

Company: Anadarko Petroleum Corporation

Well: Cowboy 21-7HZ

Field: DJ Basin

County: Weld State: Colorado

Cement Bond Log
Variable Density Log

County:	Weld
Field:	DJ Basin
Location:	SENE Sec. 21, T2N, R67W
Well:	Cowboy 21-7HZ
Company:	Anadarko Petroleum Corporation
Location:	
SENE Sec. 21, T2N, R67W	Elev.: K.B. 5067.00 ft
SHL: 2334' FNL & 856' FEL	G.L. 5041.00 ft
Lat/Long: 40.124674 / -104.889199	D.F. 5067.00 ft
Permanent Datum:	Ground Level
Log Measured From:	Kelly Bushing
Drilling Measured From:	Kelly Bushing
API Serial No.	Section: 21
05-123-47099	Township: 2N
	Range: 67W

Logging Date	25-Nov-2018
Run Number	ONE
Depth Driller	21554.00 ft
Schlumberger Depth	21554.00 ft
Bottom Log Interval	7250.00 ft
Top Log Interval	100.00 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	106.00 ft
To	21554.00 ft
Casing/Tubing Size	5.5 in
Weight	17 lbm/ft
Grade	P110
From	0.00 ft
To	21544.00 ft
Max Recorded Temperatures	189.27 degF
Logger on Bottom	25-Nov-2018
Unit Number	3701
Recorded By	Ashley Rosacker
Witnessed By	Justin McMillan

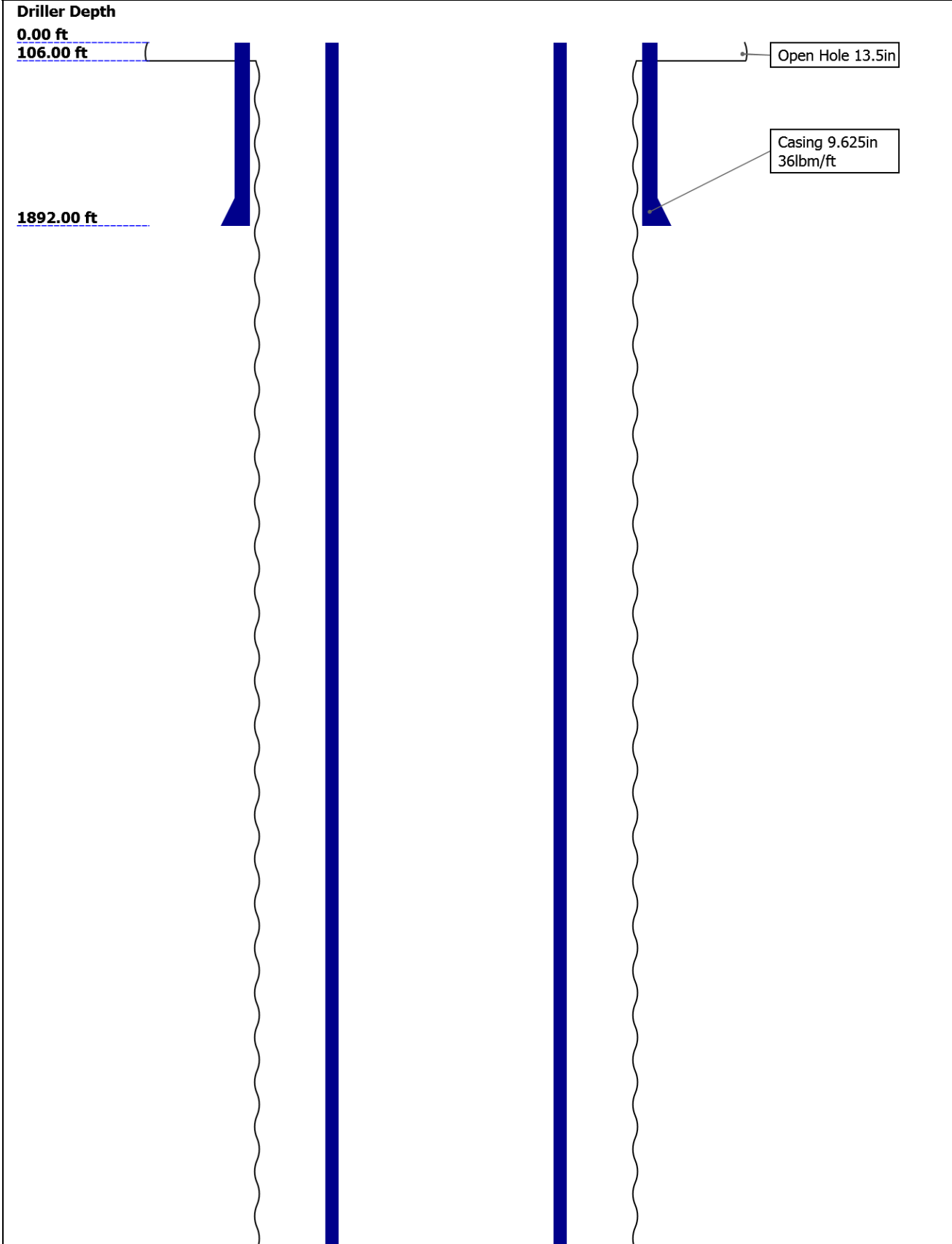
Disclaimer

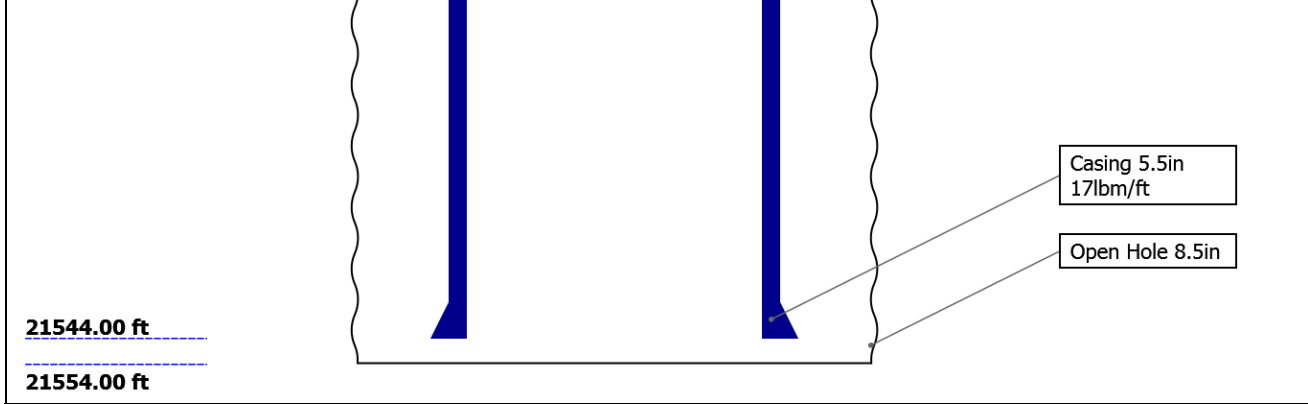
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Well Sketch




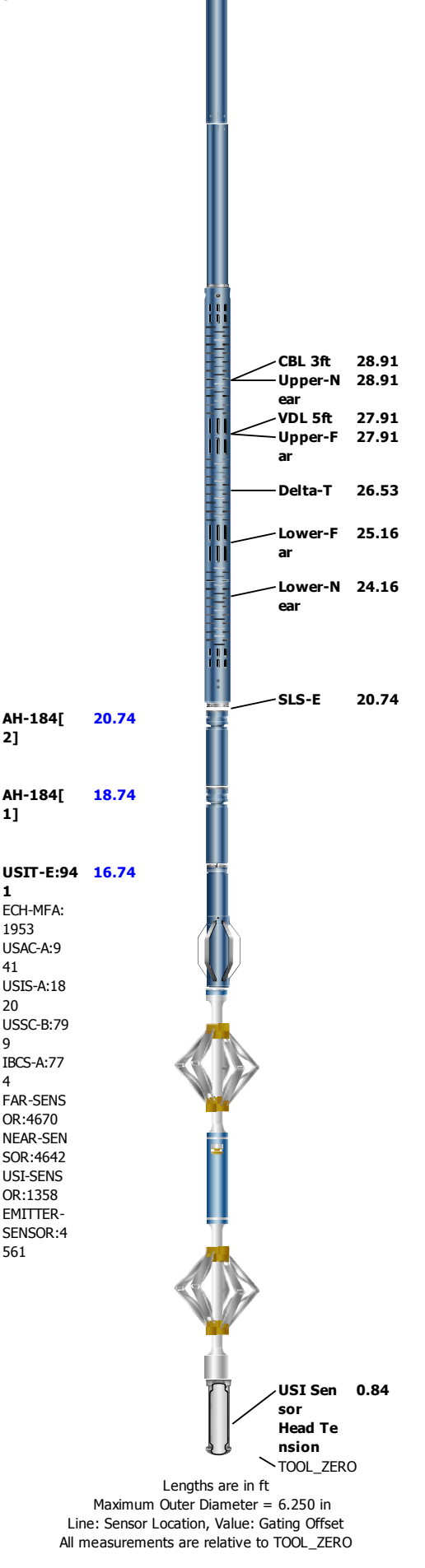


Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	13.5	8.5				
Top Driller (ft)	0	106				
Top Logger (ft)	0	106				
Bottom Driller (ft)	106	21554				
Bottom Logger (ft)	106	21554				
Casing						
Size (in)	9.625	5.5				
Weight (lbm/ft)	36	17				
Inner Diameter (in)	8.921	4.892				
Grade	J55	P110				
Top Driller (ft)	0	0				
Top Logger (ft)	0	0				
Bottom Driller (ft)	1892	21544				
Bottom Logger (ft)	1892	21544				

Remarks and Equipment Summary

ONE: Toolstring				ONE: Remarks	
<div>Equip nameLengthMP nameOffset</div> <div>LEH-QT55.65LEH-QT</div> <div>SAH-F52.73</div> <div>EDTC-B:847.88EDTH-B:8624EDTG-A:77437EDTC-B:8473</div> <div>DSLT-H41.38ECH-KHDSLCHSLS-E:1563</div>		<div>CTEM44.38</div> <div>ACCZ0.00</div> <div>HV0.00</div> <div>Gamma Ray42.51</div> <div>TelStatus41.38</div>		Thank you for choosing Schlumberger!	
				Log run for cement evaluation.	
				Toolstring run centralized using houma kit, gemcos, and knuckles as per tool sketch.	
				IBCS-A run with IBC-TX Transducers.	
				Well logged under 0 psi and 7500 psi.	
				Log correlated to down log.	
				Crew: Tim Ludgate, Adewale Fajingbesi	



Depth Summary

	ONE		
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Depth Measuring Device

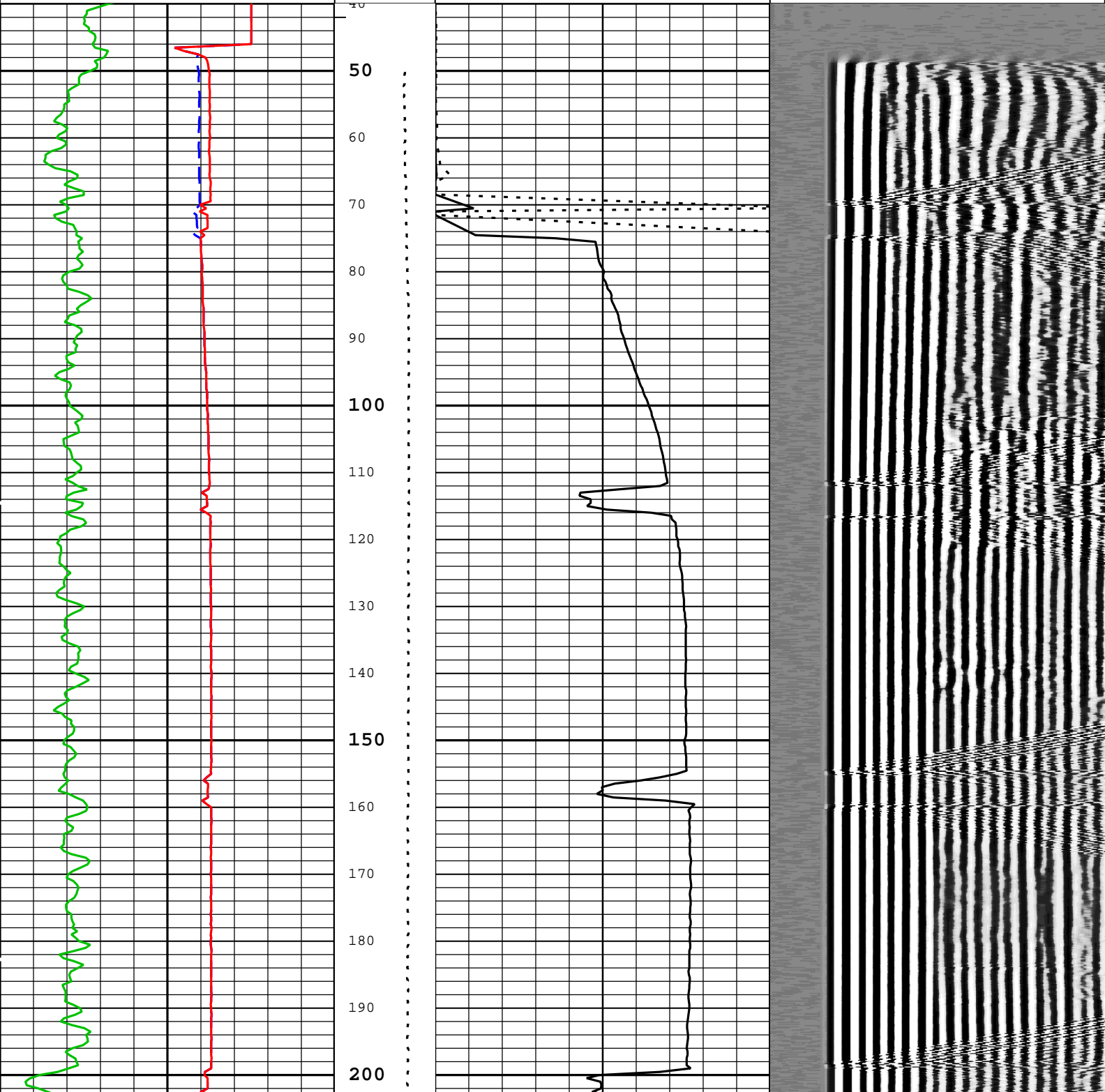
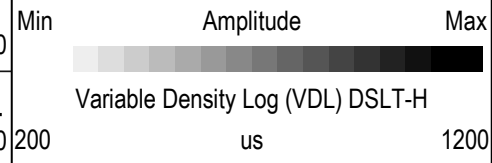
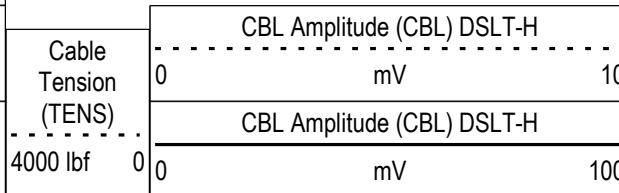
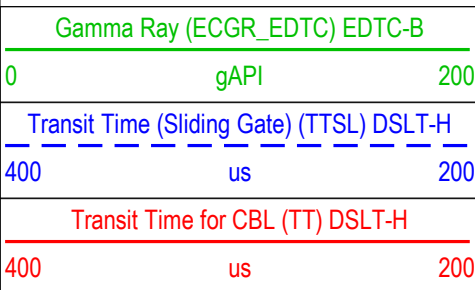
Type	IDW-B		
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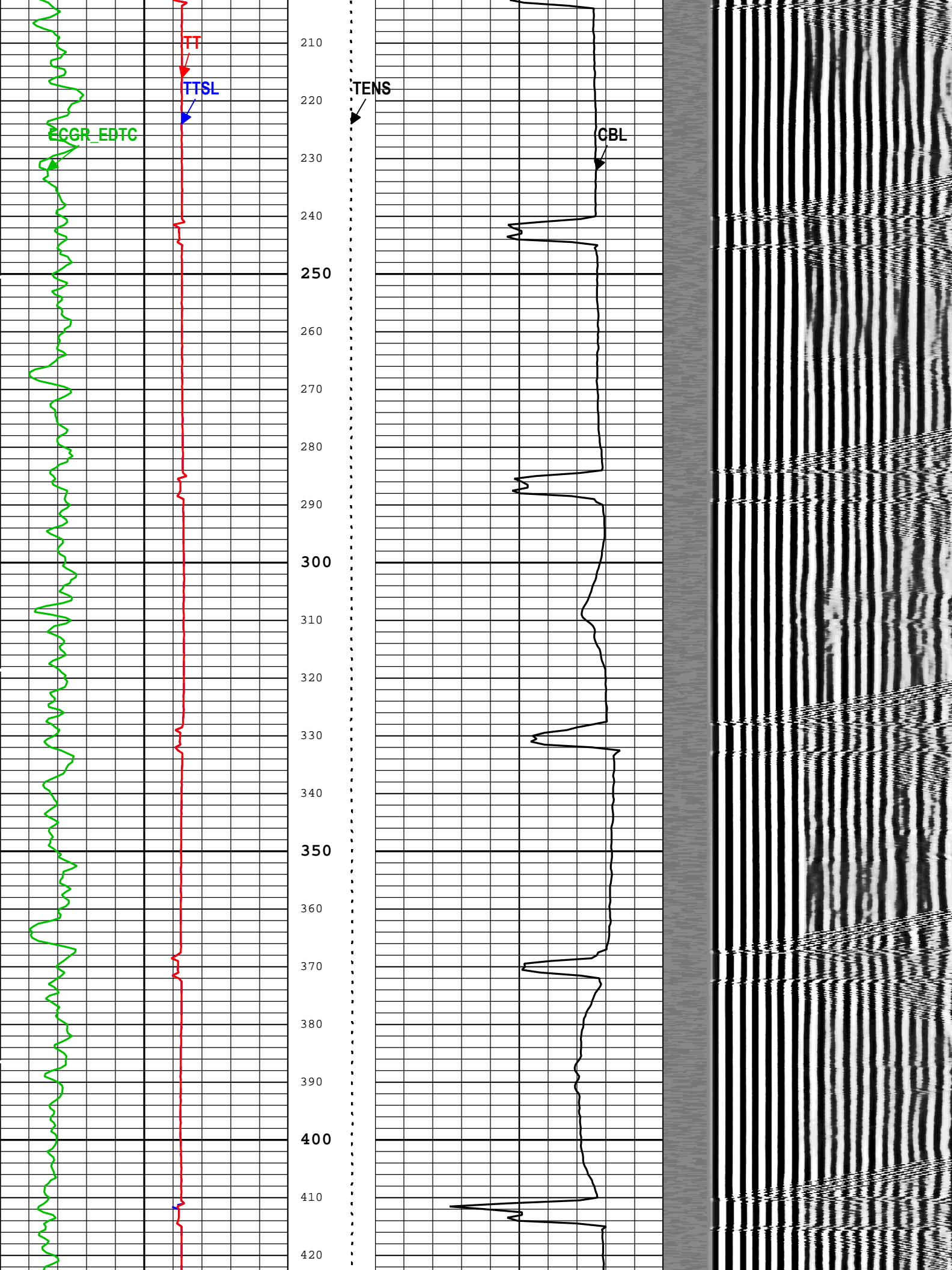
Serial Number									
Calibration Date									
Calibrator Serial Number									
Calibration Cable Type									
Wheel Correction 1	0								
Wheel Correction 2	0								
Tension Device									
Type	CMTD-B/A								
Serial Number									
Calibration Date									
Calibrator Serial Number									
Number of Calibration Points	0								
Logging Cable									
Type	7-39AI-XXS								
Serial Number									
Length	24000.00 ft								
Conveyance Type	Wireline								
Rig Type	Crane								
ONE:Depth Control Parameters		Depth Control Remarks							
Log Sequence	First Log In the Well	All Schlumberger depth control policies followed.							
Rig Up Length At Surface		IDW used as primary depth reference.							
Rig Up Length At Bottom		Z-Chart used as secondary depth reference.							
Rig Up Length Correction									
Stretch Correction									
Tool Zero Check At Surface									
ONE									
CBL 0 PSI									
Software Version									
Acquisition System		Version							
Maxwell 2017 SP1		7.1.82245.3100							
Application Patch		Wireline_NPD-PNX-2017SP1_7.1.88213							
		Wireline_NPD-ICE2-2017SP1_7.1.87324							
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[4]:Up	Up	49.64 ft	7255.44 ft	25-Nov-2018 10:46:37 AM	25-Nov-2018 12:30:01 PM	ON	9.09 ft	No
All depths are referenced to toolstring zero									
Log									
Company:Anadarko Petroleum Corporation									
Well:Cowboy 21-7HZ									
ONE: Log[4]:Up:S008									
Description: CBL_Dual_Gate Format: Log (CBL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 25-Nov-2018 16:21:36									
Channel	Source	Sampling							
TT	DSLT-H:SLS-E:SLS-E	6in							
BIEP	DSLT-H:SLS-E:SLS-E	6in							
CBL	DSLT-H:SLS-E:SLS-E	6in							

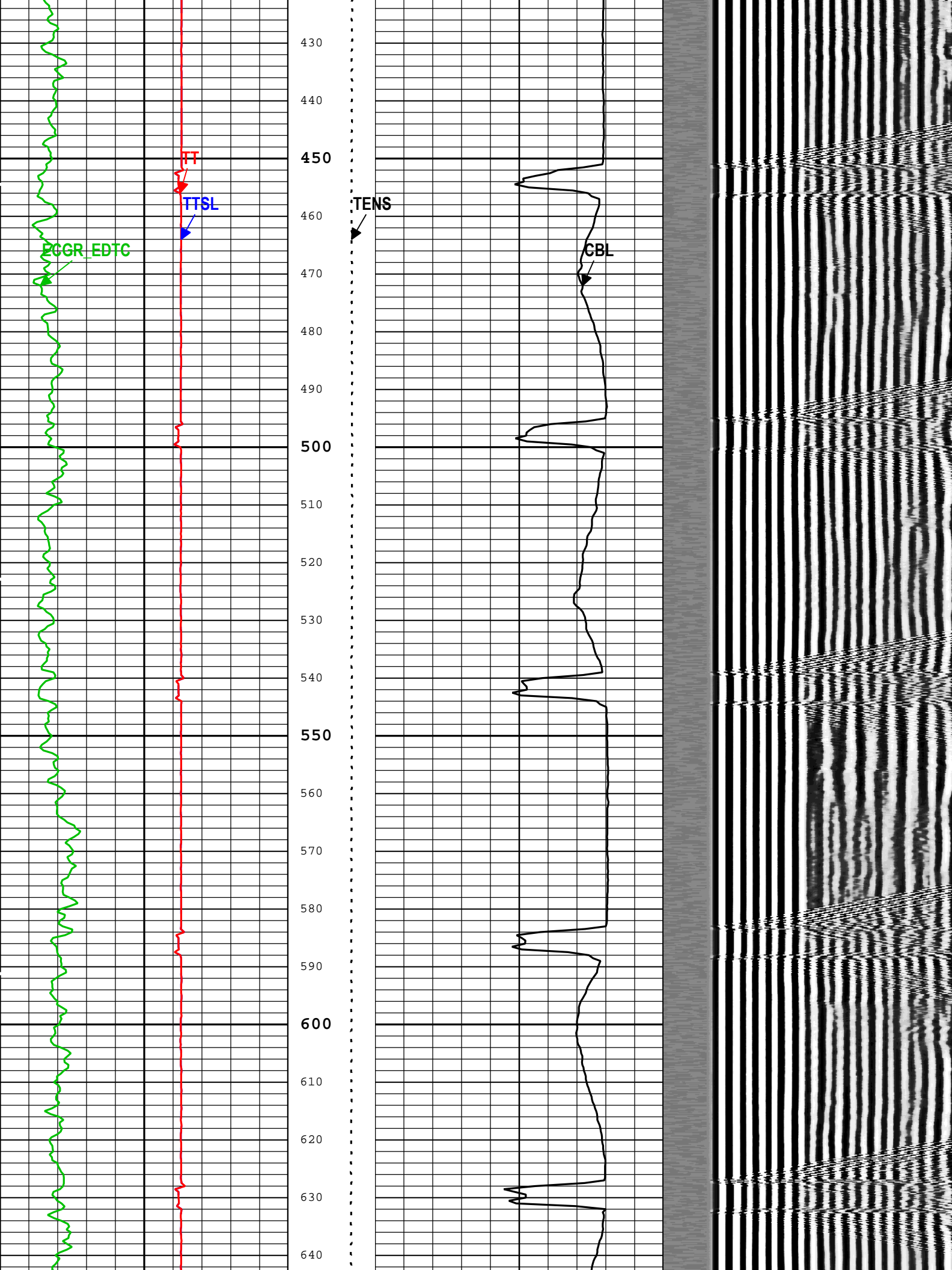
GR EDTC-B:EDTC-B 6in
TENS WLWorkflow 1in
TIME_1900 WLWorkflow 0.1in
TTSL DSLT-H:SLS-E:SLS-E 6in

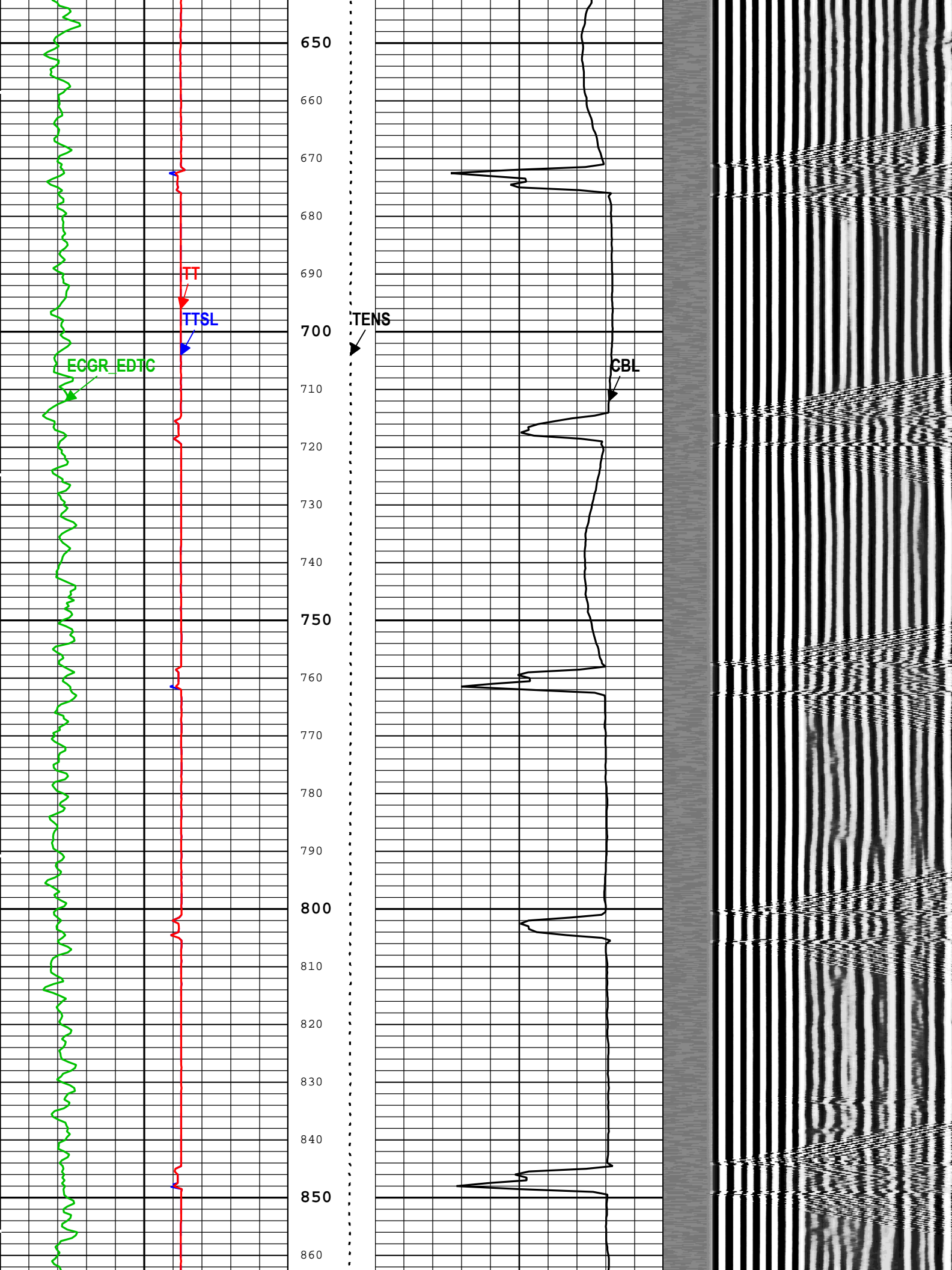
TIME_1900 - Time Marked every 60.00 (s)

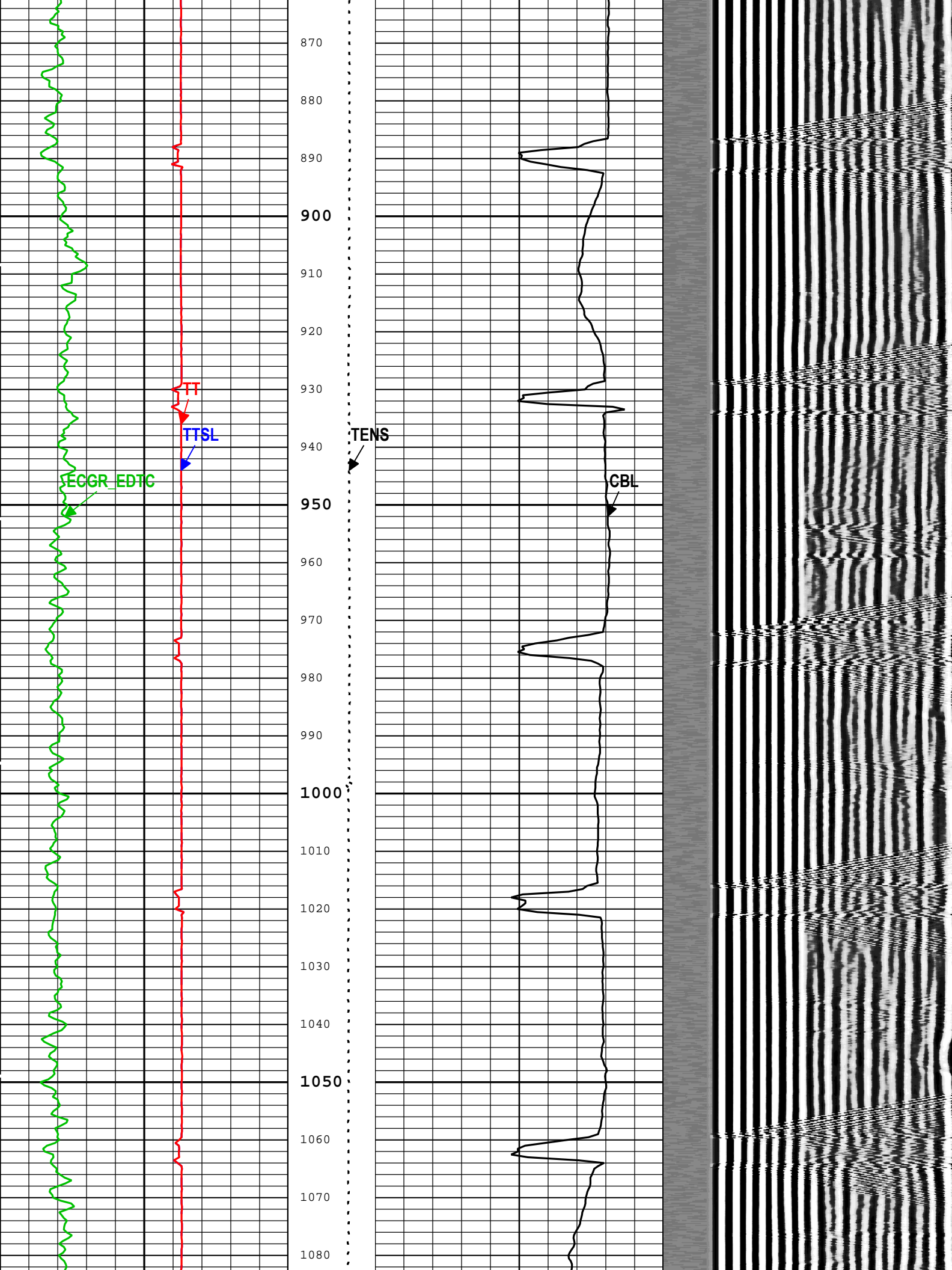
└─ BIEP - Bond Index Event Pips DSLT-H

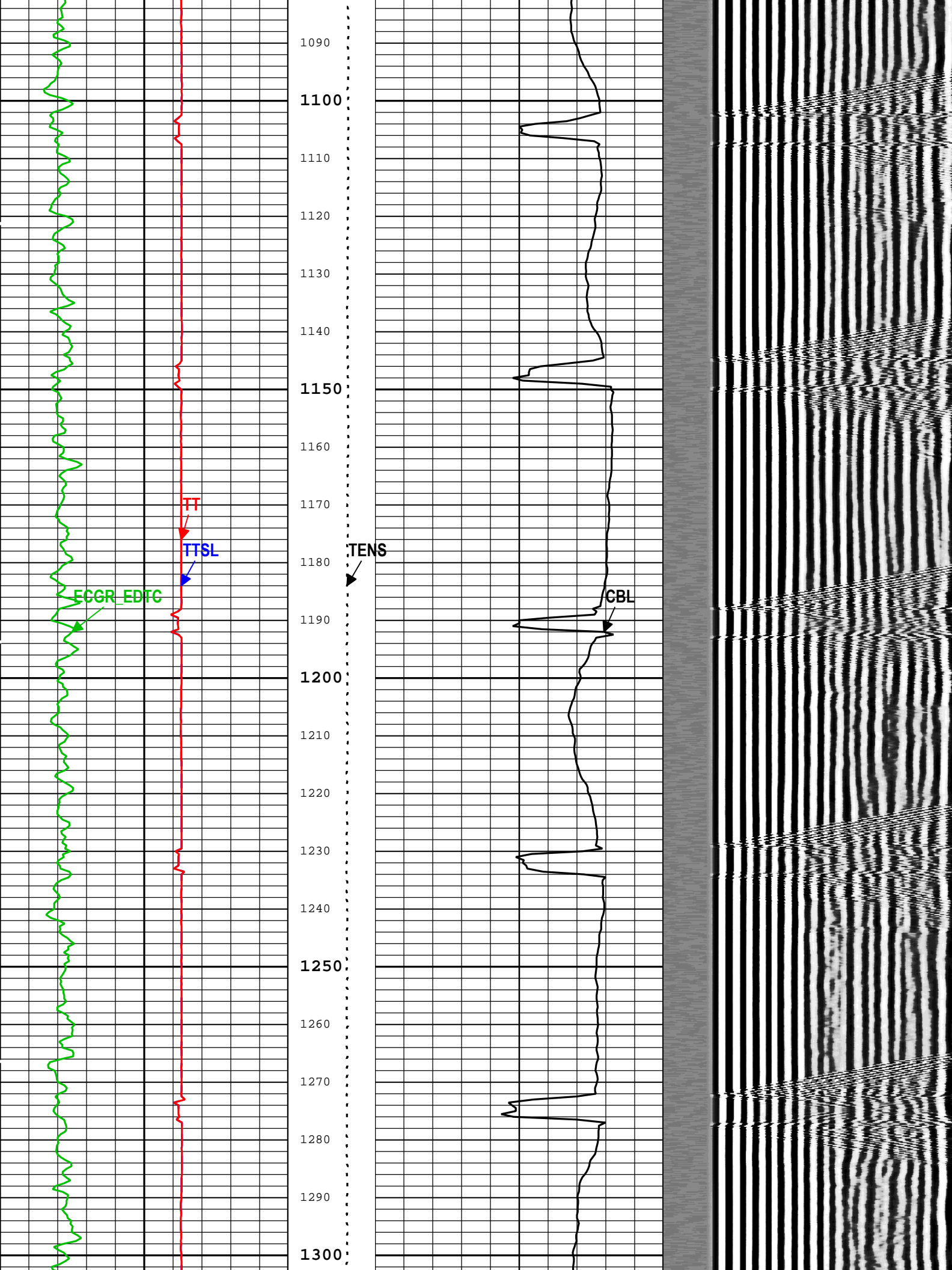


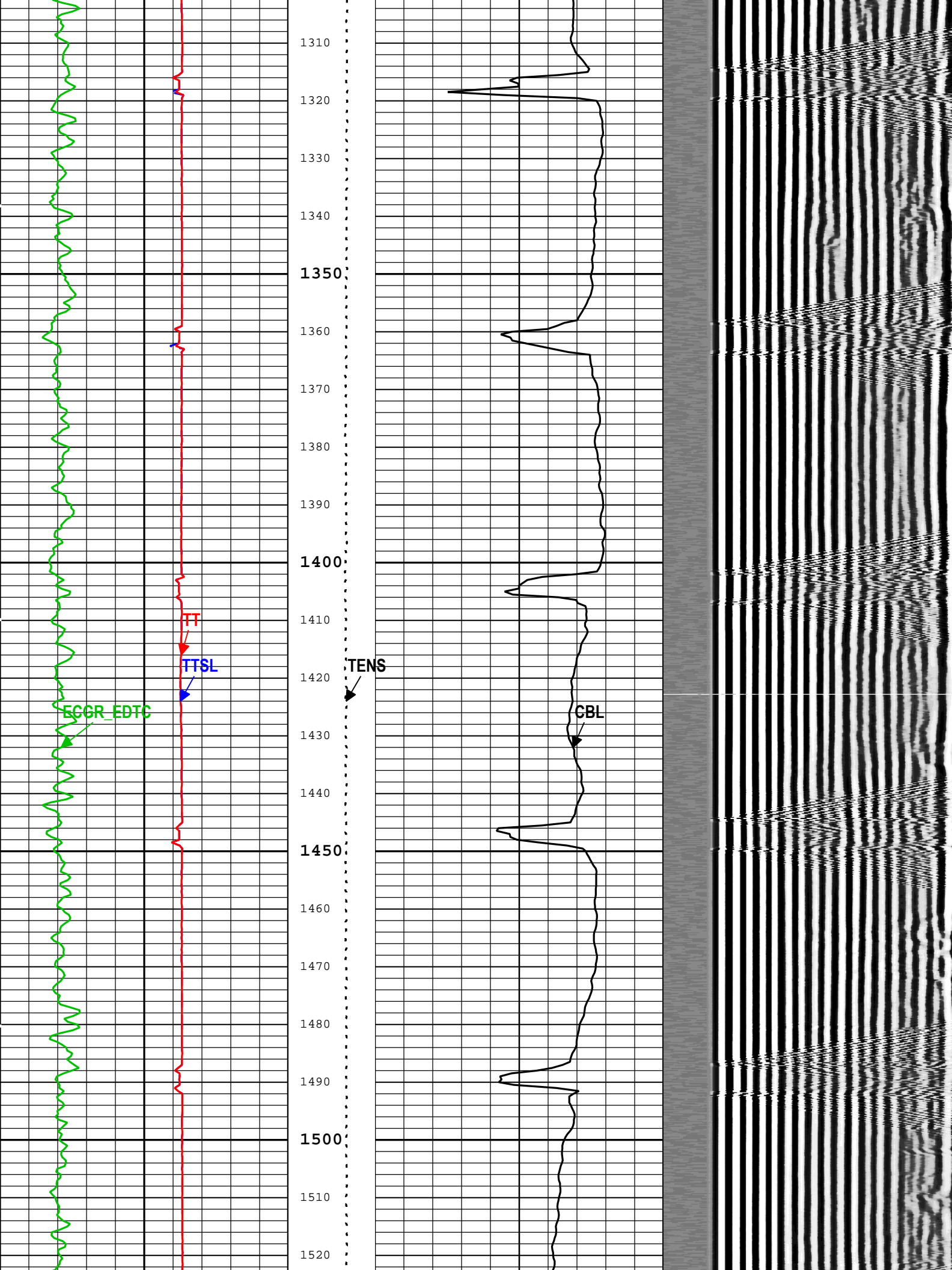


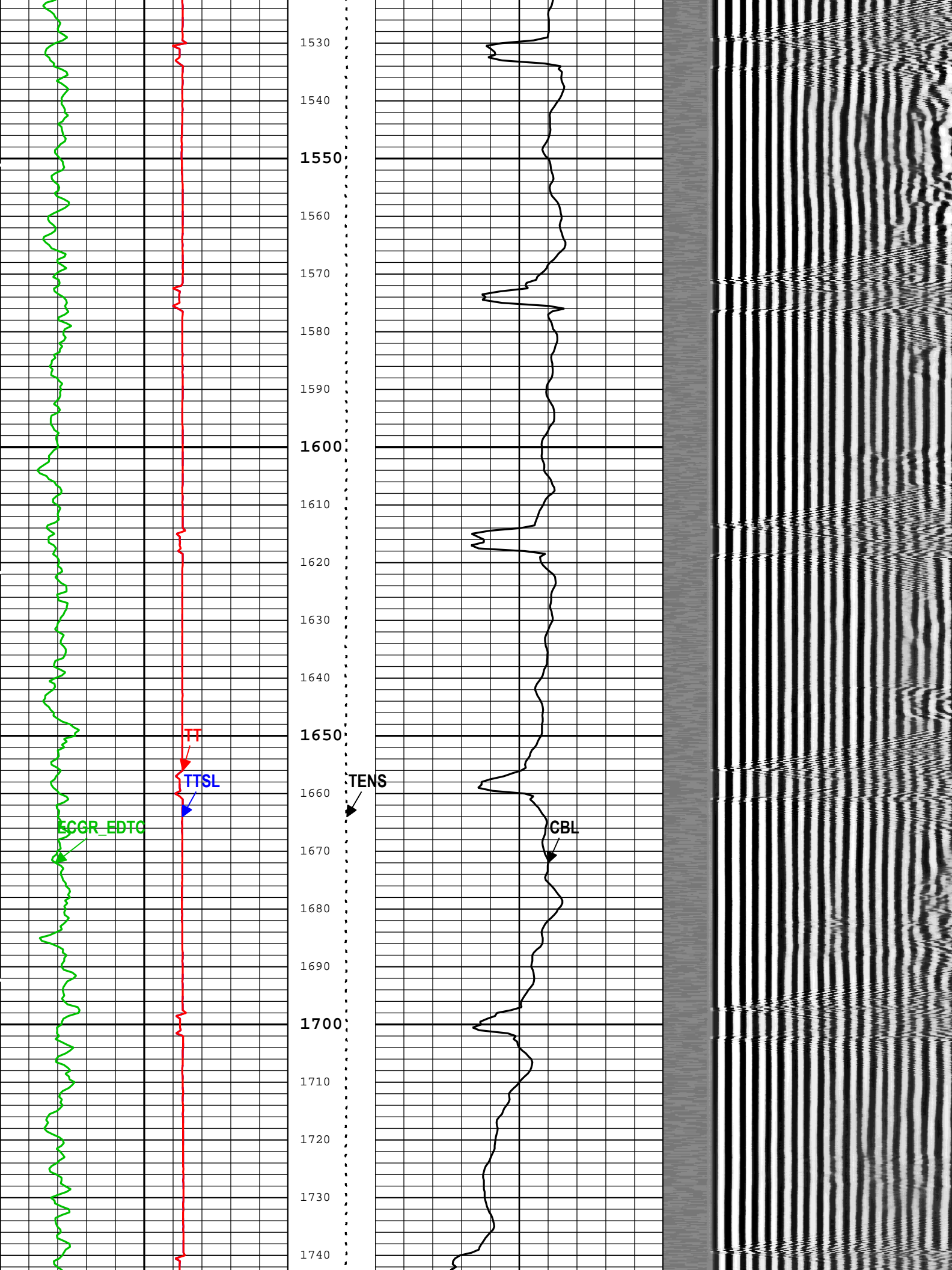


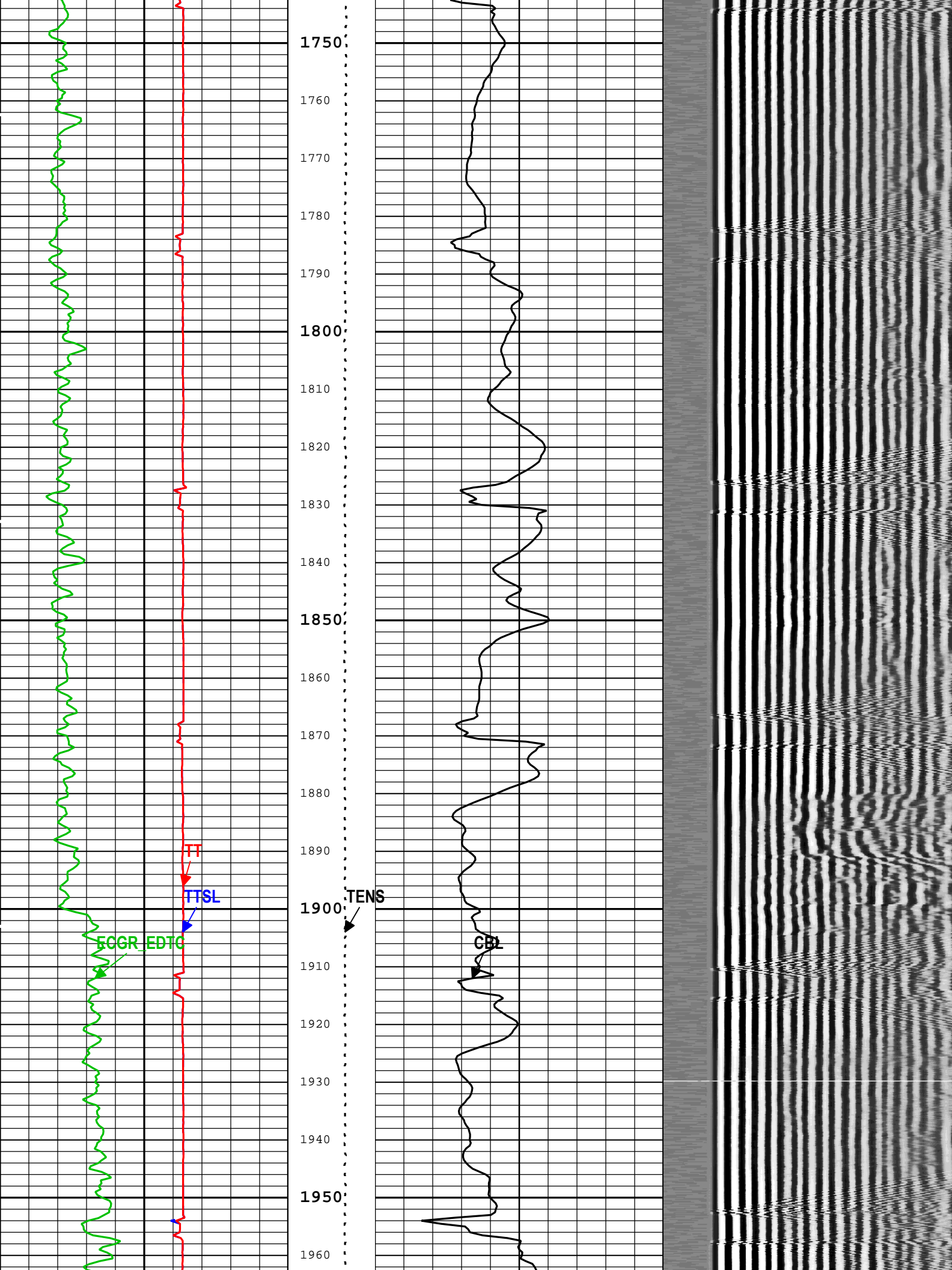


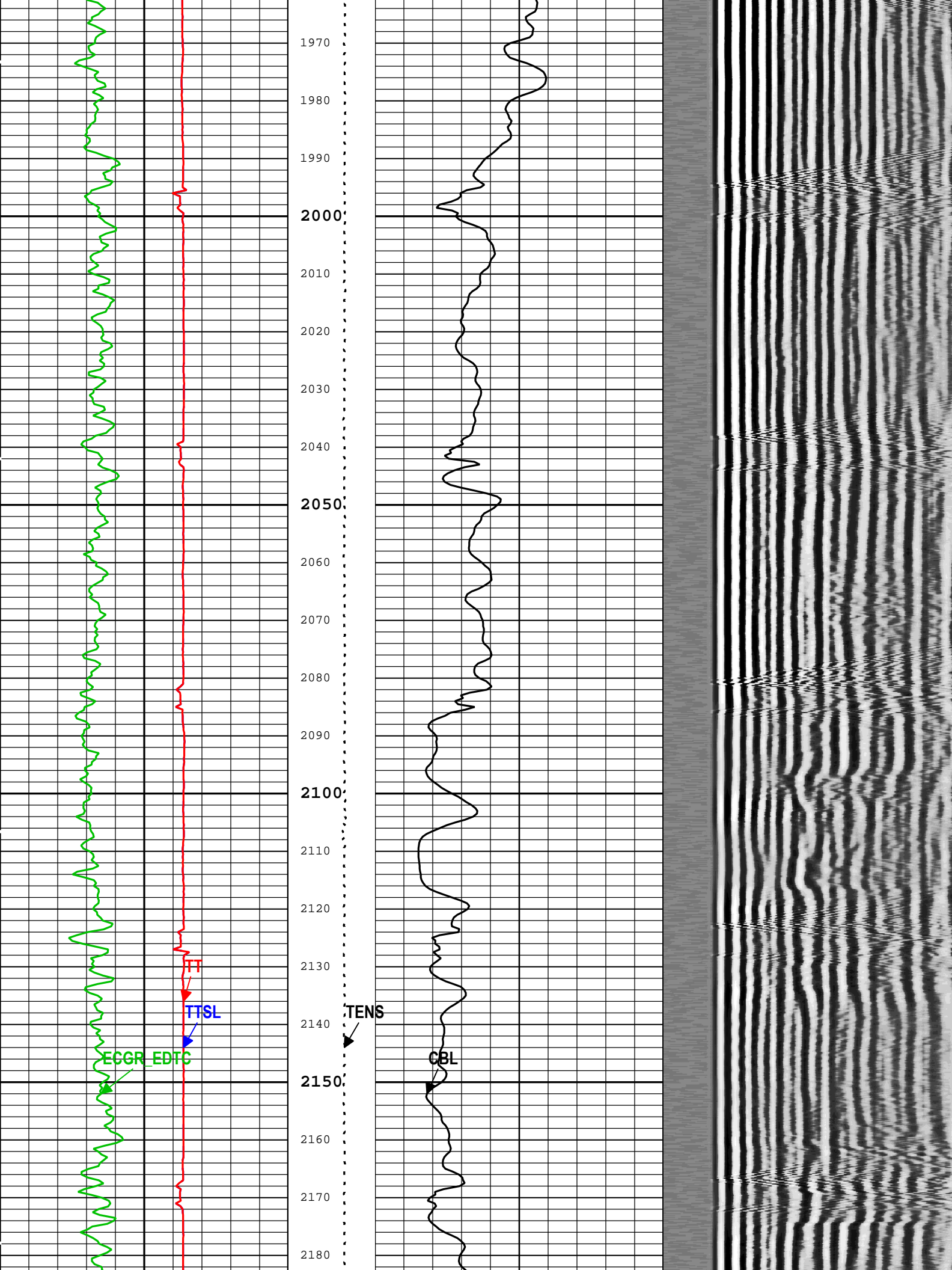


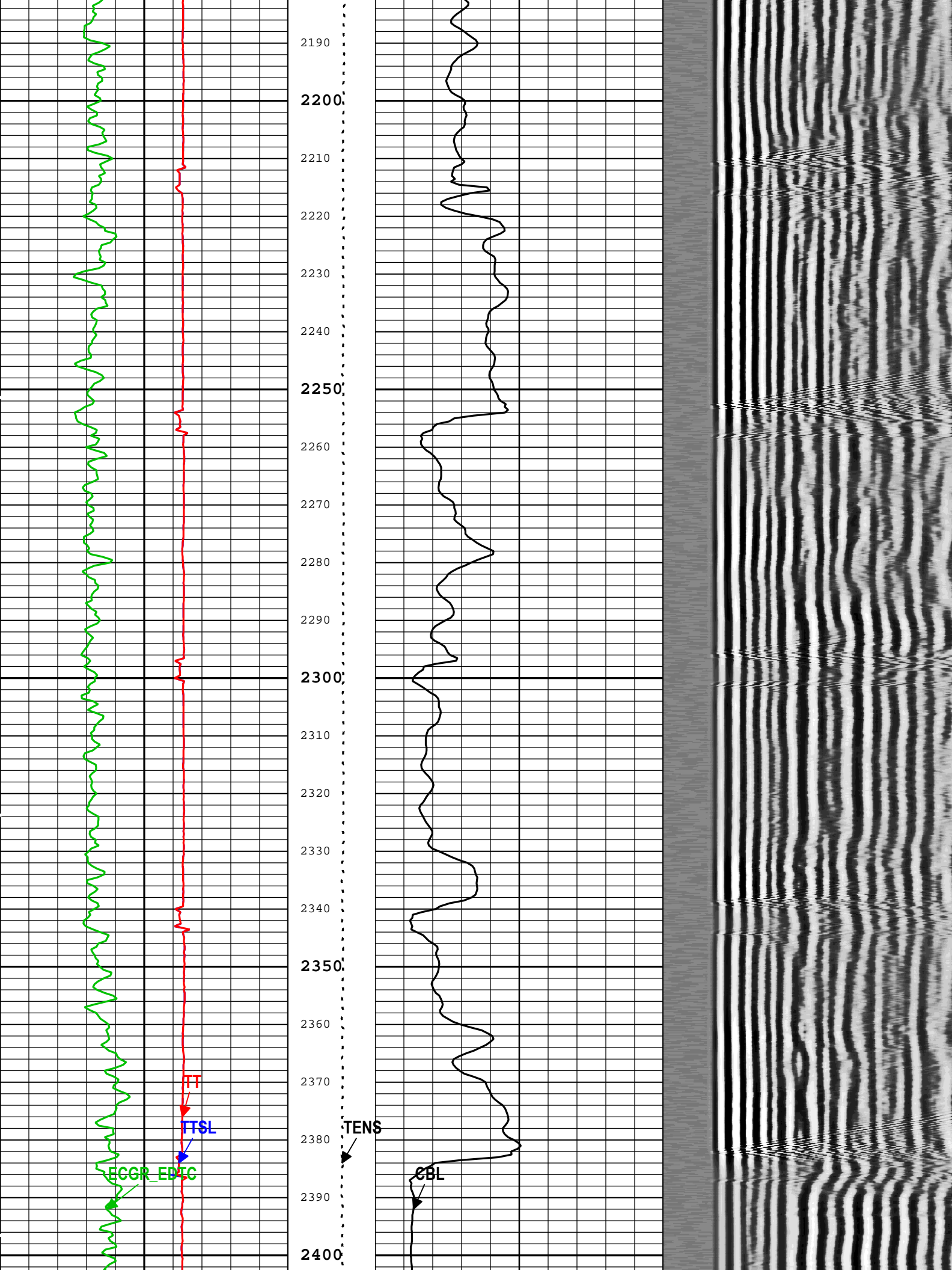


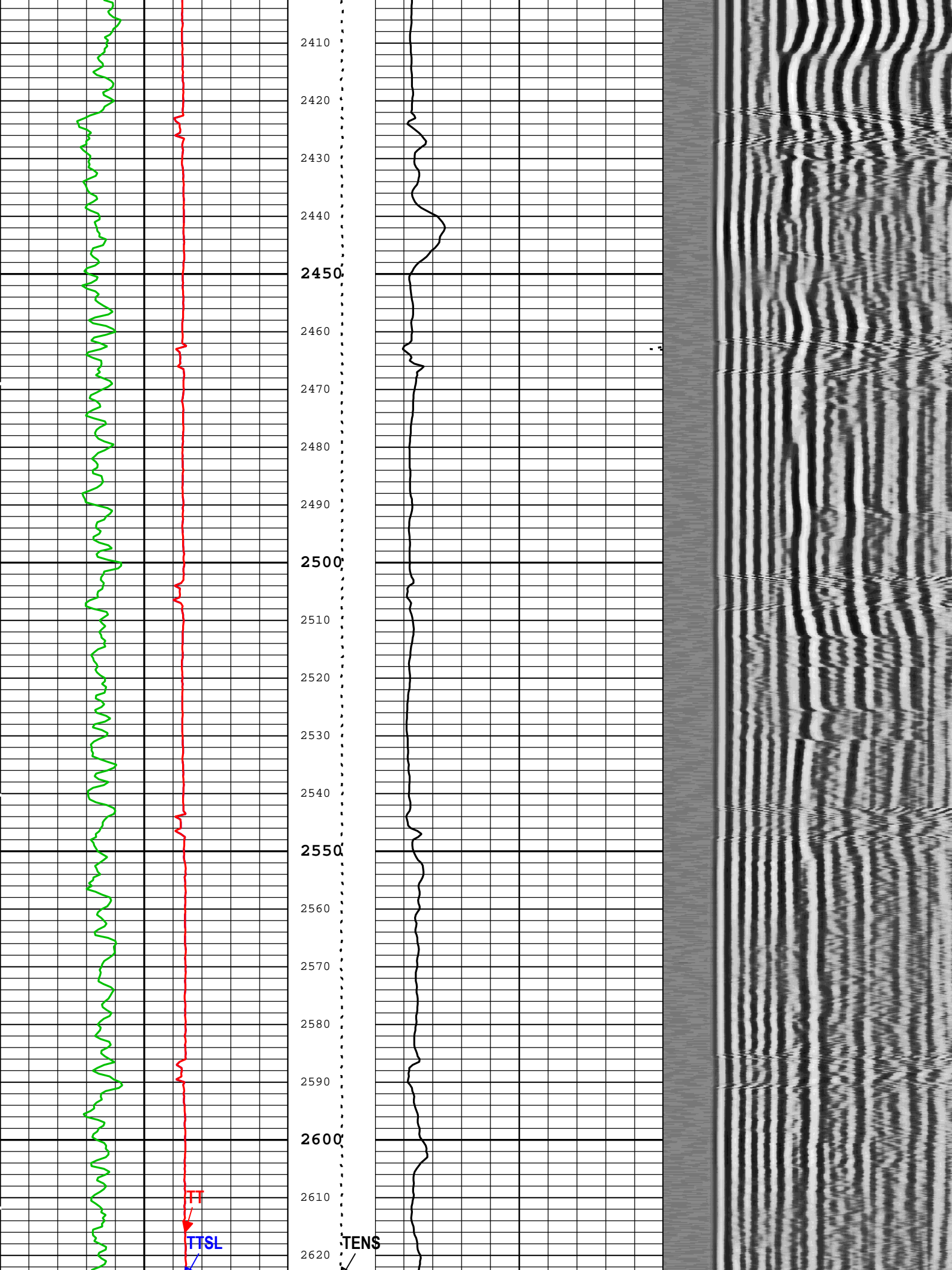


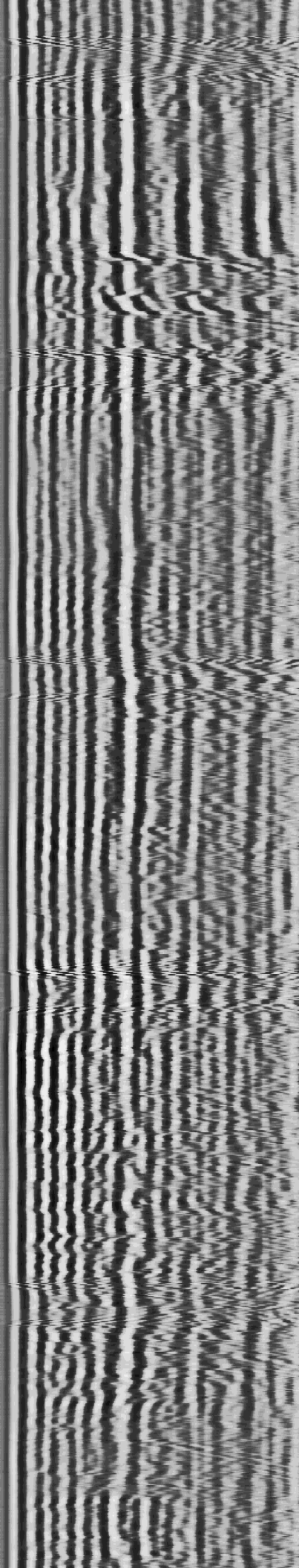
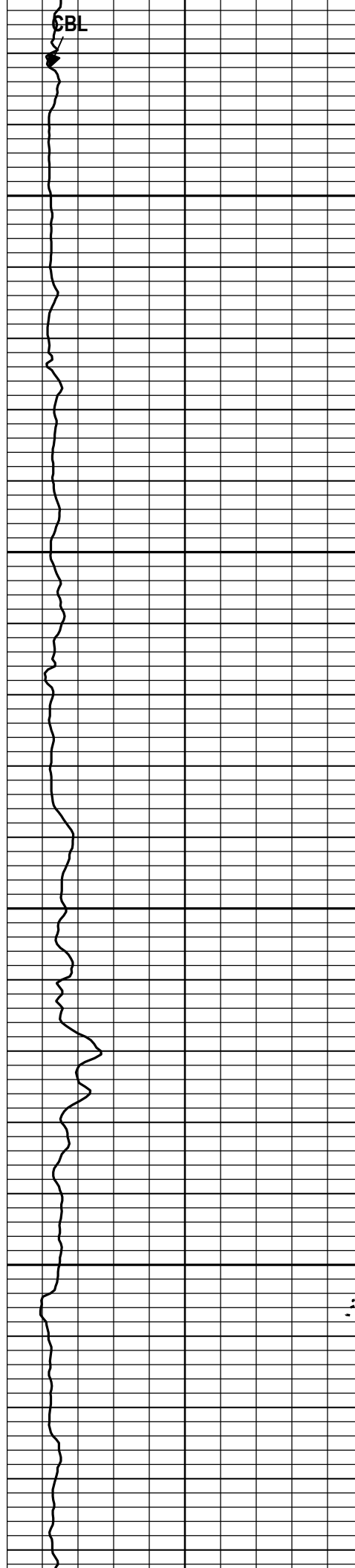
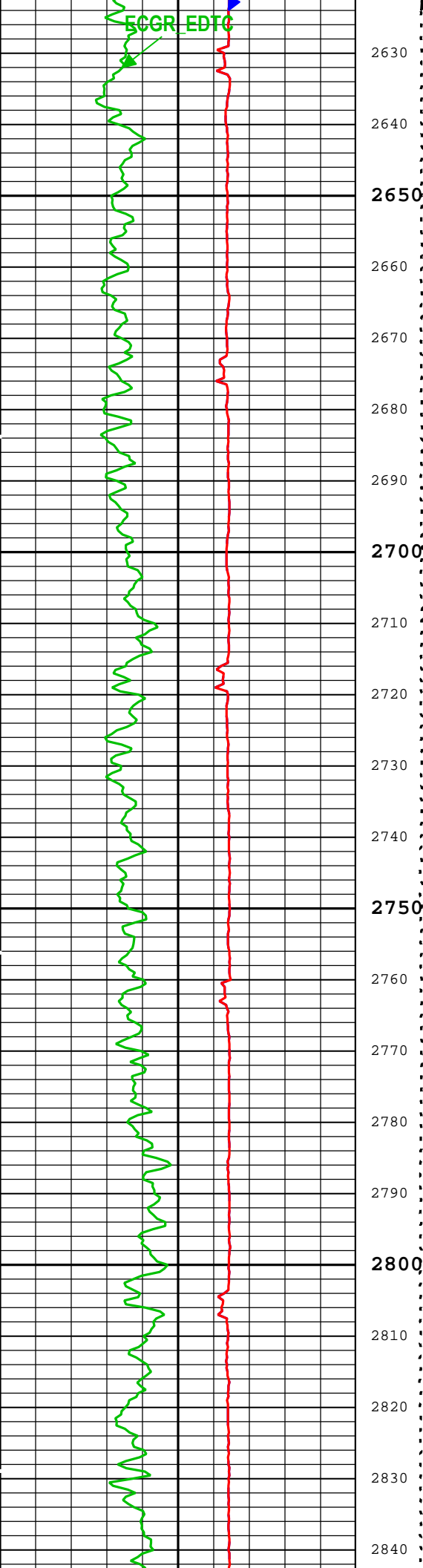


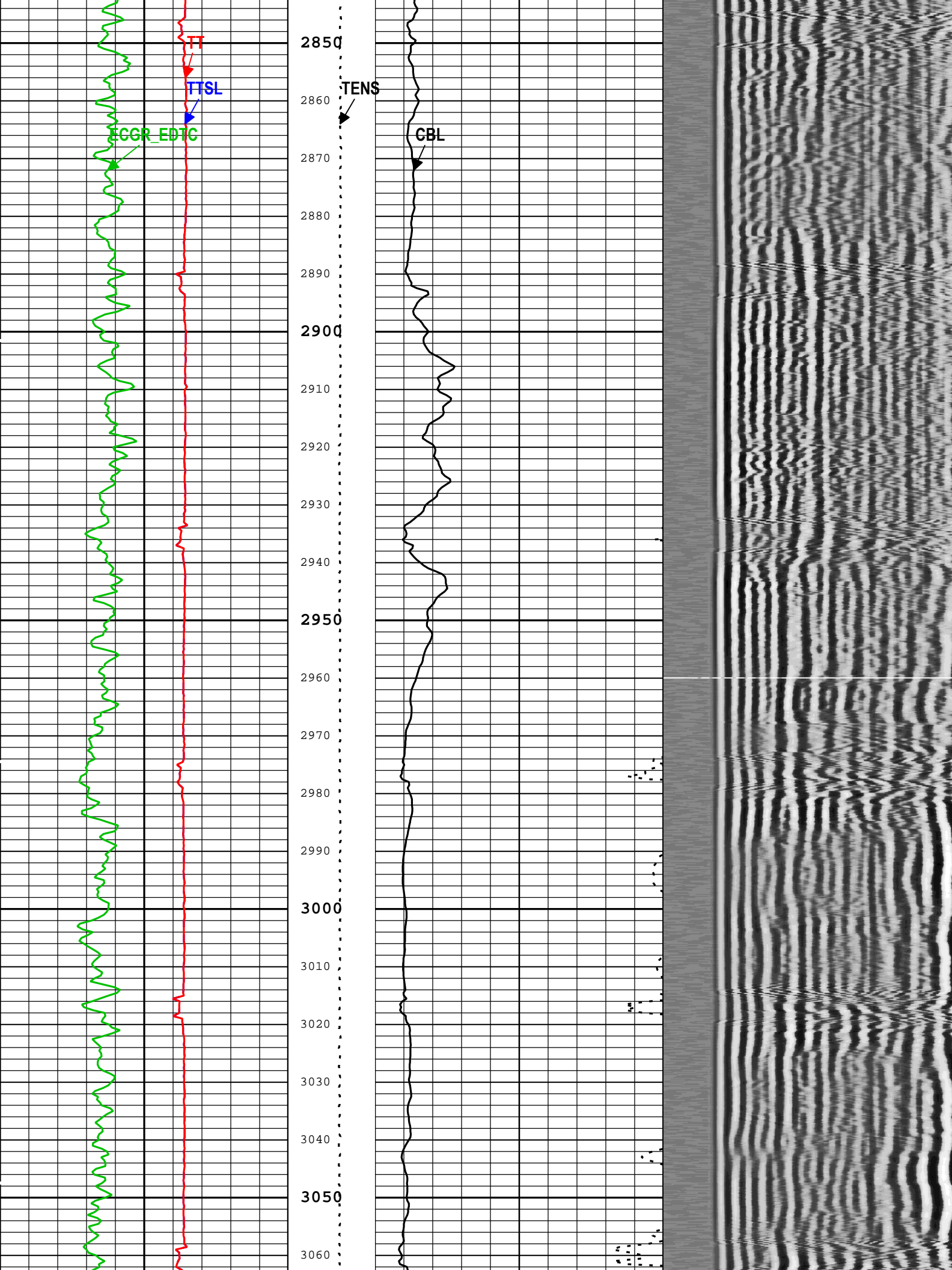


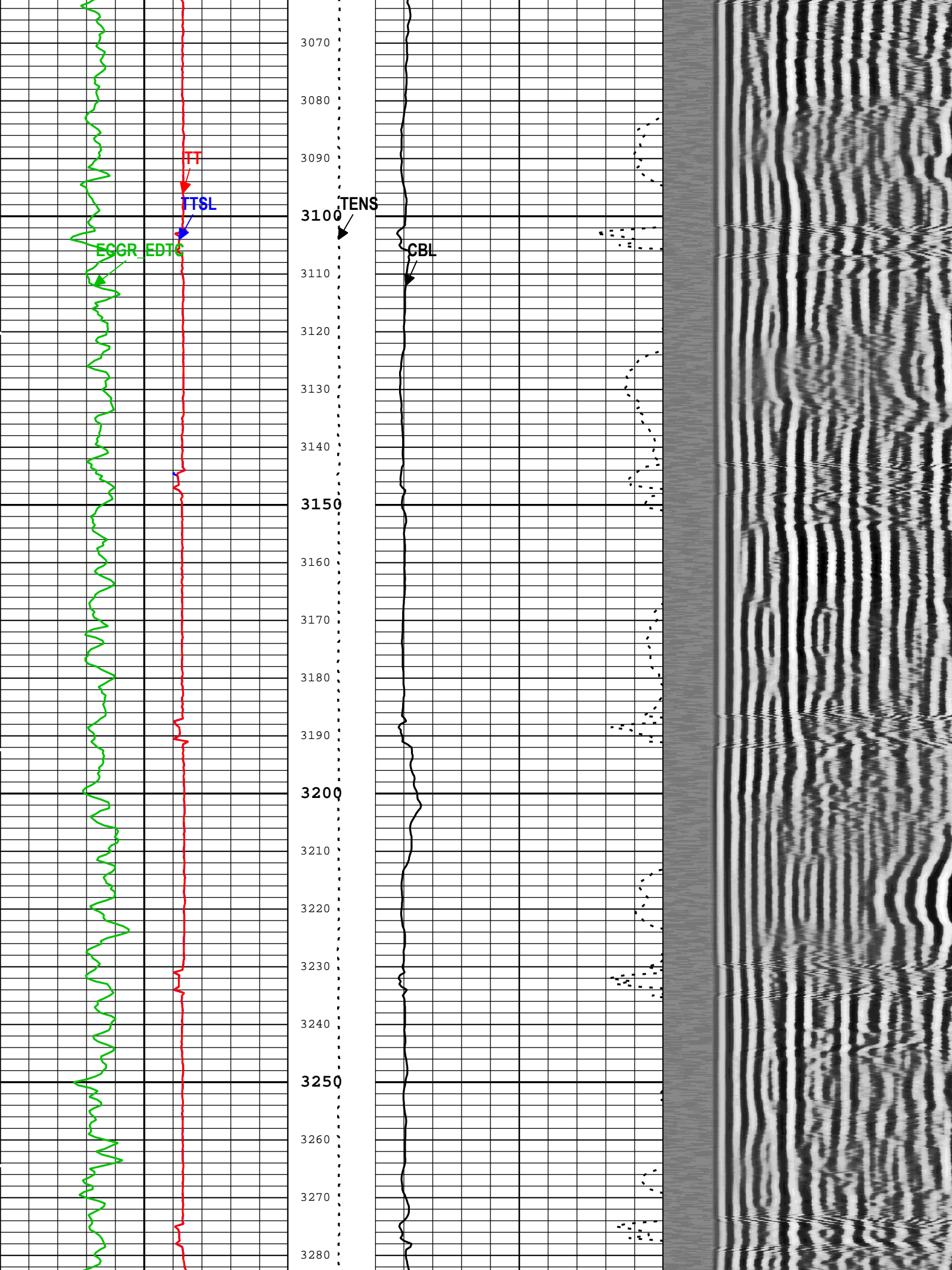


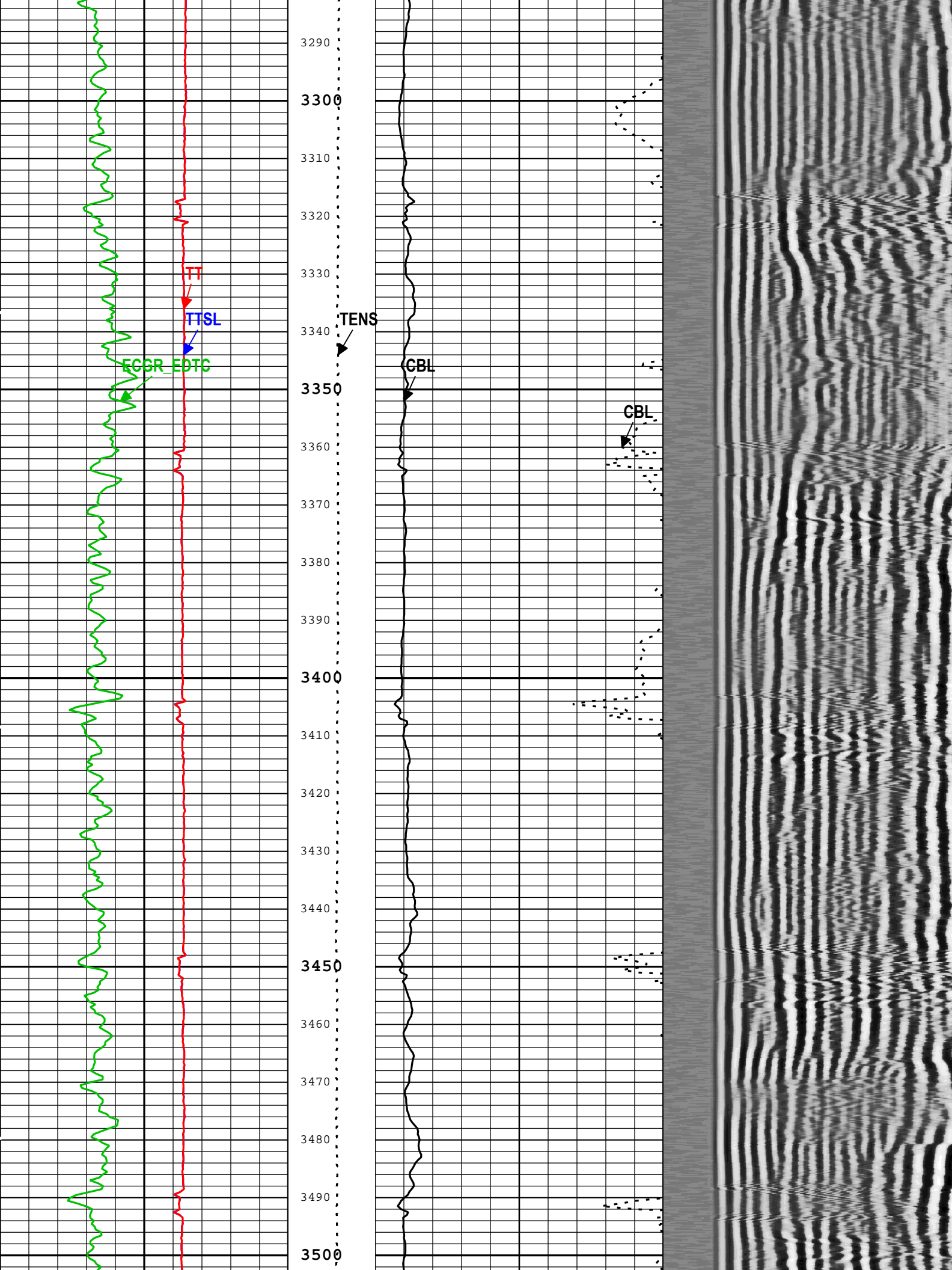


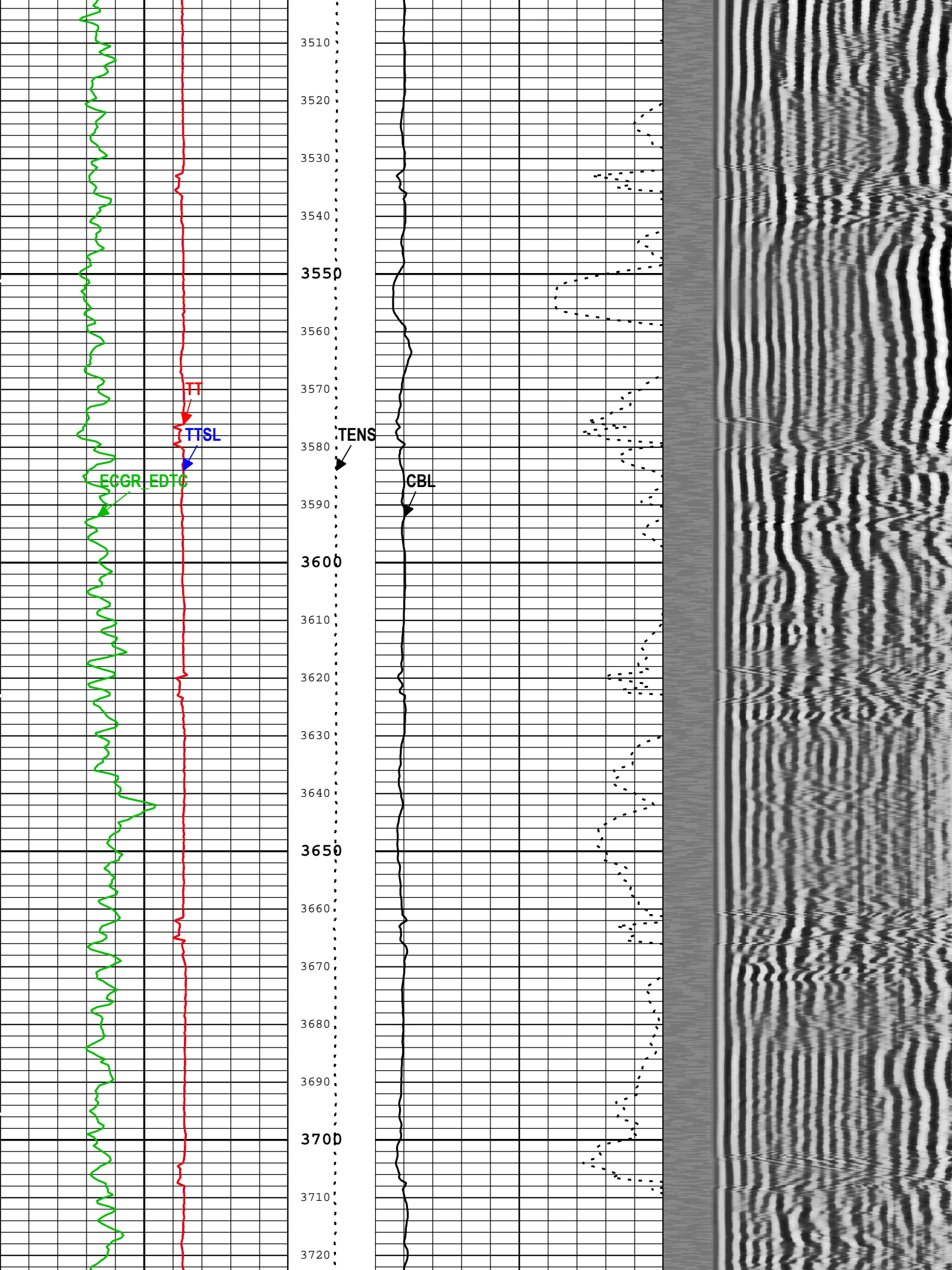


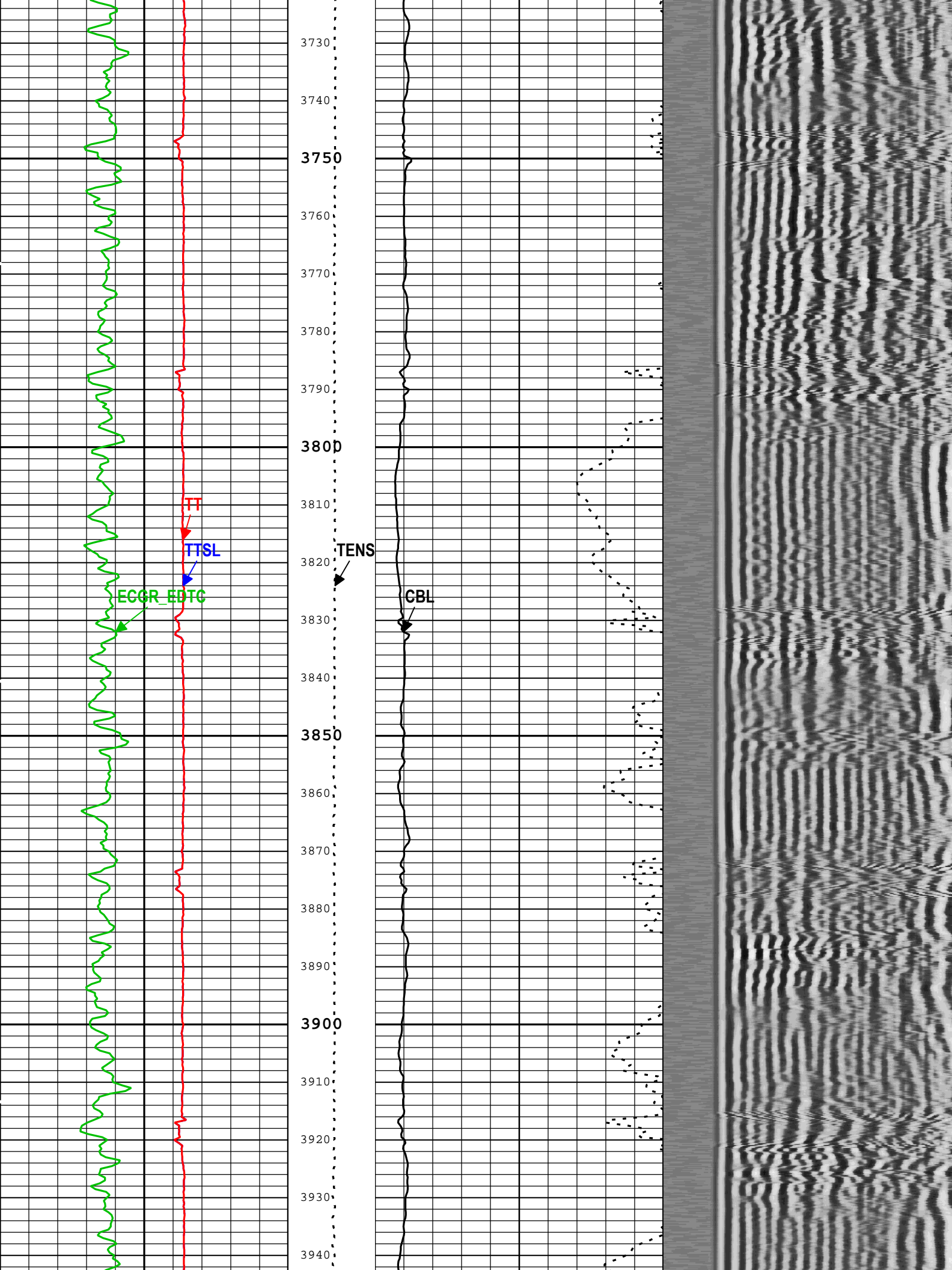


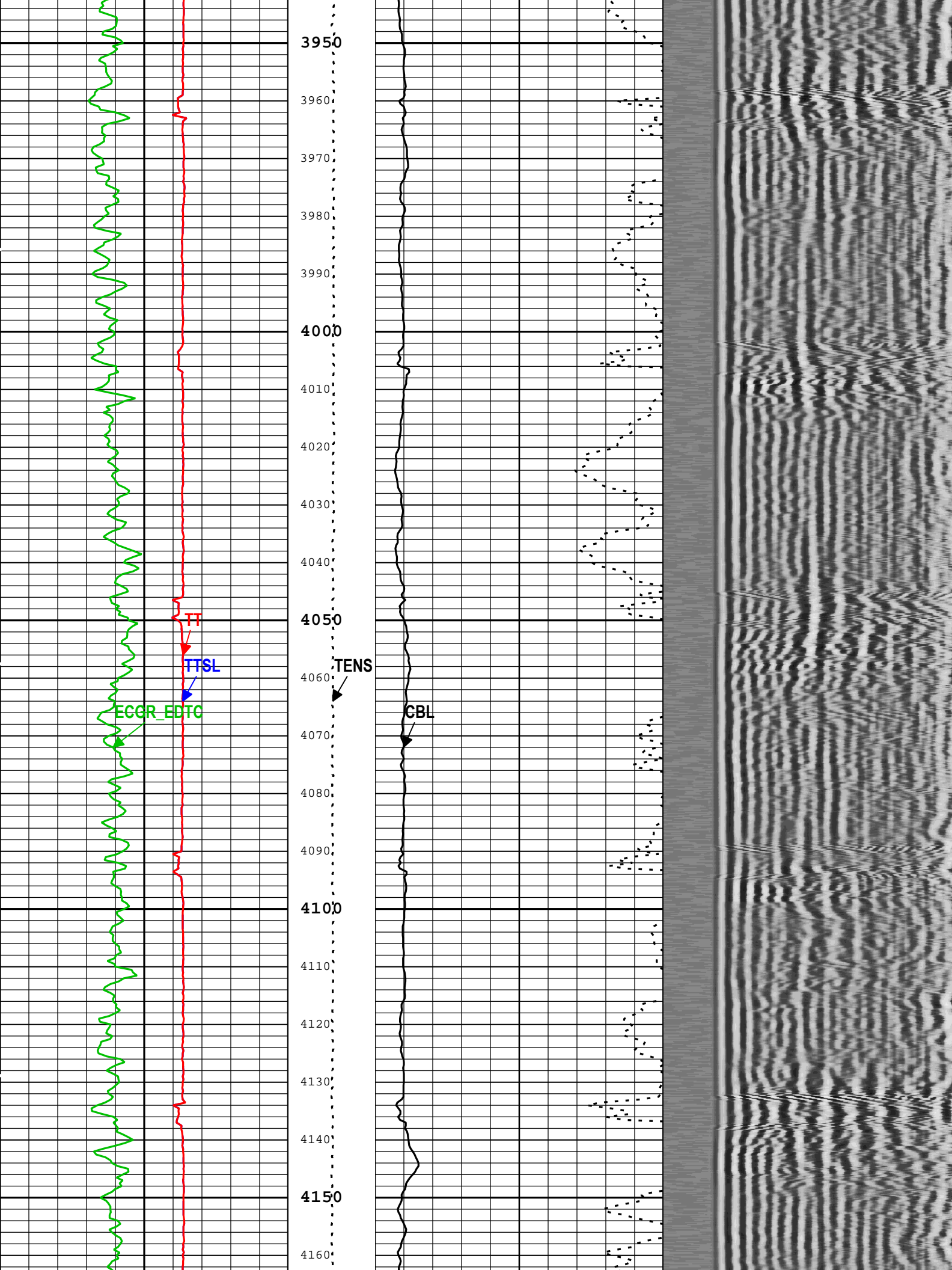


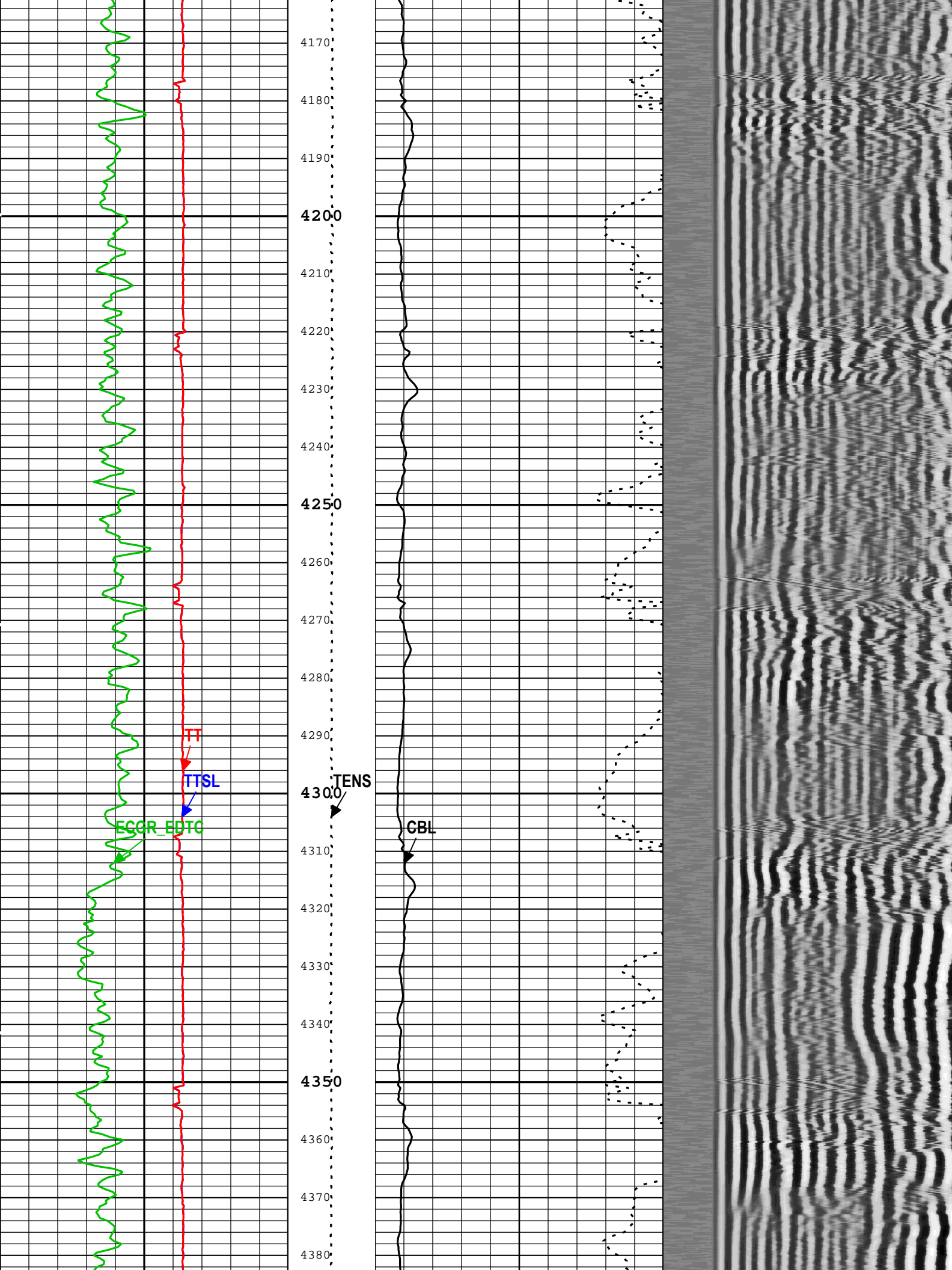


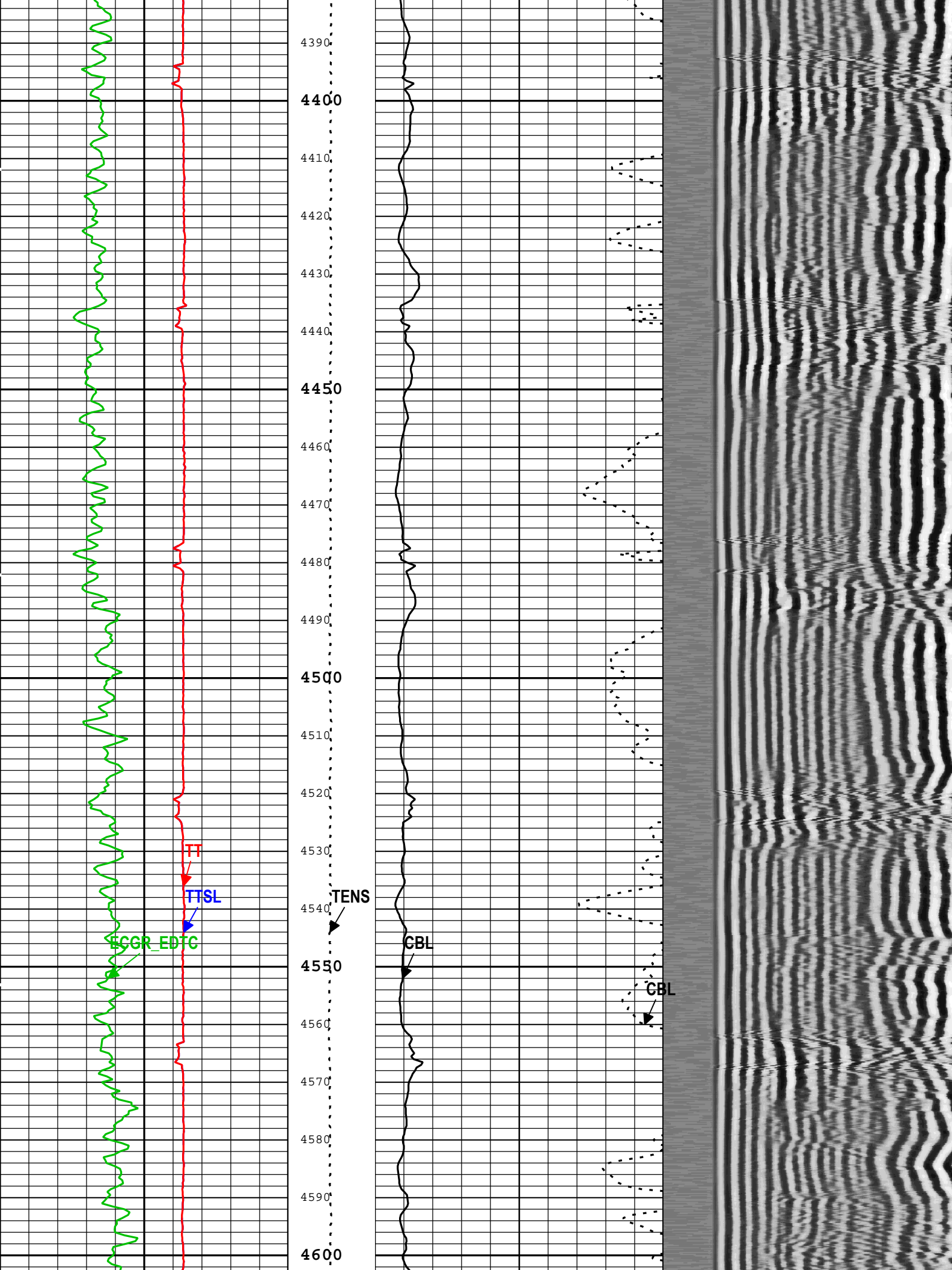


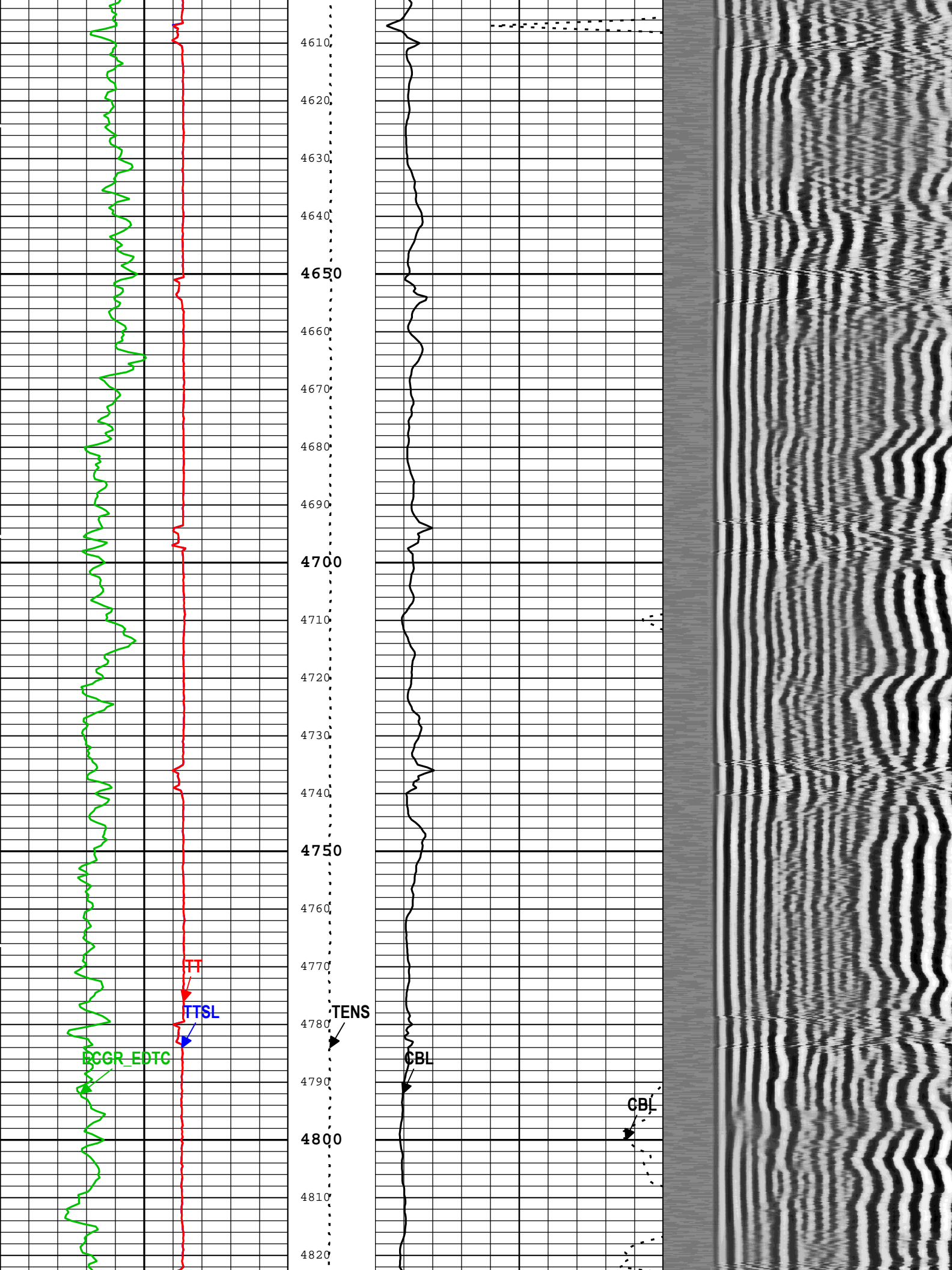


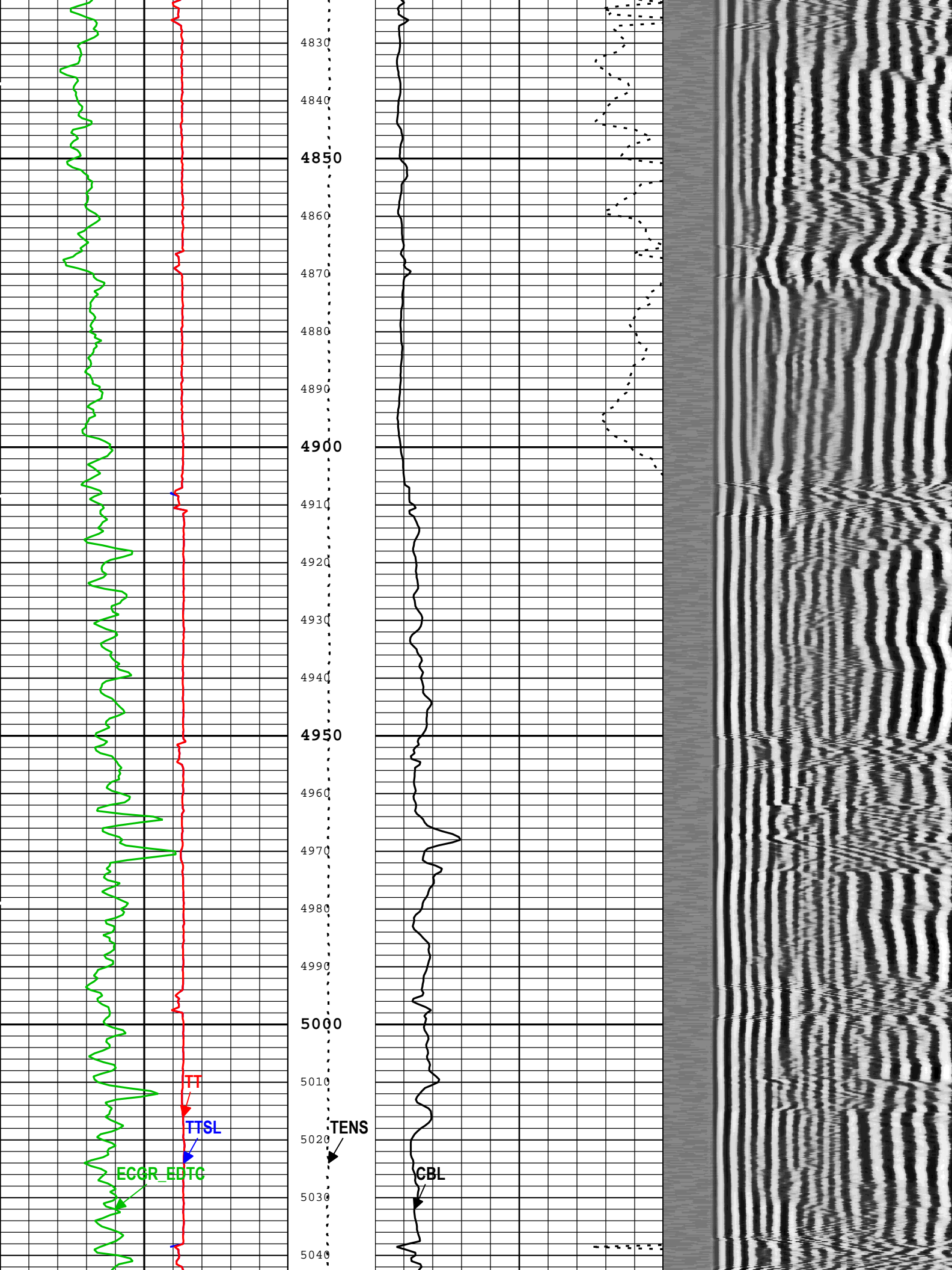


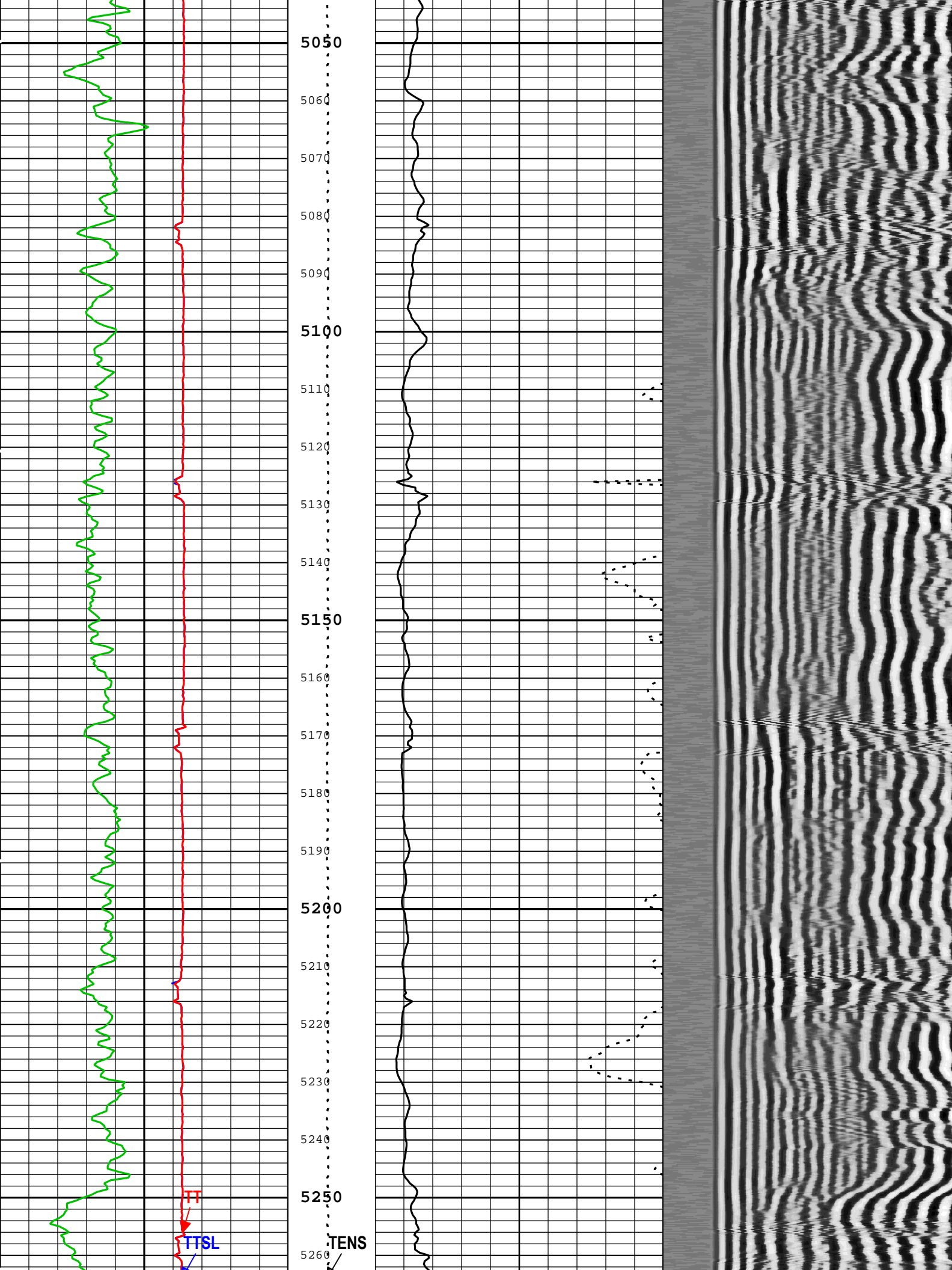


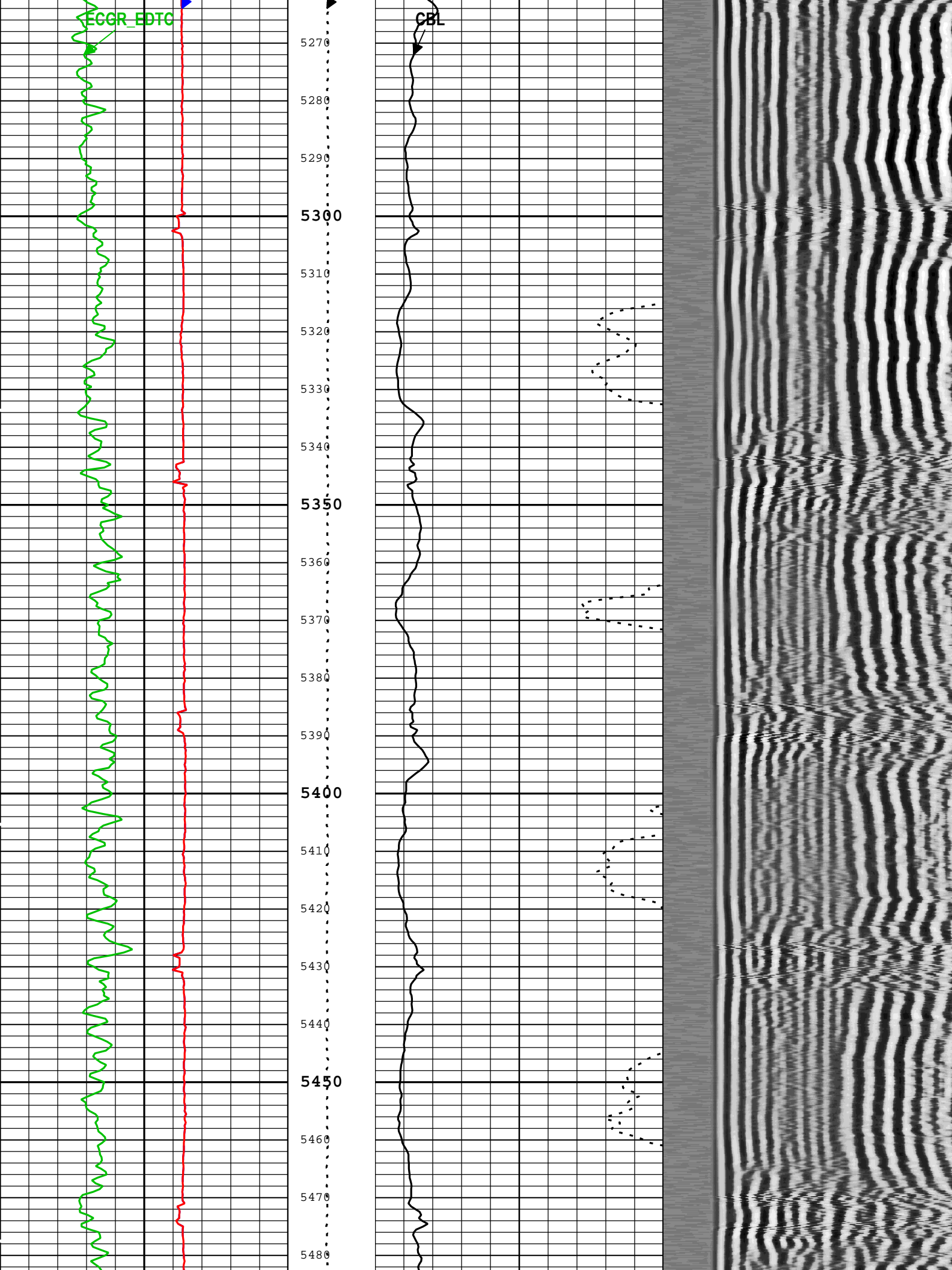


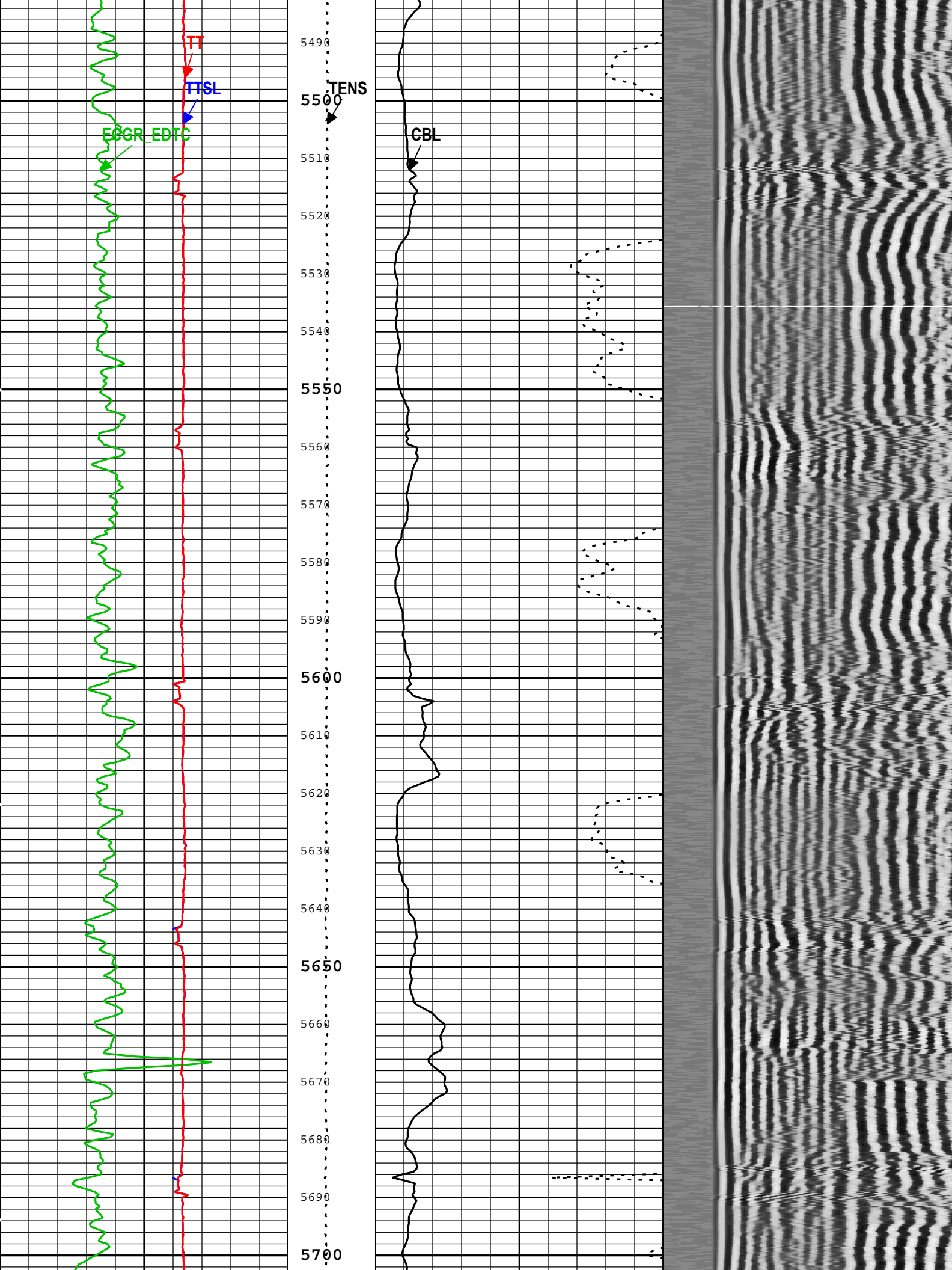


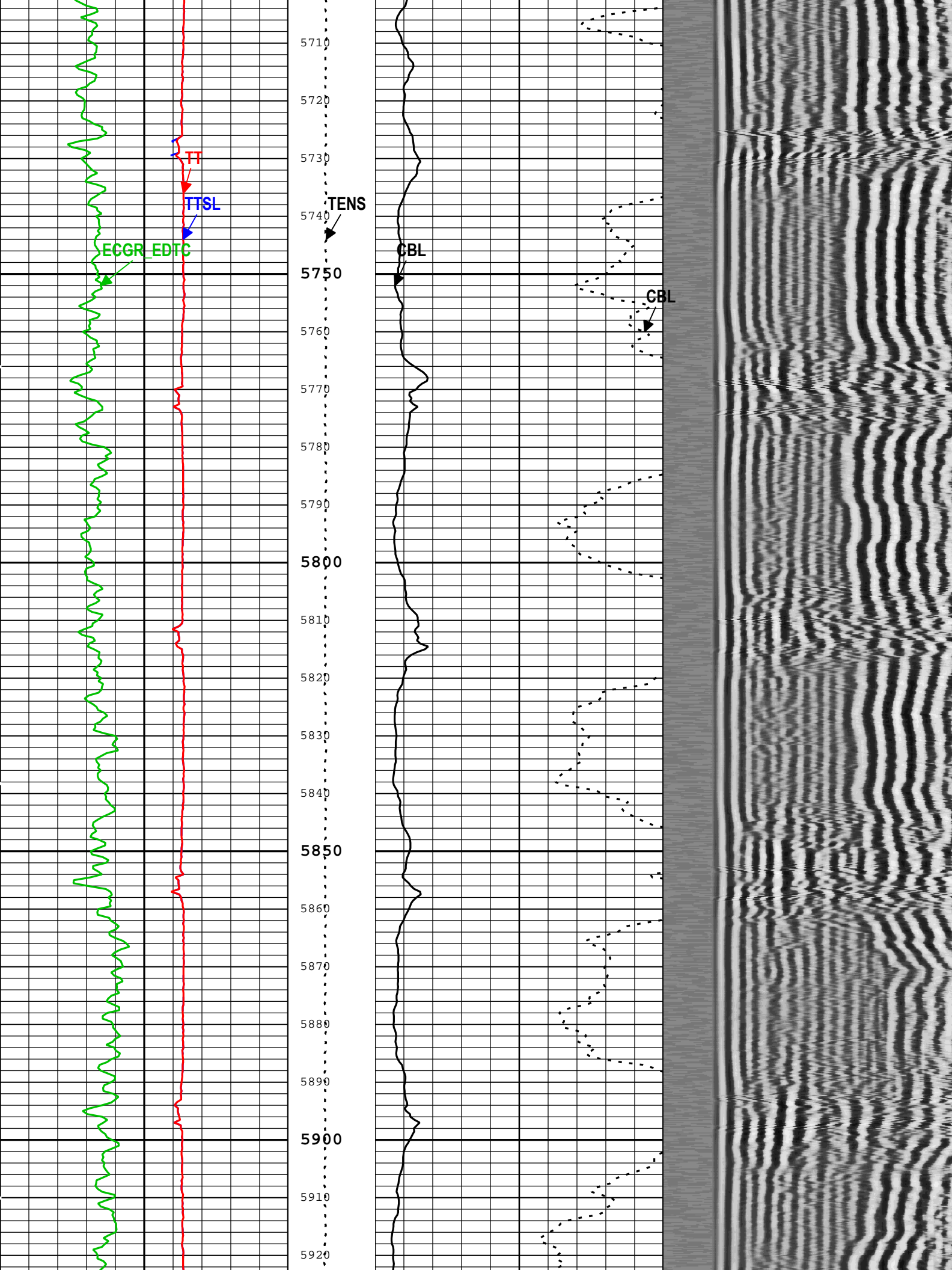


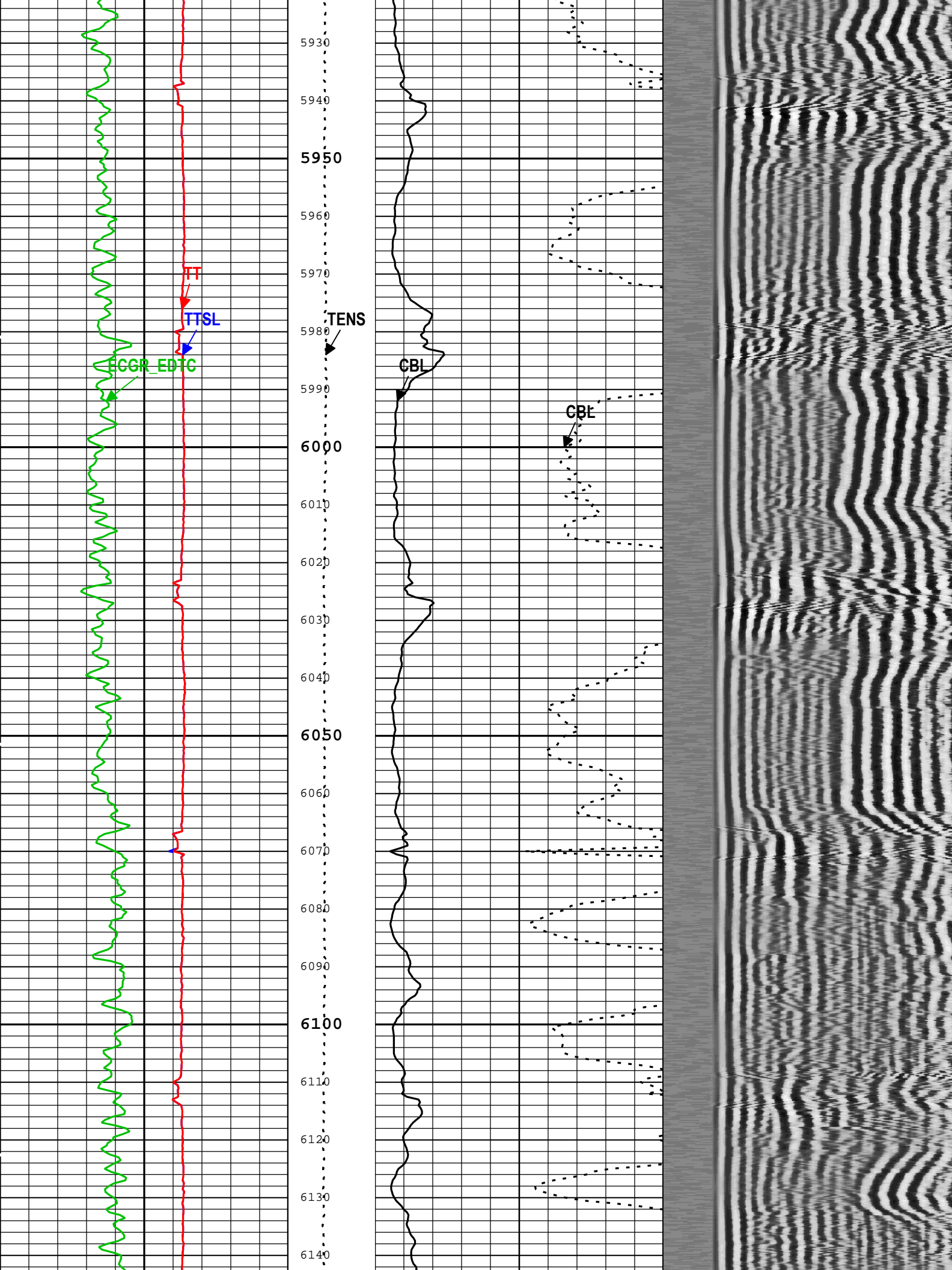


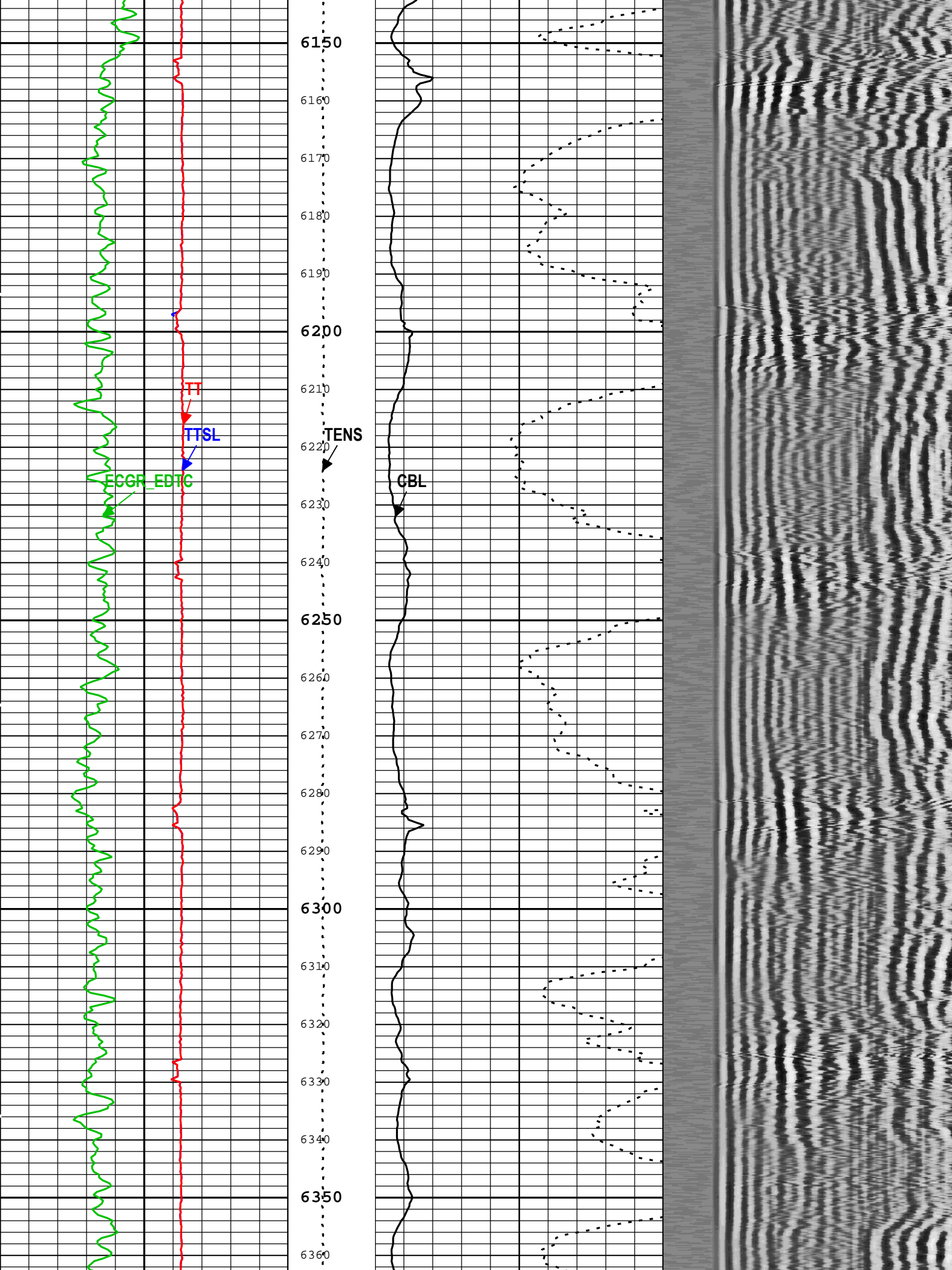


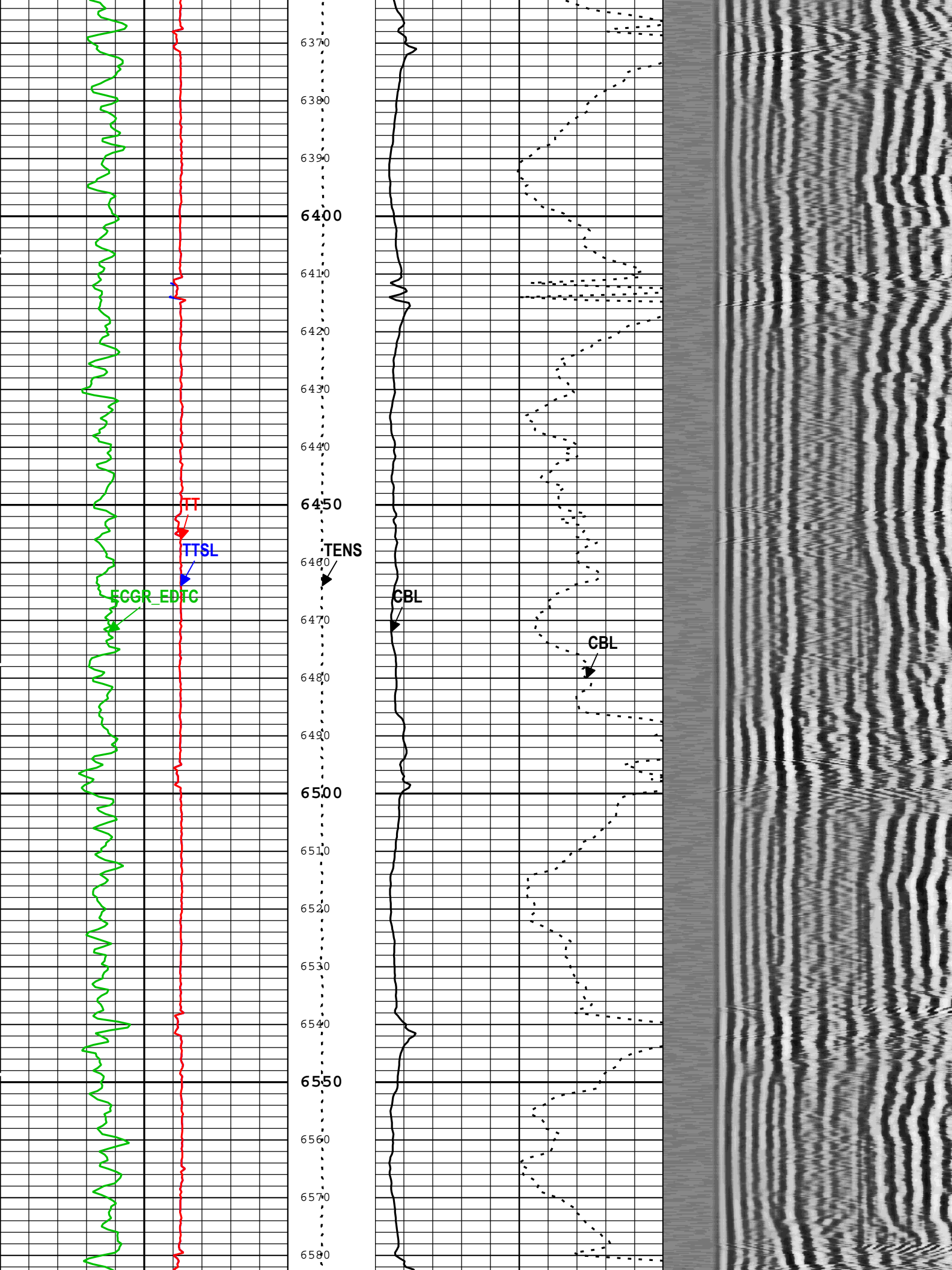


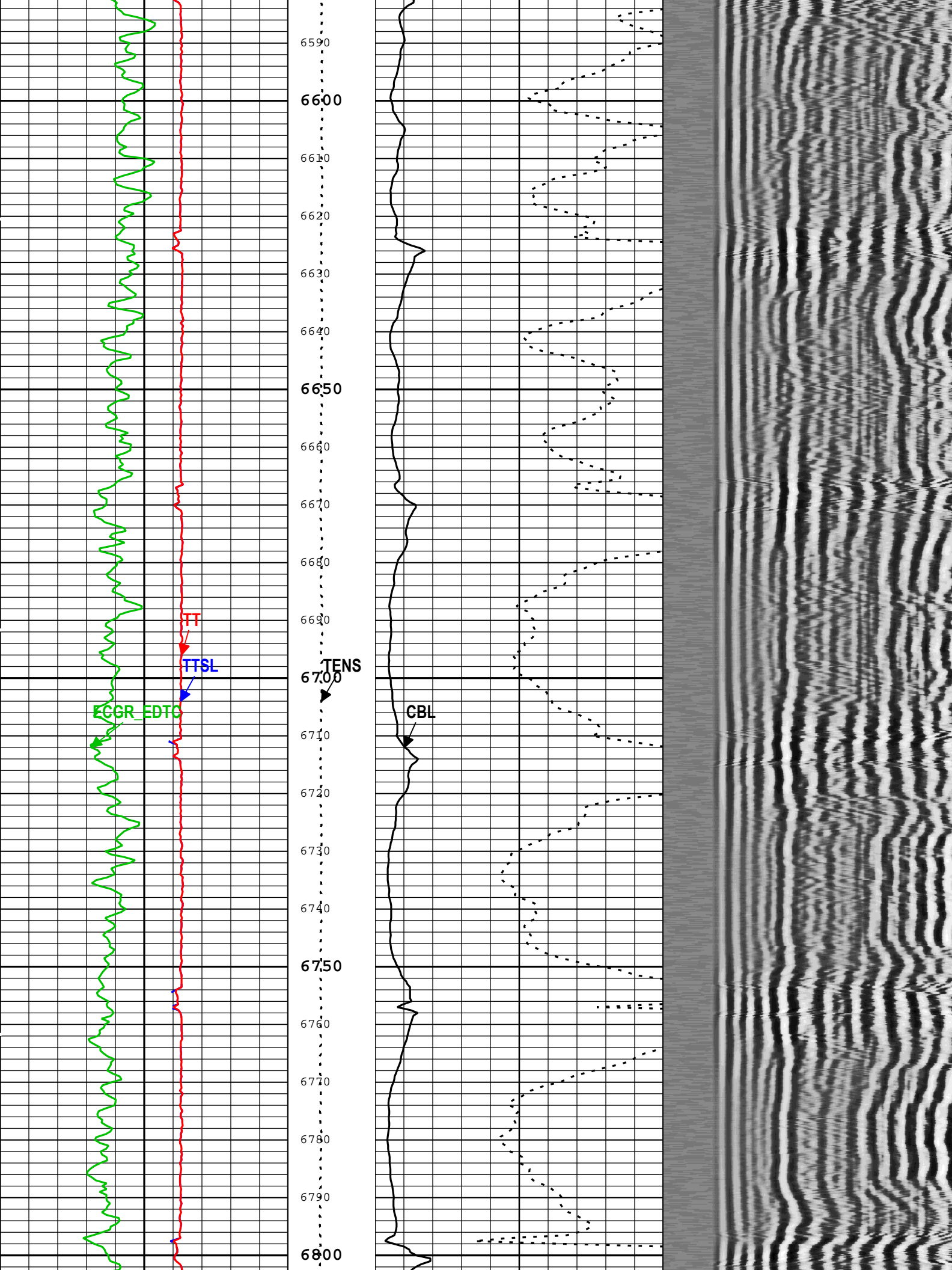


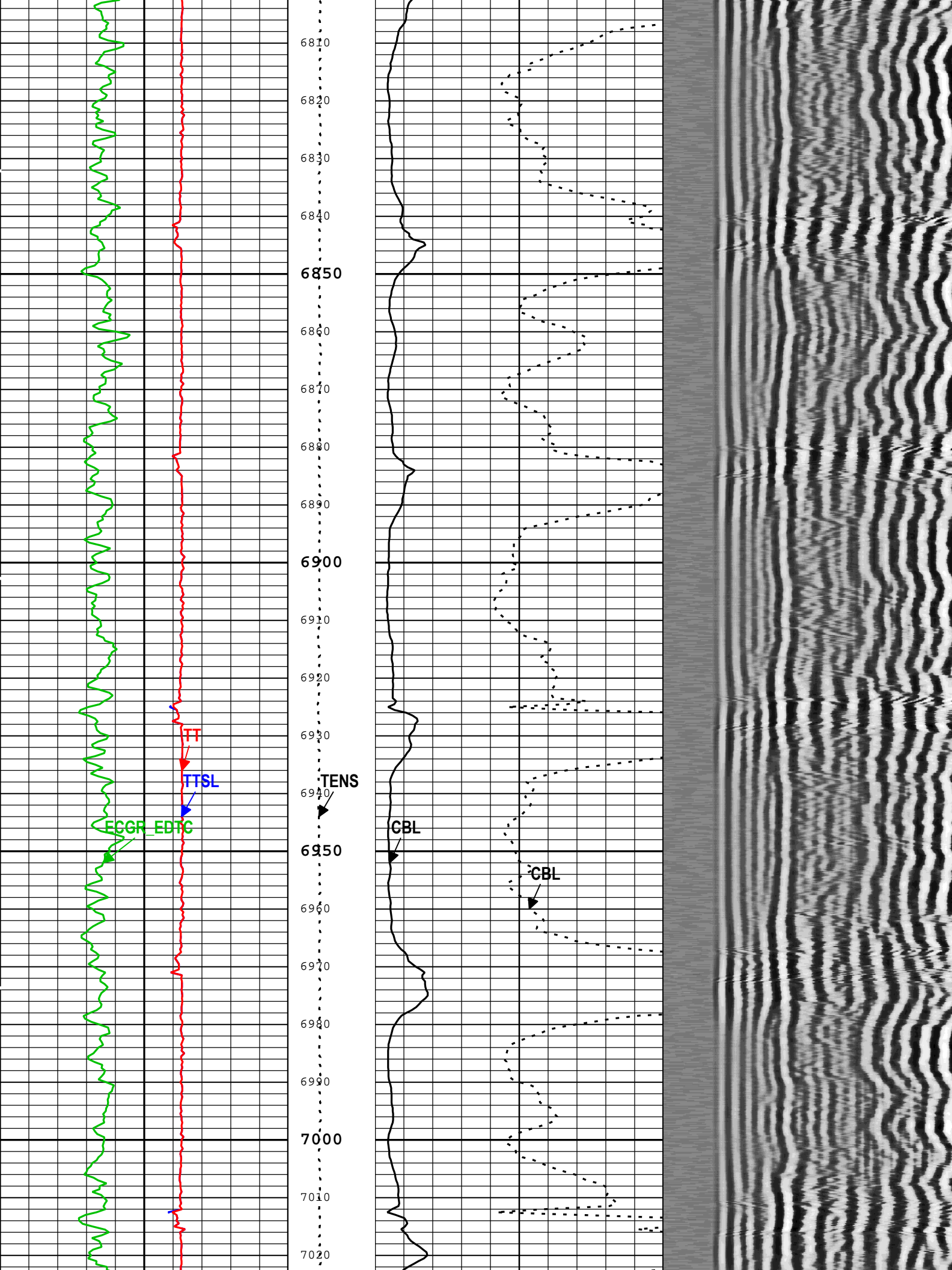


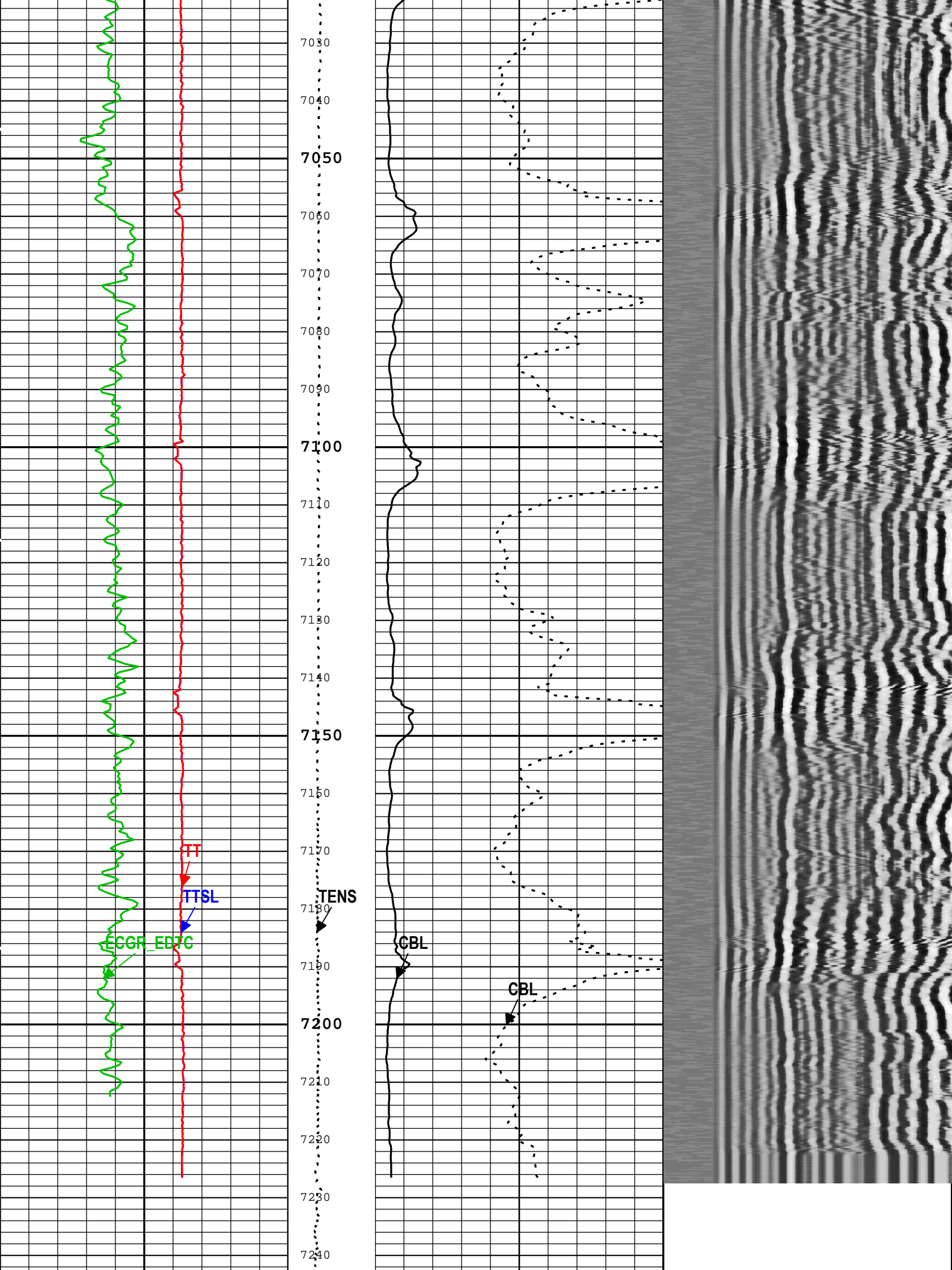













										7250																													
Gamma Ray (ECGR_EDTC) EDTC-B										Cable Tension (TENS)										CBL Amplitude (CBL) DSLT-H										Min Amplitude Max									
0 gAPI 200										4000 lbf 0										0 mV 10																			
Transit Time (Sliding Gate) (TTSL) DSLT-H																				CBL Amplitude (CBL) DSLT-H										Variable Density Log (VDL) DSLT-H									
400 us 200																				0 mV 100										200 us 1200									
Transit Time for CBL (TT) DSLT-H																																							
400 us 200																																							
										BIEP - Bond Index Event Pips DSLT-H																													
TIME_1900 - Time Marked every 60.00 (s)																																							
Description: CBL_Dual_Gate Format: Log (CBL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 25-Nov-2018 16:21:36																																							

Channel Processing Parameters				
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
AMSG	Auxiliary Minimum Sliding Gate	DSLTH	250	us
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	Depth Zoned	in
CBLO	Casing Bottom (Logger)	WLSESSION	21544	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSLTH	71	mV
CDEN	Cement Density	EDTC-B	2	g/cm3
CDEN	Cement Density	USIT-E	1.58	g/cm3
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DETE	Delta-T Detection	DSLTH	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	DSLTH	1.89	mV
IBC_FRP_OFFSET	IBC Flexural Offset from Free Pipe	USIT-E	-19.18	dB/m
FSOD	USIT IBC Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF	
IBC_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	UFAO	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	Theoretical	
IMAR	Image Rotation	USIT-E	RB	
MAHTR	Manual High Threshold Reference for first arrival detection	DSLTH	120	
MATT_CURR	Maximum Attenuation in Arbitrary Cement	DSLTH	13.94	dB/ft
MCI	Minimum Cemented Interval for Isolation	DSLTH	Depth Zoned	ft
MNHTR	Minimum High Threshold Reference for first arrival detection	DSLTH	120	
MSA	Minimum Sonic Amplitude	DSLTH	0.76	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	DSLTH	0.76	mV
NMSG	Near Minimum Sliding Gate	DSLTH	250	us
U-USIT_OCDI	Outer Casing Diameter	USIT-E	0	in
U-USIT_OCSH	Outer Casing Shoe	USIT-E	0	ft
U-USIT_OCWE	Outer Casing Weight	USIT-E	0	lbm/ft
SGAD	Sliding Gate Status	DSLTH	Off	
SGDT	Sliding Gate Delta-T	DSLTH	57	us/ft
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.88	Mrayl

U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	-22	dB/m
UFGDE	Fiberglass Density	USIT-E	1.95	g/cm3
UFGPS	Fiberglass Processing Selection	USIT-E	No	
UFGVL	Fiberglass Velocity	USIT-E	9678.48	ft/s
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SolidLiquidGasMap	

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	13.5	40	106
BS	8.5	106	7255.42
MCI	14.81	40	1892
MCI	4.75	1892	7255.42

All depth are actual.

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	4408.8	ft/h
SGAI	Selectable Acquisition Gain	DSLT-H	x1	
U-USIT_UFWB	Far Receiver Window Begin Time	USIT-E	137	us
U-USIT_UFWE	Far Receiver Window End Time	USIT-E	177	us
ULOG	Logging Objective	USIT-E	MEASUREMENT	
U-USIT_UNWB	Near Receiver Window Begin Time	USIT-E	106	us
U-USIT_UNWE	Near Receiver Window End Time	USIT-E	146	us
UPLIHT	Ultrasonic Pulse Echo Large Inhibit Time	USIT-E	Off	
UPAT	USIT Emission Pattern	USIT-E	Pattern 500 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 6.0 in	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	7250	ft
U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VRES	Vertical Resolution	USIT-E	6.0 in	
WINB	Window Begin Time	USIT-E	33.1	us
WINE	Window End Time	USIT-E	Time Zoned	us

Company:	Anadarko Petroleum Corporation	Schlumberger
Well:	Cowboy 21-7HZ	
Field:	DJ Basin	
County:	Weld	
State:	Colorado	
Cement Bond Log		
Variable Density Log		