

Company: Noble Energy Inc

Well: Wells Ranch AE32-690

Field: Wattenberg

County: Weld State: Colorado

Isolation Scanner
Cement Evaluation (Short)
Gamma Ray - CCL Log

Cement Evaluation (Short)			
Gamma Ray - CCL Log			
Location:		Elev.:	
NWNW Sec.32, T6N, R62W		K.B. 4772.00 ft	
SHL: 539' FNL x 650' FWL		G.L. 4748.00 ft	
Lat: 40.448950/ Long: -104.354230		D.F. 4771.00 ft	
Permanent Datum:	Ground Level	Elev.:	4748.00 f
Log Measured From:	Kelly Bushing	24.00 ft	above Perm.Datum
Drilling Measured From:	Kelly Bushing		
API Serial No.	Section:	Township:	Range:
05-123-41733	32	6N	62W

Run Number	Run 1
Depth Driller	7022.00 ft
Schlumberger Depth	7022.00 ft
Bottom Log Interval	6910.00 ft
Top Log Interval	24.00 ft
Casing Fluid Type	Brine
Salinity	
Density	8.4 lbm/gal
Fluid Level	0.00 ft
BIT/CASING/TUBING STRING	
Bit Size	8.75 in
From	639.00 ft
To	7022.00 ft
Casing/Tubing Size	7 in
Weight	26 lbm/ft
Grade	P110
From	0.00 ft
To	7011.30 ft
Max Recorded Temperatures	220.9 degF
Logger on Bottom	03-Nov-2015
Unit Number	9115
Recorded By	Aleksei Bekhterev
Witnessed By	Bill Mansfield

Disclaimer

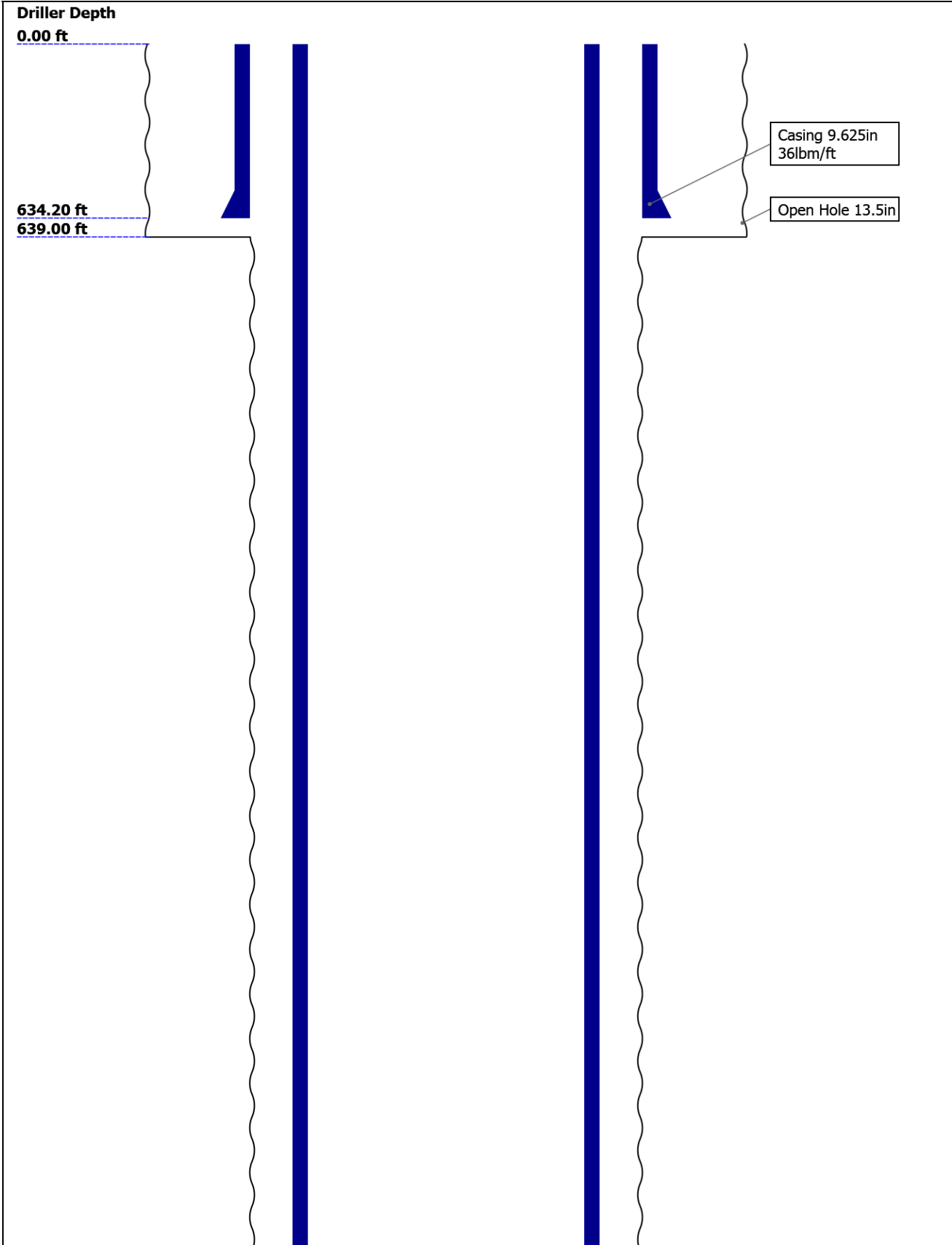
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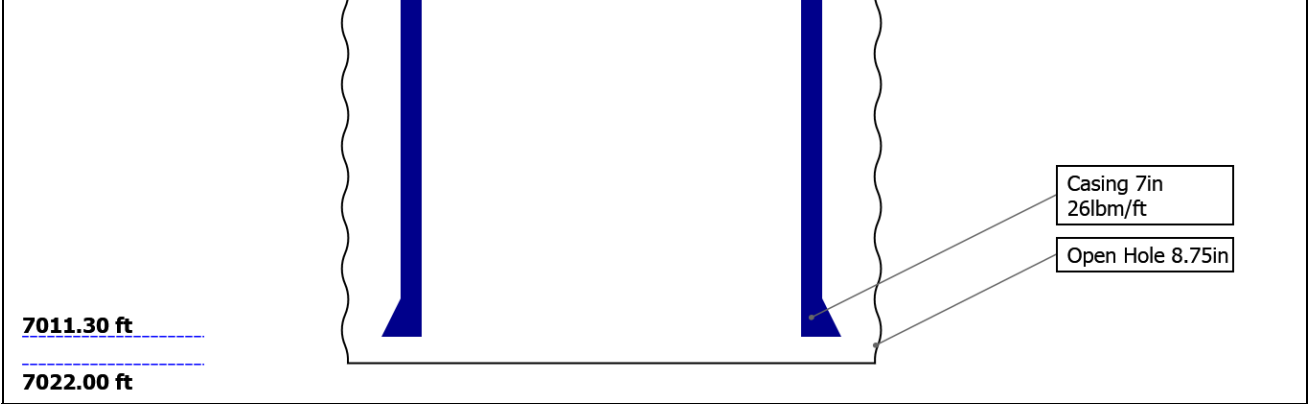
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Well Sketch





Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	13.5	8.75				
Top Driller (ft)	0	639				
Top Logger (ft)	0	639				
Bottom Driller (ft)	639	7022				
Bottom Logger (ft)	639	7022				
Casing						
Size (in)	9.625	7				
Weight (lbm/ft)	36	26				
Inner Diameter (in)	8.921	6.276				
Grade	J55	P110				
Top Driller (ft)	0	0				
Top Logger (ft)	0	0				
Bottom Driller (ft)	634.2	7011.3				
Bottom Logger (ft)	634.2	7011.3				

Operational Run Summary

Parameter (unit)	Run 1					
Date Log Started	03-Nov-2015					
Time Log Started	16:33:21					
Date Log Finished	03-Nov-2015					
Time Log Finished	22:39:41					
Top Log Interval (ft)	24.00					
Bottom Log Interval (ft)	6910.00					
Total Depth (ft)						
Max Hole Deviation (deg)	0.00					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	8.750					
Logging Unit Number	9115					
Logging Unit Location	Ft. Morgan, CO					
Recorded By	Aleksei Bekhterev					

Witnessed By	Bill Mansfield					
Service Order Number	CY37-00148					

Borehole Fluids						
Parameter(unit)	Run 1					
Fluid Type	Water					
Fluid Name	Brine					
Max Recorded Temperatures (degF)	220.9					
Salinity (ppm)	0					
Density (lbm/gal)	8.4					
Date Logger on Bottom	03-Nov-2015					
Time Logger on Bottom	18:05:00					
Total Solid (%)						
High Gravity Solids (%)						

Remarks and Equipment Summary

Run 1: Toolstring			Run 1: Remarks
<div><div><div><div><div>Equip name</div><div>length</div></div><div>LEH-QT</div><div>33.92</div></div><div>LEH-QT</div></div><div><div><div><div>EDTC-B</div><div>31.00</div></div><div>EDTH-B</div><div>EDTG-A</div><div>EDTC-B</div></div><div><div><div><div>CTEM</div><div>27.5</div></div><div>ACCZ</div><div>0.00</div></div><div>HV</div><div>0.00</div></div><div>Gamm</div><div>25.63</div></div><div>a Ray</div><div>TelSta</div><div>24.5</div></div> <div>tus</div>			Toolstring ran as per tool sketch
			12 ppg Flex Seal, 15.8 ppg Tail cement
			Repeat pass is done with 0 psi
			Main pass is done with 2500 psi
			Temperature at the bottom: 220.9 degF
			Top of cement: 660 ft
			Log started 30 ft above top of the liner (6910 ft)
			Data affected by high deviation and dog legs at section: TD-5720'
			Casing wear observed at 2835', 2496', 1758', 1659', 1560'. Repeated at high resolution
			Crew: Jake Jump, Jay Musgrave
			Thank you for choosing Schlumberger Wireline!

AH-184

24.5

[2]

AH-184

22.5

[1]

CME-AF

20.5

USIT-E

16.71

ECH-MFA

:1964

USAC-A

USIS-A:9

99

USSC-B

IBCS-B

FAR-SEN

SOR

NEAR-SE

NSOR

USI-SEN

SOR

EMITTER

-SENSOR

Toolstring ran as per tool sketch

12 ppg Flex Seal, 15.8 ppg Tail cement

Repeat pass is done with 0 psi

Main pass is done with 2500 psi

Temperature at the bottom: 220.9 degF

Top of cement: 660 ft

Log started 30 ft above top of the liner (6910 ft)

Data affected by high deviation and dog legs at section: TD-5720'

Casing wear observed at 2835', 2496', 1758', 1659', 1560'. Repeated at high resolution

Crew: Jake Jump, Jay Musgrave

Thank you for choosing Schlumberger Wireline!



USI Se 0.87
nsor
Head T
ension
TOOL_ZERO

Lengths are in ft
Maximum Outer Diameter = 4.472 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

Run 1

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

7-46A-XS

Serial Number

Length

12000.00 ft

Conveyance Type

Wireline

Rig Type

Crane

Run 1:Depth Control Parameters

Depth Control Remarks

Log Sequence

First Log In the Well

Rig Up Length At Surface

Rig Up Length At Bottom

Rig Up Length Correction

Stretch Correction

Tool Zero Check At Surface

All Schlumberger depth policies followed

IDW used as primary depth device

Z-chart used as secondary depth reference

USI IBC SLG

USIT - Fluid Properties Measurement

Run Name

Pass Name

Start Depth(ft)

Stop Depth(ft)

Run 1

Main[5]:Up

6917.93

2645.65

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 : 94.69m(310.65ft) to 101.80m(333.98ft)

MUD_N_FRP = 1.13

CZMD median computed in free pipe normalization interval = 1.66 MRayl

Composite 1

IBC SLG

Acquisition System

Maxwell 2016

6.0.52439.3100

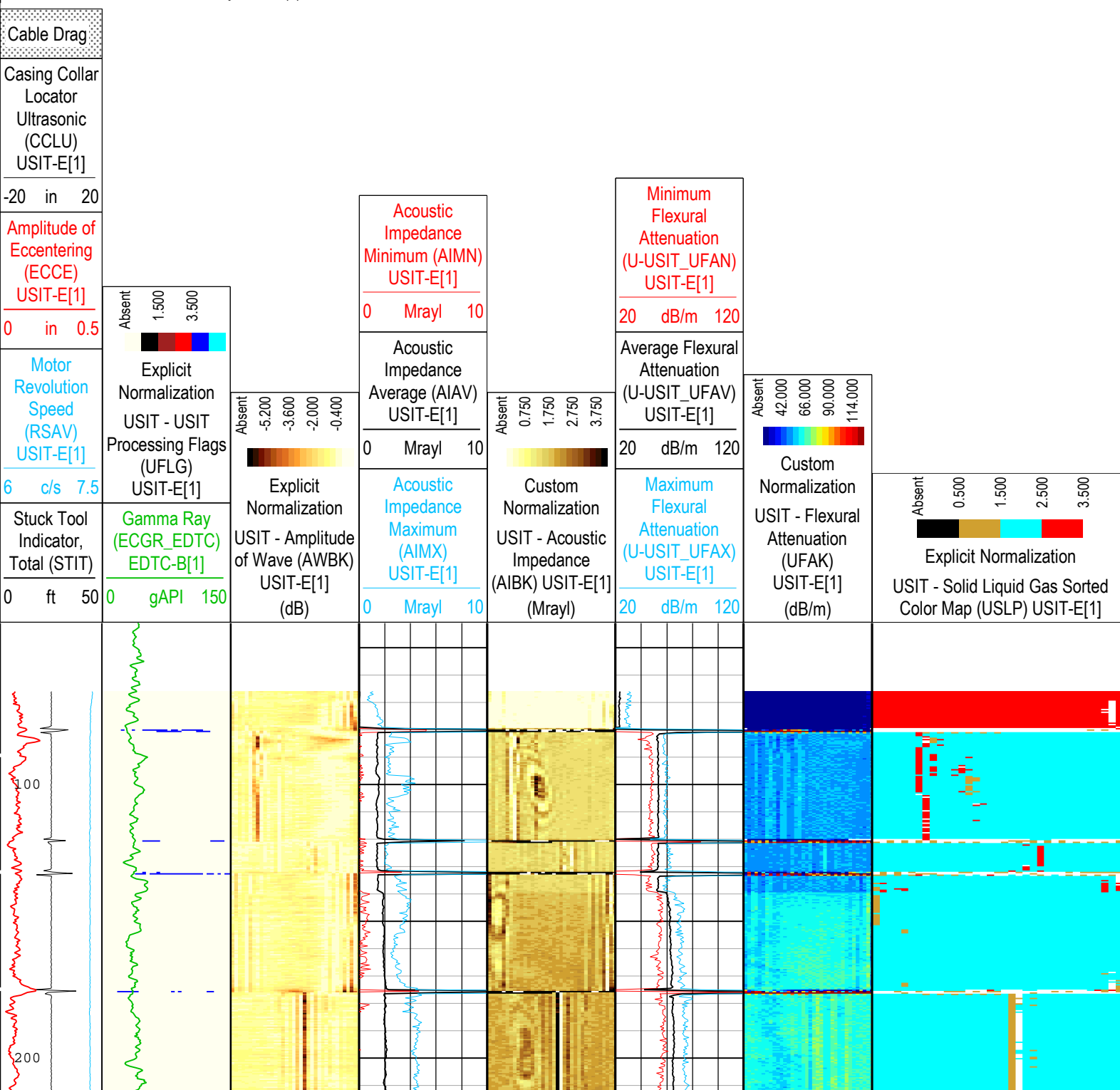
Company:Noble Energy Inc

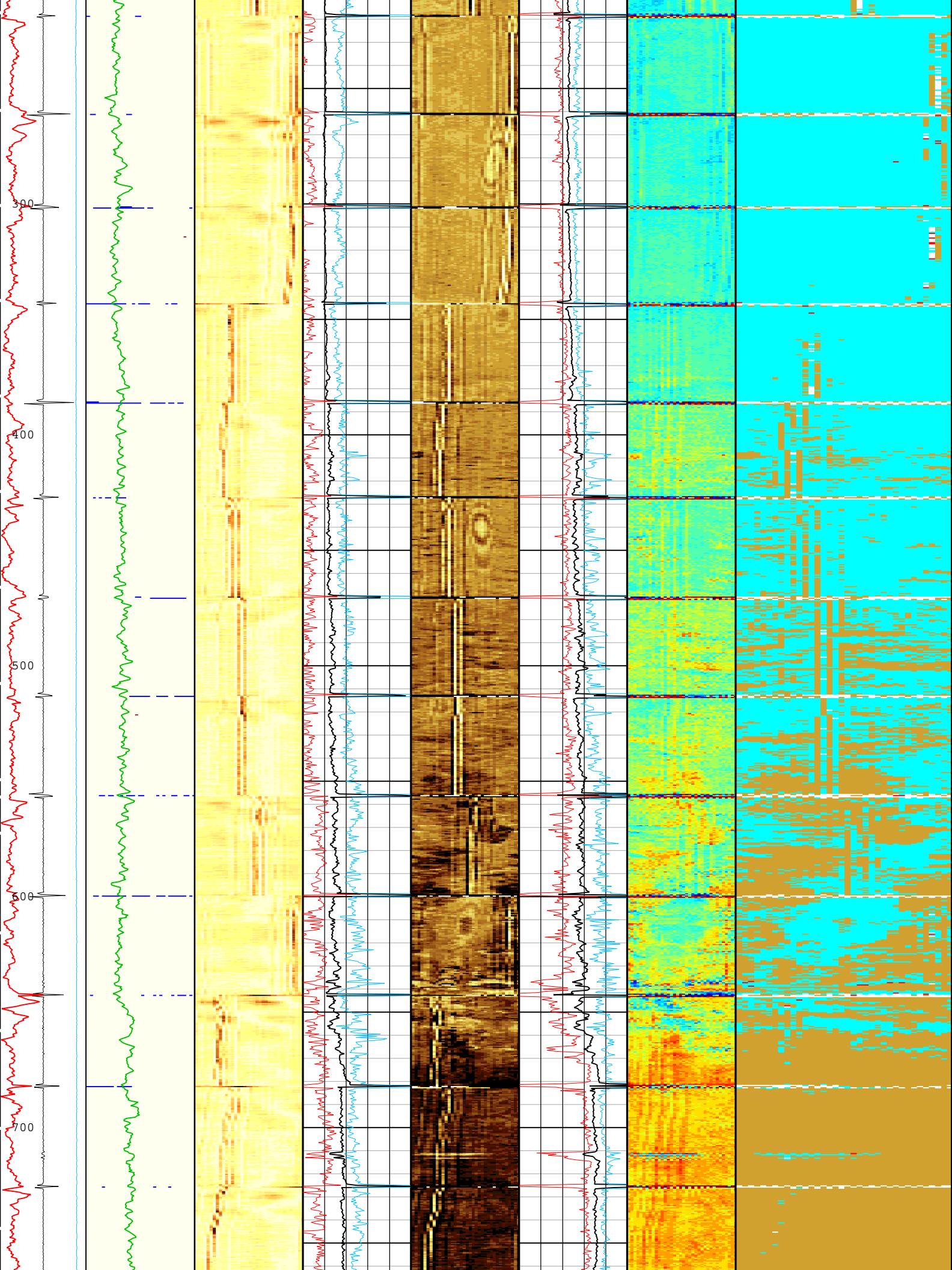
Well: Wells Ranch AE32-690

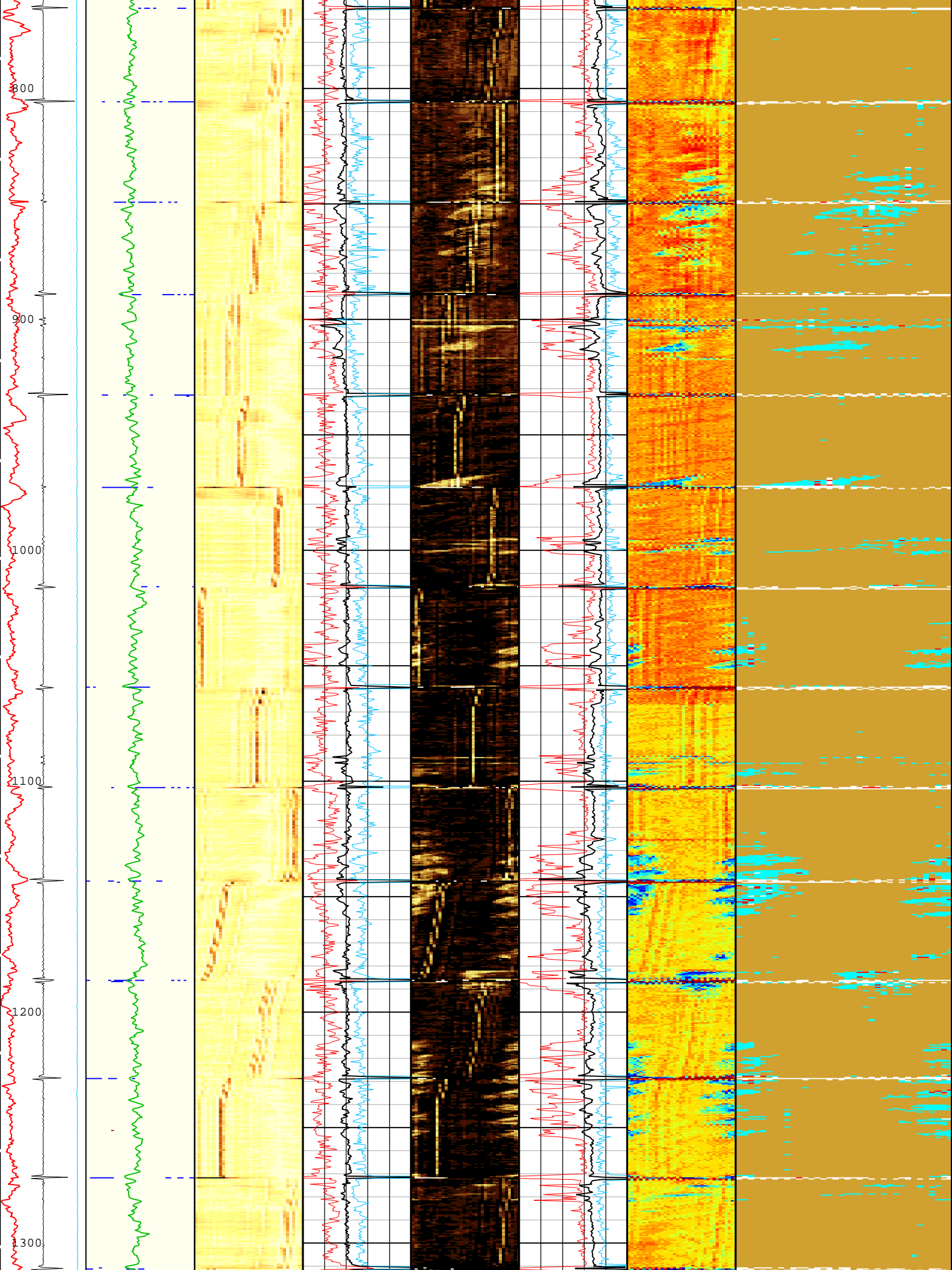
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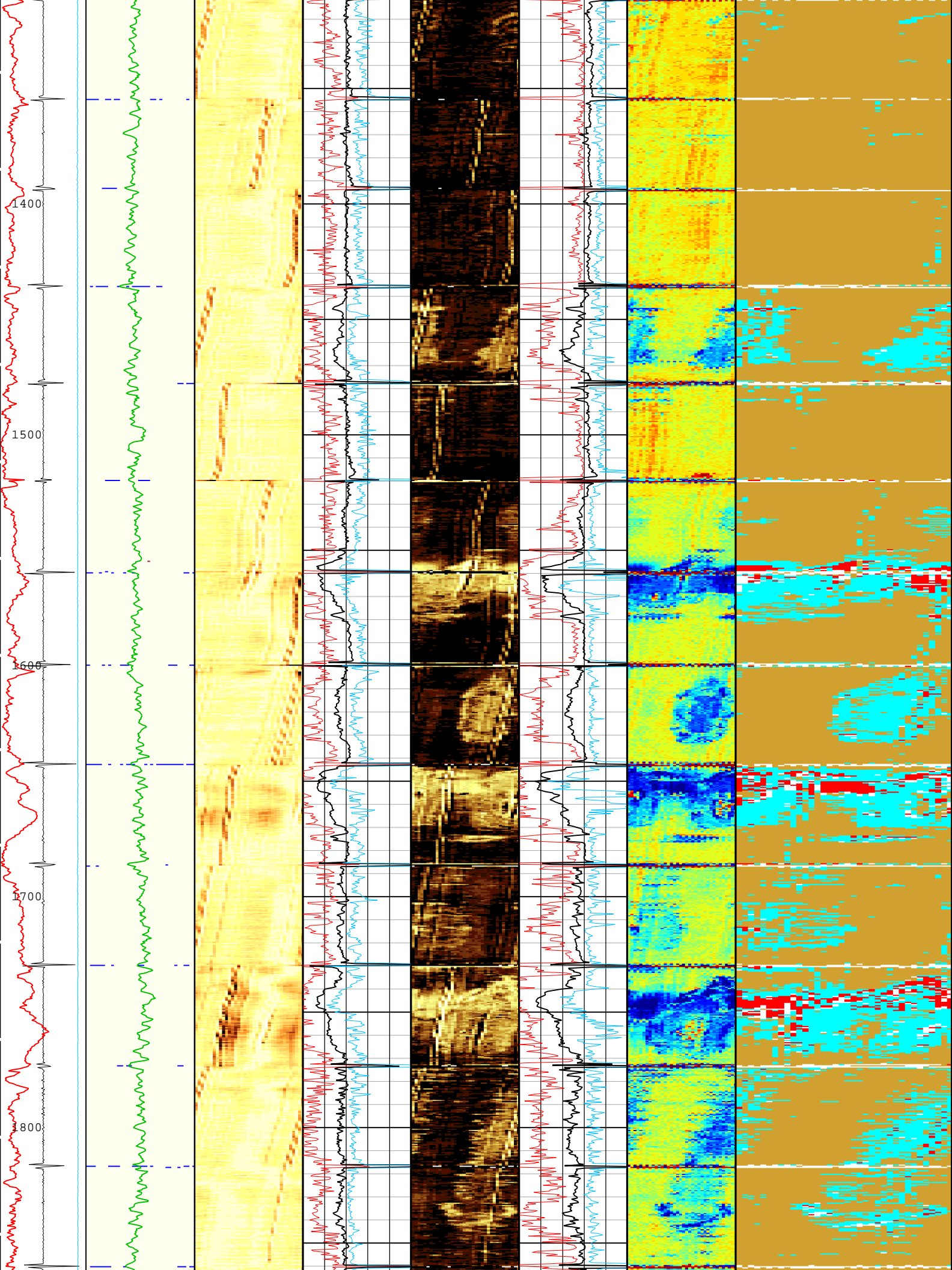
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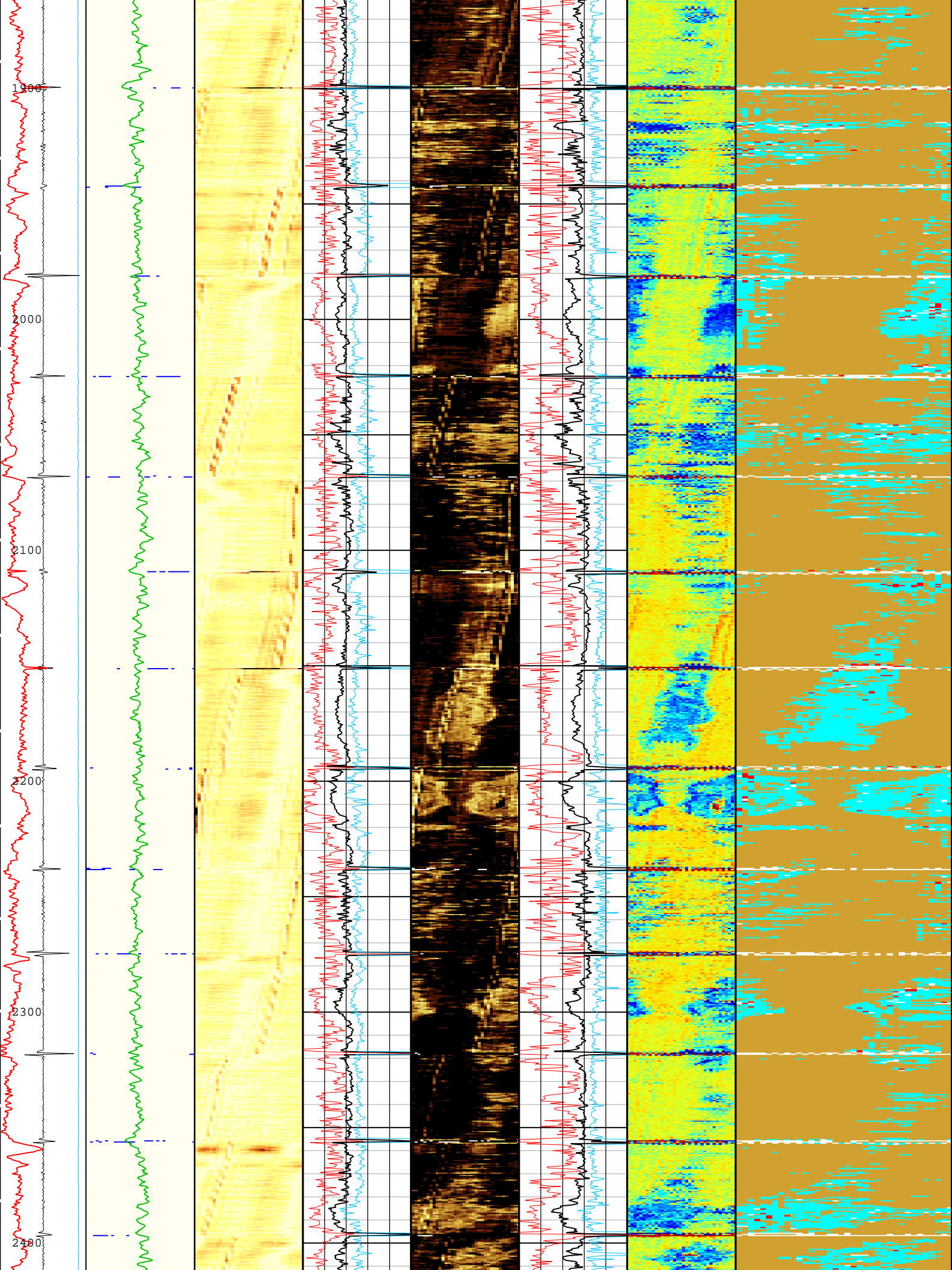
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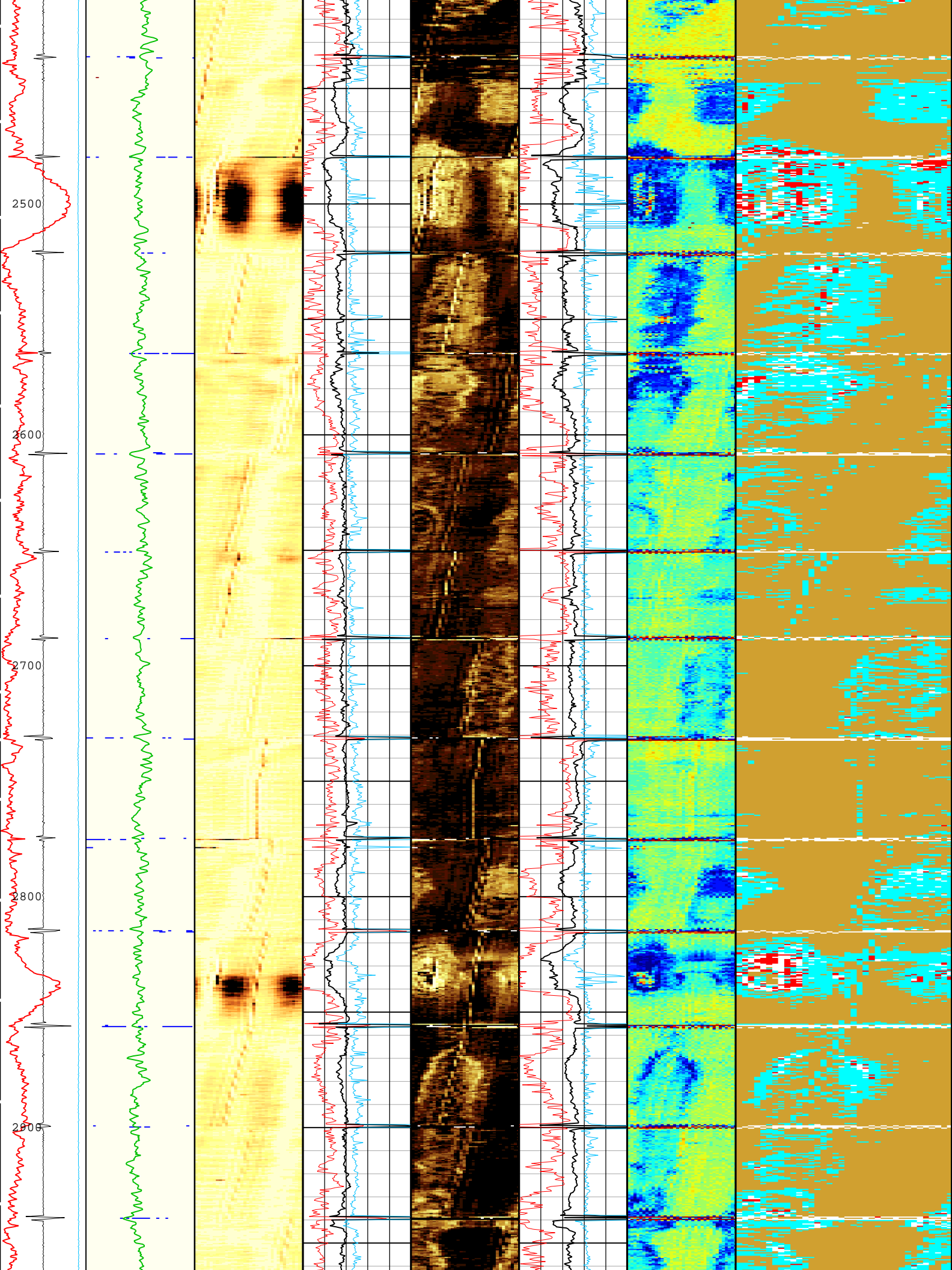


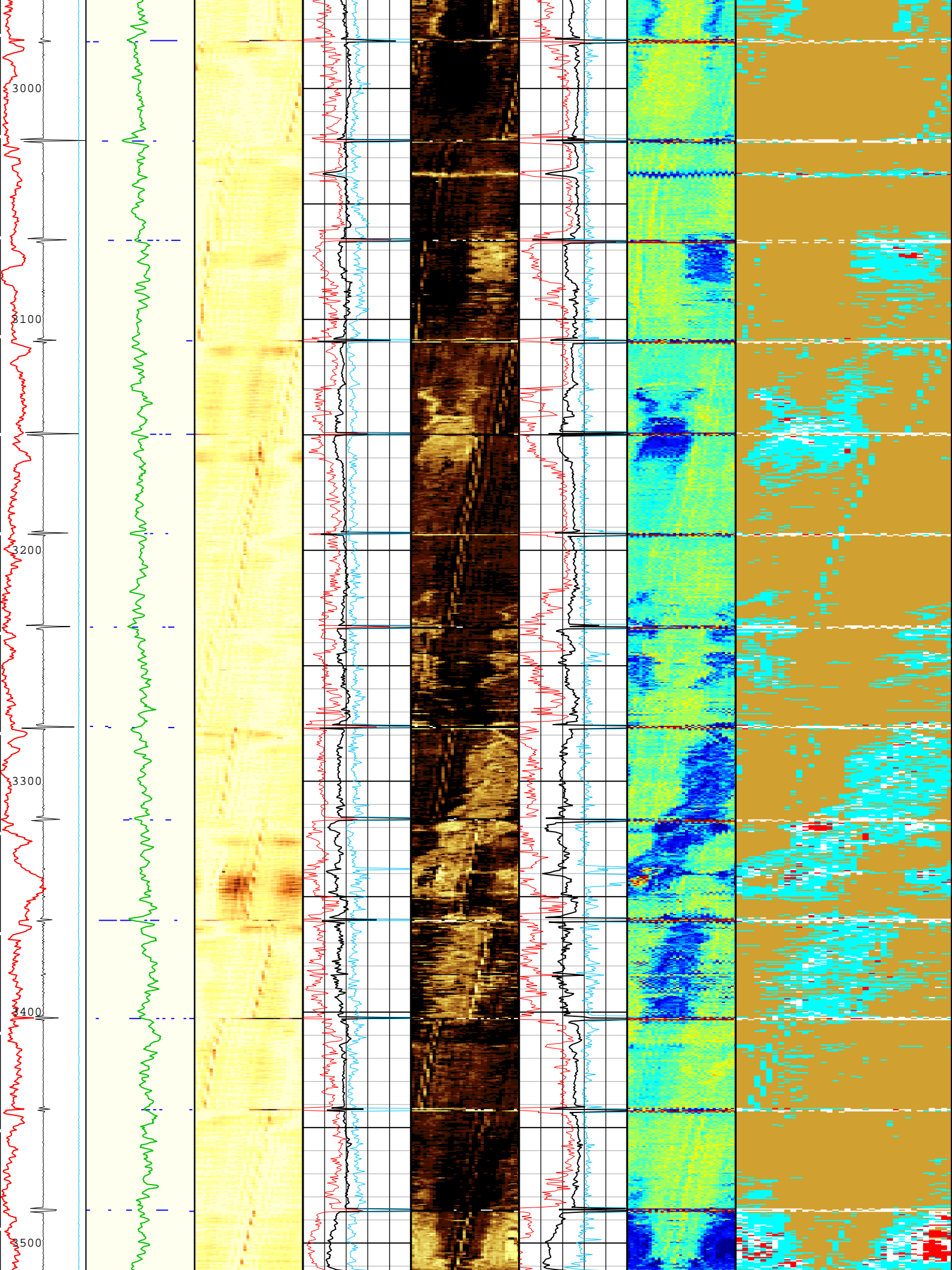


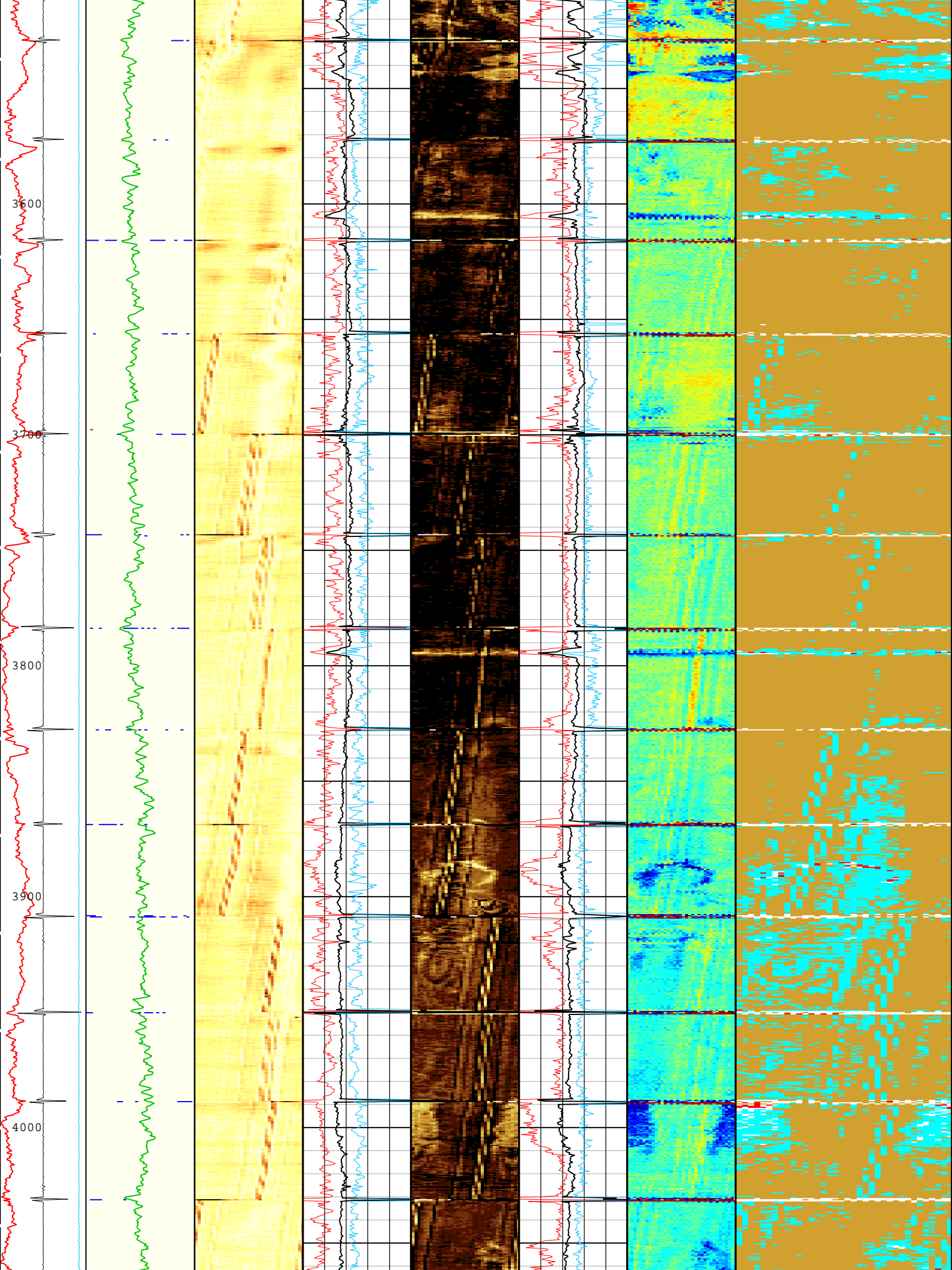


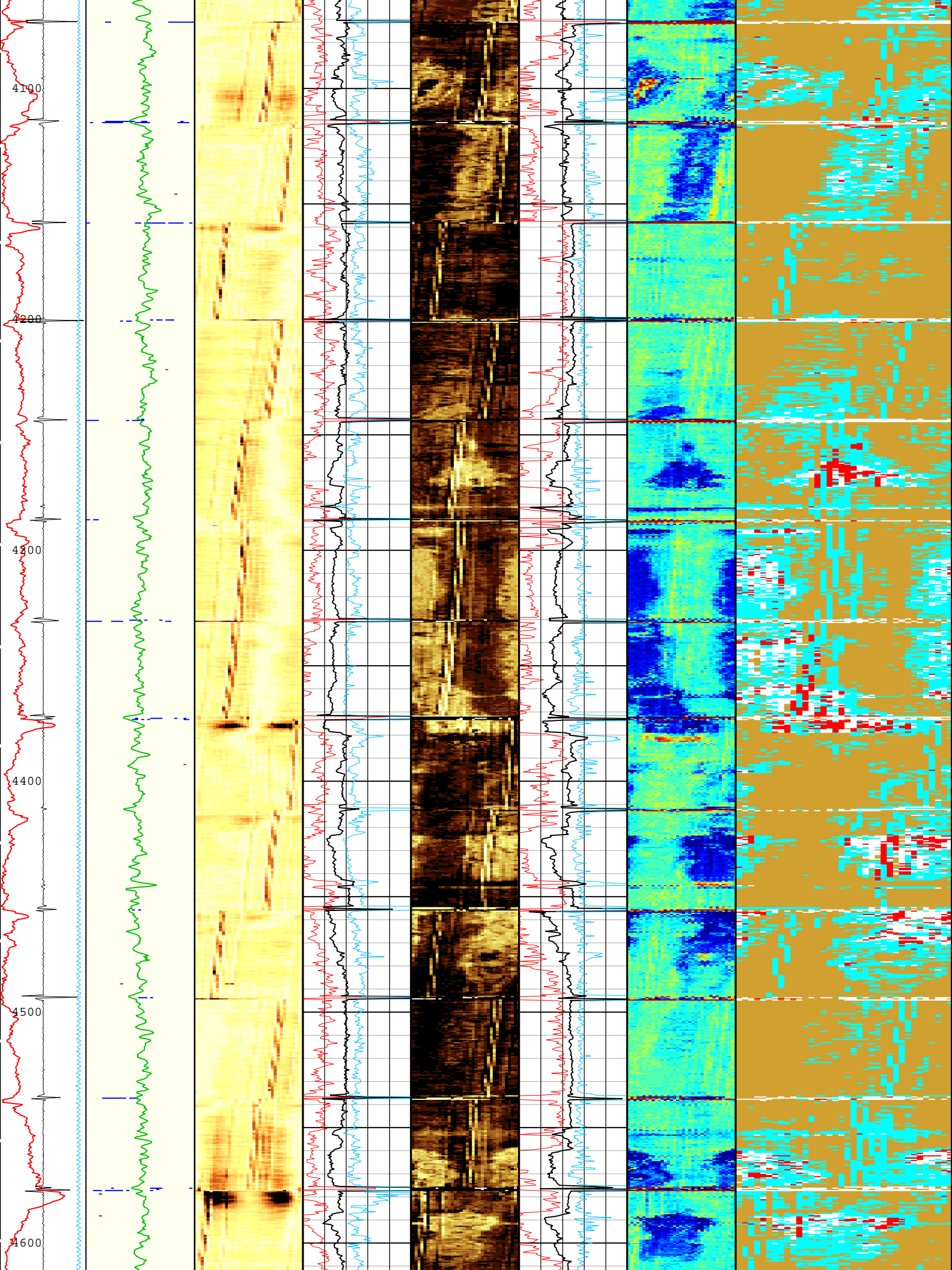


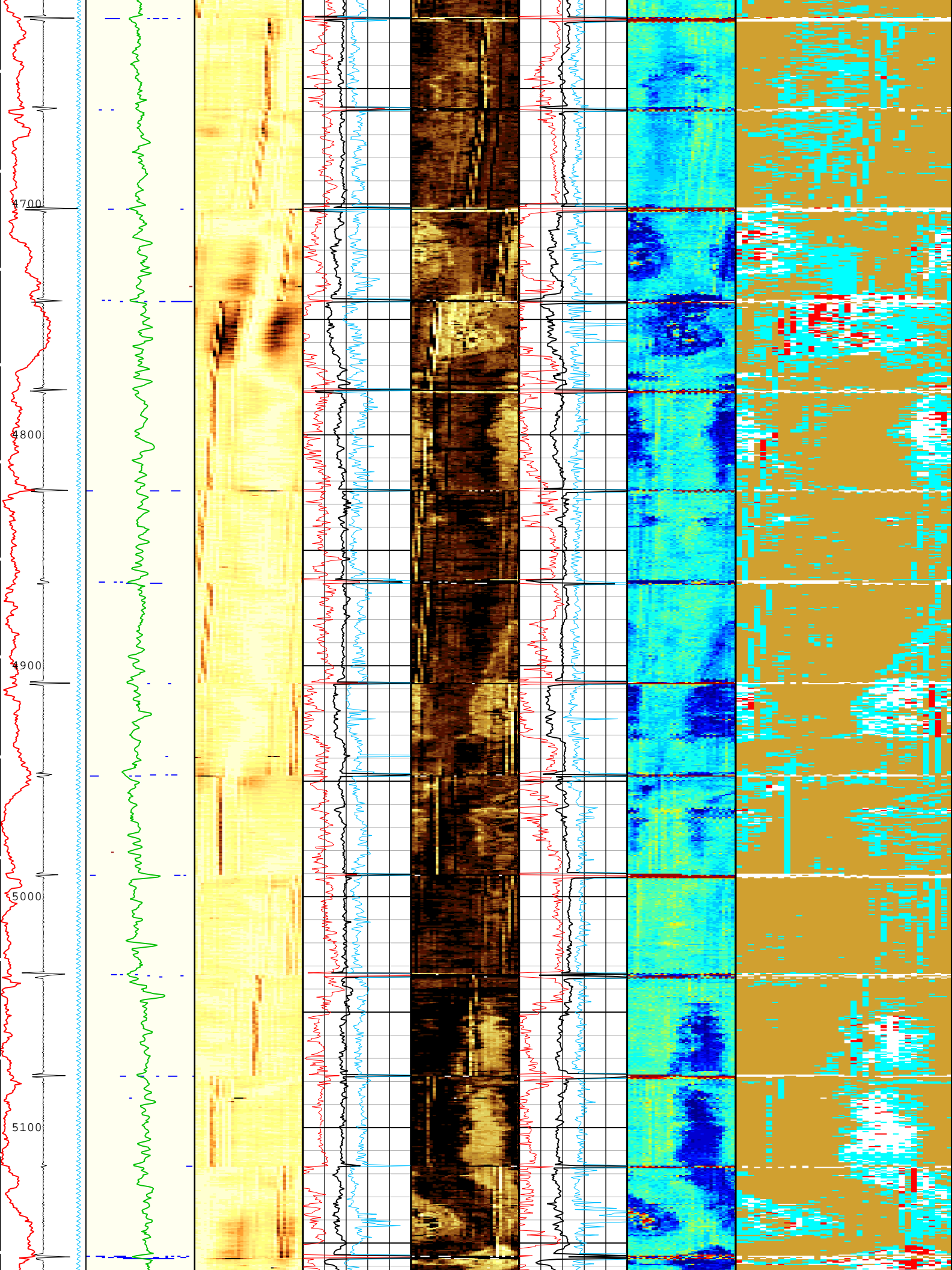


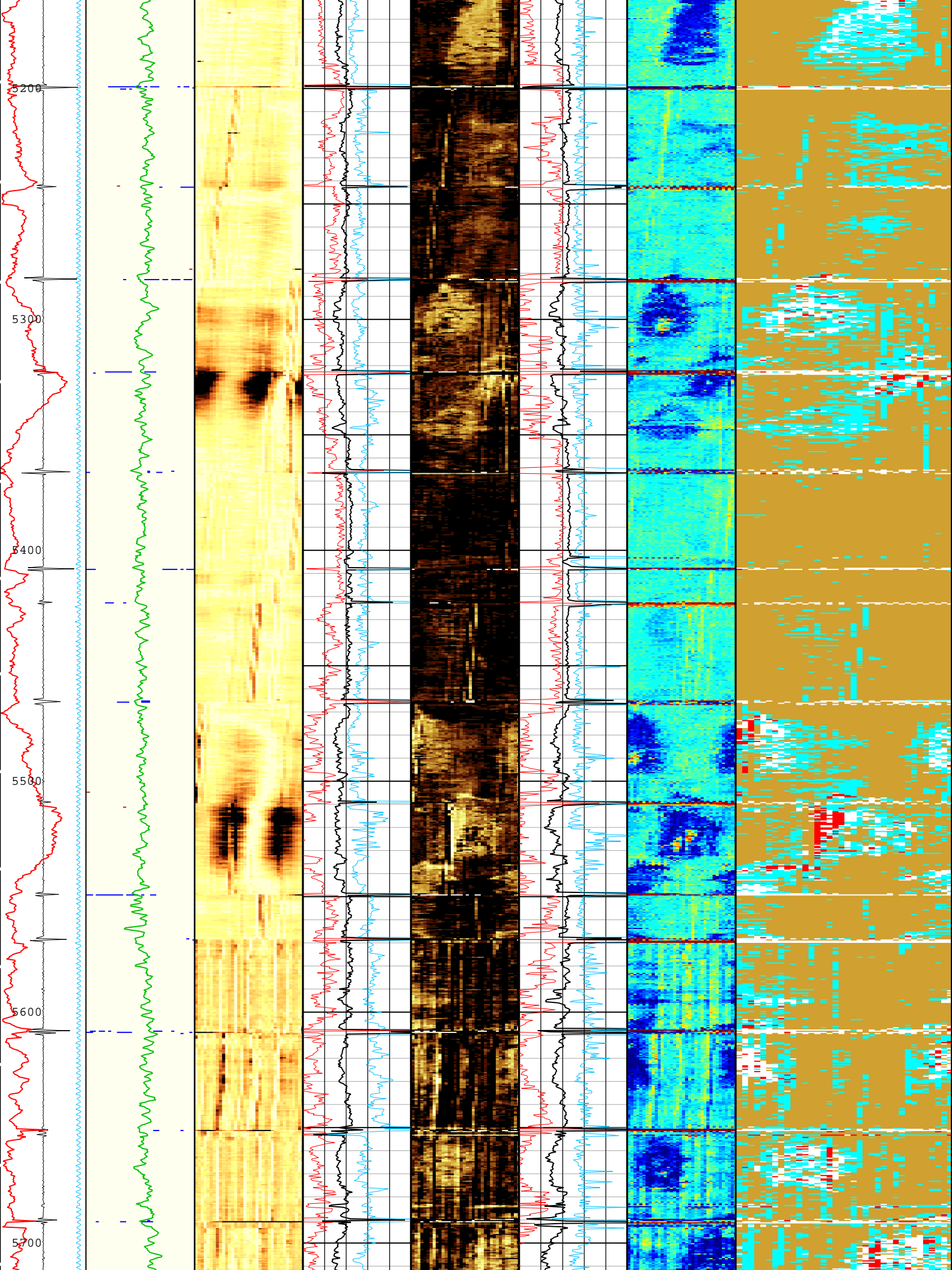


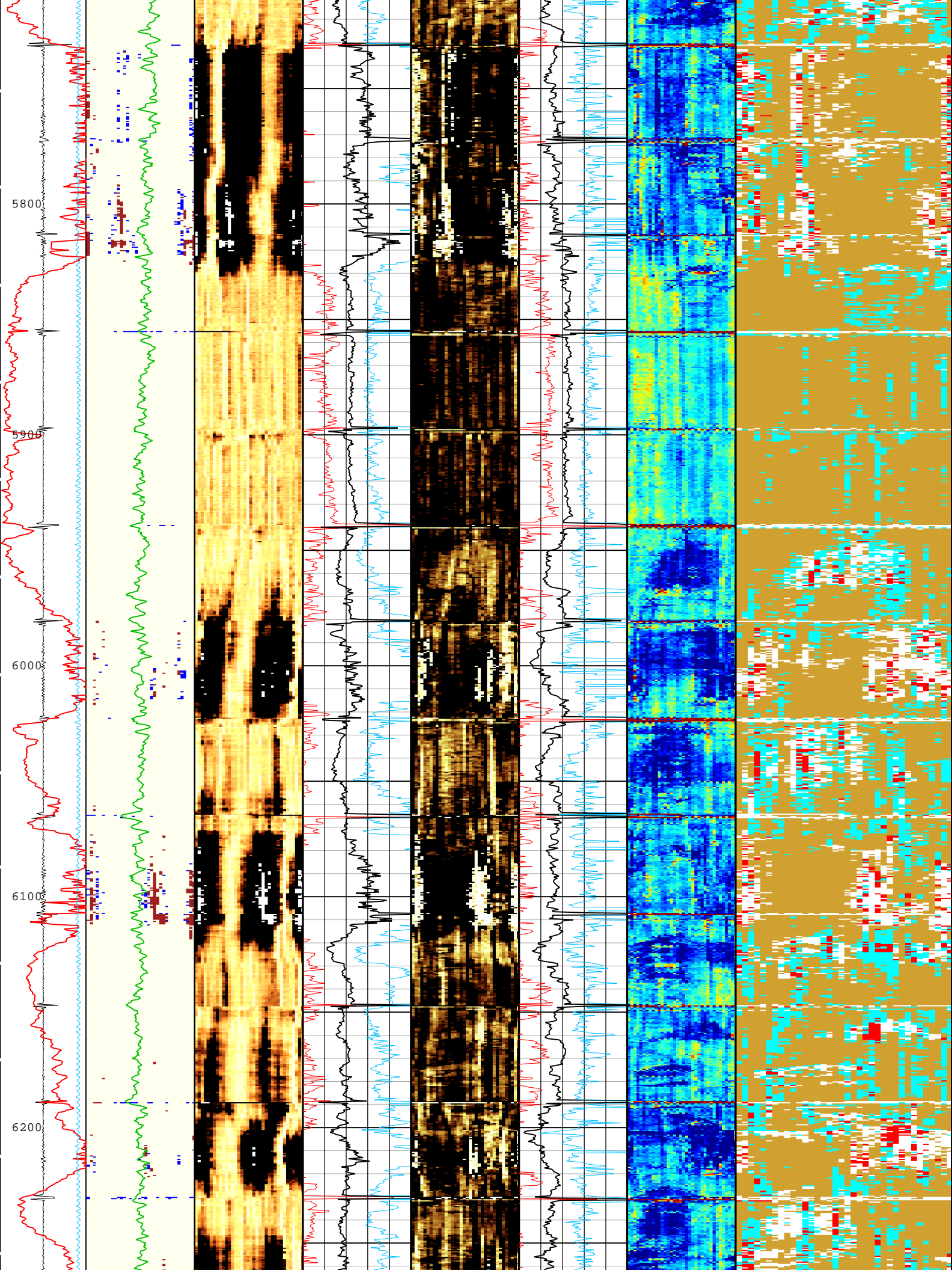


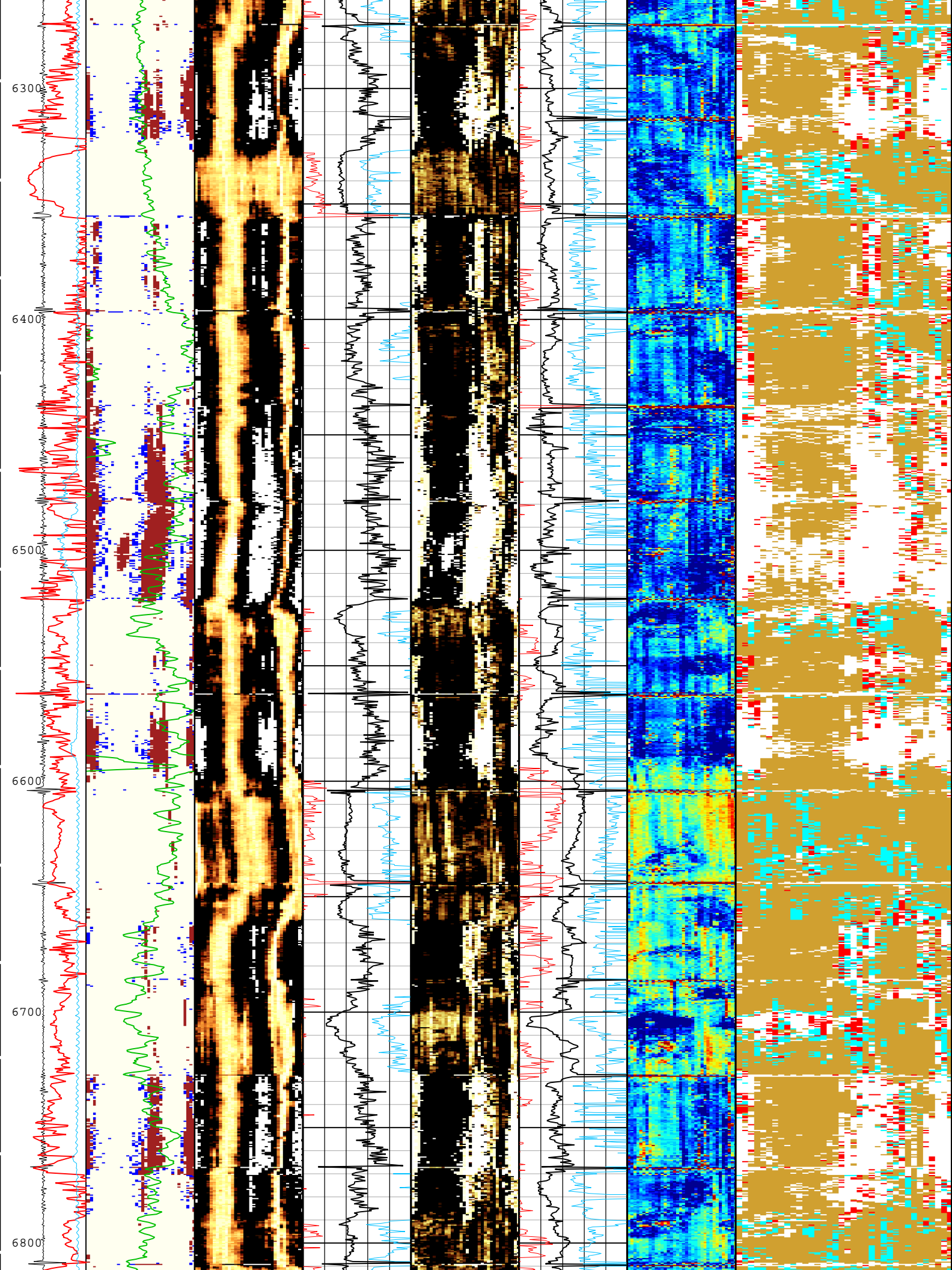


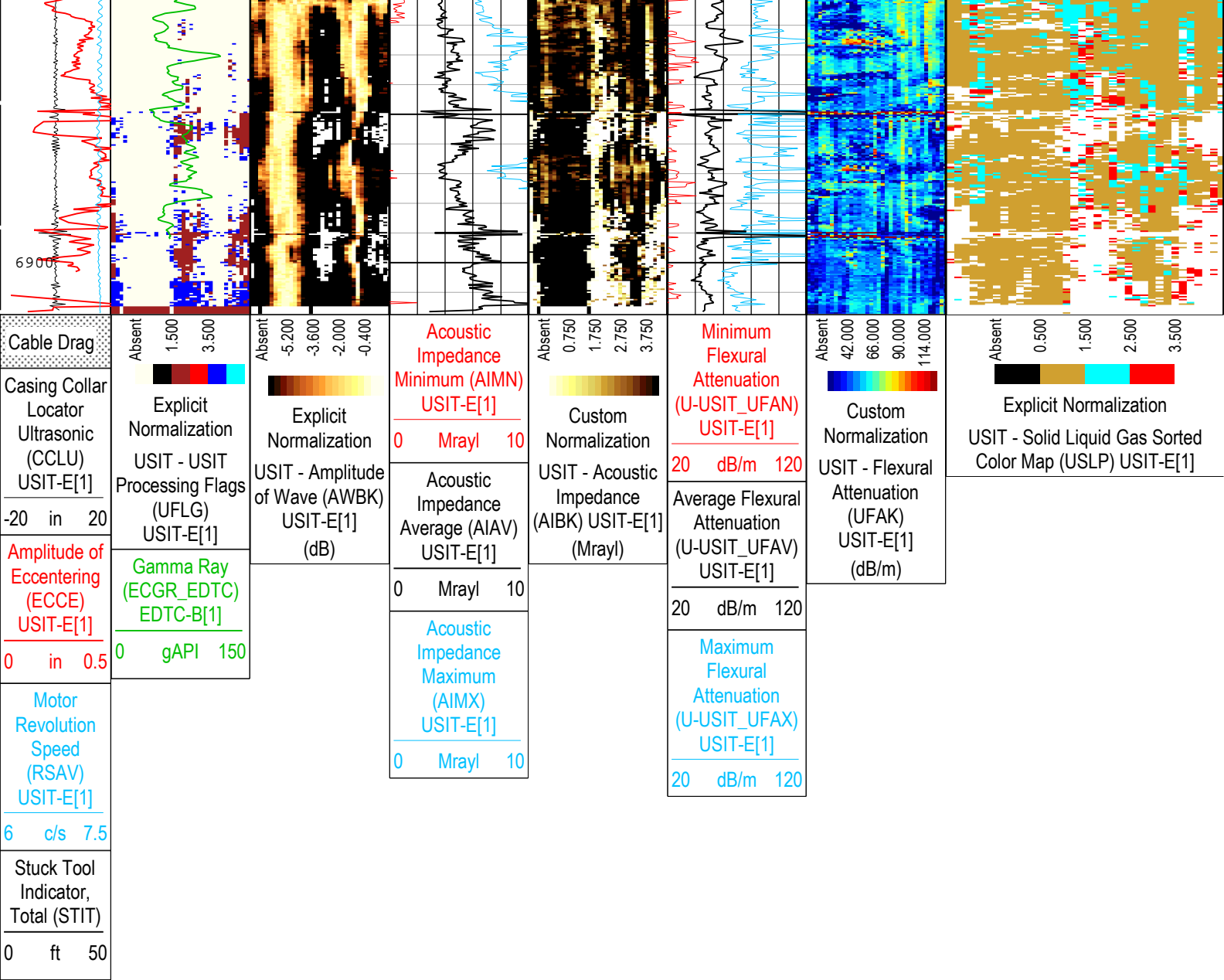












TIME_1900 - Time Marked every 60.00 (s)

Description: USI IBC SLG Format: USI IBC SLG Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 03-Nov-2015 23:08:15

Channel Processing Parameters				
Run 1: 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	7011.3	ft
CDEN	Cement Density	USIT-E	0	lbm/gal
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Light Cement	
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
ED	Fluid Density	USIT-E	11.5	lbm/gal

	Fluid Density	USIT-E	11.3	lbm/gal
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS	
GR_MULTIPLIER	Gamma Ray Multiplier	EDTC-B	1	
HEMA	Hematite Presence Flag	Borehole	No	
IBC_FRP_OFFSET	IBC Flexural Offset from Free Pipe	USIT-E	-11.52	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	1.13	
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	Centered	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	2.06	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	-22.98	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	2.6	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Run 1Depth Zoned Parameters				
Parameter	Value	Start (ft)	Stop (ft)	
BS	13.5	41	639	
BS	8.75	639	6917.5	
All depth are actual.				

Tool Control Parameters

Run 1: 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	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	2700	ft/h
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	Time Zoned	us
U-USIT_UFWE	Far Receiver Window End Time	USIT-E	Time Zoned	us
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UMFR	Modulation Frequency	USIT-E	333333	Hz
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	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	Time Zoned	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	Time Zoned	us
WINE	Window End Time	USIT-E	Time Zoned	us

Run 1Time Zoned Parameters

Pass Main[5]:Up

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	120	03-Nov-2015 18:15:01	03-Nov-2015 18:53:34	6917.87	5936.92
EMXV	115	03-Nov-2015 18:53:34	03-Nov-2015 18:53:38	5936.92	5934.29
EMXV	110	03-Nov-2015 18:53:38	03-Nov-2015 18:53:41	5934.29	5932.04
EMXV	105	03-Nov-2015 18:53:41	03-Nov-2015 18:58:41	5932.04	5722.26
EMXV	100	03-Nov-2015 18:58:41	03-Nov-2015 18:58:44	5722.26	5720.31
EMXV	95	03-Nov-2015 18:58:44	03-Nov-2015 18:58:46	5720.31	5718.38
EMXV	90	03-Nov-2015 18:58:46	03-Nov-2015 18:58:49	5718.38	5716.57
EMXV	85	03-Nov-2015 18:58:49	03-Nov-2015 18:58:52	5716.57	5714.83
EMXV	80	03-Nov-2015 18:58:52	03-Nov-2015 18:58:54	5714.83	5712.96
EMXV	75	03-Nov-2015 18:58:54	03-Nov-2015 18:58:57	5712.96	5710.99
EMXV	70	03-Nov-2015 18:58:57	03-Nov-2015 18:59:00	5710.99	5709.16
EMXV	65	03-Nov-2015 18:59:00	03-Nov-2015 19:29:39	5709.16	4398.92
EMXV	60	03-Nov-2015 19:29:39	03-Nov-2015 19:29:42	4398.92	4397.16
EMXV	55	03-Nov-2015 19:29:42	03-Nov-2015 19:29:44	4397.16	4395.25
EMXV	50	03-Nov-2015 19:29:44	03-Nov-2015 20:10:36	4395.25	2731.92
U-USIT_UFWB	133	03-Nov-2015 18:15:01	03-Nov-2015 18:30:02	6917.87	6916.19
U-USIT_UFWB	77.08	03-Nov-2015 18:30:02	03-Nov-2015 19:06:14	6916.19	5402.38
U-USIT_UFWB	100.11	03-Nov-2015 19:06:14	03-Nov-2015 19:15:40	5402.38	4997.66
U-USIT_UFWB	108.48	03-Nov-2015 19:15:40	03-Nov-2015 19:15:43	4997.66	4995.69

U-USIT_UFWB	115.8	03-Nov-2015 19:15:43	03-Nov-2015 20:10:36	4995.69	2731.92
U-USIT_UFWE	173	03-Nov-2015 18:15:01	03-Nov-2015 18:30:03	6917.87	6915.84
U-USIT_UFWE	201.62	03-Nov-2015 18:30:03	03-Nov-2015 19:06:15	6915.84	5401.36
U-USIT_UFWE	179.64	03-Nov-2015 19:06:15	03-Nov-2015 20:10:36	5401.36	2731.92
U-USIT_UNWB	102	03-Nov-2015 18:15:01	03-Nov-2015 18:29:58	6917.87	6916.91
U-USIT_UNWB	57.2	03-Nov-2015 18:29:58	03-Nov-2015 19:06:11	6916.91	5404.29
U-USIT_UNWB	79.18	03-Nov-2015 19:06:11	03-Nov-2015 19:25:11	5404.29	4590.57
U-USIT_UNWB	89.64	03-Nov-2015 19:25:11	03-Nov-2015 20:10:36	4590.57	2731.92
U-USIT_UNWE	142	03-Nov-2015 18:15:01	03-Nov-2015 18:30:00	6917.87	6916.51
U-USIT_UNWE	164.99	03-Nov-2015 18:30:00	03-Nov-2015 19:06:12	6916.51	5403.32
U-USIT_UNWE	153.48	03-Nov-2015 19:06:12	03-Nov-2015 20:10:36	5403.32	2731.92
WINB	37.61	03-Nov-2015 18:15:01	03-Nov-2015 18:30:05	6917.87	6915.34
WINB	15.09	03-Nov-2015 18:30:05	03-Nov-2015 18:30:32	6915.34	6906.64
WINB	24.3	03-Nov-2015 18:30:32	03-Nov-2015 19:06:17	6906.64	5400.28
WINB	35.81	03-Nov-2015 19:06:17	03-Nov-2015 20:10:36	5400.28	2731.92
WINE	77.61	03-Nov-2015 18:15:01	03-Nov-2015 18:30:07	6917.87	6914.98
WINE	101.04	03-Nov-2015 18:30:07	03-Nov-2015 19:06:18	6914.98	5399.45
WINE	82.62	03-Nov-2015 19:06:18	03-Nov-2015 20:10:36	5399.45	2731.92

Pass Main[8]:Up					
EMXV	50	03-Nov-2015 20:26:28	03-Nov-2015 21:20:39	2732.97	556.85
U-USIT_UFWB	133	03-Nov-2015 20:25:54	03-Nov-2015 20:32:24	2732.97	2488.59
U-USIT_UFWB	123.13	03-Nov-2015 20:32:24	03-Nov-2015 21:20:39	2488.59	556.85
U-USIT_UFWE	173	03-Nov-2015 20:25:54	03-Nov-2015 20:32:26	2732.97	2487.81
U-USIT_UFWE	180.69	03-Nov-2015 20:32:26	03-Nov-2015 21:20:39	2487.81	556.85
U-USIT_UNWB	102	03-Nov-2015 20:25:54	03-Nov-2015 20:32:23	2732.97	2489.52
U-USIT_UNWB	94.87	03-Nov-2015 20:32:23	03-Nov-2015 21:20:39	2489.52	556.85
U-USIT_UNWE	142	03-Nov-2015 20:25:54	03-Nov-2015 20:32:22	2732.97	2490.26
U-USIT_UNWE	152.43	03-Nov-2015 20:32:22	03-Nov-2015 21:20:39	2490.26	556.85
WINB	37.61	03-Nov-2015 20:25:54	03-Nov-2015 20:32:18	2732.97	2493.12
WINB	41.95	03-Nov-2015 20:32:18	03-Nov-2015 21:20:39	2493.12	556.85
WINE	77.61	03-Nov-2015 20:25:54	03-Nov-2015 20:32:16	2732.97	2494.19
WINE	90.3	03-Nov-2015 20:32:16	03-Nov-2015 21:20:39	2494.19	556.85

Pass Main[9]:Up					
EMXV	50	03-Nov-2015 21:40:48	03-Nov-2015 21:53:07	556.85	66.87
U-USIT_UFWB	133	03-Nov-2015 21:40:48	03-Nov-2015 21:53:07	556.85	66.87
U-USIT_UFWE	173	03-Nov-2015 21:40:48	03-Nov-2015 21:53:07	556.85	66.87
U-USIT_UNWB	102	03-Nov-2015 21:40:48	03-Nov-2015 21:53:07	556.85	66.87
U-USIT_UNWE	142	03-Nov-2015 21:40:48	03-Nov-2015 21:53:07	556.85	66.87
WINB	37.61	03-Nov-2015 21:40:48	03-Nov-2015 21:53:07	556.85	66.87
WINE	77.61	03-Nov-2015 21:40:48	03-Nov-2015 21:53:07	556.85	66.87

All depth are at tool zero.

USI Goodwin	
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Composite 1

IBC Goodwin Compressed

Log

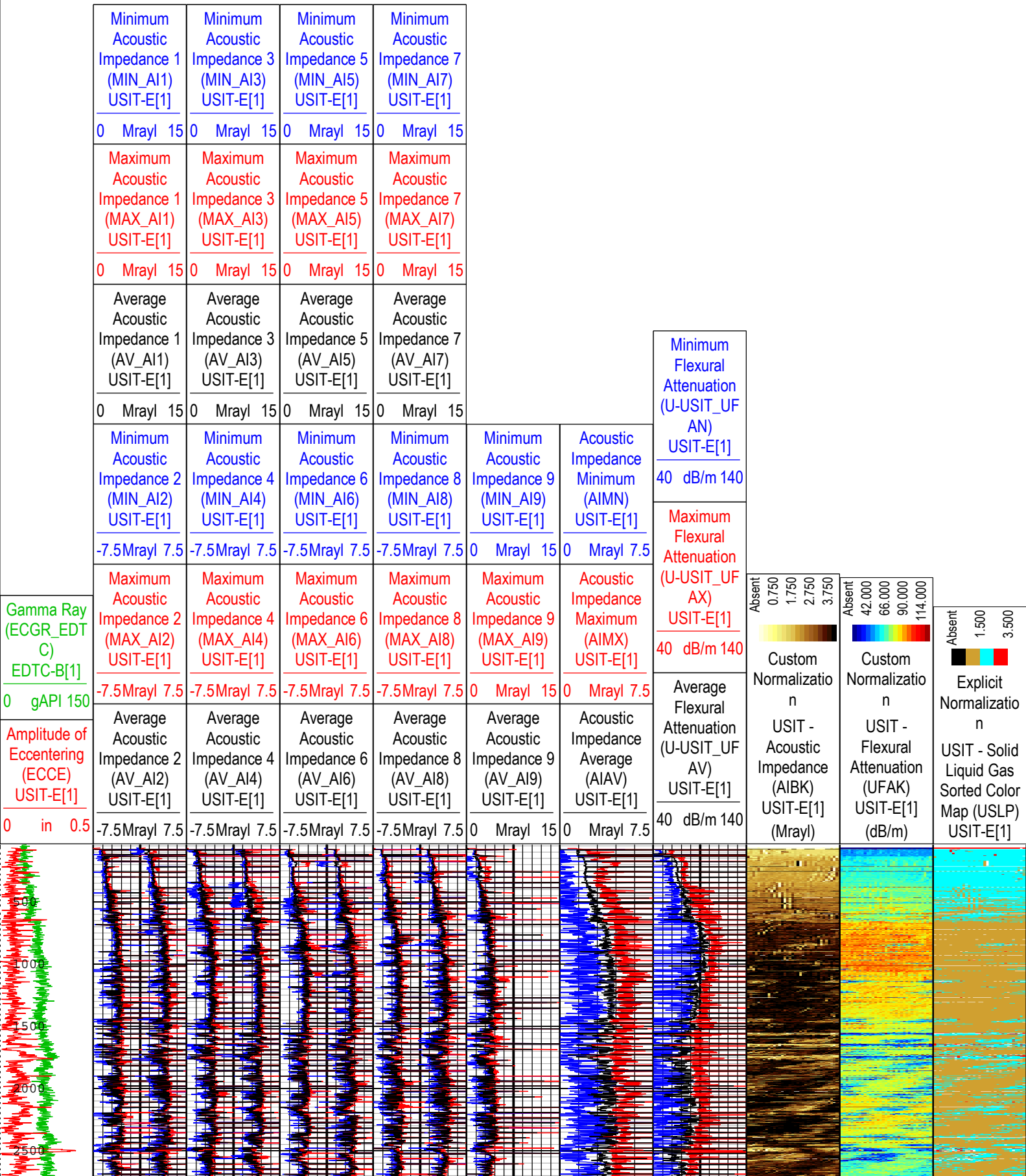
Company:Noble Energy Inc

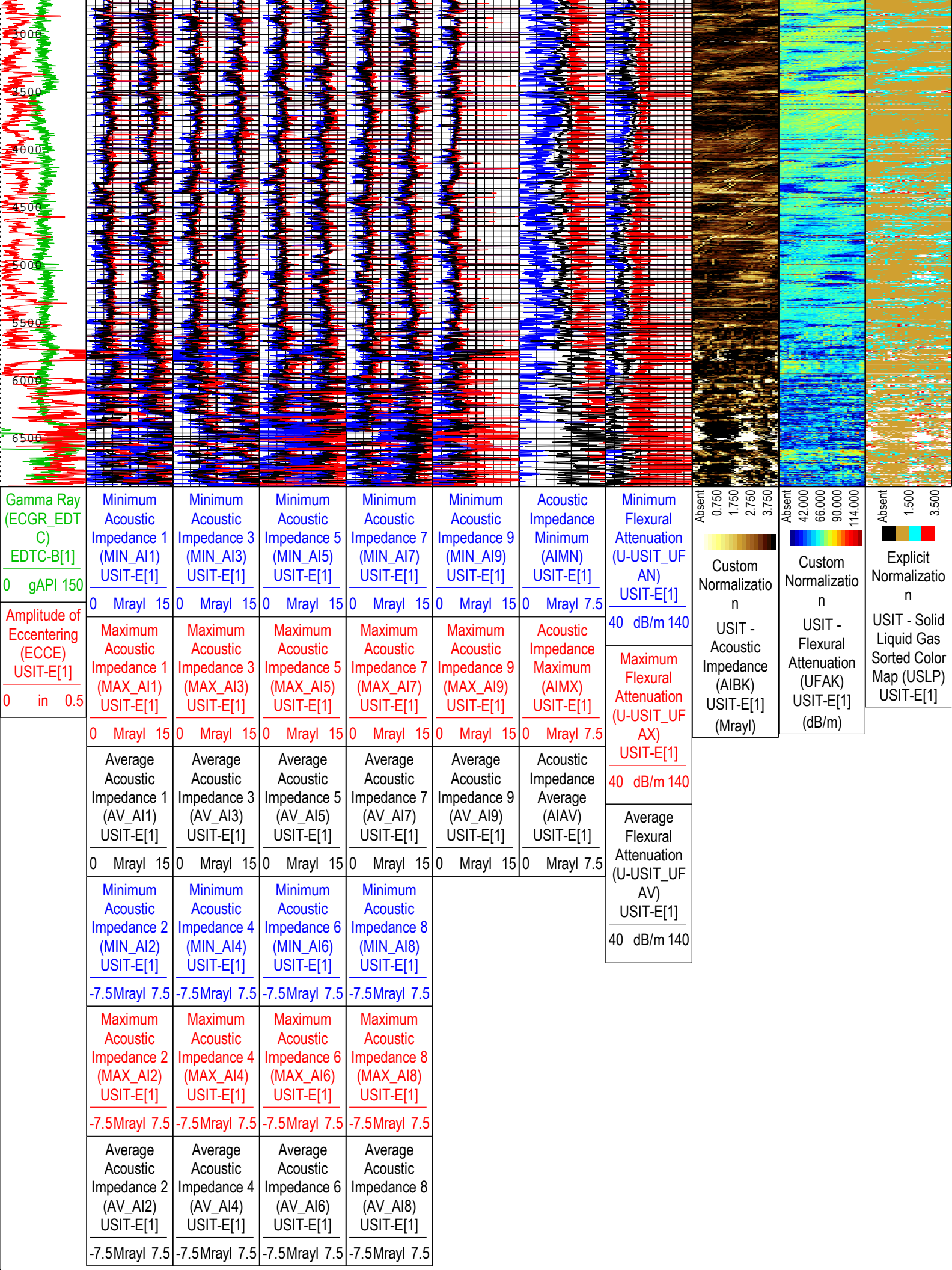
Well:Wells Ranch AE32-690

Composite 1:S008

Description: USI Goodwin Format: USI Goodwin Index Scale: 0.1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 03-Nov-2015 23:08:28

TIME_1900 - Time Marked every 60.00 (s)





Gamma Ray (ECGR_EDT C) EDTC-B[1] 0 gAPI 150	Minimum Acoustic Impedance 1 (MIN_AI1) USIT-E[1] 0 Mrayl 15	Minimum Acoustic Impedance 3 (MIN_AI3) USIT-E[1] 0 Mrayl 15	Minimum Acoustic Impedance 5 (MIN_AI5) USIT-E[1] 0 Mrayl 15	Minimum Acoustic Impedance 7 (MIN_AI7) USIT-E[1] 0 Mrayl 15	Minimum Acoustic Impedance 9 (MIN_AI9) USIT-E[1] 0 Mrayl 15	Acoustic Impedance Minimum (AIMN) USIT-E[1] 0 Mrayl 7.5	Minimum Flexural Attenuation (U-USIT_UF AN) USIT-E[1] 40 dB/m 140	Absent 0.750 1.750 2.750 3.750 Custom Normalizatio n USIT - Acoustic Impedance (AIBK) USIT-E[1] (Mrayl)	Absent 42,000 66,000 90,000 114,000 Custom Normalizatio n USIT - Flexural Attenuation (UFAK) USIT-E[1] (dB/m)	Absent 1,500 3,500 Explicit Normalizatio n USIT - Solid Liquid Gas Sorted Color Map (USLP) USIT-E[1]
Amplitude of Eccentering (ECCE) USIT-E[1] 0 in 0.5	Maximum Acoustic Impedance 1 (MAX_AI1) USIT-E[1] 0 Mrayl 15	Maximum Acoustic Impedance 3 (MAX_AI3) USIT-E[1] 0 Mrayl 15	Maximum Acoustic Impedance 5 (MAX_AI5) USIT-E[1] 0 Mrayl 15	Maximum Acoustic Impedance 7 (MAX_AI7) USIT-E[1] 0 Mrayl 15	Maximum Acoustic Impedance 9 (MAX_AI9) USIT-E[1] 0 Mrayl 15	Acoustic Impedance Maximum (AIMX) USIT-E[1] 0 Mrayl 7.5	Maximum Flexural Attenuation (U-USIT_UF AX) USIT-E[1] 40 dB/m 140			
	Average Acoustic Impedance 1 (AV_AI1) USIT-E[1] 0 Mrayl 15	Average Acoustic Impedance 3 (AV_AI3) USIT-E[1] 0 Mrayl 15	Average Acoustic Impedance 5 (AV_AI5) USIT-E[1] 0 Mrayl 15	Average Acoustic Impedance 7 (AV_AI7) USIT-E[1] 0 Mrayl 15	Average Acoustic Impedance 9 (AV_AI9) USIT-E[1] 0 Mrayl 15	Acoustic Impedance Average (AIAV) USIT-E[1] 0 Mrayl 7.5	Average Flexural Attenuation (U-USIT_UF AV) USIT-E[1] 40 dB/m 140			
	Minimum Acoustic Impedance 2 (MIN_AI2) USIT-E[1] -7.5Mrayl 7.5	Minimum Acoustic Impedance 4 (MIN_AI4) USIT-E[1] -7.5Mrayl 7.5	Minimum Acoustic Impedance 6 (MIN_AI6) USIT-E[1] -7.5Mrayl 7.5	Minimum Acoustic Impedance 8 (MIN_AI8) USIT-E[1] -7.5Mrayl 7.5						
	Maximum Acoustic Impedance 2 (MAX_AI2) USIT-E[1] -7.5Mrayl 7.5	Maximum Acoustic Impedance 4 (MAX_AI4) USIT-E[1] -7.5Mrayl 7.5	Maximum Acoustic Impedance 6 (MAX_AI6) USIT-E[1] -7.5Mrayl 7.5	Maximum Acoustic Impedance 8 (MAX_AI8) USIT-E[1] -7.5Mrayl 7.5						
	Average Acoustic Impedance 2 (AV_AI2) USIT-E[1] -7.5Mrayl 7.5	Average Acoustic Impedance 4 (AV_AI4) USIT-E[1] -7.5Mrayl 7.5	Average Acoustic Impedance 6 (AV_AI6) USIT-E[1] -7.5Mrayl 7.5	Average Acoustic Impedance 8 (AV_AI8) USIT-E[1] -7.5Mrayl 7.5						

XYZ

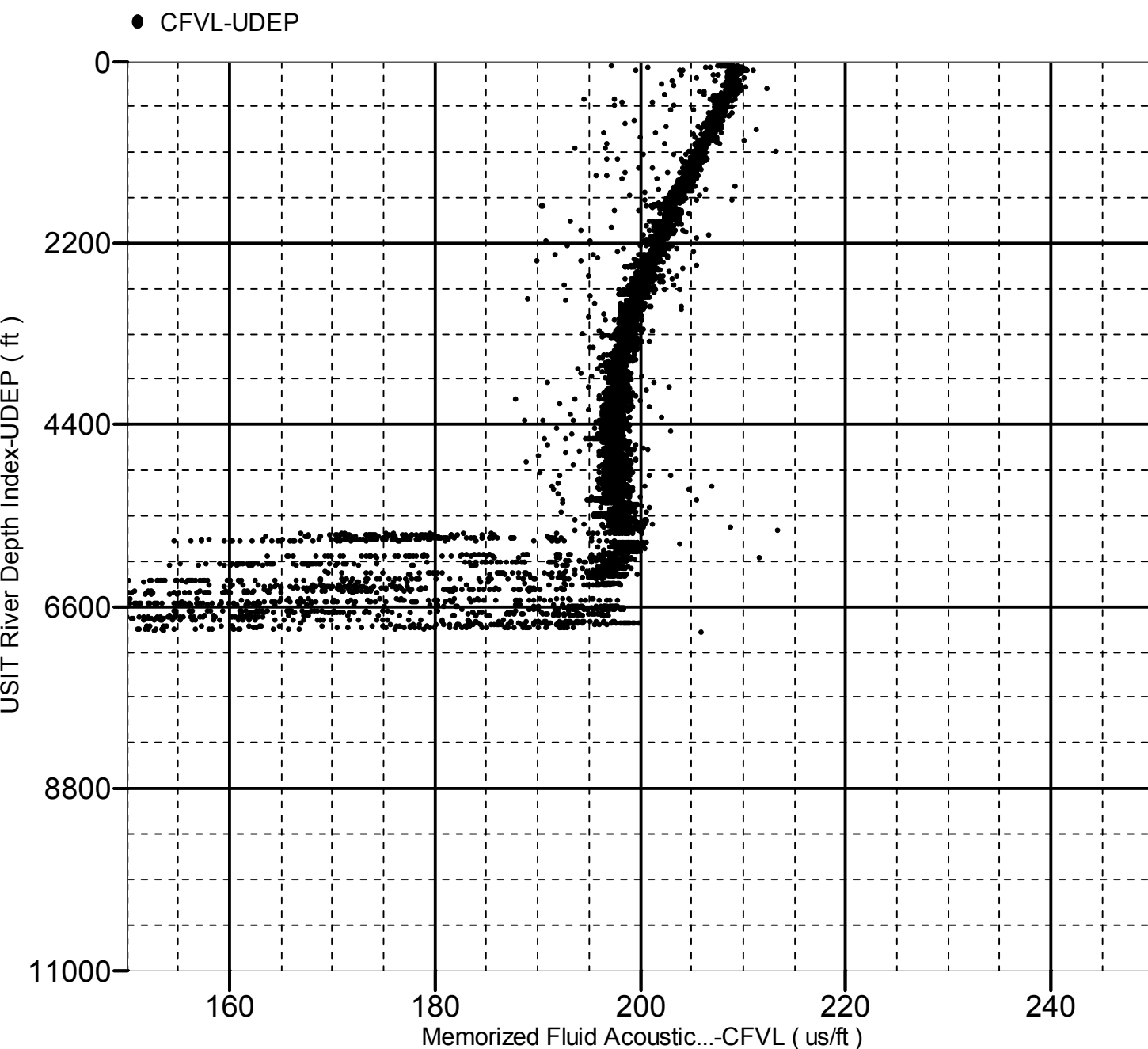
Company:Noble Energy Inc Well:Wells Ranch AE32-690

Composite 1:S008

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 66.00 to 6917.00 ft



XYZ

Company:Noble Energy Inc Well:Wells Ranch AE32-690

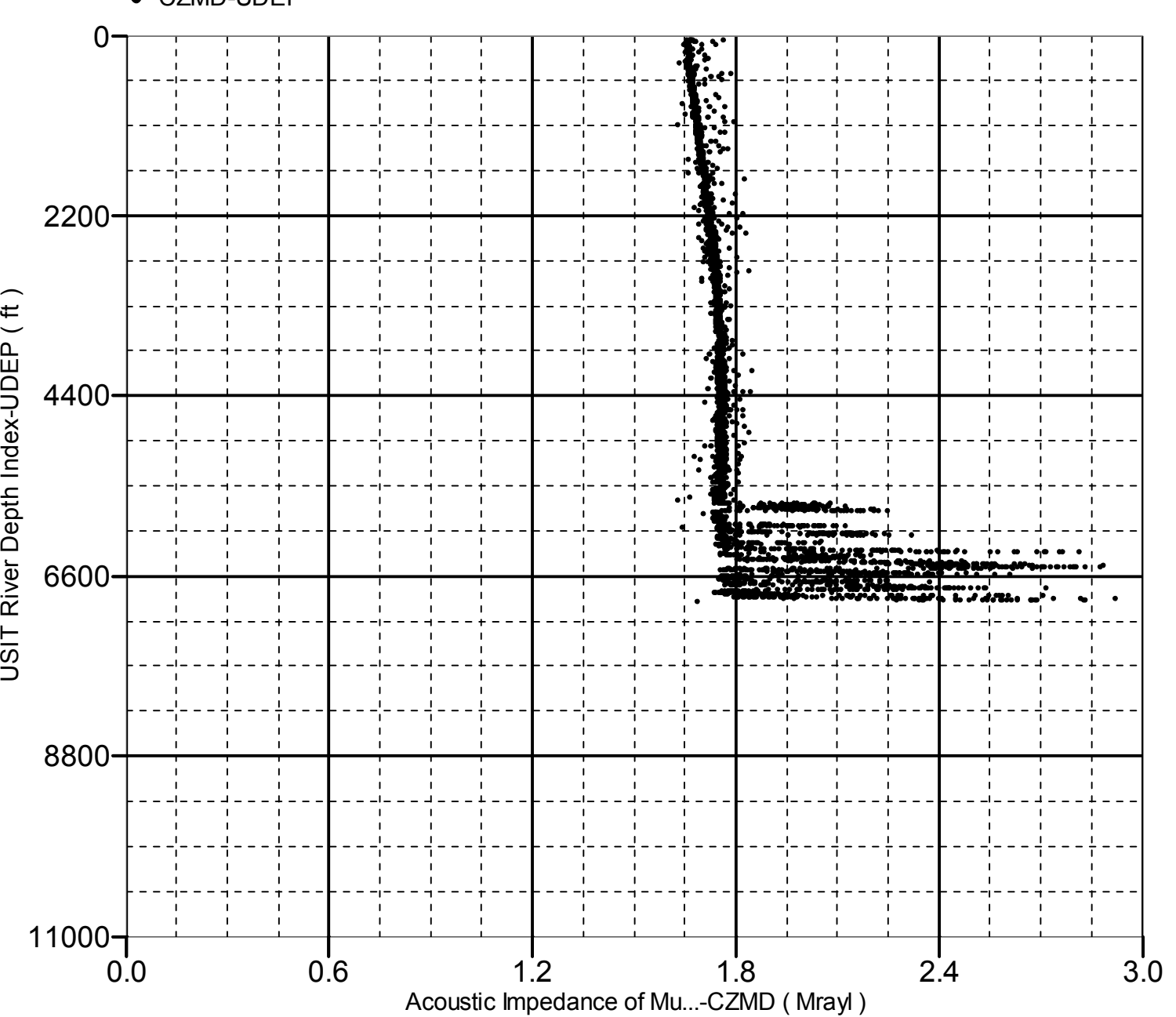
Composite 1:S008

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 66.00 to 6917.00 ft

● CZMD-UDEP



Calibration Report

EDTC-B (Enhanced Digital Telemetry Cartridge - Version B) Calibration - Run 1

Primary Equipment :
EDTC-B
EDTC-B

Calibration Parameter :
Plus Reference (Jig minus background reference)
160

EDTC-B Accelerometer Calibration - EDTC-B Accelerometer Calibration

Before (Measured): 16:40:49 03-Nov-2015

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
AZ Vertical Measurement	ft/s2	Before	32.19	31.53	32.10	32.84		

EDTC-B Memory Data - EDTC-B Memory Data

Master (EEPROM): 20:13:26 03-Nov-2015

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
Initial PMT HV	V	Master			1482.000			
Accelerometer Serial Number		Master			696			
Accelerometer Coefficients - 0		Master	----	----	2.987	----		
Accelerometer Coefficients - 1		Master	----	----	0.000	----		
Accelerometer Coefficients - 2		Master	----	----	0.000	----		
Accelerometer Coefficients - 3		Master	----	----	0.000	----		

Accelerometer Coefficients - 4		Master	----	----	0.000	----	<div></div>
Accelerometer Coefficients - 5		Master	----	----	0.000	----	<div></div>
Accelerometer Coefficients - 6		Master	----	----	0.000	----	<div></div>
Accelerometer Coefficients - 7		Master	----	----	-0.007	----	<div></div>
Accelerometer Coefficients - 8		Master	----	----	0.000	----	<div></div>
Accelerometer Coefficients - 9		Master	----	----	0.000	----	<div></div>
Accelerometer Coefficients - 10		Master	----	----	0.000	----	<div></div>
Accelerometer Coefficients - 11		Master	----	----	0.000	----	<div></div>
Gamma-Ray Detector Serial Number		Master			7792		<div></div>

EDTC-B Gamma-Ray Calibration - Gamma Ray Coefficients

Before (Measured):		20:41:14 01-Nov-2015					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div></div>
Gamma Ray Gain		Before	1.000	0.900	1.066	1.100	<div></div>

EDTC-B Gamma-Ray Calibration - Gamma Ray Accumulations

Before (Measured):		20:41:14 01-Nov-2015					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div></div>
RGR Zero Measurement	gAPI	Before		0	70.943	120.000	<div></div>
RGR Plus Measurement	gAPI	Before	160.000	145.000	150.150	175.000	<div></div>

Well: Wells Ranch AE32-690
Field: Wattenberg
County: Weld
State: Colorado

Isolation Scanner

Cement Evaluation (Short)

Gamma Ray - CCL Log