Schlumberger

Company: **Kerr−McGee Oil & Gas Onshore LP**

Well: **Bydalek 3N−20HZ**
Field: **Wattenberg**
County: **Weld** State: **Colorado**

County: Weld
Field: Wattenberg
Location: Lat/Long : 40.118262/−104.6932
Well: Bydalek 3N−20HZ
Company: Kerr−McGee Oil & Gas Onshore

Cement Evaluation
USIT

LOCATION

Lat/Long : 40.118262/−104.693211
SHL : 551' FSL X 1146' FWL SWSW

Elev.: K.B. 4945.00 ft
G.L. 4931.00 ft
D.F. 4945.00 ft

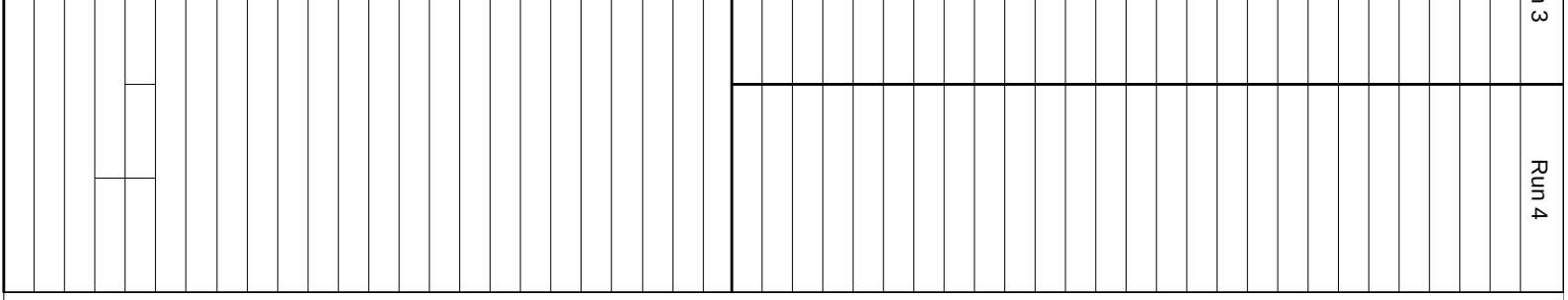
Permanent Datum: GROUND LEVEL Elev.: 4931.00 ft
Log Measured From: 14.00 ft above Perm. Datum
Drilling Measured From:

API Serial No.	Section	Township	Range
05−123−36217−00	20	2N	65W

Logging Date		29−May−2013						
Run Number		One						
Depth Driller		11597 ft						
Schlumberger Depth		6620 ft						
Bottom Log Interval		6620 ft						
Top Log Interval		0 ft						
Casing Fluid Type		Fresh Water						
Salinity								
Density		8.6 lbm/gal						
Fluid Level		0 ft						
BIT/CASING/TUBING STRING								
Bit Size		8.750 in						
From								
To								
Casing/Tubing Size		7.000 in						
Weight		26 lbm/ft						
Grade								
From								
To								
Maximum Recorded Temperatures								
Logger On Bottom	Time	29−May−2013	10:30					
Unit Number	Location	9108	Fort Morgan					
Recorded By		Arvin Shi						
Witnessed By		Keith Kallsen						

		Run 1	Run 2	Run
PVT DATA	Oil Density			
	Water Salinity			
	Gas Gravity			
	Bo			
	Bw			
	1/Bg			
	Bubble Point Pressure			
	Bubble Point Temperature			
Solution GOR				
Maximum Deviation				
CEMENTING DATA				
Primary/Squeeze		Primary		
Casing String No				
Lead Cement Type				
Volume				
Density				
Water Loss				
Additives				
Tail Cement Type				
Volume				
Density				
Water Loss				
Additives				
Expected Cement Top				

Logging Date								
Run Number								
Depth Driller								
Schlumberger Depth								
Bottom Log Interval								
Top Log Interval								
Casing Fluid Type								
Salinity								
Density								
Fluid Level								
BIT/CASING/TUBING STRING								
Bit Size								
From								
To								
Casing/Tubing Size								
Weight								
Grade								
From								
To								
Maximum Recorded Temperatures								
Logger On Bottom	Time							
Unit Number	Location							
Recorded By								
Witnessed By								



DEPTH SUMMARY LISTING

Date Created: 29−MAY−2013 20:49:00

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW−B	Type:	CMTD−B/A	Type:	7−46A−XS
Serial Number:		Serial Number:	147	Serial Number:	
Calibration Date:		Calibration Date:	09−May−2013	Length:	24000 FT
Calibrator Serial Number:		Calibrator Serial Number:	78135		
Calibration Cable Type:	7−46P	Number of Calibration Points:	10	Conveyance Method:	Wireline
Wheel Correction 1:	−7	Calibration RMS:	5	Rig Type:	LAND
Wheel Correction 2:	−6	Calibration Peak Error:	8		

Depth Control Parameters

Log Sequence: First Log In the Well

Rig Up Length At Surface: 0.00 FT
Rig Up Length At Bottom: 0.00 FT
Rig Up Length Correction: 0.00 FT
Stretch Correction:
Tool Zero Check At Surface:

Depth Control Remarks

1. All Schlumberger depth measurement policies followed
2. IDW used as primary depth measurement and Z−Chart as secondary depth measurement
3.
4.
5.
6.

OTHER SERVICES1	OTHER SERVICES2
OS1: None	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:

REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
1. Toolstring run as per tool sketch	
2. Packer set at 6715 ft and liner set up at 6640 ft	
3. Mainpass start from 6620 ft with 10 Deg 3 in resolution with 2000 psi pressure	
4. Repeatpass was done from 6620 ft to 6300 ft with 10 Deg 3 in resolution without pressure	
5. Hi resolution pass was done with 10 Deg 0.6 in resolution without pressure	
6. Tail Cement is 14.4 ppg and Lead cement is 12.7 ppg	
7. Log was measured from Ground Level	

Your Crew : Josh Strand, Tyler Riter, Matt Steinman

RUN 1		RUN 2	
SERVICE ORDER #:		SERVICE ORDER #:	
PROGRAM VERSION:	19C1−222	PROGRAM VERSION:	
FLUID LEVEL:	0 ft	FLUID LEVEL:	

LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

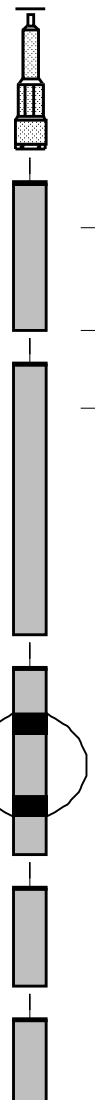
EQUIPMENT DESCRIPTION

RUN 1 RUN 2

SURFACE EQUIPMENT

GSR−U/Y
WITM (DTS)−A

DOWNHOLE EQUIPMENT



LEH−QT 32.8
LEH−QT

DTC−H 29.8
ECH−KC
DTCH0−A
DTCH1−A

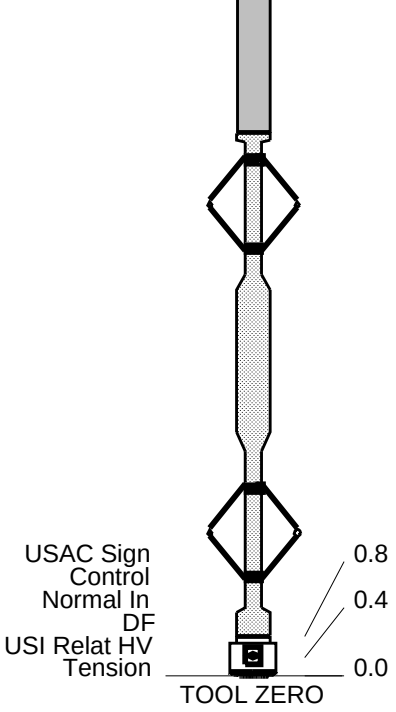
SGT−N 26.8
SGH−K
SGC−TB
SGD−TAB

AH−CEN 21.3
AH−CEN

AH−107 17.5
AH−107

USIT−E 15.5
ECH−MFA 1964
USAC−A 992
USIS−A 2797

USSC−A
USRS−B 875



MAXIMUM STRING DIAMETER 7.50 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Schlumberger

Composite 5 in

MAXIS Field Log

Company: Kerr−McGee Oil & Gas Onshore LP **Well: Bydalek 3N−20HZ**

Input DLIS Files

	USI_011LUP	FN:10		29−May−2013 20:40	6620.5 FT	−19.8 FT

Output DLIS Files

DEFAULT	USI_008PUP	FN:7	PRODUCER	29−May−2013 21:16	6624.5 FT	−15.4 FT

OP System Version: 19C1−222

eWAFE Version: 1.186

USIT−E	19C1−222	SGT−N	19C1−222
DTC−H	19C1−222		

Zoning of Mud Parameters

Depth	Fluid Velocity (DFVL)	Acoustic Impedance (ZMUD)
6600.00	187.00	1.64
6300.00	187.00	1.65

6300.00	187.00	1.65
6000.00	187.00	1.62
5700.00	187.20	1.63
5400.00	188.30	1.62
5100.00	188.80	1.59
4800.00	185.95	1.63
4500.00	187.50	1.65
4200.00	186.00	1.63
3900.00	187.00	1.95
3600.00	189.00	1.95
3300.00	187.82	1.95
3000.00	188.39	1.95
2700.00	189.39	1.95
2400.00	190.40	1.95
2100.00	191.92	1.95
1800.00	192.92	1.64
1500.00	195.00	1.65
1200.00	196.00	1.65
900.00	197.00	1.63
600.00	199.00	1.63
300.00	202.00	1.73

Image rotation (UCAZ) (DEG)

0 360

Azimuth of eccent. (AZEC) (DEG)

0 360

Tool/Tot. Drag From D4T to STIA

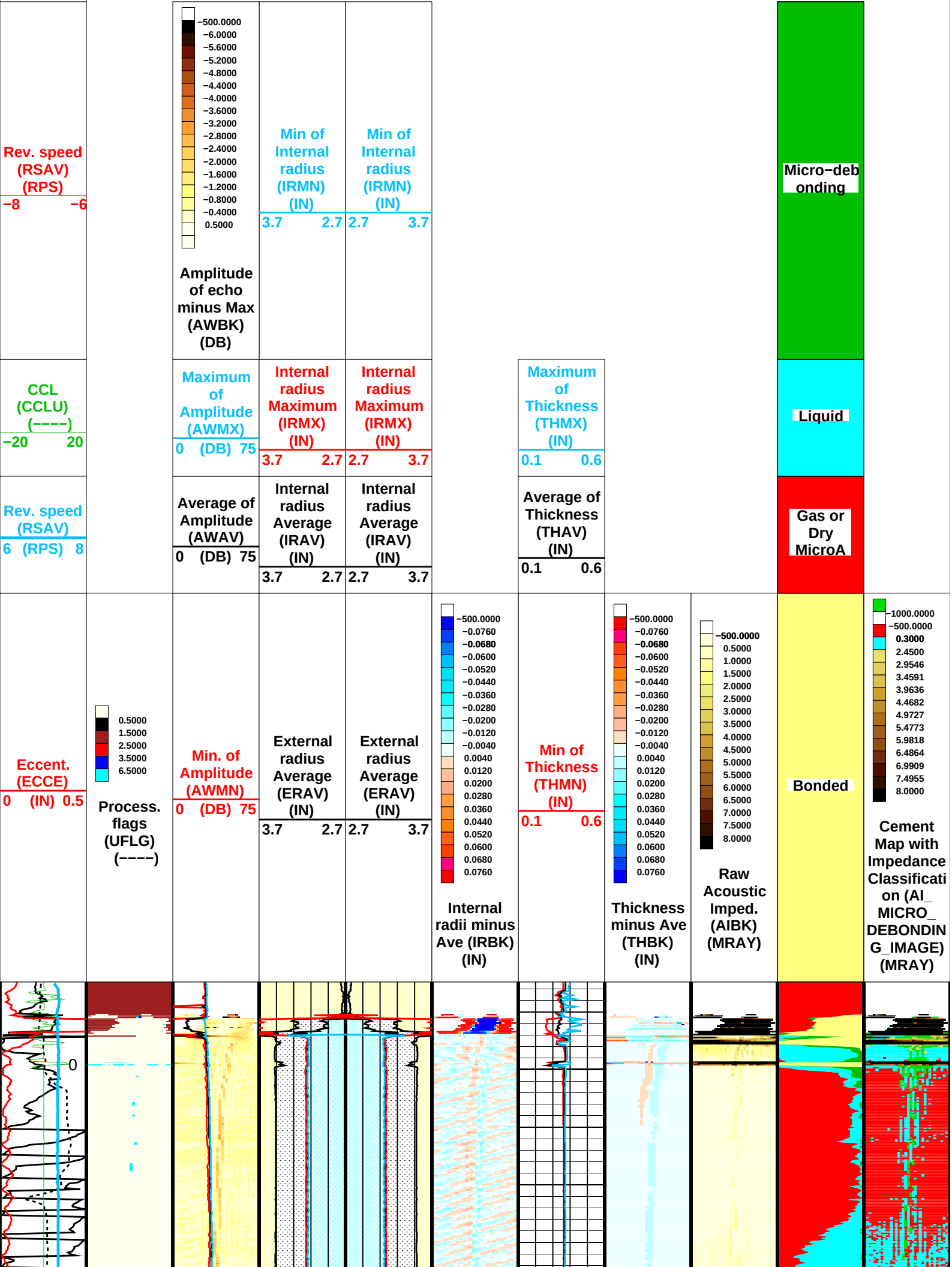
Cable Drag From D4T to STIT

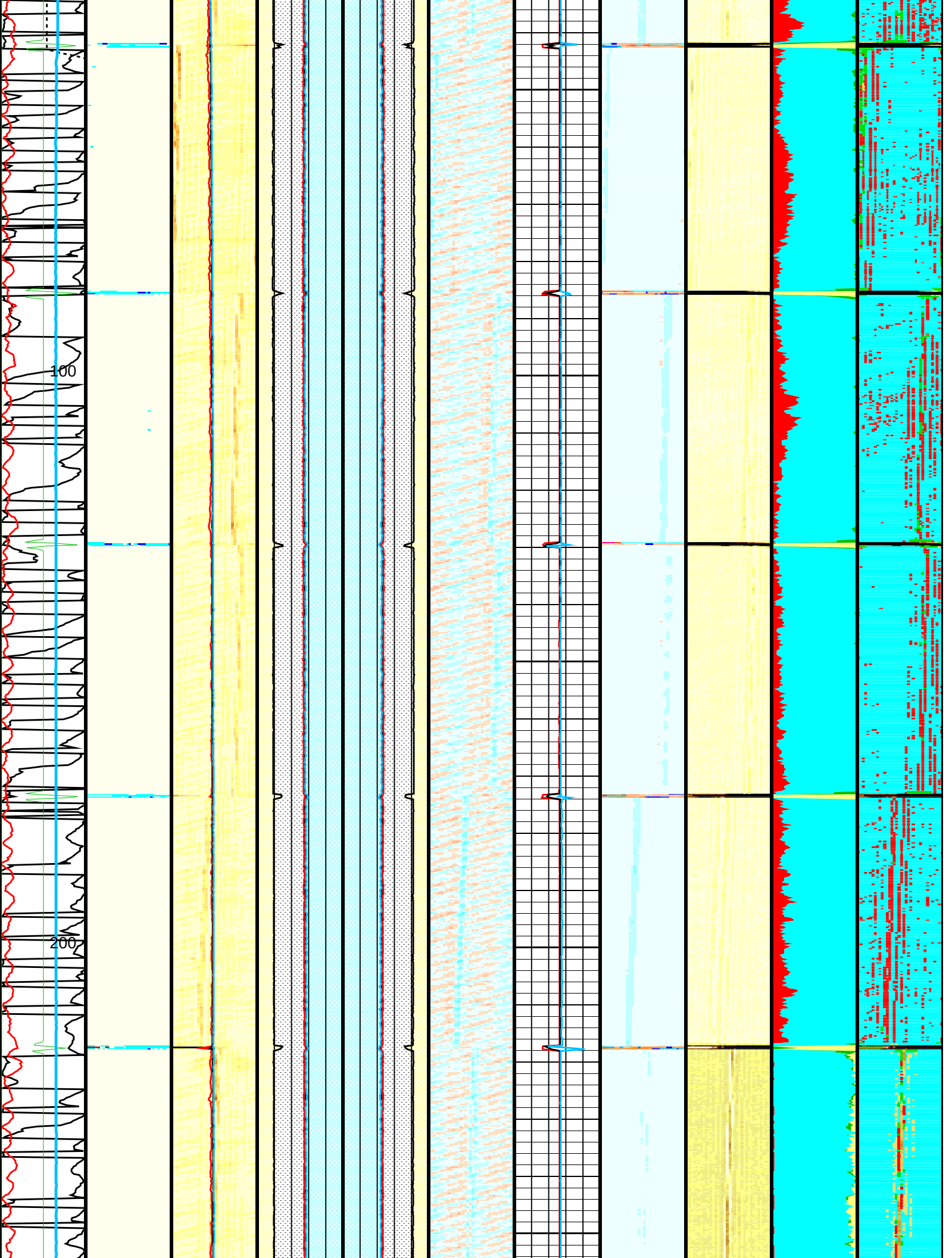
Stuck Stretch (STIT)

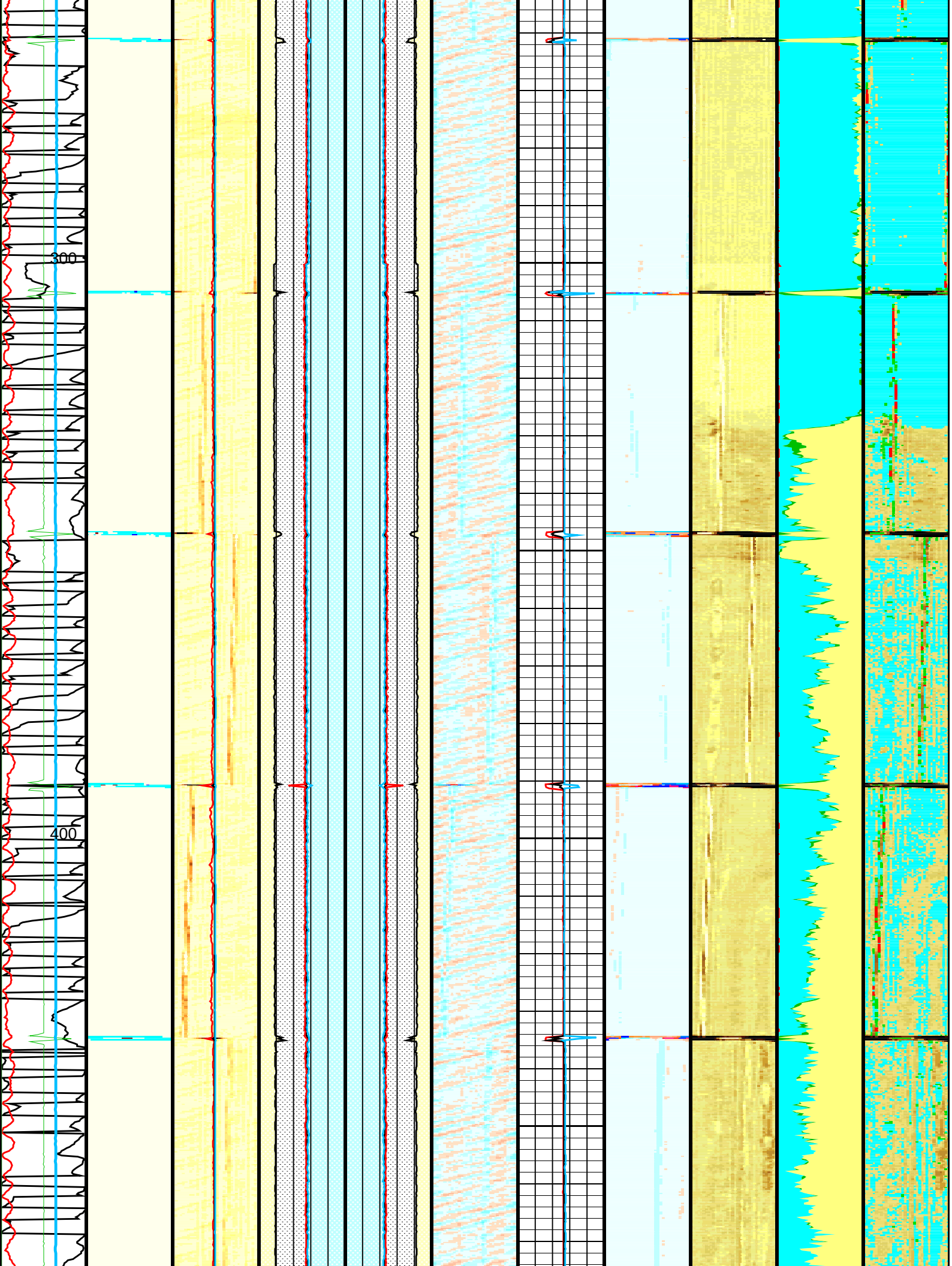
0 (F) 50

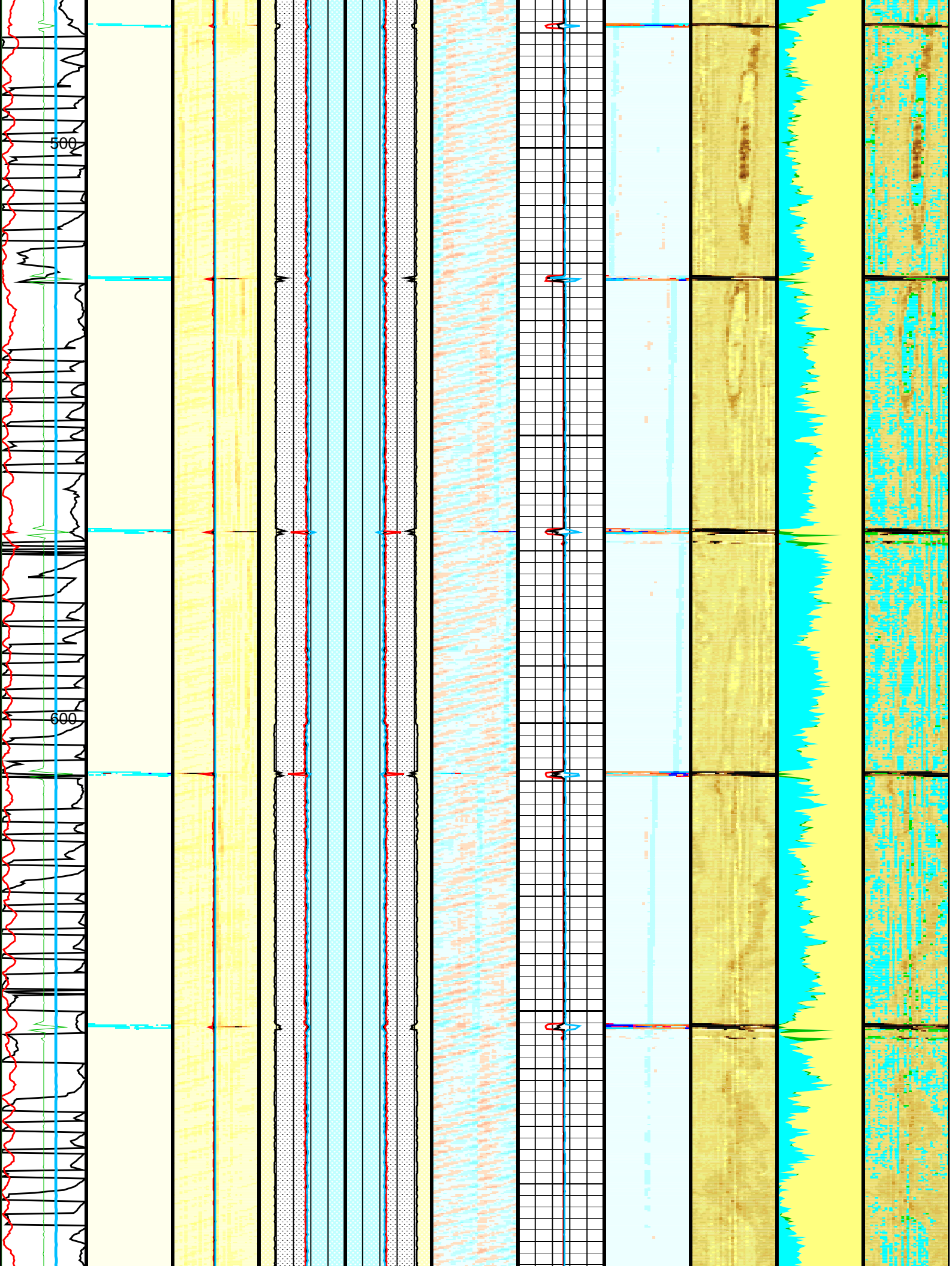
Cable Speed (CS) (F/HR)

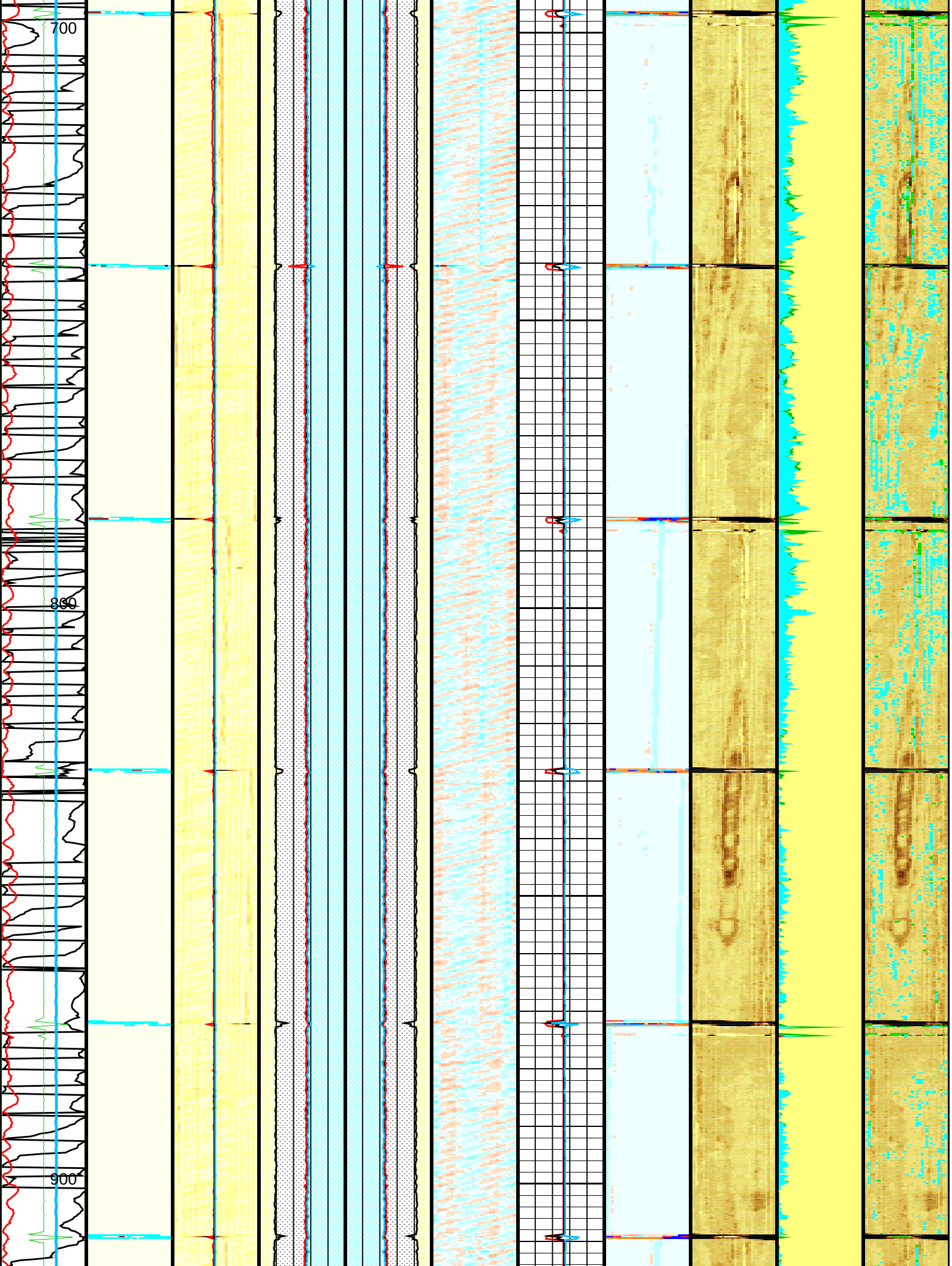
0 2000

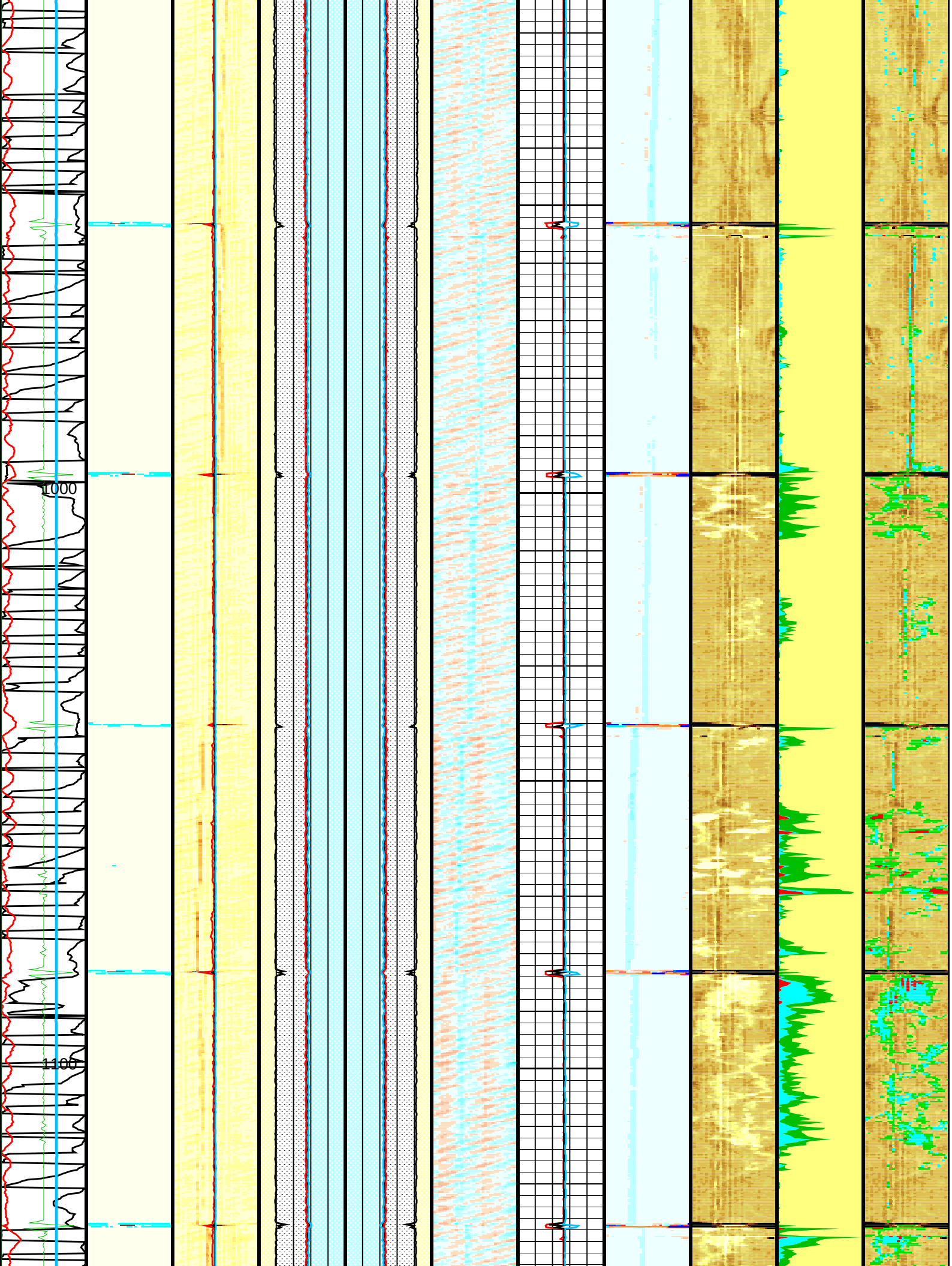

Rev. speed (RSAV) (RPS)
−8 −6
CCL (CCLU) (−−−−)
−20 20
Rev. speed (RSAV)
6 (RPS) 8
Eccent. (ECCE)
0 (IN) 0.5
−500.0000
−6.0000
−5.6000
−5.2000
−4.8000
−4.4000
−4.0000
−3.6000
−3.2000
−2.8000
−2.4000
−2.0000
−1.6000
−1.2000
−0.8000
−0.4000
0.5000
Amplitude of echo minus Max (AWBK) (DB)
Maximum of Amplitude (AWMX)
0 (DB) 75
Average of Amplitude (AWAV)
0 (DB) 75
Min. of Amplitude (AWMN)
0 (DB) 75
0.5000
1.5000
2.5000
3.5000
6.5000
Process. flags (UFLG) (−−−−)
Min of Internal radius (IRMN) (IN)
3.7 2.7
Internal radius Maximum (IRMX) (IN)
3.7 2.7
Internal radius Average (IRAV) (IN)
3.7 2.7
External radius Average (ERAV) (IN)
3.7 2.7
Min of Internal radius (IRMN) (IN)
2.7 3.7
Internal radius Maximum (IRMX) (IN)
2.7 3.7
Internal radius Average (IRAV) (IN)
2.7 3.7
External radius Average (ERAV) (IN)
2.7 3.7
−500.0000
−0.0760
−0.0680
−0.0600
−0.0520
−0.0440
−0.0360
−0.0280
−0.0200
−0.0120
−0.0040
0.0040
0.0120
0.0200
0.0280
0.0360
0.0440
0.0520
0.0600
0.0680
0.0760
Internal radii minus Ave (IRBK) (IN)
Maximum of Thickness (THMX) (IN)
0.1 0.6
Average of Thickness (THAV) (IN)
0.1 0.6
Min of Thickness (THMN) (IN)
0.1 0.6
−500.0000
−0.0760
−0.0680
−0.0600
−0.0520
−0.0440
−0.0360
−0.0280
−0.0200
−0.0120
−0.0040
0.0040
0.0120
0.0200
0.0280
0.0360
0.0440
0.0520
0.0600
0.0680
0.0760
Thickness minus Ave (THBK) (IN)
−500.0000
0.5000
1.0000
1.5000
2.0000
2.5000
3.0000
3.5000
4.0000
4.5000
5.0000
5.5000
6.0000
6.5000
7.0000
7.5000
8.0000
Raw Acoustic Imped. (AIBK) (MRAY)
Micro−debonding
Liquid
Gas or Dry MicroA
Bonded
−1000.0000
−500.0000
0.3000
2.4500
2.9546
3.4591
3.9636
4.4682
4.9727
5.4773
5.9818
6.4864
6.9909
7.4955
8.0000
Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (MRAY)
0

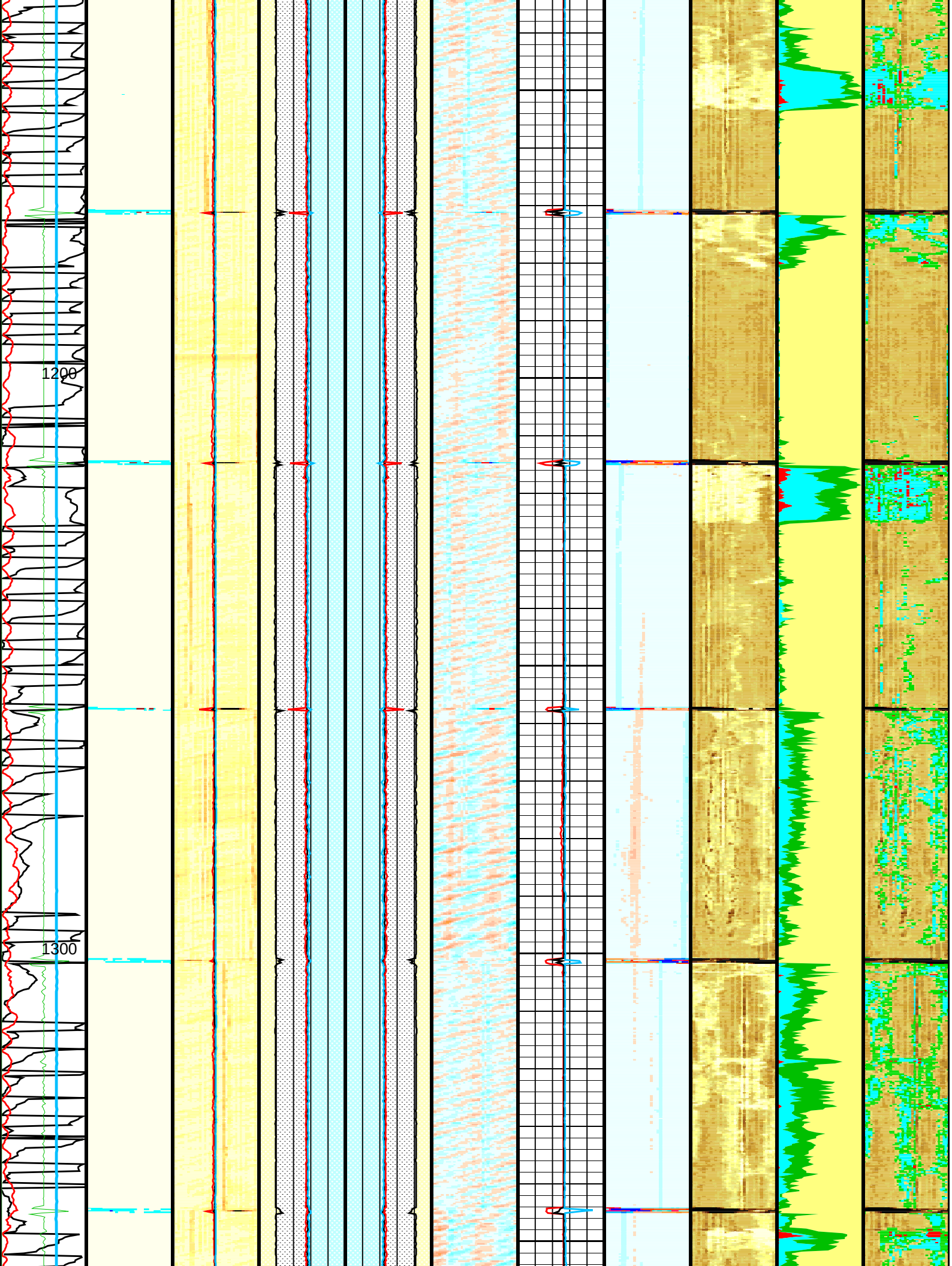

100
200

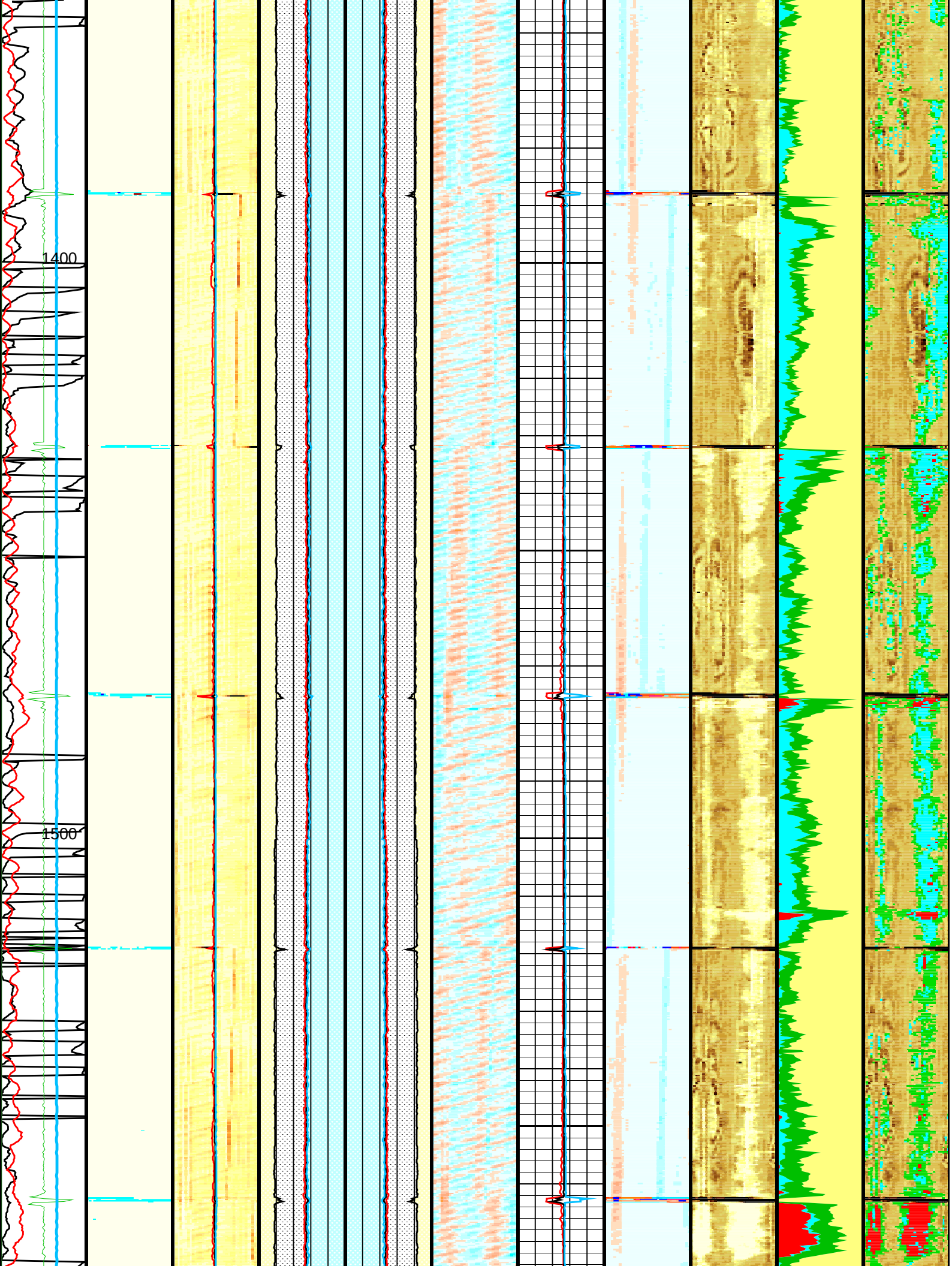

300
400

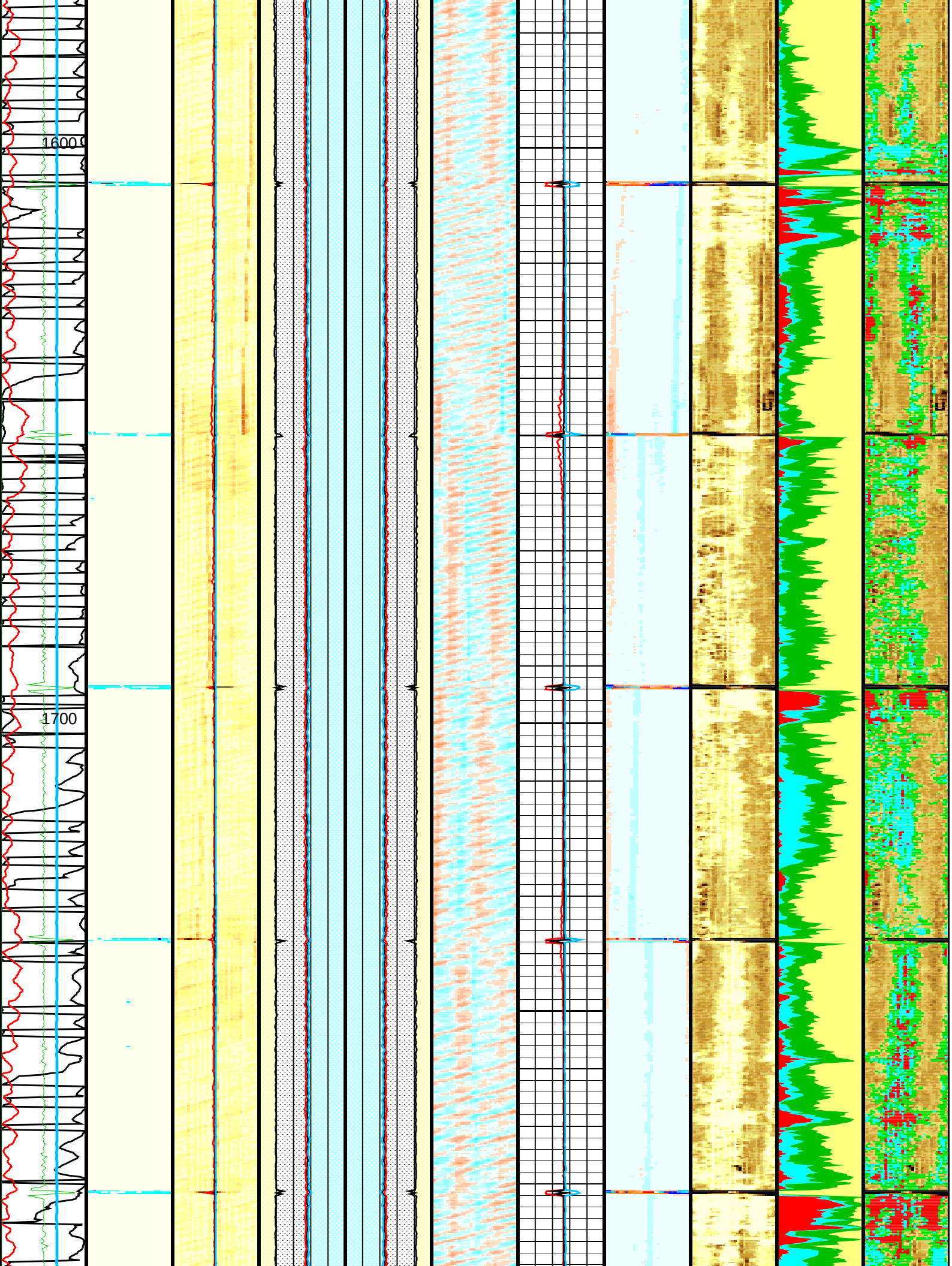

500
600

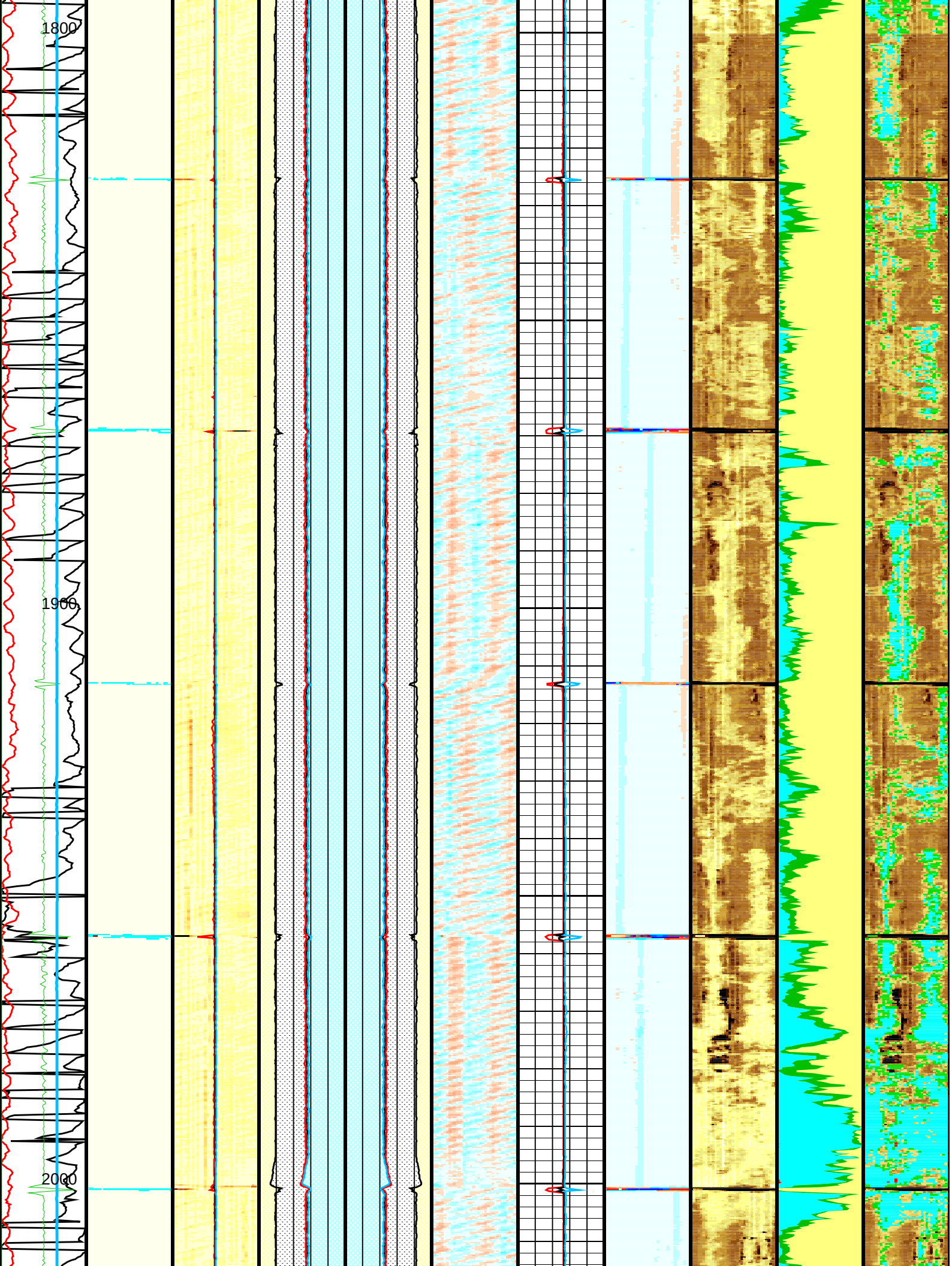

700
800
900

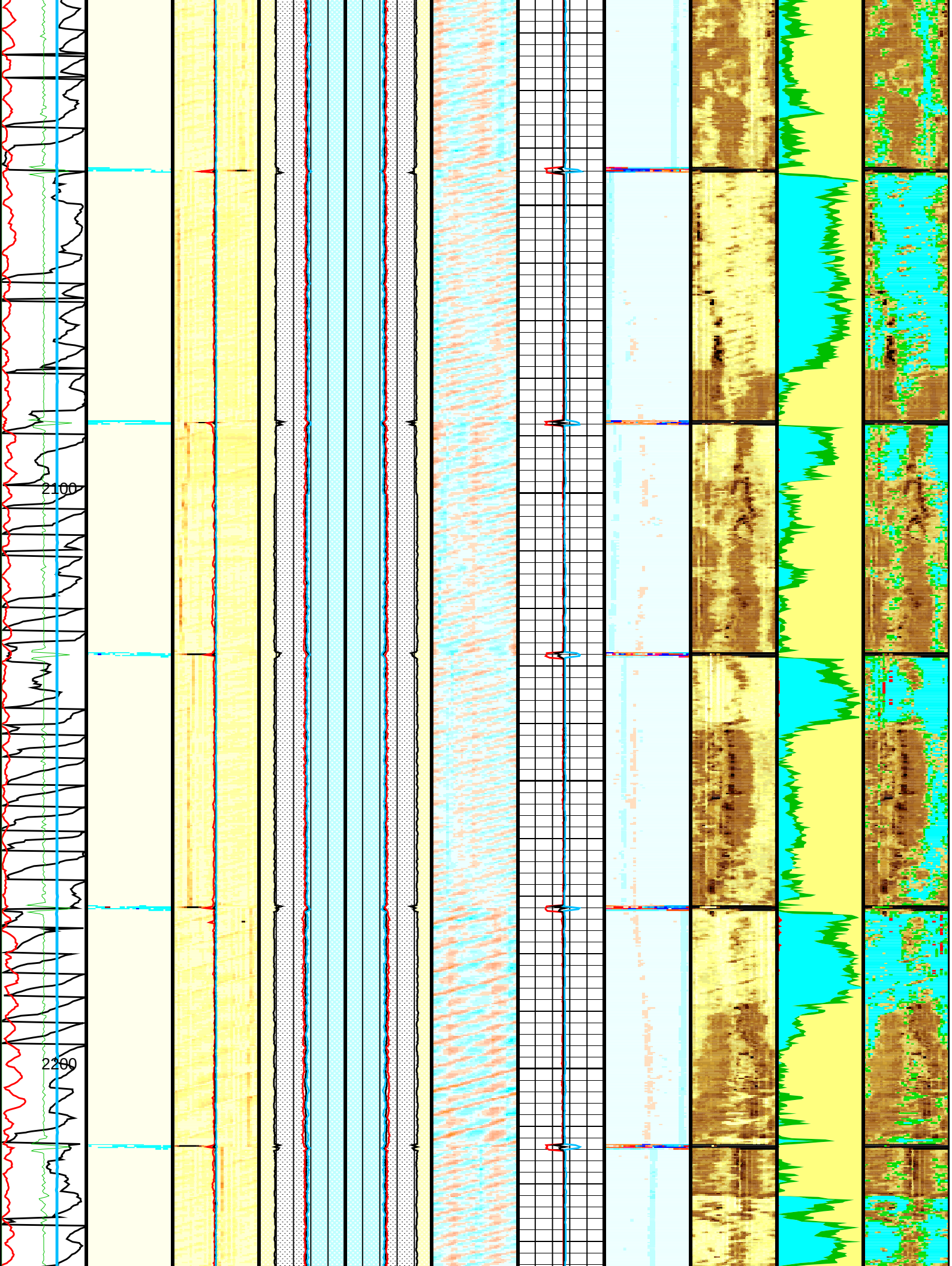

1000
1100

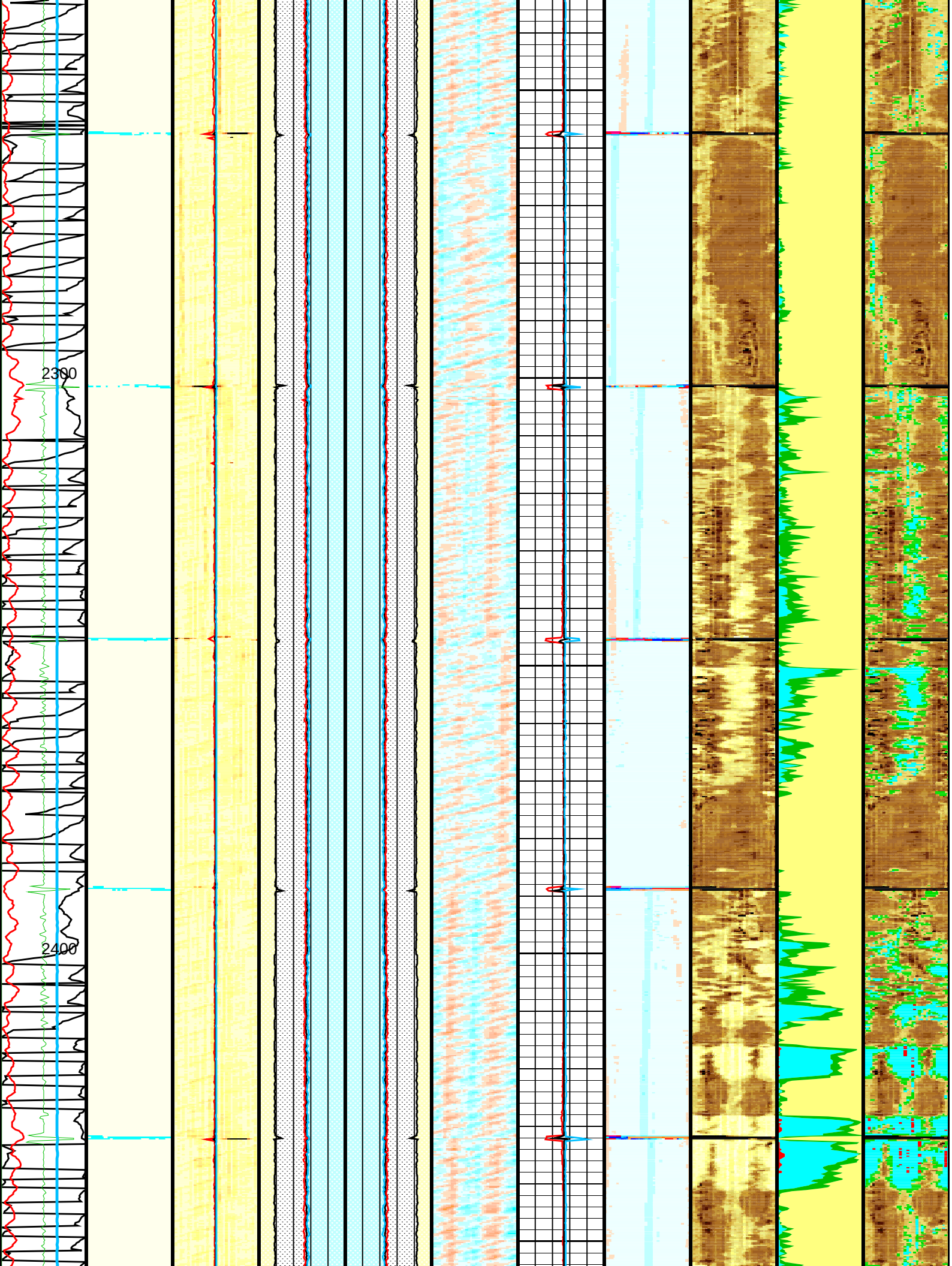

1200
1300

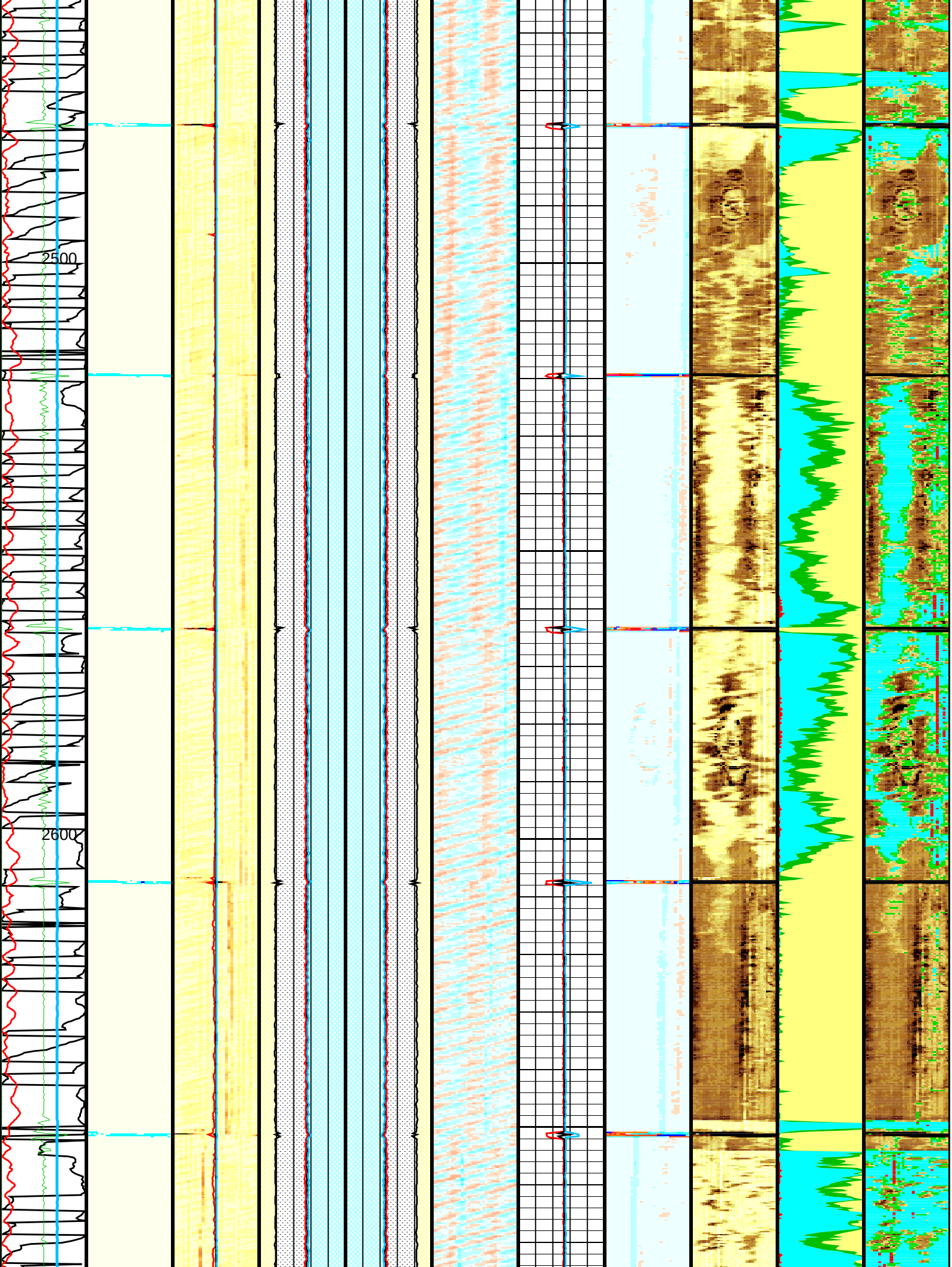

1400
1500

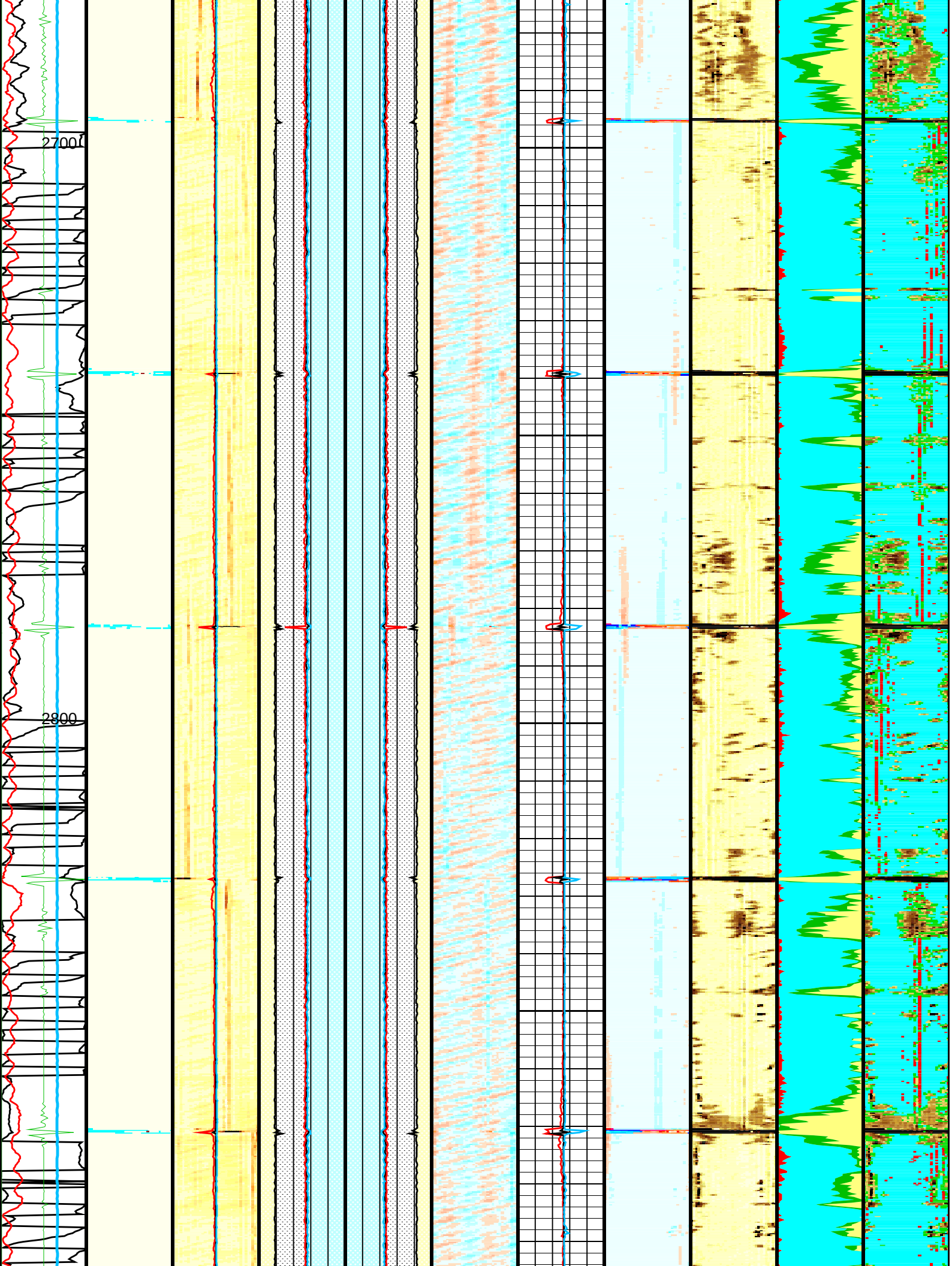

1600
1700

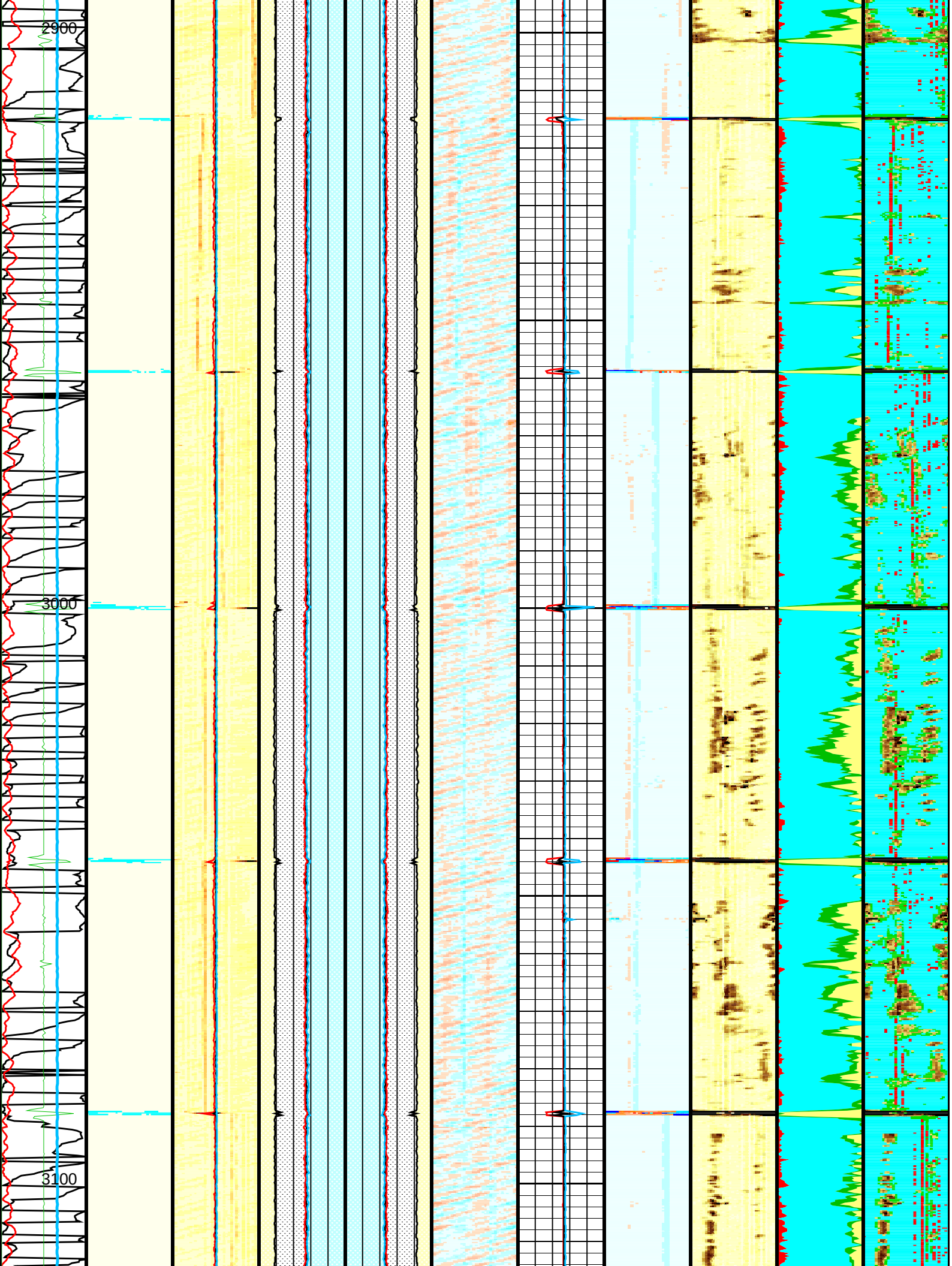

1800
1900
2000

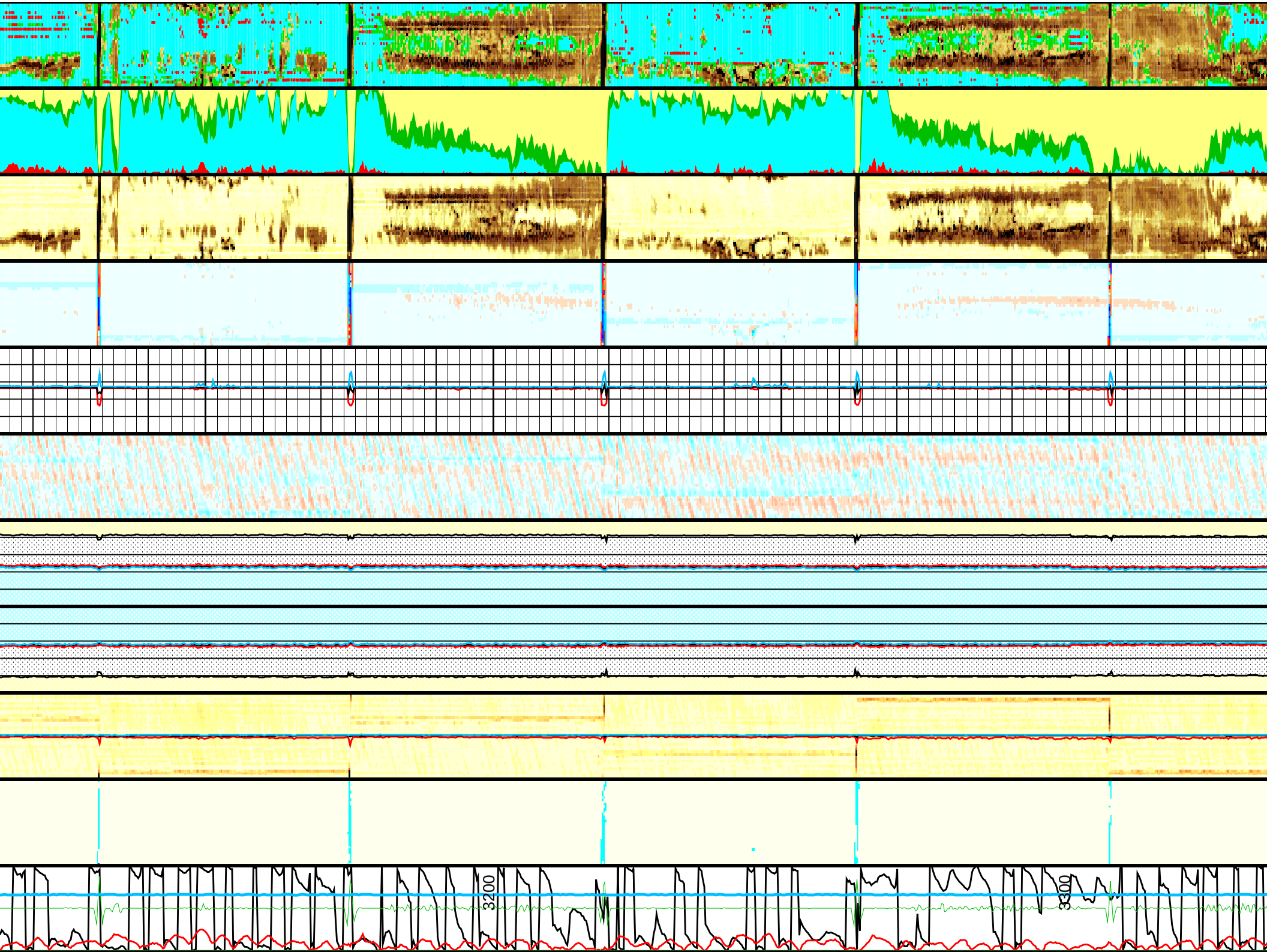

2100
2200

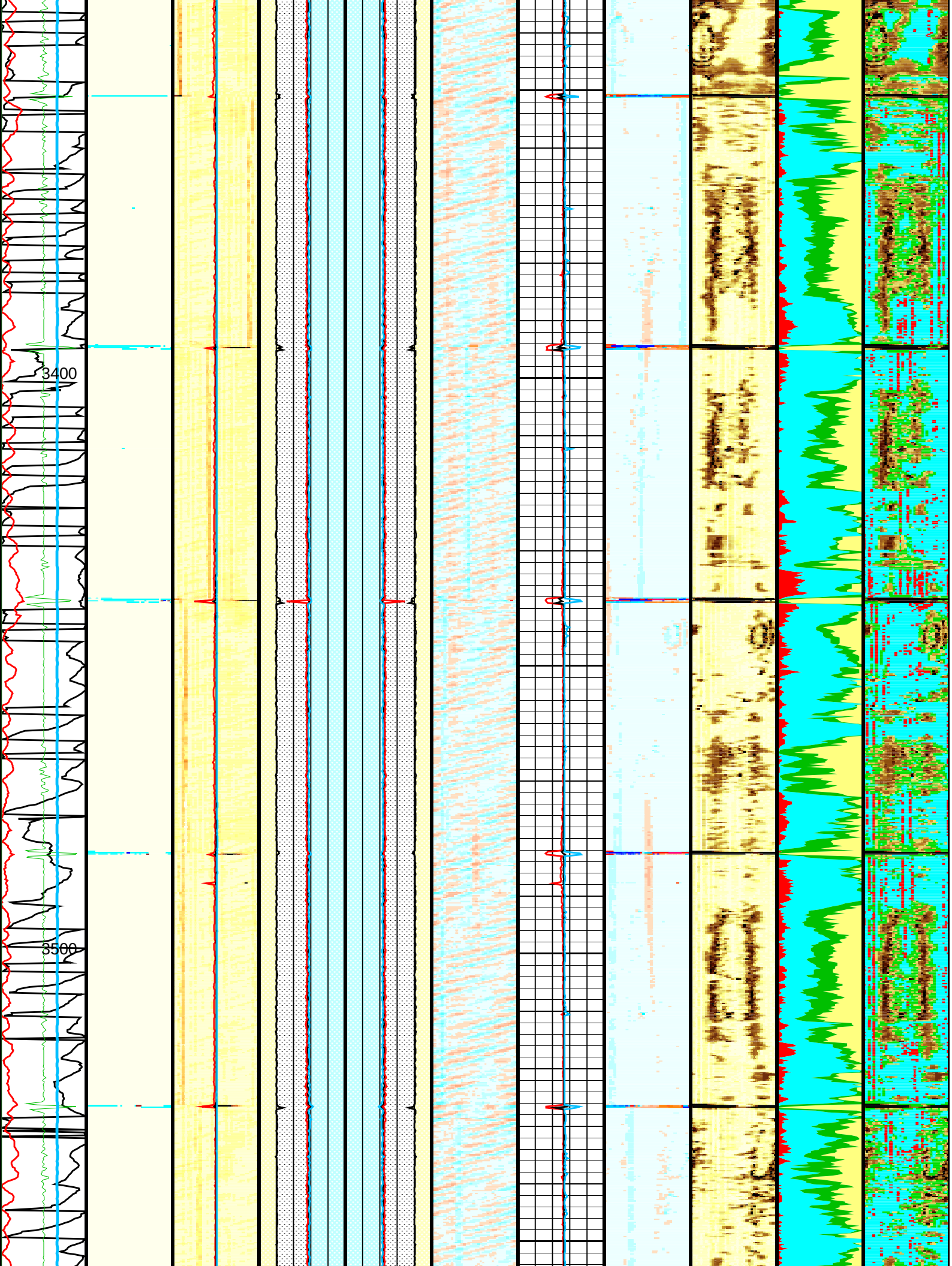

2300
2400

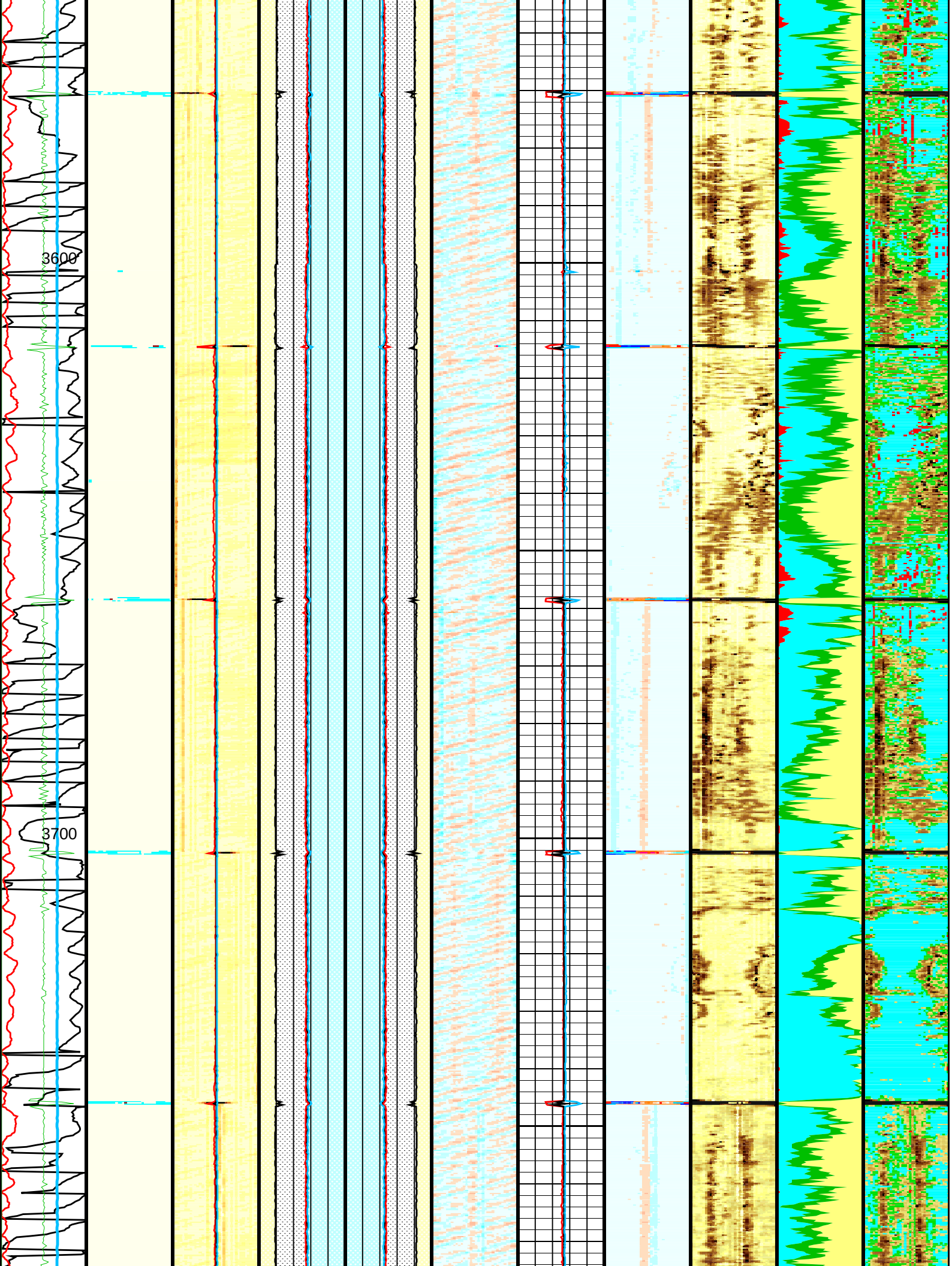

2500
2600

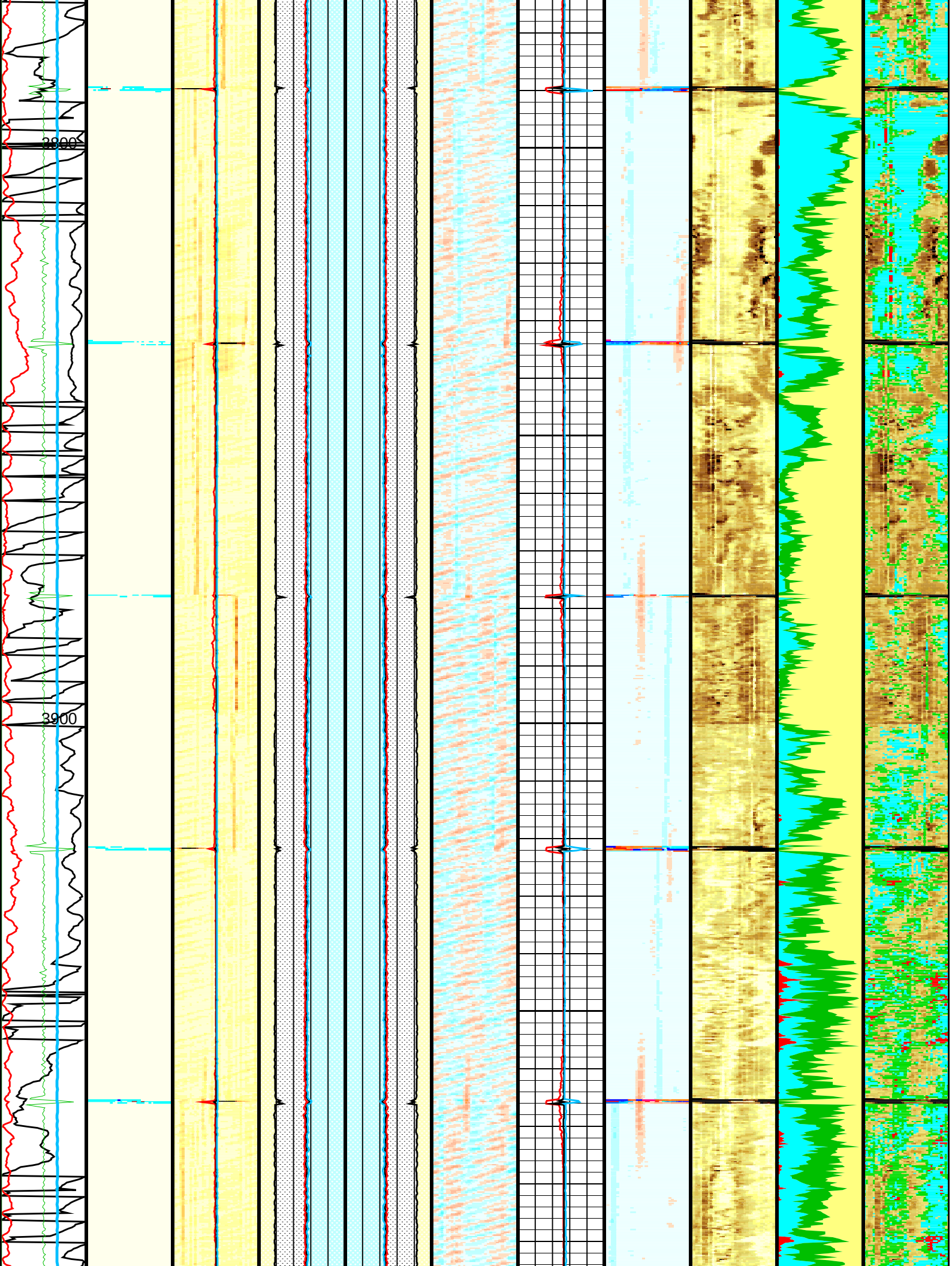

2700
2800

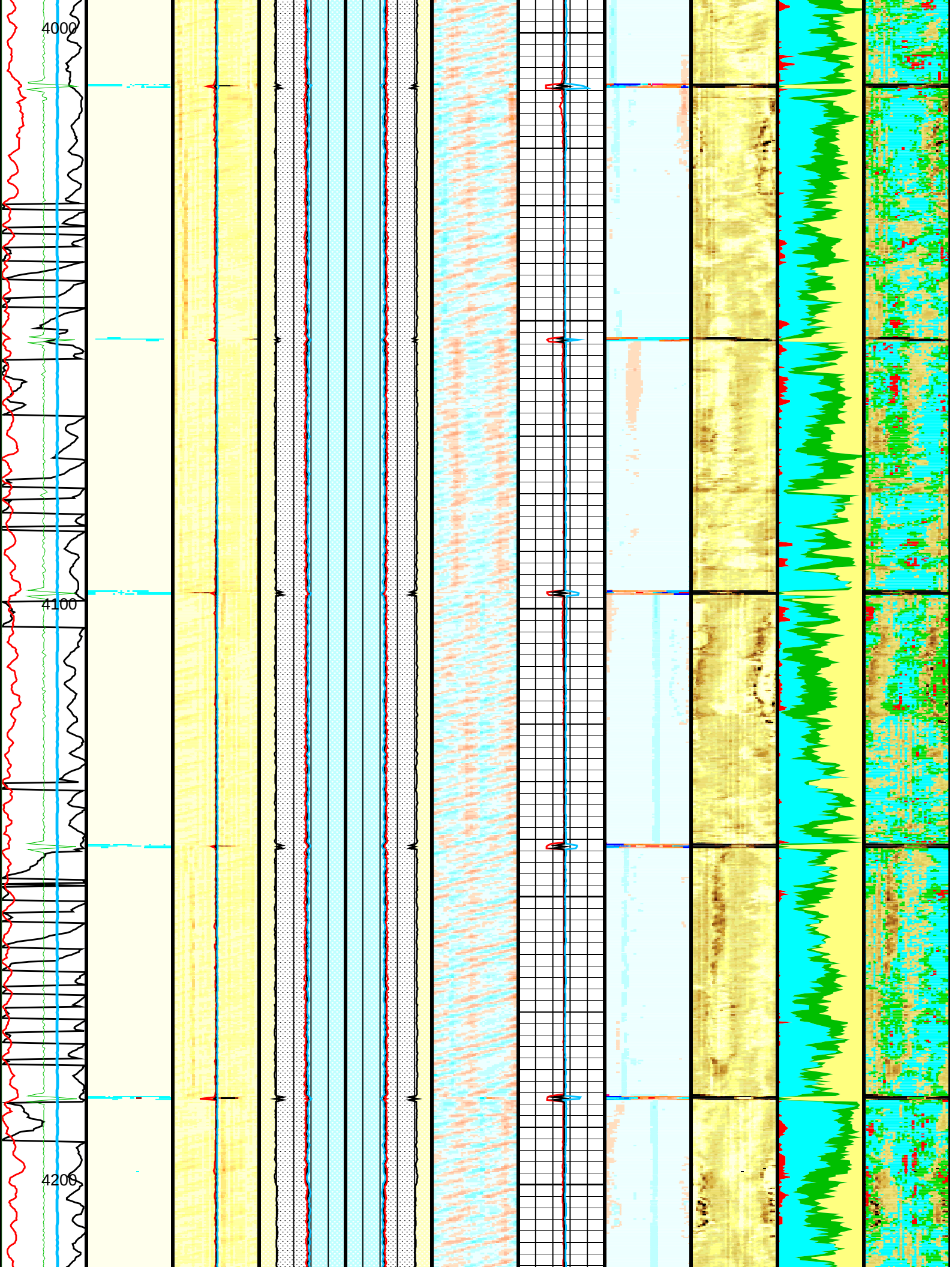

2900
3000
3100

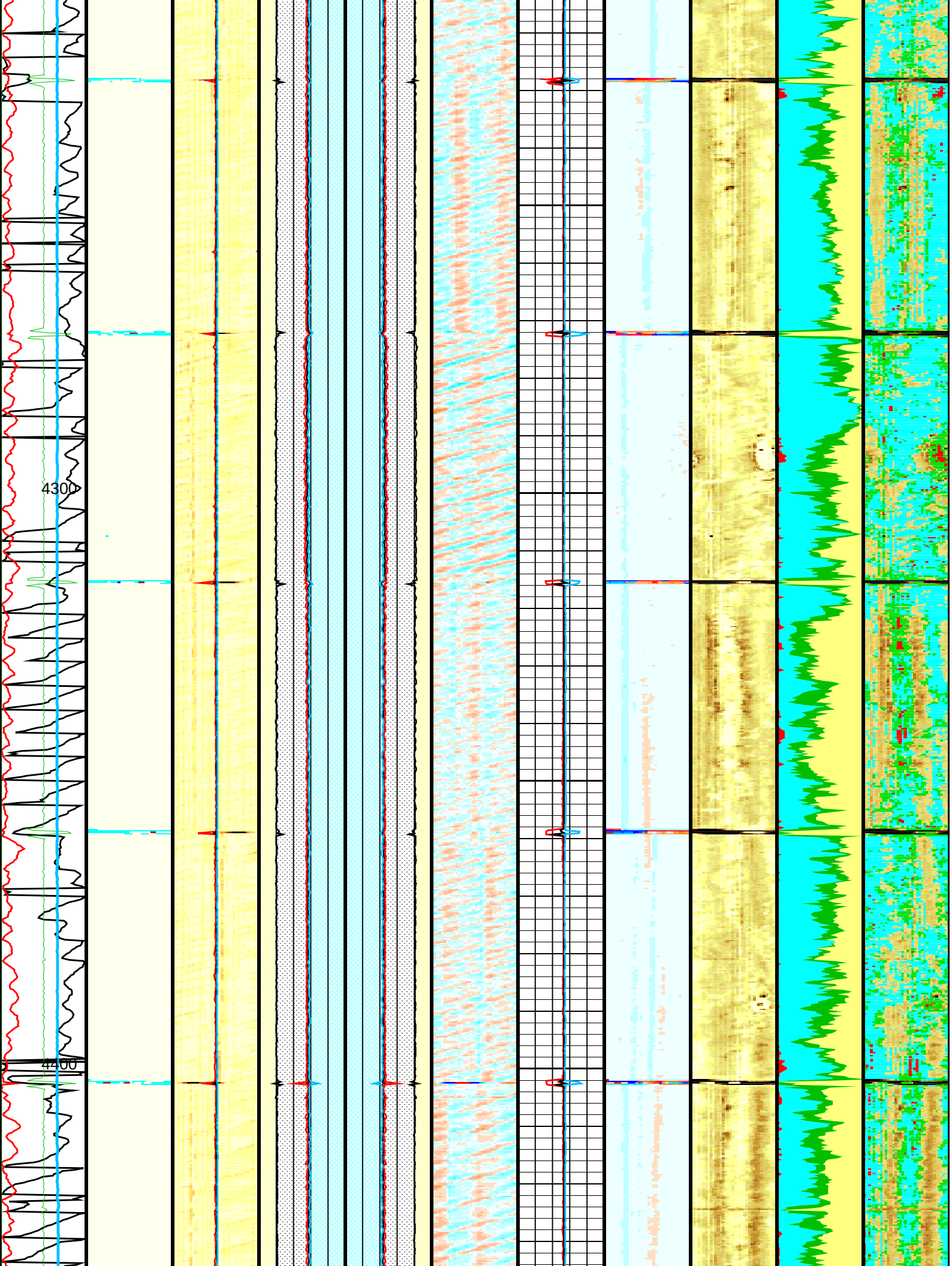

3200
3300

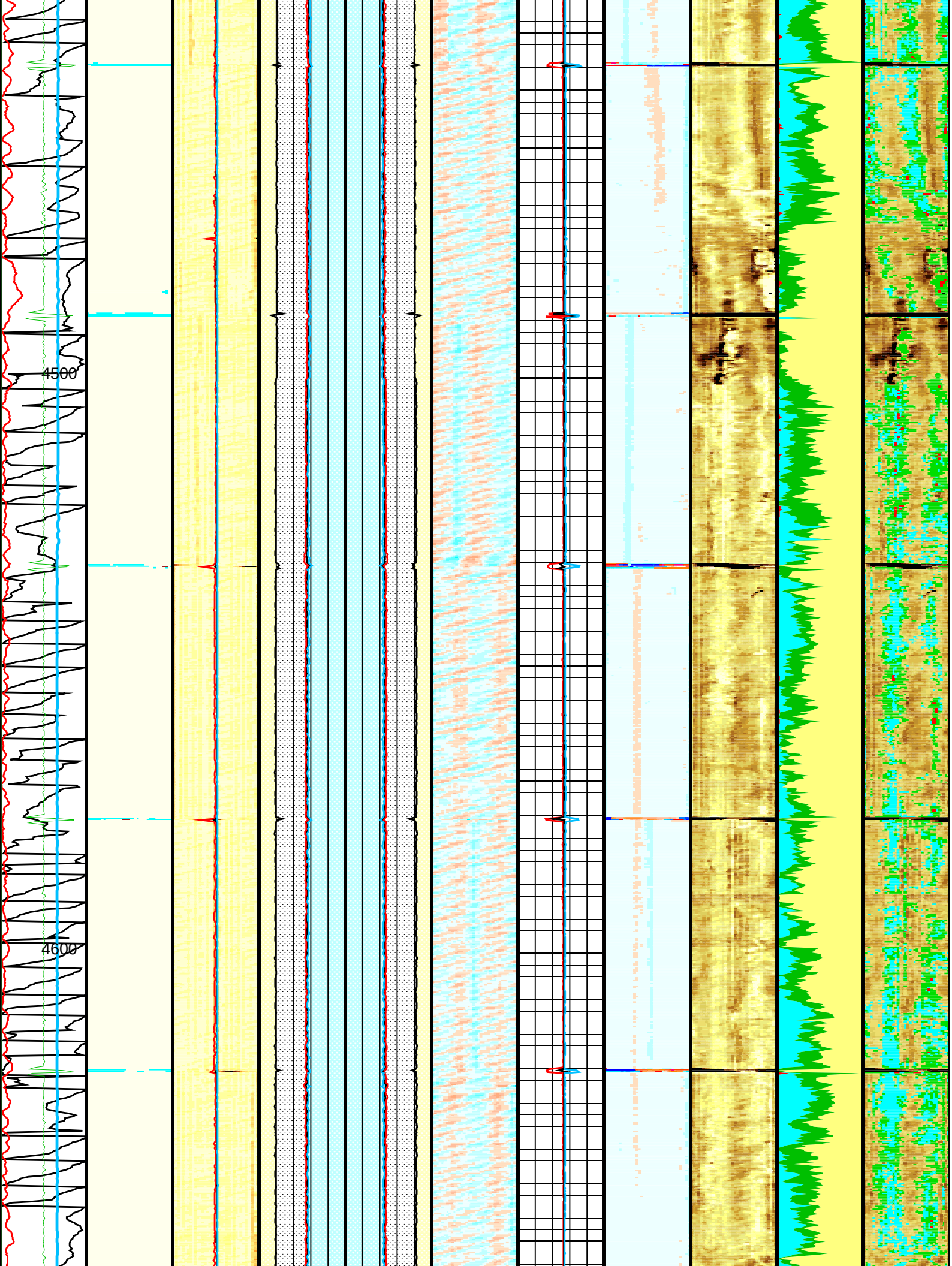

3400
3500

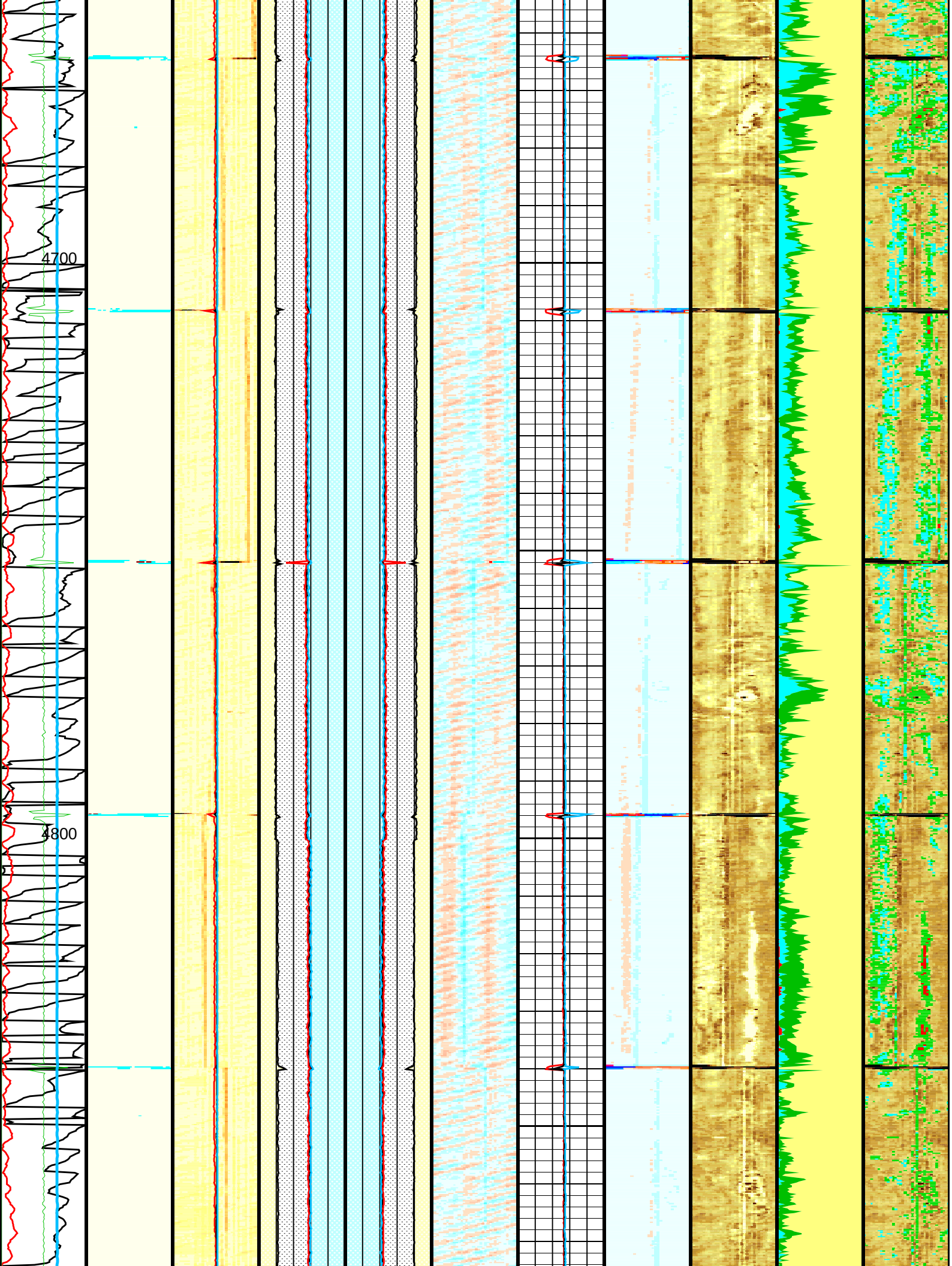

3600
3700

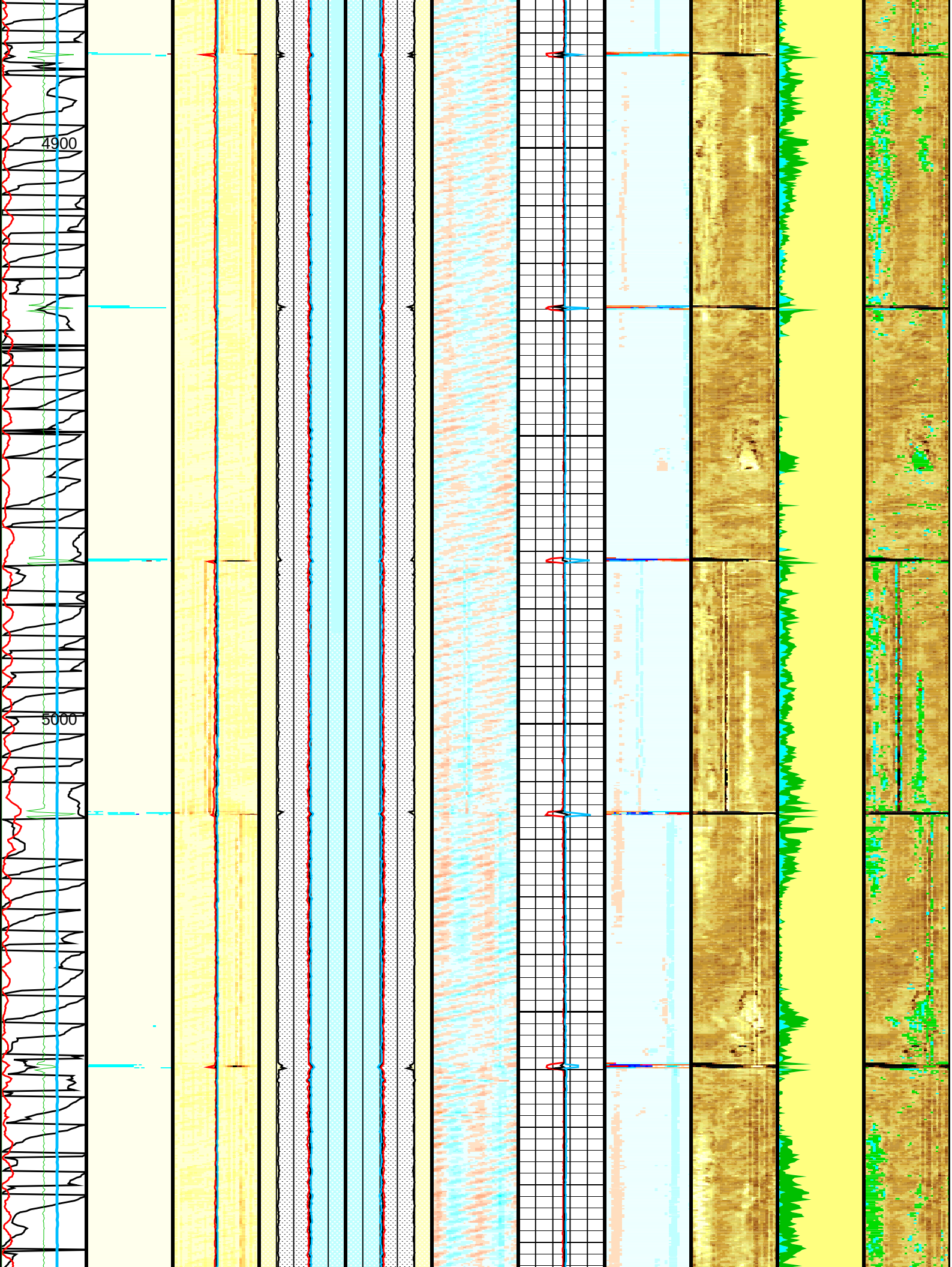

3800
3900

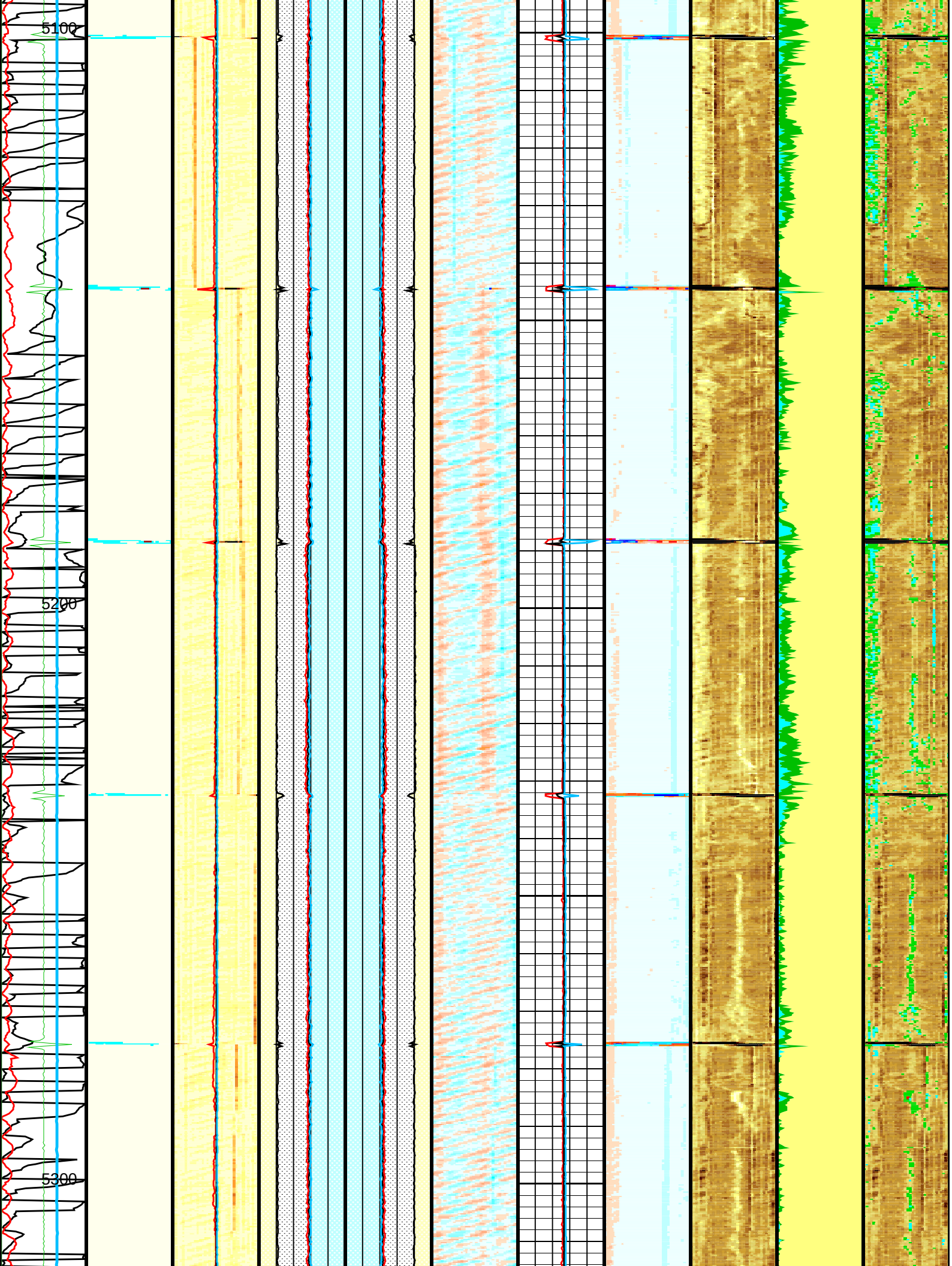

4000
4100
4200

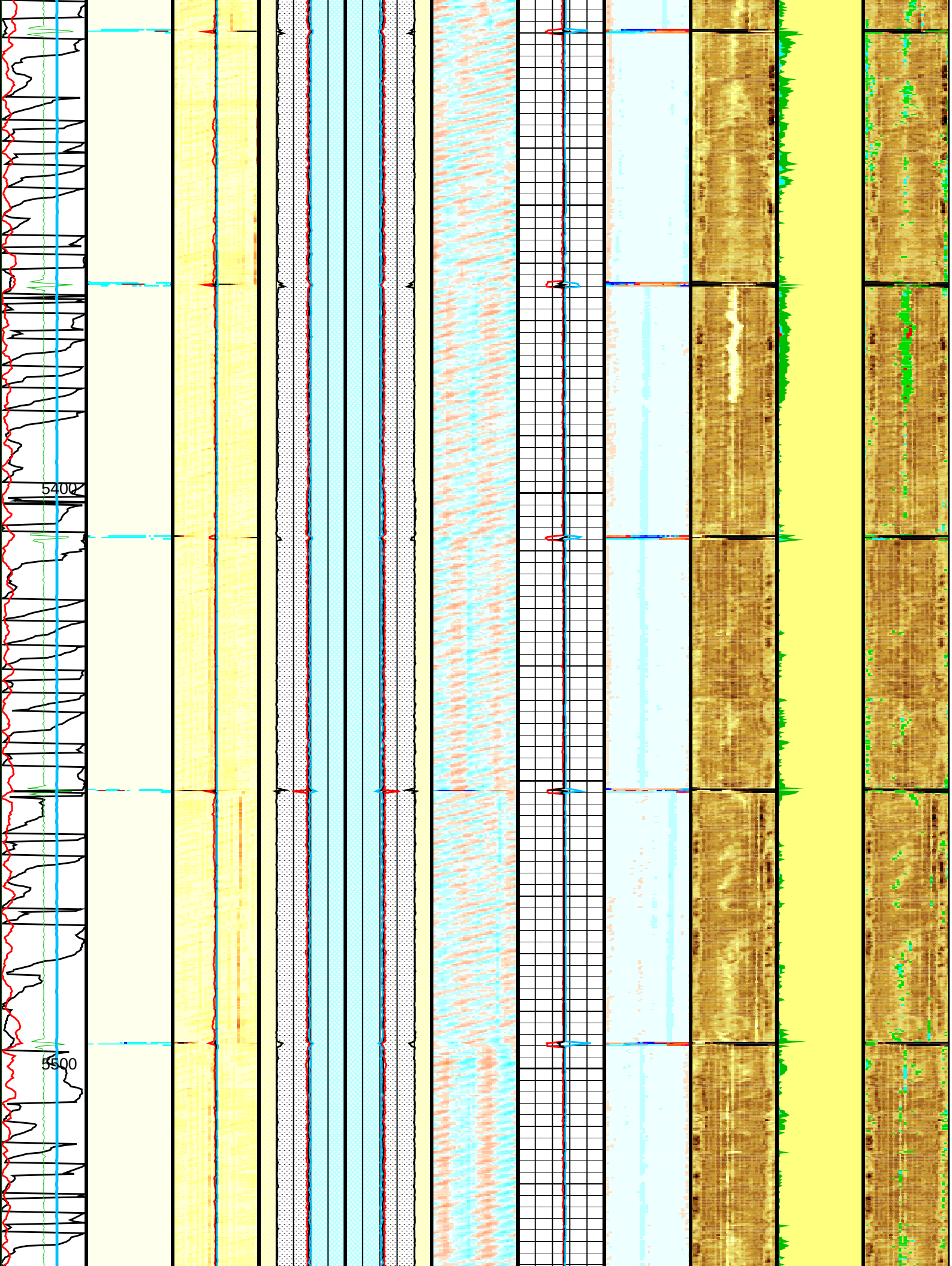

4300
4400

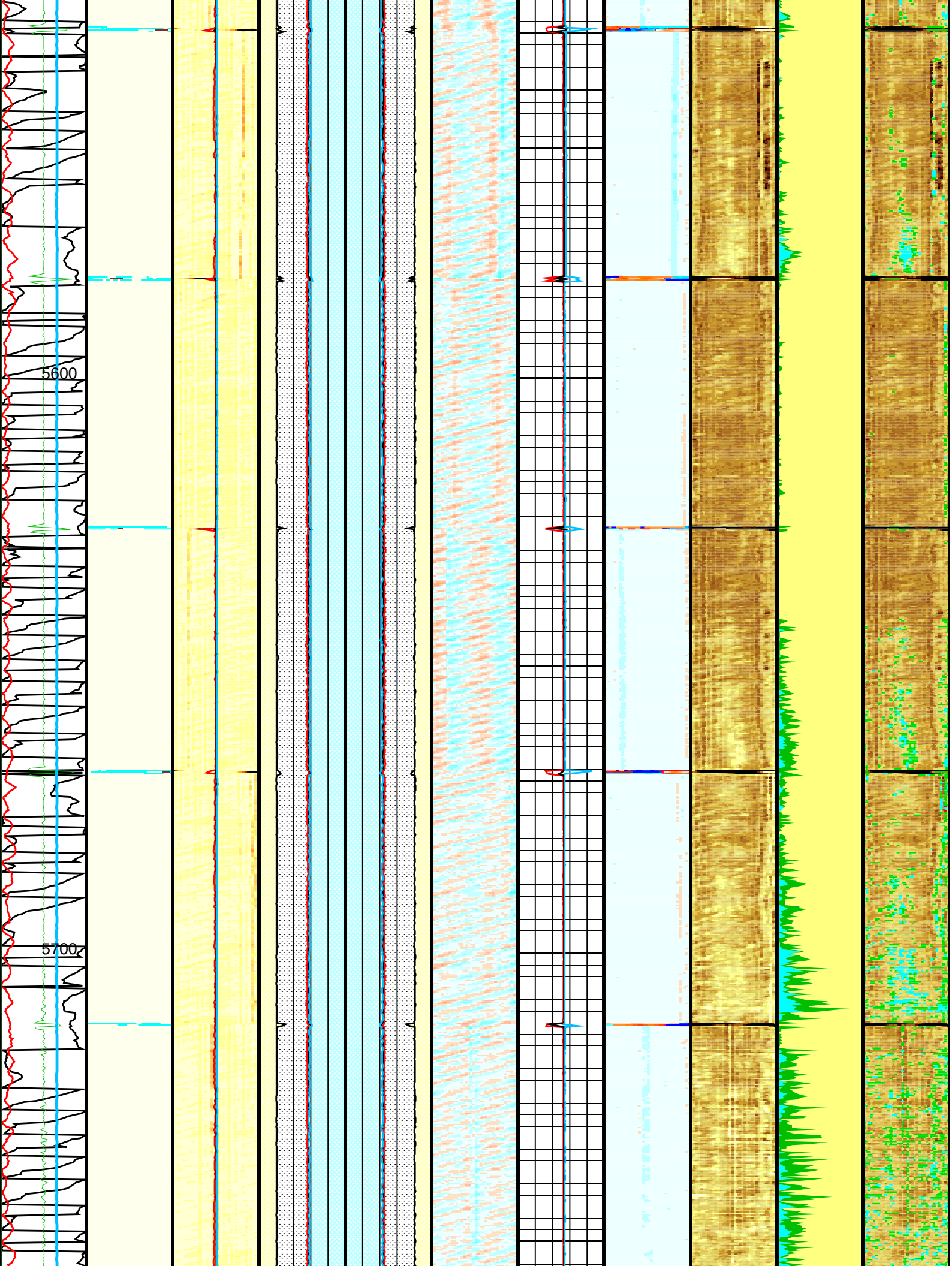

4500
4600

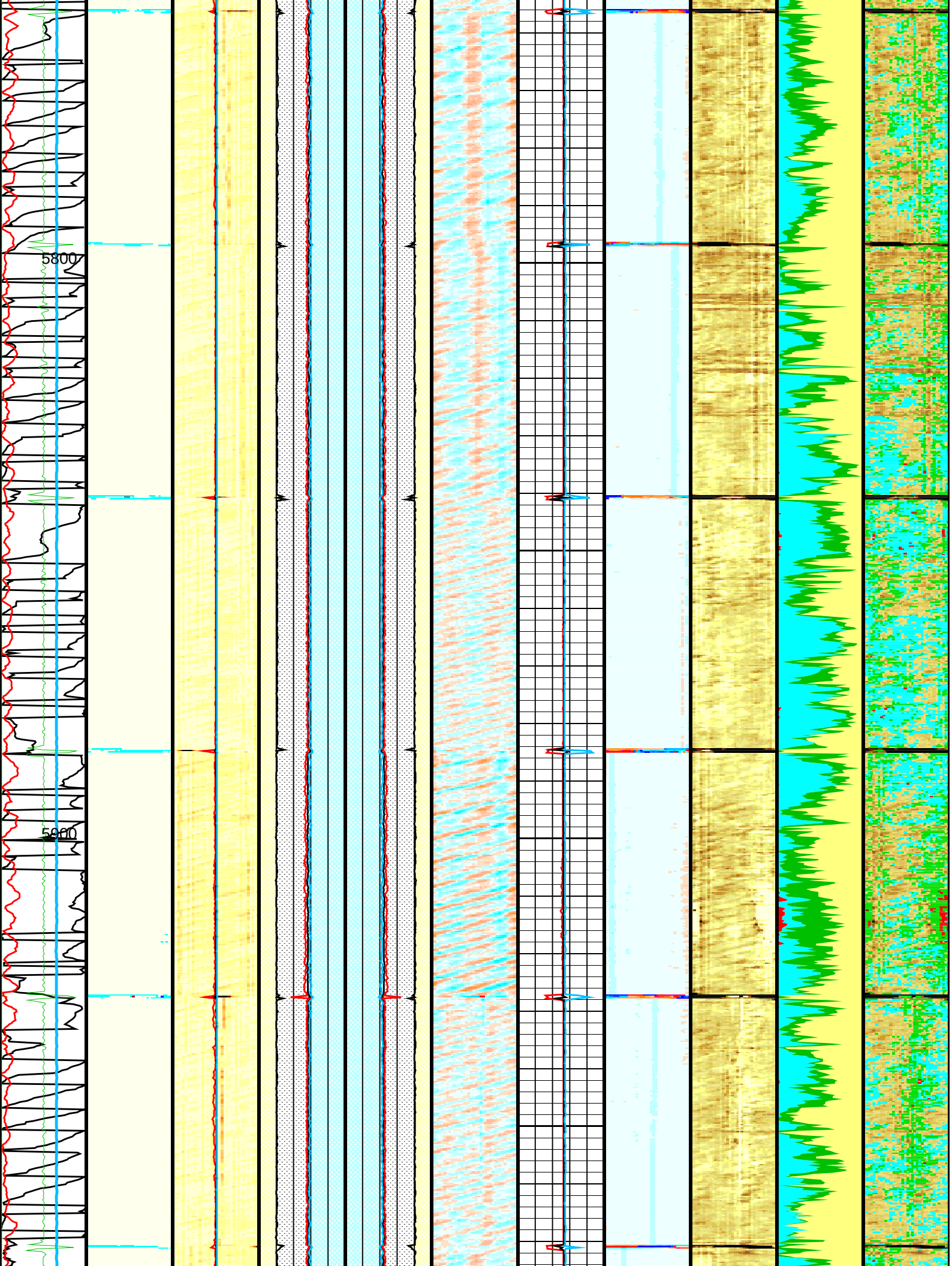

4700
4800

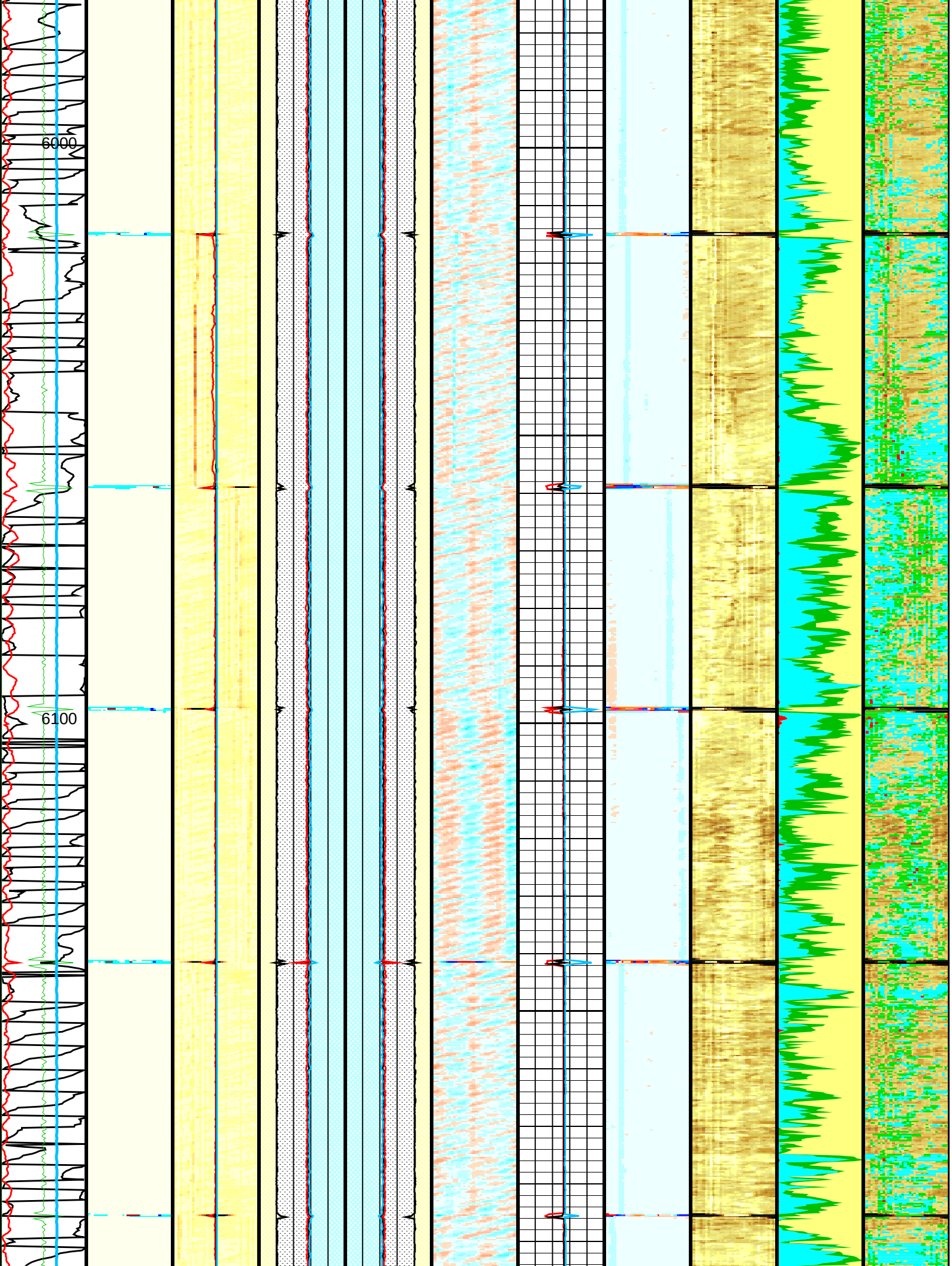

4900
5000

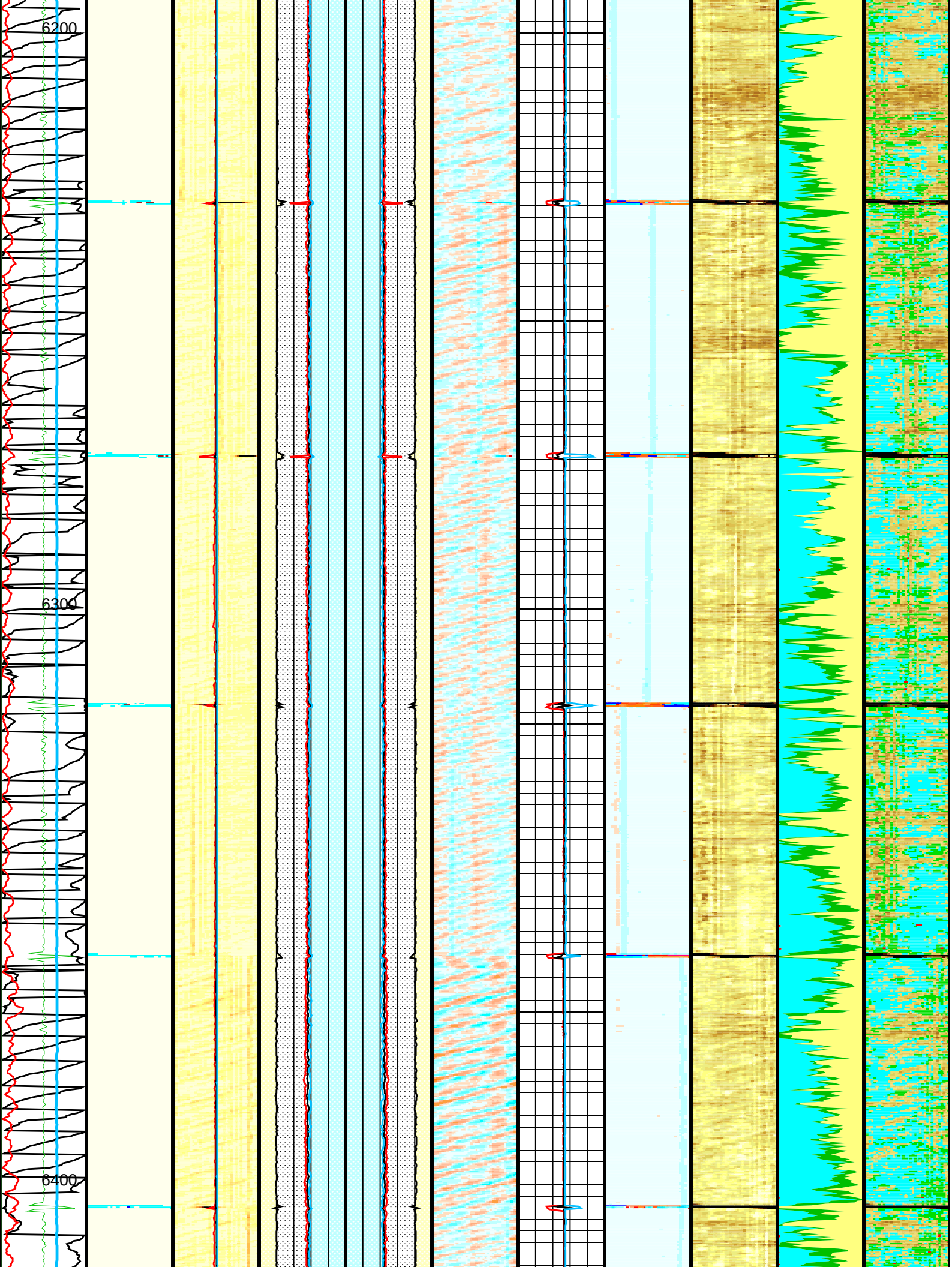

5100
5200
5300

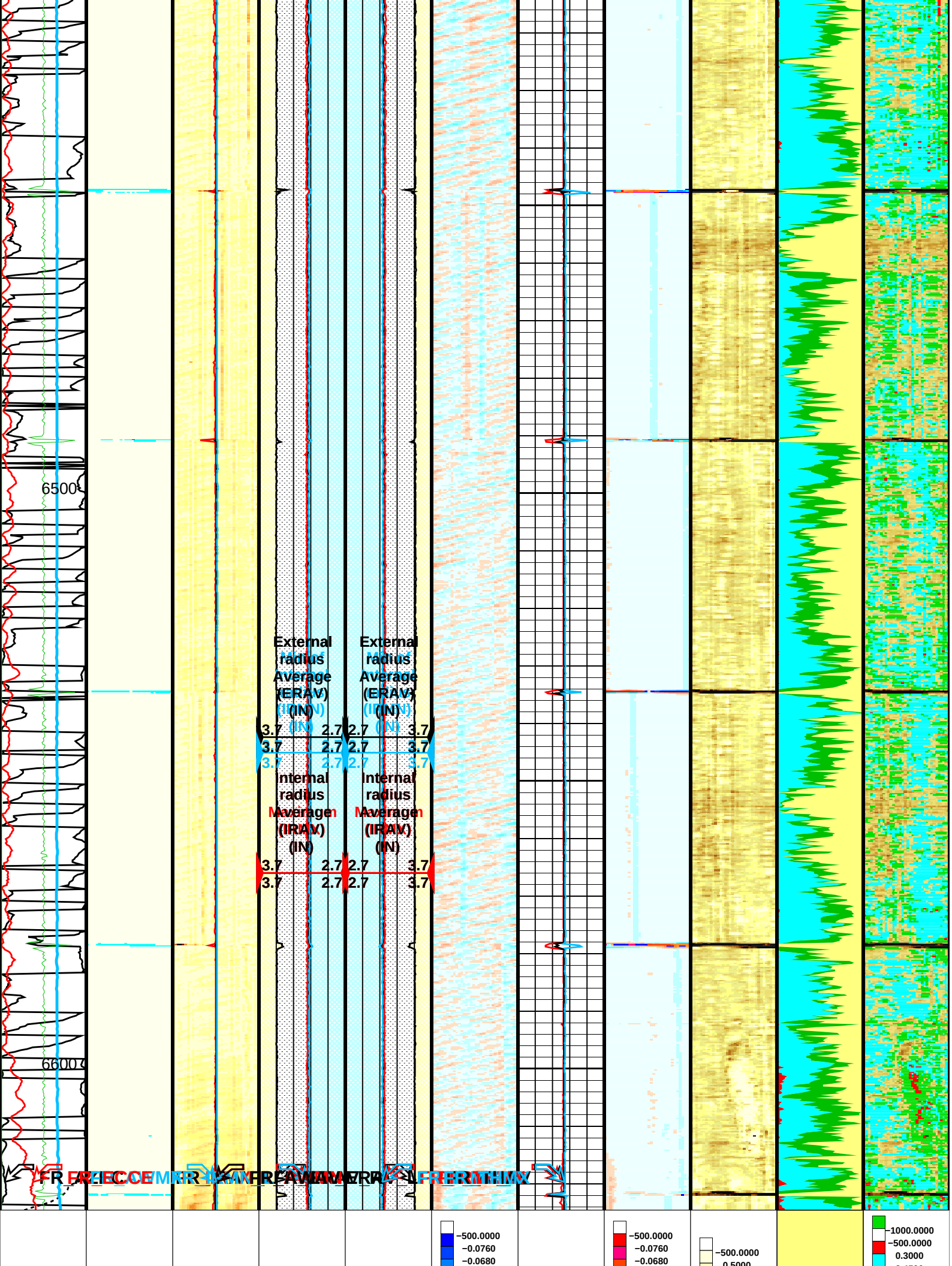

5400
5500

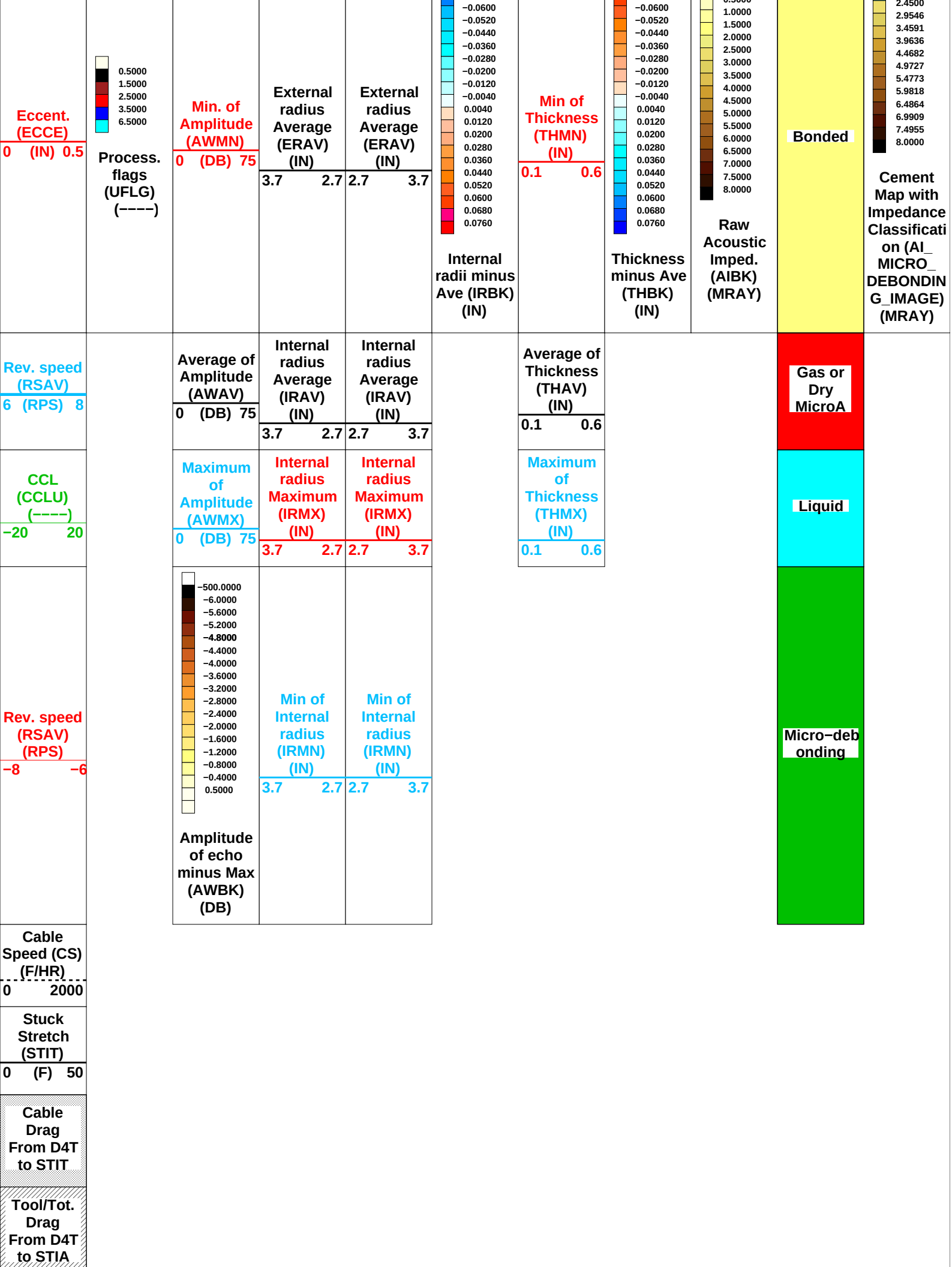

5600
5700


5800
5900


6000
6100


6200
6300
6400


6500
6600
External radius Average (ERAV) (IN)
3.7
2.7
2.7
3.7
3.7
2.7
2.7
3.7
3.7
2.7
2.7
3.7
Internal radius Average (IRAV) (IN)
3.7
2.7
2.7
3.7
3.7
2.7
2.7
3.7
−500.0000
−0.0760
−0.0680
−500.0000
−0.0760
−0.0680
−500.0000
0.5000
−1000.0000
−500.0000
0.3000


Eccent. (ECCE)
0 (IN) 0.5
0.5000
1.5000
2.5000
3.5000
6.5000
Process. flags (UFLG) (----)
Min. of Amplitude (AWMN)
0 (DB) 75
External radius Average (ERAV) (IN)
3.7 2.7
External radius Average (ERAV) (IN)
2.7 3.7
−0.0600
−0.0520
−0.0440
−0.0360
−0.0280
−0.0200
−0.0120
−0.0040
0.0040
0.0120
0.0200
0.0280
0.0360
0.0440
0.0520
0.0600
0.0680
0.0760
Internal radii minus Ave (IRBK) (IN)
Min of Thickness (THMN) (IN)
0.1 0.6
−0.0600
−0.0520
−0.0440
−0.0360
−0.0280
−0.0200
−0.0120
−0.0040
0.0040
0.0120
0.0200
0.0280
0.0360
0.0440
0.0520
0.0600
0.0680
0.0760
Thickness minus Ave (THBK) (IN)
1.0000
1.5000
2.0000
2.5000
3.0000
3.5000
4.0000
4.5000
5.0000
5.5000
6.0000
6.5000
7.0000
7.5000
8.0000
Raw Acoustic Imped. (AIBK) (MRAY)
Bonded
2.4500
2.9546
3.4591
3.9636
4.4682
4.9727
5.4773
5.9818
6.4864
6.9909
7.4955
8.0000
Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (MRAY)
Rev. speed (RSAV)
6 (RPS) 8
Average of Amplitude (AWAV)
0 (DB) 75
Internal radius Average (IRAV) (IN)
3.7 2.7
Internal radius Average (IRAV) (IN)
2.7 3.7
Average of Thickness (THAV) (IN)
0.1 0.6
Gas or Dry MicroA
CCL (CCLU) (----)
−20 20
Maximum of Amplitude (AWMX)
0 (DB) 75
Internal radius Maximum (IRMX) (IN)
3.7 2.7
Internal radius Maximum (IRMX) (IN)
2.7 3.7
Maximum of Thickness (THMX) (IN)
0.1 0.6
Liquid
Rev. speed (RSAV) (RPS)
−8 −6
−500.0000
−6.0000
−5.6000
−5.2000
−4.8000
−4.4000
−4.0000
−3.6000
−3.2000
−2.8000
−2.4000
−2.0000
−1.6000
−1.2000
−0.8000
−0.4000
0.5000
Amplitude of echo minus Max (AWBK) (DB)
Min of Internal radius (IRMN) (IN)
3.7 2.7
Min of Internal radius (IRMN) (IN)
2.7 3.7
Micro−debonding
Cable Speed (CS) (F/HR)
0 2000
Stuck Stretch (STIT)
0 (F) 50
Cable Drag From D4T to STIT
Tool/Tot. Drag From D4T to STIA

Azimuth of eccent. (AZEC) (DEG)	
0	360

Image rotation (UCAZ) (DEG)	
0	360

Format: USI_Composite **Vertical Scale: 5" per 100'** **Graphics File Created: 29−May−2013 21:16**

OP System Version: 19C1−222

eWAFE Version: 1.186

USIT−E	**19C1−222**	**SGT−N**	**19C1−222**
DTC−H	**19C1−222**		

All USI Images are outside views

COMPUTATION FLAGS LABELLING

(0 − 1.5)	**UFLG 1**	**UTIM error**
(1.5 − 2.5)	**UFLG 2**	**Pulse origin not detected**
(2.5 − 3.5)	**UFLG 3**	**WINLEN error**
(3.5 − 6.5)	**UFLG 4 UFLG 5 UFLG 6**	**CASING THICKNESS error**
(6.5 − 10)	**UFLG 7 UFLG 8 UFLG 9**	**LOOP PROCESSING error**

USI : LOW Frequency Compression Mode Used For Logging.

Recommended casing thickness range for optimum cement impedance measurement : 0.27 to 0.6 IN.

Parameters

DLIS Name	Description	Value	
	USIT−E: Ultrasonic Imaging − E		
AGMN	Minimum Gain of Cartridge	−4	DB
AGMX	Maximum Gain of Cartridge	20	DB
BERJ	Bad Echo Rejection	ON	
CDIA	Casing Outer Diameter	7	IN
CSDE	Casing Density	486.94	LBCF
CSID	Casing Inner Diameter	6.276	IN
DFVL	Default Fluid Velocity	190	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	20	V
FDII	FPM Data Interpolation Interval	0	FT
IMAR	Image Rotation	OFF	
MW	Mud Weight	8.5	LB/G
RCOD	Reference Calibrator Outer Diameter	7	IN
RCSO	Reference Calibrator Standoff	1.1811	IN
RCTH	Reference Calibrator Thickness	0.2952	IN
SDNV	Number of Vertical Samples used for Micro−debonding Computation	5	
SDTHOR	Acoustic Impedance STD Horizontal Threshold for Micro−debonding	0.5	
SDTVER	Acoustic Impedance STD Vertical Threshold for Micro−debonding	0.3	
TCUB	T^3 Processing Level	Vax_Loop	
THDH	Maximum Search Thickness (percentage of nominal)	130	
THDL	Minimum Search Thickness (percentage of nominal)	70	

THDL	Minimum Search Thickness (percentage of nominal)	70	
THDP	Thickness Detection Policy	Fundamental	
THNO	Nominal Thickness of Casing	0.362	IN
UMAO	USIT Measurement Angular Offset	18	DEG
USTO	Ultrasonic Time Offset	−2	US
USUB	Ultrasonic Subassembly Identifier	Sub_7_inch	
UWKM	Ultrasonic Working Mode	10DEG_3IN_60U_LF	
VCAS	Ultrasonic Transversal Velocity in Casing	51.4	US/F
WLEN	T^3 Processing Length	21.7078	US
ZCAS	Acoustic Impedance of Casing	46.25	MRAY
ZINI	Initial Estimate of Cement Impedance	−1	MRAY
ZMUD	Acoustic Impedance of Mud	1.65	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.45	MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3	MRAY
	STI: Stuck Tool Indicator		
LBFR	Trigger for MAXIS First Reading Label	TDL	
STKT	STI Stuck Threshold	5	FT
TDD	Total Depth − Driller	11597.00	FT
TDL	Total Depth − Logger	6620.00	FT
	System and Miscellaneous		
CWEI	Casing Weight	26.00	LB/F
DO	Depth Offset for Playback	4.0	FT
PP	Playback Processing	RECOMPUTE	

Input DLIS Files

	USI_011LUP	FN:10	29−May−2013 20:40	6620.5 FT	−19.8 FT

Output DLIS Files

DEFAULT	USI_008PUP	FN:7	PRODUCER	29−May−2013 21:16

Schlumberger

Cement 2 in

MAXIS Field Log

Company: Kerr−McGee Oil & Gas Onshore LP **Well: Bydalek 3N−20HZ**

Input DLIS Files

	USI_011LUP	FN:10	29−May−2013 20:40	6620.5 FT	−19.8 FT

Output DLIS Files

DEFAULT	USI_008PUP	FN:7	PRODUCER	29−May−2013 21:16

OP System Version: 19C1−222

eWAFE Version: 1.186

USIT−E	19C1−222	SGT−N	19C1−222
DTC−H	19C1−222		

Zoning of Mud Parameters

Depth	Fluid Velocity (DFVL)	Acoustic Impedance (ZMUD)
6600.00	187.00	1.64
6300.00	187.00	1.65

6000.00	187.00	1.62
5700.00	187.20	1.63
5400.00	188.30	1.62
5100.00	188.80	1.59
4800.00	185.95	1.63
4500.00	187.50	1.65
4200.00	186.00	1.63
3900.00	187.00	1.95
3600.00	189.00	1.95
3300.00	187.82	1.95
3000.00	188.39	1.95
2700.00	189.39	1.95
2400.00	190.40	1.95
2100.00	191.92	1.95
1800.00	192.92	1.64
1500.00	195.00	1.65
1200.00	196.00	1.65
900.00	197.00	1.63
600.00	199.00	1.63
300.00	202.00	1.73

Image rotation (UCAZ) (DEG)
0 360

Tool/Tot. Drag From D4T to STIA

Cable Drag From D4T to STIT

Stuck Stretch (STIT)
0 (F) 50

Min of Internal radius (IRMN)
3.7 (IN) 2.7

Min of Internal radius (IRMN)
2.7 (IN) 3.7

Gamma Ray (GR) (GAPI)
0 150

External radius Average (ERAV)
3.7 (IN) 2.7

Internal radius Maximum (IRMX)
2.7 (IN) 3.7

Cable Speed (CS) (F/HR)
0 2000

Internal radius Maximum (IRMX)
3.7 (IN) 2.7

Internal radius Average (IRAV)
2.7 (IN) 3.7

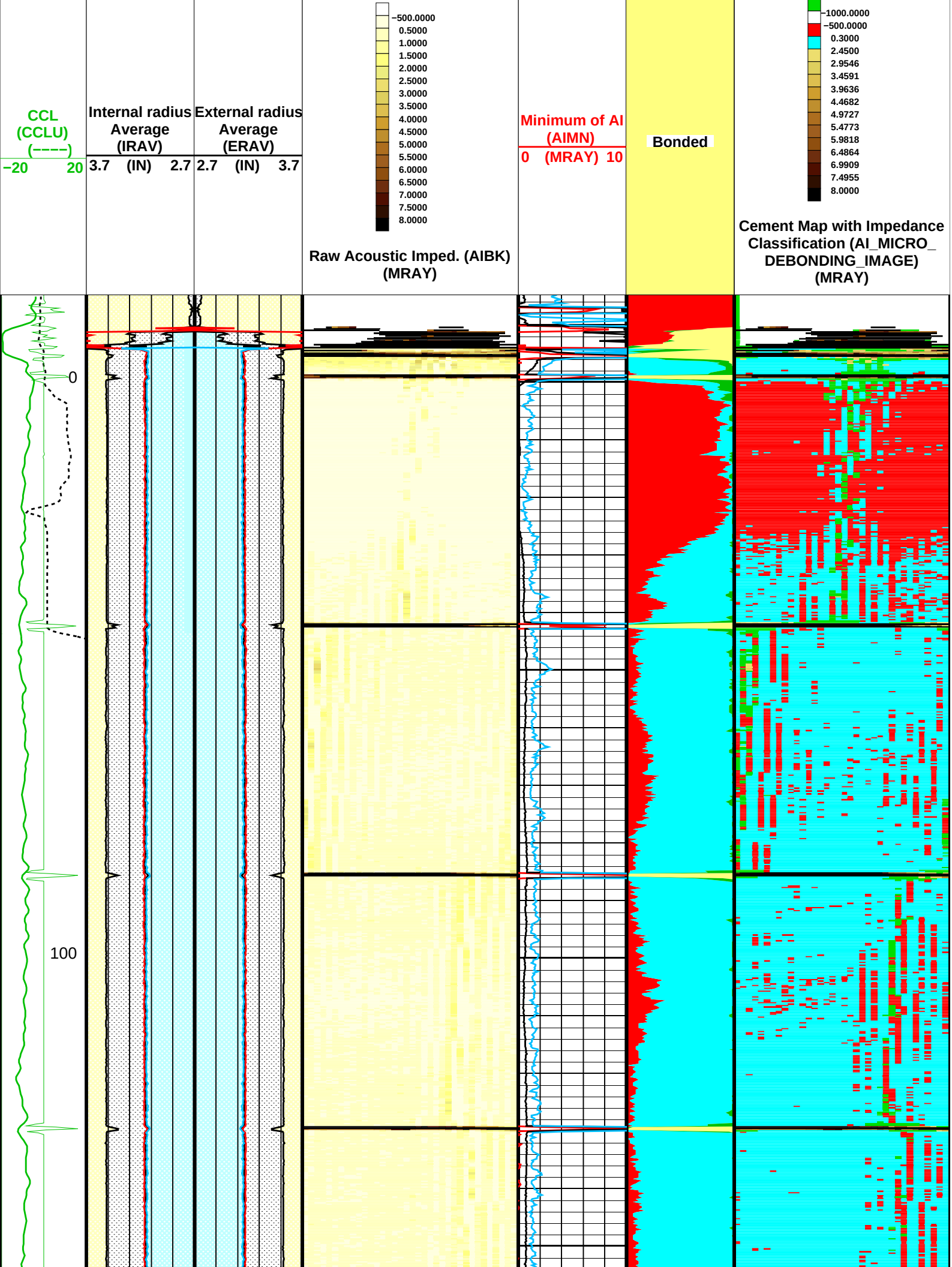
Maximum of AI (AIMX)
0 (MRAY) 10

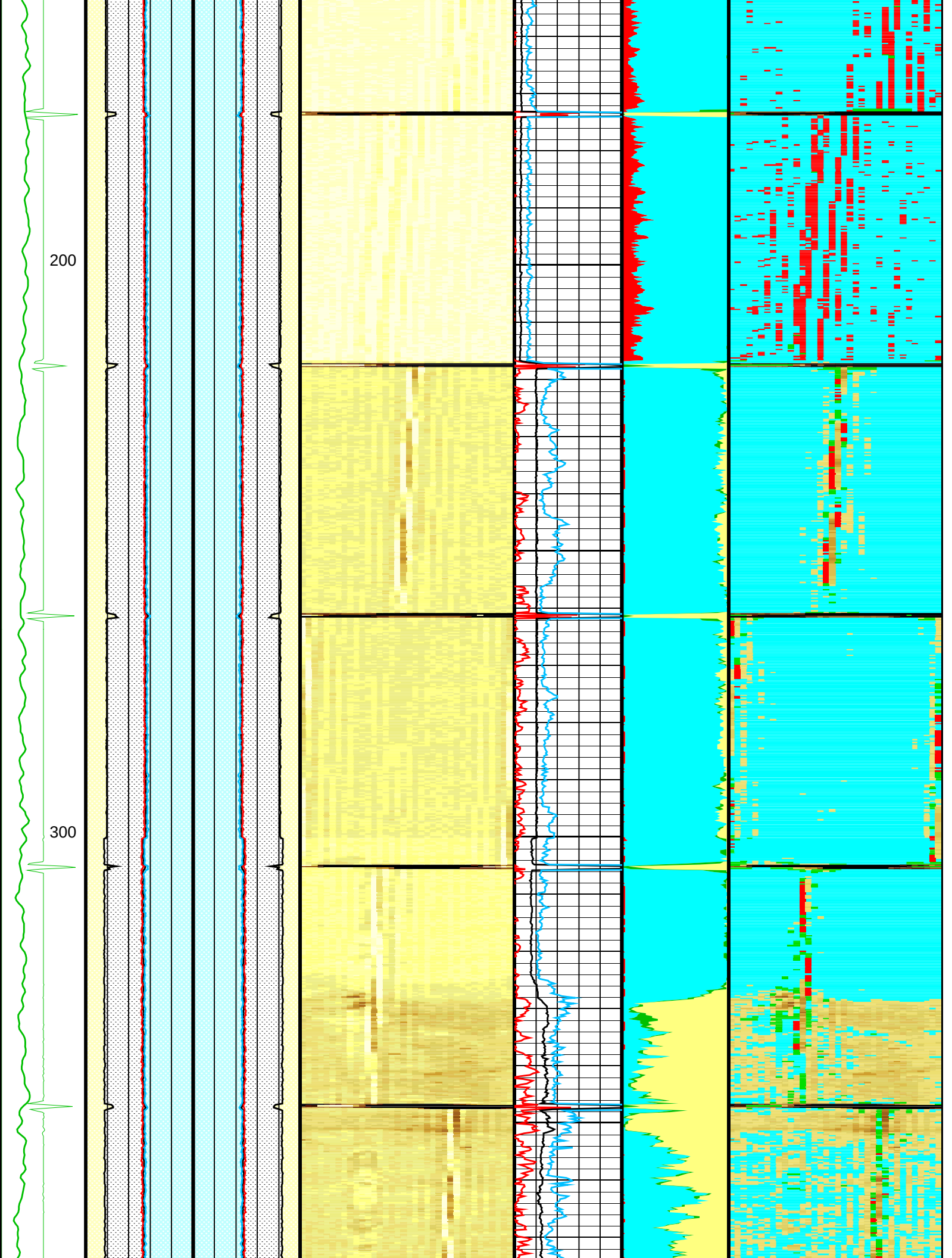
Average of AI (AIAV)
0 (MRAY) 10

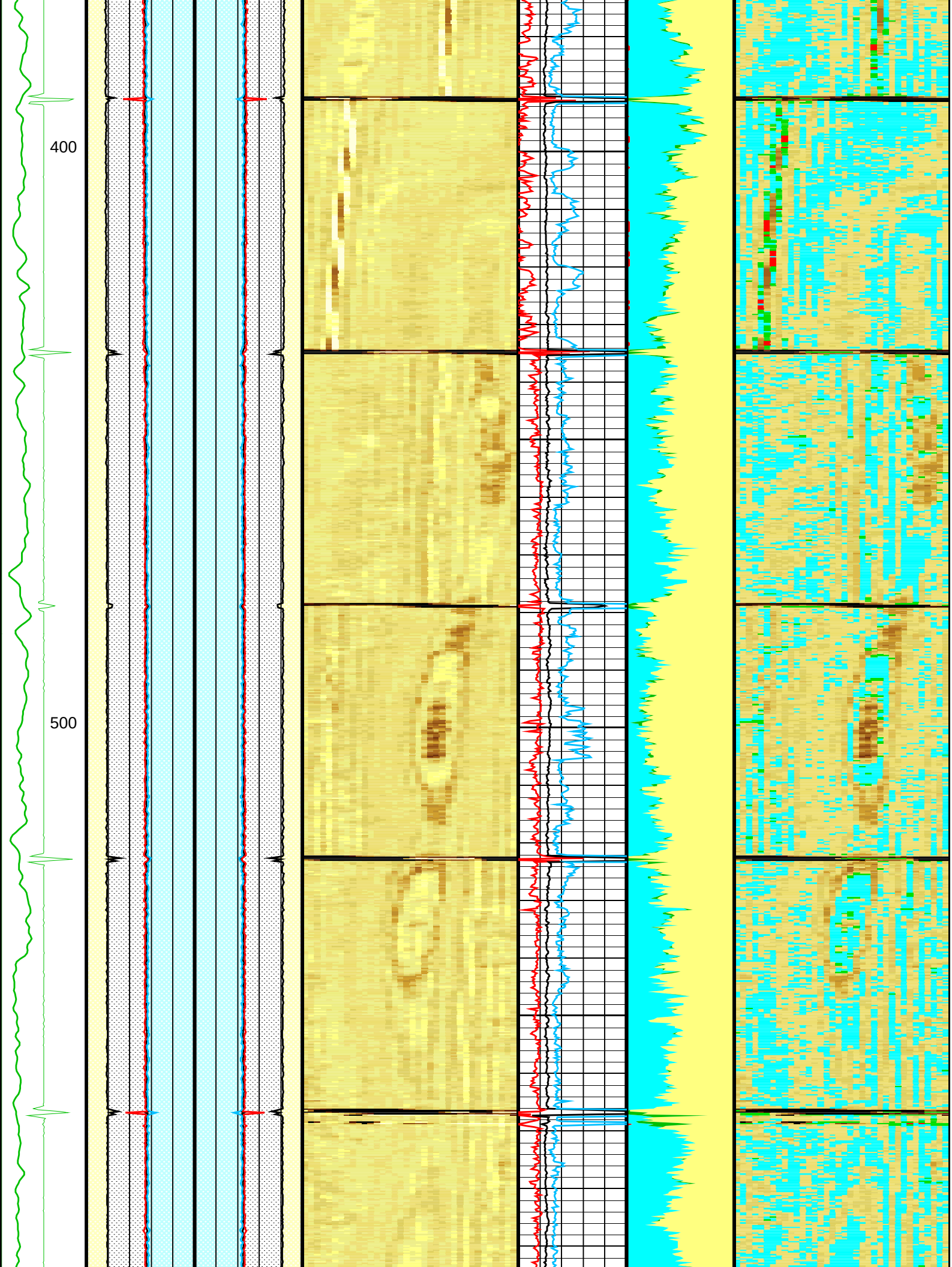
Micro−debonding

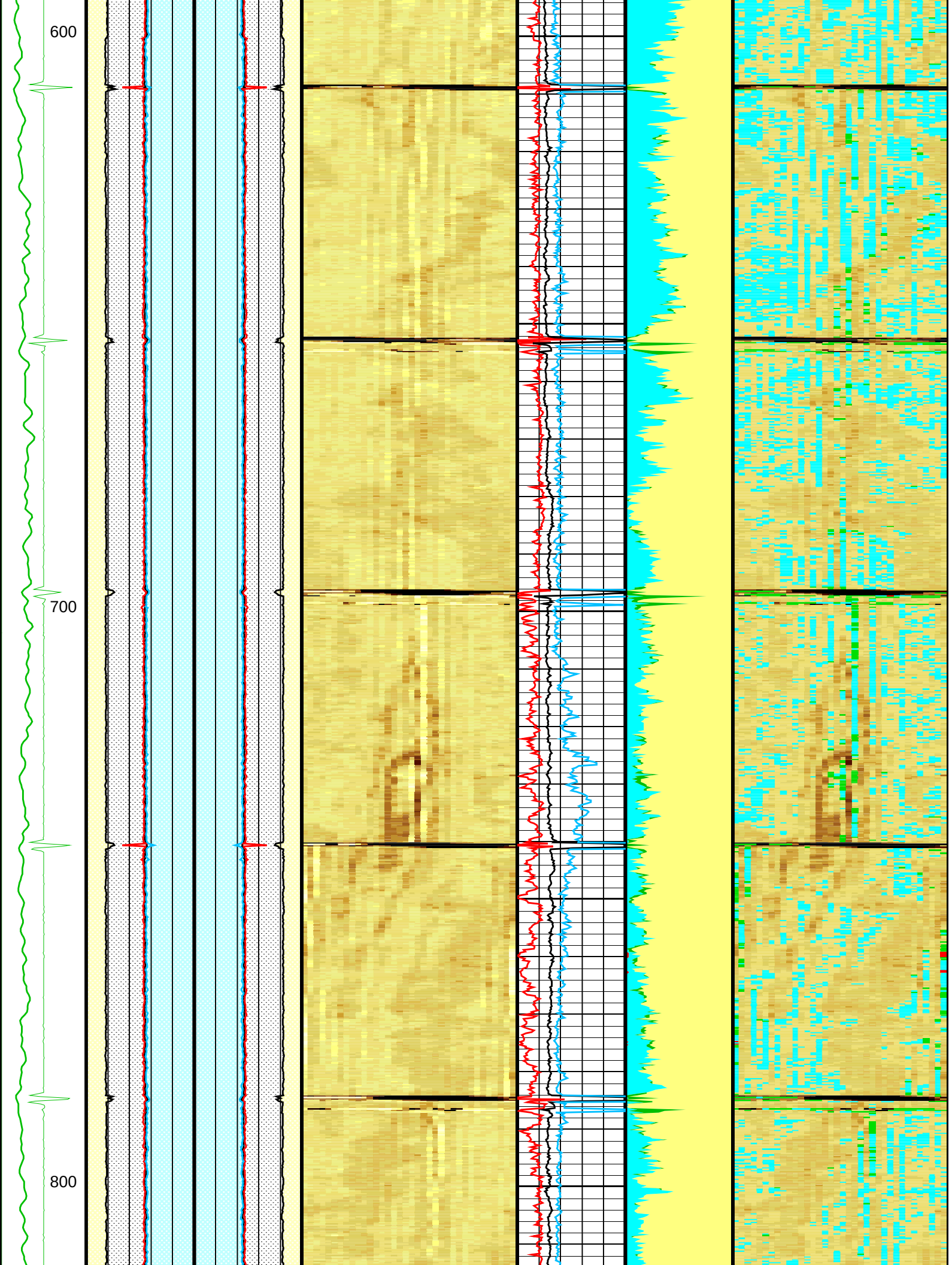
Liquid

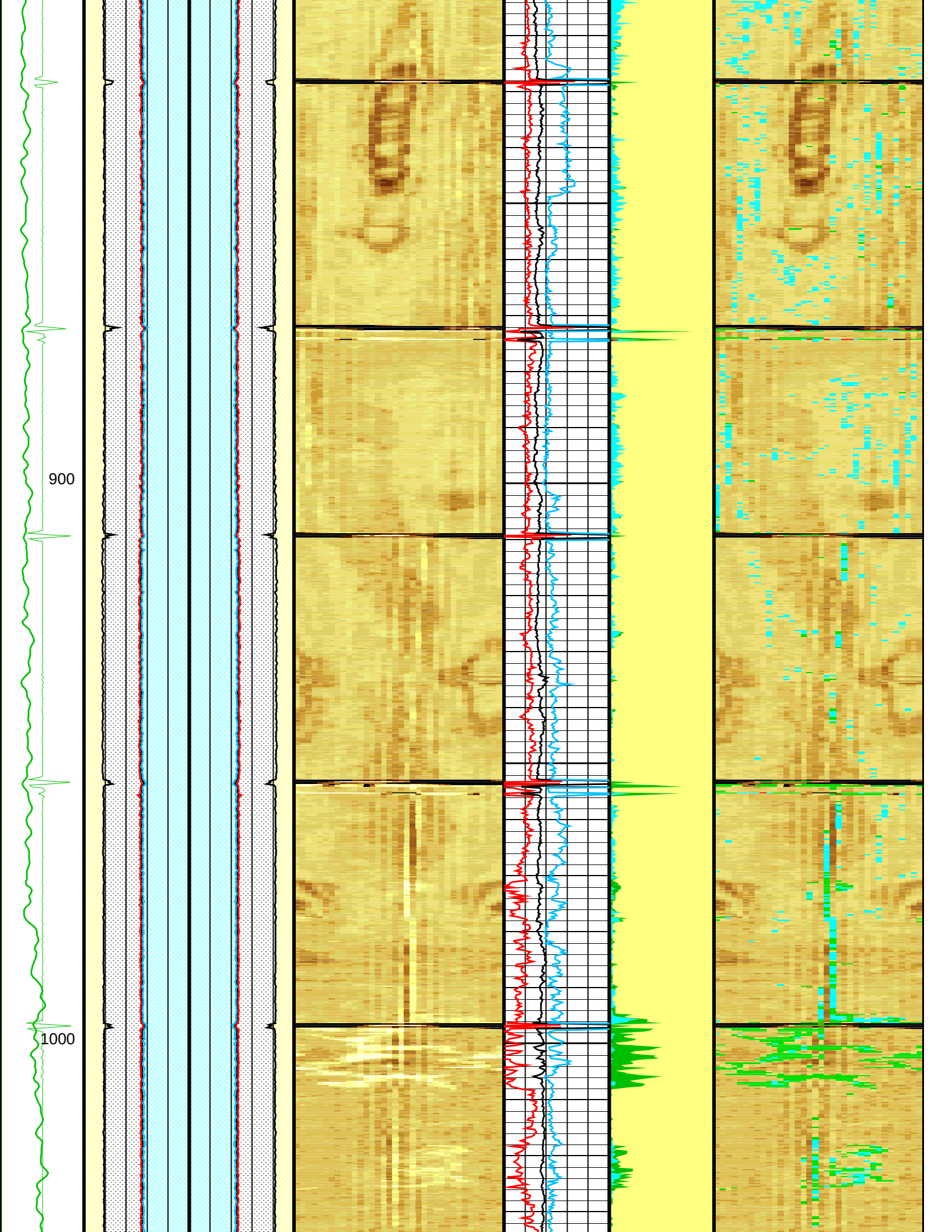
Gas or Dry MicroA

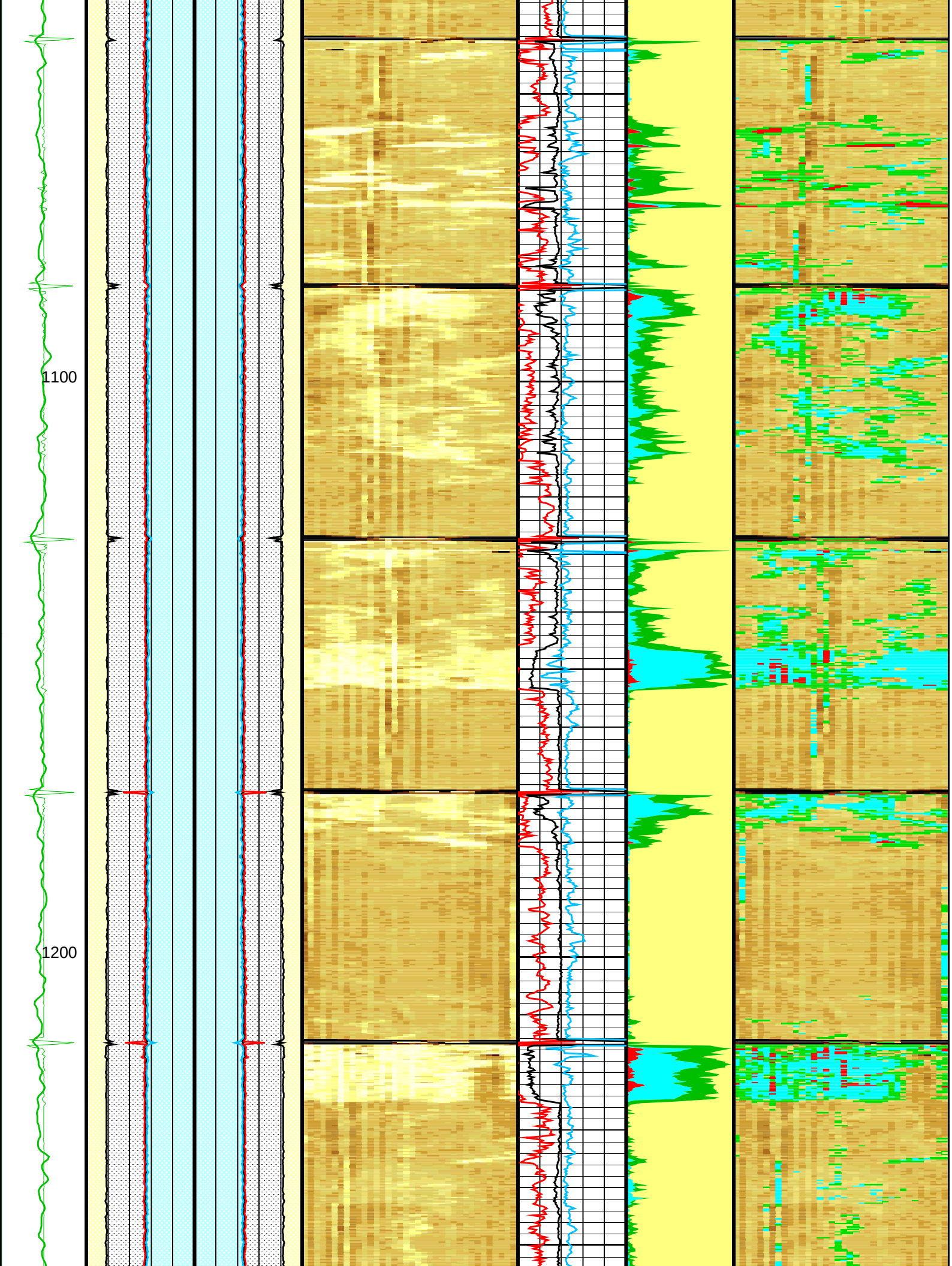

CCL
(CCLU)
(----)
−20
20
Internal radius
Average
(IRAV)
3.7
(IN)
2.7
External radius
Average
(ERAV)
2.7
(IN)
3.7
−500.0000
0.5000
1.0000
1.5000
2.0000
2.5000
3.0000
3.5000
4.0000
4.5000
5.0000
5.5000
6.0000
6.5000
7.0000
7.5000
8.0000
Raw Acoustic Imped. (AIBK)
(MRAY)
Minimum of AI
(AIMN)
0
(MRAY)
10
Bonded
−1000.0000
−500.0000
0.3000
2.4500
2.9546
3.4591
3.9636
4.4682
4.9727
5.4773
5.9818
6.4864
6.9909
7.4955
8.0000
Cement Map with Impedance
Classification (AI_MICRO_
DEBONDING_IMAGE)
(MRAY)
0
100

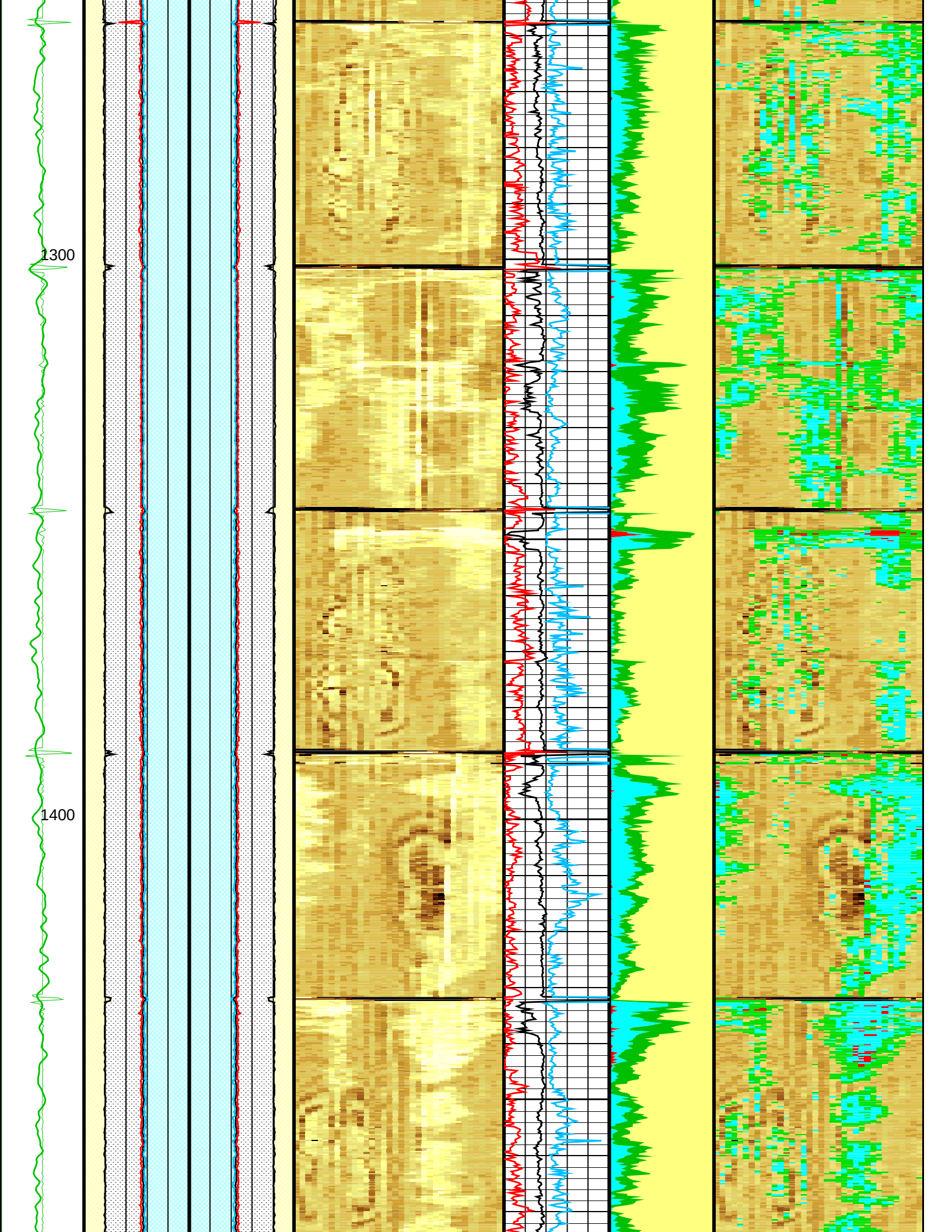

200
300

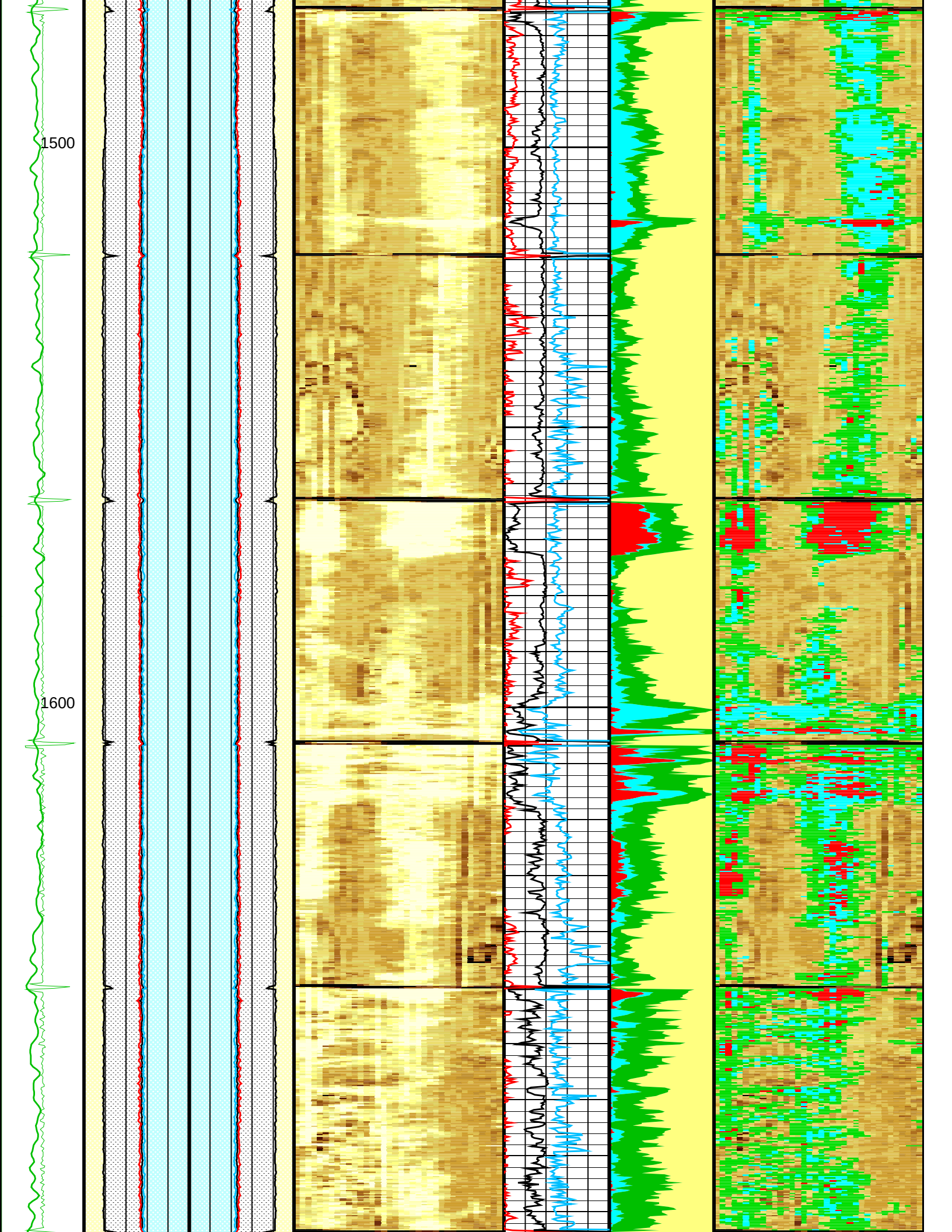

400
500

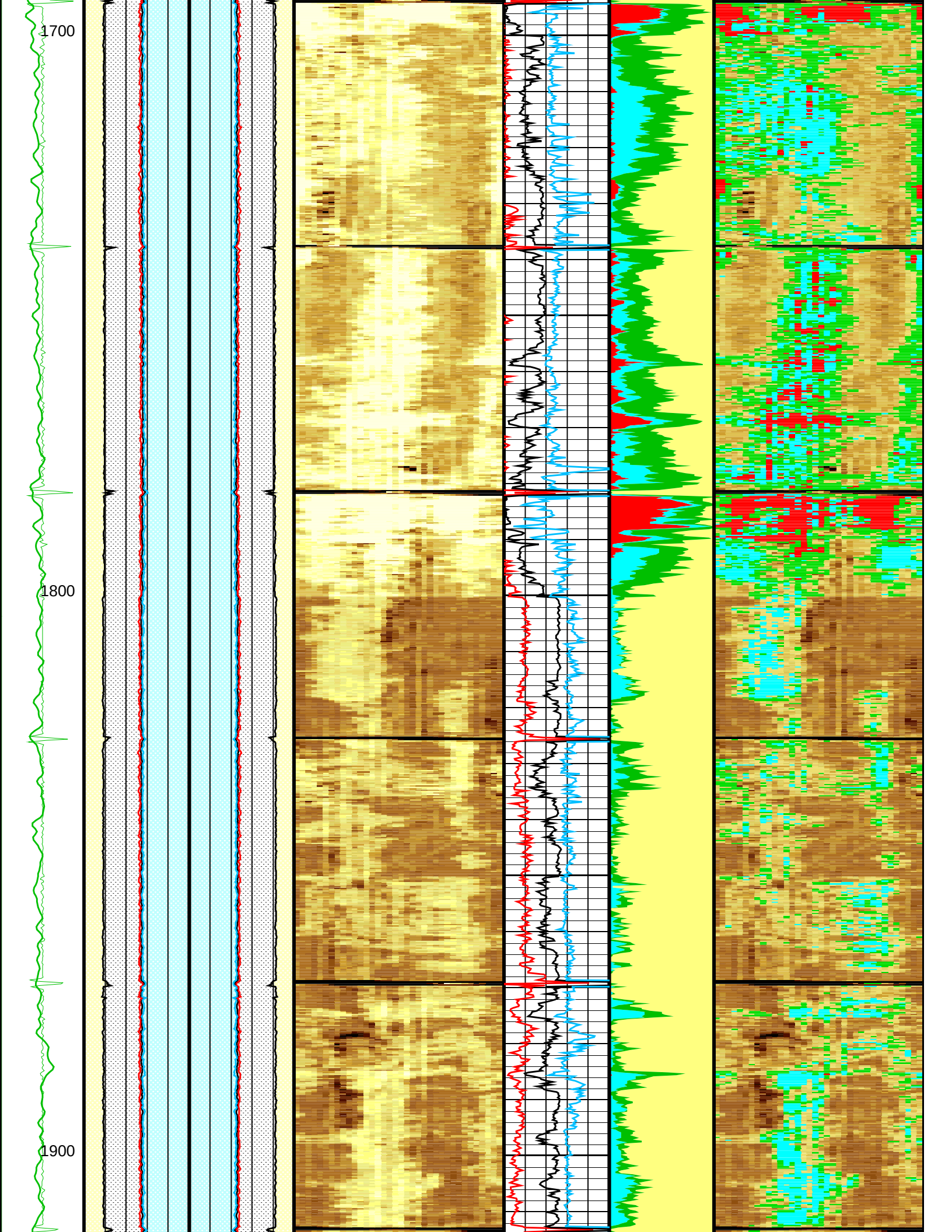

600
700
800

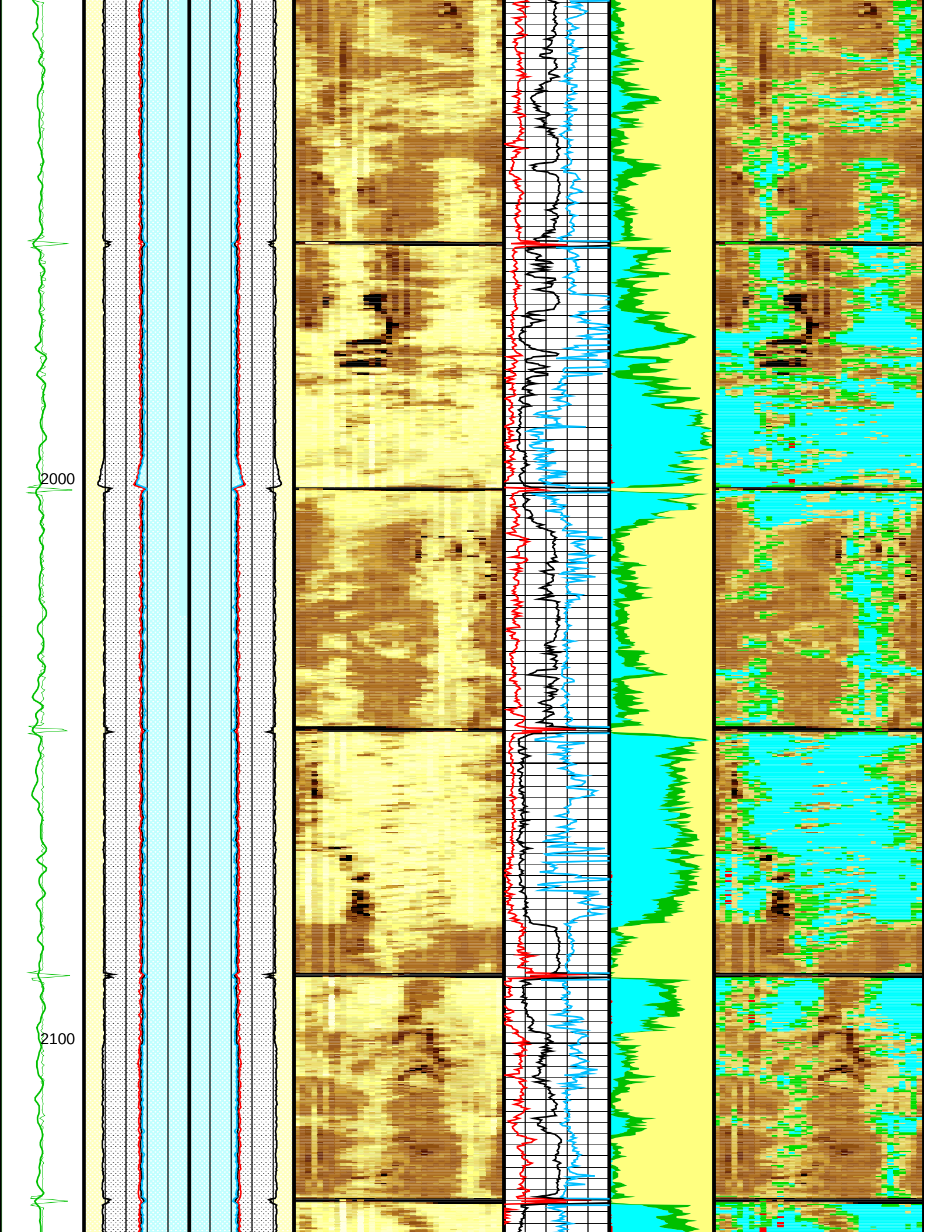

900
1000

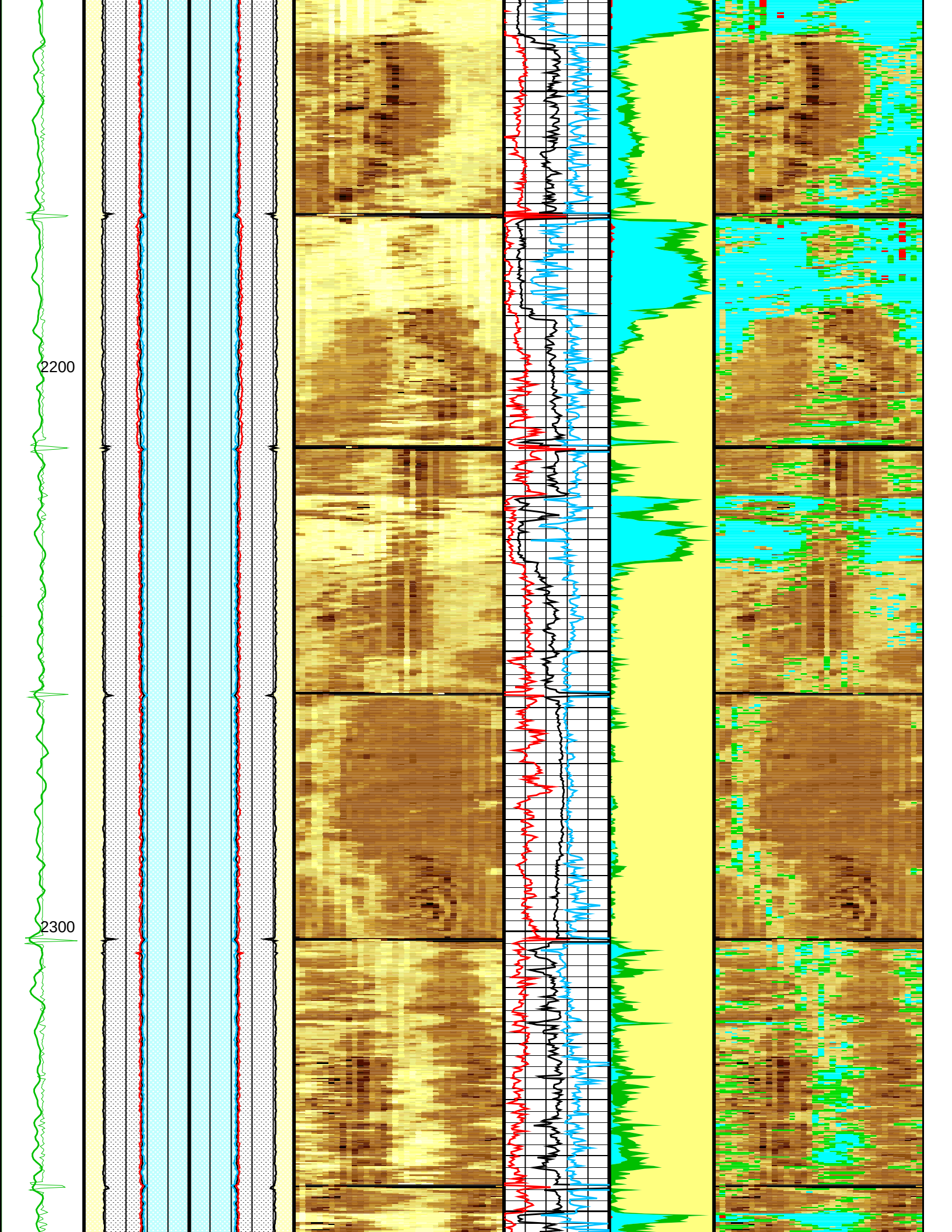

1100
1200

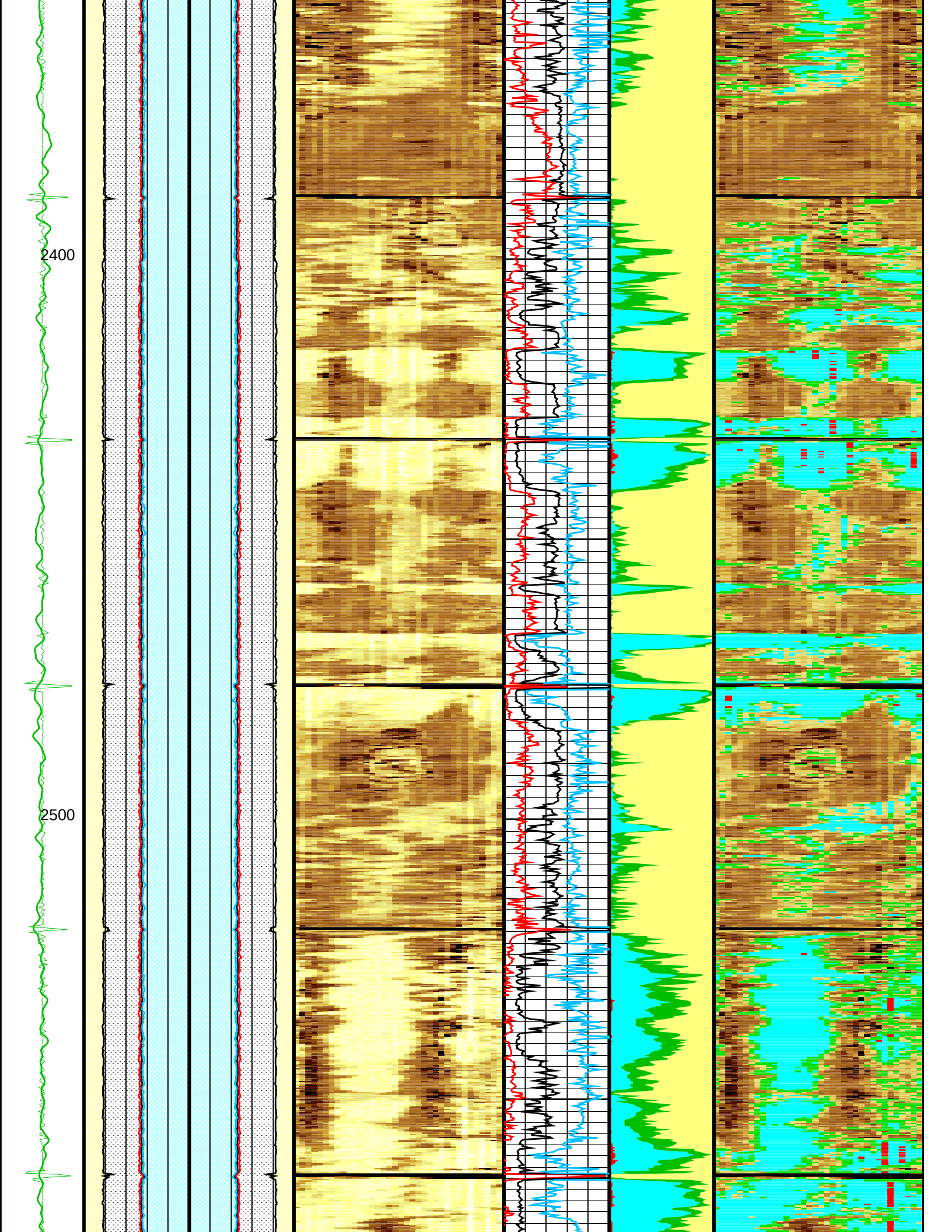

1300
1400

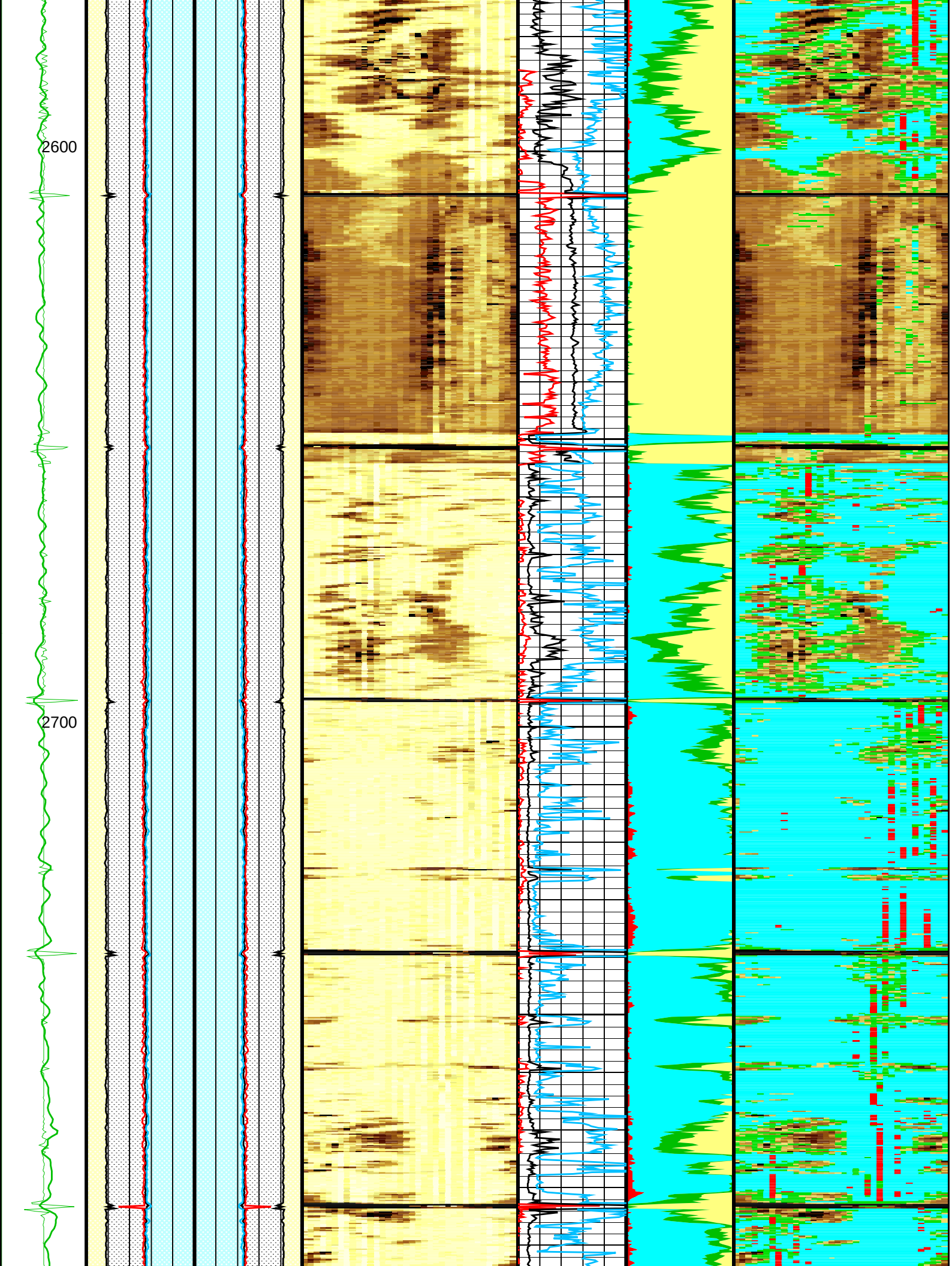

1500
1600

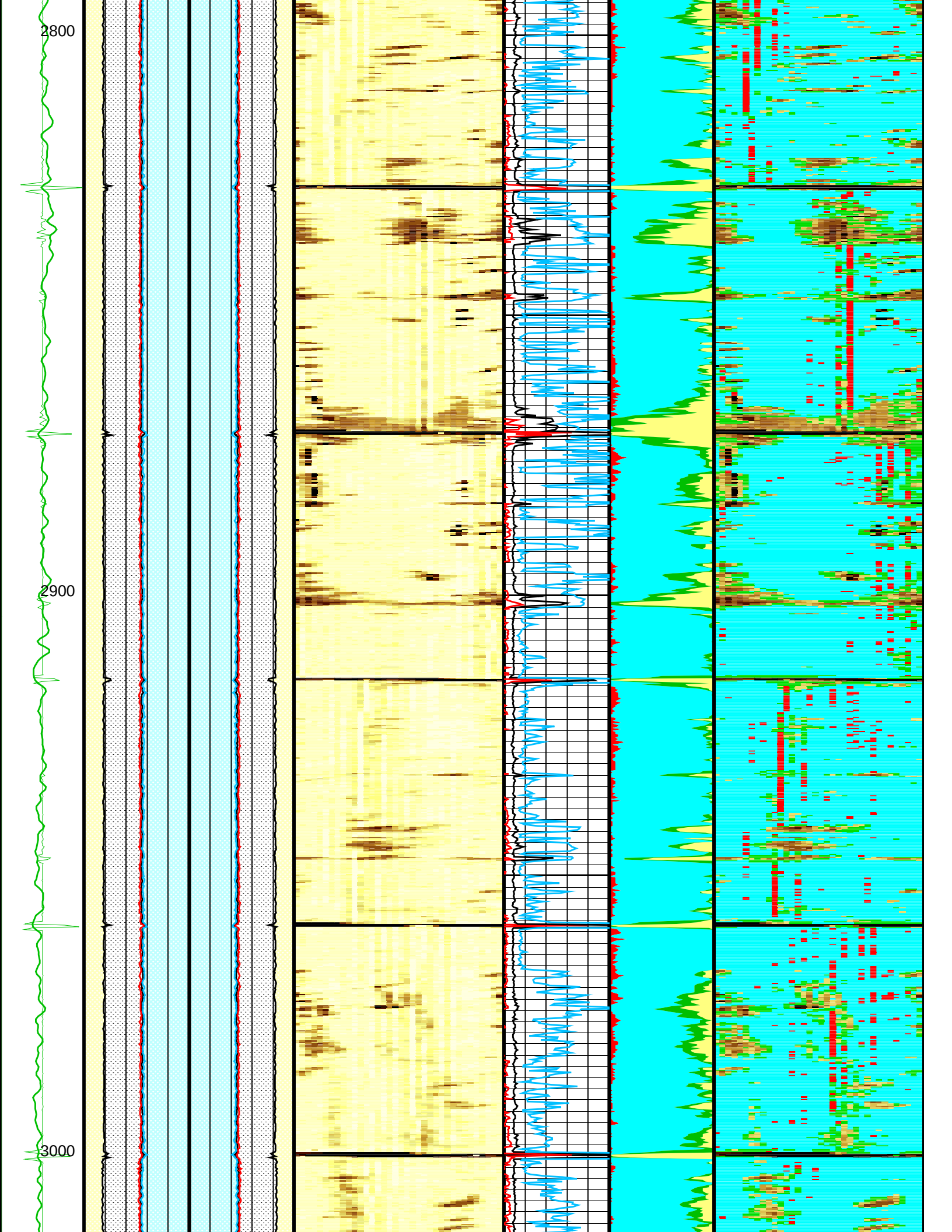

1700
1800
1900

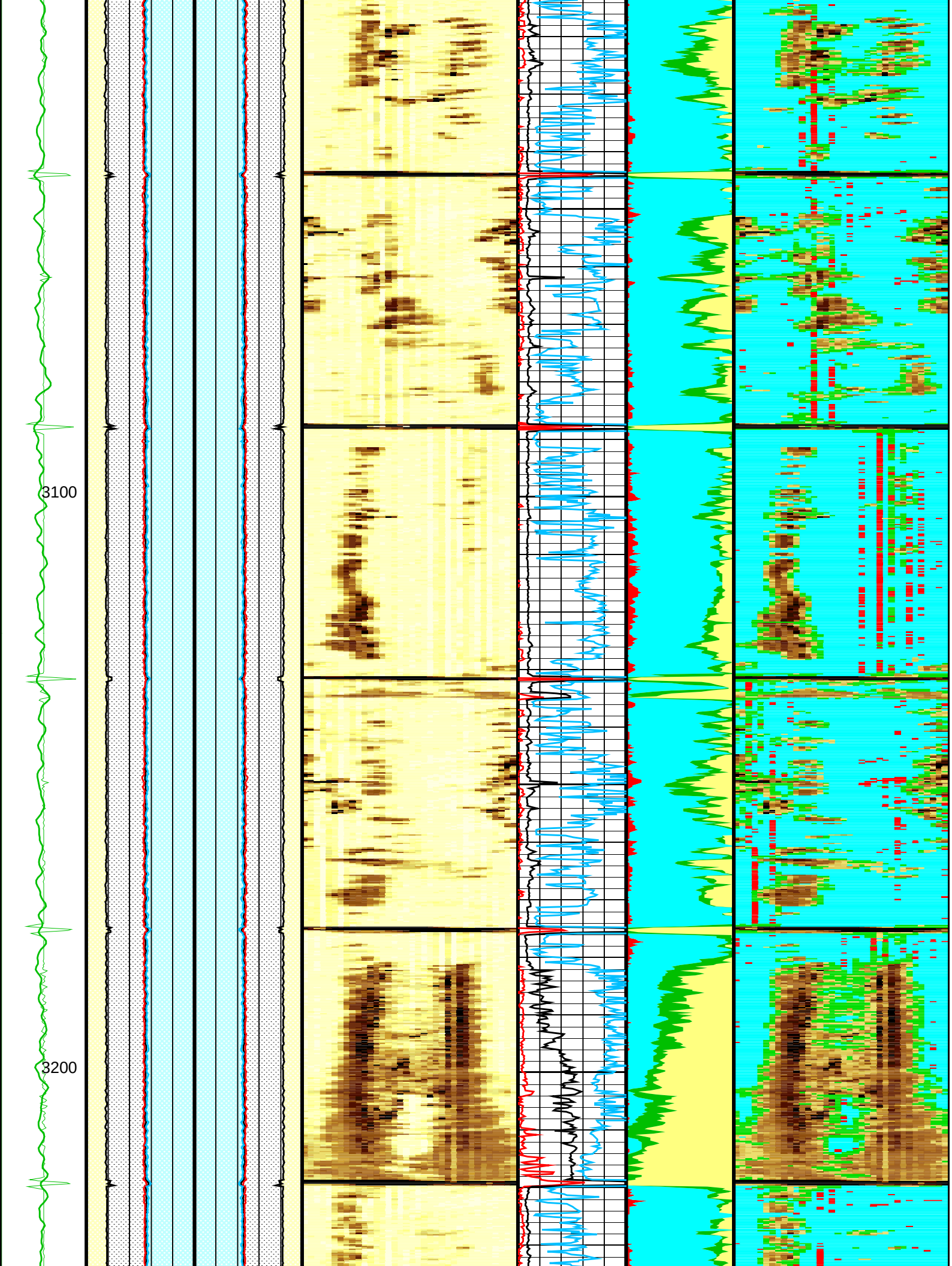

2000
2100

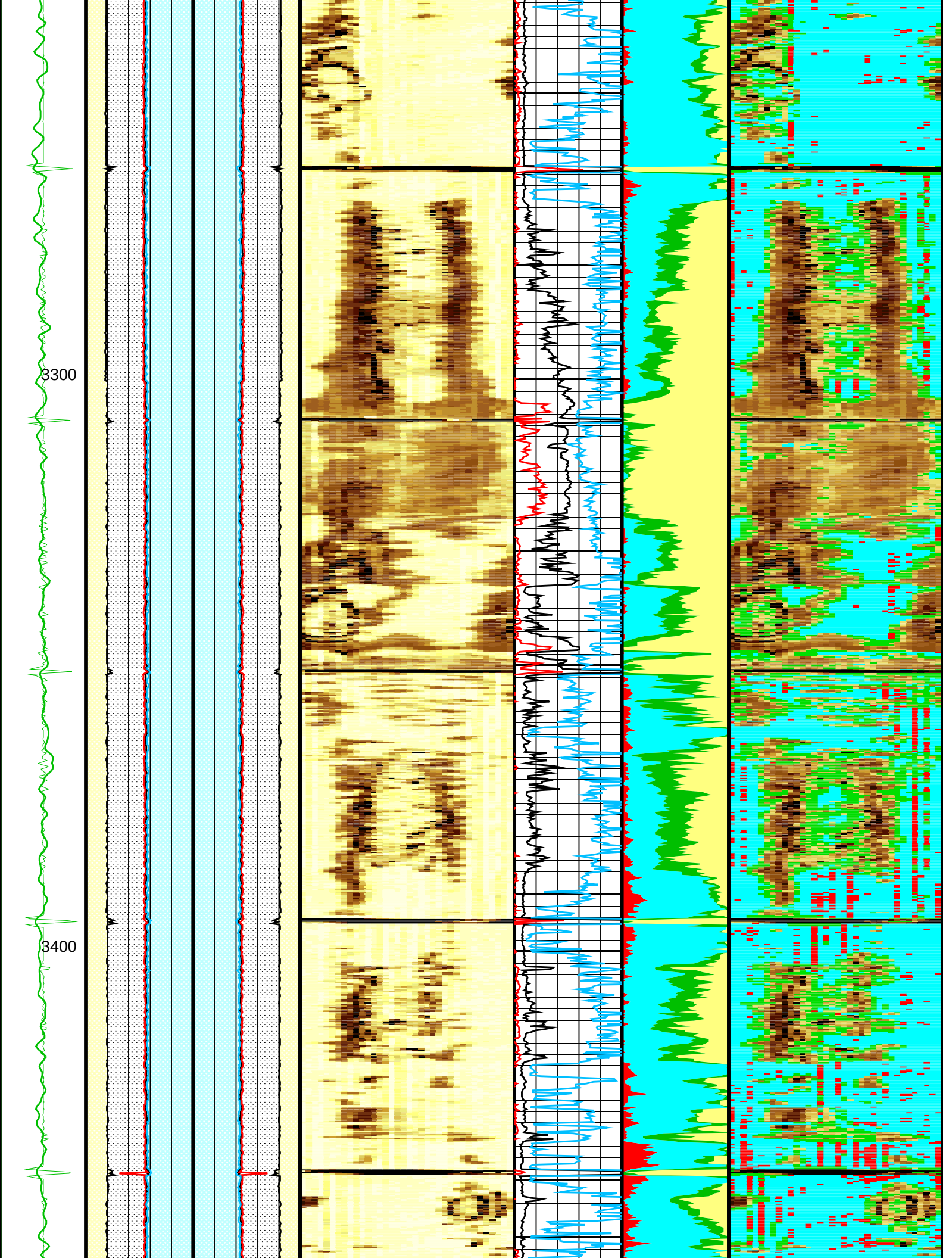

2200
2300

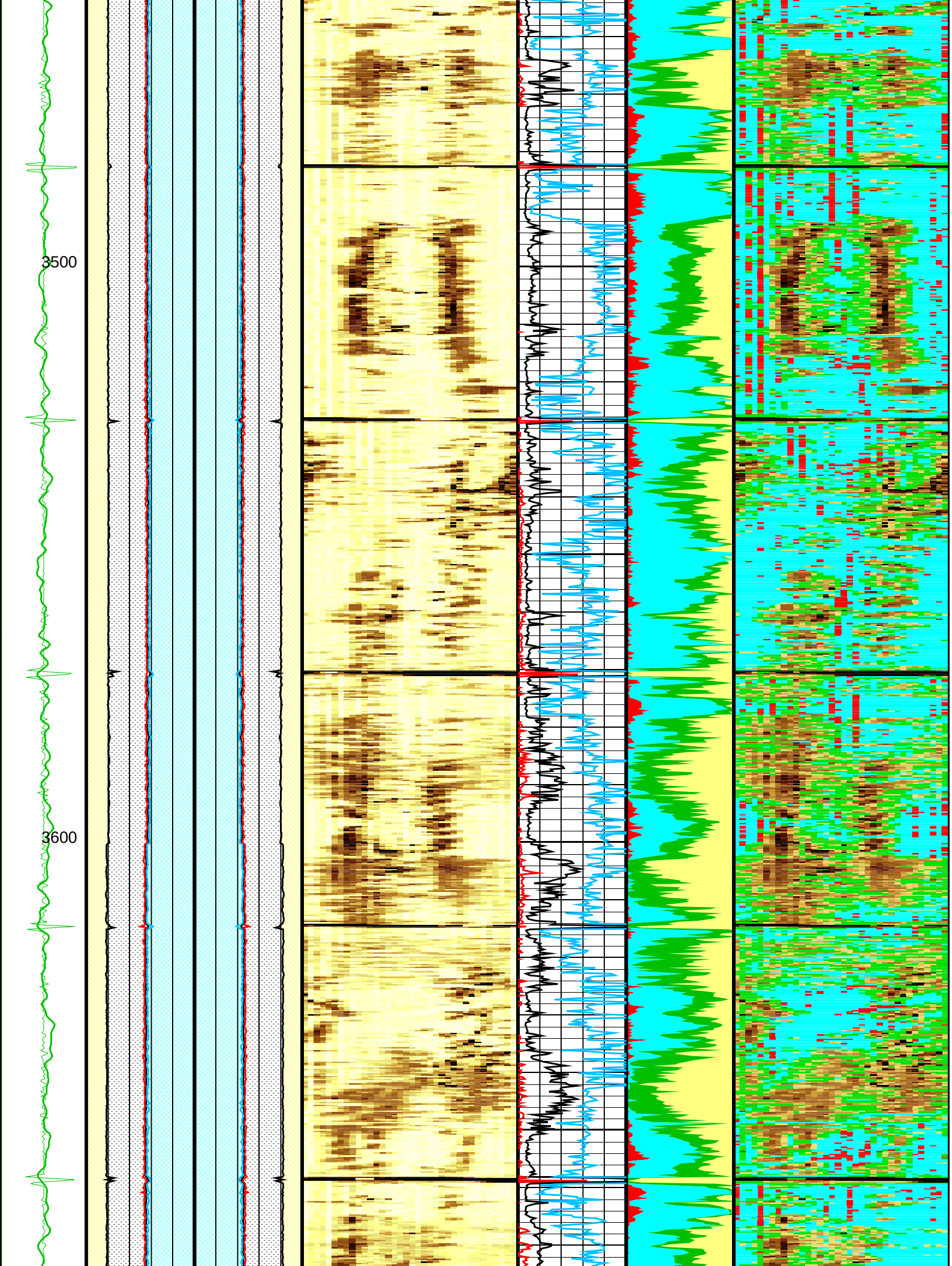

2400
2500

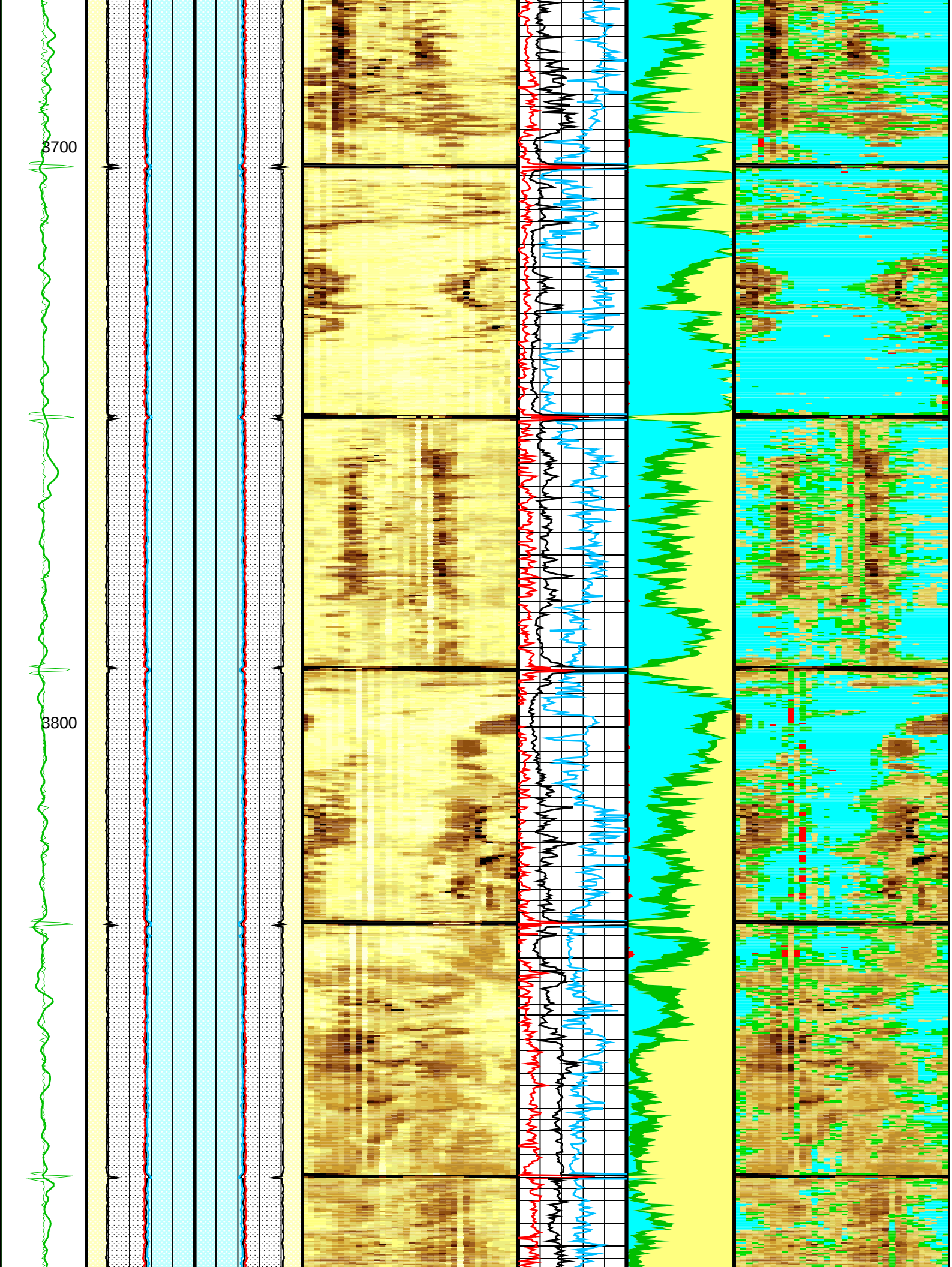

2600
2700

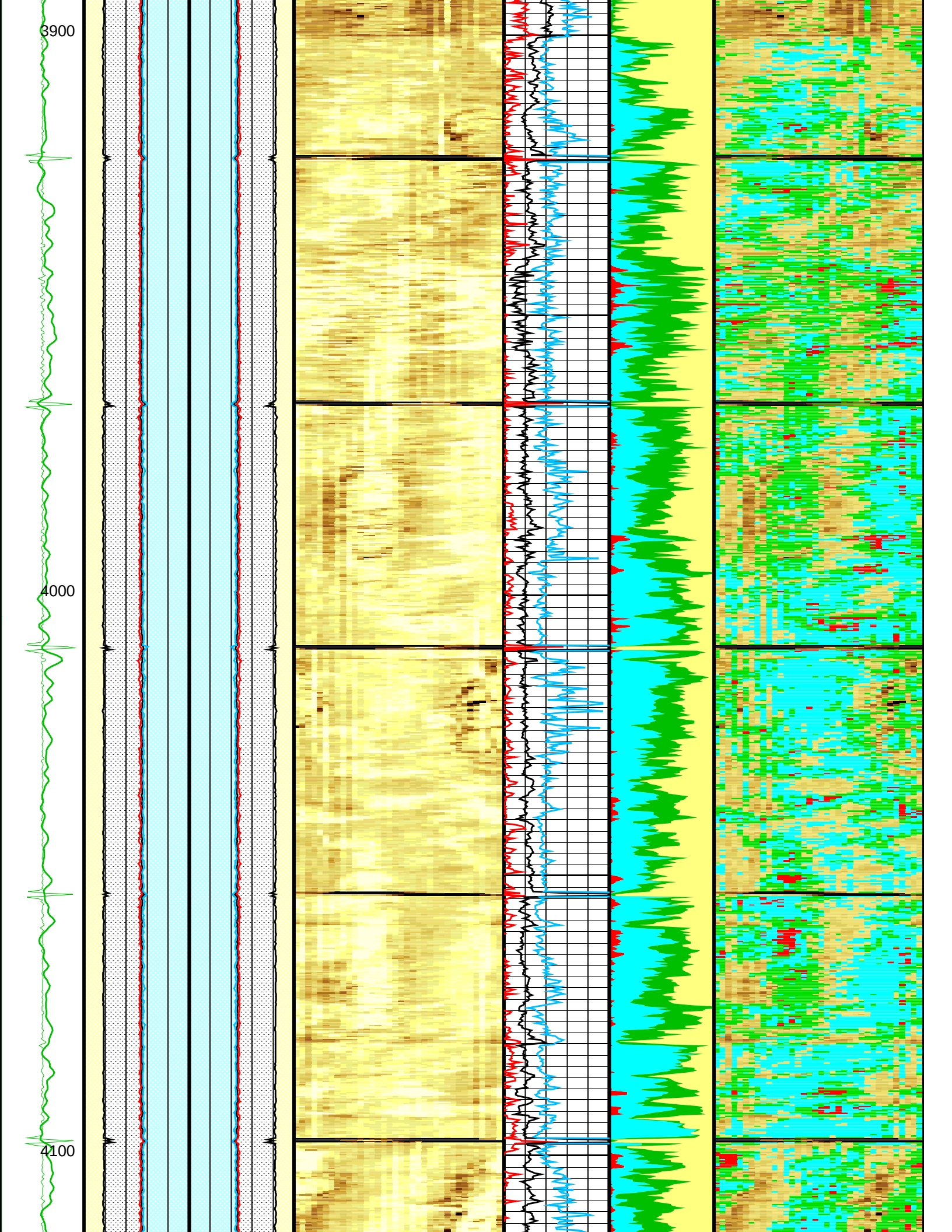

2800
2900
3000

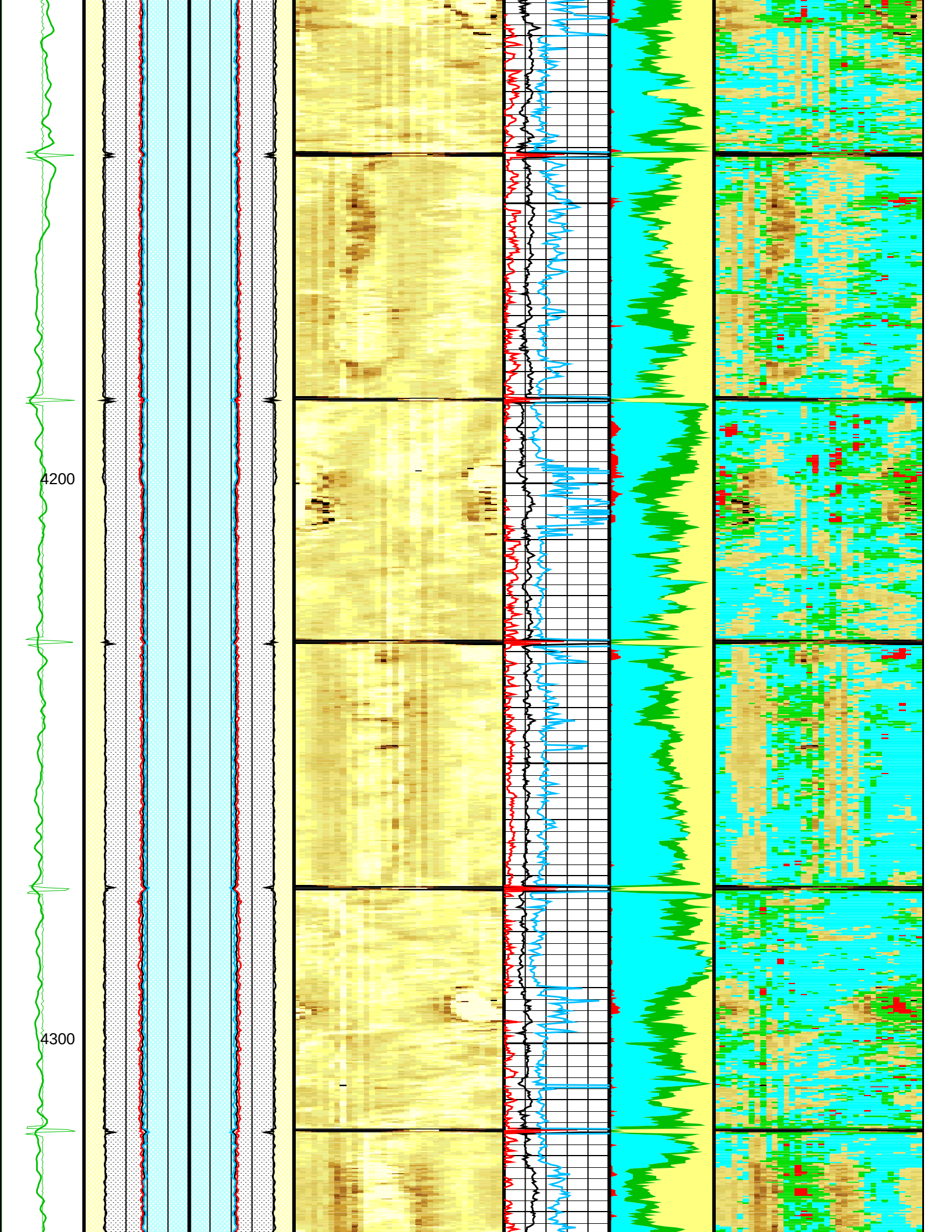

3100
3200

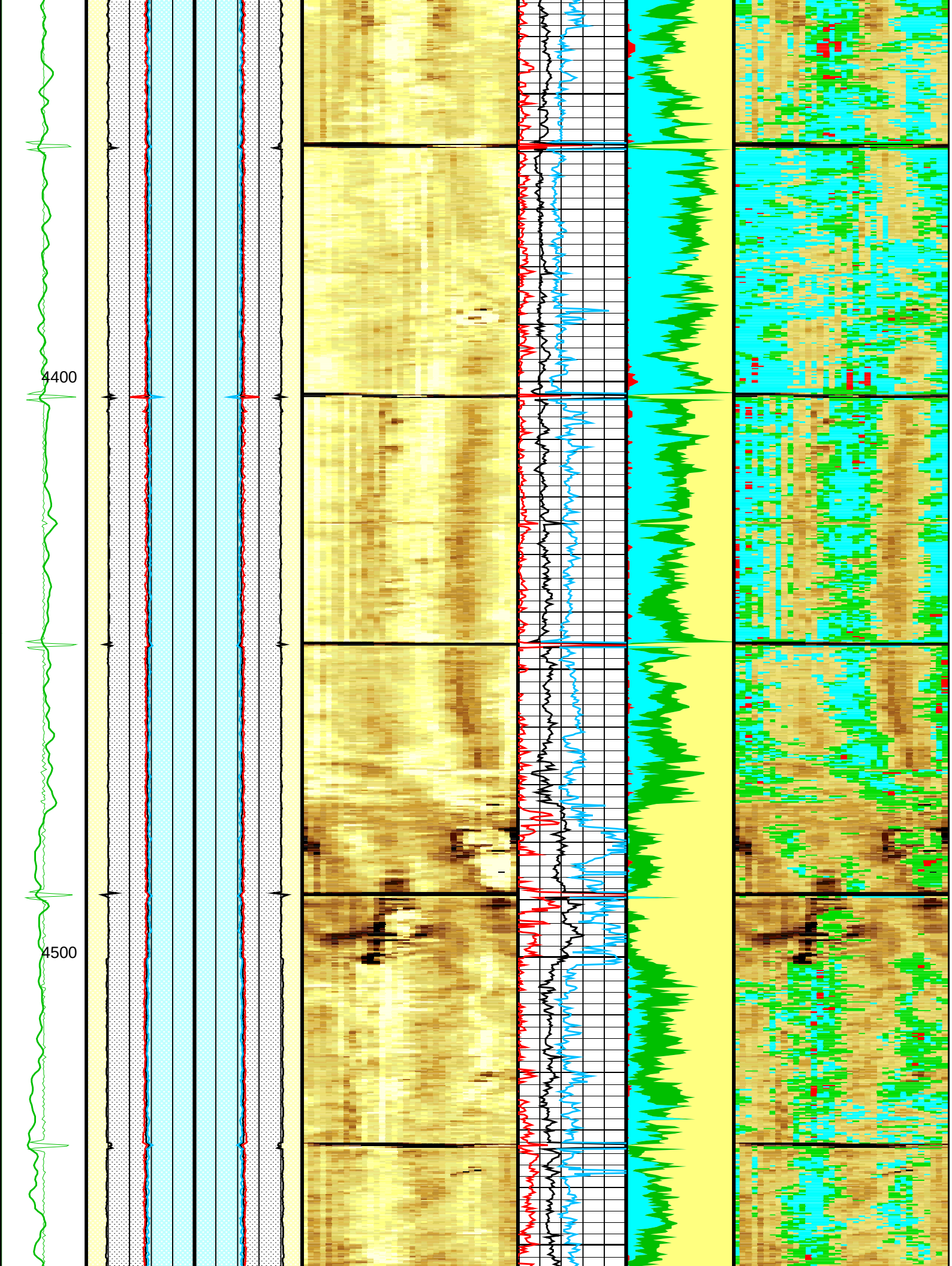

3300
3400

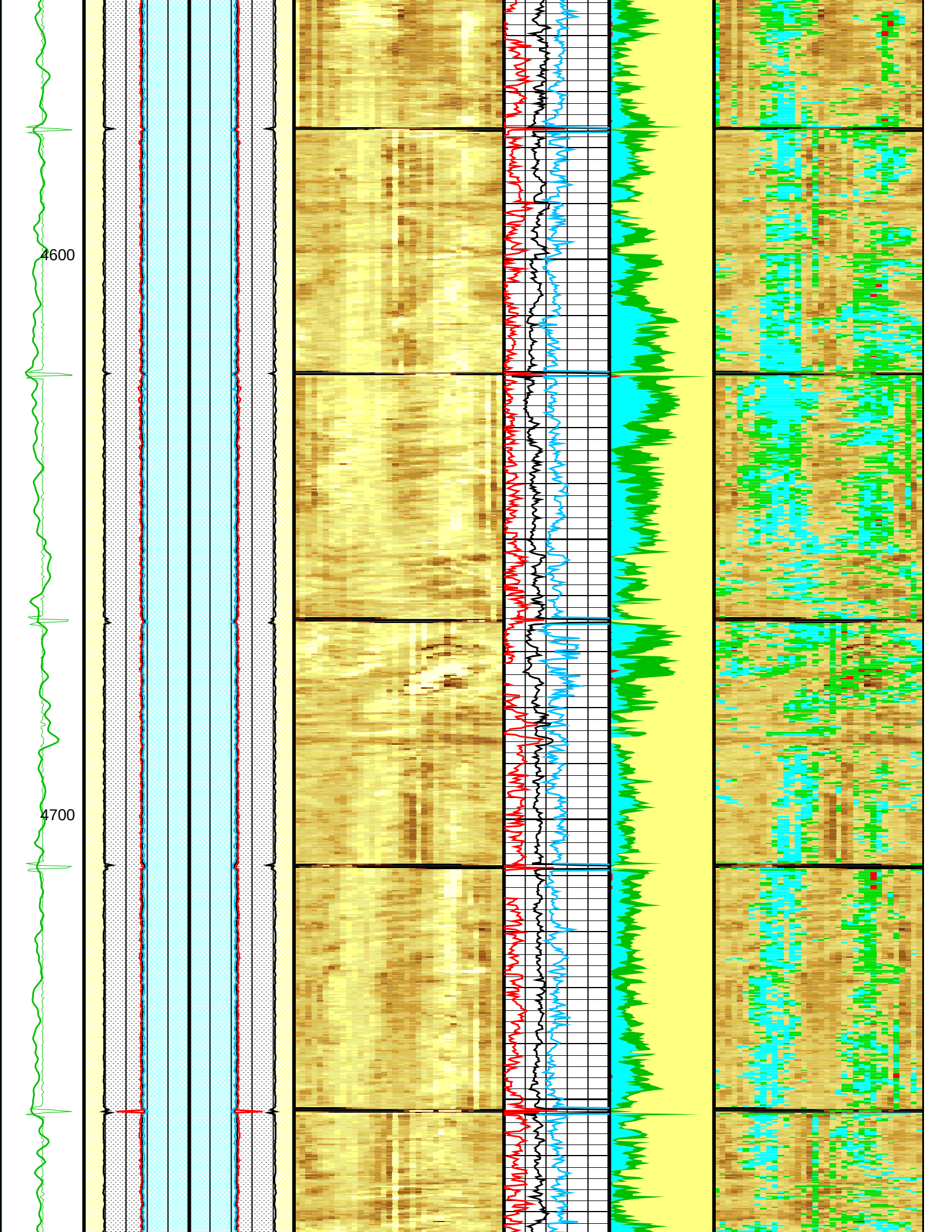

3500
3600

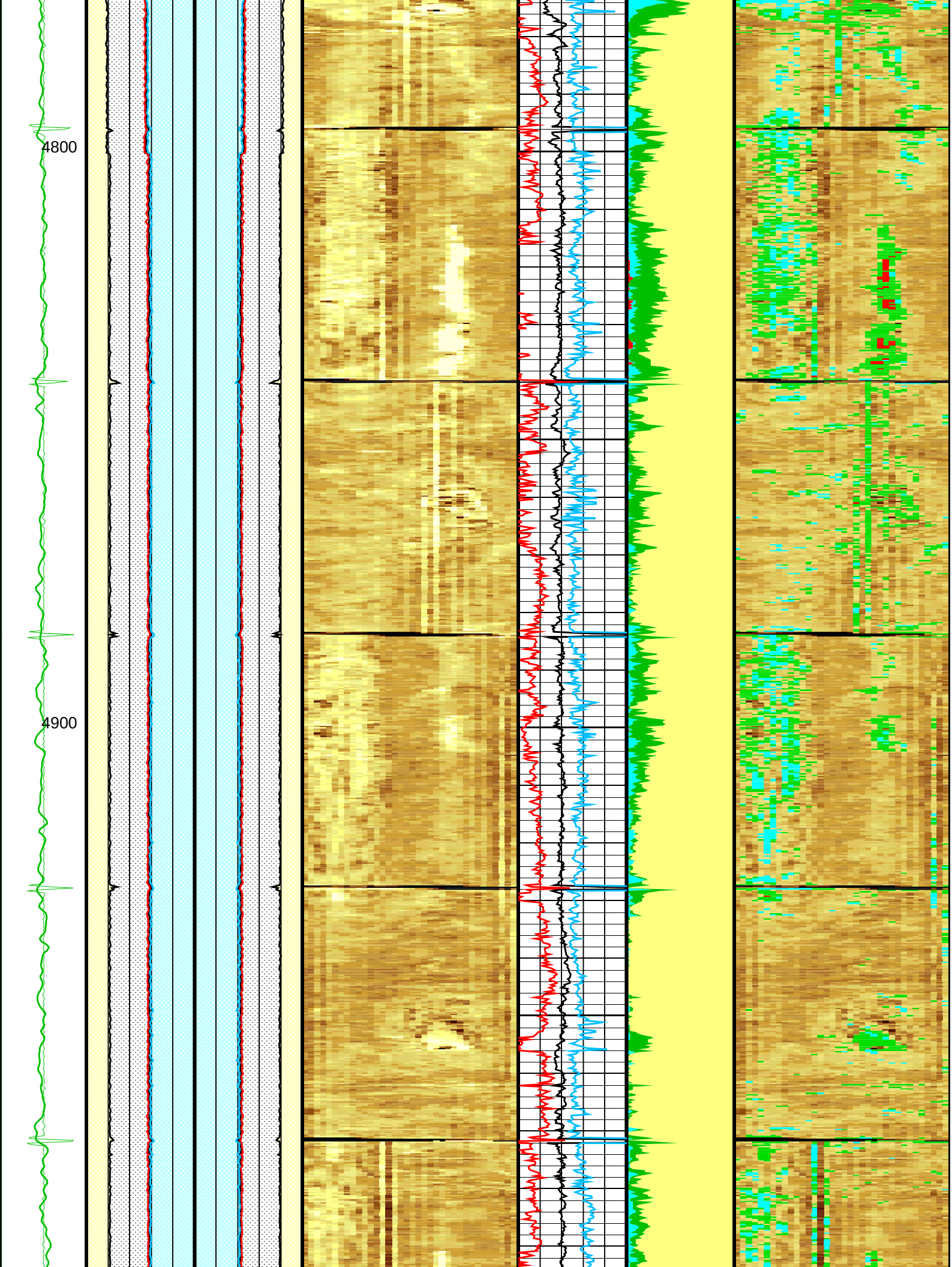

3700
3800

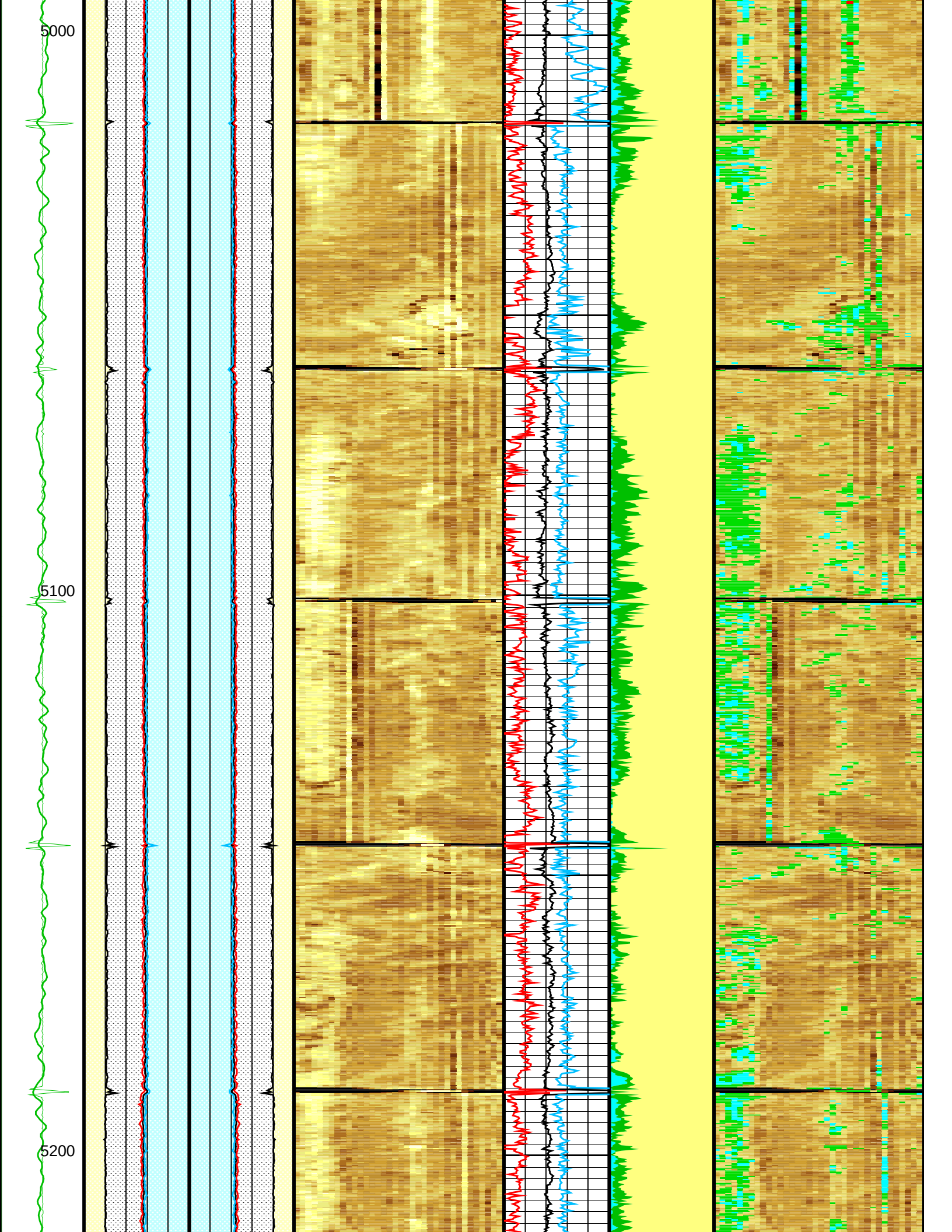

3900
4000
4100

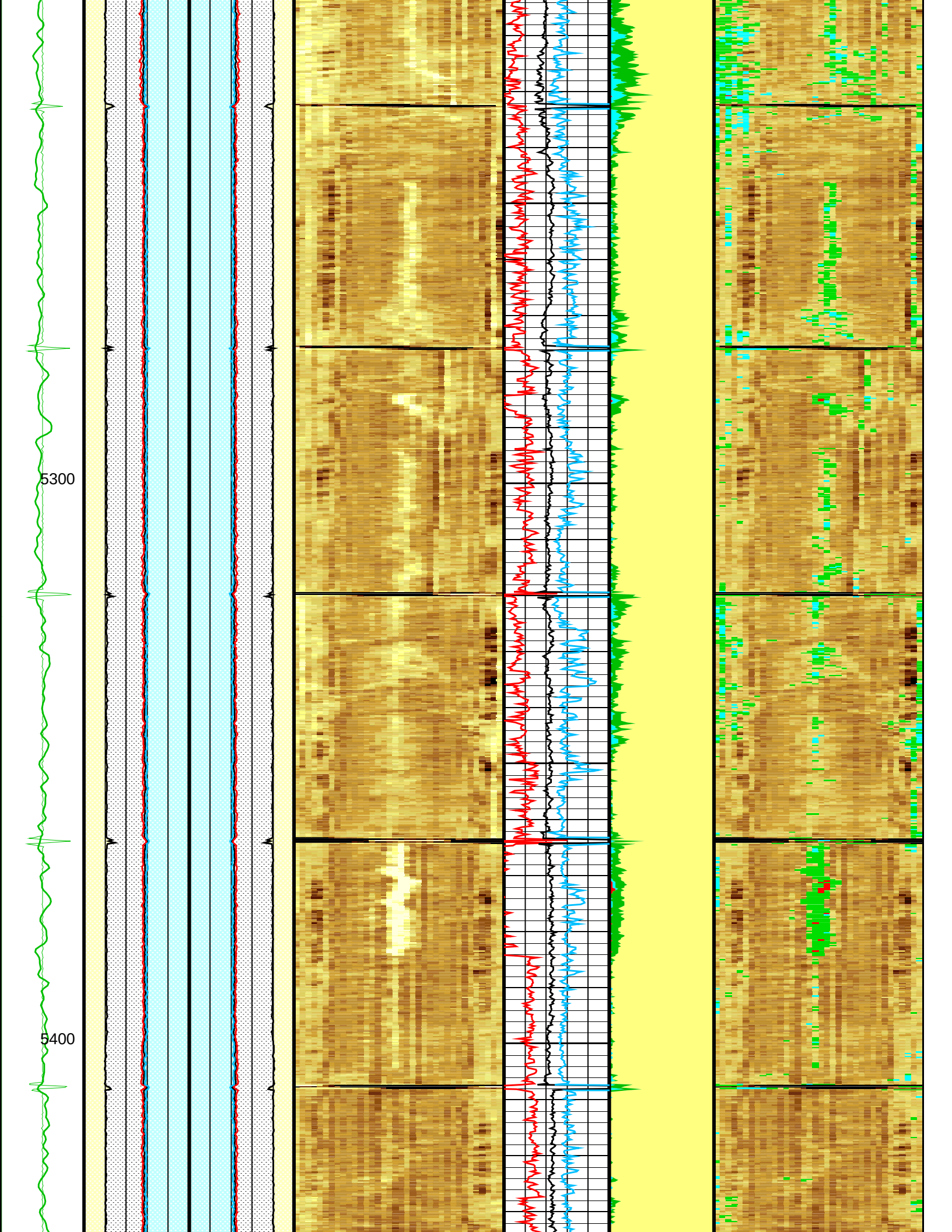

4200
4300

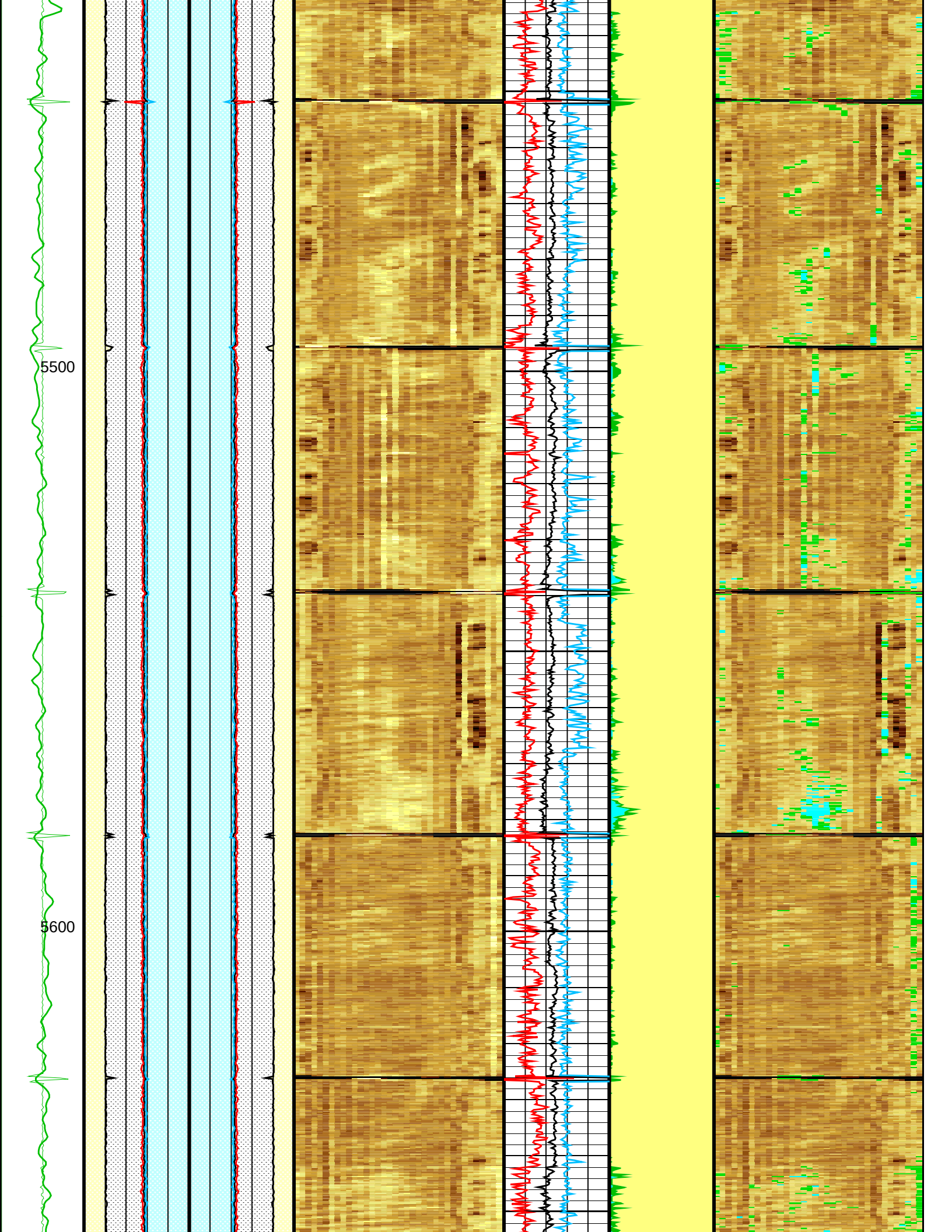

4400
4500

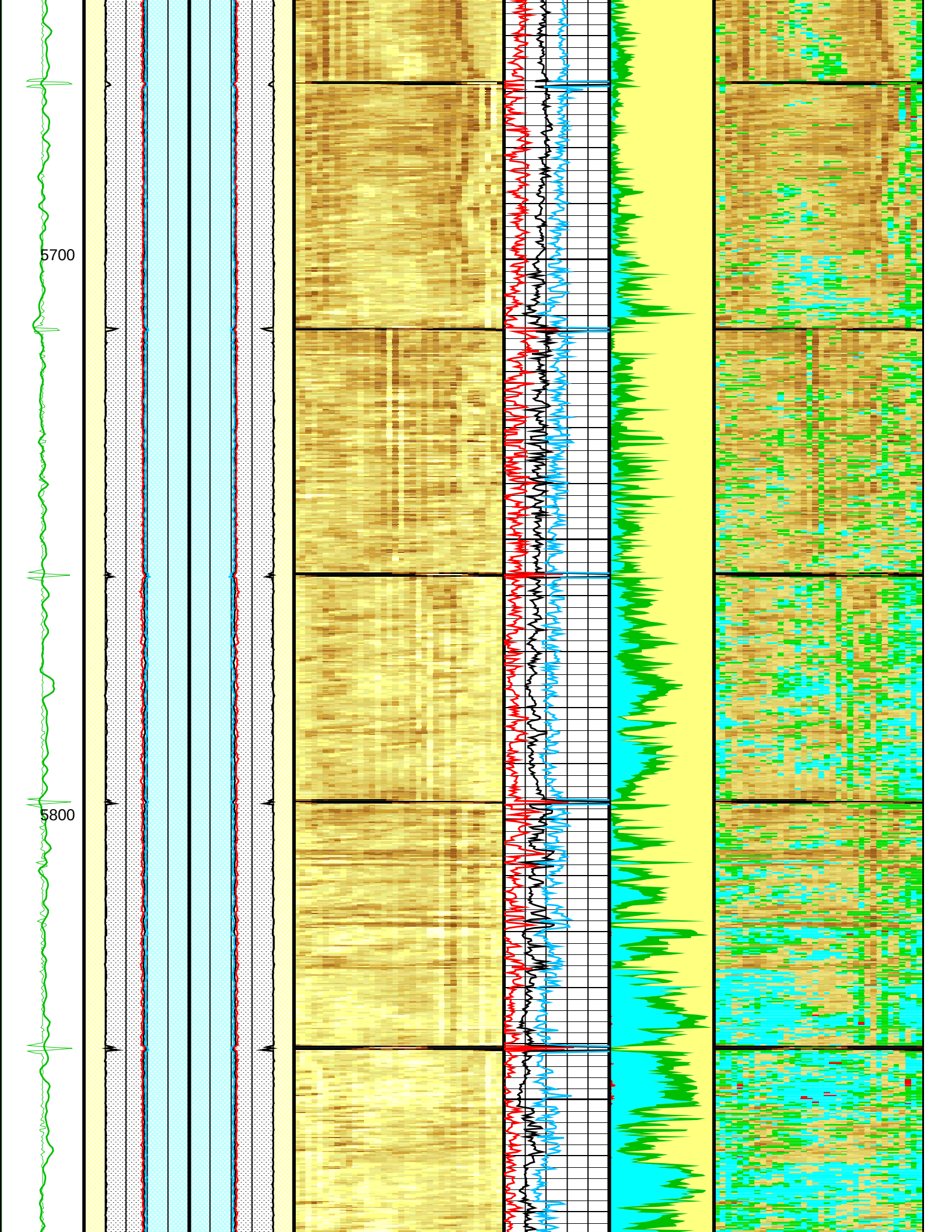

4600
4700

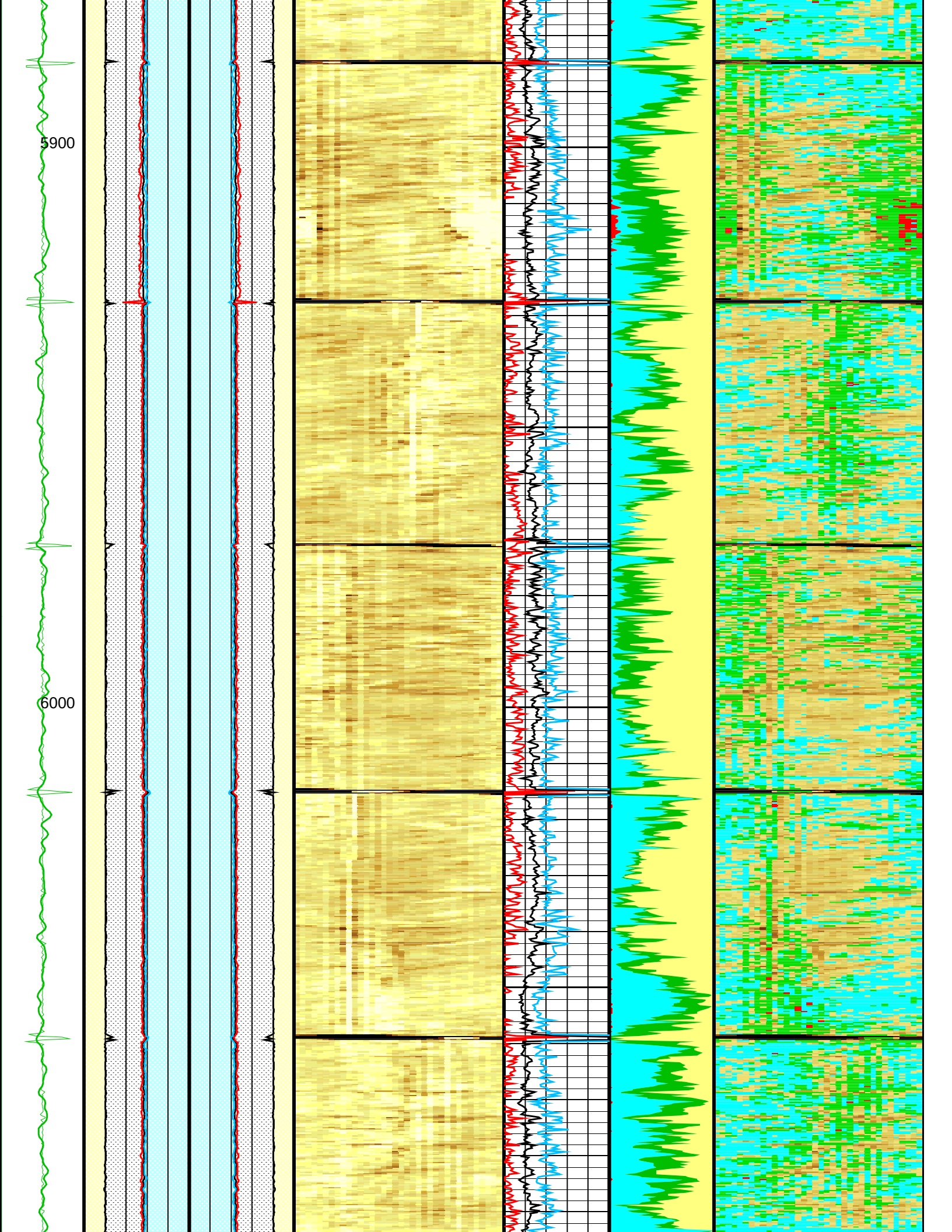

4800
4900

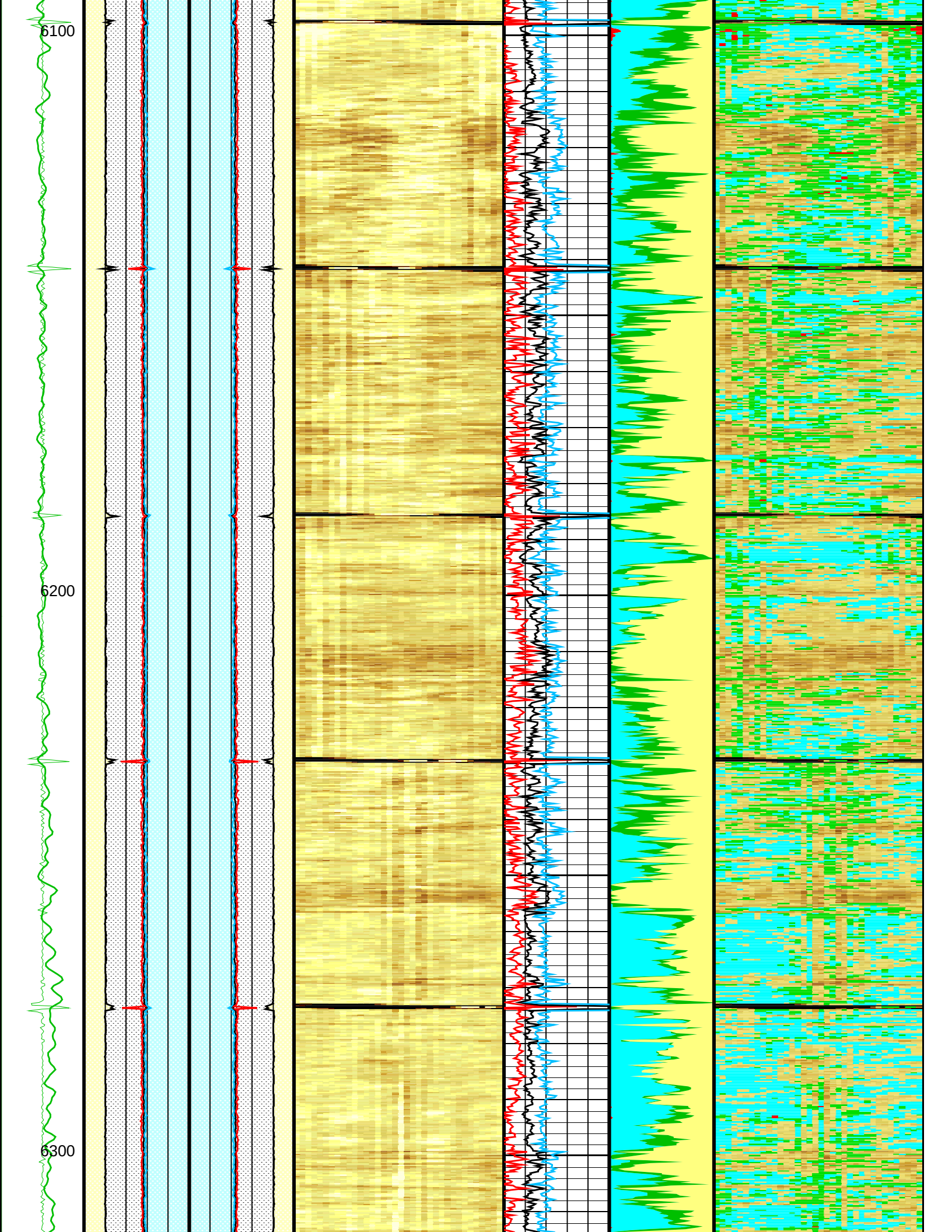

5000
5100
5200

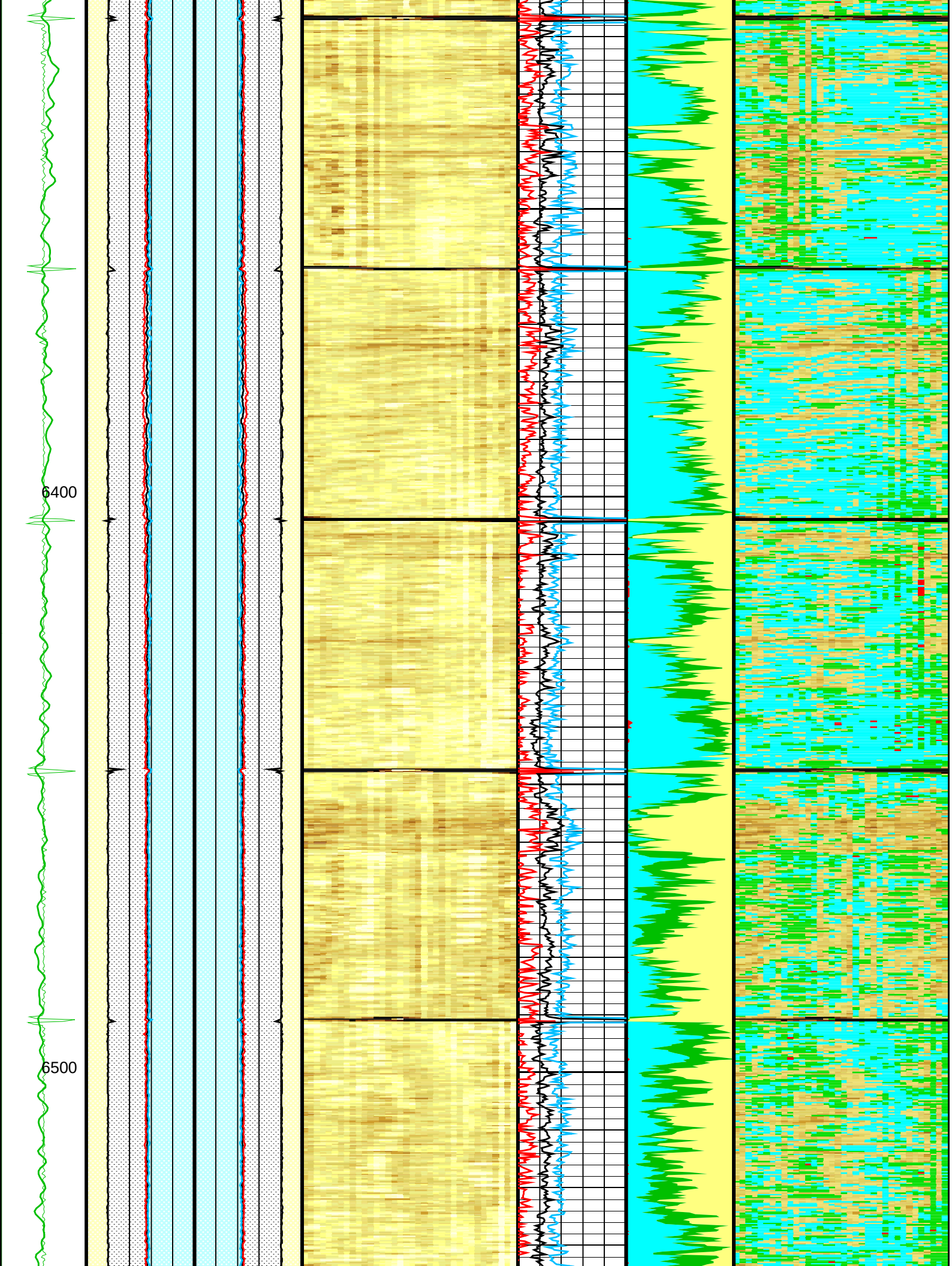

5300
5400

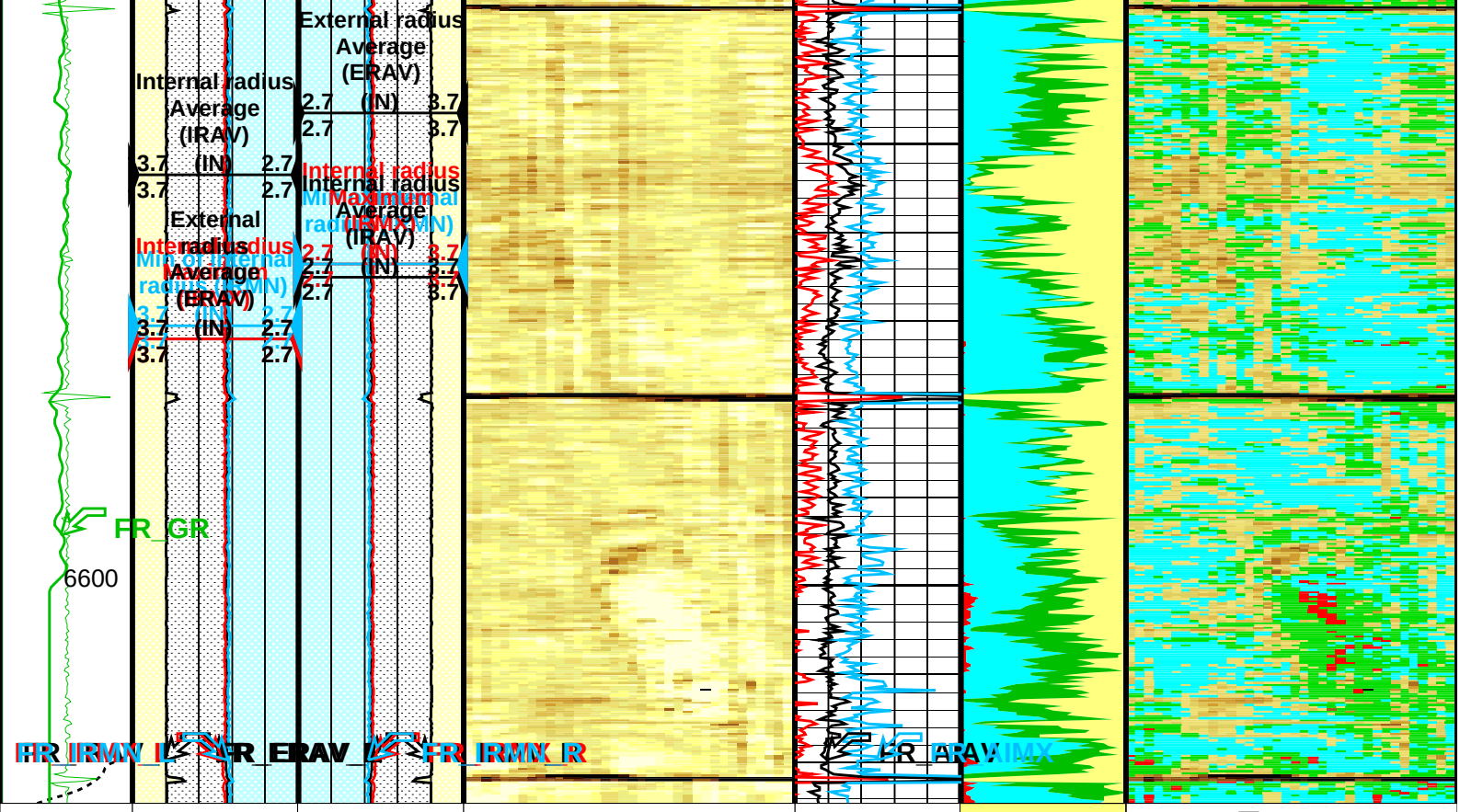

5500
5600


5700
5800


5900
6000


6100
6200
6300


6400
6500



CCL (CCLU) (----)	Internal radius Average (IRAV)	External radius Average (ERAV)	Raw Acoustic Imped. (AIBK) (MRAY)	Minimum of AI (AIMN)	Bonded	Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (MRAY)
−20 20	3.7 (IN) 2.7	2.7 (IN) 3.7	−500.0000 0.5000 1.0000 1.5000 2.0000 2.5000 3.0000 3.5000 4.0000 4.5000 5.0000 5.5000 6.0000 6.5000 7.0000 7.5000 8.0000	0 (MRAY) 10		−1000.0000 −500.0000 0.3000 2.4500 2.9546 3.4591 3.9636 4.4682 4.9727 5.4773 5.9818 6.4864 6.9909 7.4955 8.0000
Cable Speed (CS) (F/HR)	Internal radius Maximum (IRMX)	Internal radius Average (IRAV)		Average of AI (AIAV)	Gas or Dry MicroA	
0 2000	3.7 (IN) 2.7	2.7 (IN) 3.7		0 (MRAY) 10		
Gamma Ray (GR) (GAPI)	External radius Average (ERAV)	Internal radius Maximum (IRMX)		Maximum of AI (AIMX)	Liquid	
0 150	3.7 (IN) 2.7	2.7 (IN) 3.7		0 (MRAY) 10		
Stuck Stretch (STIT)	Min of Internal radius (IRMN)	Min of Internal radius (IRMN)			Micro−debon ding	
0 (F) 50	3.7 (IN) 2.7	2.7 (IN) 3.7				
Cable Drag From D4T to STIT						
Tool/Tot. Drag From D4T to STIA						

to STIA

Image rotation (UCAZ) (DEG)

0 360

Format: USIT CEMENT 5 inch Vertical Scale: 5" per 100' Graphics File Created: 29−May−2013 21:16

OP System Version: 19C1−222

eWAFE Version: 1.186

USIT−E	19C1−222	SGT−N	19C1−222
DTC−H	19C1−222		

All USI Images are outside views

USI : LOW Frequency Compression Mode Used For Logging.

Recommended casing thickness range for optimum cement impedance measurement : 0.27 to 0.6 IN.

Parameters

DLIS Name	Description	Value	
	USIT−E: Ultrasonic Imaging − E		
AGMN	Minimum Gain of Cartridge	−4	DB
AGMX	Maximum Gain of Cartridge	20	DB
BERJ	Bad Echo Rejection	ON	
CDIA	Casing Outer Diameter	7	IN
CSDE	Casing Density	486.94	LBCF
CSID	Casing Inner Diameter	6.276	IN
DFVL	Default Fluid Velocity	190	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	20	V
FDII	FPM Data Interpolation Interval	0	FT
IMAR	Image Rotation	OFF	
MW	Mud Weight	8.5	LB/G
RCOD	Reference Calibrator Outer Diameter	7	IN
RCSO	Reference Calibrator Standoff	1.1811	IN
RCTH	Reference Calibrator Thickness	0.2952	IN
SDNV	Number of Vertical Samples used for Micro−debonding Computation	5	
SDTHOR	Acoustic Impedance STD Horizontal Threshold for Micro−debonding	0.5	
SDTVER	Acoustic Impedance STD Vertical Threshold for Micro−debonding	0.3	
TCUB	T^3 Processing Level	Vax_Loop	
THDH	Maximum Search Thickness (percentage of nominal)	130	
THDL	Minimum Search Thickness (percentage of nominal)	70	
THDP	Thickness Detection Policy	Fundamental	
THNO	Nominal Thickness of Casing	0.362	IN
UMAO	USIT Measurement Angular Offset	18	DEG
USTO	Ultrasonic Time Offset	−2	US
USUB	Ultrasonic Subassembly Identifier	Sub_7_inch	
UWKM	Ultrasonic Working Mode	10DEG_3IN_60U_LF	
VCAS	Ultrasonic Transversal Velocity in Casing	51.4	US/F
WLEN	T^3 Processing Length	21.7078	US
ZCAS	Acoustic Impedance of Casing	46.25	MRAY
ZINI	Initial Estimate of Cement Impedance	−1	MRAY
ZMUD	Acoustic Impedance of Mud	1.65	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.45	MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3	MRAY
	STI: Stuck Tool Indicator		
LBFR	Trigger for MAXIS First Reading Label	TDL	
STKT	STI Stuck Threshold	5	FT
TDD	Total Depth − Driller	11597.00	FT
TDL	Total Depth − Logger	6620.00	FT
	System and Miscellaneous		
CWEI	Casing Weight	26.00	LB/F
DO	Depth Offset for Playback	4.0	FT
PP	Playback Processing	RECOMPUTE	

Input DLIS Files

USI_011LUP	FN:10	29−May−2013 20:40	6620.5 FT	−19.8 FT

USI_011LUP FN:10 29−May−2013 20:40 6620.5 FT −19.8 FT

Output DLIS Files

DEFAULT	USI_008PUP	FN:7	PRODUCER	29−May−2013 21:16	

Schlumberger

Compressed Goodwin

MAXIS Field Log

Company: Kerr−McGee Oil & Gas Onshore LP **Well: Bydalek 3N−20HZ**

Input DLIS Files

	USI_011LUP	FN:10	29−May−2013 20:40	6620.5 FT	−19.8 FT

Output DLIS Files

DEFAULT	USI_008PUP	FN:7	PRODUCER	29−May−2013 21:16	

OP System Version: 19C1−222

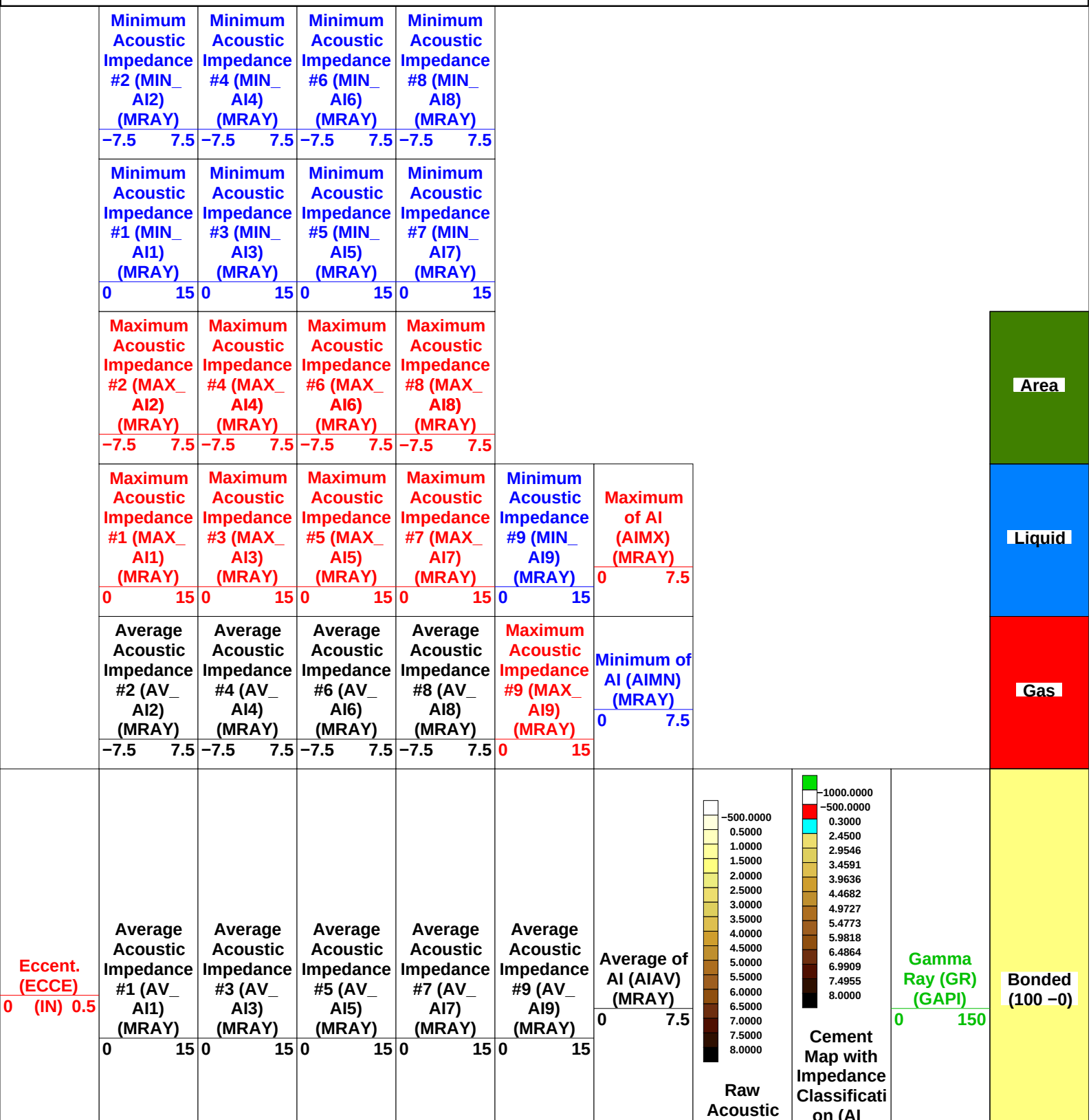
eWAFE Version: 1.186

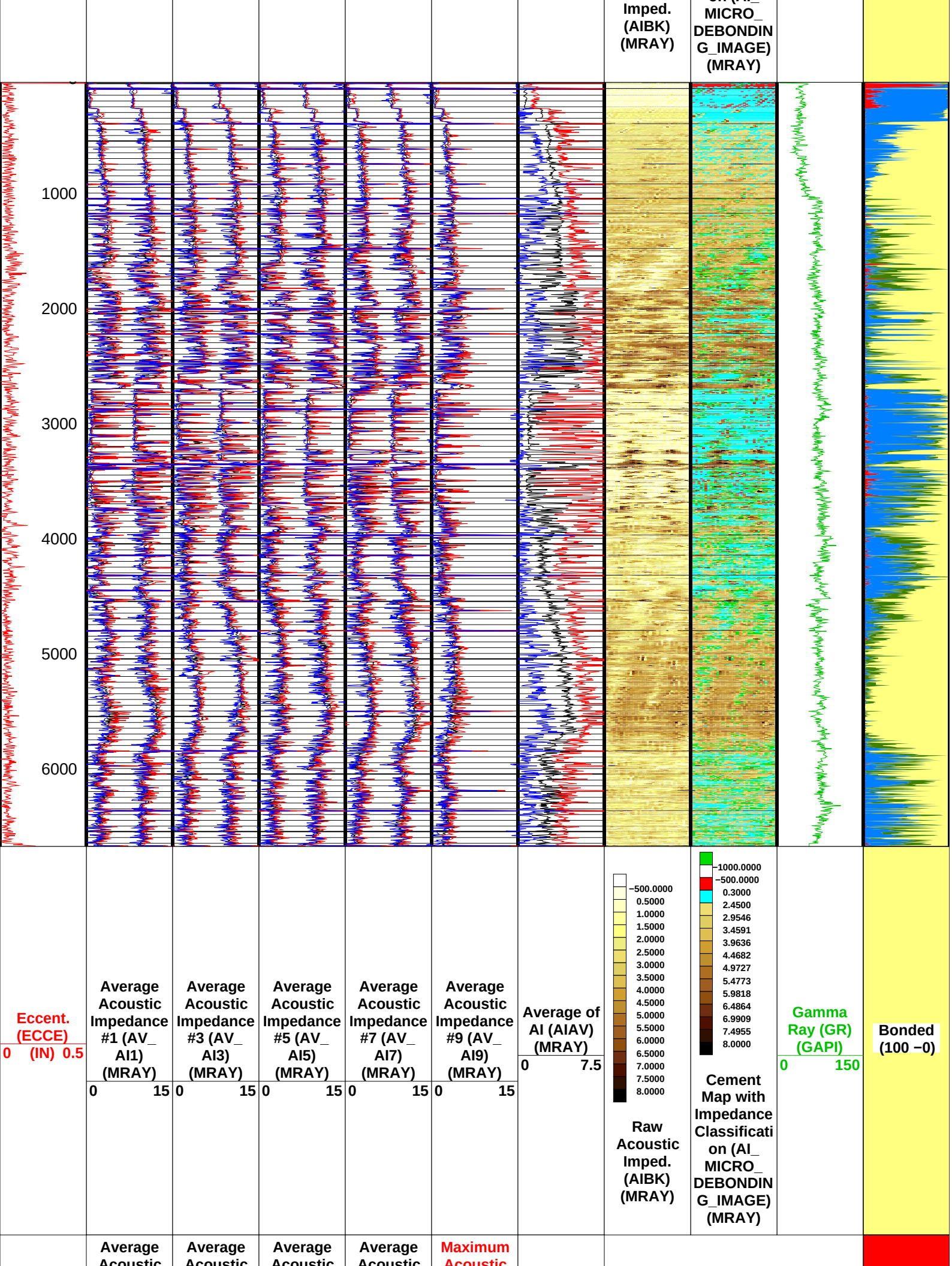
USIT−E	19C1−222	SGT−N	19C1−222
DTC−H	19C1−222		

Zoning of Mud Parameters

Depth	Fluid Velocity (DFVL)	Acoustic Impedance (ZMUD)
6600.00	187.00	1.64
6300.00	187.00	1.65
6000.00	187.00	1.62
5700.00	187.20	1.63
5400.00	188.30	1.62
5100.00	188.80	1.59
4800.00	185.95	1.63
4500.00	187.50	1.65
4200.00	186.00	1.63
3900.00	187.00	1.95
3600.00	189.00	1.95
3300.00	187.82	1.95
3000.00	188.39	1.95
2700.00	189.39	1.95

2400.00	190.40	1.95
2100.00	191.92	1.95
1800.00	192.92	1.64
1500.00	195.00	1.65
1200.00	196.00	1.65
900.00	197.00	1.63
600.00	199.00	1.63
300.00	202.00	1.73




Imped. (AIBK) (MRAY)
MICRO_ DEBONDIN G_IMAGE) (MRAY)
1000
2000
3000
4000
5000
6000
Eccent. (ECCE)
0 (IN) 0.5
Average Acoustic Impedance #1 (AV_ AI1) (MRAY)
0 15
Average Acoustic Impedance #3 (AV_ AI3) (MRAY)
0 15
Average Acoustic Impedance #5 (AV_ AI5) (MRAY)
0 15
Average Acoustic Impedance #7 (AV_ AI7) (MRAY)
0 15
Average Acoustic Impedance #9 (AV_ AI9) (MRAY)
0 15
Average of AI (AIAV) (MRAY)
0 7.5
−500.0000
0.5000
1.0000
1.5000
2.0000
2.5000
3.0000
3.5000
4.0000
4.5000
5.0000
5.5000
6.0000
6.5000
7.0000
7.5000
8.0000
Raw Acoustic Imped. (AIBK) (MRAY)
−1000.0000
−500.0000
0.3000
2.4500
2.9546
3.4591
3.9636
4.4682
4.9727
5.4773
5.9818
6.4864
6.9909
7.4955
8.0000
Cement Map with Impedance Classificati on (AI_ MICRO_ DEBONDIN G_IMAGE) (MRAY)
Gamma Ray (GR) (GAPI)
0 150
Bonded (100 −0)
Average
Average
Average
Average
Maximum

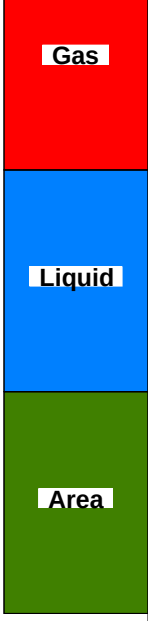
Acoustic Impedance #2 (AV_AI2) (MRAY)	Acoustic Impedance #4 (AV_AI4) (MRAY)	Acoustic Impedance #6 (AV_AI6) (MRAY)	Acoustic Impedance #8 (AV_AI8) (MRAY)	Acoustic Impedance #9 (MAX_AI9) (MRAY)	Minimum of AI (AIMN) (MRAY)
−7.5 7.5	−7.5 7.5	−7.5 7.5	−7.5 7.5	0 15	0 7.5

Maximum Acoustic Impedance #1 (MAX_AI1) (MRAY)	Maximum Acoustic Impedance #3 (MAX_AI3) (MRAY)	Maximum Acoustic Impedance #5 (MAX_AI5) (MRAY)	Maximum Acoustic Impedance #7 (MAX_AI7) (MRAY)	Minimum Acoustic Impedance #9 (MIN_AI9) (MRAY)	Maximum of AI (AIMX) (MRAY)
0 15	0 15	0 15	0 15	0 15	0 7.5

Maximum Acoustic Impedance #2 (MAX_AI2) (MRAY)	Maximum Acoustic Impedance #4 (MAX_AI4) (MRAY)	Maximum Acoustic Impedance #6 (MAX_AI6) (MRAY)	Maximum Acoustic Impedance #8 (MAX_AI8) (MRAY)
−7.5 7.5	−7.5 7.5	−7.5 7.5	−7.5 7.5

Minimum Acoustic Impedance #1 (MIN_AI1) (MRAY)	Minimum Acoustic Impedance #3 (MIN_AI3) (MRAY)	Minimum Acoustic Impedance #5 (MIN_AI5) (MRAY)	Minimum Acoustic Impedance #7 (MIN_AI7) (MRAY)
0 15	0 15	0 15	0 15

Minimum Acoustic Impedance #2 (MIN_AI2) (MRAY)	Minimum Acoustic Impedance #4 (MIN_AI4) (MRAY)	Minimum Acoustic Impedance #6 (MIN_AI6) (MRAY)	Minimum Acoustic Impedance #8 (MIN_AI8) (MRAY)
−7.5 7.5	−7.5 7.5	−7.5 7.5	−7.5 7.5



Format: USIT only Goodwin Compressed **Vertical Scale: 0.1" per 100'** **Graphics File Created: 29−May−2013 21:16**

OP System Version: 19C1−222

eWAFE Version: 1.186

USIT−E	19C1−222	SGT−N	19C1−222
DTC−H	19C1−222		

All USI Images are outside views

USI : LOW Frequency Compression Mode Used For Logging.

Recommended casing thickness range for optimum cement impedance measurement : 0.27 to 0.6 IN.

Input DLIS Files

	USI_011LUP	FN:10	29−May−2013 20:40	6620.5 FT	−19.8 FT

Output DLIS Files

DEFAULT	USI_008PUP	FN:7	PRODUCER	29−May−2013 21:16

Schlumberger

Repeat pass

Company: Kerr−McGee Oil & Gas Onshore LP **Well: Bydalek 3N−20HZ**

Input DLIS Files

	USI_008LUP	FN:7	29−May−2013 20:40	6611.0 FT	6208.6 FT

Output DLIS Files

DEFAULT	USI_009PUP	FN:8	PRODUCER	29−May−2013 21:25

OP System Version: 19C1−222

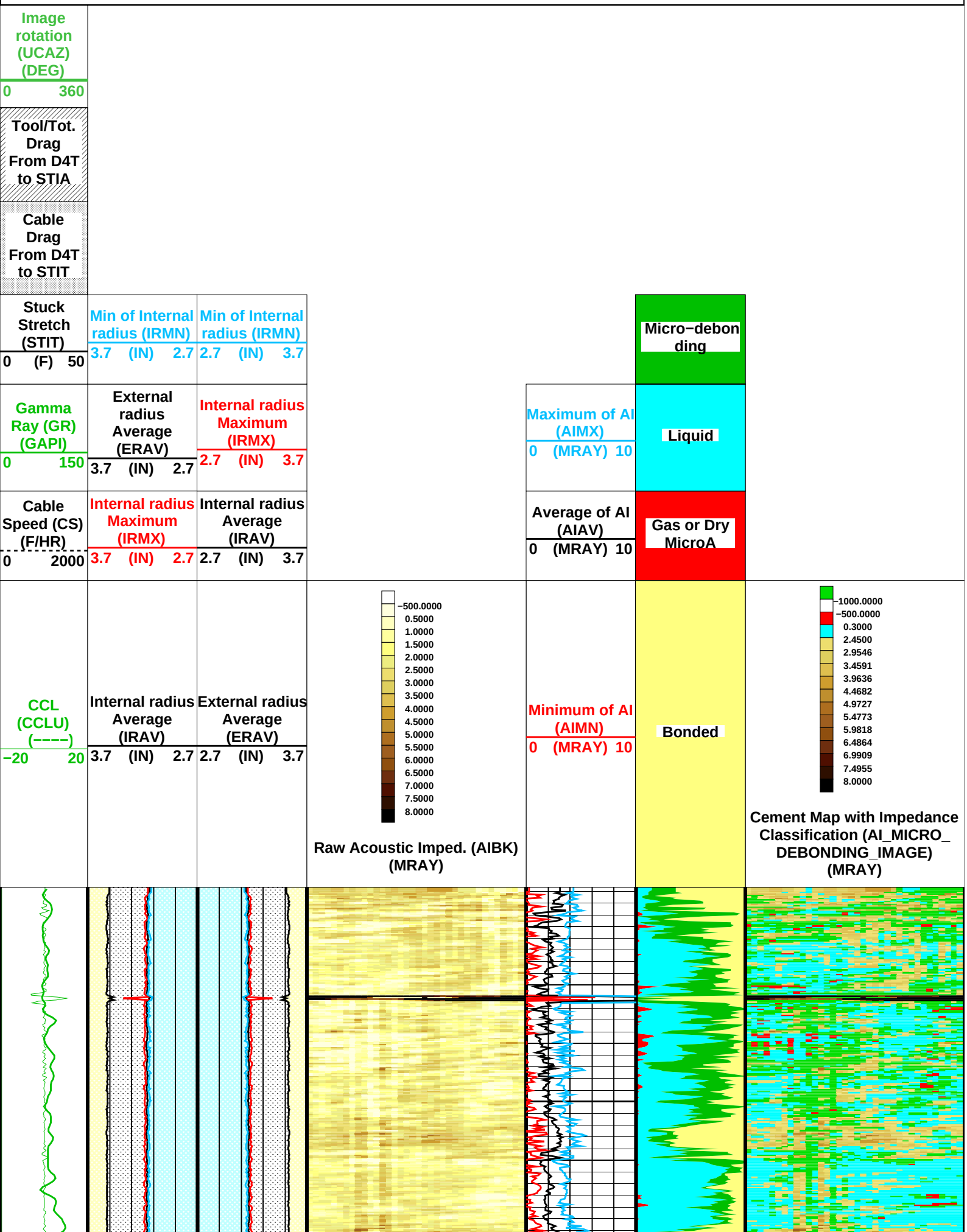
eWAFE Version: 1.186

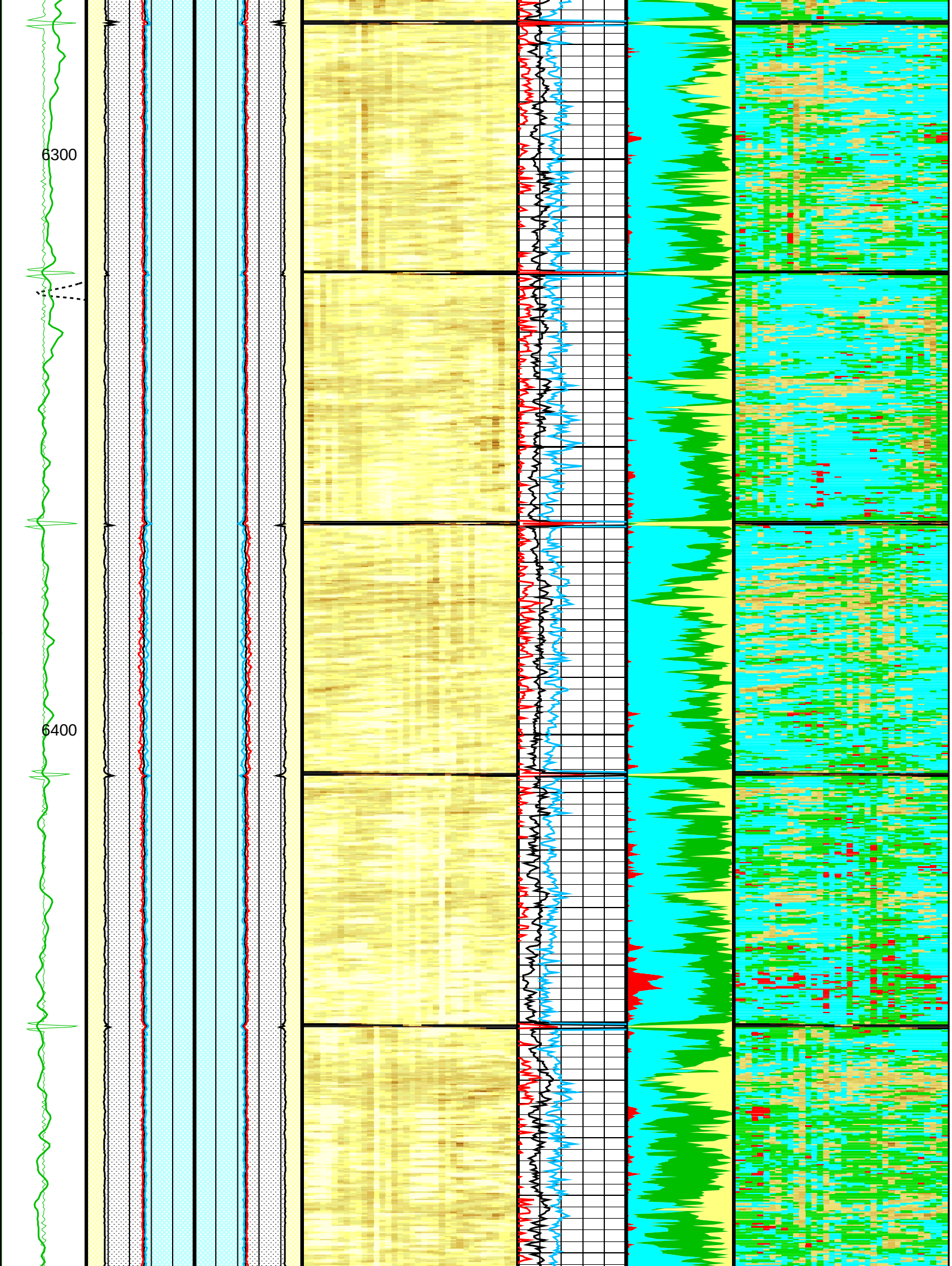
USIT−E	19C1−222	SGT−N	19C1−222
DTC−H	19C1−222		

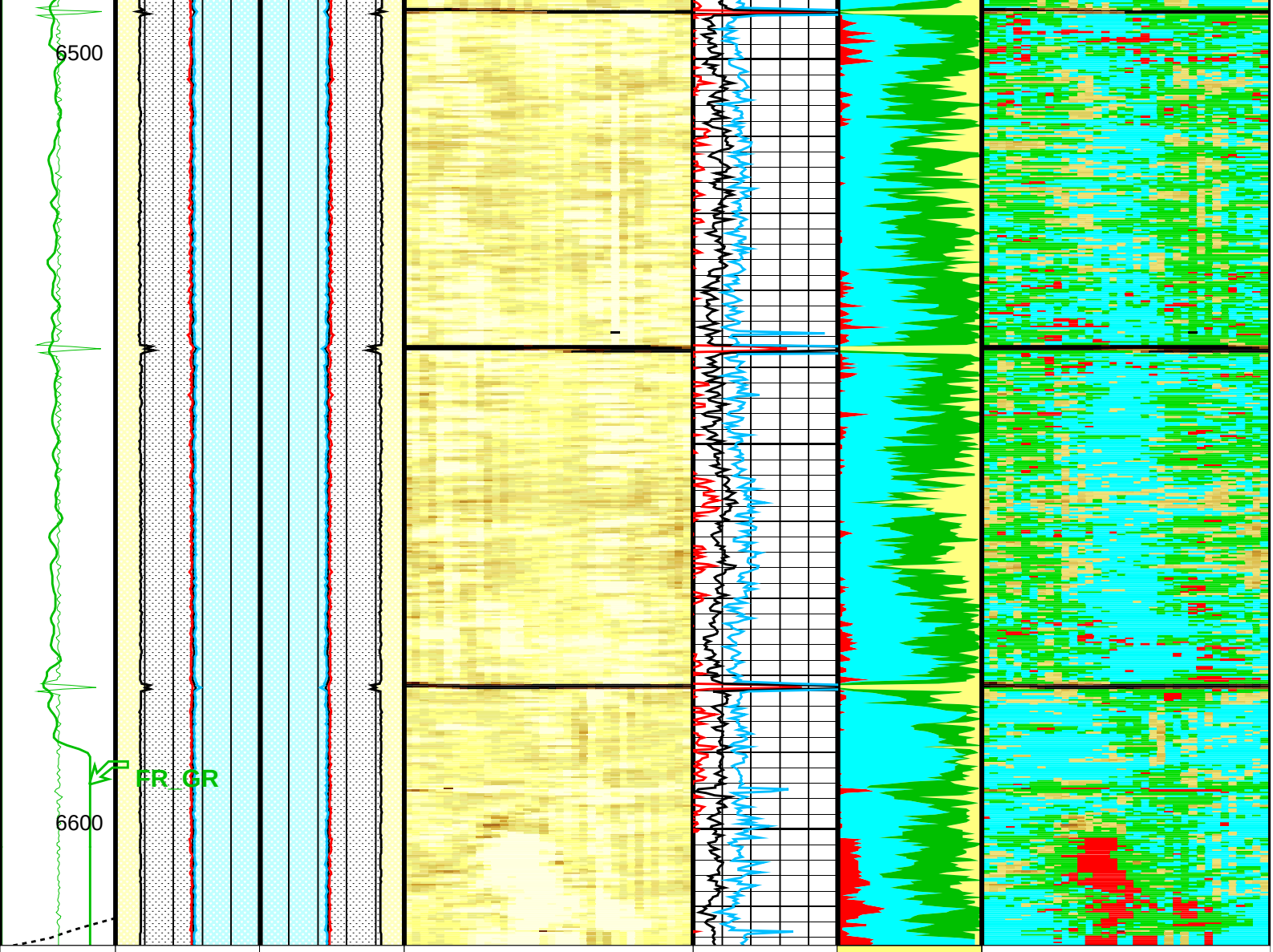
Zoning of Mud Parameters

Depth	Fluid Velocity (DFVL)	Acoustic Impedance (ZMUD)
6600.00	187.00	1.64
6300.00	187.00	1.65
6000.00	187.00	1.62
5700.00	188.28	1.63
5400.00	189.31	1.62
5100.00	190.86	1.59
4800.00	187.95	1.63
4500.00	186.29	1.65
4200.00	184.53	1.63
3900.00	185.75	1.55
3600.00	187.78	1.58
3300.00	187.82	1.56
3000.00	188.39	1.56
2700.00	189.39	1.56
2400.00	190.40	1.59
2100.00	191.92	1.64
1800.00	192.92	1.64
1500.00	193.92	1.65
1200.00	194.42	1.65
900.00	195.93	1.63
600.00	197.94	1.62

600.00	197.94	1.63
300.00	200.74	1.73




6300
6400



CCL (CCLU) (----) −20 20	Internal radius Average (IRAV) 3.7 (IN) 2.7	External radius Average (ERAV) 2.7 (IN) 3.7	−500.0000 0.5000 1.0000 1.5000 2.0000 2.5000 3.0000 3.5000 4.0000 4.5000 5.0000 5.5000 6.0000 6.5000 7.0000 7.5000 8.0000 Raw Acoustic Imped. (AIBK) (MRAY)	Minimum of AI (AIMN) 0 (MRAY) 10	Bonded	−1000.0000 −500.0000 0.3000 2.4500 2.9546 3.4591 3.9636 4.4682 4.9727 5.4773 5.9818 6.4864 6.9909 7.4955 8.0000 Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (MRAY)
Cable Speed (CS) (F/HR) 0 2000	Internal radius Maximum (IRMX) 3.7 (IN) 2.7	Internal radius Average (IRAV) 2.7 (IN) 3.7		Average of AI (AIAV) 0 (MRAY) 10	Gas or Dry MicroA	
Gamma Ray (GR) (GAPI) 0 150	External radius Average (ERAV) 3.7 (IN) 2.7	Internal radius Maximum (IRMX) 2.7 (IN) 3.7		Maximum of AI (AIMX) 0 (MRAY) 10	Liquid	
Stuck Stretch (STIT) 0 (F) 50	Min of Internal radius (IRMN) 3.7 (IN) 2.7	Min of Internal radius (IRMN) 2.7 (IN) 3.7			Micro−debonding	

0 (F) 50			
Cable Drag From D4T to STIT			
Tool/Tot. Drag From D4T to STIA			
Image rotation (UCAZ) (DEG)			
0 360			

Format: USIT CEMENT 5 inch **Vertical Scale: 5" per 100'** **Graphics File Created: 29−May−2013 21:25**

OP System Version: 19C1−222

eWAFE Version: 1.186

USIT−E	19C1−222	SGT−N	19C1−222
DTC−H	19C1−222		

All USI Images are outside views

USI : LOW Frequency Compression Mode Used For Logging.

Recommended casing thickness range for optimum cement impedance measurement : 0.27 to 0.6 IN.

Parameters

DLIS Name	Description	Value	
	USIT−E: Ultrasonic Imaging − E		
AGMN	Minimum Gain of Cartridge	−4	DB
AGMX	Maximum Gain of Cartridge	20	DB
BERJ	Bad Echo Rejection	ON	
CDIA	Casing Outer Diameter	7	IN
CSDE	Casing Density	486.94	LBCF
CSID	Casing Inner Diameter	6.276	IN
DFVL	Default Fluid Velocity	190	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	20	V
FDII	FPM Data Interpolation Interval	0	FT
IMAR	Image Rotation	OFF	
MW	Mud Weight	8.5	LB/G
RCOD	Reference Calibrator Outer Diameter	7	IN
RCSO	Reference Calibrator Standoff	1.1811	IN
RCTH	Reference Calibrator Thickness	0.2952	IN
SDNV	Number of Vertical Samples used for Micro−debonding Computation	5	
SDTHOR	Acoustic Impedance STD Horizontal Threshold for Micro−debonding	0.5	
SDTVER	Acoustic Impedance STD Vertical Threshold for Micro−debonding	0.3	
TCUB	T^3 Processing Level	Vax_Loop	
THDH	Maximum Search Thickness (percentage of nominal)	130	
THDL	Minimum Search Thickness (percentage of nominal)	70	
THDP	Thickness Detection Policy	Fundamental	
THNO	Nominal Thickness of Casing	0.362	IN
UMAO	USIT Measurement Angular Offset	18	DEG
USTO	Ultrasonic Time Offset	−2	US
USUB	Ultrasonic Subassembly Identifier	Sub_7_inch	
UWKM	Ultrasonic Working Mode	10DEG_3IN_60U_LF	
VCAS	Ultrasonic Transversal Velocity in Casing	51.4	US/F
WLEN	T^3 Processing Length	21.7078	US
ZCAS	Acoustic Impedance of Casing	46.25	MRAY
ZINI	Initial Estimate of Cement Impedance	−1	MRAY
ZMUD	Acoustic Impedance of Mud	1.65	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.6	MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3	MRAY
	STI: Stuck Tool Indicator		

LBFR	Trigger for MAXIS First Reading Label	TDL	
STKT	STI Stuck Threshold	5	FT
TDD	Total Depth − Driller	11597.00	FT
TDL	Total Depth − Logger	6620.00	FT
	System and Miscellaneous		
CWEI	Casing Weight	26.00	LB/F
DO	Depth Offset for Playback	4.0	FT
PP	Playback Processing	RECOMPUTE	

Input DLIS Files

	USI_008LUP	FN:7	29−May−2013 20:40	6611.0 FT	6208.6 FT

Output DLIS Files

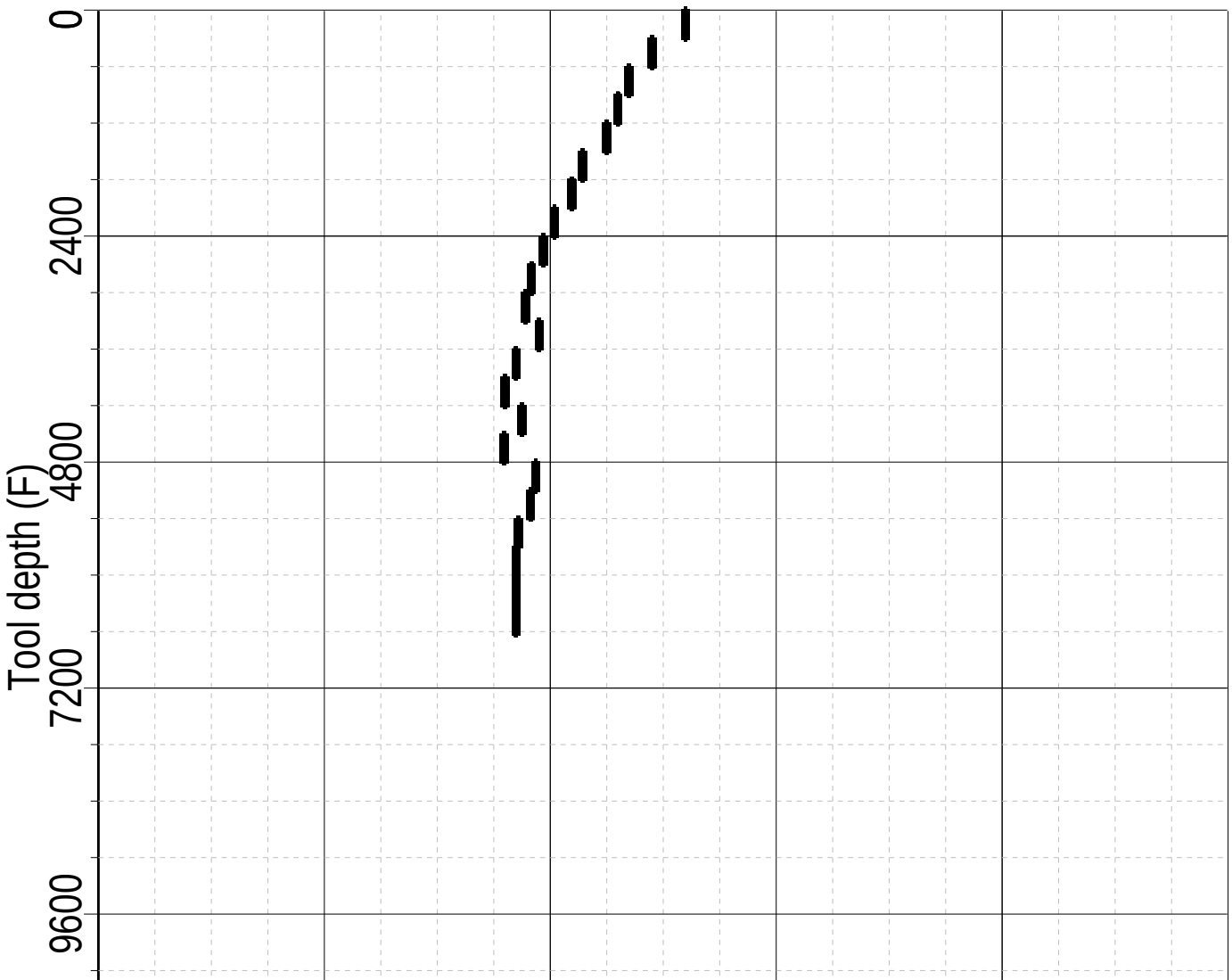
DEFAULT	USI_009PUP	FN:8	PRODUCER	29−May−2013 21:25

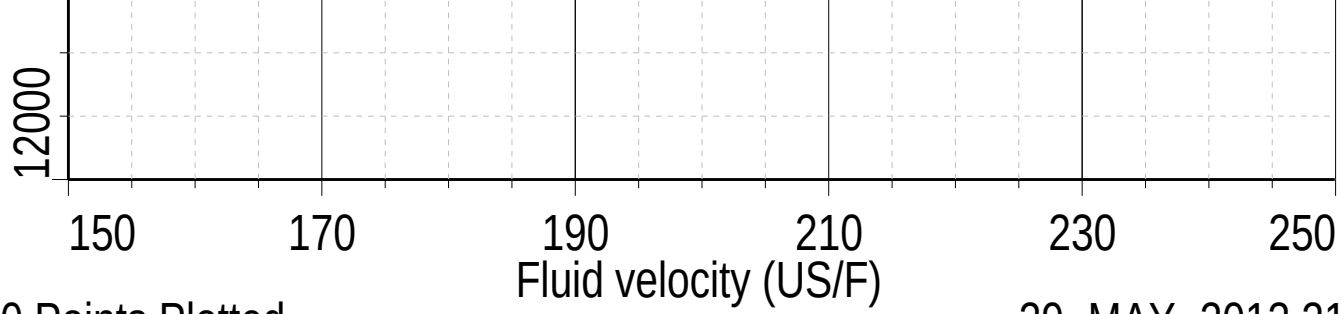
Schlumberger

FPM

MAXIS Field Log

Index: 6624.5 − −15.2 FT

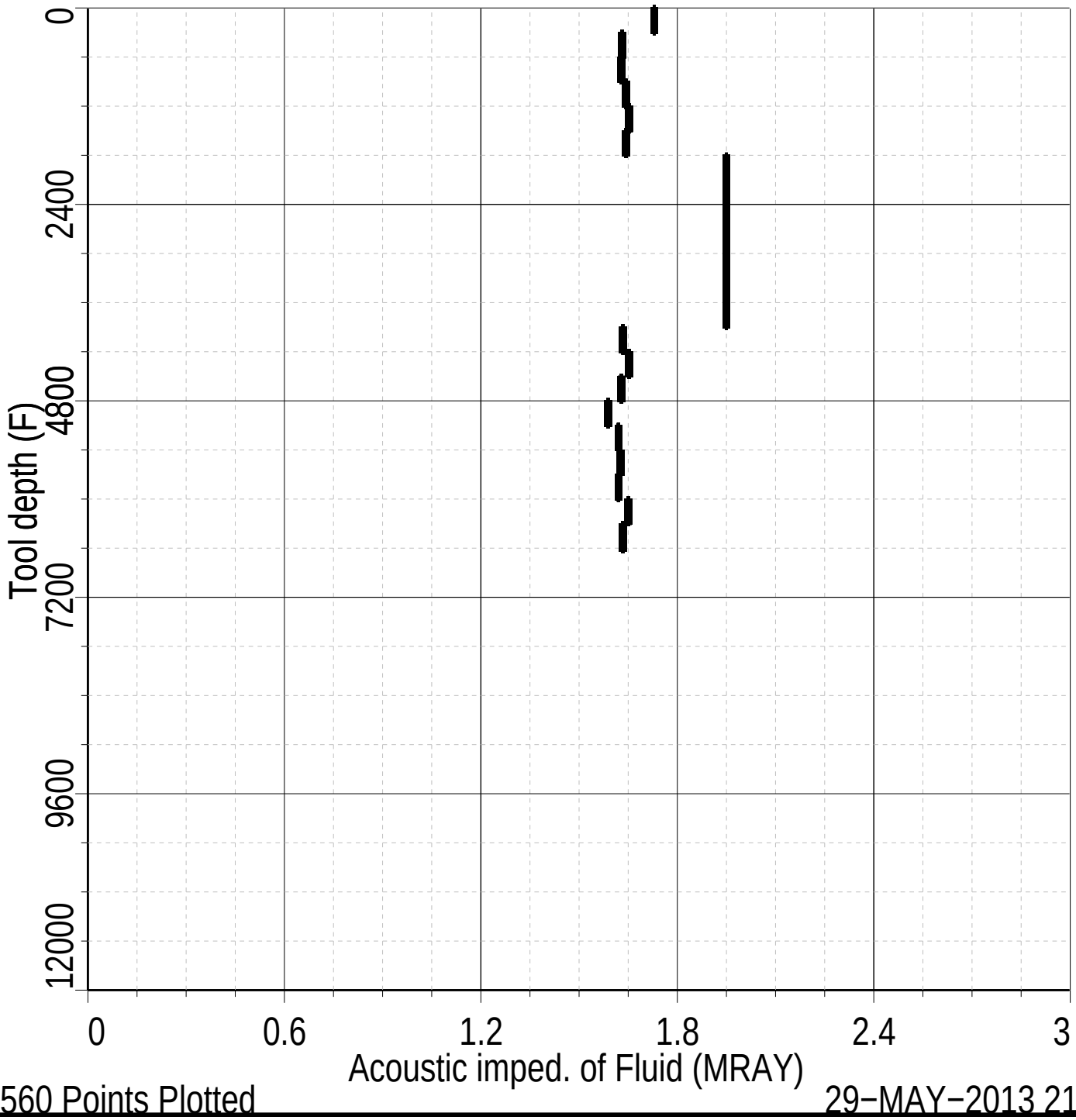




26560 Points Plotted

29−MAY−2013 21:24

Index: 6624.5 − −15.2 FT



26560 Points Plotted

29−MAY−2013 21:24

MAXIS Field Log

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
Ultrasonic Imaging − E Wellsite Calibration − IBC CSL: Far versus Near Gain Offset							
Before: Calibration not done							
Near Waveform for azimuth 001	0	N/A	0	N/A	N/A	N/A	DB/M
Scintillation Gamma Ray Tool − N Wellsite Calibration − Detector Calibration							
Before: 28−May−2013 18:08							
Gamma Ray (Jig − Bkg)	167.3	N/A	167.3	N/A	N/A	15.21	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI

Ultrasonic Imaging − E / Equipment Identification

Primary Equipment:

7 inches Sub	USRS −	875
USIT sonde	USIS − A	2797
USIT Sonde Cartridge	USSC − A	
USAC Acquisition Cartridge DTS/FTB	USAC − A	992

Auxiliary Equipment:

USAC Housing/cartridge	ECH − MFA	1964

Ultrasonic Imaging − E Wellsite Calibration

IBC CSL: Far versus Near Gain Offset

Phase	Near Waveform for azimuth 001 DB/M	Value
Before		0

−200.0 (Minimum) 0 (Nominal) 200.0 (Maximum)

Before: Calibration not done

Scintillation Gamma Ray Tool − N / Equipment Identification

Primary Equipment:

Scintillation Gamma Cartridge	SGC − TB
Scintillation Gamma Detector	SGD − TAB

Auxiliary Equipment:

Scintillation Gamma Housing	SGH − K
Gamma Source Radioactive	GSR − U/Y

Scintillation Gamma Ray Tool − N Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig − Bkg) GAPI	Value	Phase	Gamma Ray (Calibrated) GAPI	Value
Before		71.01	Before		167.3	Before		165.0
0 (Minimum) 30.00 (Nominal) 120.0 (Maximum)			152.1 (Minimum) 167.3 (Nominal) 182.5 (Maximum)			150.0 (Minimum) 165.0 (Nominal) 180.0 (Maximum)		

Before: 28−May−2013 18:08

DTS Telemetry Tool / Equipment Identification

Primary Equipment:

DTC−H Auxiliary Cartridge	DTCH − A
DTC−H Telemetry Cartridge	DTCH − A

Auxiliary Equipment:

DTCH Telemetry Cartridge Housing	ECH − KC

Company:	**Kerr−McGee Oil & Gas Onshore LP**
Well:	**Bydalek 3N−20HZ**
Field:	**Wattenberg**
County:	**Weld**
State:	**Colorado**

Schlumberger

Cement Evaluation
USIT