

Company: Noble Energy Inc

Well: Wells Ranch AE32-630

Field: Wattenberg

County: Weld State: Colorado

Slim Cement Mapping Tool  
Cement Evaluation

County: Weld  
Field: Wattenberg  
Location: SWSW Sec. 32, T6N, R62W  
Well: Wells Ranch AE32-630  
Company: Noble Energy Inc

Location:

SWSW Sec. 32, T6N, R62W  
SHL: 765' FSL x 650' FWL  
Lat: 40.438050/ Lat: -104.354480

Elev.: K.B. 4744.00 ft  
G.L. 4720.00 ft  
D.F. 4743.00 ft

Permanent Datum: \_\_\_\_\_  
Log Measured From: \_\_\_\_\_  
Drilling Measured From: \_\_\_\_\_

Ground Level \_\_\_\_\_  
Kelly Bushing \_\_\_\_\_  
Kelly Bushing \_\_\_\_\_

Elev.: 24.00 ft  
above Perm. Datum

API Serial No. \_\_\_\_\_  
05-123-41787

Section: 32

Township: 6N

Range: 62W

Logging Date 02-Nov-2015

Run Number Run 1

Depth Driller 7005.00 ft

Schlumberger Depth 7005.00 ft

Bottom Log Interval 6854.60 ft

Top Log Interval 24.00 ft

Casing Fluid Type Brine

Salinity

Density 8.4 lbm/gal

Fluid Level 0.00 ft

BIT/CASING/TUBING STRING

Bit Size 8.75 in

From 0.00 ft

To 7005.00 ft

Casing/Tubing Size 7 in

Weight 26 lbm/ft

Grade P110

From 0.00 ft

To 6997.10 ft

Max Recorded Temperatures 232.4 degF

Logger on Bottom 02-Nov-2015 10:15:00

Unit Number 9115 Location: Ft. Morgan, CO

Recorded By Aleksei Bekhterev

Witnessed By Bill Mansfield

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 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.

Contents

1. Header

2. Disclaimer

3. Contents

4. Well Sketch

5. Borehole Size/Casing/Tubing Record

6. Operational Run Summary

7. Borehole Fluids

8. Remarks and Equipment Summary

9. Depth Summary

10. Composite1

10.1 Integration Summary

10.2 Software Version

10.3 Composite Summary

10.4 Log ( SCMT\_VDL\_Image )

10.5 Parameter Listing

11. No Data Assignment

11.1 Software Version
13. Calibration Report

14. Tail

11.2 Log ( SCMT\_Amp\_Image )

12. Run 1

12.1 Integration Summary

12.2 Software Version

12.3 Composite Summary

12.4 Log ( SCMT\_VDL\_Image )

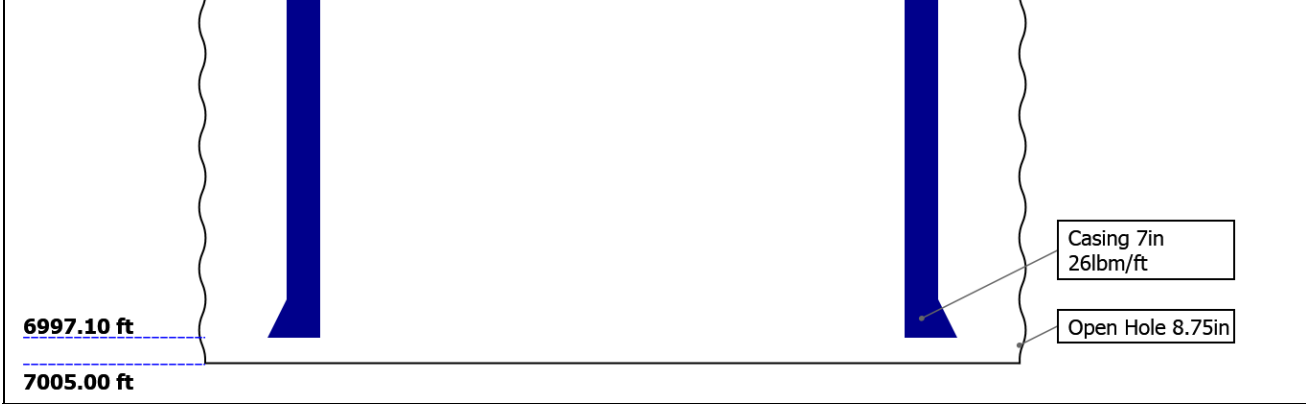
12.5 Parameter Listing

## Well Sketch

**Driller Depth**

**0.00 ft**





Borehole Size/Casing/Tubing Record

Bit						
Bit Size ( in )	8.75					
Top Driller ( ft )	0					
Top Logger ( ft )	0					
Bottom Driller ( ft )	7005					
Bottom Logger ( ft )	7005					
Casing						
Size ( in )	7					
Weight ( lbm/ft )	26					
Inner Diameter ( in )	6.276					
Grade	P110					
Top Driller ( ft )	0					
Top Logger ( ft )	0					
Bottom Driller ( ft )	6997.1					
Bottom Logger ( ft )	6997.1					


Operational Run Summary

Parameter ( unit )	Run 1					
Date Log Started	02-Nov-2015					
Time Log Started	09:58:08					
Date Log Finished	02-Nov-2015					
Time Log Finished	16:02:27					
Top Log Interval ( ft )	24.00					
Bottom Log Interval ( ft )	6854.60					
Total Depth ( ft )	6997.10					
Max Hole Deviation ( deg )	0.00					
Azimuth of Max Deviation ( deg )	0.00					
Bit Size ( in )	8.750					
Logging Unit Number	9115					
Logging Unit Location	Ft. Morgan, CO					
Recorded By	Aleksei Bekhterev					

Witnessed By	Bill Mansfield					
Service Order Number	CY37-00147					

Borehole Fluids						
Parameter( unit )	Run 1					
Fluid Type	Water					
Fluid Name	Brine					
Max Recorded Temperatures ( degF )	232.4					
Salinity ( ppm )	0					
Density ( lbm/gal )	8.4					
Date Logger on Bottom	02-Nov-2015					
Time Logger on Bottom	10:15:00					
Total Solid ( % )						
High Gravity Solids ( % )						

## Remarks and Equipment Summary

Run 1: Toolstring				Run 1: Remarks																			
<div><div><div><div>Equip name</div><div>Length</div></div><div>LEH-QT</div><div>44.74</div></div><div><div><div>MP name</div><div>Offset</div></div><div>LEH-QT</div><div></div></div></div> <div></div> <div><div><div>GR</div><div>PSTC</div><div>PSTC Tool String Bottom</div><div>Temperature</div><div>CQG Pressure</div><div>CCL</div><div>PBMS</div></div><div><div>36.97</div><div>36.68</div><div>0.00</div><div>33.92</div><div>33.58</div><div>33.16</div><div>32.41</div></div></div> <div><div><div>Caliper, Inclino</div></div><div><div>27.14</div></div></div> <div><div><div>DT</div></div><div><div>14.47</div></div></div> <div><div><div>CBL5</div><div>DTSC</div></div><div><div>12.97</div><div>12.97</div></div></div> <tr><td colspan="2">This is first run in hole</td></tr> <tr><td colspan="2">Toolstring ran as per tool sketch</td></tr> <tr><td colspan="2">Repeat Pass is done with 0 psi</td></tr> <tr><td colspan="2">Main Pass is done with 2500 psi</td></tr> <tr><td colspan="2">Log started 30 ft above top of the liner (6854.6 ft)</td></tr> <tr><td colspan="2">Temperature on bottom: 232.4 degF</td></tr> <tr><td colspan="2">PMIT resolution: 0.2"</td></tr> <tr><td colspan="2">Pressure released at 984 ft</td></tr> <tr><td colspan="2">Crew: Jake Jump, Jay Musgrave</td></tr> <tr><td colspan="2">Thank you for choosing Schlumberger Wireline!</td></tr>				This is first run in hole		Toolstring ran as per tool sketch		Repeat Pass is done with 0 psi		Main Pass is done with 2500 psi		Log started 30 ft above top of the liner (6854.6 ft)		Temperature on bottom: 232.4 degF		PMIT resolution: 0.2"		Pressure released at 984 ft		Crew: Jake Jump, Jay Musgrave		Thank you for choosing Schlumberger Wireline!	
				This is first run in hole																			
				Toolstring ran as per tool sketch																			
				Repeat Pass is done with 0 psi																			
				Main Pass is done with 2500 psi																			
				Log started 30 ft above top of the liner (6854.6 ft)																			
				Temperature on bottom: 232.4 degF																			
				PMIT resolution: 0.2"																			
				Pressure released at 984 ft																			
				Crew: Jake Jump, Jay Musgrave																			
				Thank you for choosing Schlumberger Wireline!																			

GR

PSTC

PSTC To

ol String

Bottom

Tempera

ture

CQG Pre

ssure

CCL

PBMS

36.97

36.68

0.00

33.92

33.58

33.16

32.41

PMIT-B:47

78

32.41

Caliper,I

nclino

27.14

DT

14.47

CBL5

DTSC

12.97

12.97

MITH:800

MITC-A:75

9

MITS-B:477

8

FINGERS-4

0\_STD

Inclinomete

r:4778

SCMT-CB:

8198

SECH-CA

SCMC-CA:

8268

CMIR-AG

SCMS-CB:8

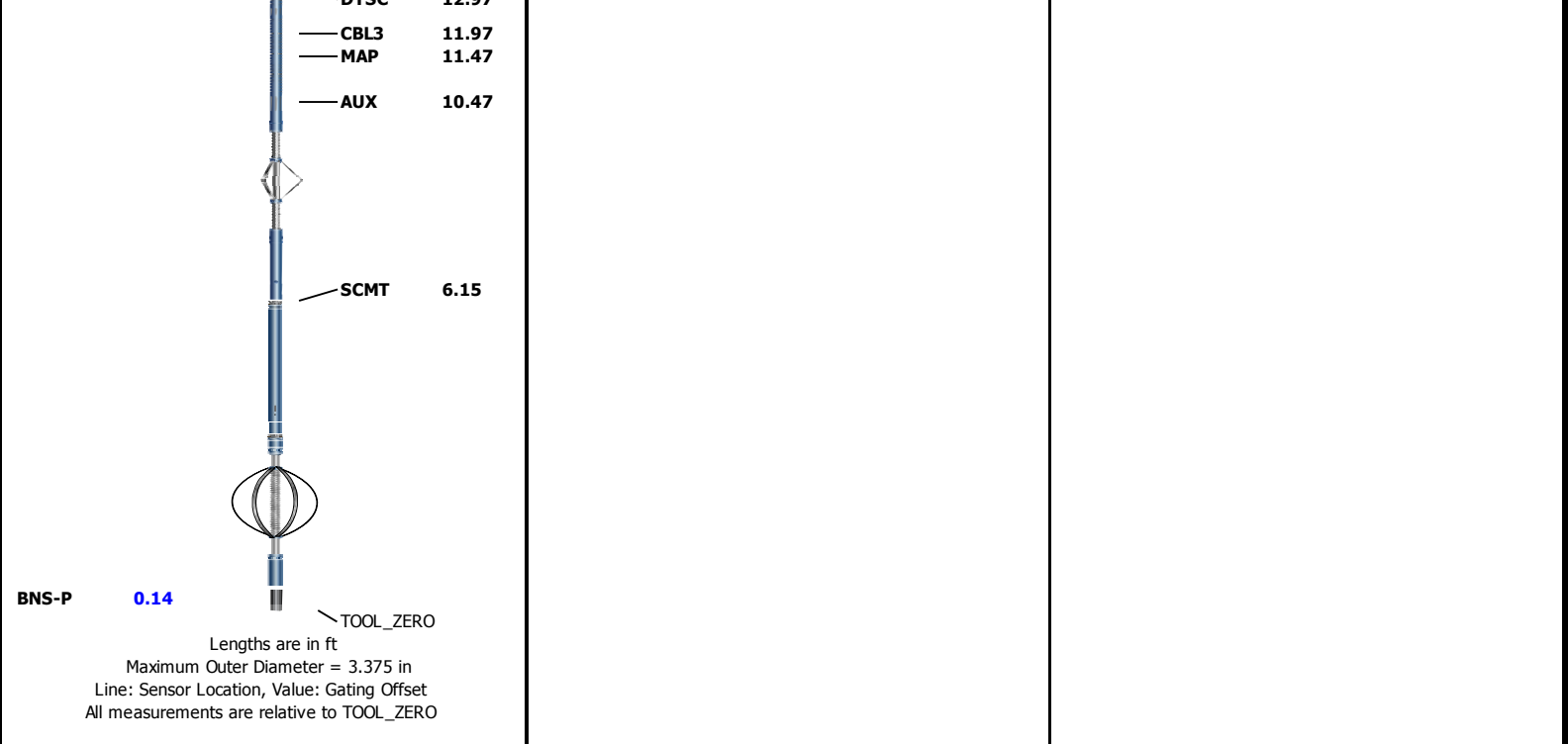
198

SCMX-CA:8

161

AH-278

TTG-C



Depth Summary			
Run 1			
Depth Measuring Device			
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		
Tension Device			
Type	CMTD-B/A		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0		
Logging Cable			
Type	7-46A-XS		
Serial Number			
Length	12000.00 ft		
Conveyance Type	Wireline		
Rig Type	Crane		
Run 1:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well	All Schlumberger depth policies followed	
Rig Up Length At Surface		IDW used as primary depth device	
Rig Up Length At Bottom		Z-chart used as secondary depth reference	
Rig Up Length Correction			
Stretch Correction			

Composite 1

Software Version

Acquisition System	Version
Maxwell 2016	6.0.53731.3100

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Run 1	Main[4]:Up	Up	844.93 ft	6861.92 ft	02-Nov-2015 11:09:29 AM	02-Nov-2015 2:33:14 PM	ON	4.92 ft	Yes
Run 1	Main[5]:Up	Up	69.88 ft	1105.00 ft	02-Nov-2015 2:44:51 PM	02-Nov-2015 3:19:11 PM	ON	4.92 ft	Yes

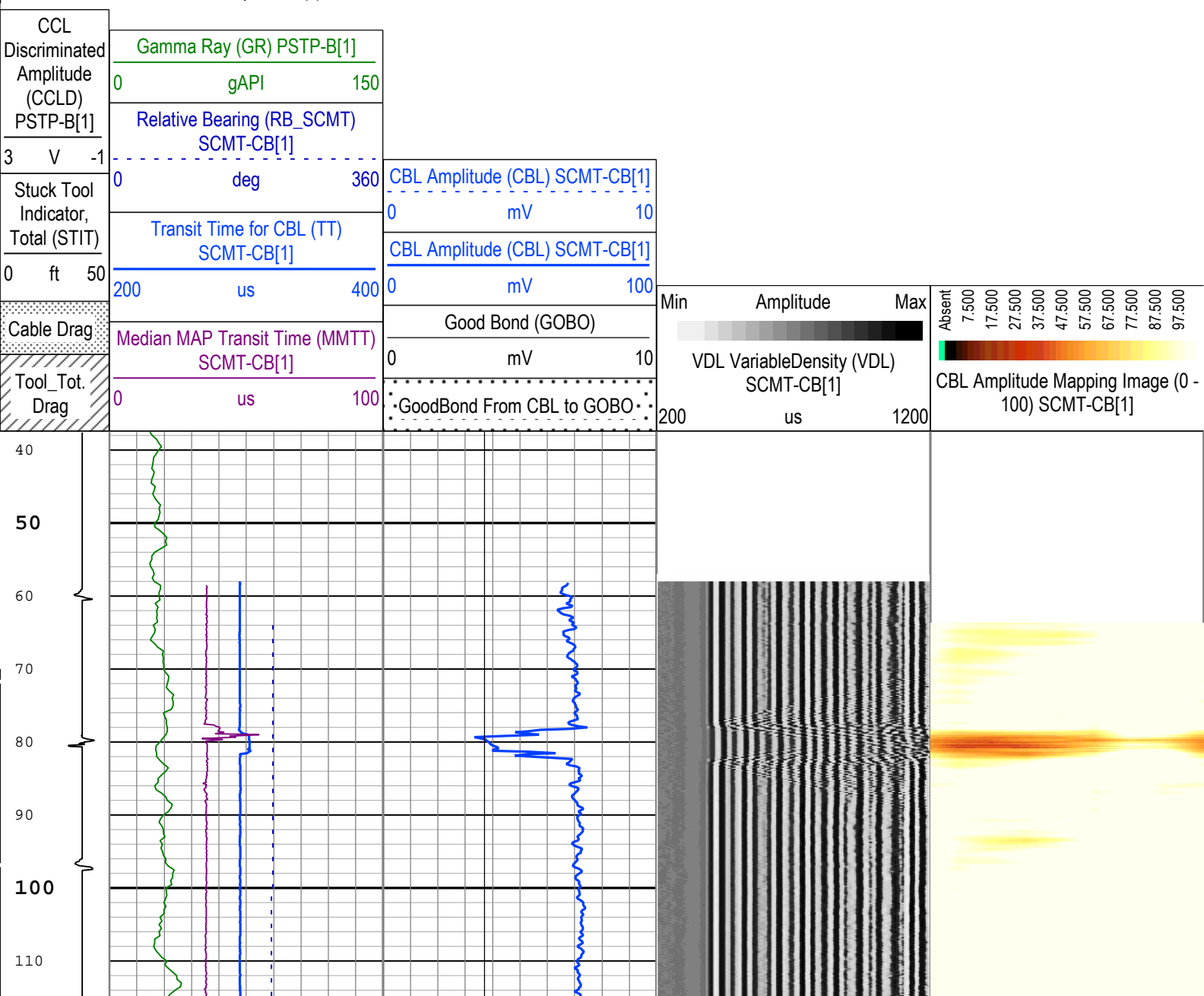
All depths are referenced to toolstring zero

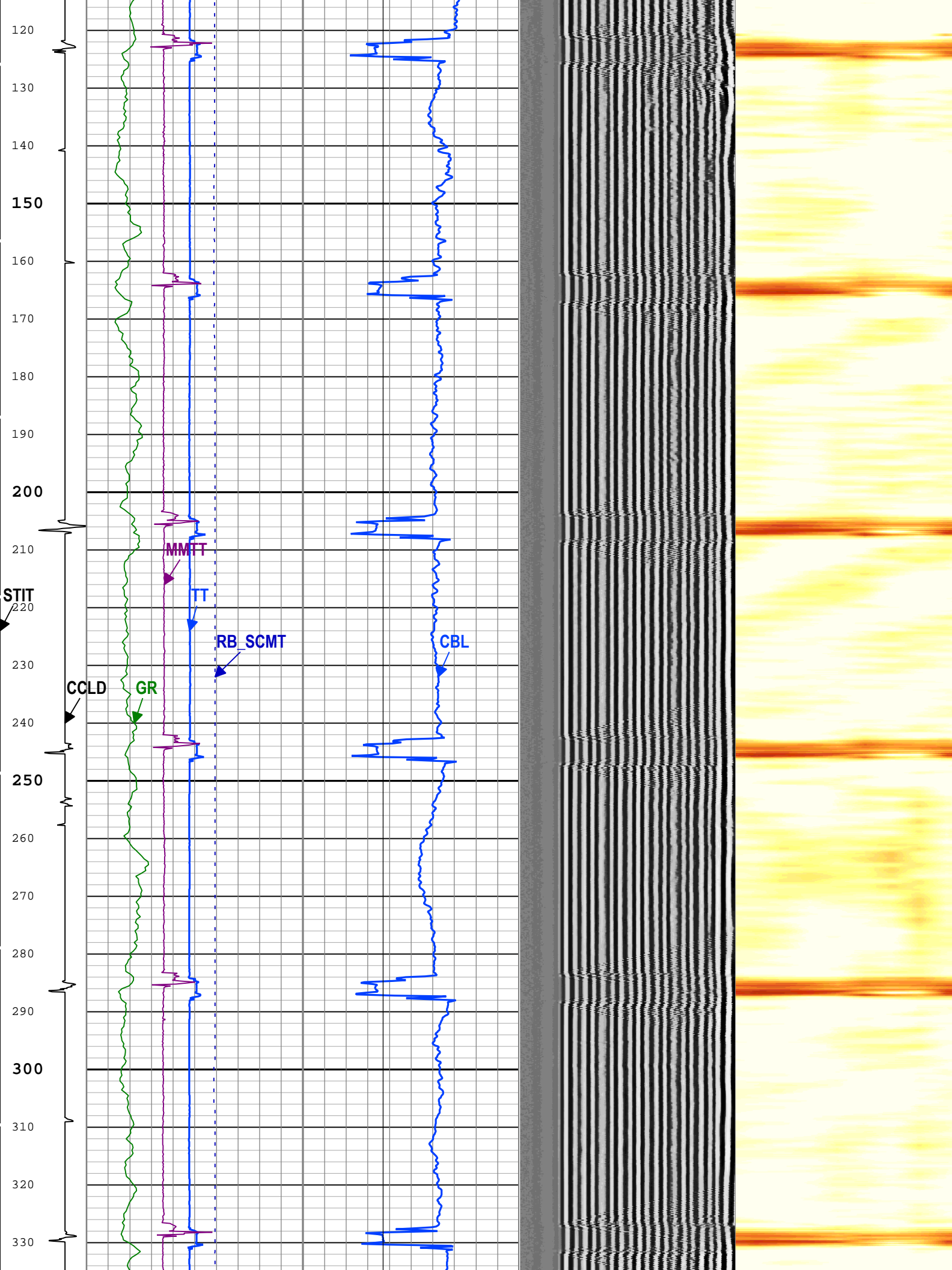
Log

Company:Noble Energy Inc Well:Wells Ranch AE32-630  
Composite 1:S038

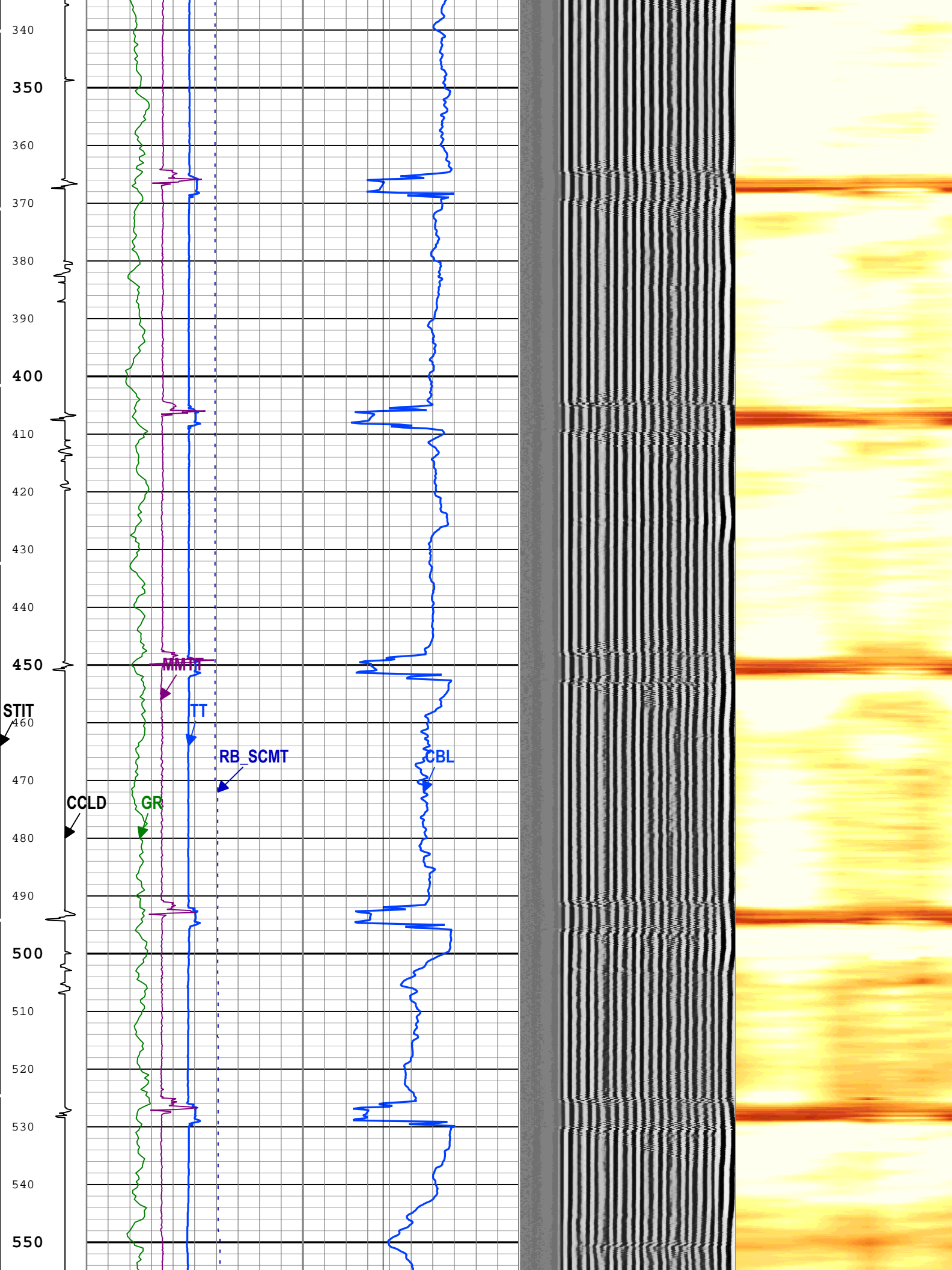
Description: SCMT VDL Image Format: Log ( SCMT\_VDL\_Image ) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 02-Nov-2015 19:12:10

TIME\_1900 - Time Marked every 60.00 (s)

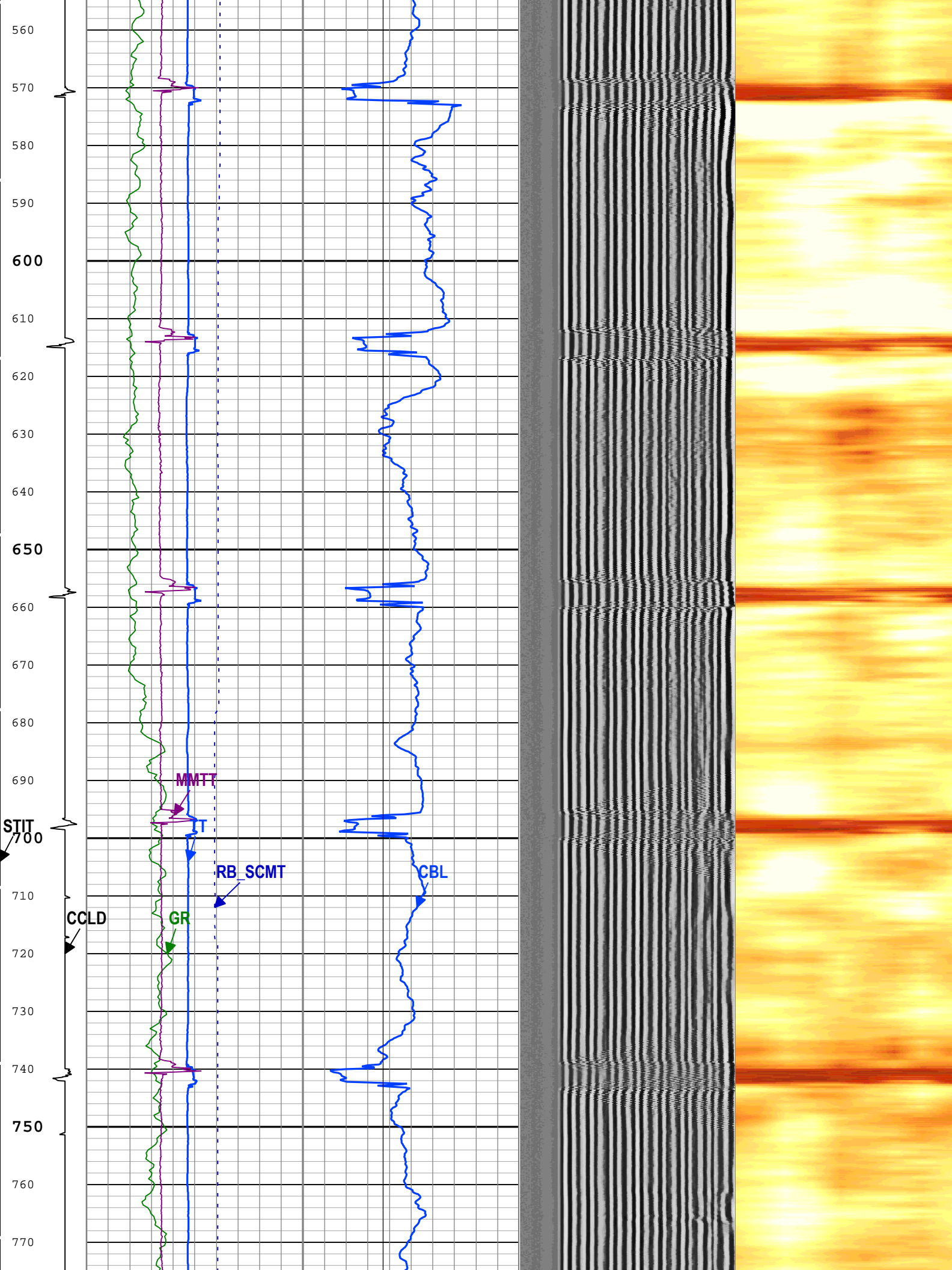


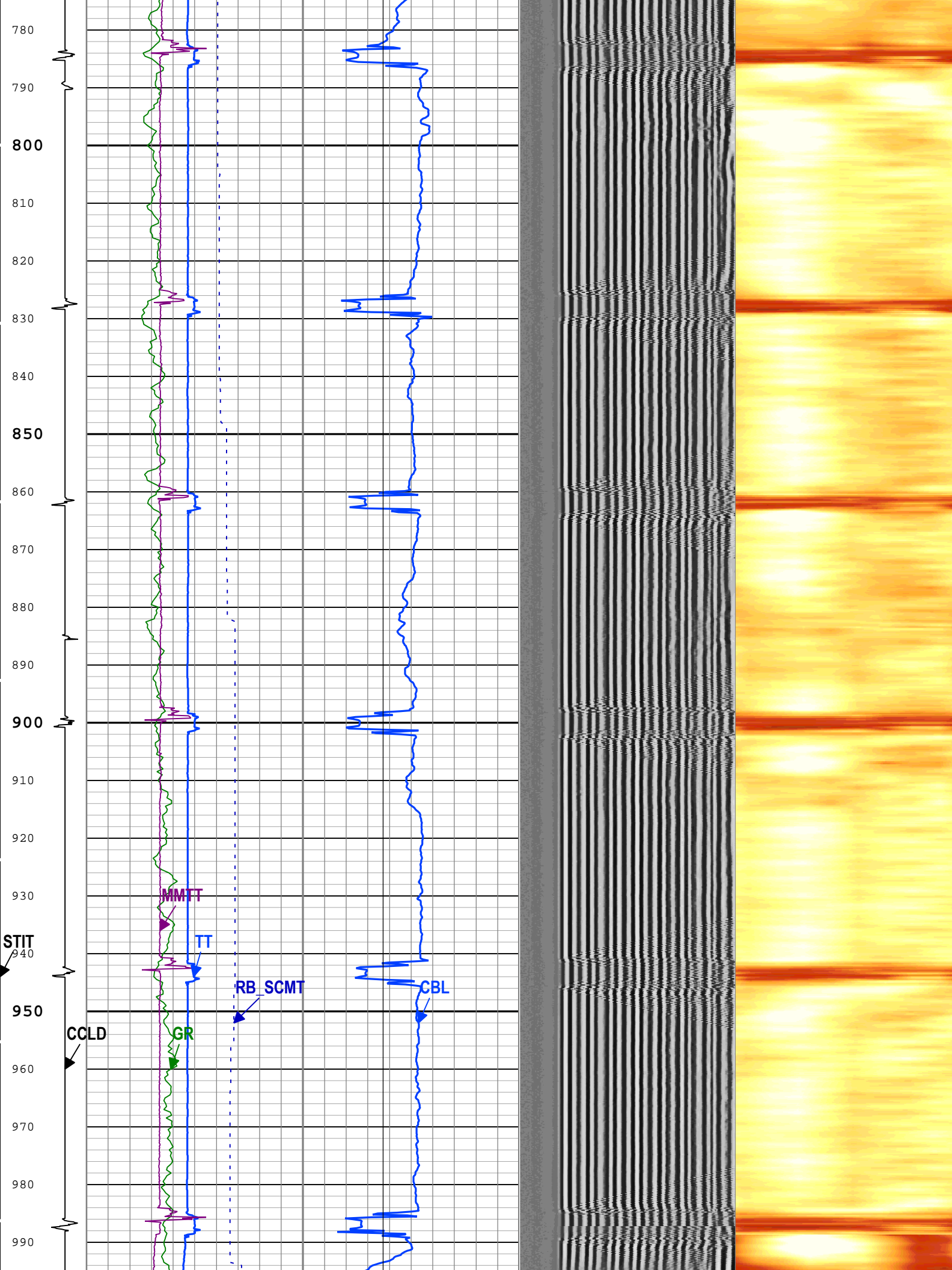


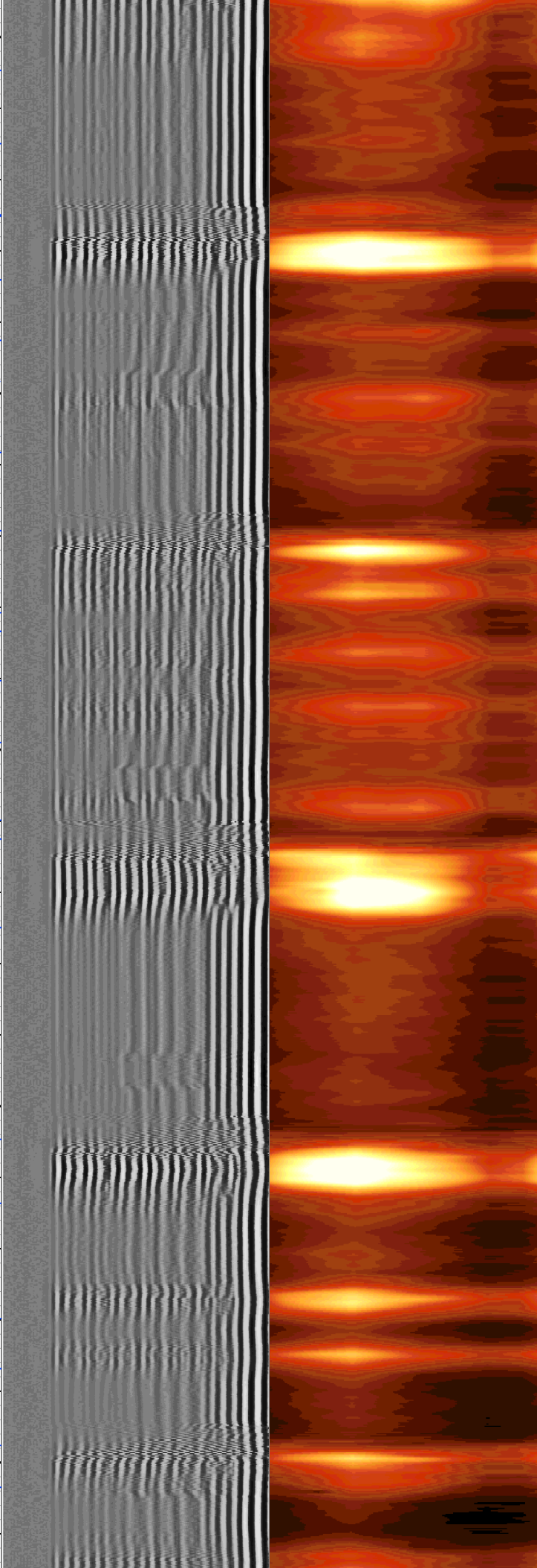
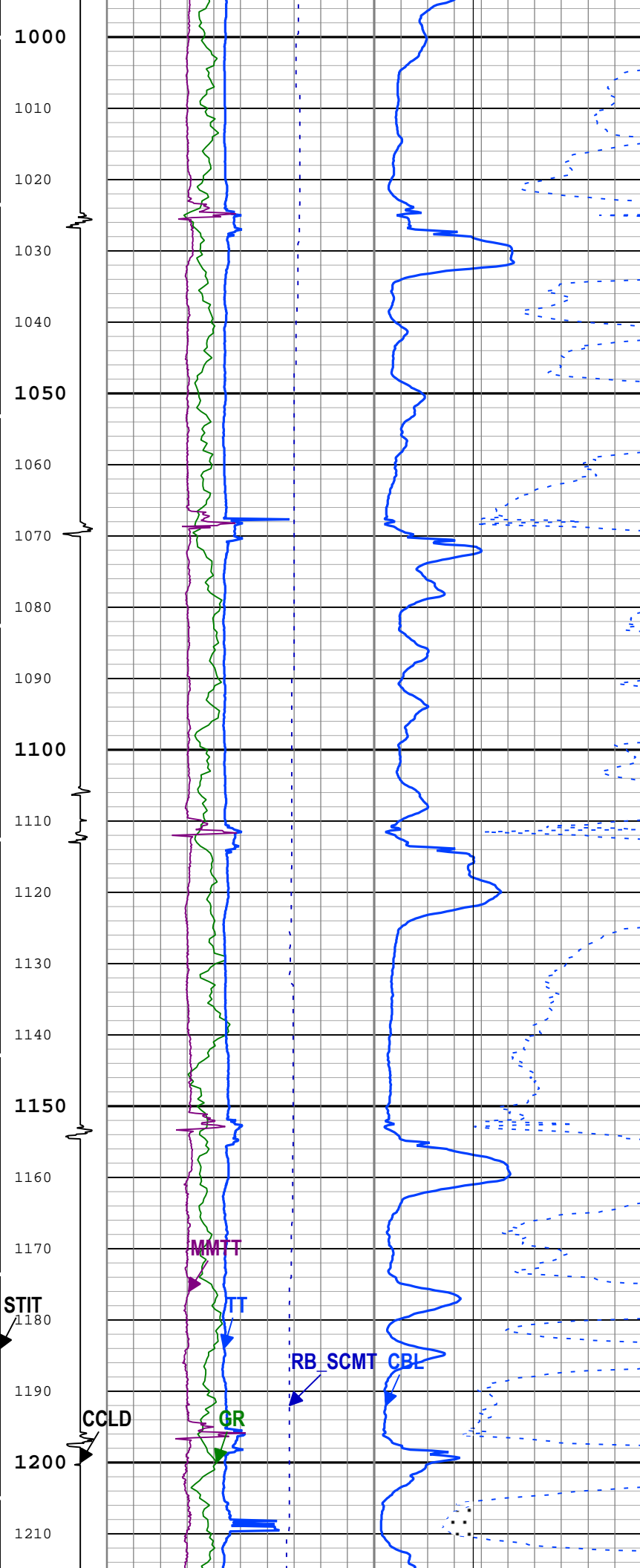




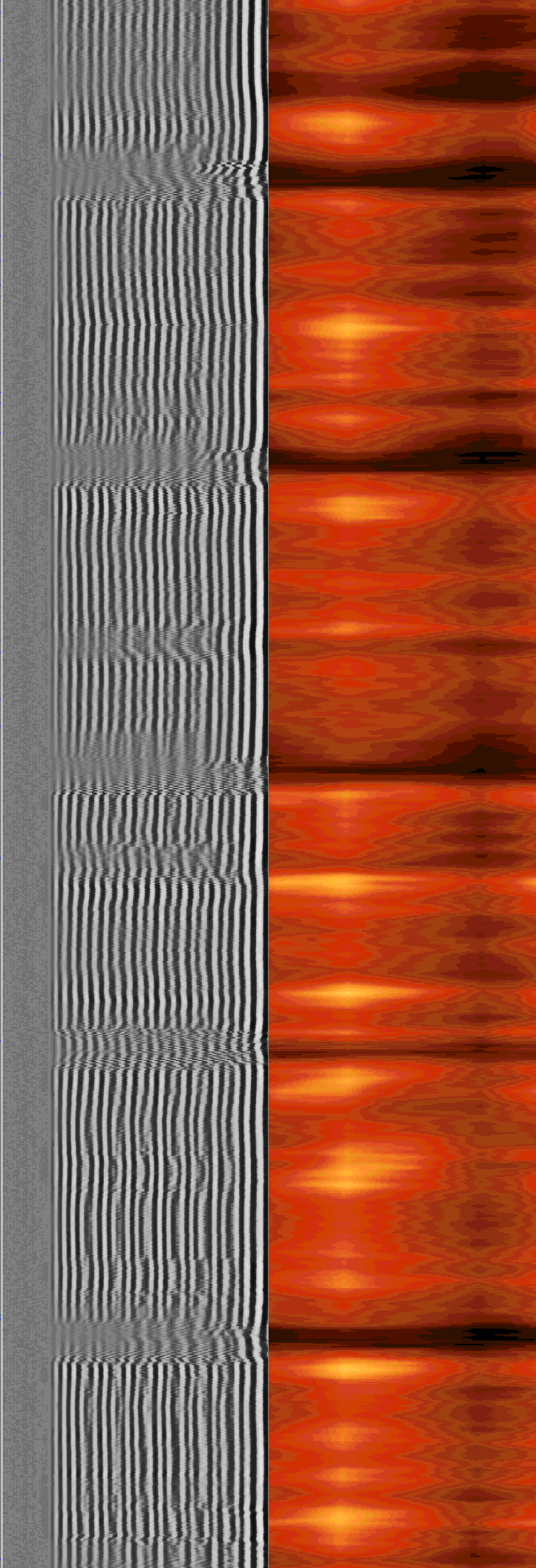
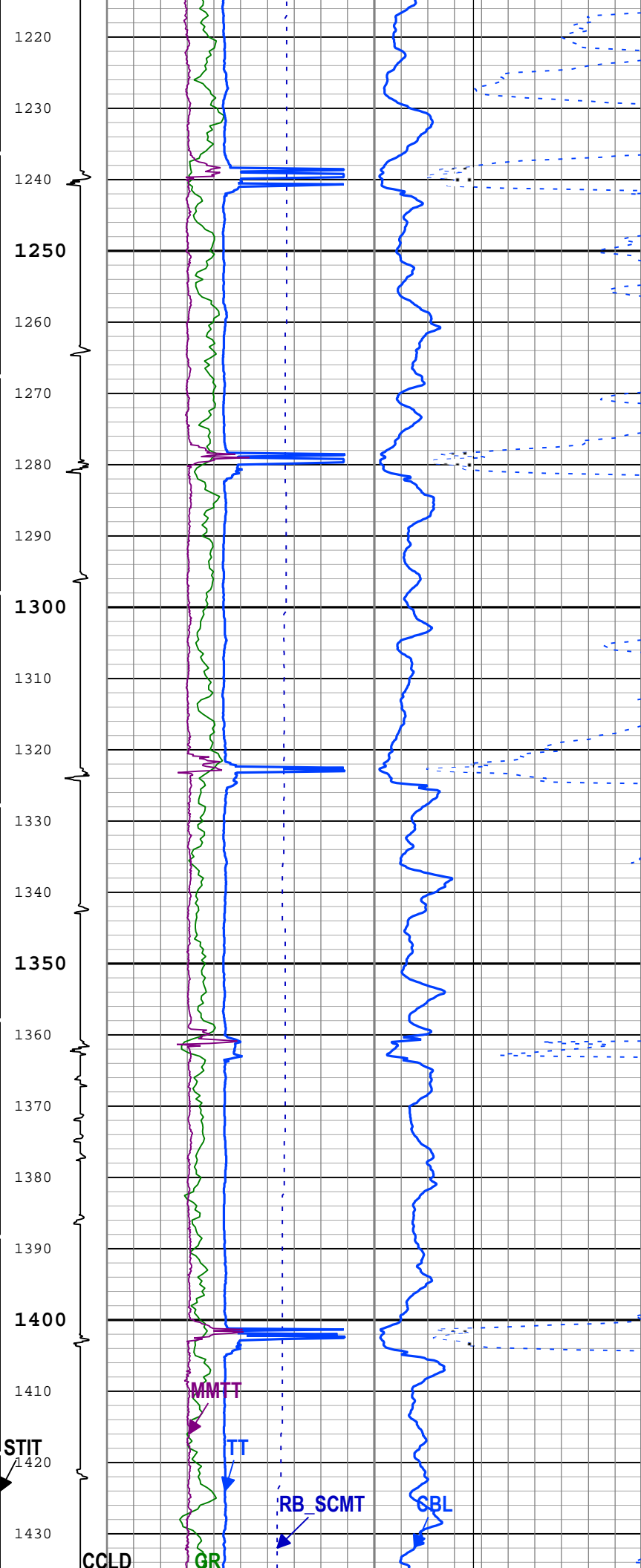


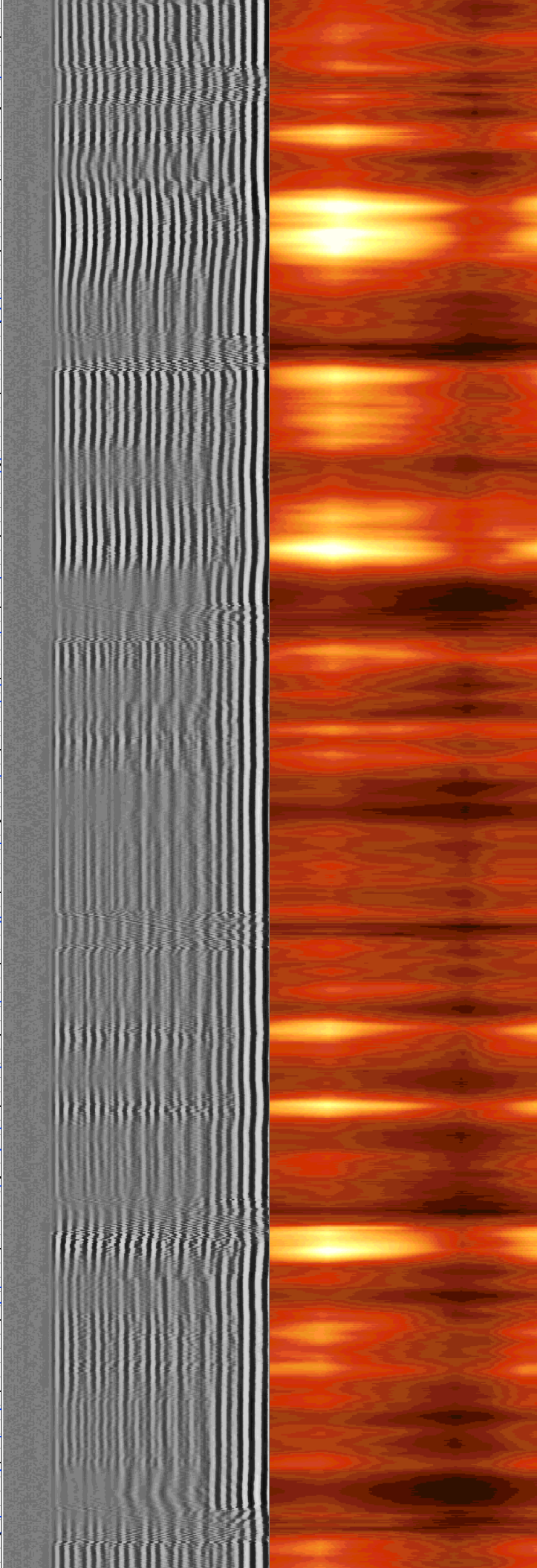
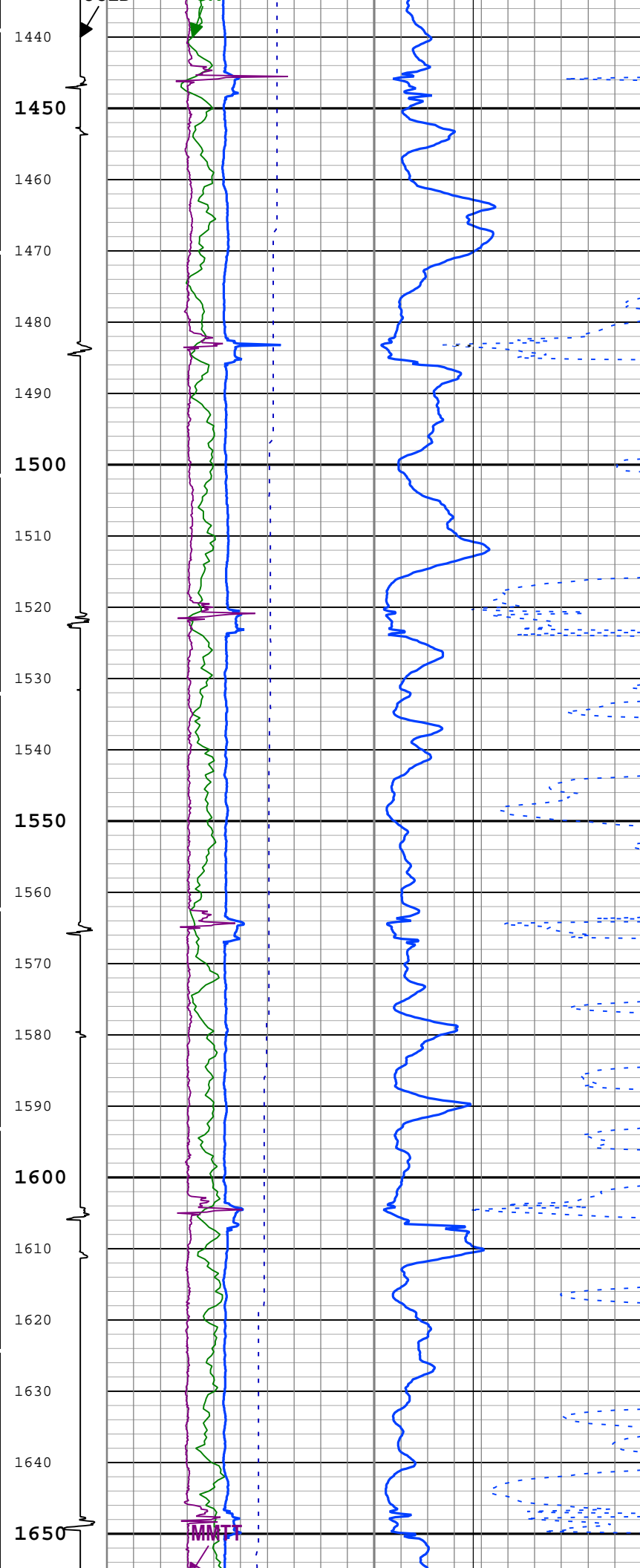


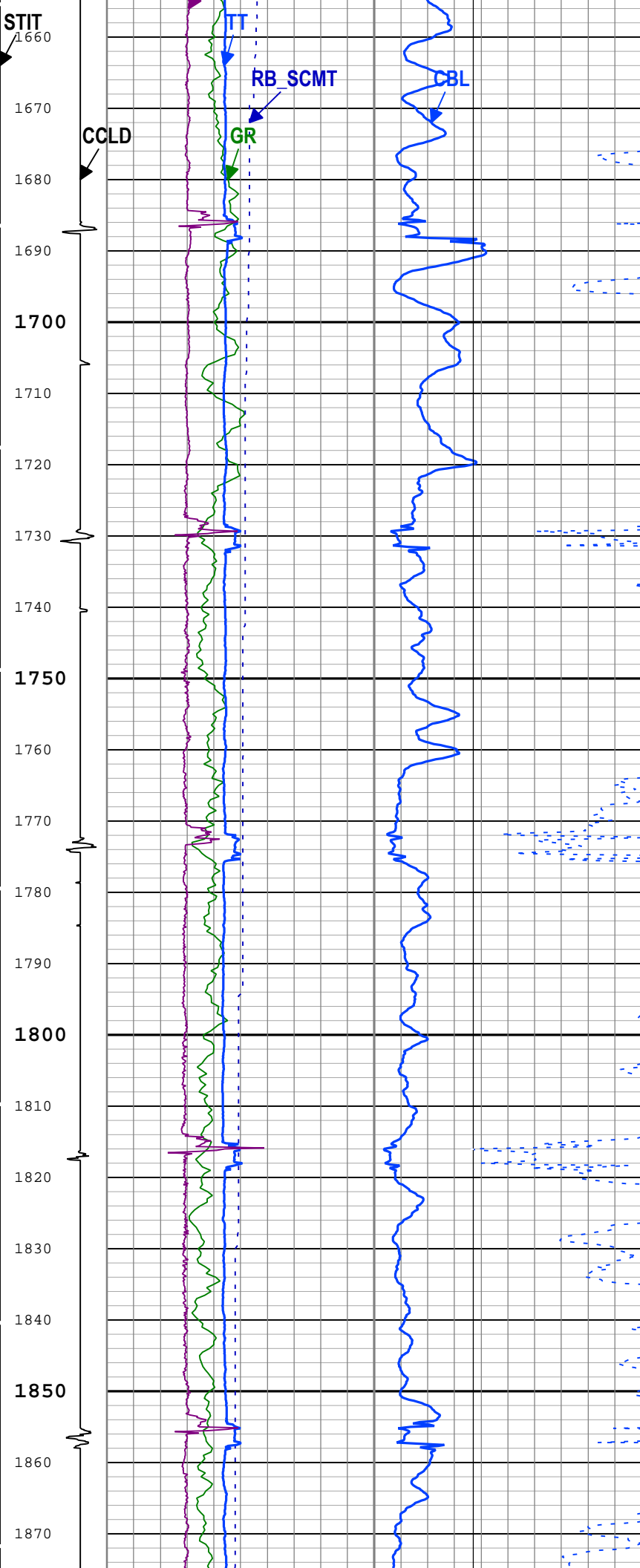




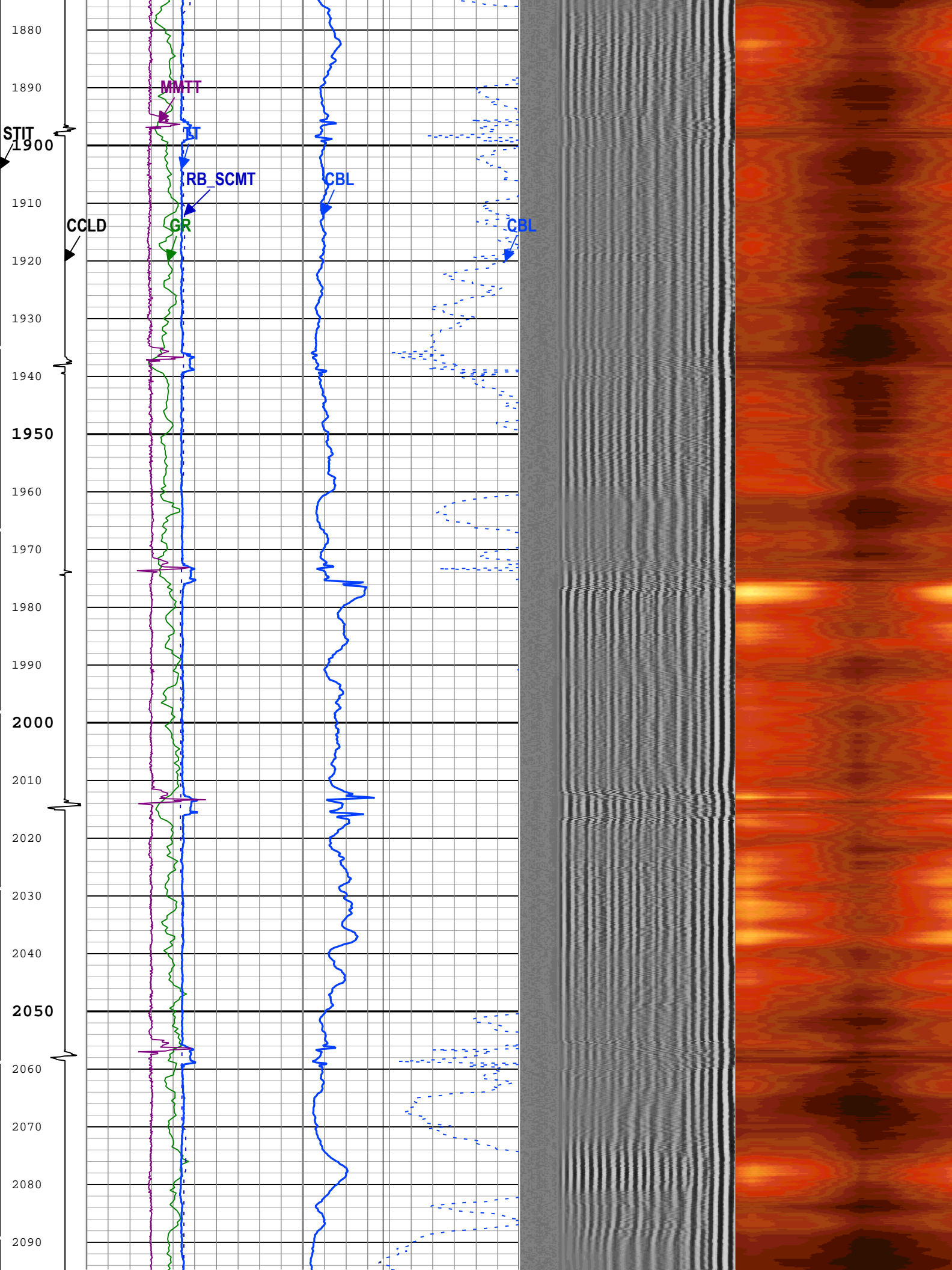




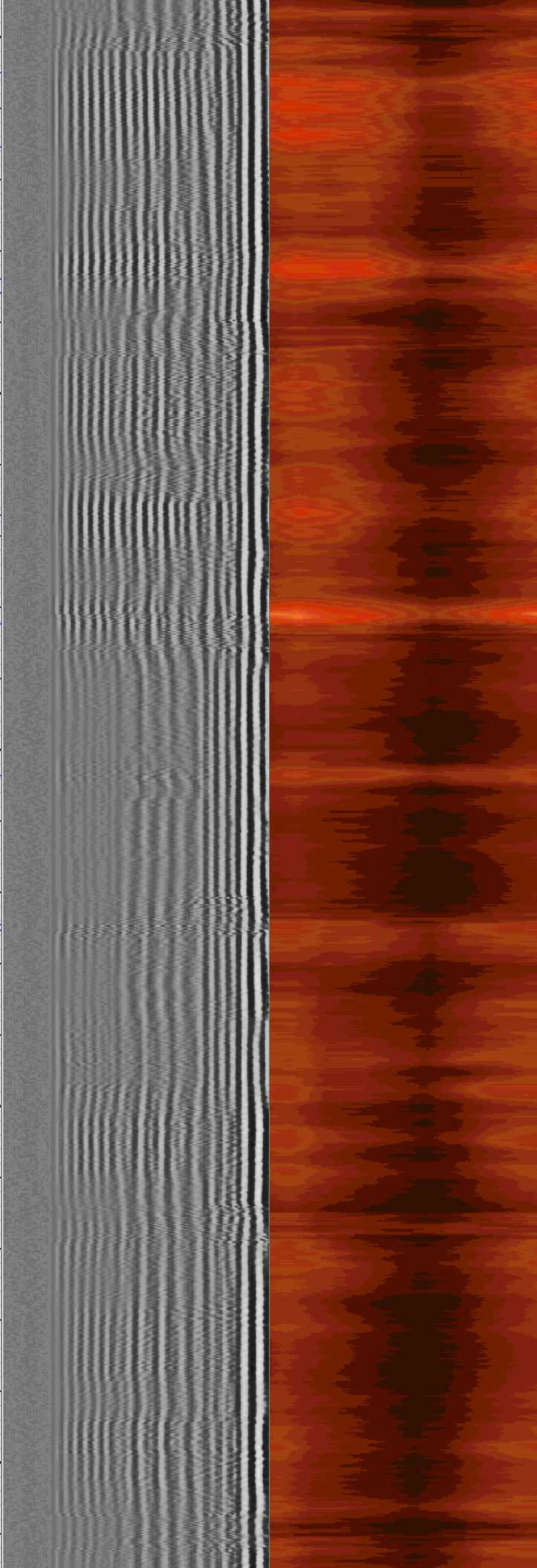
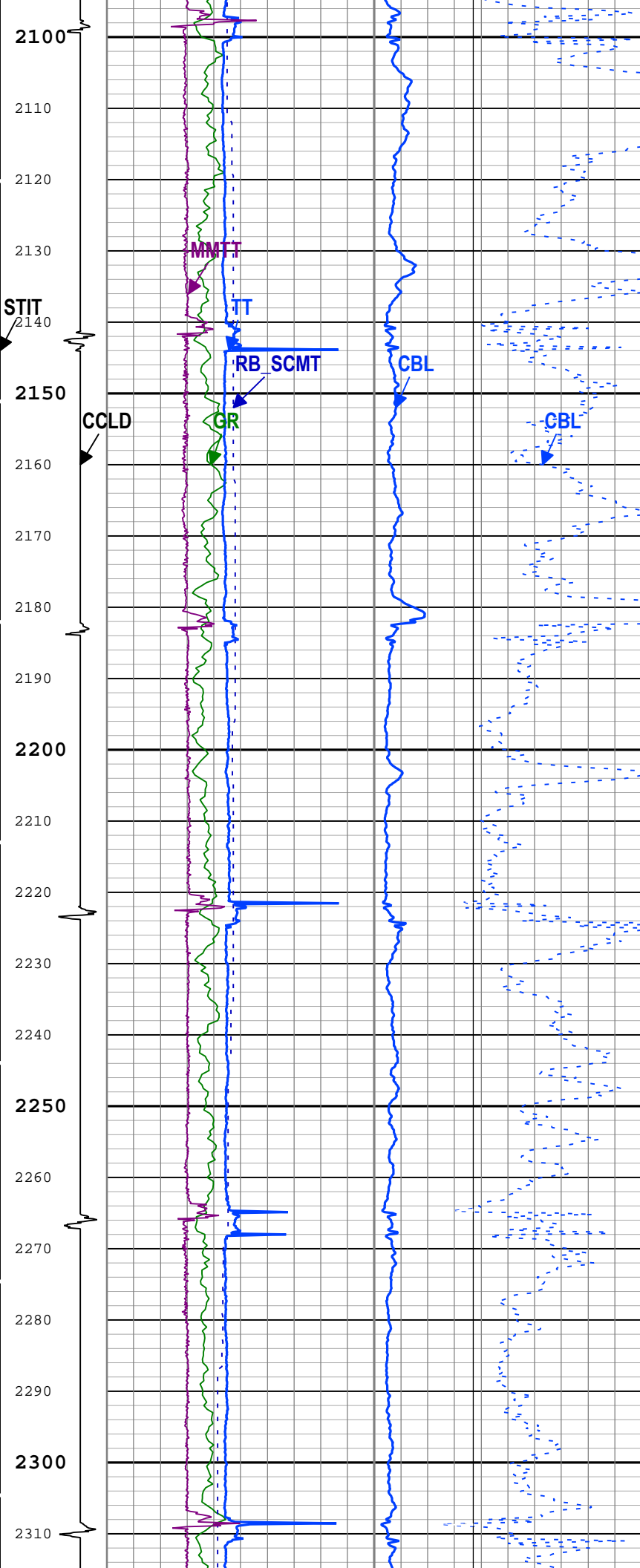


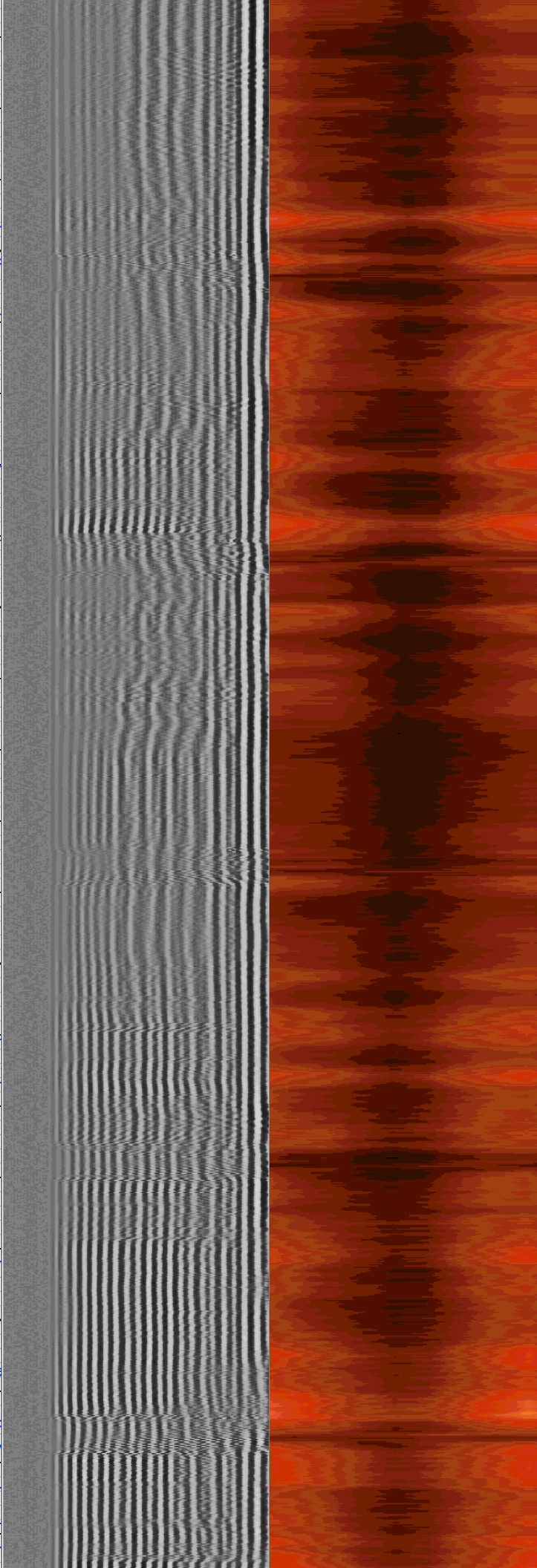
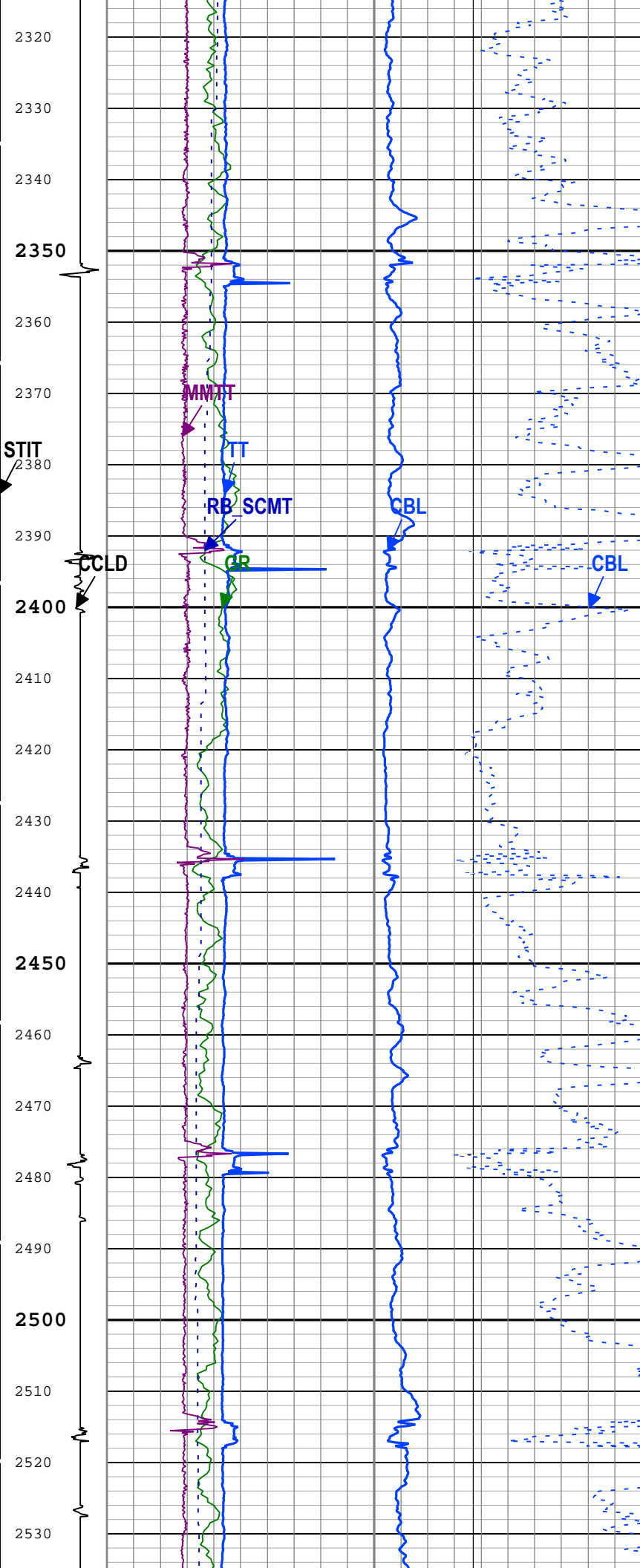


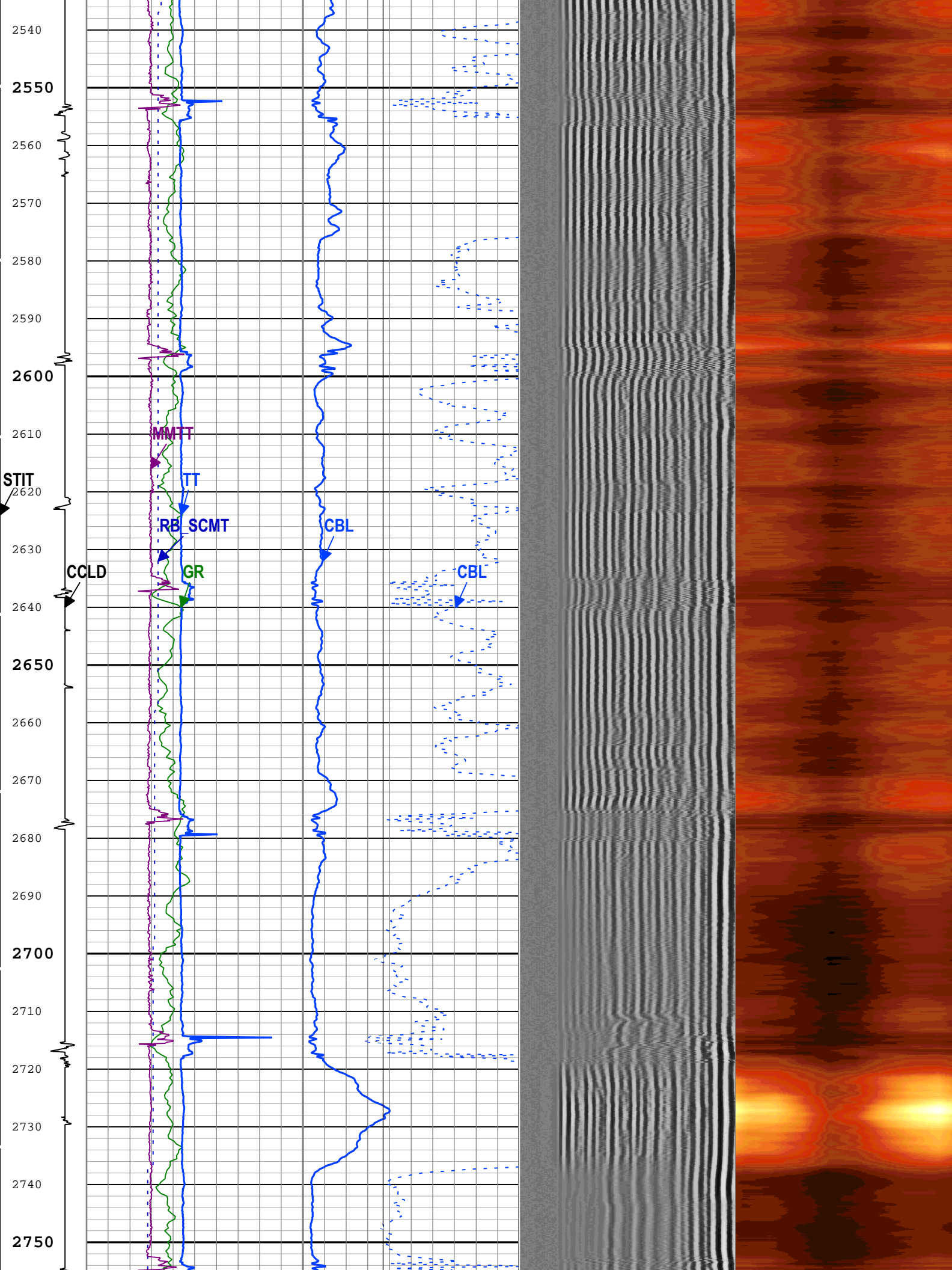




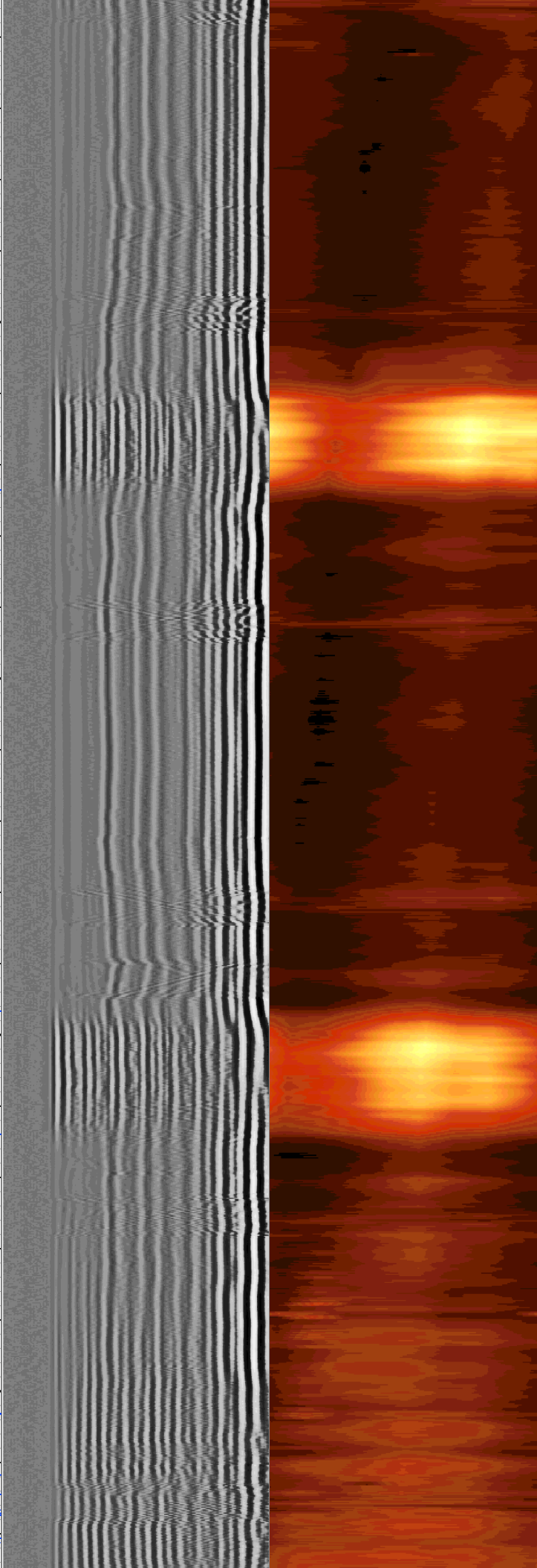
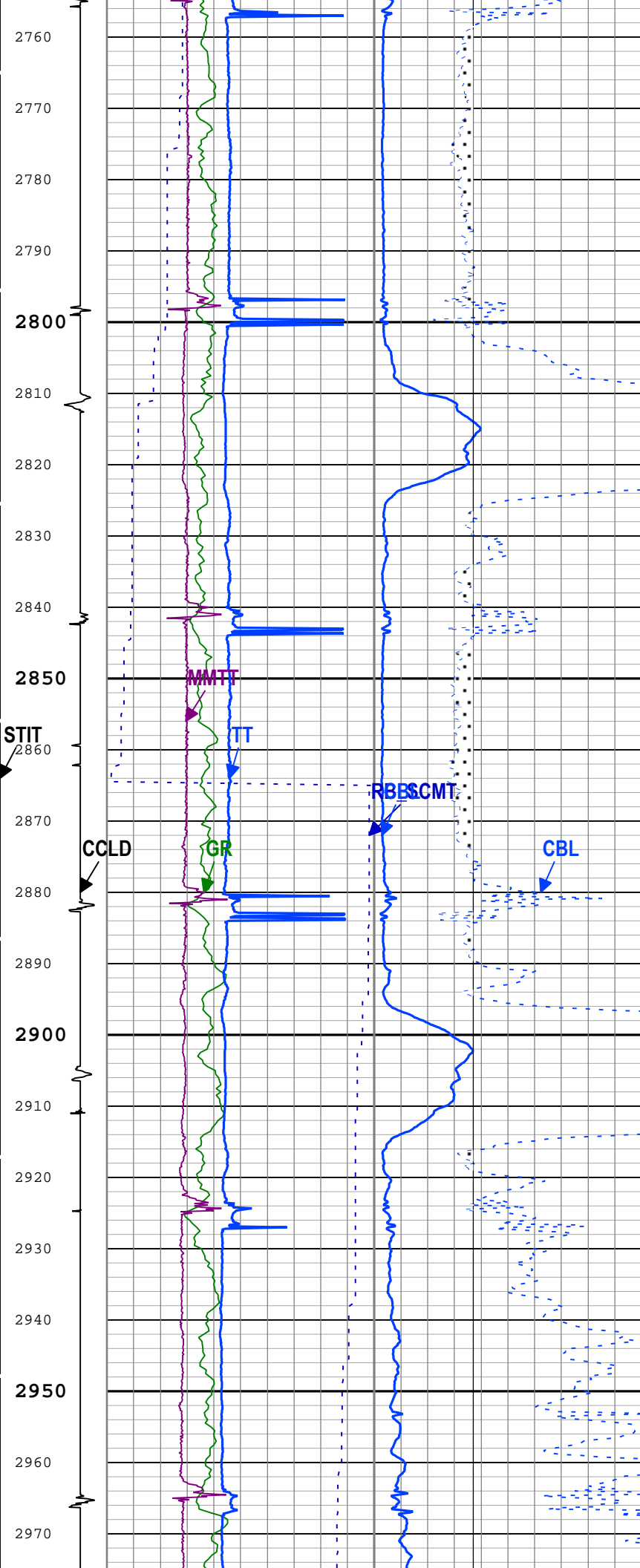


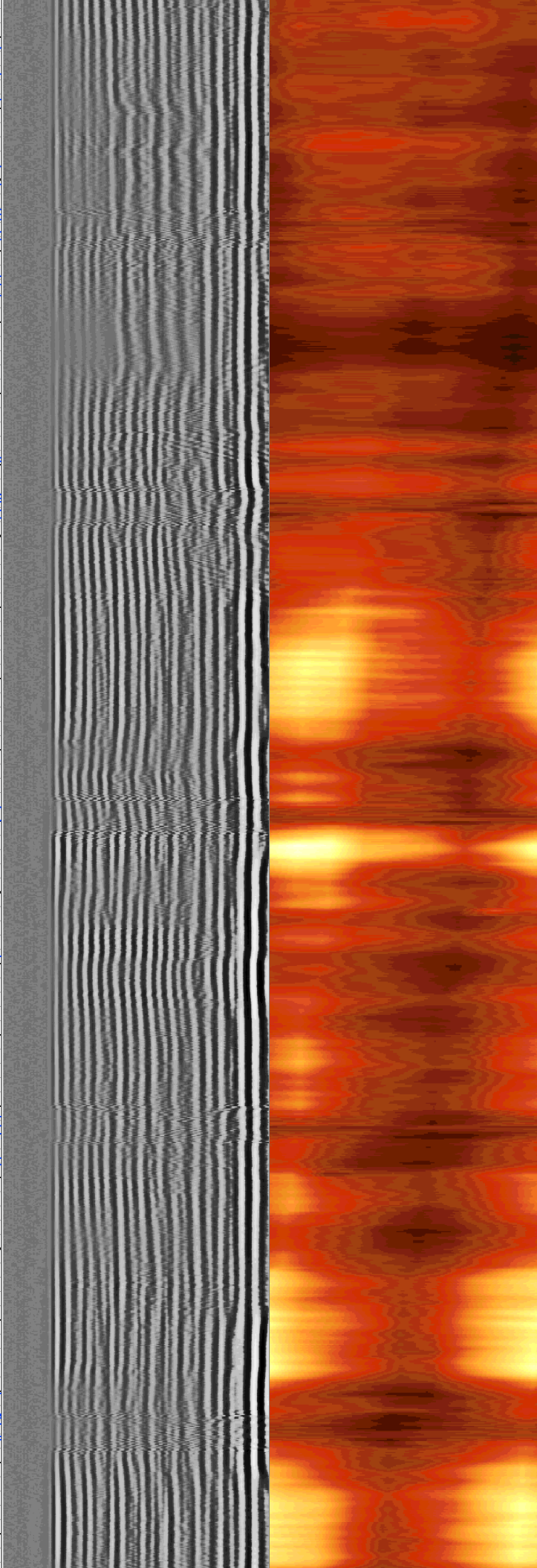
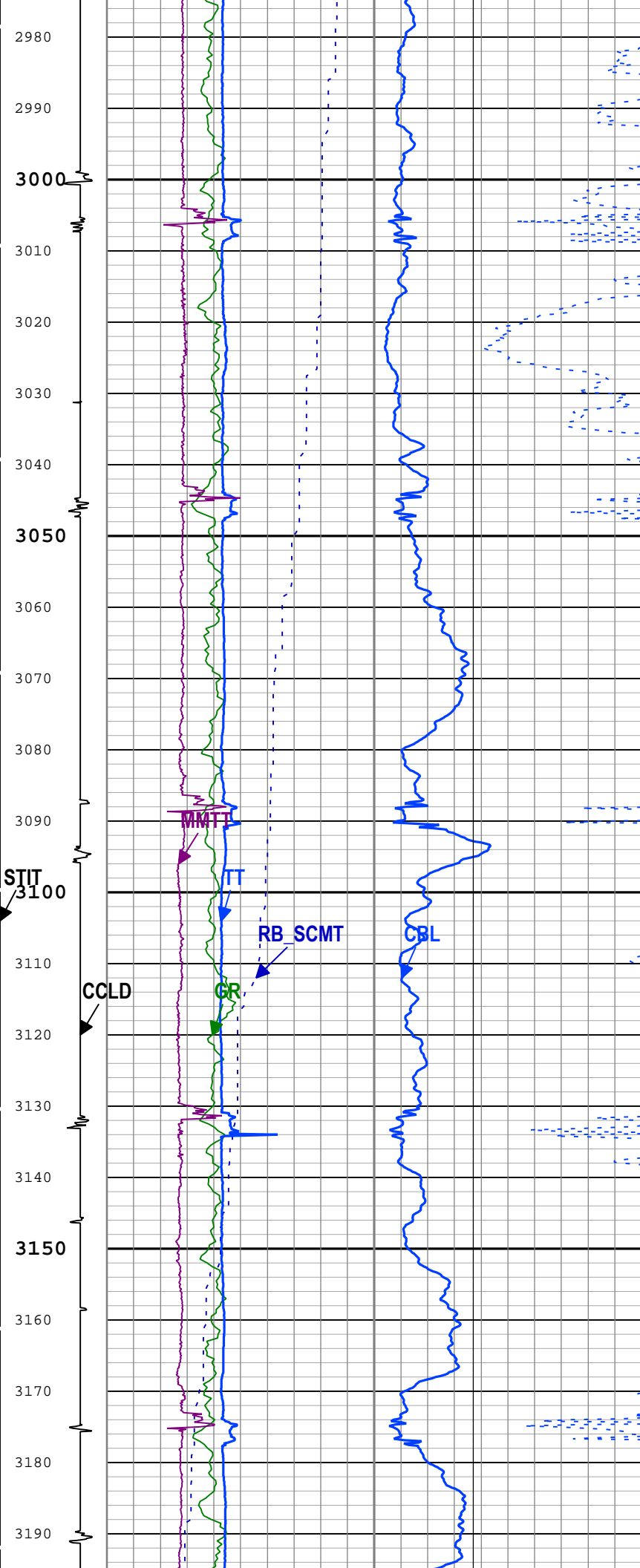


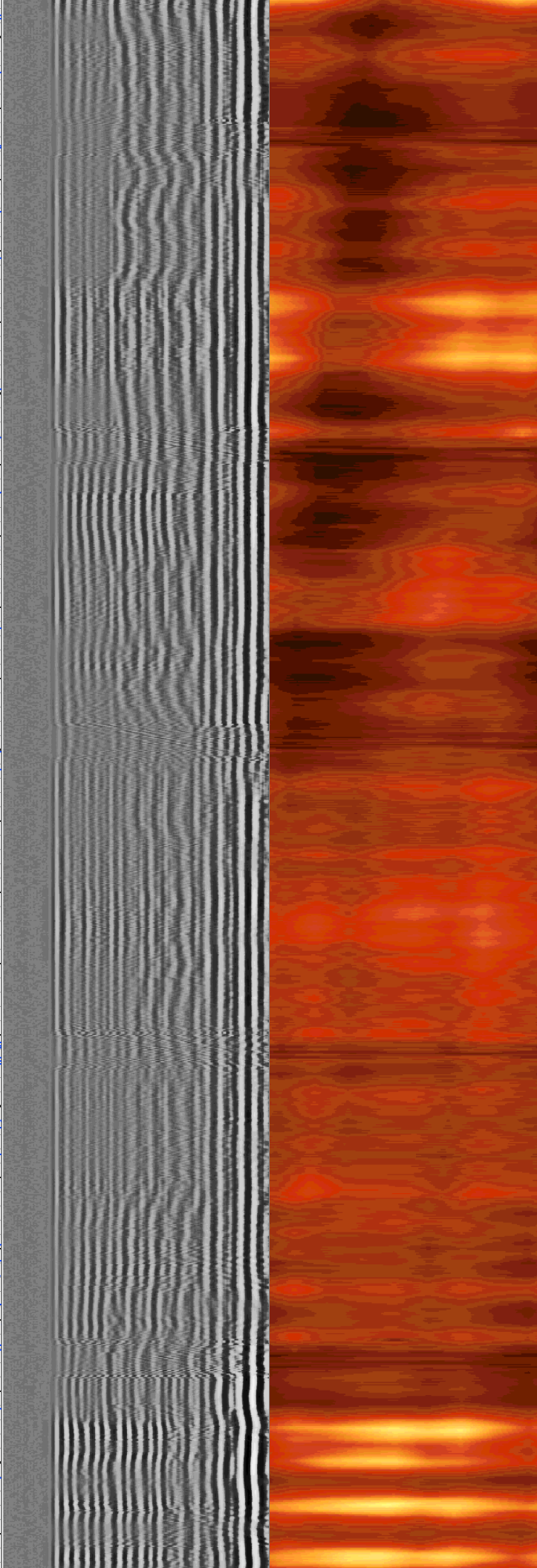
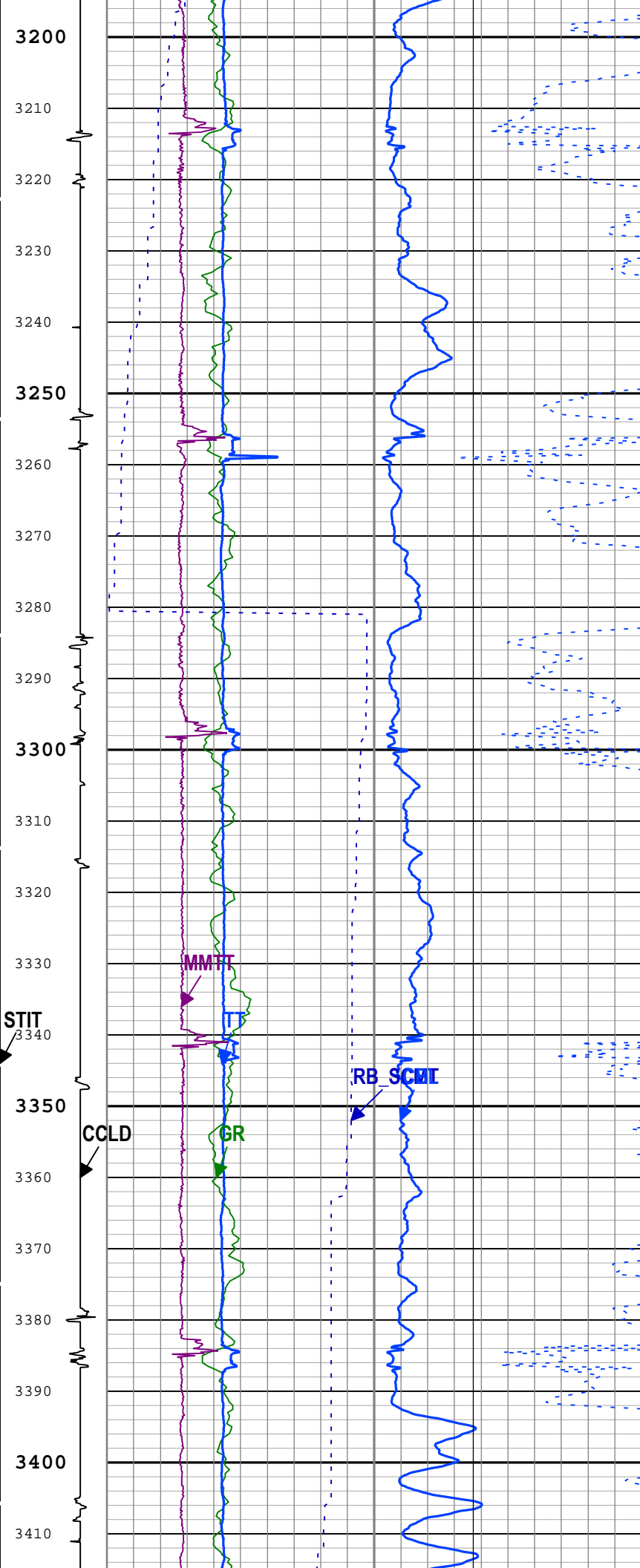




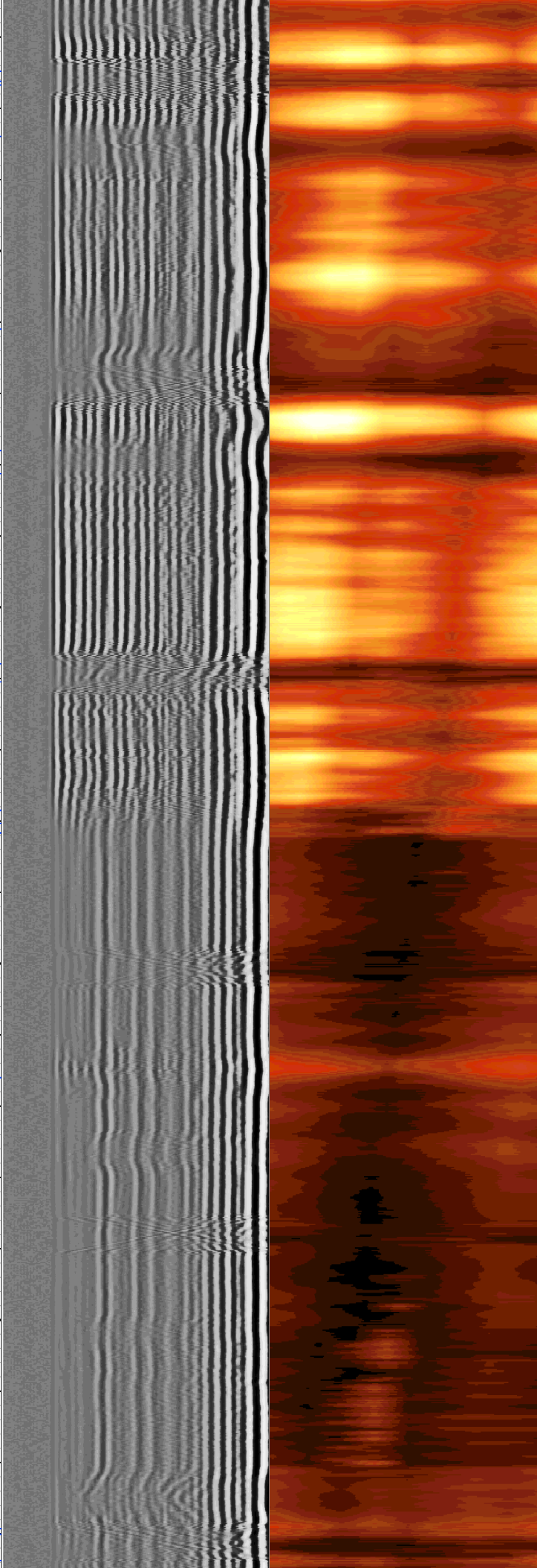
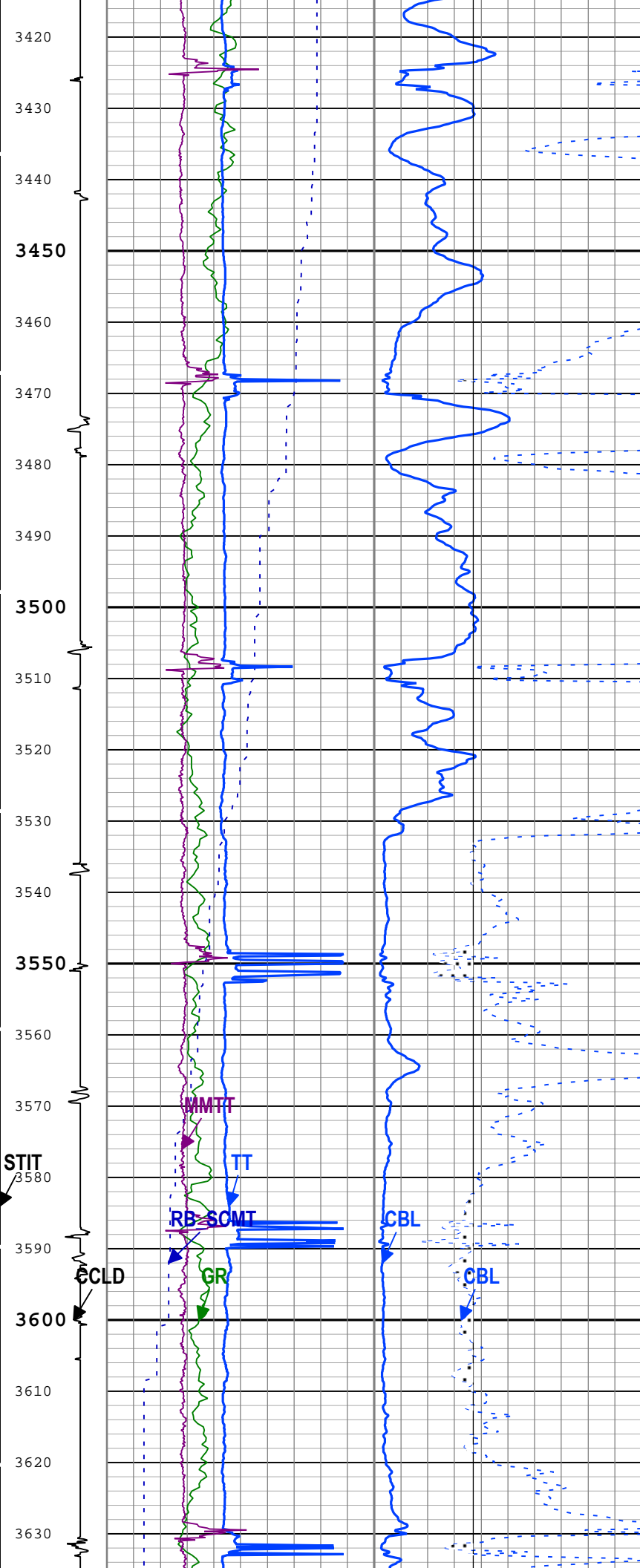




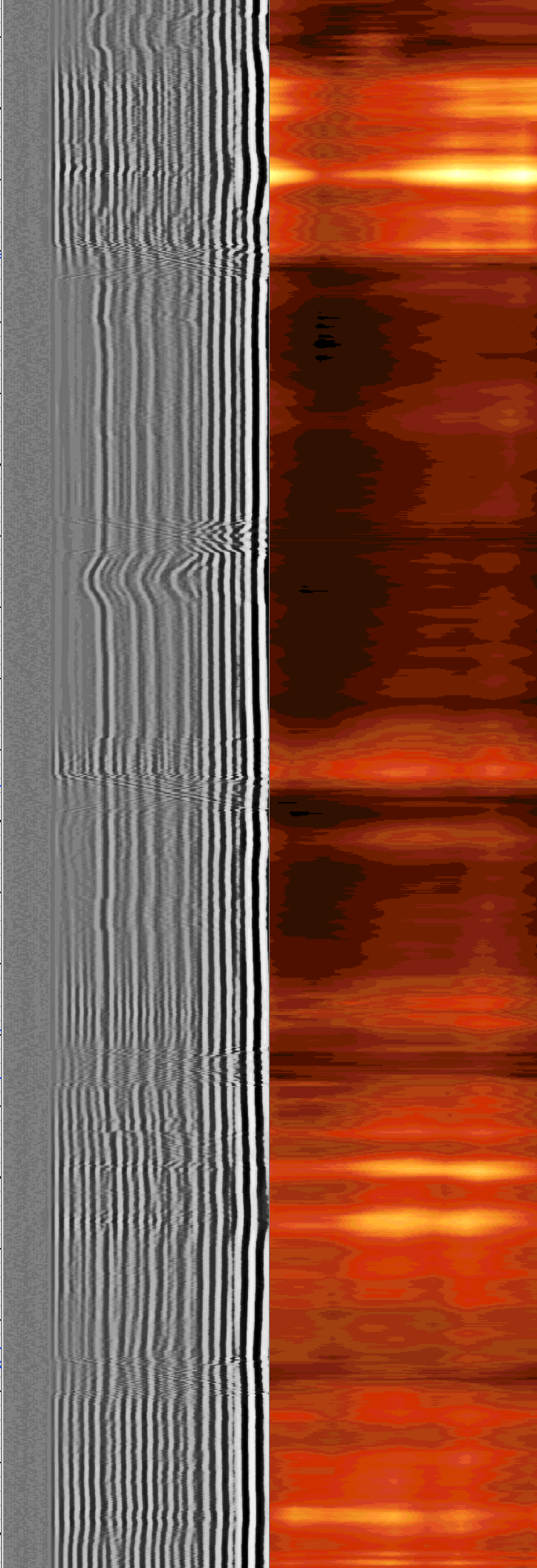
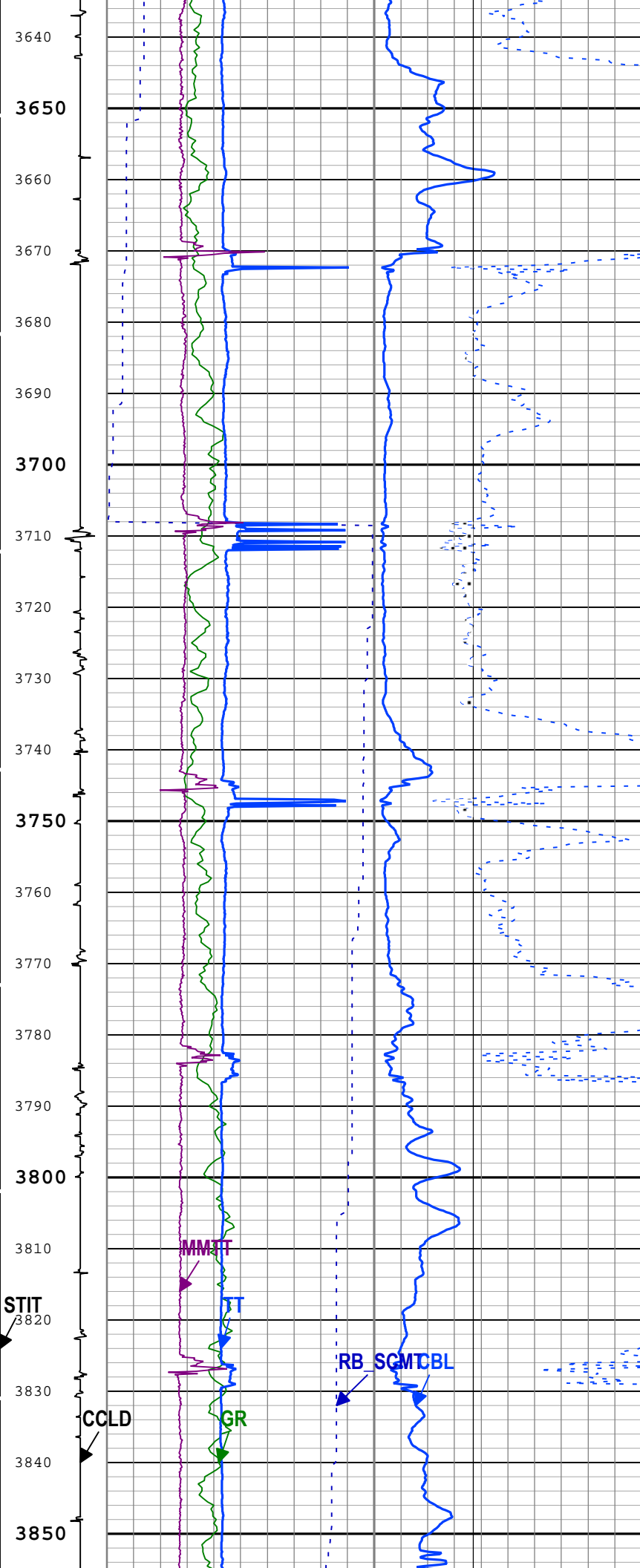


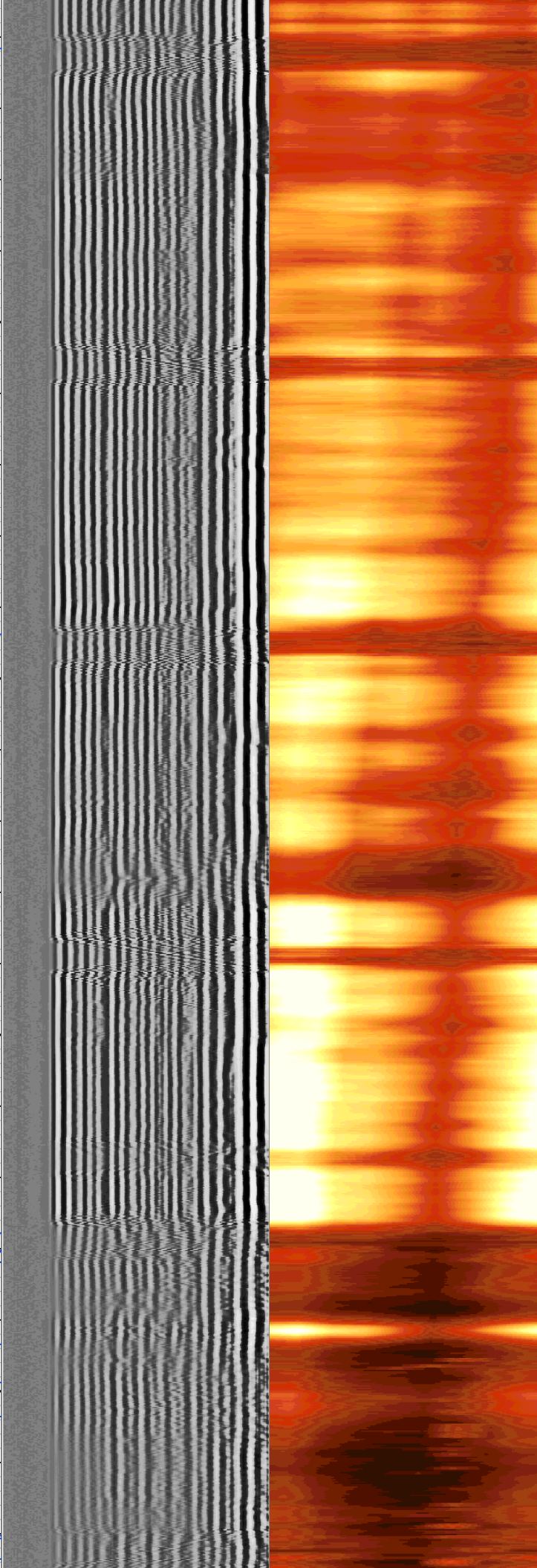
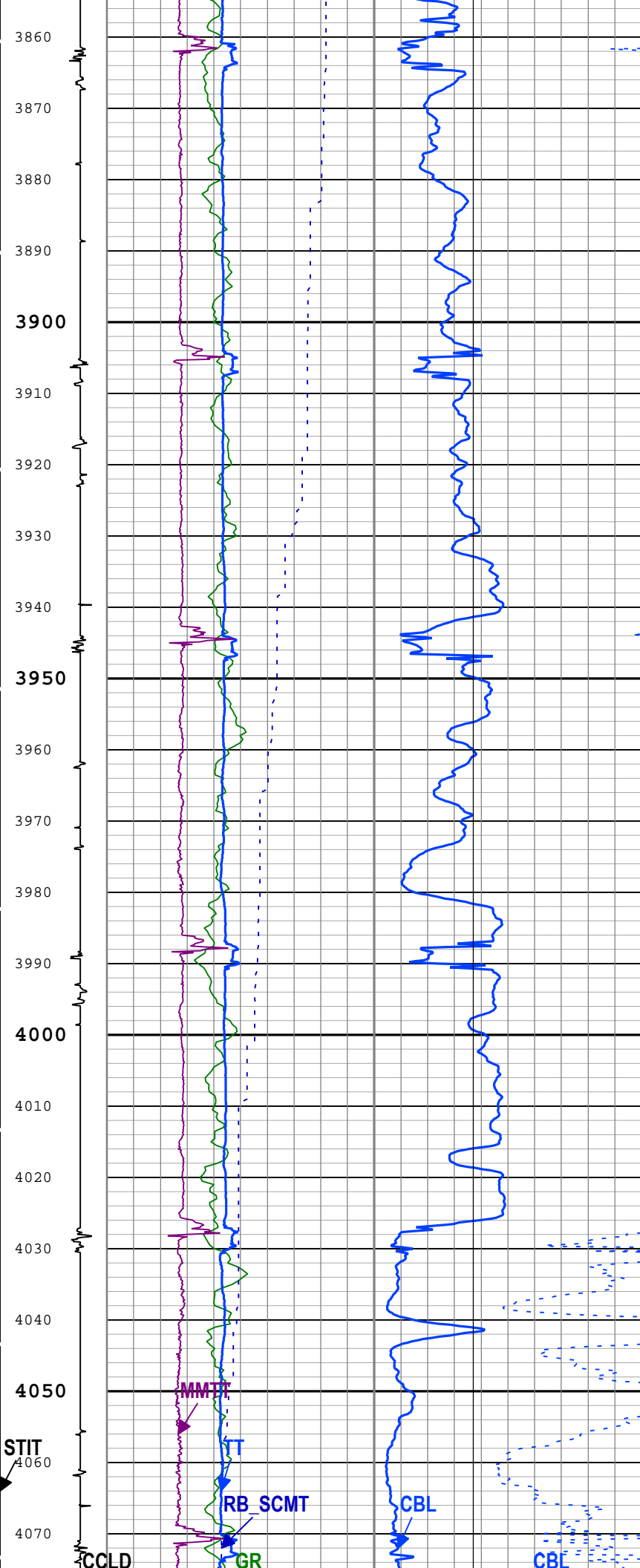


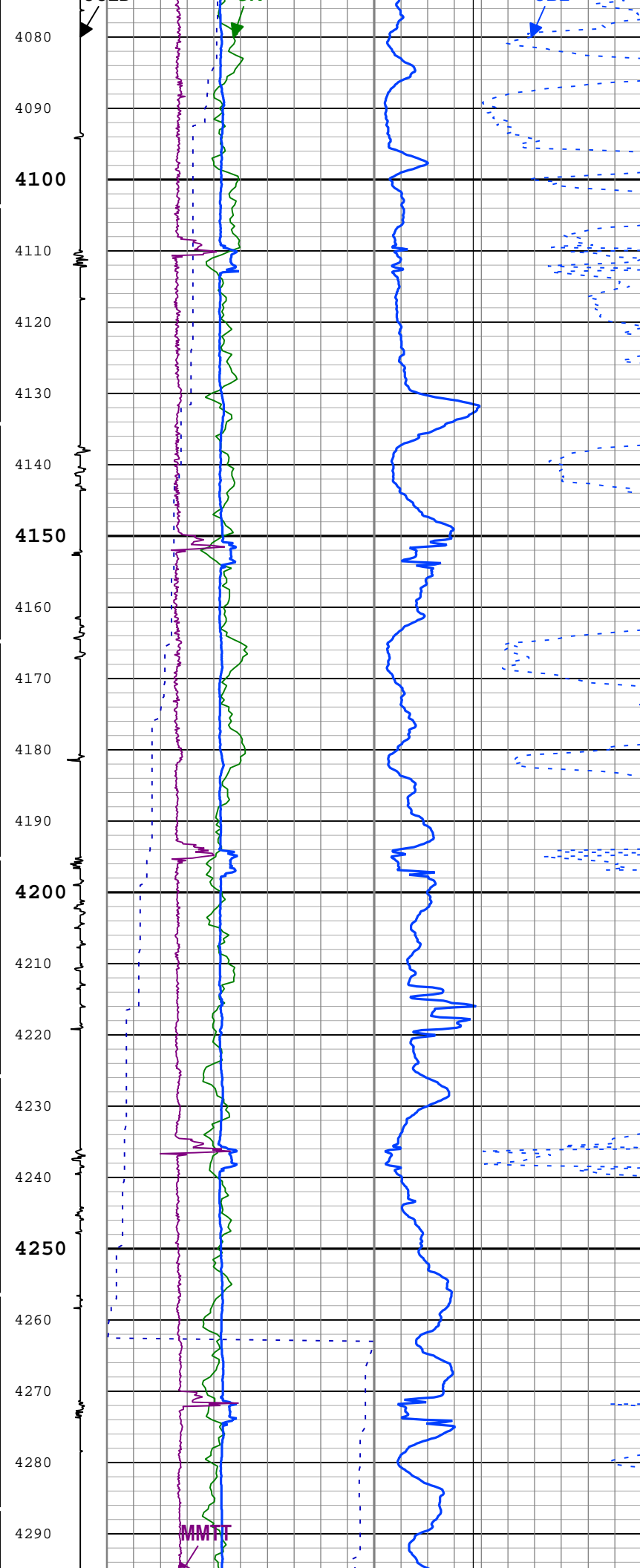




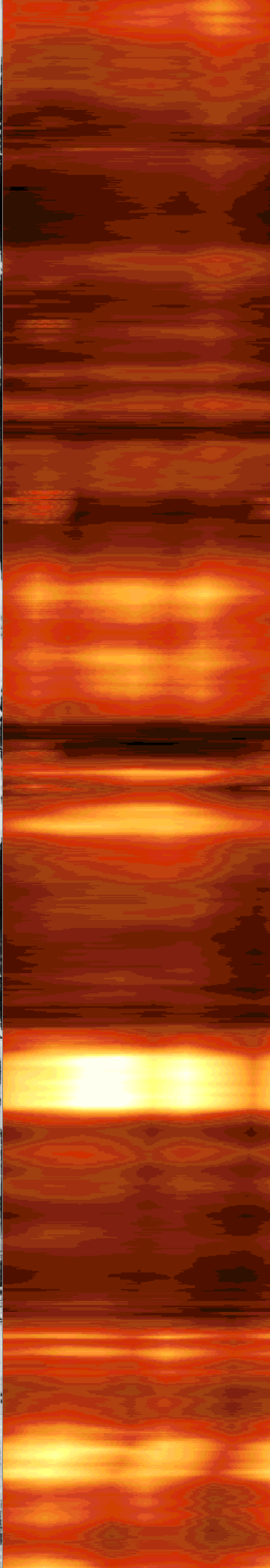
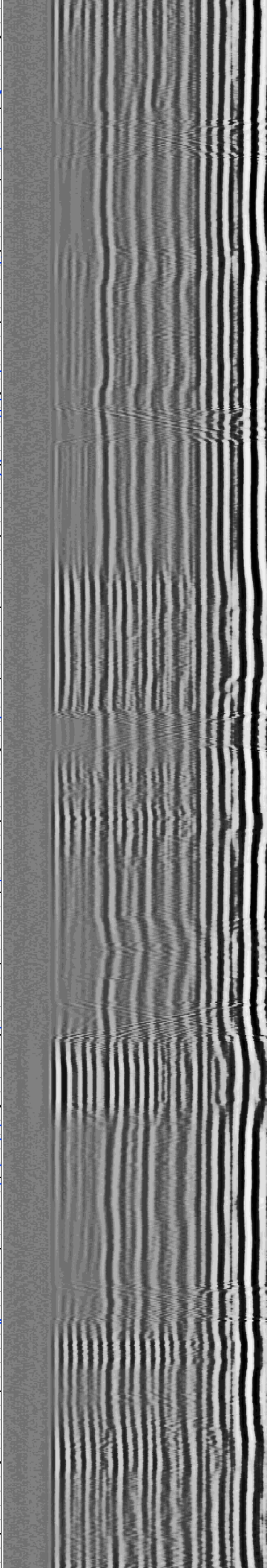
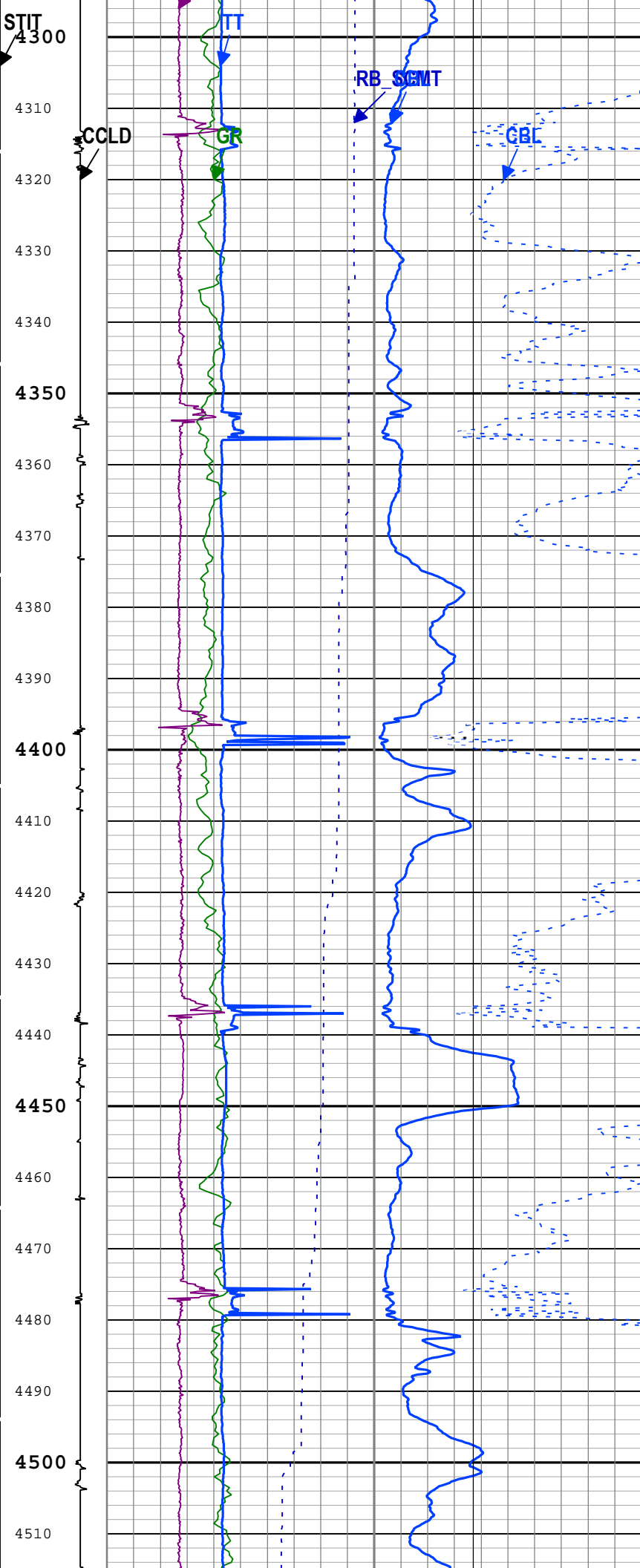


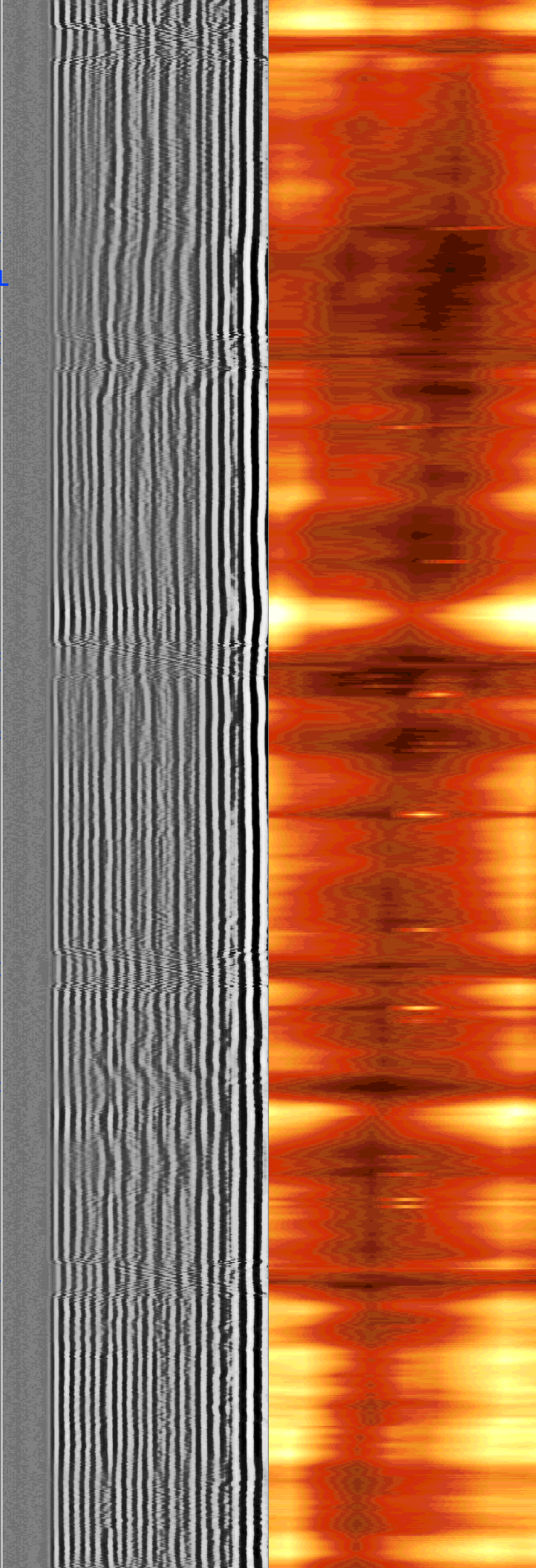
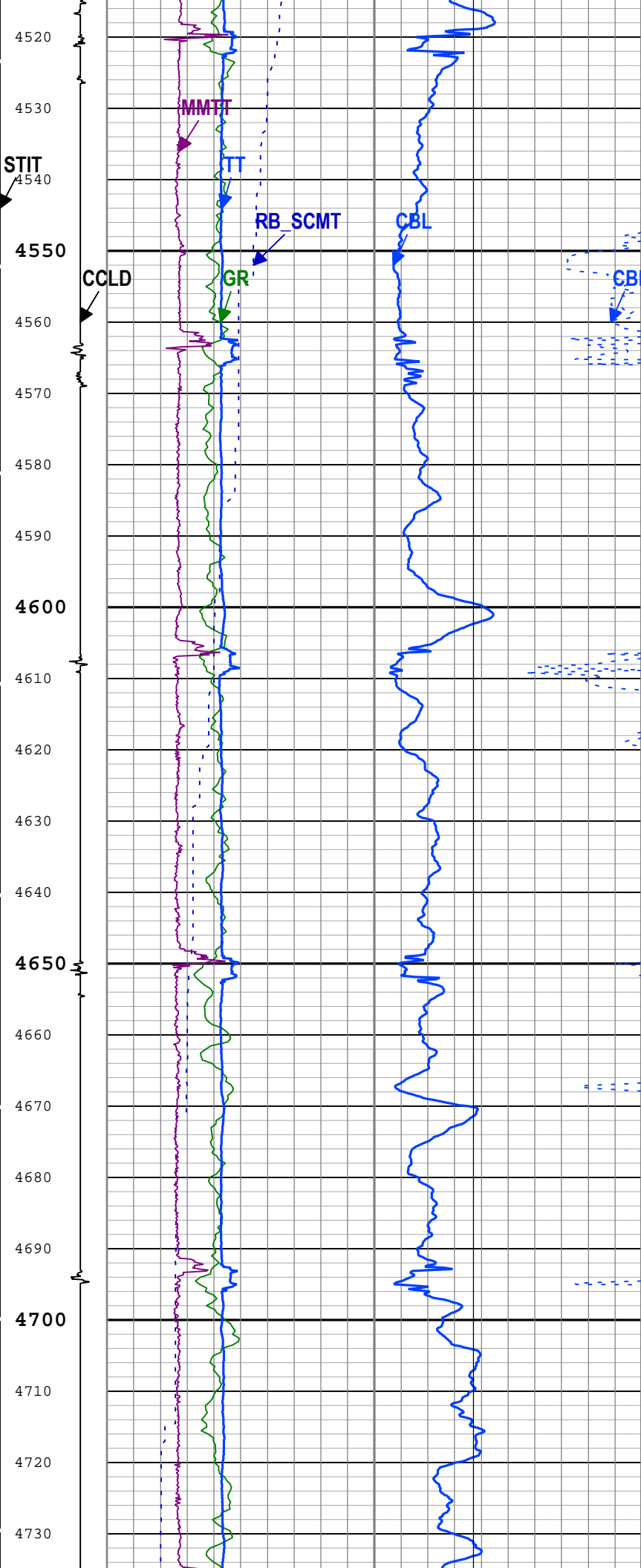




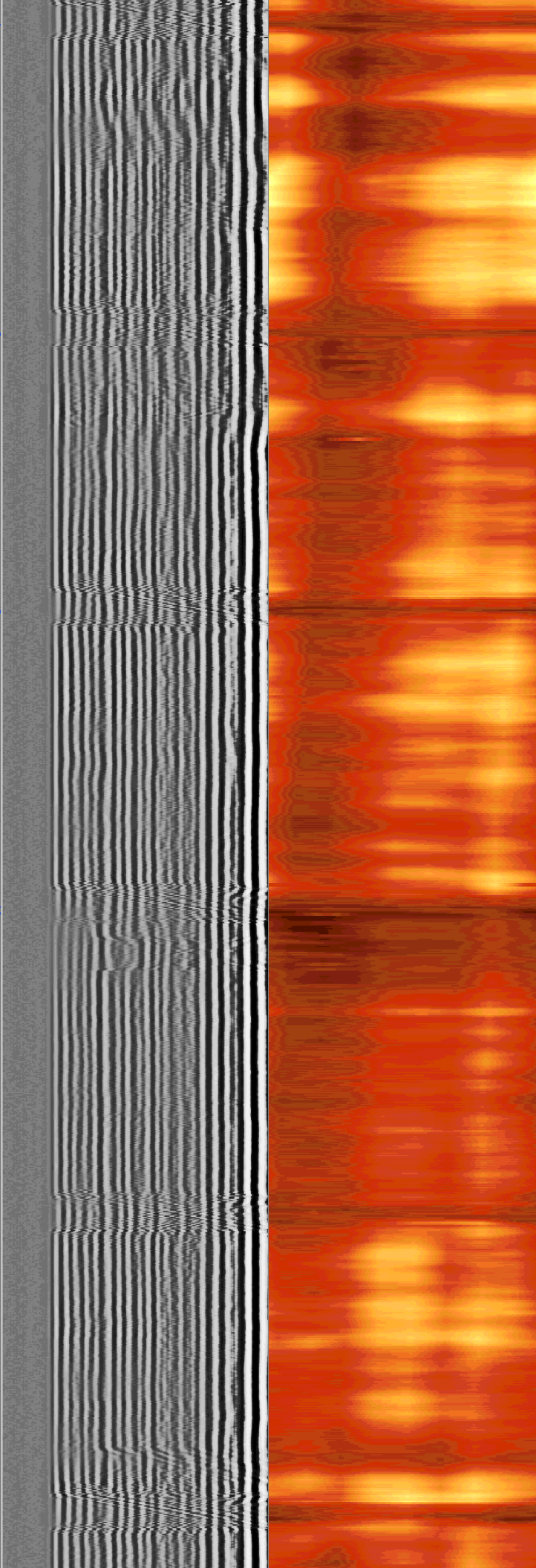
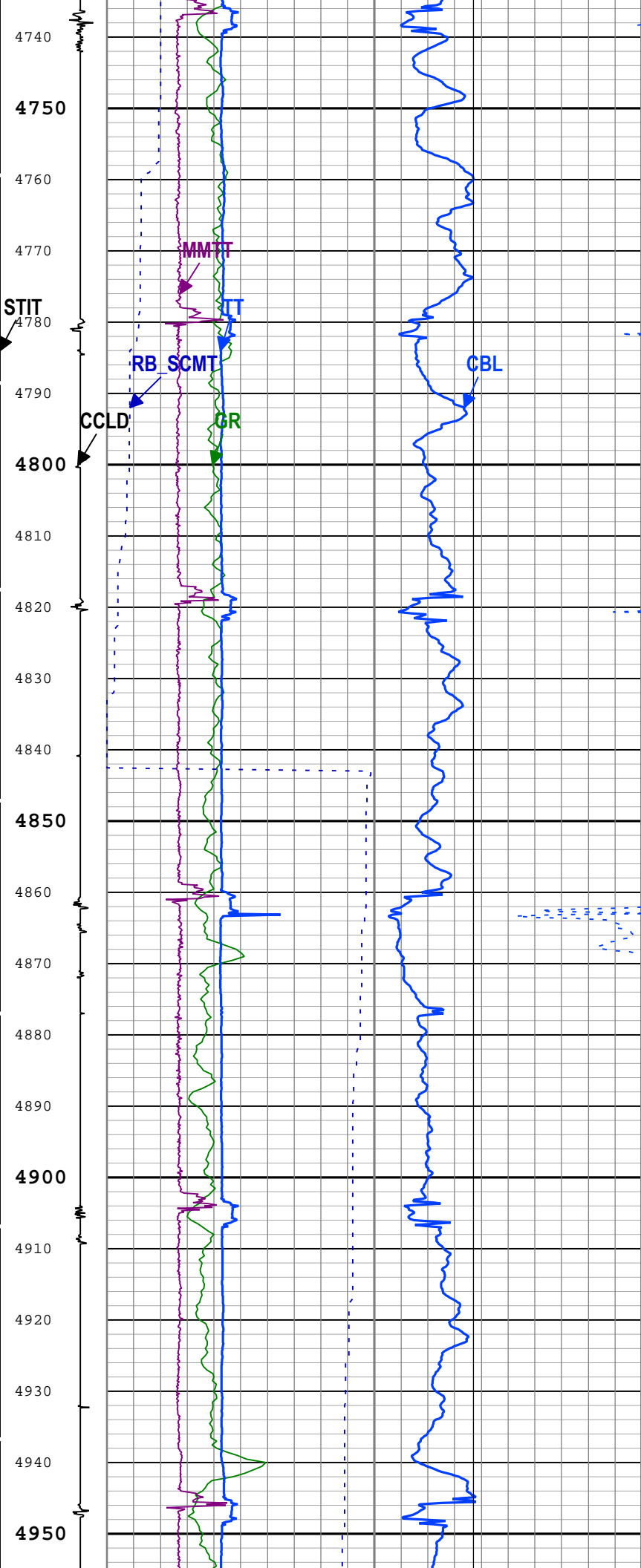


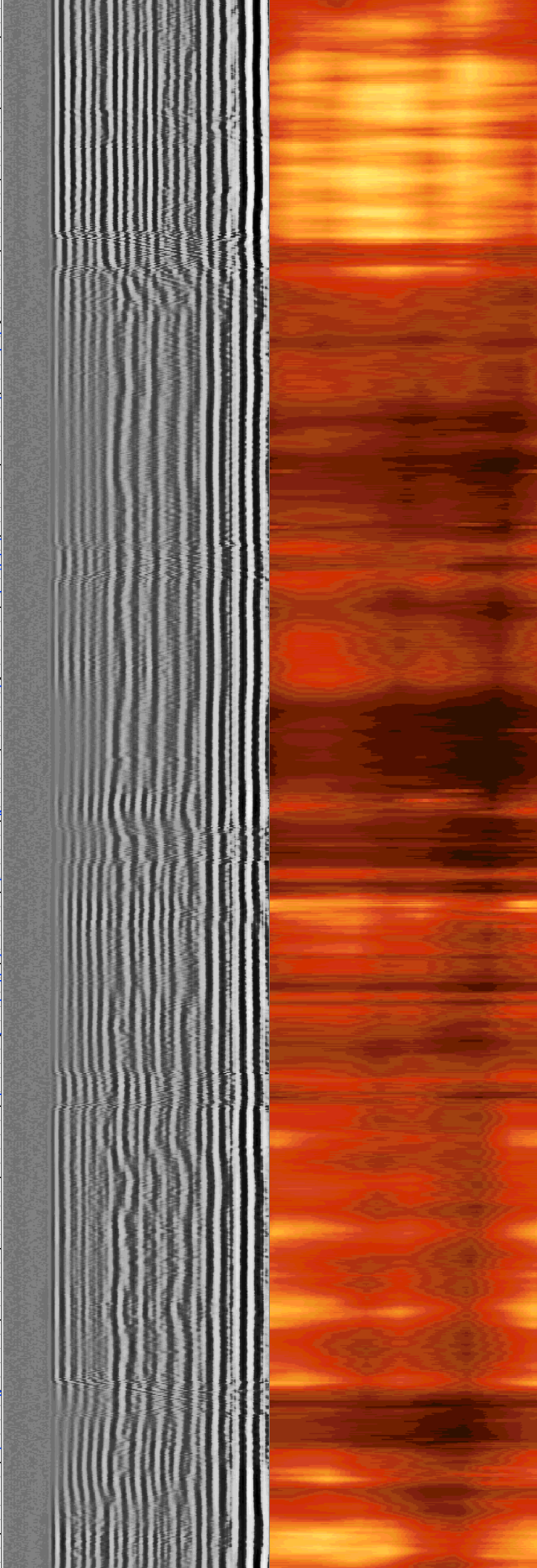
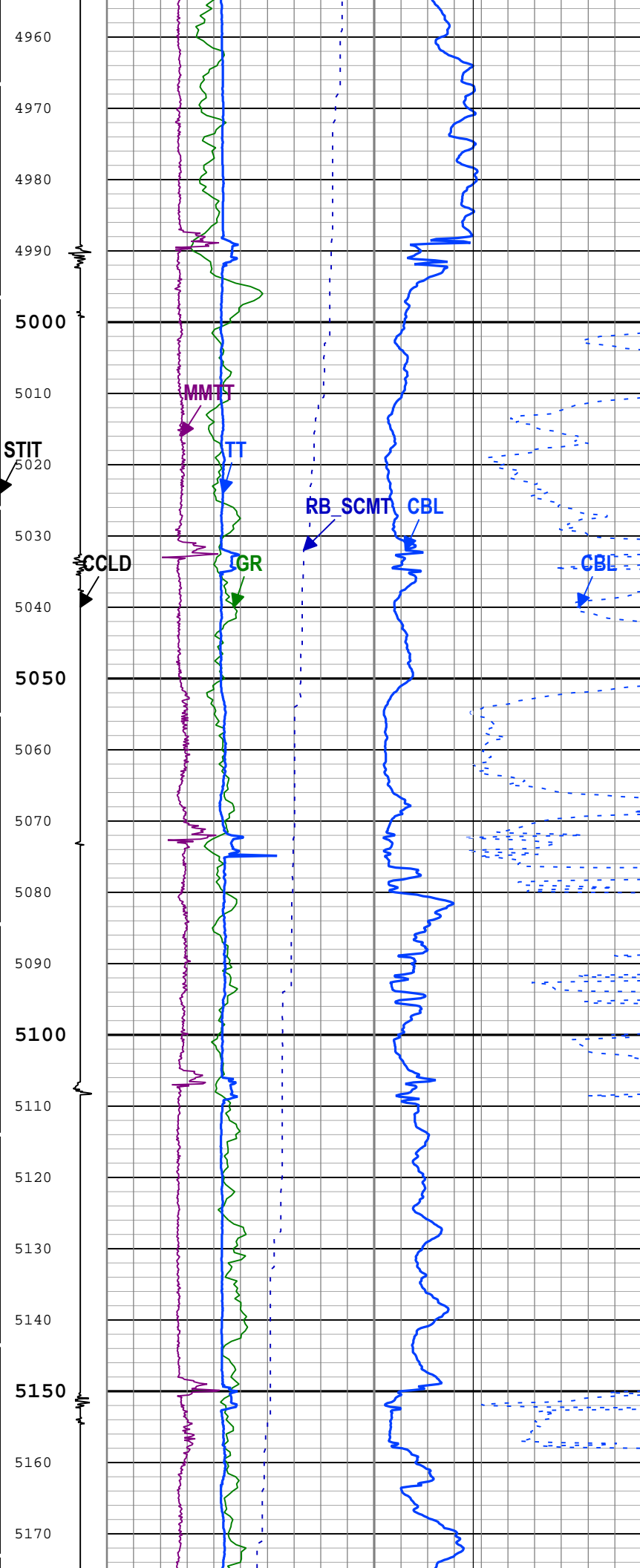




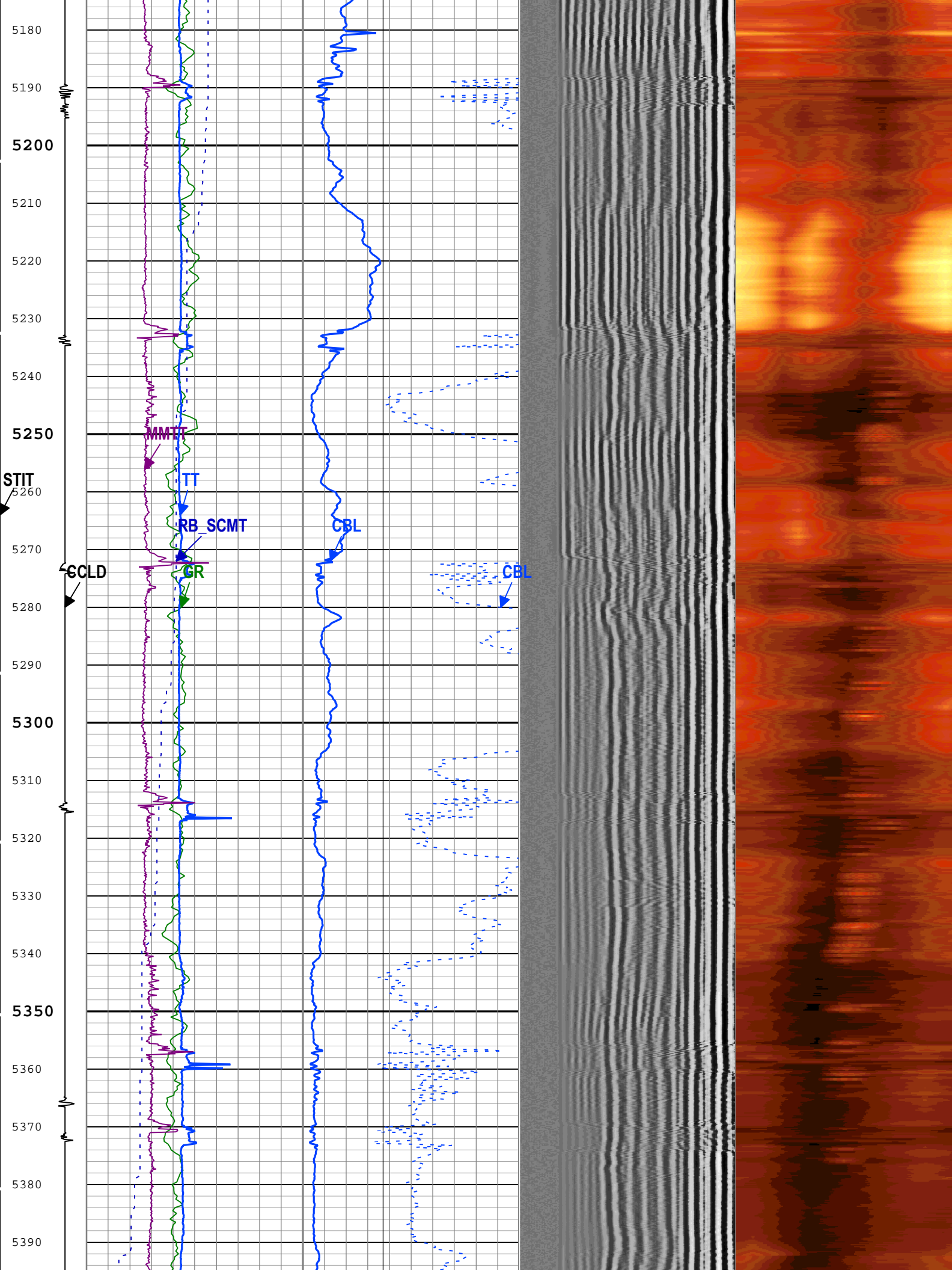


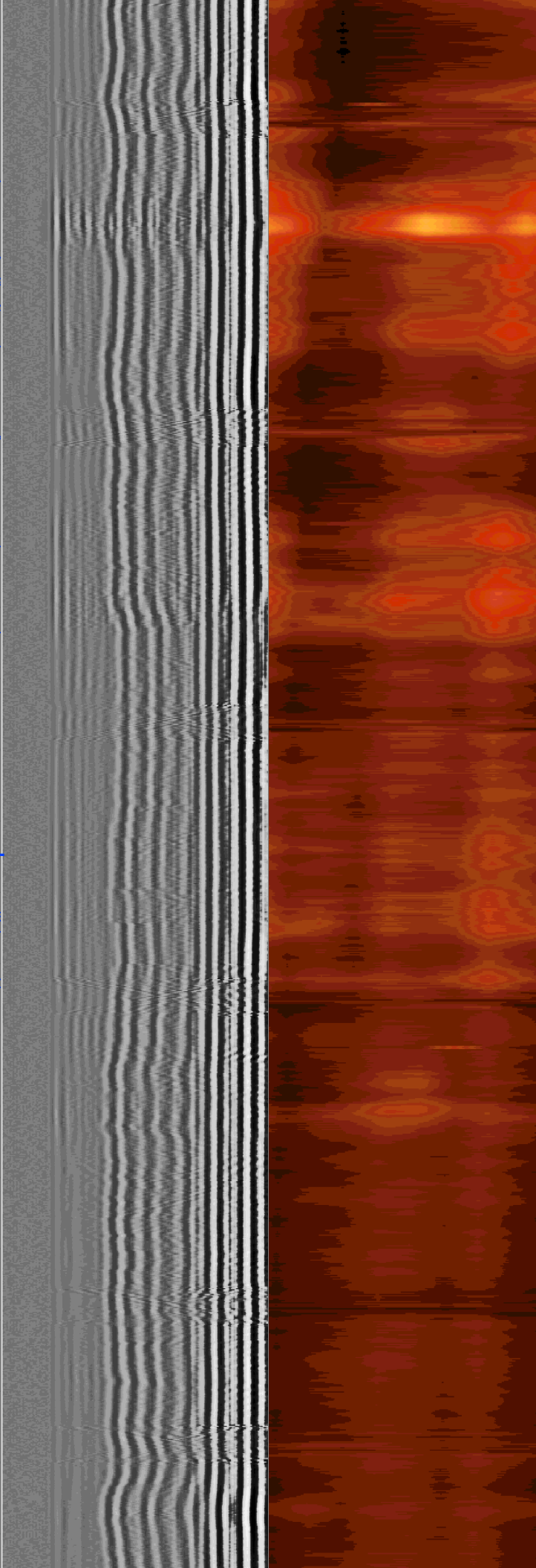
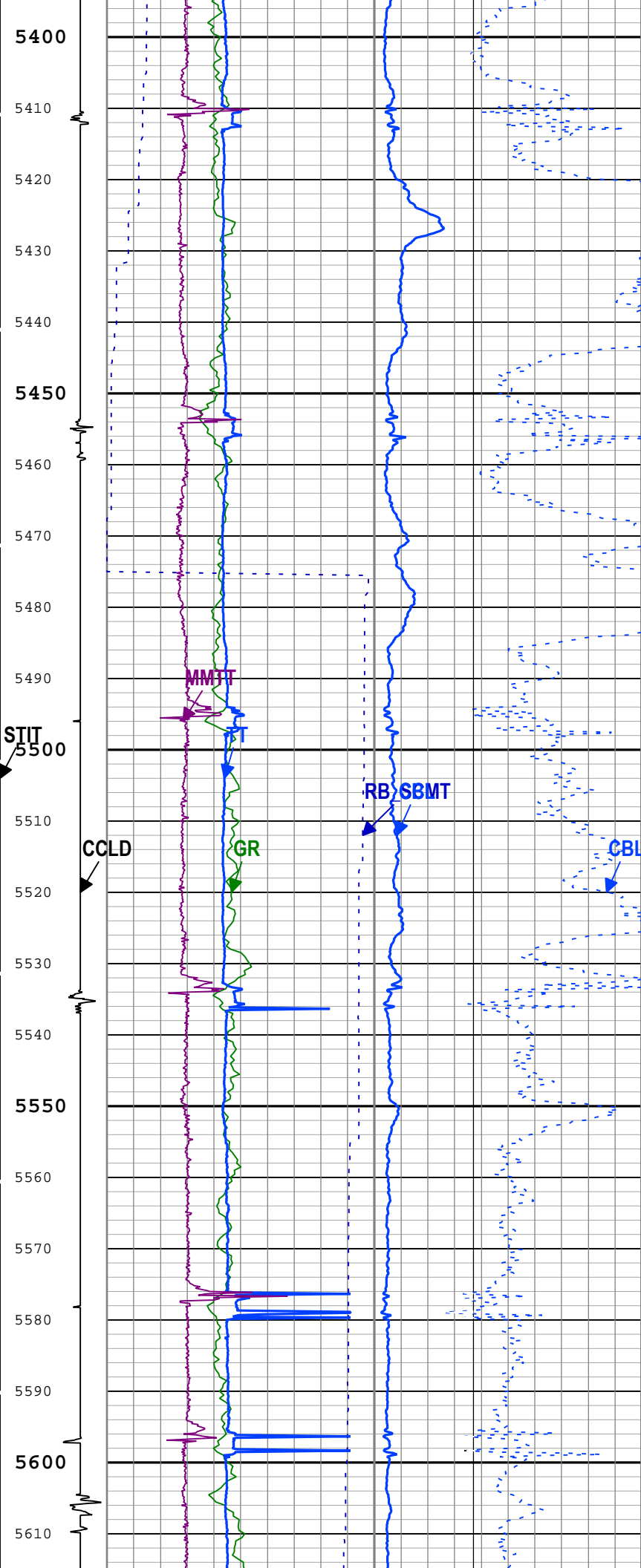


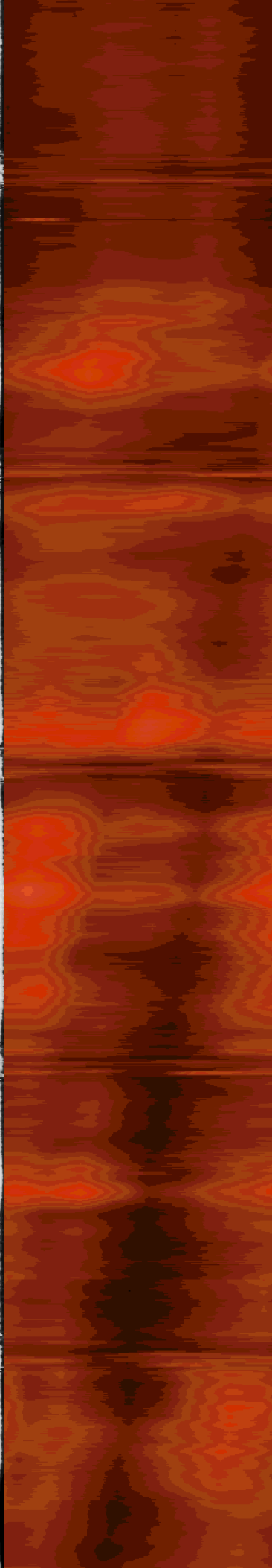
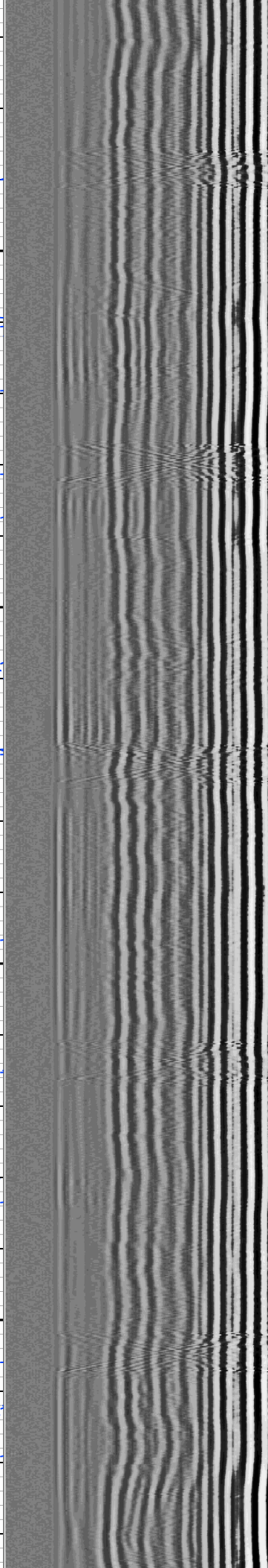
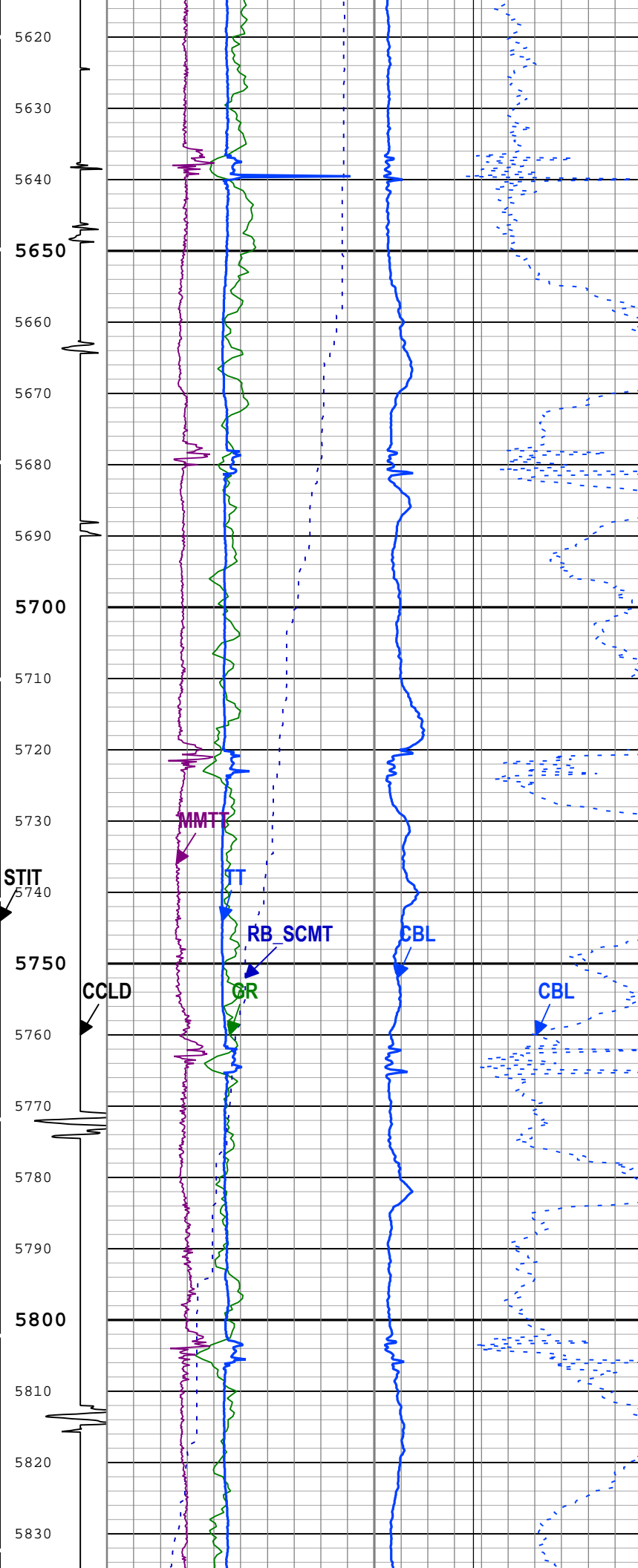




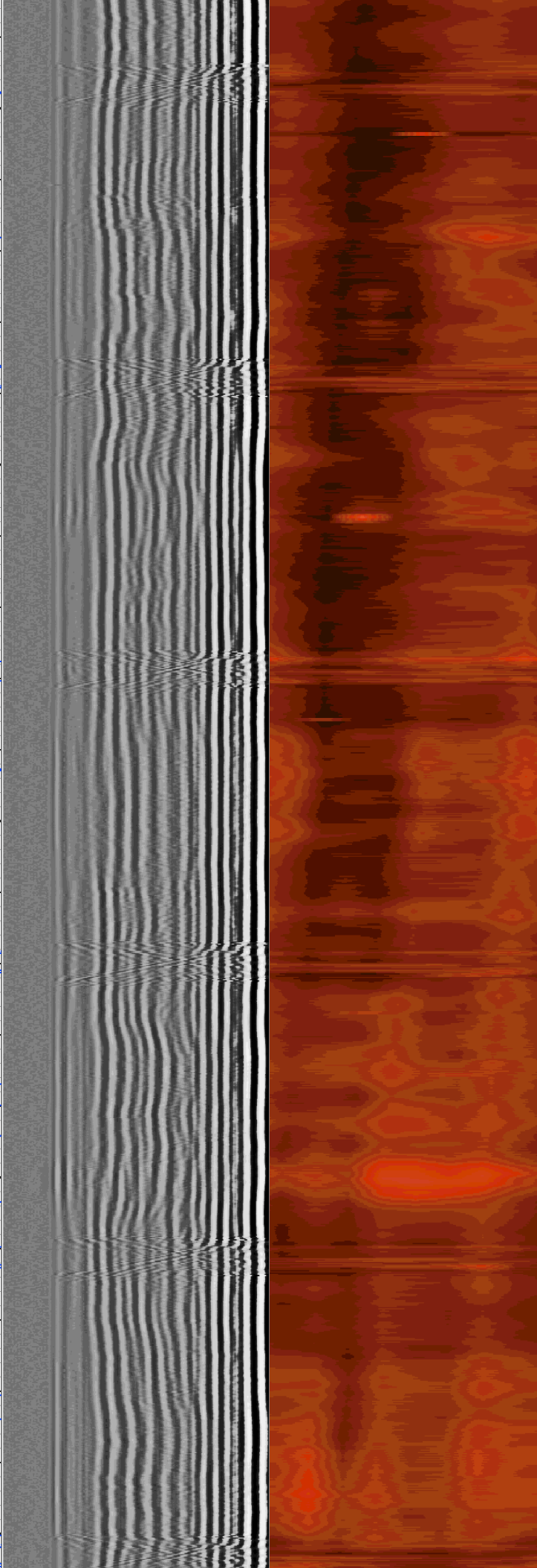
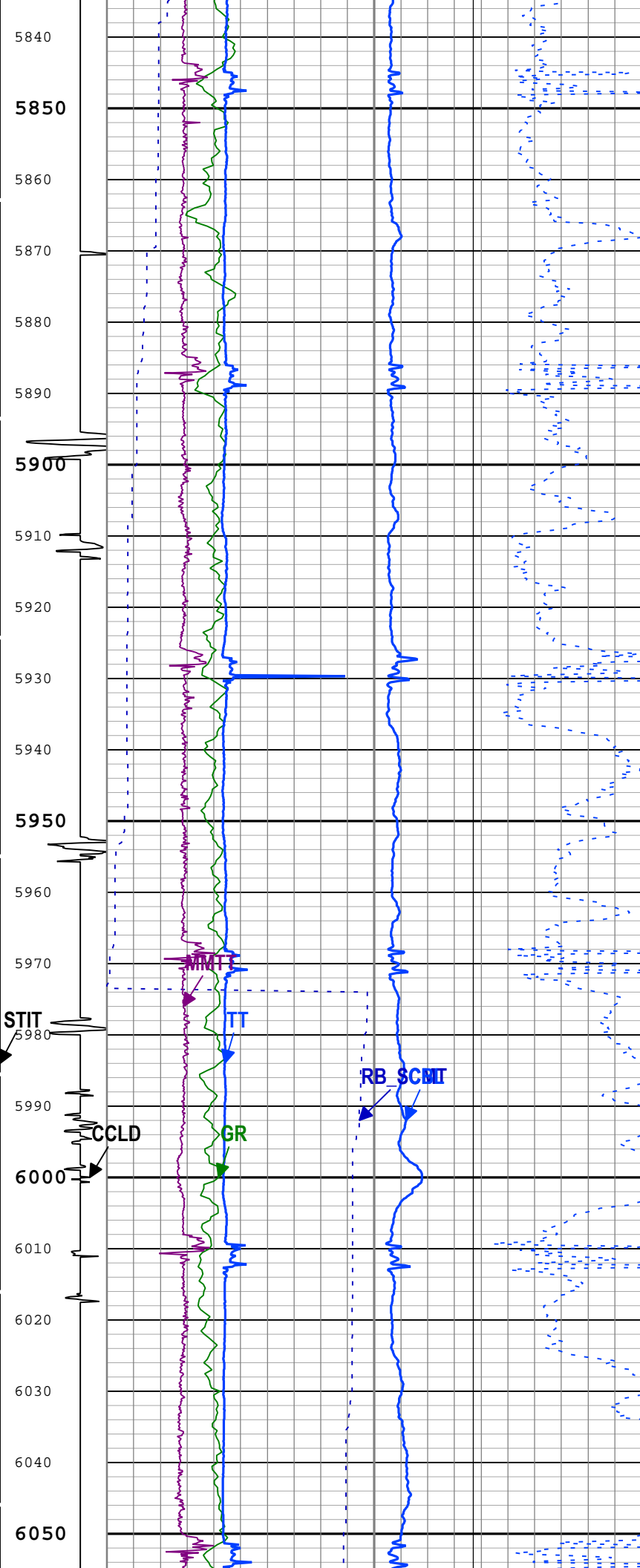


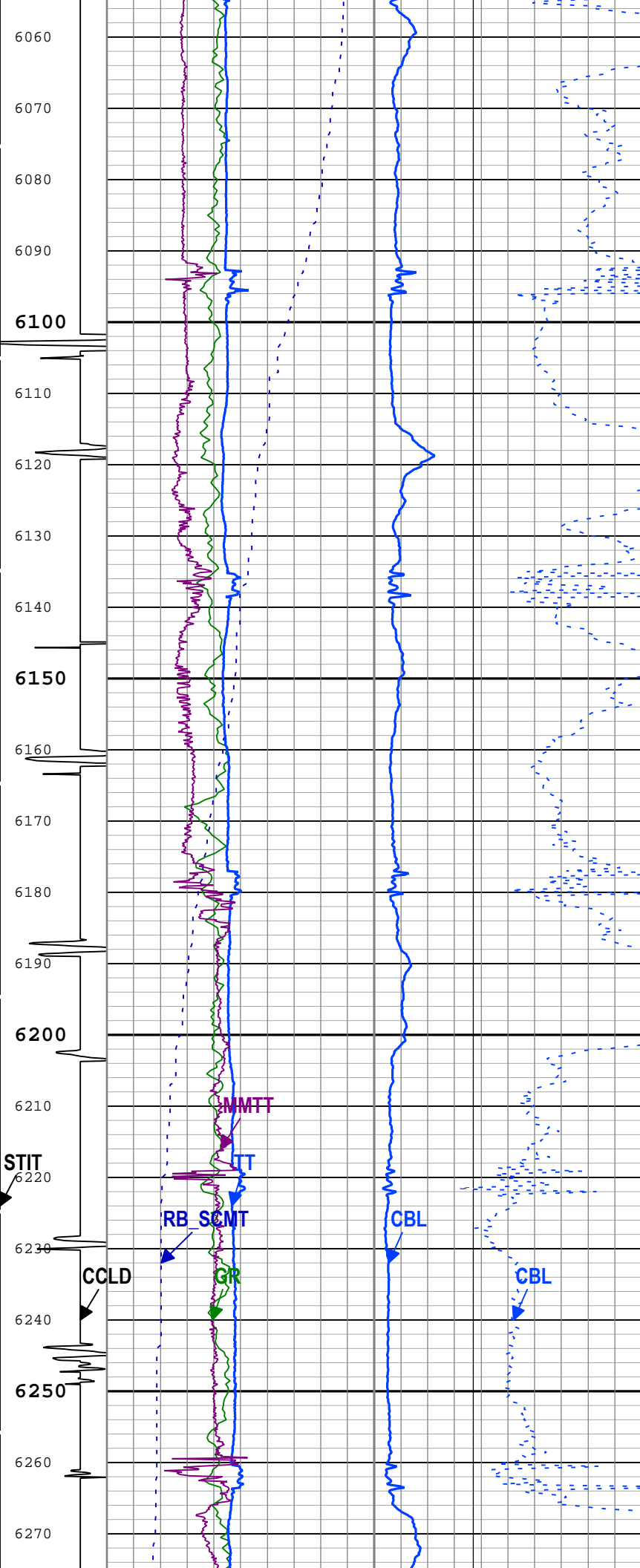


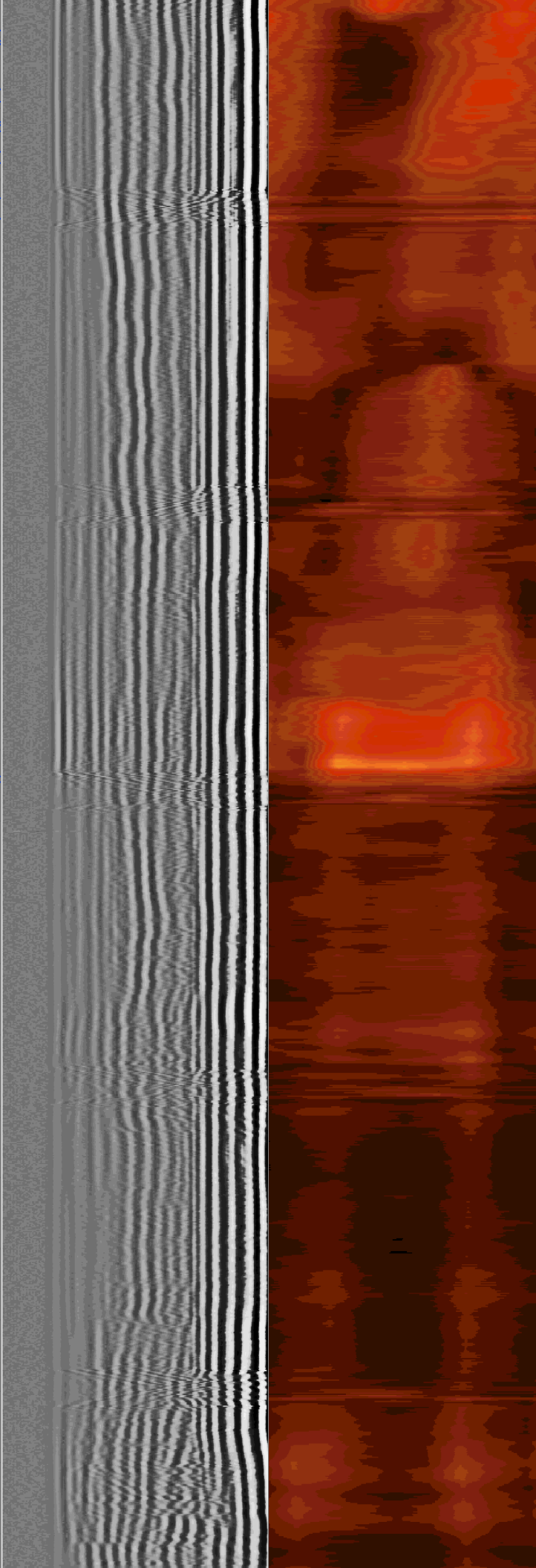
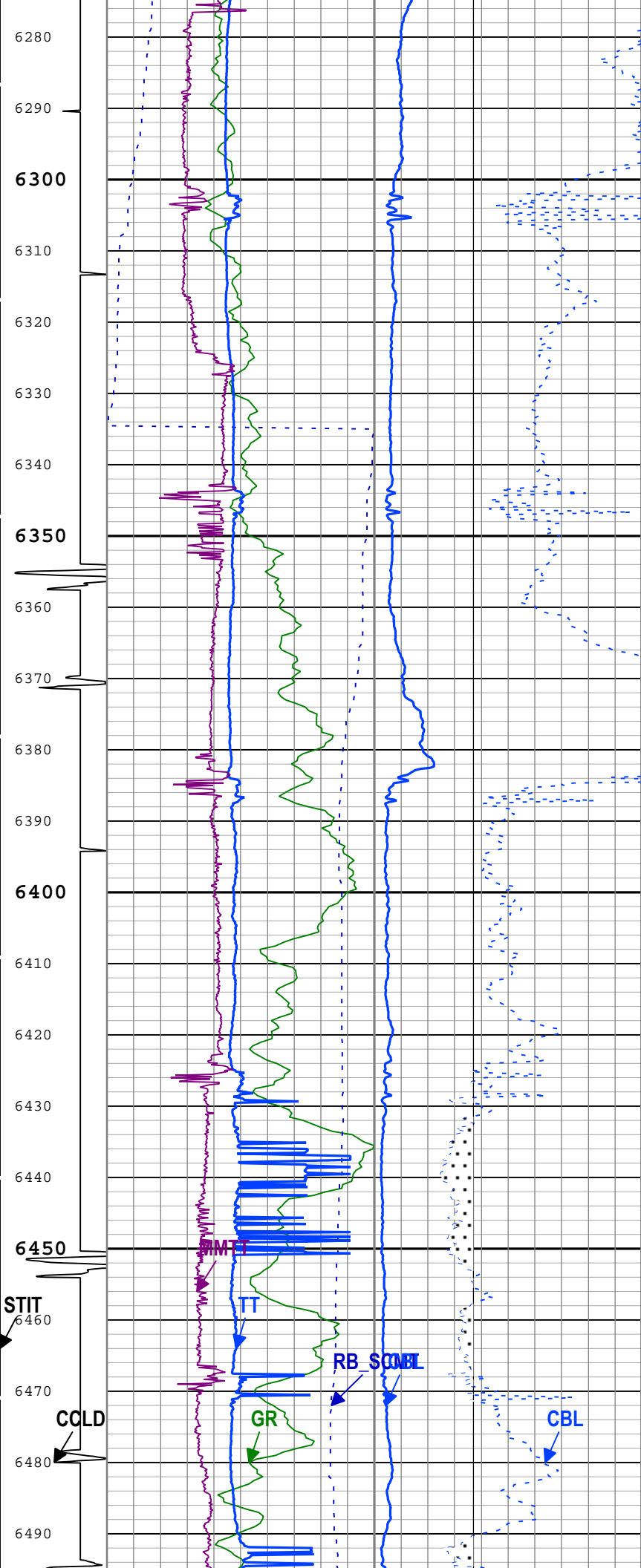




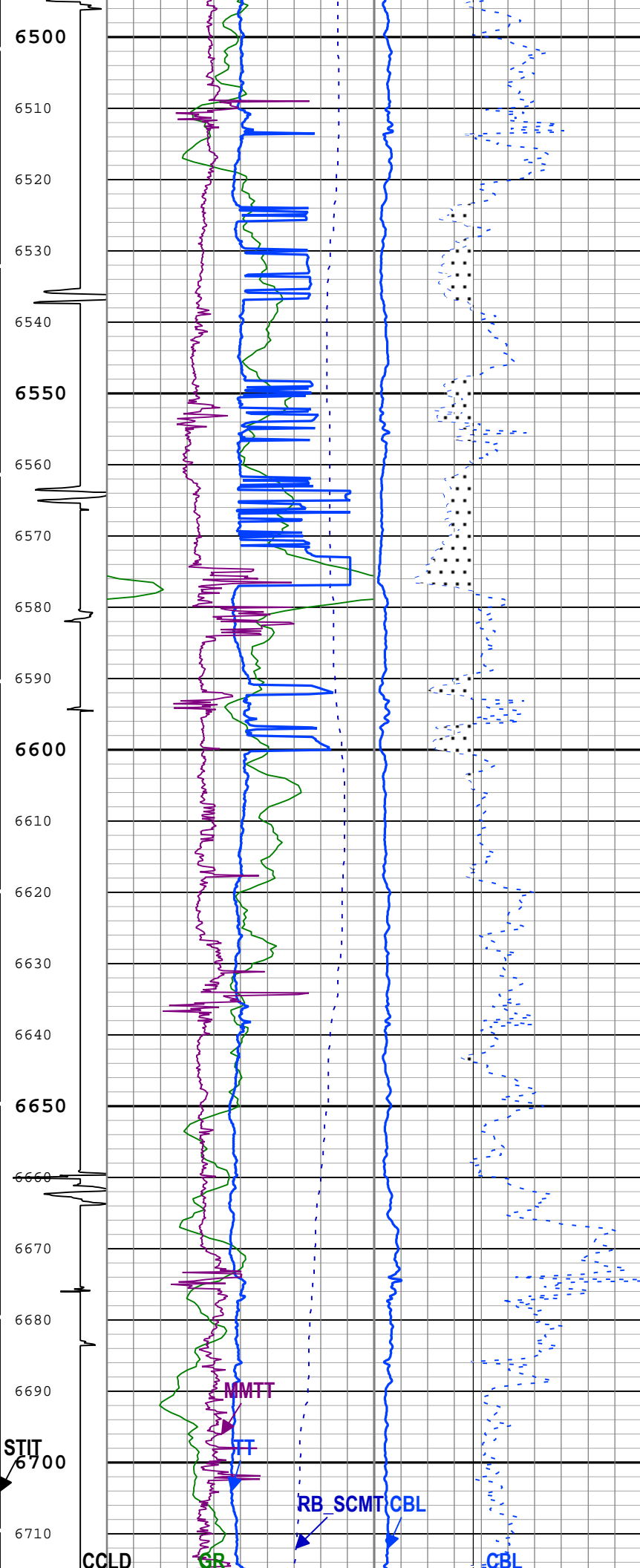




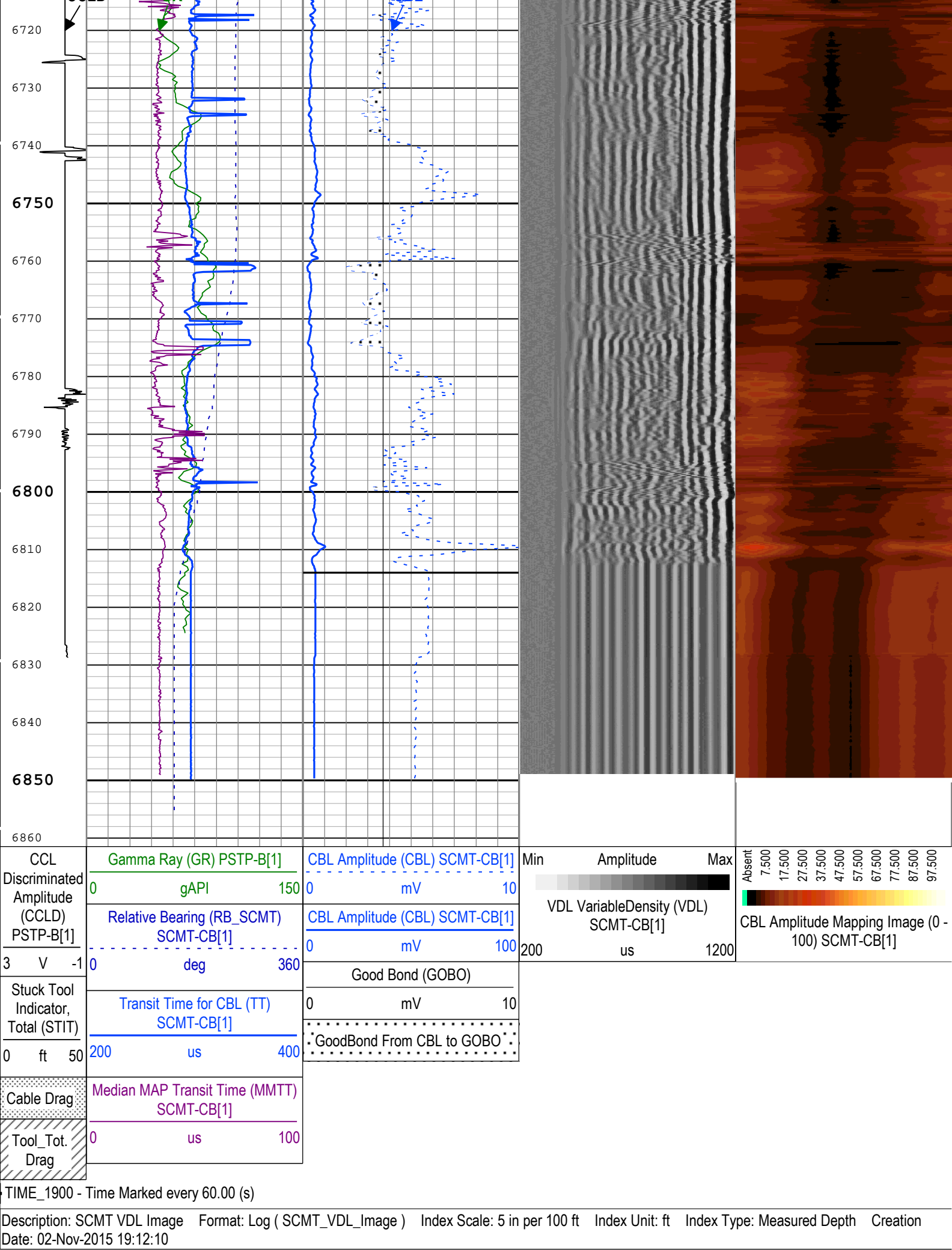












# Channel Processing Parameters

## Run 1: Parameters

Parameter	Description	Tool	Value	Unit
BHT	Bottom Hole Temperature	Borehole	232.4	degF
CB3G	SCMT CBL 3 ft Peak Detection T0_Delay and Noise Gate	SCMT-CB	Time Zoned	us
CBLG	CBL Gate Width	SCMT-CB	40	us
CBRA	CBL LQC Reference Amplitude in Free Pipe	SCMT-CB	62	mV
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
EDF	Elevation of Derrick Floor Above Permanent Datum	WLSESSION	23	ft
EPD	Elevation of Permanent Datum (PDAT) above Mean Sea Level	WLSESSION	4720	ft
FCF	CBL Fluid Compensation Factor	SCMT-CB	1	
GGRD	Geothermal Gradient	Borehole	1	0.01 degF/ft
GOBO_CURR	Good Bond in Arbitrary Cement	SCMT-CB	3.71	mV
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	GTEM_LINEST	
M1EF	MAP sensitivity equalization factor of receiver 1	SCMT-CB	Time Zoned	
M2EF	MAP sensitivity equalization factor of receiver 2	SCMT-CB	Time Zoned	
M3EF	MAP sensitivity equalization factor of receiver 3	SCMT-CB	Time Zoned	
M4EF	MAP sensitivity equalization factor of receiver 4	SCMT-CB	Time Zoned	
M5EF	MAP sensitivity equalization factor of receiver 5	SCMT-CB	Time Zoned	
M6EF	MAP sensitivity equalization factor of receiver 6	SCMT-CB	Time Zoned	
M7EF	MAP sensitivity equalization factor of receiver 7	SCMT-CB	Time Zoned	
M8EF	MAP sensitivity equalization factor of receiver 8	SCMT-CB	Time Zoned	
MAPG	SCMT MAP Peak Detection T0_Delay and Noise Gate	SCMT-CB	217	us
MATT_CURR	Maximum Attenuation in Arbitrary Cement	SCMT-CB	38.78	dB/m
MCI	Minimum Cemented Interval for Isolation	SCMT-CB	10	ft
MMSA	MAP Minimum Sonic Amplitude	SCMT-CB	10.86	mV
MSA	Minimum Sonic Amplitude	SCMT-CB	1.84	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	SCMT-CB	1.84	mV
PDAT	Permanent Datum	WLSESSION	GL	
RUN_SNUM	Run Sequence Number	WSDRUN	2	
SHT	Surface Hole Temperature	Borehole	68	degF
TD	Total Measured Depth	Borehole	6997.1	ft

## Run 1Time Zoned Parameters

## Pass Main[4]:Up

Parameter	Value	Start Time	Stop Time	Start Depth ( ft )	Stop Depth ( ft )
CB3G	282	02-Nov-2015 11:09:29	02-Nov-2015 12:59:35	6861.8	3663.72
CB3G	277.06	02-Nov-2015 12:59:35	02-Nov-2015 14:33:14	3663.72	1000.09
M1EF	1	02-Nov-2015 11:12:47	02-Nov-2015 14:33:14	6861.8	1000.09
M2EF	1	02-Nov-2015 11:12:47	02-Nov-2015 14:33:14	6861.8	1000.09
M3EF	1	02-Nov-2015 11:12:47	02-Nov-2015 14:33:14	6861.8	1000.09
M4EF	1	02-Nov-2015 11:12:47	02-Nov-2015 14:33:14	6861.8	1000.09
M5EF	1	02-Nov-2015 11:12:47	02-Nov-2015 14:33:14	6861.8	1000.09
M6EF	1	02-Nov-2015 11:12:47	02-Nov-2015 14:33:14	6861.8	1000.09
M7EF	1	02-Nov-2015 11:12:47	02-Nov-2015 14:33:14	6861.8	1000.09
M8EF	1	02-Nov-2015 11:12:47	02-Nov-2015 14:33:14	6861.8	1000.09

Pass Main[5]:Up

CB3G	277.06	02-Nov-2015 14:48:30	02-Nov-2015 15:19:11	1001.16	69.97
M1EF	1.43	02-Nov-2015 14:48:30	02-Nov-2015 15:19:11	1001.16	69.97
M2EF	2.14	02-Nov-2015 14:48:30	02-Nov-2015 15:19:11	1001.16	69.97
M3EF	1.51	02-Nov-2015 14:48:30	02-Nov-2015 15:19:11	1001.16	69.97
M4EF	0.75	02-Nov-2015 14:48:30	02-Nov-2015 15:19:11	1001.16	69.97
M5EF	0.65	02-Nov-2015 14:48:30	02-Nov-2015 15:19:11	1001.16	69.97
M6EF	0.68	02-Nov-2015 14:48:30	02-Nov-2015 15:19:11	1001.16	69.97
M7EF	0.92	02-Nov-2015 14:48:30	02-Nov-2015 15:19:11	1001.16	69.97
M8EF	1.08	02-Nov-2015 14:48:30	02-Nov-2015 15:19:11	1001.16	69.97

All depth are at tool zero.

Tool Control Parameters	
-------------------------	--

### Run 1: Parameters

Parameter	Description	Tool	Value	Unit
CMTM	SCMT Operating Mode	SCMT-CB	Log	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	1800	ft/h

No Data Assignment


Software Version	
------------------	--

Acquisition System	Version
Maxwell 2016	6.0.53731.3100

Log	
-----	--

Description: SCMT Amplitudes and MAP Image					Format: Log ( SCMT_Amp_Image )	Index Scale: 5 in per 100 ft	Index Unit: ft	Index Type: Measured
Depth	Creation Date: 02-Nov-2015 19:12:18							

Description: SCMT Amplitudes and MAP Image		Format: Log ( SCMT_Amp_Image )	Index Scale: 5 in per 100 ft	Index Unit: ft	Index Type: Measured
Depth	Creation Date: 02-Nov-2015 19:12:18				

Run 1

[illegible]

Software Version	
------------------	--

Acquisition System	Version
Maxwell 2016	6.0.53731.3100

Pass Summary	
--------------	--

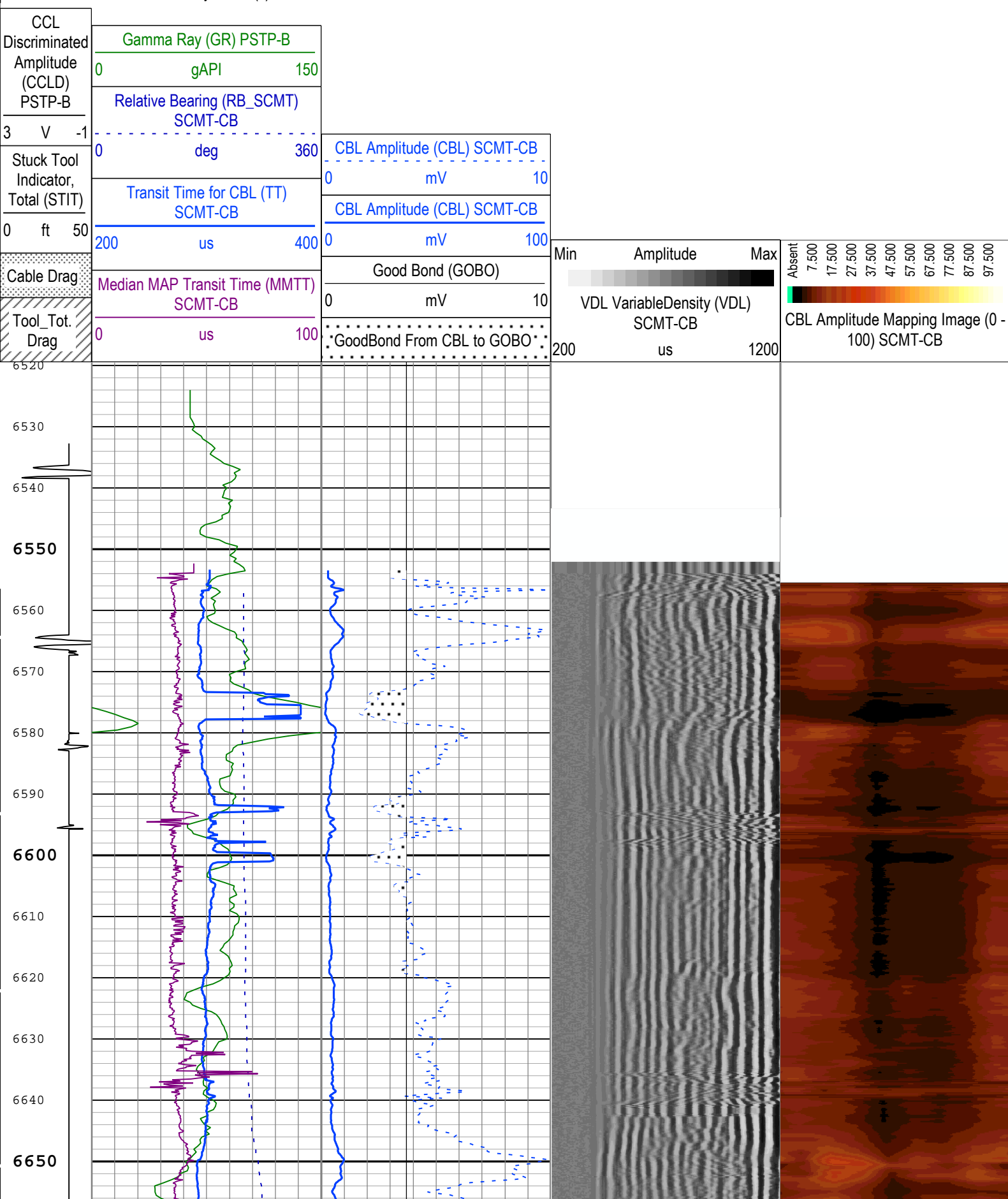
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Run 1	Repeat[2]:Up	Up	6556.25 ft	6859.36 ft	02-Nov-2015 10:40:33 AM	02-Nov-2015 10:51:34 AM	ON	3.45 ft	Yes

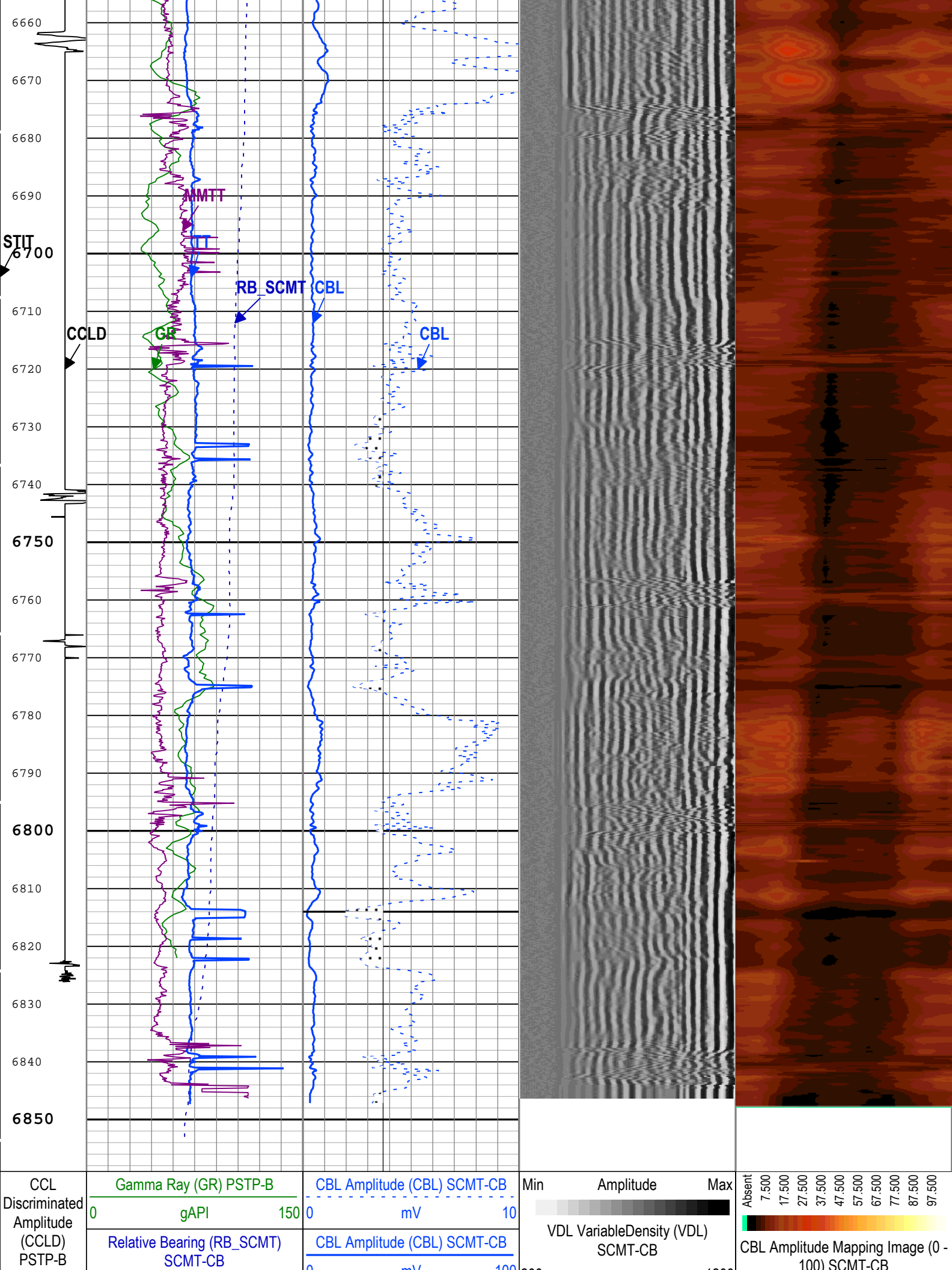


Description: SCMT VDL Image Format: Log ( SCMT\_VDL\_Image ) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation

Date: 02-Nov-2015 19:12:20

TIME\_1900 - Time Marked every 60.00 (s)





3	V	-1	0	deg	360	0	mV	100	200	us	1200	100	SCMT-CB
Stuck Tool Indicator, Total (STIT)			Transit Time for CBL (TT) SCMT-CB			Good Bond (GOBO)							
0	ft	50	200	us	400	0	mV	10					
Cable Drag			Median MAP Transit Time (MMTT) SCMT-CB			GoodBond From CBL to GOBO							
Tool_Tot. Drag			0	us	100								

TIME\_1900 - Time Marked every 60.00 (s)

Description: SCMT VDL Image    Format: Log ( SCMT\_VDL\_Image )    Index Scale: 5 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation Date: 02-Nov-2015 19:12:20

Channel Processing Parameters				
Run 1: Parameters				
Parameter	Description	Tool	Value	Unit
BHT	Bottom Hole Temperature	Borehole	232.4	degF
CB3G	SCMT CBL 3 ft Peak Detection T0_Delay and Noise Gate	SCMT-CB	282	us
CBLG	CBL Gate Width	SCMT-CB	40	us
CBRA	CBL LQC Reference Amplitude in Free Pipe	SCMT-CB	62	mV
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
EDF	Elevation of Derrick Floor Above Permanent Datum	WLSESSION	23	ft
EPD	Elevation of Permanent Datum (PDAT) above Mean Sea Level	WLSESSION	4720	ft
FCF	CBL Fluid Compensation Factor	SCMT-CB	1	
GGRD	Geothermal Gradient	Borehole	1	0.01 degF/ft
GOBO_CURR	Good Bond in Arbitrary Cement	SCMT-CB	3.71	mV
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	GTEM_LINEST	
M1EF	MAP sensitivity equalization factor of receiver 1	SCMT-CB	1	
M2EF	MAP sensitivity equalization factor of receiver 2	SCMT-CB	1	
M3EF	MAP sensitivity equalization factor of receiver 3	SCMT-CB	1	
M4EF	MAP sensitivity equalization factor of receiver 4	SCMT-CB	1	
M5EF	MAP sensitivity equalization factor of receiver 5	SCMT-CB	1	
M6EF	MAP sensitivity equalization factor of receiver 6	SCMT-CB	1	
M7EF	MAP sensitivity equalization factor of receiver 7	SCMT-CB	1	
M8EF	MAP sensitivity equalization factor of receiver 8	SCMT-CB	1	
MAPG	SCMT MAP Peak Detection T0_Delay and Noise Gate	SCMT-CB	217	us
MATT_CURR	Maximum Attenuation in Arbitrary Cement	SCMT-CB	38.78	dB/m
MCI	Minimum Cemented Interval for Isolation	SCMT-CB	10	ft
MMSA	MAP Minimum Sonic Amplitude	SCMT-CB	10.86	mV
MSA	Minimum Sonic Amplitude	SCMT-CB	1.84	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	SCMT-CB	1.84	mV
PDAT	Permanent Datum	WLSESSION	GL	
RUN_SNUM	Run Sequence Number	WSDRUN	2	
SHT	Surface Hole Temperature	Borehole	68	degF
TD	Total Measured Depth	Borehole	6997.1	ft

Tool Control Parameters				
Run 1: Parameters				



Parameter	Description	Tool	Value	Unit
CMTM	SCMT Operating Mode	SCMT-CB	Log	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	1800	ft/h

Calibration Report

SCMT-CB (Slim Cement Mapping Tool, 1-11/16 OD) Calibration - Run 1

Primary Equipment :	Slim Cement Mapping Sonde	SCMS-CB	8198
---------------------	---------------------------	---------	------

CBL and MAP Amplitude Normalization - Measurements

Master (Manual Entry):	12:46:06 31-Oct-2015
------------------------	----------------------

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
CBL 3 ft Temperature/Pressure Compensated Raw Amplitude (at 0 degree) - 0	mV	Master	----	----	----	----	
MAP 1 Temperature/Pressure Compensated Raw Amplitude (at 0 degree) - 0	mV	Master	----	----	----	----	
MAP 2 Temperature/Pressure Compensated Raw Amplitude (at 0 degree) - 0	mV	Master	----	----	----	----	
MAP 3 Temperature/Pressure Compensated Raw Amplitude (at 0 degree) - 0	mV	Master	----	----	----	----	
MAP 4 Temperature/Pressure Compensated Raw Amplitude (at 0 degree) - 0	mV	Master	----	----	----	----	
MAP 5 Temperature/Pressure Compensated Raw Amplitude (at 0 degree) - 0	mV	Master	----	----	----	----	
MAP 6 Temperature/Pressure Compensated Raw Amplitude (at 0 degree) - 0	mV	Master	----	----	----	----	
MAP 7 Temperature/Pressure Compensated Raw Amplitude (at 0 degree) - 0	mV	Master	----	----	----	----	
MAP 8 Temperature/Pressure Compensated Raw Amplitude (at 0 degree) - 0	mV	Master	----	----	----	----	
CBL 3 ft Temperature/Pressure Compensated Raw Amplitude (at 90 degree) - 0	mV	Master	----	----	----	----	
MAP 1 Temperature/Pressure Compensated Raw Amplitude (at 90 degree) - 0	mV	Master	----	----	----	----	
MAP 2 Temperature/Pressure Compensated Raw Amplitude (at 90 degree) - 0	mV	Master	----	----	----	----	
MAP 3 Temperature/Pressure Compensated Raw Amplitude (at 90 degree) - 0	mV	Master	----	----	----	----	
MAP 4 Temperature/Pressure Compensated Raw Amplitude (at 90 degree) - 0	mV	Master	----	----	----	----	
MAP 5 Temperature/Pressure Compensated Raw Amplitude (at 90 degree) - 0	mV	Master	----	----	----	----	
MAP 6 Temperature/Pressure Compensated Raw Amplitude (at 90 degree) - 0	mV	Master	----	----	----	----	
MAP 7 Temperature/Pressure Compensated Raw Amplitude (at 90 degree) - 0	mV	Master	----	----	----	----	
MAP 8 Temperature/Pressure Compensated Raw Amplitude (at 90 degree) - 0	mV	Master	----	----	----	----	
CBL 3 ft Temperature/Pressure Compensated Raw Amplitude (at 180 degree) - 0	mV	Master	----	----	----	----	
MAP 1 Temperature/Pressure Compensated Raw Amplitude (at 180 degree) - 0	mV	Master	----	----	----	----	
MAP 2 Temperature/Pressure Compensated Raw Amplitude (at 180 degree) - 0	mV	Master	----	----	----	----	
MAP 3 Temperature/Pressure Compensated Raw Amplitude (at 180 degree) - 0	mV	Master	----	----	----	----	
MAP 4 Temperature/Pressure Compensated Raw Amplitude (at 180 degree) - 0	mV	Master	----	----	----	----	
MAP 5 Temperature/Pressure Compensated Raw Amplitude (at 180 degree) - 0	mV	Master	----	----	----	----	
MAP 6 Temperature/Pressure Compensated Raw Amplitude (at 180 degree) - 0	mV	Master	----	----	----	----	
MAP 7 Temperature/Pressure Compensated Raw Amplitude (at 180 degree) - 0	mV	Master	----	----	----	----	
MAP 8 Temperature/Pressure Compensated Raw Amplitude (at 180 degree) - 0	mV	Master	----	----	----	----	
CBL 3 ft Temperature/Pressure Compensated Raw Amplitude (at 270 degree) - 0	mV	Master	----	----	----	----	
MAP 1 Temperature/Pressure Compensated Raw Amplitude (at 270 degree) - 0	mV	Master	----	----	----	----	

MAP 2 Temperature/Pressure Compensated Raw Amplitude (at 270 degree) - 0	mV	Master	-----	-----	-----	-----	<div></div>
MAP 3 Temperature/Pressure Compensated Raw Amplitude (at 270 degree) - 0	mV	Master	-----	-----	-----	-----	<div></div>
MAP 4 Temperature/Pressure Compensated Raw Amplitude (at 270 degree) - 0	mV	Master	-----	-----	-----	-----	<div></div>
MAP 5 Temperature/Pressure Compensated Raw Amplitude (at 270 degree) - 0	mV	Master	-----	-----	-----	-----	<div></div>
MAP 6 Temperature/Pressure Compensated Raw Amplitude (at 270 degree) - 0	mV	Master	-----	-----	-----	-----	<div></div>
MAP 7 Temperature/Pressure Compensated Raw Amplitude (at 270 degree) - 0	mV	Master	-----	-----	-----	-----	<div></div>
MAP 8 Temperature/Pressure Compensated Raw Amplitude (at 270 degree) - 0	mV	Master	-----	-----	-----	-----	<div></div>

## CBL and MAP Amplitude Normalization - Coefficients

Master (Manual Entry):		12:46:06 31-Oct-2015					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div></div>
Normalization Temperature in SFT Tube	degF	Master			50.70		<div></div>
CBL Correction Factor		Master	0		0.074		<div></div>
MAP 1 Correction Factor		Master	0		0.092		<div></div>
MAP 2 Correction Factor		Master	0		0.098		<div></div>
MAP 3 Correction Factor		Master	0		0.126		<div></div>
MAP 4 Correction Factor		Master	0		0.124		<div></div>
MAP 5 Correction Factor		Master	0		0.111		<div></div>
MAP 6 Correction Factor		Master	0		0.113		<div></div>
MAP 7 Correction Factor		Master	0		0.107		<div></div>
MAP 8 Correction Factor		Master	0		0.113		<div></div>

## CBL and MAP Amplitude Adjustment - Measurements

Before (Measured):		15:34:09 02-Nov-2015					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div></div>
CBL Amplitude	mV	Before			68.55		<div></div>
Average MAP Amplitude (Fluid Compensated)	mV	Before			102.11		<div></div>
Measurement Depth	ft	Before			192.48		<div></div>

## CBL and MAP Amplitude Adjustment - Coefficients

Before (Measured):		15:34:09 02-Nov-2015					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div></div>
CBL Adjustment Factor		Before			0.904		<div></div>
CBL LQC Reference Amplitude in Free Pipe	mV	Before			62.00		<div></div>
MAP Adjustment Factor		Before			0.979		<div></div>
Depth of Before Calibration	ft	Before			192.48		<div></div>

## PSTP-B (PSP Telemetry Platform B - Quartz) Calibration - Run 1

Primary Equipment :			
PBMS-B		PBMS-B	895
Calibration Parameter :			
JIG-BKGD (Jig minus background reference)		165	

## PBMS Gamma Ray Check - PBMSB Gamma Ray Accumulations

Before (Measured):		20:14:20 01-Nov-2015					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div></div>
GR Zero Average	gAPI	Before	30	0	79.99882	120	<div></div>
GR Zero Standard Deviation	gAPI	Before			101.1545		<div></div>
GR Zero Accumulation	gAPI	Before			2404.201		<div></div>
GR Plus Average	gAPI	Before			250.1696		<div></div>
GR Plus Standard Deviation	gAPI	Before			55.57677		<div></div>
GR Plus Max Deviation	gAPI	Before			200.3329		<div></div>
Jig-Background	gAPI	Before	165	150	170.2109	180	<div></div>

## PBMS RTD Well Thermometer Master Calibration

Master (EEPROM):		00:00:00 11-Apr-2005					
------------------	--	----------------------	--	--	--	--	--

Master (EEPROM): 00:00:00 17-Feb-2000						
PBMS_RTD_THERM RTD Coefficients (Master)						
	Tt**0	Tt**1	Tt**2	Tt**3	Tt**4	Tt**5
Tt**0	-113.3502	-126.7791	89.36301	-14.96306	0.9659584	0

PBMS Gamma Ray Master Calibration						
Master (EEPROM): 00:00:00 21-Feb-2000						
PBMS_GR_MODEL GR Coefficients (Master)						
	Rt**0			Rt**1		
Rt**0	1600			3320		

PBMS CQG Master Calibration						
Master (EEPROM): 00:00:00 11-Apr-2005						
PBMS_P_GAUGE PRES CQG Pressure Model Coefficients (Master)						
	Fb**0	Fb**1	Fb**2	Fb**3	Fb**4	Fb**5
Fc**0	6928.421	0.01695133	-2.371159E-07	-7.894375E-11	-1.688694E-15	-1.489738E-20
Fc**1	-1.057536	-1.26827E-05	-1.010593E-10	2.749792E-16	2.106705E-20	0
Fc**2	9.095486E-07	4.011838E-11	1.093711E-15	0	0	0
Fc**3	4.121544E-12	1.401973E-16	0	0	0	0
Fc**4	0	0	0	0	0	0
Fc**5	0	0	0	0	0	0
PBMS_P_GAUGE_TEMP CQG Temperature Model Coefficients (Master)						
	Fc**0	Fc**1	Fc**2	Fc**3	Fc**4	Fc**5
Fb**0	113.0794	-0.0003661232	5.263181E-09	1.161349E-13	3.705114E-17	8.671497E-22
Fb**1	-0.006004141	1.753311E-08	2.825828E-13	-2.300864E-17	-2.39651E-21	0
Fb**2	-3.646861E-08	3.607396E-13	-2.082994E-18	0	0	0
Fb**3	-1.41916E-13	8.972574E-18	0	0	0	0
Fb**4	0	0	0	0	0	0
Fb**5	0	0	0	0	0	0
PBMS_CQG_FCLK_FREQ CQG Clock Frequency Model Coefficients (Master)						
	(Fb'-Fc')**0	(Fb'-Fc')**1	(Fb'-Fc')**2	(Fb'-Fc')**3	(Fb'-Fc')**4	(Fb'-Fc')**5
(Fb'-Fc')**0	31070.55	0.002979222	7.897237E-07	-6.784442E-11	-1.143966E-16	-8.231635E-21
PBMS_CQG_FCLK_TEMP CQG Clock Temperature Model Coefficients (Master)						
	(Fb'-Fc')**0	(Fb'-Fc')**1	(Fb'-Fc')**2	(Fb'-Fc')**3	(Fb'-Fc')**4	(Fb'-Fc')**5
(Fb'-Fc')**0	118.5889	-0.005601334	-4.772541E-08	-6.362224E-13	2.731165E-16	-1.116716E-20



Company:	Noble Energy Inc	Schlumberger
Well:	Wells Ranch AE32-630	
Field:	Wattenberg	
County:	Weld	
State:	Colorado	

Slim Cement Mapping Tool  
Cement Evaluation