

Company: PDC Energy Inc

Well: Vega #2N

Field: Wattenberg

County: Weld Country: United States of Americ

Cement Bond Log
Variable Density Log
Gamma Ray - CCL

County: Weld
Field: Wattenberg
Location: 2329' FNL & 2596' FWL
Well: Vega #2N
Company: PDC Energy Inc

Location:		2329' FNL & 2596' FWL SENNW 6 3N65W Lat/Long: 40.25528/-104.70636	Elev.: K.B. 5004.00 ft G.L. 4976.00 ft D.F. 5003.00 ft
Permanent Datum:	Ground Level		Elev.: 4976.00 f
Log Measured From:	Kelly Bushing		28.00 ft above Perm.Datum
Drilling Measured From:	Kelly Bushing		
API Serial No.	Section:	Township:	Range:
05-123-48464	6	3N	65W

Logging Date	09-Apr-2022	
Run Number	1A	
Depth Driller	15833.00 ft	
Schlumberger Depth	15833.00 ft	
Bottom Log Interval	7369.00 ft	
Top Log Interval	65.00 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	1705.00 ft	
To	15833.00 ft	
Casing/Tubing Size	5.5 in	
Weight	20 lbm/ft	
Grade	N/A	
From	0.00 ft	
To	15833.00 ft	
Max Recorded Temperatures	244.61 degF	
Logger on Bottom	10-Apr-2022	16:20:00
Unit Number	Location: TAM	Fort Morgan
Recorded By	E.Morrone/W. Armstrong	
Witnessed By	B. Myers	

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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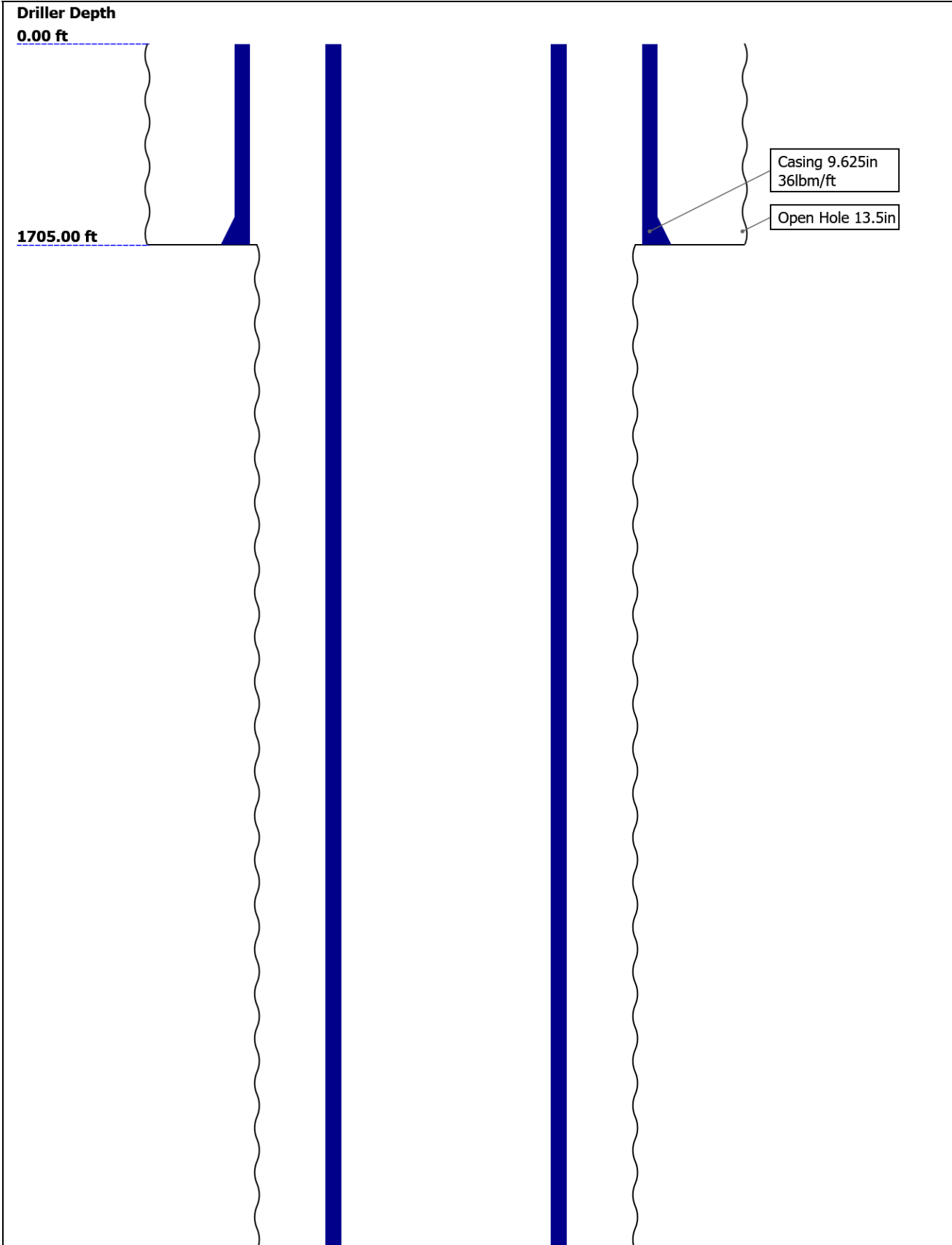
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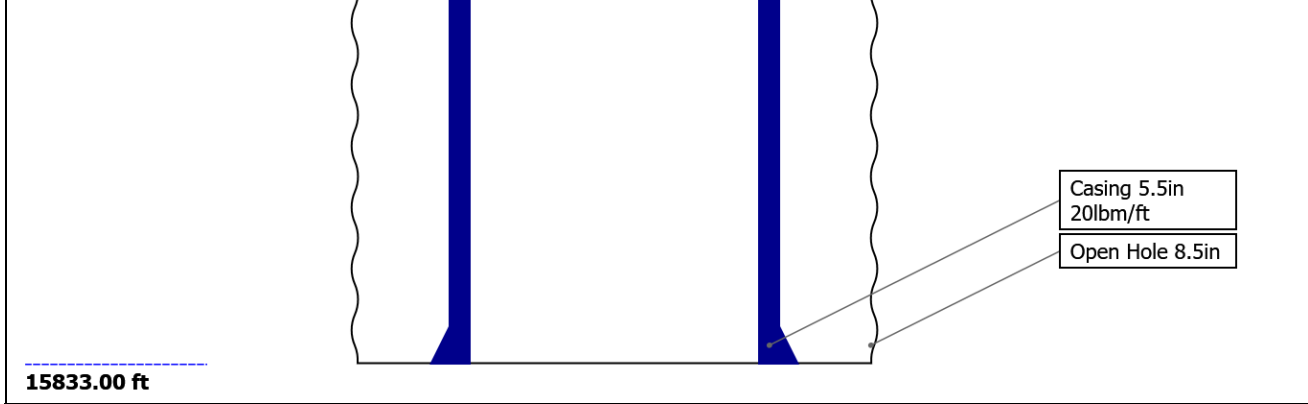
10.1 Composite Summary

10.2 Log (DSLT ASLT_CBL-VDL RA)

11. Tail

Well Sketch

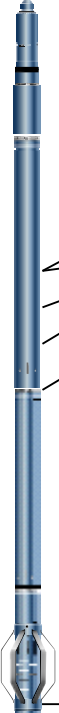


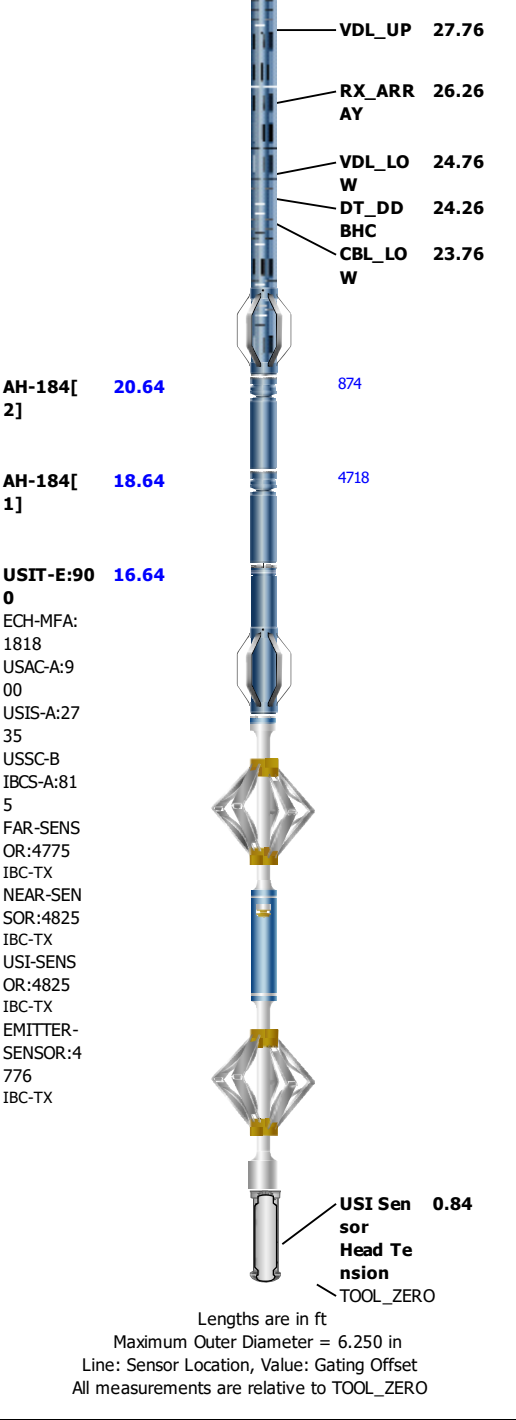


Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	13.5	8.5				
Top Driller (ft)	0	1705				
Top Logger (ft)	0	1705				
Bottom Driller (ft)	1705	15833				
Bottom Logger (ft)	1705	15833				
Casing						
Size (in)	9.625	5.5				
Weight (lbm/ft)	36	20				
Inner Diameter (in)	8.921	4.778				
Grade	N/A	N/A				
Top Driller (ft)	0	0				
Top Logger (ft)	0	0				
Bottom Driller (ft)	1705	15833				
Bottom Logger (ft)	1705	15833				

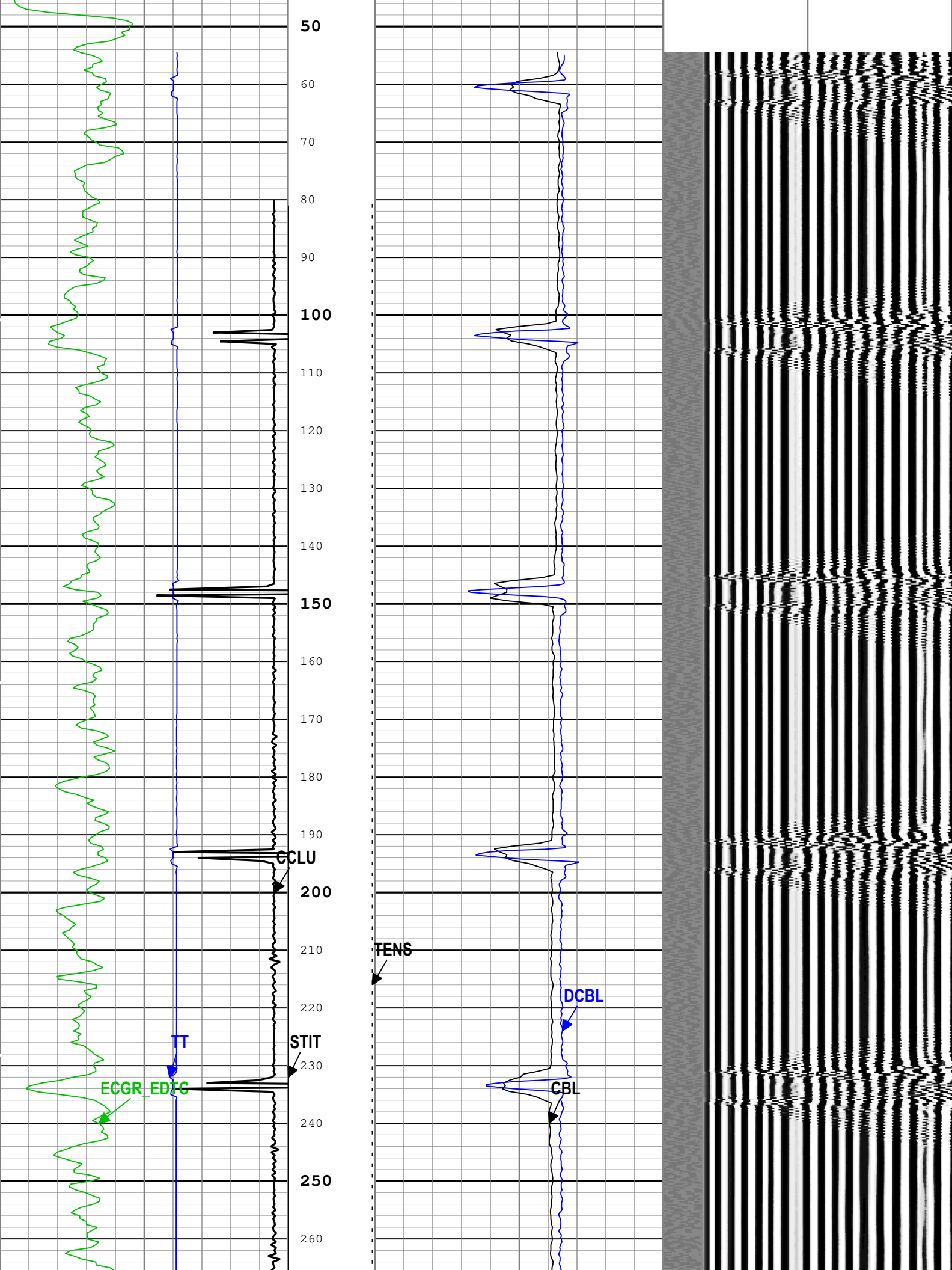
Remarks and Equipment Summary

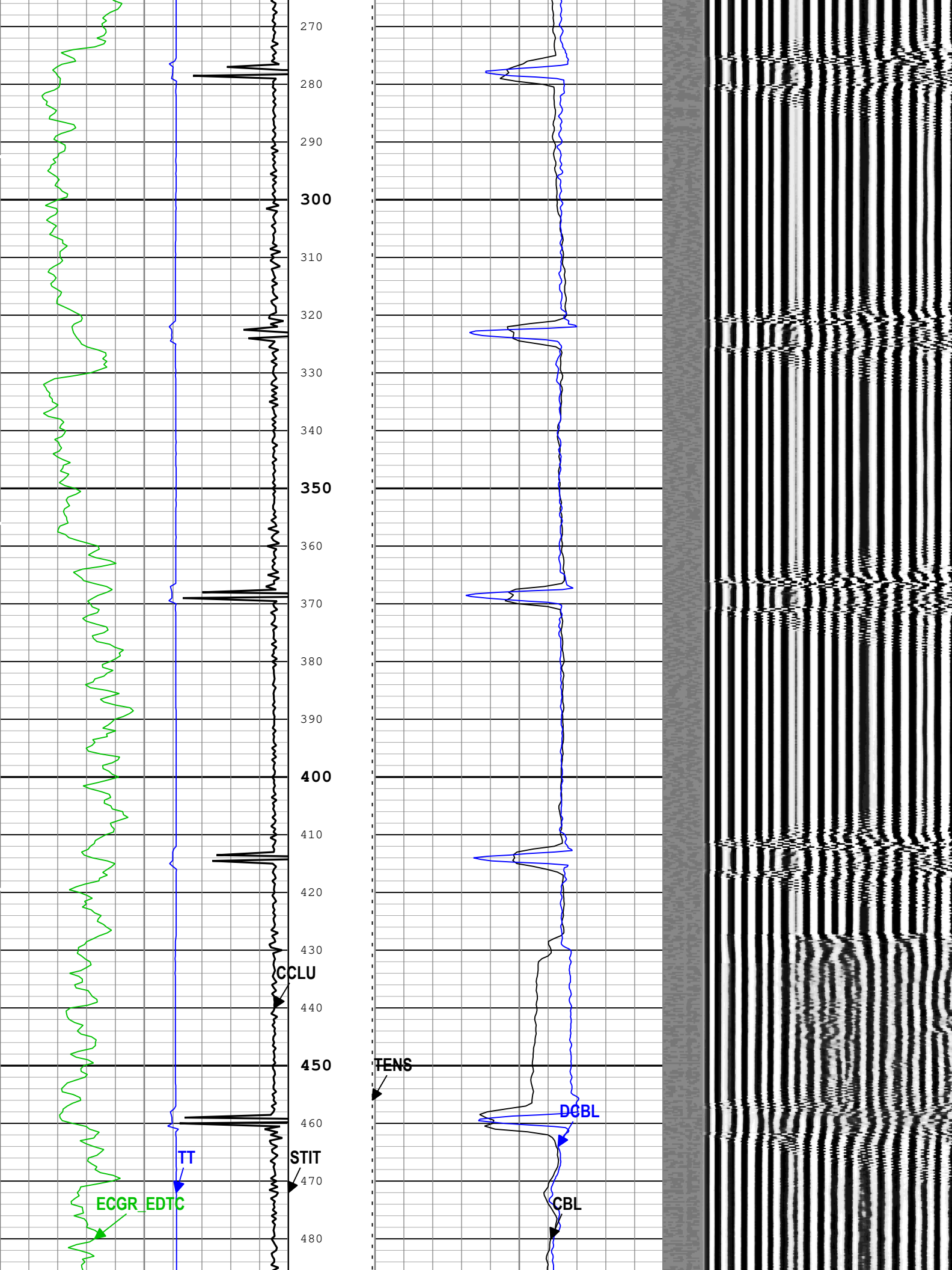
1A: Toolstring			1A: Remarks
<div><div><div>Equip nameLengthMP nameOffset</div><div>LEH-QT45.28LEH-QT</div><div>EDTC-B:941.79100EDTH-B:9293EDTG-AEDTC-B:9100</div><div>ASLT-B:835.29073ASLT-BB:8073</div><div>CBL_UP28.76</div></div><div><div>CTEM38.29ACCZ0.00HV0.00Gamma36.42RayTelStatu35.29s</div><div></div></div></div>	Thank you for choosing Schlumberger!		
	AFE: DC 003132		
	Log run for cement evaluation in 10 deg 6" resolution		
	Toolstring run as per tool sketch		
	BCS-A sub with ICE-TX transducers run		
	Cement Info: Lead Cement: 12.9 ppg with expected TOC at 2400 ft Tail Cement: 13.7 ppg with expected TOC at 7700 ft		
	Log correlated to marker joint from 6837.1 to 6849.0		
	Main and repeat passes logged under 5000psi		

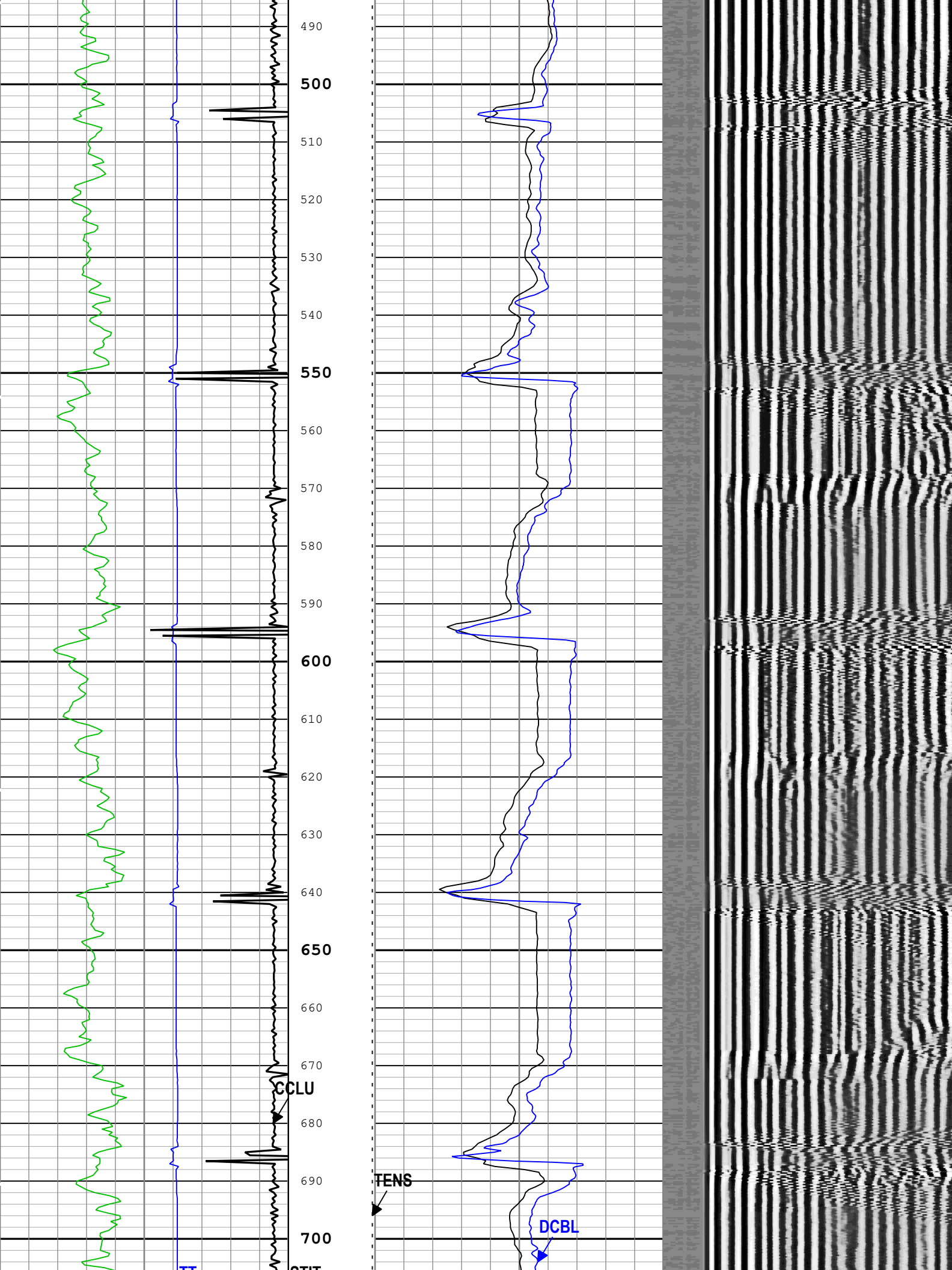


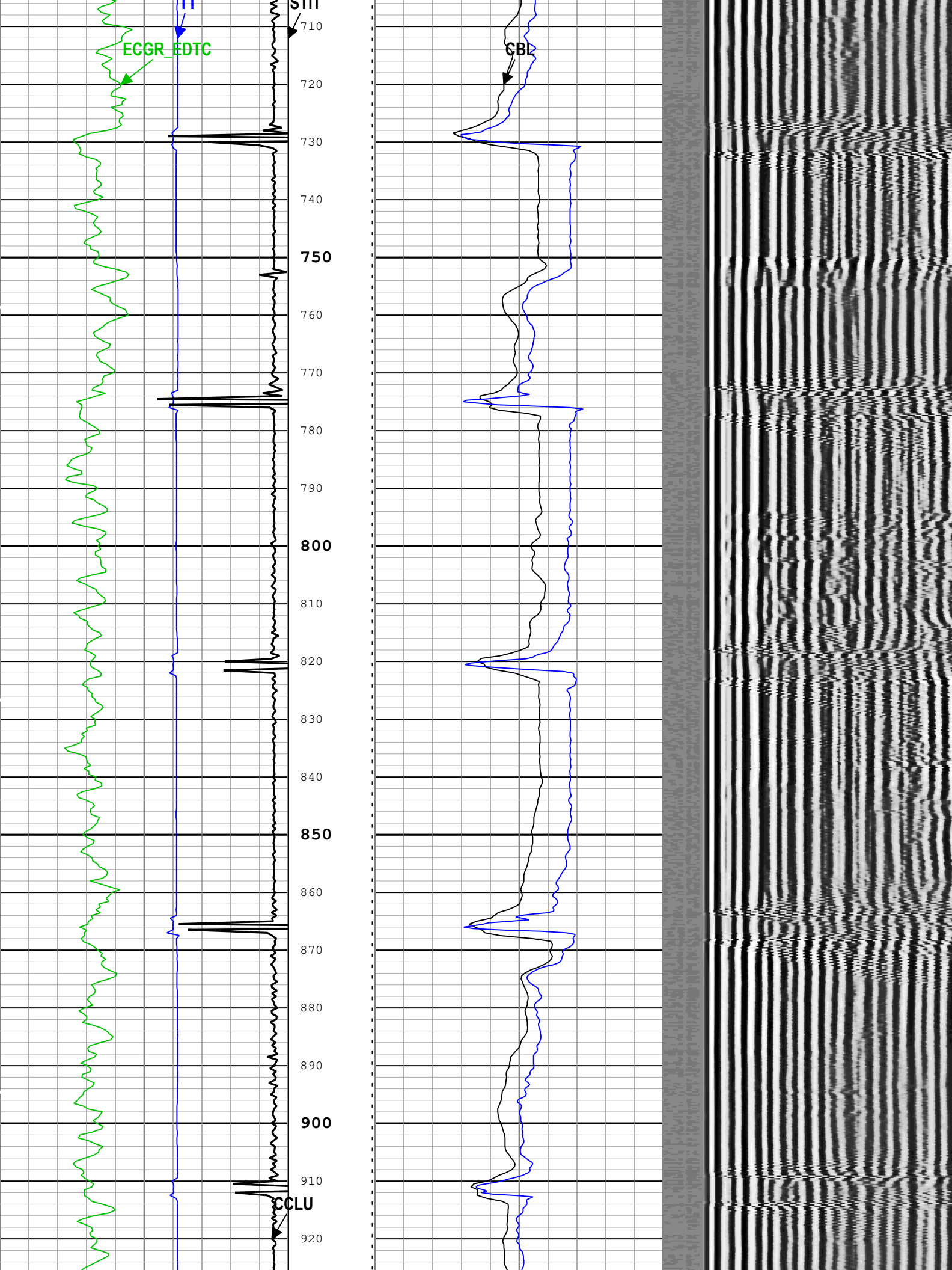
Depth Summary			
	1A		
Depth Measuring Device			
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		
Tension Device			
Type	CMTD-B/A		
Serial Number			
Calibration Date			

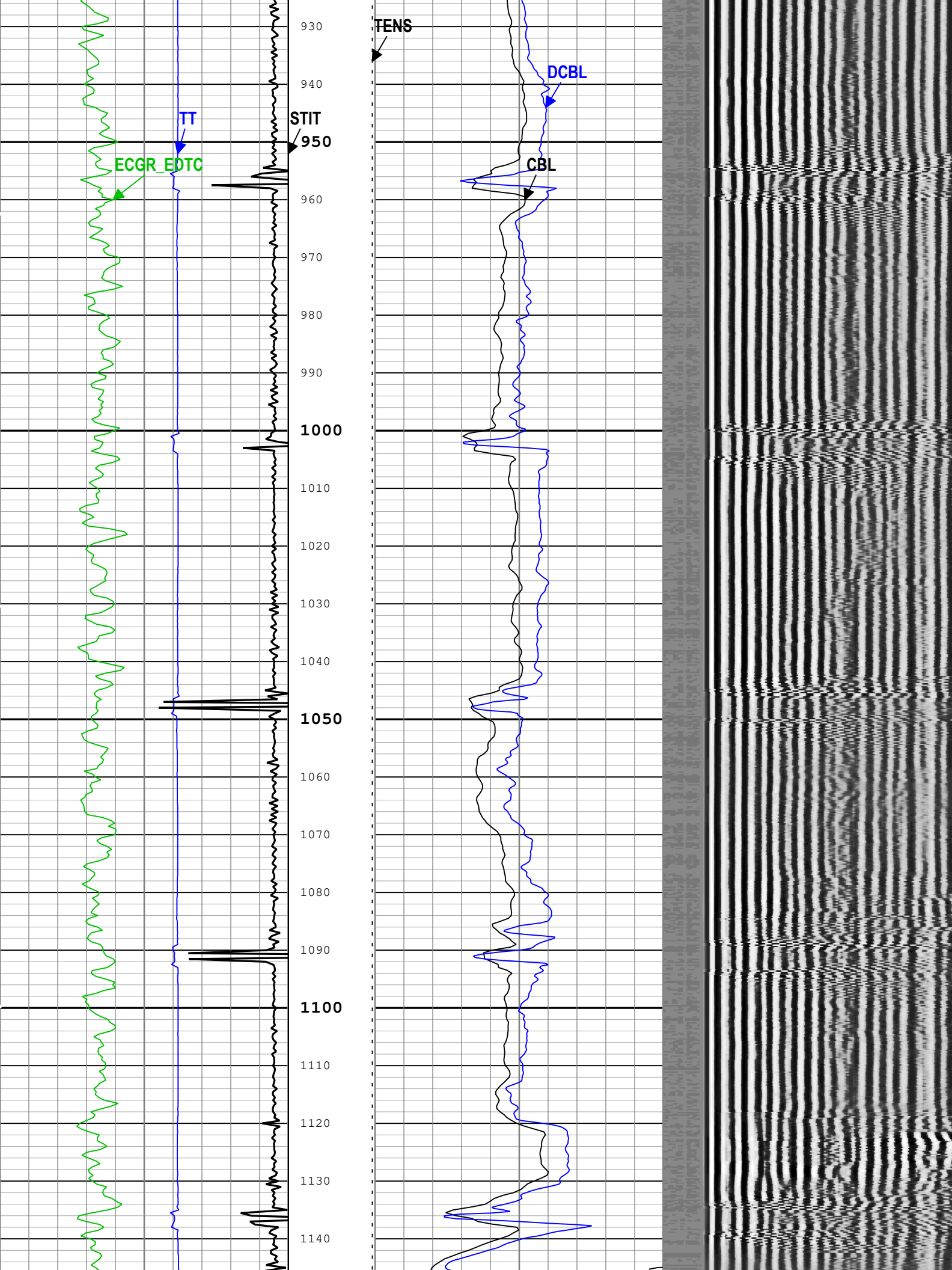
Calibrator Serial Number			
Number of Calibration Points	0		
Logging Cable			
Type	7-39PI-XXS		
Serial Number	1234		
Length	28000.00 ft		
Conveyance Type	Wireline		
Rig Type	Land		
1A:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well	Schlumberger depth control procedures followed	
Rig Up Length At Surface		IDW used as primary depth control system	
Rig Up Length At Bottom		Z-Chart used as secondary depth control system	
Rig Up Length Correction			
Stretch Correction			
Tool Zero Check At Surface			

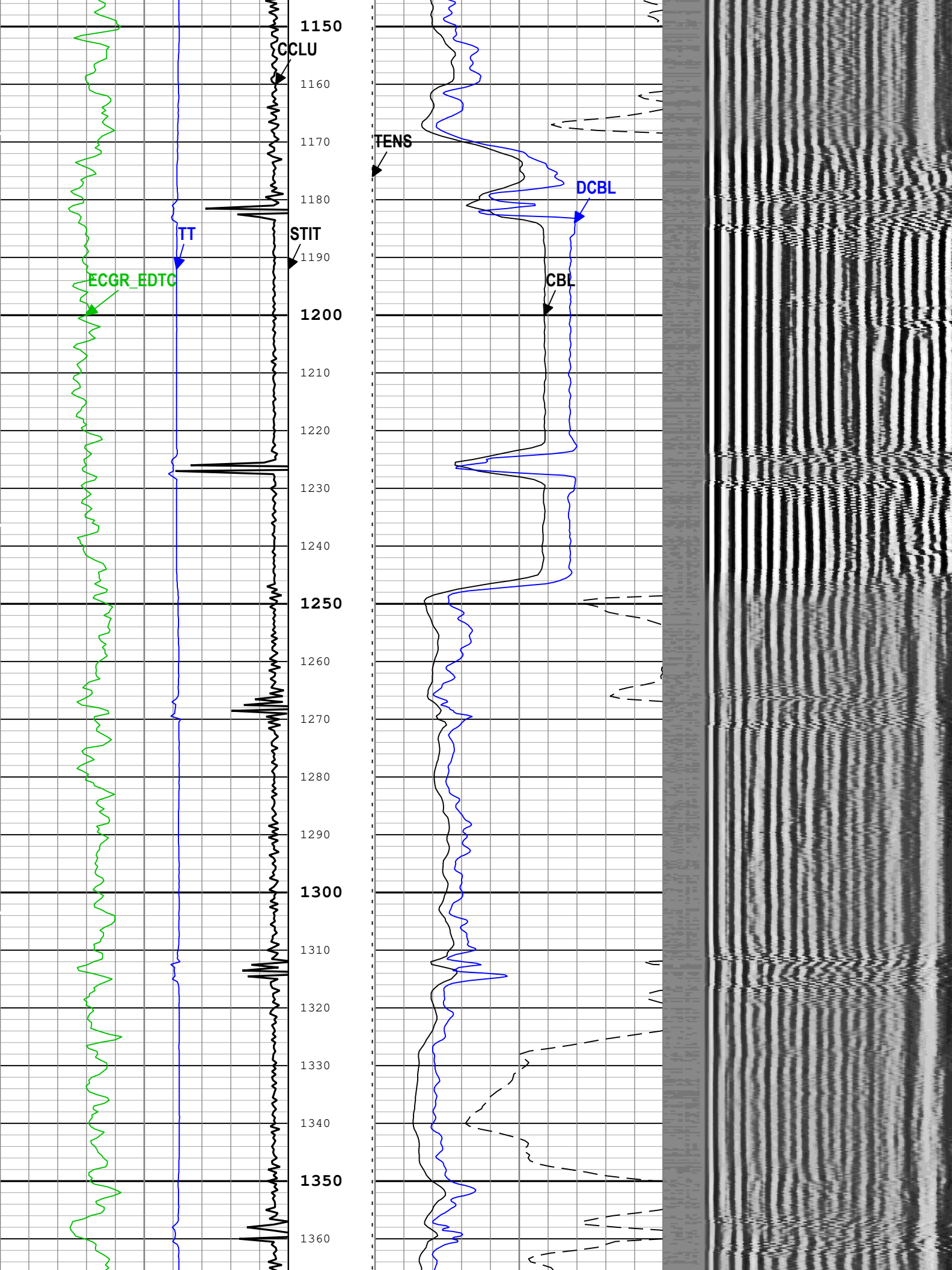


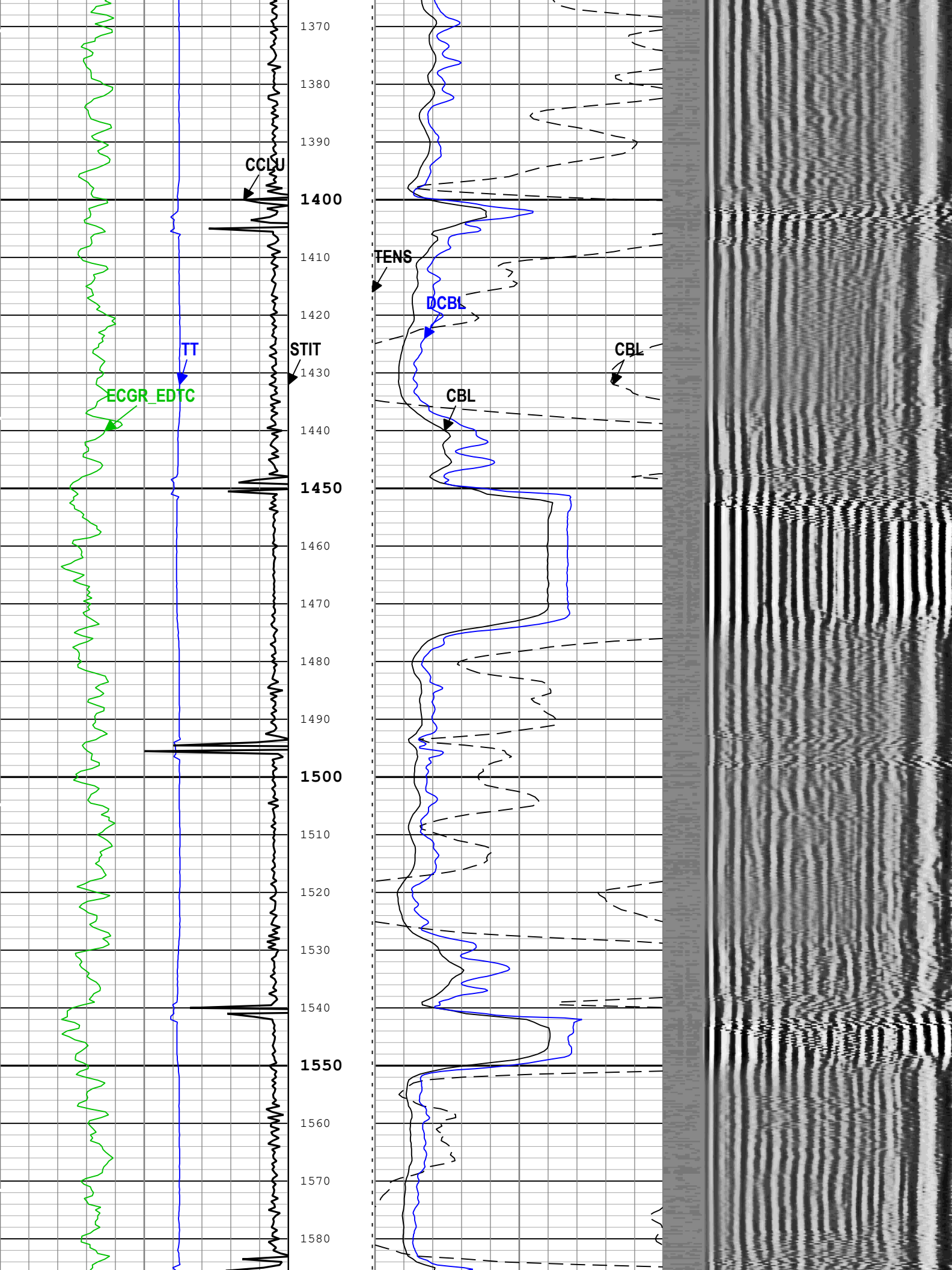


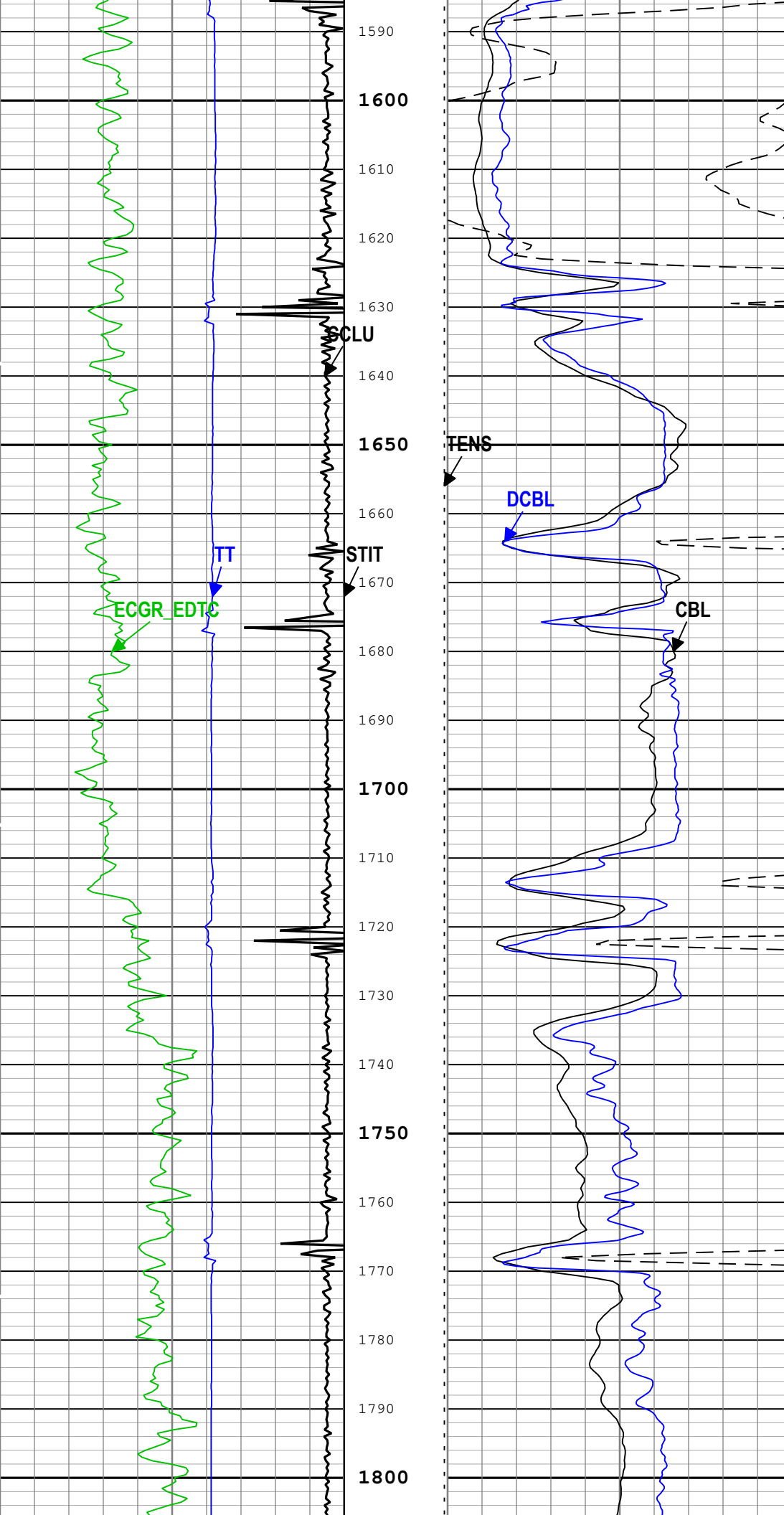


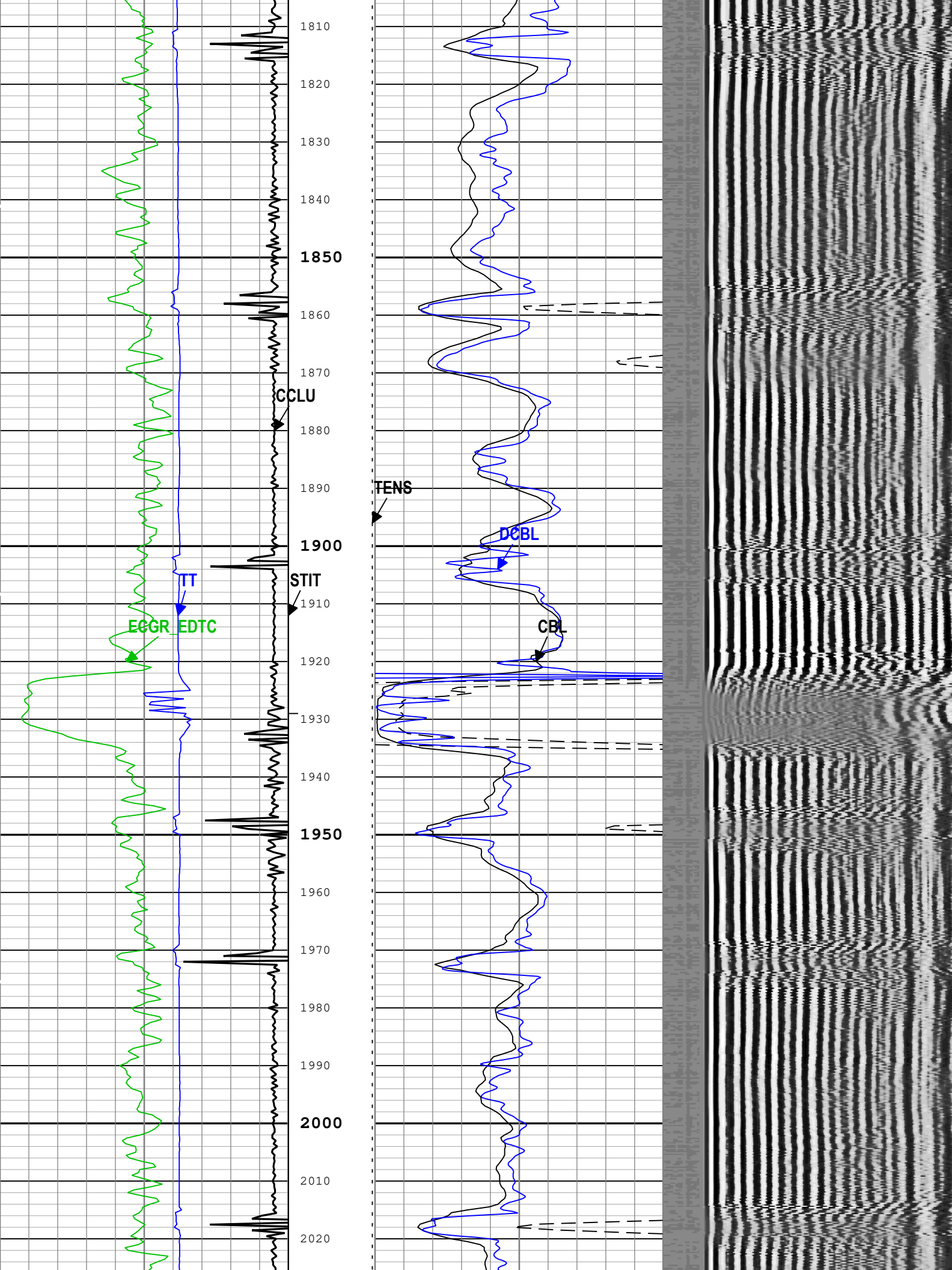


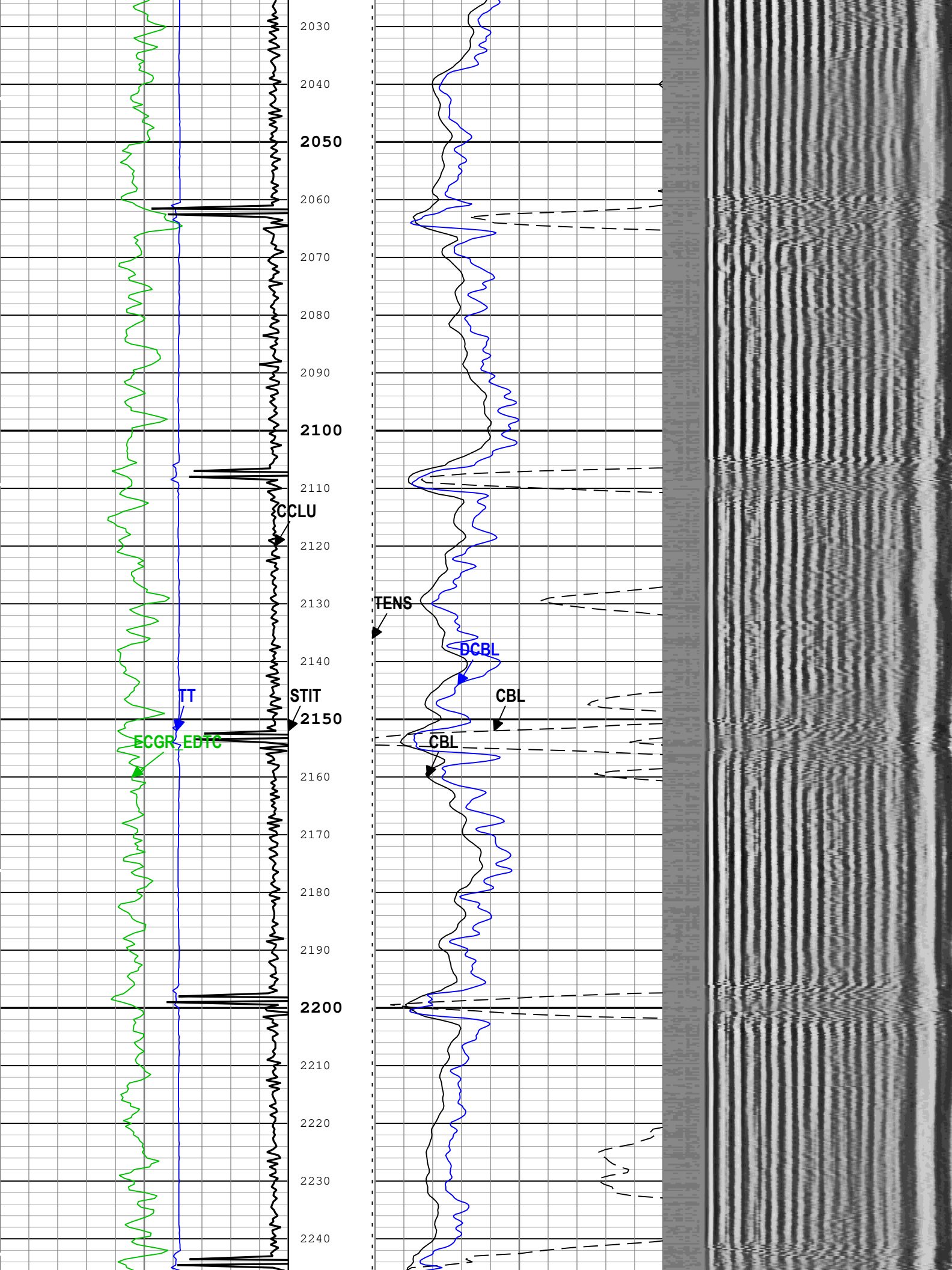


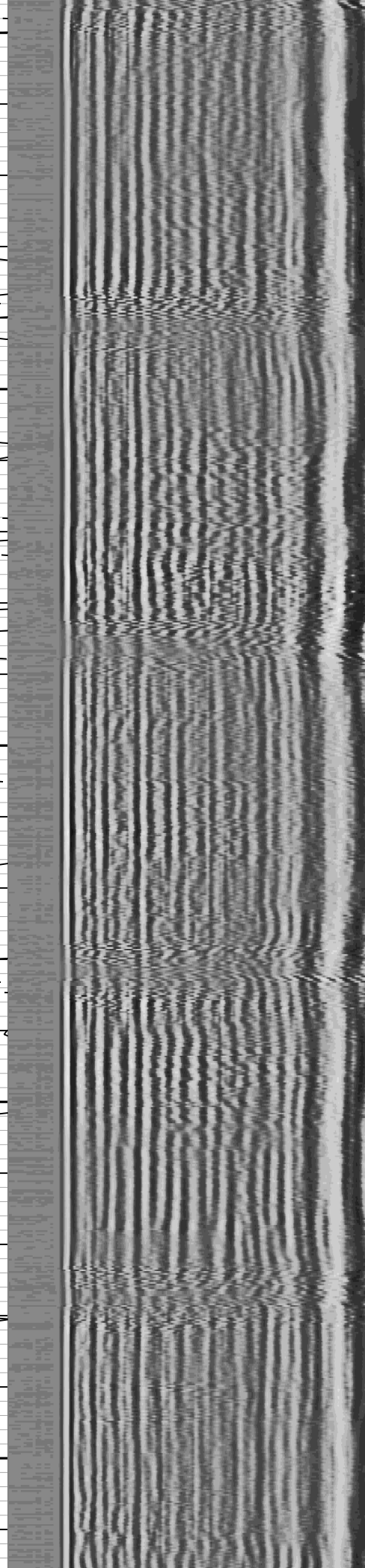
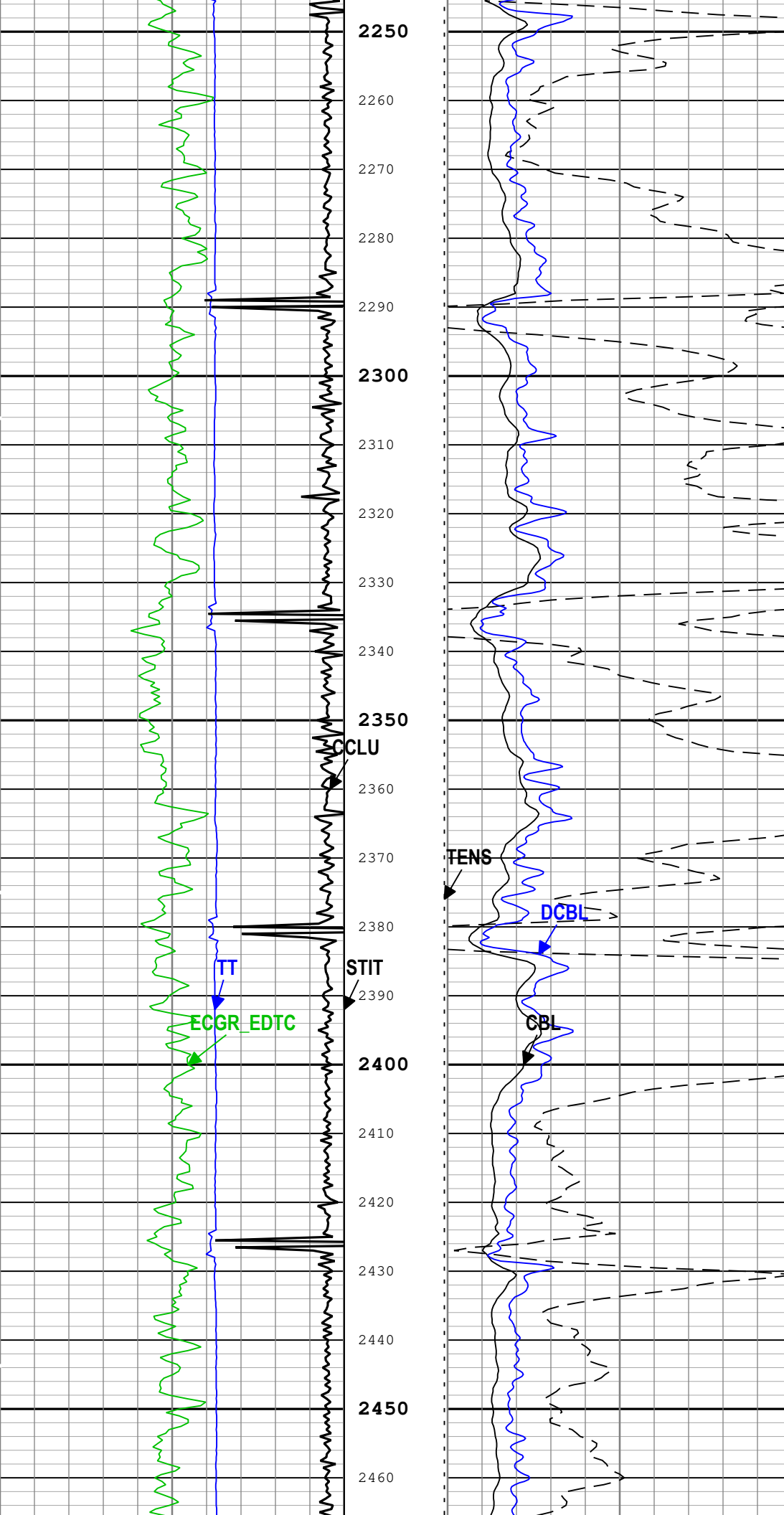


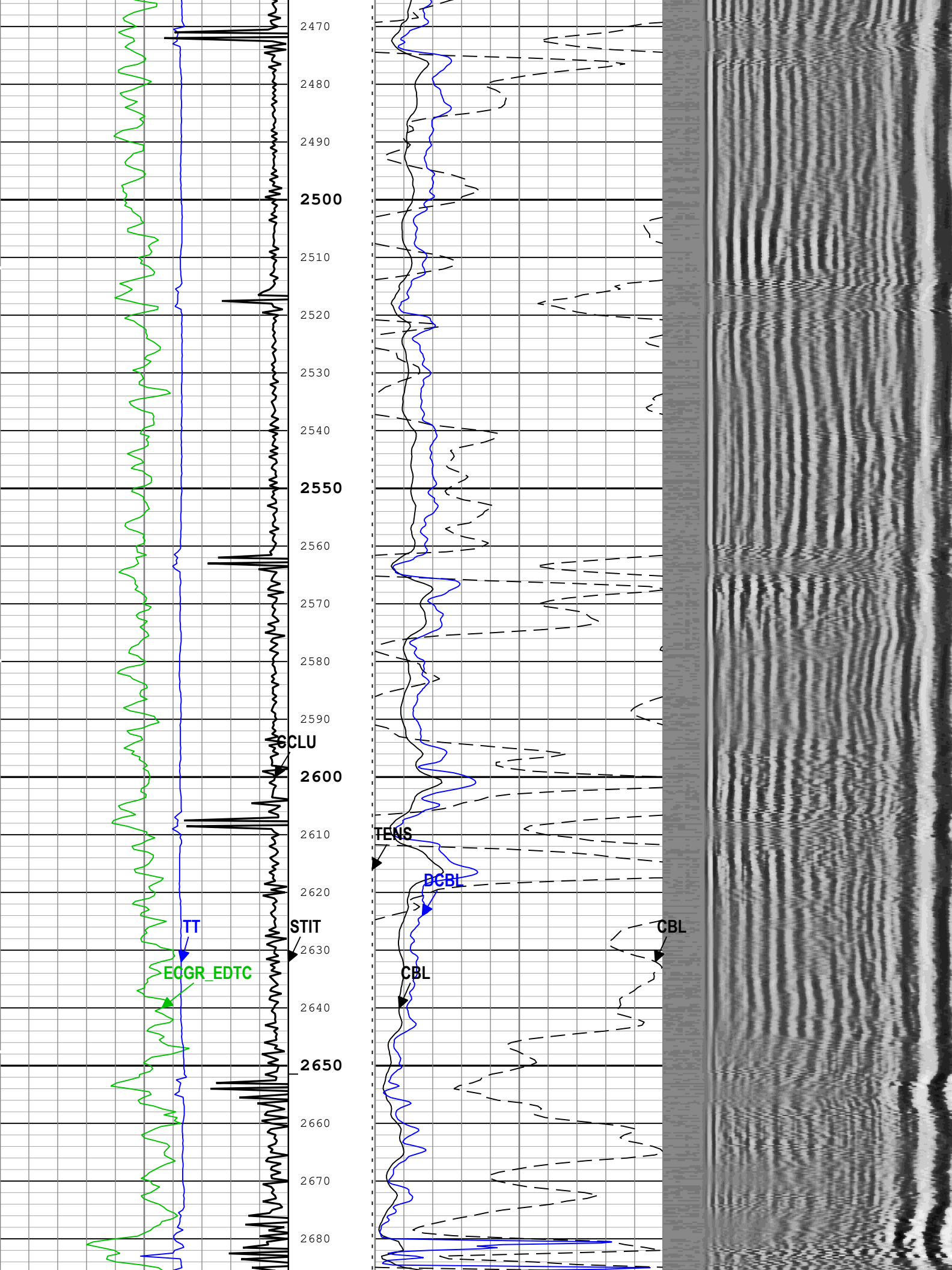


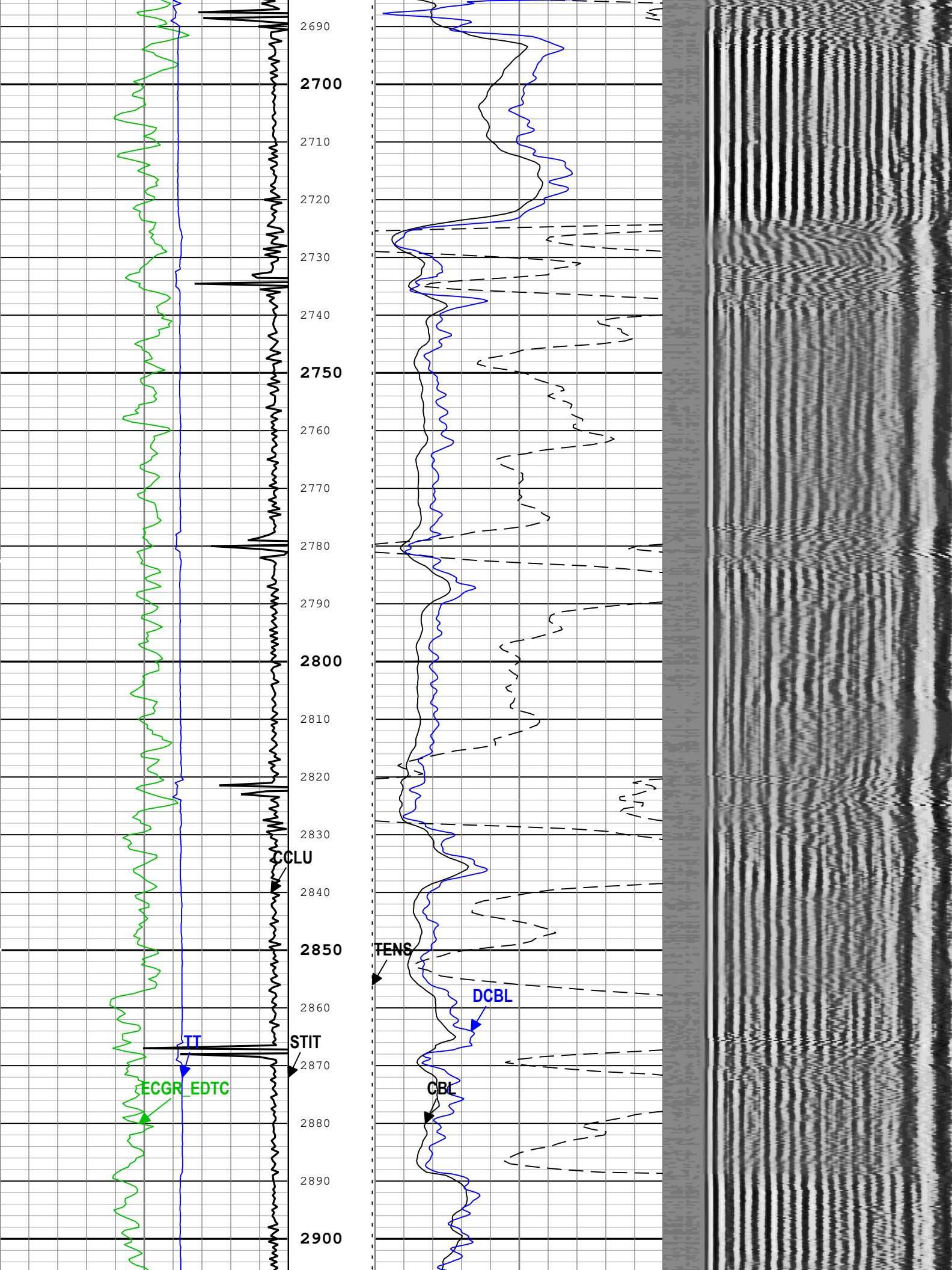


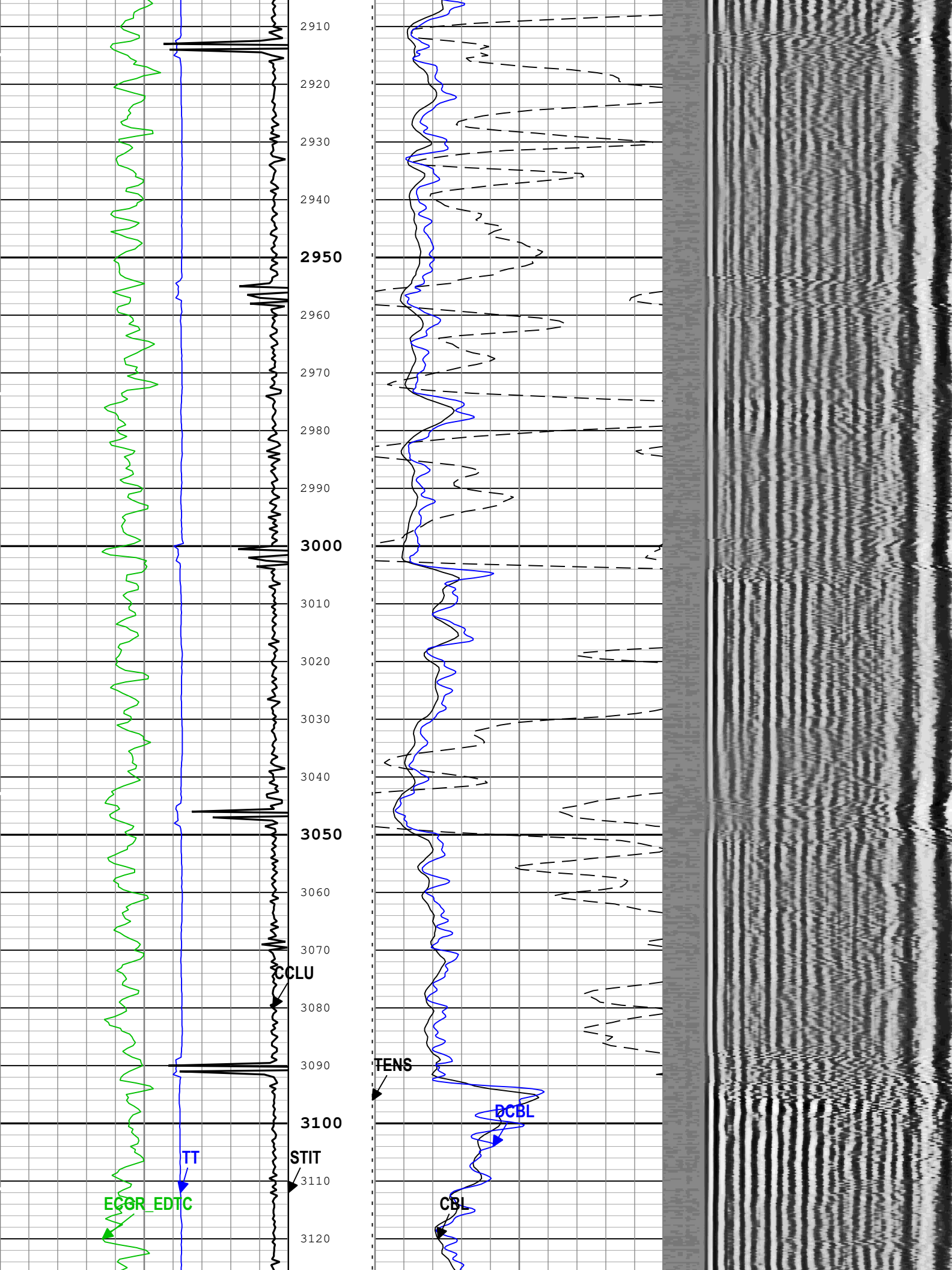


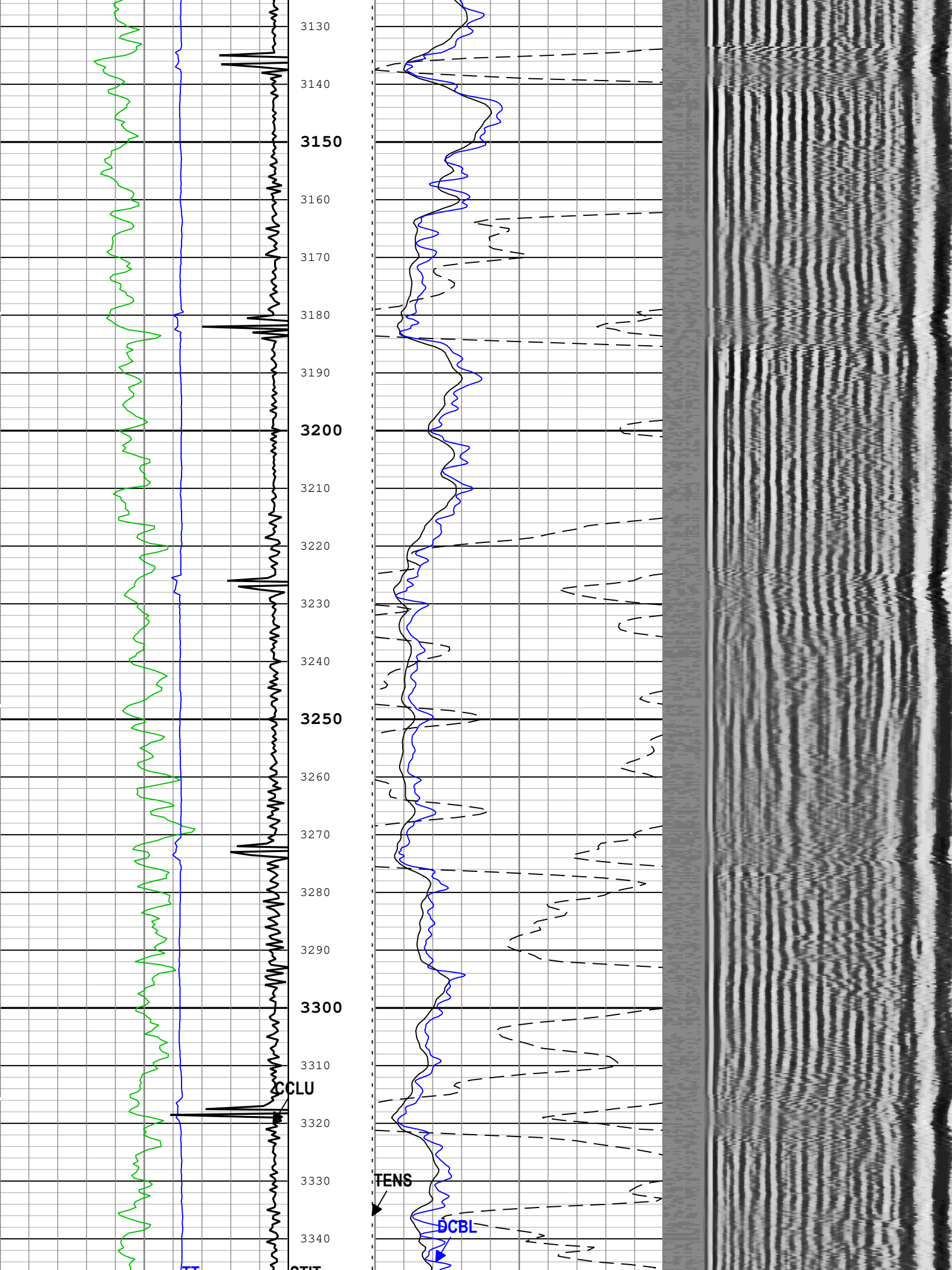


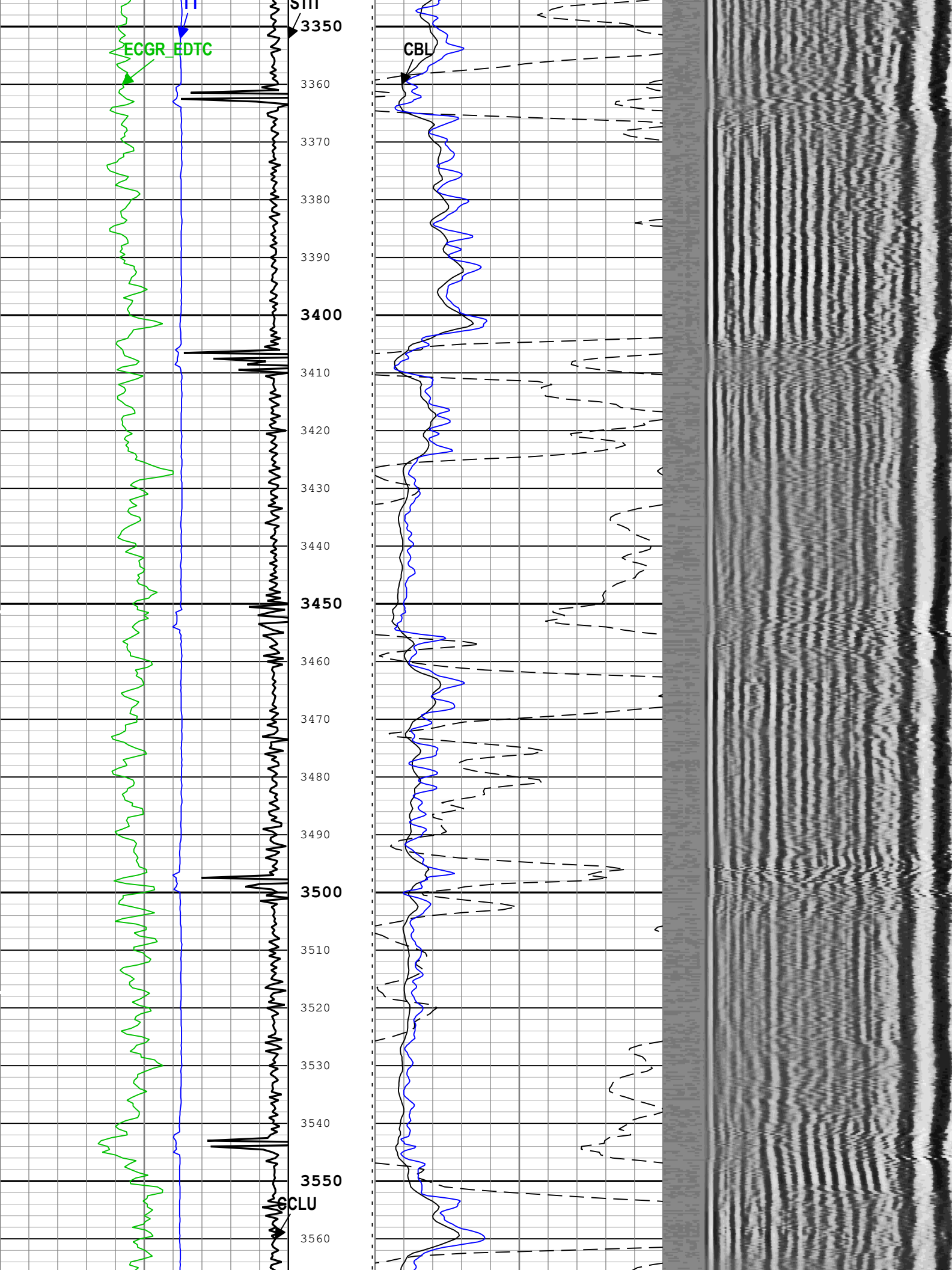


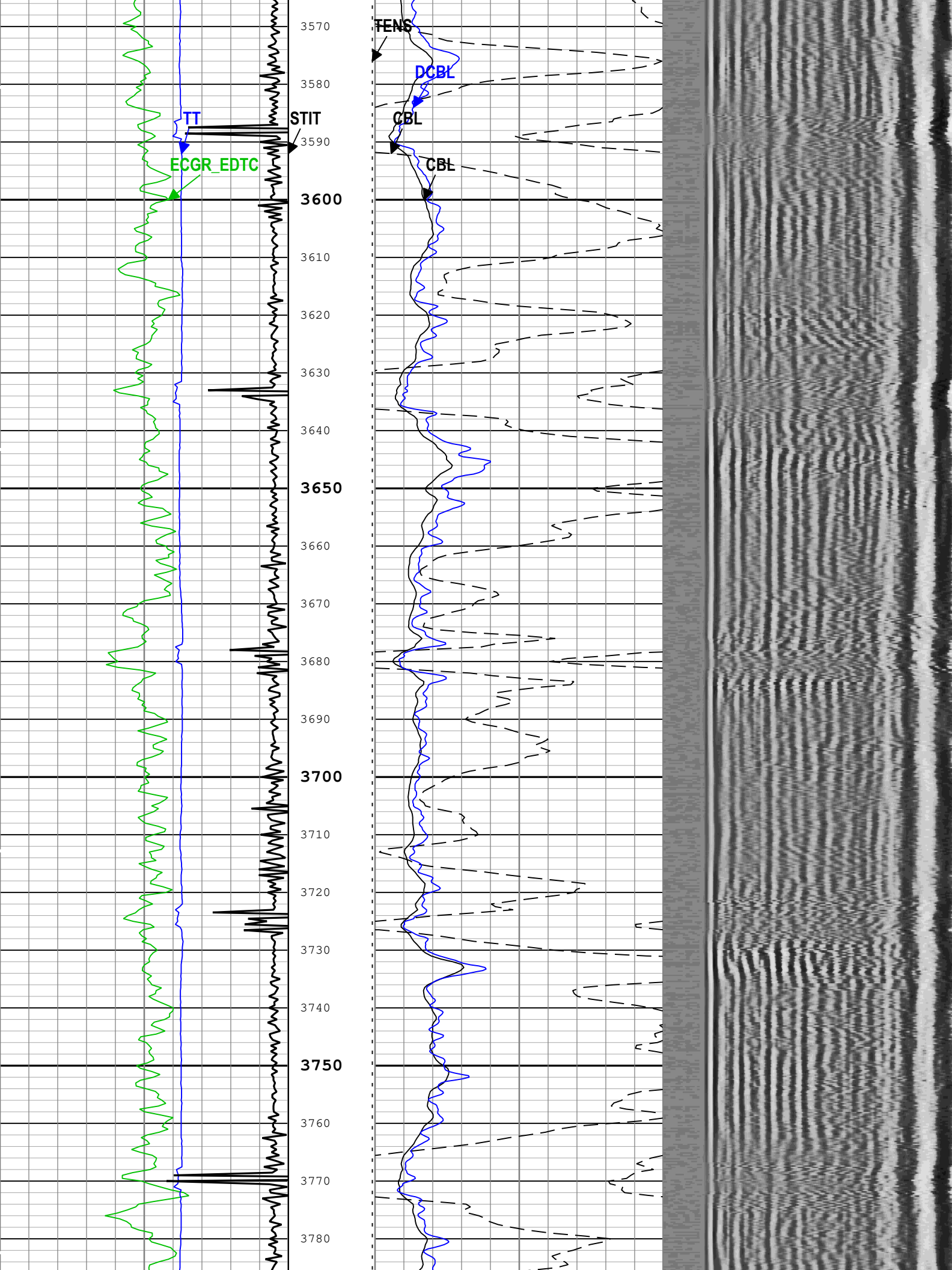


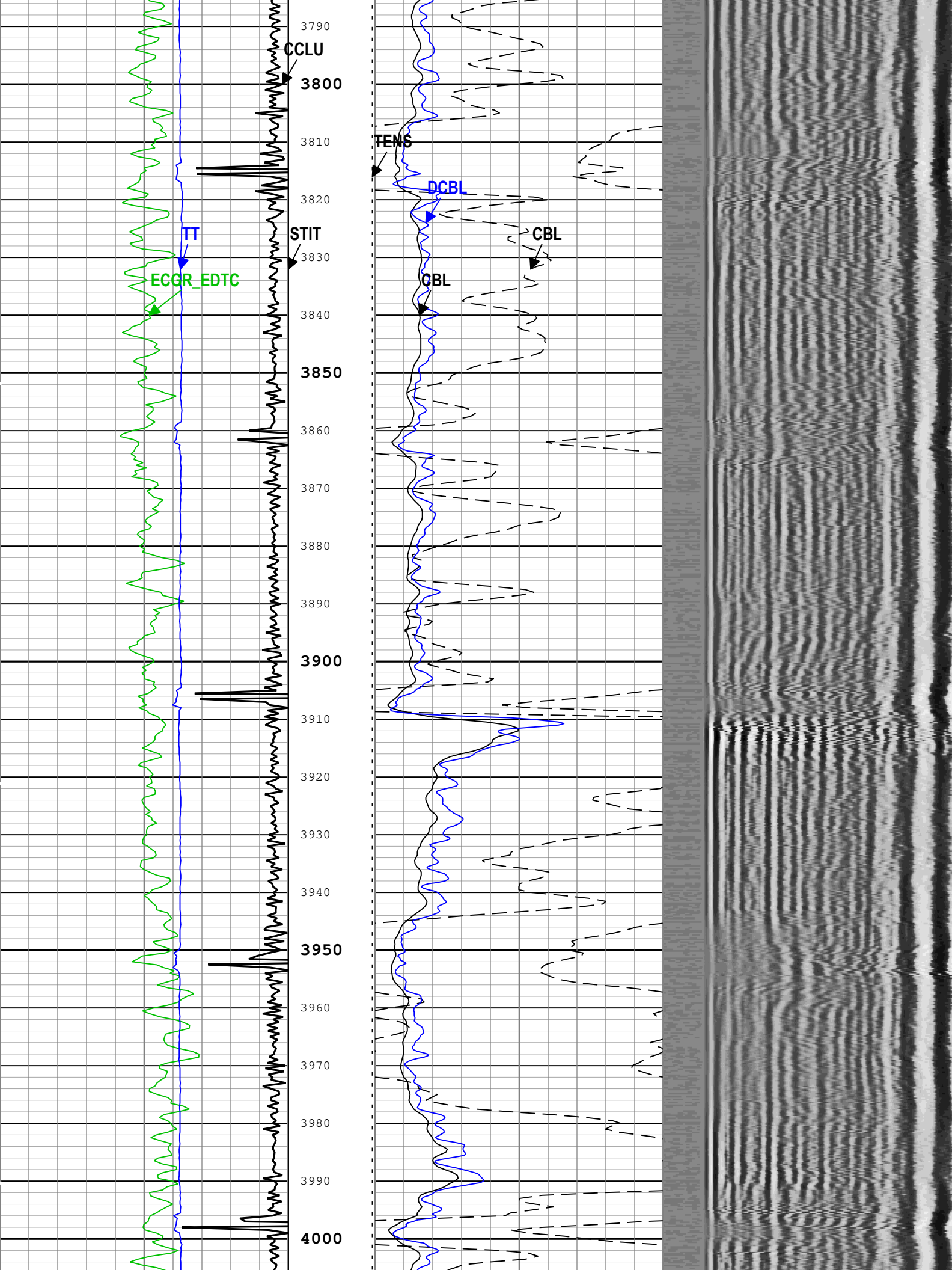


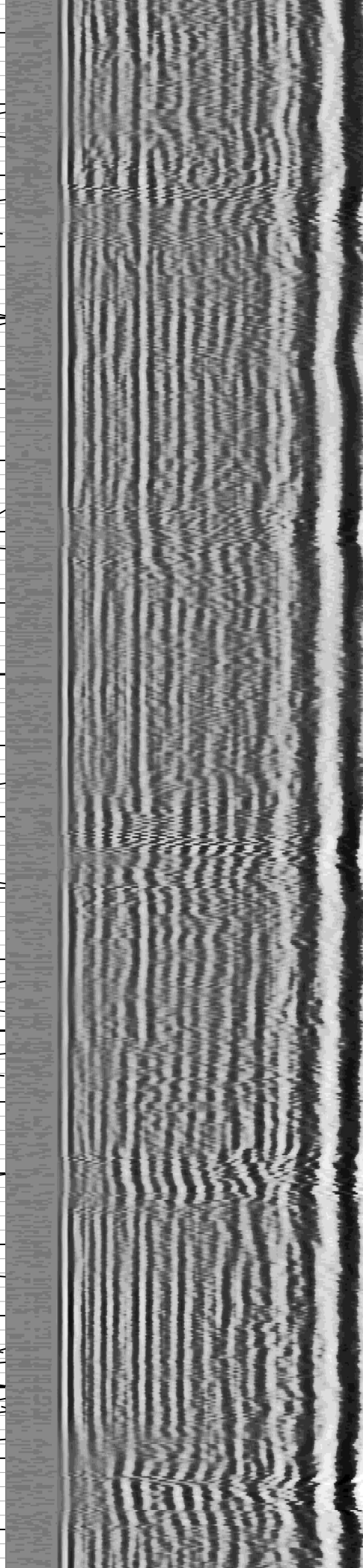
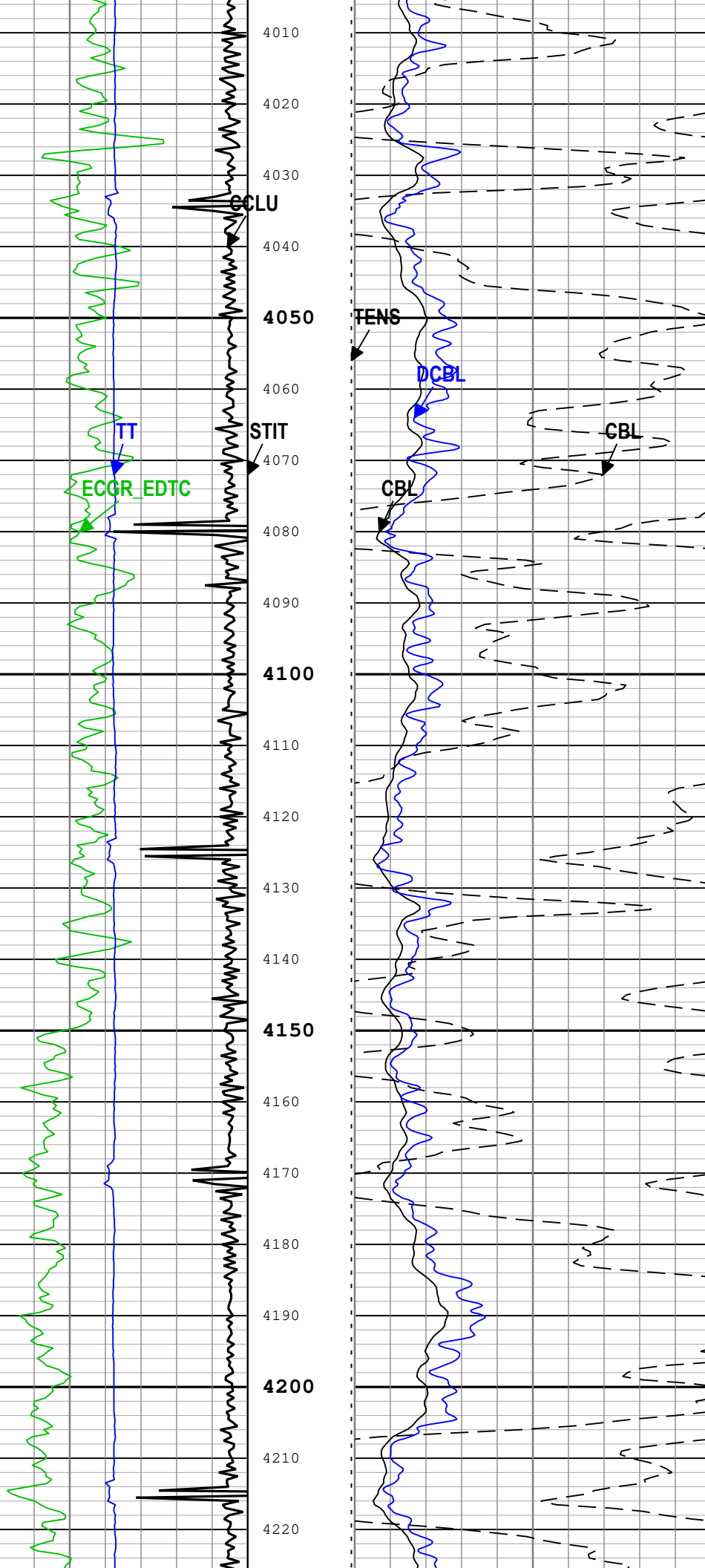


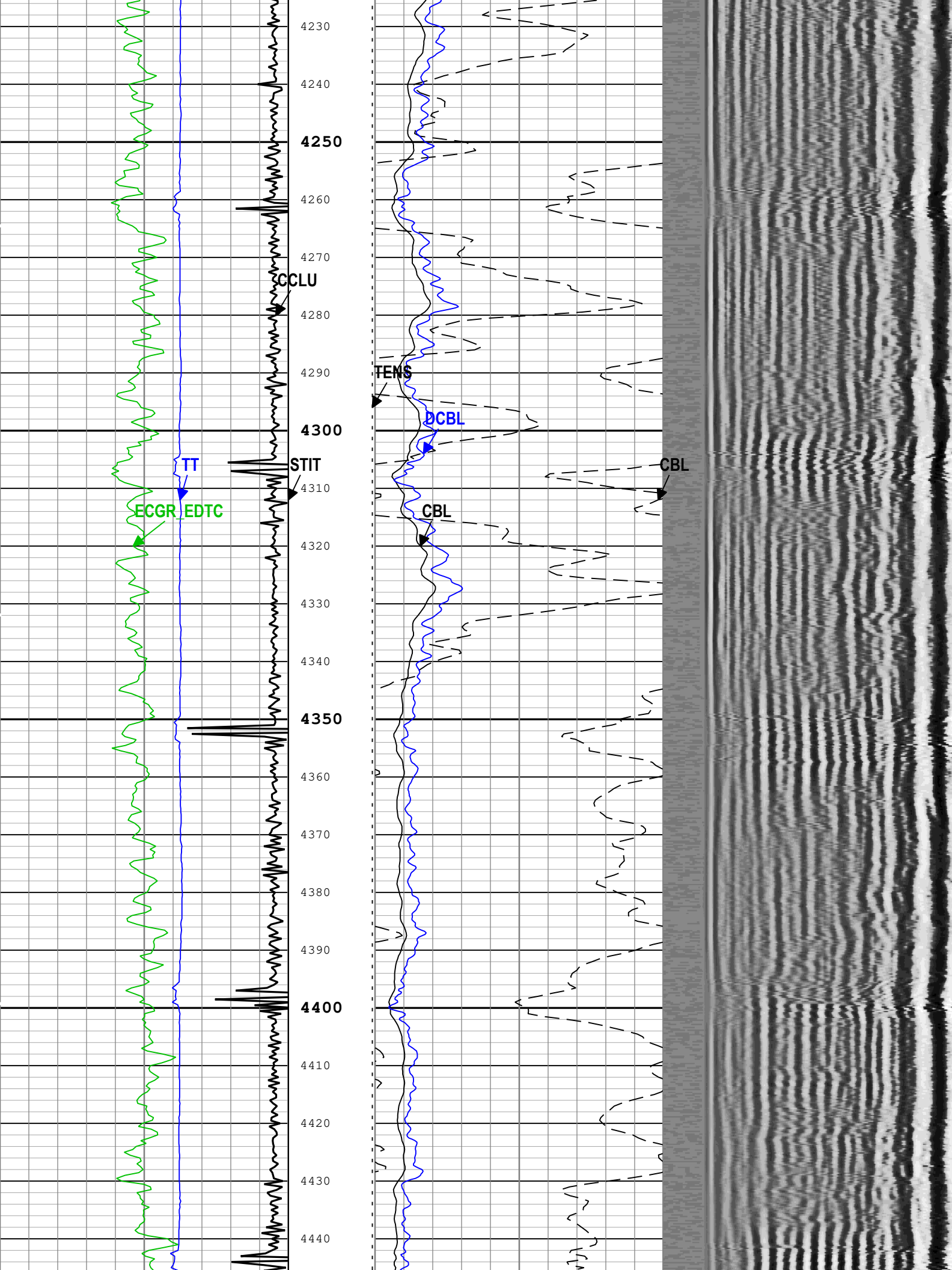


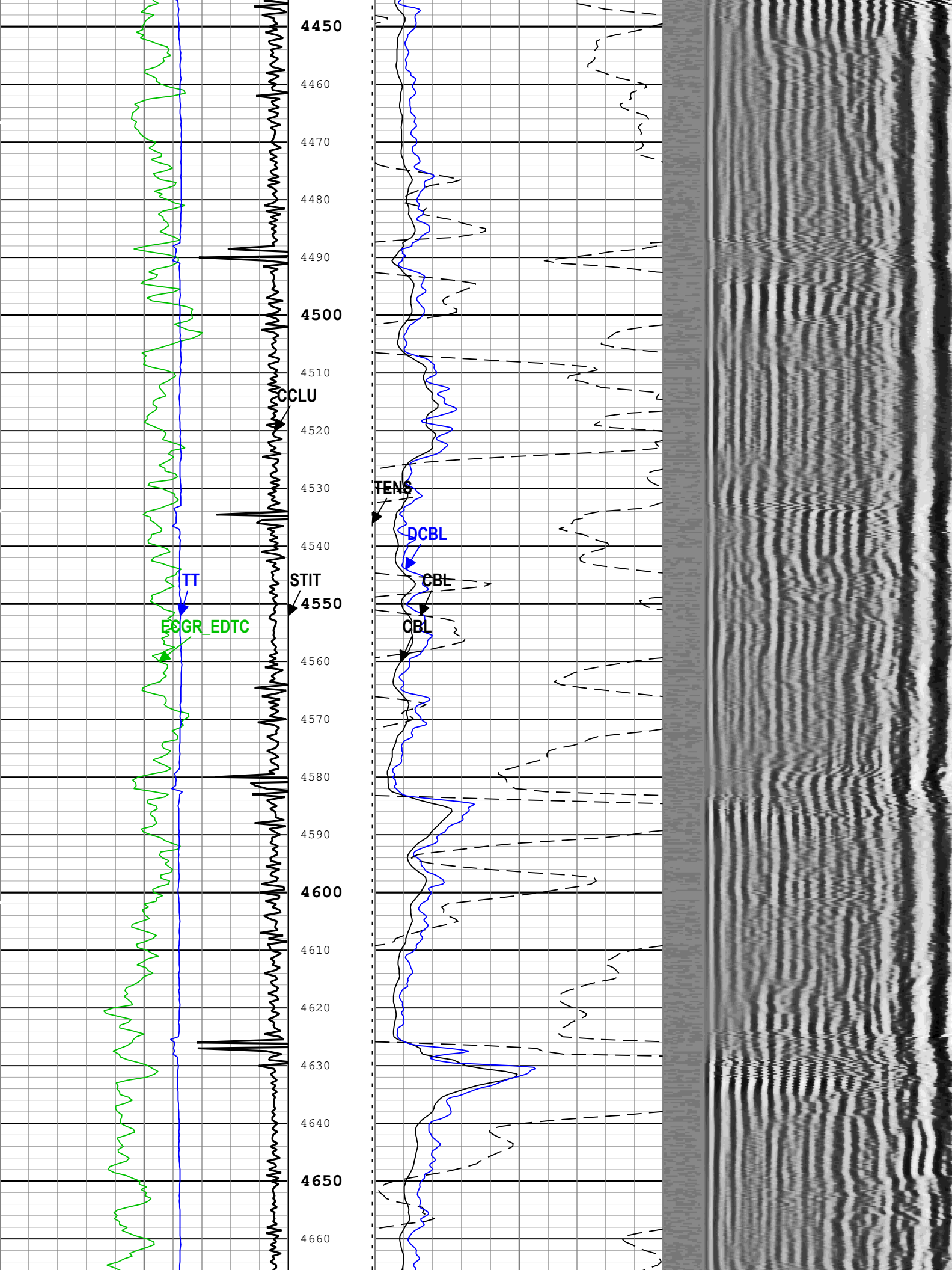


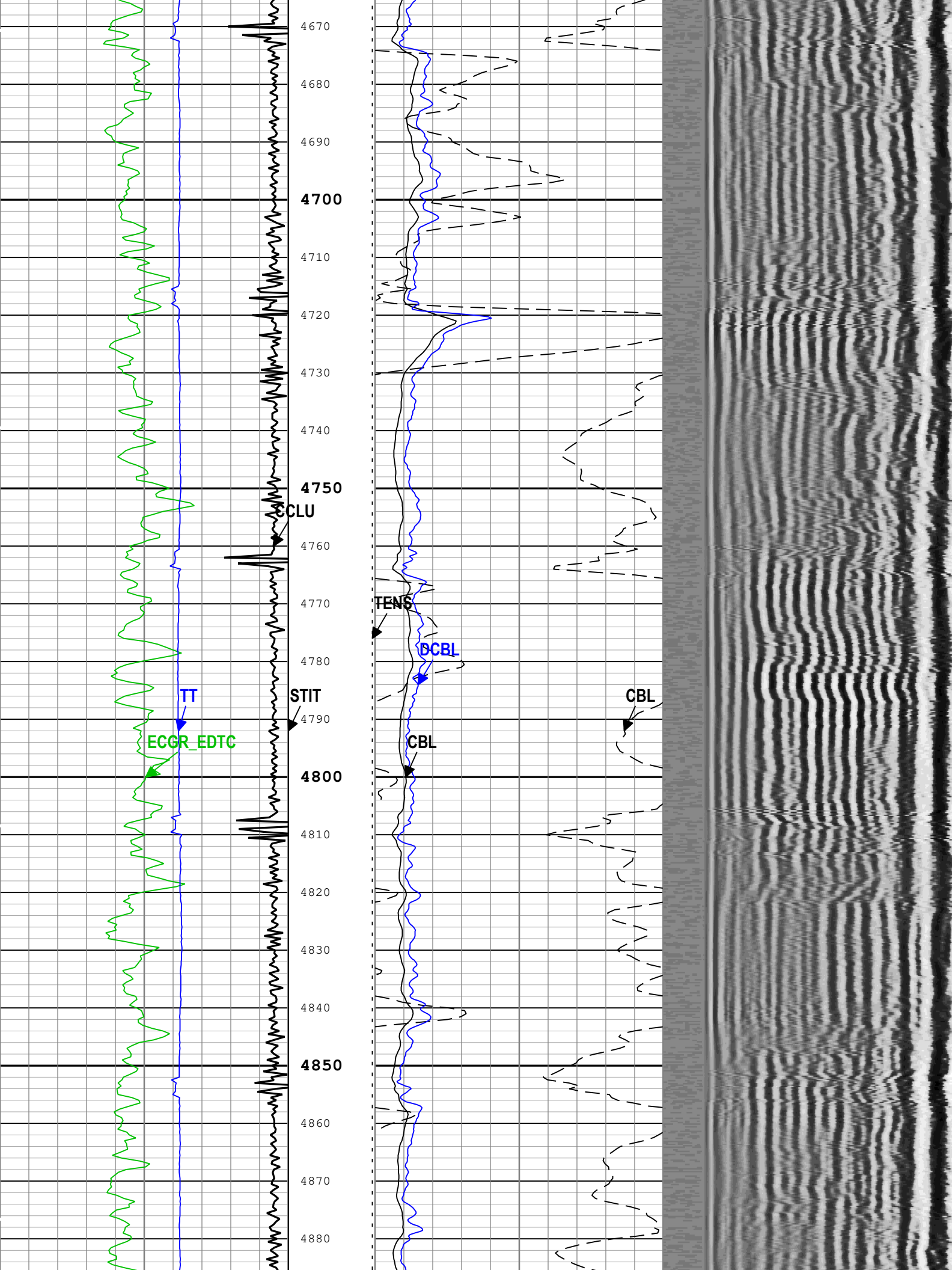


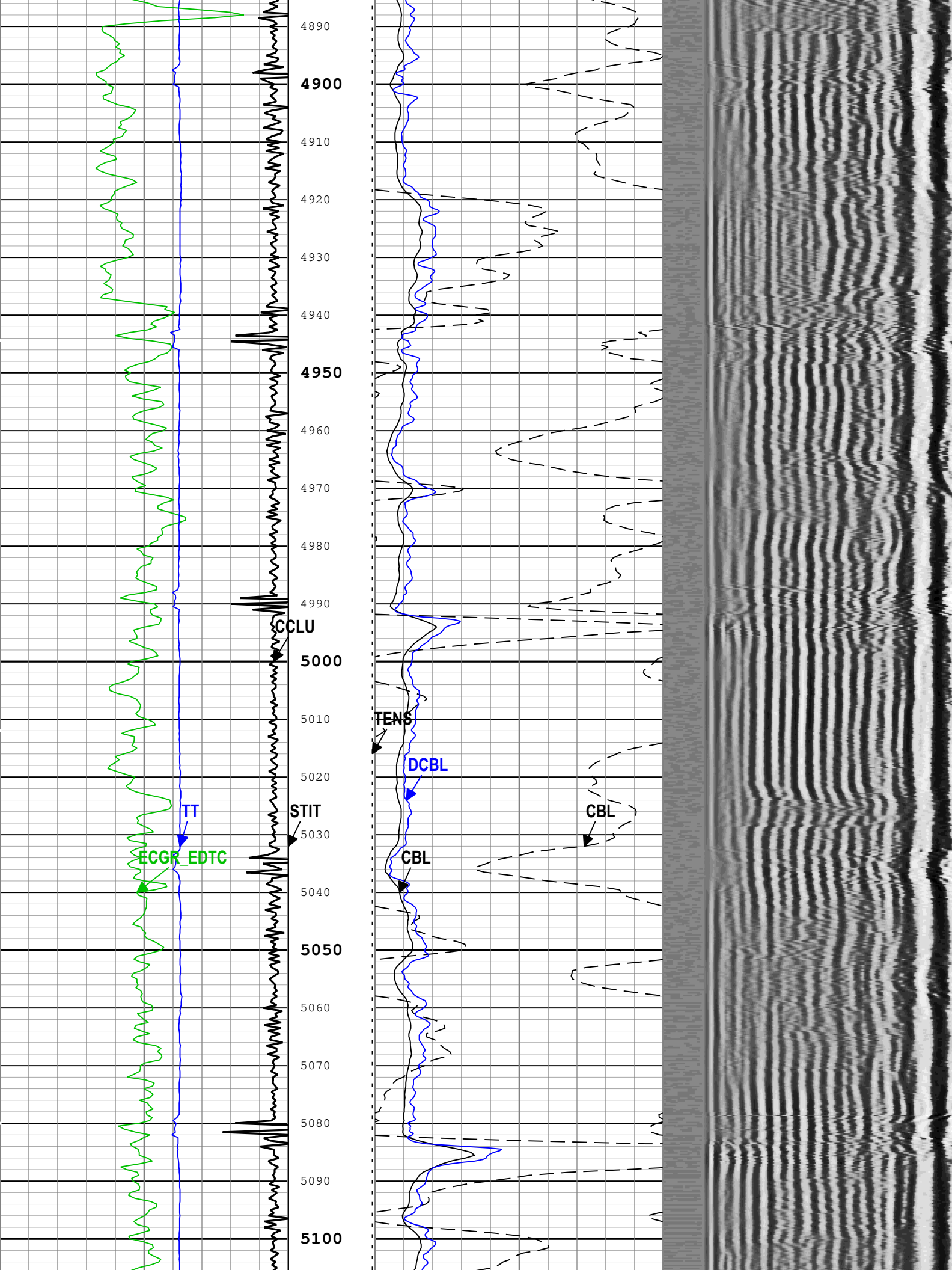


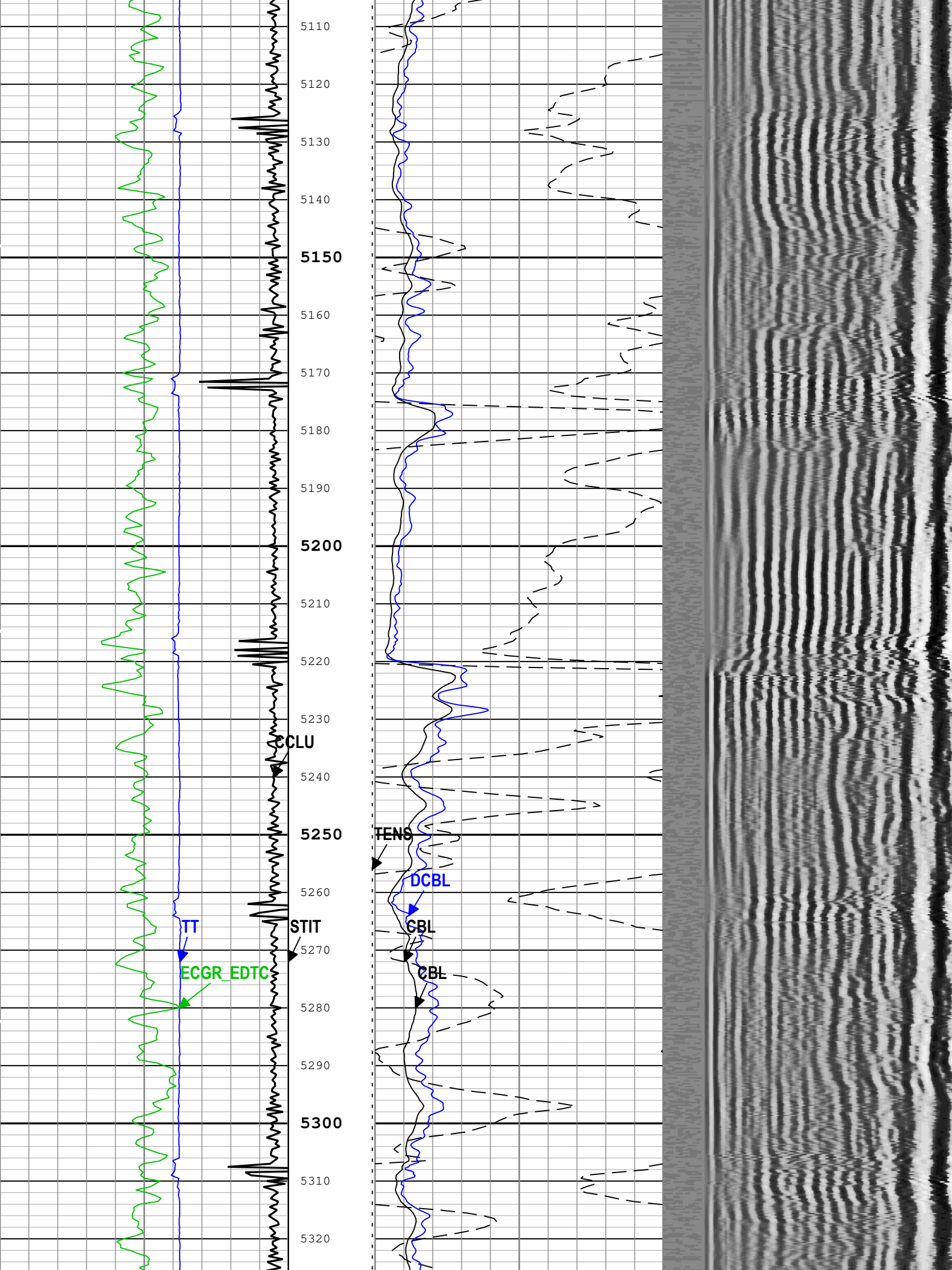


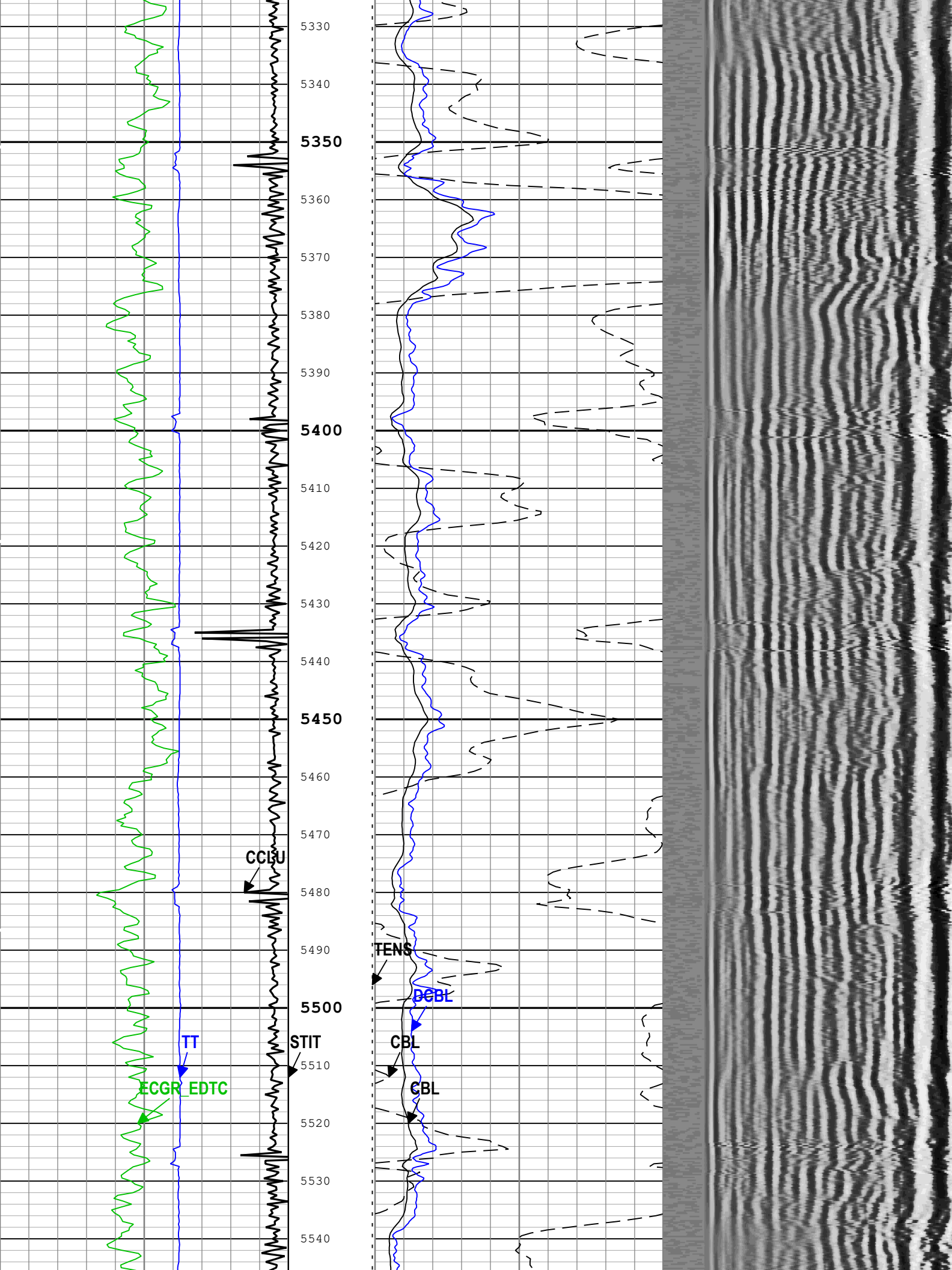


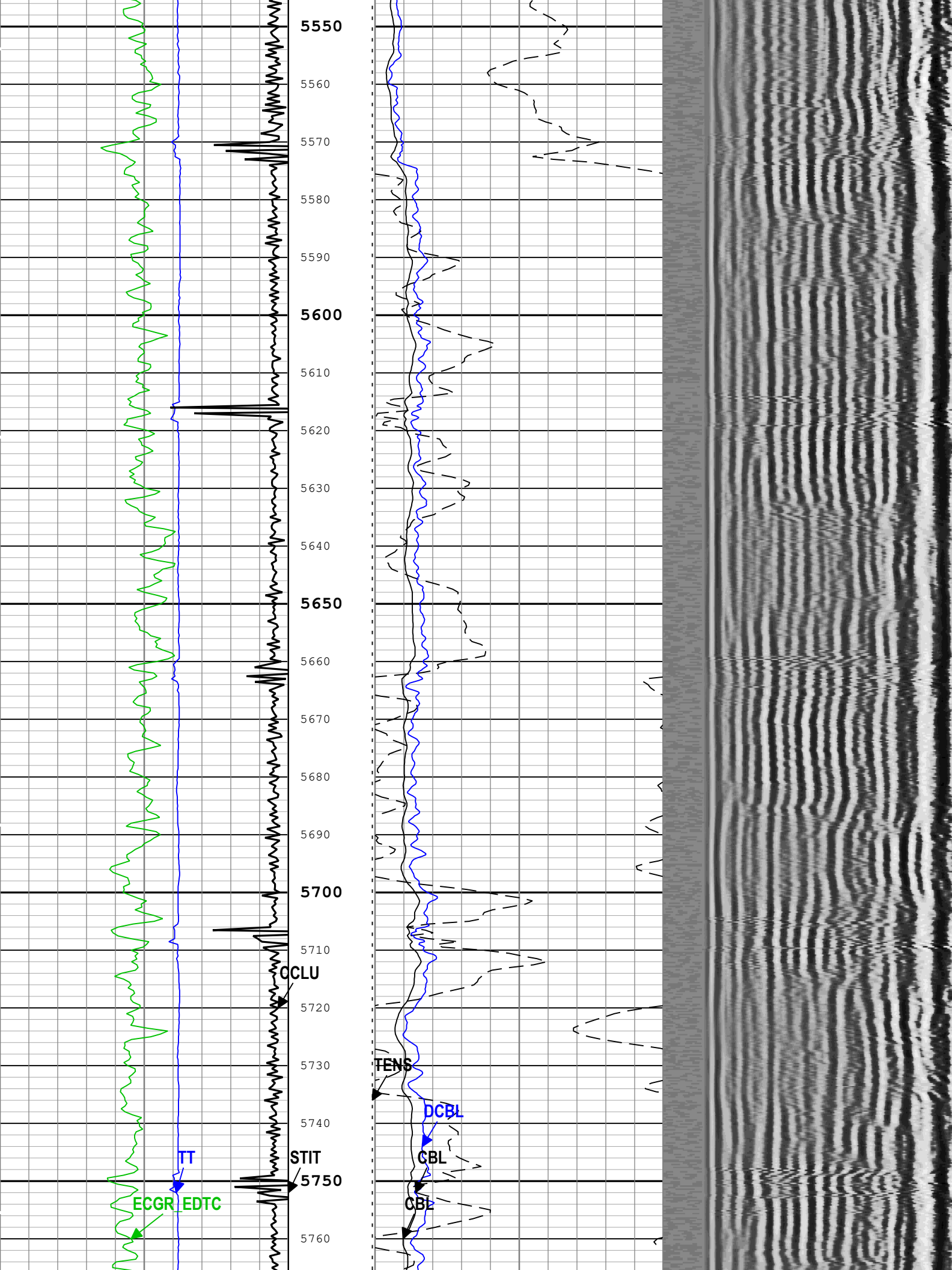


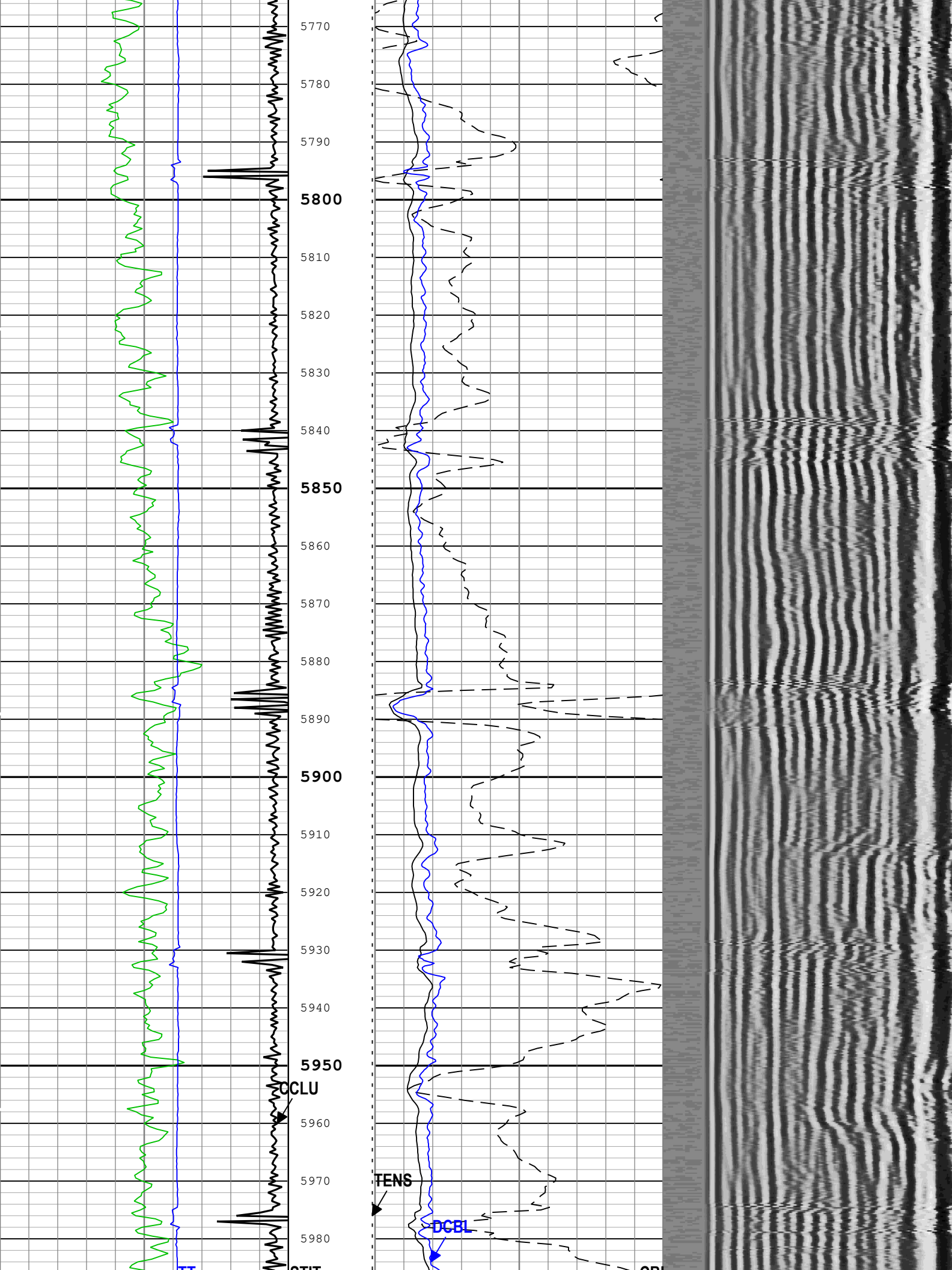


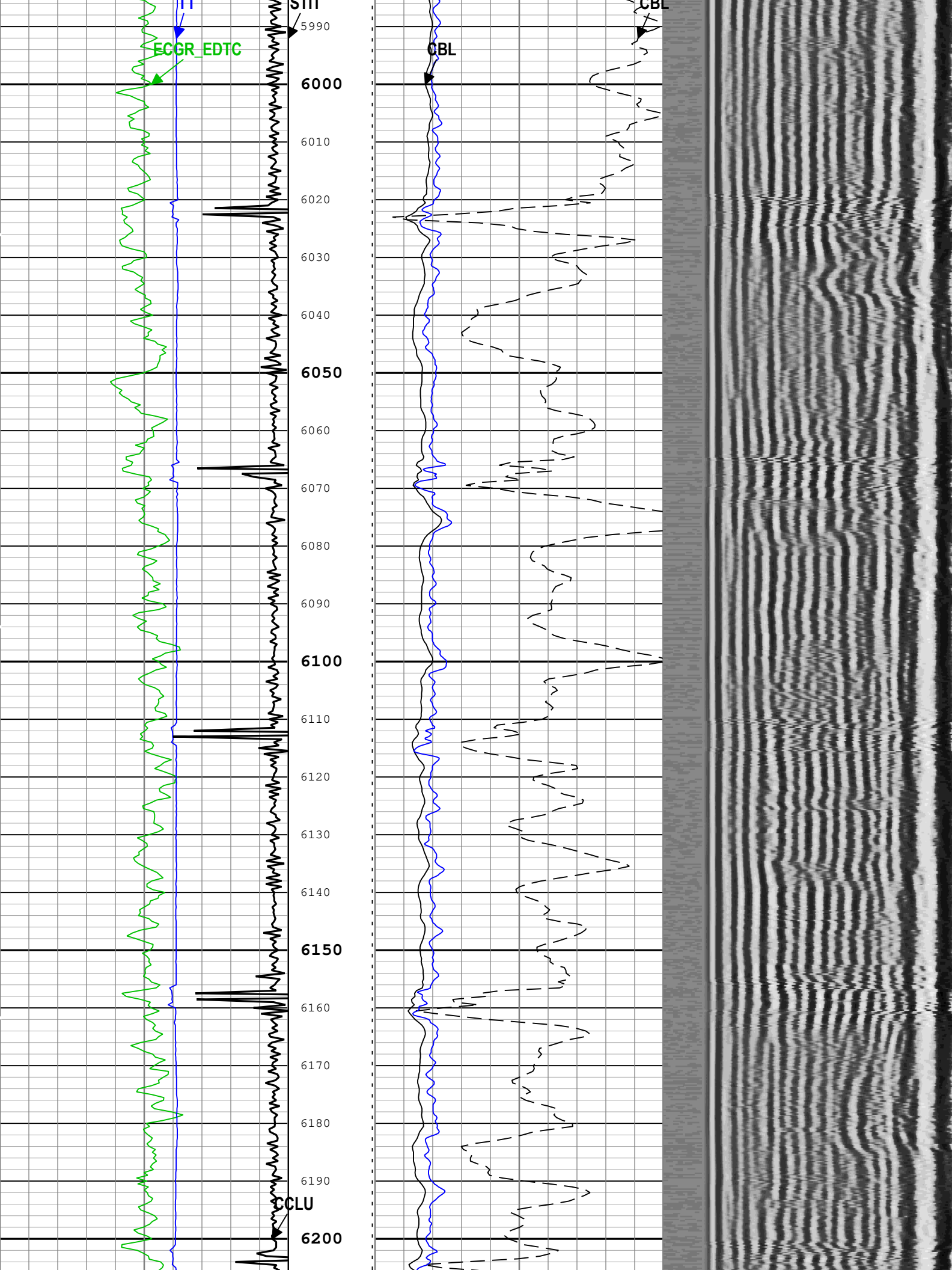


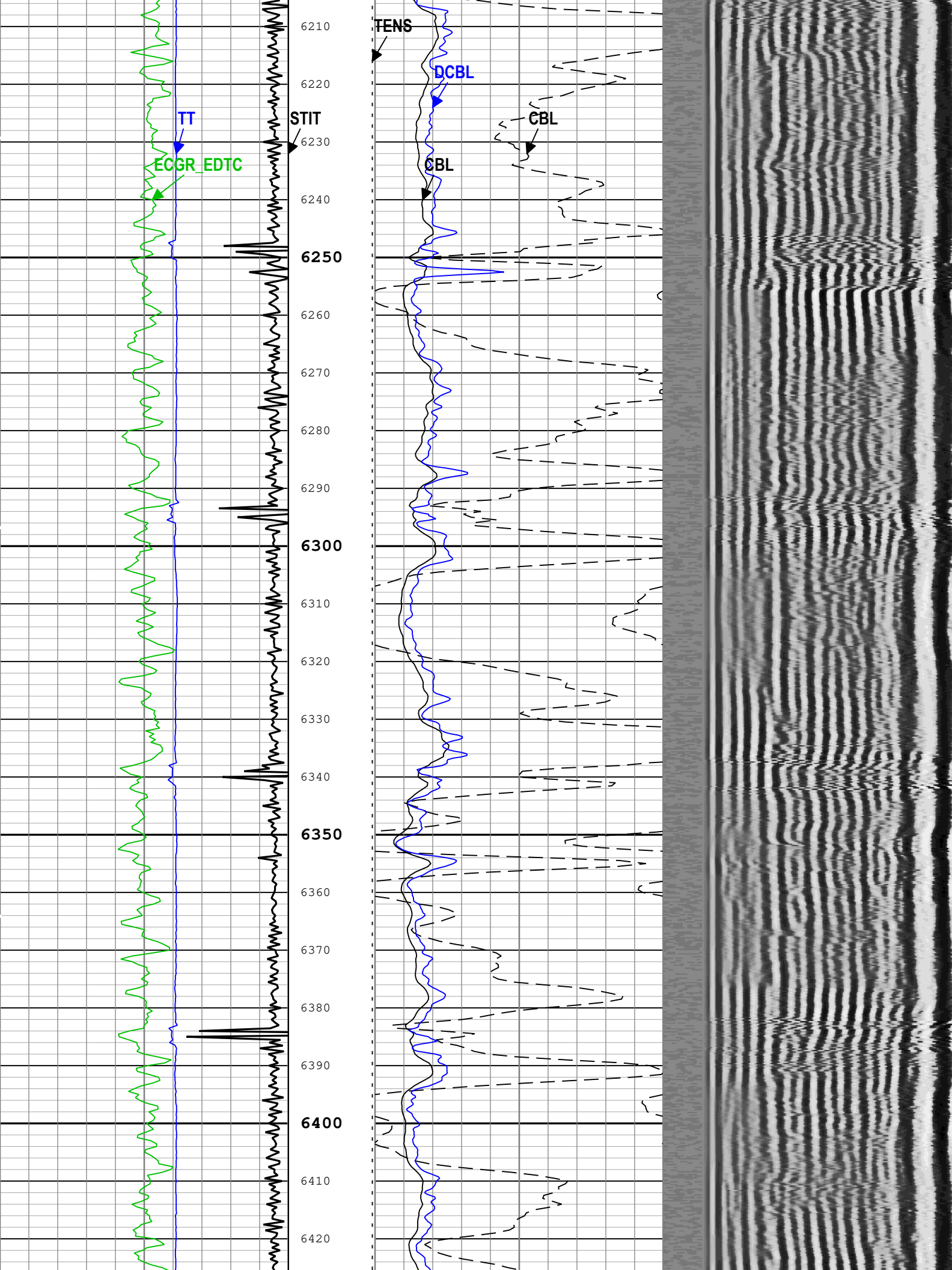


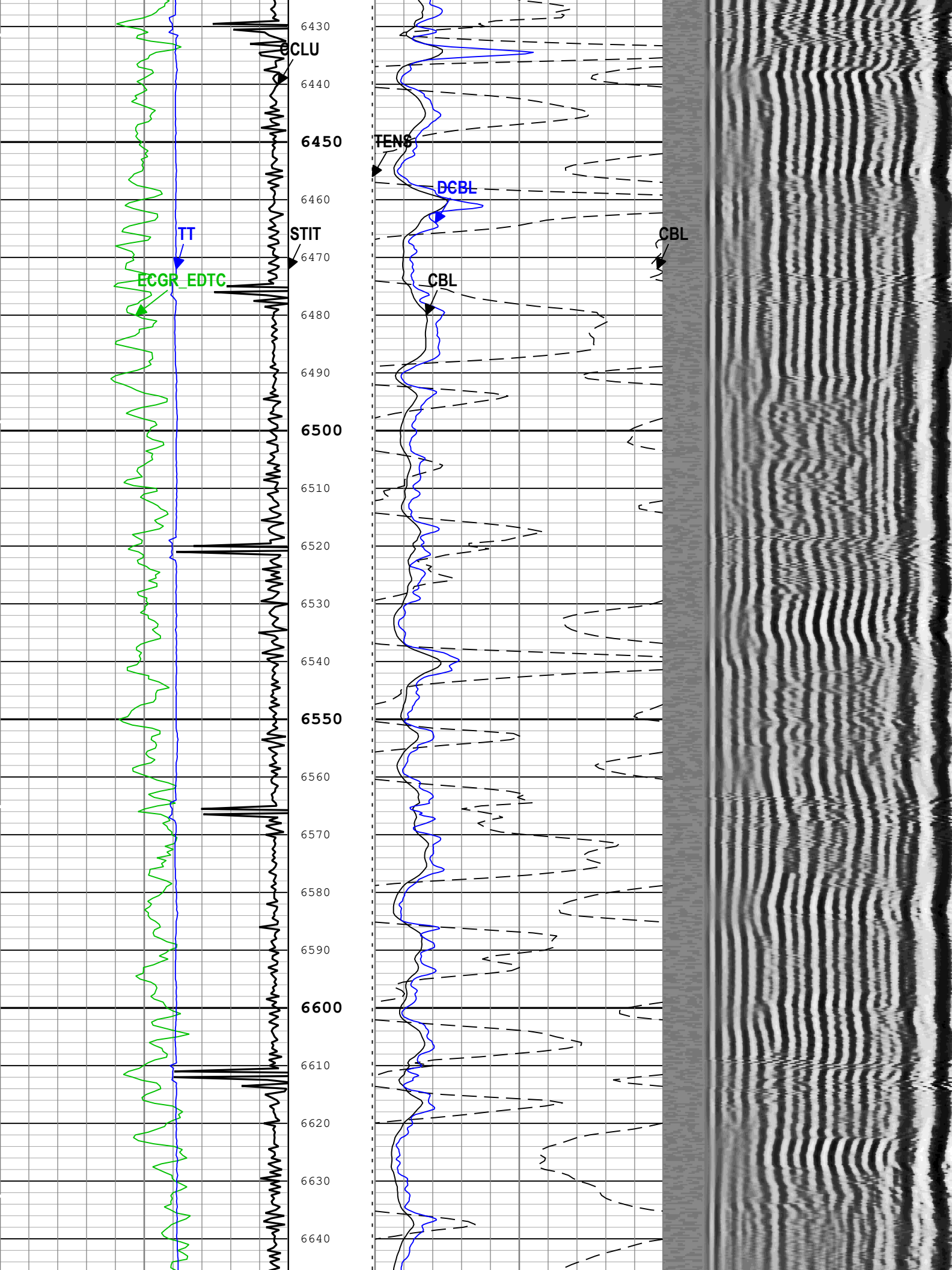


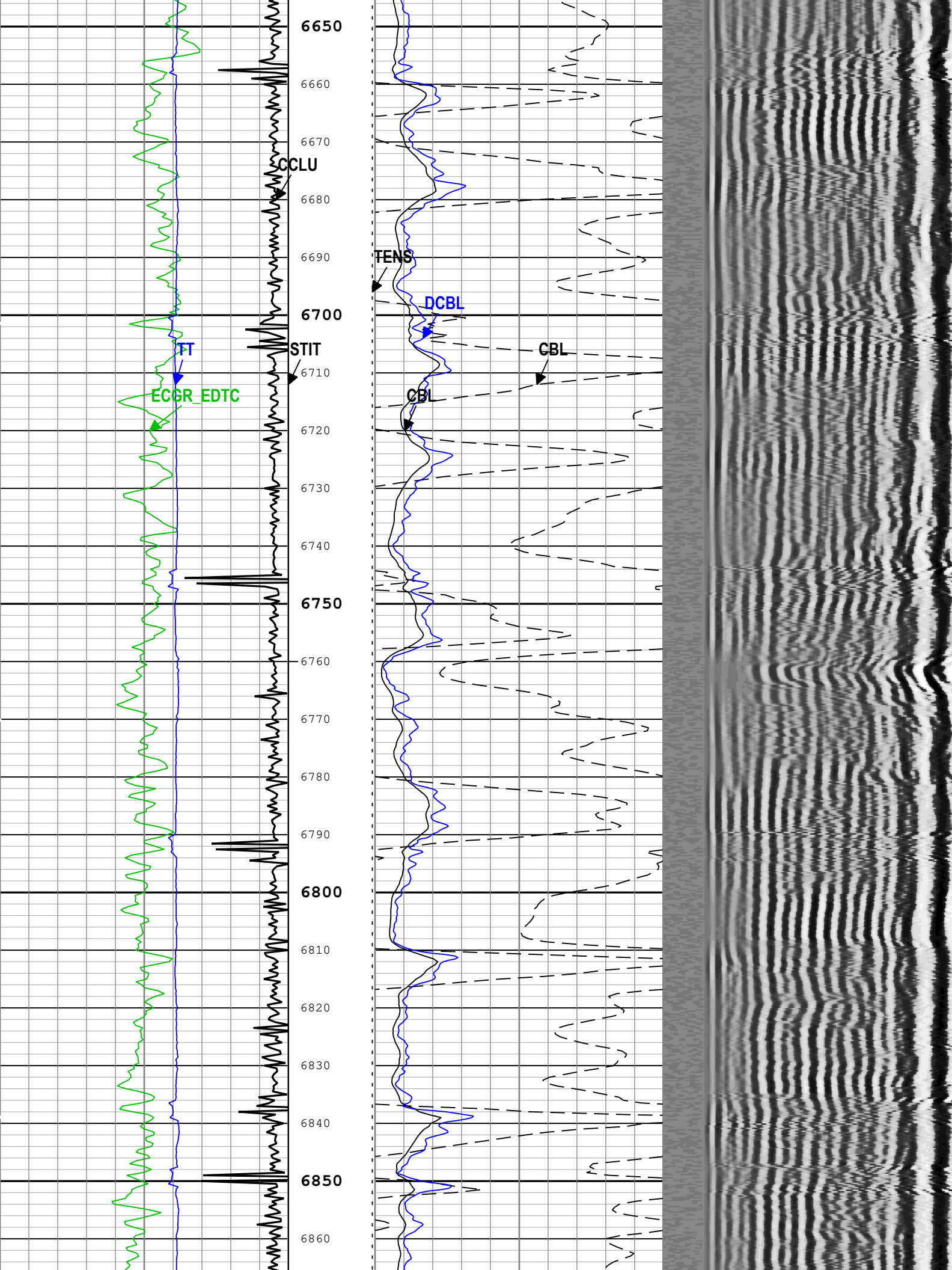


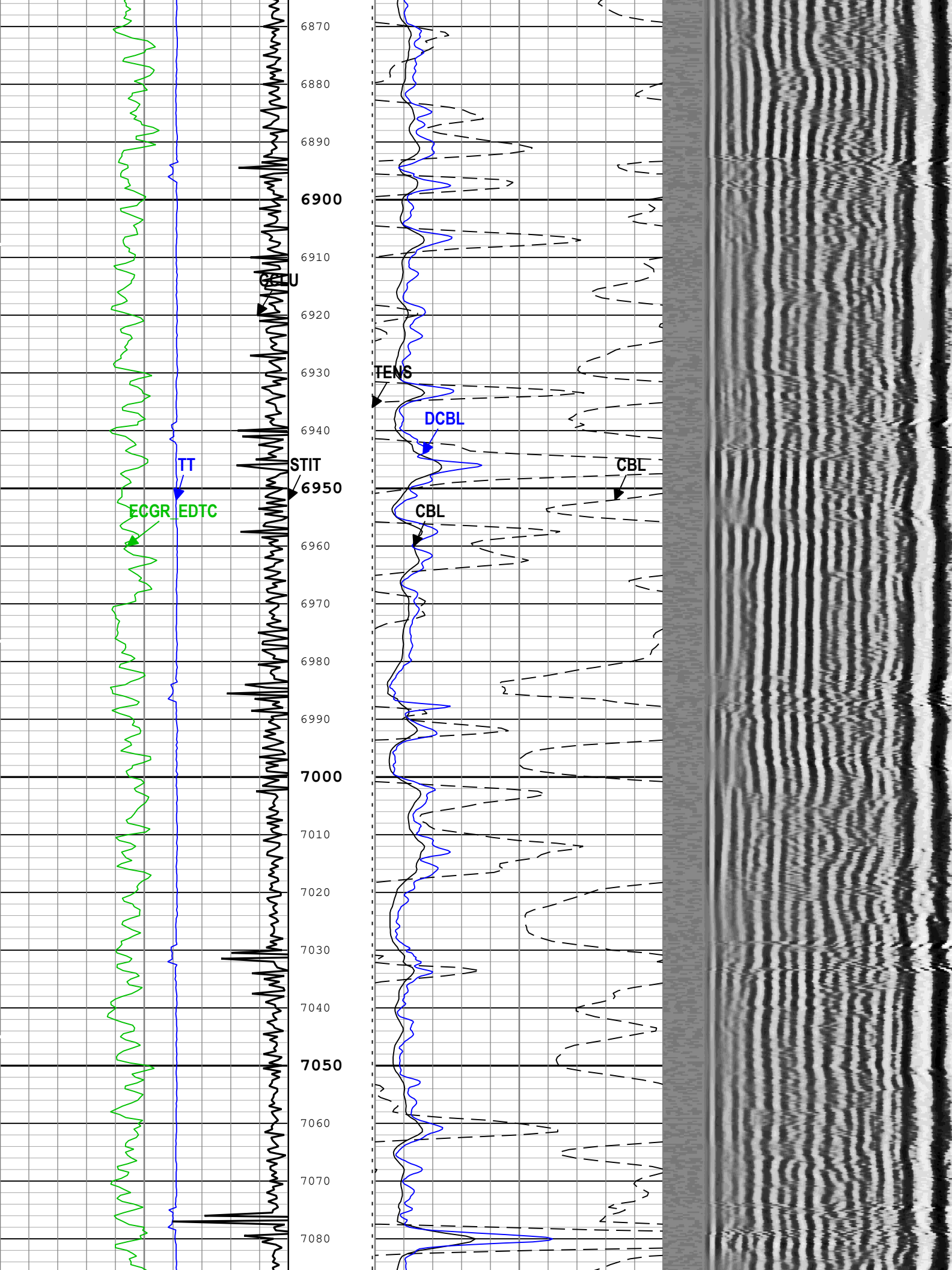


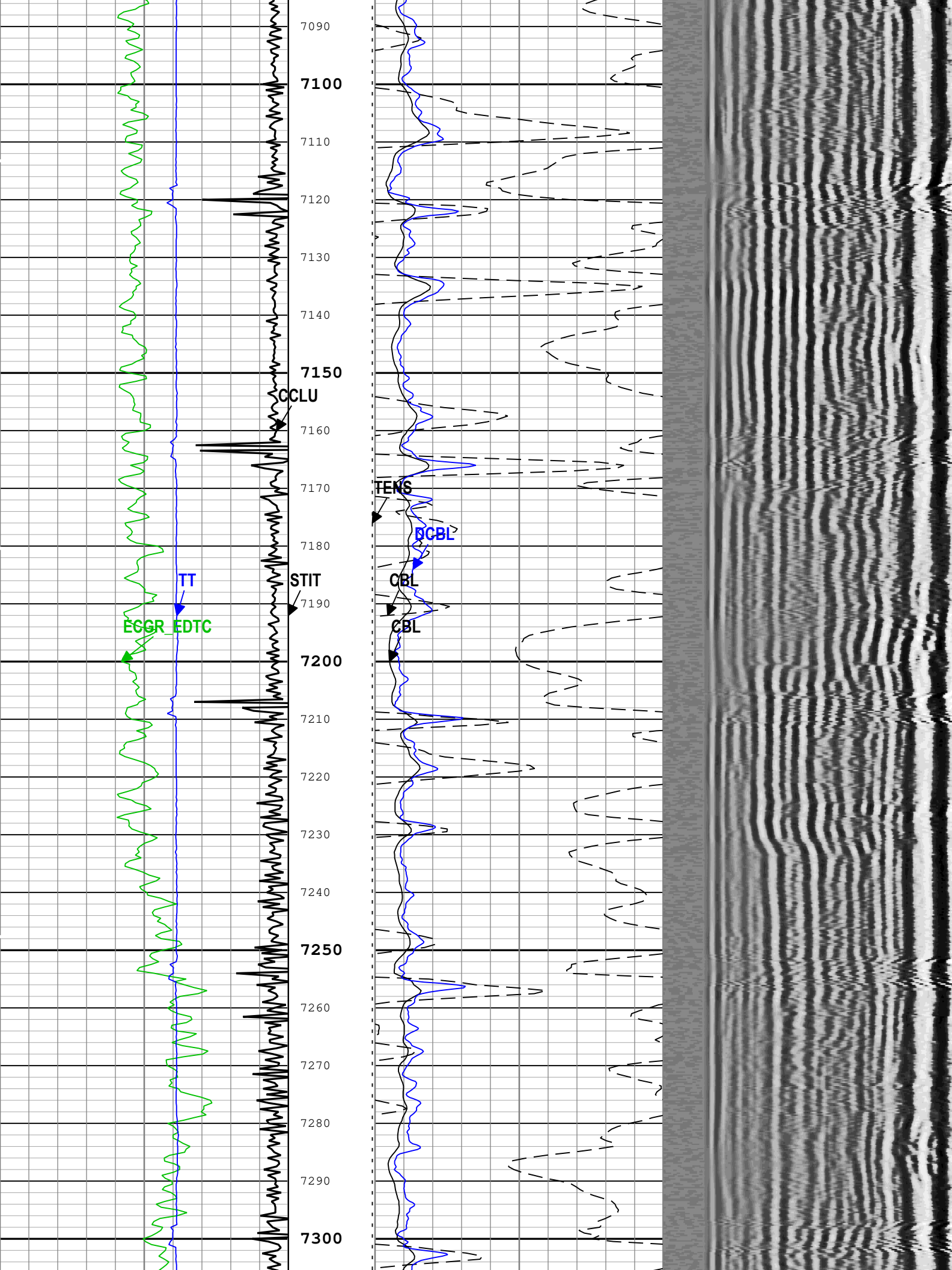


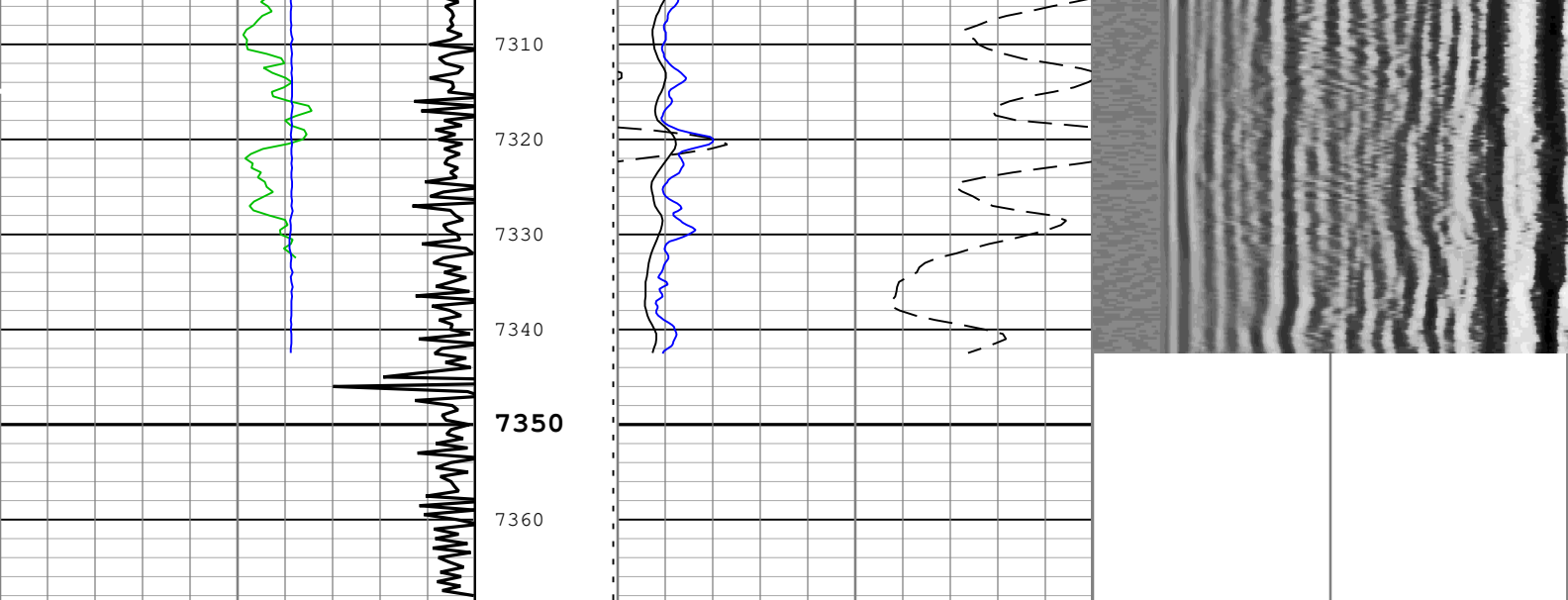












Gamma Ray (ECGR_EDTC) EDTC-B[1] 0 gAPI 150	Stuck Tool Indicator, Total (STIT) 0 ft 50	CBL Amplitude (CBL) ASLT-B[1] 0 mV 100	Min Amplitude Max
Transit Time for CBL (TT) ASLT-B[1] 400 us 200	Cable Tension (TENS) 10000 lbf 0	CBL Amplitude (CBL) ASLT-B[1] 0 mV 10	Variable Density Log (VDL) ASLT-B[1] 100 us 700
Casing Collar Locator Ultrasonic (CCLU) USIT-E[1] -19 in 1	Cable Drag Tool_Tot. Drag	Synthetic CBL from Discriminated Attenuation (DCBL) ASLT-B[1] 0 mV 100	

TIME_1900 - Time Marked every 60.00 (s)

— BIEP - Bond Index Event Pips ASLT-B[1]

Description: CBL_VDL Format: Log (DSLT ASLT_CBL-VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-Apr-2022 01:51:49

Channel Processing Parameters				
1A: Parameters				
Parameter	Description	Tool	Value	Unit
BARI(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	15833	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	ASLT-B	72	mV
CDEN	Cement Density	USIT-E	1.55	g/cm3
CDEN	Cement Density	EDTC-B	2	g/cm3
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.361	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTF	Delta-T Fluid	Borehole	189	us/ft
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FCF	CBL Fluid Compensation Factor	ASLT-B	1.01	

	Fluid Density	USIT-E	1.44	g/cm3
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	Good Bond	ASLT-B	4.3	mV
GOBO_CURR	Good Bond in Arbitrary Cement	ASLT-B	4.3	mV
HEMA	Hematite Presence Flag	Borehole	No	
IBC_FRP_OFFSET	IBC Flexural Offset from Free Pipe	USIT-E	-7.85	dB/m
IBC_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	IBC_FRP_OFFSET	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	FreePipe Norm.	
IMAR	Image Rotation	USIT-E	Off	
MATT	Maximum Attenuation	ASLT-B	11.85	dB/ft
MATT_CURR	Maximum Attenuation in Arbitrary Cement	ASLT-B	11.85	dB/ft
MCI	Minimum Cemented Interval for Isolation	ASLT-B	Depth Zoned	ft
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MSA	Minimum Sonic Amplitude	ASLT-B	2.12	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	ASLT-B	2.12	mV
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.31	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.29	
RUN_SNUM	Run Sequence Number	WSDRUN	1	
THDH	Maximum Search Thickness (percentage of nominal)	USIT-E	120	%
THDL	Minimum Search Thickness (percentage of nominal)	USIT-E	80	%
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.87	Mrayl
U-USIT_UFAO	USIT Flexural Attenuation Offset	USIT-E	-5.7	dB/m
UFSFLT	Ultrasonic Flexural Surface Filter	USIT-E	LPF 250k	
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SolidLiquidGasMap	
ZMUD	Acoustic Impedance of Mud	Borehole	1.5	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

1ADepth Zoned Parameters			
Parameter	Value	Start (ft)	Stop (ft)
BS	13.5	44.5	1705
BS	8.5	1705	7369
MCI	14.81	44.5	1705
MCI	4.75	1705	7369
All depth are actual.			

Tool Control Parameters	
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1A: Parameters				
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	48	dB
EMXV	EMEX Voltage	USIT-E	Time Zoned	V
IBC_ACQTYPE	IBC Acquisition type	USIT-E	1 MHz	
IBC_FLEXDBP	IBC Flex Duration Before Peak	USIT-E	30	us
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	4010	ft/h
MODE	SSLT Firing Mode	ASLT-B	Attenuation	
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 6.0 in	

U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VDM	SSLT VDL Display Mode	ASLT-B	R5	
VRES	Vertical Resolution	USIT-E	6.0 in	

1A Time Zoned Parameters

Pass Main[3]:Up					
Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	40	09-Apr-2022 16:20:47	09-Apr-2022 16:50:54	7368.84	5356.61
EMXV	35	09-Apr-2022 16:50:54	09-Apr-2022 17:05:09	5356.61	4389.09
EMXV	30	09-Apr-2022 17:05:09	09-Apr-2022 17:39:40	4389.09	2914.84

Pass Main[4]:Up					
EMXV	30	09-Apr-2022 17:51:15	09-Apr-2022 18:14:52	2914.84	1512.77
EMXV	40	09-Apr-2022 18:14:52	09-Apr-2022 18:36:43	1512.77	80.84

All depth are at tool zero.

1A

Software Version	
Acquisition System	Version
Maxwell 2022.0	12.0.215014.3100
Application Patch	Wireline_Hotfix-Mandatory-2022.0_12.0.216515

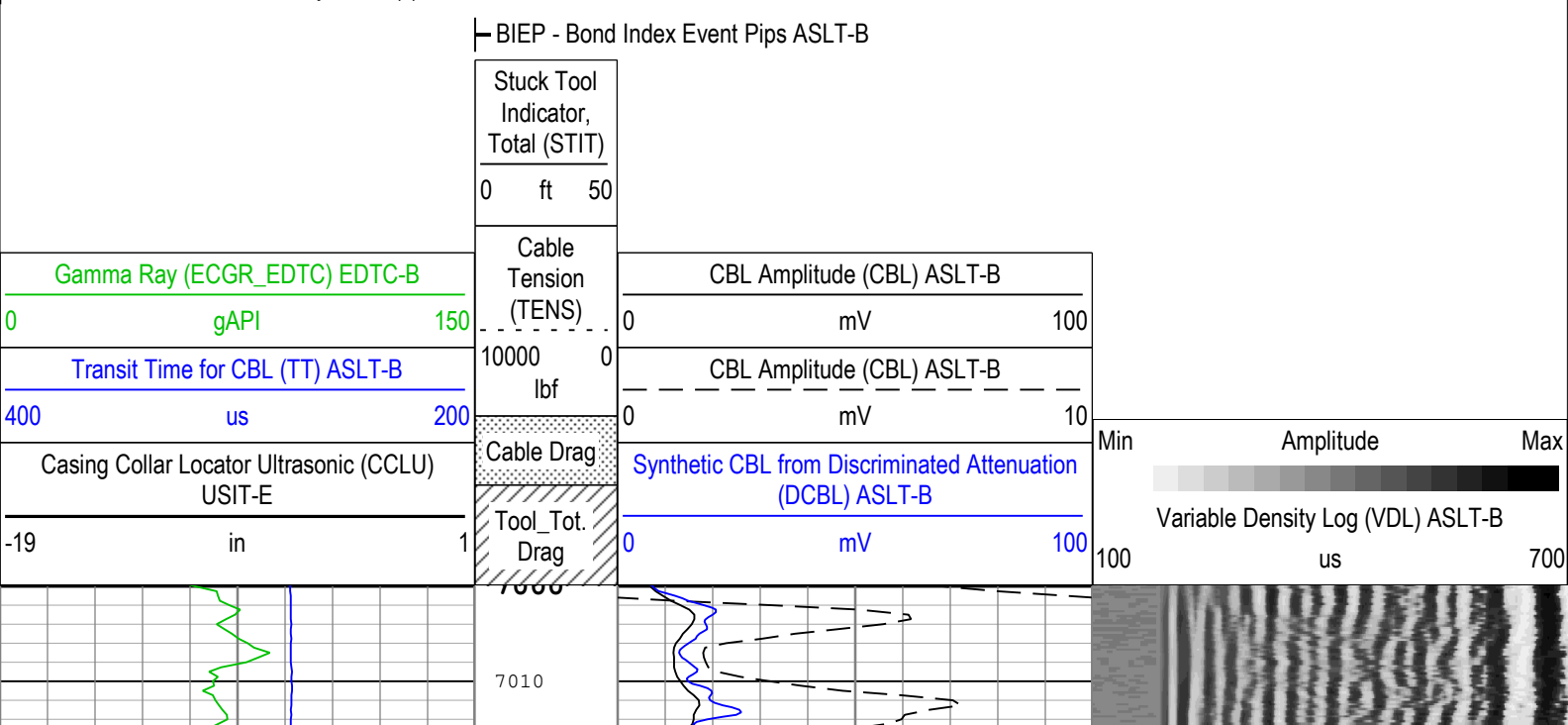
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
1A	Repeat[2]:Up	Up	7016.04 ft	7387.49 ft	09-Apr-2022 3:49:12 PM	09-Apr-2022 4:17:31 PM	ON	17.78 ft	Yes

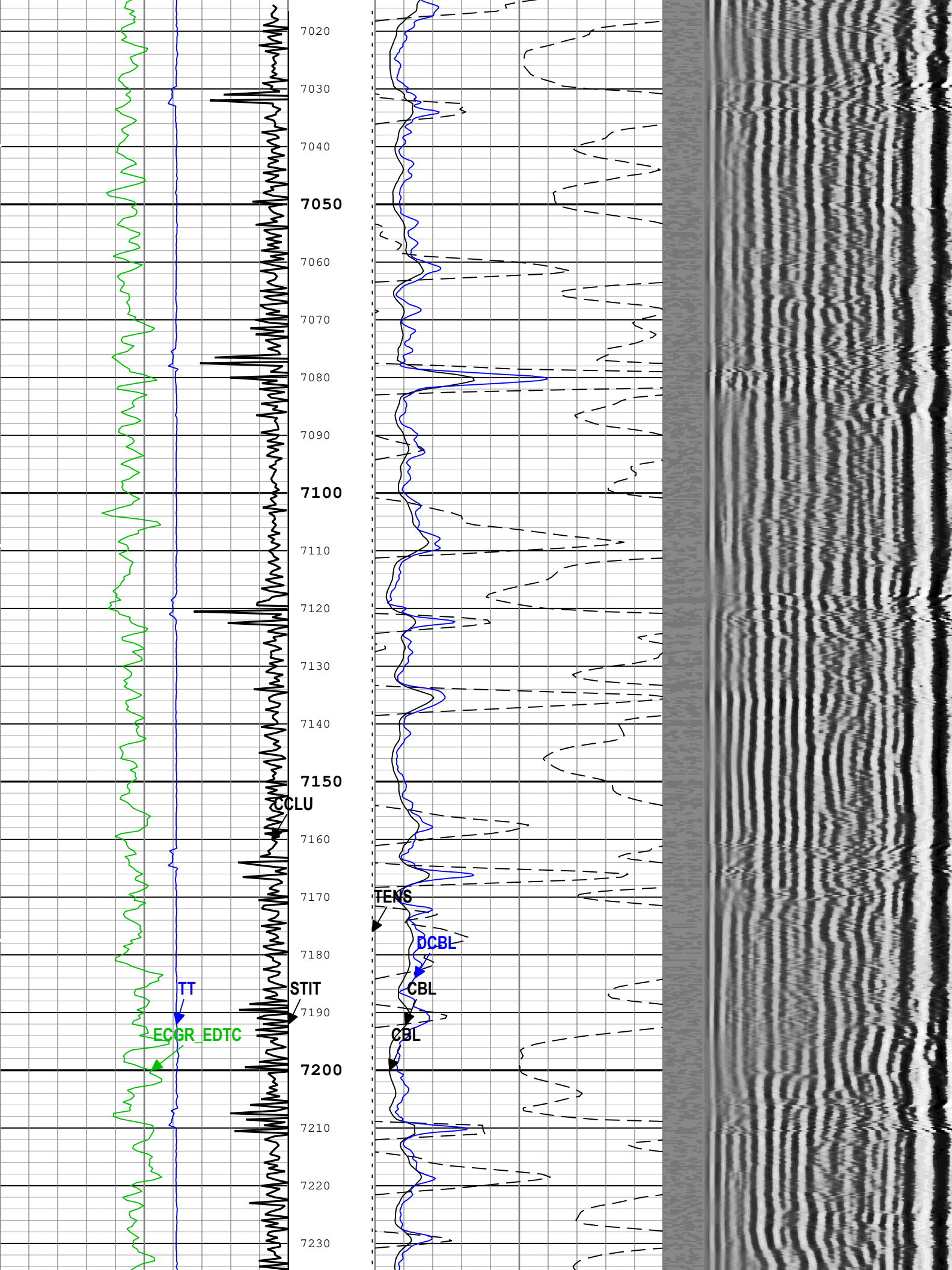
All depths are referenced to toolstring zero

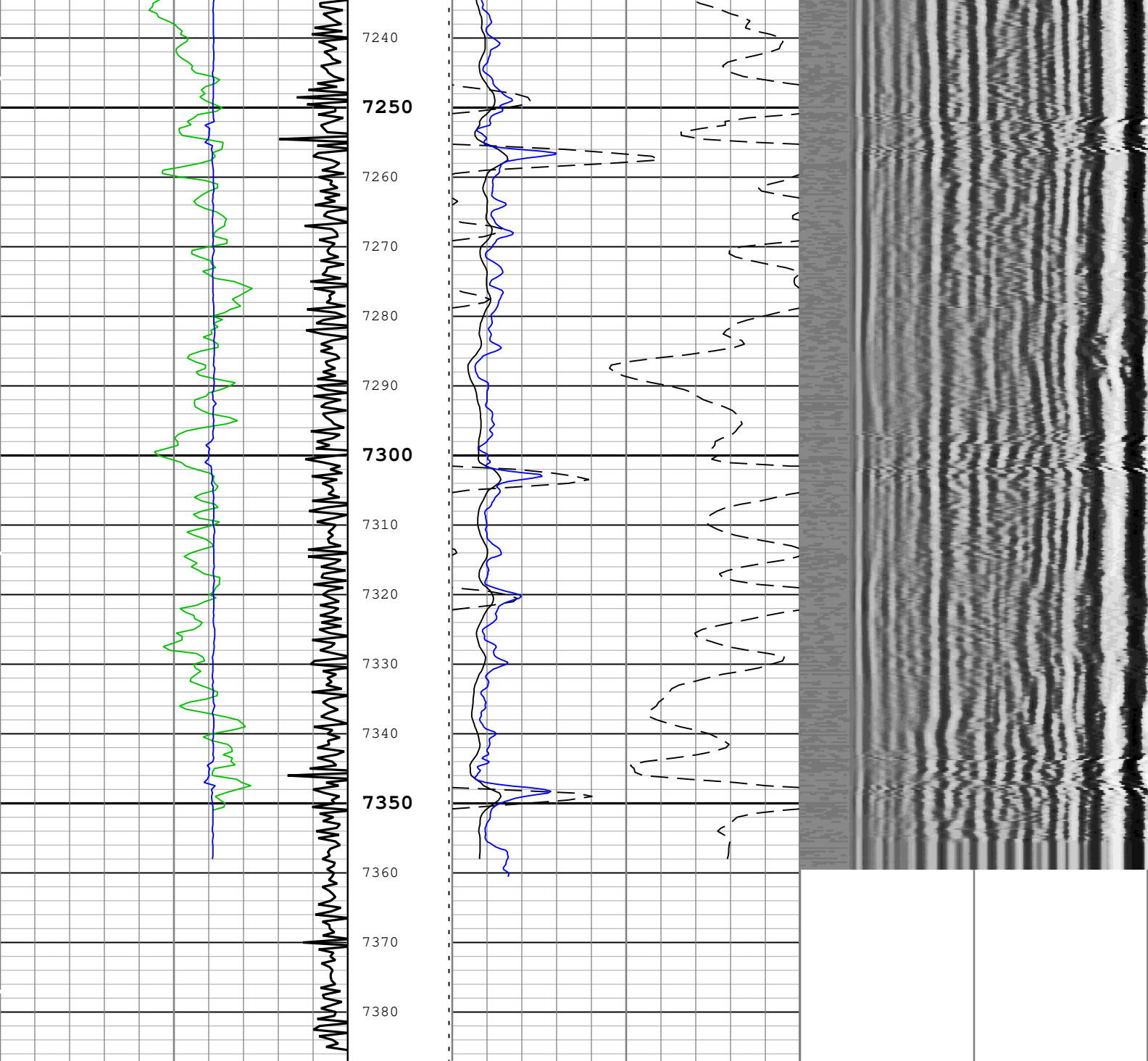
Log	Company:PDC Energy Inc Well:Vega #2N 1A: Repeat[2]:Up:S004
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Description: CBL_VDL Format: Log (DSLT ASLT_CBL-VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-Apr-2022 01:52:00

TIME_1900 - Time Marked every 60.00 (s)







<div>Gamma Ray (ECGR_EDTC) EDTC-B</div> <div>0gAPI150</div> <div>Transit Time for CBL (TT) ASLT-B</div> <div>400us200</div> <div>Casing Collar Locator Ultrasonic (CCLU) USIT-E</div> <div>-19in1</div>	<div>Stuck Tool Indicator, Total (STIT)</div> <div>0ft50</div> <div>Cable Tension (TENS)</div> <div>100000lbf</div> <div>Cable Drag</div> <div>Tool_Tot. Drag</div>	<div>CBL Amplitude (CBL) ASLT-B</div> <div>0mV100</div> <div>CBL Amplitude (CBL) ASLT-B</div> <div>0mV10</div> <div>Synthetic CBL from Discriminated Attenuation (DCBL) ASLT-B</div> <div>0mV100</div>	<div>Min</div> <div>Amplitude</div> <div>Max</div> <div></div> <div>Variable Density Log (VDL) ASLT-B</div> <div>100us700</div>
<div>BIEP - Bond Index Event Pips ASLT-B</div>			

TIME_1900 - Time Marked every 60.00 (s)

Description: CBL_VDL - Format: Log (DSLT ASLT, CBL_VDL) - Index Scale: 5 in per 100 ft - Index Unit: ft - Index Type: Measured Depth - Creation Date:

Channel Processing Parameters				
1A: Parameters				
Parameter	Description	Tool	Value	Unit
BARI(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	8.5	in
CBLO	Casing Bottom (Logger)	WLSESSION	15833	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	ASLT-B	72	mV
CDEN	Cement Density	USIT-E	1.55	g/cm3
CDEN	Cement Density	EDTC-B	2	g/cm3
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.361	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTF	Delta-T Fluid	Borehole	189	us/ft
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FCF	CBL Fluid Compensation Factor	ASLT-B	1.01	
FD	Fluid Density	USIT-E	1.44	g/cm3
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	Good Bond	ASLT-B	4.3	mV
GOBO_CURR	Good Bond in Arbitrary Cement	ASLT-B	4.3	mV
HEMA	Hematite Presence Flag	Borehole	No	
IBC_FRP_OFFSET	IBC Flexural Offset from Free Pipe	USIT-E	-7.85	dB/m
IBC_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	IBC_FRP_OFFSET	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	FreePipe Norm.	
IMAR	Image Rotation	USIT-E	Off	
MATT	Maximum Attenuation	ASLT-B	11.85	dB/ft
MATT_CURR	Maximum Attenuation in Arbitrary Cement	ASLT-B	11.85	dB/ft
MCI	Minimum Cemented Interval for Isolation	ASLT-B	4.75	ft
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MSA	Minimum Sonic Amplitude	ASLT-B	2.12	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	ASLT-B	2.12	mV
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.31	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.29	
RUN_SNUM	Run Sequence Number	WSDRUN	1	
THDH	Maximum Search Thickness (percentage of nominal)	USIT-E	120	%
THDL	Minimum Search Thickness (percentage of nominal)	USIT-E	80	%
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.87	Mrayl
U-USIT_UFAO	USIT Flexural Attenuation Offset	USIT-E	-5.7	dB/m
UFSFILT	Ultrasonic Flexural Surface Filter	USIT-E	LPF 250k	
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SolidLiquidGasMap	
ZMUD	Acoustic Impedance of Mud	Borehole	1.5	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

1A: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	48	dB
EMXV	EMEX Voltage	USIT-E	40	V
IBC_ACQTYPE	IBC Acquisition type	USIT-E	1 MHz	
IBC_FLEXDBP	IBC Flex Duration Before Peak	USIT-E	30	us
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	4010	ft/h
MODE	SSLT Firing Mode	ASLT-B	Attenuation	
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 6.0 in	
U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VDM	SSLT VDL Display Mode	ASLT-B	R5	
VRES	Vertical Resolution	USIT-E	6.0 in	

1A

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
1A	Repeat[2]:Up	Up	7016.04 ft	7387.49 ft	09-Apr-2022 3:49:12 PM	09-Apr-2022 4:17:31 PM	ON	17.78 ft	Yes
1A	Main[3]:Up	Up	2751.53 ft	7386.89 ft	09-Apr-2022 4:20:47 PM	09-Apr-2022 5:39:40 PM	ON	17.59 ft	Yes

All depths are referenced to toolstring zero

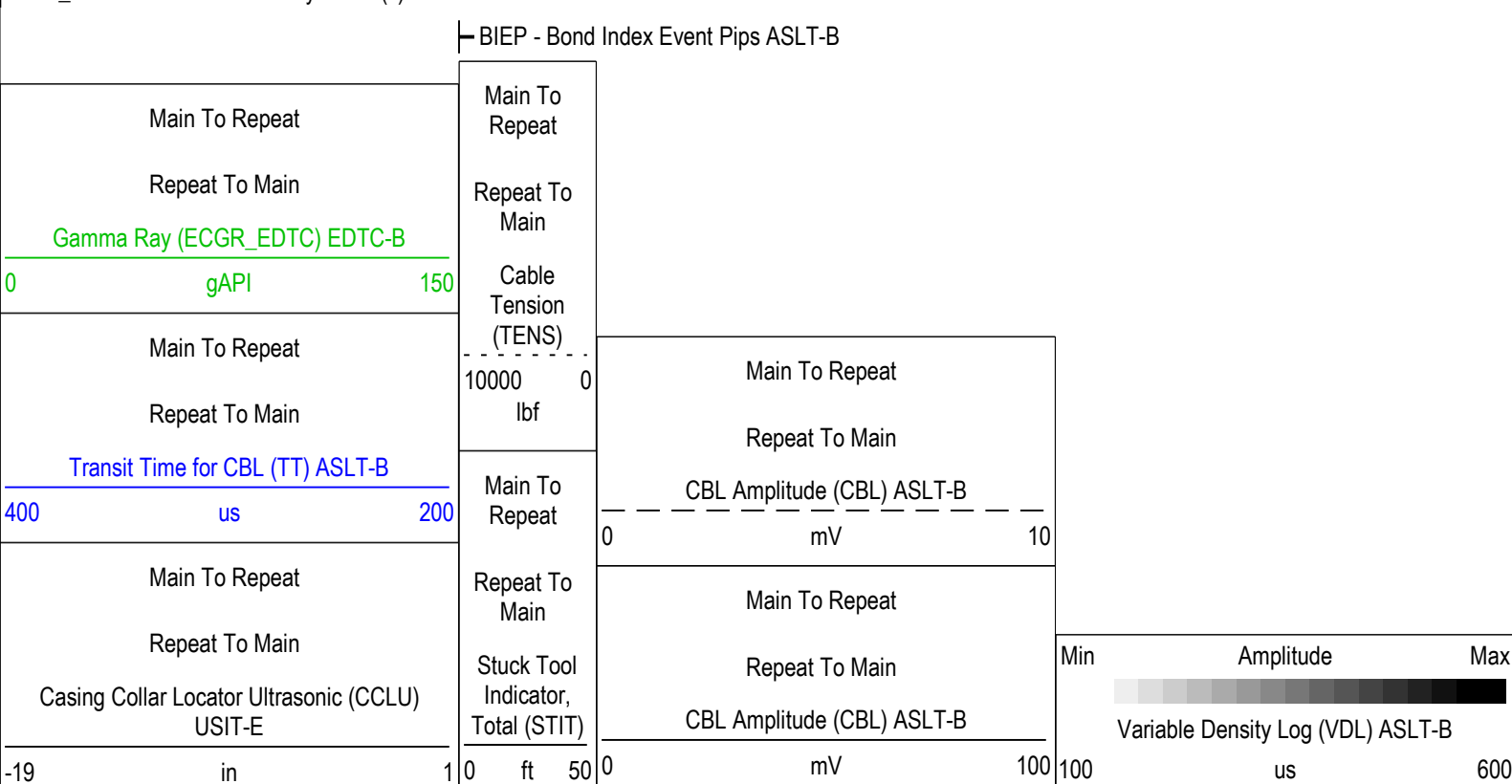
Log

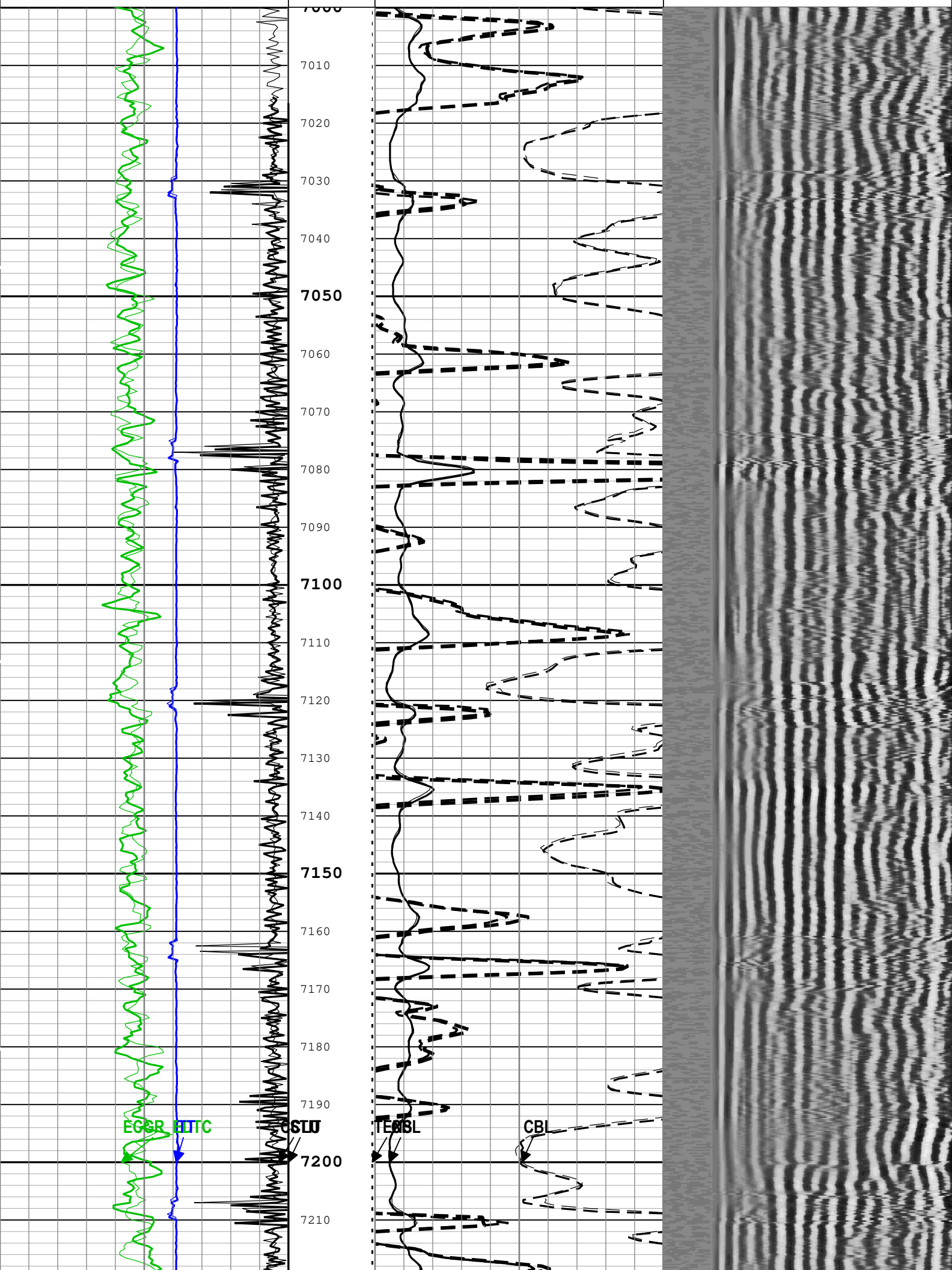
Company:PDC Energy Inc Well:Vega #2N

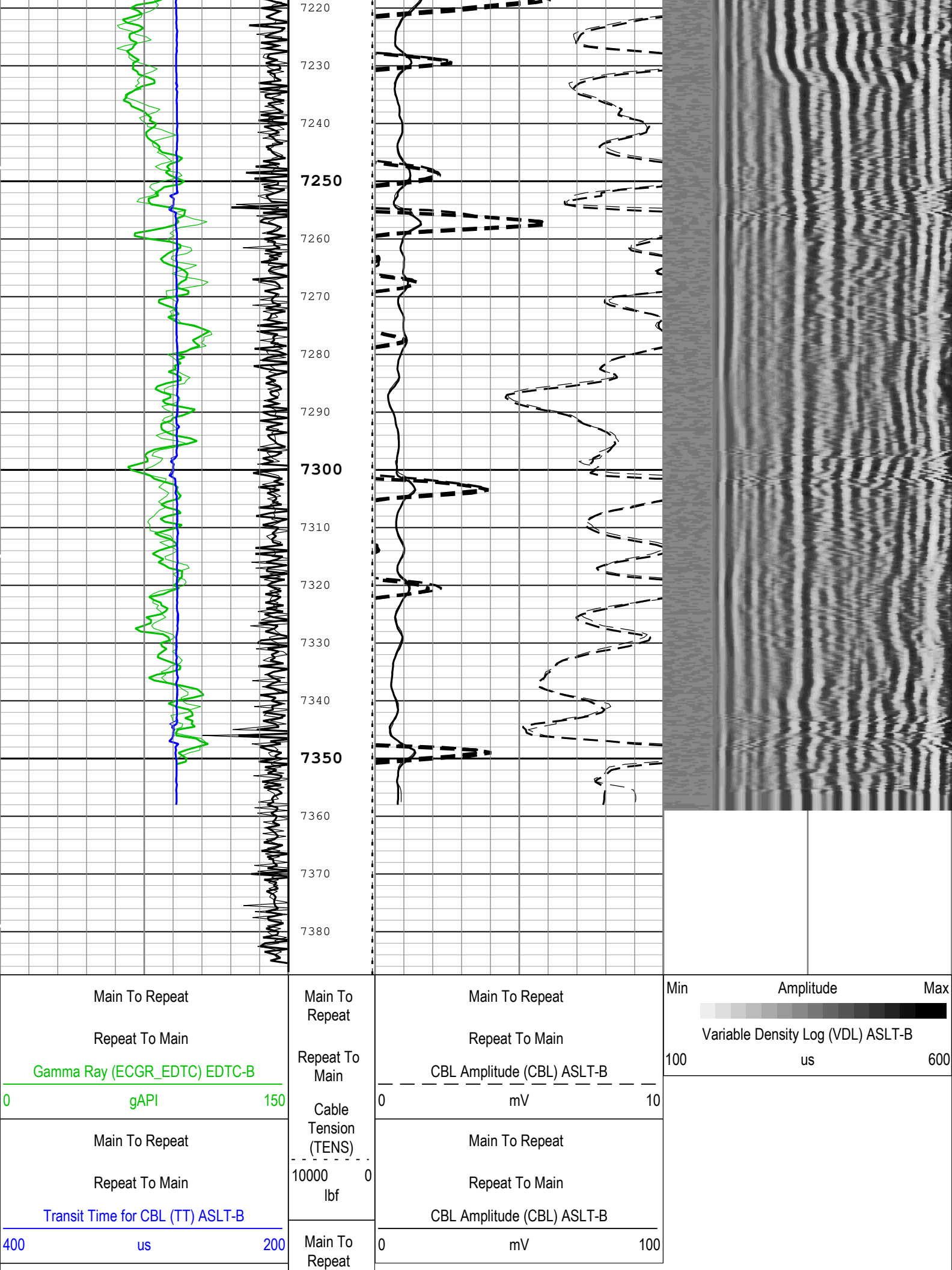
1A: Main[3]:Up:S004

Description: CBL_VDL Format: Log (DSLT ASLT_CBL-VDL RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-Apr-2022 01:52:02

TIME_1900 - Time Marked every 60.00 (s)







Main To Repeat	Repeat To Main
Repeat To Main	Stuck Tool Indicator, Total (STIT)
Casing Collar Locator Ultrasonic (CCLU) USIT-E	
-19 in 1	0 ft 50
	└─ BIEP - Bond Index Event Pips ASLT-B
TIME_1900 - Time Marked every 60.00 (s)	
Description: CBL_VDL Format: Log (DSLT ASLT_CBL-VDL RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-Apr-2022 01:52:02	

Company:	PDC Energy Inc	Schlumberger
Well:	Vega #2N	
Field:	Wattenberg	
County:	Weld	
Country:	United States of America - US	
Cement Bond Log		
Variable Density Log		
Gamma Ray - CCL		