

Company: Kerr-McGee Oil & Gas Onshore LP

Well: Brotemarkle 3N-13HZ

Field: Wattenberg

County: Weld State: Colorado

Ultrasonic Imager

Cement Evaluation

Gamma Ray - CCL Log

County:	Weld				
Field:	Wattenberg				
Location:	SESW Sec. 13, T3N, R66W				
Well:	Brotemarkle 3N-13HZ				
Company:	Kerr-McGee Oil & Gas Onshore LP				
Logging Date	Location:				
	SESWSec. 13, T3N, R66W		Elev.: K.B. 5049.00 ft		
	SHL: 309' FSL X 2060' FWL		G.L. 5033.00 ft		
	Permanent Datum:		D.F. 5048.00 ft		
	Log Measured From:		16.00 ft above Perm.Datum		
Run Number	Drilling Measured From:				
	API Serial No.				
	Section:				
	Township:				
	Range:				
Logging Date	28-Apr-2014	05-123-36395-0000	13	3N	66W
Run Number	Run 1: USIT				
Depth Driller	11753.00 ft				
Schlumberger Depth	11753.00 ft				
Bottom Log Interval	6621.00 ft				
Top Log Interval					
Casing Fluid Type	Brine				
Salinity					
Density	8.4 lbm/gal				
Fluid Level	0.00 ft				
BIT/CASING/TUBING STRING					
Bit Size	8.75 in				
From	0.00 ft				
To	11753.00 ft				
Casing/Tubing Size	7 in				
Weight	26 lbm/ft				
Grade	P110				
From	0.00 ft				
To	7593.00 ft				
Max Recorded Temperatures					
Logger on Bottom	Time	28-Apr-2014	13:00:10		
Unit Number	Location:	3022	Ft. Morgan, CO		
Recorded By		Tim Hoffman			
Witnessed By		Trevor Daniel			

Disclaimer

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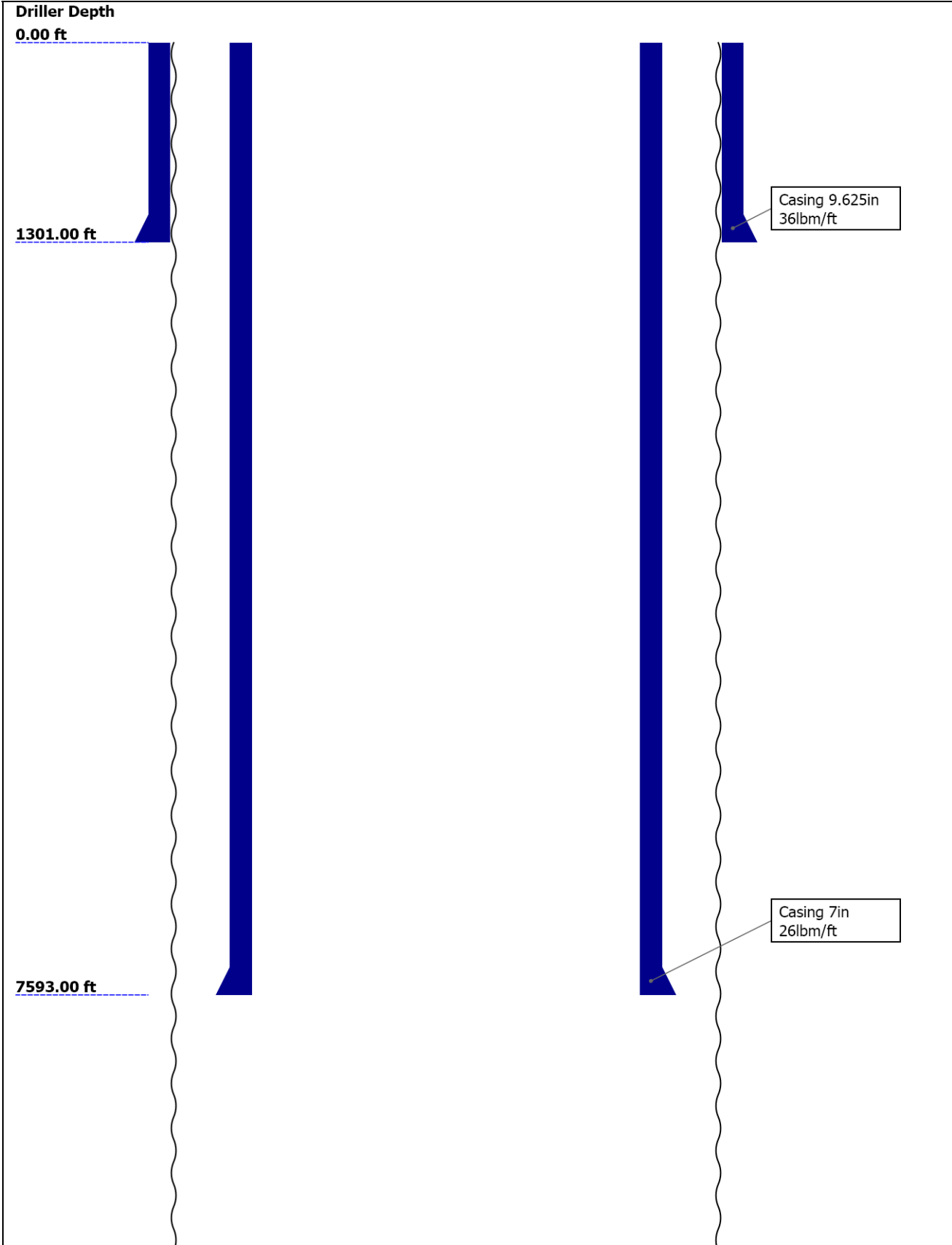
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Well Sketch





Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	8.75					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	11753					
Bottom Logger (ft)	11753					
Casing						
Size (in)	9.625	7				
Weight (lbm/ft)	36	26				
Inner Diameter (in)	8.921	6.276				
Grade	J55	P110				
Top Driller (ft)	0	0				
Top Logger (ft)	0	0				
Bottom Driller (ft)	1301	7593				
Bottom Logger (ft)	1301	7593				

Operational Run Summary

Parameter (unit)	Run1: USIT					
Date Log Started	28-Apr-2014					
Time Log Started	11:56:37					
Date Log Finished	28-Apr-2014					
Time Log Finished	14:14:54					
Top Log Interval (ft)	NaN					
Bottom Log Interval (ft)	6621.00					
Total Depth (ft)	11753.00					
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	Ft. Morgan, CO					
Recorded By	Tim Hoffman					
Witnessed By	Trevor Daniel					
Service Order Number	CX03-00023					

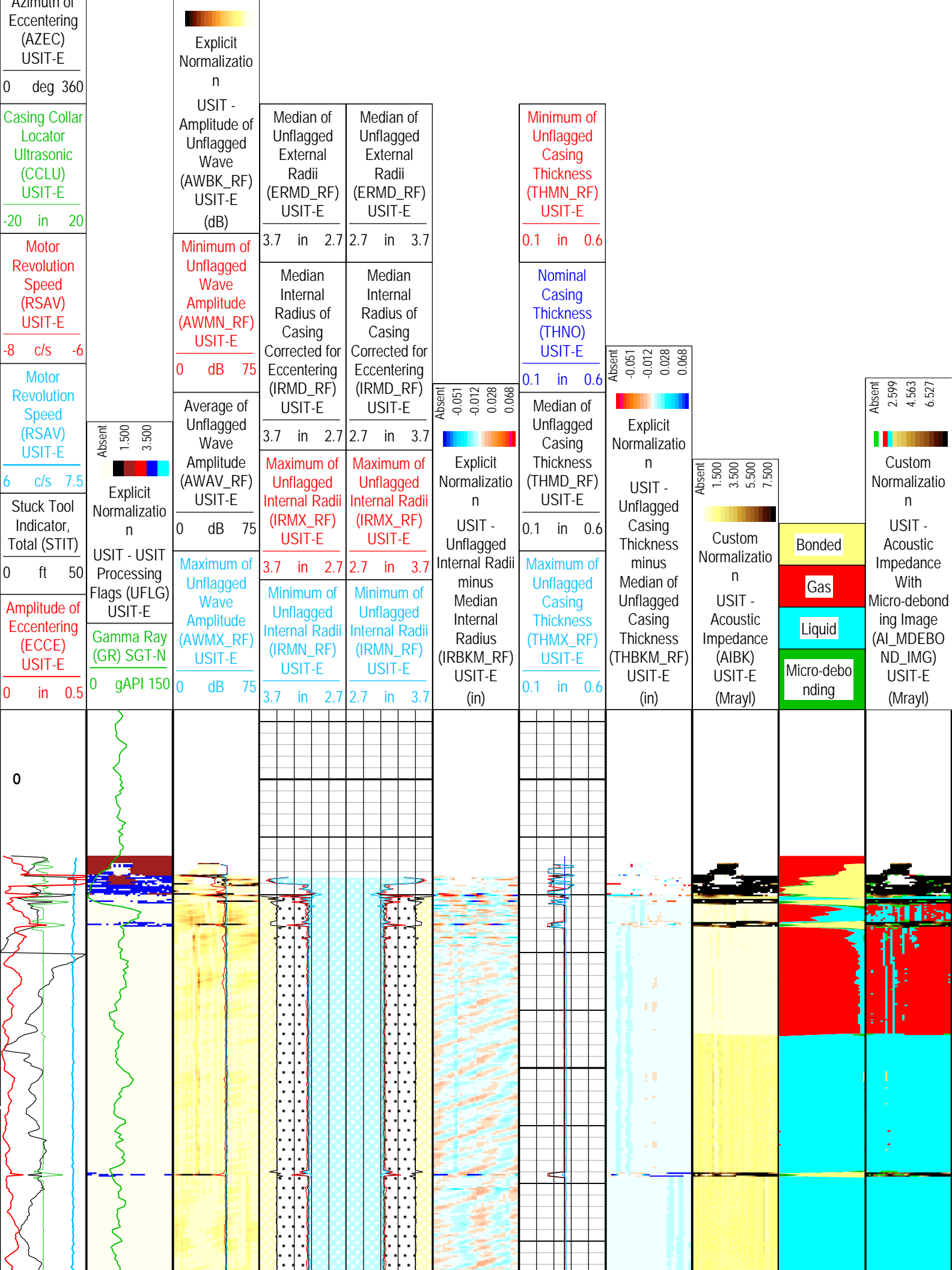
Remarks and Equipment Summary

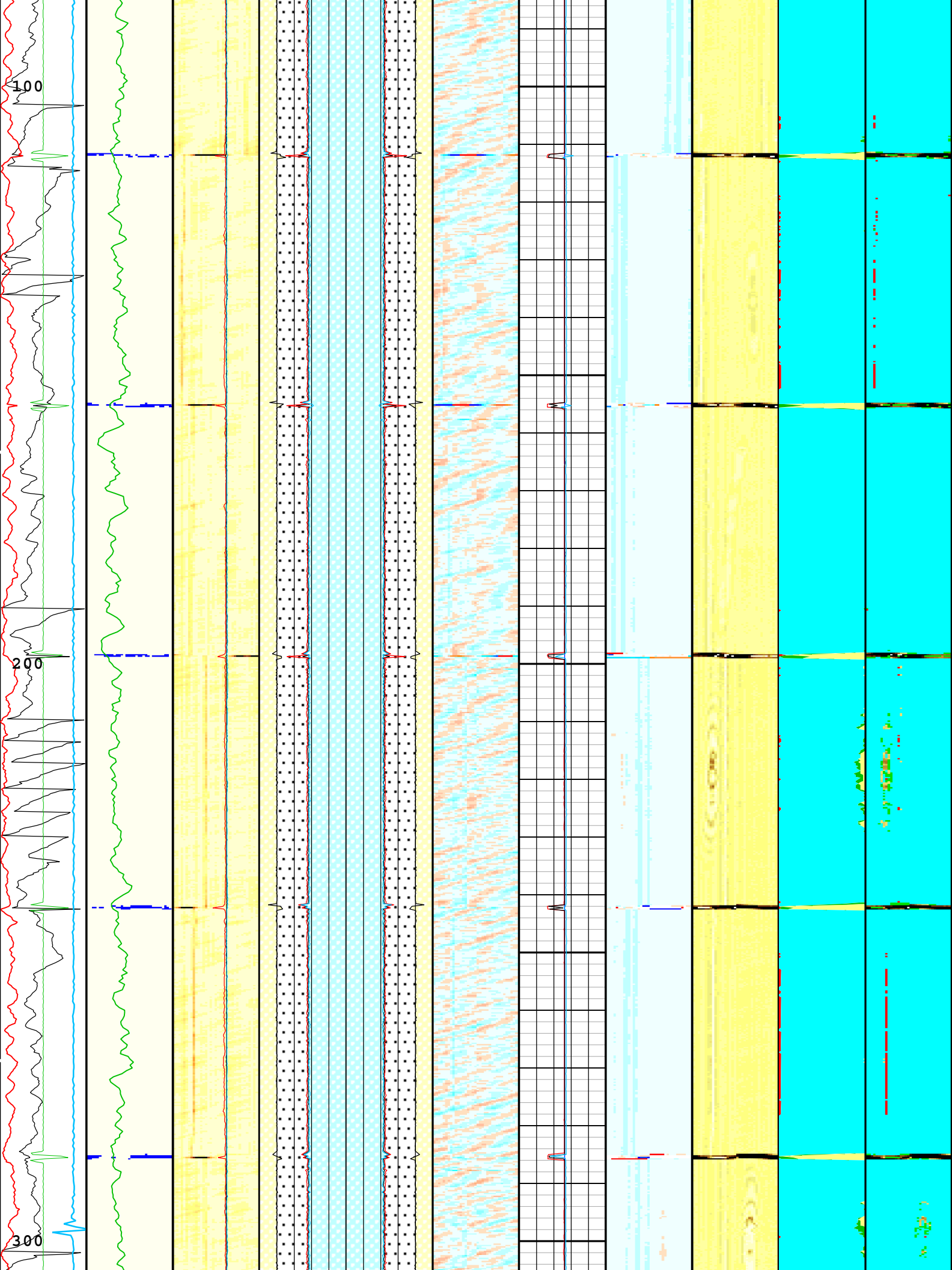
Run1: USIT: Toolstring				Run1: USIT: Remarks	
<div><div><div><div><div>Equip name</div><div>Length</div></div><div>LEH-QT</div><div>32.75</div></div><div>LEH-QT</div><div><div><div>DTC-H:880</div><div>29.84</div></div><div>3</div><div>ECH-KC:1035</div><div>4</div><div>DTC-H:8803</div></div><div><div><div>SGT-N:984</div><div>26.84</div></div><div>1</div><div>SGH-K:2693</div><div>SGC-TB:9841</div><div>SGD-TAA:213</div><div>65</div></div><div><div><div>CME-AF</div><div>21.34</div></div><div><div>AH-184:39</div><div>17.54</div></div><div>06</div><div><div><div>USIT-E:977</div><div>15.54</div></div><div>ECH-MFA:19</div><div>69</div><div>USAC-A:977</div><div>USIS-A:2797</div><div>USSC-B:1738</div><div>USRS-B:938</div><div>USI-SENSOR</div></div></div><div><div><div>USI Sens</div><div>0.38</div></div><div>or</div><div>TOOL_ZERO</div><div>sion</div></div><div>Lengths are in ft</div><div>Maximum Outer Diameter = 4.645 in</div><div>Line: Sensor Location, Value: Gating Offset</div><div>All measurements are relative to TOOL_ZERO</div></div><div><div><div><div><div>CTEM</div><div>28.94</div></div><div><div>HV</div><div>0.00</div></div><div><div>TelStatus</div><div>26.84</div></div><div><div>ToolStat</div><div>26.84</div></div><div>us</div><div><div>GR</div><div>25.92</div></div></div></div></div></div>				This is the first run in hole	
				Toolstring run as per tool sketch	
				12.7 ppg lead cement	
				14.4 ppg tail cement	
				0 PSI repeat pass	
				3000 PSI main pass	
				Liner top set at 6651'. Logged out from 6621'	
				Crew: Jay Musgrave, Troy Ocanas	

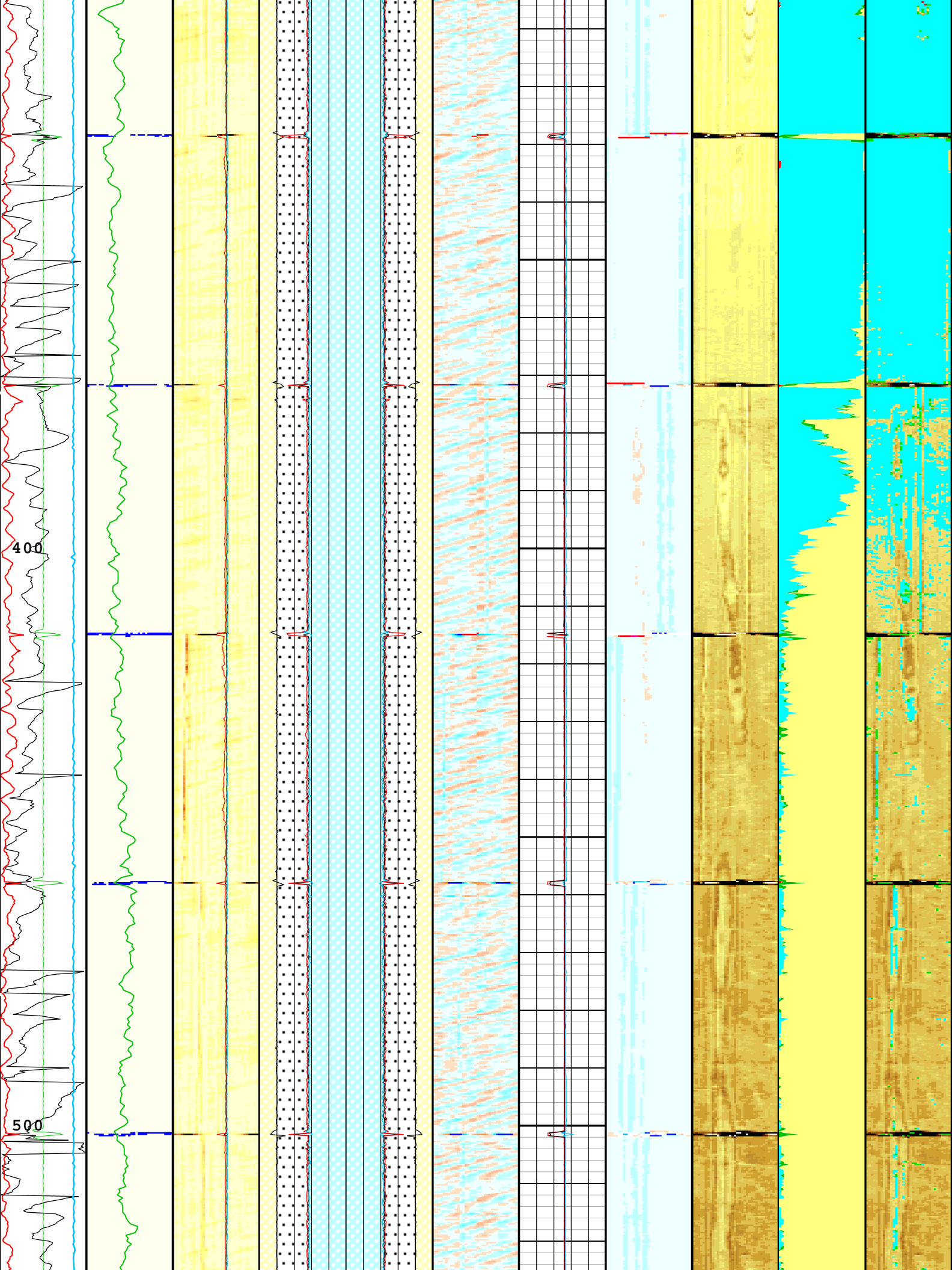
Depth Summary

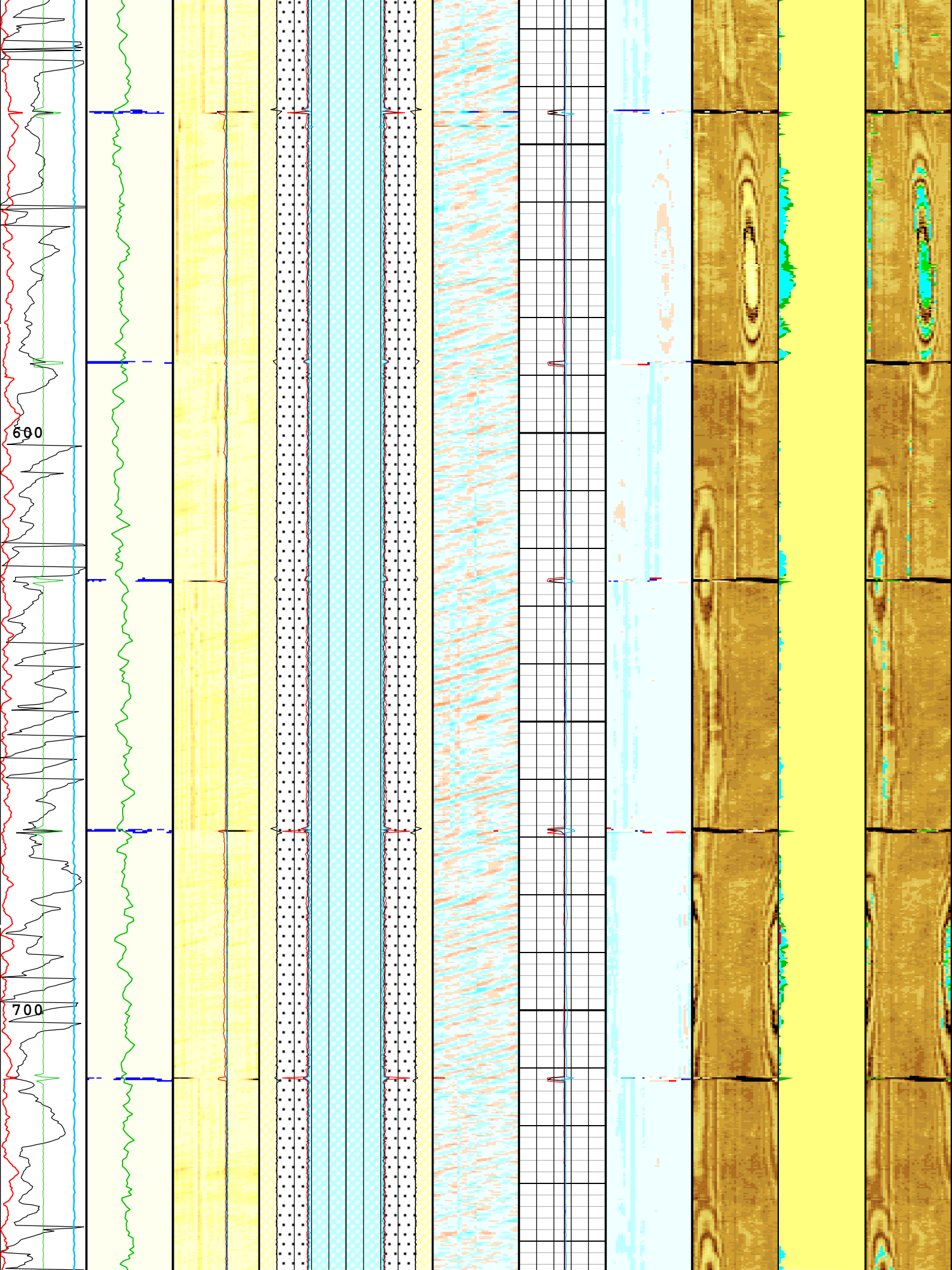
	Run1: USIT		
Depth Measuring Device			
Type	IDW-B		
Serial Number	6239		
Calibration Date	10-Jan-2014		
Calibrator Serial Number			
Calibration Cable Type	7-396P LXS		

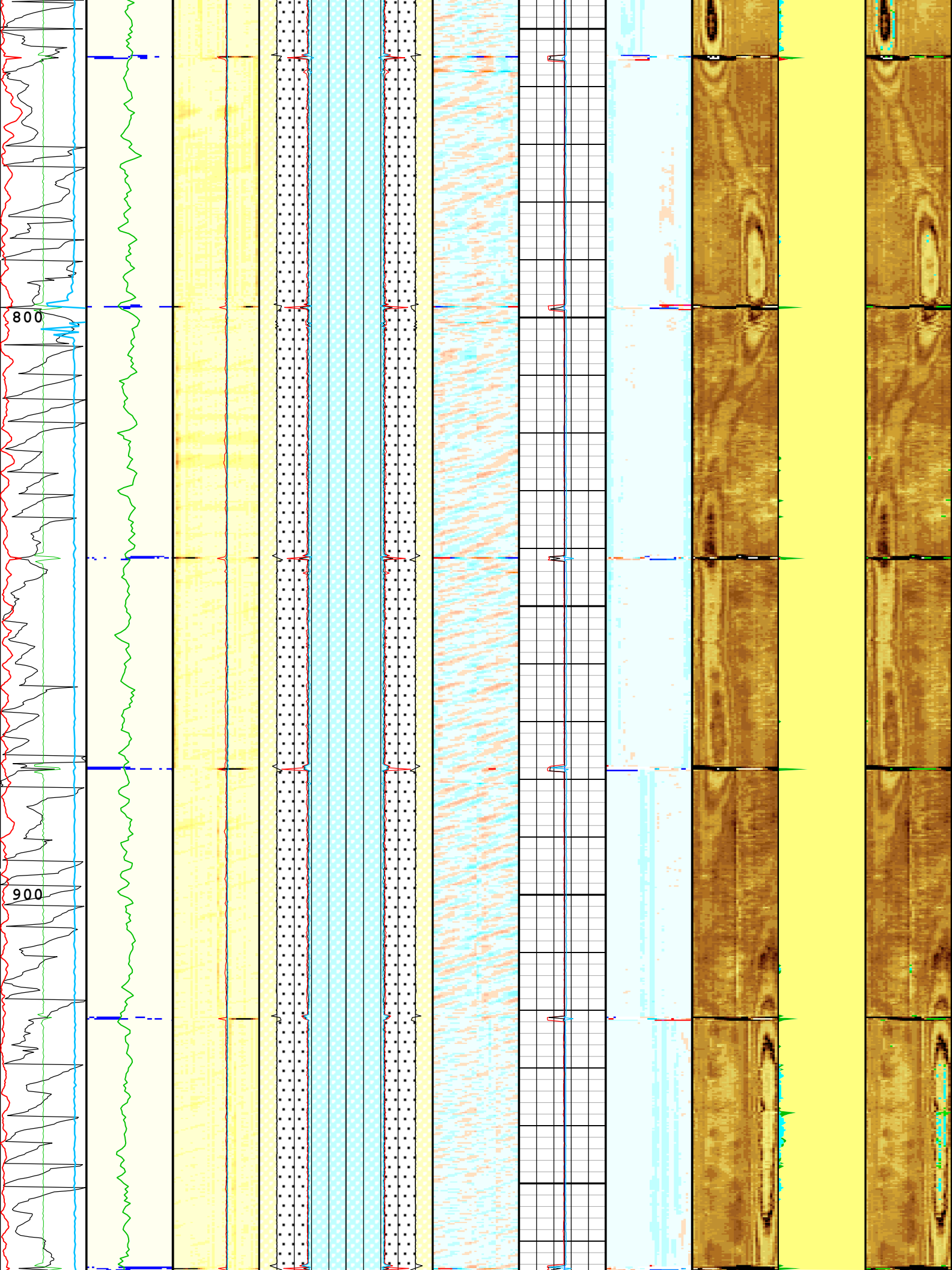
CableDrag	
Azimuth of	

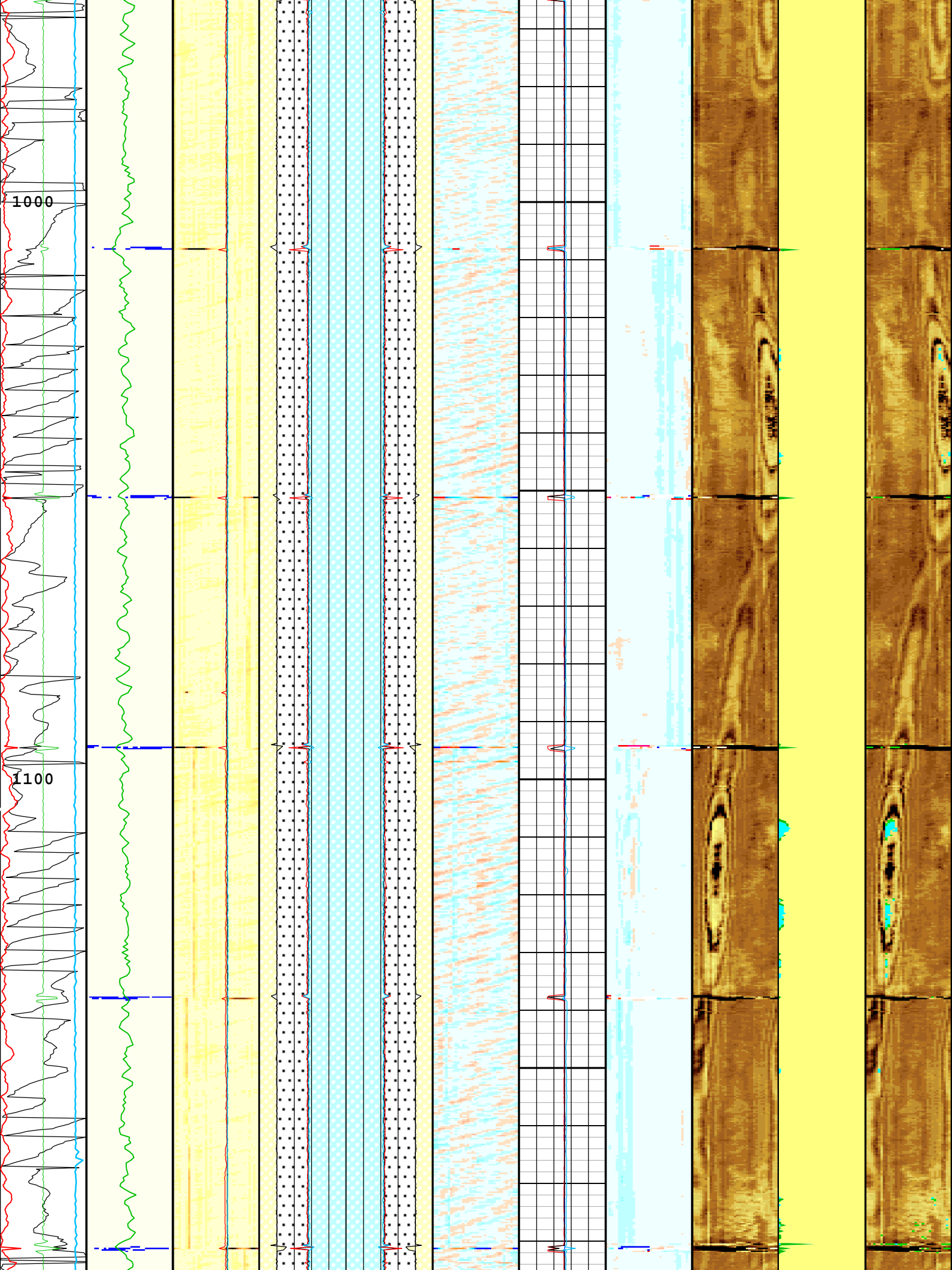


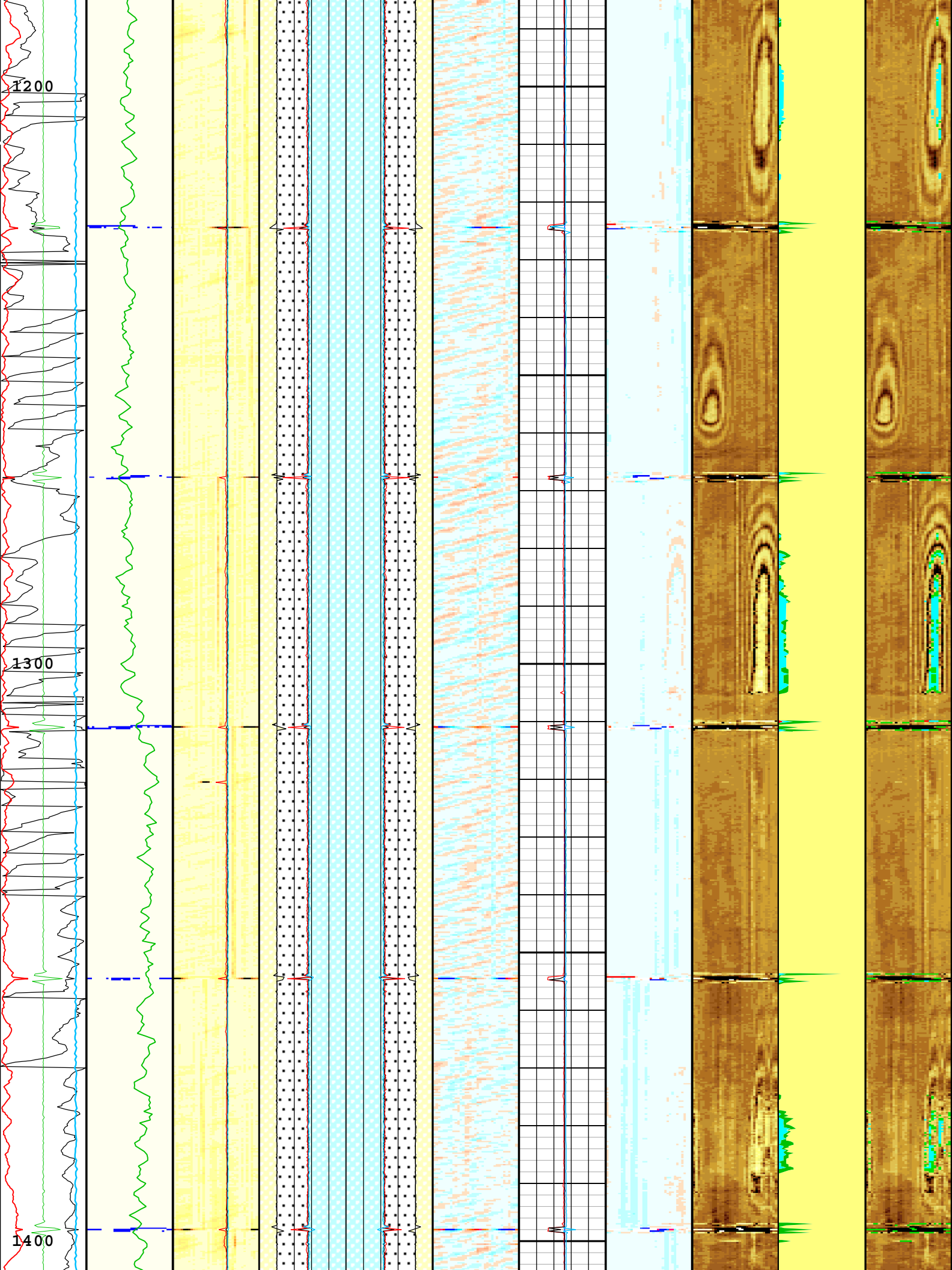


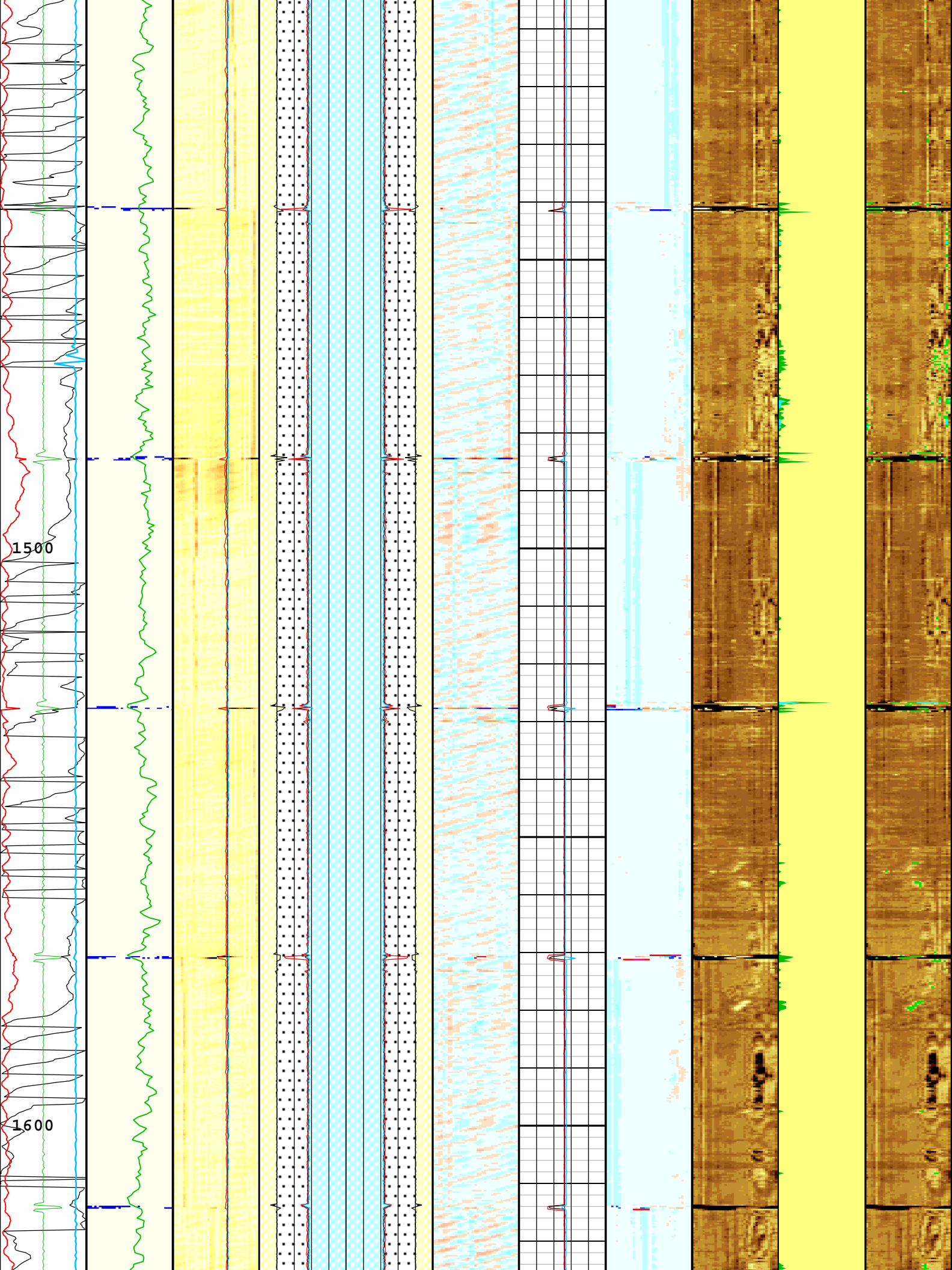


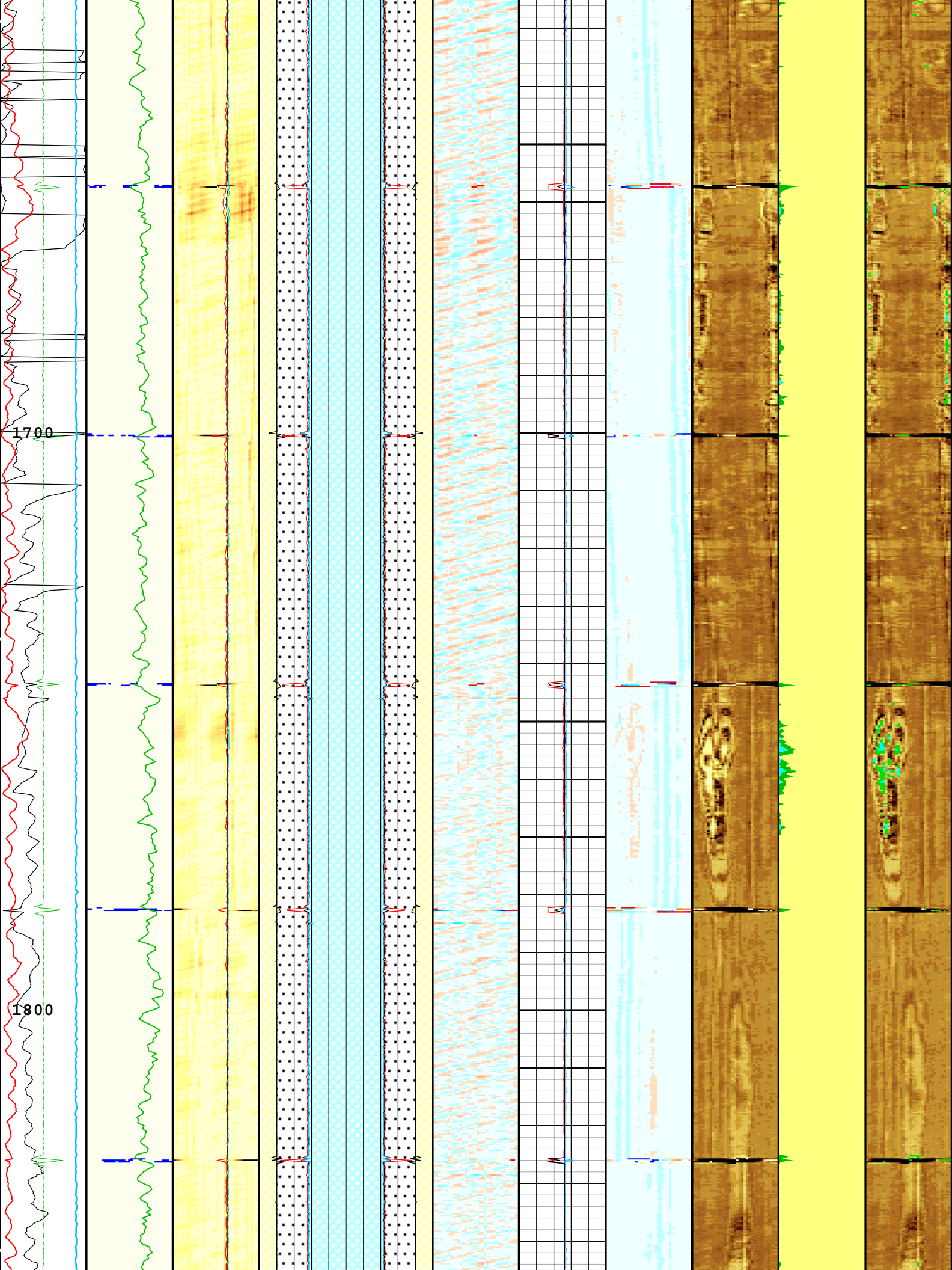


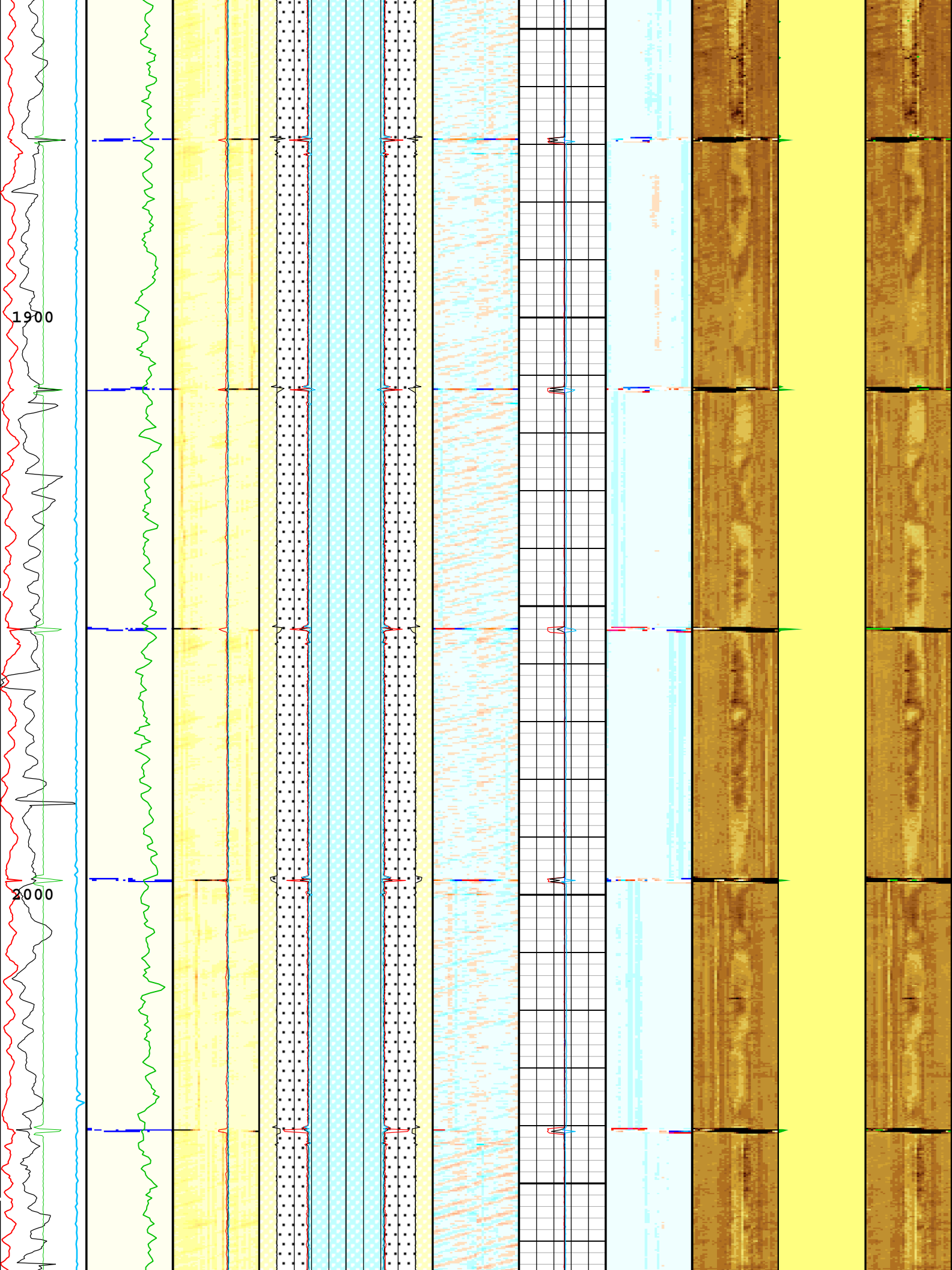


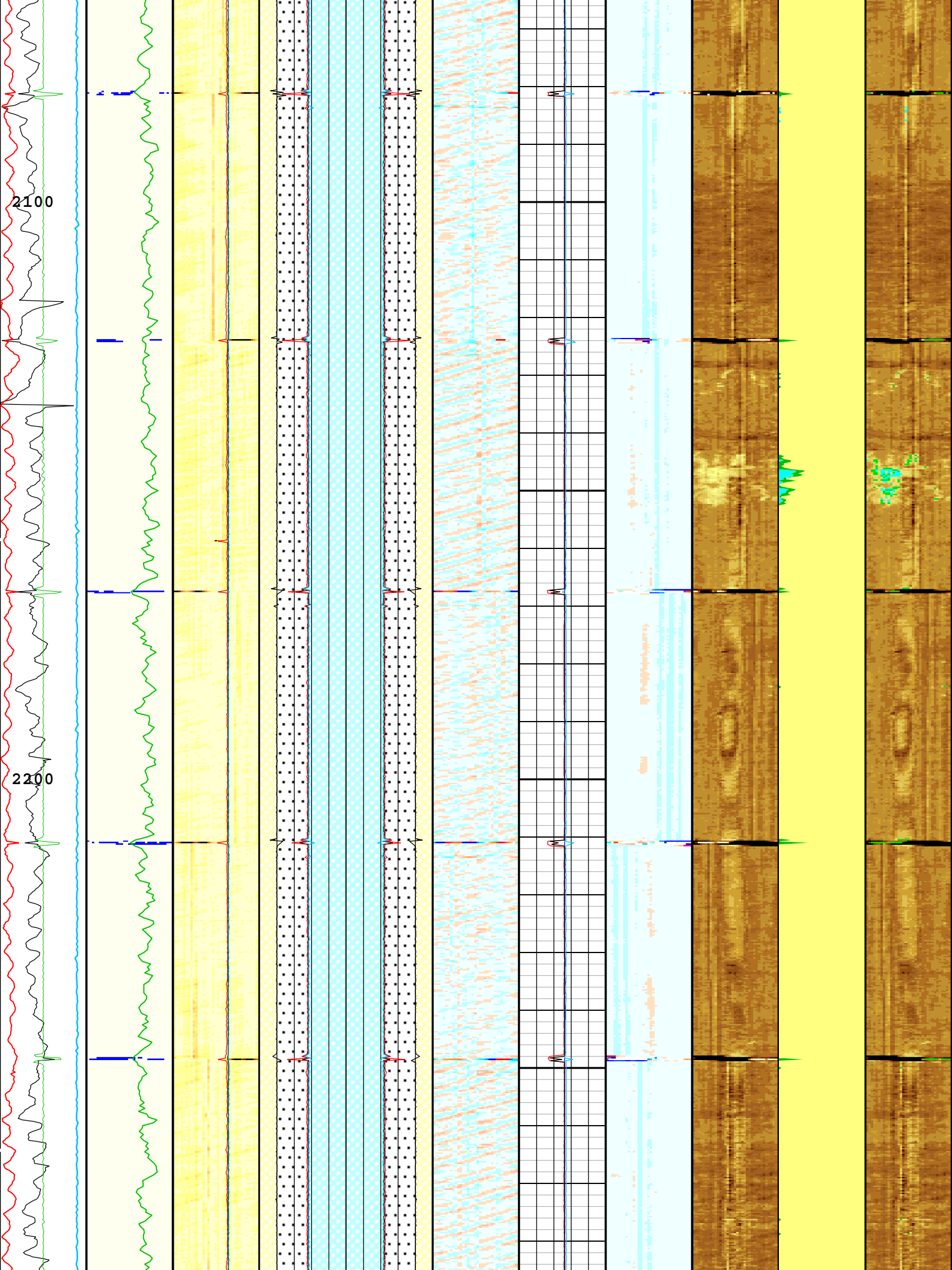


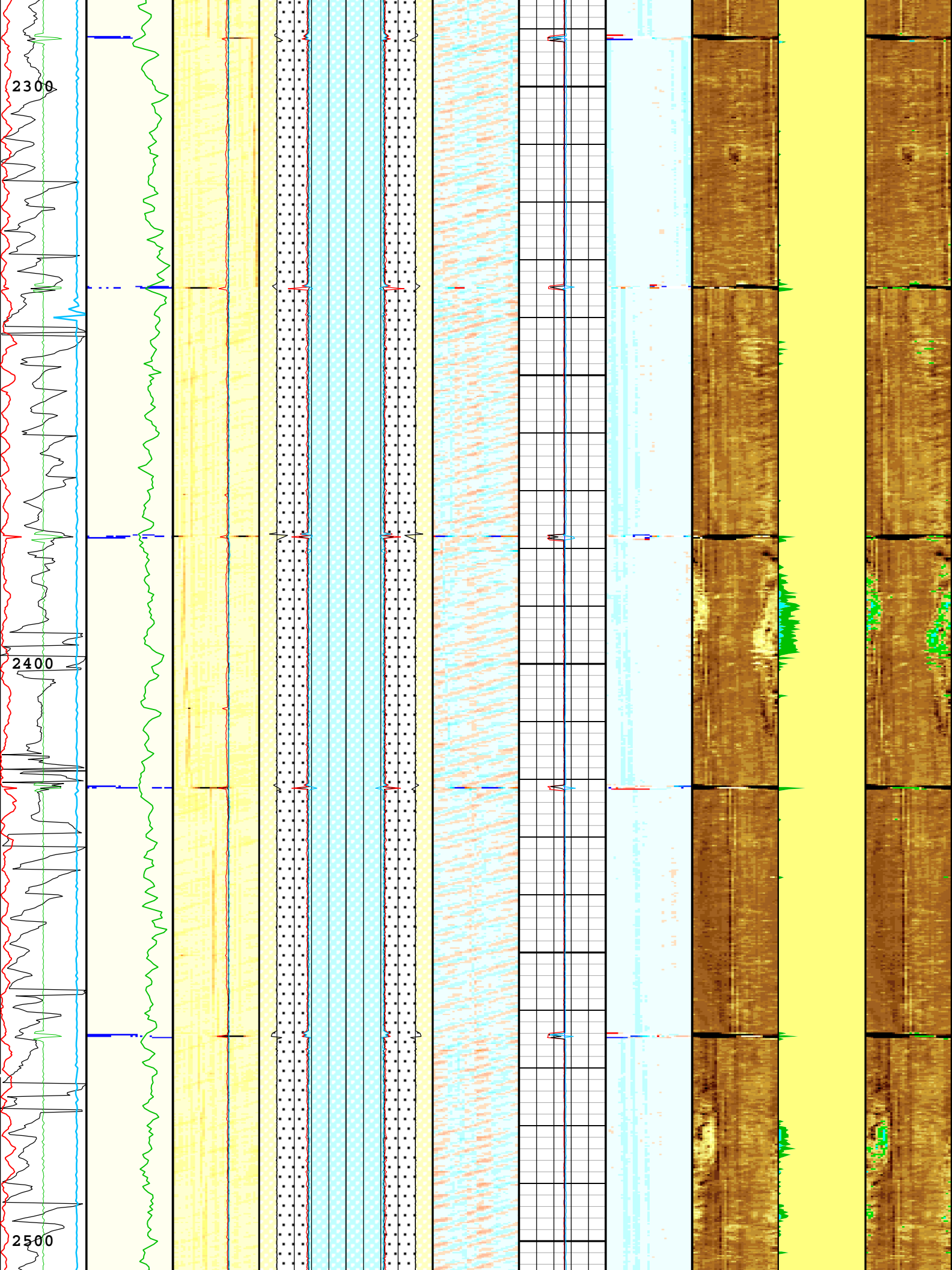


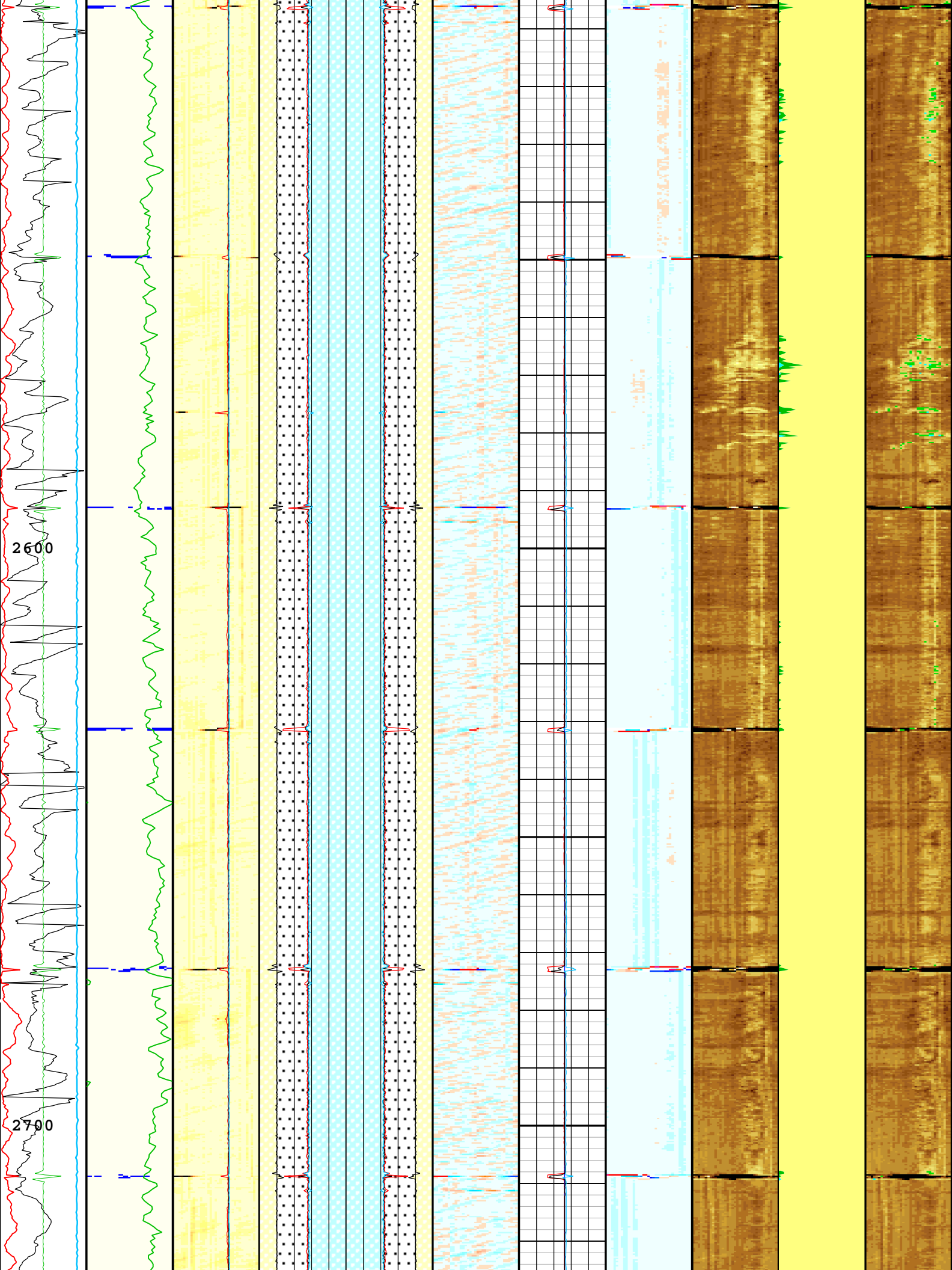


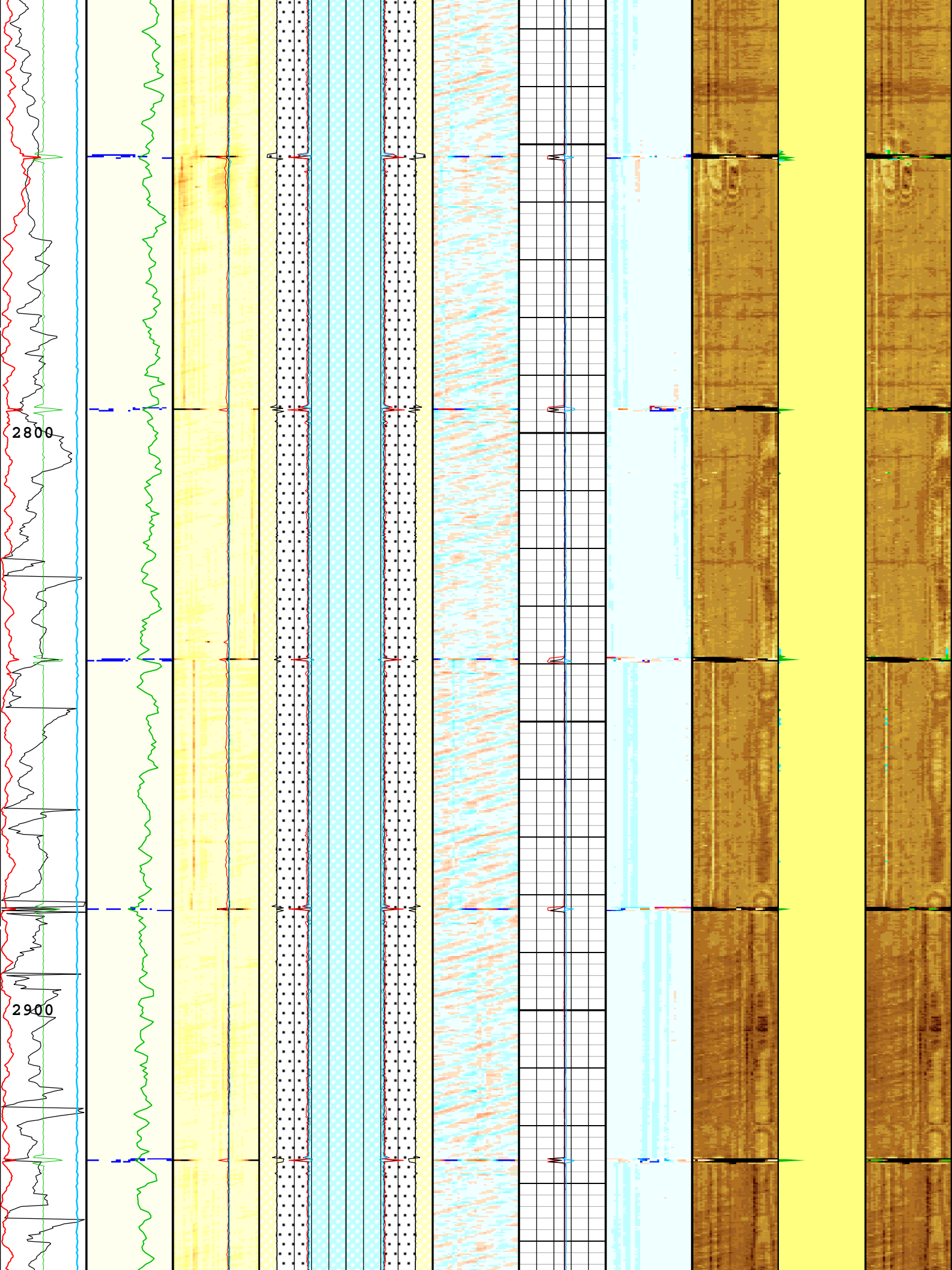


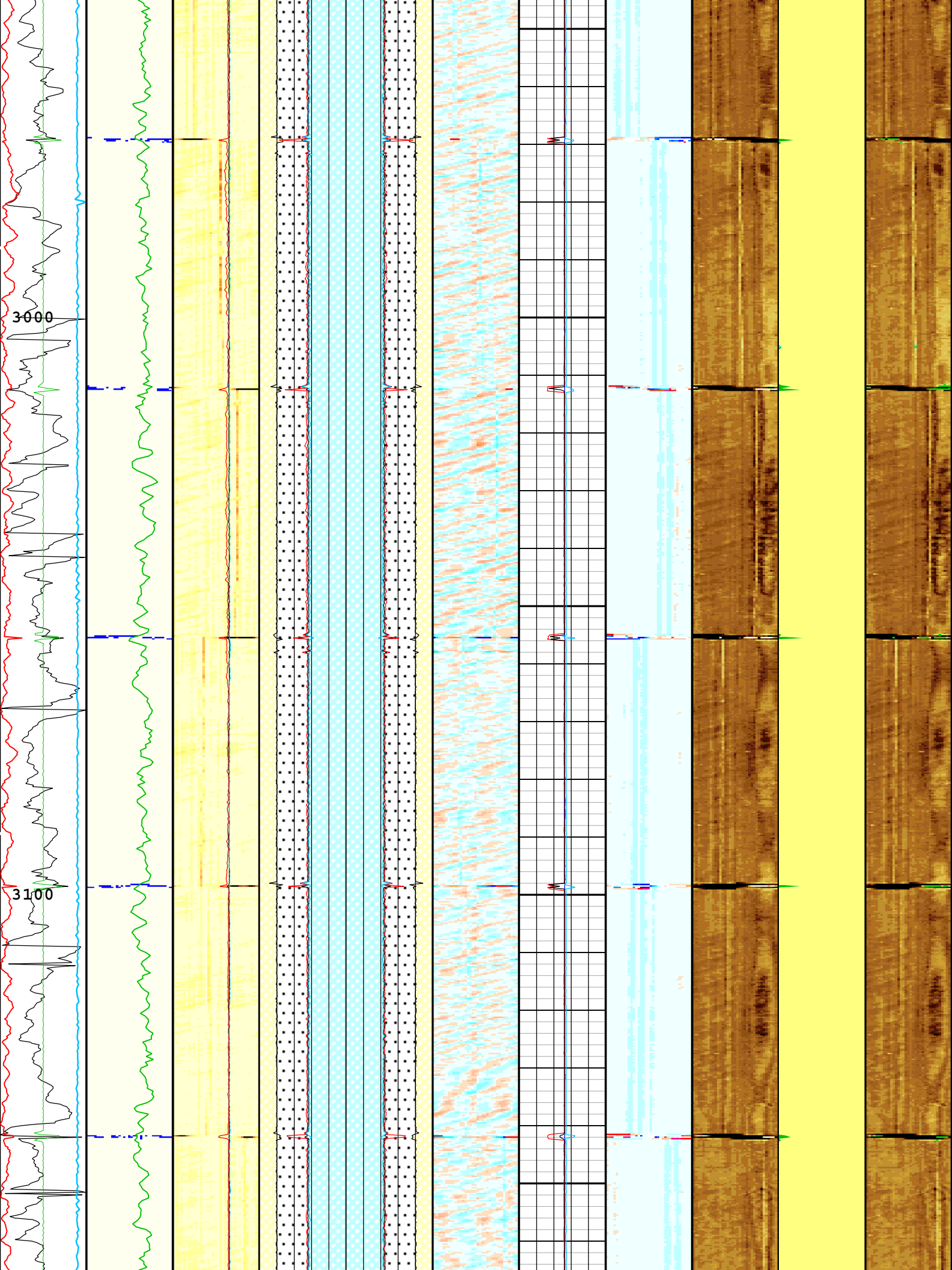


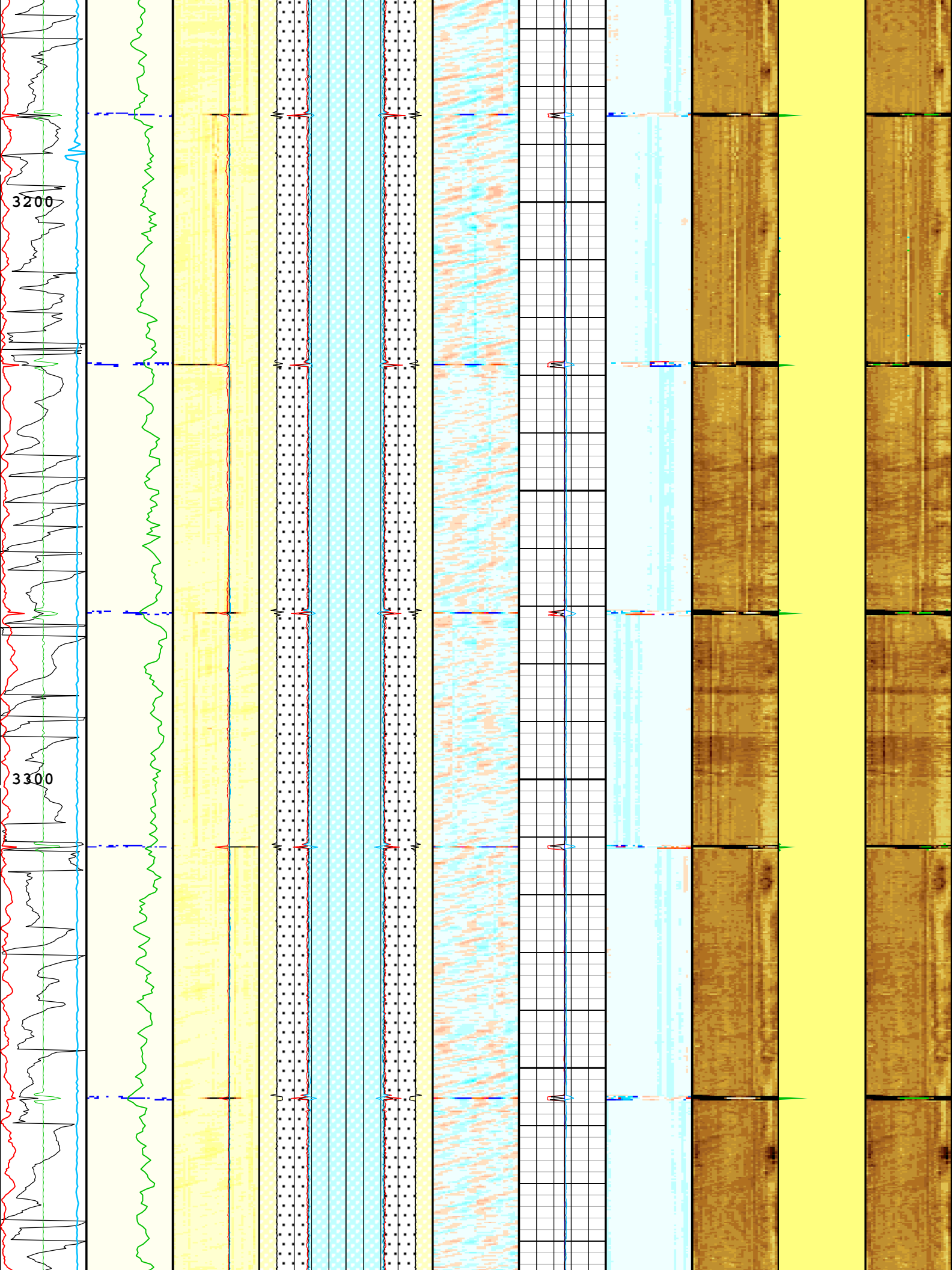


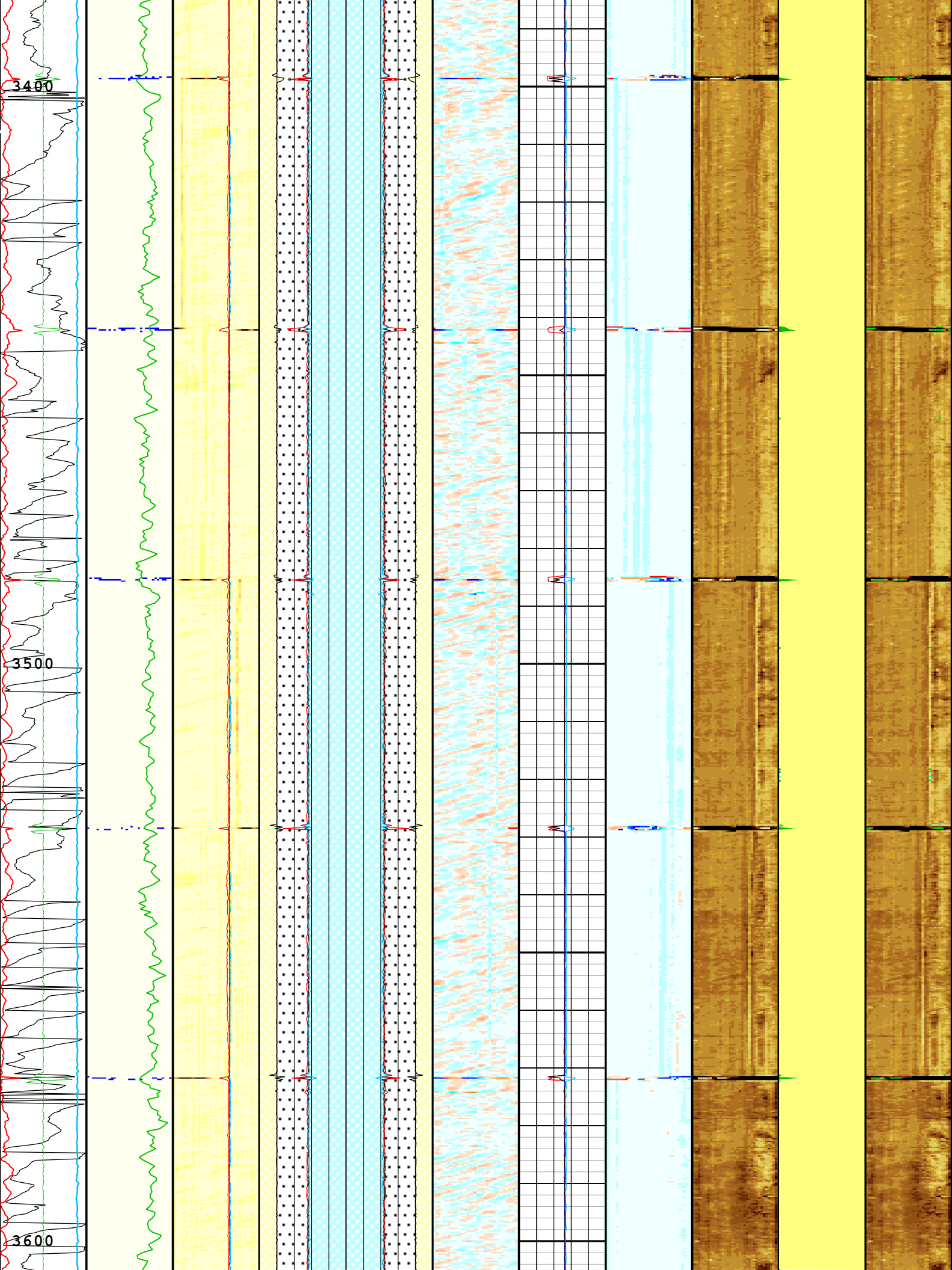


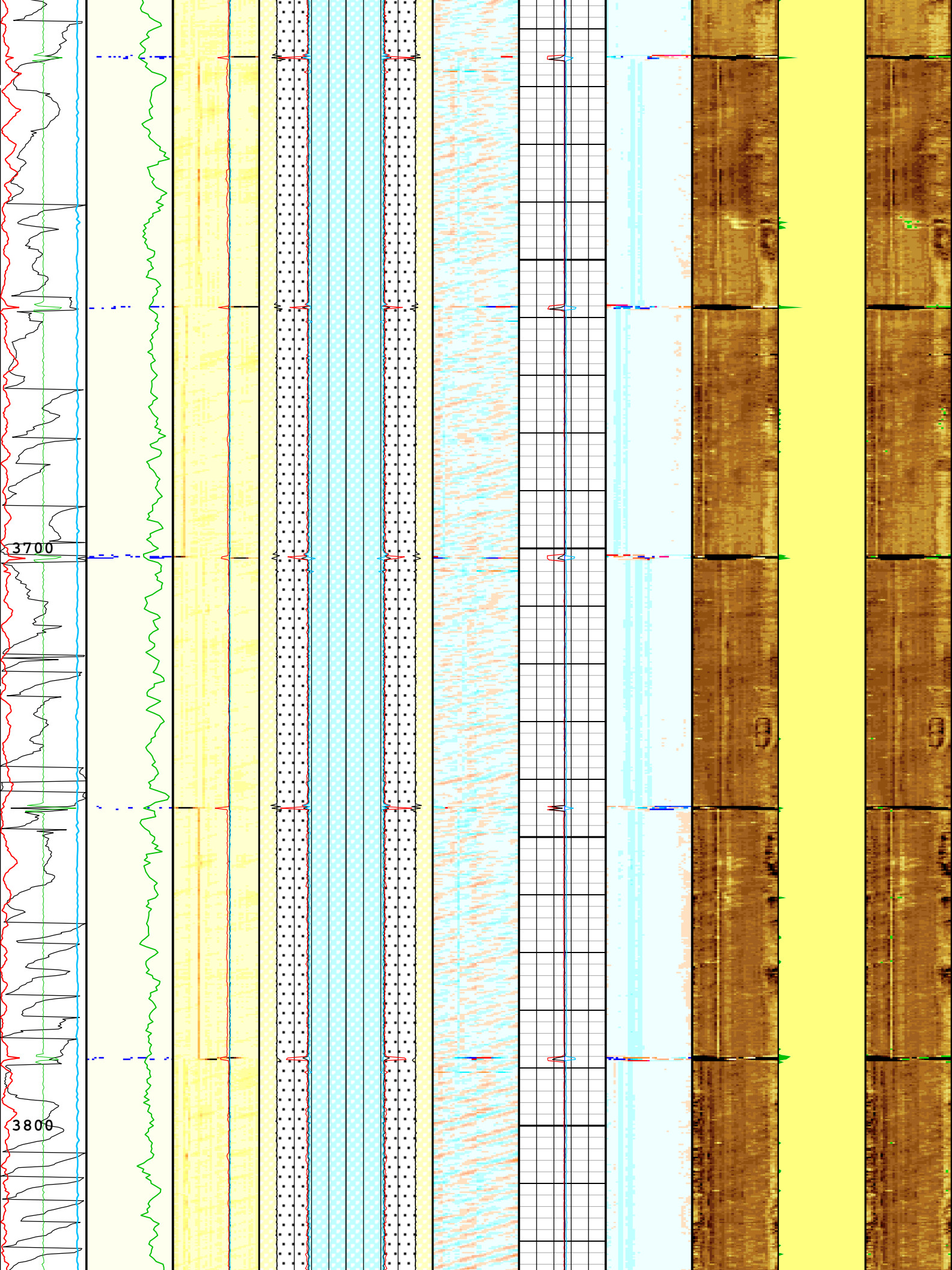


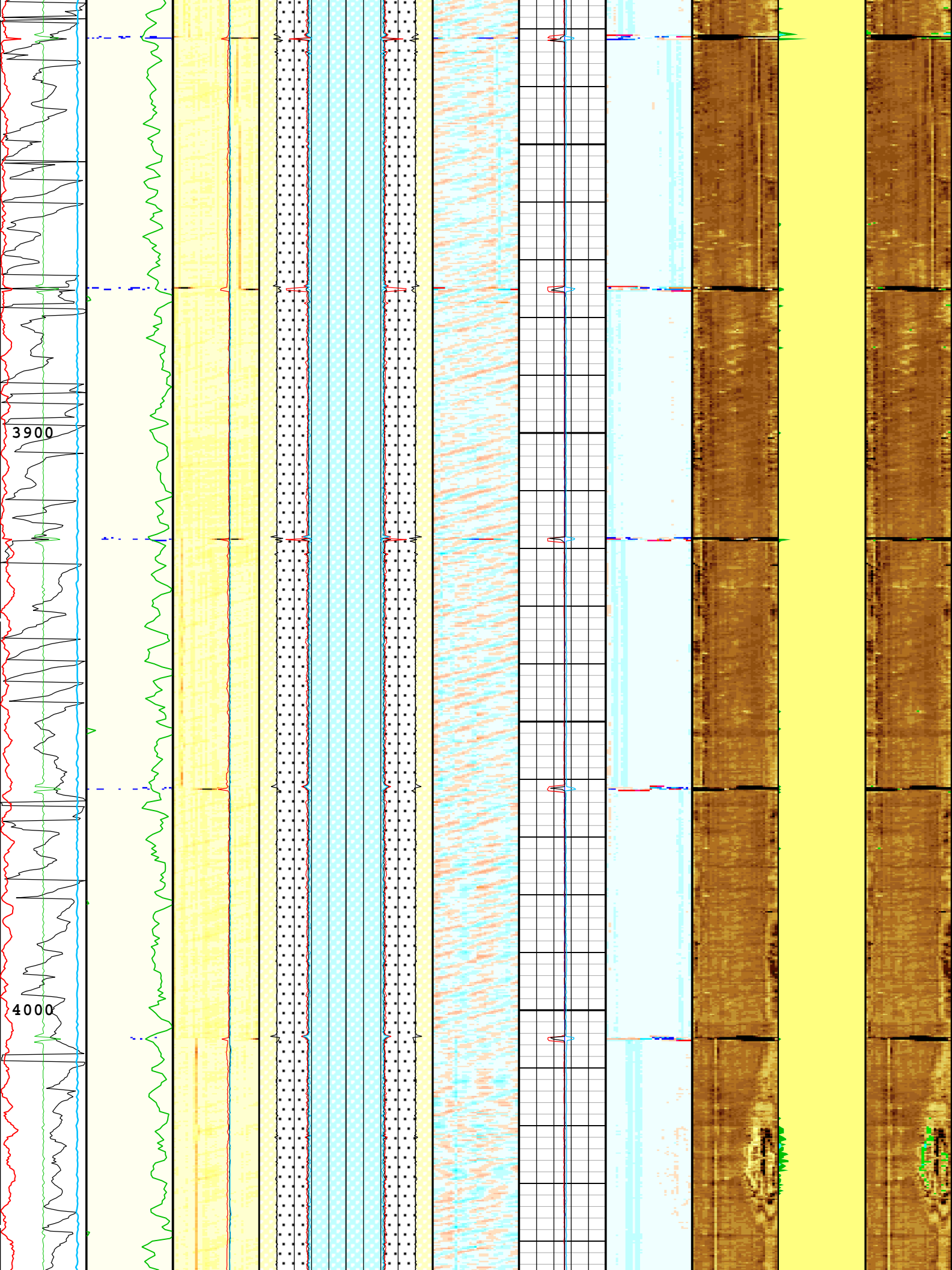


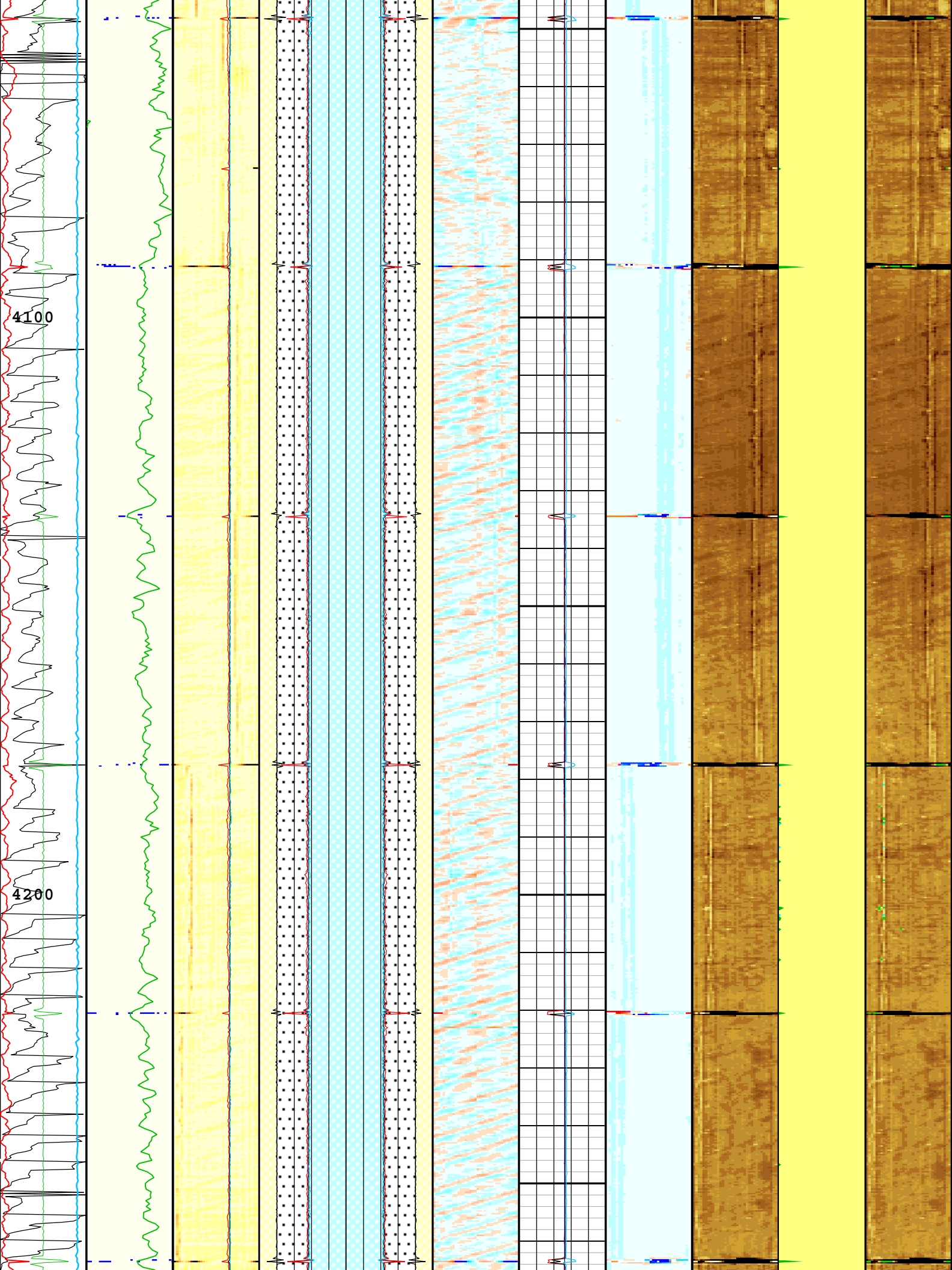


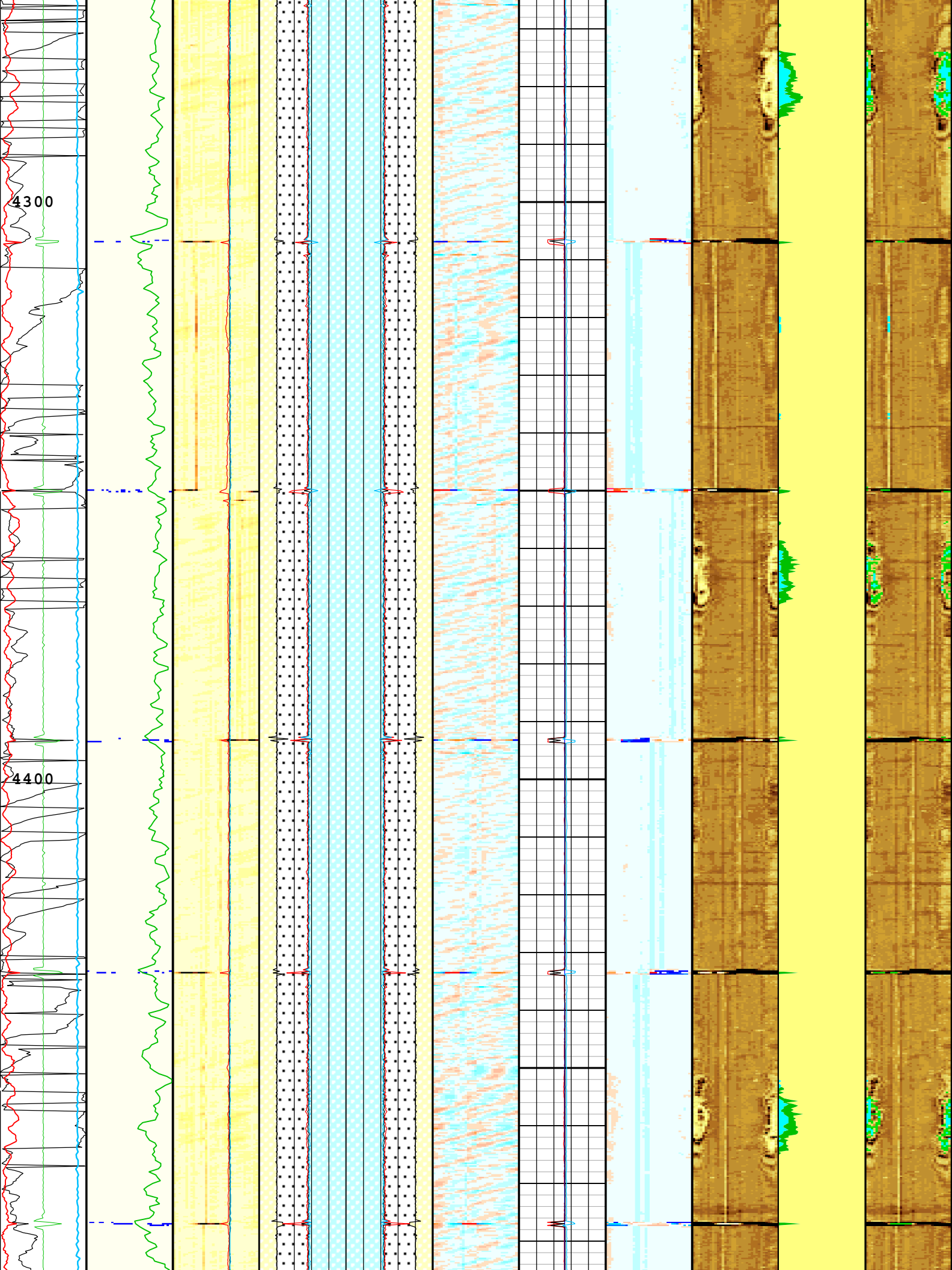






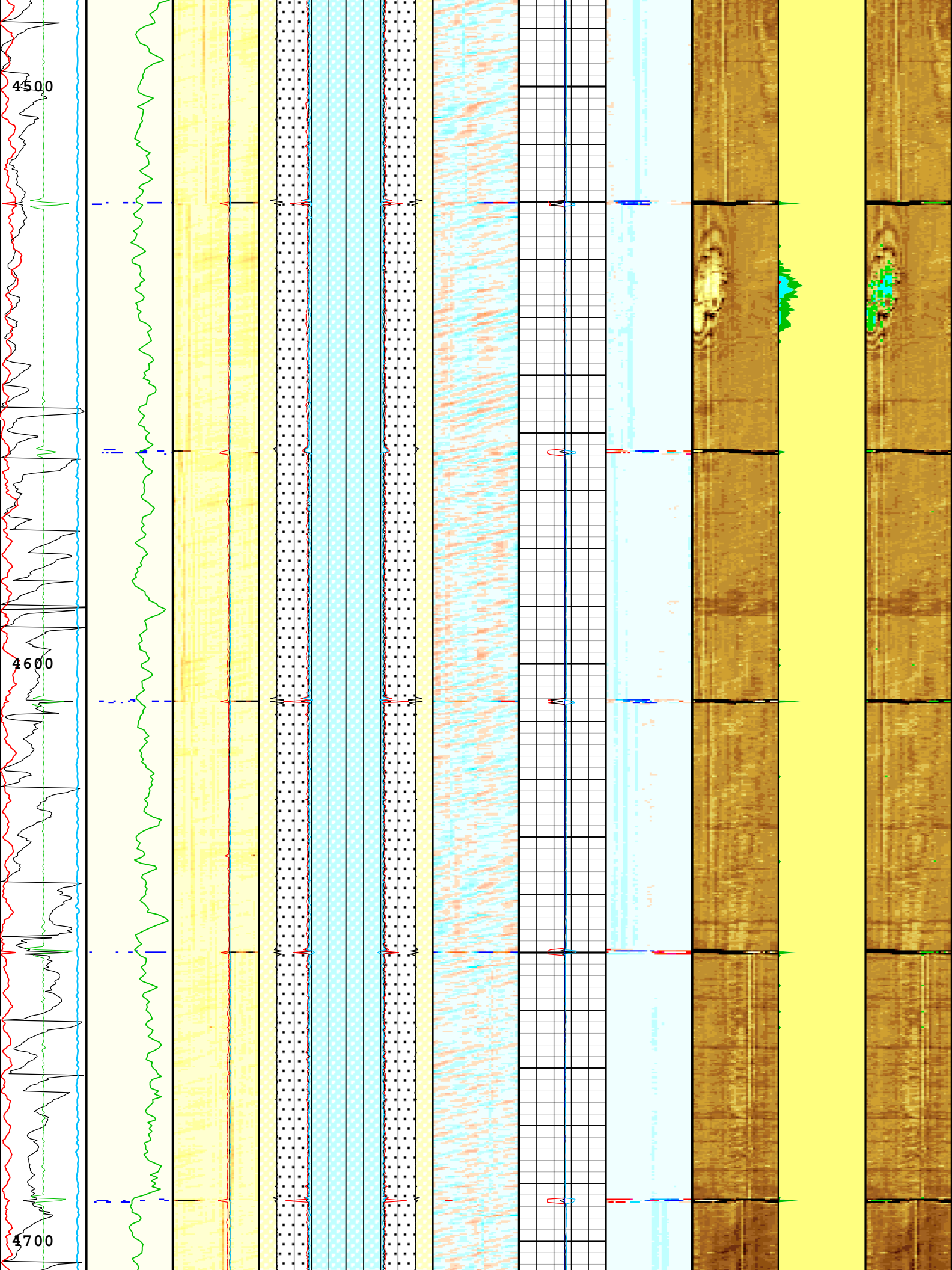


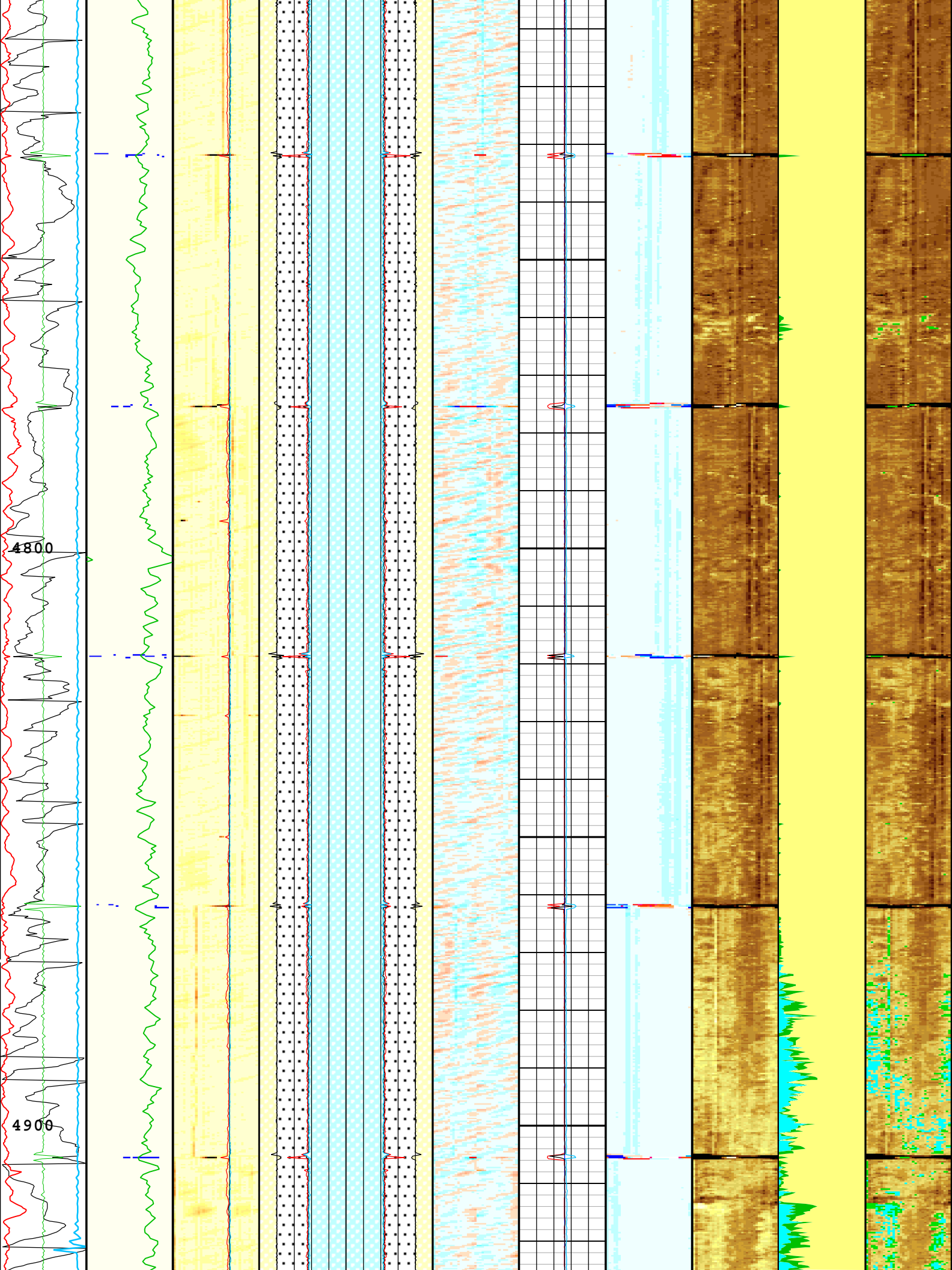


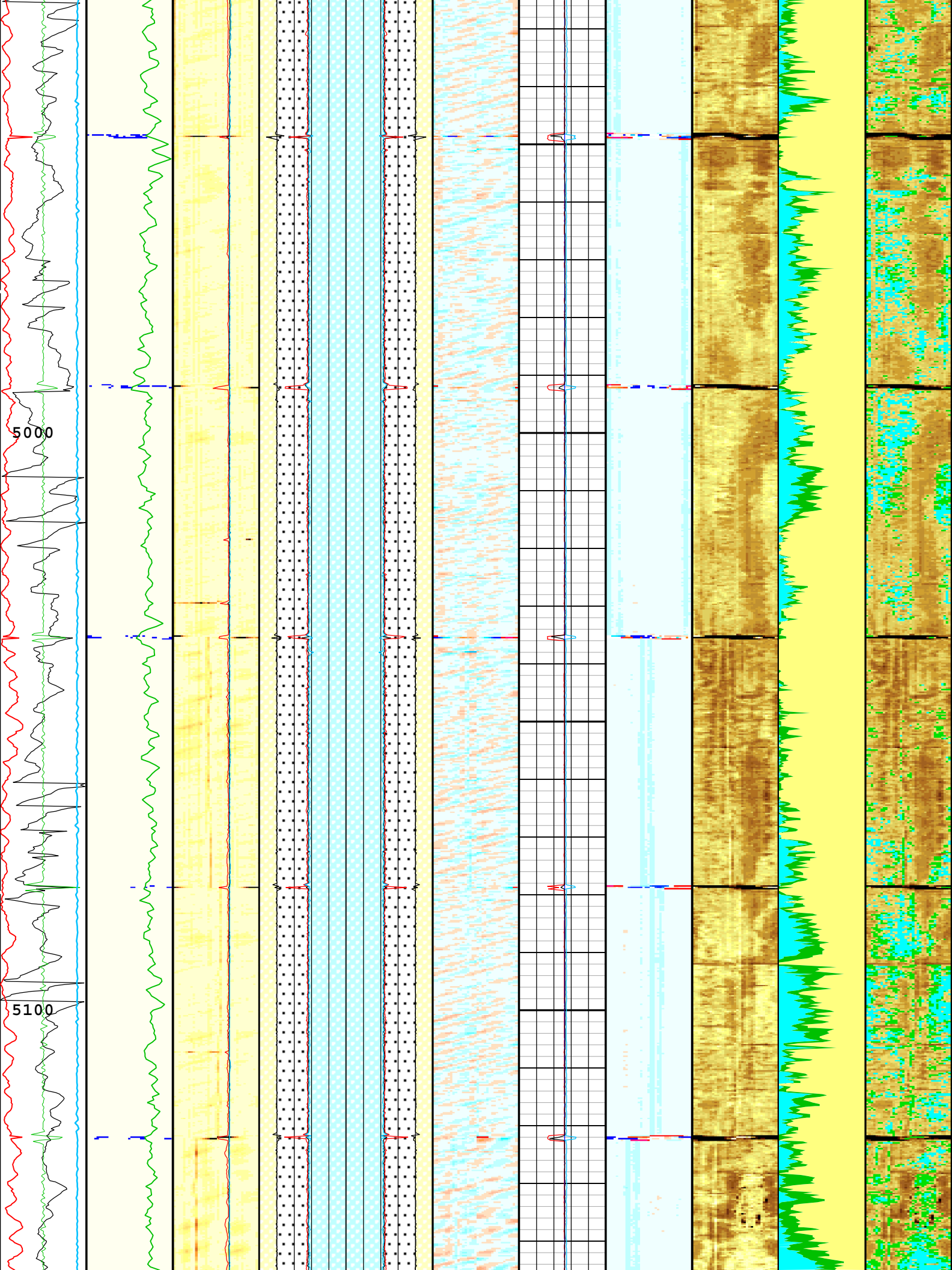


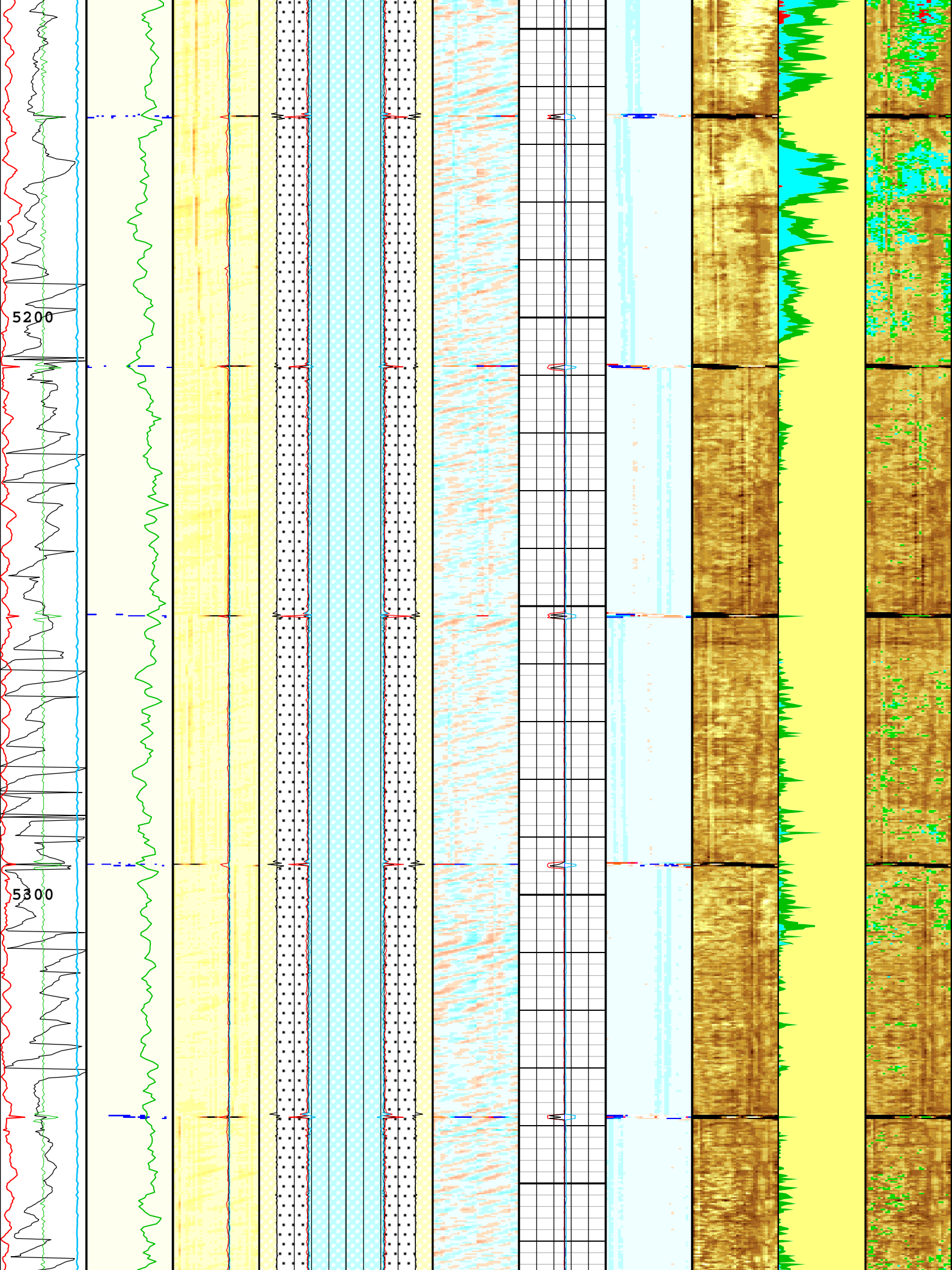
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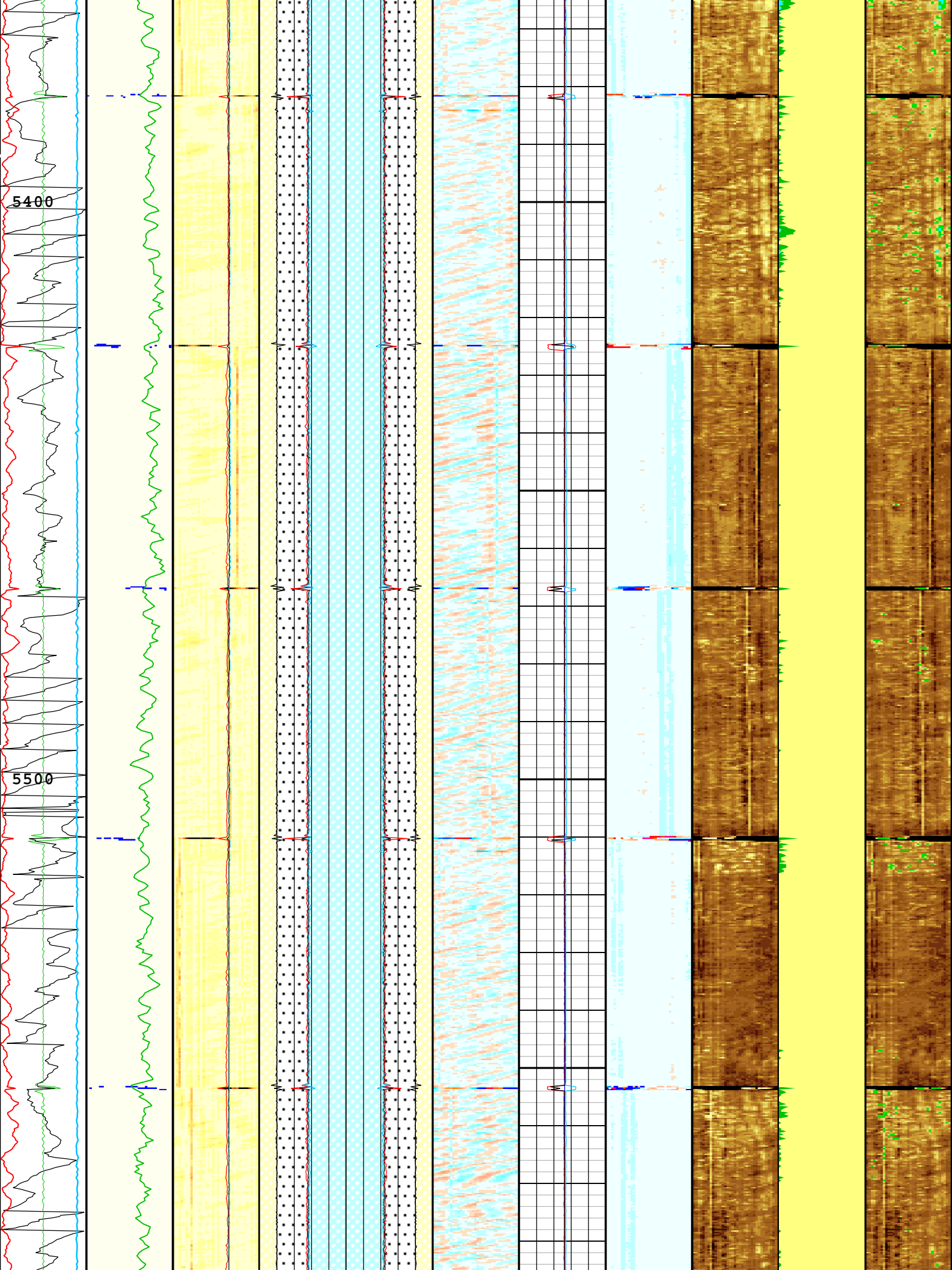
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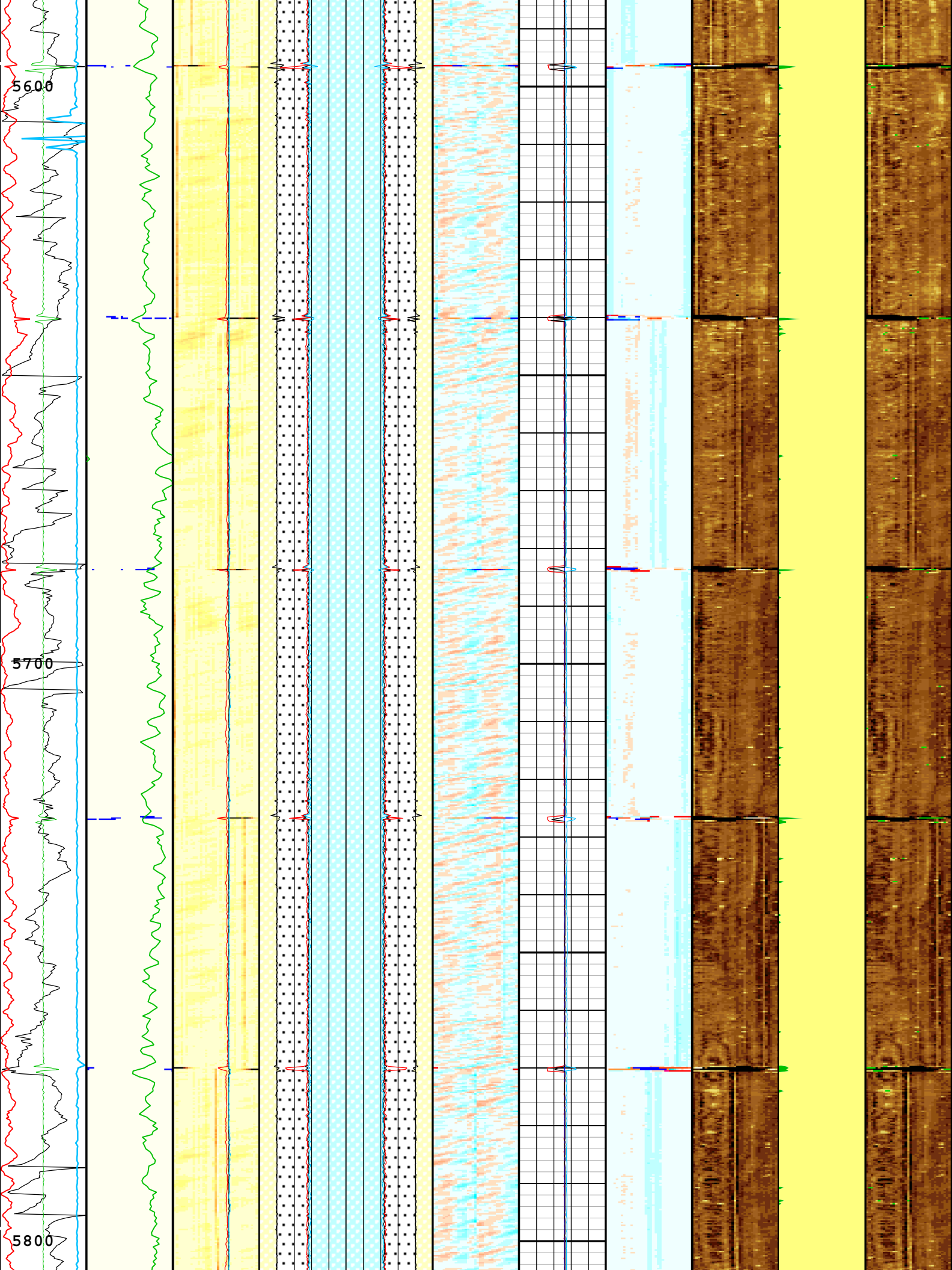


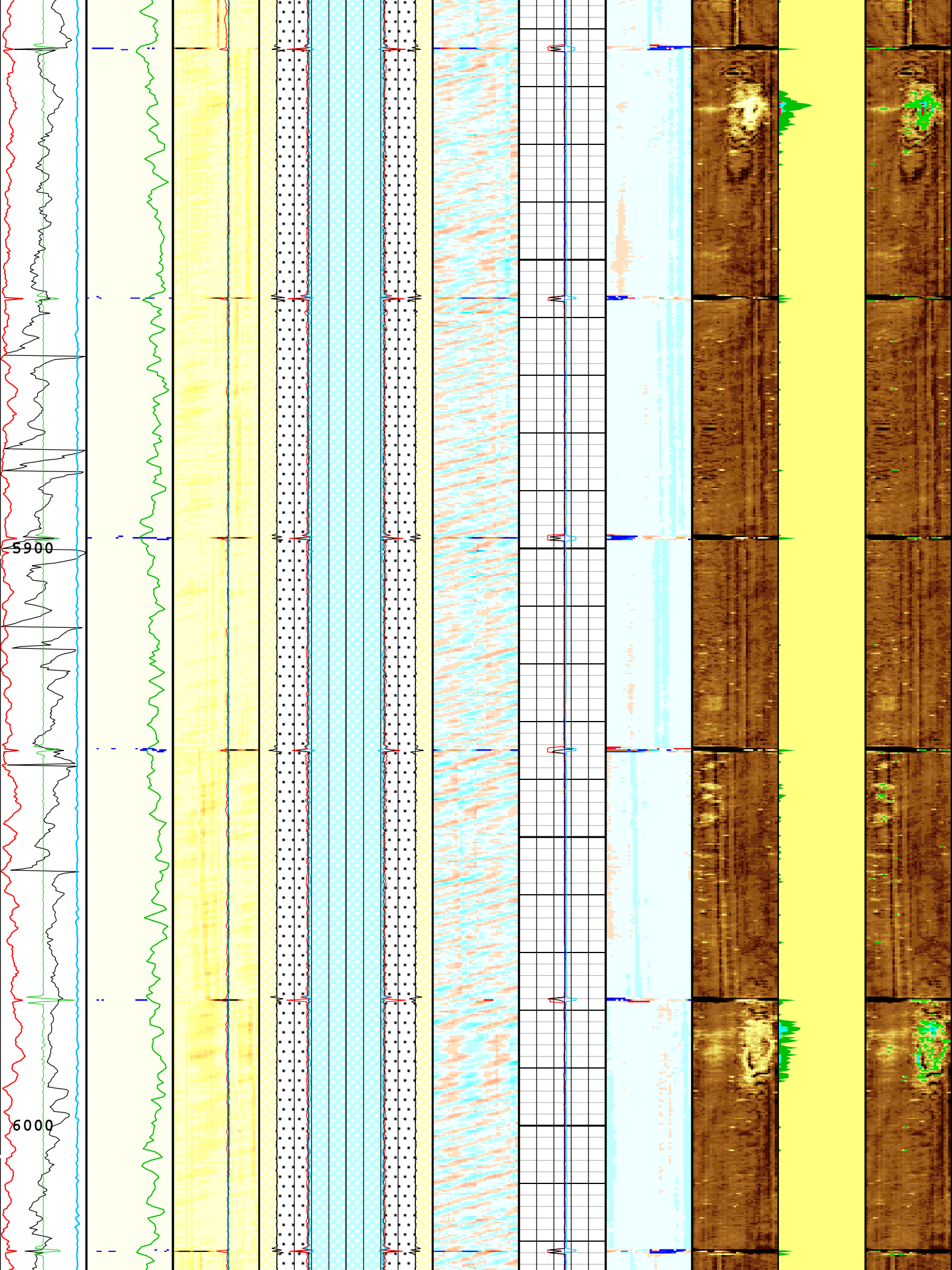


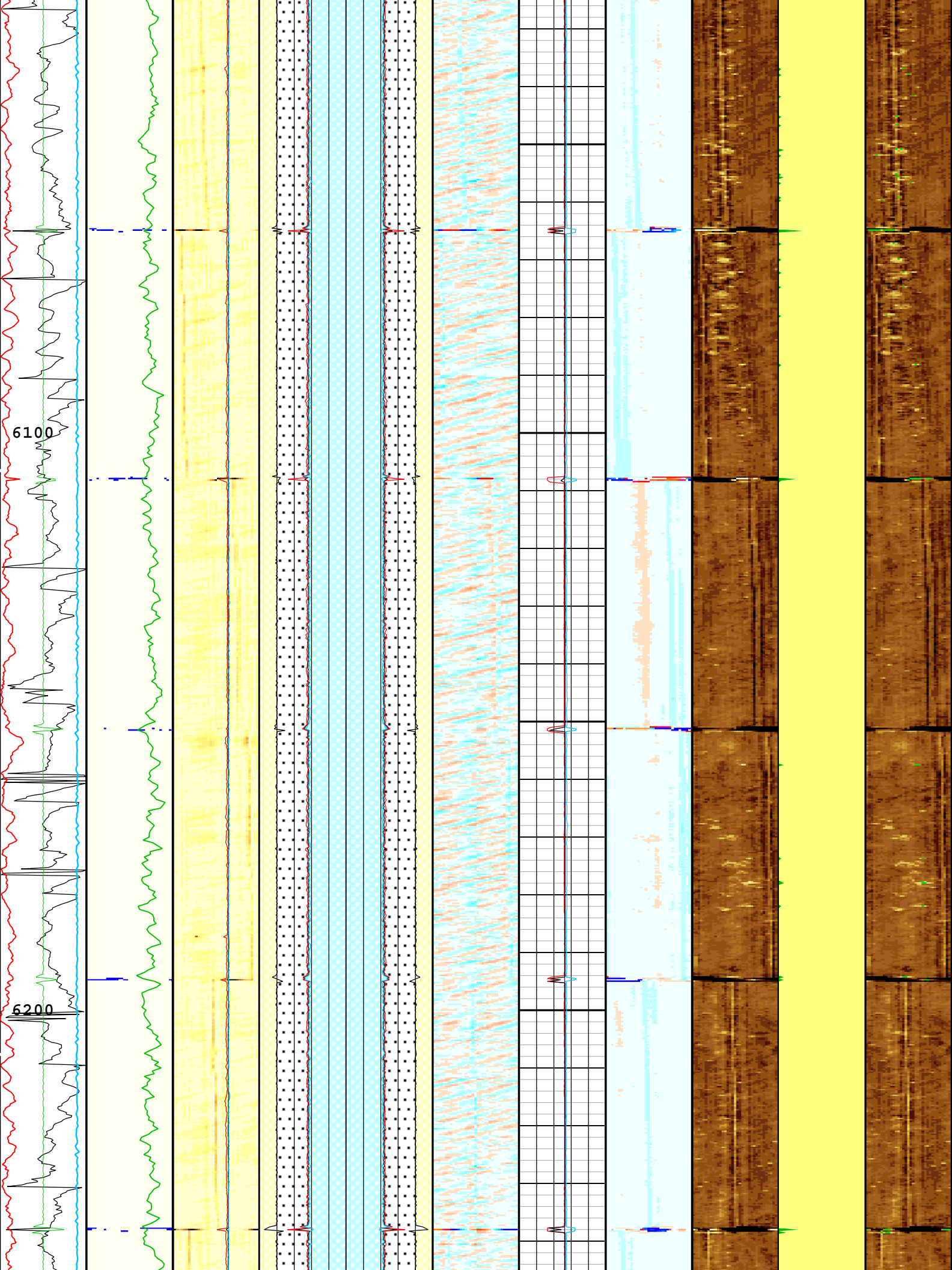


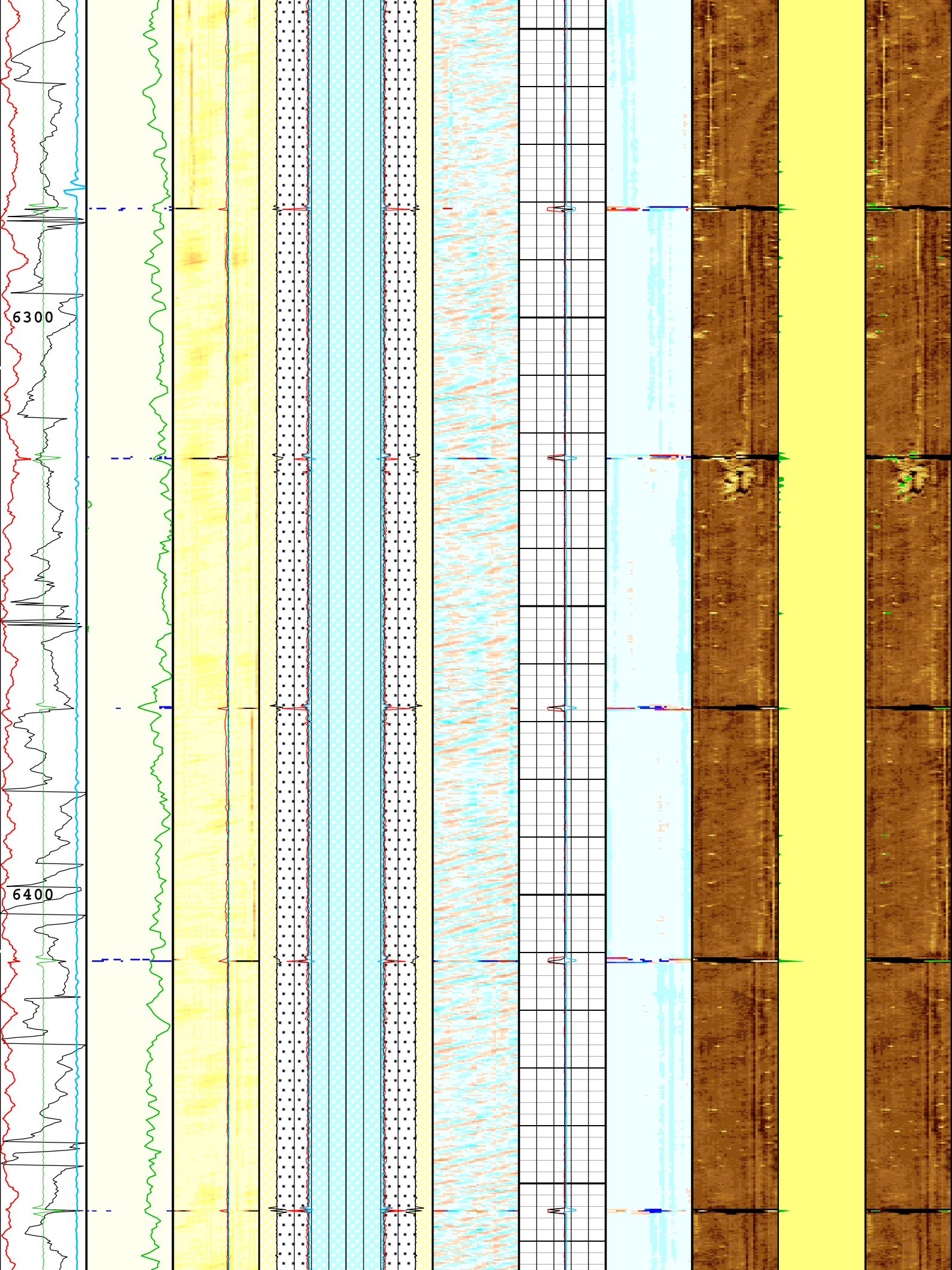


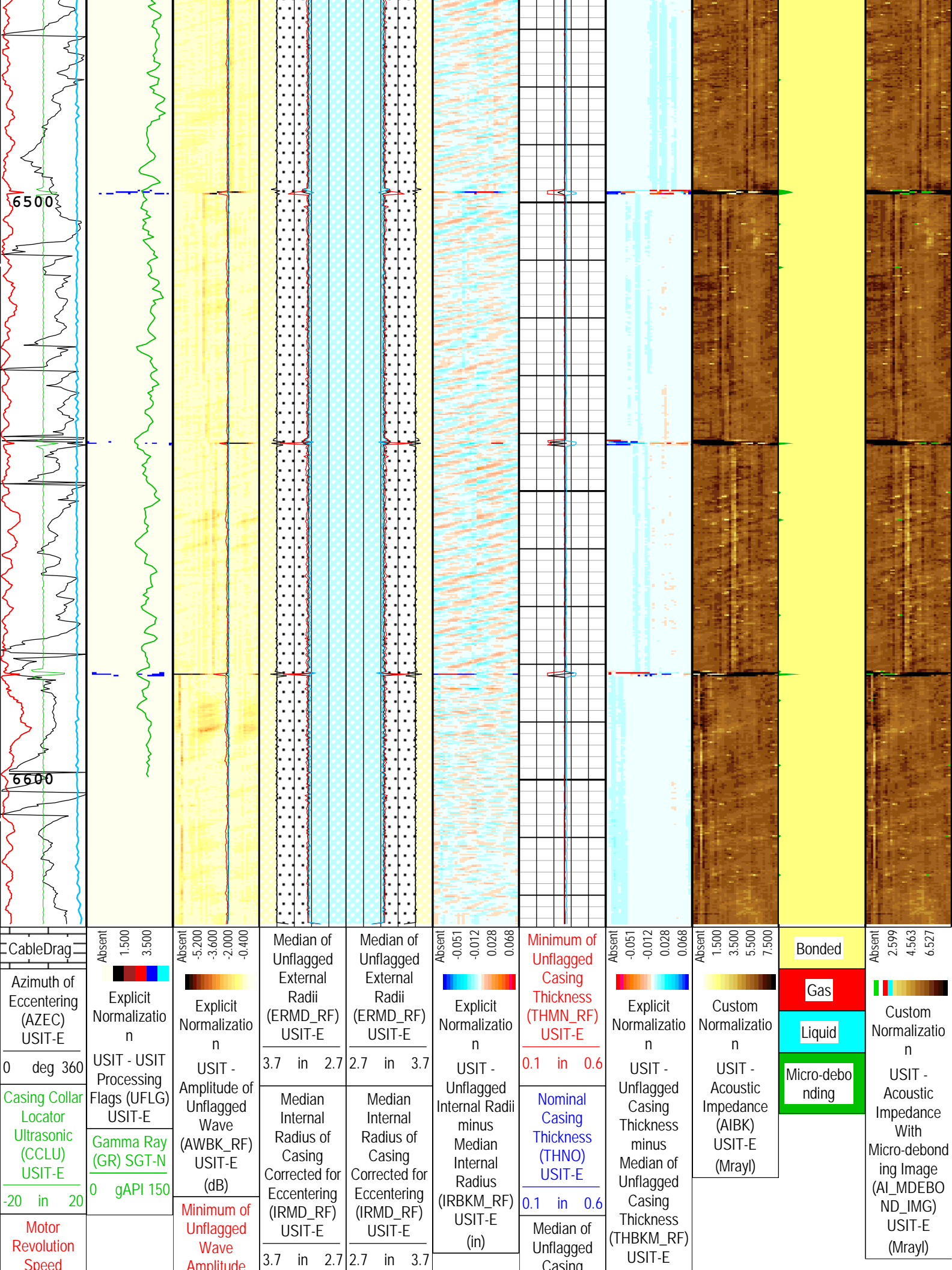












Amplitude (RSAV) USIT-E	Amplitude (AWMN_RF) USIT-E	Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E	Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E	Casing Thickness (THMD_RF) USIT-E	(in)
-8 c/s -6	0 dB 75	3.7 in 2.7	2.7 in 3.7	0.1 in 0.6	
Motor Revolution Speed (RSAV) USIT-E	Average of Unflagged Wave Amplitude (AWAV_RF) USIT-E	Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E	Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E	Maximum of Unflagged Casing Thickness (THMX_RF) USIT-E	
6 c/s 7.5	0 dB 75	3.7 in 2.7	2.7 in 3.7	0.1 in 0.6	
Stuck Tool Indicator, Total (STIT)	Maximum of Unflagged Wave Amplitude (AWMX_RF) USIT-E				
0 ft 50	0 dB 75				
Amplitude of Eccentering (ECCE) USIT-E					
0 in 0.5					

TIME_1900 - Time Marked every 60.00 (s)

Description: USI Composite Format: USI Composite Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Apr-2014 14:44:47

Channel Processing Parameters				
Parameter	Description	Tool	Value	Unit
AFVU	Automatic Fluid Velocity Update	USIT-E	On	
BARI	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	7593	ft
CDEN	Cement Density	SGT-N	16.69	lbm/gal
CMTY	Cement Type	USIT-E	Regular Cement	
CTHILGR	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.352	in
CYSTLGR	Casing Yield Strength - Zoned along logger depths	WLSESSION	55000	psi
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	190	us/ft
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	SGT-N	1	
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	Depth Zoned	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
SOGR	Standoff Distance of the Gamma Ray Tool	SGT-N	0	in
TCUB	T^3 Processing Level	USIT-E	Loop	
TD	Total Measured Depth	Borehole	11753	ft
THDH	Maximum Search Thickness (percentage of nominal)	USIT-E	130	%
THDL	Minimum Search Thickness (percentage of nominal)	USIT-E	70	%
TPOS	Tool Position: Centered or Eccentered	SGT-N	Centered	
UDFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0	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	
UTHDP	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	Depth Zoned	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)
MEAS_WLEN	22.5	0	6625.5
ZMUD	1.66	0	200
ZMUD	1.68	200	400
ZMUD	1.69	400	700
ZMUD	1.7	700	1000
ZMUD	1.72	1000	1500
ZMUD	1.74	1500	2000
ZMUD	1.76	2000	2500
ZMUD	1.77	2500	3000
ZMUD	1.79	3000	3500
ZMUD	1.8	3500	6625.5
All depth are actual.			

Tool Control Parameters				
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
DOTF	Distance between Opposite Transducer Faces	USIT-E	2.874	in
EMXV	EMEX Voltage	USIT-E	50	V
HRES	Horizontal Resolution	USIT-E	10 deg	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
ULOG	Logging Objective	USIT-E	MEASUREMENT	

UMFR	Modulation Frequency	USIT-E	333333	Hz
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
USI_UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
USI_UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 3.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	6621	ft
VRES	Vertical Resolution	USIT-E	3.0 in	
WINB	Window Begin Time	USIT-E	33.87	us
WINE	Window End Time	USIT-E	73.87	us

USI Cement

USIT - Fluid Properties Measurement

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[4]:Up	6625.5	13.49

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	200	1.66	1.66
200	400	1.68	1.68
400	700	1.69	1.69
700	1000	1.7	1.7
1000	1500	1.72	1.72
1500	2000	1.74	1.74
2000	2500	1.76	1.76
2500	3000	1.77	1.77
3000	3500	1.79	1.79
3500	4000	1.8	1.8
4000		1.8	1.8

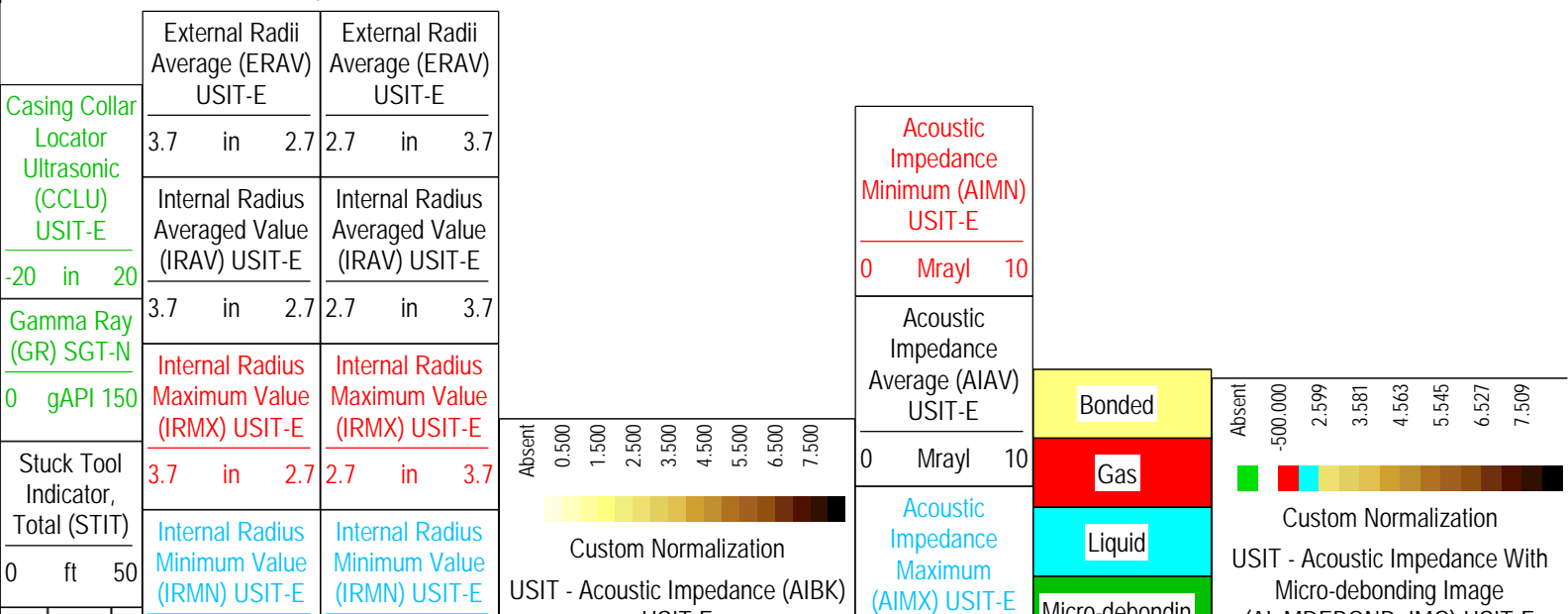
Run1: USIT

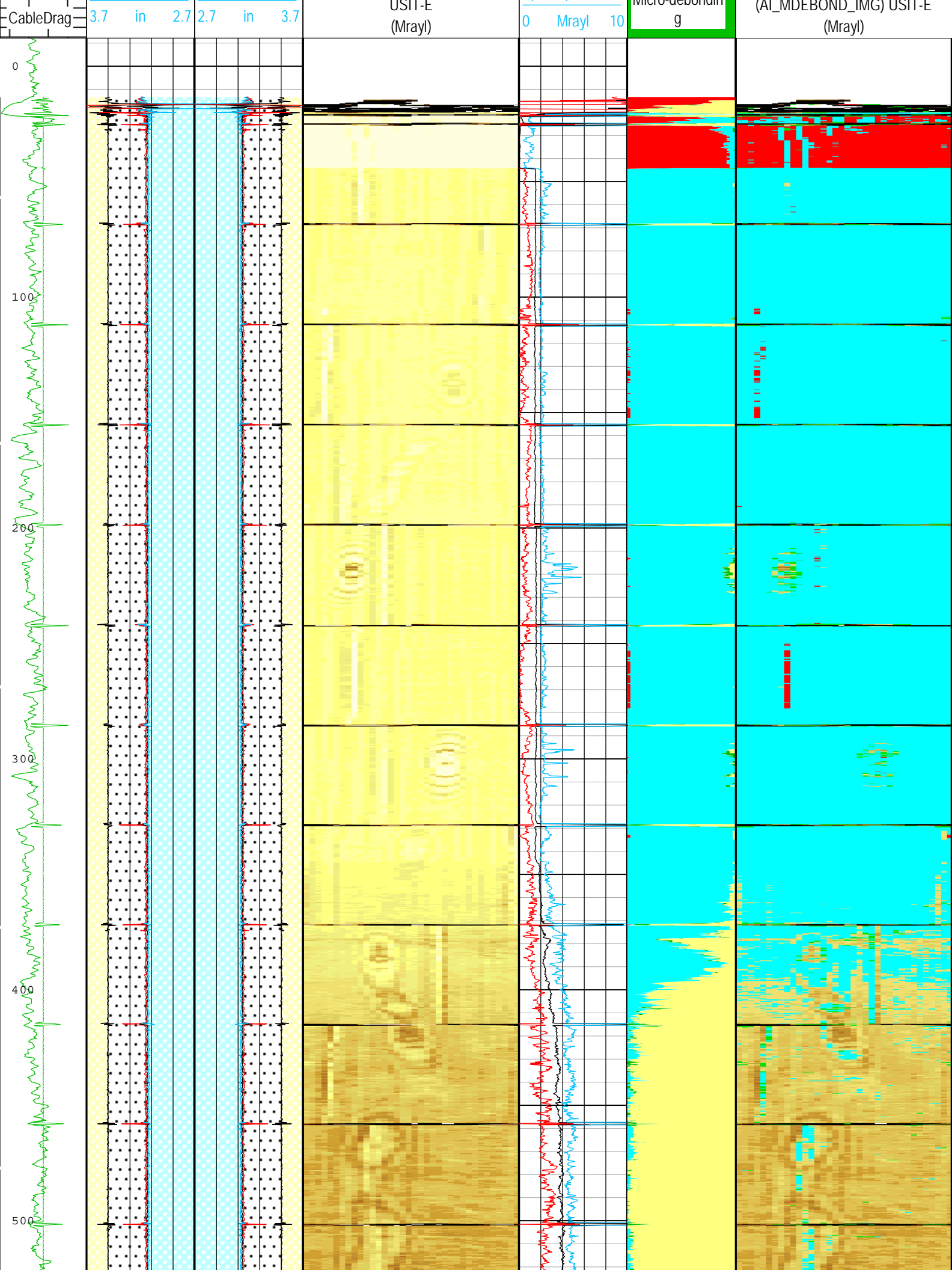
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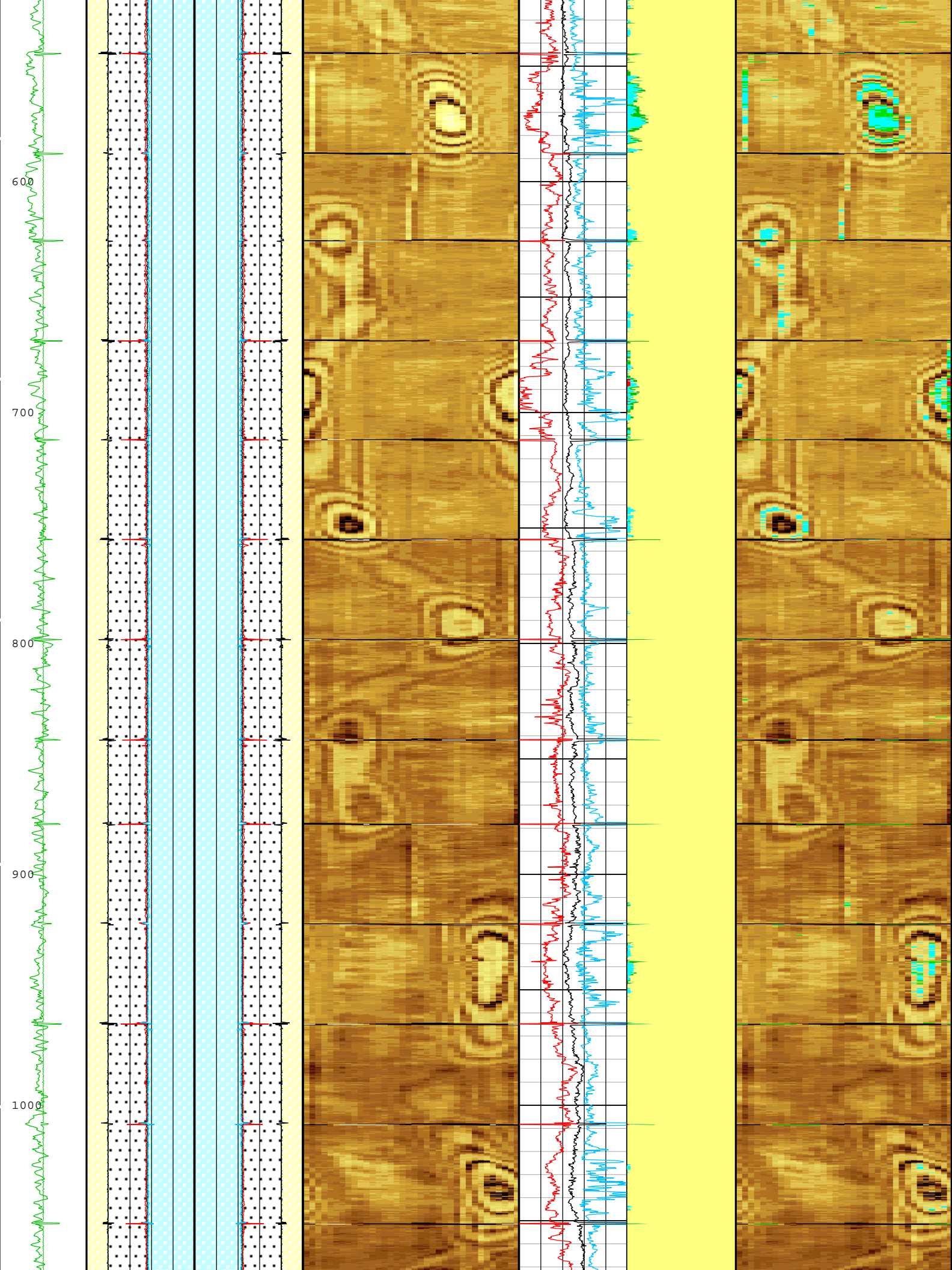
Log	Company:Kerr-McGee Oil & Gas Onshore LP	Well:Brotemarkle 3N-13HZ
		Run1: USIT: Log[4]:Up:S002

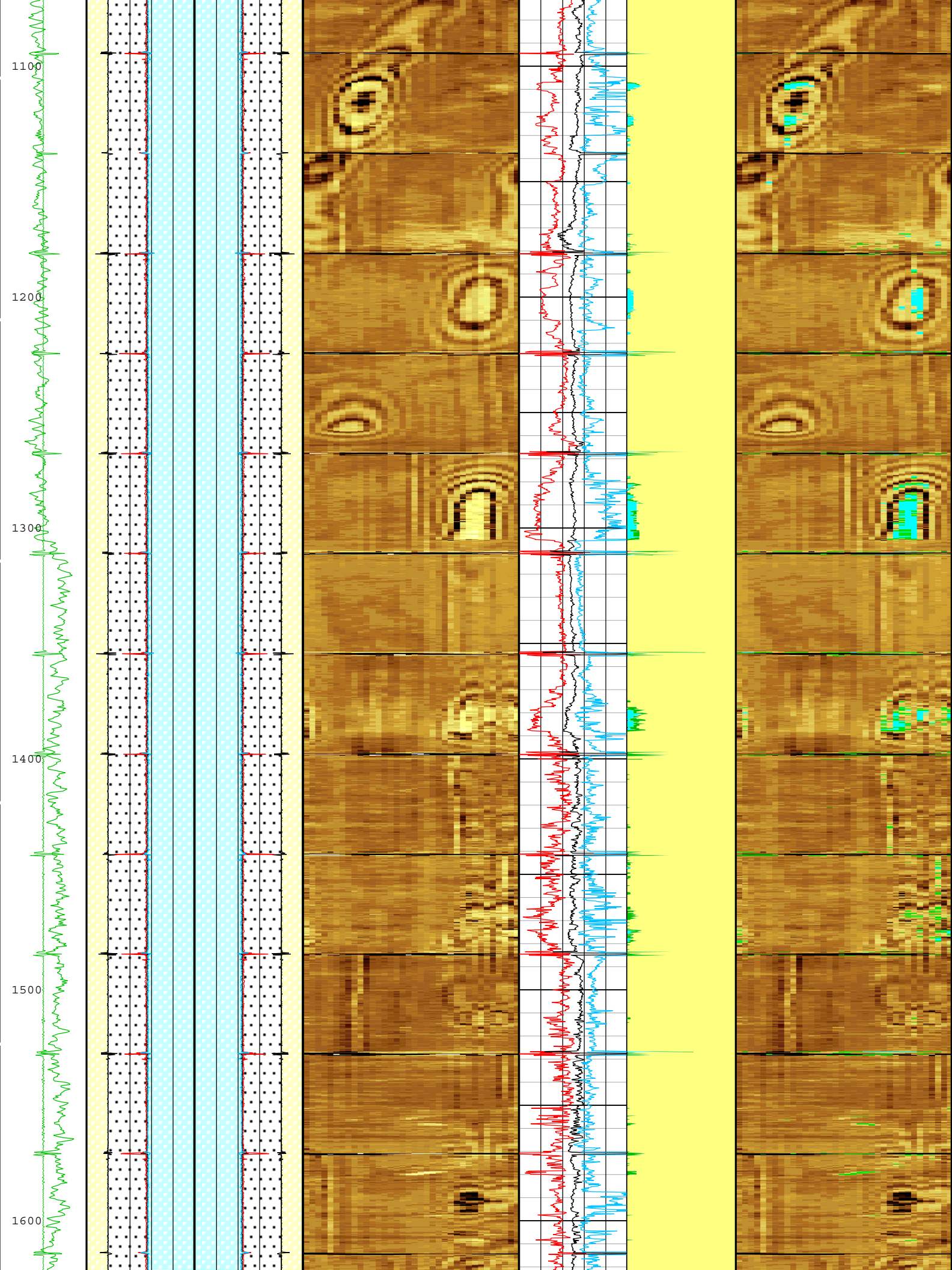
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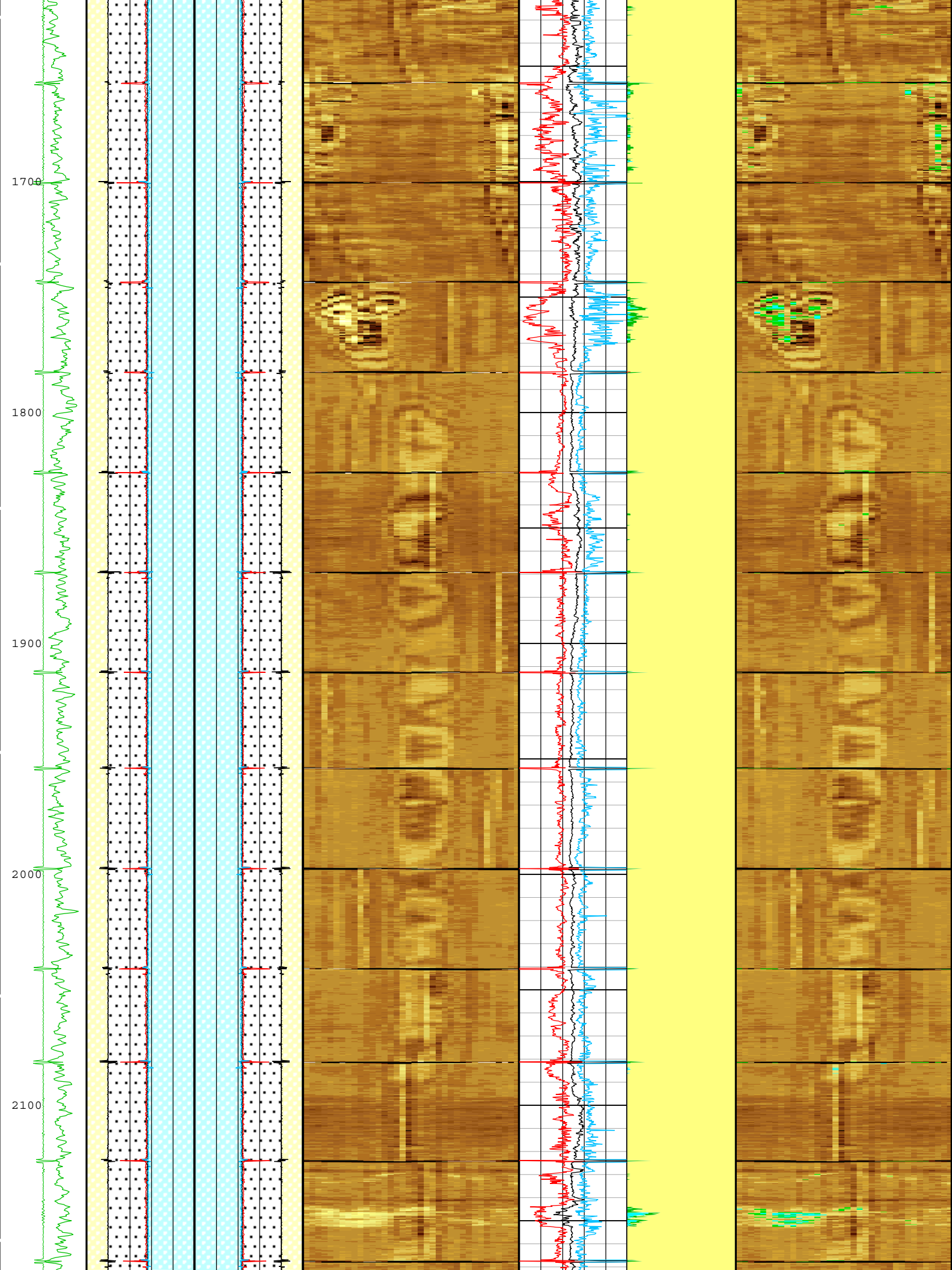
TIME_1900 - Time Marked every 60.00 (s)

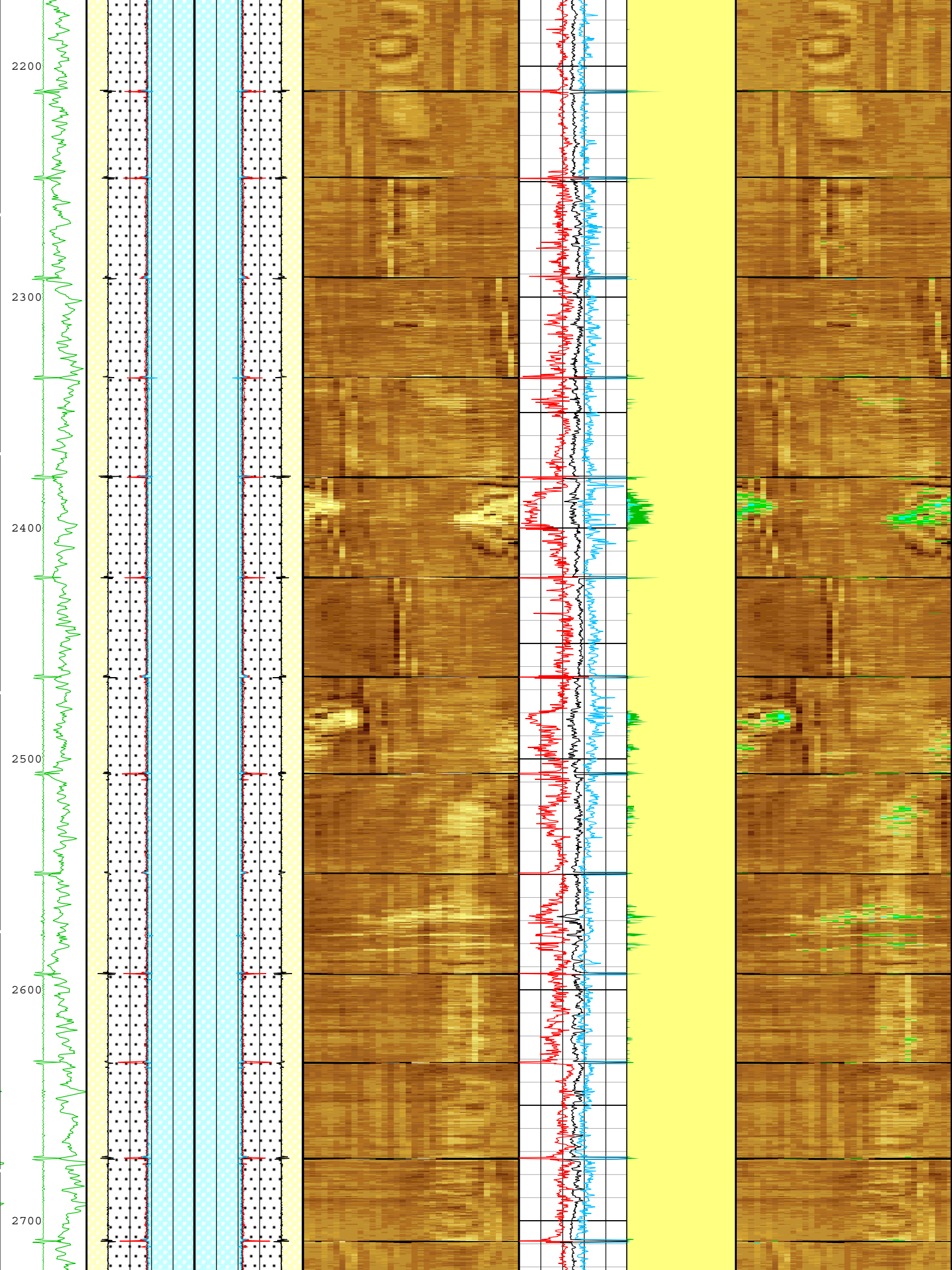


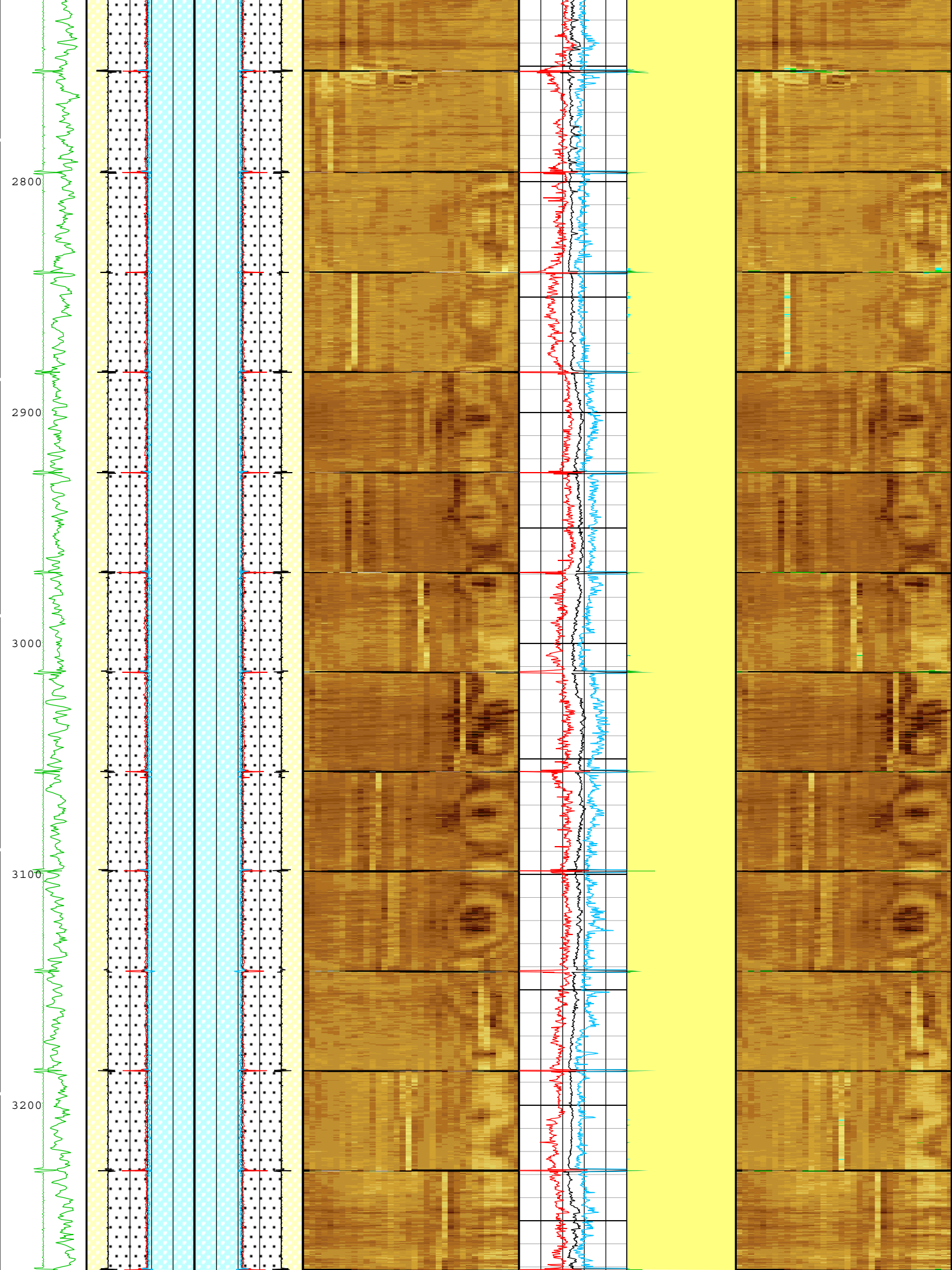


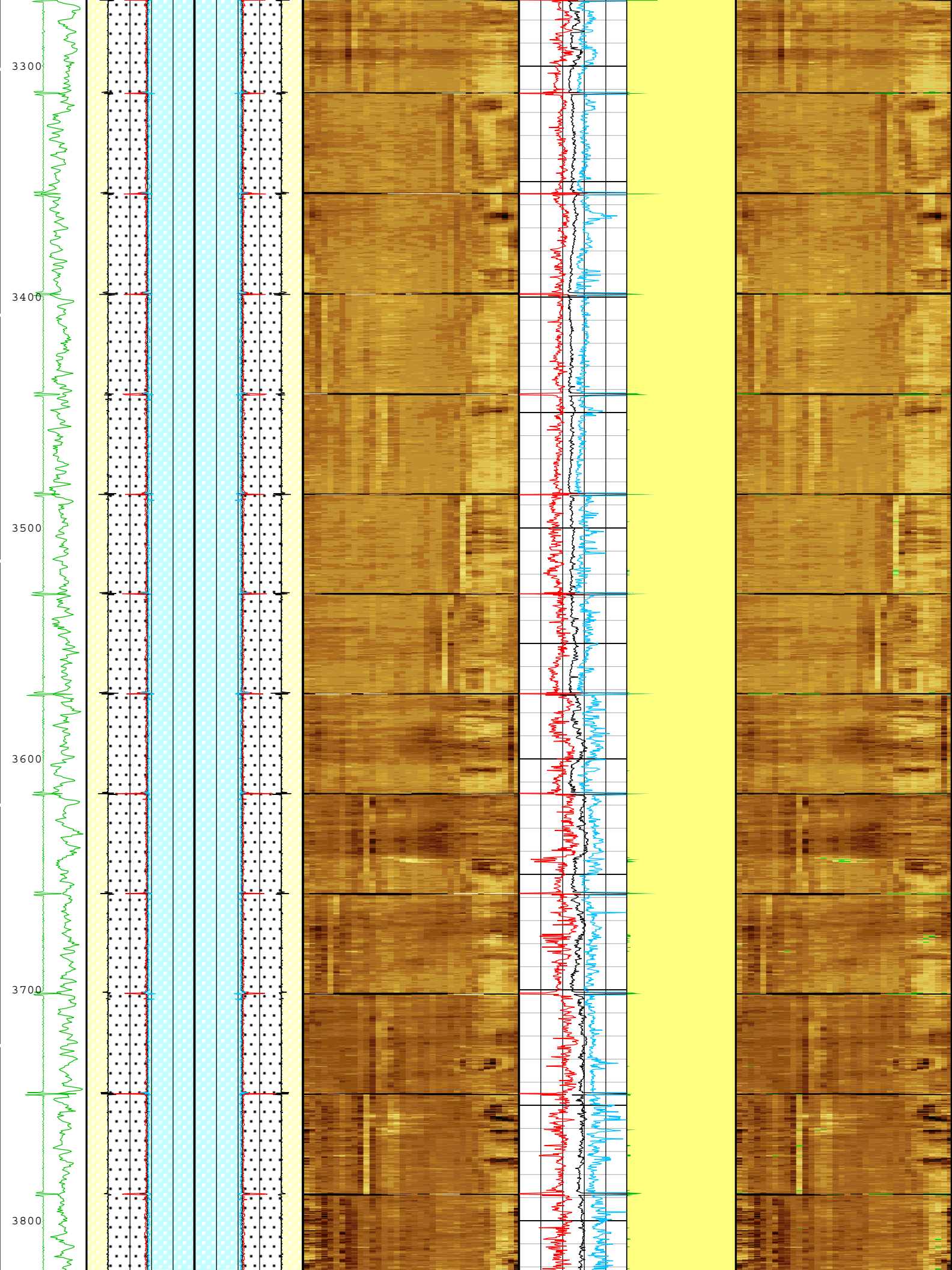


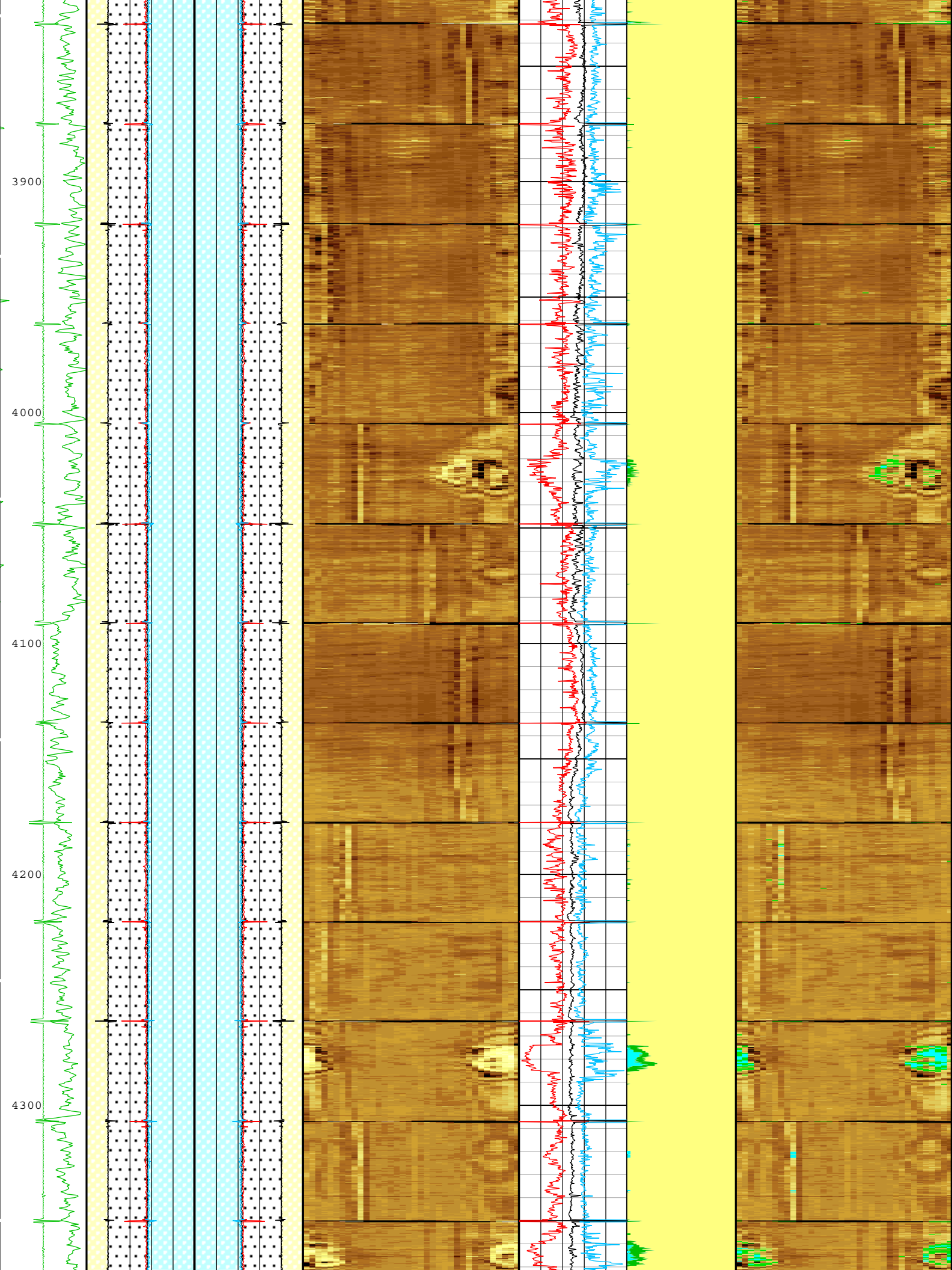


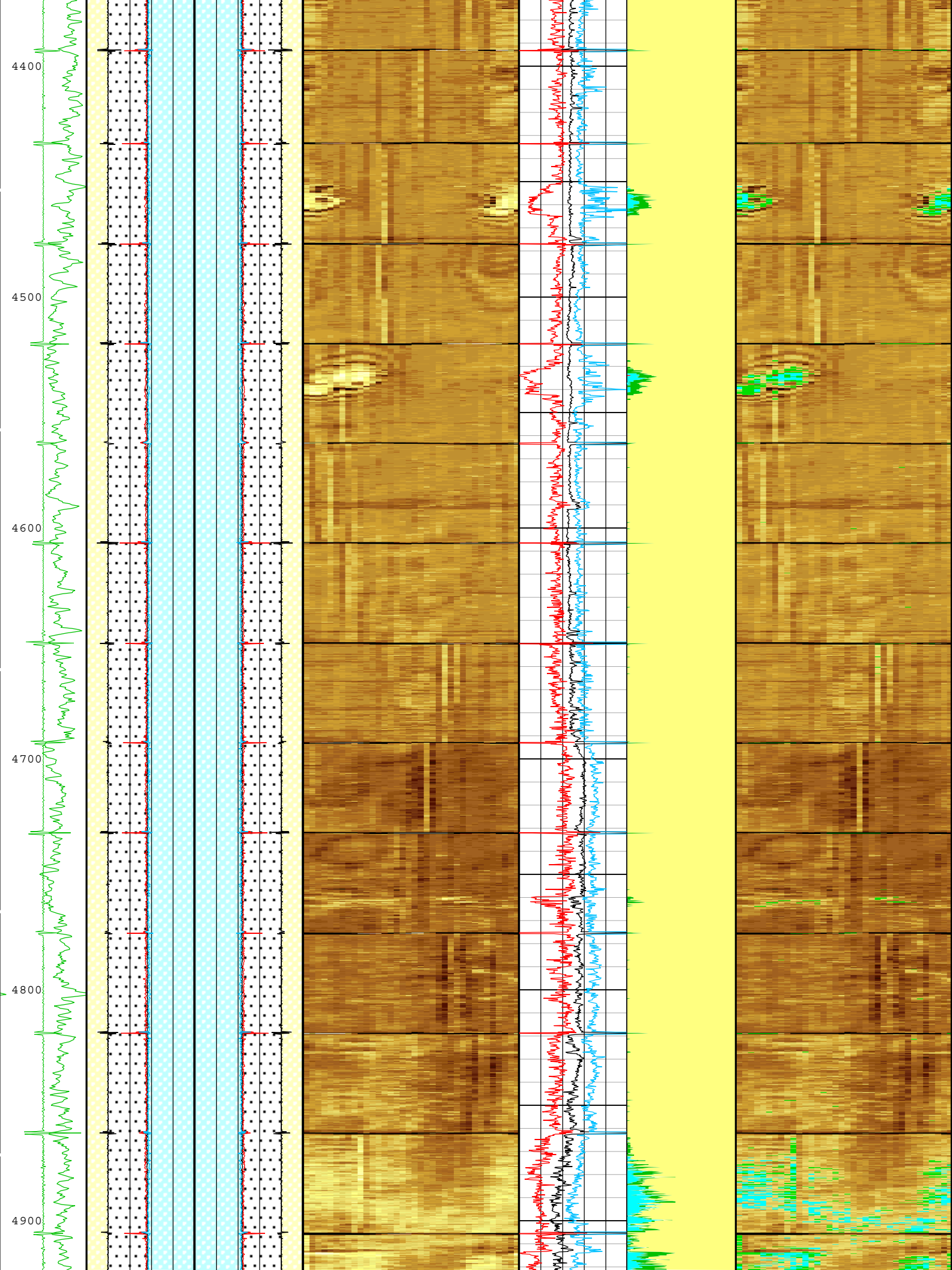


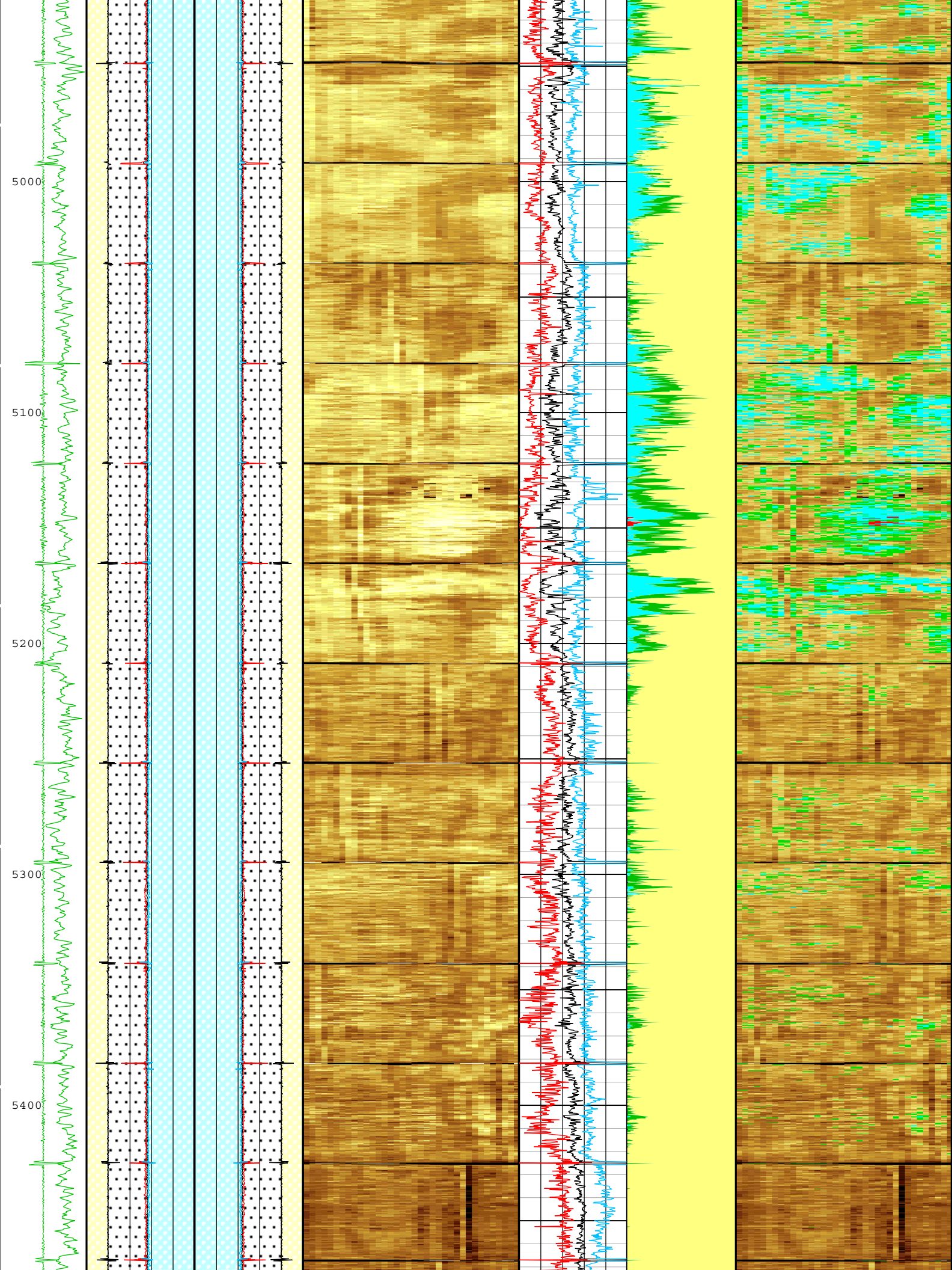


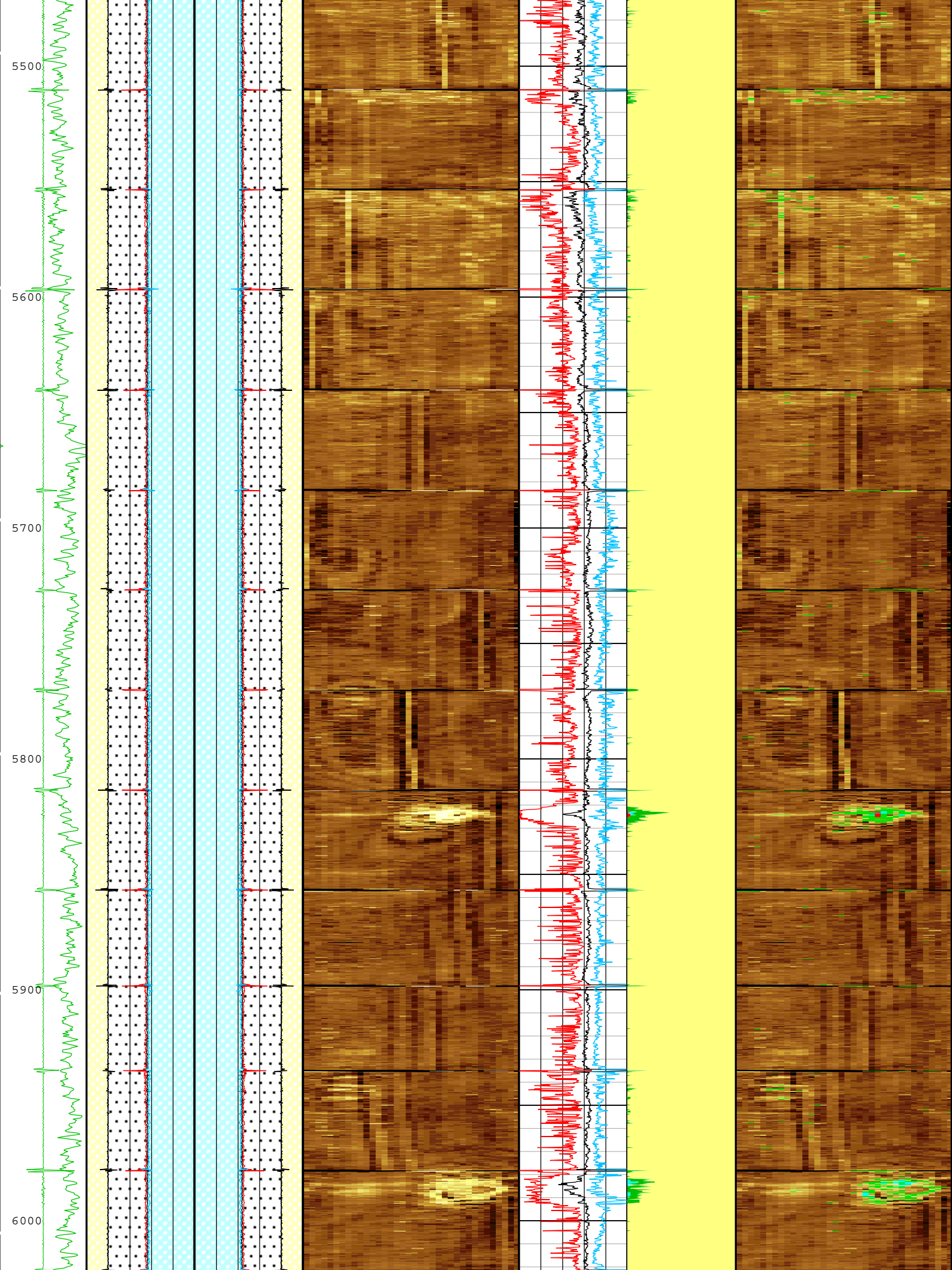


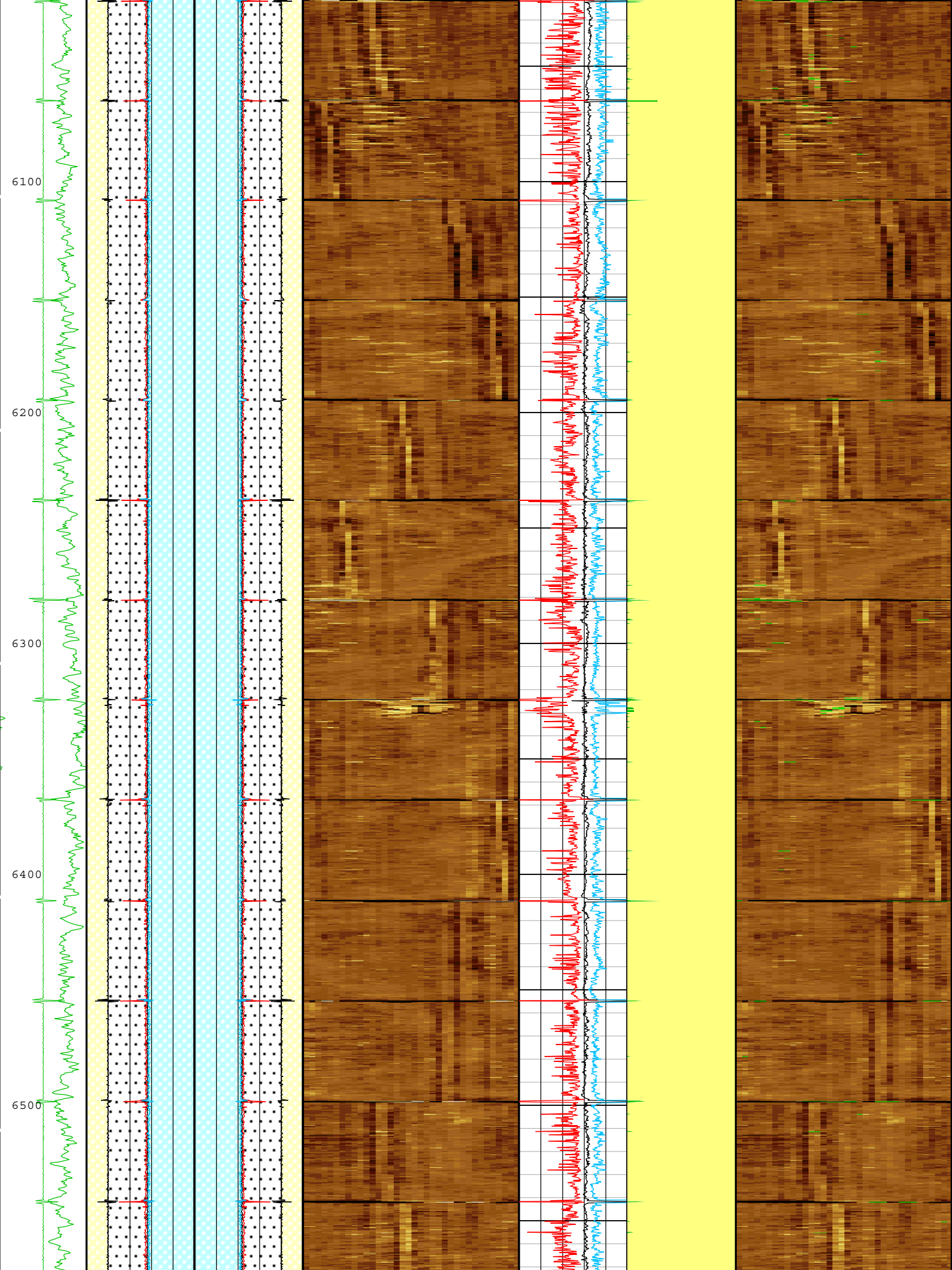


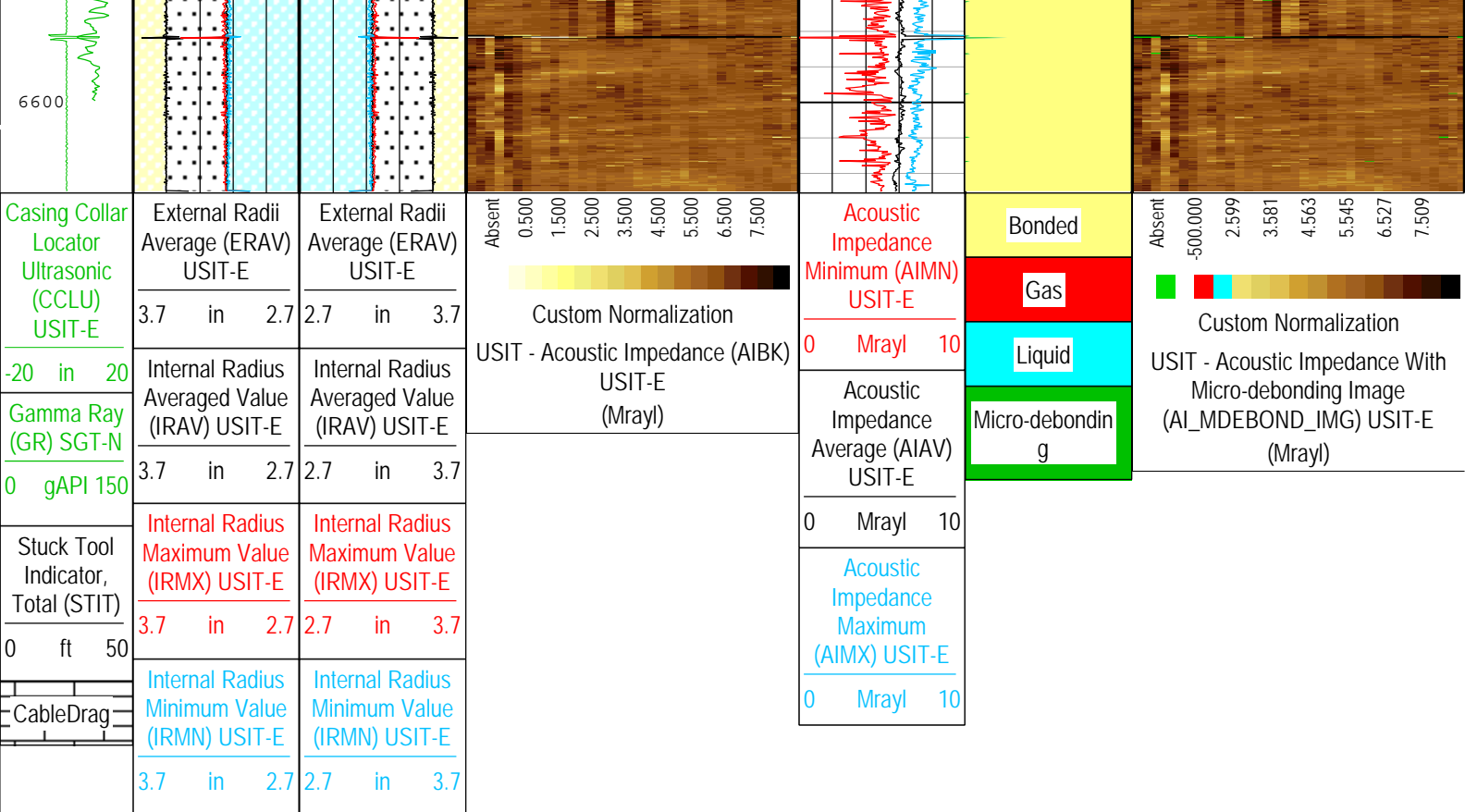












TIME_1900 - Time Marked every 60.00 (s)

Description: USI Cement Format: USI Cement Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Apr-2014 14:45:00

Channel Processing Parameters				
Parameter	Description	Tool	Value	Unit
AFVU	Automatic Fluid Velocity Update	USIT-E	On	
BARI	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	7593	ft
CDEN	Cement Density	SGT-N	16.69	lbm/gal
CMTY	Cement Type	USIT-E	Regular Cement	
CTHILGR	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.352	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	190	us/ft
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	SGT-N	1	
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	Depth Zoned	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	0	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1	

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
SDTVR	Acoustic Impedance STD Vertical Threshold for Micro-debonding	USIT-E	0.3	Mrayl
SOGR	Standoff Distance of the Gamma Ray Tool	SGT-N	0	in
TCUB	T^3 Processing Level	USIT-E	Loop	
TD	Total Measured Depth	Borehole	11753	ft
THDH	Maximum Search Thickness (percentage of nominal)	USIT-E	130	%
THDL	Minimum Search Thickness (percentage of nominal)	USIT-E	70	%
TPOS	Tool Position: Centered or Eccentered	SGT-N	Centered	
UDFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0	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	
UTHDP	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	Depth Zoned	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)
MEAS_WLEN	22.5	0	6625.5
ZMUD	1.66	0	200
ZMUD	1.68	200	400
ZMUD	1.69	400	700
ZMUD	1.7	700	1000
ZMUD	1.72	1000	1500
ZMUD	1.74	1500	2000
ZMUD	1.76	2000	2500
ZMUD	1.77	2500	3000
ZMUD	1.79	3000	3500
ZMUD	1.8	3500	6625.5

All depth are actual.

Tool Control Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
DOTF	Distance between Opposite Transducer Faces	USIT-E	2.874	in
EMXV	EMEX Voltage	USIT-E	50	V
HPRES	Horizontal Resolution	USIT-E	10_deg	

THRES	Horizontal Resolution	USIT-E	10 deg	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UMFR	Modulation Frequency	USIT-E	333333	Hz
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
USI_UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
USI_UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 3.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	6621	ft
VRES	Vertical Resolution	USIT-E	3.0 in	
WINB	Window Begin Time	USIT-E	33.87	us
WINE	Window End Time	USIT-E	73.87	us

USI Goodwin

USIT - Fluid Properties Measurement

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[4]:Up	6625.5	13.49

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 = "Manual".
CZMD uses ZMUD parameter zoned table below

Start Depth(ft)	Stop Depth(ft)	Start Value(Mrayl)	End Value(Mrayl)
0	200	1.66	1.66
200	400	1.68	1.68
400	700	1.69	1.69
700	1000	1.7	1.7
1000	1500	1.72	1.72
1500	2000	1.74	1.74
2000	2500	1.76	1.76
2500	3000	1.77	1.77
3000	3500	1.79	1.79
3500	4000	1.8	1.8
4000		1.8	1.8

Run1: USIT

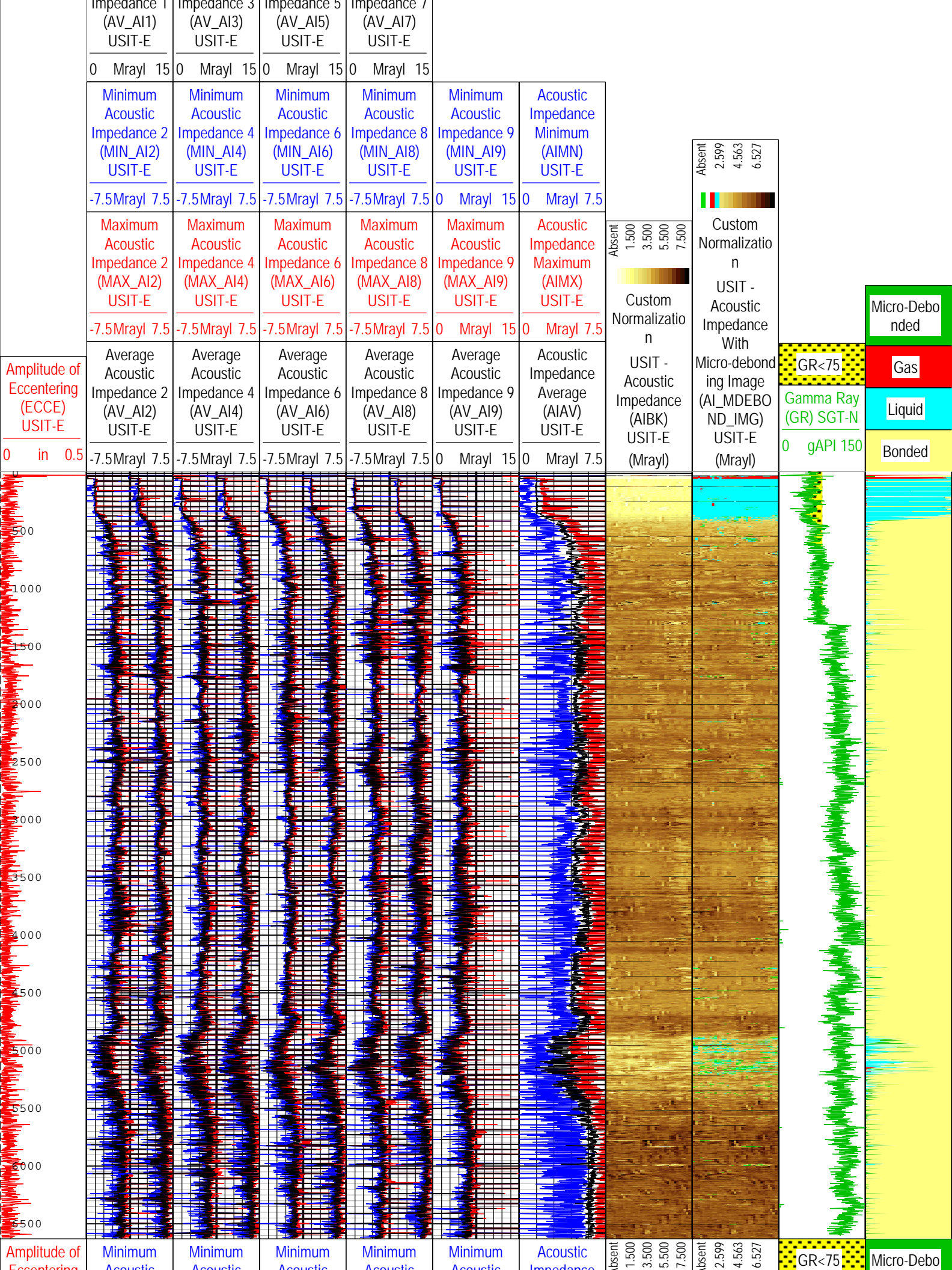
USI Goodwin Compressed

Log	Company:Kerr-McGee Oil & Gas Onshore LP	Well:Brotemarkle 3N-13HZ
	Run1: USIT: Log[4]:Up:S002	

Description: USI Goodwin Format: USI Goodwin Index Scale: 0.1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Apr-2014 14:45:08

TIME_1900 - Time Marked every 60.00 (s)

Minimum Acoustic Impedance 1 (MIN_AI1) USIT-E	Minimum Acoustic Impedance 3 (MIN_AI3) USIT-E	Minimum Acoustic Impedance 5 (MIN_AI5) USIT-E	Minimum Acoustic Impedance 7 (MIN_AI7) USIT-E
0 Mrayl 15	0 Mrayl 15	0 Mrayl 15	0 Mrayl 15
Maximum Acoustic Impedance 1 (MAX_AI1) USIT-E	Maximum Acoustic Impedance 3 (MAX_AI3) USIT-E	Maximum Acoustic Impedance 5 (MAX_AI5) USIT-E	Maximum Acoustic Impedance 7 (MAX_AI7) USIT-E
0 Mrayl 15	0 Mrayl 15	0 Mrayl 15	0 Mrayl 15
Average Acoustic Impedance 1	Average Acoustic Impedance 3	Average Acoustic Impedance 5	Average Acoustic Impedance 7



Decentering
(ECCE)
USIT-E

0 in 0.5

Acoustic
Impedance 1
(MIN_AI1)
USIT-E

0 Mrayl 15

Maximum
Acoustic
Impedance 1
(MAX_AI1)
USIT-E

0 Mrayl 15

Average
Acoustic
Impedance 1
(AV_AI1)
USIT-E

0 Mrayl 15

Minimum
Acoustic
Impedance 2
(MIN_AI2)
USIT-E

-7.5Mrayl 7.5

Maximum
Acoustic
Impedance 2
(MAX_AI2)
USIT-E

-7.5Mrayl 7.5

Average
Acoustic
Impedance 2
(AV_AI2)
USIT-E

-7.5Mrayl 7.5

Acoustic
Impedance 3
(MIN_AI3)
USIT-E

0 Mrayl 15

Maximum
Acoustic
Impedance 3
(MAX_AI3)
USIT-E

0 Mrayl 15

Average
Acoustic
Impedance 3
(AV_AI3)
USIT-E

0 Mrayl 15

Minimum
Acoustic
Impedance 4
(MIN_AI4)
USIT-E

-7.5Mrayl 7.5

Maximum
Acoustic
Impedance 4
(MAX_AI4)
USIT-E

-7.5Mrayl 7.5

Average
Acoustic
Impedance 4
(AV_AI4)
USIT-E

-7.5Mrayl 7.5

Acoustic
Impedance 5
(MIN_AI5)
USIT-E

0 Mrayl 15

Maximum
Acoustic
Impedance 5
(MAX_AI5)
USIT-E

0 Mrayl 15

Average
Acoustic
Impedance 5
(AV_AI5)
USIT-E

0 Mrayl 15

Minimum
Acoustic
Impedance 6
(MIN_AI6)
USIT-E

-7.5Mrayl 7.5

Maximum
Acoustic
Impedance 6
(MAX_AI6)
USIT-E

-7.5Mrayl 7.5

Average
Acoustic
Impedance 6
(AV_AI6)
USIT-E

-7.5Mrayl 7.5

Acoustic
Impedance 7
(MIN_AI7)
USIT-E

0 Mrayl 15

Maximum
Acoustic
Impedance 7
(MAX_AI7)
USIT-E

0 Mrayl 15

Average
Acoustic
Impedance 7
(AV_AI7)
USIT-E

0 Mrayl 15

Minimum
Acoustic
Impedance 8
(MIN_AI8)
USIT-E

-7.5Mrayl 7.5

Maximum
Acoustic
Impedance 8
(MAX_AI8)
USIT-E

-7.5Mrayl 7.5

Average
Acoustic
Impedance 8
(AV_AI8)
USIT-E

-7.5Mrayl 7.5

Acoustic
Impedance 9
(MIN_AI9)
USIT-E

0 Mrayl 15

Maximum
Acoustic
Impedance 9
(MAX_AI9)
USIT-E

0 Mrayl 15

Average
Acoustic
Impedance 9
(AV_AI9)
USIT-E

0 Mrayl 15

Minimum
Impedance
(AIMN)
USIT-E

0 Mrayl 7.5

Acoustic
Impedance
Maximum
(AIMX)
USIT-E

0 Mrayl 7.5

Acoustic
Impedance
Average
(AIAV)
USIT-E

0 Mrayl 7.5

Custom
Normalizatio
n

USIT -
Acoustic
Impedance
(AIBK)
USIT-E
(Mrayl)

Custom
Normalizatio
n

USIT -
Acoustic
Impedance
With
Micro-debond
ing Image
(AI_MDEBO
ND_IMG)
USIT-E
(Mrayl)

Gamma Ray
(GR) SGT-N

0 gAPI 150

nded

Gas

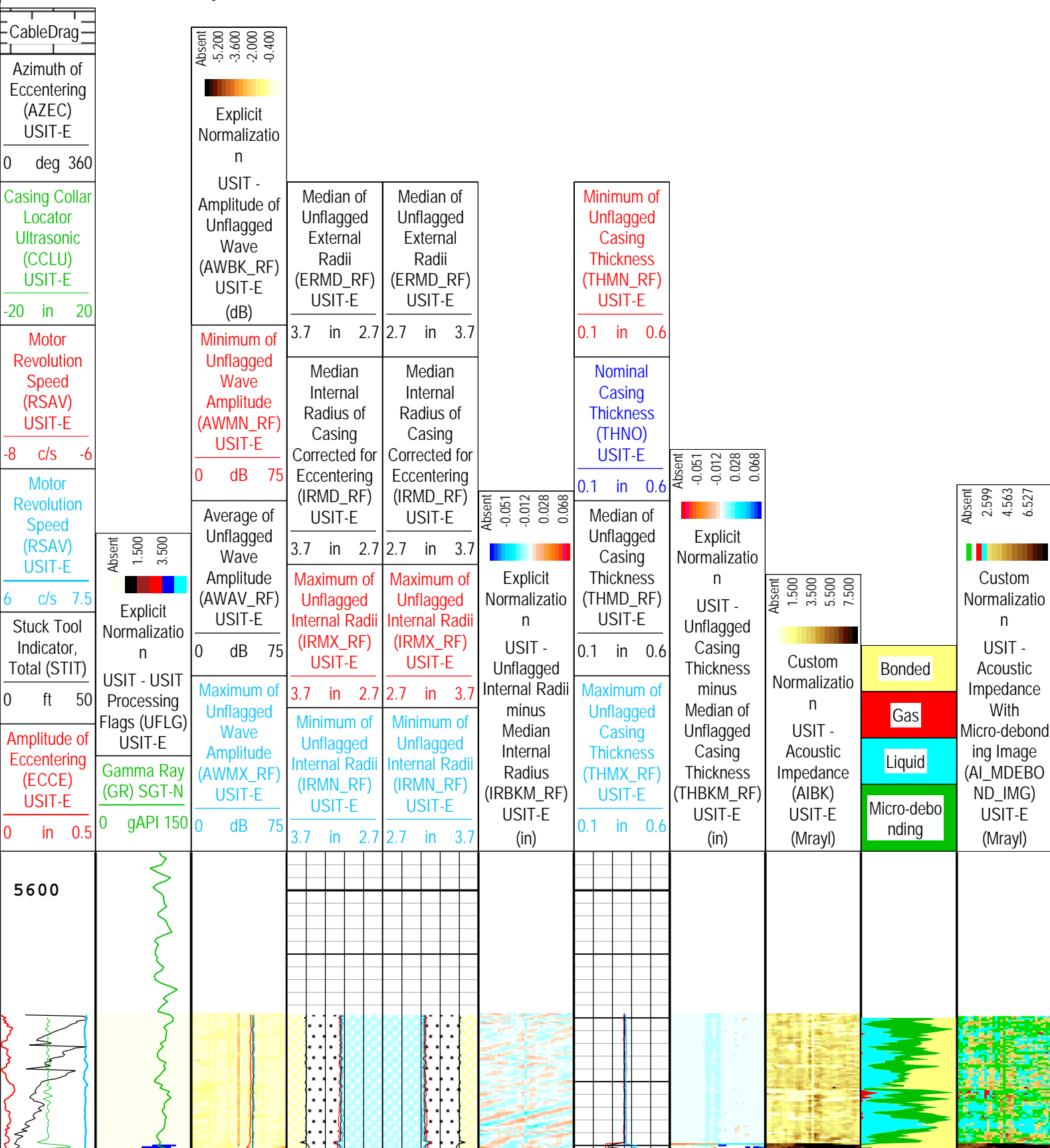
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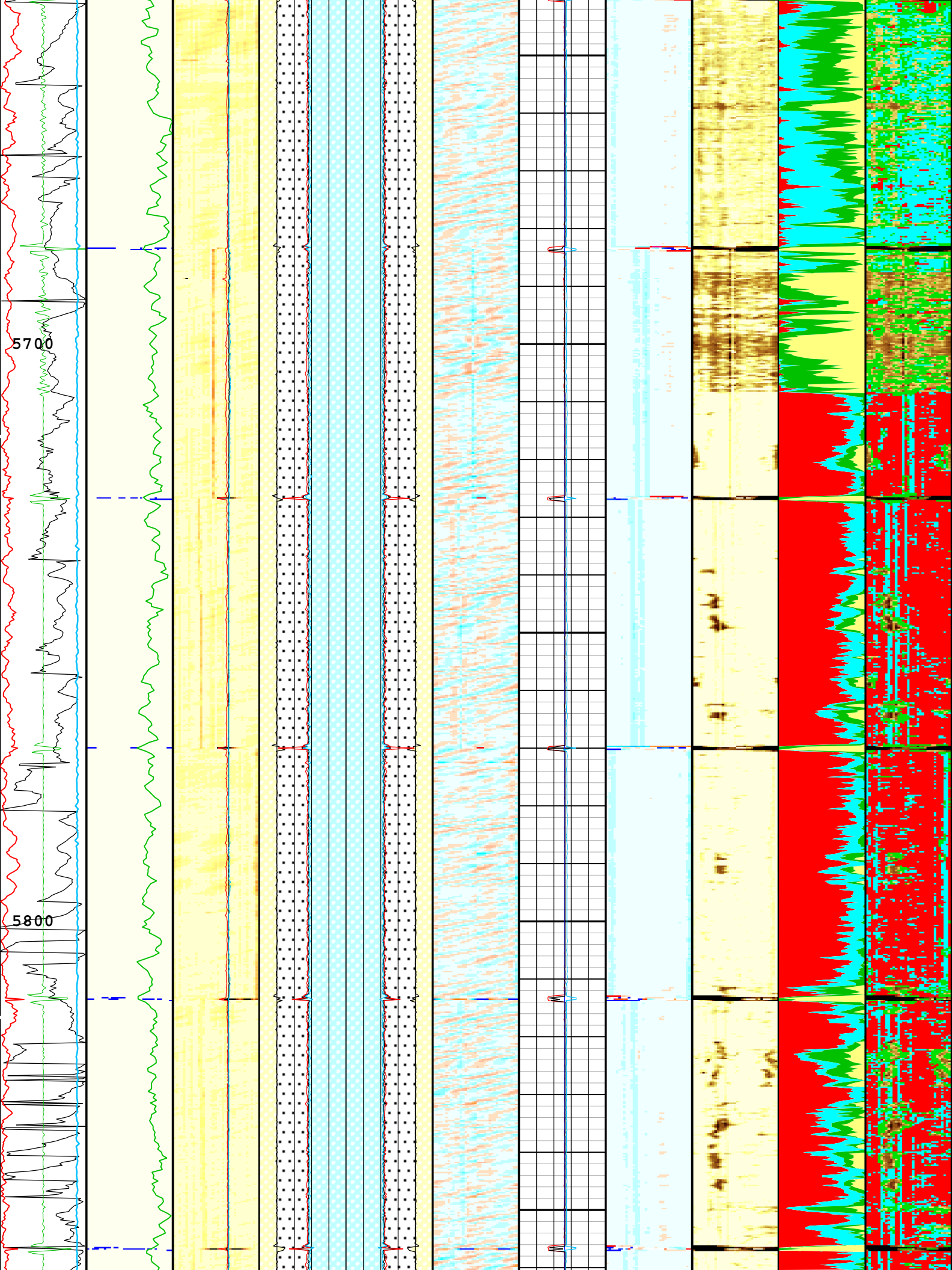
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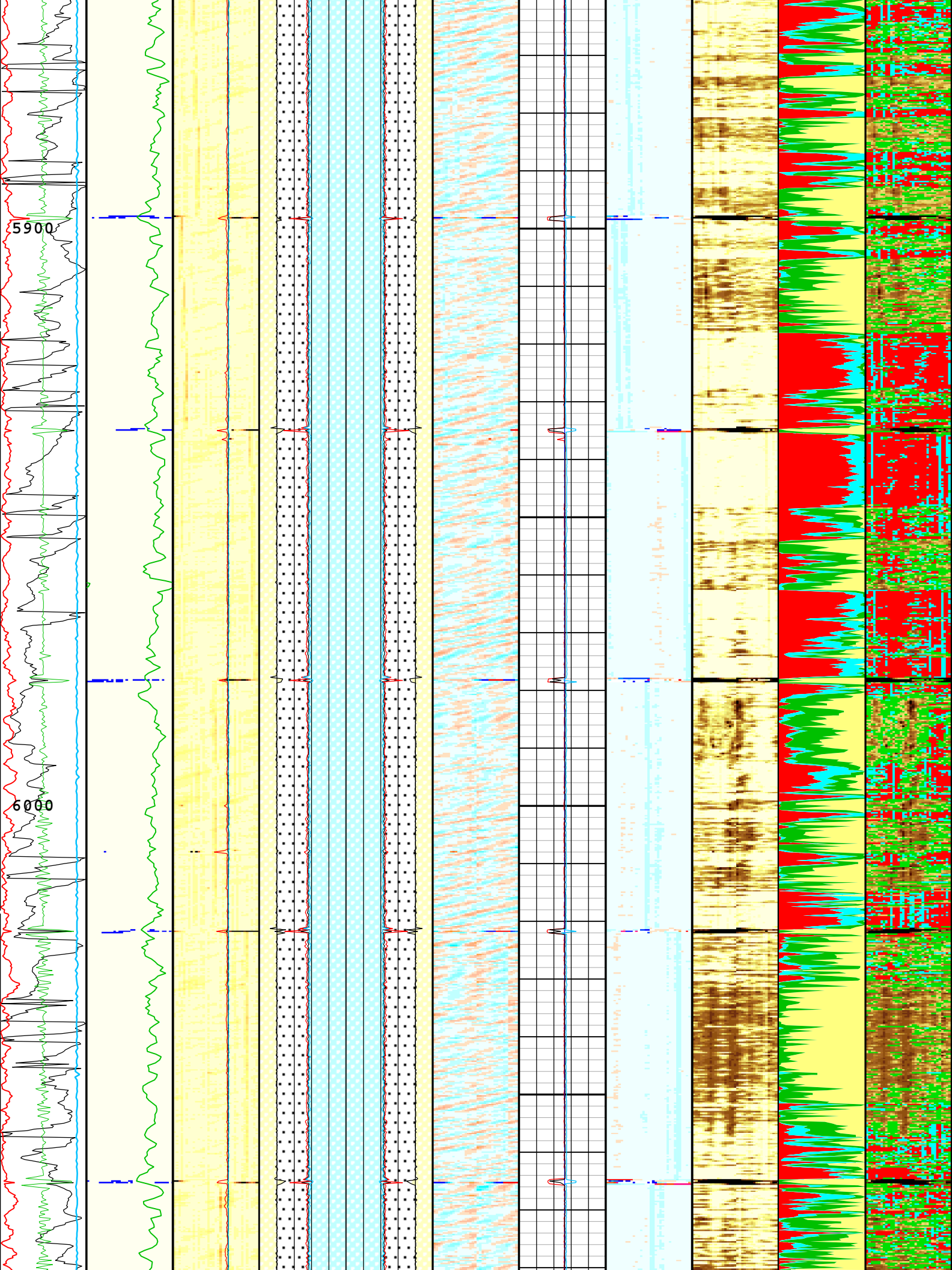
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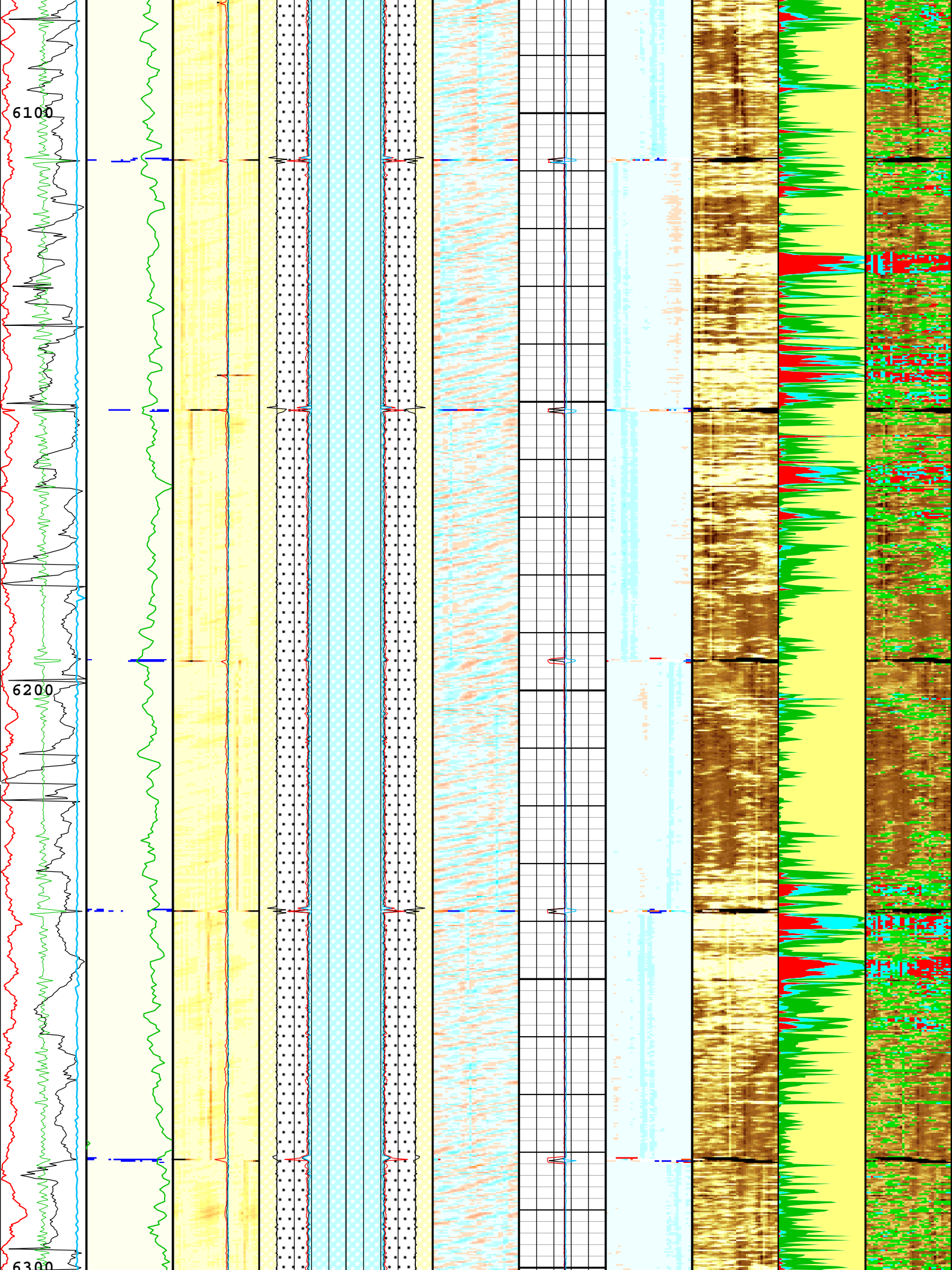
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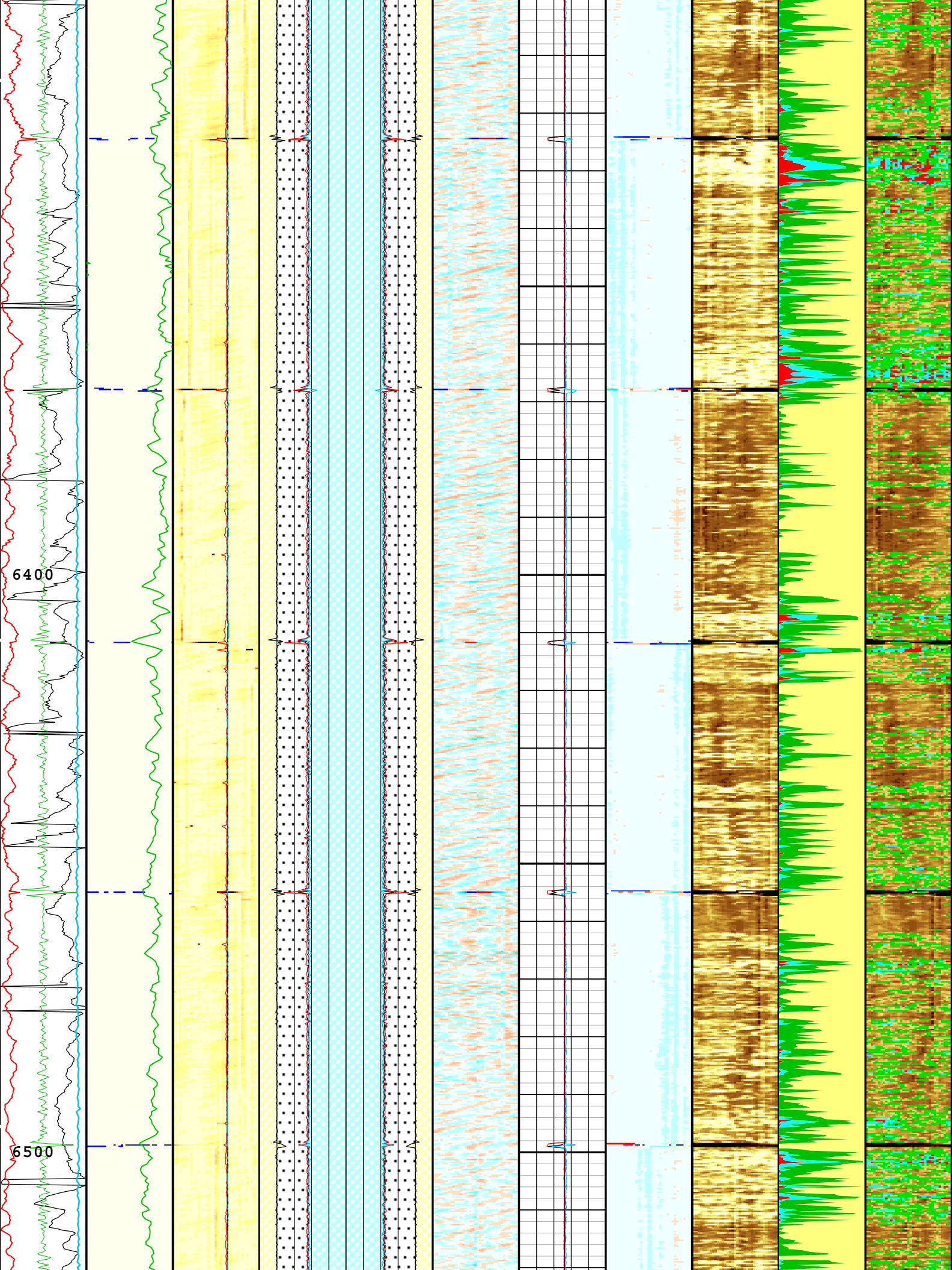
USI Composite			
USIT - Fluid Properties Measurement			
Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[3]:Up	6630.18	5619.62
Fluid Velocity = "Automatic". CFVL equals DFSL channel			
Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)
Mud Impedance = "Manual". CZMD uses ZMUD parameter zoned table below			
Start Depth(ft)	Stop Depth(ft)	Start Value(Mrayl)	End Value(Mrayl)
0	200	1.66	1.66
200	400	1.68	1.68
400	700	1.69	1.69
700	1000	1.7	1.7
1000	1500	1.72	1.72
1500	2000	1.74	1.74
2000	2500	1.76	1.76
2500	3000	1.77	1.77
3000	3500	1.79	1.79
3500	4000	1.8	1.8

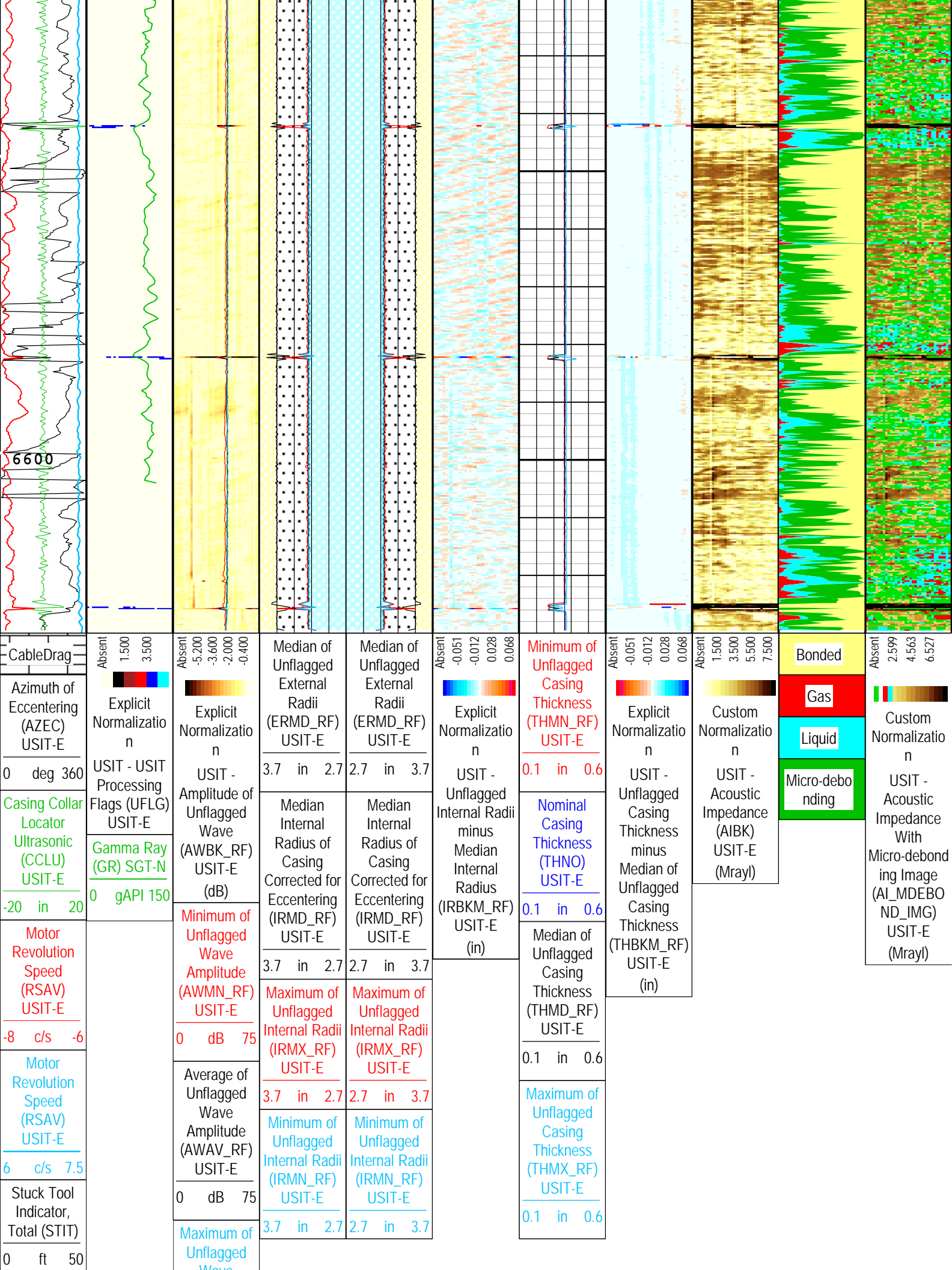












Amplitude of Eccentering (ECCE)
USIT-E

0 in 0.5

Wave Amplitude (AWMX_RF)
USIT-E

0 dB 75

TIME_1900 - Time Marked every 60.00 (s)

Description: USI Composite Format: USI Composite Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Apr-2014 14:45:14

Channel Processing Parameters				
Parameter	Description	Tool	Value	Unit
AFVU	Automatic Fluid Velocity Update	USIT-E	On	
BARI	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	7593	ft
CDEN	Cement Density	SGT-N	16.69	lbm/gal
CMTY	Cement Type	USIT-E	Regular Cement	
CTHILGR	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.362	in
CYSTLGR	Casing Yield Strength - Zoned along logger depths	WLSESSION	110000	psi
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	190	us/ft
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	SGT-N	1	
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	22.5	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
SOGR	Standoff Distance of the Gamma Ray Tool	SGT-N	0	in
TCUB	T^3 Processing Level	USIT-E	Loop	
TD	Total Measured Depth	Borehole	11753	ft
THDH	Maximum Search Thickness (percentage of nominal)	USIT-E	130	%
THDL	Minimum Search Thickness (percentage of nominal)	USIT-E	70	%
TPOS	Tool Position: Centered or Eccentered	SGT-N	Centered	
USIT-E	USIT-E	USIT-E	USIT-E	USIT-E

UDFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0	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	
UTHDP	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	1.8	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				
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
DOTF	Distance between Opposite Transducer Faces	USIT-E	2.874	in
EMXV	EMEX Voltage	USIT-E	50	V
HRES	Horizontal Resolution	USIT-E	10 deg	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UMFR	Modulation Frequency	USIT-E	333333	Hz
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
USI_UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
USI_UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 3.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	6621	ft
VRES	Vertical Resolution	USIT-E	3.0 in	
WINB	Window Begin Time	USIT-E	33.87	us
WINE	Window End Time	USIT-E	73.87	us

USI Cement			
USIT - Fluid Properties Measurement			
Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[3]:Up	6630.18	5619.62
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	200	1.66	1.66
200	400	1.68	1.68
400	700	1.69	1.69
700	1000	1.7	1.7
1000	1500	1.72	1.72
1500	2000	1.74	1.74
2000	2500	1.76	1.76
2500	3000	1.77	1.77
3000	3500	1.79	1.79
3500	4000	1.8	1.8

3500	4000	1.8	1.8
4000		1.8	1.8

Run1: USIT

USI Cement

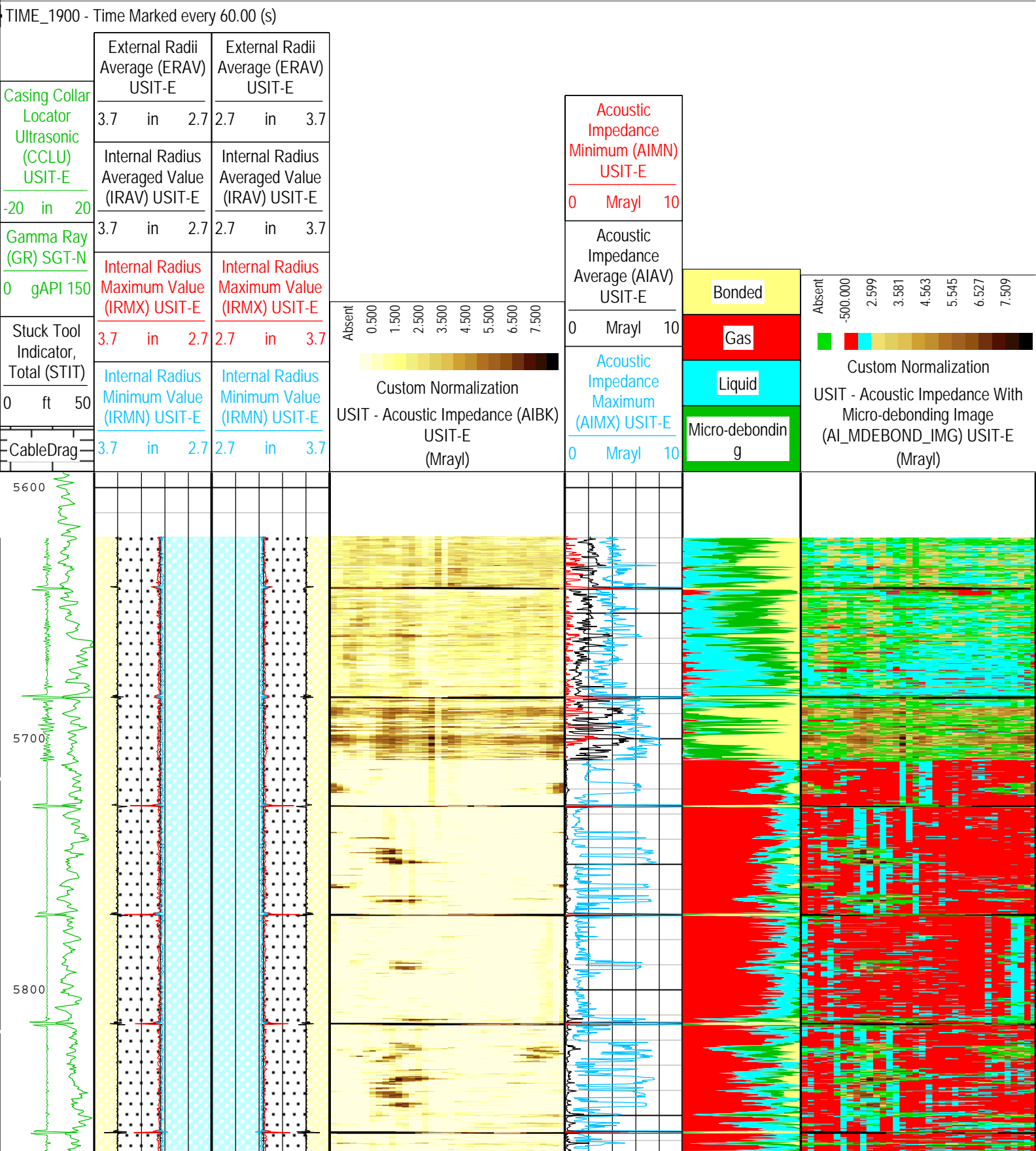
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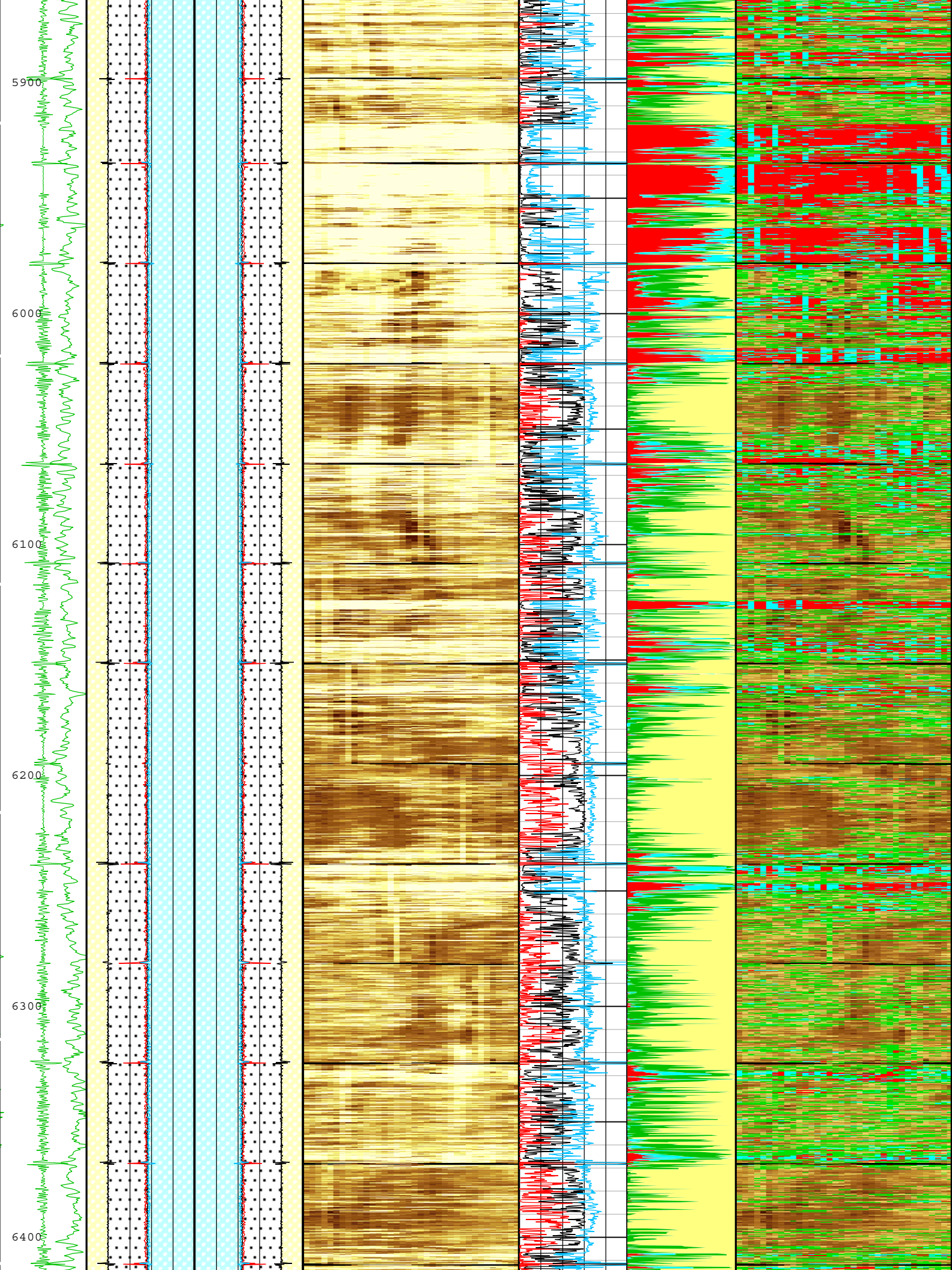
Company:Kerr-McGee Oil & Gas Onshore LP

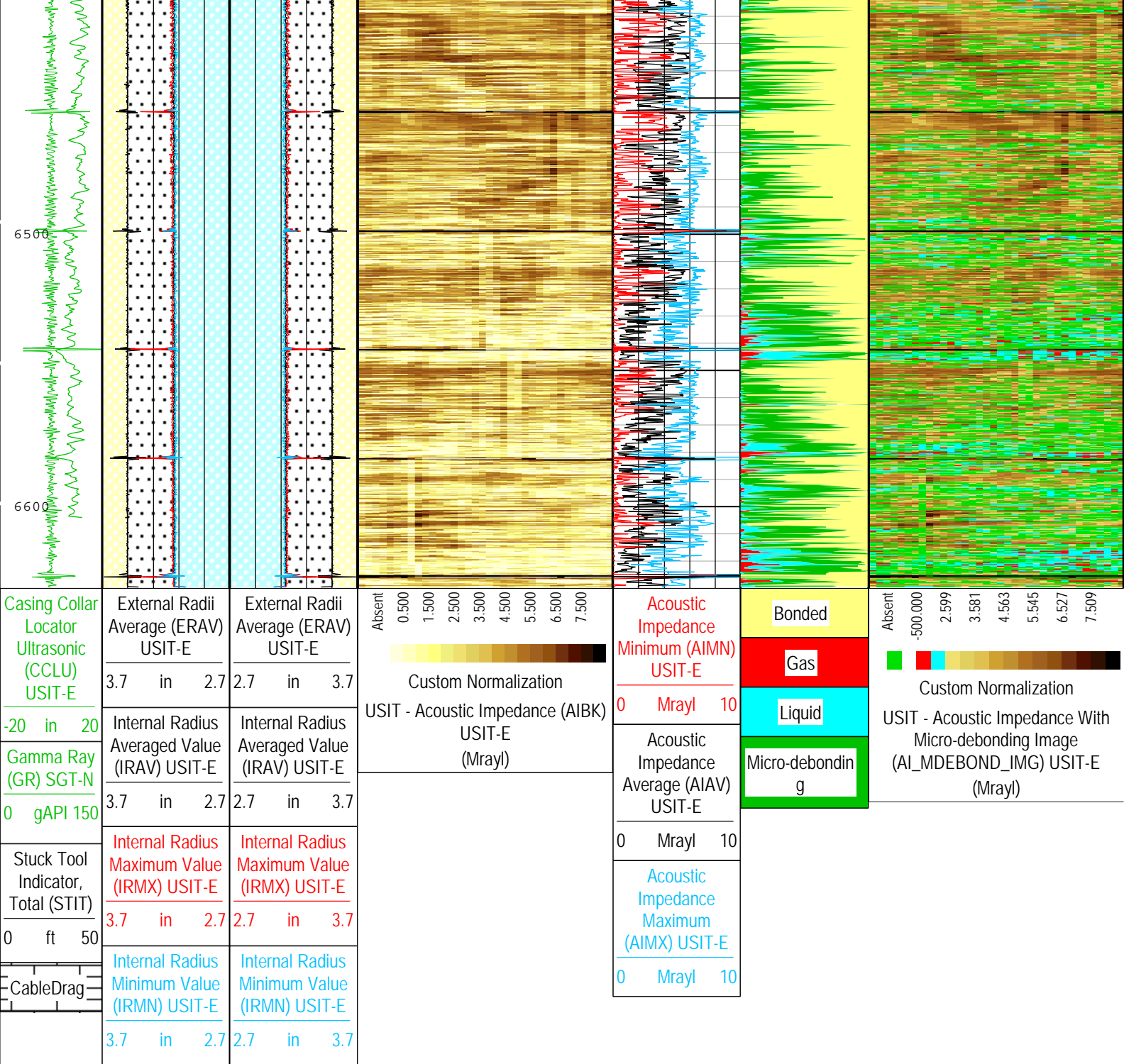
Well:Brotemarkle 3N-13HZ

Run1: USIT: Log[3]:Up:S002

Description: USI Cement Format: USI Cement Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Apr-2014 14:45:18







Description: USI Cement Format: USI Cement Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Apr-2014 14:45:18

Channel Processing Parameters				
Parameter	Description	Tool	Value	Unit
AFVU	Automatic Fluid Velocity Update	USIT-E	On	
BARI	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	7593	ft
CDEN	Cement Density	SGT-N	16.69	lbm/gal
CMTY	Cement Type	USIT-E	Regular Cement	

CTHILGR	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.362	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	190	us/ft
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	SGT-N	1	
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	22.5	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	0	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1	
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
SOGR	Standoff Distance of the Gamma Ray Tool	SGT-N	0	in
TCUB	T^3 Processing Level	USIT-E	Loop	
TD	Total Measured Depth	Borehole	11753	ft
THDH	Maximum Search Thickness (percentage of nominal)	USIT-E	130	%
THDL	Minimum Search Thickness (percentage of nominal)	USIT-E	70	%
TPOS	Tool Position: Centered or Eccentered	SGT-N	Centered	
UDFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0	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	
UTHDP	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	1.8	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				
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
DOTF	Distance between Opposite Transducer Faces	USIT-E	2.874	in
EMXV	EMEX Voltage	USIT-E	50	V

HRES	Horizontal Resolution	USIT-E	10 deg	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UMFR	Modulation Frequency	USIT-E	333333	Hz
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
USI_UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
USI_UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 3.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	6621	ft
VRES	Vertical Resolution	USIT-E	3.0 in	
WINB	Window Begin Time	USIT-E	33.87	us
WINE	Window End Time	USIT-E	73.87	us

XYZ

Company:Kerr-McGee Oil & Gas Onshore LP

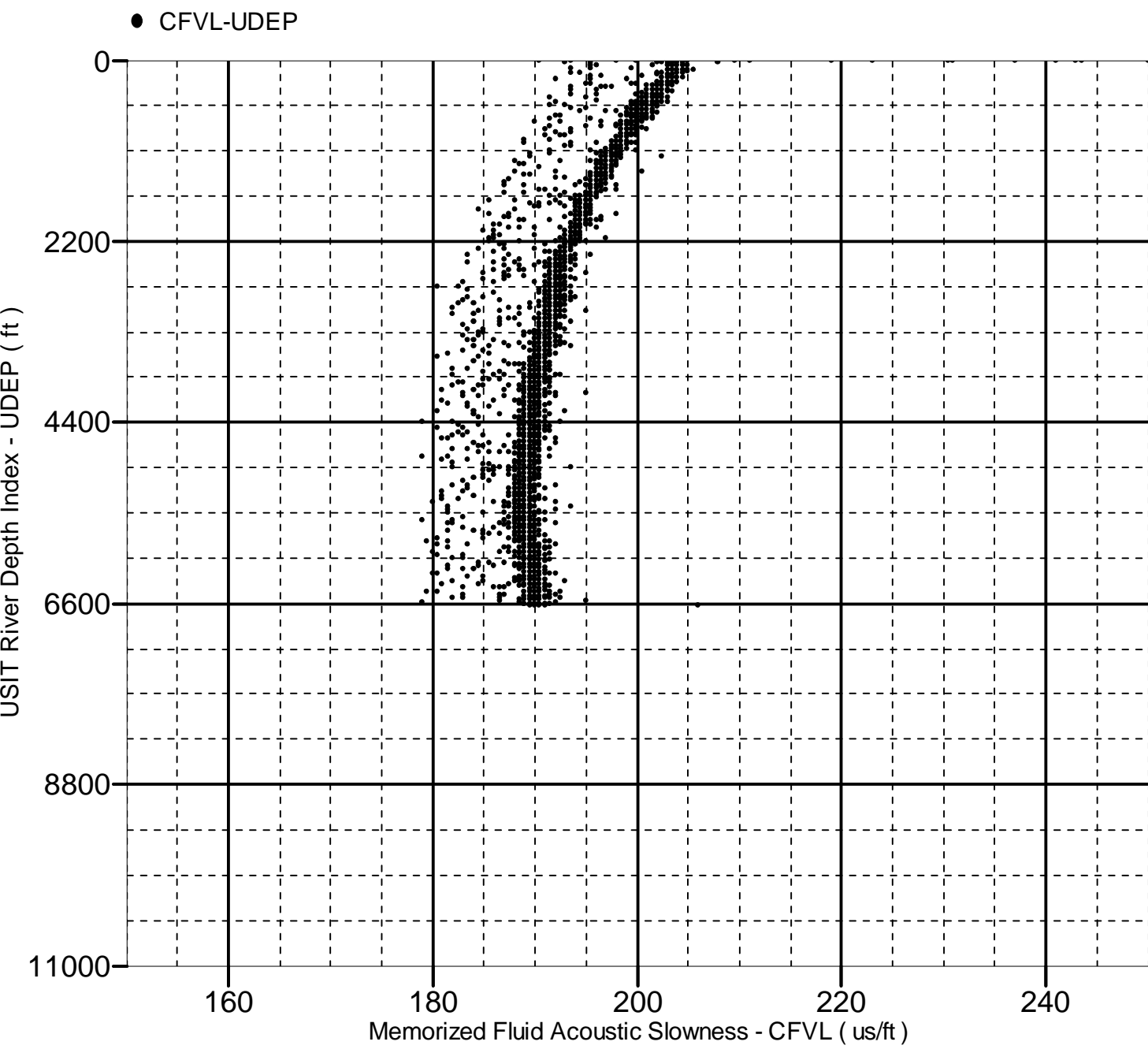
Well:Brotemarkle 3N-13HZ

Run1: USIT: Log[4]:Up:S002

Fluid Acoustic Slowness vs Depth

2D Cross Plot

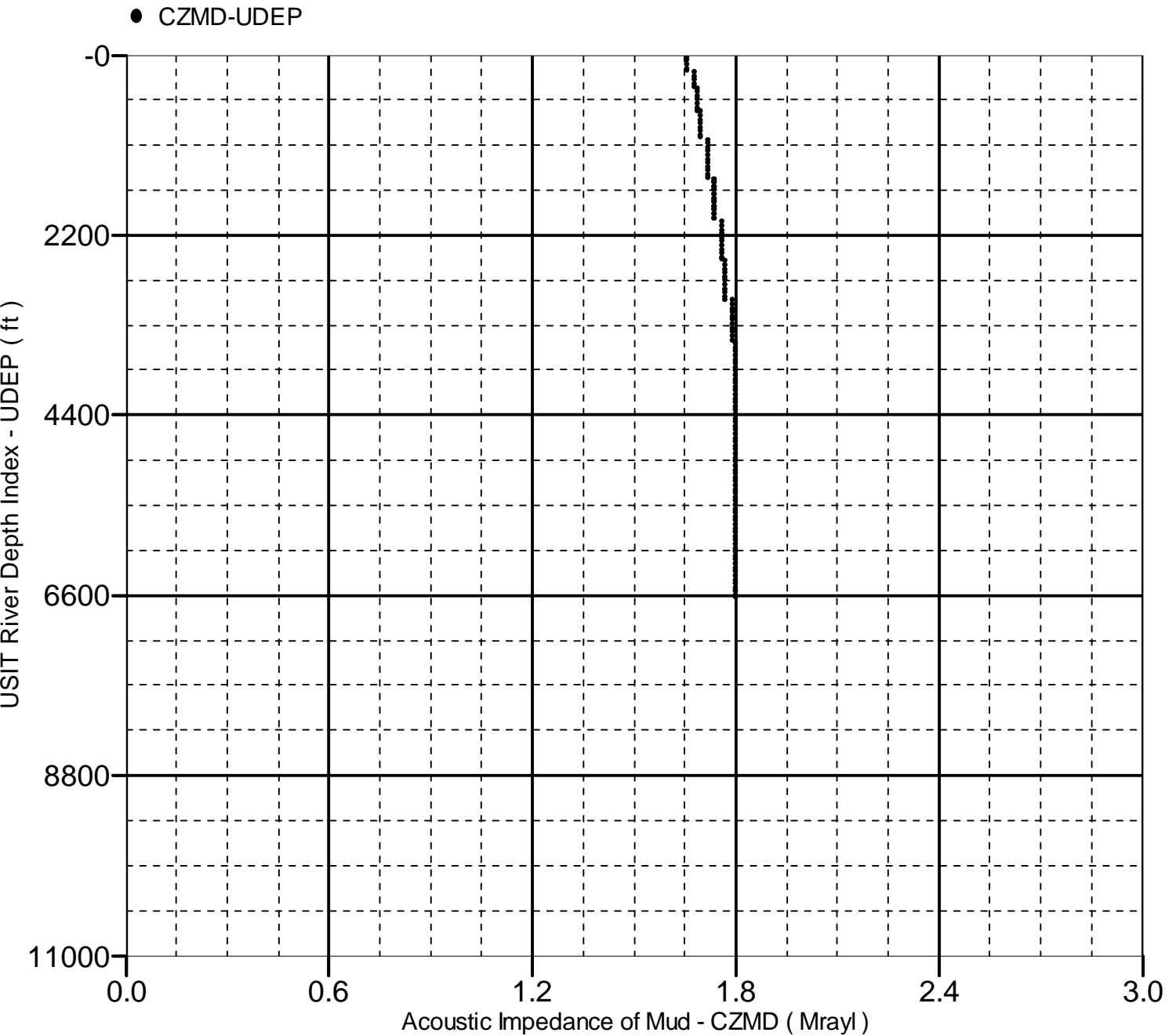
Index Range: From 6625.00 to 13.25 ft



Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6625.00 to 13.25 ft



Company:	Kerr-McGee Oil & Gas Onshore LP	Schlumberger
Well:	Brotemarkle 3N-13HZ	
Field:	Wattenberg	
County:	Weld	
State:	Colorado	
Ultrasonic Imager		
Cement Evaluation		
Gamma Ray - CCL Log		