

Company: NOBLE ENERGY INC

Well: WELLS RANCH STATE AA36-683

Field: WATTENBERG

County: WELD State: COLORADO

UltraSonic Summary Print

County:	WELD
Field:	WATTENBERG
Location:	SHL: NWNW SEC 32 TWP 6N RNG 62W
Well:	WELLS RANCH STATE AA36-683
Company:	NOBLE ENERGY INC
Location:	
SHL: NWNW SEC 32 TWP 6N RNG 62W	Elev.: K.B. 4792.00 ft
BHL: 470' FNL & 40' FWL	G.L. 4762.00 ft
Permanent Datum:	D.F. 4791.00 ft
Log Measured From:	Ground Level
Drilling Measured From:	Kelly Bushing
API Serial No.	Kelly Bushing
05-123-48163	Section: 32
	Township: 6N
	Range: 62W

Logging Date	28-May-2019
Run Number	ONE
Depth Driller	17177.00 ft
Schlumberger Depth	17177.00 ft
Bottom Log Interval	6468.00 ft
Top Log Interval	4.00 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	1941.00 ft
To	17177.00 ft
Casing/Tubing Size	5.5 in
Weight	17 lbm/ft
Grade	P110
From	0.00 ft
To	17157.00 ft
Max Recorded Temperatures	218 degF
Logger on Bottom	28-May-2019
Unit Number	9108
Recorded By	MORRIS MOORE
Witnessed By	BILL MANSFIELD

Disclaimer

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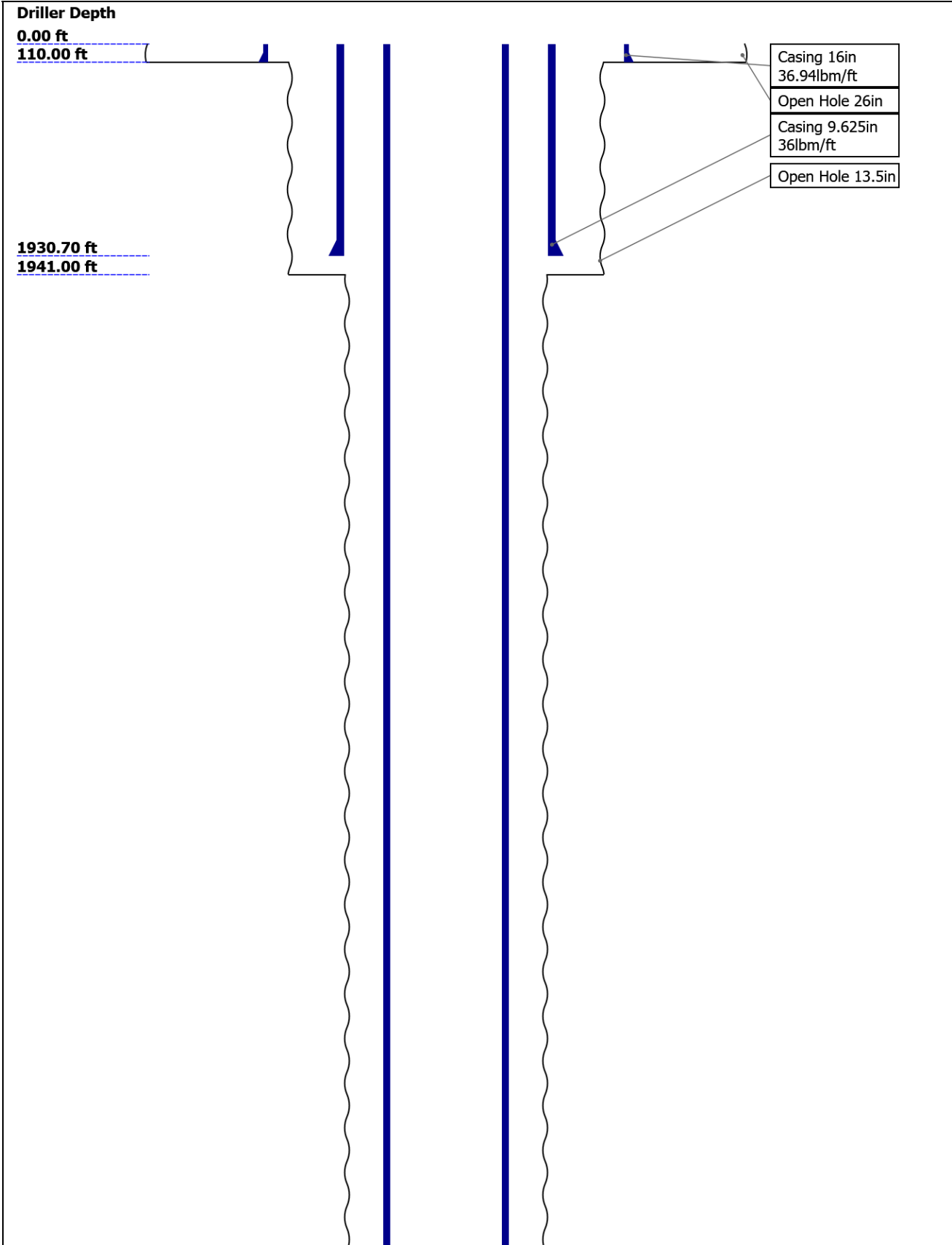
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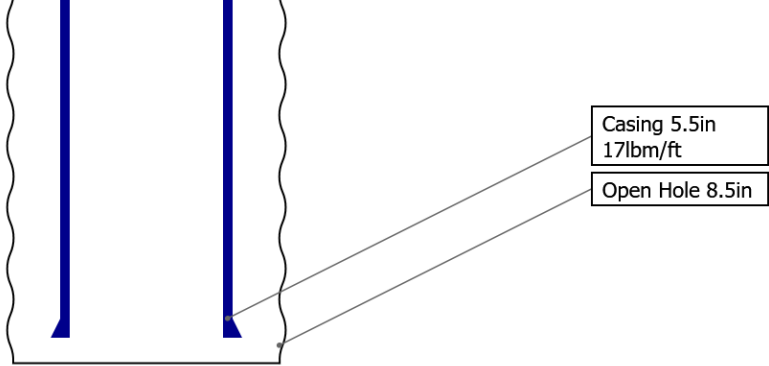
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Well Sketch




17157.00 ft
17177.00 ft



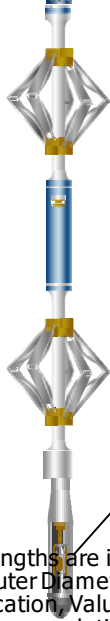
Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	0	110	1941			
Top Logger (ft)	0	110	1941			
Bottom Driller (ft)	110	1941	17177			
Bottom Logger (ft)	110	1941	17177			
Casing						
Size (in)	16	9.625	5.5			
Weight (lbm/ft)	36.94	36	17			
Inner Diameter (in)	15.572	8.921	4.892			
Grade	N/A	J55	P110			
Top Driller (ft)	0	0	0			
Top Logger (ft)	0	0	0			
Bottom Driller (ft)	110	1930.7	17157			
Bottom Logger (ft)	110	1930.7	17157			

Remarks and Equipment Summary

ONE: Toolstring			ONE: Remarks		
<div><div><div>Equip nameLengthMP nameOffset</div><div>LEH-Q29.44</div><div>T</div><div>LEH-QT</div><div>EDTC-B25.96</div><div>EDTH-B</div><div>EDTG-A</div><div>EDTC-B</div><div>CTEM22.46</div><div>ACCZ0.00</div><div>HV0.00</div><div>Gamm20.59</div><div>a Ra</div><div>y</div><div>TelSt19.46</div><div>atus</div><div>AH-1019.46</div><div>7[2]</div><div>AH-1017.46</div><div>7[1]</div><div>USIT-E15.46</div><div>ECH-MF</div><div>A</div><div>USAC-A</div><div>USIS-A</div><div>USSC-B</div></div><div></div></div> <td colspan="3">Thank you for selecting Schlumberger Wireline</td>	Thank you for selecting Schlumberger Wireline				
	Log objective: Casing and Cement evaluation				
	Toolstring ran as per toolsketch				
	Main Pass logged under 2500 psi				
	Repeat Pass logged under 0 psi				
	Your crew: Robert Stelter, Juice Florress, & Chester Tanner				

USRS-A
USI-SE
NSOR:6
7
USI-TX



USI S 0.37

enso

TOOL_ZERO

Head

Tension

Lengths are in ft

Maximum Outer Diameter = 3.625 in

Line: Sensor Location Value: Gating Offset

All measurements are relative to TOOL_ZERO

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

7-32AS-XS

Serial Number

Length

24000.00 ft

Conveyance Type

Wireline

Rig Type

ONE: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

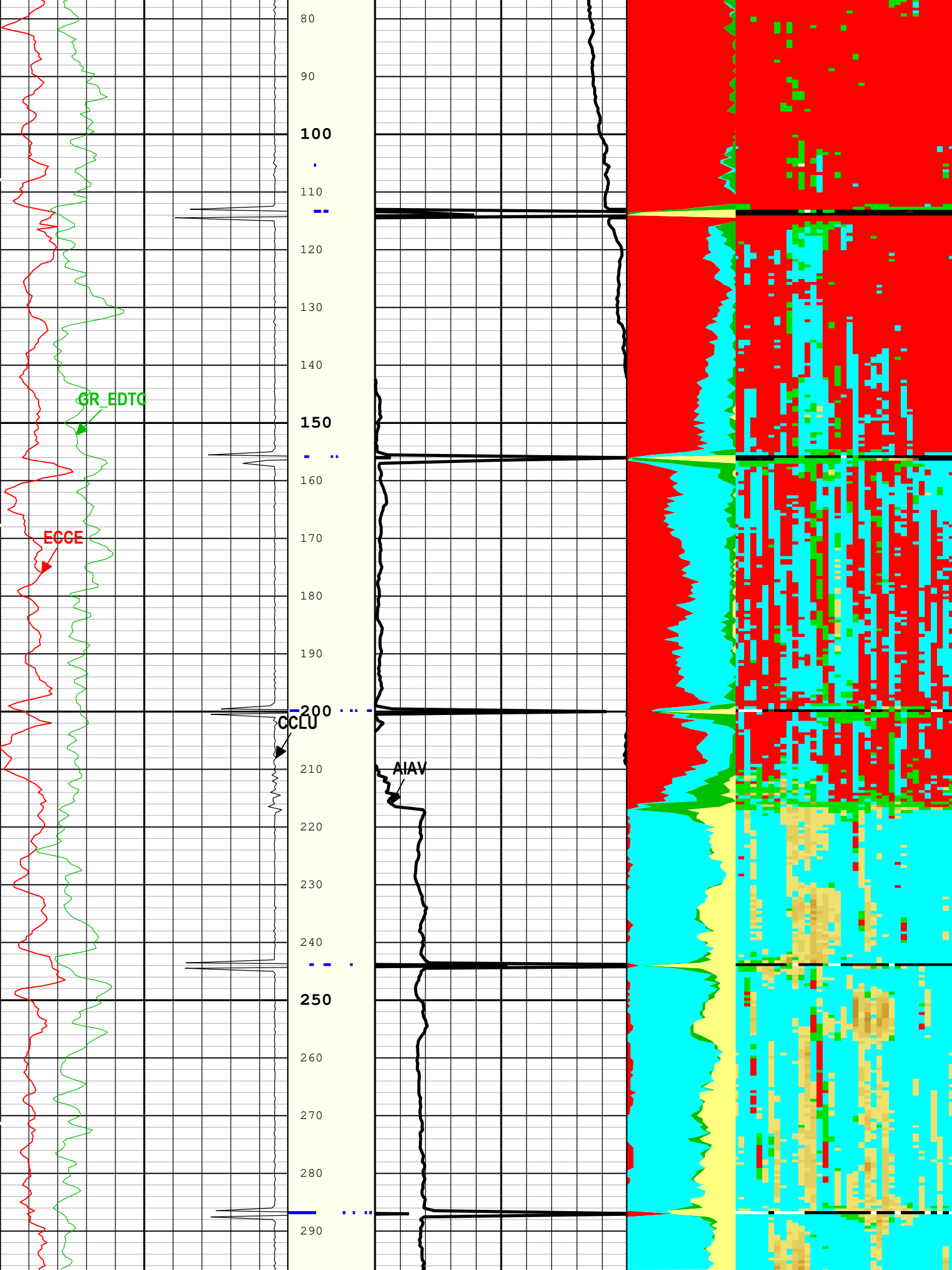
Tool Zero Check At Surface

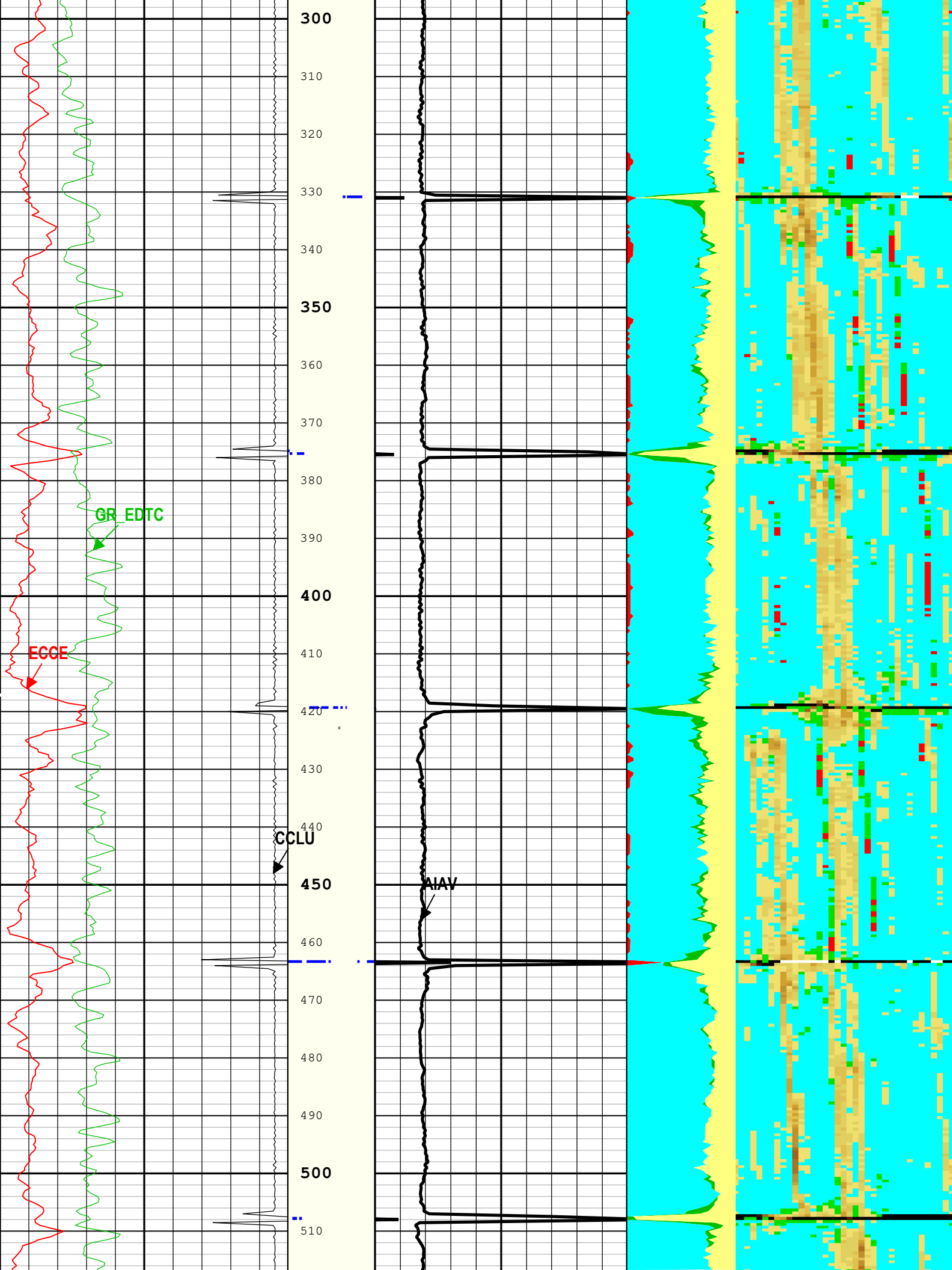
Followed Schlumberger depth control procedures.

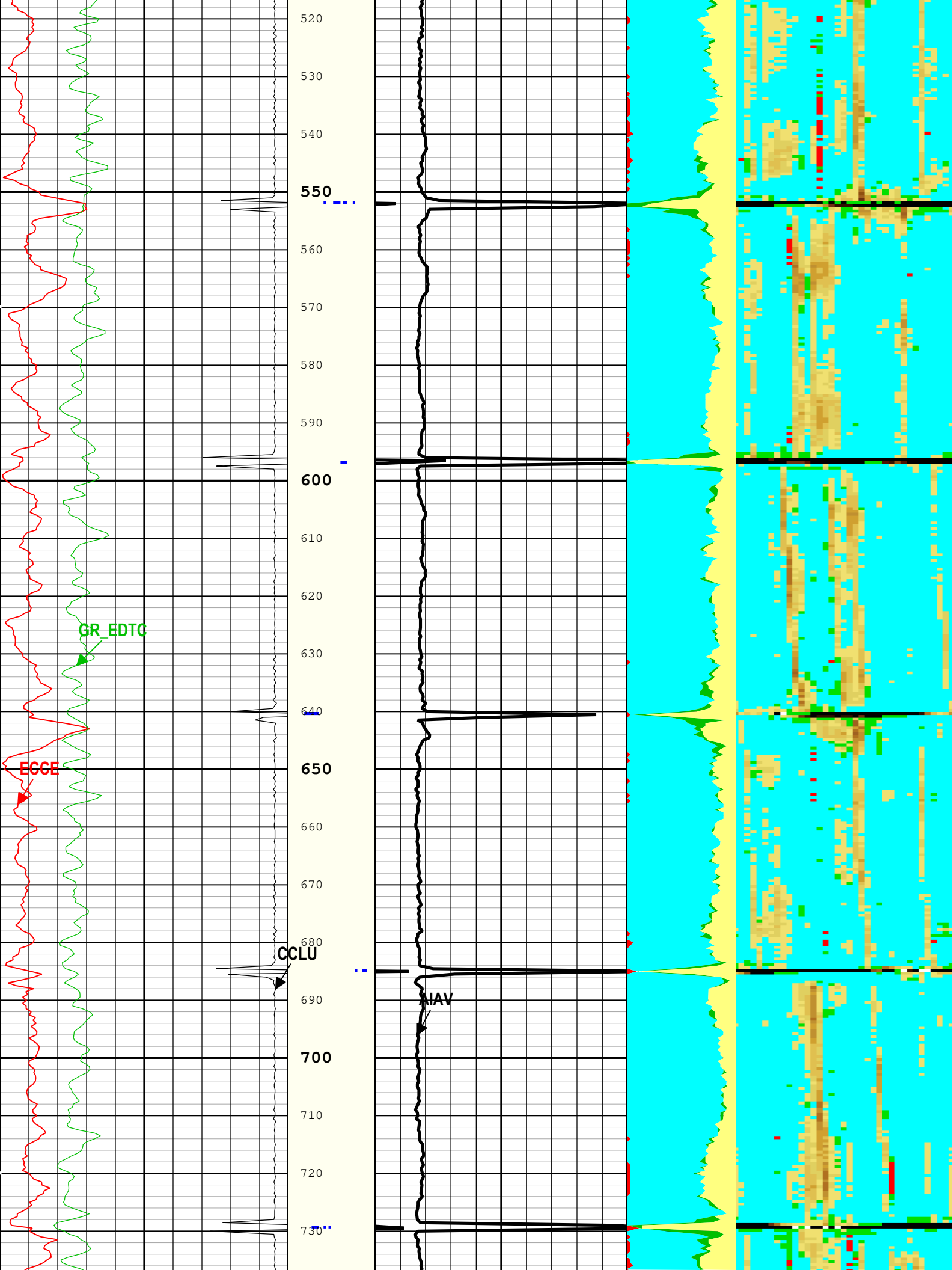
Used IDW as primary depth control

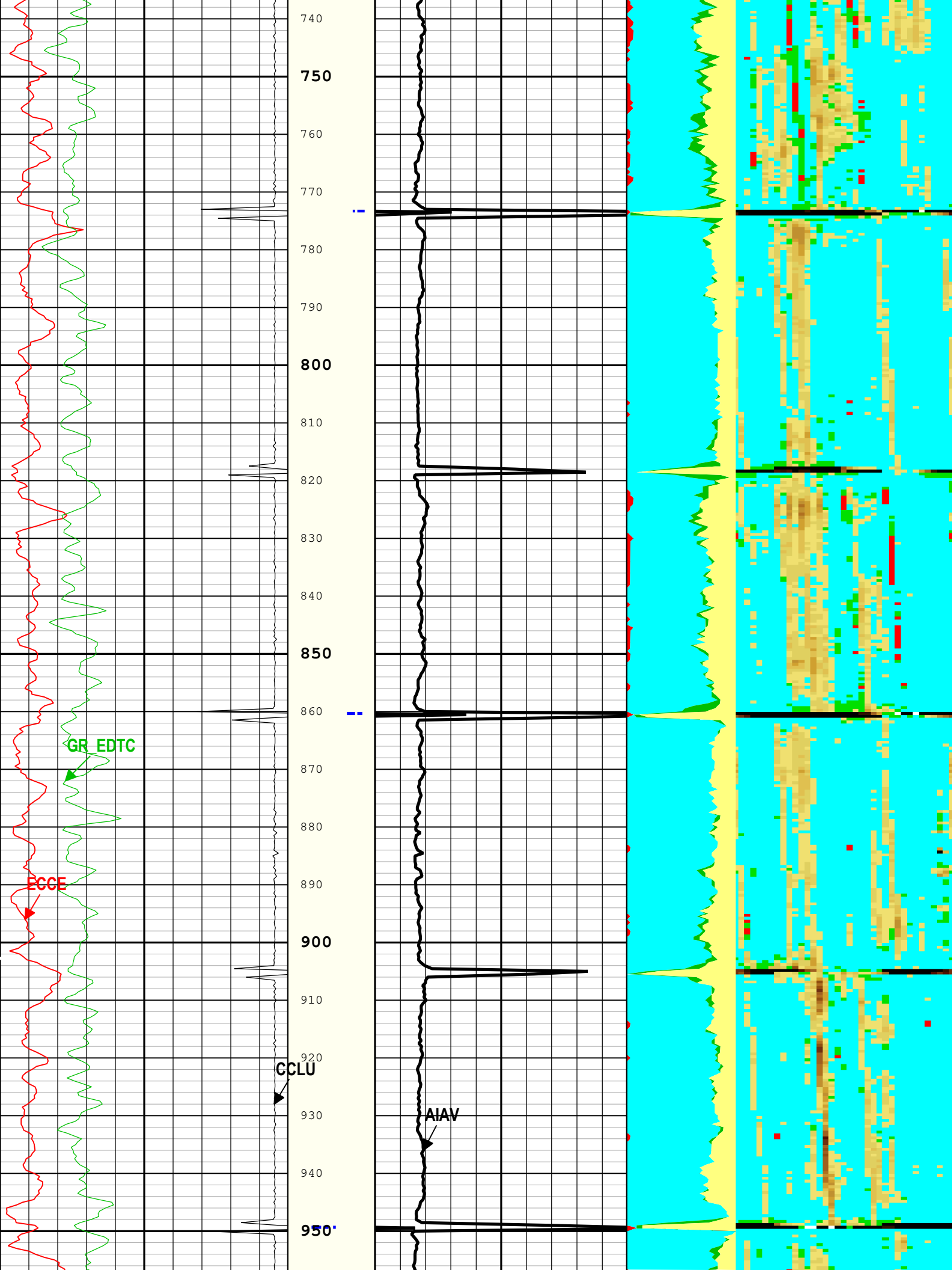
Used Z-chart as secondary depth control.

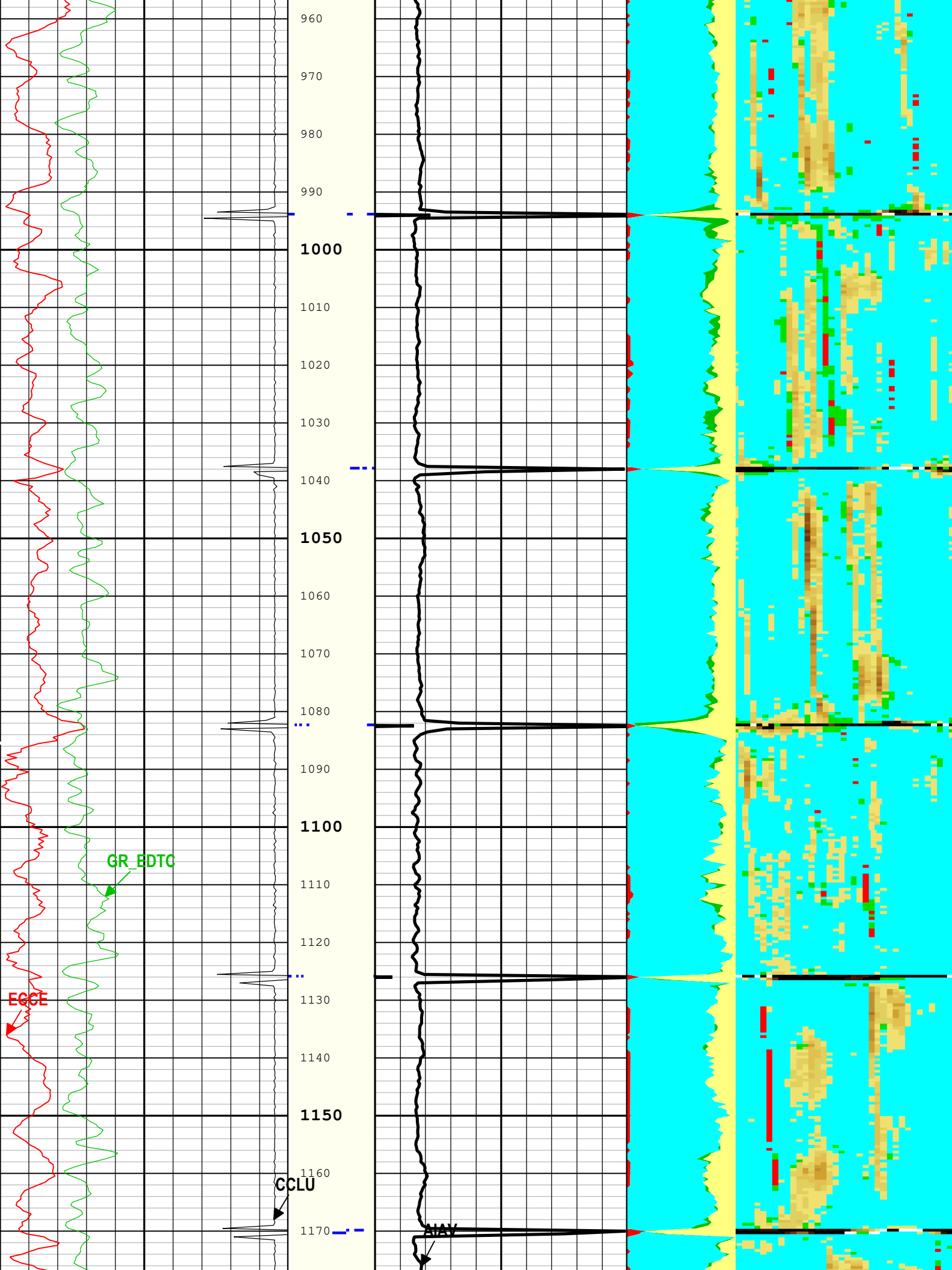
USIT - Fluid Properties Measurement

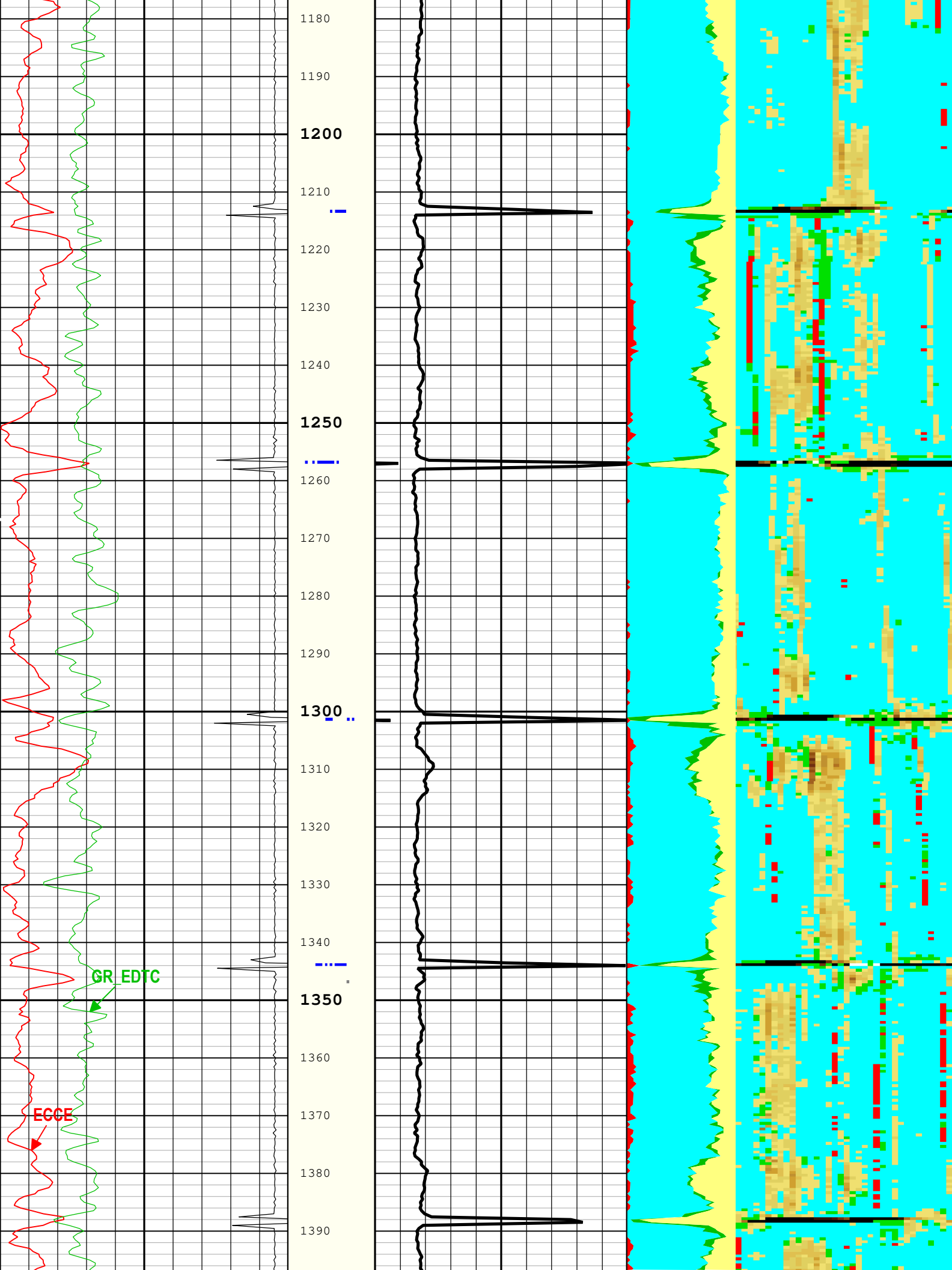


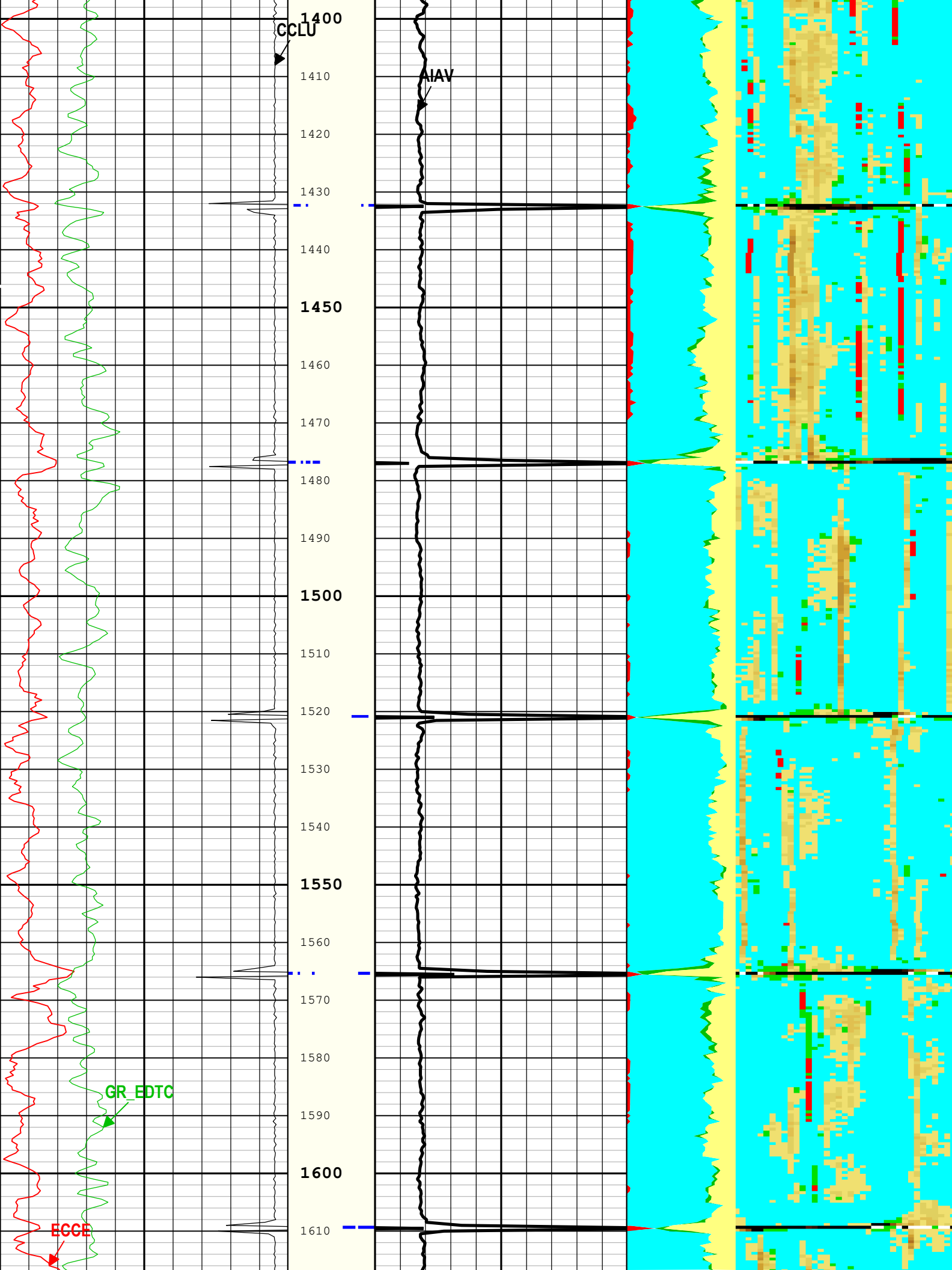


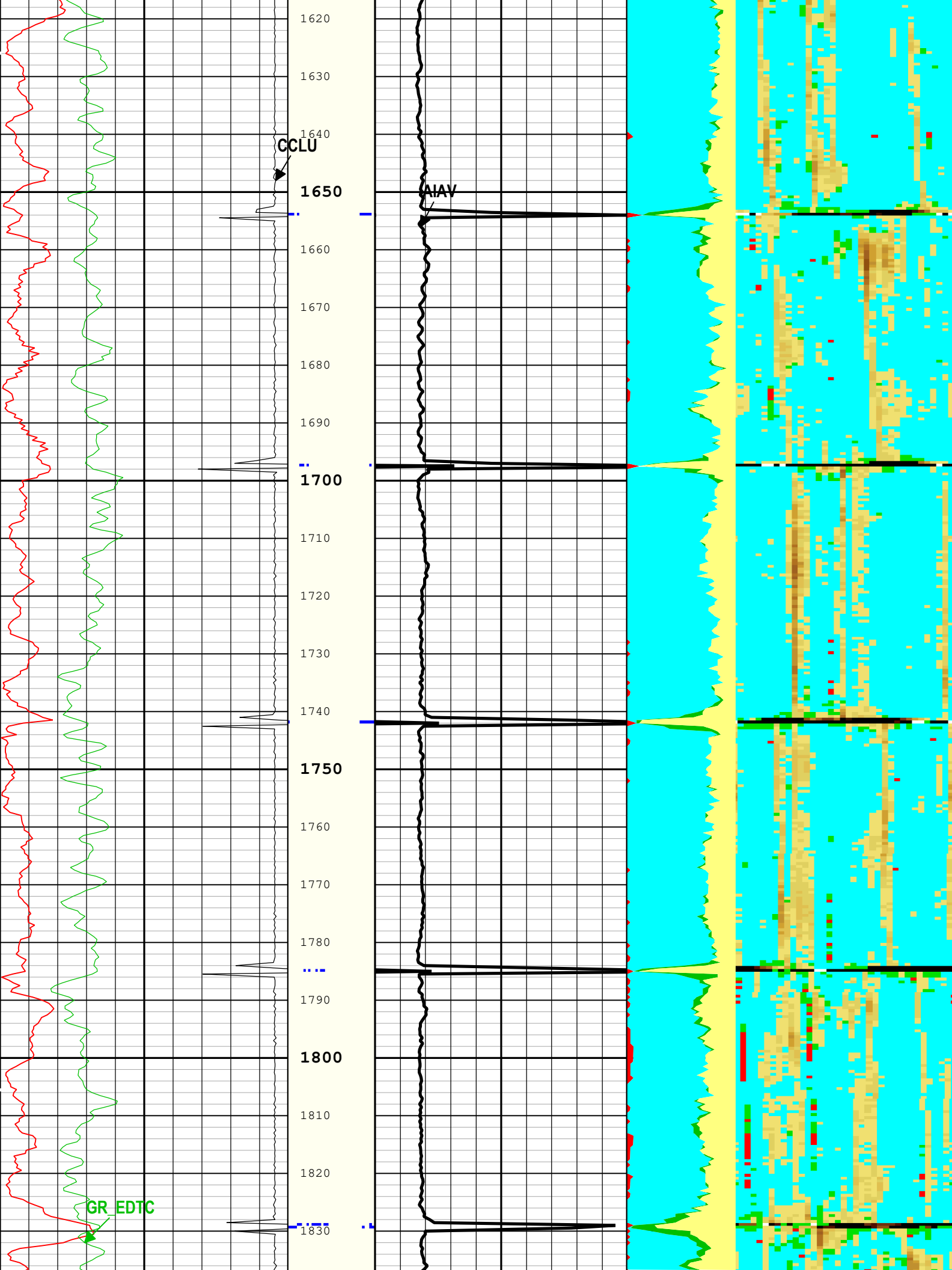


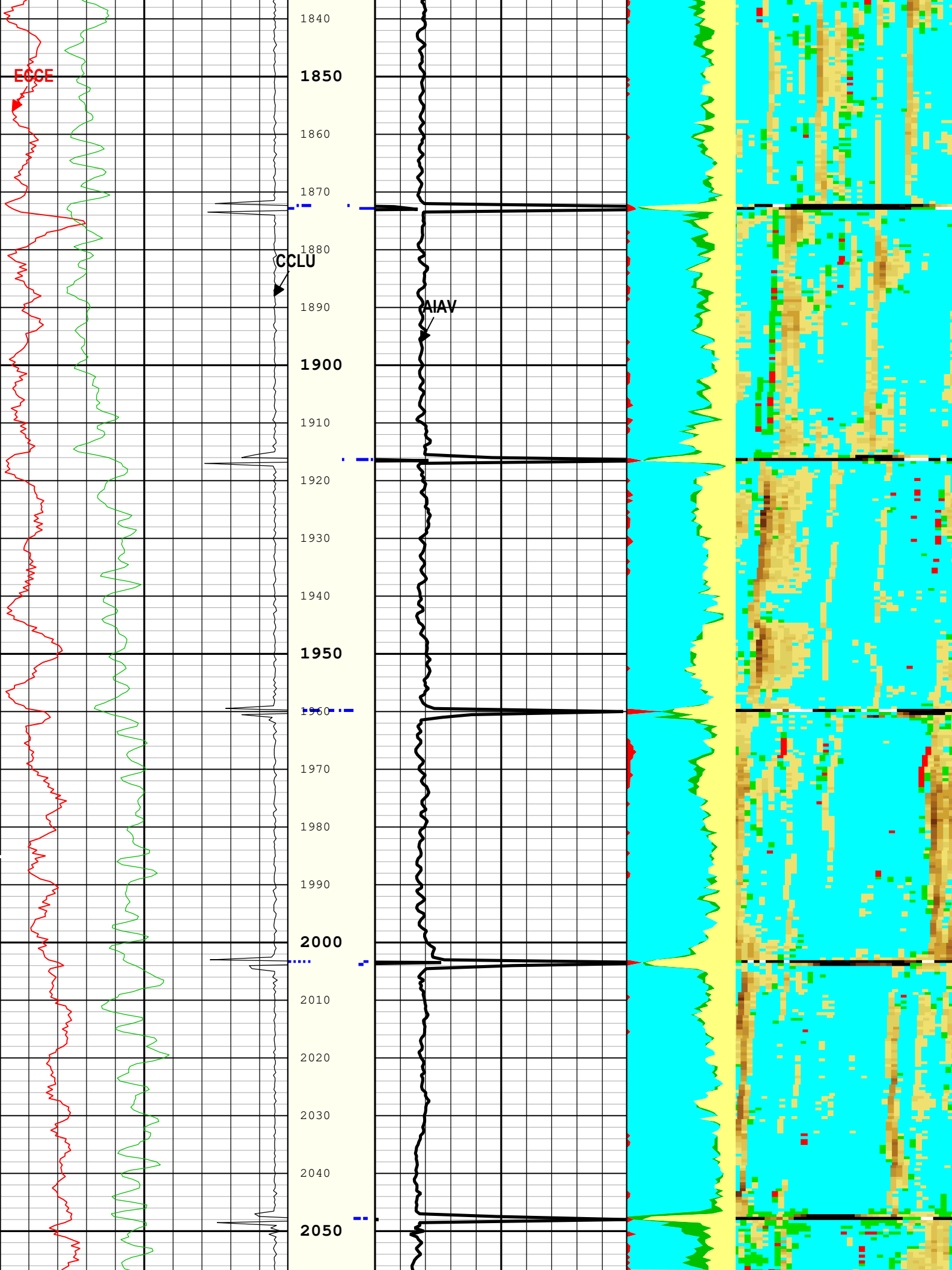


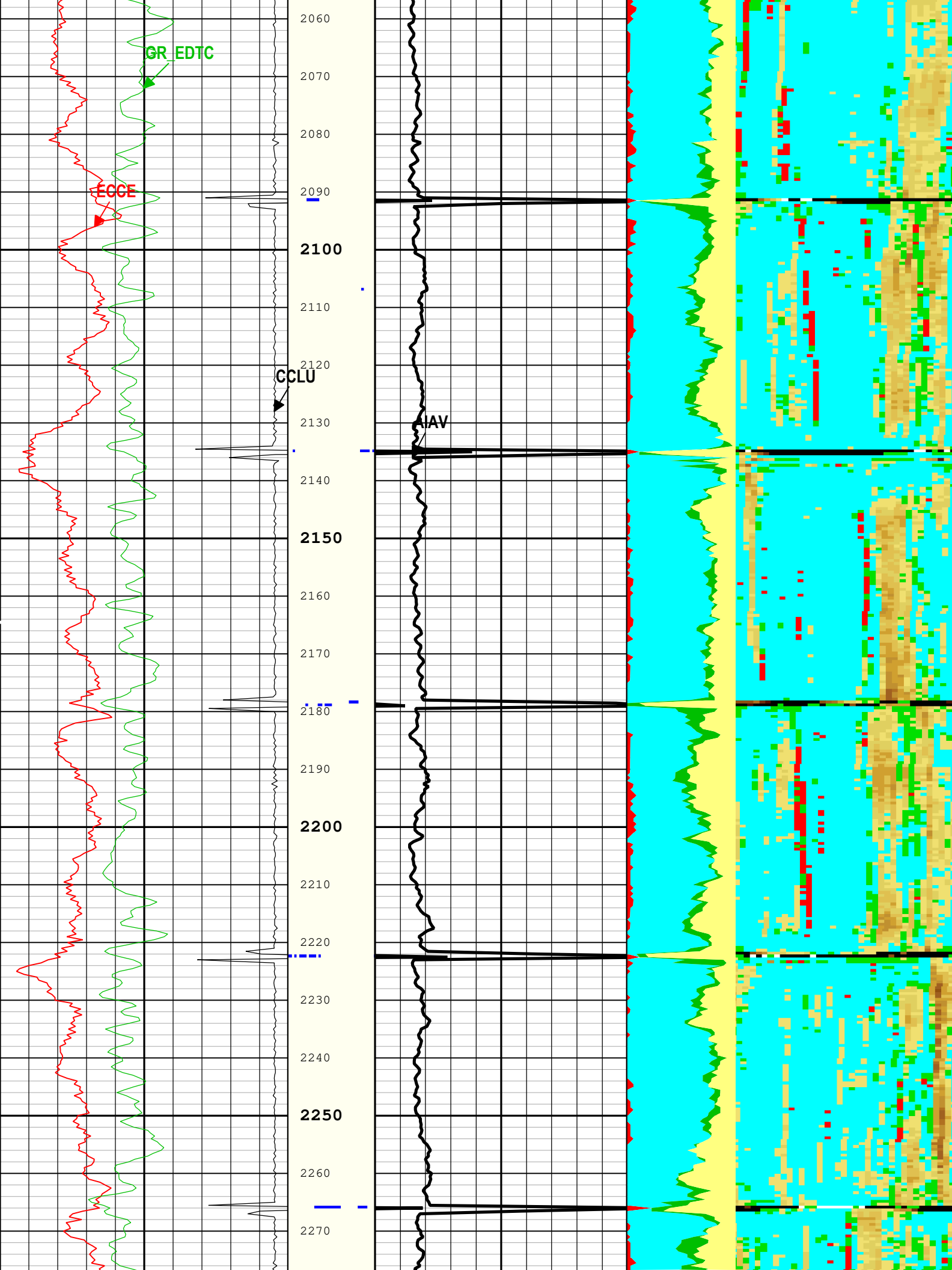


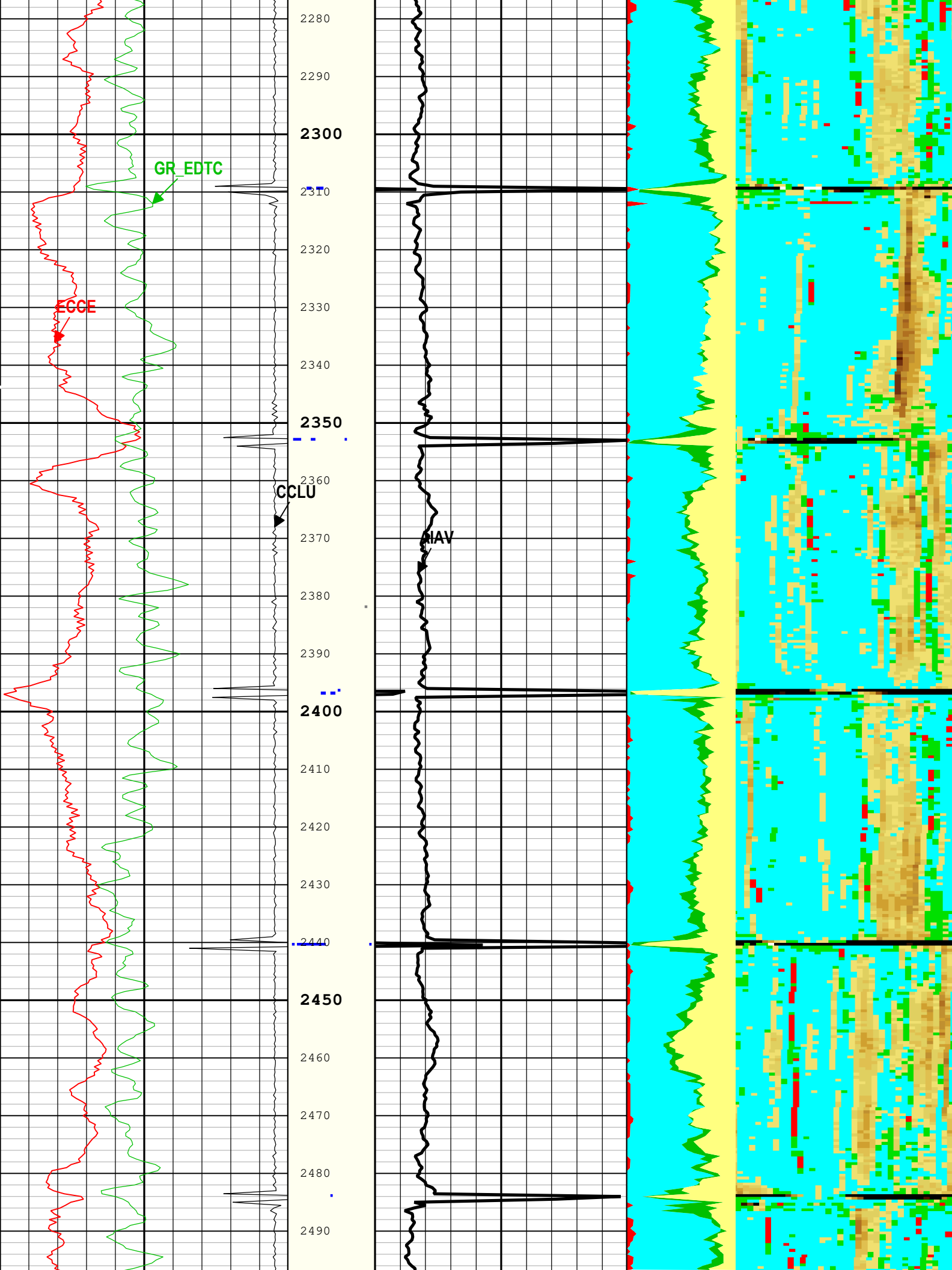


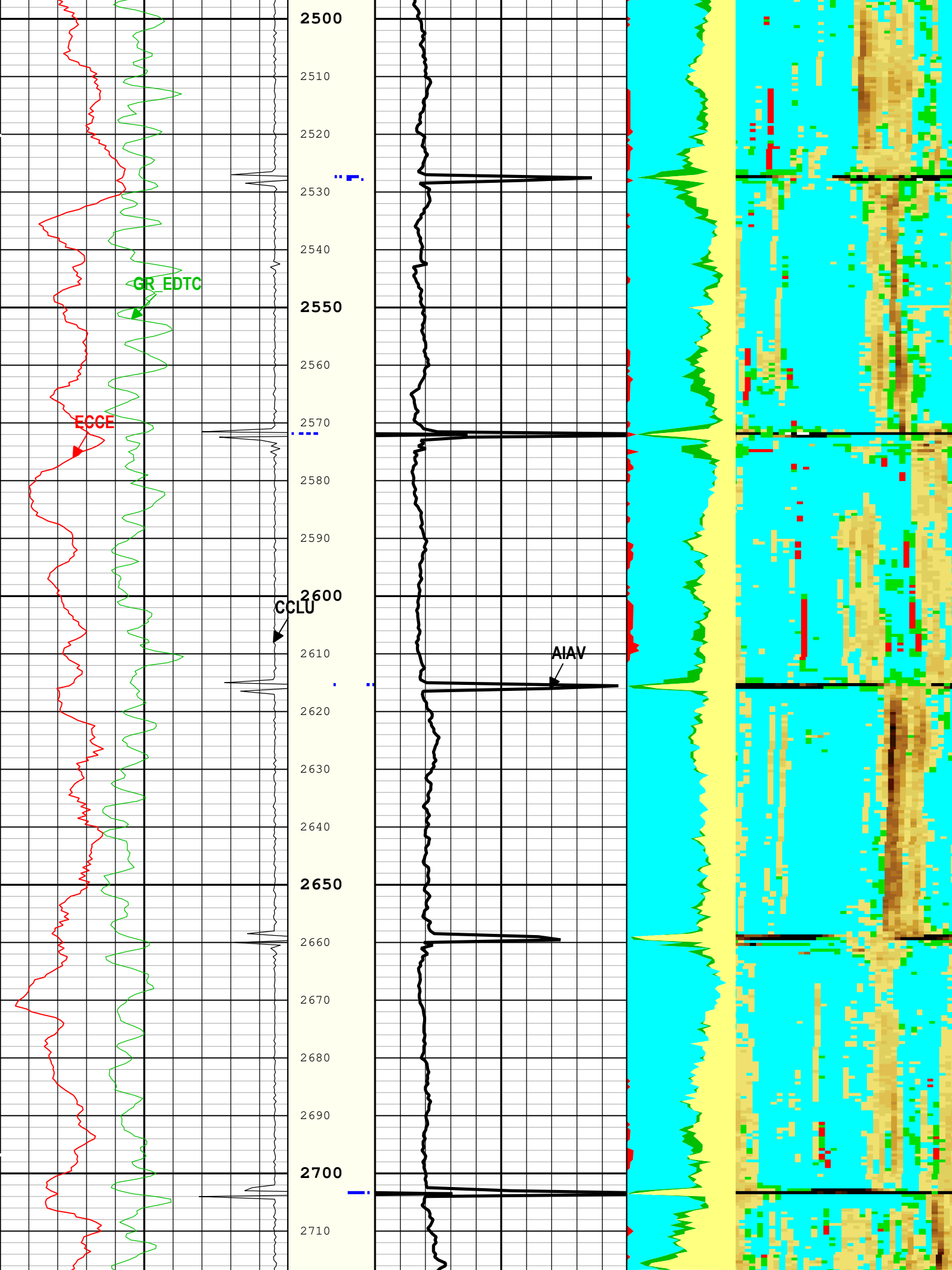


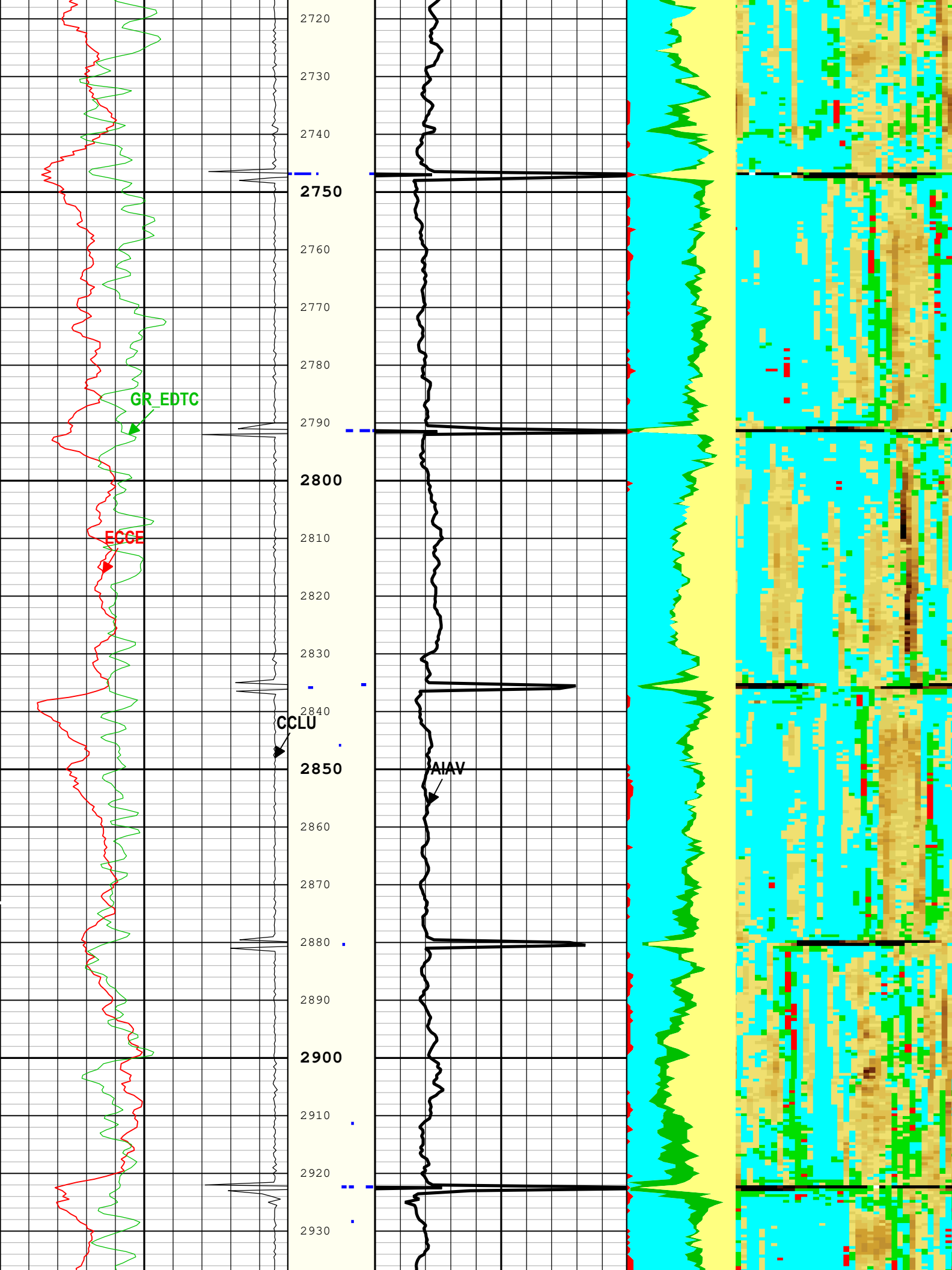


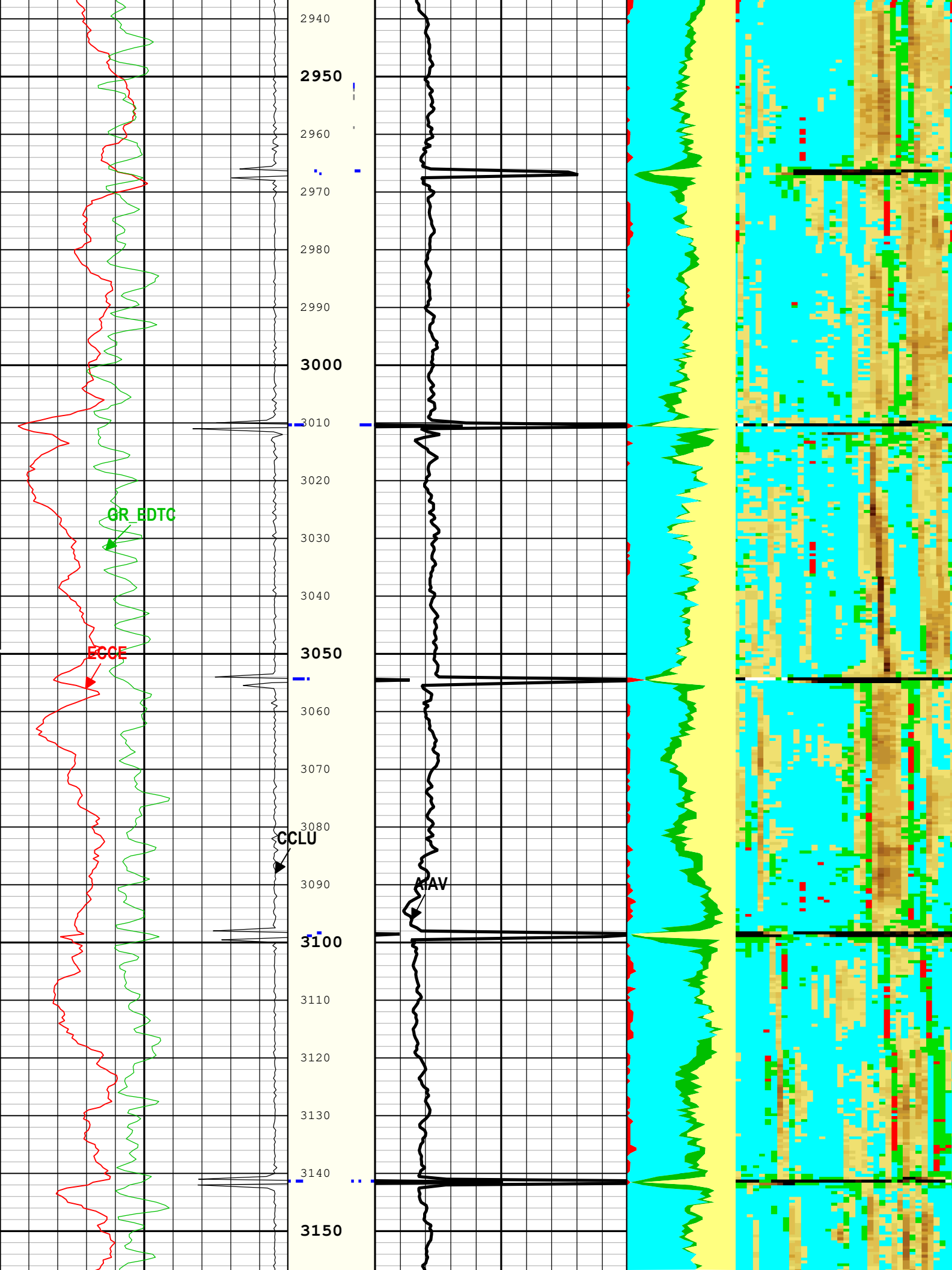


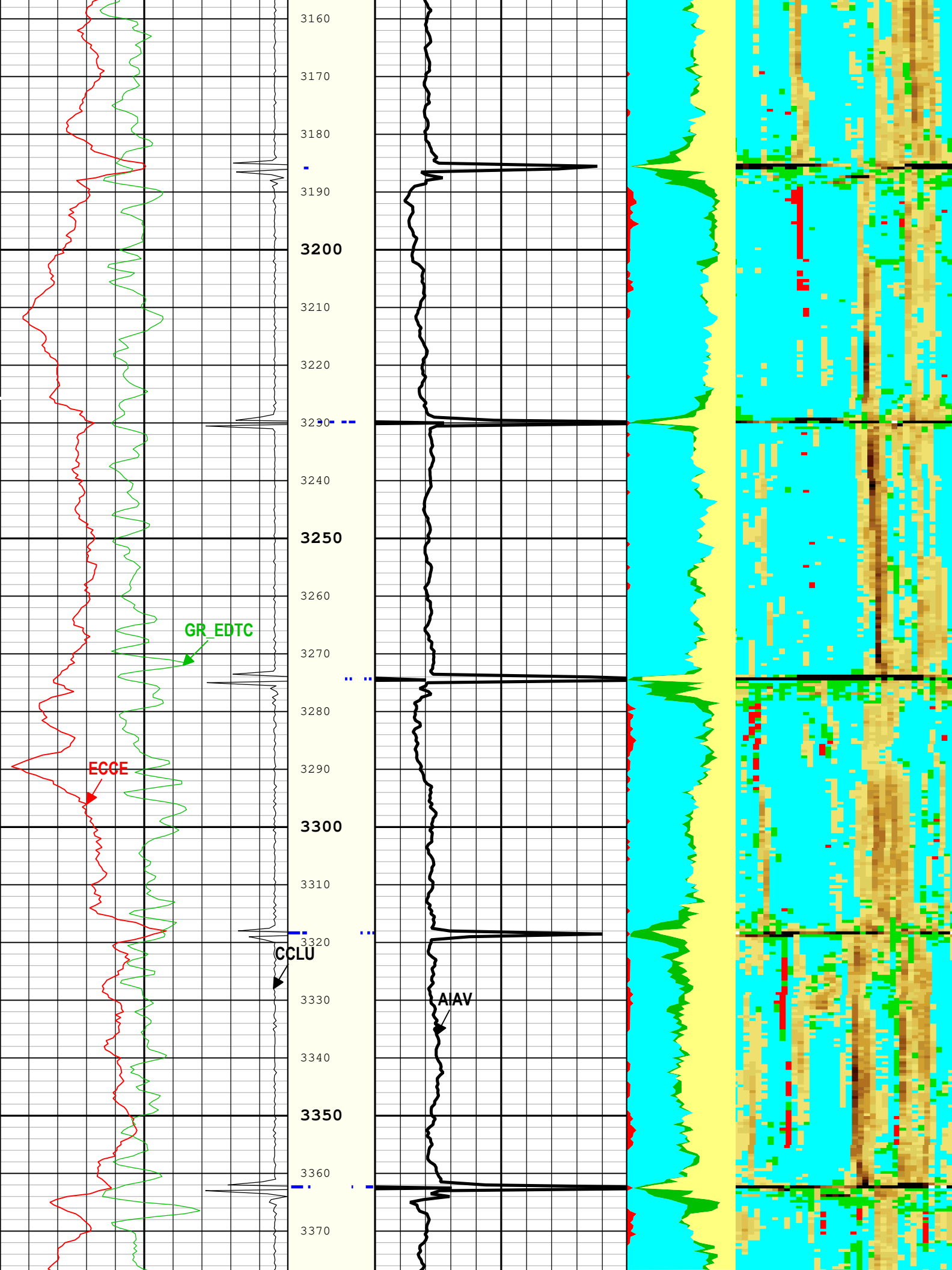


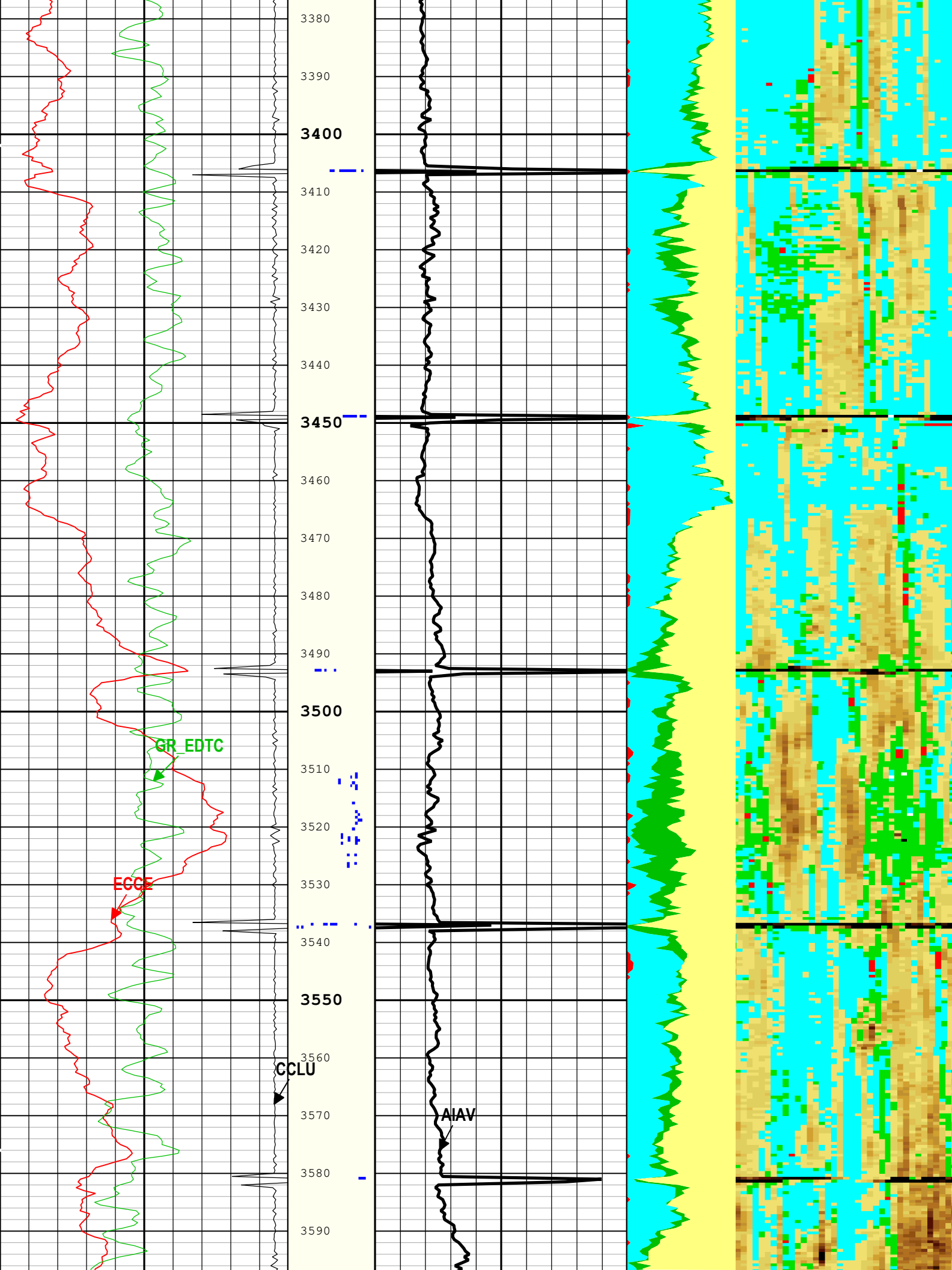


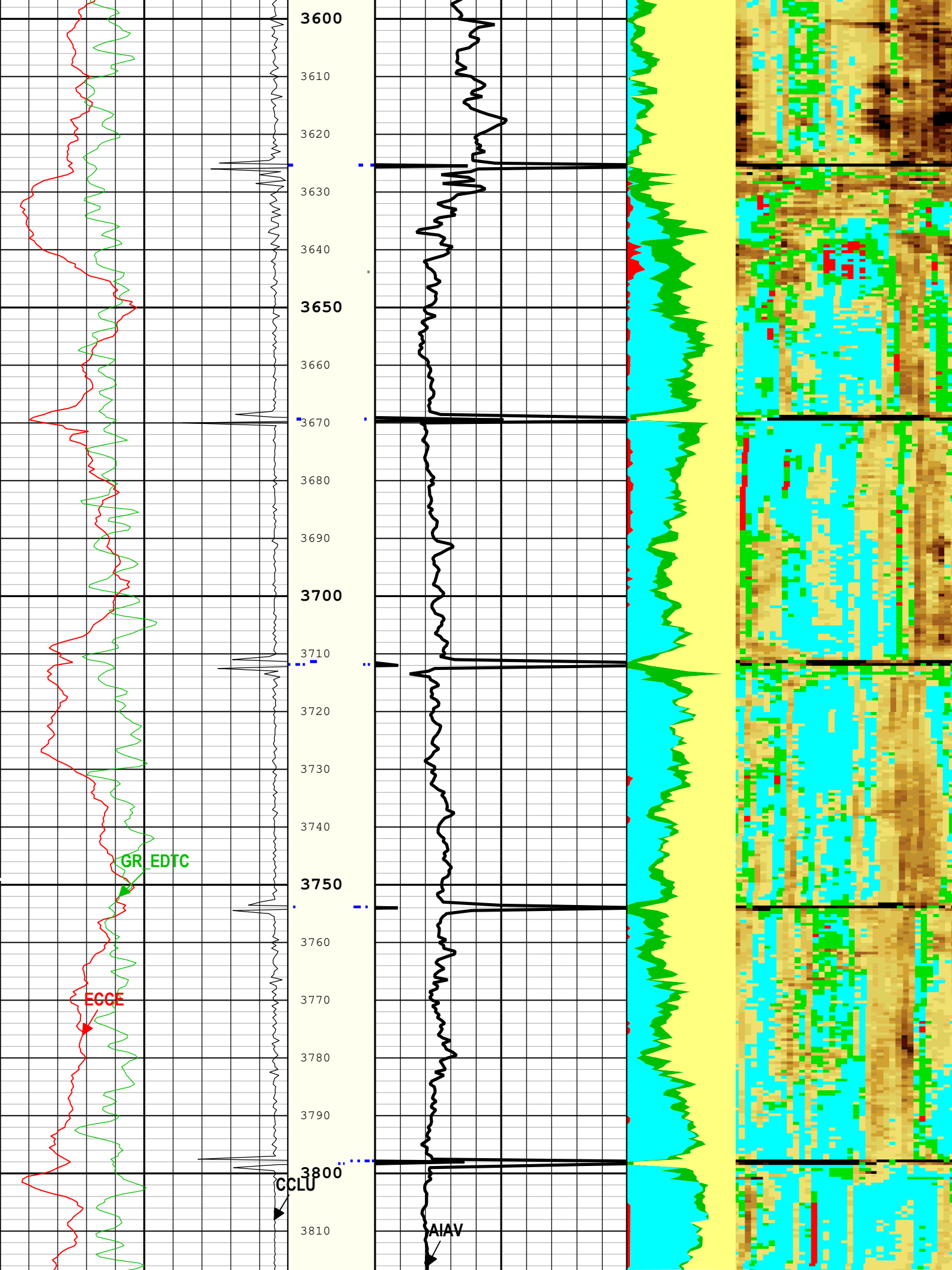


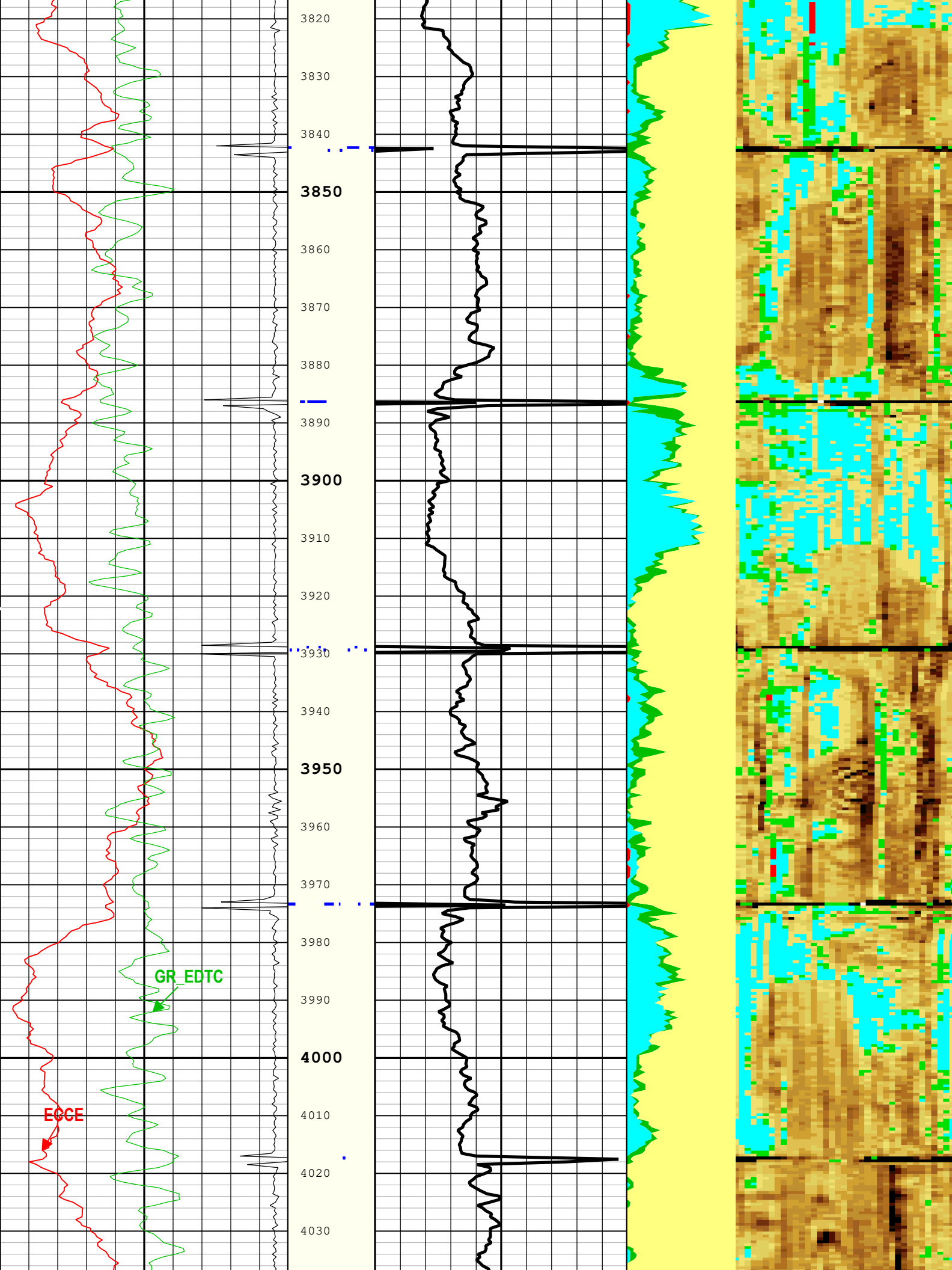


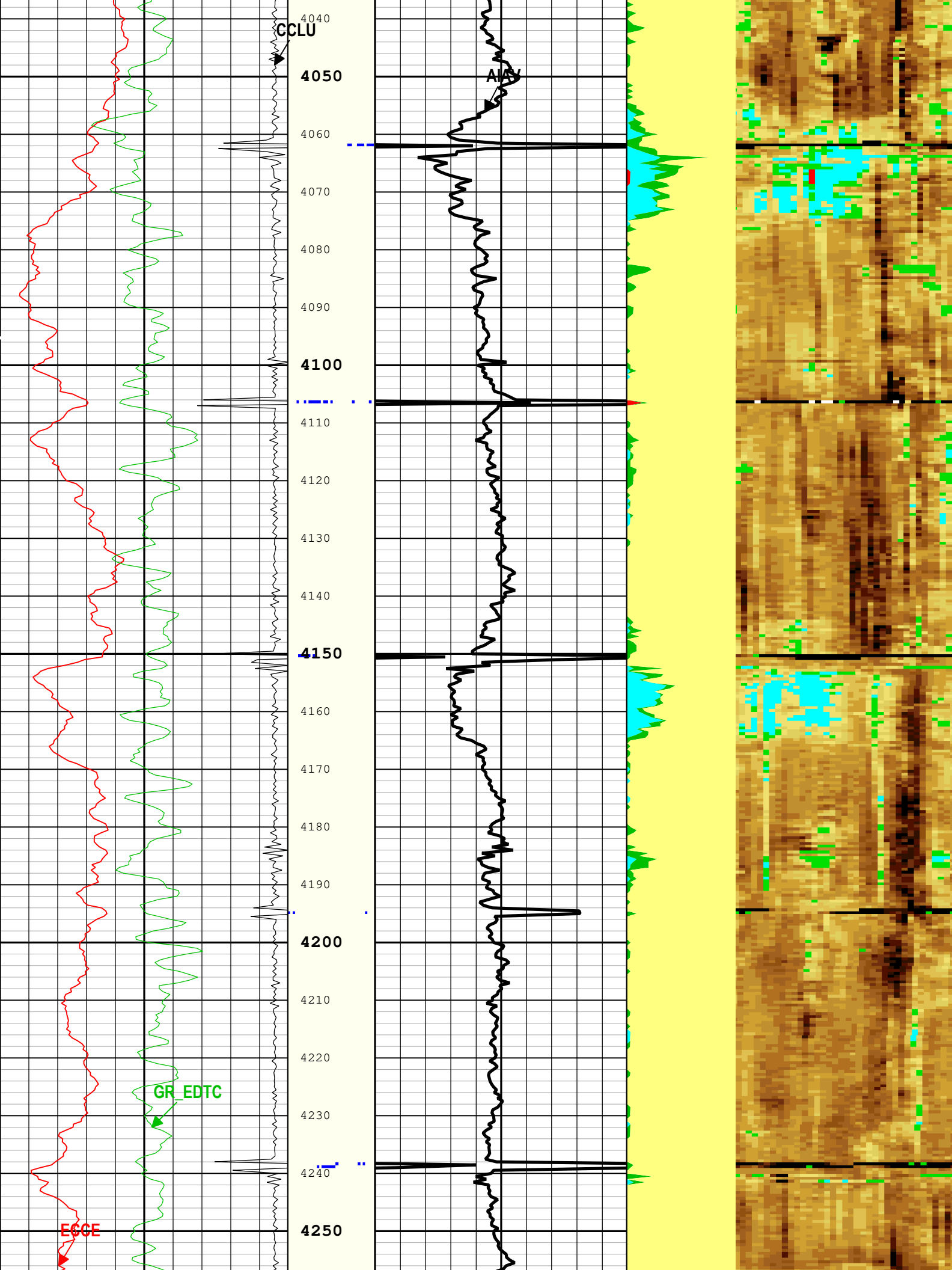


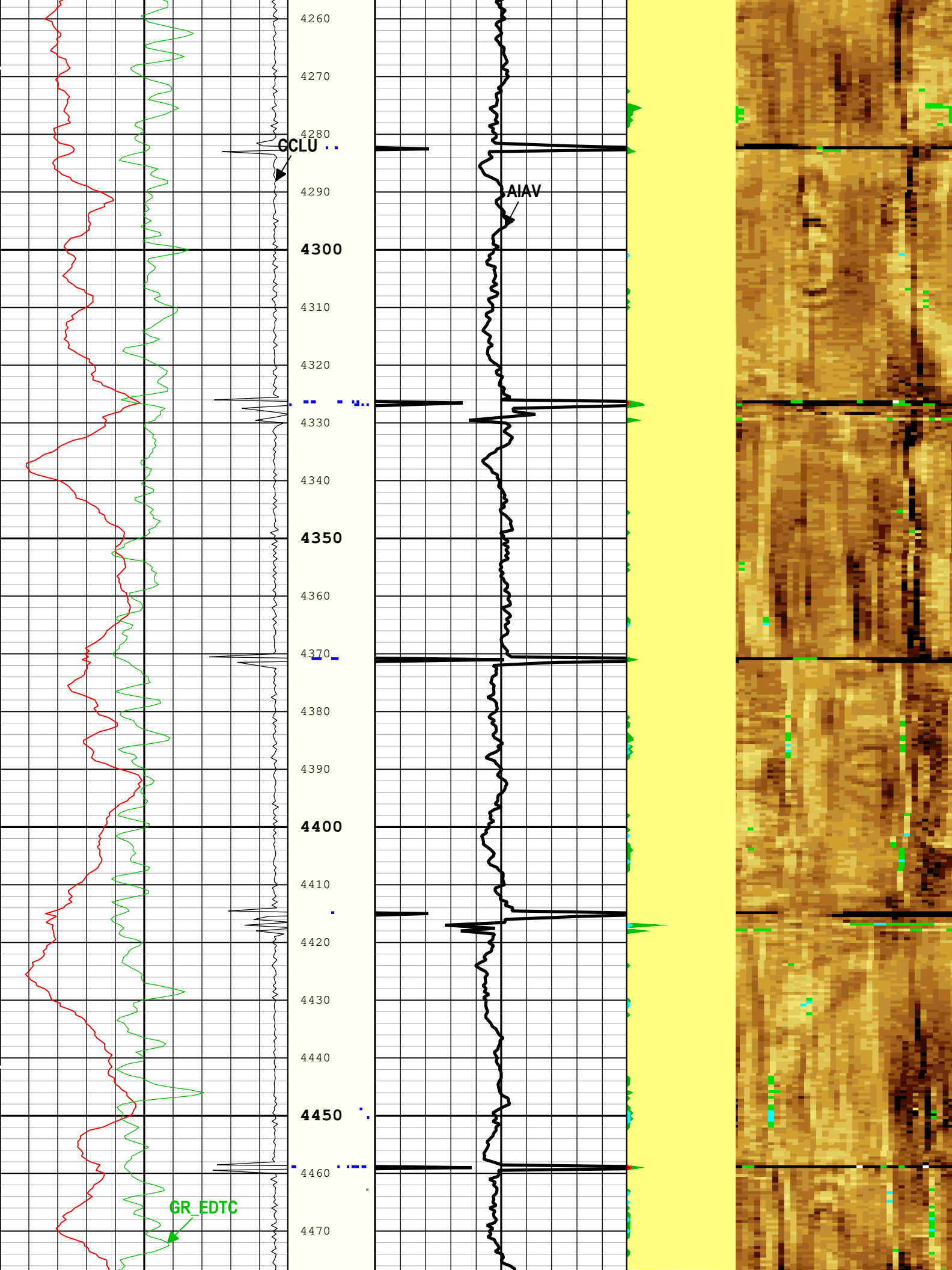


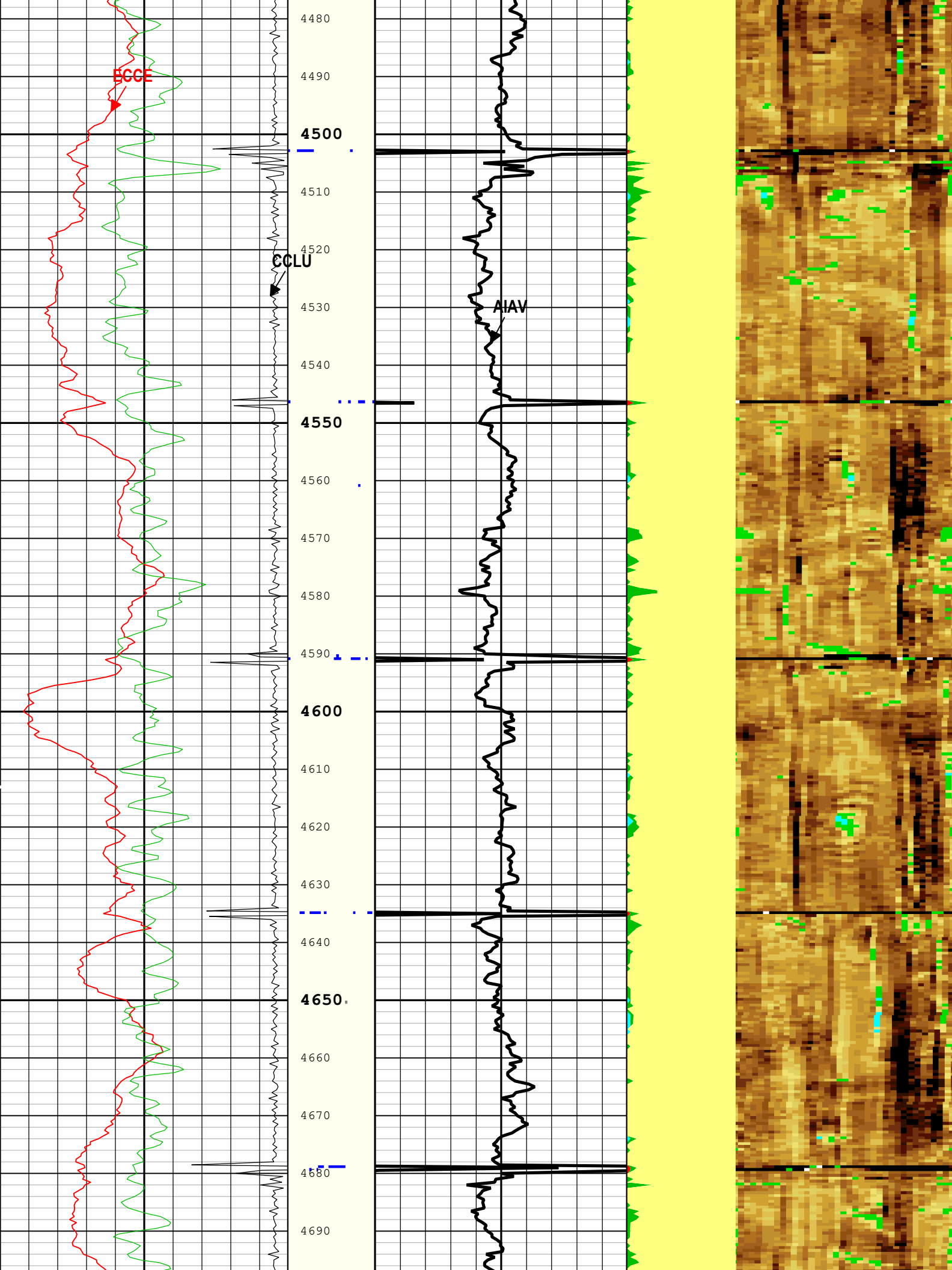


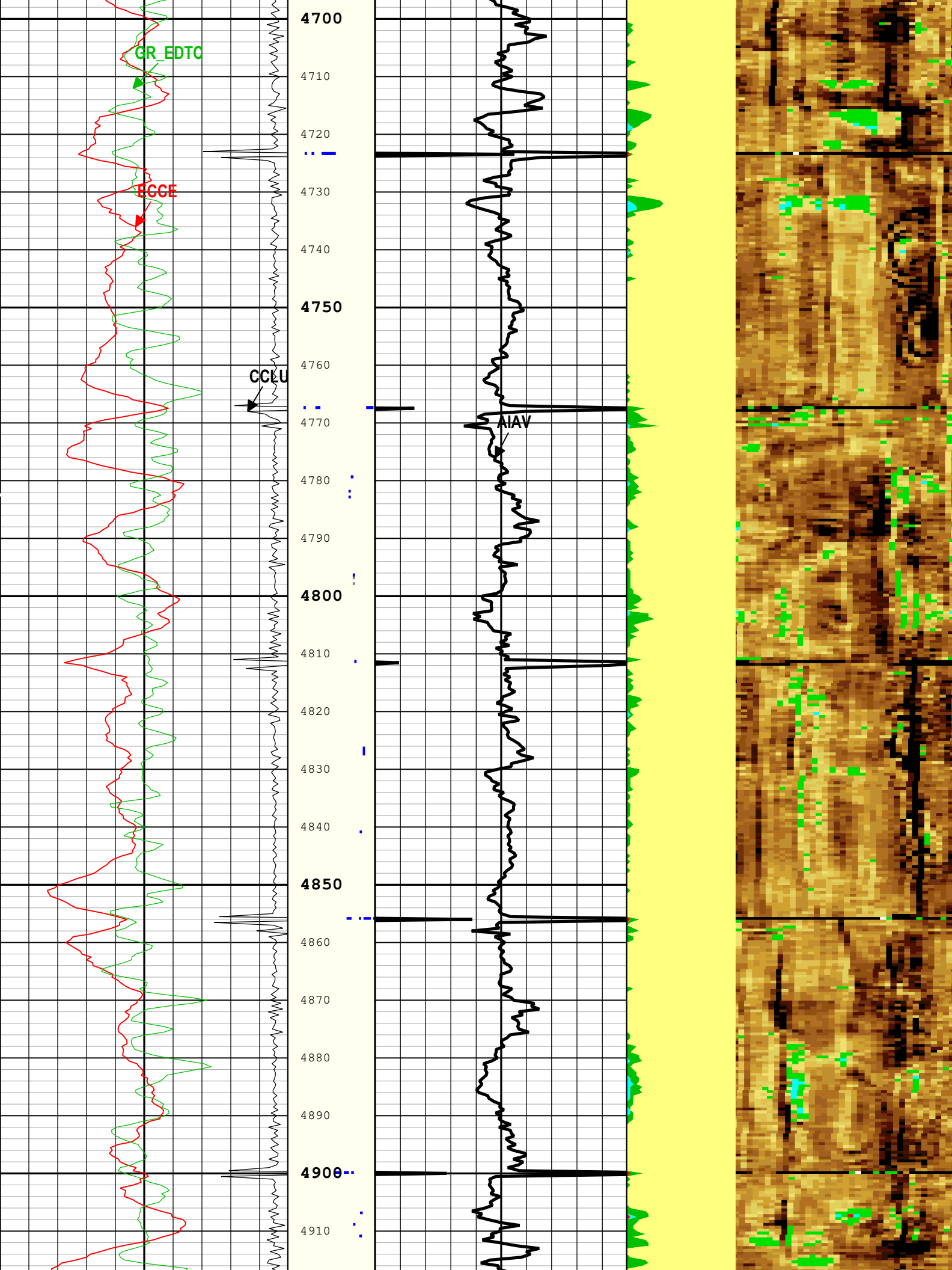


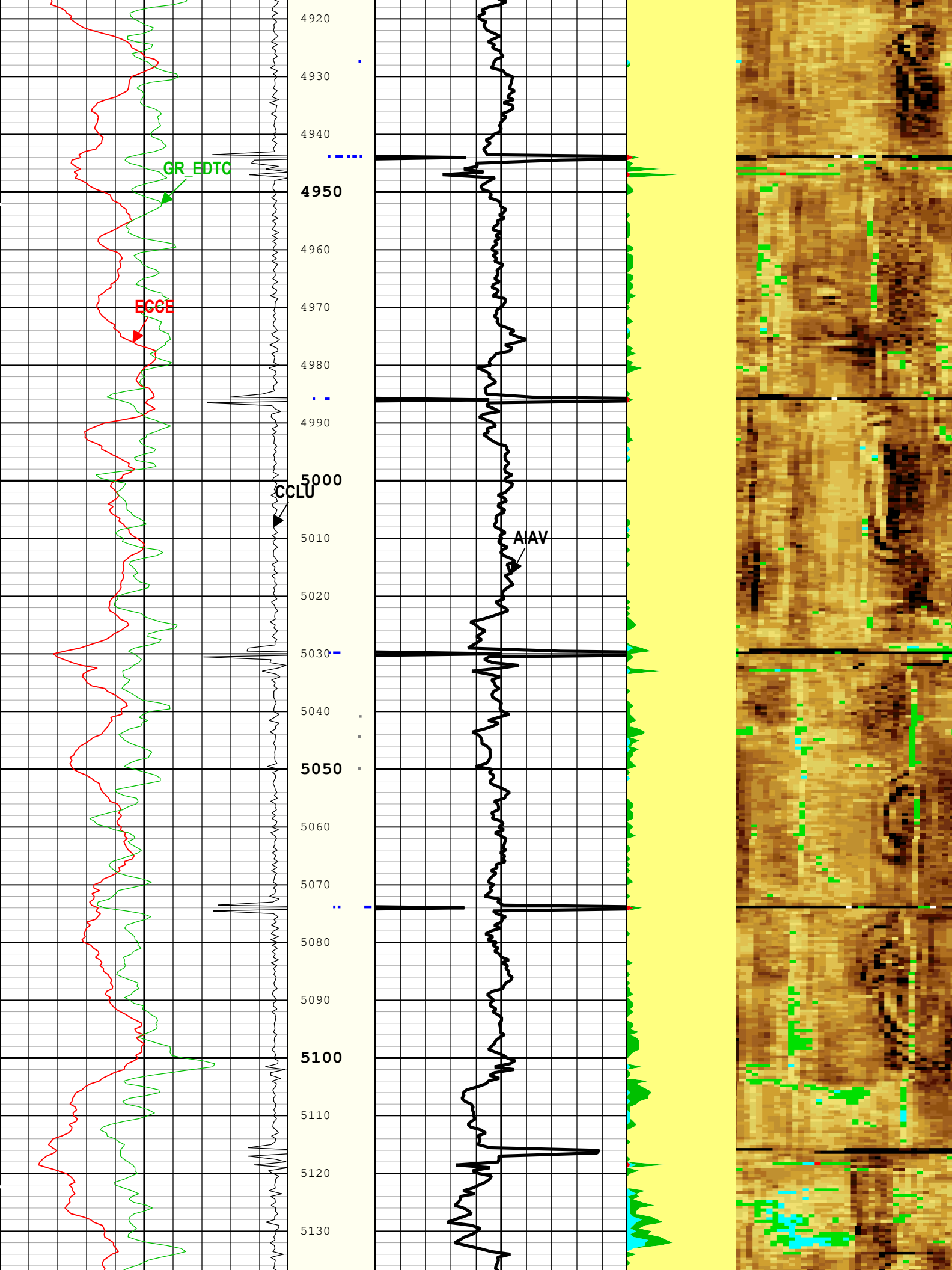


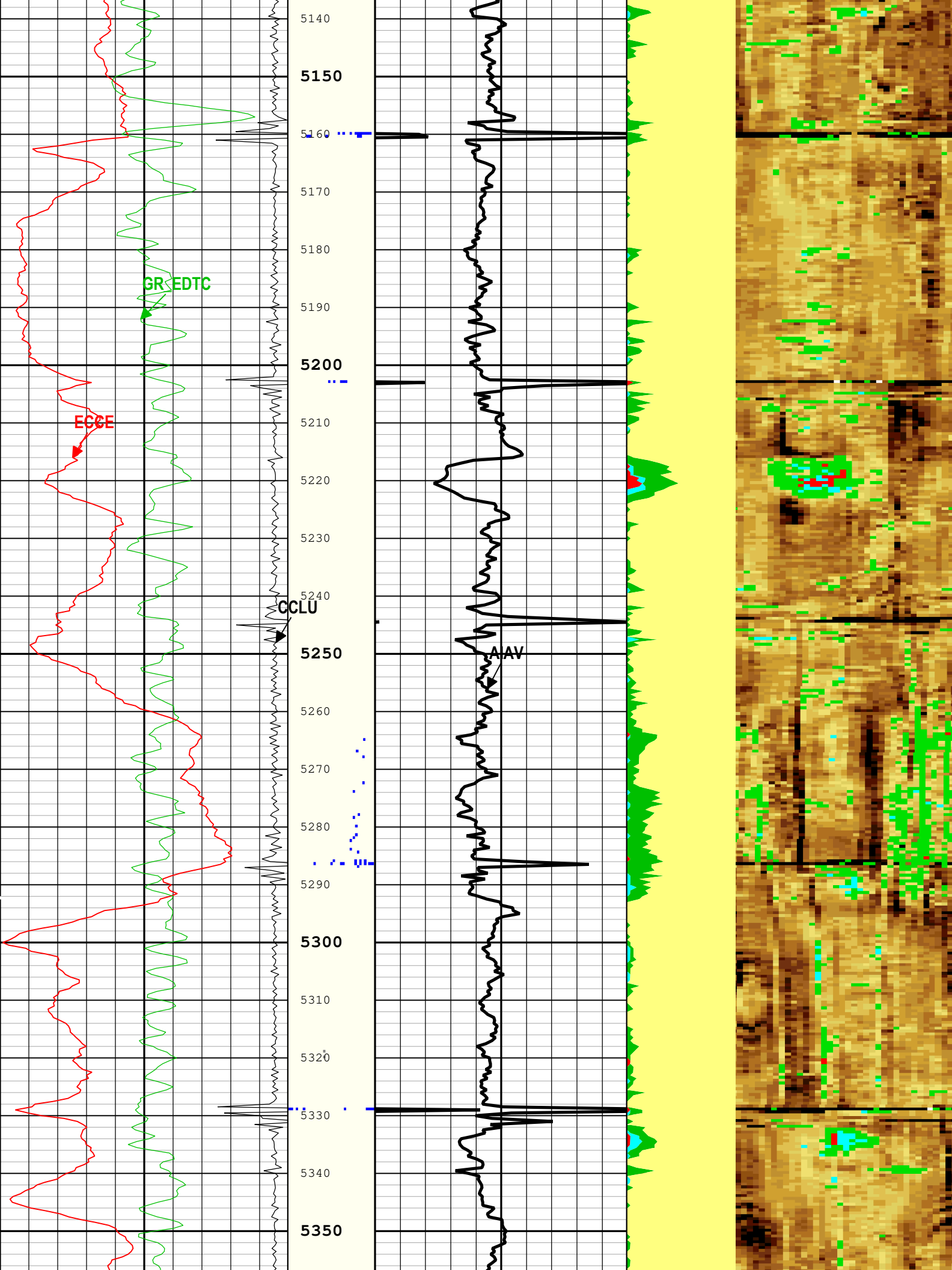


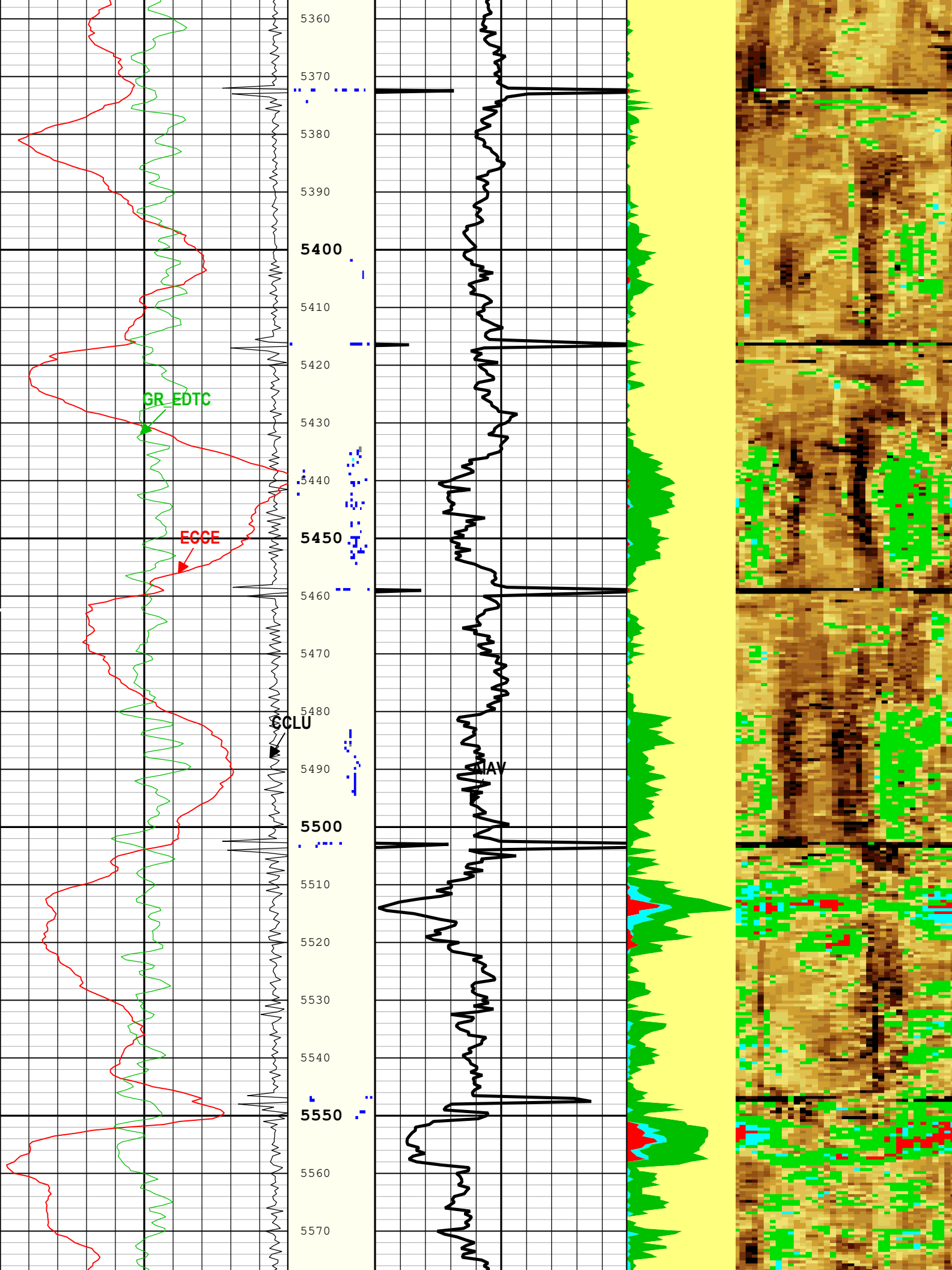


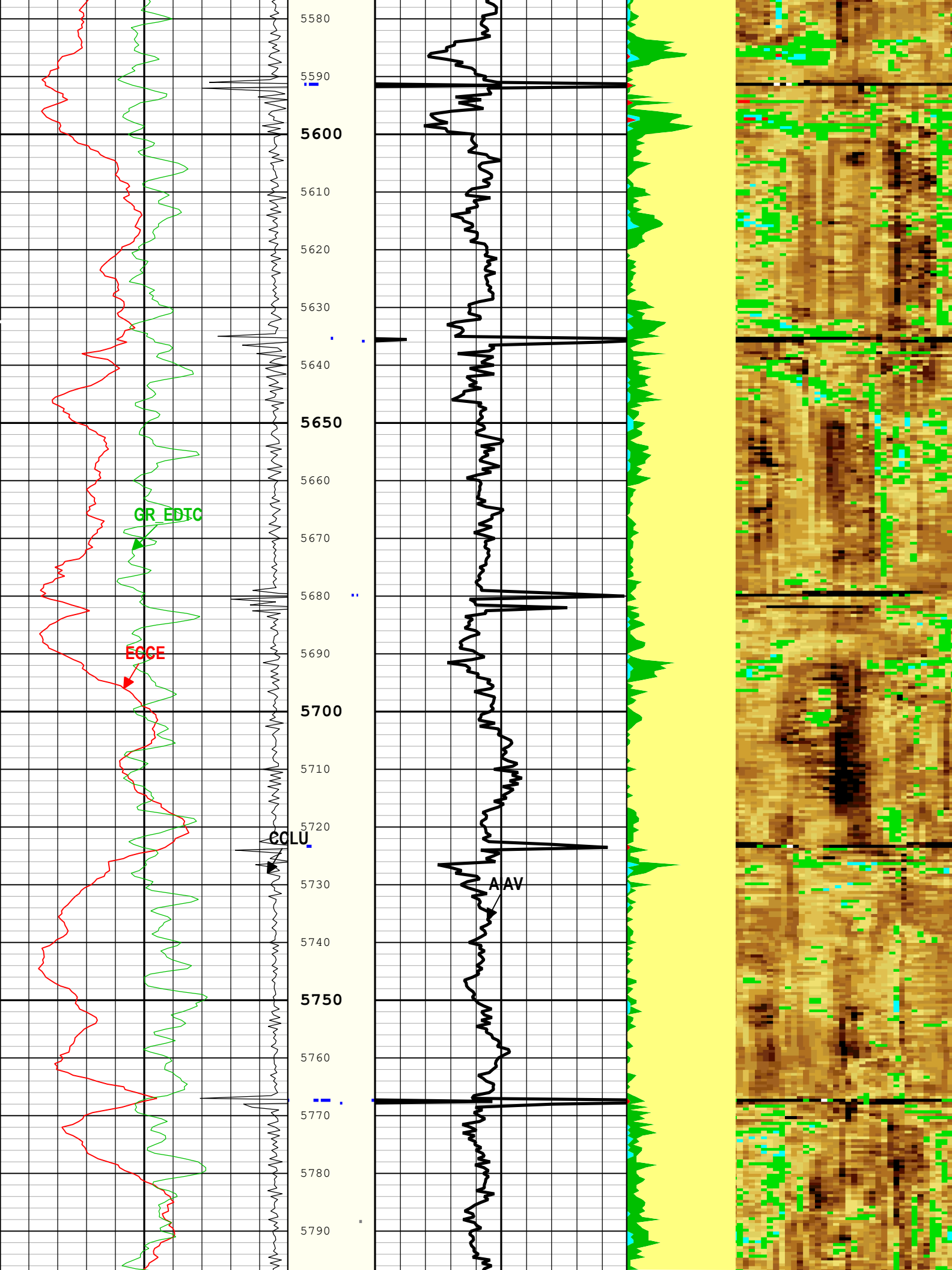


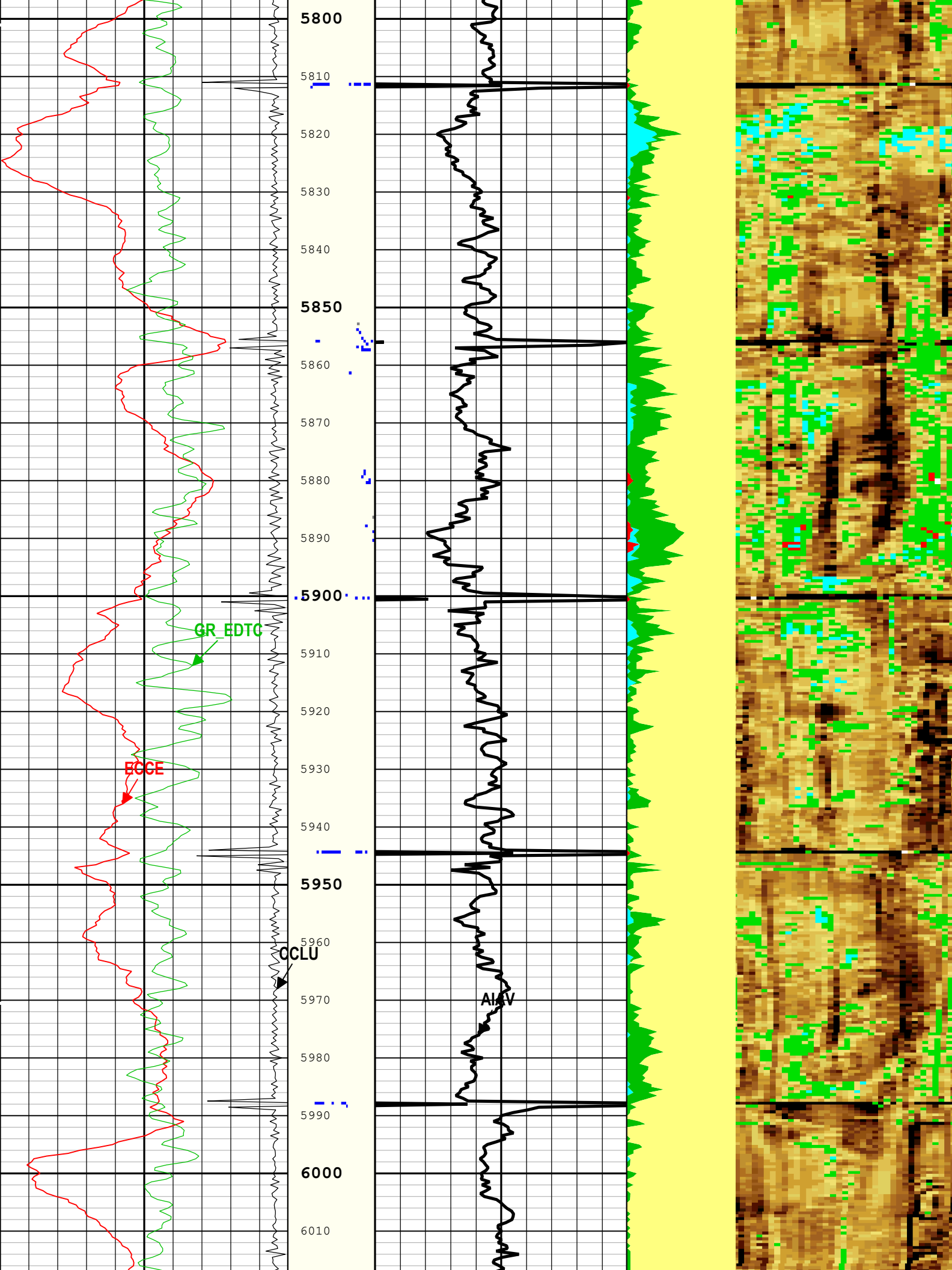


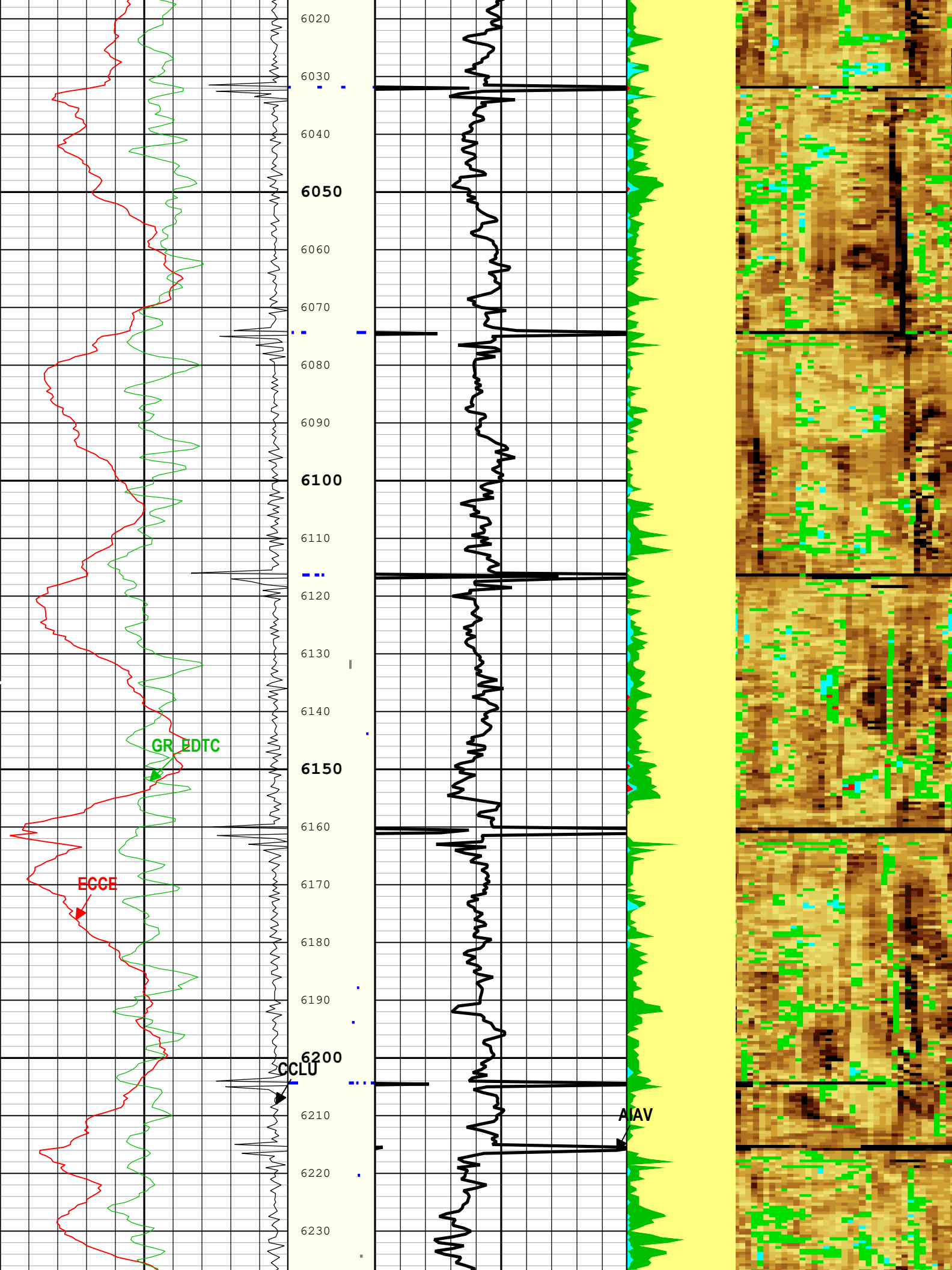


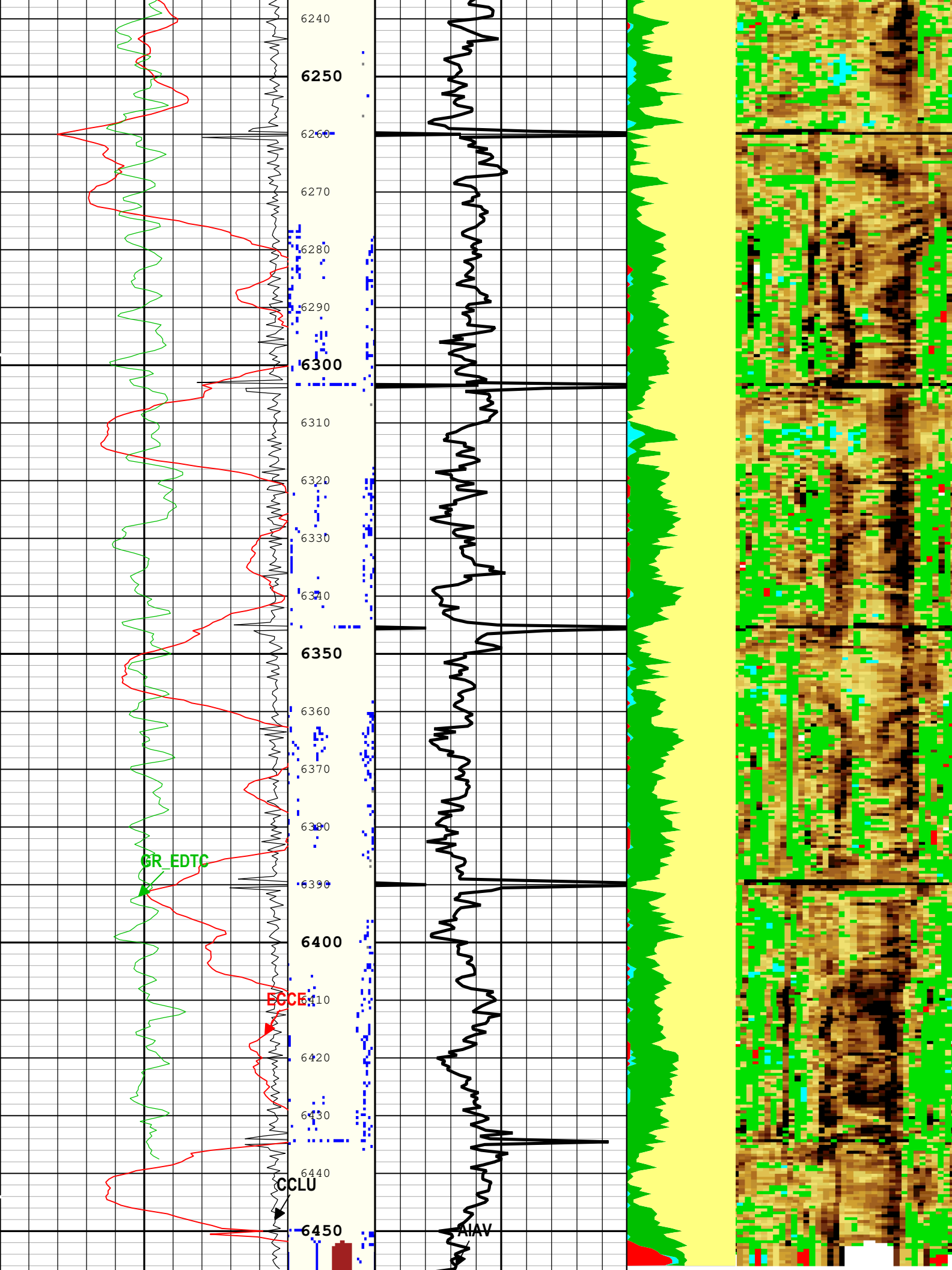












Casing Collar Locator Ultrasonic (CCLU)
USIT-E

-20

in

1

Amplitude of Eccentering (ECCE) USIT-E

0

in

0.5

Calibrated Gamma Ray (GR_EDTC) EDTC-B

0

gAPI

150

Absent

1.500

2.500

6.500

Explicit

Normalization

USIT - USIT

Processing

Flags (UFLG)

USIT-E

Orientation:

Top of Hole

U L B R U

Acoustic Impedance Average (AIAV)
USIT-E

0

Mrayl

10

Gas

Liquid

Micro-Debonding

Bonded

Absent

-500.000

2.200

3.254

4.309

5.363

6.418

7.472

Custom Normalization

USIT - Acoustic Impedance With

Micro-debonding Image

(AI_MDEBOND_IMG) USIT-E

(Mrayl)

Orientation: Top of Hole

U L B R U

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: 03-Dec-2019 14:09:00

Channel Processing Parameters

ONE: Parameters

Parameter	Description	Tool	Value	Unit
BARI(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
HEMA	Hematite Presence Flag	Borehole	No	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	RB	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	18.79	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.32	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.15	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.55	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	1.5	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

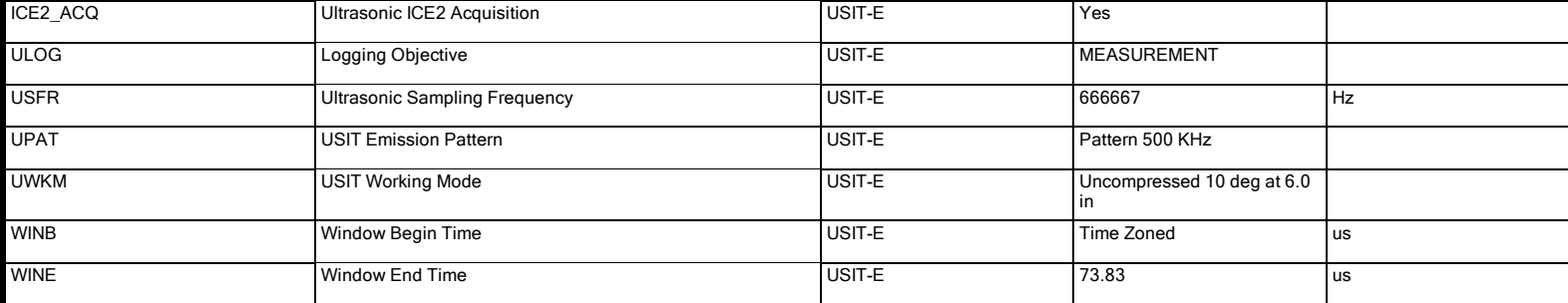
Parameter	Value	Start (ft)	Stop (ft)
BS	26	0	110
BS	13.5	110	1941
BS	8.5	1941	6457.5

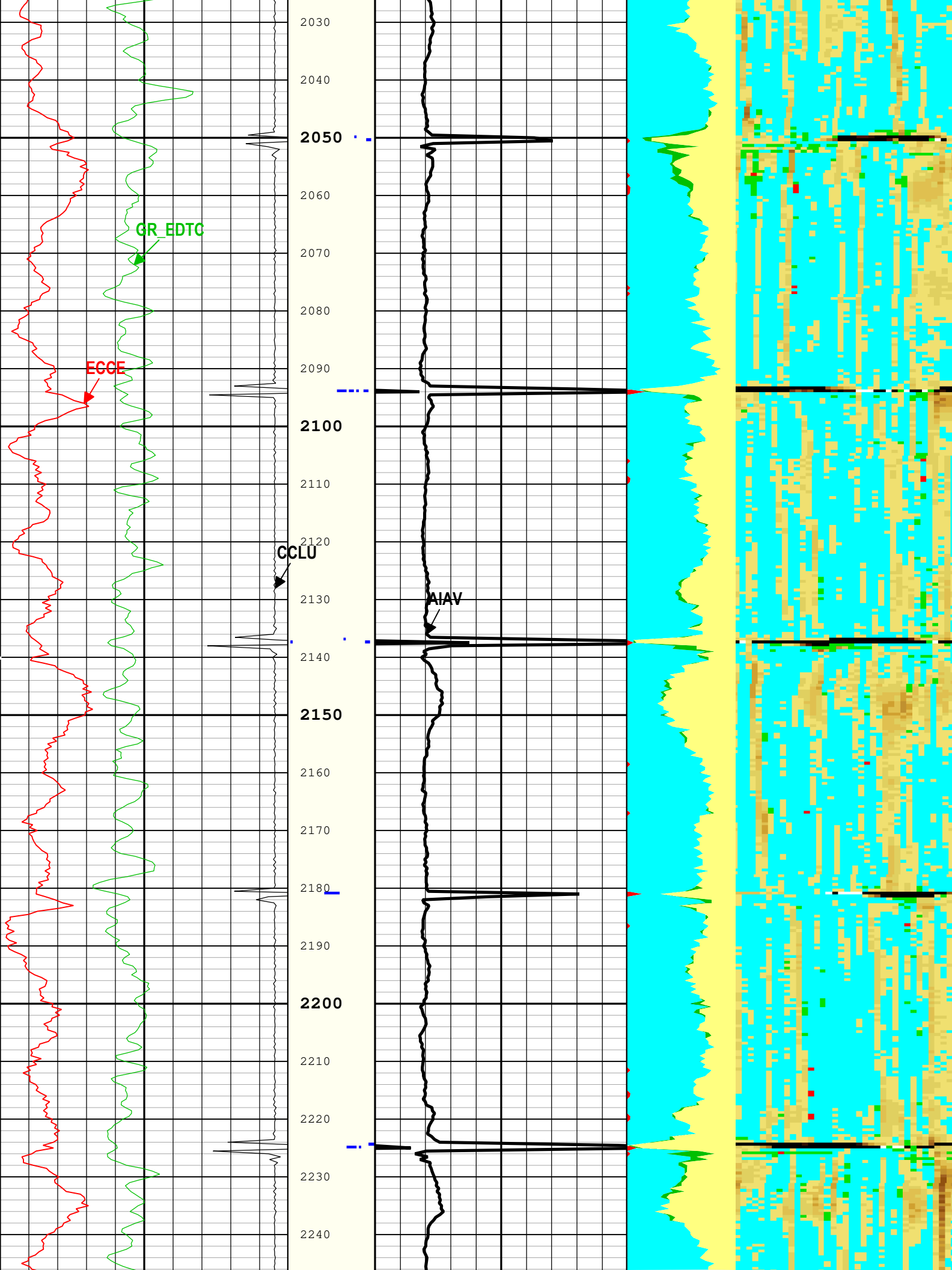
All depth are actual.

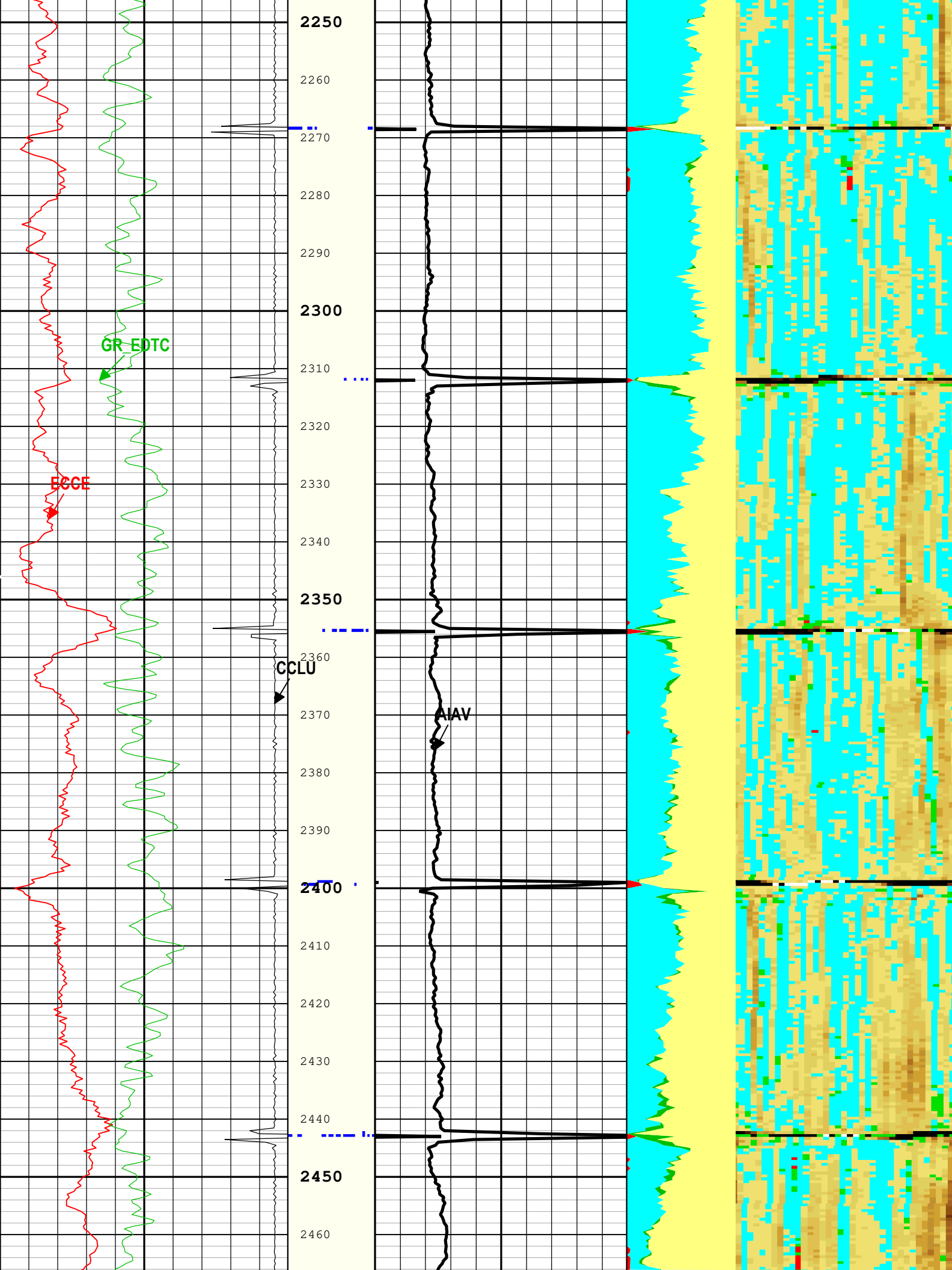
Tool Control Parameters

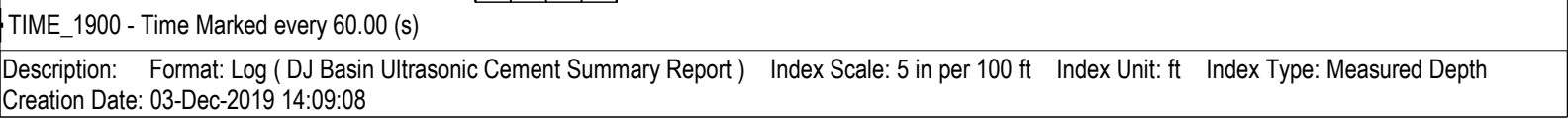
ONE: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
EMXV	EMEX Voltage	USIT-E	Time Zoned	V
HRES	Horizontal Resolution	USIT-E	10 deg	









ONE: Parameters

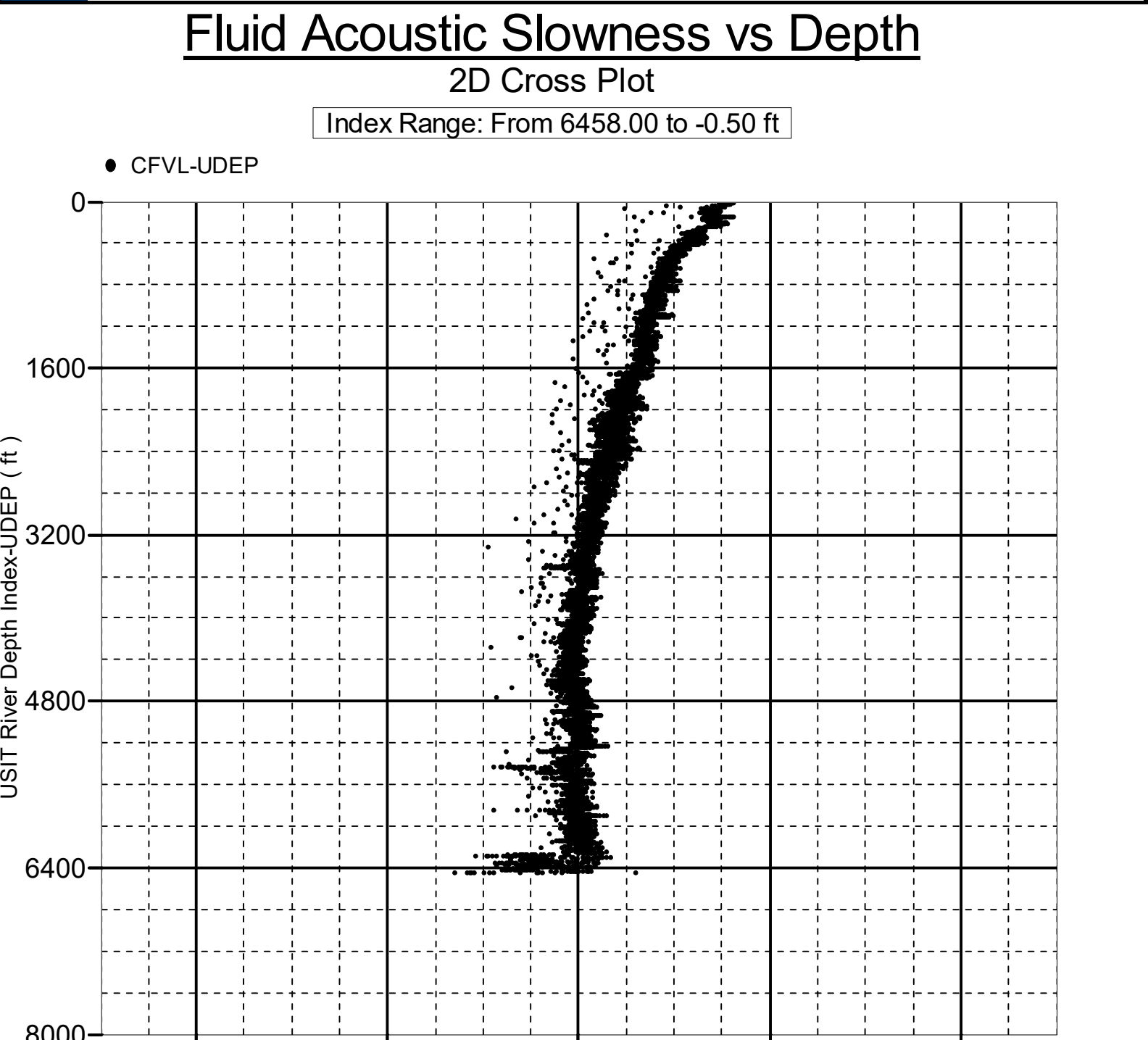
Parameter	Description	Tool	Value	Unit
BARI(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BS	Bit Size	WLSESSION	8.5	in
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
HEMA	Hematite Presence Flag	Borehole	No	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	RB	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	18.79	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.32	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.15	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.55	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	1.5	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

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
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 500 KHz	
UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 6.0 in	
WINB	Window Begin Time	USIT-E	33.83	us
WINE	Window End Time	USIT-E	73.83	us

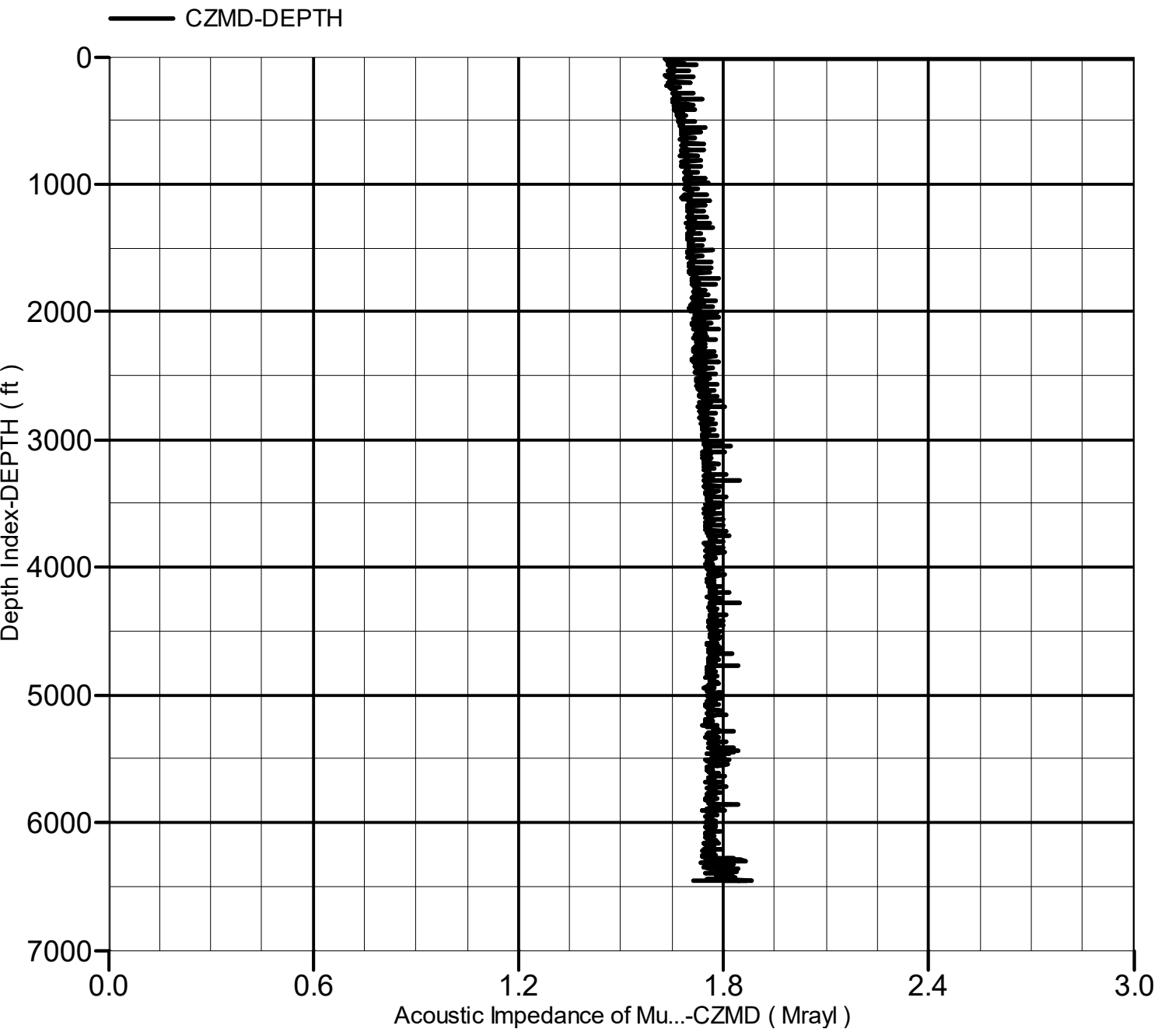
Time Zone Parameters					
Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	20	28-May-2019 12:34:40	28-May-2019 12:35:54	2500.93	2364.1
EMXV	25	28-May-2019 12:35:54	28-May-2019 12:38:34	2364.1	1988.18
All depth are at tool zero.					
XYZ	Company:NOBLE ENERGY INC Well:WELLS RANCH STATE AA36-683 ONE: Log[5]:Up:S014				



Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6458.50 to -0.50 ft



Company: NOBLE ENERGY INC

Schlumberger

Well: WELLS RANCH STATE AA36-683

Field: WATTENBERG

County: WELD

State: COLORADO

UltraSonic Summary Print

