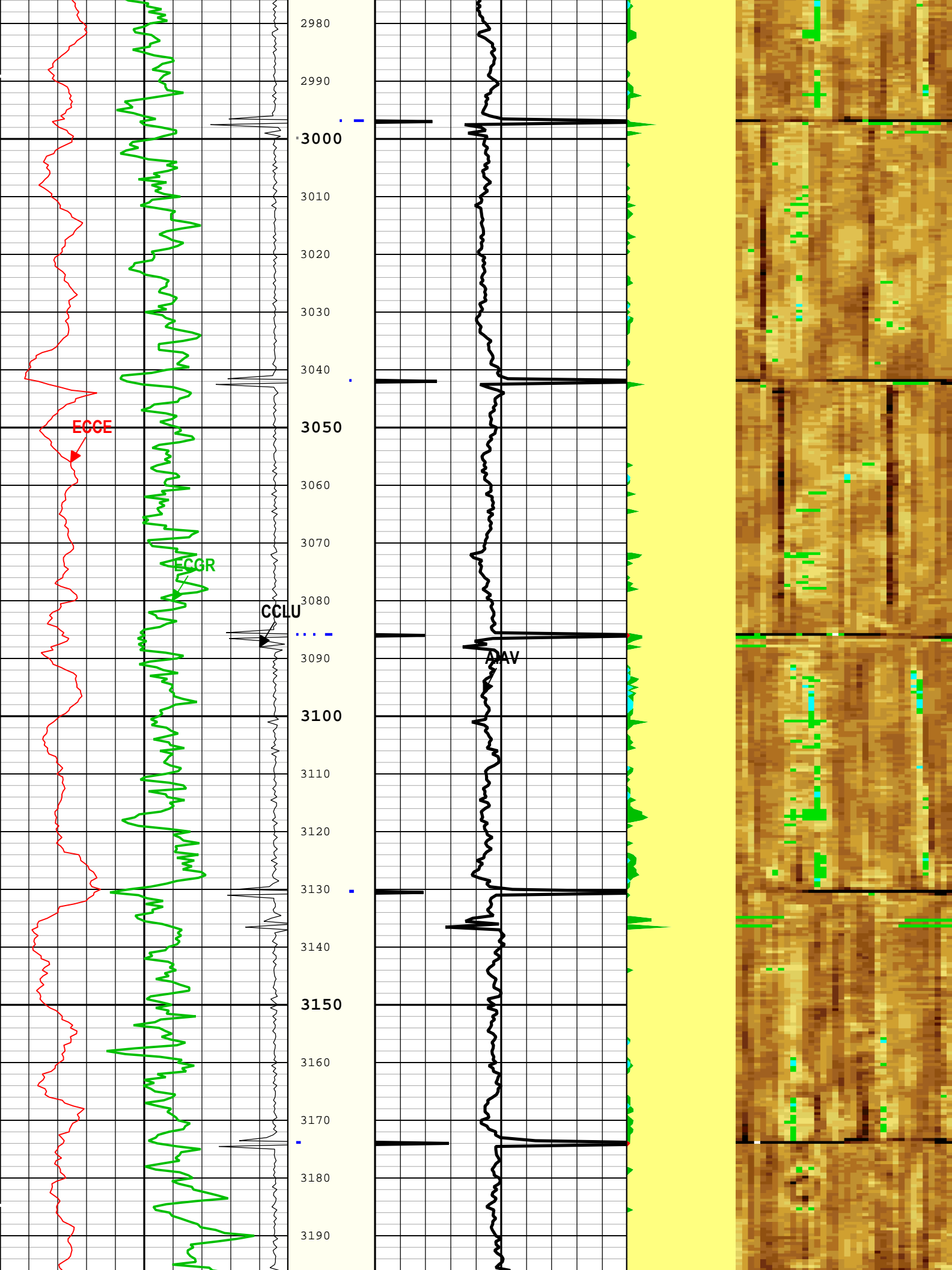


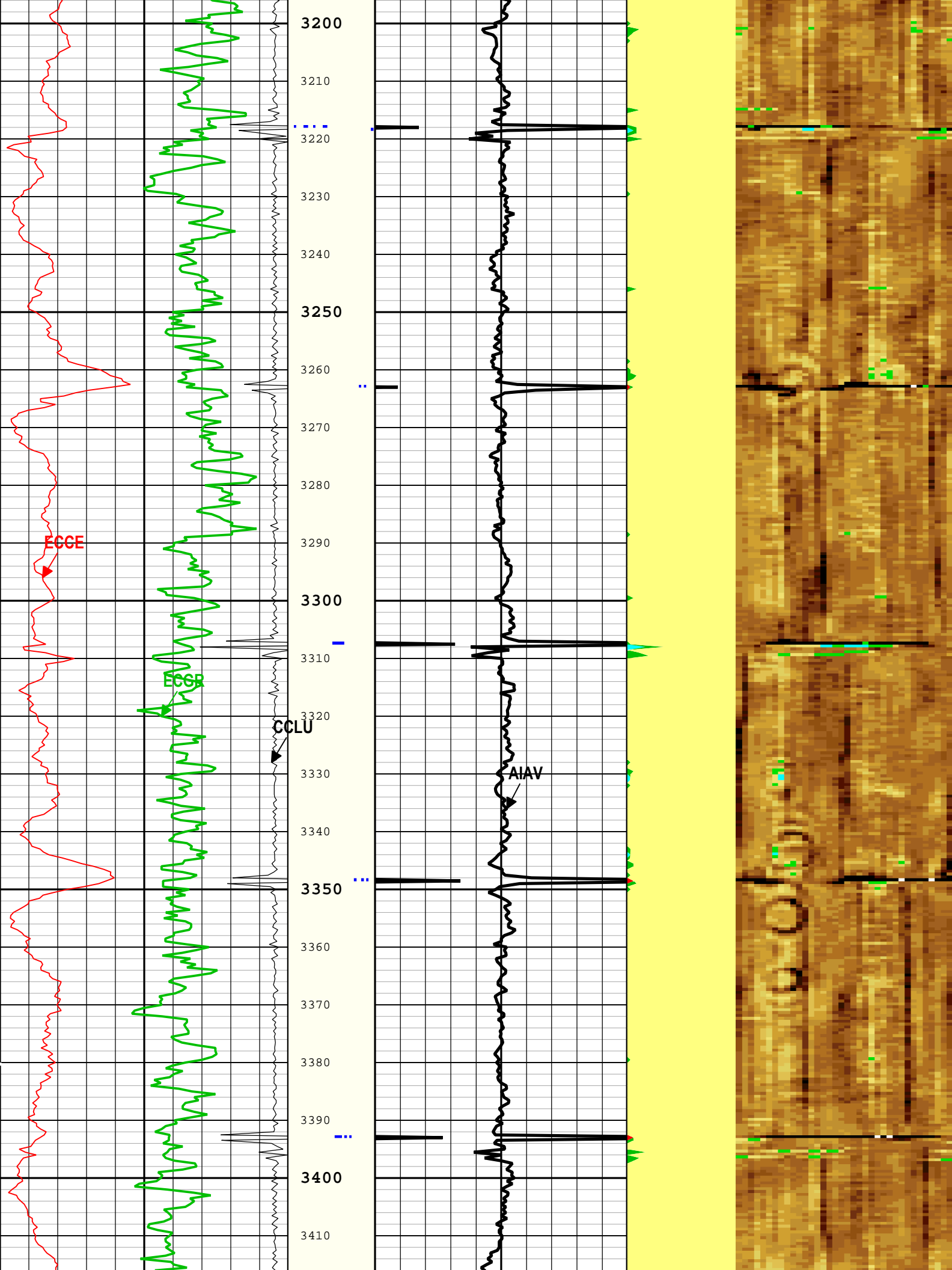


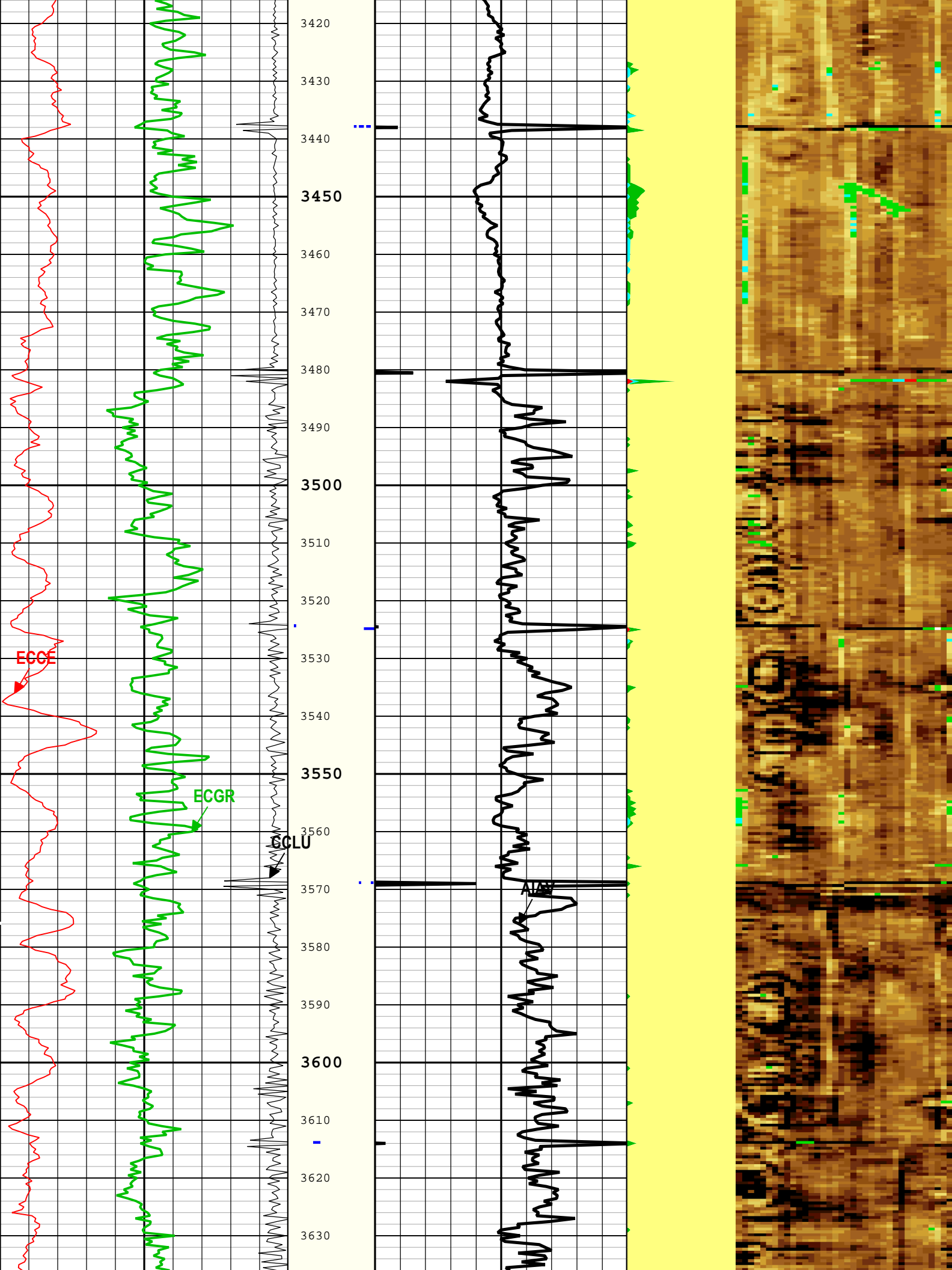


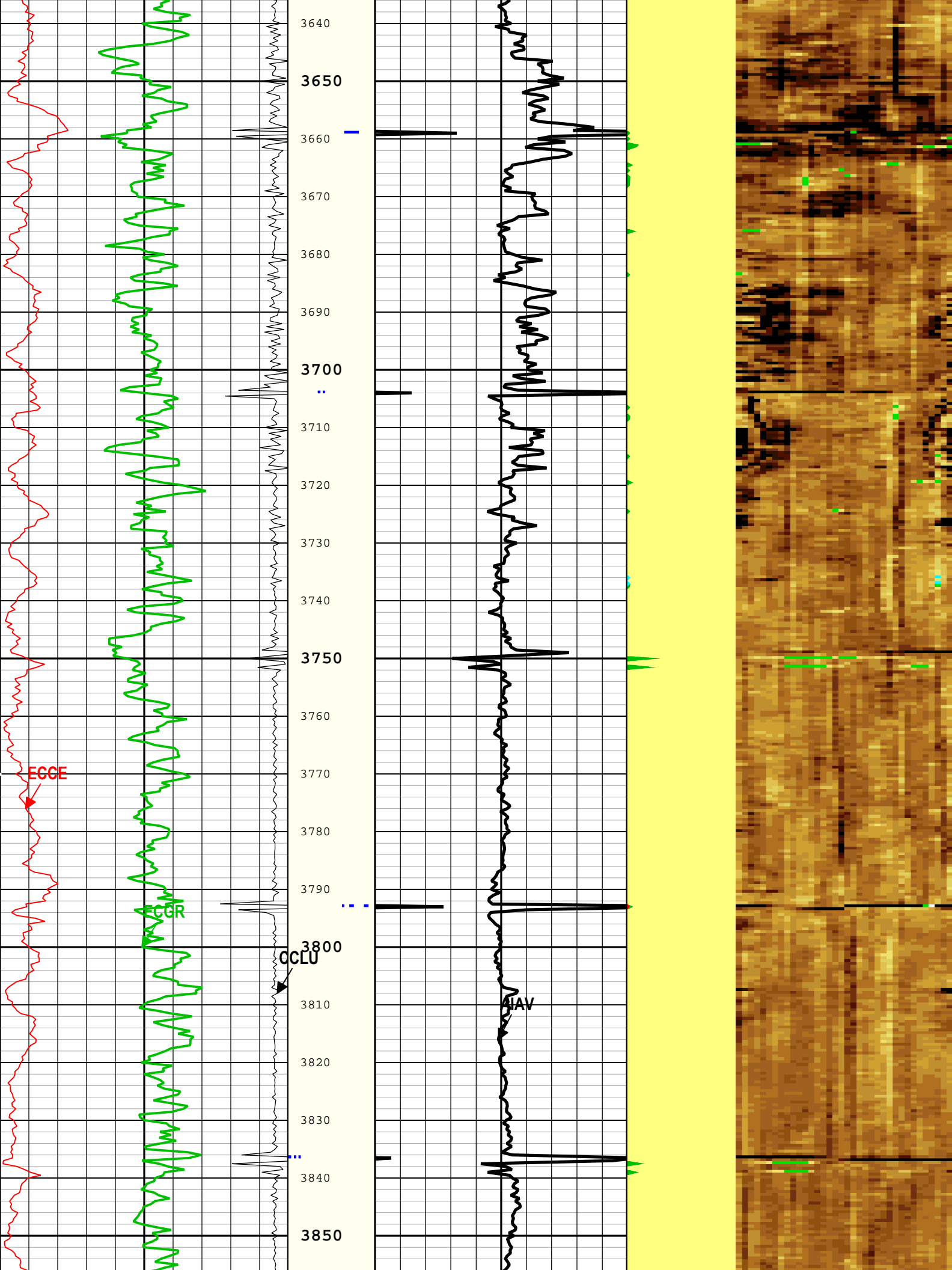


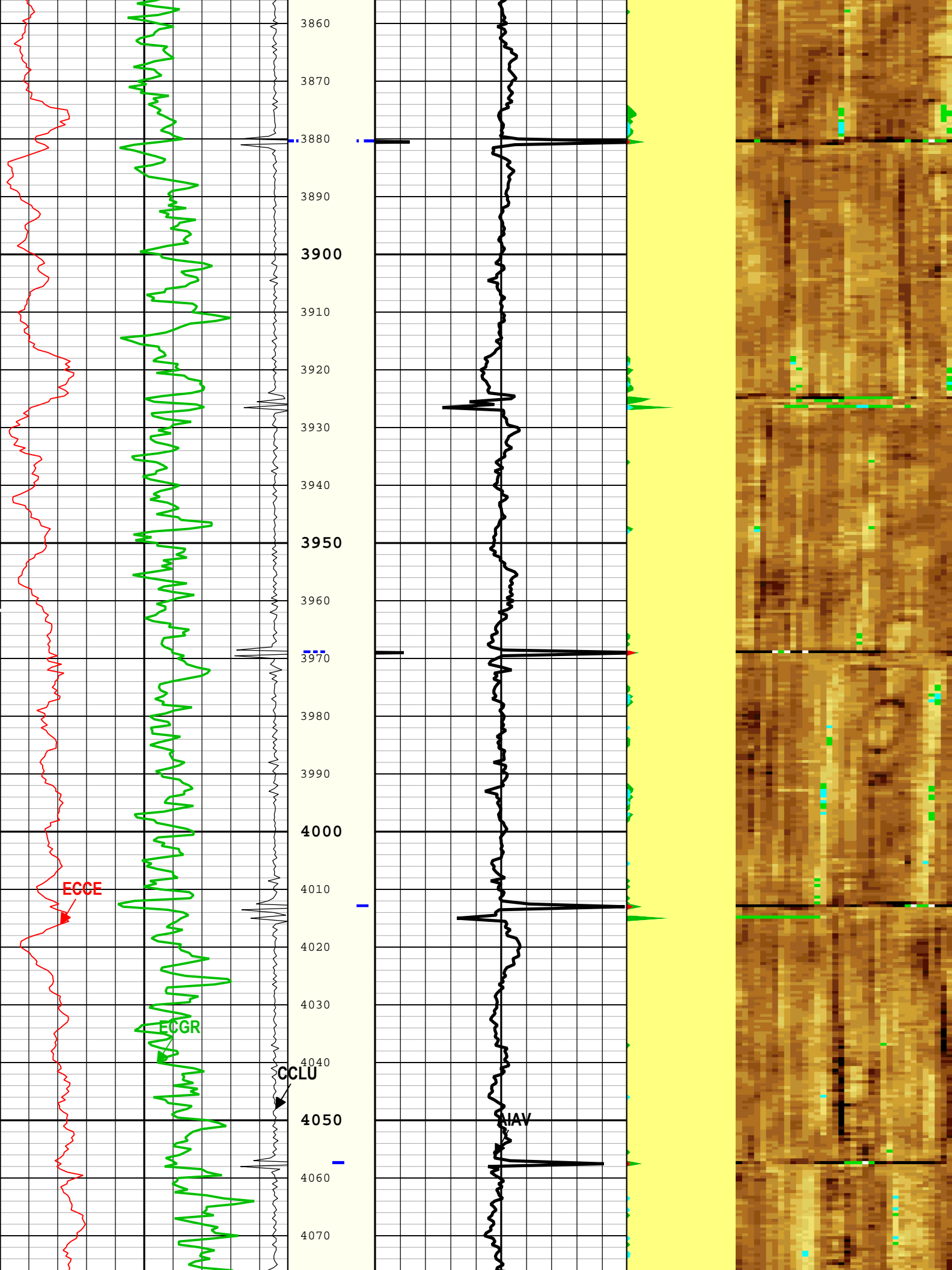


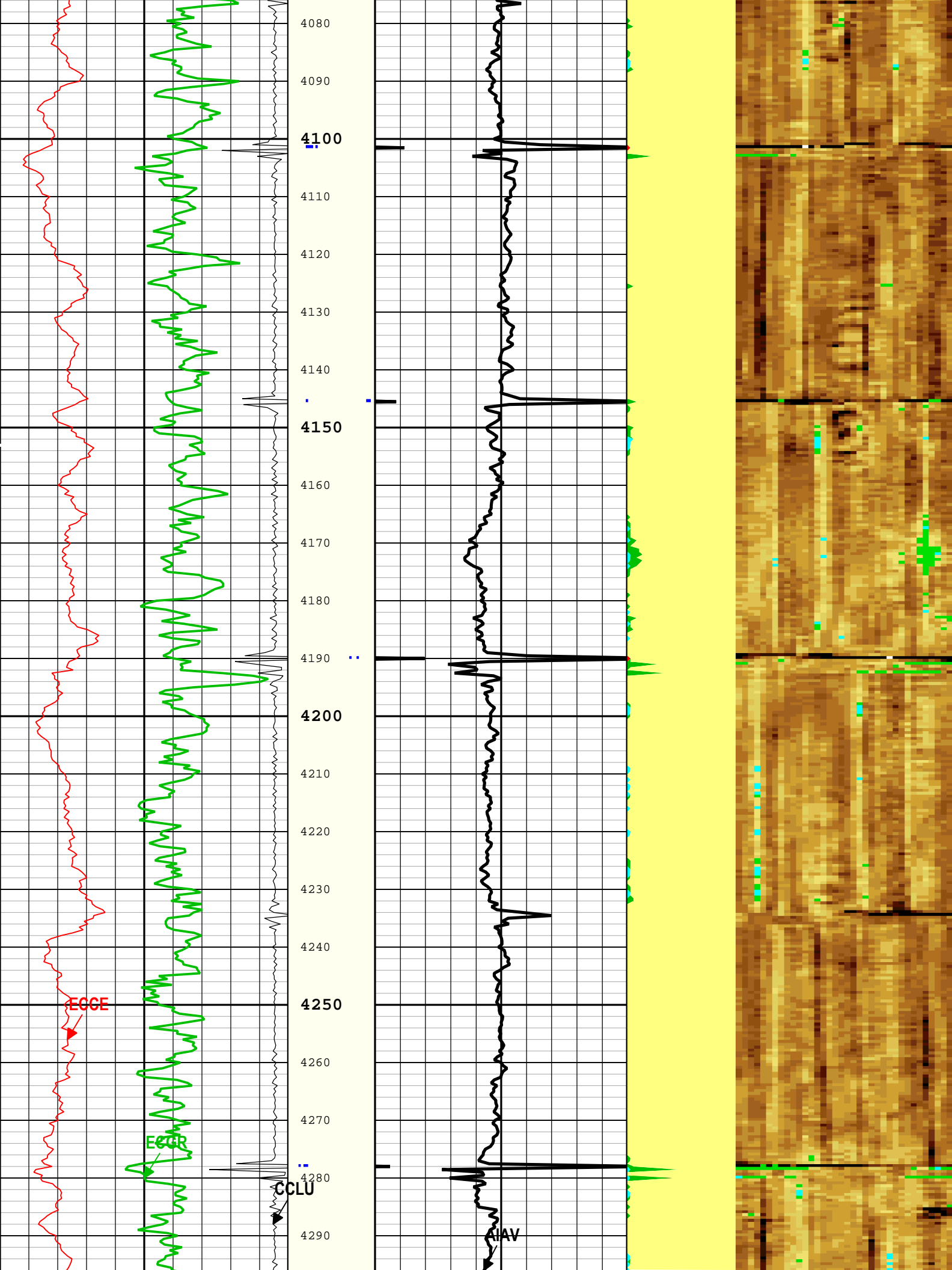


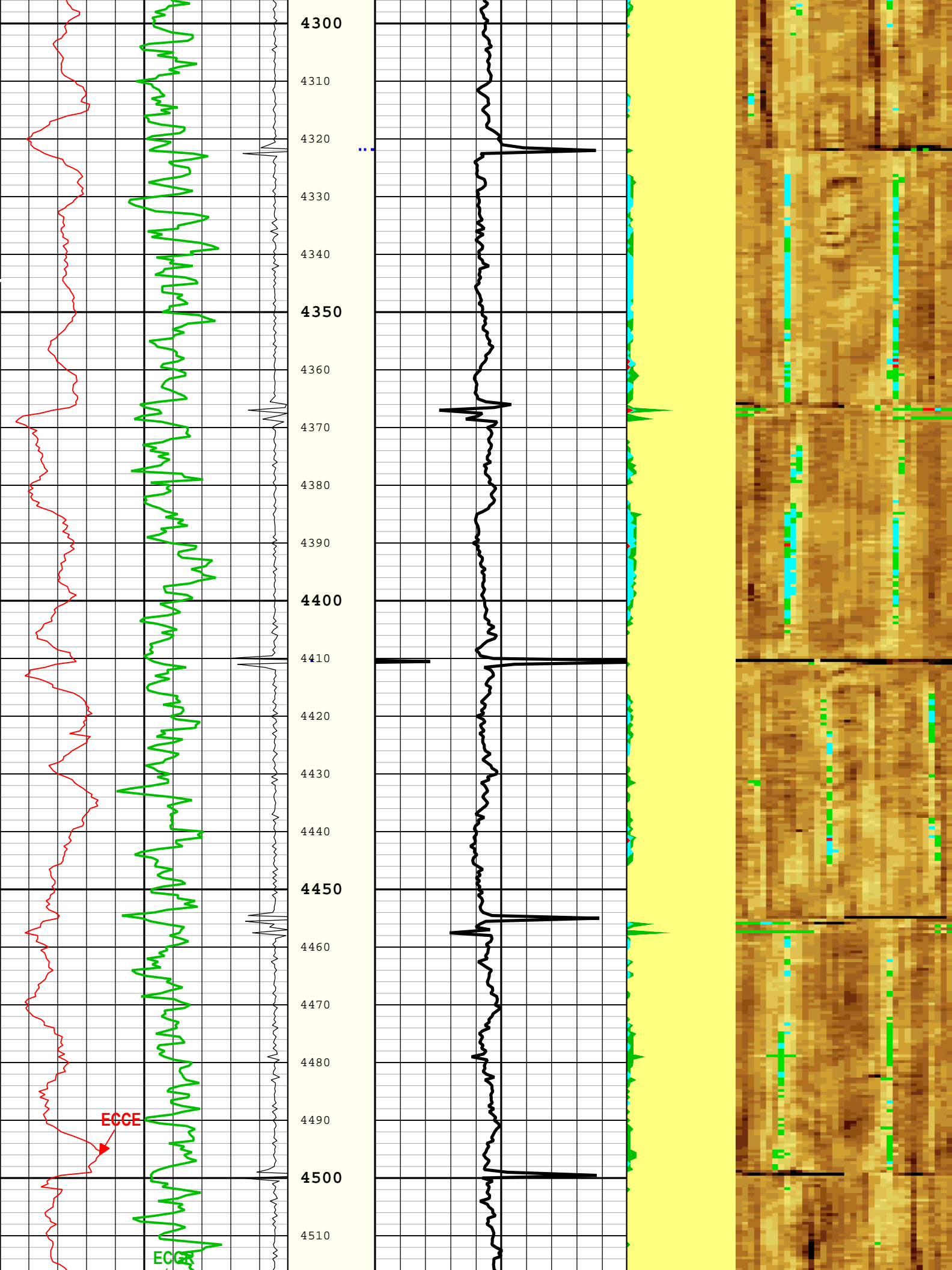


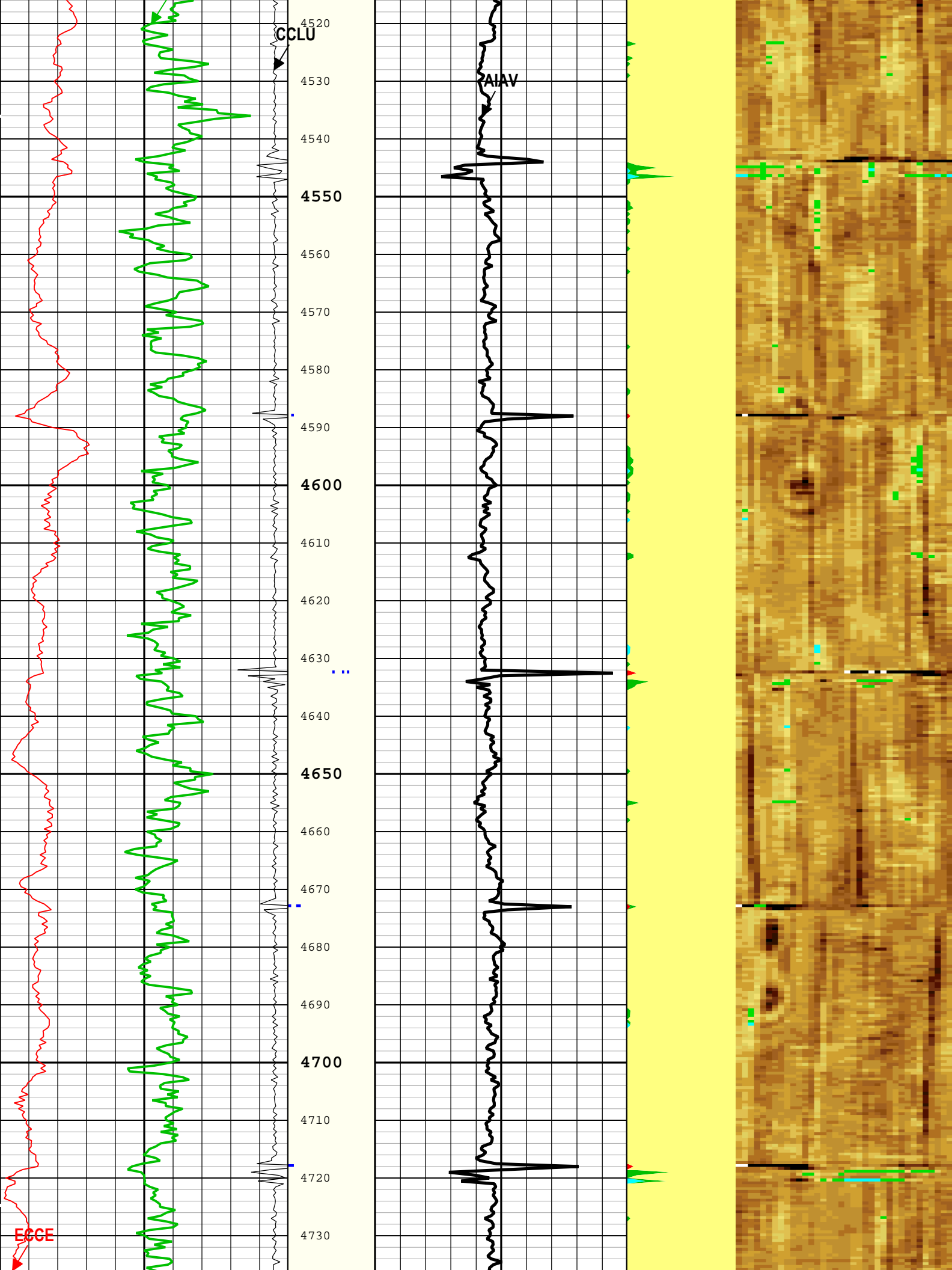


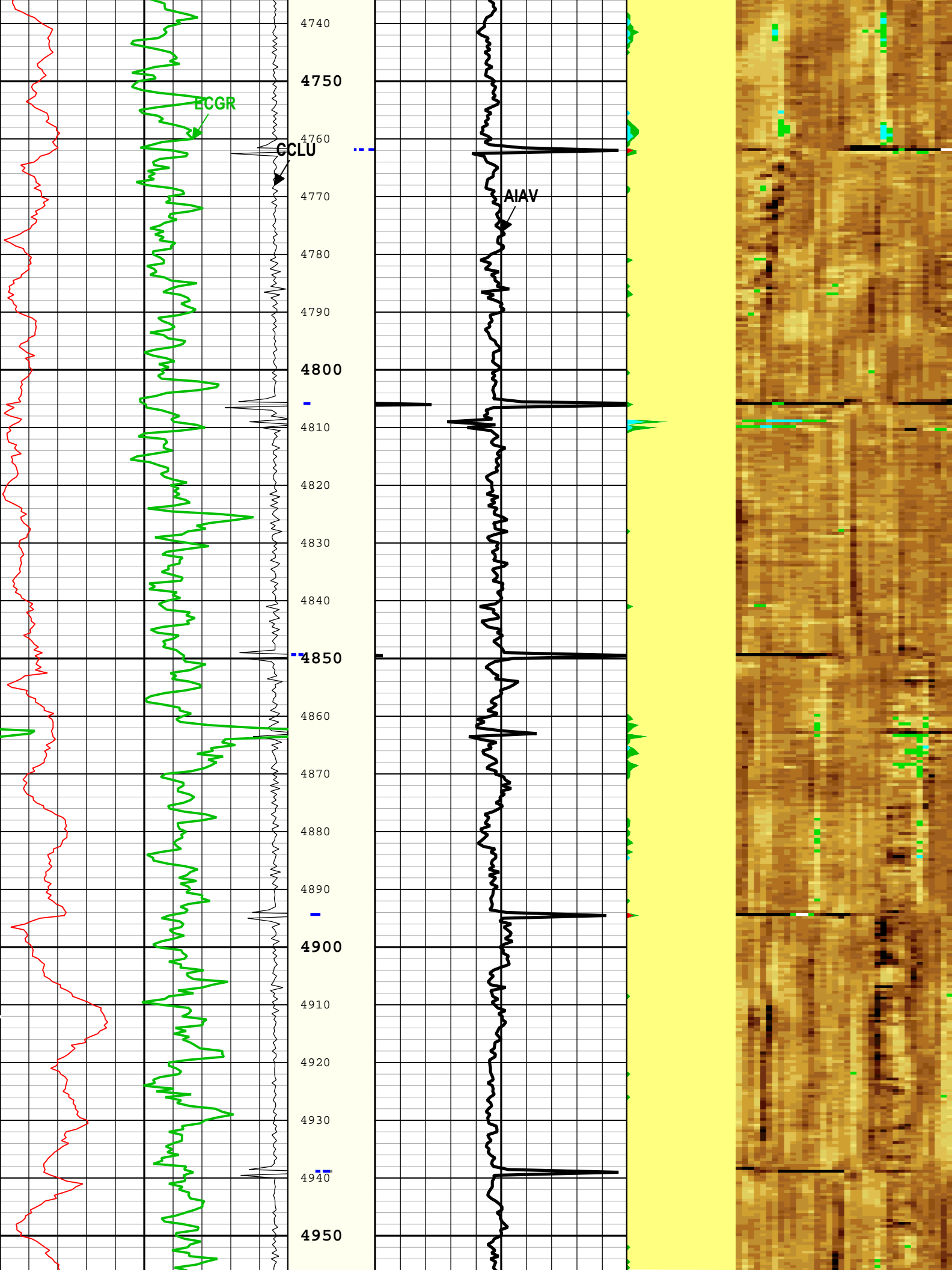


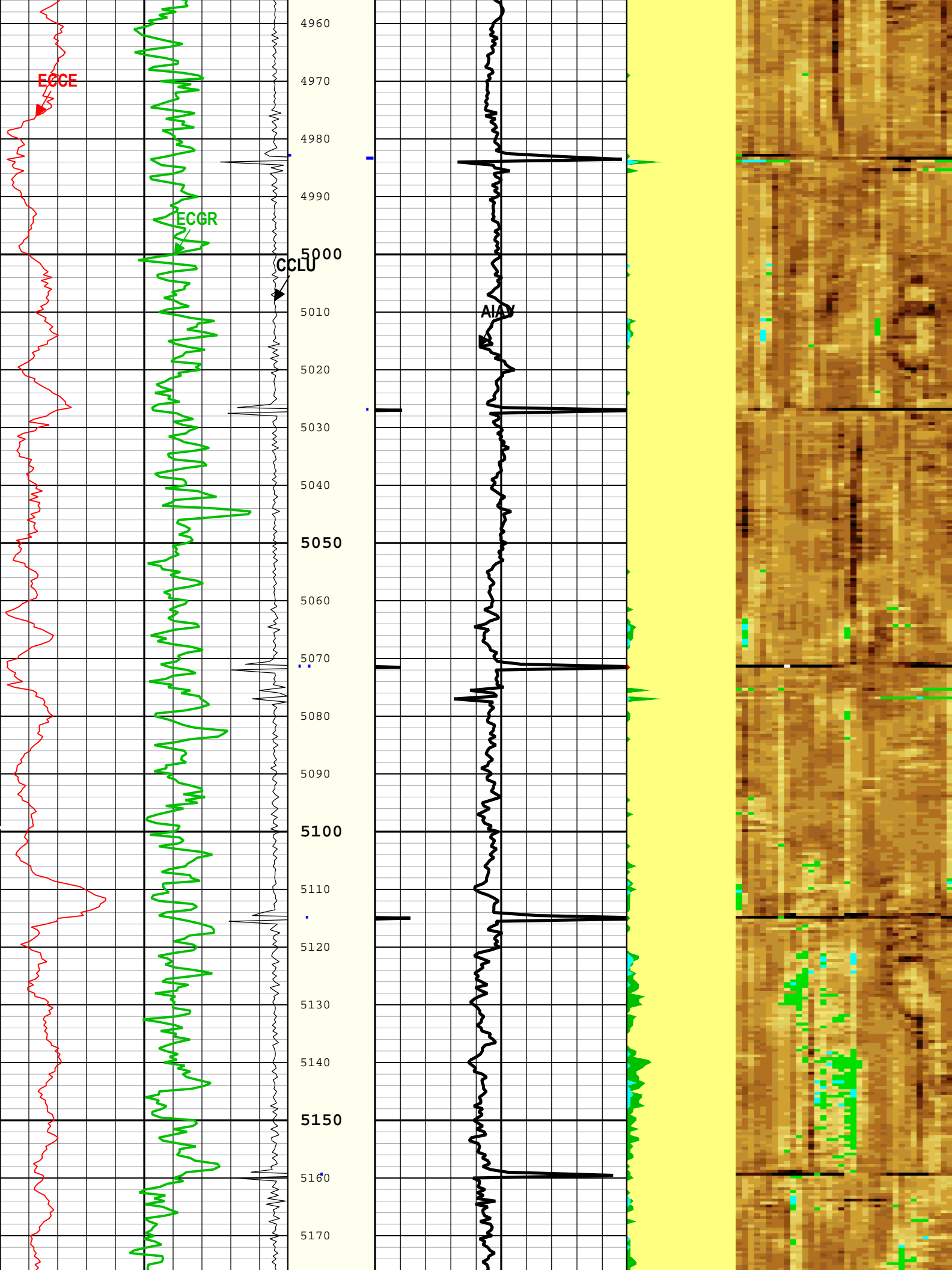


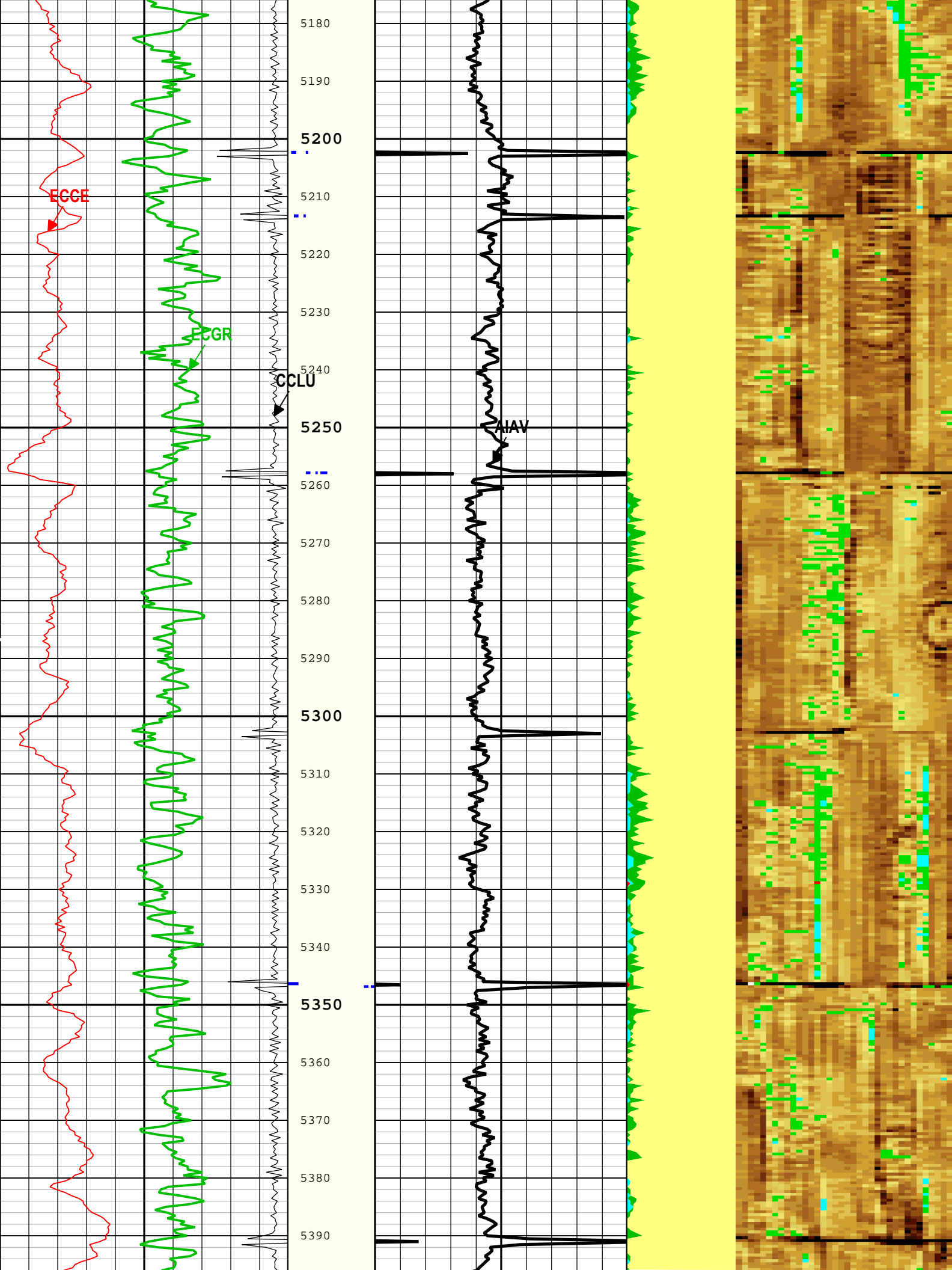


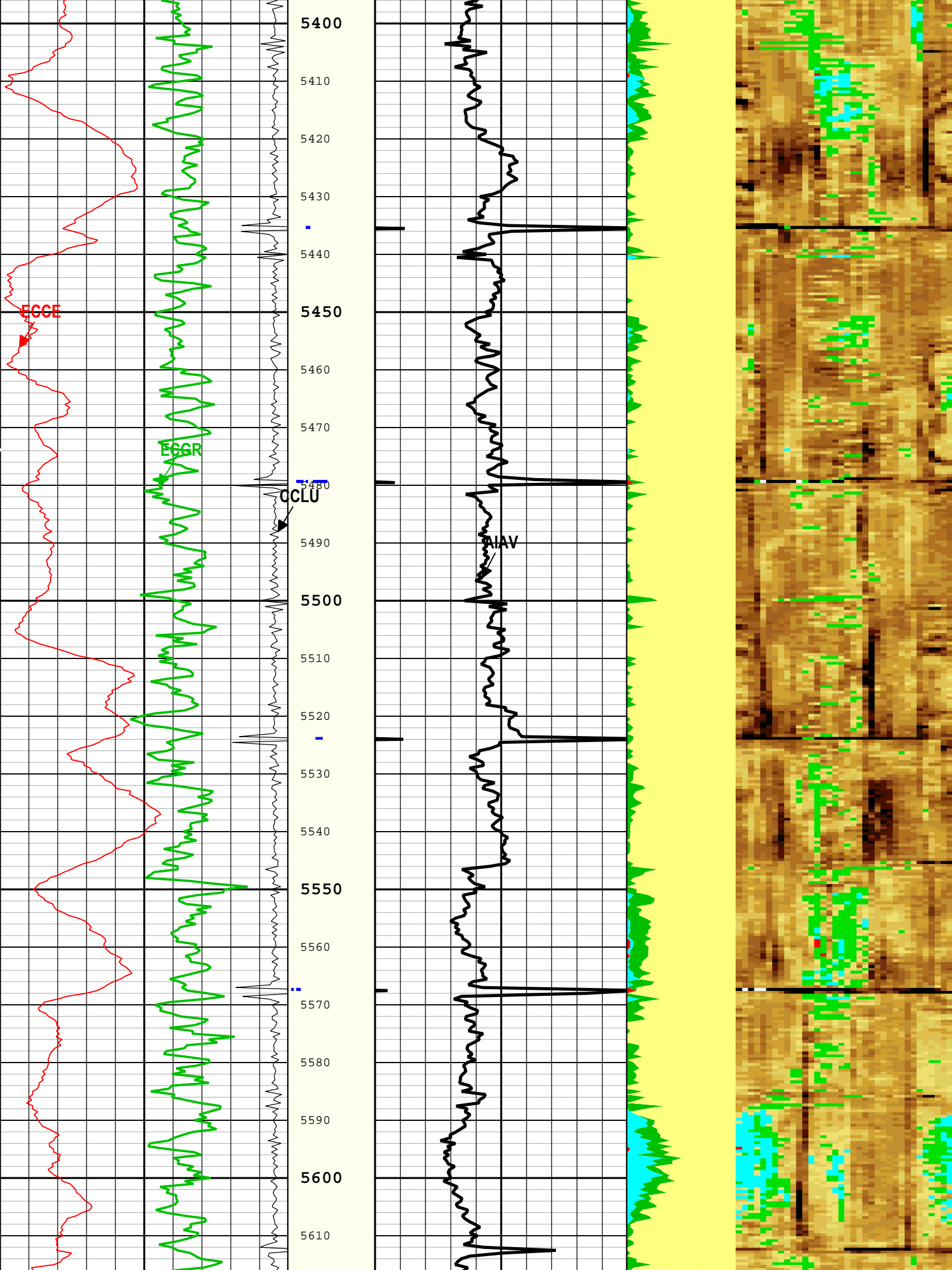


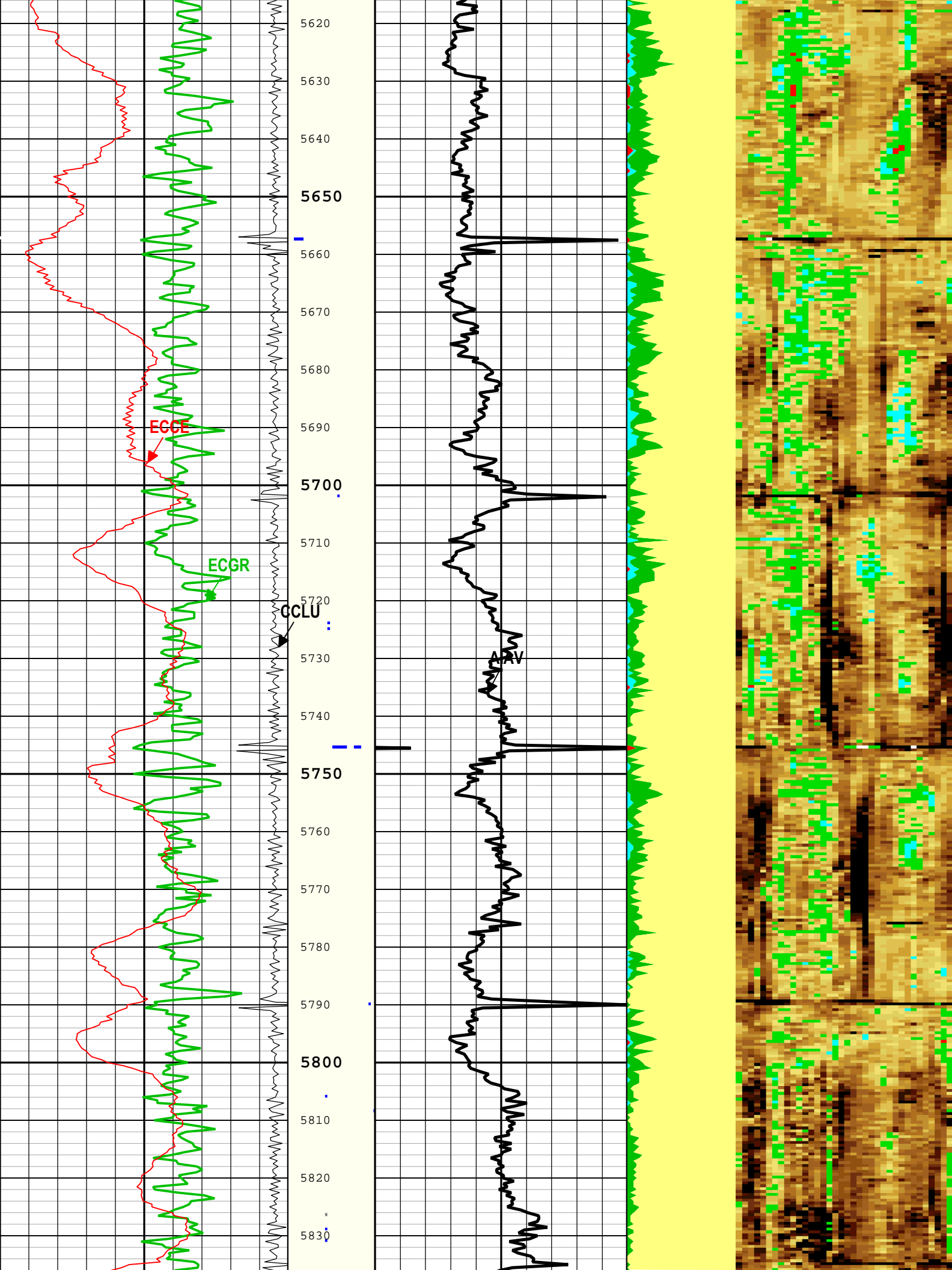


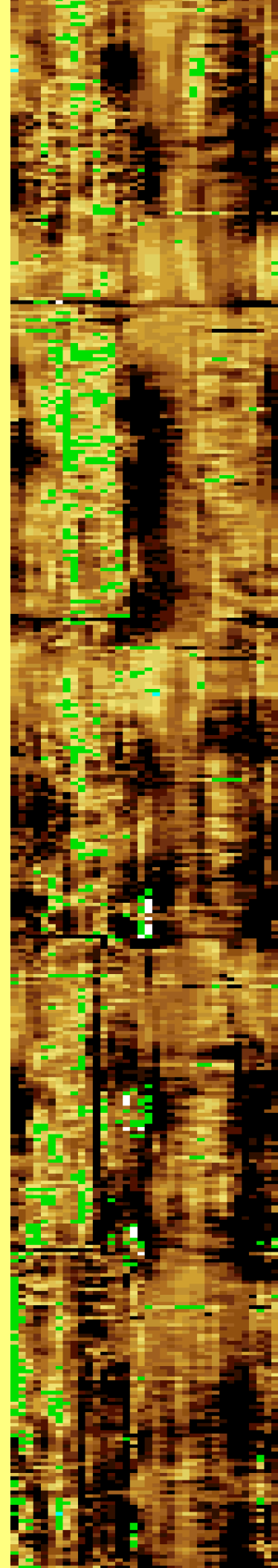
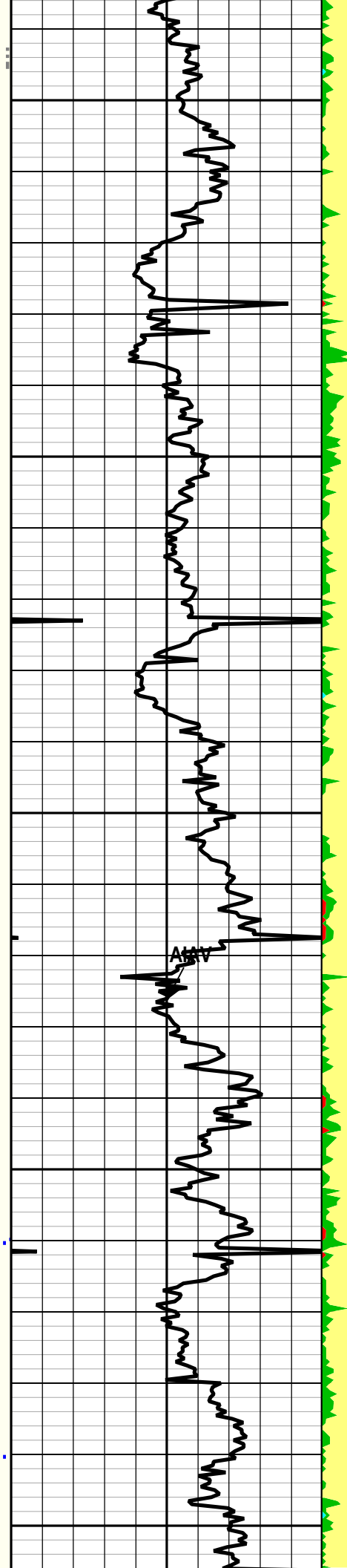
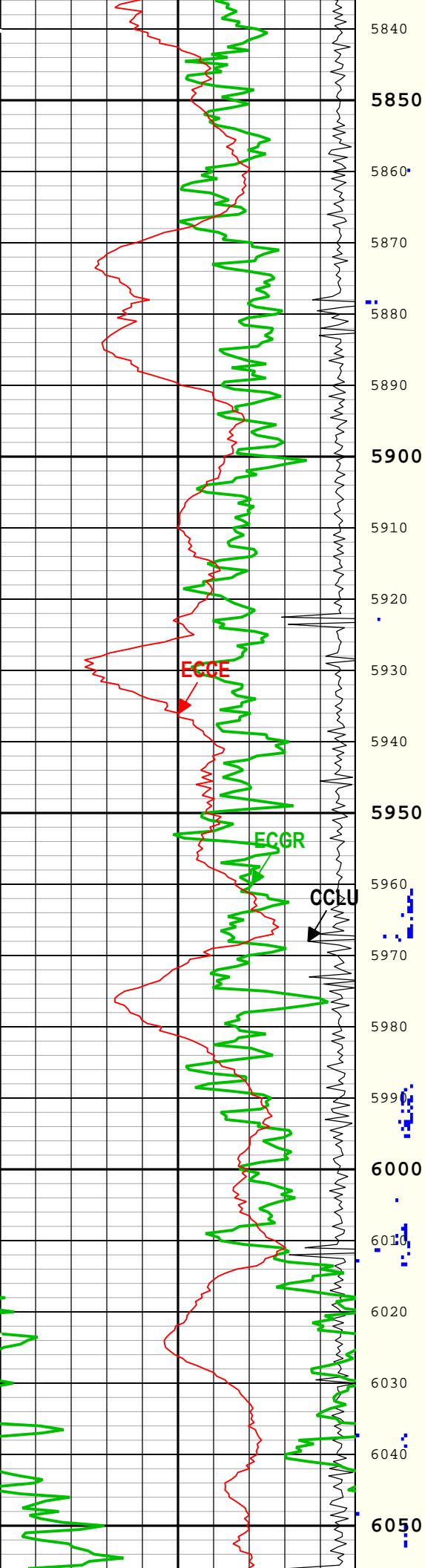


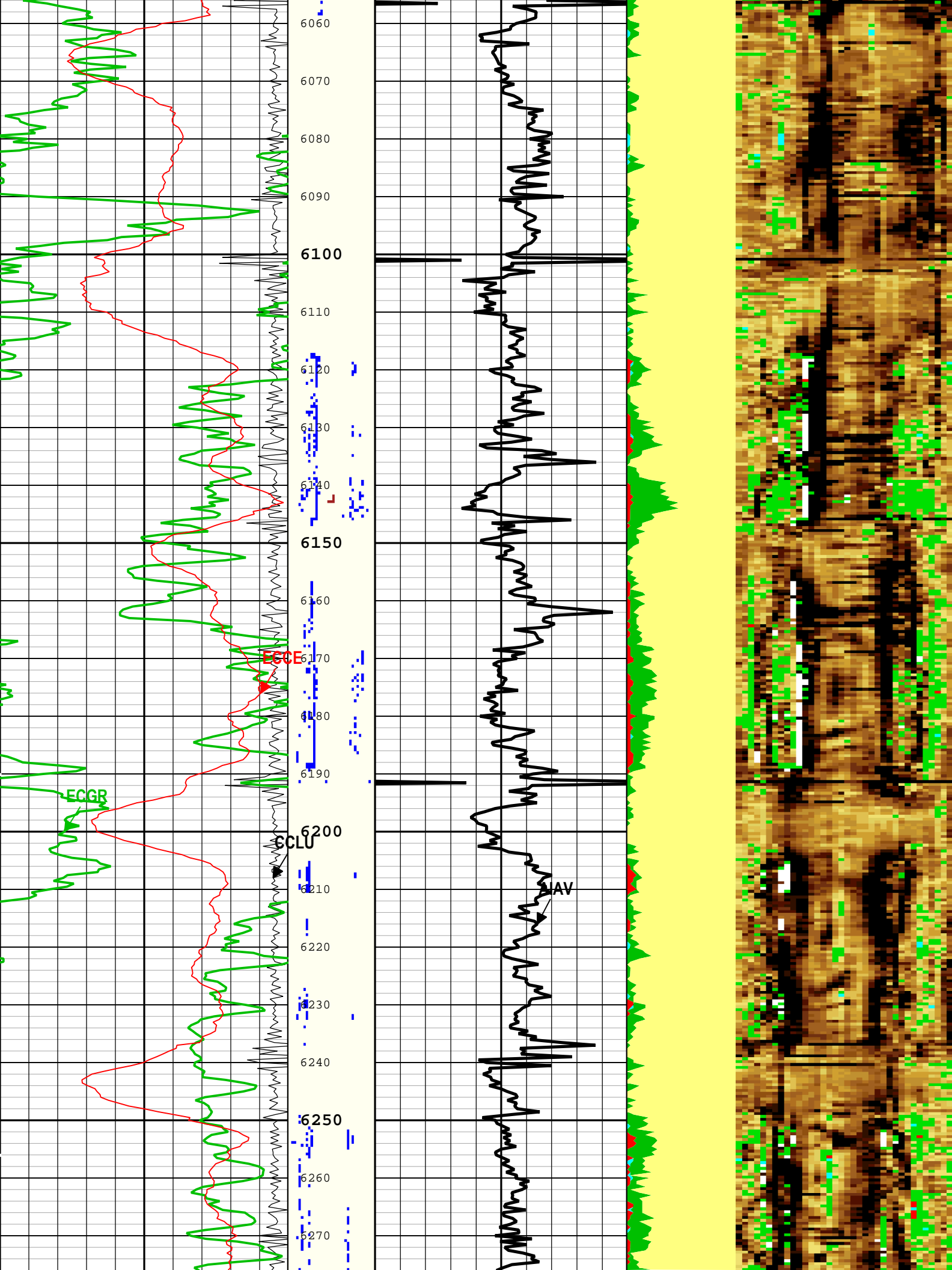


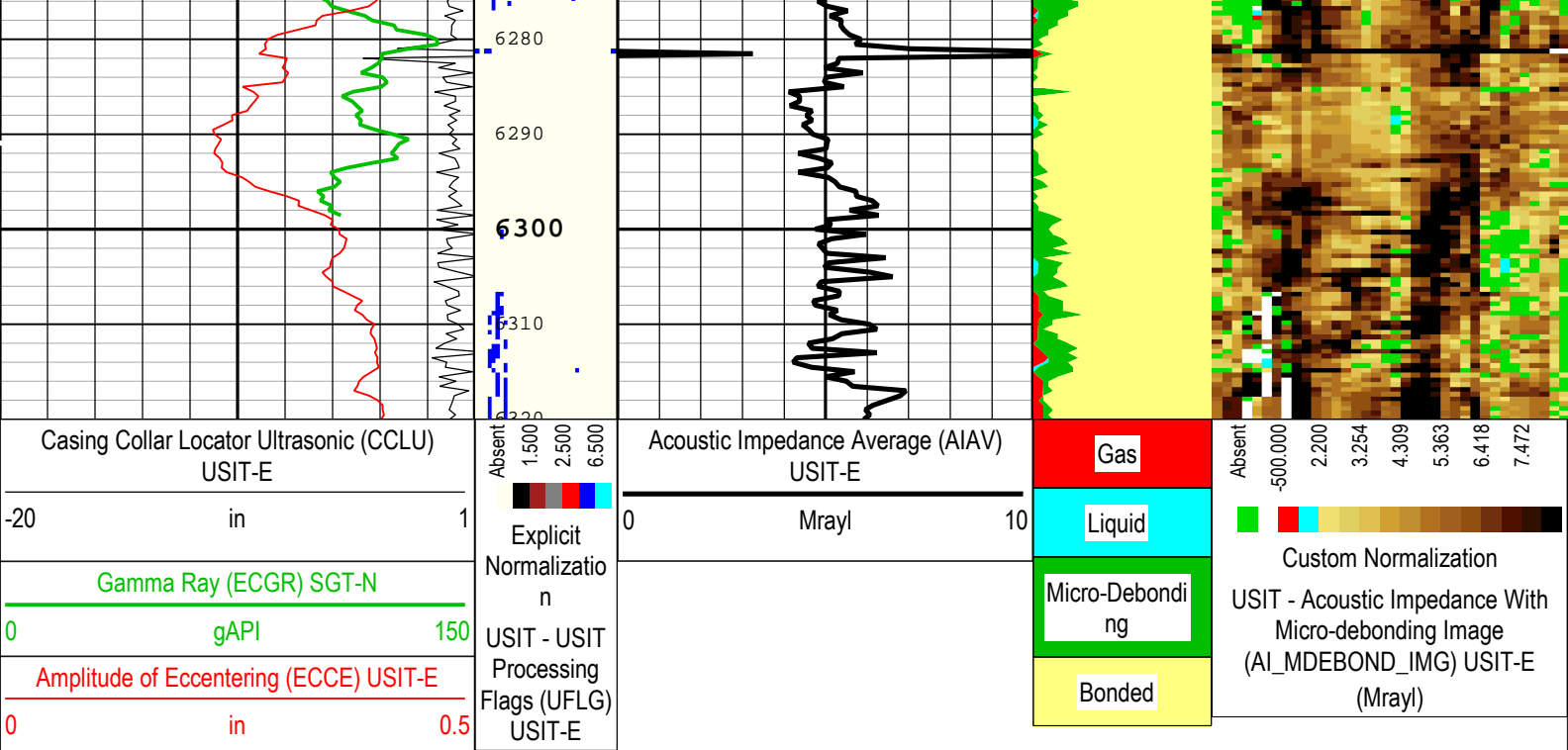












TIME_1900 - Time Marked every 60.00 (s)

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: 09-Jan-2017 19:49:01

Channel Processing Parameters				
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
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	10840.5	ft
CDEN	Cement Density	SGT-N	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	9.4	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FDII	FPM Data Interpolation Interval	USIT-E	0	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	1.04	
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

CTOM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	26	60	110
BS	13.5	110	1925
BS	8.5	1925	6320

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
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	6319	ft
WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	71.88	us

Time Zone Parameters

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	40	09-Jan-2017 12:19:11	09-Jan-2017 12:21:41	6323.02	6301.61
EMXV	55	09-Jan-2017 12:21:41	09-Jan-2017 12:22:01	6301.61	6289.95
EMXV	50	09-Jan-2017 12:22:01	09-Jan-2017 12:22:17	6289.95	6280.75
EMXV	47	09-Jan-2017 12:22:17	09-Jan-2017 12:24:08	6280.75	6170.25
EMXV	40	09-Jan-2017 12:24:08	09-Jan-2017 12:24:55	6170.25	6036.71
EMXV	45	09-Jan-2017 12:24:55	09-Jan-2017 12:25:10	6036.71	5992.28
EMXV	50	09-Jan-2017 12:25:10	09-Jan-2017 12:27:30	5992.28	5565.44
EMXV	45	09-Jan-2017 12:27:30	09-Jan-2017 12:36:08	5565.44	3934.13
EMXV	40	09-Jan-2017 12:36:08	09-Jan-2017 12:41:10	3934.13	2955.03
EMXV	35	09-Jan-2017 12:41:10	09-Jan-2017 12:57:55	2955.03	57.79

All depth are at tool zero.

ONE

0 PSI Repeat Pass

Software Version

Acquisition System	Version
Maxwell 2016 SP2	6.2.68624.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include
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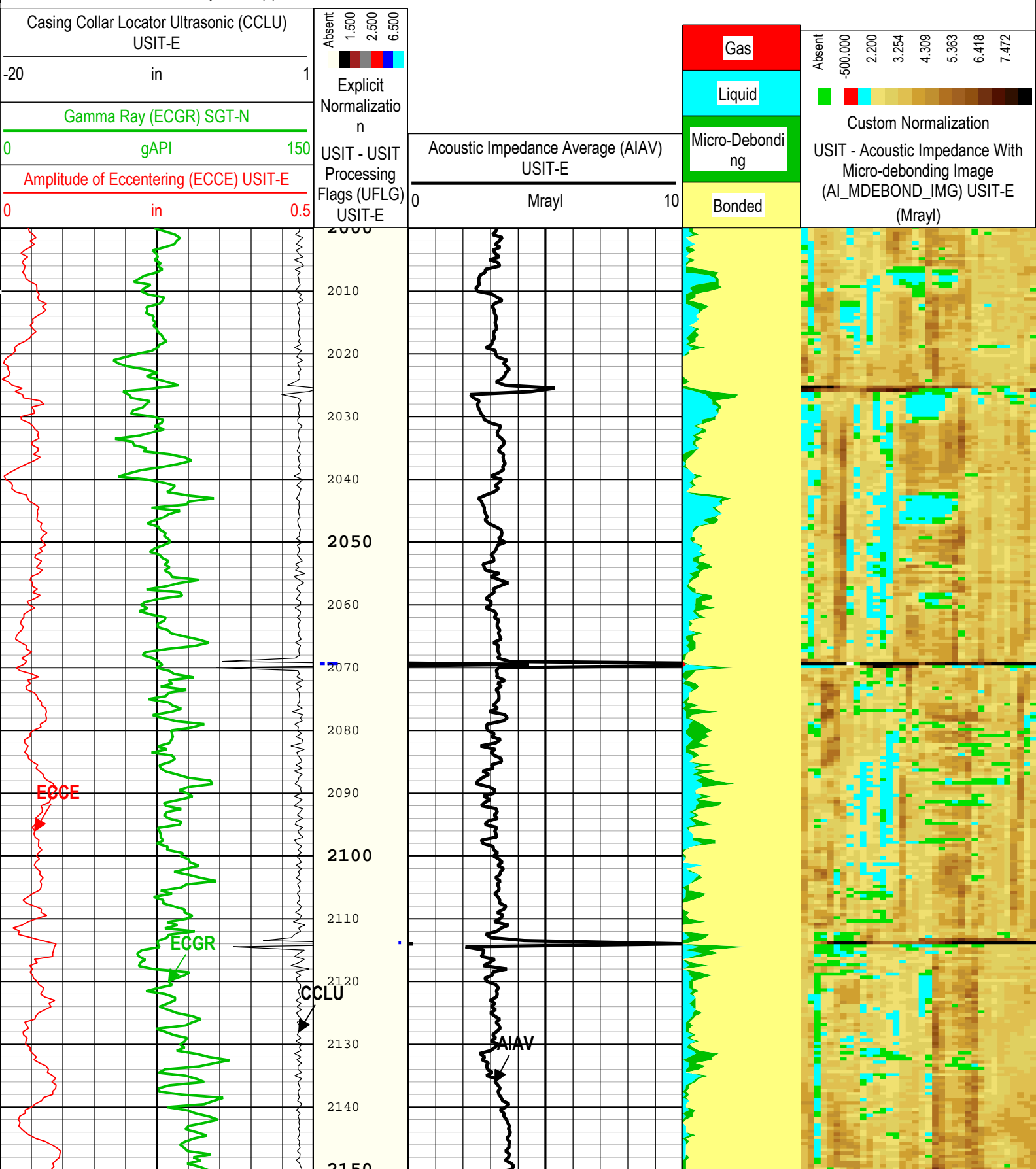
ONE	Log[2]:Up	Up	1901.45 ft	2605.80 ft	09-Jan-2017 11:57:11 AM	09-Jan-2017 12:02:59 PM	ON	2.08 ft	Yes
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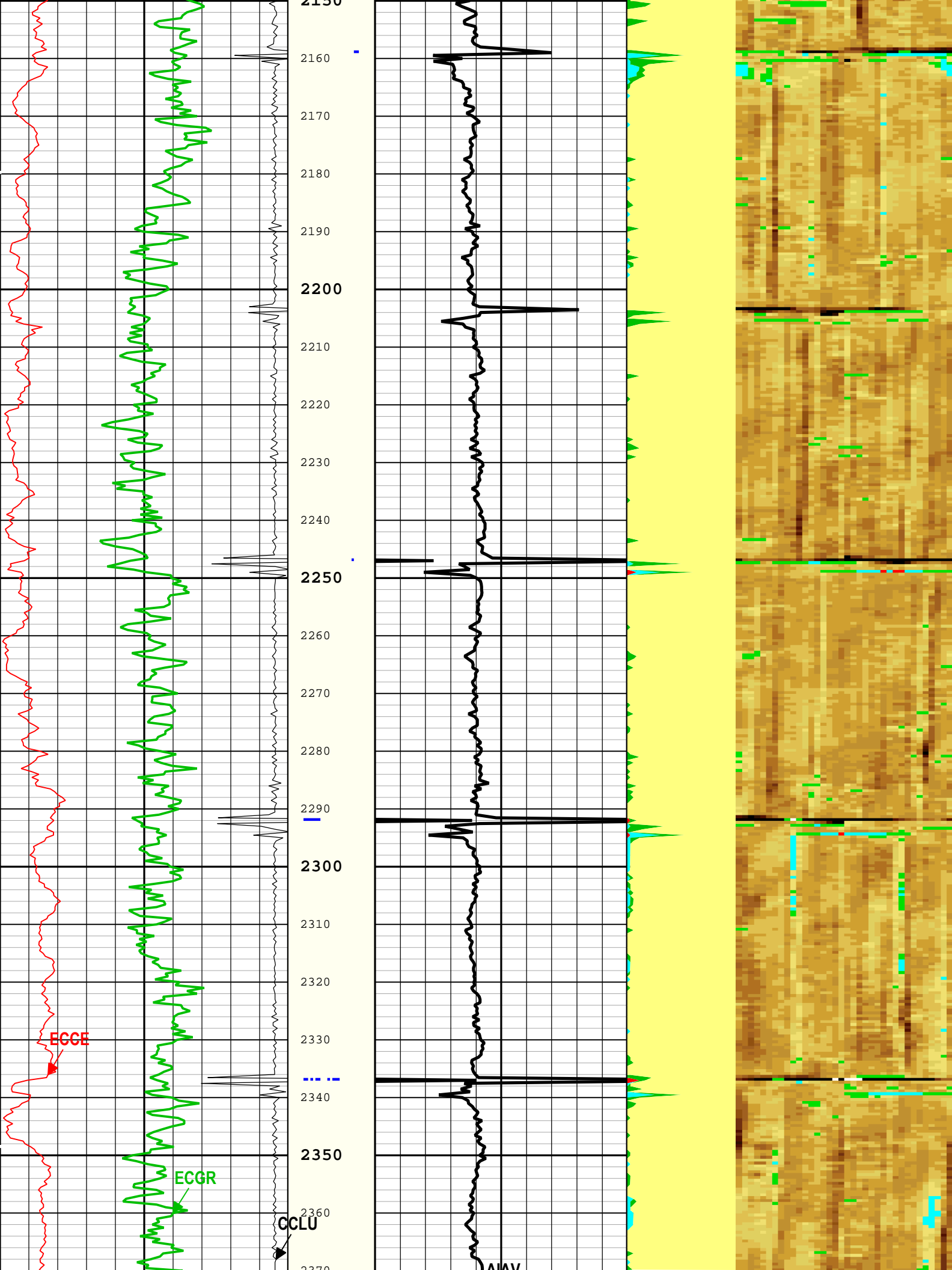
All depths are referenced to toolstring zero

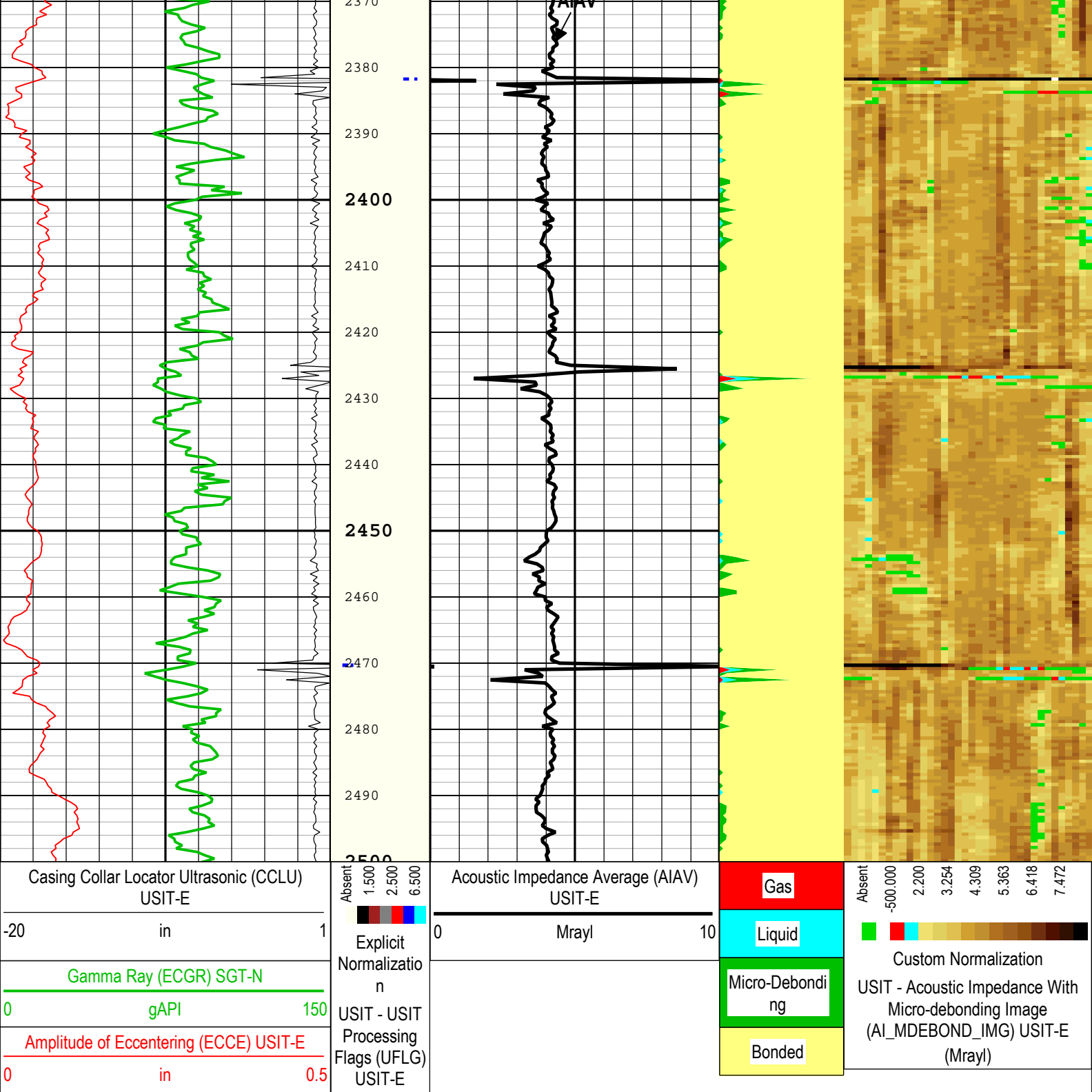
Log	Company:NOBLE ENERGY INC	Well:BROWNING FEDERAL LC24-780	ONE: Log[2]:Up:S003
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Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 09-Jan-2017 19:49:06

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: 09-Jan-2017 19:49:06

Channel Processing Parameters				
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
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	10840.5	ft
CDEN	Cement Density	SGT-N	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	

DFD	Drilling Fluid Density	Borehole	9.4	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FDII	FPM Data Interpolation Interval	USIT-E	0	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	1.04	
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

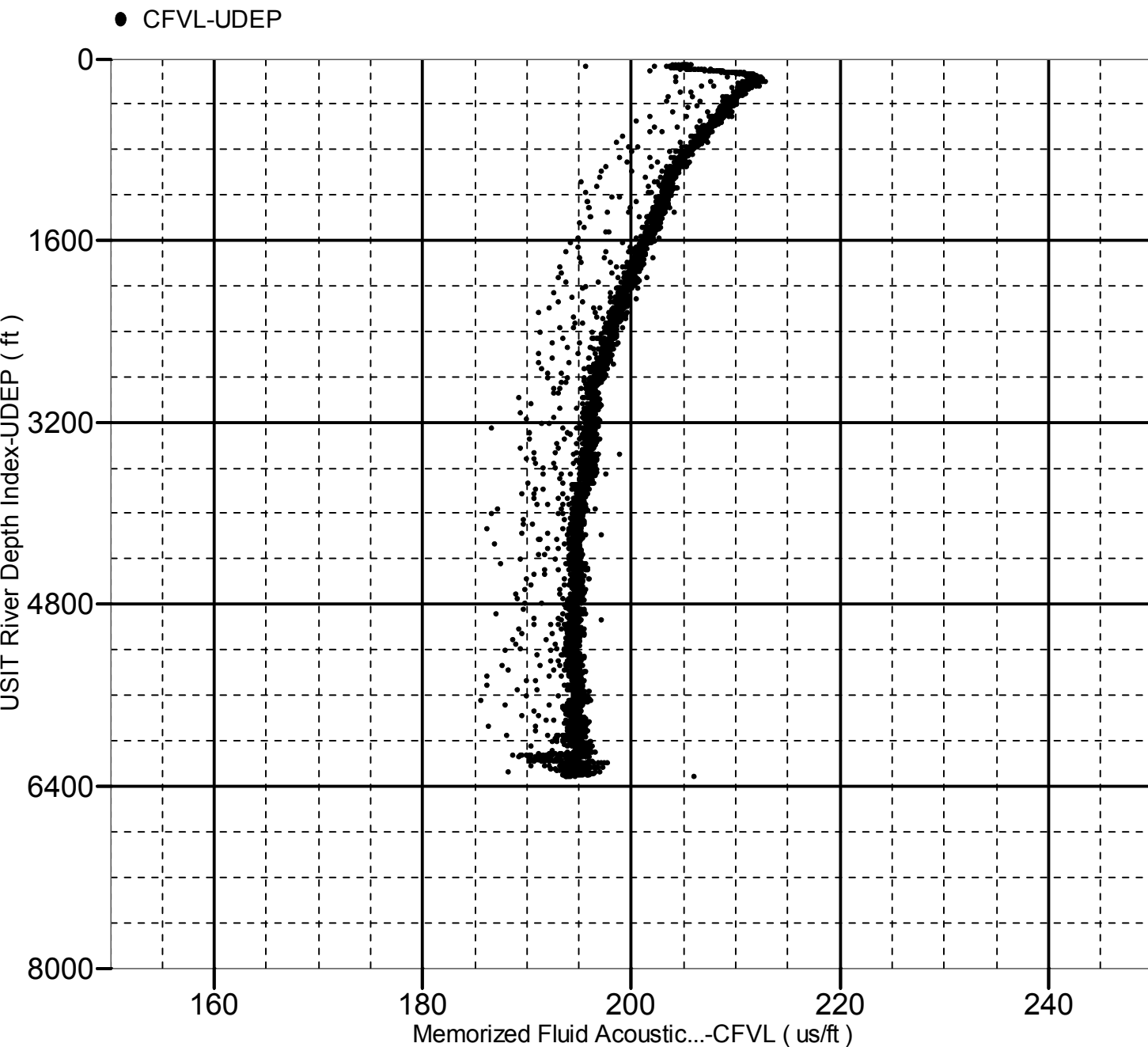
Tool Control Parameters				
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
EMXV	EMEX Voltage	USIT-E	Time Zoned	V
HRES	Horizontal Resolution	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	2603	ft
WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	71.88	us

Time Zone Parameters					
Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	40	09-Jan-2017 11:57:11	09-Jan-2017 11:59:56	2605.8	2357.09
EMXV	35	09-Jan-2017 11:59:56	09-Jan-2017 12:02:59	2357.09	1901.45
All depth are at tool zero.					
XYZ		Company:NOBLE ENERGY INC Well:BROWNING FEDERAL LC24-780 ONE: Log[4]:Up:S003			

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6322.50 to 57.50 ft



XYZ

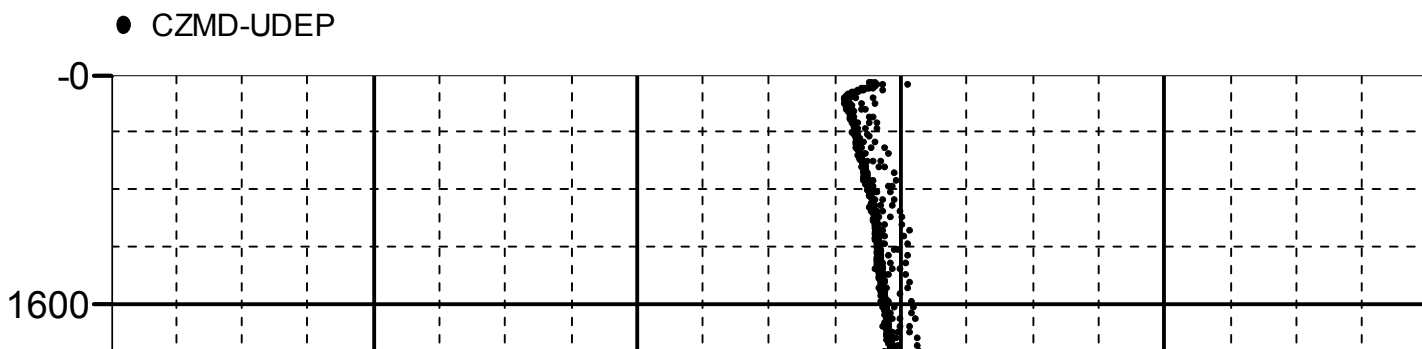
Company:NOBLE ENERGY INC Well:BROWNING FEDERAL LC24-780

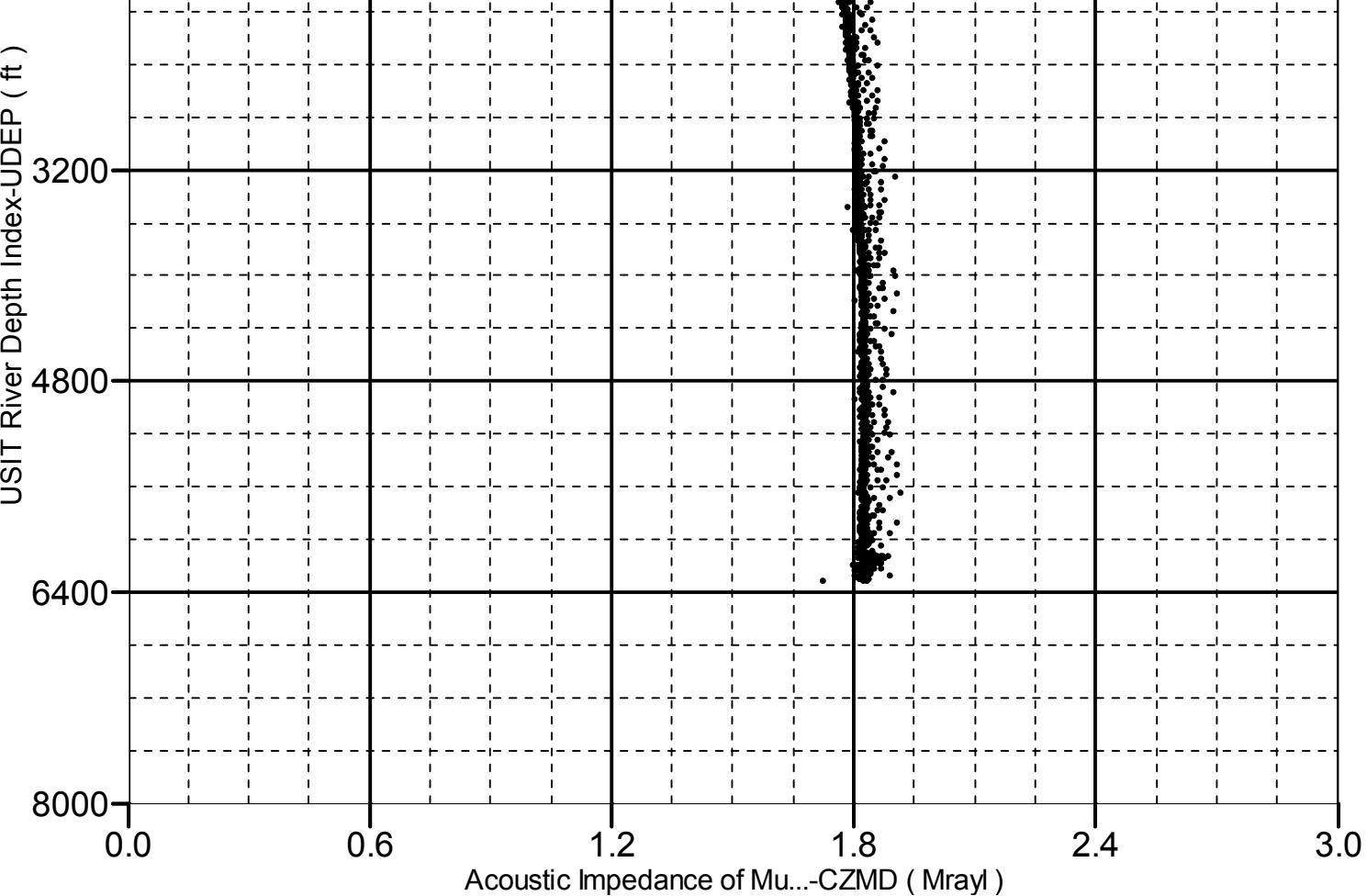
ONE: Log[4]:Up:S003

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6322.50 to 57.50 ft





Company: NOBLE ENERGY INC

Schlumberger

Well: BROWNING FEDERAL LC24-780

Field: WILDCAT

County: WELD

State: COLORADO

UltraSonic Summary Print