

Schlumberger

Company: Kerr–McGee Oil & Gas Onshore LP

Well: D&C Farms 14N–33HZ

Field: Wattenberg

County: Weld State: Colorado

Ultrasonic Imager  
Cement Evaluation

County: Weld

Field: Wattenberg

Location: SESW Sec. 28, T1N, R67W

Well: D&C Farms 14N–33HZ

Company: Kerr–McGee Oil & Gas Onshore

LOCATION	
SESW Sec. 28, T1N, R67W SHL: 752' FSL X 2160' FWL	Elev.: K.B. 5027.00 ft G.L. 5011.00 ft D.F. 5026.00 ft
Permanent Datum: _____ Log Measured From: _____ Drilling Measured From: _____	Ground Level _____ Elev.: 5011.00 ft _____ Ground Level _____ 0.00 ft above Perm. Datum Kelly Bushing _____
API Serial No. 05–123–37894–000C	Section 28 Township 1N Range 67W

Logging Date	15–Nov–2013		
Run Number	1		
Depth Driller	12000 ft		
Schlumberger Depth	6895 ft		
Bottom Log Interval	6895 ft		
Top Log Interval	0 ft		
Casing Fluid Type	Fresh Water		
Salinity			
Density	8.7 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	HCP-110 LTC/DQX		
From			
To			
Maximum Recorded Temperatures			
Logger On Bottom	Time	15:30	
Unit Number	Location	3030 Ft. Morgan, CO	
Recorded By	Tim Hoffman		
Witnessed By	Brandon Hildreth		

	Run 1	Run 2	Run 3
Oil Density			
Water Salinity			
Gas Gravity			
Bo			
Bw			
1/Bg			
Bubble Point Pressure			
Bubble Point Temperature			
Solution GOR			
Maximum Deviation	0 deg		
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: 15-NOV-2013 16:24:30

## Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW-B	Type:	CMTD-B/A	Type:	7-39P-LXS
Serial Number:	6404	Serial Number:	2858	Serial Number:	
Calibration Date:	30-Oct-2013	Calibration Date:	4-Nov-2013	Length:	17500 FT
Calibrator Serial Number:		Calibrator Serial Number:			
Calibration Cable Type:	7-39P-LXS	Number of Calibration Points:	10	Conveyance Method:	Wireline
Wheel Correction 1:	-4	Calibration RMS:	4	Rig Type:	LAND
Wheel Correction 2:	-4	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 policies followed.
2. IDW used as primary depth reference. Z-Chart used as secondary.
- 3.
- 4.
- 5.
- 6.

## DISCLAIMER

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OTHER SERVICES1 OS1:   None OS2: OS3: OS4: OS5:	OTHER SERVICES2 OS1: OS2: OS3: OS4: OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
This is the first run in hole	
Toolstring run as per tool sketch	
Main pass logged with 2800 psi	
Repeats logged with 0 psi	

Lead cement: 12 lb/gal	
Tail cement: 13 lb/gal	
Main pass logged at 10deg3inch resolution	
Liner top at 6924 ft, logged out from 6895 ft	
Rig: Crane	
Crew: Tyler Riter, Matt Rocha, Cody Bruns	

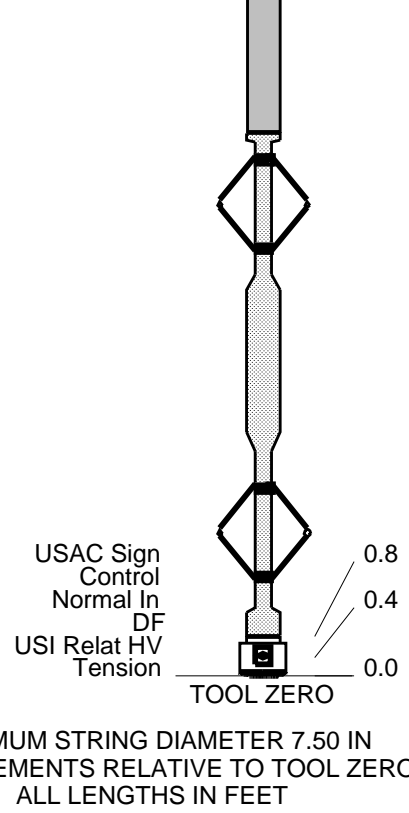
RUN 1 SERVICE ORDER #: CCN1-00032 PROGRAM VERSION: 19C1-222 FLUID LEVEL: 0 ft			RUN 2 SERVICE ORDER #: PROGRAM VERSION: FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

[illegible]

SURFACE EQUIPMENT	
GSR-U/Y WITM (DTS)-A	

DOWNHOLE EQUIPMENT	
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Item	Height (m)
LEH-QT LEH-QT	32.8
DTC-H ECH-KC 9562 DTCH0-A DTCH1-A	29.8
SGT-N SGH-K 3039 SGC-TB 10249 SGD-TAB 21700	26.8
AH-cen AH-cen	21.3
AH-107 AH-107 757	17.5
USIT-E ECH-MFA 1964 USAC-A 992 USIS-A 2797	15.5



Schlumberger

Cement Composite  
5" = 100'

MAXIS Field Log

Company: Kerr-McGee Oil & Gas Onshore LP Well: D&C Farms 14N-33HZ

Input DLIS Files						
DEFAULT	Splice_USI_022CUP	FN:1	PRODUCER	15-Nov-2013 17:03	6895.0 FT	-21.4 FT

Output DLIS Files						
DEFAULT	USI_023PUP	FN:14	PRODUCER	15-Nov-2013 17:04	6899.0 FT	-17.0 FT

OP System Version: 19C1-222						
USIT-E	19C1-222	SGT-N	19C1-222			
DTC-H	19C1-222					

Zoning of Mud Parameters		
Depth	Fluid Velocity (DFVL)	Acoustic Impedance (ZMUD)
7000.00	188.00	1.67
6500.00	188.00	1.67



6500.00	188.00	1.67
6000.00	188.00	1.67
5500.00	188.00	1.67
5000.00	188.00	1.67
4500.00	189.00	1.66
4000.00	190.00	1.65
3500.00	191.00	1.65
3000.00	192.00	1.64
2500.00	194.00	1.62
2000.00	196.00	1.61
1500.00	198.00	1.60
1000.00	200.00	1.59
500.00	203.00	1.57

The figure displays a color-coded map of a cable's internal structure, with a color scale on the left ranging from -500.0000 (dark blue) to 0.5000 (light blue). The map is divided into three main horizontal sections, each with a corresponding data table.

**Top Section (Green background):**

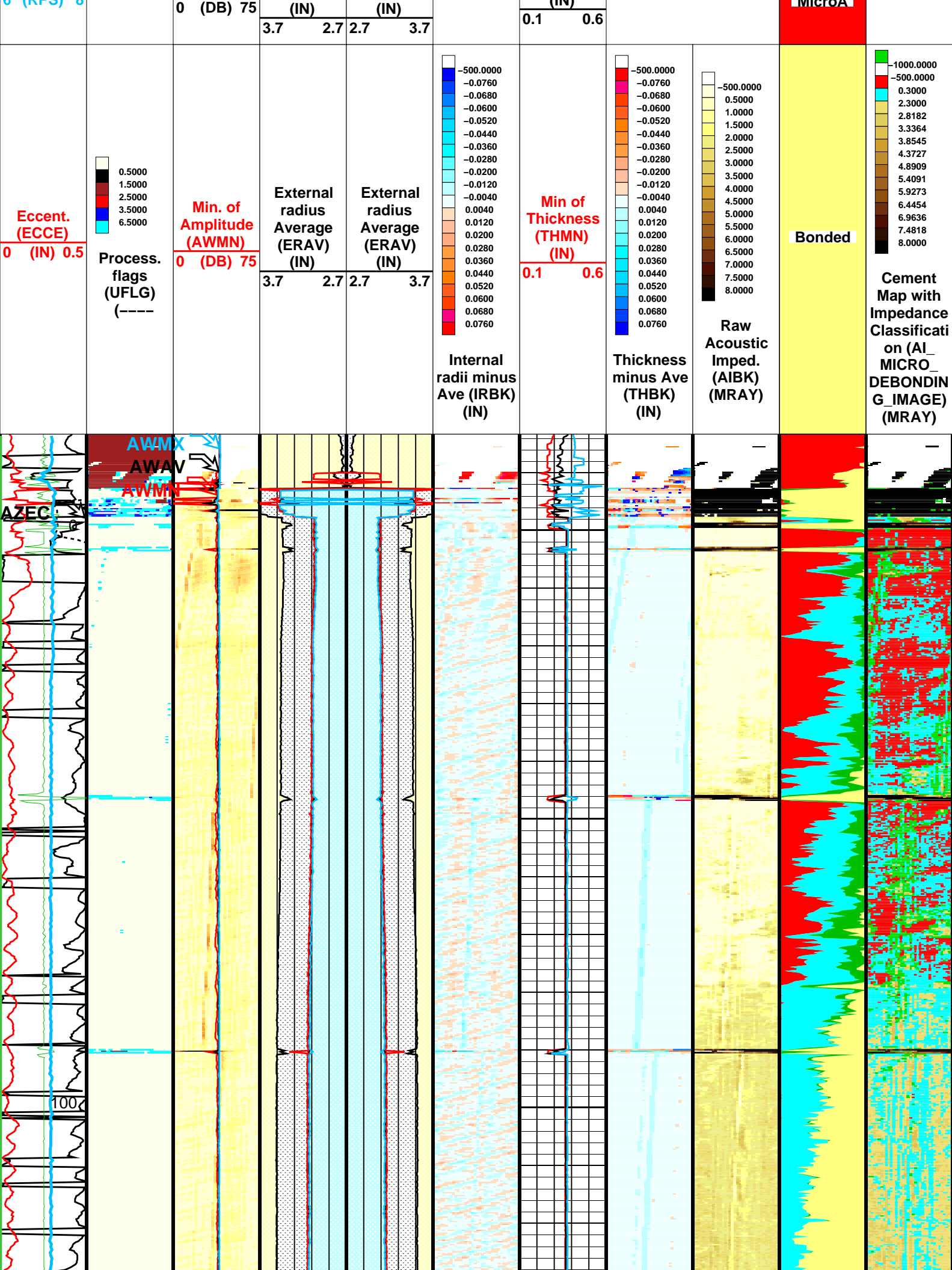
- Image rotation (UCAZ) (DEG):** 0 to 360
- Azimuth of eccent. (AZEC) (DEG):** 0 to 360
- Cable Speed (CS) (F/HR):** 0 to 2000
- Rev. speed (RSAV) (RPS):** -8 to -6
- Micro-debonding** (Label on the right)

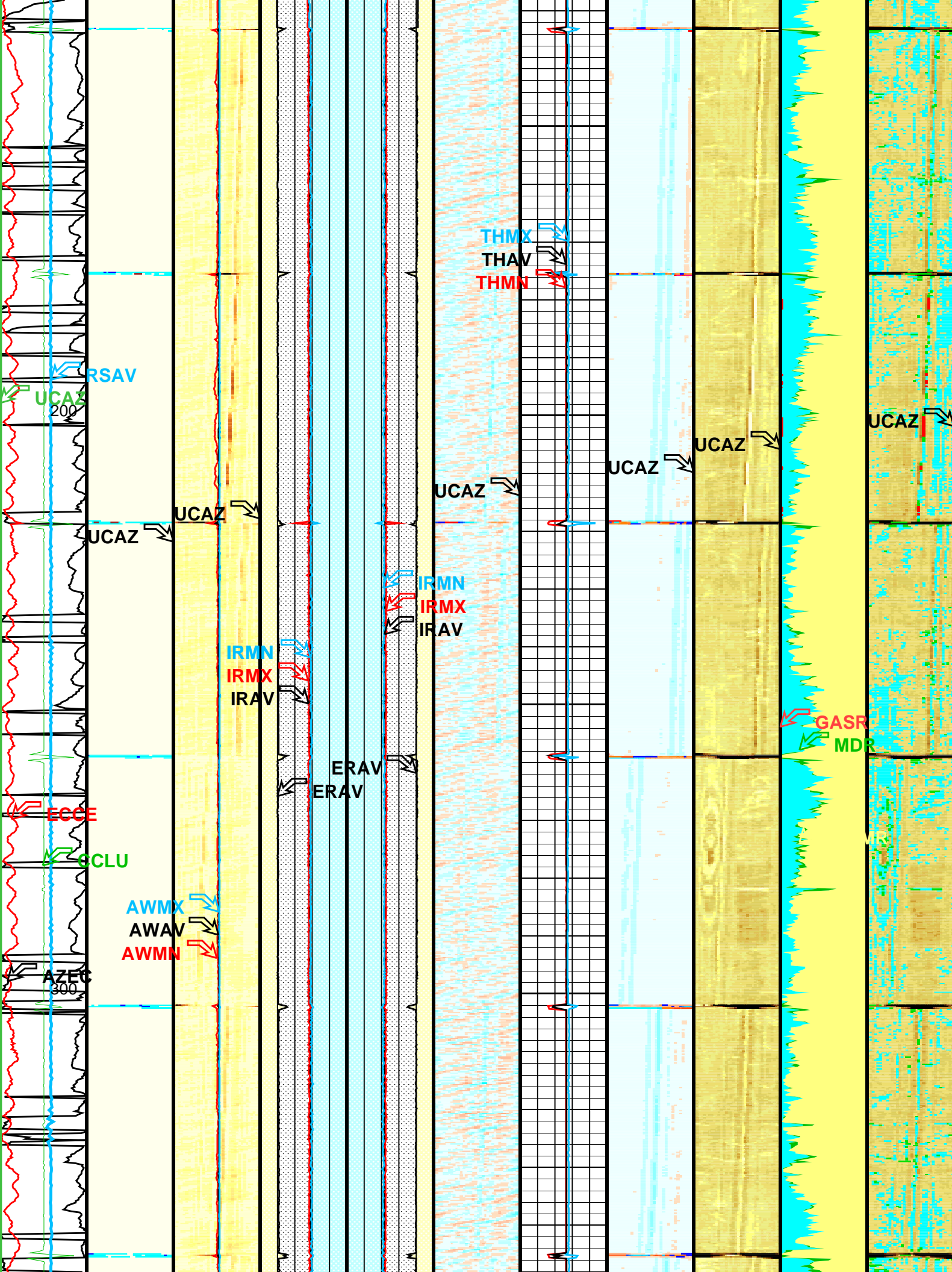
**Middle Section (Cyan background):**

- Amplitude of echo minus Max (AWBK) (DB):** -500.0000 to 0.5000
- Maximum of Amplitude (AWMX) (DB):** 0 to 75
- Internal radius Maximum (IRMN) (IN):** 3.7 to 2.7
- Internal radius Maximum (IRMX) (IN):** 2.7 to 3.7
- Maximum of Thickness (THMX) (IN):** 0.1 to 0.6
- Liquid** (Label on the right)

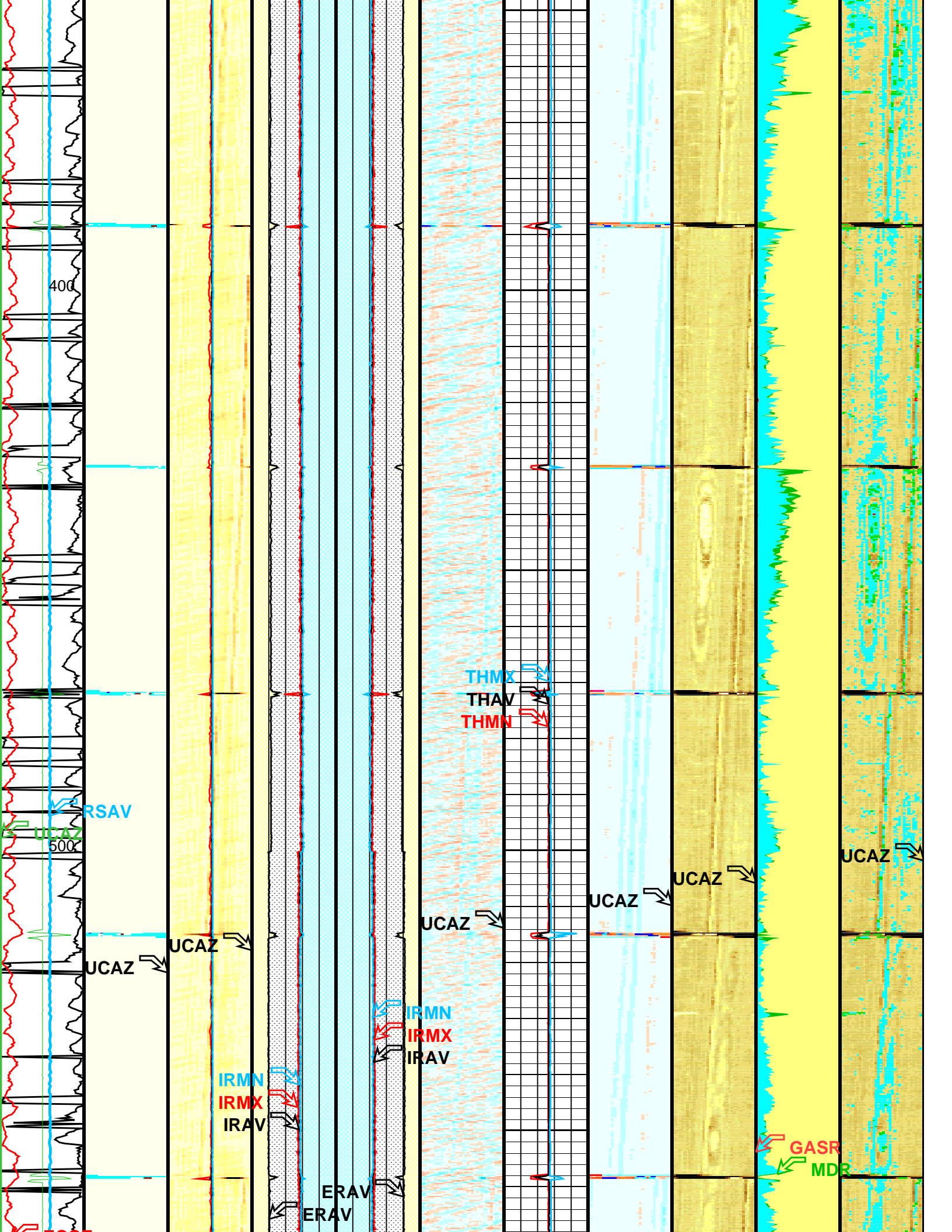
**Bottom Section (Red background):**

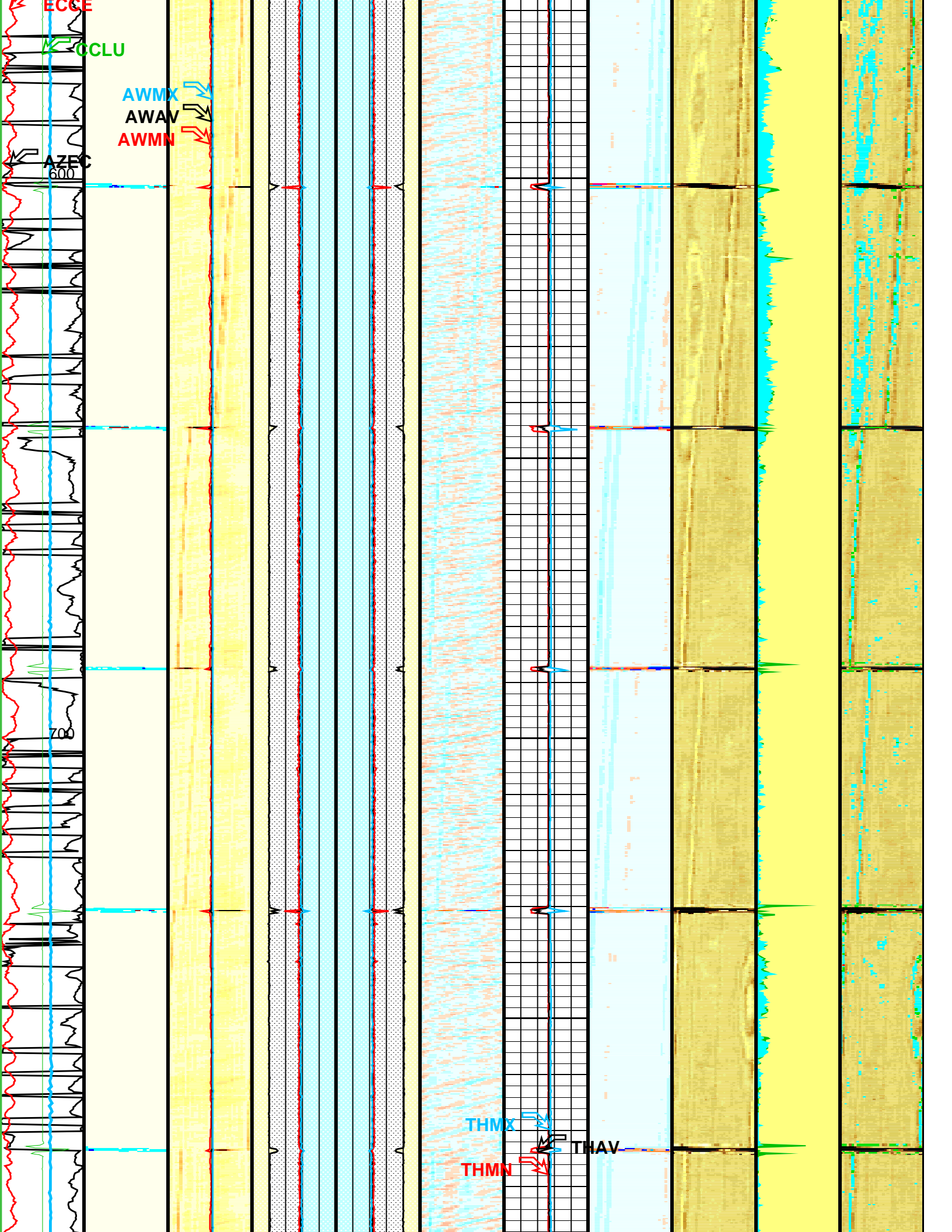
- Rev. speed (RSAV) (RPS):** 6 to 8
- Average of Amplitude (AWAV):** -500.0000 to 0.5000
- Internal radius Average (IRAV):** 3.7 to 2.7
- Internal radius Average (IRAV):** 2.7 to 3.7
- Average of Thickness (THAV) (IN):** 0.1 to 0.6
- Gas or Dry Micro A** (Label on the right)



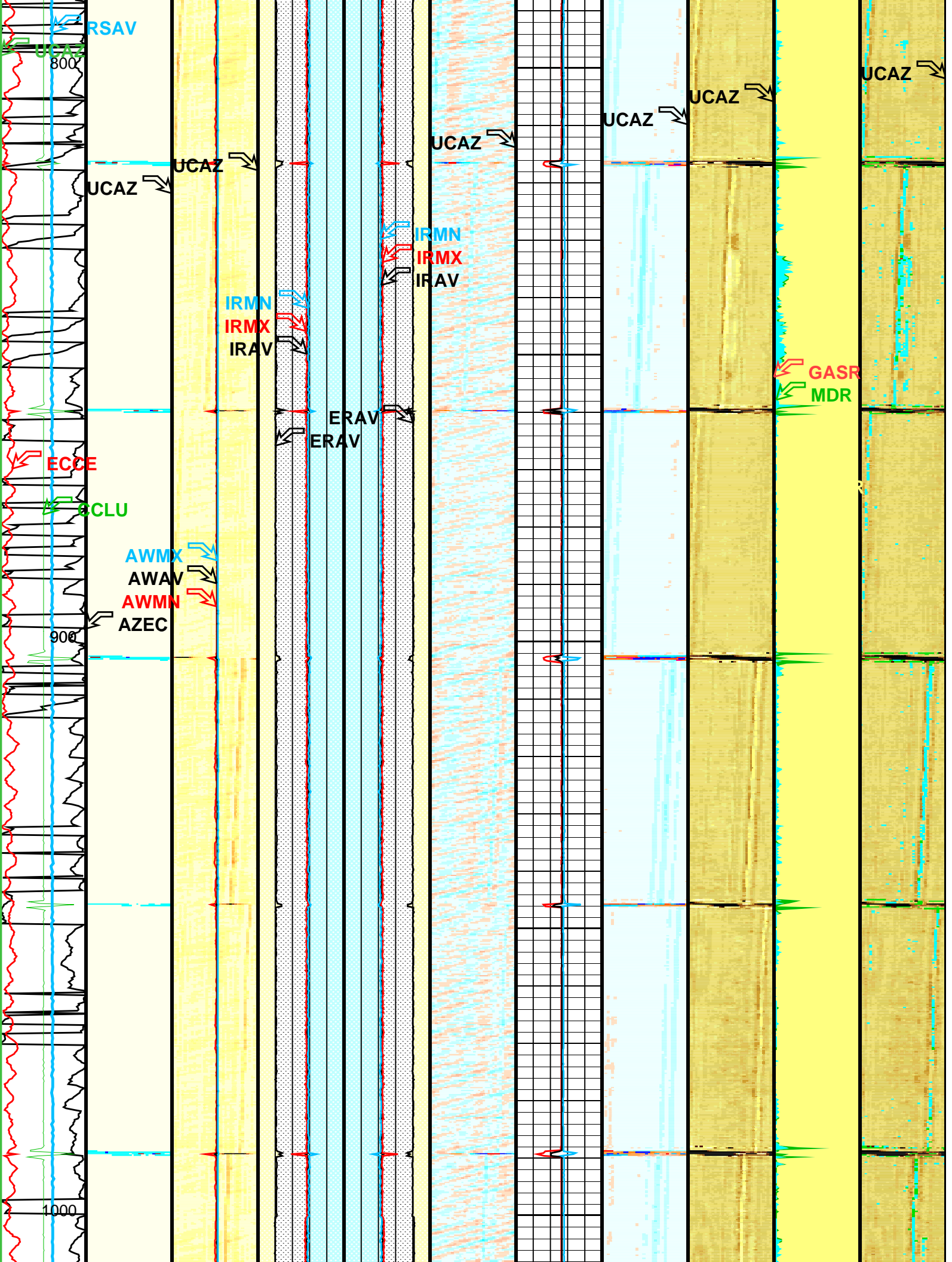


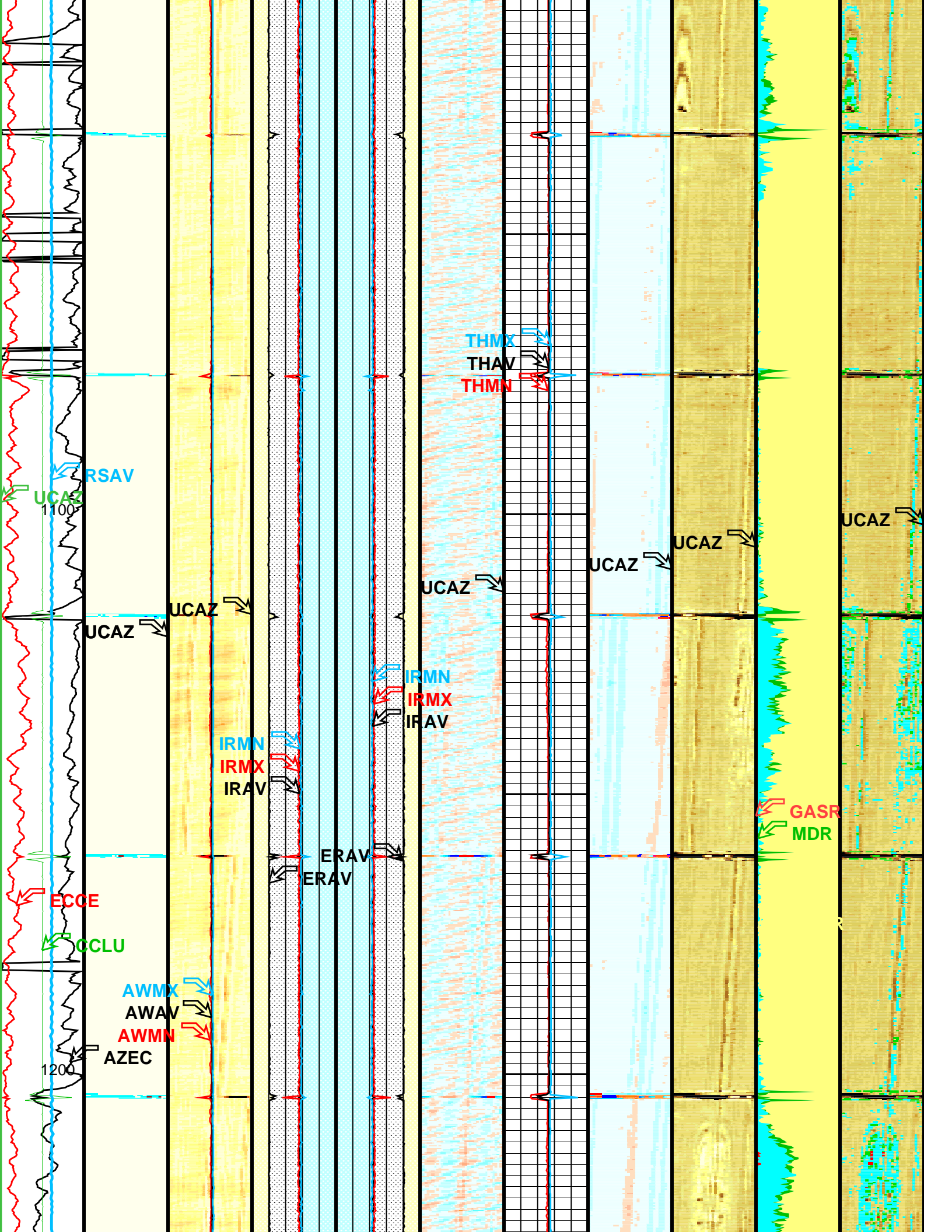




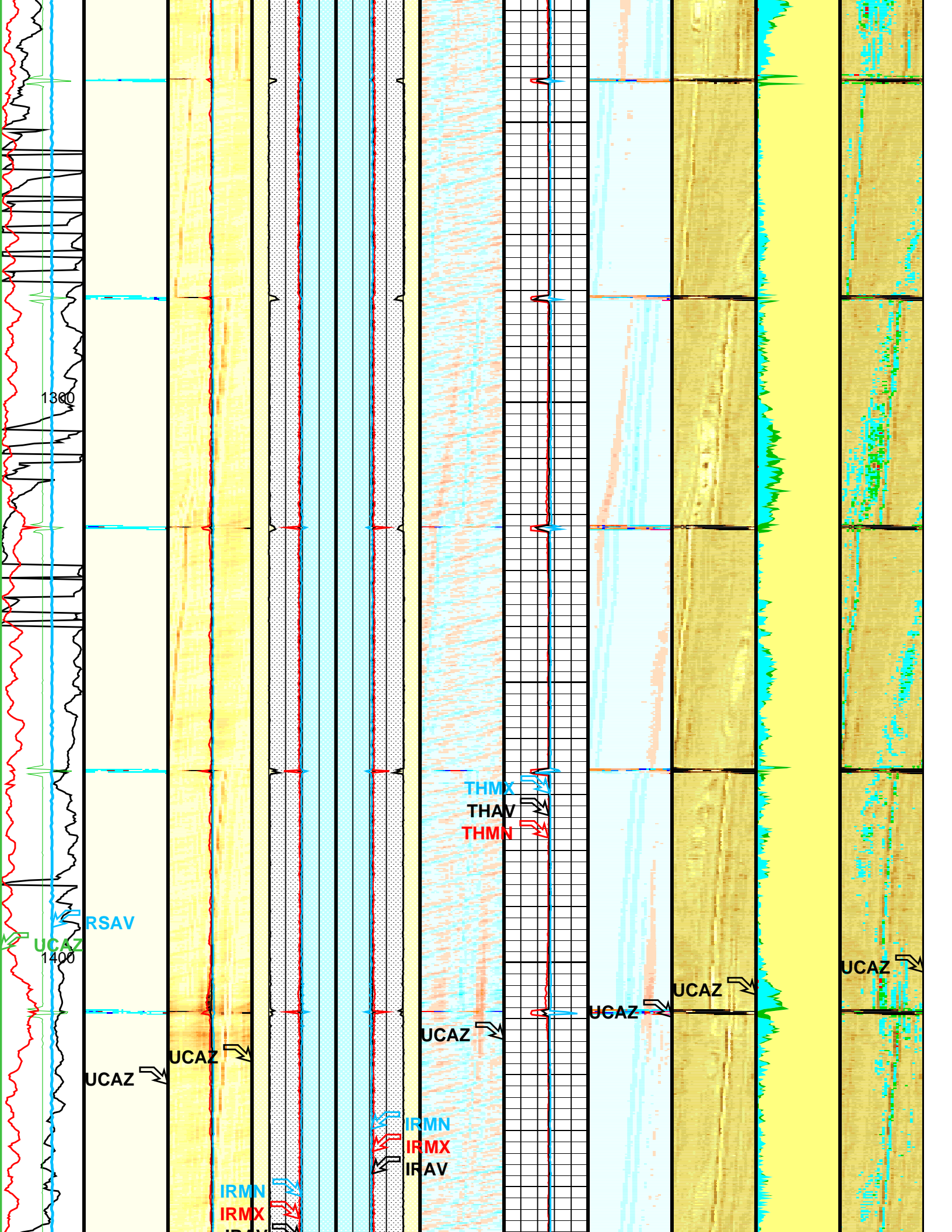




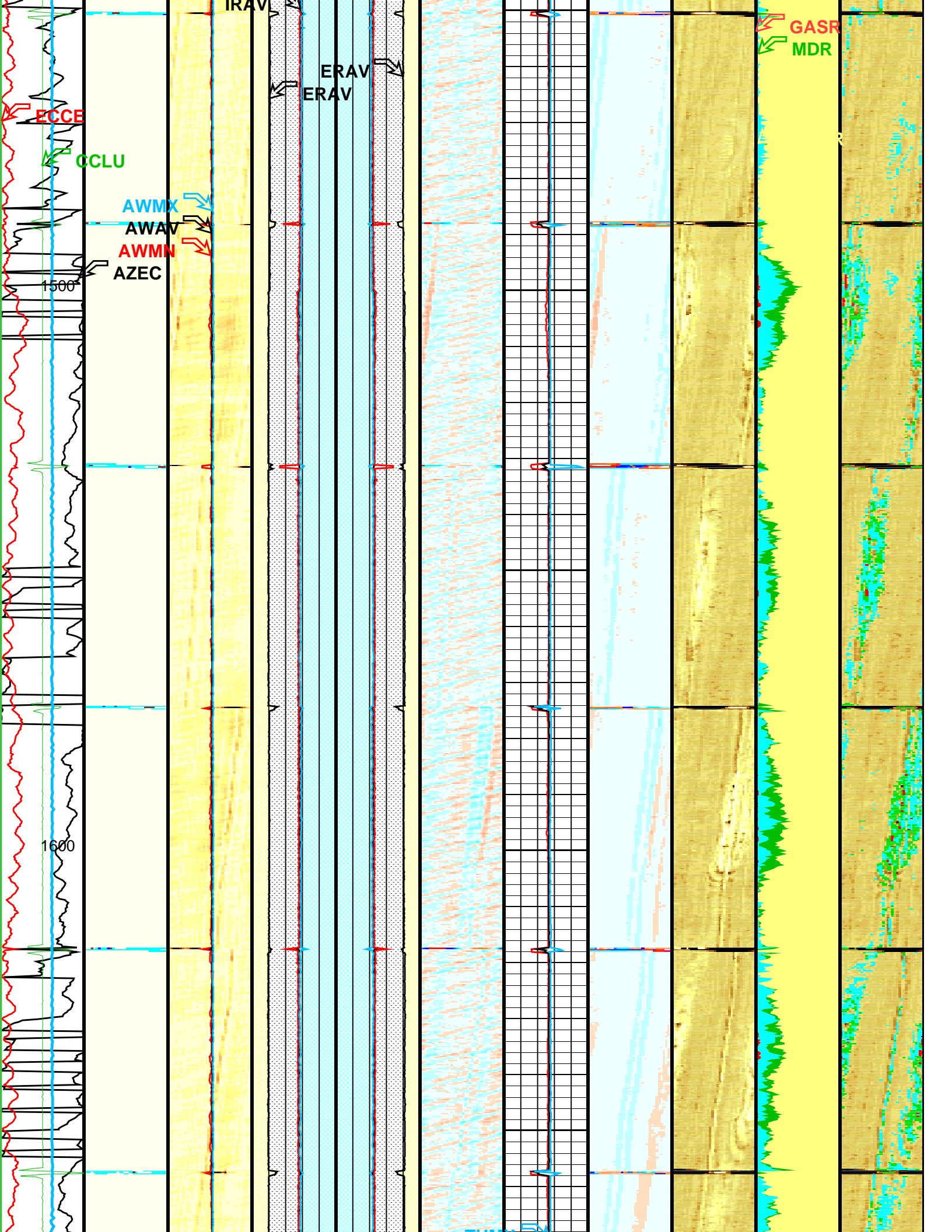


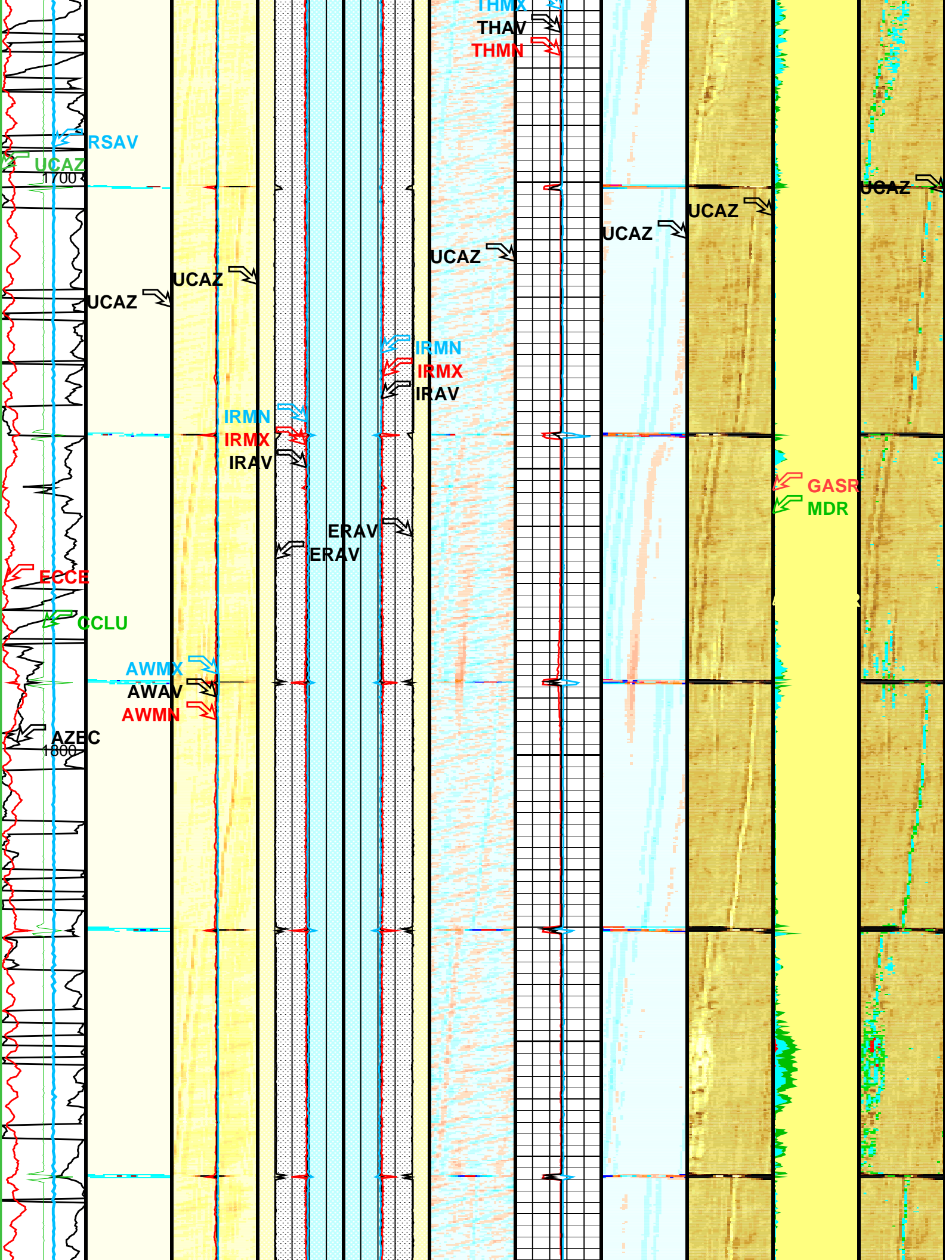




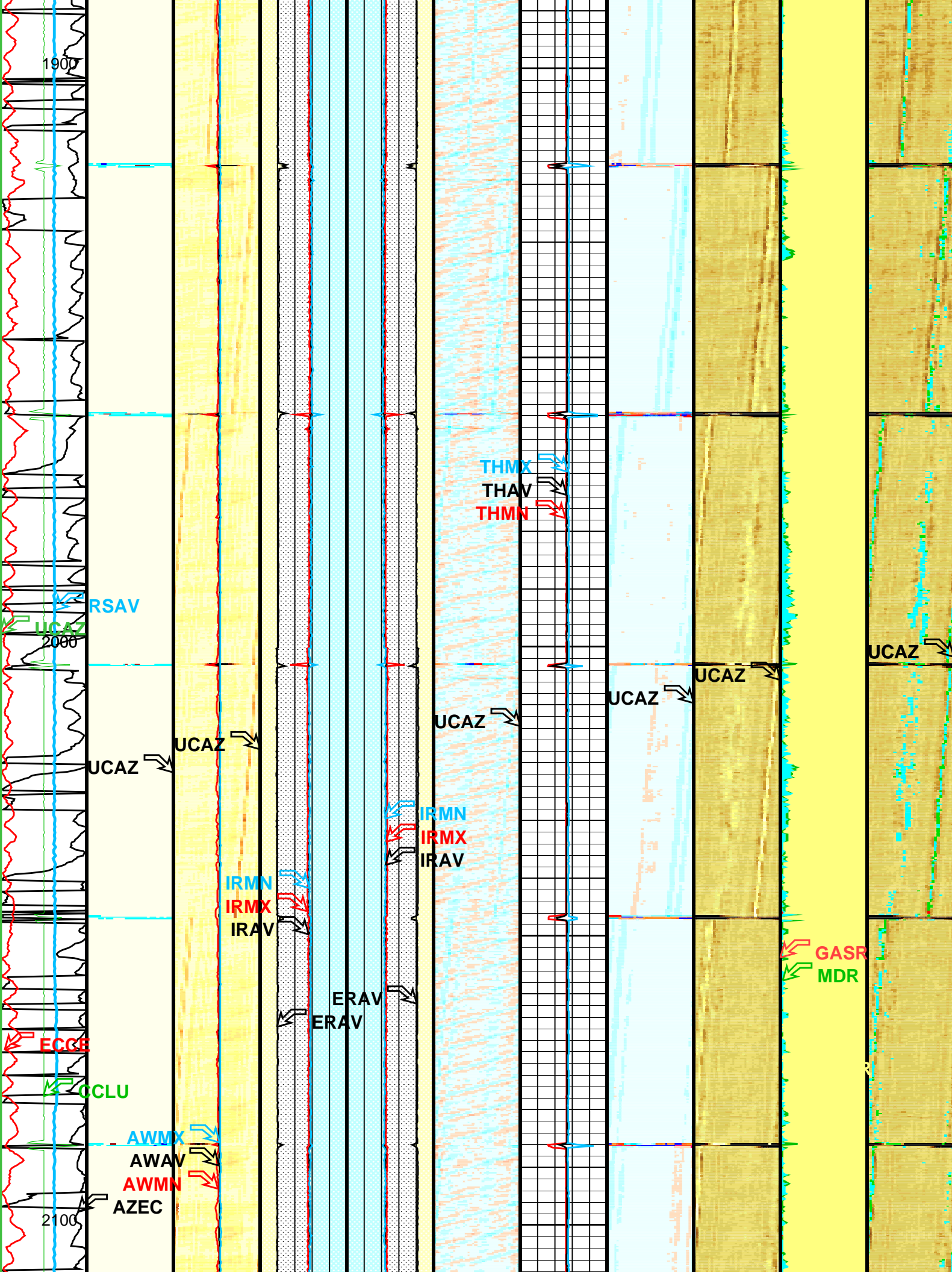


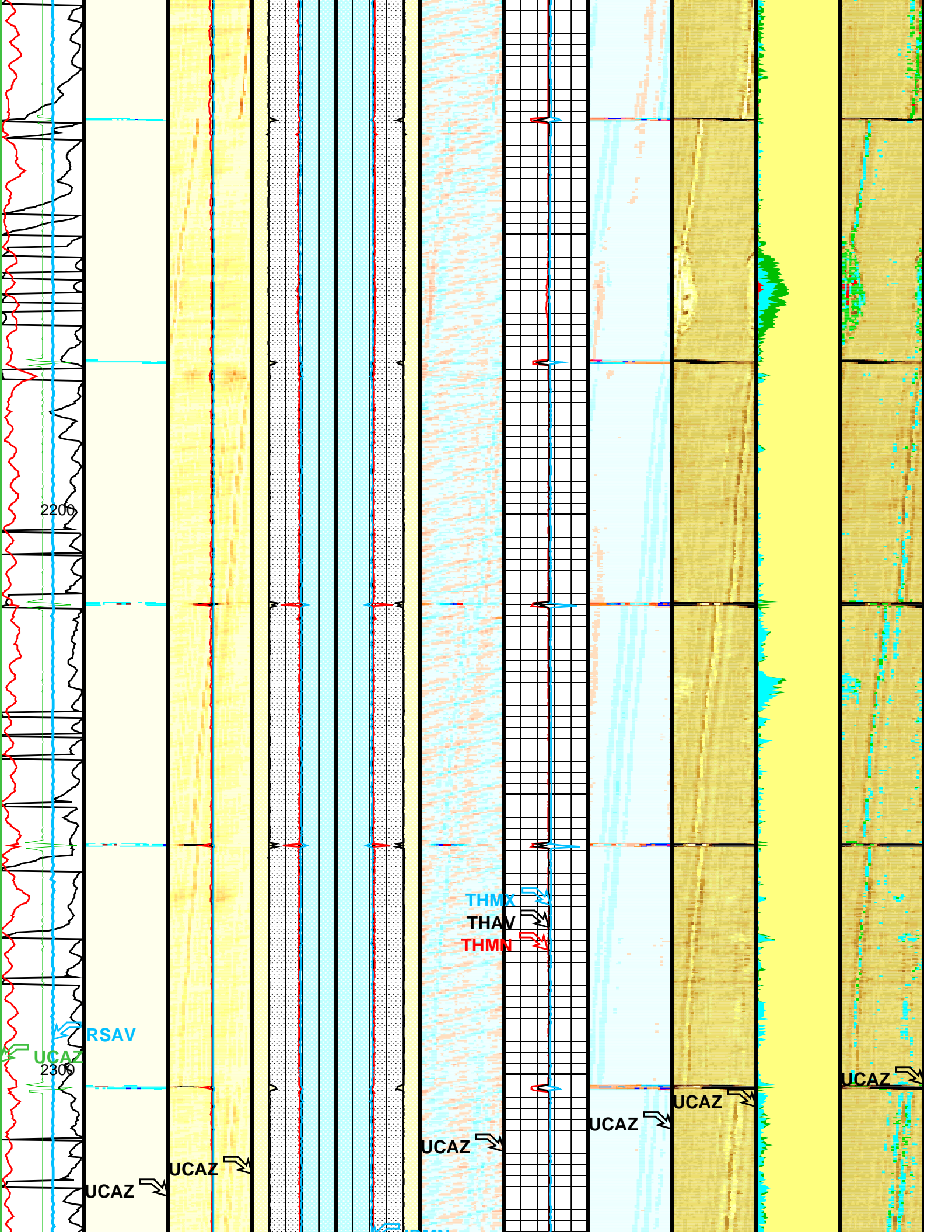




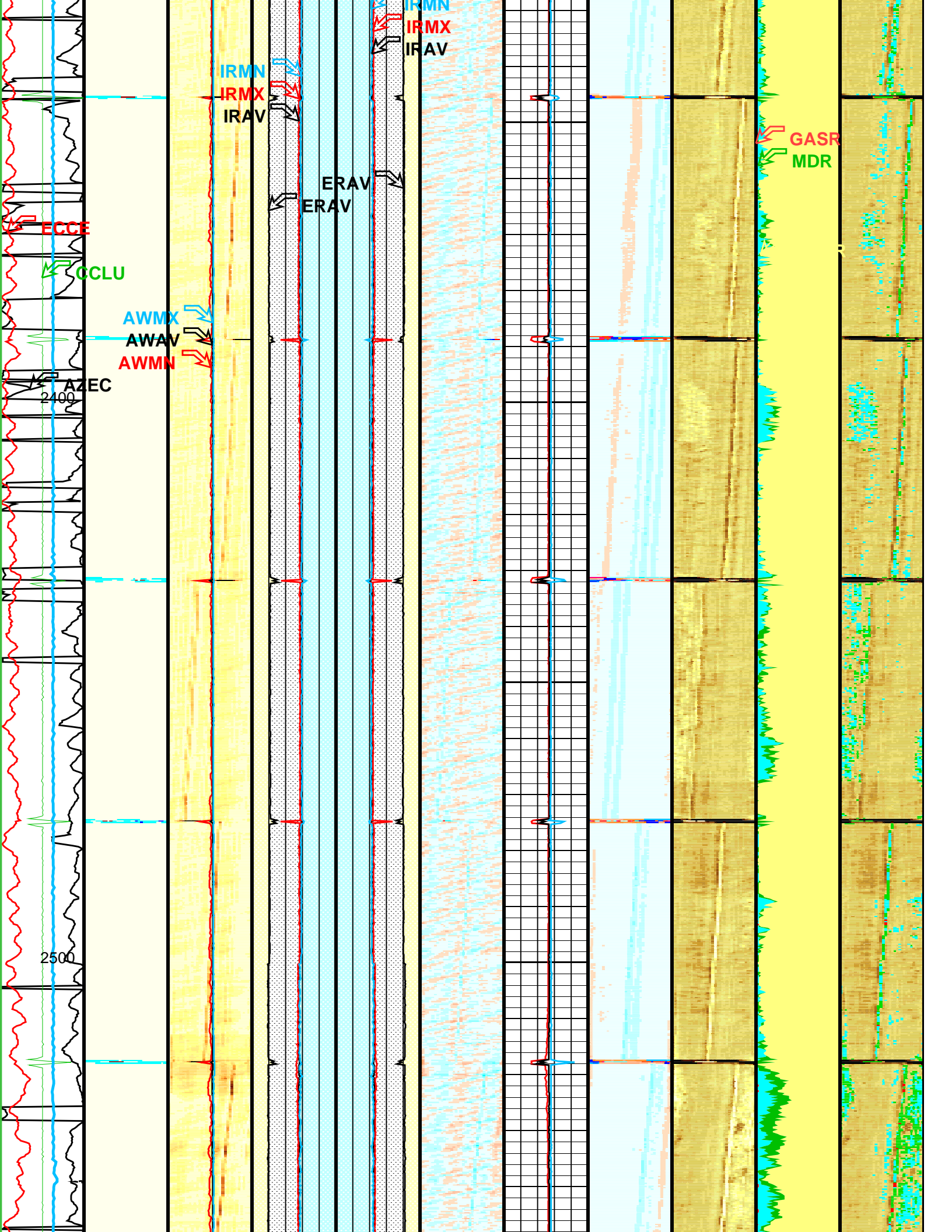


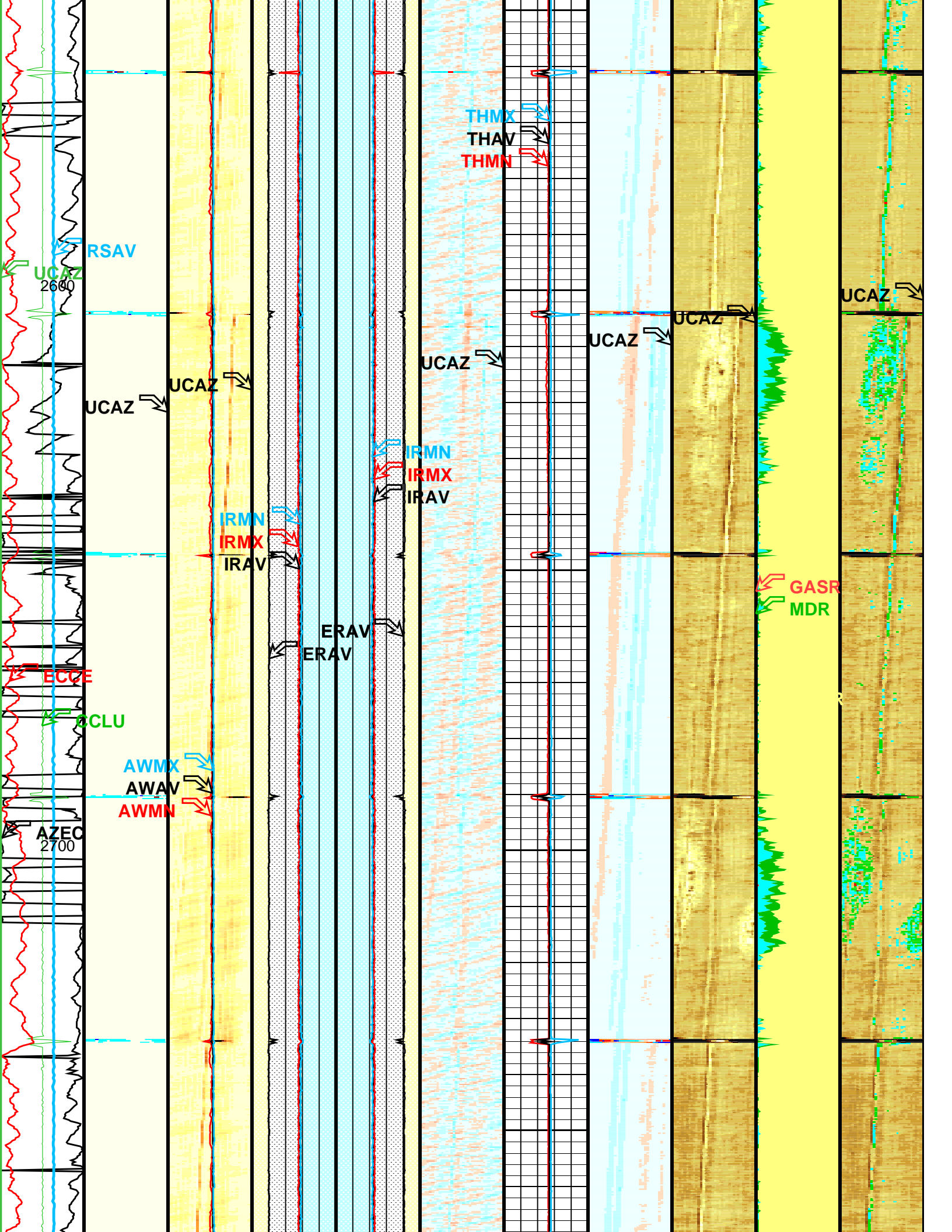




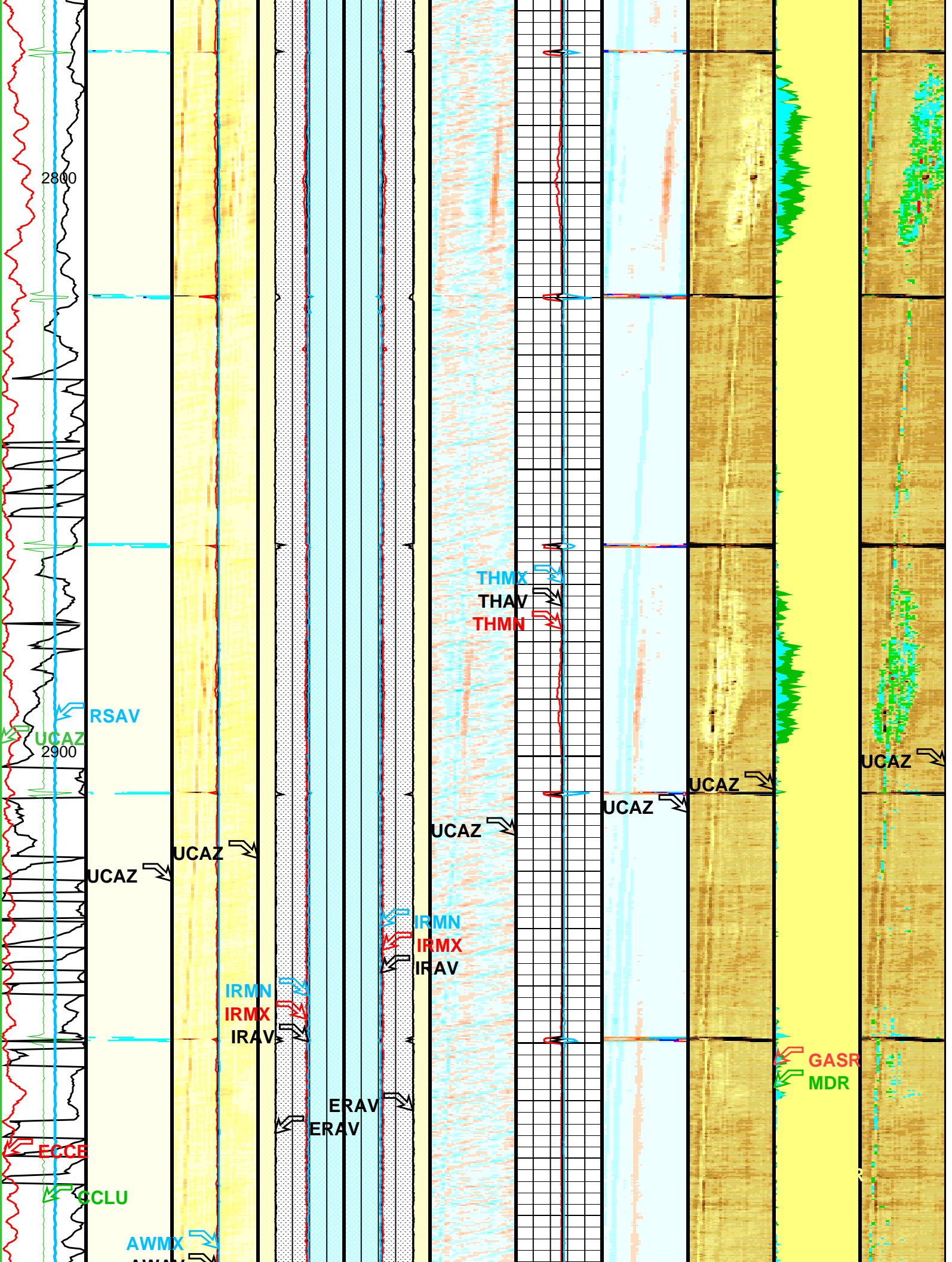


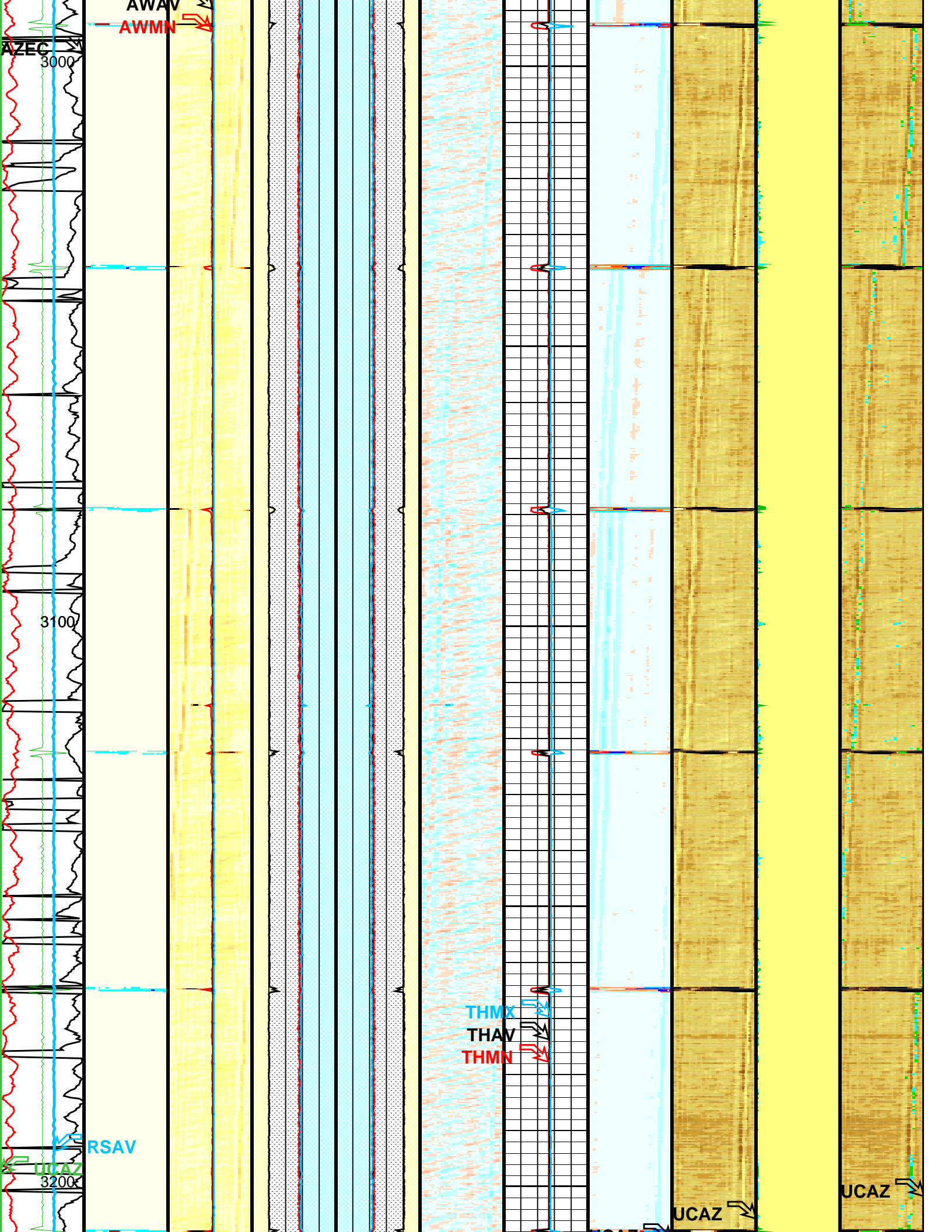




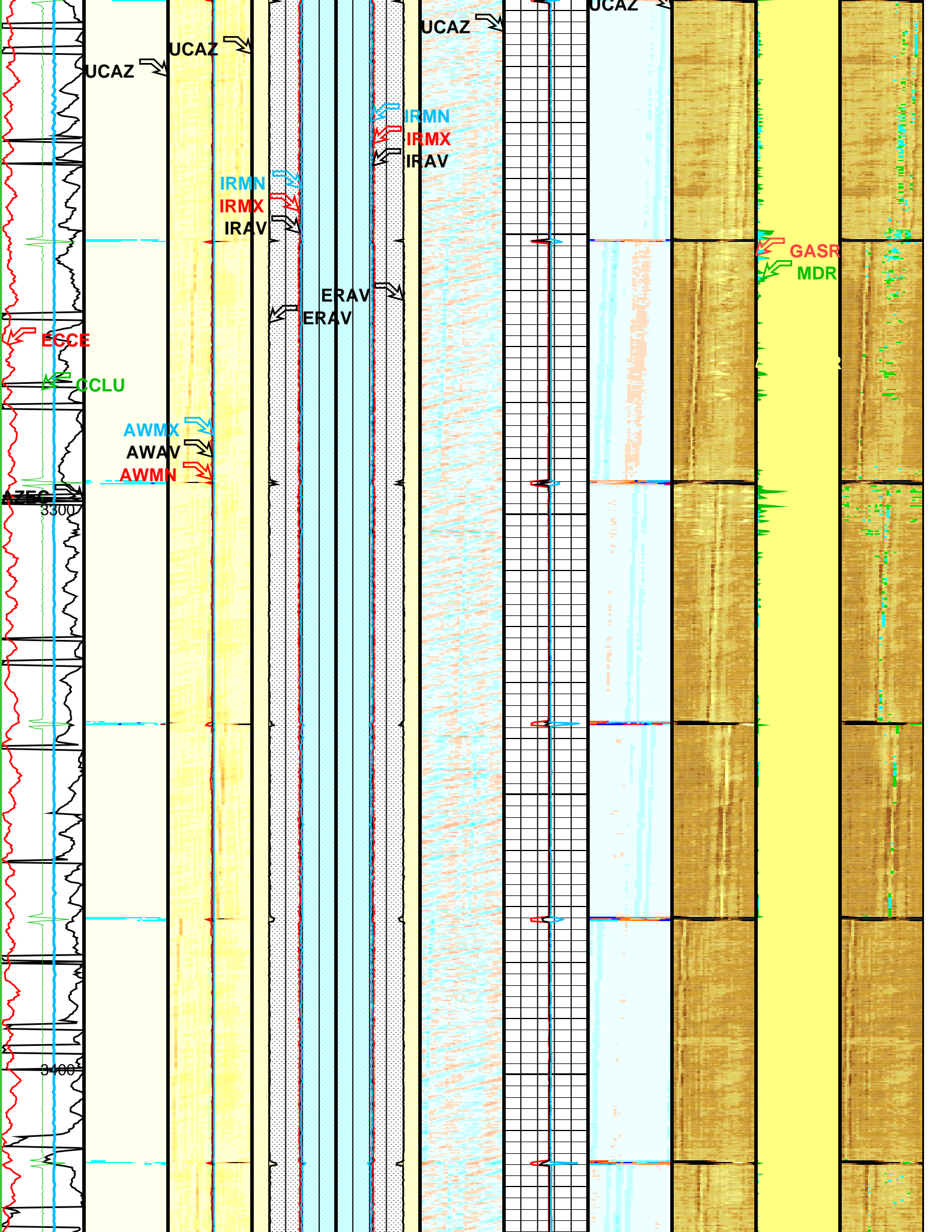


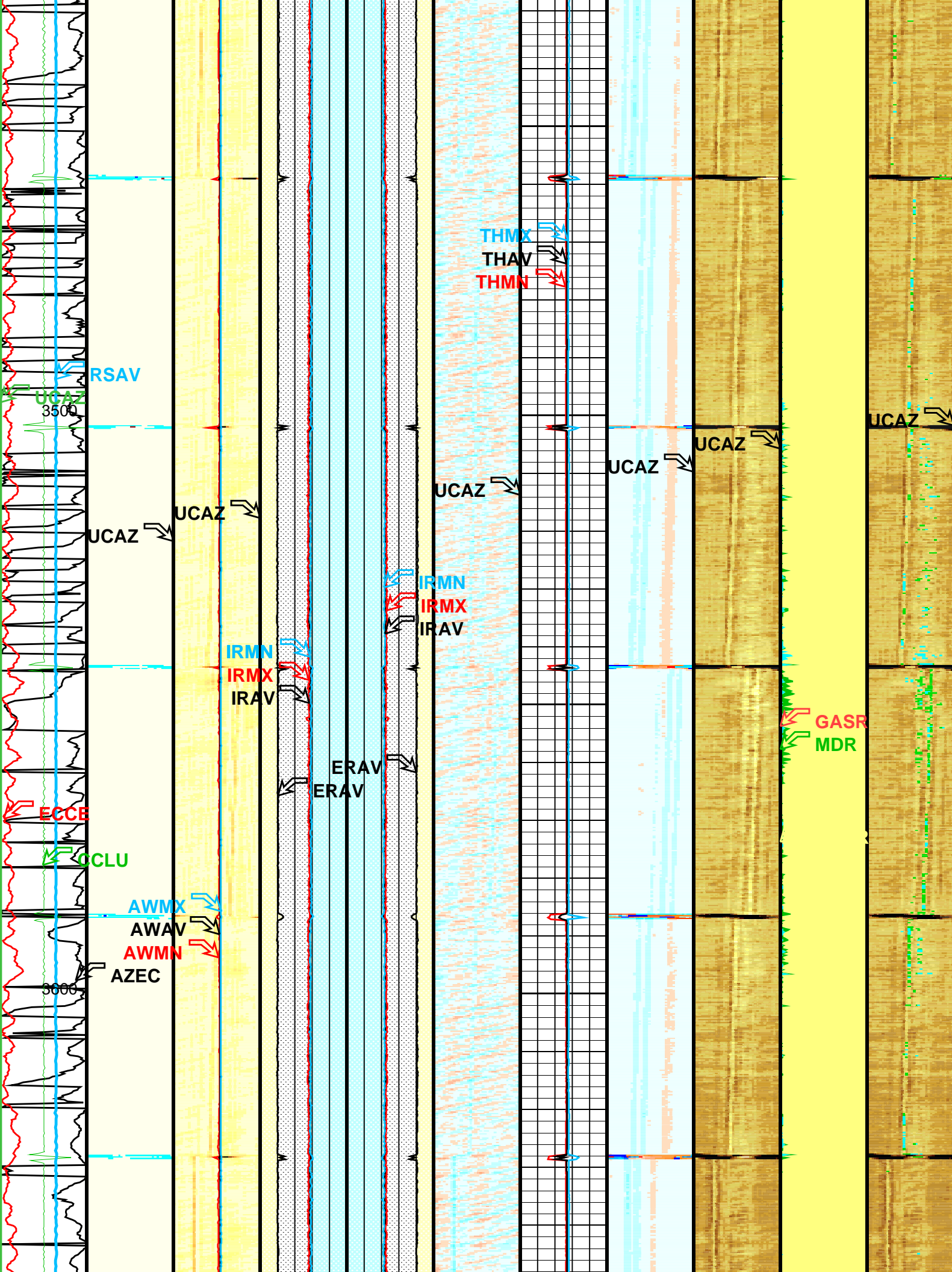




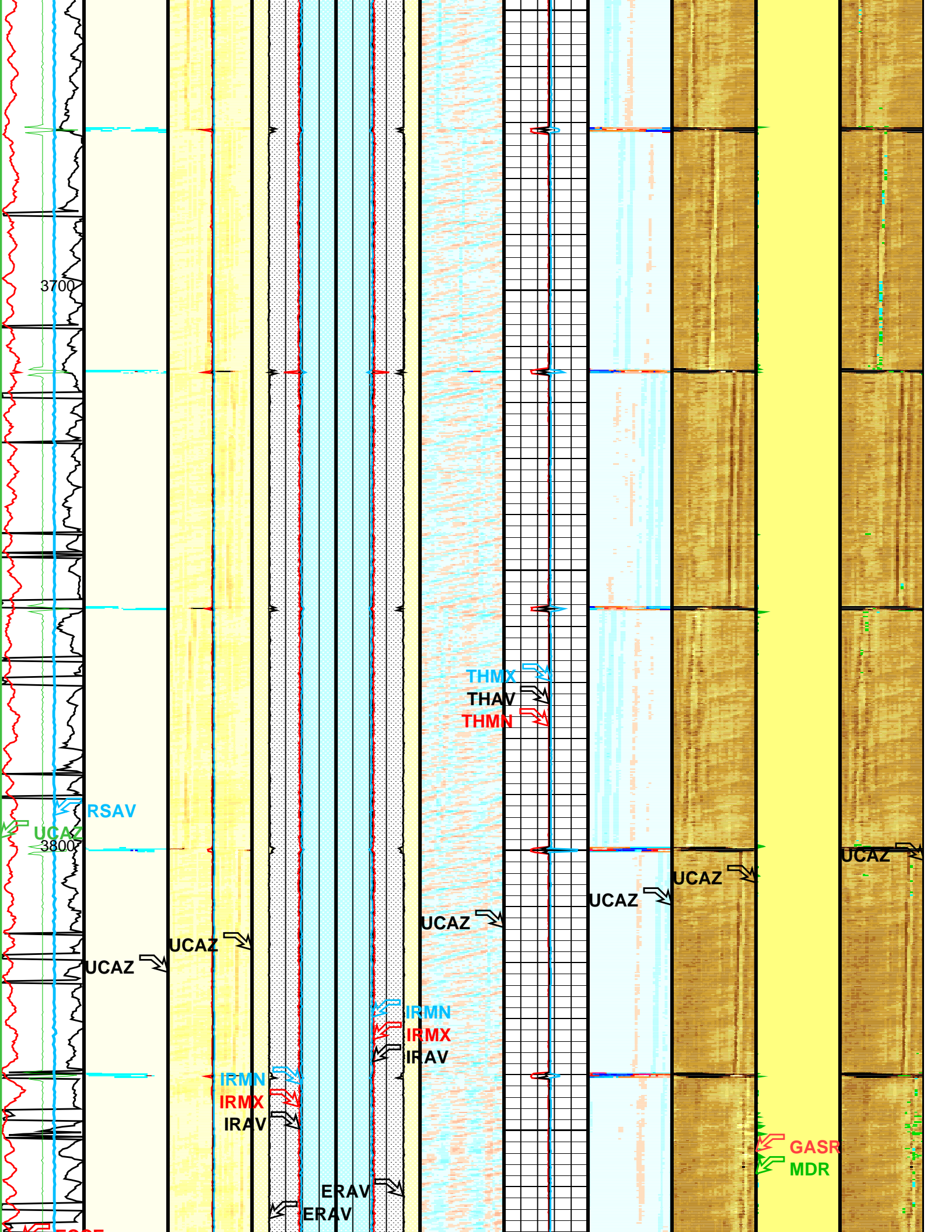


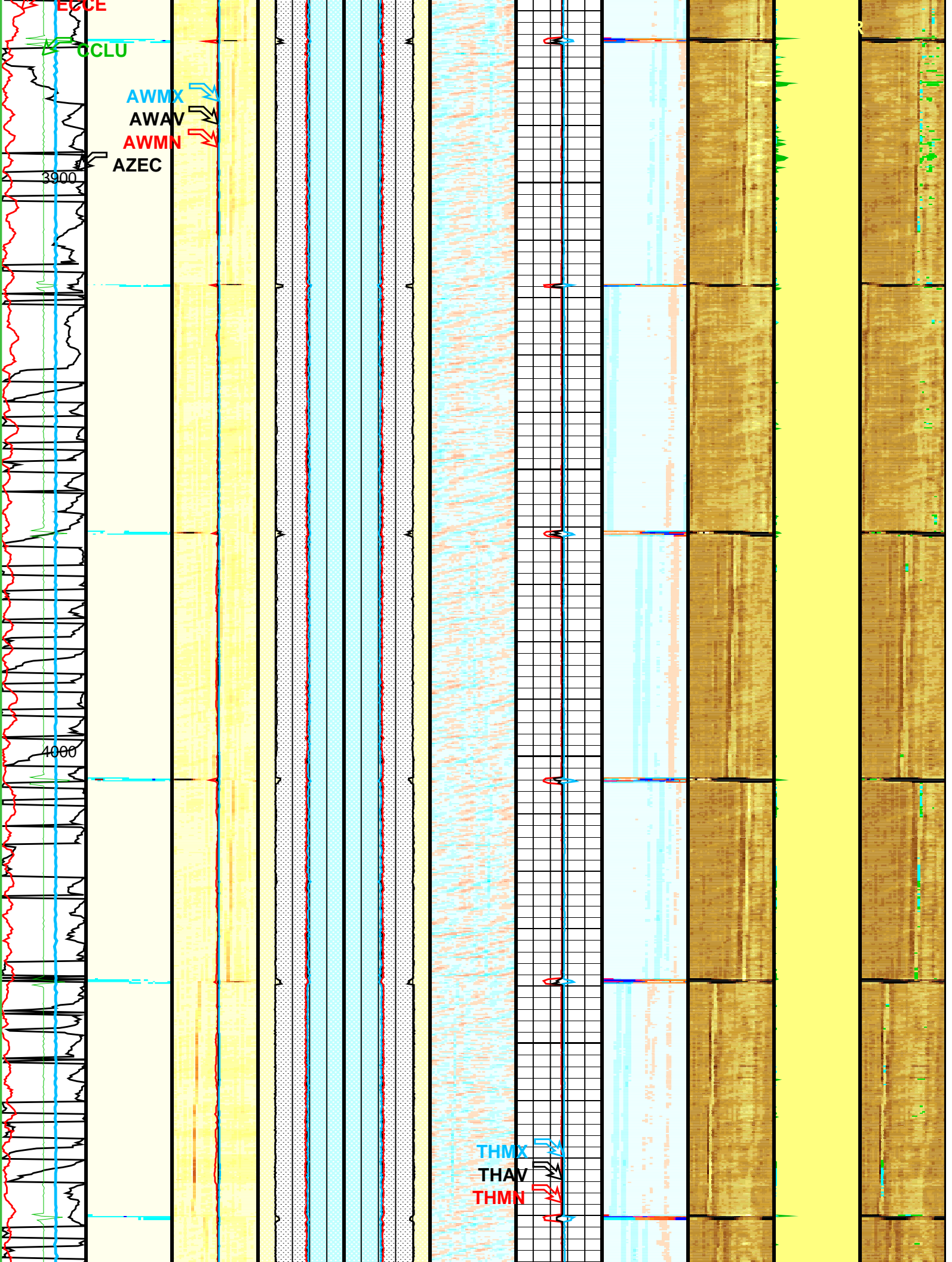




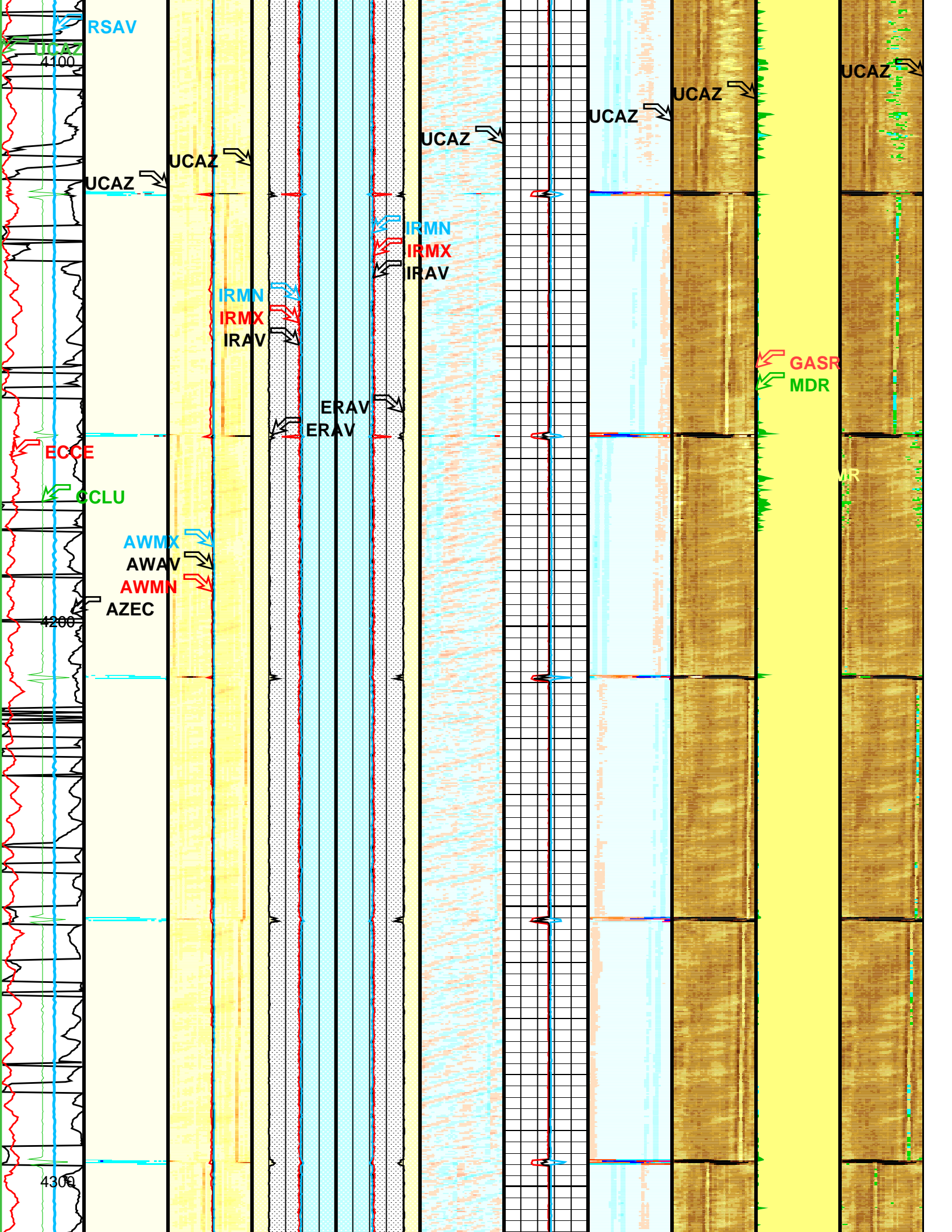


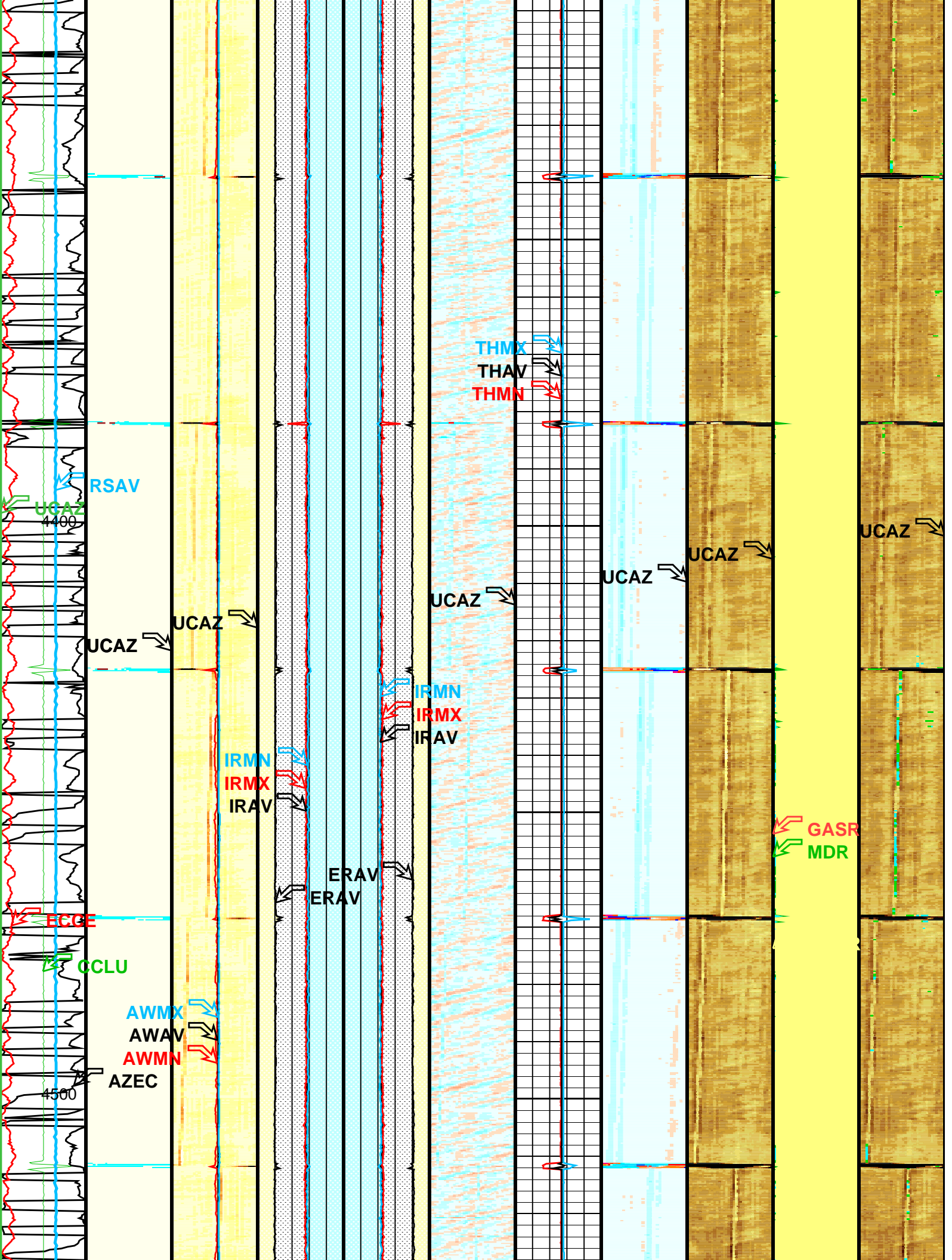




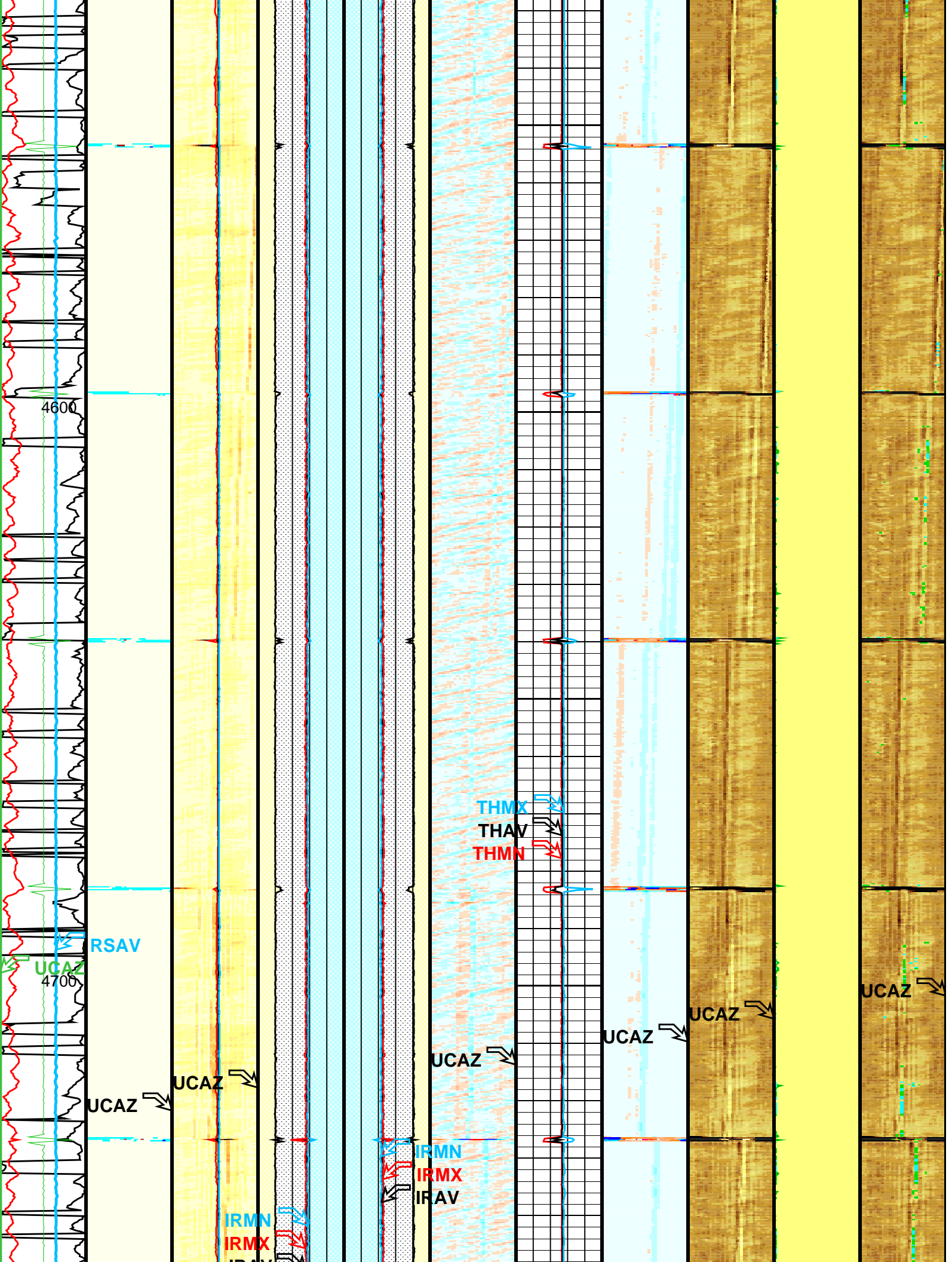


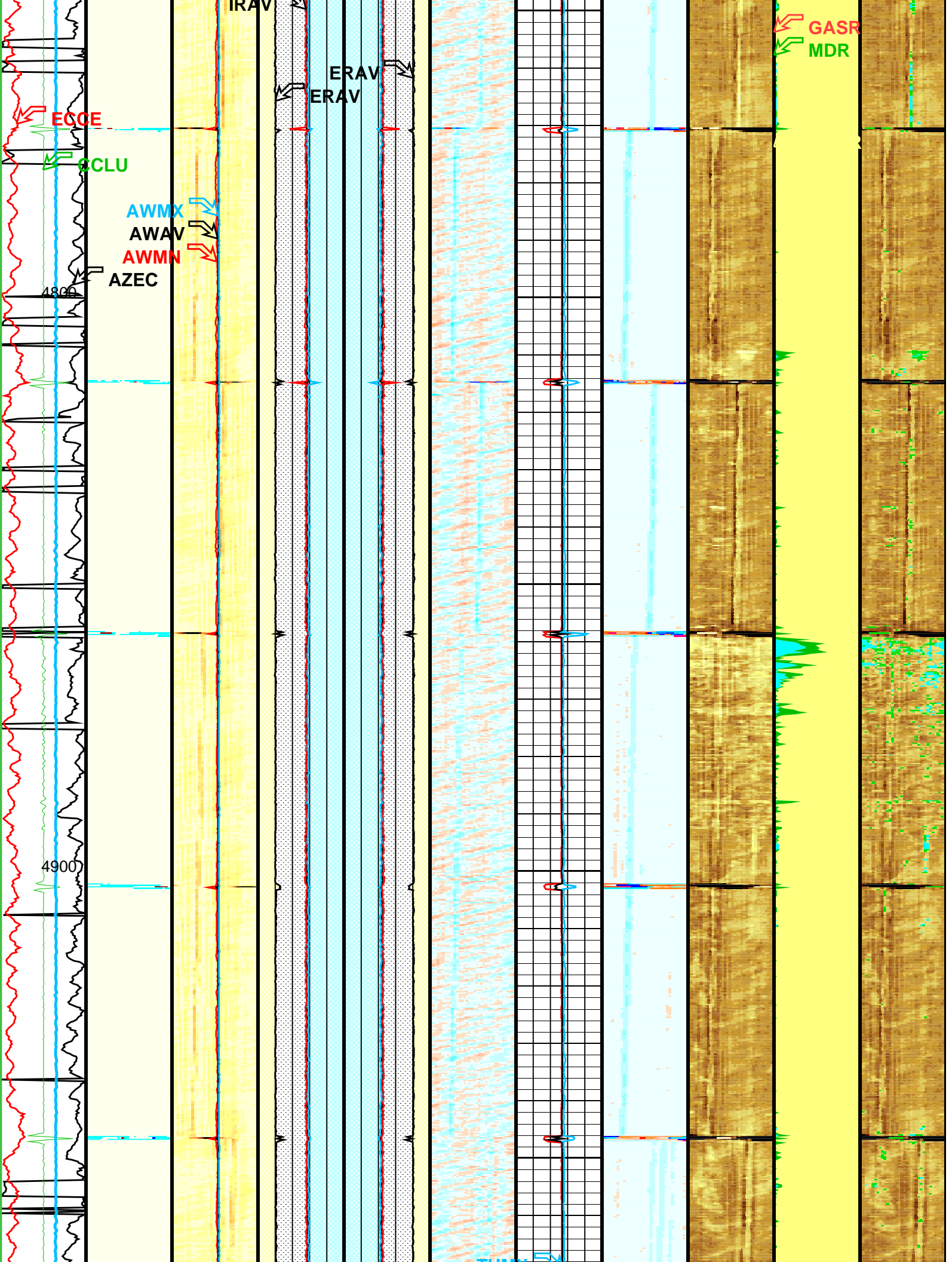




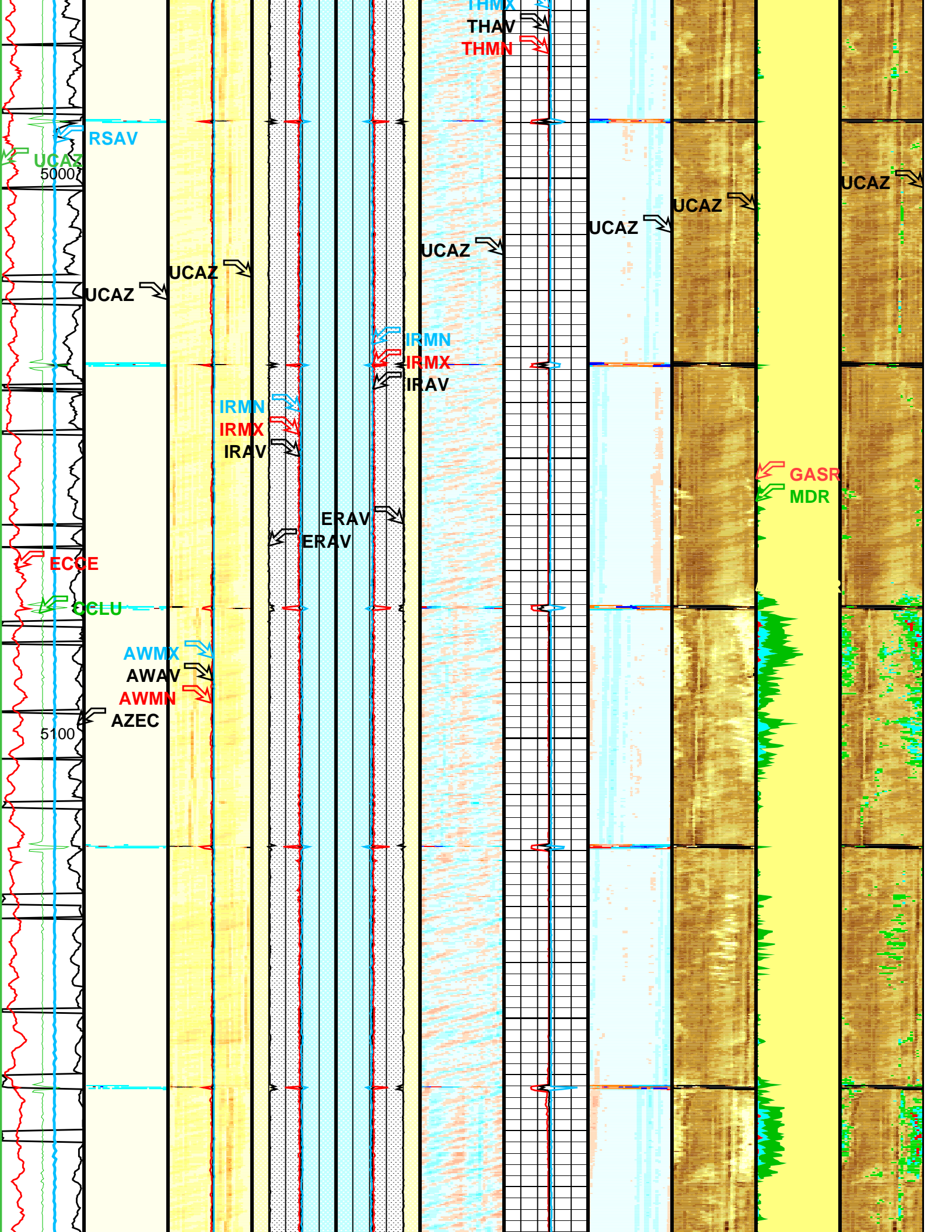


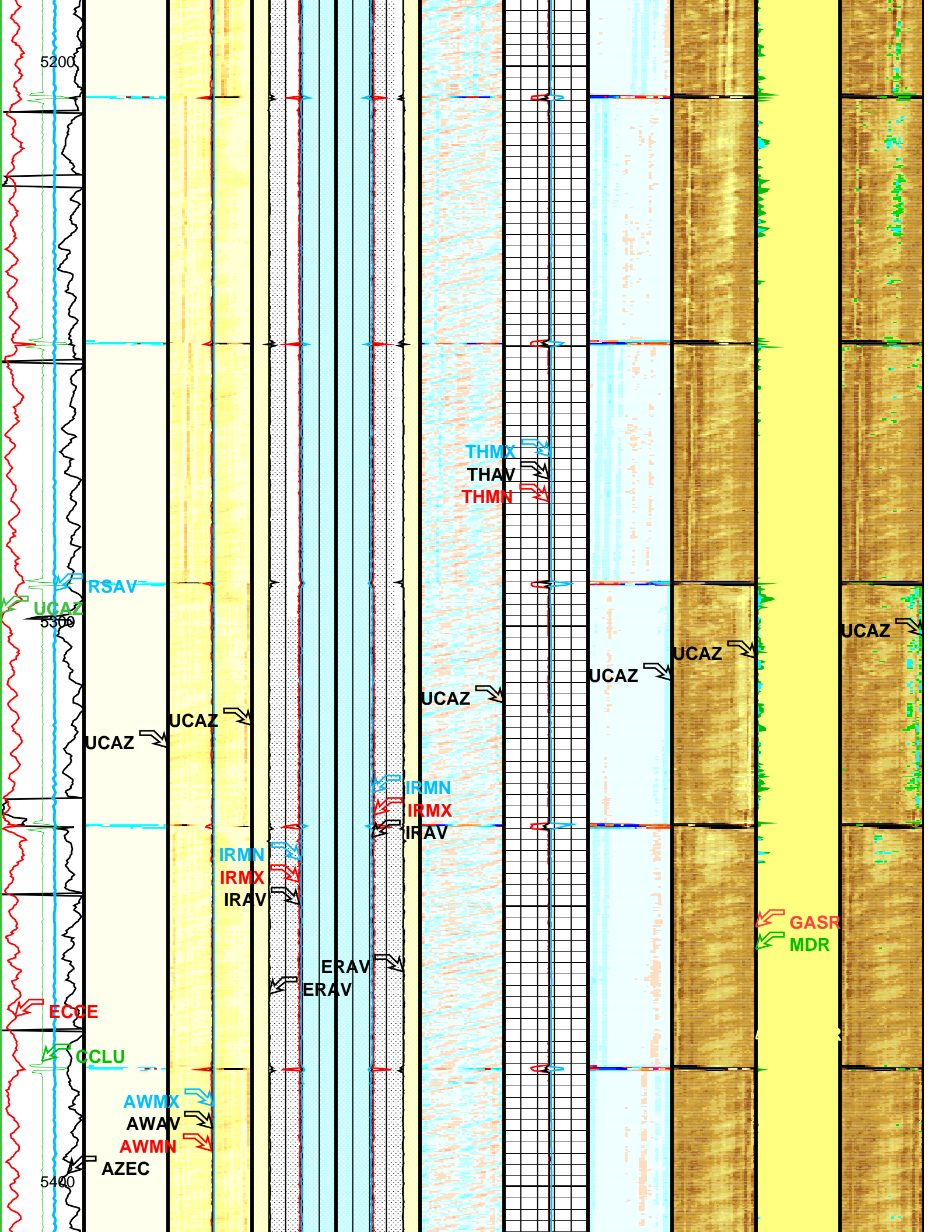




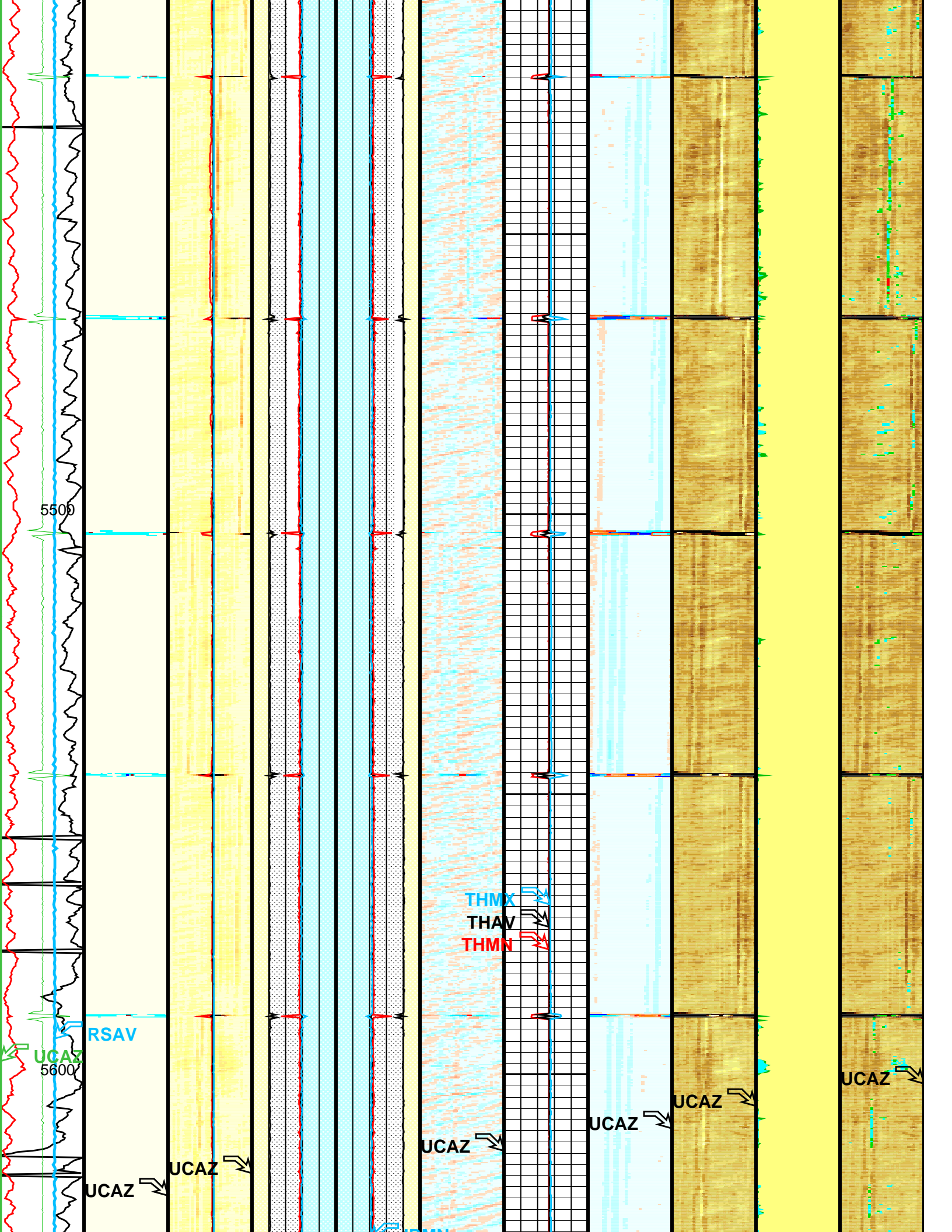


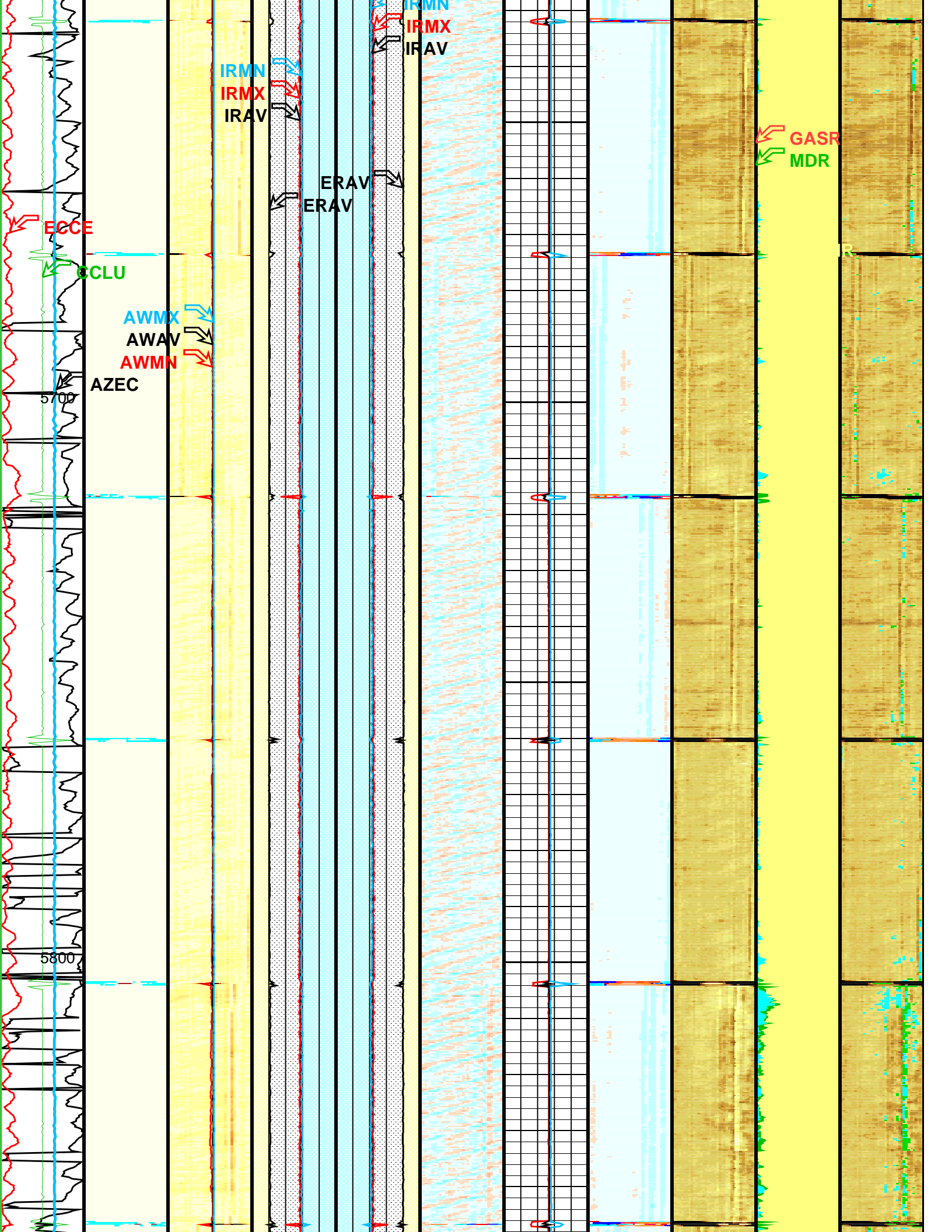




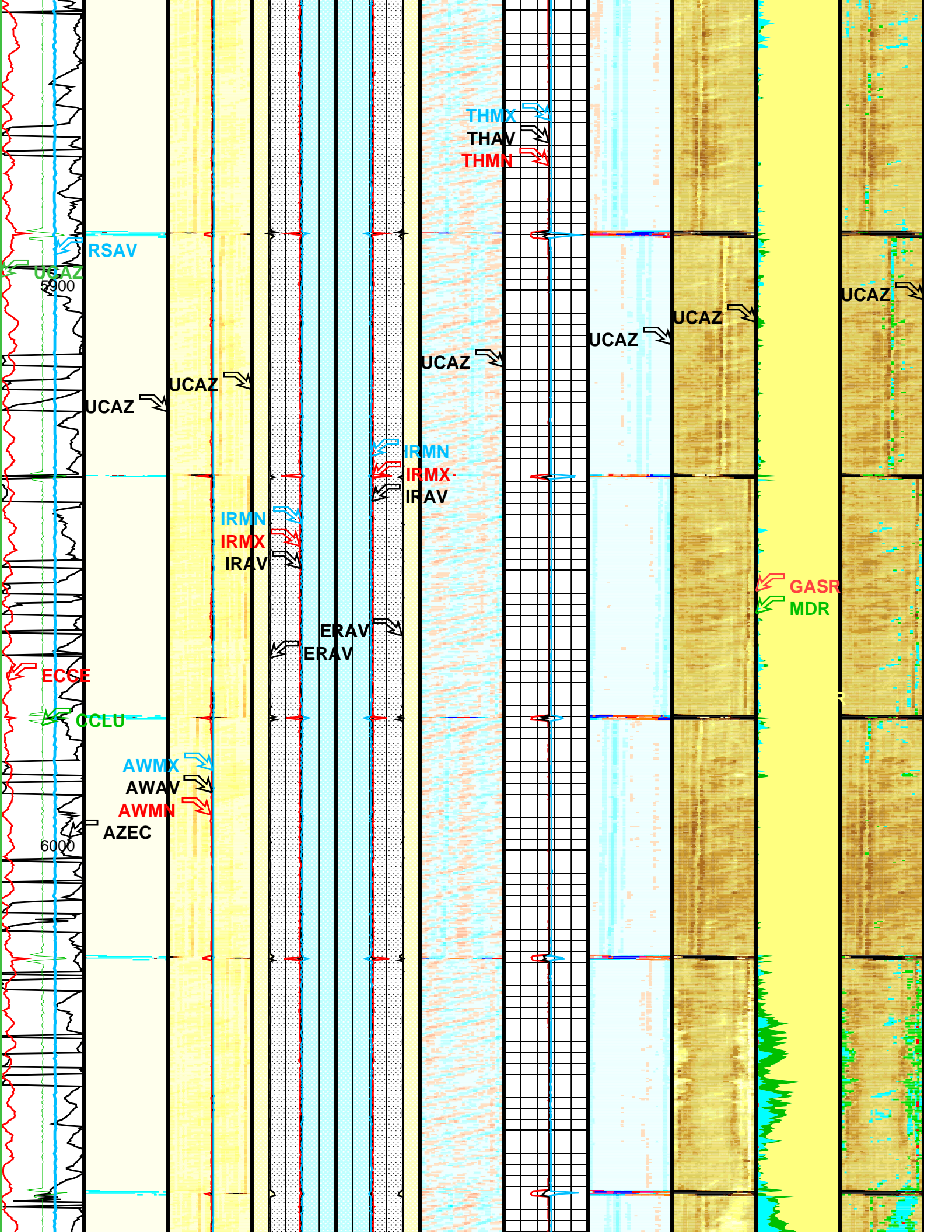


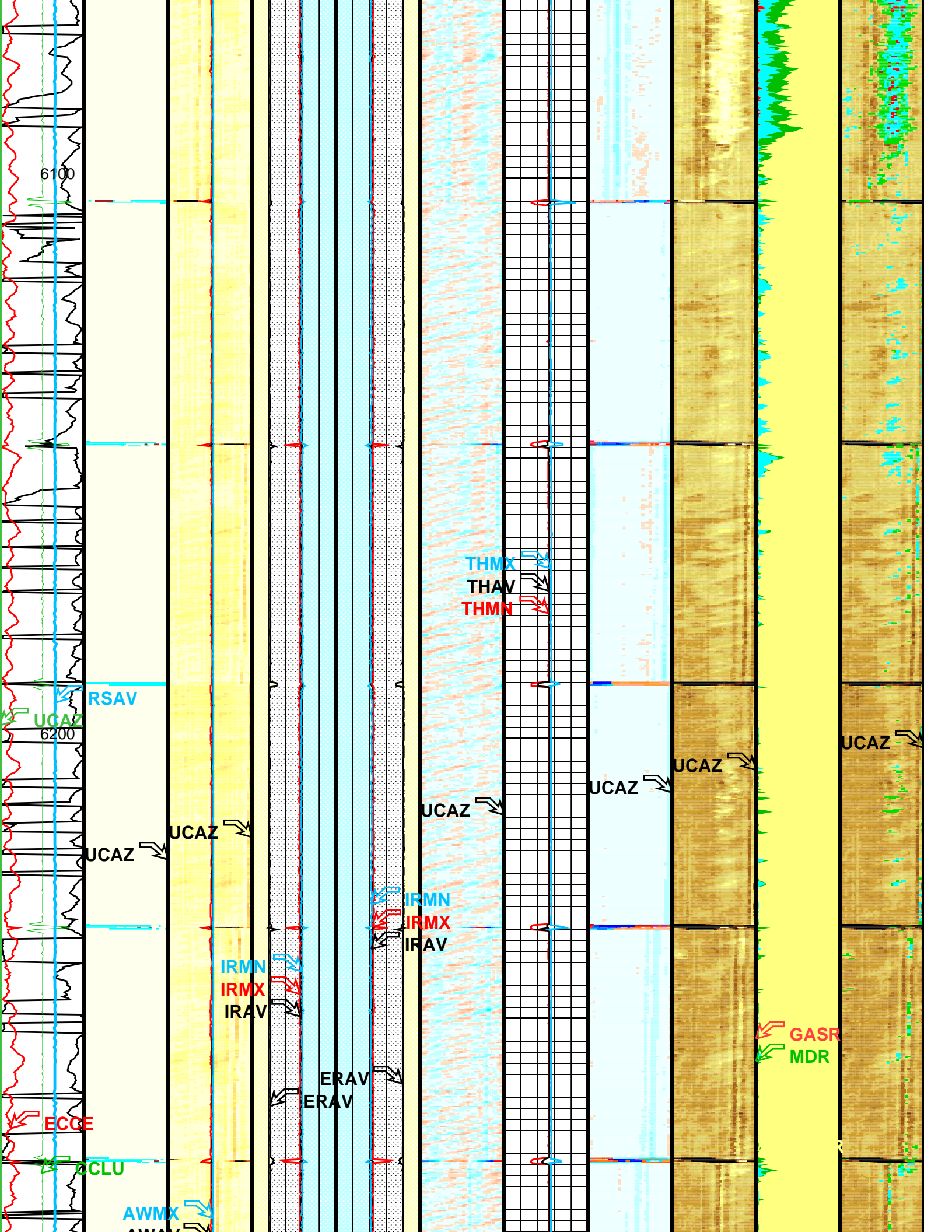




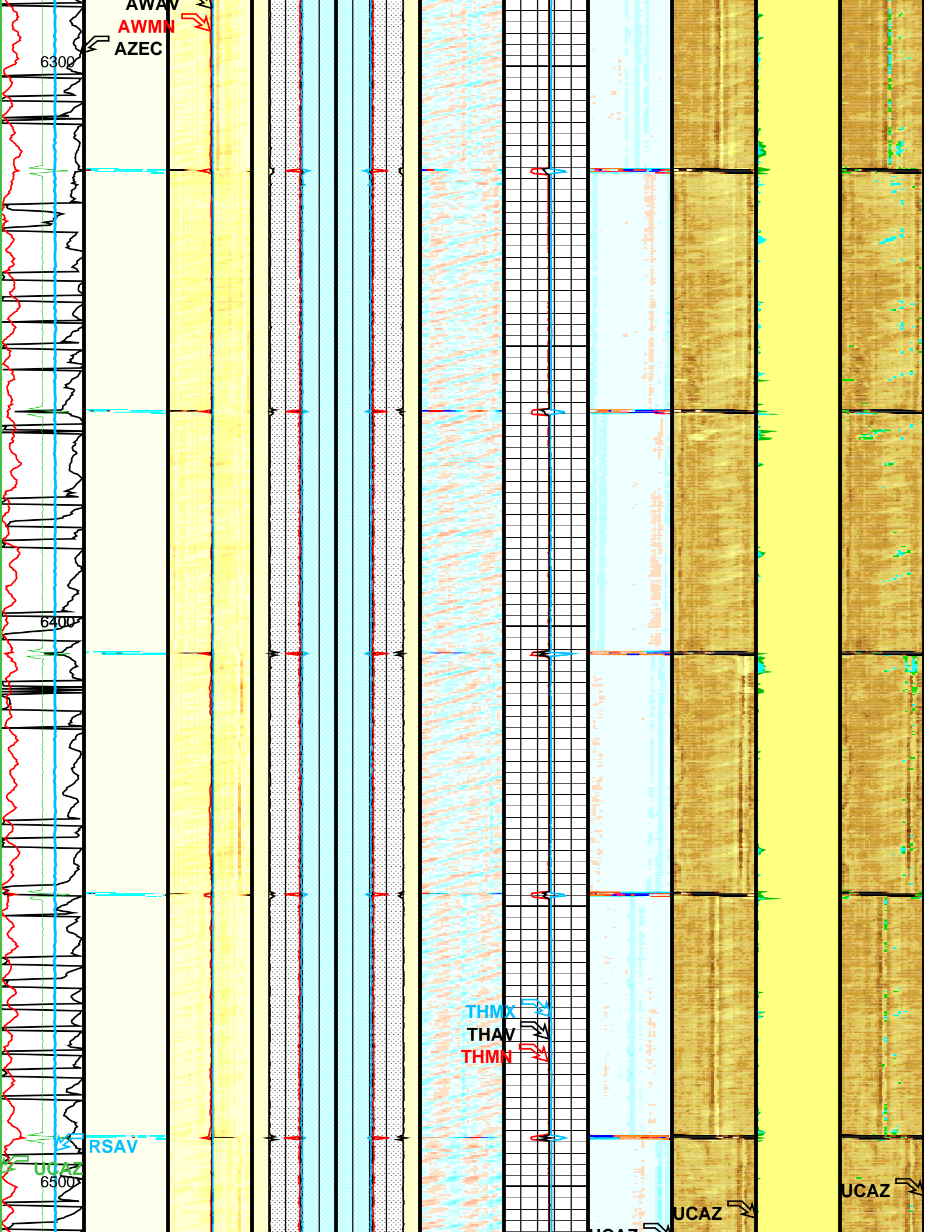


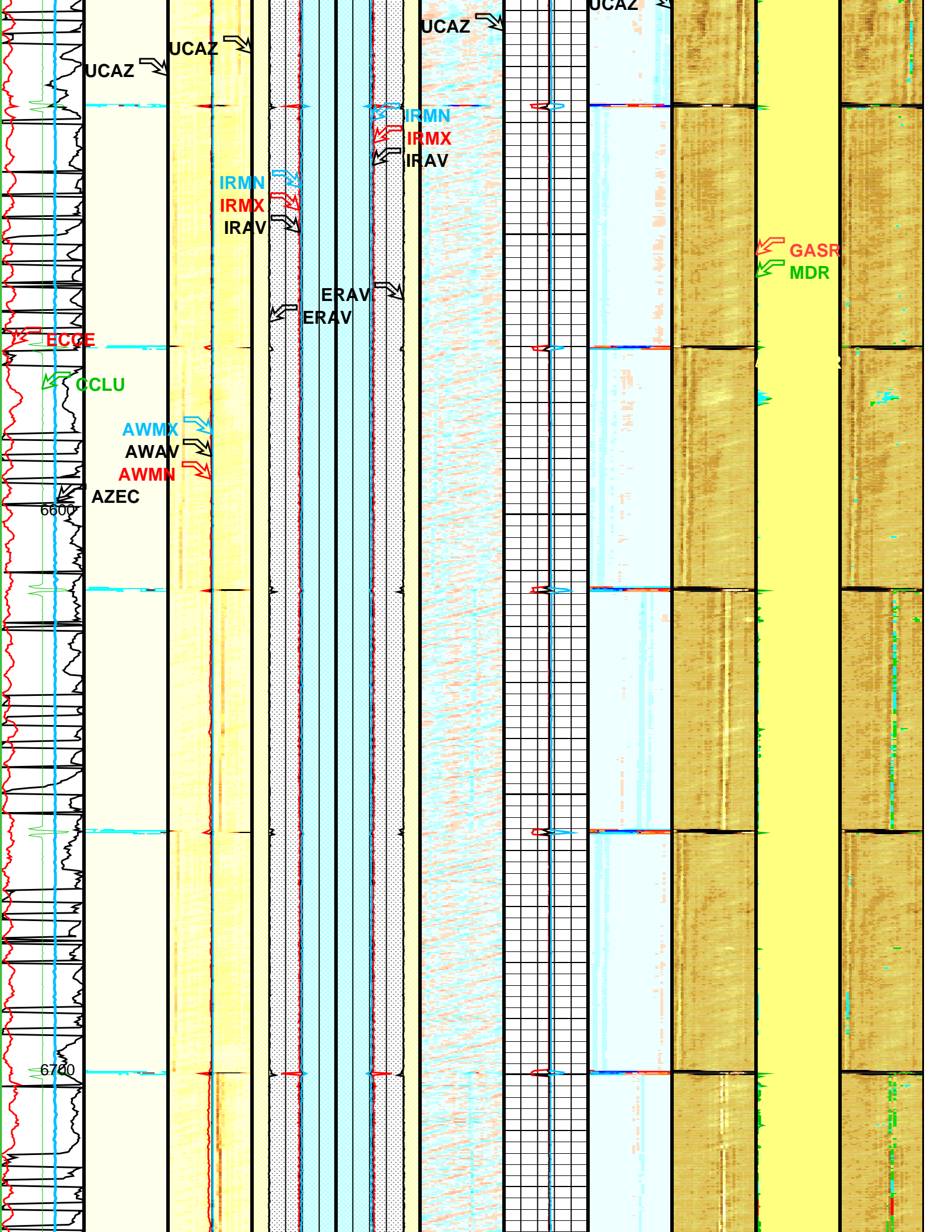




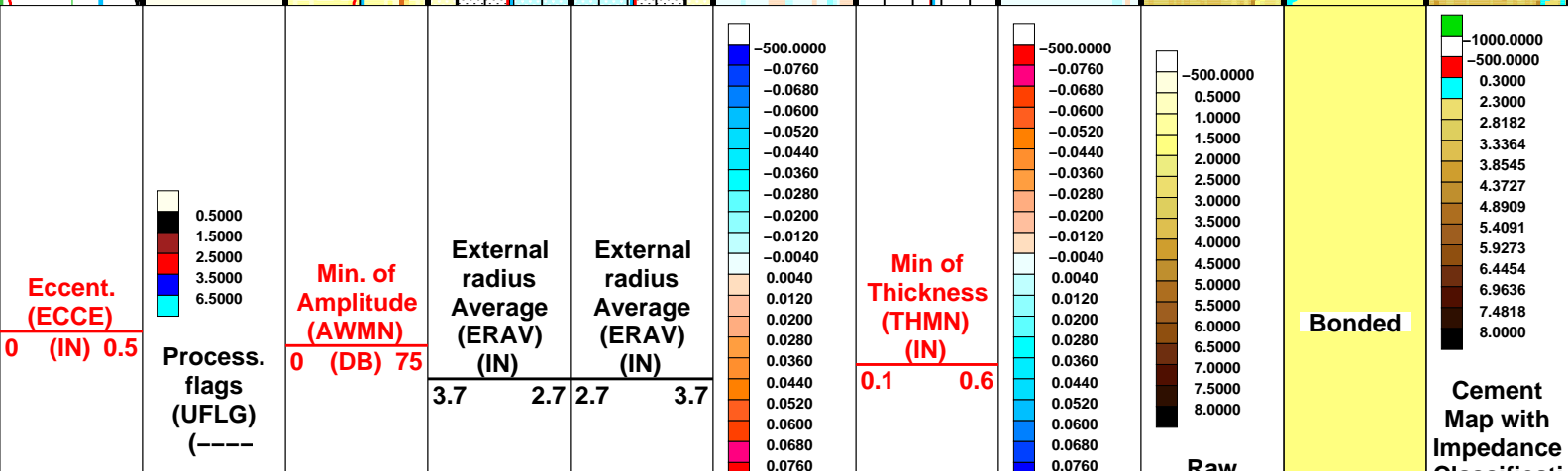
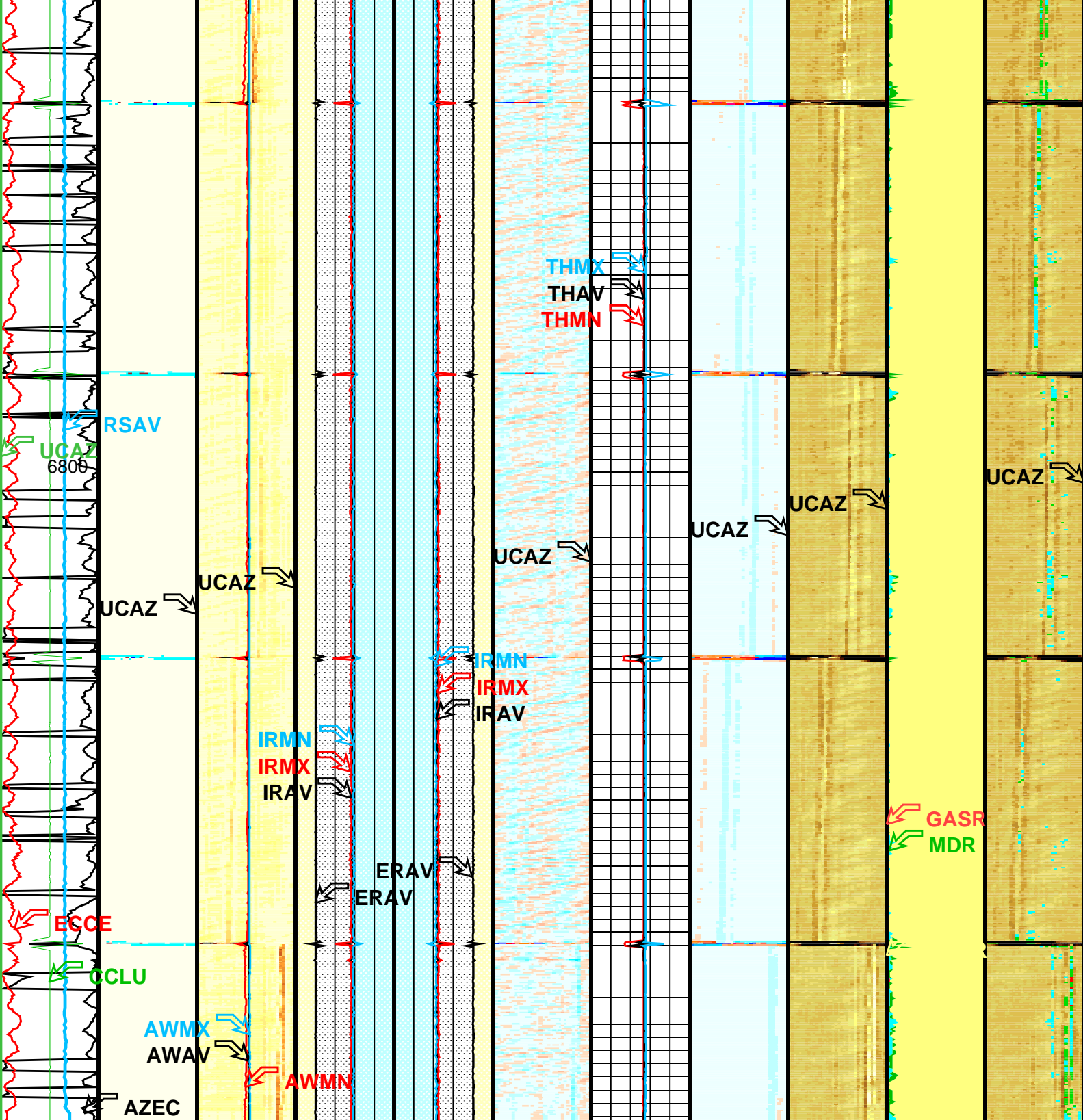


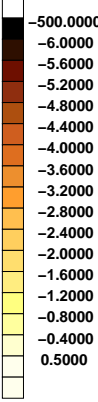










					Internal radii minus Ave (IRBK) (IN)		Thickness minus Ave (THBK) (IN)	Raw Acoustic Imped. (AIBK) (MRAY)		Classificati on (AI_ MICRO_ DEBONDIN G_IMAGE) (MRAY)
Rev. speed (RSAV) 6 (RPS) 8		Average of Amplitude (AWAV) 0 (DB) 75	Internal radius Average (IRAV) (IN) 3.7 2.7	Internal radius Average (IRAV) (IN) 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		 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-deb onding	
Cable Speed (CS) (F/HR) 0 2000										
Azimuth of eccent. (AZEC) (DEG) 0 360										
Image rotation (UCAZ) (DEG) 0 360										



(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	50	V
FDII	FPM Data Interpolation Interval	0	FT
IMAR	Image Rotation	OFF	
MW	Mud Weight	8.7	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	46.2537	MRAY
ZINI	Initial Estimate of Cement Impedance	–1	MRAY
ZMUD	Acoustic Impedance of Mud	1.7	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.3	MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3	MRAY
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						
DEFAULT	Splice_USI_022CUP	FN:1	PRODUCER	15–Nov–2013 17:03	6895.0 FT	–21.4 FT
Output DLIS Files						
DEFAULT	USI_023PUP	FN:14	PRODUCER	15–Nov–2013 17:04		

Input DLIS Files
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Output DLIS Files

OP System Version: 19C1-222

USIT-E  
DTC-H

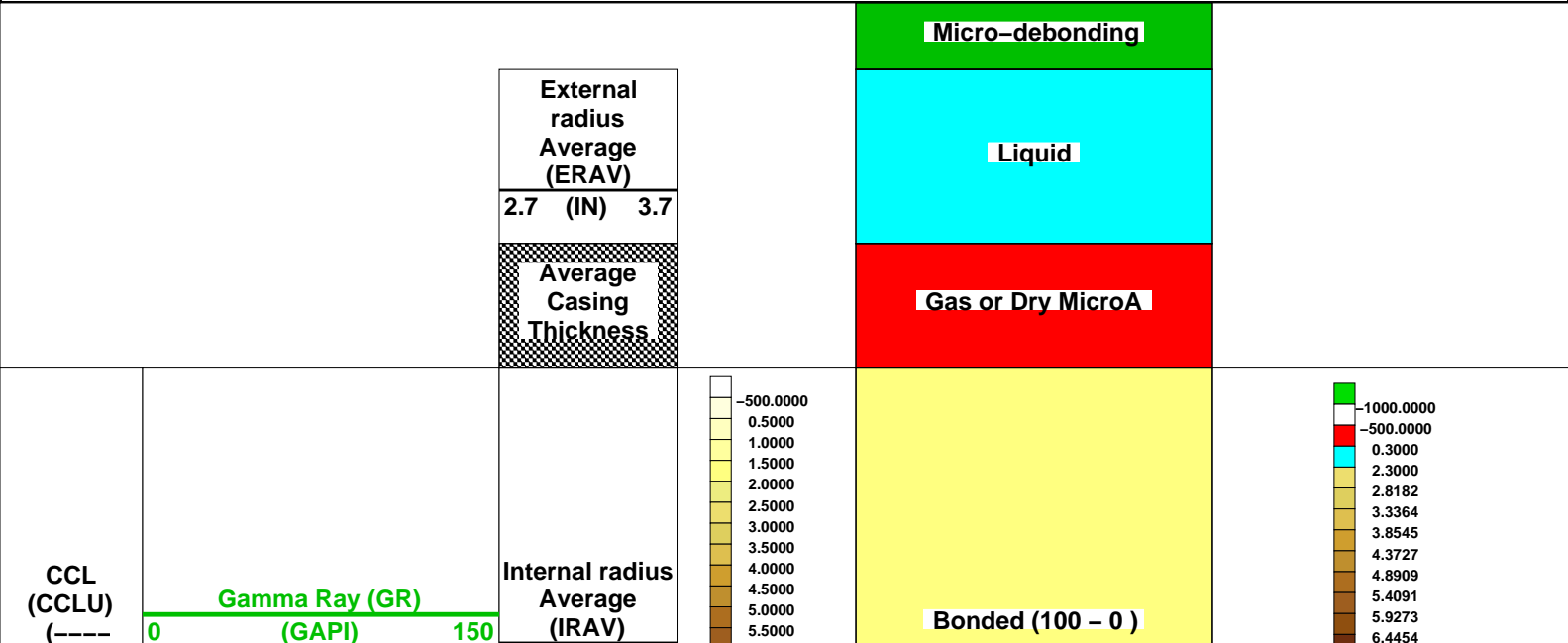
19C1-222  
19C1-222

SGT-N

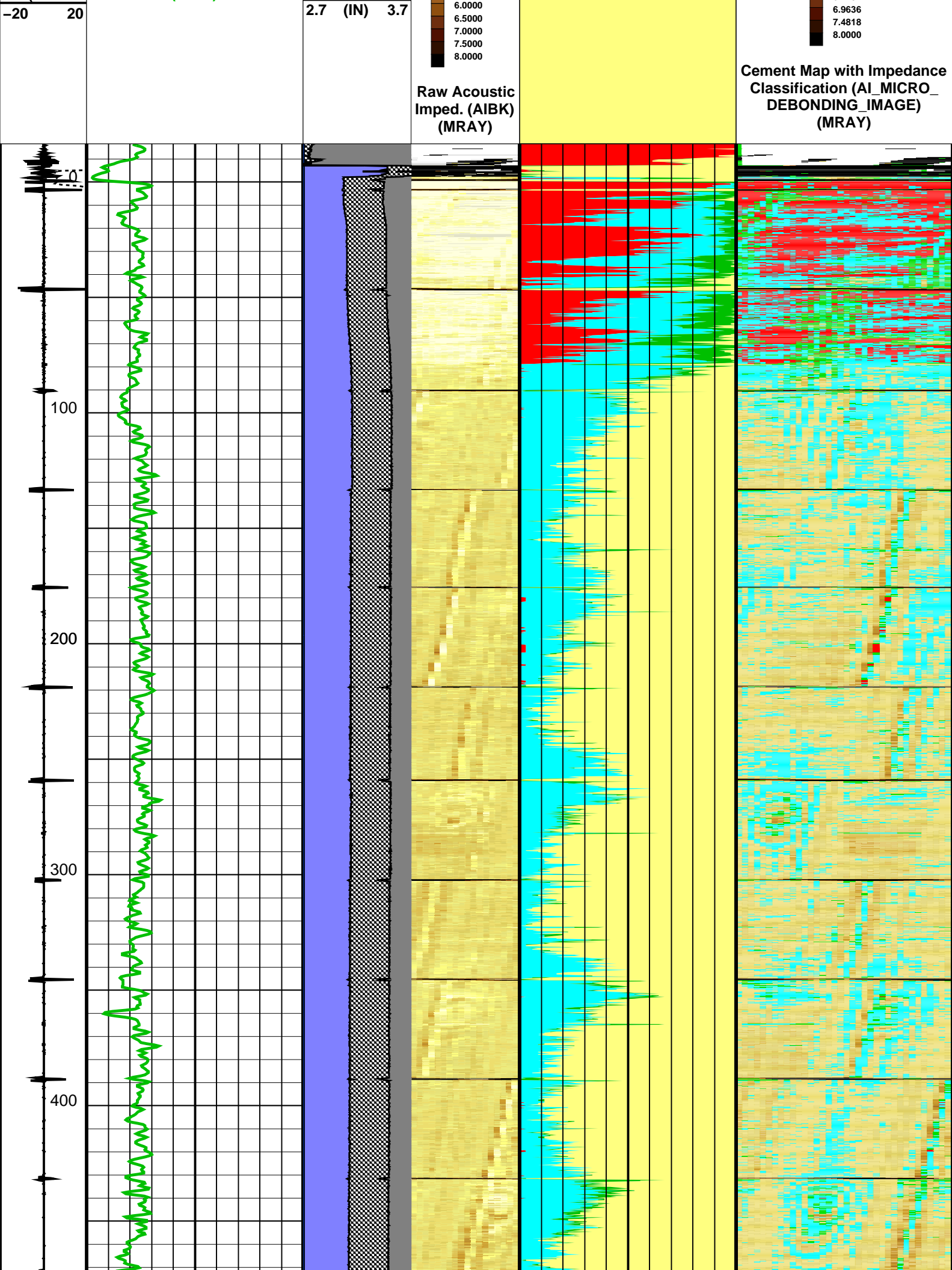
19C1-222

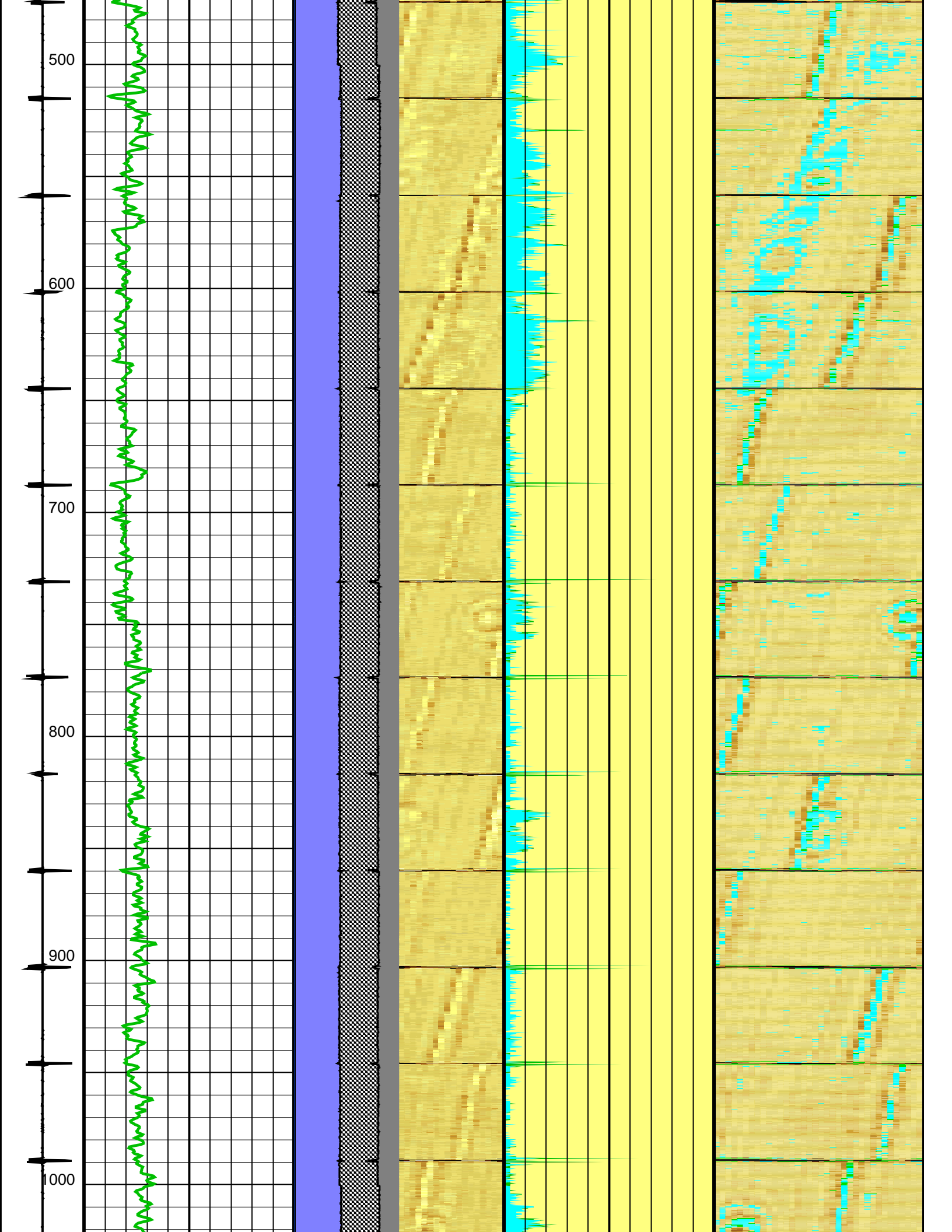
Zoning of Mud Parameters

Depth	Fluid Velocity (DFVL)	Acoustic Impedance (ZMUD)
7000.00	188.00	1.67
6500.00	188.00	1.67
6000.00	188.00	1.67
5500.00	188.00	1.67
5000.00	188.00	1.67
4500.00	189.00	1.66
4000.00	190.00	1.65
3500.00	191.00	1.65
3000.00	192.00	1.64
2500.00	194.00	1.62
2000.00	196.00	1.61
1500.00	198.00	1.60
1000.00	200.00	1.59
500.00	203.00	1.57

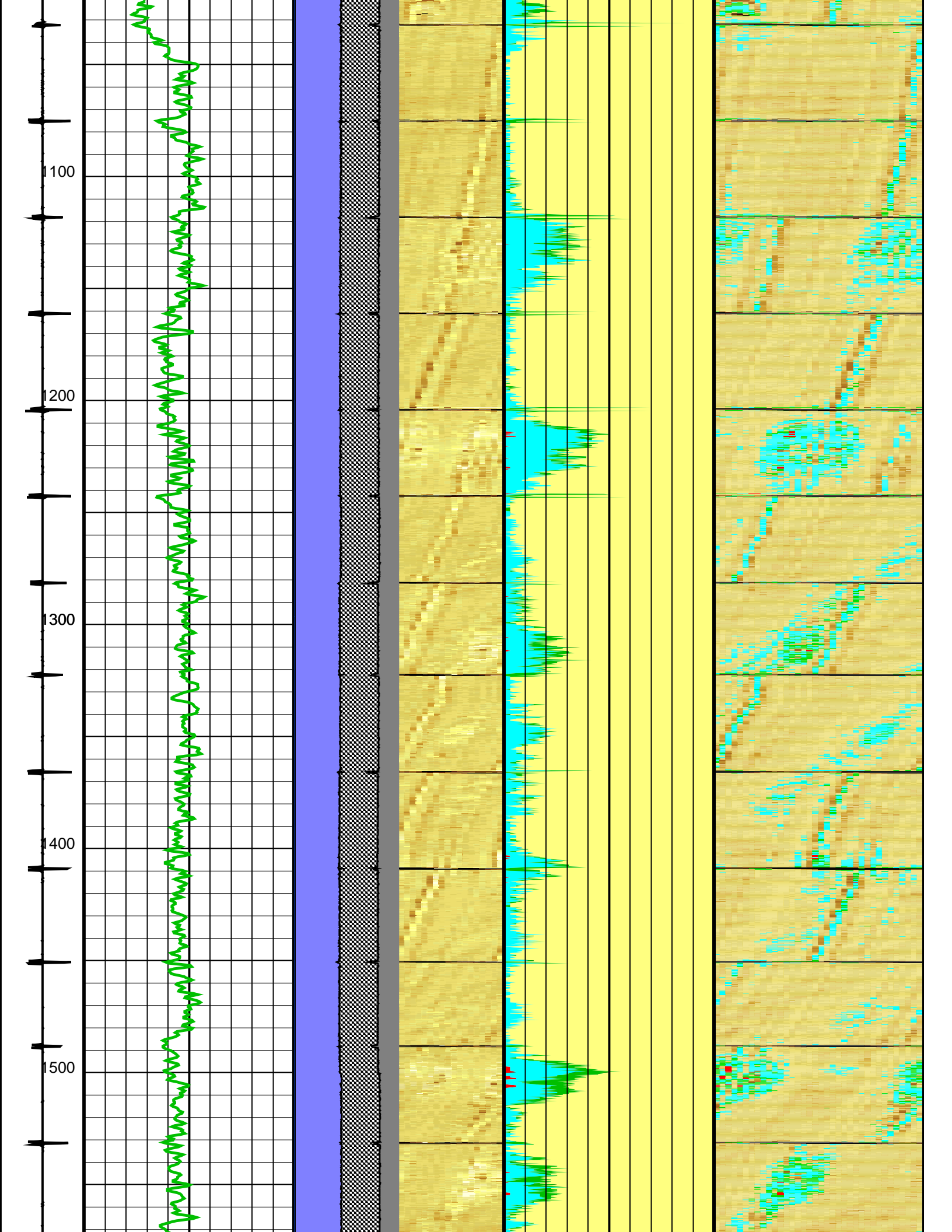


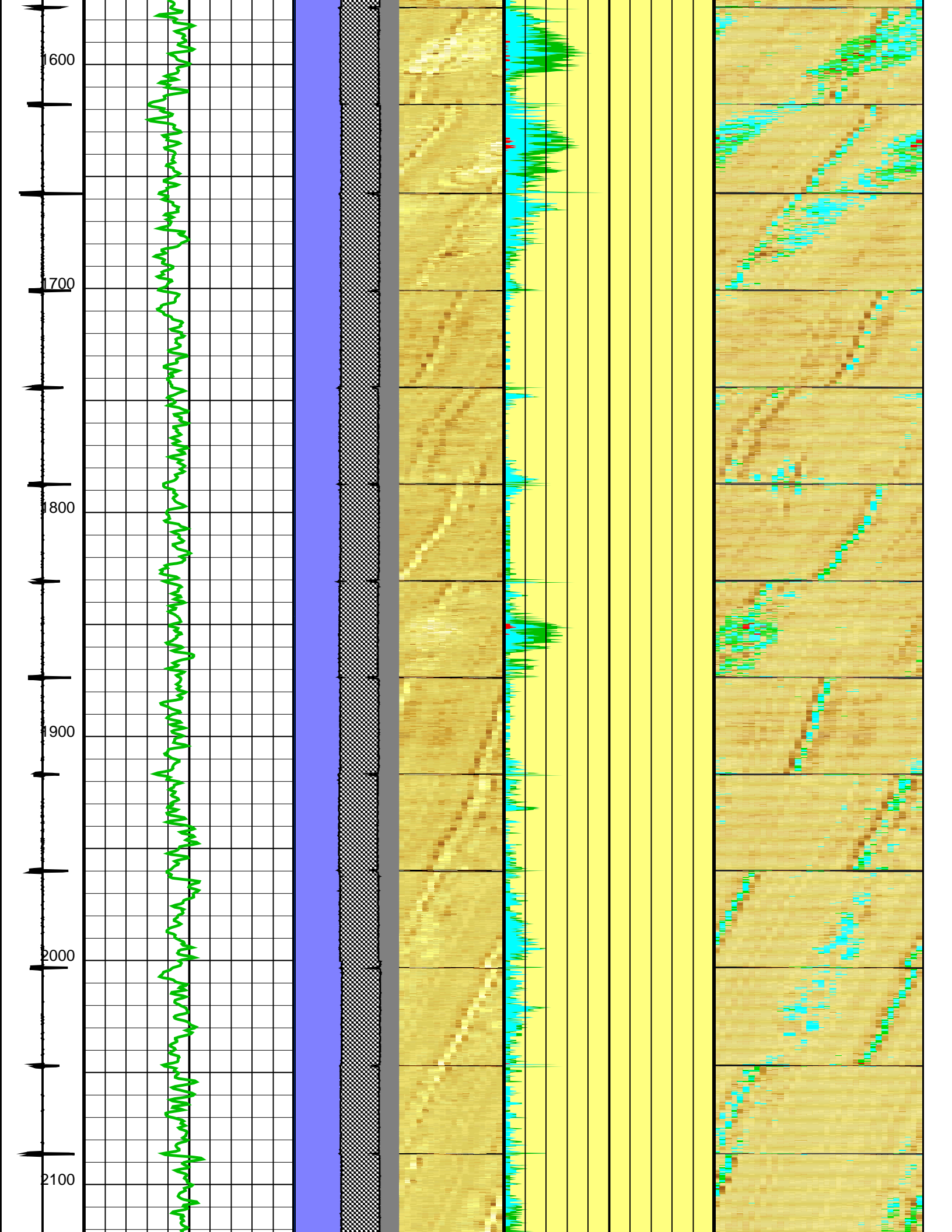




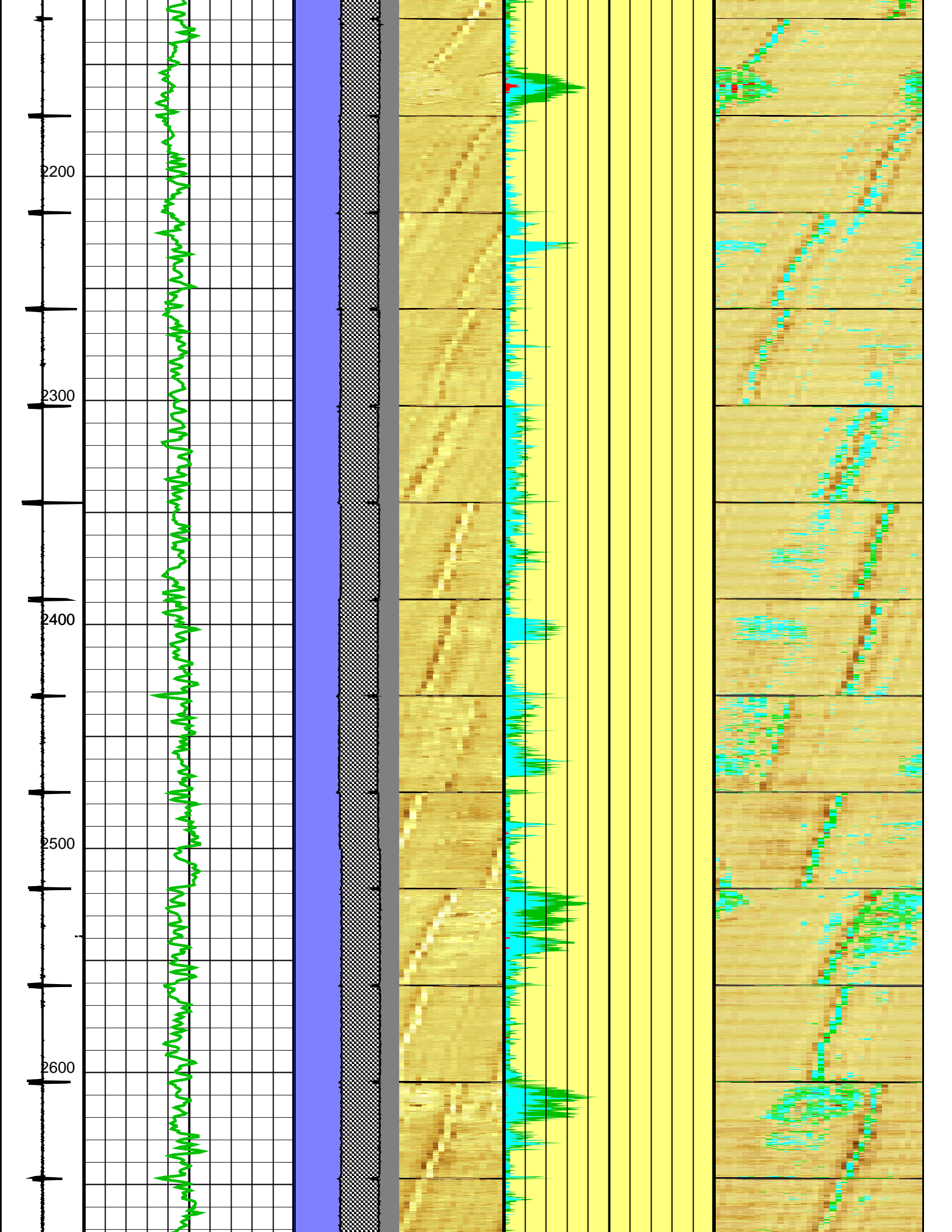


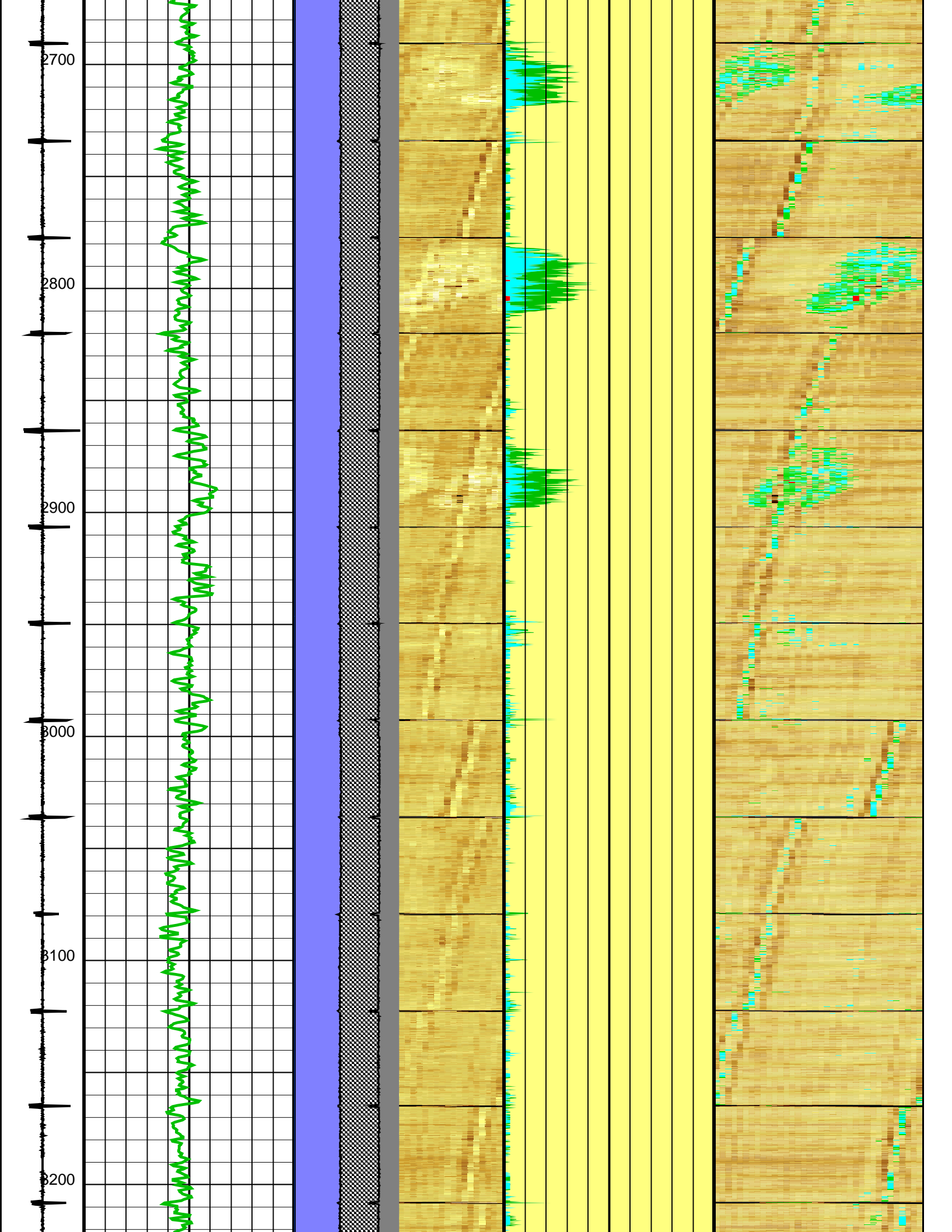




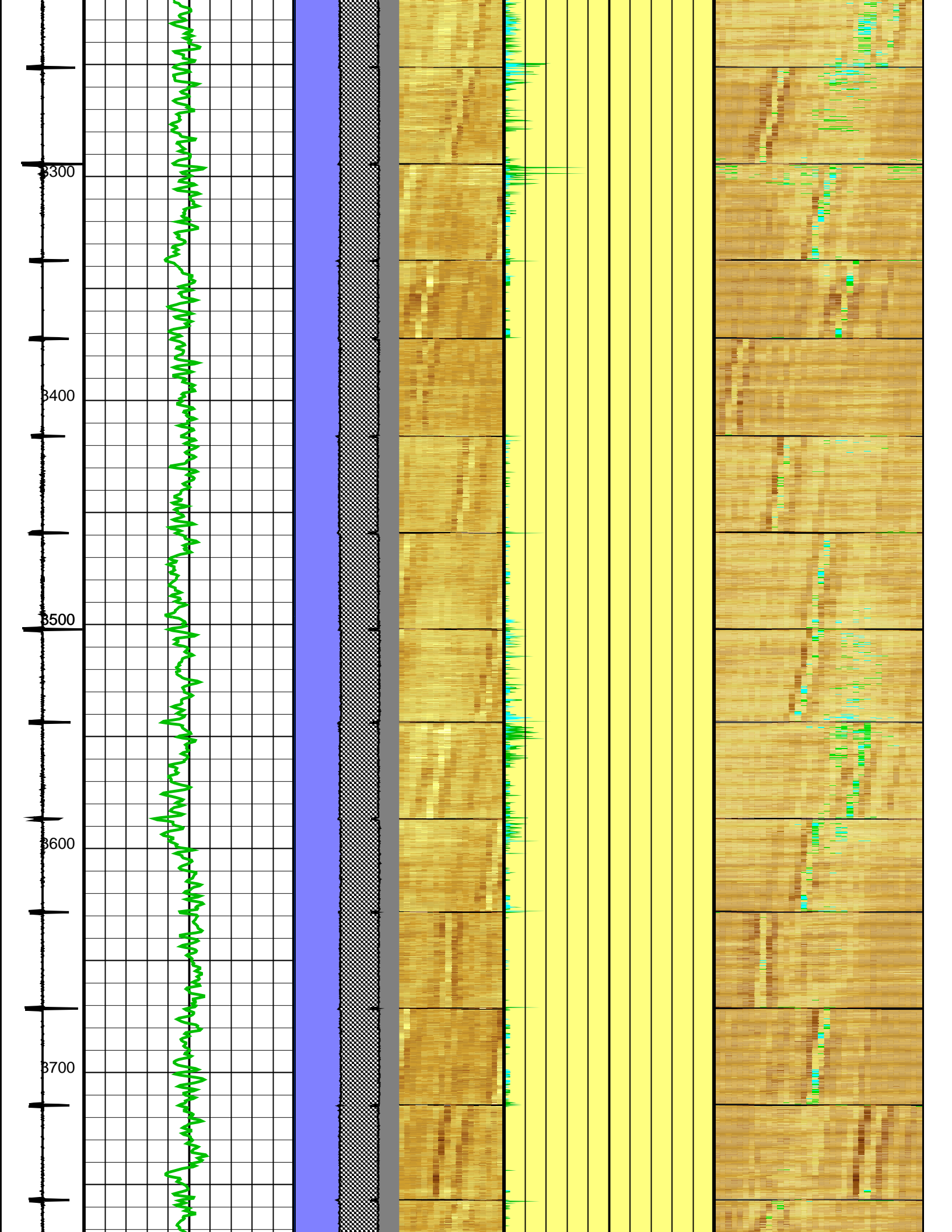


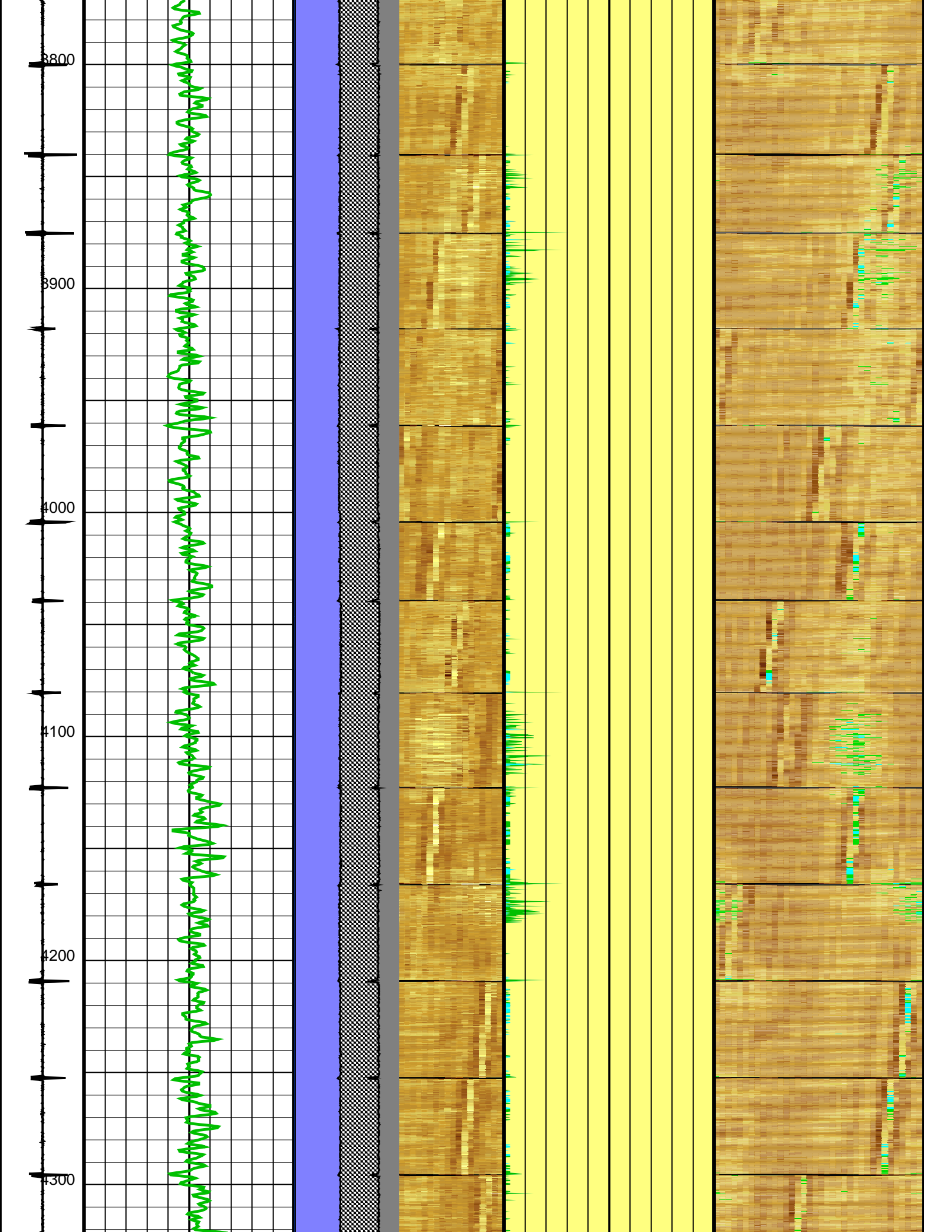




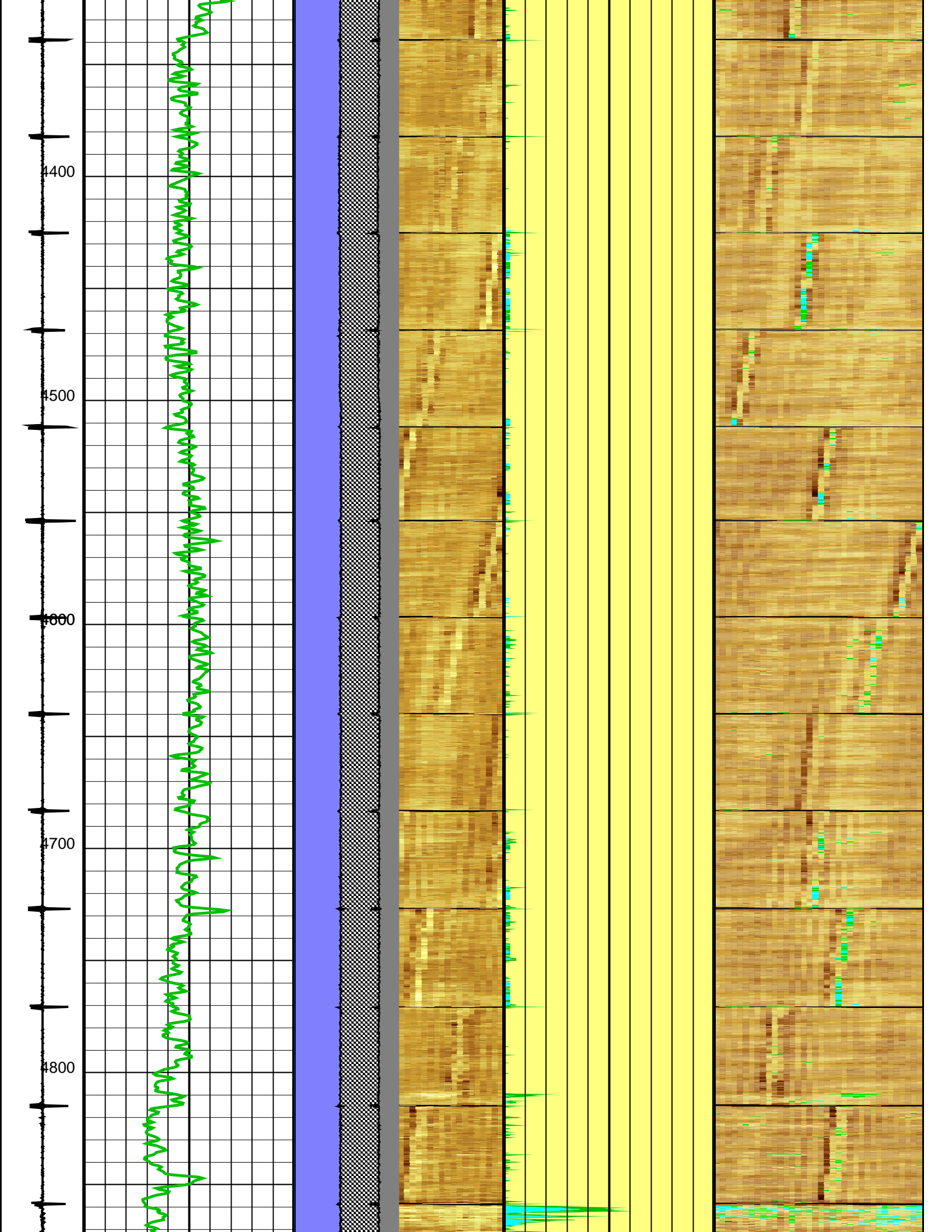


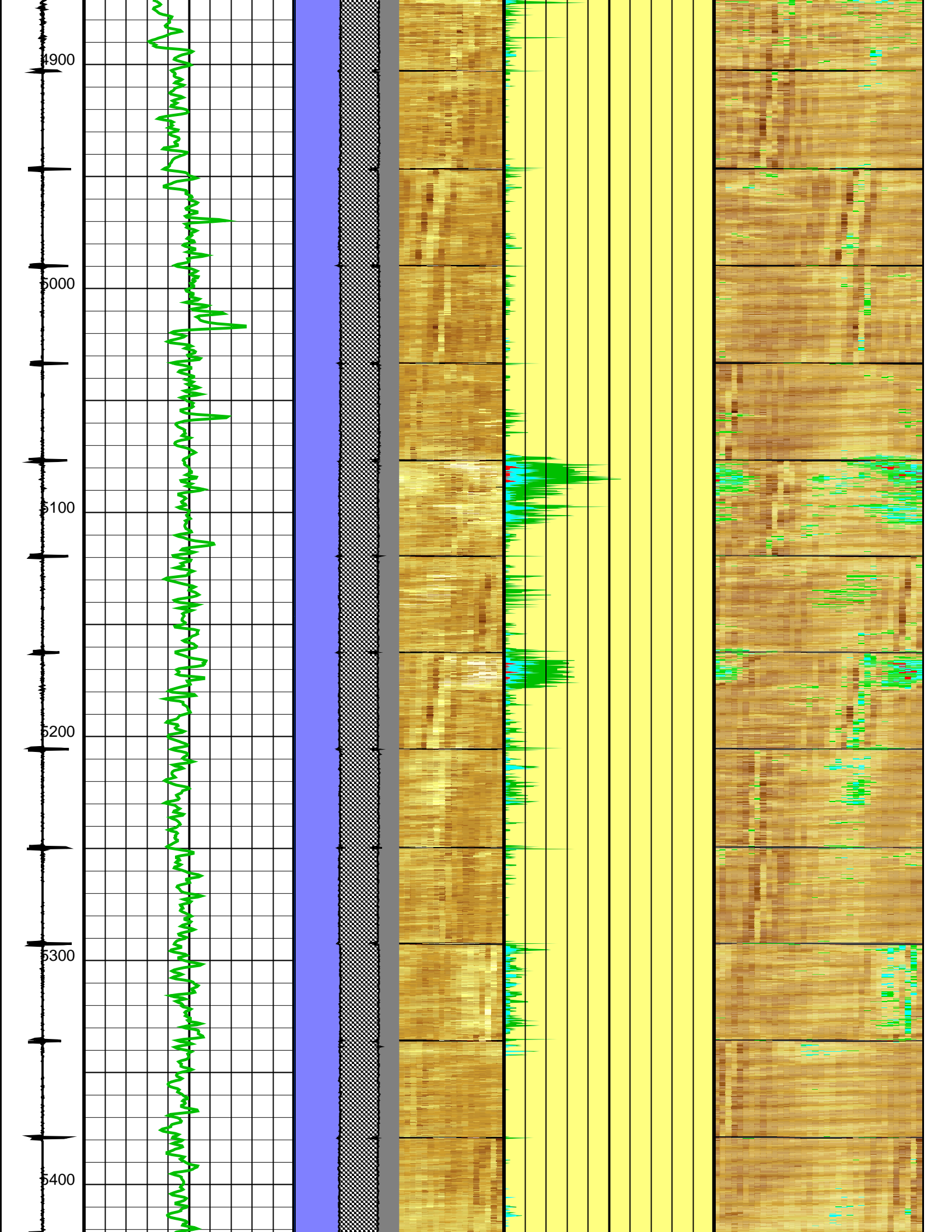




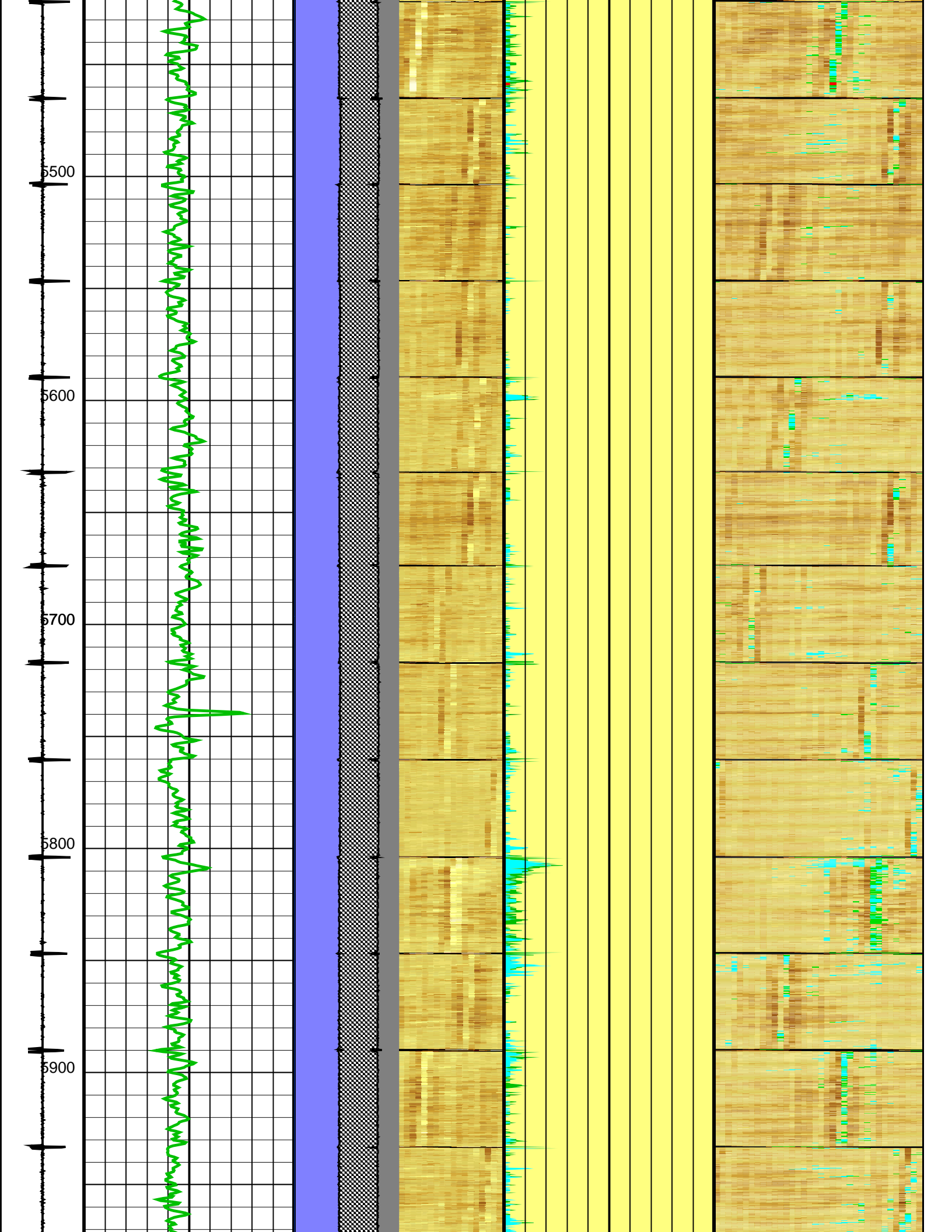


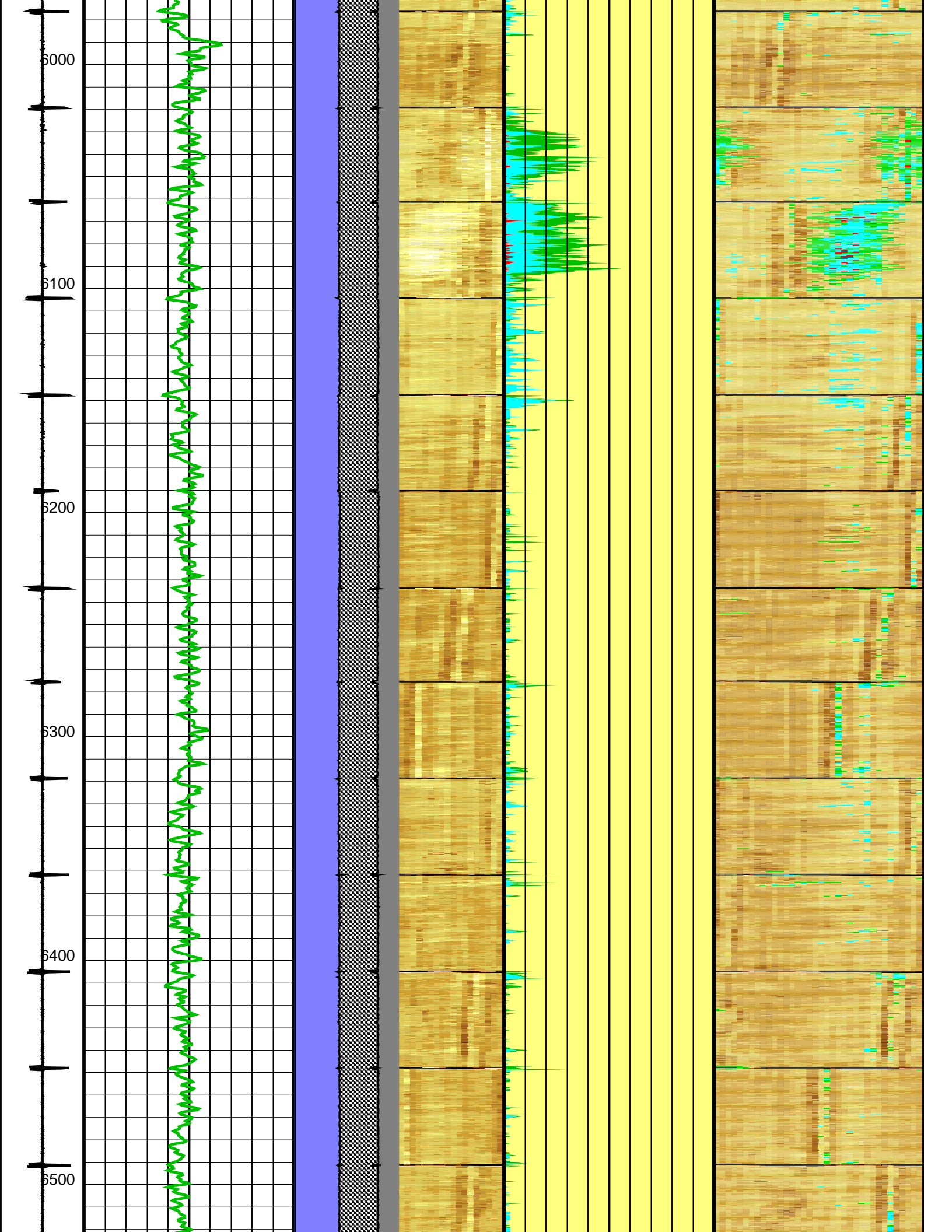


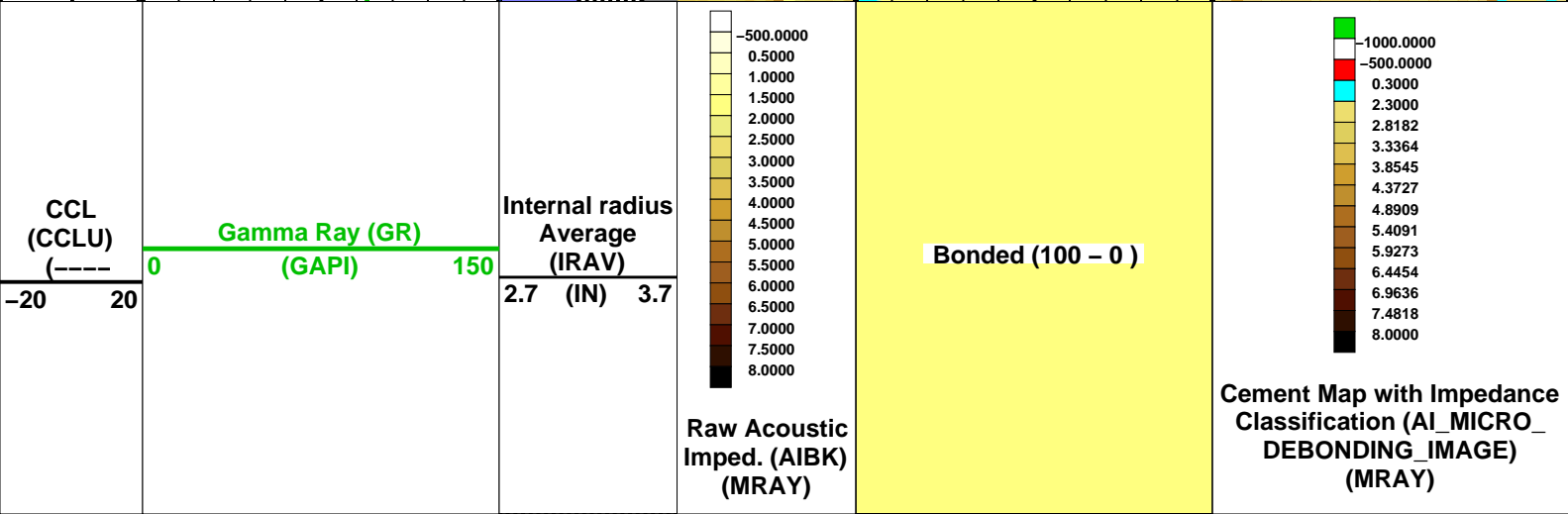
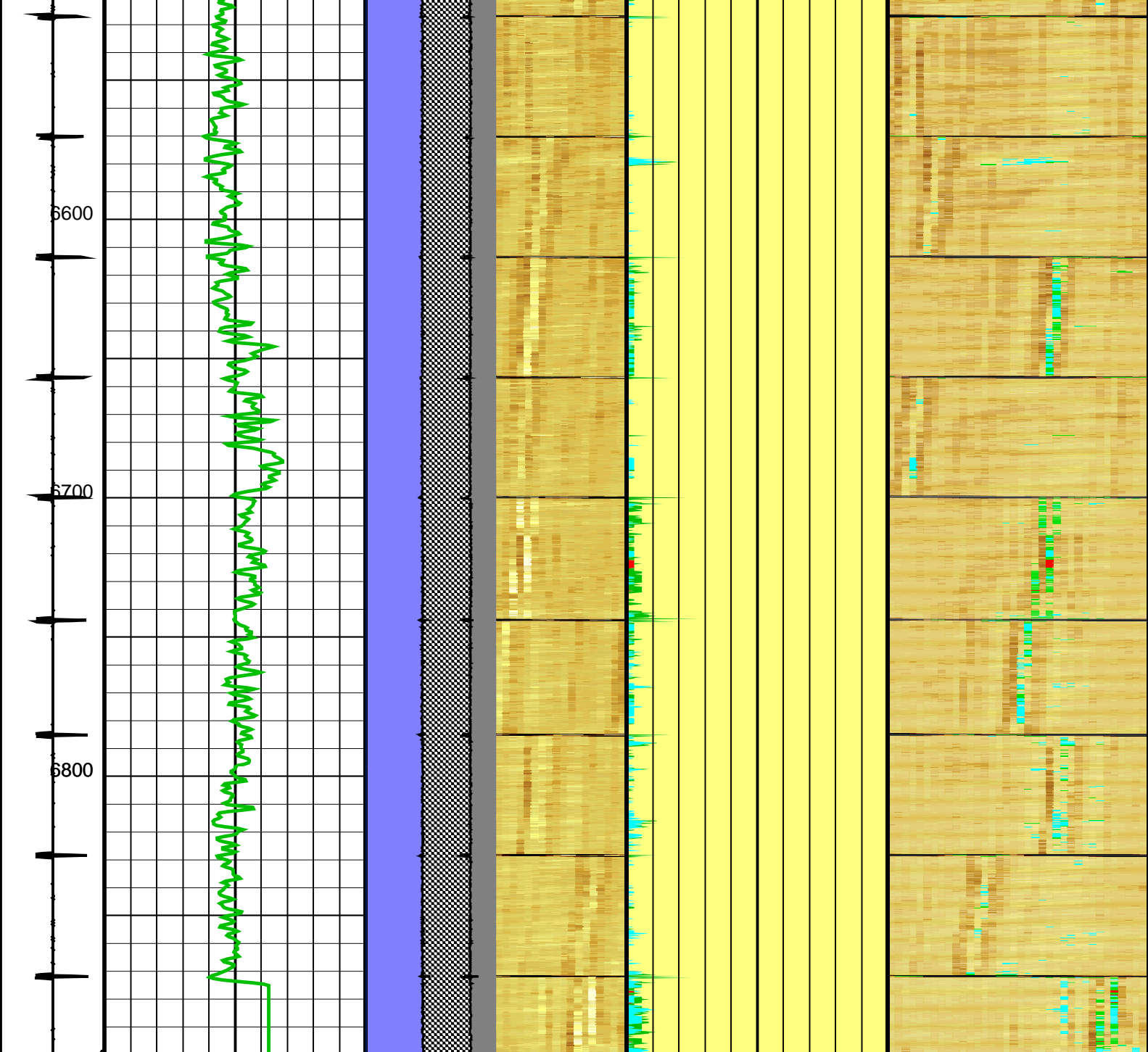














External radius Average (ERAV)
2.7 (IN) 3.7

Liquid

Micro-debonding

Format: USIT ND State 2 inch

Vertical Scale: 2" per 100'

Graphics File Created: 15-Nov-2013 17:04

## OP System Version: 19C1-222

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	50	V
FDII	FPM Data Interpolation Interval	0	FT
IMAR	Image Rotation	OFF	
MW	Mud Weight	8.7	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	46.2537	MRAY
ZINI	Initial Estimate of Cement Impedance	–1	MRAY
ZMUD	Acoustic Impedance of Mud	1.7	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.3	MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3	MRAY
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

DEFAULT	Splice_USI_022CUP	FN:1	PRODUCER	15-Nov-2013 17:03	6895.0 FT	-21.4 FT
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### Output DLIS Files

Schlumberger

Compressed Goodwin

MAXIS Field Log

Company: Kerr-McGee Oil & Gas Onshore LP

Well: D&C Farms 14N-33HZ

Input DLIS Files

DEFAULT	Splice_USI_022CUP	FN:1	PRODUCER	15-Nov-2013 17:03	6895.0 FT	-21.4 FT
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Output DLIS Files

DEFAULT	USI_023PUP	FN:14	PRODUCER	15-Nov-2013 17:04	6899.0 FT	-17.0 FT
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OP System Version: 19C1-222

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

Zoning of Mud Parameters

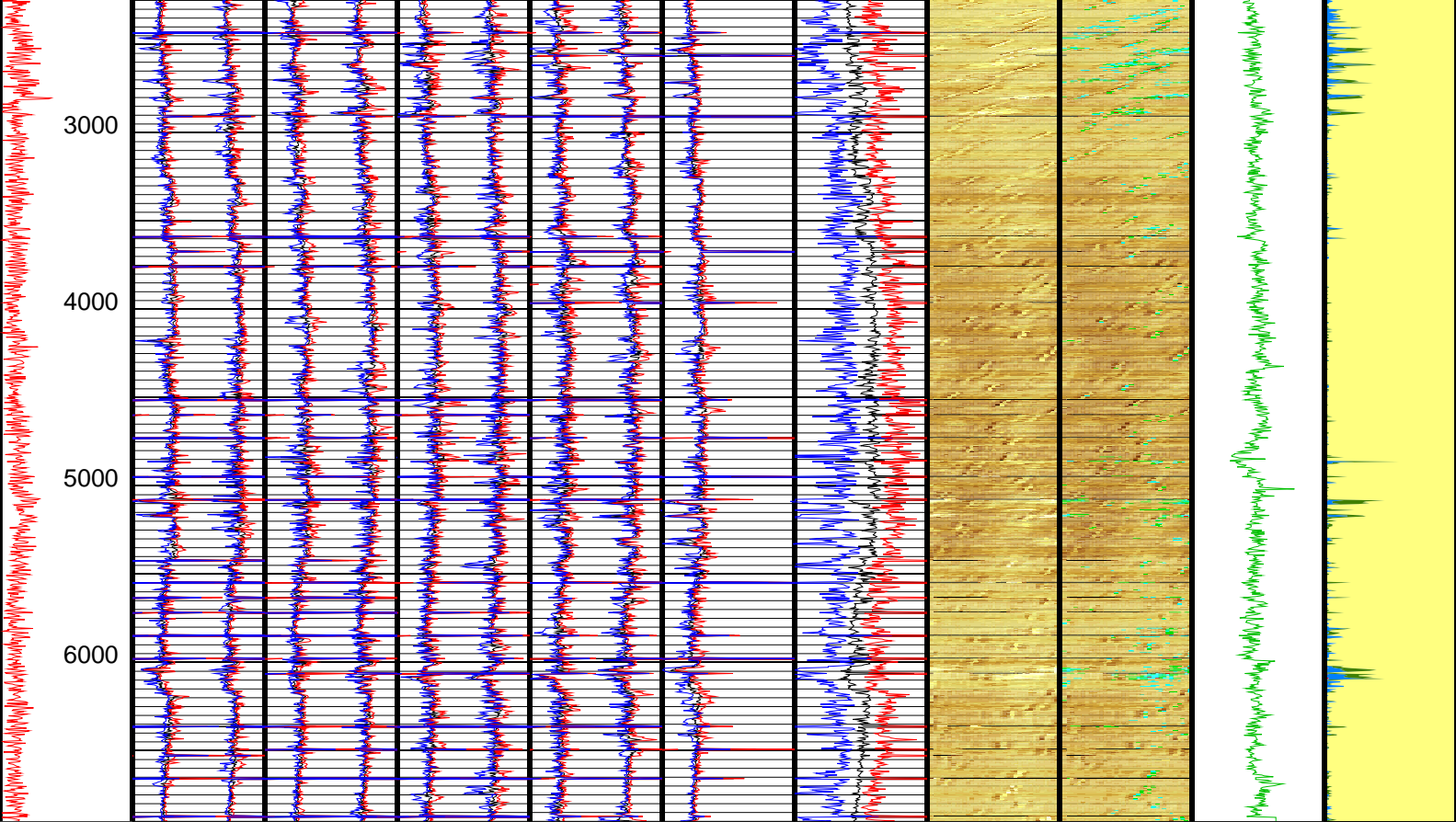
Depth	Fluid Velocity (DFVL)	Acoustic Impedance (ZMUD)
-------	-----------------------	---------------------------

7000.00	188.00	1.67
6500.00	188.00	1.67
6000.00	188.00	1.67
5500.00	188.00	1.67
5000.00	188.00	1.67
4500.00	189.00	1.66
4000.00	190.00	1.65
3500.00	191.00	1.65
3000.00	192.00	1.64
2500.00	194.00	1.62
2000.00	196.00	1.61
1500.00	198.00	1.60
1000.00	200.00	1.59
500.00	203.00	1.57

Minimum Acoustic Impedance	Minimum Acoustic Impedance	Minimum Acoustic Impedance	Minimum Acoustic Impedance
----------------------------	----------------------------	----------------------------	----------------------------

[illegible]





<div><div>Eccent. (ECCE)</div><div>0 (IN) 0.5</div></div>	<div>Average Acoustic Impedance #1 (AV_ AI1) (MRAY)</div> <div>015</div>	<div>Average Acoustic Impedance #3 (AV_ AI3) (MRAY)</div> <div>015</div>	<div>Average Acoustic Impedance #5 (AV_ AI5) (MRAY)</div> <div>015</div>	<div>Average Acoustic Impedance #7 (AV_ AI7) (MRAY)</div> <div>015</div>	<div>Average Acoustic Impedance #9 (AV_ AI9) (MRAY)</div> <div>015</div>	<div>Average of AI (AIAV) (MRAY)</div> <div>07.5</div>	<div><div><div></div><div>-500.0000</div><div>0.5000</div><div>1.0000</div><div>1.5000</div><div>2.0000</div><div>2.5000</div><div>3.0000</div><div>3.5000</div><div>4.0000</div><div>4.5000</div><div>5.0000</div><div>5.5000</div><div>6.0000</div><div>6.5000</div><div>7.0000</div><div>7.5000</div><div>8.0000</div></div><div>Raw Acoustic Imped. (AIBK) (MRAY)</div></div>	<div><div><div></div><div>-1000.0000</div><div>-500.0000</div><div>0.3000</div><div>2.3000</div><div>2.8182</div><div>3.3364</div><div>3.8545</div><div>4.3727</div><div>4.8909</div><div>5.4091</div><div>5.9273</div><div>6.4454</div><div>6.9636</div><div>7.4818</div><div>8.0000</div></div><div>Cement Map with Impedance Classificati on (AI_ MICRO_ DEBONDIN G_IMAGE) (MRAY)</div></div>	<div>Gamma Ray (GR) (GAPI)</div> <div>0150</div>	<div>Bonded (100 -0)</div>
	<div>Average Acoustic Impedance #2 (AV_ AI2) (MRAY)</div> <div>-7.57.5</div>	<div>Average Acoustic Impedance #4 (AV_ AI4) (MRAY)</div> <div>-7.57.5</div>	<div>Average Acoustic Impedance #6 (AV_ AI6) (MRAY)</div> <div>-7.57.5</div>	<div>Average Acoustic Impedance #8 (AV_ AI8) (MRAY)</div> <div>-7.57.5</div>	<div>Maximum Acoustic Impedance #9 (MAX_ AI9) (MRAY)</div> <div>015</div>	<div>Minimum of AI (AIMN) (MRAY)</div> <div>07.5</div>				<div>Gas</div>
<div>Maximum Acoustic Impedance #1 (MAX_ AI1) (MRAY)</div> <div>015</div>	<div>Maximum Acoustic Impedance #3 (MAX_ AI3) (MRAY)</div> <div>015</div>	<div>Maximum Acoustic Impedance #5 (MAX_ AI5) (MRAY)</div> <div>015</div>	<div>Maximum Acoustic Impedance #7 (MAX_ AI7) (MRAY)</div> <div>015</div>	<div>Minimum Acoustic Impedance #9 (MIN_ AI9) (MRAY)</div> <div>015</div>	<div>Maximum of AI (AIMX) (MRAY)</div> <div>07.5</div>				<div>Liquid</div>	
<div>Maximum Acoustic Impedance #2 (MAX_ AI2) (MRAY)</div>	<div>Maximum Acoustic Impedance #4 (MAX_ AI4) (MRAY)</div>	<div>Maximum Acoustic Impedance #6 (MAX_ AI6) (MRAY)</div>	<div>Maximum Acoustic Impedance #8 (MAX_ AI8) (MRAY)</div>							<div>Area</div>

<b>A12)</b> <b>(MRAY)</b>	<b>A14)</b> <b>(MRAY)</b>	<b>A16)</b> <b>(MRAY)</b>	<b>A18)</b> <b>(MRAY)</b>
<b>-7.5</b> <b>7.5</b>	<b>-7.5</b> <b>7.5</b>	<b>-7.5</b> <b>7.5</b>	<b>-7.5</b> <b>7.5</b>
<b>Minimum Acoustic Impedance #1 (MIN_ AI1) (MRAY)</b>	<b>Minimum Acoustic Impedance #3 (MIN_ AI3) (MRAY)</b>	<b>Minimum Acoustic Impedance #5 (MIN_ AI5) (MRAY)</b>	<b>Minimum Acoustic Impedance #7 (MIN_ AI7) (MRAY)</b>
<b>0</b> <b>15</b>	<b>0</b> <b>15</b>	<b>0</b> <b>15</b>	<b>0</b> <b>15</b>
<b>Minimum Acoustic Impedance #2 (MIN_ AI2) (MRAY)</b>	<b>Minimum Acoustic Impedance #4 (MIN_ AI4) (MRAY)</b>	<b>Minimum Acoustic Impedance #6 (MIN_ AI6) (MRAY)</b>	<b>Minimum Acoustic Impedance #8 (MIN_ AI8) (MRAY)</b>
<b>-7.5</b> <b>7.5</b>	<b>-7.5</b> <b>7.5</b>	<b>-7.5</b> <b>7.5</b>	<b>-7.5</b> <b>7.5</b>



Format: USIT only Goodwin Compressed      Vertical Scale: 0.1" per 100'      Graphics File Created: 15-Nov-2013 17:04

## OP System Version: 19C1-222

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

DEFAULT                      Splice\_USI\_022CUP                      FN:1      PRODUCER      15-Nov-2013 17:03      6895.0 FT                      -21.4 FT

### Output DLIS Files

DEFAULT                      USI\_023PUP                      FN:14      PRODUCER      15-Nov-2013 17:04



Repeat Pass

MAXIS Field Log

Company: Kerr-McGee Oil & Gas Onshore LP      Well: D&C Farms 14N-33HZ

### Input DLIS Files

DEFAULT                      USI\_010LUP                      FN:9      PRODUCER      15-Nov-2013 15:03      6739.5 FT                      6448.7 FT

### Output DLIS Files

DEFAULT                      USI\_024PUP                      FN:15      PRODUCER      15-Nov-2013 17:17      6742.5 FT                      6452.0 FT

OP System Version: 19C1-222

Zoning of Mud Parameters

Depth	Fluid Velocity (DFVL)	Acoustic Impedance (ZMUD)
7000.00	188.00	1.67
6500.00	188.00	1.67
6000.00	188.00	1.67
5500.00	188.00	1.67
5000.00	188.00	1.67
4500.00	189.00	1.66
4000.00	190.00	1.65
3500.00	191.00	1.65
3000.00	192.00	1.64
2500.00	194.00	1.62
2000.00	196.00	1.61
1500.00	198.00	1.60
1000.00	200.00	1.59
500.00	203.00	1.57

Image rotation  
(UCAZ)  
(DEG)

0360

Azimuth of  
eccent.  
(AZEC)  
(DEG)

0360

Cable  
Speed (CS)  
(F/HR)

02000

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

Min of  
Internal  
radius  
(IRMN)  
(IN)

3.72.7

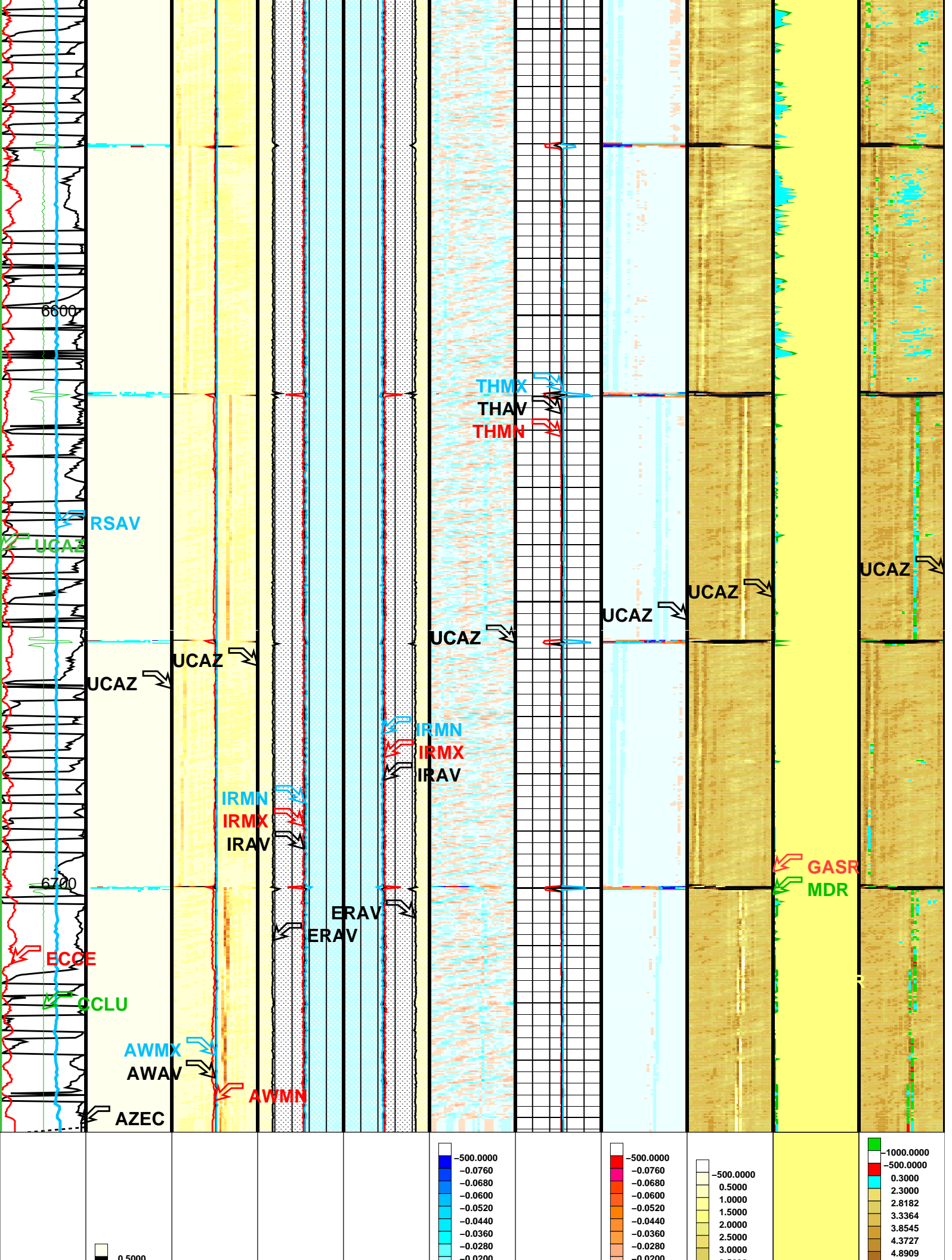
Min of  
Internal  
radius  
(IRMN)  
(IN)

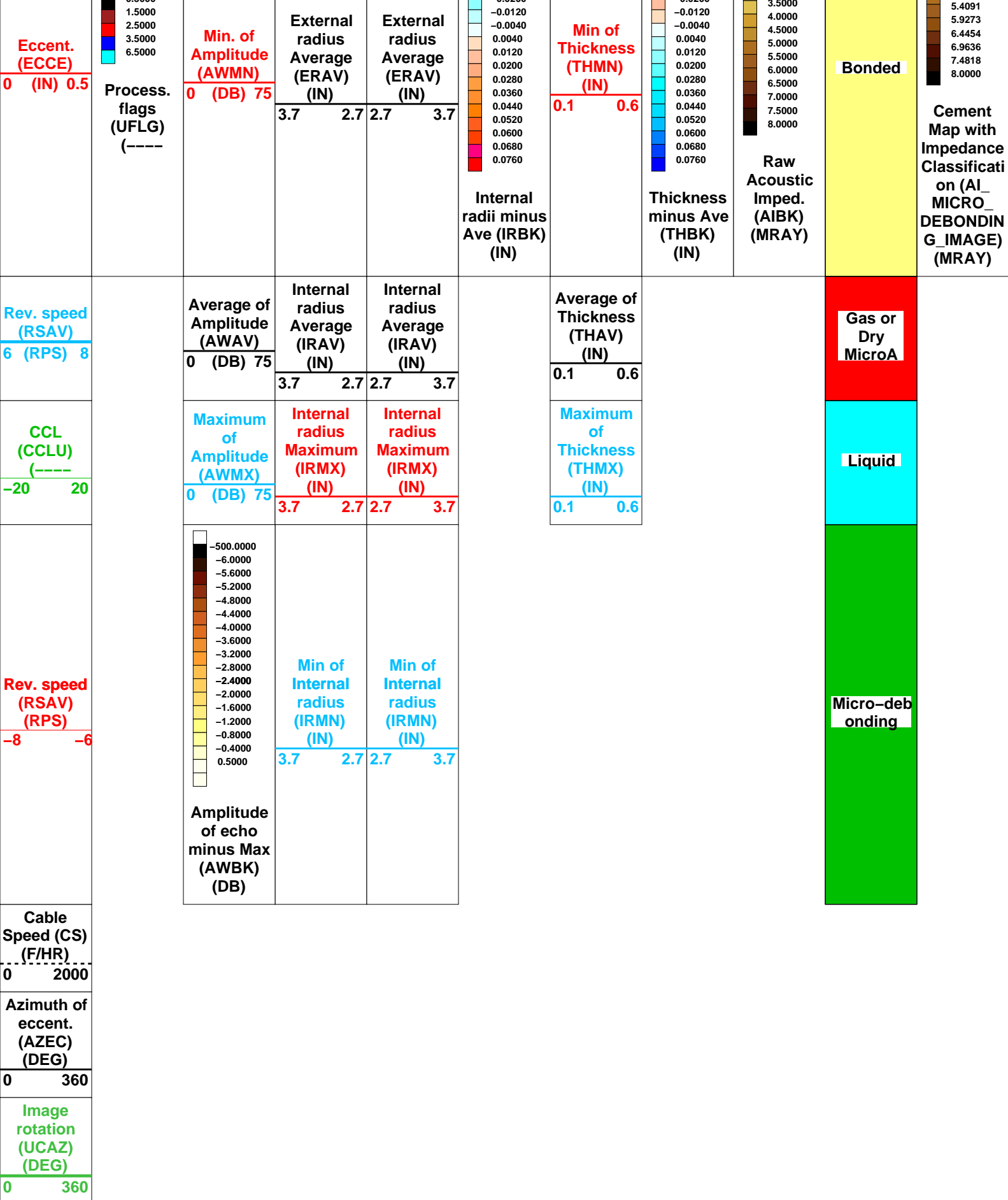
2.73.7

Micro-deb  
onding











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	50	V
FDII	FPM Data Interpolation Interval	0	FT
IMAR	Image Rotation	OFF	
MW	Mud Weight	8.7	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	46.2537	MRAY
ZINI	Initial Estimate of Cement Impedance	–1	MRAY
ZMUD	Acoustic Impedance of Mud	1.7	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.3	MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3	MRAY
System and Miscellaneous			
CWEI	Casing Weight	26.00	LB/F
DO	Depth Offset for Playback	3.0	FT
PP	Playback Processing	RECOMPUTE	

# Output DLIS Files

DEFAULT

USI\_024PUP

FN:15

PRODUCER

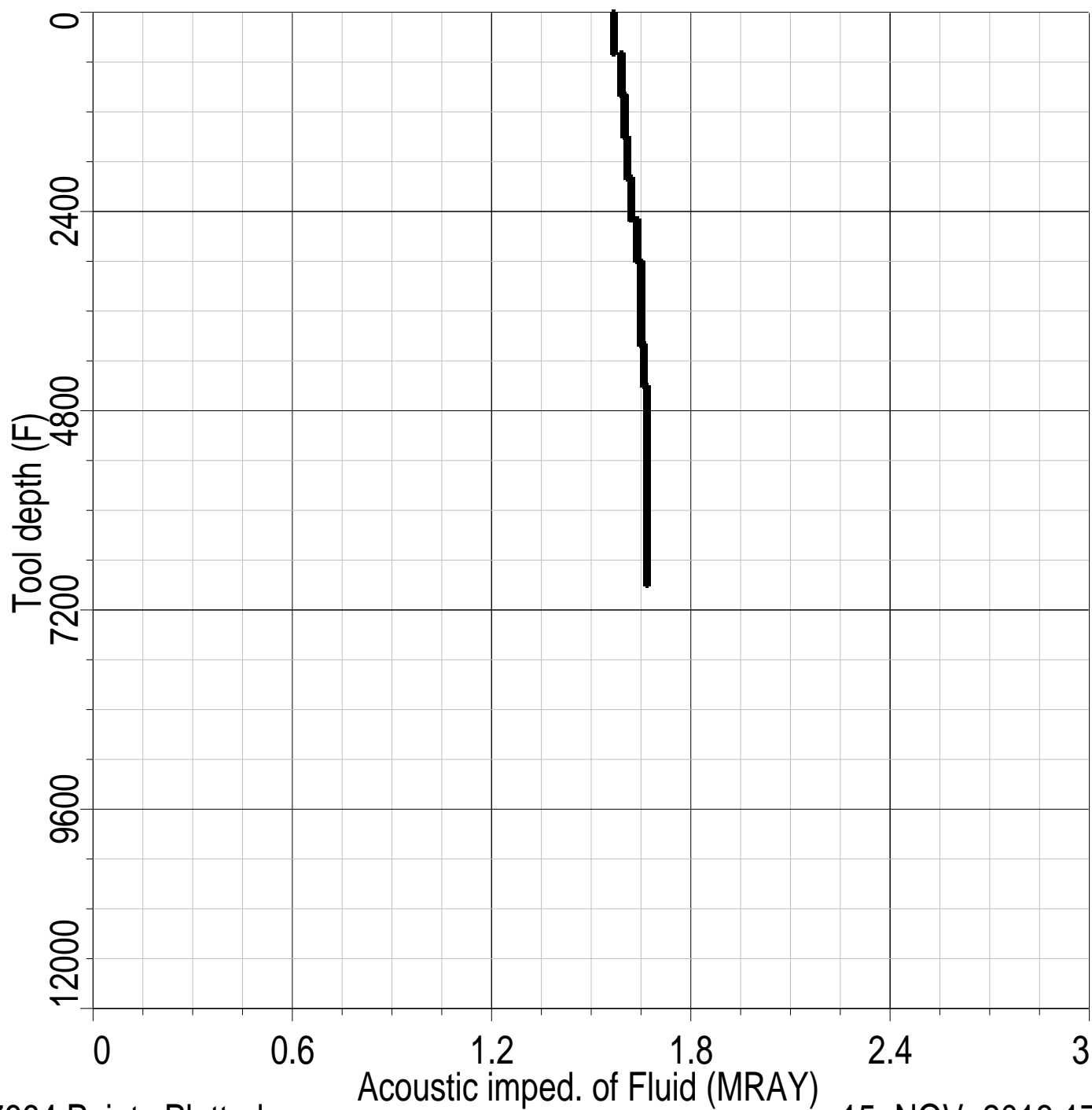
15-Nov-2013 17:17

**Schlumberger**

## Fluid Properties

MAXIS Field Log

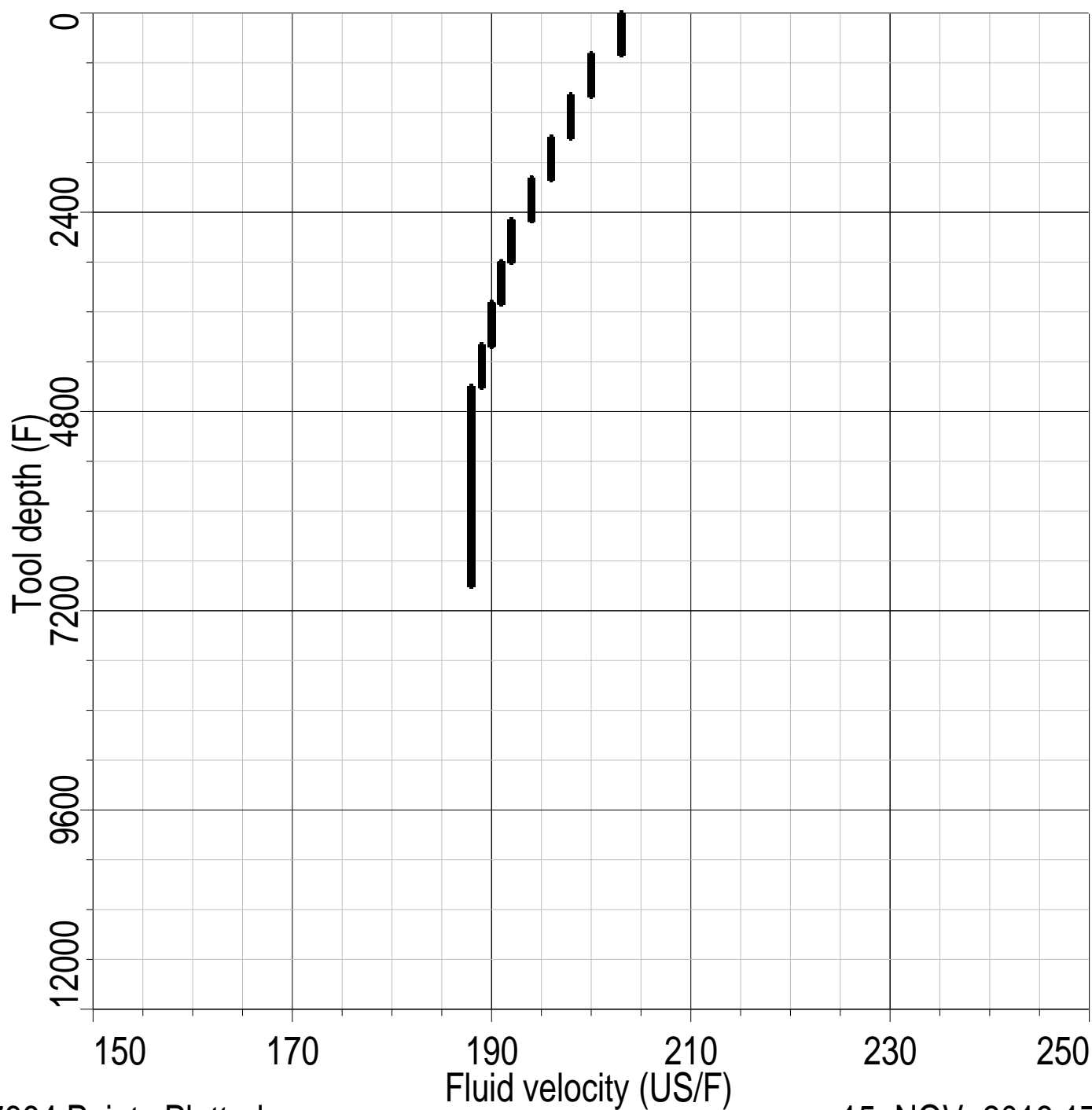
Index: 6899.0 – -16.7 FT



27664 Points Plotted

15-NOV-2013 17:13

Index: 6899.0 – -16.7 FT



27664 Points Plotted

15-NOV-2013 17:13

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

**Schlumberger**

Well: **D&C Farms 14N-33HZ**

Field: **Wattenberg**

County: **Weld**

State: **Colorado**

Ultrasonic Imager  
Cement Evaluation