

Company: Noble Energy Inc

Well: COLT A13-635

Field: WATTENBERG

County: WELD State: COLORADO

Ultrasonic Imager
Cement Evaluation
Gamma Ray - CCL

County: WELD
Field: WATTENBERG
Location: SHL: SWSW S17, T6N, R63W
Well: COLT A13-635
Company: Noble Energy Inc

Location:		SHL: SWSW S17, T6N, R63W 1,670' FSL , 535' FEL LAT: 40.482460 / -104.46880	Elev.: K.B. 4693.00 ft G.L. 4669.00 ft D.F. 4692.00 ft
Permanent Datum:	Ground Level		Elev.: 4669.00 f
Log Measured From:	Kelly Bushing		24.00 ft above Perm.Datum
Drilling Measured From:	Kelly Bushing		
API Serial No. 05-123-40915	Section: 17	Township: 6N	Range: 63W

Logging Date	24-Apr-2015
Run Number	ONE
Depth Driller	7002.00 ft
Schlumberger Depth	6840.00 ft
Bottom Log Interval	6840.00 ft
Top Log Interval	
Casing Fluid Type	Water
Salinity	
Density	8.7 lbm/gal
Fluid Level	0.00 ft
BIT/CASING/TUBING STRING	
Bit Size	8.75 in
From	948.00 ft
To	6840.00 ft
Casing/Tubing Size	7 in
Weight	26 lbm/ft
Grade	P110
From	0.00 ft
To	6995.00 ft
Max Recorded Temperatures	235 degF
Logger on Bottom	24-Apr-2015 10:31:00
Unit Number	3022
Recorded By	Benjamin Mammon
Witnessed By	

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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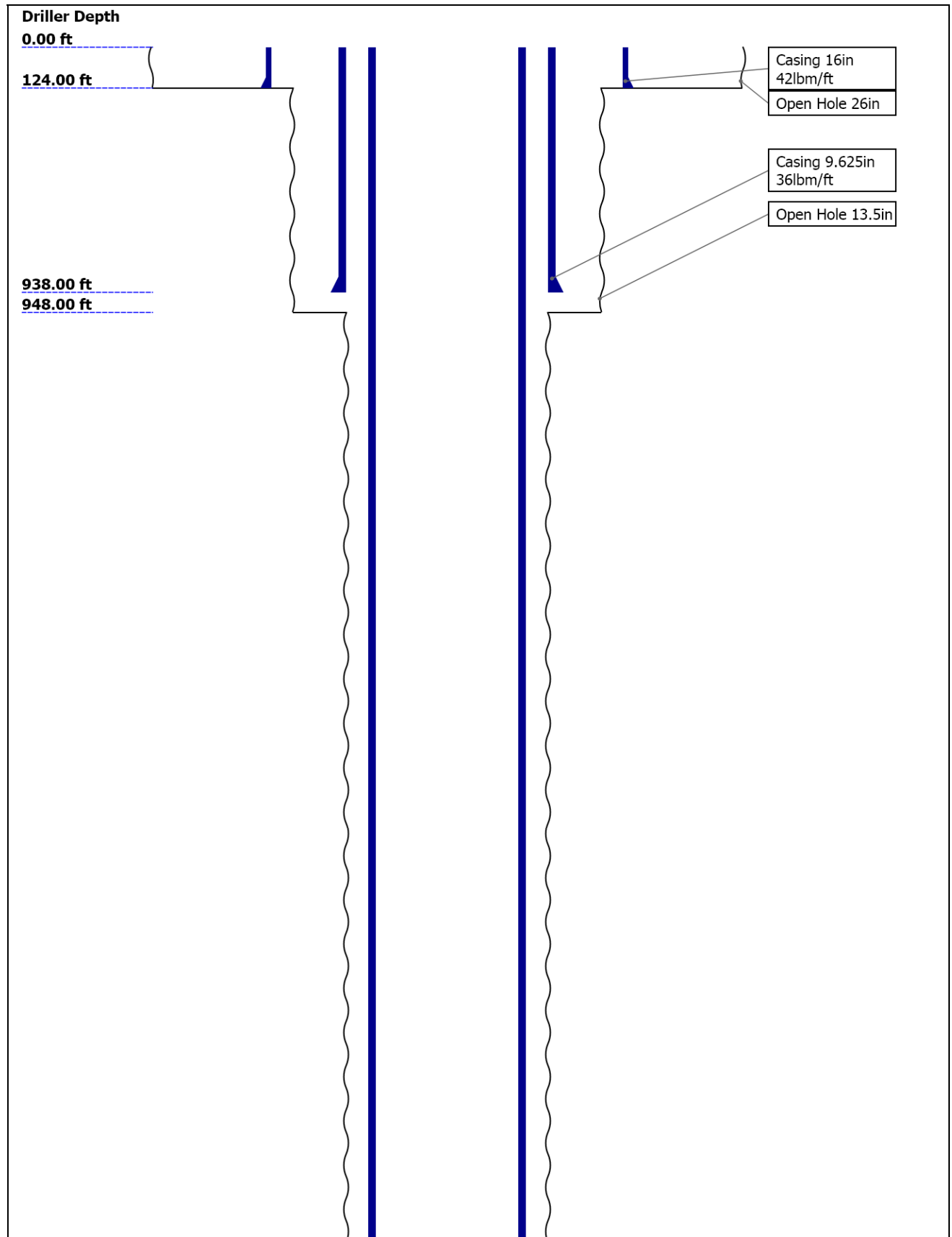
11.3 Parameter Listing

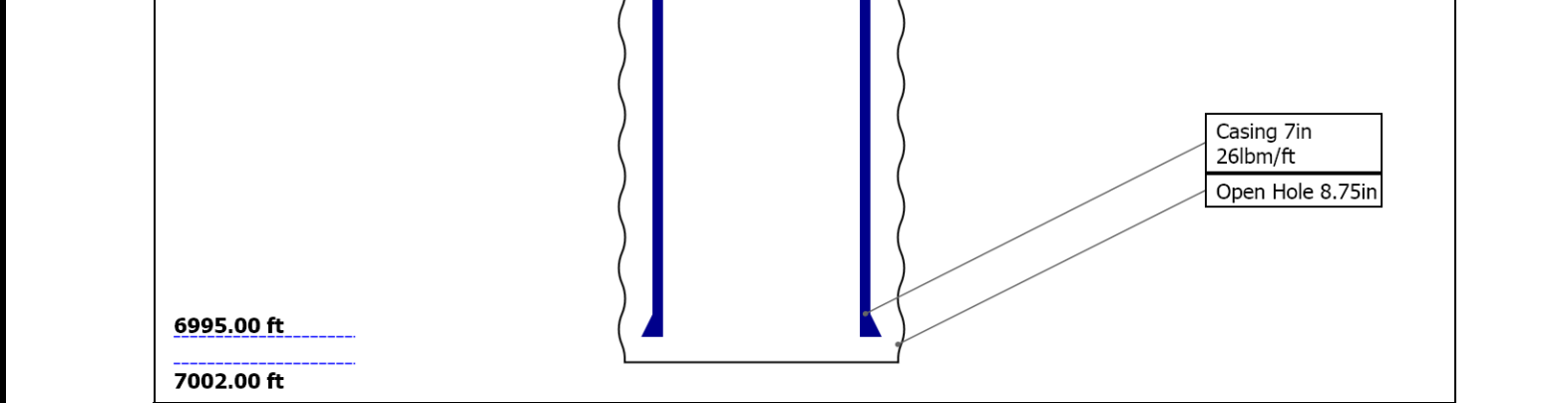
12. XYZ (USI Acoustic Impedance of Mud vs Depth 3.0 in)

13. XYZ (USI Fluid Acoustic Slowness vs Depth 3.0 in)

14. Tail

Well Sketch





Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	26	13.5	8.75			
Top Driller (ft)	0	124	948			
Top Logger (ft)	0	124	948			
Bottom Driller (ft)	124	948	7002			
Bottom Logger (ft)	124	948	6840			
Casing						
Size (in)	16	9.625	7			
Weight (lbm/ft)	42	36	26			
Inner Diameter (in)	15.512	8.921	6.276			
Grade	N/A	J55	P110			
Top Driller (ft)	0	0	0			
Top Logger (ft)	0	0	0			
Bottom Driller (ft)	124	938	6995			
Bottom Logger (ft)	124	938	6995			

Operational Run Summary

Parameter (unit)	ONE					
Date Log Started	24-Apr-2015					
Time Log Started	10:05:31					
Date Log Finished	24-Apr-2015					
Time Log Finished	12:05:44					
Top Log Interval (ft)						
Bottom Log Interval (ft)	6840.00					
Total Depth (ft)						
Max Hole Deviation (deg)	0.00					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	8.750					
Logging Unit Number	3022					
Logging Unit Location	Fort Morgan, CO.					
Recorded By	Benjamin Marmon					

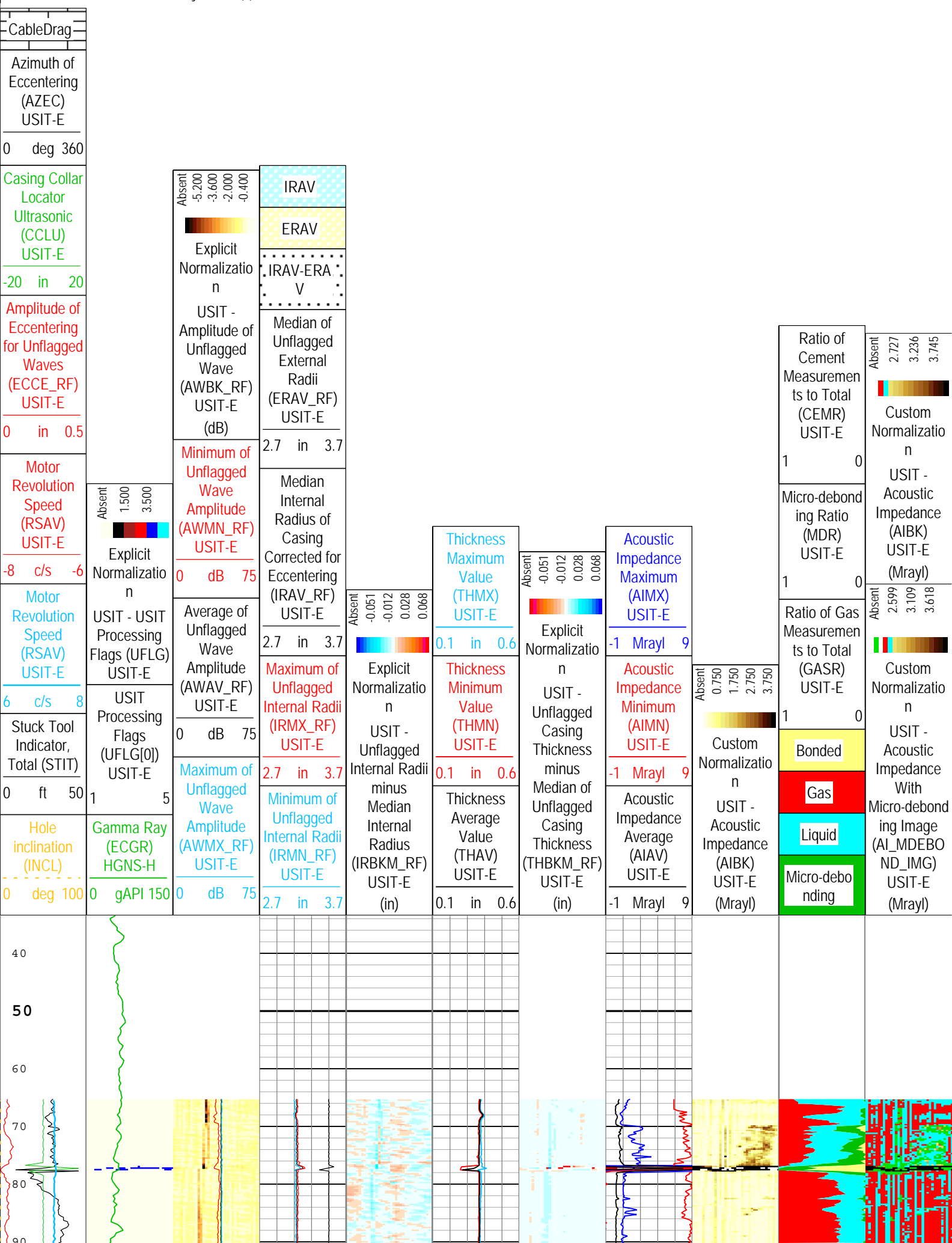
Witnessed By						
Service Order Number	D5ND-00035					

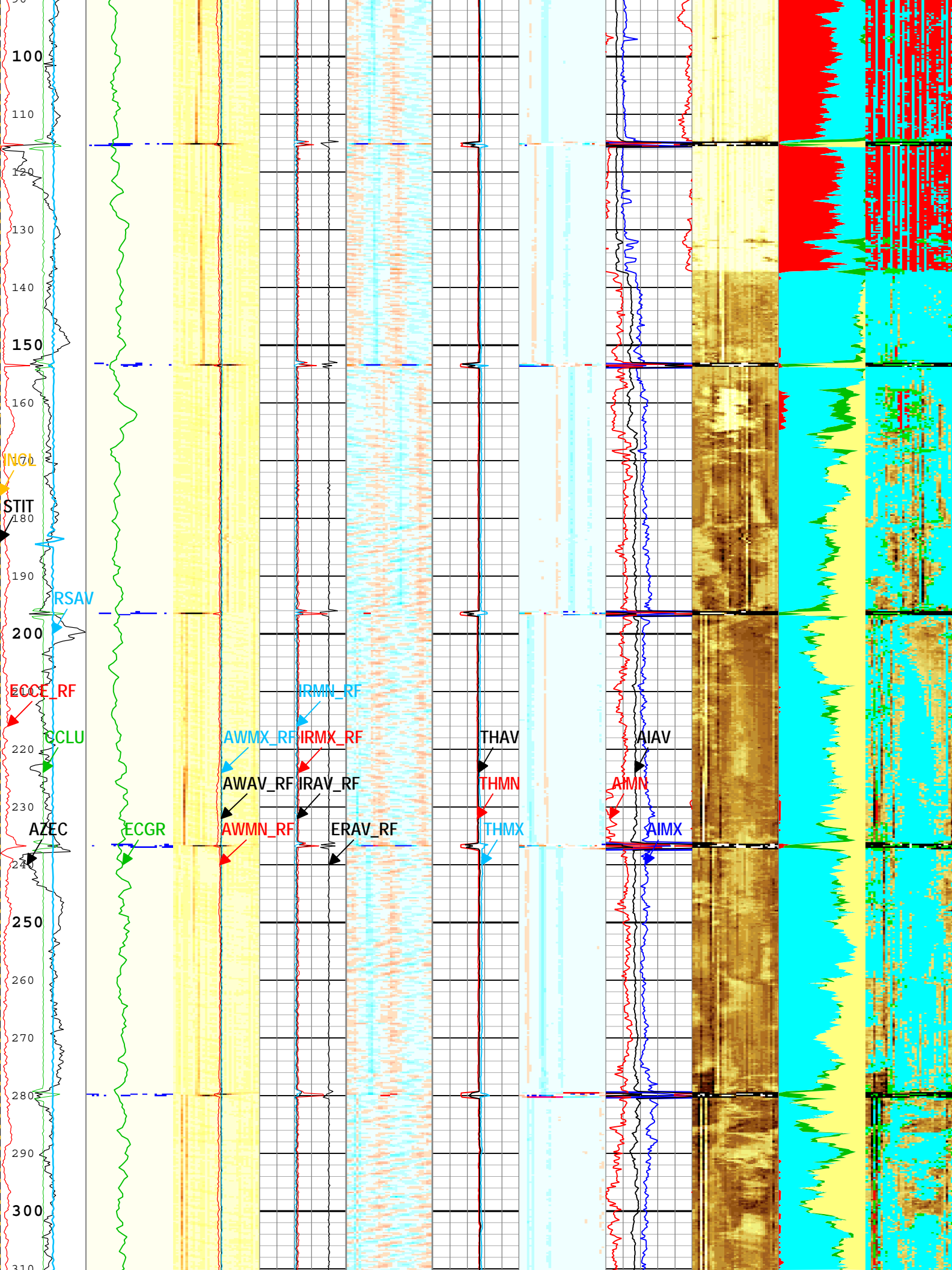
Remarks and Equipment Summary

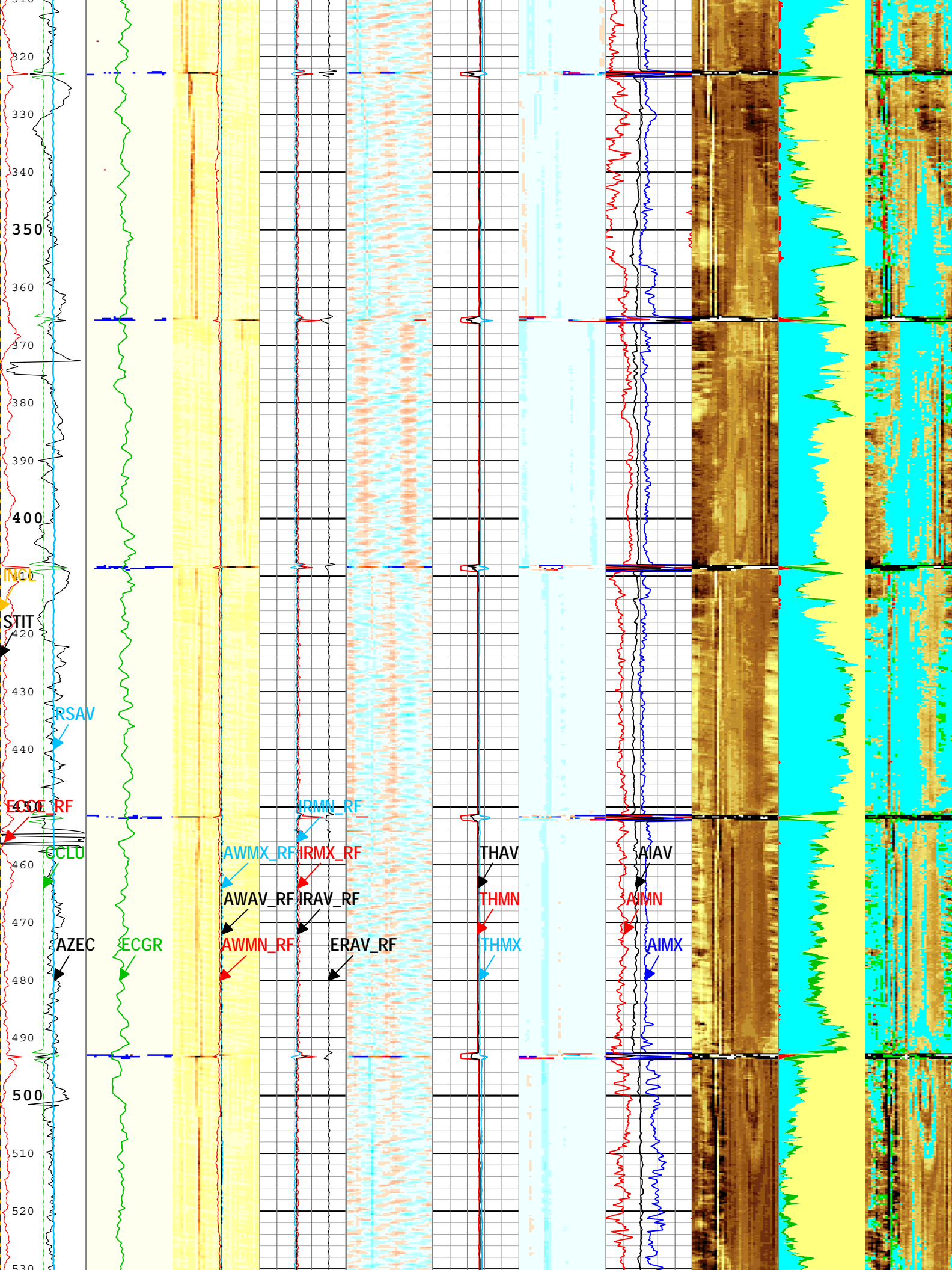
ONE: Toolstring			ONE: Remarks
<div><div><div><div><div>Equip nameLength</div><div>LEH-QT38.66</div><div>LEH-QT</div></div><div><div>DTC-H:835.74</div><div>803</div><div>ECH-KC</div><div>DTC-H:803</div></div><div><div>HGNS-H32.74</div><div>:4810</div><div>HGNH</div><div>HMCA-H</div><div>HGNS-H:4810</div><div>HACCZ-H:5955</div></div><div><div>AH-18423.34</div><div>:2746</div></div><div><div>AH-12021.34</div><div>:795</div></div><div><div>CME-AF19.34</div><div>:36</div></div><div><div>USIT-E:915.54</div><div>92</div><div>ECH-MFA</div><div>:1964</div><div>USAC-A:992</div><div>USIS-A:999</div><div>USSC-B:1794</div><div>USRS-B</div><div>USI-SEN</div><div>SOR</div></div></div><div><div><div>MP nameOffset</div><div>CTEM34.85</div><div>HV0.00</div><div>TelStatus32.74</div><div>ToolStatus32.74</div><div>Temperature32.72</div><div>GR32.00</div><div>CNL Porosity25.67</div><div>HGNS23.34</div><div>HMCA23.34</div><div>Accelerometer0.00</div><div>USI Sensor Head-Tension0.38</div><div>TOOL_ZERO</div></div><div><div>Lengths are in ft</div><div>Maximum Outer Diameter = 4.700 in</div><div>Line: Sensor Location, Value: Gating Offset</div><div>All measurements are relative to TOOL_ZERO</div></div></div></div><div><div>This is the first run in the hole.</div><div>Toolstring run as per toolsketch.</div><div>Log Objective: Cement Evaluation</div><div>0 PSI repeat pass and 2500 PSI main pass.</div><div>Estimated TOC @ 481'.</div><div>Expected TOC @ 1000'.</div><div>Top of Liner 4.5" at 6891'</div><div>Bottom Log interval at 6840'. Lost tension and could not spin sup below this point.</div><div>Bottom Hole Temp was 235 degF.</div></div></div>			

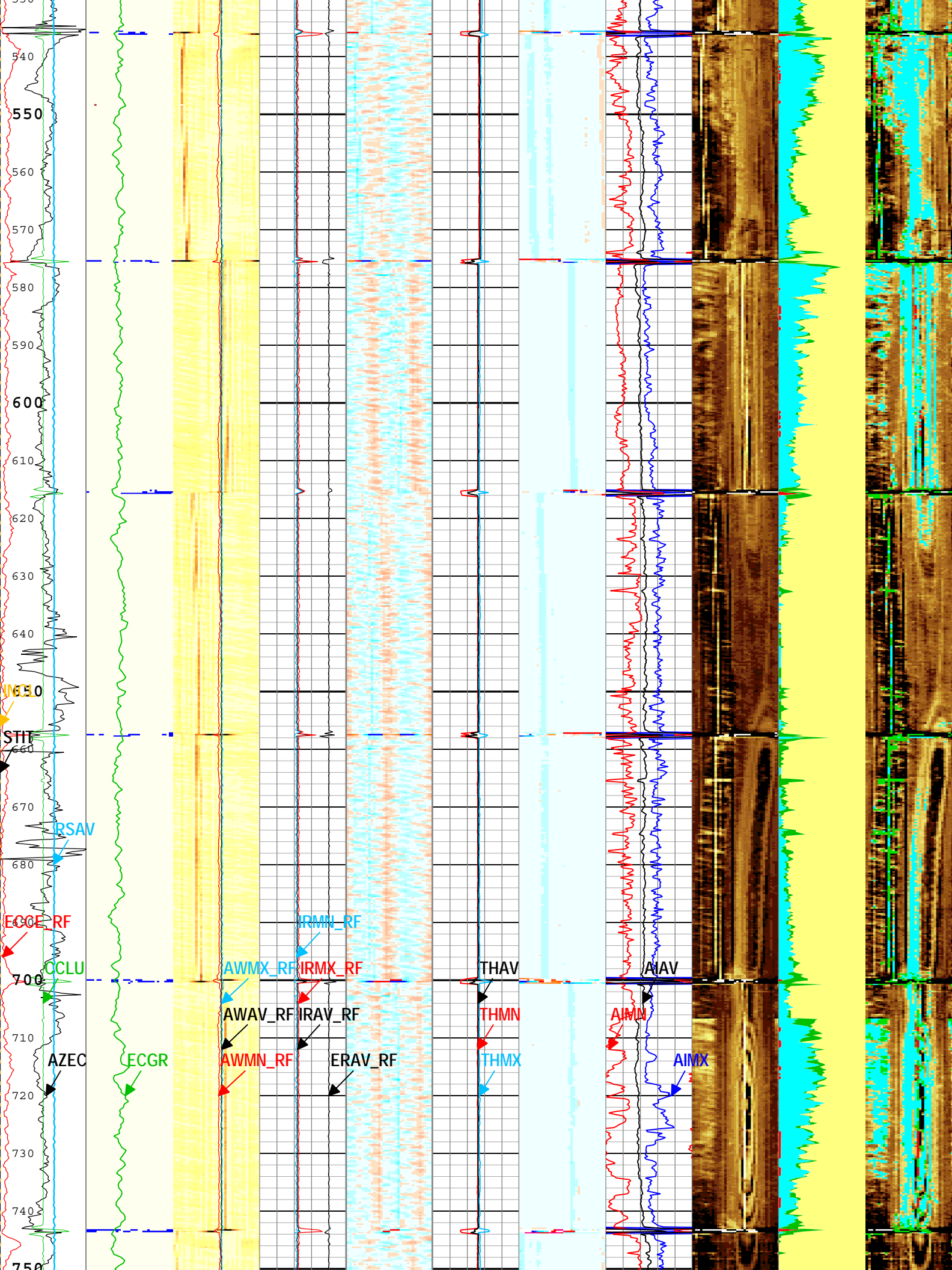
Depth Summary			
	ONE		
Depth Measuring Device			
Type	IDW-JA		
Serial Number	7234		
Calibration Date	13-Feb-2015		
Calibrator Serial Number			
Calibration Cable Type	7-39 PLXS		
Wheel Correction 1	-4		
Wheel Correction 2	-2		
Tension Device			
Type	CMTD-B/A		
Serial Number	1109		
Calibration Date	23-Apr-2015		
Calibrator Serial Number	78135A		
Number of Calibration Points	10		
Calibration Root Mean Square Error	6		
Calibration Peak Error	11		
Logging Cable			
Type	7-39P-LXS		
Serial Number	U711136		
Length	17200.00 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.	
Rig Up Length At Surface		IDW used as primary depth control.	
Rig Up Length At Bottom		Z-Chart used as secondary depth control.	
Rig Up Length Correction			
Stretch Correction			
Tool Zero Check At Surface			
Copy of USI Composite			
USIT - Fluid Properties Measurement			
Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Main[5]:Up	6845.77	65.41
Fluid Velocity = "Automatic". CFVL equals DFSL channel			
Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)
Mud Impedance = "Manual". CZMD uses ZMUD parameter zoned table below			
Start Depth(ft)	Stop Depth(ft)	Start Value(Mrayl)	End Value(Mrayl)
0		1.7	1.7
Log	Company:Noble Energy Inc Well:COLT A13-635 ONE: Main[5]:Up:S005		
Description: USI Composite Format: USI Composite Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 24-Apr-2015 15:29:50			
USIT Processing Flags (UFLG[0]) USIT-E			
1 - UFLG 1 Value within [0.0 - 1.5] - :	UTIM Error		
2 - UFLG 2 Value within [1.5 - 2.5] - :	Pulse Origin Not Detected		
3 - UFLG 3 Value within [2.5 - 3.5] - :	WINLEN Error		
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :	Casing Thickness Error		
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :	Loop Processing Error		

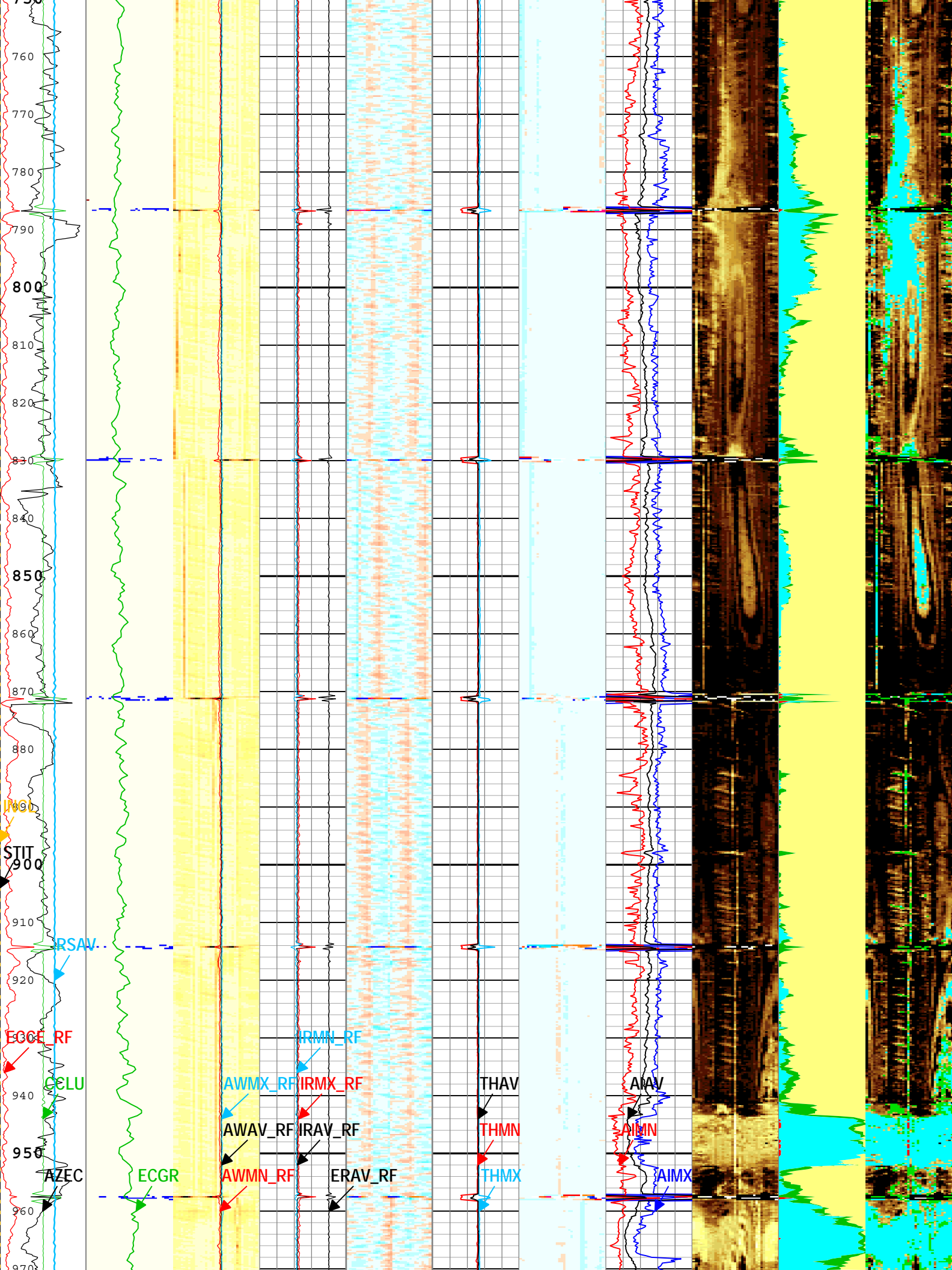
TIME_1900 - Time Marked every 60.00 (s)

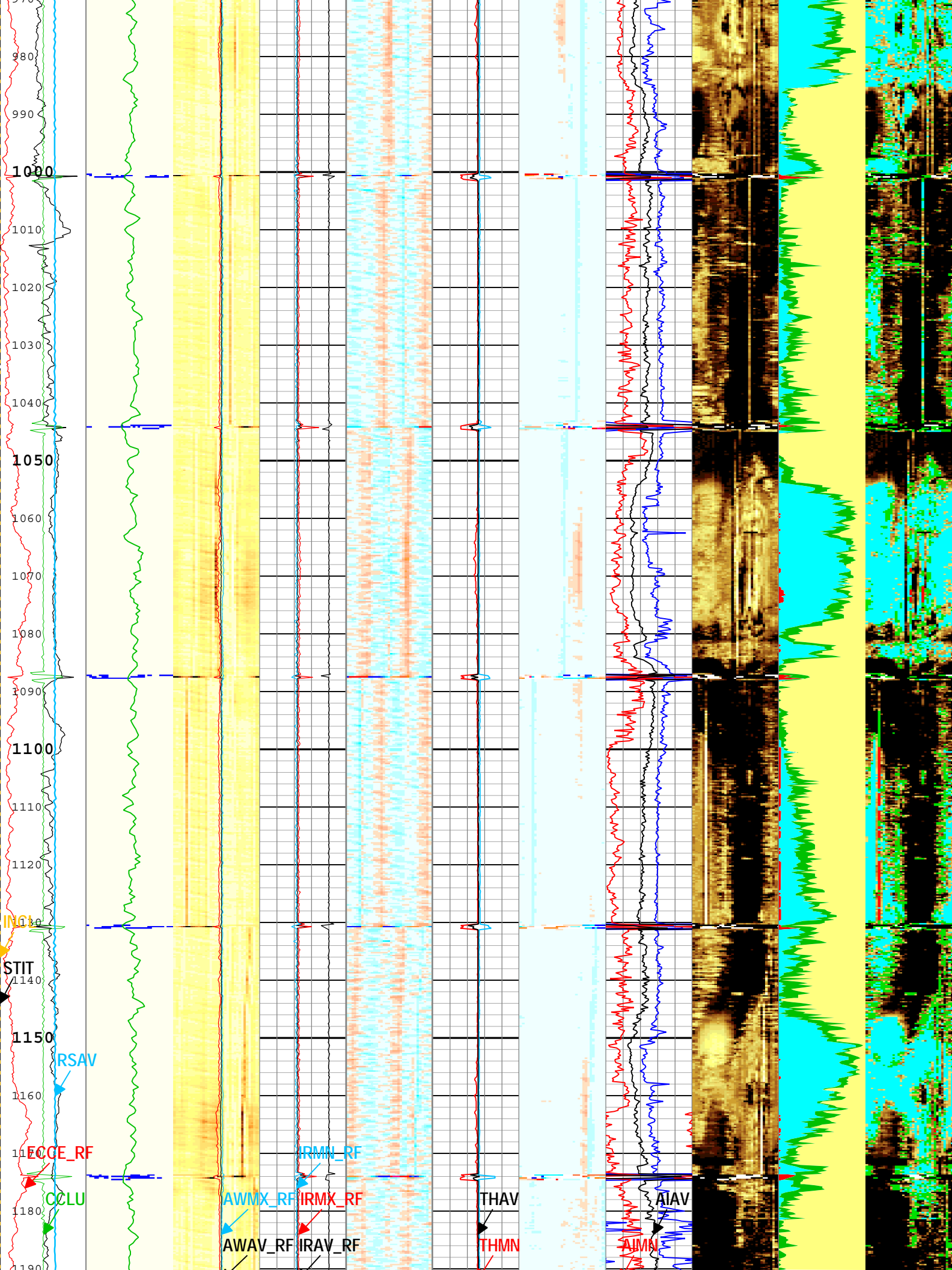


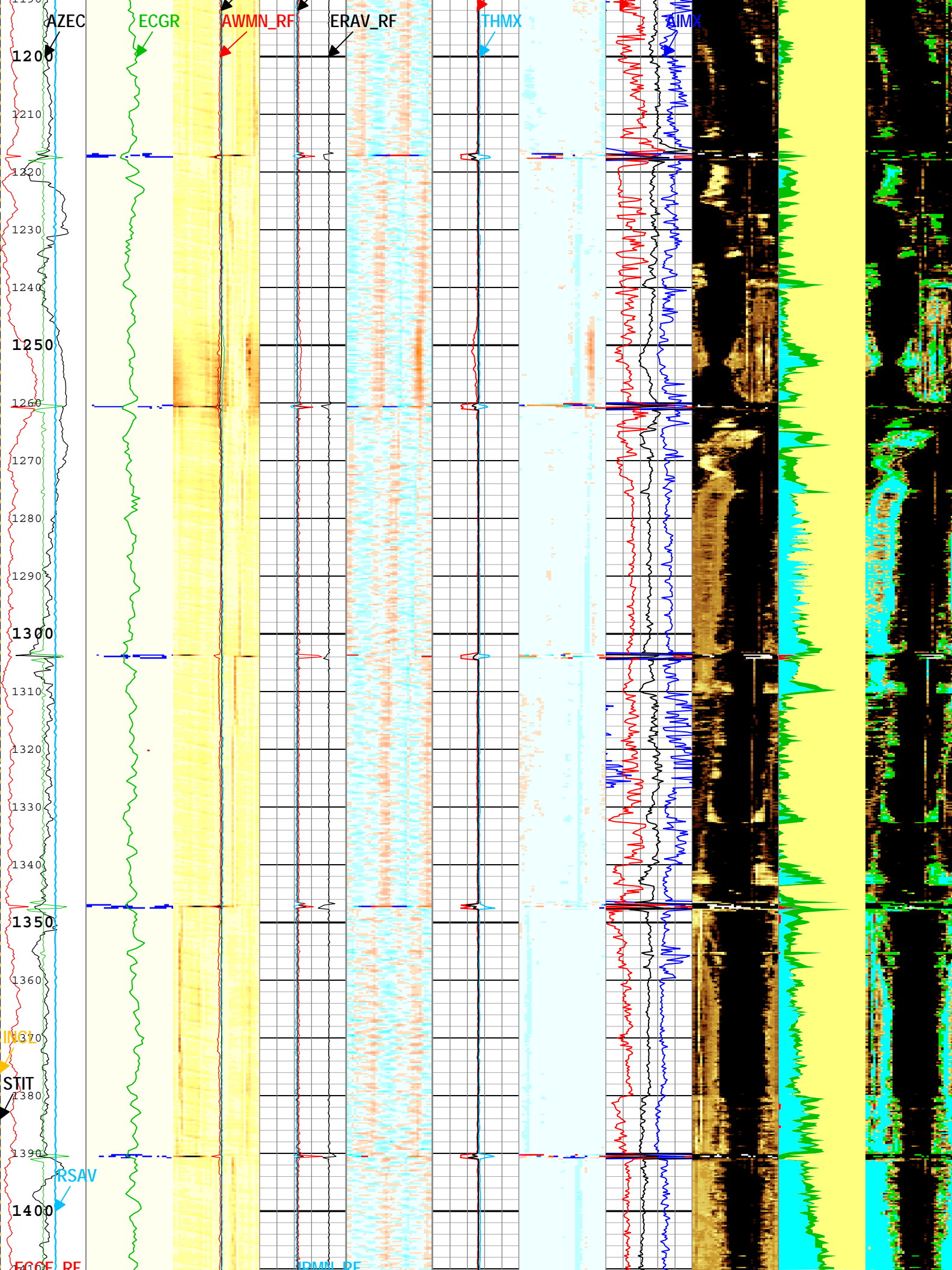


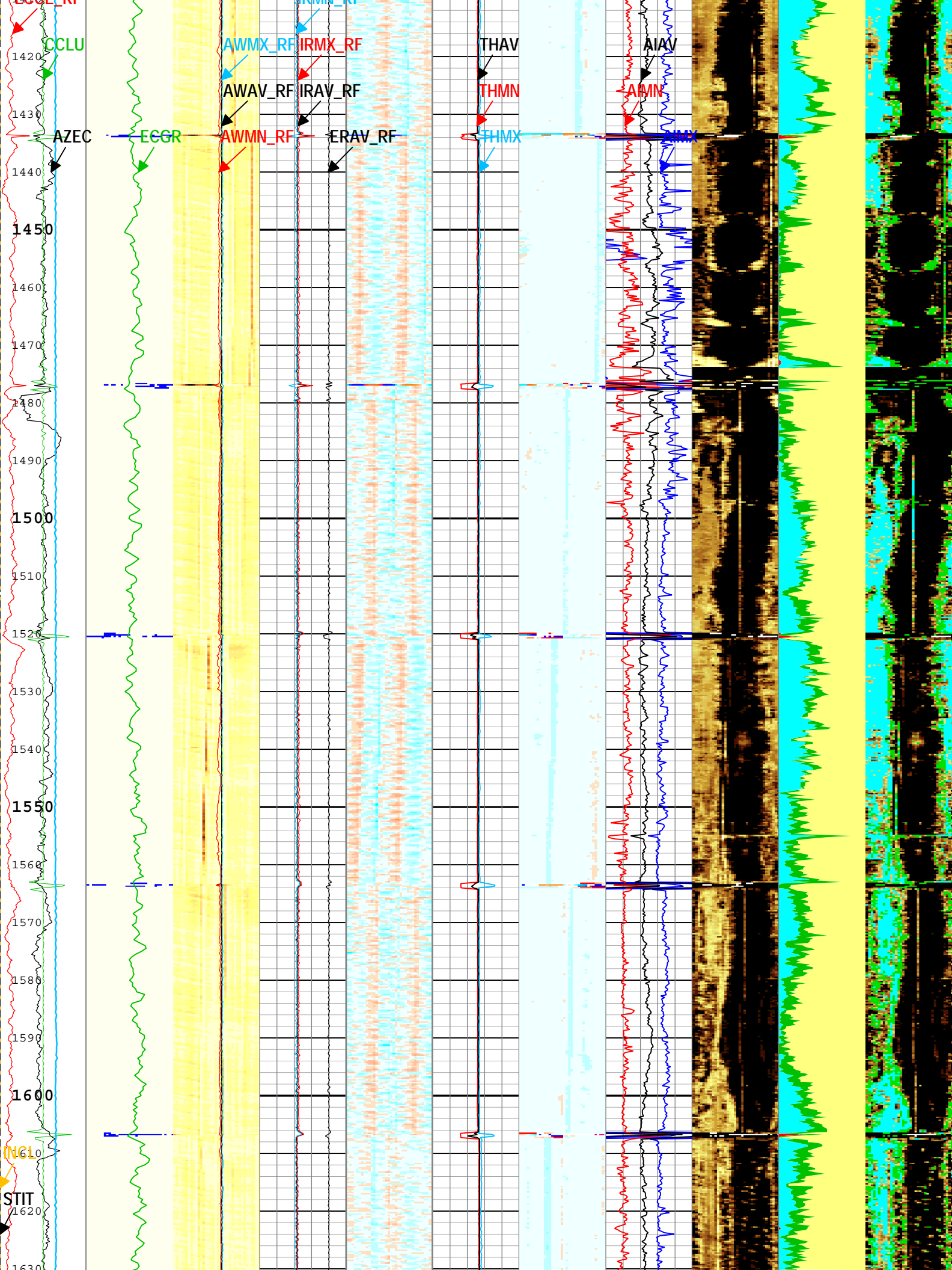


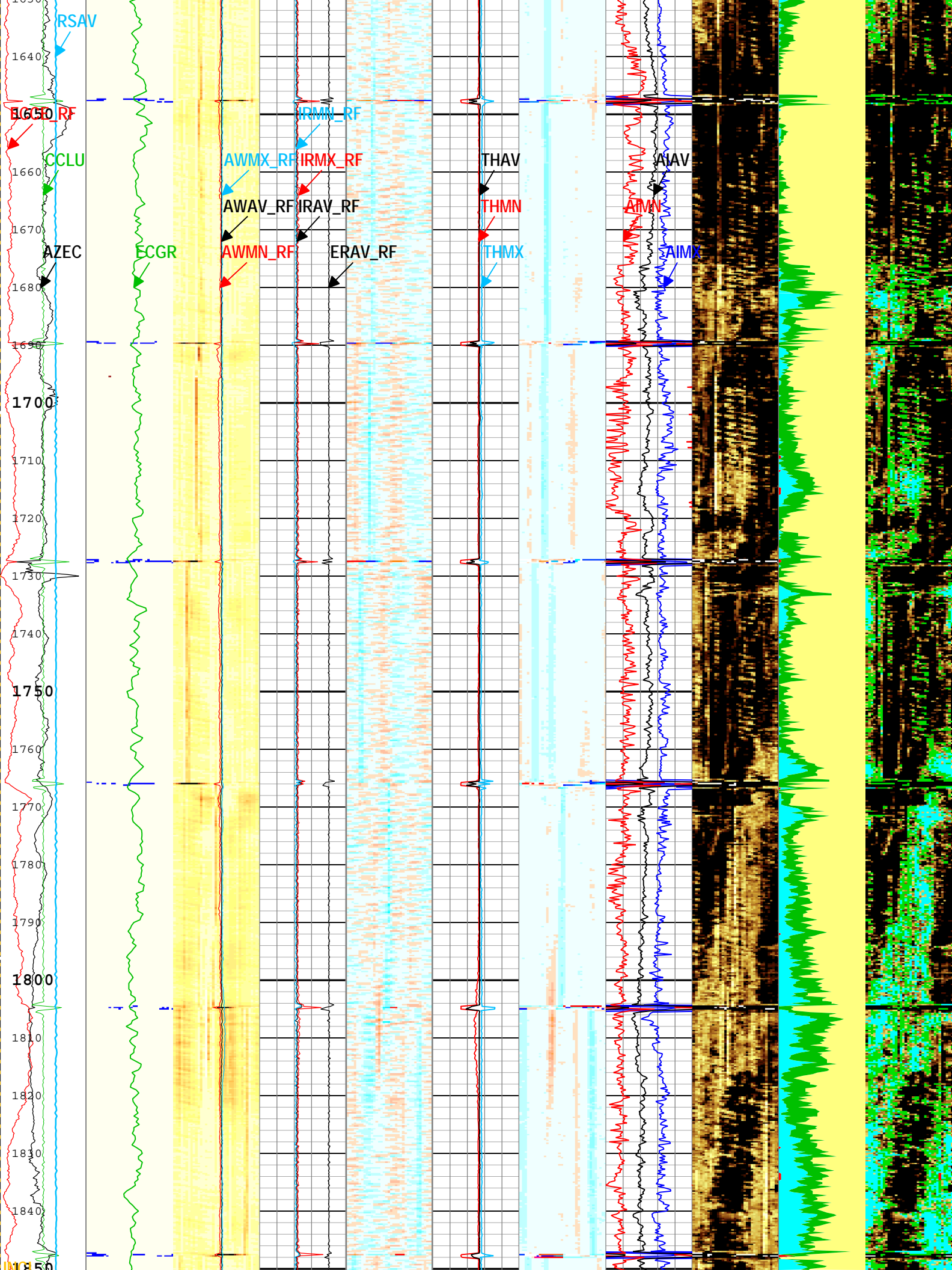


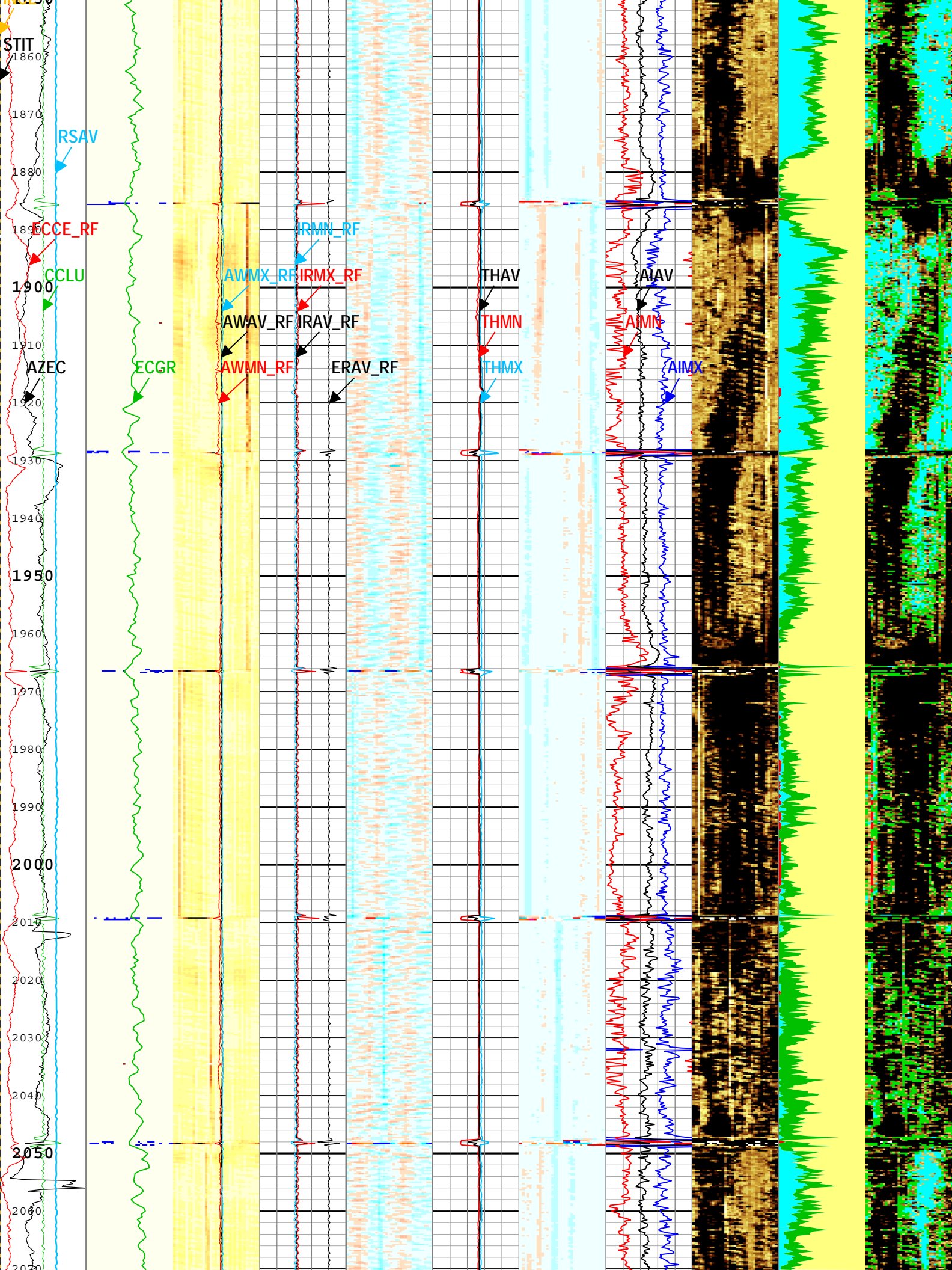


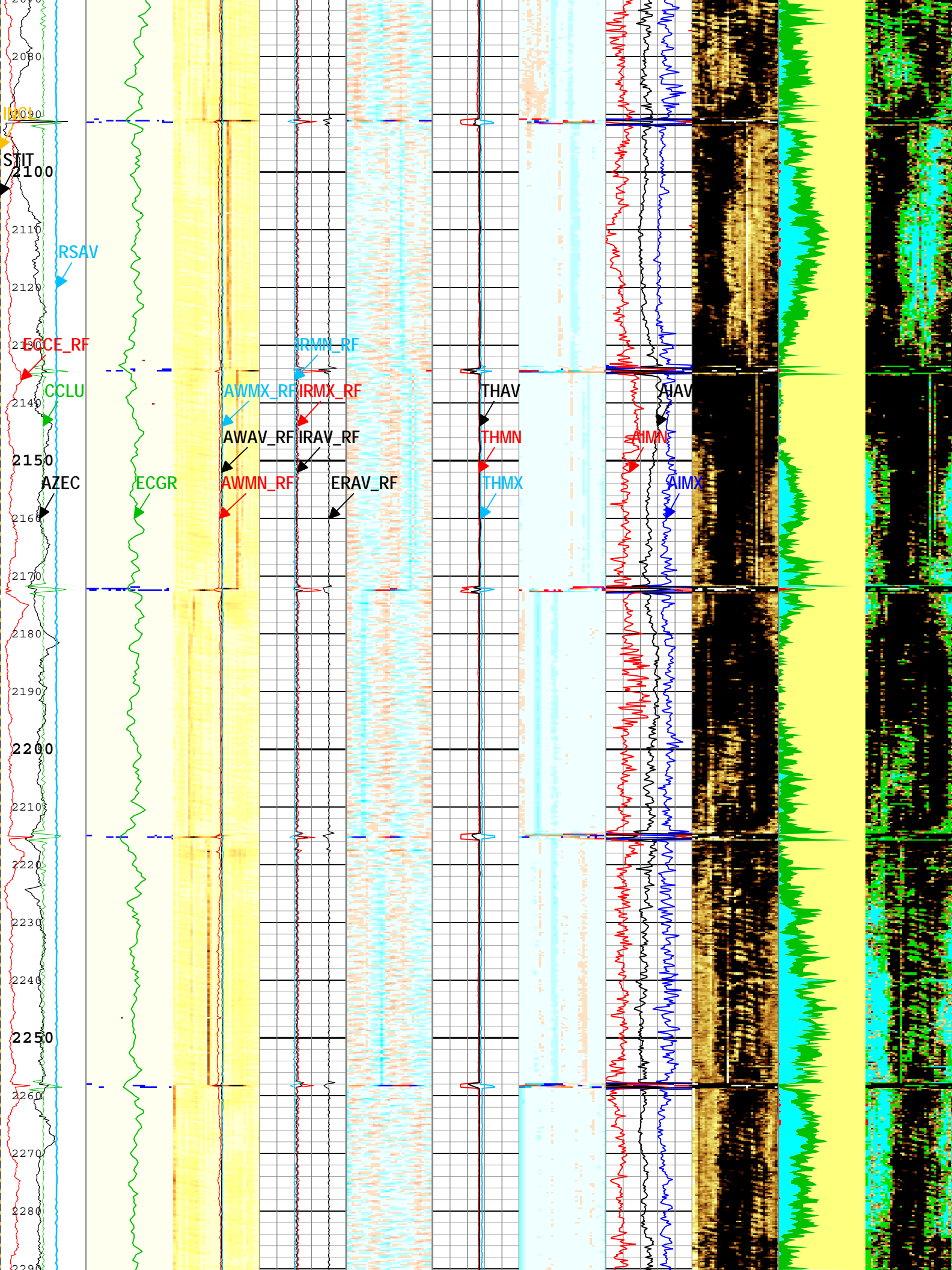


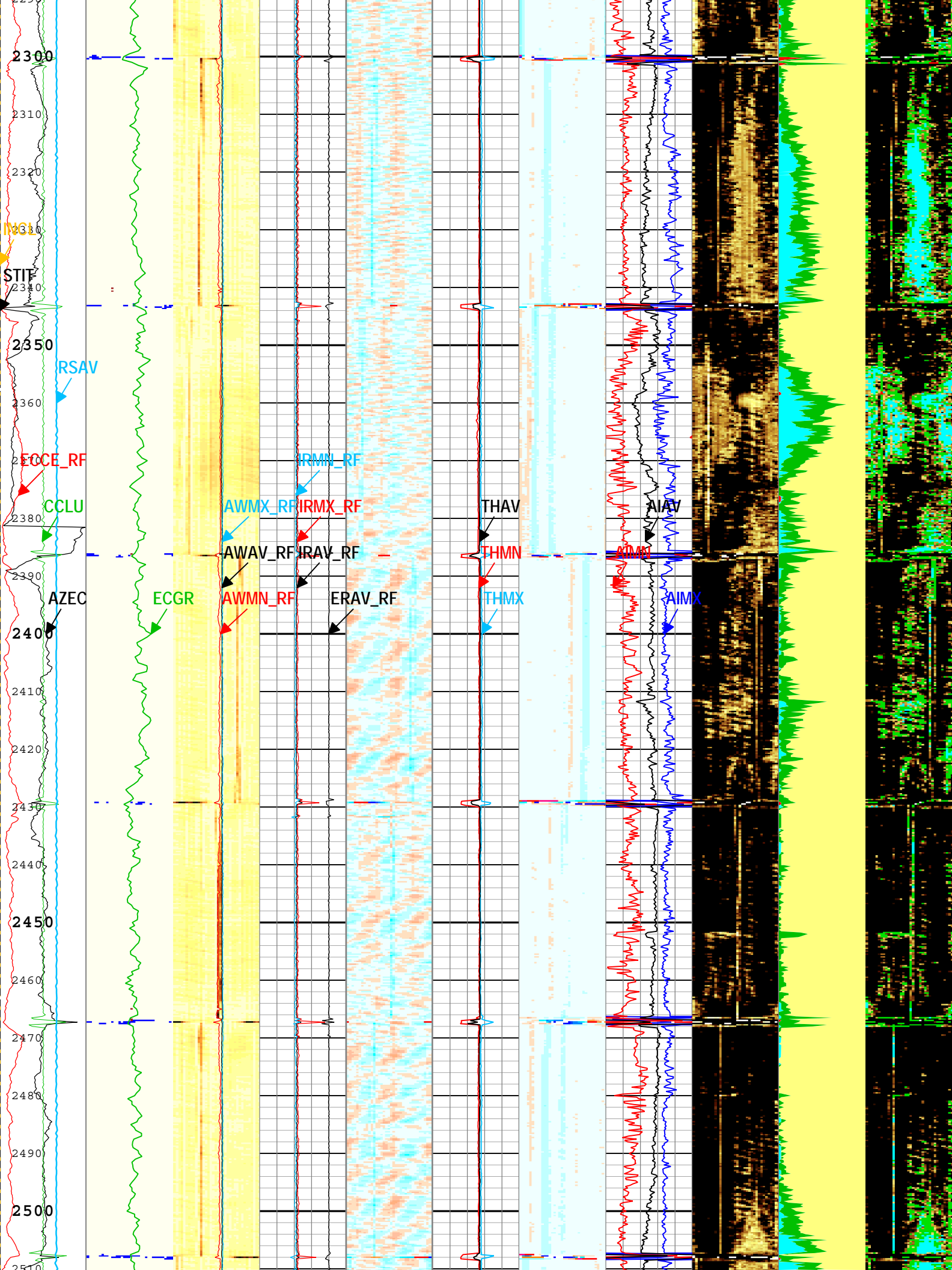


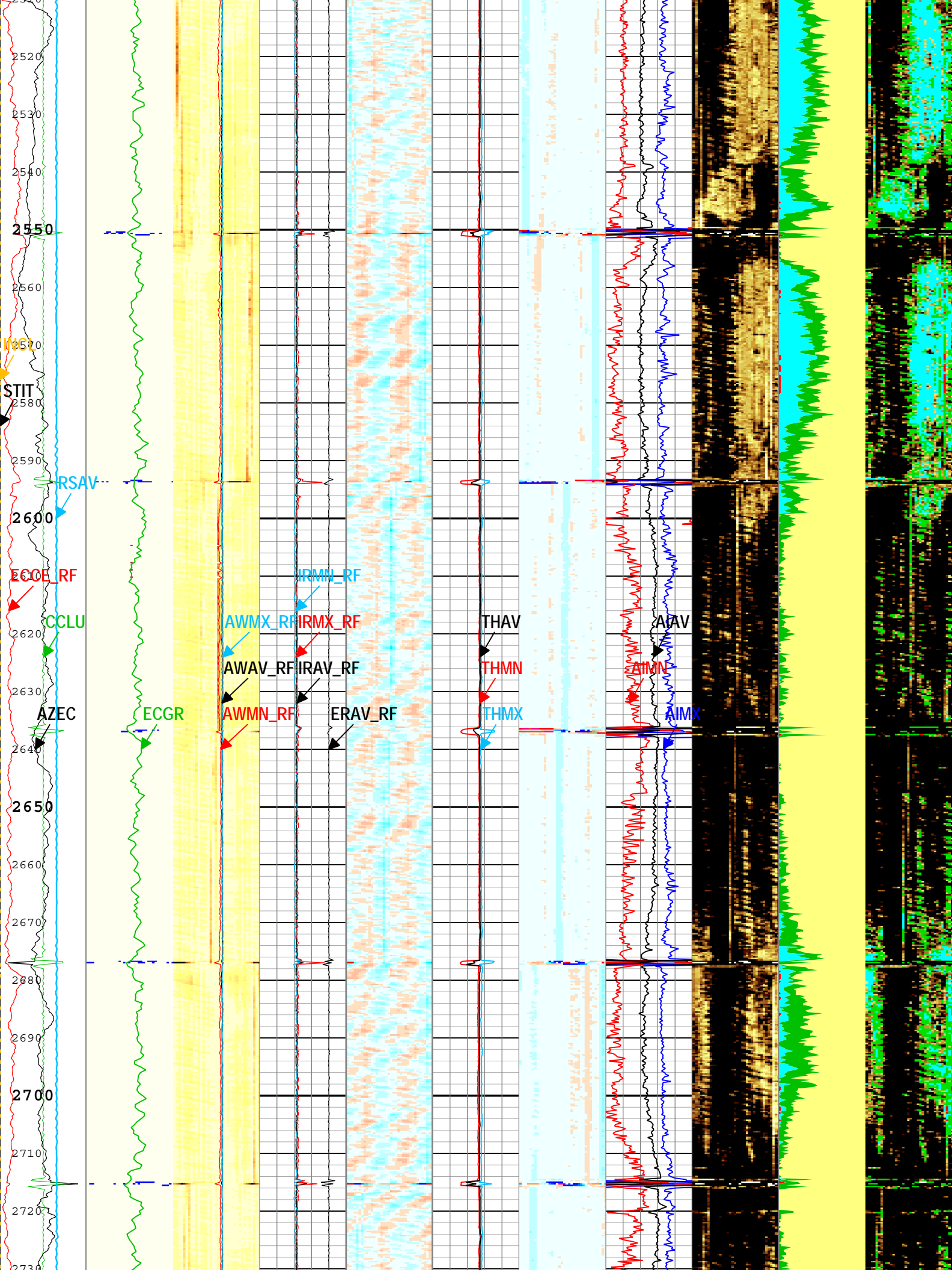


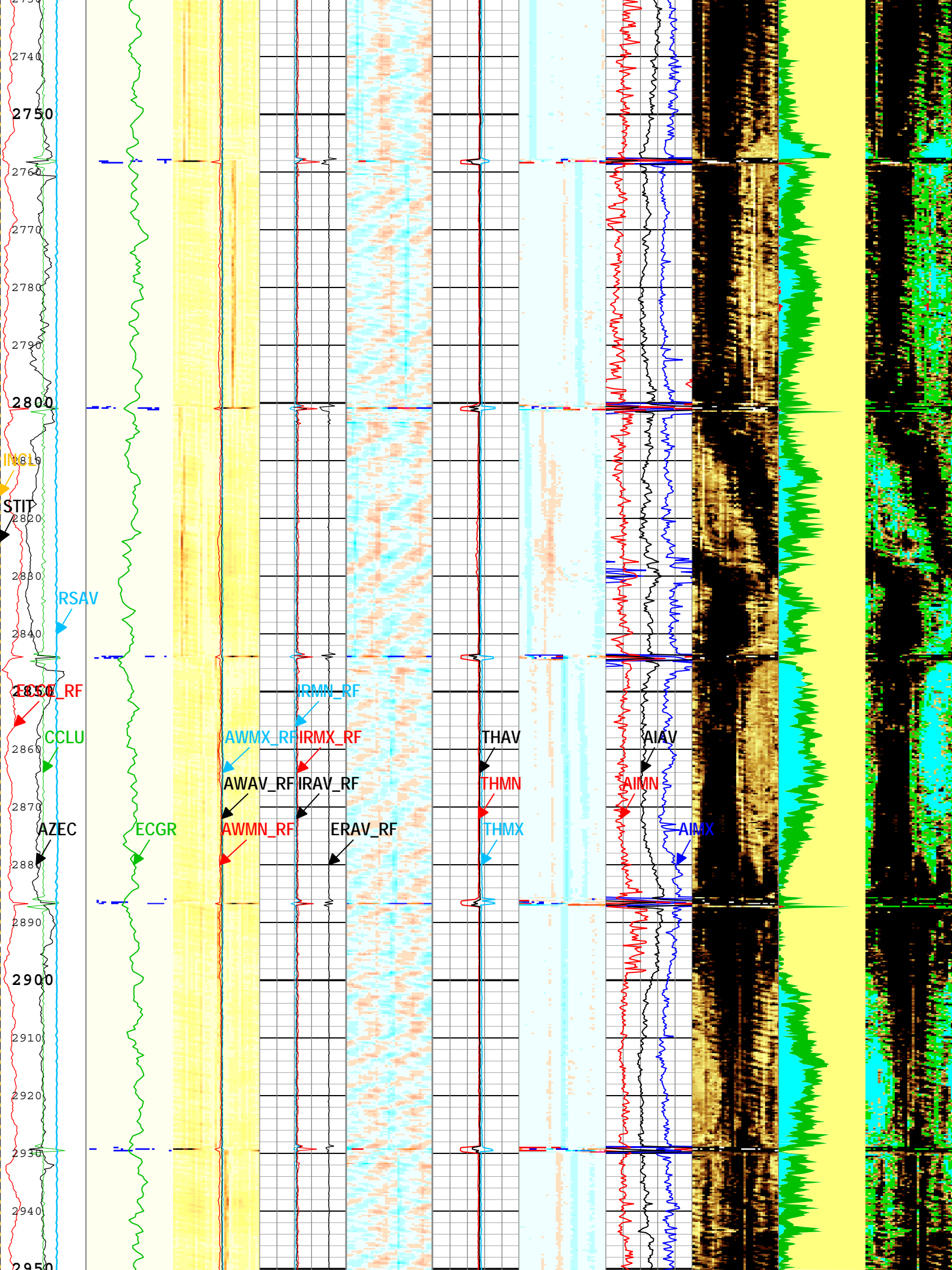


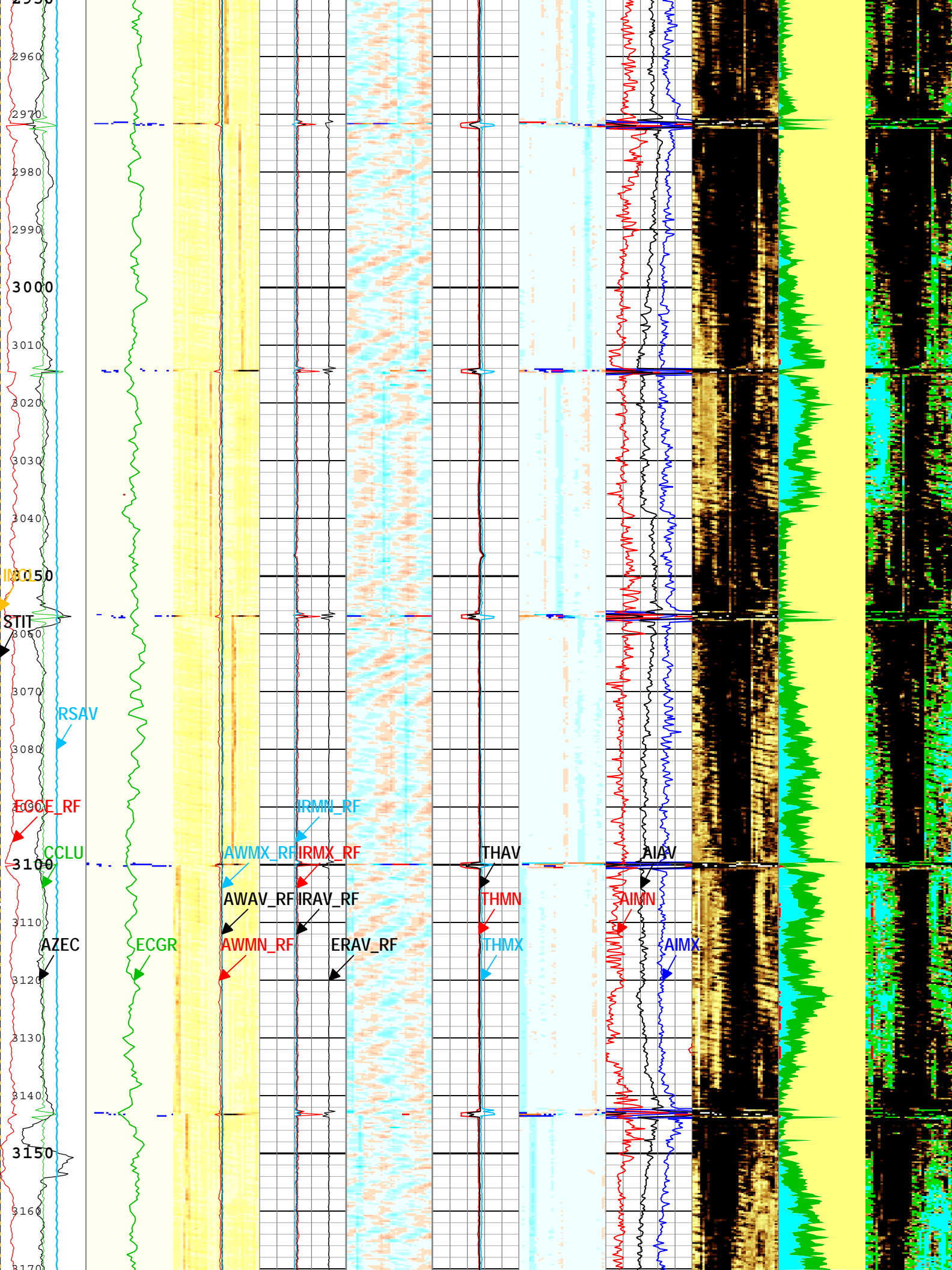


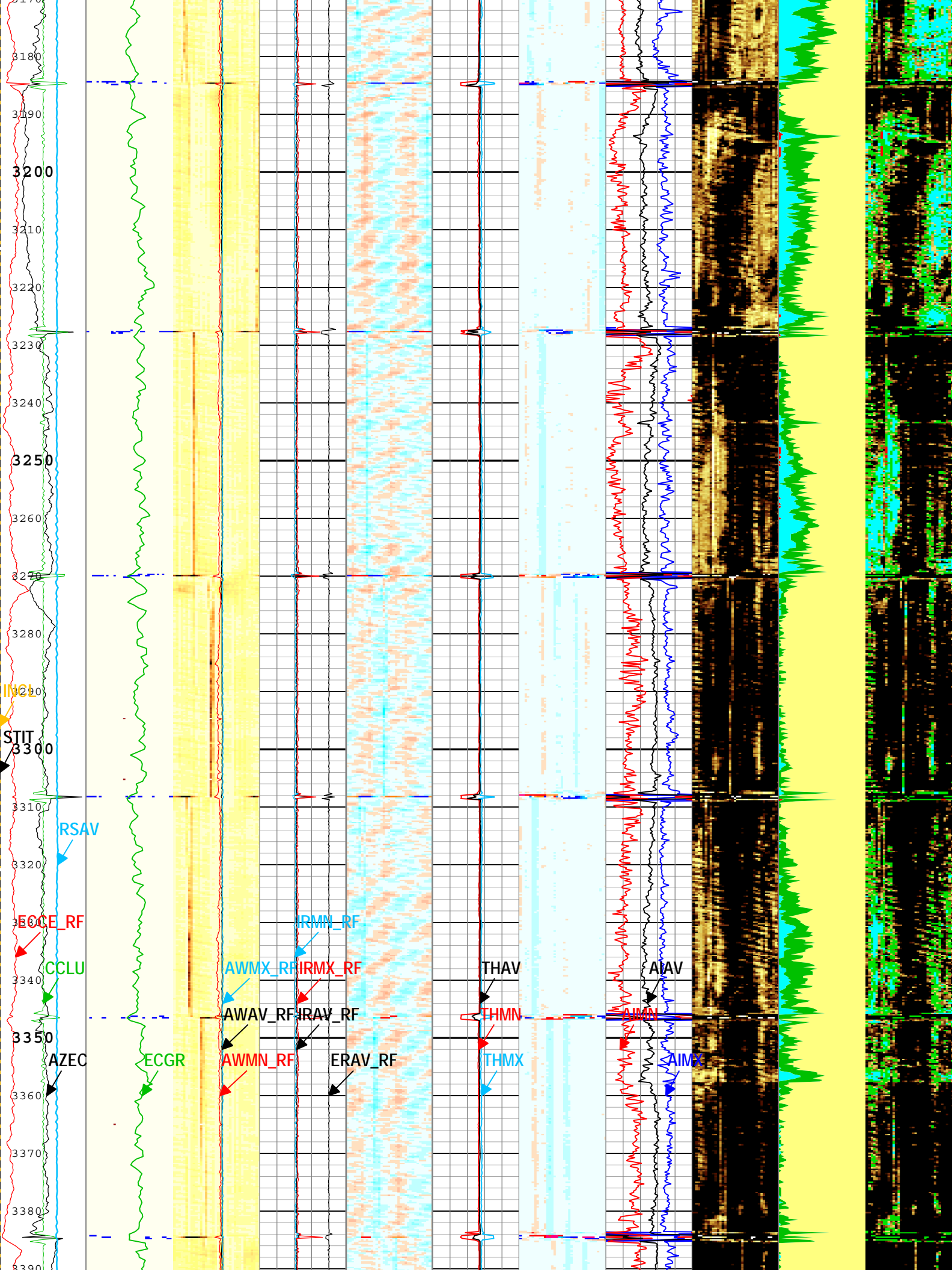


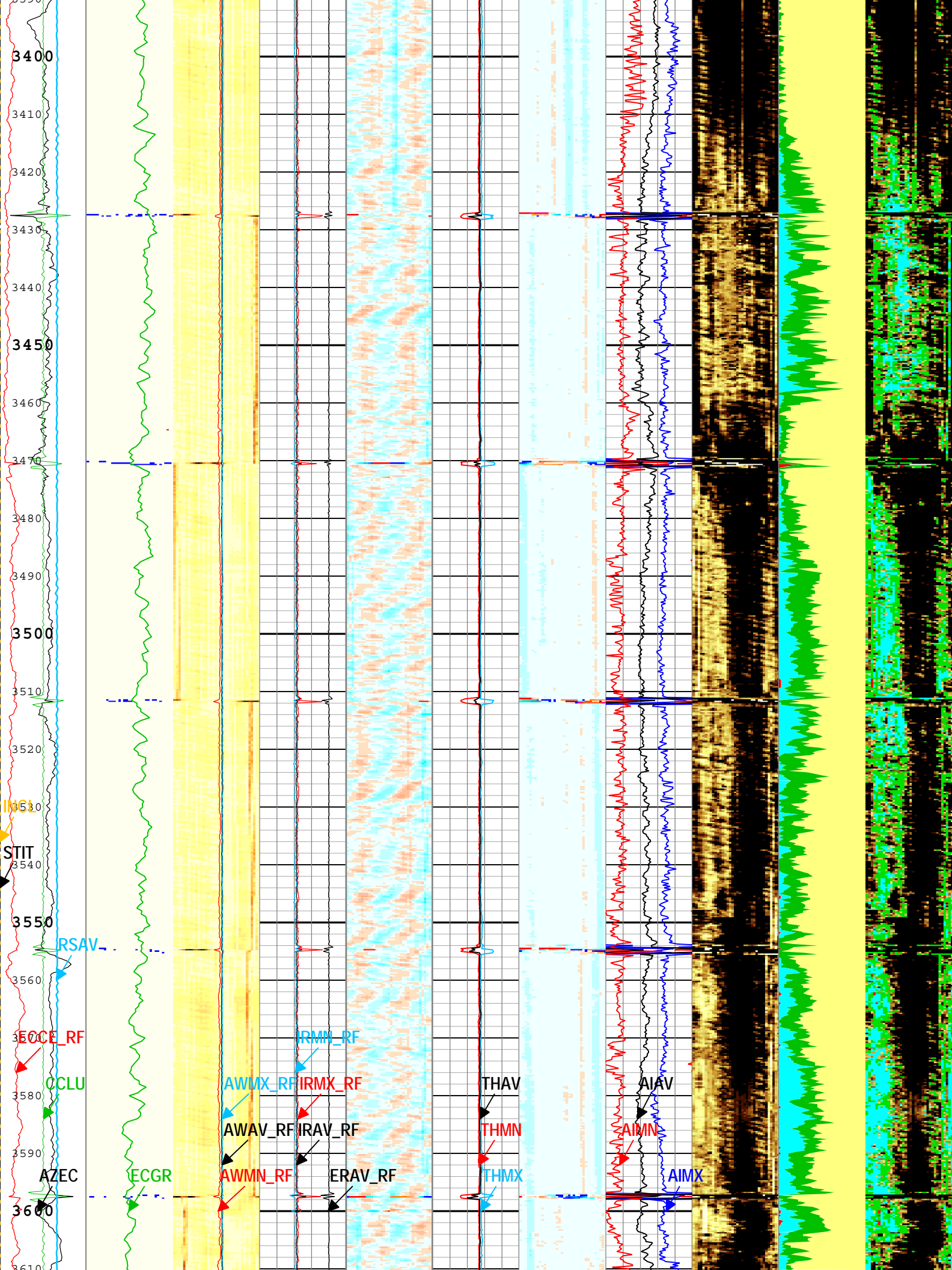


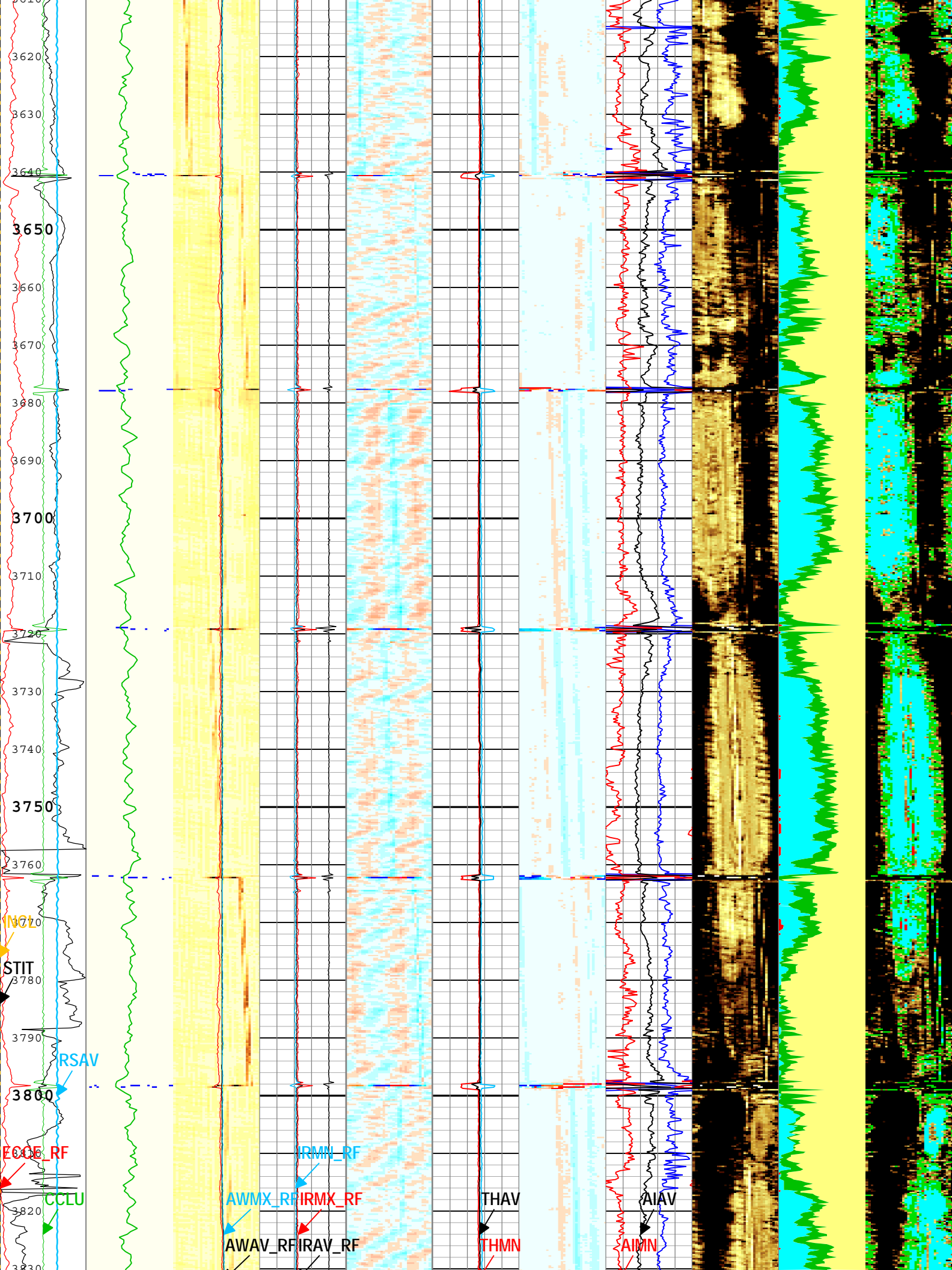


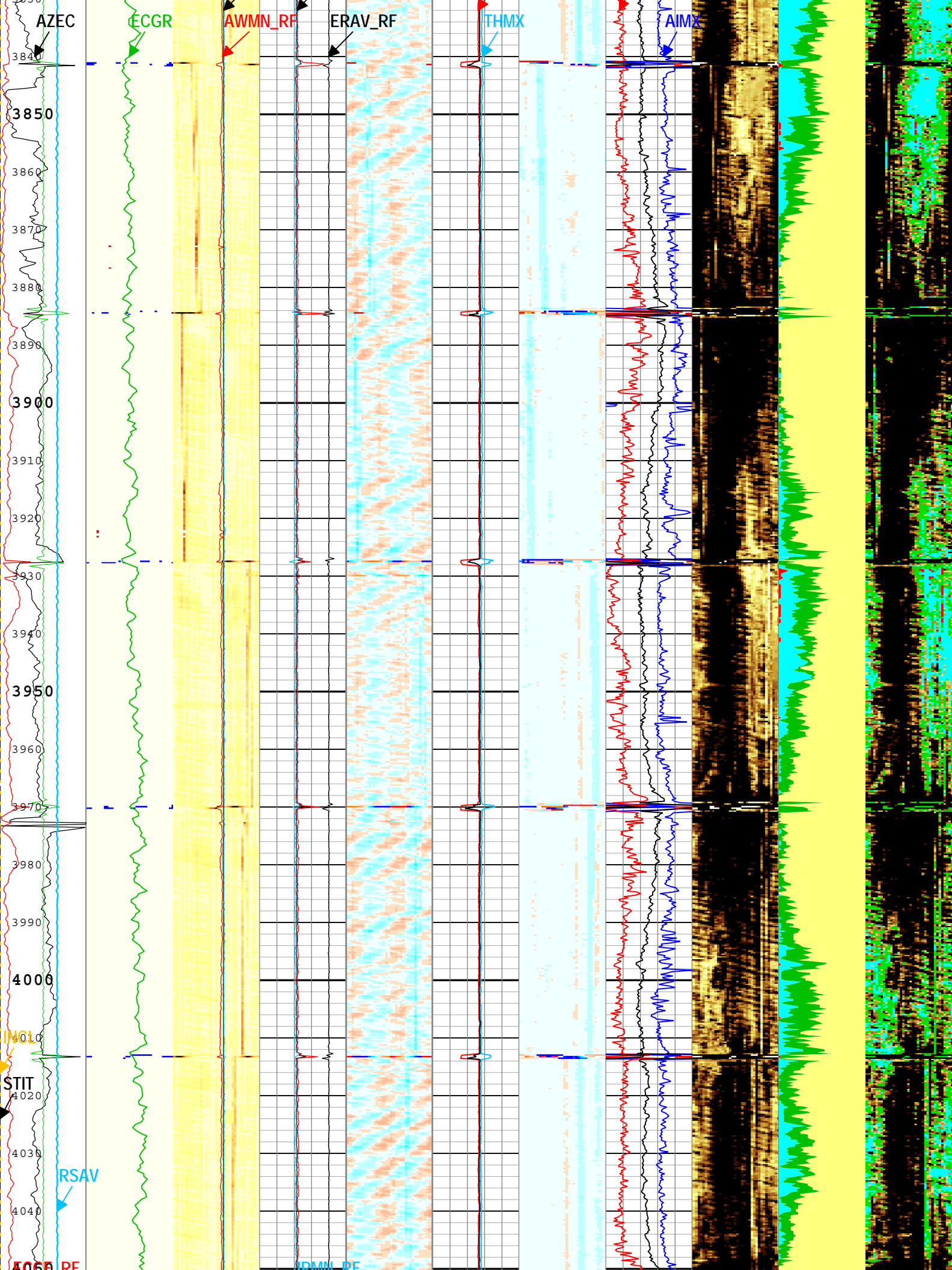


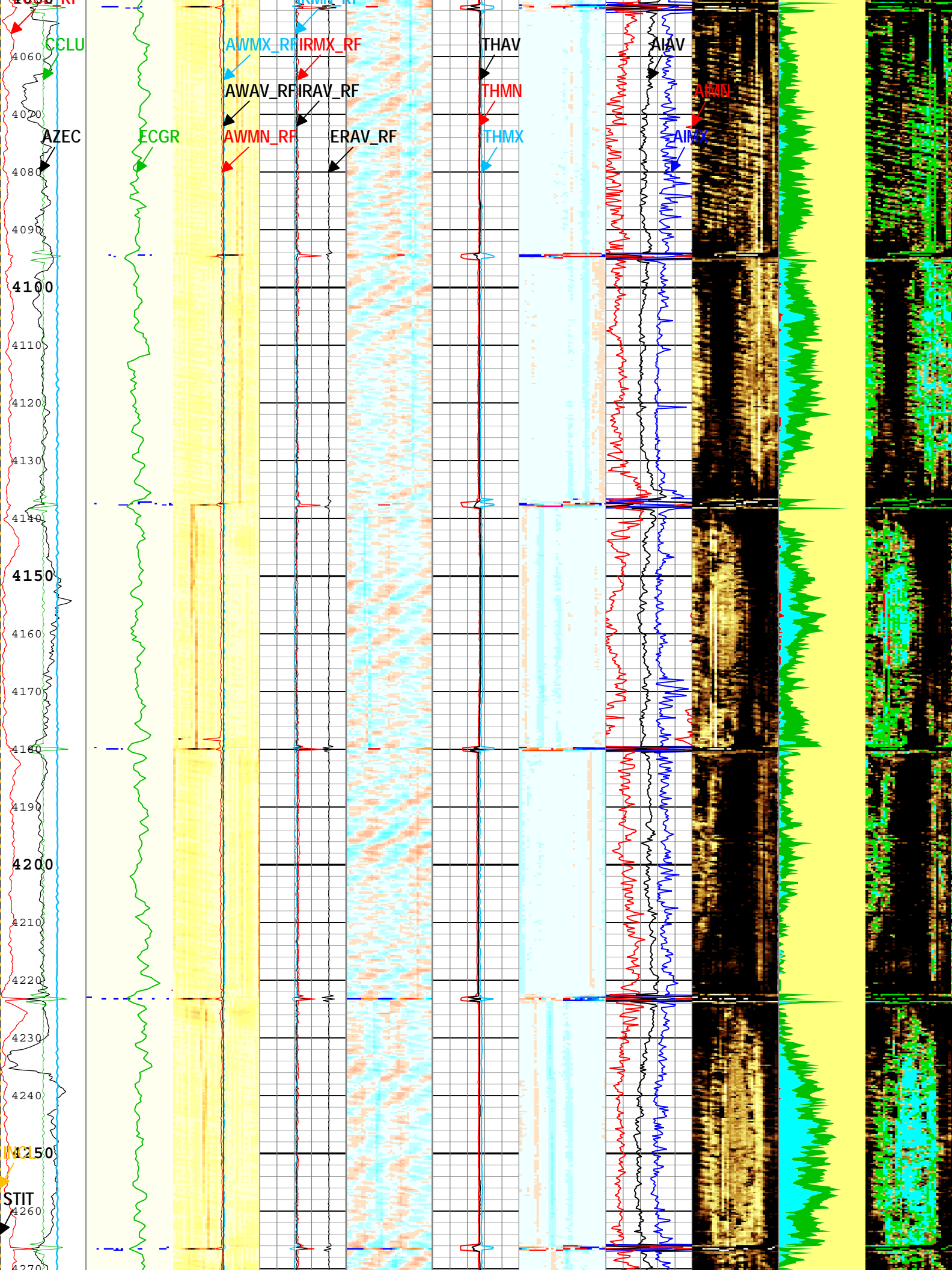


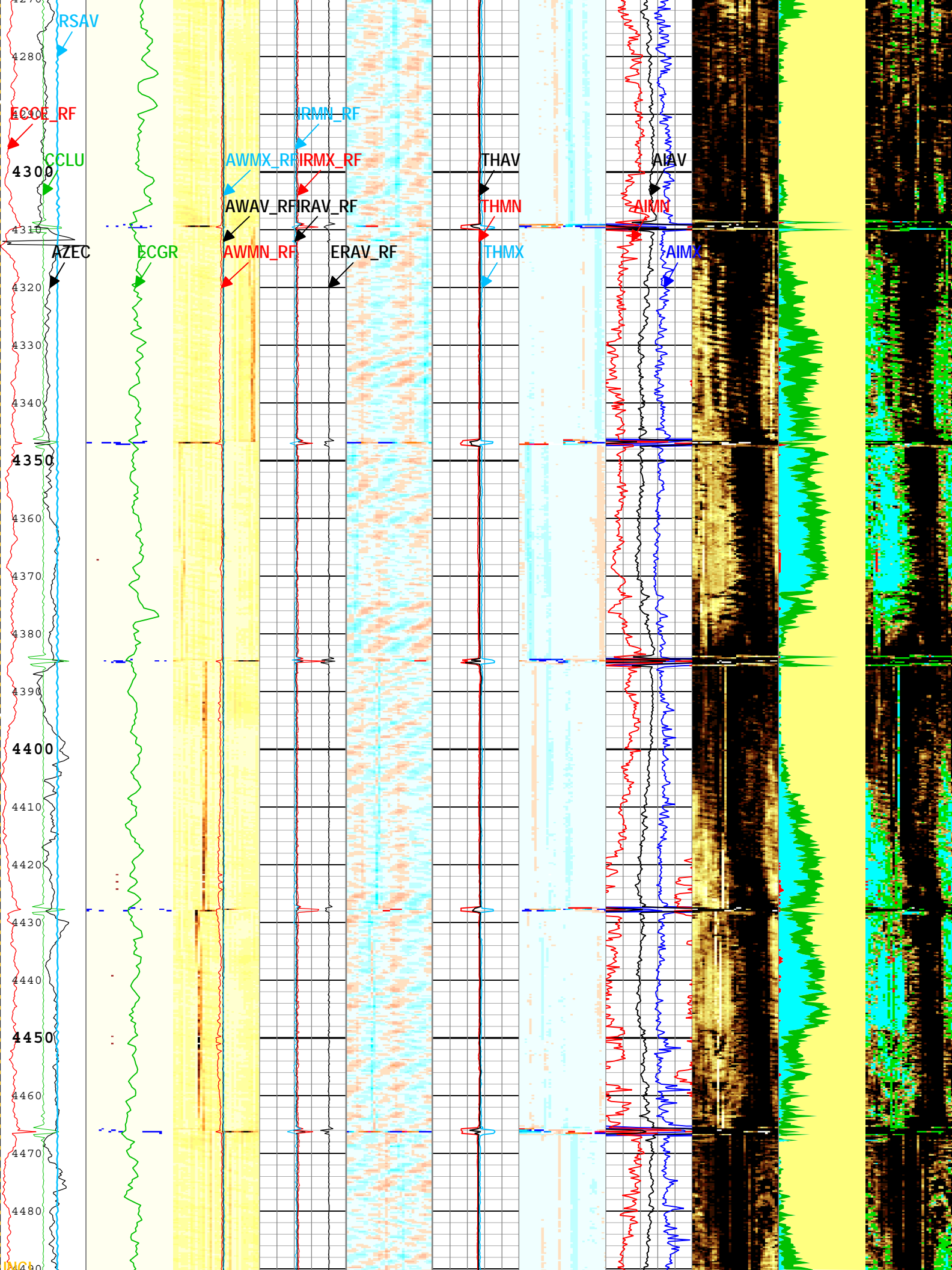


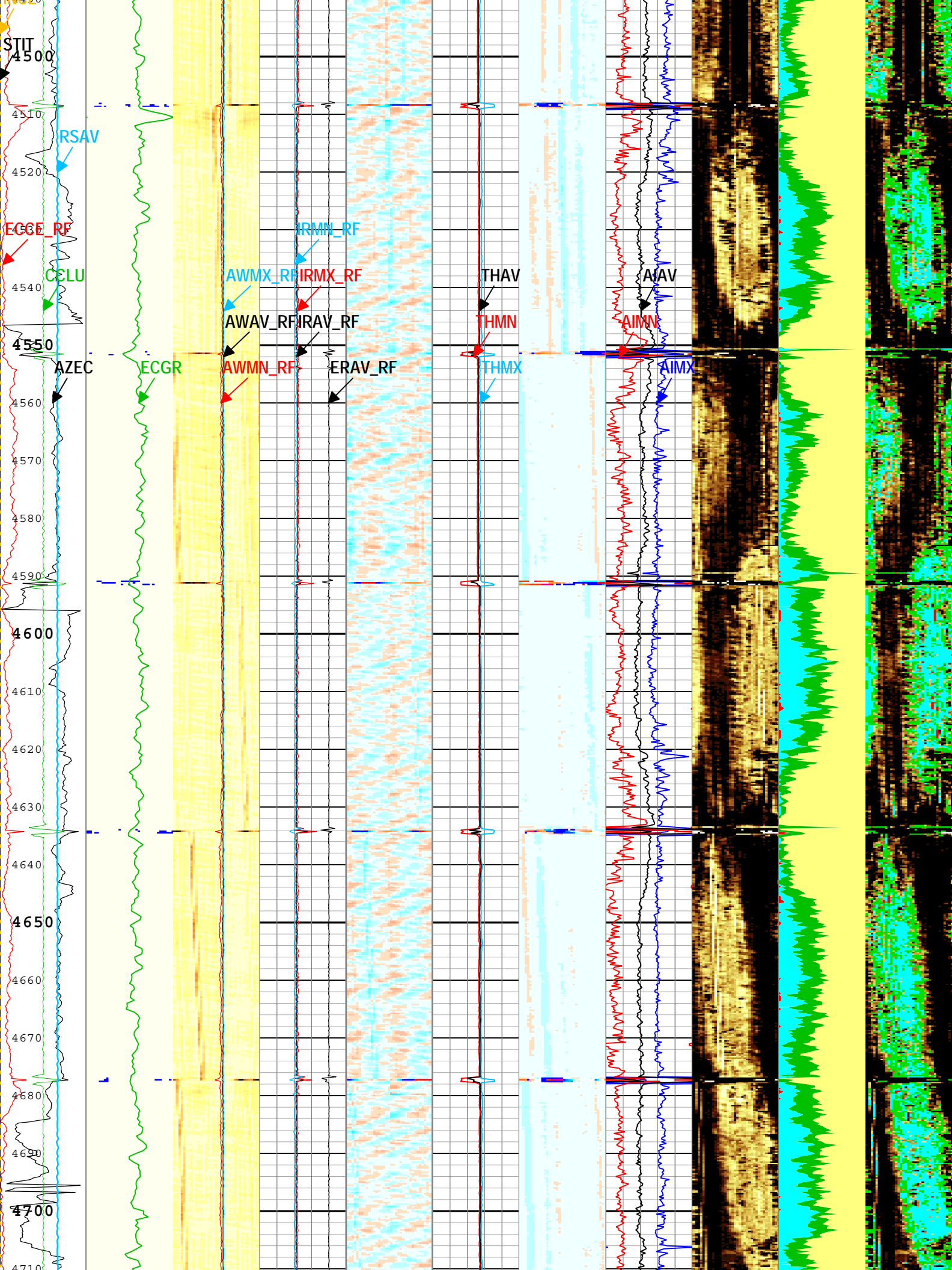


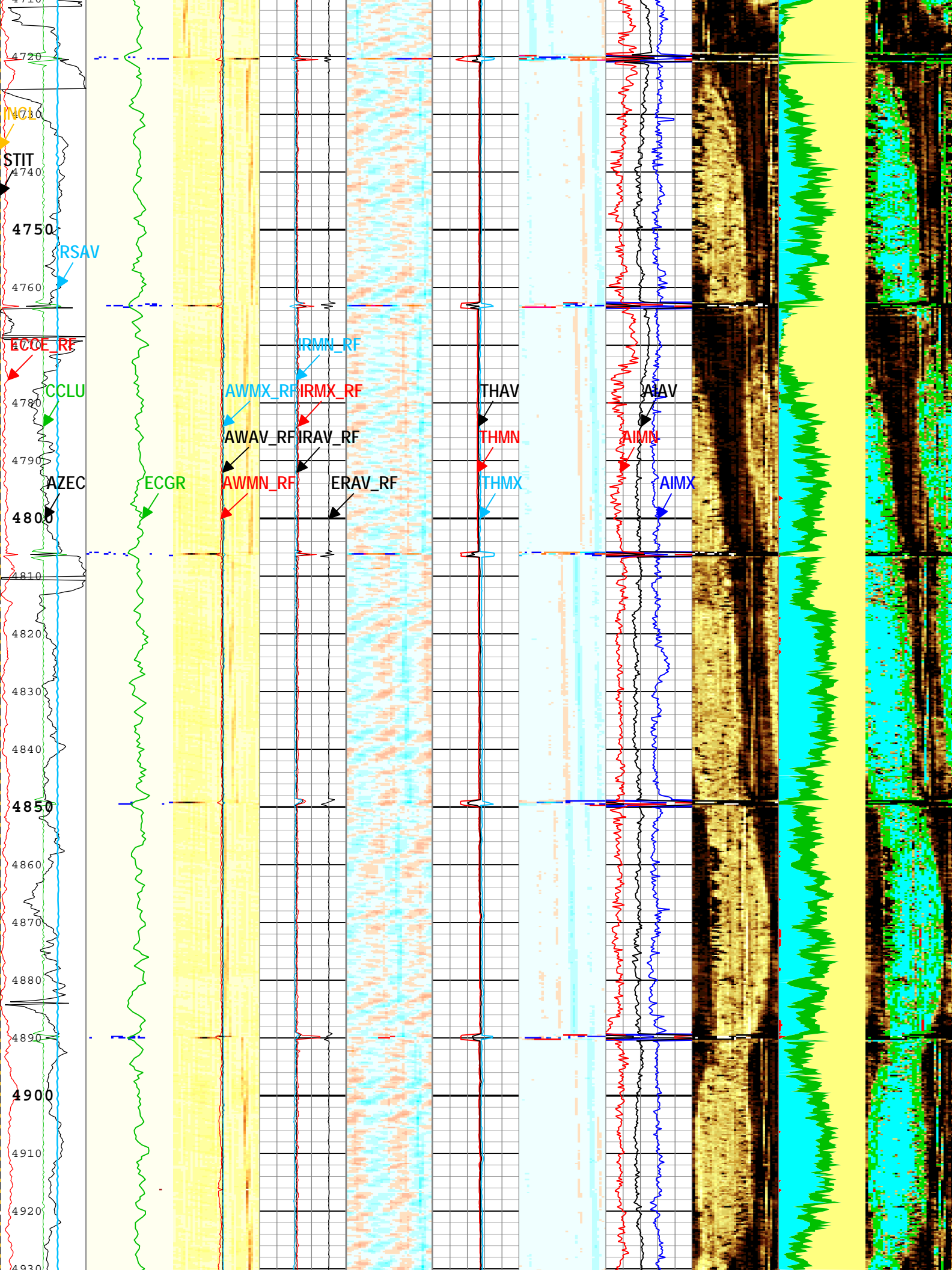


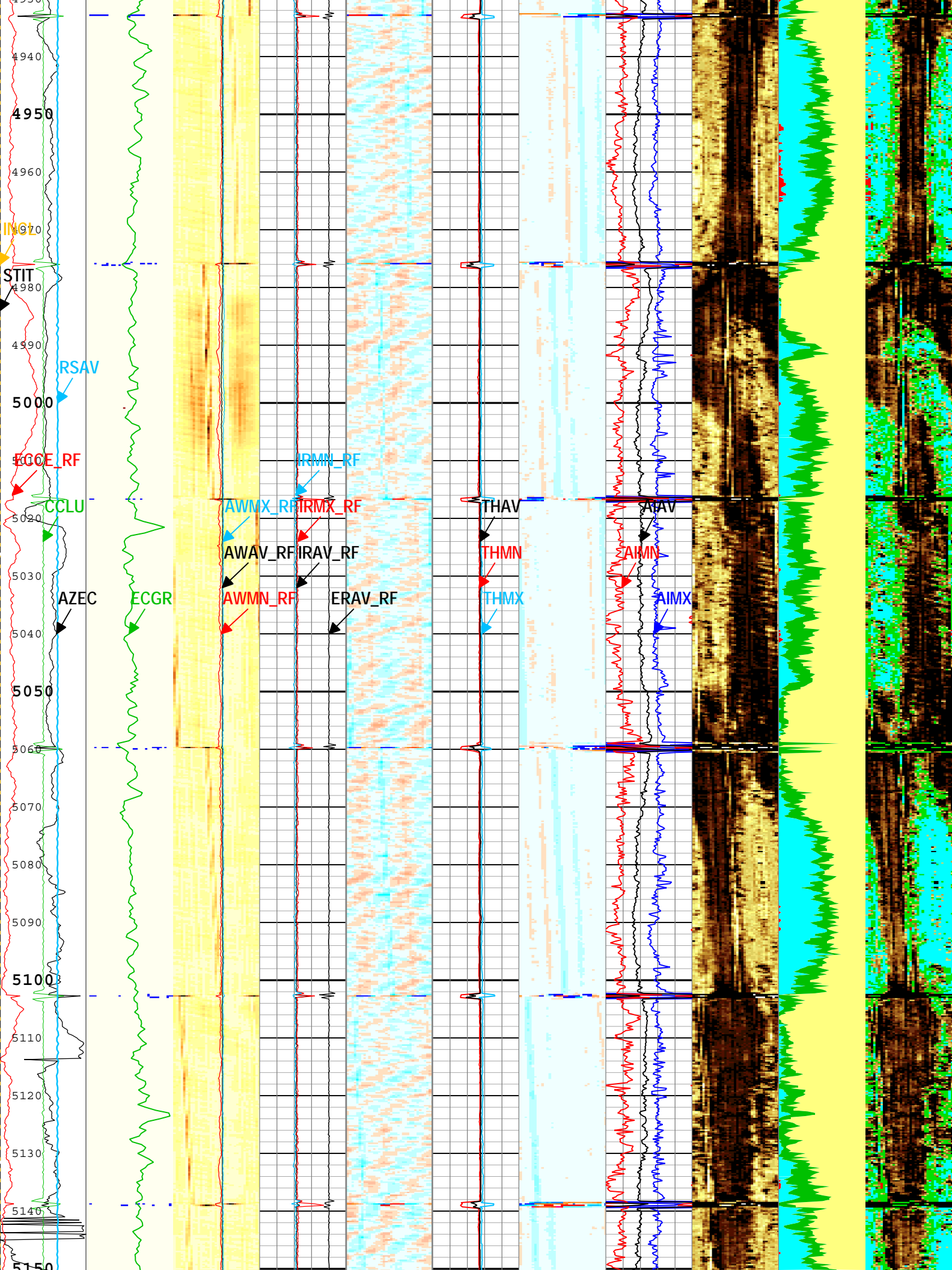


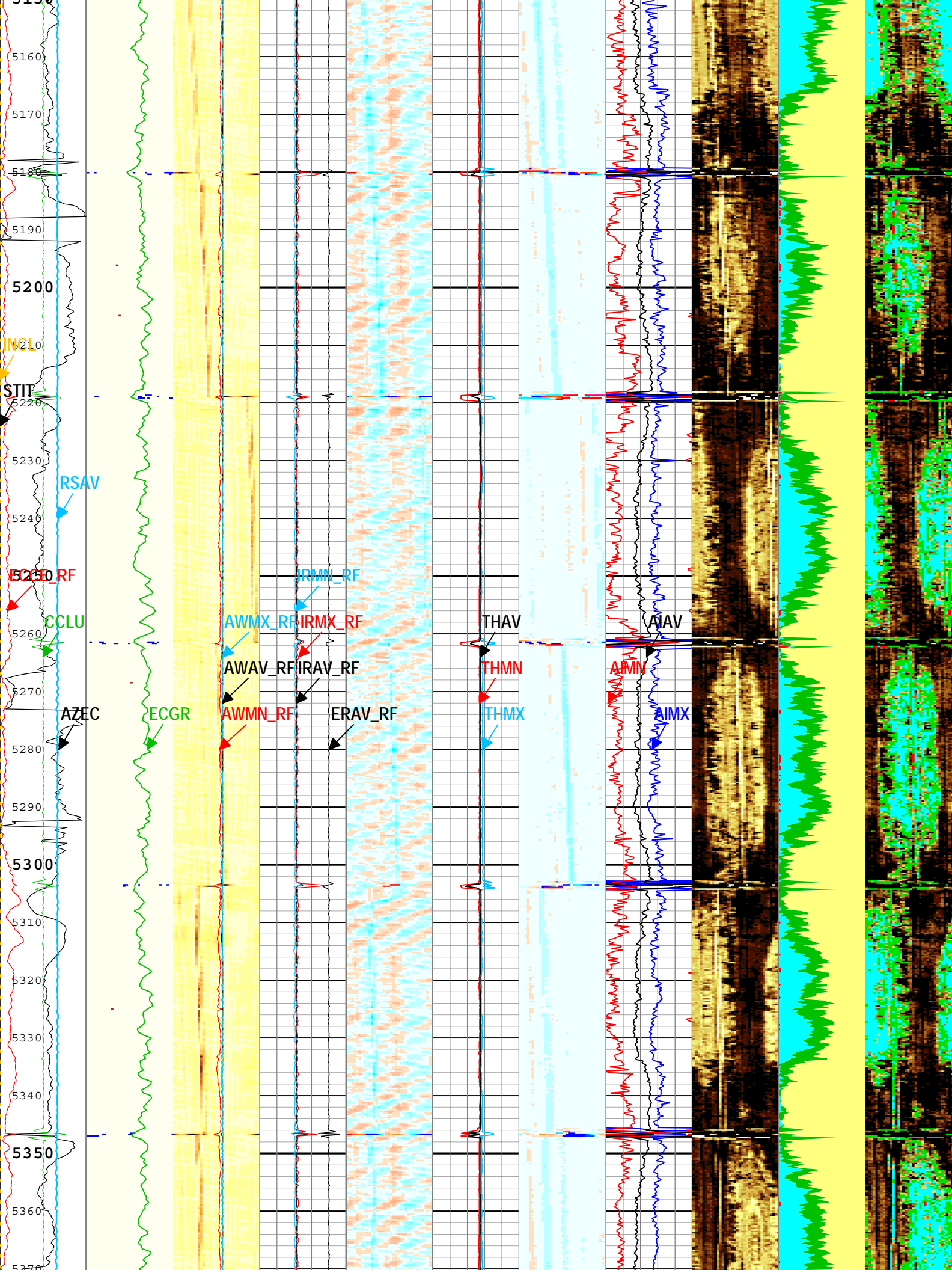


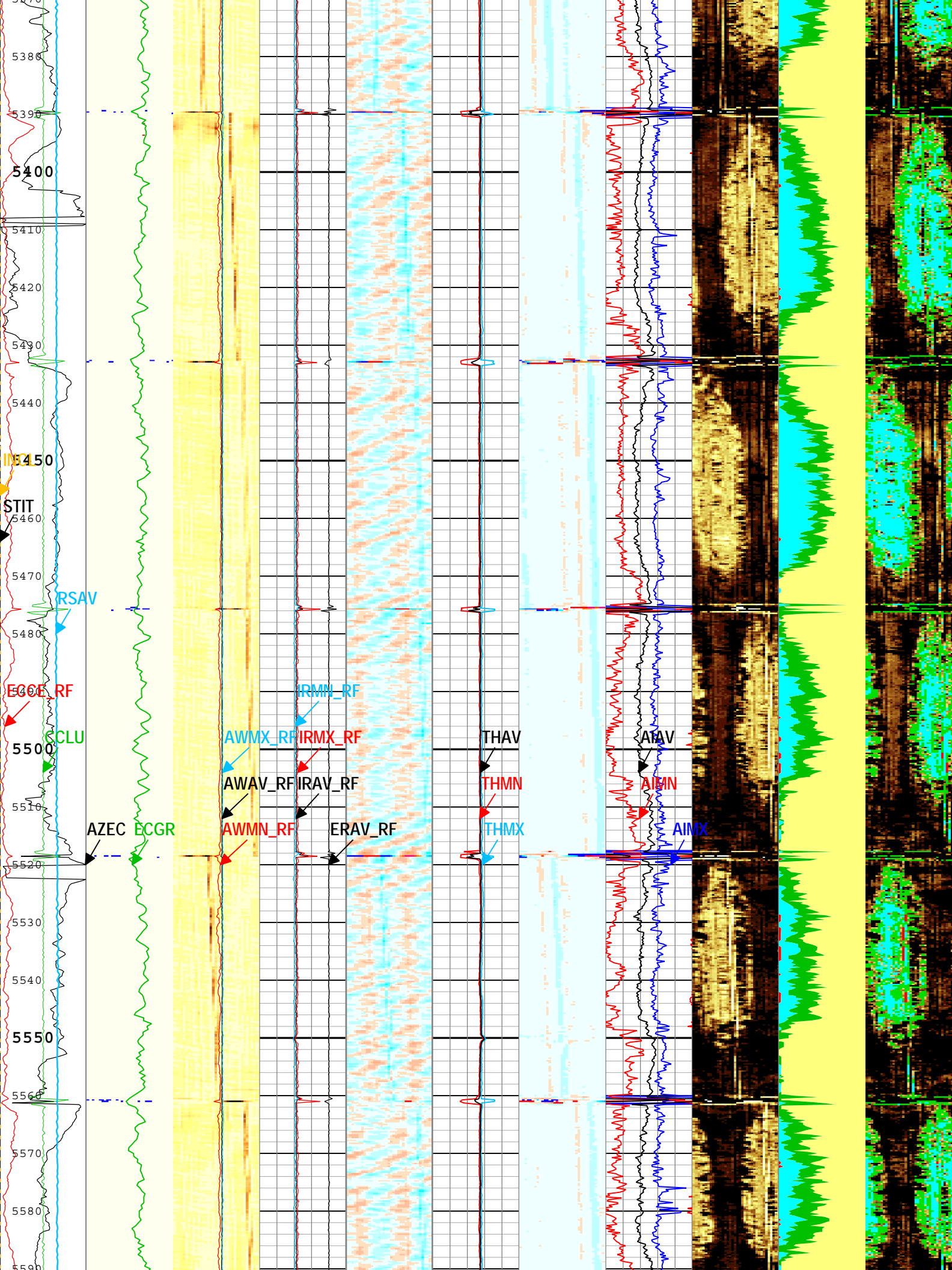


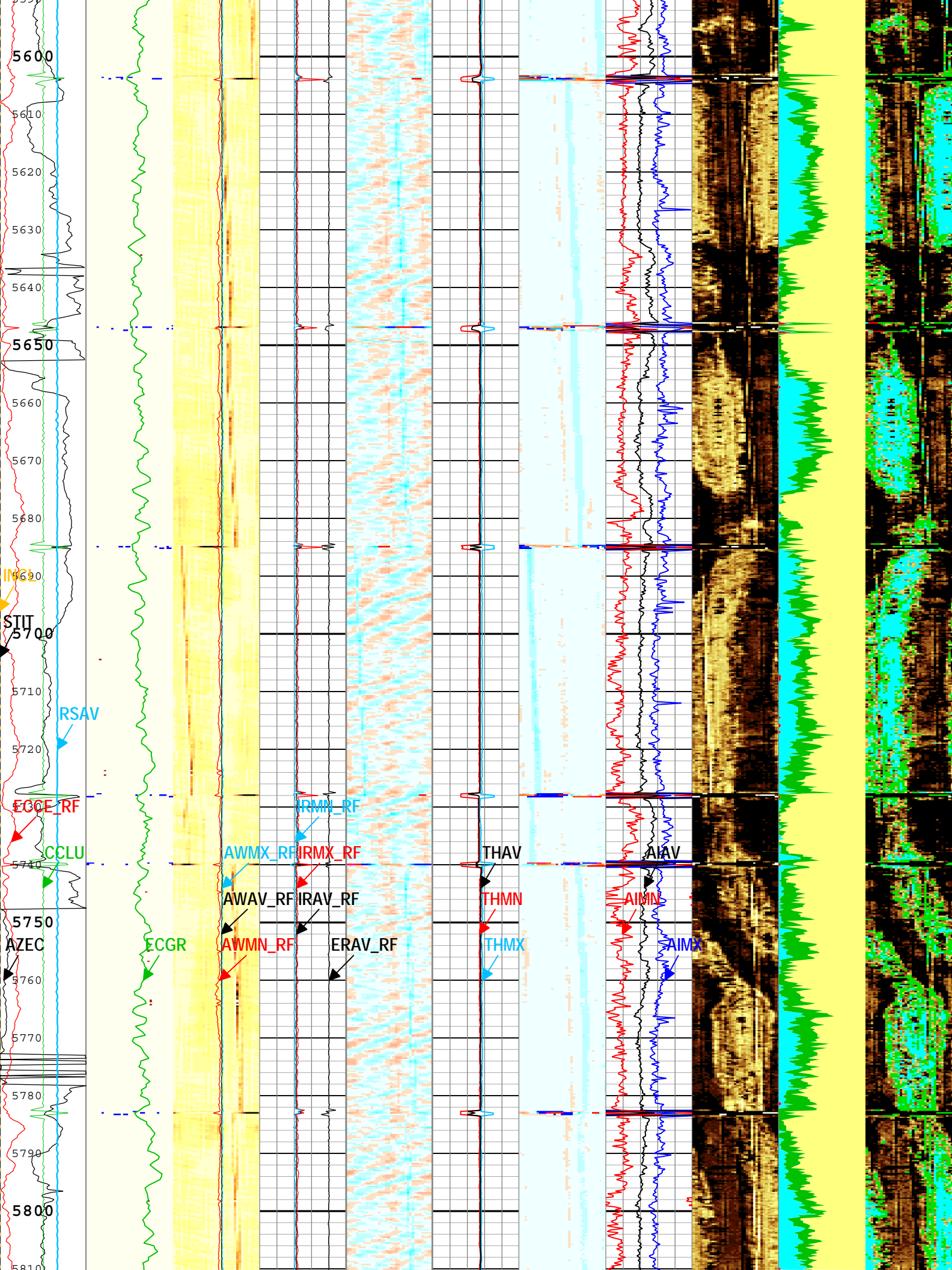


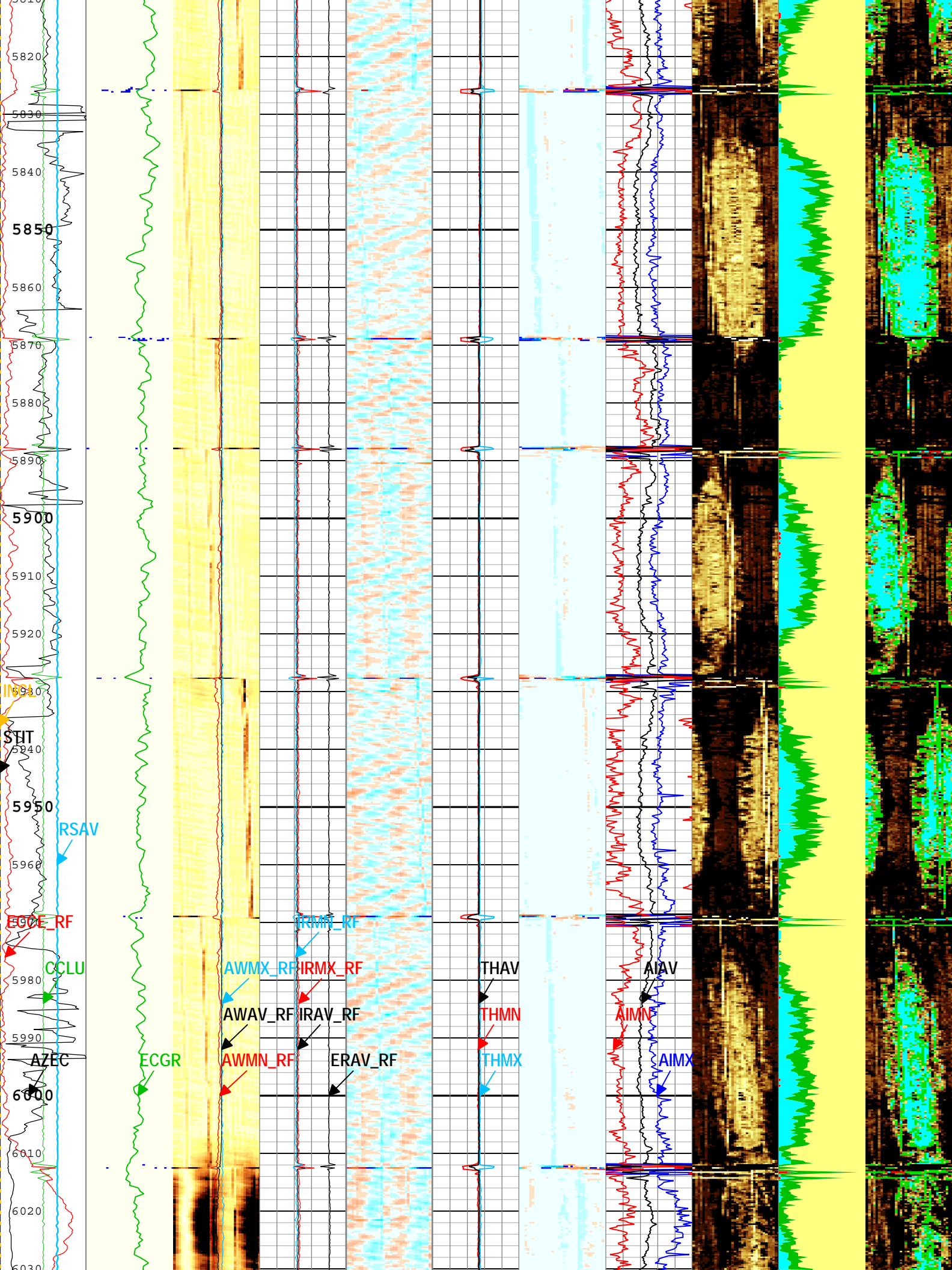


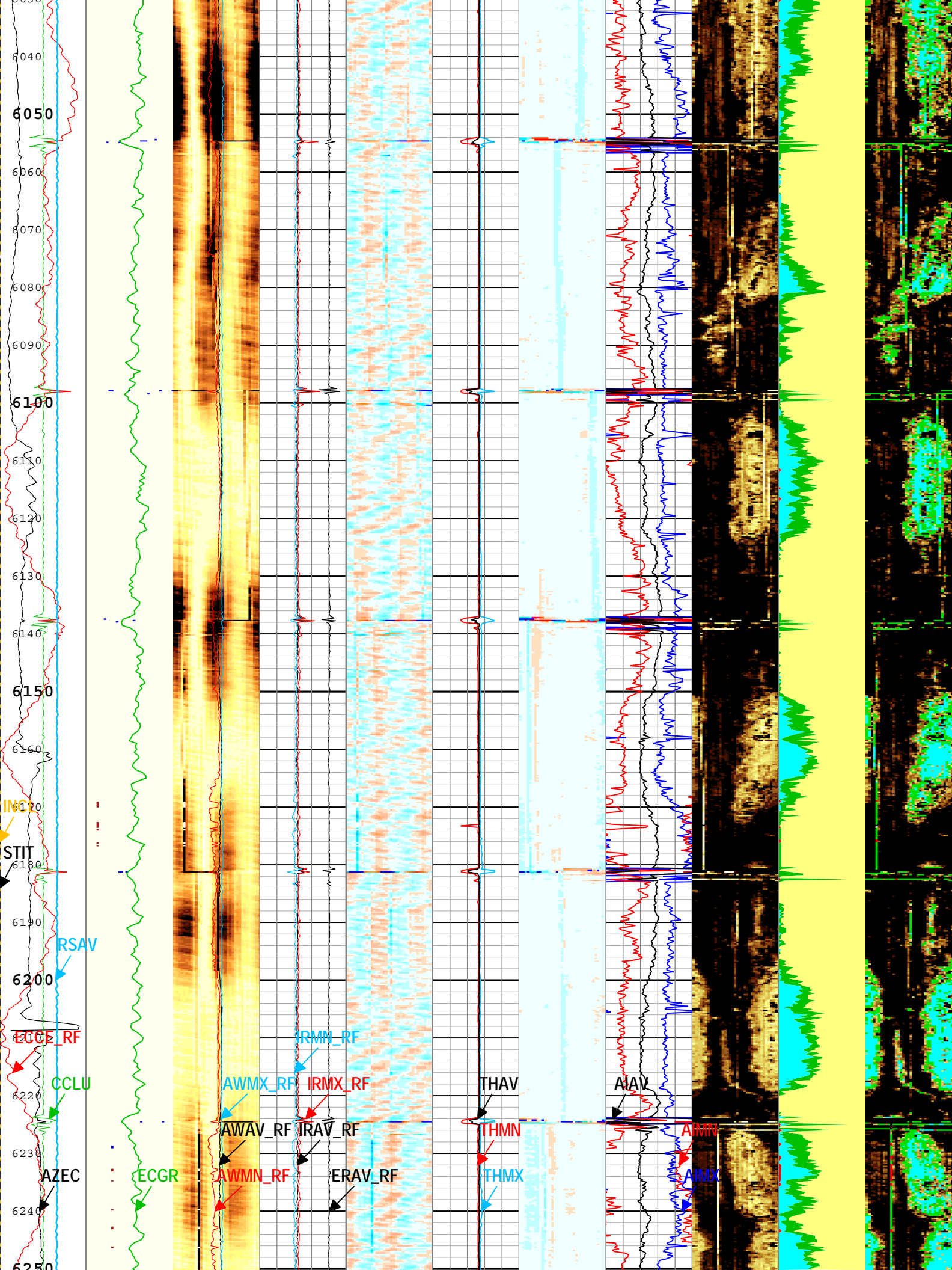


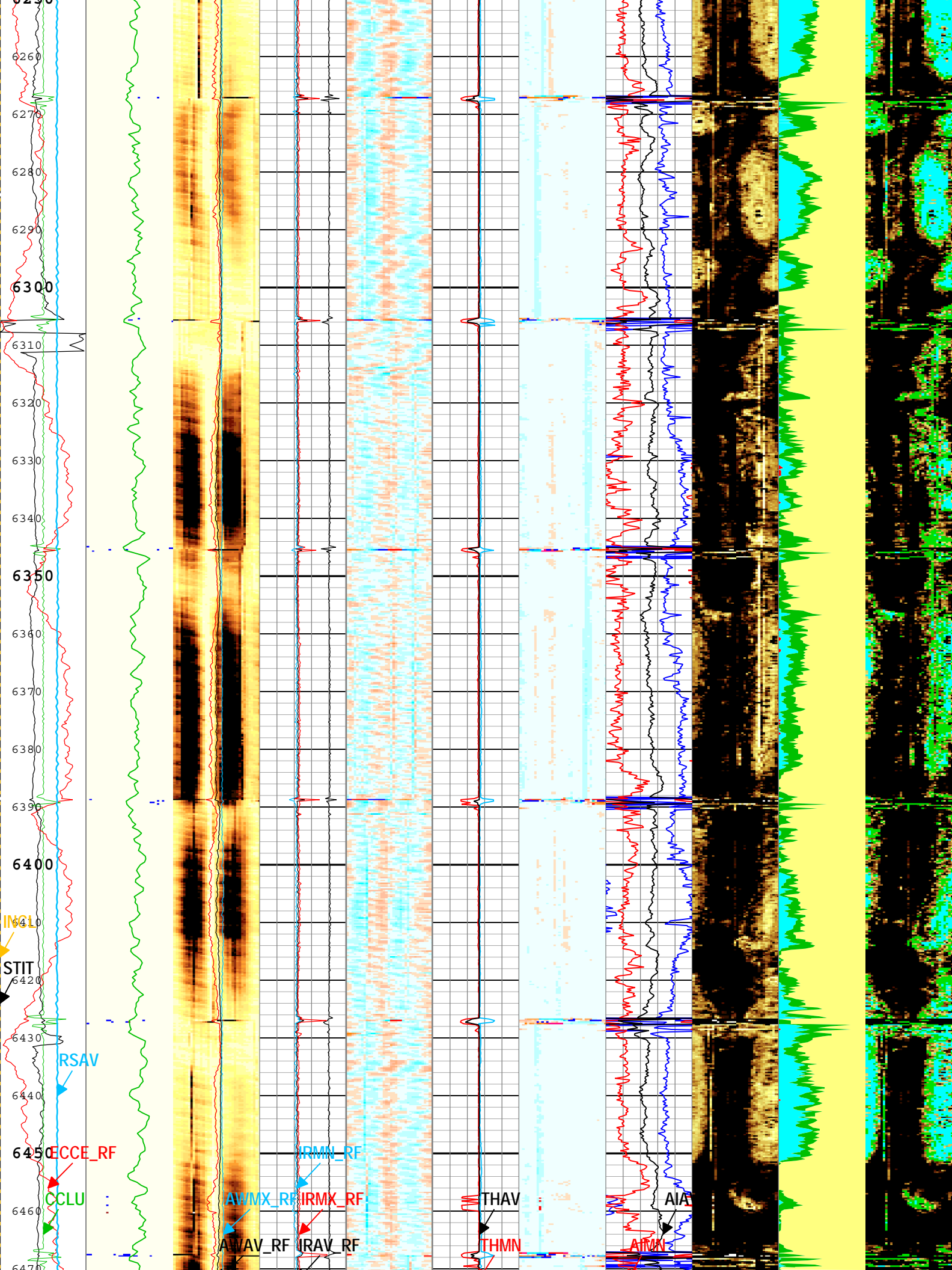


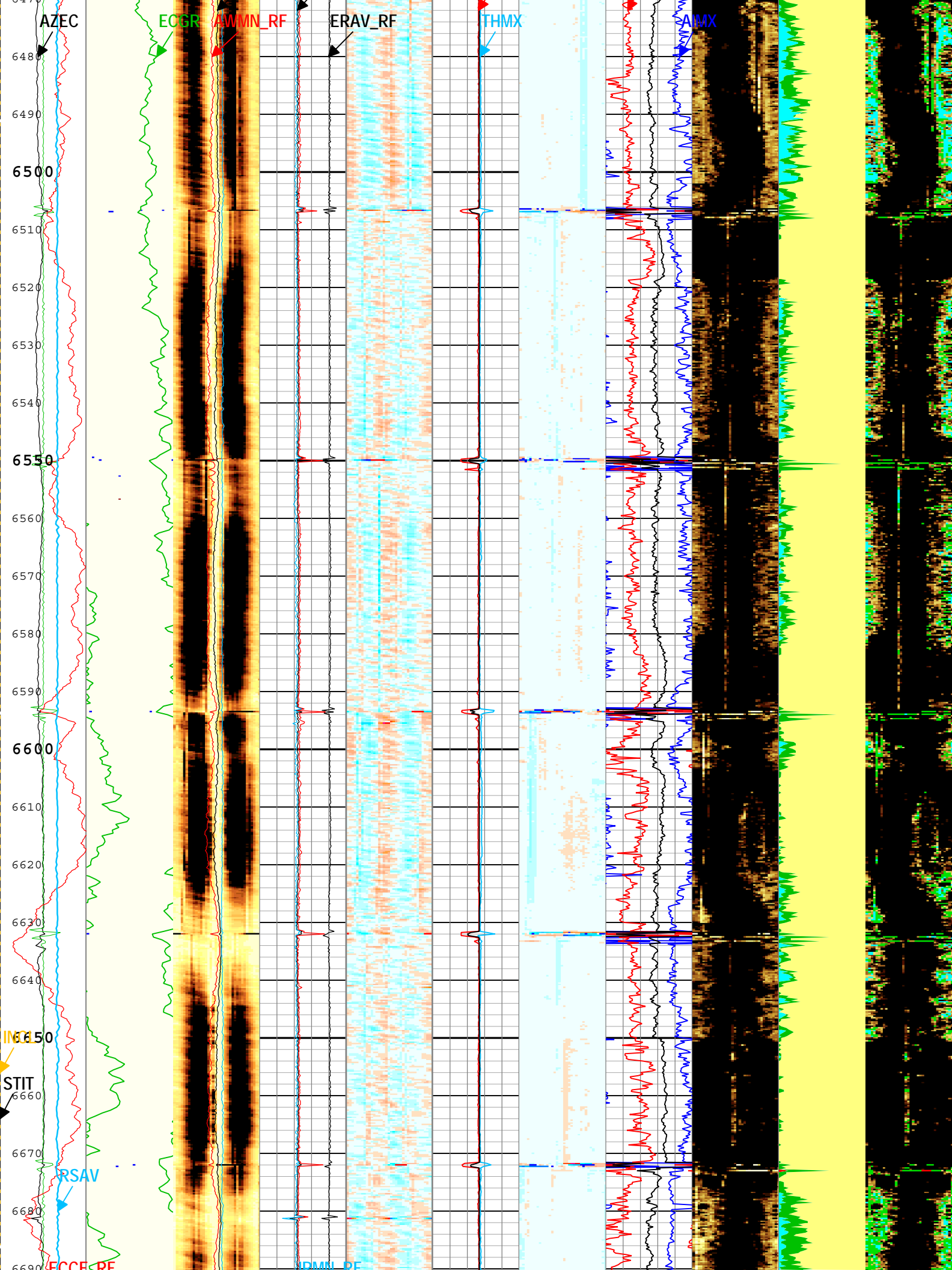


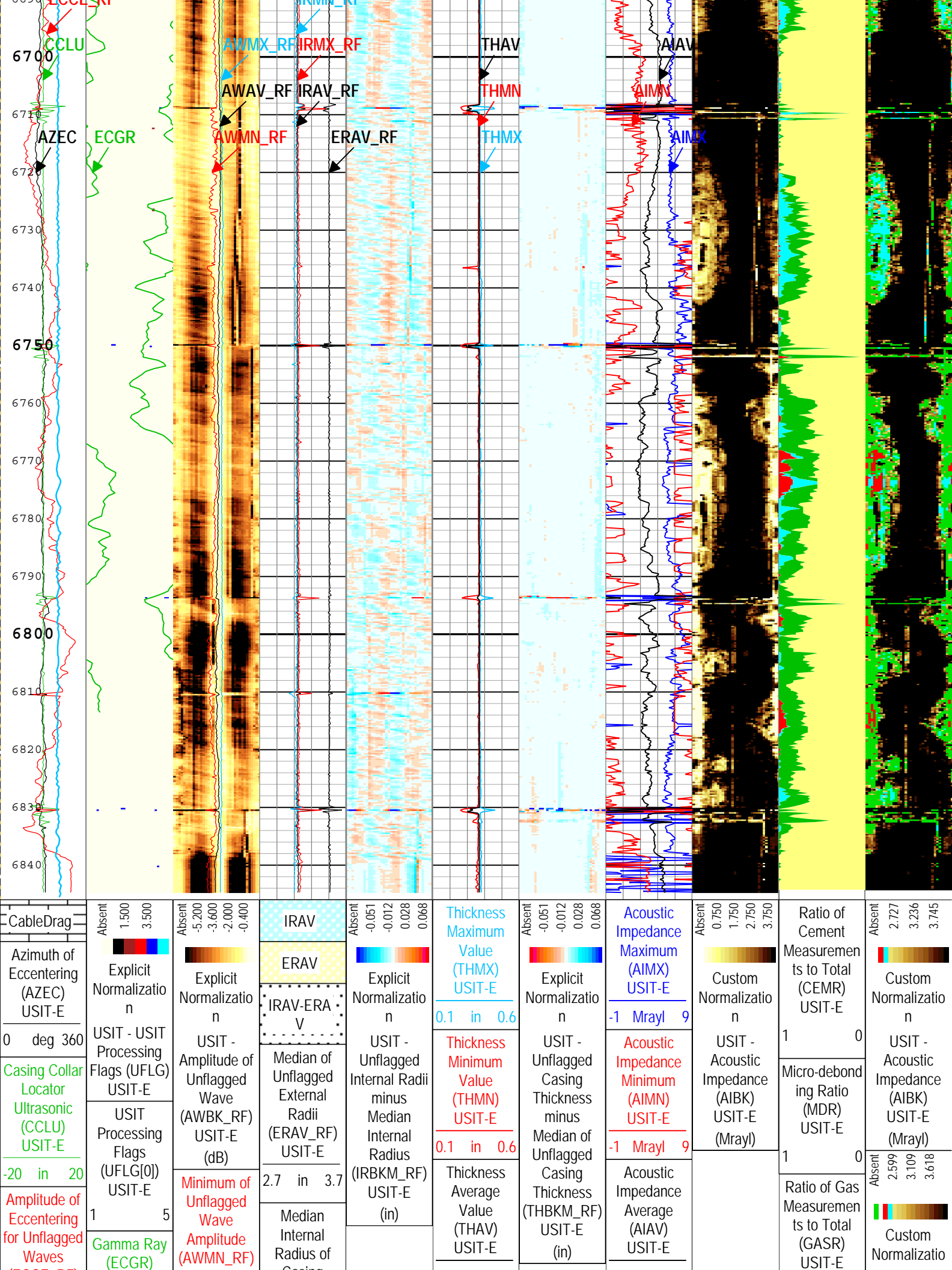












(E_CCE_RF) USIT-E	HGNS-H	USIT-E	Casing Corrected for Eccentering (IRAV_RF) USIT-E	0.1 in 0.6	-1 Mrayl 9	1 0	n USIT - Acoustic Impedance With Micro-debond ing Image (AI_MDEBO ND_IMG) USIT-E (Mrayl)
0 in 0.5	0 gAPI 150	0 dB 75	Average of Unflagged Wave Amplitude (AWAV_RF) USIT-E	2.7 in 3.7		Bonded	
Motor Revolution Speed (RSAV) USIT-E			Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E			Gas	
-8 c/s -6		0 dB 75	Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E	2.7 in 3.7		Liquid	
Motor Revolution Speed (RSAV) USIT-E		Maximum of Unflagged Wave Amplitude (AWMX_RF) USIT-E				Micro-debo nding	
6 c/s 8		0 dB 75					
Stuck Tool Indicator, Total (STIT)							
0 ft 50							
Hole inclination (INCL)							
0 deg 100							

TIME_1900 - Time Marked every 60.00 (s)

USIT Processing Flags (UFLG[0]) USIT-E

- 1 - UFLG 1 Value within [0.0 - 1.5] - :

2 - UFLG 2 Value within [1.5 - 2.5] - :

3 - UFLG 3 Value within [2.5 - 3.5] - :

4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :

5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :
- UTIM Error

Pulse Origin Not Detected

WINLEN Error

Casing Thickness Error

Loop Processing Error

Description: USI Composite Format: USI Composite Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 24-Apr-2015 15:29:50

Channel Processing Parameters				
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
AFVU	Automatic Fluid Velocity Update	USIT-E	On	
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BERJ	Bad Echo Rejection	USIT-E	On	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	Depth Zoned	in
CASING_PRATIO	Casing Poisson Ratio	USIT-E	Standard Poisson Ratio	
CBLO	Casing Bottom (Logger)	WLSESSION	6995	ft
CDEN	Cement Density	HGNS-H	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Light Cement	
THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.362	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.7	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	190	us/ft
ETIP	Elevation of the TIP above MSL	WLSESSION	4693	ft
FD	Fluid Density	USIT-E	8.7	lbm/gal

FDII	PFM Data Interpolation Interval	USIT-E	0	ft
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS	
GR_MULTIPLIER	Gamma Ray Multiplier	HGNS-H	1	
HEMA	Hematite Presence Flag	Borehole	No	
ICE_BINPROC	ICE Bin Processing Depth Interval	USIT-E	0	ft
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.5	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	0	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1	
OPELV	USIT Remove Flagged Data Level	USIT-E	OPT2	
RAPID_OPTION	Rapid Access Computation Option	USIT-E	Off	
RCOD	Reference Calibrator Outer Diameter	USIT-E	7	in
RCSO	Reference Calibrator Standoff	USIT-E	1.181	in
RCTH	Reference Calibrator Thickness	USIT-E	0.295	in
SDNV	Number of Vertical Samples used for Micro-debonding Computation	USIT-E	5	
SDTHOR	Acoustic Impedance STD Horizontal Threshold for Micro-debonding	USIT-E	0.5	Mrayl
SDTVER	Acoustic Impedance STD Vertical Threshold for Micro-debonding	USIT-E	0.3	Mrayl
SOCN	Standoff Distance	HGNS-H	0.125	in
SOCO	Standoff Correction Option	HGNS-H	No	
TCUB	T^3 Processing Level	USIT-E	Loop	
THDH	Maximum Search Thickness (percentage of nominal)	USIT-E	130	%
THDL	Minimum Search Thickness (percentage of nominal)	USIT-E	70	%
HISC	Tool Position: Centered or Eccentered	HGNS-H	Eccentered	
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	Manual	
THDP	Thickness Detection Policy	USIT-E	Fundamental	
VCAS	Ultrasonic Transversal Velocity in Casing	USIT-E	51.4	us/ft
ZCAS	Acoustic Impedance of Casing	USIT-E	46.25	Mrayl
ZINI	Initial Estimate of Cement Impedance	USIT-E	-1	Mrayl
ZMUD	Acoustic Impedance of Mud	Borehole	1.7	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.6	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Depth Zone Parameters			
Parameter	Value	Start (ft)	Stop (ft)
BS	26	33.5	124
BS	13.5	124	948
BS	8.75	948	6840
All depth are actual.			

Tool Control Parameters	
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ONE: Parameters				
Parameter	Description	Tool	Value	Unit

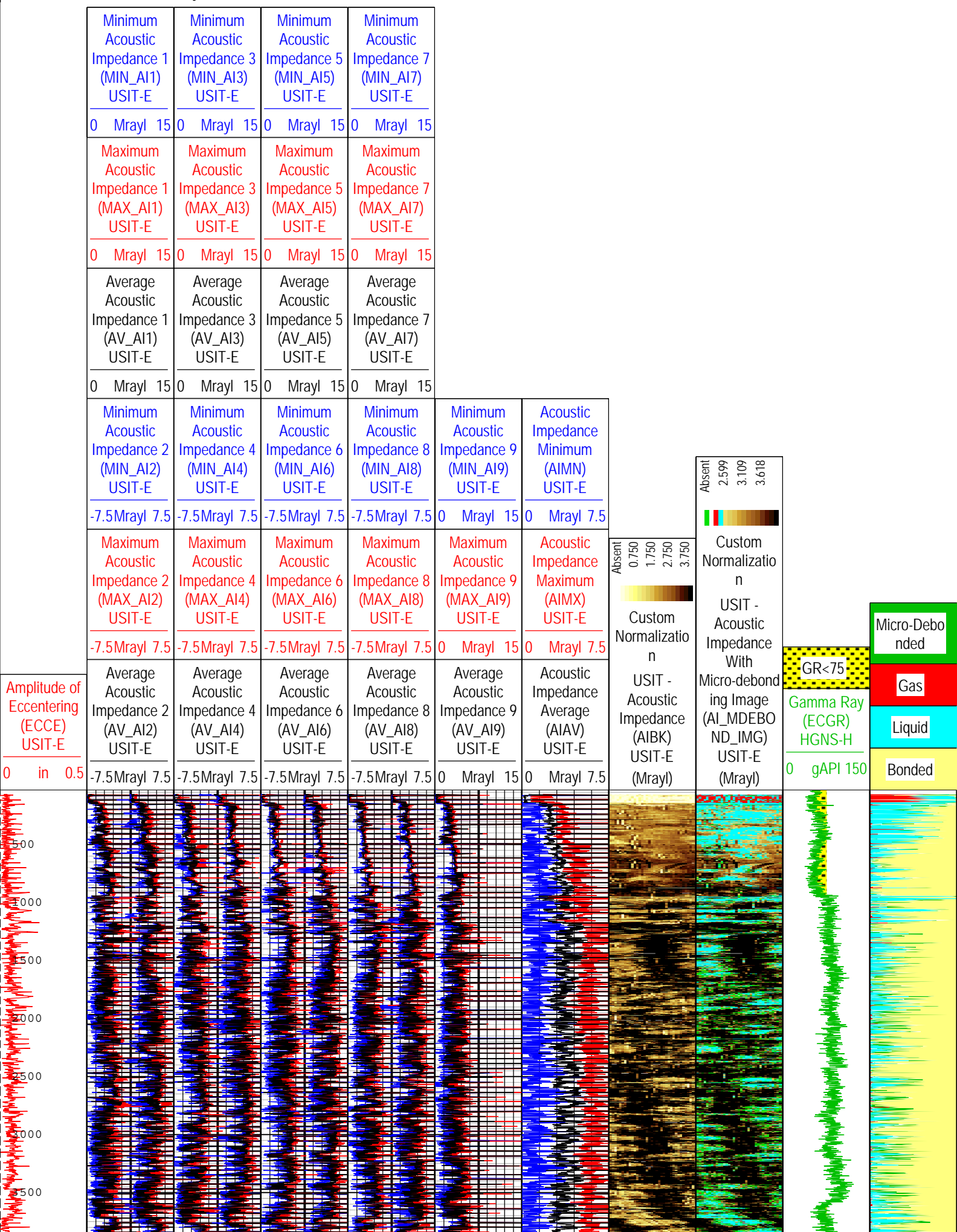
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	Time Zoned	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
DOT(DOS)	Distance between Opposite Transducer Faces	USIT-E	2.874	in
EMXV	EMEX Voltage	USIT-E	Time Zoned	V
HRES	Horizontal Resolution	USIT-E	10 deg	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
MOTOR_PROTECT	Motor Protection	USIT-E	On	
TMUC	Type of Mud	USIT-E	BRI	
UACLV_PERM	Ultrasonic ACLV Permanent	USIT-E	No	
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 3.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	6840	ft
USSP	Ultrasonic Service	USIT-E	USI	
VRES	Vertical Resolution	USIT-E	3.0 in	
WINB	Window Begin Time	USIT-E	Time Zoned	us
WINE	Window End Time	USIT-E	Time Zoned	us

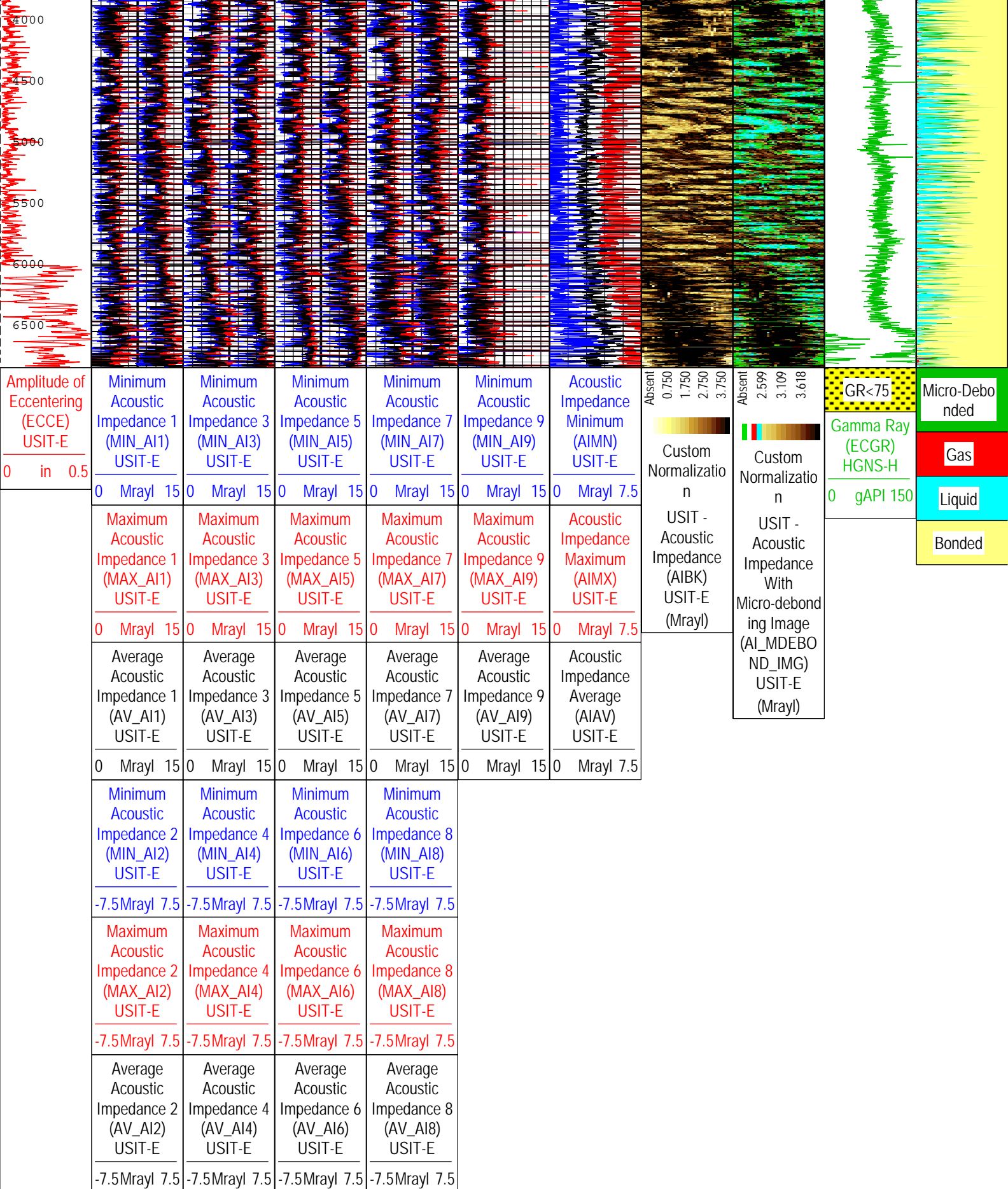
Time Zone Parameters					
Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
AGMX	18	24-Apr-2015 10:44:51	24-Apr-2015 10:55:57	6845.77	6689.52
AGMX	48	24-Apr-2015 10:55:57	24-Apr-2015 12:01:51	6689.52	65.41
EMXV	40	24-Apr-2015 10:44:51	24-Apr-2015 11:23:18	6845.77	3824.78
EMXV	35	24-Apr-2015 11:23:18	24-Apr-2015 12:01:51	3824.78	65.41
WINB	33.86	24-Apr-2015 10:44:51	24-Apr-2015 10:56:03	6845.77	6681.82
WINB	30	24-Apr-2015 10:56:03	24-Apr-2015 12:01:51	6681.82	65.41
WINE	73.87	24-Apr-2015 10:44:51	24-Apr-2015 10:56:06	6845.77	6678.55
WINE	75	24-Apr-2015 10:56:06	24-Apr-2015 12:01:51	6678.55	65.41
All depth are at tool zero.					

All depth are at tool zero.			
USI Goodwin			
USIT - Fluid Properties Measurement			
Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Main[5]:Up	6845.77	65.41
Fluid Velocity = "Automatic". CFVL equals DFSL channel			
Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)
Mud Impedance = "Manual". CZMD uses ZMUD parameter zoned table below			
Start Depth(ft)	Stop Depth(ft)	Start Value(Mrayl)	End Value(Mrayl)
0		1.7	1.7
ONE			
USI Goodwin Compressed			
Log	Company:Noble Energy Inc Well:COLT A13-635 ONE: Main[5]:Up:S005		

Description: USI Goodwin
Format: USI Goodwin
Index Scale: 0.1 in per 100 ft
Index Unit: ft
Index Type: Measured Depth
Creation Date: 24-Apr-2015

TIME_1900 - Time Marked every 60.00 (s)





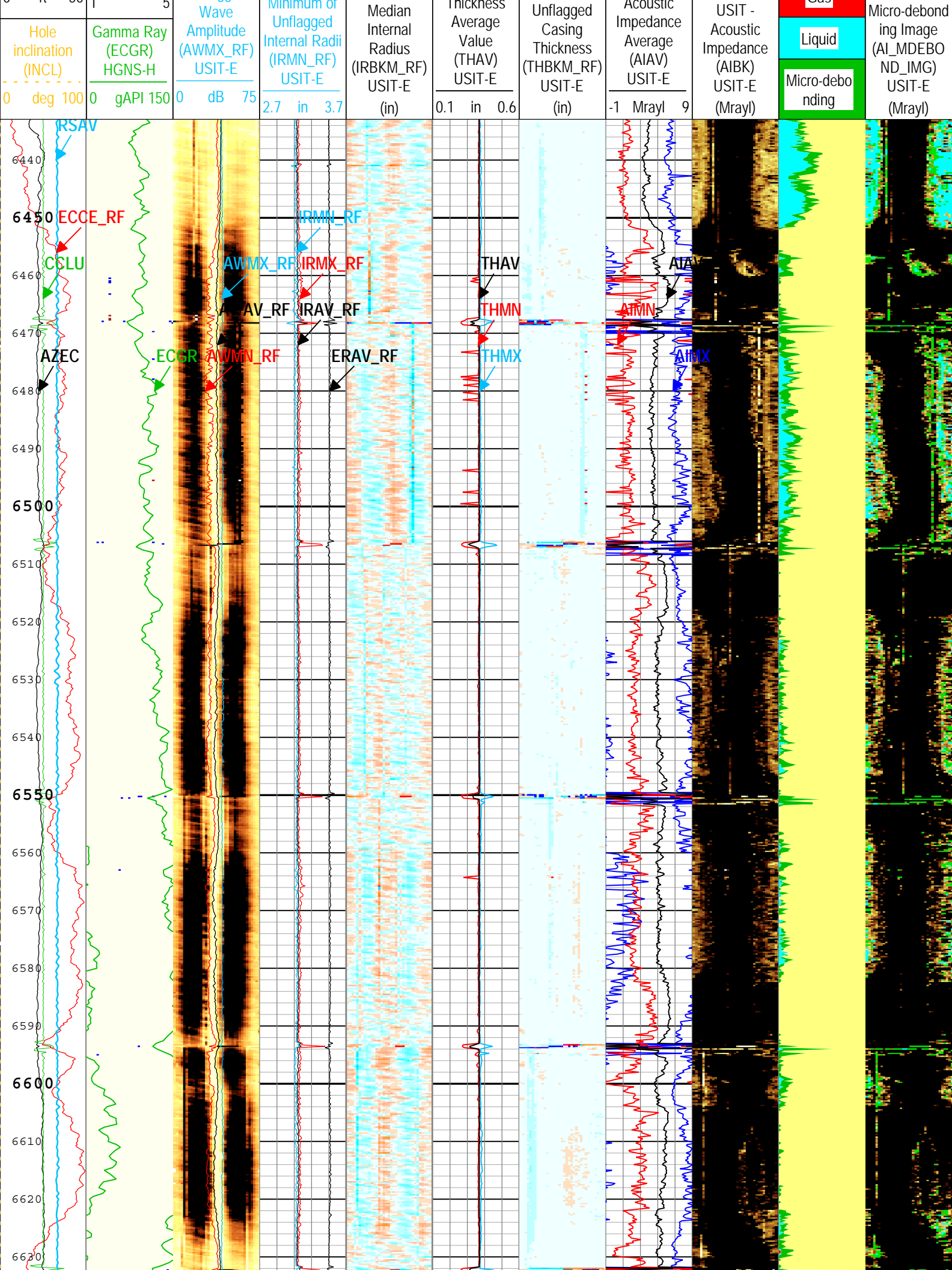
TIME_1900 - Time Marked every 60.00 (s)

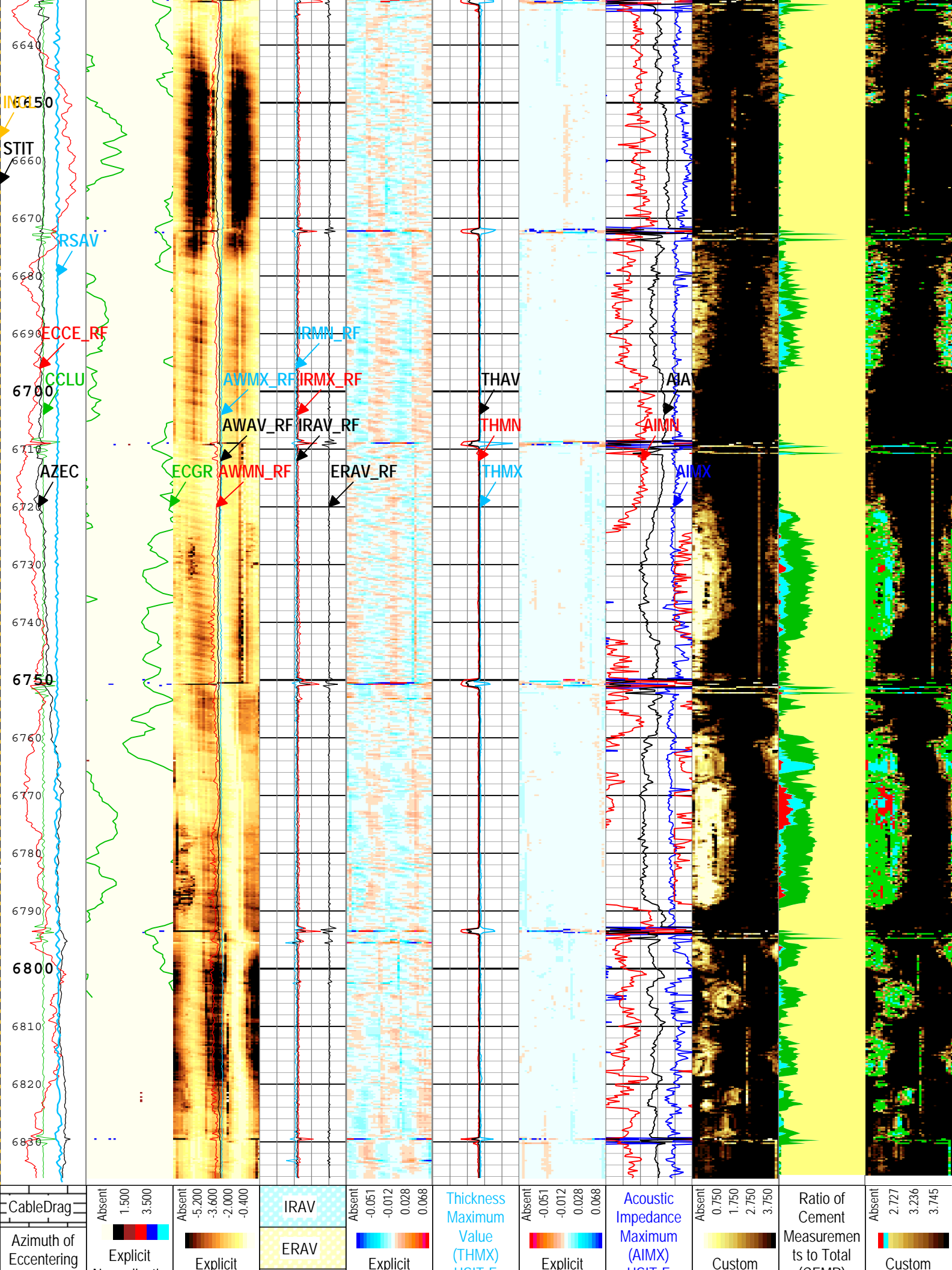
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Copy of USI Composite

USIT - Fluid Properties Measurement

6	c/s	8	USIT	(AVRVR-IR)	Unflagged	Normalizatio	Minimum	USIT -	Impedance	Ab	USIT-E	Normalizatio
Stuck Tool			Processing	USIT-E	Internal Radii	n	Value	Unflagged	Minimum	0	1	n
Indicator,			Flags	0	(IRMX_RF)	USIT -	(THMN)	Casing	(AIMN)	1	0	USIT -
Total (STIT)			(UFLG[0])	dB	USIT-E	Unflagged	USIT-E	Thickness	USIT-E	Custom	Bonded	Acoustic
			USIT-E	75		Internal Radii		minus		Normalizatio		Impedance
0	ft	50			Maximum of	minus	0.1 in 0.6	Median of	-1 Mrayl	n	Gas	With
					Unflagged							





(AZEC) USIT-E	Normalizatio n	Normalizatio n	IRAV-ERA V	Normalizatio n	USIT-E 0.1 in 0.6	Normalizatio n	USIT-E -1 Mrayl 9	Normalizatio n	(CEMR) USIT-E	Normalizatio n
0 deg 360	USIT - USIT Processing Flags (UFLG) USIT-E	USIT - Amplitude of Unflagged Wave (AWBK_RF) USIT-E (dB)	Median of Unflagged External Radii (ERAV_RF) USIT-E	USIT - Unflagged Internal Radii minus Median Internal Radius (IRBKM_RF) USIT-E (in)	Thickness Minimum Value (THMN) USIT-E 0.1 in 0.6	USIT - Unflagged Casing Thickness minus Median of Unflagged Casing Thickness (THBKM_RF) USIT-E (in)	Acoustic Impedance Minimum (AIMN) USIT-E -1 Mrayl 9	USIT - Acoustic Impedance (AIBK) USIT-E (Mrayl)	1 0	USIT - Acoustic Impedance (AIBK) USIT-E (Mrayl)
Casing Collar Locator Ultrasonic (CCLU) USIT-E	USIT Processing Flags (UFLG[0]) USIT-E	Minimum of Unflagged Wave Amplitude (AWMN_RF) USIT-E	2.7 in 3.7		Thickness Average Value (THAV) USIT-E 0.1 in 0.6		Acoustic Impedance Average (AIAV) USIT-E -1 Mrayl 9		Micro-debond ing Ratio (MDR) USIT-E	Absent 2.599 3.109 3.618
-20 in 20	1 5	0 dB 75	Median Internal Radius of Casing Corrected for Eccentering (IRAV_RF) USIT-E						Ratio of Gas Measuremen ts to Total (GASR) USIT-E	Custom Normalizatio n
Amplitude of Eccentering for Unflagged Waves (ECCE_RF) USIT-E	Gamma Ray (ECGR) HGNS-H	Average of Unflagged Wave Amplitude (AWAV_RF) USIT-E	2.7 in 3.7						1 0	USIT - Acoustic Impedance With Micro-debond ing Image (AI_MDEBO ND_IMG) USIT-E (Mrayl)
0 in 0.5	0 gAPI 150	0 dB 75	Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E						Bonded	
Motor Revolution Speed (RSAV) USIT-E		Maximum of Unflagged Wave Amplitude (AWMX_RF) USIT-E	2.7 in 3.7						Gas	
-8 c/s -6		0 dB 75	Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E						Liquid	
Motor Revolution Speed (RSAV) USIT-E		0 dB 75	2.7 in 3.7						Micro-debo nding	
6 c/s 8										
Stuck Tool Indicator, Total (STIT)										
0 ft 50										
Hole inclination (INCL)										
0 deg 100										

USIT Processing Flags (UFLG[0]) USIT-E			
1 - UFLG 1 Value within [0.0 - 1.5] - :		UTIM Error	
2 - UFLG 2 Value within [1.5 - 2.5] - :		Pulse Origin Not Detected	
3 - UFLG 3 Value within [2.5 - 3.5] - :		WINLEN Error	
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :		Casing Thickness Error	
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :		Loop Processing Error	

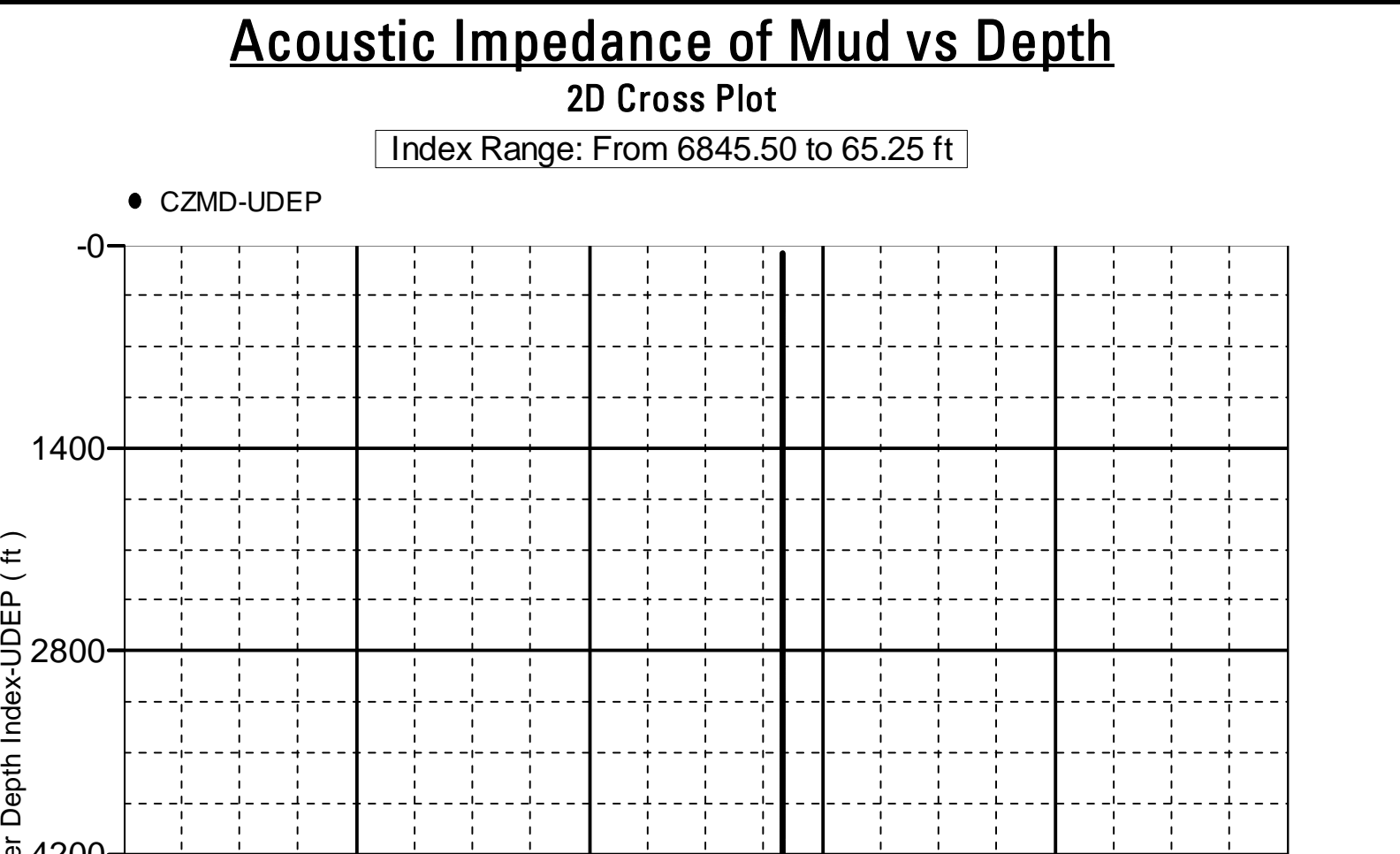
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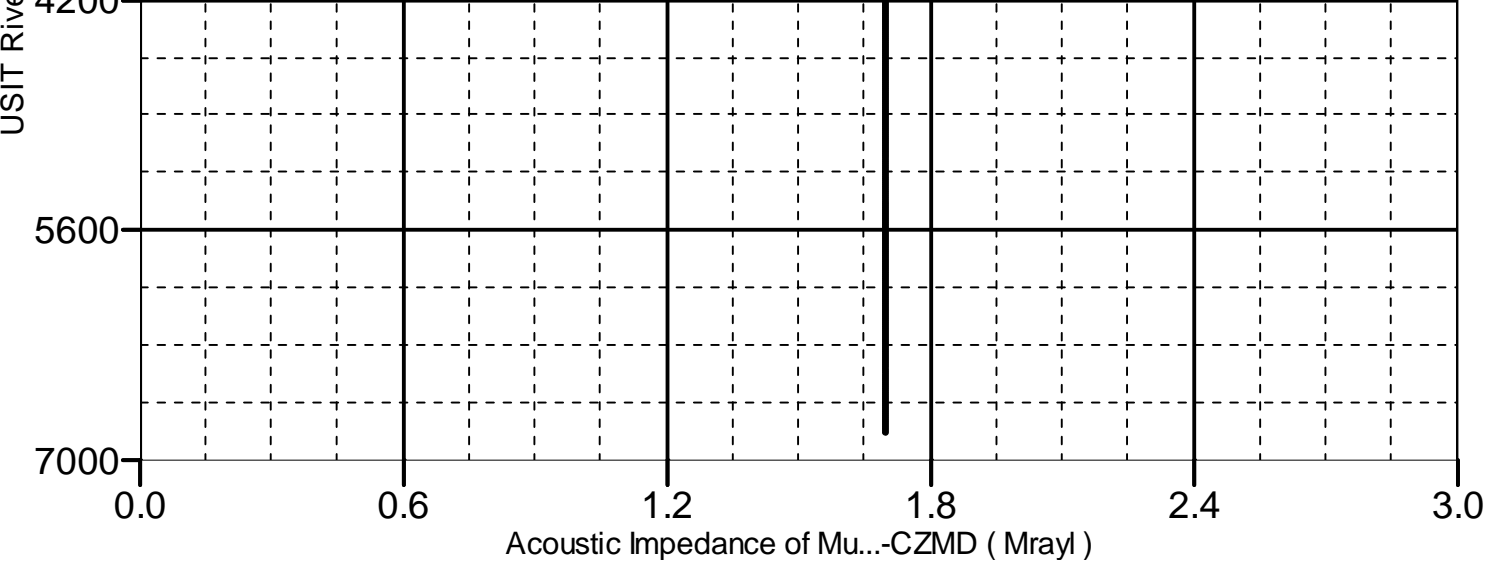
Description: USI Composite Format: USI Composite Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 24-Apr-2015 15:30:16

Channel Processing Parameters				
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
AFVU	Automatic Fluid Velocity Update	USIT-E	On	
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BERJ	Bad Echo Rejection	USIT-E	On	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	8.75	in

CASING_PRATIO	Casing Poisson Ratio	USIT-E	Standard Poisson Ratio	
CBLO	Casing Bottom (Logger)	WLSESSION	6995	ft
CDEN	Cement Density	HGNS-H	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Light Cement	
THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.362	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.7	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	190	us/ft
ETIP	Elevation of the TIP above MSL	WLSESSION	4693	ft
FD	Fluid Density	USIT-E	8.7	lbm/gal
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS	
GR_MULTIPLIER	Gamma Ray Multiplier	HGNS-H	1	
HEMA	Hematite Presence Flag	Borehole	No	
ICE_BINPROC	ICE Bin Processing Depth Interval	USIT-E	0	ft
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.5	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	0	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1	
OPLEV	USIT Remove Flagged Data Level	USIT-E	OPT2	
RAPID_OPTION	Rapid Access Computation Option	USIT-E	Off	
RCOD	Reference Calibrator Outer Diameter	USIT-E	7	in
RCSO	Reference Calibrator Standoff	USIT-E	1.181	in
RCTH	Reference Calibrator Thickness	USIT-E	0.295	in
SDNV	Number of Vertical Samples used for Micro-debonding Computation	USIT-E	5	
SDTHOR	Acoustic Impedance STD Horizontal Threshold for Micro-debonding	USIT-E	0.5	Mrayl
SDTVER	Acoustic Impedance STD Vertical Threshold for Micro-debonding	USIT-E	0.3	Mrayl
SOCN	Standoff Distance	HGNS-H	0.125	in
SOCO	Standoff Correction Option	HGNS-H	No	
TCUB	T^3 Processing Level	USIT-E	Loop	
THDH	Maximum Search Thickness (percentage of nominal)	USIT-E	130	%
THDL	Minimum Search Thickness (percentage of nominal)	USIT-E	70	%
HISC	Tool Position: Centered or Eccentered	HGNS-H	Eccentered	
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	Manual	
THDP	Thickness Detection Policy	USIT-E	Fundamental	
VCAS	Ultrasonic Transversal Velocity in Casing	USIT-E	51.4	us/ft
ZCAS	Acoustic Impedance of Casing	USIT-E	46.25	Mrayl
ZINI	Initial Estimate of Cement Impedance	USIT-E	-1	Mrayl
ZMUD	Acoustic Impedance of Mud	Borehole	1.7	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.6	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	
DOT(DOS)	Distance between Opposite Transducer Faces	USIT-E	2.874	in
EMXV	EMEX Voltage	USIT-E	40	V
HRES	Horizontal Resolution	USIT-E	10 deg	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
MOTOR_PROTECT	Motor Protection	USIT-E	On	
TMUC	Type of Mud	USIT-E	BRI	
UACLV_PERM	Ultrasonic ACLV Permanent	USIT-E	No	
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 3.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	6833	ft
USSP	Ultrasonic Service	USIT-E	USI	
VRES	Vertical Resolution	USIT-E	3.0 in	
WINB	Window Begin Time	USIT-E	33.86	us
WINE	Window End Time	USIT-E	73.87	us
XYZ	Company:Noble Energy Inc Well:COLT A13-635 ONE: Main[5]:Up:S005			

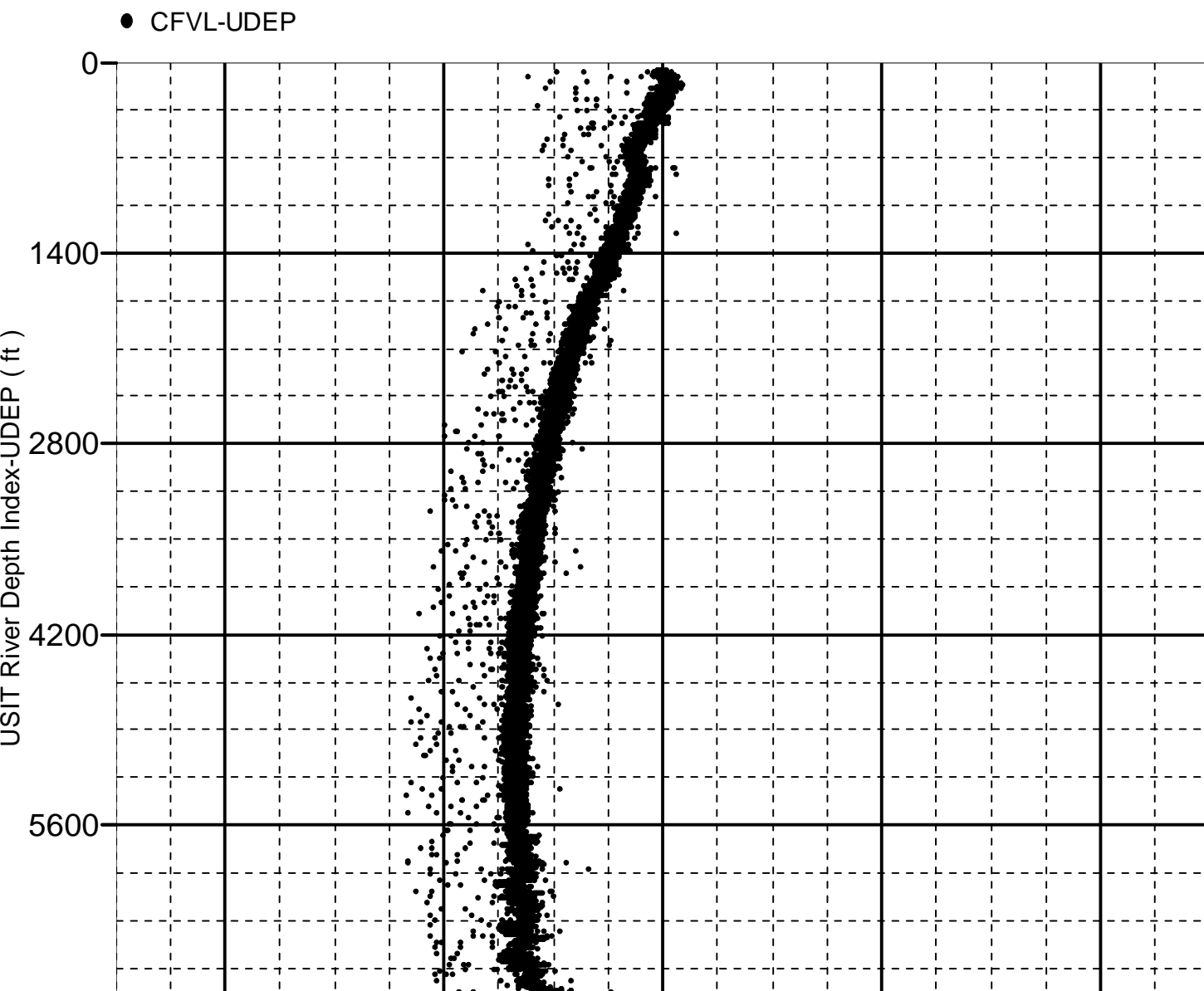


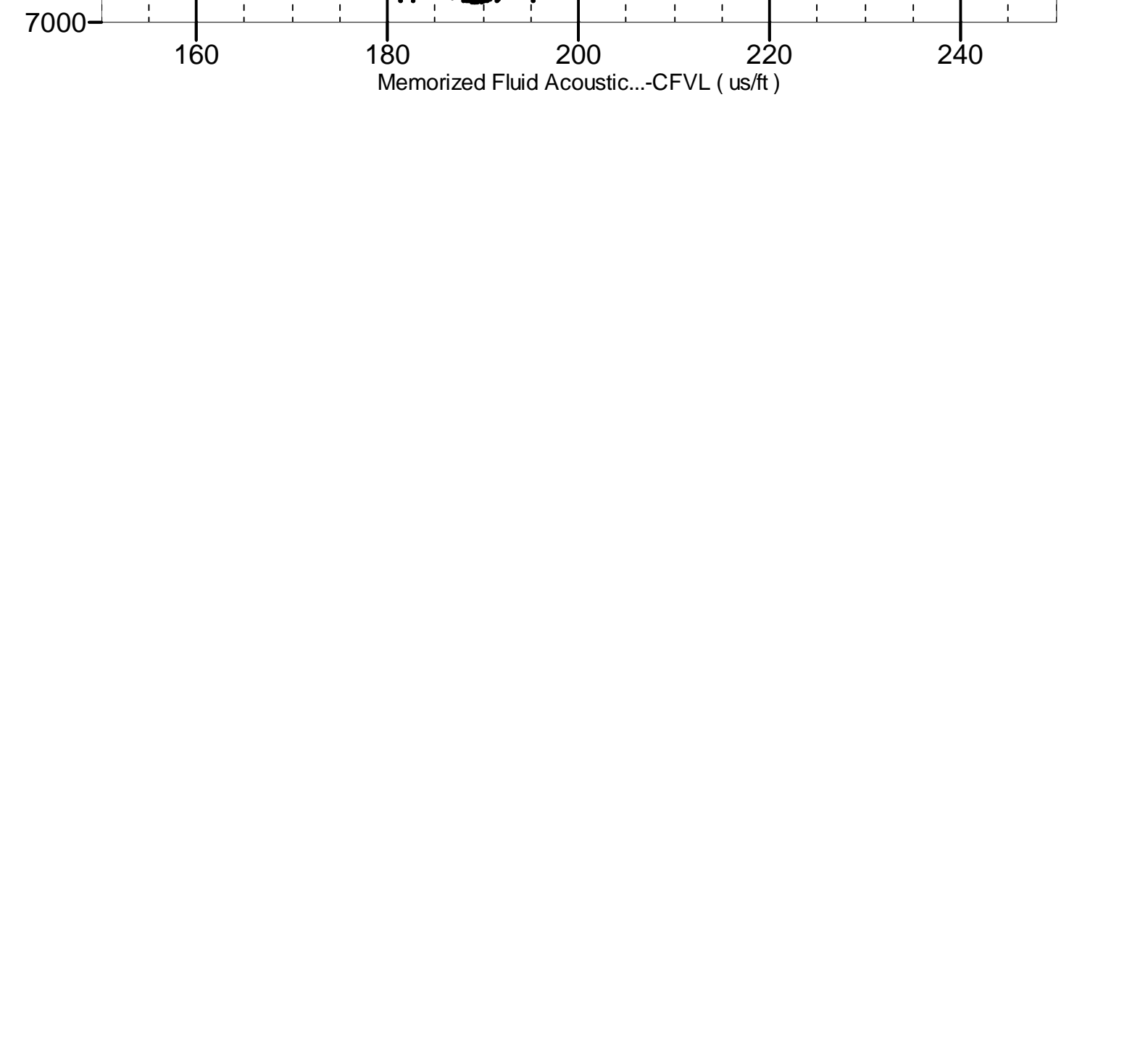


Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6845.50 to 65.25 ft





Company:	Noble Energy Inc	Schlumberger
Well:	COLT A13-635	
Field:	WATTENBERG	
County:	WELD	
State:	COLORADO	
Ultrasonic Imager		
Cement Evaluation		
Gamma Ray - CCL		