Schlumberger

Company: Expedition Water Solutions LLC

Well: EWS 4A

Field: Wattenberg

County: Weld State: Colorado

Isolation Scanner

Casing Integrity

Gamma Ray - CCL Log

County: Weld
Field: Wattenberg
Location: SHL: SENW Sec 17, T2N, R63W
Well: EWS 4A
Company: Expedition Water Solutions LLC

Location:			
SHL: SENW Sec 17, T2N, R63W Lat: 40.13947 / Long: -104.46356	Elev.:	K.B.	4856.00 ft
		G.L.	4843.00 ft
		D.F.	4856.00 ft
Permanent Datum: Ground Level	Elev.:		4843.00 f
Log Measured From: Kelly Bushing	13.00 ft		above Perm.Datum
Drilling Measured From: Kelly Bushing			

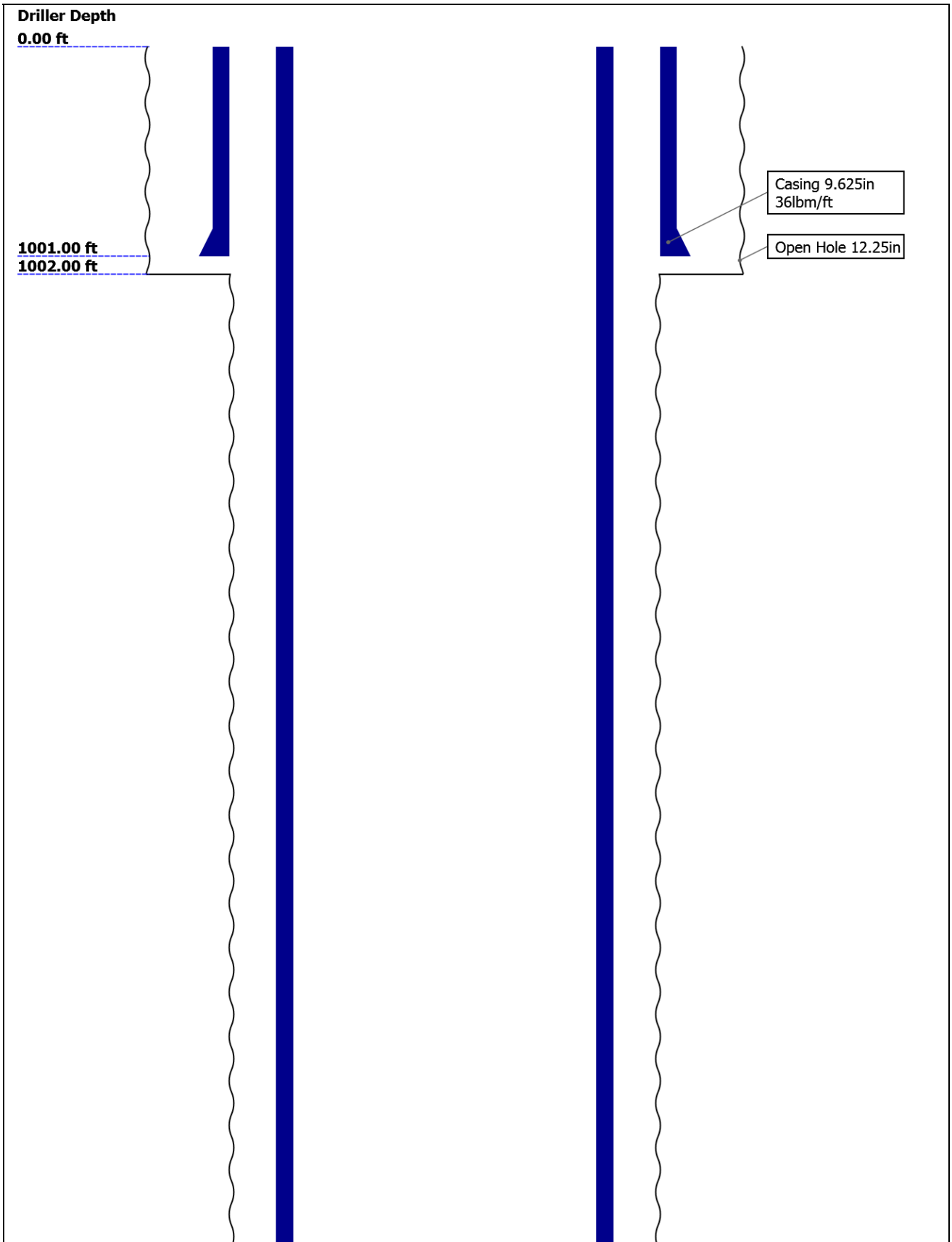
API Serial No.	Section:	Township:	Range:
05-123-44047	17	2N	63W

Logging Date			01-Feb-2017			
Run Number			One			
Depth Driller			8500.00 ft			
Schlumberger Depth			8500.00 ft			
Bottom Log Interval			8440.00 ft			
Top Log Interval			200.00 ft			
Casing Driller Size @ Depth			7 in @ 8499.00 ft			
Casing Schlumberger			8499 ft			
Bit Size			8.75 in			
Type Fluid In Hole			Water			
MUD	Density	Viscosity	9 lbm/gal	42 s		
	Fluid Loss	PH				
	Source of Sample		Active Tank			
RM @ Meas Temp			0.2 ohm.m @ 68 degF			
RMF @ Meas Temp			0.15 ohm.m @ 68 degF			
RMC @ Meas Temp						
Source RMF	RMC			Pressed		
RM @ BHT	RMF @ BHT		0.07 @ 212	0.05 @ 212		
Max Recorded Temperatures						
Circulation Stopped	Time		01-Feb-2017	12:00:00		
Logger on Bottom	Time		02-Feb-2017	15:30:00		
Unit Number	Location:		2161	Fort Morgan, CO		
Recorded By			Benjamin Marmon			
Witnessed By			Bill Stone			

Disclaimer

Contents

Well Sketch



Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	12.25	8.75				
Top Driller (ft)	0	1002				
Top Logger (ft)	0	1002				
Bottom Driller (ft)	1002	8500				
Bottom Logger (ft)	1002	8500				
Casing						
Size (in)	9.625	7				
Weight (lbm/ft)	36	26				
Inner Diameter (in)	8.921	6.276				
Grade	N/A	N/A				
Top Driller (ft)	0	0				
Top Logger (ft)	0	0				
Bottom Driller (ft)	1001	8499				
Bottom Logger (ft)	1001	8499				

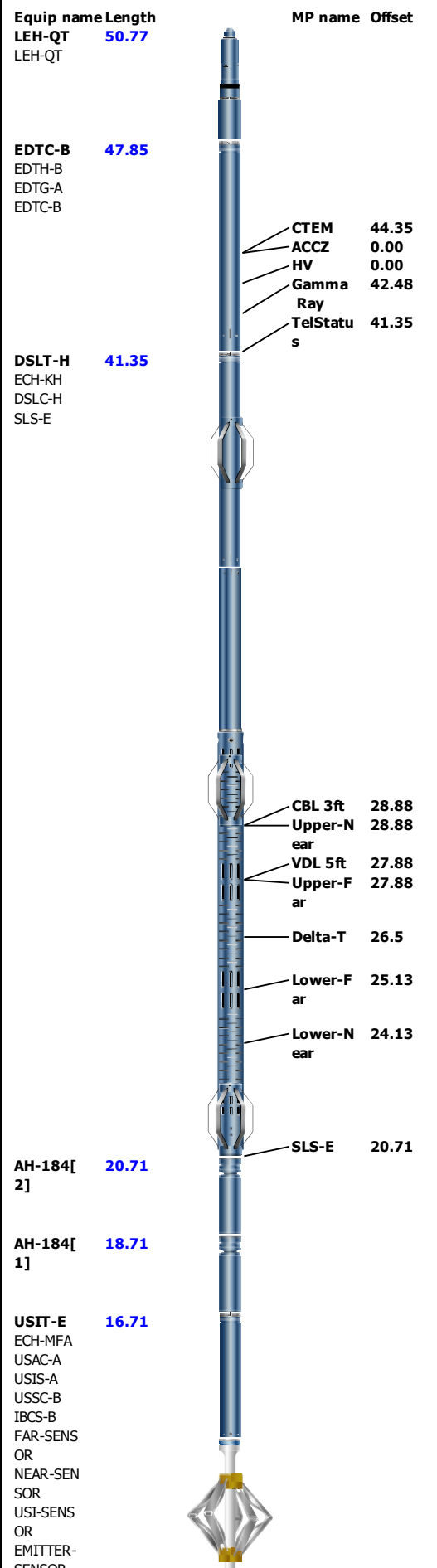
Operational Run Summary

Parameter (unit)	One					
Date Log Started	01-Feb-2017					
Time Log Started	16:04:17					
Date Log Finished	01-Feb-2017					
Time Log Finished	23:21:25					
Top Log Interval (ft)						
Bottom Log Interval (ft)						
Total Depth (ft)						
Max Hole Deviation (deg)						
Azimuth of Max Deviation (deg)						
Bit Size (in)	8.750					
Logging Unit Number	2161					
Logging Unit Location	Fort Morgan, CO					
Recorded By	Benjamin Marmon					

Witnessed By	Bill Stone					
Service Order Number	D5ND-00154					

Remarks and Equipment Summary

One: Toolstring



One: Remarks

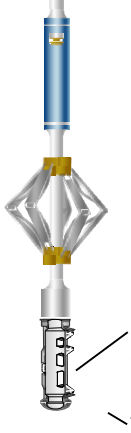
This is the first log in the well.

Toolstring ran as per tool sketch.

Stage Cement job with DV tool set at 6006.64'

Stage 1: Lead - 12.5 Tail - 13 Mud Push - 10.31

Stage 2: Lead 13.2 Mud Push - 12.97



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

	One		
Depth Measuring Device			
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		
Tension Device			
Type	CMTD-B/A		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0		
Logging Cable			
Type	7-46NT-XS		
Serial Number			
Length	24000.00 ft		
Conveyance Type	Wireline		
Rig Type	Land		

One:Depth Control Parameters		Depth Control Remarks
Log Sequence	First Log In the Well	All Schlumberger depth control procedures followed during logging operations.
Rig Up Length At Surface		IDW used as primary depth control device.
Rig Up Length At Bottom		ZChart used as secondary depth control device.
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[4]:Up	8446.26	205.12

Fluid Velocity = "Automatic"

CFVL equals DFSL channel

Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)

Mud Impedance = "FreePipe Norm.".
Free Pipe normalization zone is : 1915.04m(6282.93ft) to 1923.76m(6311.56ft)
MUD_N_FRP = 1.14
DFD = 1.08g/cm3(9.00lbm/gal)
CZMD median computed in free pipe normalization interval = 1.87 MRayl

Start Depth(ft)	Stop Depth(ft)	Start Value(Mrayl)	End Value(Mrayl)

One

IBC Casing Integrity

Software Version

Acquisition System	Version
Maxwell 2017 SP1	7.1.82245.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[4]:Up	Up	205.13 ft	8446.26 ft	01-Feb-2017 5:28:39 PM	01-Feb-2017 7:30:12 PM	ON	5.31 ft	No

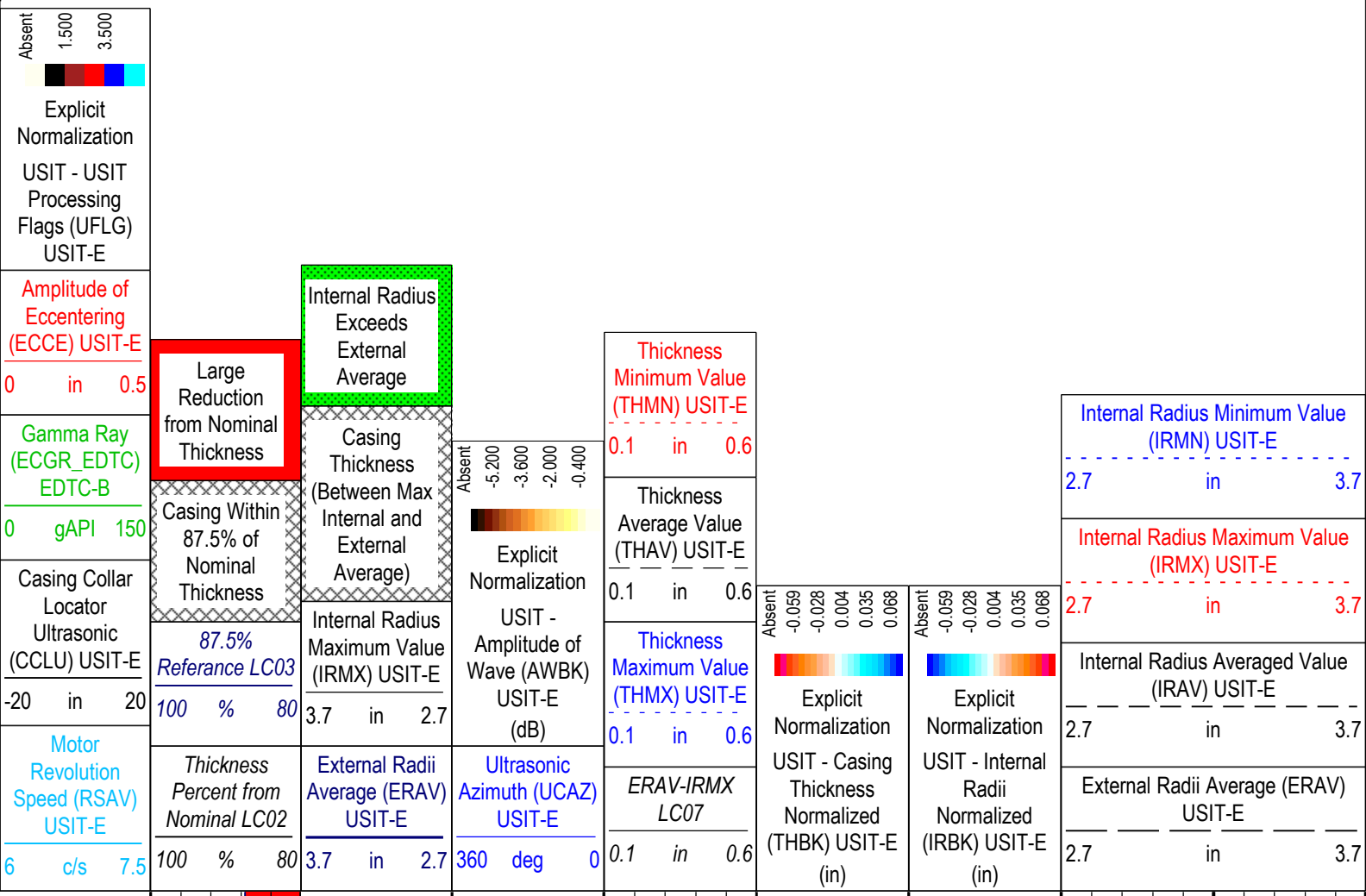
All depths are referenced to toolstring zero

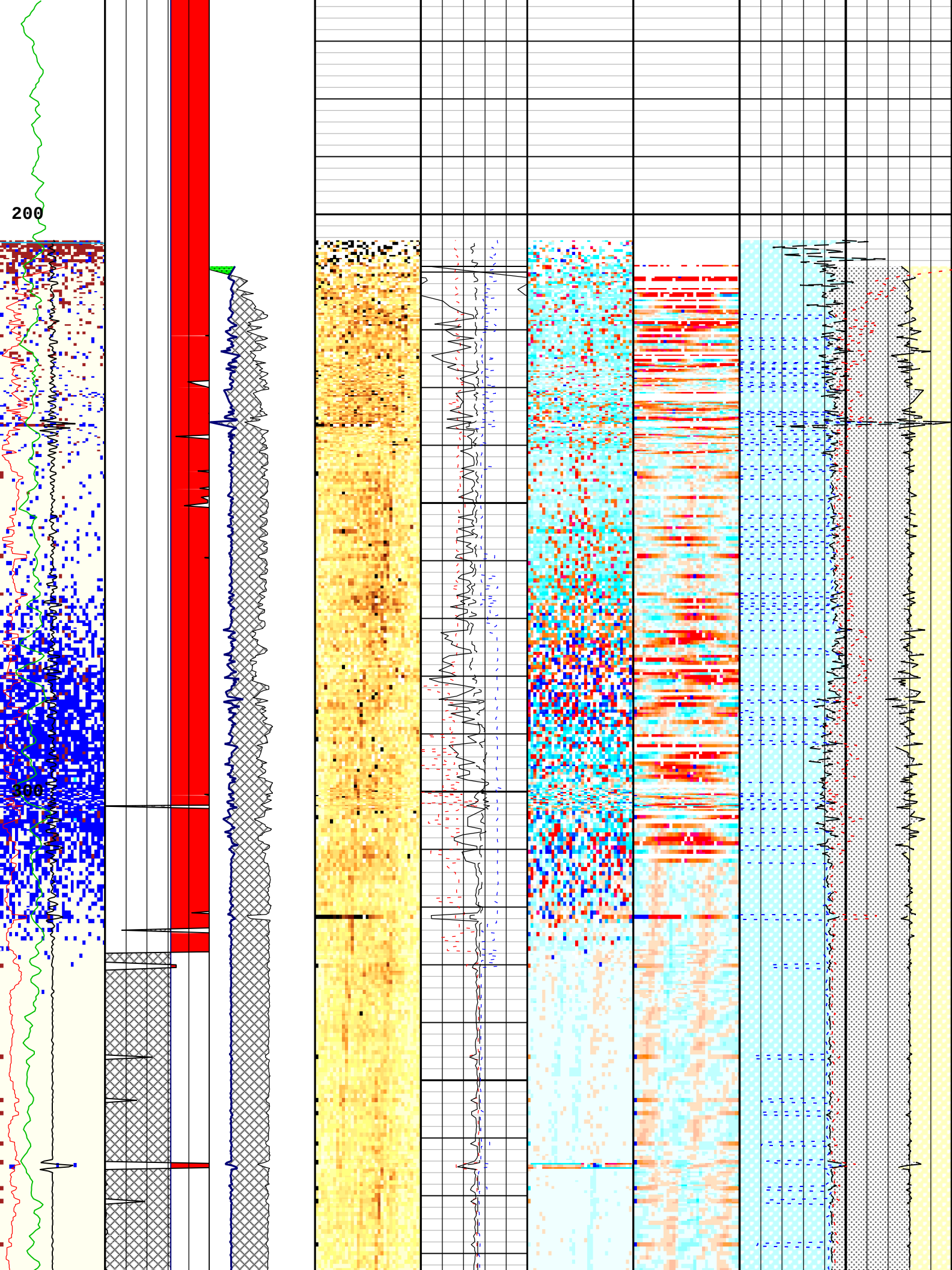
Log

Company:Expedition Water Solutions LLC Well:EWS 4A
One: Log[4]:Up:S018

Description: USI Corrosion Format: Log (USI IBC Casing Integrity) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 02-Feb-2017 00:20:35

TIME_1900 - Time Marked every 60.00 (s)

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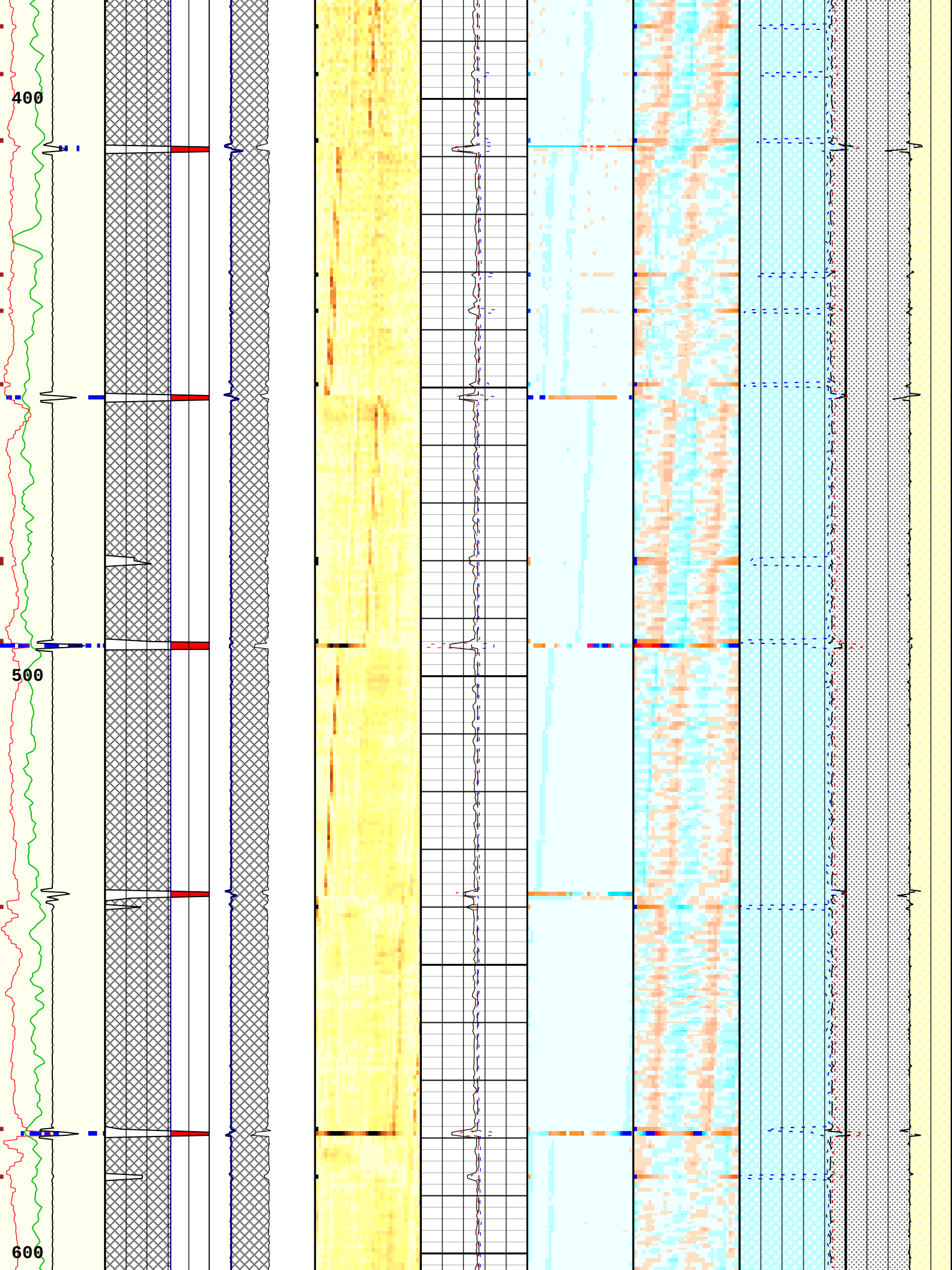
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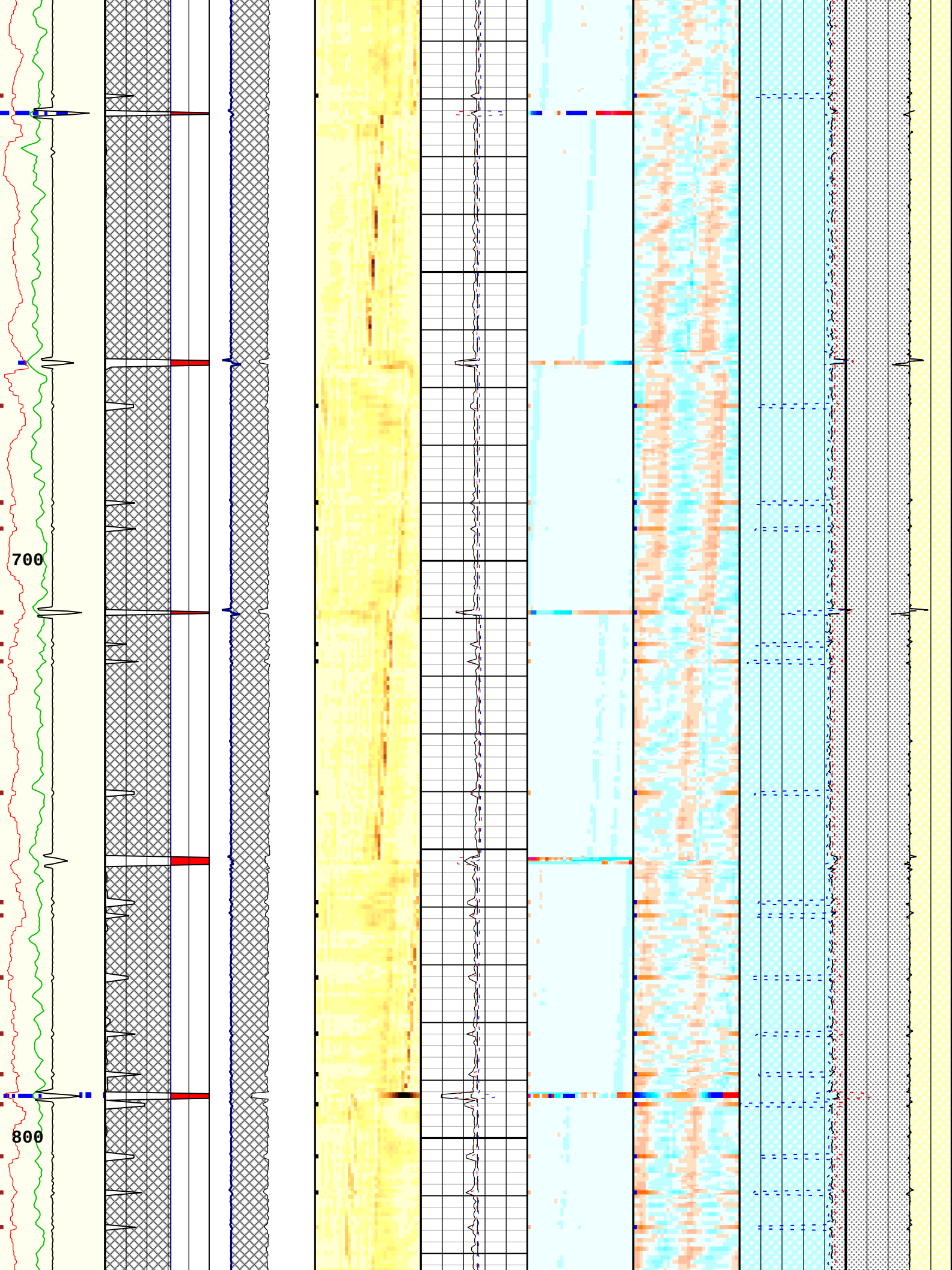
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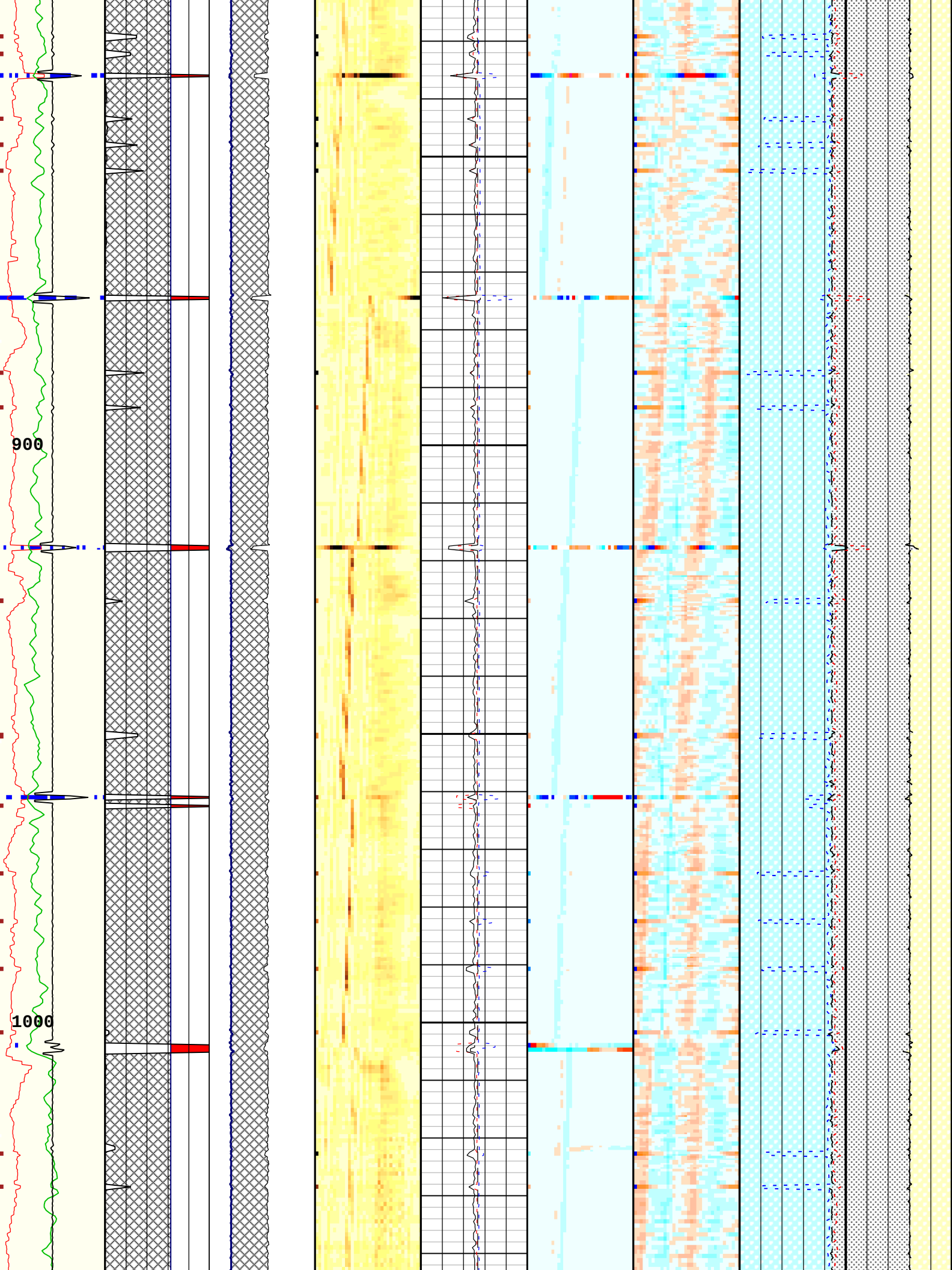
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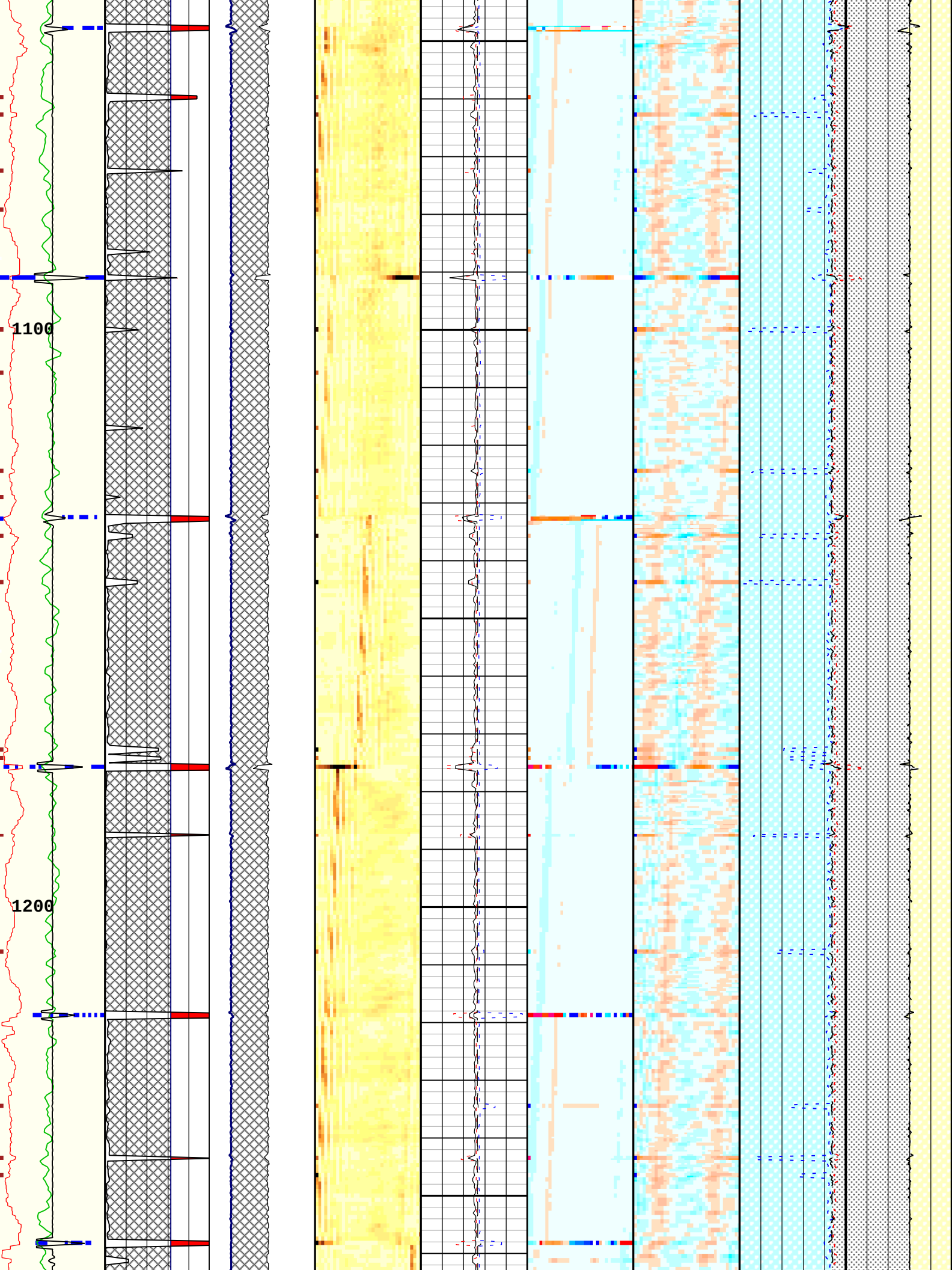
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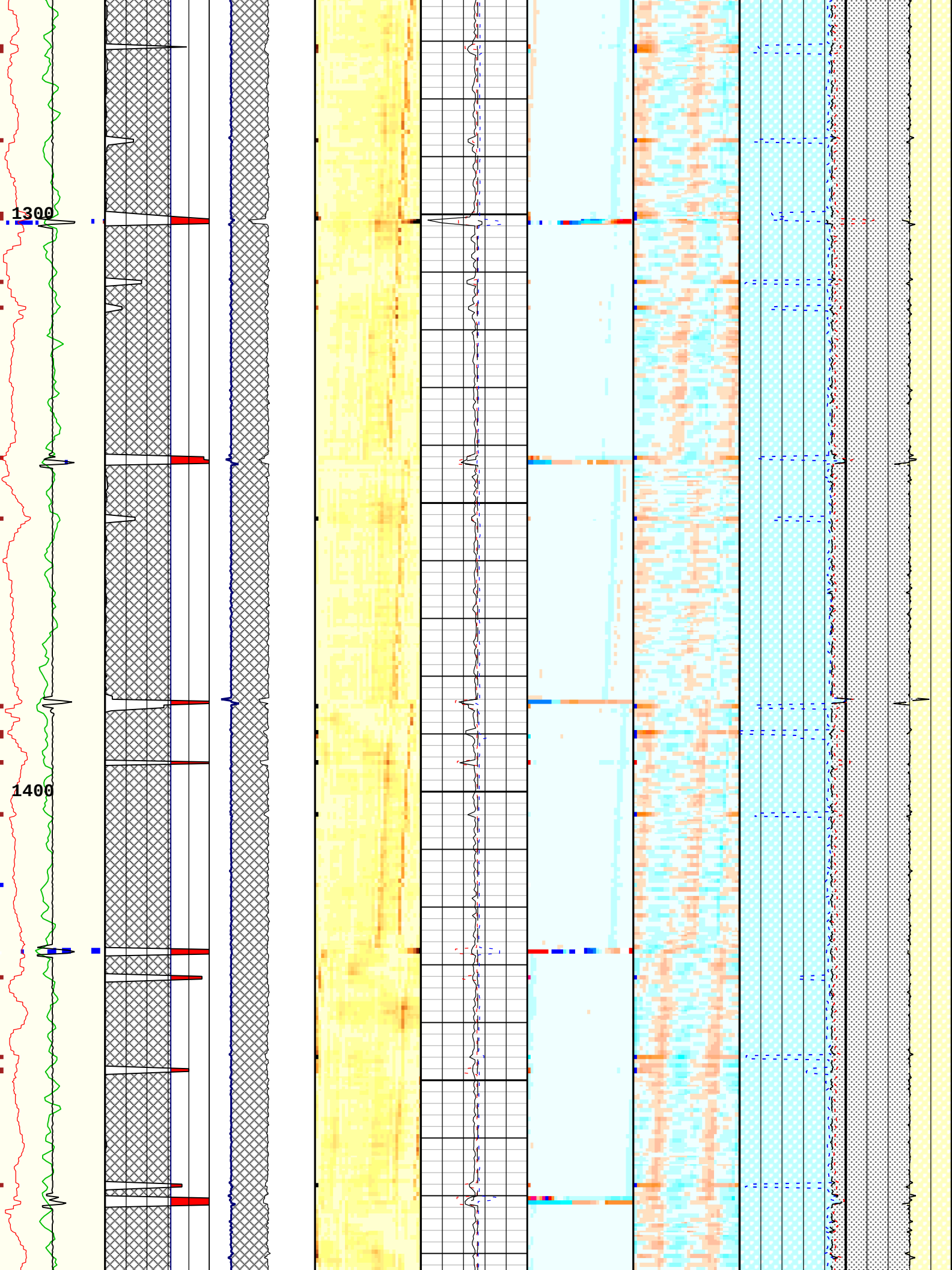
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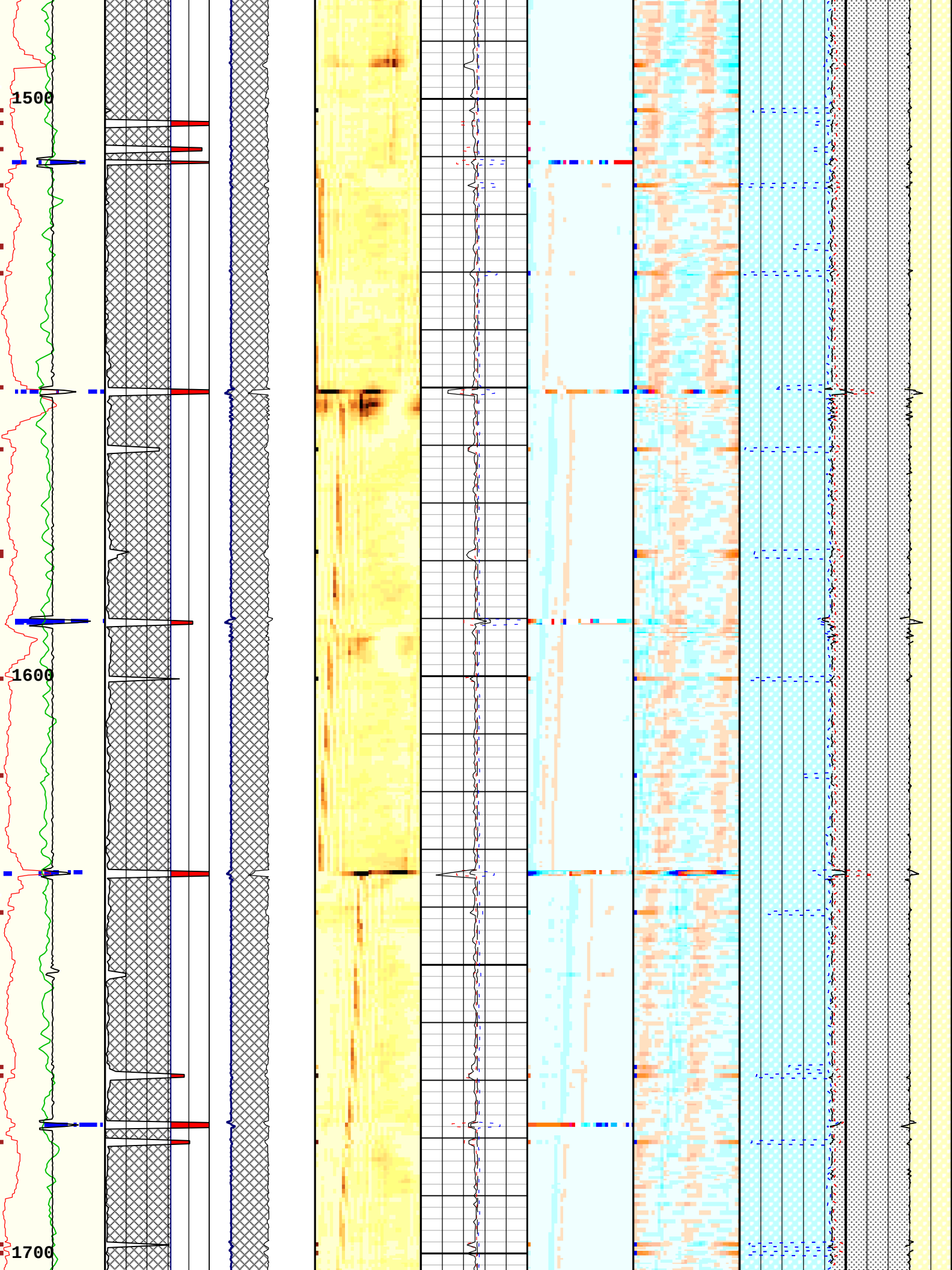
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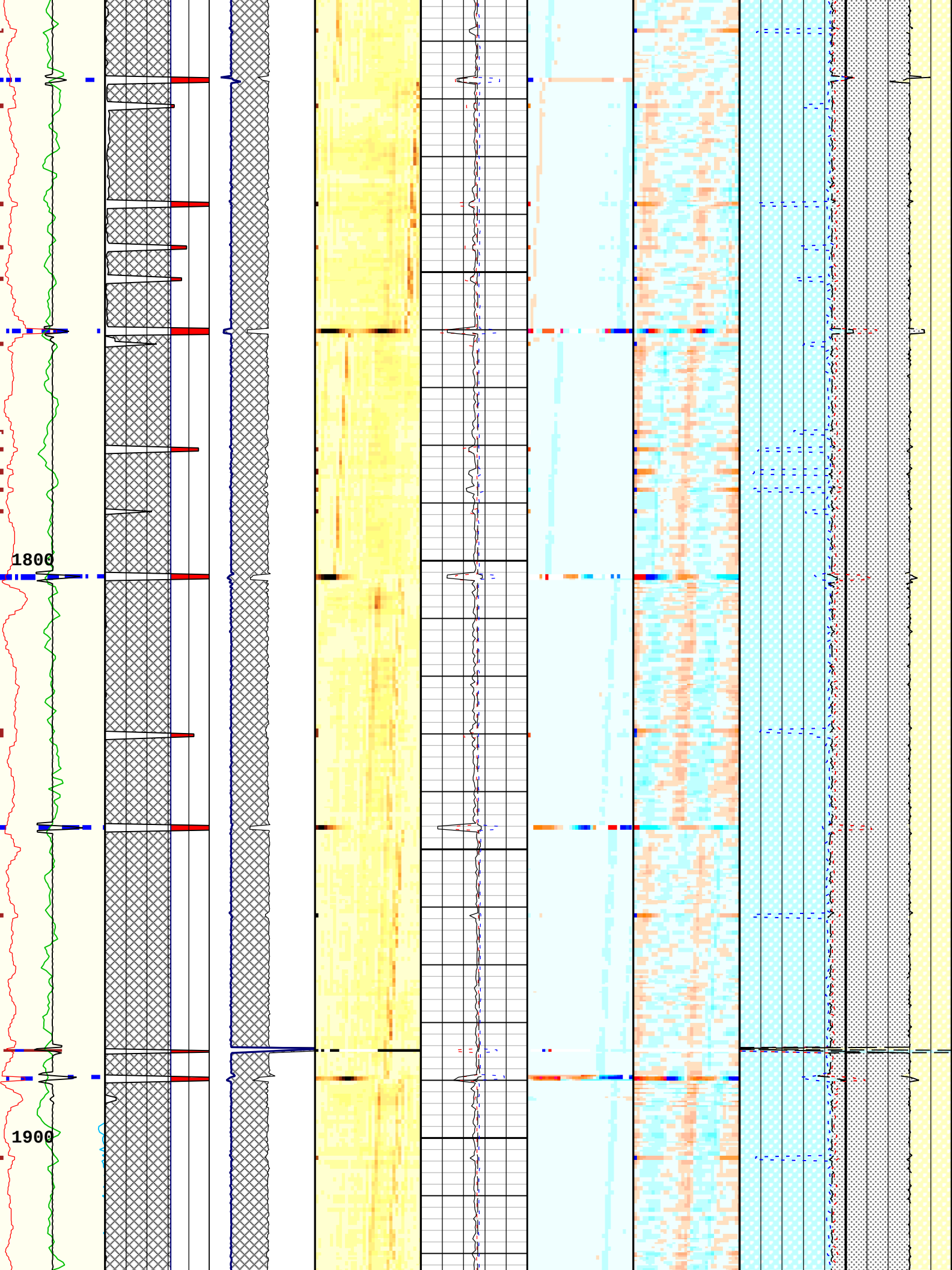
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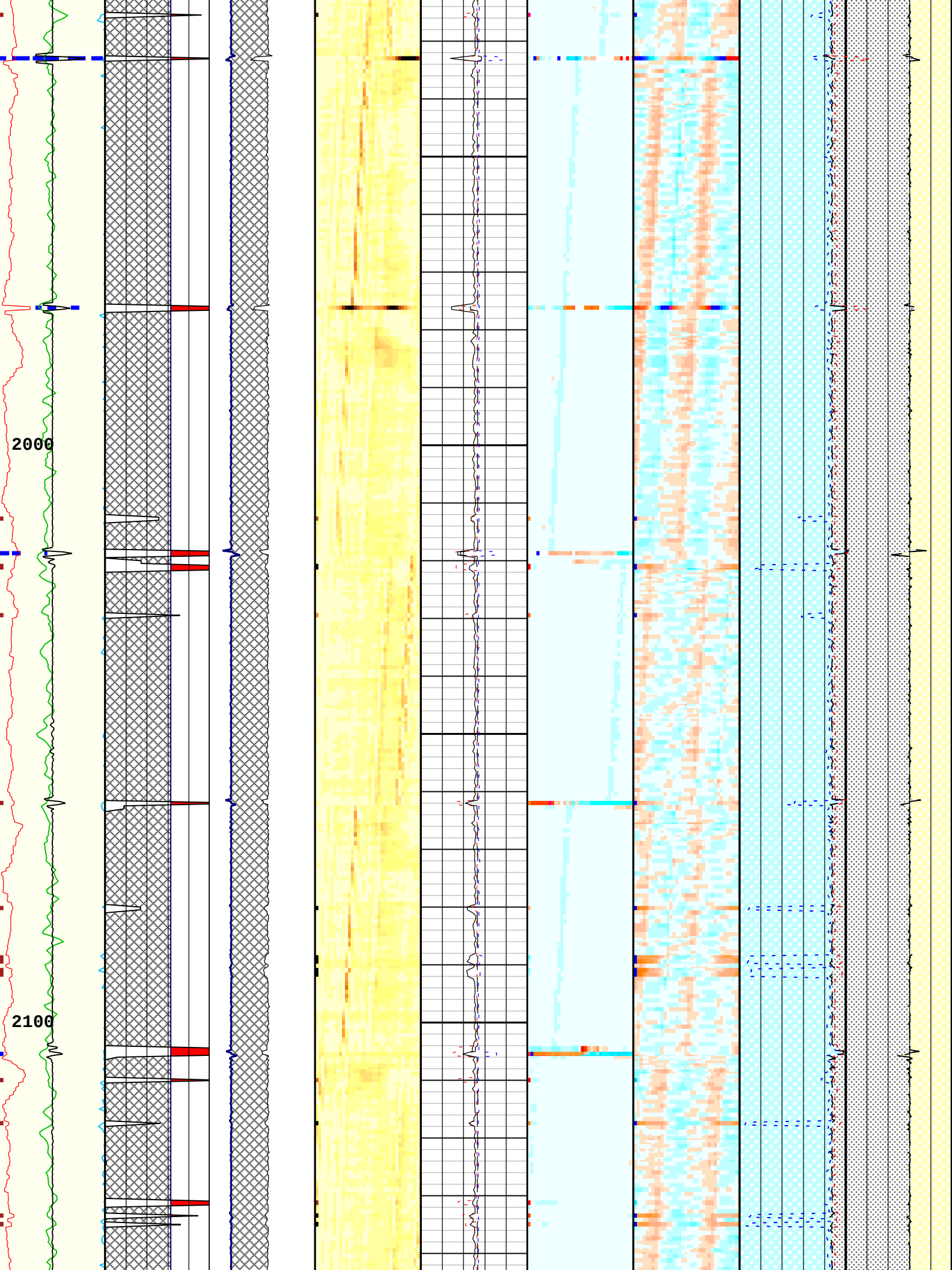
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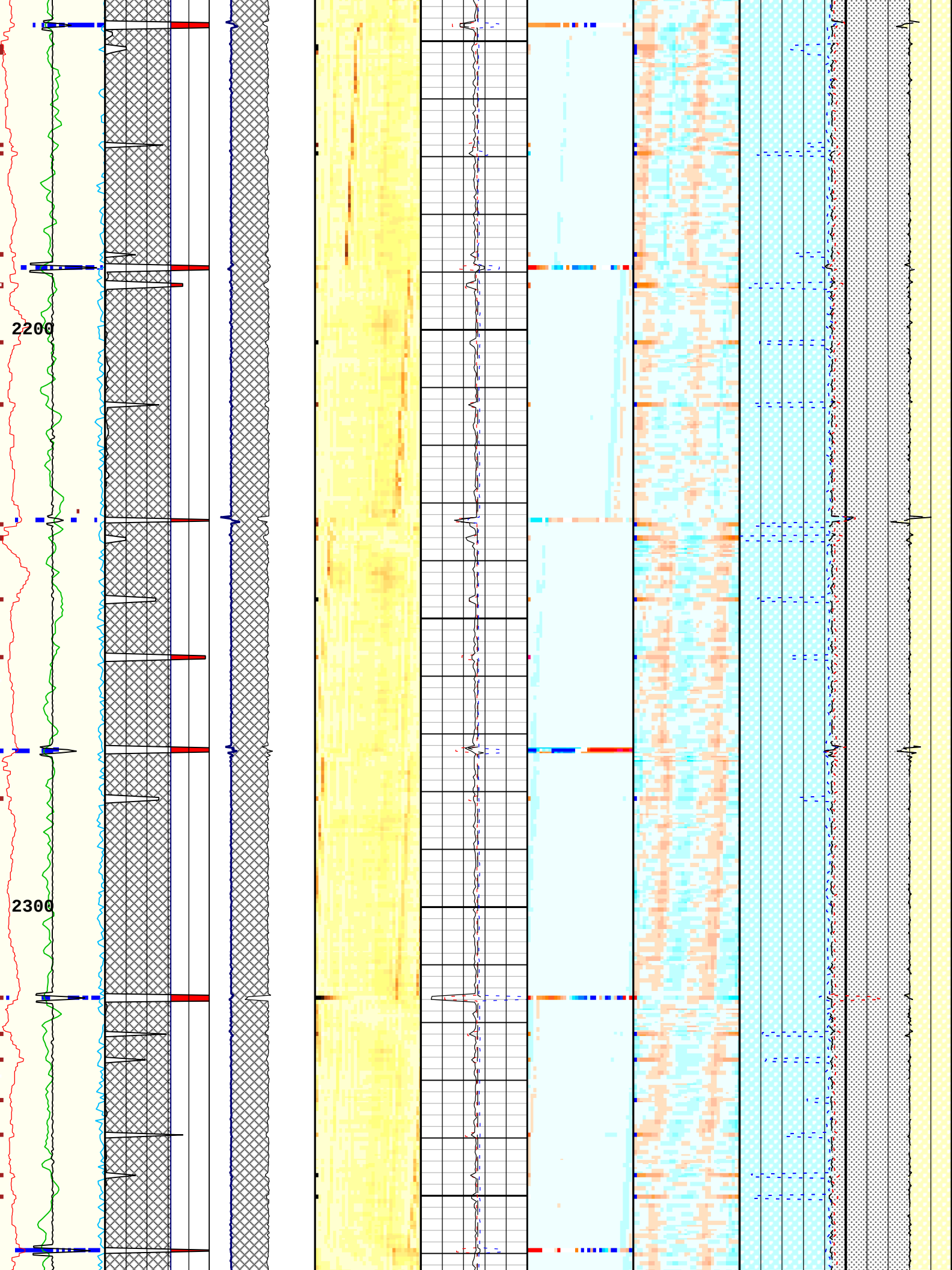
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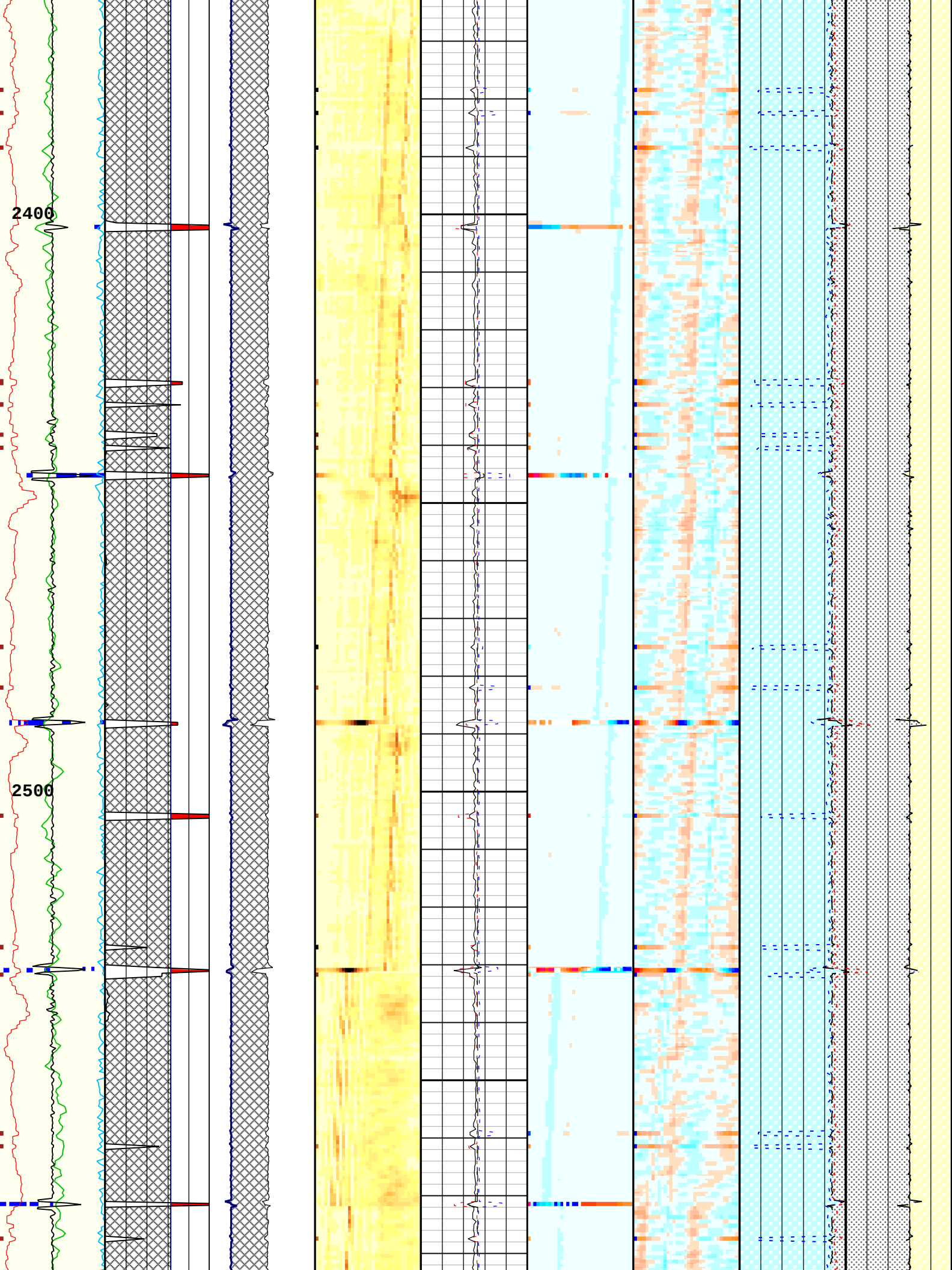
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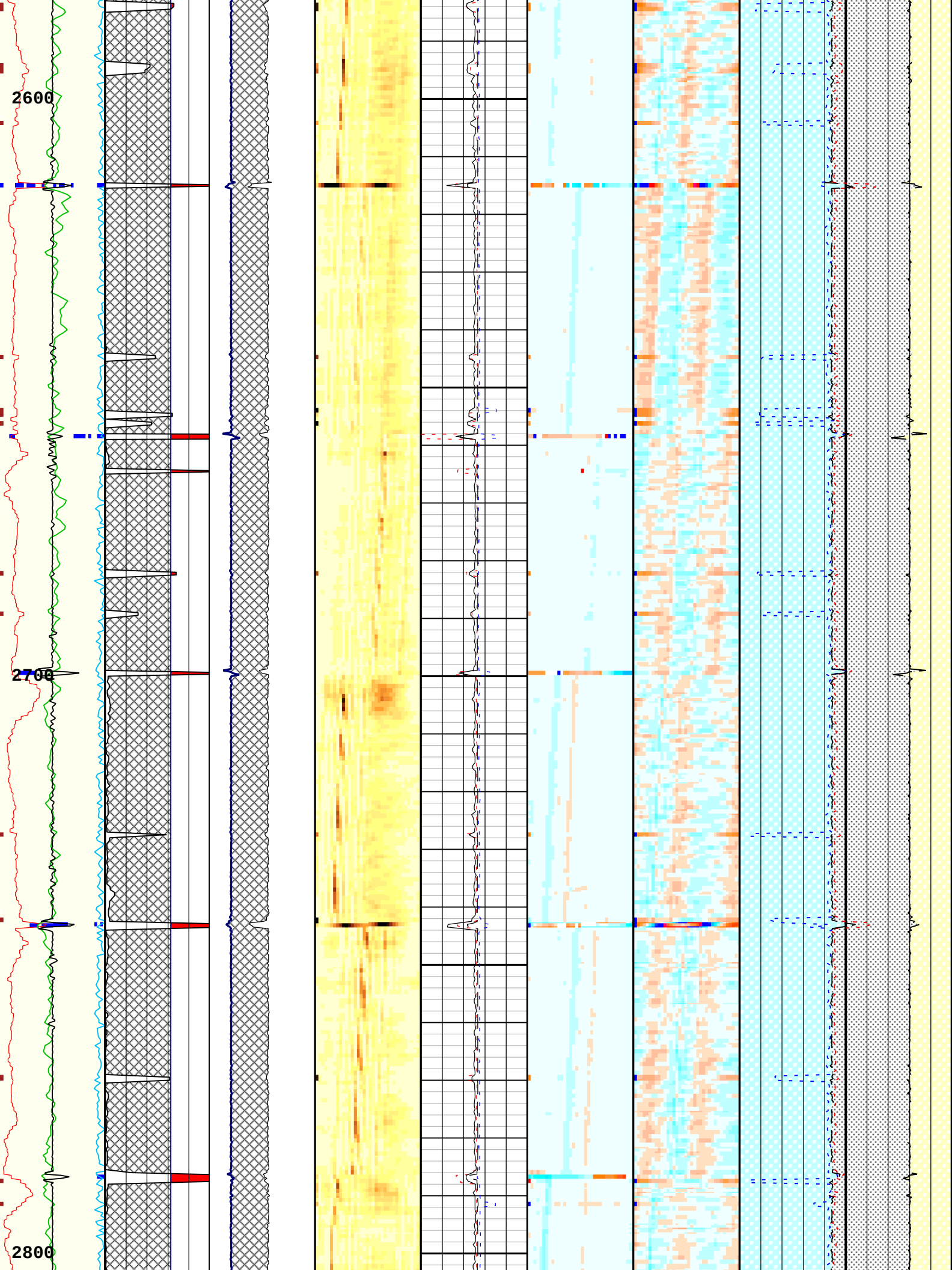
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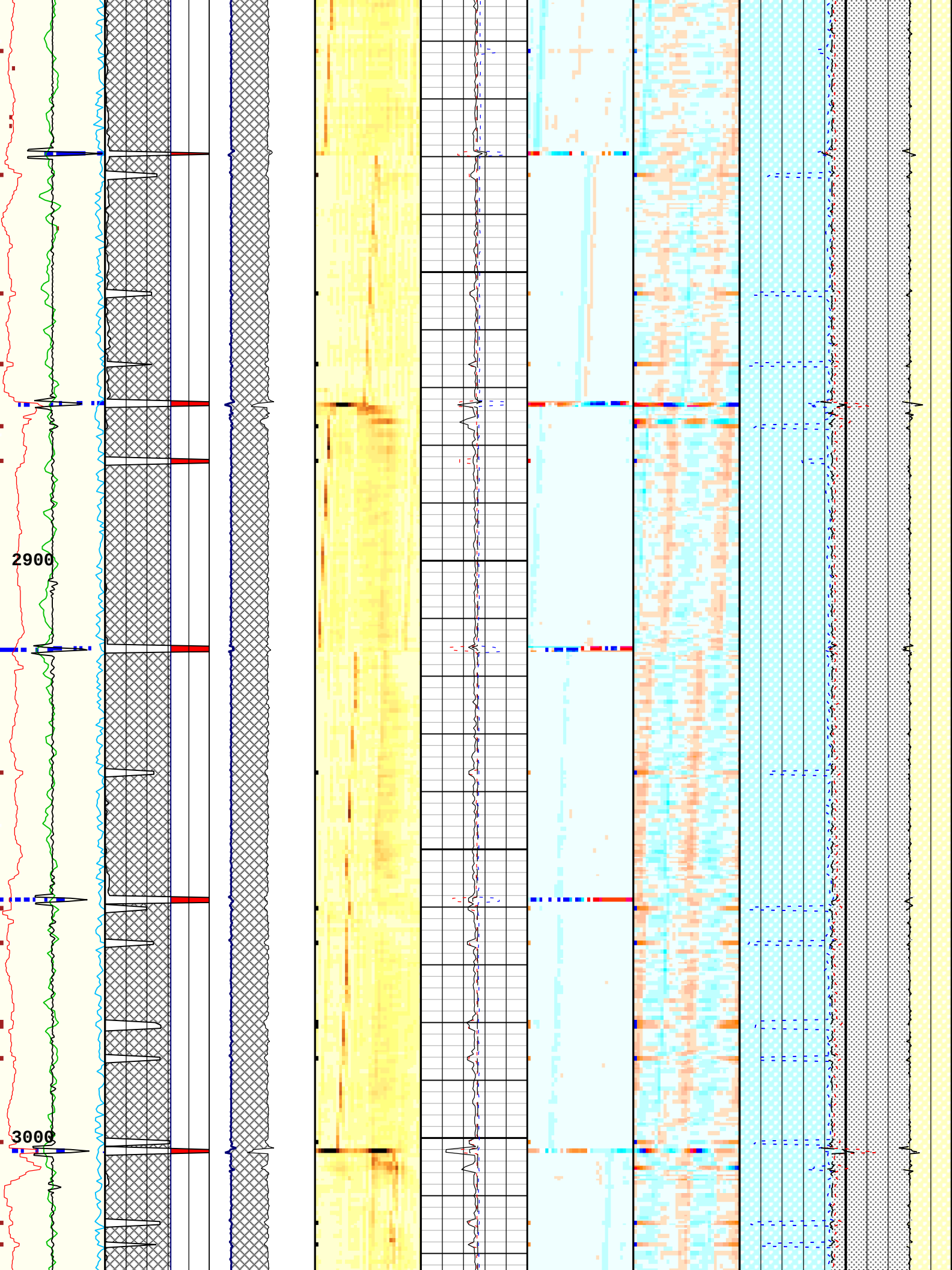
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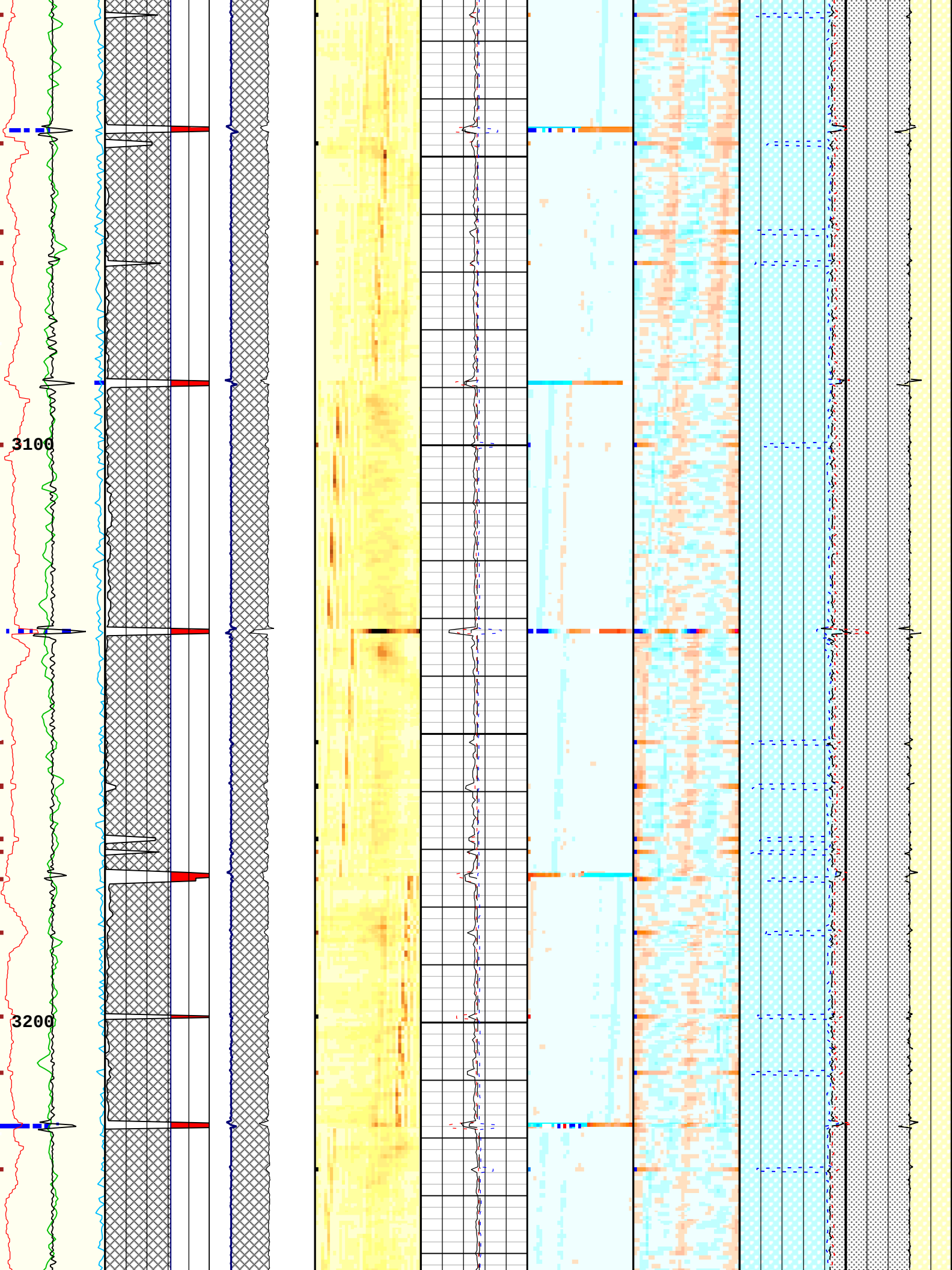
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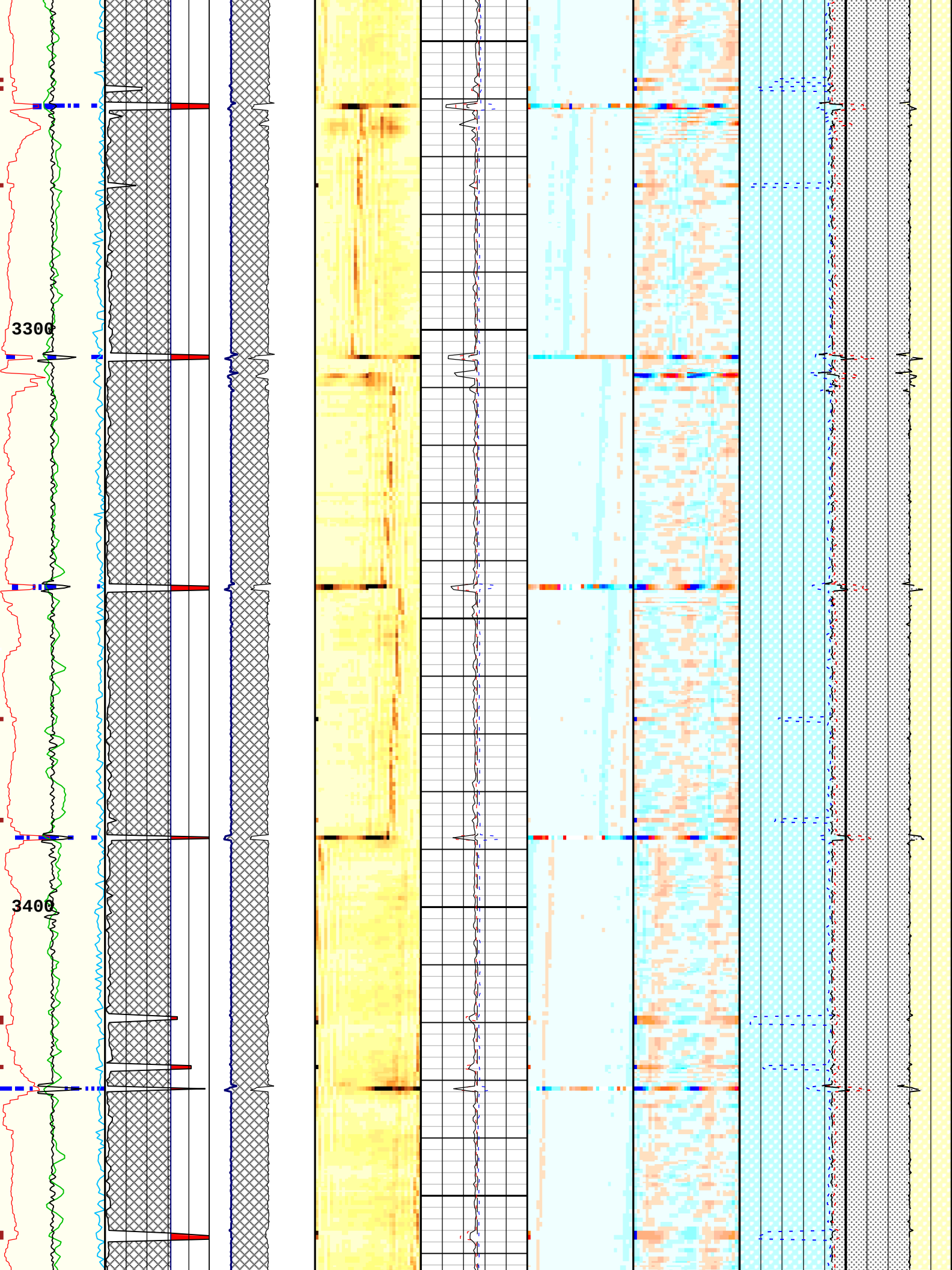
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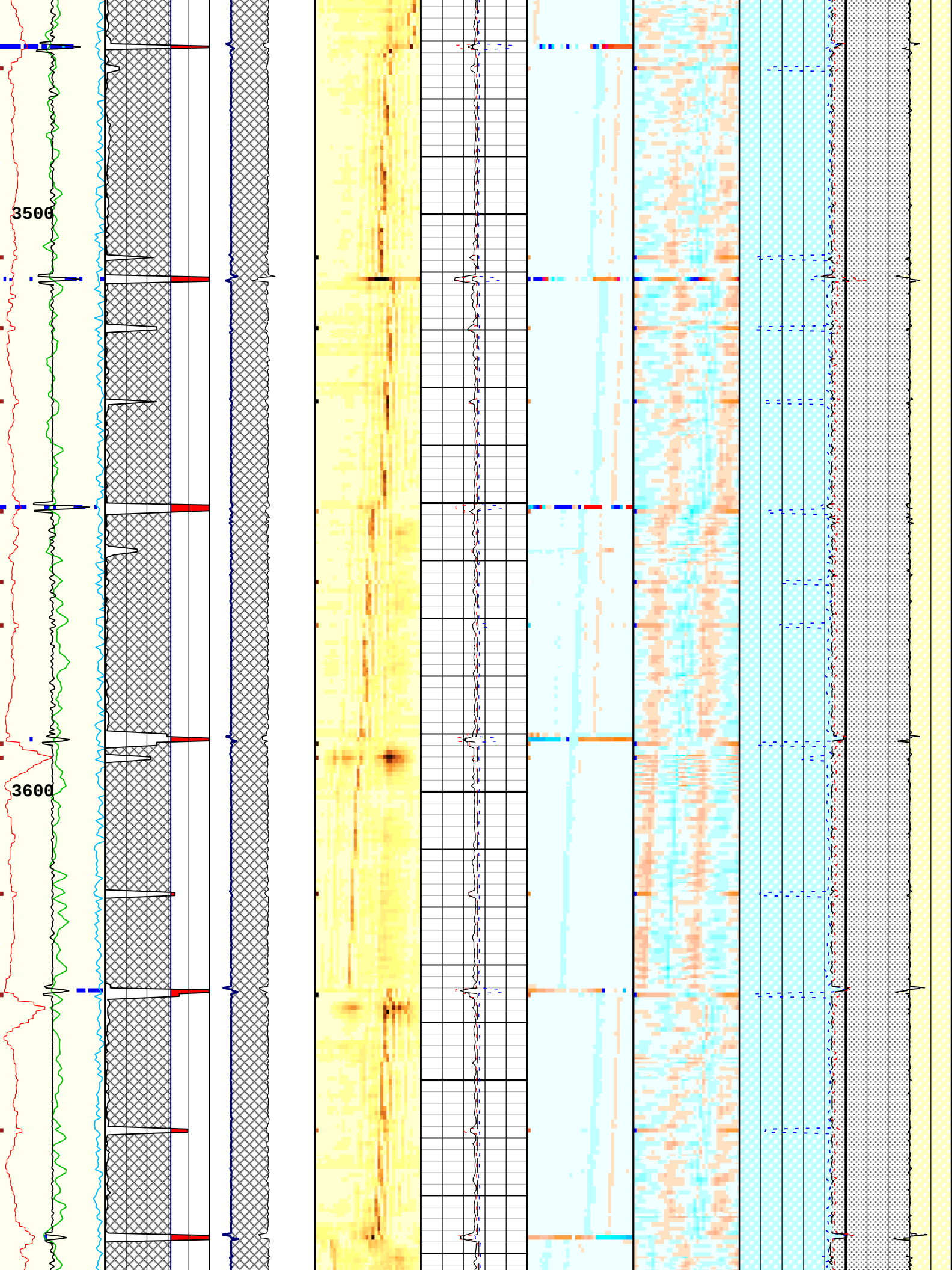
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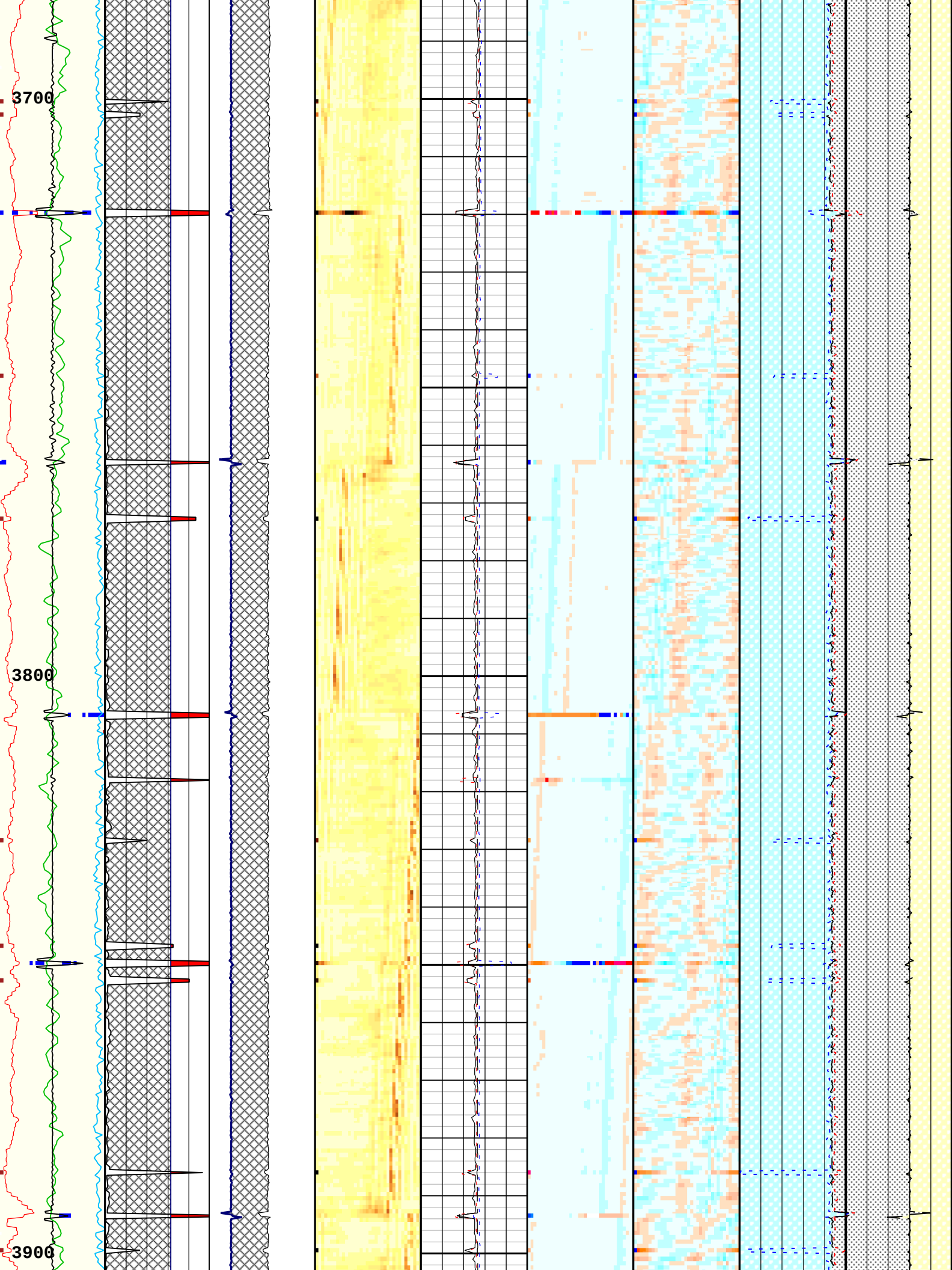
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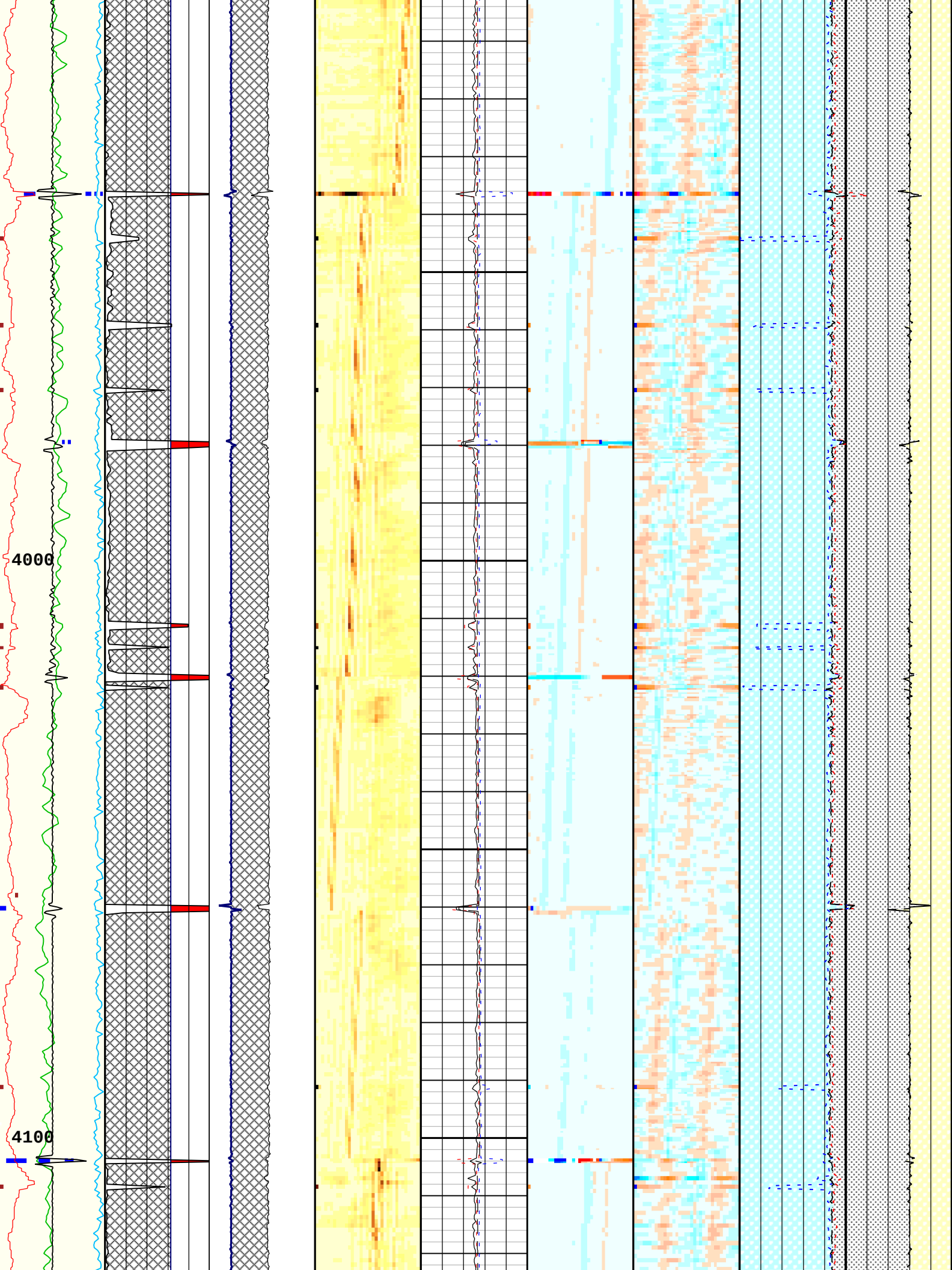
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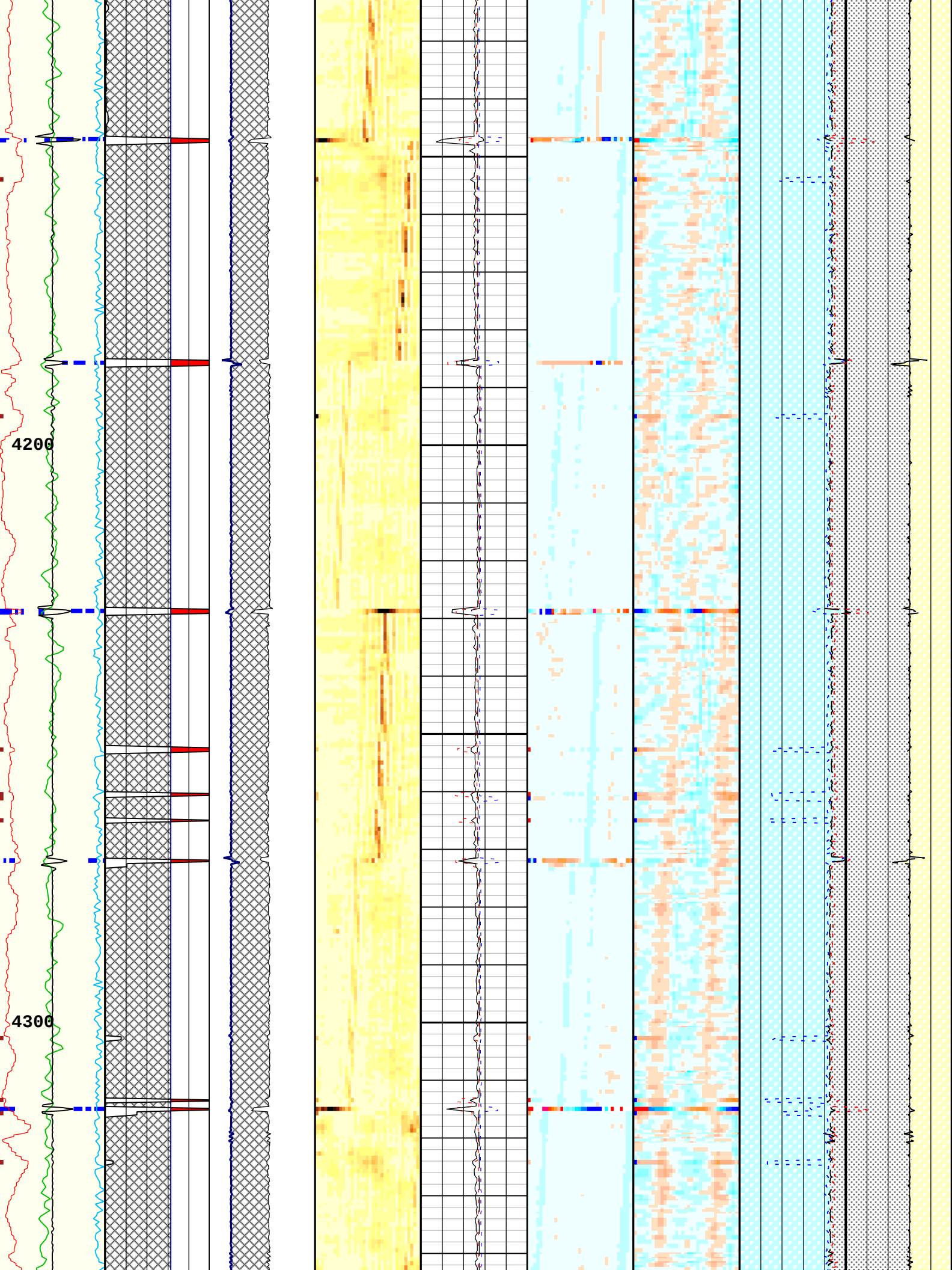
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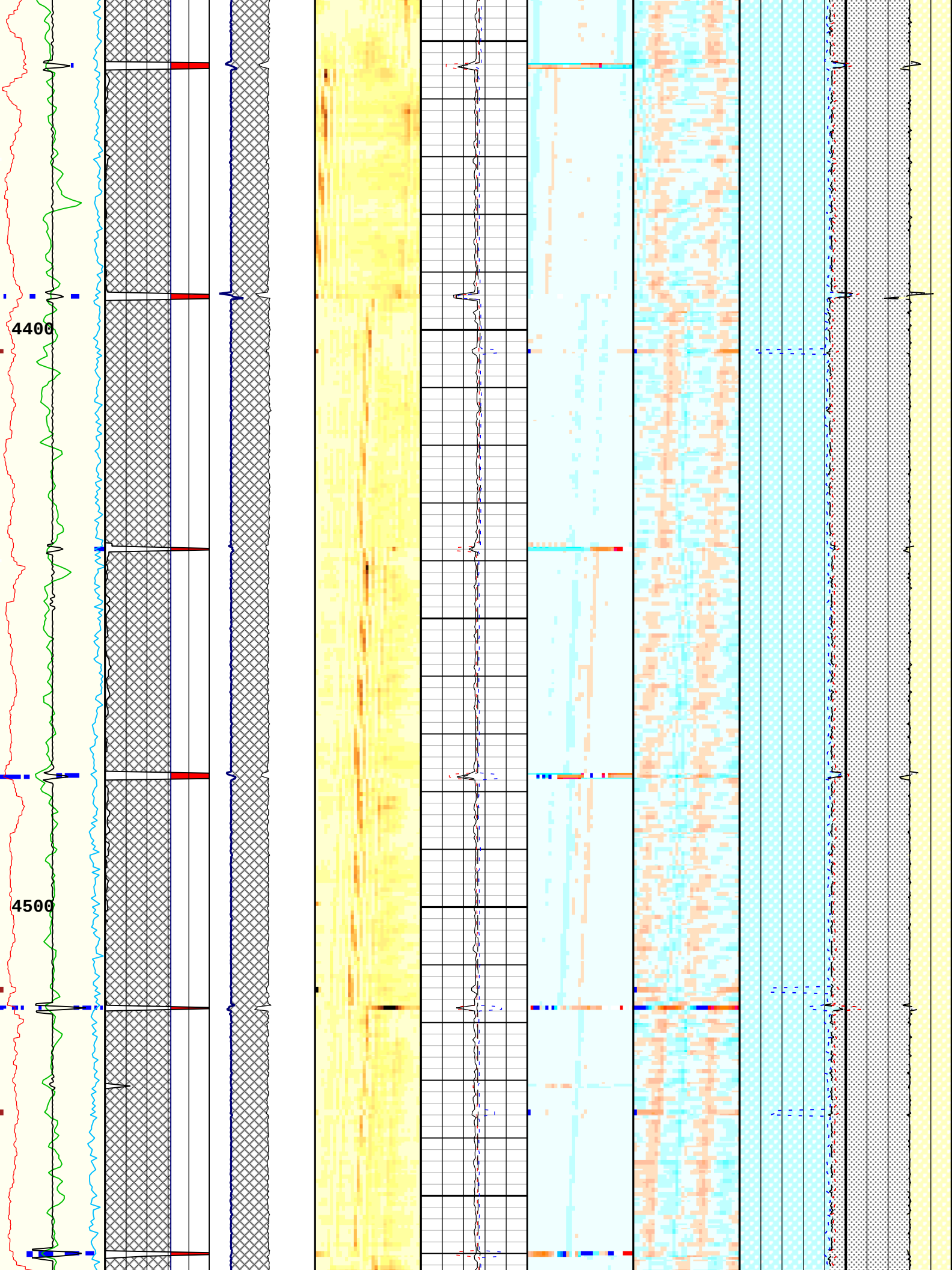
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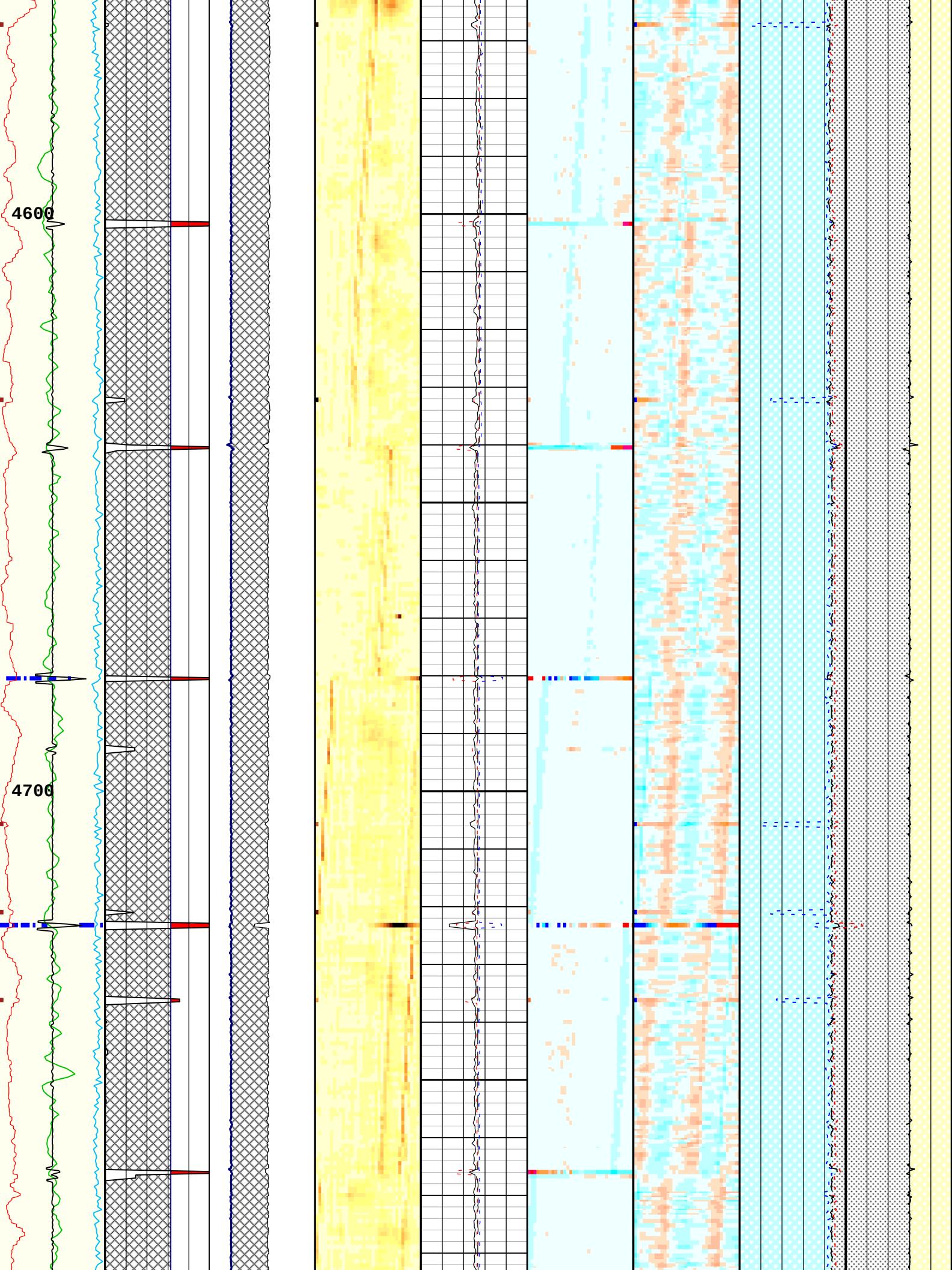
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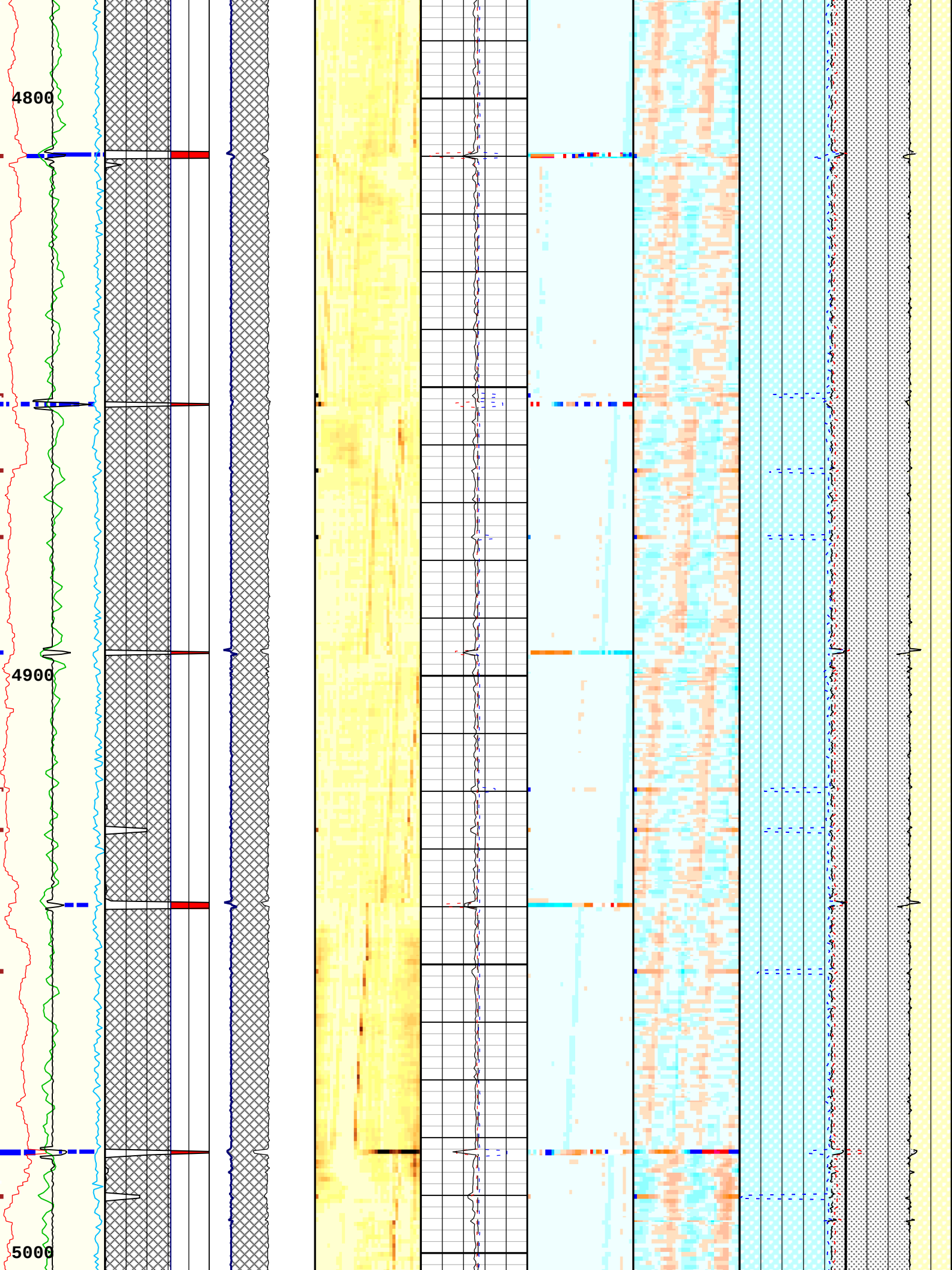
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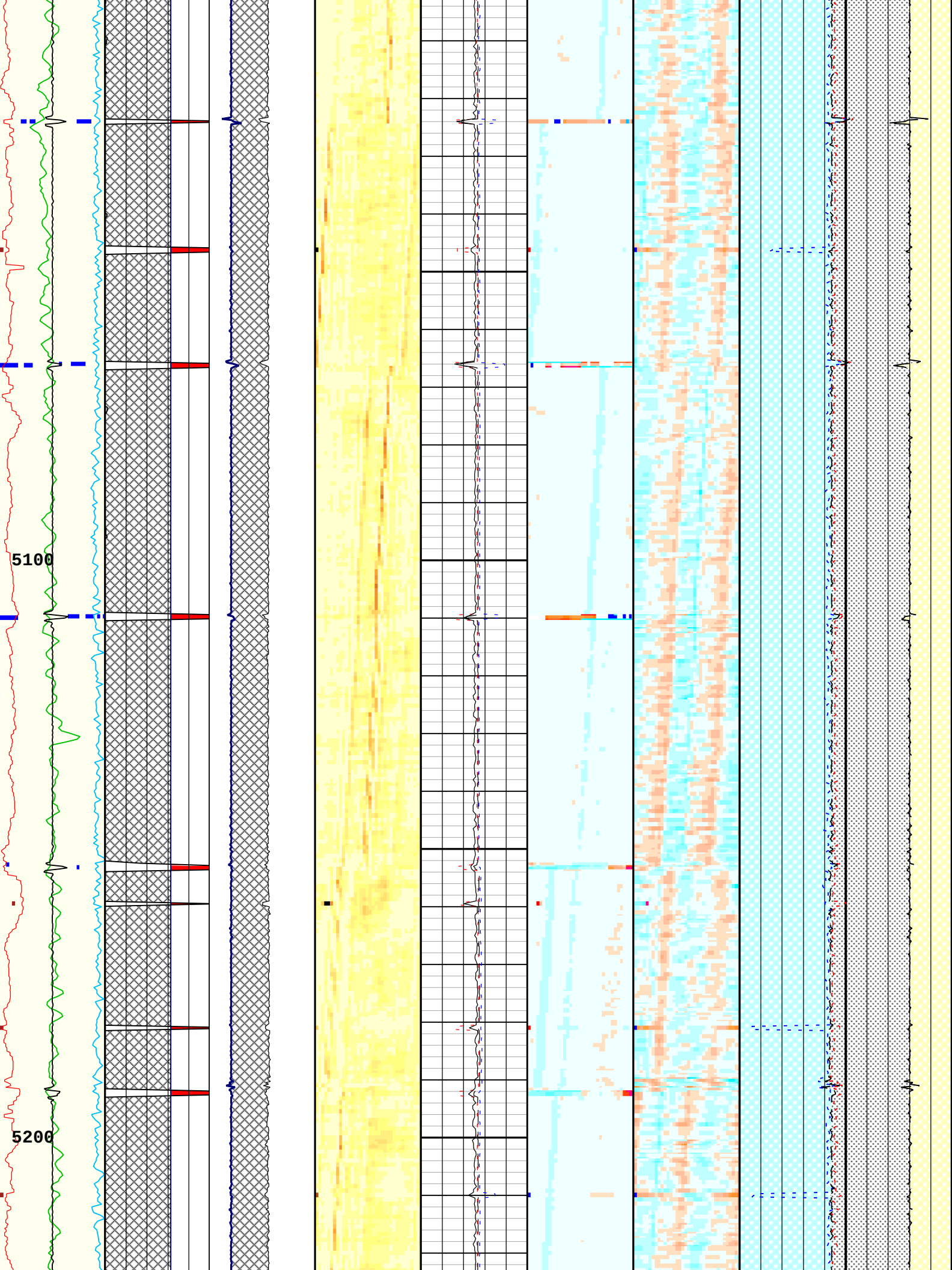
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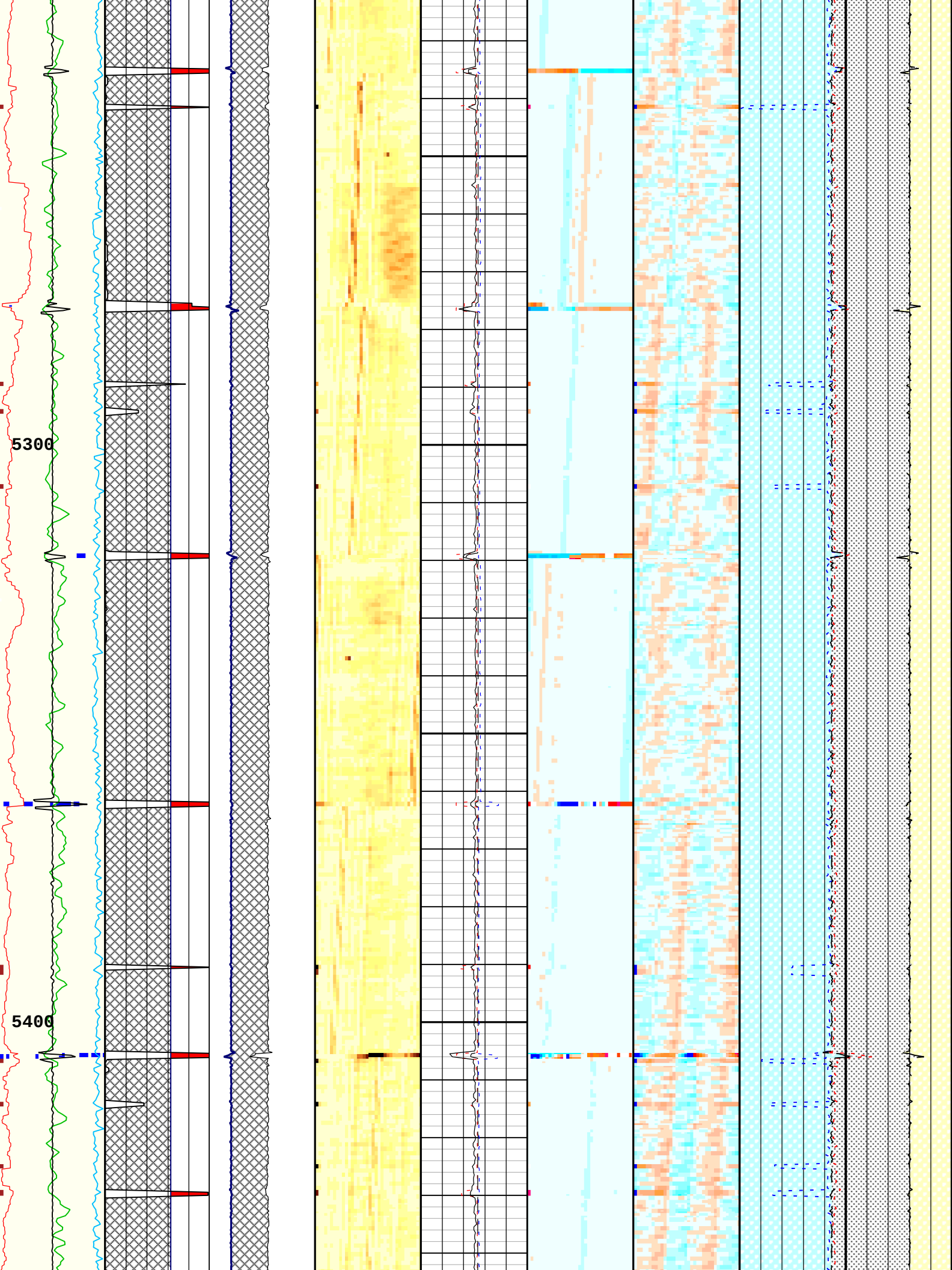
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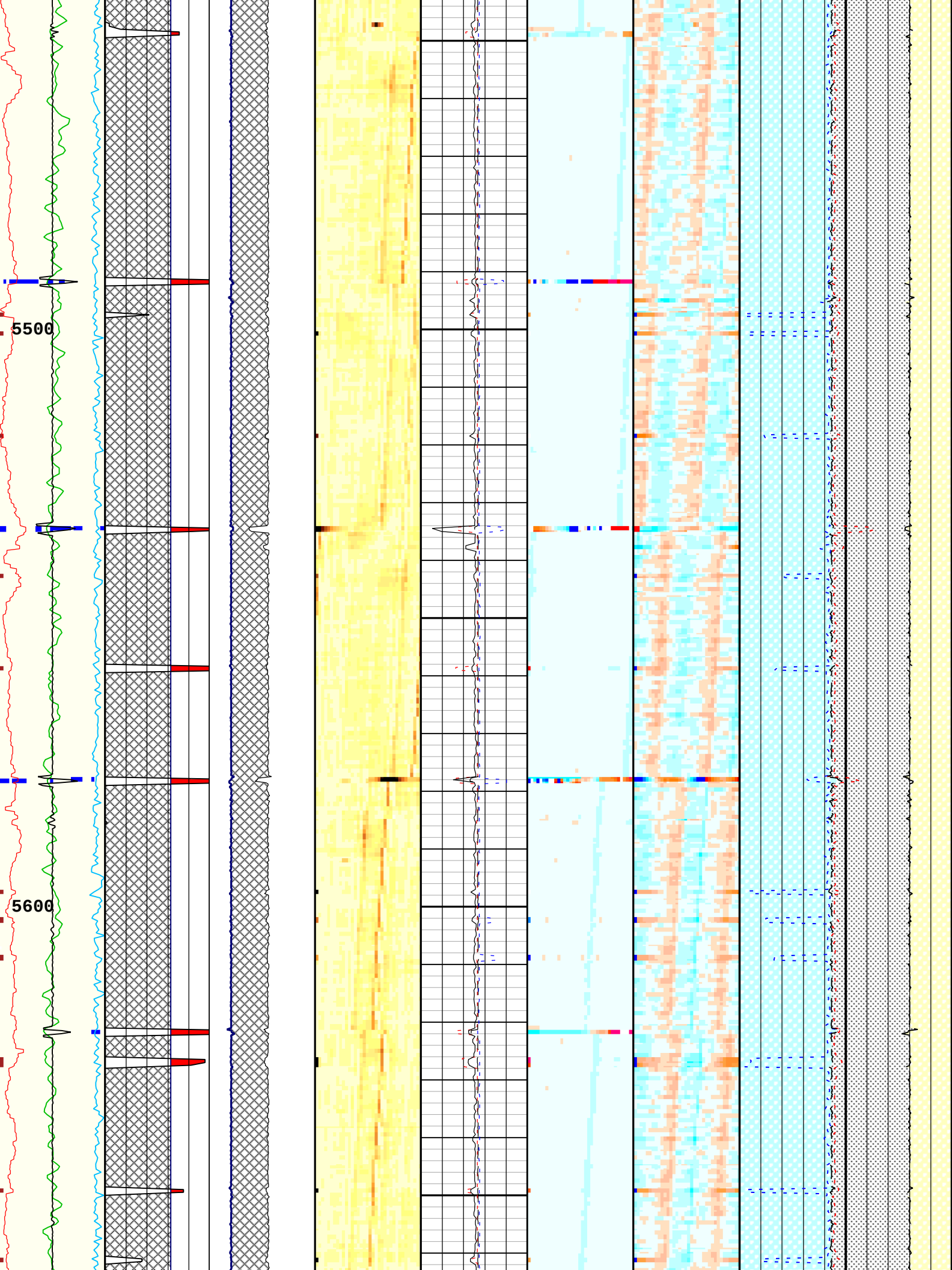
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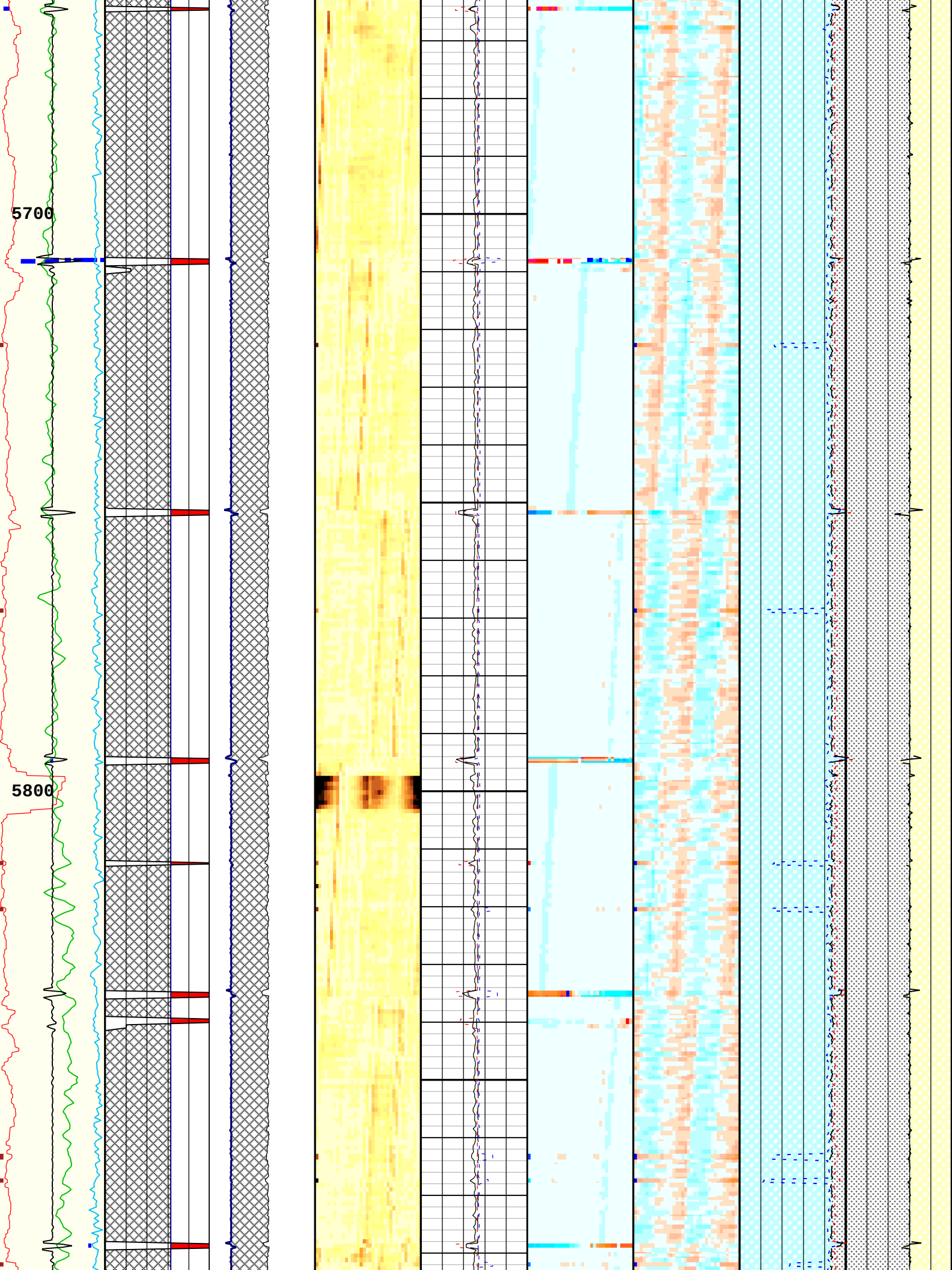
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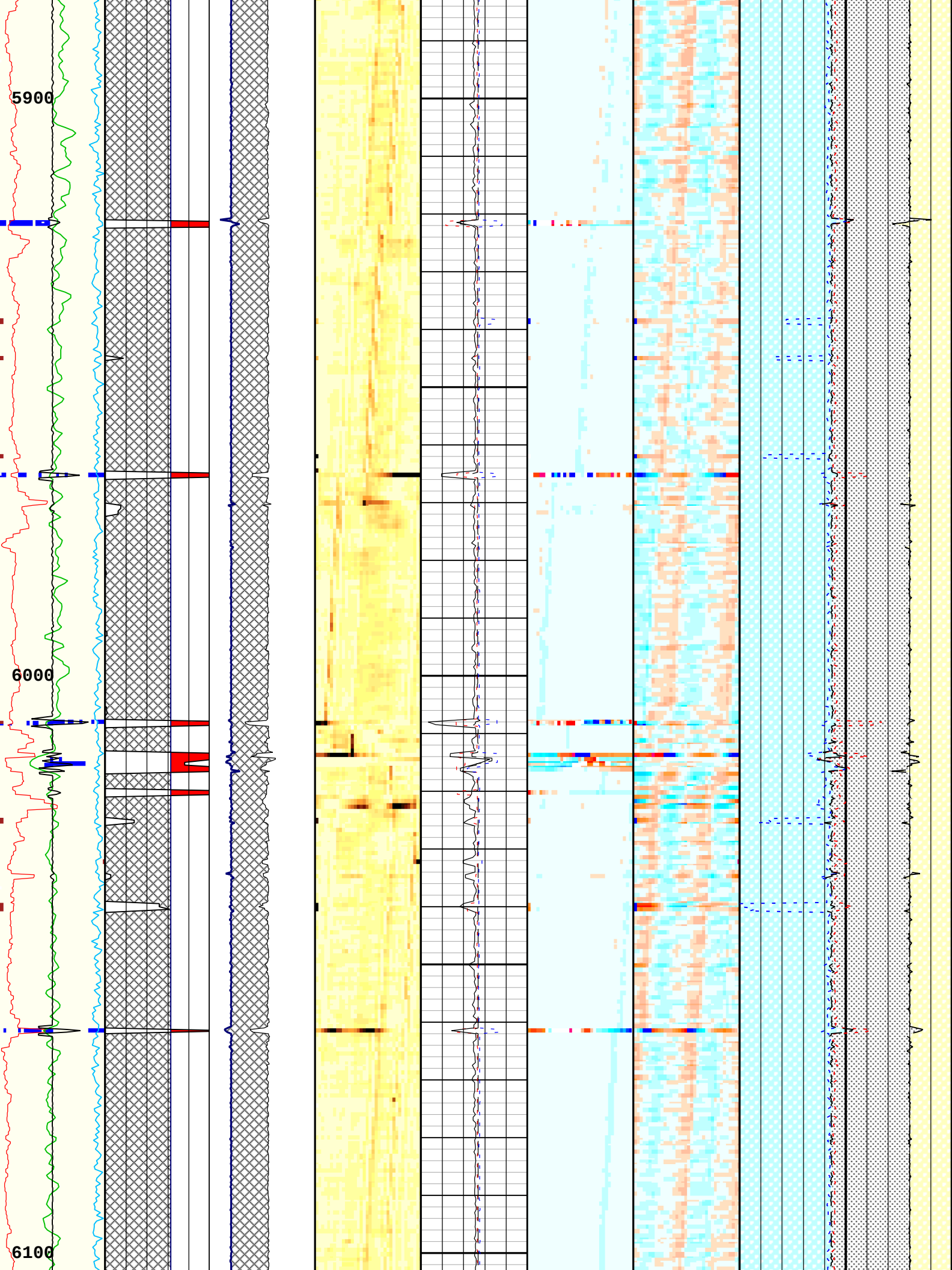
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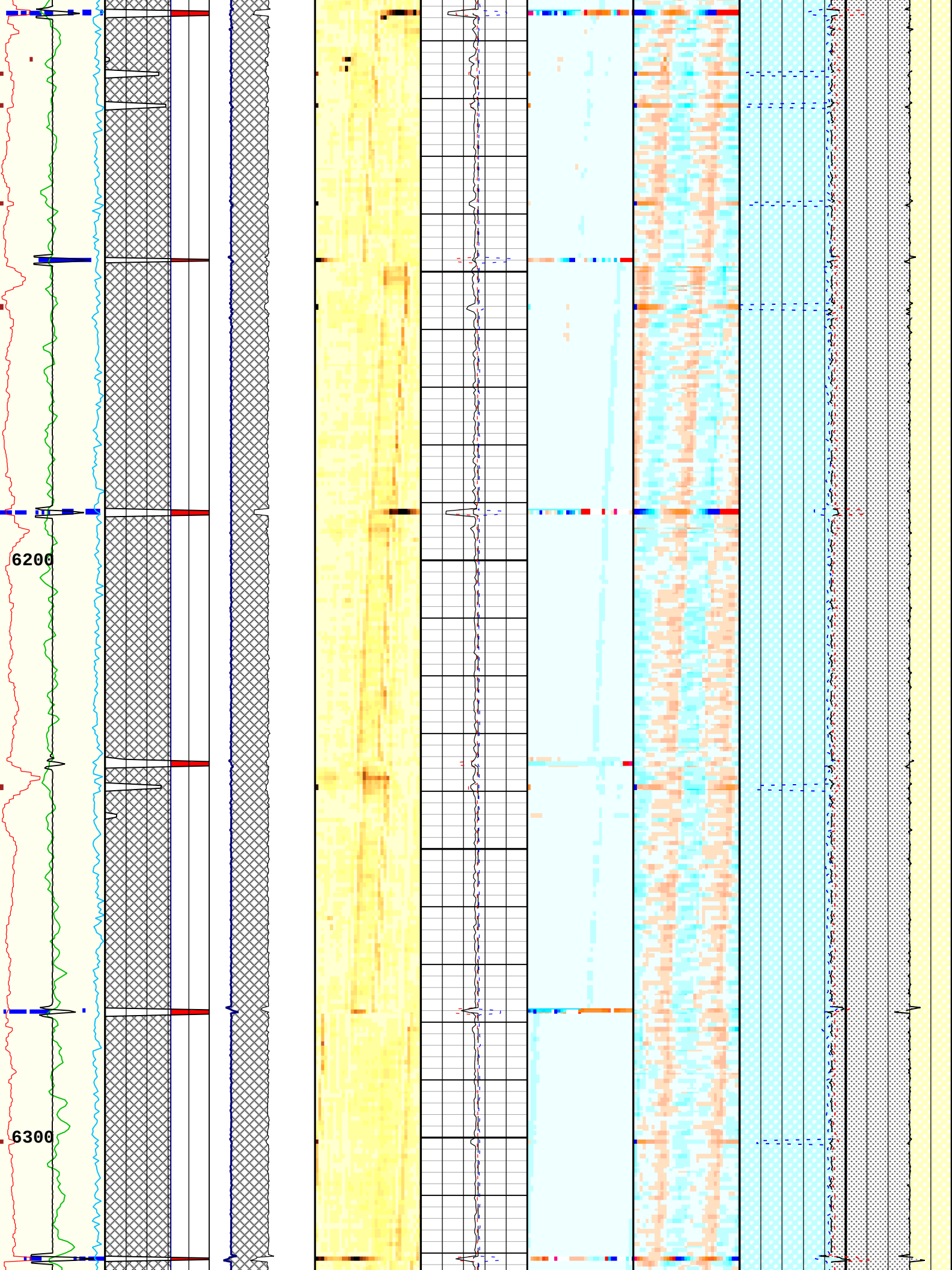
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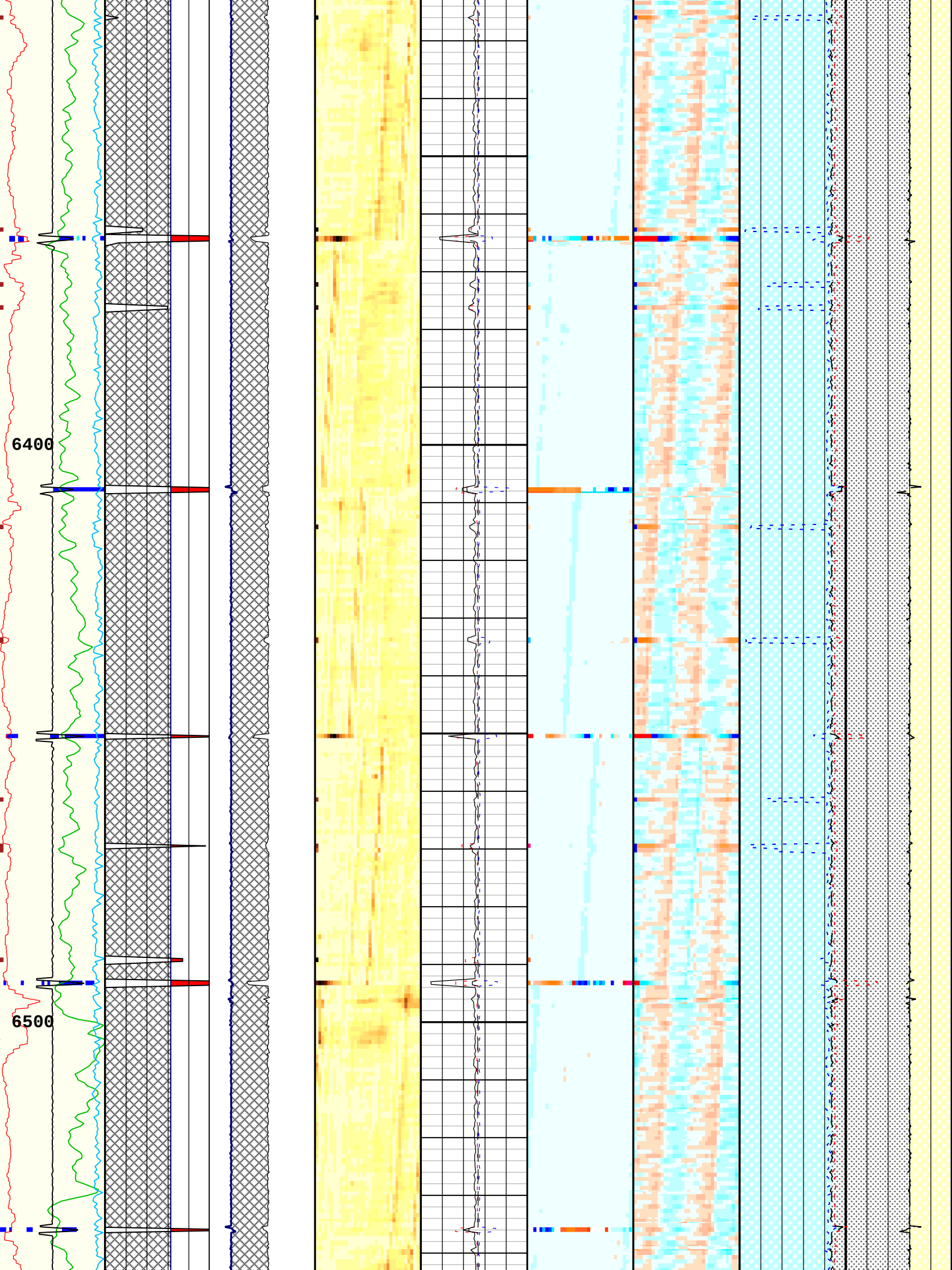
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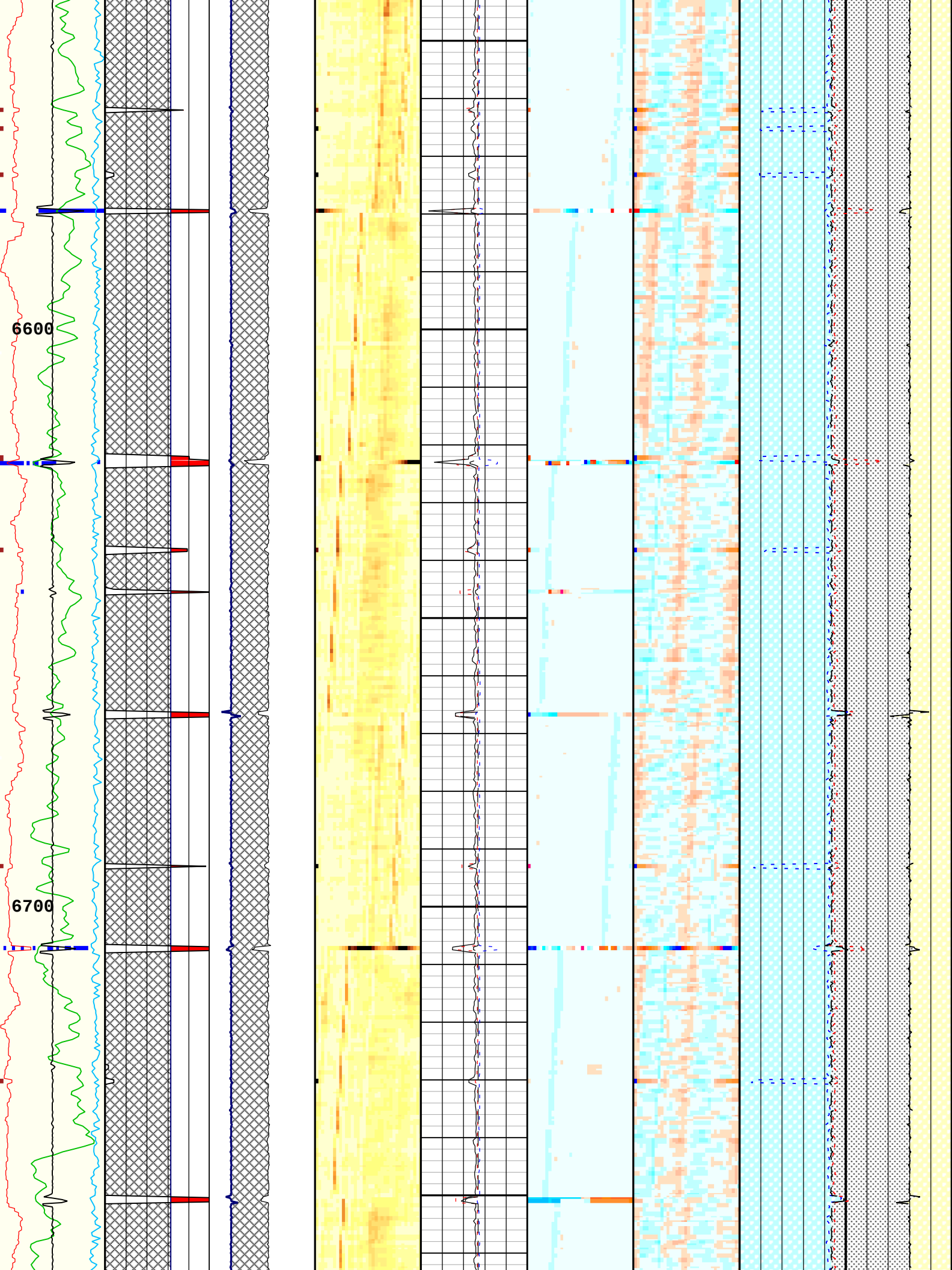
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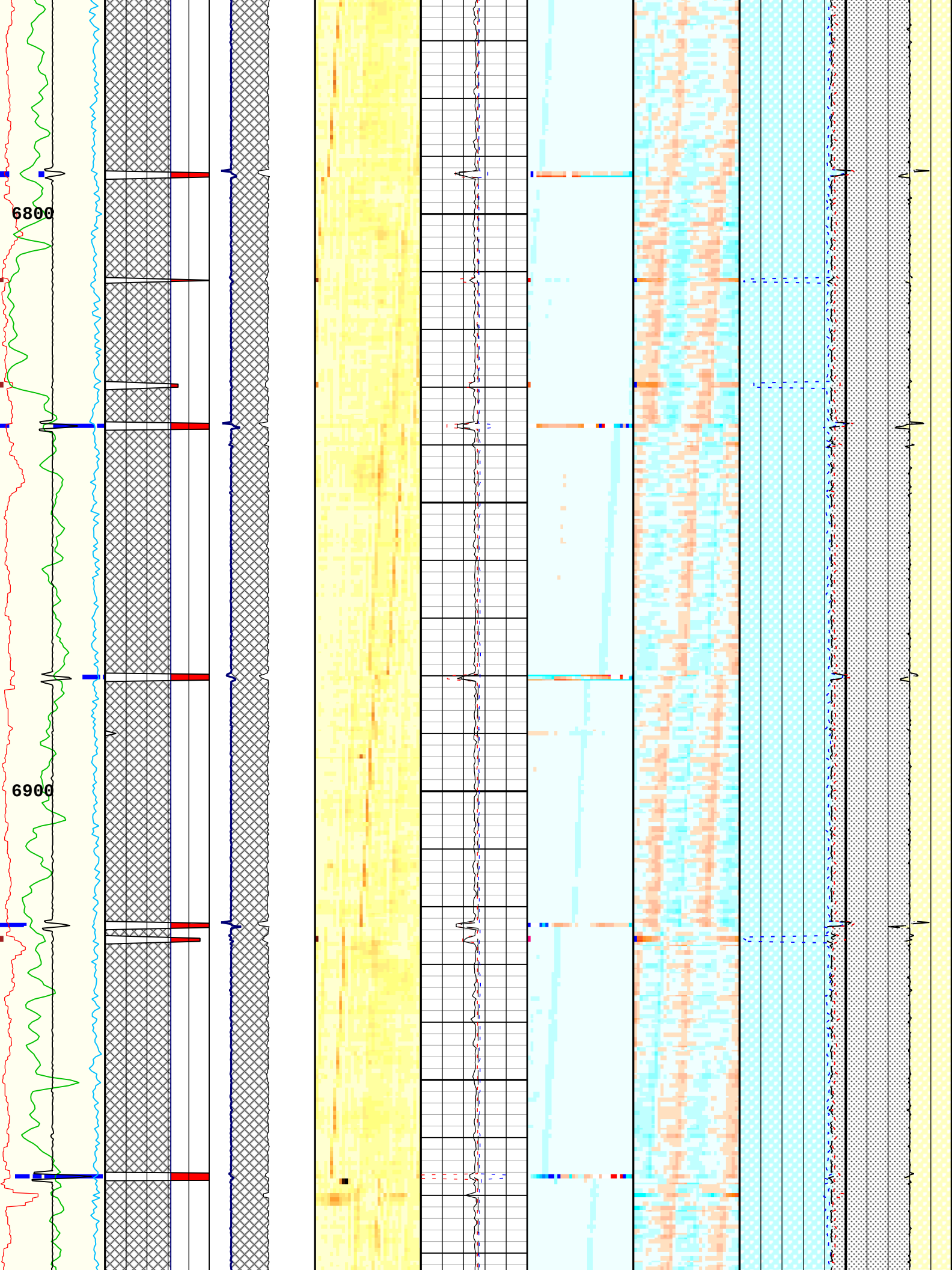
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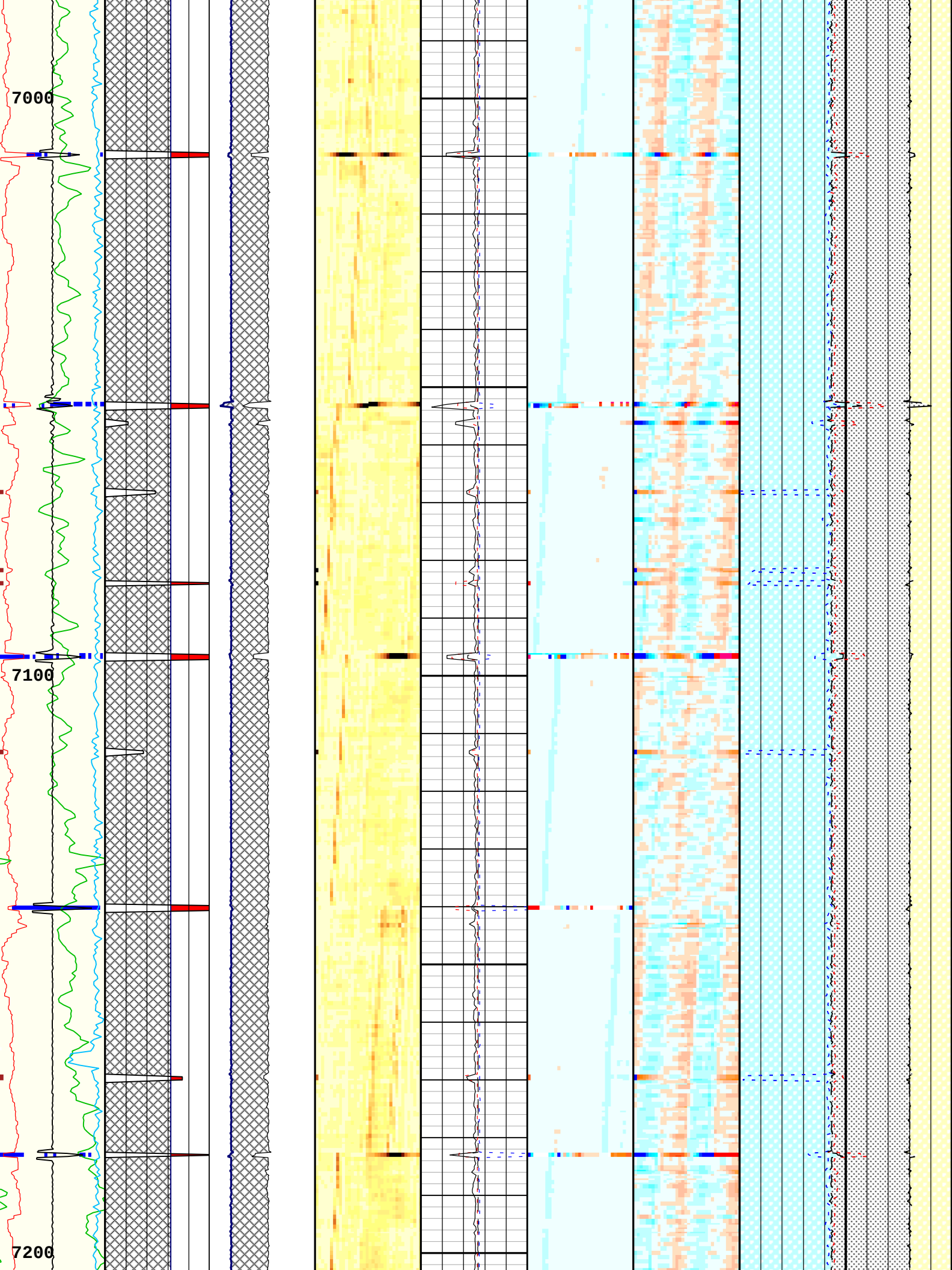
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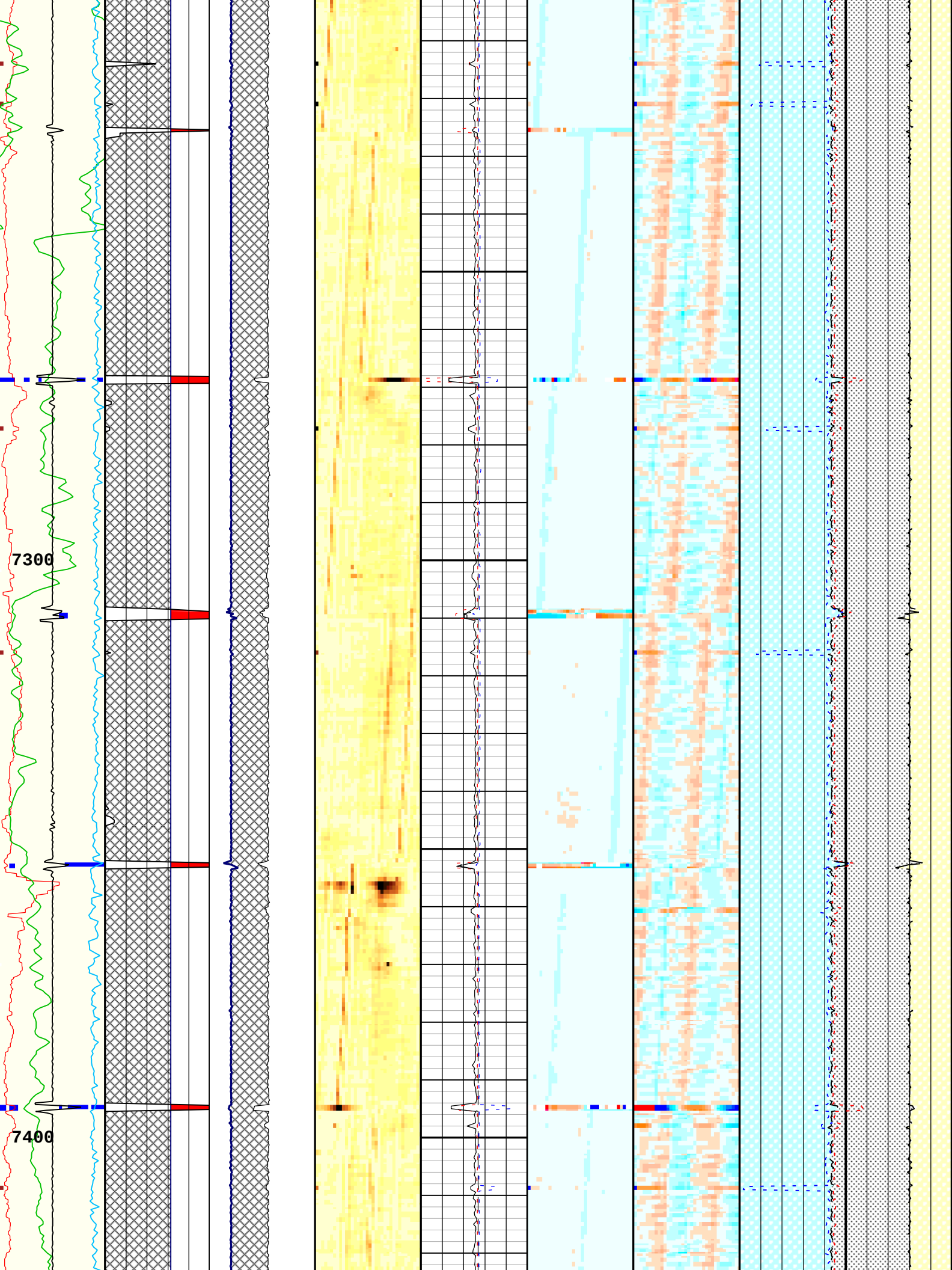
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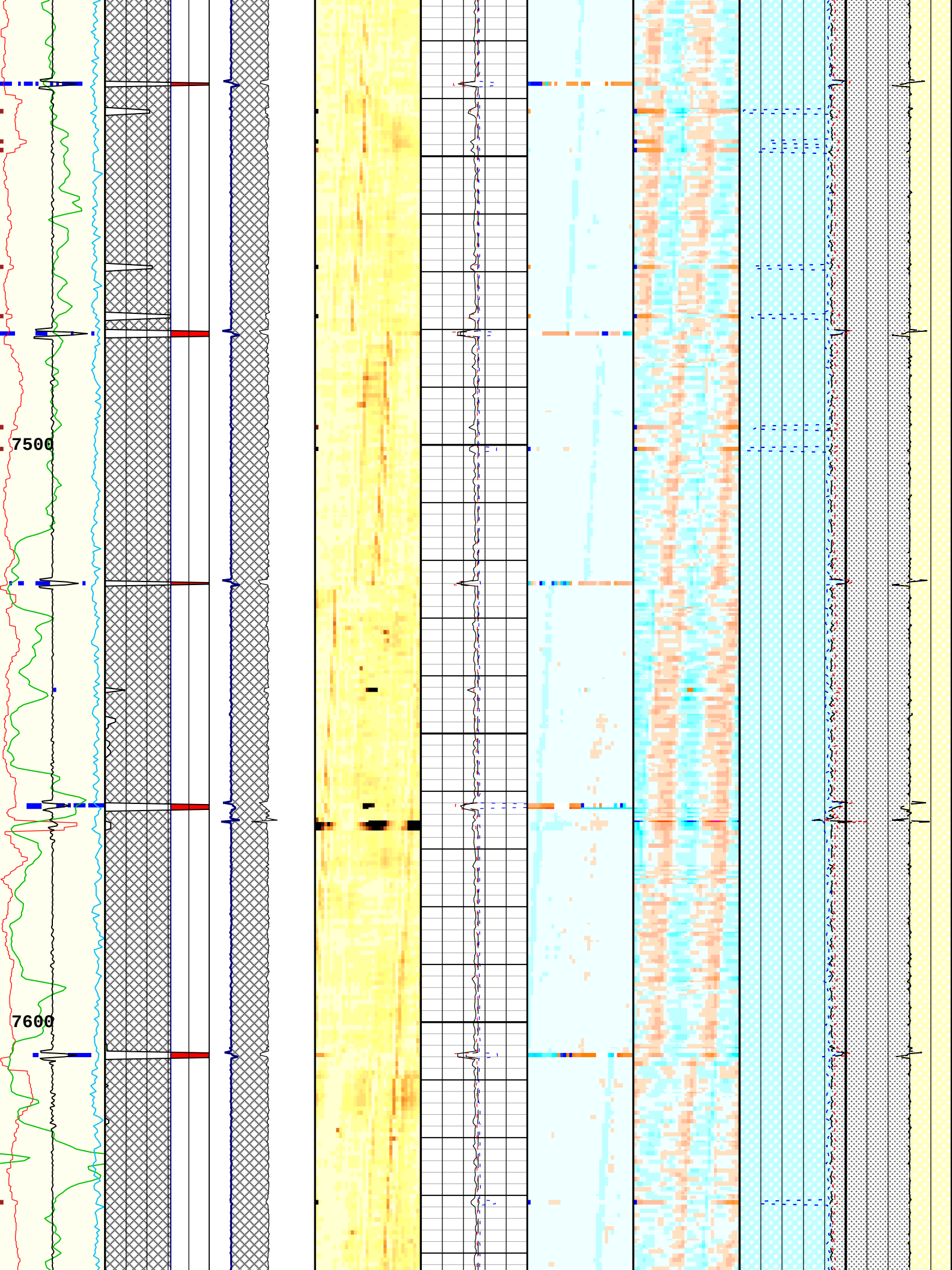
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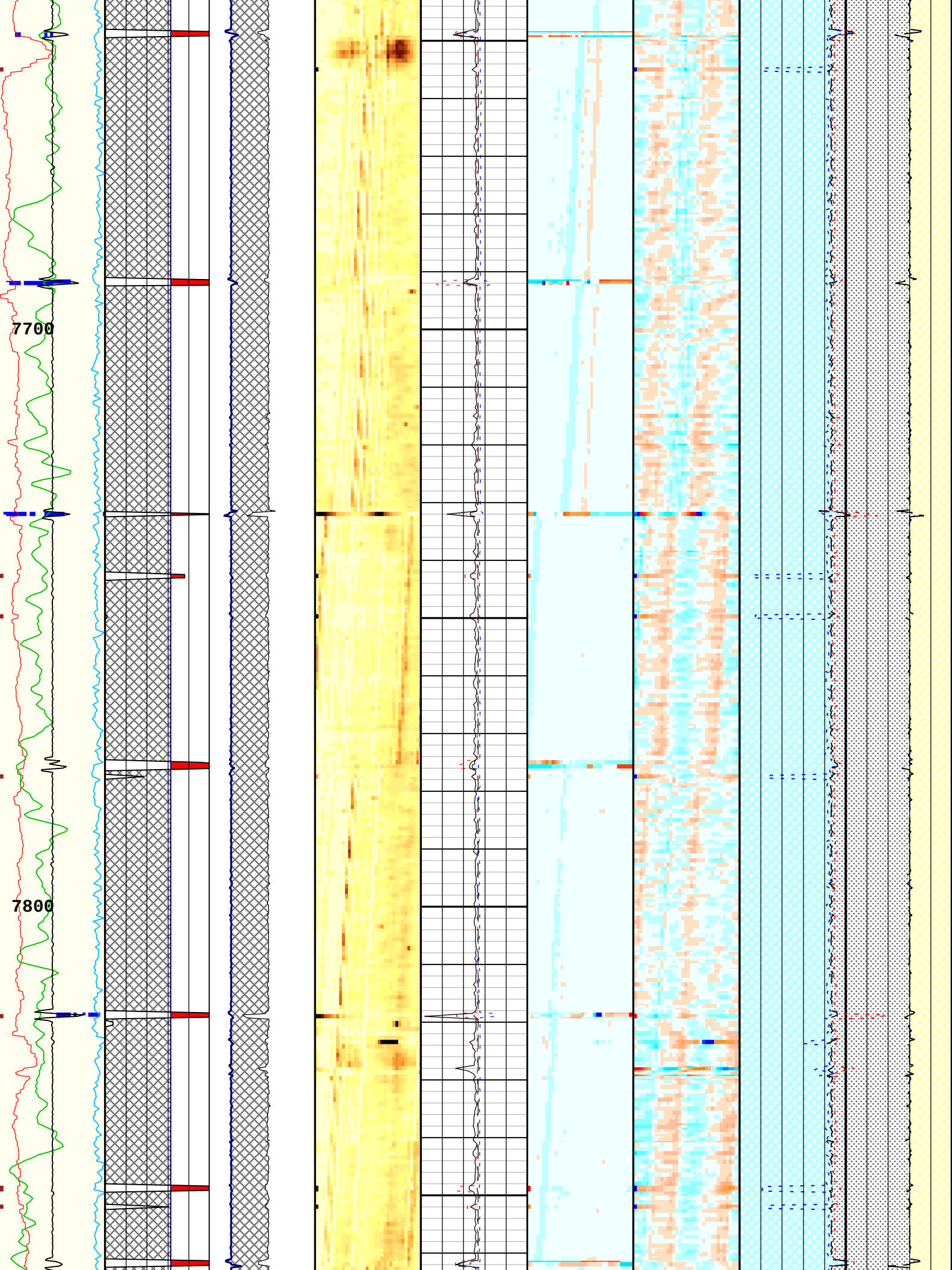
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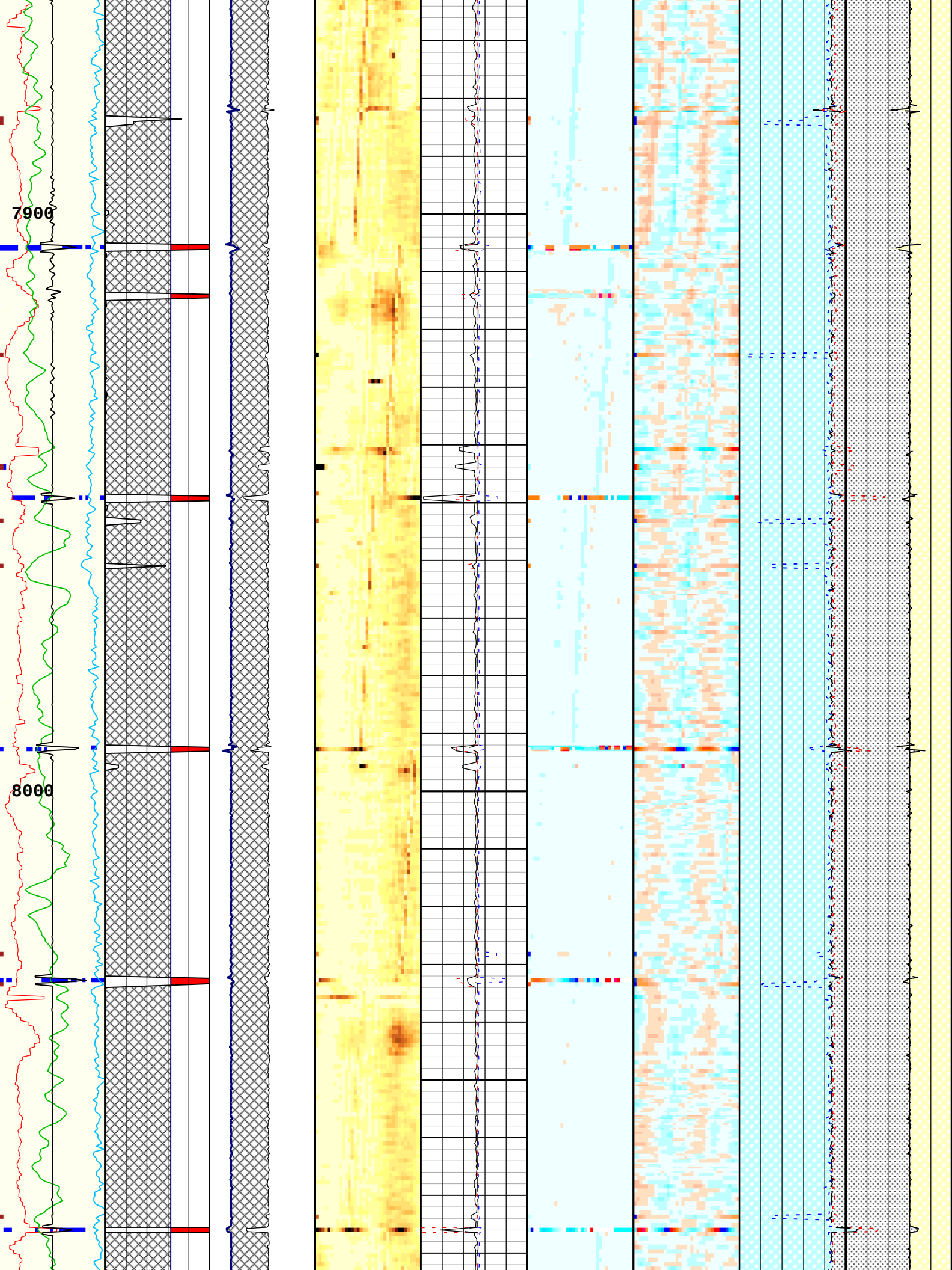
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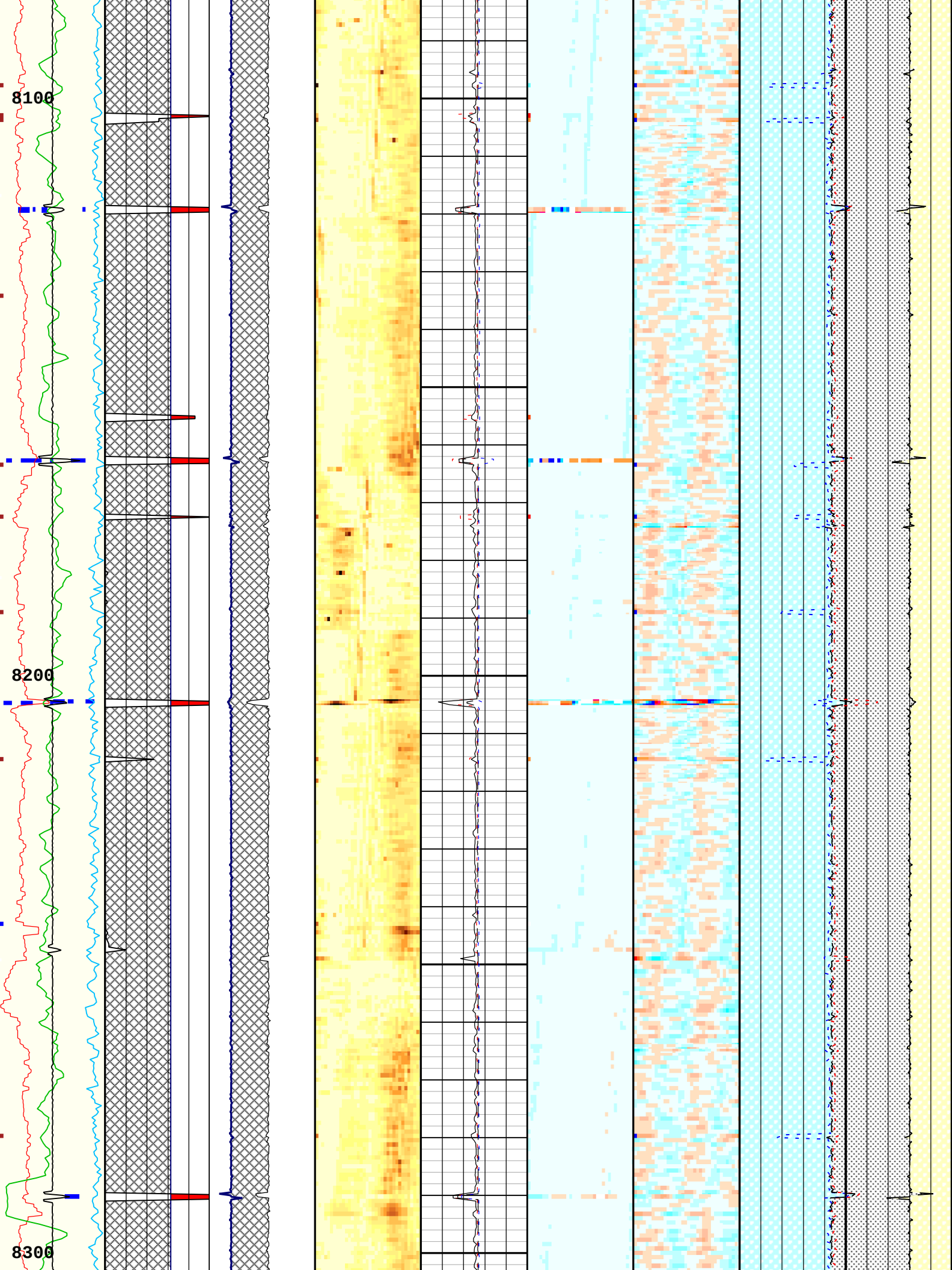
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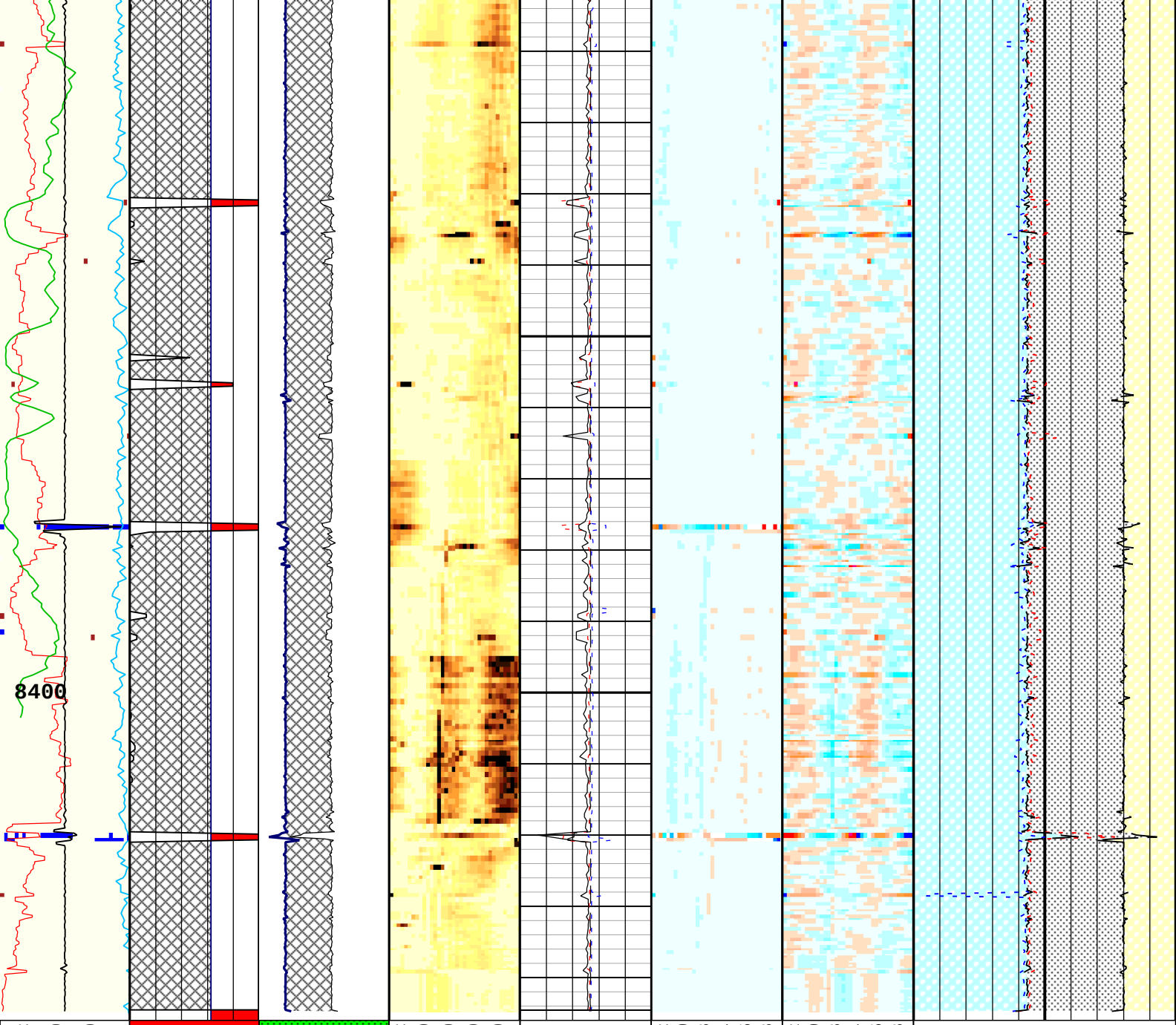


Absent 1.500 3.500

Explicit Normalization

USIT - USIT Processing Flags (UFLG) USIT-E

Amplitude of Eccentering (ECCE) USIT-E

0 in 0.5

Gamma Ray (ECGR_EDTC) EDTC-B

0 gAPI 150

Casing Collar Locator Ultrasonic

Large Reduction from Nominal Thickness

Casing Within 87.5% of Nominal Thickness

87.5% Referance LC03

100 % 80

Thickness Percent from Nominal LC02

100 % 80

Internal Radius Exceeds External Average

Casing Thickness (Between Max Internal and External Average)

Internal Radius Maximum Value (IRMX) USIT-E

3.7 in 2.7

External Radii Average (ERAV) USIT-E

3.7 in 2.7

Absent -5.200 -3.600 -2.000 -0.400

Explicit Normalization

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

Ultrasonic Azimuth (UCAZ) USIT-E

360 deg 0

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

ERAV-IRMX LC07

0.1 in 0.6

Absent -0.059 -0.028 0.004 0.035 0.068

Explicit Normalization

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

Absent -0.059 -0.028 0.004 0.035 0.068

Explicit Normalization

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

Internal Radius Minimum Value (IRMN) USIT-E

2.7 in 3.7

Internal Radius Maximum Value (IRMX) USIT-E

2.7 in 3.7

Internal Radius Averaged Value (IRAV) USIT-E

2.7 in 3.7

External Radii Average (ERAV) USIT-E

2.7 in 3.7

(CCLU) USIT-E

-20 in 20

Motor Revolution Speed (RSAV) USIT-E

6 c/s 7.5

TIME_1900 - Time Marked every 60.00 (s)

Description: USI Corrosion Format: Log (USI IBC Casing Integrity) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 02-Feb-2017 00:20:35

Channel Processing Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
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	8499	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	Regular Cement	
THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.362	in
CYSTLGR	Casing Yield Strength - Zoned along logger depths	WLSESSION	0	psi
DFD	Drilling Fluid Density	Borehole	9	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	29.42	dB/m
FSOD	USIT IBC Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF	
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	22.5	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.14	
MUD_N_INV	IBC Inversion Mud Normalization Factor	USIT-E	0.92	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1	
U-USIT_OCDI	Outer Casing Diameter	USIT-E	0	in
U-USIT_OCSH	Outer Casing Shoe	USIT-E	0	ft
U-USIT_OCWE	Outer Casing Weight	USIT-E	0	lbm/ft
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

SOCN	Standoff Distance	EDTC-B	0.125	in
SOCO	Standoff Correction Option	EDTC-B	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	%
TPOS_EDTC	Tool Position: Centered or Eccentered	EDTC-B	Eccentered	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.85	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	3.6	dB/m
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
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SolidLiquidGasMap	
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	1.48	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	12.25	154.5	1002
BS	8.75	1002	8446

All depth are actual.

Tool Control Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
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	55	V
HRES	Horizontal Resolution	USIT-E	10 deg	
MOTOR_PROTECT	Motor Protection	USIT-E	On	
TMUC	Type of Mud	USIT-E	BRI	
UACLV_PERM	Ultrasonic ACLV Permanent	USIT-E	No	
U-USIT_UFWB	Far Receiver Window Begin Time	USIT-E	130	us
U-USIT_UFWE	Far Receiver Window End Time	USIT-E	170	us
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UMFR	Modulation Frequency	USIT-E	333333	Hz
U-USIT_UNWB	Near Receiver Window Begin Time	USIT-E	99	us
U-USIT_UNWE	Near Receiver Window End Time	USIT-E	139	us
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 3.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	8441	ft
USSP	Ultrasonic Service	USIT-E	IBC	
U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	

VRES	Vertical Resolution	USIT-E	3.0 in	
WINB	Window Begin Time	USIT-E	35.04	us
WINE	Window End Time	USIT-E	75.04	us

One

IBC Casing Integrity

Software Version

Acquisition System	Version
Maxwell 2017 SP1	7.1.82245.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[2]:Up	Up	1944.41 ft	2504.26 ft	01-Feb-2017 4:26:57 PM	01-Feb-2017 4:35:14 PM	ON	3.54 ft	No

All depths are referenced to toolstring zero

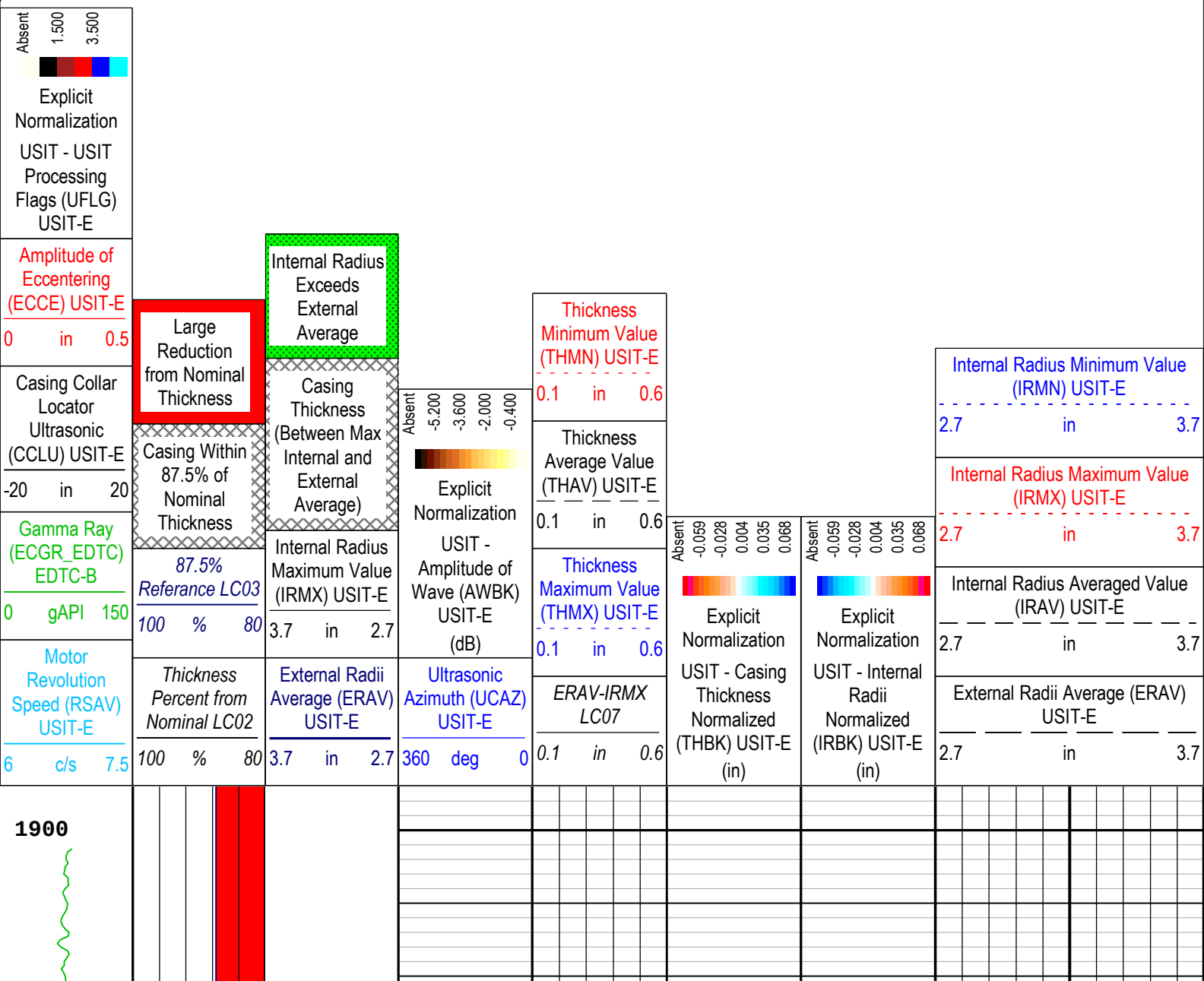
Log

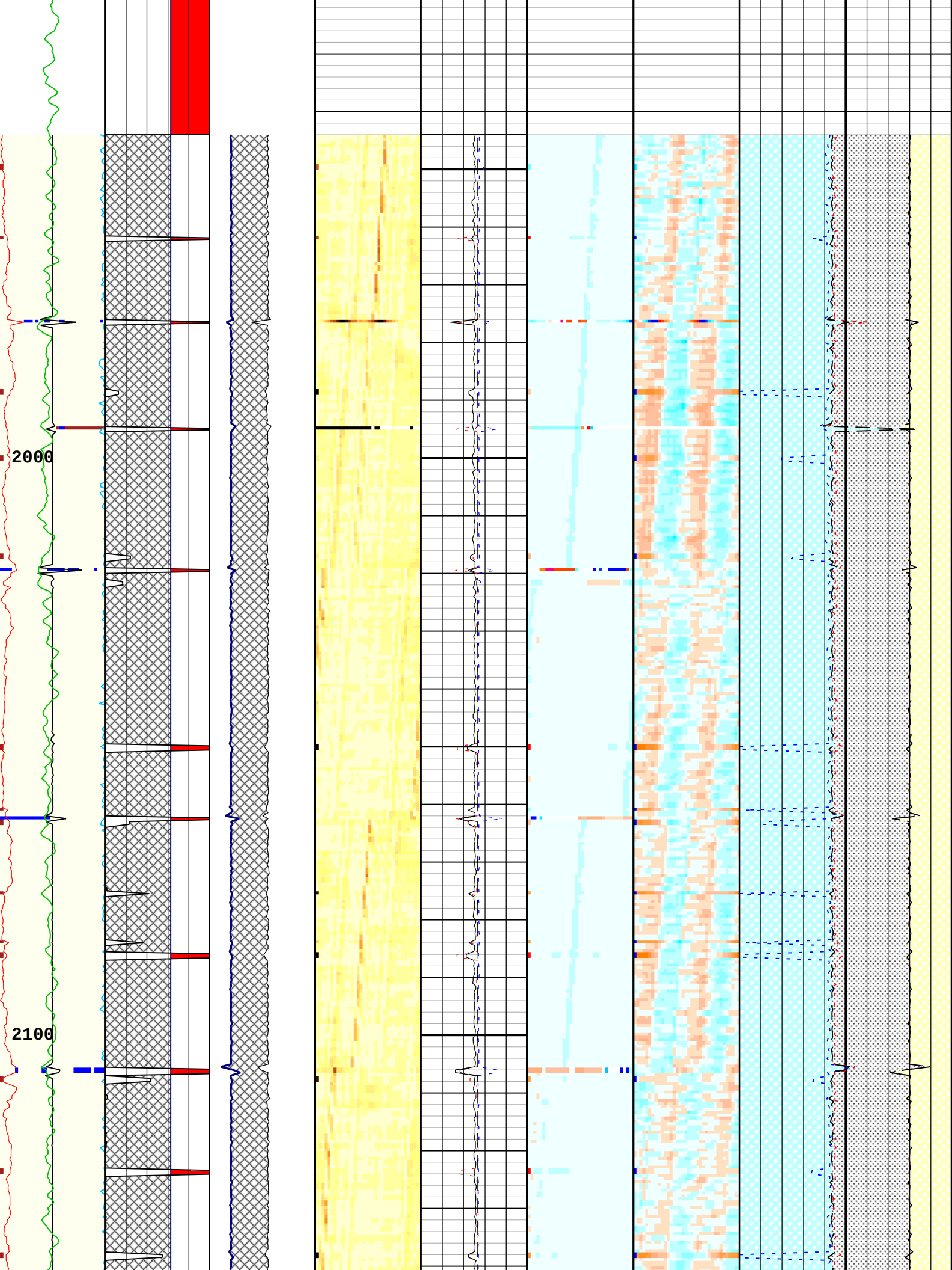
Company:Expedition Water Solutions LLC Well:EWS 4A

One: Log[2]:Up:S018

Description: USI Corrosion Format: Log (USI IBC Casing Integrity) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 02-Feb-2017 00:20:55

TIME_1900 - Time Marked every 60.00 (s)

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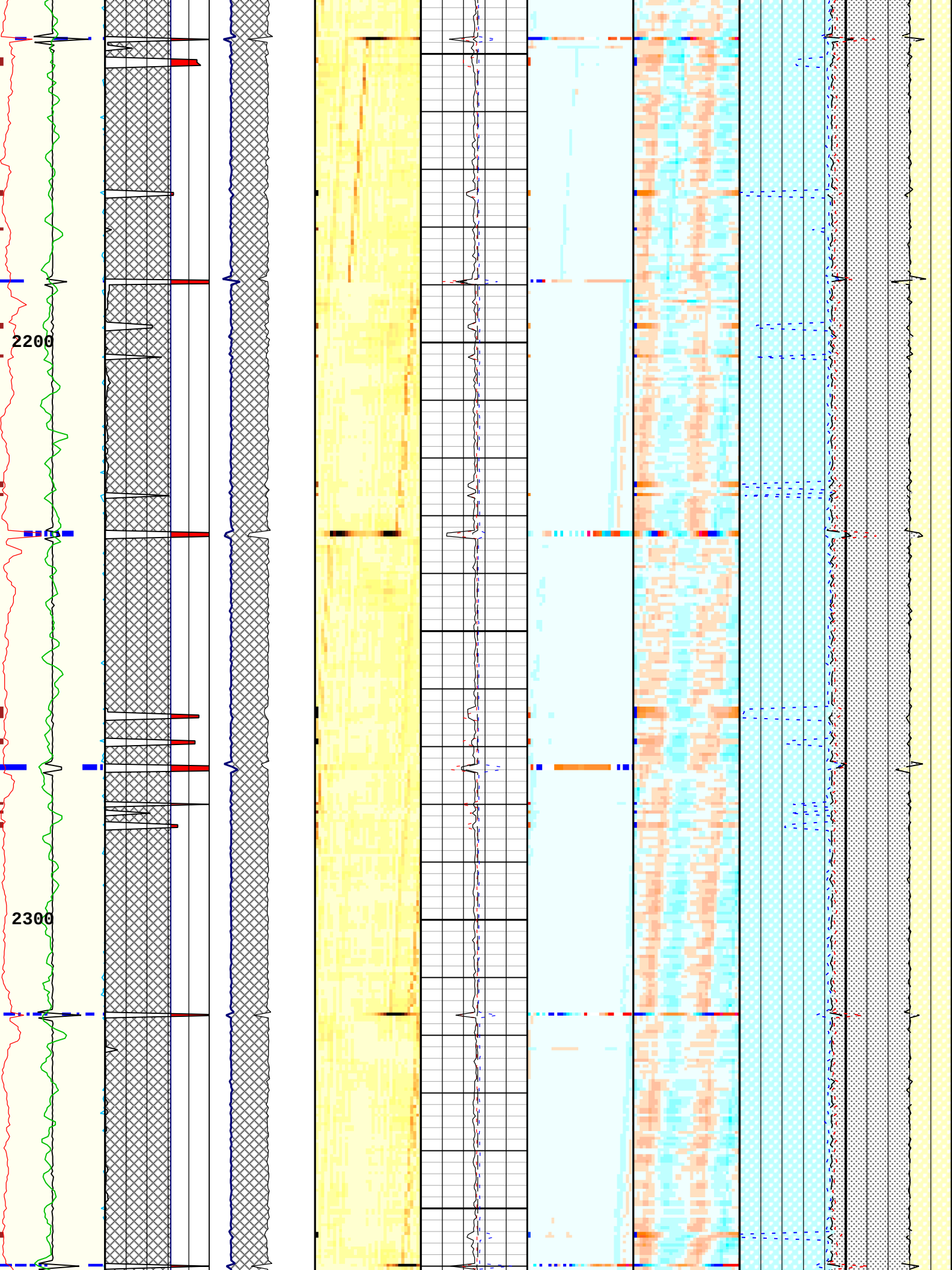
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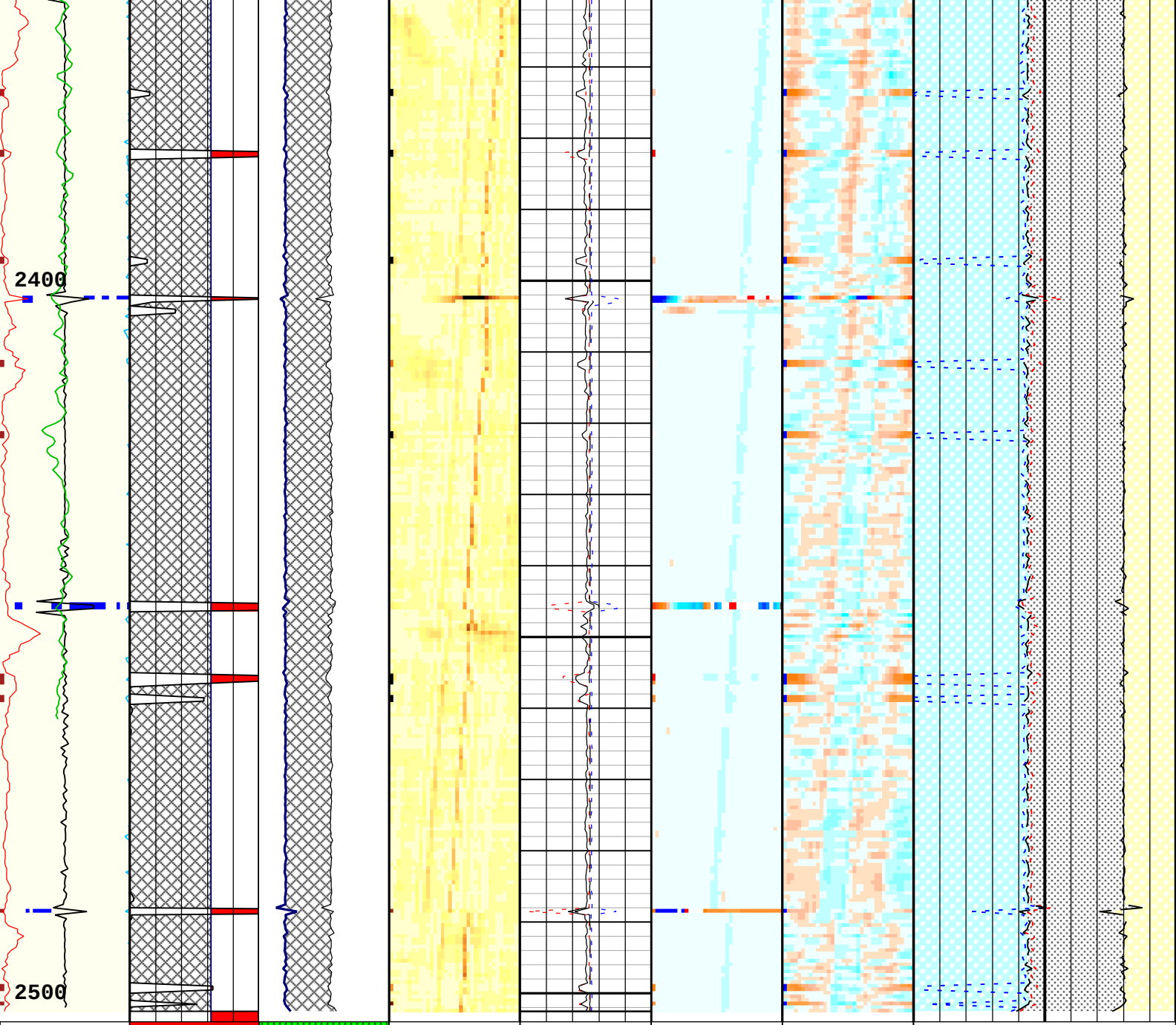
2300



Absent 1.500 3.500

Explicit Normalization

USIT - USIT Processing Flags (UFLG) USIT-E

Amplitude of Eccentering (ECCE) USIT-E

0 in 0.5

Casing Collar Locator Ultrasonic (CCLU) USIT-E

-20 in 20

Gamma Ray (ECGR_EDTC)

Large Reduction from Nominal Thickness

Casing Within 87.5% of Nominal Thickness

87.5% Referance LC03

100 % 80

Thickness Percent from Nominal LC02

100 % 80

Internal Radius Exceeds External Average

Casing Thickness (Between Max Internal and External Average)

Internal Radius Maximum Value (IRMX) USIT-E

3.7 in 2.7

External Radii Average (ERAV) USIT-E

3.7 in 2.7

Absent -5.200 -3.600 -2.000 -0.400

Explicit Normalization

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

Ultrasonic Azimuth (UCAZ) USIT-E

360 deg 0

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

ERAV-IRMX LC07

0.1 in 0.6

Absent -0.059 -0.028 0.004 0.035 0.068

Explicit Normalization

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

Absent -0.059 -0.028 0.004 0.035 0.068

Explicit Normalization

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

Internal Radius Minimum Value (IRMN) USIT-E

2.7 in 3.7

Internal Radius Maximum Value (IRMX) USIT-E

2.7 in 3.7

Internal Radius Averaged Value (IRAV) USIT-E

2.7 in 3.7

External Radii Average (ERAV) USIT-E

2.7 in 3.7

EDTC-B

0 gAPI 150

Motor Revolution Speed (RSAV) USIT-E

6 c/s 7.5

TIME_1900 - Time Marked every 60.00 (s)

Description: USI Corrosion Format: Log (USI IBC Casing Integrity) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 02-Feb-2017 00:20:55

Channel Processing Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
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	8499	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	Regular Cement	
THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.362	in
CYSTLGR	Casing Yield Strength - Zoned along logger depths	WLSESSION	0	psi
DFD	Drilling Fluid Density	Borehole	9	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	29.42	dB/m
FSOD	USIT IBC Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF	
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	22.5	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.14	
MUD_N_INV	IBC Inversion Mud Normalization Factor	USIT-E	0.92	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1	
U-USIT_OCDI	Outer Casing Diameter	USIT-E	0	in
U-USIT_OCSH	Outer Casing Shoe	USIT-E	0	ft
U-USIT_OCWE	Outer Casing Weight	USIT-E	0	lbm/ft
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

SOCN	Standoff Distance	EDTC-B	0.125	in
SOCO	Standoff Correction Option	EDTC-B	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	%
TPOS_EDTC	Tool Position: Centered or Eccentered	EDTC-B	Eccentered	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.85	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	3.6	dB/m
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
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SolidLiquidGasMap	
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	1.48	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Tool Control Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
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	
MOTOR_PROTECT	Motor Protection	USIT-E	On	
TMUC	Type of Mud	USIT-E	BRI	
UACLV_PERM	Ultrasonic ACLV Permanent	USIT-E	No	
U-USIT_UFWB	Far Receiver Window Begin Time	USIT-E	130	us
U-USIT_UFWE	Far Receiver Window End Time	USIT-E	170	us
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UMFR	Modulation Frequency	USIT-E	333333	Hz
U-USIT_UNWB	Near Receiver Window Begin Time	USIT-E	99	us
U-USIT_UNWE	Near Receiver Window End Time	USIT-E	139	us
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 6.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	8440	ft
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	35.04	us
WINE	Window End Time	USIT-E	75.04	us

Time Zone Parameters

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)

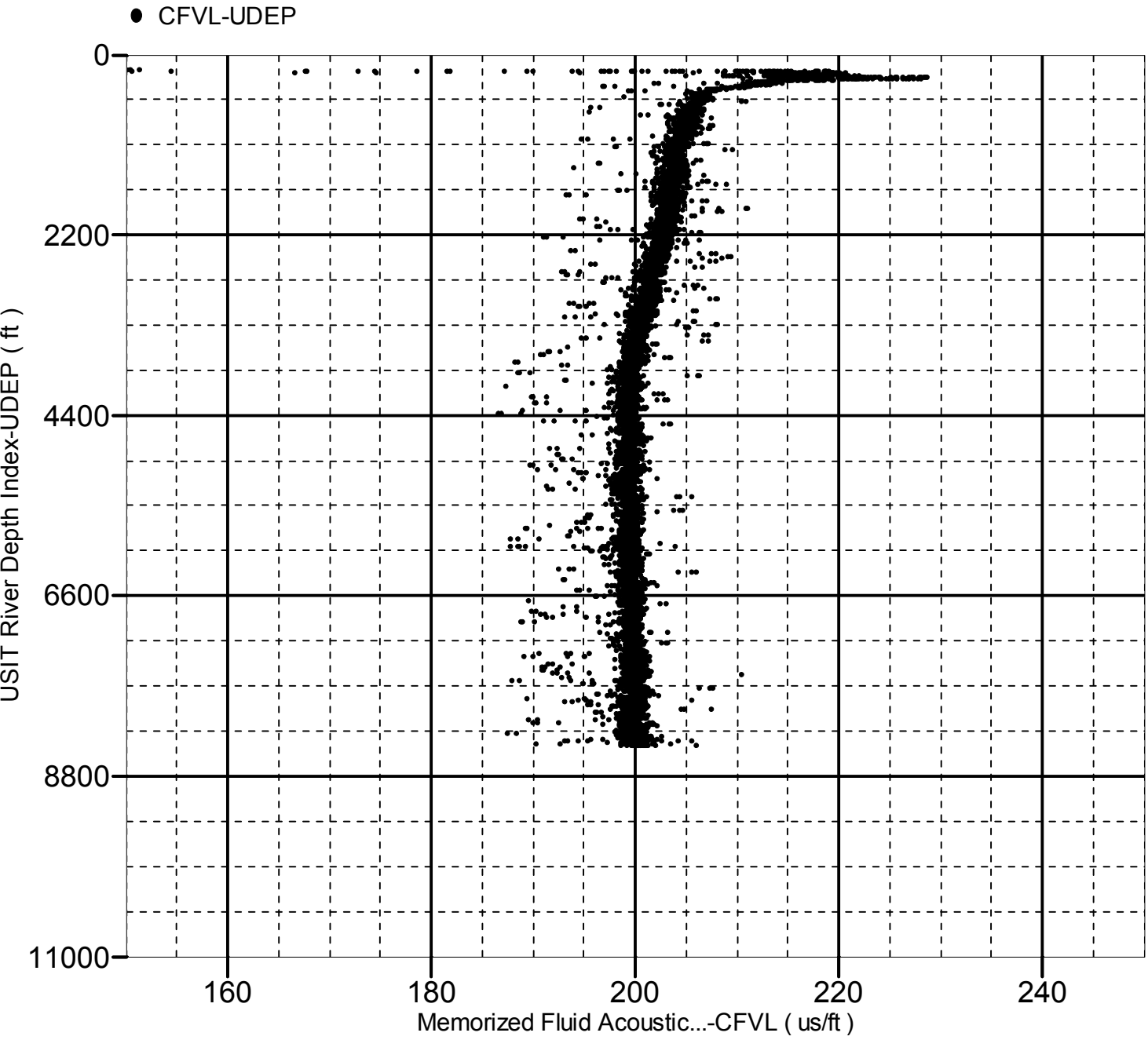
EMXV	45	01-Feb-2017 16:26:57	01-Feb-2017 16:30:44	2504.26	2251.25
EMXV	55	01-Feb-2017 16:30:44	01-Feb-2017 16:35:14	2251.25	1944.41

All depth are at tool zero.

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 8445.50 to 204.50 ft

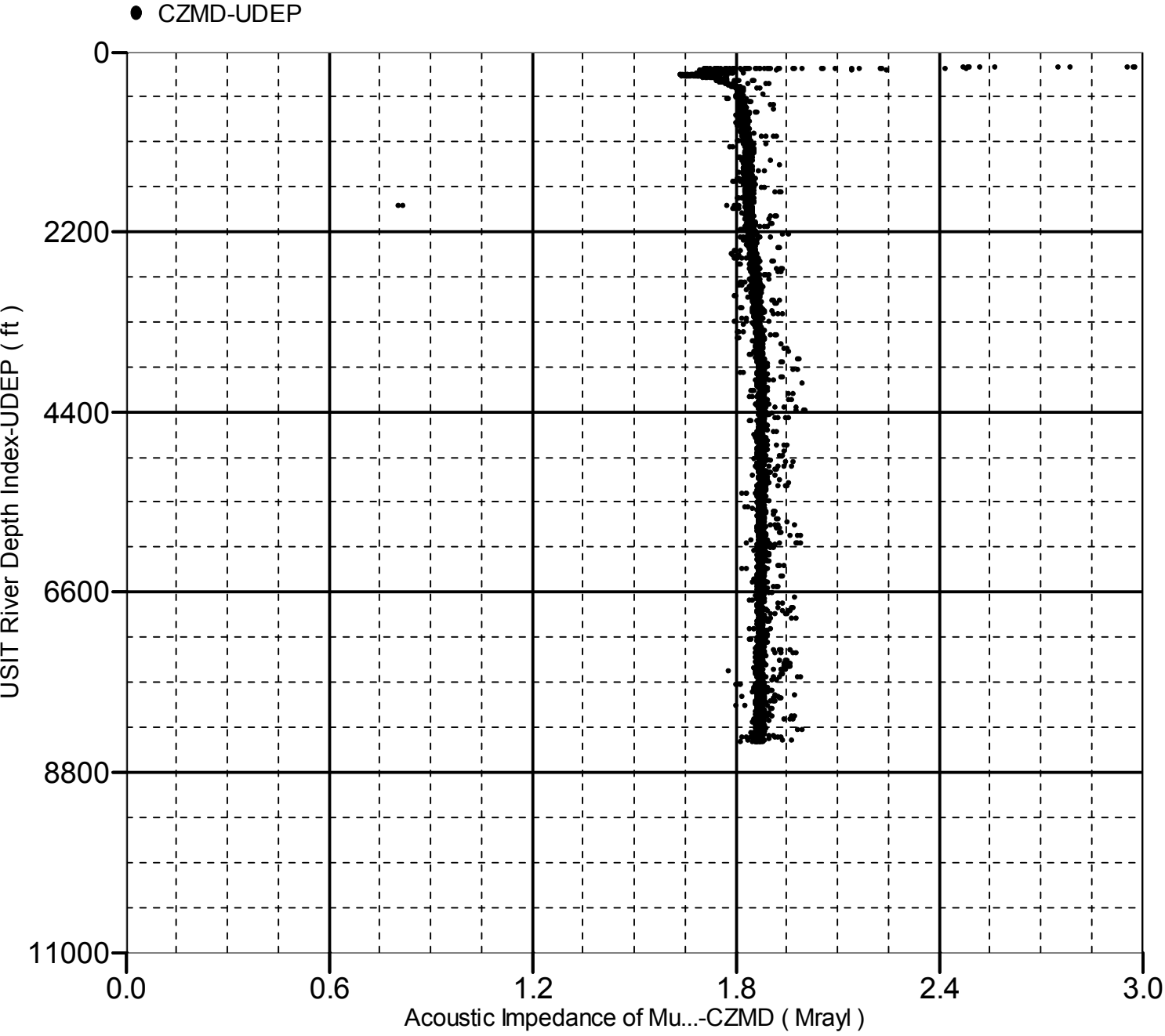


XYZ
Company:Expedition Water Solutions LLC Well:EWS 4A
One: Log[4]:Up:S018

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 8445.50 to 204.50 ft



Calibration Report

DSLT-H (Digitizing Sonic Logging Tool - H) Calibration - Run One

Primary Equipment :

Sonic Logging Sonde E supports 3'-5'BHC DT and CBL/VDL SLS-E

CBL Normalization - CBL Accumulations

Master:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Upper Far Amplitude - 0		Master	-----	-----	-----	-----
Upper Near Raw Amplitude - 0	mV	Master	-----	-----	-----	-----
Lower Far Amplitude - 0		Master	-----	-----	-----	-----
Lower Near Raw Amplitude - 0	mV	Master	-----	-----	-----	-----

CBL Normalization - CBL/VDL Coefficients

Master:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
CBL Correction Factor for UT		Master	3.500	2.700	NOT DONE	4.300
CBL Correction Factor for LT		Master	2.500	1.700	NOT DONE	4.300
VDL Ratio between UT and LT for CBLB Mode		Master	1.000		NOT DONE	

CBL Free Pipe Adjustment - Free Pipe Measurement

Before (Manual Entry): 22:15:10 01-Feb-2017

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
CBL Amplitude - 0	mV	Before	-----	-----	-----	-----
CBL Reference Amplitude (CBRA) - 0	mV	Before	-----	-----	-----	-----
Measurement Depth - 0	ft	Before	-----	-----	-----	-----

CBL Free Pipe Adjustment - CBL Amplitude Coefficient

Before (Manual Entry): 22:15:10 01-Feb-2017

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
CBL Adjustment Factor		Before	1.000	0.200	0.790	5.000
Depth of Before Calibration	ft	Before			0.79	

EDTC-B (Enhanced Digital Telemetry Cartridge - Version B) Calibration - Run One

Primary Equipment :

EDTC-B EDTC-B

Calibration Parameter :

Plus Reference

EDTC-B Accelerometer Calibration - EDTC-B Accelerometer Calibration

Before (Measured): 16:05:41 01-Feb-2017

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
AZ Vertical Measurement	ft/s2	Before	32.19	31.53	31.98	32.84

EDTC-B Memory Data - EDTC-B Memory Data

Master (EEPROM): 23:08:09 01-Feb-2017

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Initial PMT HV	V	Master			1461.000	
Accelerometer Serial Number		Master			1479	
Accelerometer Coefficients - 0		Master	-----	-----	2.996E+000	-----
Accelerometer Coefficients - 1		Master	-----	-----	2.558E-004	-----
Accelerometer Coefficients - 2		Master	-----	-----	2.079E-007	-----
Accelerometer Coefficients - 3		Master	-----	-----	-5.995E-008	-----
Accelerometer Coefficients - 4		Master	-----	-----	1.478E-009	-----
Accelerometer Coefficients - 5		Master	-----	-----	-1.135E-011	-----
Accelerometer Coefficients - 6		Master	-----	-----	2.947E-014	-----
Accelerometer Coefficients - 7		Master	-----	-----	6.055E-003	-----
Accelerometer Coefficients - 8		Master	-----	-----	2.126E-005	-----
Accelerometer Coefficients - 9		Master	-----	-----	-1.013E-007	-----
Accelerometer Coefficients - 10		Master	-----	-----	-8.952E-011	-----
Accelerometer Coefficients - 11		Master	-----	-----	-4.922E-015	-----
Gamma-Ray Detector Serial Number		Master			79417	

EDTC-B Gamma-Ray Calibration - Gamma Ray Coefficients

Before: After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Gamma Ray Gain		Before	1.000	0.900	NOT DONE	1.100
		After	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----

EDTC-B Gamma-Ray Calibration - Gamma Ray Accumulations

Before: After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
RGR Zero Measurement - 0	gAPI	Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
RGR Plus Measurement	gAPI	Before			NOT DONE	
		After			NOT DONE	
		After-Before	-----	-----	-----	-----

LEH-QT (Logging Equipment Head - QT, 3-3/8 inch 31 pin HPHT with Tension Sensor) Calibration - Run One

Primary Equipment :

Logging Equipment Head - QT, 3-3/8 inch 31 pin HPHT with Tension Sensor	LEH-QT

HTEN Master Calibration - HTEN Master Calibration

Master:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
HTEN Shop Gain		Master	1.000	0.800	NOT DONE	4.500
HTEN Shop Offset	lbf	Master	0	-1000.000	NOT DONE	1000.000

HTEN Before Calibration - HTEN Before Calibration

Before:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
RHTE Zero Measurement - 0	lbf	Before	-----	-----	-----	-----
RHTE Plus Measurement - 0	lbf	Before	-----	-----	-----	-----
HTEN Gain - 0		Before	-----	-----	-----	-----
HTEN Offset - 0	lbf	Before	-----	-----	-----	-----

Company: Expedition Water Solutions LLC

Schlumberger

Well: EWS 4A

Field: Wattenberg

County: Weld

State: Colorado

Isolation Scanner

Casing Integrity

Gamma Ray - CCL Log