

Company: Noble Energy Inc

Well: Wells Ranch BB11-618

Field: Wattenberg

County: Weld State: Colorado

UltraSonic Summary Print

County: Weld
Field: Wattenberg
Location: SWSW Sec. 11, T5N, R63W
Well: Wells Ranch BB11-618
Company: Noble Energy Inc

Location:		SWSW Sec. 11, T5N, R63W SHL: 535' FSL & 2100' FWL Lat/Long: 40.40881 / -104.41261	Elev.: K.B. 1735.00 ft G.L. 1705.00 ft D.F. 1735.00 ft
Permanent Datum:	Ground Level		Elev.: 1705.00 f
Log Measured From:	Kelly Bushing		30.00 ft above Perm.Datum
Drilling Measured From:	Kelly Bushing		
API Serial No.	Section: 11	Township: 5N	Range: 63W
05-123-44950			

Logging Date 02-Oct-2017

Run Number ONE

Depth Driller 14000.00 ft

Schlumberger Depth 6230.00 ft

Bottom Log Interval 6230.00 ft

Top Log Interval 45.00 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 1972.00 ft

To 6230.00 ft

Casing/Tubing Size 5.5 in

Weight 20 lbm/ft

Grade P110

From 0.00 ft

To 6230.00 ft

Max Recorded Temperatures 216.9 degF

Logger on Bottom 02-Oct-2017 14:14:00

Unit Number 2161

Recorded By A.BLOCHOWICZ Fort Morgan, CO

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.

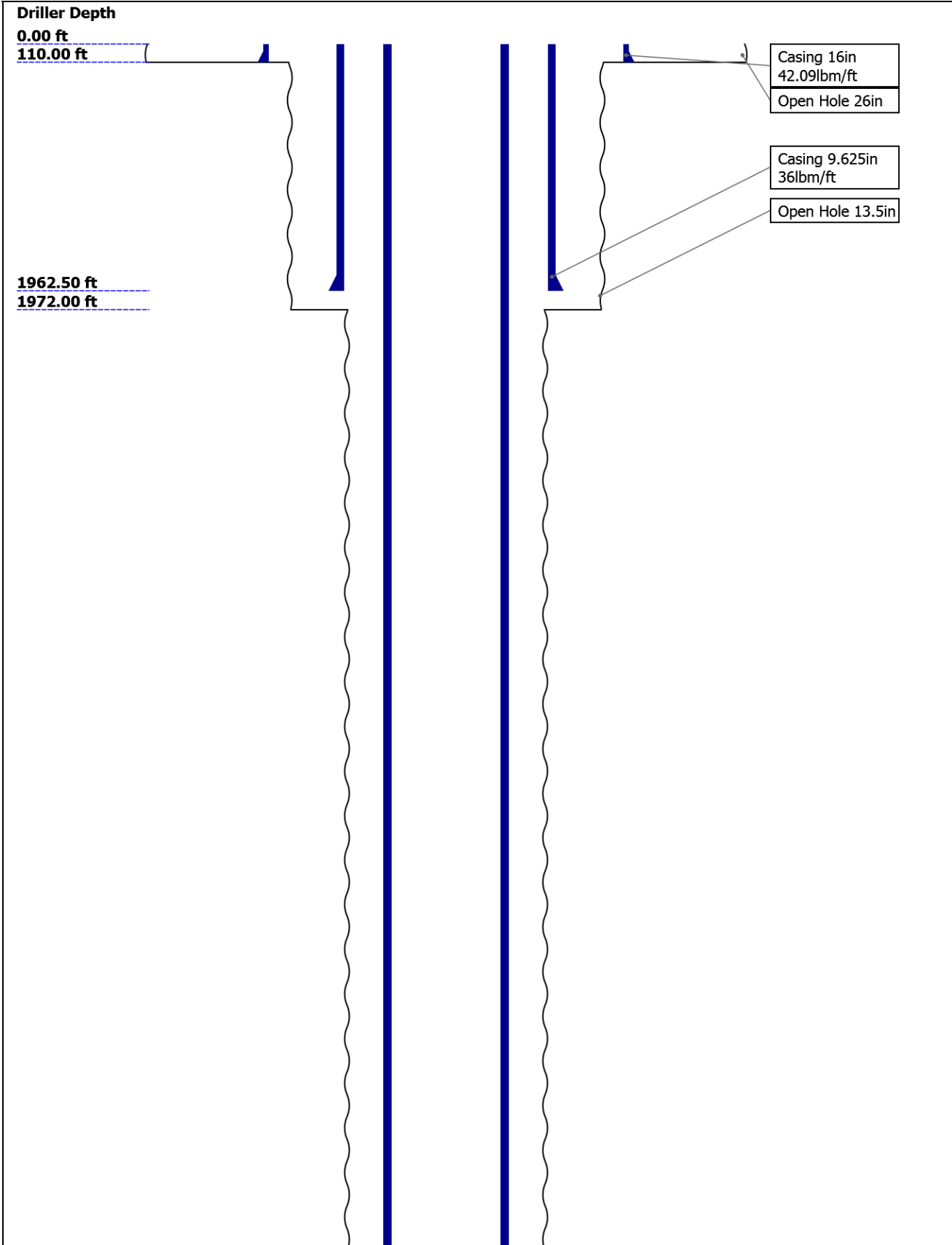
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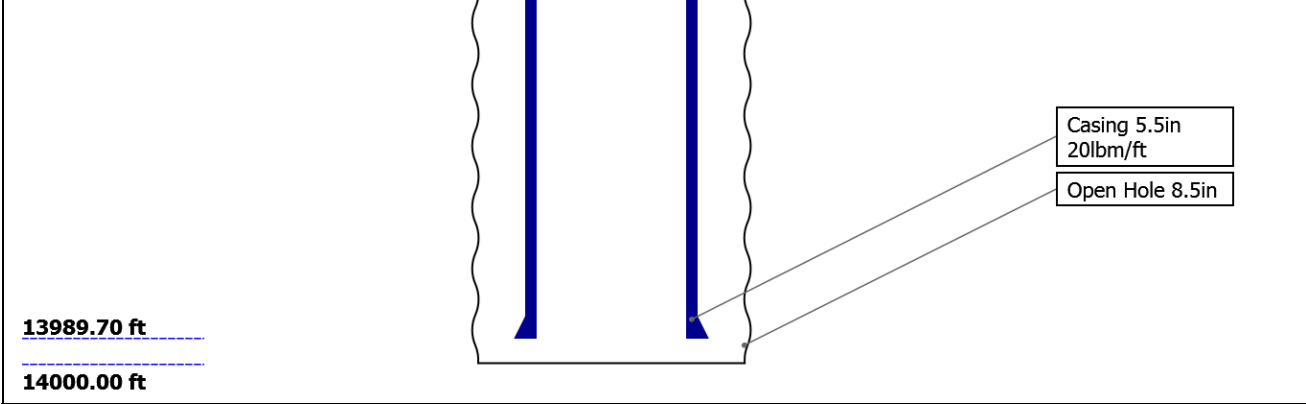
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Well Sketch





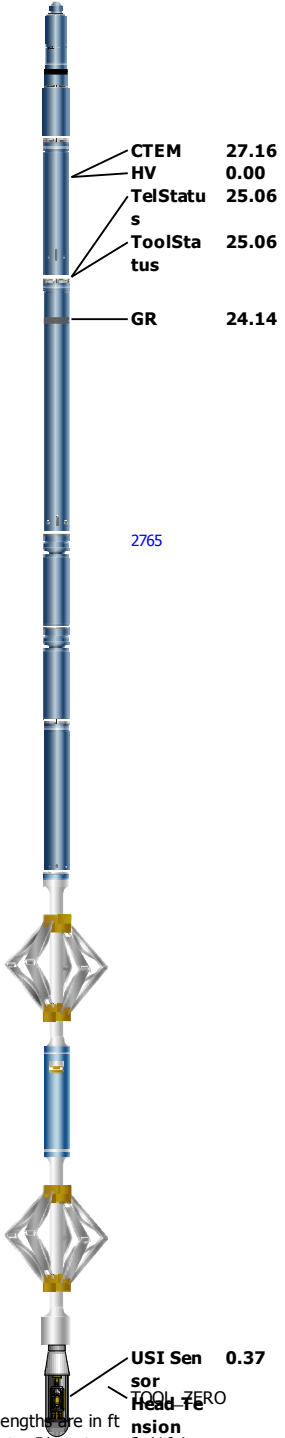
Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	0	110	1972			
Top Logger (ft)	0	110	1972			
Bottom Driller (ft)	110	1972	14000			
Bottom Logger (ft)	110	1972	6230			
Casing						
Size (in)	16	9.625	5.5			
Weight (lbm/ft)	42.09	36	20			
Inner Diameter (in)	15.511	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	1962.5	13989.7			
Bottom Logger (ft)	110	1962.5	6230			

Operational Run Summary

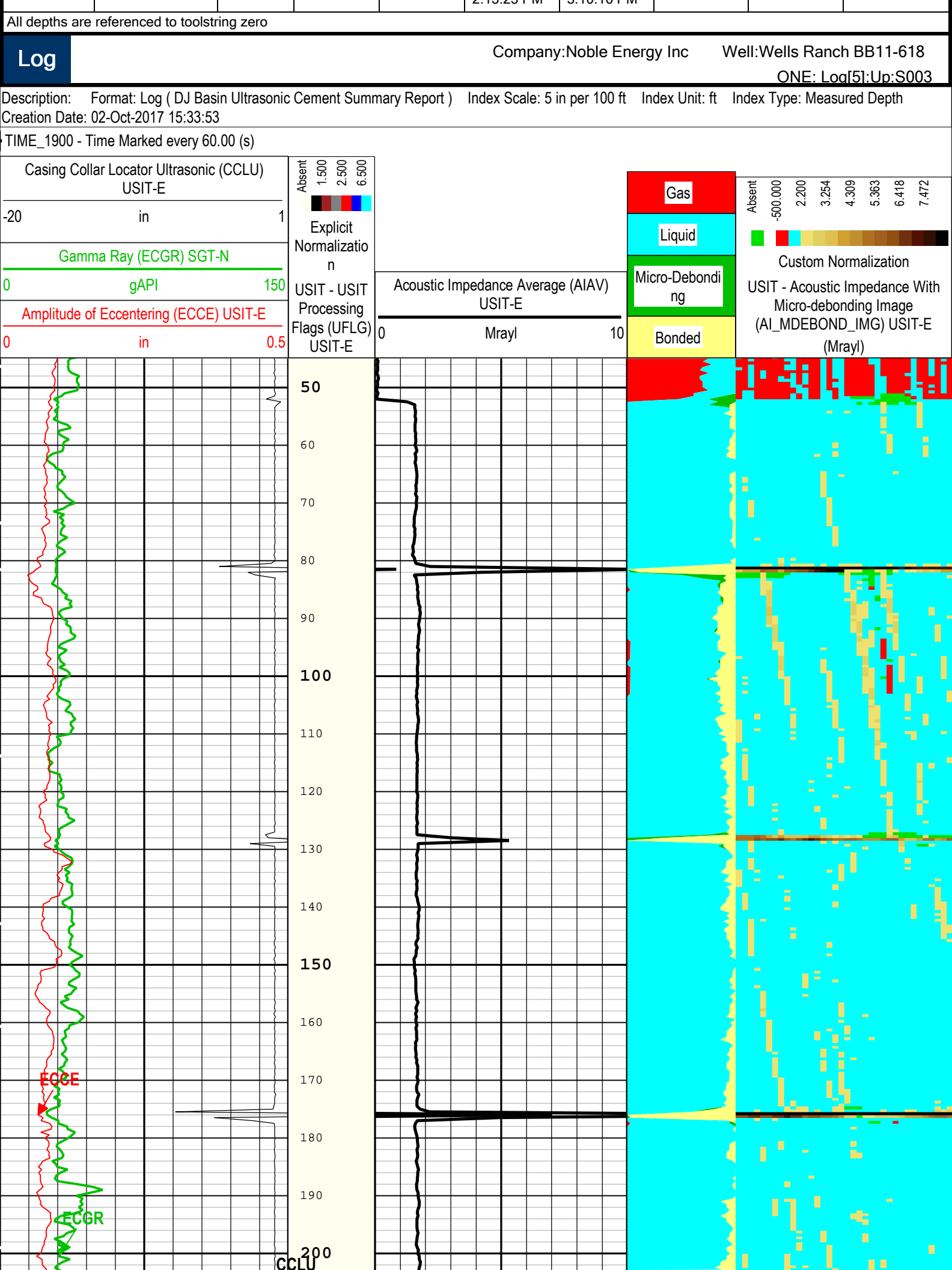
Parameter (unit)	ONE					
Date Log Started	02-Oct-2017					
Time Log Started	13:40:50					
Date Log Finished	02-Oct-2017					
Time Log Finished	15:10:32					
Top Log Interval (ft)						
Bottom Log Interval (ft)						
Total Depth (ft)	6230.00					
Max Hole Deviation (deg)						
Azimuth of Max Deviation (deg)						
Bit Size (in)	8.500					
Logging Unit Number	2161					
Logging Unit Location	Fort Morgan, CO					
Recorded By	A.BLOCHOWICZ					

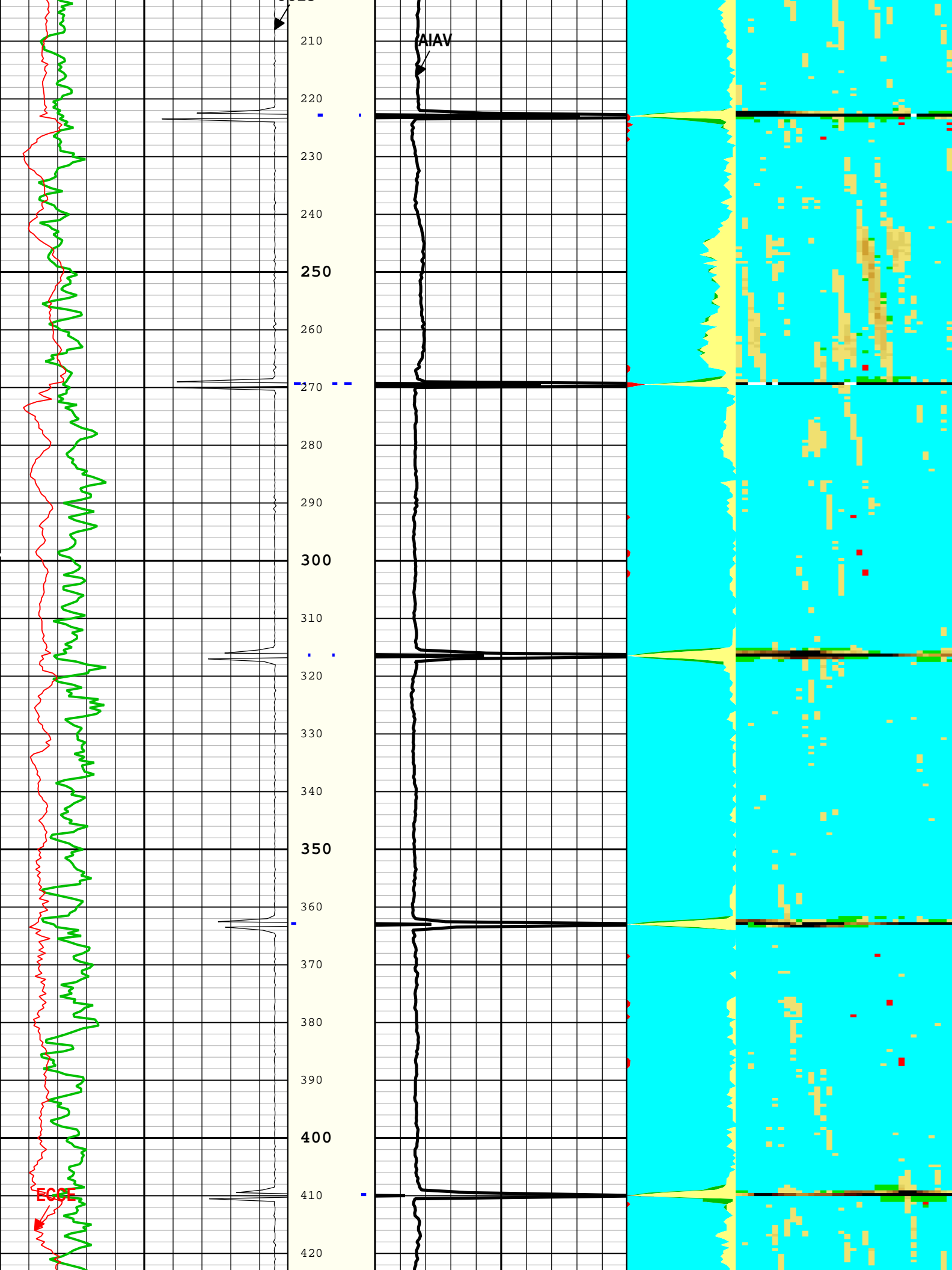
Witnessed By	BILL MANSFIELD					
Service Order Number	DXCR-00001					

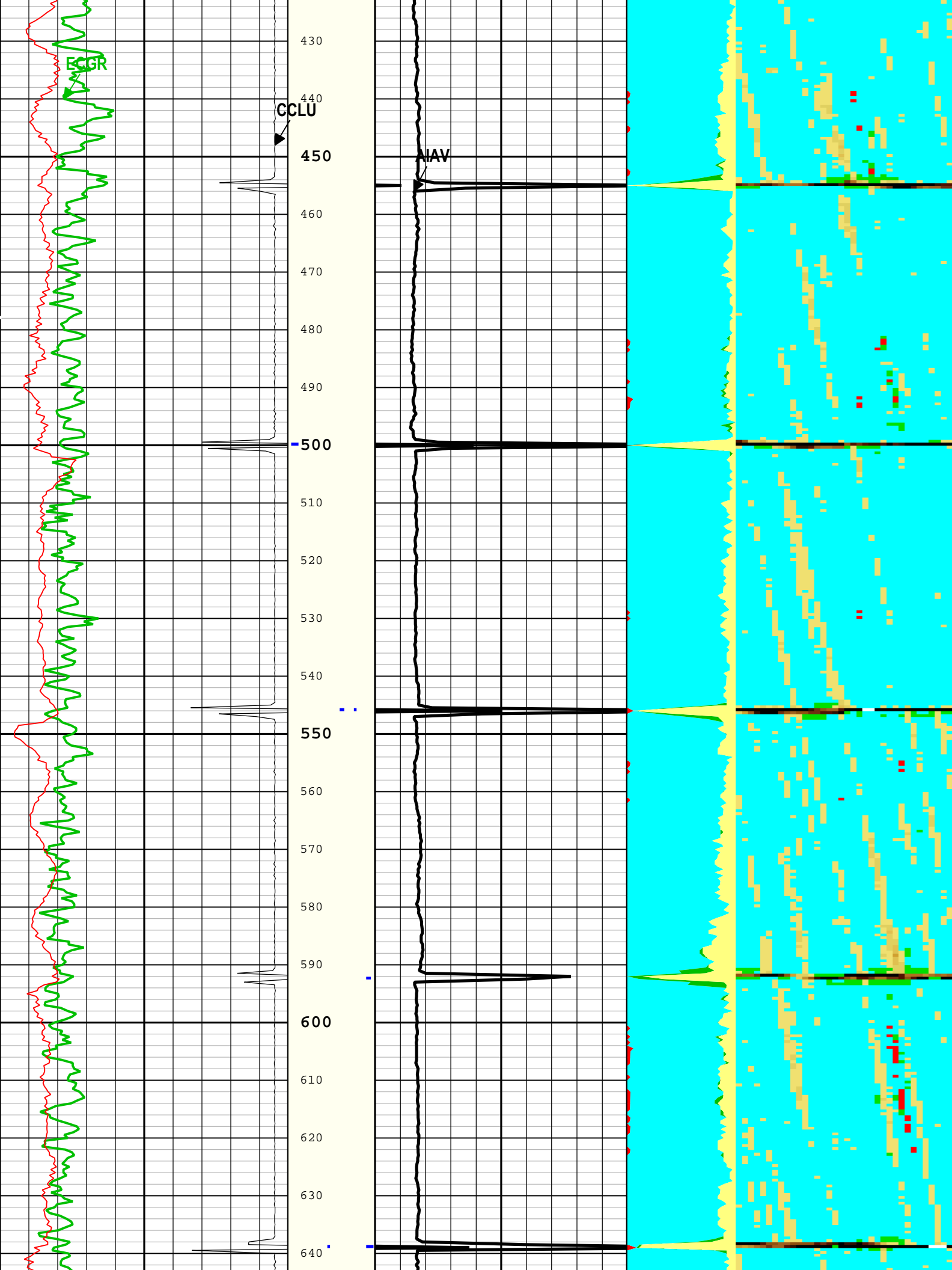
Remarks and Equipment Summary						
ONE: Toolstring			ONE: Remarks			
Equip name Length LEH-QT 30.97 LEH-QT DTC-H:86 28.06 02 ECH-KC:9 680 DTC-H:860 2 SGT-N:97 25.06 47 SGH-K:260 5 SGC-TB:97 47 SGD-TAA: 21259 AH-184[2] 19.56 AH-184[1]:5941 17.56 USIT-E:93 15.56 0 ECH-MFA: 1924 USAC-A:9 30 USIS-A:18 26 USSC-B:17 78 USRS-AB: 873 USI-SENS OR:1014 USI-TX			Thank you for choosing Schlumberger!			
			Tool string run as per tool sketch.			
			This is the first log in well.			
			Main Pass: 2500 PSI Repeat Pass: 0 PSI			
			BHT: 211.2 deg F			
			Tail/Lead: 15.2# / 13.5#			

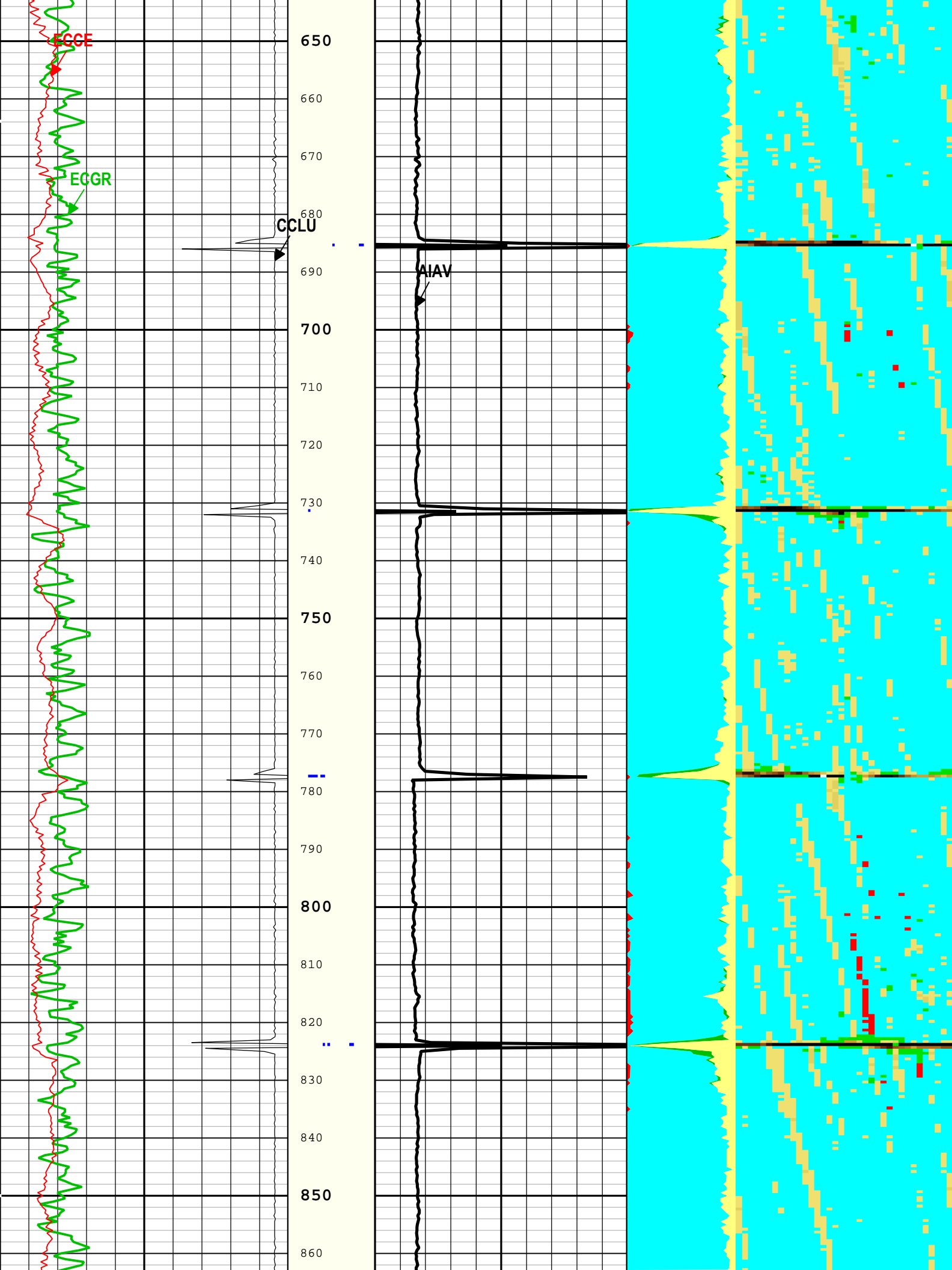
Depth Summary					
		ONE			
Depth Measuring Device					
Type	IDW-B				
Serial Number	5836				
Calibration Date	12-SEP-2017				
Calibrator Serial Number					

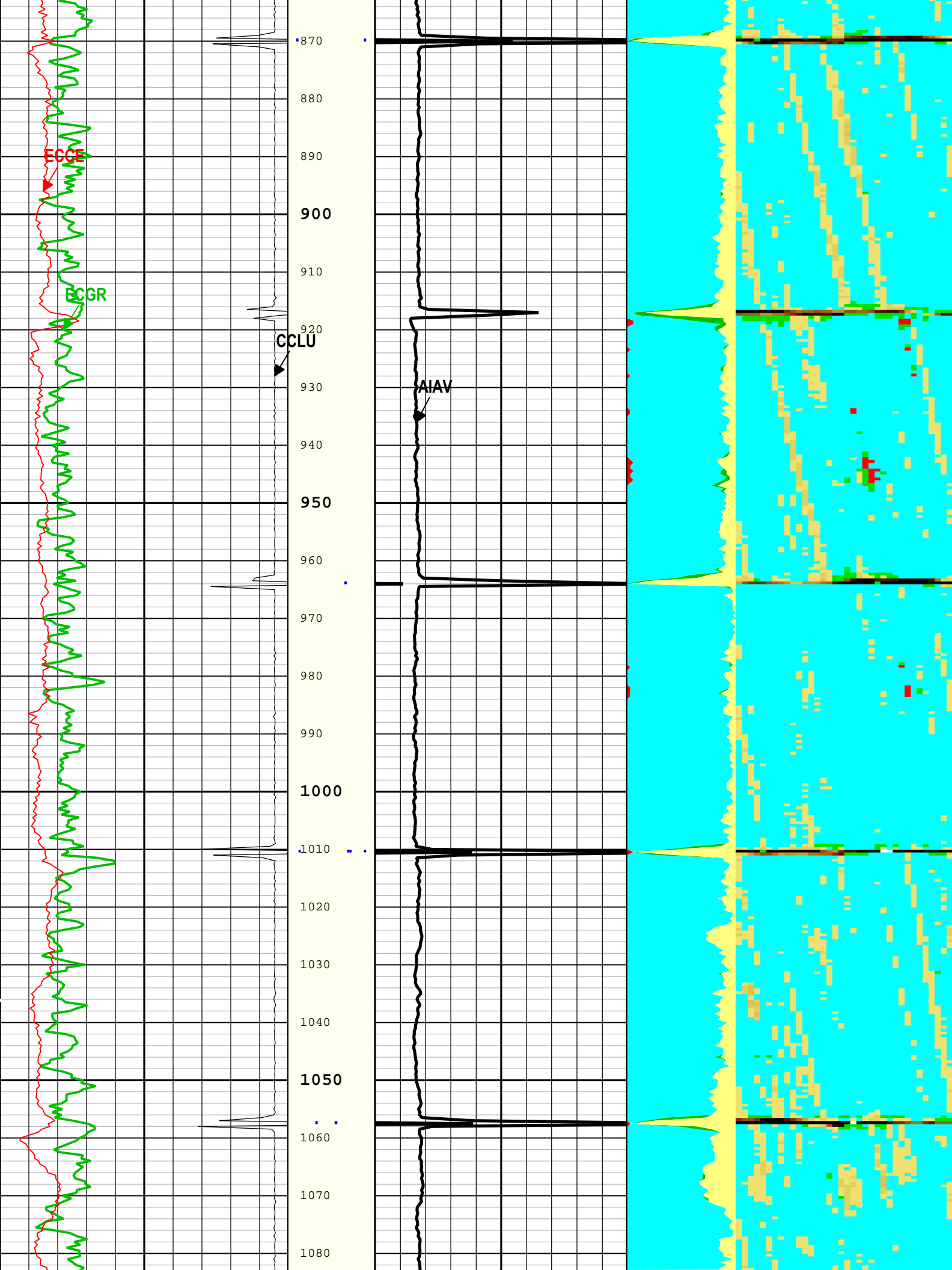
Calibration Cable Type	7-39pxs								
Wheel Correction 1	-4								
Wheel Correction 2	-2								
Tension Device									
Type	CMTD-B/A								
Serial Number	1109								
Calibration Date	12-SEP-2017								
Calibrator Serial Number	441345a								
Number of Calibration Points	10								
Calibration Root Mean Square Error	7								
Calibration Peak Error	11								
Logging Cable									
Type	7-39PI-XS								
Serial Number	F713311								
Length	13000.00 ft								
Conveyance Type	Wireline								
Rig Type	Crane USA								
ONE:Depth Control Parameters		Depth Control Remarks							
Log Sequence	First Log In the Well	All Schlumberger depth control policies followed.							
Rig Up Length At Surface		IDW used as primary depth reference.							
Rig Up Length At Bottom		Z-chart used as secondary depth reference.							
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[5]:Up	6392.46	42.25						
Fluid Velocity = "Automatic". CFVL equals DFSL channel									
Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)						
Mud Impedance = "FreePipe Norm". Free Pipe normalization zone is : 13.14m(43.11ft) to 15.81m(51.86ft) MUD_N_FRP = 1.15 DFD = 1.01g/cm3(8.40lbm/gal) CZMD median computed in free pipe normalization interval = 1.67 MRayl									
Start Depth(ft)	Stop Depth(ft)	Start Value(Mrayl)	End Value(Mrayl)						
ONE									
2500 PSI Main Pass									
Software Version									
Acquisition System		Version							
Maxwell 2017 SP1		7.1.82245.3100							
Application Patch		Wireline_NPD-ICE2-2017SP1_7.1.87324							
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[5]:Up	Up	42.25 ft	6392.46 ft	02-Oct-2017 2:13:23 PM	02-Oct-2017 3:10:16 PM	ON	3.87 ft	No

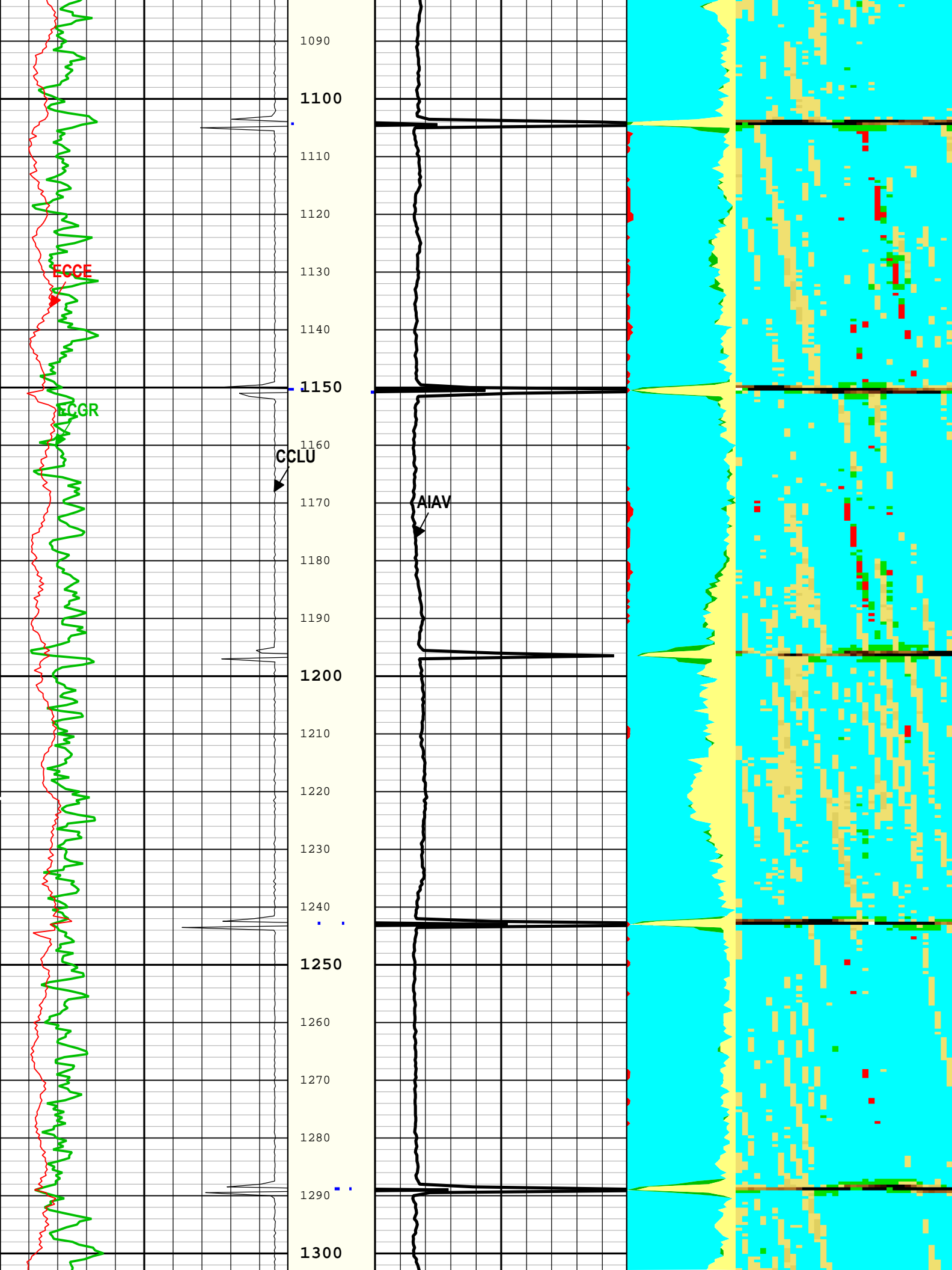


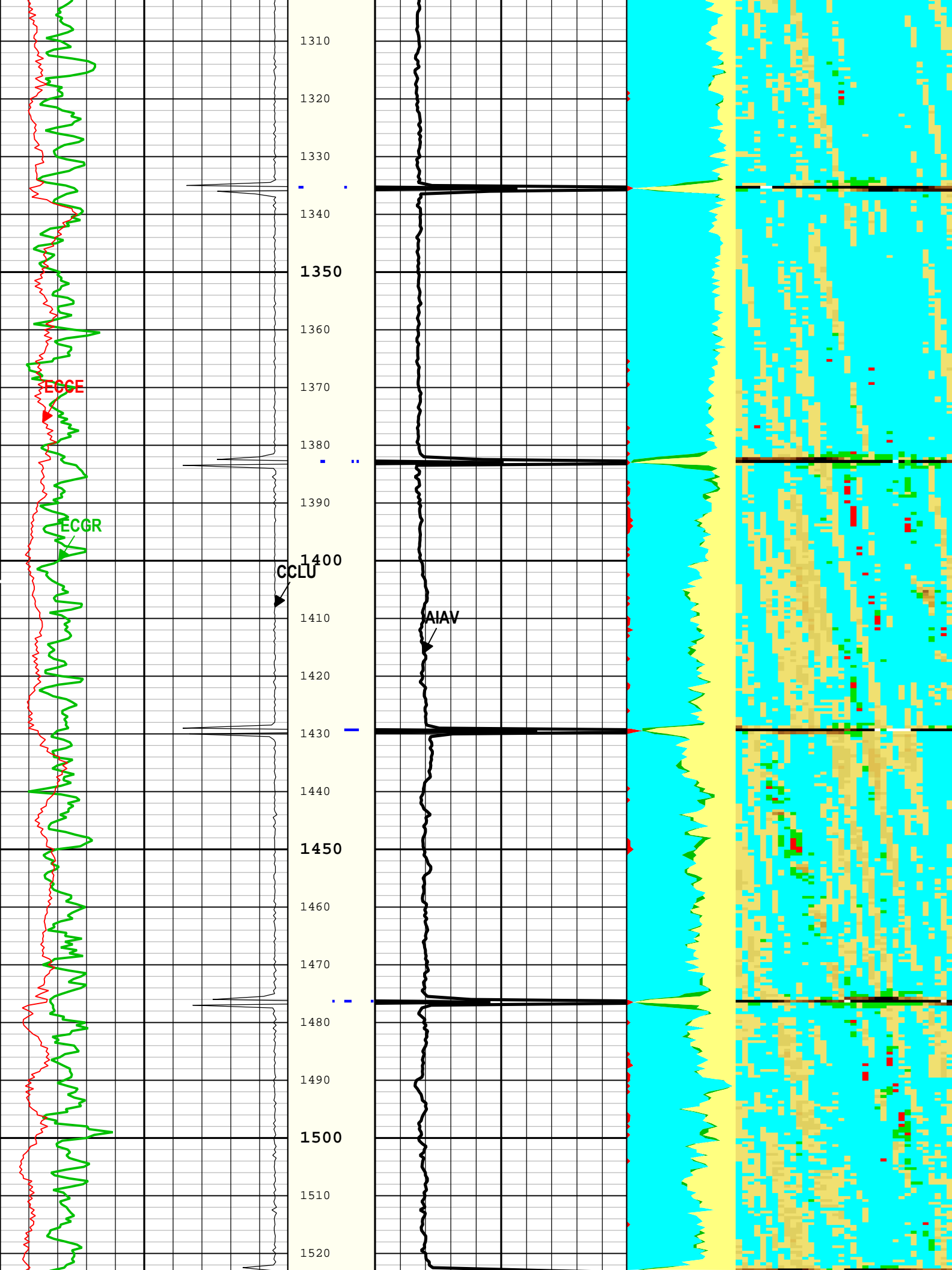


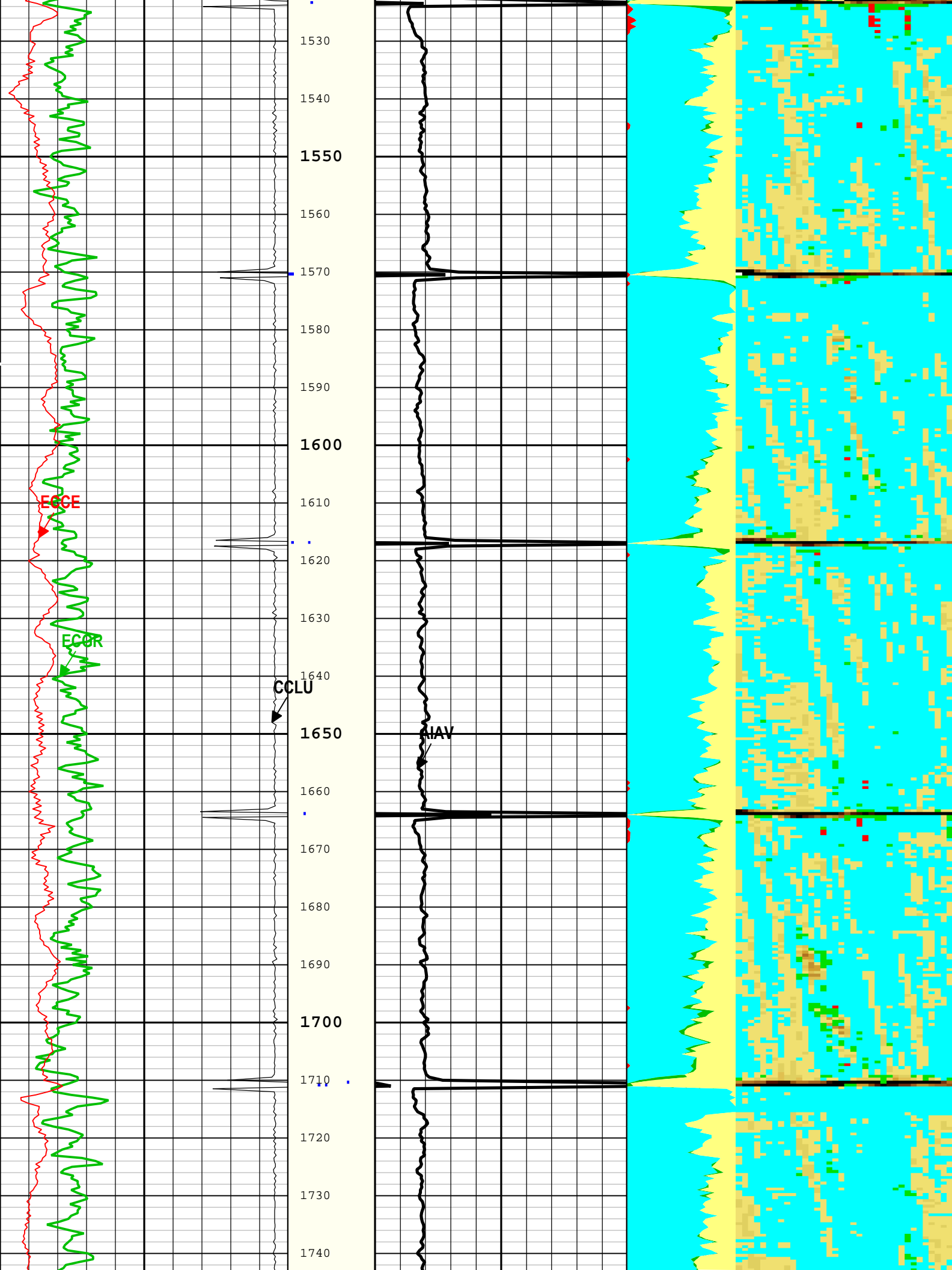


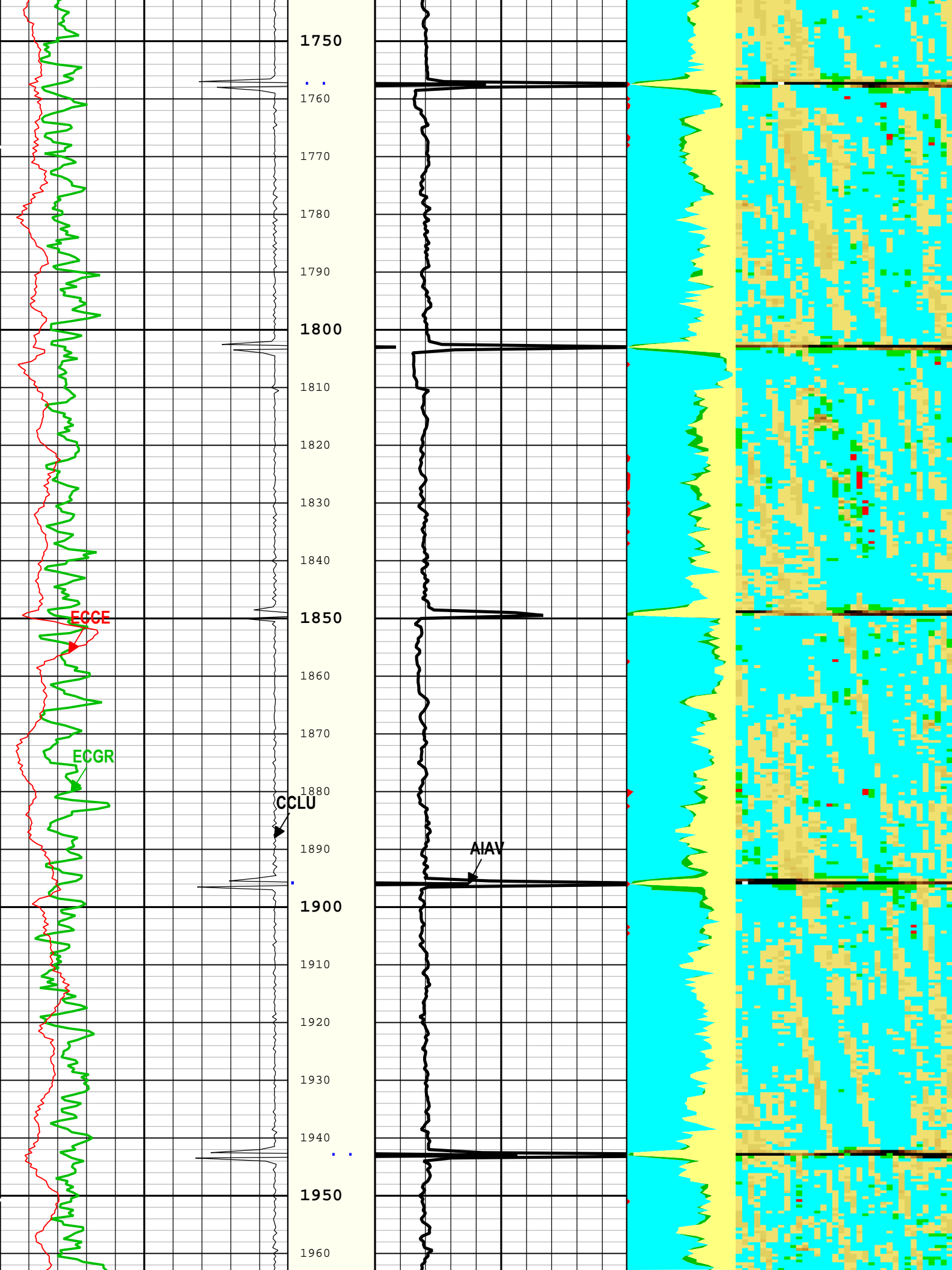


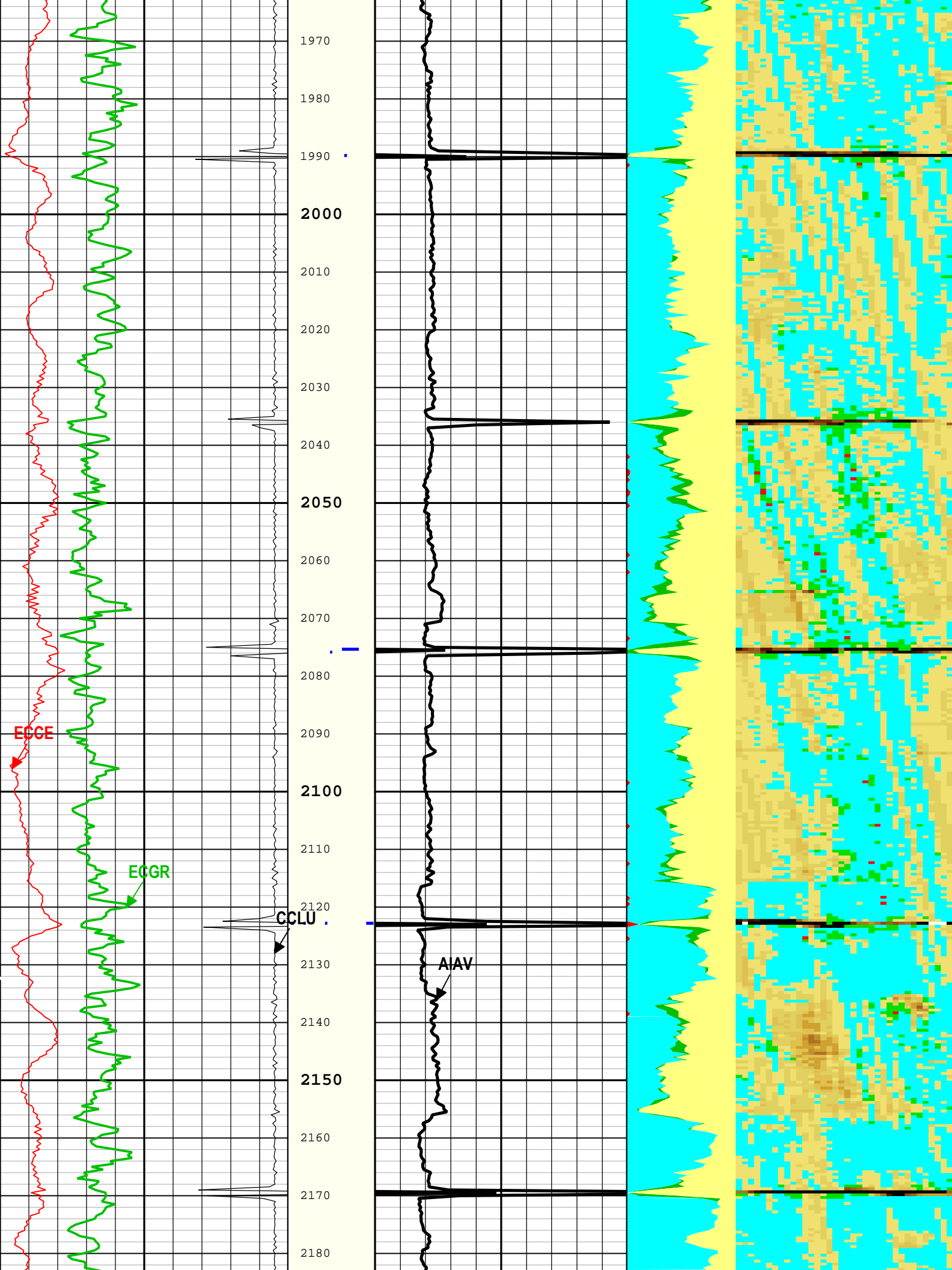


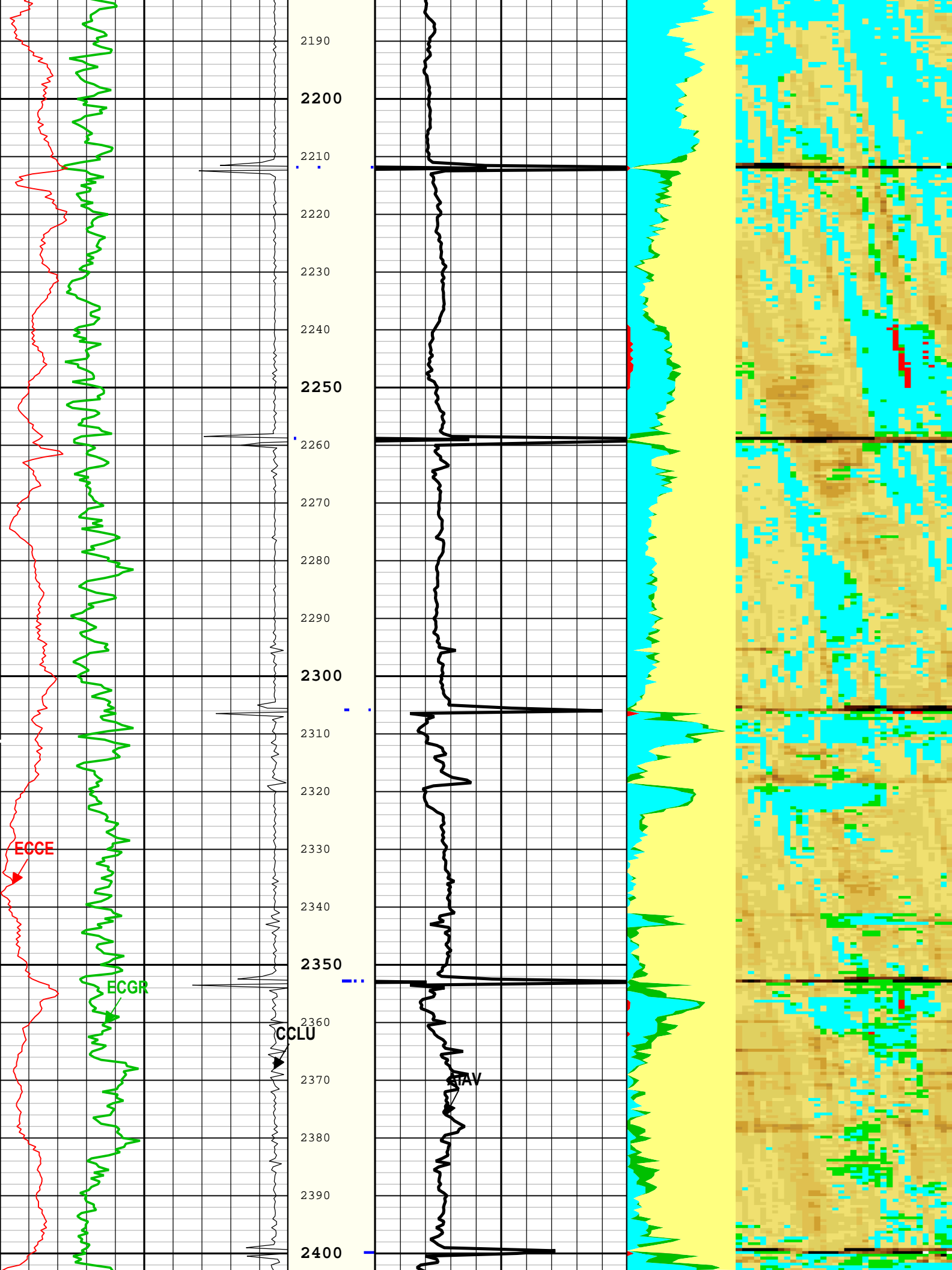


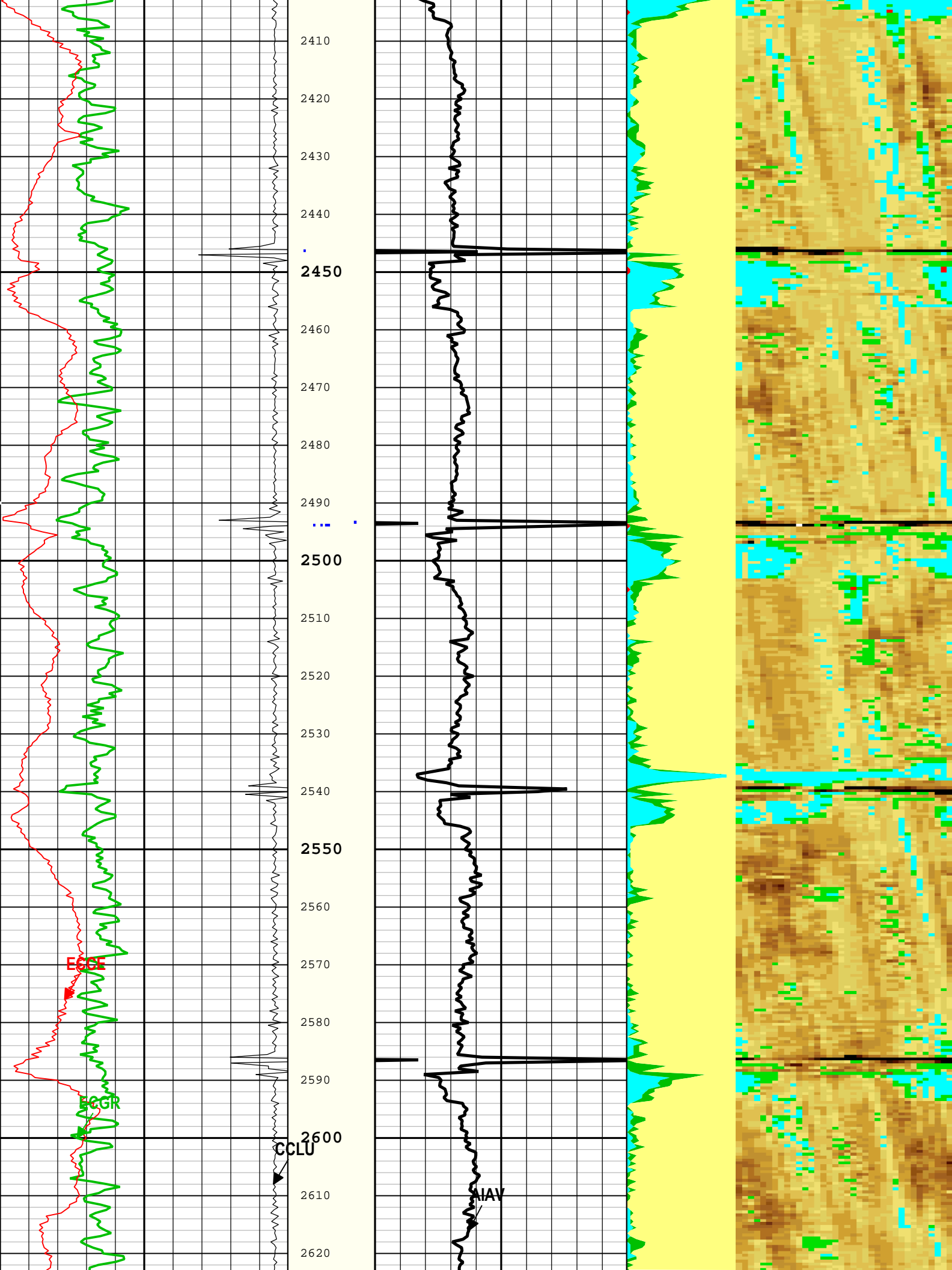


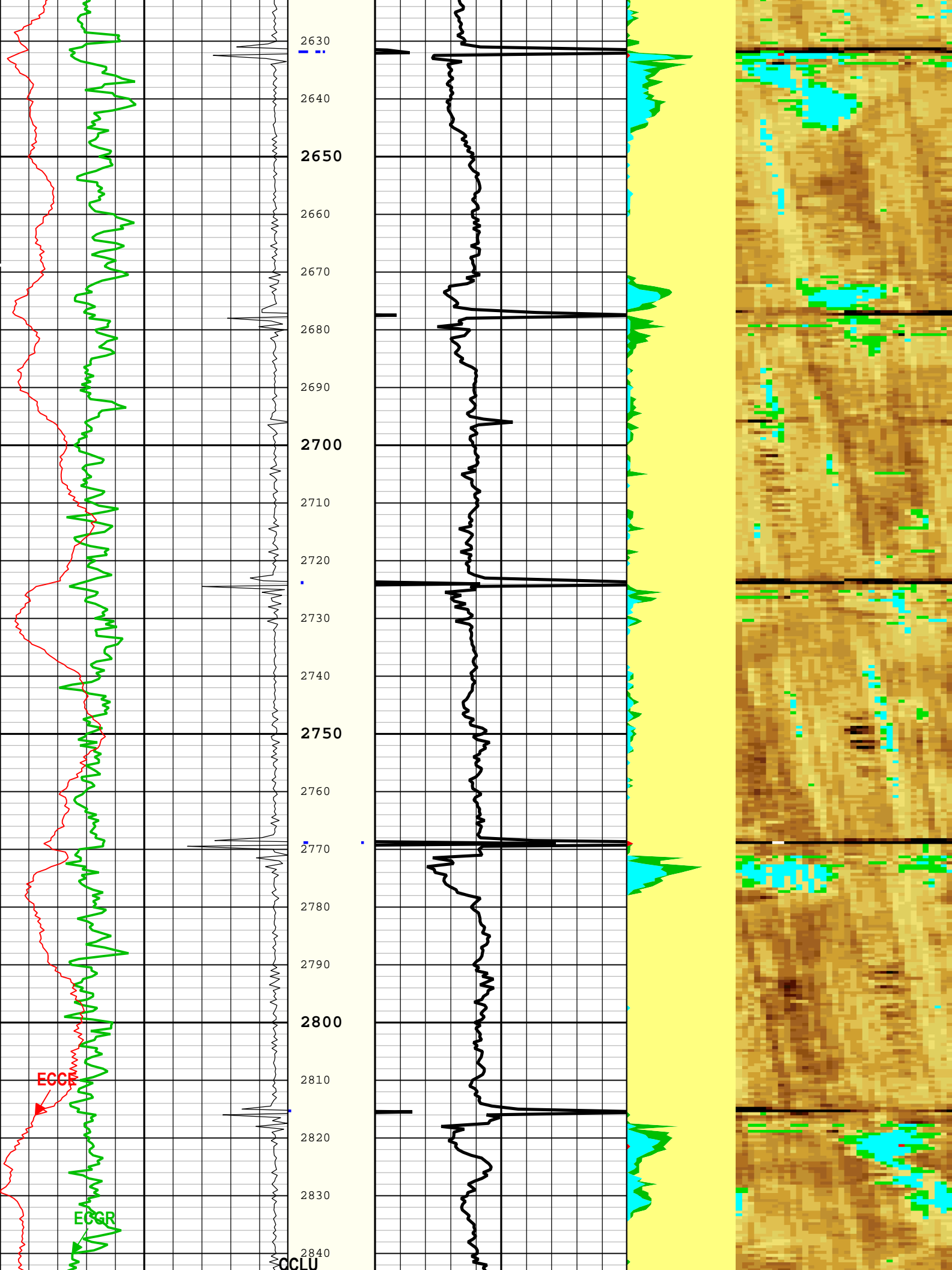


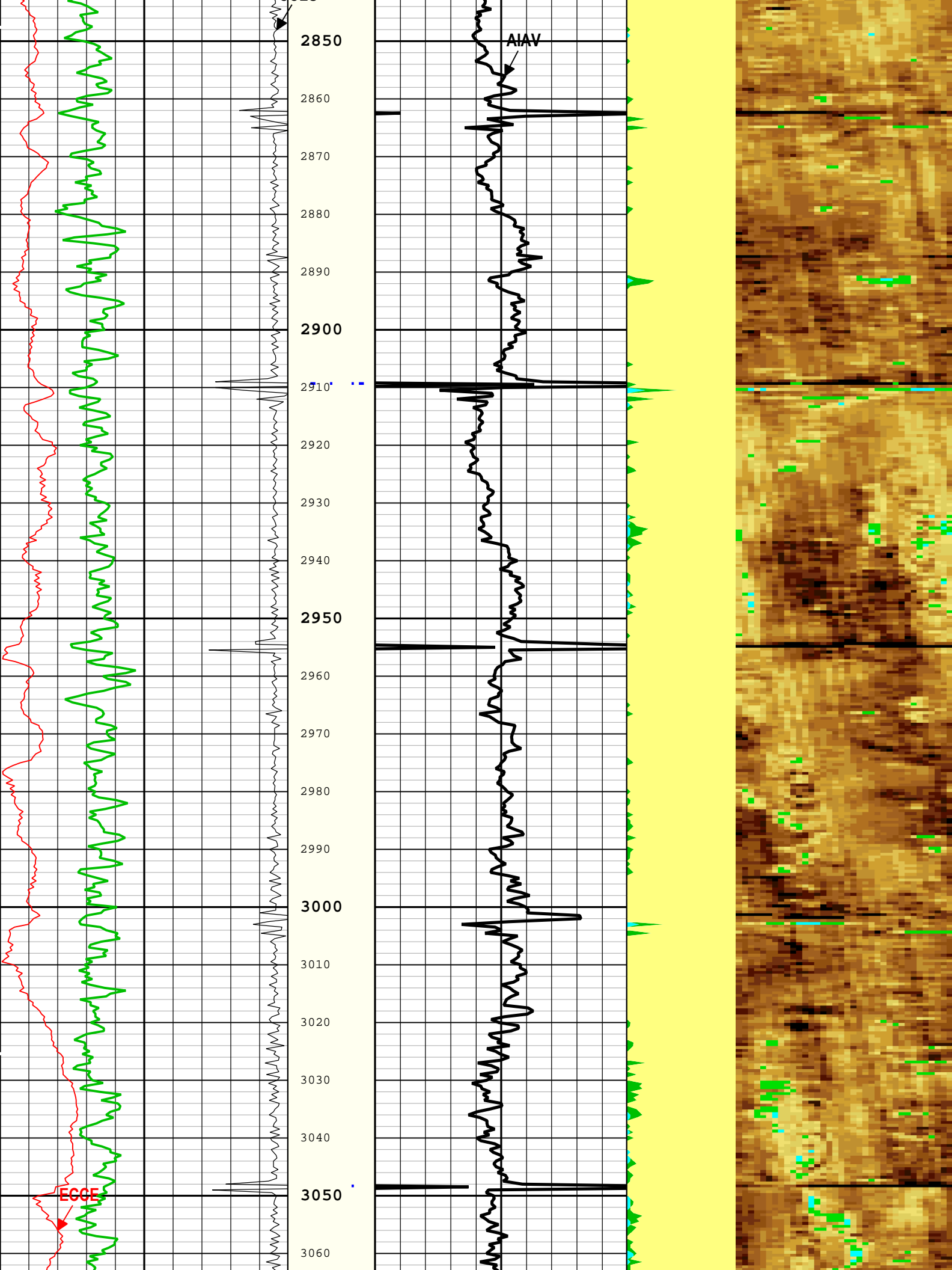


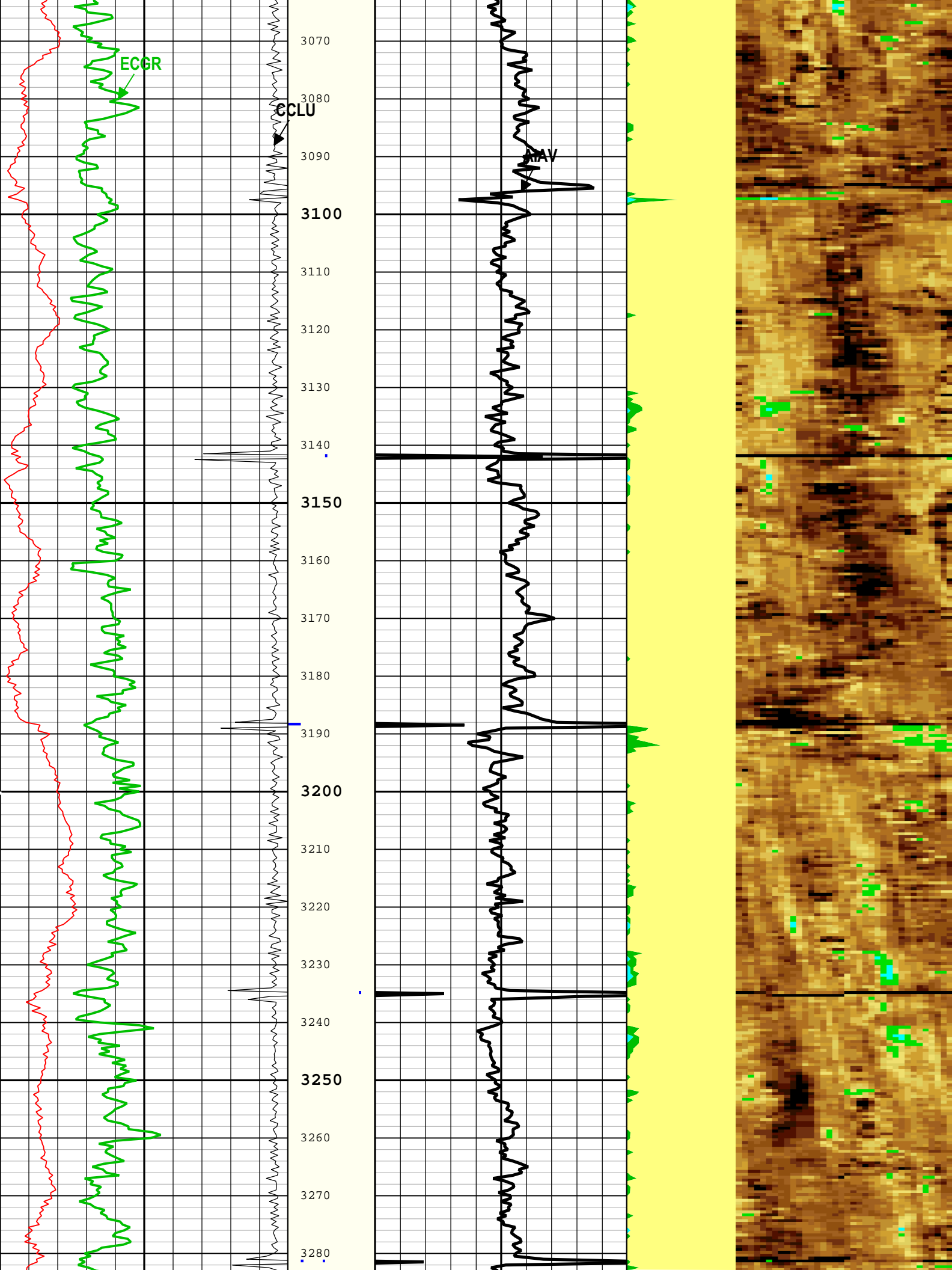


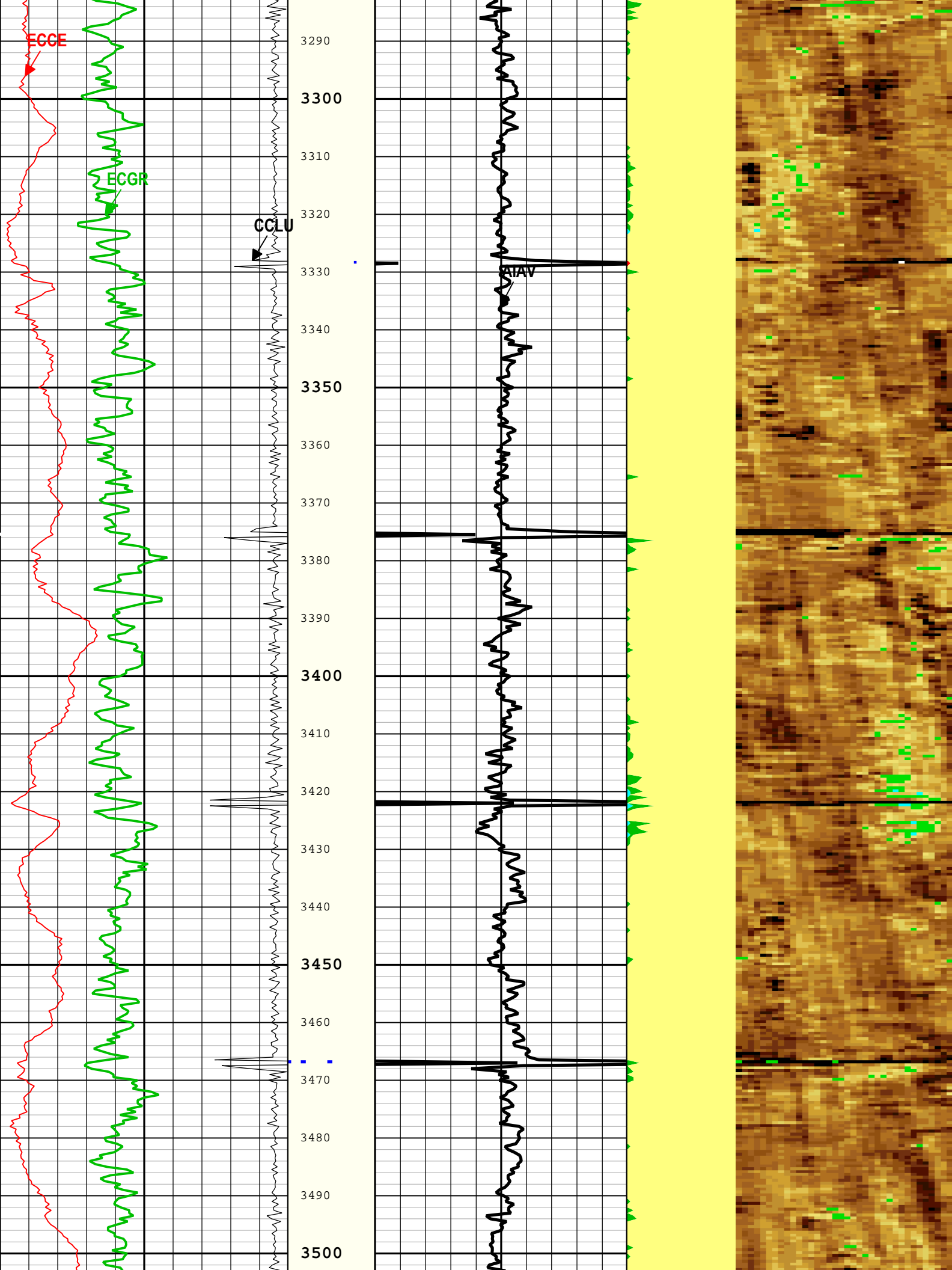


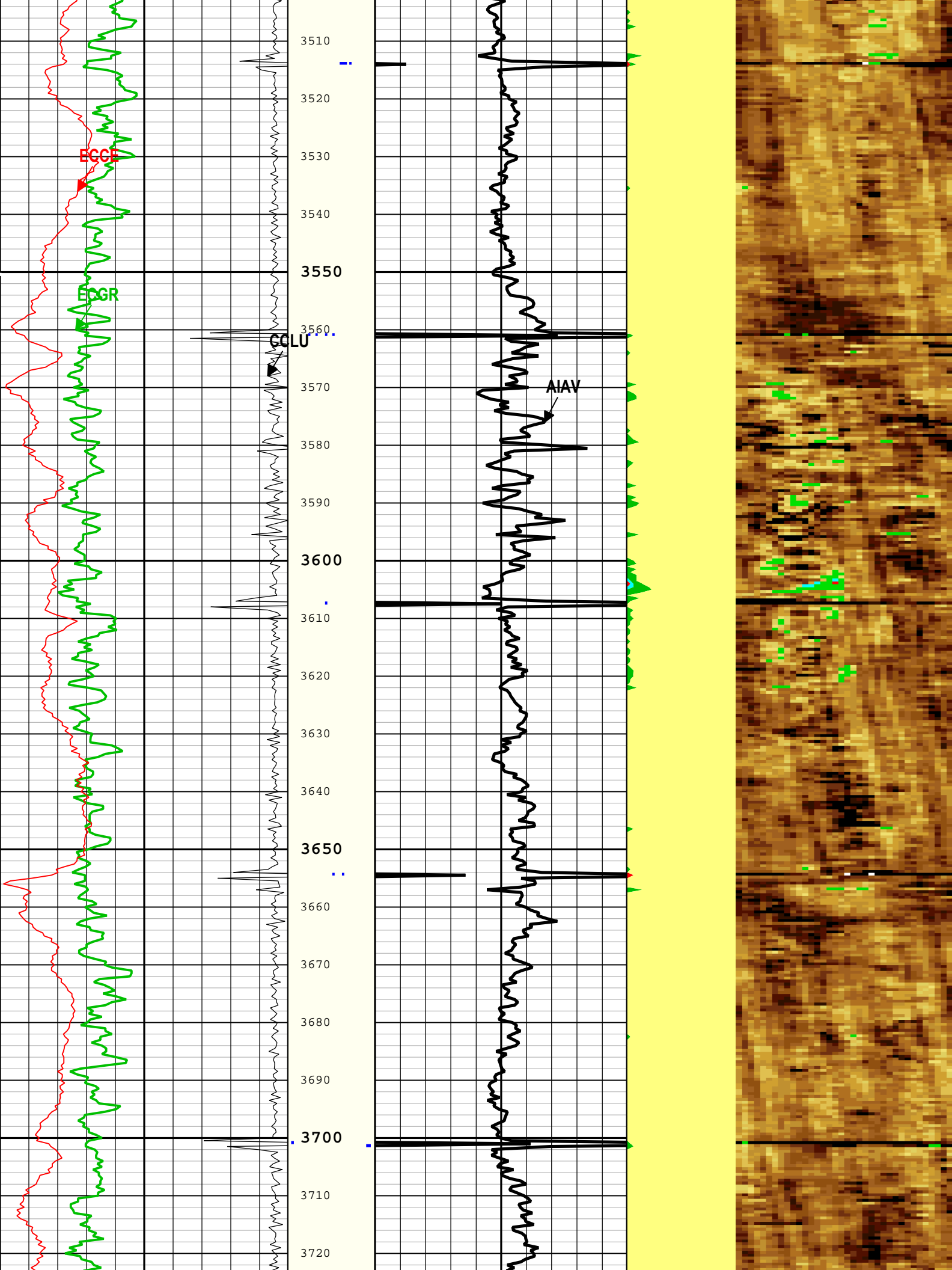


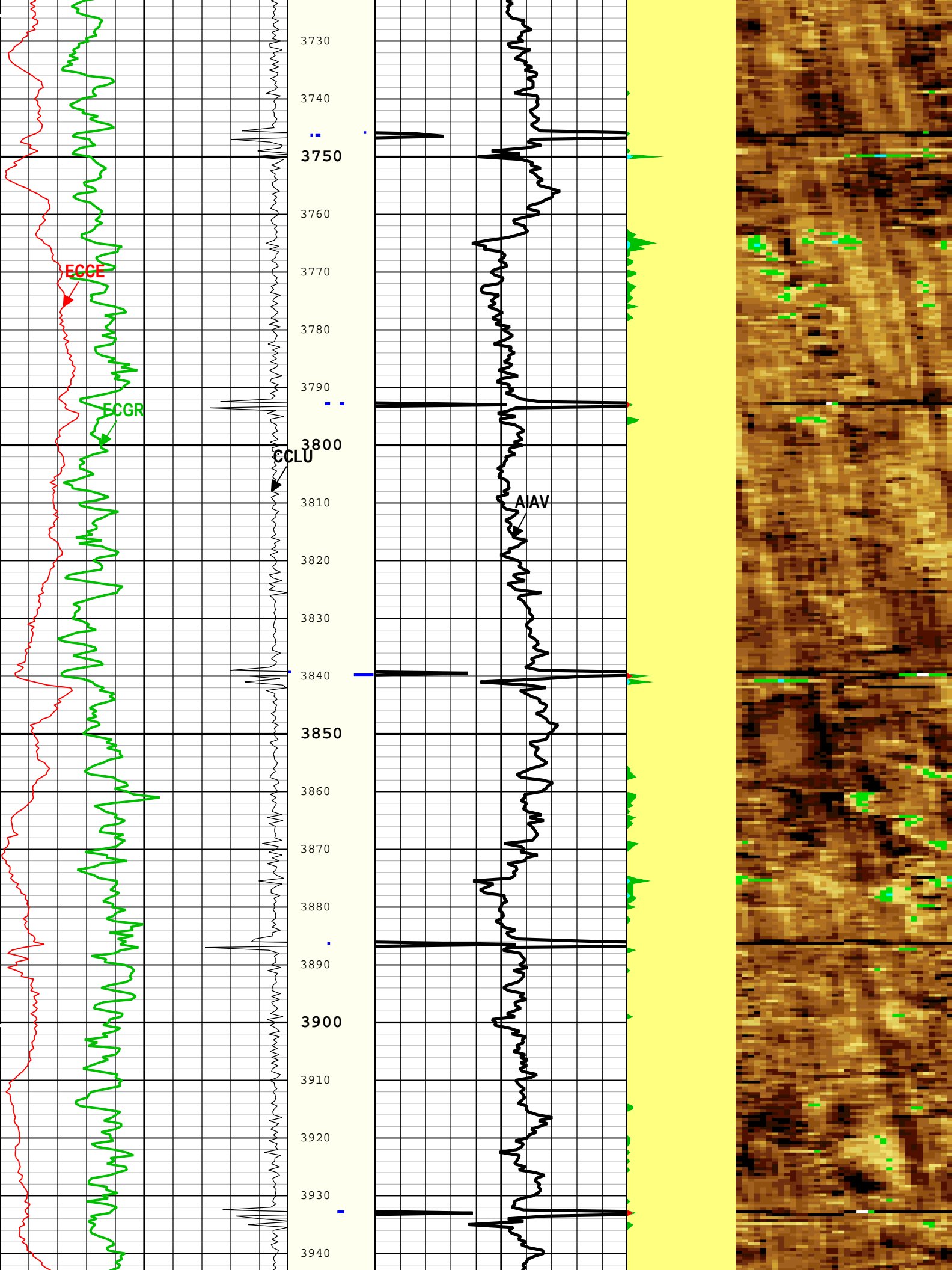


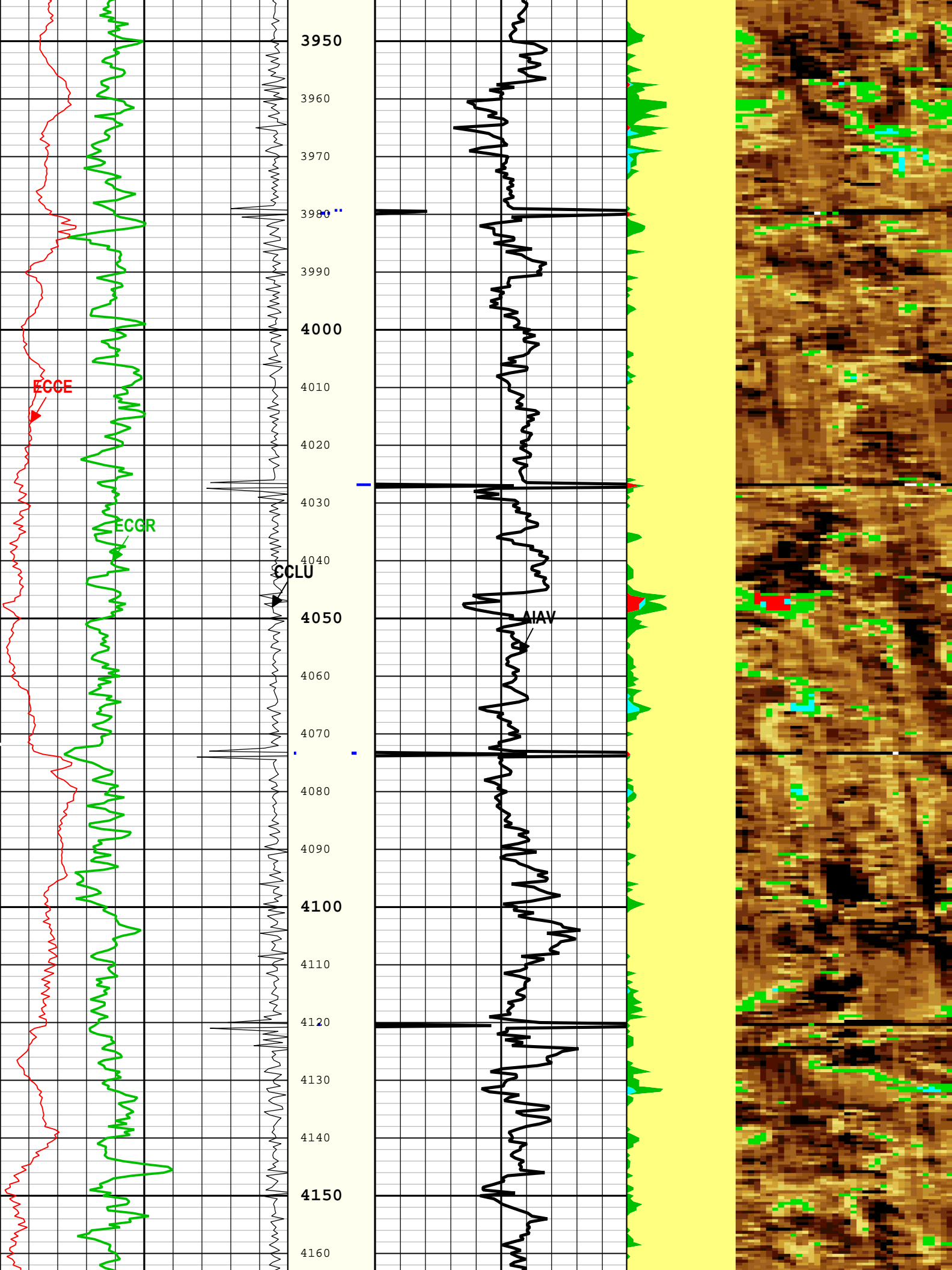


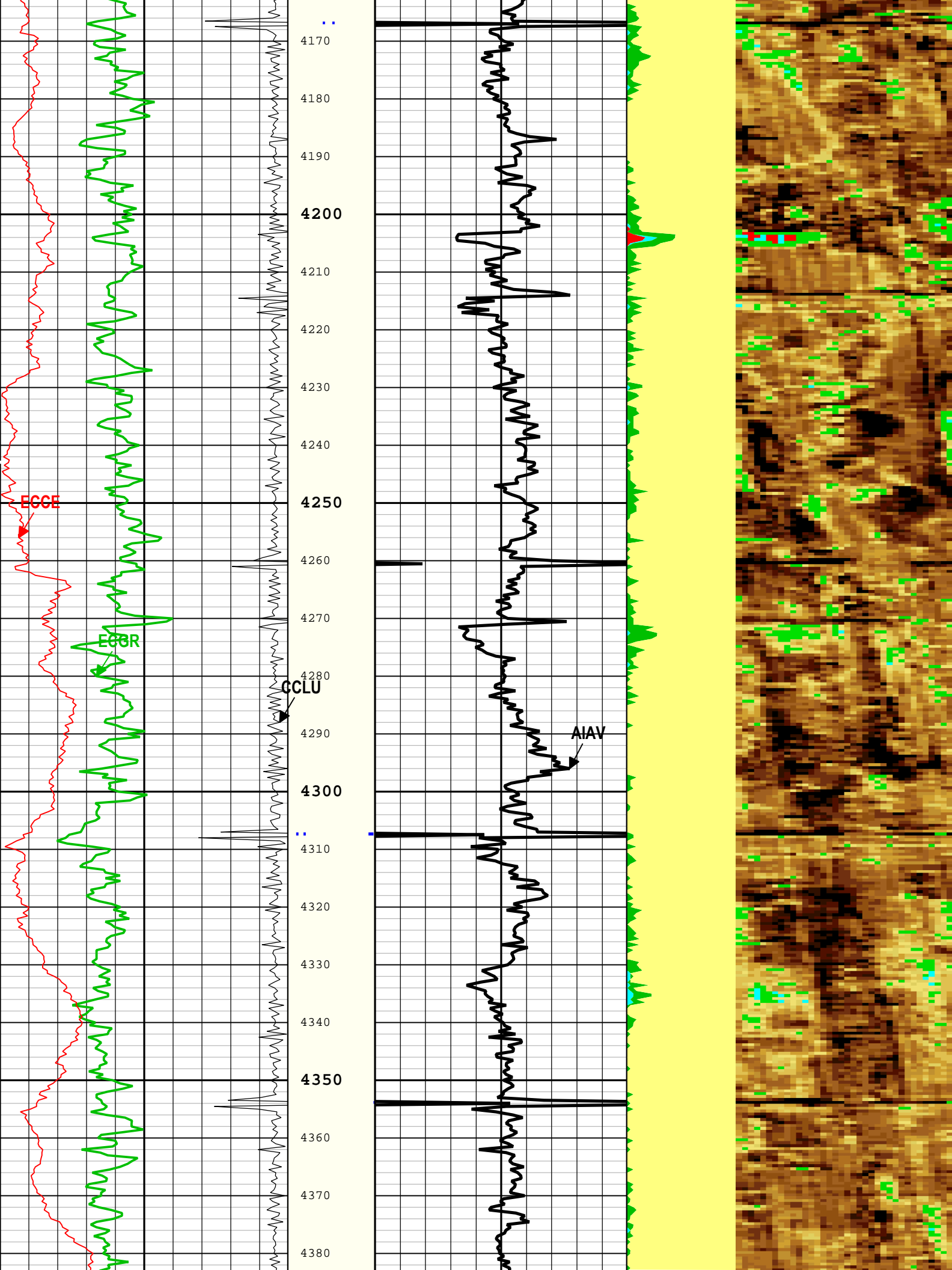


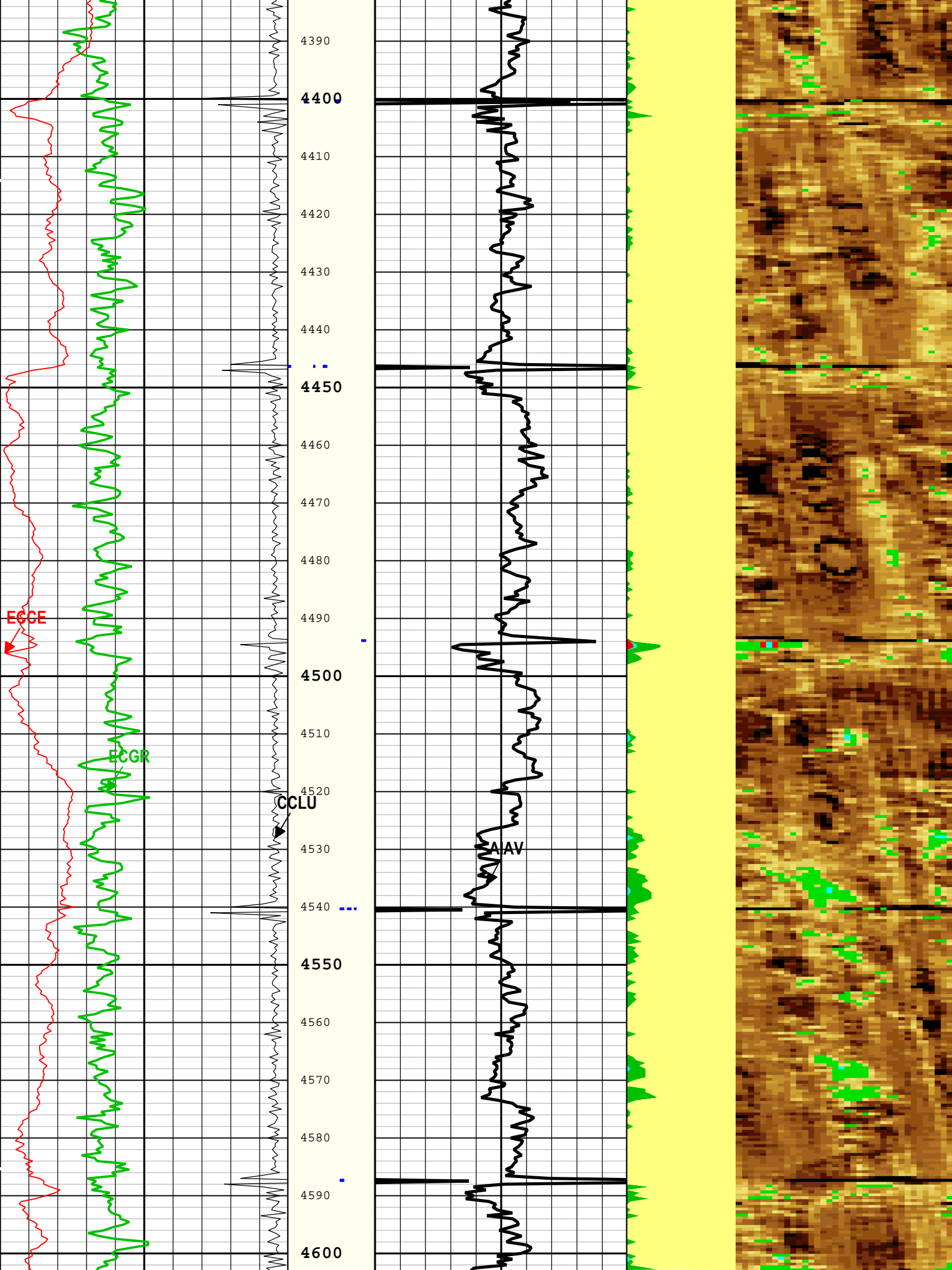


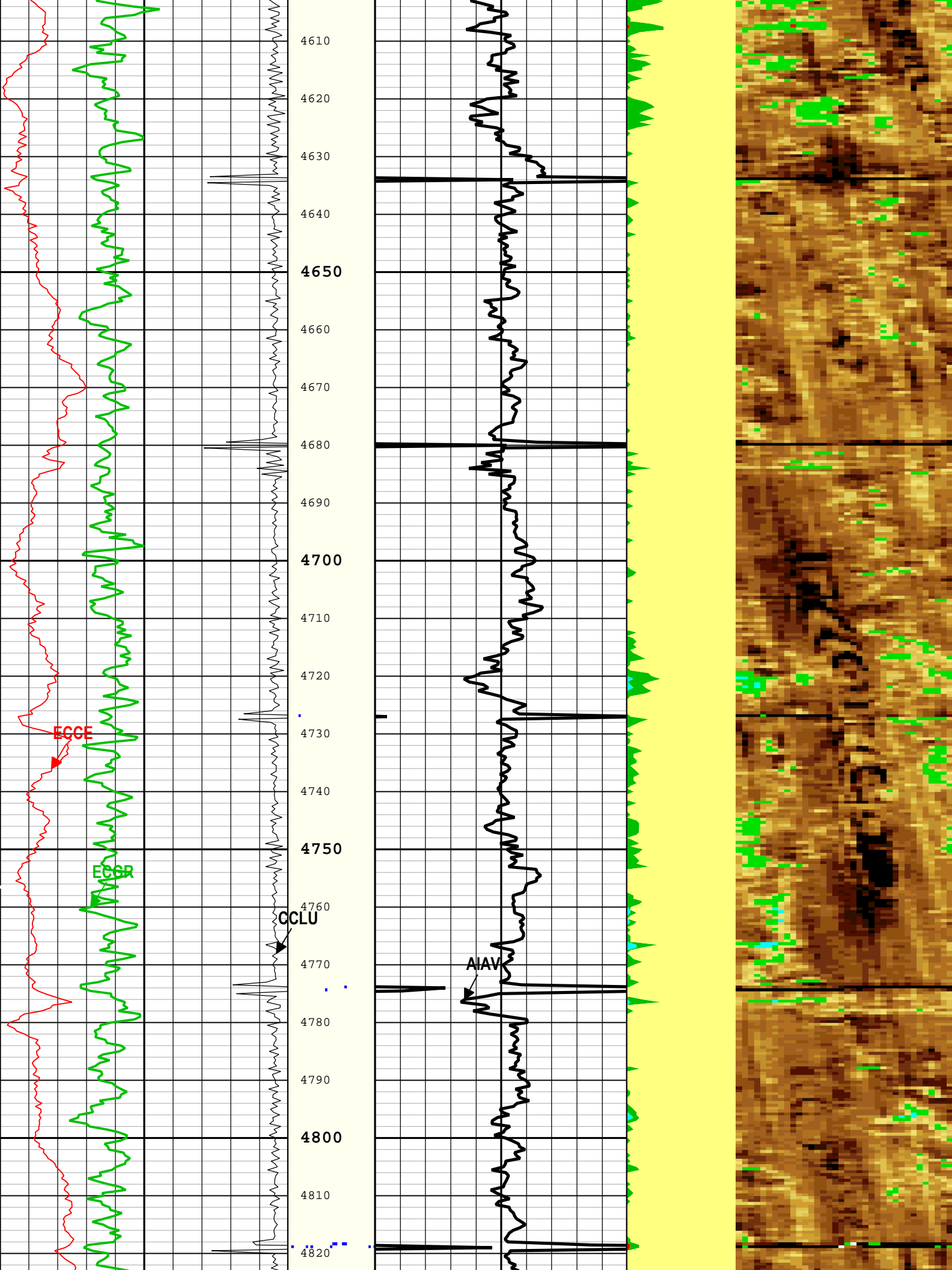


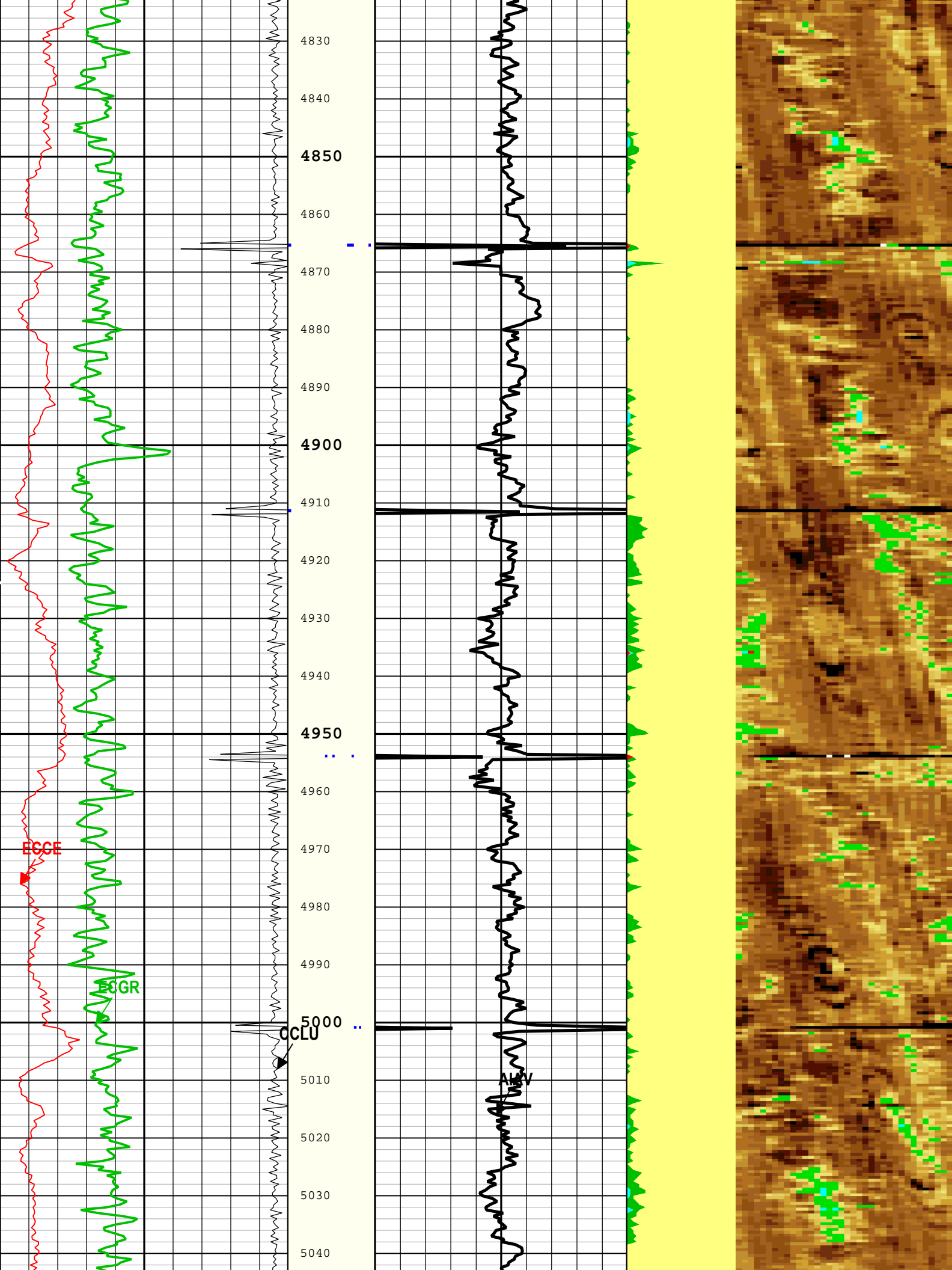


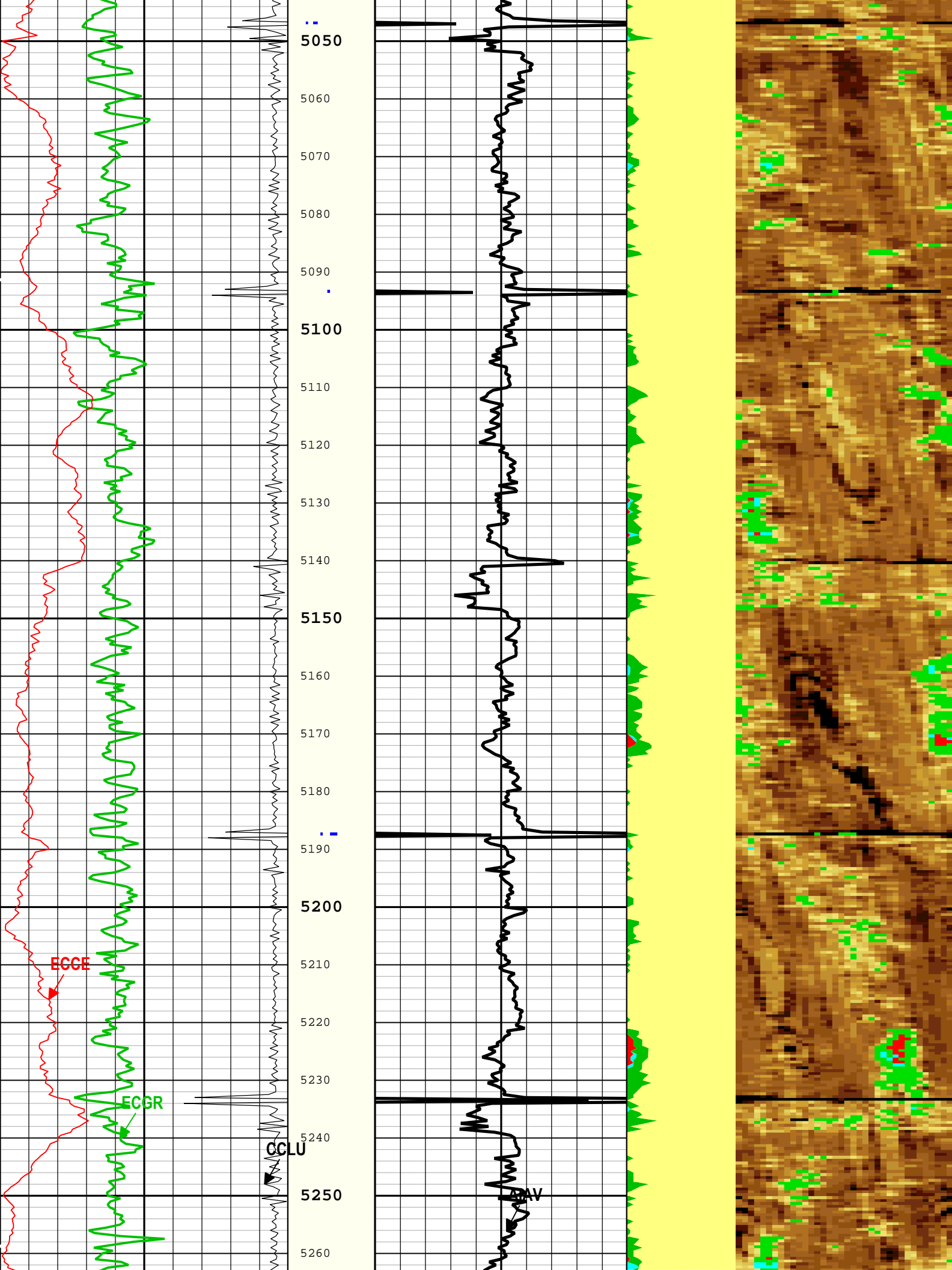


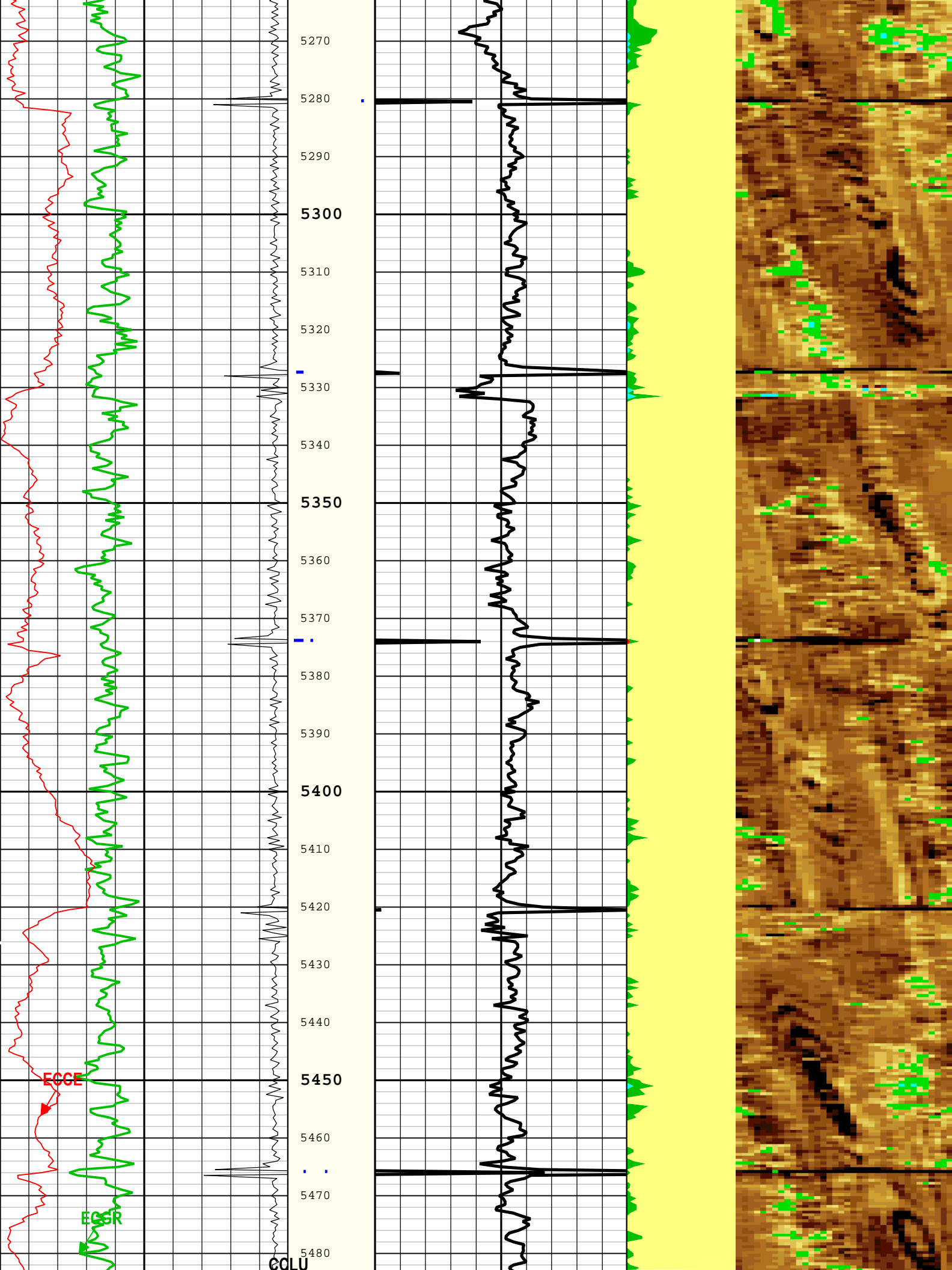


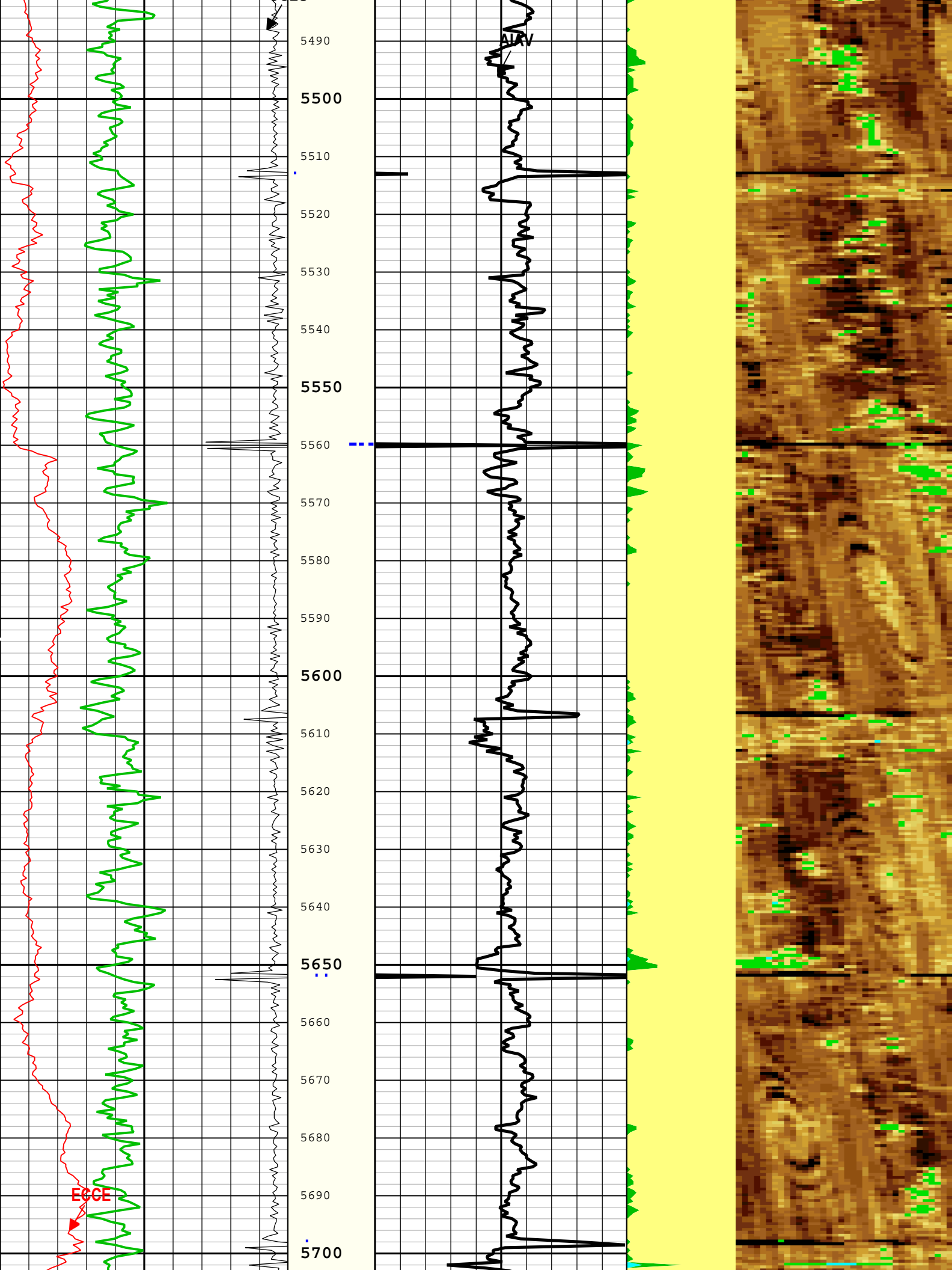


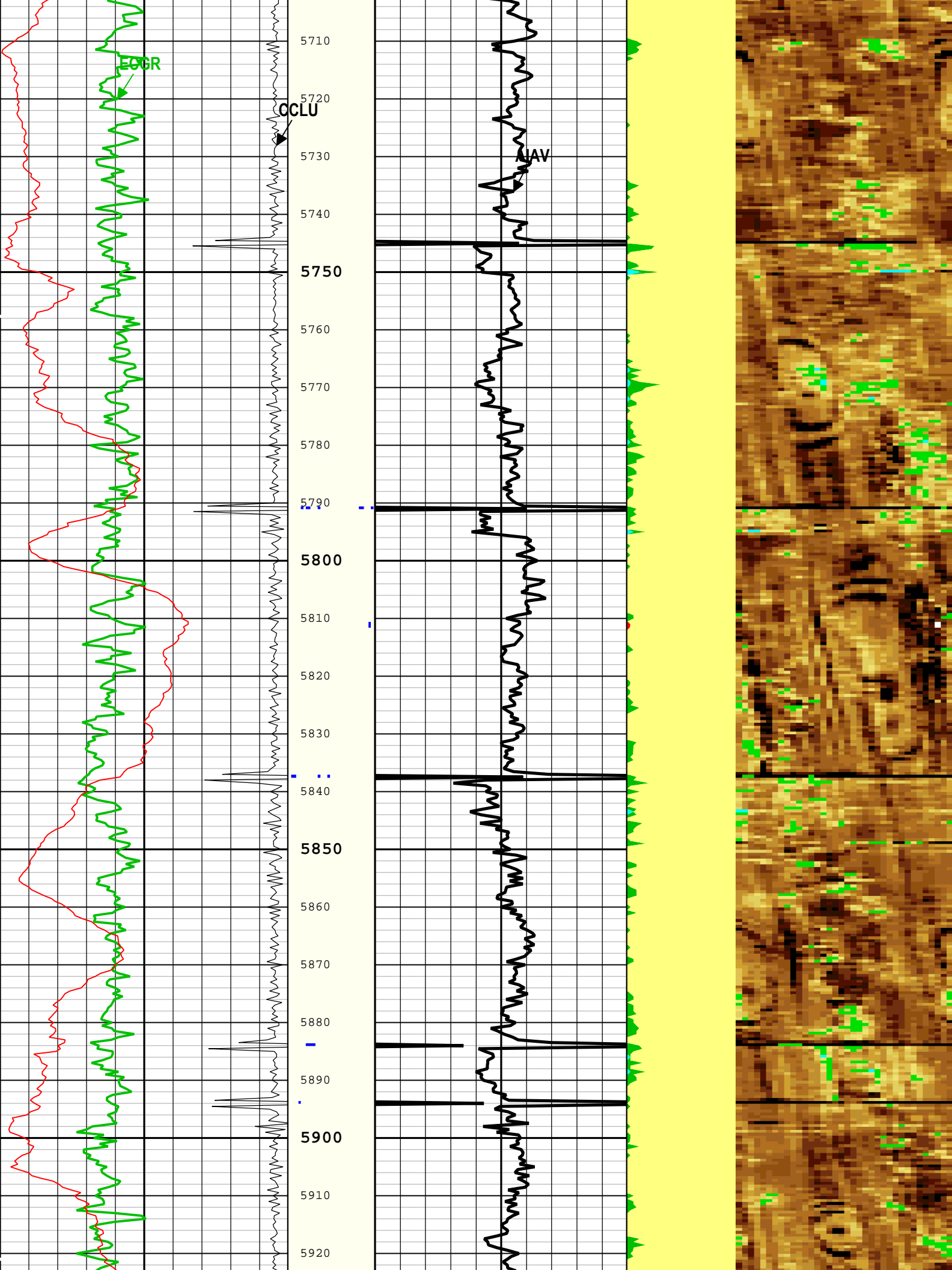


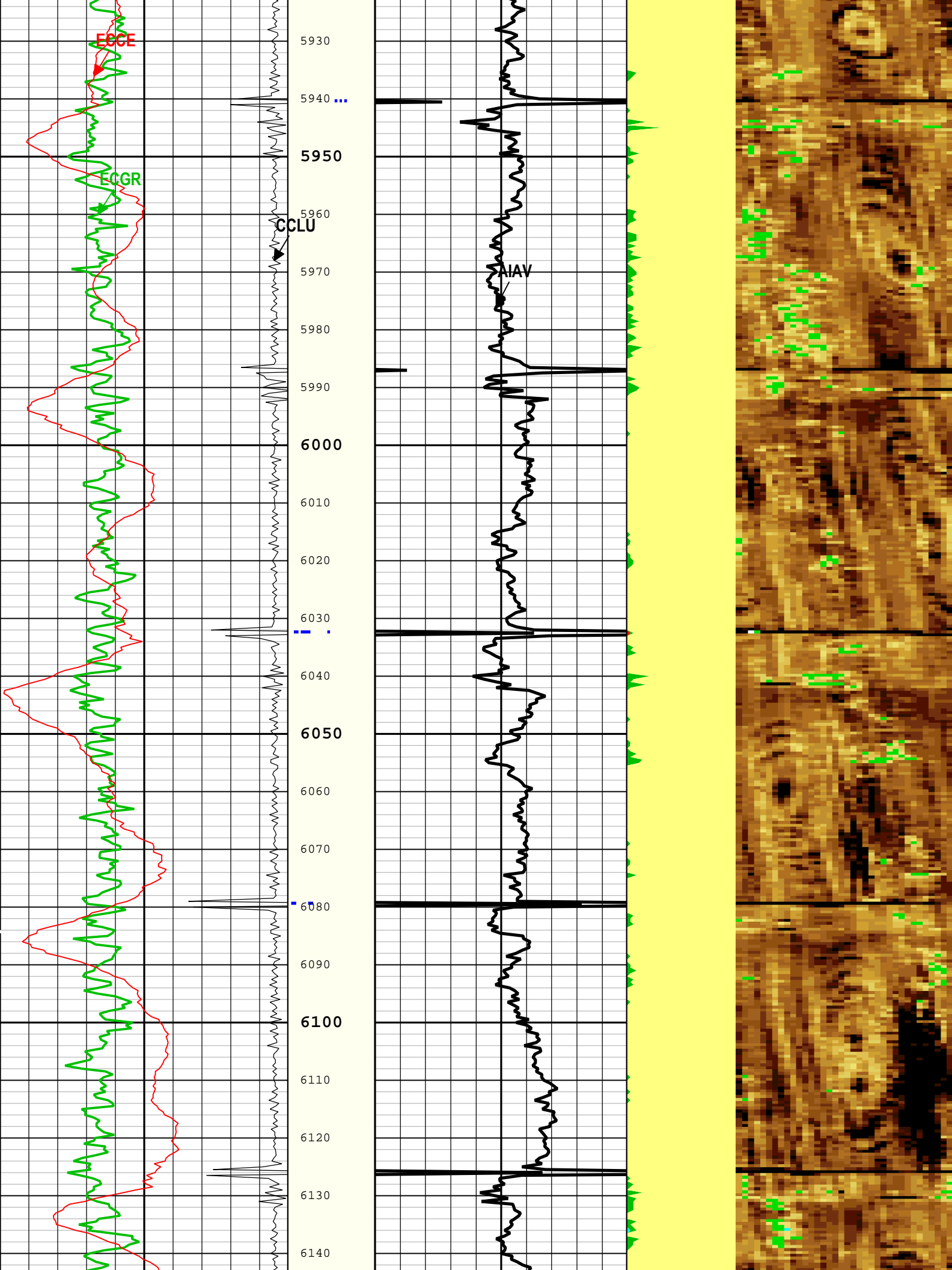


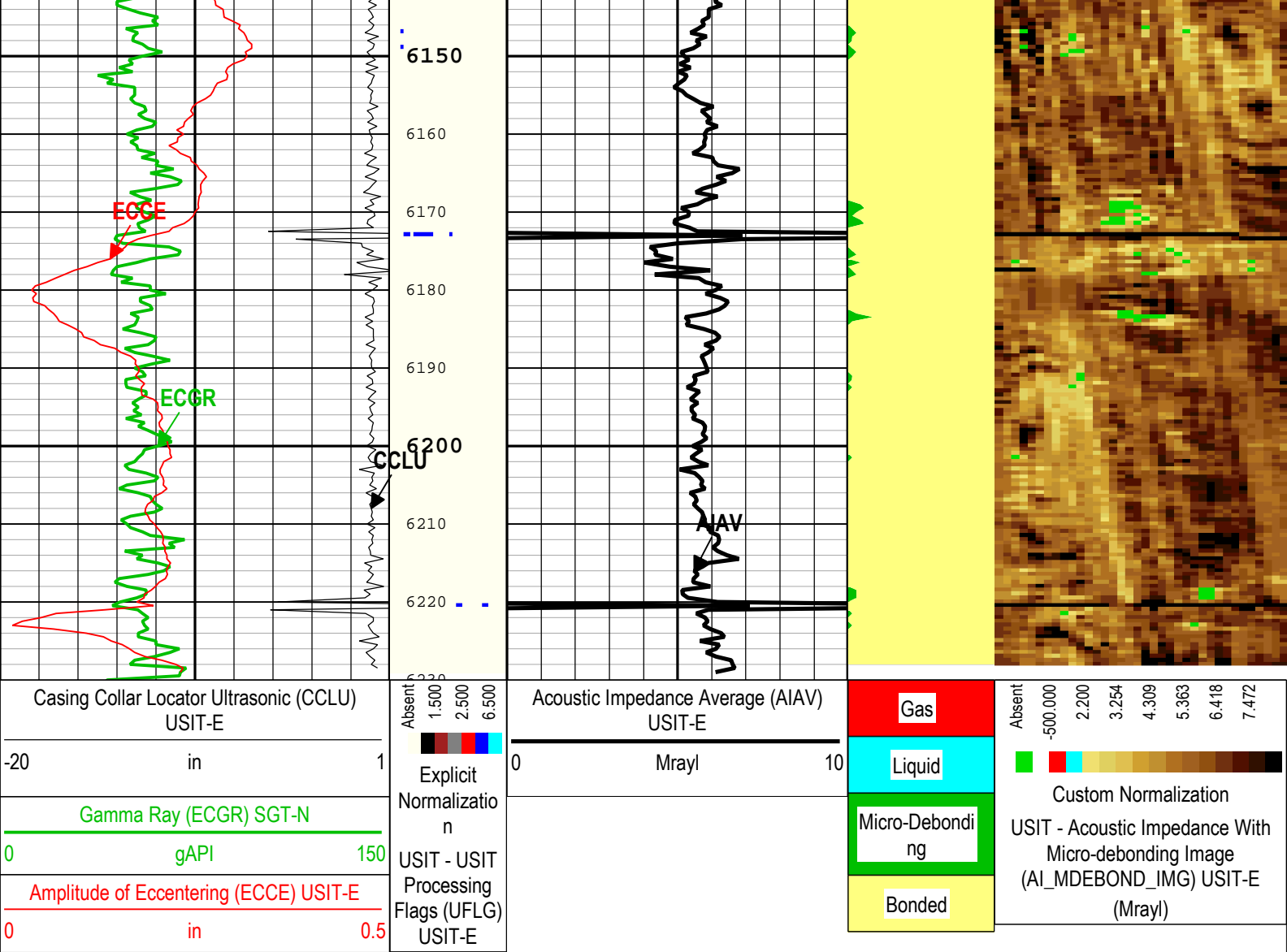












TIME_1900 - Time Marked every 60.00 (s)

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: 02-Oct-2017 15:33:53

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	6230	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	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
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	
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	1.15	

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	26	45	110
BS	13.5	110	1972
BS	8.5	1972	6230
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	
UPLIHT	Ultrasonic Pulse Echo Large Inhibit Time	USIT-E	Off	
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	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	6500	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	50	02-Oct-2017 14:13:23	02-Oct-2017 14:13:48	6392.46	6390.14
EMXV	80	02-Oct-2017 14:13:48	02-Oct-2017 14:13:52	6390.14	6390.14
EMXV	100	02-Oct-2017 14:13:52	02-Oct-2017 14:14:03	6390.14	6390.14
EMXV	120	02-Oct-2017 14:14:03	02-Oct-2017 15:10:16	6390.14	42.25
All depth are at tool zero.					

ONE				
0 PSI Repeat Pass				

Software Version				
Acquisition System			Version	
Maxwell 2017 SP1			7.1.82245.3100	

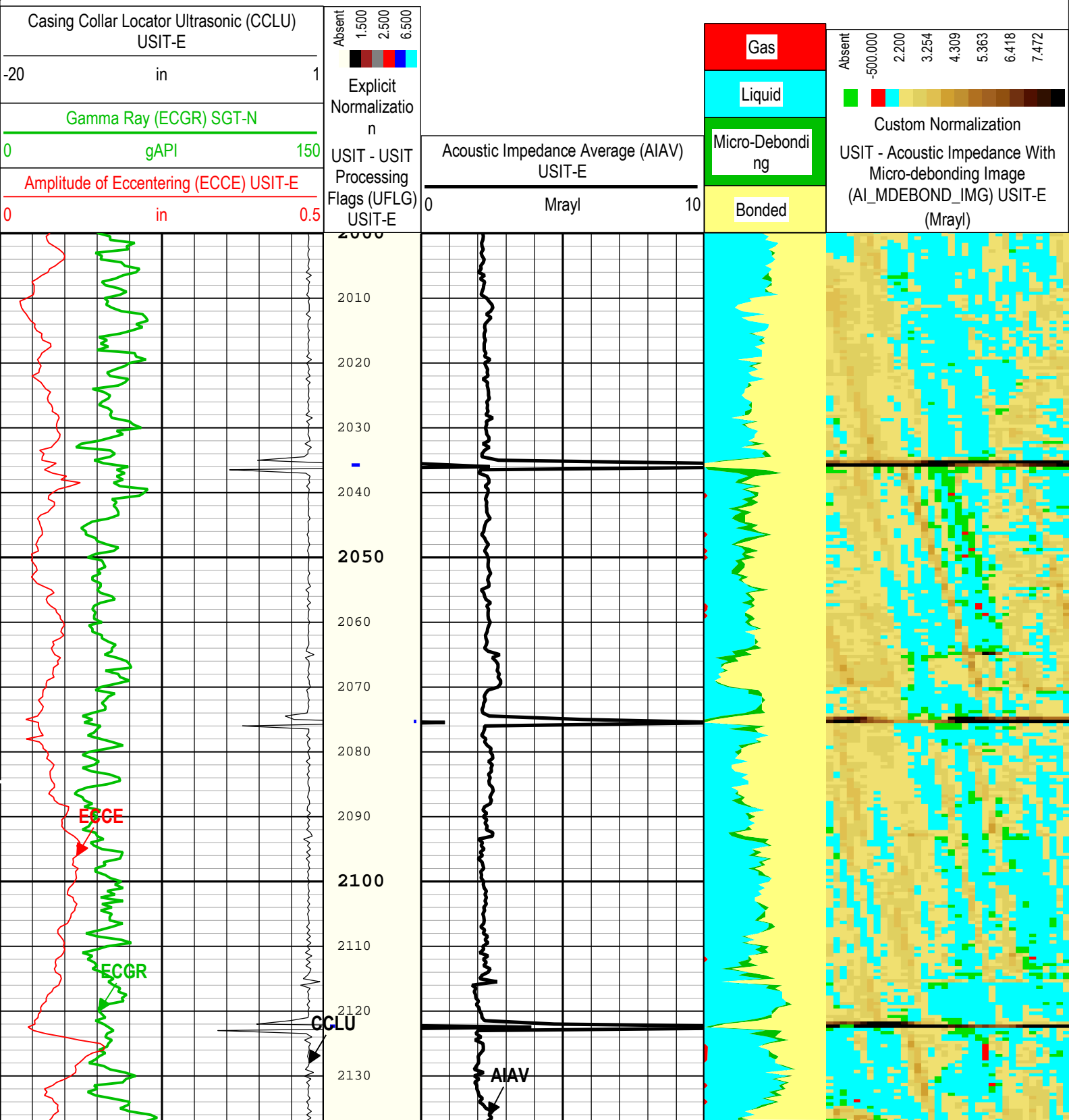
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[2]:Up	Up	1982.13 ft	2505.42 ft	02-Oct-2017 1:54:03 PM	02-Oct-2017 1:57:42 PM	ON	1.10 ft	No

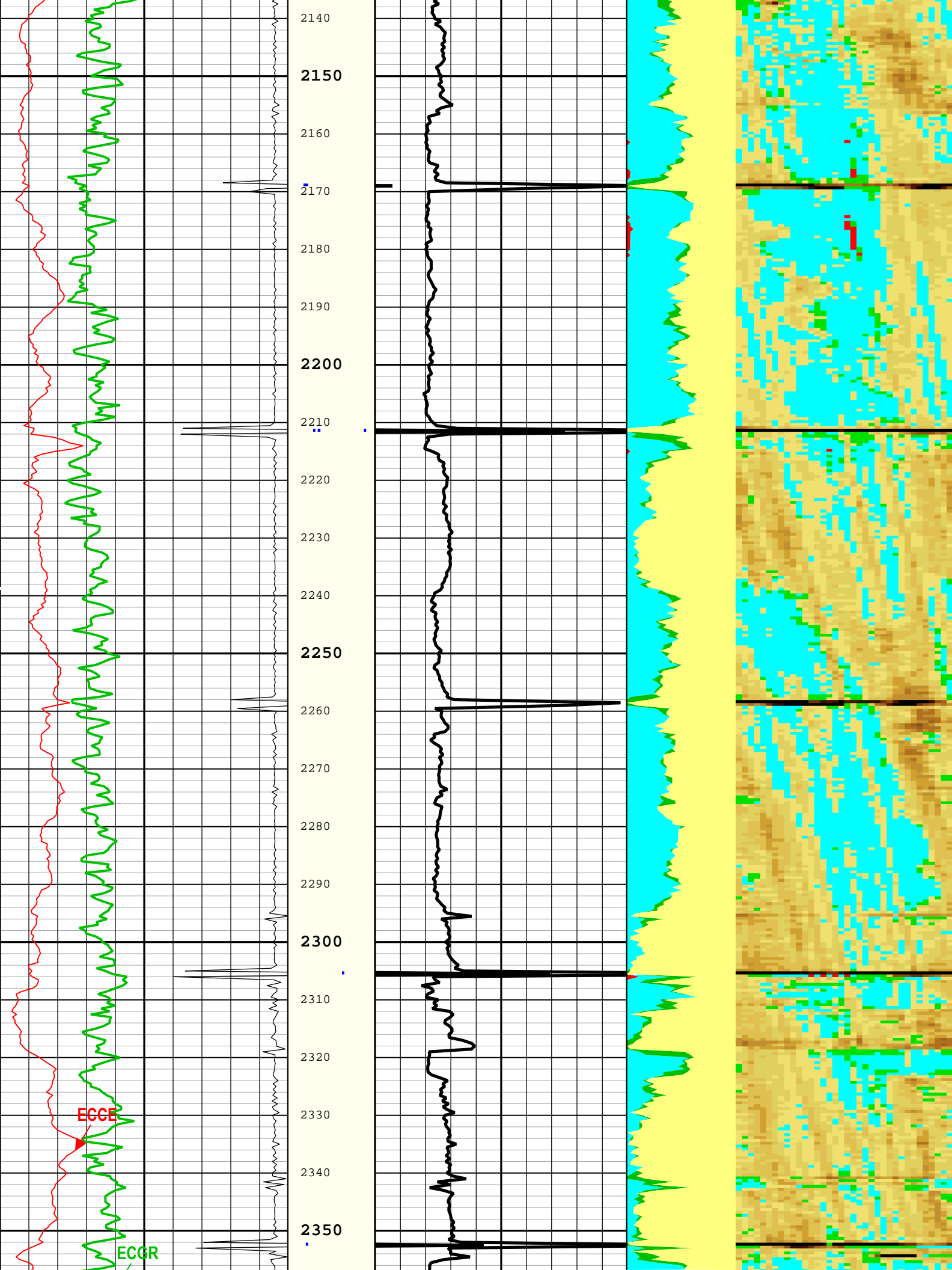
All depths are referenced to toolstring zero

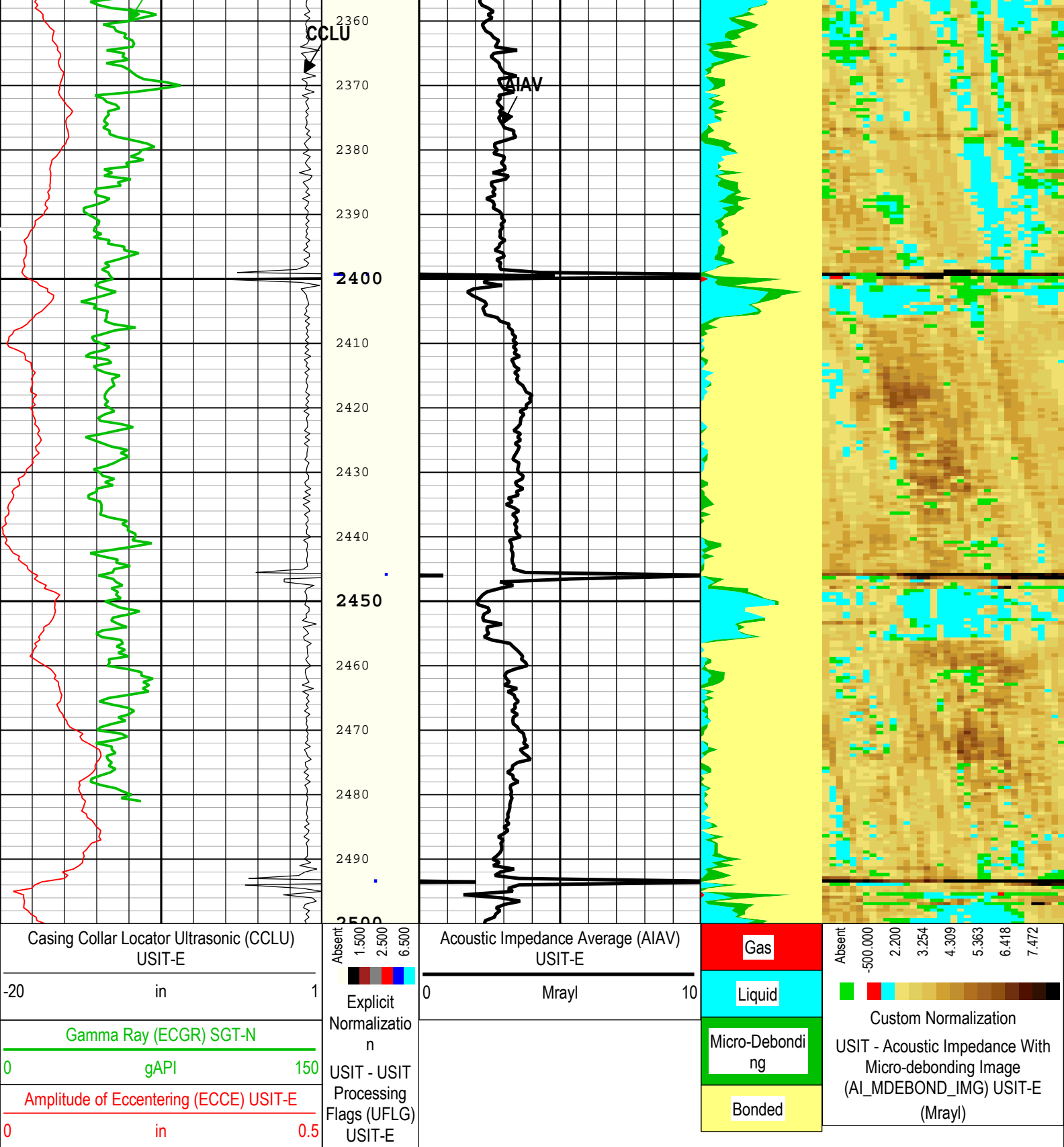
Log	Company:Noble Energy Inc	Well:Wells Ranch BB11-618
	ONE: Log[2]:Up:S003	

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: 02-Oct-2017 15:33:59

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: 02-Oct-2017 15:33:59

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	6230	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	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
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	
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	1.15	
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	50	V
HRES	Horizontal Resolution	USIT-E	10 deg	
TMUC	Type of Mud	USIT-E	BRI	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UPLIHT	Ultrasonic Pulse Echo Large Inhibit Time	USIT-E	Off	
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	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	3000	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:Wells Ranch BB11-618
ONE: Log[5]:Up:S003

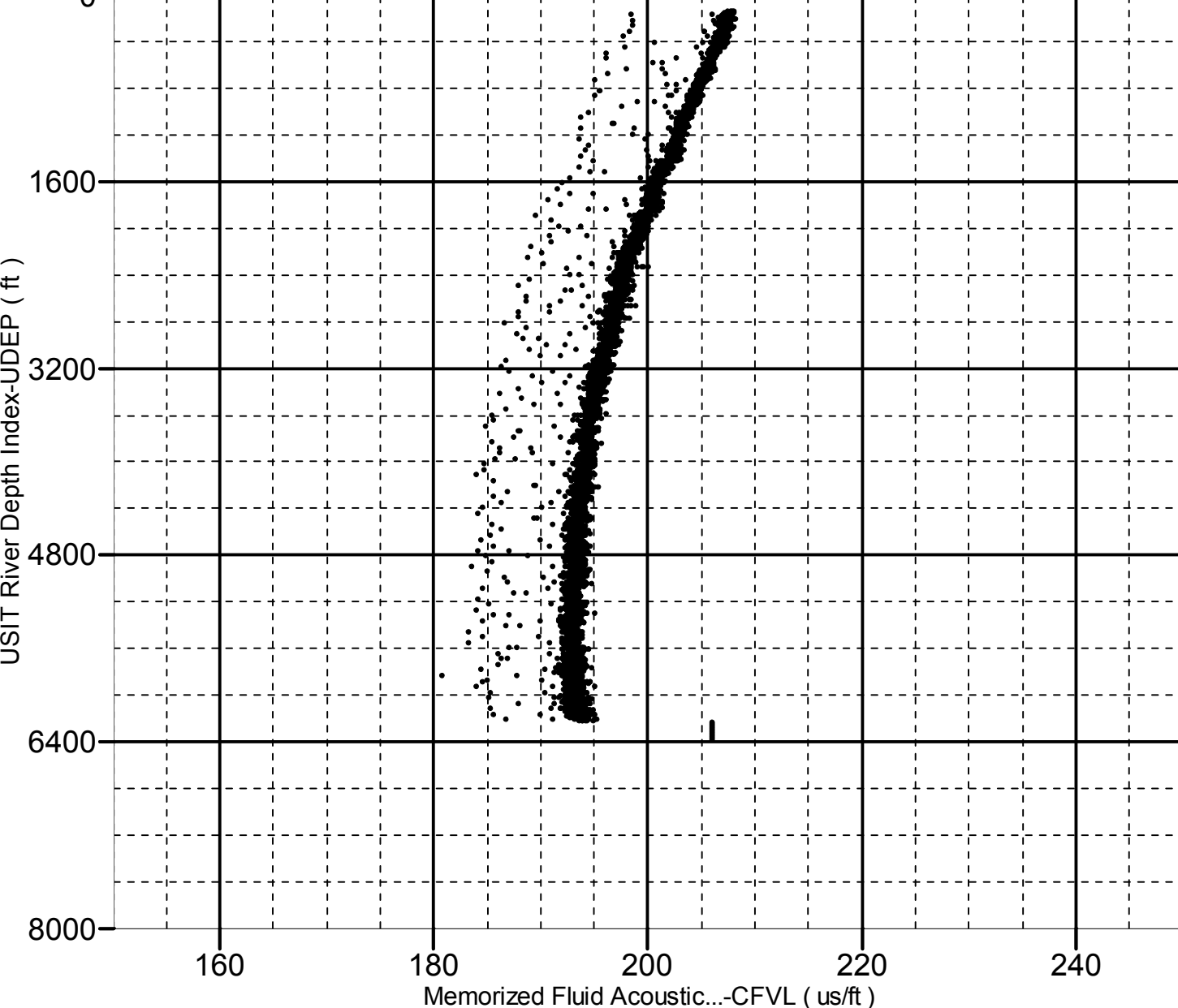
Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6230.00 to 45.00 ft

● CFVL-UDEP

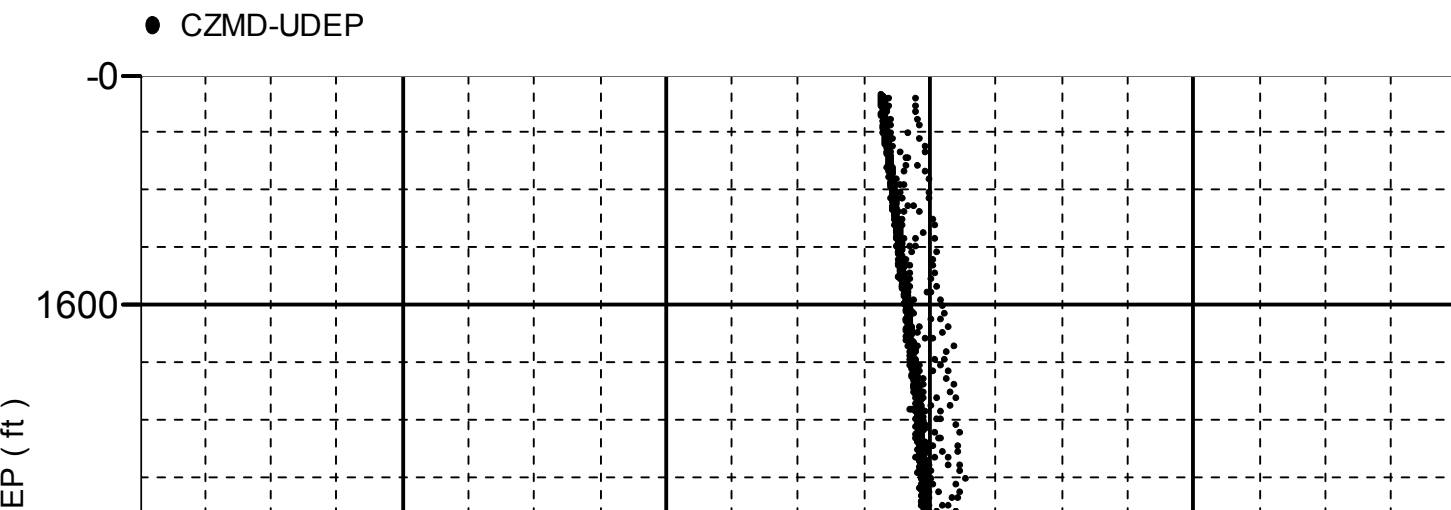


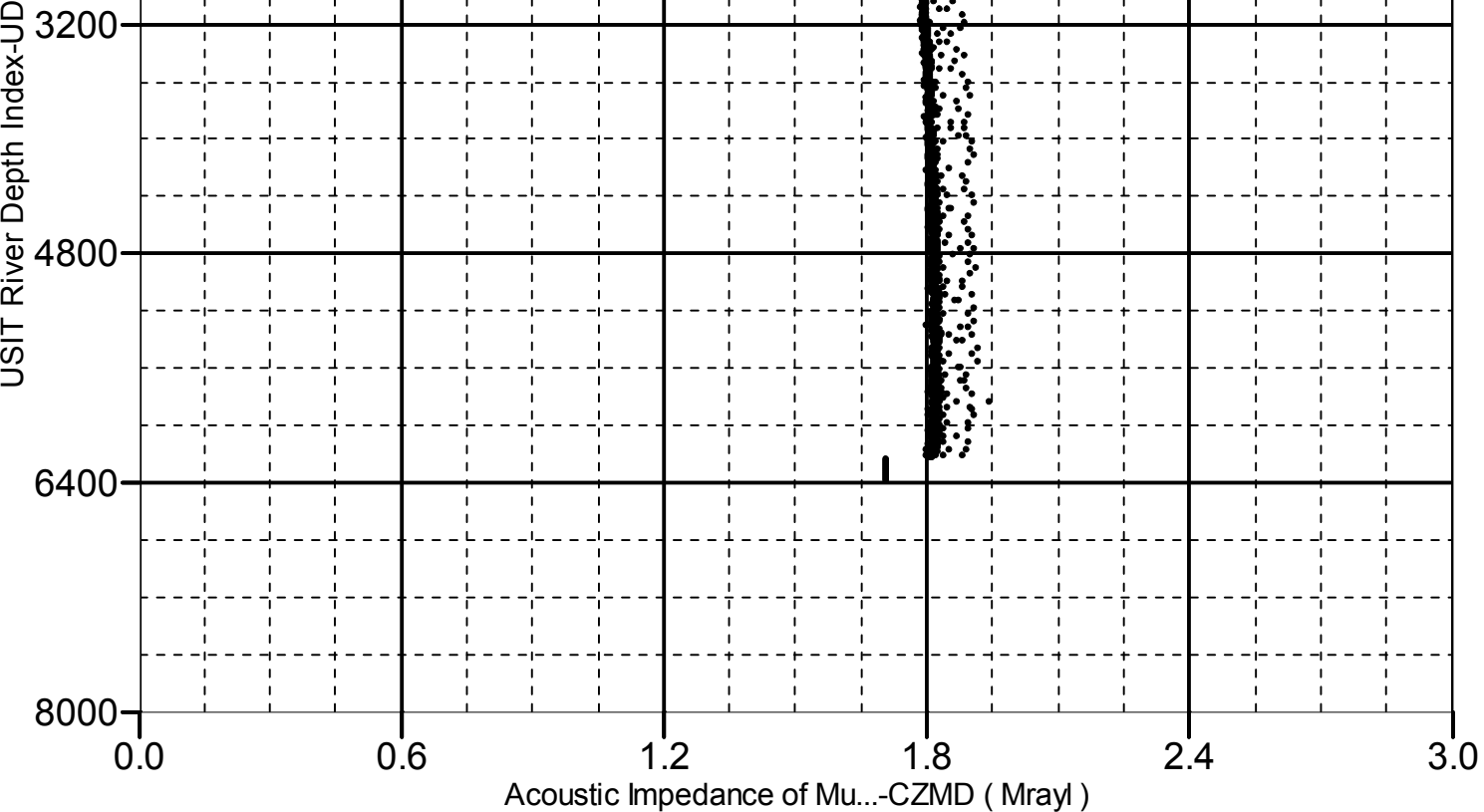


Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6230.00 to 45.00 ft





Company: Noble Energy Inc

Schlumberger

Well: Wells Ranch BB11-618

Field: Wattenberg

County: Weld

State: Colorado

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