

Company: Whiting Oil & Gas Corporation

Well: Razor 25N-2407

Field: Wildcat

County: Weld State: Colorado

Cement Bond Log

GR-CCL

County:	Weld			
Field:	Wildcat			
Location:	SESW Sec 25, T10N, R58W			
Well:	Razor 25N-2407			
Company:	Whiting Oil & Gas Corporation			
	Location:			
	SESW Sec 25, T10N, R58W		Elev.:	K.B. 4722.00 ft
	SHL: 355' FSL x 2040' FWL			G.L. 4701.00 ft
	Lat/Long: 40.803414/-103.815072			D.F. 4721.00 ft
	Permanent Datum:	Ground Level	Elev.:	4701.00 f
	Log Measured From:	Kelly Bushing	21.00 ft	above Perm.Datum
	Drilling Measured From:	Kelly Bushing		
	API Serial No.	Section:	Township:	Range:
	05-123-42640-0000	25	10N	58W
Logging Date	31-Aug-2016			

Run Number	One		
Depth Driller	15740.00 ft		
Schlumberger Depth	15740.00 ft		
Bottom Log Interval	5790.00 ft		
Top Log Interval	60.00 ft		
Casing Fluid Type	Brine		
Salinity			
Density	8.4 lbm/gal		
Fluid Level	8.00 ft		
BIT/CASING/TUBING STRING			
Bit Size	8.50 in		
From	2030.00 ft		
To	15740.00 ft		
Casing/Tubing Size	5.5 in		
Weight	20 lbm/ft		
Grade	P110		
From	0.00 ft		
To	15719.00 ft		
Max Recorded Temperatures	213 degF		
Logger on Bottom	31-Aug-2016	16:15:00	
Unit Number	Location:	FtMorgan	
Recorded By	Avery Becker		
Witnessed By	Kelly Lewis		

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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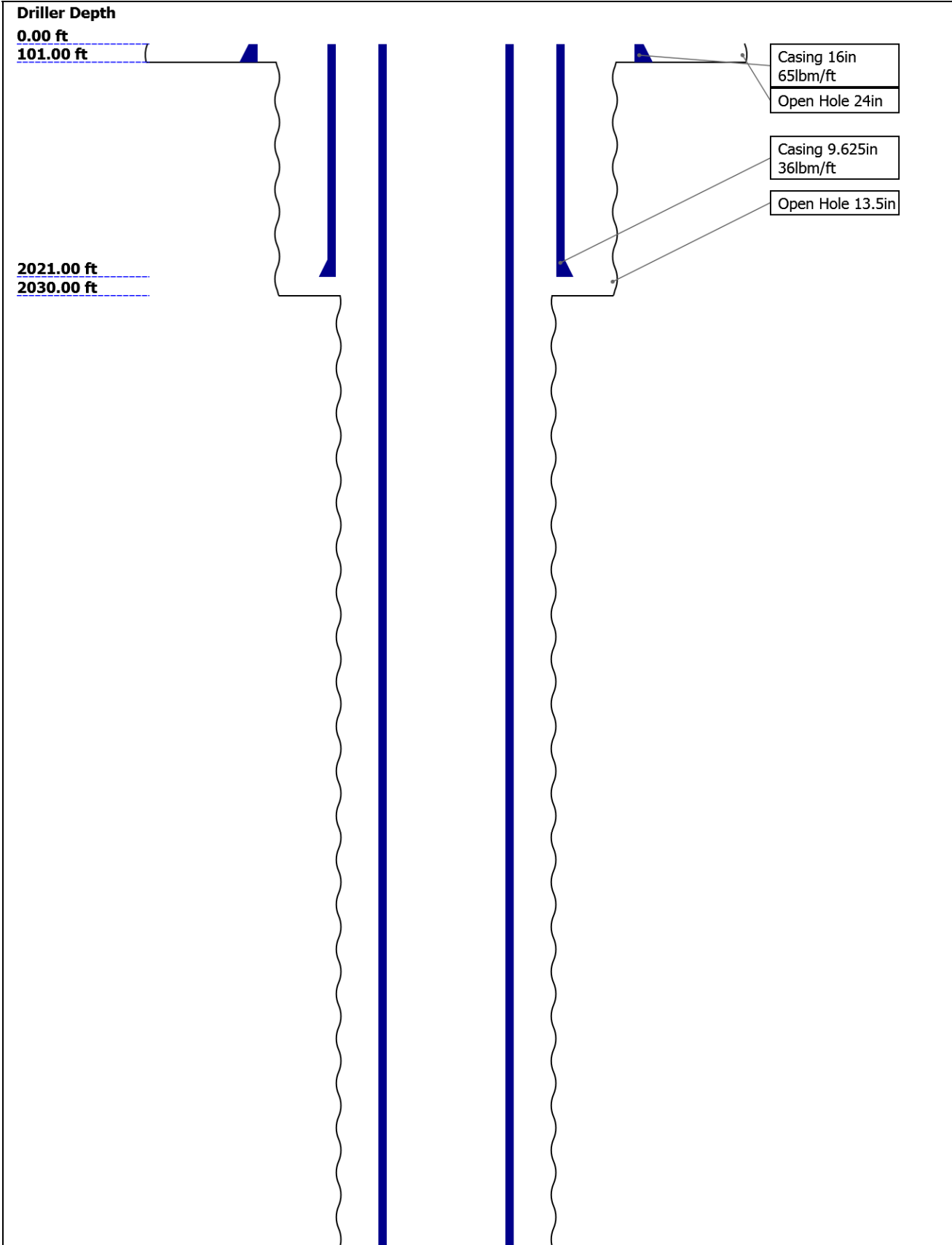
9.4 Log (Sonic CBL with VDL)

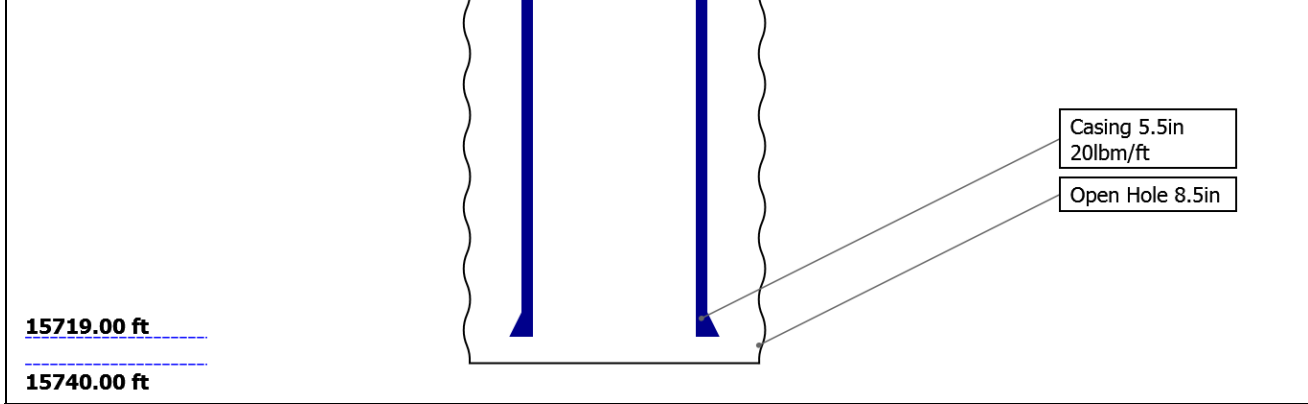
9.5 Parameter Listing

10. Calibration Report

11. Tail

Well Sketch






Borehole Size/Casing/Tubing Record

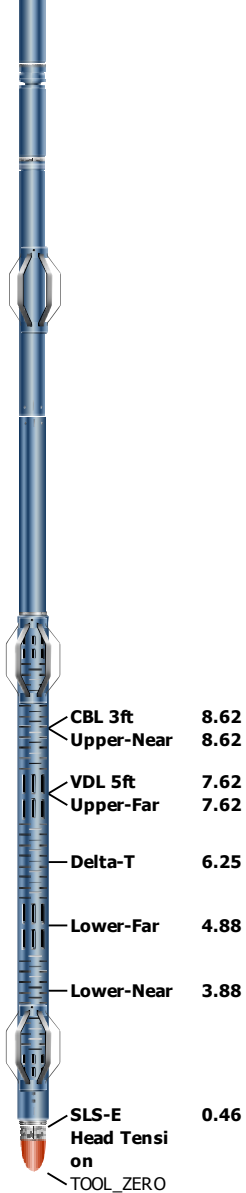
Bit						
Bit Size (in)	24	13.5	8.5			
Top Driller (ft)	0	101	2030			
Top Logger (ft)	0	101	2030			
Bottom Driller (ft)	101	2030	15740			
Bottom Logger (ft)	101	2030	15740			
Casing						
Size (in)	16	9.625	5.5			
Weight (lbm/ft)	65	36	20			
Inner Diameter (in)	15.25	8.921	4.778			
Grade	N/A	K55	P110			
Top Driller (ft)	0	0	0			
Top Logger (ft)	0	0	0			
Bottom Driller (ft)	101	2021	15719			
Bottom Logger (ft)	101	2021	15719			

Remarks and Equipment Summary

One: Toolstring				One: Remarks	
Equip name LEH-QT LEH-QT	Length 40.01	MP name	Offset	Toolstring run as per tool sketch	
				Main Pass recorded under 1500 psi, repeat under 0 psi	
				Crew: Patrick Sullivan & Tim Ludgate	
				Thank you for choosing Schlumberger	
CAL-YA:666 CAL-YA:666	37.1	CCL	36.31		
DTC-H:8803 ECH-KC:10354 DTC-H:8803	33.6	CTEM HV	32.7 0.00		
SGT-N:10210 SGH-K:2996 SGC-TB:10210 SGD-TAA:2166 1	30.6	TelStatus ToolStatus	30.6 30.6		
AH-184[2]:4 202	25.1	GR	29.68		

AH-184[1]:3 23.1
906

DSLTH:8318 21.1
ECH-KH:8373
DSLCH:8318
SLS-E:1650



BNS-STD 0.46

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		
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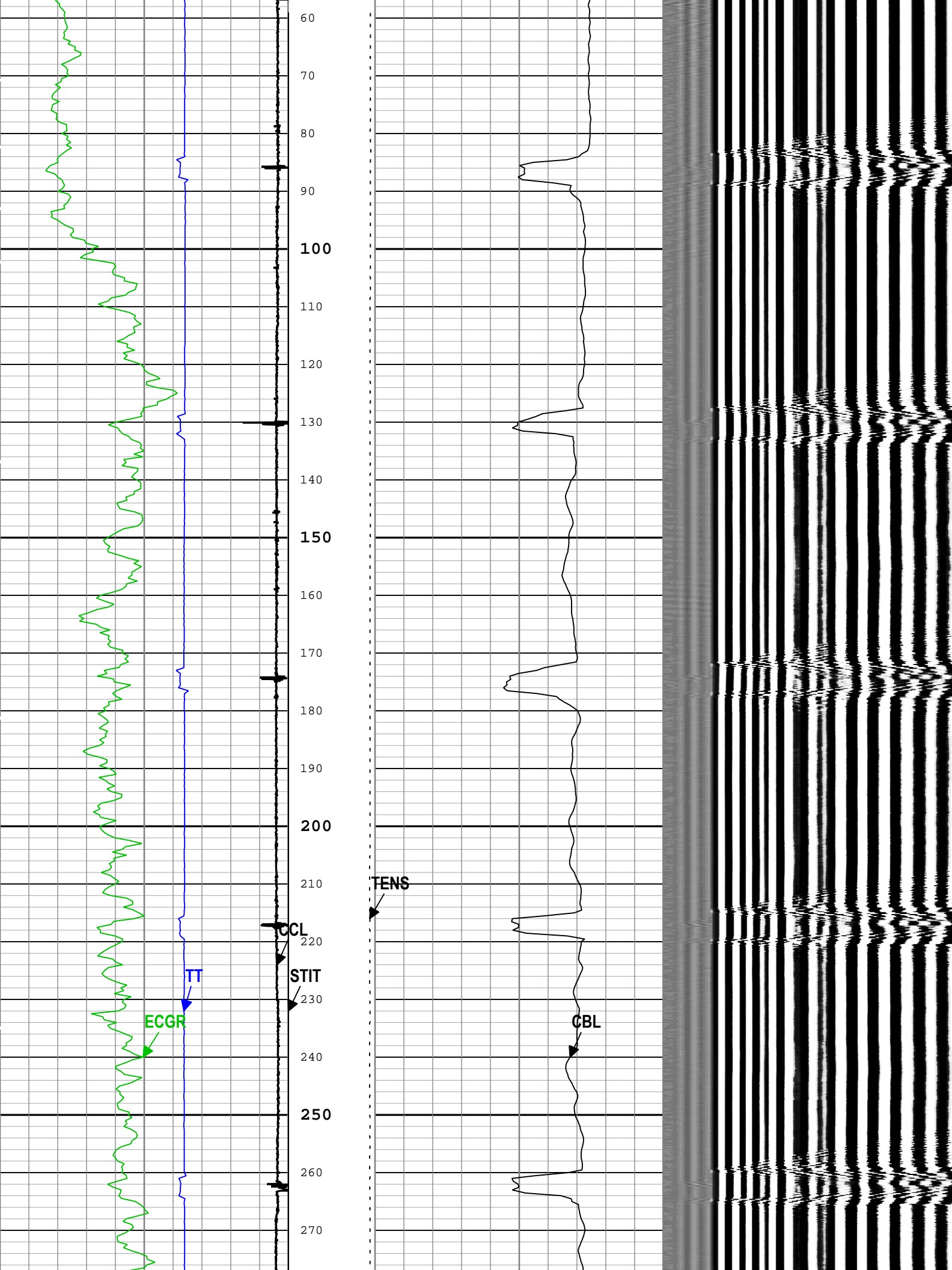
Depth Measuring Device

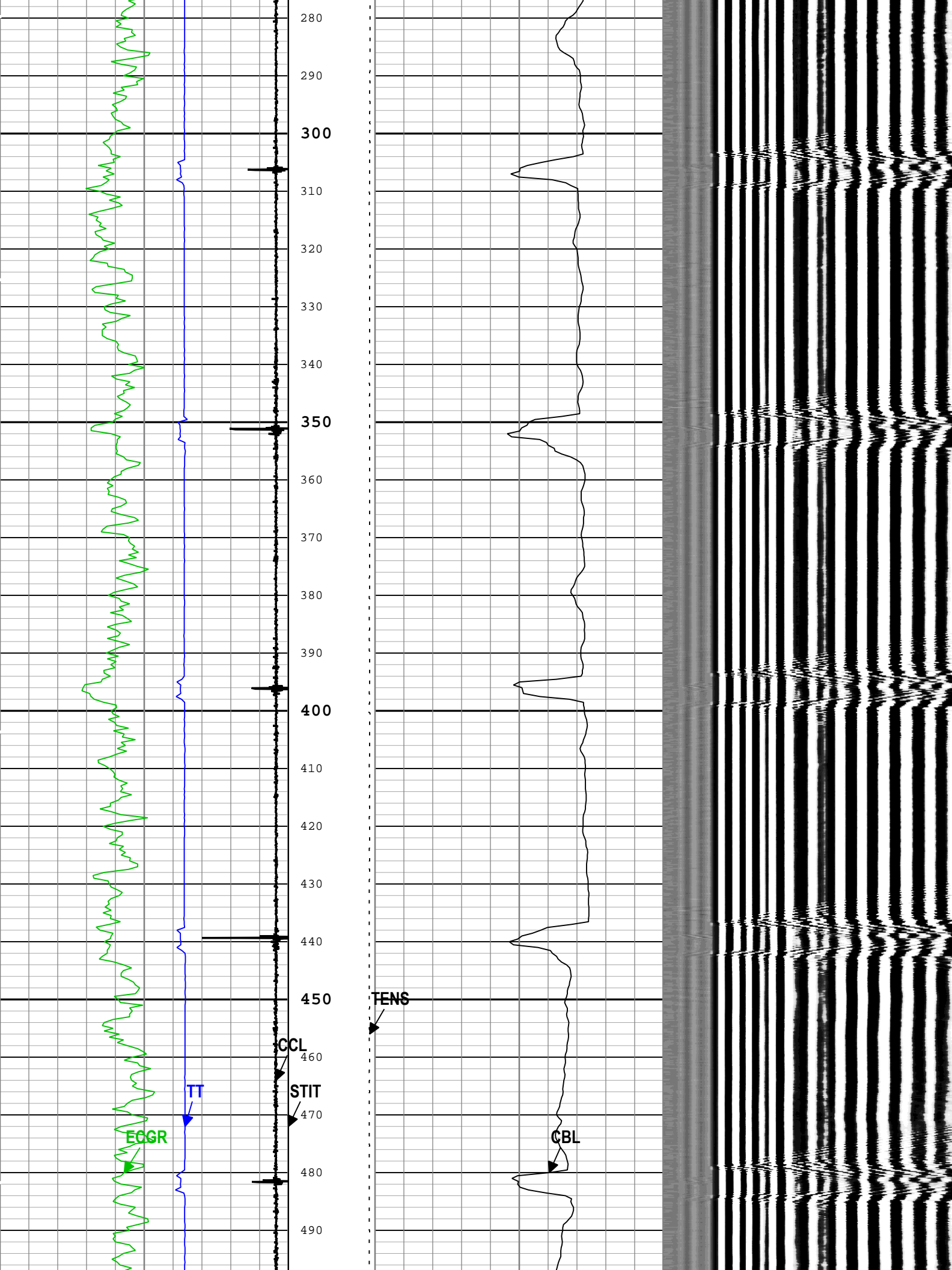
Type	IDW-JA		
Serial Number	5896		
Calibration Date	29-Apr-2016		
Calibrator Serial Number			
Calibration Cable Type	7-39P-LXS		
Wheel Correction 1	-1		
Wheel Correction 2	-3		

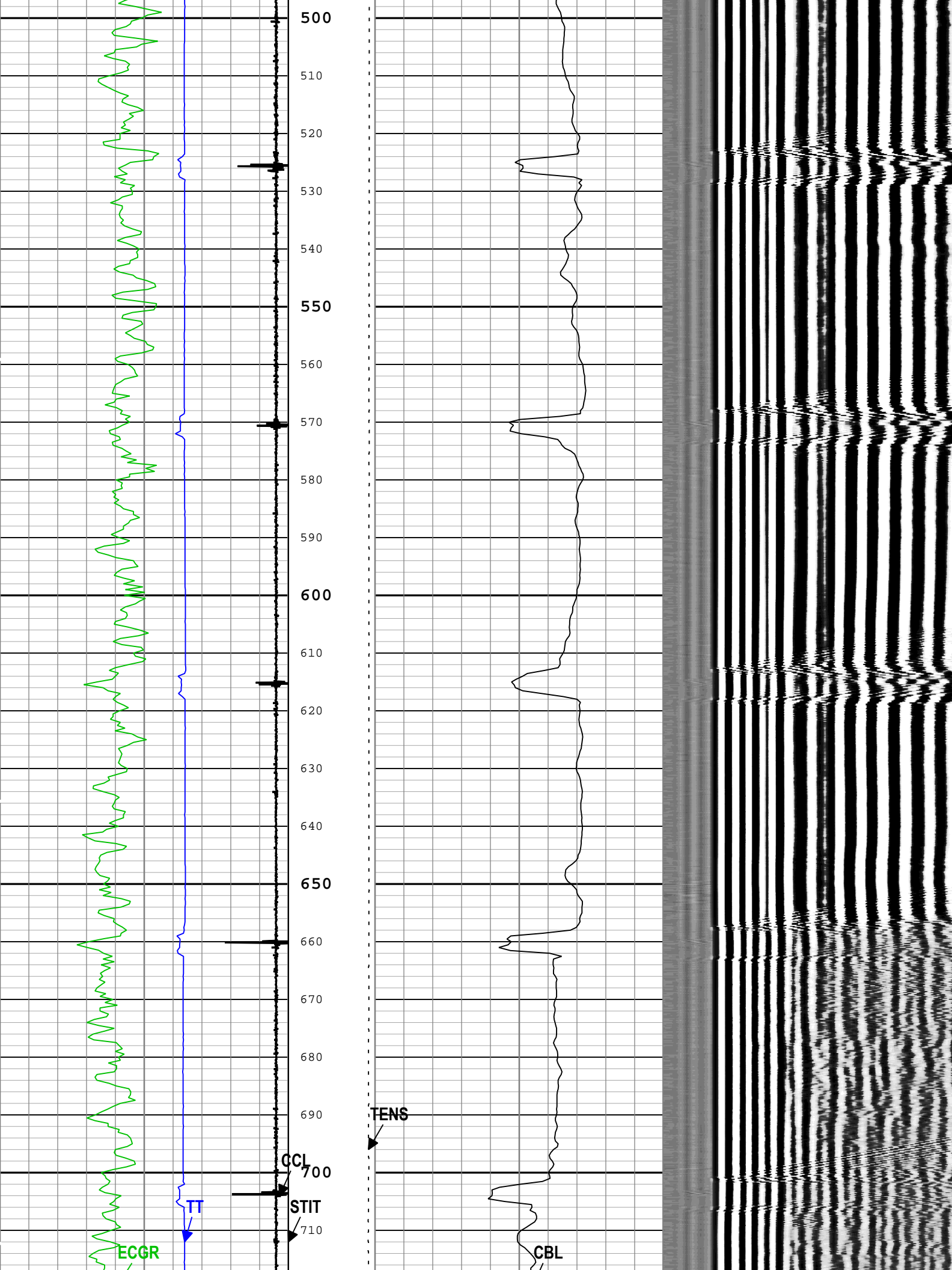
Tension Device

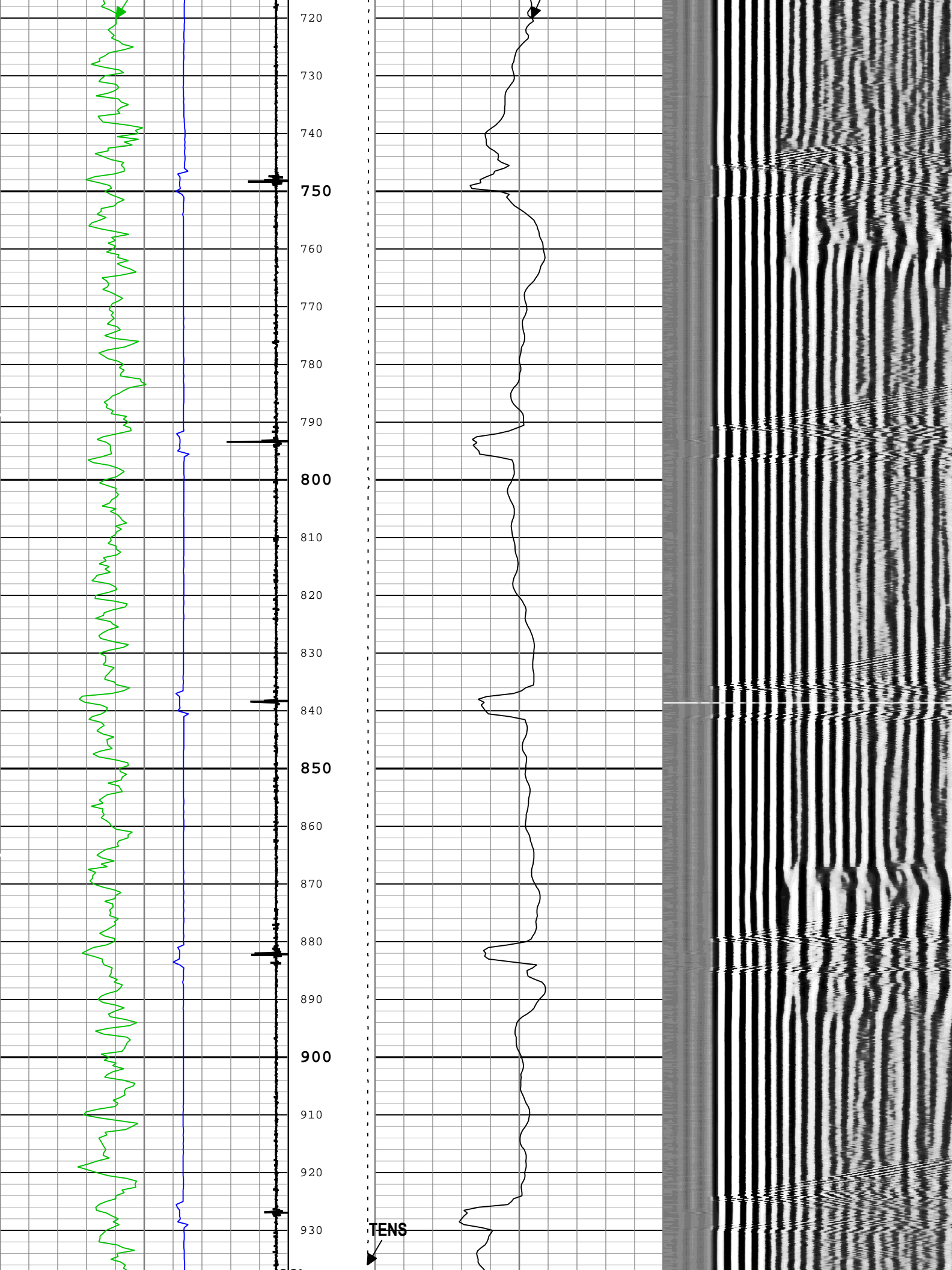
Type	CMTD-B/A		
Serial Number	1109		
Calibration Date			
Calibrator Serial Number	441435A		
Number of Calibration Points	10		
Calibration Root Mean Square	2		

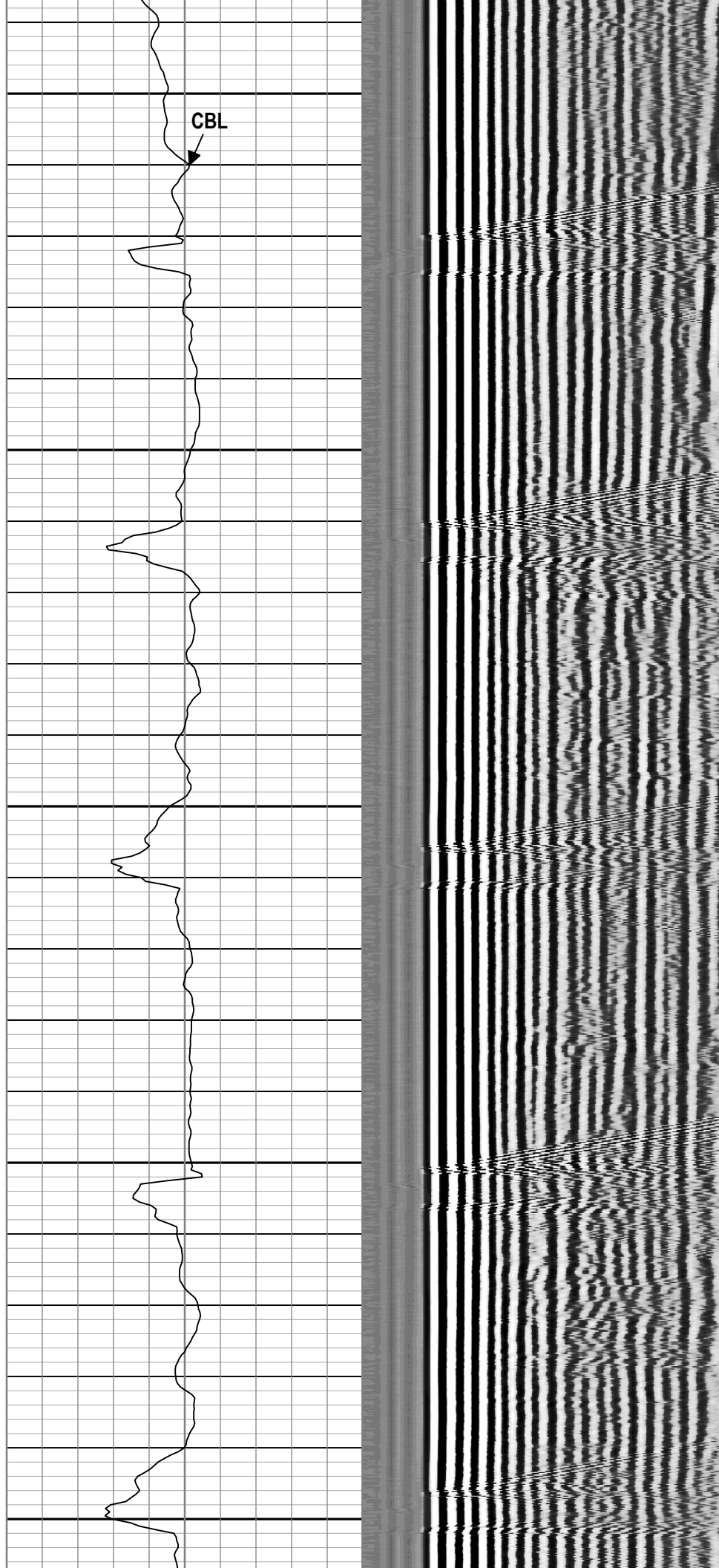
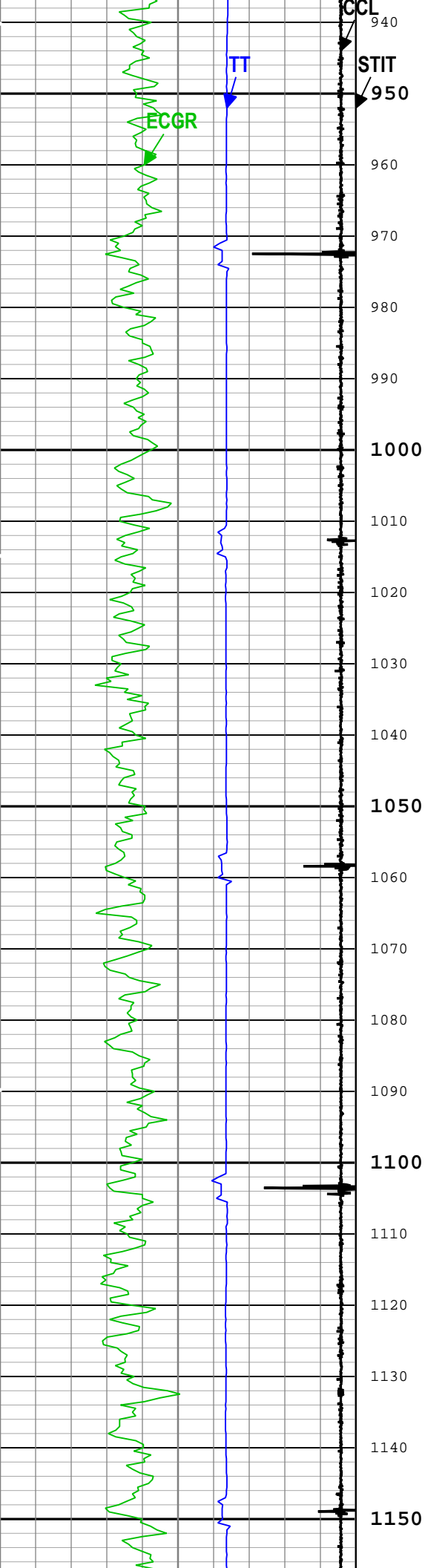
Error	3		
Calibration Peak Error	4		
Logging Cable			
Type	7-39P-LXS		
Serial Number			
Length	15000.00 ft		
Conveyance Type	Wireline		
Rig Type			
One:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well	First run in well depth control procedures followed	
Rig Up Length At Surface		IDW used as primary depth device, z-chart used for secondary	
Rig Up Length At Bottom		Log correlated to short joint from 4894 to 4914 ft	
Rig Up Length Correction			
Stretch Correction			
Tool Zero Check At Surface			

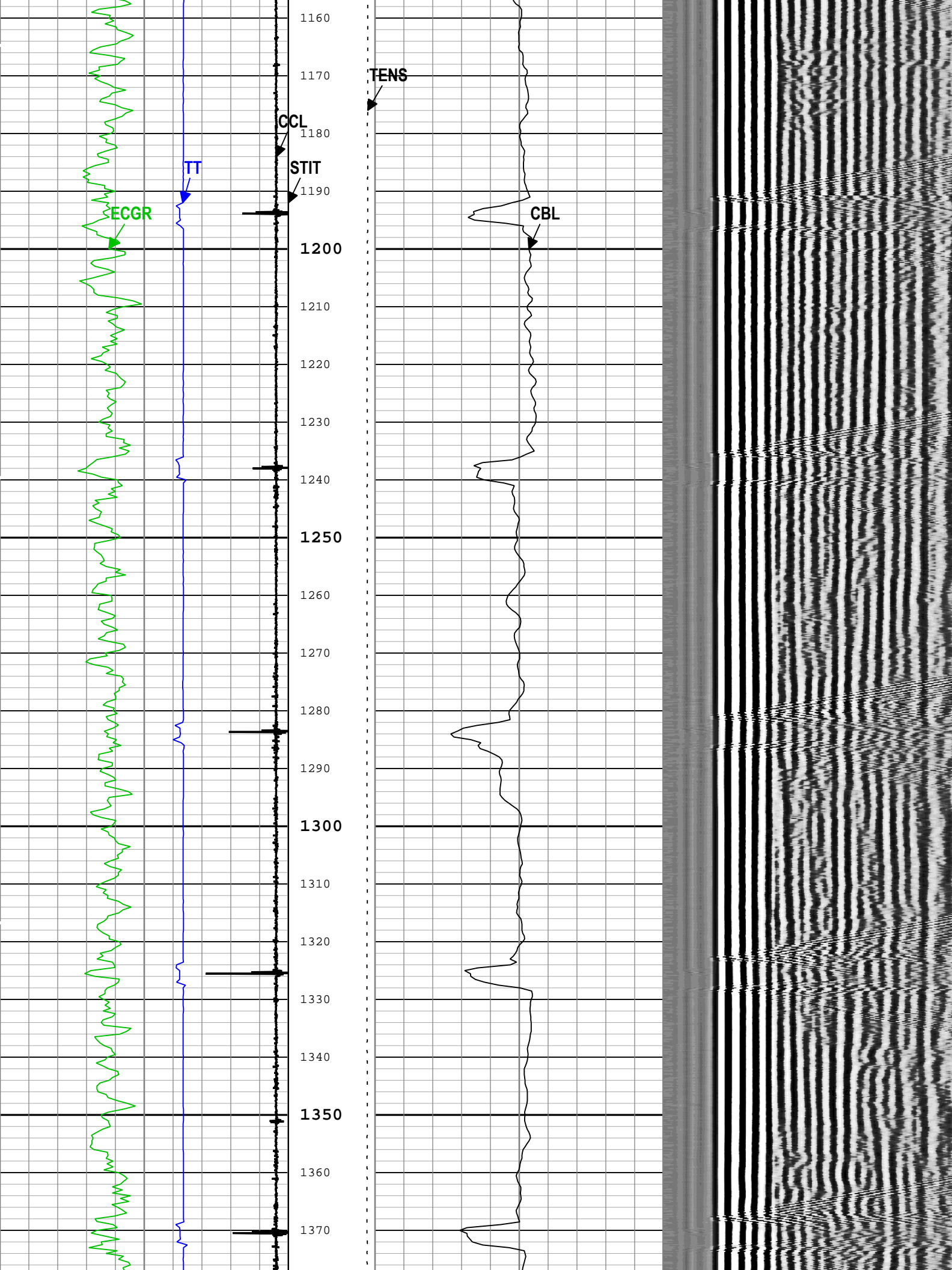


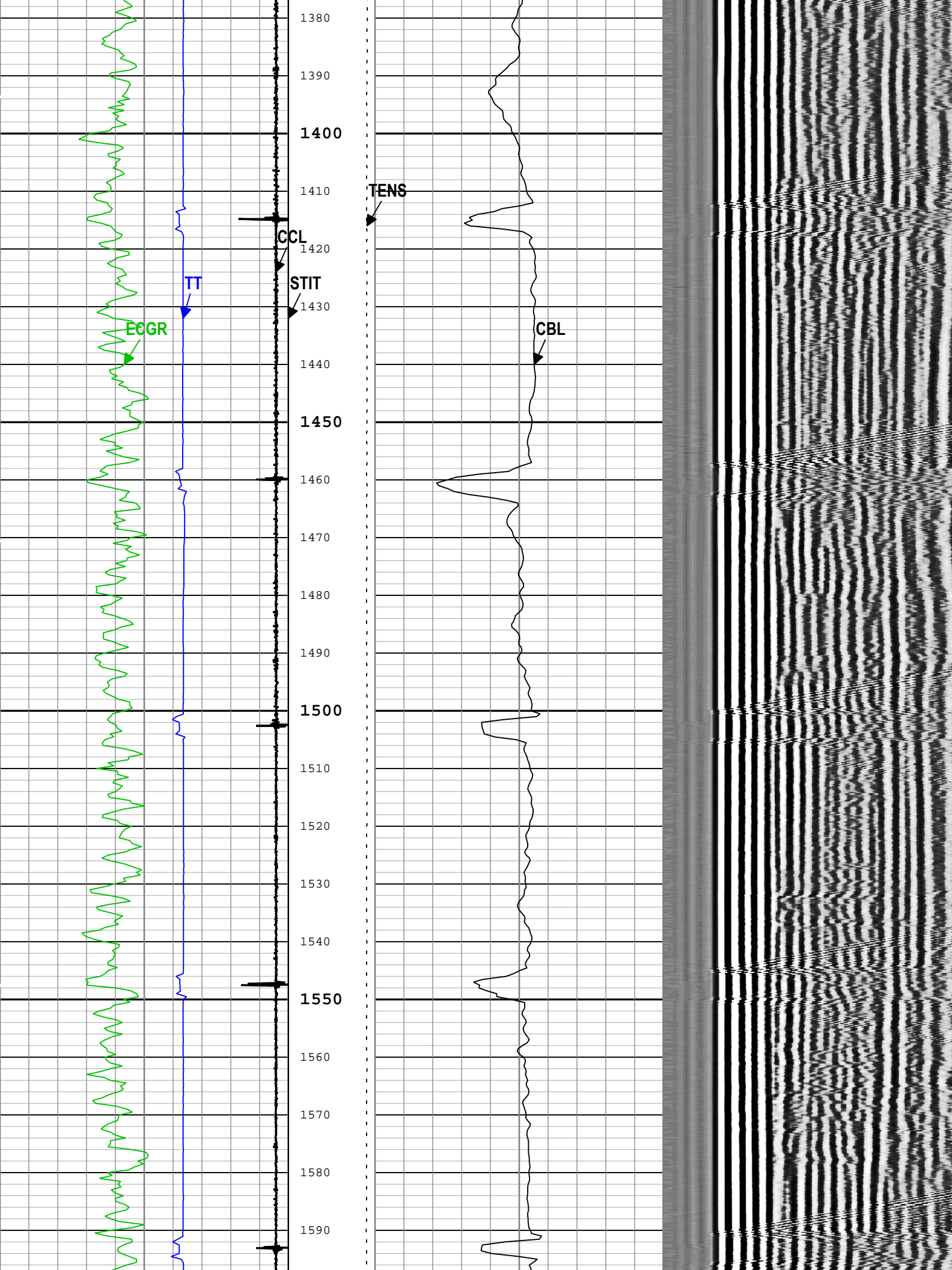


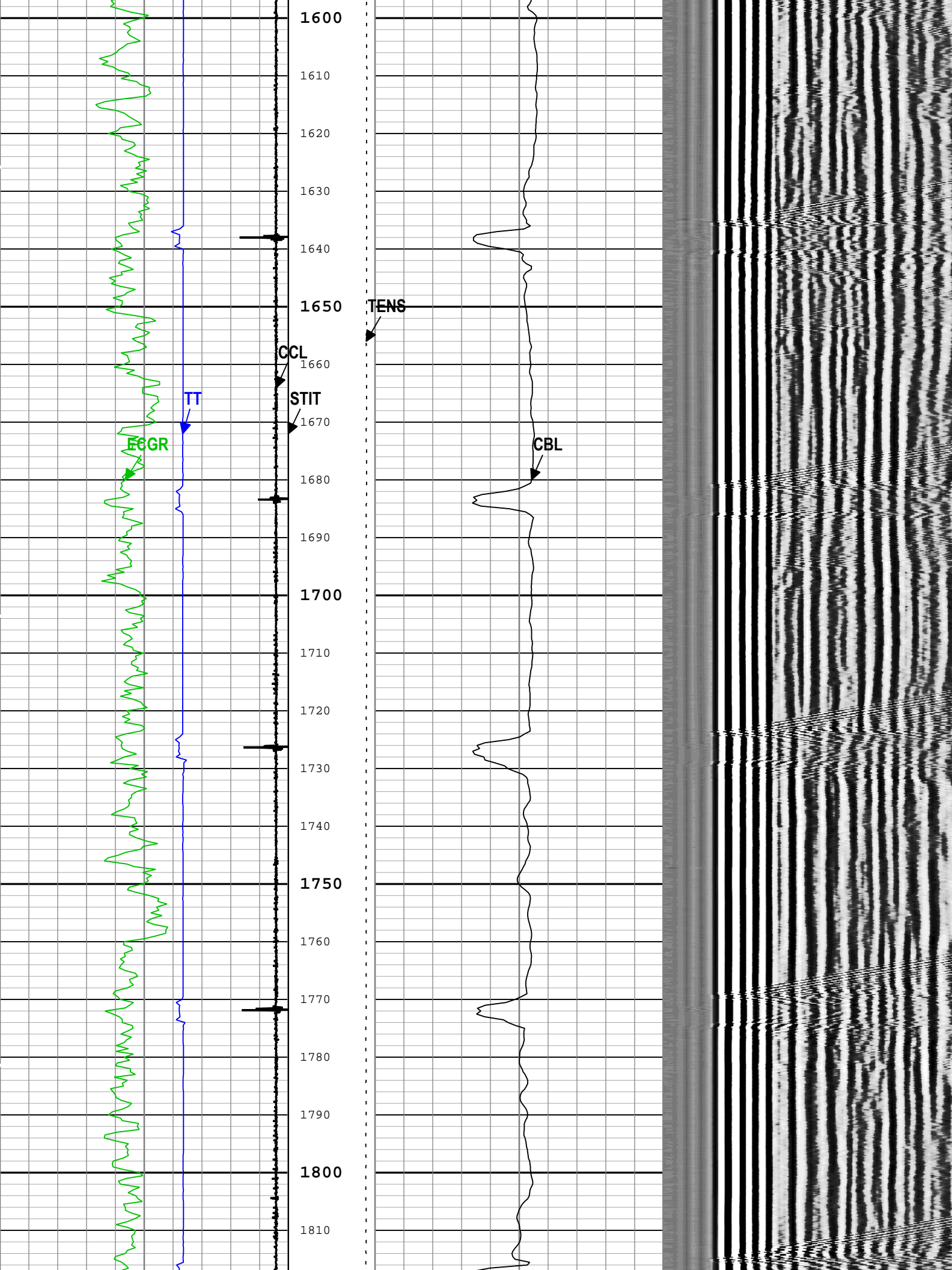


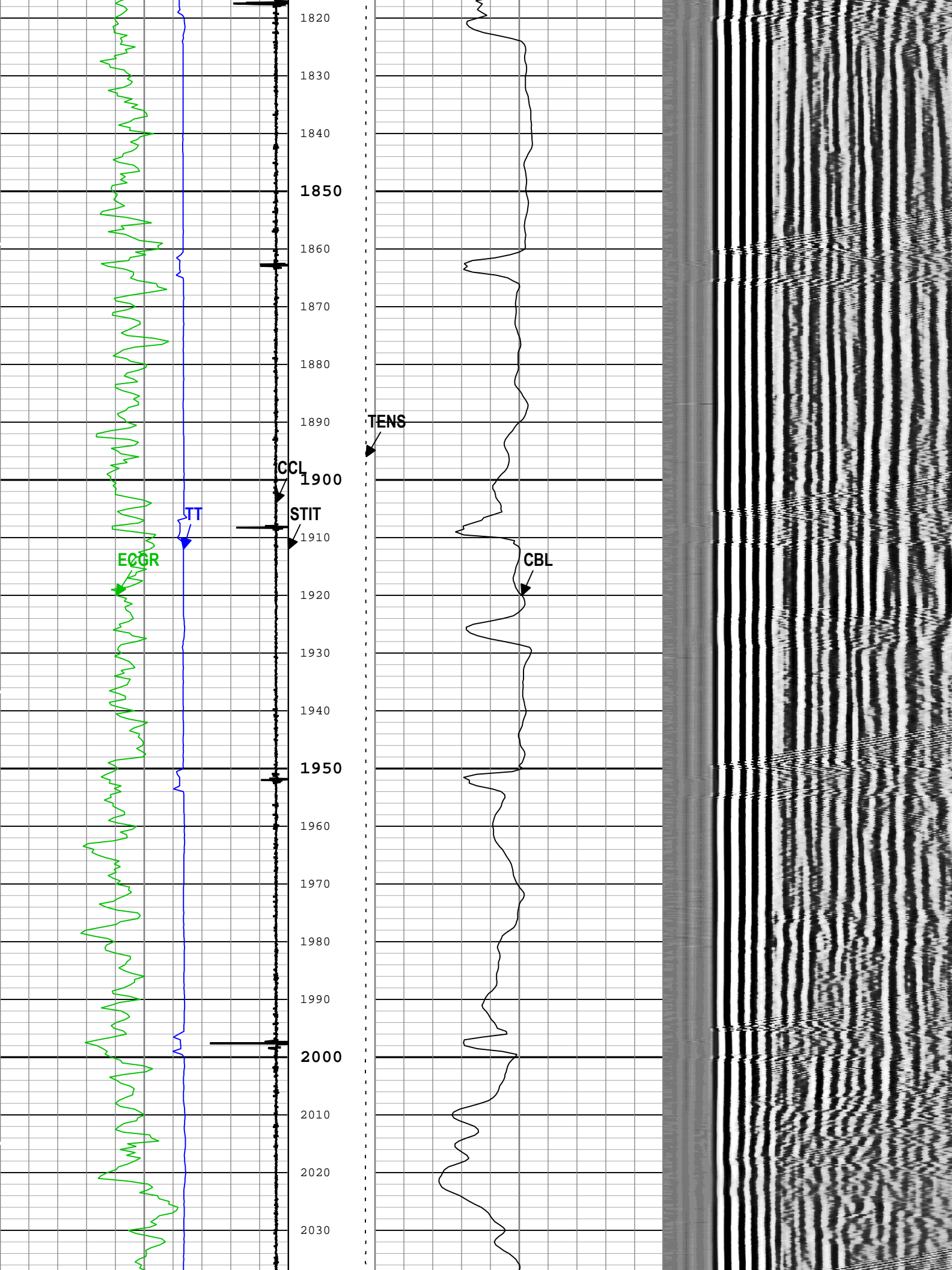


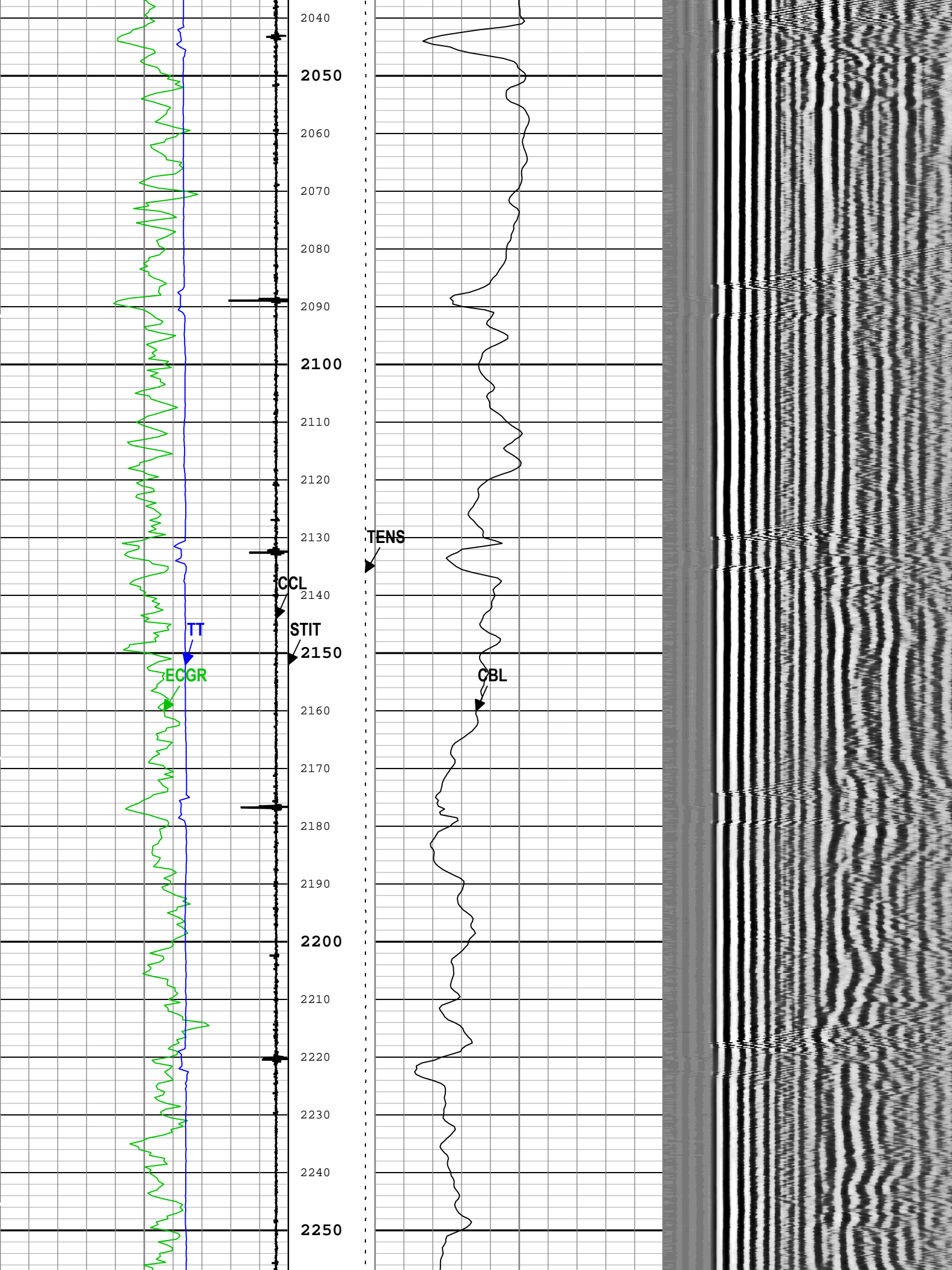


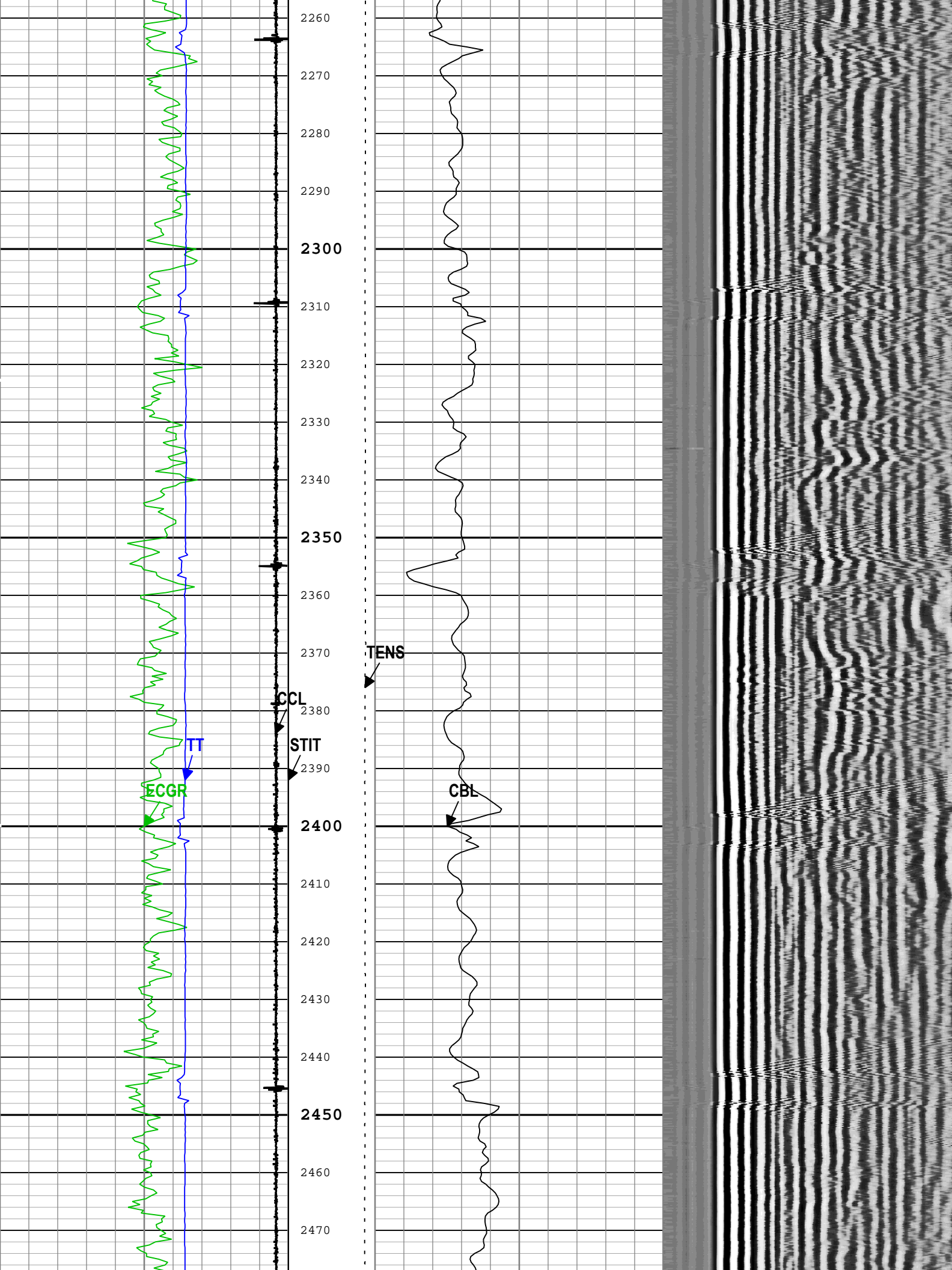


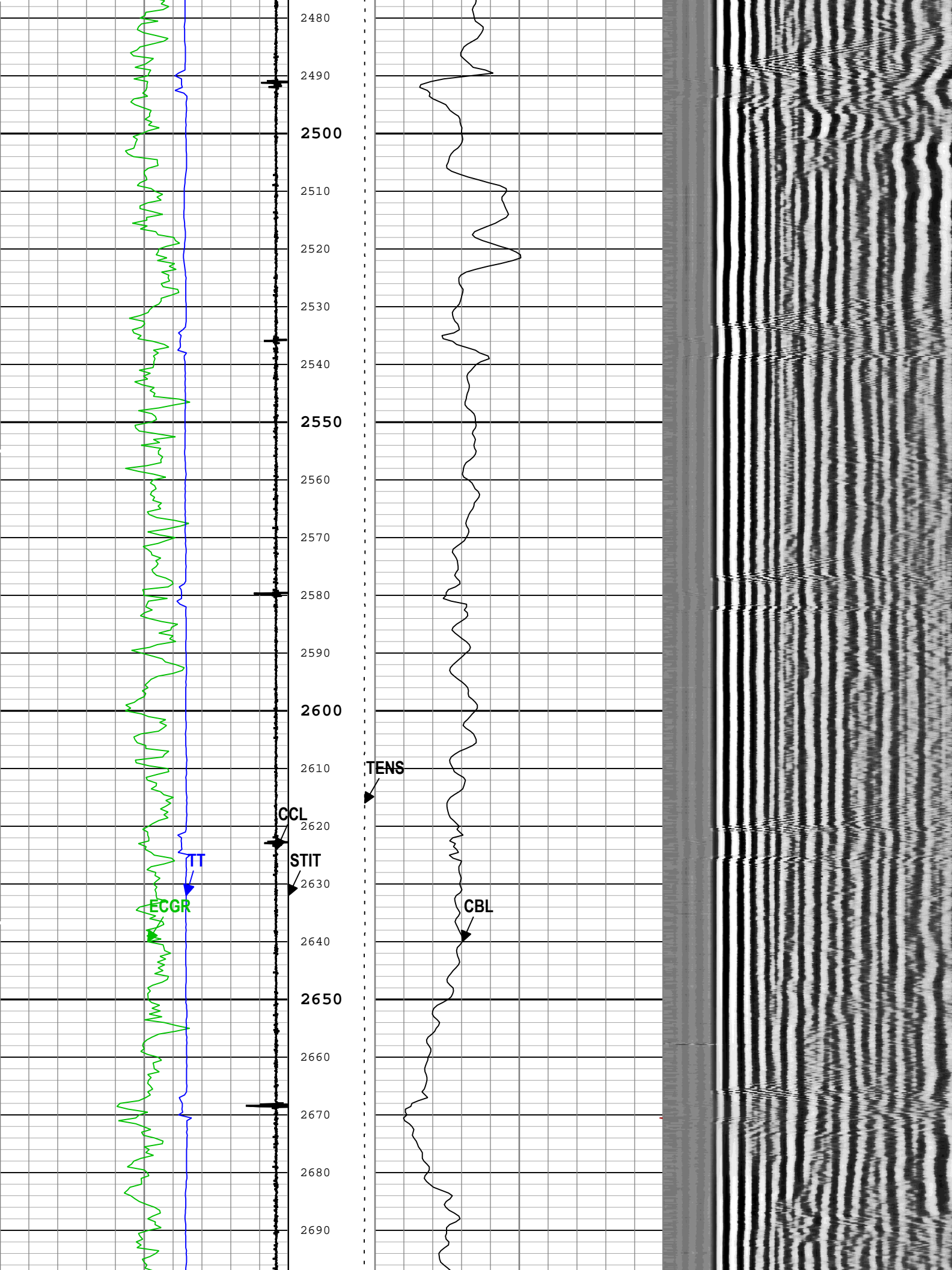


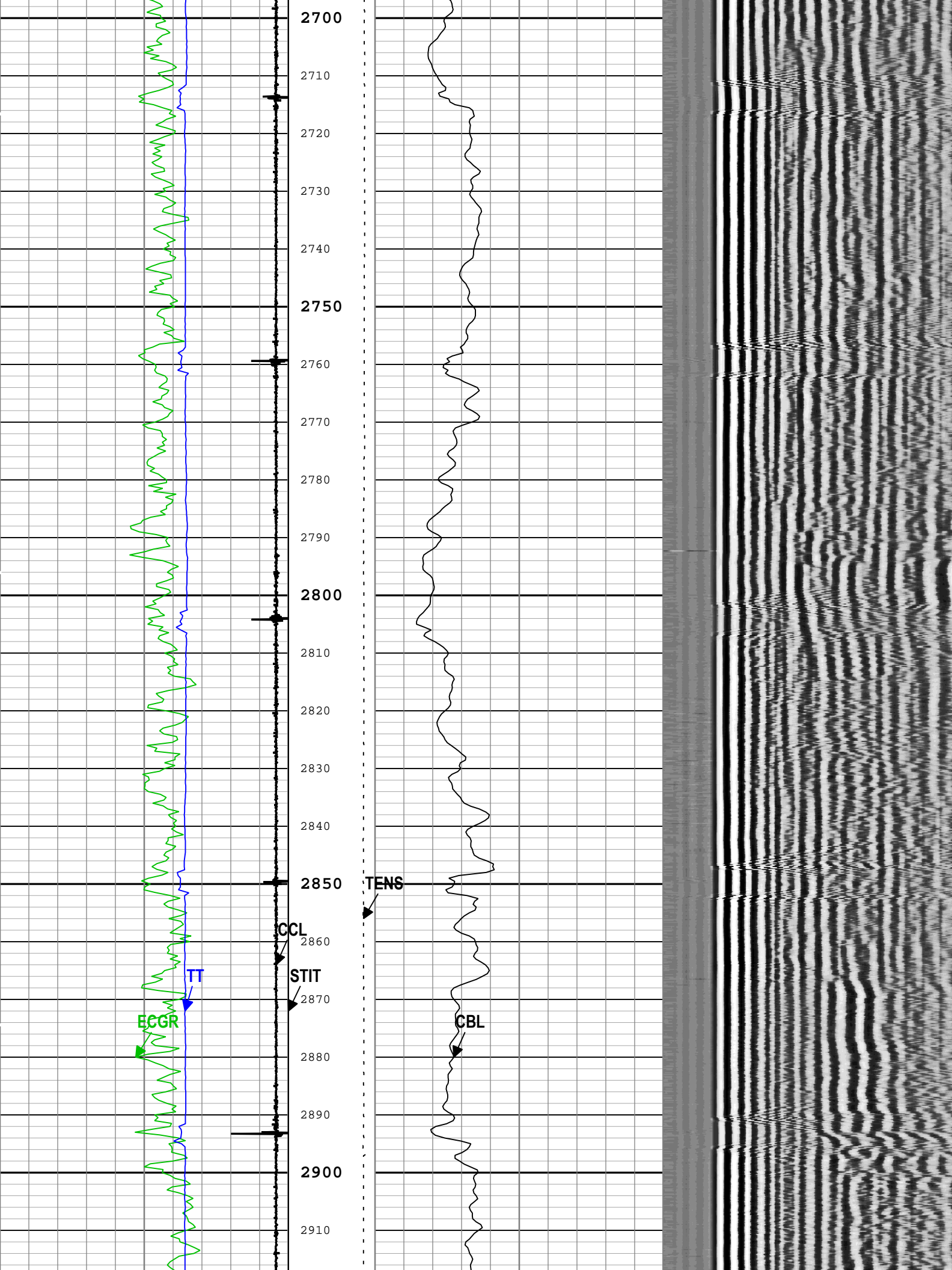


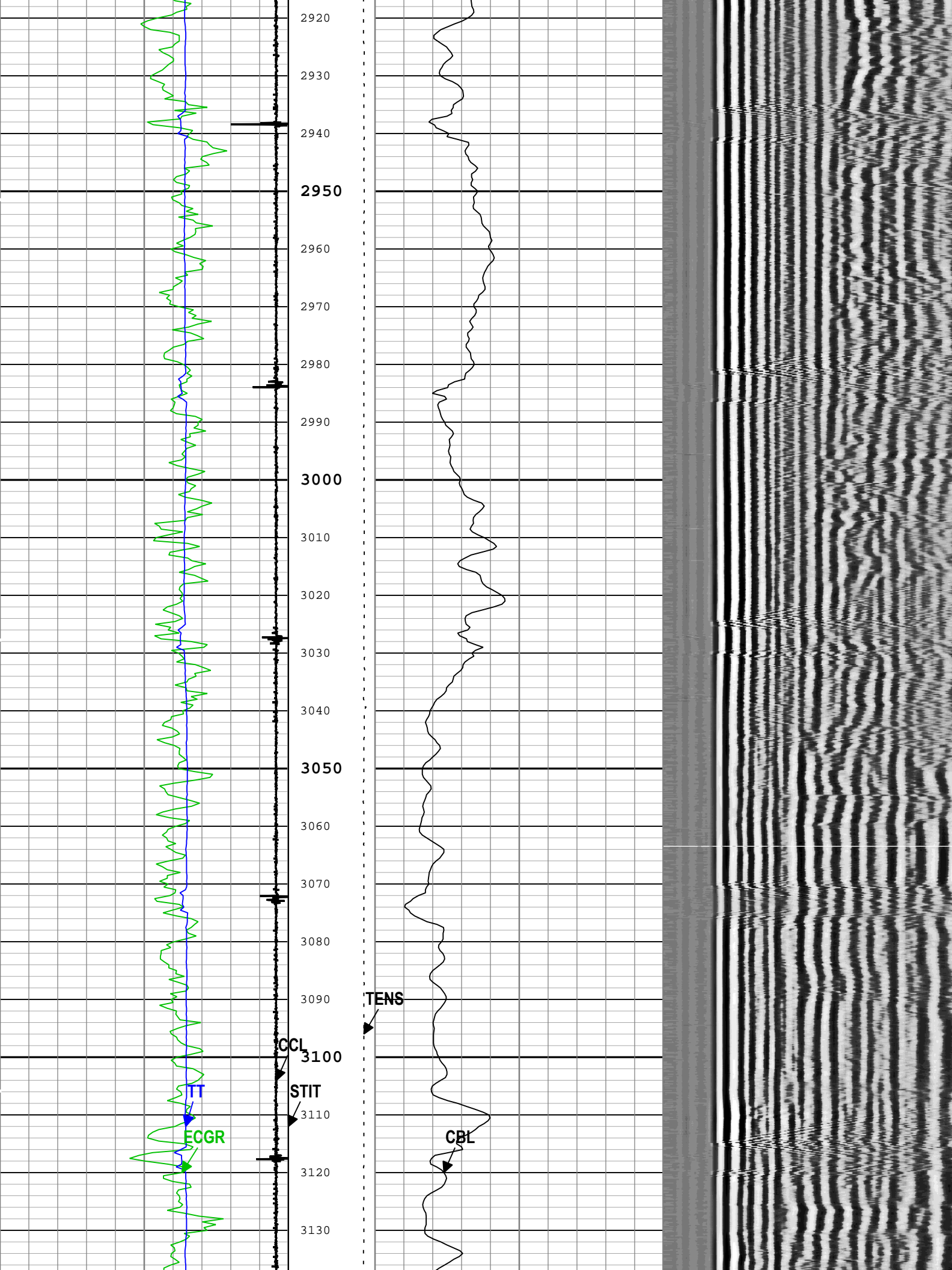


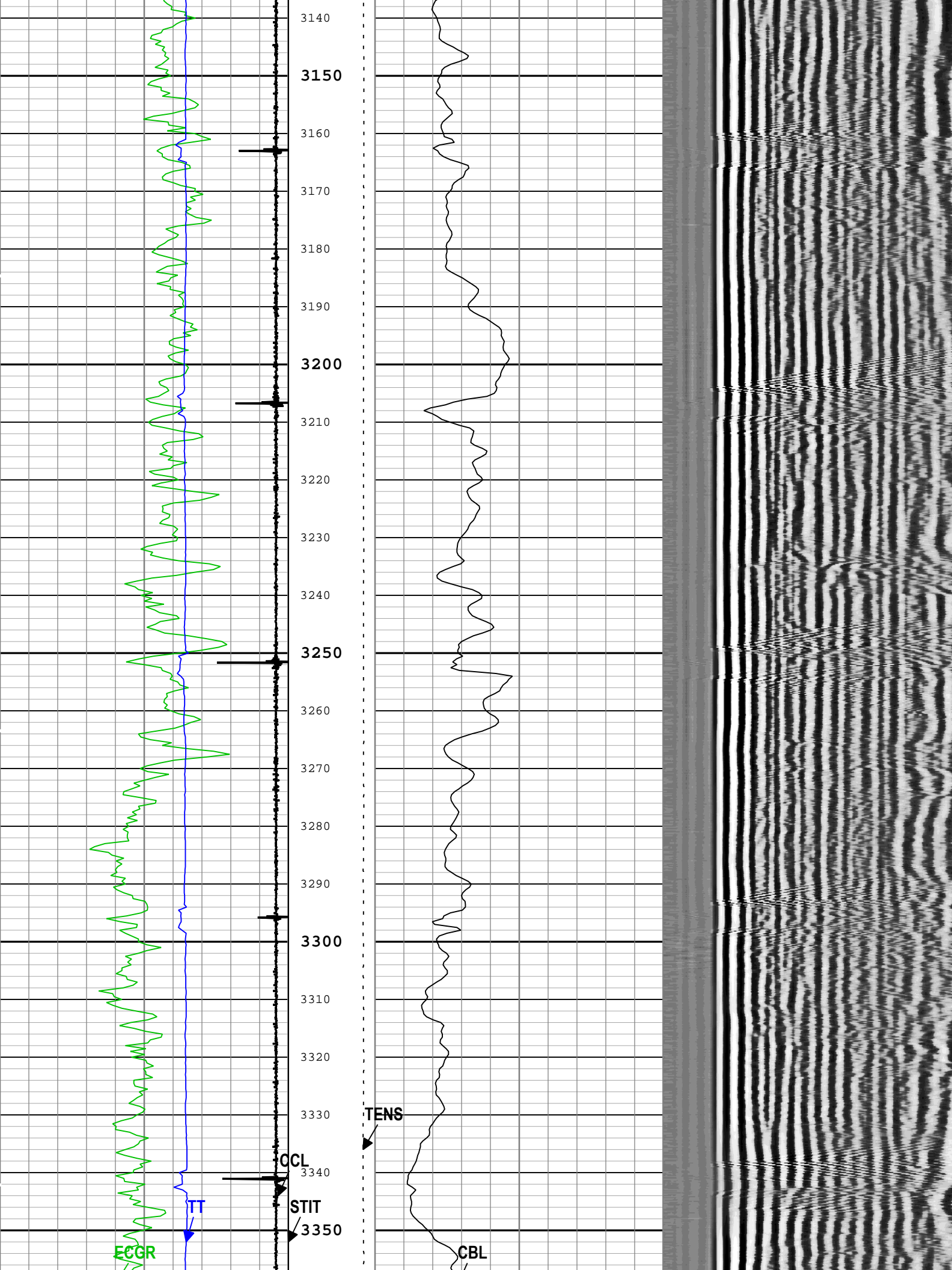


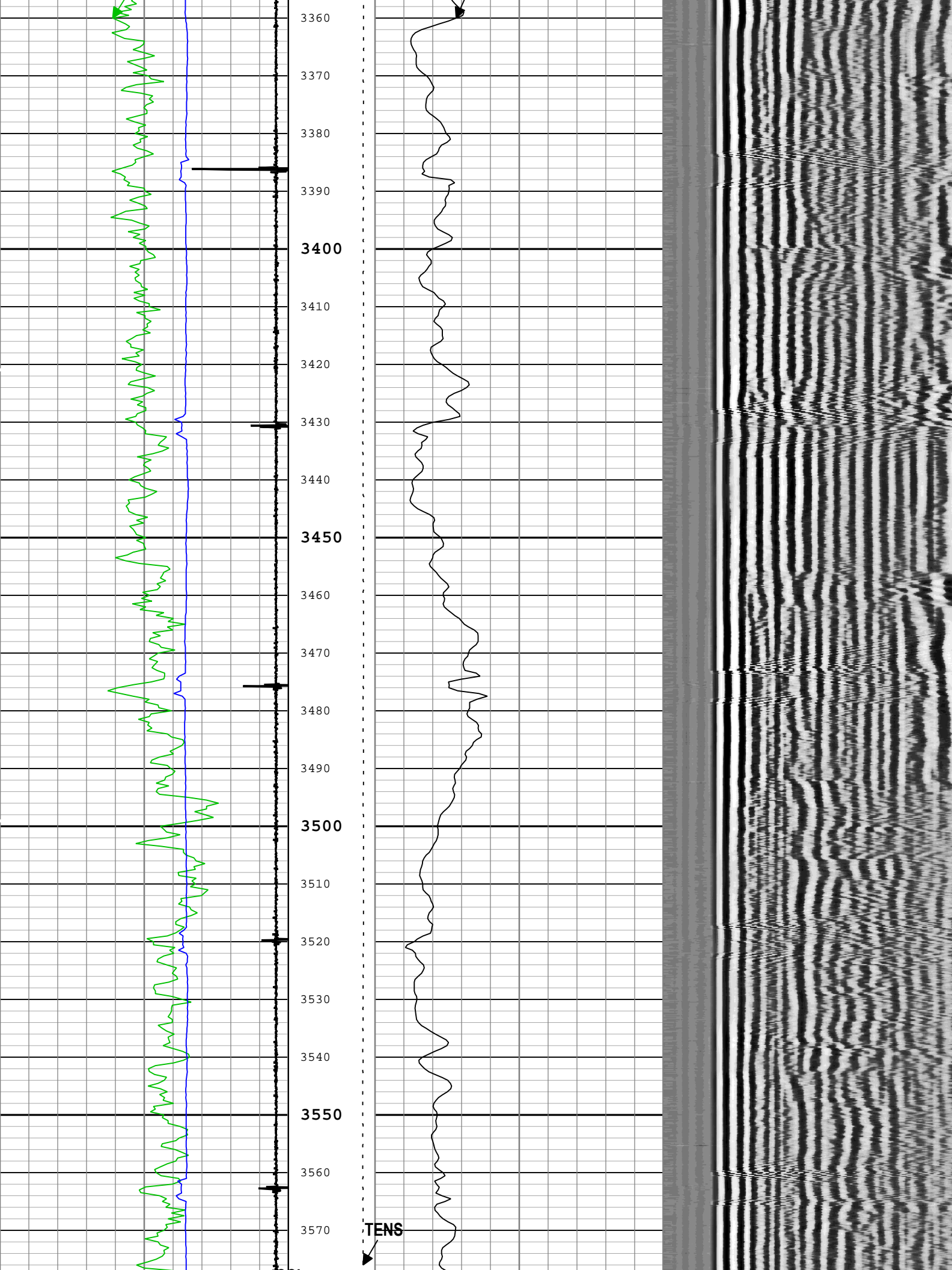


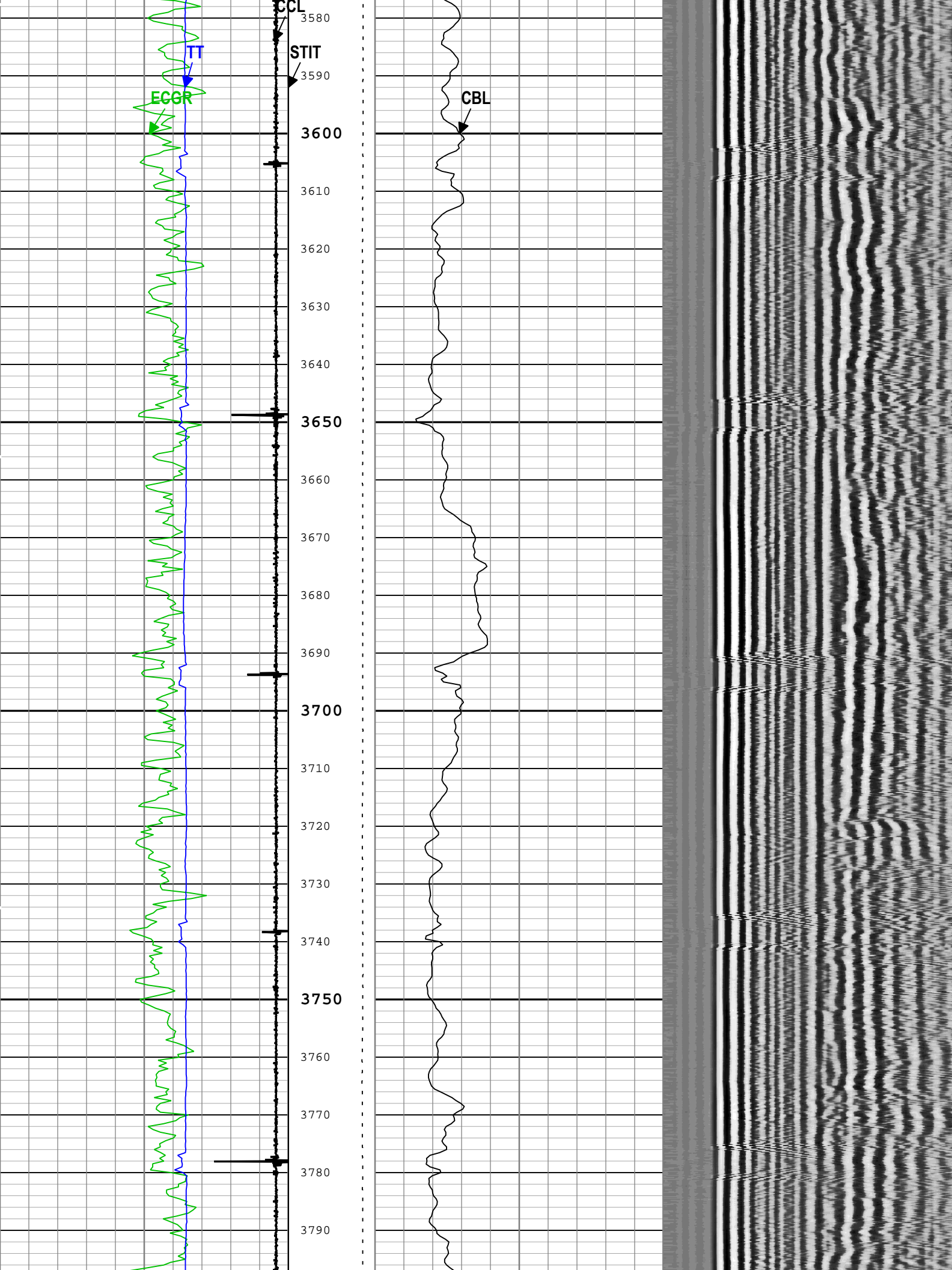


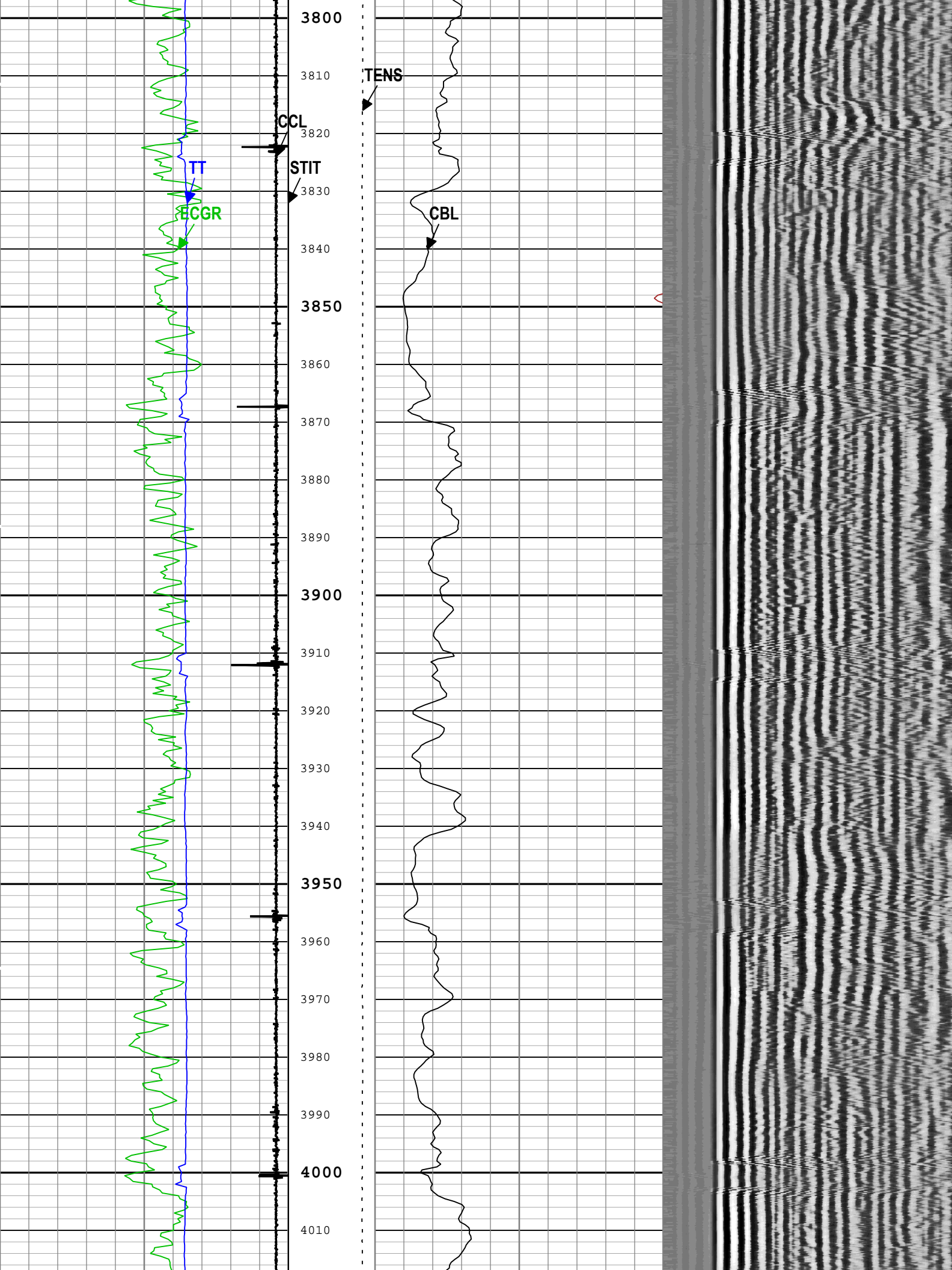


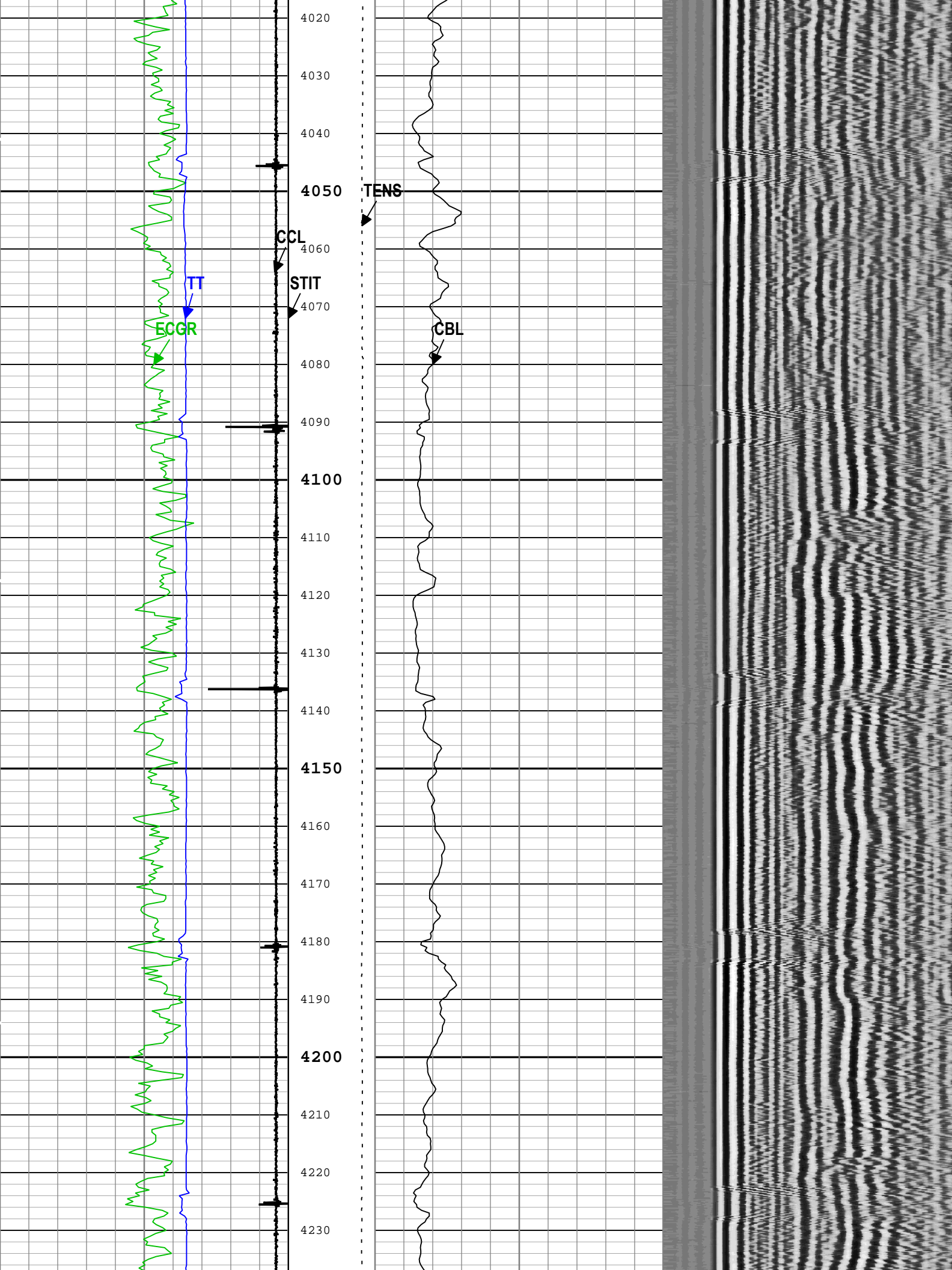


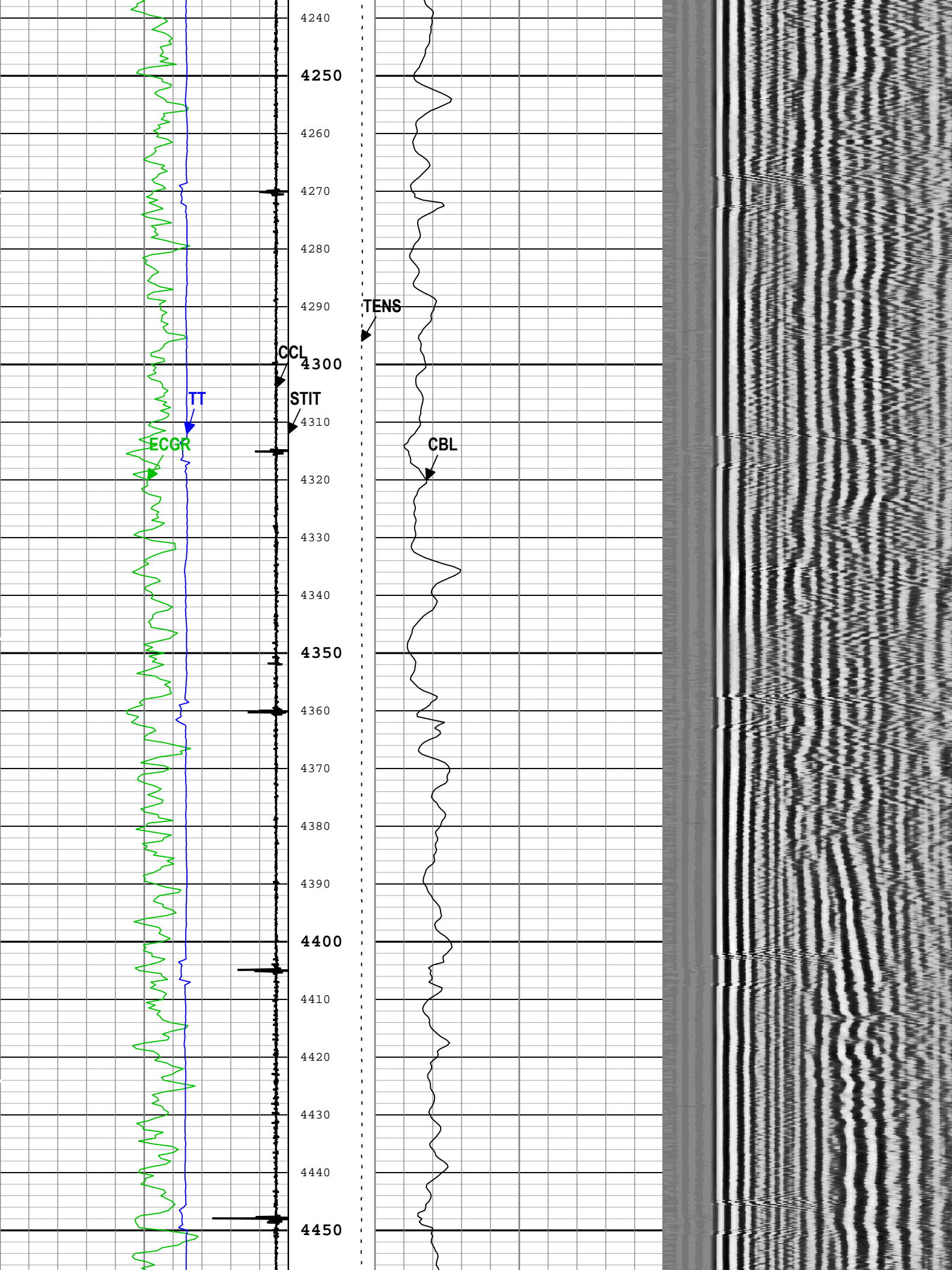


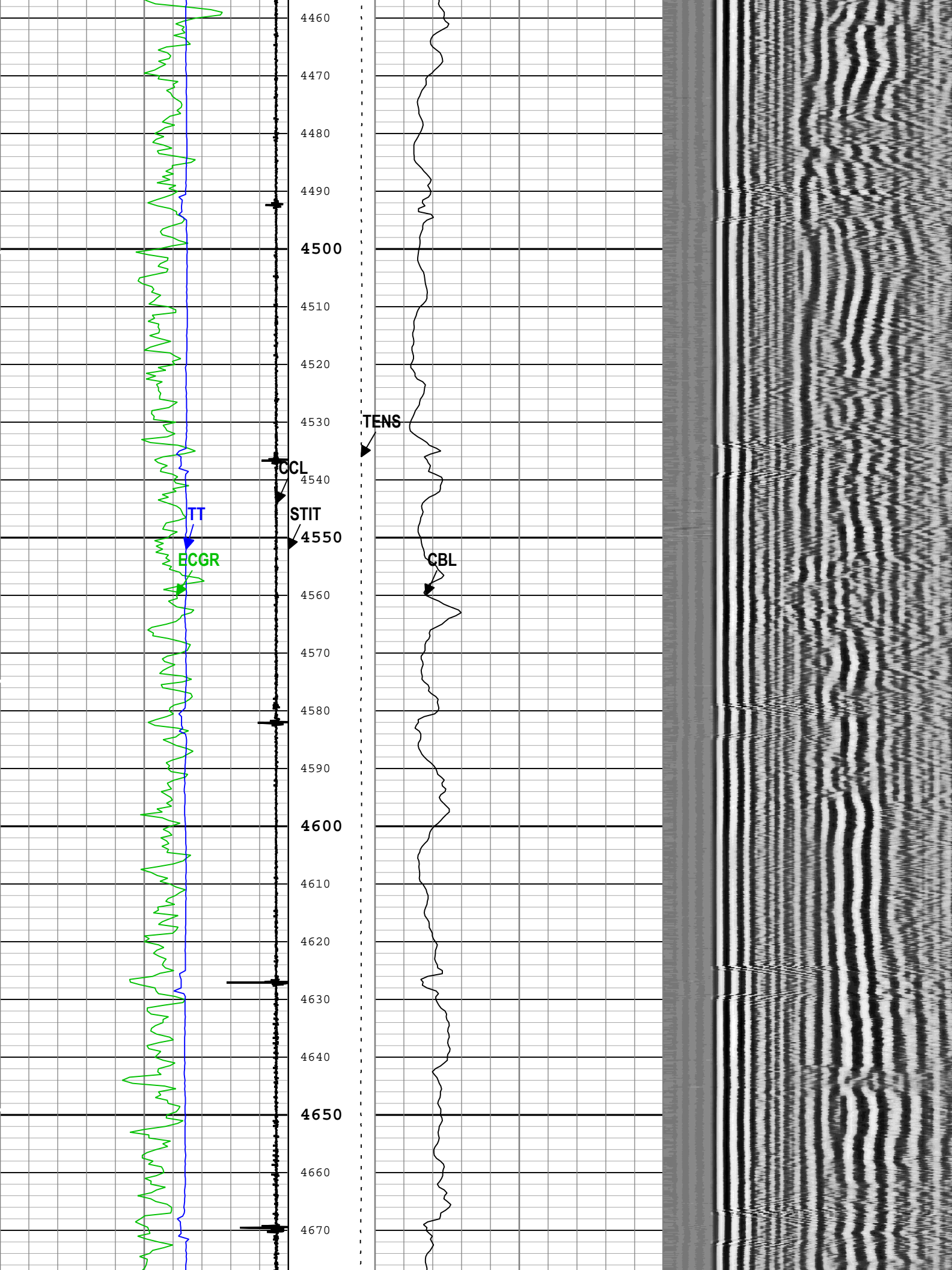


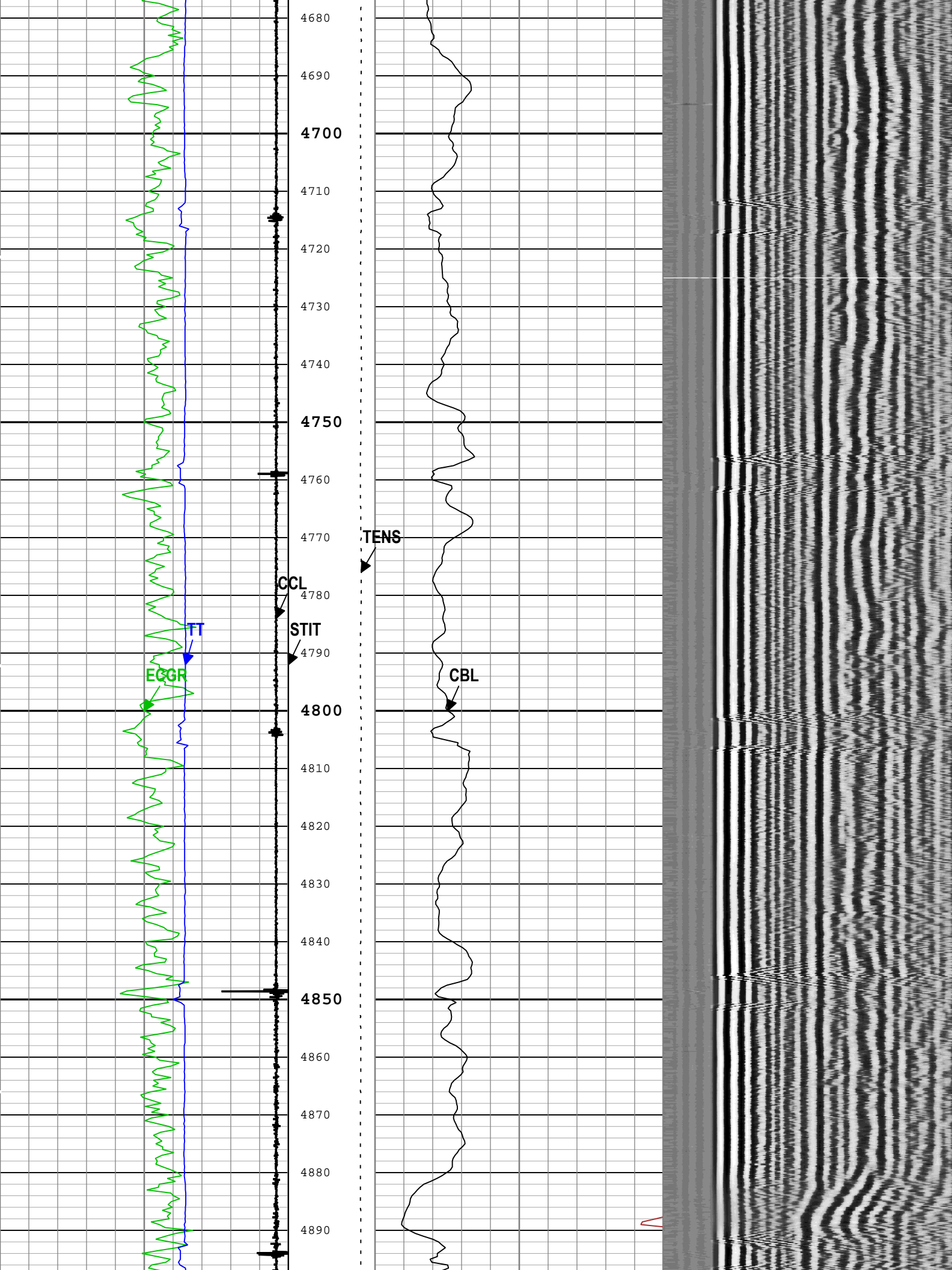


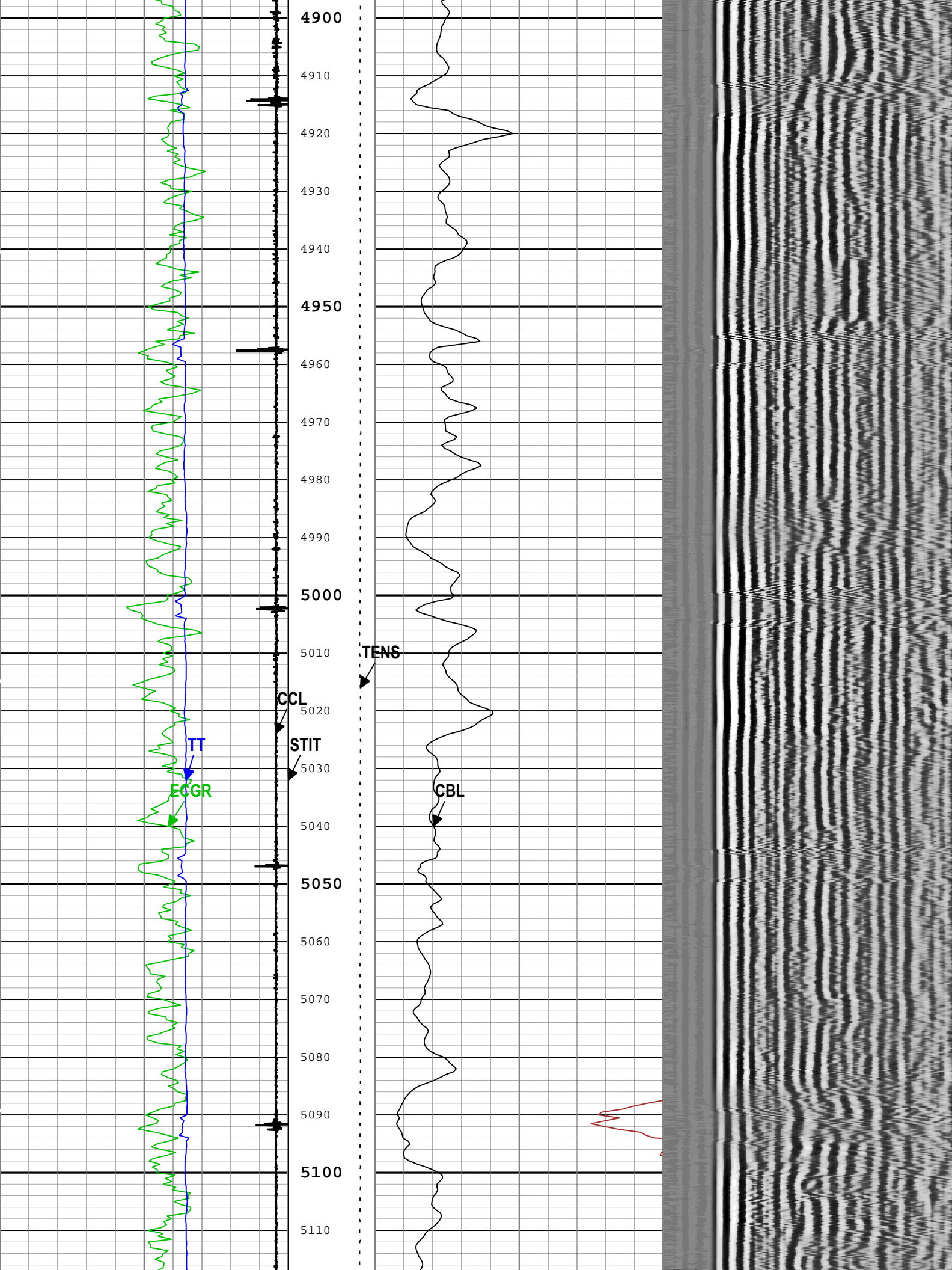


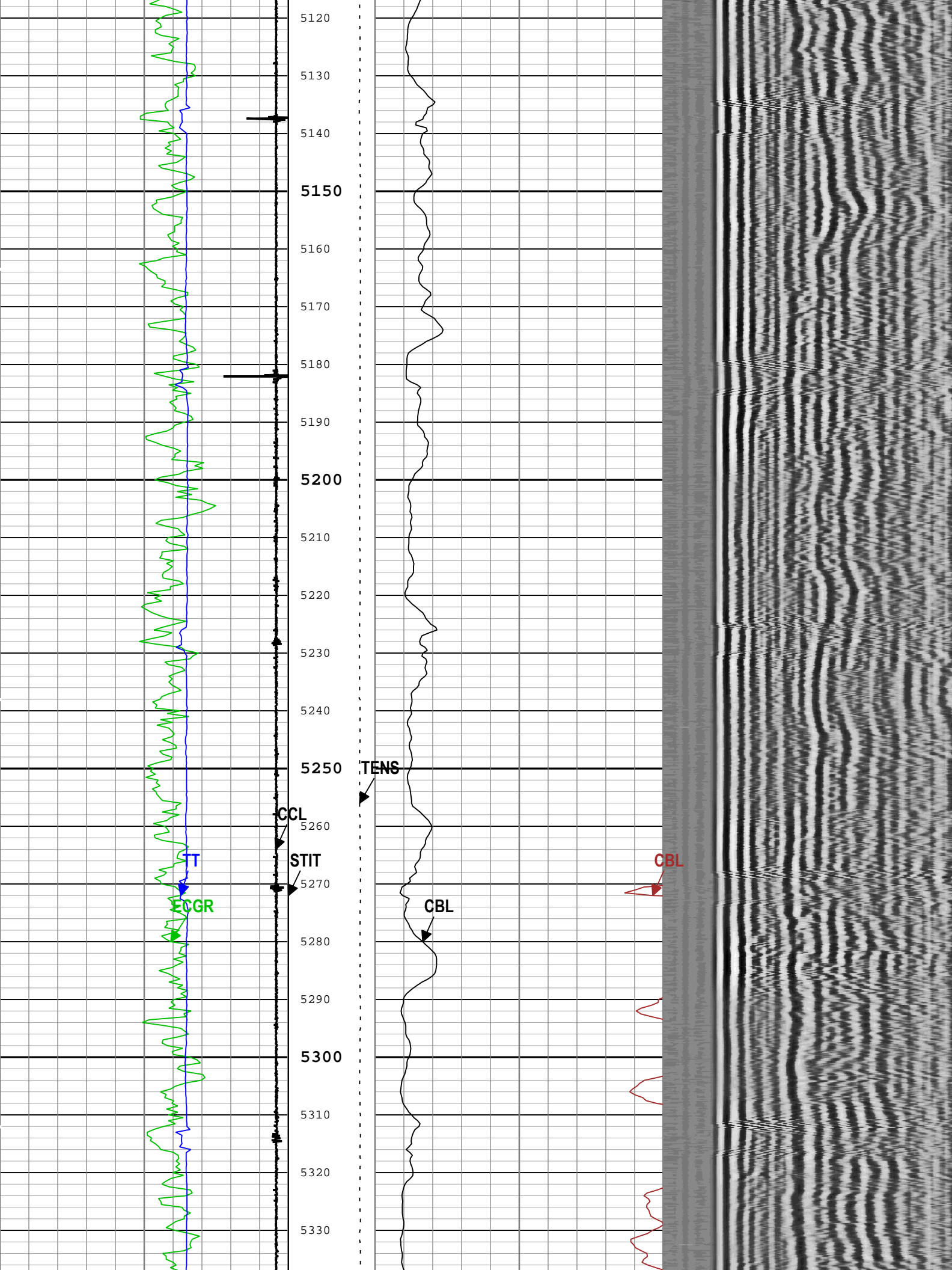


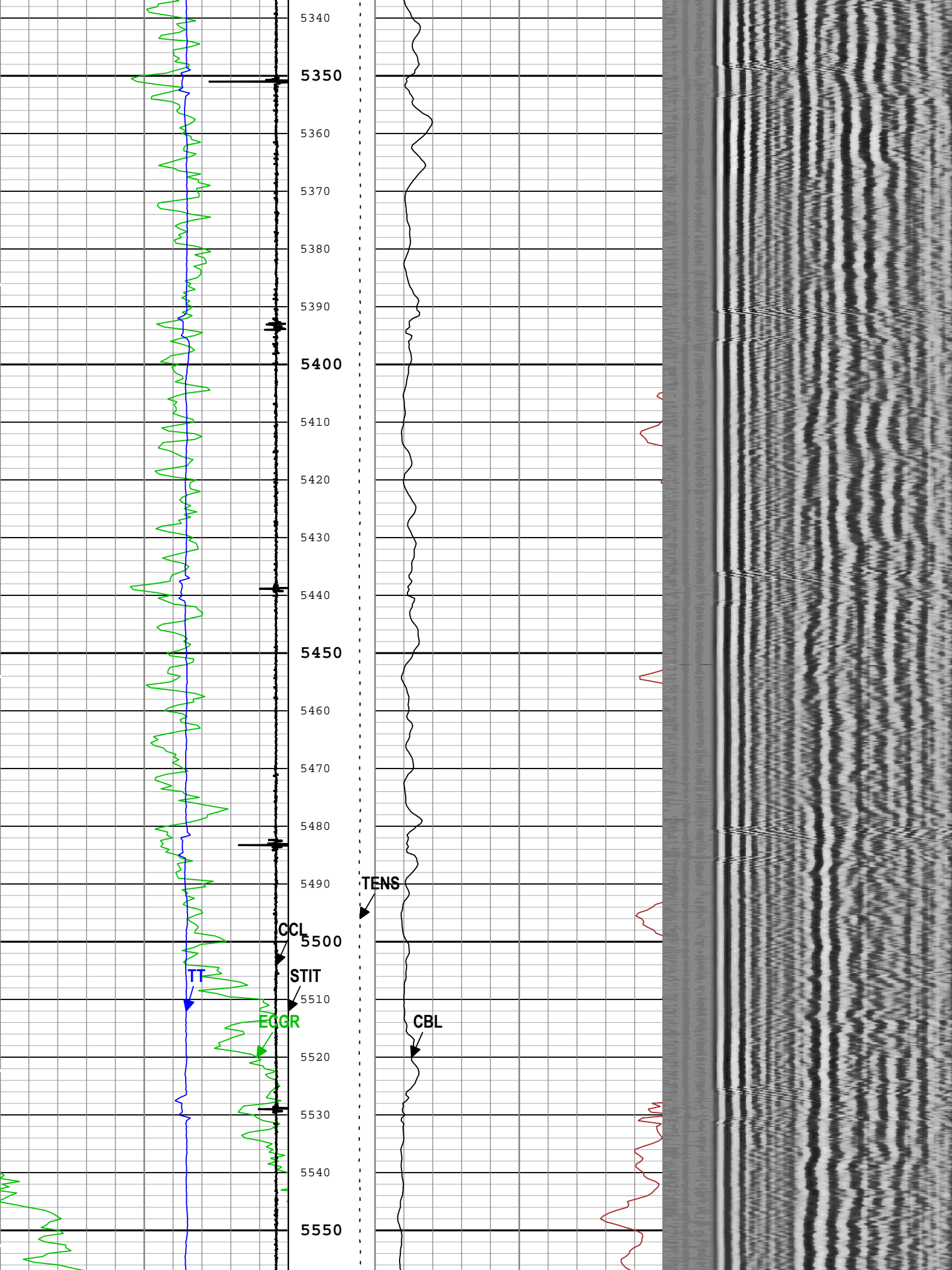


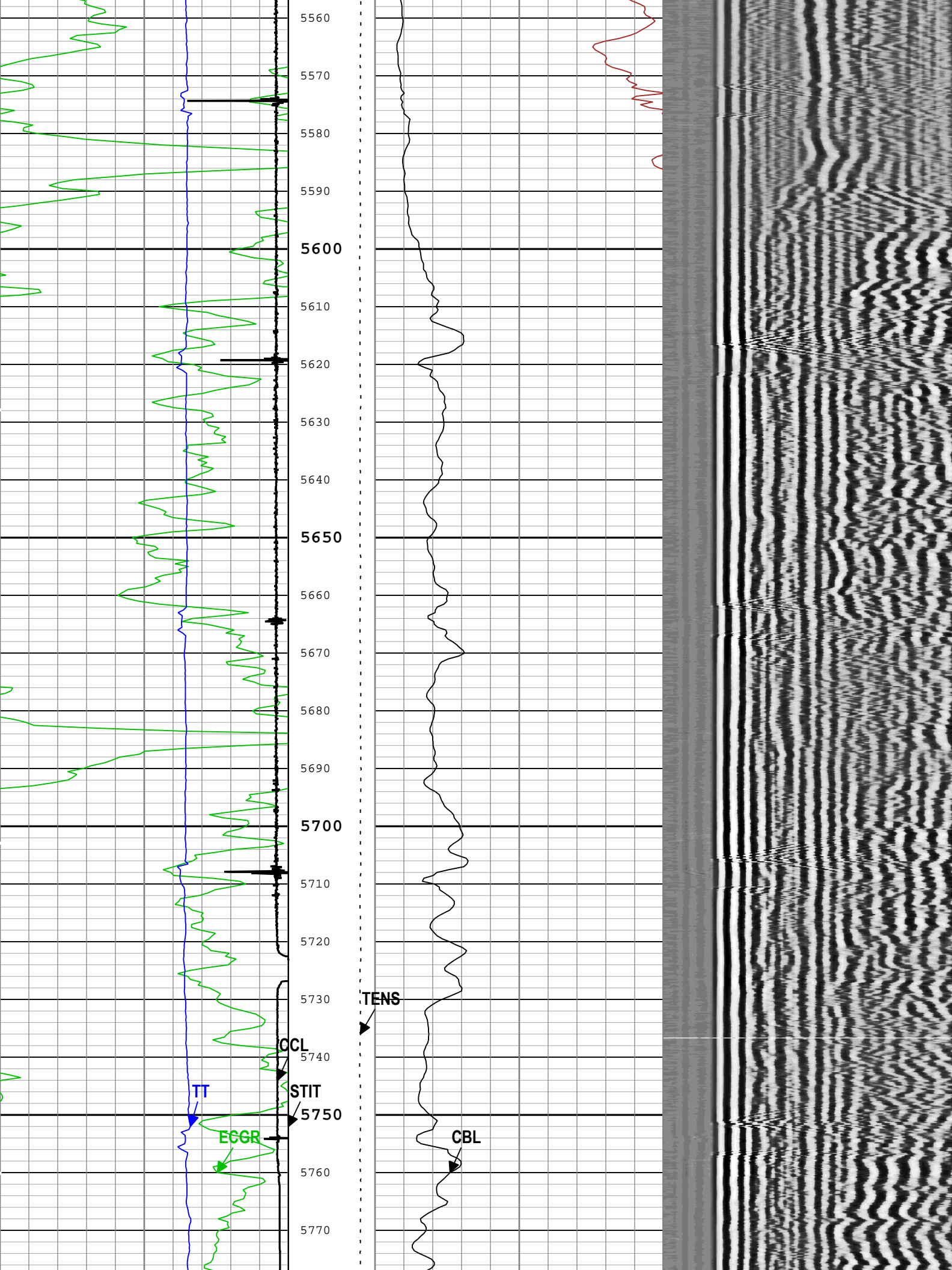


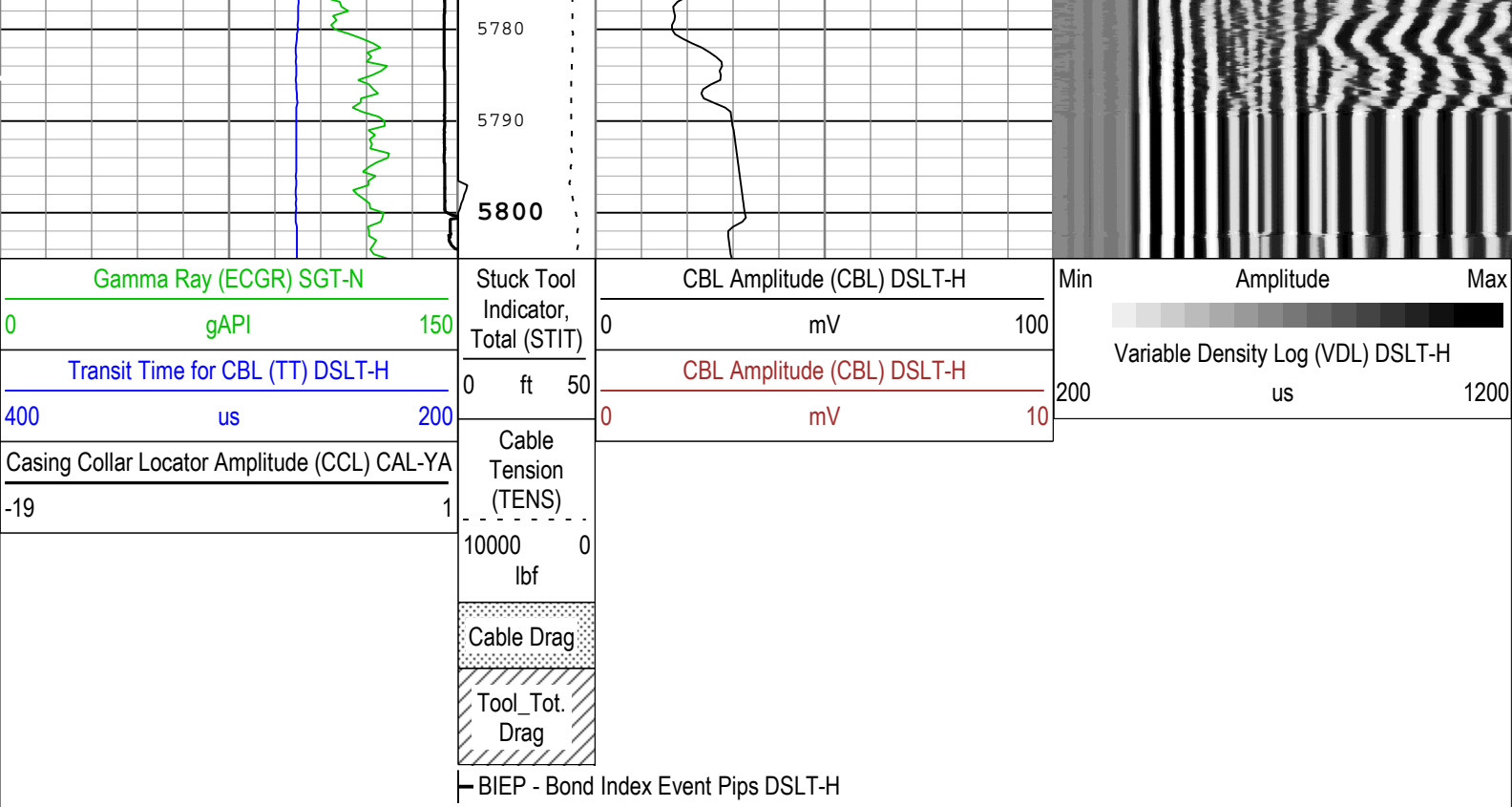












TIME_1900 - Time Marked every 60.00 (s)

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: 31-Aug-2016 17:40:21

Channel Processing Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
AMSG	Auxiliary Minimum Sliding Gate	DSL-T-H	258	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	DSL-T-H	41	us
CBLO	Casing Bottom (Logger)	WLSESSION	15719	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSL-T-H	72	mV
CCL_MULTIPLIER	Casing Collar Locator Multiplier	CAL-YA	5	
CDEN	Cement Density	SGT-N	2	g/cm3
DETE	Delta-T Detection	DSL-T-H	E1	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
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	DSL-T-H	3.42	mV
MAHTR	Manual High Threshold Reference for first arrival detection	DSL-T-H	120	
MATT_CURR	Maximum Attenuation in Arbitrary Cement	DSL-T-H	11.85	dB/ft
MCI	Minimum Cemented Interval for Isolation	DSL-T-H	Depth Zoned	ft
MNHTR	Minimum High Threshold Reference for first arrival detection	DSL-T-H	100	
MSA	Minimum Sonic Amplitude	DSL-T-H	1.6	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	DSL-T-H	1.6	mV
NMSG	Near Minimum Sliding Gate	DSL-T-H	256	us
SGAD	Sliding Gate Status	DSL-T-H	Off	
SGDT	Sliding Gate Delta-T	DSL-T-H	57	us/ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	24	45	101
BS	13.5	101	2030
BS	8.5	2030	5805
MCI	26.48	45	101
MCI	14.81	101	2021
MCI	4.75	2021	5805

All depth are actual.

Tool Control Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
MODE	DSLTL Acquisition Mode	DSLTL-H	CBL	
RATE	DSLTL Firing Rate	DSLTL-H	15 Hz	
DTFS	DSLTL Telemetry Frame Size	DSLTL-H	536	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
SGAI	Selectable Acquisition Gain	DSLTL-H	x1	

One

0 PSI Repeat Pass

Software Version

Acquisition System	Version
Maxwell 2016 SP2	6.2.68624.3100

Pass Summary

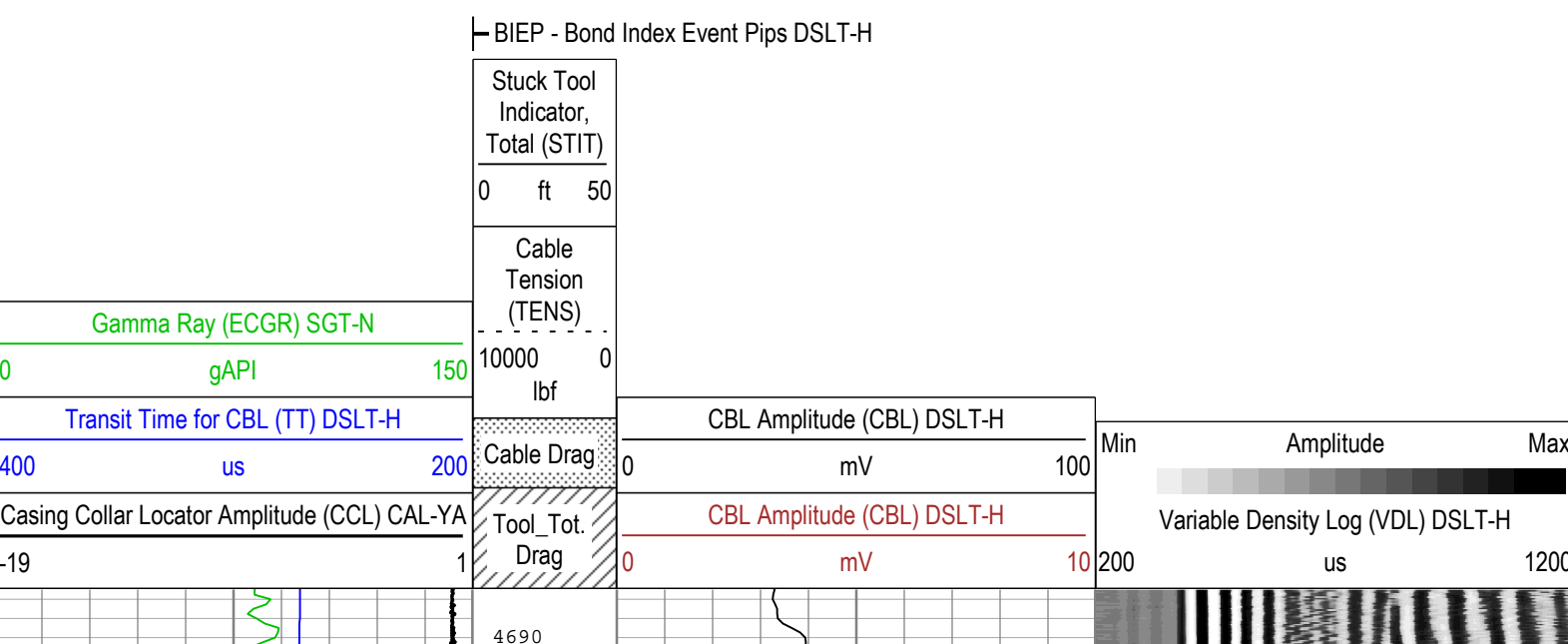
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[3]:Up	Up	4692.53 ft	5010.19 ft	31-Aug-2016 4:00:20 PM	31-Aug-2016 4:04:58 PM	ON	4.90 ft	No

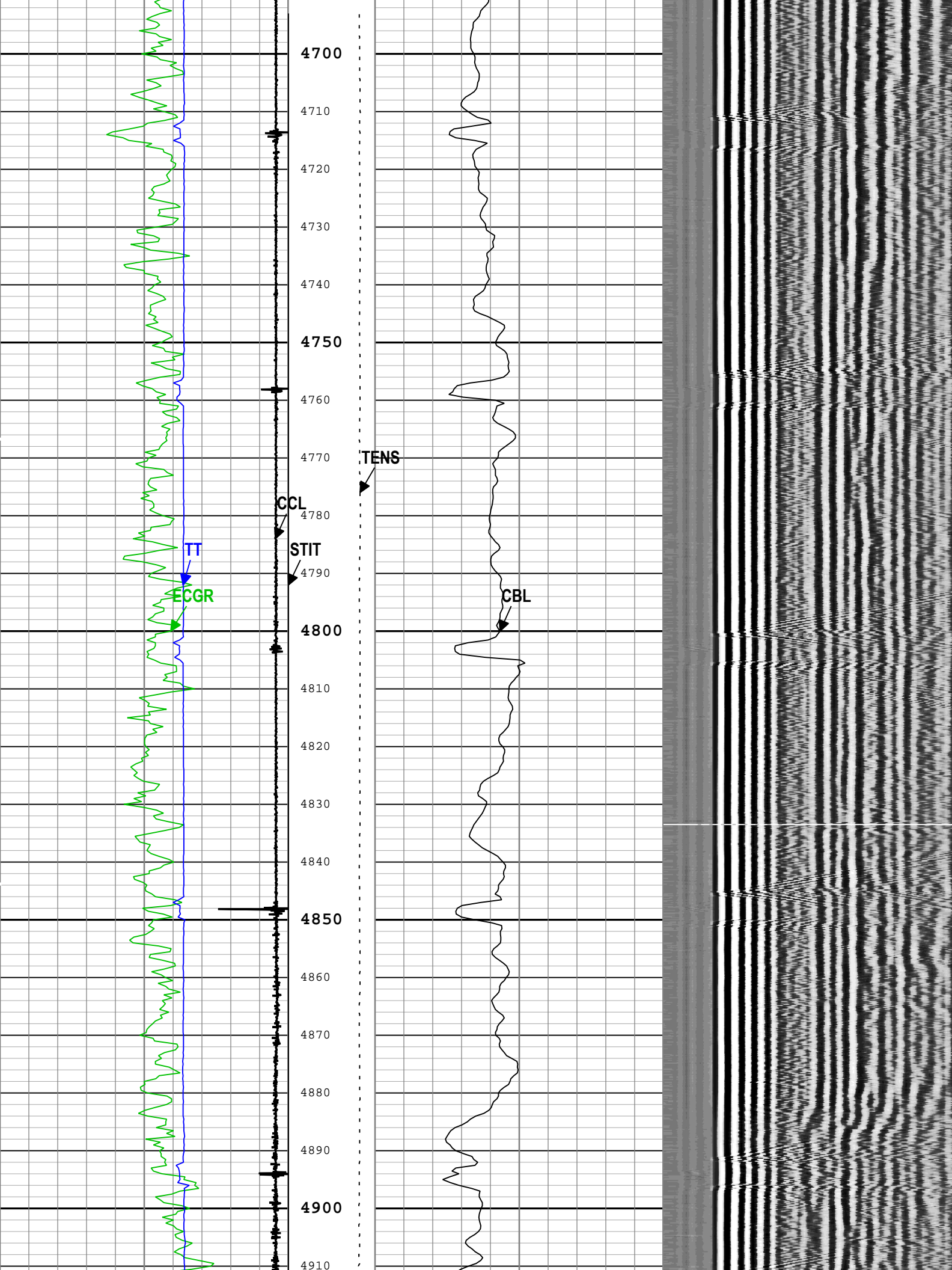
All depths are referenced to toolstring zero

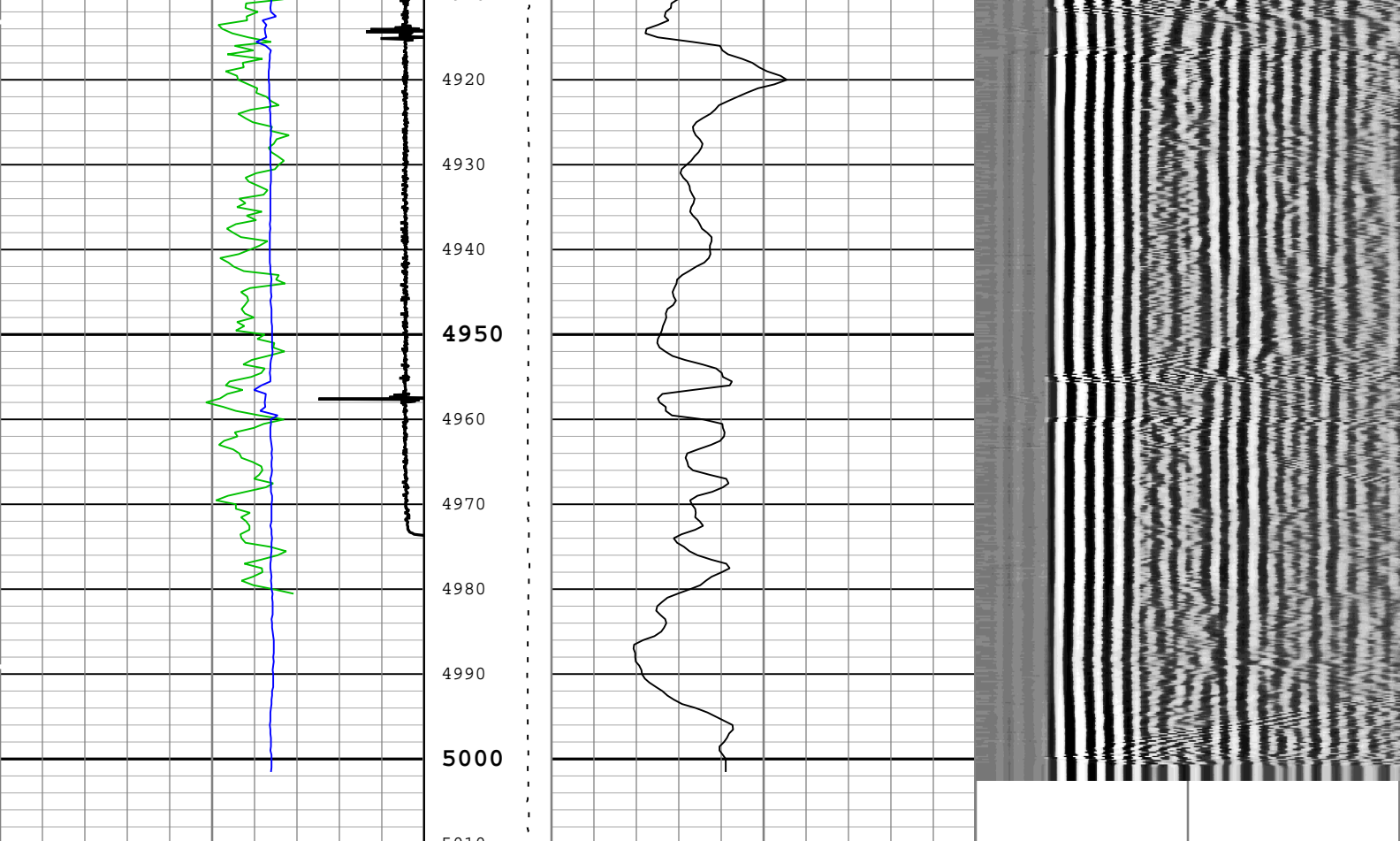
Log	Company:Whiting Oil & Gas Corporation Well:Razor 25N-2407 One: Log[3]:Up:S008
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Description: CBL_VDL Format: Log (Sonic CBL with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 31-Aug-2016 17:40:27

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 ft 50	0 mV 100			
Transit Time for CBL (TT) DSLT-H		CBL Amplitude (CBL) DSLT-H		Variable Density Log (VDL) DSLT-H	
400 us 200		0 mV 10	200	us	1200
Casing Collar Locator Amplitude (CCL) CAL-YA	Cable Tension (TENS)				
-19 1	10000 0 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: 31-Aug-2016 17:40:27

Channel Processing Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
AMSG	Auxiliary Minimum Sliding Gate	DSLTH	258	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	DSLTH	41	us
CBLO	Casing Bottom (Logger)	WLSESSION	15719	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSLTH	72	mV

CCL_MULTIPLIER	Casing Collar Locator Multiplier	CAL-YA	5	
CDEN	Cement Density	SGT-N	2	g/cm3
DETE	Delta-T Detection	DSLT-H	E1	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
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	4.75	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	256	us
SGAD	Sliding Gate Status	DSLT-H	Off	
SGDT	Sliding Gate Delta-T	DSLT-H	57	us/ft

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
SGAI	Selectable Acquisition Gain	DSLT-H	x1	

Calibration Report

DSLT-H (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 (Manual Entry): 17:37:44 31-Aug-2016

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
CBL Amplitude - 0	mV	Before	----	----	----	----		
CBL Reference Amplitude (CBRA) - 0	mV	Before	----	----	----	----		
Measurement Depth - 0	ft	Before	----	----	----	----		

CBL Free Pipe Adjustment - CBL Amplitude Coefficient

Before (Manual Entry): 17:37:44 31-Aug-2016

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
CBL Adjustment Factor		Before	1.000	0.200	0.996	5.000		
Depth of Before Calibration	ft	Before			237.75			

Company:	Whiting Oil & Gas Corporation	Schlumberger
Well:	Razor 25N-2407	
Field:	Wildcat	
County:	Weld	
State:	Colorado	

Cement Bond Log
GR-CCL