Schlumberger

Company: CRESTONE PEAK RESOURCES OPERATING LLC

Well: HWY 52 4U-32H-O268

Field: WATTENBERG

County: WELD State: COLORADO

Isolation Scanner

Cement Evaluation

Gamma Ray - CCL Log

County: WELD
Field: WATTENBERG
Location: 598' FSL & 1924' FEL
Well: HWY 52 4U-32H-O268
Company: CRESTONE PEAK RESOURCES OPERATING LLC

Location: 598' FSL & 1924' FEL

Elev.: K.B. 5004.00 ft
G.L. 4991.00 ft
D.F. 5004.00 ft

Permanent Datum:	Ground Level	Elev.:	4991.00 f
Log Measured From:	Kelly Bushing	13.00 ft	above Perm.Datum
Drilling Measured From:	Kelly Bushing		

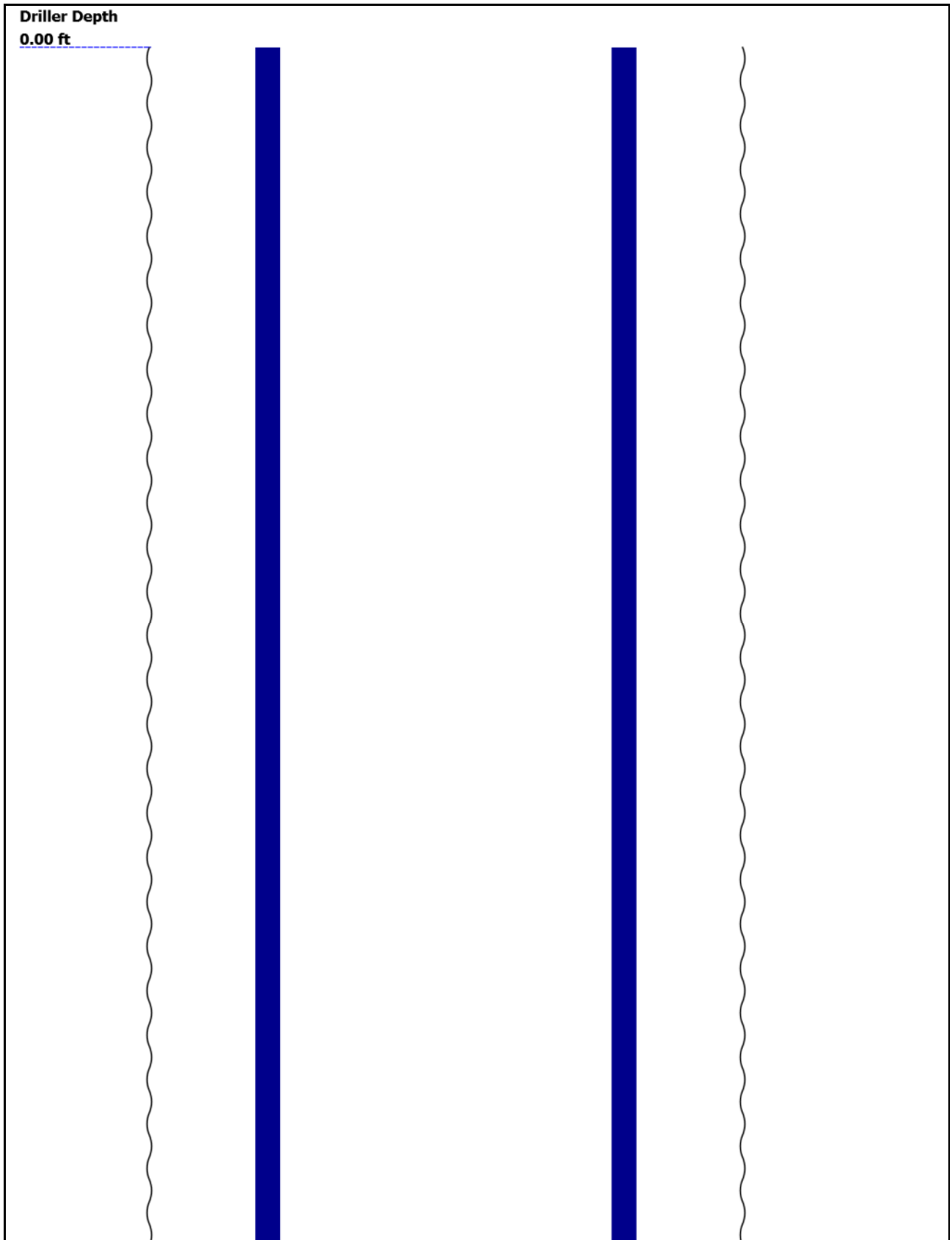
API Serial No.	Section:	Township:	Range:
05-123-43108	32	2N	68W

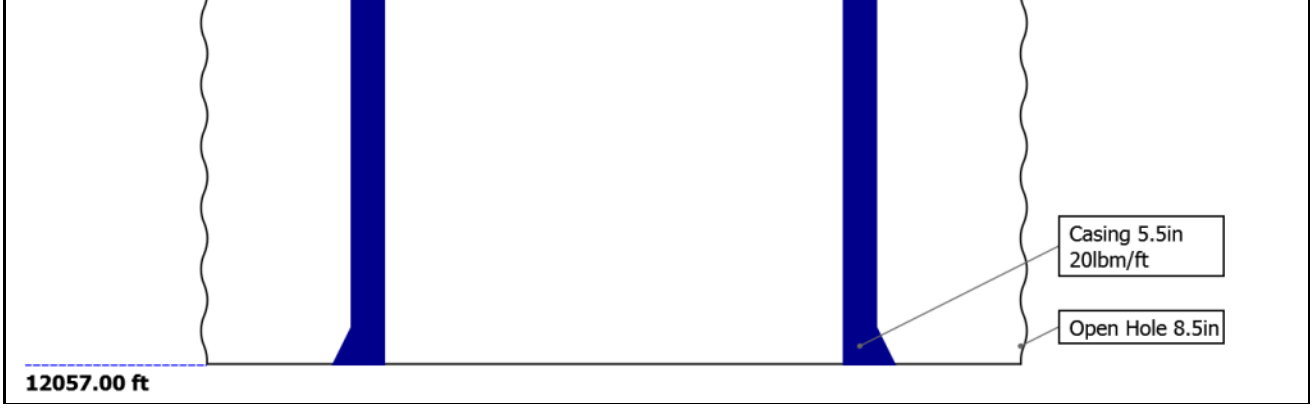
Logging Date		19-Oct-2017			
Run Number		ONE			
Depth Driller		12057.00 ft			
Schlumberger Depth		12057.00 ft			
Bottom Log Interval		7300.00 ft			
Top Log Interval		50.00 ft			
Casing Fluid Type		Water			
Salinity					
Density		8.4 lbm/gal			
Fluid Level		8.00 ft			
BIT/CASING/TUBING STRING					
Bit Size		8.50 in			
From		0.00 ft			
To		12057.00 ft			
Casing/Tubing Size		5.5 in			
Weight		20 lbm/ft			
Grade		P110			
From		0.00 ft			
To		12057.00 ft			
Max Recorded Temperatures		173.5 degF			
Logger on Bottom	Time	19-Oct-2017	16:13:00		
Unit Number	Location:	2132	MOORE		
Recorded By		MEGAN LEONE			
Witnessed By		CALEB BREWER			

Disclaimer

Contents

Well Sketch





Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	8.5					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	12057					
Bottom Logger (ft)	12057					
Casing						
Size (in)	5.5					
Weight (lbm/ft)	20					
Inner Diameter (in)	4.778					
Grade	P110					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	12057					
Bottom Logger (ft)	12057					

Remarks and Equipment Summary

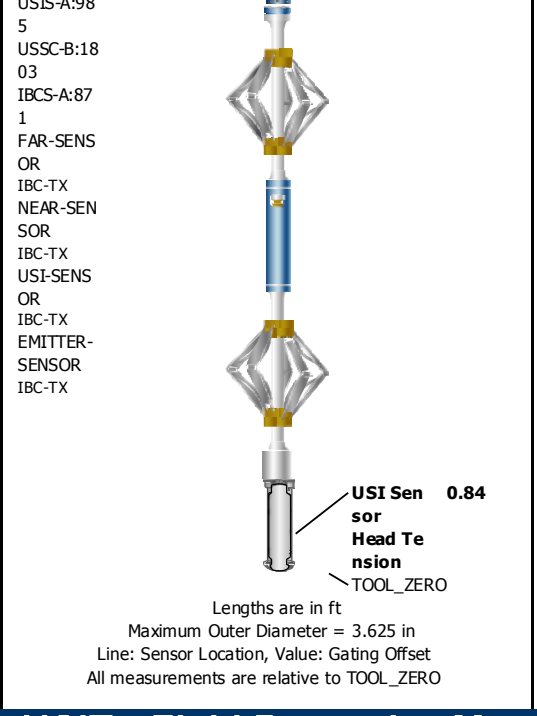
ONE: Toolstring

Equip name	Length
LEH-QT	**30.16**
LEH-QT	
EDTC-B:9045	**27.24**
EDTH-B:9292	
EDTG-A:77998	
EDTC-B:9045	
AH-184[2]	**20.74**
AH-184[1]	**18.74**
USIT-E:871	**16.74**
ECH-MFA:1775	
USAC-A:871	

MP name	Offset
CTEM	**23.74**
ACCZ	**0.00**
HV	**0.00**
Gamma Ray	**21.87**
TelStatus	**20.74**

ONE: Remarks

THANK YOU FOR CHOOSING SCHLUMBERGER!
TOOLSTRING RUN AS PER TOOLSKETCH
GEMCO'S AND IN-LINE CENTRALIZER USED FOR CENTRALIZATION
ALL PASS RUN UNDER 0 PSI
LEAD 12 PPG
TAIL 13.5 PPG



Lengths are in ft
Maximum Outer Diameter = 3.625 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

USIT - Fluid Properties Measurement

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[4]:Up	7669	3793.95

Fluid Velocity = "Automatic".
CFVL equals DFSL channel

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

Mud Impedance = "Inversion Norm.".
IBC Inversion normalization zone is : 576.73m(1892.17ft) to 580.70m(1905.19ft)
MUD_N_INV = 1.19
DFD = 1.01g/cm3(8.40lbm/gal)
CZMD median computed in inversion normalization interval = 1.74 MRayl

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

Composite 1

IBC SLG

Software Version

Acquisition System	Version
Maxwell 2018	8.0.93964.3100

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[4]:Up	Up	3793.95 ft	7669.00 ft	19-Oct-2017 4:14:23 PM	19-Oct-2017 5:09:59 PM	ON	7.55 ft	Yes
ONE	Log[5]:Up	Up	62.48 ft	3891.02 ft	19-Oct-2017 5:11:30 PM	19-Oct-2017 6:06:23 PM	ON	7.81 ft	Yes

All depths are referenced to toolstring zero

Log Company:CRESTONE PEAK RESOURCES OPERATING LLC Well:HWY 52 4U-32H-O268 Composite 1:S008

Description: USI IBC SLG Format: Log (IBC SLG) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 20-Oct-2017 04:53:55

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

1 - UFLG 1 Value within [0.0 - 1.5] - :
2 - UFLG 2 Value within [1.5 - 2.5] - :
3 - UFLG 3 Value within [2.5 - 3.5] - :
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :

UTIM Error
Pulse Origin Not Detected
WINLEN Error
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)

Casing Collar Locator Ultrasonic (CCLU) USIT-E[1]
-20 in 20

Amplitude of Eccentering (ECCE) USIT-E[1]
0 in 0.5

Motor Revolution Speed (RSAV) USIT-E[1]
6 c/s 7.5

U L B R U
Orientation: Top of Hole
Absent 1.500 3.500
Explicit Normalization
USIT - USIT Processing Flags (UFLG) USIT-E[1]

USIT Processing Flags (UFLG[0]) USIT-E[1]
1 5

Gamma Ray (ECGR_EDTC) EDTC-B[1]
0 gAPI 150

Relative Bearing (RB) USIT-E[1]
-40 deg 360

U L B R U
Orientation: Top of Hole
Absent -5.200 -3.600 -2.000 -0.400
Explicit Normalization
USIT - Amplitude of Wave (AWBK) USIT-E[1] (dB)

Acoustic Impedance Minimum (AIMN) USIT-E[1]
-1 Mrayl 9

Acoustic Impedance Average (AIAV) USIT-E[1]
-1 Mrayl 9

Acoustic Impedance Maximum (AIMX) USIT-E[1]
-1 Mrayl 9

U L B R U
Orientation: Top of Hole
Absent 1.000 2.500 4.000 5.500 7.000
Custom Normalization
USIT - Acoustic Impedance (AIBK) USIT-E[1] (Mrayl)

Minimum Flexural Attenuation (U-USIT_UFAN) USIT-E[1]
0 dB/m 150

Average Flexural Attenuation (U-USIT_UFAV) USIT-E[1]
0 dB/m 150

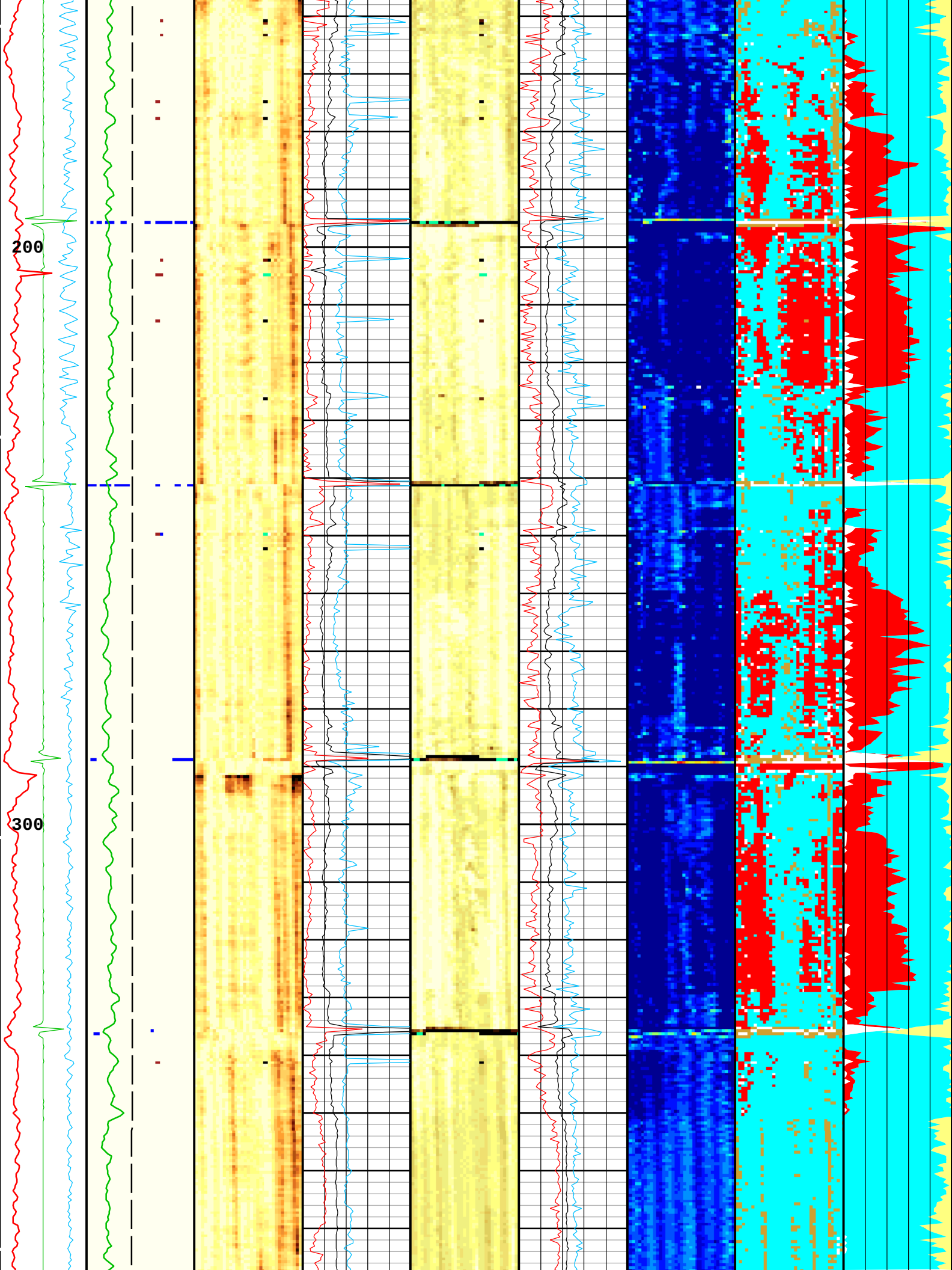
Maximum Flexural Attenuation (U-USIT_UFAX) USIT-E[1]
0 dB/m 150

U L B R U
Orientation: Top of Hole
Absent 57.000 78.000 99.000 120.000 141.000
Custom Normalization
USIT - Flexural Attenuation (UFAK) USIT-E[1] (dB/m)

U L B R U
Orientation: Top of Hole
Absent 0.500 1.500 2.500 3.500
Explicit Normalization
USIT - Solid Liquid Gas Sorted Color Map (USLP) USIT-E[1]

SLG Solid Index
SLG Liquid Index
SLG Gas Index
SLG White Point Index

100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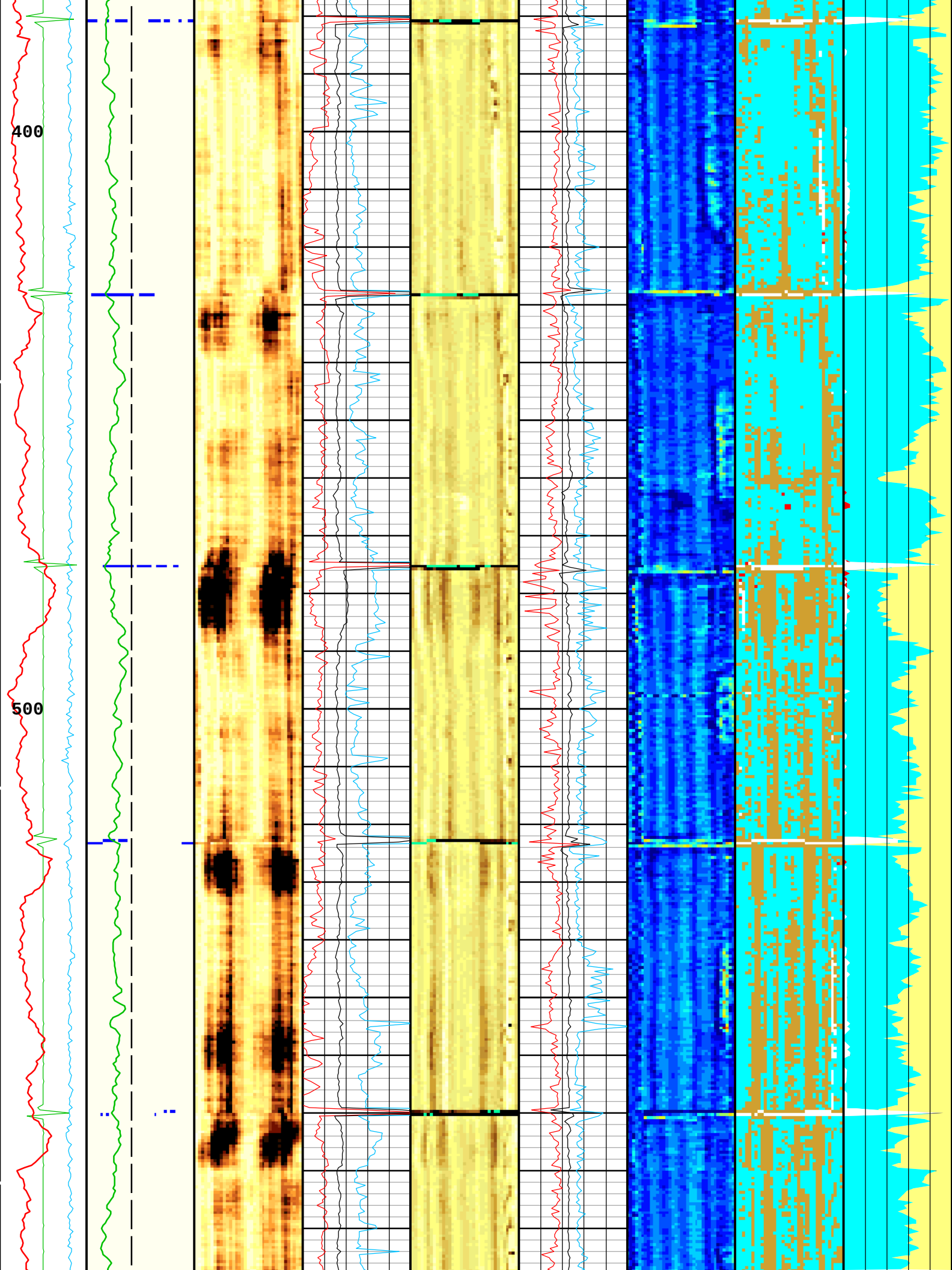
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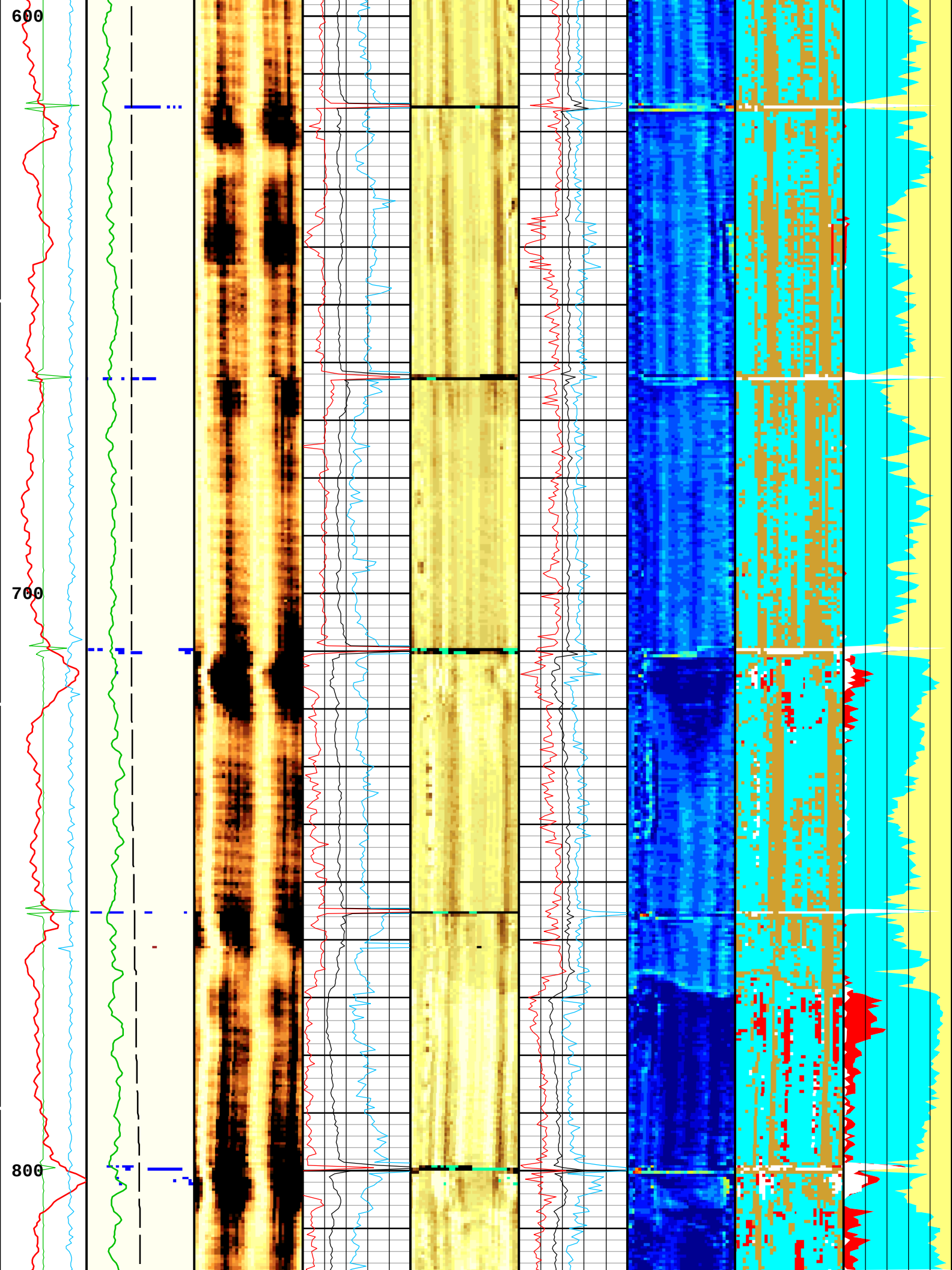
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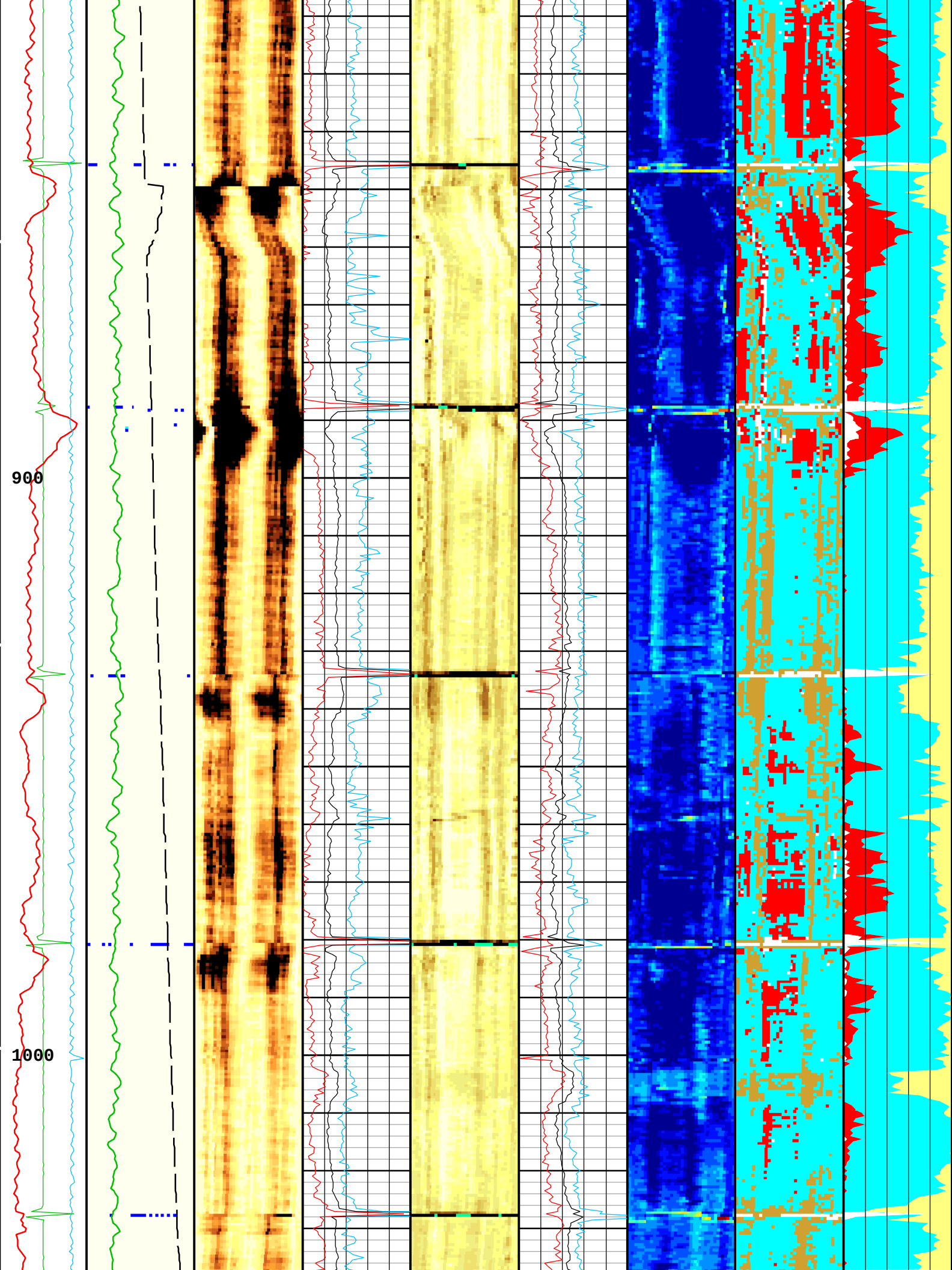
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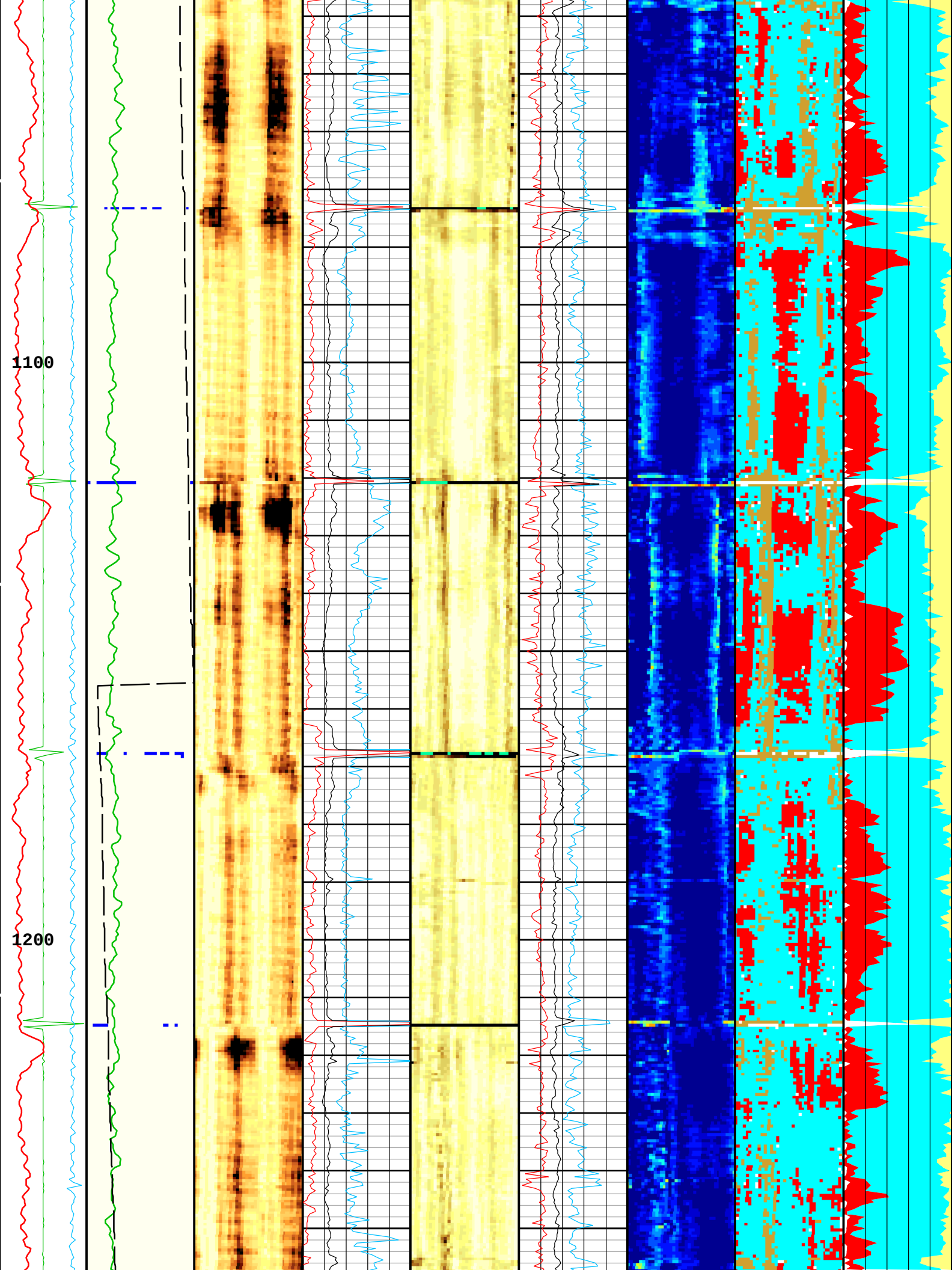
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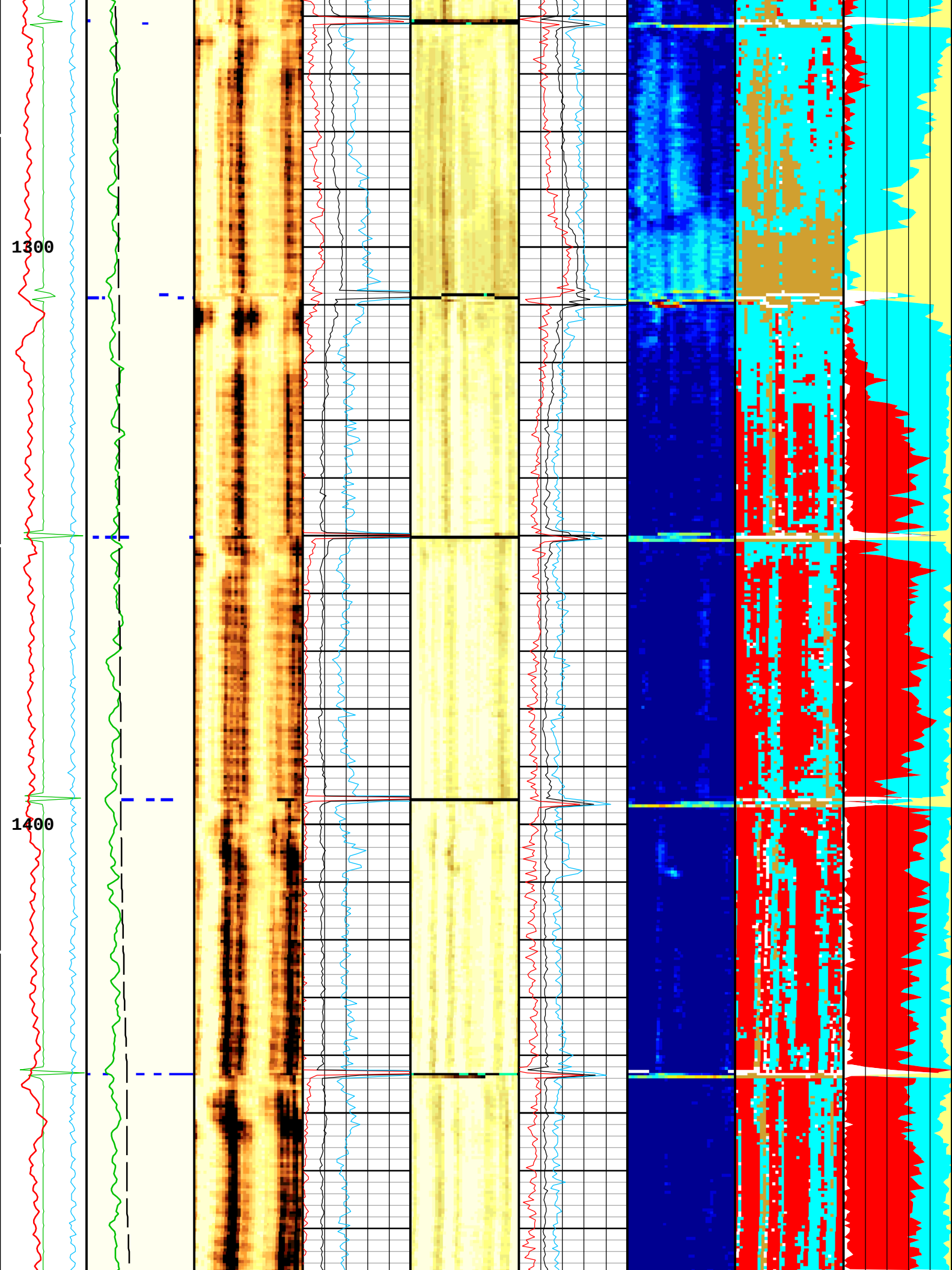
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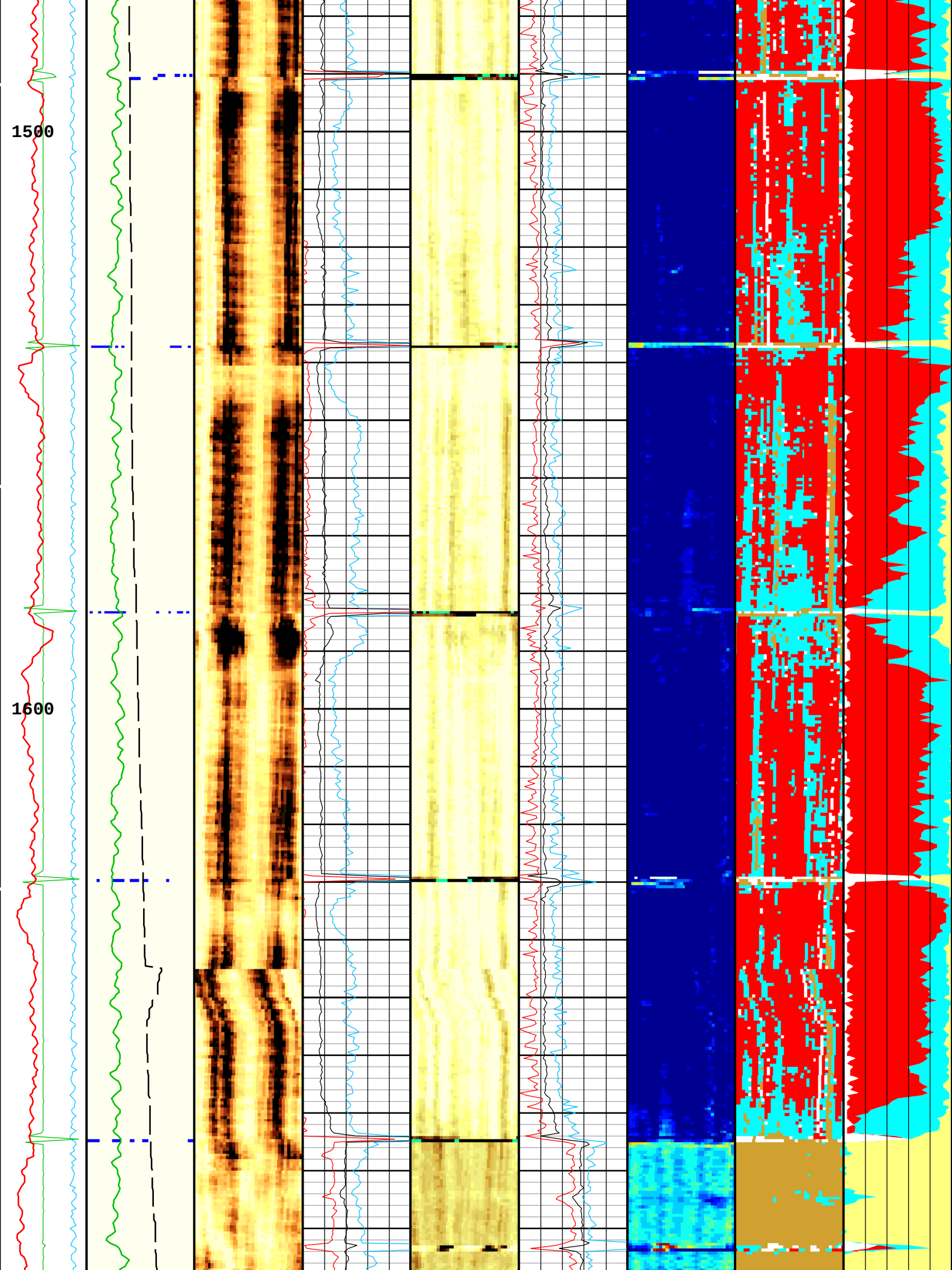
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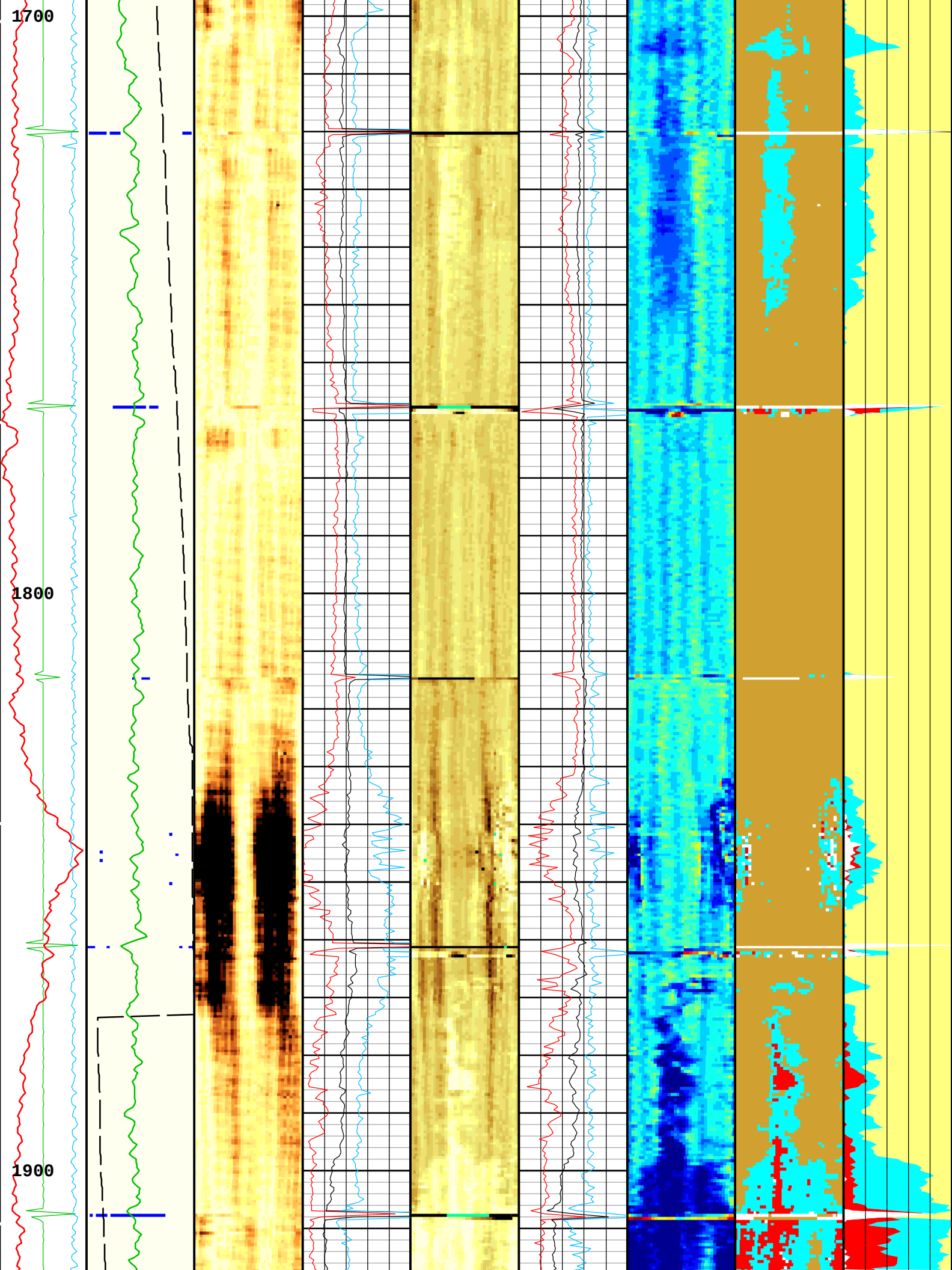
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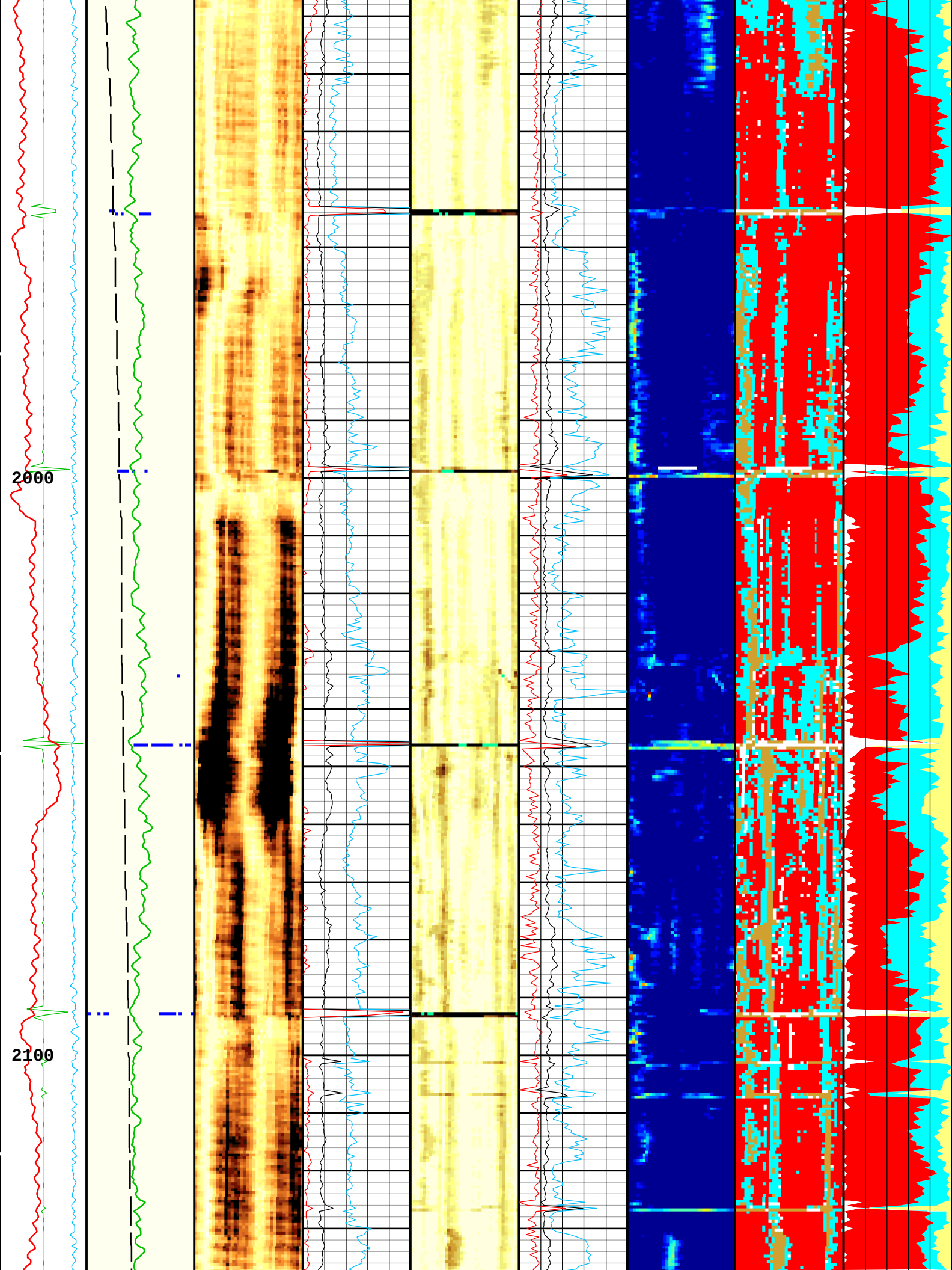
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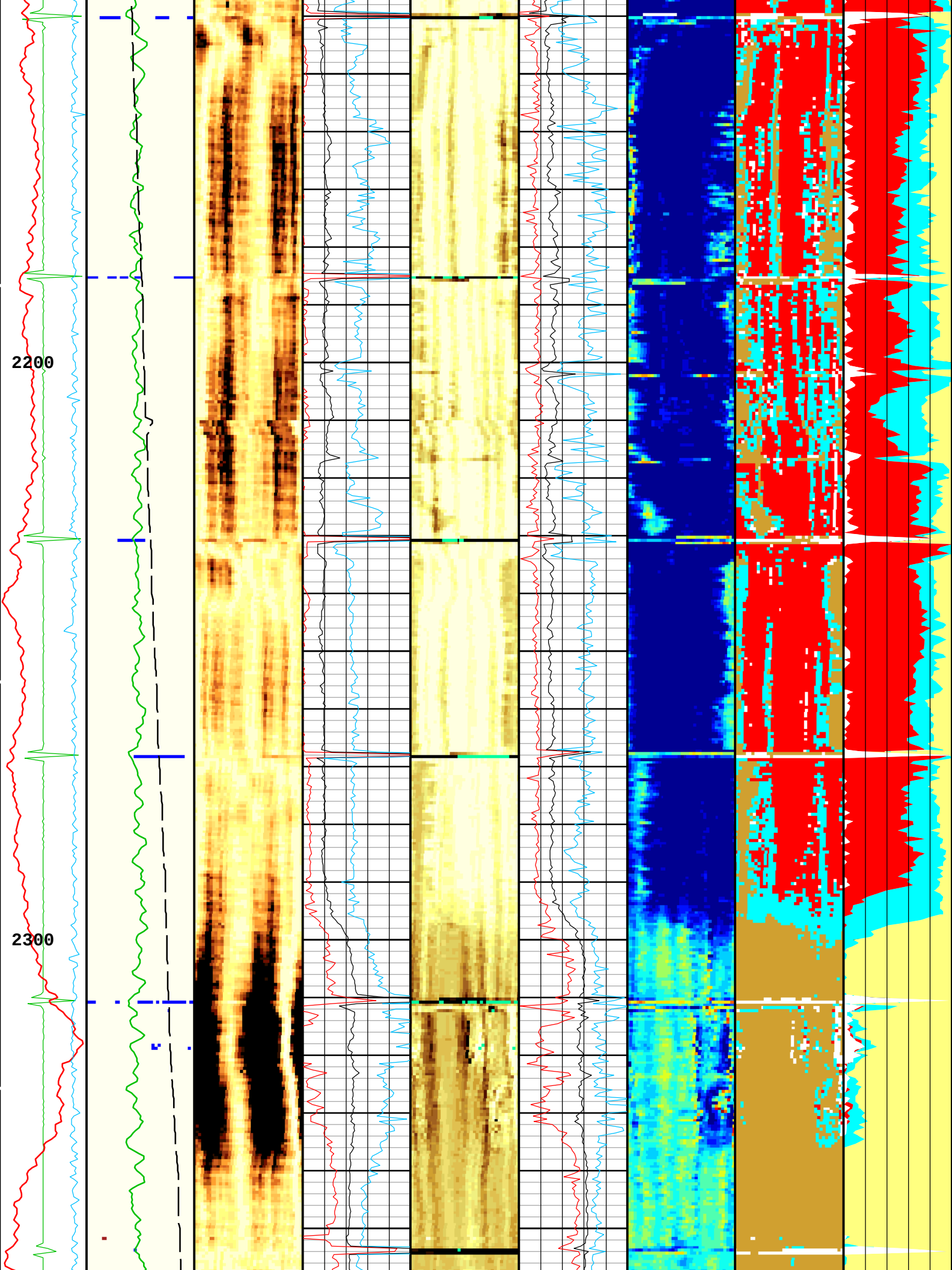
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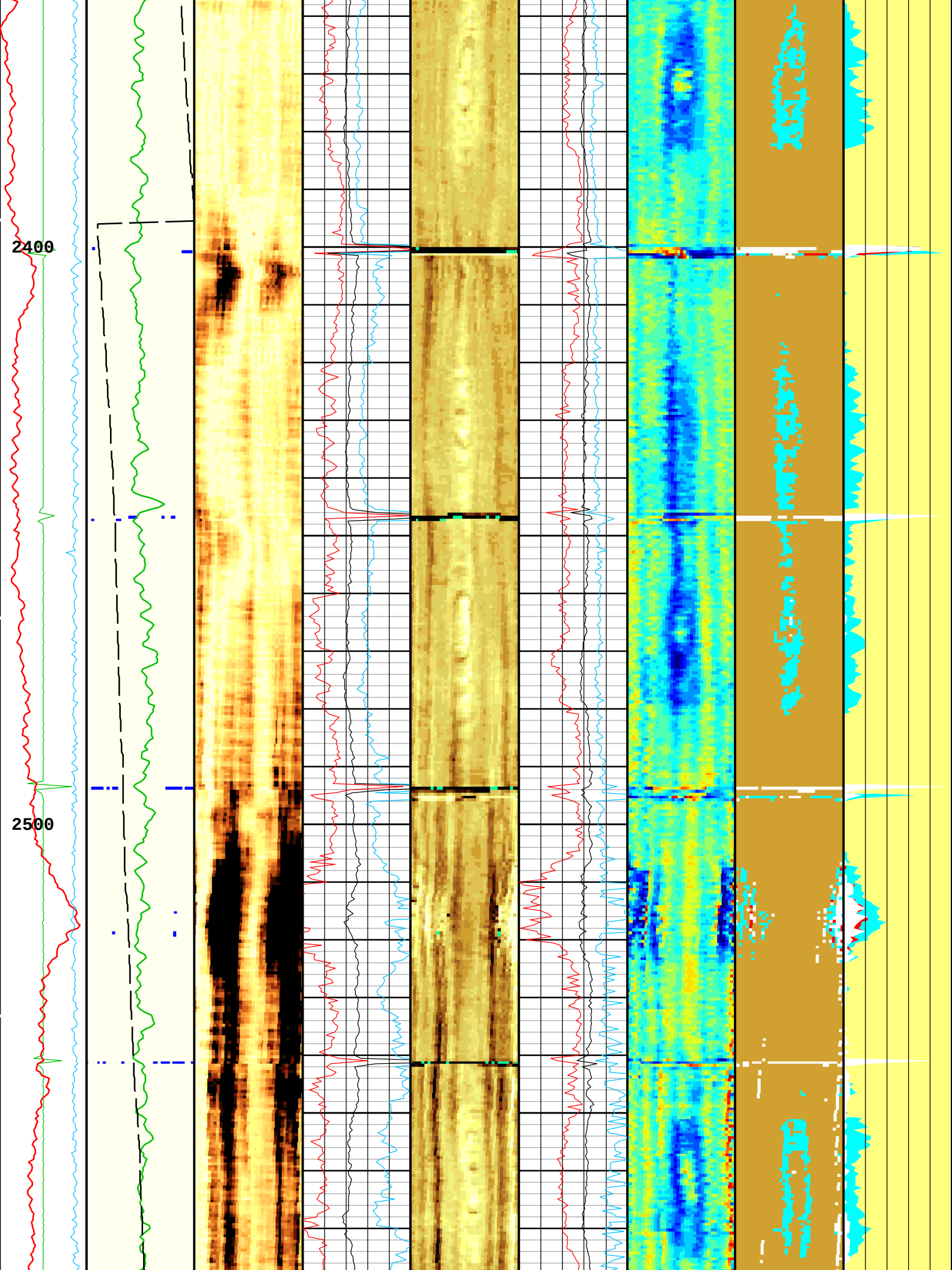
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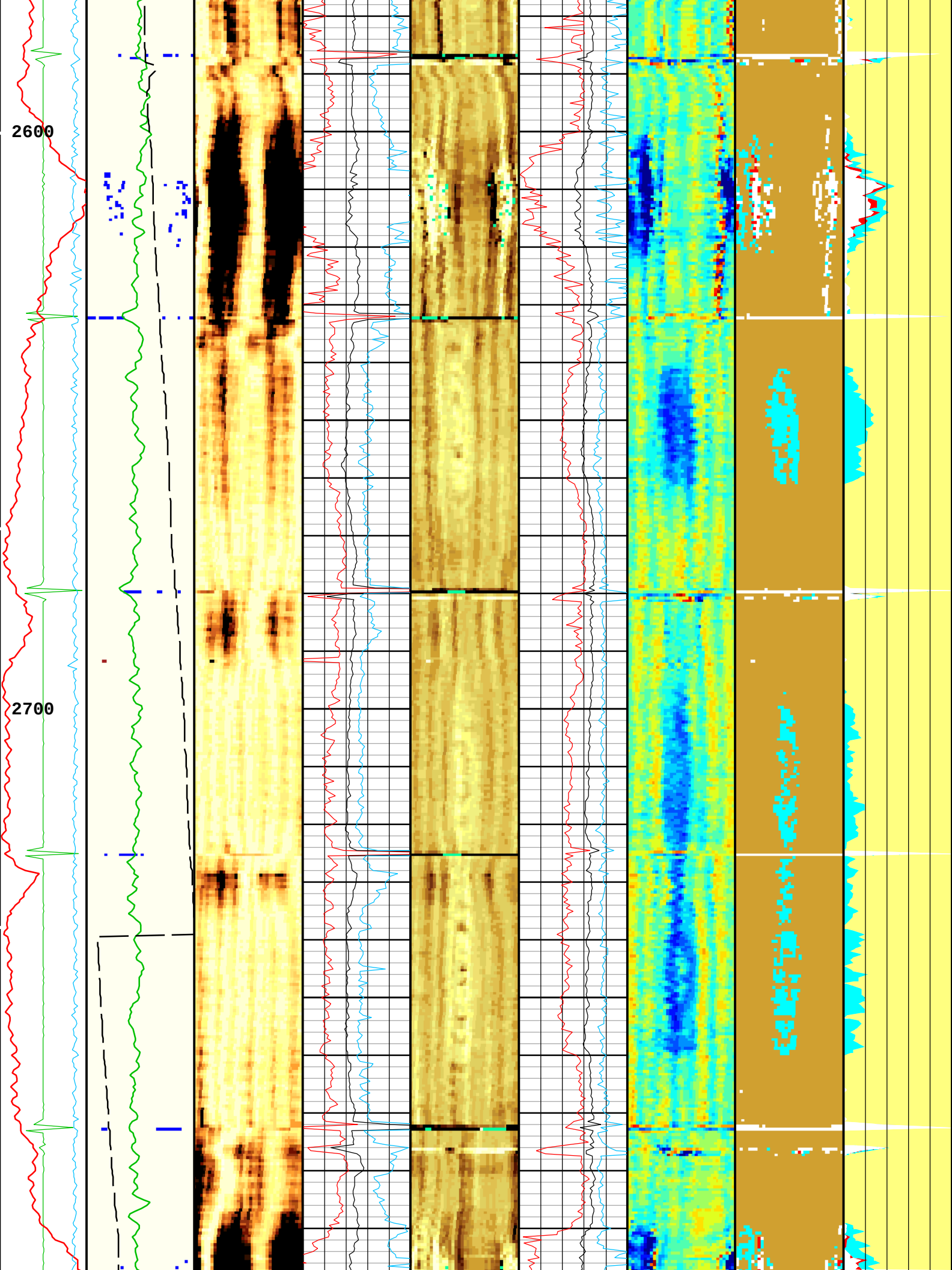
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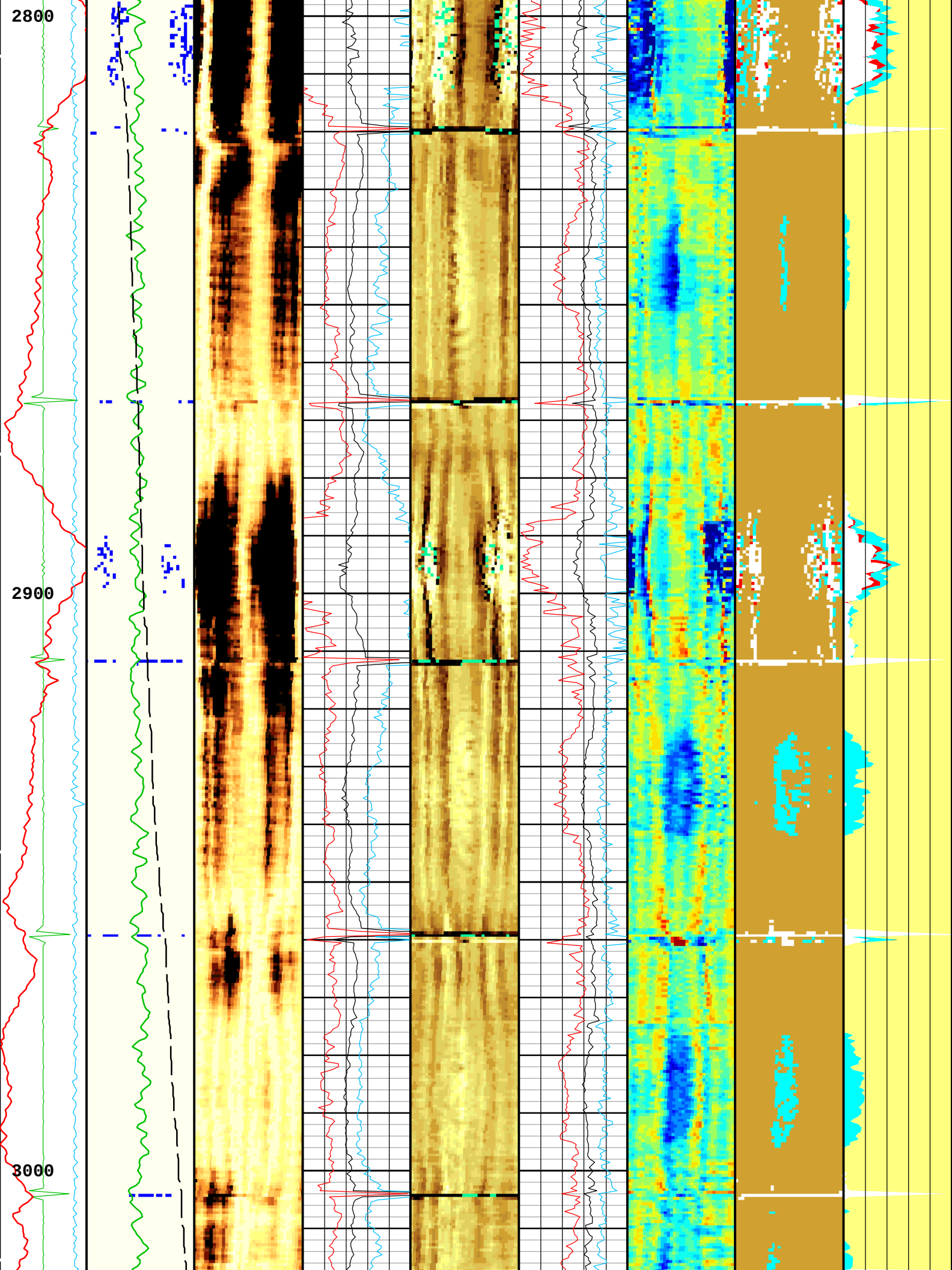
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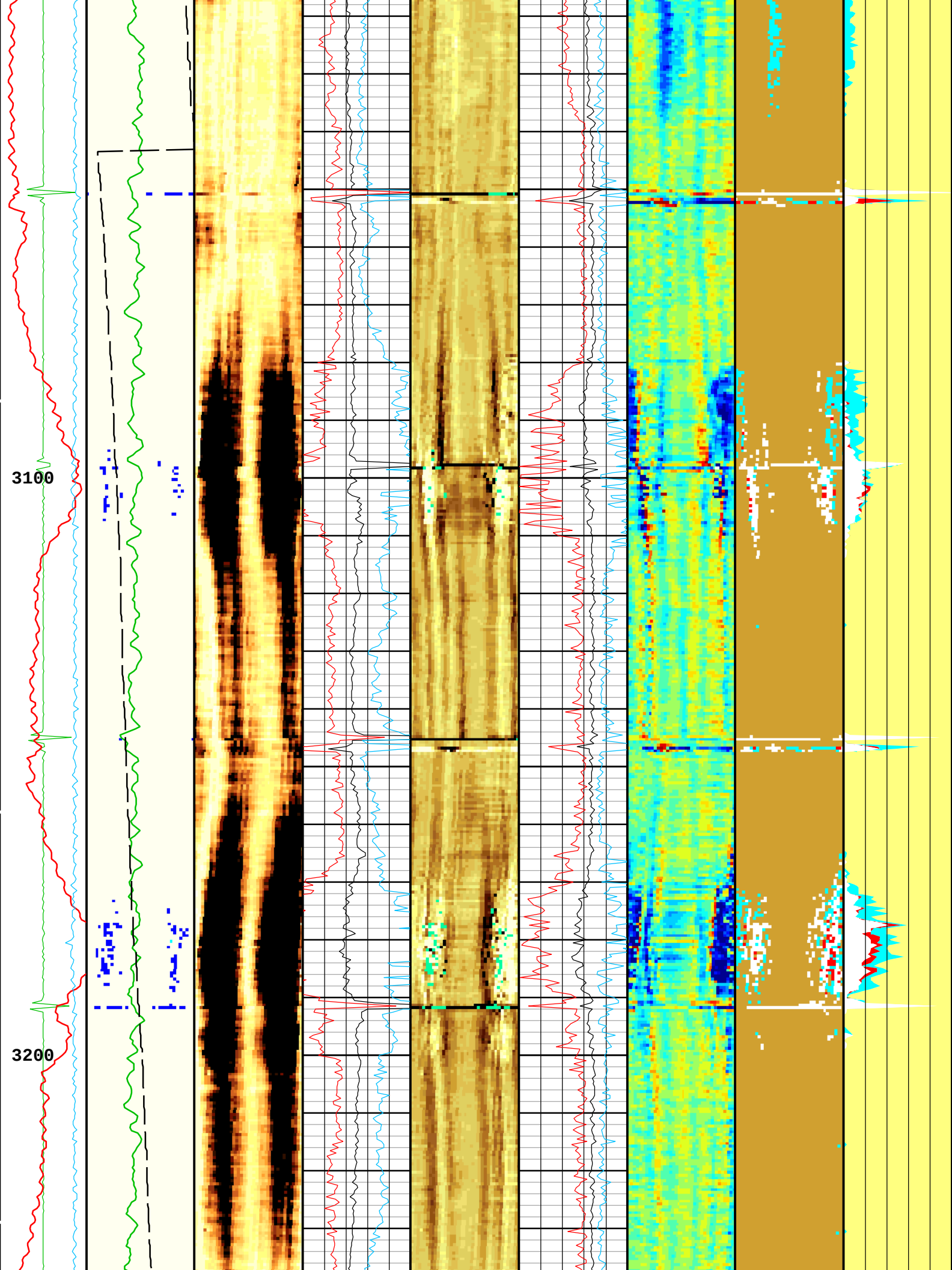
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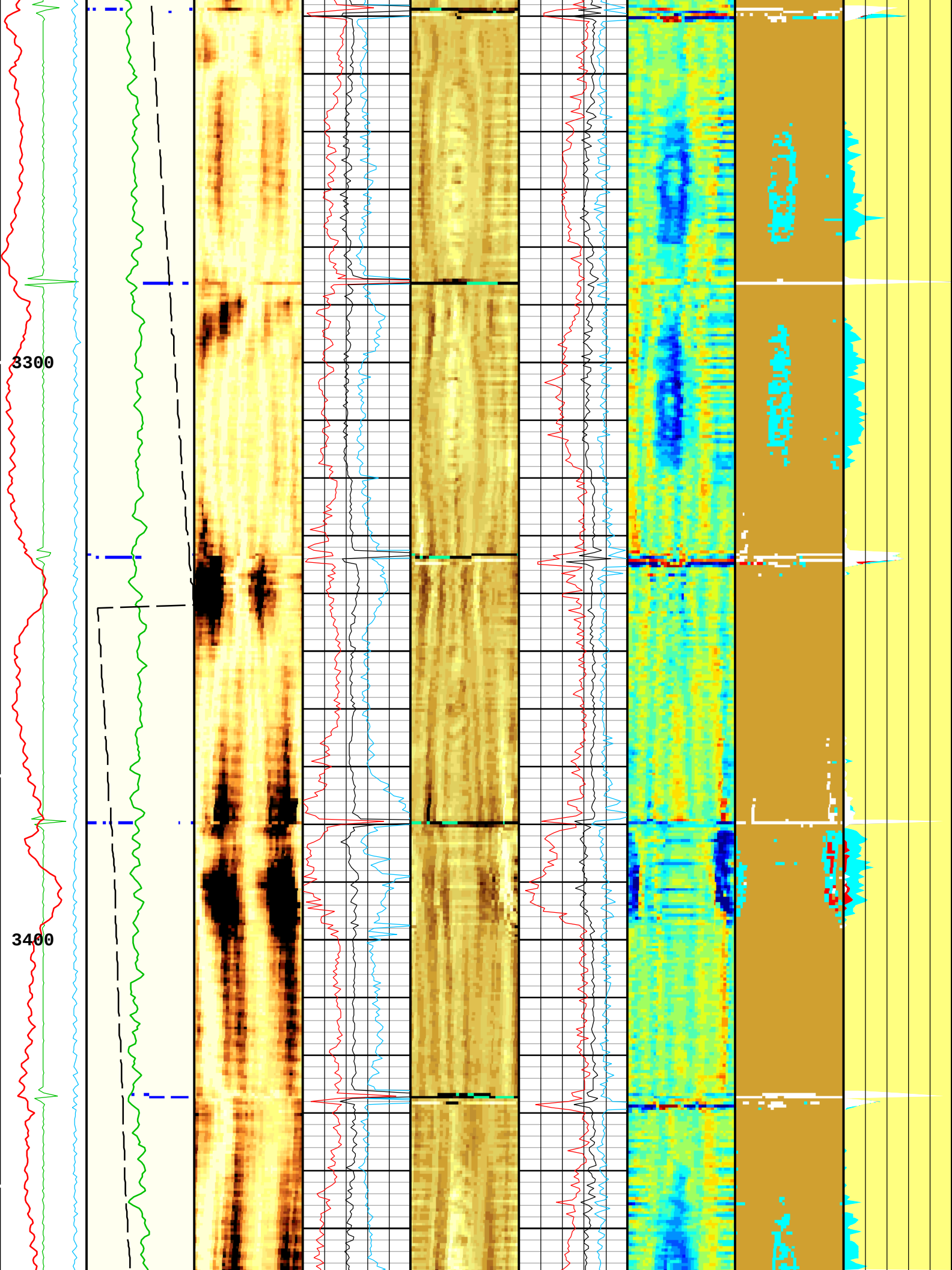
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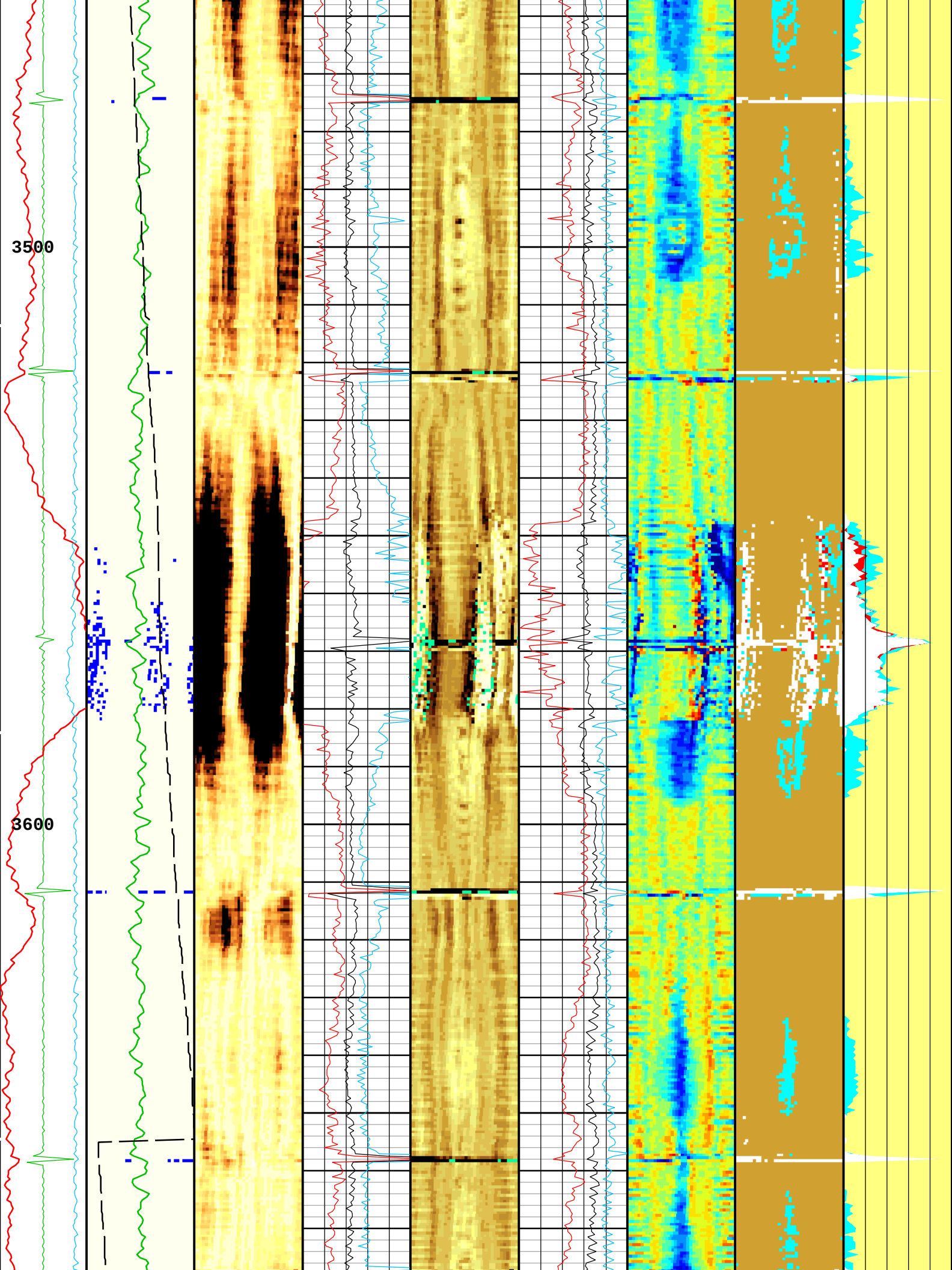
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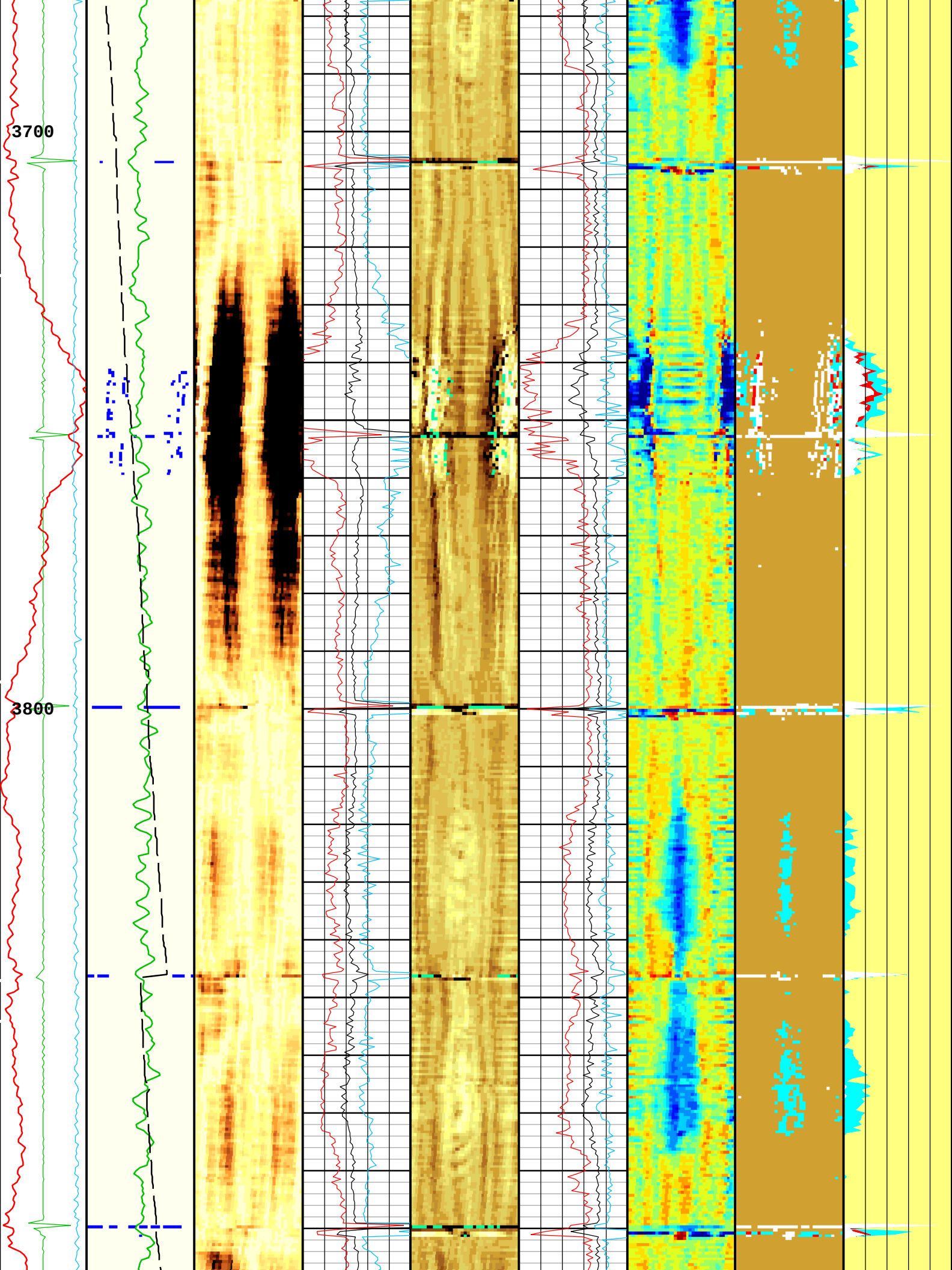
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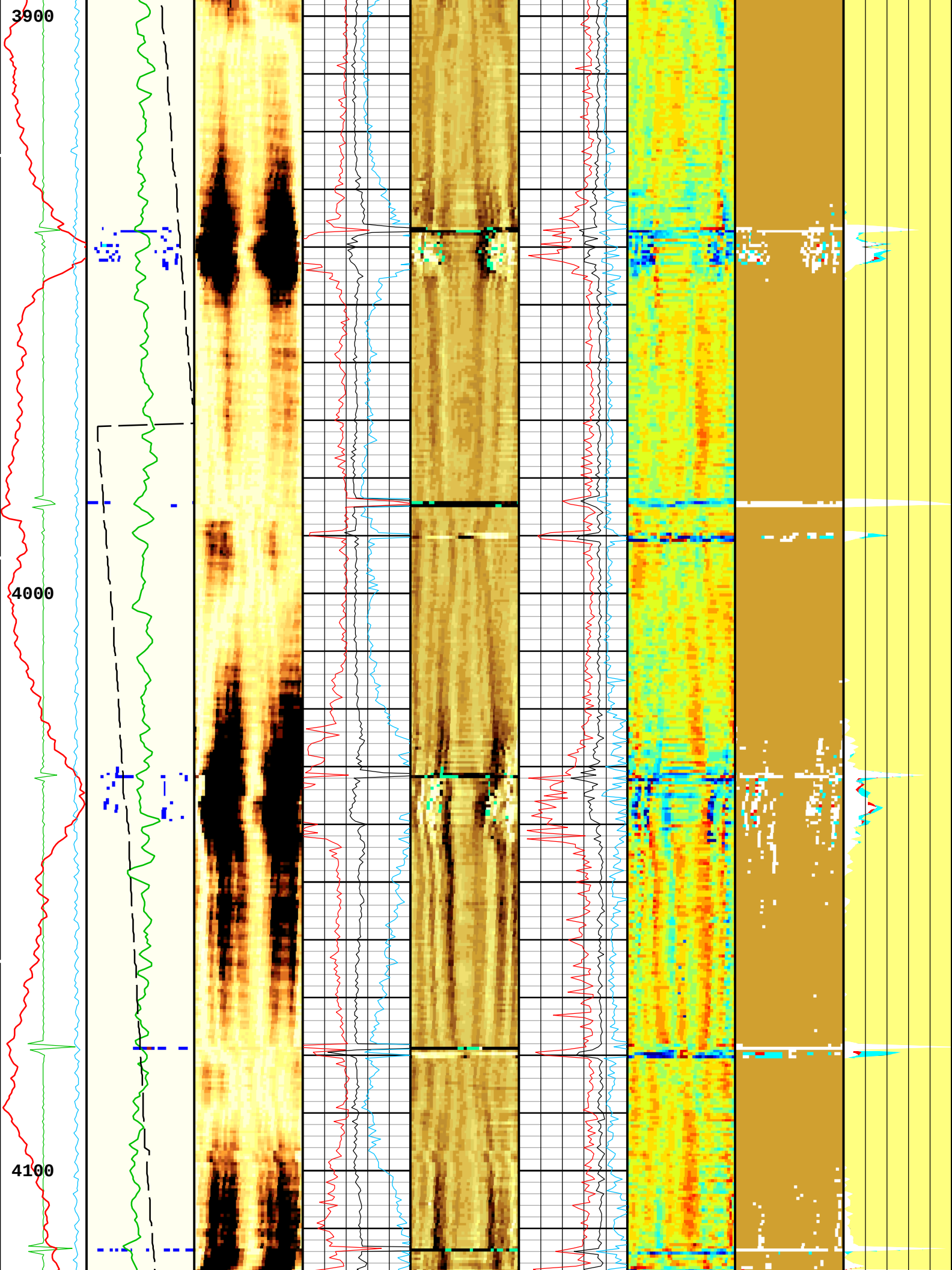
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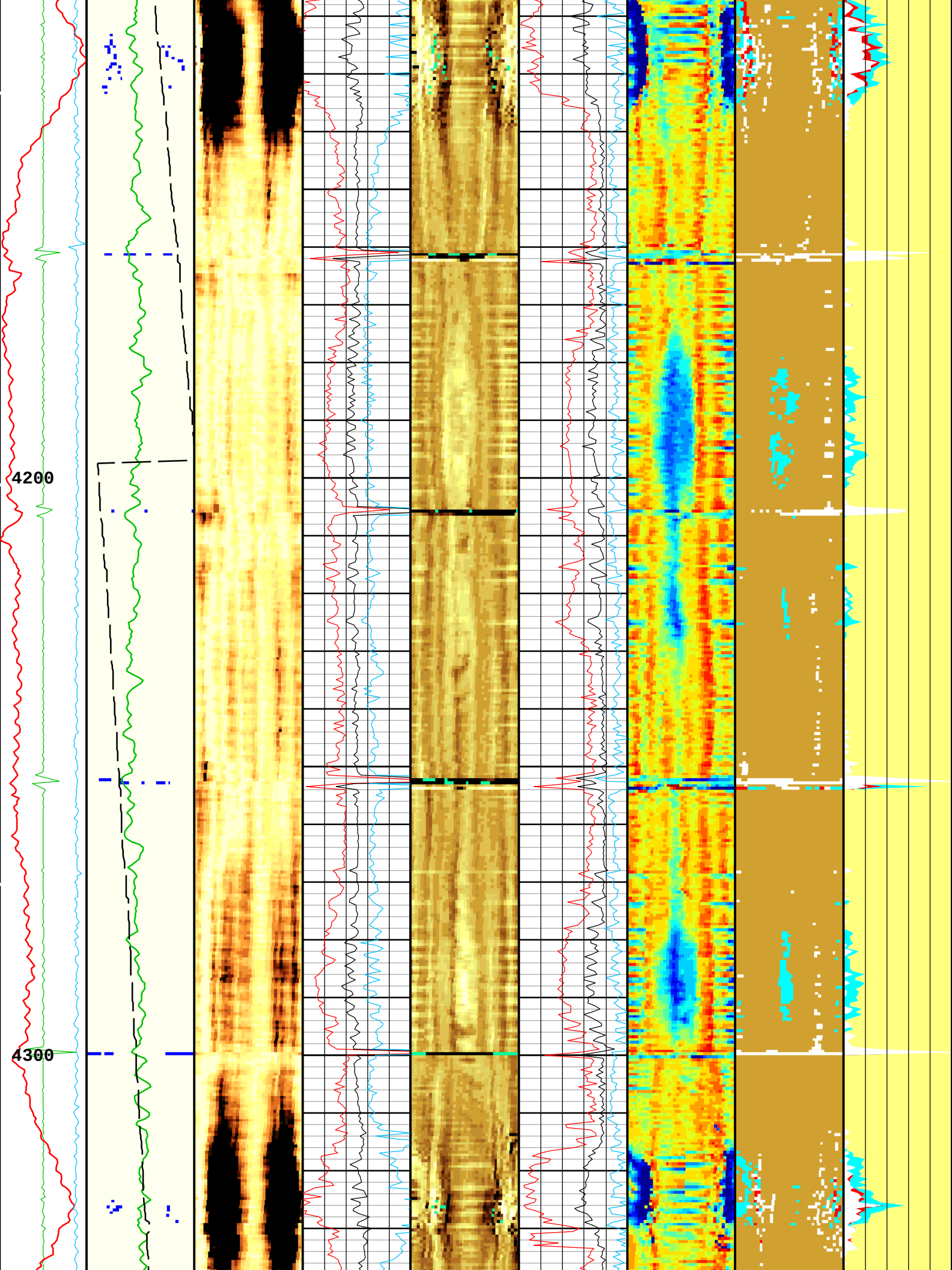
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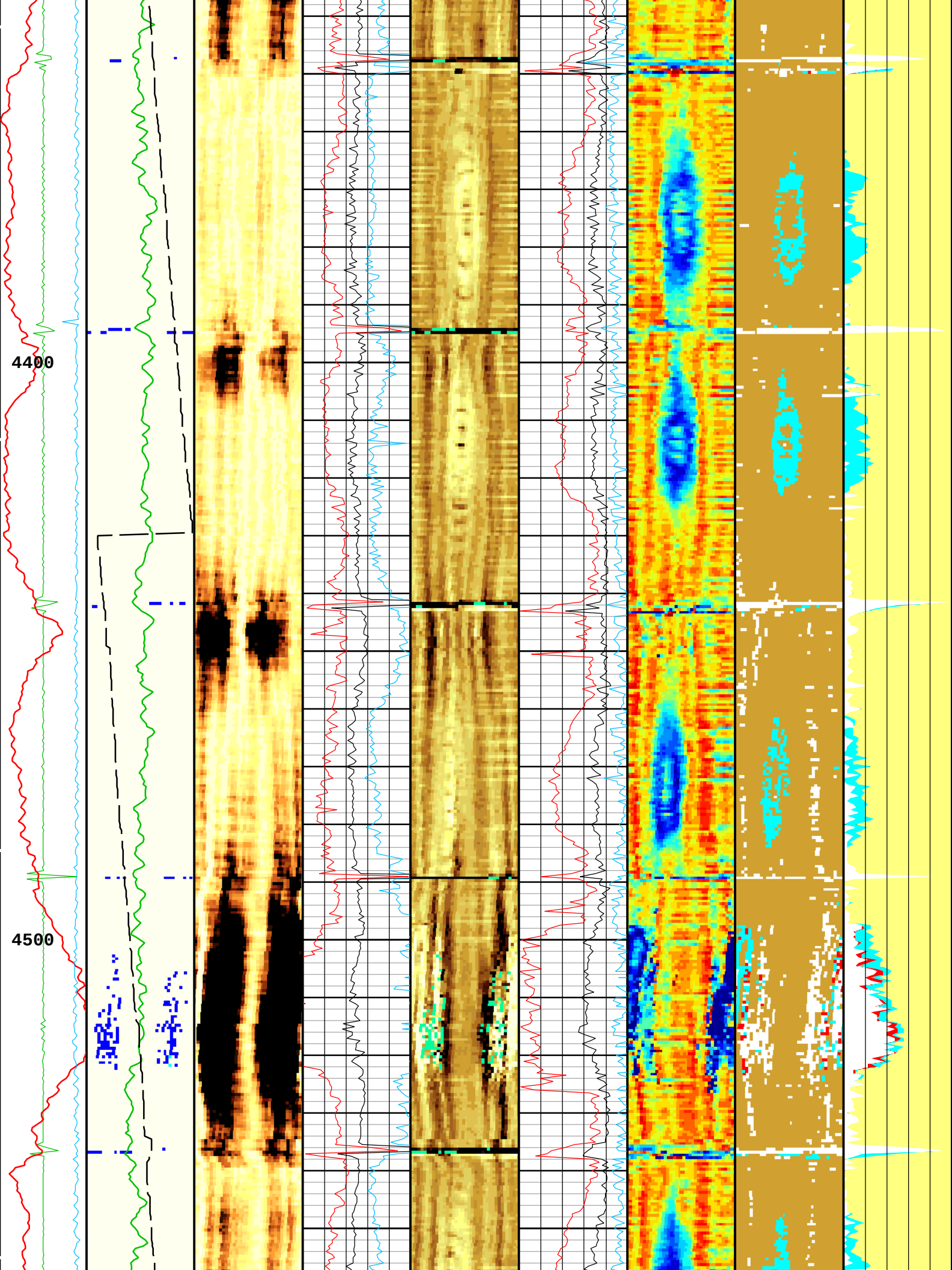
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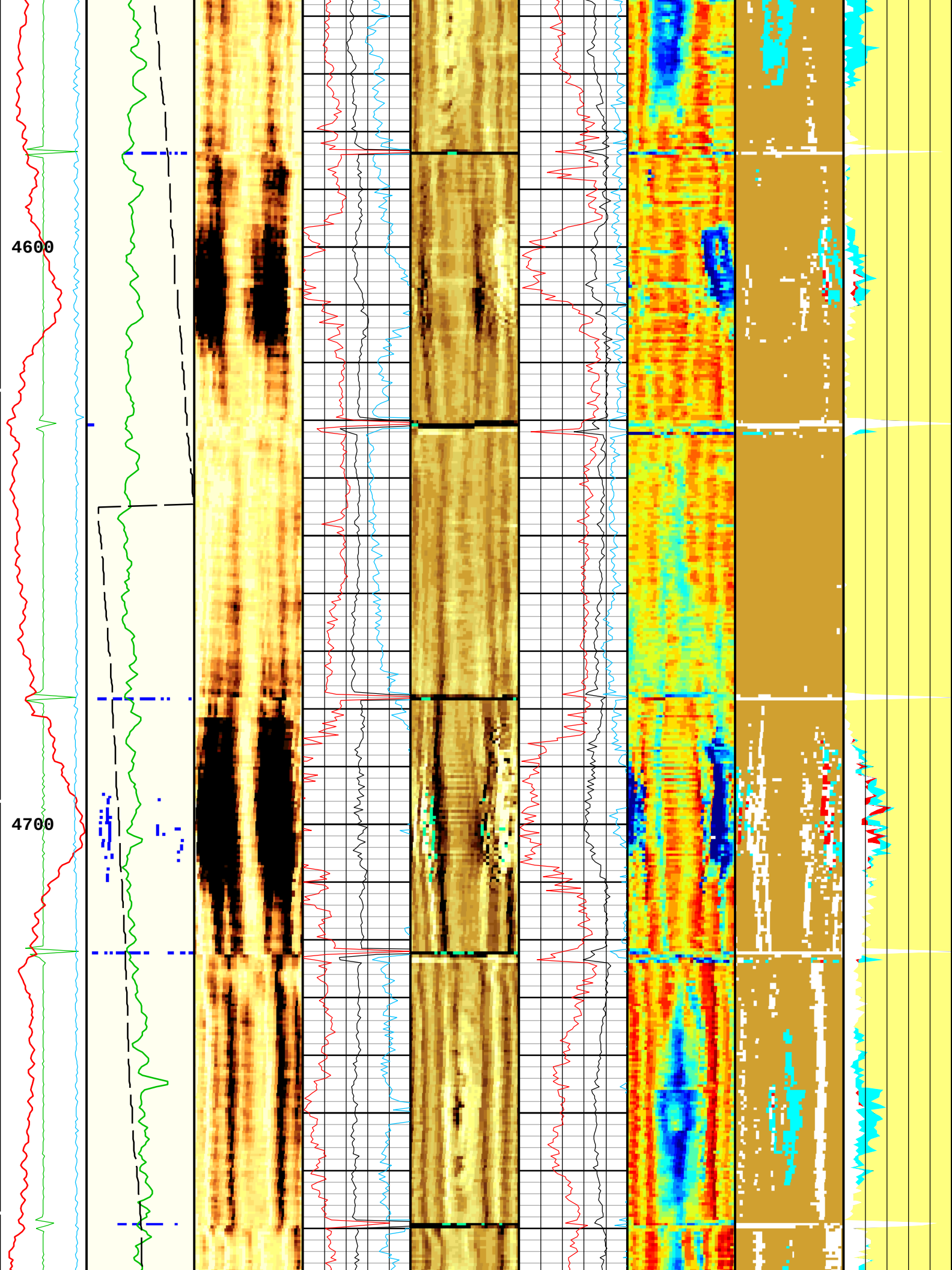
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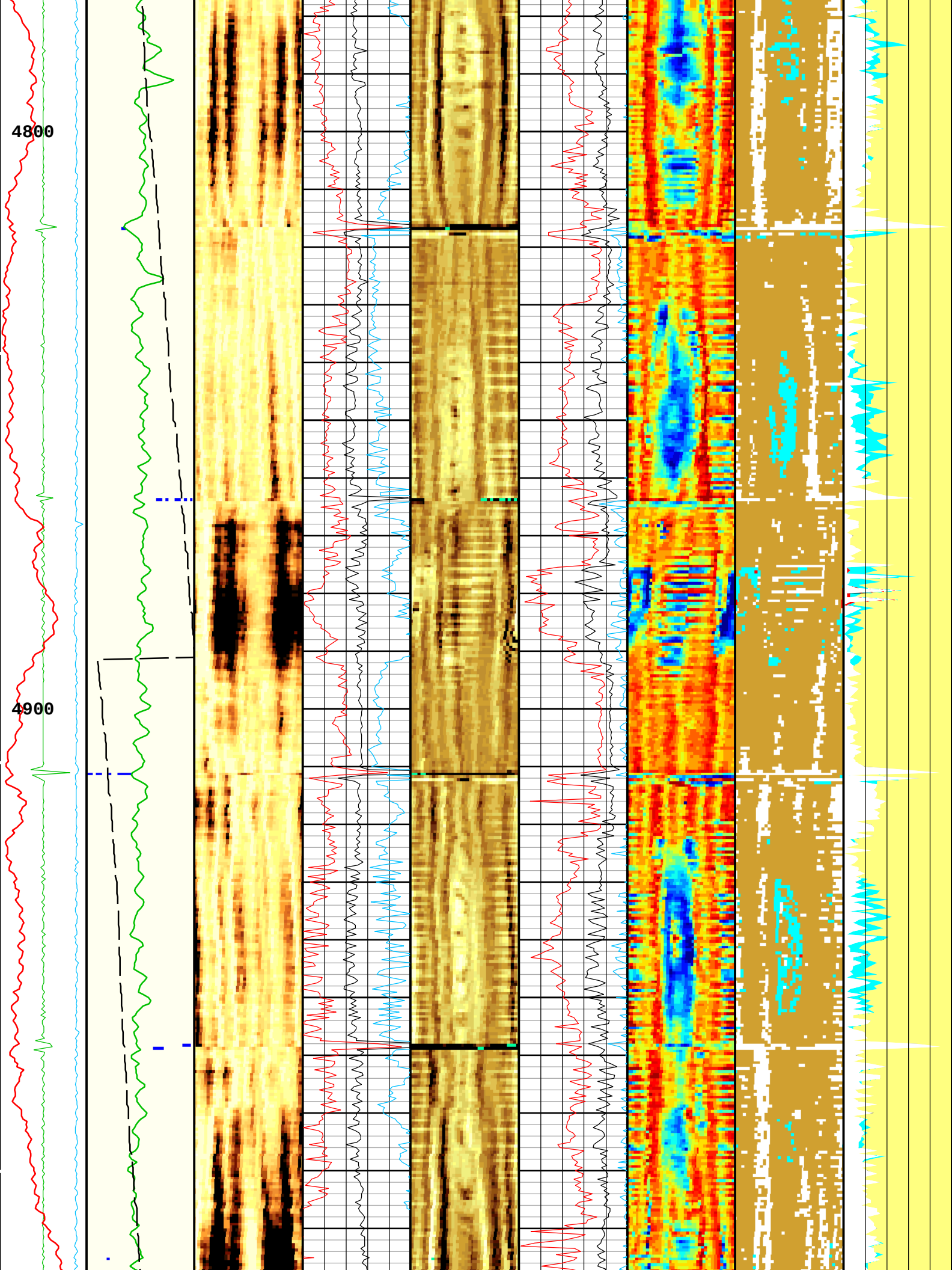
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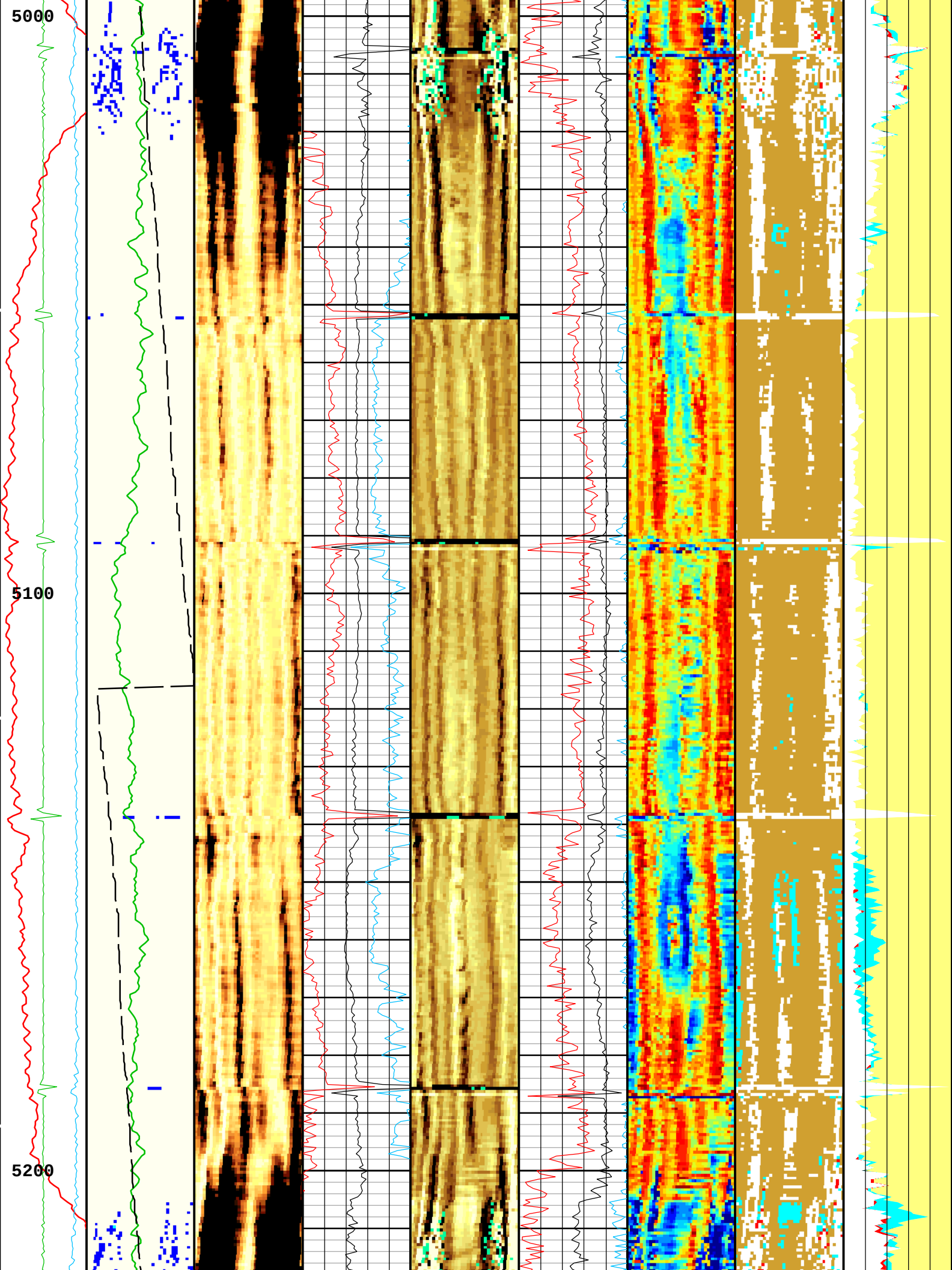
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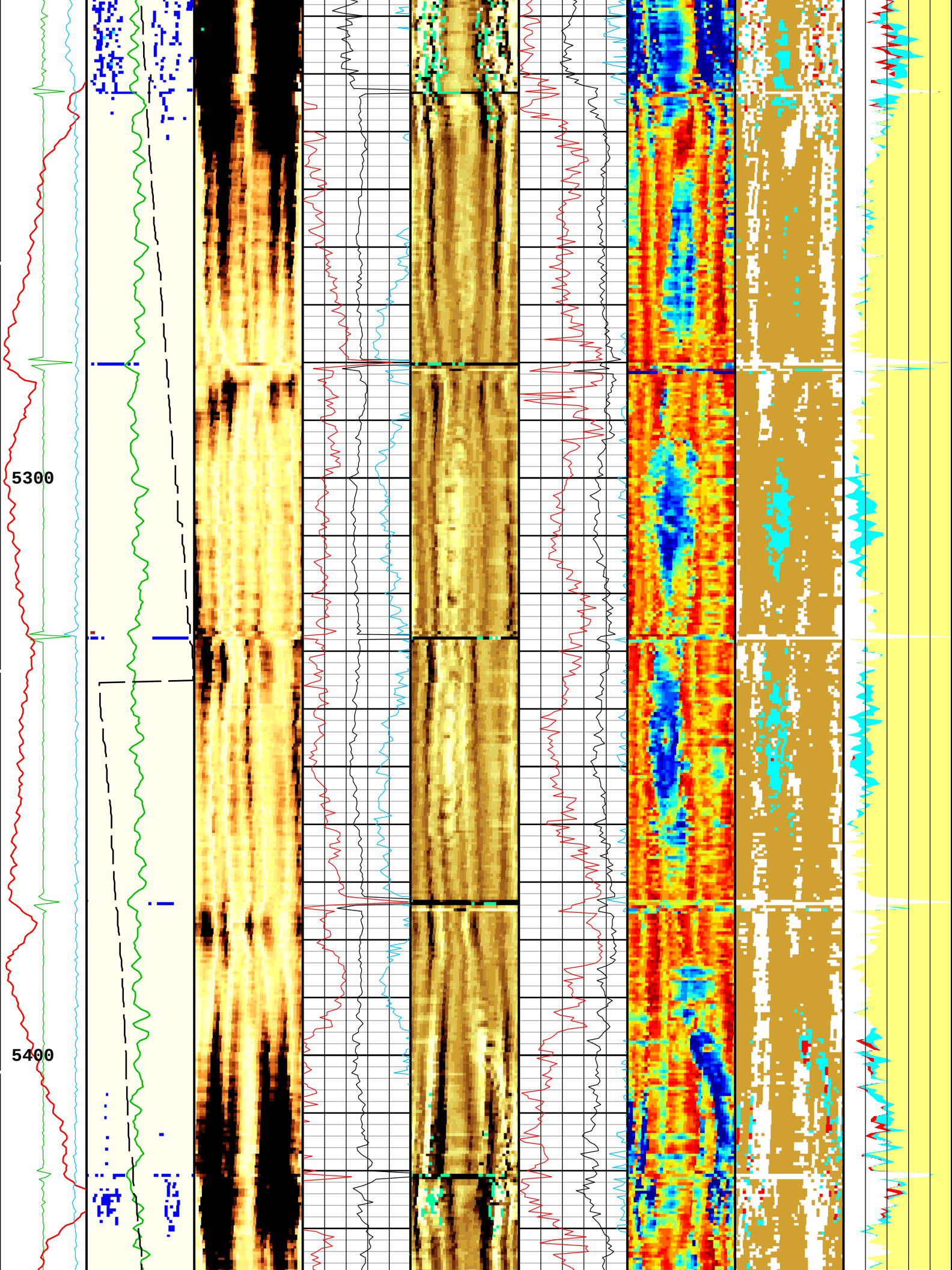
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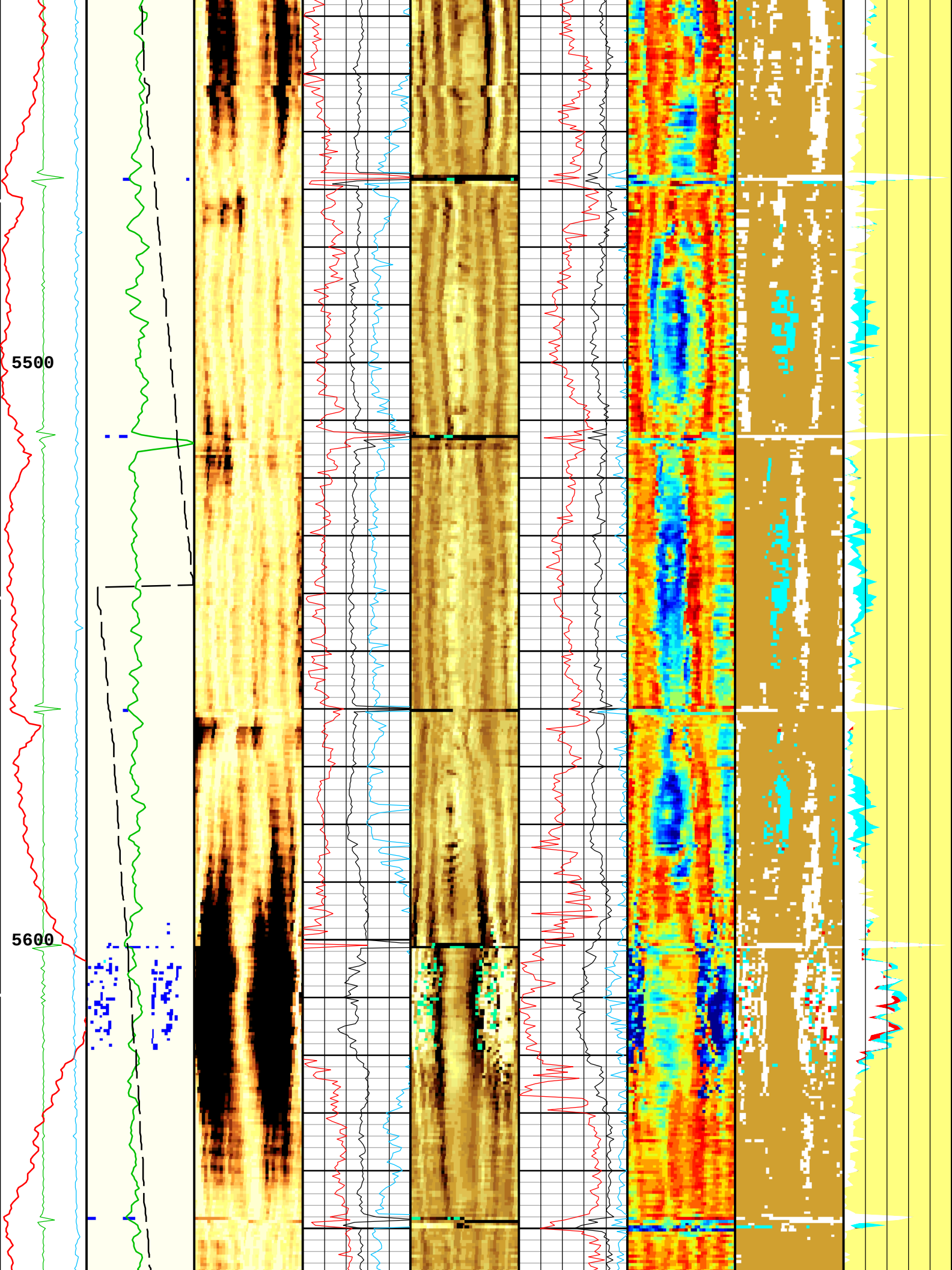
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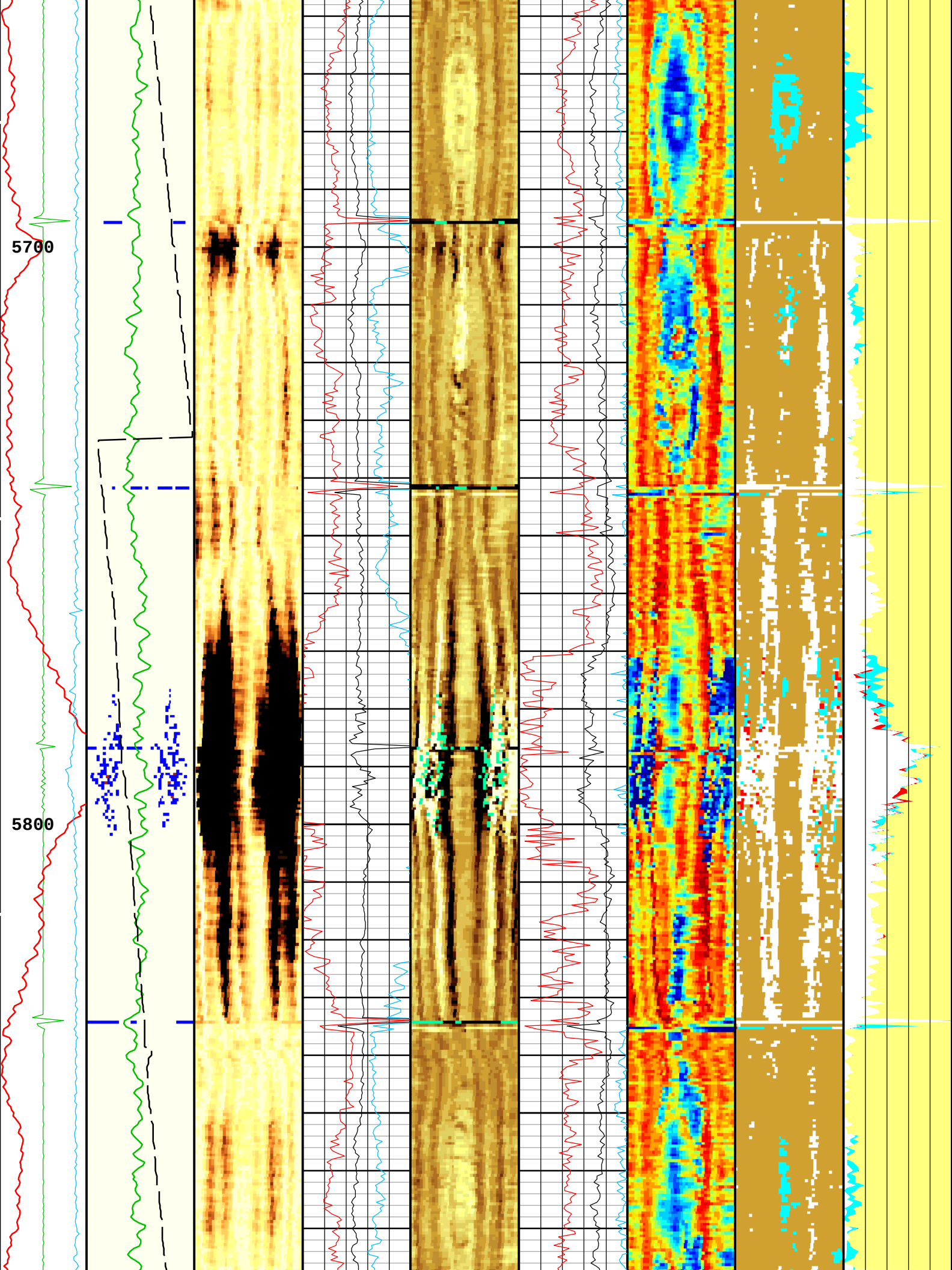
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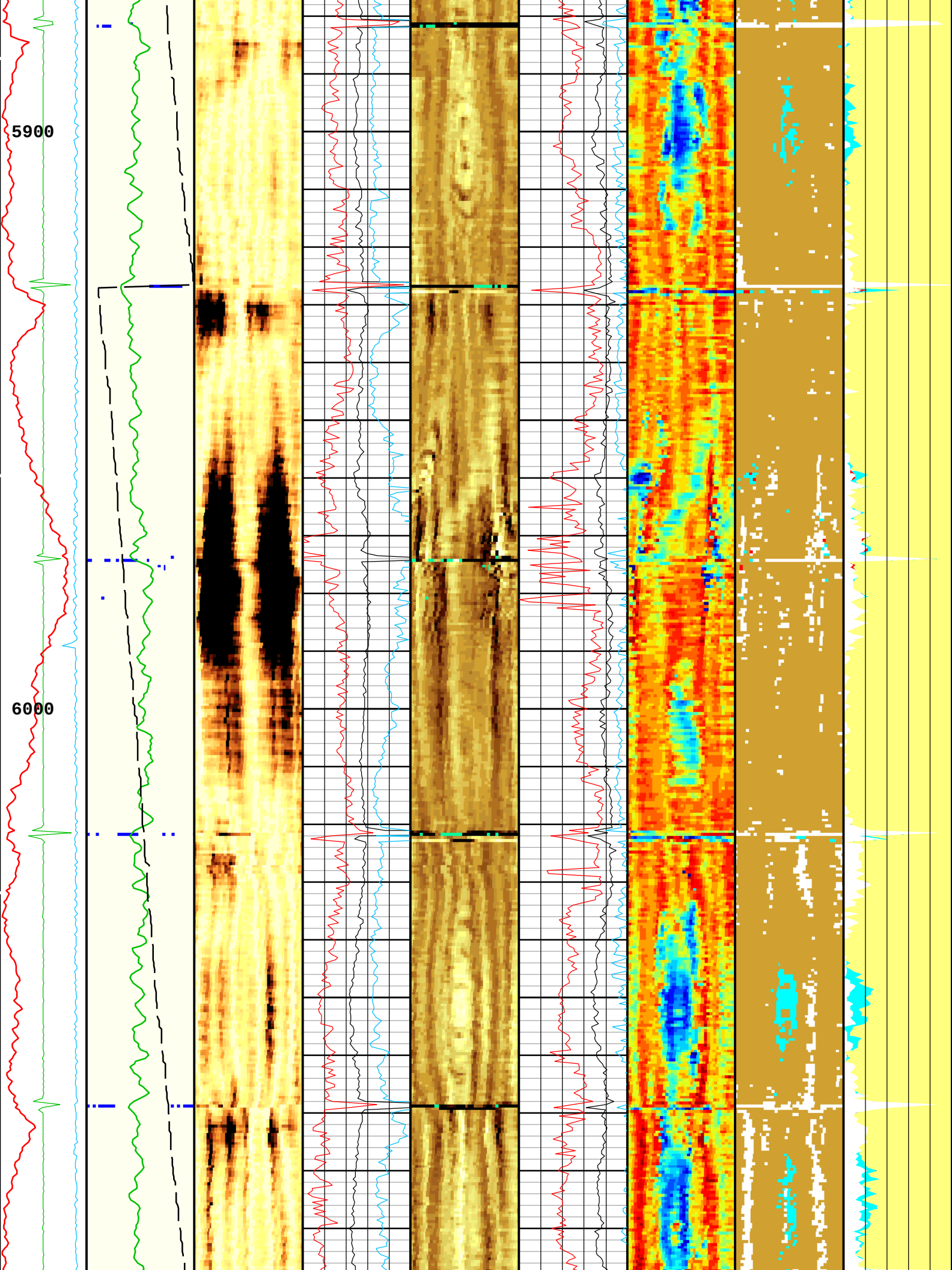
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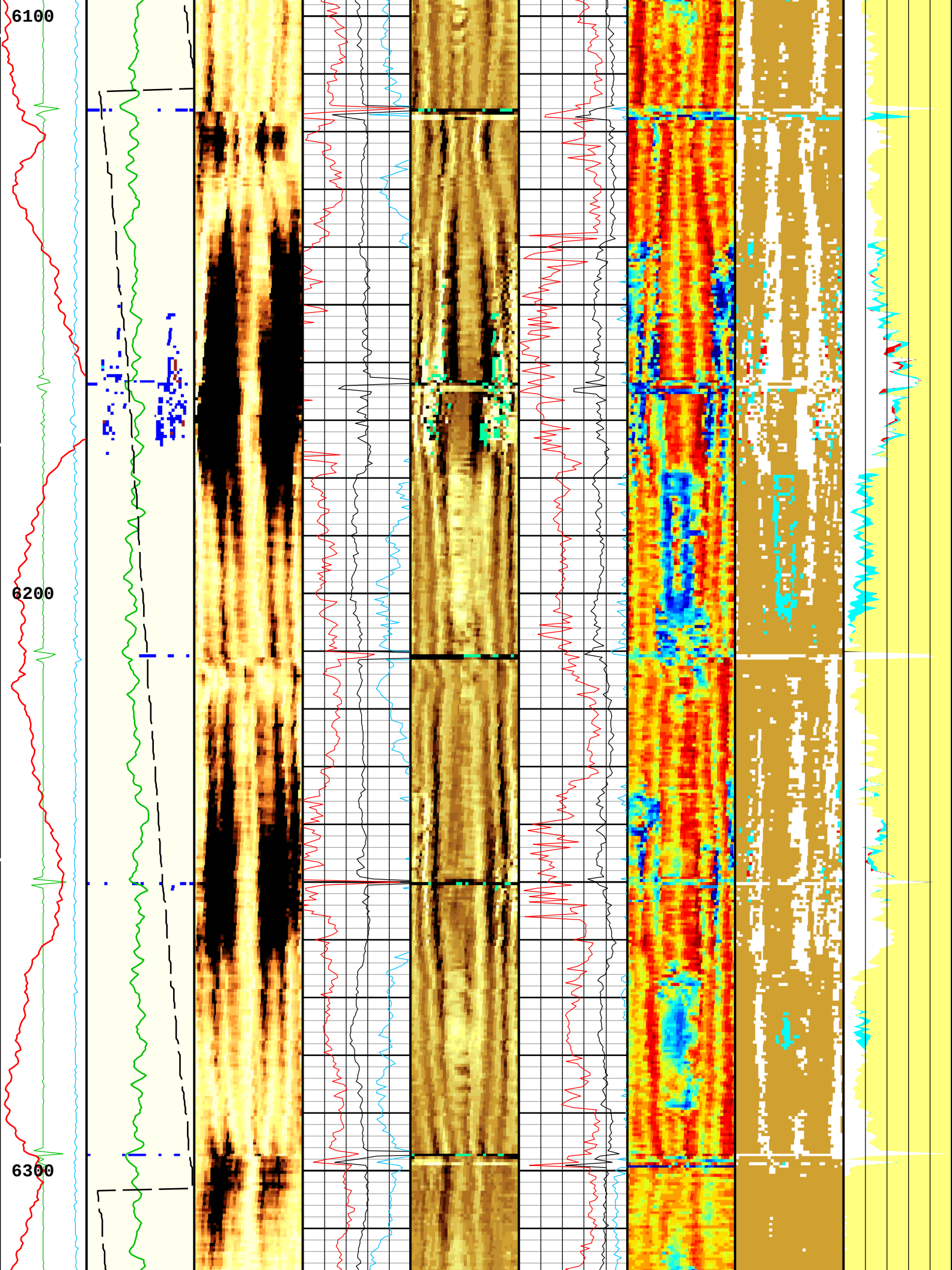
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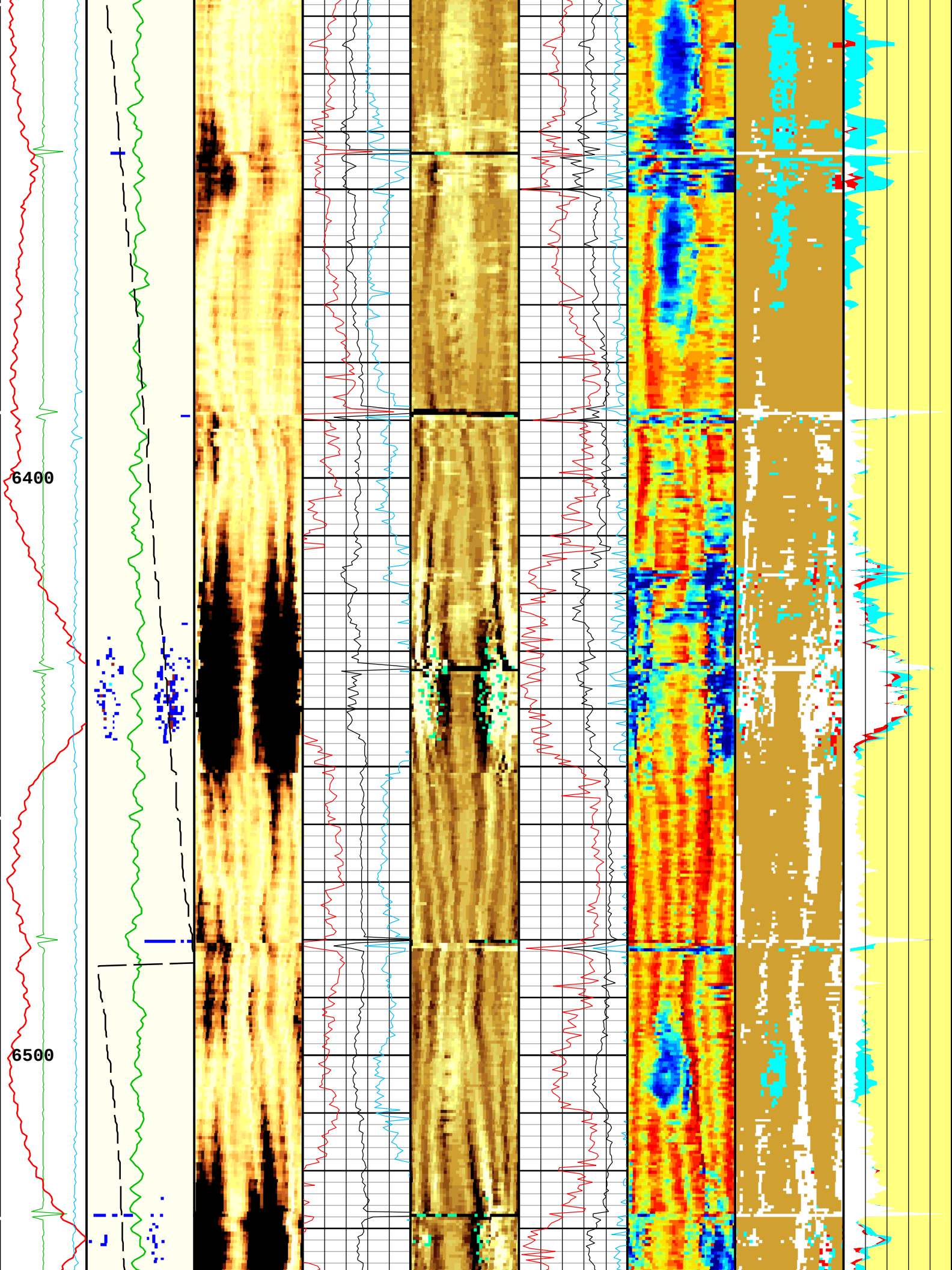
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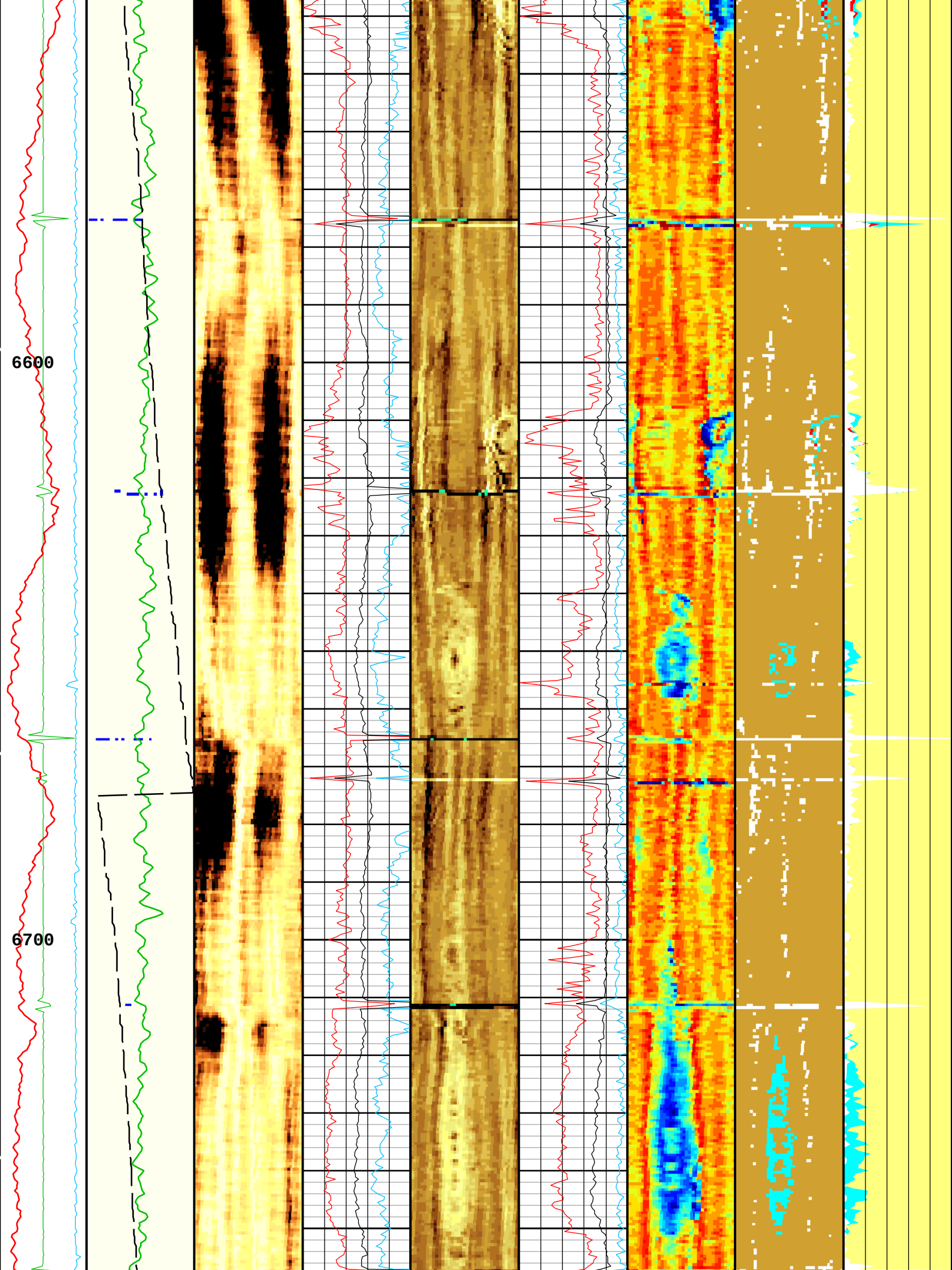
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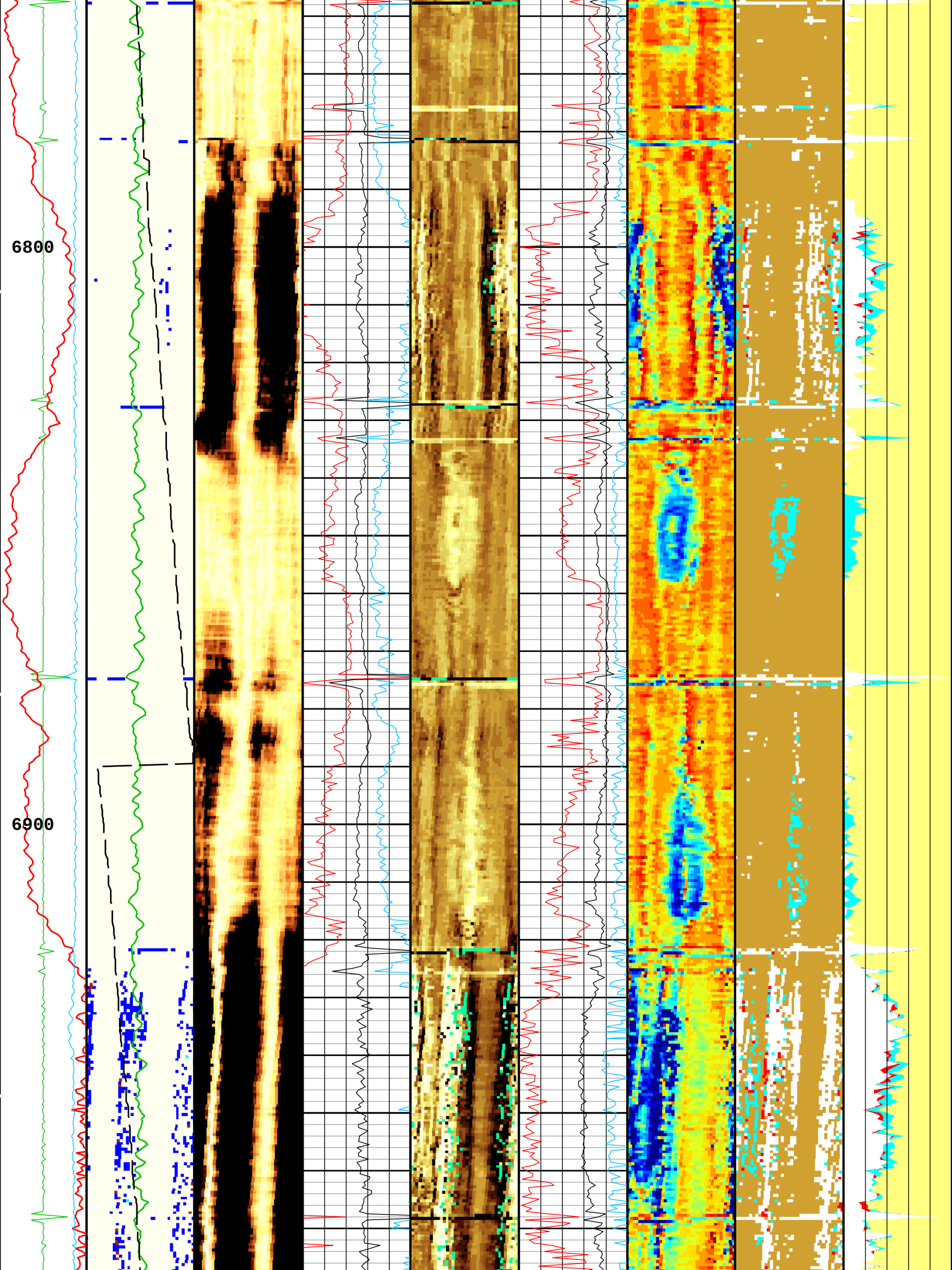
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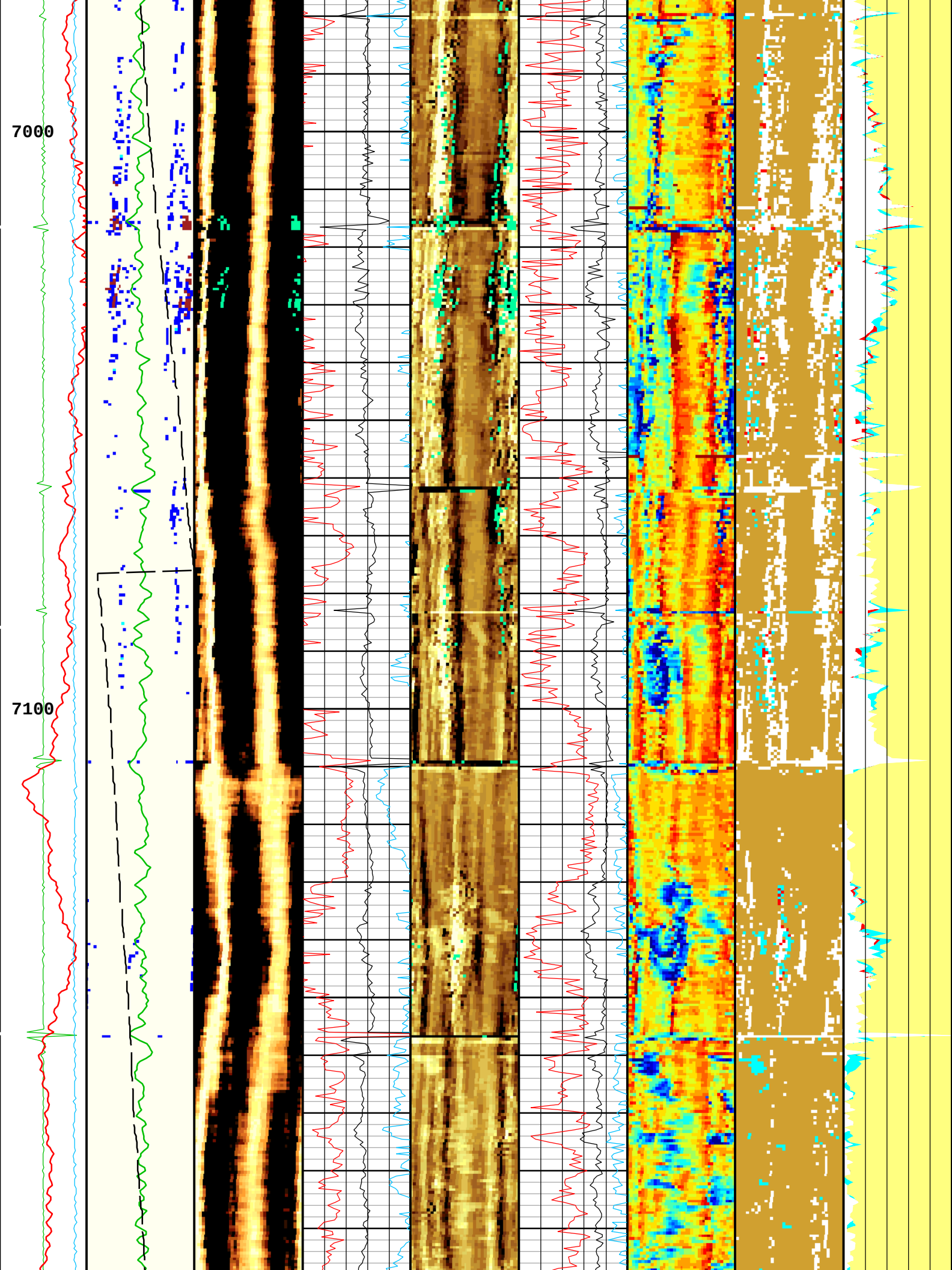
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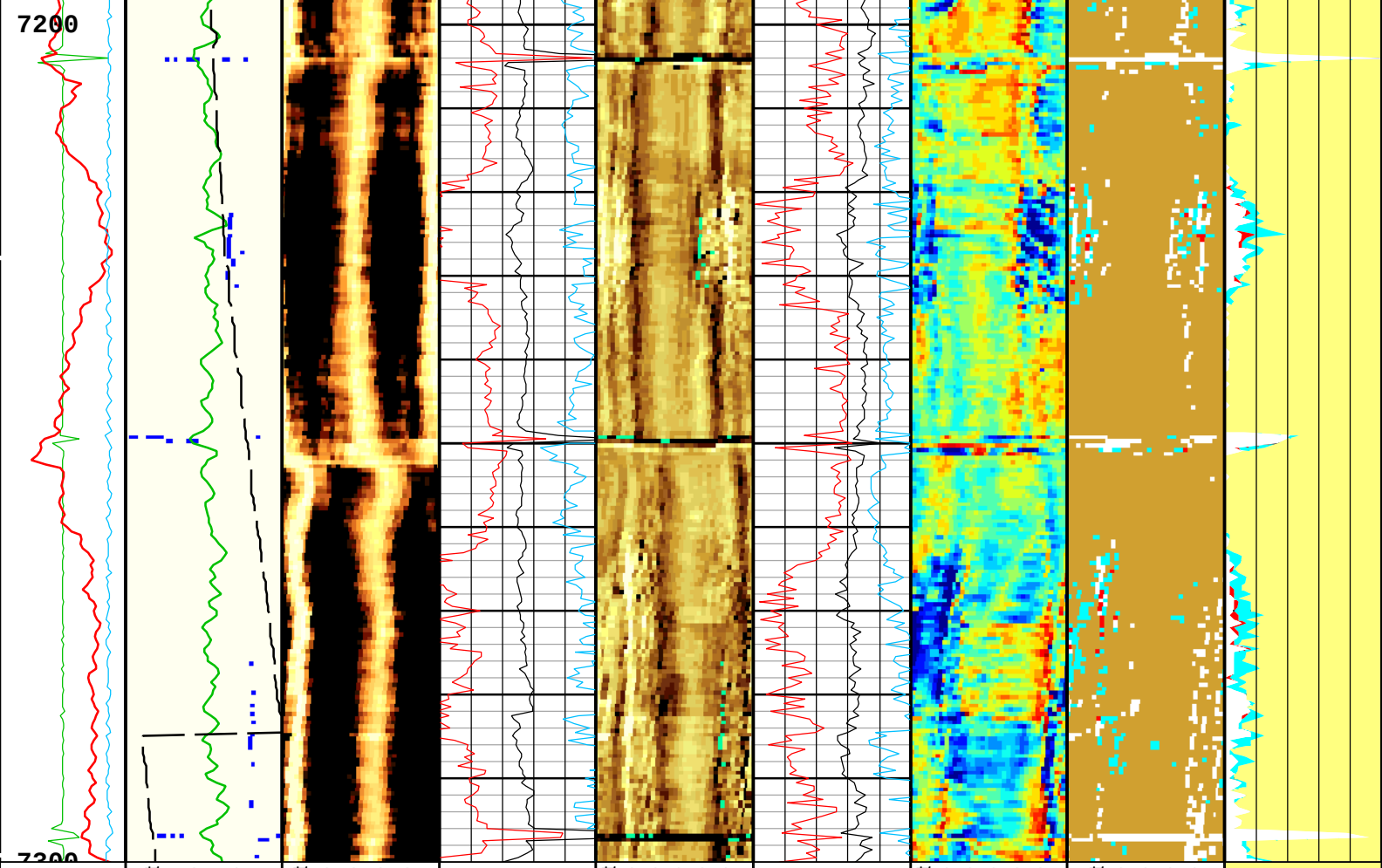


Casing Collar Locator Ultrasonic (CCLU) USIT-E[1]
-20 in 20

Amplitude of Eccentering (ECCE) USIT-E[1]
0 in 0.5

Motor Revolution Speed (RSAV) USIT-E[1]
6 c/s 7.5

Absent 1.500 3.500
Explicit Normalization
USIT - USIT Processing Flags (UFLG) USIT-E[1]
Orientation: Top of Hole
U L B R U

USIT Processing Flags (UFLG[0]) USIT-E[1]
1 5

Gamma Ray (ECGR_EDTC) EDTC-B[1]
0 gAPI 150

Relative Bearing (RB) USIT-E[1]
-40 deg 360

Absent -5.200 -3.600 -2.000 -0.400
Explicit Normalization
USIT - Amplitude of Wave (AWBK) USIT-E[1]
(dB)
Orientation: Top of Hole
U L B R U

Acoustic Impedance Minimum (AIMN) USIT-E[1]
-1 Mrayl 9

Acoustic Impedance Average (AIAV) USIT-E[1]
-1 Mrayl 9

Acoustic Impedance Maximum (AIMX) USIT-E[1]
-1 Mrayl 9

Absent 1.000 2.500 4.000 5.500 7.000
Custom Normalization
USIT - Acoustic Impedance (AIBK) USIT-E[1]
(Mrayl)
Orientation: Top of Hole
U L B R U

Minimum Flexural Attenuation (U-USIT_UFAN) USIT-E[1]
0 dB/m 150

Average Flexural Attenuation (U-USIT_UFAV) USIT-E[1]
0 dB/m 150

Maximum Flexural Attenuation (U-USIT_UFAX) USIT-E[1]
0 dB/m 150

Absent 57.000 78.000 99.000 120.000 141.000
Custom Normalization
USIT - Flexural Attenuation (UFAK) USIT-E[1]
(dB/m)
Orientation: Top of Hole
U L B R U

Absent 0.500 1.500 2.500 3.500
Explicit Normalization
USIT - Solid Liquid Gas Sorted Color Map (USLP) USIT-E[1]
Orientation: Top of Hole
U L B R U

SLG Solid Index
SLG Liquid Index
SLG Gas Index
SLG White Point Index

TIME_1900 - Time Marked every 60.00 (s)

USIT Processing Flags (UFLG[0]) USIT-E[1]
1 - UFLG 1 Value within [0.0 - 1.5] - :
2 - UFLG 2 Value within [1.5 - 2.5] - :
3 - UFLG 3 Value within [2.5 - 3.5] - :

UTIM Error
Pulse Origin Not Detected
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: 20-Oct-2017 04:53:55

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	8.5	in
CASING_PRATIO	Casing Poisson Ratio	USIT-E	Standard Poisson Ratio	
CBLO	Casing Bottom (Logger)	WLSESSION	12057	ft
CDEN	Cement Density	USIT-E	12	lbm/gal
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
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_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	UFAO	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	Inversion Norm.	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	RB	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_INV	IBC Inversion Mud Normalization Factor	USIT-E	1.19	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1	
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	1.75	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	1.07	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	1.8	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.3	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	1.756	in
EMXV	EMEX Voltage	USIT-E	Time Zoned	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	Time Zoned	us
U-USIT_UFWE	Far Receiver Window End Time	USIT-E	Time Zoned	us
U-USIT_UNWB	Near Receiver Window Begin Time	USIT-E	Time Zoned	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	Time Zoned	us
WINE	Window End Time	USIT-E	Time Zoned	us

ONETime Zoned Parameters

Pass Log[4]:Up

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	125	19-Oct-2017 16:14:23	19-Oct-2017 16:45:46	7668.84	5487.42
EMXV	60	19-Oct-2017 16:45:46	19-Oct-2017 16:46:20	5487.42	5448.28
EMXV	120	19-Oct-2017 16:46:20	19-Oct-2017 16:47:07	5448.28	5393.89
EMXV	60	19-Oct-2017 16:47:07	19-Oct-2017 17:09:59	5393.89	3847.02
U-USIT_UFWB	137	19-Oct-2017 16:14:23	19-Oct-2017 16:14:52	7668.84	7653.79
U-USIT_UFWB	122.08	19-Oct-2017 16:14:52	19-Oct-2017 16:16:13	7653.79	7562.75
U-USIT_UFWB	114.76	19-Oct-2017 16:16:13	19-Oct-2017 17:09:59	7562.75	3847.02
U-USIT_UFWE	177	19-Oct-2017 16:14:23	19-Oct-2017 16:16:33	7668.84	7540.02
U-USIT_UFWE	181.73	19-Oct-2017 16:16:33	19-Oct-2017 17:09:59	7540.02	3847.02
U-USIT_UNWB	106	19-Oct-2017 16:14:23	19-Oct-2017 16:14:50	7668.84	7655.43
U-USIT_UNWB	94.87	19-Oct-2017 16:14:50	19-Oct-2017 16:16:09	7655.43	7567.68
U-USIT_UNWB	77.08	19-Oct-2017 16:16:09	19-Oct-2017 17:09:59	7567.68	3847.02
U-USIT_UNWE	146	19-Oct-2017 16:14:23	19-Oct-2017 16:16:35	7668.84	7537.78
U-USIT_UNWE	146.15	19-Oct-2017 16:16:35	19-Oct-2017 16:46:59	7537.78	5403.18
U-USIT_UNWE	149.29	19-Oct-2017 16:46:59	19-Oct-2017 17:09:59	5403.18	3847.02

WINB	31.88	19-Oct-2017 16:14:23	19-Oct-2017 16:14:55	7668.84	7651.1
WINB	25.06	19-Oct-2017 16:14:55	19-Oct-2017 16:16:03	7651.1	7574.3
WINB	22	19-Oct-2017 16:16:03	19-Oct-2017 16:23:27	7574.3	7053.84
WINB	27.37	19-Oct-2017 16:23:27	19-Oct-2017 16:24:01	7053.84	7014.42
WINB	24.3	19-Oct-2017 16:24:01	19-Oct-2017 16:24:05	7014.42	7010.6
WINB	22	19-Oct-2017 16:24:05	19-Oct-2017 17:09:59	7010.6	3847.02
WINE	71.88	19-Oct-2017 16:14:23	19-Oct-2017 16:14:40	7668.84	7657.39
WINE	78.02	19-Oct-2017 16:14:40	19-Oct-2017 16:15:49	7657.39	7591.21
WINE	58.83	19-Oct-2017 16:15:49	19-Oct-2017 16:16:21	7591.21	7554.41
WINE	64.97	19-Oct-2017 16:16:21	19-Oct-2017 16:18:31	7554.41	7402.38
WINE	60.37	19-Oct-2017 16:18:31	19-Oct-2017 16:19:47	7402.38	7314.02
WINE	69.57	19-Oct-2017 16:19:47	19-Oct-2017 16:23:24	7314.02	7057.12
WINE	78.78	19-Oct-2017 16:23:24	19-Oct-2017 17:09:59	7057.12	3847.02

Pass Log[5]:Up

EMXV	60	19-Oct-2017 17:12:15	19-Oct-2017 18:06:23	3847.01	62.84
U-USIT_UFWB	114.76	19-Oct-2017 17:12:15	19-Oct-2017 18:06:23	3847.01	62.84
U-USIT_UFWE	181.73	19-Oct-2017 17:12:15	19-Oct-2017 18:06:23	3847.01	62.84
U-USIT_UNWB	77.08	19-Oct-2017 17:12:15	19-Oct-2017 18:06:23	3847.01	62.84
U-USIT_UNWE	149.29	19-Oct-2017 17:12:15	19-Oct-2017 18:06:23	3847.01	62.84
WINB	22	19-Oct-2017 17:12:15	19-Oct-2017 18:06:23	3847.01	62.84
WINE	78.78	19-Oct-2017 17:12:15	19-Oct-2017 18:06:23	3847.01	62.84

All depth are at tool zero.

Composite 1

IBC SLG Composite

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[4]:Up	Up	3793.95 ft	7669.00 ft	19-Oct-2017 4:14:23 PM	19-Oct-2017 5:09:59 PM	ON	7.55 ft	Yes
ONE	Log[5]:Up	Up	62.48 ft	3891.02 ft	19-Oct-2017 5:11:30 PM	19-Oct-2017 6:06:23 PM	ON	7.81 ft	Yes

All depths are referenced to toolstring zero

Log

Company:CRESTONE PEAK RESOURCES OPERATING LLC Well:HWY 52 4U-32H-O268 Composite 1:S008

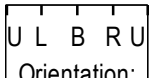
Description: USI IBC SLG Composite Format: Log (IBC SLG Composite) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 20-Oct-2017 04:54:15

TIME_1900 - Time Marked every 60.00 (s)

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

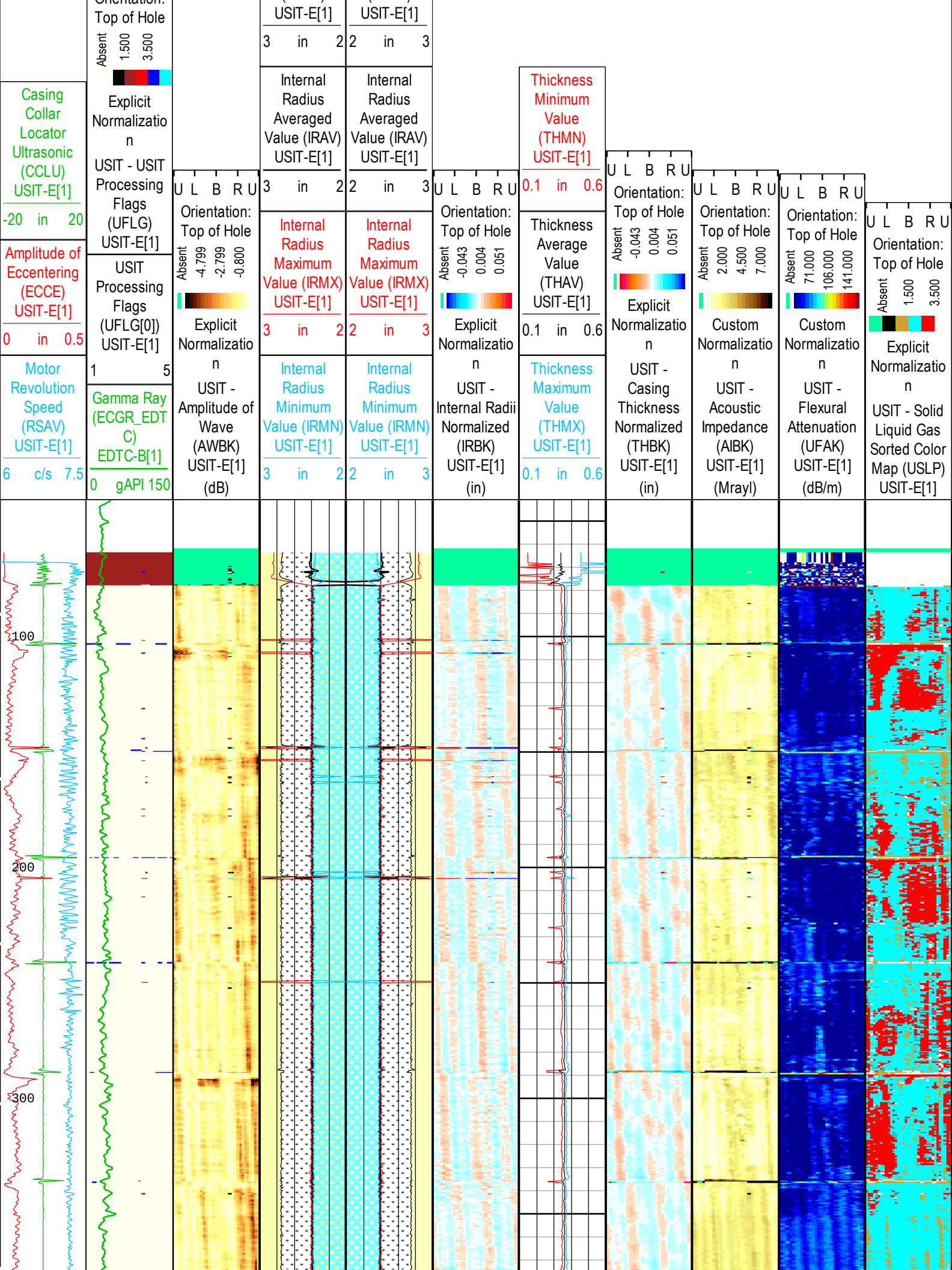
1 - UFLG 1 Value within [0.0 - 1.5] - :
2 - UFLG 2 Value within [1.5 - 2.5] - :
3 - UFLG 3 Value within [2.5 - 3.5] - :
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :

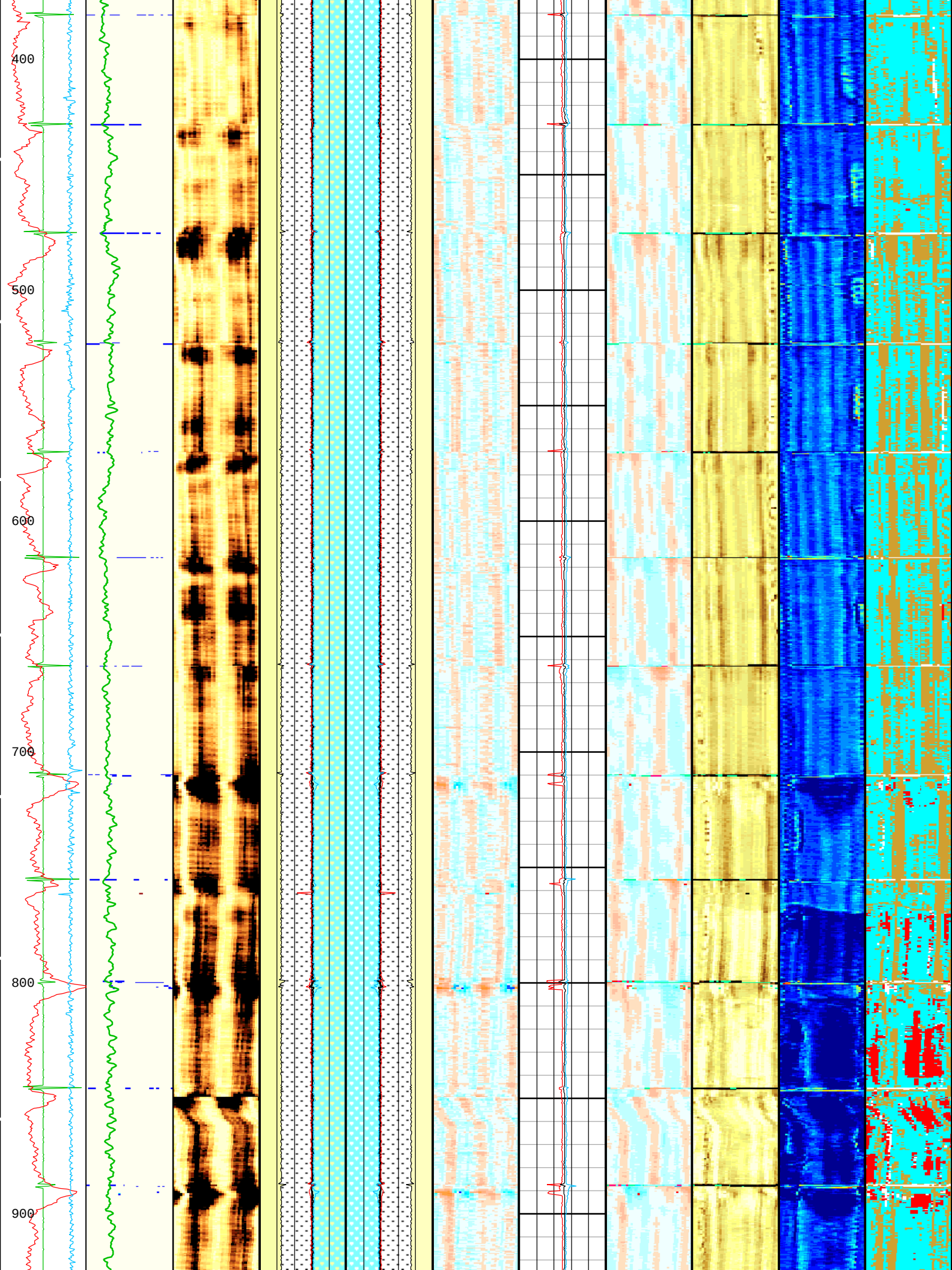
UTIM Error
Pulse Origin Not Detected
WINLEN Error
Casing Thickness Error
Loop Processing Error



External Radii Average (ERAV)

External Radii Average (ERAV)


Casing Collar Locator Ultrasonic (CCLU) USIT-E[1]
-20 in 20
Amplitude of Eccentering (ECCE) USIT-E[1]
0 in 0.5
Motor Revolution Speed (RSAV) USIT-E[1]
6 c/s 7.5
Orientation: Top of Hole
Absent 1.500 3.500
Explicit Normalization
USIT - USIT Processing Flags (UFLG) USIT-E[1]
USIT Processing Flags (UFLG[0]) USIT-E[1]
1 5
Gamma Ray (ECGR_EDTC) EDTC-B[1]
0 gAPI 150
U L B R U
Orientation: Top of Hole
Absent -4.799 -2.799 -0.800
Explicit Normalization
USIT - Amplitude of Wave (AWBK) USIT-E[1] (dB)
USIT-E[1]
3 in 2
Internal Radius Averaged Value (IRAV) USIT-E[1]
Internal Radius Maximum Value (IRMX) USIT-E[1]
Internal Radius Minimum Value (IRMN) USIT-E[1]
2 in 3
Orientation: Top of Hole
Absent -0.043 0.004 0.051
Explicit Normalization
USIT - Internal Radii Normalized (IRBK) USIT-E[1] (in)
Thickness Minimum Value (THMN) USIT-E[1]
0.1 in 0.6
Thickness Average Value (THAV) USIT-E[1]
Thickness Maximum Value (THMX) USIT-E[1]
Absent -0.043 0.004 0.051
Explicit Normalization
USIT - Casing Thickness Normalized (THBK) USIT-E[1] (in)
Absent 2.000 4.500 7.000
Custom Normalization
USIT - Acoustic Impedance (AIBK) USIT-E[1] (Mrayl)
Absent 71.000 106.000 141.000
Custom Normalization
USIT - Flexural Attenuation (UFAK) USIT-E[1] (dB/m)
Absent 1.500 3.500
Explicit Normalization
USIT - Solid Liquid Gas Sorted Color Map (USLP) USIT-E[1]
100
200
300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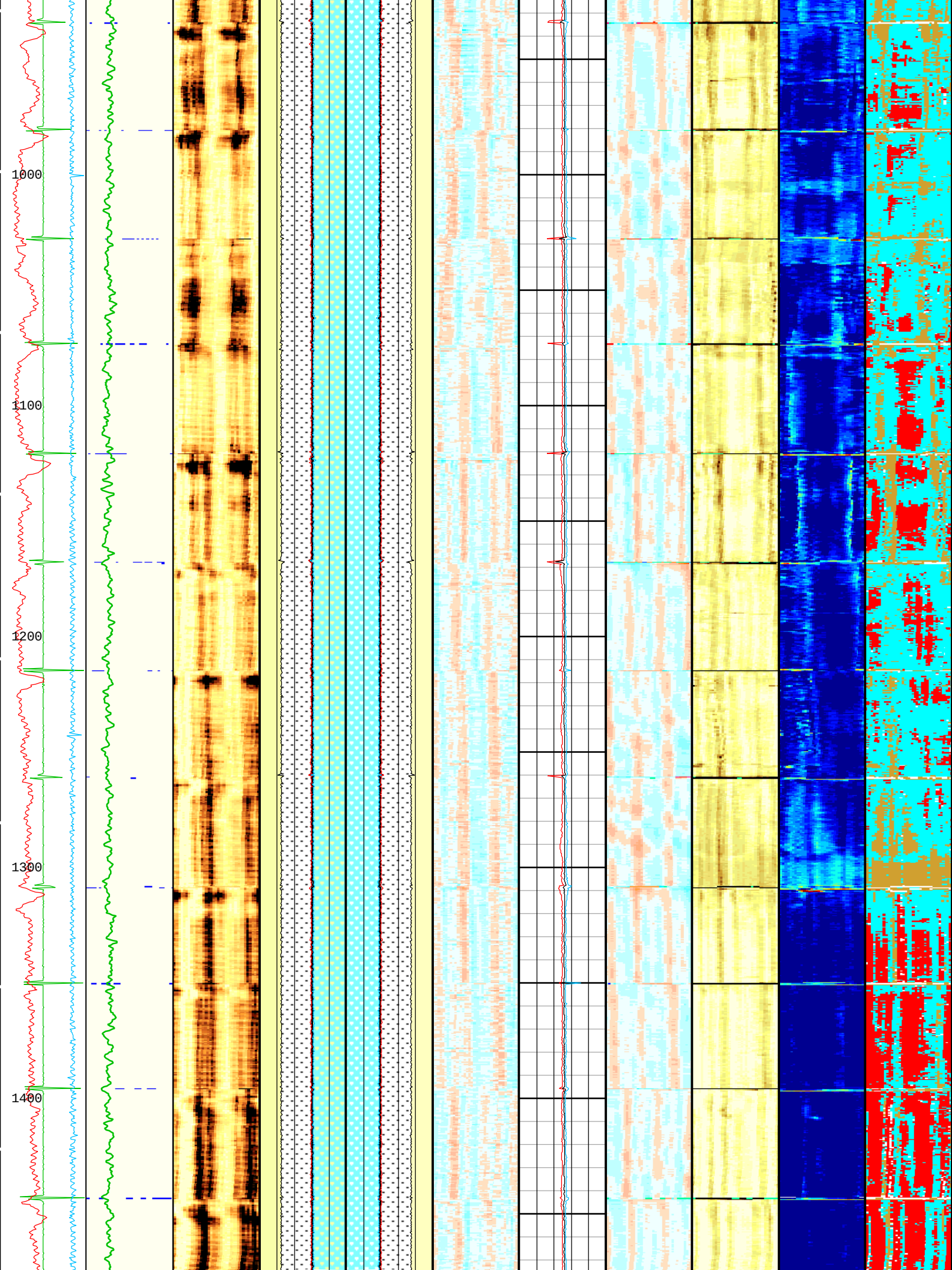
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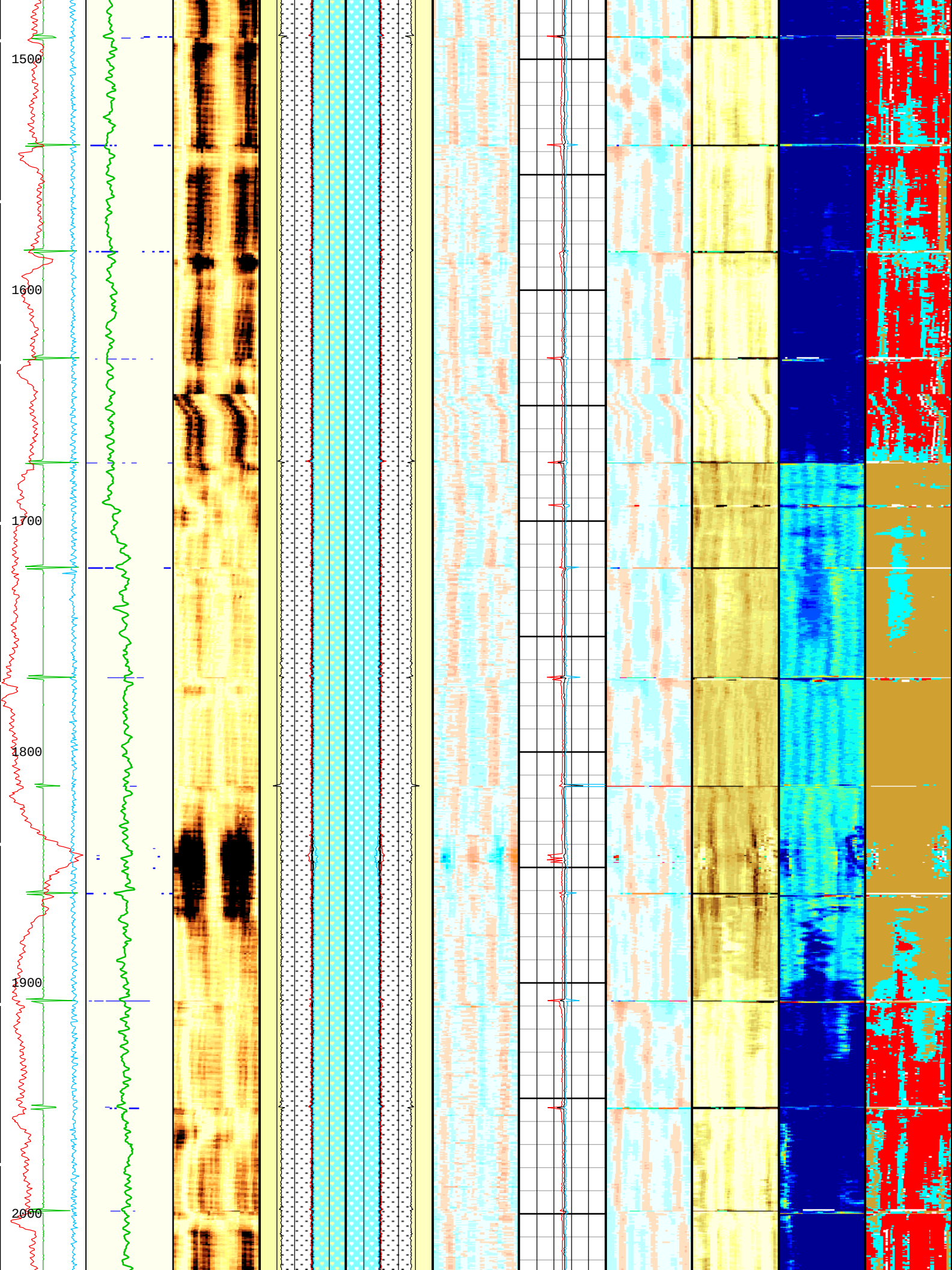
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1900
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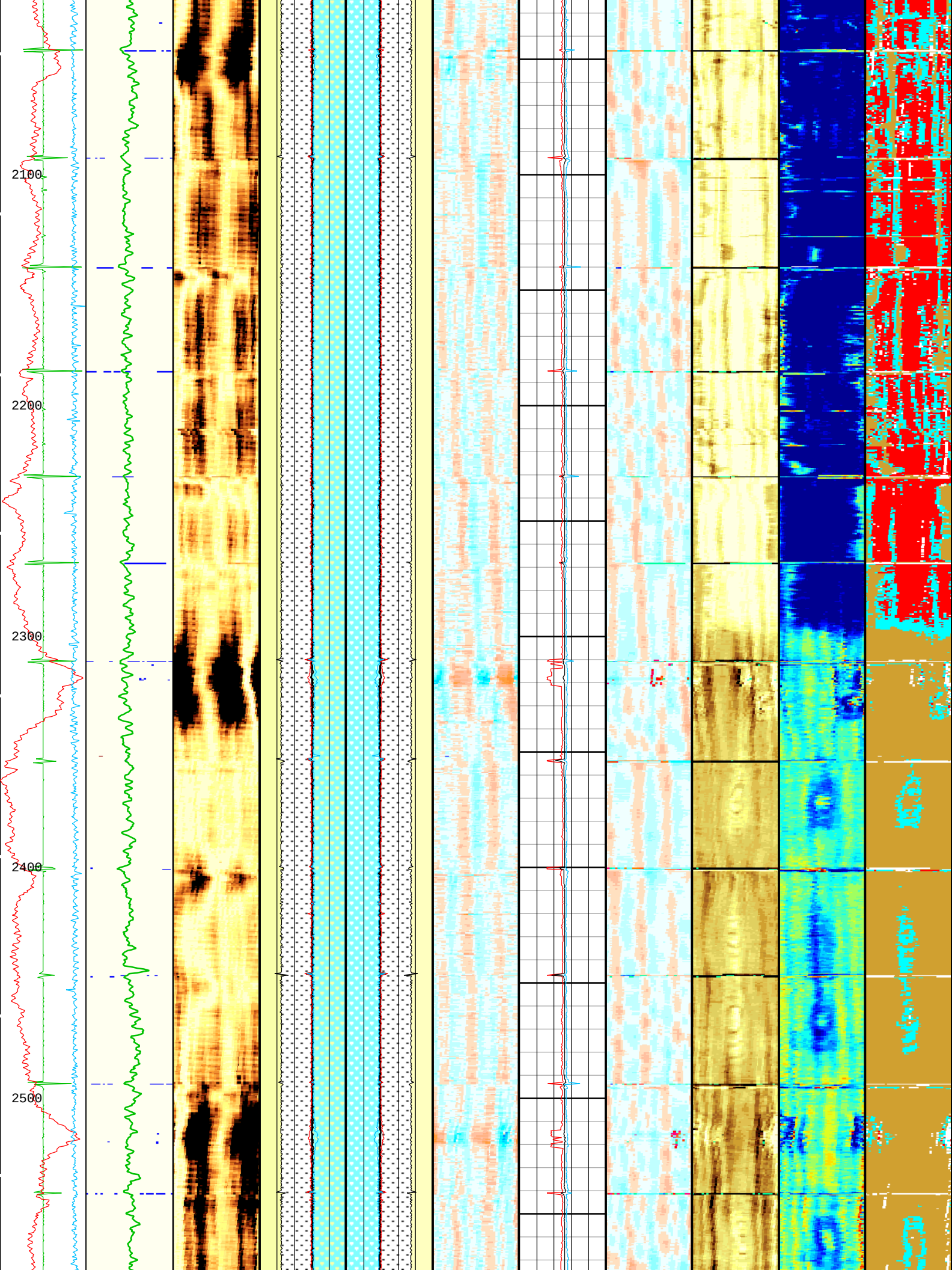
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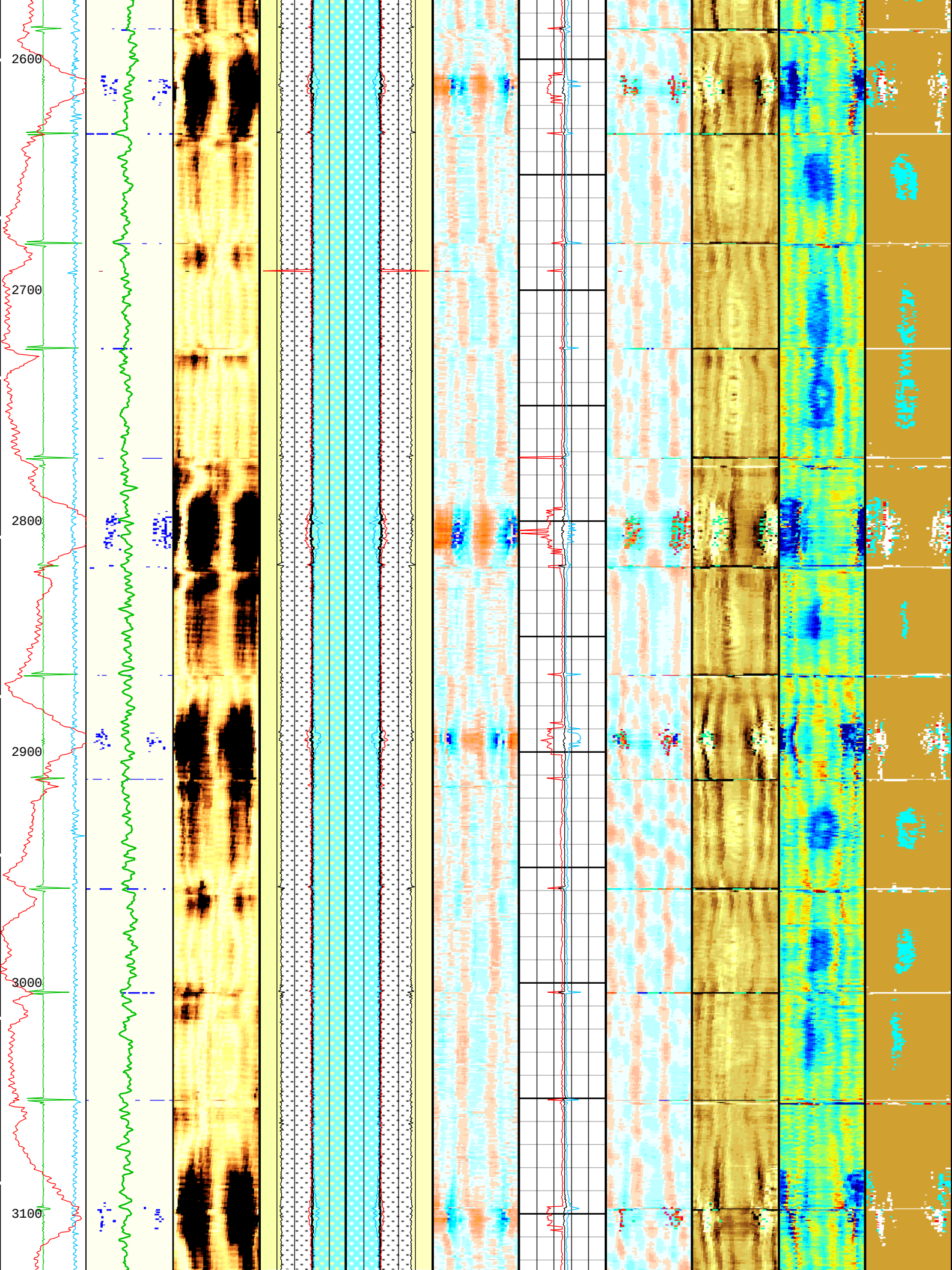
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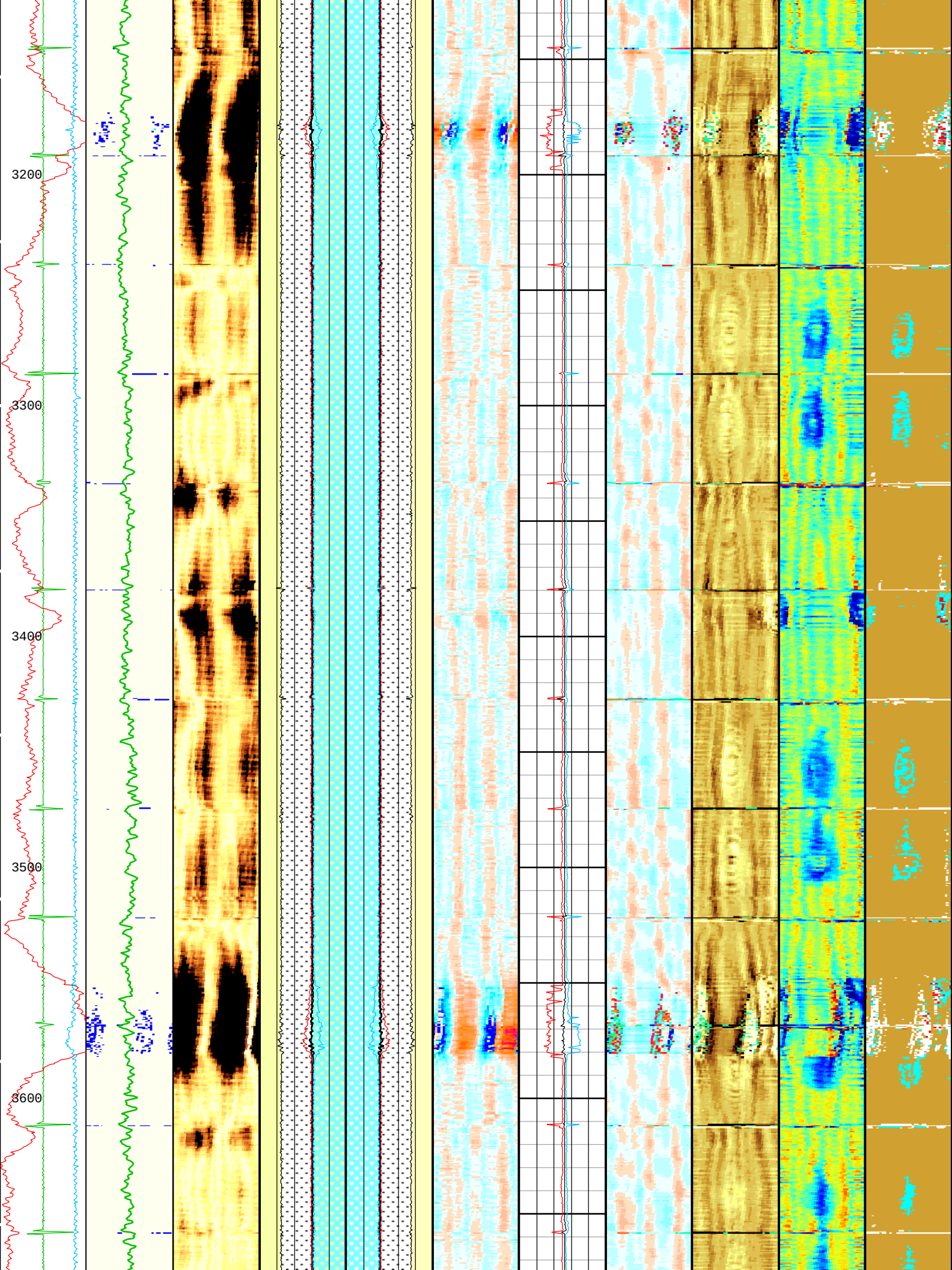
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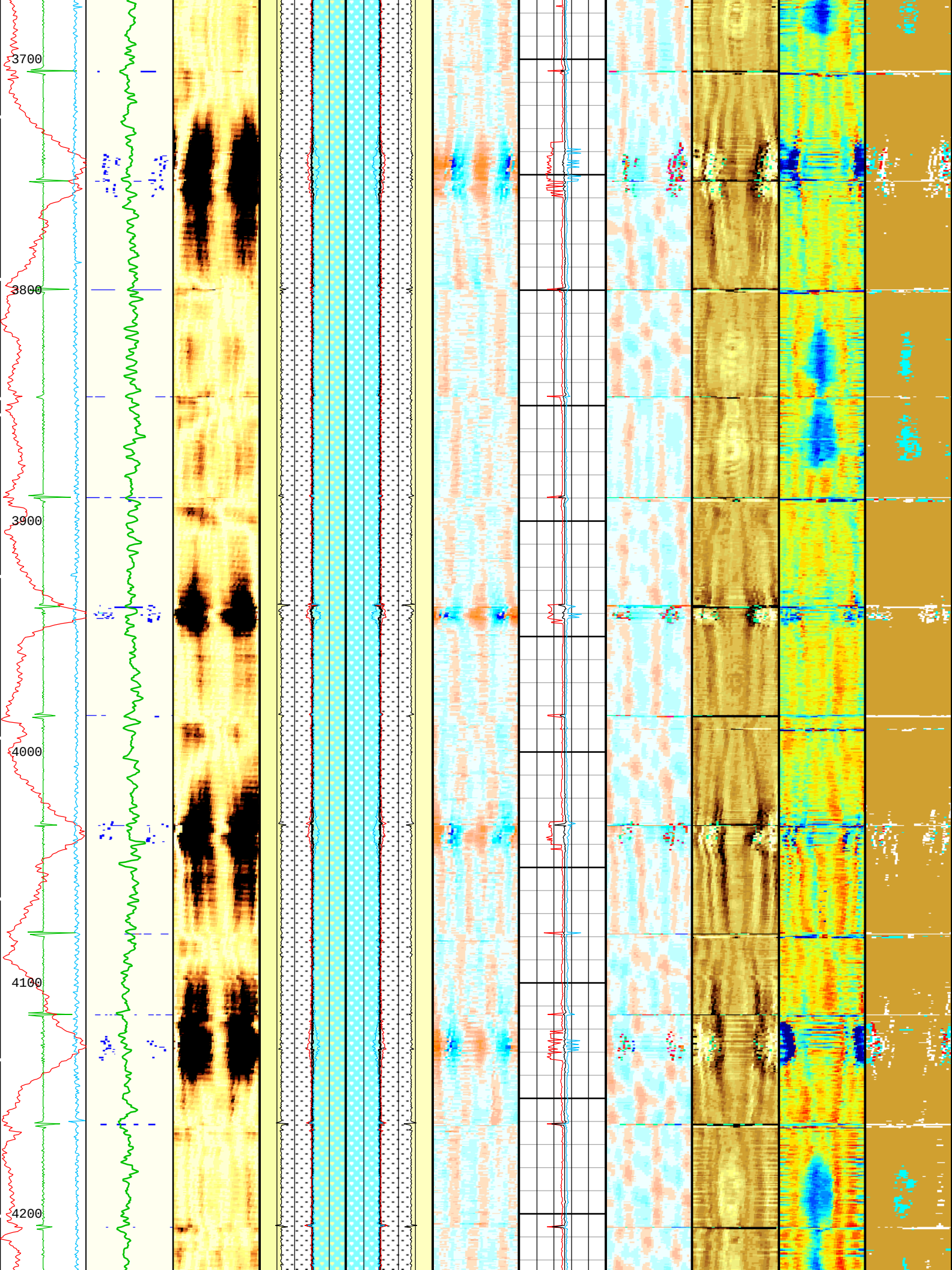
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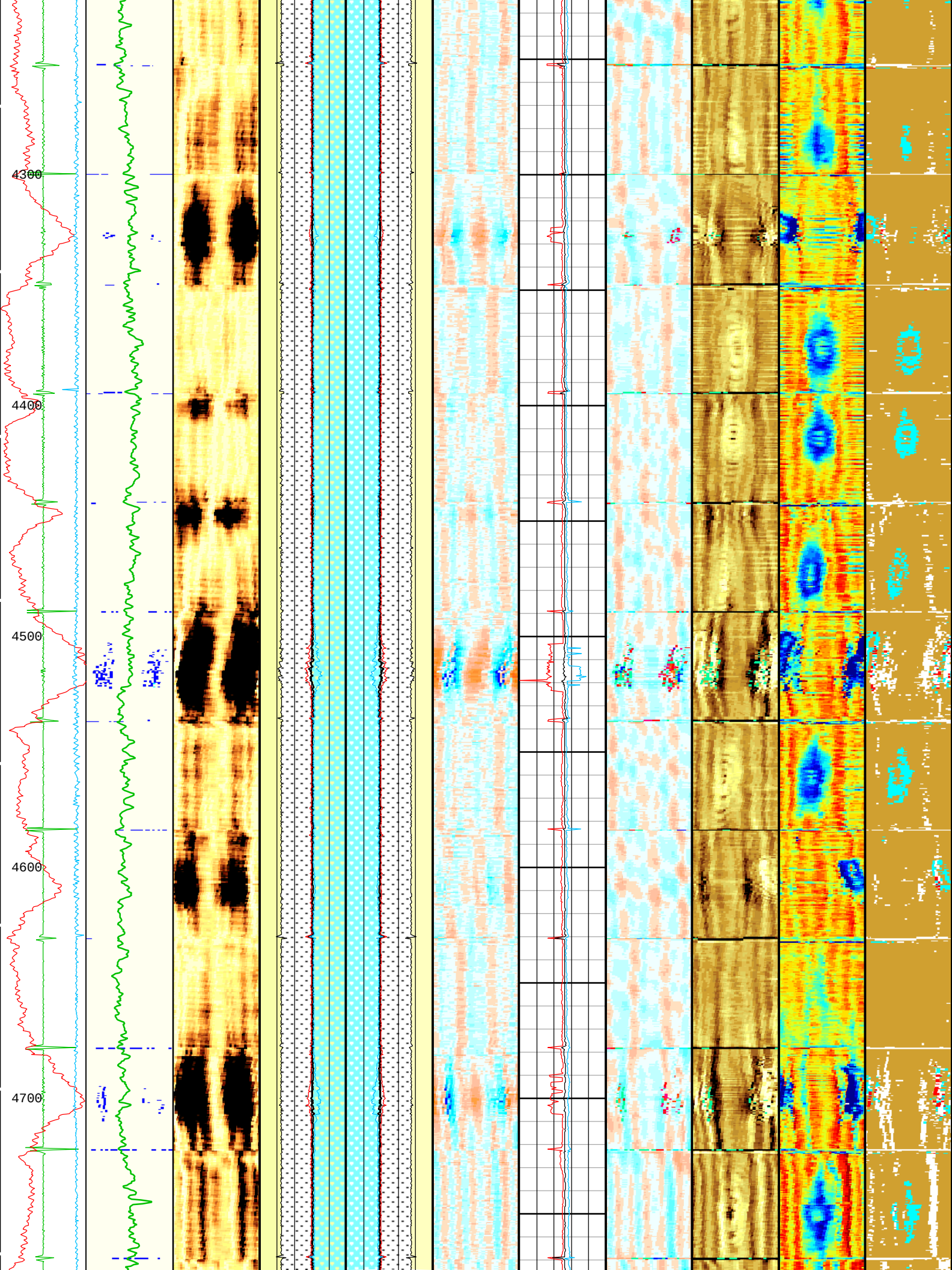
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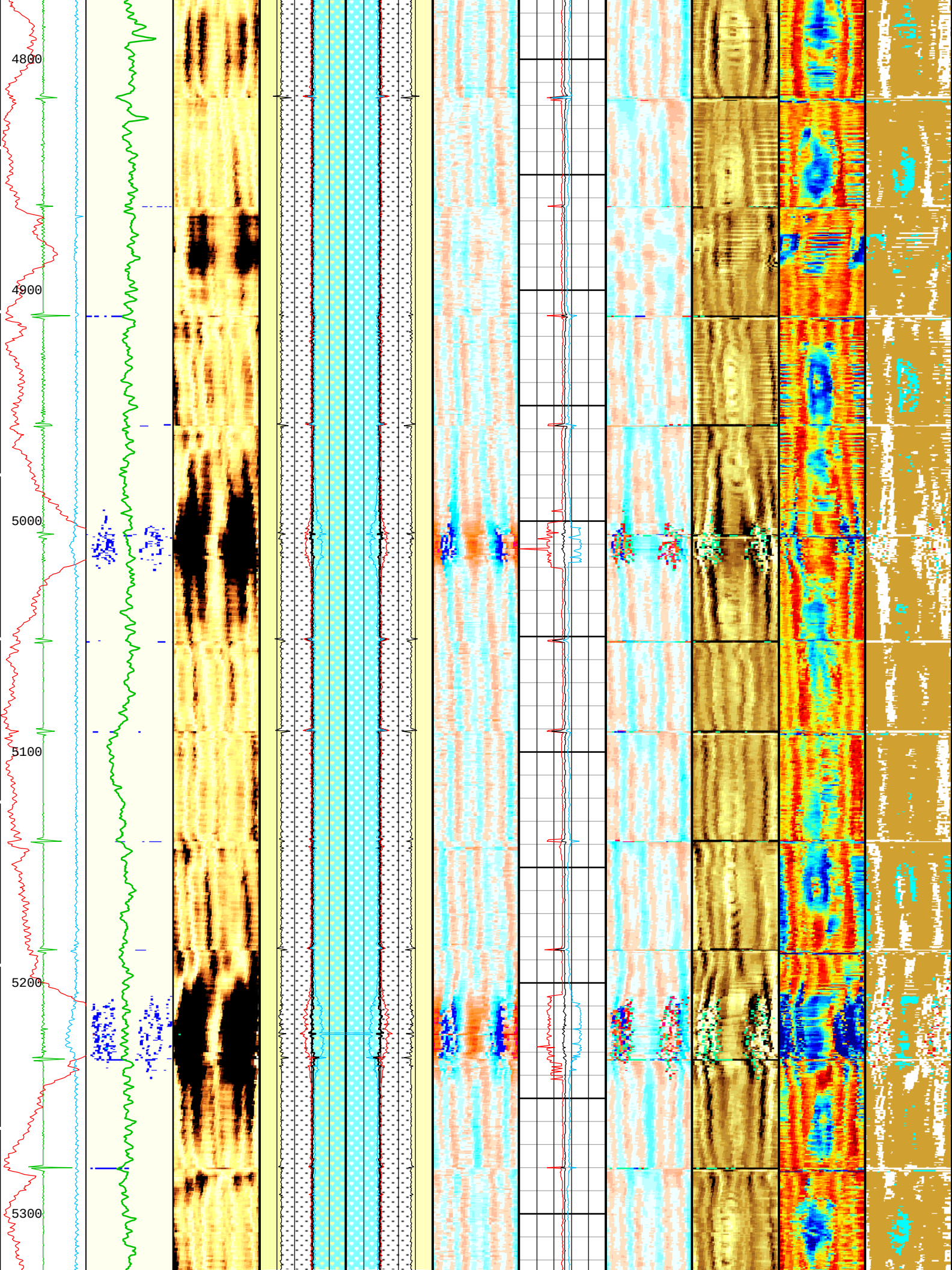
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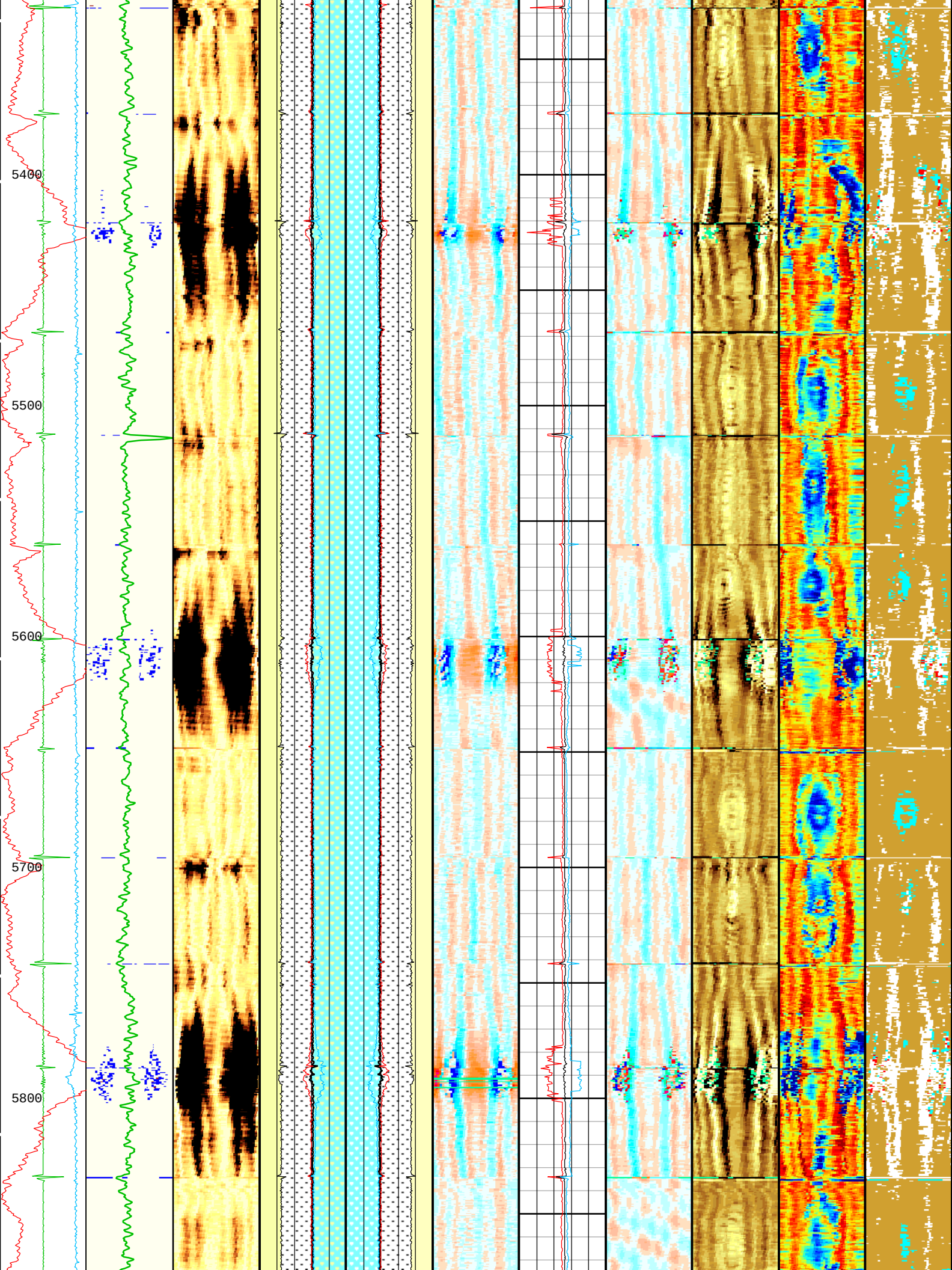
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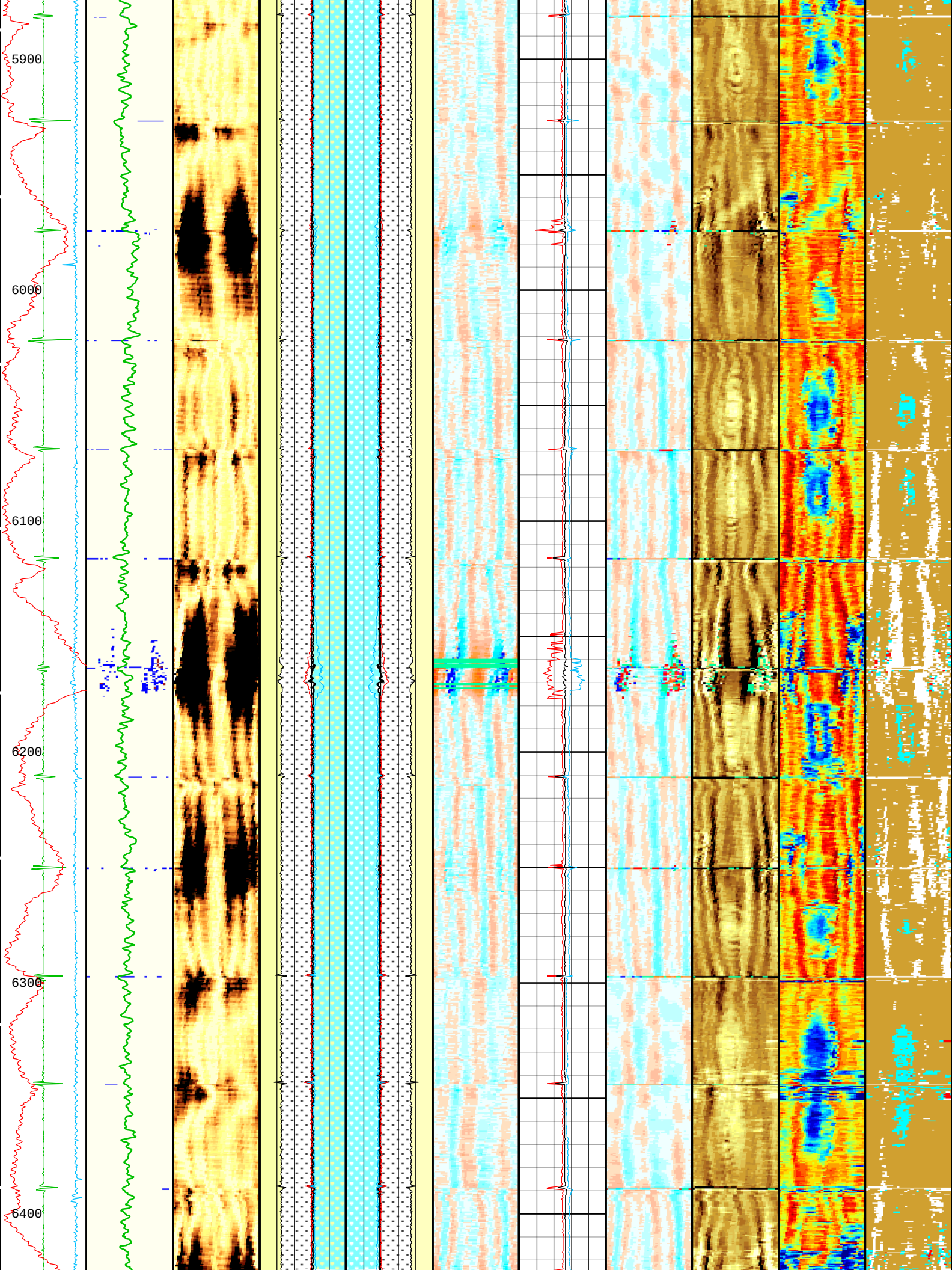
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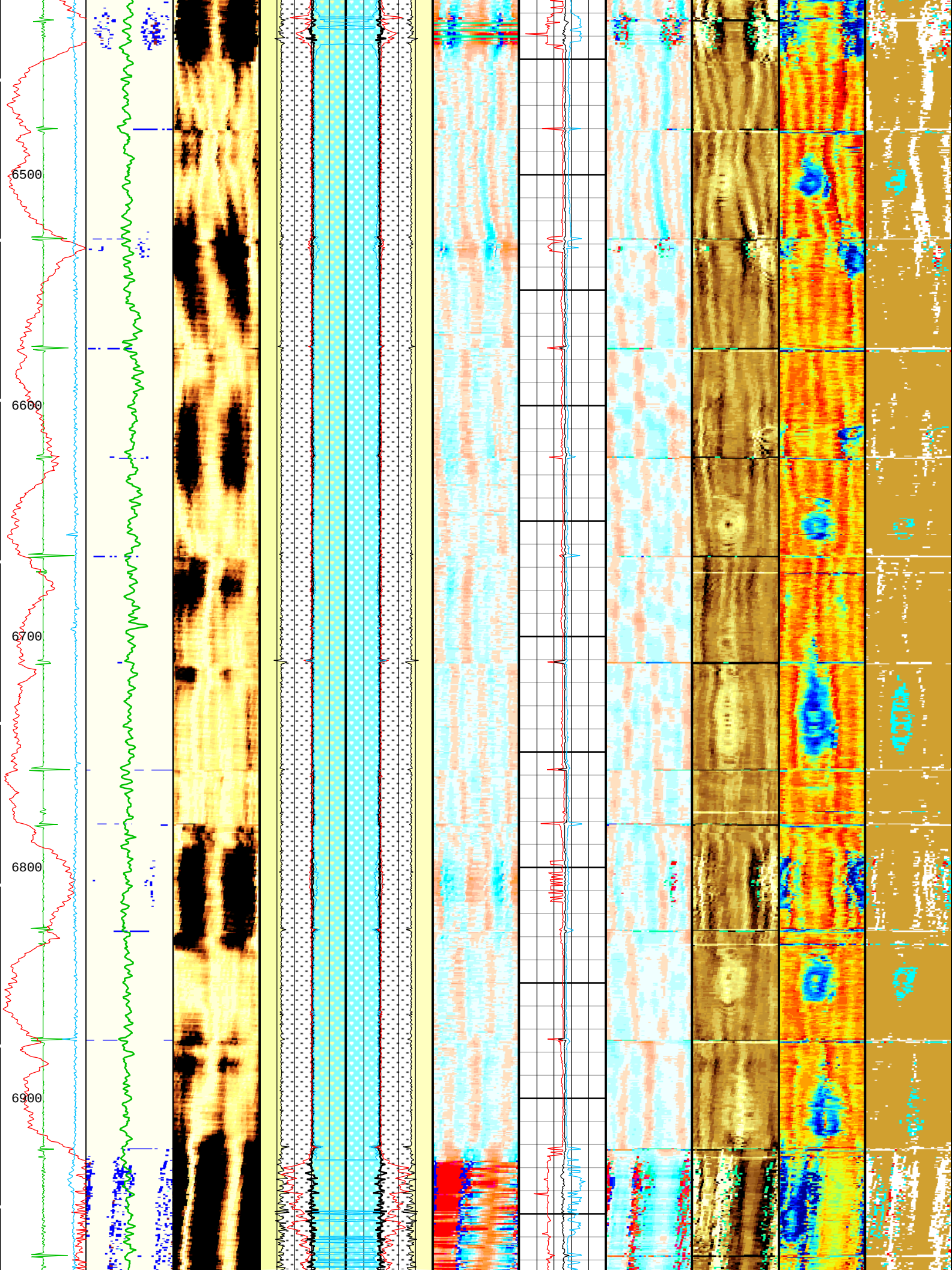
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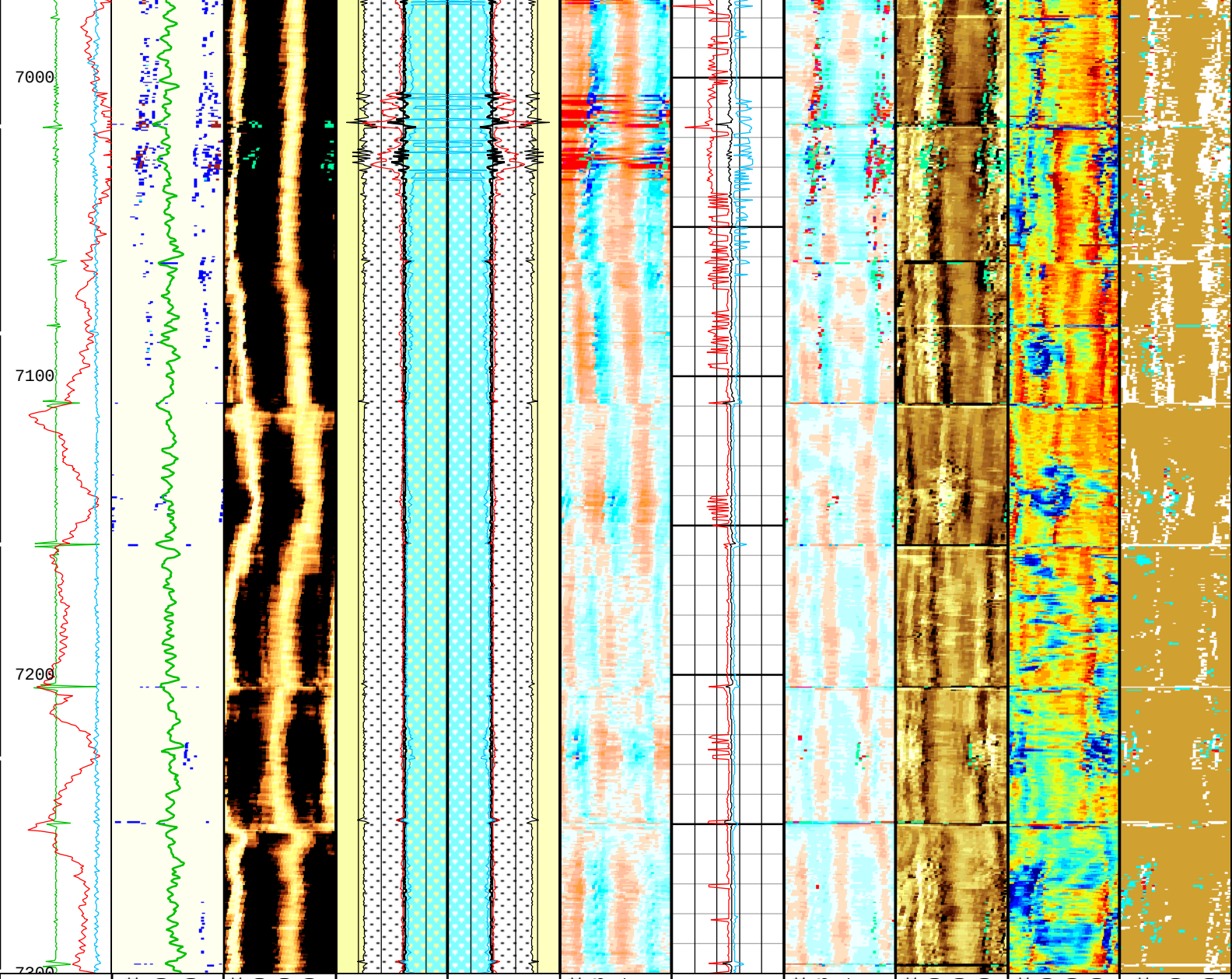


Casing Collar Locator Ultrasonic (CCLU) USIT-E[1]
-20 in 20

Amplitude of Eccentering (ECCE) USIT-E[1]
0 in 0.5

Motor Revolution Speed (RSAV) USIT-E[1]
6 c/s 7.5

Absent 1.500 3.500
Explicit Normalization
USIT - USIT Processing Flags (UFLG) USIT-E[1]
Orientation: Top of Hole
U L B R U

USIT Processing Flags (UFLG[0]) USIT-E[1]
1 5

Gamma Ray (ECGR_EDTC) EDTC-B[1]

Absent -4.799 -2.799 -0.800
Explicit Normalization
USIT - Amplitude of Wave (AWBK) USIT-E[1] (dB)
Orientation: Top of Hole
U L B R U

External Radii Average (ERAV) USIT-E[1]
3 in 2

Internal Radius Averaged Value (IRAV) USIT-E[1]
3 in 2

Internal Radius Maximum Value (IRMX) USIT-E[1]
3 in 2

Internal Radius Minimum Value (IRMN)

External Radii Average (ERAV) USIT-E[1]
2 in 3

Internal Radius Averaged Value (IRAV) USIT-E[1]
2 in 3

Internal Radius Maximum Value (IRMX) USIT-E[1]
2 in 3

Internal Radius Minimum Value (IRMN)

Absent -0.043 0.004 0.051
Explicit Normalization
USIT - Internal Radii Normalized (IRBK) USIT-E[1] (in)
Orientation: Top of Hole
U L B R U

Thickness Minimum Value (THMN) USIT-E[1]
0.1 in 0.6

Thickness Average Value (THAV) USIT-E[1]
0.1 in 0.6

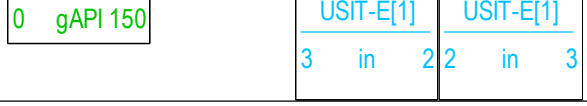
Thickness Maximum Value (THMX) USIT-E[1]
0.1 in 0.6

Absent -0.043 0.004 0.051
Explicit Normalization
USIT - Casing Thickness Normalized (THBK) USIT-E[1] (in)
Orientation: Top of Hole
U L B R U

Absent 2.000 4.500 7.000
Custom Normalization
USIT - Acoustic Impedance (AIBK) USIT-E[1] (Mrayl)
Orientation: Top of Hole
U L B R U

Absent 71.000 106.000 141.000
Custom Normalization
USIT - Flexural Attenuation (UFAK) USIT-E[1] (dB/m)
Orientation: Top of Hole
U L B R U

Absent 1.500 3.500
Explicit Normalization
USIT - Solid Liquid Gas Sorted Color Map (USLP) USIT-E[1]
Orientation: Top of Hole
U L B R U



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

1 - UFLG 1 Value within [0.0 - 1.5] - :
2 - UFLG 2 Value within [1.5 - 2.5] - :
3 - UFLG 3 Value within [2.5 - 3.5] - :
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :

UTIM Error
Pulse Origin Not Detected
WINLEN Error
Casing Thickness Error
Loop Processing Error

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: 20-Oct-2017 04:54:15

Channel Processing Parameters

ONE: Parameters

Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	8.5	in
CBLO	Casing Bottom (Logger)	WLSESSION	12057	ft
CDEN	Cement Density	USIT-E	12	lbm/gal
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
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_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	UFAO	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	Inversion Norm.	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	RB	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_INV	IBC Inversion Mud Normalization Factor	USIT-E	1.19	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.75	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	1.07	dB/m
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SolidLiquidGasMap	
ZMUD	Acoustic Impedance of Mud	Borehole	1.8	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.3	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
EMXV	EMEX Voltage	USIT-E	Time Zoned	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	Time Zoned	us
U-USIT_UFWE	Far Receiver Window End Time	USIT-E	Time Zoned	us
U-USIT_UNWB	Near Receiver Window Begin Time	USIT-E	Time Zoned	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	Time Zoned	us
WINE	Window End Time	USIT-E	Time Zoned	us

ONETime Zoned Parameters

Pass Log[4]:Up

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	125	19-Oct-2017 16:14:23	19-Oct-2017 16:45:46	7668.84	5487.42
EMXV	60	19-Oct-2017 16:45:46	19-Oct-2017 16:46:20	5487.42	5448.28
EMXV	120	19-Oct-2017 16:46:20	19-Oct-2017 16:47:07	5448.28	5393.89
EMXV	60	19-Oct-2017 16:47:07	19-Oct-2017 17:09:59	5393.89	3847.02
U-USIT_UFWB	137	19-Oct-2017 16:14:23	19-Oct-2017 16:14:52	7668.84	7653.79
U-USIT_UFWB	122.08	19-Oct-2017 16:14:52	19-Oct-2017 16:16:13	7653.79	7562.75
U-USIT_UFWB	114.76	19-Oct-2017 16:16:13	19-Oct-2017 17:09:59	7562.75	3847.02
U-USIT_UFWE	177	19-Oct-2017 16:14:23	19-Oct-2017 16:16:33	7668.84	7540.02
U-USIT_UFWE	181.73	19-Oct-2017 16:16:33	19-Oct-2017 17:09:59	7540.02	3847.02
U-USIT_UNWB	106	19-Oct-2017 16:14:23	19-Oct-2017 16:14:50	7668.84	7655.43
U-USIT_UNWB	94.87	19-Oct-2017 16:14:50	19-Oct-2017 16:16:09	7655.43	7567.68
U-USIT_UNWB	77.08	19-Oct-2017 16:16:09	19-Oct-2017 17:09:59	7567.68	3847.02
U-USIT_UNWE	146	19-Oct-2017 16:14:23	19-Oct-2017 16:16:35	7668.84	7537.78
U-USIT_UNWE	146.15	19-Oct-2017 16:16:35	19-Oct-2017 16:46:59	7537.78	5403.18
U-USIT_UNWE	149.29	19-Oct-2017 16:46:59	19-Oct-2017 17:09:59	5403.18	3847.02
WINB	31.88	19-Oct-2017 16:14:23	19-Oct-2017 16:14:55	7668.84	7651.1
WINB	25.06	19-Oct-2017 16:14:55	19-Oct-2017 16:16:03	7651.1	7574.3
WINB	22	19-Oct-2017 16:16:03	19-Oct-2017 16:23:27	7574.3	7053.84
WINB	27.37	19-Oct-2017 16:23:27	19-Oct-2017 16:24:01	7053.84	7014.42
WINB	24.3	19-Oct-2017 16:24:01	19-Oct-2017 16:24:05	7014.42	7010.6
WINB	22	19-Oct-2017 16:24:05	19-Oct-2017 17:09:59	7010.6	3847.02
WINE	71.88	19-Oct-2017 16:14:23	19-Oct-2017 16:14:40	7668.84	7657.39
WINE	78.02	19-Oct-2017 16:14:40	19-Oct-2017 16:15:49	7657.39	7591.21
WINE	58.83	19-Oct-2017 16:15:49	19-Oct-2017 16:16:21	7591.21	7554.41
WINE	64.97	19-Oct-2017 16:16:21	19-Oct-2017 16:18:31	7554.41	7402.38
WINE	60.37	19-Oct-2017 16:18:31	19-Oct-2017 16:19:47	7402.38	7314.02
WINE	69.57	19-Oct-2017 16:19:47	19-Oct-2017 16:23:24	7314.02	7057.12
WINE	78.78	19-Oct-2017 16:23:24	19-Oct-2017 17:09:59	7057.12	3847.02

Pass Log[5]:Up

EMXV	60	19-Oct-2017 17:12:15	19-Oct-2017 18:06:23	3847.01	62.84

U-USIT_UFWB	114.76	19-Oct-2017 17:12:15	19-Oct-2017 18:06:23	3847.01	62.84
U-USIT_UFWE	181.73	19-Oct-2017 17:12:15	19-Oct-2017 18:06:23	3847.01	62.84
U-USIT_UNWB	77.08	19-Oct-2017 17:12:15	19-Oct-2017 18:06:23	3847.01	62.84
U-USIT_UNWE	149.29	19-Oct-2017 17:12:15	19-Oct-2017 18:06:23	3847.01	62.84
WINB	22	19-Oct-2017 17:12:15	19-Oct-2017 18:06:23	3847.01	62.84
WINE	78.78	19-Oct-2017 17:12:15	19-Oct-2017 18:06:23	3847.01	62.84

All depth are at tool zero.

Composite 1

IBC Goodwin Compressed

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[4]:Up	Up	3793.95 ft	7669.00 ft	19-Oct-2017 4:14:23 PM	19-Oct-2017 5:09:59 PM	ON	7.55 ft	Yes
ONE	Log[5]:Up	Up	62.48 ft	3891.02 ft	19-Oct-2017 5:11:30 PM	19-Oct-2017 6:06:23 PM	ON	7.81 ft	Yes

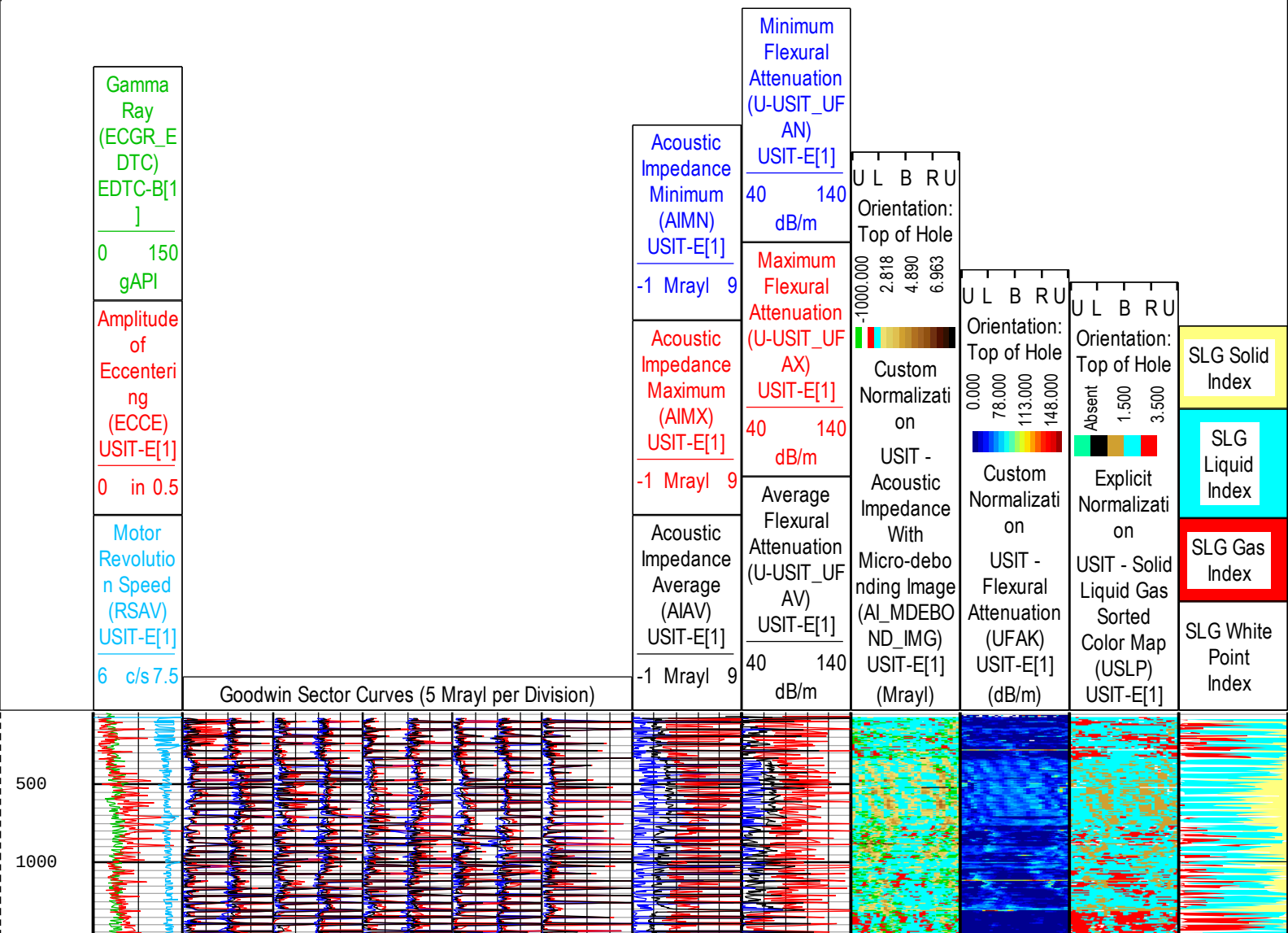
All depths are referenced to toolstring zero

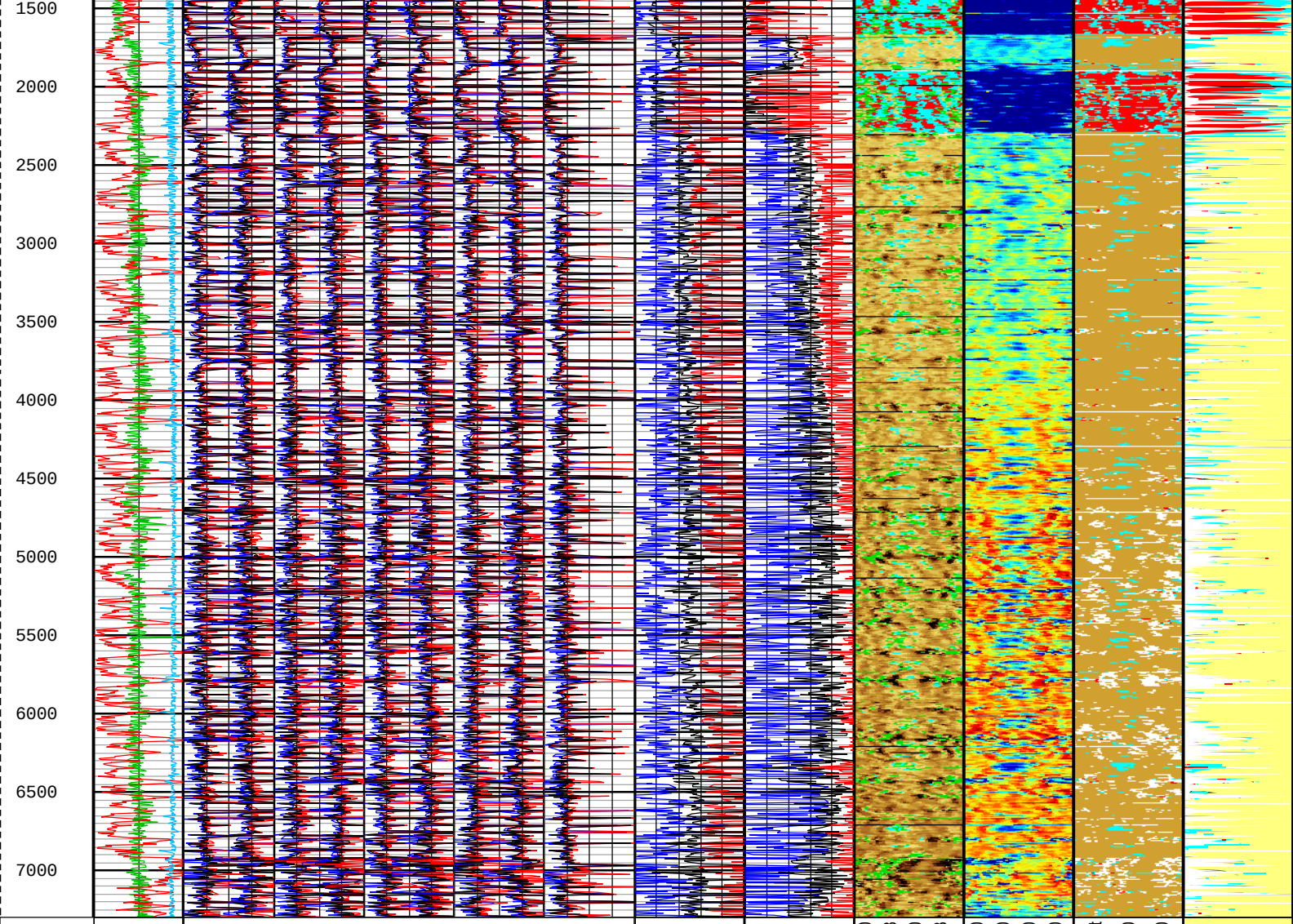
Log

Company:CRESTONE PEAK RESOURCES OPERATING LLC Well:HWY 52 4U-32H-O268 Composite 1:S008

Description: USI Goodwin Format: Log (IBC Goodwin) Index Scale: 0.1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 20-Oct-2017 04:54:28

TIME_1900 - Time Marked every 60.00 (s)





Gamma Ray (ECGR_EDTC) EDTC-B[1]
0 150 gAPI

Amplitude of Eccentering (ECCE) USIT-E[1]
0 in 0.5

Motor Revolution Speed (RSAV) USIT-E[1]
6 c/s 7.5

Goodwin Sector Curves (5 Mrayl per Division)

Acoustic Impedance Minimum (AIMN) USIT-E[1]
-1 Mrayl 9

Acoustic Impedance Maximum (AIMX) USIT-E[1]
-1 Mrayl 9

Acoustic Impedance Average (AIAV) USIT-E[1]
-1 Mrayl 9

Minimum Flexural Attenuation (U-USIT_UFAN) USIT-E[1]
40 140 dB/m

Maximum Flexural Attenuation (U-USIT_UFAX) USIT-E[1]
40 140 dB/m

Average Flexural Attenuation (U-USIT_UFAV) USIT-E[1]
40 140 dB/m

-1000.000 2.818 4.890 6.963
Custom Normalization
USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E[1] (Mrayl)
Orientation: Top of Hole
U L B R U

0.000 78.000 113.000 148.000
Custom Normalization
USIT - Flexural Attenuation (UFAK) USIT-E[1] (dB/m)
Orientation: Top of Hole
U L B R U

Absent 1.500 3.500
Explicit Normalization
USIT - Solid Liquid Gas Sorted Color Map (USLP) USIT-E[1]
Orientation: Top of Hole
U L B R U

SLG Solid Index

SLG Liquid Index

SLG Gas Index

SLG White Point Index

TIME_1900 - Time Marked every 60.00 (s)

Description: USI Goodwin Format: Log (IBC Goodwin) Index Scale: 0.1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 20-Oct-2017 04:54:28

ONE

IBC SLG

Software Version

Acquisition System	Version
Maxwell 2018	8.0.93964.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[2]:Up	Up	1663.63 ft	1940.74 ft	19-Oct-2017 3:46:00 PM	19-Oct-2017 3:50:08 PM	ON	1.89 ft	Yes

All depths are referenced to toolstring zero

Log

Company:CRESTONE PEAK RESOURCES OPERATING LLC Well:HWY 52 4U-32H-O268 ONE: Log[2]:Up:S008

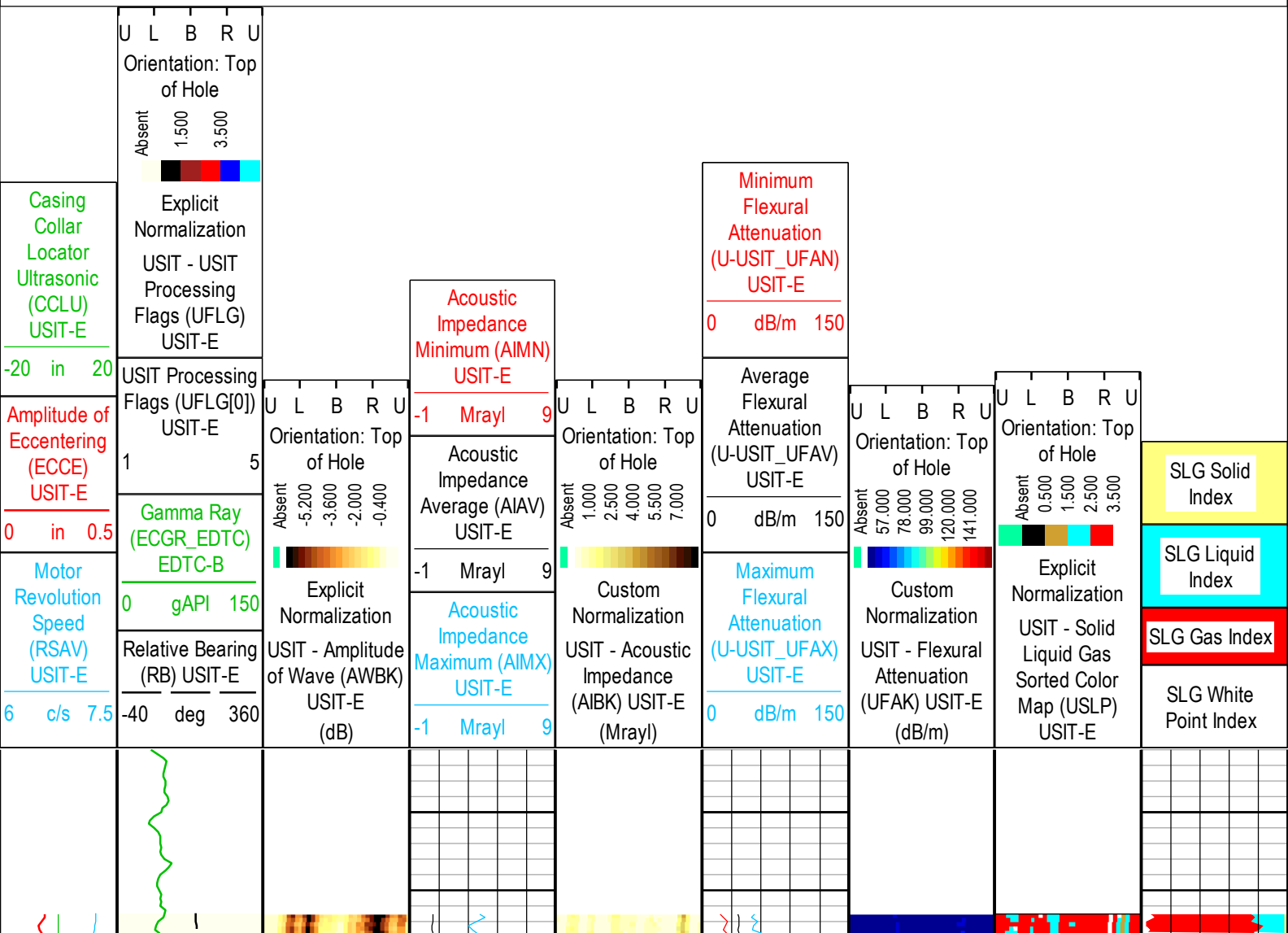
Description: USI IBC SLG Format: Log (IBC SLG) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 20-Oct-2017 04:54:33

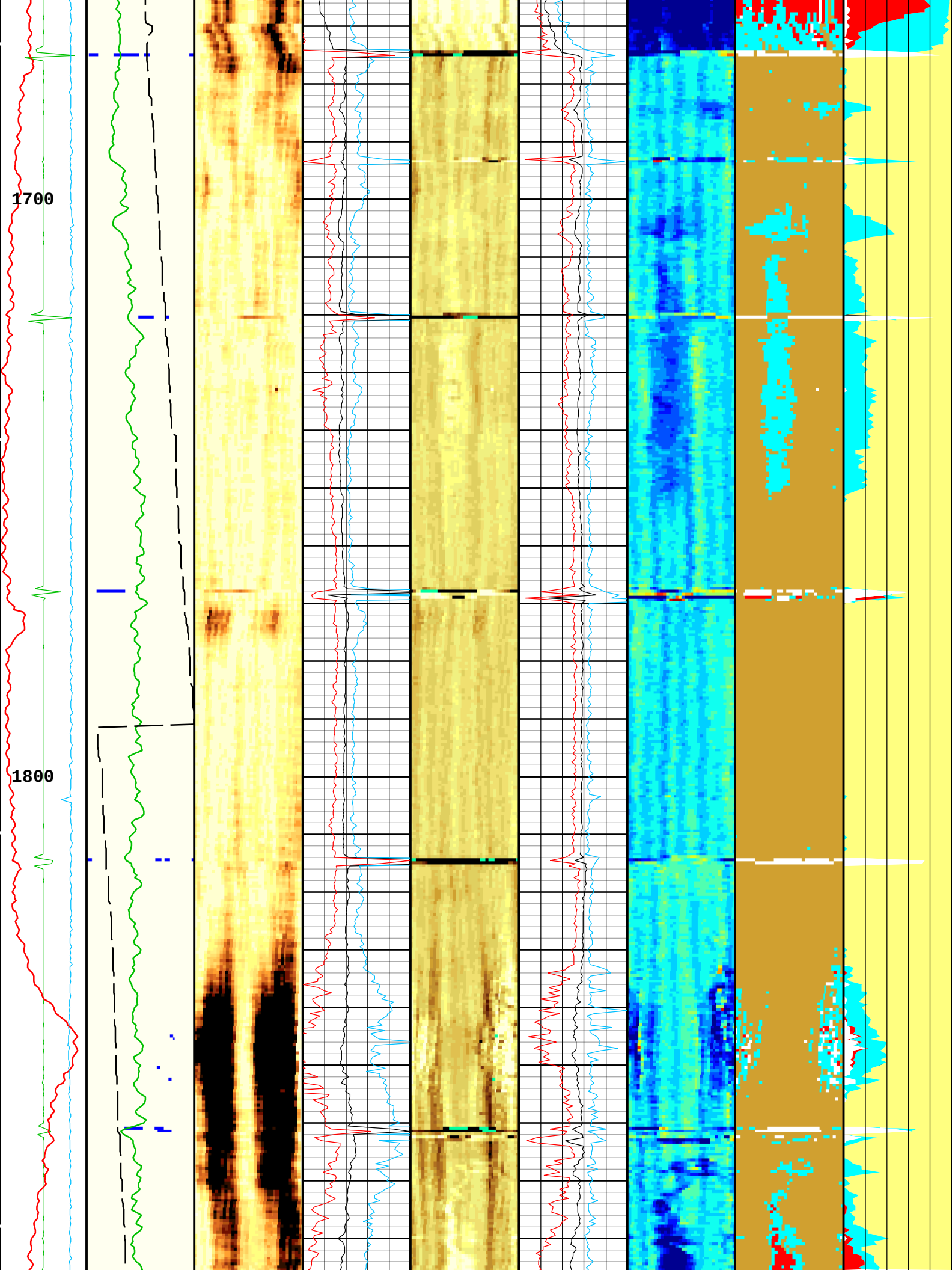
TIME_1900 - Time Marked every 60.00 (s)

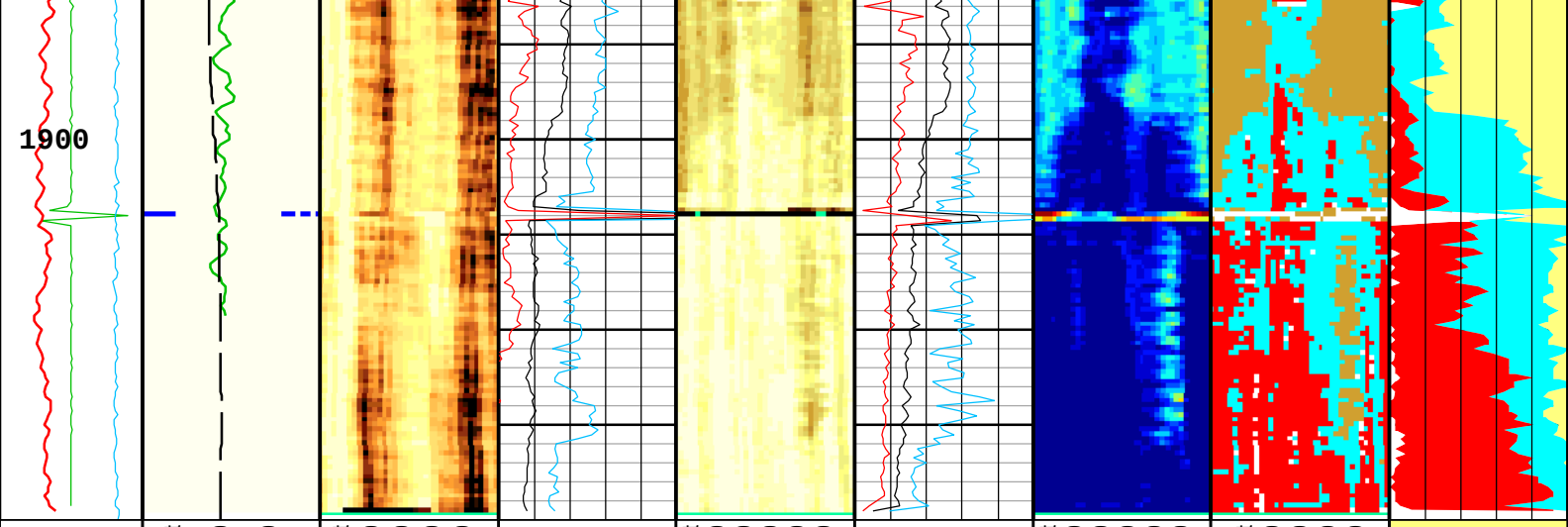
USIT Processing Flags (UFLG[0]) USIT-E

1 - UFLG 1 Value within [0.0 - 1.5] - :
2 - UFLG 2 Value within [1.5 - 2.5] - :
3 - UFLG 3 Value within [2.5 - 3.5] - :
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :

UTIM Error
Pulse Origin Not Detected
WINLEN Error
Casing Thickness Error
Loop Processing Error




1700
1800



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

Absent 1.500 3.500
Explicit Normalization
USIT - USIT Processing Flags (UFLG) USIT-E
Orientation: Top of Hole
U L B R U

USIT Processing Flags (UFLG[0]) USIT-E
1 5

Gamma Ray (ECGR_EDTC) EDTC-B
0 gAPI 150

Relative Bearing (RB) USIT-E
-40 deg 360

Absent -5.200 -3.600 -2.000 -0.400
Explicit Normalization
USIT - Amplitude of Wave (AWBK) USIT-E (dB)
Orientation: Top of Hole
U L B R U

Acoustic Impedance Minimum (AIMN) USIT-E
-1 Mrayl 9

Acoustic Impedance Average (AIAV) USIT-E
-1 Mrayl 9

Acoustic Impedance Maximum (AIMX) USIT-E
-1 Mrayl 9

Absent 1.000 2.500 4.000 5.500 7.000
Custom Normalization
USIT - Acoustic Impedance (AIBK) USIT-E (Mrayl)
Orientation: Top of Hole
U L B R U

Minimum Flexural Attenuation (U-USIT_UFAN) USIT-E
0 dB/m 150

Average Flexural Attenuation (U-USIT_UFAV) USIT-E
0 dB/m 150

Maximum Flexural Attenuation (U-USIT_UFAX) USIT-E
0 dB/m 150

Absent 57.000 78.000 99.000 120.000 141.000
Custom Normalization
USIT - Flexural Attenuation (UFAK) USIT-E (dB/m)
Orientation: Top of Hole
U L B R U

Absent 0.500 1.500 2.500 3.500
Explicit Normalization
USIT - Solid Liquid Gas Sorted Color Map (USLP) USIT-E
Orientation: Top of Hole
U L B R U

SLG Solid Index
SLG Liquid Index
SLG Gas Index
SLG White Point Index

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

1 - UFLG 1 Value within [0.0 - 1.5] - :
2 - UFLG 2 Value within [1.5 - 2.5] - :
3 - UFLG 3 Value within [2.5 - 3.5] - :
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :

UTIM Error
Pulse Origin Not Detected
WINLEN Error
Casing Thickness Error
Loop Processing Error

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: 20-Oct-2017 04:54:33

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	8.5	in
CASING_PRATIO	Casing Poisson Ratio	USIT-E	Standard Poisson Ratio	
CBLO	Casing Bottom (Logger)	WLSESSION	12057	ft
CDEN	Cement Density	USIT-E	12	lbm/gal
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
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_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	UFAO	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	Inversion Norm.	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	RB	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_INV	IBC Inversion Mud Normalization Factor	USIT-E	1.19	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1	
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	1.75	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	1.07	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	1.8	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.3	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	1.756	in

EMXV	EMEX Voltage	USIT-E	60	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	71.88	us

ONE

IBC SLG Composite

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[2]:Up	Up	1663.63 ft	1940.74 ft	19-Oct-2017 3:46:00 PM	19-Oct-2017 3:50:08 PM	ON	1.89 ft	Yes

All depths are referenced to toolstring zero

Log

Company:CRESTONE PEAK RESOURCES OPERATING LLC Well:HWY 52 4U-32H-O268

ONE: Log[2]:Up:S008

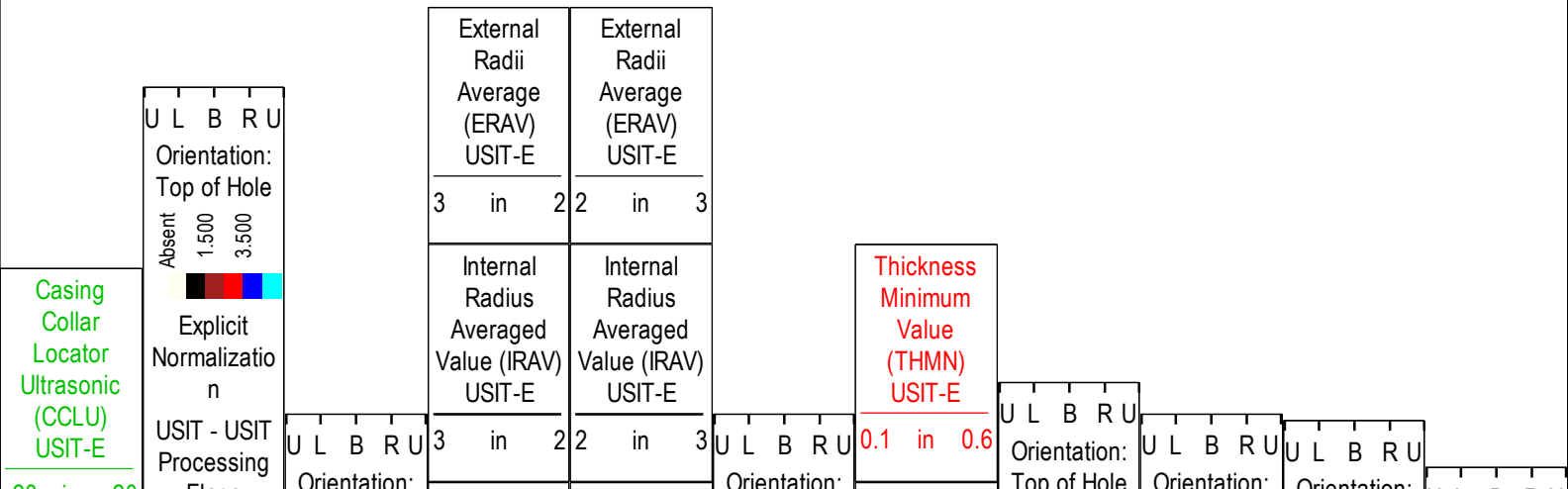
Description: USI IBC SLG Composite Format: Log (IBC SLG Composite) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 20-Oct-2017 04:54:37

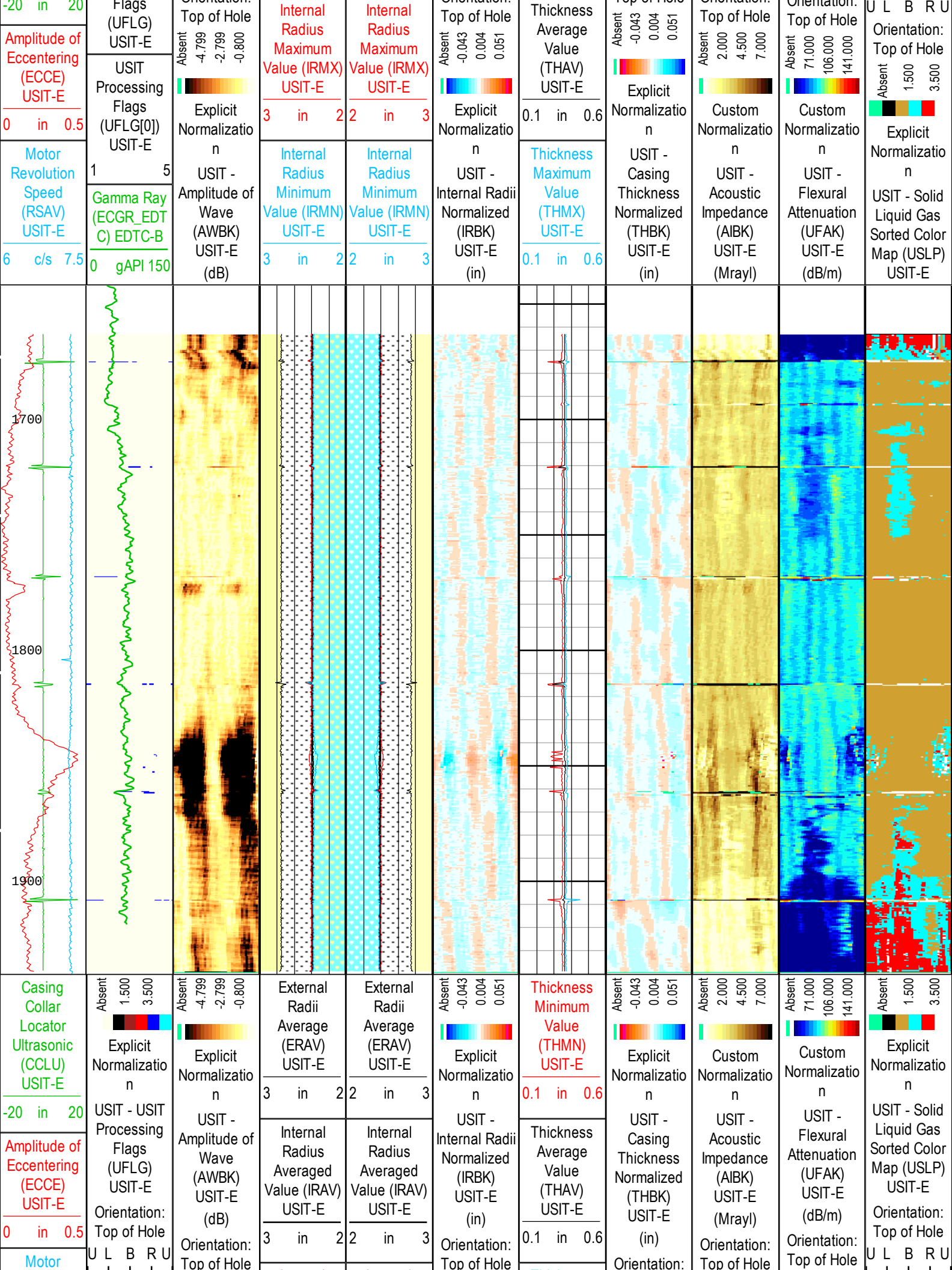
USIT Processing Flags (UFLG[0]) USIT-E

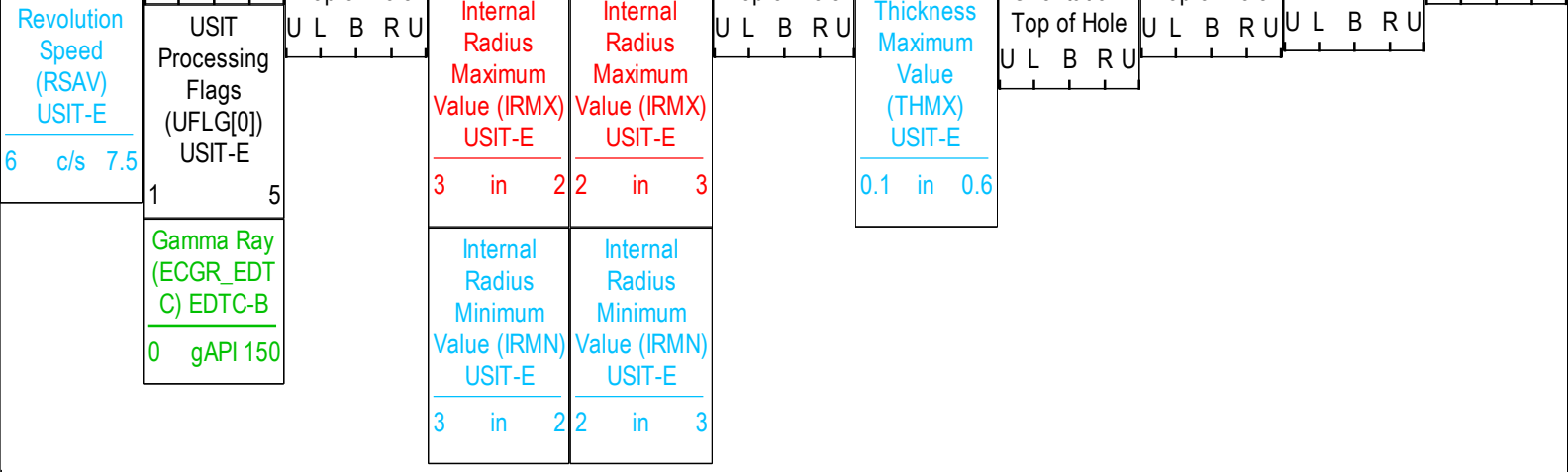
1 - UFLG 1 Value within [0.0 - 1.5] - :
2 - UFLG 2 Value within [1.5 - 2.5] - :
3 - UFLG 3 Value within [2.5 - 3.5] - :
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :

UTIM Error
Pulse Origin Not Detected
WINLEN Error
Casing Thickness Error
Loop Processing Error

TIME_1900 - Time Marked every 60.00 (s)




-20 in 20
Amplitude of Eccentering (ECCE) USIT-E
0 in 0.5
Motor Revolution Speed (RSAV) USIT-E
6 c/s 7.5
Flags (UFLG) USIT-E
USIT Processing Flags (UFLG[0]) USIT-E
1 5
Gamma Ray (ECGR_EDTC) EDTC-B
0 gAPI 150
Orientation: Top of Hole
Absent -4.799 -2.799 -0.800
Explicit Normalization
USIT - Amplitude of Wave (AWBK) USIT-E (dB)
Internal Radius Maximum Value (IRMX) USIT-E
3 in 2
Internal Radius Minimum Value (IRMN) USIT-E
3 in 2
Internal Radius Maximum Value (IRMX) USIT-E
2 in 3
Internal Radius Minimum Value (IRMN) USIT-E
2 in 3
Orientation: Top of Hole
Absent -0.043 0.004 0.051
Explicit Normalization
USIT - Internal Radii Normalized (IRBK) USIT-E (in)
Thickness Average Value (THAV) USIT-E
0.1 in 0.6
Thickness Maximum Value (THMX) USIT-E
0.1 in 0.6
Orientation: Top of Hole
Absent -0.043 0.004 0.051
Explicit Normalization
USIT - Casing Thickness Normalized (THBK) USIT-E (in)
Orientation: Top of Hole
Absent 2.000 4.500 7.000
Custom Normalization
USIT - Acoustic Impedance (AIBK) USIT-E (Mrayl)
Orientation: Top of Hole
Absent 71.000 106.000 141.000
Custom Normalization
USIT - Flexural Attenuation (UFAK) USIT-E (dB/m)
Orientation: Top of Hole
U L B R U
Absent 1.500 3.500
Explicit Normalization
USIT - Solid Liquid Gas Sorted Color Map (USLP) USIT-E
1700
1800
1900
Casing Collar Locator Ultrasonic (CCLU) USIT-E
-20 in 20
Amplitude of Eccentering (ECCE) USIT-E
0 in 0.5
Motor
Absent 1.500 3.500
Explicit Normalization
USIT - USIT Processing Flags (UFLG) USIT-E
Orientation: Top of Hole
U L B R U
Absent -4.799 -2.799 -0.800
Explicit Normalization
USIT - Amplitude of Wave (AWBK) USIT-E (dB)
Orientation: Top of Hole
External Radii Average (ERAV) USIT-E
3 in 2
External Radii Average (ERAV) USIT-E
2 in 3
Internal Radius Averaged Value (IRAV) USIT-E
3 in 2
Internal Radius Averaged Value (IRAV) USIT-E
2 in 3
Orientation: Top of Hole
Absent -0.043 0.004 0.051
Explicit Normalization
USIT - Internal Radii Normalized (IRBK) USIT-E (in)
Orientation: Top of Hole
Thickness Minimum Value (THMN) USIT-E
0.1 in 0.6
Thickness Average Value (THAV) USIT-E
0.1 in 0.6
Absent -0.043 0.004 0.051
Explicit Normalization
USIT - Casing Thickness Normalized (THBK) USIT-E (in)
Orientation:
Absent 2.000 4.500 7.000
Custom Normalization
USIT - Acoustic Impedance (AIBK) USIT-E (Mrayl)
Orientation: Top of Hole
Absent 71.000 106.000 141.000
Custom Normalization
USIT - Flexural Attenuation (UFAK) USIT-E (dB/m)
Orientation: Top of Hole
U L B R U
Absent 1.500 3.500
Explicit Normalization
USIT - Solid Liquid Gas Sorted Color Map (USLP) USIT-E
Orientation: Top of Hole



TIME_1900 - Time Marked every 60.00 (s)

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

1 - UFLG 1 Value within [0.0 - 1.5] - :
2 - UFLG 2 Value within [1.5 - 2.5] - :
3 - UFLG 3 Value within [2.5 - 3.5] - :
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :

UTIM Error
Pulse Origin Not Detected
WINLEN Error
Casing Thickness Error
Loop Processing Error

Description: USI IBC SLG Composite Format: Log (IBC SLG Composite) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 20-Oct-2017 04:54:37

Channel Processing Parameters

ONE: Parameters

Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	8.5	in
CBLO	Casing Bottom (Logger)	WLSESSION	12057	ft
CDEN	Cement Density	USIT-E	12	lbm/gal
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
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_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	UFAO	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	Inversion Norm.	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	RB	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_INV	IBC Inversion Mud Normalization Factor	USIT-E	1.19	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.75	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	1.07	dB/m
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SolidLiquidGasMap	
ZMUD	Acoustic Impedance of Mud	Borehole	1.8	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.3	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
EMXV	EMEX Voltage	USIT-E	60	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	71.88	us

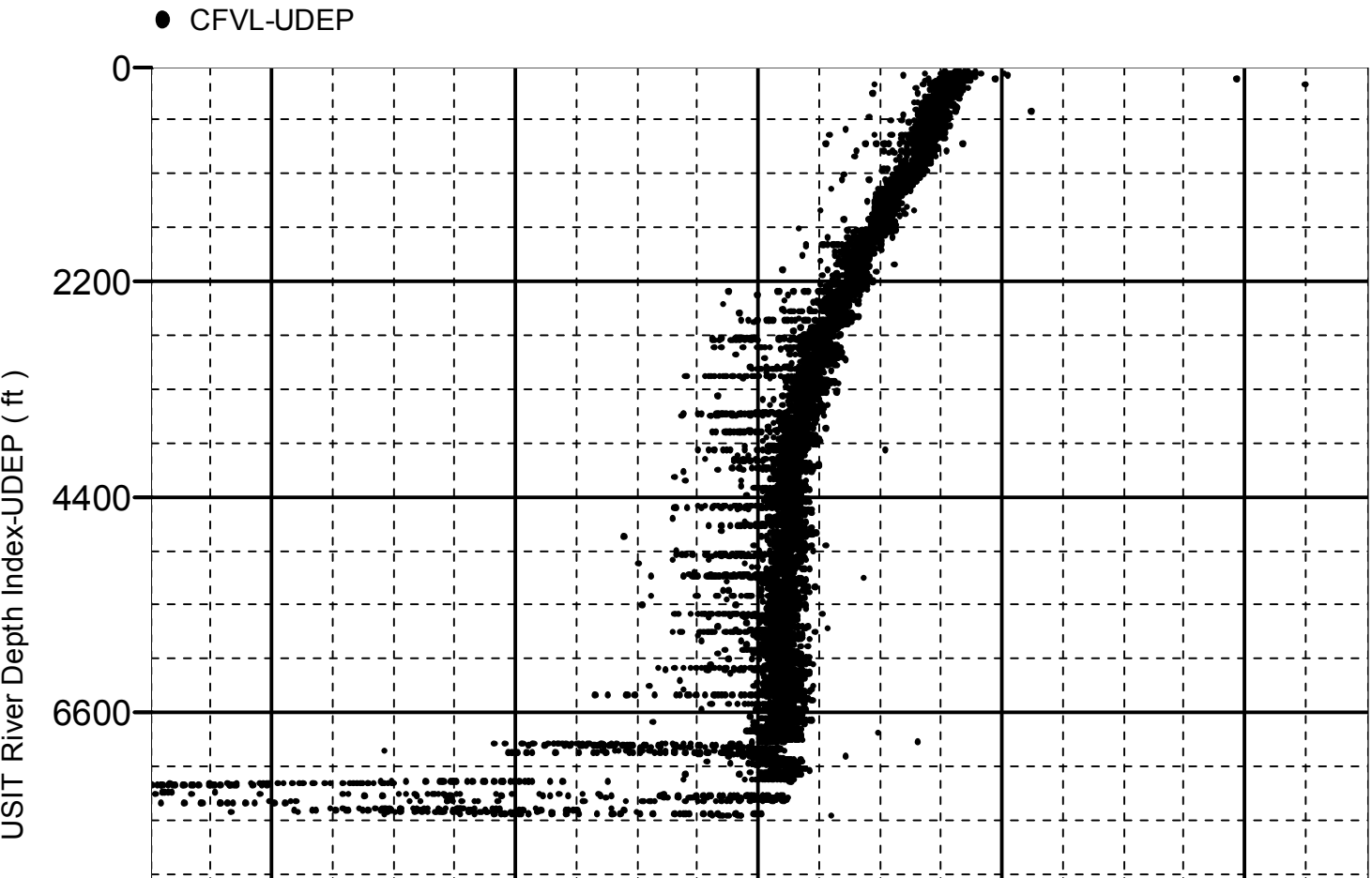
XYZ

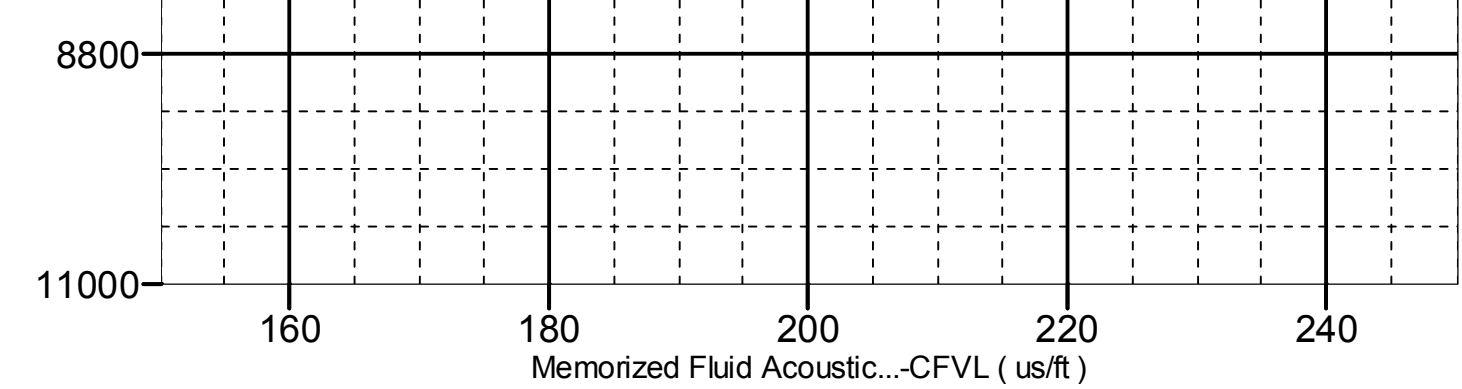
Company:CRESTONE PEAK RESOURCES OPERATING LLC Well:HWY 52 4U-32H-O268
Composite 1:S008

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 62.00 to 7300.00 ft





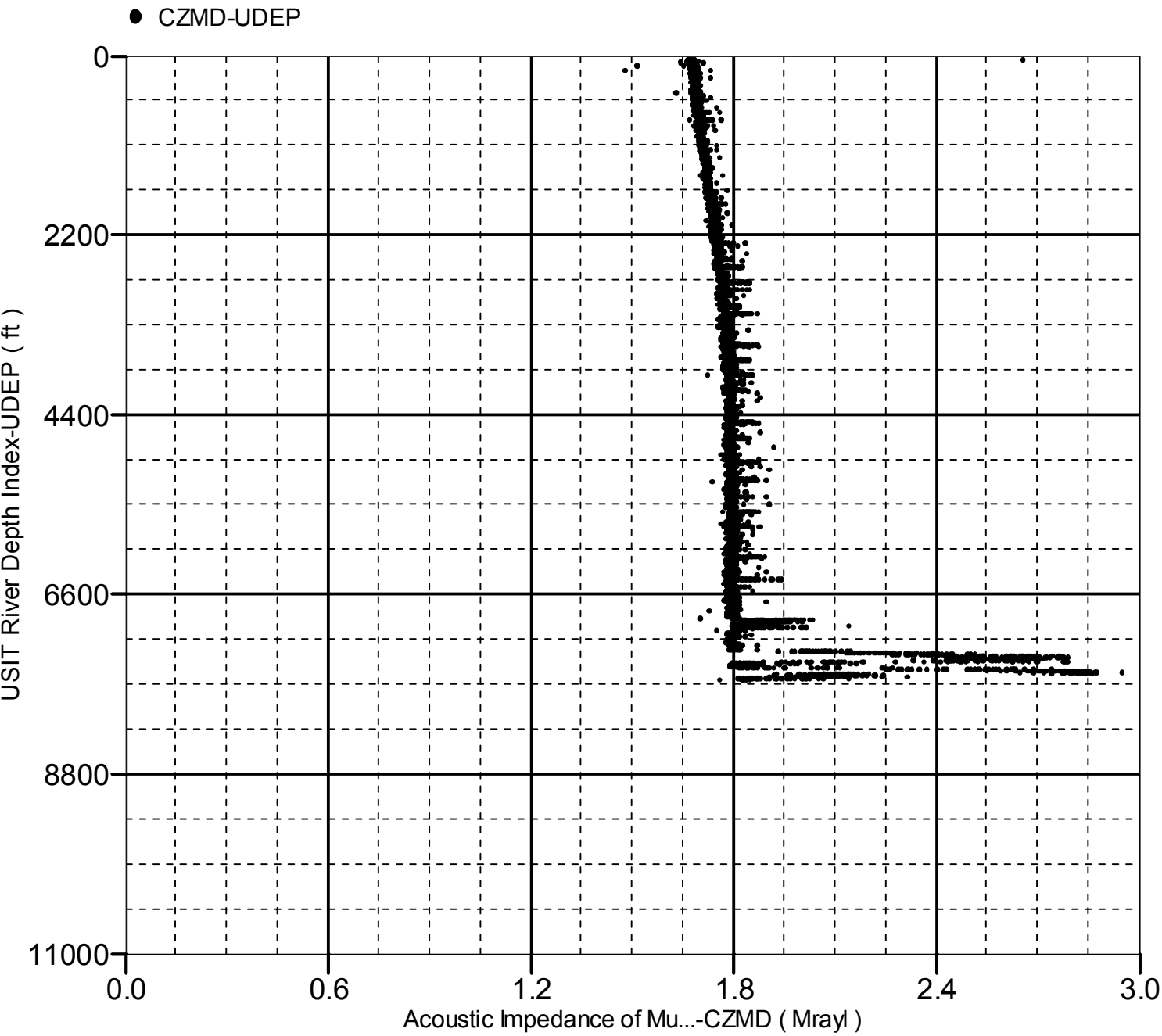
XYZ

Company:CRESTONE PEAK RESOURCES OPERATING LLC Well:HWY 52 4U-32H-O268
Composite 1:S008

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 62.00 to 7300.00 ft



Company:	CRESTONE PEAK RESOURCES OPERATING LLC
Well:	HWY 52 4U-32H-O268
Field:	WATTENBERG
County:	WELD
State:	COLORADO

Schlumberger

Isolation Scanner
Cement Evaluation
Gamma Ray - CCL Log