

Company: Whiting Oil & Gas Corporation

Well: Razor 250-2412

Field: Wildcat

County: Weld State: Colorado

Cement Bond Log
GR-CCL

County:	Weld		
Field:	Wildcat		
Location:	SWSE Sec 25, T10N, R58W		
Well:	Razor 250-2412		
Company:	Whiting Oil & Gas Corporation		
Location:	SWSE Sec 25, T10N, R58W	Elev.: K.B. 4739.00 ft	
	SHL: 331' FNL x 1880' FEL	G.L. 4718.00 ft	
	Lat/Long: 40.803461/-103.810089	D.F. 4738.00 ft	
	Permanent Datum:	Ground Level	Elev.: 4718.00 f
Log Measured From:		Kelly Bushing	21.00 ft above Perm.Datum
Drilling Measured From:		Kelly Bushing	
API Serial No.	Section:	Township:	Range:
05-123-42650	25	10N	58W
Logging Date	22-Sep-2016		

Run Number	One		
Depth Driller	15825.00 ft		
Schlumberger Depth	15825.00 ft		
Bottom Log Interval	4970.00 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	2110.00 ft		
To	15825.00 ft		
Casing/Tubing Size	5.5 in		
Weight	20 lbm/ft		
Grade	N/A		
From	21.00 ft		
To	15825.00 ft		
Max Recorded Temperatures	195 degF		
Logger on Bottom	22-Sep-2016	16:28:00	
Unit Number	Location:	Time	
2161			
Recorded By	B Kesek & B Marmon	FtMorgan	
Witnessed By	Bradd Kothe		

Disclaimer

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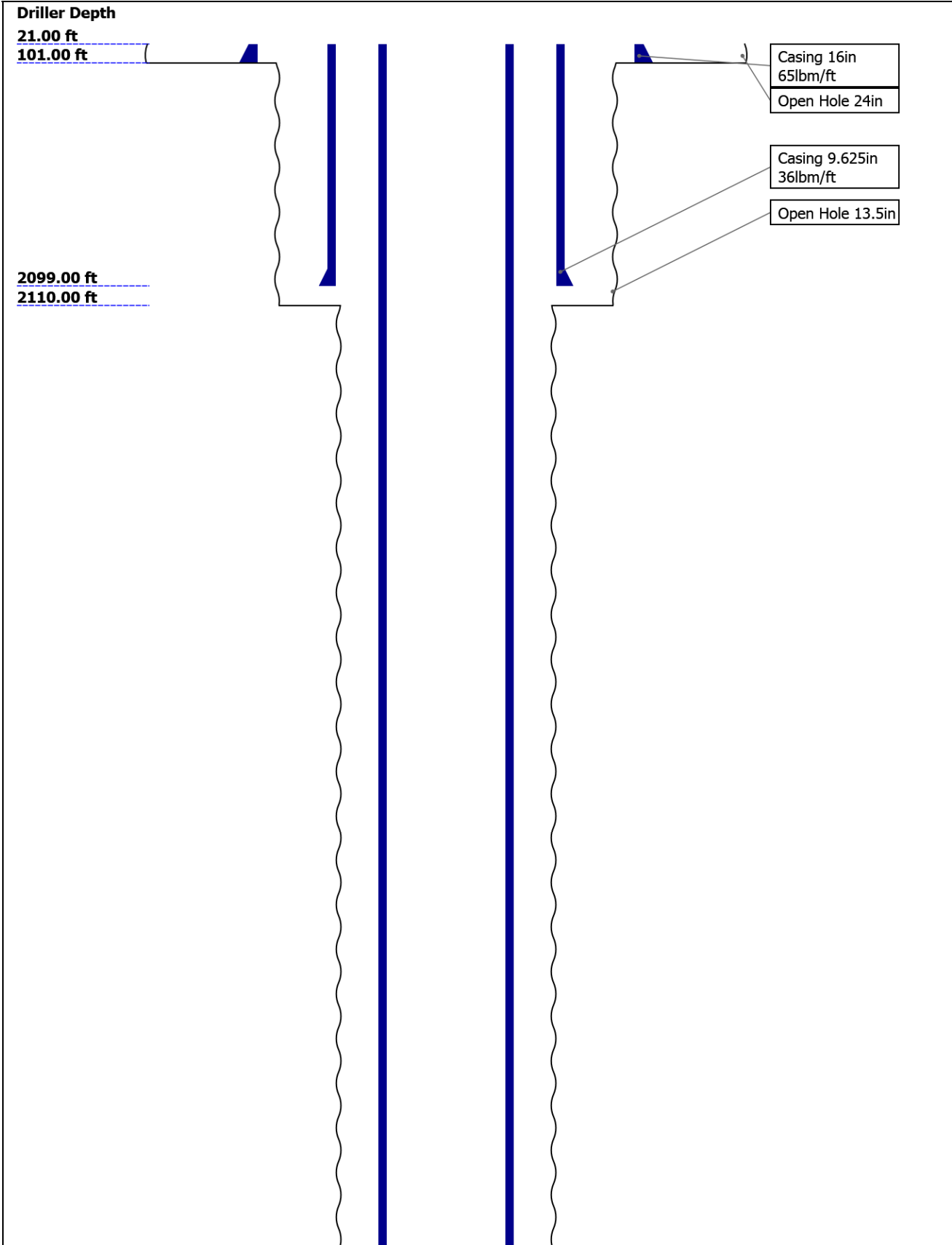
9.4 Log (Sonic CBL with VDL)

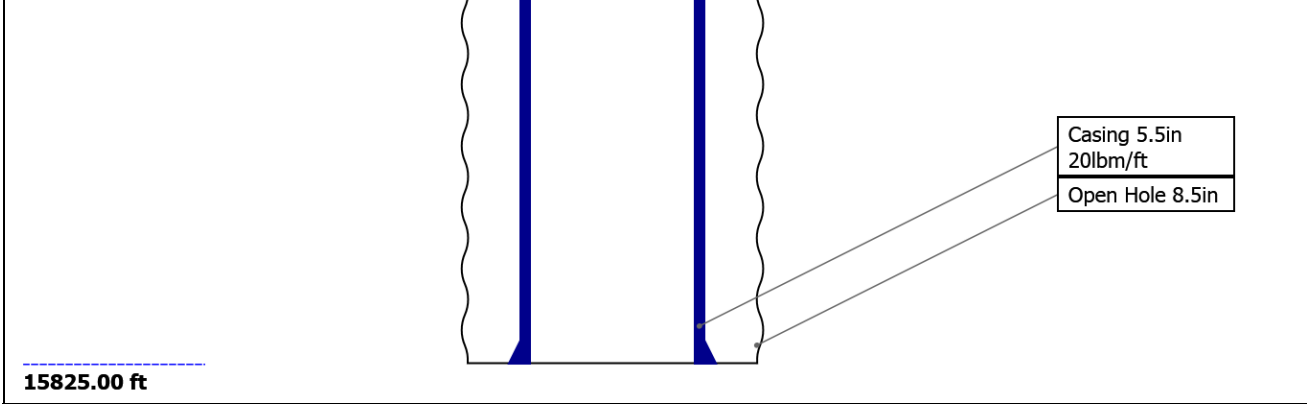
9.5 Parameter Listing

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Well Sketch






Borehole Size/Casing/Tubing Record

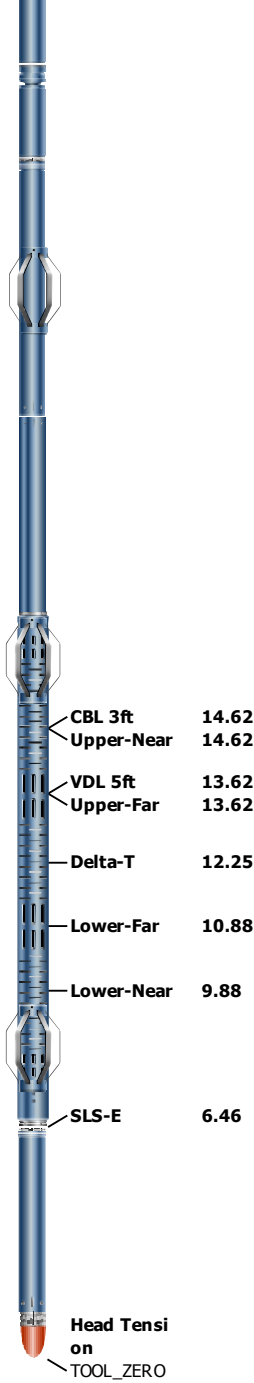
Bit						
Bit Size (in)	24	13.5	8.5			
Top Driller (ft)	21	101	2110			
Top Logger (ft)	21	101	2110			
Bottom Driller (ft)	101	2110	15825			
Bottom Logger (ft)	101	2110	15825			
Casing						
Size (in)	16	9.625	5.5			
Weight (lbm/ft)	65	36	20			
Inner Diameter (in)	15.25	8.921	4.778			
Grade	N/A	N/A	N/A			
Top Driller (ft)	21	21	21			
Top Logger (ft)	21	21	21			
Bottom Driller (ft)	101	2099	15825			
Bottom Logger (ft)	101	2099	15825			

Remarks and Equipment Summary

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

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

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	This is the first run in the well. All Schlumberger depth control procedures followed.
Rig Up Length At Surface		IDW used as primary depth control device.
Rig Up Length At Bottom		Z-Chart used as secondary depth control device.
Rig Up Length Correction		Depth correlated to short joint at 4822'.
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[3]:Up	Up	63.08 ft	5016.78 ft	22-Sep-2016 4:01:51 PM	22-Sep-2016 5:13:24 PM	ON	4.54 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Whiting Oil & Gas Corporation

Well:Razor 250-2412

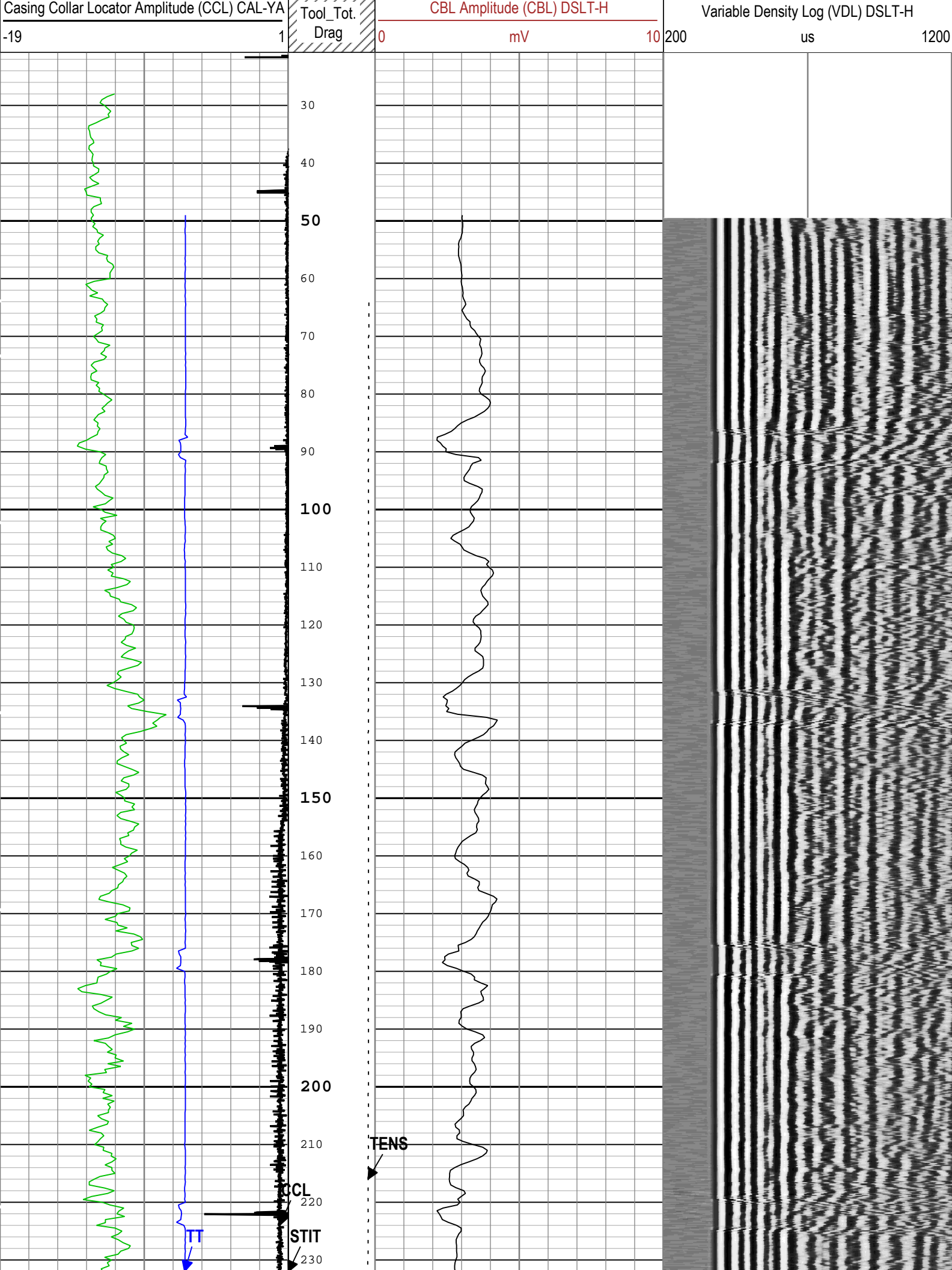
One: Log[3]:Up:S002

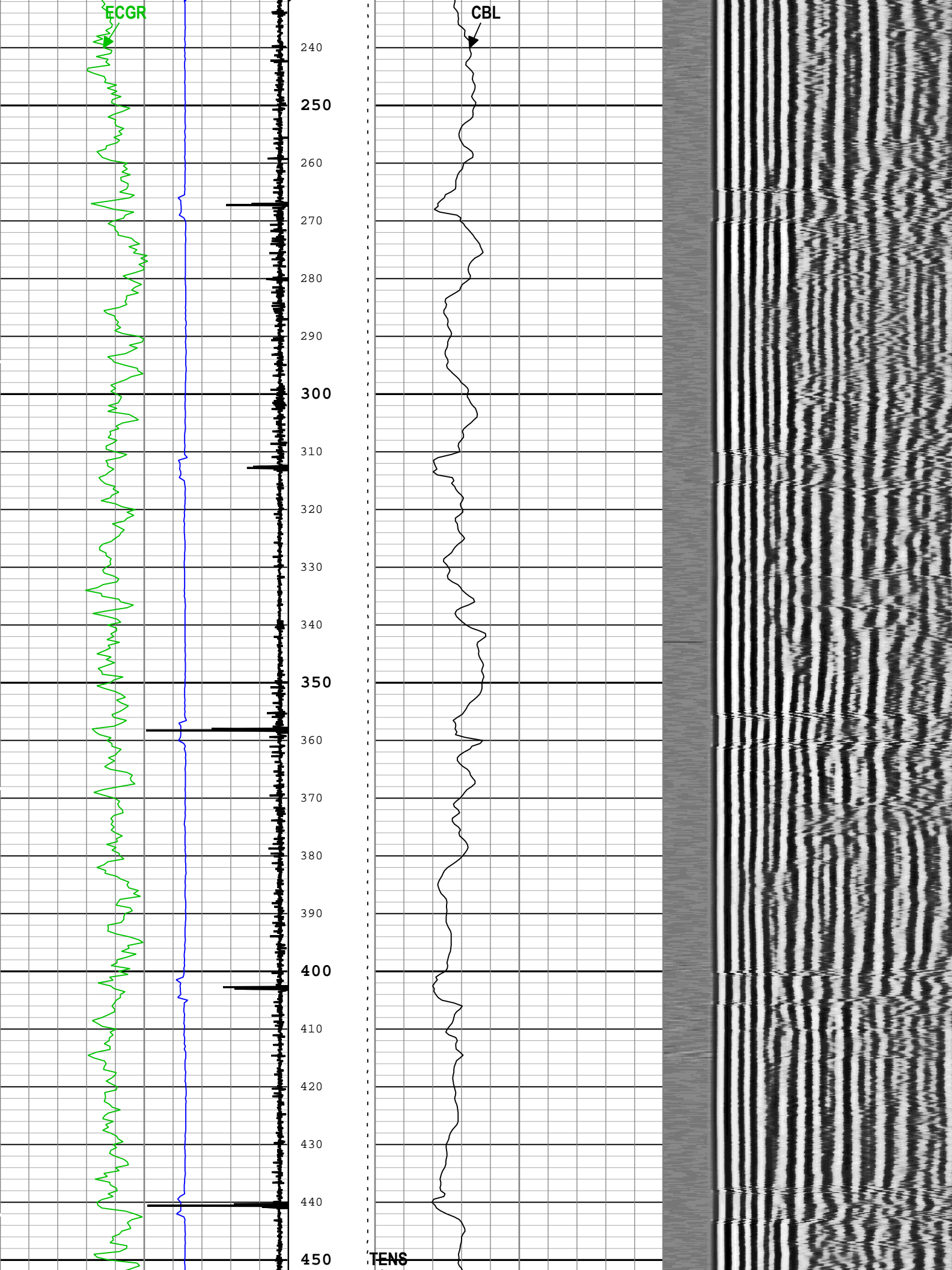
Description: CBL_VDL Format: Log (Sonic CBL with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 22-Sep-2016 17:20:59

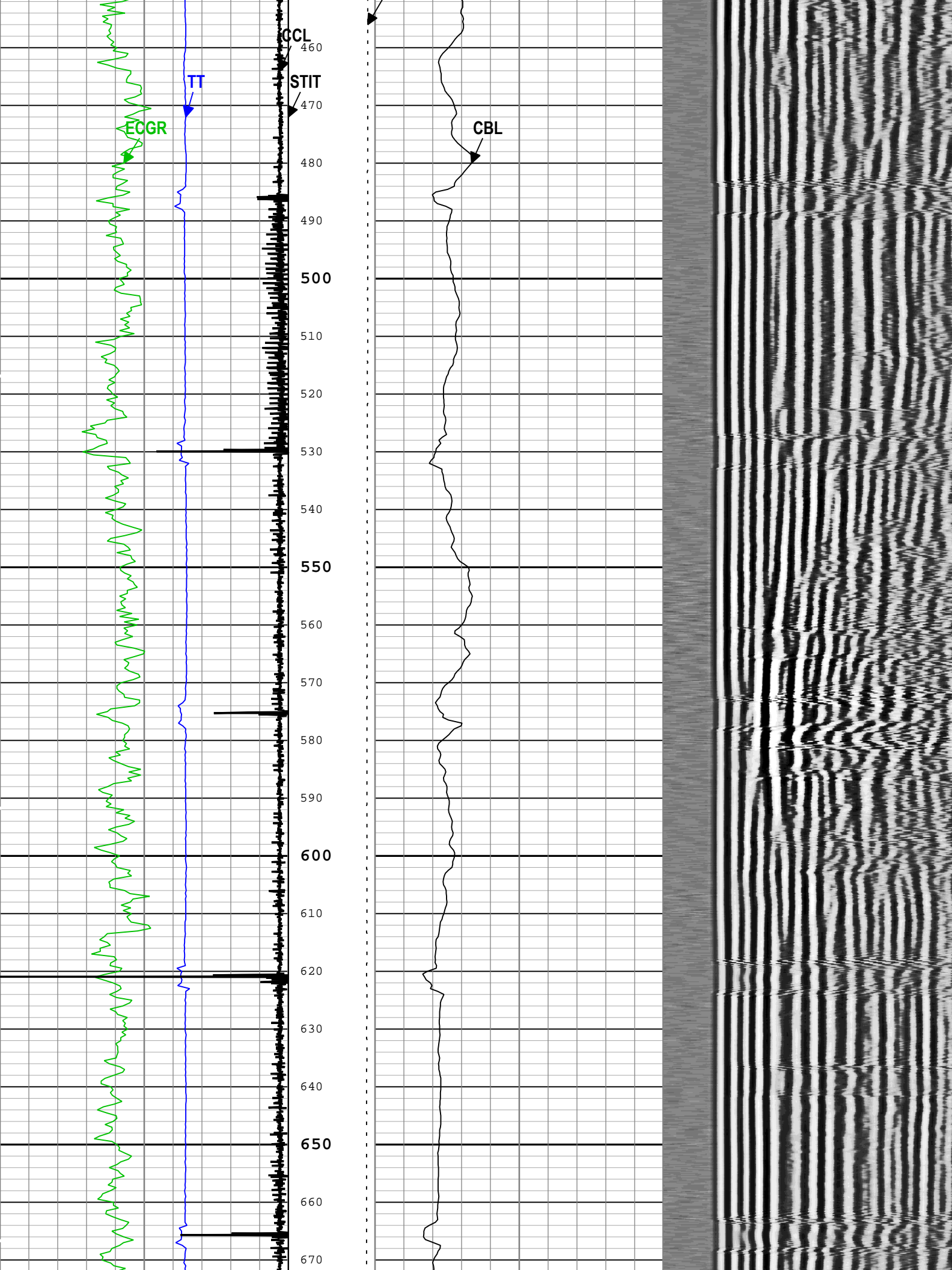
└ BIEP - Bond Index Event Pips DSLT-H

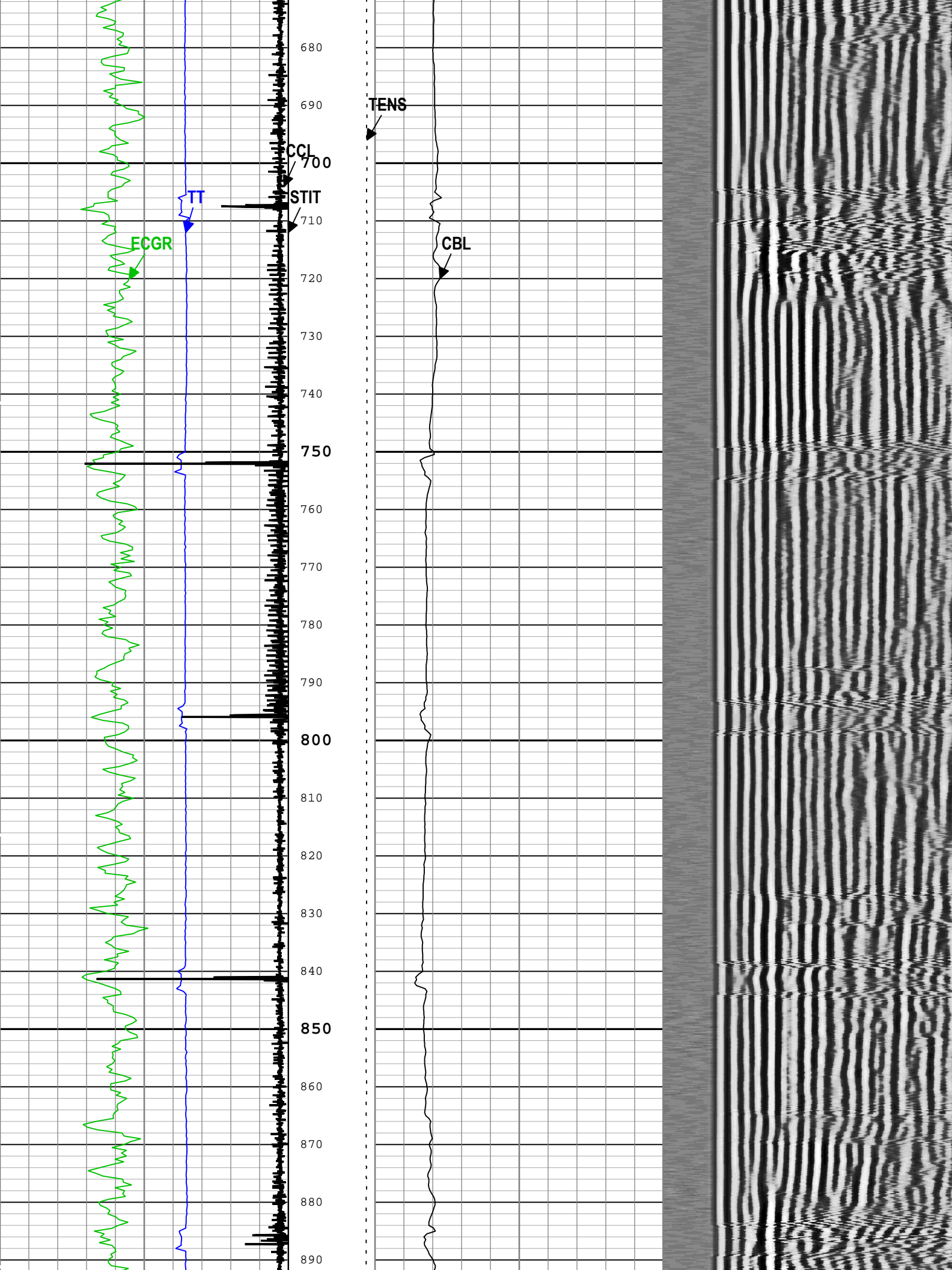
TIME_1900 - Time Marked every 60.00 (s)

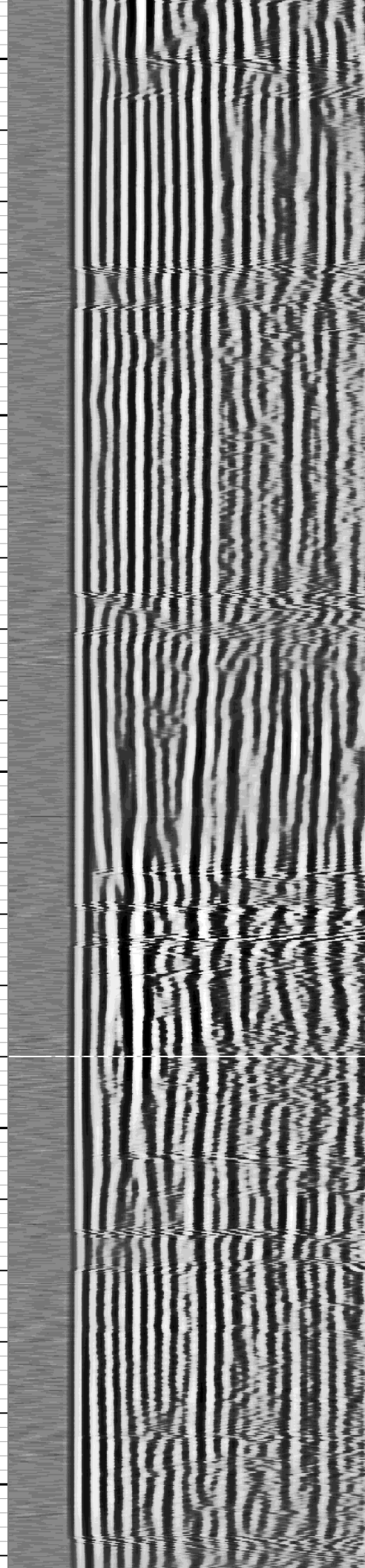
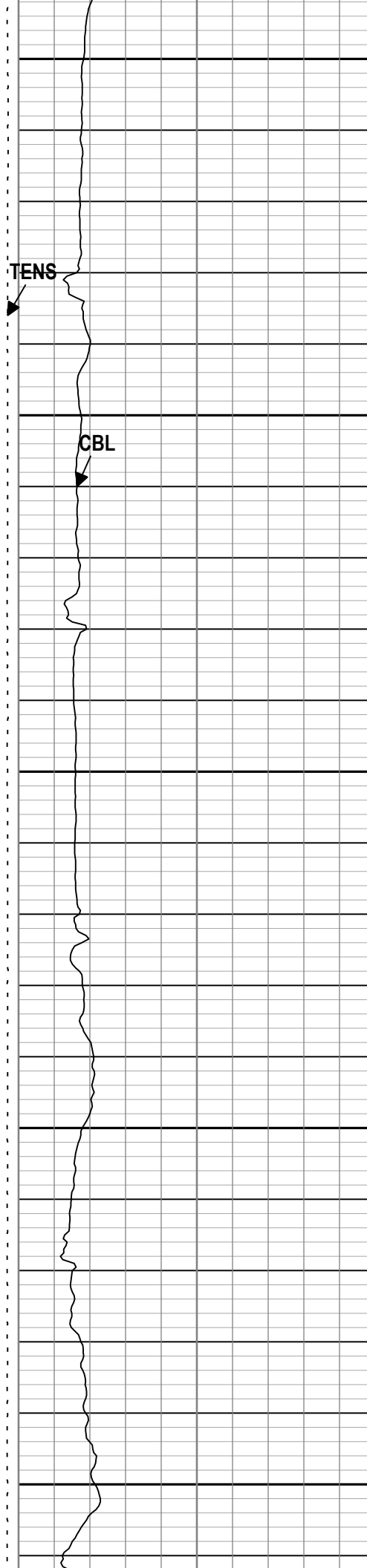
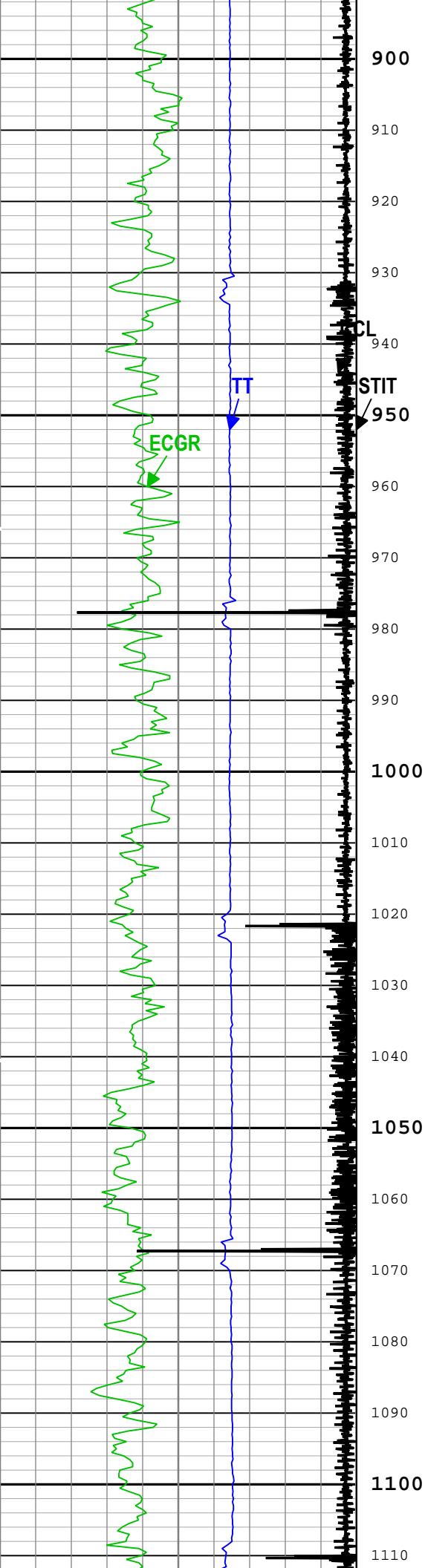
		Stuck Tool Indicator, Total (STIT)	
		0 ft 50	
		Cable Tension (TENS)	
Gamma Ray (ECGR) SGT-N	0 gAPI 150	10000 0	
		lbf	
Transit Time for CBL (TT) DSLT-H	400 us 200	Cable Drag	
		CBL Amplitude (CBL) DSLT-H	Min Amplitude Max
		0 mV 100	

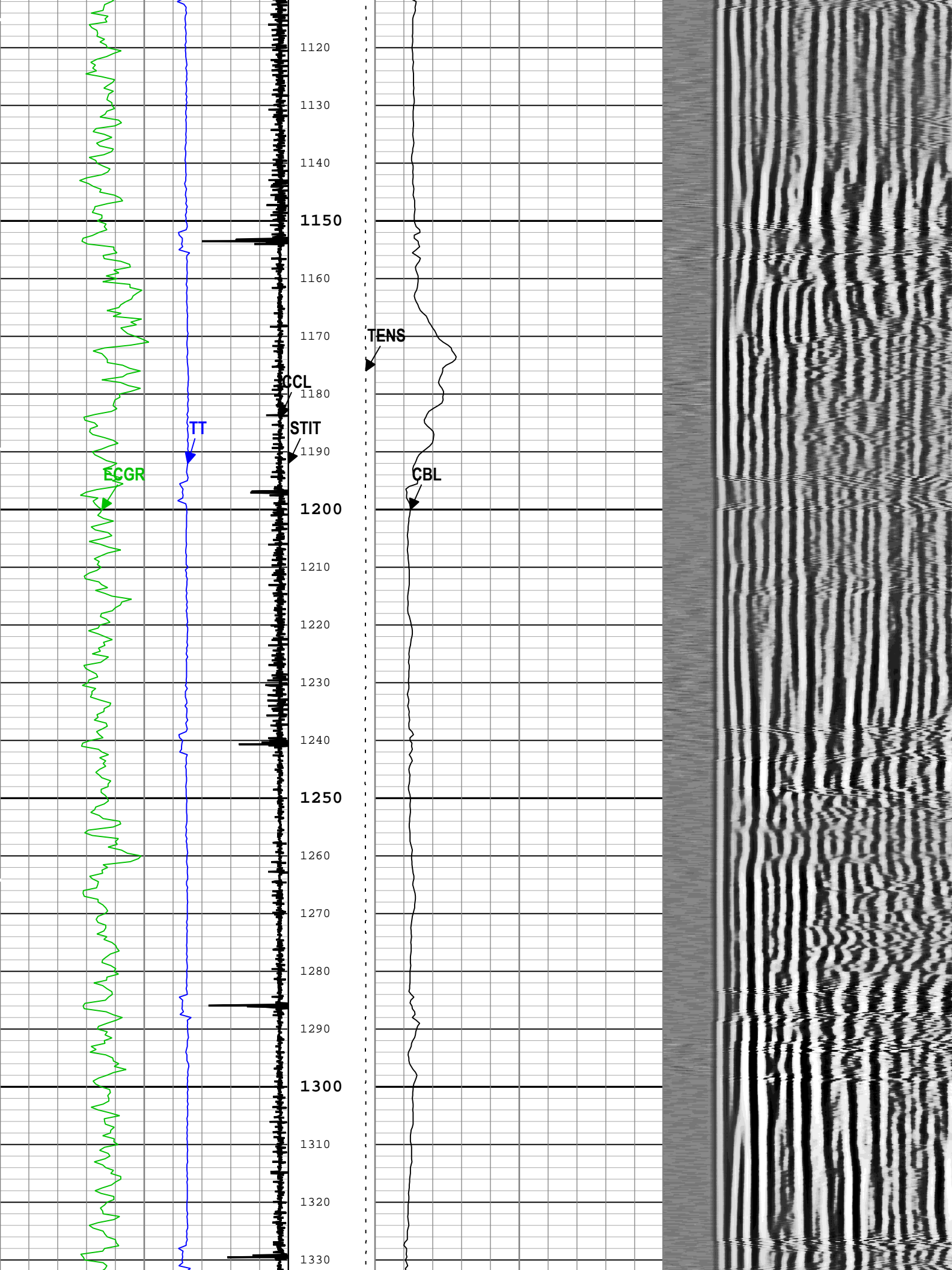


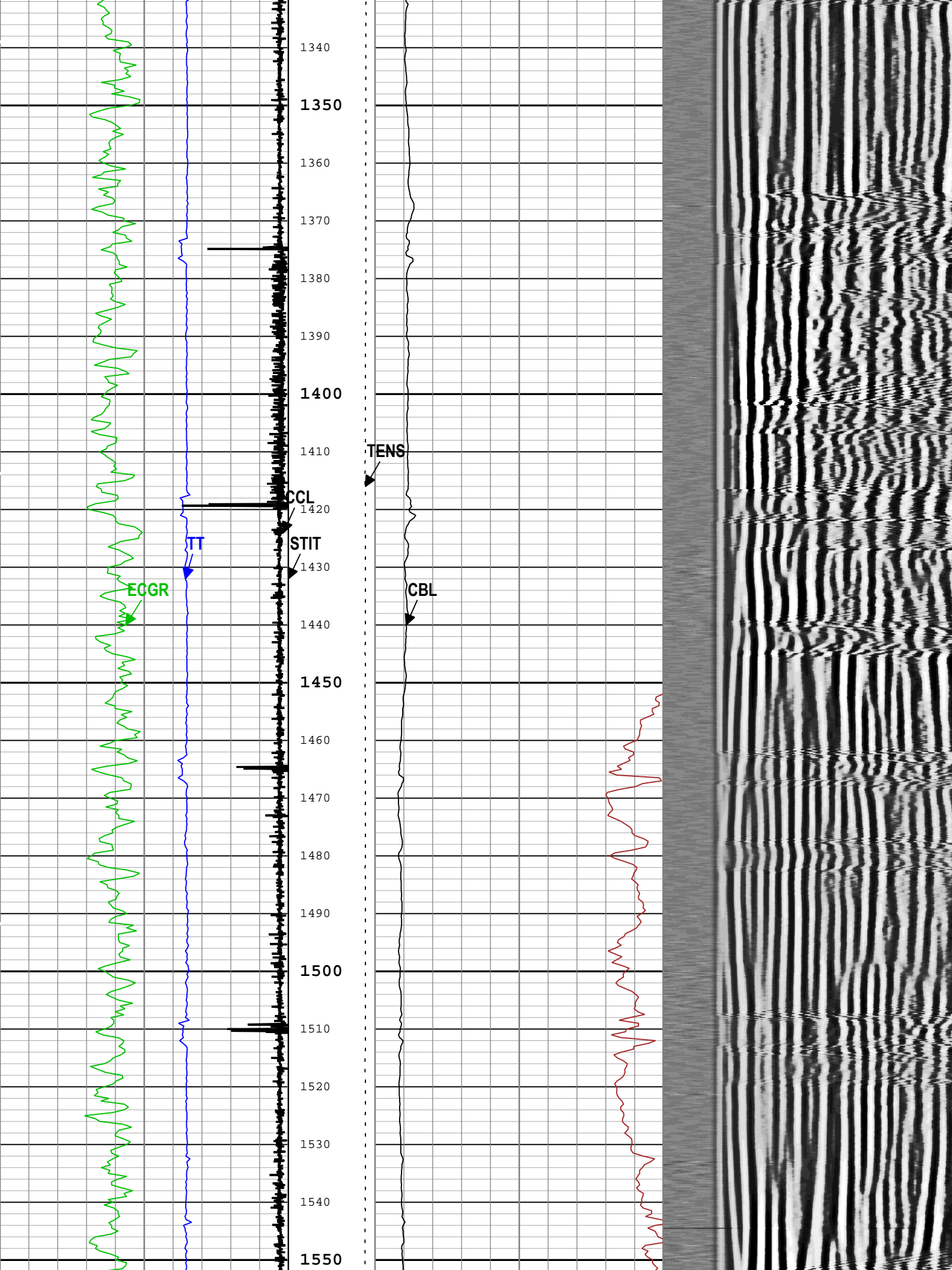


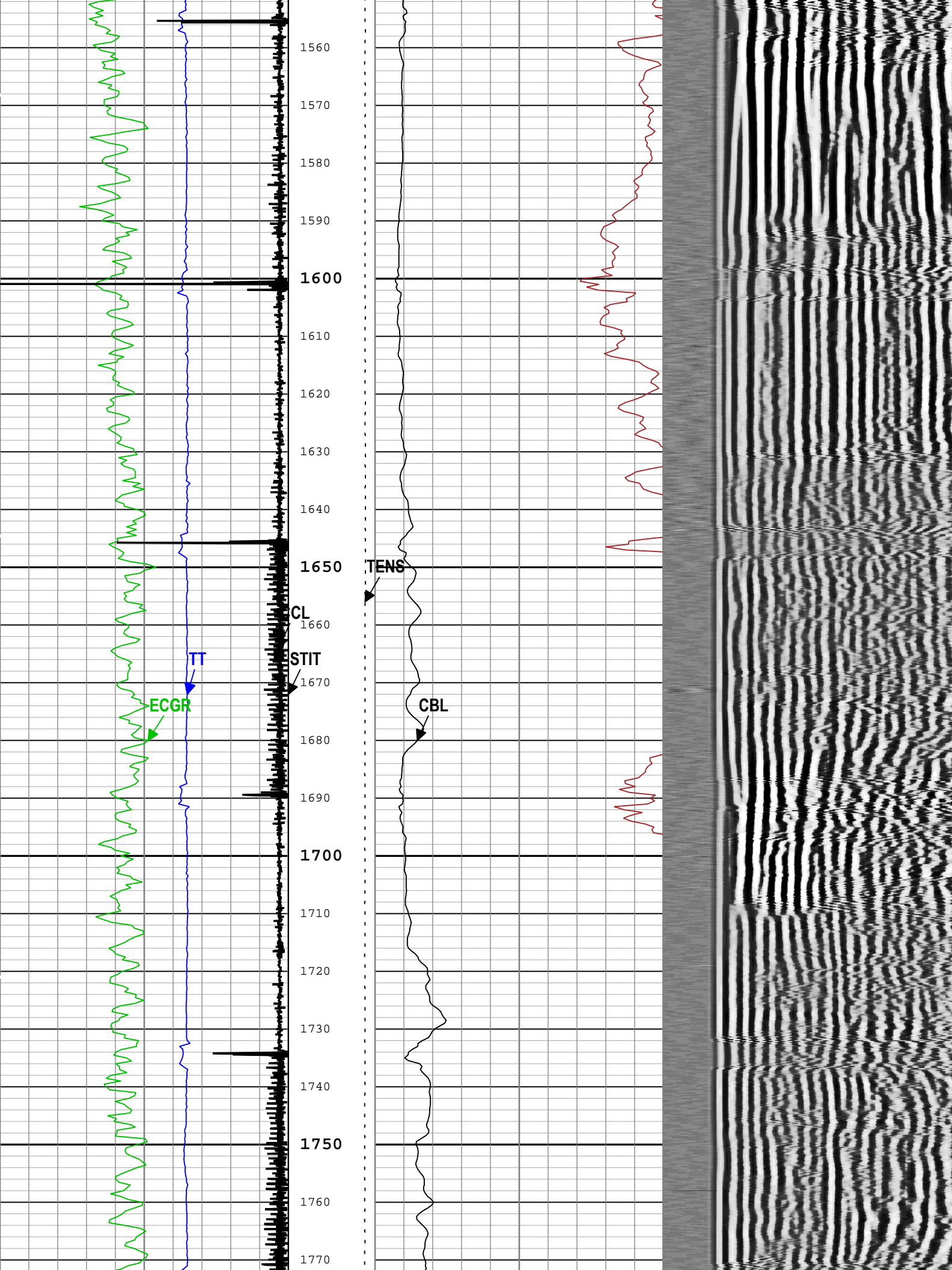


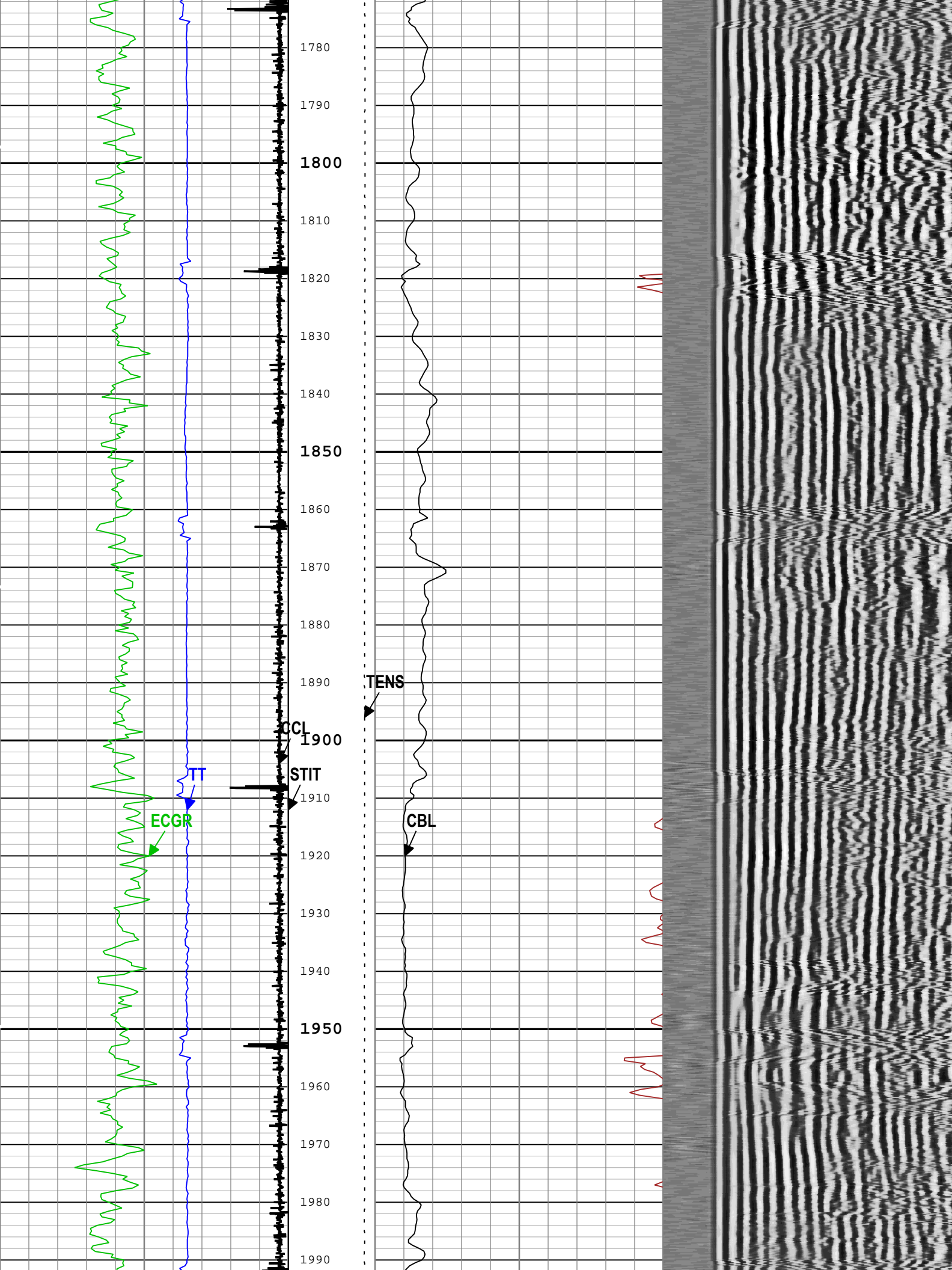


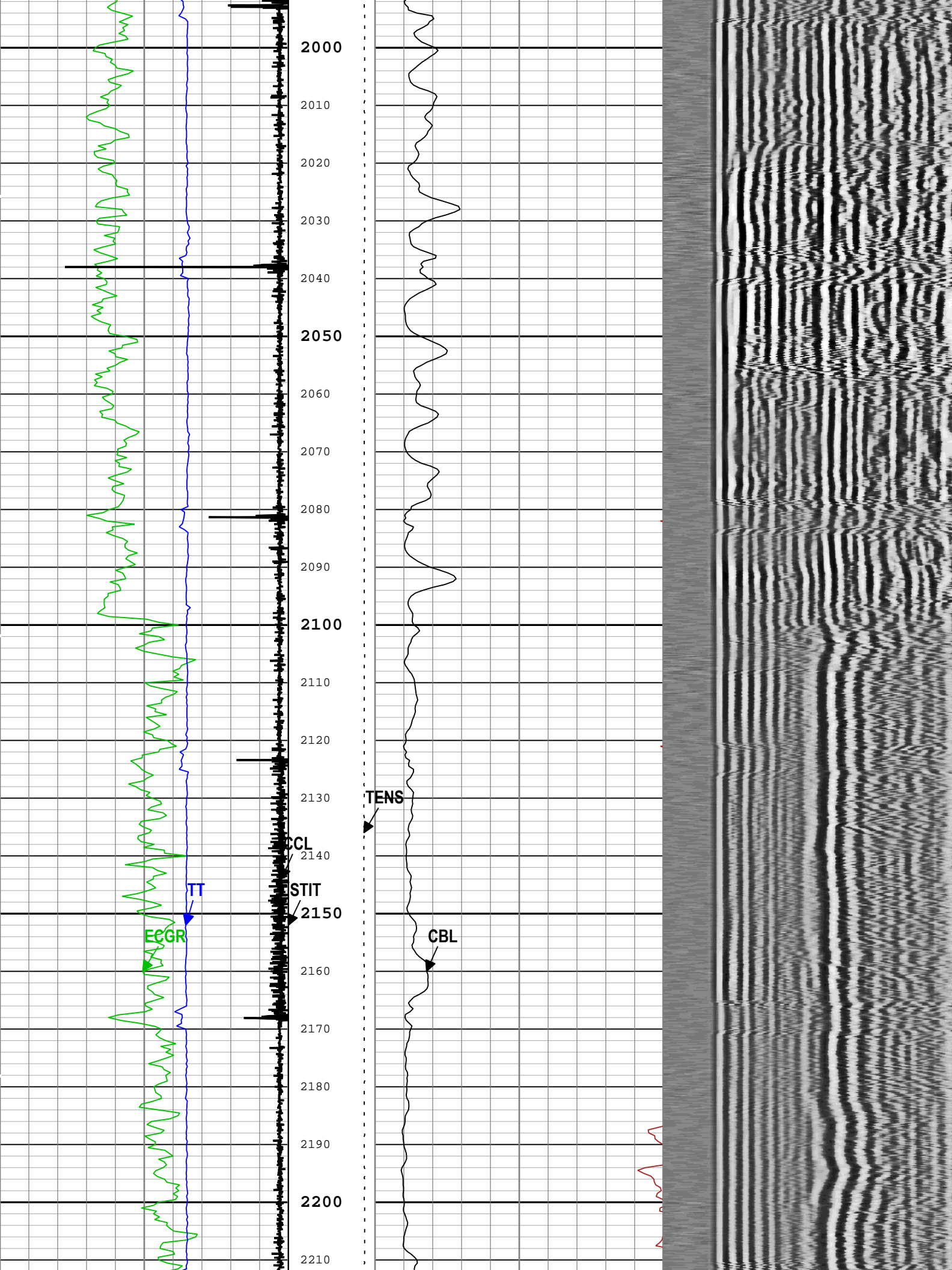


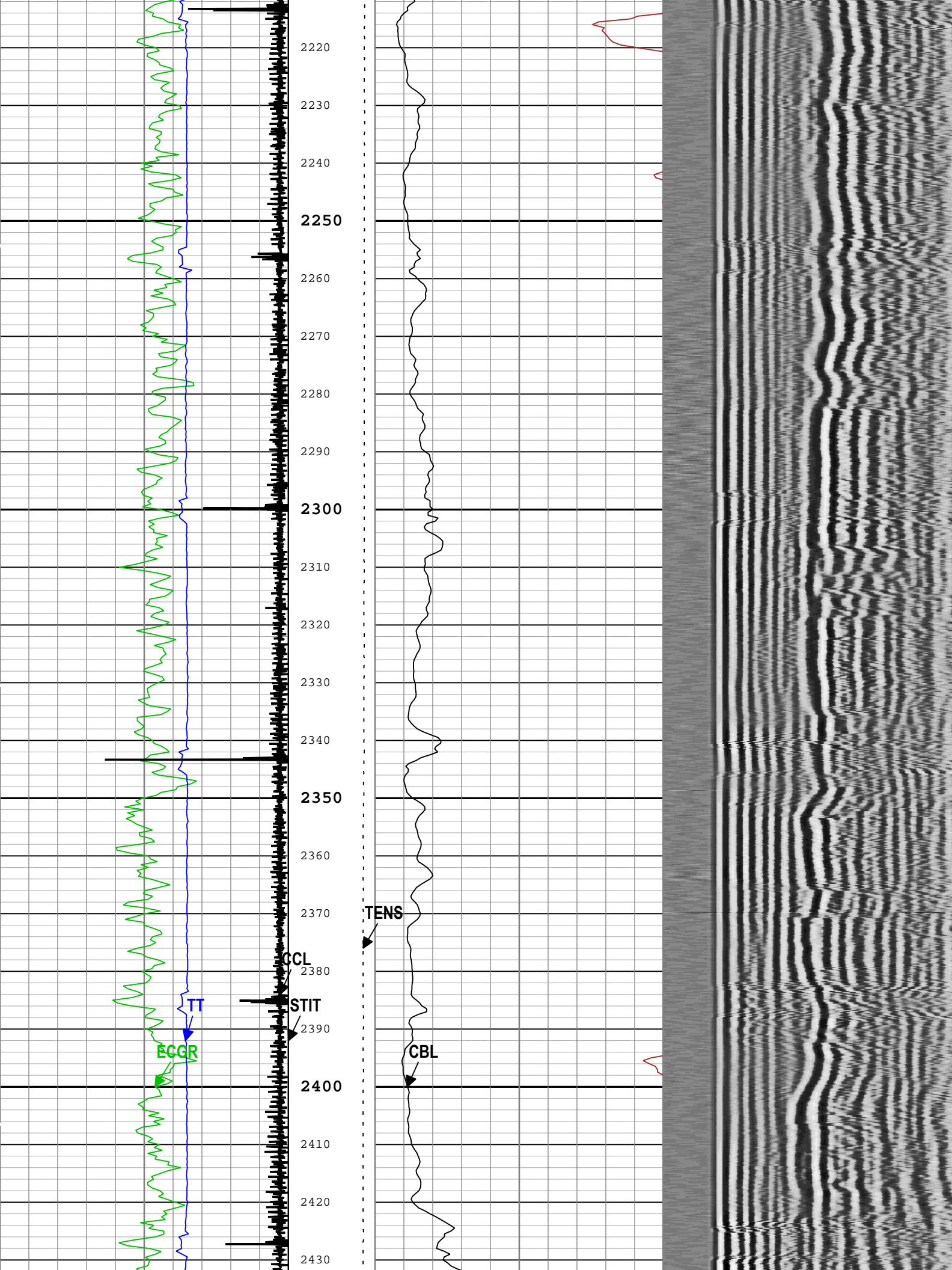


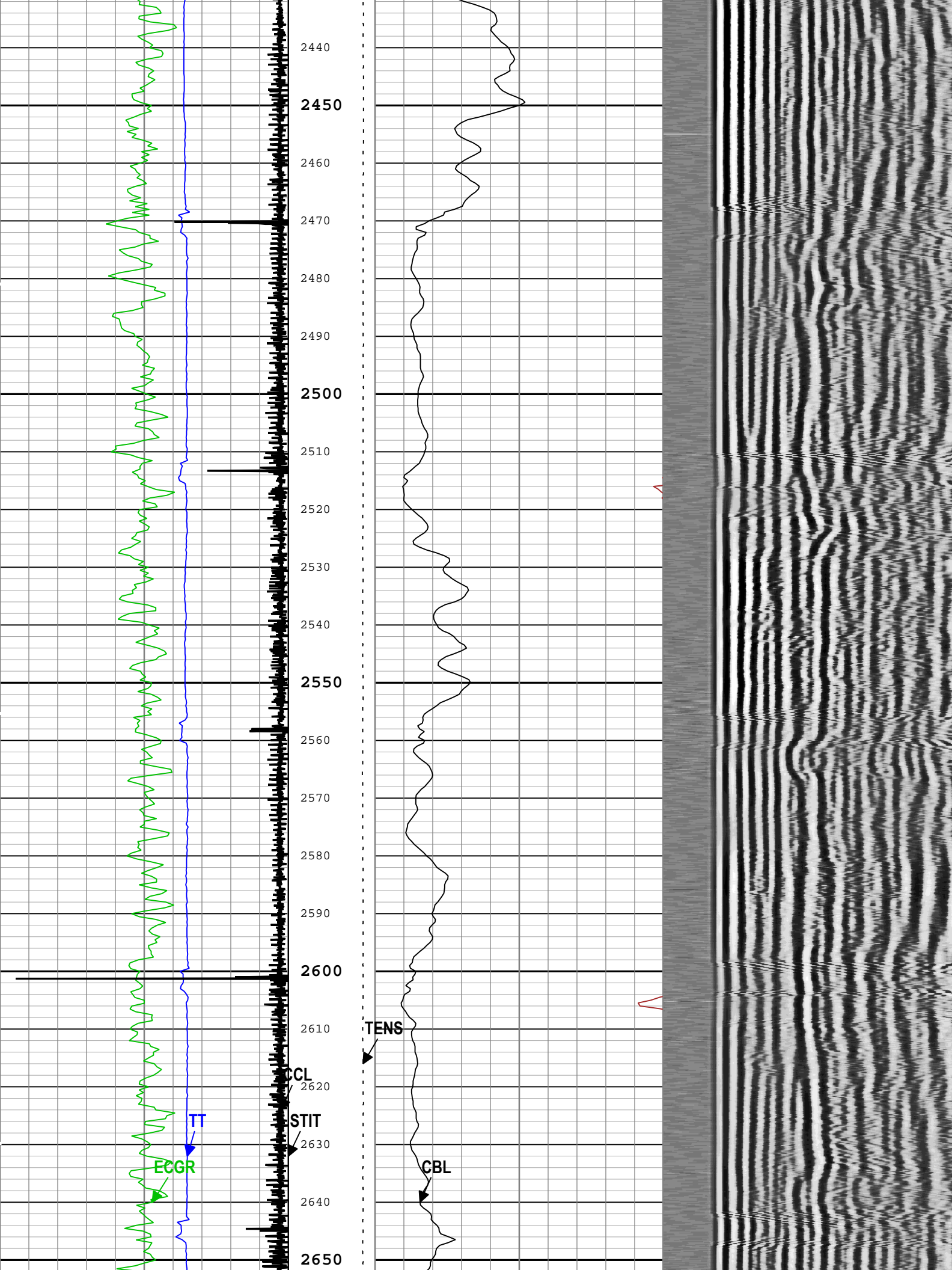


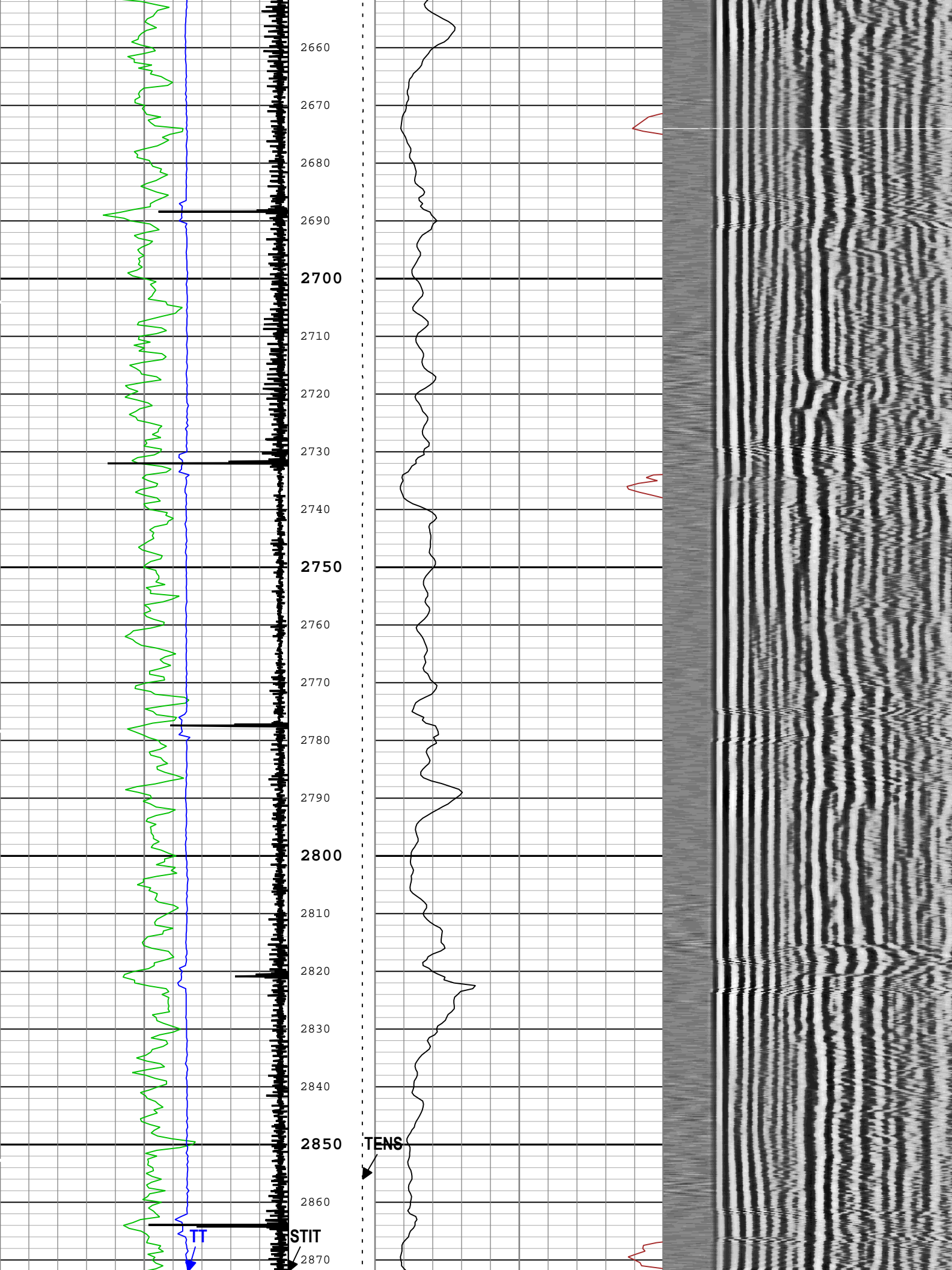


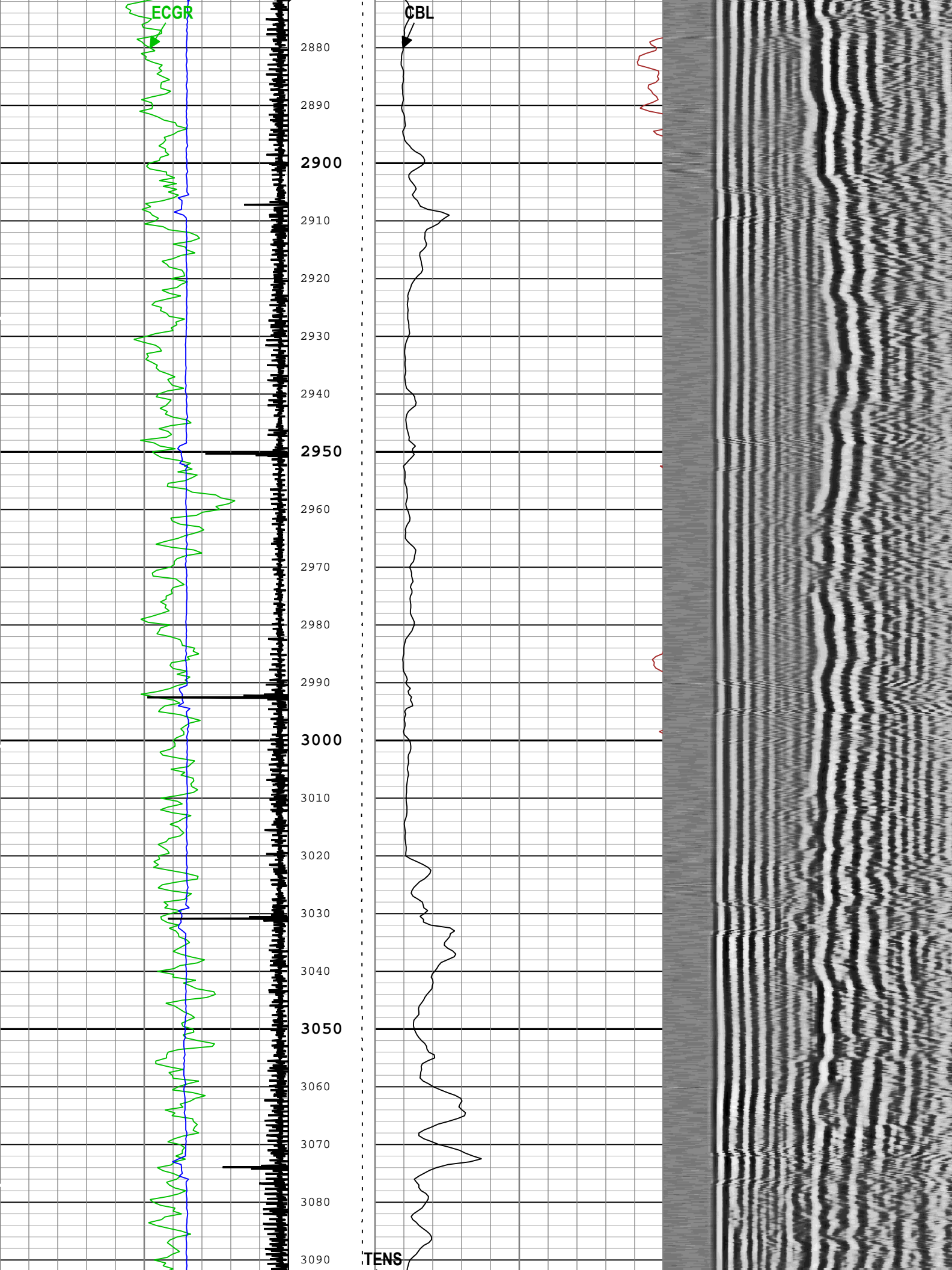


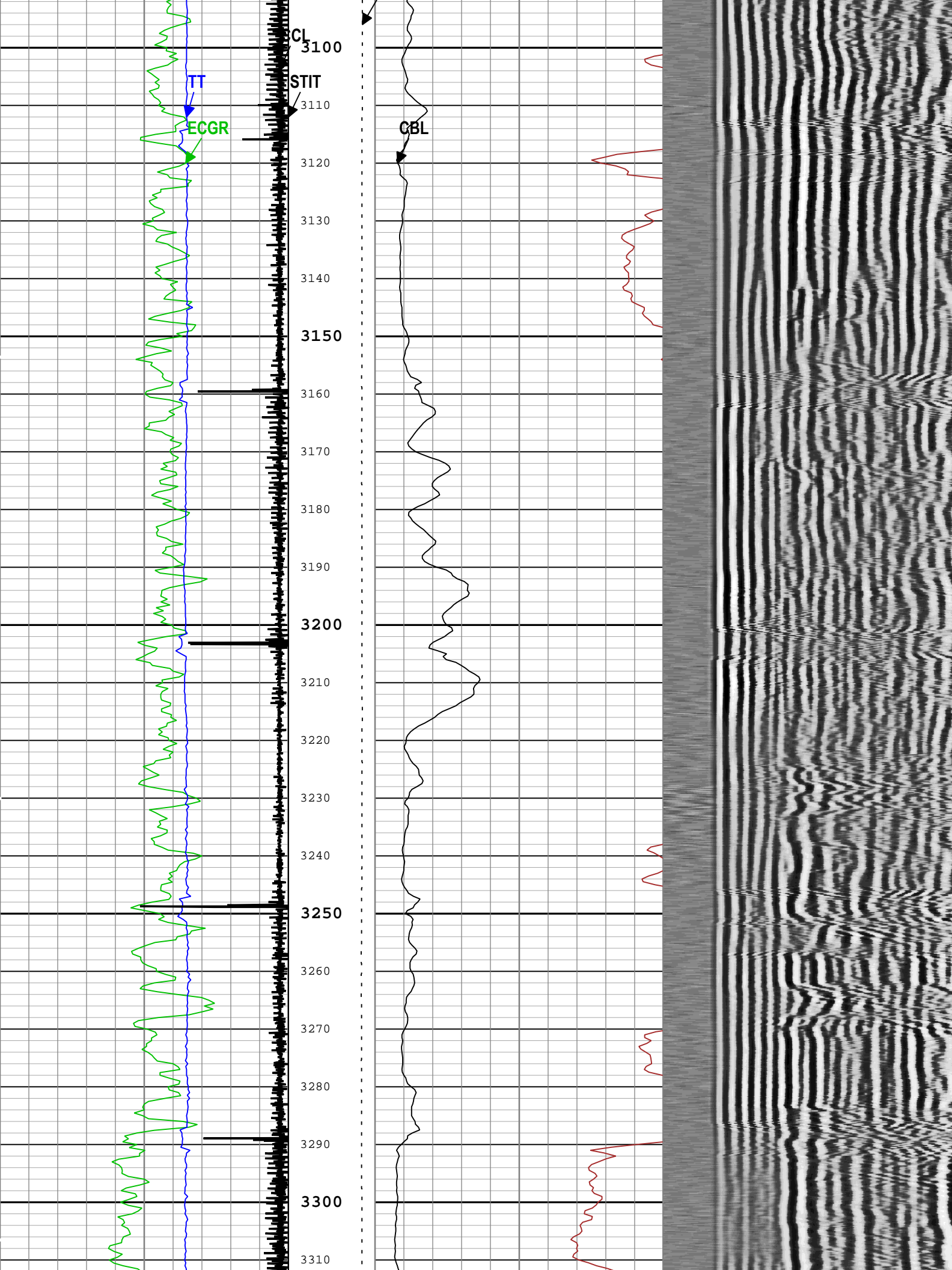


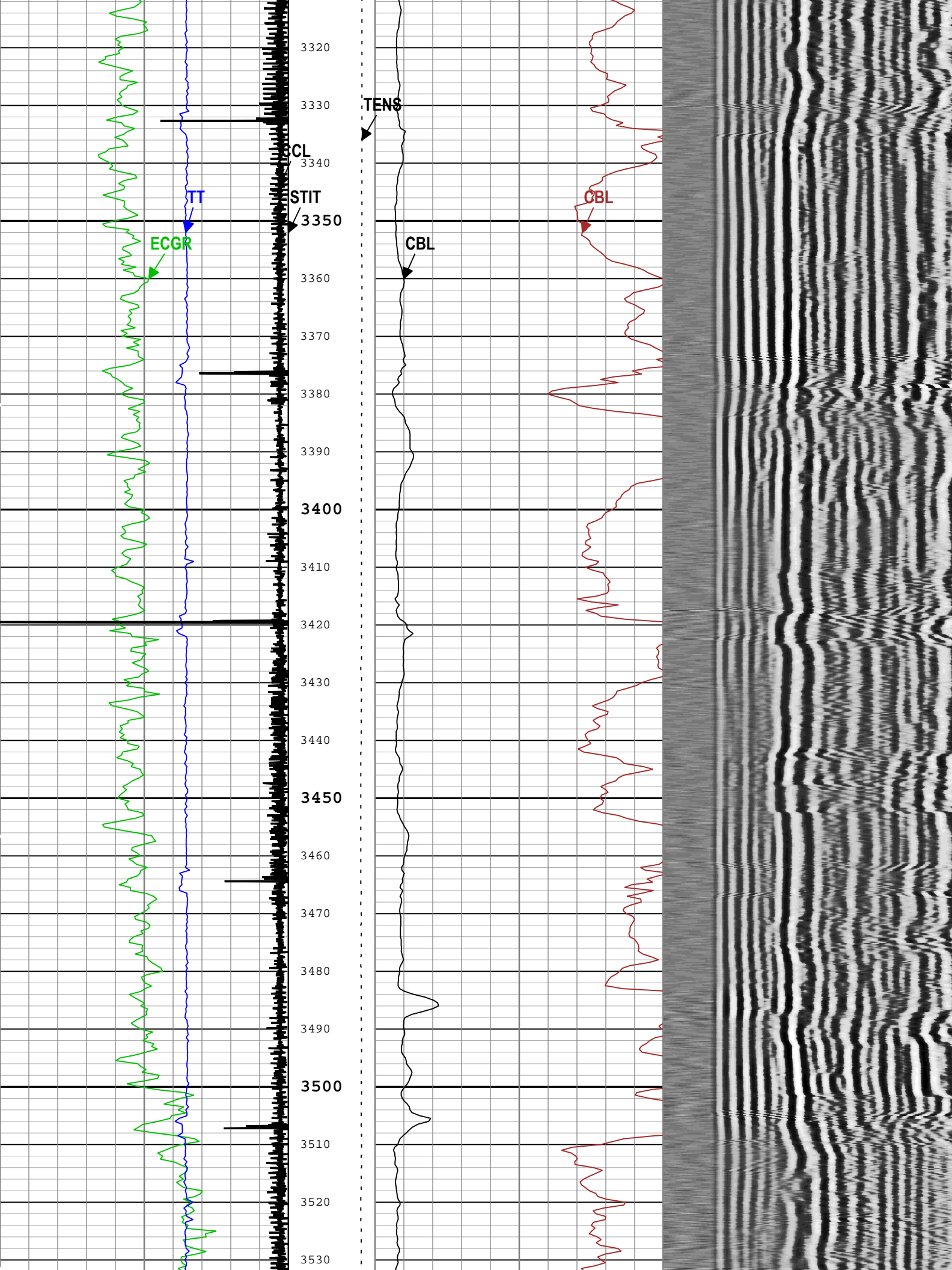


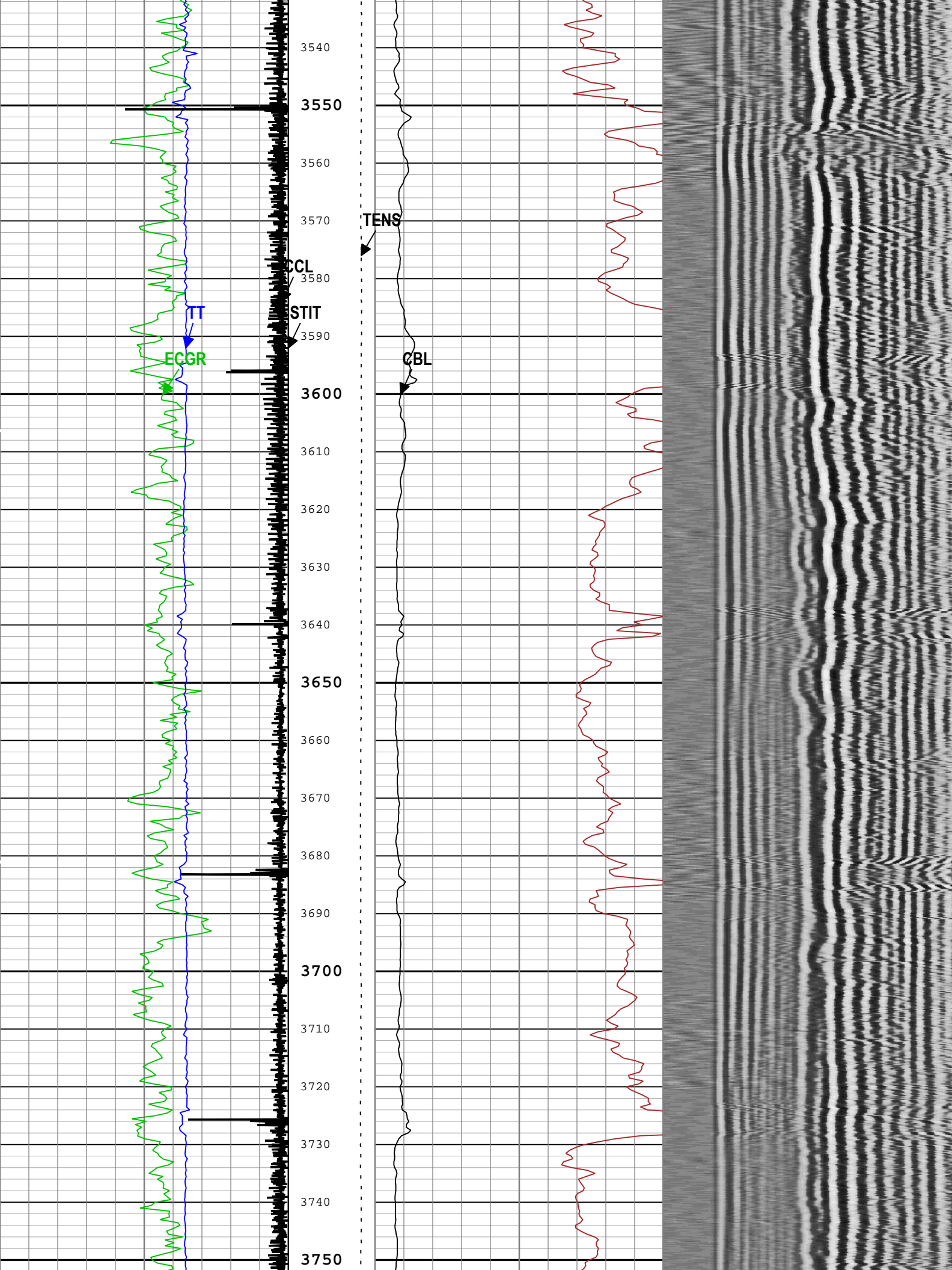


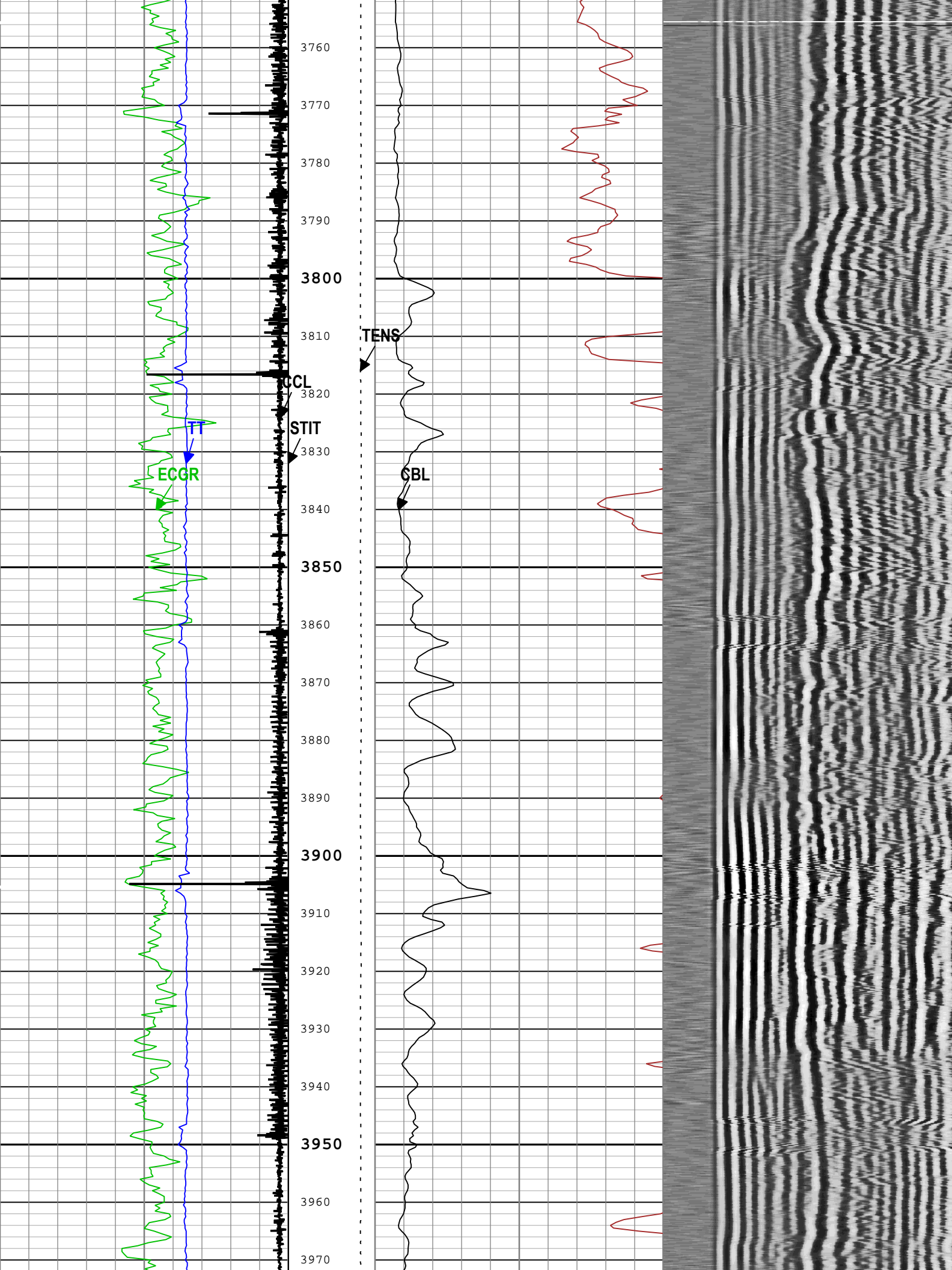


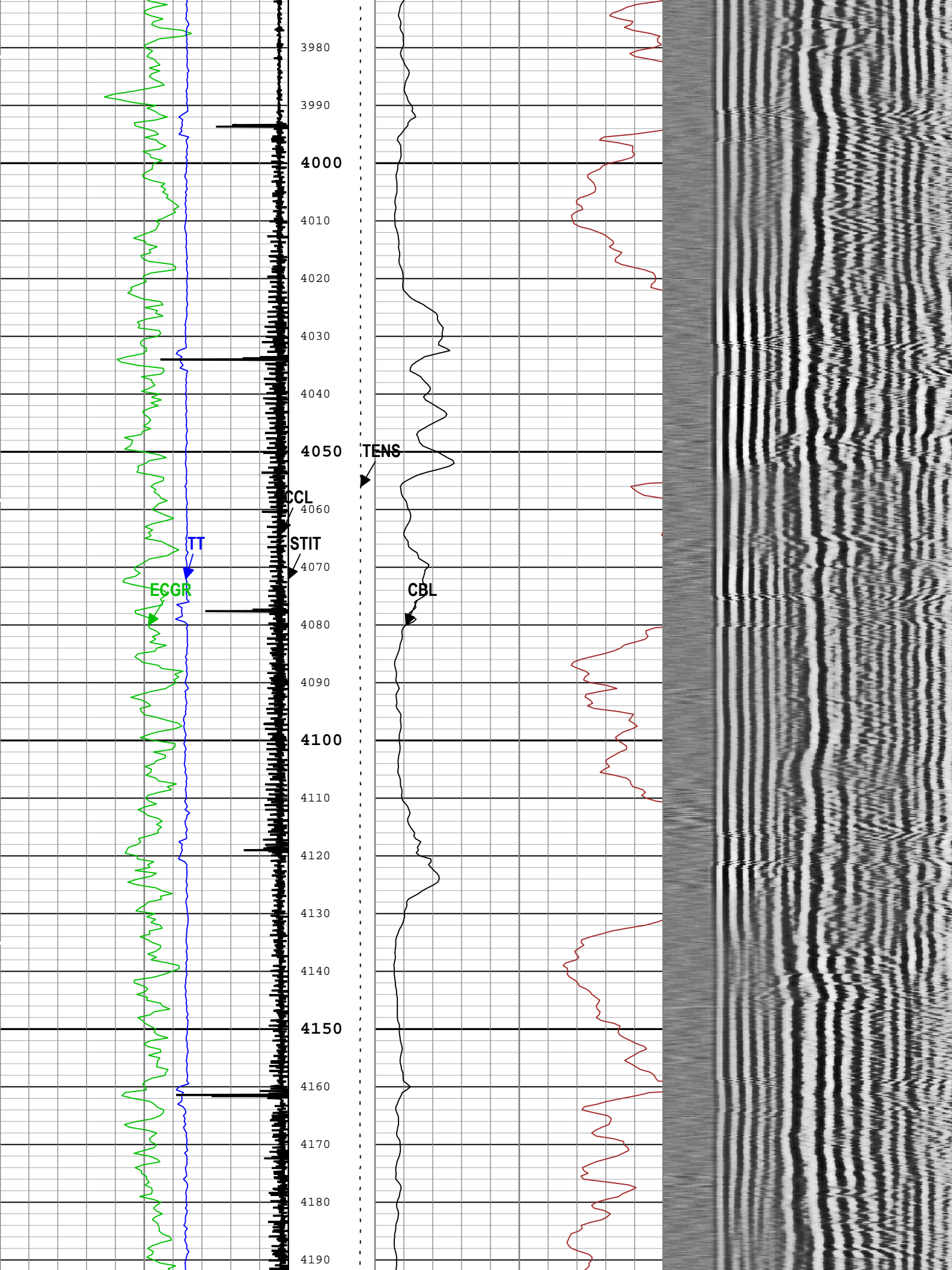


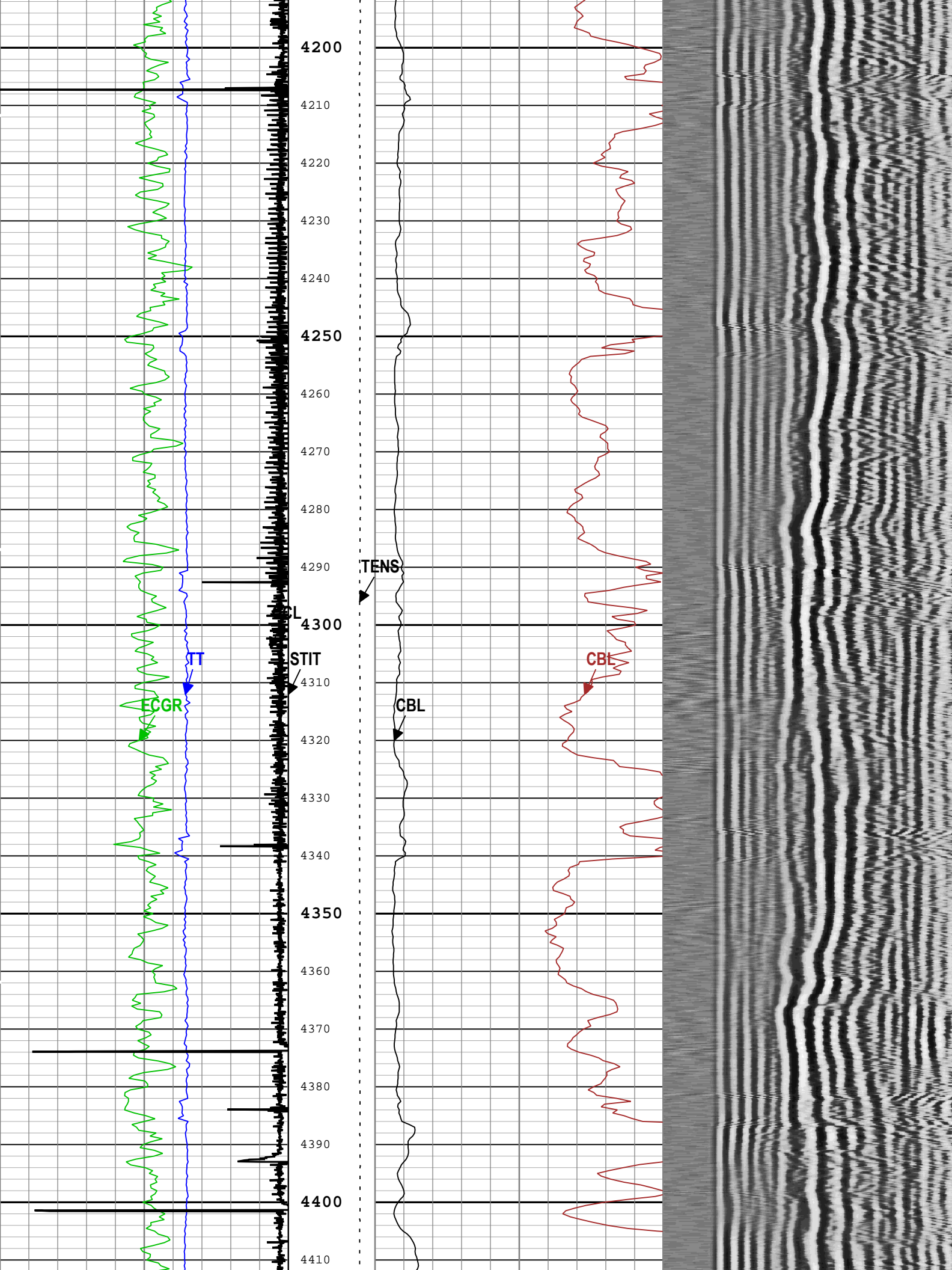


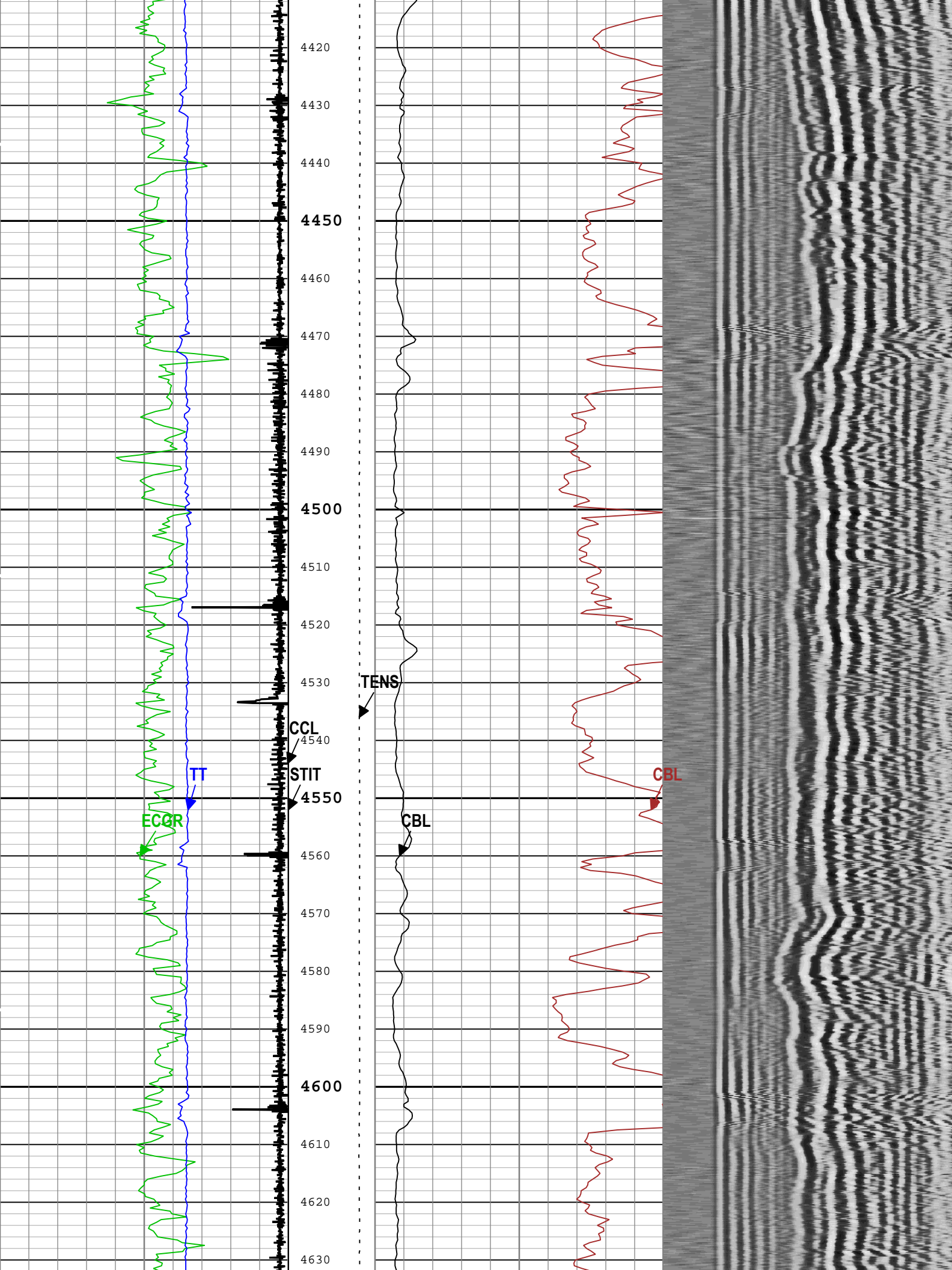


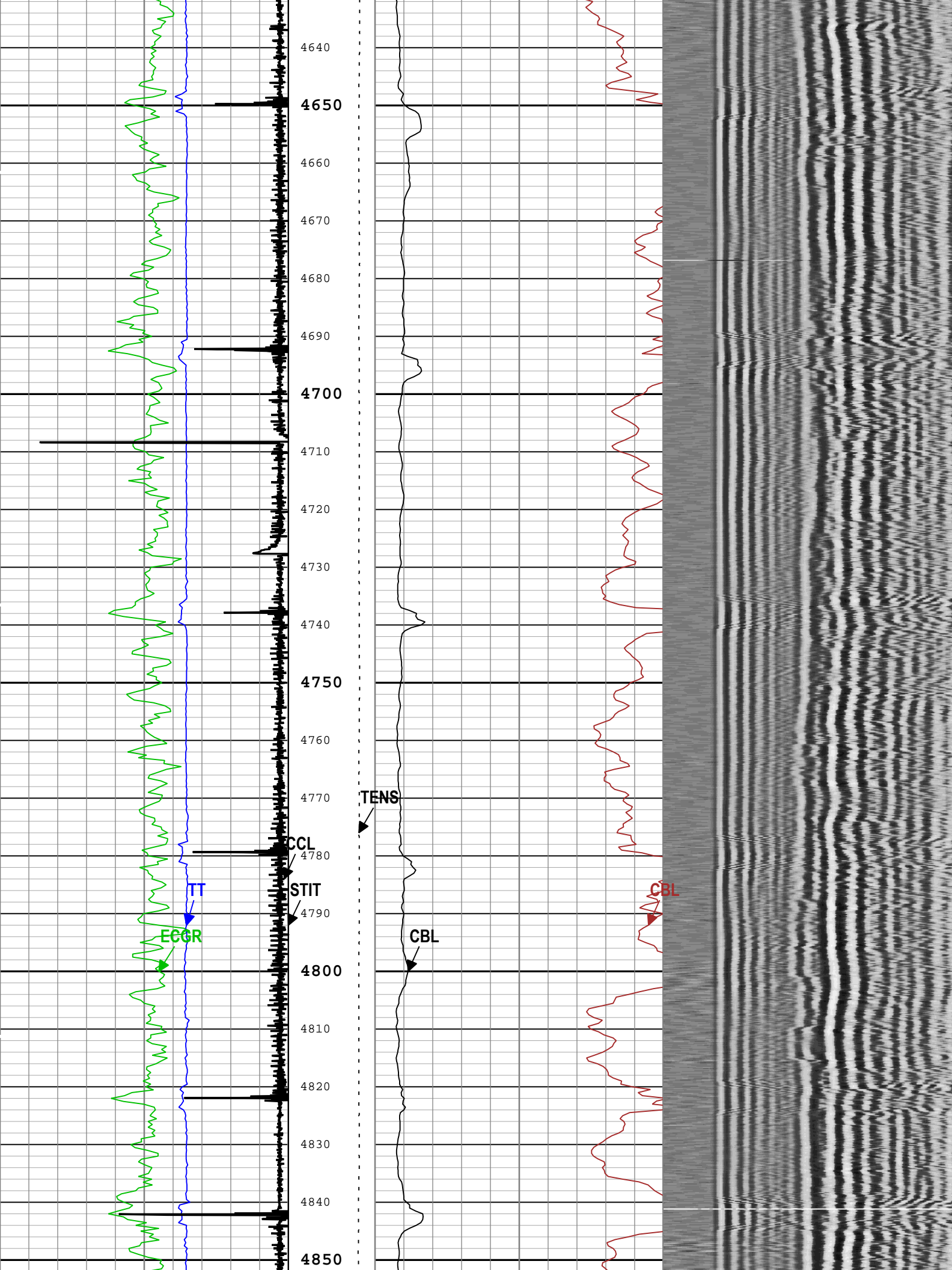


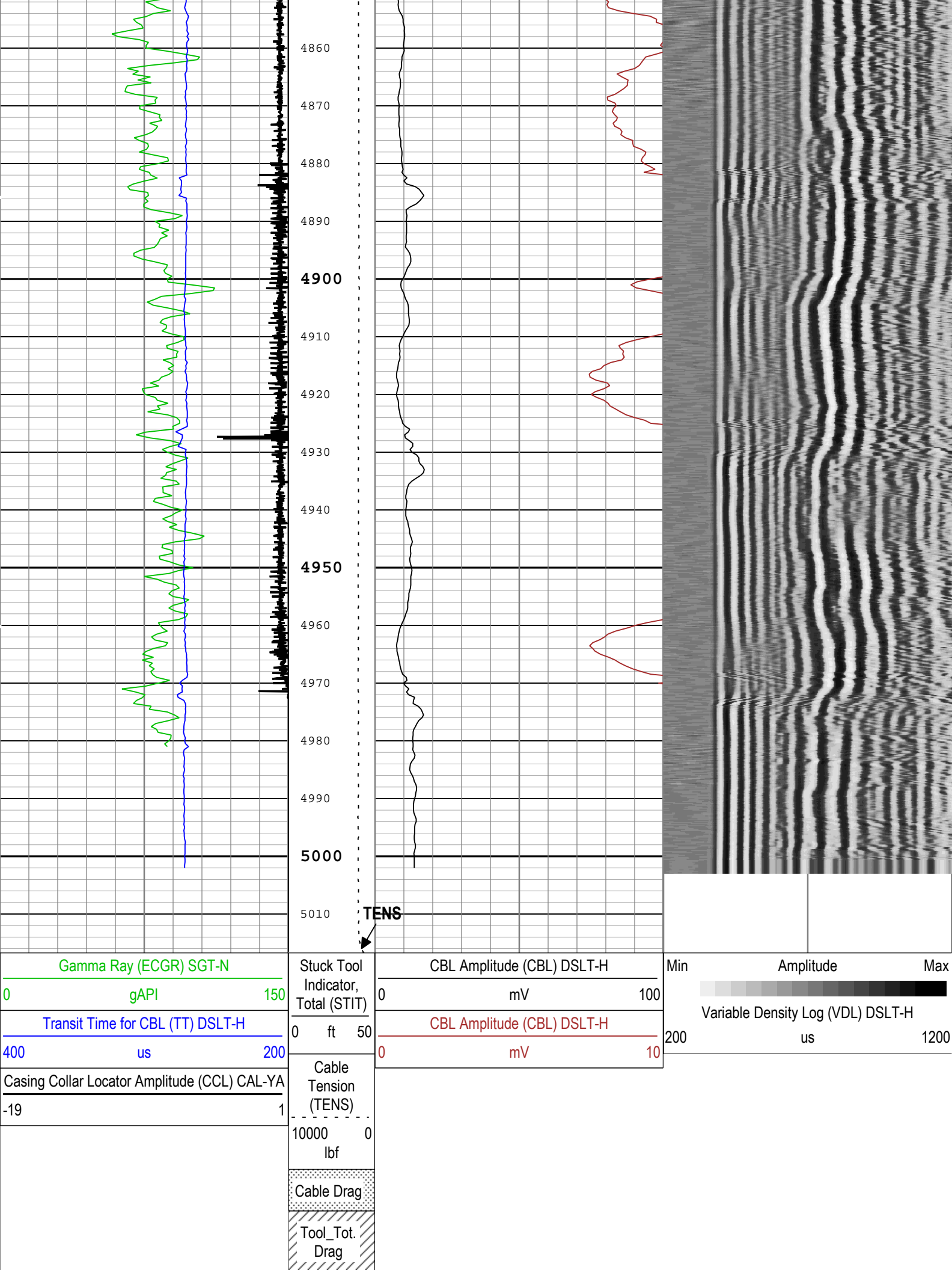












Description: CBL_VDL Format: Log (Sonic CBL with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 22-Sep-2016 17:20:59

Channel Processing Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
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	DSLTH	50	us
CBLO	Casing Bottom (Logger)	WLSESSION	15825	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSLTH	Depth Zoned	mV
CCL_MULTIPLIER	Casing Collar Locator Multiplier	CAL-YA	20	
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	Depth Zoned	mV
MAHTR	Manual High Threshold Reference for first arrival detection	DSLTH	120	
MATT_CURR	Maximum Attenuation in Arbitrary Cement	DSLTH	Depth Zoned	dB/ft
MCI	Minimum Cemented Interval for Isolation	DSLTH	Depth Zoned	ft
MNHTR	Minimum High Threshold Reference for first arrival detection	DSLTH	100	
MSA	Minimum Sonic Amplitude	DSLTH	Depth Zoned	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	DSLTH	Depth Zoned	mV
NMSG	Near Minimum Sliding Gate	DSLTH	247	us
SGAD	Sliding Gate Status	DSLTH	Off	

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	24	21	101
BS	13.5	101	2110
BS	8.5	2110	5016.75
CBRA	0	20.83	21
CBRA	72	21	5016.75
GOBO_CURR	0	20.83	21
GOBO_CURR	3.42	21	5016.75
MATT_CURR	0	20.83	21
MATT_CURR	11.85	21	5016.75
MCI	0	20.83	21
MCI	26.48	21	101
MCI	14.81	101	2099
MCI	4.75	2099	5016.75
MSA	0	20.83	21
MSA	1.6	21	5016.75
MSA_CURR	0	20.83	21
MSA_CURR	1.6	21	5016.75

All depth are actual.			
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Tool Control Parameters	
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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

One

0 PSI Repeat Pass

Software Version	
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Acquisition System	Version
Maxwell 2016 SP2	6.2.64464.3100

Pass Summary	
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Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[2]:Up	Up	4645.50 ft	4959.97 ft	22-Sep-2016 3:47:43 PM	22-Sep-2016 3:52:38 PM	ON	3.63 ft	Yes

All depths are referenced to toolstring zero

Log	Company:Whiting Oil & Gas Corporation	Well:Razor 250-2412
		One: Log[2]:Up:S002

Well:Razor 25O-2412

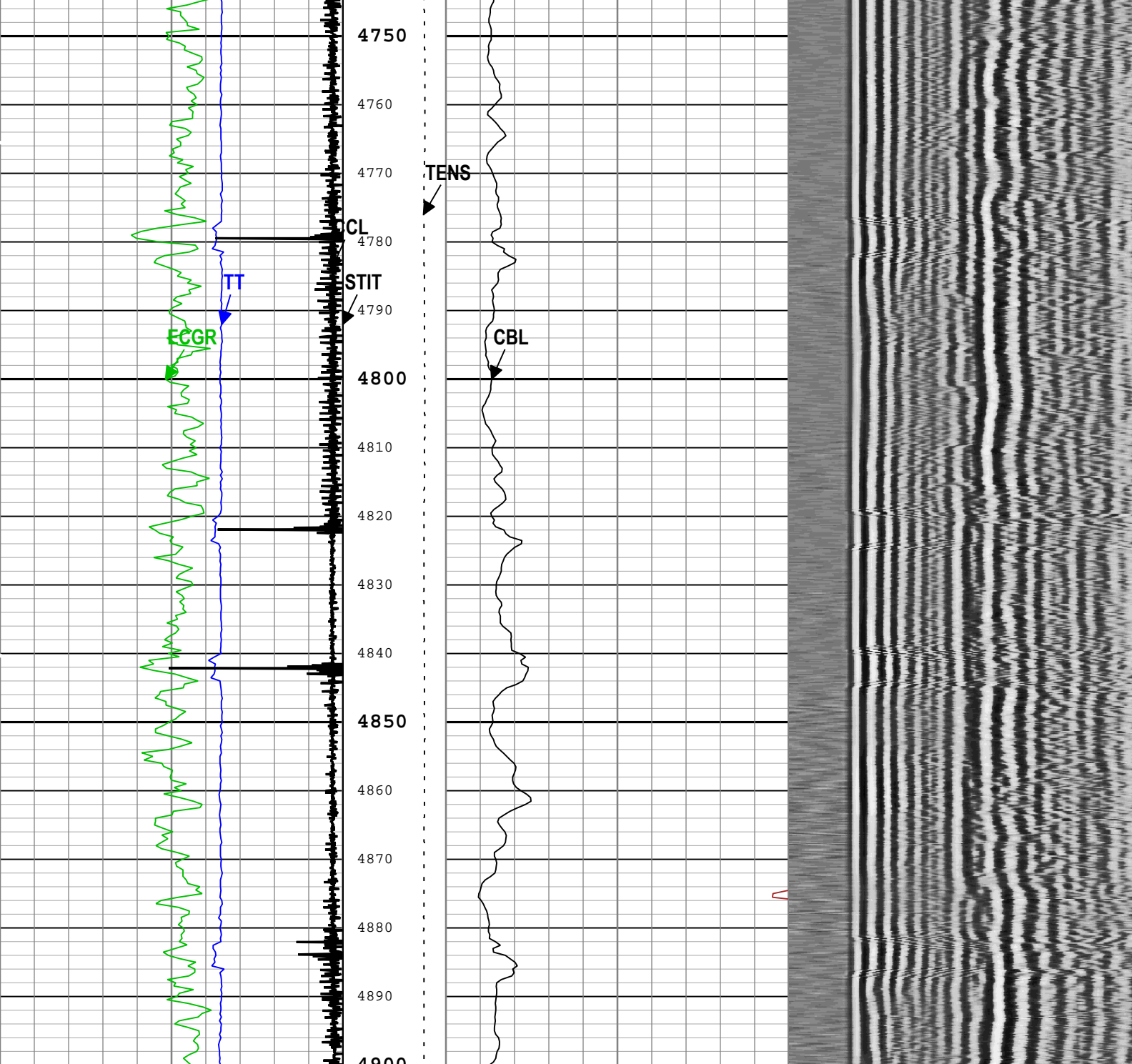
One: Log[2]:Up:S002

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: 22-Sep-2016 17:21:04

TIME_1900 - Time Marked every 60.00 (s)

└ BIEP - Bond Index Event Pips DSLT-H

		Stuck Tool Indicator, Total (STIT)
		0 ft 50
		Cable Tension (TENS)
Gamma Ray (ECGR) SGT-N		10000 0
0	gAPI	150
		Cable Drag
Transit Time for CBL (TT) DSLT-H		0 mV 100
400	us	200
		Tool_Tot. Drag
Casing Collar Locator Amplitude (CCL) CAL-YA		0 mV 10
-19		1



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			Cable Tension (TENS)			CBL Amplitude (CBL) DSLT-H		
400	us	200	10000	lbf	0	0	mV	10
Casing Collar Locator Amplitude (CCL) CAL-YA			Cable Drag			Variable Density Log (VDL) DSLT-H		
-19		1	Tool_Tot. Drag			200	us	1200
			BIEP - Bond Index Event Pips DSLT-H					

Channel Processing Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
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	50	us
CBLO	Casing Bottom (Logger)	WLSESSION	15825	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSLTH	72	mV
CCL_MULTIPLIER	Casing Collar Locator Multiplier	CAL-YA	20	
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	247	us
SGAD	Sliding Gate Status	DSLTH	Off	

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-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):		08:27:29 01-Sep-2016					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div></div>
CBL Amplitude - 0	mV	Before	-----	-----	-----	-----	<div></div>
CBL Reference Amplitude (CBRA) - 0	mV	Before	-----	-----	-----	-----	<div></div>
Measurement Depth - 0	ft	Before	-----	-----	-----	-----	<div></div>
CBL Free Pipe Adjustment - CBL Amplitude Coefficient							
Before (Manual Entry):		08:27:29 01-Sep-2016					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div></div>
CBL Adjustment Factor		Before	1.000	0.200	0.996	5.000	<div></div>

Depth of Before Calibration	ft	Before			60.00		
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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-2412	
Field:	Wildcat	
County:	Weld	
State:	Colorado	
Cement Bond Log		
GR-CCL		