Schlumberger

Company: **OXY US LA Basin**

Well: **DOM-002**
Field: **Dominguez**
County: **Los Angeles** State: **California**

ULTRA SONIC IMAGER
GAMMA RAY TIE IN
2IN/100FT LINEAR MD

DOGGR
Received
OCT 09 2013

County: Los Angeles
Field: Dominguez
Location: Surface Lambert Coordinates:
Well: DOM-002
Company: OXY US LA Basin

LOCATION

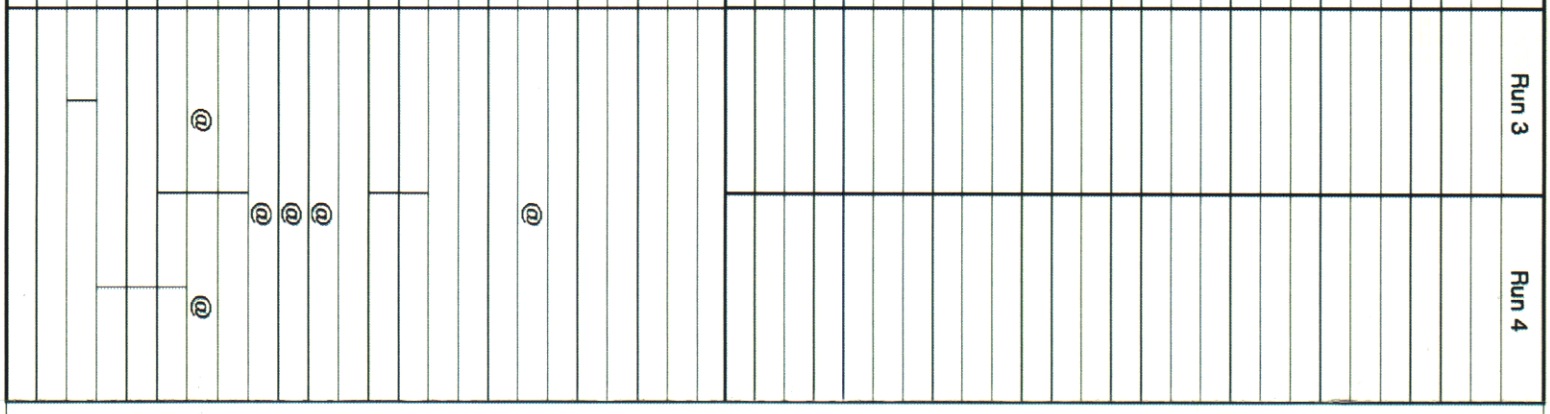
Surface Lambert Coordinates:
N: 4 062 757.48
E: 4 214 076.81

Elev.: K.B.
G.L. 168.97 ft
D.F. 194.09 ft

Permanent Datum: Mat — Elev.: 168.97 ft
Log Measured From: Derrick Floor — 25.12 ft above Perm. Datum
Drilling Measured From: Derrick Floor

API Serial No.	Section	Township	Range
3727148	33	3S	13W

		Run 1	Run 2
Logging Date	28-Apr-2011		
Run Number	THREE		
Depth Driller	13182 ft		
Schlumberger Depth	9992 ft		
Bottom Log Interval	9991 ft		
Top Log Interval	80 ft		
Casing Driller Size @ Depth	9.625 in @ 9992 ft	@	@
Casing Schlumberger	9988 ft		
Bit Size	12.250 in		
Type Fluid In Hole	8% KCL GELITE/SP-101		
MUD Density / Viscosity	13.2 lbm/gal / 50 s		
MUD Fluid Loss / PH	3.6 cm3 / 7		
MUD Source Of Sample	FLOWLINE		
RM @ Measured Temperature	0.157 ohm.m @ 73 degF	@	@
RMF @ Measured Temperature	0.108 ohm.m @ 72 degF	@	@
RMC @ Measured Temperature	0.269 ohm.m @ 73 degF	@	@
Source RMF / RMC	MUDPRESS / MUDPRESS		
RM @ MRT / RMF @ MRT	0.041 @ 300 / 0.028 @ 300	@ / @	@ / @
Maximum Recorded Temperatures	298 degF / 300		
Circulation Stopped / Time	27-Apr-2011 / 13:00		
Logger On Bottom / Time	28-Apr-2011 / 23:51		
Unit Number / Location	2363 / BAKERSFIELD		
Recorded By	WILLIAM TURNER		
Witnessed By	MR. SCOTT PRIOR		



DEPTH SUMMARY LISTING

Date Created: 28-APR-2011 13:13:57

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW-B	Type:	CMTD-B/A	Type:	7-48A SUS
Serial Number:	5905	Serial Number:	1311	Serial Number:	708176
Calibration Date:	2-DEC-2010	Calibration Date:	27-APR-2010	Length:	20300 FT
Calibrator Serial Number:		Calibrator Serial Number:	185	Conveyance Method:	Wireline
Calibration Cable Type:	7-48A SUS	Number of Calibration Points:	9	Rig Type:	LAND
Wheel Correction 1:	-5	Calibration RMS:	26		
Wheel Correction 2:	-5	Calibration Peak Error:	48		

Depth Control Parameters

Log Sequence: Subsequent Log In the Well

Reference Log Name: CALIPER
Reference Log Run Number: THREE
Reference Log Date: 27-APR-2011

Depth Control Remarks

1. ALL SLB DEPTH CONTROL PROCEDURES WERE FOLLOWED
2. IDW USED AS PRIMARY DEPTH REFERENCE
3.
4.
5.
6.

DISCLAIMER
THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE OF AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

OTHER SERVICES1	OTHER SERVICES2
OS1: FMI	OS1:
OS2: PEX	OS2:
OS3: ECS / HNGS	OS3:
OS4: CMR	OS4:
OS5: MSCT	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
SUBSEQUENT TRIP	
LOG CORRELATED TO "ARRAY INDUCTION" 4-APR-2011	
FLUID PROPERTIES RECORDED ON DOWN LOG. MEASURED Z-MUD	= 2.61 WHITH THEORETICAL
Z-MUD = 2.67: THEORETICAL WAS USED AFTER VERIFYING WITH OP	DATA

Z-MUD = 2.37; THEORETICAL WAS USED AFTER VERIFYING WITH CBL DATA
C-SUB WOULD TOUCH THE SIDE OF THE CASING IN DOG LEGS AND STOP THE LOG.
INTERVAL WAS RECORDED IN MULTIPLE SECTIONS
CHANNEL SEEN BEHIND CASING FROM 5980FT TO 5620FT

CBL RECORDED USING SONIC SCANNER TOOL IN MINIMUM SERVICE MODE
SONIC SCANNER WAS CENTERED USING THREE GEMCOS AS IN SKETCH

RIG: H&P 236
CREW: H. BOJORQUEZ, A. PENA, J. CORONADO
THANK YOU FOR USING SCHLUMBERGER

RUN 1		RUN 2	
SERVICE ORDER #:	BH2Y-00052	SERVICE ORDER #:	
PROGRAM VERSION:	19C0-187	PROGRAM VERSION:	
FLUID LEVEL:		FLUID LEVEL:	

LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

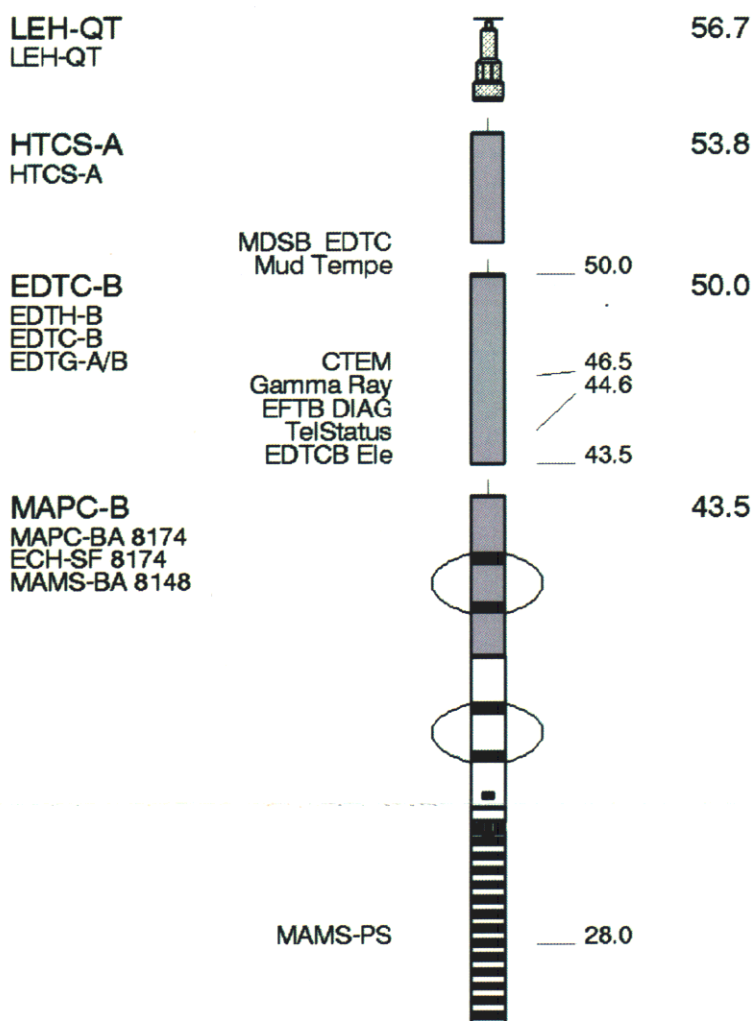
EQUIPMENT DESCRIPTION

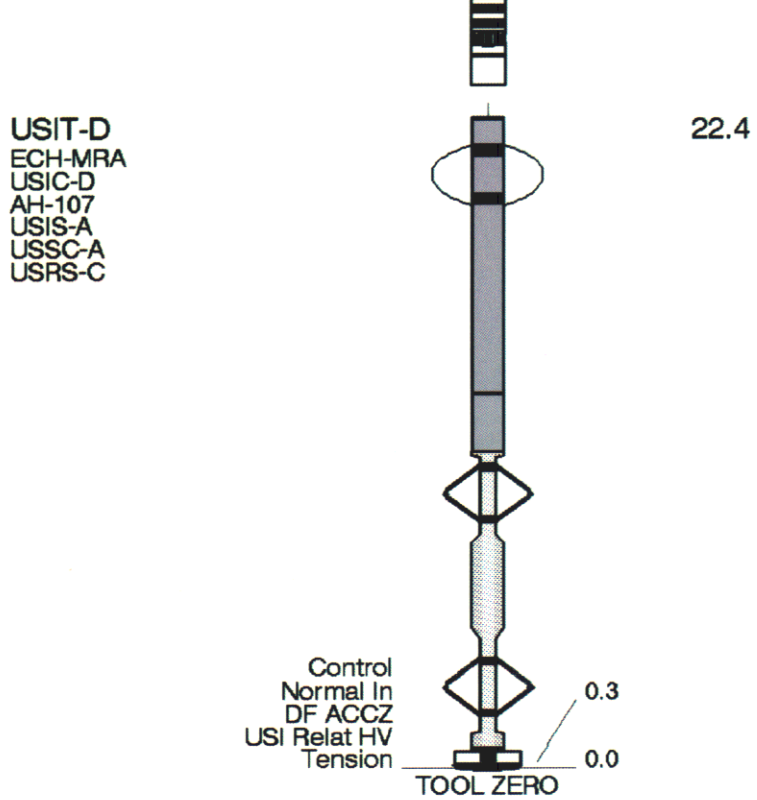
RUN 1 | RUN 2

SURFACE EQUIPMENT

WITM (EDTS)-A

DOWNHOLE EQUIPMENT





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

Schlumberger

USIT VDL-CEMENT

MAXIS Field Log

Company: OXY US LA Basin **Well: DOM-002**

Input DLIS Files

DEFAULT	Splice_USI_MAPC_153CUC	FN:1	PRODUCER	30-Apr-2011 01:08	9995.5 FT	77.2 FT

Output DLIS Files

DEFAULT	USI_MAPC_155PUP	FN:212	PRODUCER	30-Apr-2011 01:40	9995.5 FT	77.5 FT

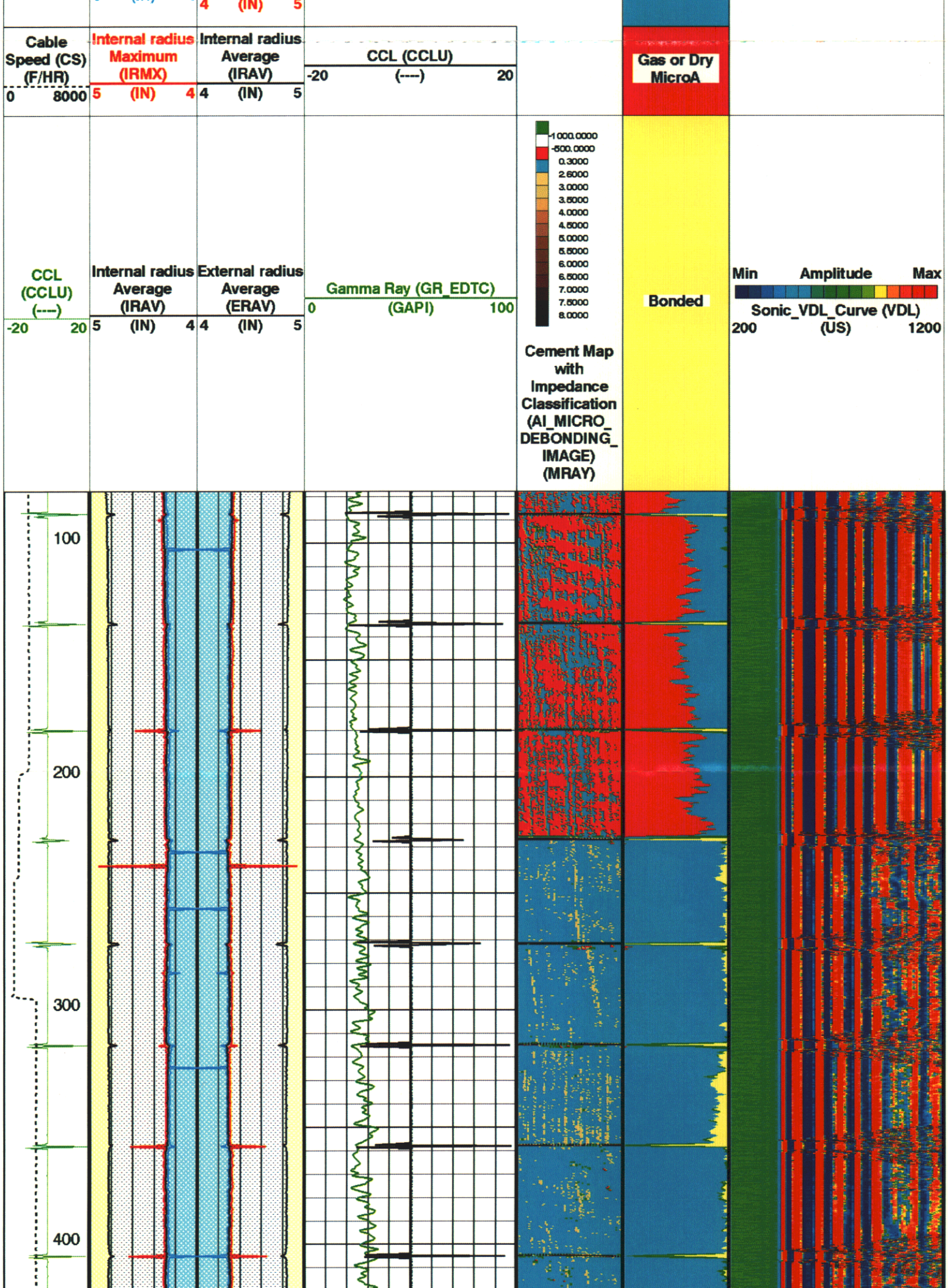
OP System Version: 19C0-187

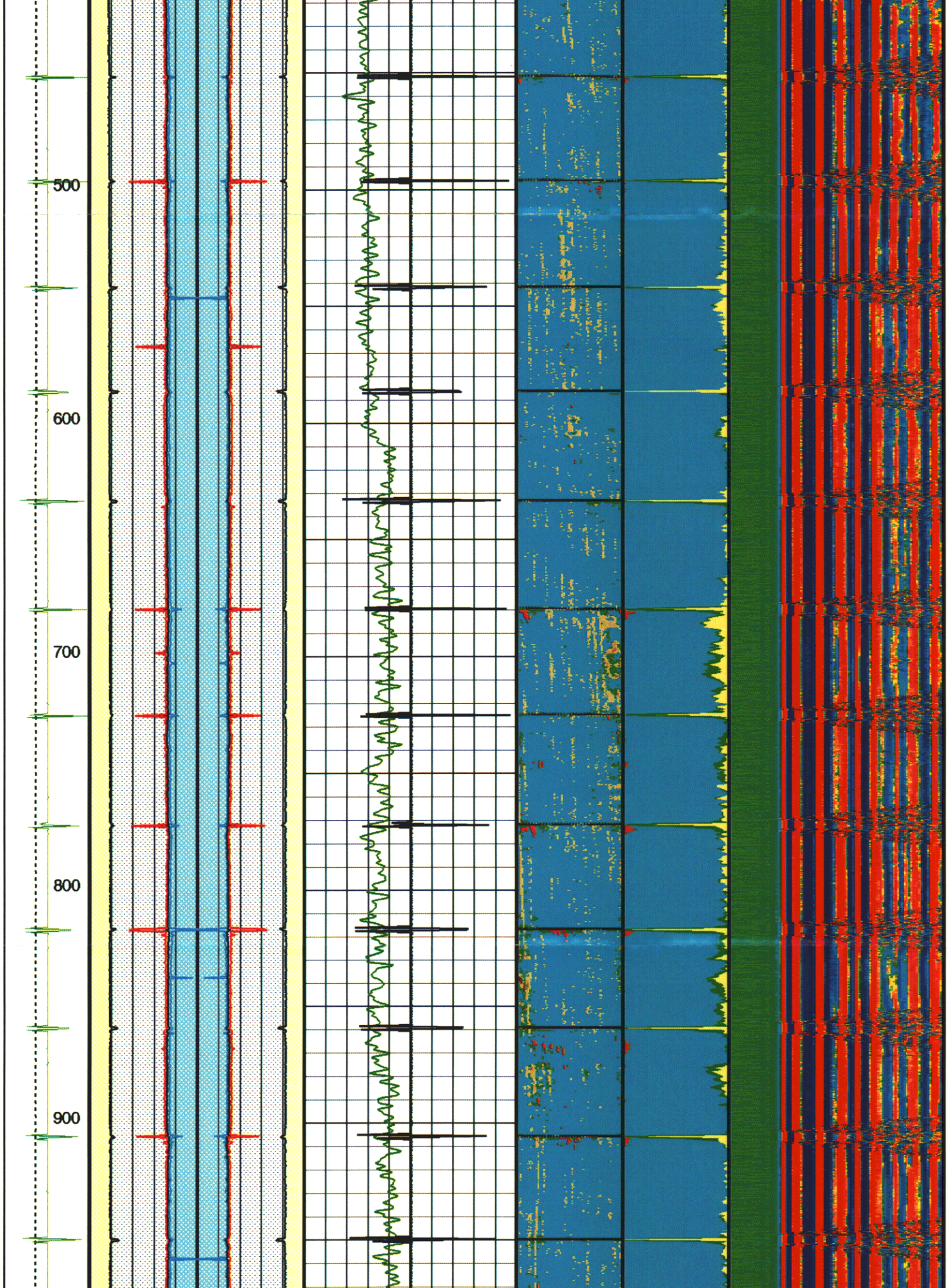
USIT-D	19C0-187	MAPC-B	19C0-187
EDTC-B	19C0-187		

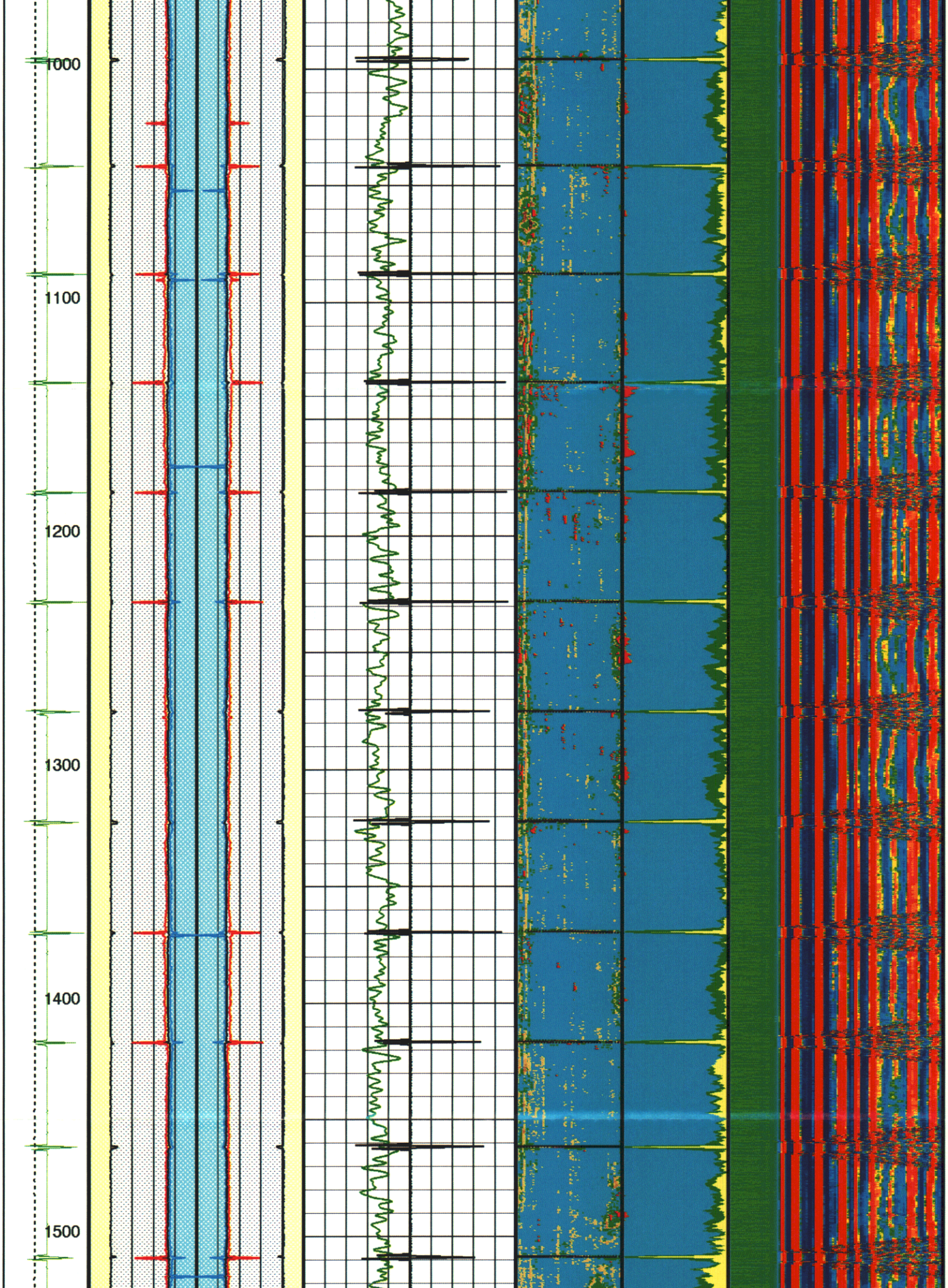
External radius Average (ERAV)	Min of Internal radius (IRMN)
5 (IN) 4	4 (IN) 5
Min of Internal radius (IRMN)	**Internal radius Maximum (IRMX)**
5 (IN) 4	

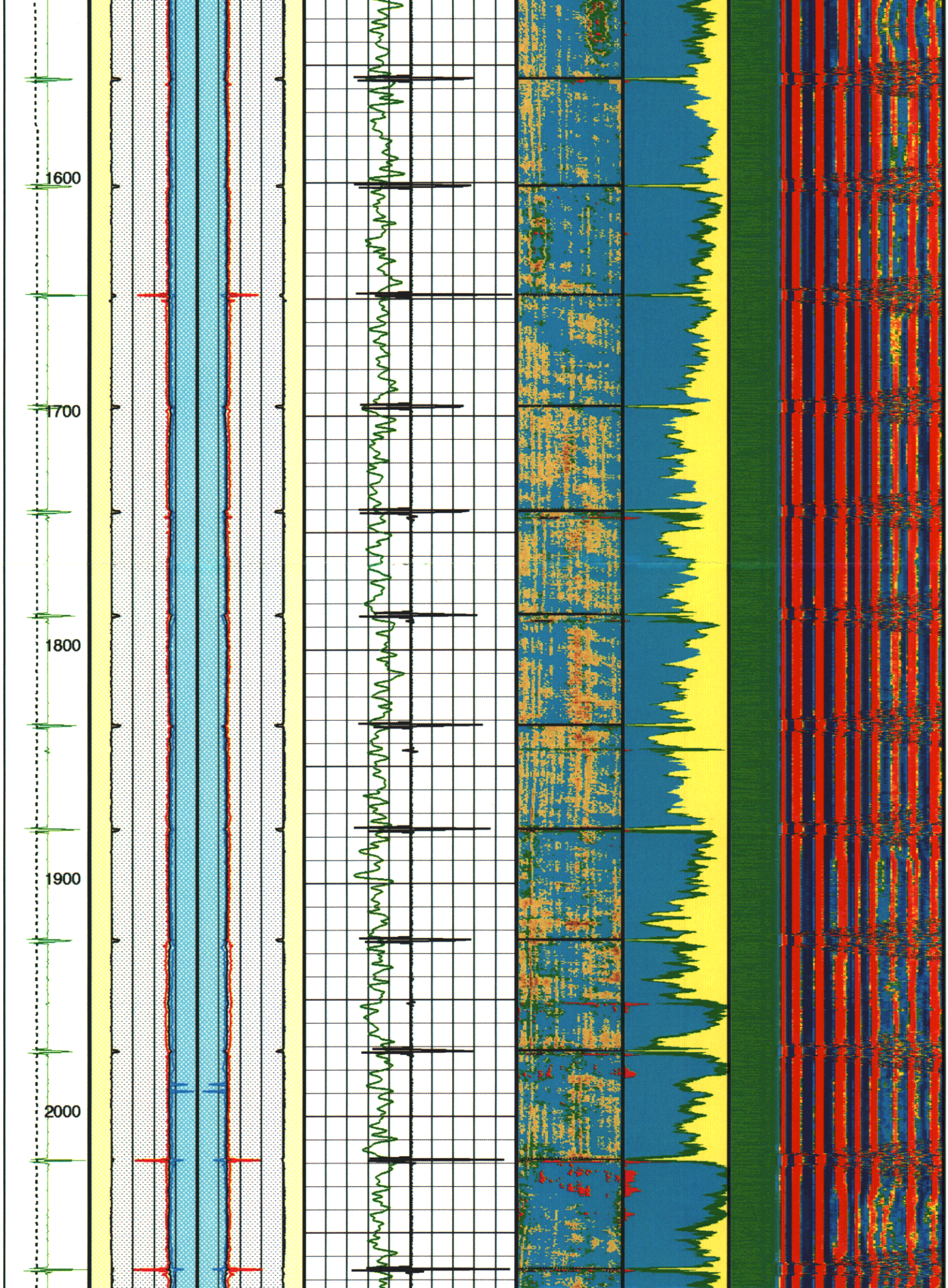
Micro-debonding

Liquid


Cable Speed (CS) (F/HR)
0 8000
Internal radius Maximum (IRMX)
5 (IN) 4
Internal radius Average (IRAV)
4 (IN) 5
CCL (CCLU)
-20 (----) 20
Gas or Dry MicroA
CCL (CCLU) (----)
-20 20
Internal radius Average (IRAV)
5 (IN) 4
External radius Average (ERAV)
4 (IN) 5
Gamma Ray (GR_EDTC)
0 (GAPI) 100
-1000.0000
-500.0000
0.3000
2.6000
3.0000
3.5000
4.0000
4.5000
5.0000
5.5000
6.0000
6.5000
7.0000
7.5000
8.0000
Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (MRAY)
Bonded
Min Amplitude Max
Sonic_VDL_Curve (VDL)
200 (US) 1200
100
200
300
400


500
600
700
800
900


1000
1100
1200
1300
1400
1500


1600
1700
1800
1900
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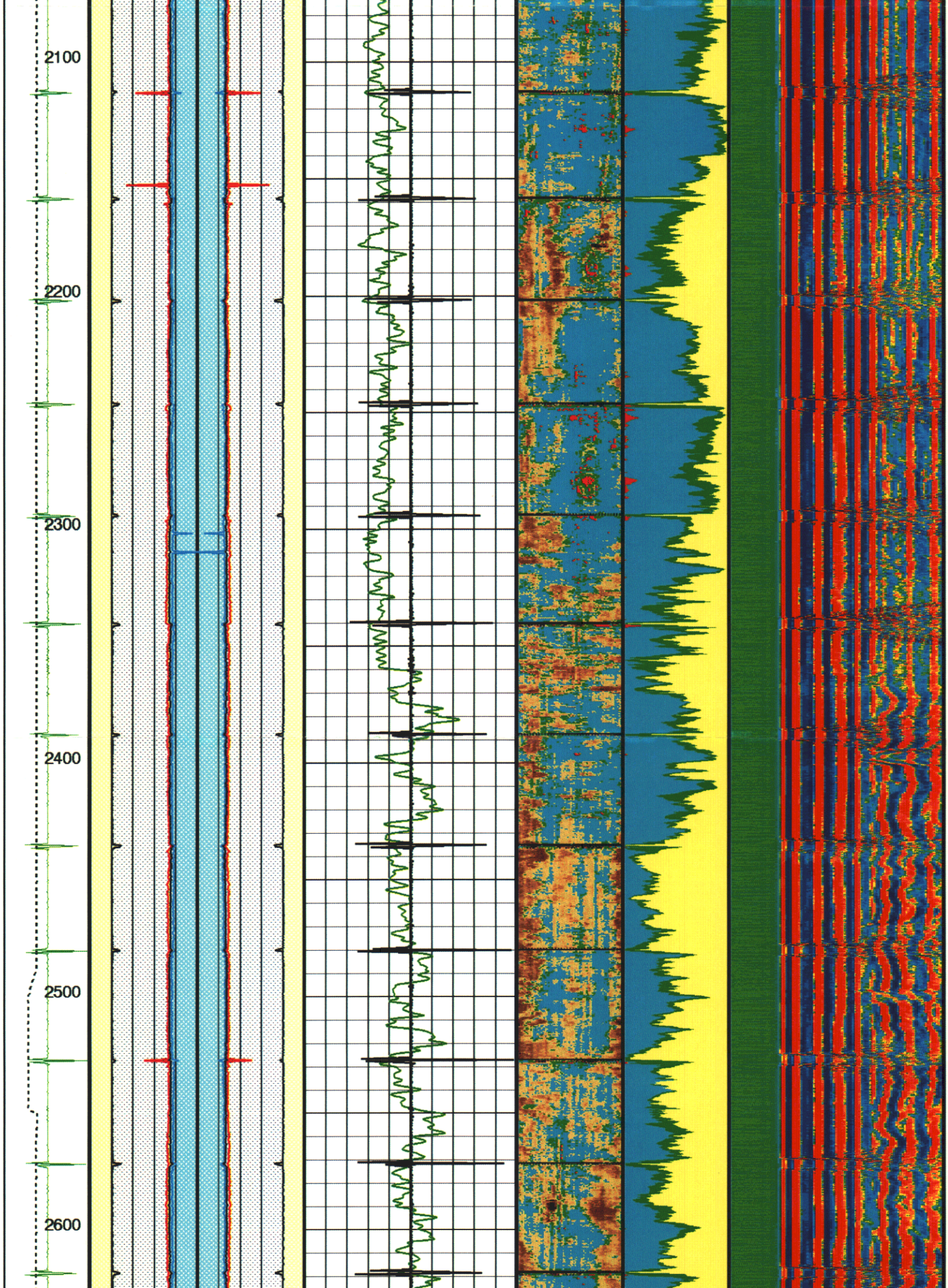
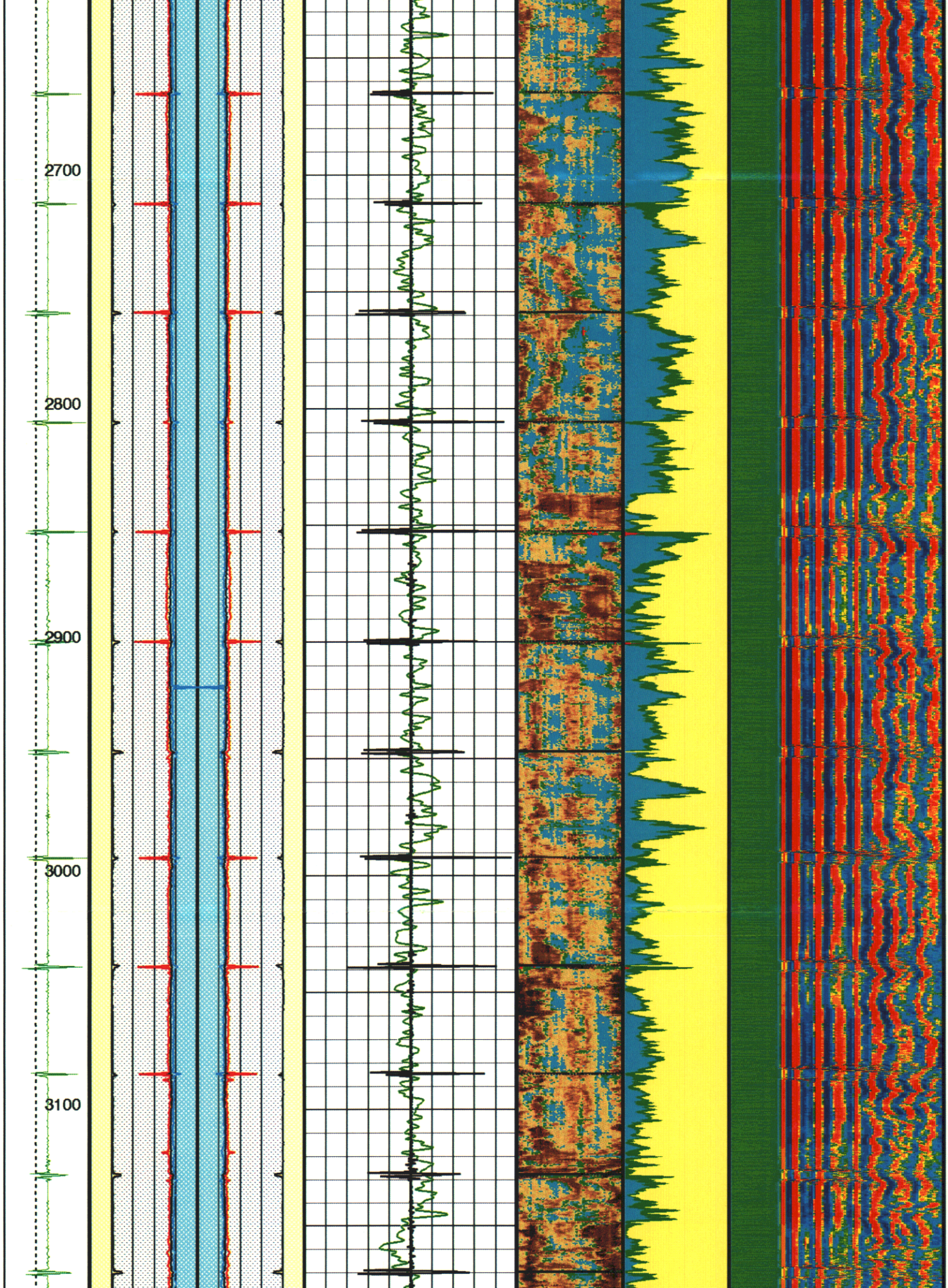

2100
2200
2300
2400
2500
2600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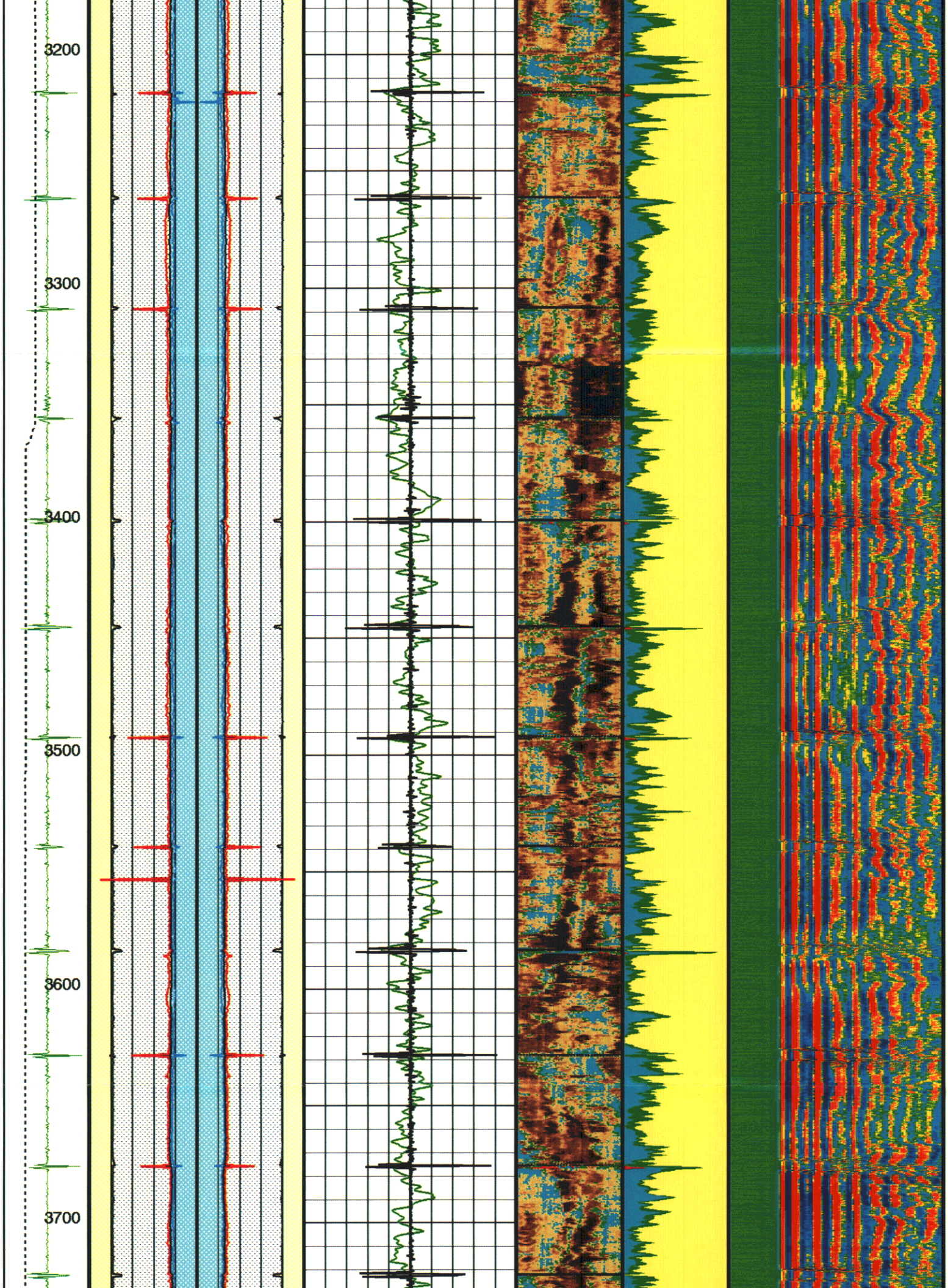
2800
2900
3000
3100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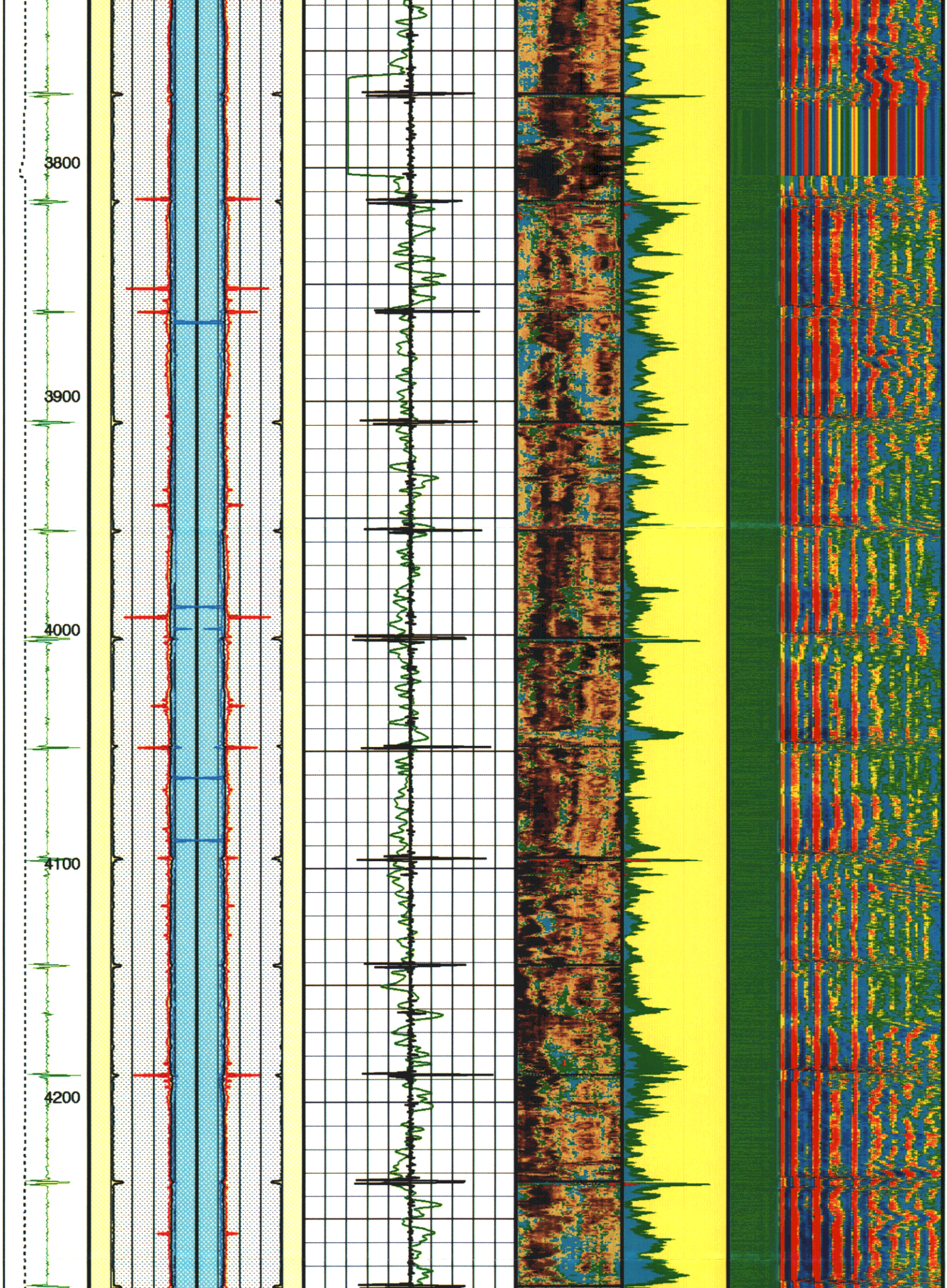
3300
3400
3500
3600
3700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3900
4000
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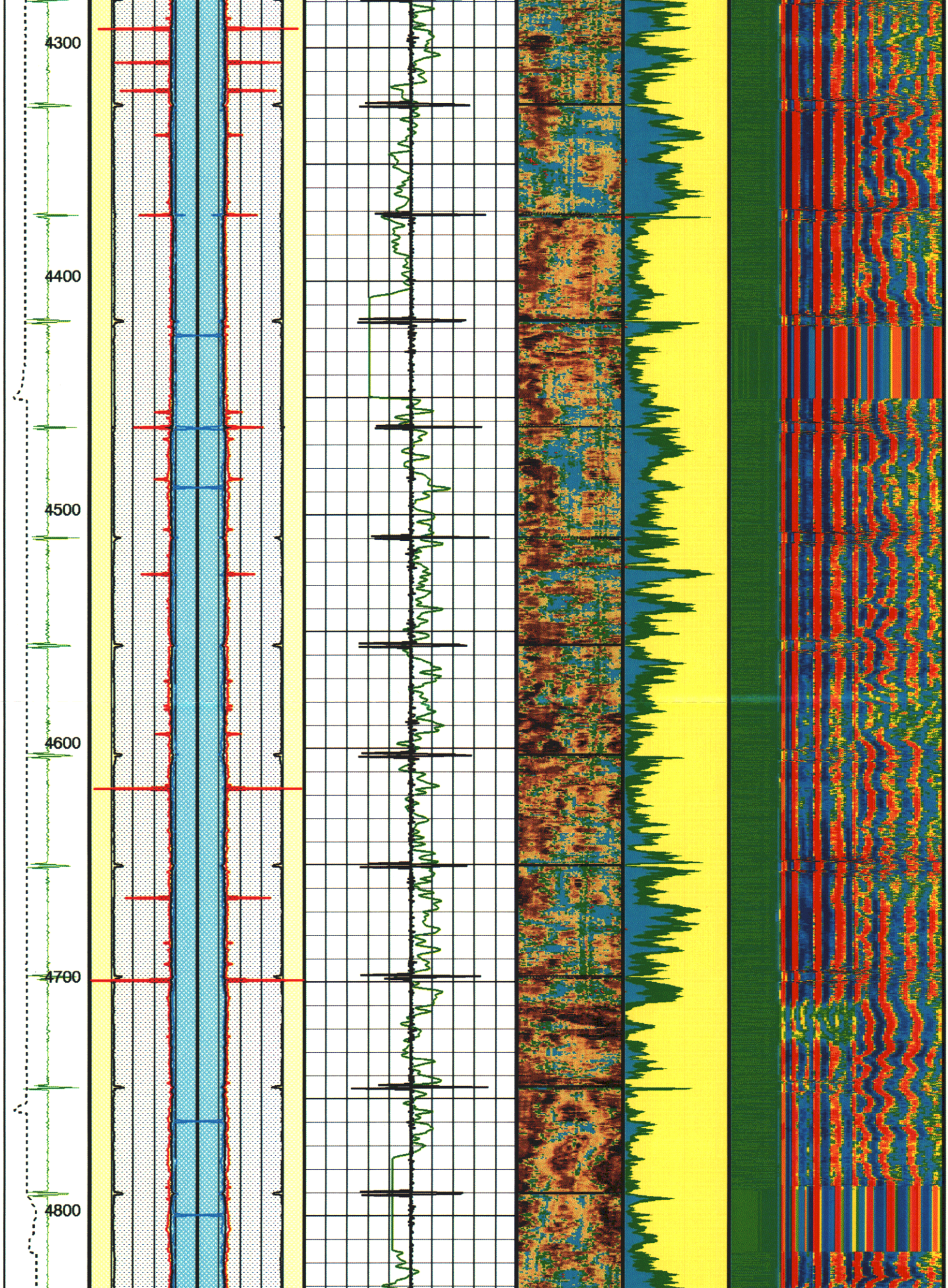
4200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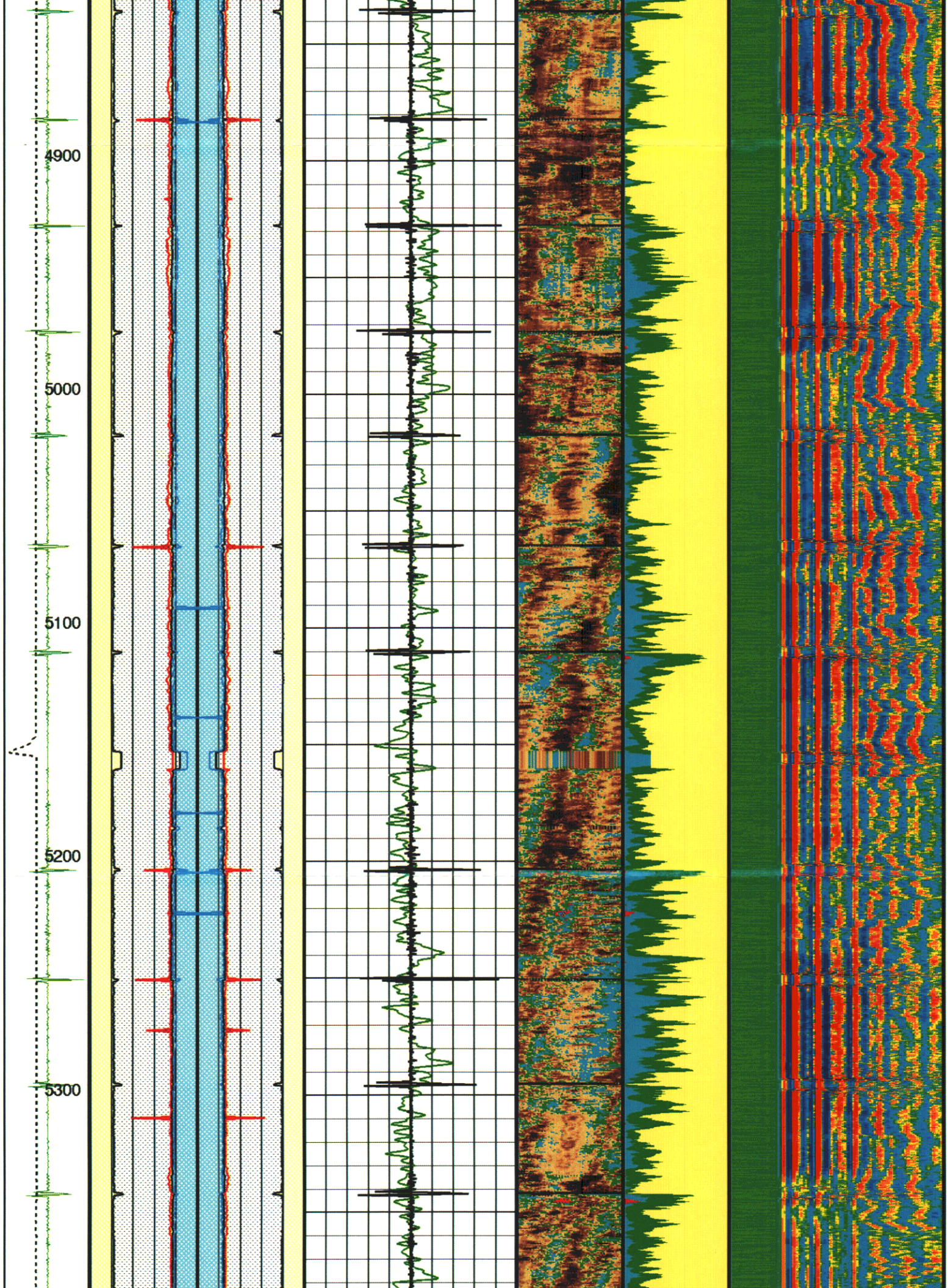
4800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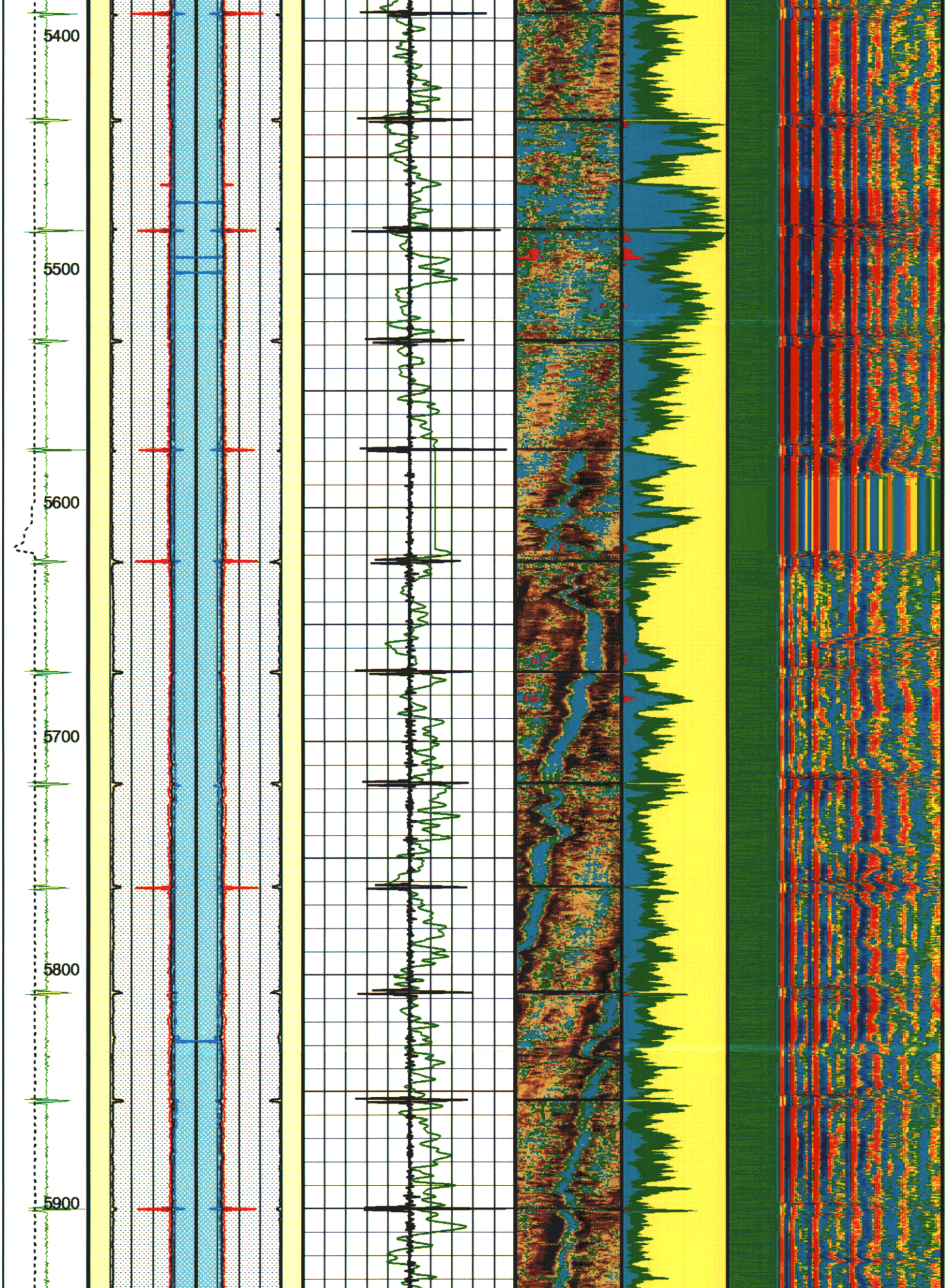
5100
5200
5300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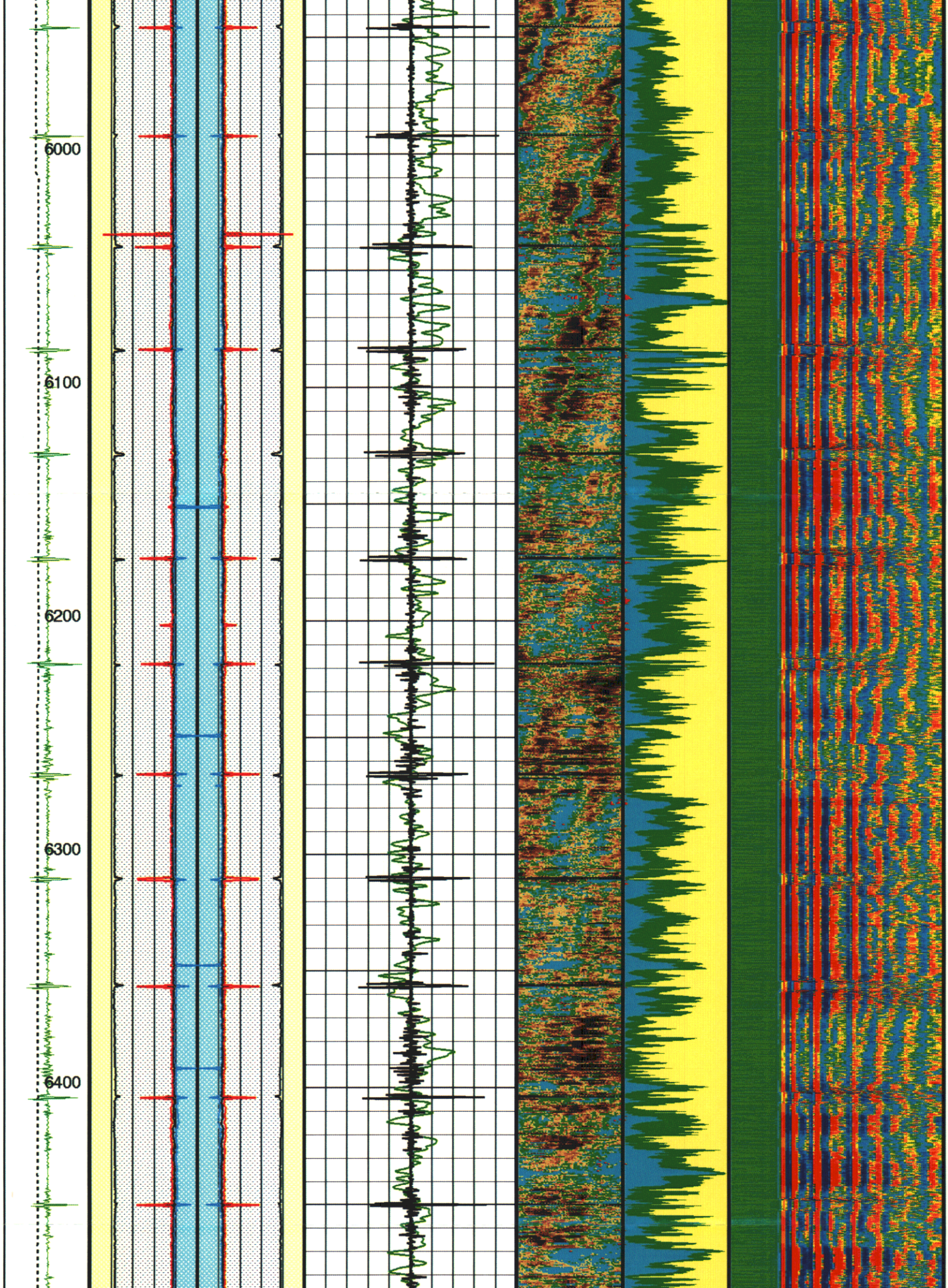
5800
5900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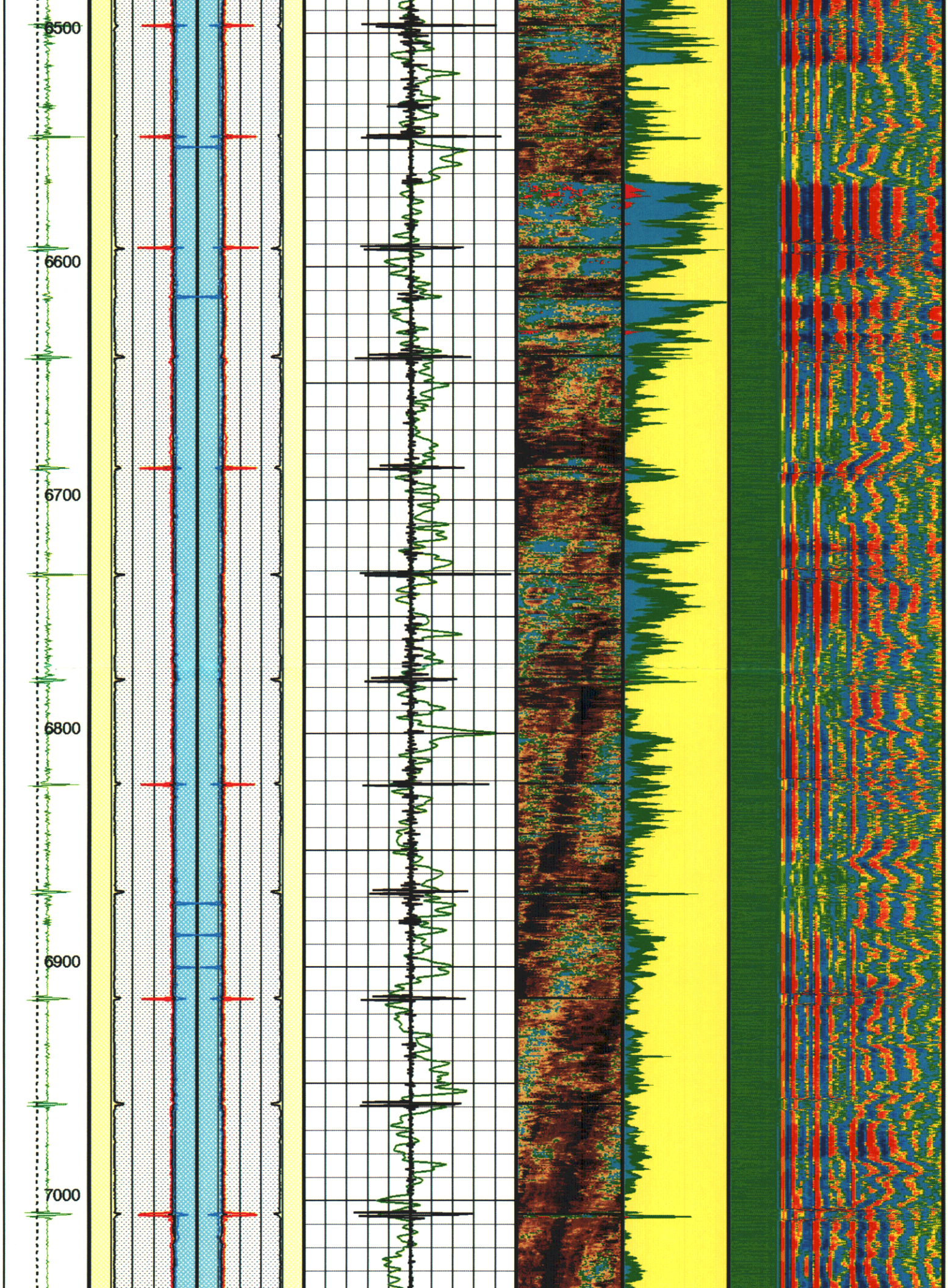
6100
6200
6300
6400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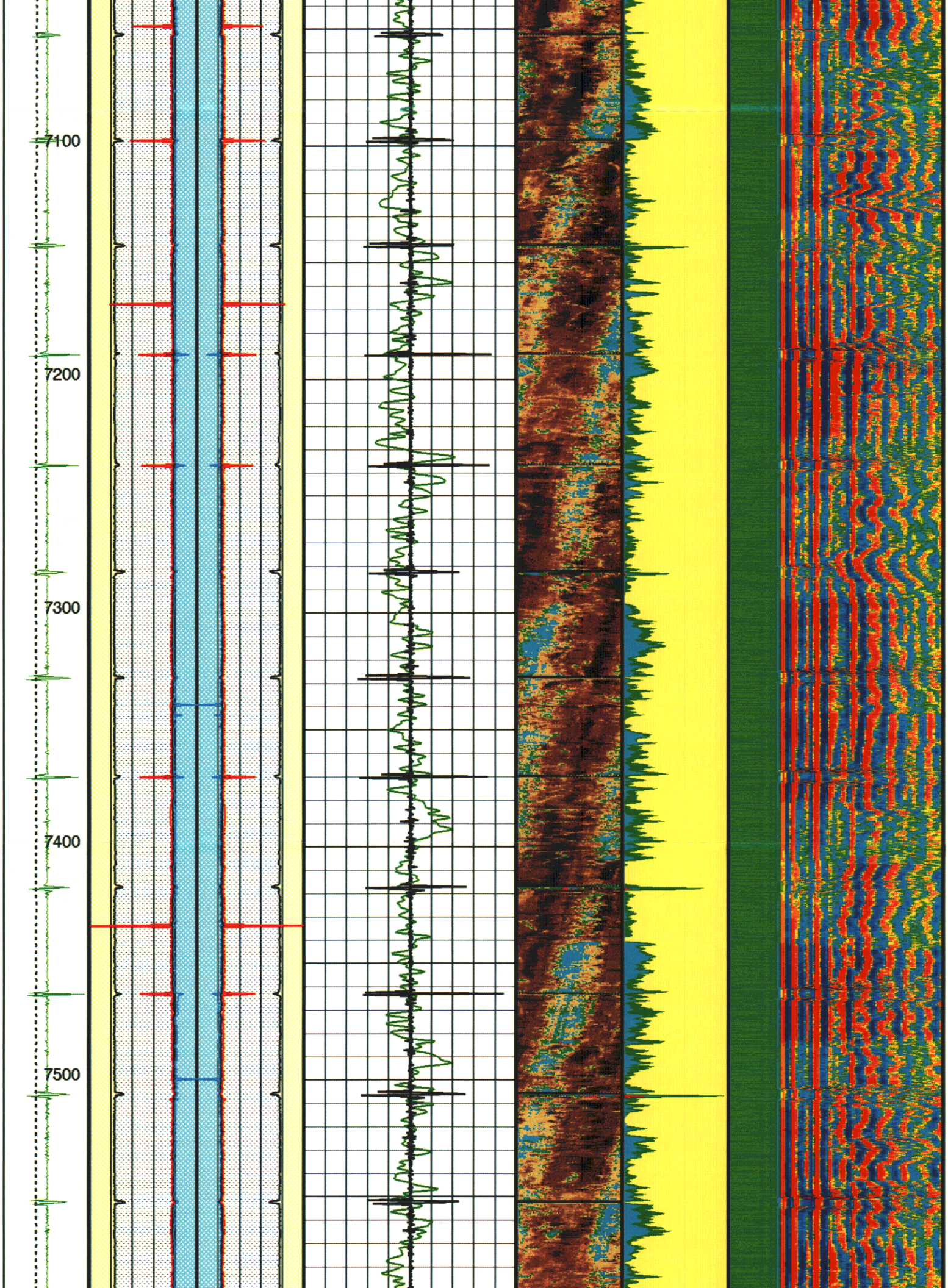
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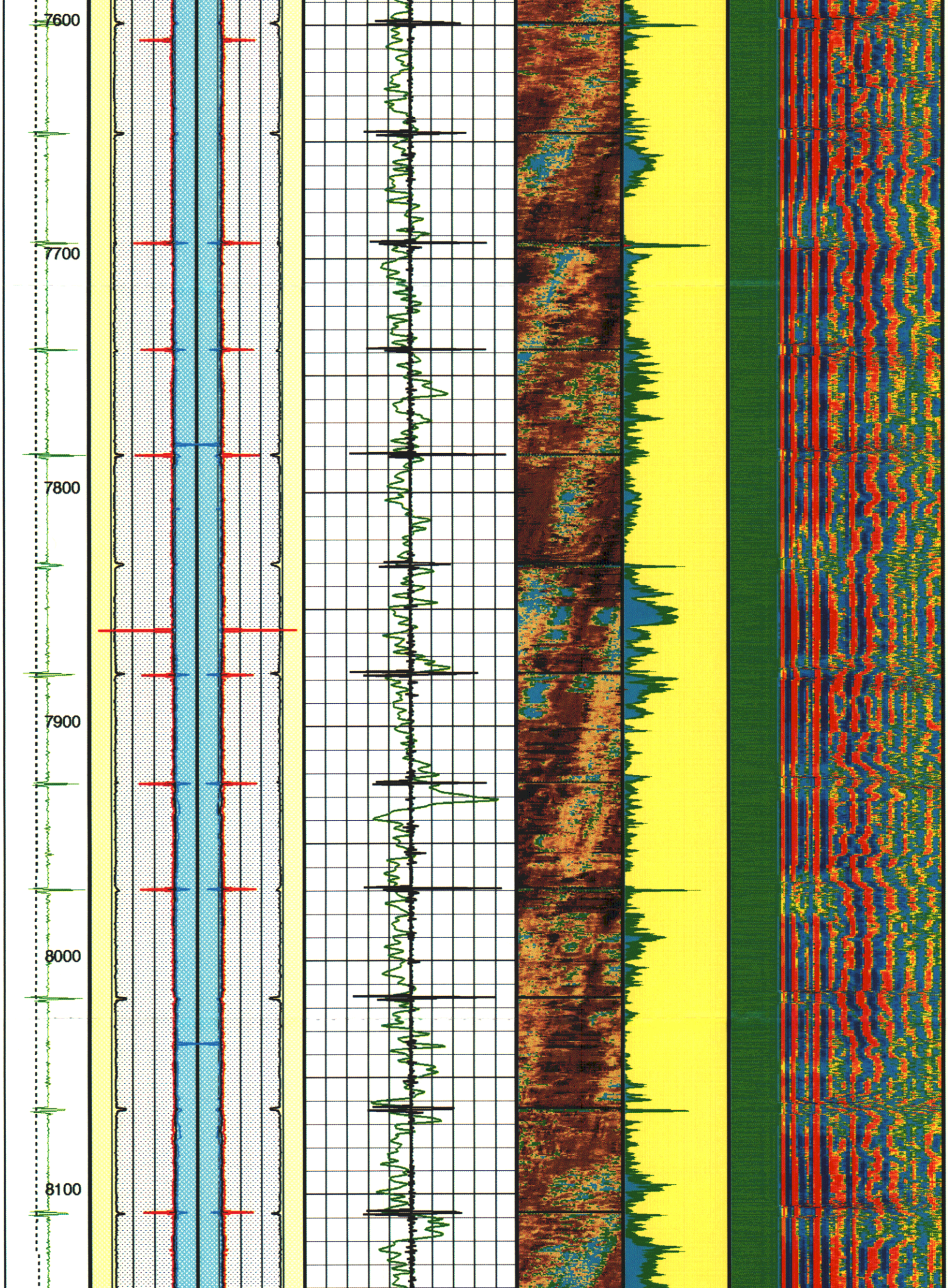
7200
7300
7400
7500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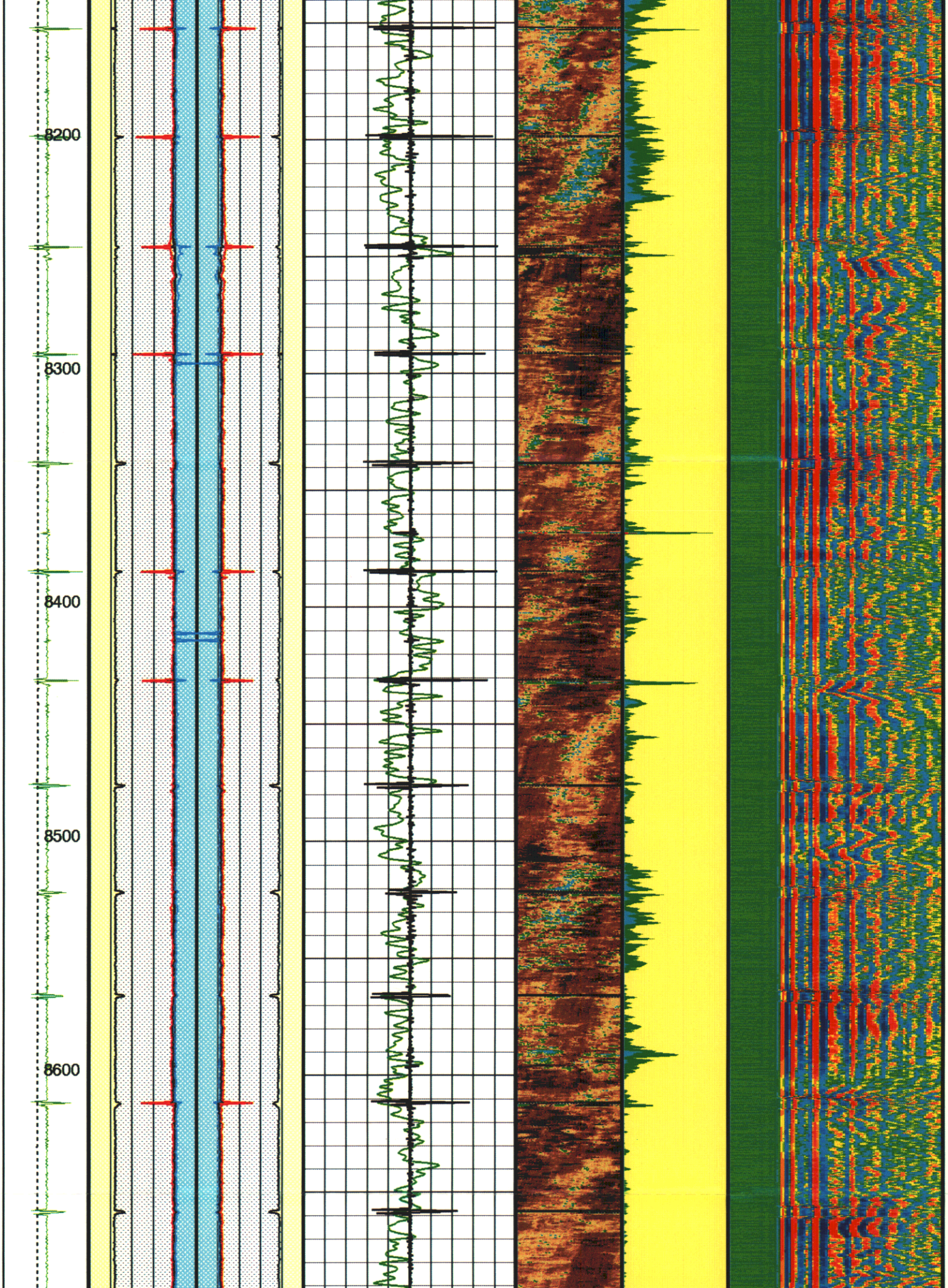
7700
7800
7900
8000
8100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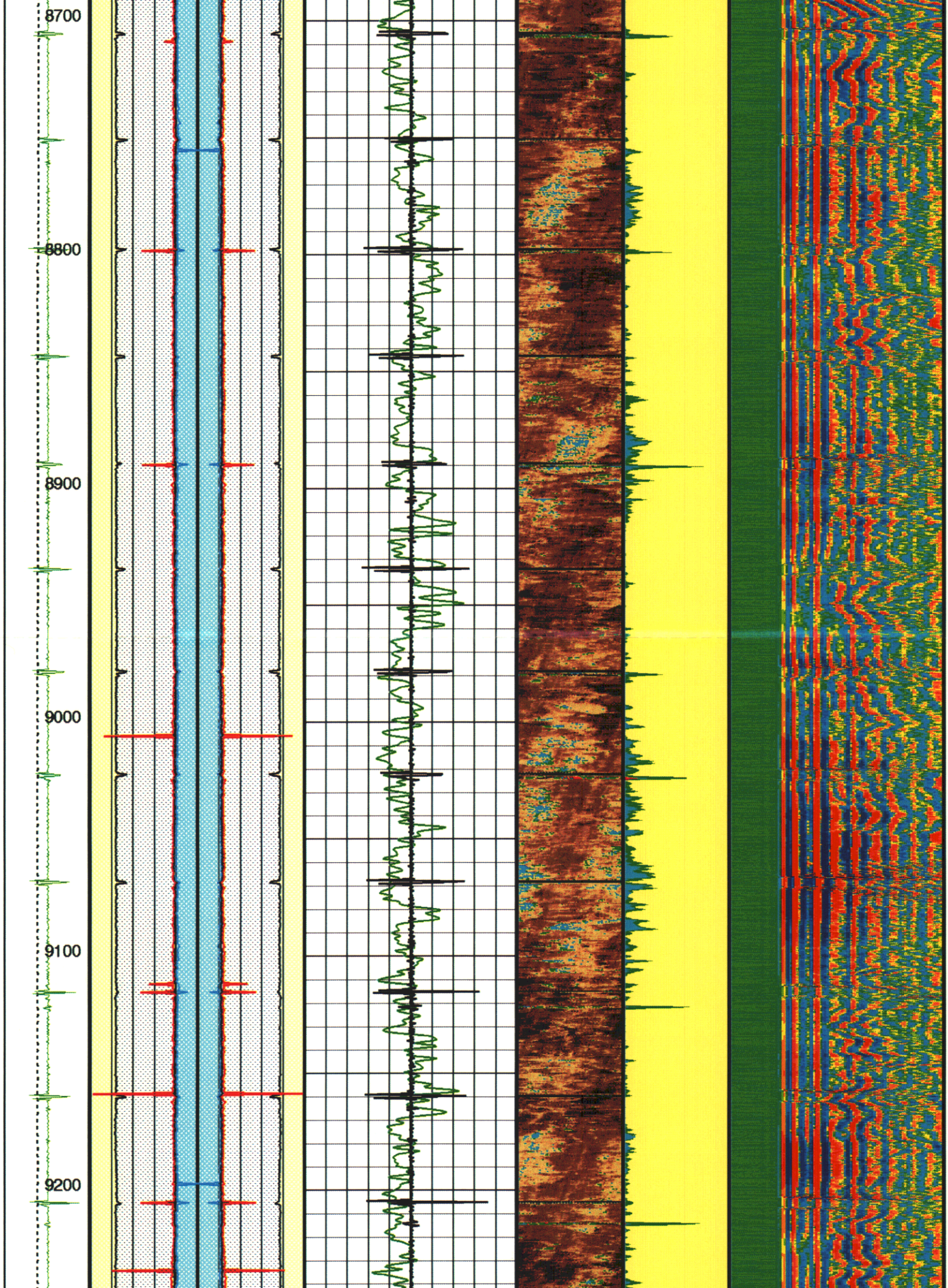
8300
8400
8500
8600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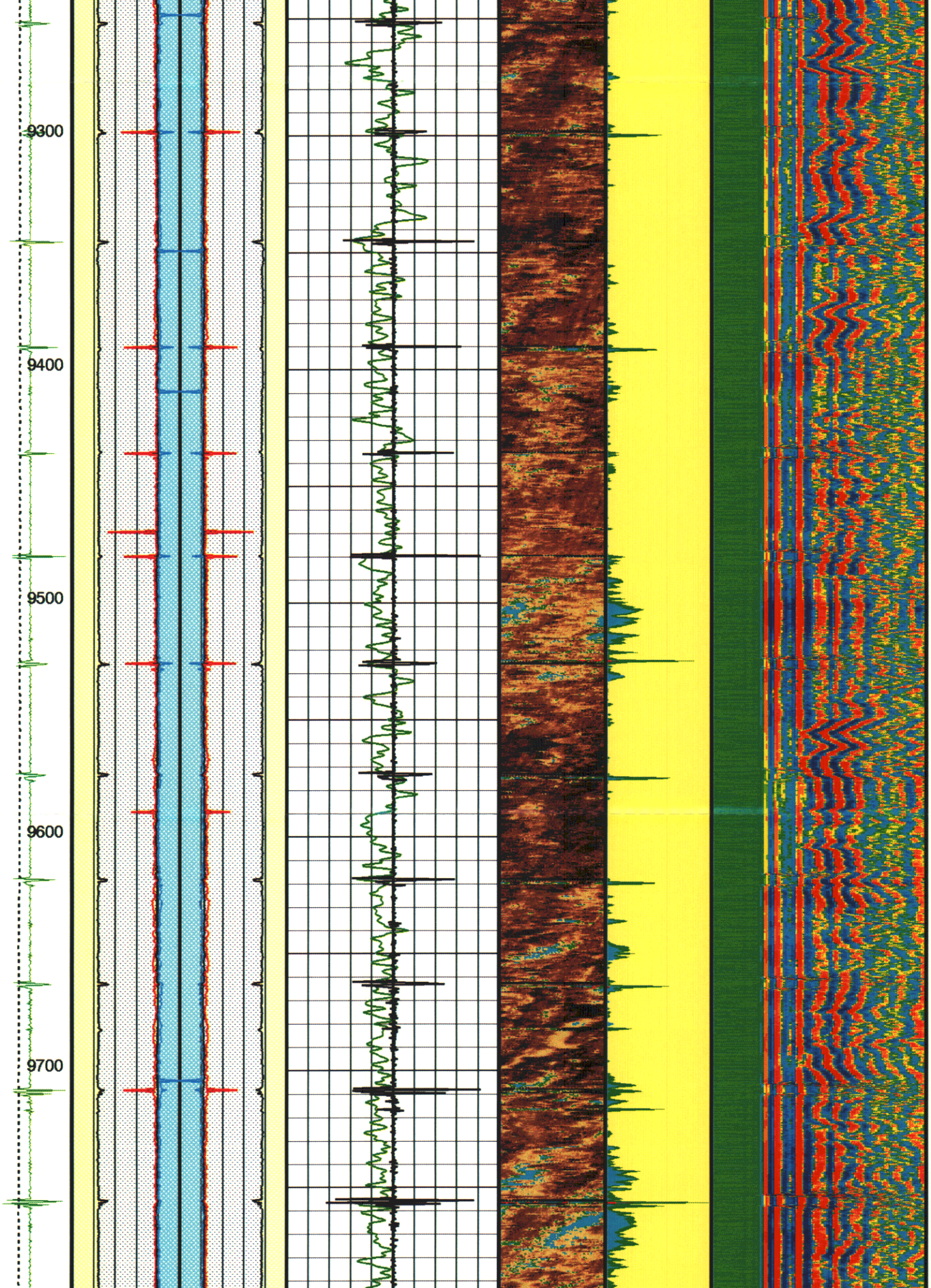
8800
8900
9000
9100
9200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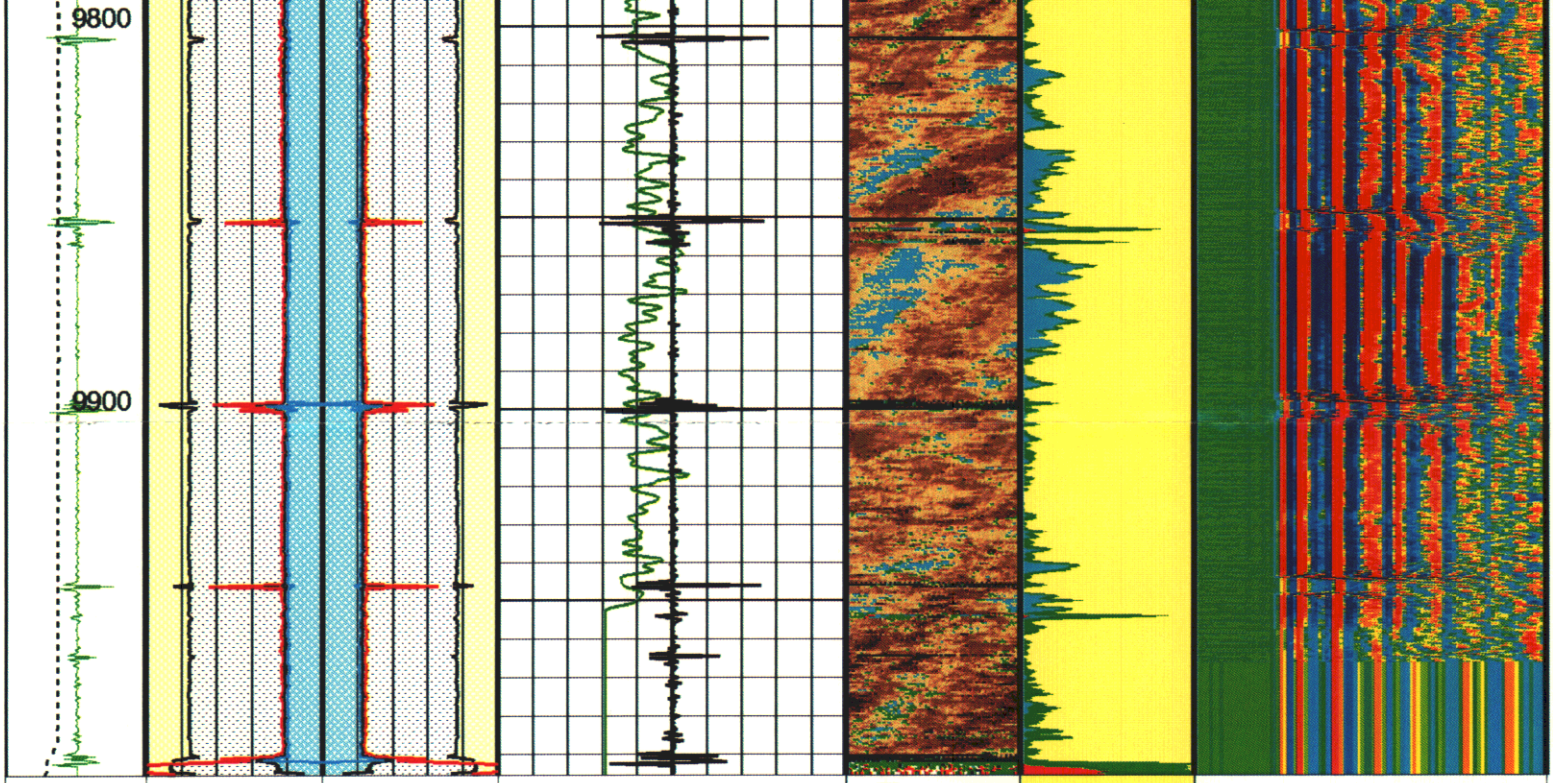


CCL (CCLU) (----) -20 20	Internal radius Average (IRAV) 5 (IN) 4	External radius Average (ERAV) 4 (IN) 5	Gamma Ray (GR_EDTC) 0 (GAPI) 100	Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (MRAY)	Bonded	Min Amplitude Max Sonic_VDL_Curve (VDL) 200 (US) 1200
Cable Speed (CS) (F/HR) 0 8000	Internal radius Maximum (IRMX) 5 (IN) 4	Internal radius Average (IRAV) 4 (IN) 5	CCL (CCLU) -20 (----) 20		Gas or Dry MicroA	
	Min of Internal radius (IRMN) 5 (IN) 4	Internal radius Maximum (IRMX) 4 (IN) 5			Liquid	
	External radius Average (ERAV) 5 (IN) 4	Min of Internal radius (IRMN) 4 (IN) 5			Micro-debon ding	

Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (MRAY)

-1000.0000
-500.0000
0.3000
2.6000
3.0000
3.5000
4.0000
4.5000
5.0000
5.5000
6.0000
6.5000
7.0000
7.5000
8.0000

Format: USI_VDLCement_S2 Vertical Scale: 2" per 100' Graphics File Created: 30-Apr-2011 01:40

OP System Version: 19C0-187

USIT-D 19C0-187 MAPC-B 19C0-187
EDTC-B 19C0-187

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-D: Ultrasonic Imaging - D		
AGMN	Minimum Gain of Cartridge	-4	DB
AGMX	Maximum Gain of Cartridge	20	DB
BERJ	Bad Echo Rejection	ON	
CDIA	Casing Outer Diameter	9.625	IN
CSDE	Casing Density	486.94	LBCF
CSID	Casing Inner Diameter	8.47643	IN
DFVL	Default Fluid Velocity	206	US/F
DOT	Diameter of Transducer Sensor	4.874	IN
EMXV	EMEX Voltage	60	V
FDII	FPM Data Interpolation Interval	0	FT
IMAR	Image Rotation	OFF	
MW	Mud Weight	13.2	LB/G
RCOD	Reference Calibrator Outer Diameter	7	IN
RCSO	Reference Calibrator Standoff	1.37795	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	0.574285	IN
UMAO	USIT Measurement Angular Offset	-10	DEG
USTO	Ultrasonic Time Offset	-2	US
USUB	Ultrasonic Subassembly Identifier	Sub_9_58_inch	
UWKM	Ultrasonic Working Mode	5DEG_6IN_60U_LF	
VCAS	Ultrasonic Transversal Velocity in Casing	51.4	US/F
WLEN	T^3 Processing Length	29	US
ZCAS	Acoustic Impedance of Casing	46.25	MRAY
ZINI	Initial Estimate of Cement Impedance	-1	MRAY
ZMUD	Acoustic Impedance of Mud	1.48	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.6	MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3	MRAY
	MAPC-B: Multimode Array Sonic Power Cartridge		
CE_VDLSEL	VDL Selection for Cement Evaluation	MU_5FT	
	System and Miscellaneous		
CWEI	Casing Weight	56.50	LB/F
DO	Depth Offset for Playback	0.0	FT
PP	Playback Processing	OFF	

Input DLIS Files

DEFAULT	Splice_USI_MAPC_153CUC	FN:1	PRODUCER	30-Apr-2011 01:08	9995.5 FT	77.2 FT

Output DLIS Files

DEFAULT	USI_MAPC_155PUP	FN:212	PRODUCER	30-Apr-2011 01:40

Schlumberger

USIT COMPOSITE

MAXIS Field Log

Input DLIS Files

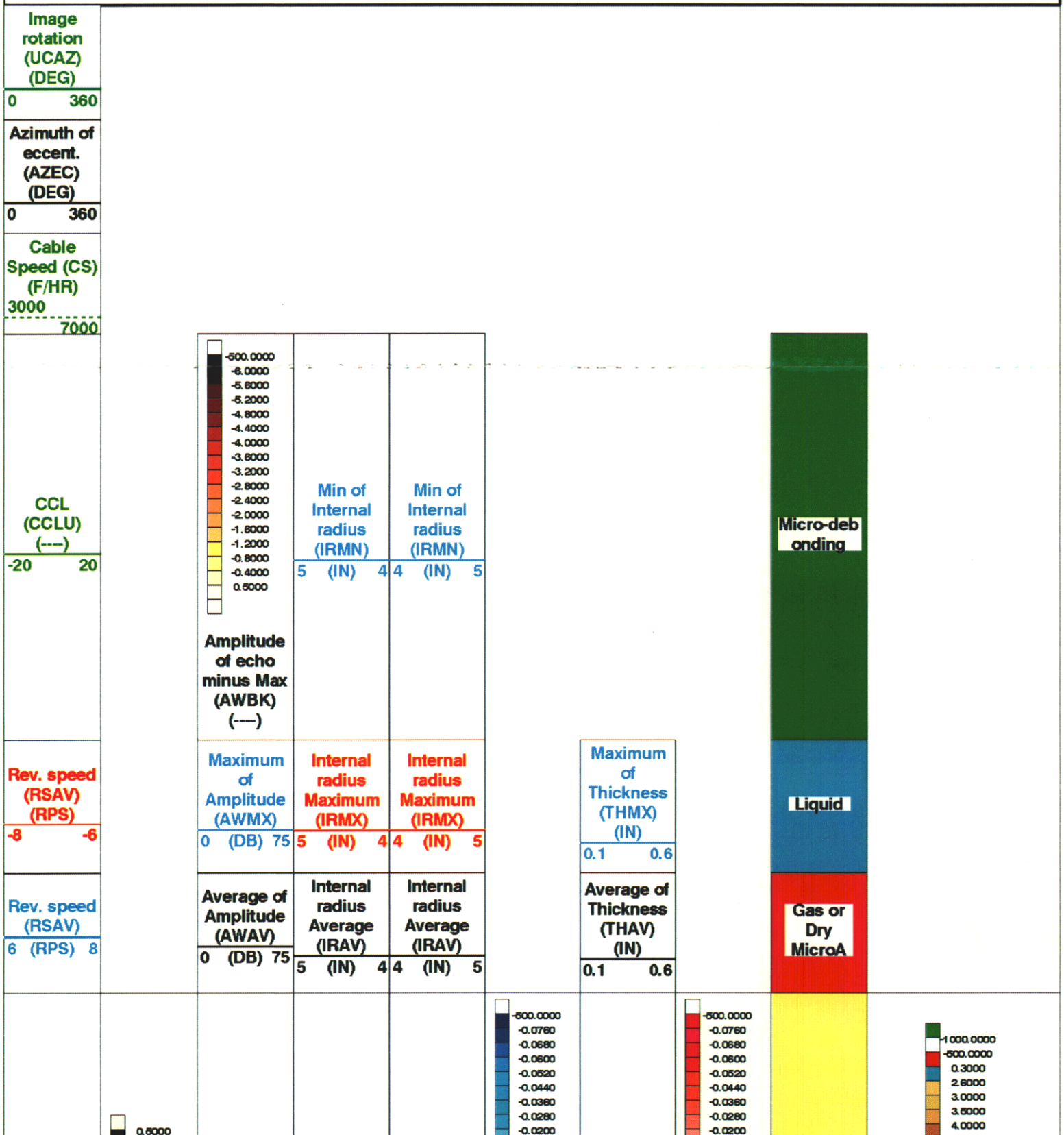
DEFAULT	Splice_USI_MAPC_153CUC	FN:1	PRODUCER	30-Apr-2011 01:08	9995.5 FT	77.2 FT

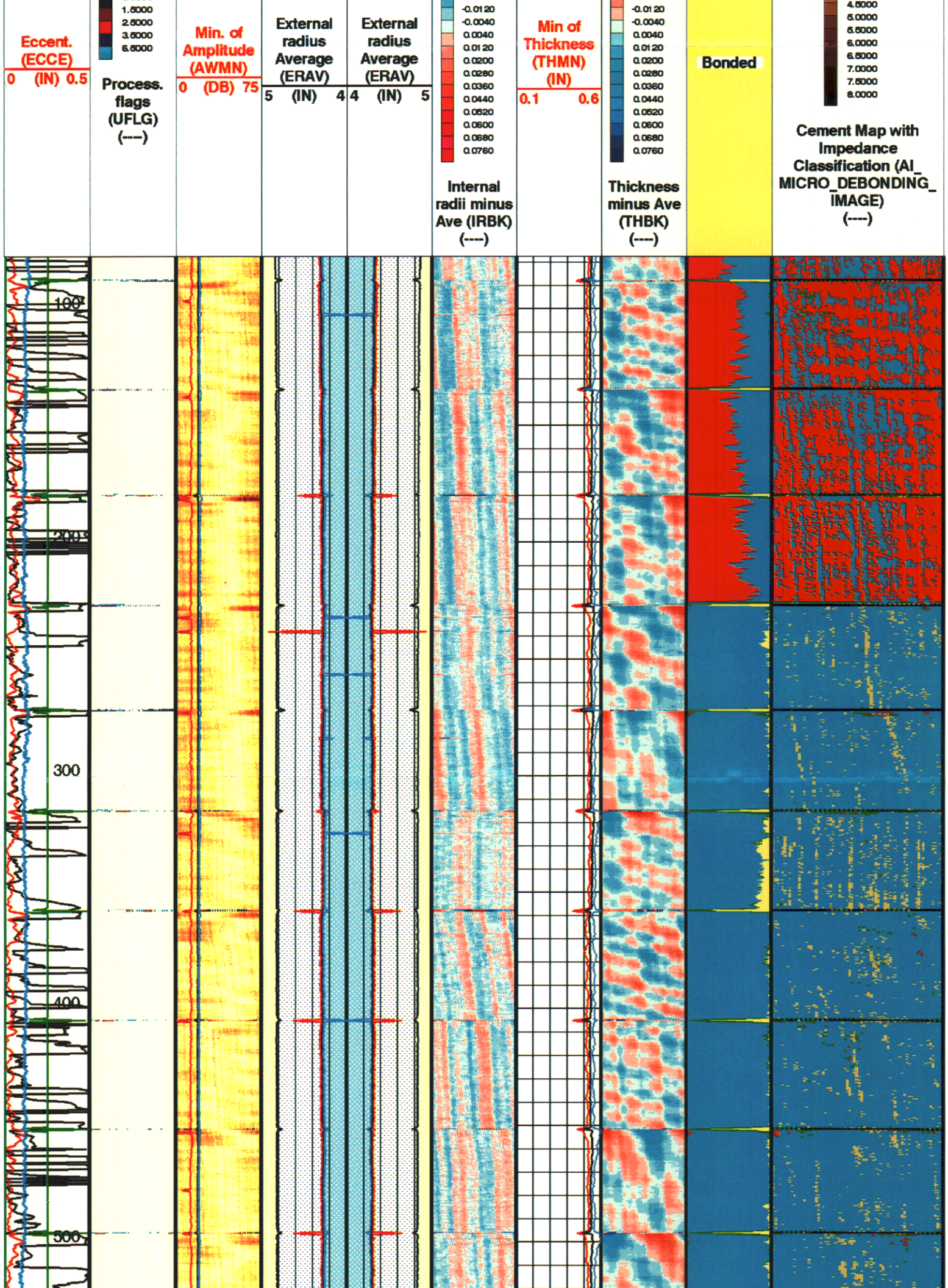
Output DLIS Files

DEFAULT	USI_MAPC_155PUP	FN:212	PRODUCER	30-Apr-2011 01:40	9995.5 FT	77.5 FT

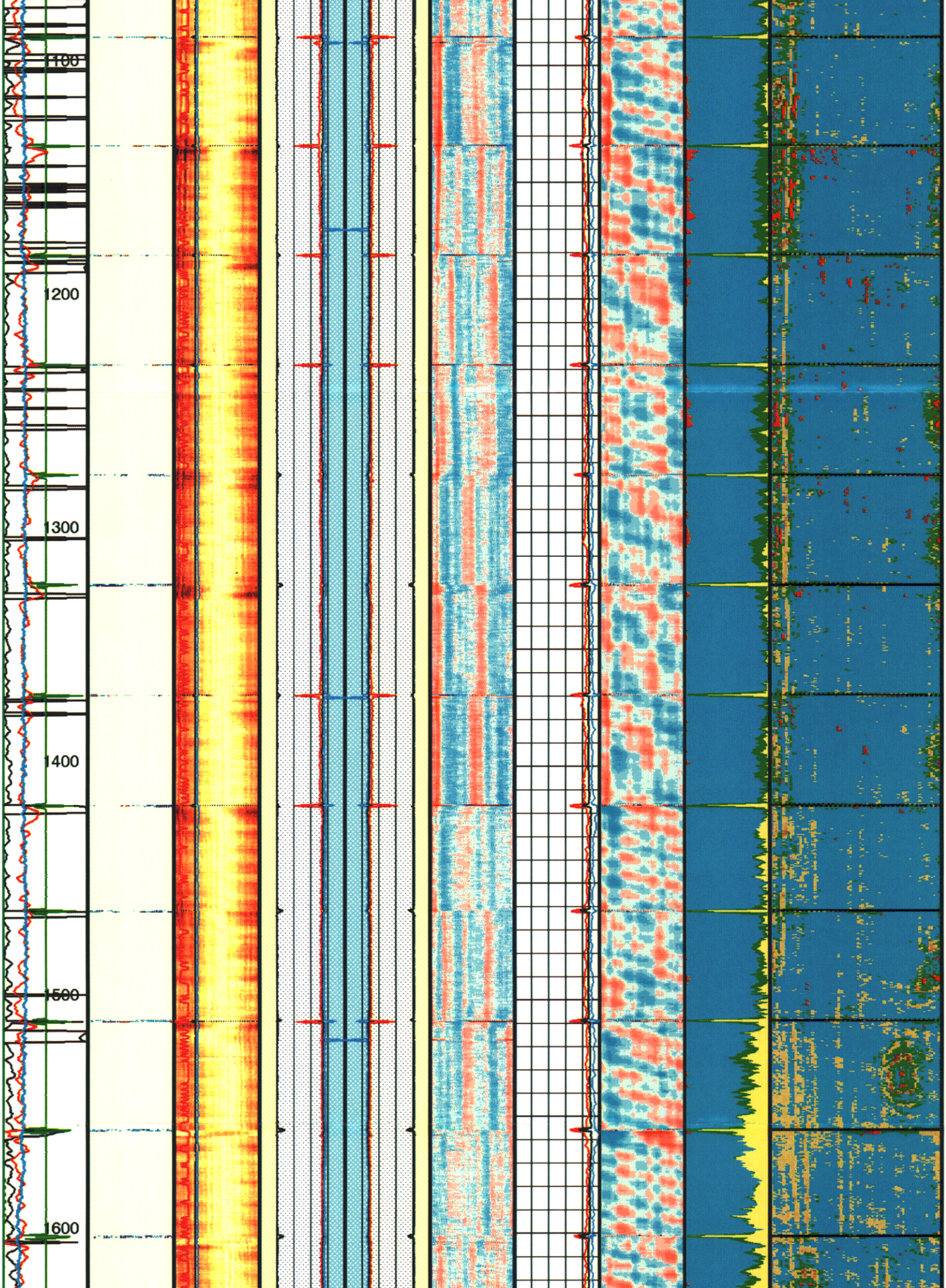
OP System Version: 19C0-187

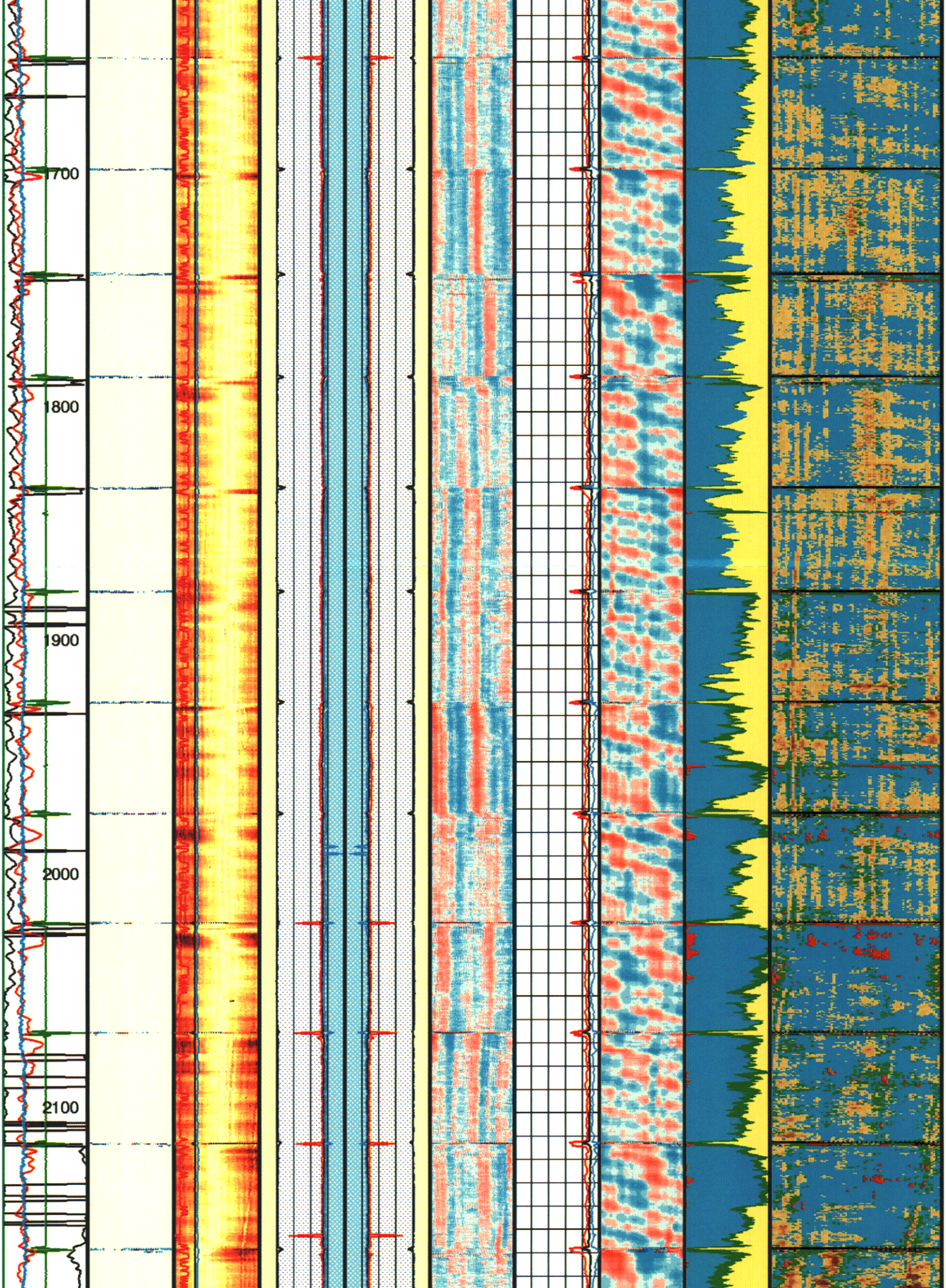
USIT-D	19C0-187	MAPC-B	19C0-187
EDTC-B	19C0-187		

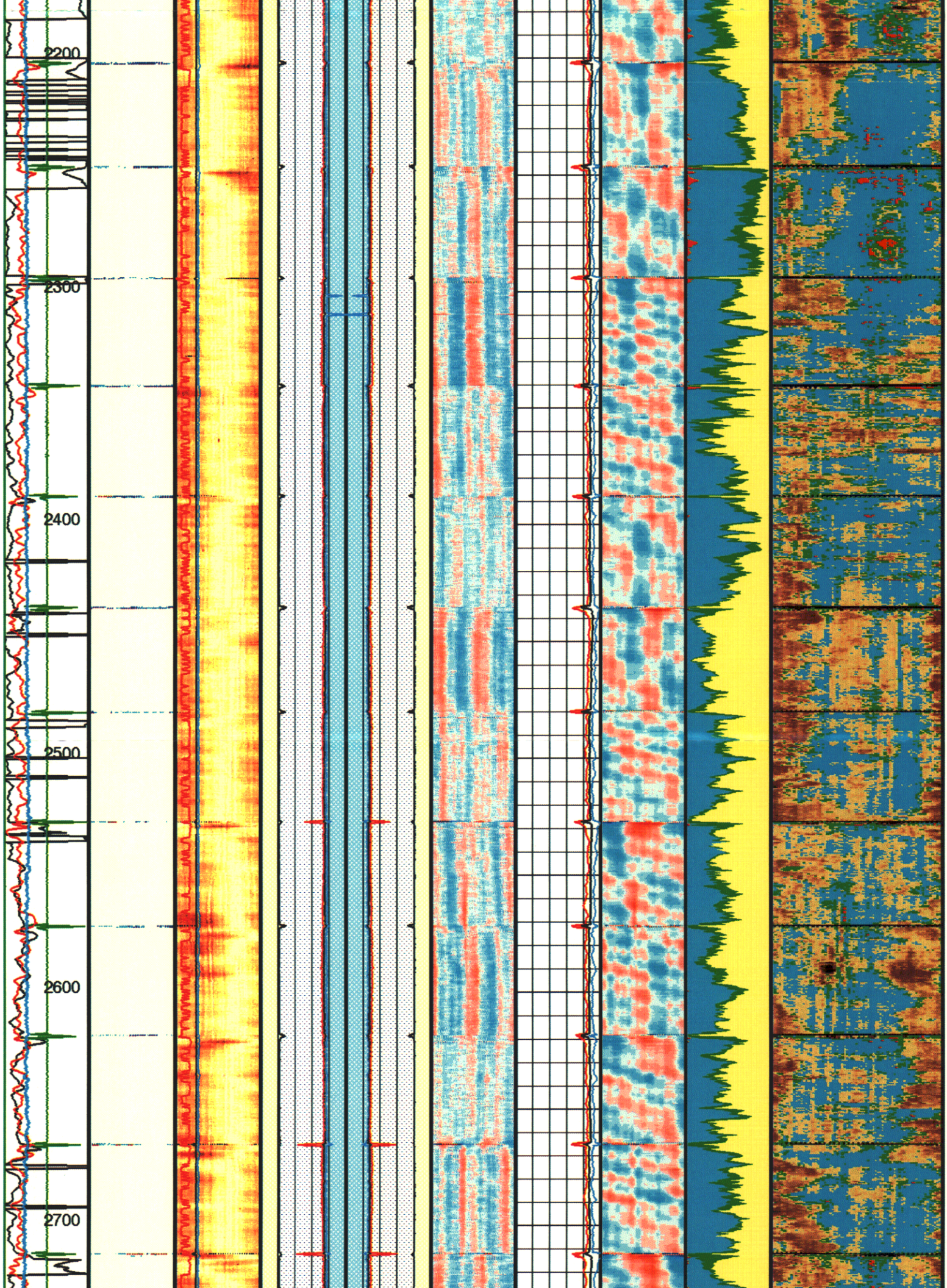



Eccent. (ECCE)
0 (IN) 0.5
1.5000
2.5000
3.5000
6.5000
Process. flags (UFLG) (----)
Min. of Amplitude (AWMN)
0 (DB) 75
External radius Average (ERAV)
5 (IN) 4
External radius Average (ERAV)
4 (IN) 5
-0.0120
-0.0040
0.0040
0.0120
0.0200
0.0280
0.0360
0.0440
0.0520
0.0600
0.0680
0.0760
Internal radii minus Ave (IRBK) (----)
Min of Thickness (THMN) (IN)
0.1 0.6
-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) (----)
Bonded
4.5000
5.0000
5.5000
6.0000
6.5000
7.0000
7.5000
8.0000
Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (----)
100
200
300
400
500

600
700
800
900
1000


1100
1200
1300
1400
1500
1600


1700
1800
1900
2000
2100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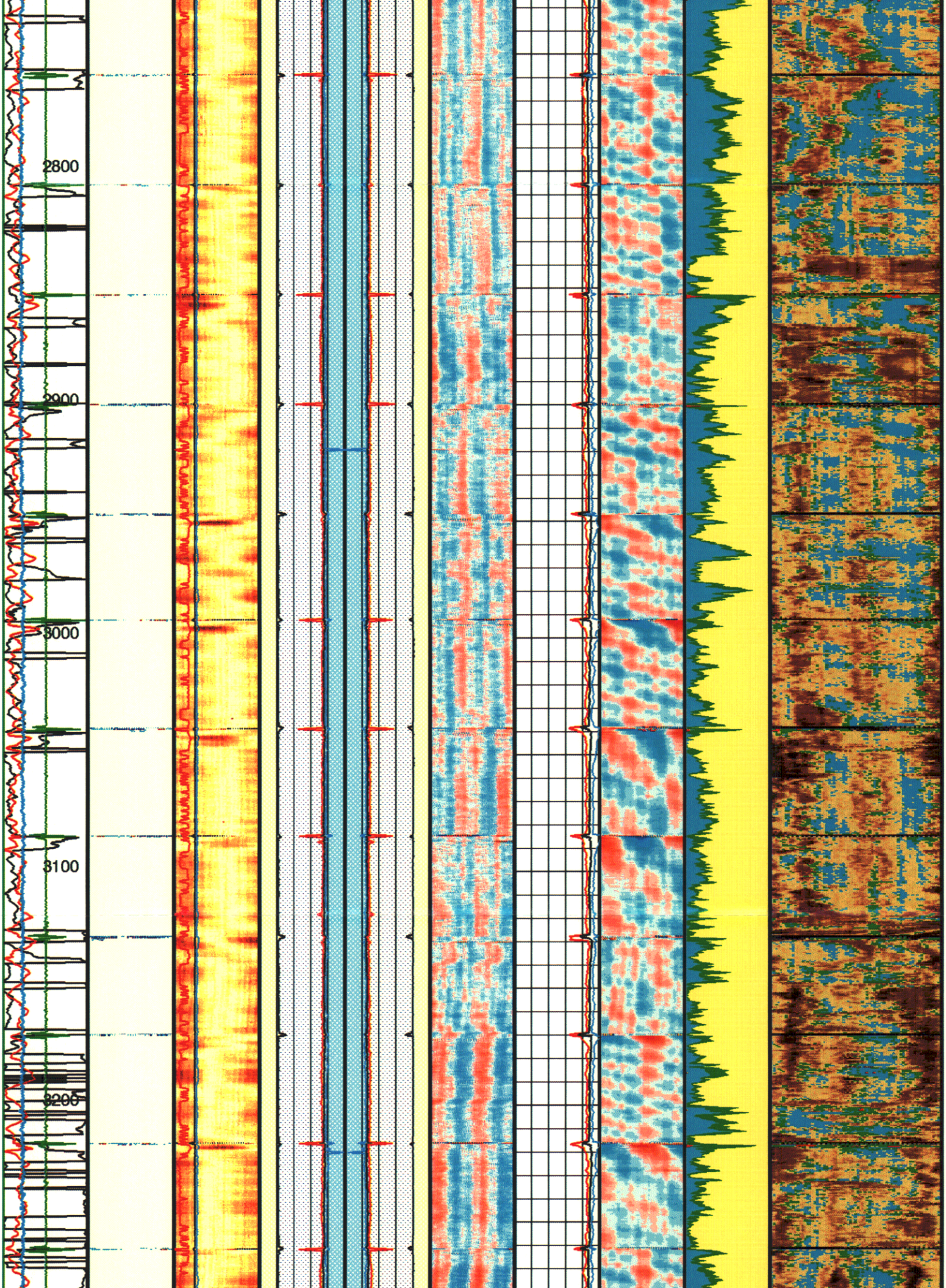
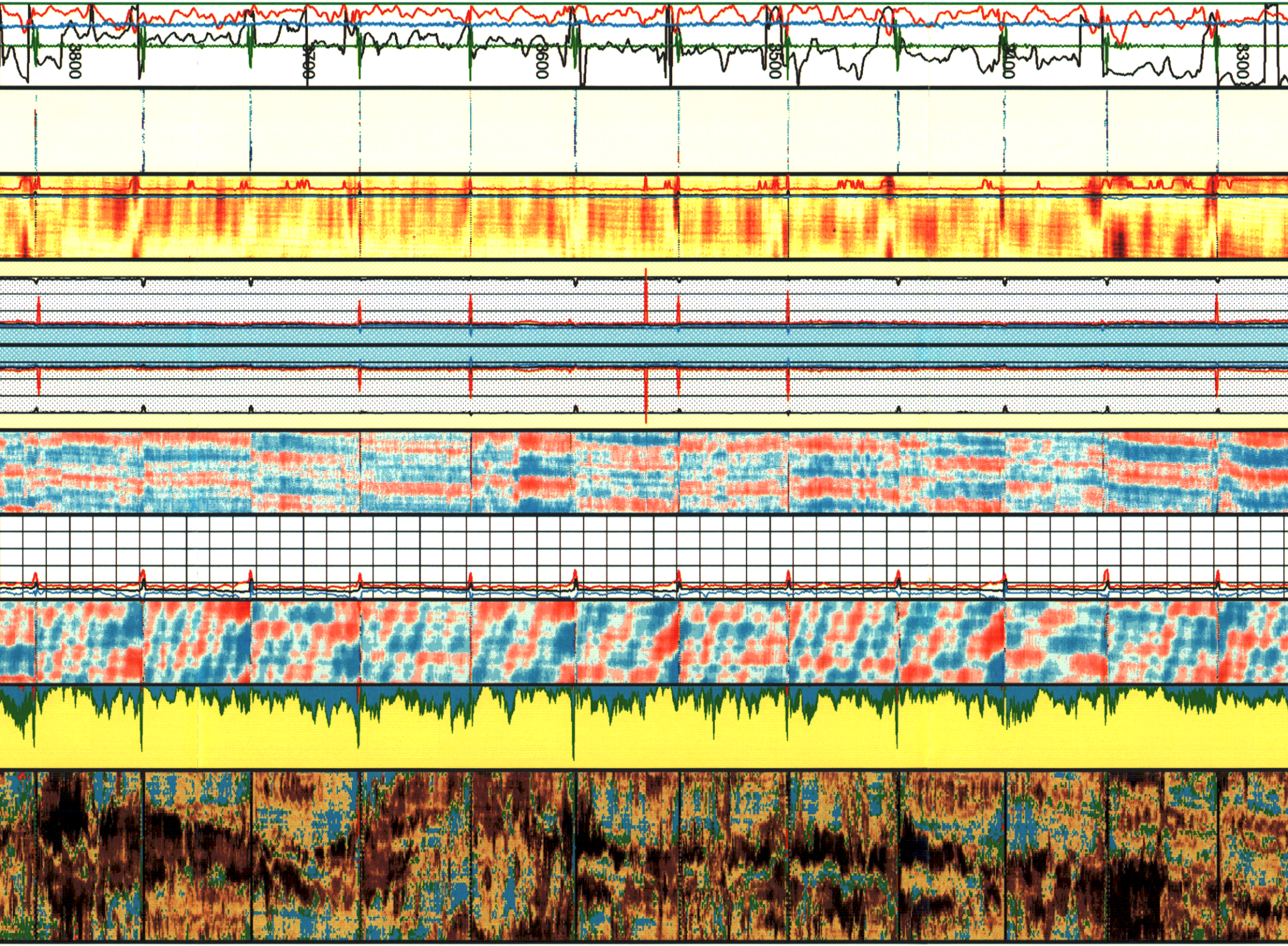
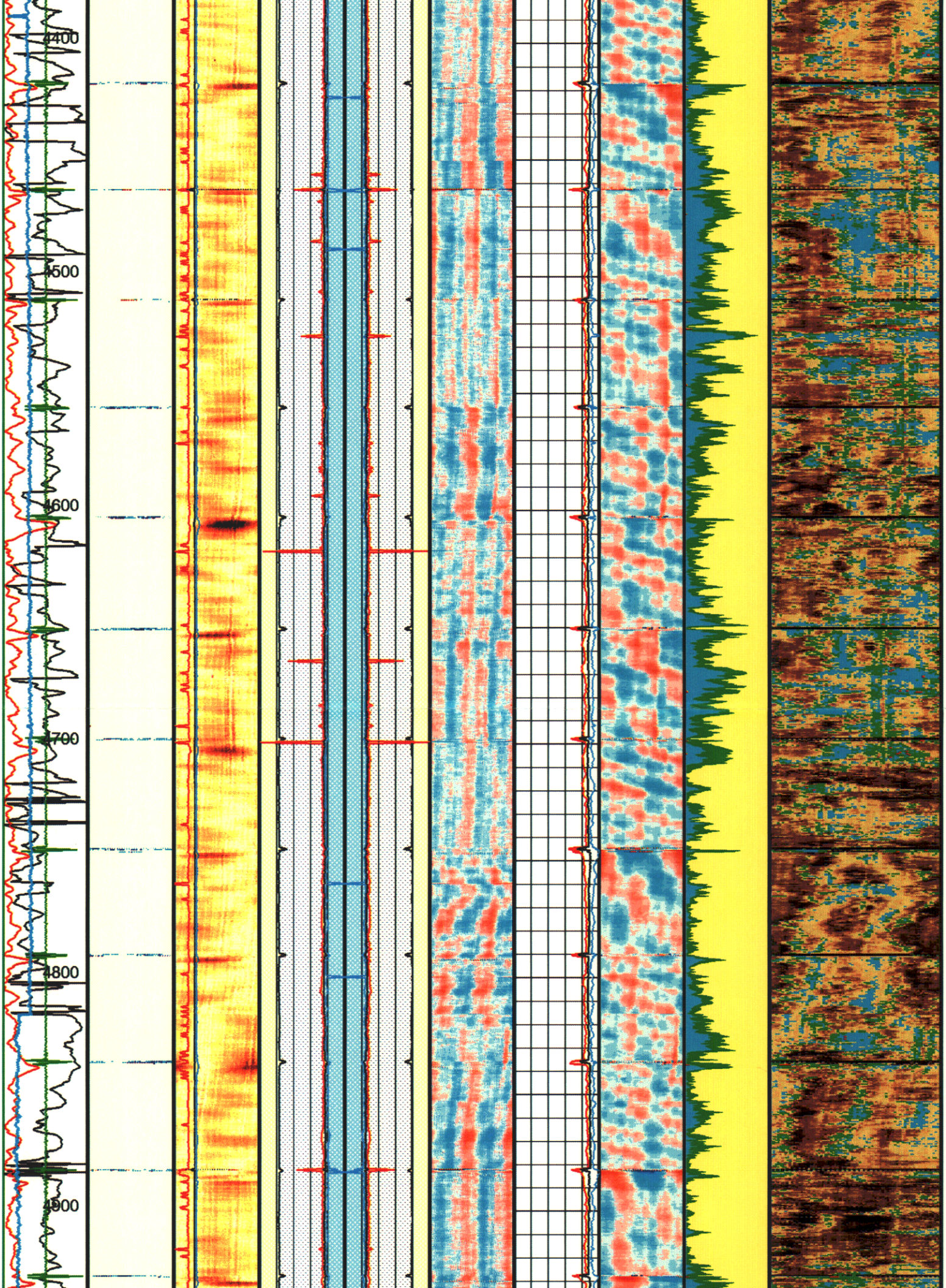
2300
2400
2500
2600
2700

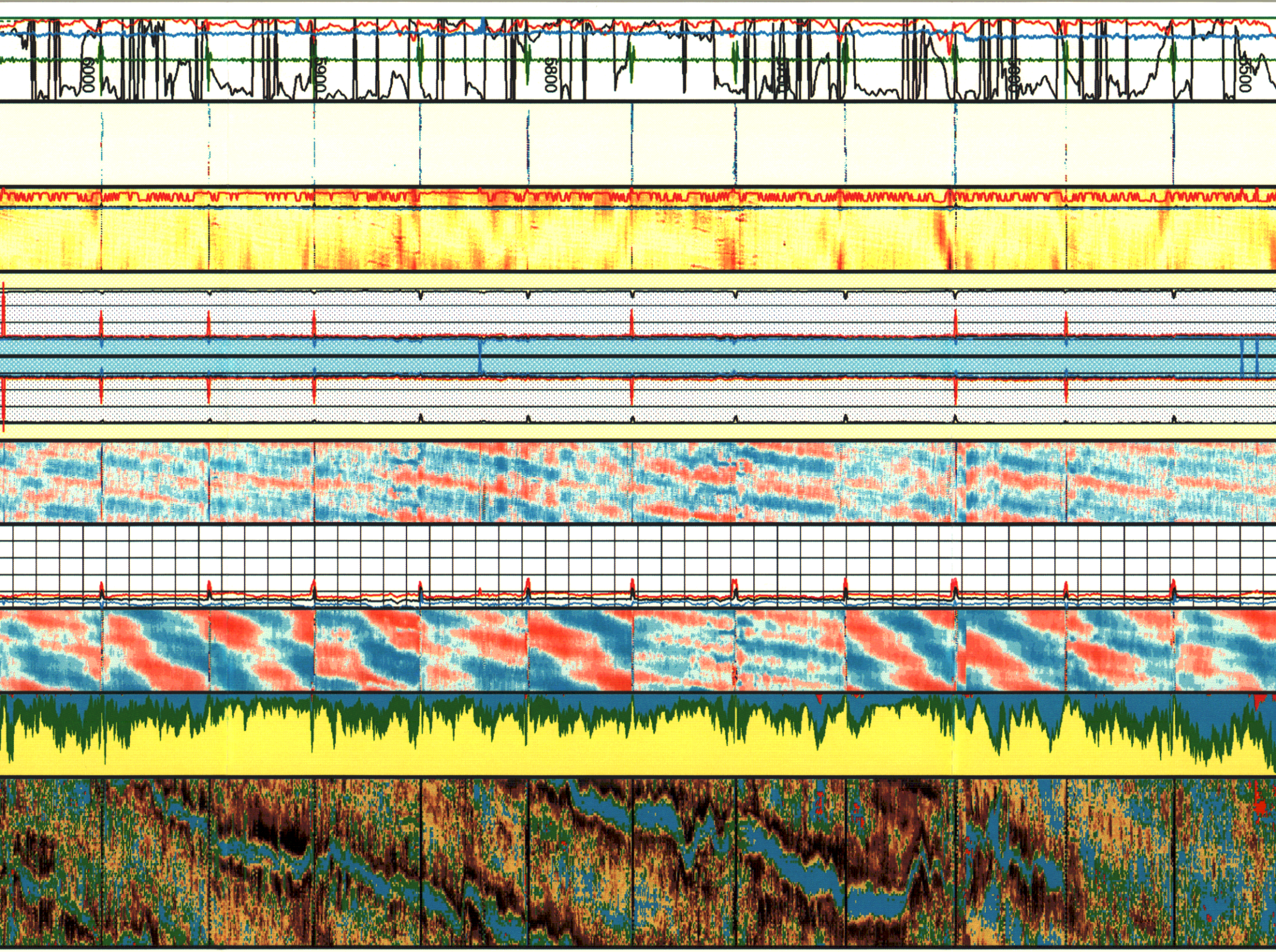

2800
2900
3000
3100
3200


8800
8700
8600
8500
8400
8300

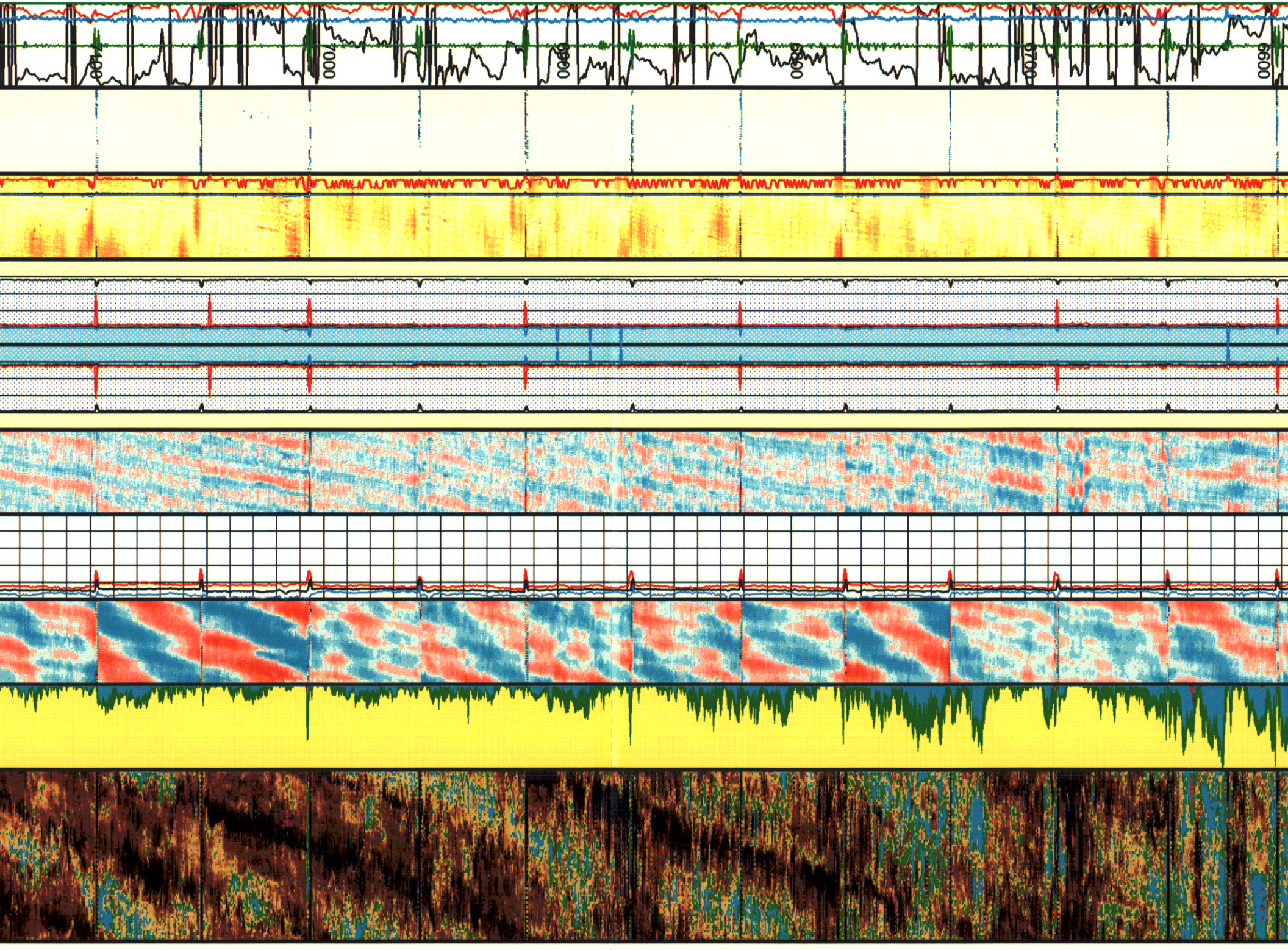
3900
4000
4100
4200
4300


4400
4500
4600
4700
4800
4900

5000
5100
5200
5300
5400


6000
5900
5800
5700
5600
5500

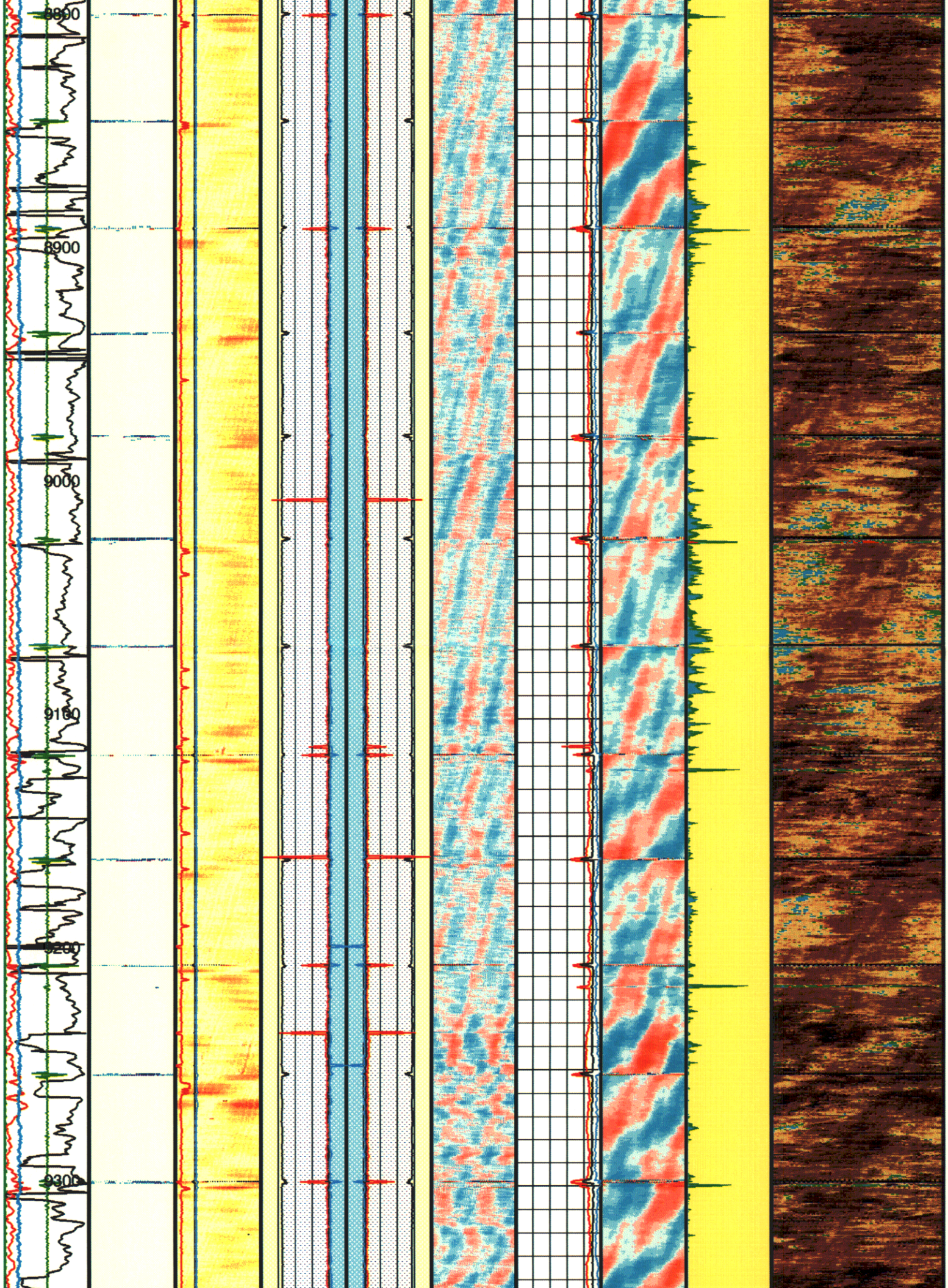
6100
6200
6300
6400
6500


6600
6700
6800
6900
7000
7100

7200
7000
7500
7600

7700
7800
7900
8000
8100
8200

8300
8400
8500
8600
8700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8900
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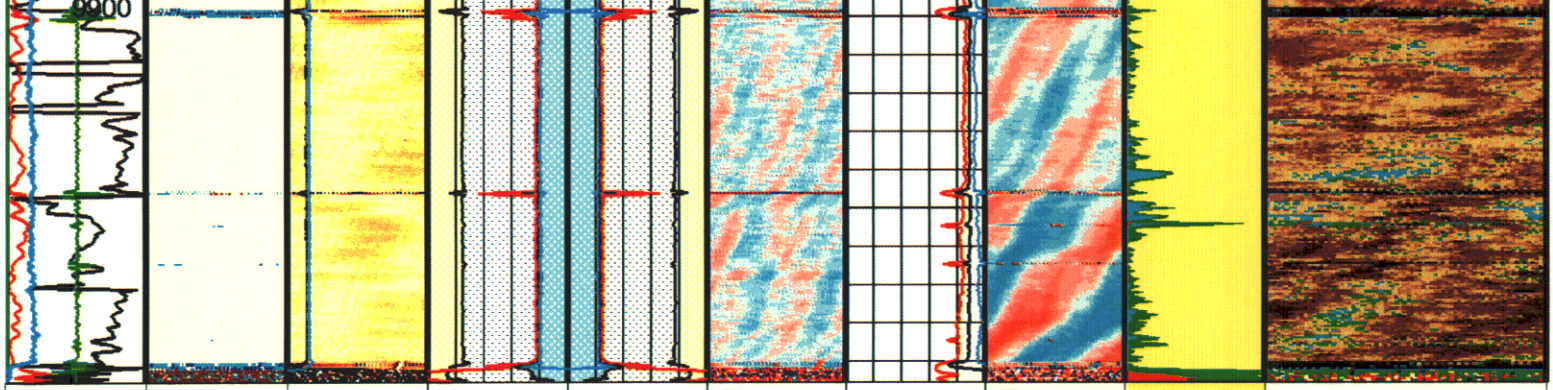
9100
9200
9300

9400
9500
9600
9700
9800



Eccent. (ECCE)
0 (IN) 0.5

Process. flags (UFLG) (----)
0.5000
1.5000
2.5000
3.5000
6.5000

Min. of Amplitude (AWMN)
0 (DB) 75

External radius Average (ERAV)
5 (IN) 4

External radius Average (ERAV)
4 (IN) 5

Internal radii minus Ave (IRBK) (----)
-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

Min of Thickness (THMN) (IN)
0.1 0.6

Thickness minus Ave (THBK) (----)
-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

Bonded

Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (----)
-1000.0000
-500.0000
0.3000
2.6000
3.0000
3.5000
4.0000
4.5000
5.0000
5.5000
6.0000
6.5000
7.0000
7.5000
8.0000

Rev. speed (RSAV) (RPS)
6 (RPS) 8

Average of Amplitude (AWAV)
0 (DB) 75

Internal radius Average (IRAV)
5 (IN) 4

Internal radius Average (IRAV)
4 (IN) 5

Average of Thickness (THAV) (IN)
0.1 0.6

Gas or Dry MicroA

Rev. speed (RSAV) (RPS)
-8 -6

Maximum of Amplitude (AWMX)
0 (DB) 75

Internal radius Maximum (IRMX)
5 (IN) 4

Internal radius Maximum (IRMX)
4 (IN) 5

Maximum of Thickness (THMX) (IN)
0.1 0.6

Liquid

CCL (CCLU) (----)
-20 20

Amplitude of echo minus Max (AWBK) (----)
-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

Min of Internal radius (IRMN)
5 (IN) 4

Min of Internal radius (IRMN)
4 (IN) 5

Micro-debonding

Cable Speed (CS) (F/HR)
3000

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

Image rotation (UCAZ) (DEG)
0 360

Format: USIT_5_S2 Vertical Scale: 2" per 100' Graphics File Created: 30-Apr-2011 01:40

OP System Version: 19C0-187

USIT-D	19C0-187	MAPC-B	19C0-187
EDTC-B	19C0-187		

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-D: Ultrasonic Imaging - D			
AGMN	Minimum Gain of Cartridge	-4	DB
AGMX	Maximum Gain of Cartridge	20	DB
BERJ	Bad Echo Rejection	ON	
CDIA	Casing Outer Diameter	9.625	IN
CSDE	Casing Density	486.94	LBCF
CSID	Casing Inner Diameter	8.47643	IN
DFVL	Default Fluid Velocity	206	US/F
DOT	Diameter of Transducer Sensor	4.874	IN
EMXV	EMEX Voltage	60	V
FDII	FPM Data Interpolation Interval	0	FT
IMAR	Image Rotation	OFF	
MW	Mud Weight	13.2	LB/G
RCOD	Reference Calibrator Outer Diameter	7	IN
RCSO	Reference Calibrator Standoff	1.37795	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	0.574285	IN
UMAO	USIT Measurement Angular Offset	-10	DEG
USTO	Ultrasonic Time Offset	-2	US
USUB	Ultrasonic Subassembly Identifier	Sub_9_58_inch	
UWKM	Ultrasonic Working Mode	5DEG_6IN_60U_LF	
VCAS	Ultrasonic Transversal Velocity in Casing	51.4	US/F

WLEN	T*3 Processing Length	29	US
ZCAS	Acoustic Impedance of Casing	46.25	MRAY
ZINI	Initial Estimate of Cement Impedance	-1	MRAY
ZMUD	Acoustic Impedance of Mud	1.48	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.6	MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3	MRAY
System and Miscellaneous			
CWEI	Casing Weight	56.50	LB/F
DO	Depth Offset for Playback	0.0	FT
PP	Playback Processing	OFF	

Input DLIS Files

DEFAULT	Splice_USI_MAPC_153CUC	FN:1	PRODUCER	30-Apr-2011 01:08	9995.5 FT	77.2 FT

Output DLIS Files

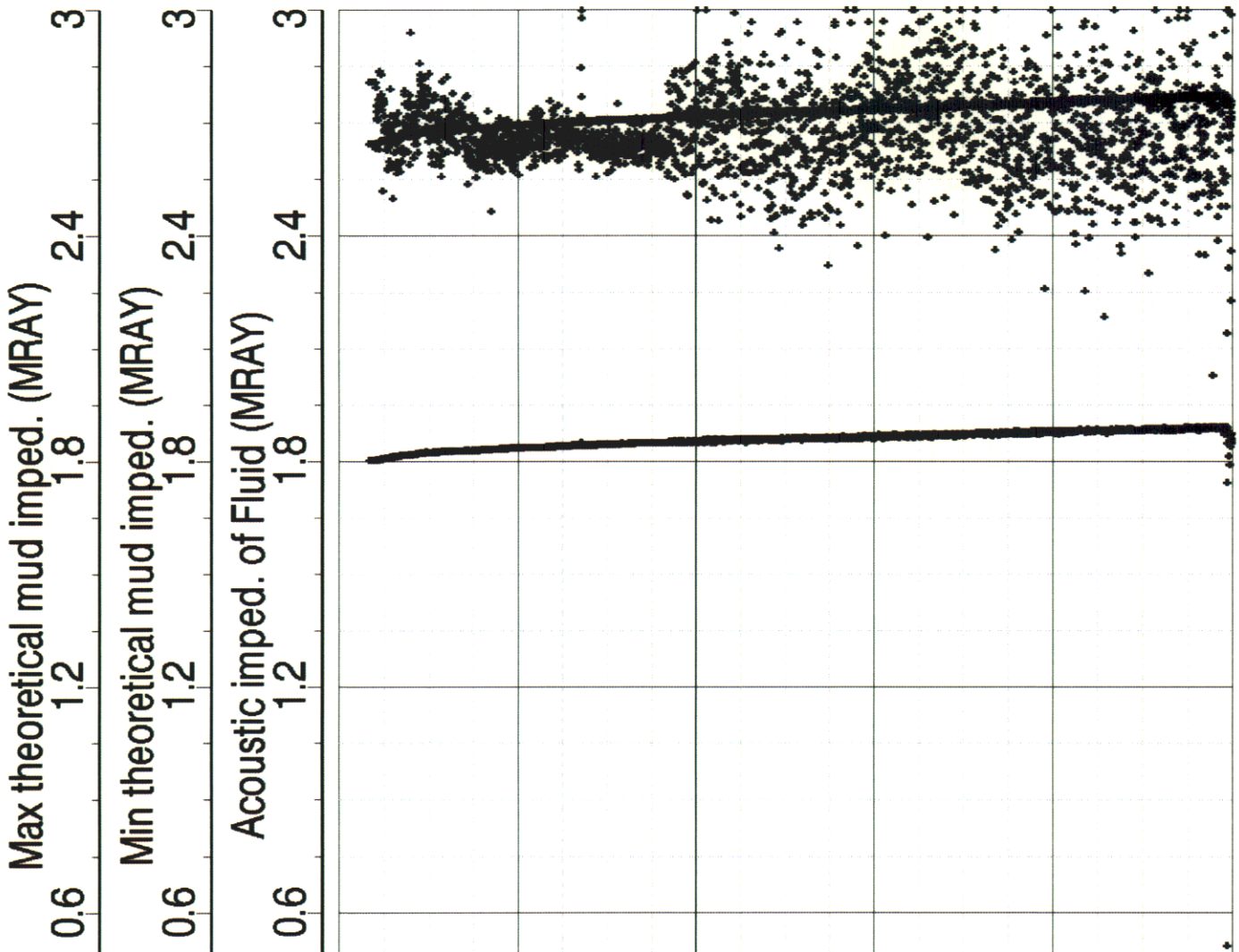
DEFAULT	USI_MAPC_155PUP	FN:212	PRODUCER	30-Apr-2011 01:40

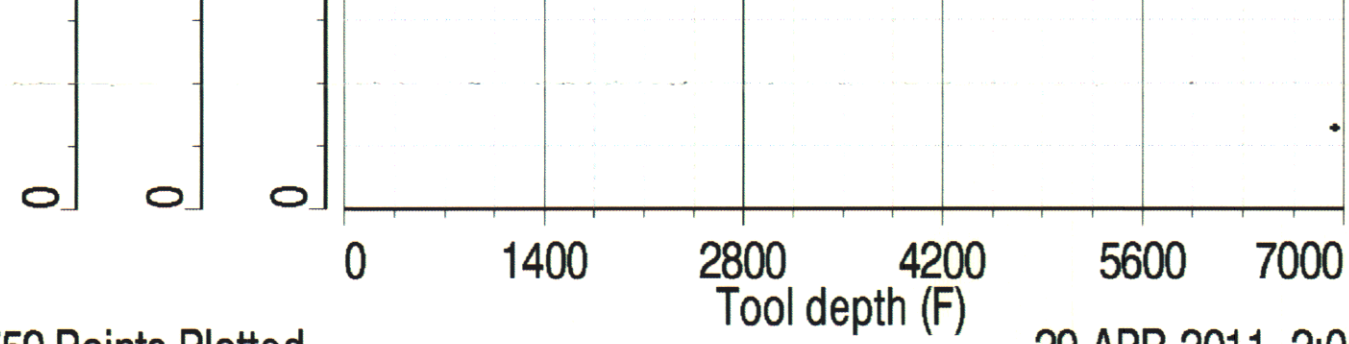
Schlumberger

FPM PLOTS

MAXIS Field Log

Index: 243.0 - 7560.0 FT

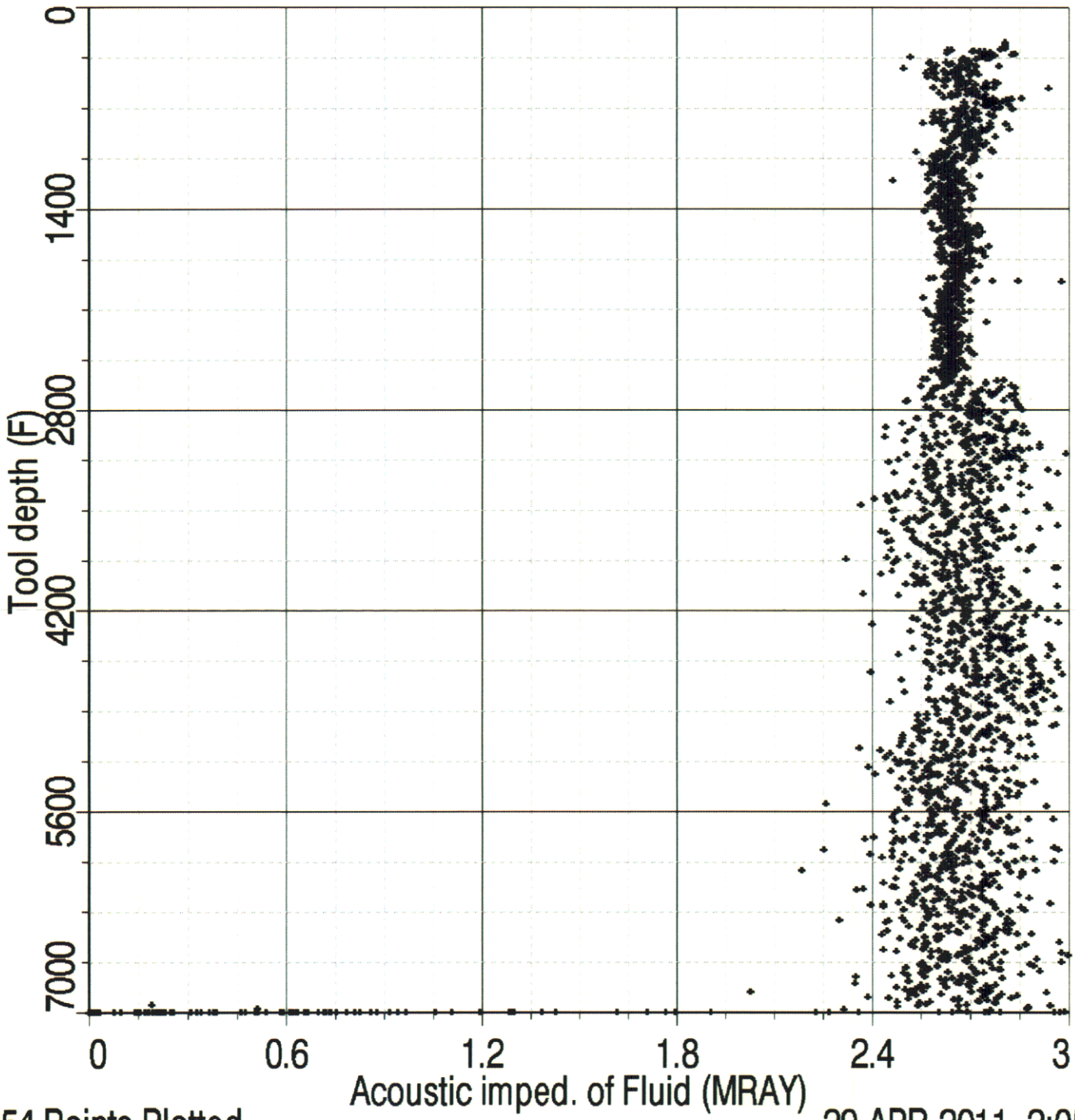




6759 Points Plotted

29-APR-2011 2:05

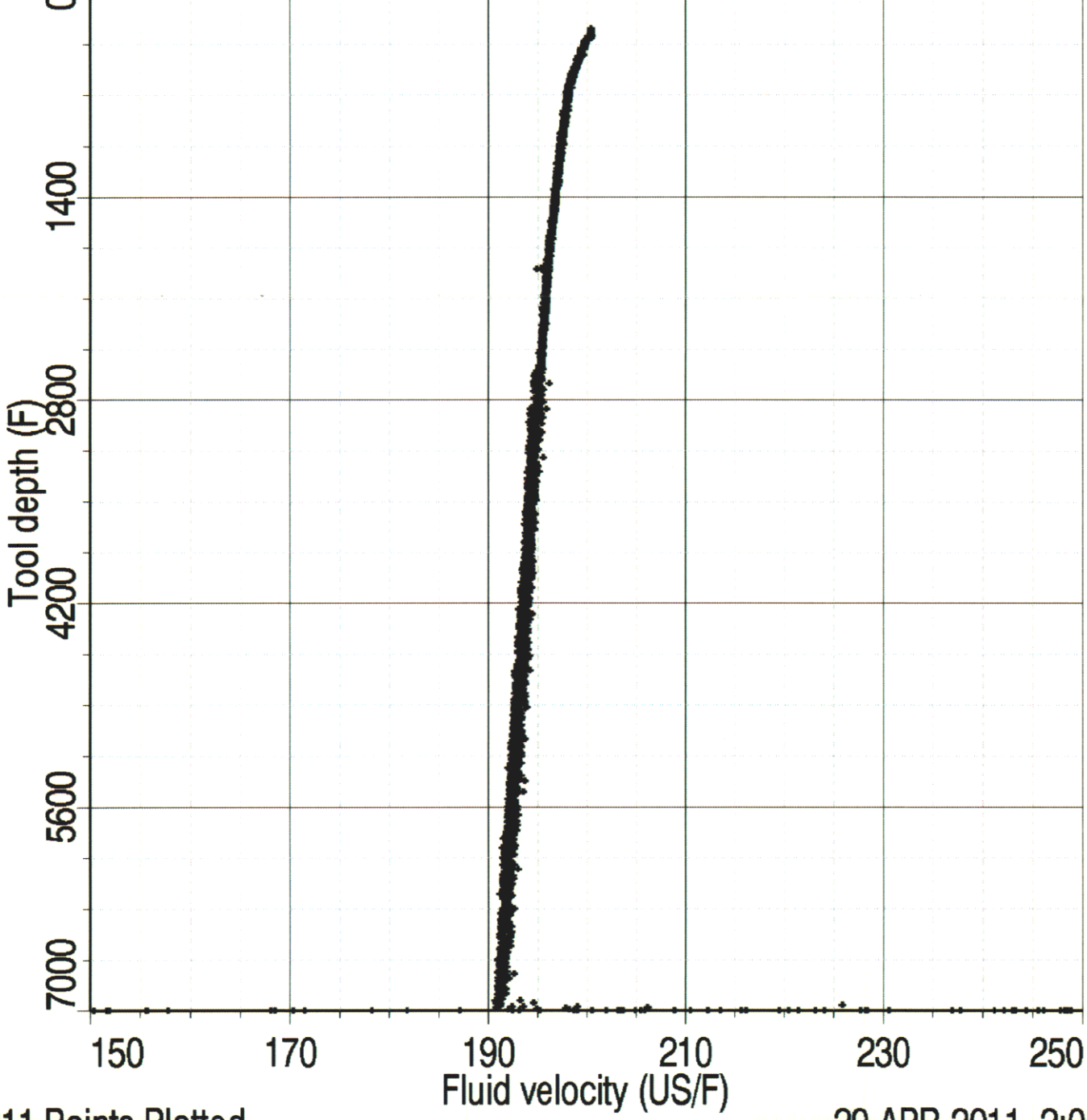
Index: 243.0 - 7560.0 FT



2354 Points Plotted

29-APR-2011 2:05

Index: 243.0 - 7560.0 FT



2311 Points Plotted

29-APR-2011 2:05

Company: OXY US LA Basin

Schlumberger

Well: DOM-002
Field: Dominguez
County: Los Angeles
State: California

ULTRA SONIC IMAGER
GAMMA RAY TIE IN
2IN/100FT LINEAR MD

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