

Company: Crestone Peak Resources Operating LLC

Well: Herren 1B-33H-H367

Field: Wattenberg

County: Weld State: Colorado

Isolation Scanner  
Cement Evaluation  
Gamma Ray - CCL Log

County:	Weld
Field:	Wattenberg
Location:	SENE 33-3N-67W
Well:	Herren 1B-33H-H367
Company:	Crestone Peak Resources Operating LLC
Location:	
SENE 33-3N-67W	Elev.: K.B. 4897.00 ft G.L. 4874.00 ft D.F. 4897.00 ft
Permanent Datum:	Ground Level
Log Measured From:	Kelly Bushing
Drilling Measured From:	Kelly Bushing
API Serial No. 05-123-47728	Section: 33
	Township: 3N
	Range: 67W

Logging Date	20-Jan-2019
Run Number	Isolation Scanner
Depth Driller	12135.00 ft
Schlumberger Depth	6615.00 ft
Bottom Log Interval	6615.00 ft
Top Log Interval	104.00 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	2021.00 ft
To	12135.00 ft
Casing/Tubing Size	5.5 in
Weight	20 lbm/ft
Grade	N/A
From	0.00 ft
To	12122.00 ft
Max Recorded Temperatures	185 degF
Logger on Bottom	20-Jan-2019
Unit Number	2143
Recorded By	L. Await
Witnessed By	Keith K.

Disclaimer

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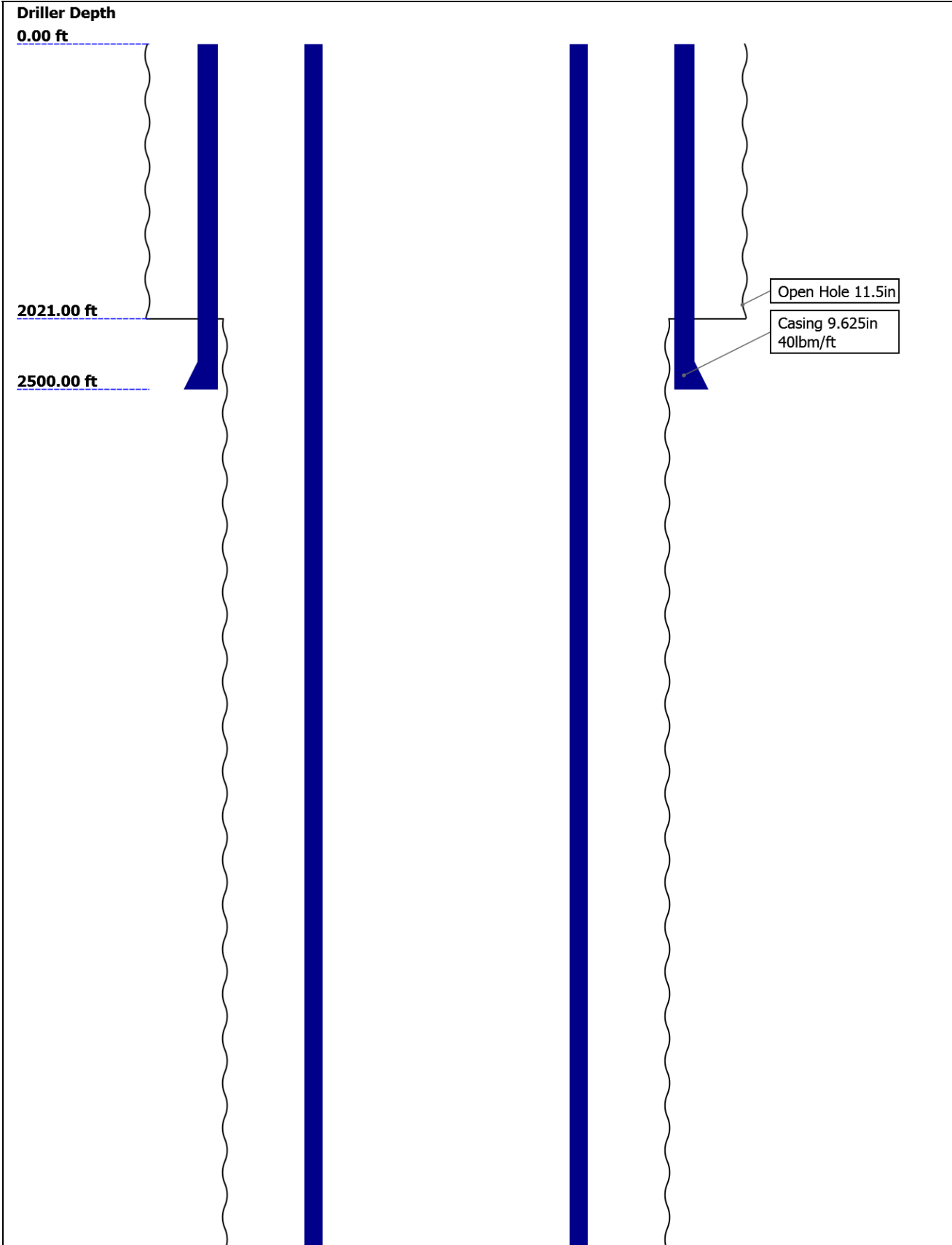
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Well Sketch



12122.00 ft

12135.00 ft

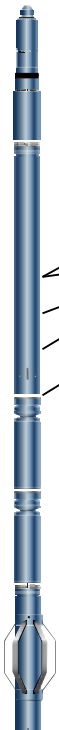
Casing 5.5in  
20lbm/ft

Open Hole 8.5in

Borehole Size/Casing/Tubing Record

Bit						
Bit Size ( in )	11.5	8.5				
Top Driller ( ft )	0	2021				
Top Logger ( ft )	0	2021				
Bottom Driller ( ft )	2021	12135				
Bottom Logger ( ft )	2021	12135				
Casing						
Size ( in )	9.625	5.5				
Weight ( lbm/ft )	40	20				
Inner Diameter ( in )	8.835	4.778				
Grade	N/A	N/A				
Top Driller ( ft )	0	0				
Top Logger ( ft )	0	0				
Bottom Driller ( ft )	2500	12122				
Bottom Logger ( ft )	2021	12122				

Remarks and Equipment Summary

Isolation Scanner: Toolstring			Isolation Scanner: Remarks		
<div><div><div>Equip nameLength</div><div>LEH-QT30.73</div><div>LEH-QT</div></div><div><div>EDTC-B:827.24</div><div>962</div><div>EDTH-B:9293</div><div>EDTG-A:79146</div><div>EDTC-B:8962</div></div><div><div>AH-184[2]:2765</div><div>AH-184[1]:2826</div><div>USIT-E:9016.74</div><div>0</div><div>ECH-MFA:1818</div><div>USAC-A:900</div><div>USIT-A:90</div></div></div> <div></div> <div><div>MP nameOffset</div><div>CTEM23.74</div><div>ACCZ0.00</div><div>HV0.00</div><div>Gamma21.87</div><div>Ray</div><div>TelStatu20.74</div><div>s</div></div>	Thank you for choosing Schlumberger!				
	Log run for cement evaluation				
	Tool run centralized as per tool sketch, with booster kit and 2 GEMCOs				
	Spacer 12.0ppg -> Lead 12.5ppg -> Tail 13.5ppg				
	Plug bumped and floats held during cementing operation				
	Crew: K. Howington, Francisco Maldonado				

USIS-A:98

8

USSC-B:77

7

IBCS-A:78

3

FAR-SENS

OR:4626

IBC-TX

NEAR-SEN

SOR:4624

IBC-TX

USI-SENS

OR:2005

IBC-TX

EMITTER-

SENSOR:4

625

IBC-TX

USI Sen 0.84

sor

Head Te

nsion

TOOL\_ZERO

Lengths are in ft

Maximum Outer Diameter = 6.250 in

Line: Sensor Location, Value: Gating Offset

All measurements are relative to TOOL\_ZERO

Depth Summary			
	Isolation Scanner		
Depth Measuring Device			
Type			
Serial Number			
Calibration Date	28-Sep-2017		
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		
Tension Device			
Type	CMTD-B/A		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0		
Logging Cable			
Type	7-46NT-XS		
Serial Number			
Length	24000.00 ft		
Conveyance Type	Wireline		
Rig Type			
Isolation Scanner: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			

# USIT - Fluid Properties Measurement

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[3]:Up	6615.16	104.63

Fluid Velocity = "Automatic".  
CFVL equals DFSL channel

Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)
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Mud Impedance = "FreePipe Norm."  
Free Pipe normalization zone is : 491.65m(1613.04ft) to 496.61m(1629.29ft)  
MUD\_N\_FRP = 1.47  
DFD = 1.01g/cm3(8.40lbm/gal)  
CZMD median computed in free pipe normalization interval = 2.09 MRayl

Start Depth(ft)	Stop Depth(ft)	Start Value(Mrayl)	End Value(Mrayl)
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## Isolation Scanner

## IBC SLG

## Software Version

Acquisition System	Version
Maxwell 2018 SP2	8.2.104493.3100

## Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Isolation Scanner	Log[3]:Up	Up	104.63 ft	6615.16 ft	20-Jan-2019 9:14:53 AM	20-Jan-2019 10:46:50 AM	ON	22.67 ft	Yes

All depths are referenced to toolstring zero

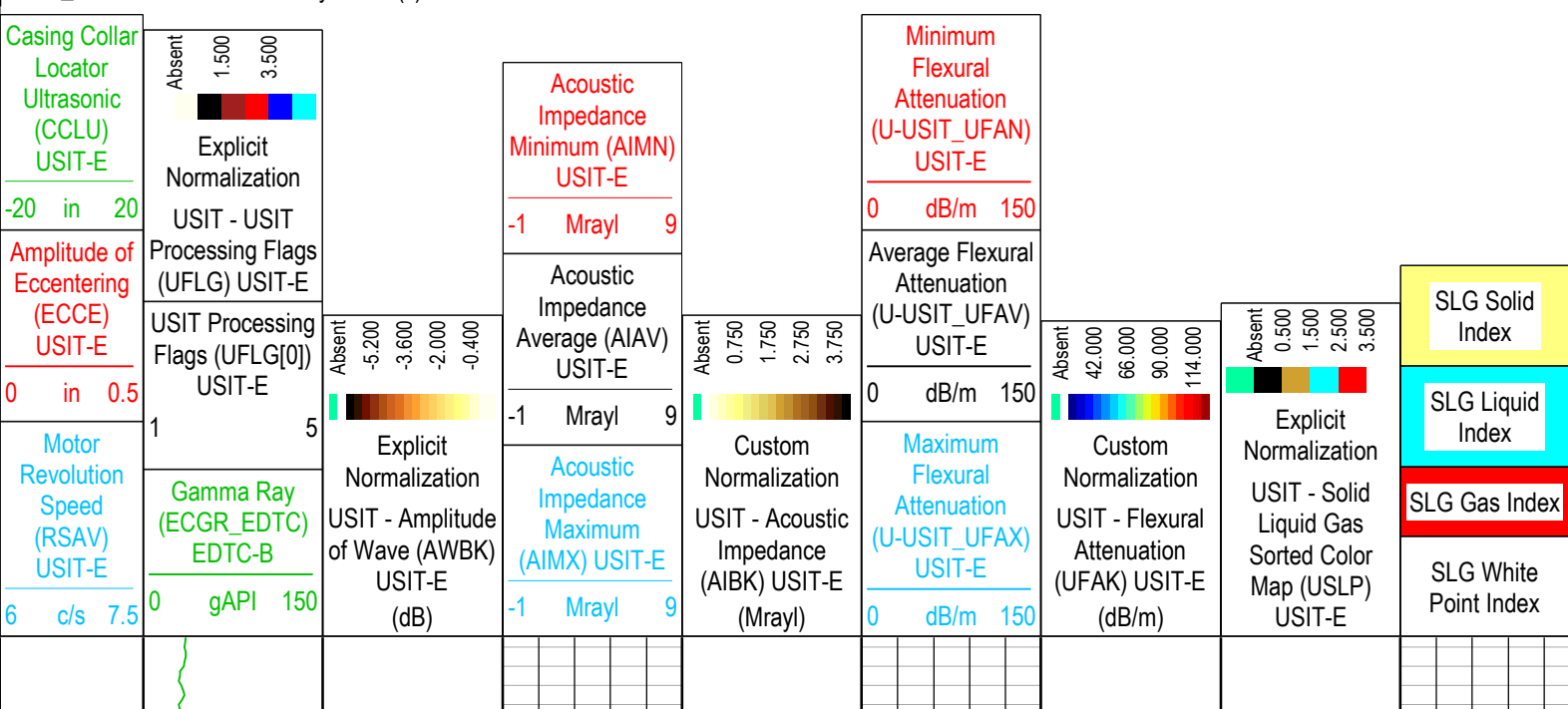
Log	Company: Crestone Peak Resources Operating LLC	Well: Herren 1B-33H-H367
		Isolation Scanner: Log[3]:Up:S012

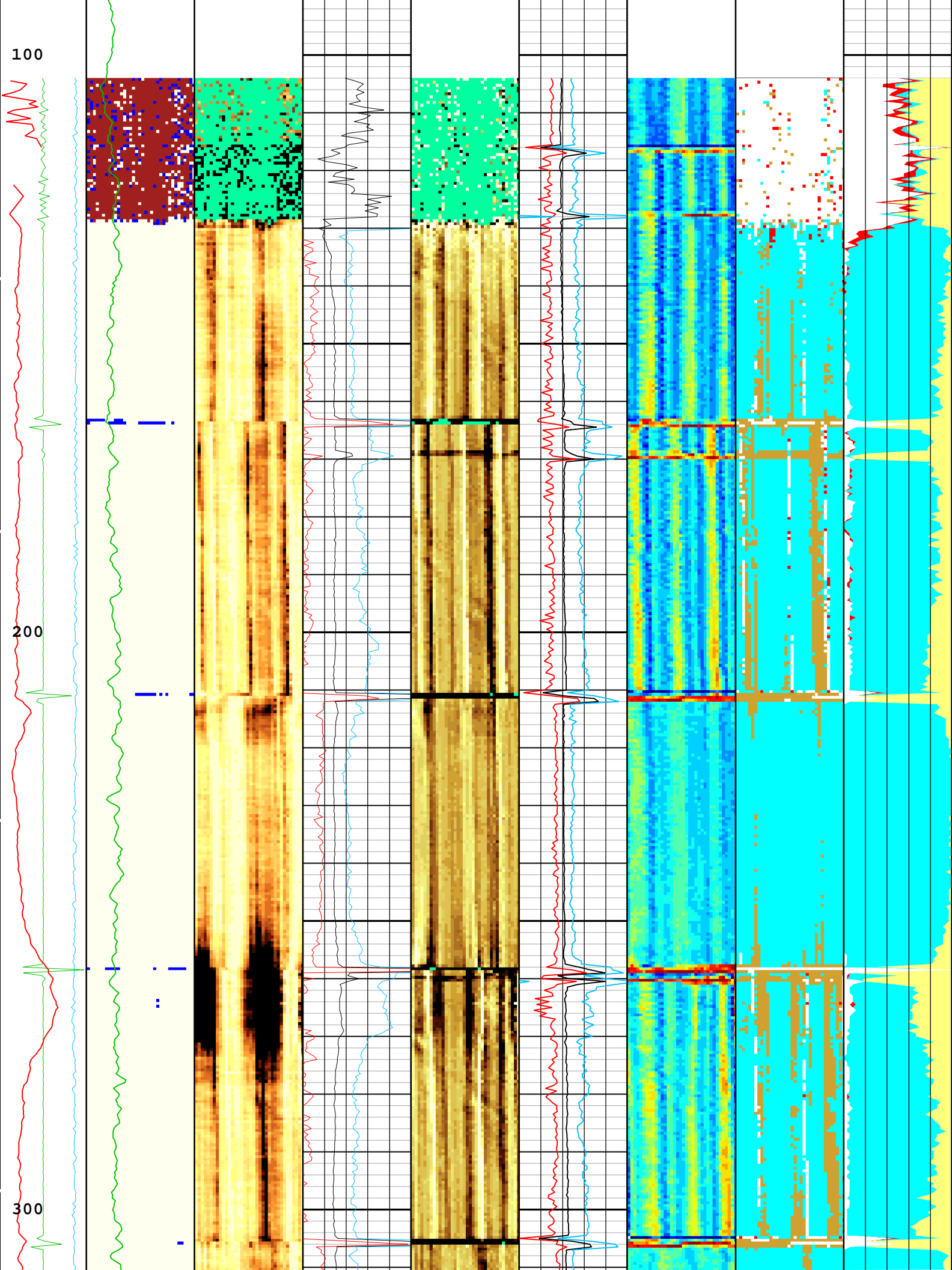
Description: USI IBC SLG    Format: Log (IBC SLG)    Index Scale: 5 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation Date: 21-Jan-2019 11:22:00

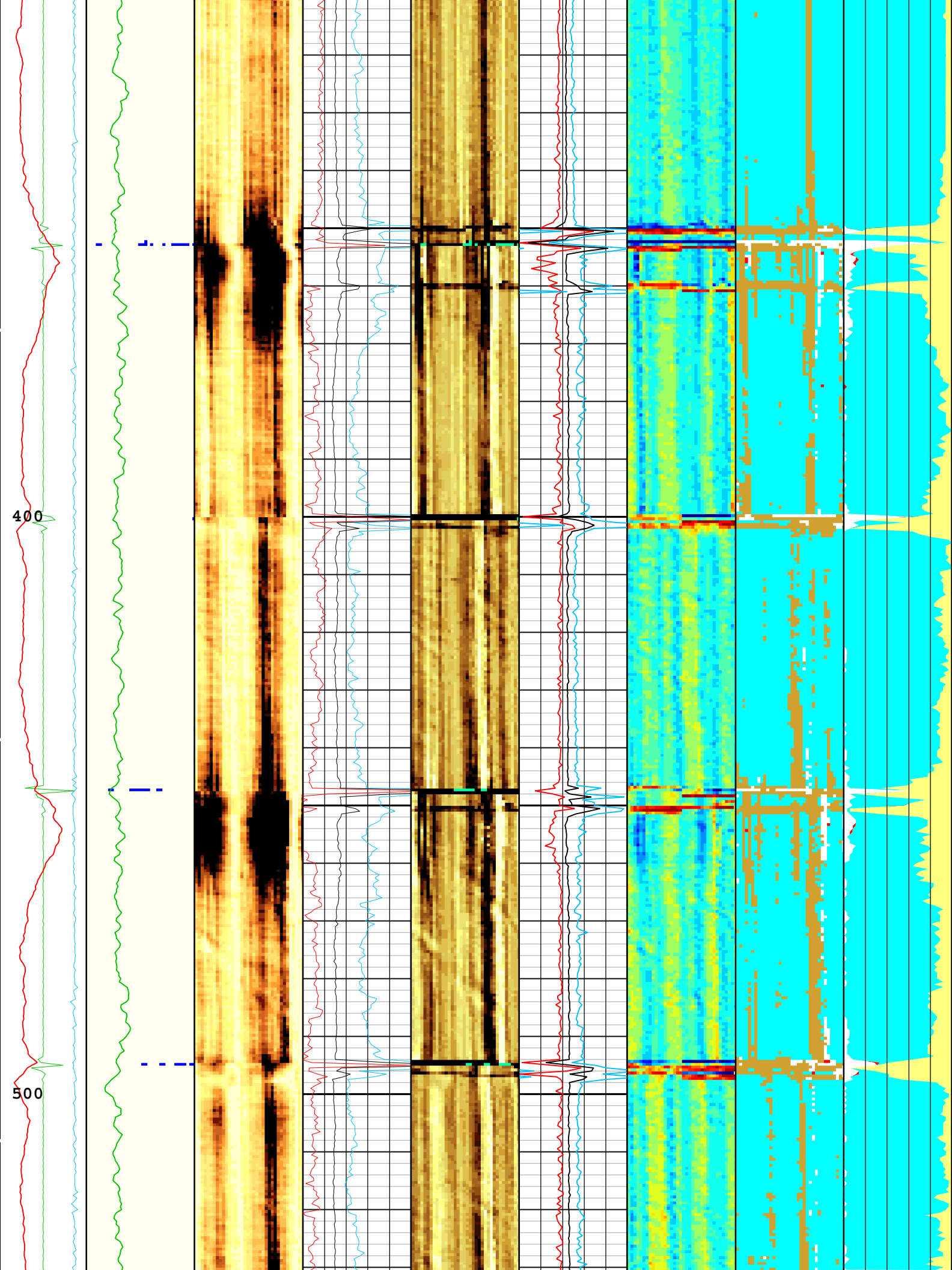
USIT Processing Flags (UFLG[0]) USIT-E

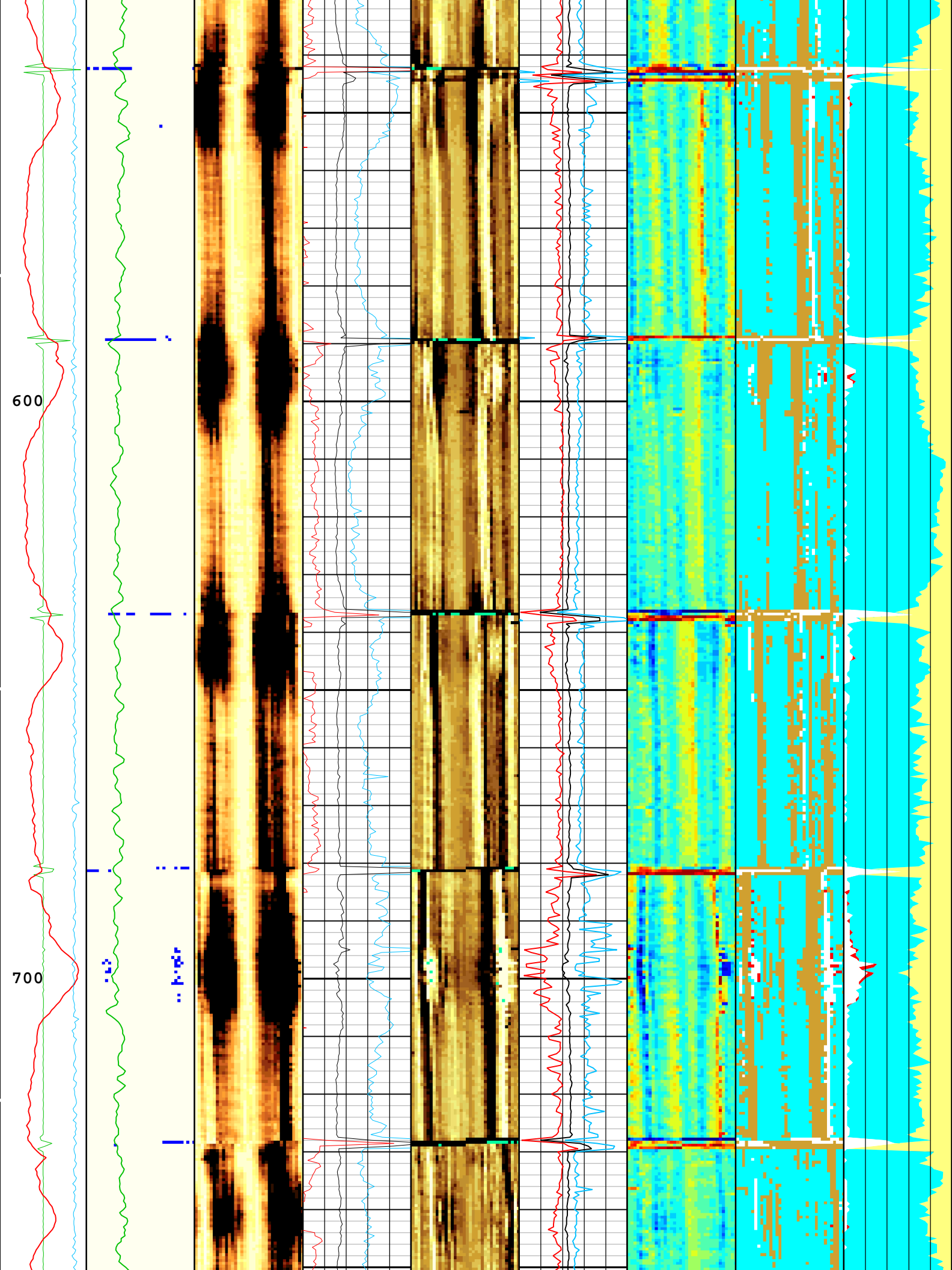
1 - UFLG 1 Value within [0.0 - 1.5] - :	UTIM Error
2 - UFLG 2 Value within [1.5 - 2.5] - :	Pulse Origin Not Detected
3 - UFLG 3 Value within [2.5 - 3.5] - :	WINLEN Error
4 - UFLG 4    UFLG 5    UFLG 6 Value within [3.5 - 6.5] - :	Casing Thickness Error
5 - UFLG 7    UFLG 8    UFLG 9 Value within [6.5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

TIME\_1900 - Time Marked every 60.00 (s)

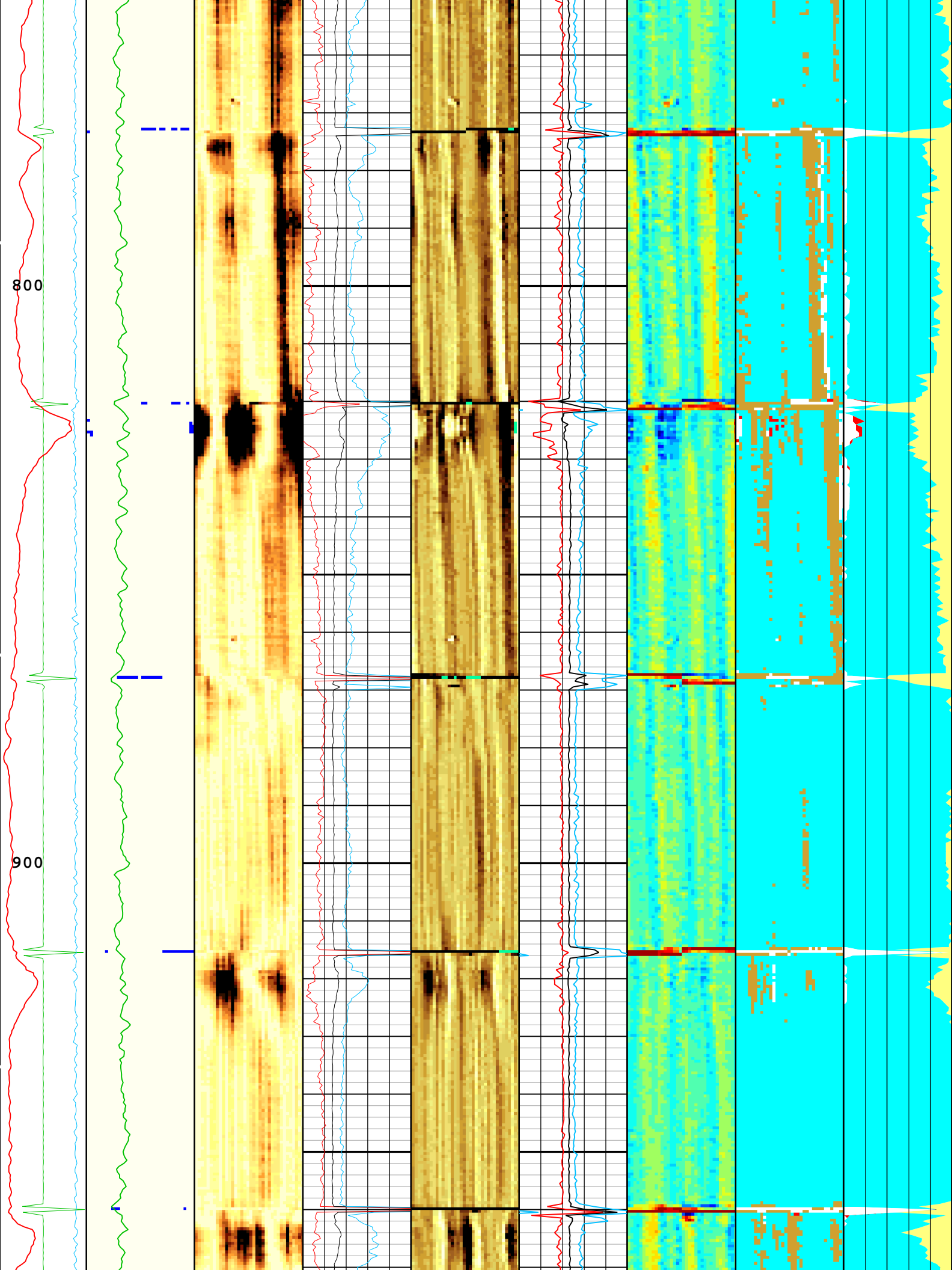


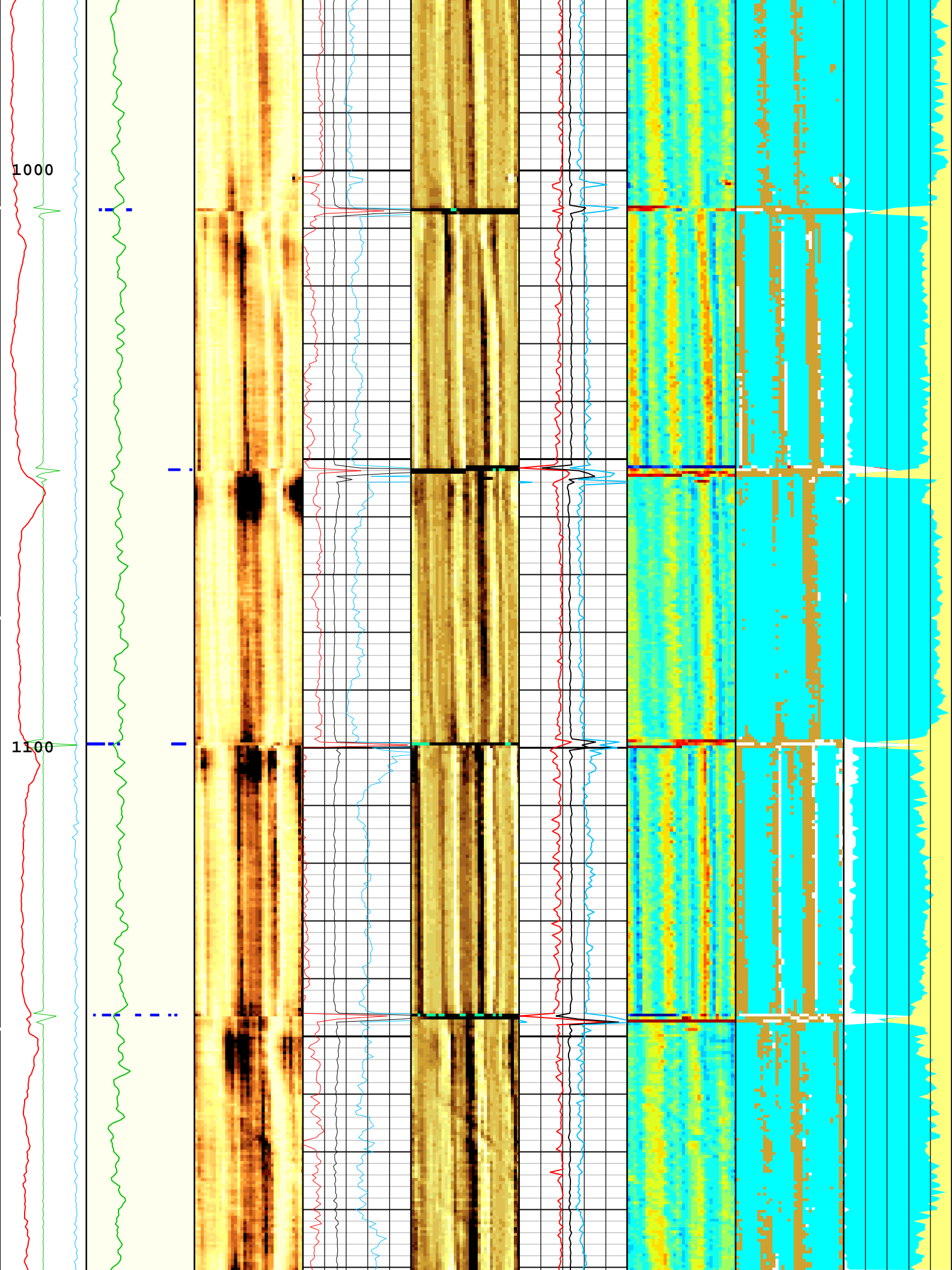


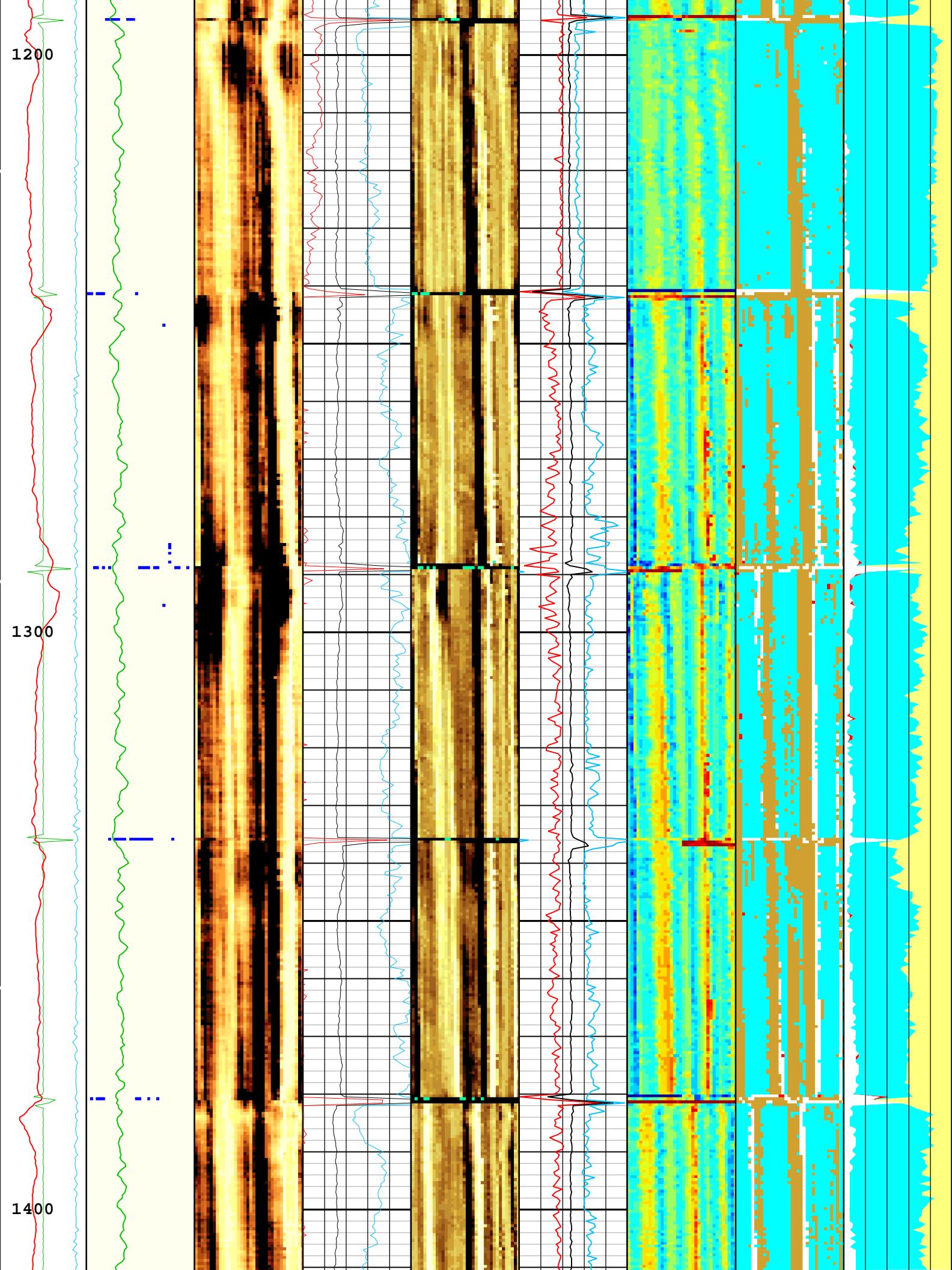


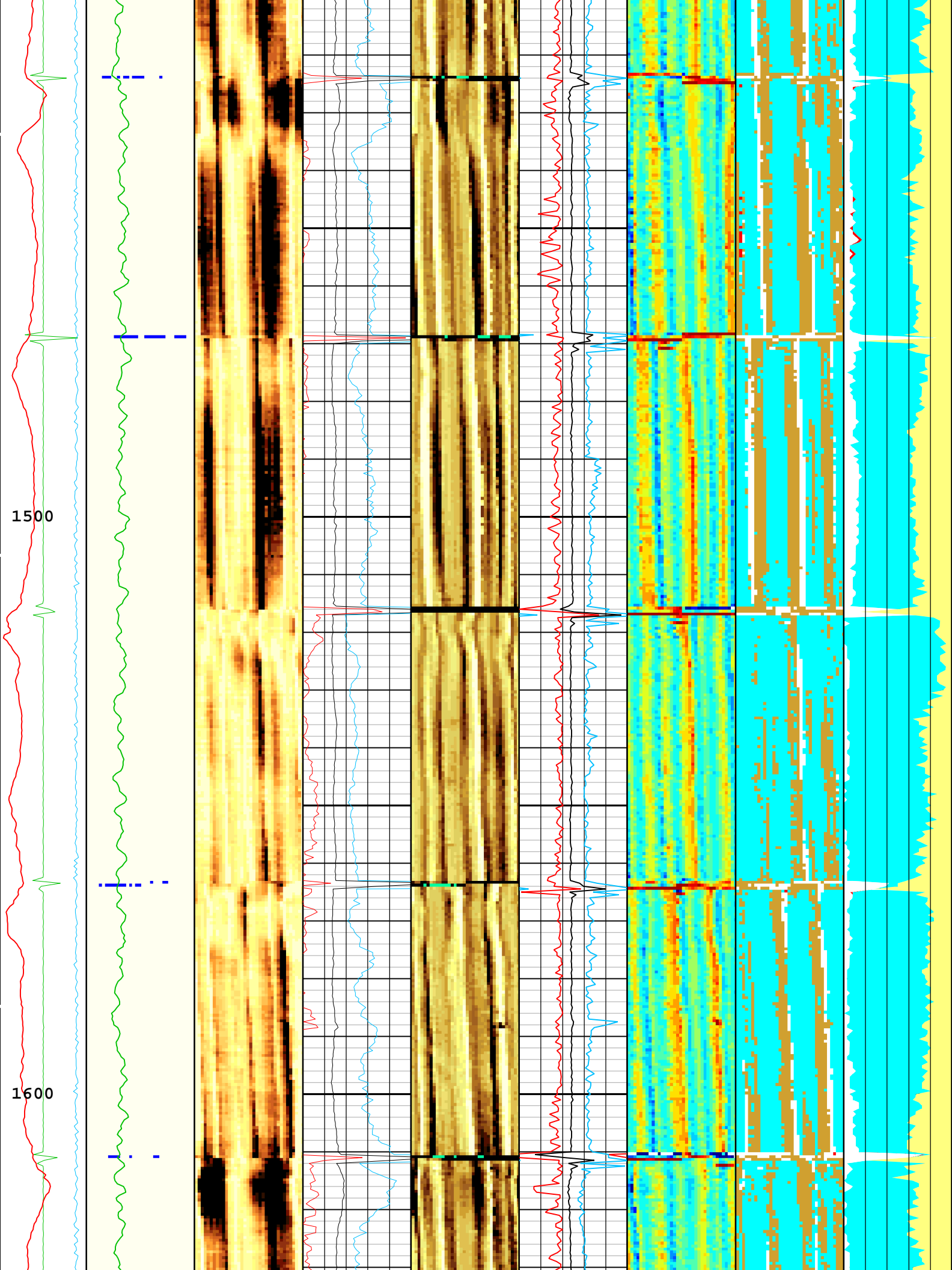


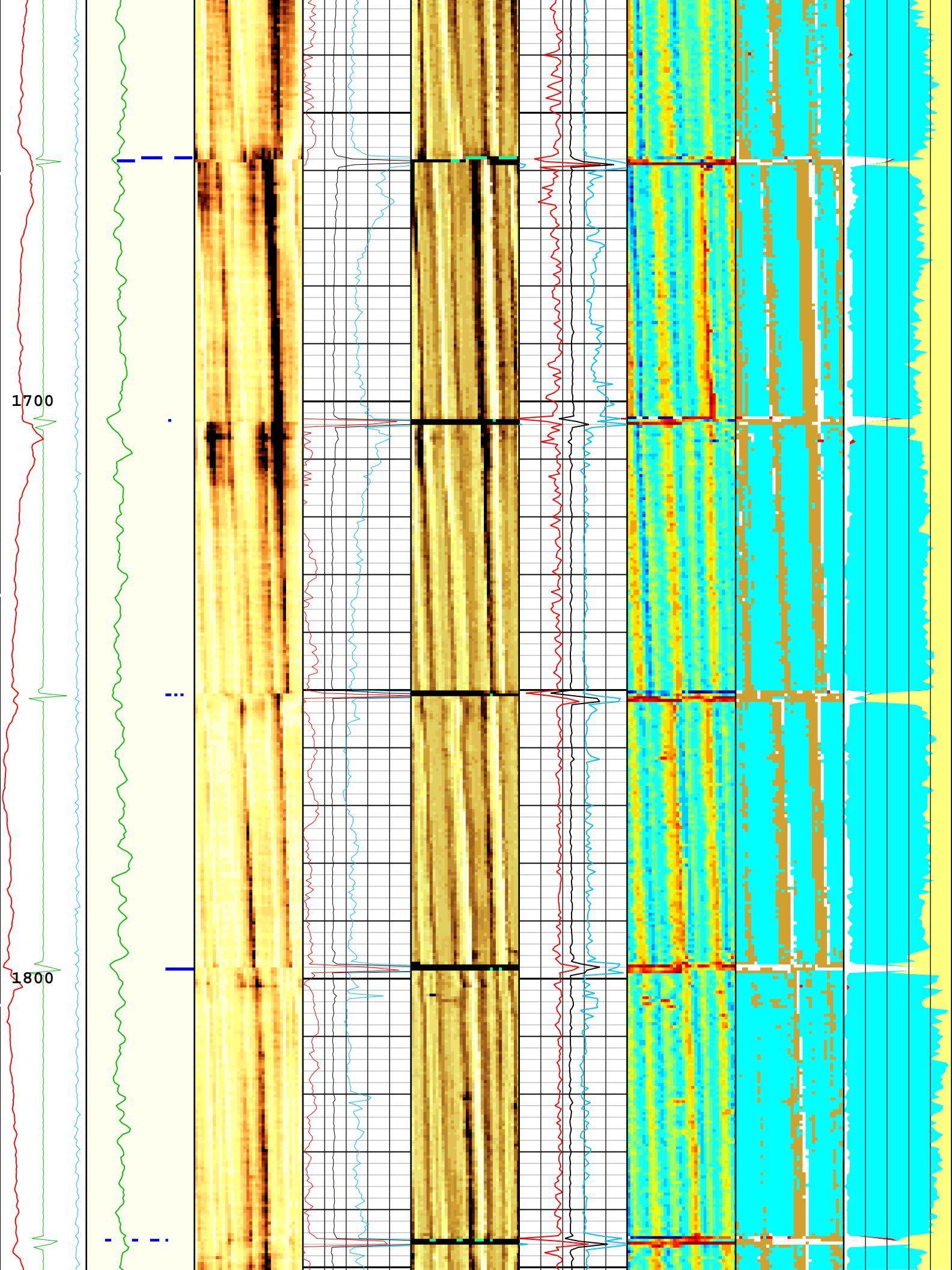


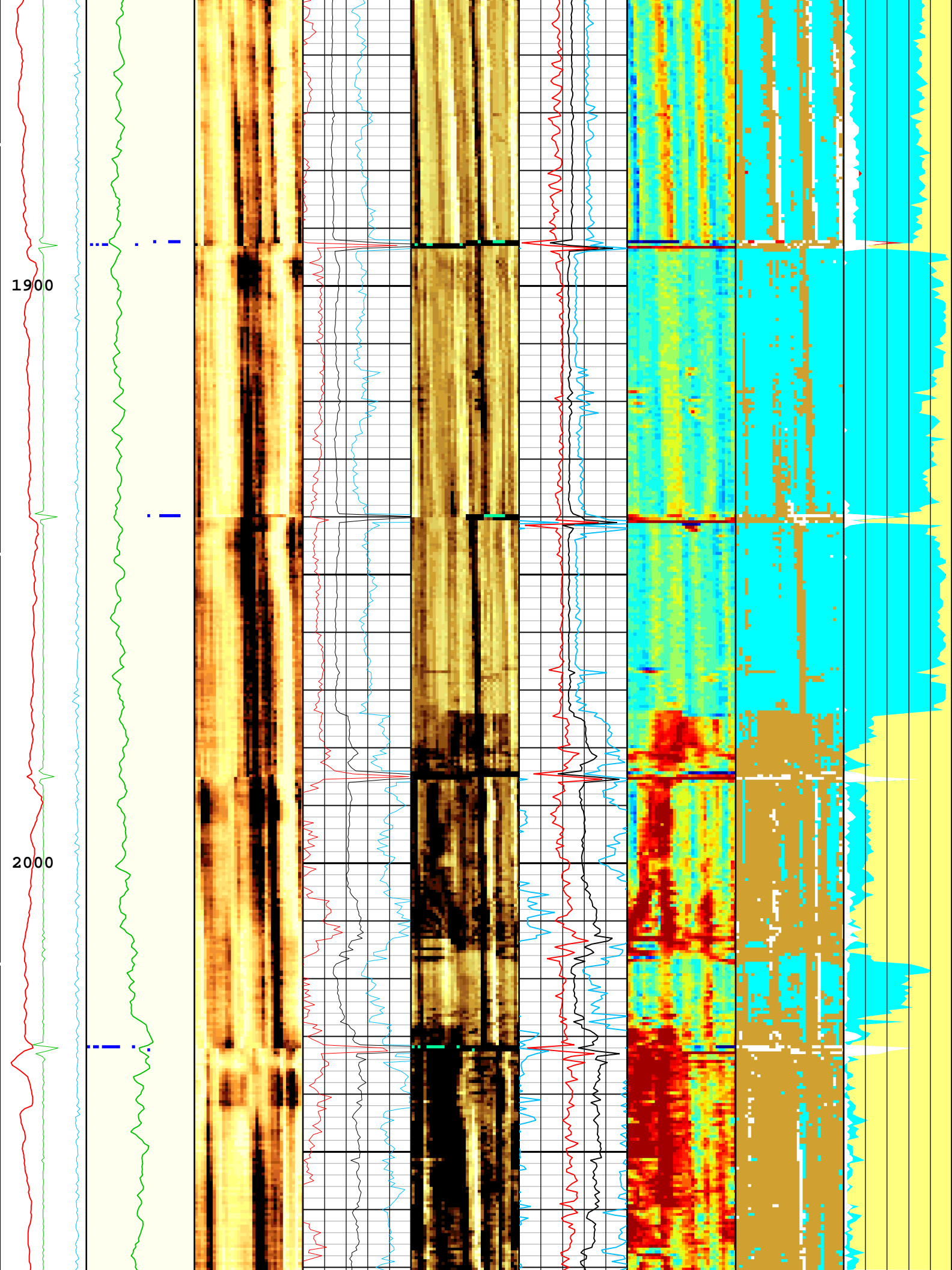




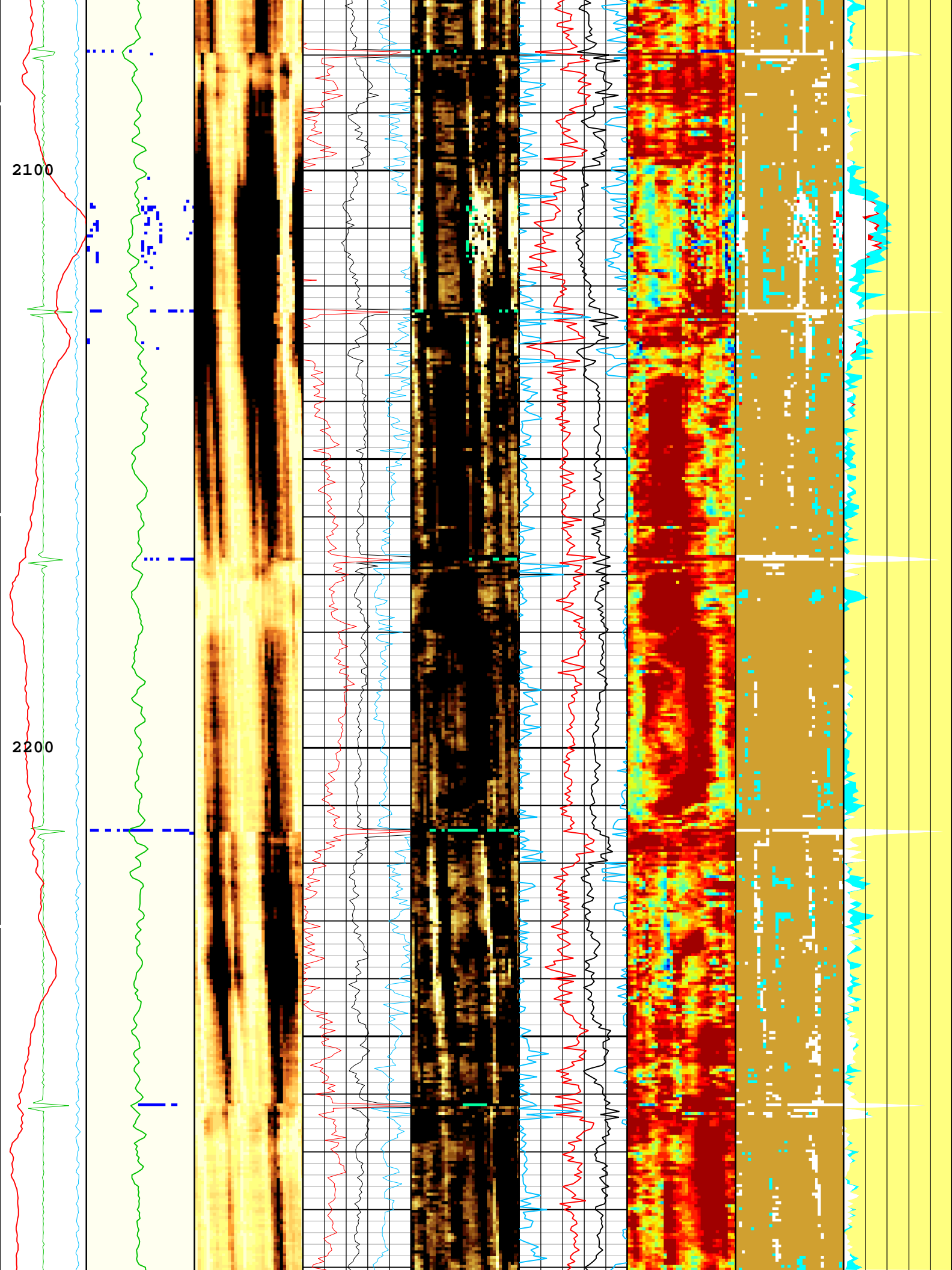


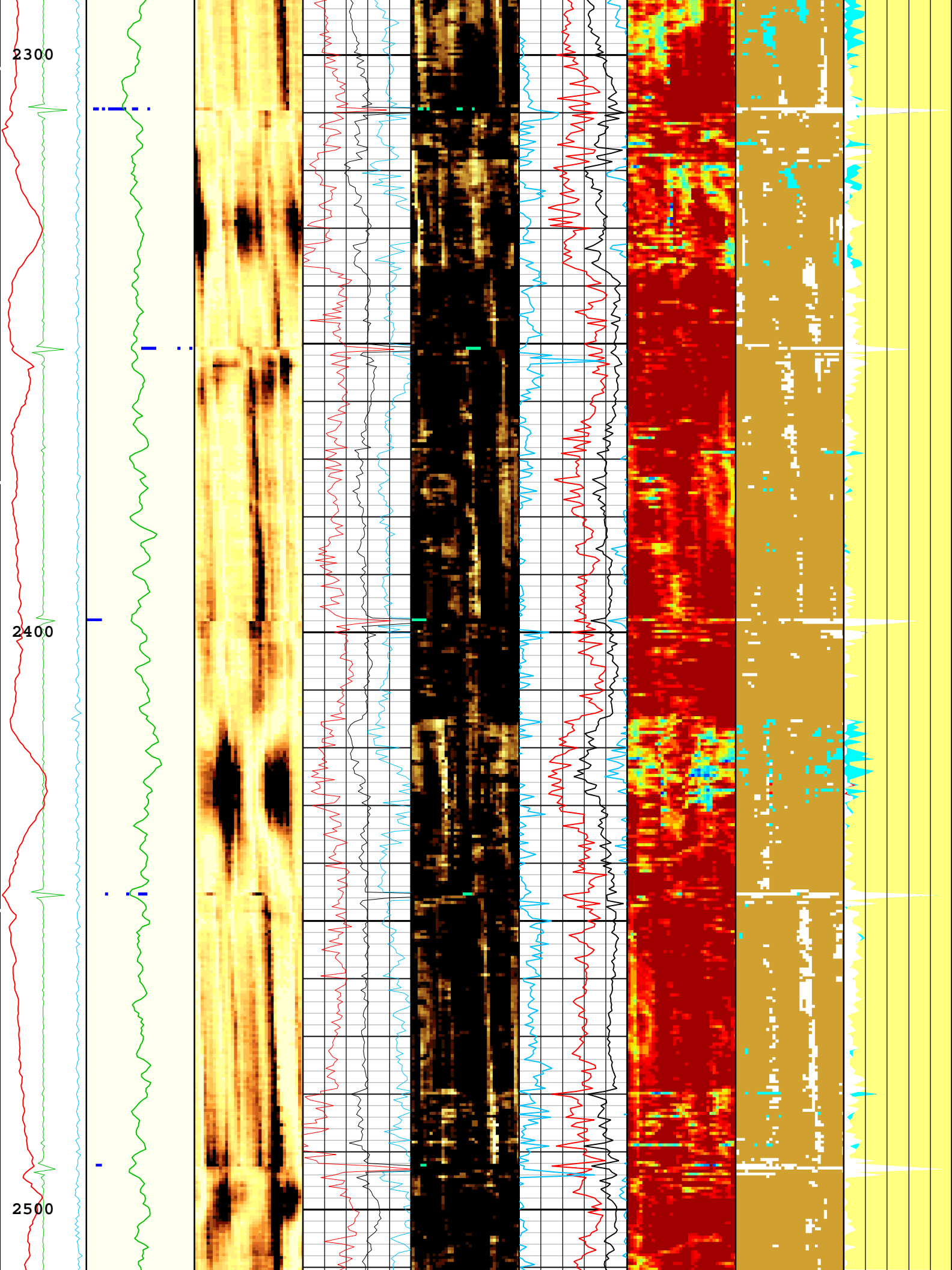




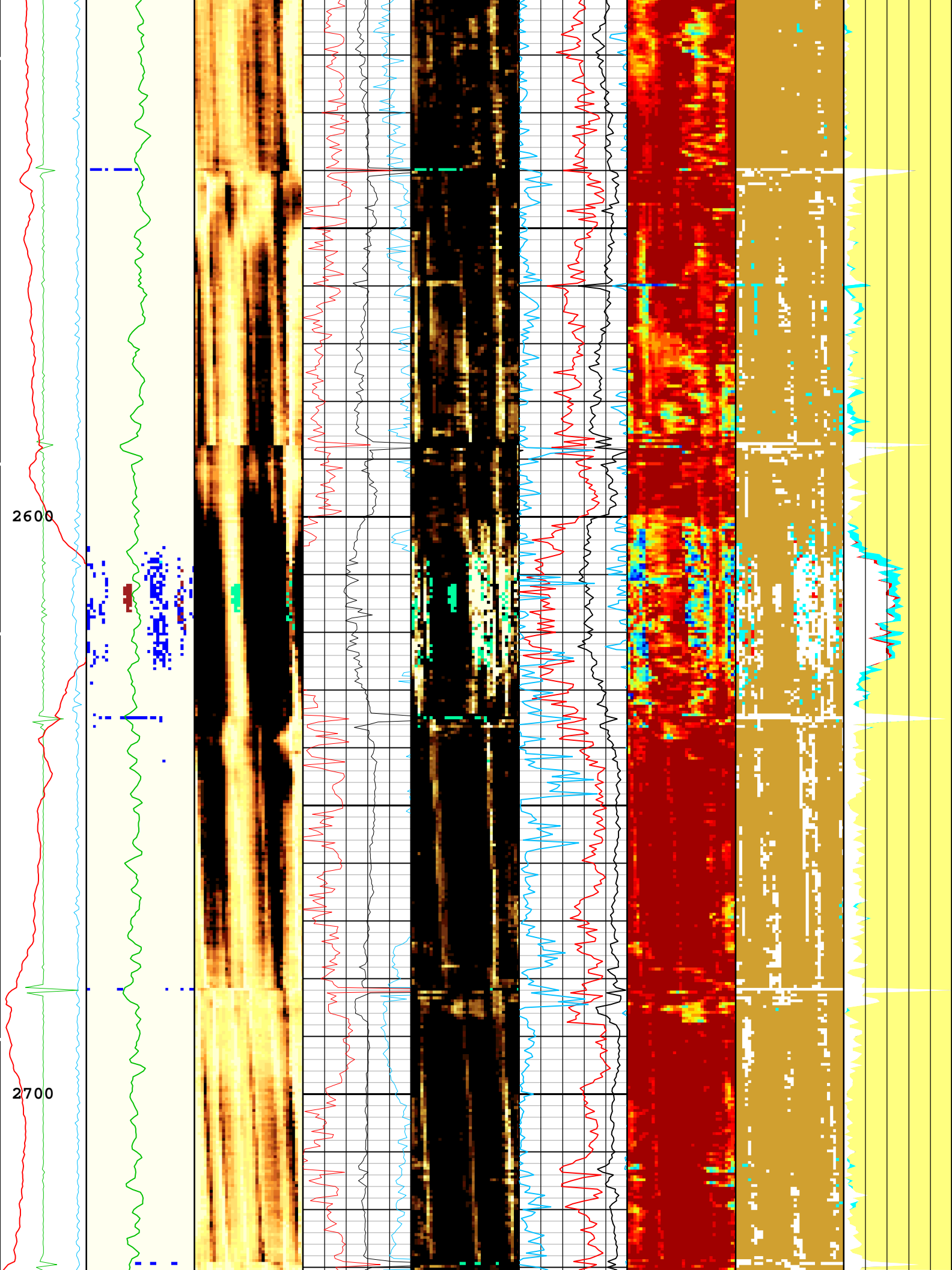


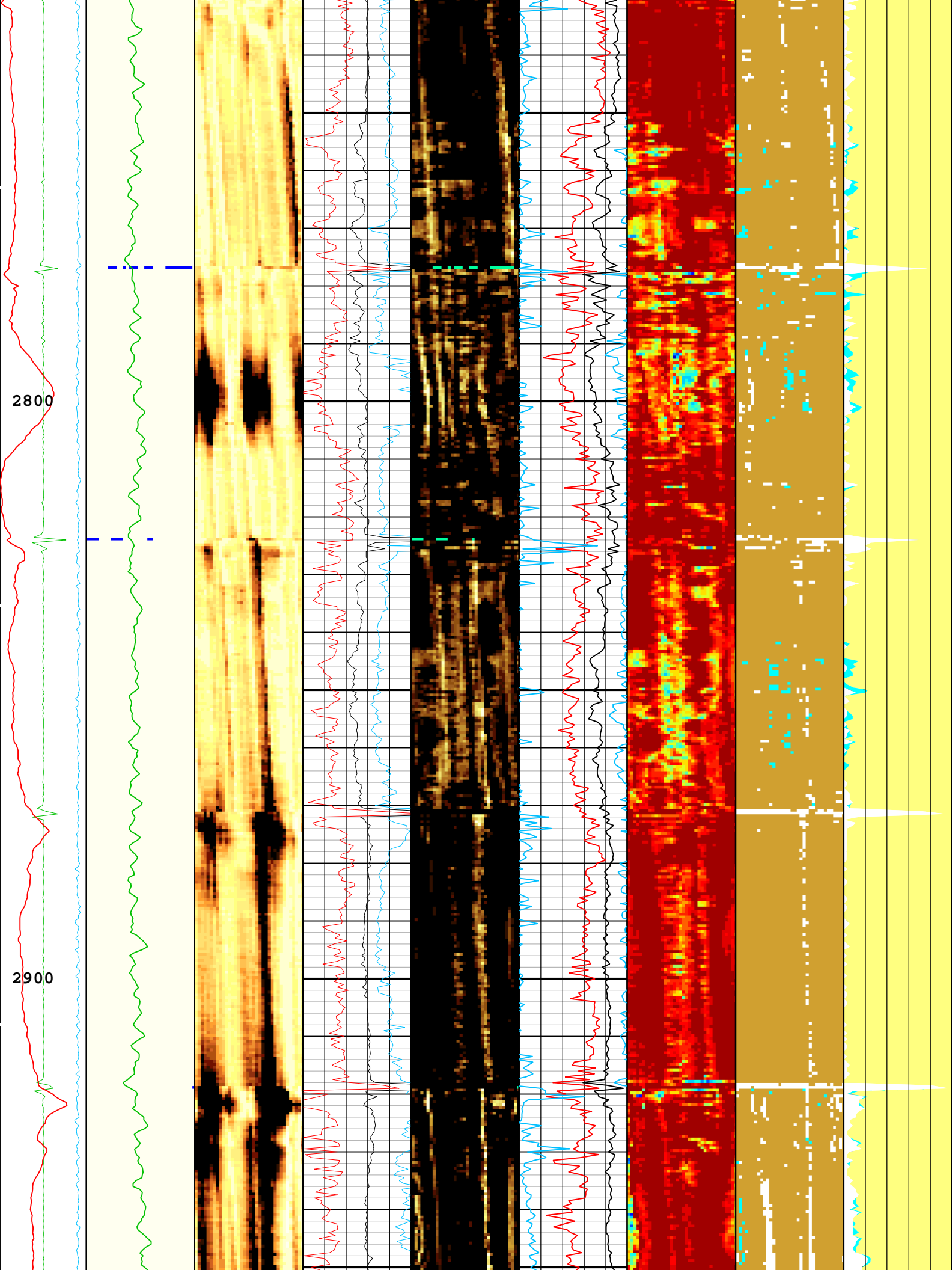


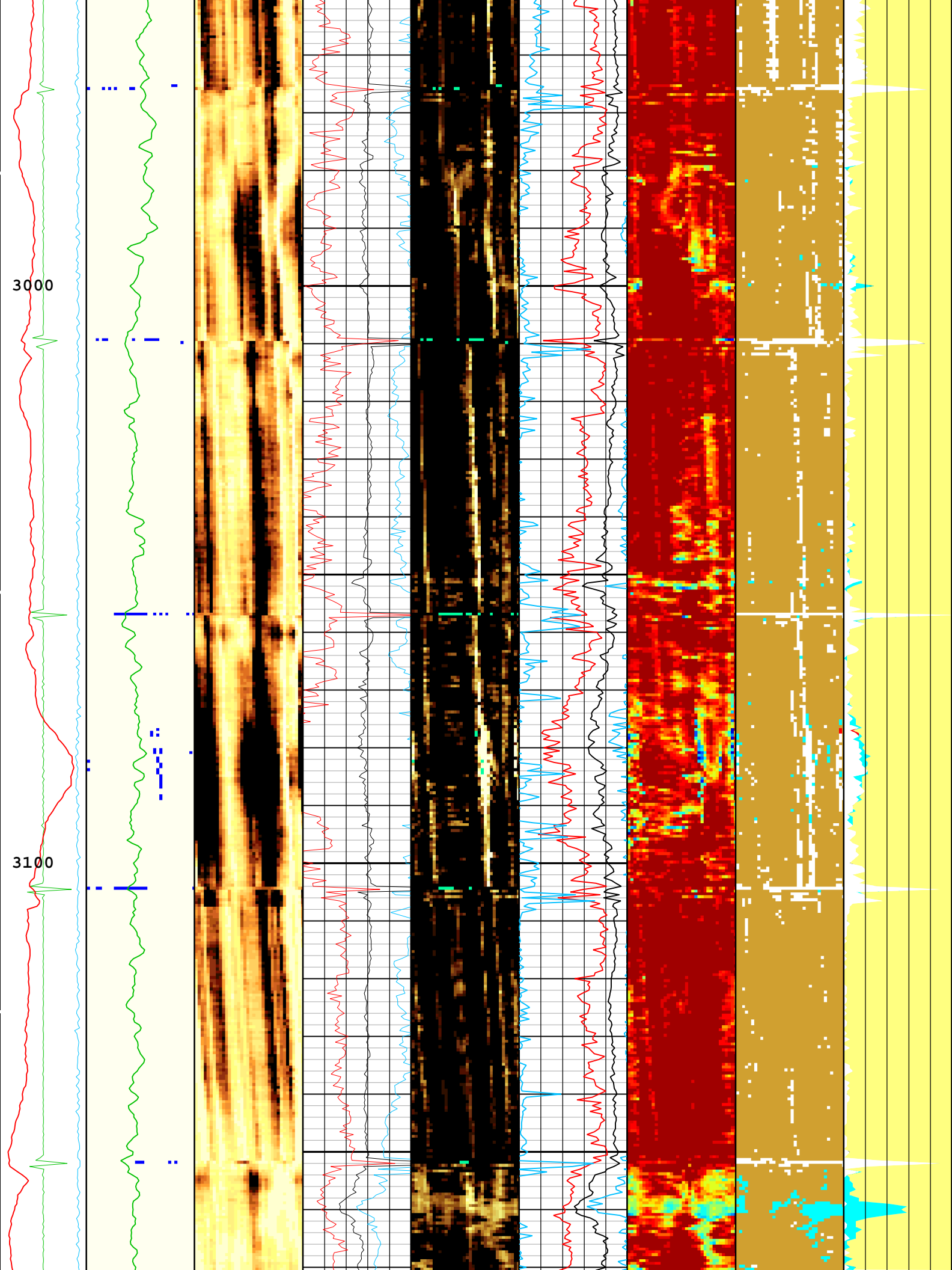


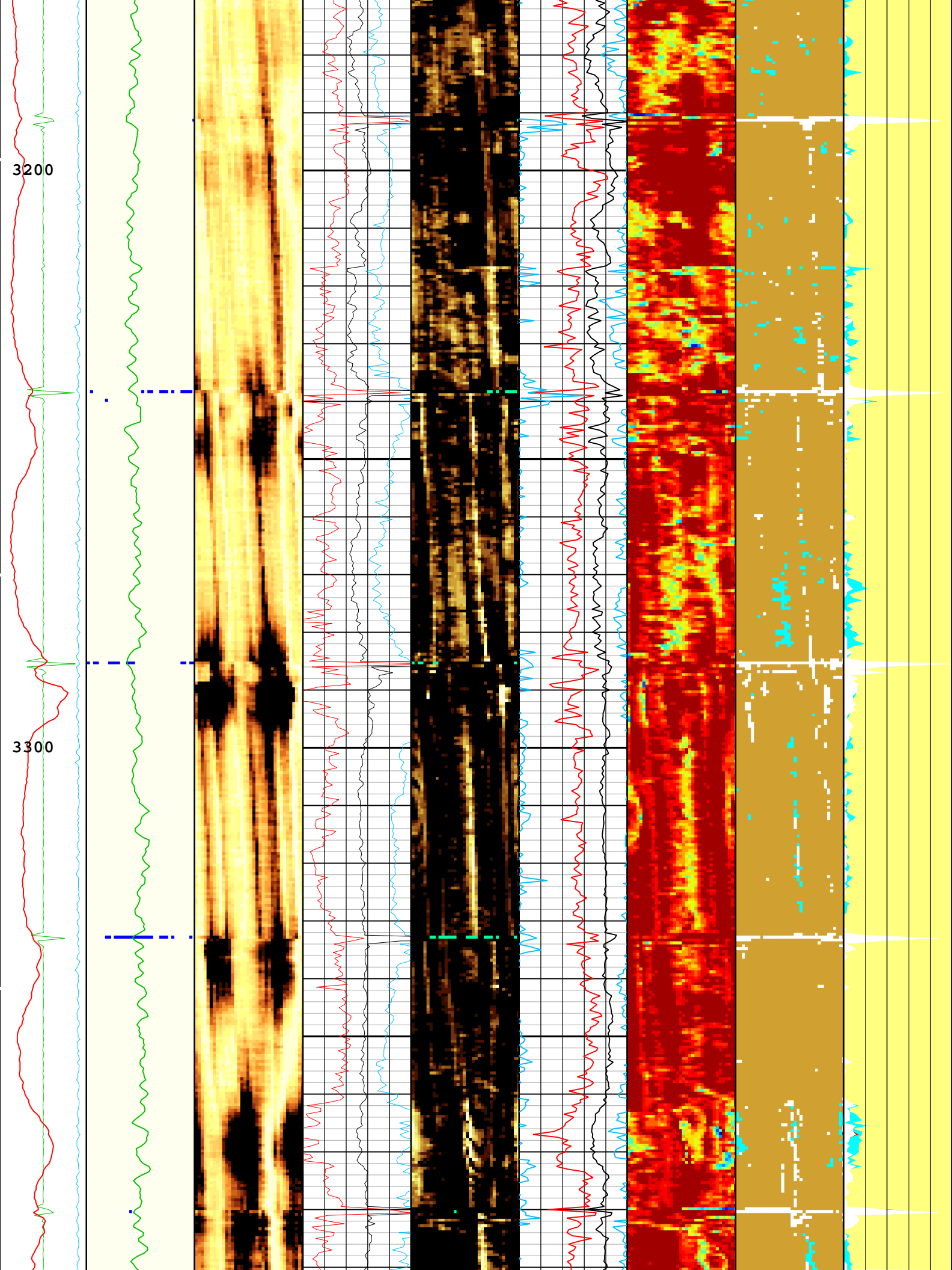


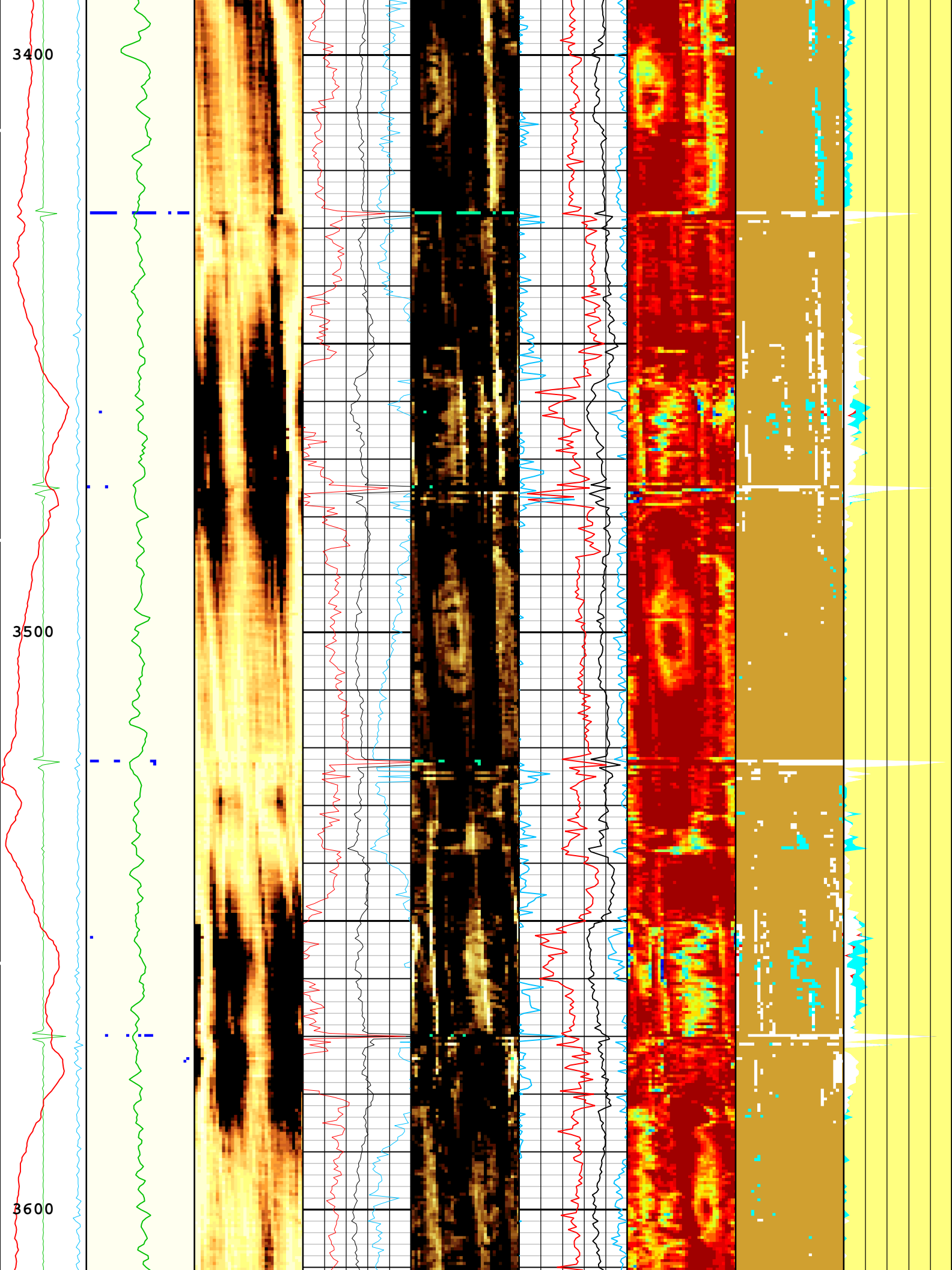


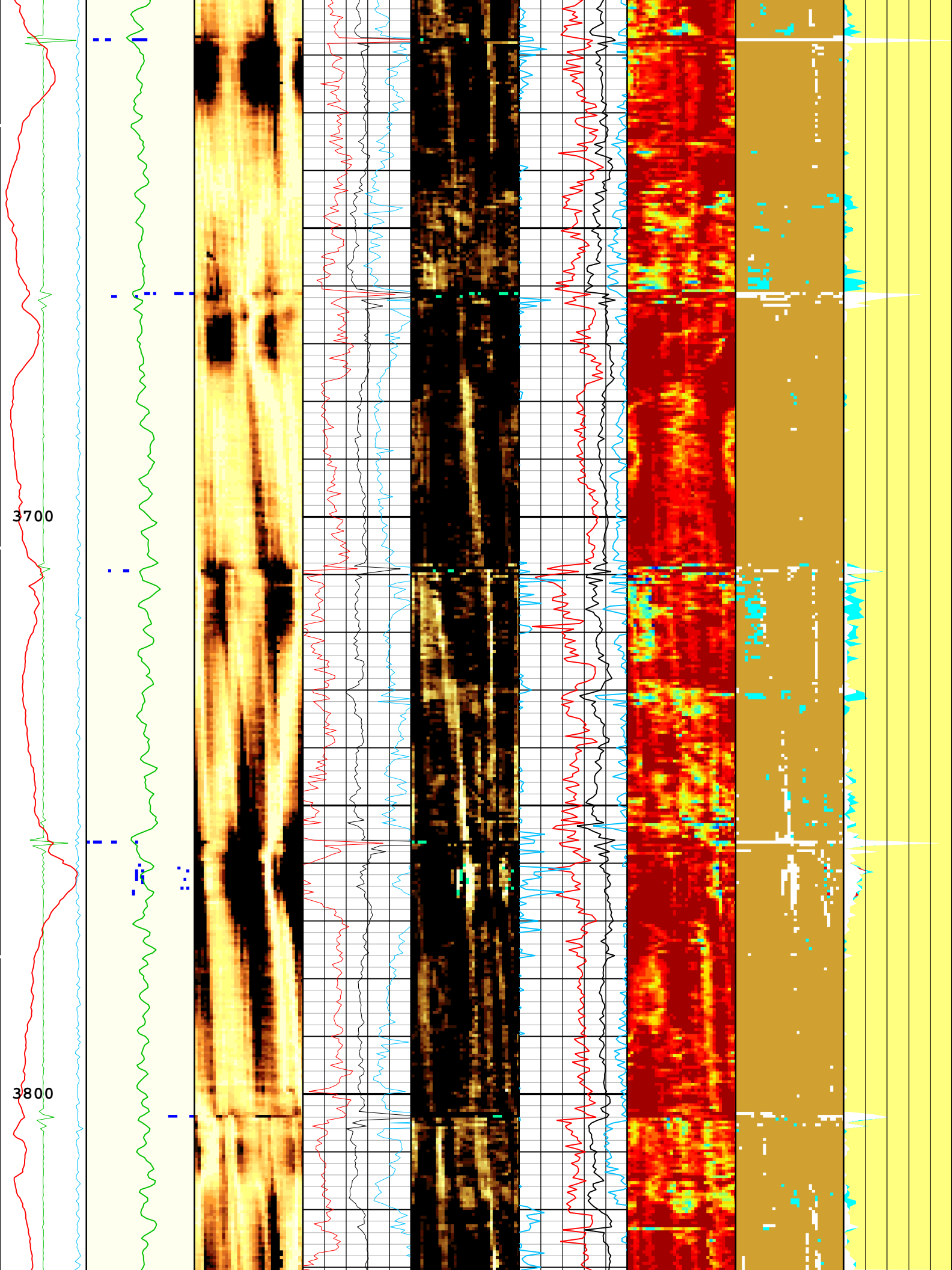




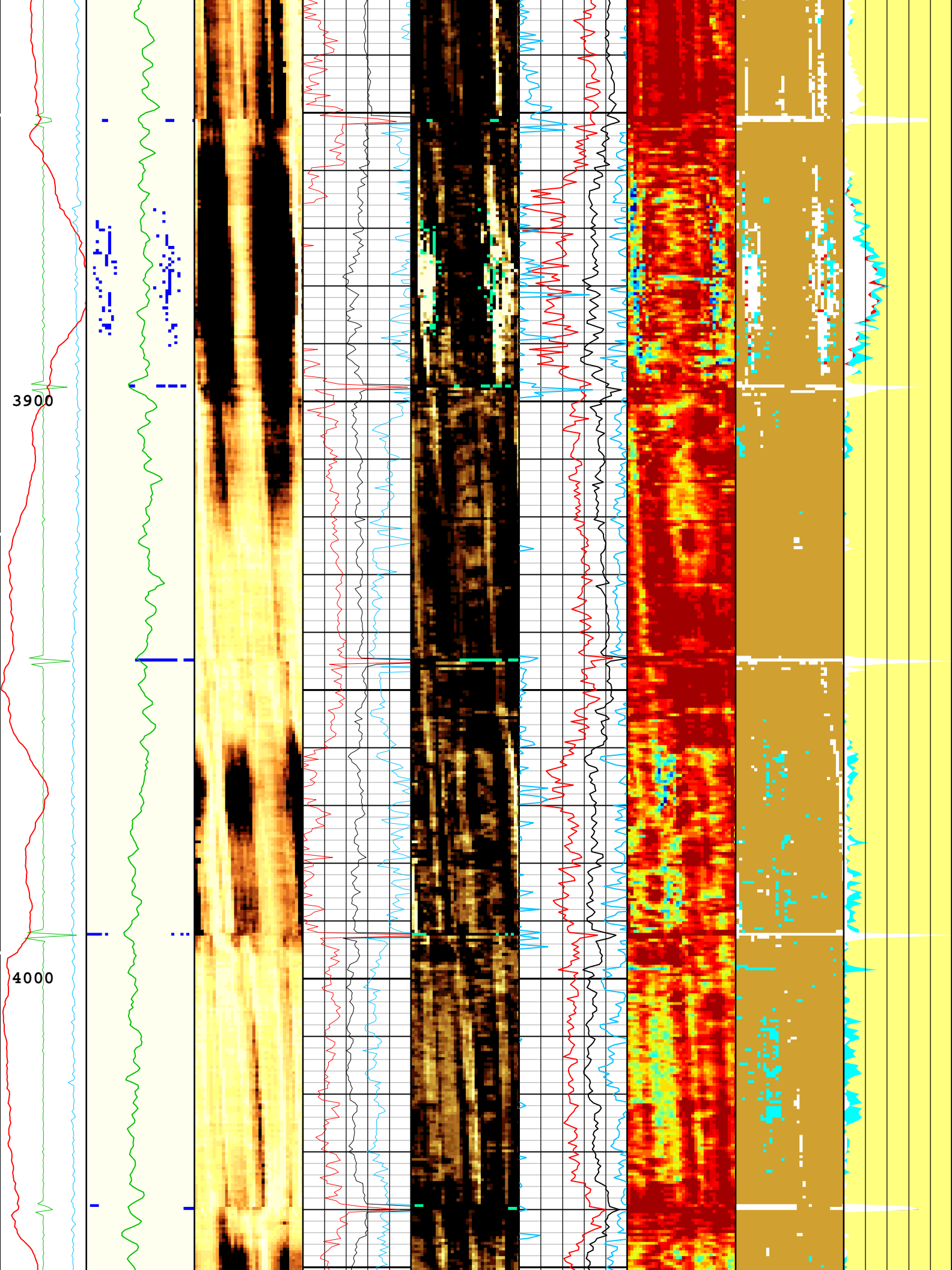


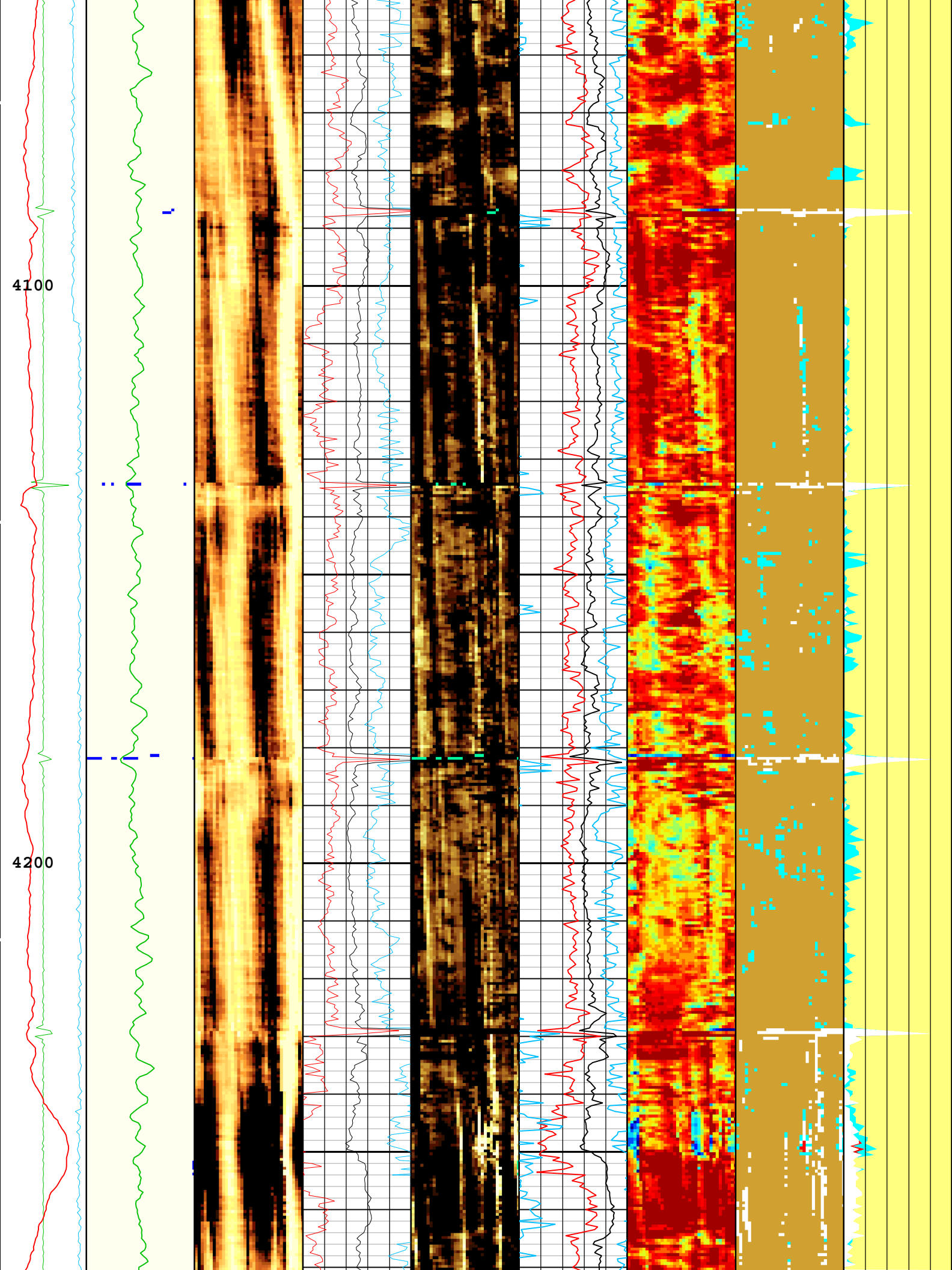




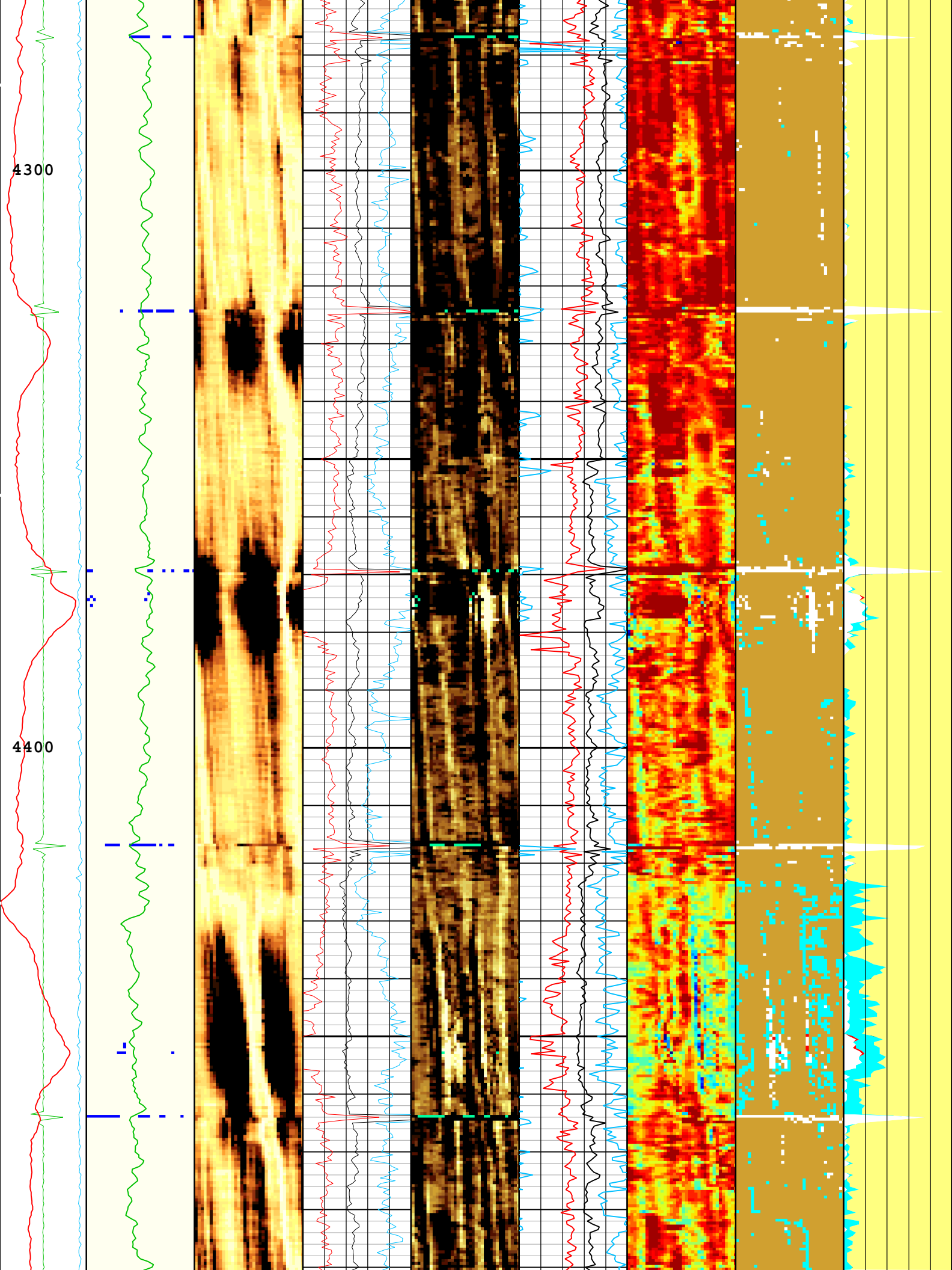


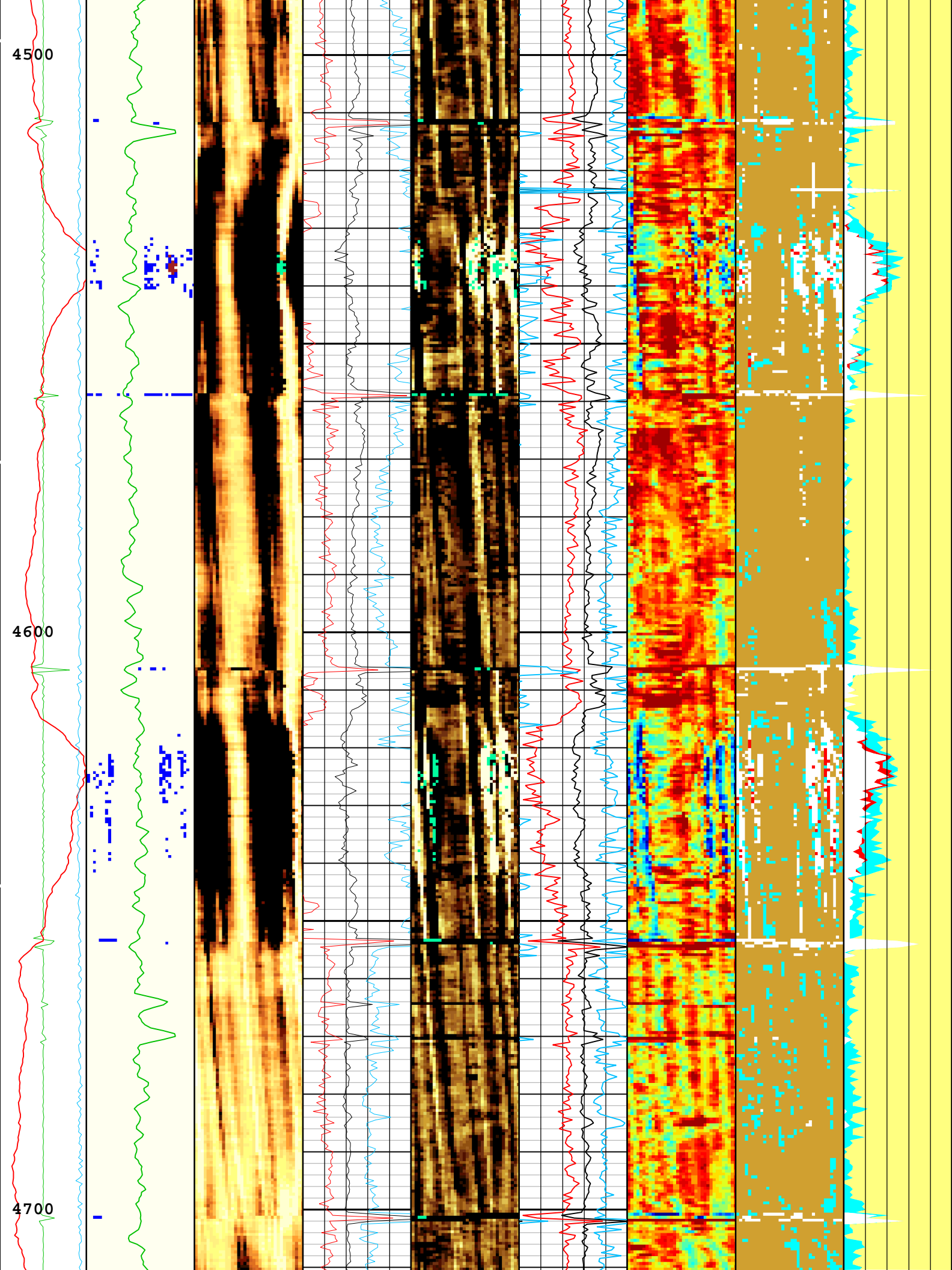


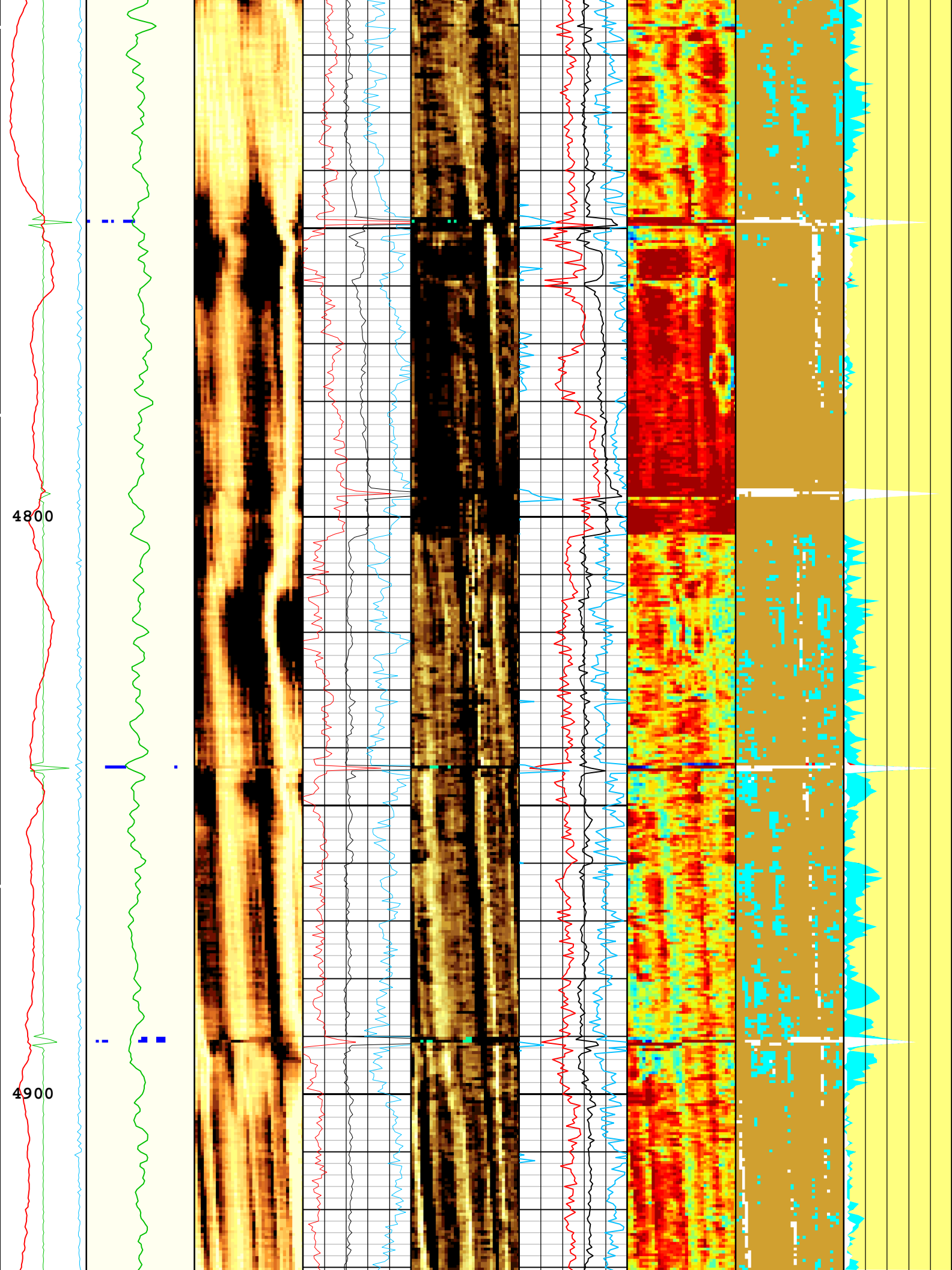


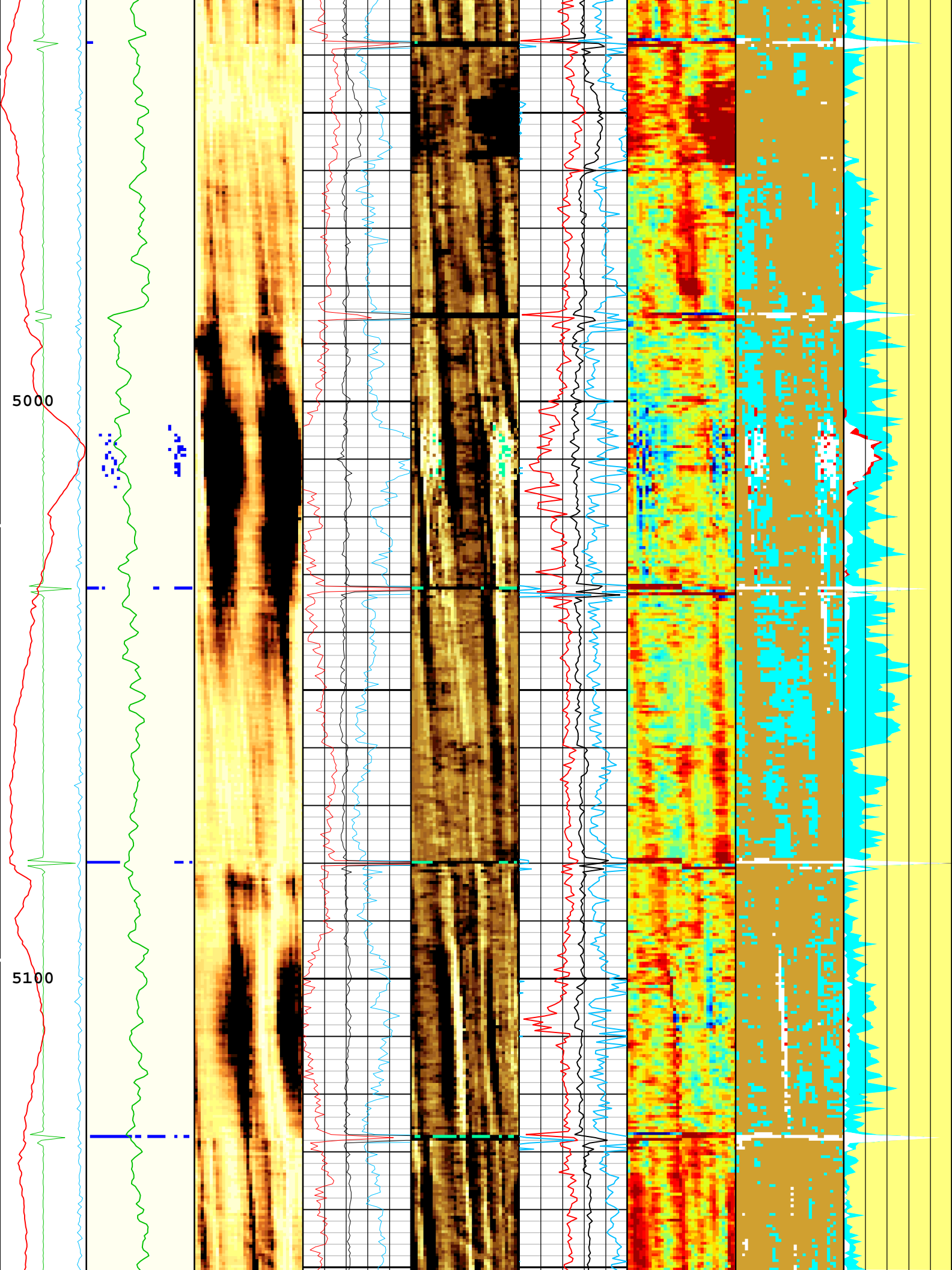


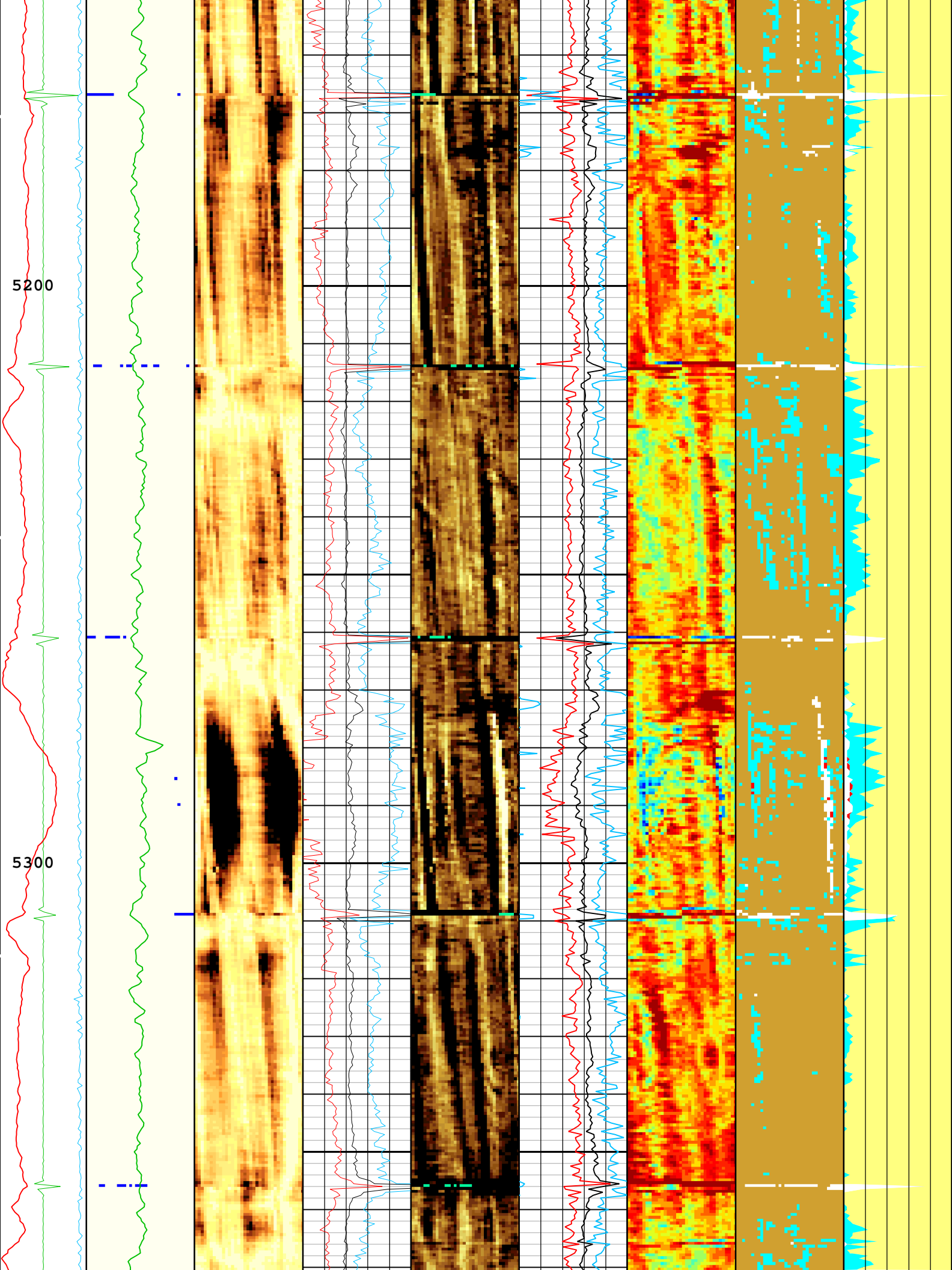




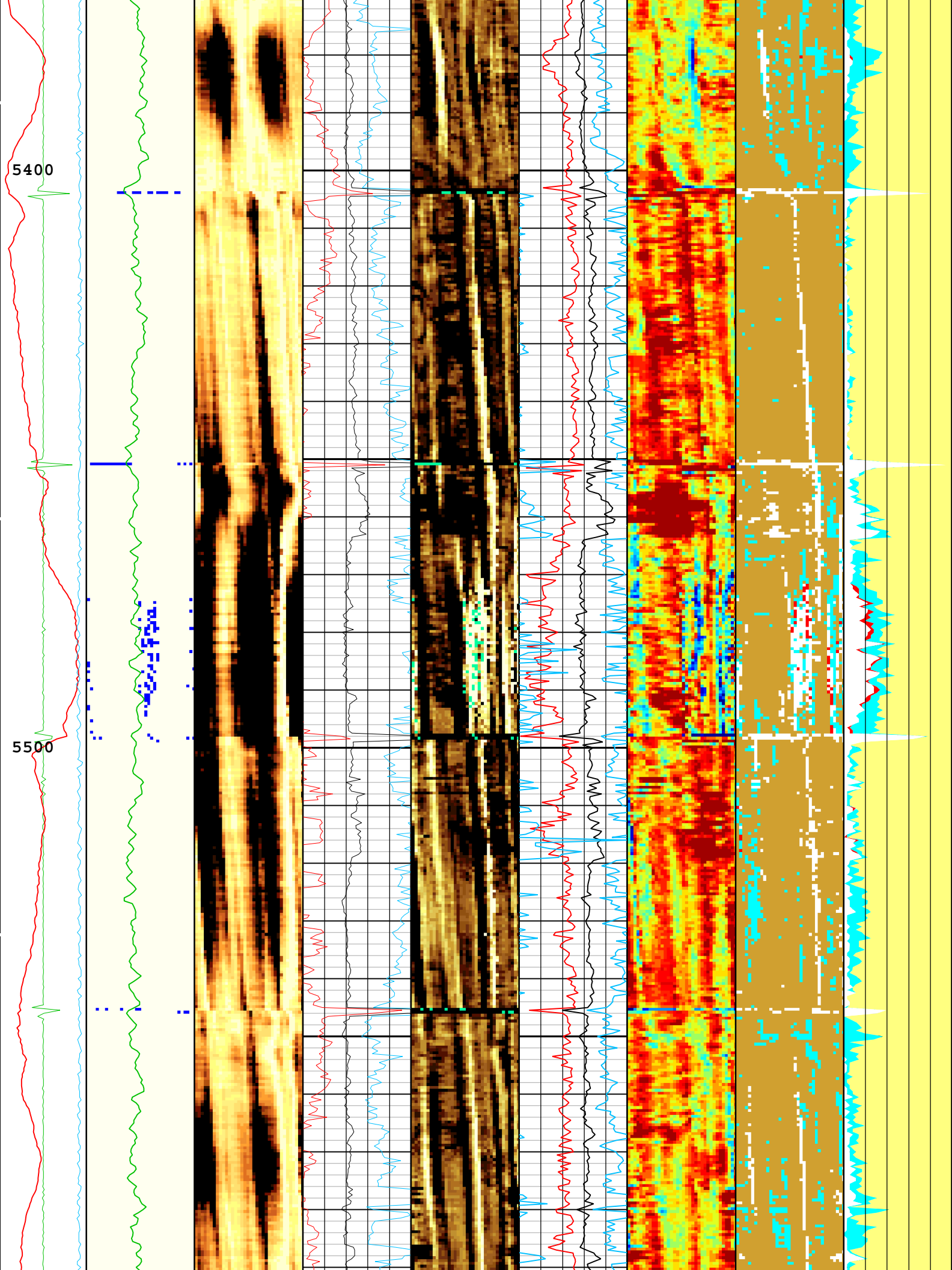


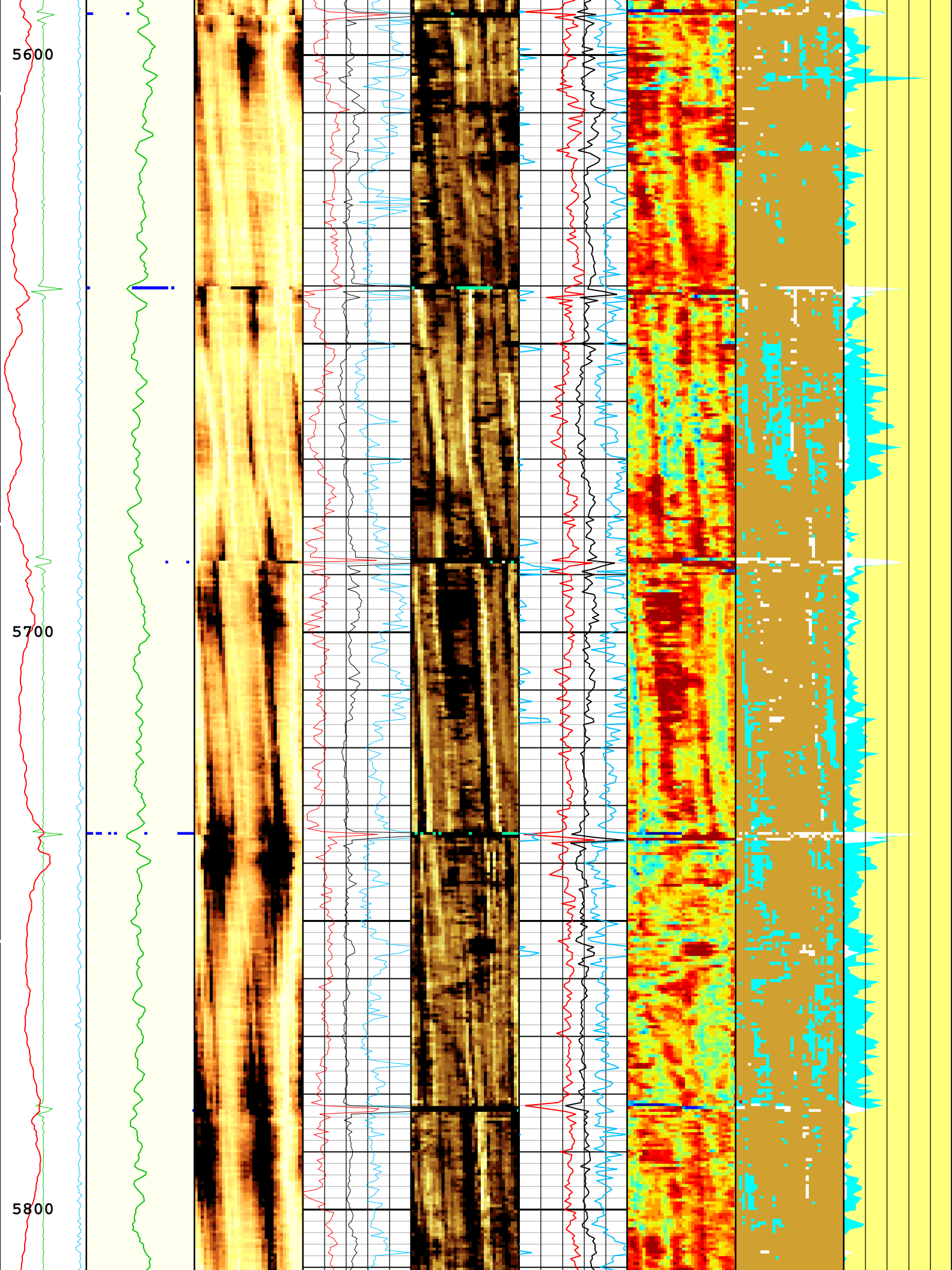


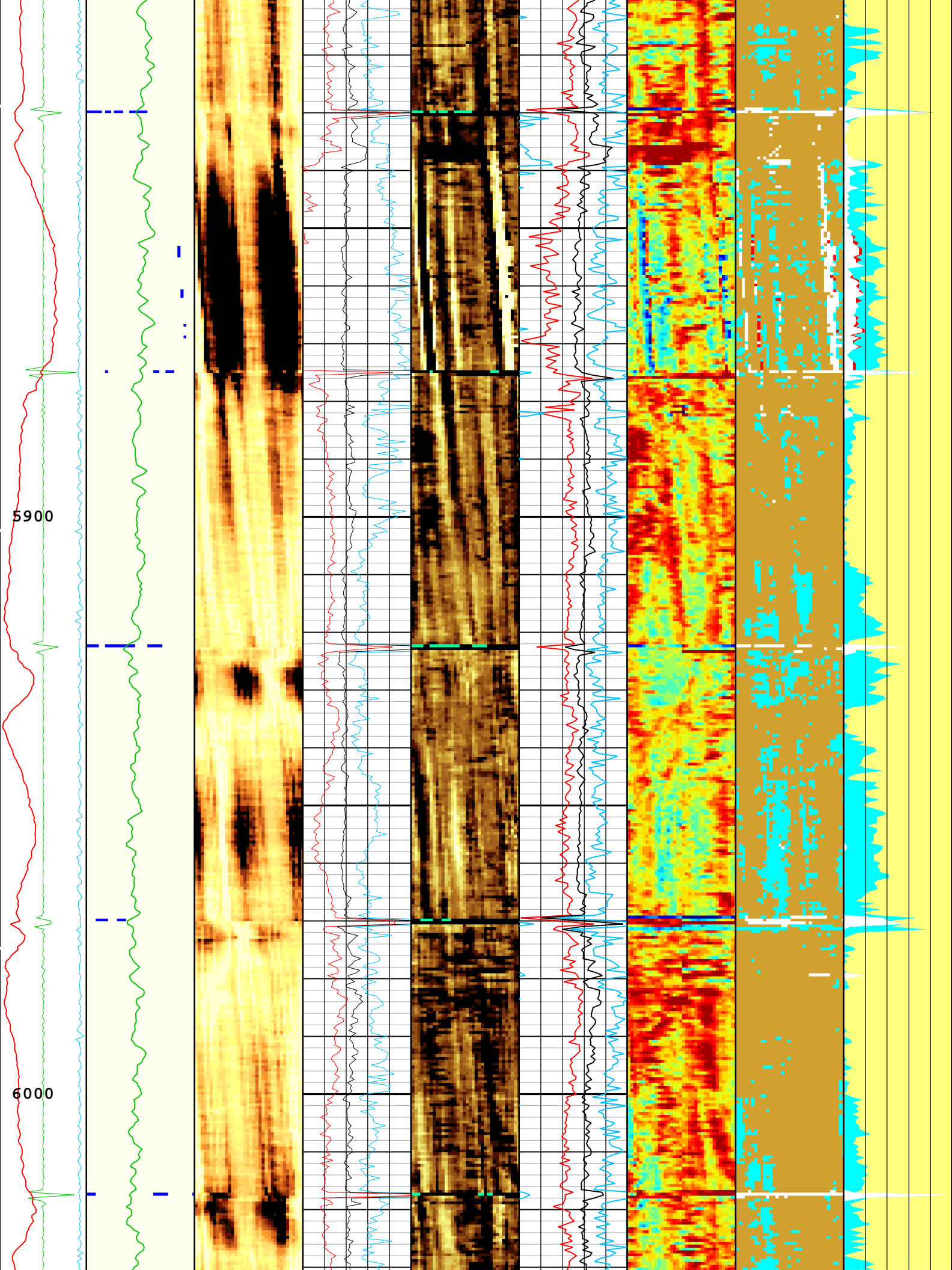




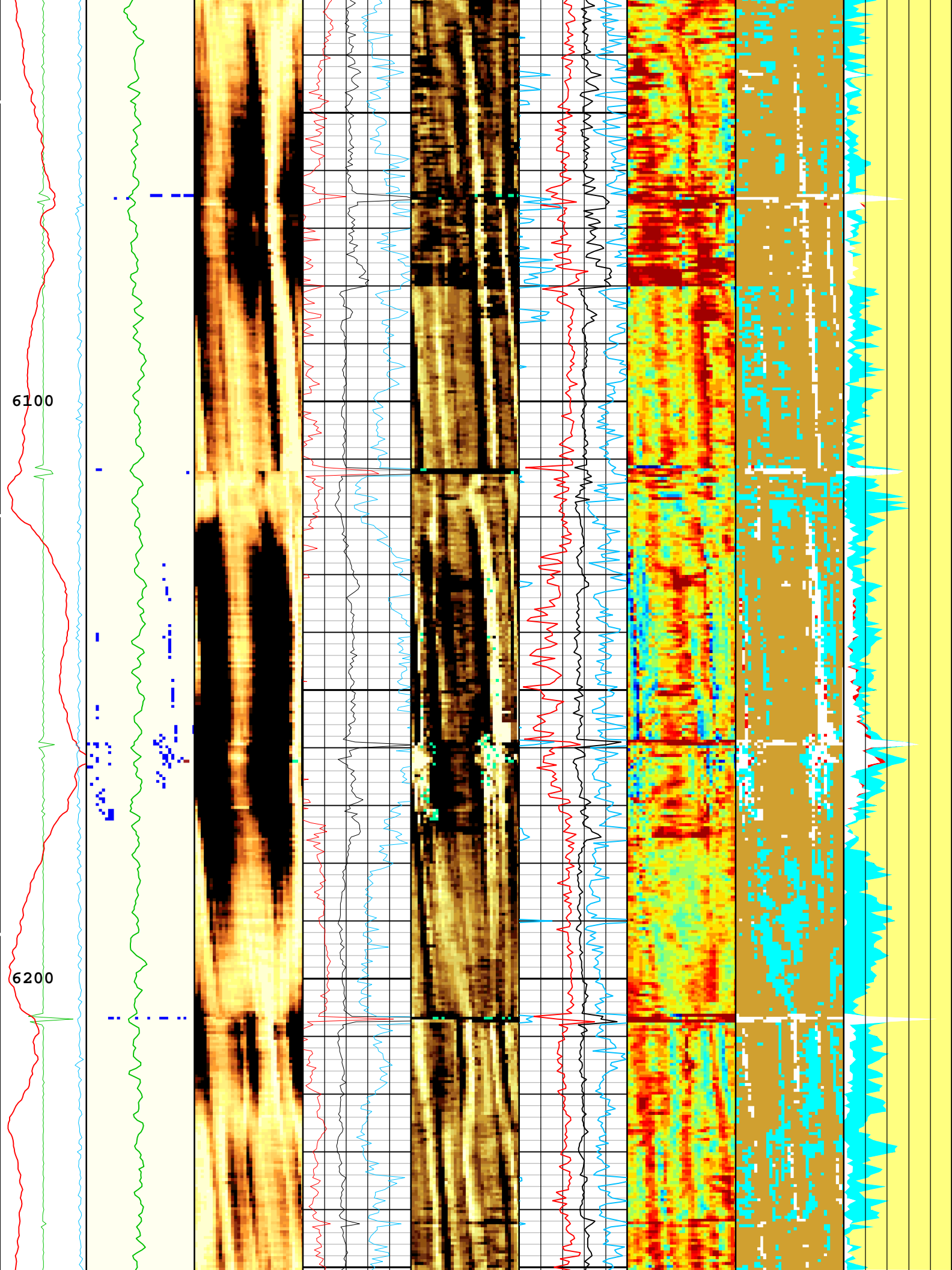


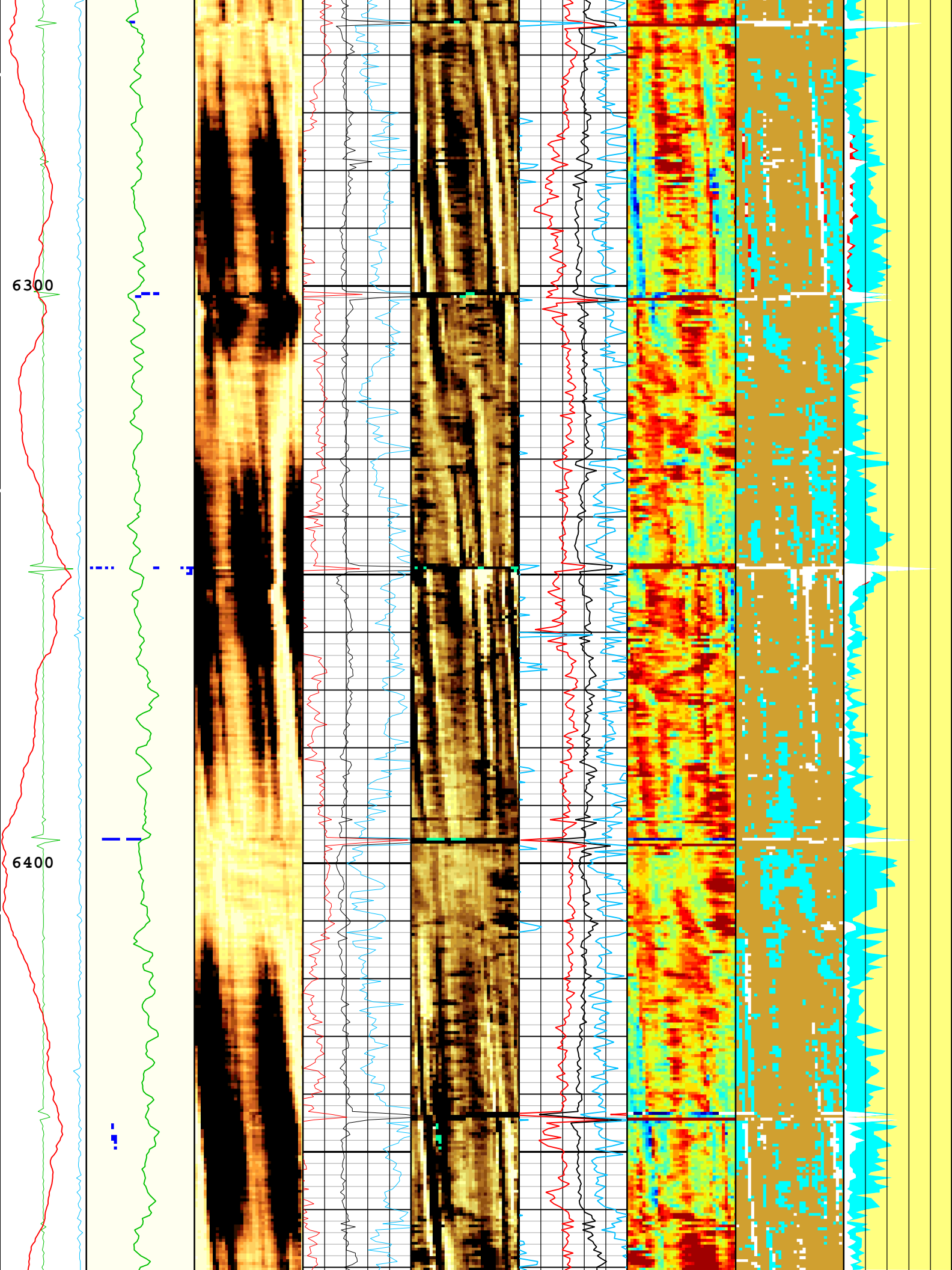


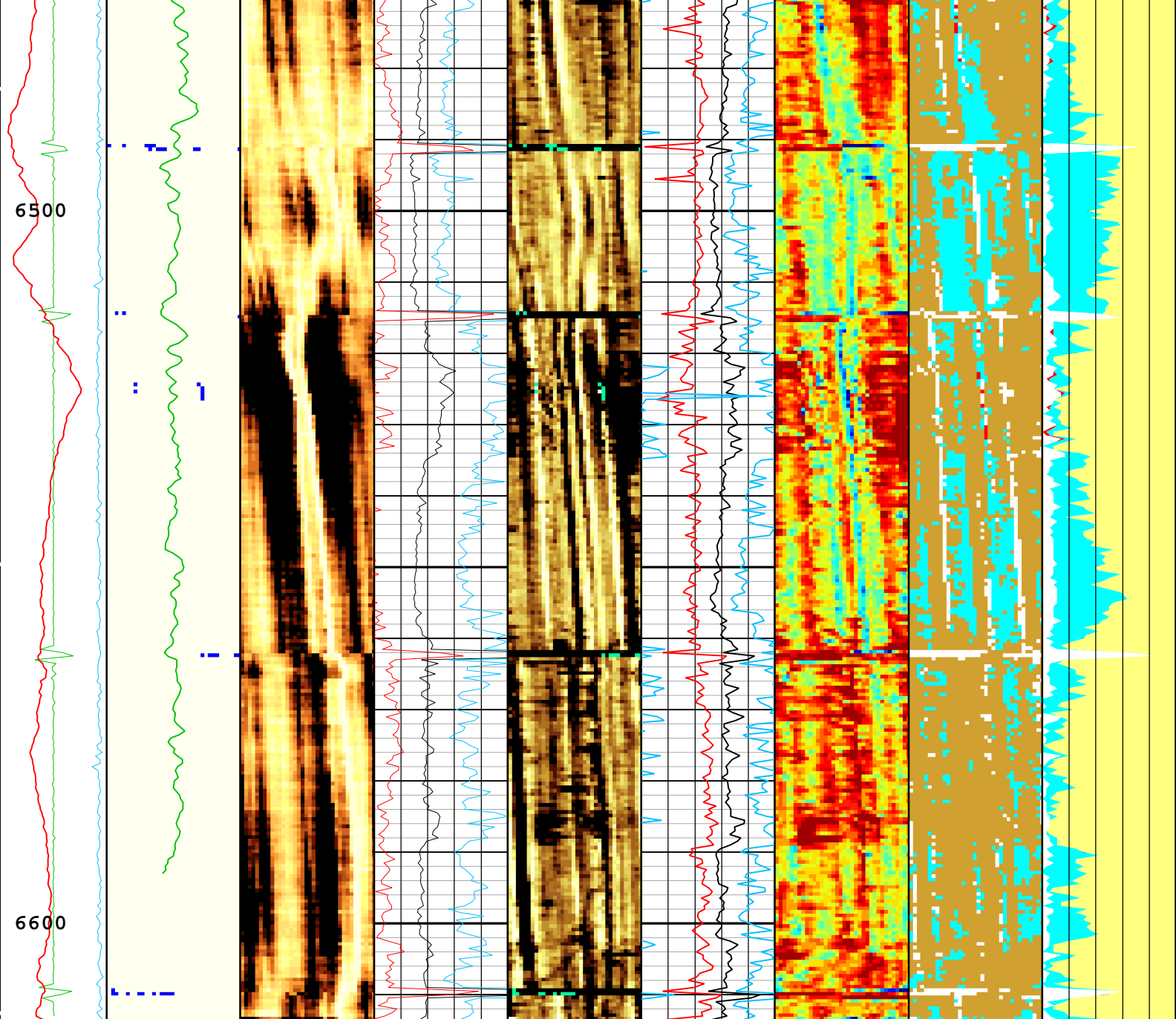

















<div>Casing Collar Locator (CCLU) USIT-E</div> <div>-20 in 20</div>	<div>Amplitude of Eccentering (ECCE) USIT-E</div> <div>0 in 0.5</div>	<div>Motor Revolution Speed (RSAV) USIT-E</div> <div>6 c/s 7.5</div>	<div>Gamma Ray (ECGR_EDTC) EDTC-B</div> <div>0 gAPI 150</div>	<div>Acoustic Impedance Minimum (AIMN) USIT-E</div> <div>-1 Mrayl 9</div>	<div>Acoustic Impedance Average (AIAV) USIT-E</div> <div>-1 Mrayl 9</div>	<div>Acoustic Impedance Maximum (AIMX) USIT-E</div> <div>-1 Mrayl 9</div>	<div>Minimum Flexural Attenuation (U-USIT_UFAN) USIT-E</div> <div>0 dB/m 150</div>	<div>Average Flexural Attenuation (U-USIT_UFAV) USIT-E</div> <div>0 dB/m 150</div>	<div>Maximum Flexural Attenuation (U-USIT_UFAX) USIT-E</div> <div>0 dB/m 150</div>	<div>USIT - Solid Liquid Gas Sorted Color Map (USLP) USIT-E</div>	<div>SLG Solid Index</div>	<div>SLG Liquid Index</div>	<div>SLG Gas Index</div>	<div>SLG White Point Index</div>
---------------------------------------------------------------------	-----------------------------------------------------------------------	----------------------------------------------------------------------	---------------------------------------------------------------	---------------------------------------------------------------------------	---------------------------------------------------------------------------	---------------------------------------------------------------------------	------------------------------------------------------------------------------------	------------------------------------------------------------------------------------	------------------------------------------------------------------------------------	-------------------------------------------------------------------	----------------------------	-----------------------------	--------------------------	----------------------------------

TIME\_1900 - Time Marked every 60.00 (s)

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

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

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

- 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

Description: USI IBC SLG    Format: Log ( IBC SLG )    Index Scale: 5 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation Date: 21-Jan-2019 11:22:00

Channel Processing Parameters

Isolation Scanner: Parameters

Parameter	Description	Tool	Value	Unit
BARI(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	12122	ft
CDEN	Cement Density	USIT-E	12.5	lbm/gal
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Light 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
FD	Fluid Density	USIT-E	10	lbm/gal
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)	
GR_MULTIPLIER	Gamma Ray Multiplier	EDTC-B	1	
HEMA	Hematite Presence Flag	Borehole	No	
IBC_FRP_OFFSET	IBC Flexural Offset from Free Pipe	USIT-E	30.17	dB/m
IBC_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	IBC_FRP_OFFSET	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	FreePipe Norm.	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.47	
MUD_N_INV	IBC Inversion Mud Normalization Factor	USIT-E	1.38	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.15	
RCOD	Reference Calibrator Outer Diameter	USIT-E	4.5	in
RCSO	Reference Calibrator Standoff	USIT-E	0.842	in
RCTH	Reference Calibrator Thickness	USIT-E	0.216	in
SOCN	Standoff Distance	EDTC-B	0.125	in
SOCO	Standoff Correction Option	EDTC-B	No	
THDH	Maximum Search Thickness (percentage of nominal)	USIT-E	130	%
THDL	Minimum Search Thickness (percentage of nominal)	USIT-E	70	%
TPOS_EDTC	Tool Position: Centered or Eccentered	EDTC-B	Eccentered	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.86	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	-4.85	dB/m
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SolidLiquidGasMap	
USI_RPLUS	Ultrasonic R+ Processing	USIT-E	No	

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	11.5	83	2021
BS	8.5	2021	6614.5

All depth are actual.

### Tool Control Parameters

### Isolation Scanner: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	48	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
DOT(DOS)	Distance between Opposite Transducer Faces	USIT-E	1.756	in
EMXV	EMEX Voltage	USIT-E	20	V
HRES	Horizontal Resolution	USIT-E	10 deg	
IBC_ACQTYPE	IBC Acquisition type	USIT-E	1 MHz	
IBC_FLEXDBP	IBC Flex Duration Before Peak	USIT-E	30	us
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
MOTOR_PROTECT	Motor Protection	USIT-E	On	
UACLV_PERM	Ultrasonic ACLV Permanent	USIT-E	Yes	
U-USIT_UFWB	Far Receiver Window Begin Time	USIT-E	137	us
U-USIT_UFWE	Far Receiver Window End Time	USIT-E	177	us
U-USIT_UNWB	Near Receiver Window Begin Time	USIT-E	106	us
U-USIT_UNWE	Near Receiver Window End Time	USIT-E	146	us
USFR	Ultrasonic Sampling Frequency	USIT-E	666667	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 6.0 in	
USSP	Ultrasonic Service	USIT-E	IBC	
U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VRES	Vertical Resolution	USIT-E	6.0 in	
WINB	Window Begin Time	USIT-E	31.88	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 )
WINE	71.88	20-Jan-2019 09:14:53	20-Jan-2019 09:43:37	6615.16	4524.99
WINE	73.67	20-Jan-2019 09:43:37	20-Jan-2019 10:46:50	4524.99	104.63

All depth are at tool zero.

### Isolation Scanner

### IBC SLG Composite

### Pass Summary



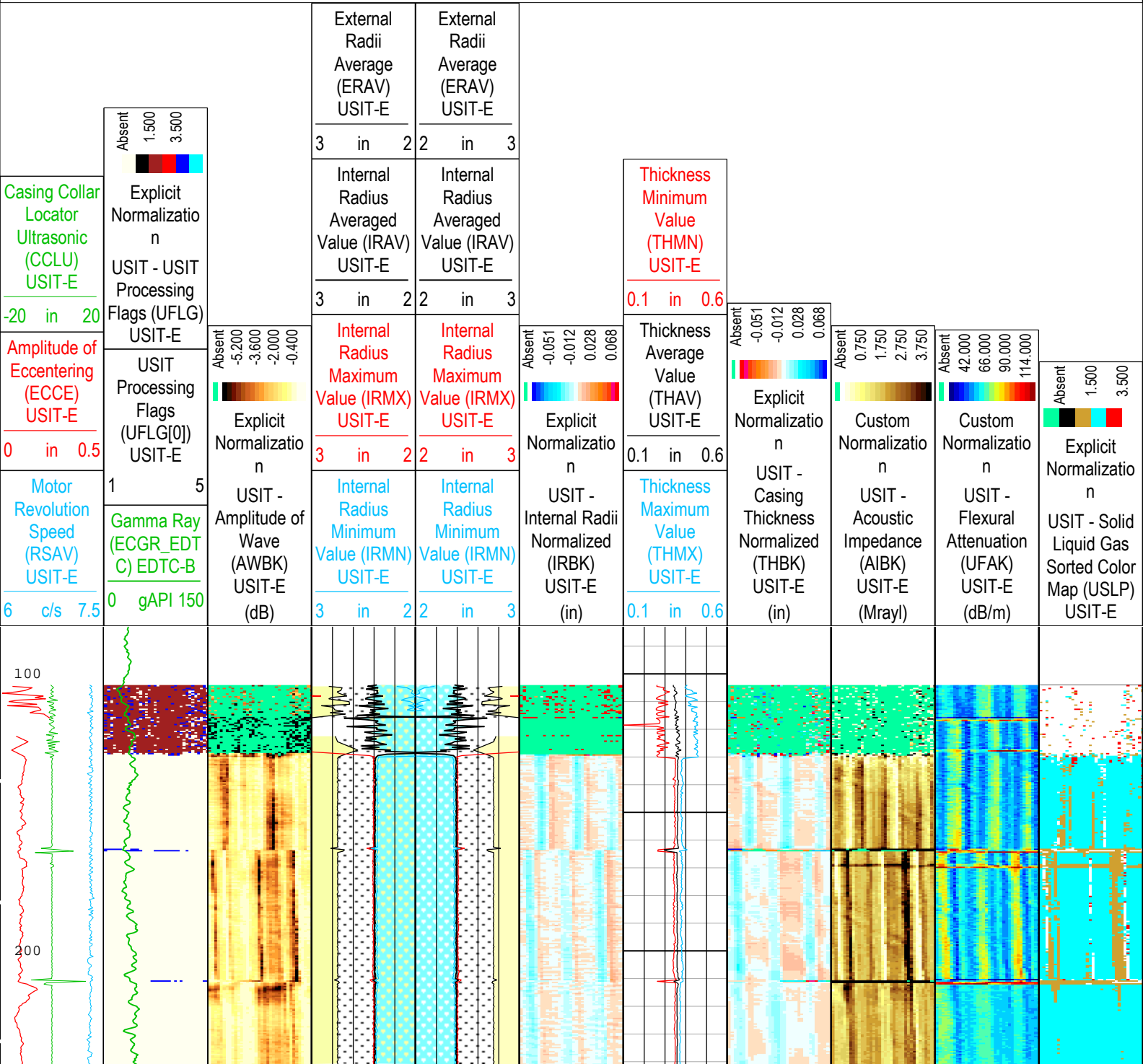
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Isolation Scanner	Log[3]:Up	Up	104.63 ft	6615.16 ft	20-Jan-2019 9:14:53 AM	20-Jan-2019 10:46:50 AM	ON	22.67 ft	Yes
All depths are referenced to toolstring zero									

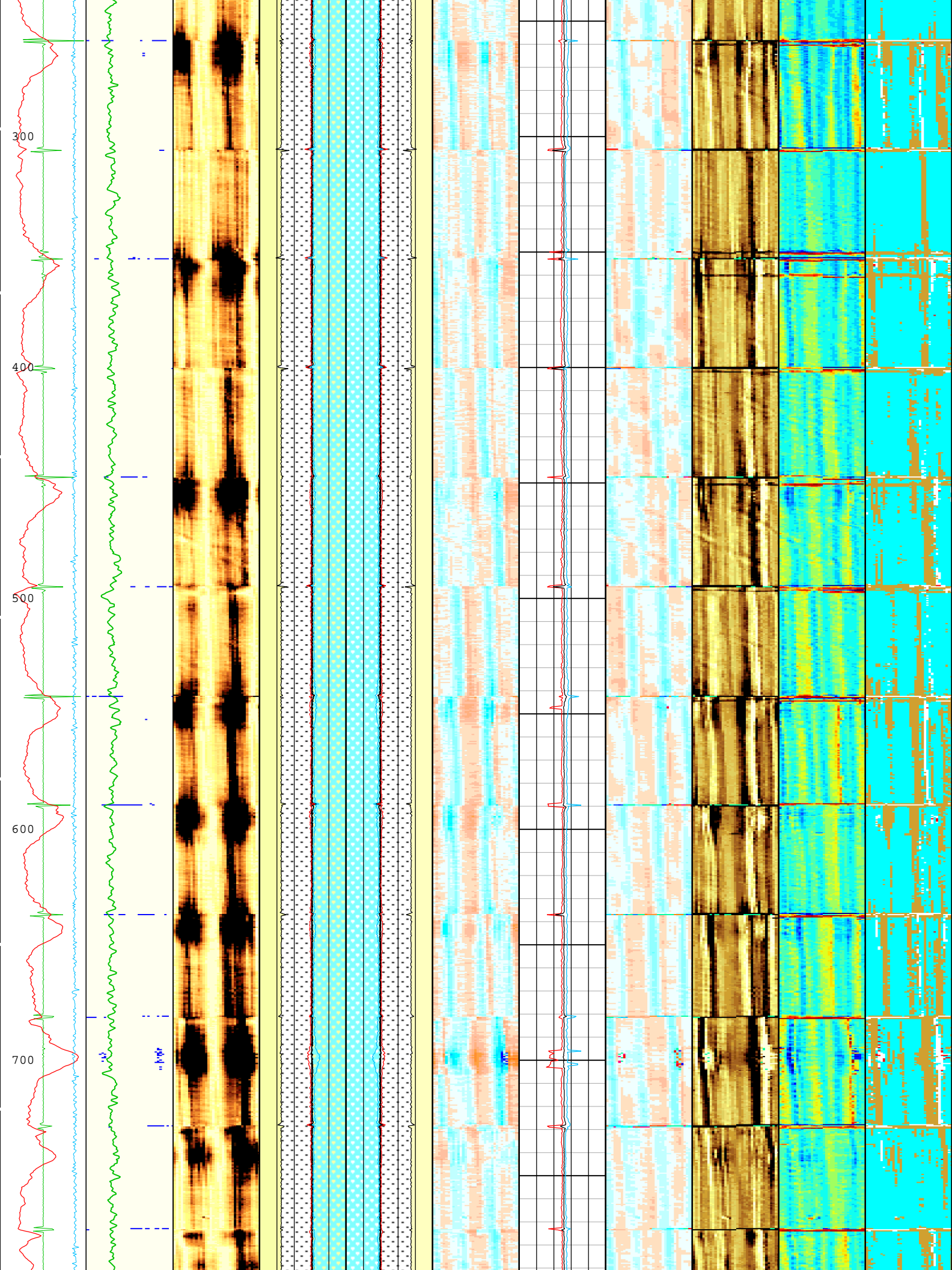
Log	Company:Crestone Peak Resources Operating LLC	Well:Herren 1B-33H-H367
	Isolation Scanner: Log[3]:Up:S012	

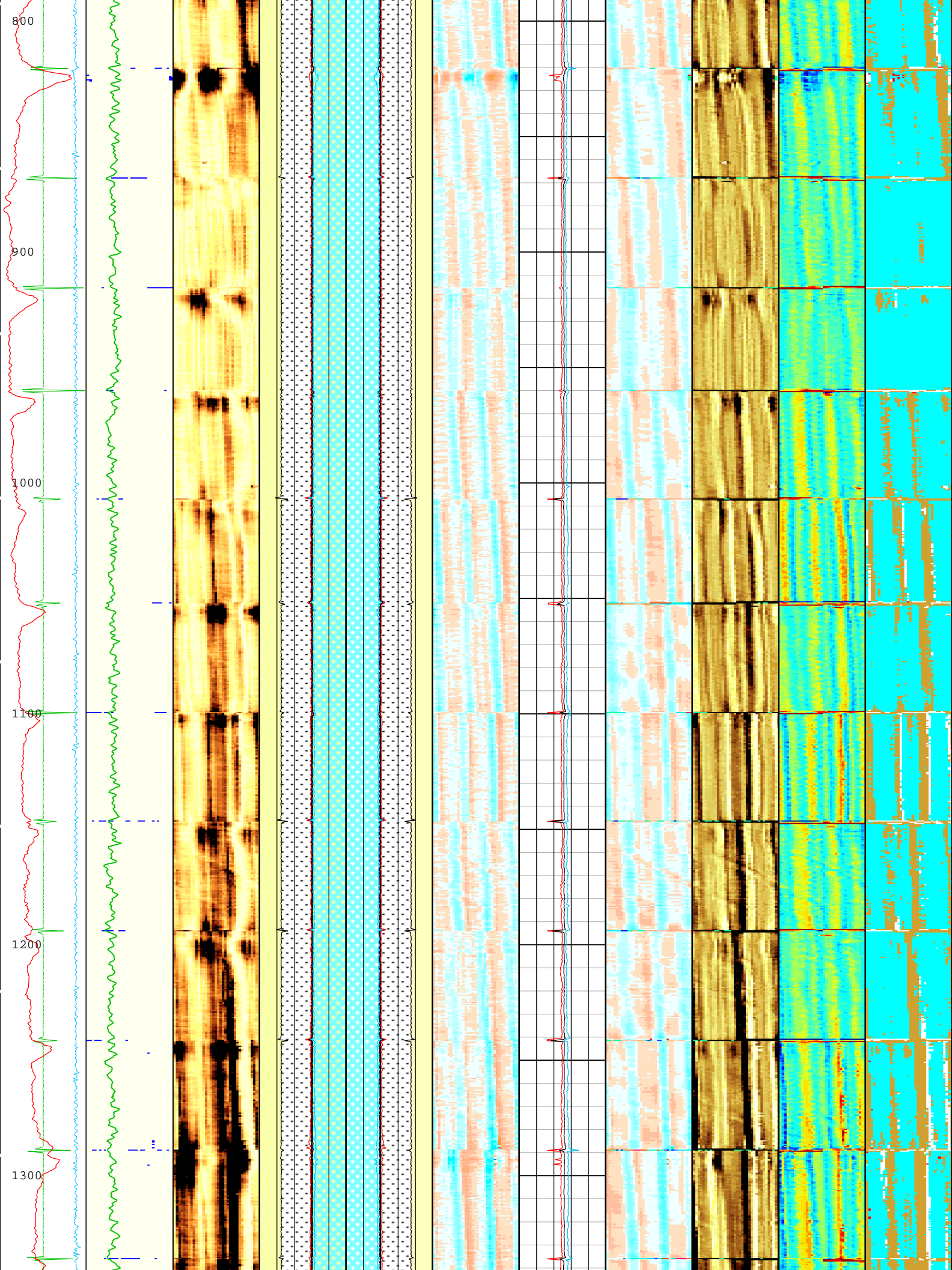
Description: USI IBC SLG Composite    Format: Log ( IBC SLG Composite )    Index Scale: 2 in per 100 ft    Index Unit: ft    Index Type: Measured Depth  
Creation Date: 21-Jan-2019 11:22:11

TIME\_1900 - Time Marked every 60.00 (s)

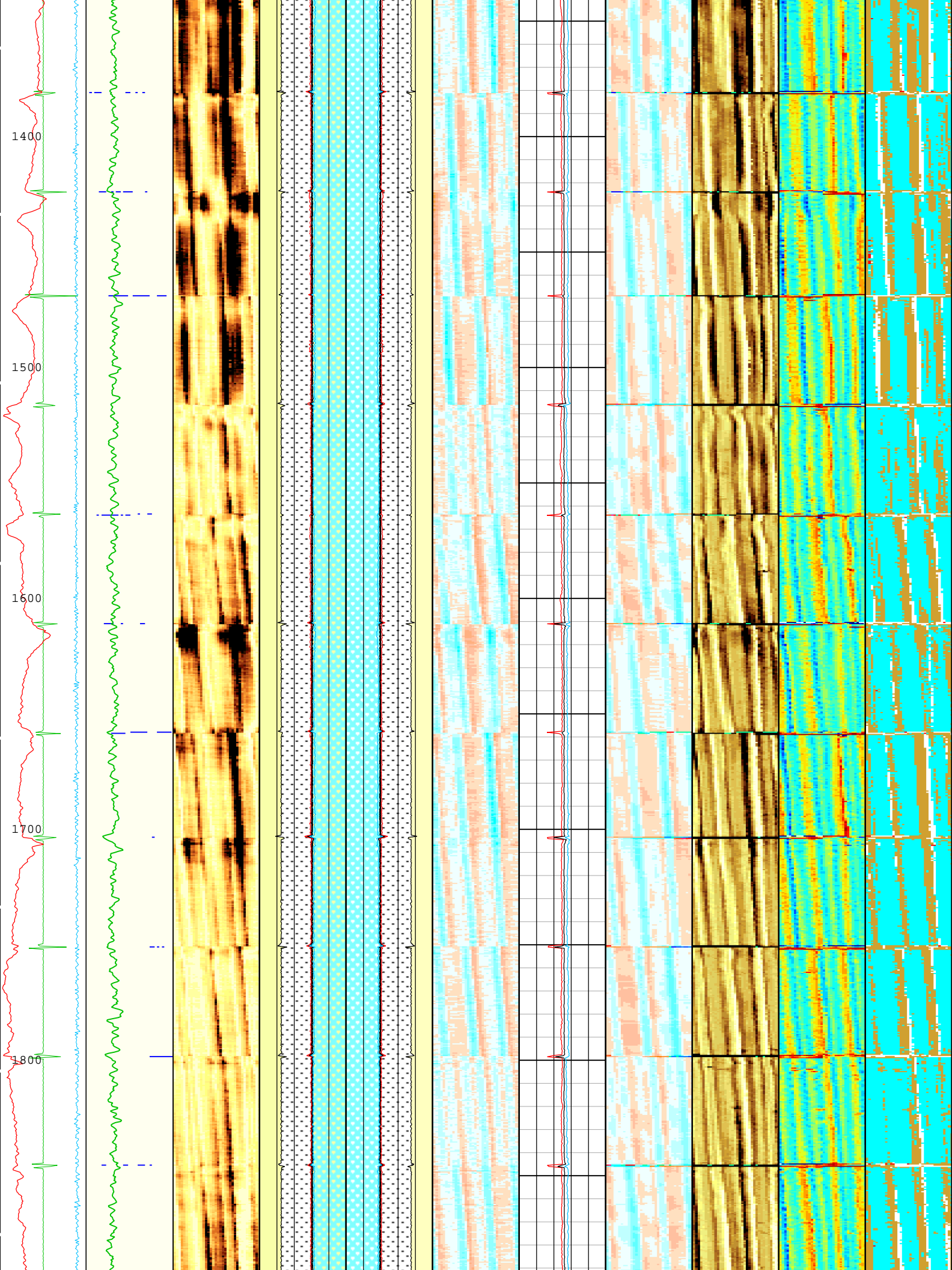
USIT Processing Flags (UFLG[0]) USIT-E									
1 - UFLG 1 Value within [0.0 - 1.5] - :				UTIM Error					
2 - UFLG 2 Value within [1.5 - 2.5] - :				Pulse Origin Not Detected					
3 - UFLG 3 Value within [2.5 - 3.5] - :				WINLEN Error					
4 - UFLG 4    UFLG 5    UFLG 6 Value within [3.5 - 6.5] - :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

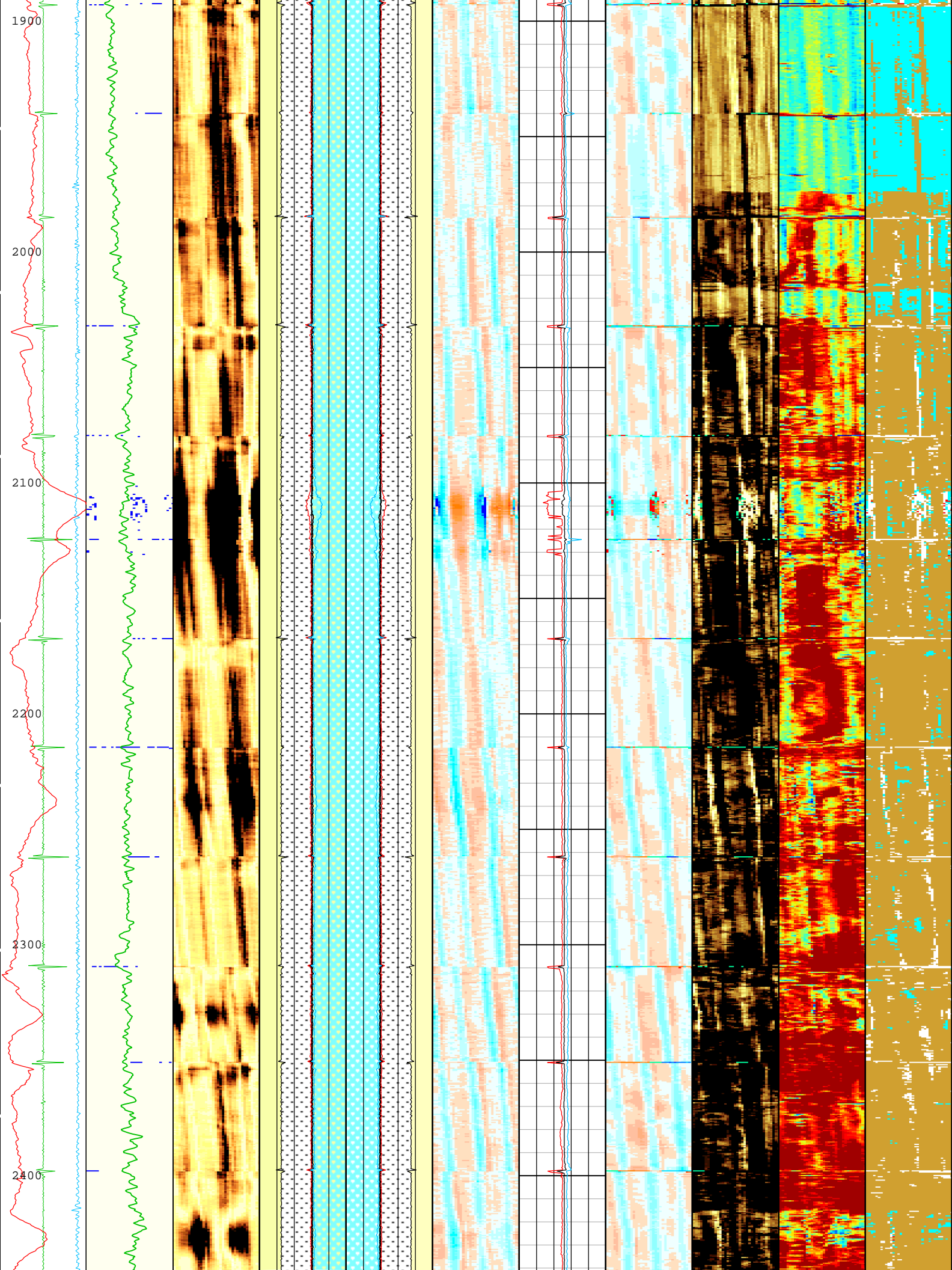




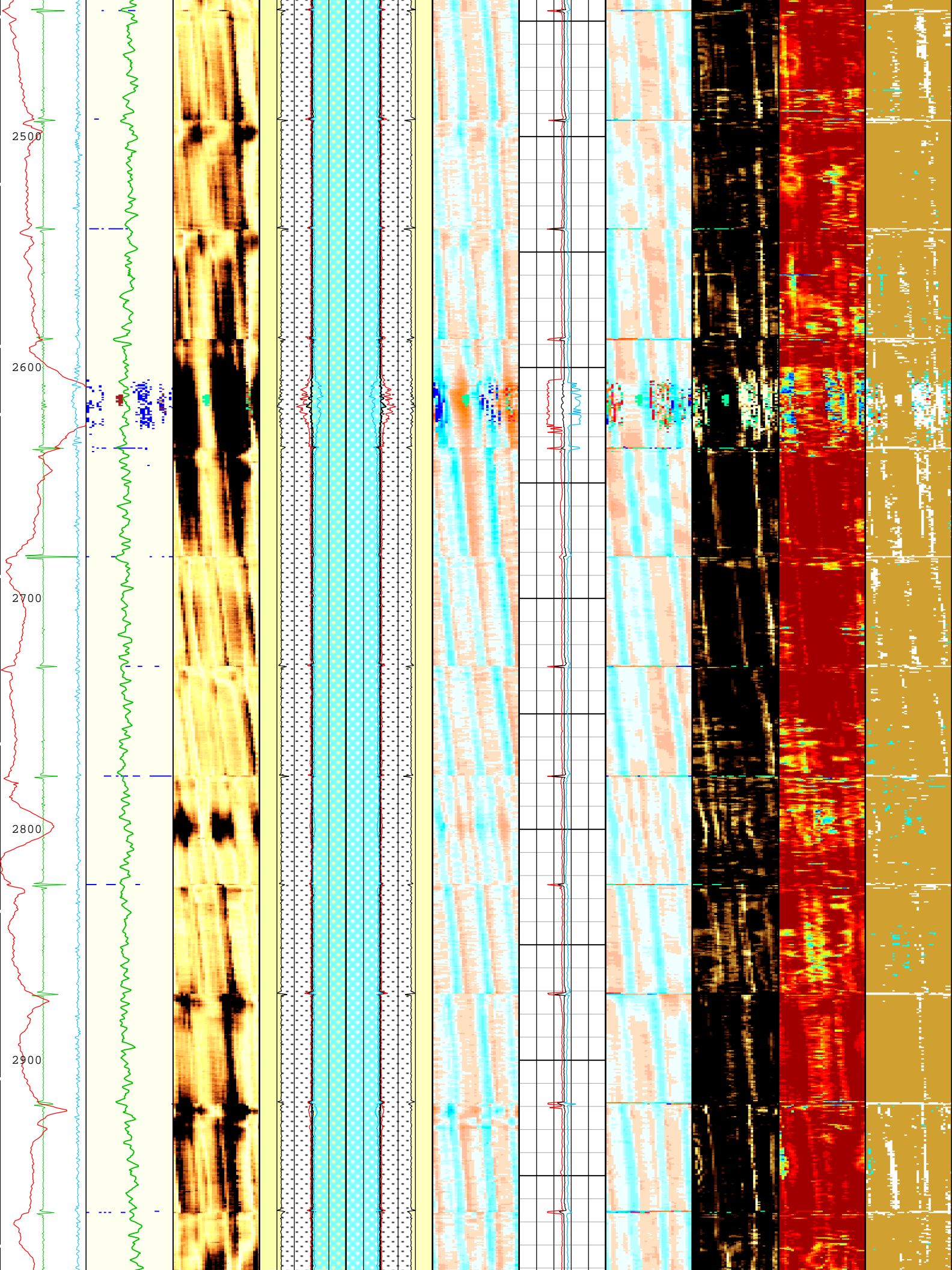


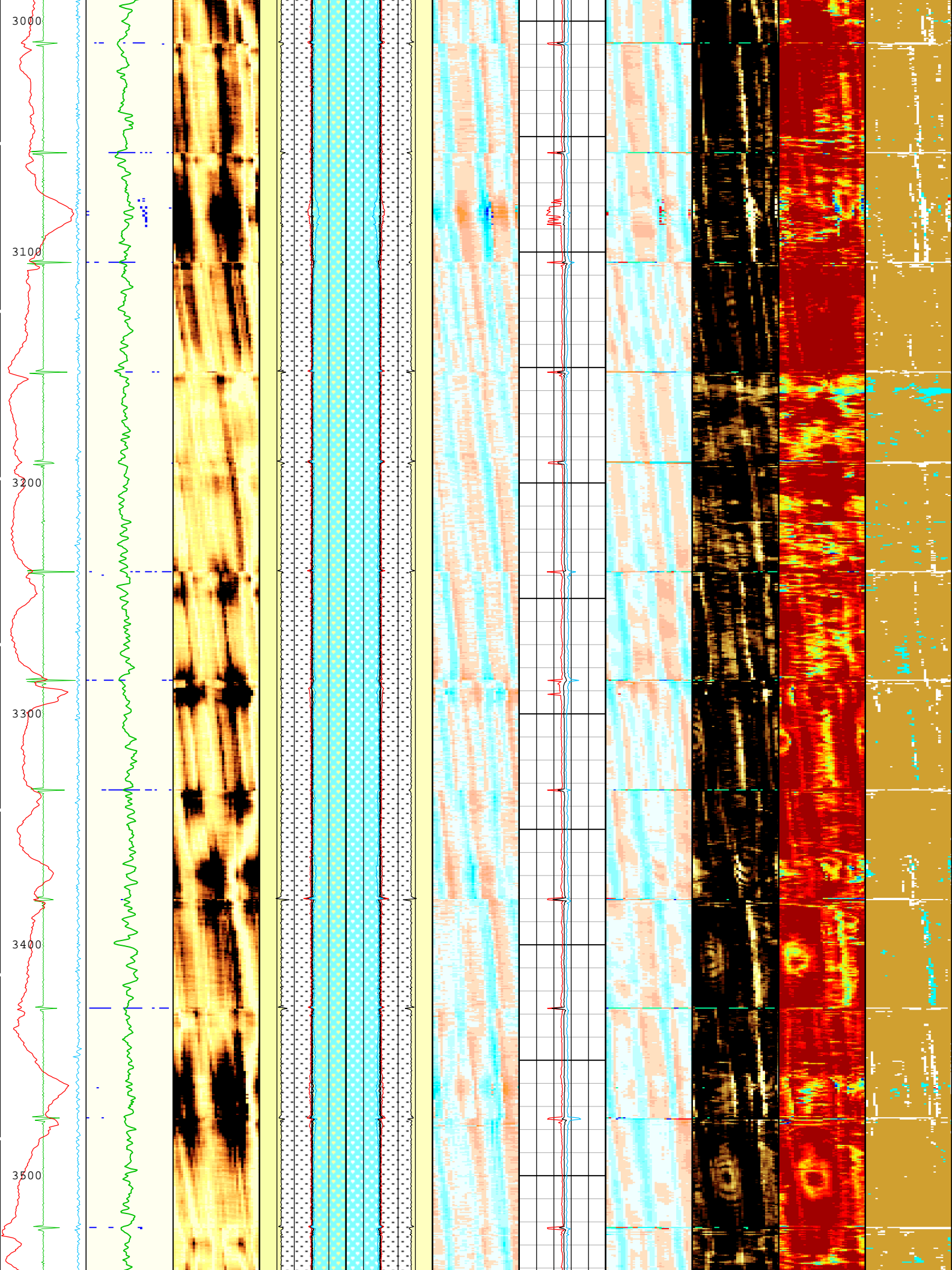


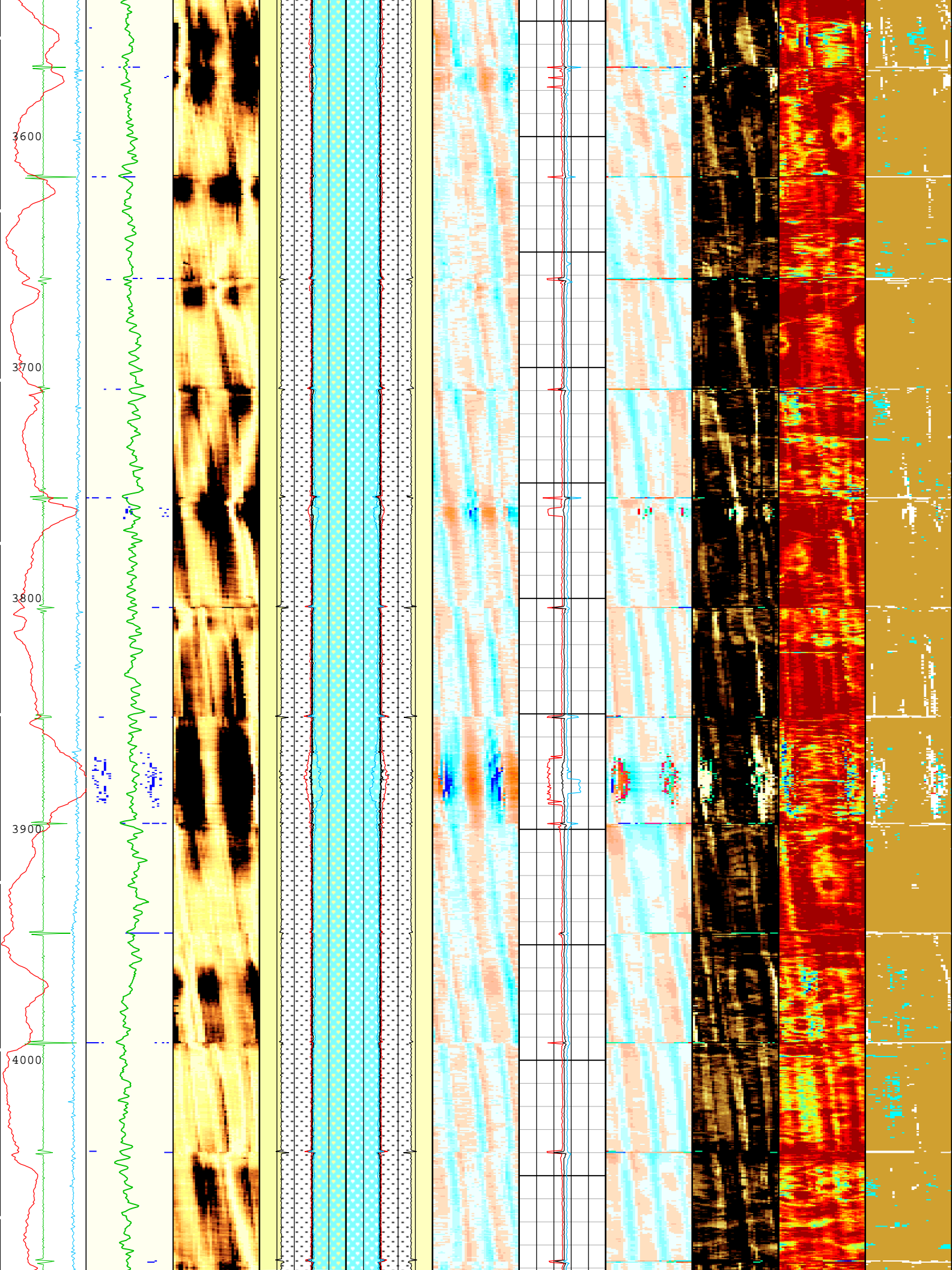




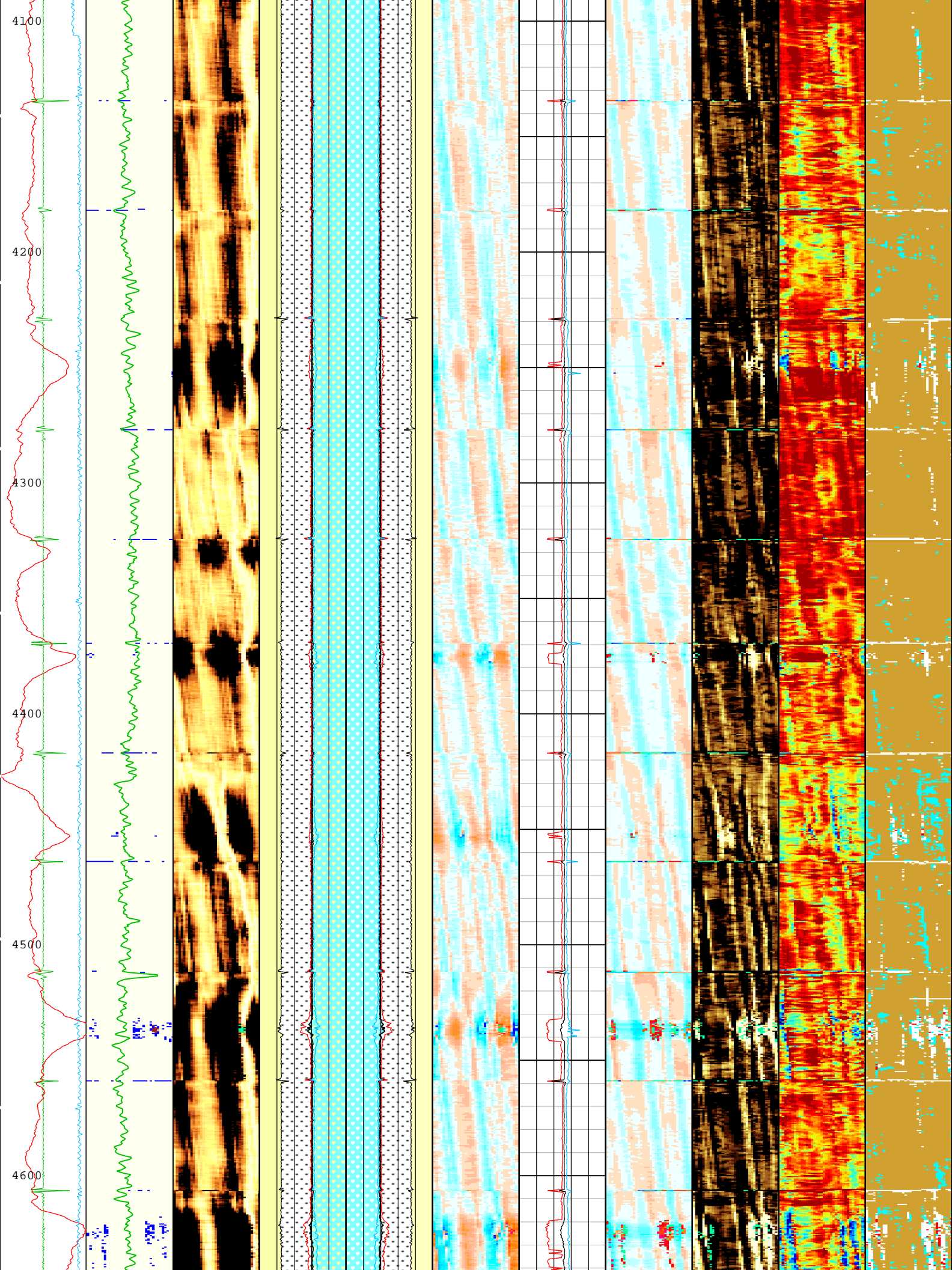


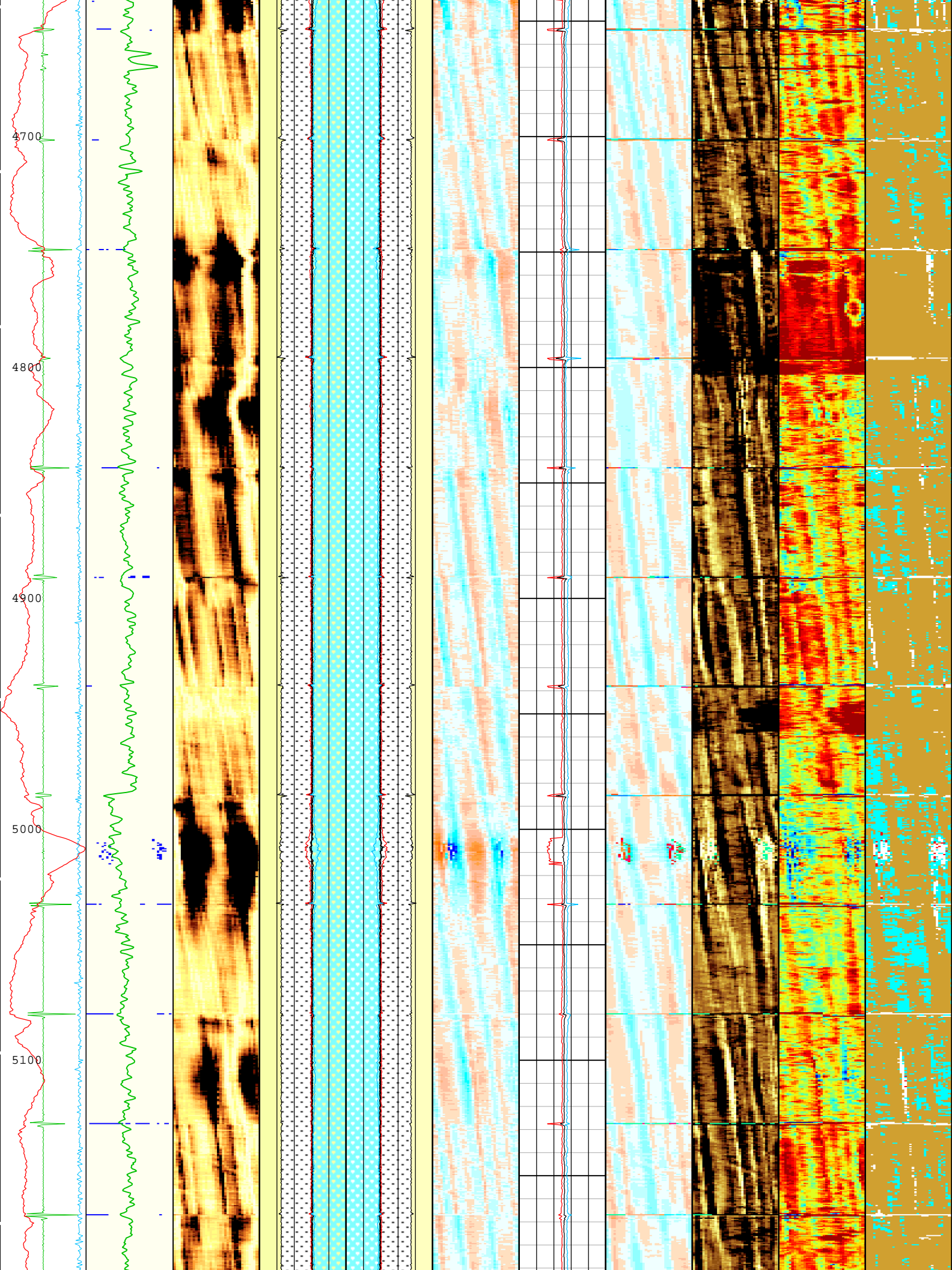




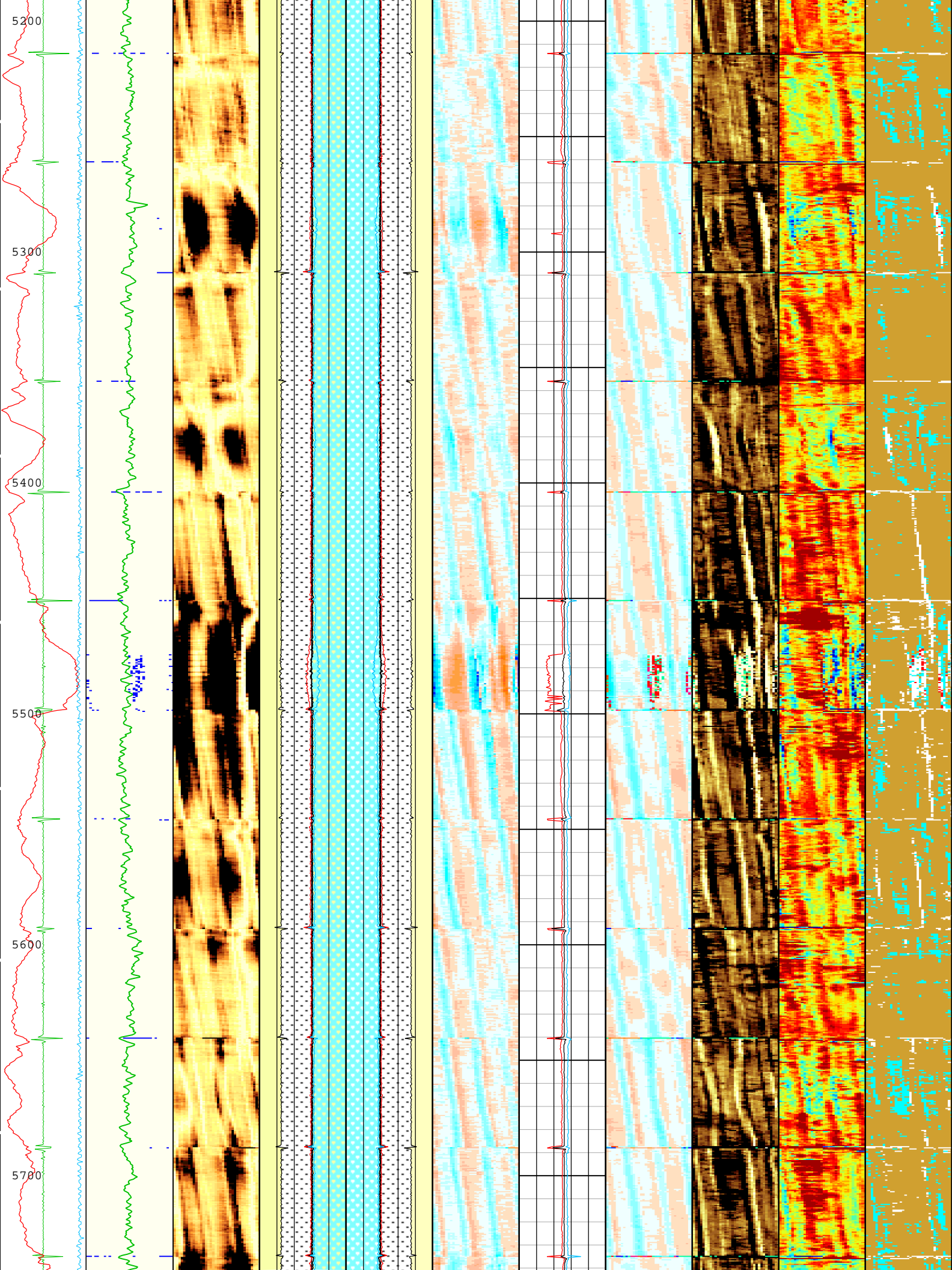


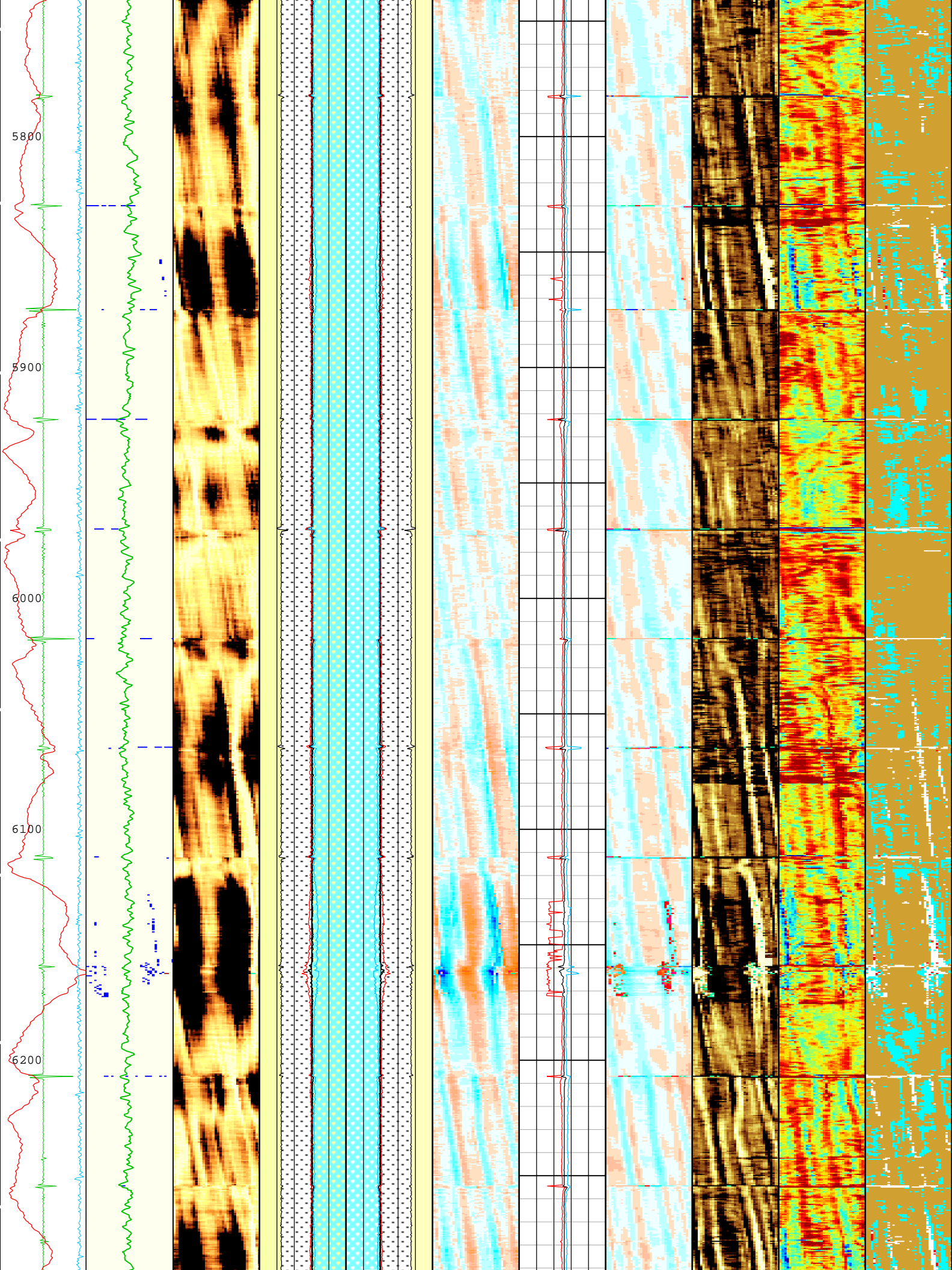




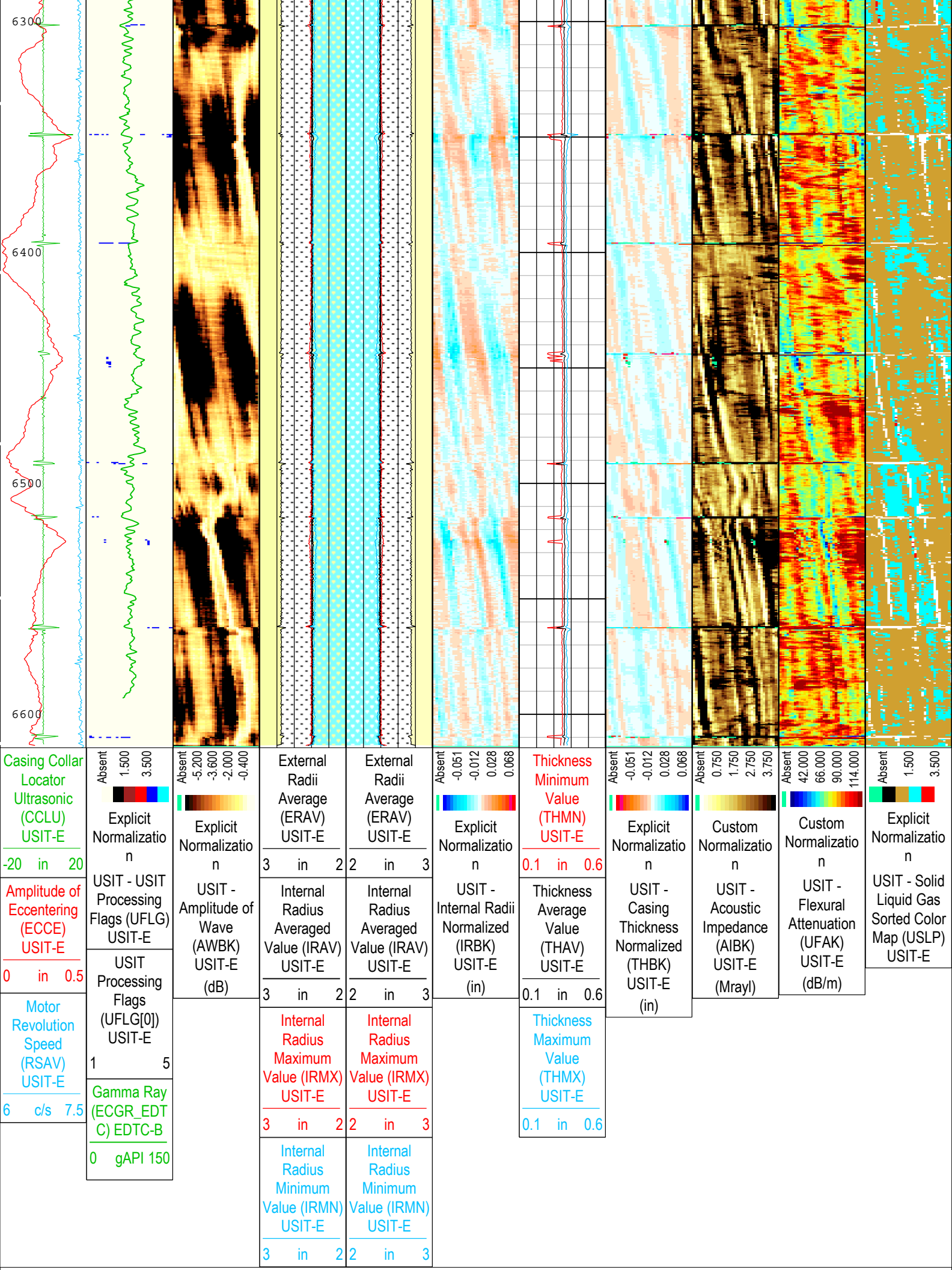














1 - UFLG 1 Value within [0.0 - 1.5] - :	UTIM Error
2 - UFLG 2 Value within [1.5 - 2.5] - :	Pulse Origin Not Detected
3 - UFLG 3 Value within [2.5 - 3.5] - :	WINLEN Error
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :	Casing Thickness Error
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10 ] - :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

TIME\_1900 - Time Marked every 60.00 (s)

Description: USI IBC SLG Composite    Format: Log ( IBC SLG Composite )    Index Scale: 2 in per 100 ft    Index Unit: ft    Index Type: Measured Depth  
Creation Date: 21-Jan-2019 11:22:11

## Channel Processing Parameters

### Isolation Scanner: Parameters

Parameter	Description	Tool	Value	Unit
BARI(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	12122	ft
CDEN	Cement Density	USIT-E	12.5	lbm/gal
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Light 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
FD	Fluid Density	USIT-E	10	lbm/gal
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	
IBC_FRP_OFFSET	IBC Flexural Offset from Free Pipe	USIT-E	30.17	dB/m
IBC_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	IBC_FRP_OFFSET	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	FreePipe Norm.	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.47	
MUD_N_INV	IBC Inversion Mud Normalization Factor	USIT-E	1.38	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.15	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.86	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	-4.85	dB/m
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SolidLiquidGasMap	
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	11.5	83	2021
BS	8.5	2021	6614.5

All depth are actual.

## Tool Control Parameters

# Isolation Scanner: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	48	dB
EMXV	EMEX Voltage	USIT-E	20	V
IBC_ACQTYPE	IBC Acquisition type	USIT-E	1 MHz	
IBC_FLEXDBP	IBC Flex Duration Before Peak	USIT-E	30	us
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
U-USIT_UFWB	Far Receiver Window Begin Time	USIT-E	137	us
U-USIT_UFWE	Far Receiver Window End Time	USIT-E	177	us
U-USIT_UNWB	Near Receiver Window Begin Time	USIT-E	106	us
U-USIT_UNWE	Near Receiver Window End Time	USIT-E	146	us
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 6.0 in	
U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VRES	Vertical Resolution	USIT-E	6.0 in	
WINB	Window Begin Time	USIT-E	31.88	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 )
WINE	71.88	20-Jan-2019 09:14:53	20-Jan-2019 09:43:37	6615.16	4524.99
WINE	73.67	20-Jan-2019 09:43:37	20-Jan-2019 10:46:50	4524.99	104.63

All depth are at tool zero.

## Isolation Scanner

## IBC Goodwin Compressed

## Pass Summary

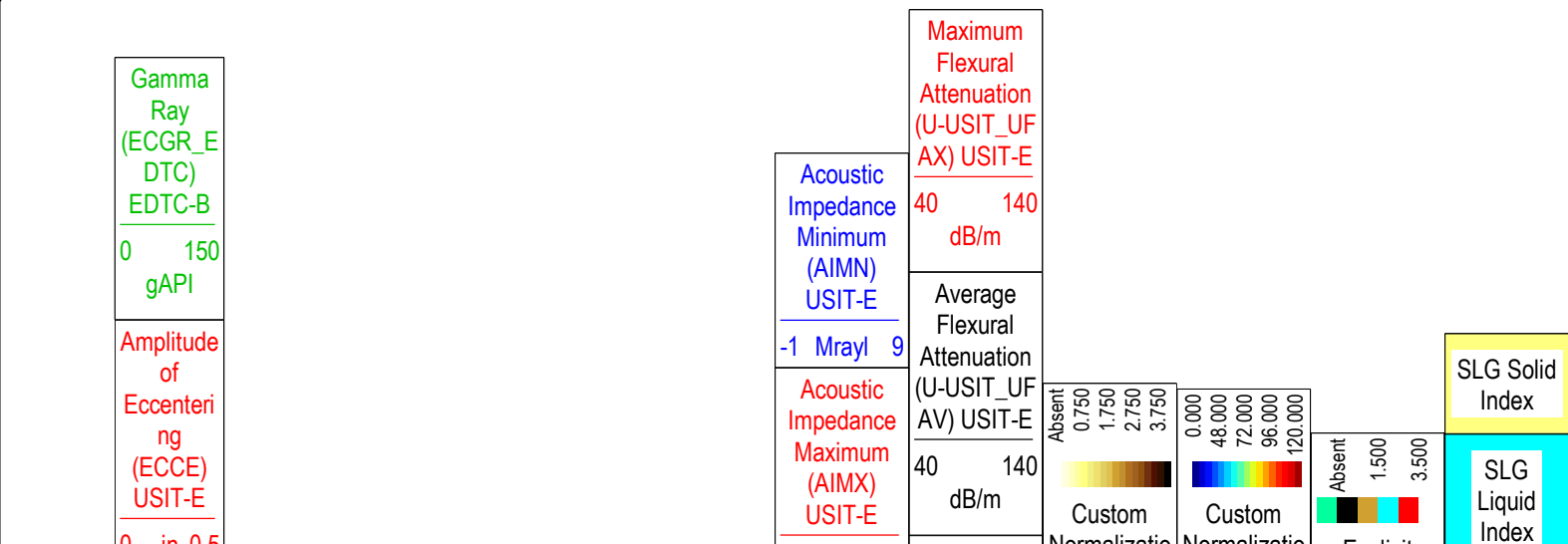
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Isolation Scanner	Log[3]:Up	Up	104.63 ft	6615.16 ft	20-Jan-2019 9:14:53 AM	20-Jan-2019 10:46:50 AM	ON	22.67 ft	Yes

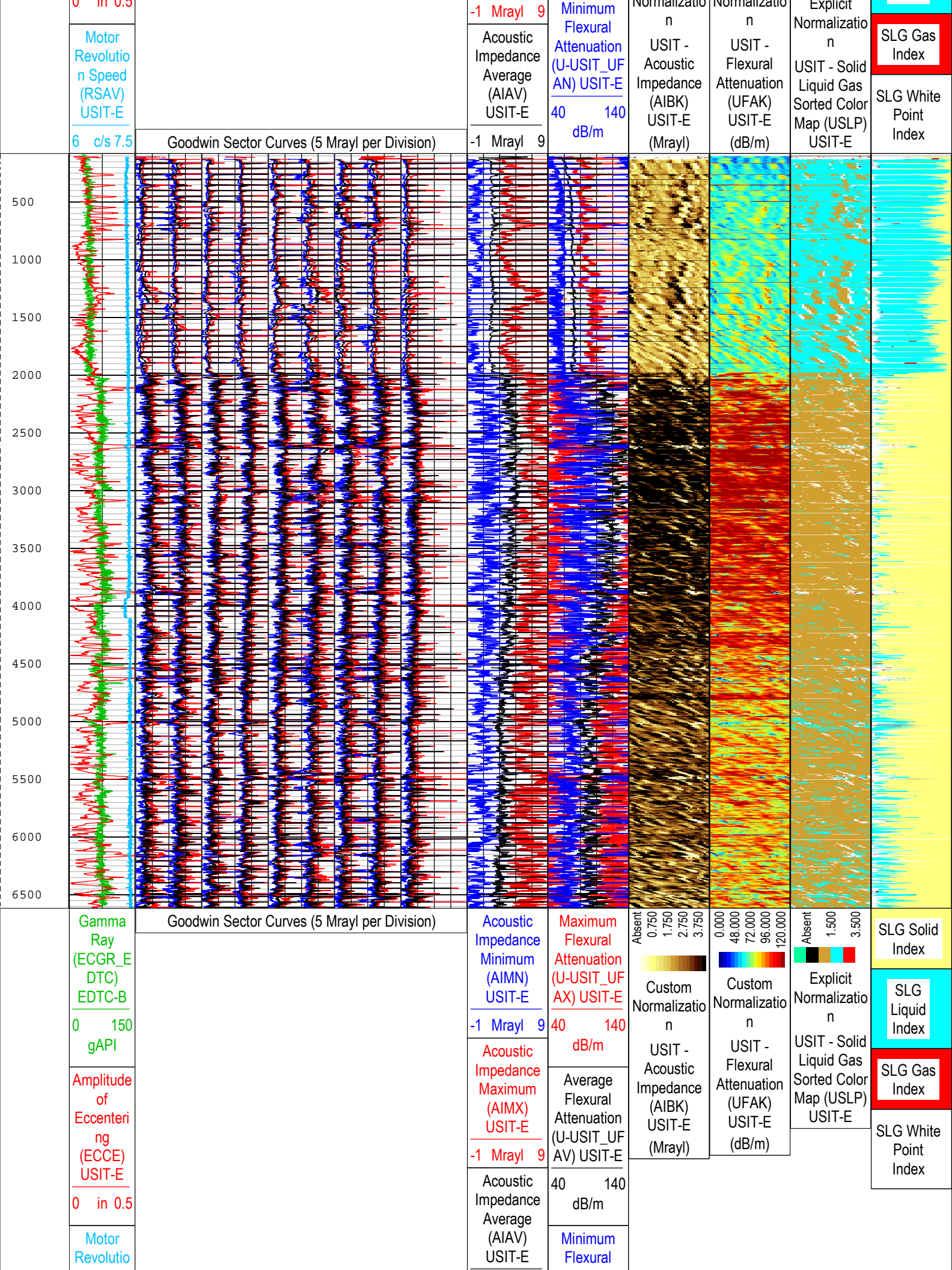
All depths are referenced to toolstring zero

Log	Company:Crestone Peak Resources Operating LLC      Well:Herren 1B-33H-H367 Isolation Scanner: Log[3]:Up:S012
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Description: USI Goodwin   Format: Log ( IBC Goodwin )   Index Scale: 0.1 in per 100 ft   Index Unit: ft   Index Type: Measured Depth   Creation Date: 21-Jan-2019 11:22:20

TIME\_1900 - Time Marked every 60.00 (s)





-1 Mrayl	9	Attenuation (U-USIT_UF AN) USIT-E
		40 140
		dB/m

Description: USI Goodwin	Format: Log ( IBC Goodwin )	Index Scale: 0.1 in per 100 ft	Index Unit: ft	Index Type: Measured Depth	Creation Date: 21-Jan-2019 11:22:20
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IBC SLG






Acquisition System	Version
Maxwell 2018 SP2	8.2.104493.3100

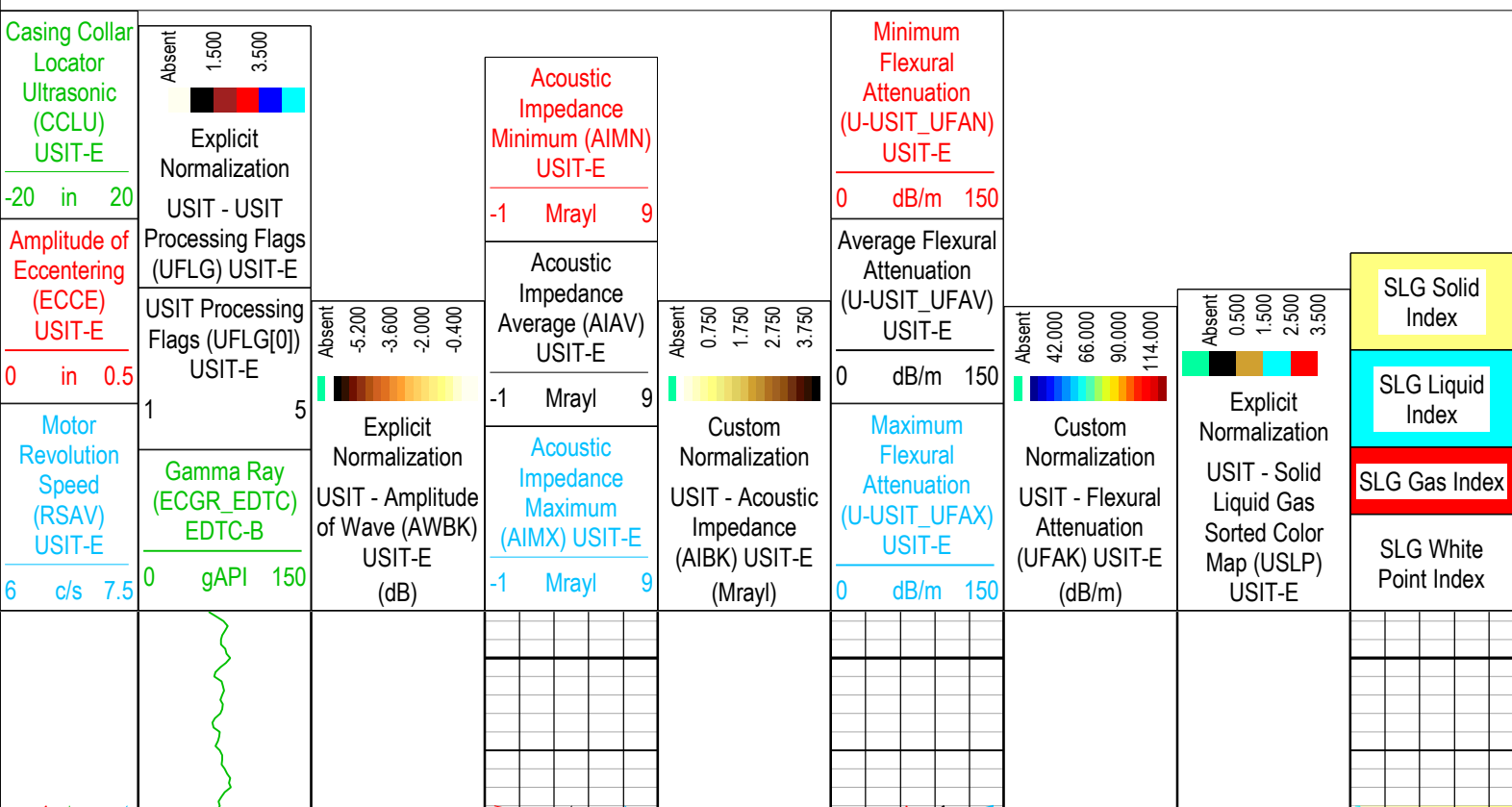
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Isolation Scanner	Log[1]:Up	Up	2066.46 ft	2519.65 ft	20-Jan-2019 8:46:25 AM	20-Jan-2019 8:53:35 AM	ON	16.58 ft	Yes

Log

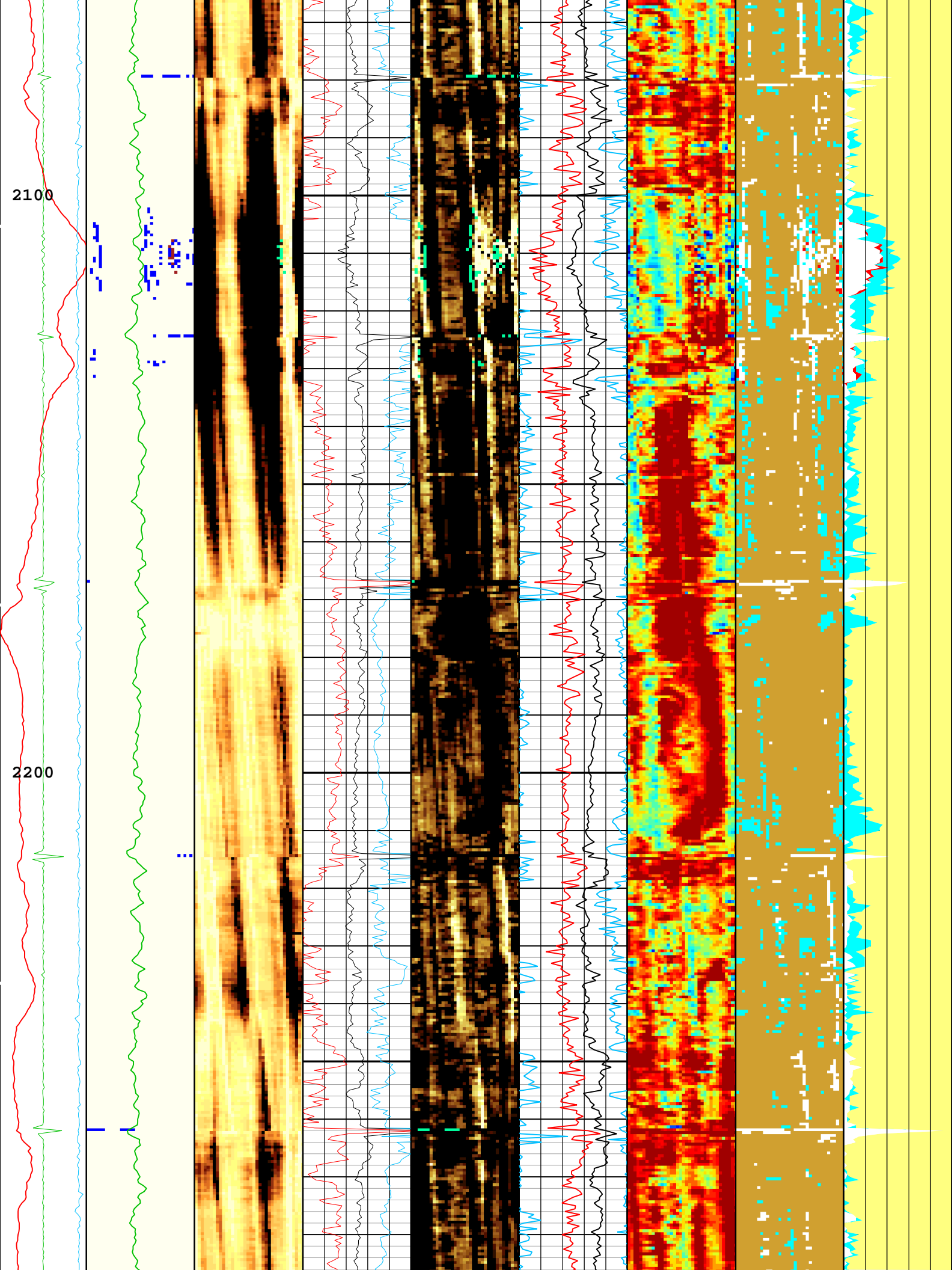
Isolation Scanner: Log[1]:Up:S012

TIME\_1900 - Time Marked every 60.00 (s)

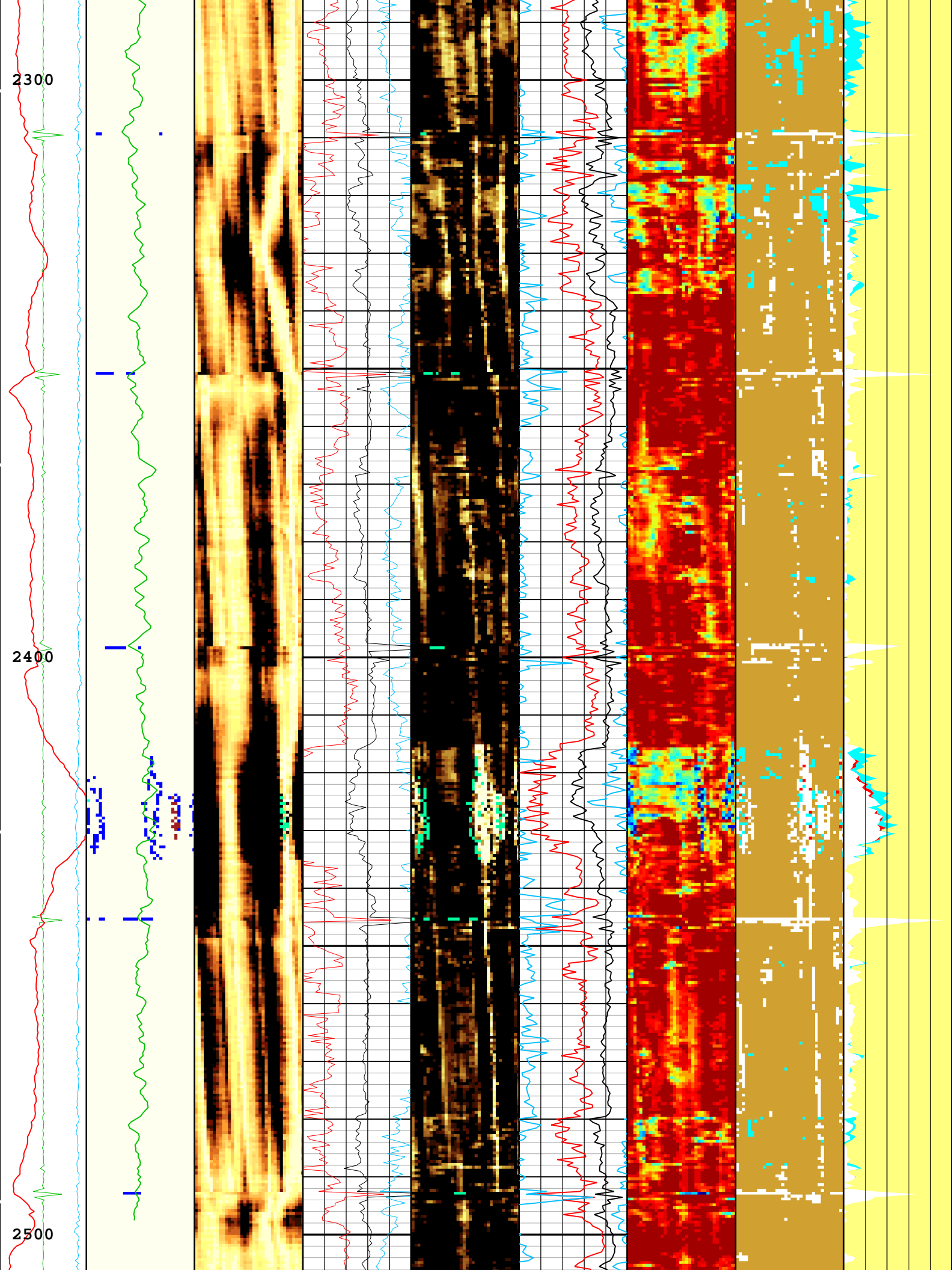
1 - UFLG 1 Value within [0.0 - 1.5] - :		UTIM Error
2 - UFLG 2 Value within [1.5 - 2.5] - :		Pulse Origin Not Detected
3 - UFLG 3 Value within [2.5 - 3.5] - :		WINLEN Error
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :		Casing Thickness Error
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] -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

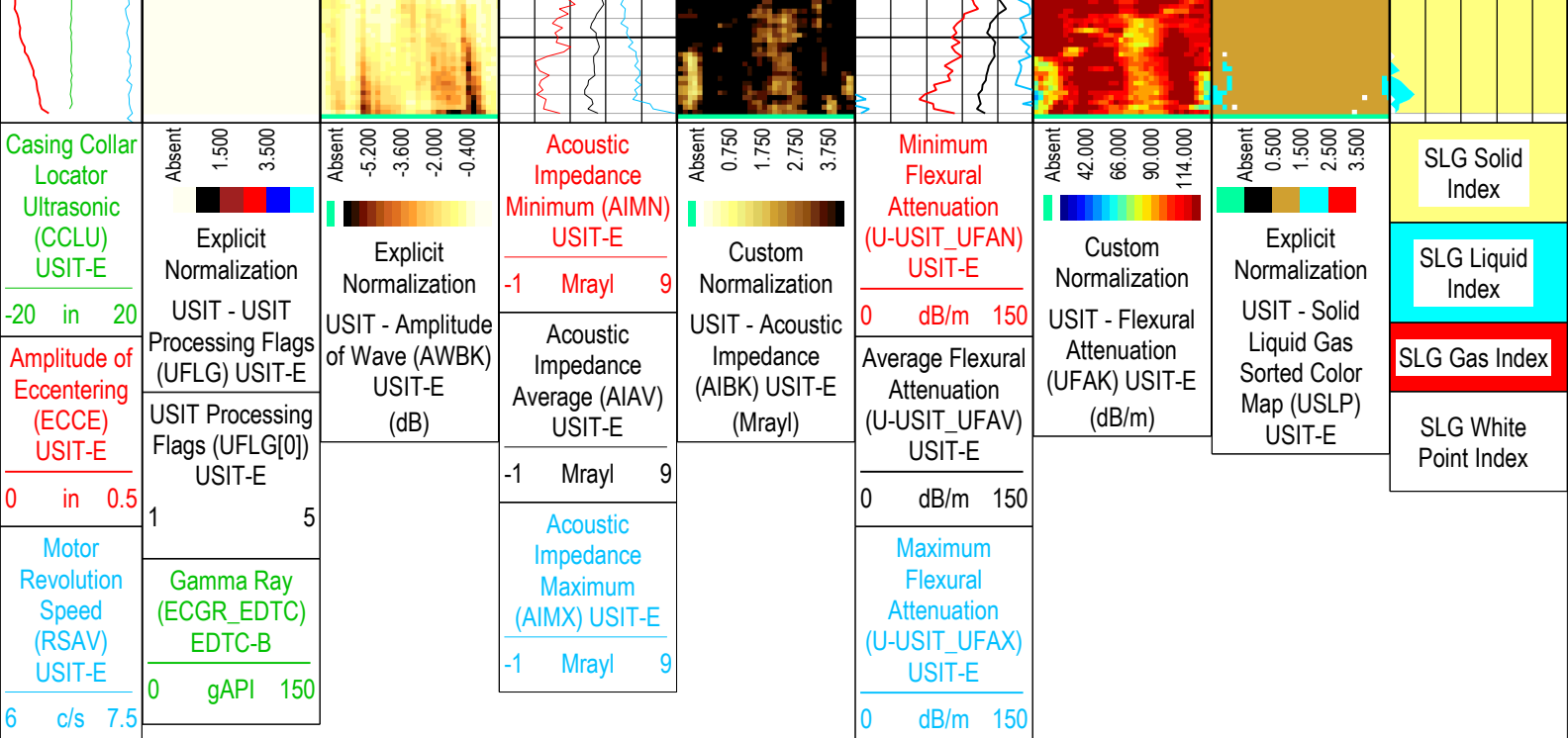

















USIT Processing Flags (UFLG[0]) USIT-E

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)

Description: USI IBC SLG   Format: Log ( IBC SLG )   Index Scale: 5 in per 100 ft   Index Unit: ft   Index Type: Measured Depth   Creation Date: 21-Jan-2019 11:22:25

Channel Processing Parameters				
Isolation Scanner: Parameters				
Parameter	Description	Tool	Value	Unit
BARI(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	8.5	in
CASING_PRATIO	Casing Poisson Ratio	USIT-E	Standard Poisson Ratio	
CBLO	Casing Bottom (Logger)	WLSESSION	12122	ft
CDEN	Cement Density	USIT-E	12.5	lbm/gal
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Light 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
FD	Fluid Density	USIT-E	10	lbm/gal
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)	
GR_MULTIPLIER	Gamma Ray Multiplier	EDTC-B	1	
HEMA	Hematite Presence Flag	Borehole	No	
IBC_FRP_OFFSET	IBC Flexural Offset from Free Pipe	USIT-E	30.17	dB/m
IBC_FLUID_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	

ICE2_FLEXSEL	IBC Flexural Offset Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	IBC_FRP_OFFSET	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	FreePipe Norm.	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.47	
MUD_N_INV	IBC Inversion Mud Normalization Factor	USIT-E	1.38	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.15	
RCOD	Reference Calibrator Outer Diameter	USIT-E	4.5	in
RCSO	Reference Calibrator Standoff	USIT-E	0.842	in
RCTH	Reference Calibrator Thickness	USIT-E	0.216	in
SOCN	Standoff Distance	EDTC-B	0.125	in
SOCO	Standoff Correction Option	EDTC-B	No	
THDH	Maximum Search Thickness (percentage of nominal)	USIT-E	130	%
THDL	Minimum Search Thickness (percentage of nominal)	USIT-E	70	%
TPOS_EDTC	Tool Position: Centered or Eccentered	EDTC-B	Eccentered	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.86	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	-4.85	dB/m
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SolidLiquidGasMap	
USI_RPLUS	Ultrasonic R+ Processing	USIT-E	No	
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

Isolation Scanner: Parameters				
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	48	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
DOT(DOS)	Distance between Opposite Transducer Faces	USIT-E	1.756	in
EMXV	EMEX Voltage	USIT-E	45	V
HRES	Horizontal Resolution	USIT-E	10 deg	
IBC_ACQTYPE	IBC Acquisition type	USIT-E	1 MHz	
IBC_FLEXDBP	IBC Flex Duration Before Peak	USIT-E	30	us
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
MOTOR_PROTECT	Motor Protection	USIT-E	On	
UACLV_PERM	Ultrasonic ACLV Permanent	USIT-E	Yes	
U-USIT_UFWB	Far Receiver Window Begin Time	USIT-E	137	us
U-USIT_UFWE	Far Receiver Window End Time	USIT-E	177	us
U-USIT_UNWB	Near Receiver Window Begin Time	USIT-E	106	us
U-USIT_UNWE	Near Receiver Window End Time	USIT-E	Time Zoned	us
USFR	Ultrasonic Sampling Frequency	USIT-E	666667	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 6.0 in	
USSP	Ultrasonic Service	USIT-E	IBC	

U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VRES	Vertical Resolution	USIT-E	6.0 in	
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 )
U-USIT_UNWE	146	20-Jan-2019 08:46:25	20-Jan-2019 08:48:14	2519.65	2415.15
U-USIT_UNWE	141.92	20-Jan-2019 08:48:14	20-Jan-2019 08:53:35	2415.15	2066.46

All depth are at tool zero.

Isolation Scanner

IBC SLG Composite

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Isolation Scanner	Log[1]:Up	Up	2066.46 ft	2519.65 ft	20-Jan-2019 8:46:25 AM	20-Jan-2019 8:53:35 AM	ON	16.58 ft	Yes

All depths are referenced to toolstring zero






Log

Company:Crestone Peak Resources Operating LLC      Well:Herren 1B-33H-H367  
Isolation Scanner: Log[1]:Up:S012

Description: USI IBC SLG Composite    Format: Log ( IBC SLG Composite )    Index Scale: 2 in per 100 ft    Index Unit: ft    Index Type: Measured Depth  
Creation Date: 21-Jan-2019 11:22:30

TIME\_1900 - Time Marked every 60.00 (s)

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

Casing Collar Locator Ultrasonic (CCLU) USIT-E

-20 in 20

Amplitude of Eccentering (ECCE) USIT-E

0 in 0.5

Motor Revolution Speed (RSAV) USIT-E

6 c/s 7.5

Explicit Normalization

USIT - USIT Processing Flags (UFLG) USIT-E


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

1 5


Gamma Ray (ECGR\_EDT C) EDTC-B

0 gAPI 150

Absent 1.500 3.500



Absent -5.200 -3.600 -2.000 -0.400



USIT - Amplitude of Wave (AWBK) USIT-E (dB)

External Radii Average (ERAV) USIT-E

3 in 2

Internal Radius Averaged Value (IRAV) USIT-E

3 in 2

Internal Radius Maximum Value (IRMX) USIT-E

3 in 2

Internal Radius Minimum Value (IRMN) USIT-E

3 in 2

External Radii Average (ERAV) USIT-E

2 in 3

Internal Radius Averaged Value (IRAV) USIT-E

2 in 3

Internal Radius Maximum Value (IRMX) USIT-E

2 in 3

Internal Radius Minimum Value (IRMN) USIT-E

2 in 3

Thickness Minimum Value (THMN) USIT-E

0.1 in 0.6


Thickness Average Value (THAV) USIT-E

0.1 in 0.6


Thickness Maximum Value (THMX) USIT-E

0.1 in 0.6

Absent -0.051 -0.012 0.028 0.068

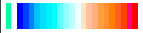


Absent 0.750 1.750 2.750 3.750




USIT - Casing Thickness Normalized (THBK) USIT-E (in)

Absent -0.051 -0.012 0.028 0.068




Absent 0.750 1.750 2.750 3.750

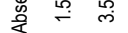


USIT - Internal Radii Normalized (IRBK) USIT-E (in)

Absent 42.000 66.000 90.000 114.000




Absent 1.500 3.500




USIT - Solid Liquid Gas Sorted Color Map (USLP) USIT-E

Absent 0.750 1.750 2.750 3.750




Absent 42.000 66.000 90.000 114.000

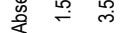


USIT - Acoustic Impedance (AIBK) USIT-E (Mravl)

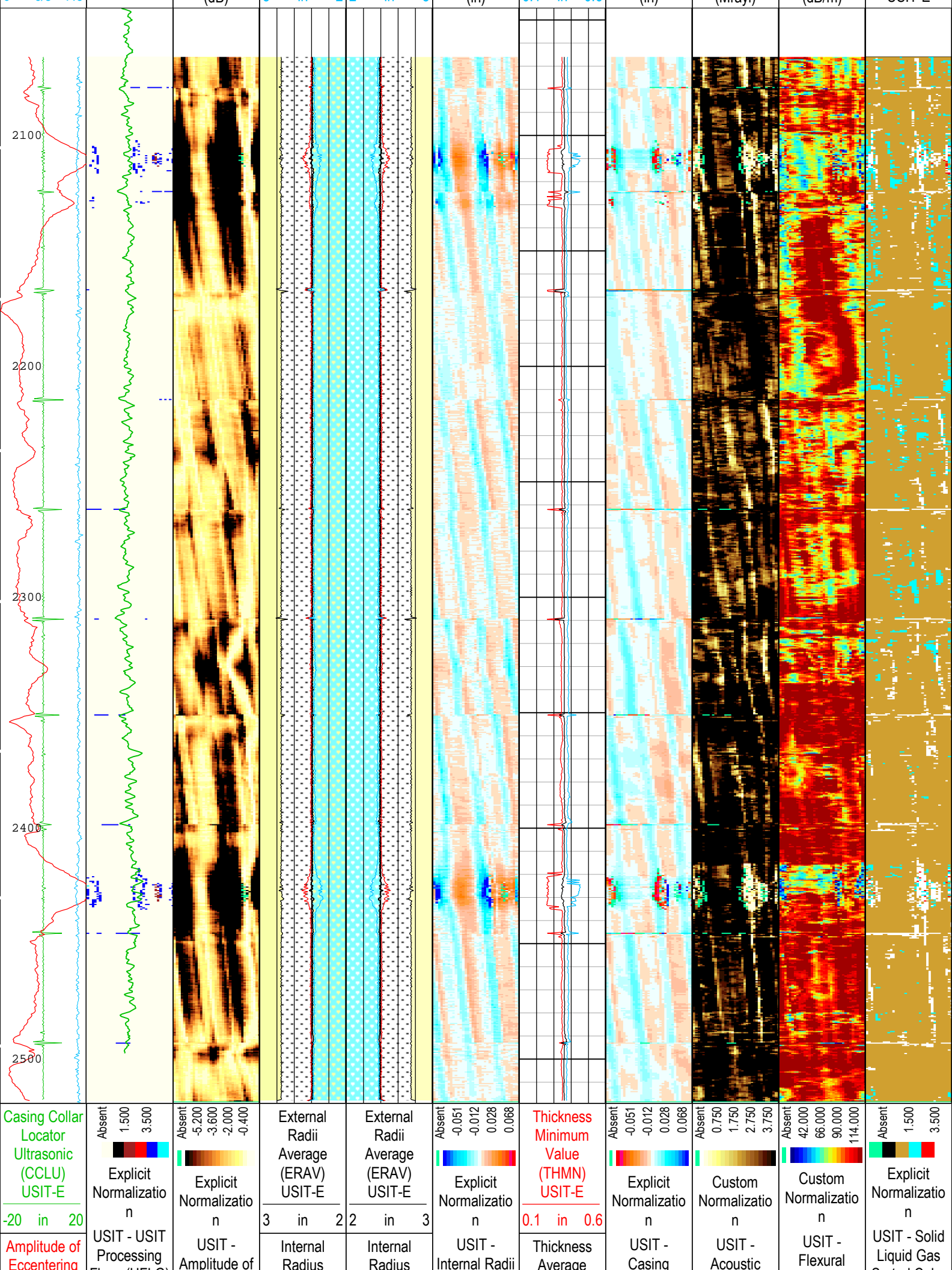
Absent 0.750 1.750 2.750 3.750



Absent 42.000 66.000 90.000 114.000



USIT - Flexural Attenuation (UFAK) USIT-E (dB/m)





Parameter	Description	Tool	Value	Unit
BARI(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	12122	ft
CDEN	Cement Density	USIT-E	12.5	lbm/gal
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Light 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
FD	Fluid Density	USIT-E	10	lbm/gal
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	
IBC_FRP_OFFSET	IBC Flexural Offset from Free Pipe	USIT-E	30.17	dB/m
IBC_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	IBC_FRP_OFFSET	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	FreePipe Norm.	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.47	
MUD_N_INV	IBC Inversion Mud Normalization Factor	USIT-E	1.38	
MUD_N_FVE	Free Pipe Mud Normalization Factor	USIT-E	1.47	

MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.15	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.86	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	-4.85	dB/m
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SolidLiquidGasMap	
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

### Isolation Scanner: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	48	dB
EMXV	EMEX Voltage	USIT-E	45	V
IBC_ACQTYPE	IBC Acquisition type	USIT-E	1 MHz	
IBC_FLEXDBP	IBC Flex Duration Before Peak	USIT-E	30	us
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
U-USIT_UFWB	Far Receiver Window Begin Time	USIT-E	137	us
U-USIT_UFWE	Far Receiver Window End Time	USIT-E	177	us
U-USIT_UNWB	Near Receiver Window Begin Time	USIT-E	106	us
U-USIT_UNWE	Near Receiver Window End Time	USIT-E	Time Zoned	us
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 6.0 in	
U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VRES	Vertical Resolution	USIT-E	6.0 in	
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 )
U-USIT_UNWE	146	20-Jan-2019 08:46:25	20-Jan-2019 08:48:14	2519.65	2415.15
U-USIT_UNWE	141.92	20-Jan-2019 08:48:14	20-Jan-2019 08:53:35	2415.15	2066.46

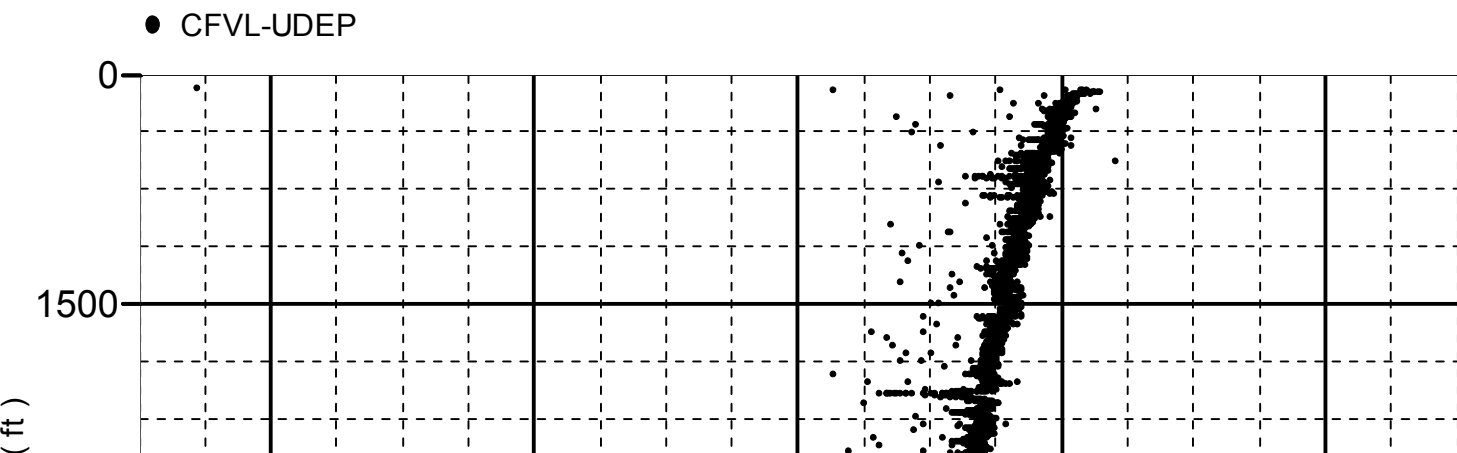
All depth are at tool zero.

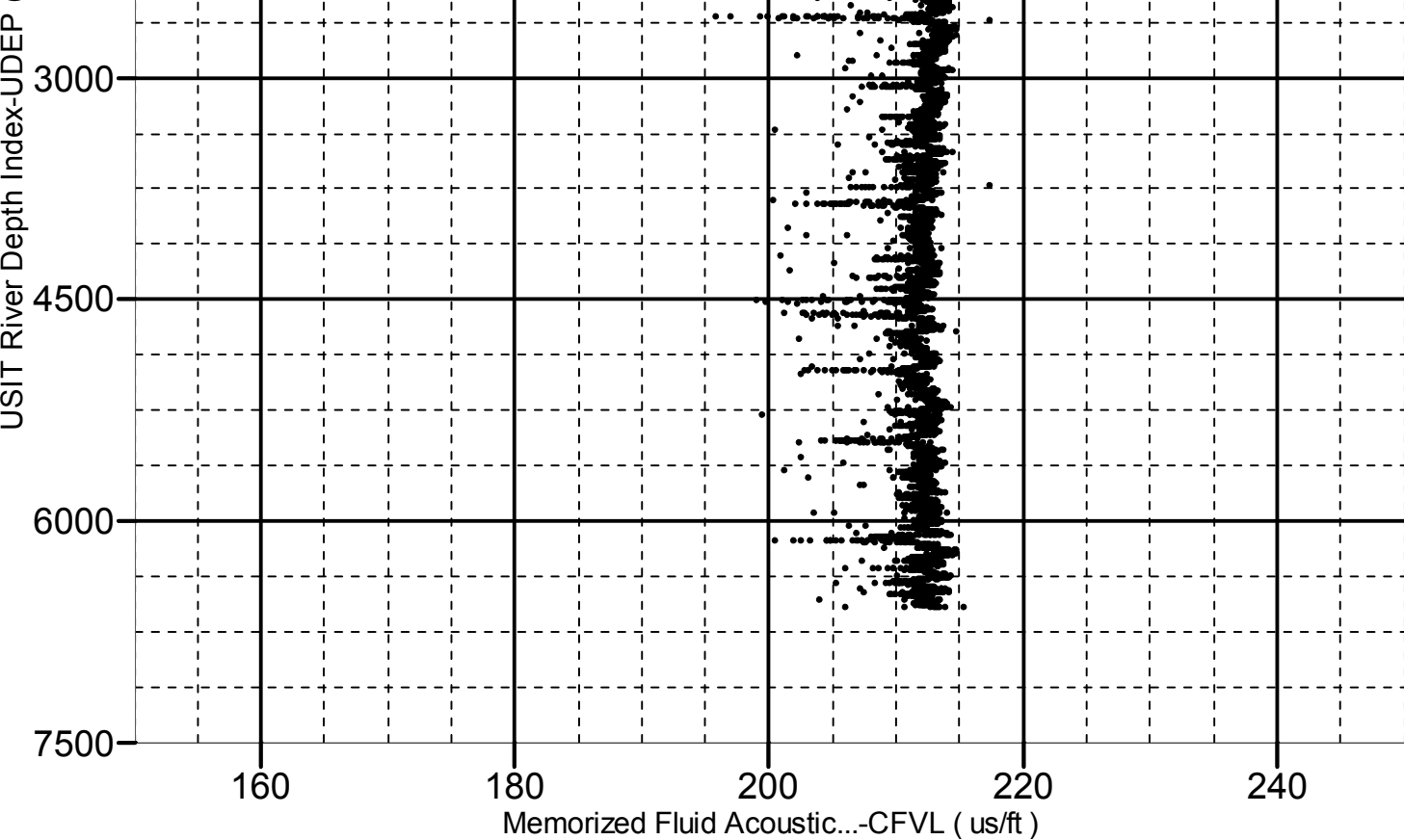
XYZ	Company:Crestone Peak Resources Operating LLC Well:Herren 1B-33H-H367 Isolation Scanner: Log[3]:Up:S012
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# Fluid Acoustic Slowness vs Depth

## 2D Cross Plot

Index Range: From 6614.50 to 104.00 ft



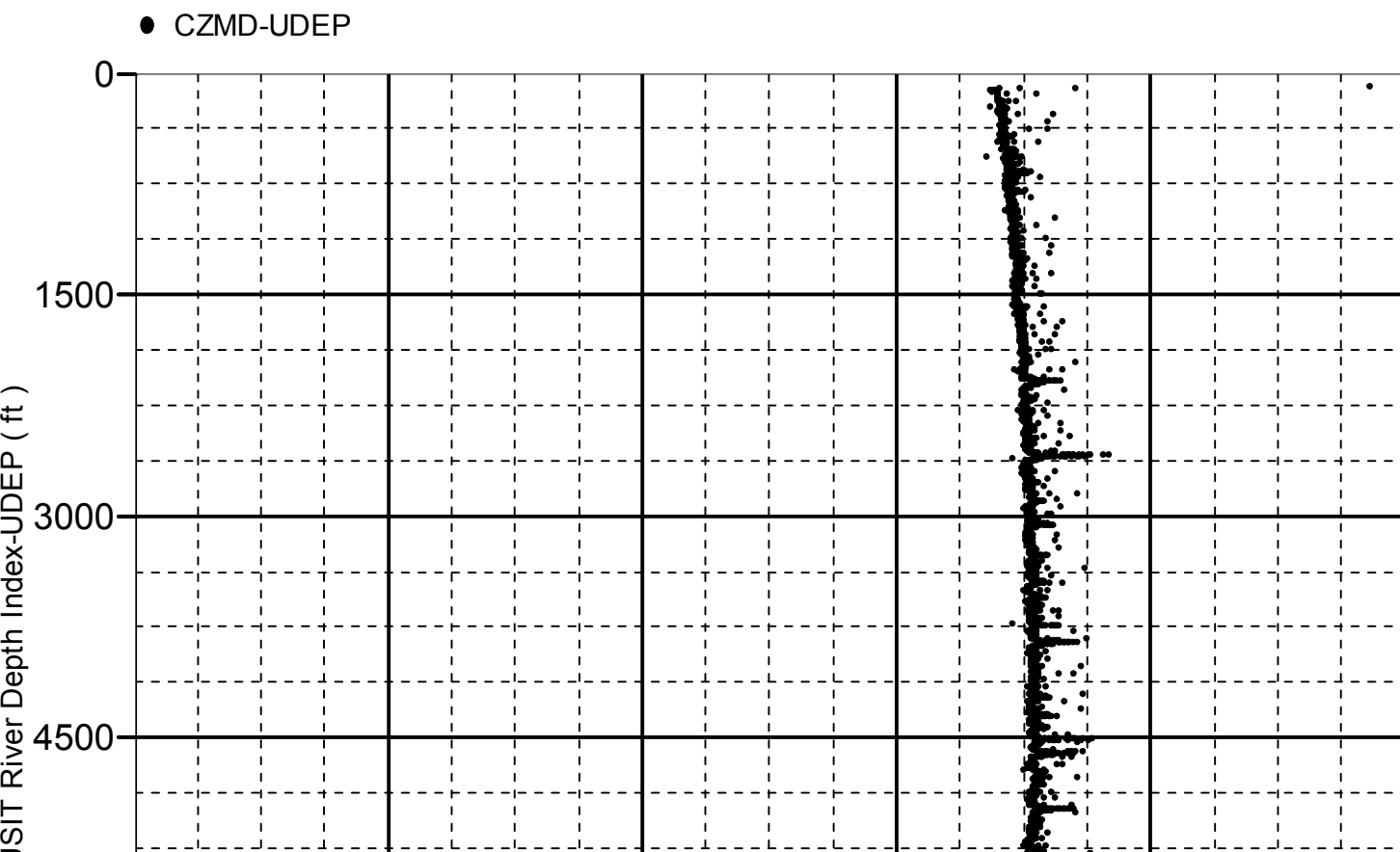


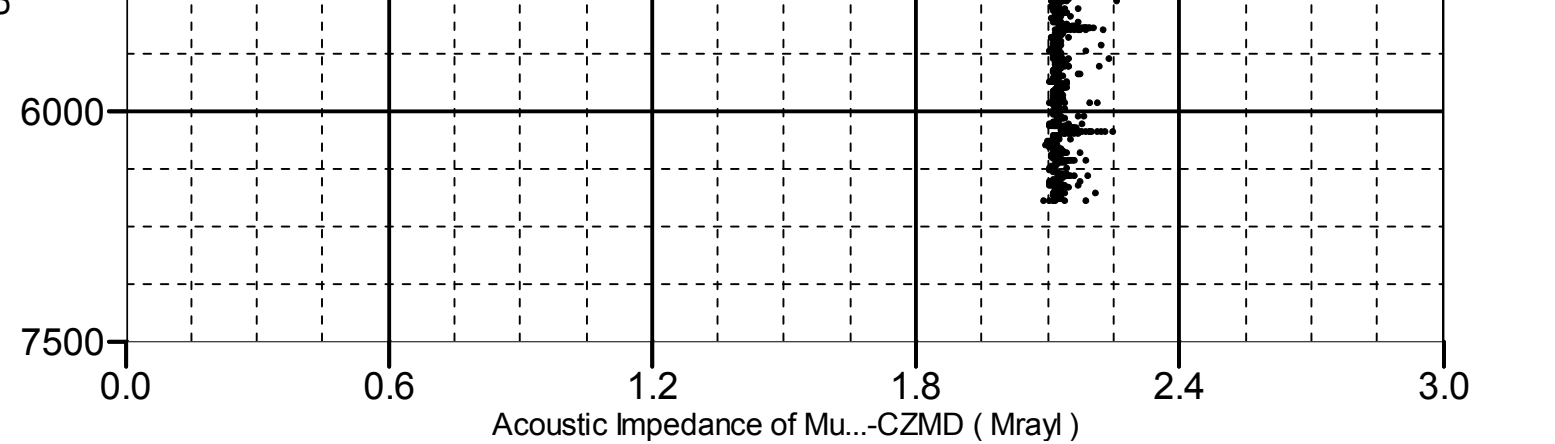
XYZ Company:Crestone Peak Resources Operating LLC Well:Herren 1B-33H-H367  
Isolation Scanner: Log[3]:Up:S012

## Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6614.50 to 104.00 ft





Company:	Crestone Peak Resources Operating LLC	Schlumberger
Well:	Herren 1B-33H-H367	
Field:	Wattenberg	
County:	Weld	
State:	Colorado	
Isolation Scanner		
Cement Evaluation		
Gamma Ray - CCL Log		