Schlumberger

Company: Crestone Peak Resources Operating LLC

Well: Sam 3B-25H-M166

Field: Wattenberg

County: Weld State: Colordao

Cement Bond Log

Surface Casing

County: Weld
Field: Wattenberg
Location: NWSW 25-1N-66W
Well: Sam 3B-25H-M166
Company: Crestone Peak Resources Operating LLC

Location:				
NWSW 25-1N-66W 1403 FSL & 311 FWL	Elev.:	K.B.	5099.00 ft	
		G.L.	5086.00 ft	
		D.F.	5099.00 ft	
Permanent Datum:	Ground Level	Elev.:	5086.00 f	
Log Measured From:	Kelly Bushing	13.00 ft	above Perm.Datum	
Drilling Measured From:	Kelly Bushing			

API Serial No.	Section:	Township:	Range:
05-123-46128	25	1N	66W

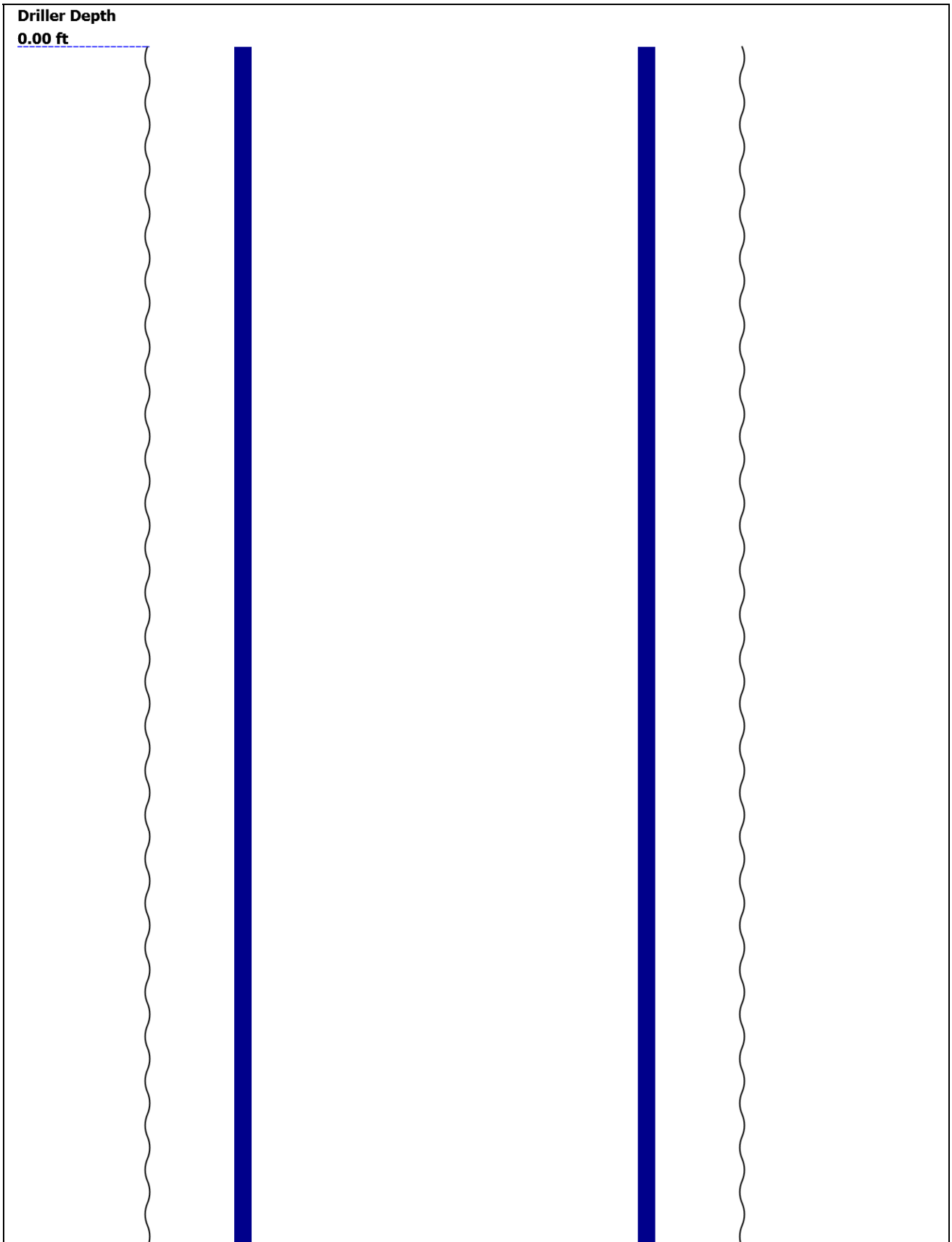
Logging Date	23-Jun-2018		
Run Number	CBL		
Depth Driller	2418.00 ft		
Schlumberger Depth	2418.00 ft		
Bottom Log Interval	2300.00 ft		
Top Log Interval	100.00 ft		
Casing Fluid Type	Water		
Salinity			
Density	8.4 lbm/gal		
Fluid Level	8.00 ft		
BIT/CASING/TUBING STRING			
Bit Size	13.50 in		
From	0.00 ft		
To	2418.00 ft		
Casing/Tubing Size	9.625 in		
Weight	40 lbm/ft		
Grade	N/A		
From	0.00 ft		
To	2418.00 ft		
Max Recorded Temperatures	83 degF		
Logger on Bottom Time	23-Jun-2018	12:24:00	
Unit Number Location:	OSLC-EA 2377	Ft. Morgan	
Recorded By	L. Awalt		
Witnessed By	Satch Bo		

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.

Contents

Well Sketch



Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	13.5					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	2418					
Bottom Logger (ft)	2418					
Casing						
Size (in)	9.625					
Weight (lbm/ft)	40					
Inner Diameter (in)	8.835					
Grade	N/A					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	2418					
Bottom Logger (ft)	2418					

Remarks and Equipment Summary

CBL: Toolstring

Equip name	Length	MP name	Offset
LEH-QT LEH-QT	**34.06**		
EDTC-B:9316 EDTH-B EDTG-A EDTC-B:9316	**31.14**		
		CTEM	**27.64**
		ACCZ	**0.00**
		HV	**0.00**
		Gamma Ray	**25.77**
		TelStatus	**24.64**
AH-184[2]	**24.64**		
AH-184[1]	**22.64**		
DSLT-H:8279 ECH-KH DSLC-H:8279 SLS-E:1563	**20.64**		

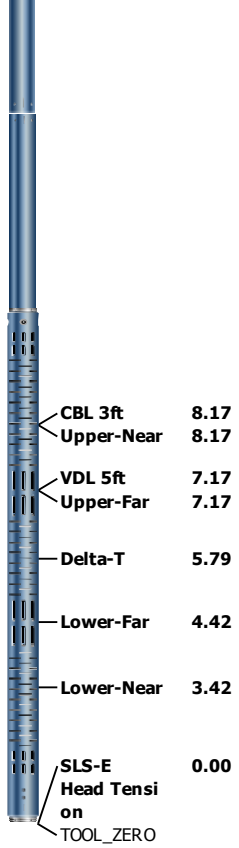
CBL: Remarks

Thank you for choosing Schlumberger!

Log run for cement evaluation

Tools run centralized as per tool sketch

Crew: Diego Saldana, Gary Lapp



Lengths are in ft
Maximum Outer Diameter = 3.625 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

	CBL		
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	7-46NT-XS		
Serial Number			
Length	24000.00 ft		
Conveyance Type	Wireline		
Rig Type			

CBL:Depth Control Parameters		Depth Control Remarks
Log Sequence	First Log In the Well	

Rig Up Length At Surface	
Rig Up Length At Bottom	
Rig Up Length Correction	
Stretch Correction	
Tool Zero Check At Surface	

CBL

Software Version

Acquisition System	Version
Maxwell 2017 SP3	7.3.92069.3100
Application Patch	Wireline_NPD-ICE2-2017SP3_7.3.93033
	Wireline_Hotfix-RTDLIS-2017SP3_7.3.92363
	Wireline_Hotfix-SML-2017SP3_7.3.101161
	Wireline_TestKit-CMR-NG-2017SP3_7.3.96073

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
CBL	Log[2]:Up	Up	33.99 ft	2299.02 ft	23-Jun-2018 1:17:56 PM	23-Jun-2018 1:45:03 PM	ON	-1.50 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Crestone Peak Resources Operating LLC Well:Sam 3B-25H-M166

CBL: Log[2]:Up:S005

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: 26-Jun-2018 14:26:29

TIME_1900 - Time Marked every 60.00 (s)

BIEP - Bond Index Event Pips DSLT-H

Stuck Tool Indicator, Total (STIT)
0 ft 50

Gamma Ray (ECGR_EDTC) EDTC-B
0 gAPI 150

Cable Tension (TENS)
2000 lbf 0

Transit Time for CBL (TT) DSLT-H
400 us 200

CBL Amplitude (CBL) DSLT-H
0 mV 50

Transit Time (Sliding Gate) (TTSL) DSLT-H
400 us 200

Cable Drag

CBL Amplitude (CBL) DSLT-H
0 mV 10

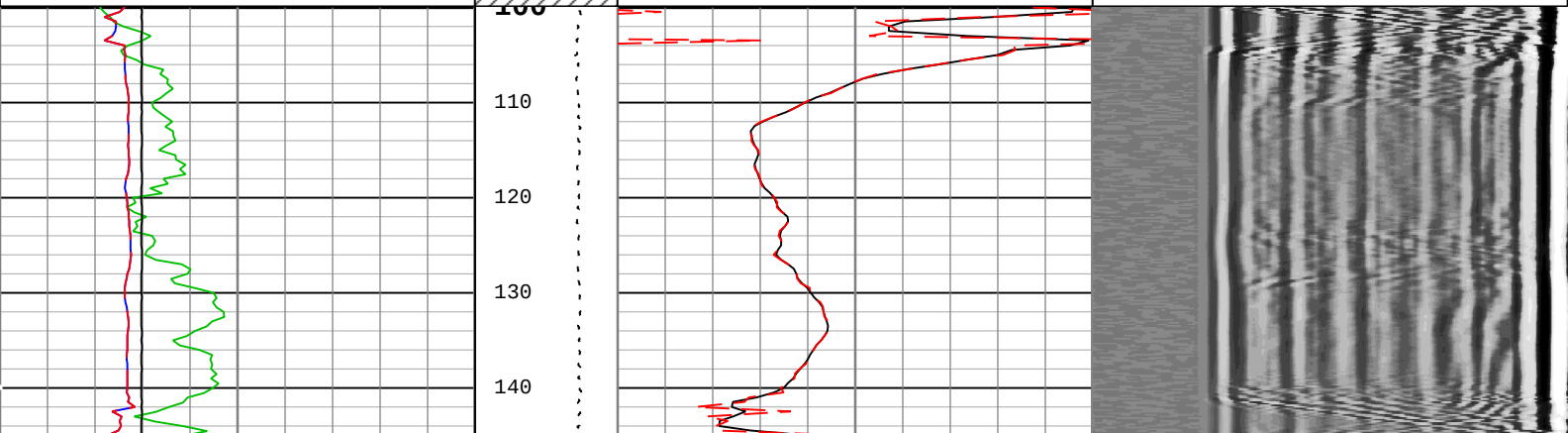
Min Amplitude Max

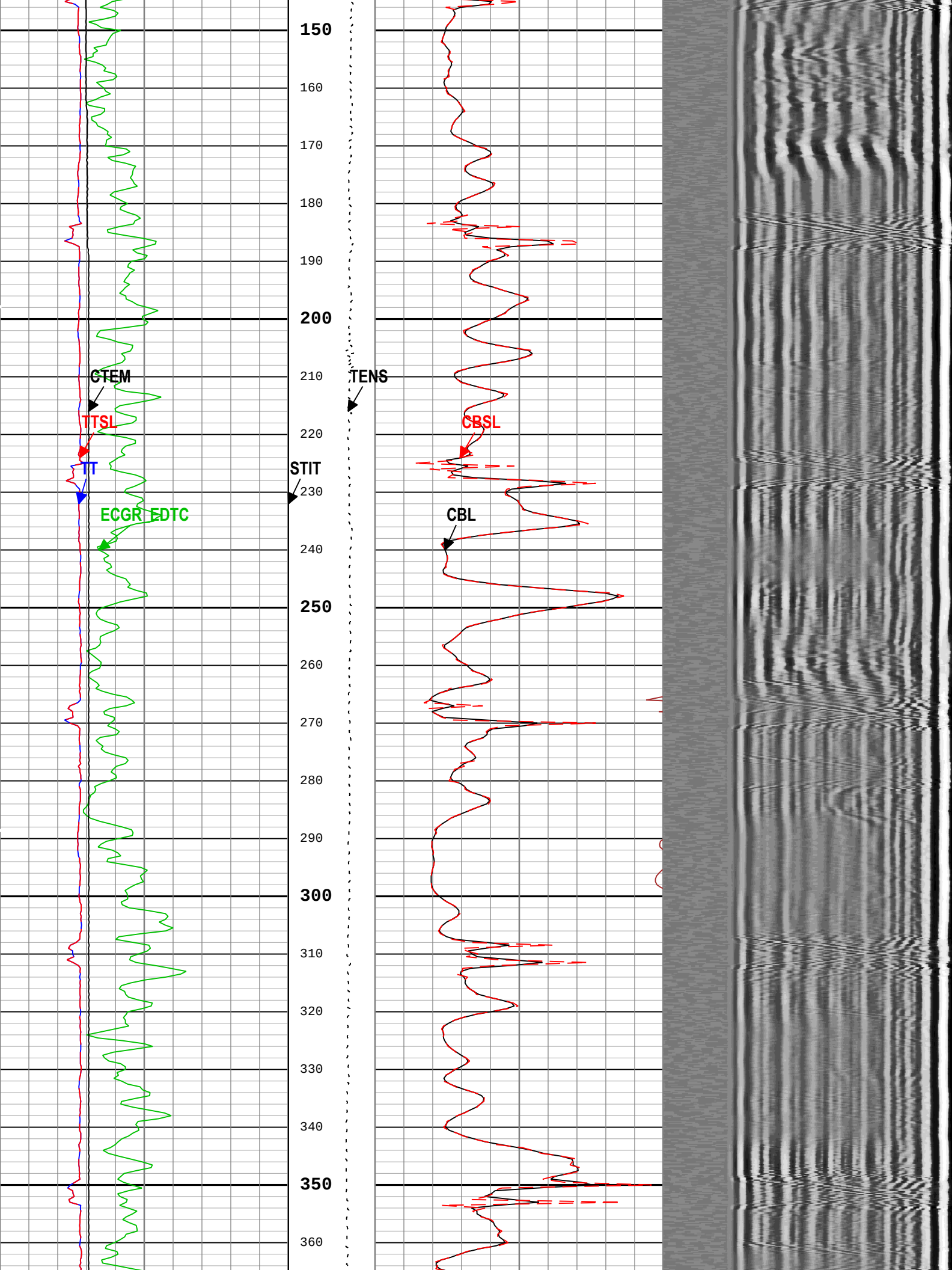
Cartridge Temperature (CTEM) EDTC-B
20 degF 220

Tool_Tot. Drag

CBL Amplitude (Sliding Gate) (CBSL) DSLT-H
0 mV 50

Variable Density Log (VDL) DSLT-H
200 us 1200

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CTEM
TTSL
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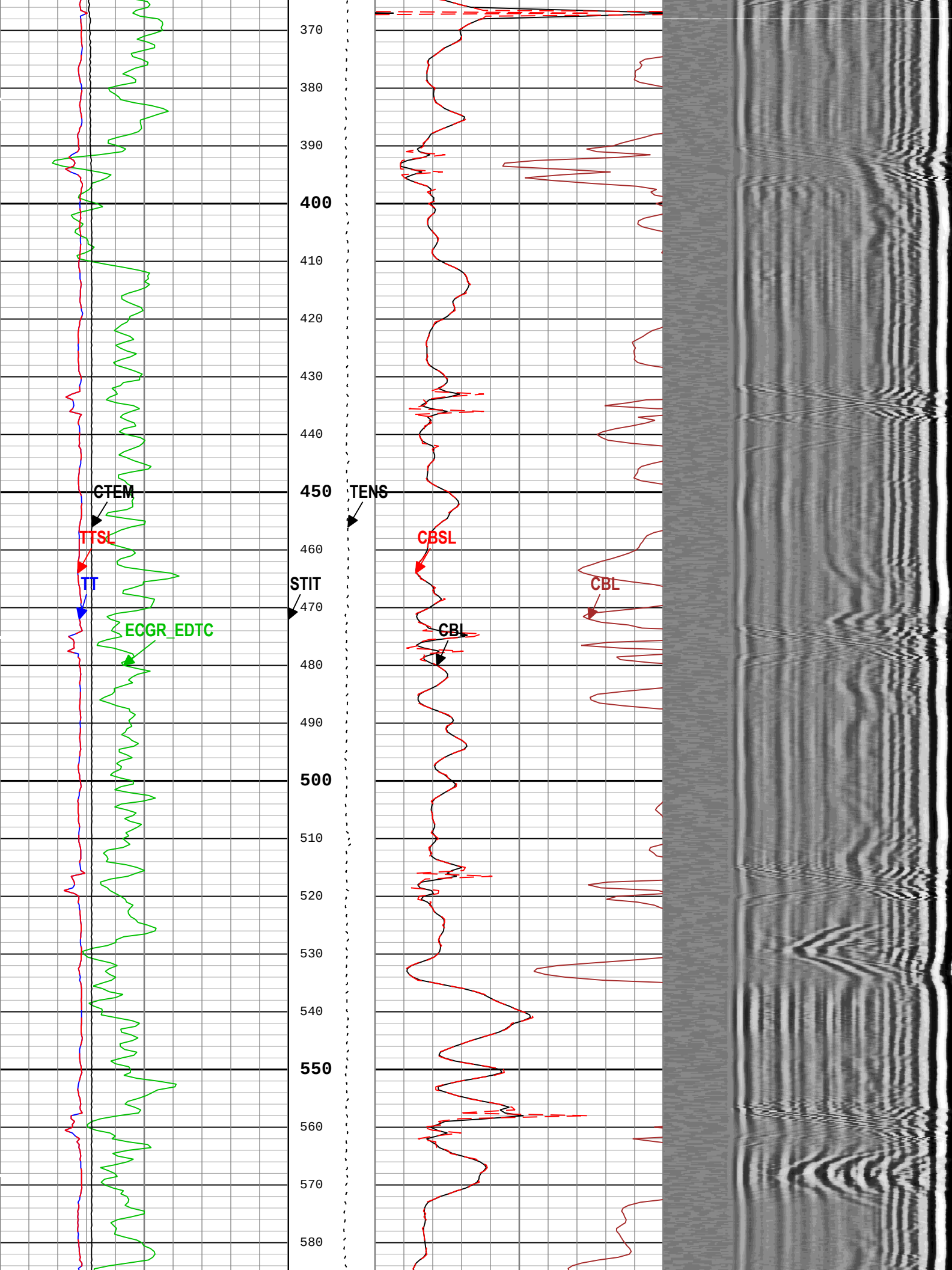
ECGR
EDTC
STIT
TENS
CBSL
CBL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TENS
CBSL
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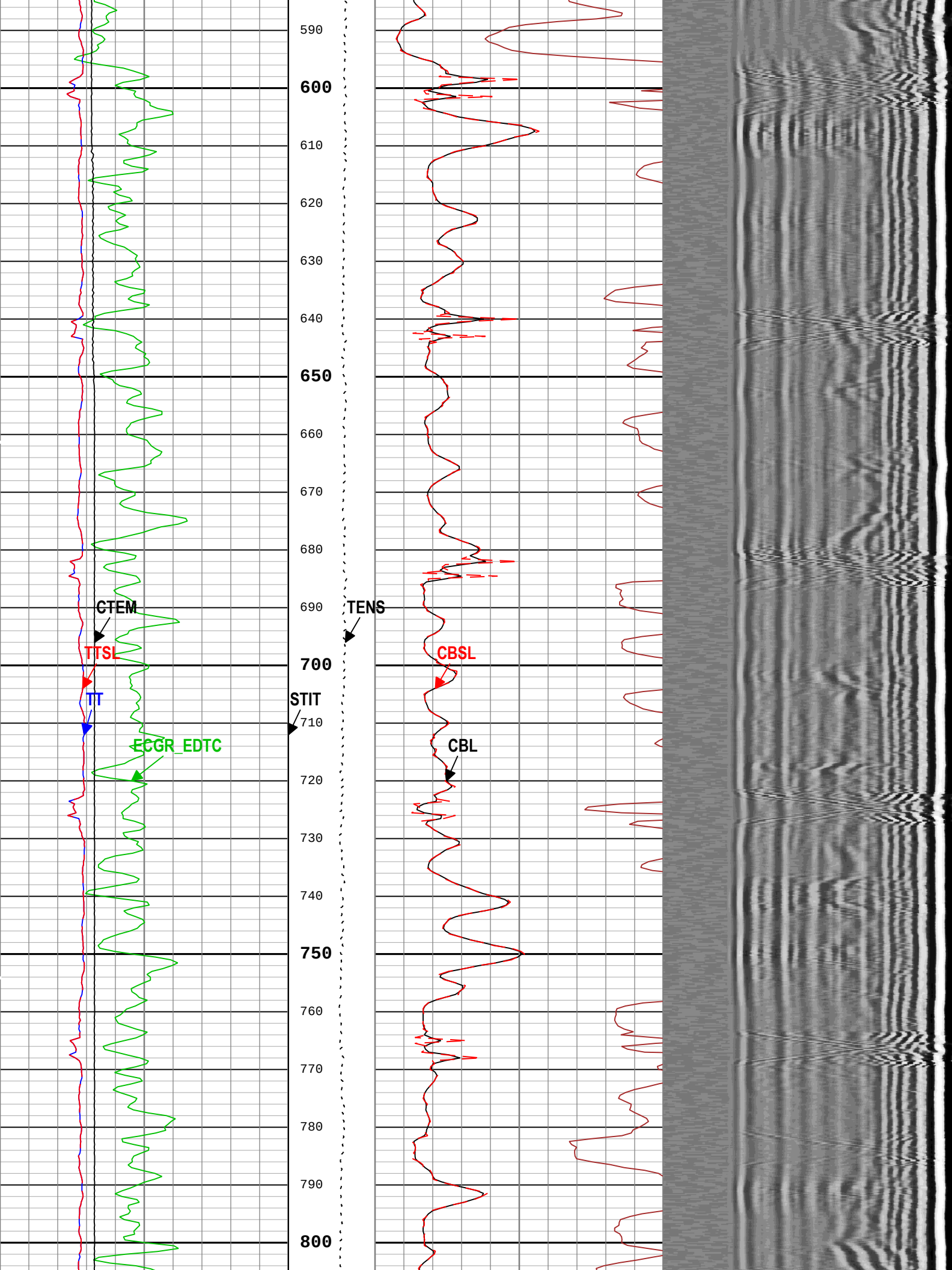
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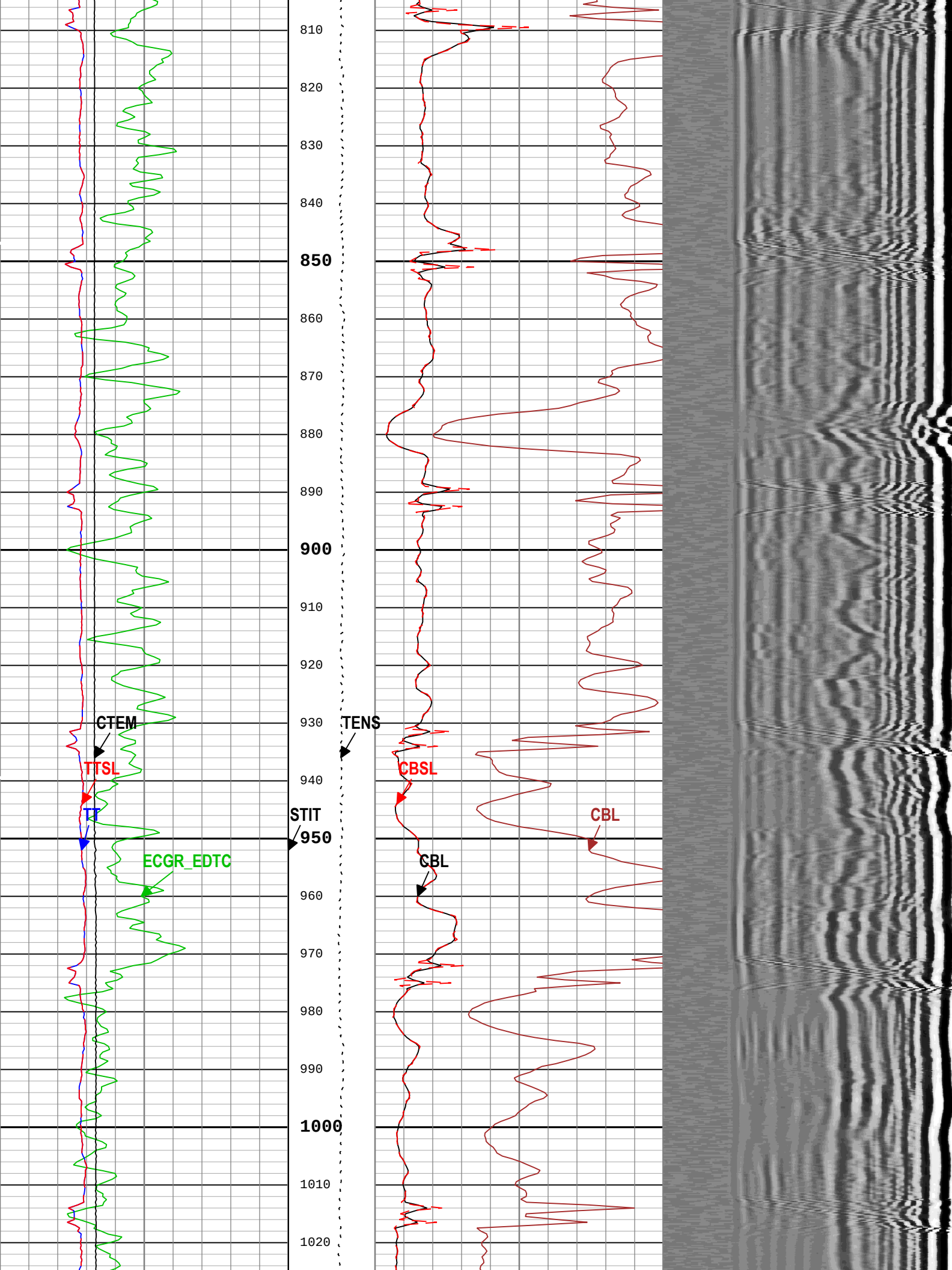
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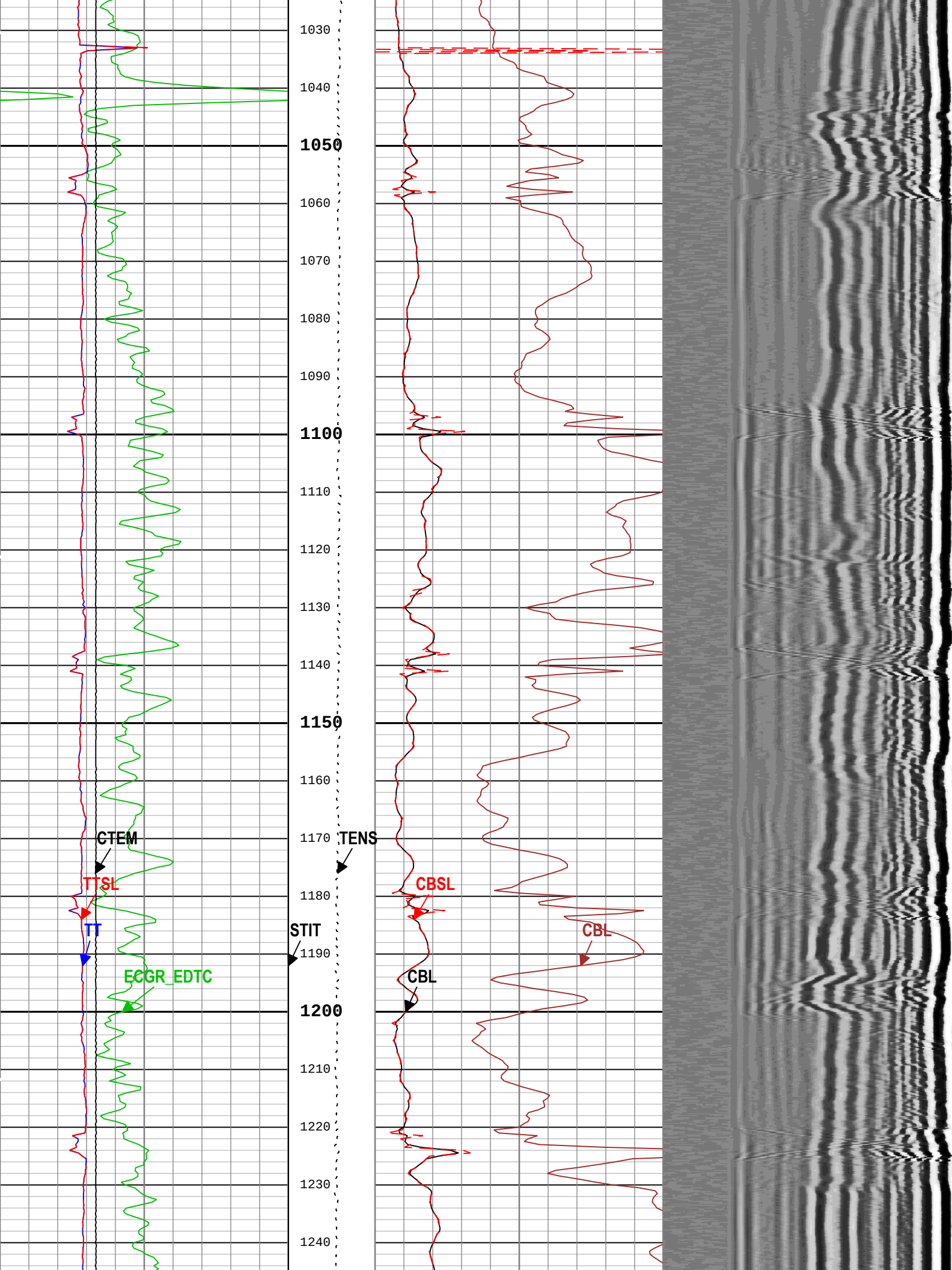
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CBSL
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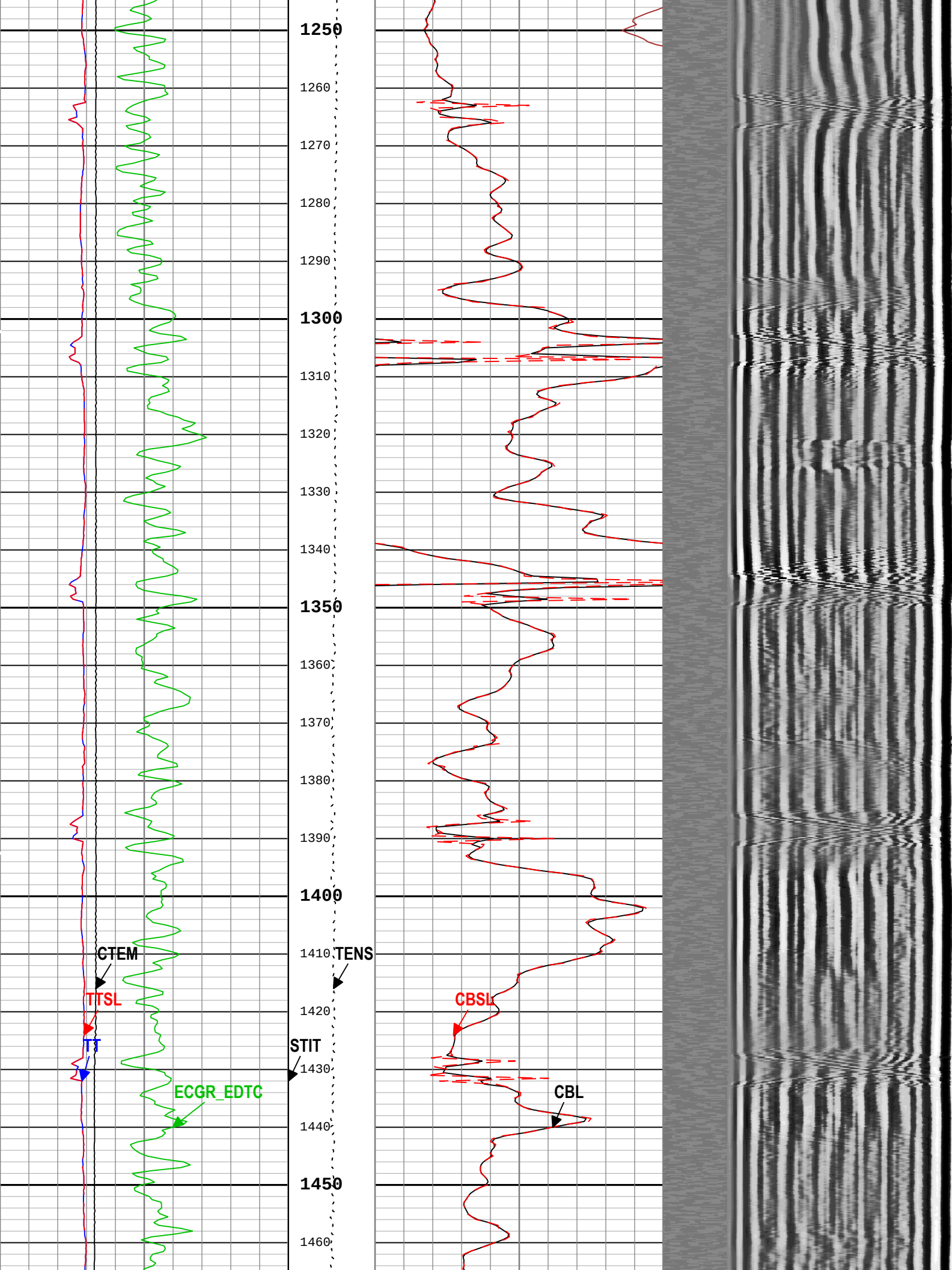
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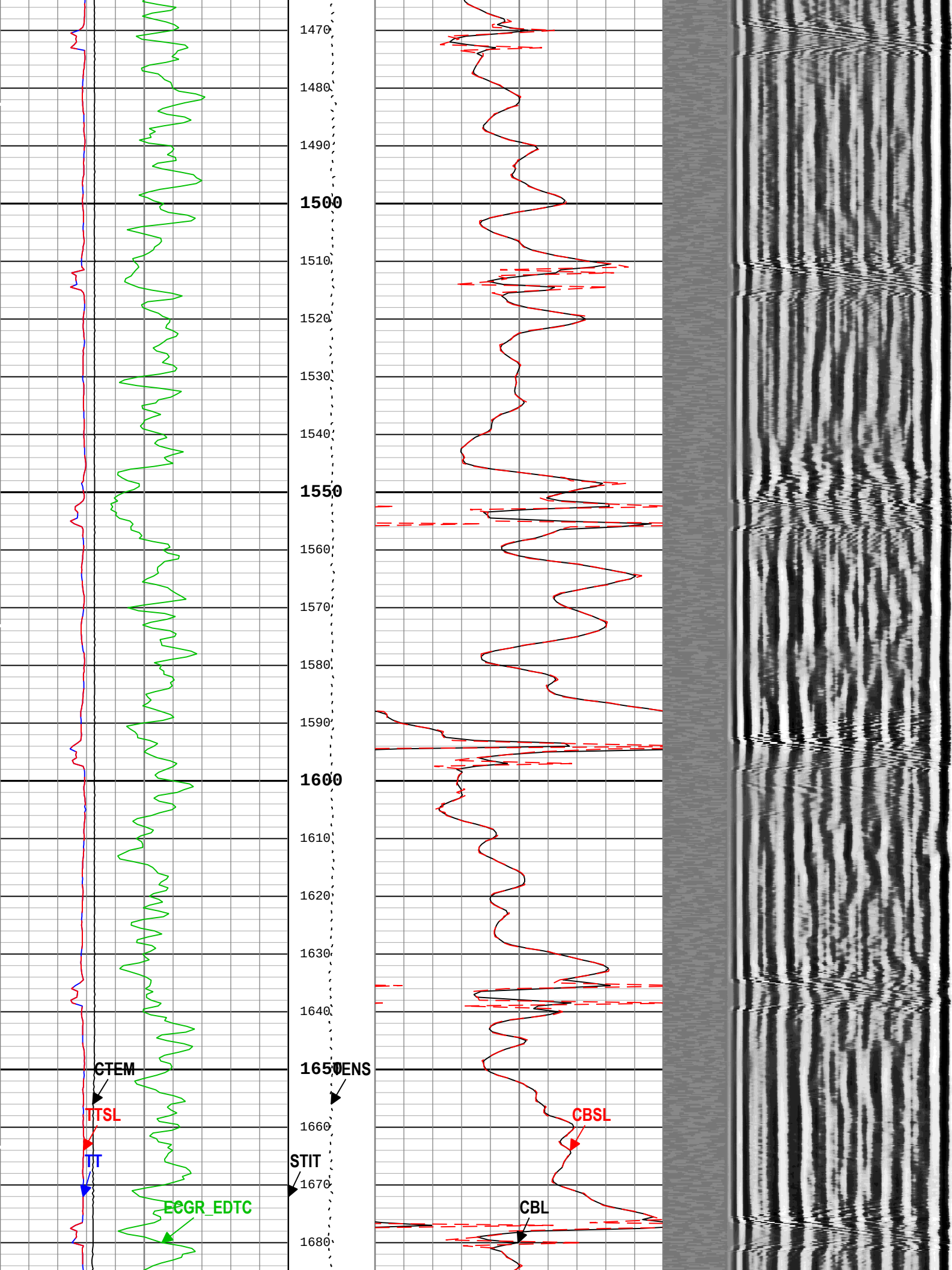
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CBSL
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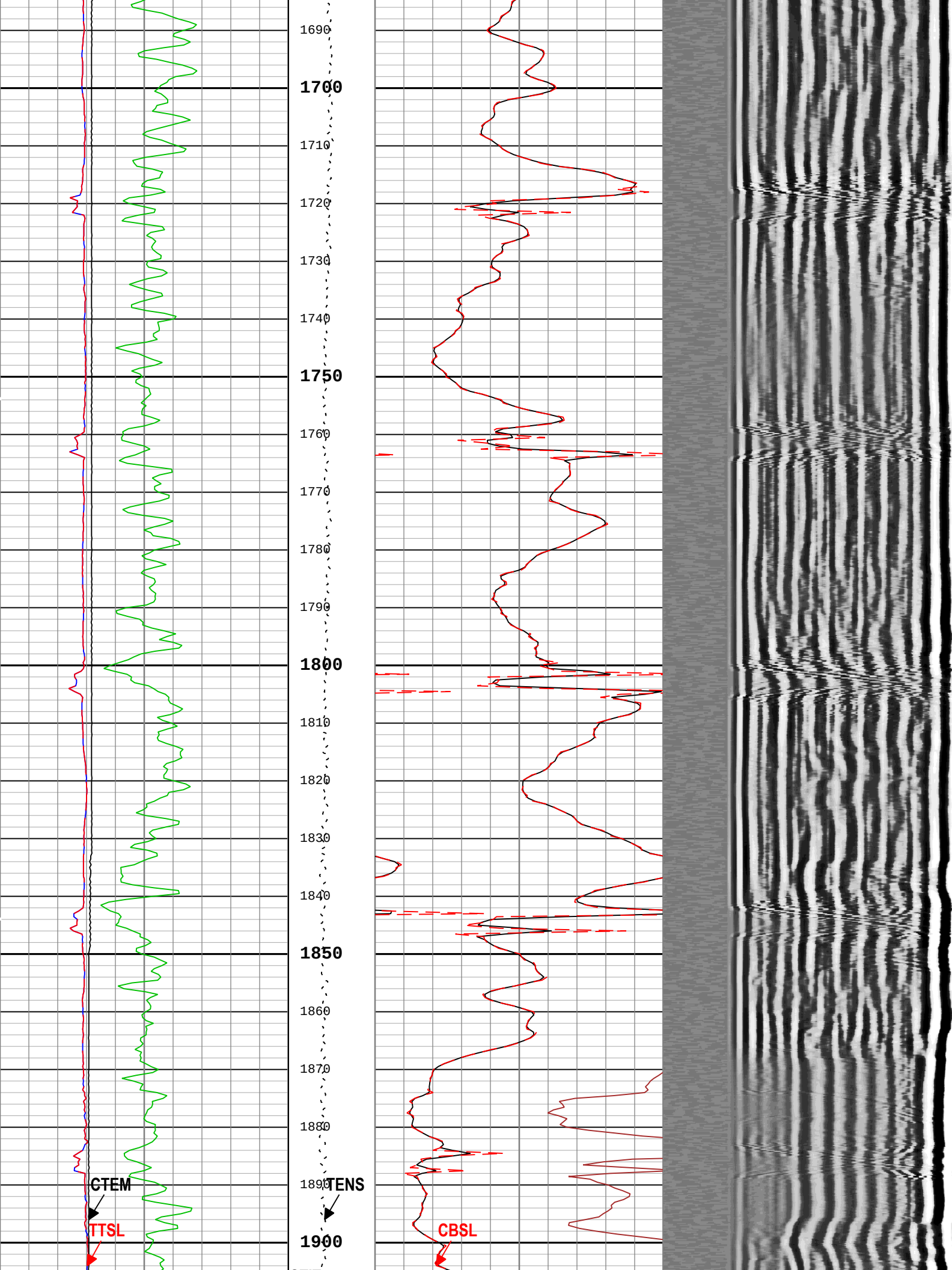
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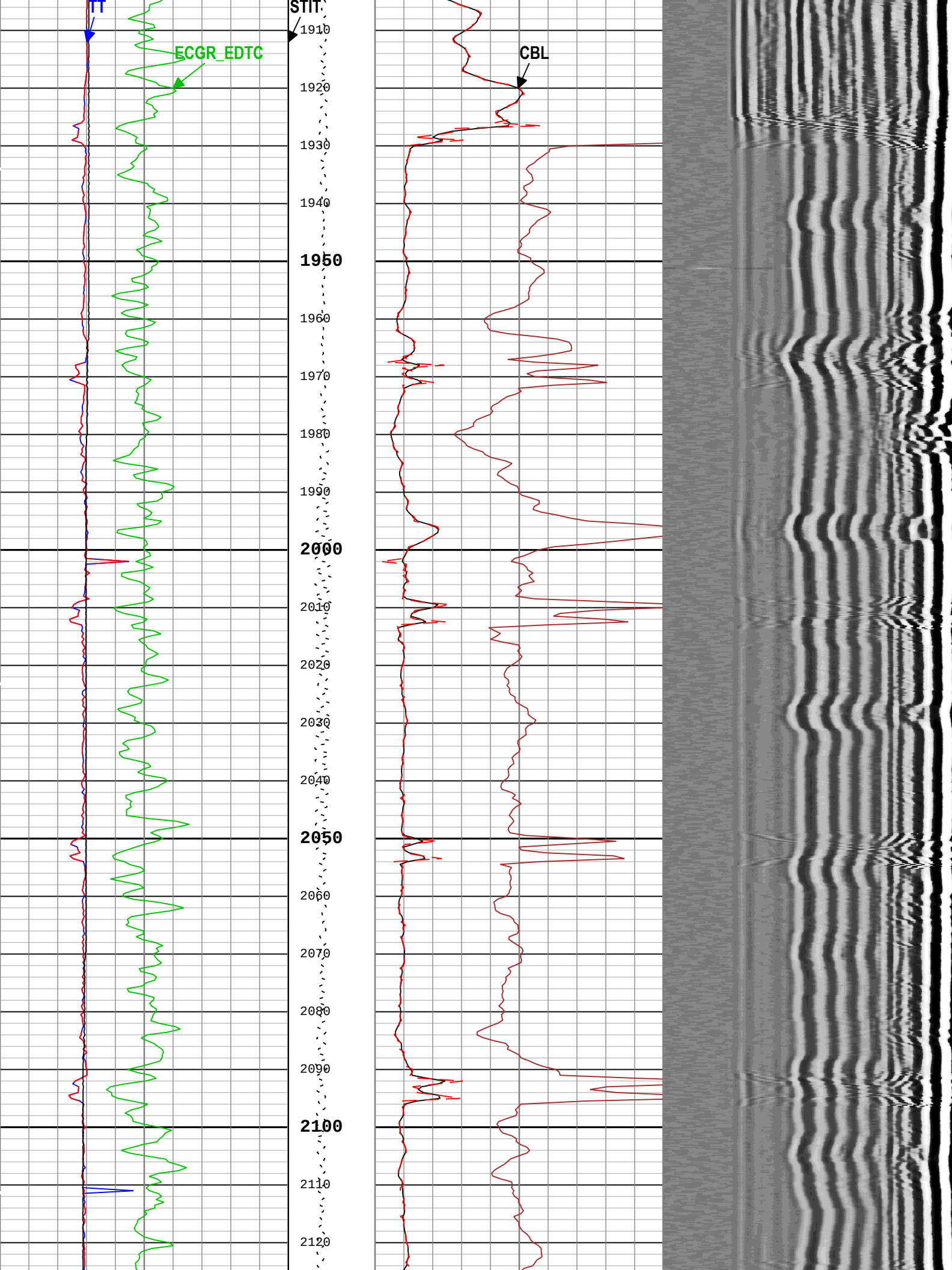
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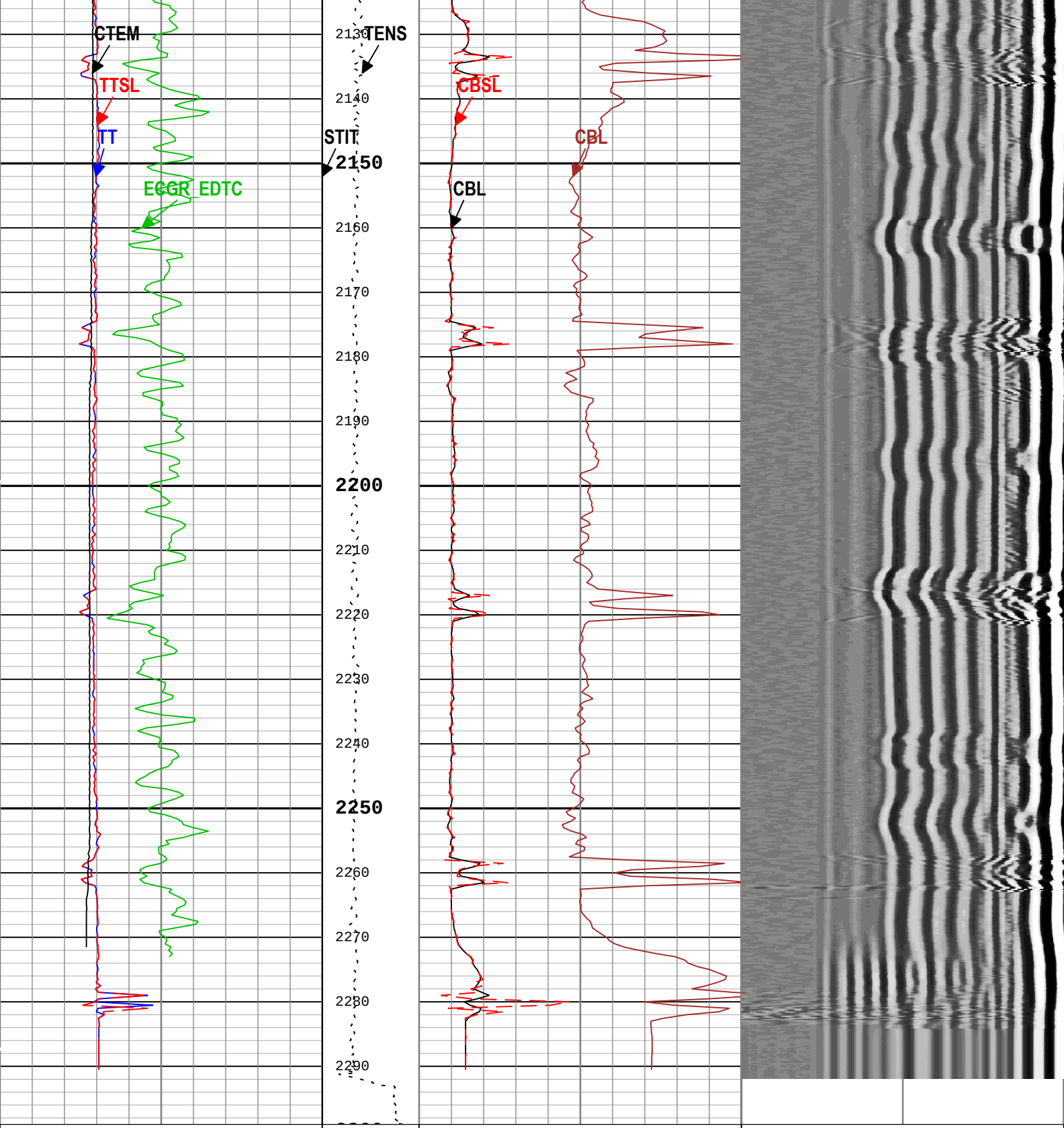


Gamma Ray (ECGR_EDTC) EDTC-B
0 gAPI 150

Transit Time for CBL (TT) DSLT-H
400 us 200

Transit Time (Sliding Gate) (TTSL) DSLT-H
400 us 200

Cartridge Temperature (CTEM) EDTC-B
20 degF 220

Stuck Tool Indicator, Total (STIT)
0 ft 50

Cable Tension (TENS)
2000 lbf 0

Cable Drag

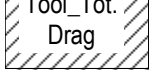
CBL Amplitude (CBL) DSLT-H
0 mV 50

CBL Amplitude (CBL) DSLT-H
0 mV 10

CBL Amplitude (Sliding Gate) (CBSL) DSLT-H
0 mV 50

Min Amplitude Max

Variable Density Log (VDL) DSLT-H
200 us 1200



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: 26-Jun-2018 14:26:29

Channel Processing Parameters

CBL: Parameters

Parameter	Description	Tool	Value	Unit
AMSG	Auxiliary Minimum Sliding Gate	DSLT-H	299	us
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	13.5	in
CBLG	CBL Gate Width	DSLT-H	65	us
CBLO	Casing Bottom (Logger)	WLSESSION	2418	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSLT-H	52	mV
CDEN	Cement Density	EDTC-B	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	3.09	mV
MAHTR	Manual High Threshold Reference for first arrival detection	DSLT-H	120	
MATT_CURR	Maximum Attenuation in Arbitrary Cement	DSLT-H	10.91	dB/ft
MCI	Minimum Cemented Interval for Isolation	DSLT-H	14.81	ft
MNHTR	Minimum High Threshold Reference for first arrival detection	DSLT-H	100	
MSA	Minimum Sonic Amplitude	DSLT-H	1.53	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	DSLT-H	1.53	mV
NMSG	Near Minimum Sliding Gate	DSLT-H	306	us
NMXG	Near Maximum Sliding Gate	DSLT-H	373	us
SGAD	Sliding Gate Status	DSLT-H	Off	
SGDT	Sliding Gate Delta-T	DSLT-H	53	us/ft
TD	Total Measured Depth	Borehole	2418	ft

Tool Control Parameters

CBL: 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	5000	ft/h

Calibration Report

DSLT-H (Digitizing Sonic Logging Tool - H) Calibration - Run CBL

Primary Equipment :

Sonic Logging Sonde E supports 3'-5'BHC DT and CBL/VDL SLS-E 1563

CBL Normalization - CBL Accumulations

Master (Manual Entry): 12:37:57 23-Jun-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Upper Far Amplitude - 0		Master	-----	-----	-----	-----	
Upper Near Raw Amplitude - 0	mV	Master	-----	-----	-----	-----	

Lower Far Amplitude - 0		Master	-----	-----	-----	-----	
Lower Near Raw Amplitude - 0	mV	Master	-----	-----	-----	-----	

CBL Normalization - CBL/VDL Coefficients

Master (Manual Entry): 12:37:57 23-Jun-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
CBL Correction Factor for UT		Master	3.500	2.700	3.431	4.300	
CBL Correction Factor for LT		Master	2.500	1.700	2.712	4.300	
VDL Ratio between UT and LT for CBLB Mode		Master	1.000		1.350		

CBL Free Pipe Adjustment - Free Pipe Measurement

Before (Manual Entry): 15:38:03 23-Jun-2018

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): 15:38:03 23-Jun-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
CBL Adjustment Factor		Before	1.000	0.200	1.460	5.000	
Depth of Before Calibration	ft	Before			50.72		

Company: Crestone Peak Resources Operating LLC

Schlumberger

Well: Sam 3B-25H-M166

Field: Wattenberg

County: Weld

State: Colordao

Cement Bond Log

Surface Casing