

Company: Whiting Oil & Gas Corporation

Well: Razor 250-2443

Field: Wildcat

County: Weld State: Colorado

Cement Bond Log
GR-CCL

County:	Weld			
Field:	Wildcat			
Location:	SWSE Sec 25, T10N, R58W	Elev.:	K.B.	4739.00 ft
Well:	Razor 250-2443		G.L.	4718.00 ft
Company:	Whiting Oil & Gas Corporation		D.F.	4738.00 ft
	Location:	Permanent Datum:	Ground Level	Elev.:
		Log Measured From:	Kelly Bushing	21.00 ft
		Drilling Measured From:	Kelly Bushing	above Perm.Datum
	API Serial No.	Section:	Township:	Range:
	05-123-42634	25	10N	58W
Logging Date	21-Sep-2016			

Run Number	One		
Depth Driller	16025.00 ft		
Schlumberger Depth	16025.00 ft		
Bottom Log Interval	5150.00 ft		
Top Log Interval	50.00 ft		
Casing Fluid Type	Water		
Salinity			
Density	8.4 lbm/gal		
Fluid Level	8.00 ft		
BIT/CASING/TUBING STRING			
Bit Size	8.50 in		
From	2097.00 ft		
To	16025.00 ft		
Casing/Tubing Size	5.5 in		
Weight	20 lbm/ft		
Grade	N/A		
From	21.00 ft		
To	16025.00 ft		
Max Recorded Temperatures	197 degF		
Logger on Bottom	21-Sep-2016	12:34:00	
Unit Number	Location:	Time	
Recorded By	2161		
	B Kesek & B Marmon	FtMorgan	
Witnessed By	Bradd Kothe		

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.

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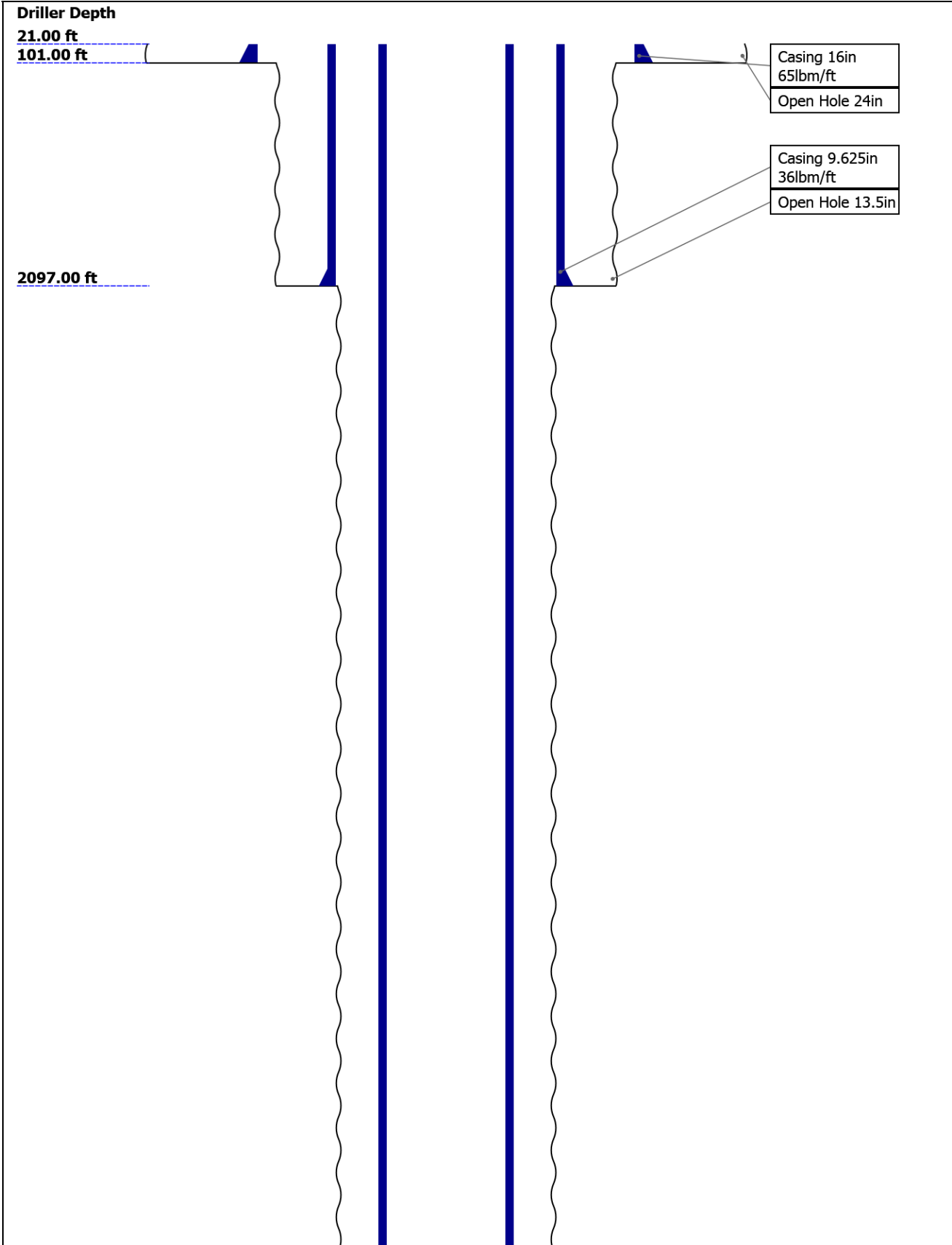
9.4 Log (Sonic CBL with VDL)

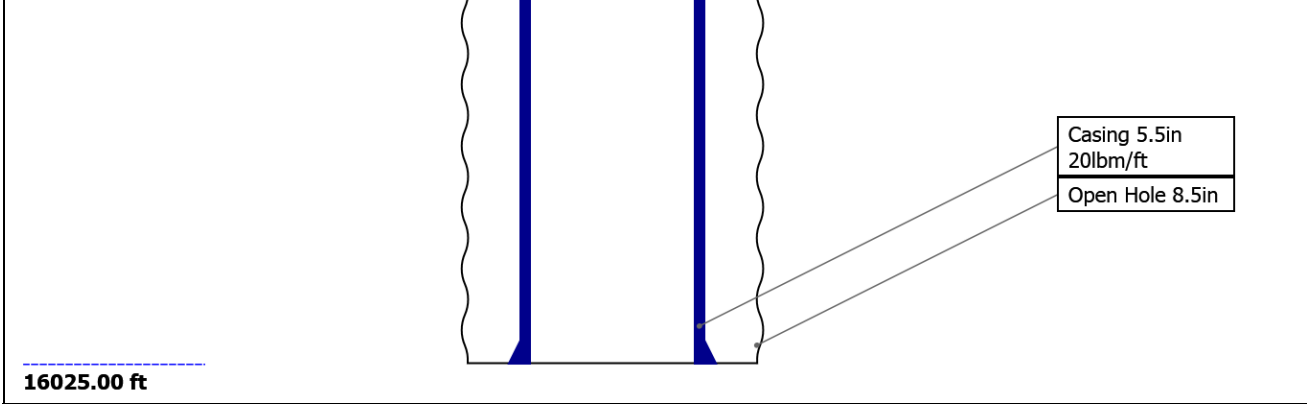
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Well Sketch





Borehole Size/Casing/Tubing Record

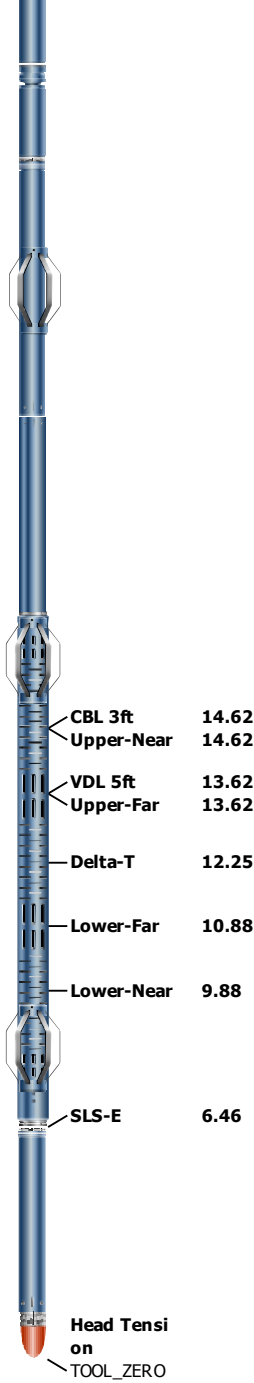
Bit						
Bit Size (in)	24	13.5	8.5			
Top Driller (ft)	21	101	2097			
Top Logger (ft)	21	101	2097			
Bottom Driller (ft)	101	2097	16025			
Bottom Logger (ft)	101	2097	16025			
Casing						
Size (in)	16	9.625	5.5			
Weight (lbm/ft)	65	36	20			
Inner Diameter (in)	15.25	8.921	4.778			
Grade	N/A	N/A	N/A			
Top Driller (ft)	21	21	21			
Top Logger (ft)	21	21	21			
Bottom Driller (ft)	101	2097	16025			
Bottom Logger (ft)	101	2097	16025			

Remarks and Equipment Summary

One: Toolstring				One: Remarks	
Equip name	Length	MP name	Offset	Tool ran as per toolsketch.	
LEH-QT	46.01			Main pass performed at 1500PSI, repeat pass at 0PSI.	
CAL-YA:666	43.1				
CAL-YA:666		CCL	42.31		
DTC-H:8803	39.6				
ECH-KC:10354		CTEM	38.7		
DTC-H:8803		HV	0.00		
		TelStatus	36.6		
		ToolStatus	36.6		
SGT-N:10210	36.6				
SGH-K:2996		GR	35.68		
SGD-TAA:2166					
1					
SGC-TB:10210					
AH-184[2]:4	31.1				
700					

AH-184[1]:3 29.1
906

DSLTH-H:8318 27.1
ECH-KH:8373
DSLCH-H:8318
SLS-E:1650



Adaptor_Head 6.46

BNS-STD 0.46

Head Tension
TOOL_ZERO

Lengths are in ft

Maximum Outer Diameter = 6.250 in

Line: Sensor Location, Value: Gating Offset

All measurements are relative to TOOL_ZERO

Depth Summary

One

Depth Measuring Device

Type	IDW-JA
Serial Number	5896
Calibration Date	29-Apr-2016
Calibrator Serial Number	
Calibration Cable Type	7-39P-LXS
Wheel Correction 1	-1
Wheel Correction 2	-3

Tension Device

Type	CMTD-B/A
Serial Number	1109

Calibration Date			
Calibrator Serial Number	441435A		
Number of Calibration Points	10		
Calibration Root Mean Square Error	3		
Calibration Peak Error	4		

Logging Cable

Type	7-39P-LXS		
Serial Number			
Length	15000.00 ft		
Conveyance Type	Wireline		
Rig Type	Crane		

One:Depth Control Parameters

Depth Control Remarks

Log Sequence	First Log In the Well	IDW used as primary depth control device,
Rig Up Length At Surface		Z-chart used as secondary depth control device.
Rig Up Length At Bottom		This is the first run in the well. All Schlumberger depth control procedures followed.
Rig Up Length Correction		Depth correlated to short joint at 5071ft.
Stretch Correction		
Tool Zero Check At Surface		

One

1500 PSI Main Pass

Software Version

Acquisition System	Version
Maxwell 2016 SP2	6.2.64464.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[4]:Up	Up	65.86 ft	5207.28 ft	21-Sep-2016 5:17:39 PM	21-Sep-2016 6:26:54 PM	ON	6.26 ft	No

All depths are referenced to toolstring zero

Log

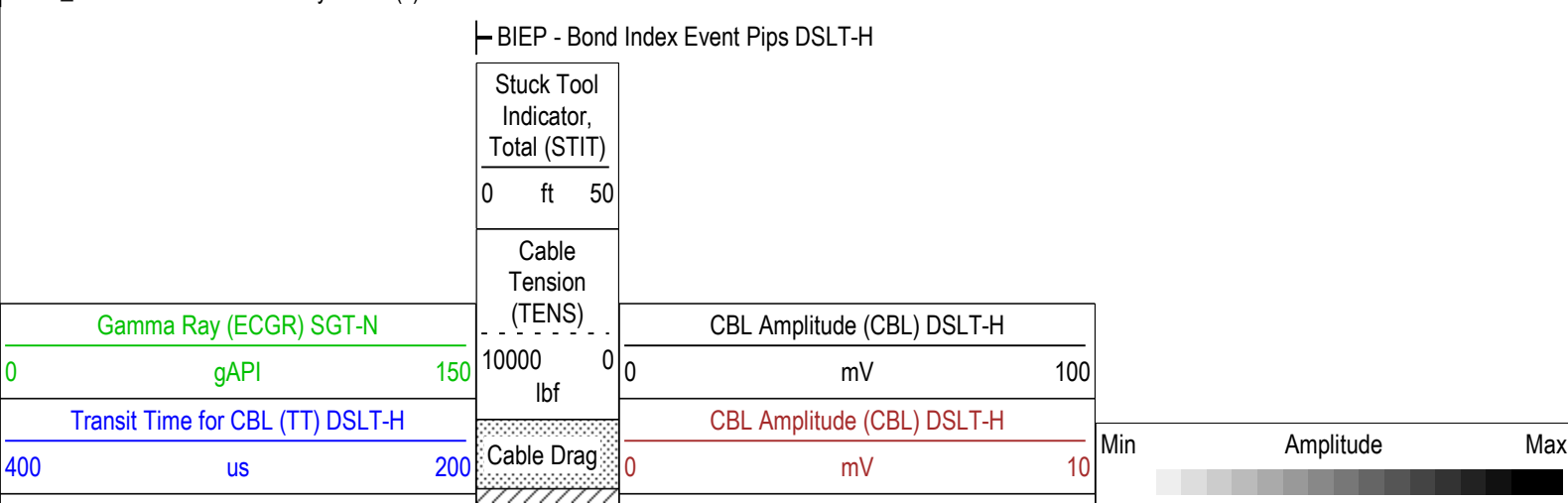
Company:Whiting Oil & Gas Corporation

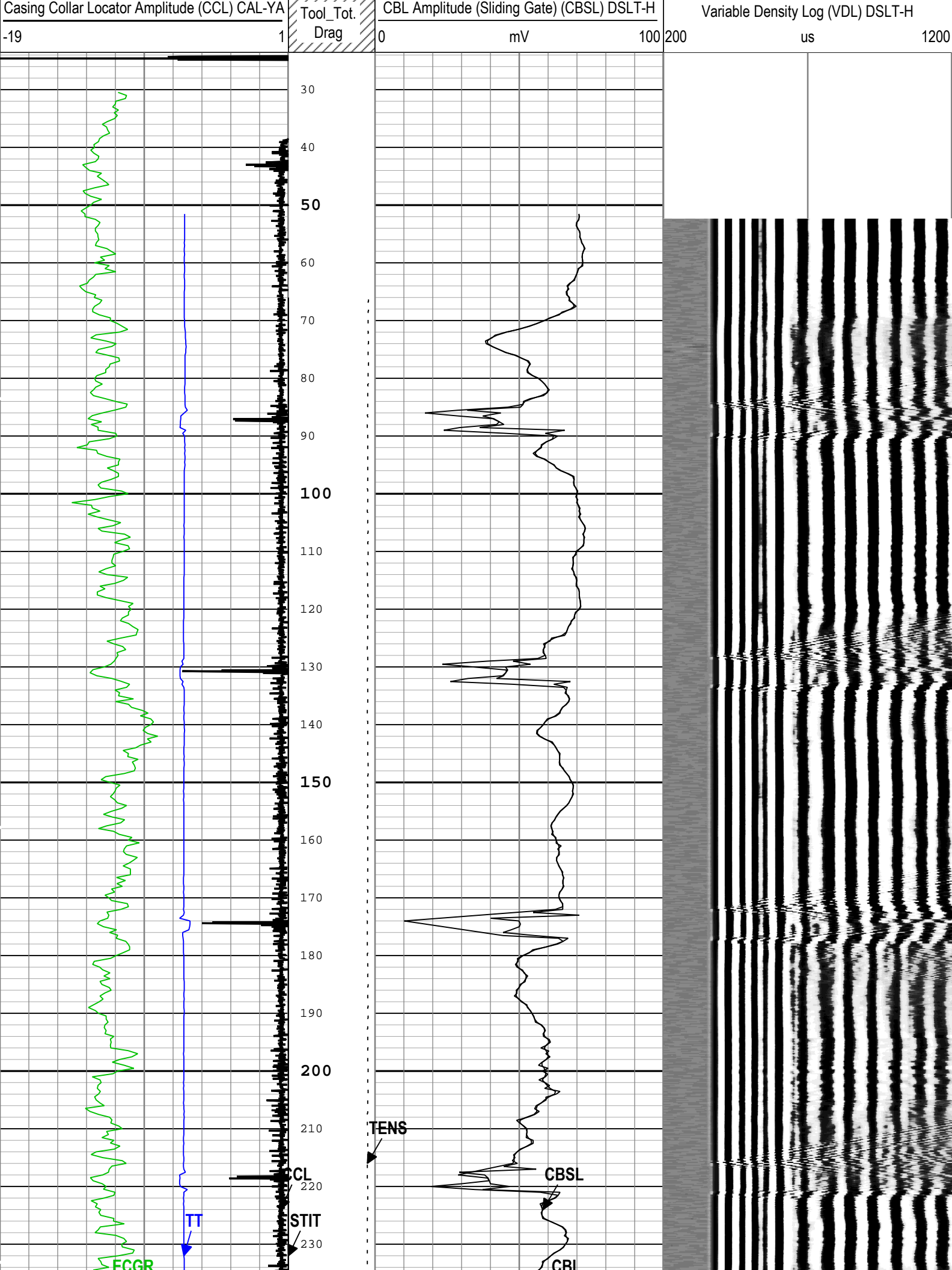
Well:Razor 25O-2443

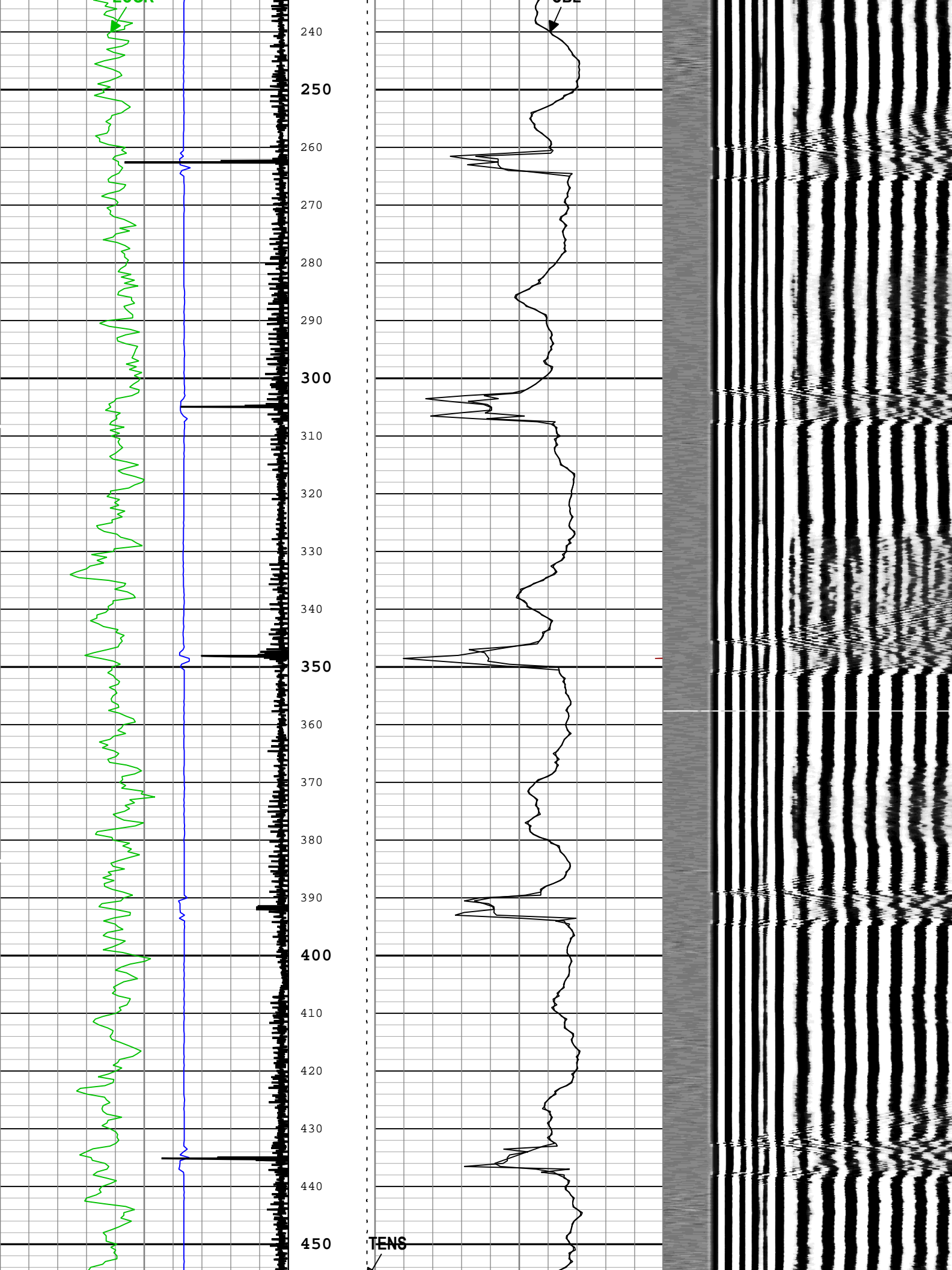
One: Log[4]:Up:S008

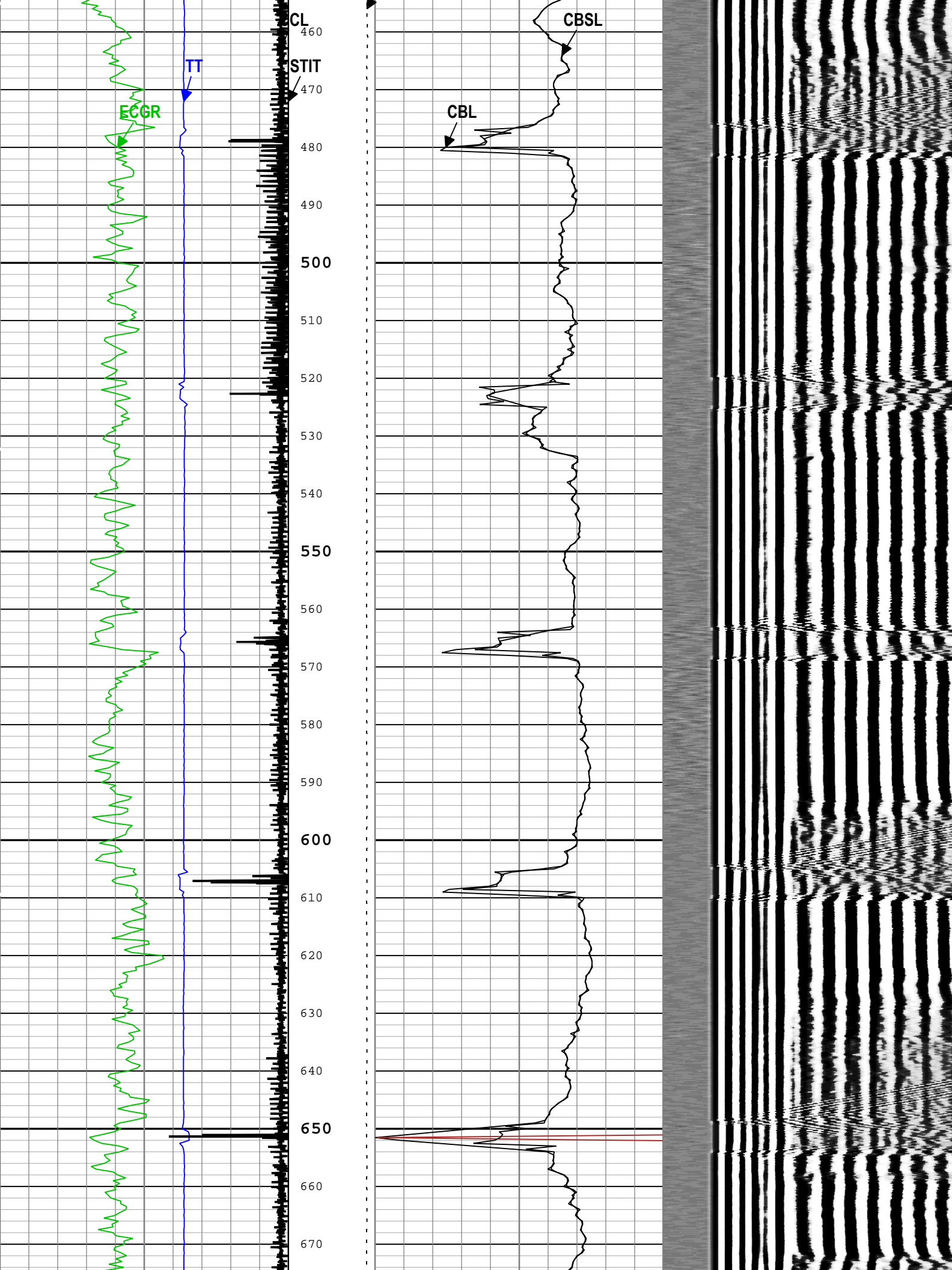
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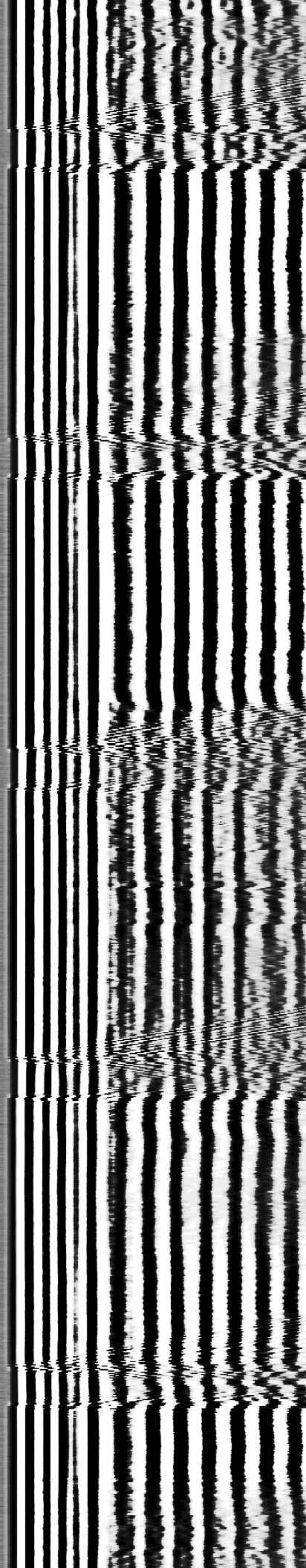
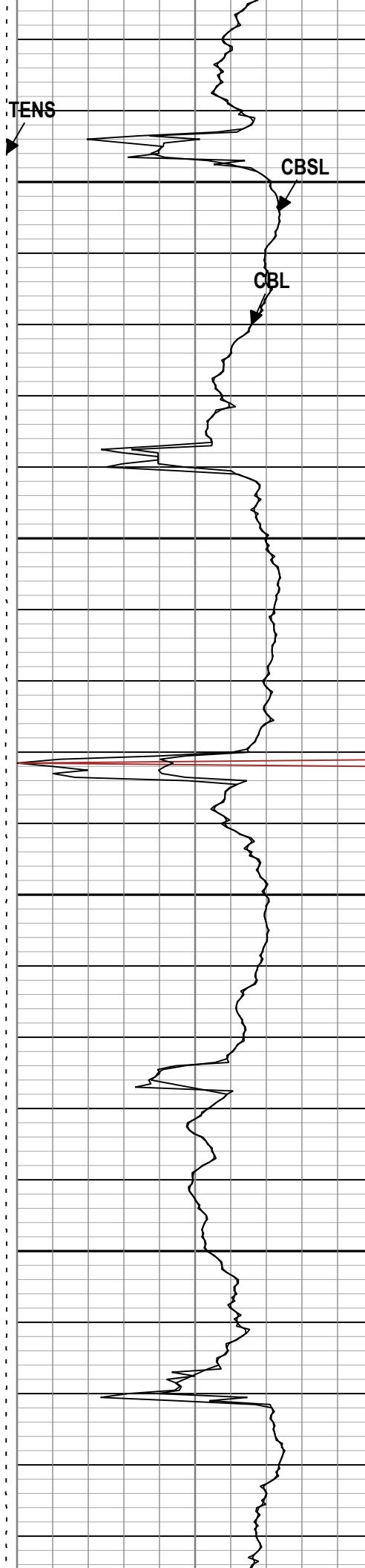
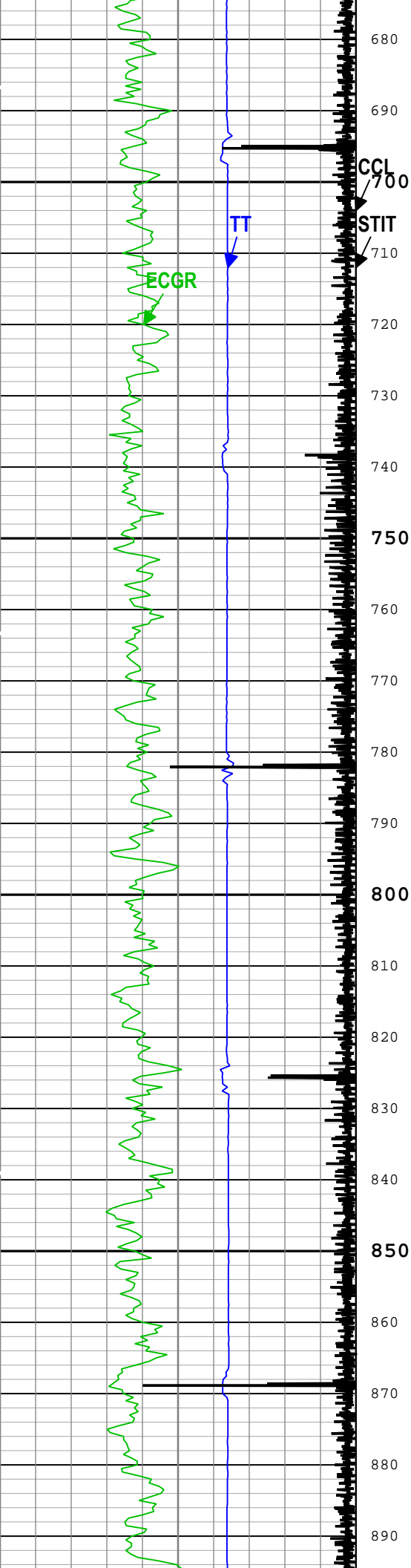
TIME 1900 - Time Marked every 60.00 (s)

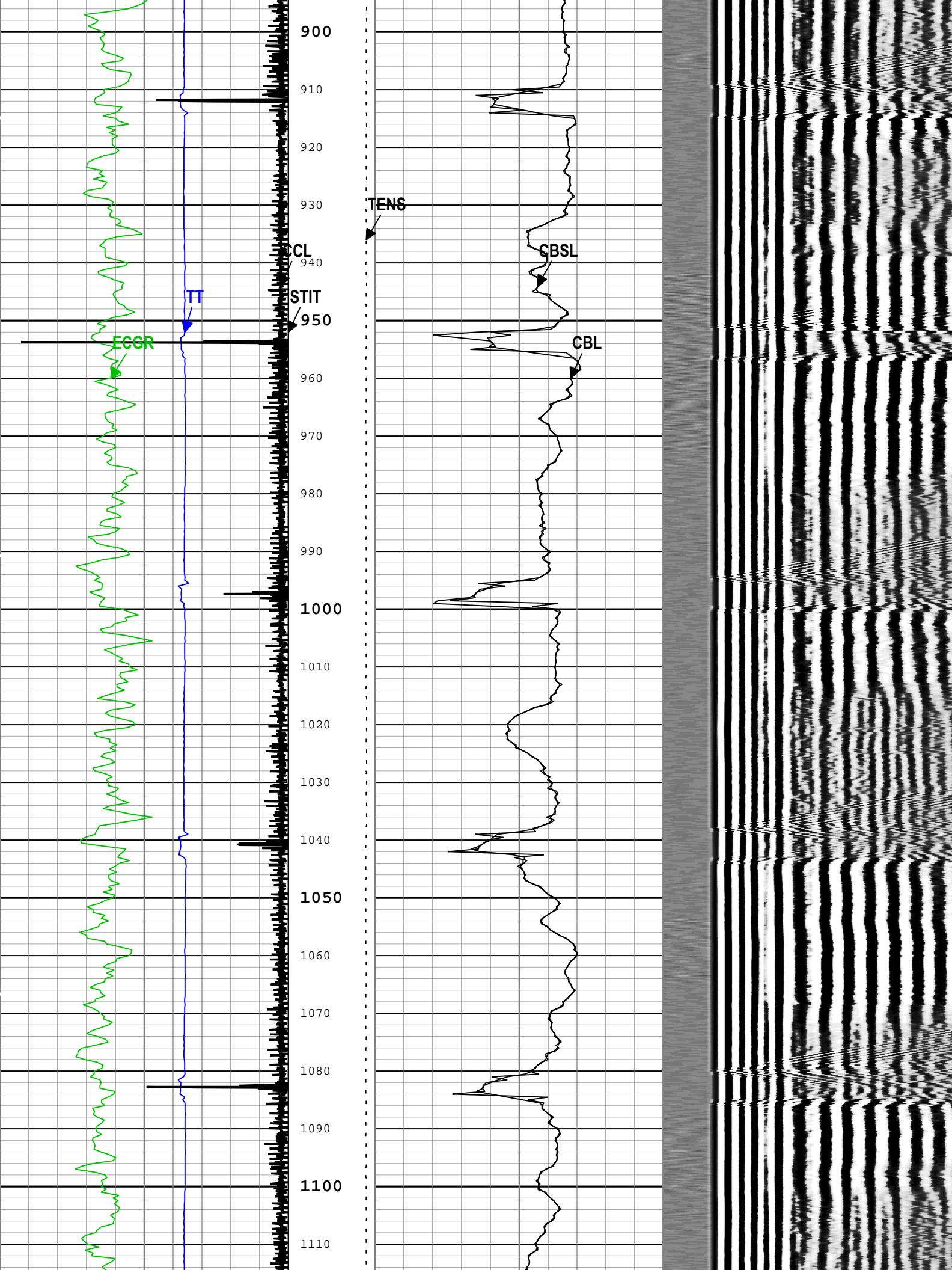


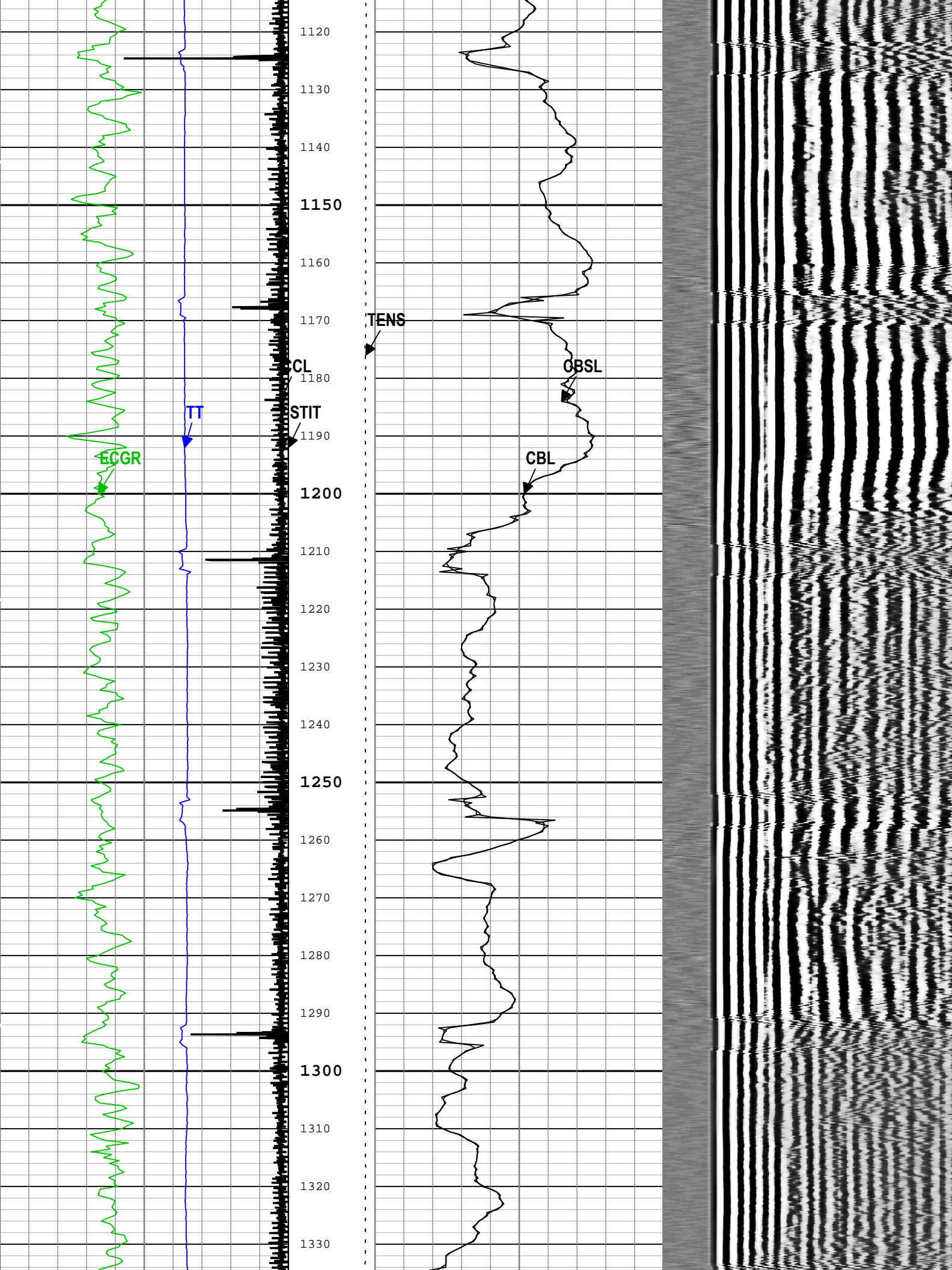


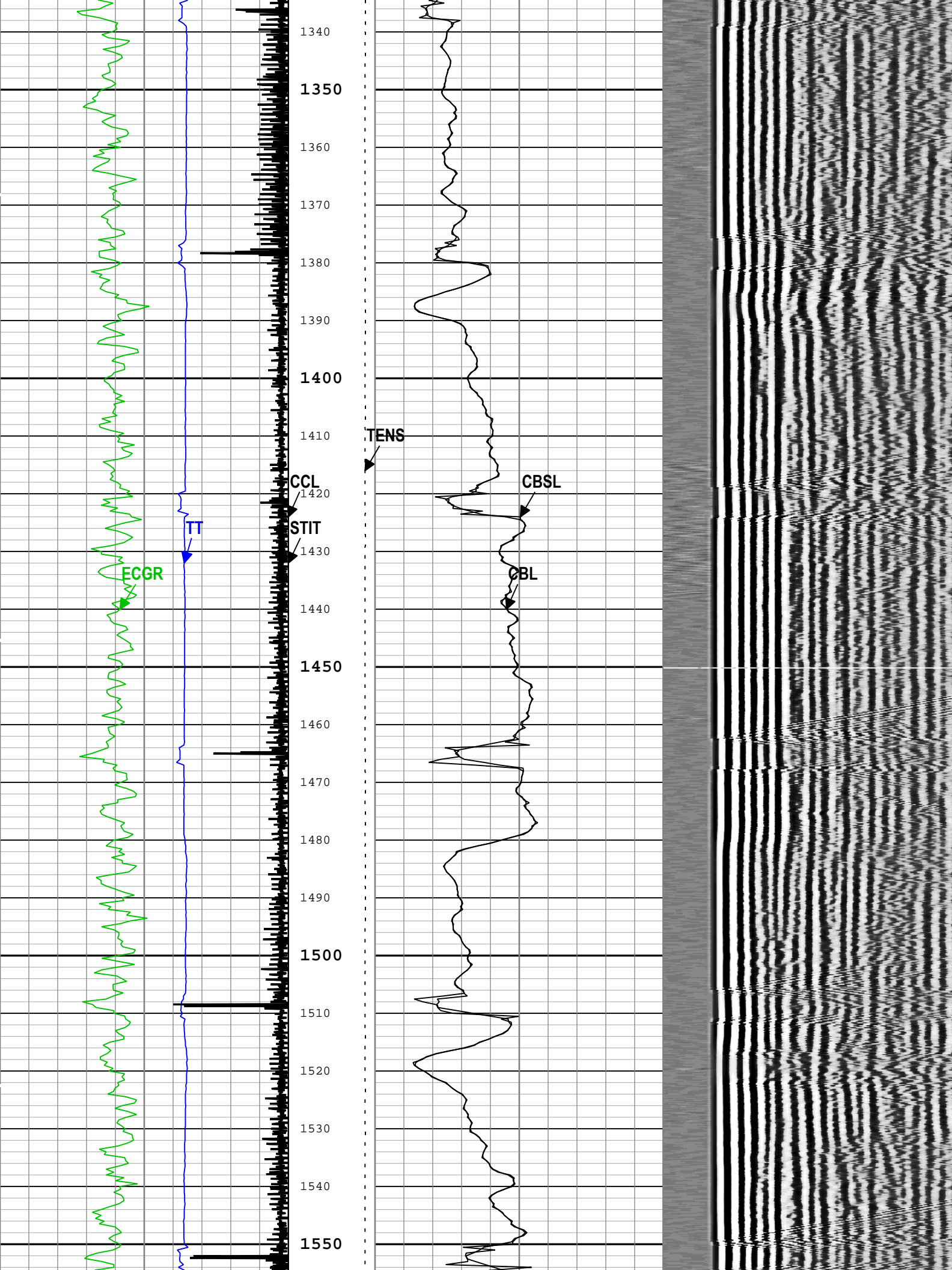


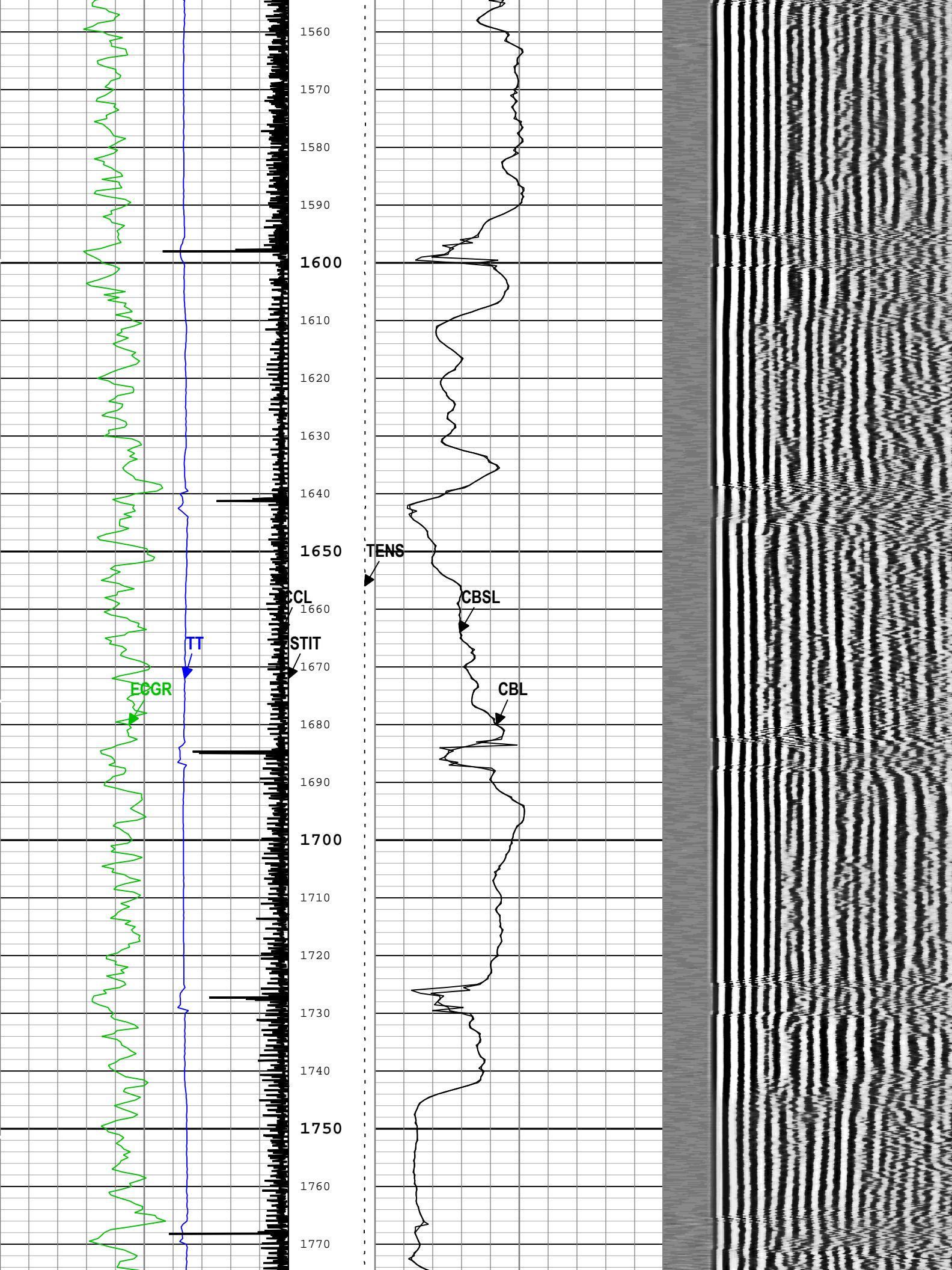


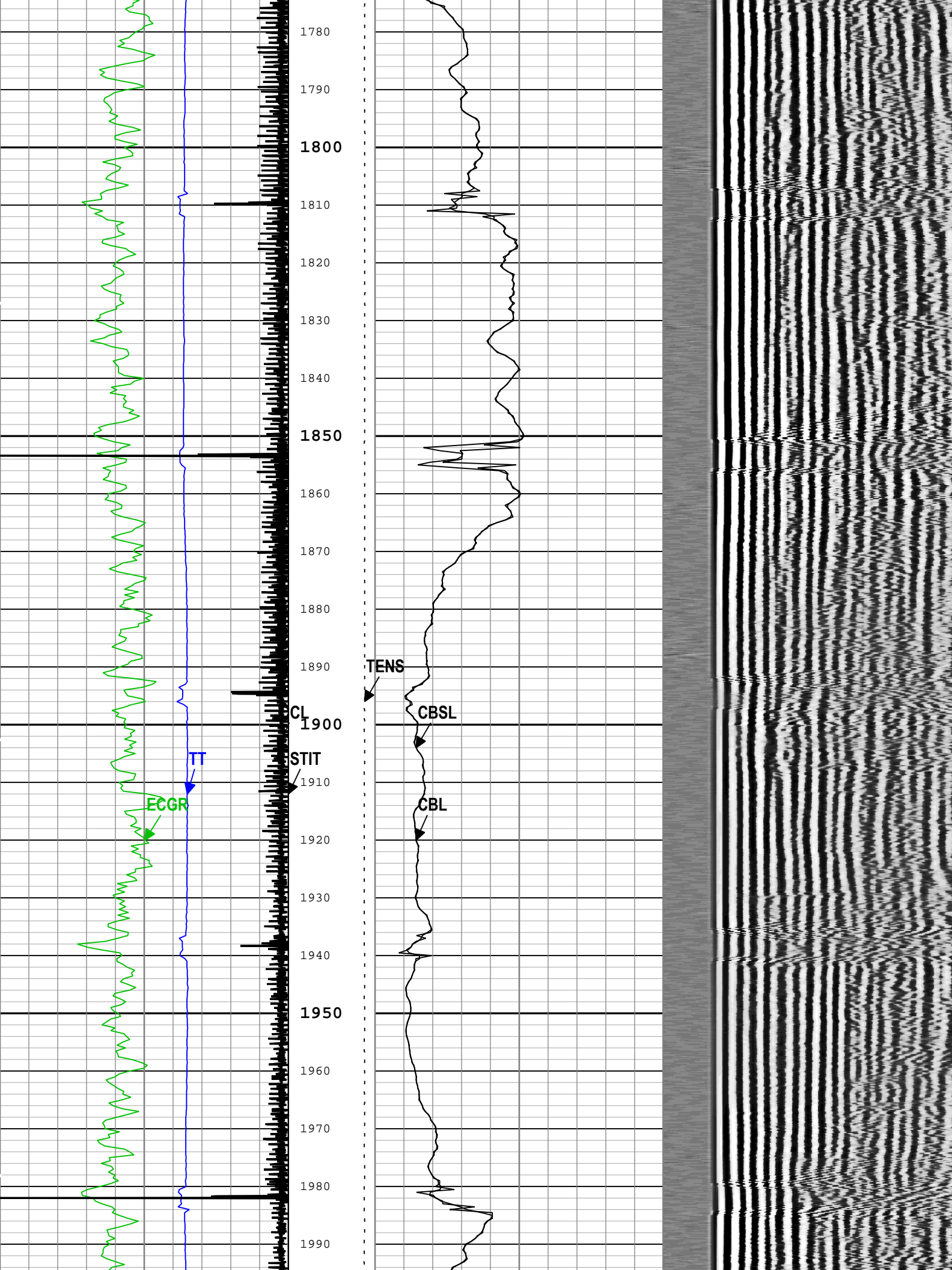


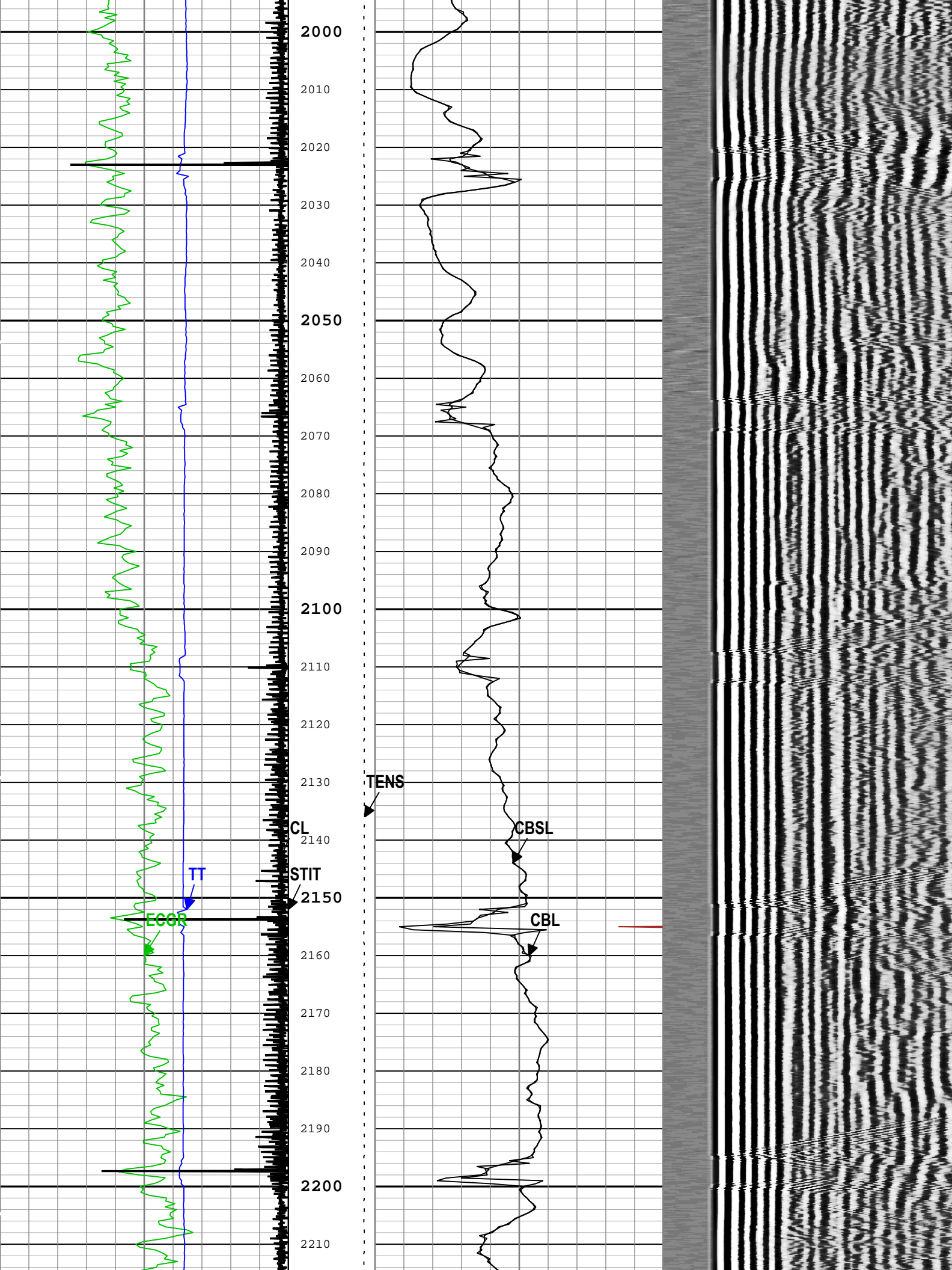


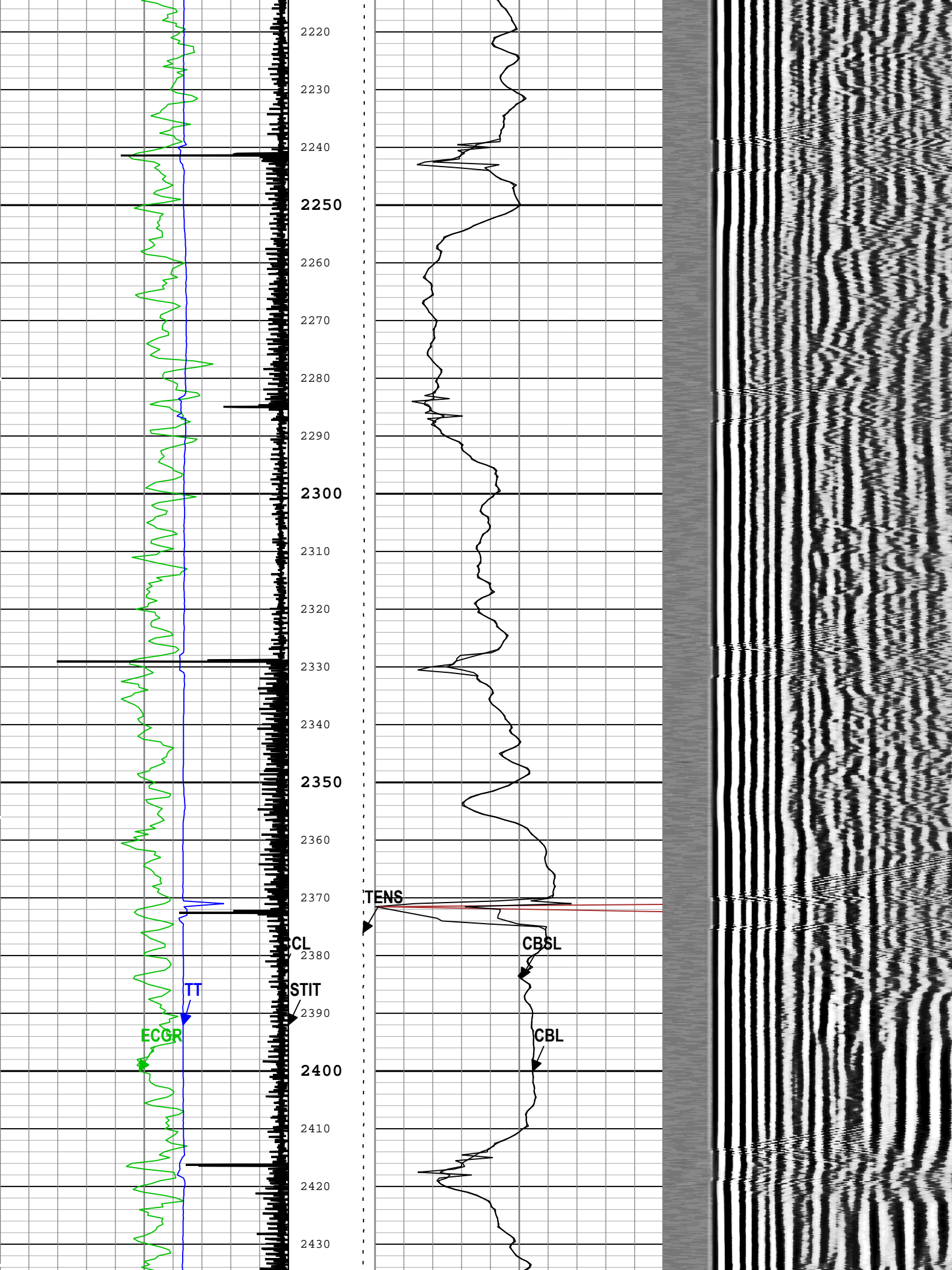


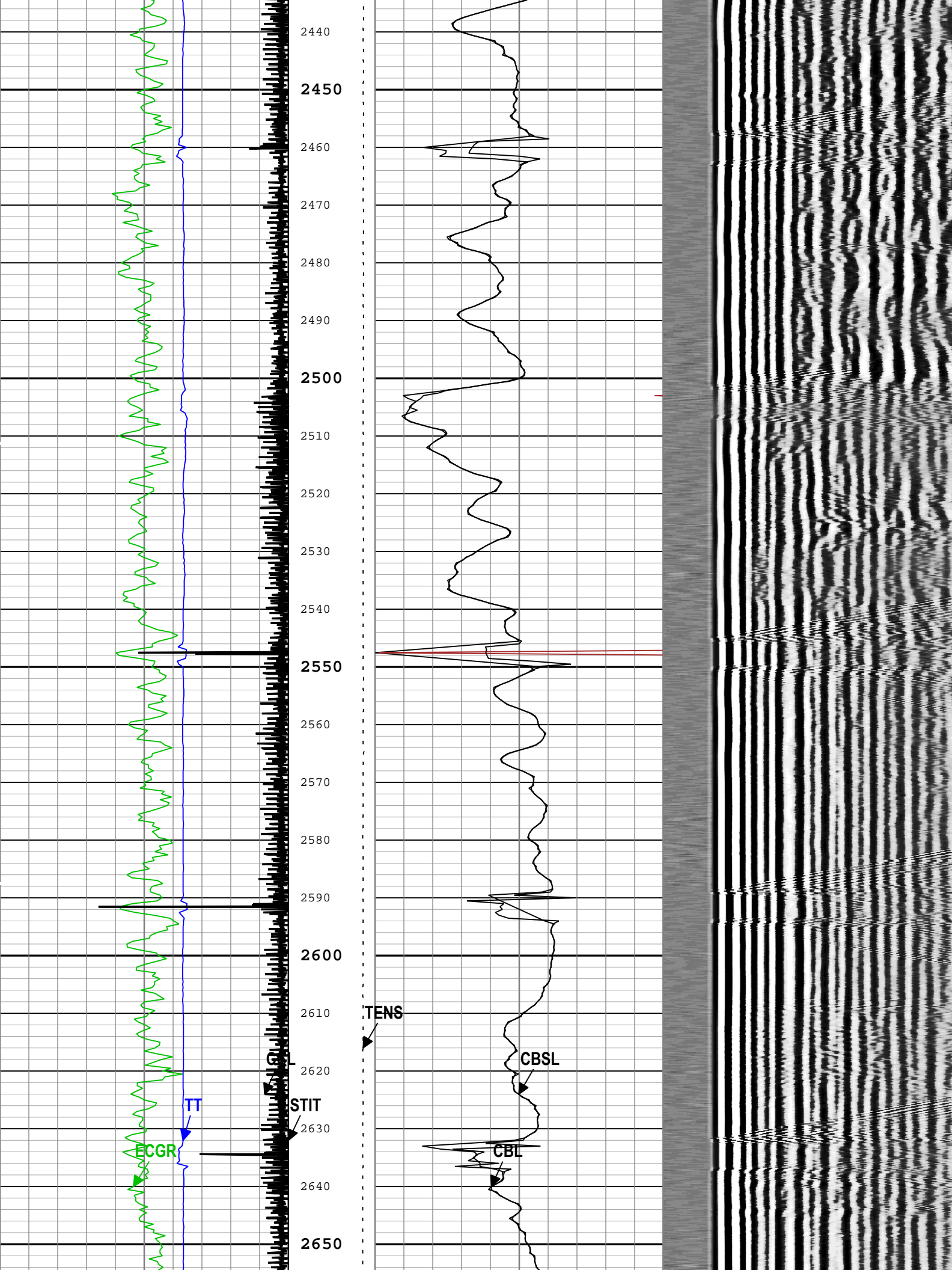


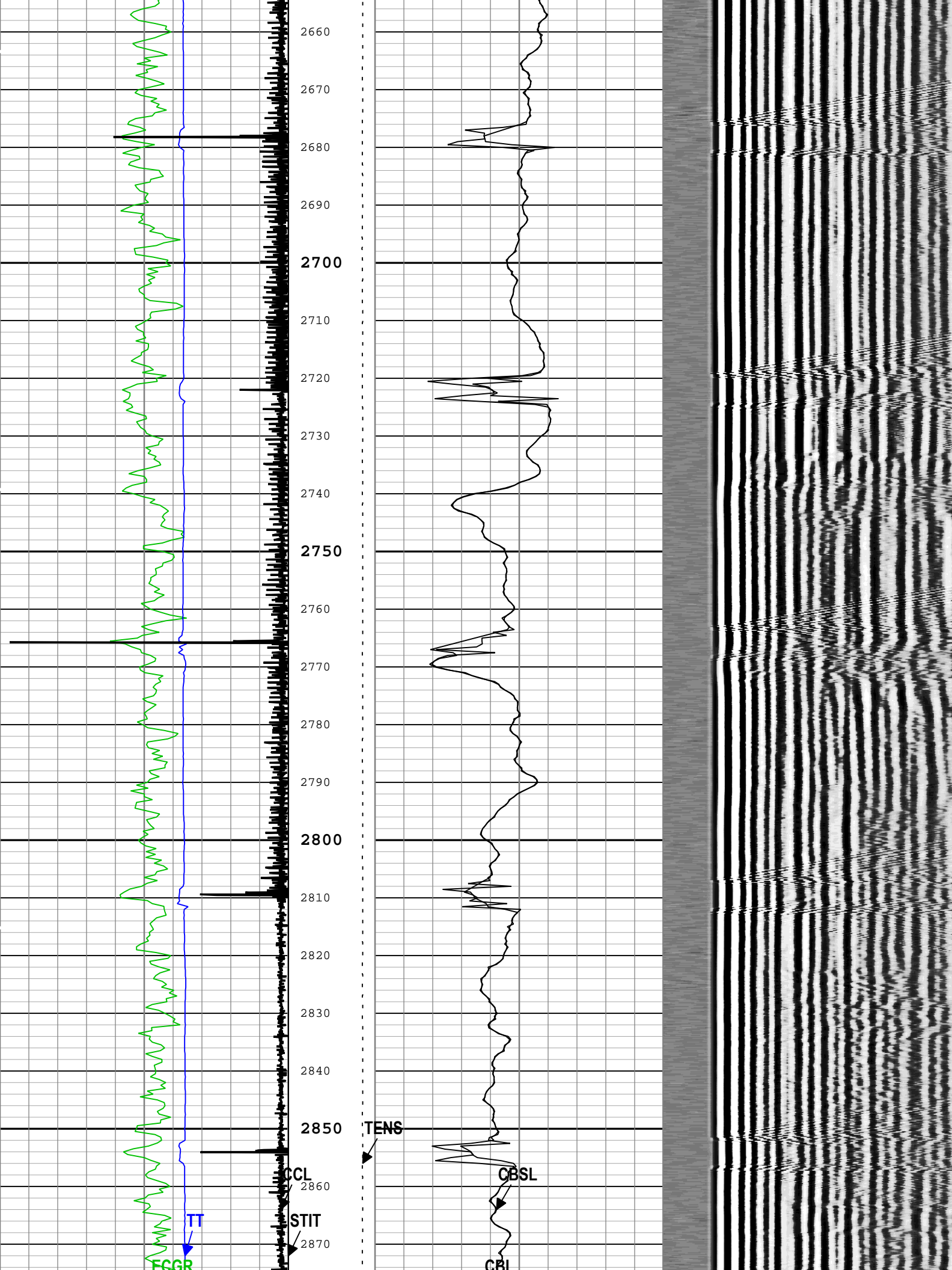


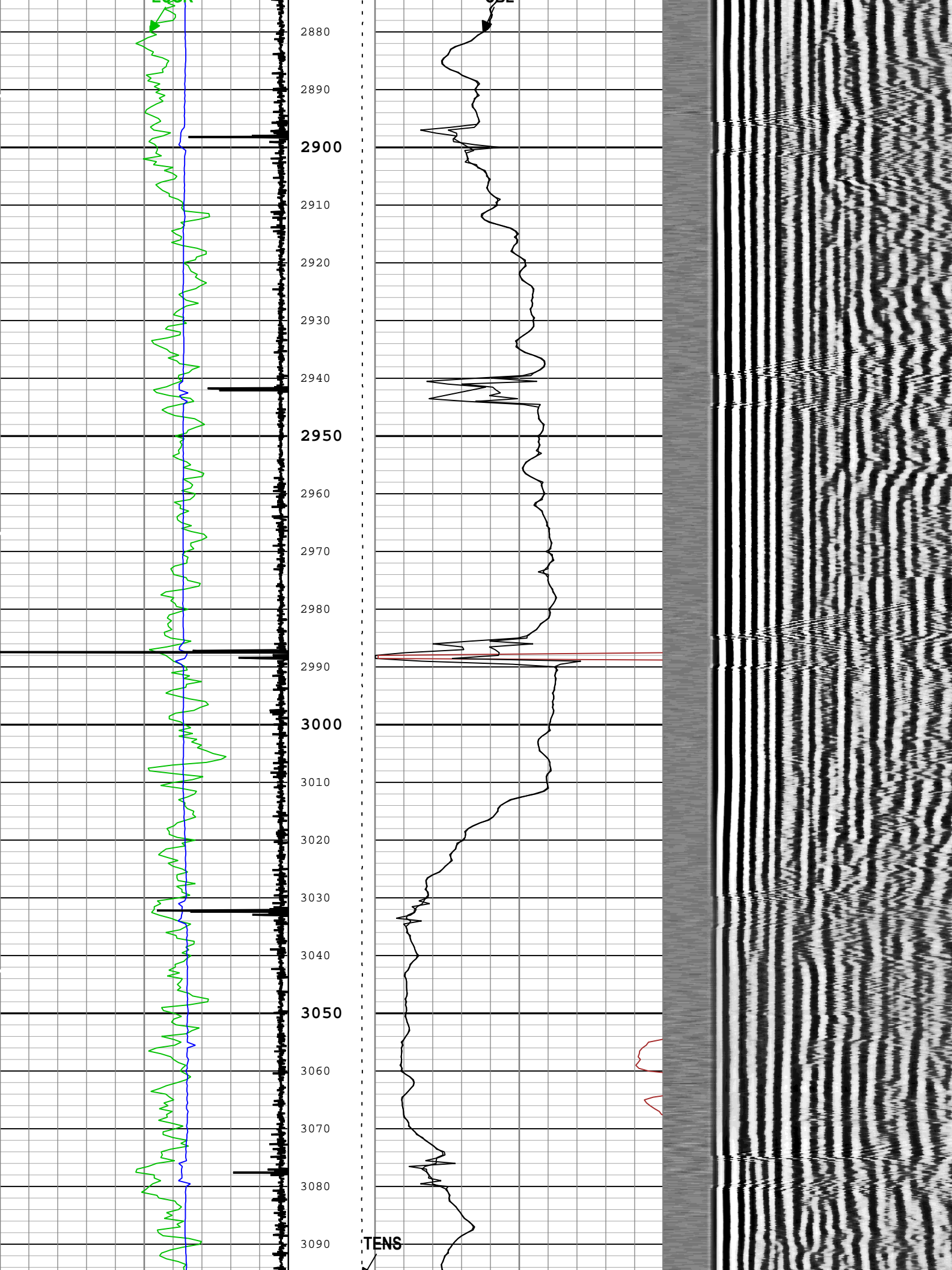


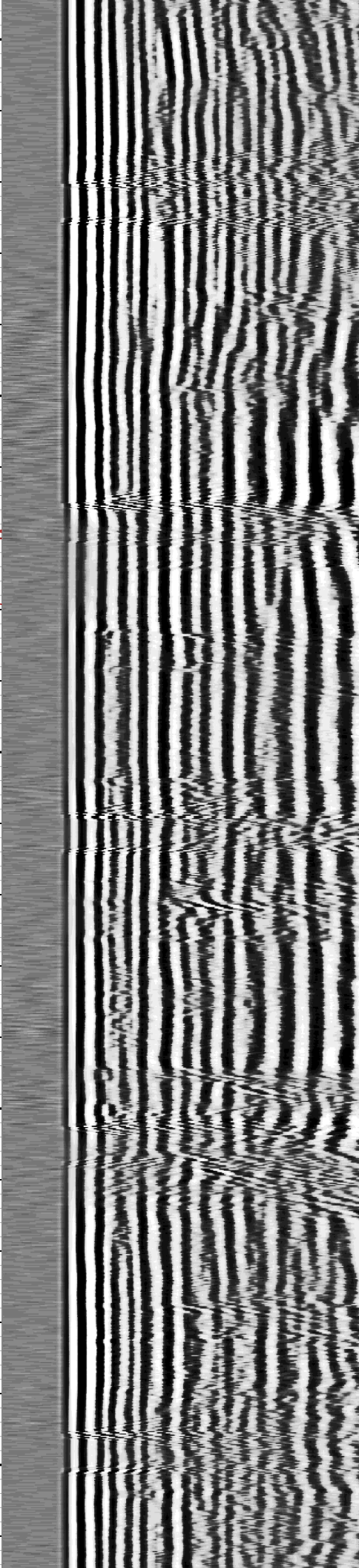
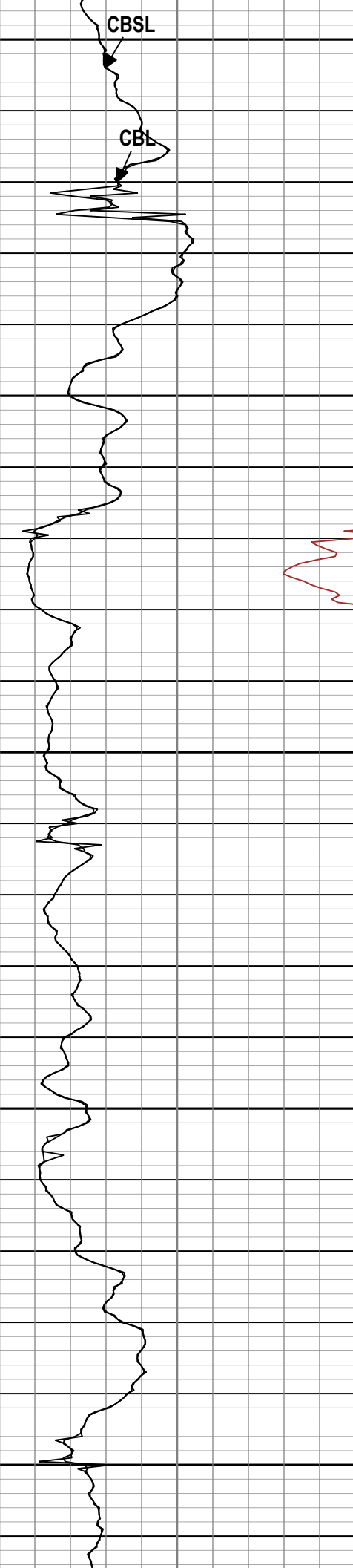
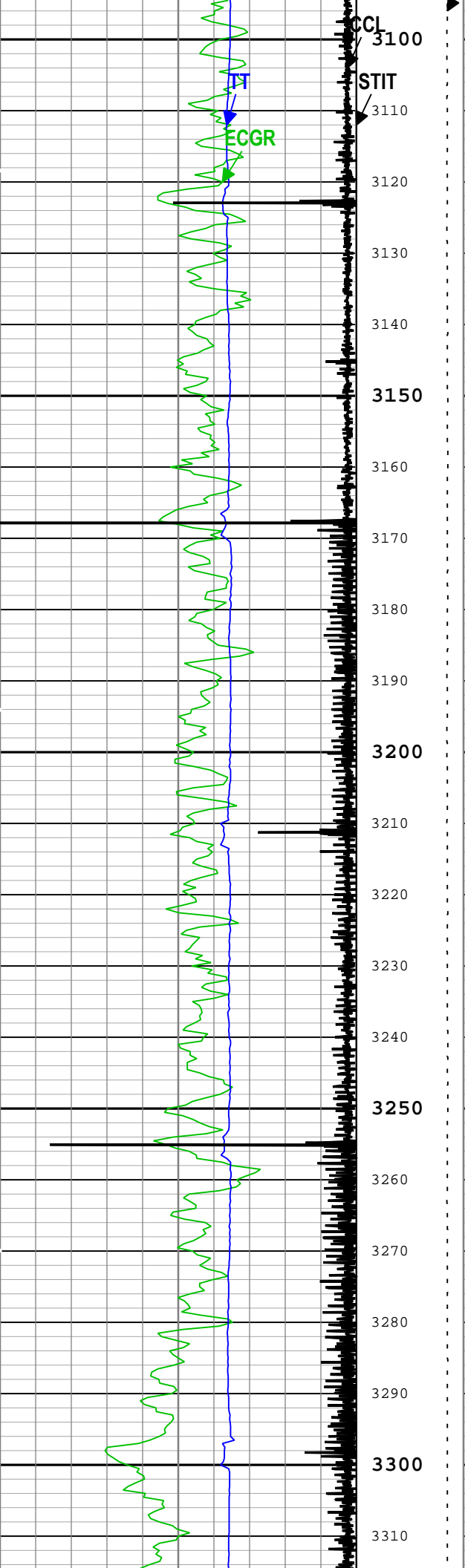


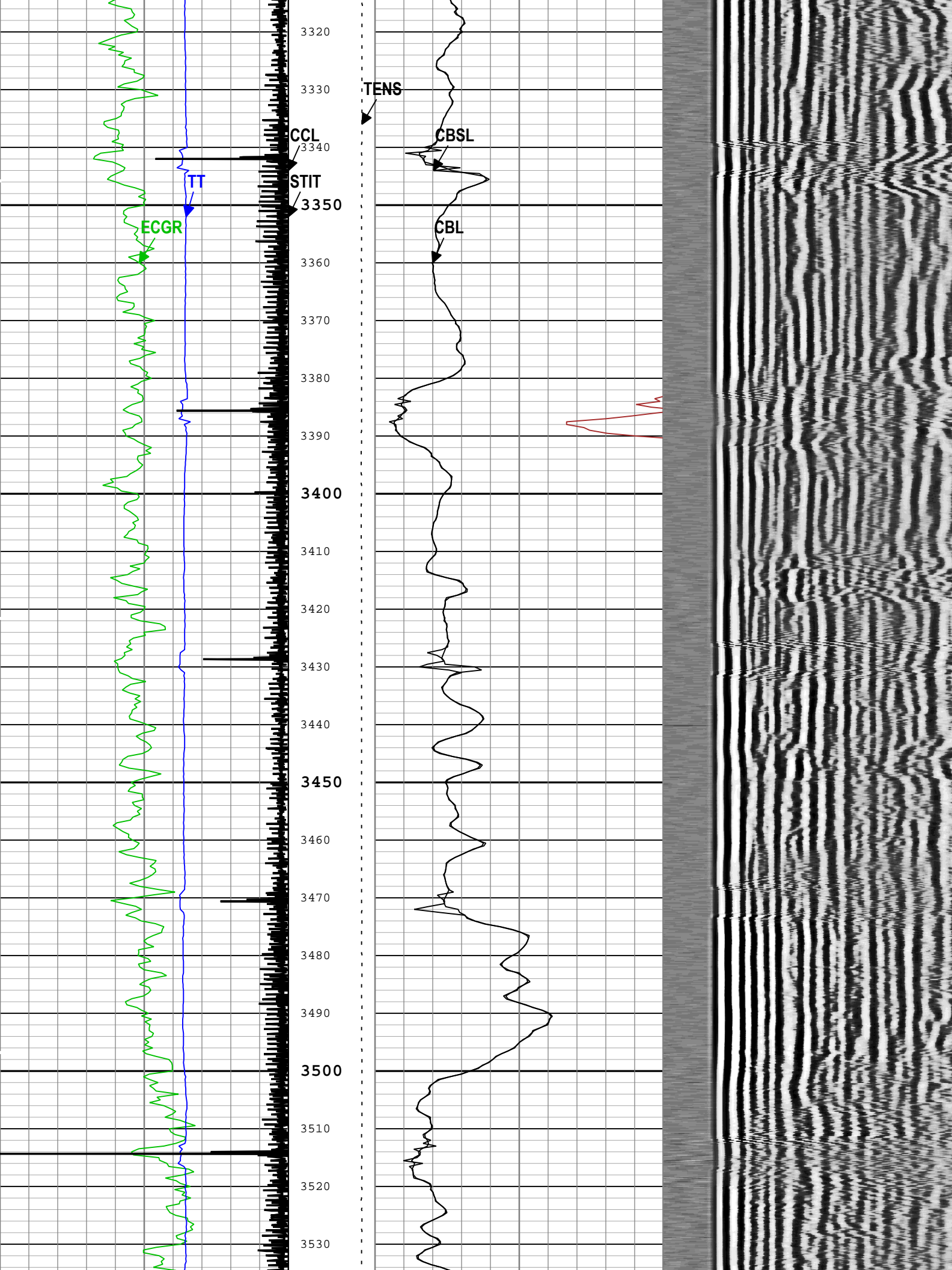


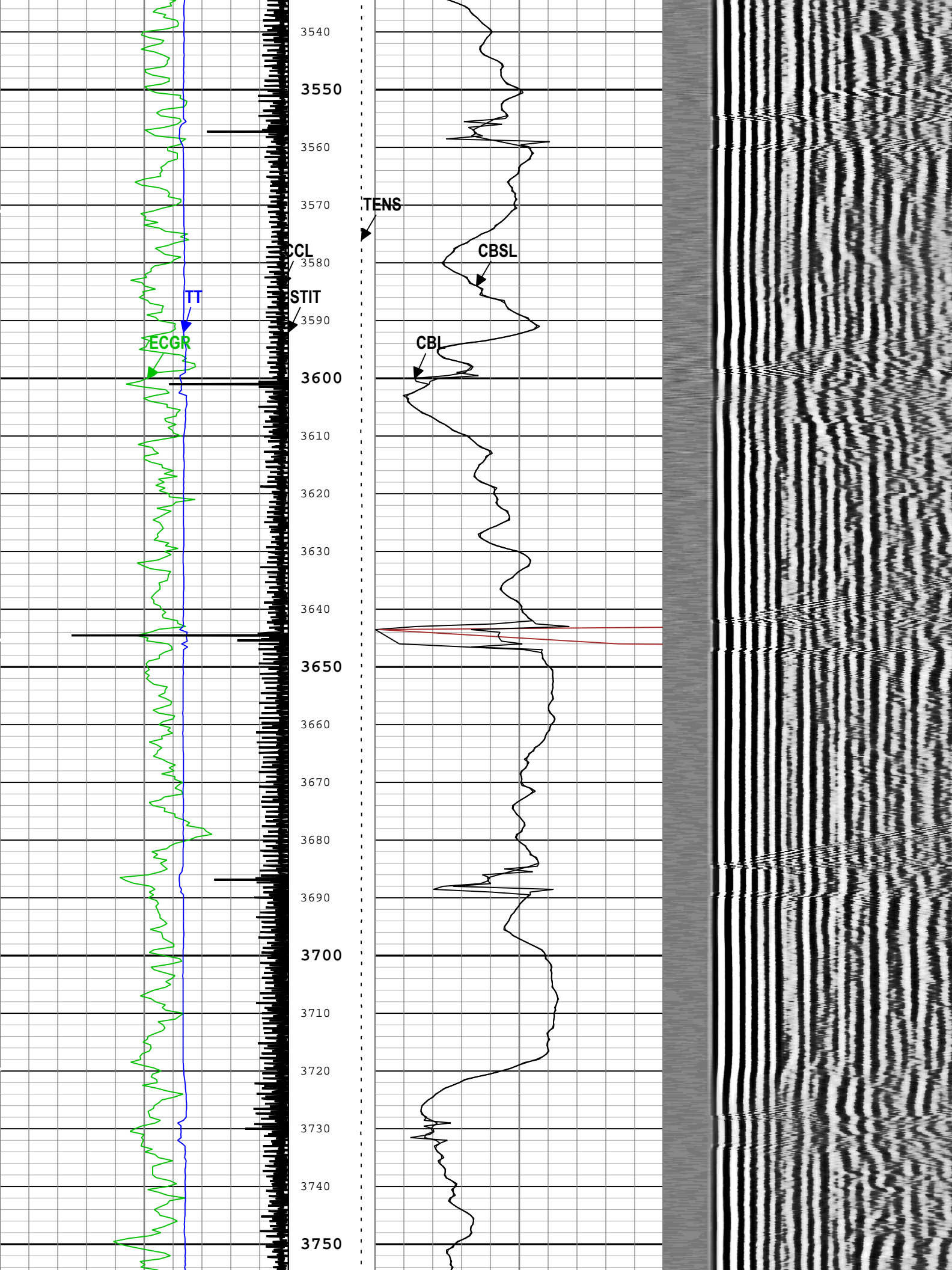


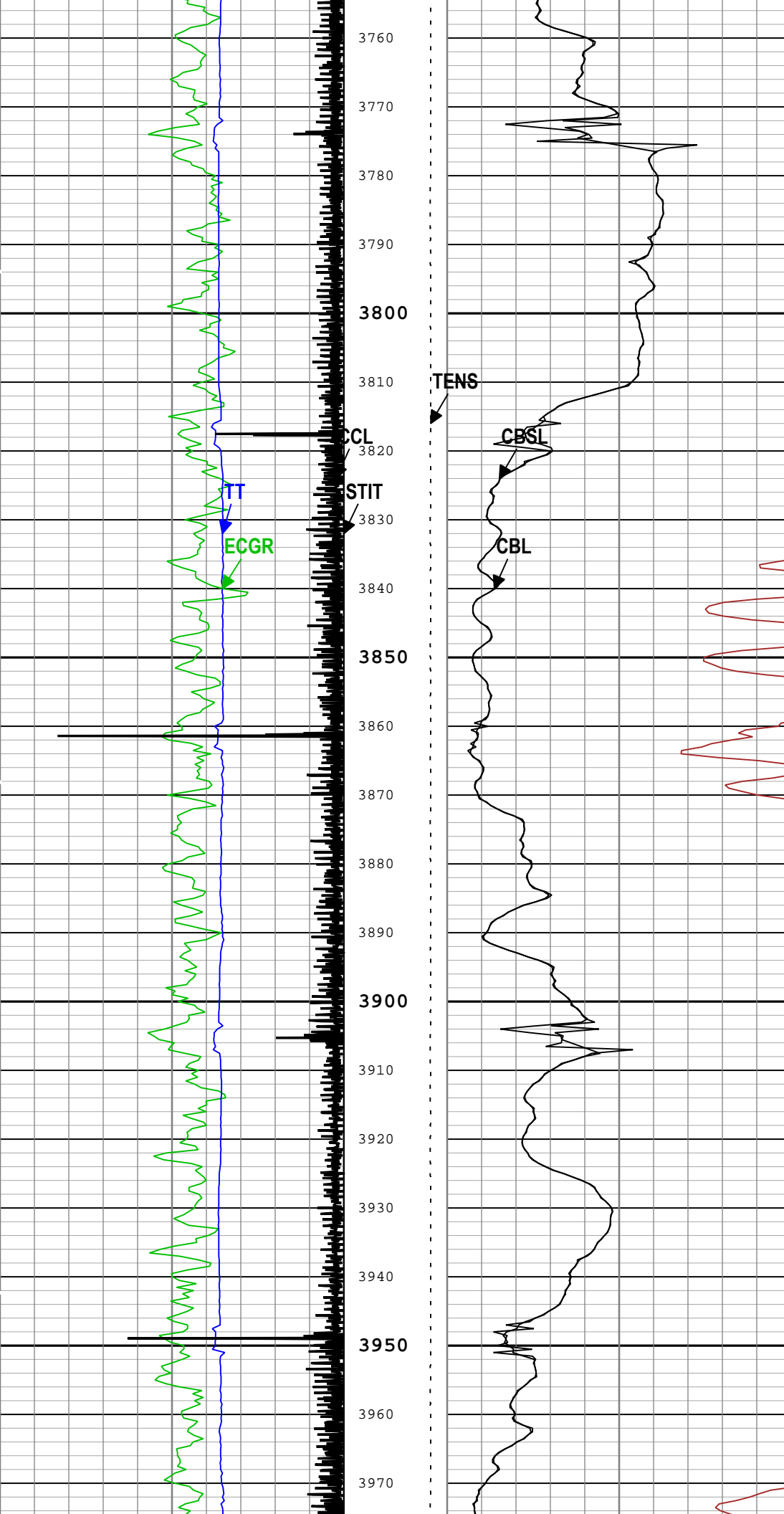


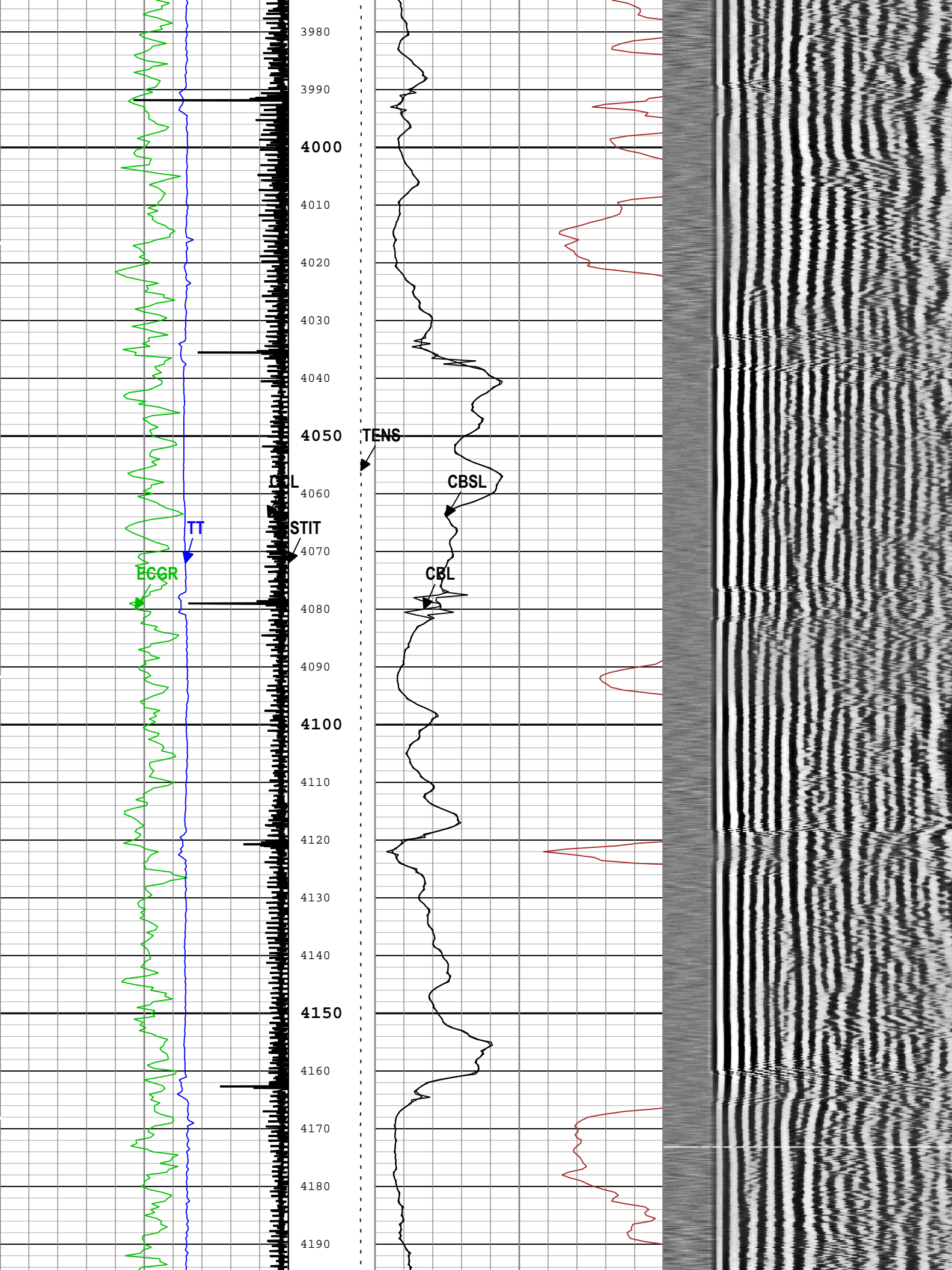


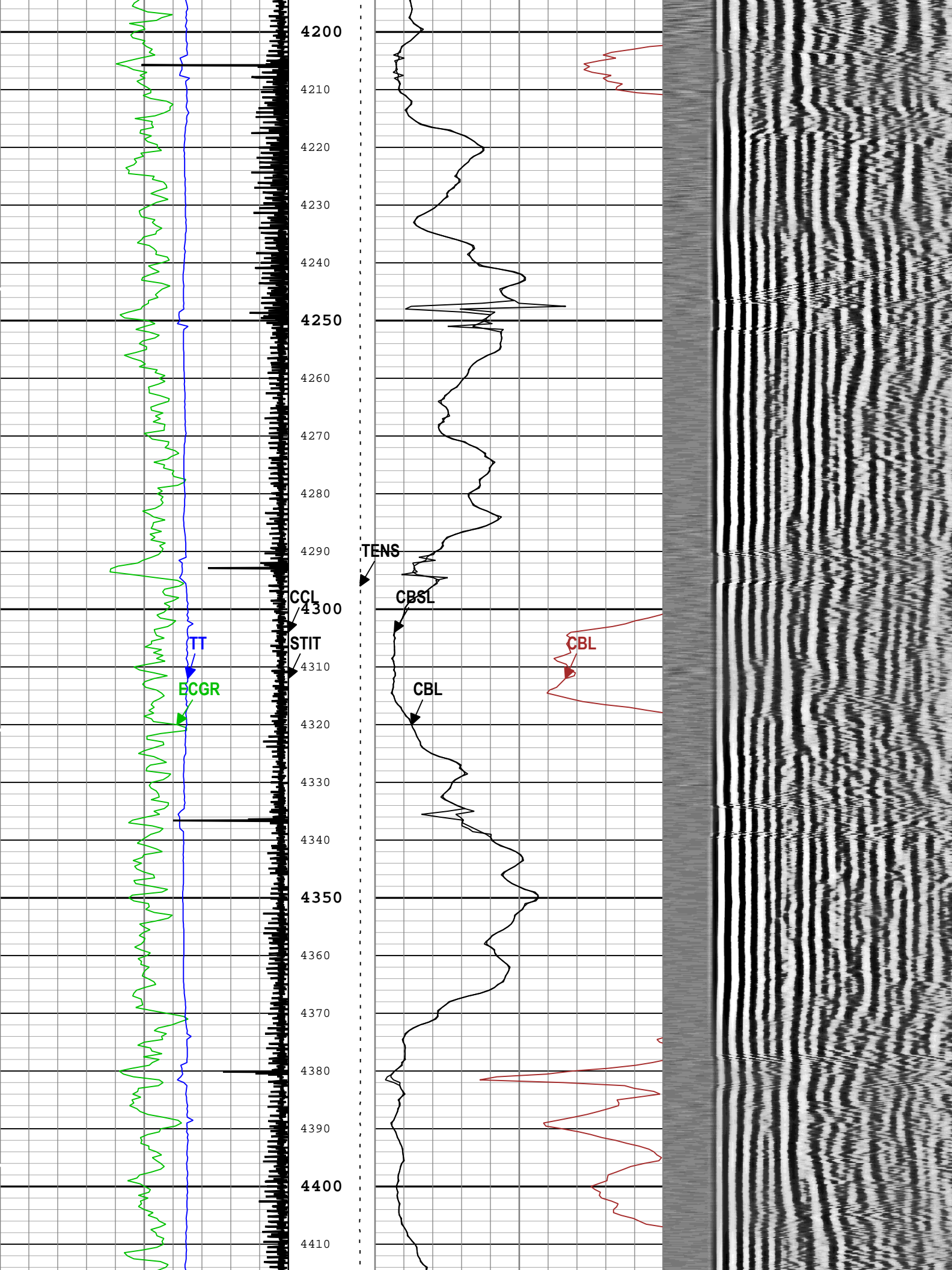


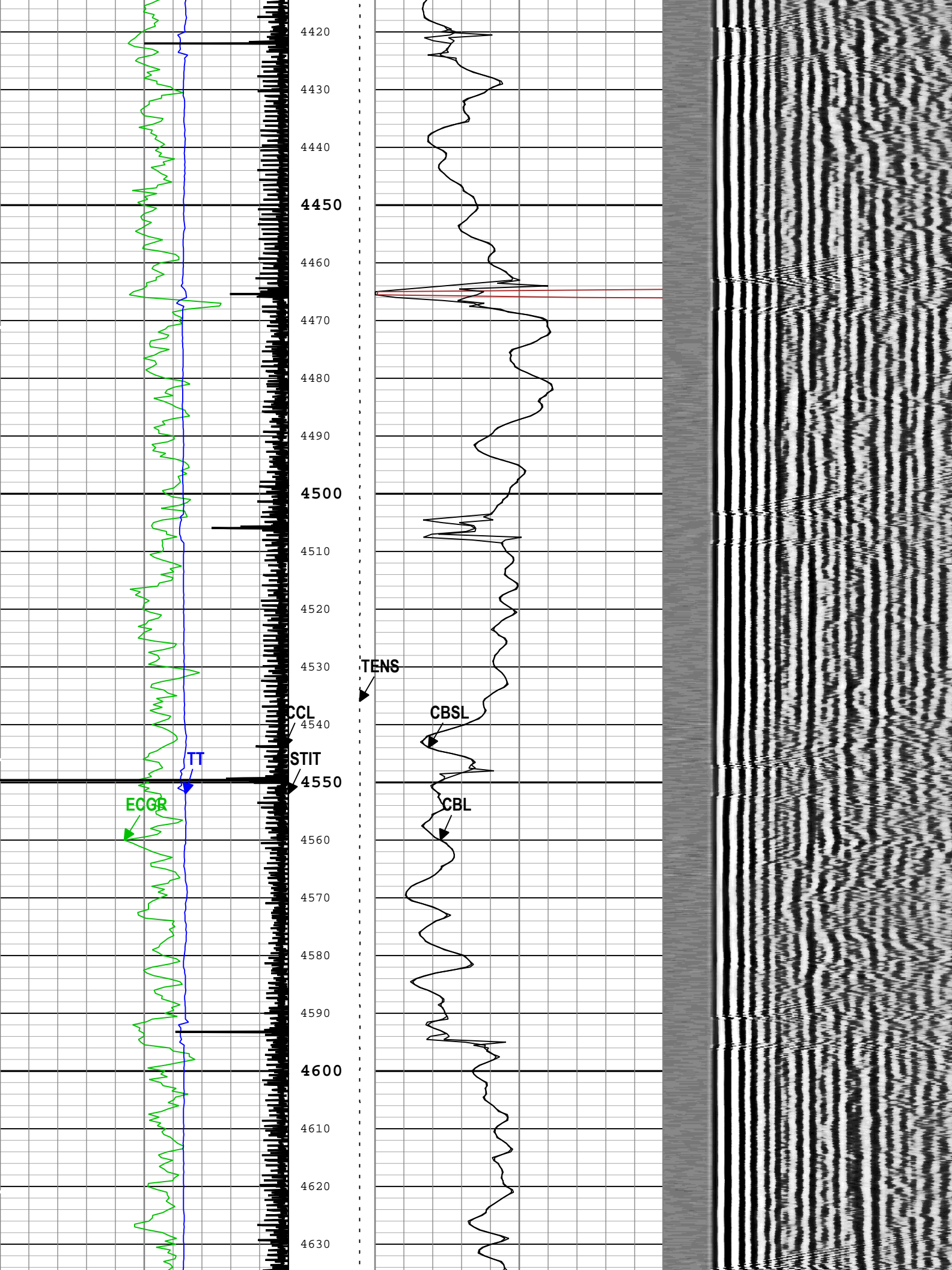


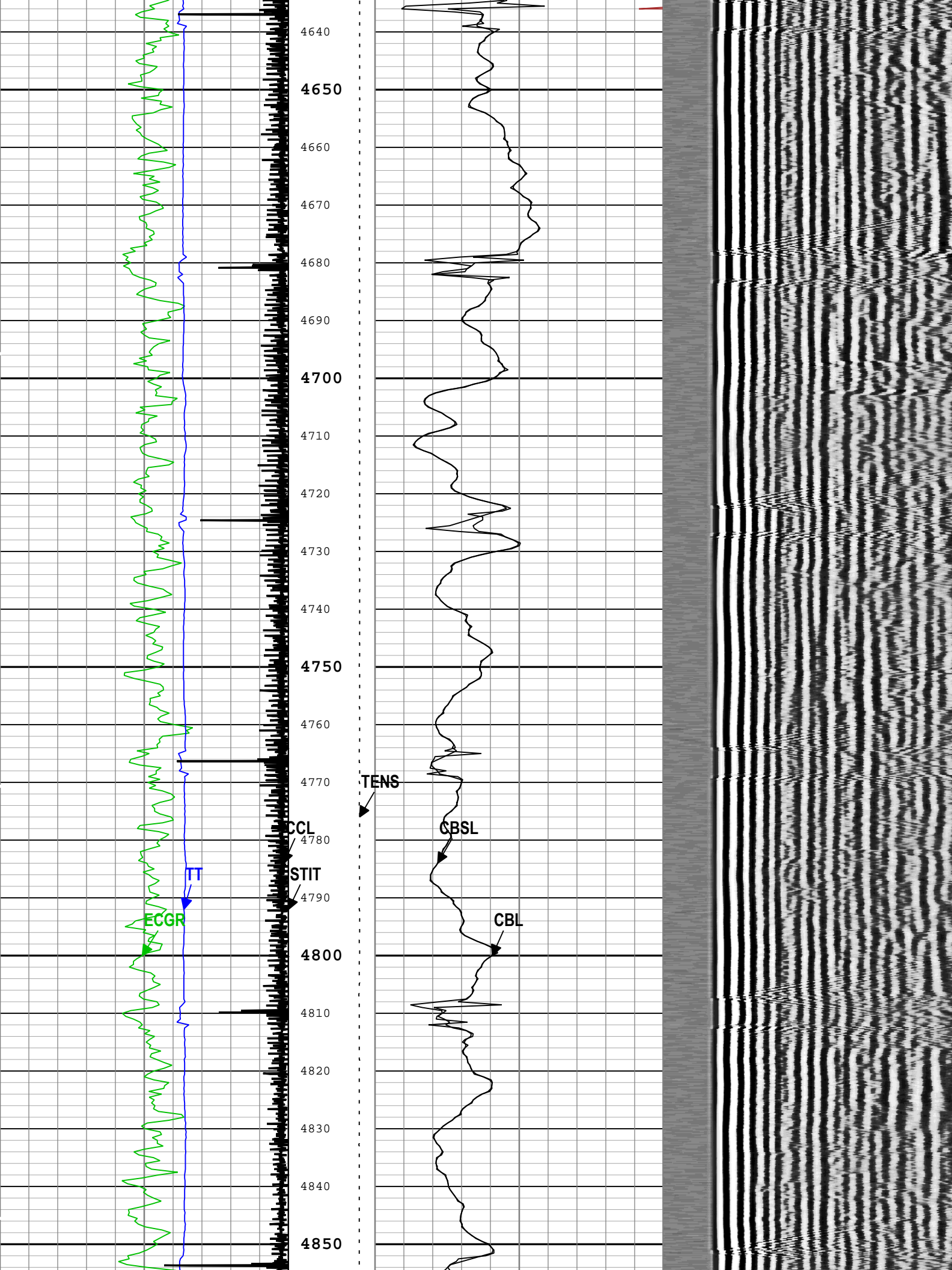


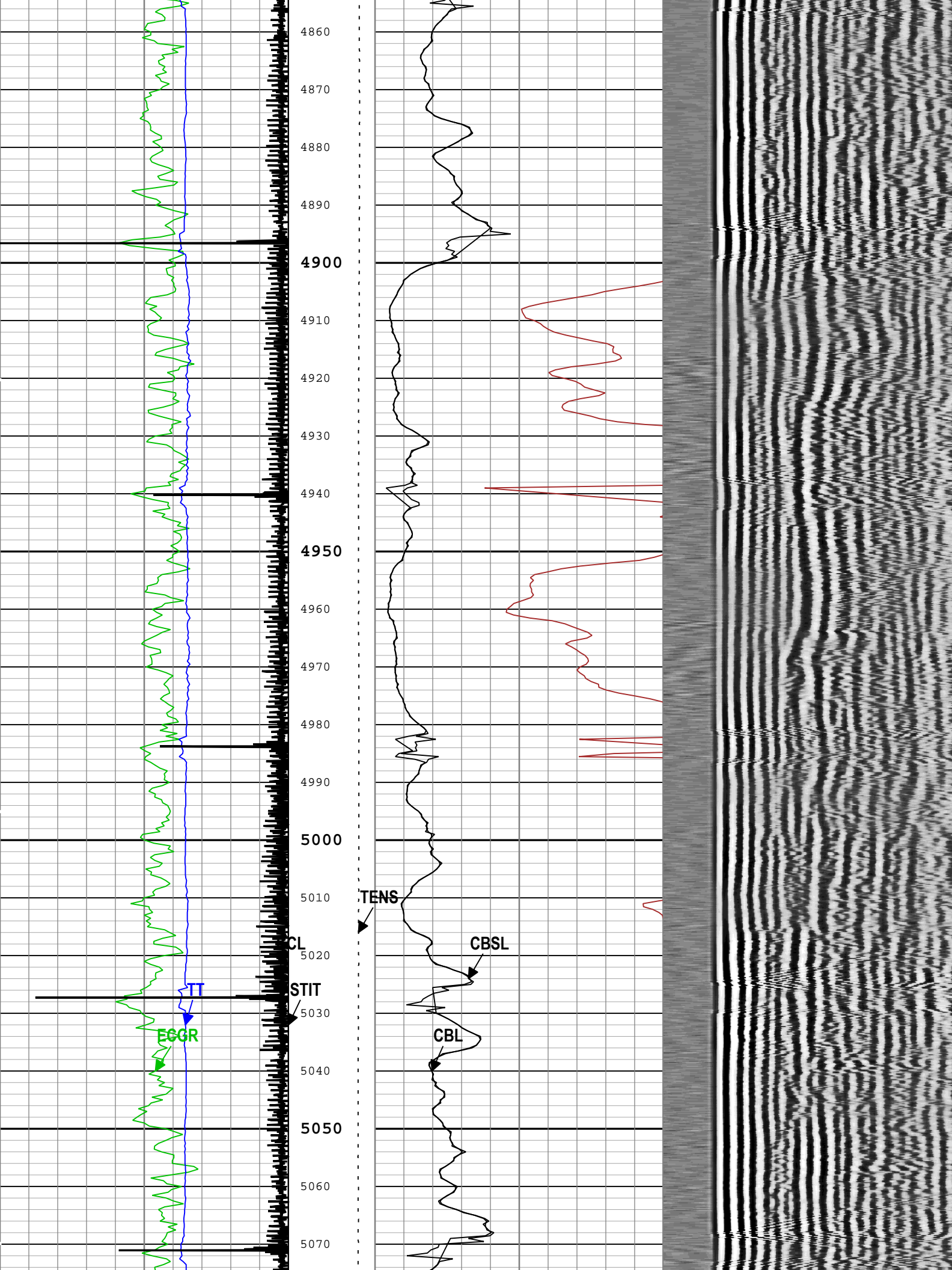


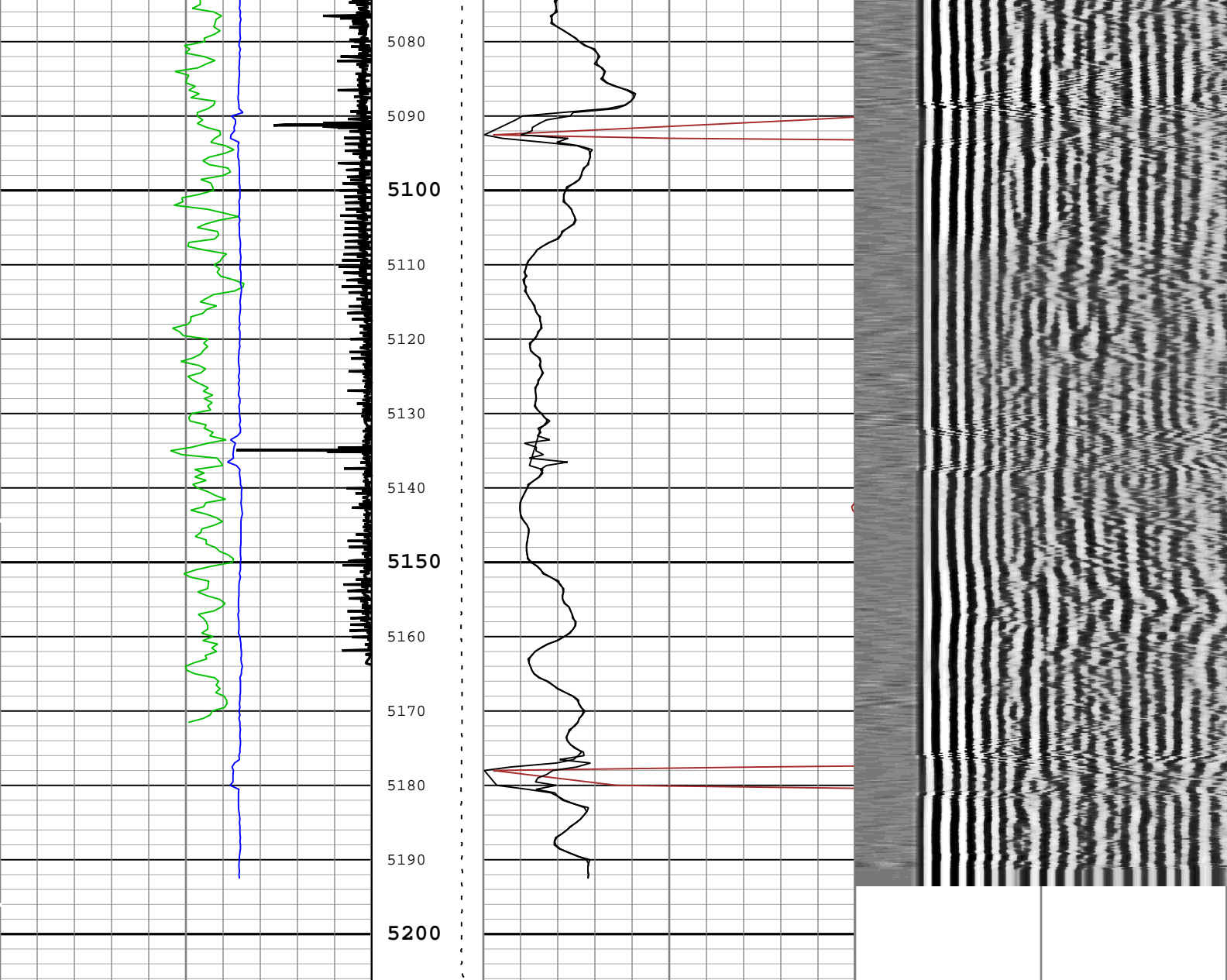













Gamma Ray (ECGR) SGT-N			Stuck Tool Indicator, Total (STIT)	CBL Amplitude (CBL) DSLT-H		Min	Amplitude										Max
0	gAPI			150	0		mV	100									
Transit Time for CBL (TT) DSLT-H			0 ft 50	CBL Amplitude (CBL) DSLT-H		200	Variable Density Log (VDL) DSLT-H										1200
400	us		200	0	mV		10										
Casing Collar Locator Amplitude (CCL) CAL-YA			Cable Tension (TENS)	CBL Amplitude (Sliding Gate) (CBSL) DSLT-H		0											100
-19				1	0		mV										
			10000 lbf														
			Cable Drag														
			Tool_Tot. Drag														
			BIEP - Bond Index Event Pips DSLT-H														

TIME_1900 - Time Marked every 60.00 (s)

Description: CBL_VDL Format: Log (Sonic CBL with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 21-Sep-2016 18:36:26

Channel Processing Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit

AMSG	Auxiliary Minimum Sliding Gate	DSLT-H	255	us
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	Depth Zoned	in
CBLG	CBL Gate Width	DSLT-H	47	us
CBLO	Casing Bottom (Logger)	WLSESSION	16025	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSLT-H	72	mV
CCL_MULTIPLIER	Casing Collar Locator Multiplier	CAL-YA	25	
CDEN	Cement Density	SGT-N	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DETE	Delta-T Detection	DSLT-H	E1	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
FCF	CBL Fluid Compensation Factor	DSLT-H	1.01	
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
GOBO_CURR	Good Bond in Arbitrary Cement	DSLT-H	3.42	mV
MAHTR	Manual High Threshold Reference for first arrival detection	DSLT-H	120	
MATT_CURR	Maximum Attenuation in Arbitrary Cement	DSLT-H	11.85	dB/ft
MCI	Minimum Cemented Interval for Isolation	DSLT-H	Depth Zoned	ft
MNHTR	Minimum High Threshold Reference for first arrival detection	DSLT-H	100	
MSA	Minimum Sonic Amplitude	DSLT-H	1.6	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	DSLT-H	1.6	mV
NMSG	Near Minimum Sliding Gate	DSLT-H	242	us
SGAD	Sliding Gate Status	DSLT-H	Off	
SGDT	Sliding Gate Delta-T	DSLT-H	Time Zoned	us/ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	24	23.58	101
BS	13.5	101	2097
BS	8.5	2097	5207.25
MCI	26.48	23.58	101
MCI	14.81	101	2097
MCI	4.75	2097	5207.25

All depth are actual.

Time Zone Parameters

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
SGDT	69	21-Sep-2016 17:17:39	21-Sep-2016 17:18:31	5207.27	5171.02
SGDT	66	21-Sep-2016 17:18:31	21-Sep-2016 18:26:54	5171.02	65.86

All depth are at tool zero.

Tool Control Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
MODE	DSLT Acquisition Mode	DSLT-H	CBL	
RATE	DSLT Firing Rate	DSLT-H	15 Hz	
DTFS	DSLT Telemetry Frame Size	DSLT-H	536	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h

0 PSI Repeat Pass

Software Version

Acquisition System

Maxwell 2016 SP2

Version

6.2.64464.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[3]:Up	Up	4903.99 ft	5206.60 ft	21-Sep-2016 5:05:43 PM	21-Sep-2016 5:09:59 PM	ON	5.24 ft	No

All depths are referenced to toolstring zero

Log

Company:Whiting Oil & Gas Corporation

Well:Razor 25O-2443

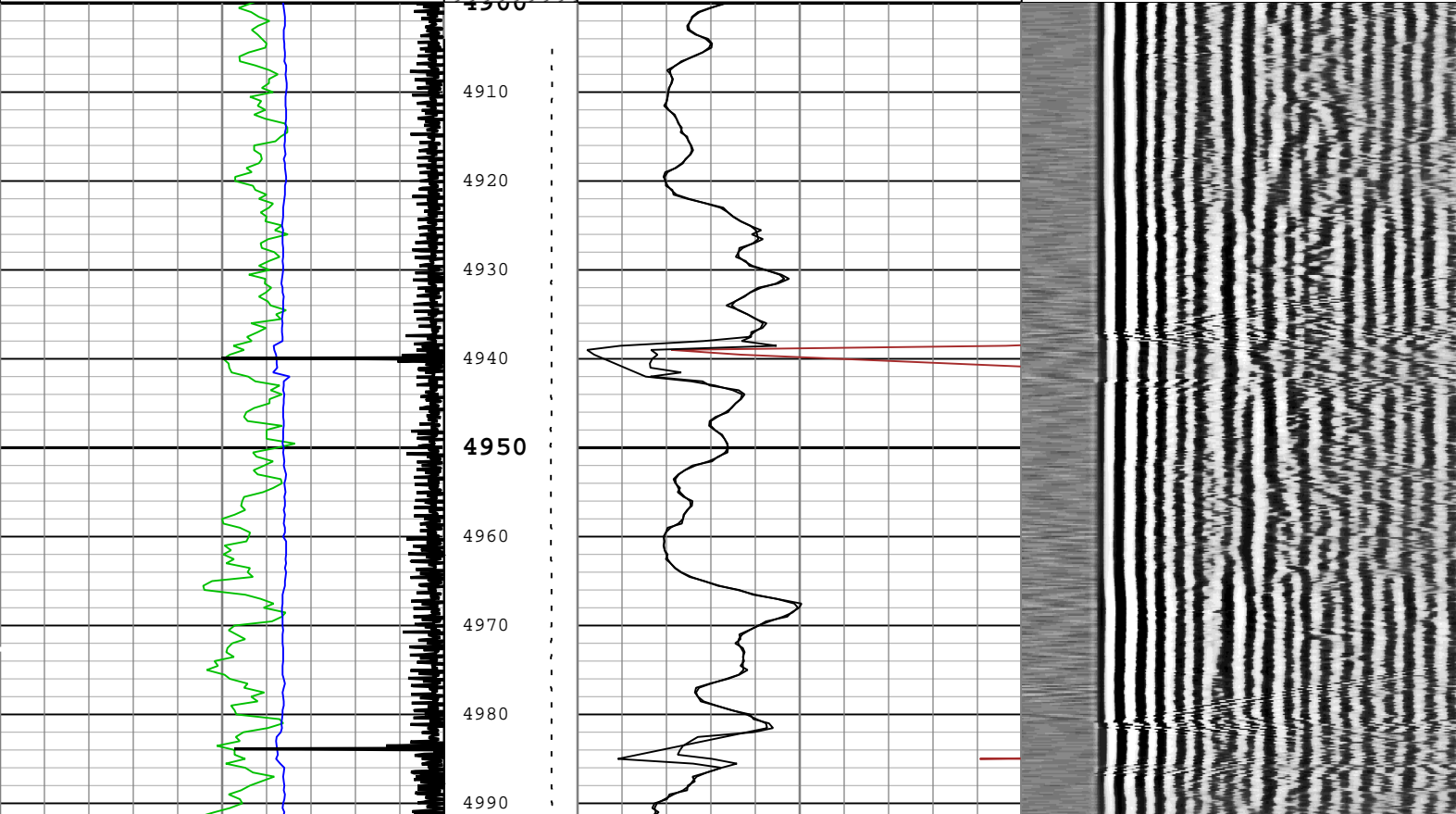
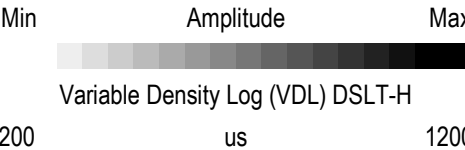
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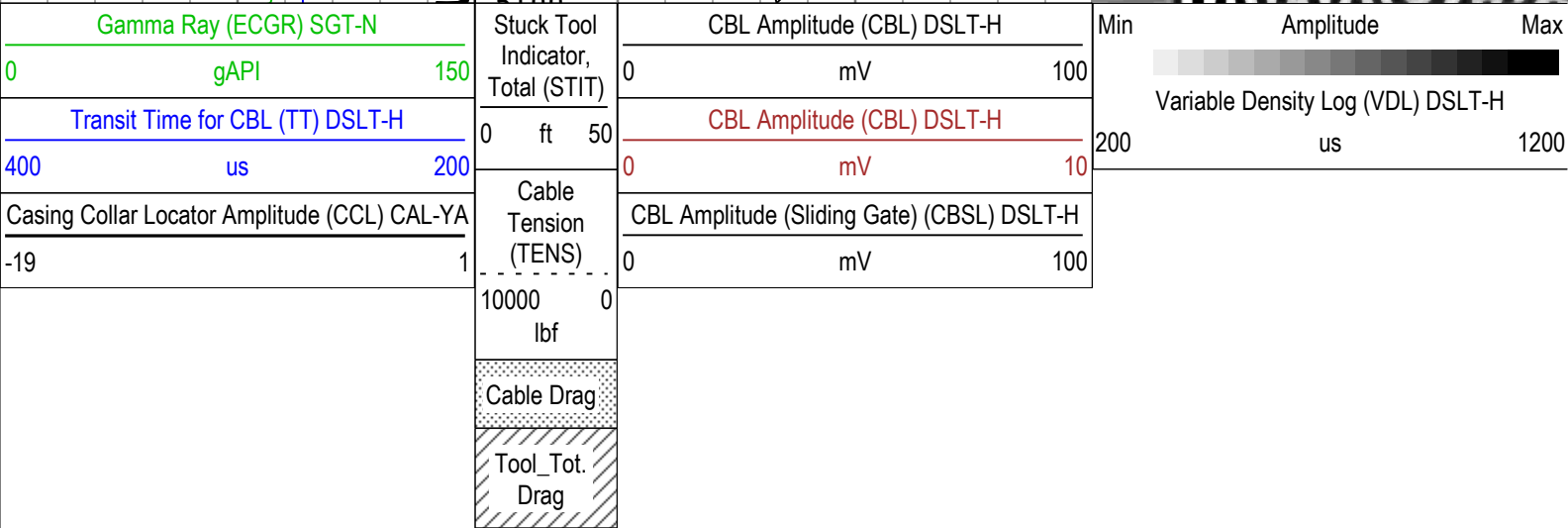
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— BIEP - Bond Index Event Pips DSLT-H

TIME_1900 - Time Marked every 60.00 (s)

		Stuck Tool Indicator, Total (STIT)		
		0 ft 50		
		Cable Tension (TENS)		
Gamma Ray (ECGR) SGT-N		10000 lbf	CBL Amplitude (CBL) DSLT-H	
0	gAPI	0	0	100
Transit Time for CBL (TT) DSLT-H		Cable Drag	CBL Amplitude (CBL) DSLT-H	
400	us	0	0	10
Casing Collar Locator Amplitude (CCL) CAL-YA		Tool_Tot. Drag	CBL Amplitude (Sliding Gate) (CBSL) DSLT-H	
-19	1	0	0	100





└ BIEP - Bond Index Event Pips DSLT-H

Channel Processing Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
AMSG	Auxiliary Minimum Sliding Gate	DSLTL-H	255	us
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	8.5	in
CBLG	CBL Gate Width	DSLTL-H	47	us

CBLO	Casing Bottom (Logger)	WLSESSION	16025	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSLTH	72	mV
CCL_MULTIPLIER	Casing Collar Locator Multiplier	CAL-YA	25	
CDEN	Cement Density	SGT-N	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DETE	Delta-T Detection	DSLTH	E1	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
FCF	CBL Fluid Compensation Factor	DSLTH	1.01	
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
GOBO_CURR	Good Bond in Arbitrary Cement	DSLTH	3.42	mV
MAHTR	Manual High Threshold Reference for first arrival detection	DSLTH	120	
MATT_CURR	Maximum Attenuation in Arbitrary Cement	DSLTH	11.85	dB/ft
MCI	Minimum Cemented Interval for Isolation	DSLTH	4.75	ft
MNHTR	Minimum High Threshold Reference for first arrival detection	DSLTH	100	
MSA	Minimum Sonic Amplitude	DSLTH	1.6	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	DSLTH	1.6	mV
NMSG	Near Minimum Sliding Gate	DSLTH	242	us
SGAD	Sliding Gate Status	DSLTH	Off	
SGDT	Sliding Gate Delta-T	DSLTH	69	us/ft

Tool Control Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
MODE	DSLTH Acquisition Mode	DSLTH	CBL	
RATE	DSLTH Firing Rate	DSLTH	15 Hz	
DTFS	DSLTH Telemetry Frame Size	DSLTH	536	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h

Calibration Report

DSLTH (Digitizing Sonic Logging Tool - H) Calibration - Run One

Primary Equipment :

Sonic Logging Sonde E supports 3'-5'BHC DT and CBL/VDL SLS-E 1650

CBL Free Pipe Adjustment - Free Pipe Measurement

Before (Measured):

18:32:34 21-Sep-2016

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
CBL Amplitude	mV	Before	60.00	15.00	98.00	174.00	<div><div></div></div>
CBL Reference Amplitude (CBRA)	mV	Before			72.00		<div><div></div></div>
Measurement Depth	ft	Before			113.80		<div><div></div></div>

CBL Free Pipe Adjustment - CBL Amplitude Coefficient

Before (Measured):

18:32:34 21-Sep-2016

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
CBL Adjustment Factor		Before	1.000	0.200	0.735	5.000	<div><div></div></div>
Depth of Before Calibration	ft	Before			113.80		<div><div></div></div>

SGT-N (Scintillation Gamma-Ray Tool) Calibration - Run One

Primary Equipment :

Scintillation Gamma Cartridge SGC-TB 10210

Calibration Parameter :

Plus Reference (Jig minus background reference) 160

SGT-N Gamma-Ray Calibration - Gamma Ray Coefficients

Before (Measured): 08:30:25 20-Sep-2016

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
Gamma Ray Gain		Before			1.148			

SGT-N Gamma-Ray Calibration - Gamma Ray Accumulations

Before (Measured): 08:30:25 20-Sep-2016

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
RGR Zero Measurement	gAPI	Before		0	60.089	120.000		
RGR Plus Measurement	gAPI	Before	139.354	126.685	139.354	152.022		

SGT-N Gamma-Ray Plateau Check - Gamma Ray Plateau Check

Before (Measured): 08:33:01 20-Sep-2016

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
RGR Plus Plateau Measurement	gAPI	Before			205.737			
RGR Minus Plateau Measurement	gAPI	Before			191.286			

Company: Whiting Oil & Gas Corporation

Schlumberger

Well: Razor 25O-2443

Field: Wildcat

County: Weld

State: Colorado

Cement Bond Log

