

Company: Expedition Water Solutions LLC

Well: EWS 4

Field: Wattenburg

County: Weld State: Colorado

Platform Express	
Compensated Neutron	
Litho-Density	
NE SE 18-2N-63W	Elev.: K.B. 4869.00 ft G.L. 4856.00 ft D.F. 4869.00 ft
Permanent Datum:	Ground Level
Log Measured From:	Kelly Bushing
Drilling Measured From:	Kelly Bushing
API Serial No. 05-123-44167	Section: 18
	Township: 2N
	Range: 63W

County: Weld  
Field: Wattenburg  
Location: NE SE 18-2N-63W  
Well: EWS 4  
Company: Expedition Water Solutions LLC

Logging Date	22-Feb-2017			
Run Number	ONE			
Depth Driller	10204.00 ft			
Schlumberger Depth	10201.00 ft			
Bottom Log Interval	10204.00 ft			
Top Log Interval	8548.00 ft			
Casing Driller Size @ Depth	7 in @ 8547.00 ft			
Casing Schlumberger	8552 ft			
Bit Size	6.125 in			
Type Fluid In Hole	Fresh Water			
Density	Viscosity	43 s		
Fluid Loss	PH	8.8		
MUD				
Source of Sample				
RM @ Meas Temp	0.5 ohm.m @ 68 degF			
RMF @ Meas Temp	0.48 ohm.m @ 68 degF			
RMC @ Meas Temp	0.36 ohm.m @ 68 degF			
Source RMF	RMC	Calculated	Calculated	
RM @ BHT	RMF @ BHT	0.17 @ 212	0.16 @ 212	
Max Recorded Temperatures				
Circulation Stopped		Time	21-Feb-2017 21:30:00	
Logger on Bottom		Time	22-Feb-2017 05:35:00	
Unit Number	Location:	OSL-C-AR2 2161	Ft. Morgan	
Recorded By	L. Await			
Witnessed By	Jeremiah Demuth			

Disclaimer

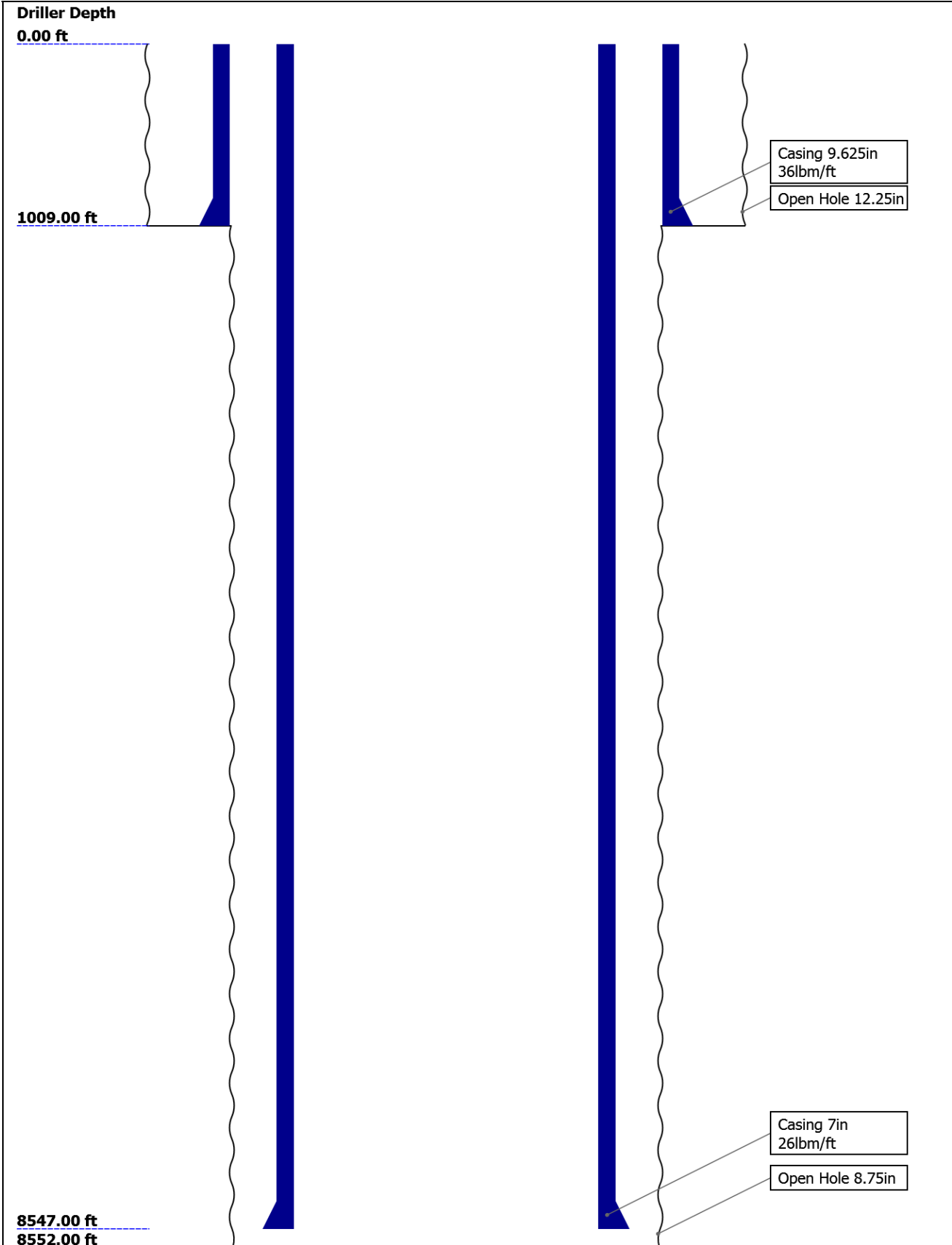
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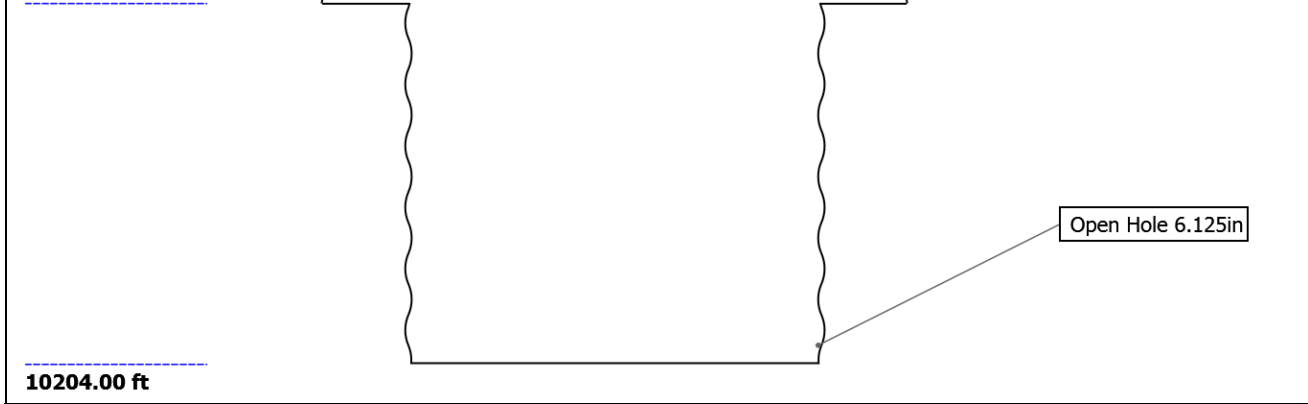
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Well Sketch

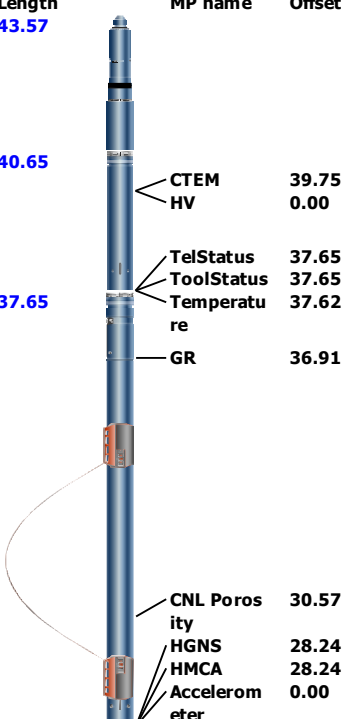




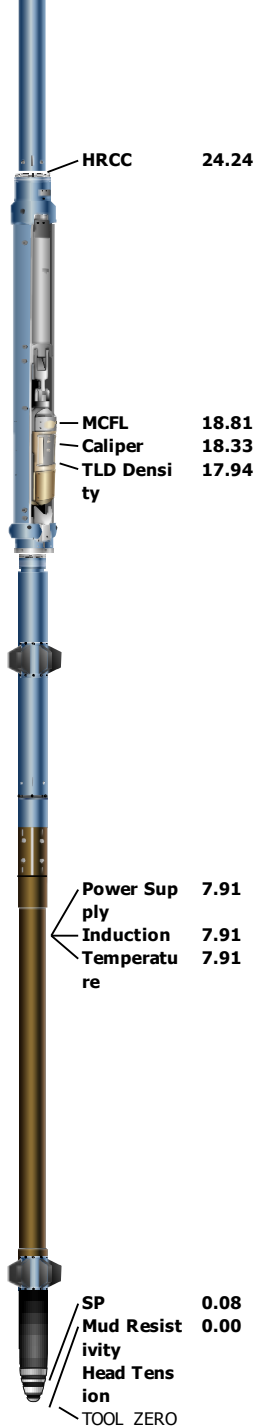
## Borehole Size/Casing/Tubing Record

Bit						
Bit Size ( in )	12.25	8.75	6.125			
Top Driller ( ft )	0	1009	8552			
Top Logger ( ft )	0	1009	8552			
Bottom Driller ( ft )	1009	8552	10204			
Bottom Logger ( ft )	1009	8552	10201			
Casing						
Size ( in )	9.625	7				
Weight ( lbm/ft )	36	26				
Inner Diameter ( in )	8.921	6.276				
Grade	N/A	N/A				
Top Driller ( ft )	0	0				
Top Logger ( ft )	0	0				
Bottom Driller ( ft )	1009	8547				
Bottom Logger ( ft )	1009	8552				

## Remarks and Equipment Summary

ONE: Toolstring				ONE: Remarks	
<b>Equip name</b> <b>LEH-QT</b> LEH-QT	<b>Length</b> <b>43.57</b>	<b>MP name</b>	<b>Offset</b>	Thank you for choosing Schlumberger!	
				Run ONE: Log ran for open hole formation evaluation	
				Run ONE: Tool ran eccentricized as per tool sketch	
				Run ONE: Sandstone Matrix of 2.65g/cc used for TD-9800 & 8780 - Surface as per client req	
				Run ONE: Limestone Matrix of 2.71g/cc used for 9800-8780 as per client request.	
<b>DTC-H</b> ECH-KC DTC-H	<b>40.65</b>	<b>CTEM HV</b>	<b>39.75</b> <b>0.00</b>	Run TWO: Log ran for casing and cement evaluation	
<b>HGNS-H</b> HGNH NPV-N NSR-F:5069 HMCA-H HGNS-H HACCZ-H	<b>37.65</b>	<b>TelStatus</b> <b>ToolStatus</b> <b>Temperature</b> <b>GR</b>	<b>37.65</b> <b>37.65</b> <b>37.62</b> <b>36.91</b>	Run TWO: Tool ran centralized with two knuckles as per tool sketch	
<b>HDPS-H</b>	<b>28.24</b>	<b>CNL Porosity</b> <b>HGNS</b> <b>HMCA</b> <b>Accelerometer</b>	<b>30.57</b> <b>28.24</b> <b>28.24</b> <b>0.00</b>		

HRMS-H  
ECH-MEB  
HRCC-H  
HRMS-H  
Backscatter  
GPV-Q  
Short Spacing  
:27786  
Long Spacing  
GSR-J:5471  
HRGD-H:4899



Lengths are in ft  
Maximum Outer Diameter = 9.000 in  
Line: Sensor Location, Value: Gating Offset  
All measurements are relative to TOOL\_ZERO

## Depth Summary

ONE		
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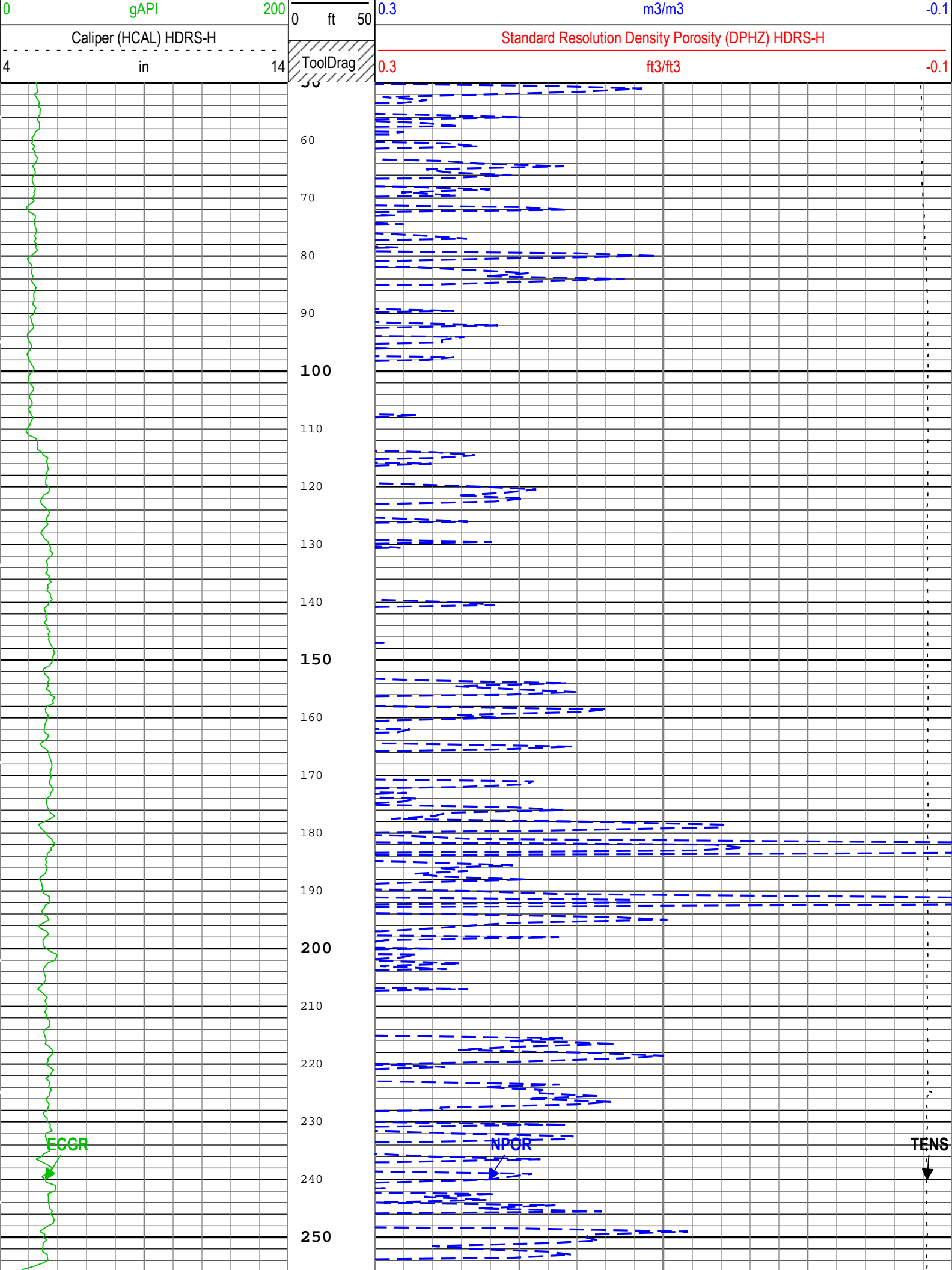
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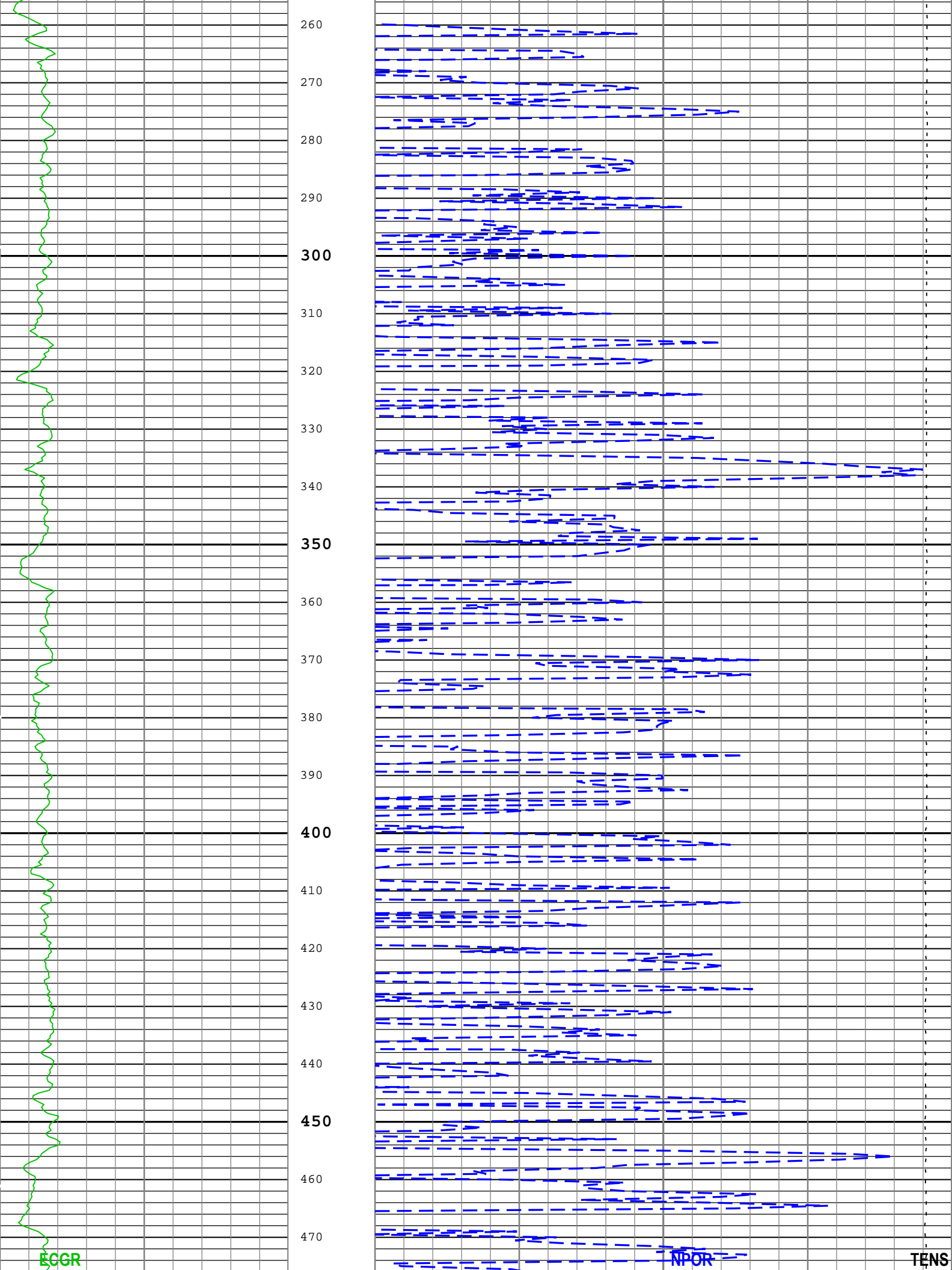
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		

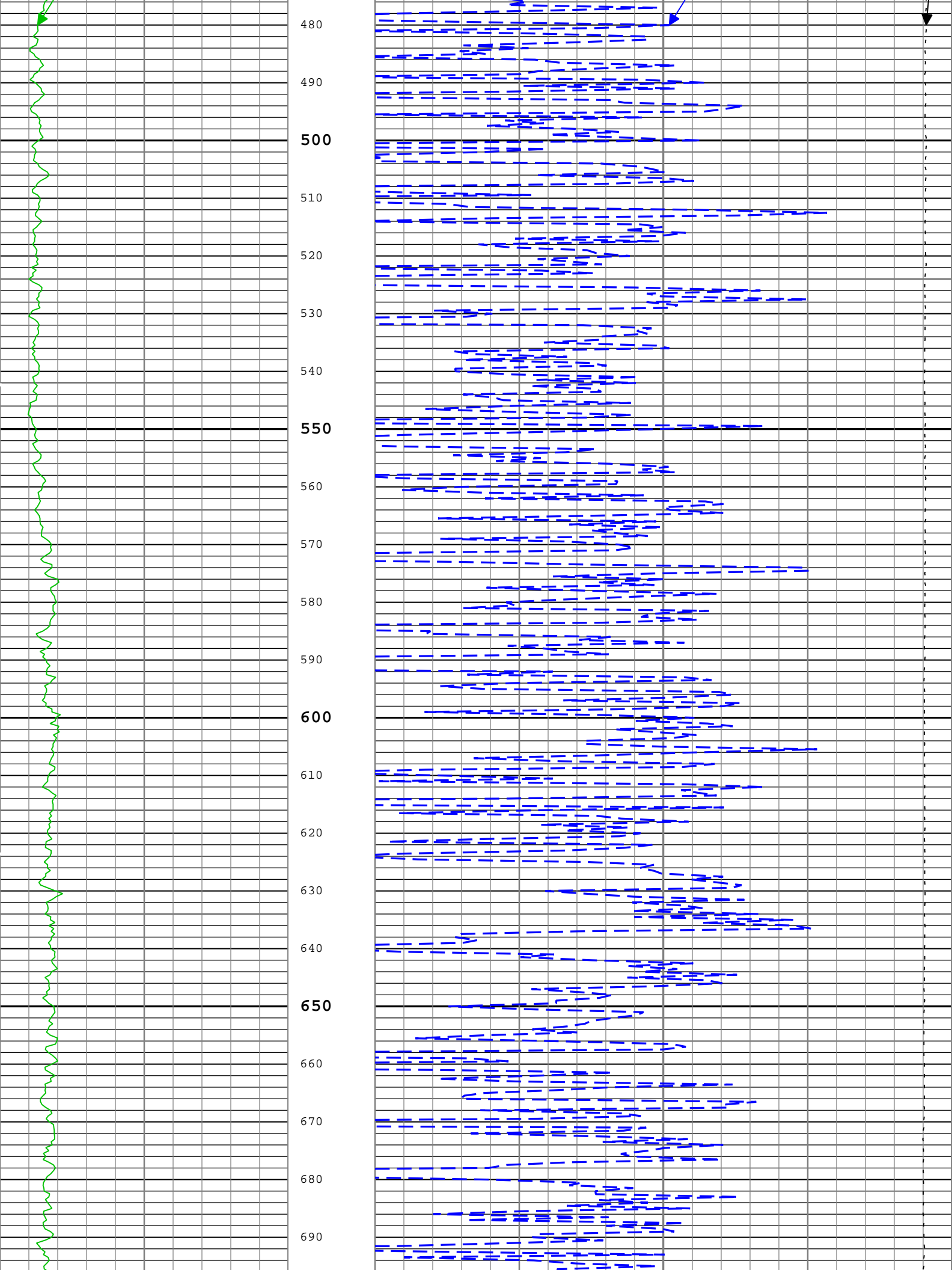
### Tension Device

Type	CMTD-B/A		
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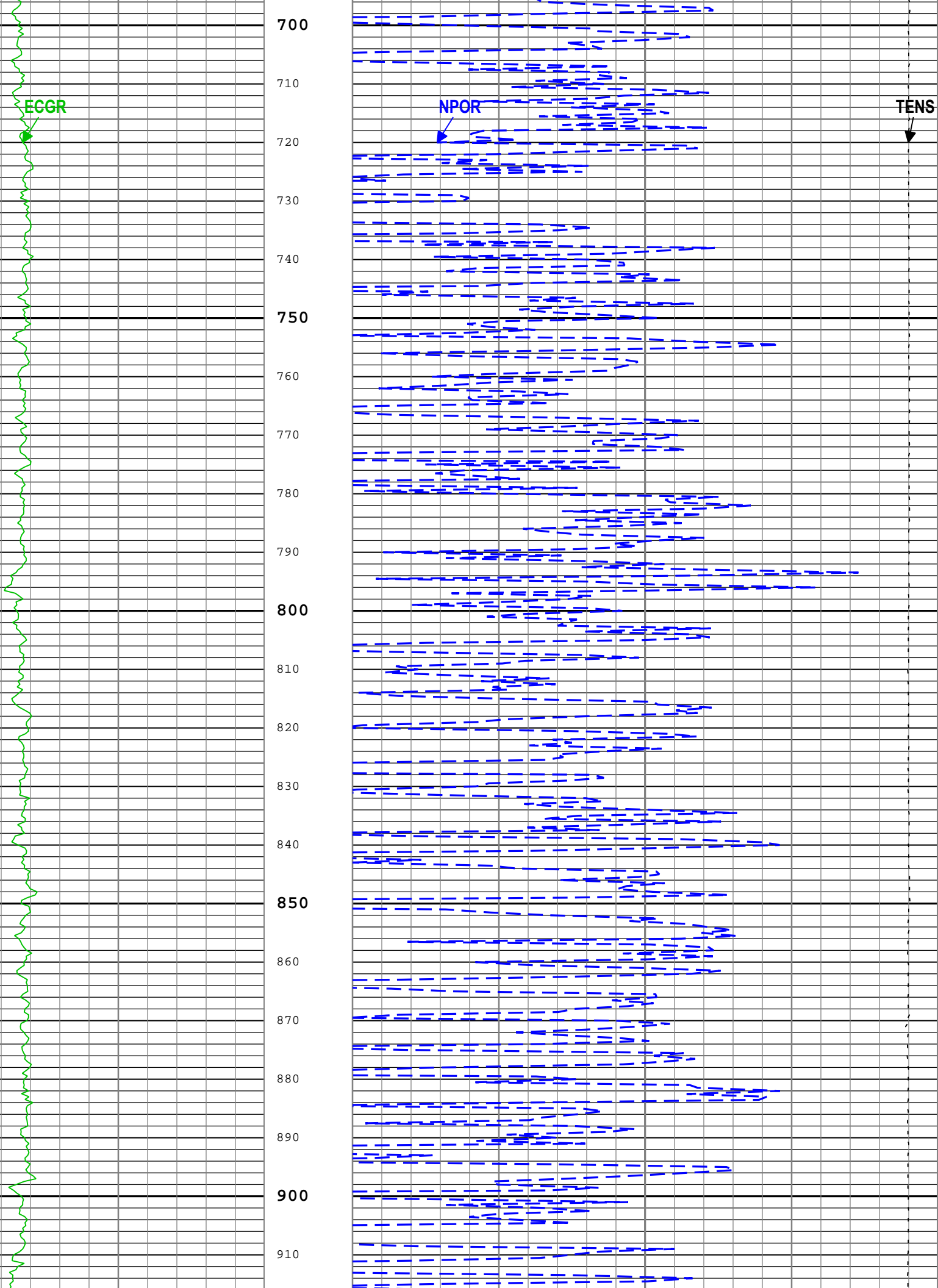
Serial Number									
Calibration Date									
Calibrator Serial Number									
Number of Calibration Points		0							
Logging Cable									
Type		7-46NT-XS							
Serial Number									
Length		24000.00 ft							
Conveyance Type		Wireline							
Rig Type		Ensign 121							
ONE:Depth Control Parameters				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									
ONE									
5" Porosity									
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[3]:Up	Up	13.94 ft	10220.98 ft	22-Feb-2017 5:31:59 AM	22-Feb-2017 8:02:44 AM	ON	-0.03 ft	Yes
All depths are referenced to toolstring zero									
Log	Company:Expedition Water Solutions LLC      Well:EWS 4							ONE: Log[3]:Up:S015	
Description: HGNS standard resolution porosities for Platform Express    Format: Log ( Porosity-5 )    Index Scale: 5 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation Date: 24-Feb-2017 08:55:41									
Channel	Source	Sampling							
CALI	HDRS-H:HRCC-H:HRCC-H	1in							
DPHZ	HDRS-H:HRMS-H:HRGD-H	2in							
GR	HGNS-H:HGNS-H:HGNS-H	6in							
NPOR	HGNS-H:HGNS-H:HGNS-H	6in							
PEFZ	HDRS-H:HRMS-H:HRGD-H	2in							
STIT	DepthCorrection	6in							
TENS	WLWorkflow	6in							
TIME_1900	WLWorkflow	0.1in							
TIME_1900 - Time Marked every 60.00 (s)									
				Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H		Cable Tension (TENS)			
				010		10000lbf0			
				Gas Effect					
Gamma Ray Back up				NPOR Backup					
Gamma Ray (ECGR) HGNS-H		Stuck Tool Indicator, Total (STIT)		Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H					

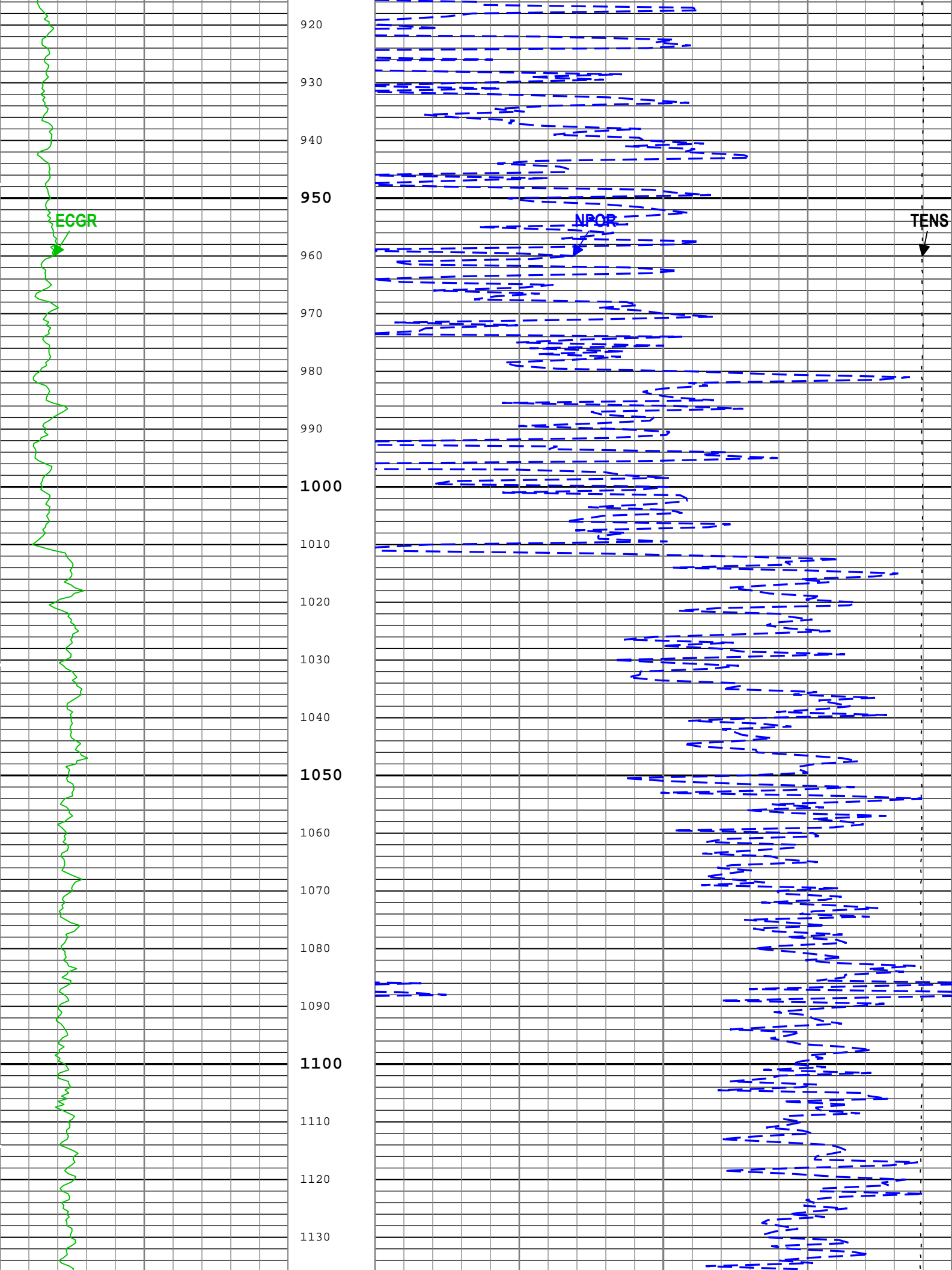


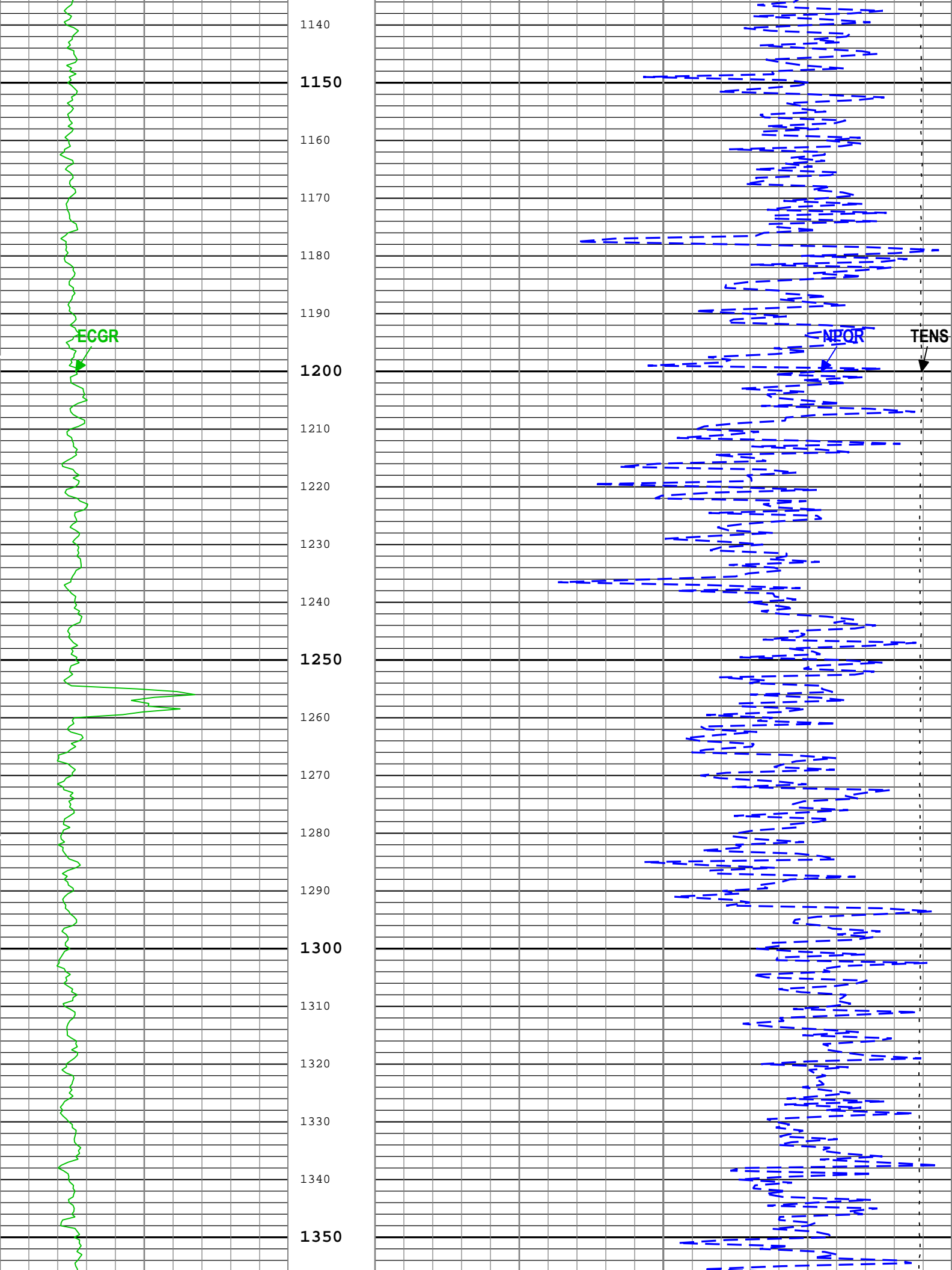


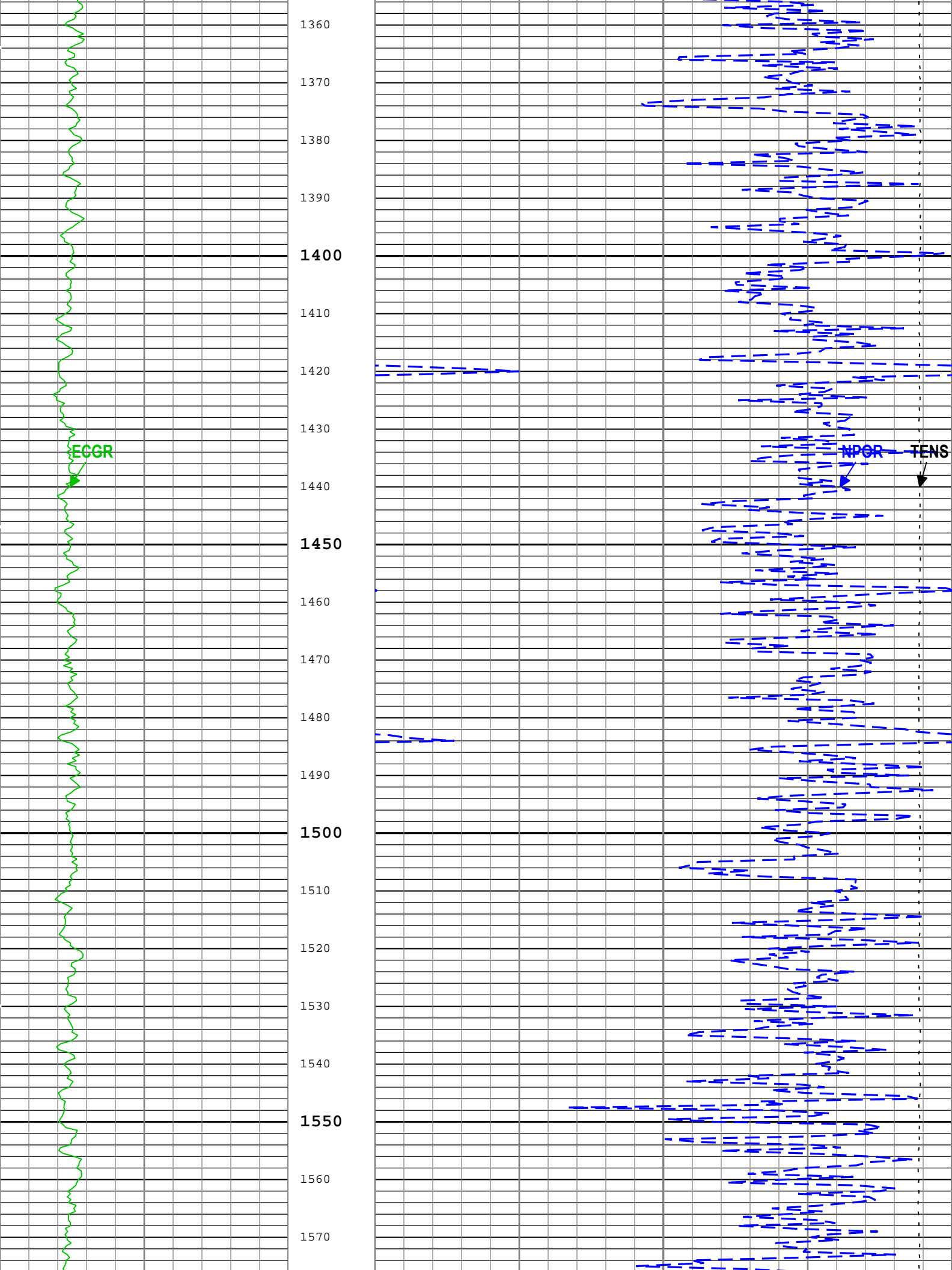


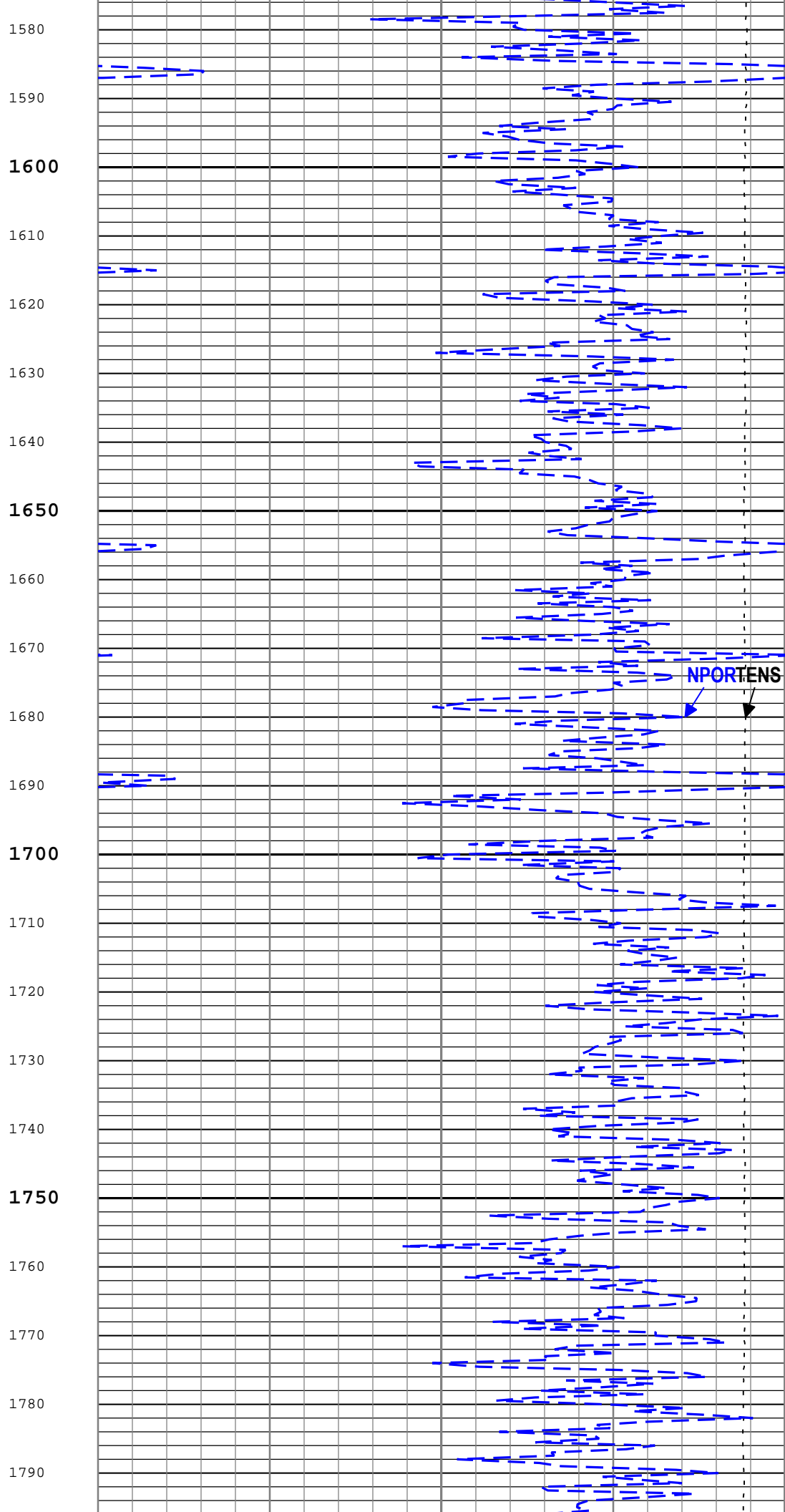
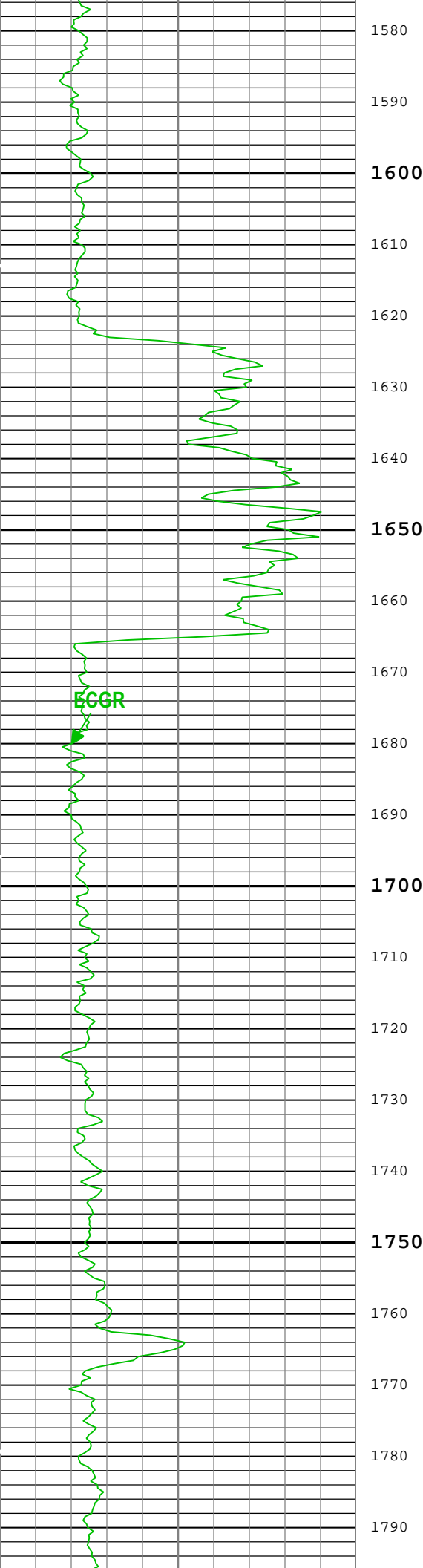


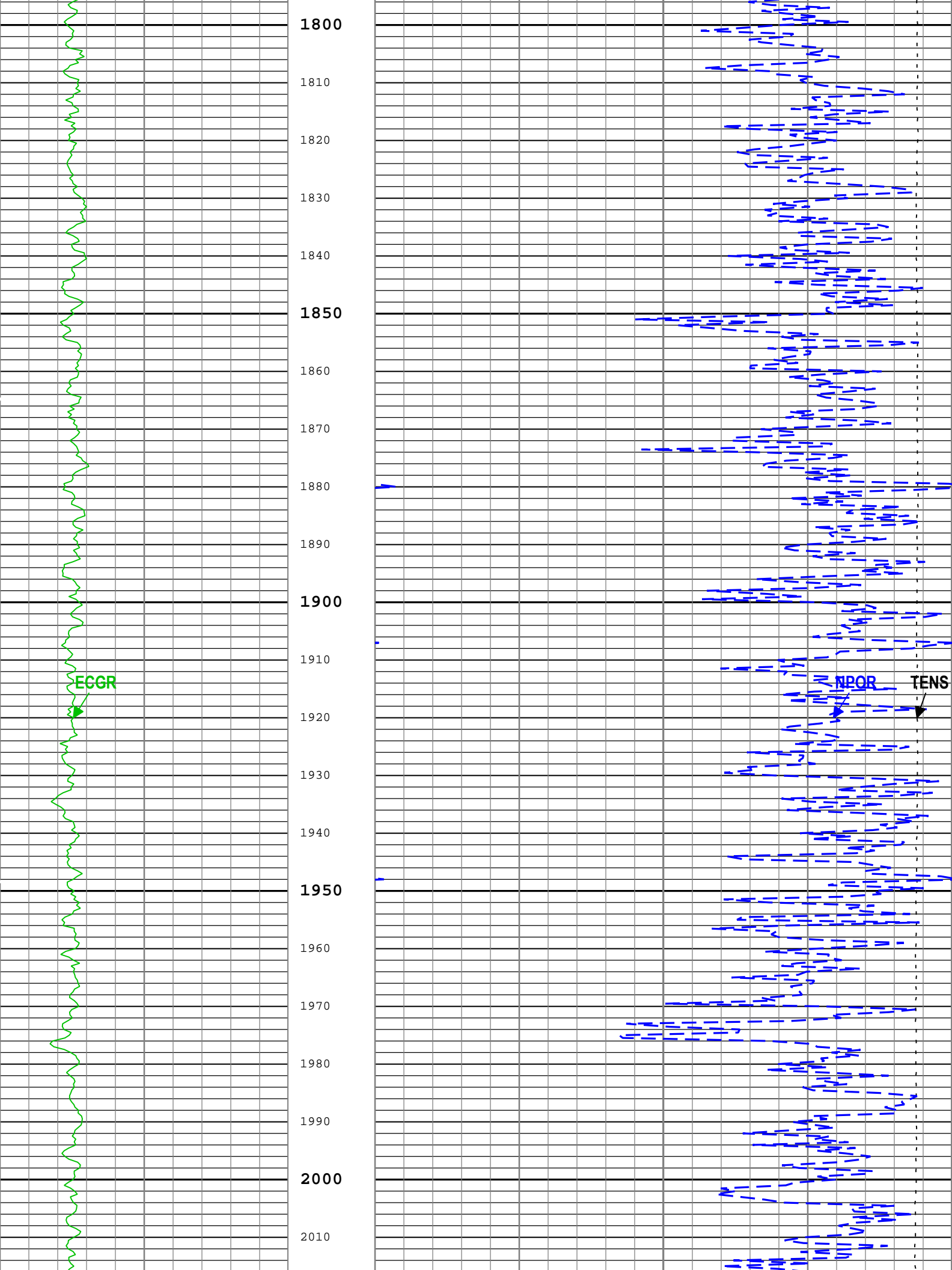


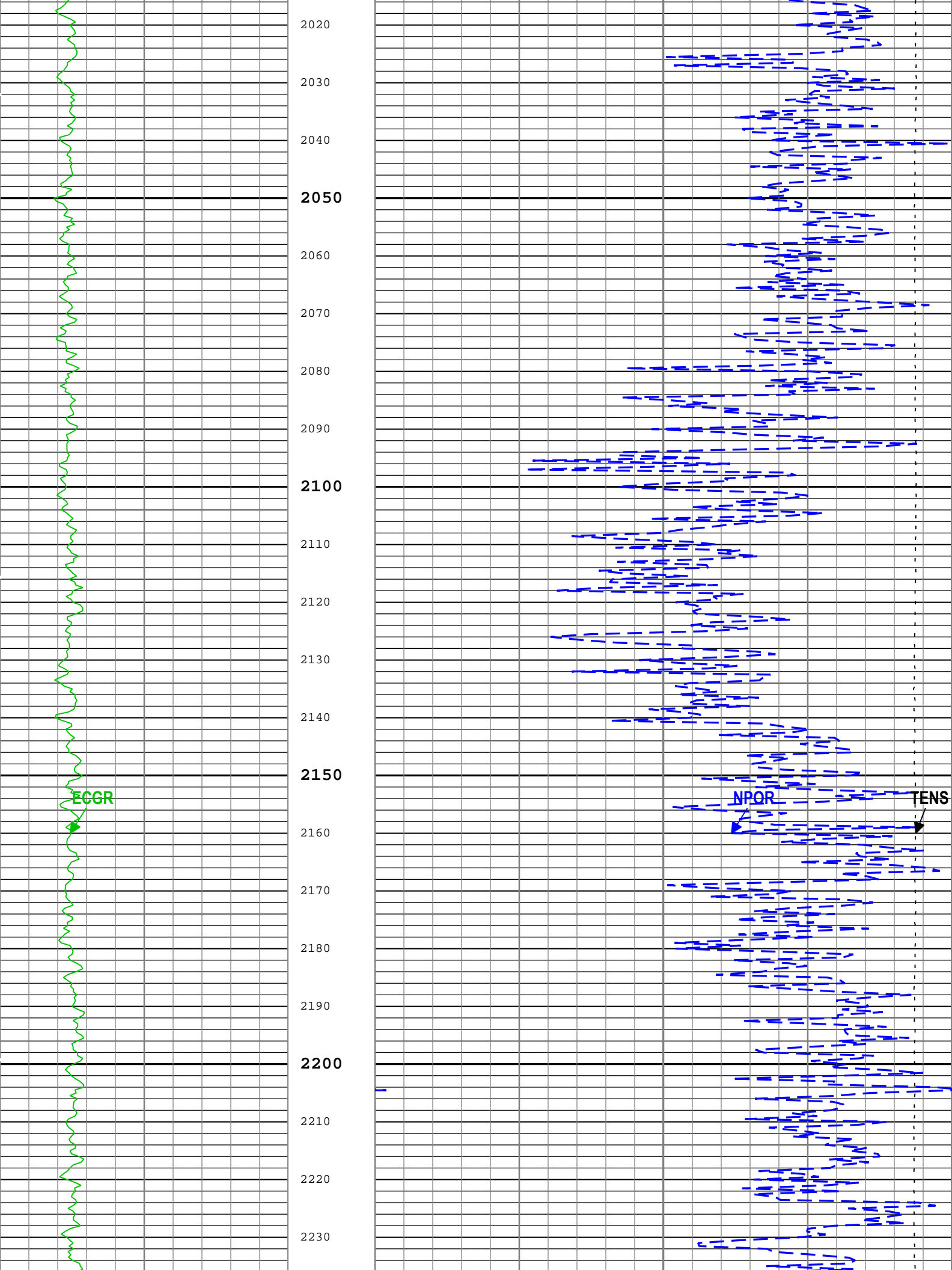


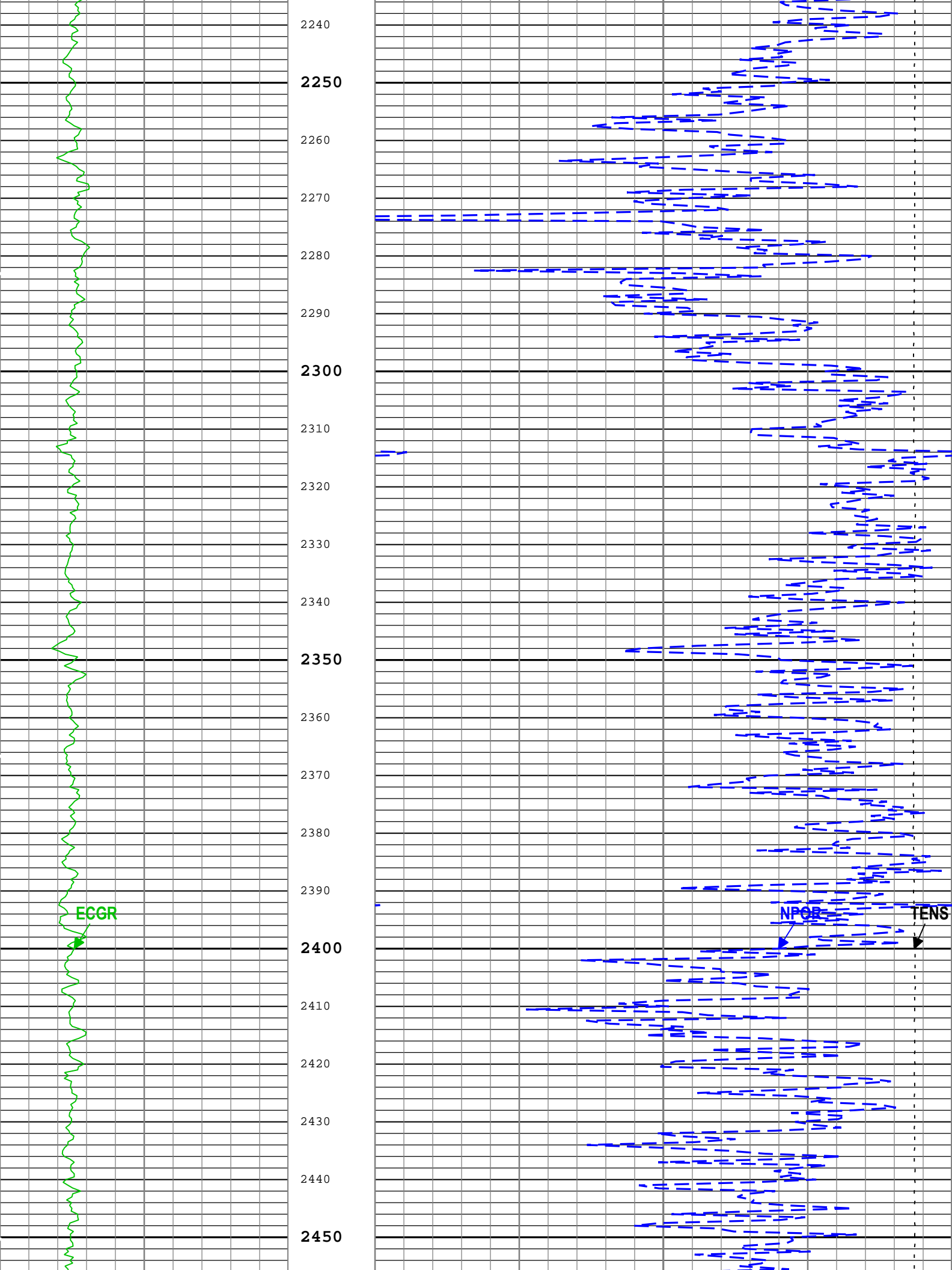




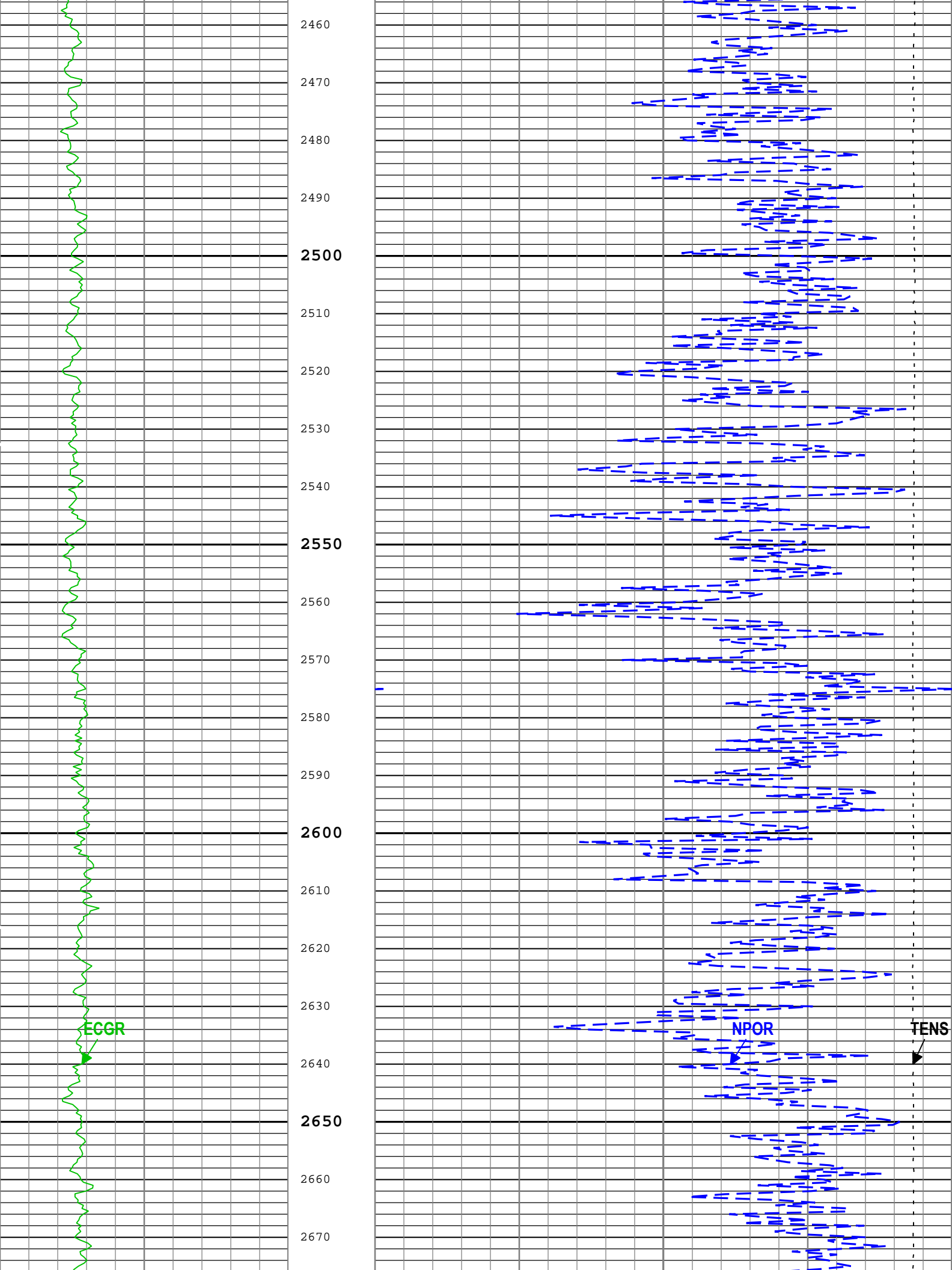


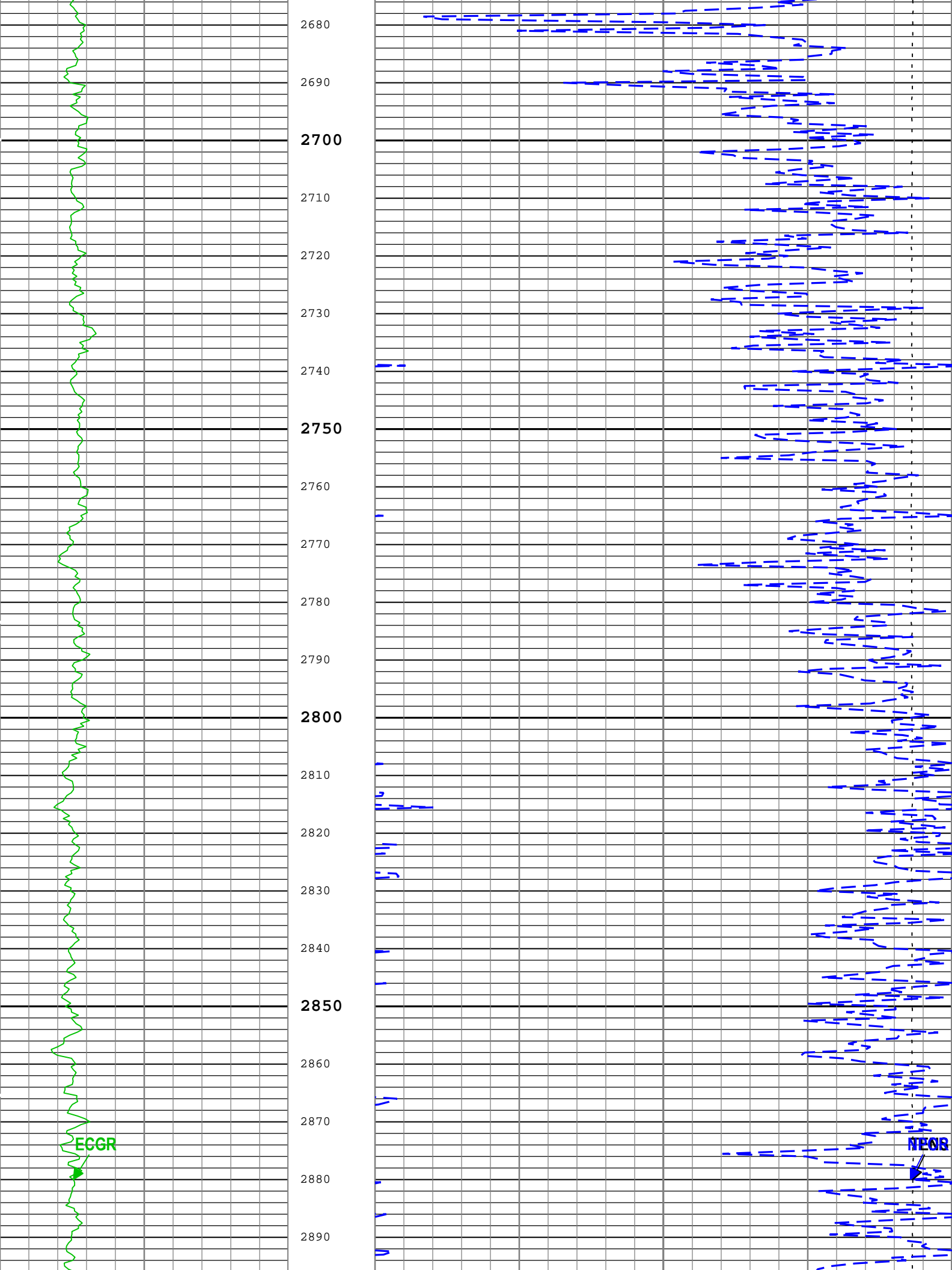


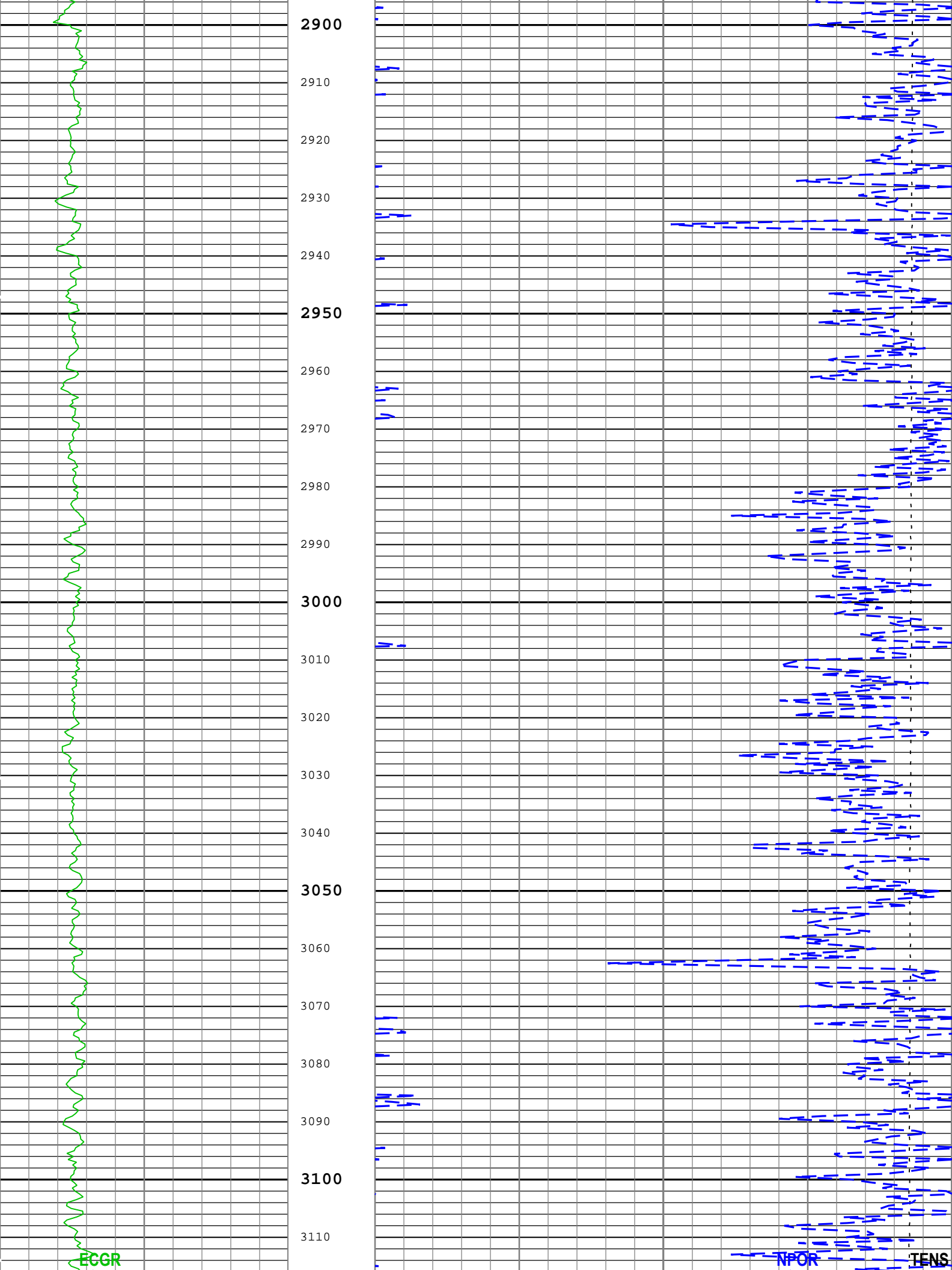


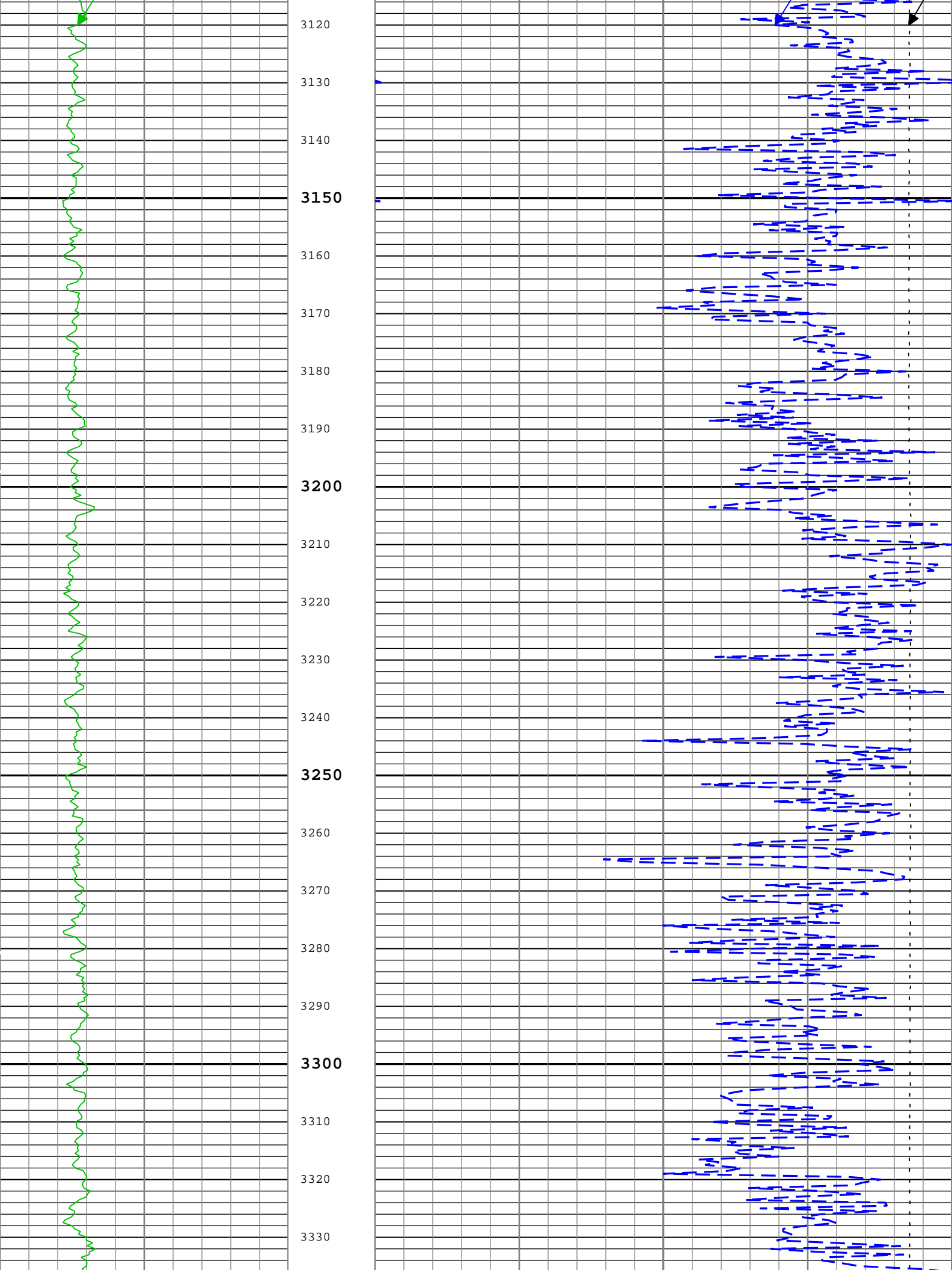


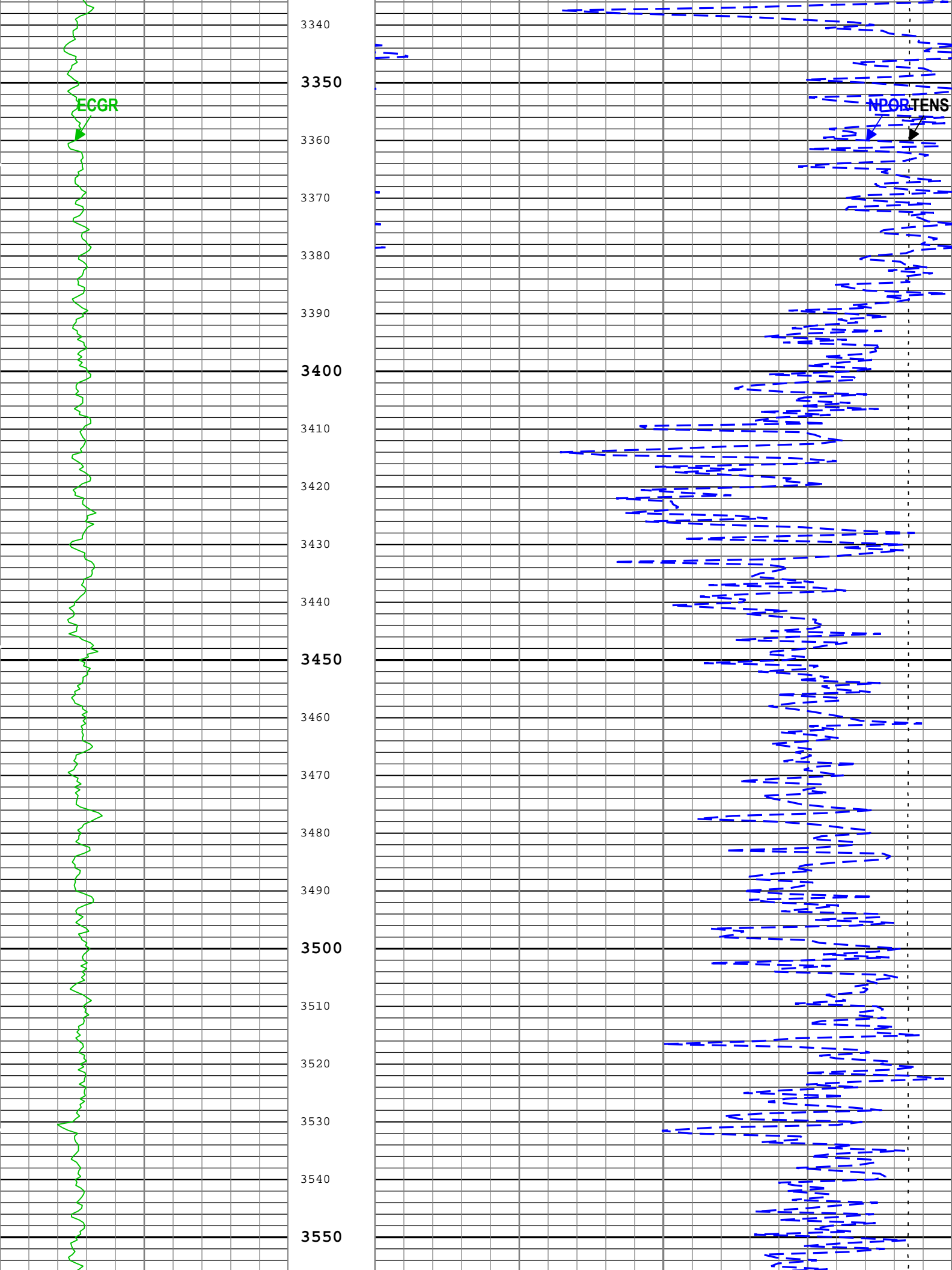


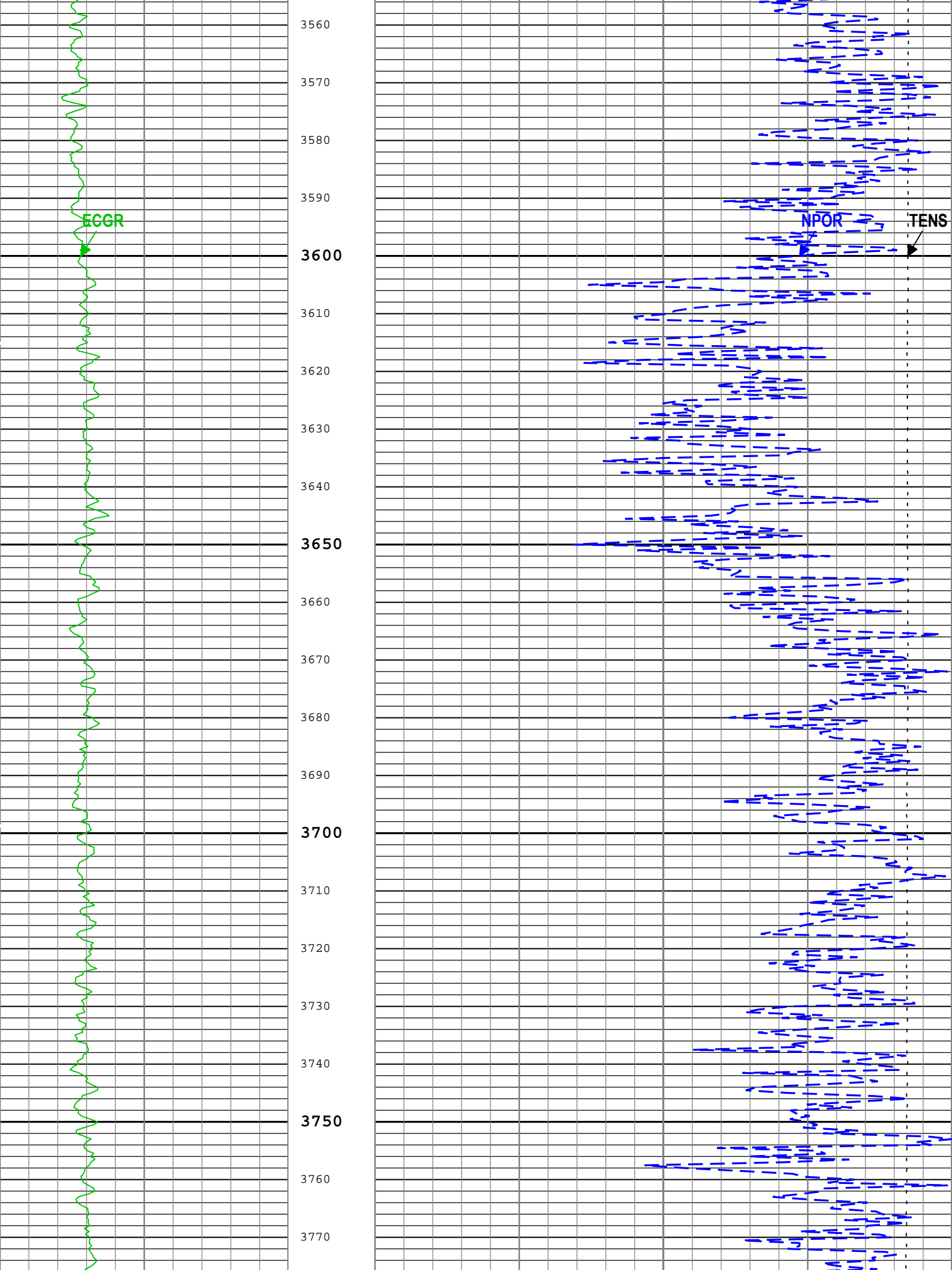


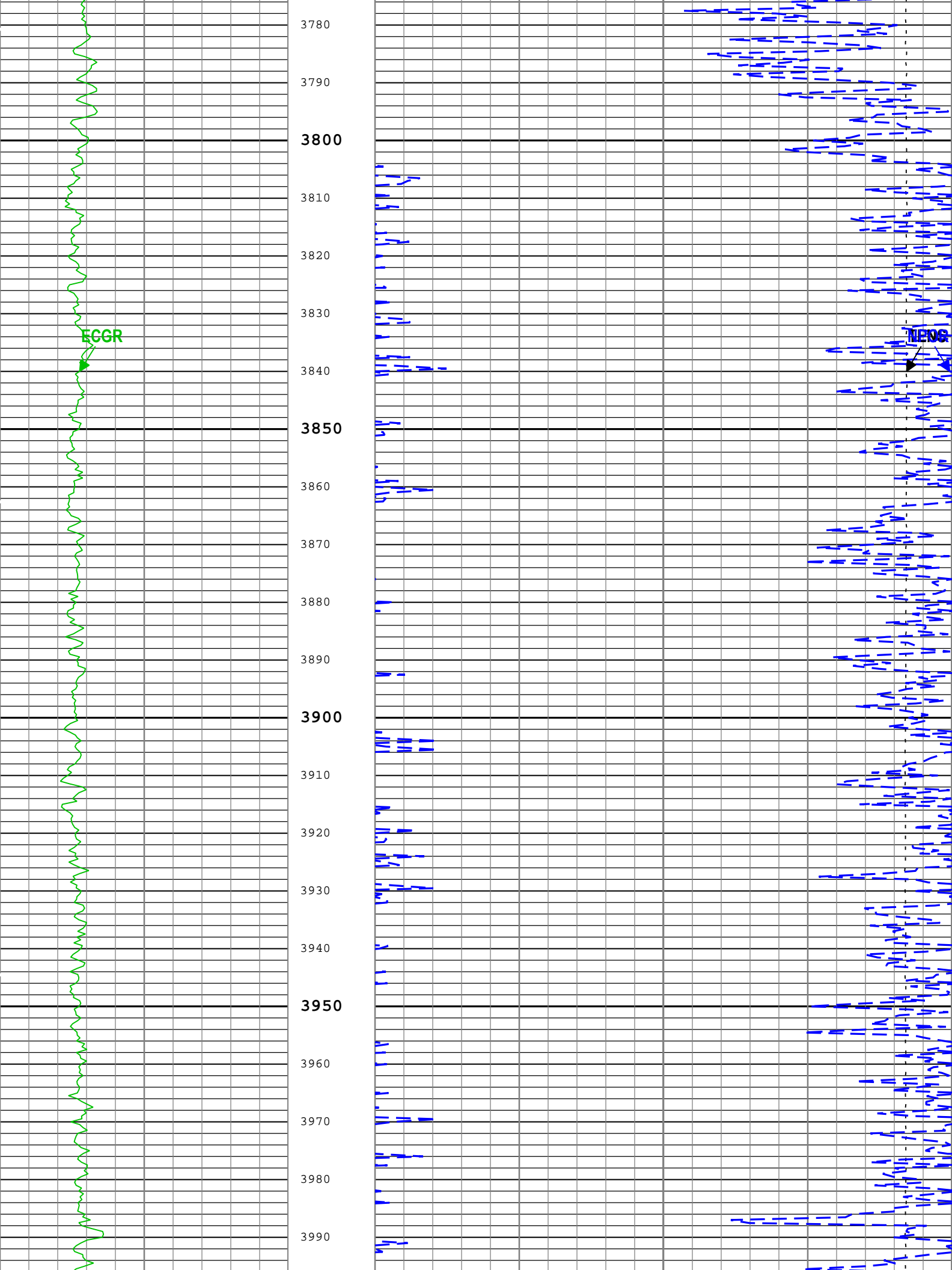


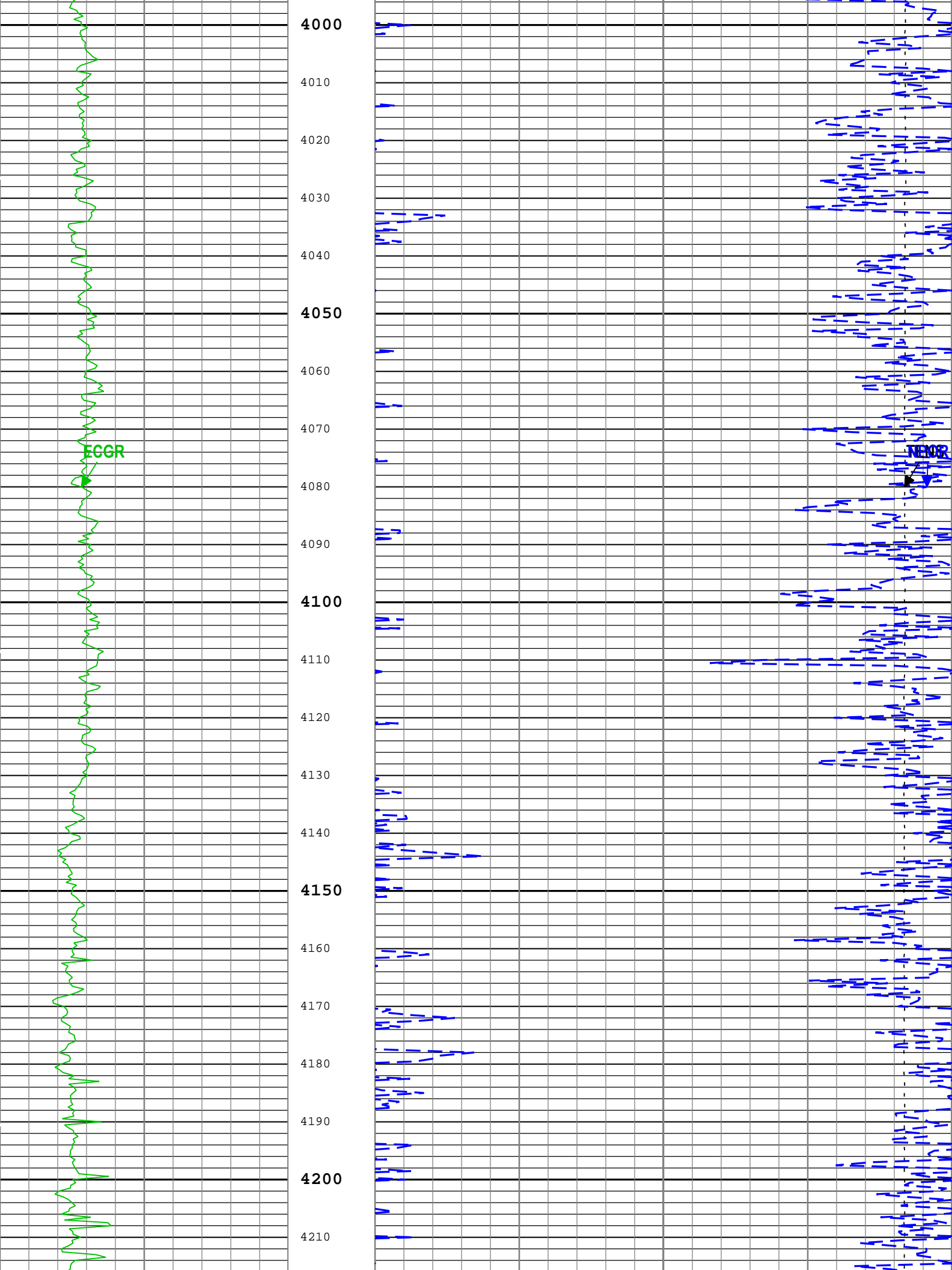




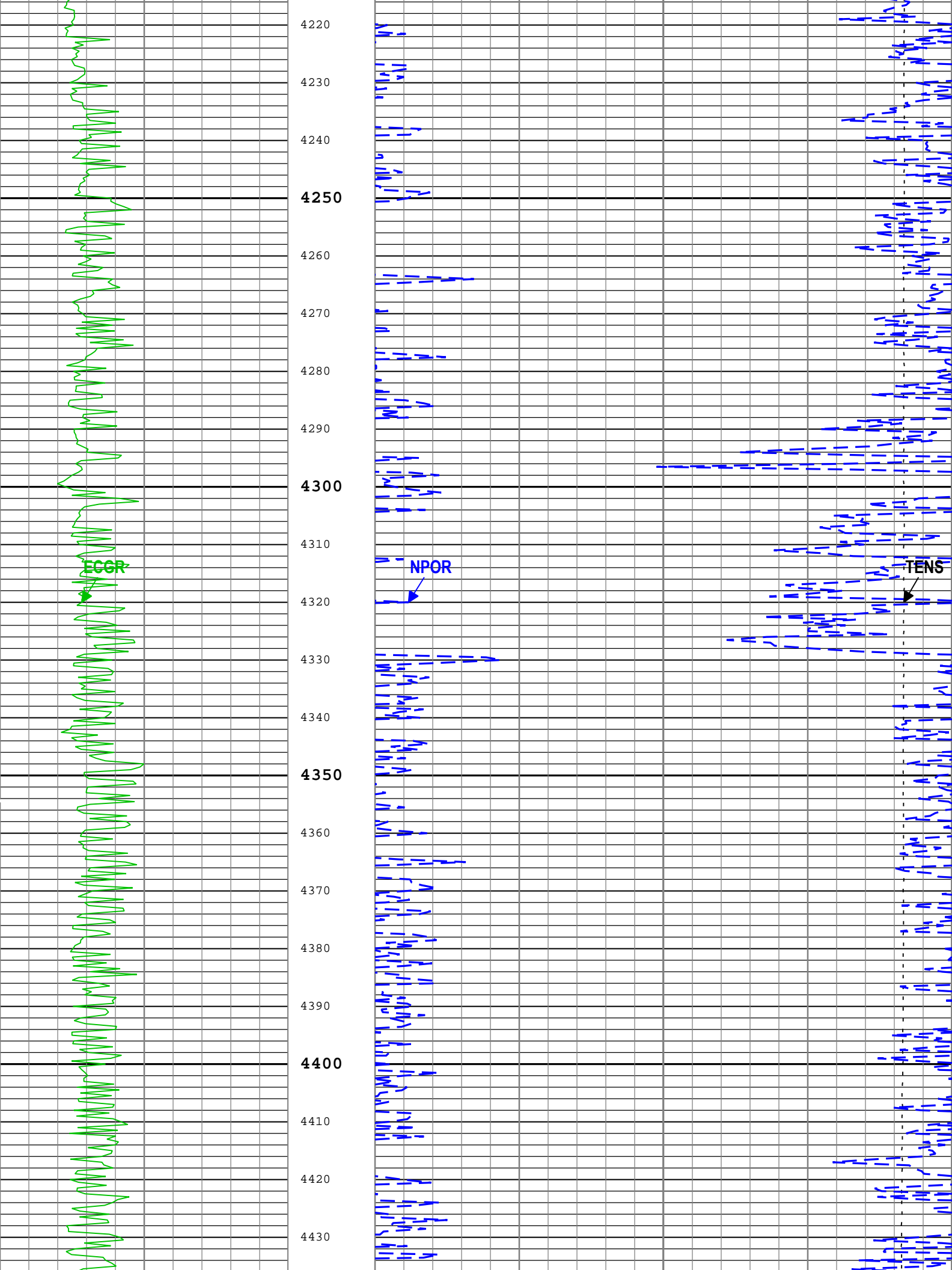


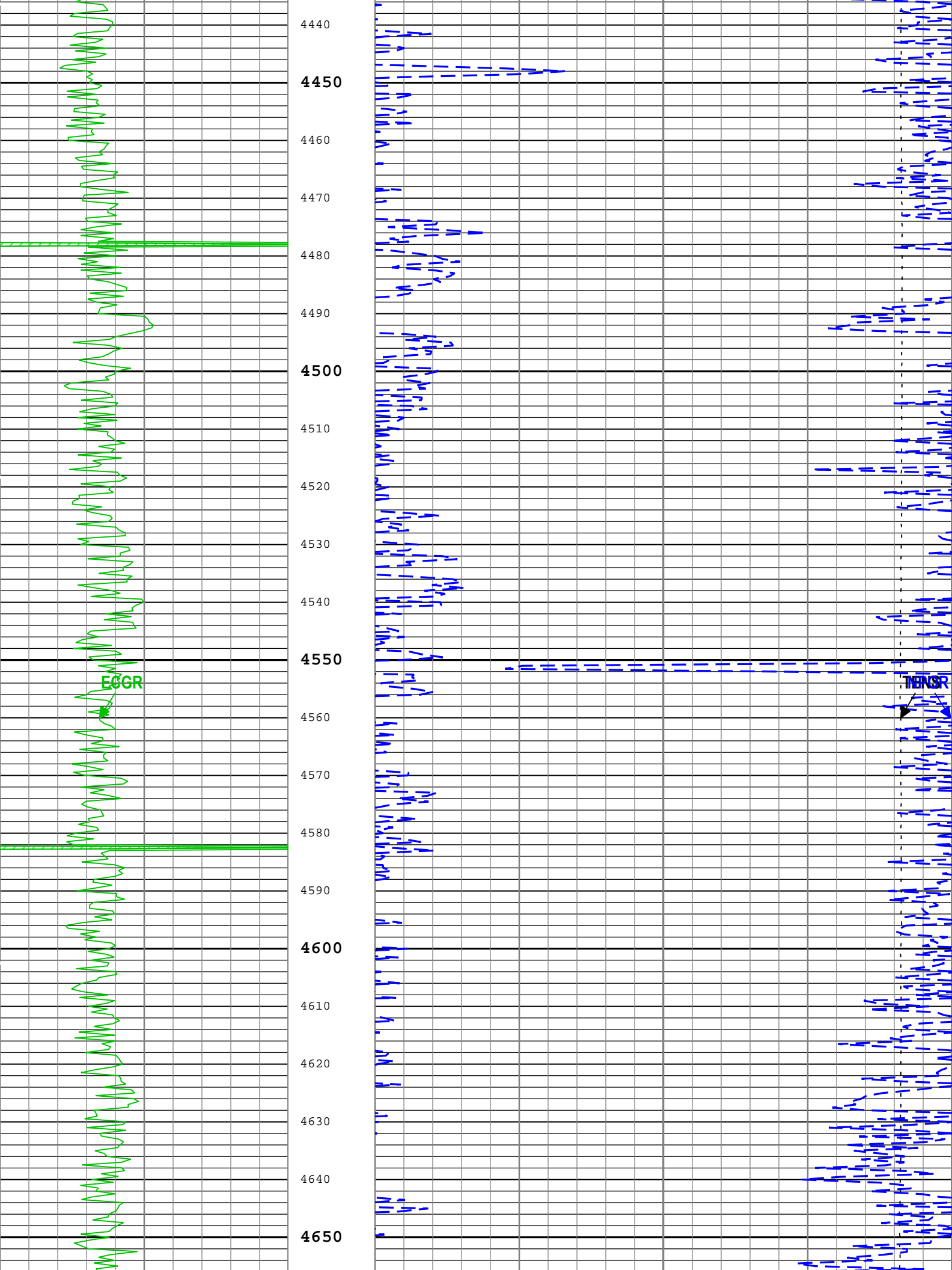


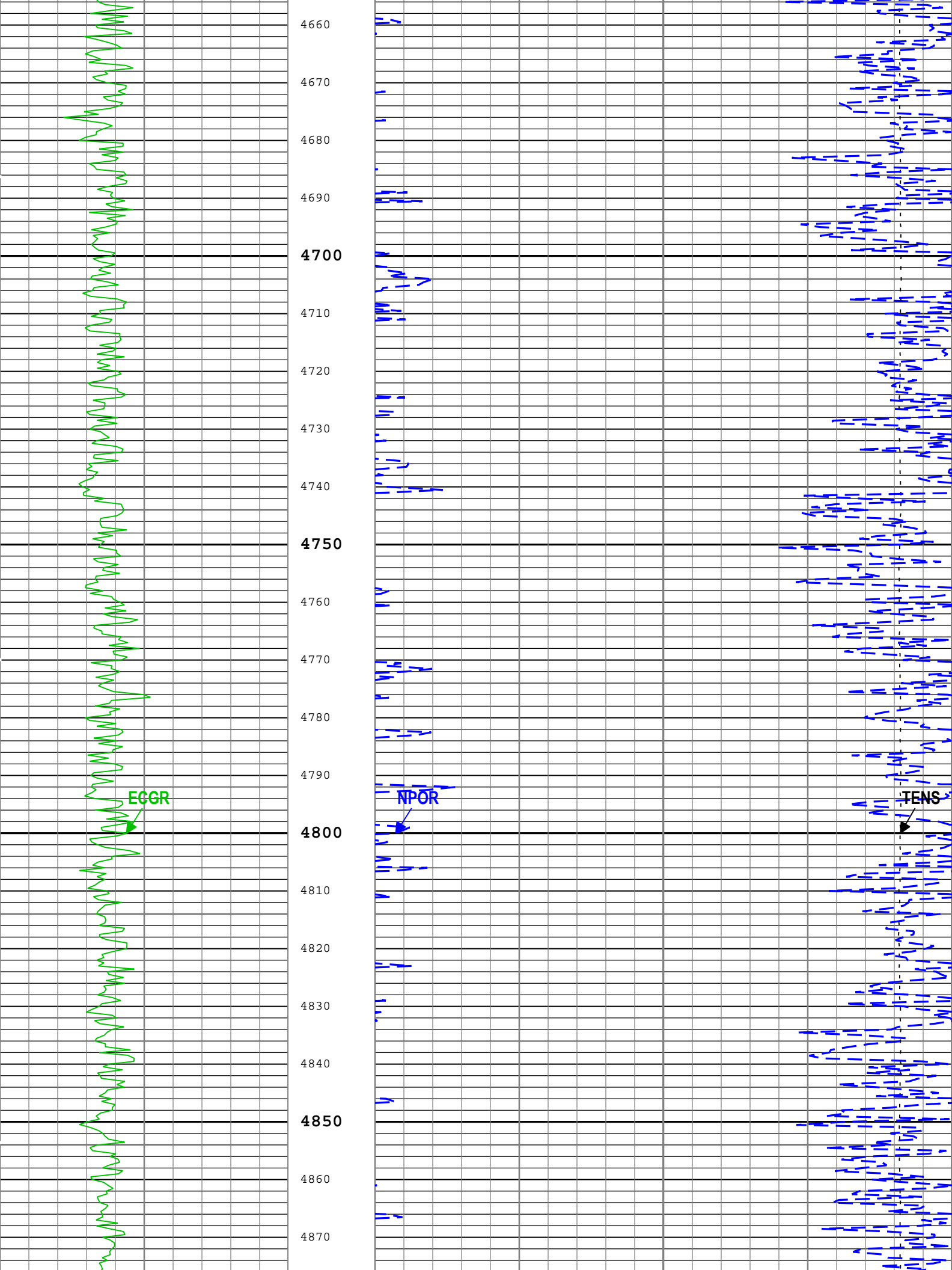


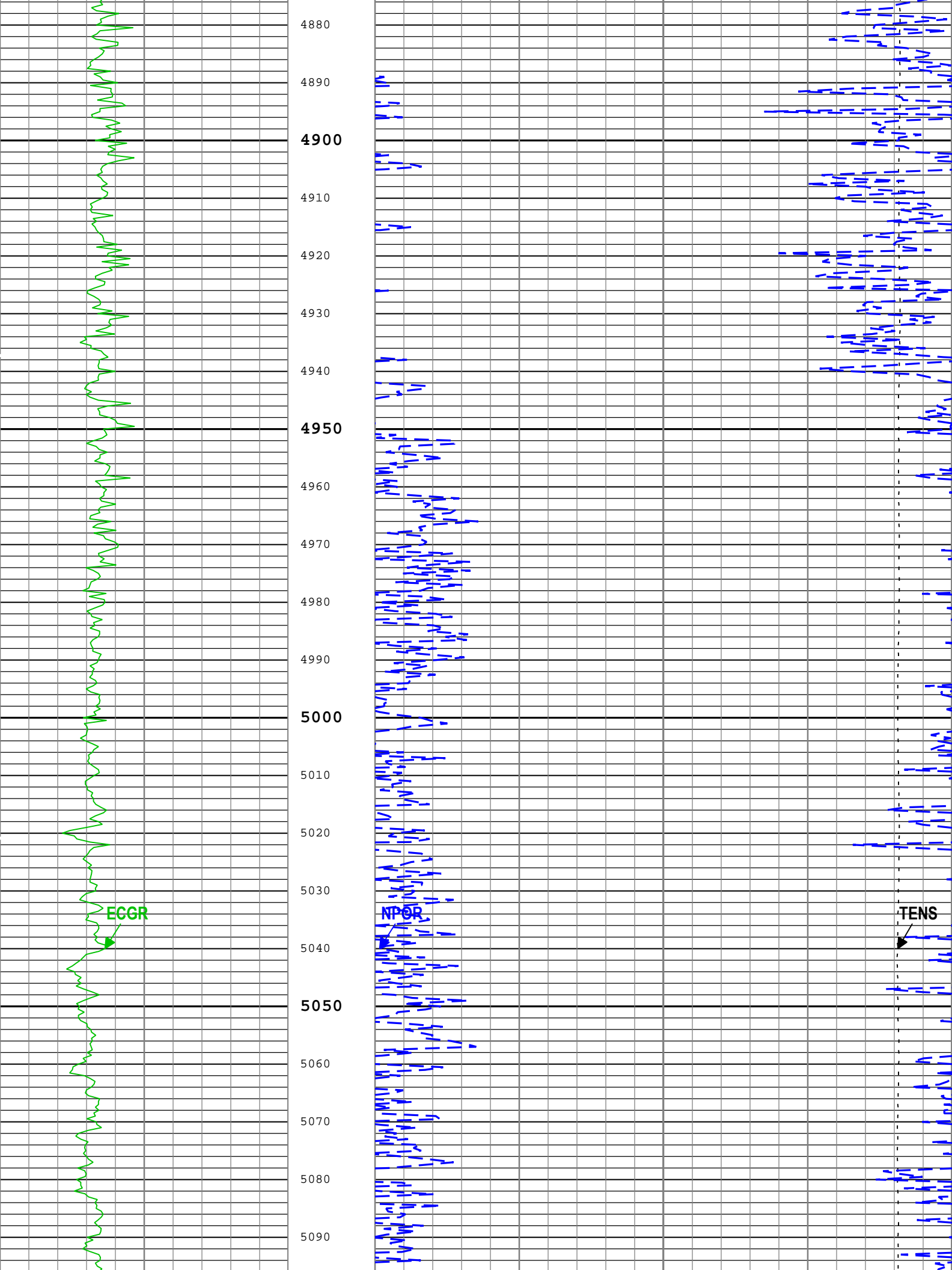


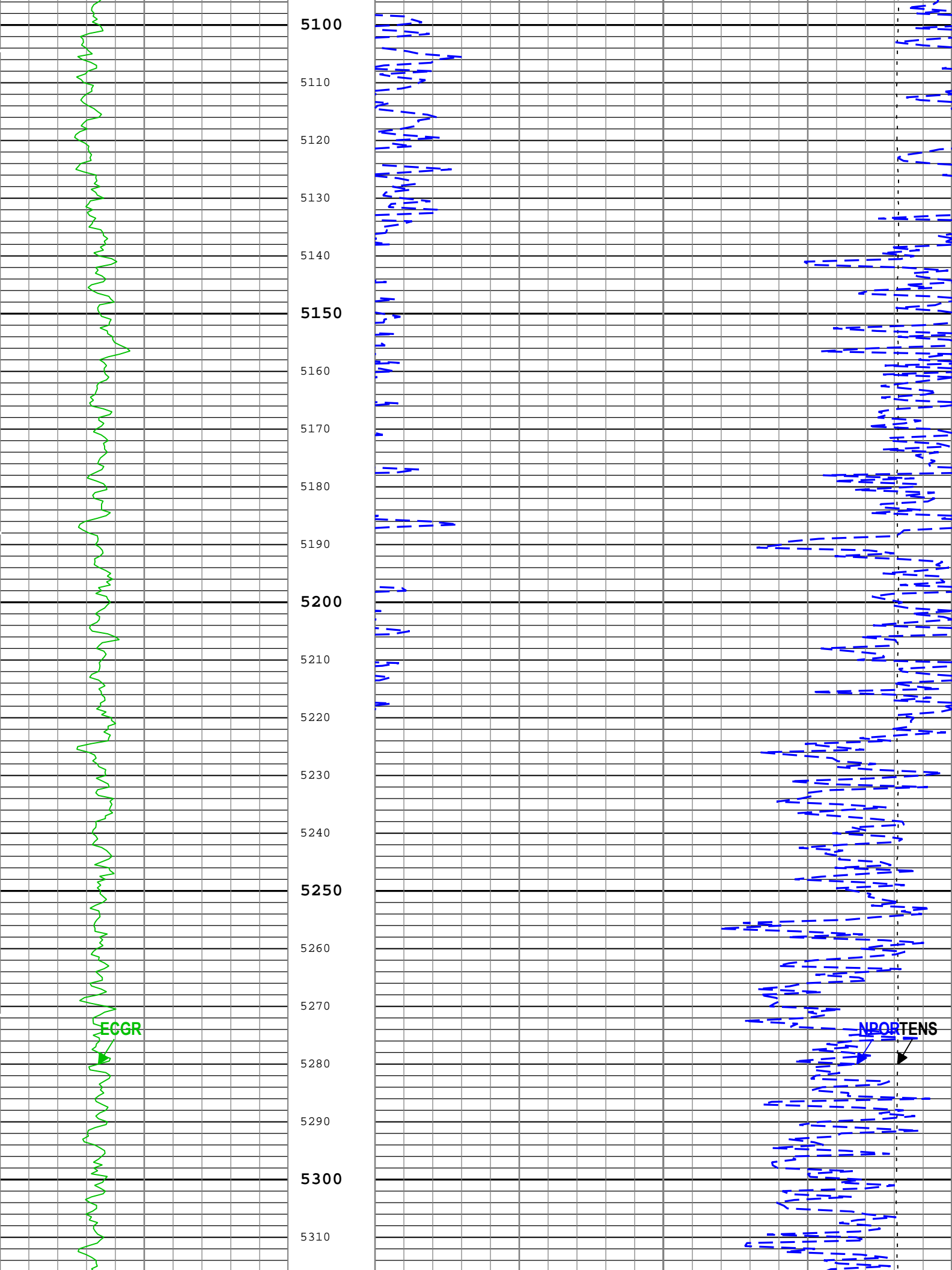


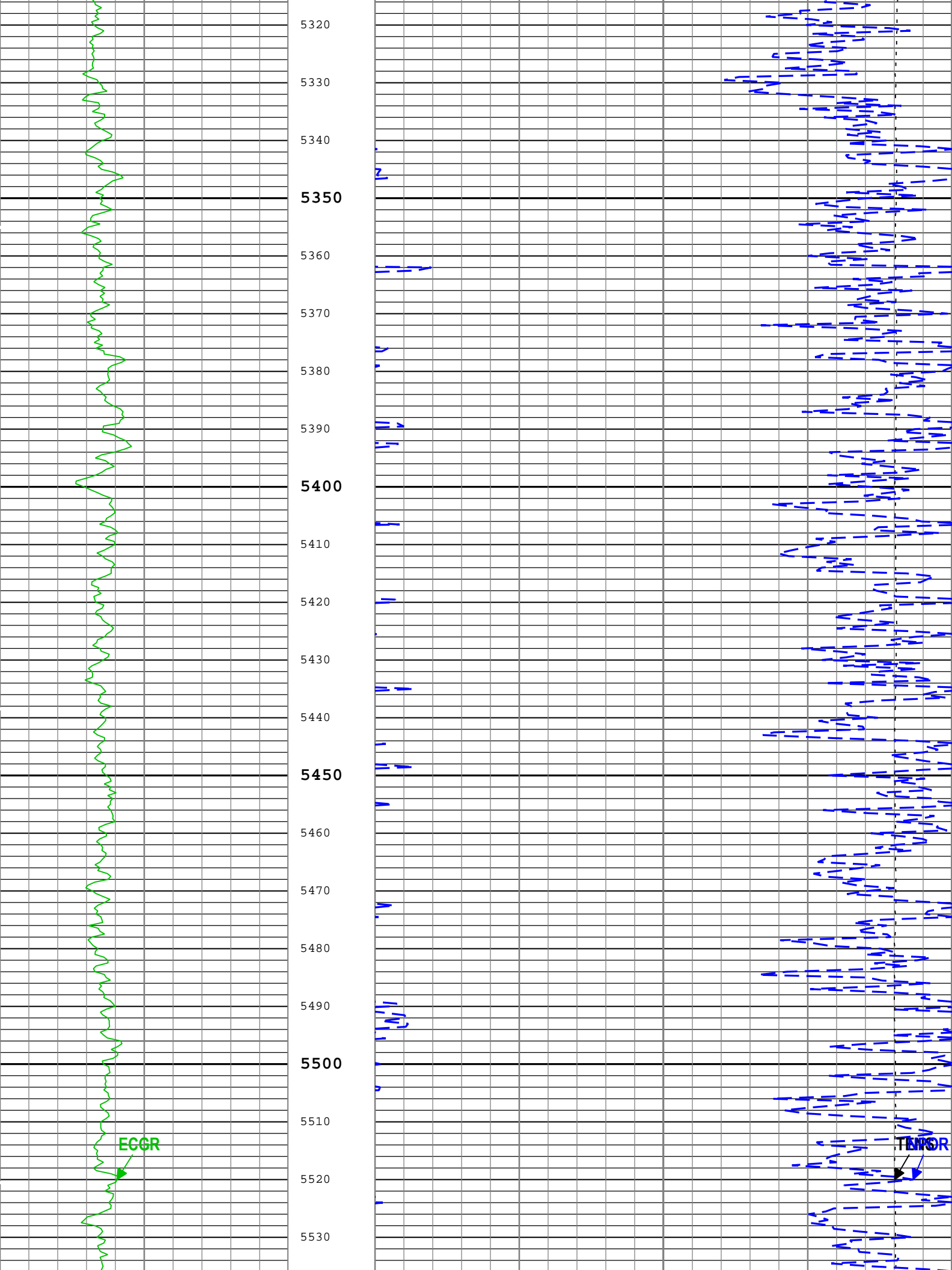


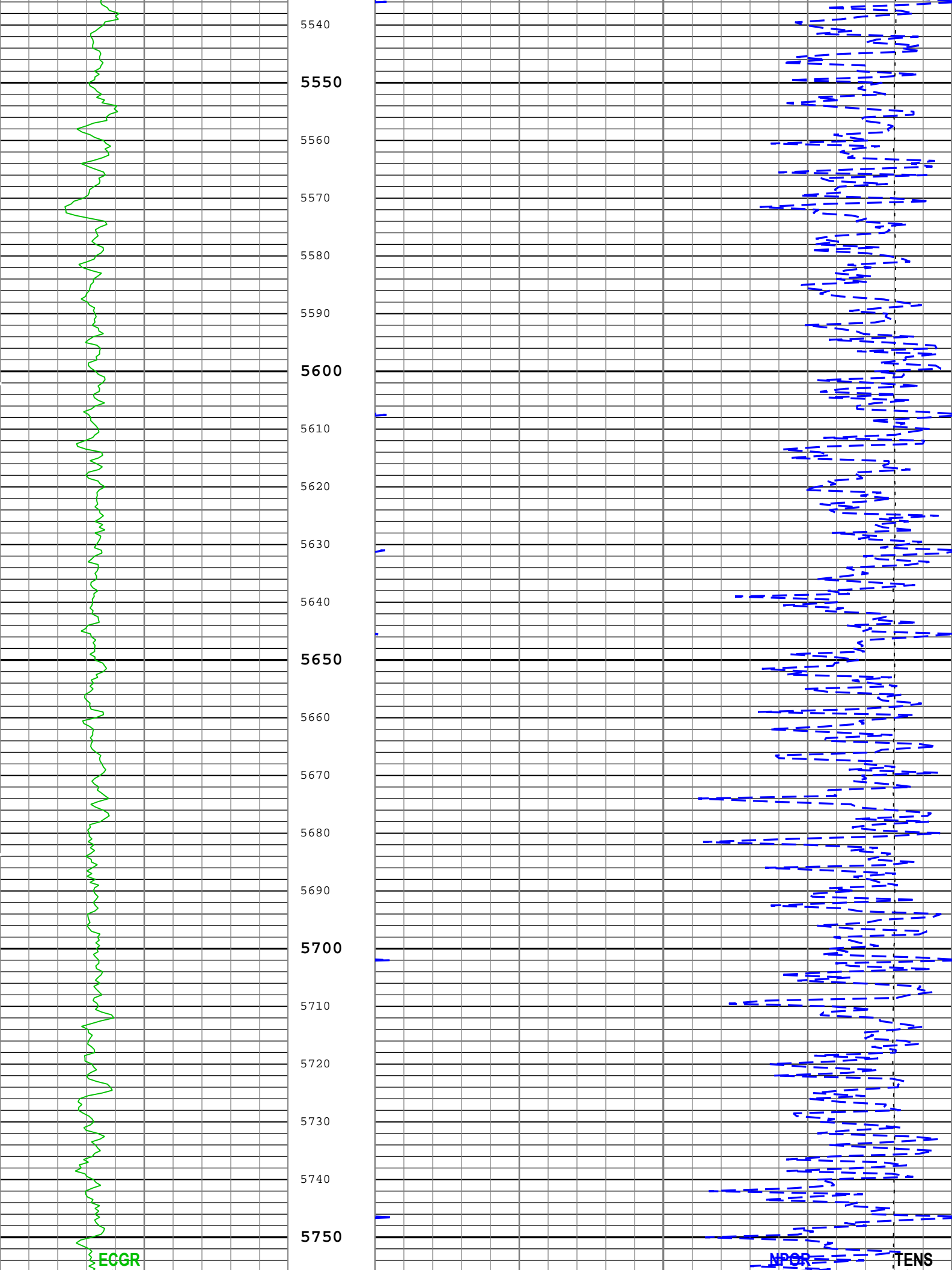


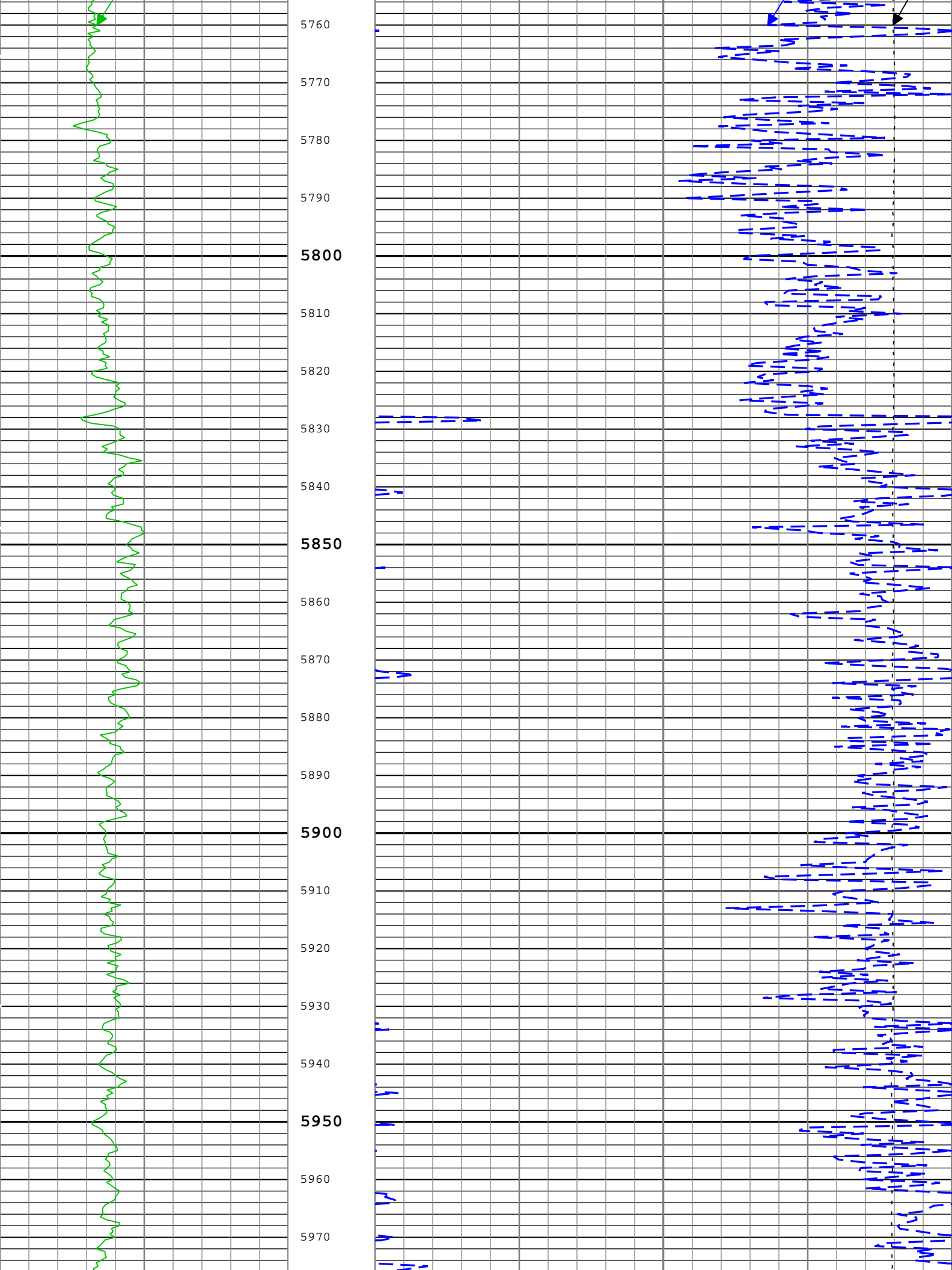




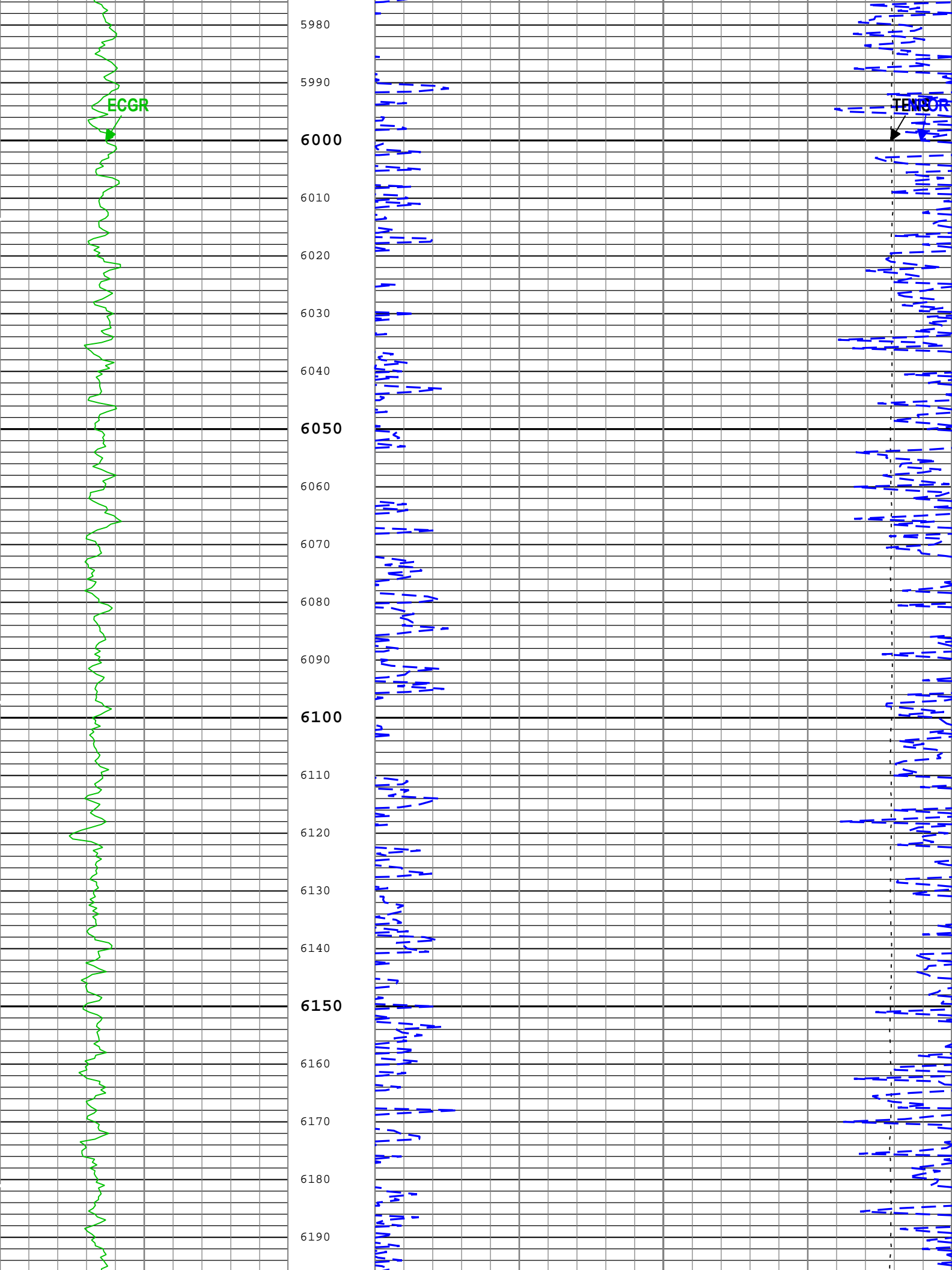


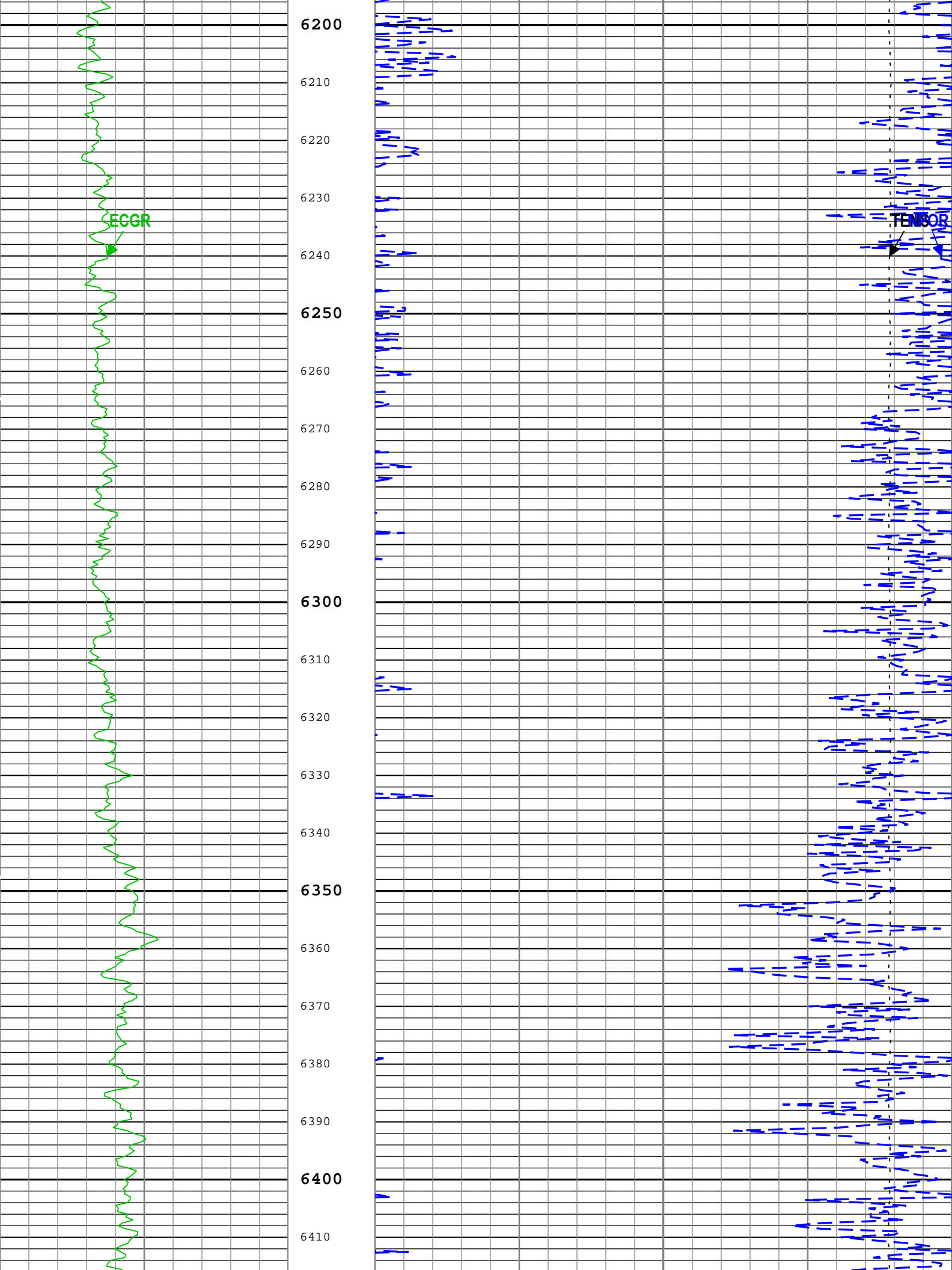


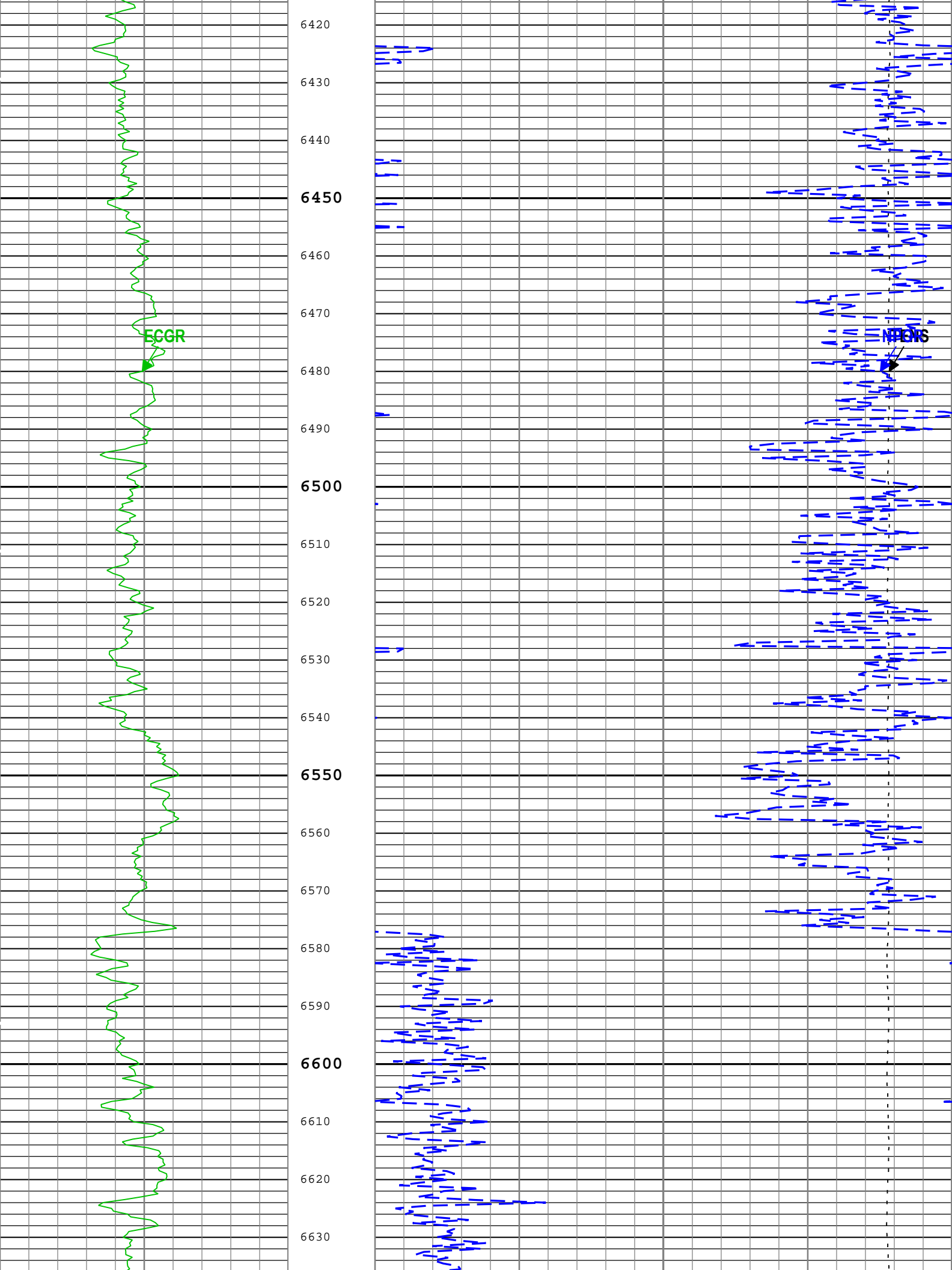


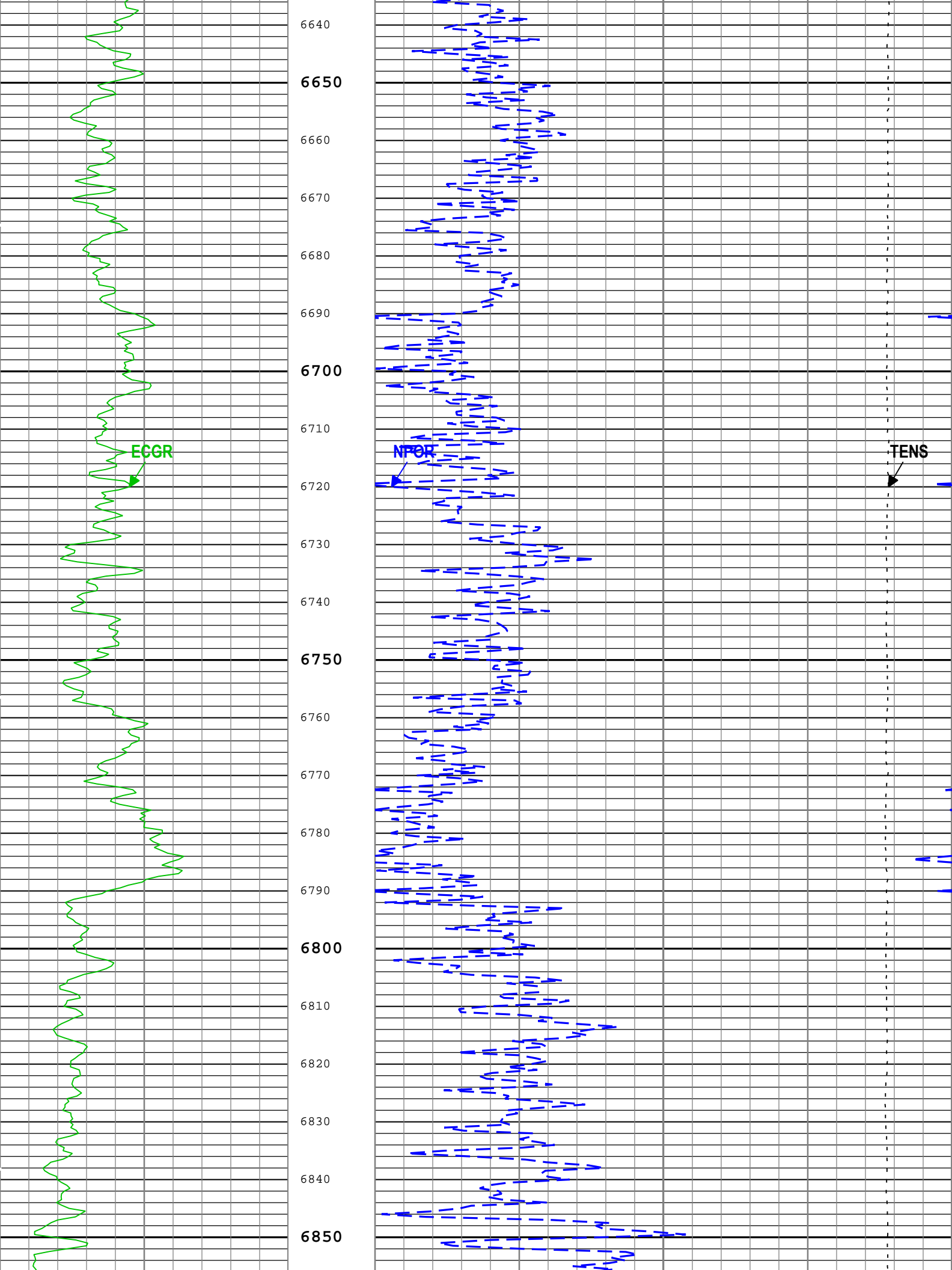


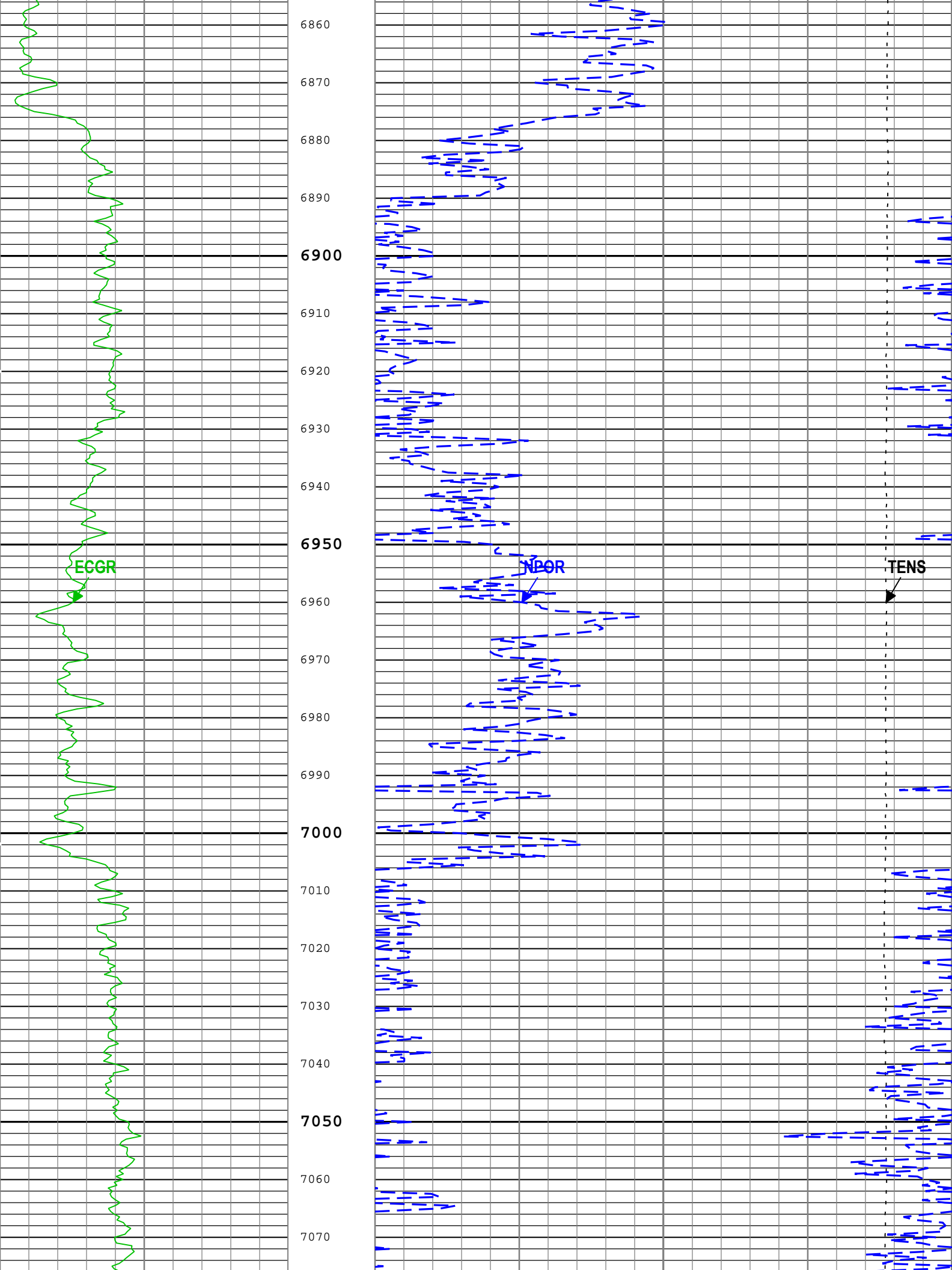


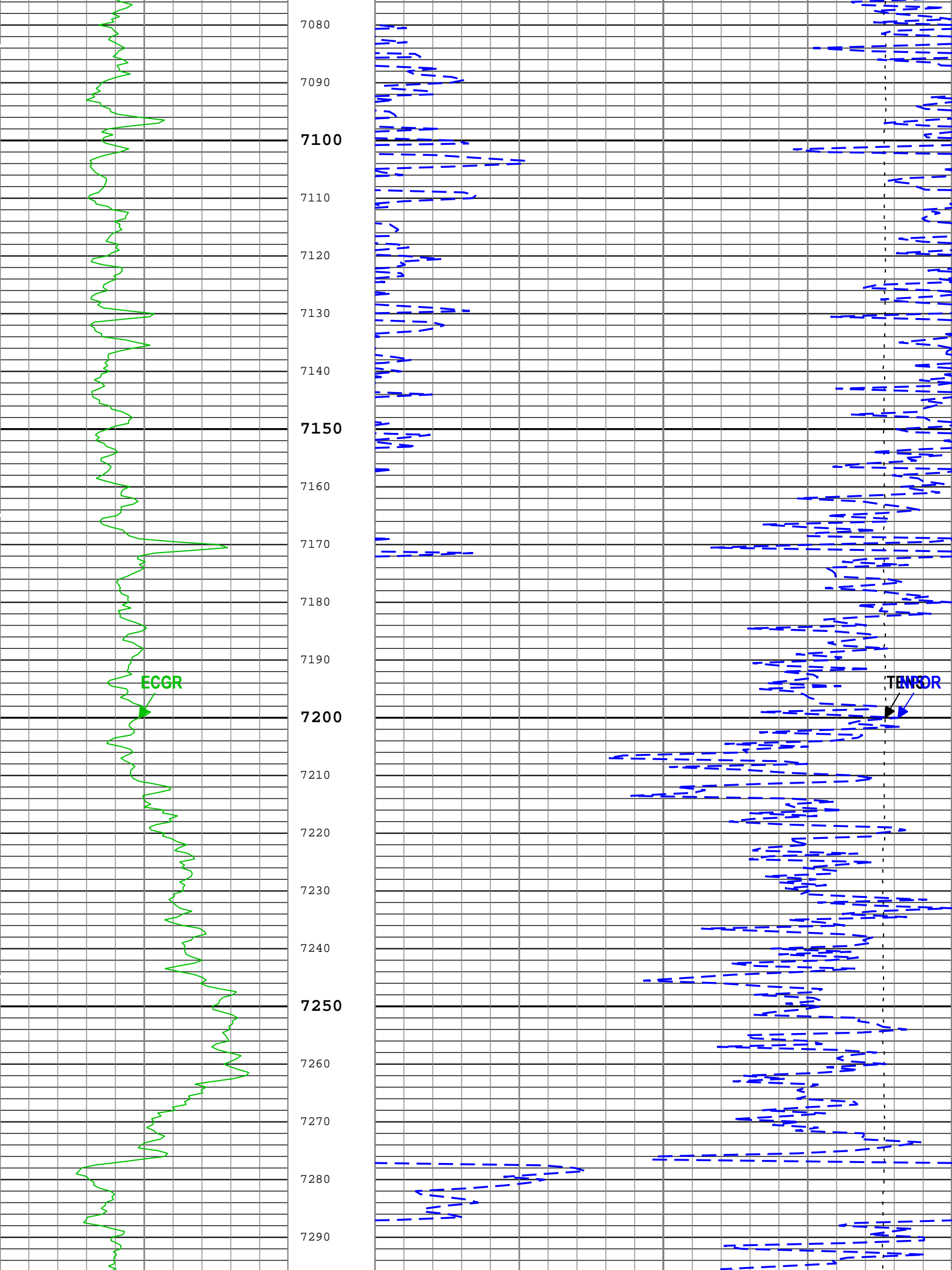


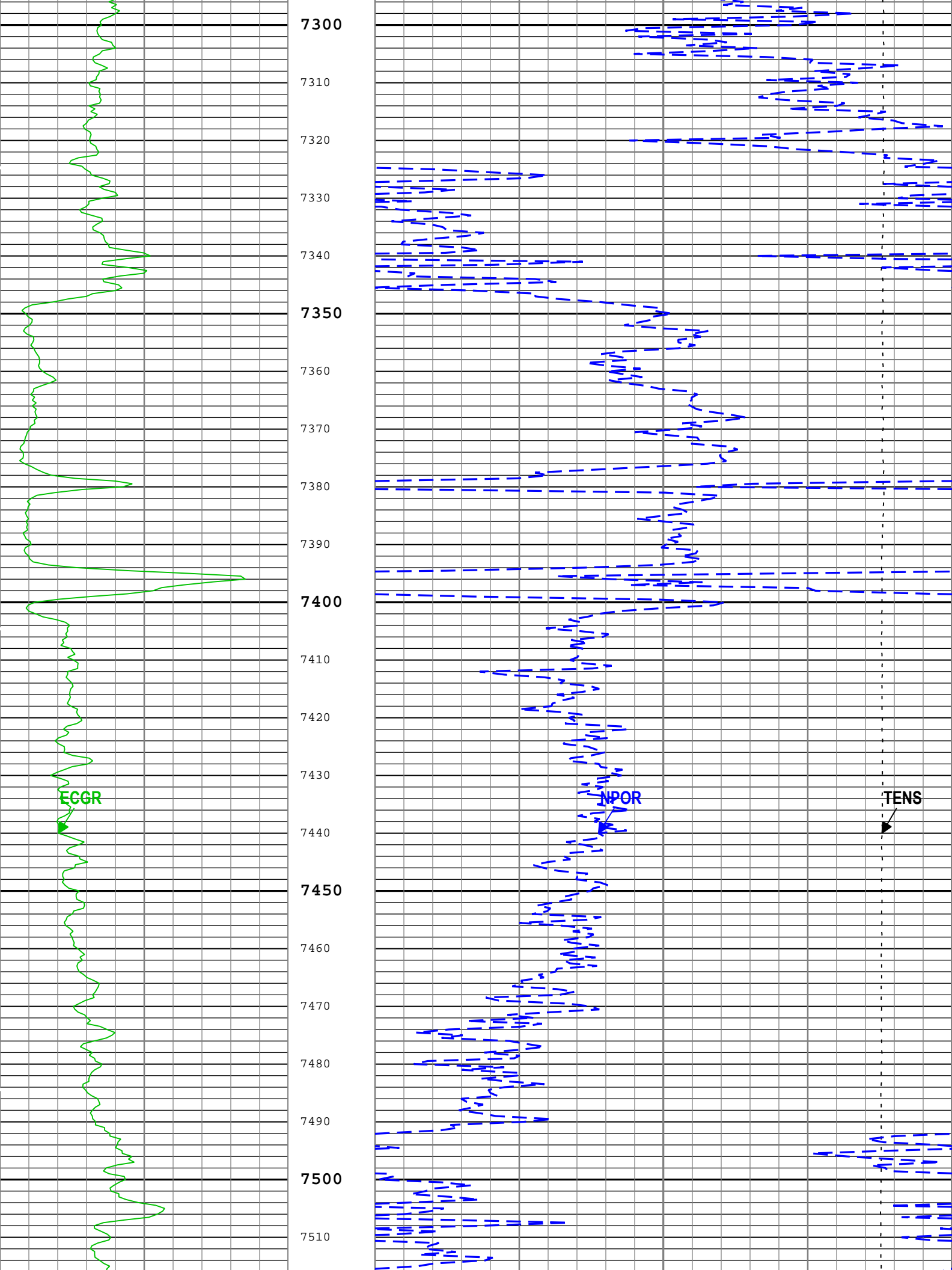


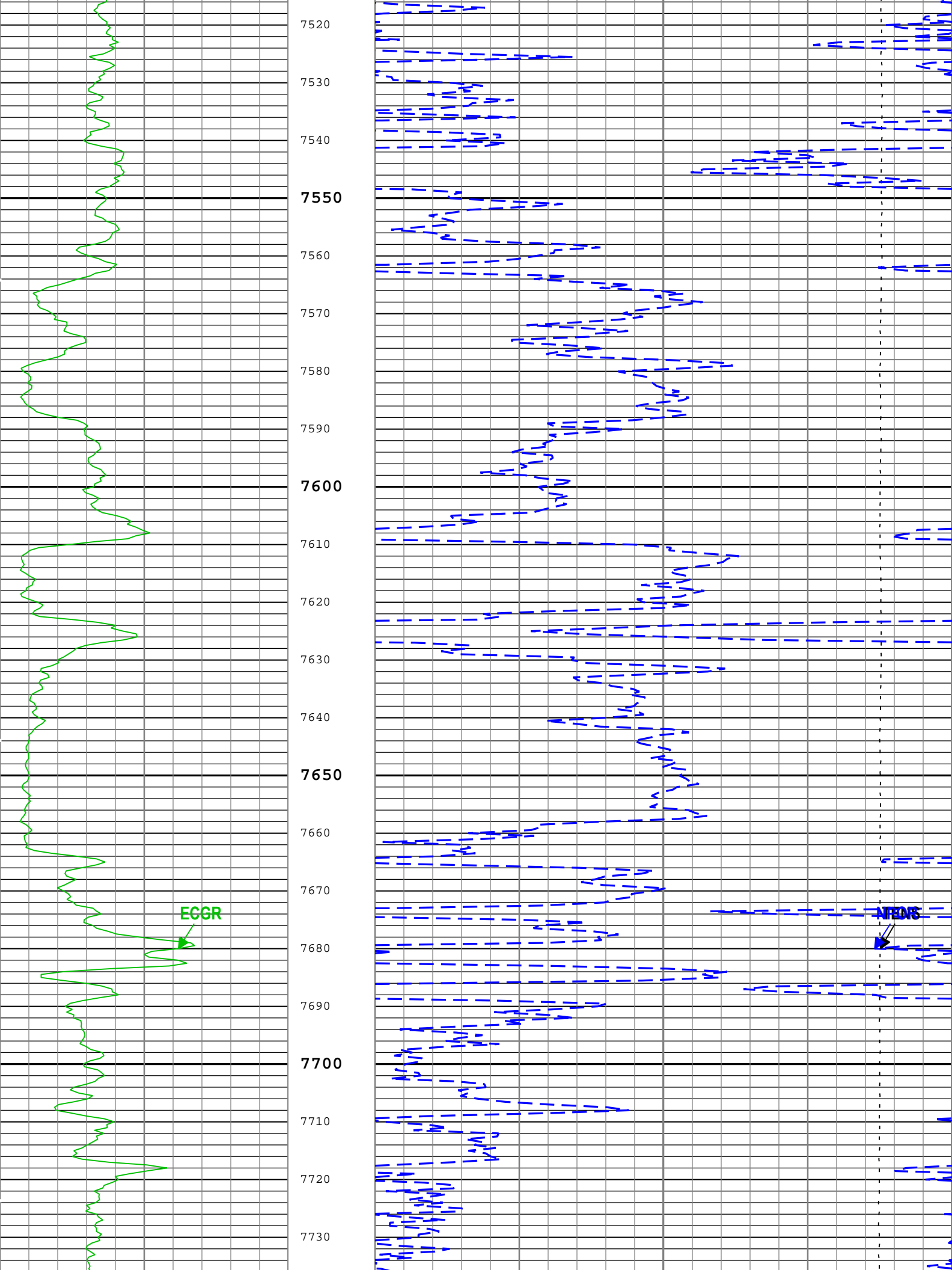




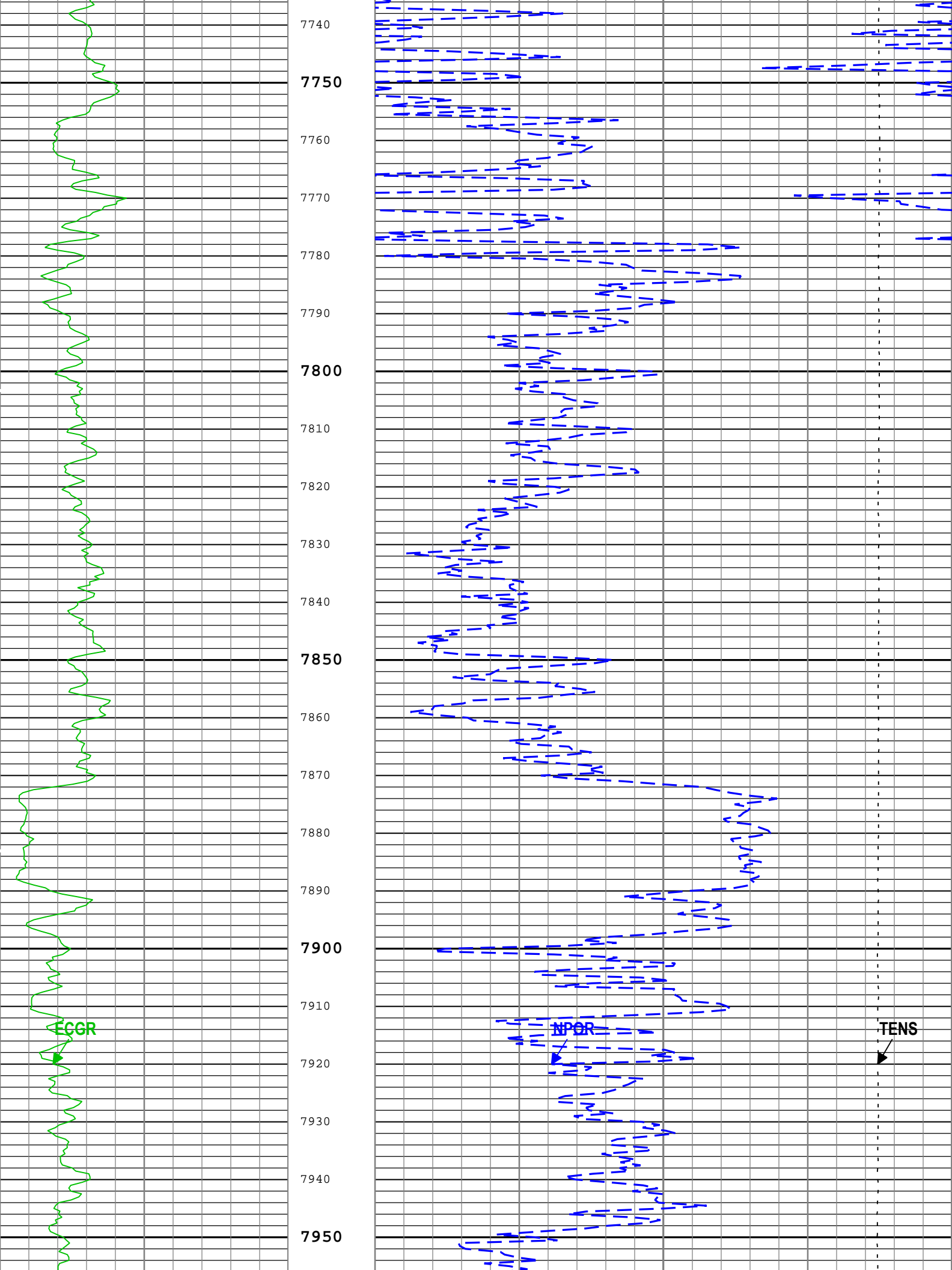


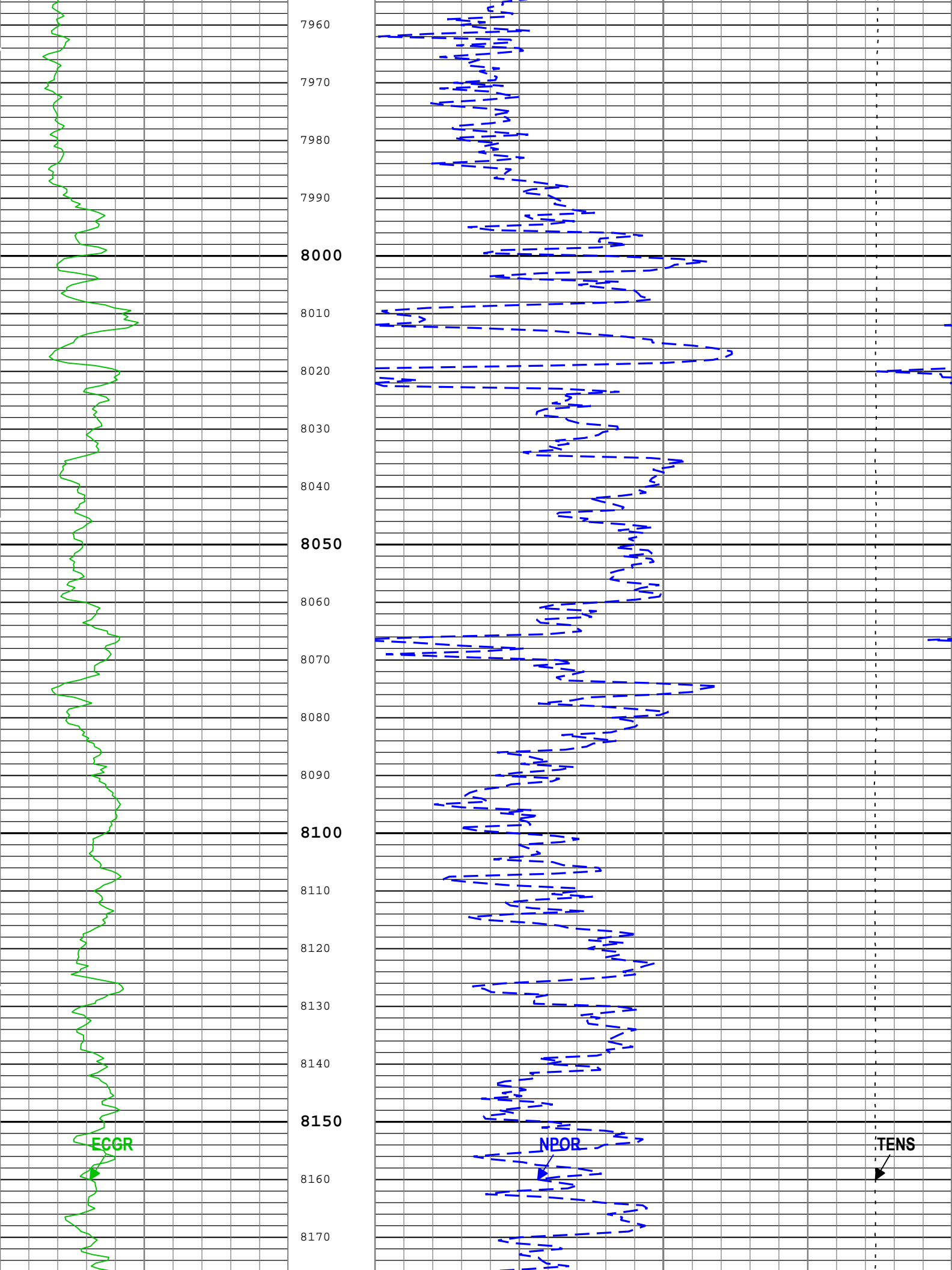


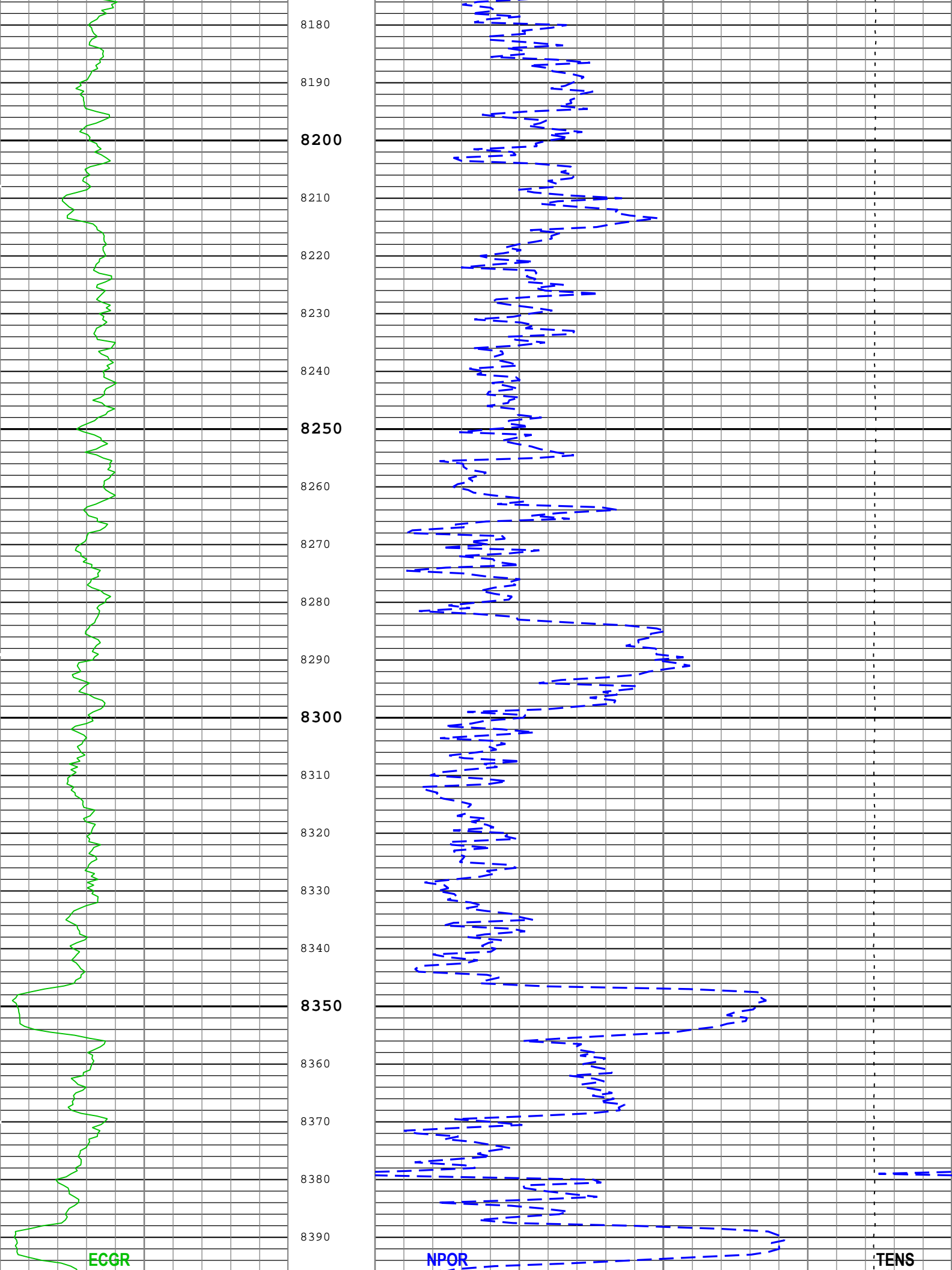


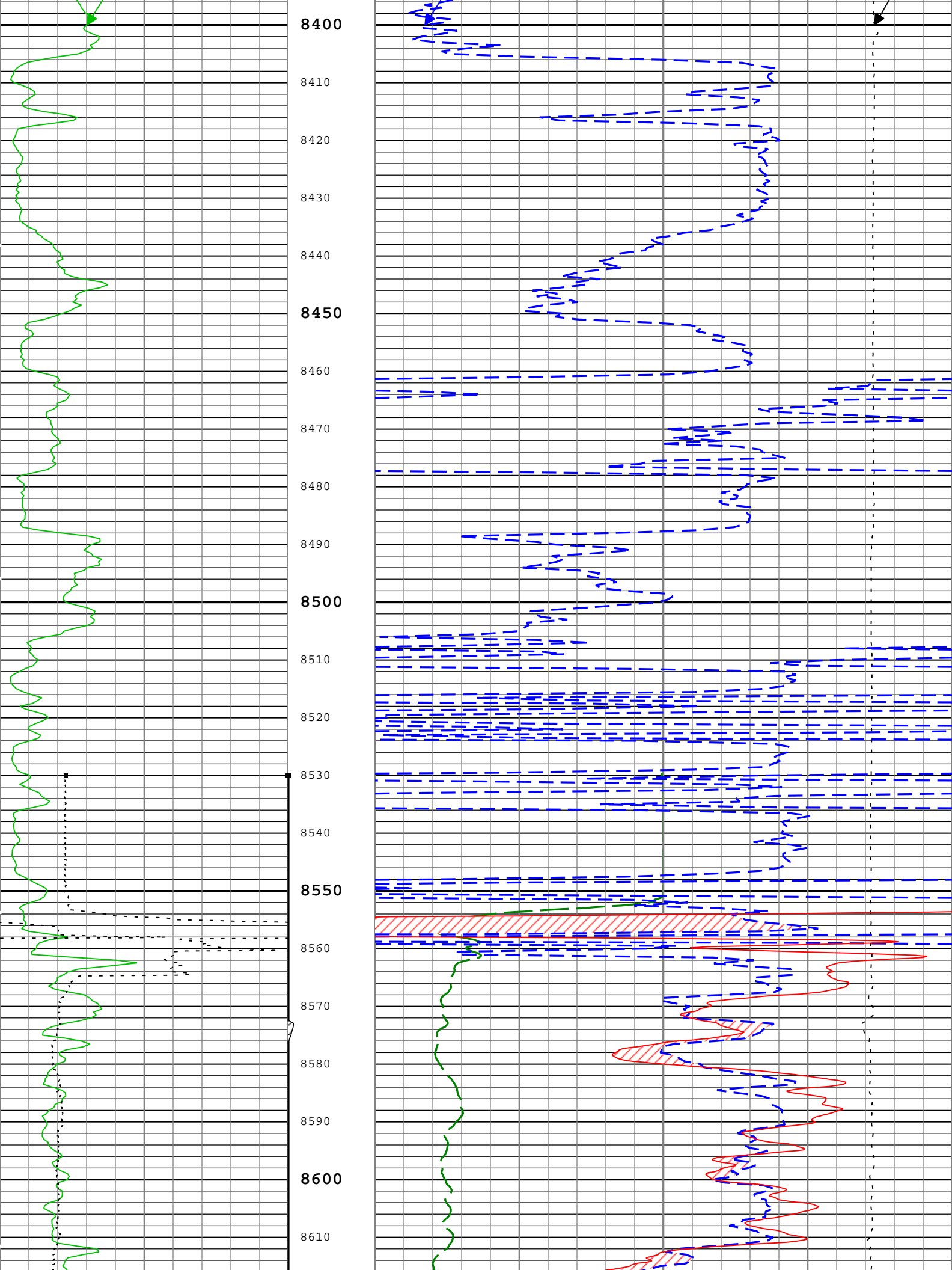


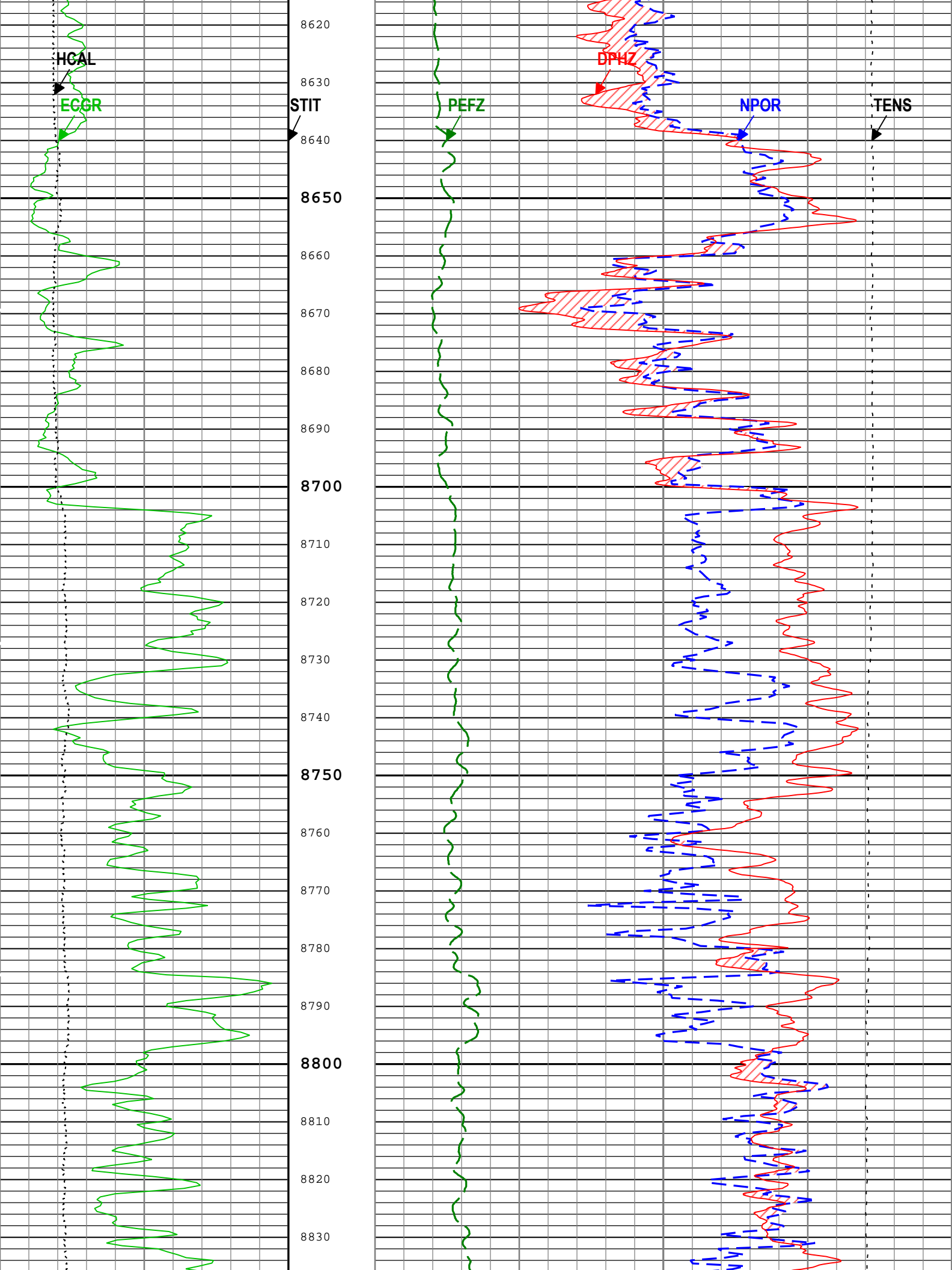


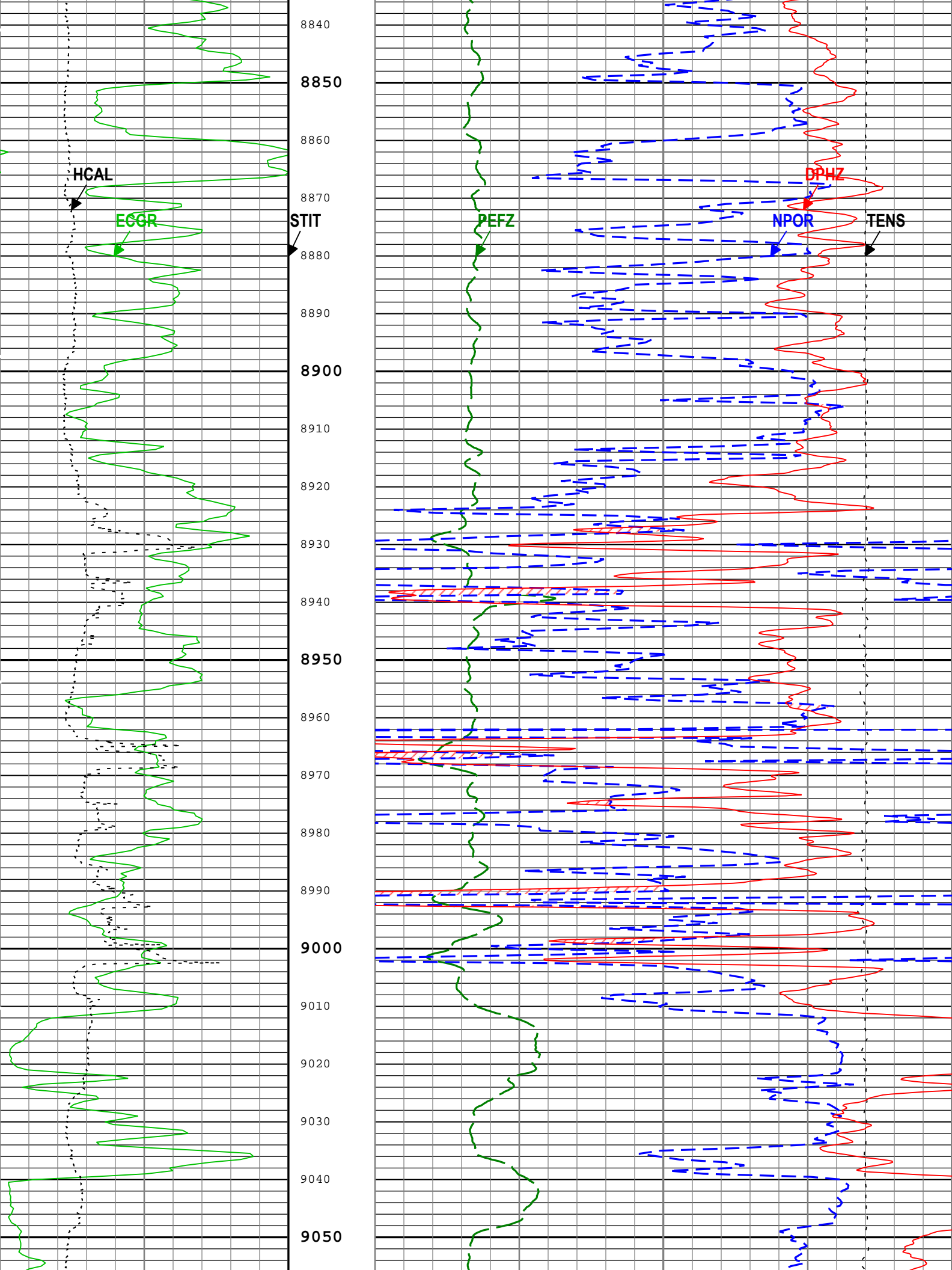


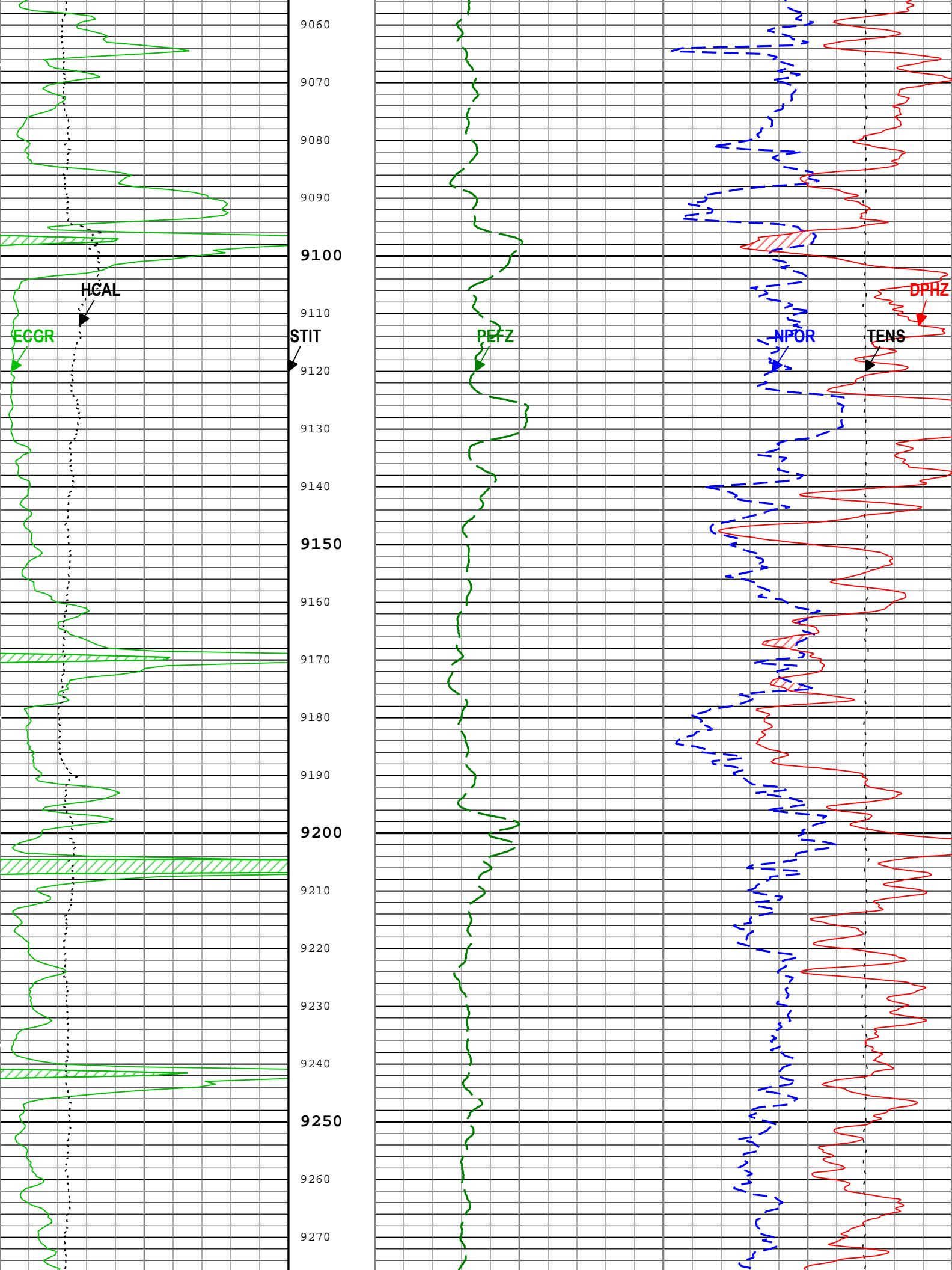


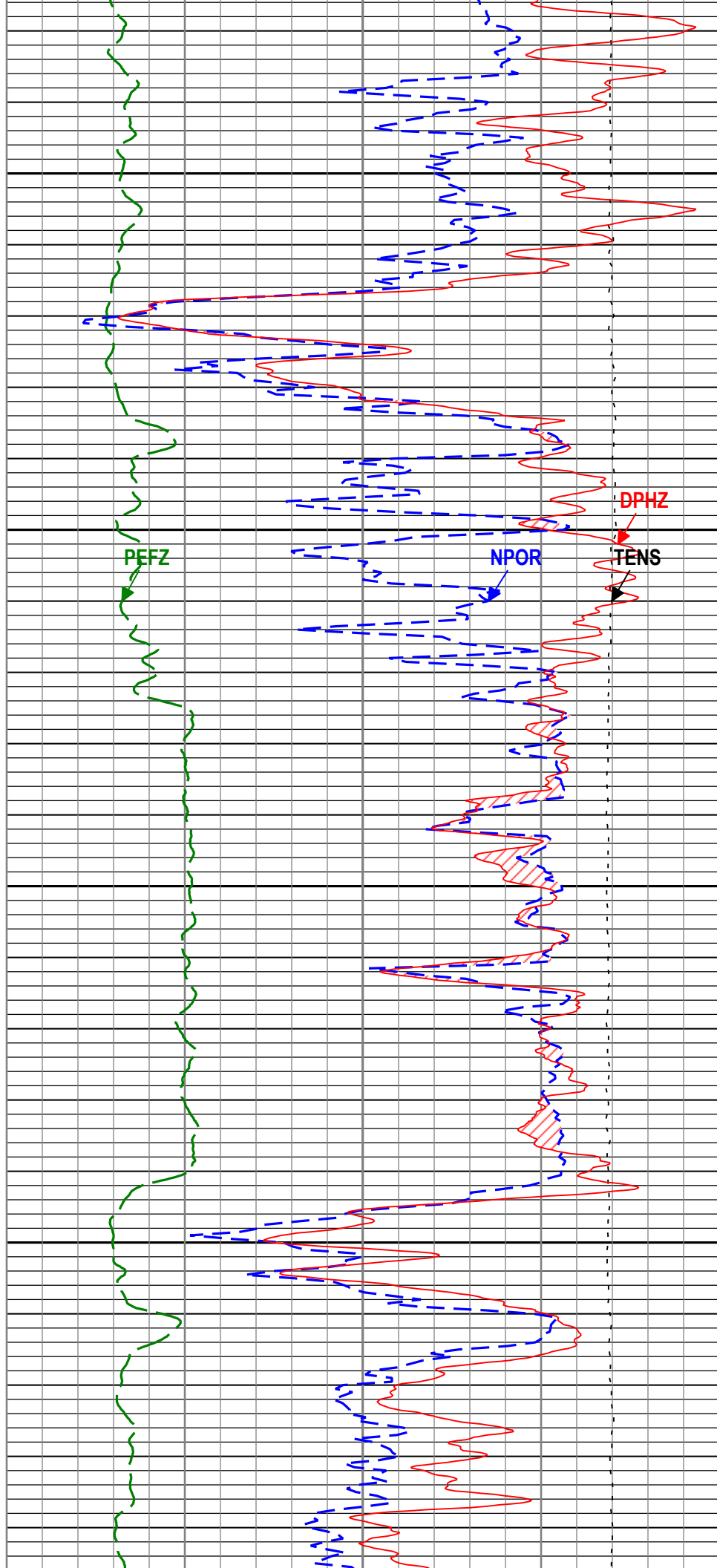
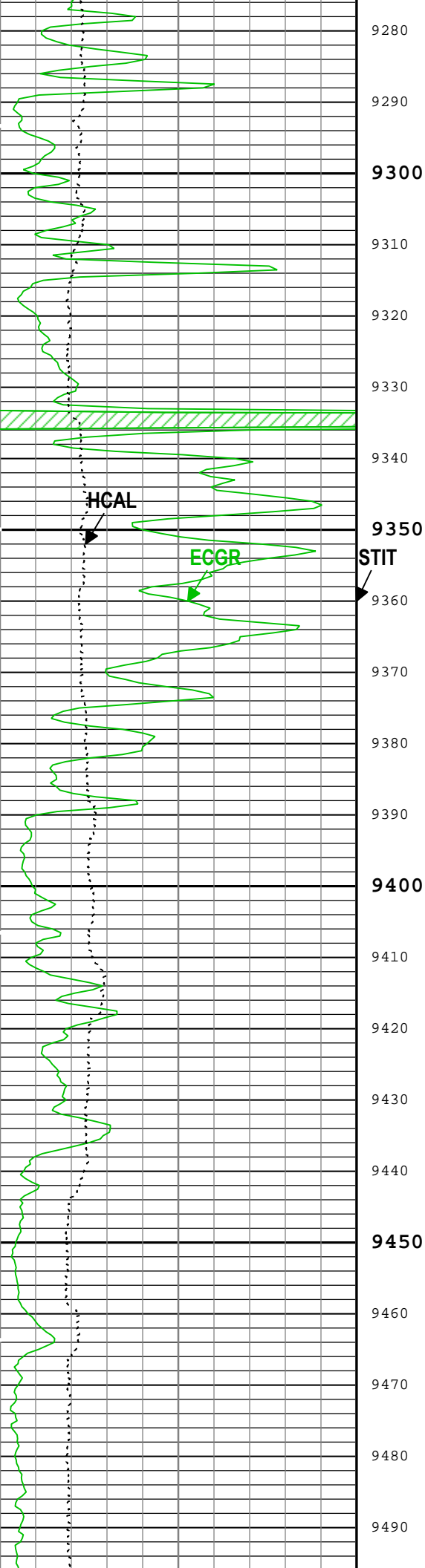




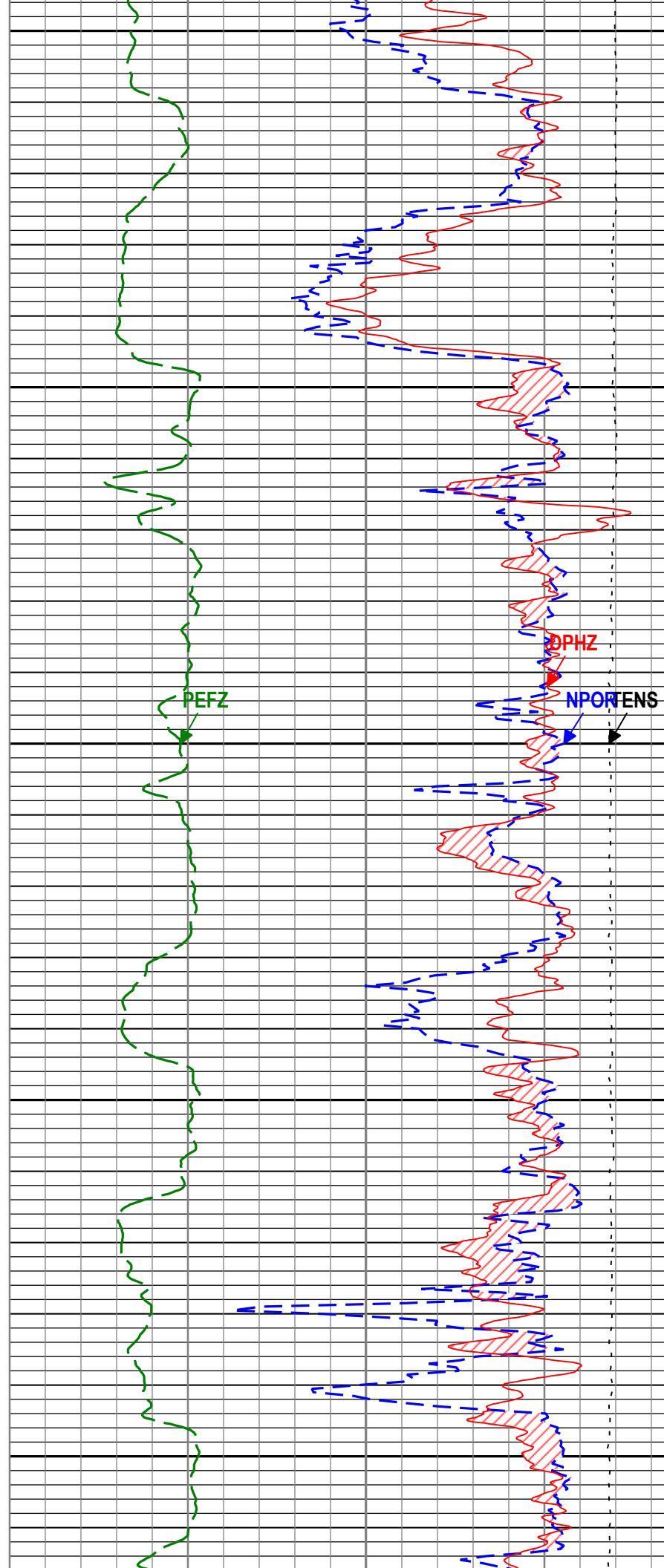
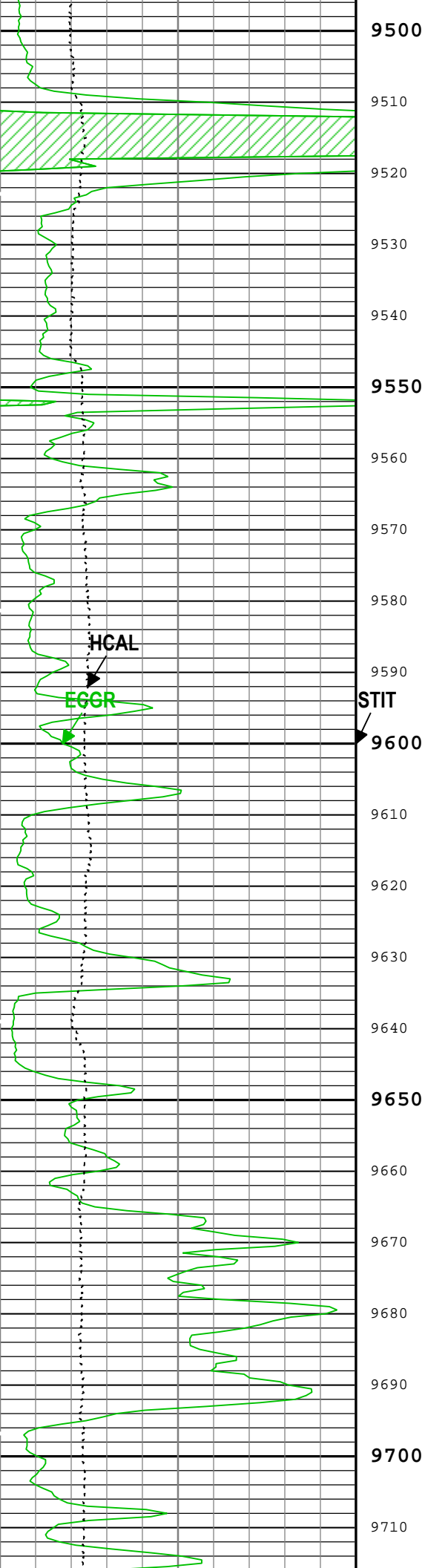


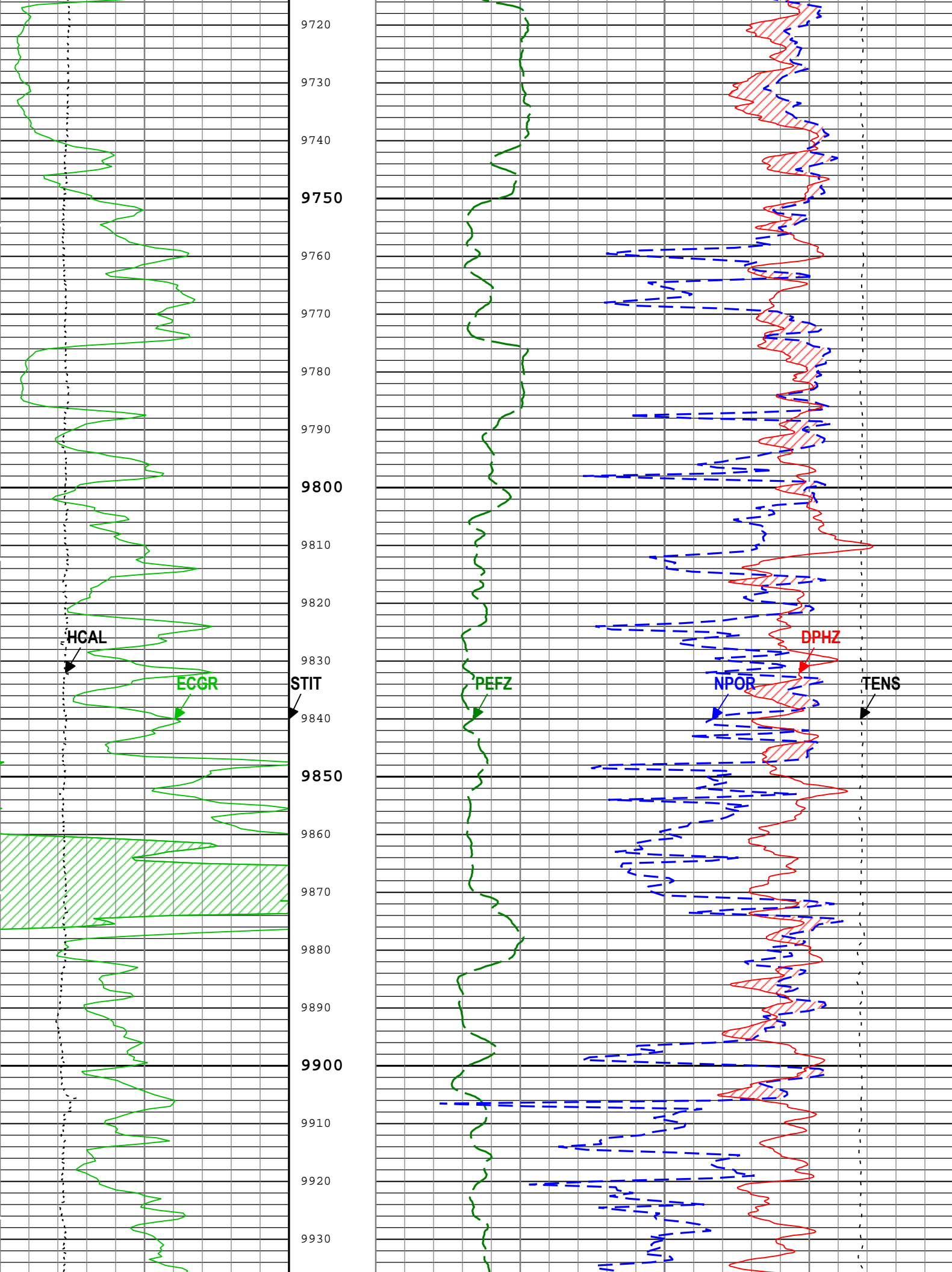


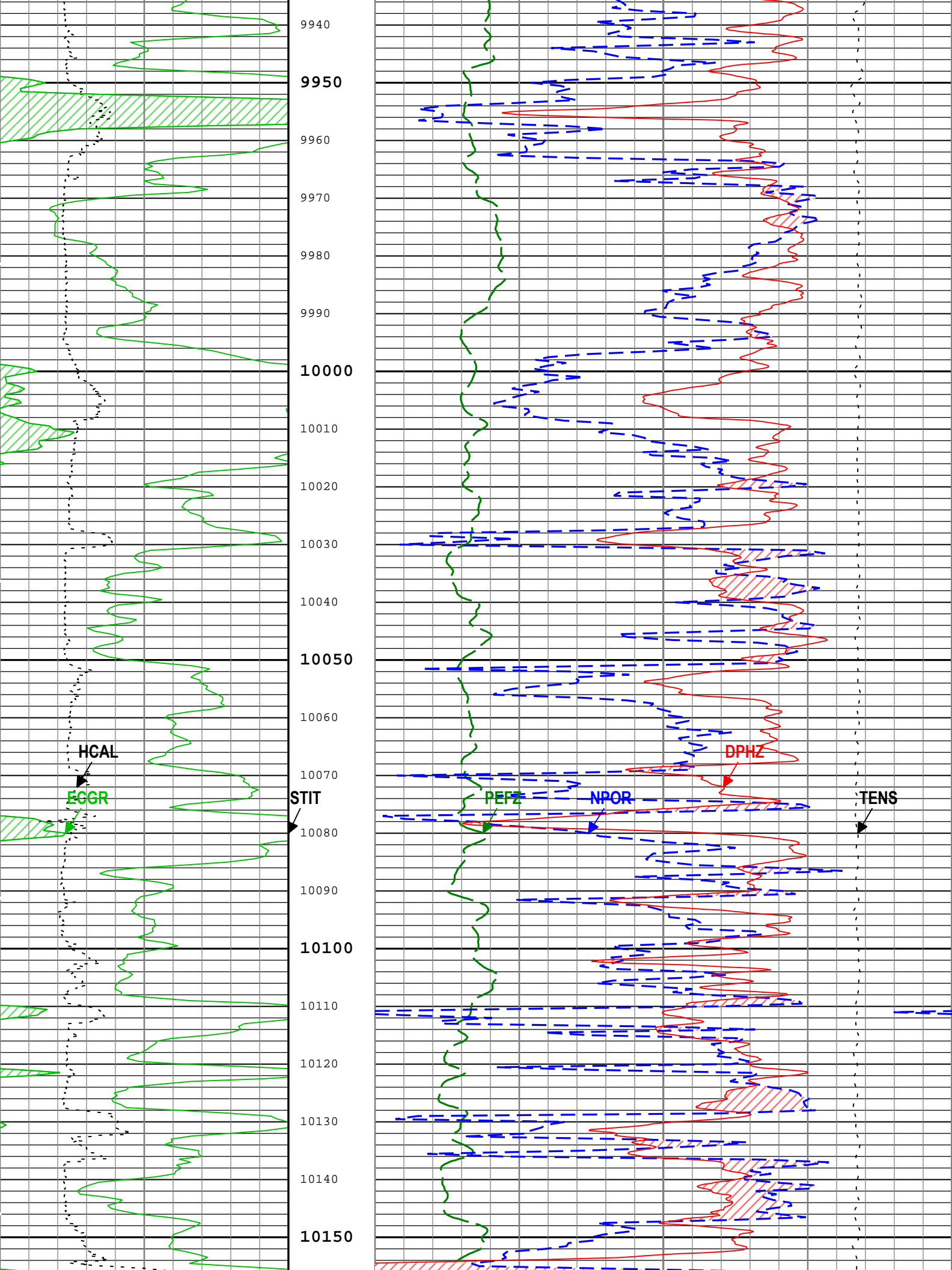


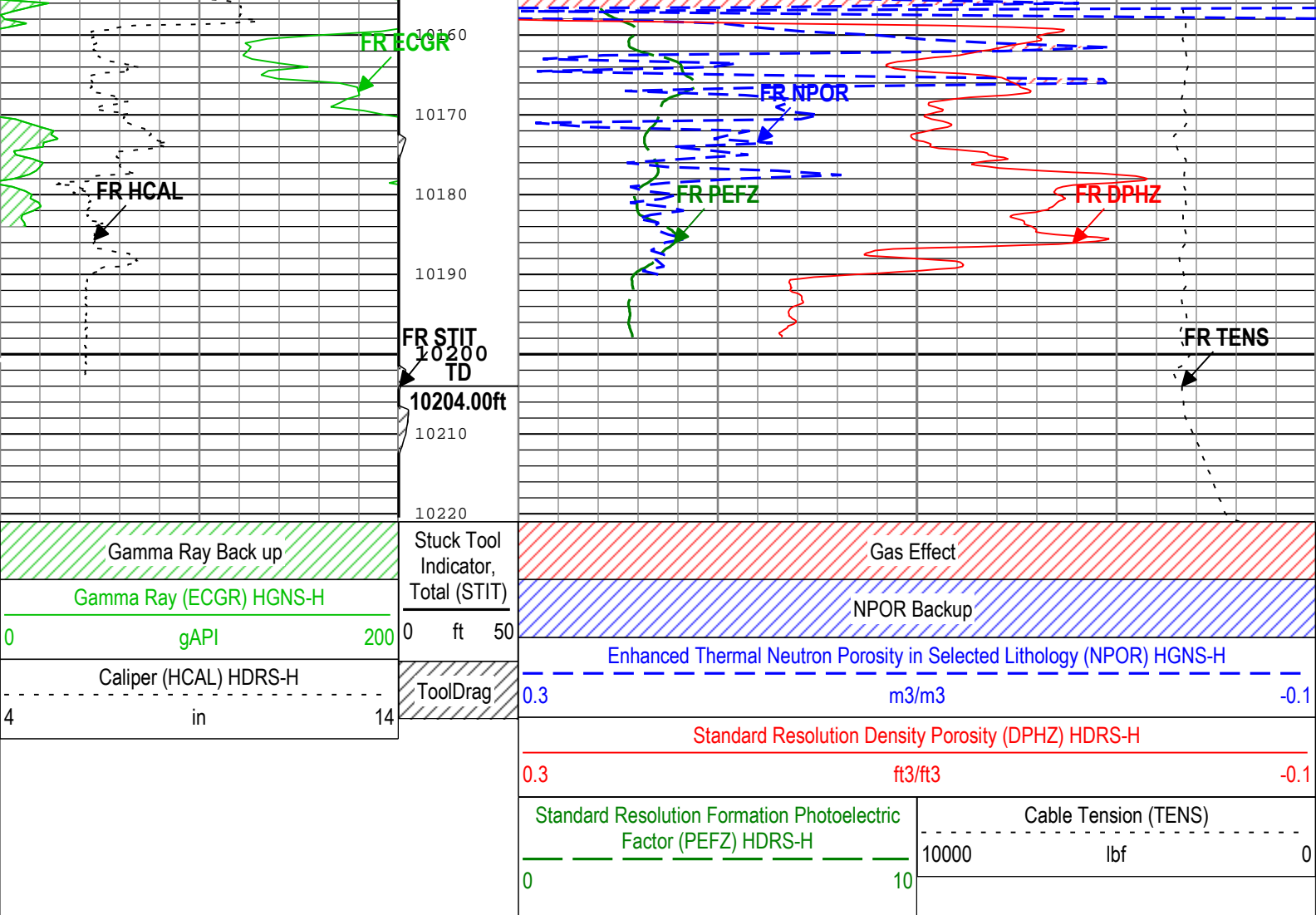












TIME\_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express    Format: Log ( Porosity-5 )    Index Scale: 5 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation Date: 24-Feb-2017 08:55:41

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	Open	
BHT	Bottom Hole Temperature	Borehole	212	degF
BS	Bit Size	WLSESSION	Depth Zoned	in
BSAL	Borehole Salinity	Borehole	0	ppm
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	-0.01	in
CBLO	Casing Bottom (Logger)	WLSESSION	8552	ft
CCCO	Casing & Cement Thickness Correction Option	HGNS-H	Yes	
CDEN	Cement Density	HGNS-H	1.58	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.1	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DFT_WATER	Drilling Fluid Water Type	Borehole	Fresh Water	
DHC	Density Hole Correction	HDRS-H	Bit Size	
FD	Fluid Density	Borehole	1	g/cm3
FSAL	Formation Salinity	Borehole	0	ppm
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)	

GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	CALI	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	CTEM	
HSCO	Hole Size Correction Option	HGNS-H	Yes	
MATR	Rock Matrix for Neutron Porosity Corrections	Borehole	Depth Zoned	
MDEN	Matrix Density for Density Porosity	Borehole	Depth Zoned	g/cm3
MFST	Mud Filtrate Sample Temperature	Borehole	68	degF
NPRM	HRDD Nuclear Processing Mode	HDRS-H	Standard Resolution	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	0.48	ohm.m
SOCO	Standoff Correction Option	HGNS-H	Yes	
TD	Total Measured Depth	Borehole	10204	ft

Depth Zone Parameters			
Parameter	Value	Start ( ft )	Stop ( ft )
BS	12.25	50	1009
BS	8.75	1009	8552
BS	6.125	8552	10201
MATR	SANDSTONE	50	8780
MATR	LIMESTONE	8780	10210
MATR	SANDSTONE	10210	10221
MDEN	2.65	50	8780
MDEN	2.71	8780	10210
MDEN	2.65	10210	10221
All depth are actual.			

Tool Control Parameters	
-------------------------	--

ONE: Parameters				
Parameter	Description	Tool	Value	Unit
HMCA_BOARD_TYPE	HMCA Board Type	HGNS-H	1	
HRGD_BOARD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h

ONE
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5" Density
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Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[3]:Up	Up	13.94 ft	10220.98 ft	22-Feb-2017 5:31:59 AM	22-Feb-2017 8:02:44 AM	ON	-0.03 ft	Yes

All depths are referenced to toolstring zero
--

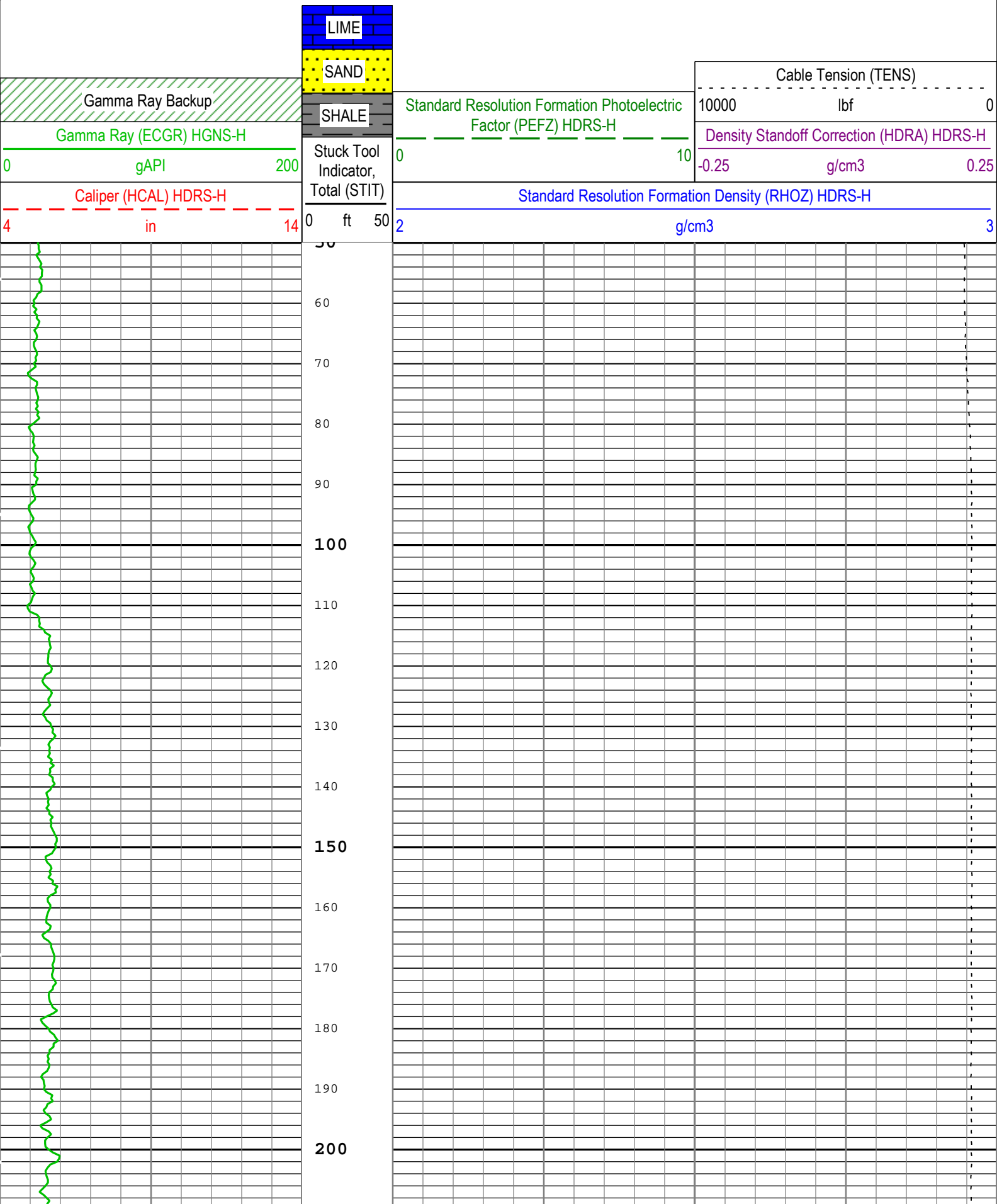
Log	Company:Expedition Water Solutions LLC      Well:EWS 4 ONE: Log[3]:Up:S015
-----	---

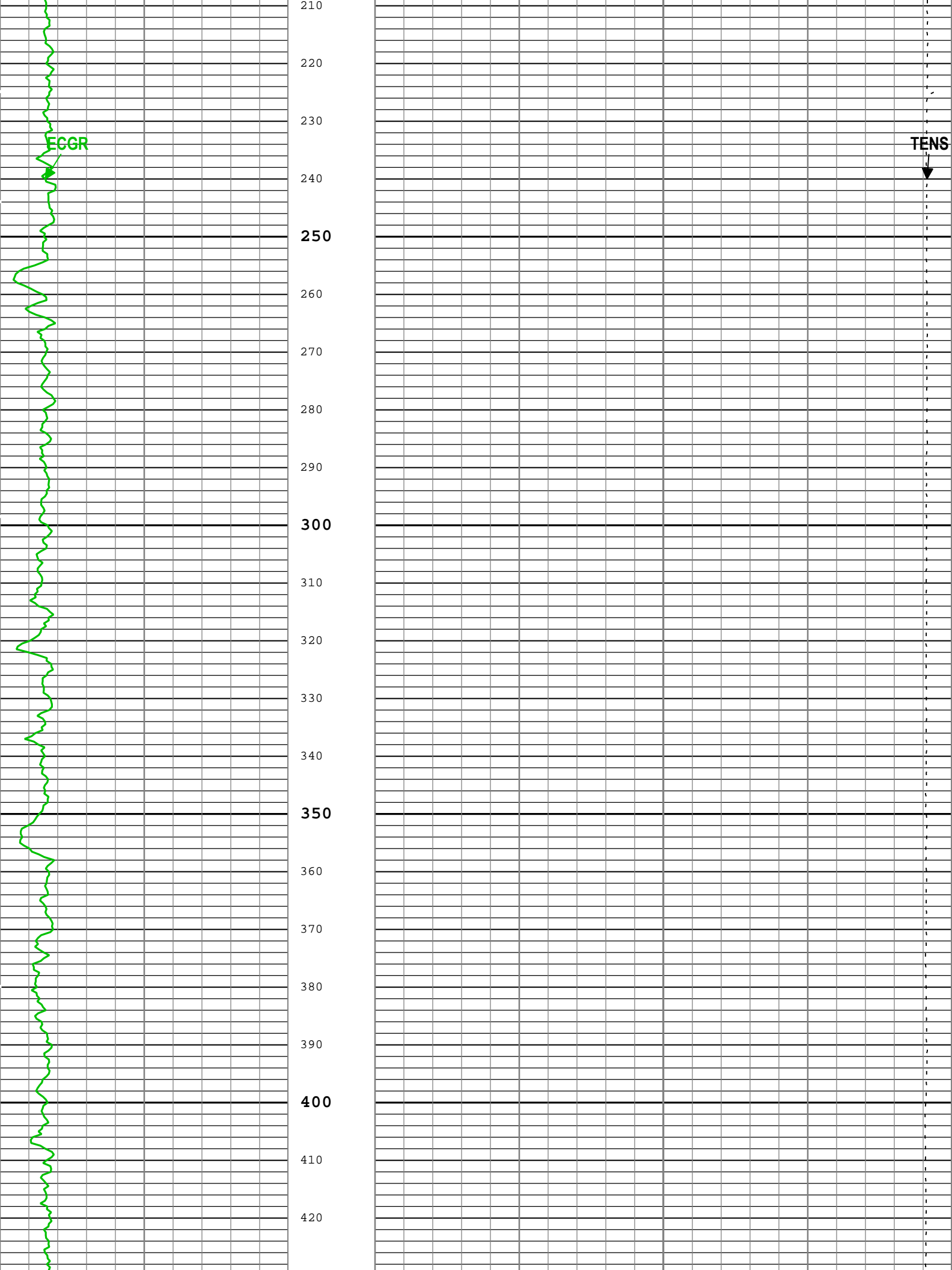
Description: HGNS standard resolution porosities for Platform Express    Format: Log ( Density-5 )    Index Scale: 5 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation Date: 24-Feb-2017 08:55:50
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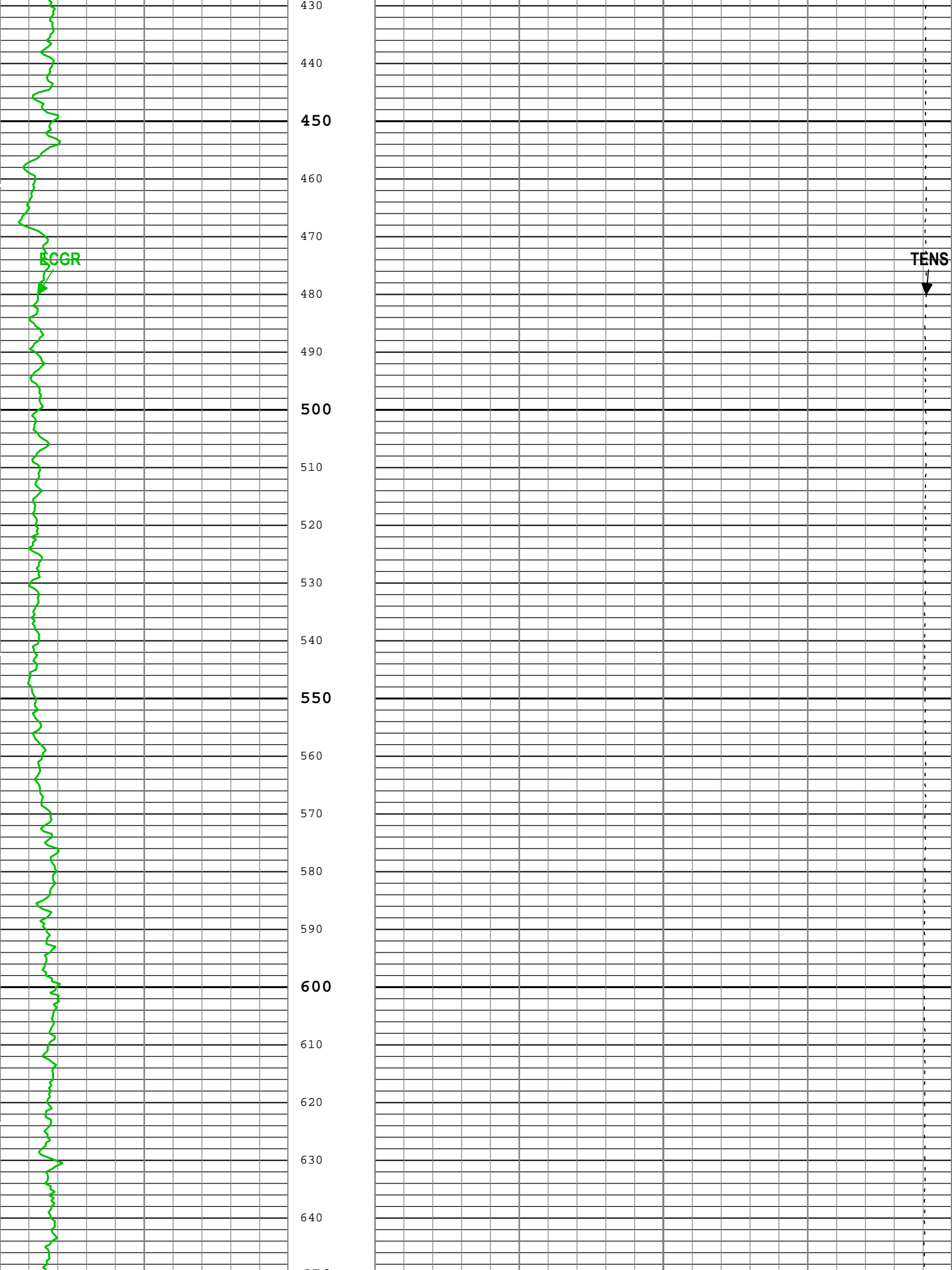
Channel	Source	Sampling
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR	HGNS-H:HGNS-H:HGNS-H	6in
HDRA	HDRS-H:HRMS-H:HRGD-H	2in
PEFZ	HDRS-H:HRMS-H:HRGD-H	2in
RHOZ	HDRS-H:HRMS-H:HRGD-H	2in
SMIN	HDRS-H:HRMS-H:HRGD-H	2in
SMIN	HDRS-H:HRMS-H:HRGD-H	2in

SMNO	HDRS-H:HRMS-H:HRGD-H	2in
STIT	DepthCorrection	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

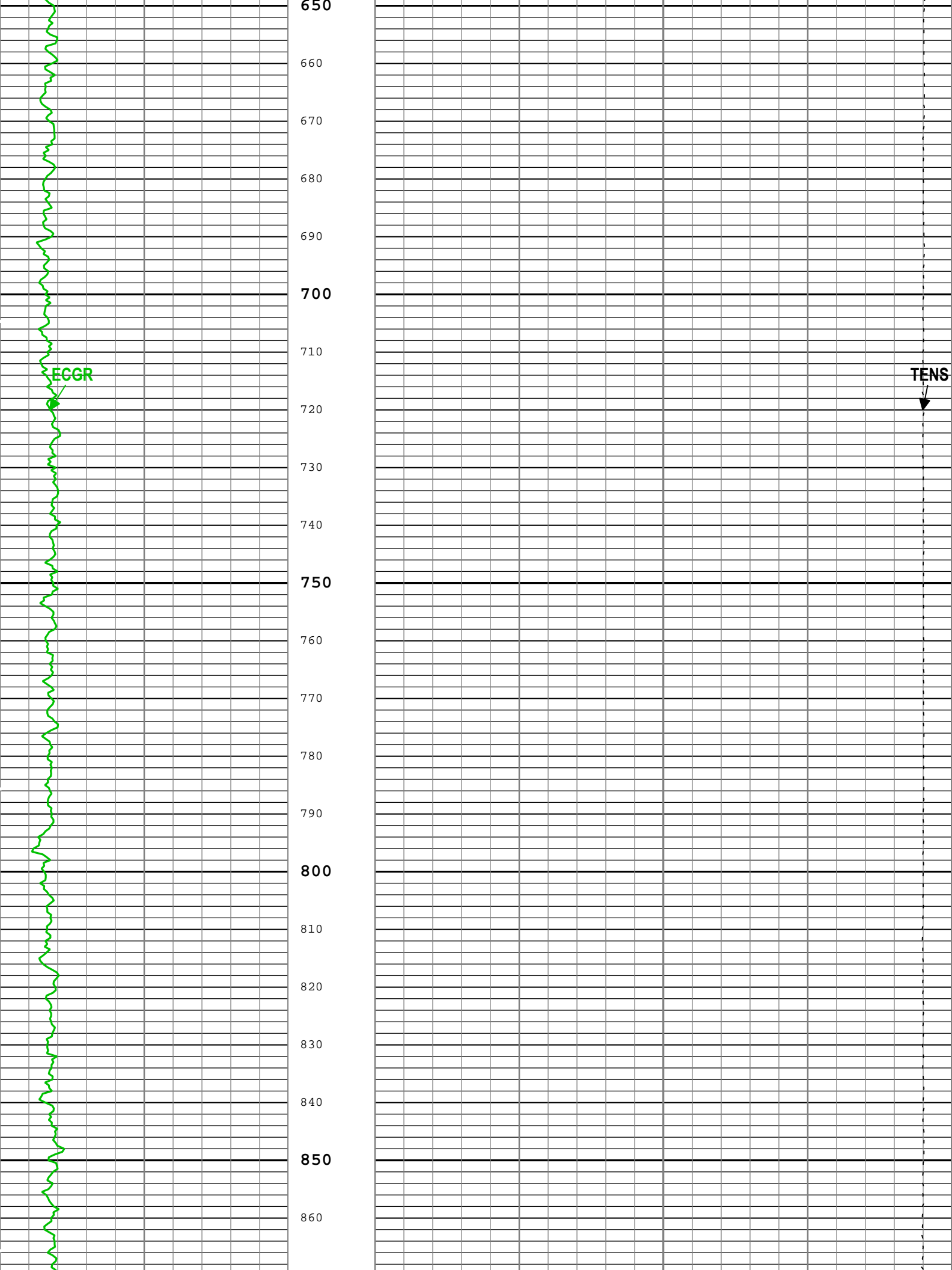
TIME\_1900 - Time Marked every 60.00 (s)

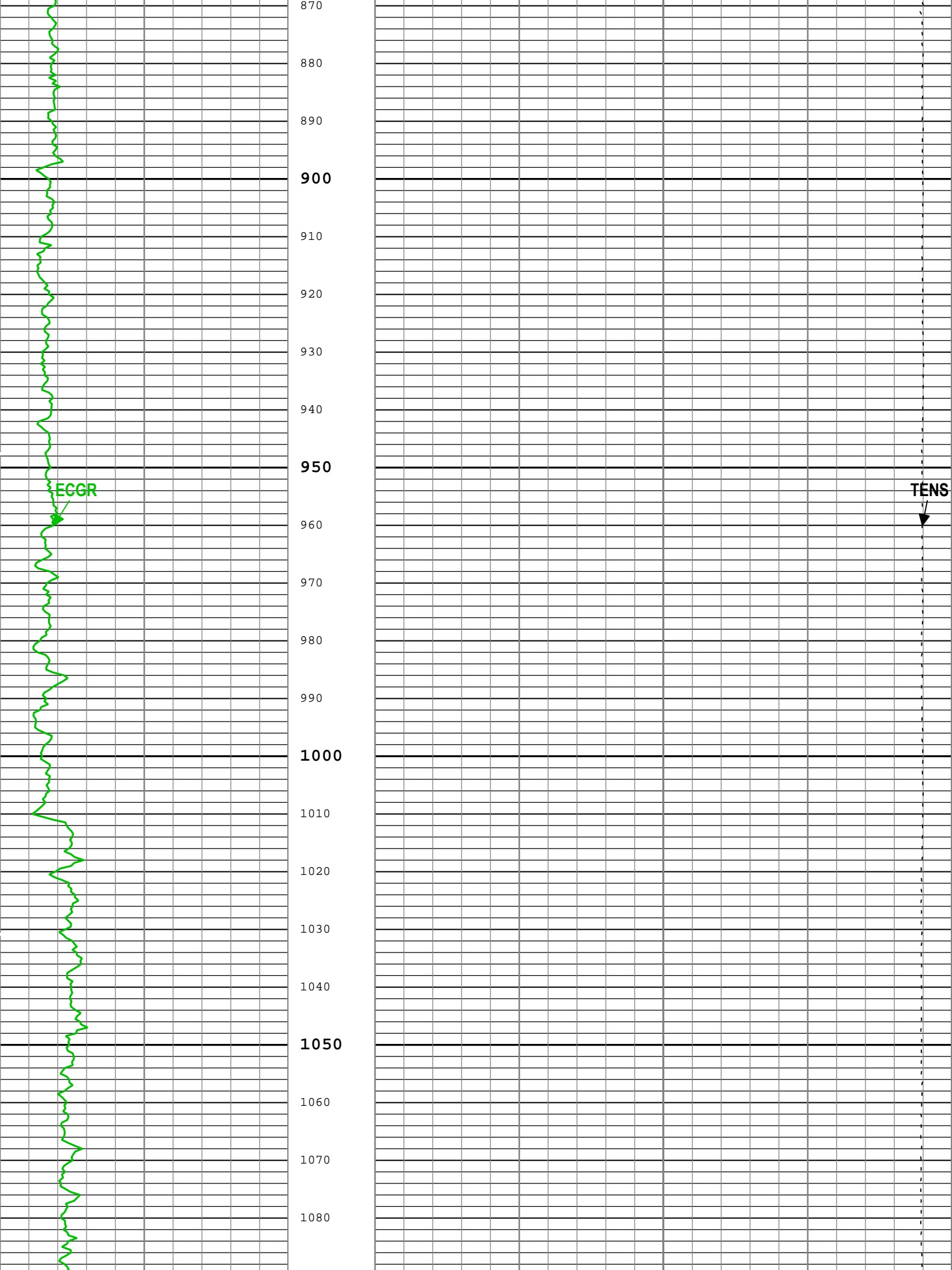


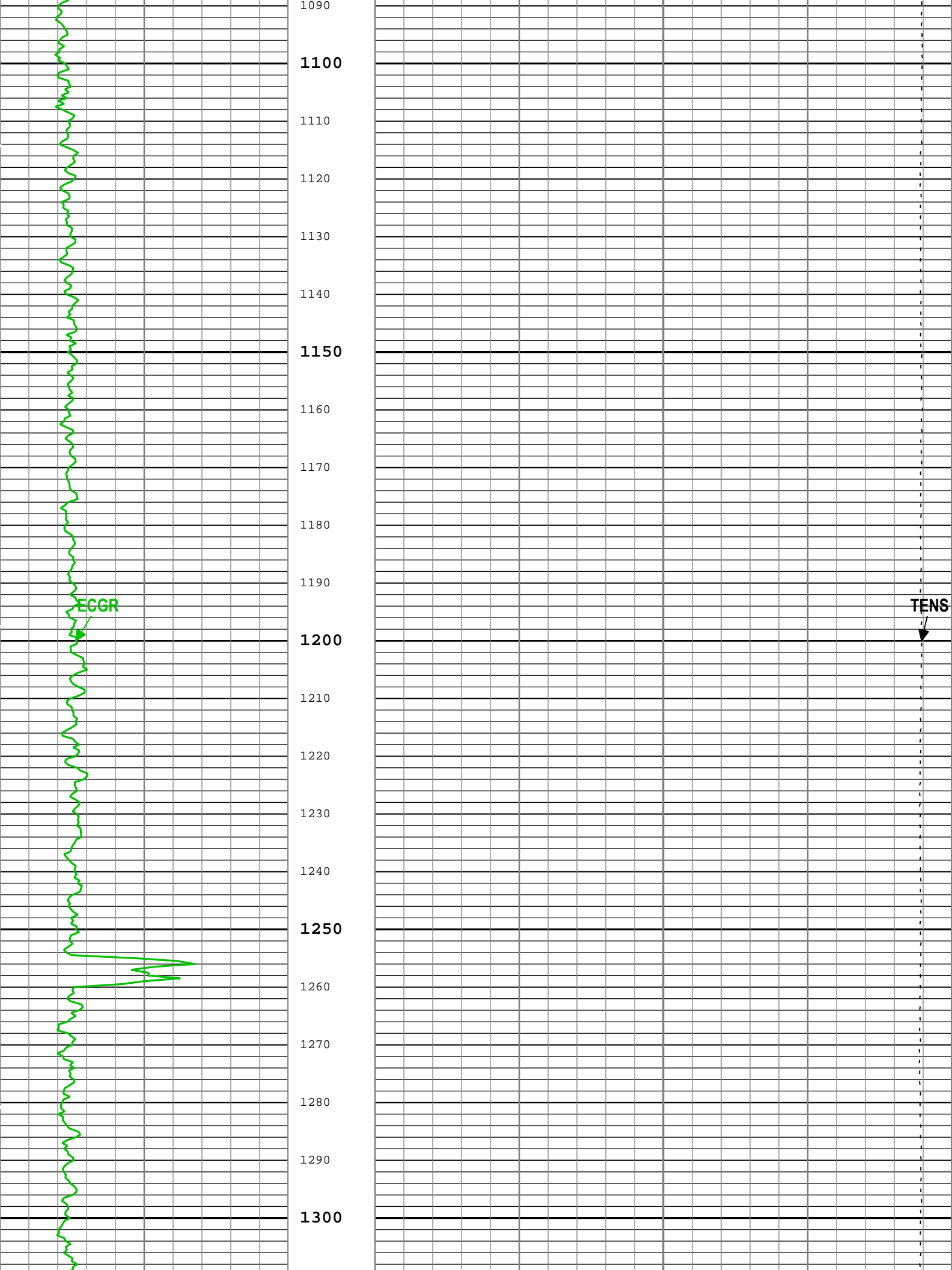


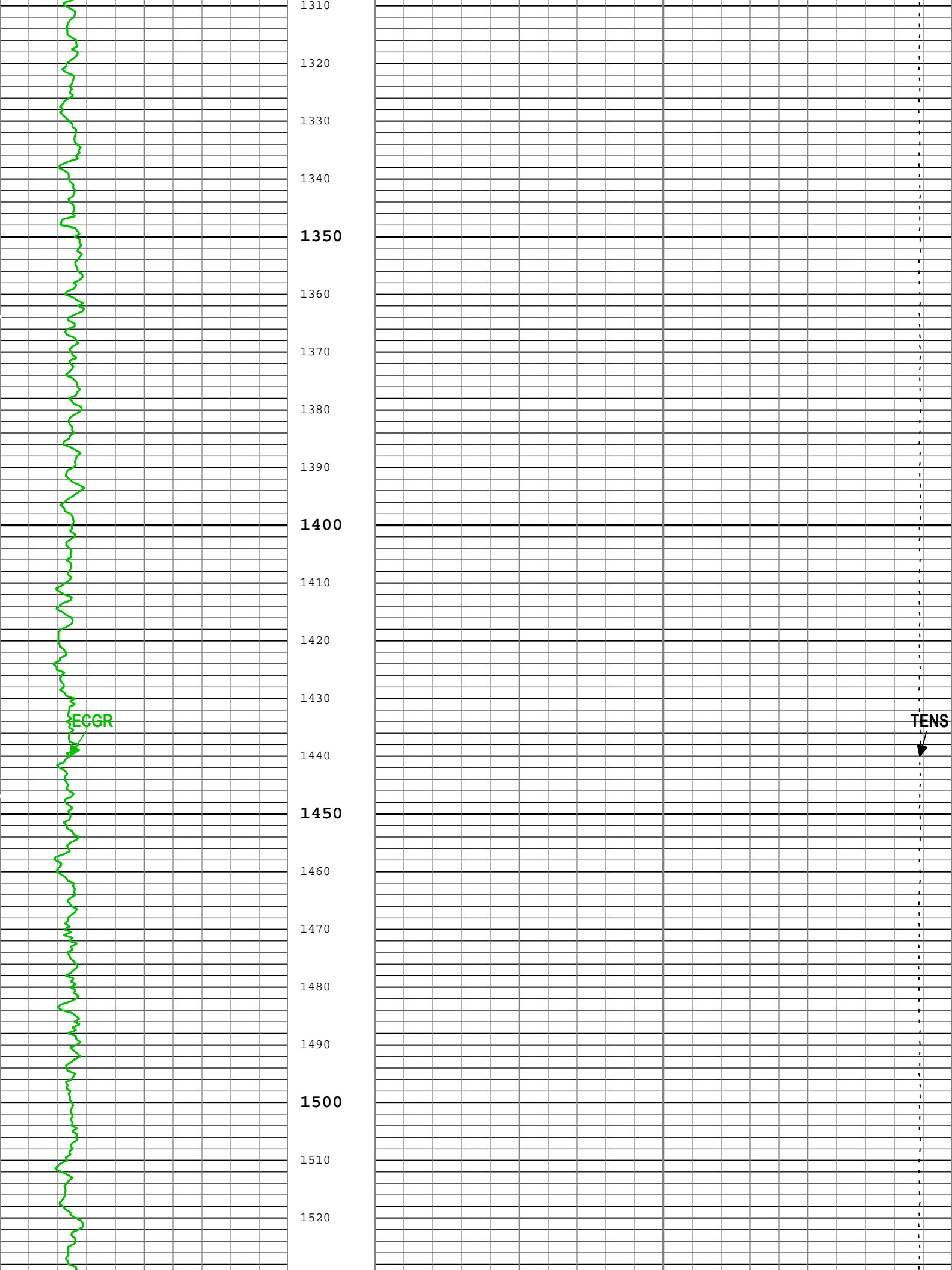


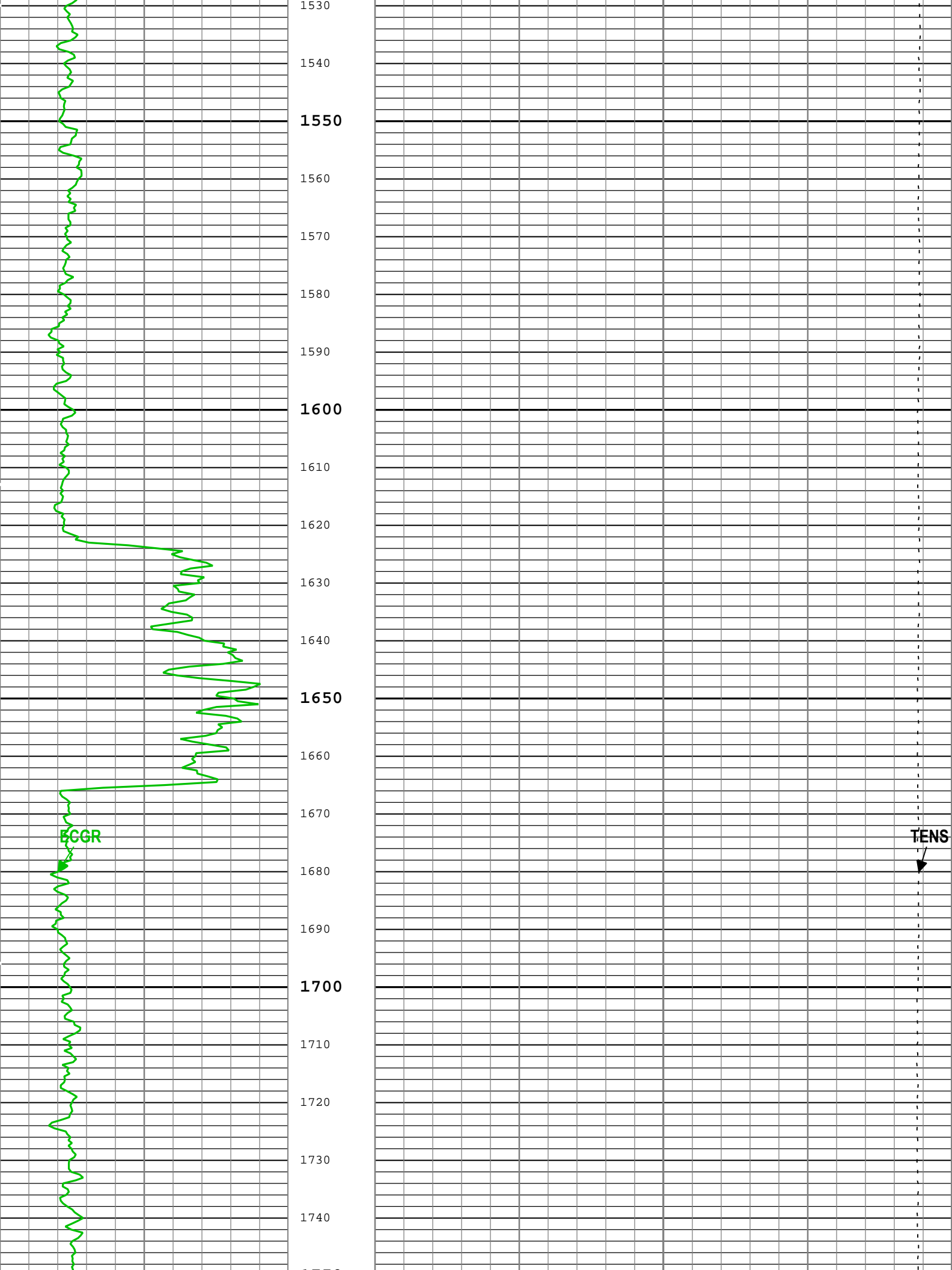


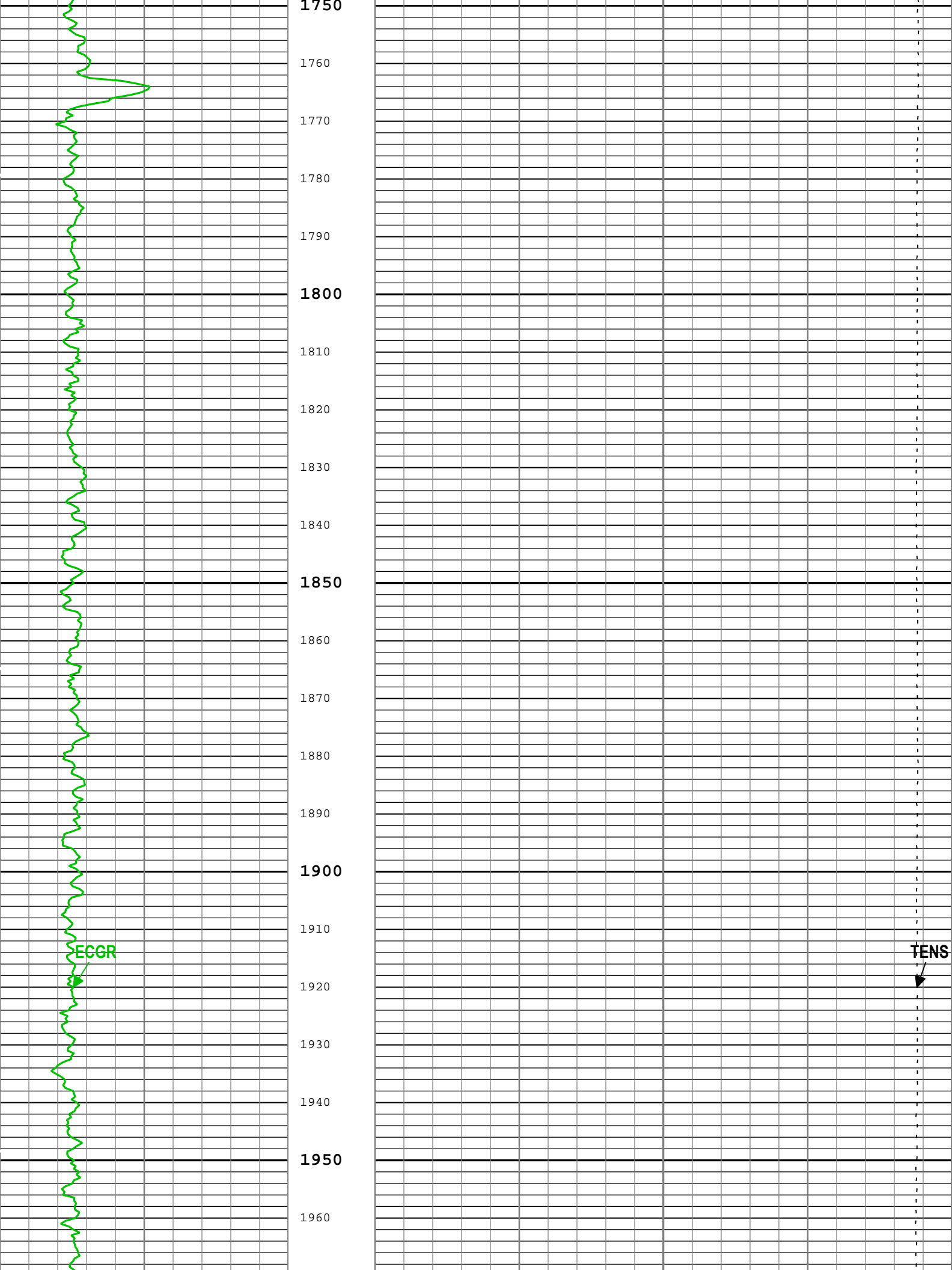


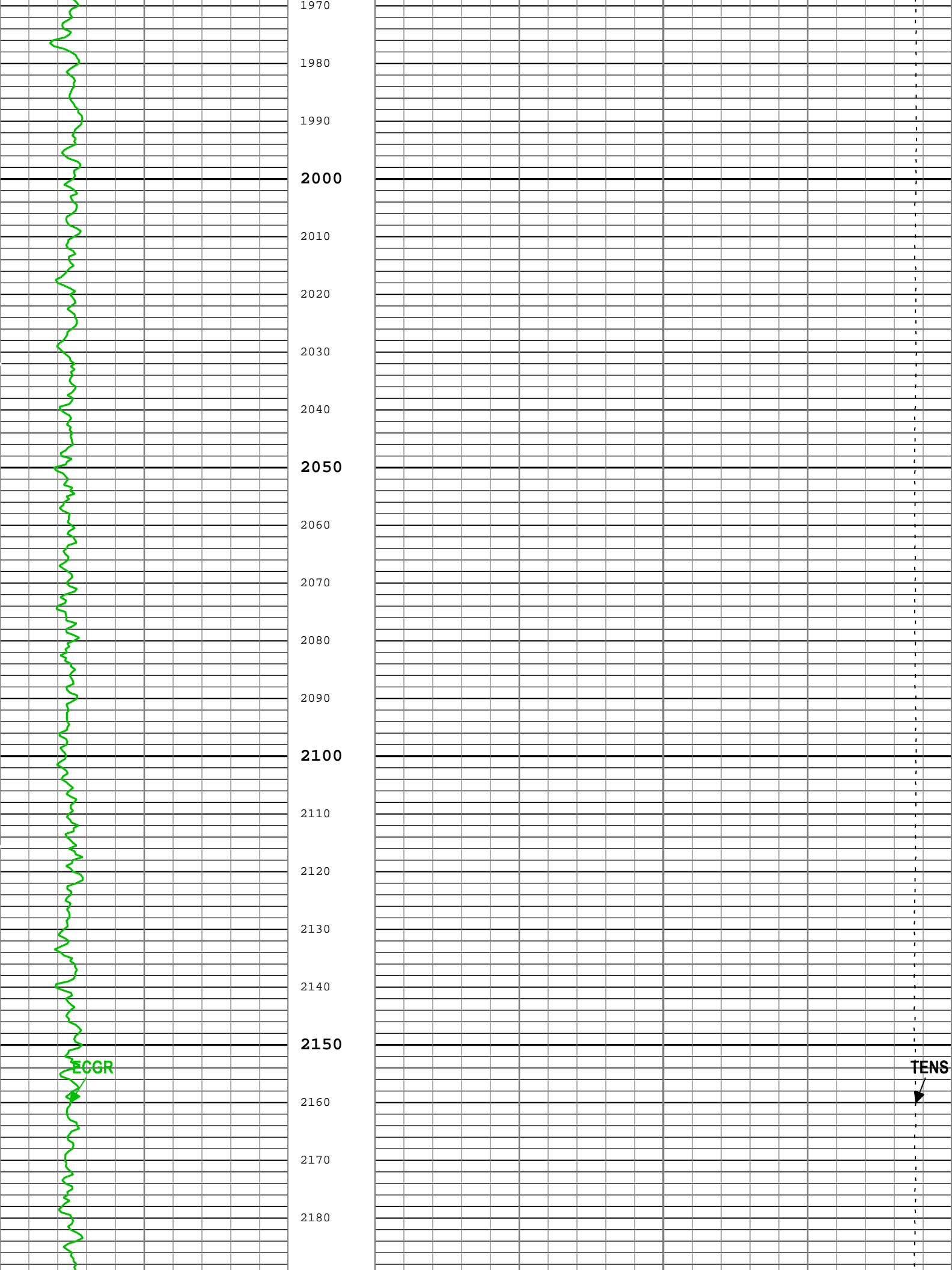


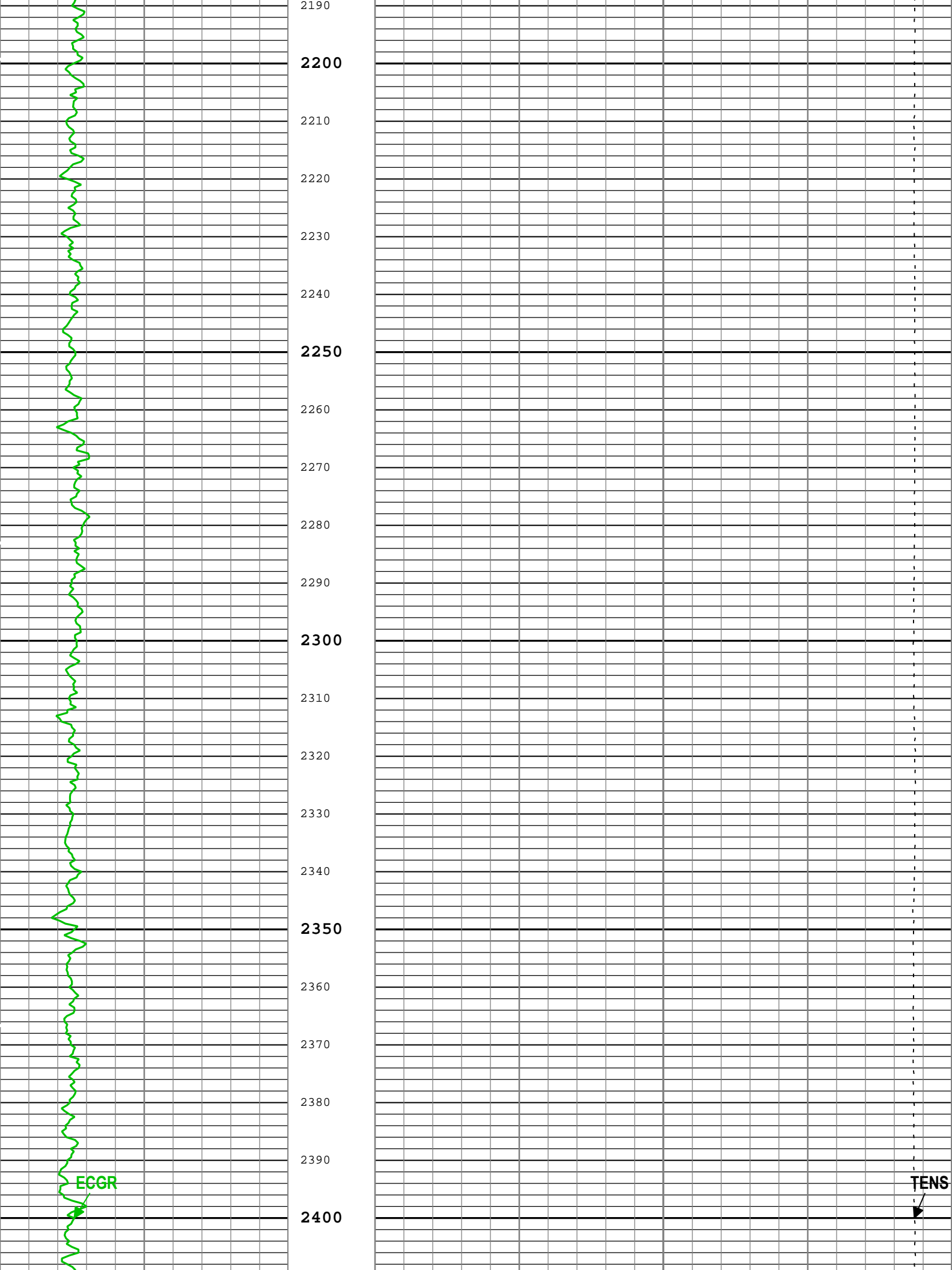




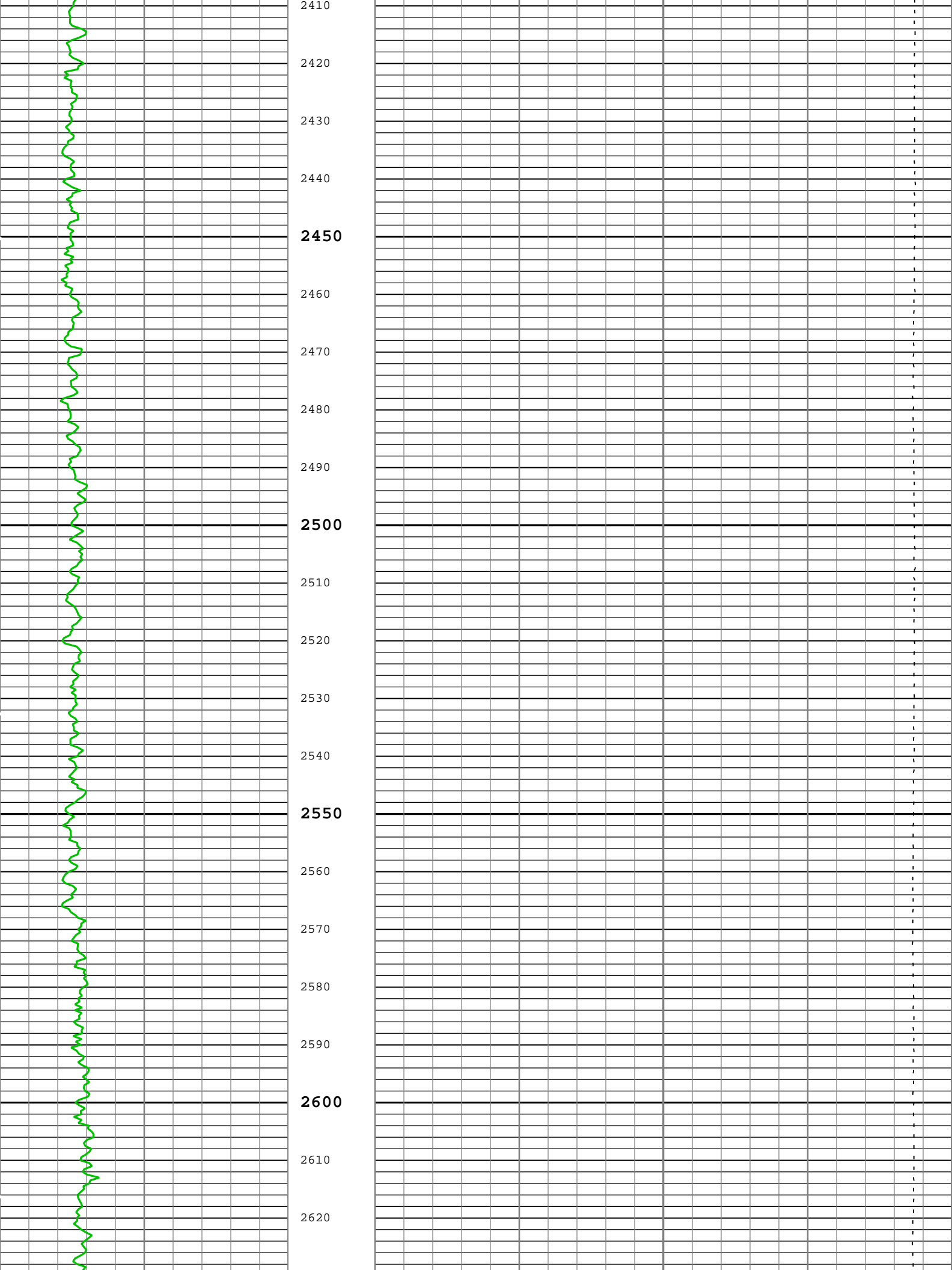


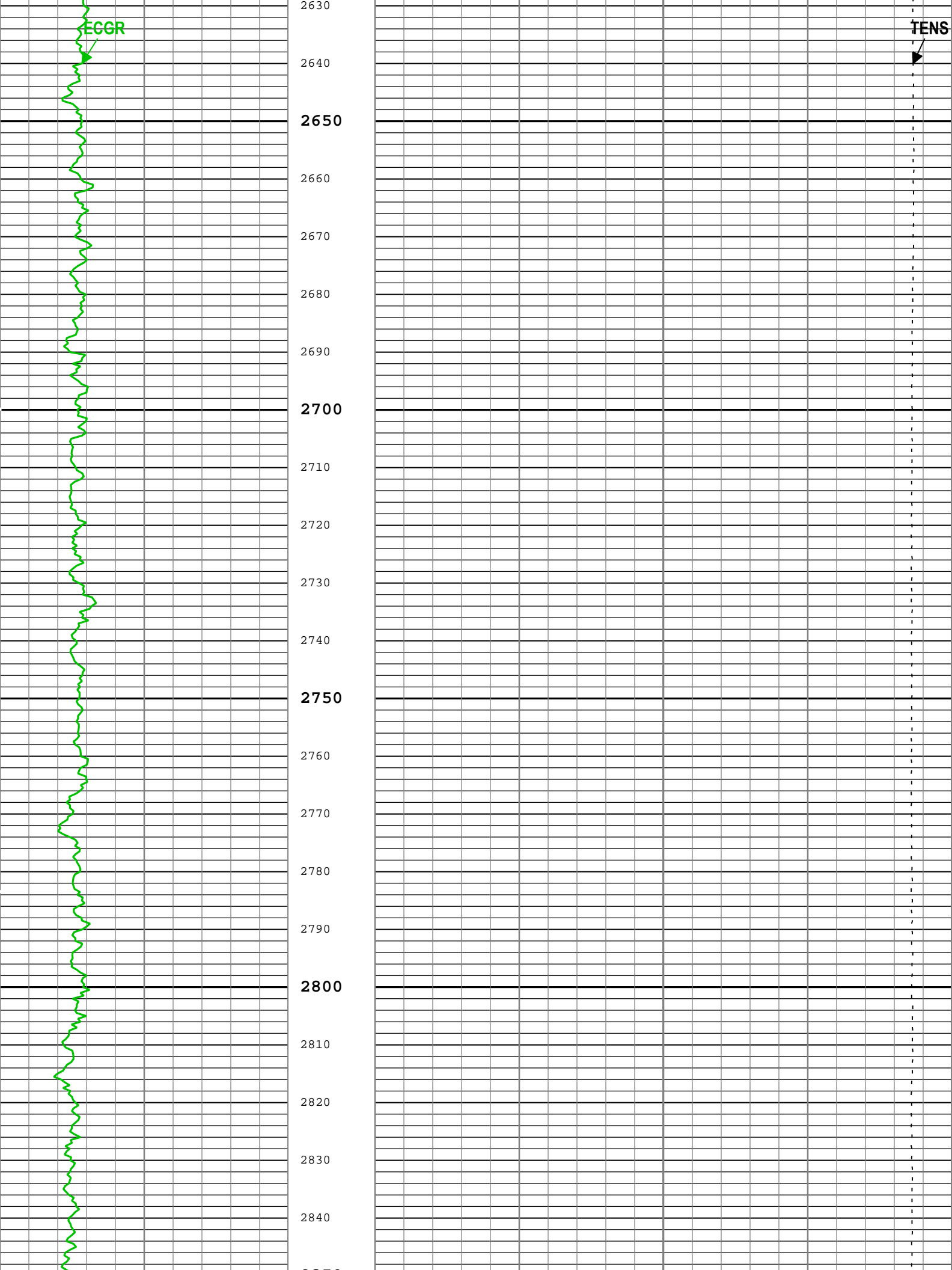


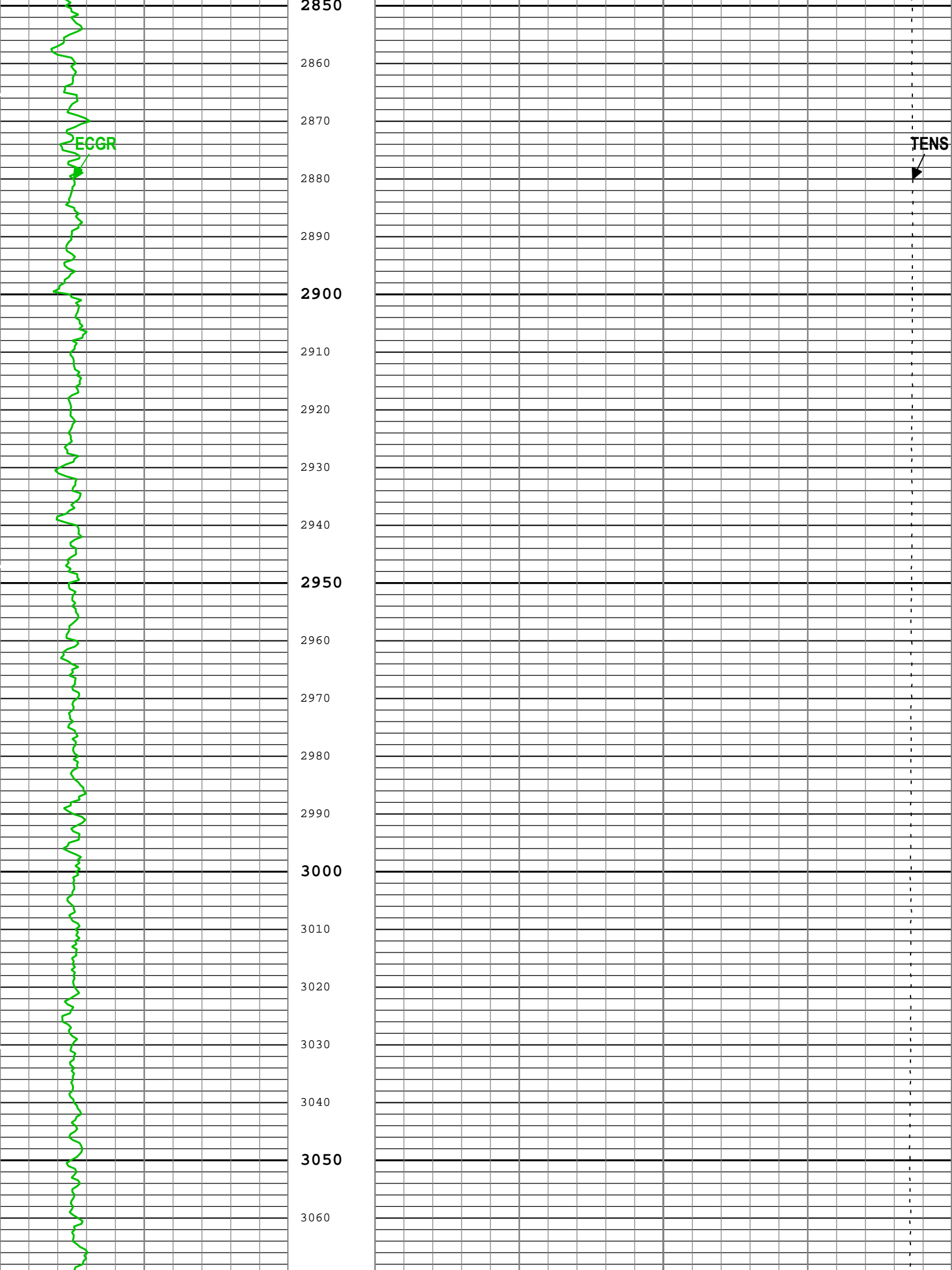


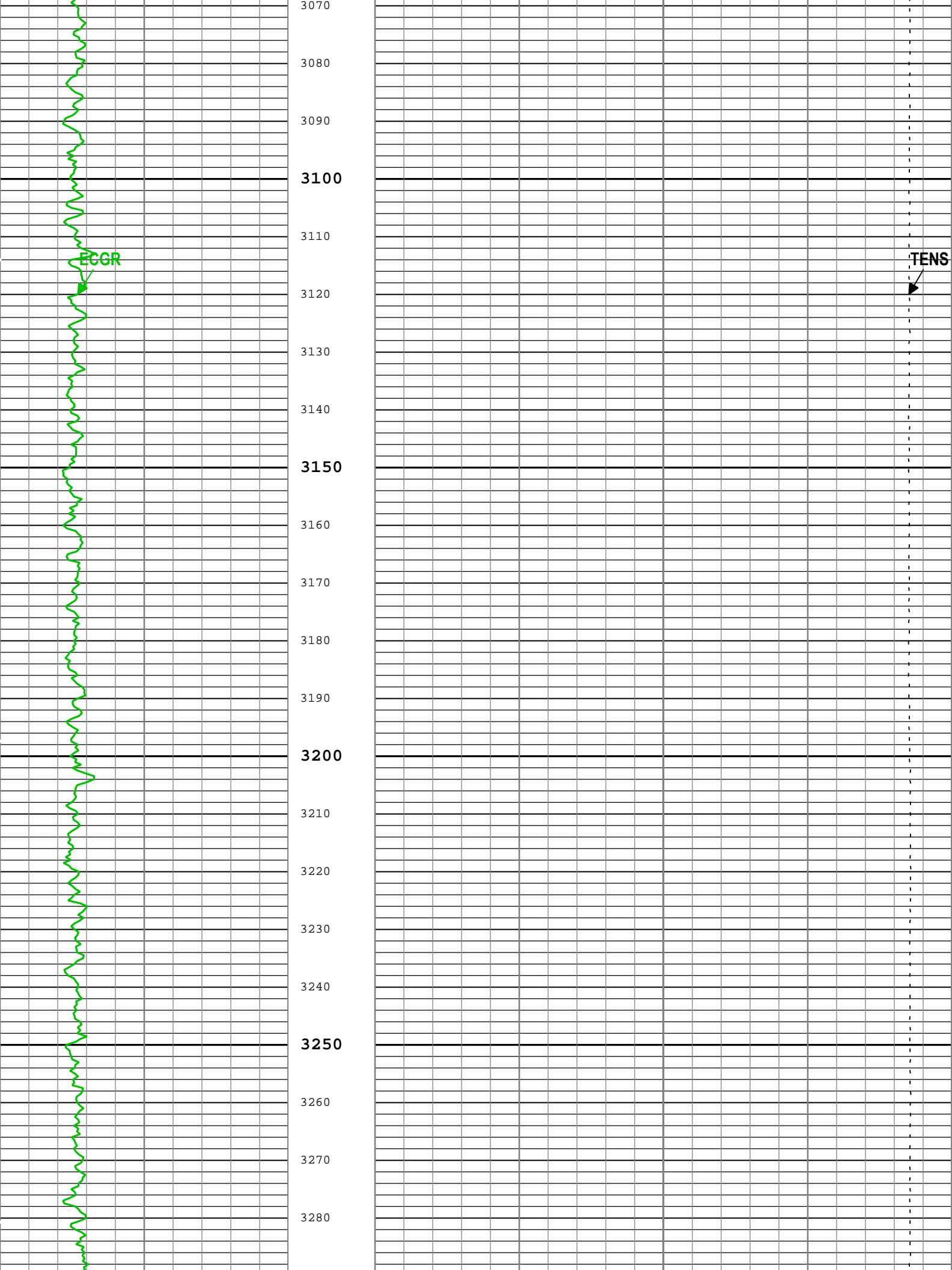


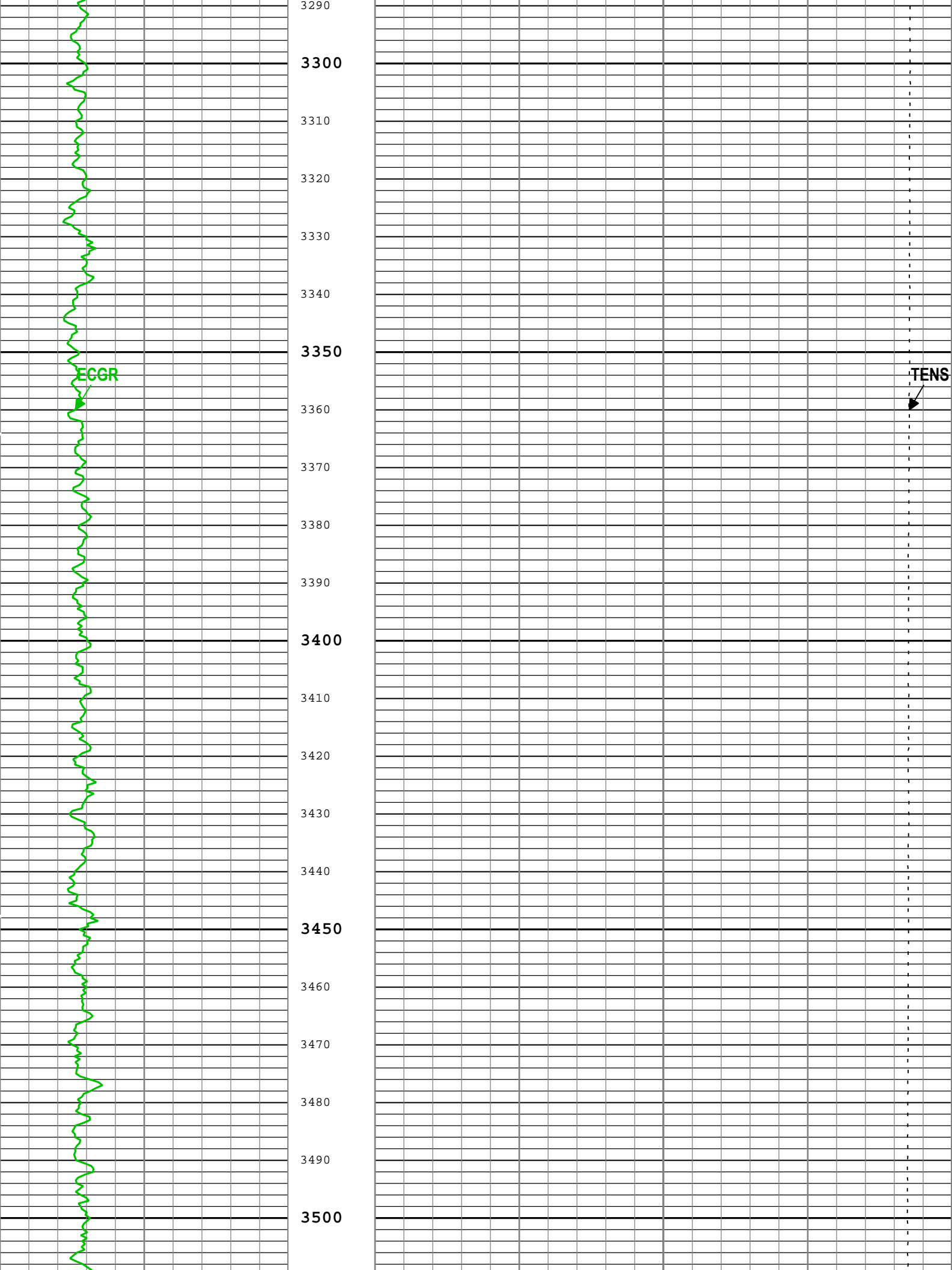


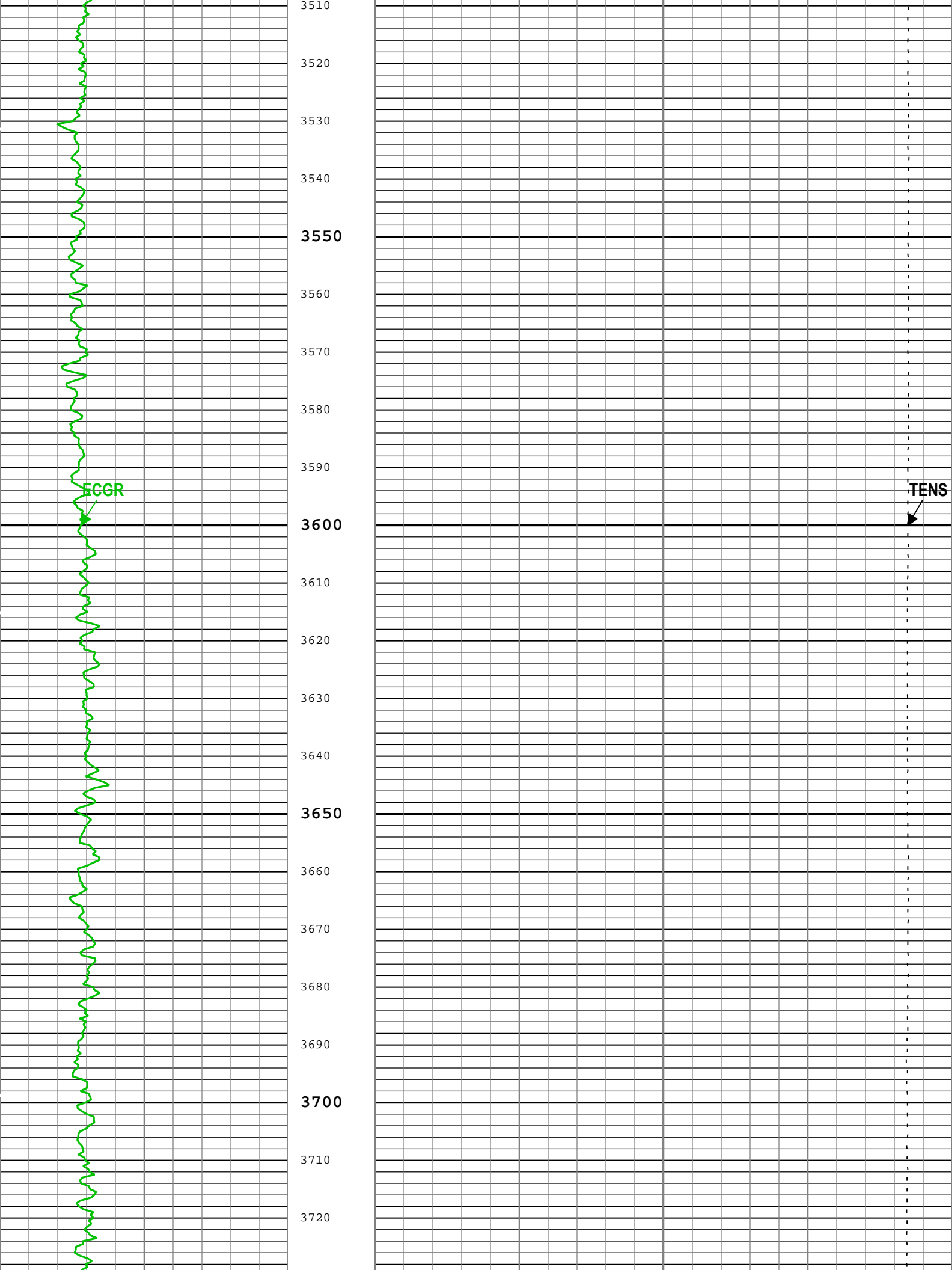


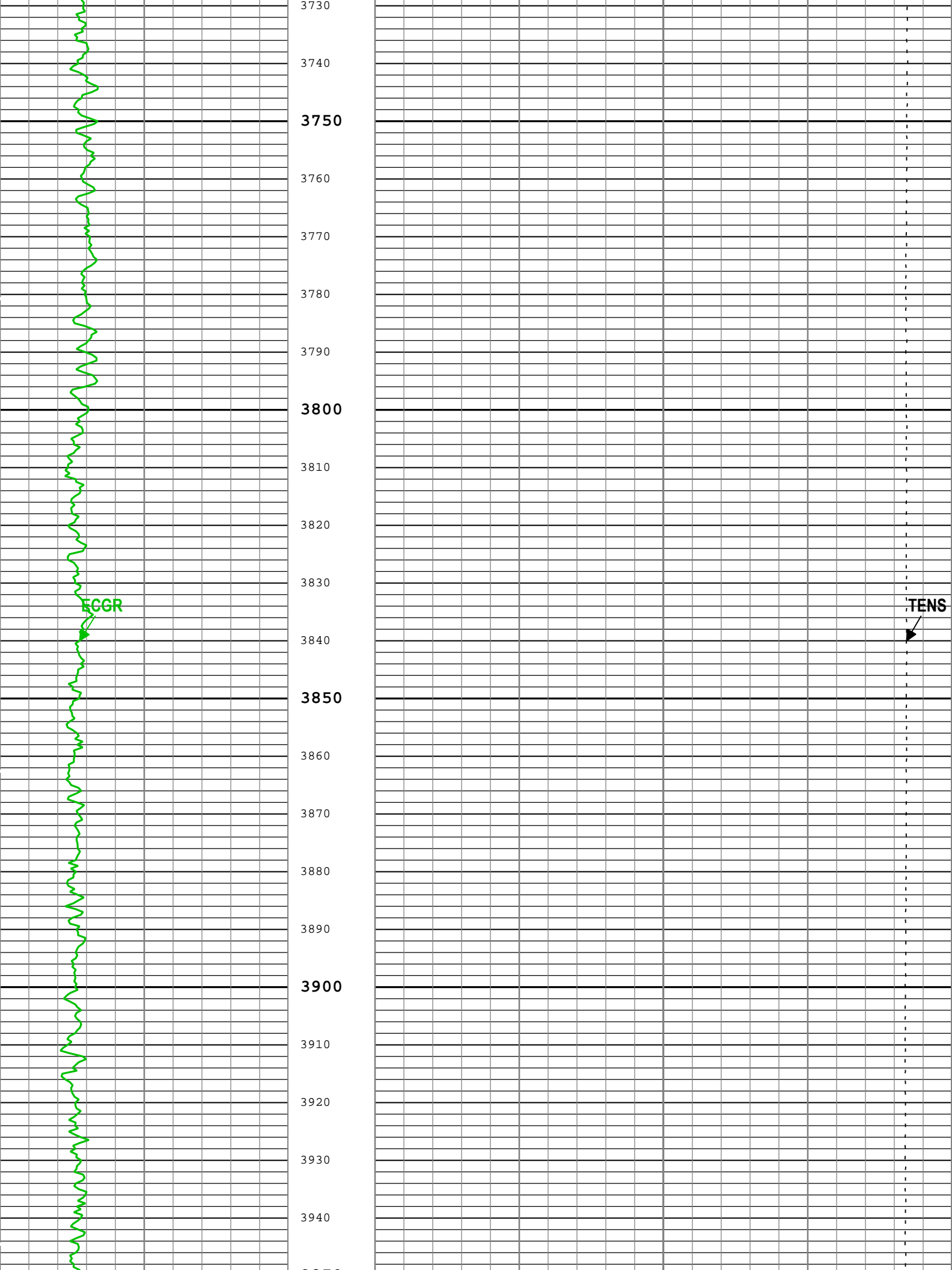


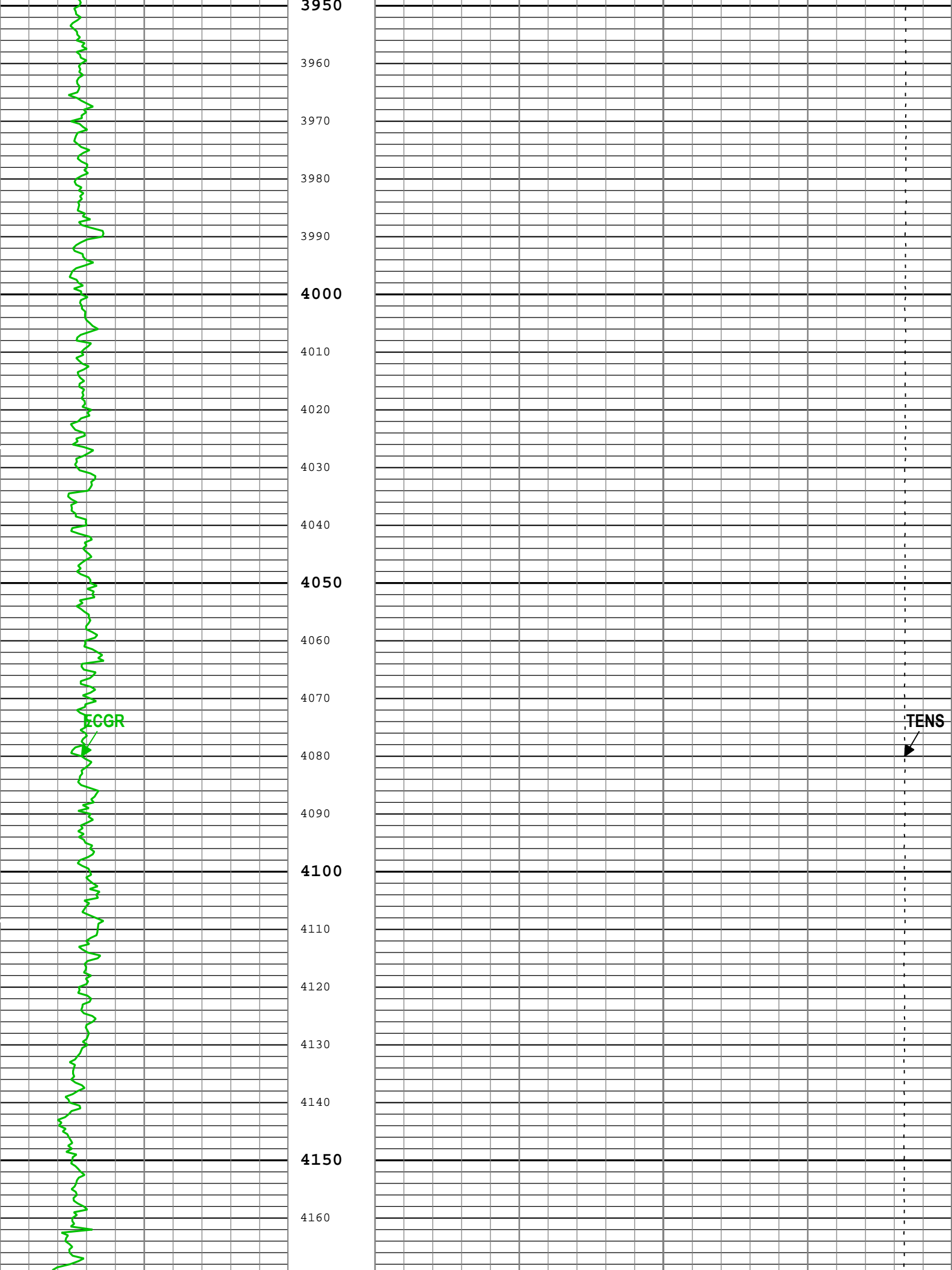




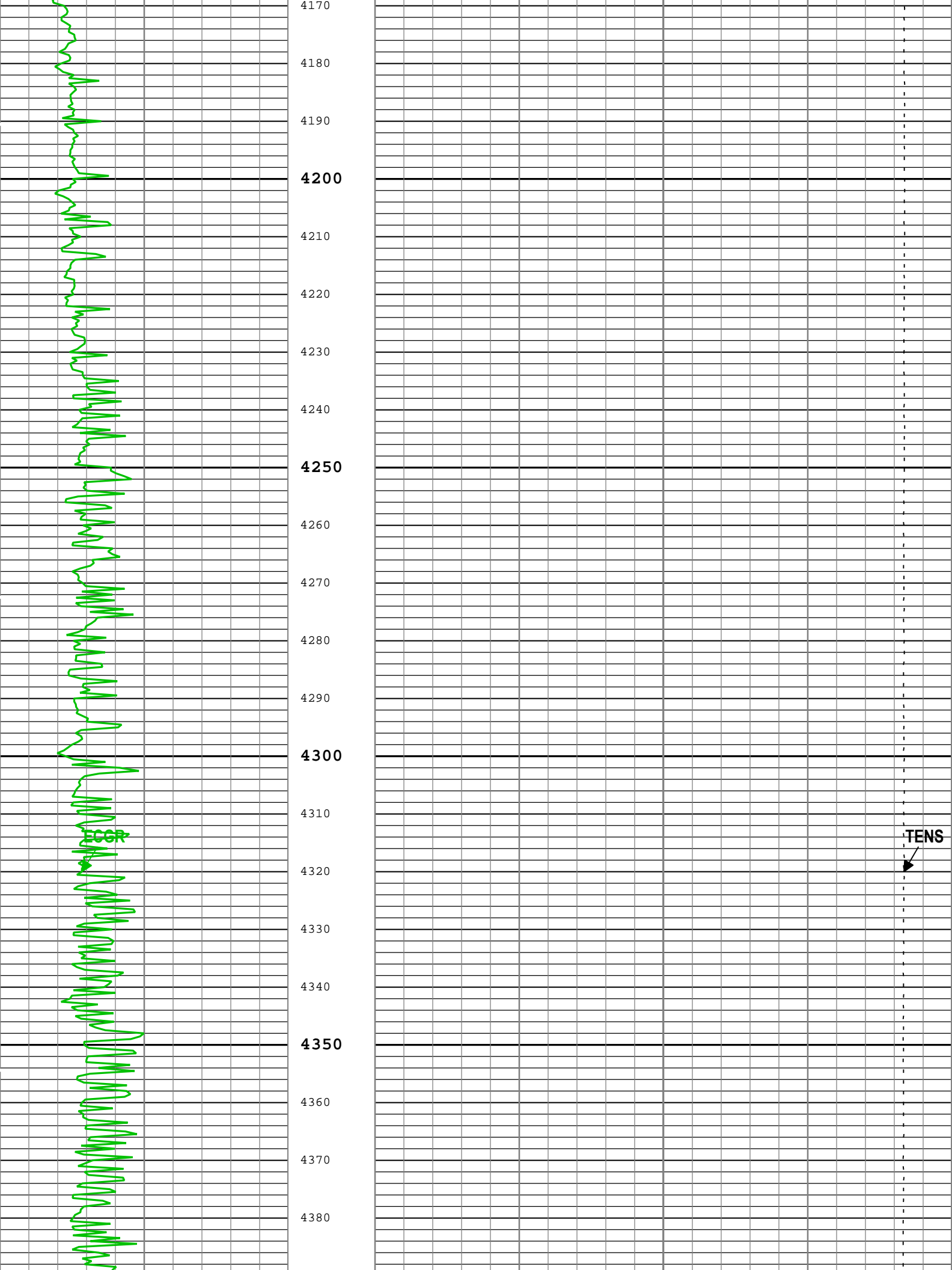


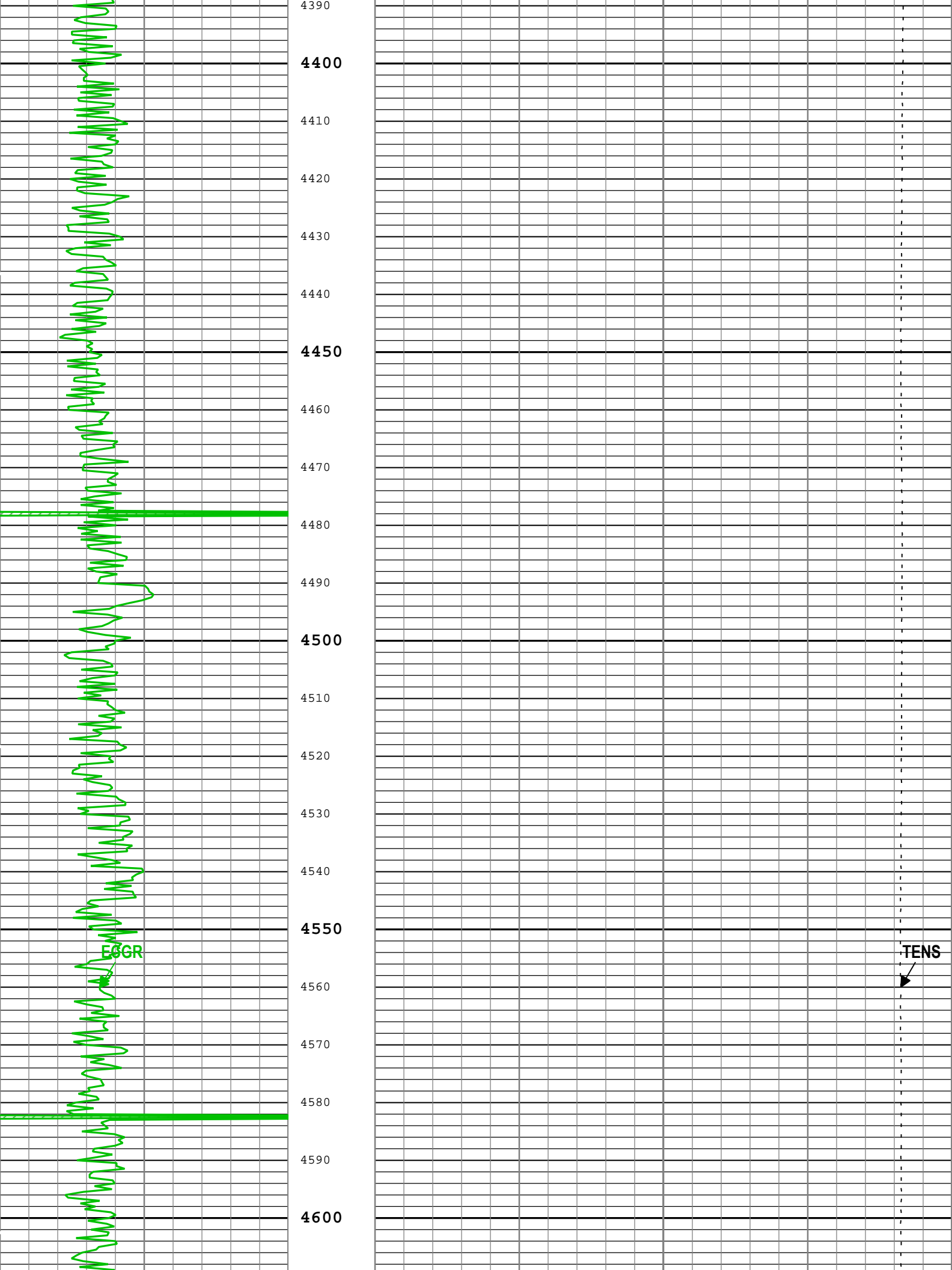


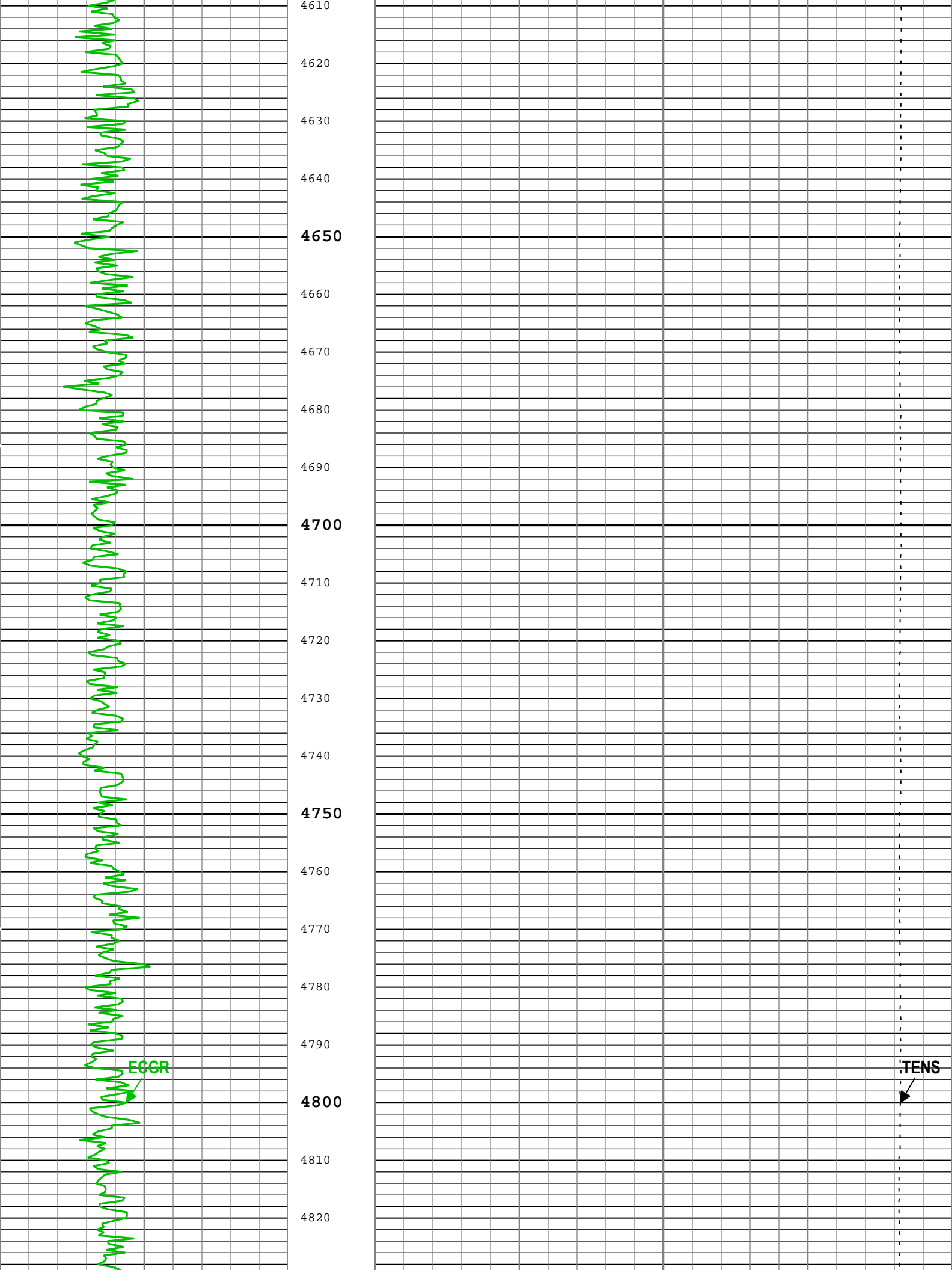


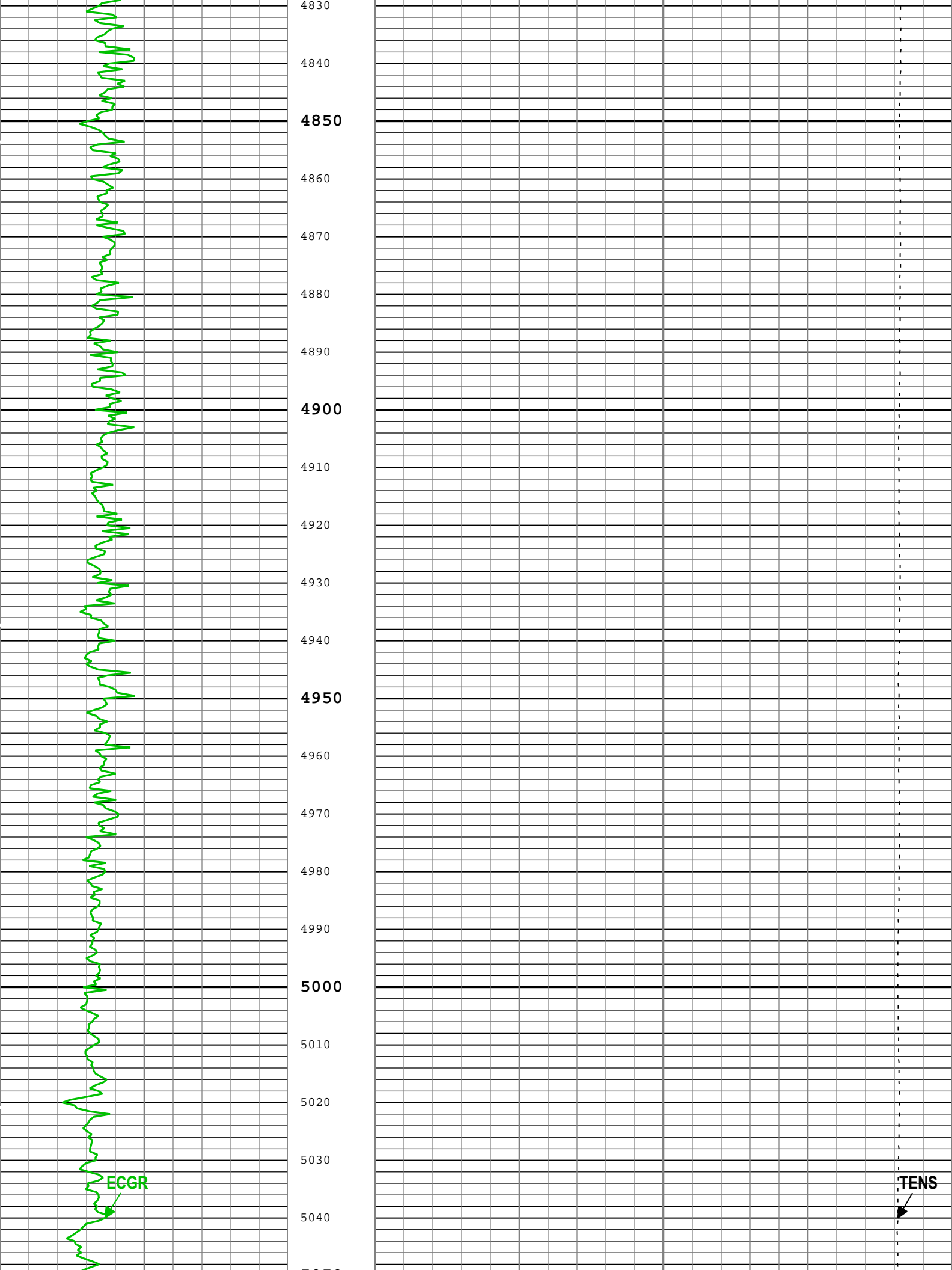


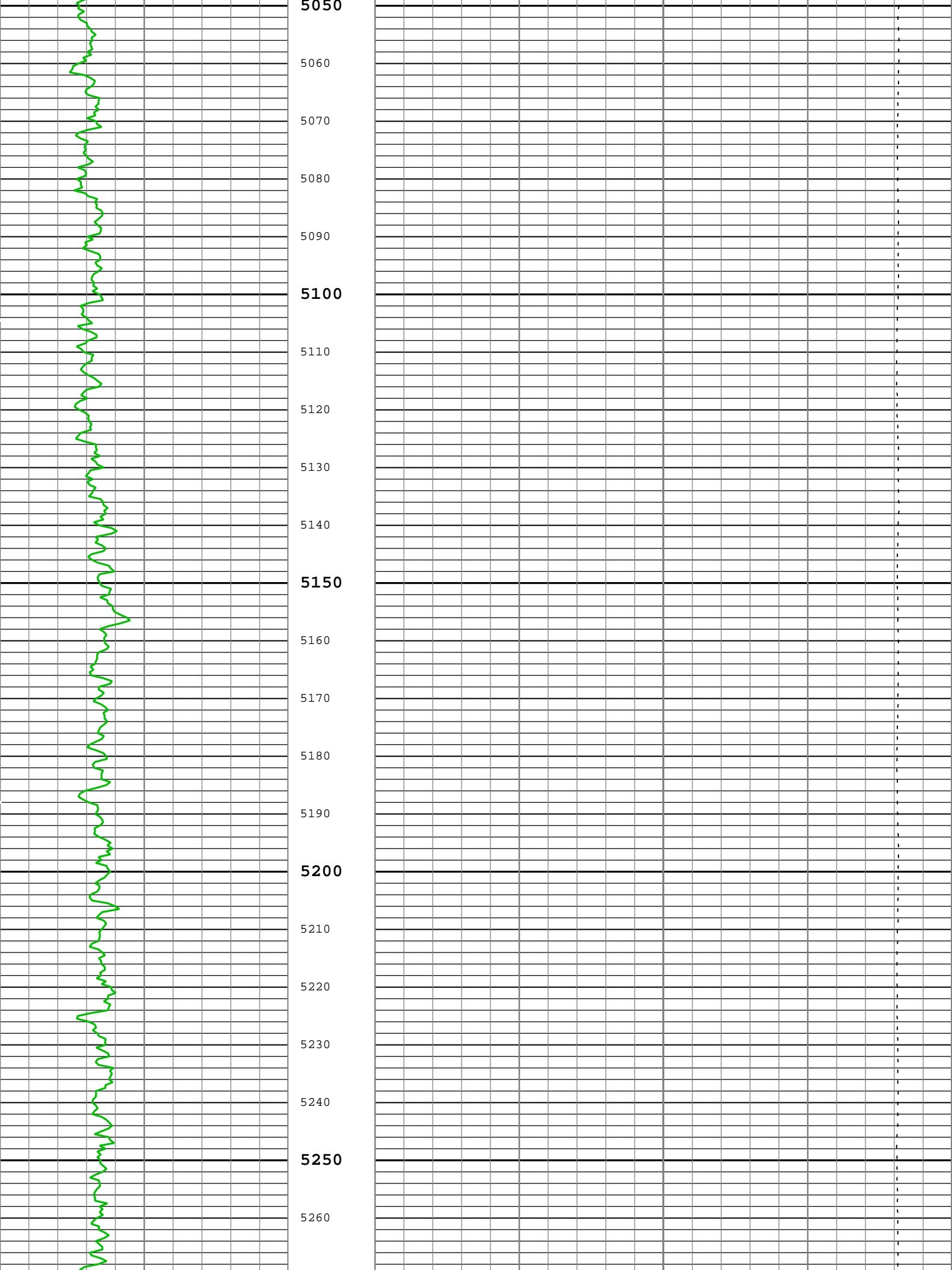


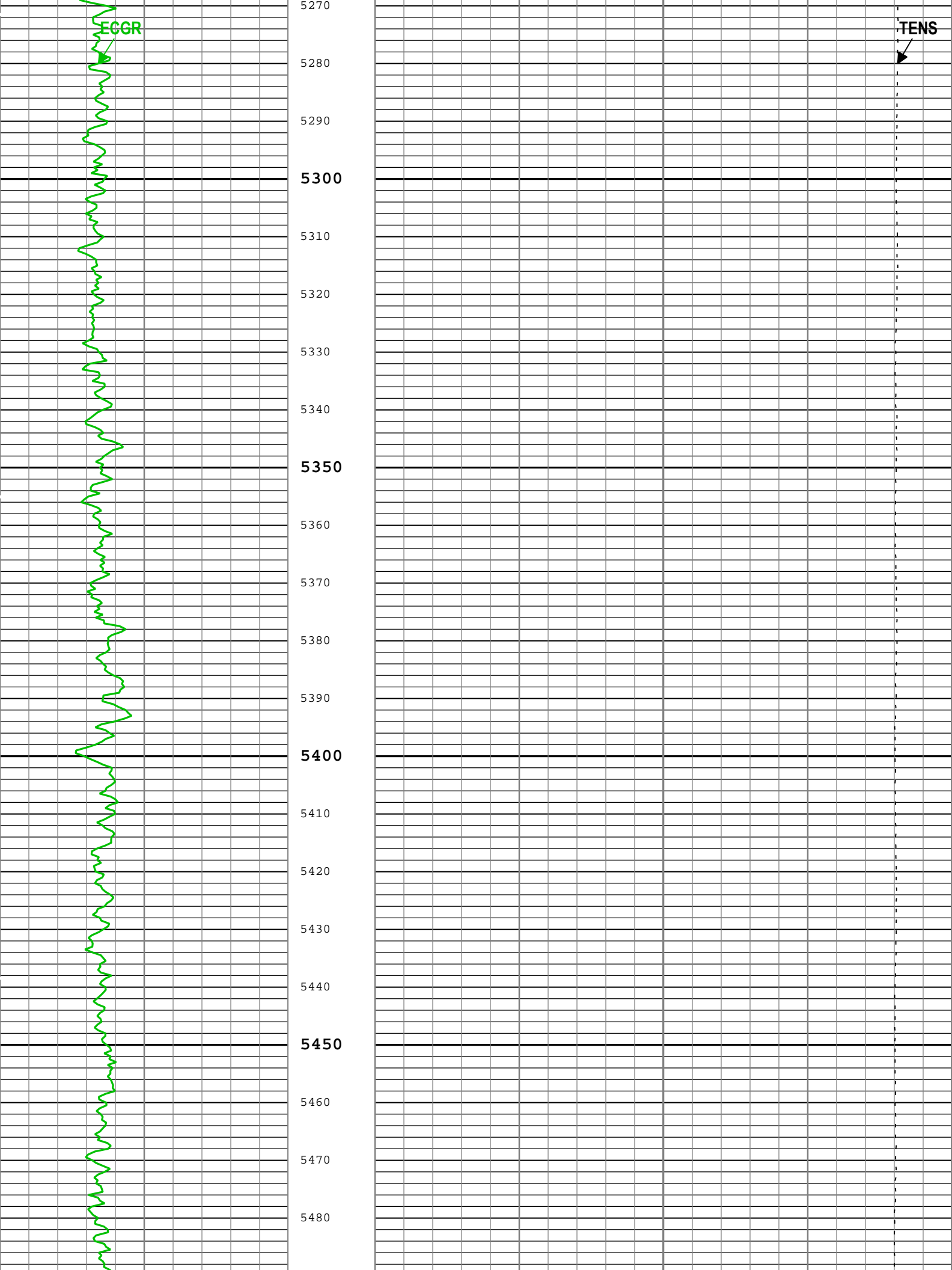


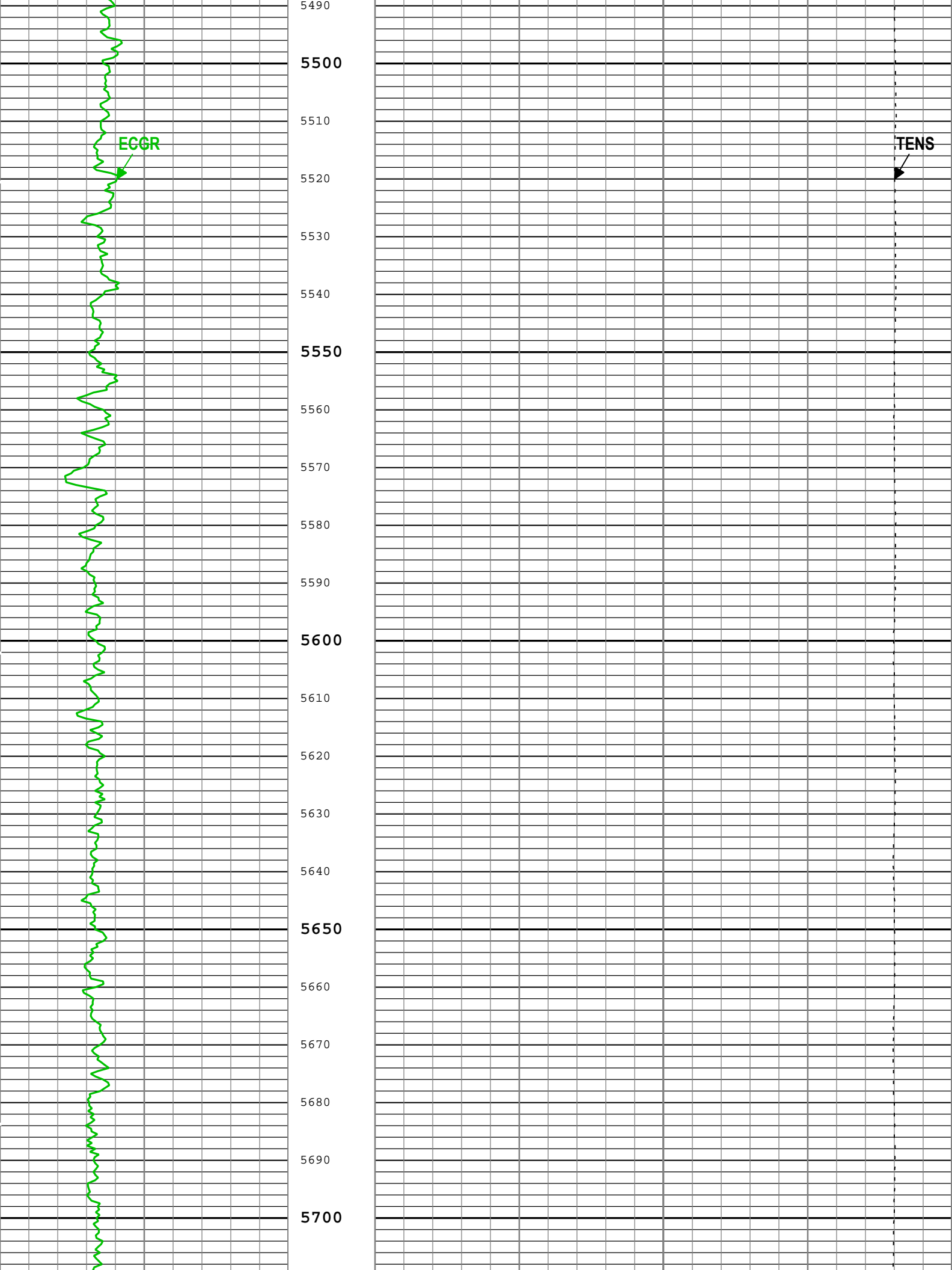


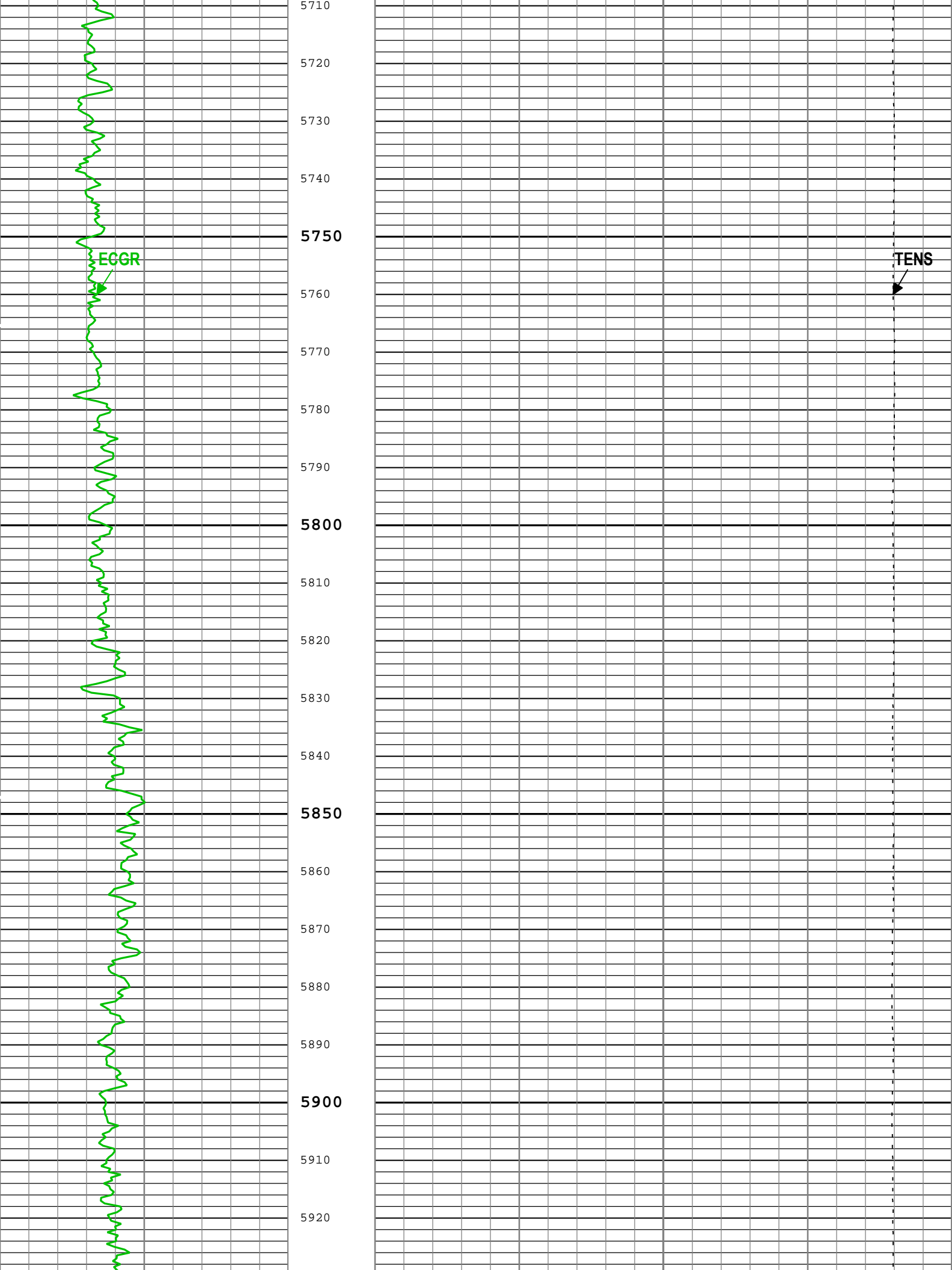




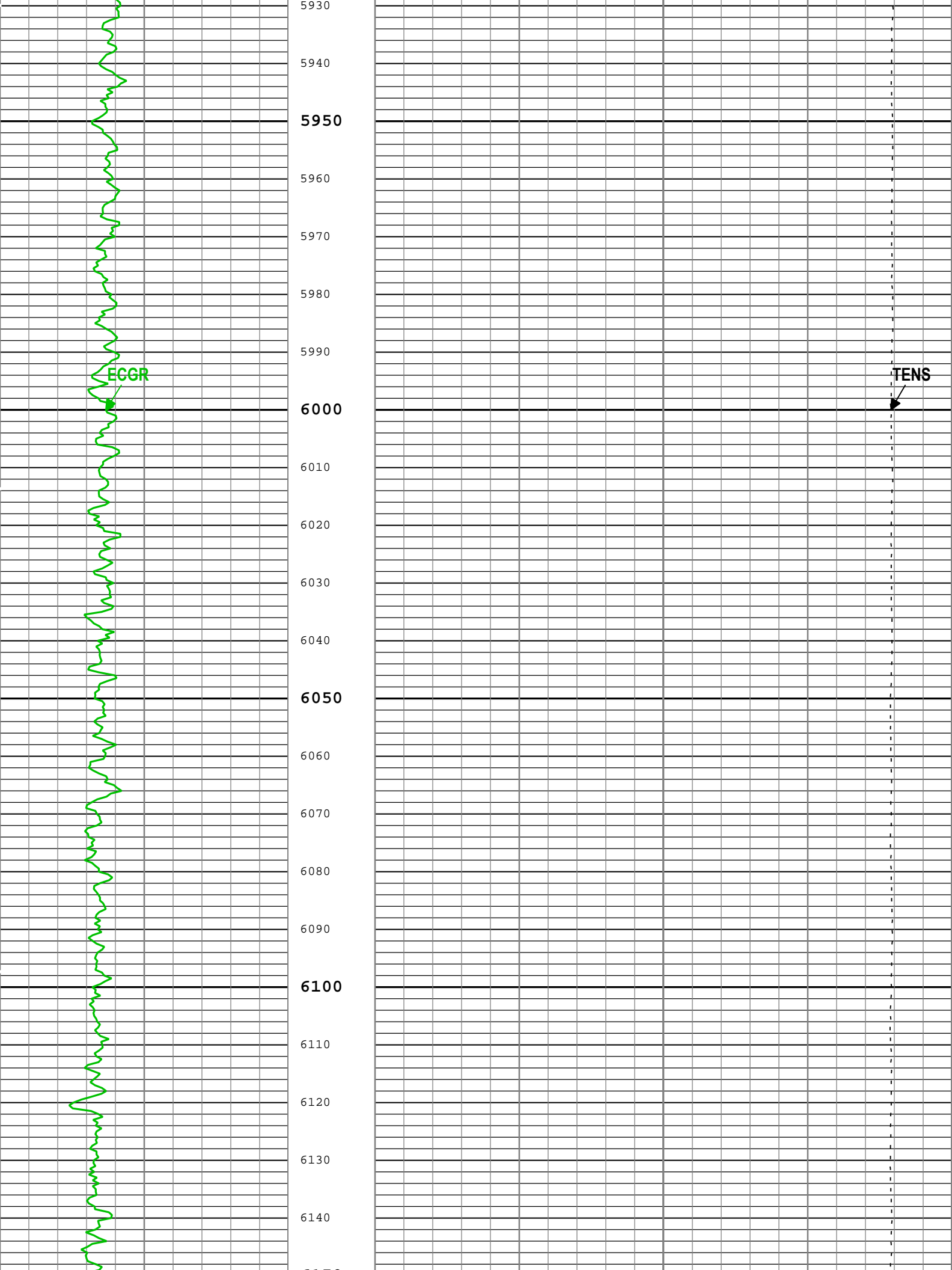


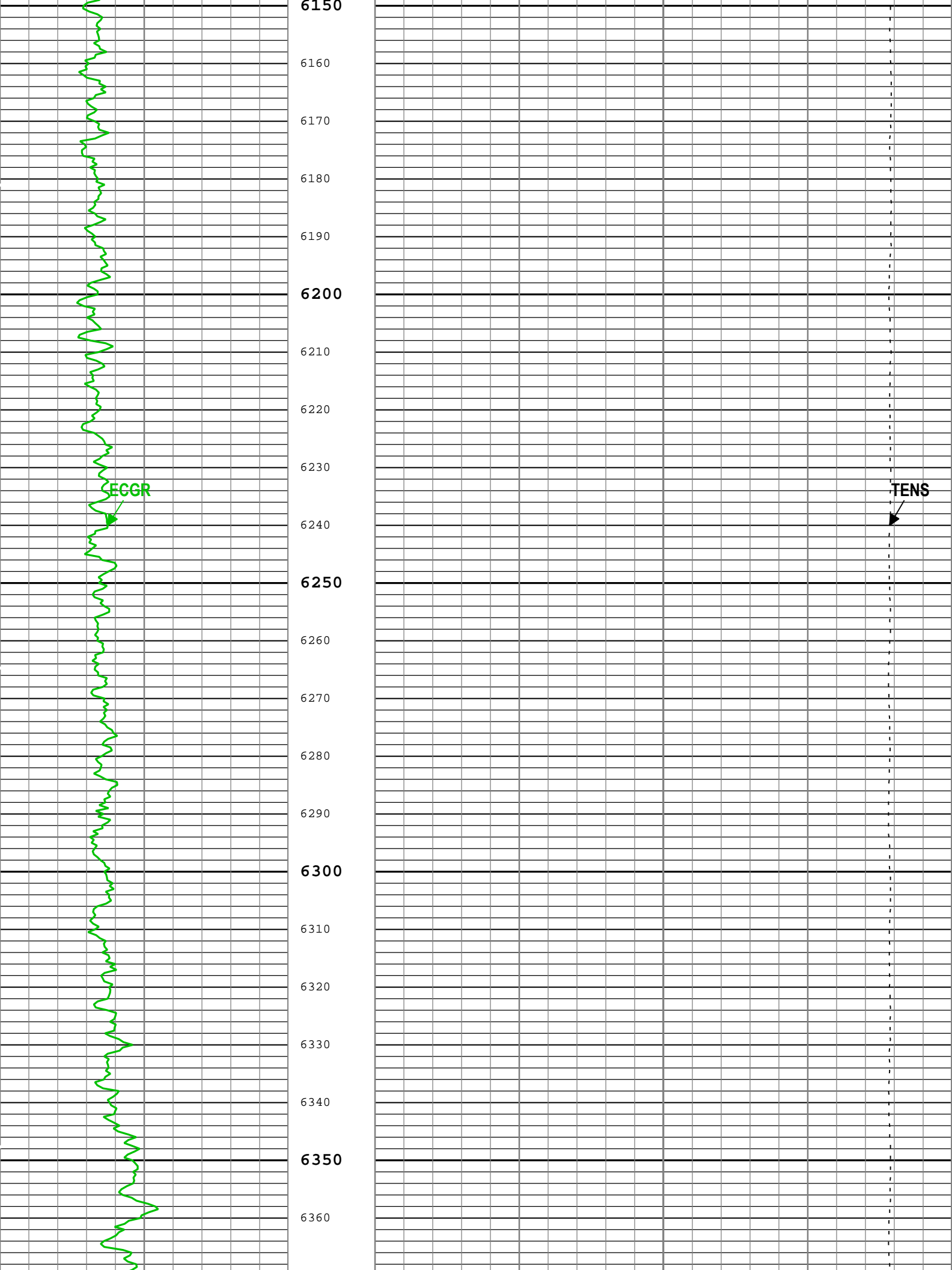


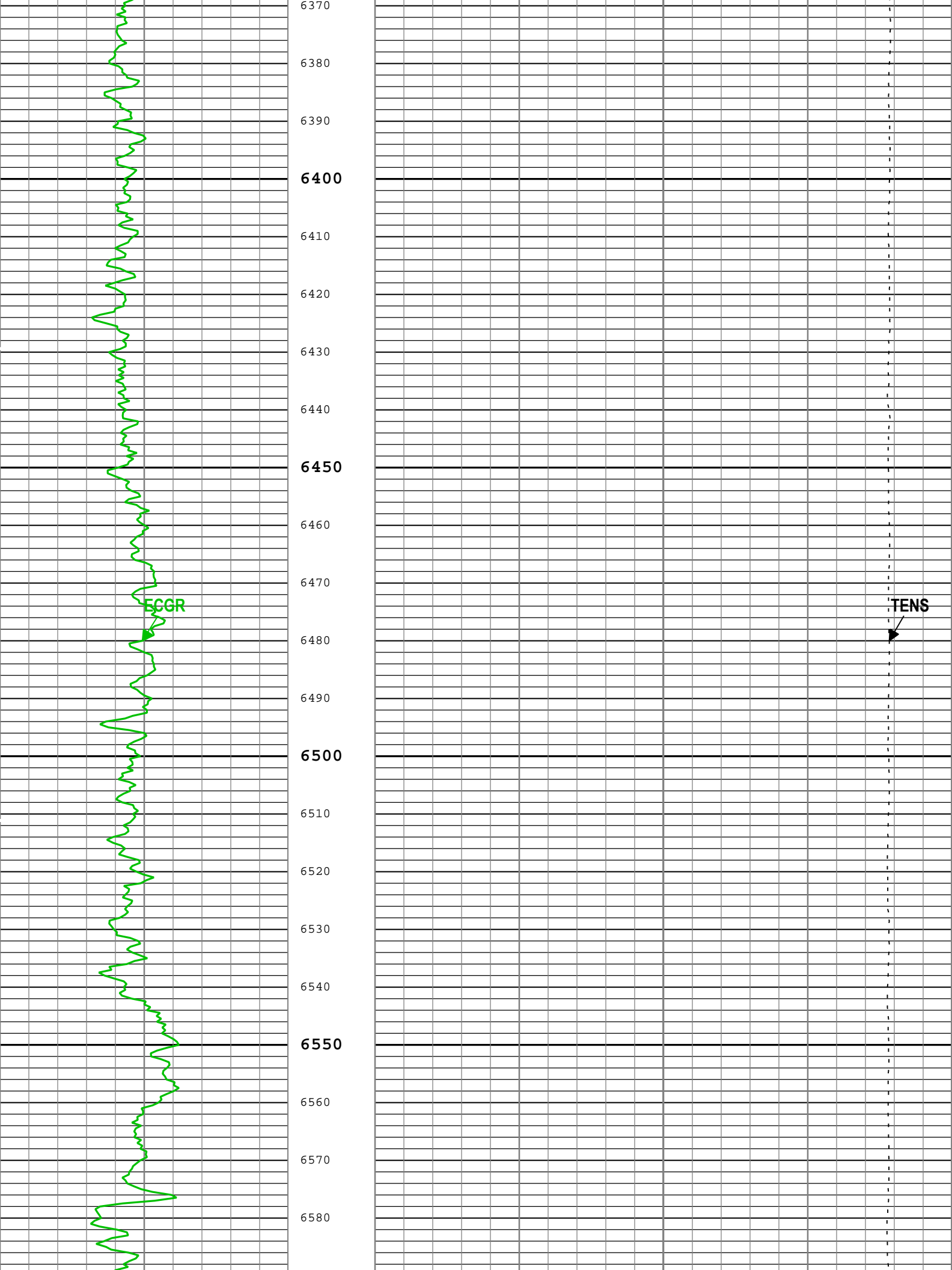


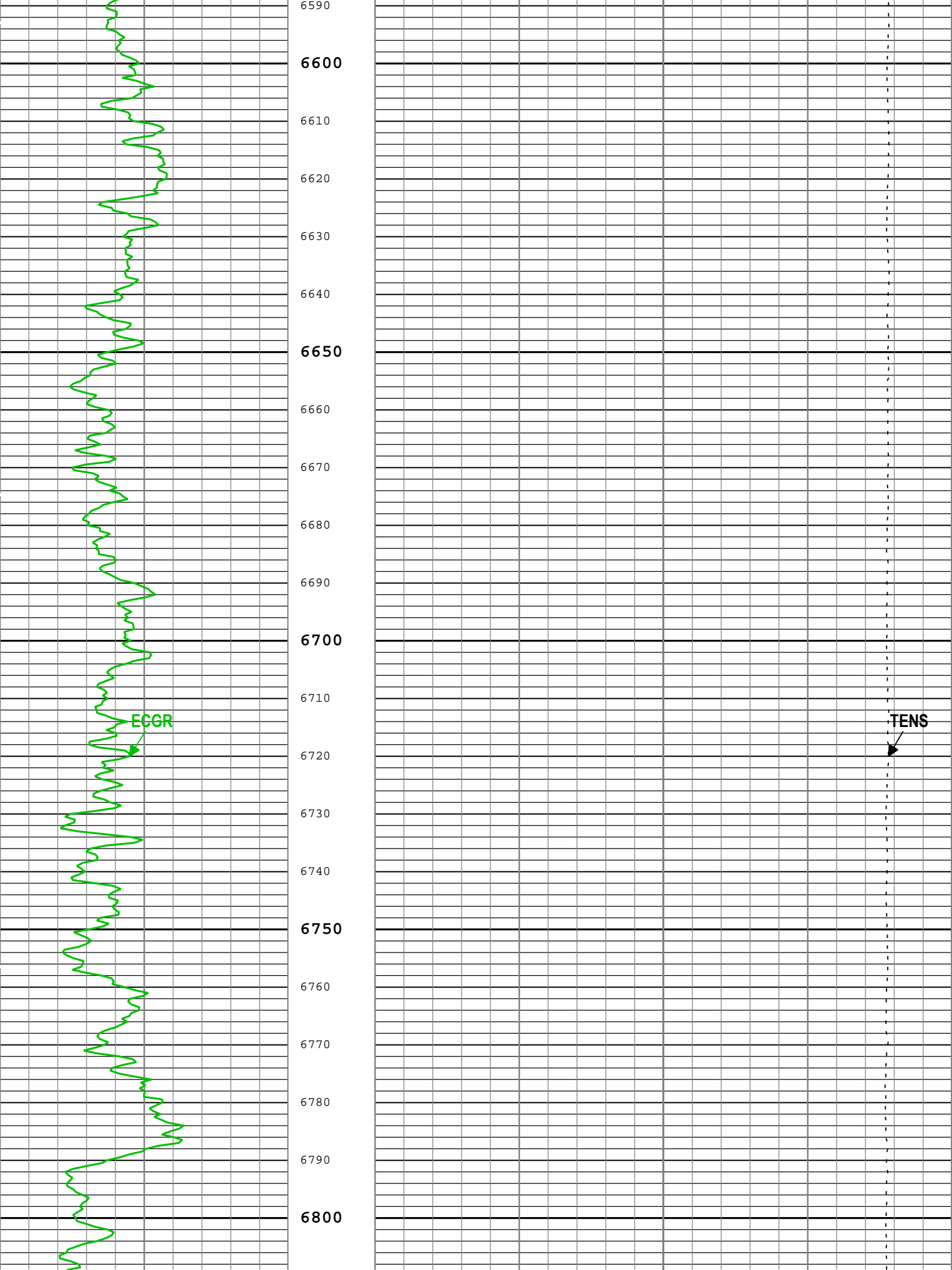


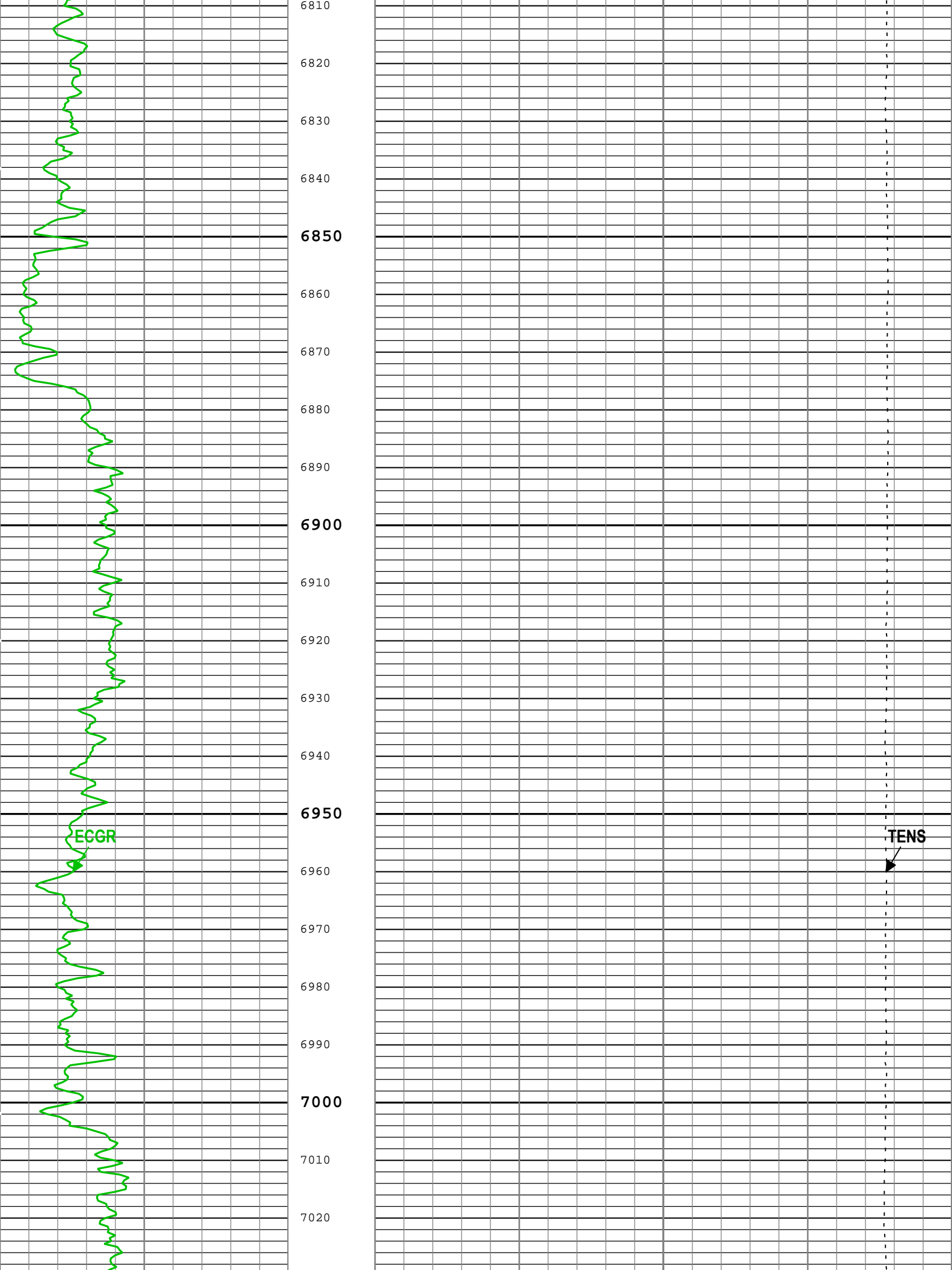


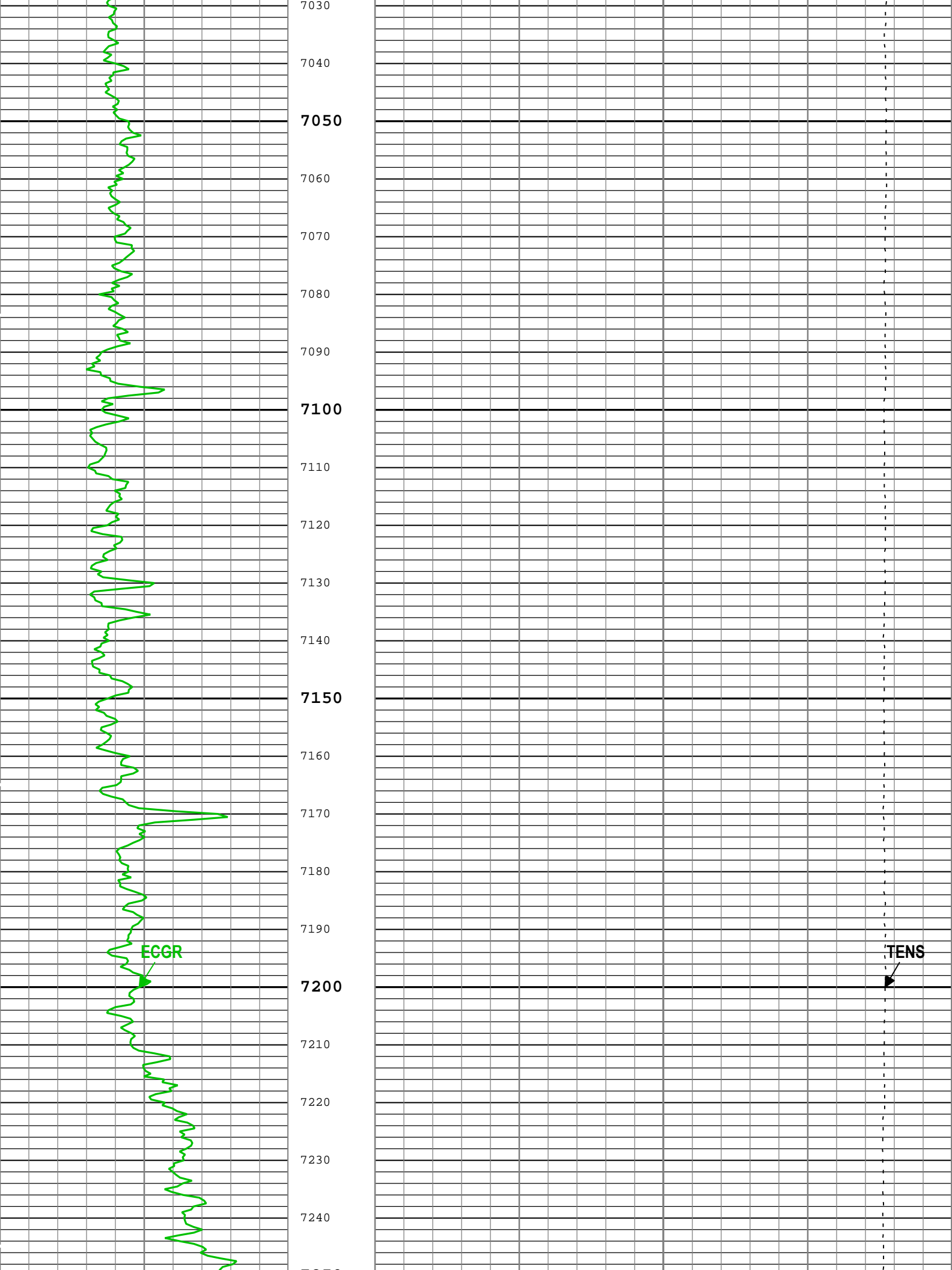


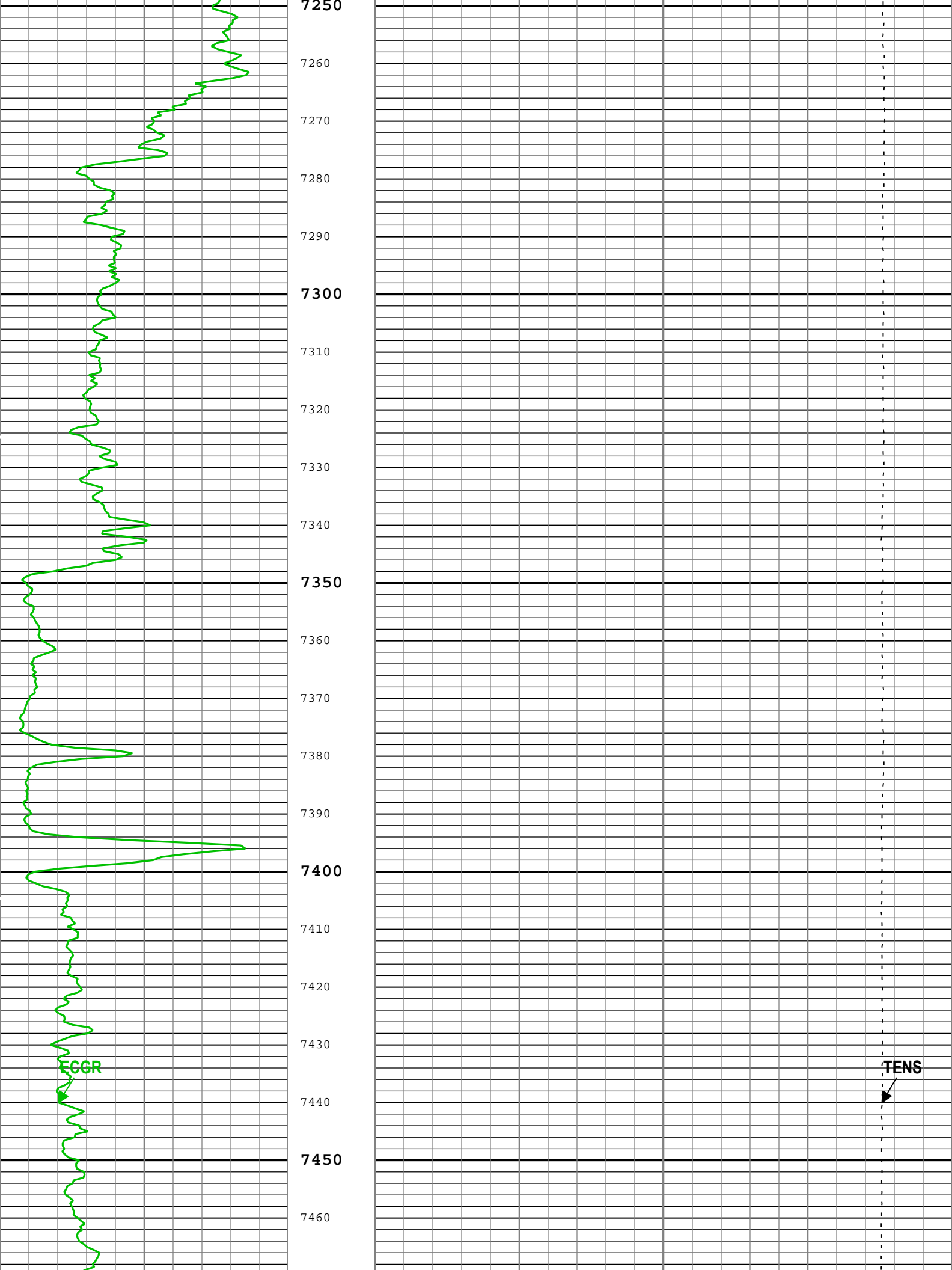


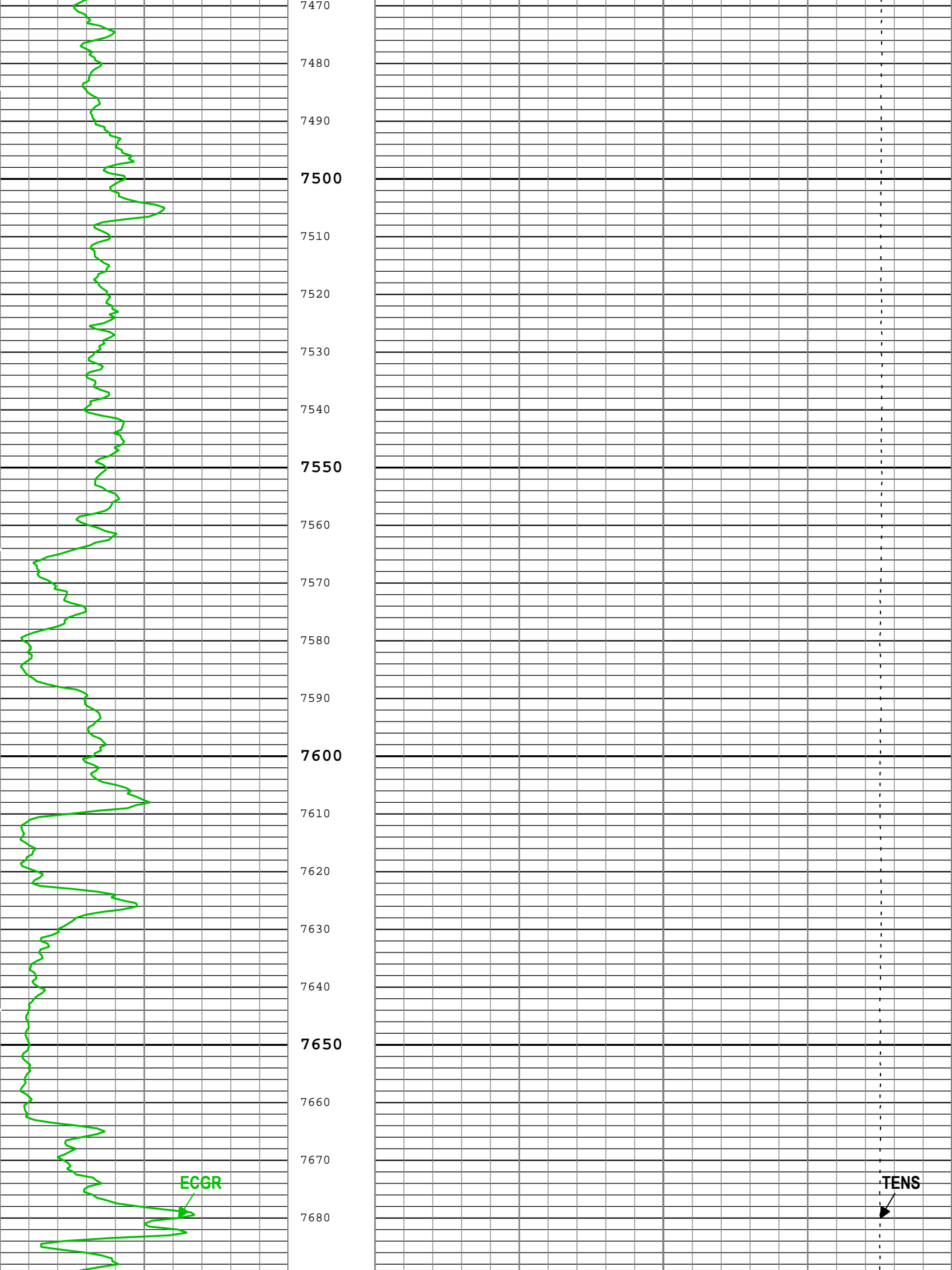




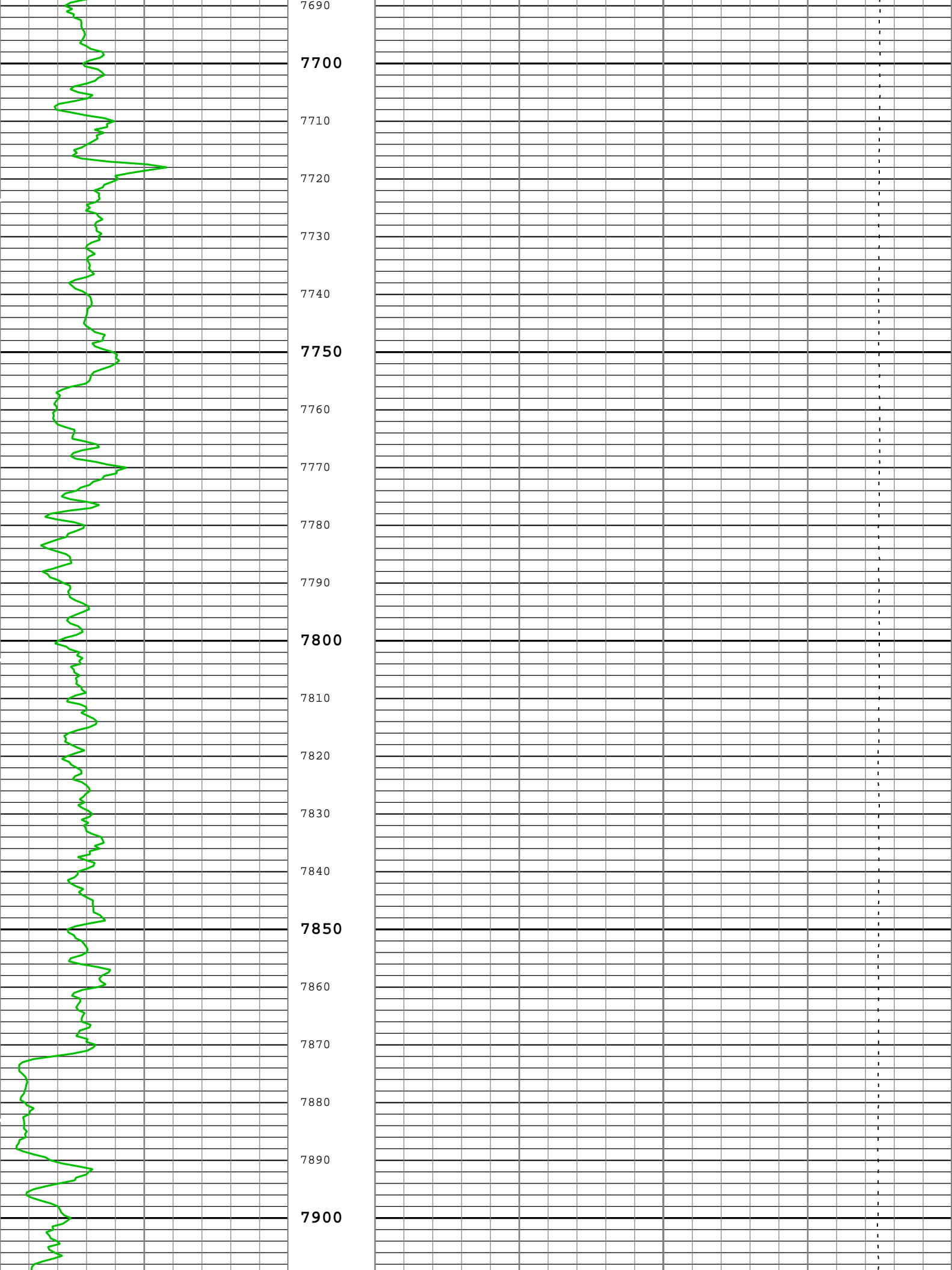


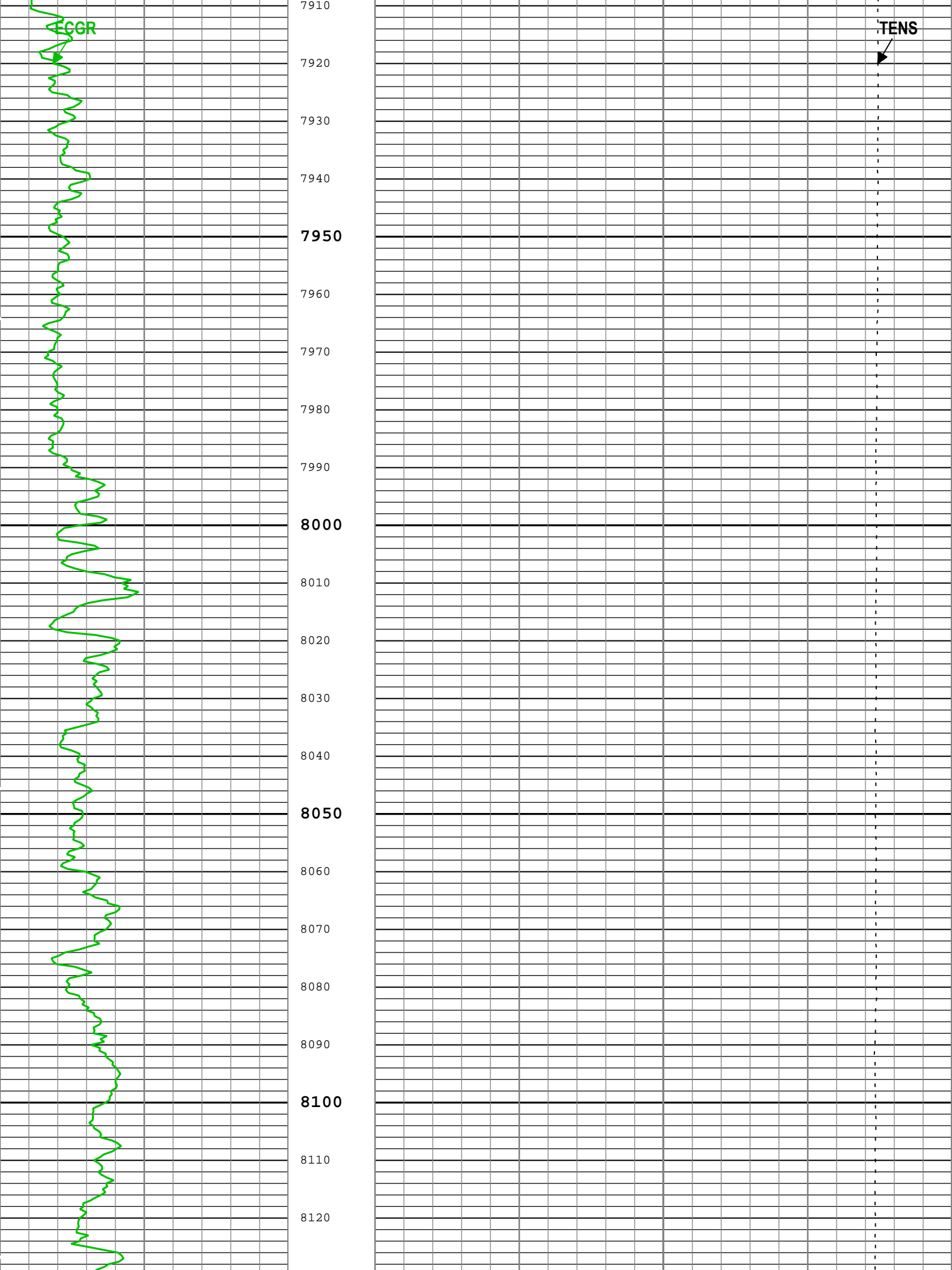


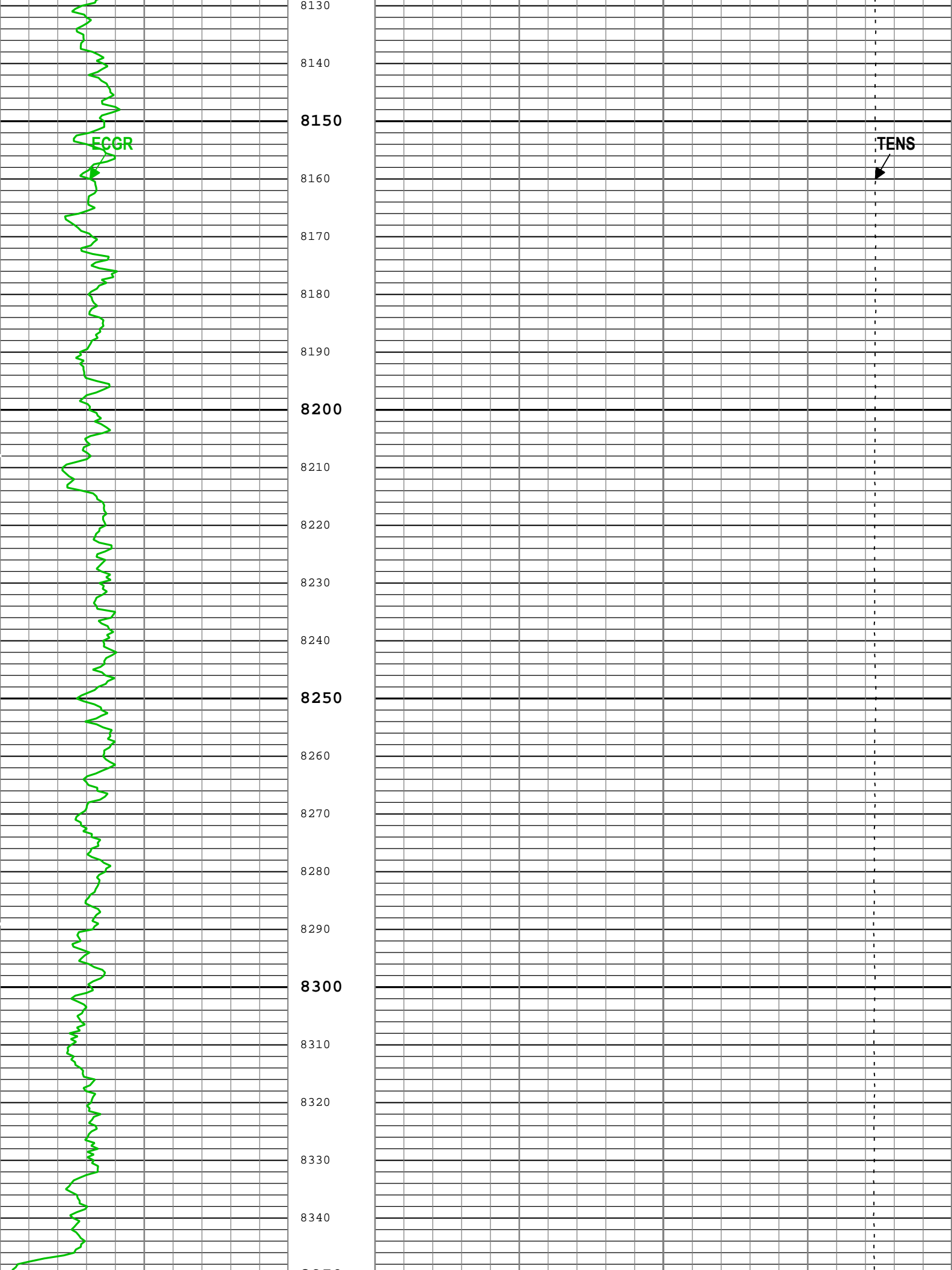


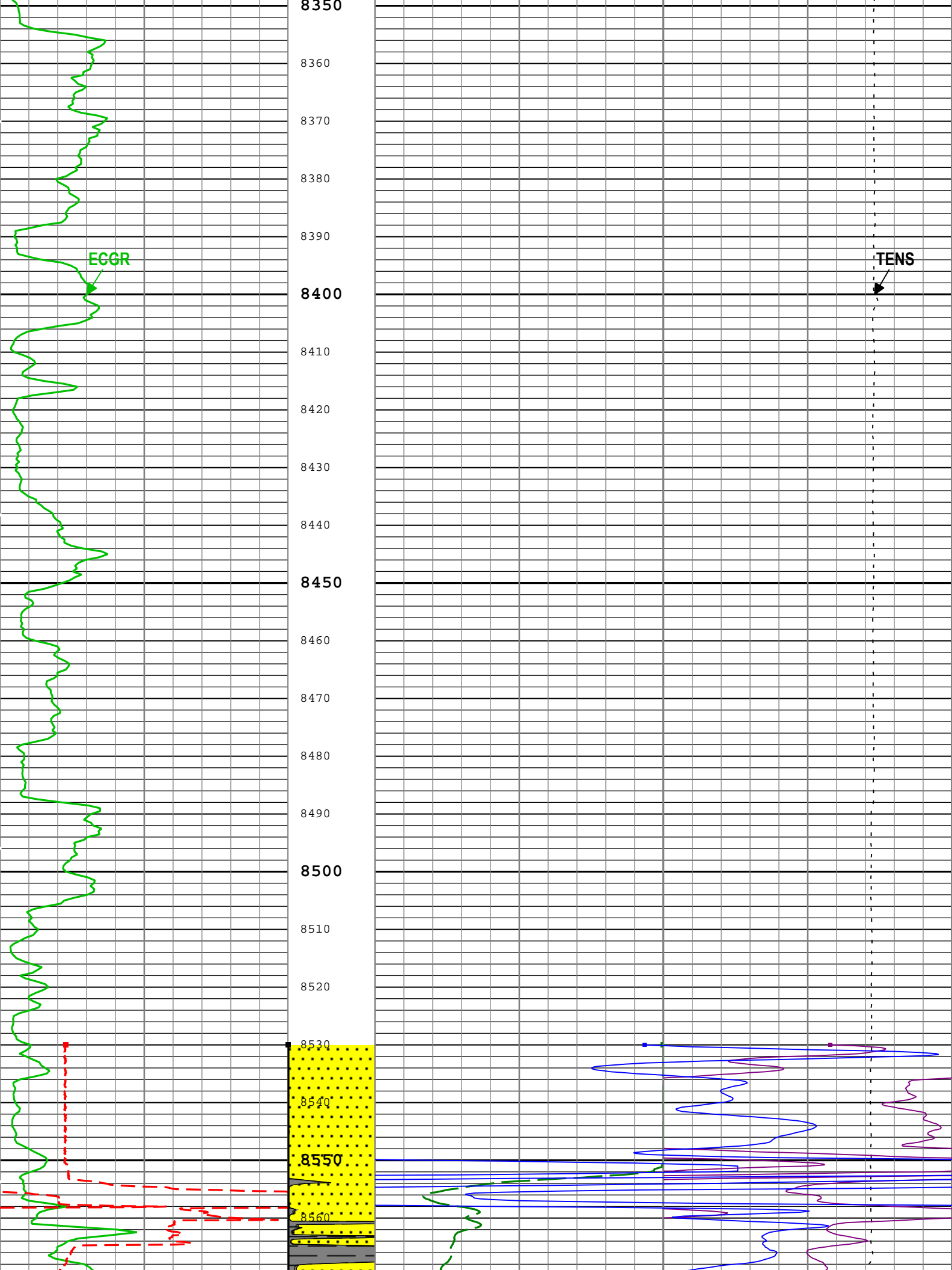


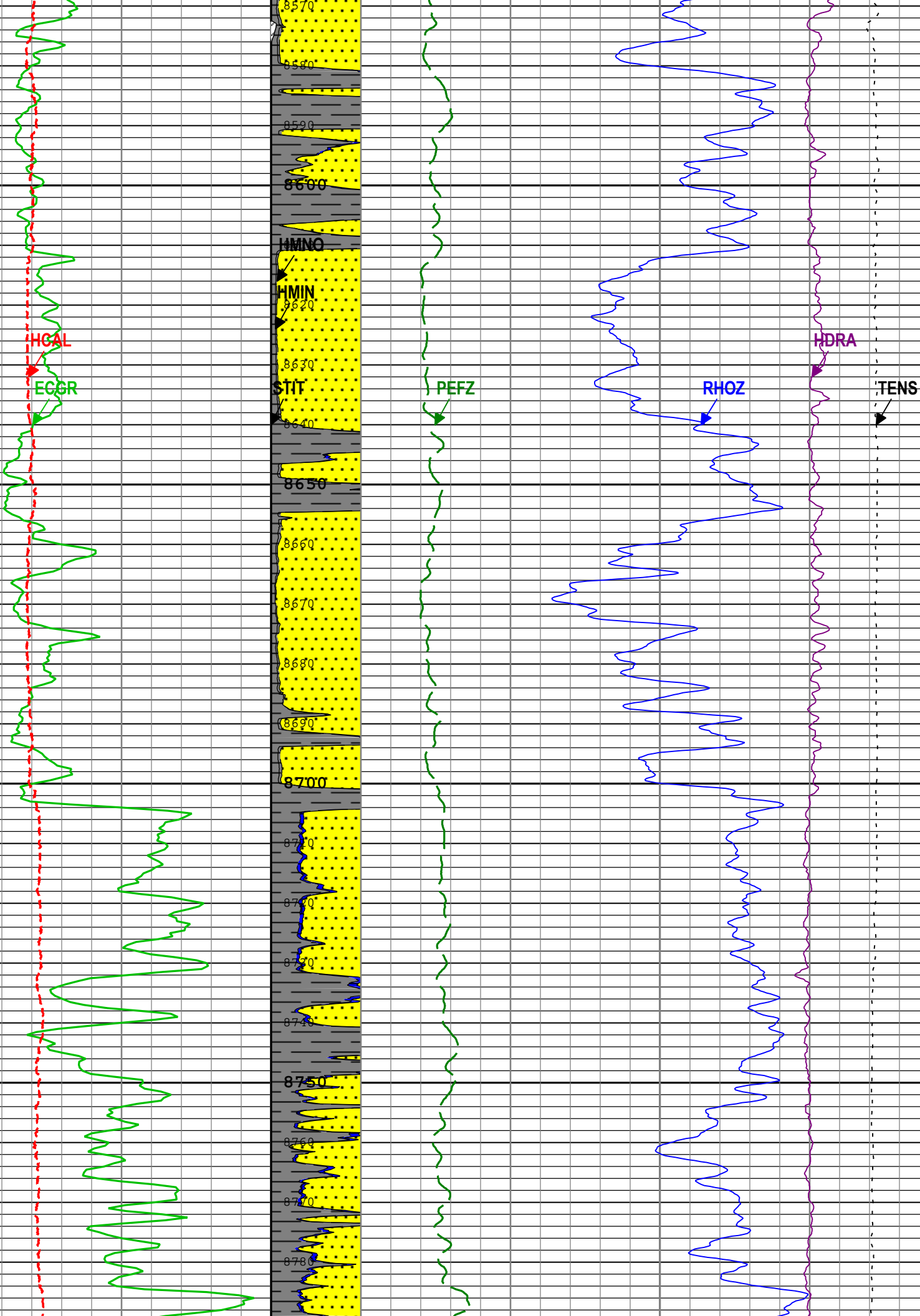


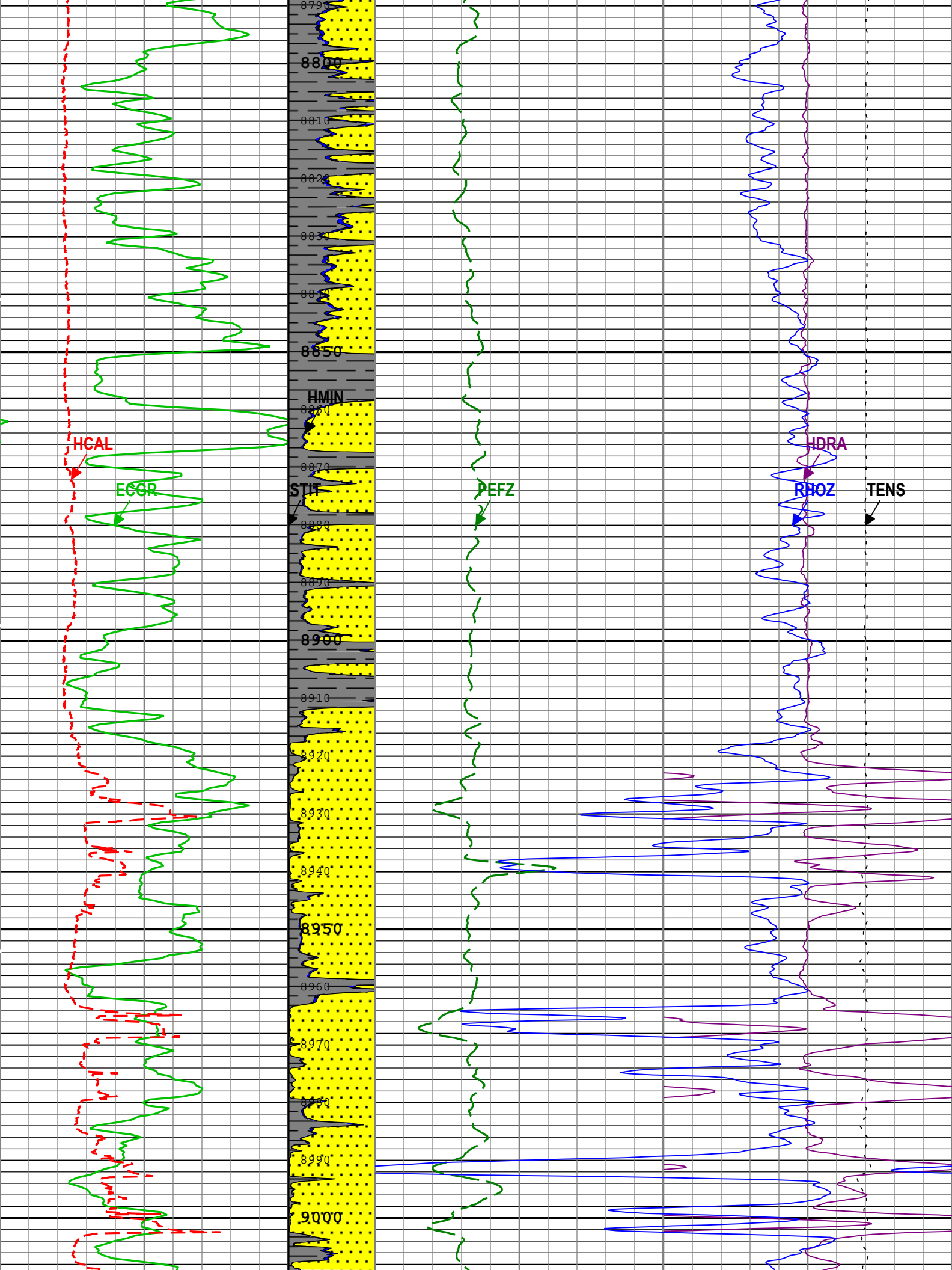


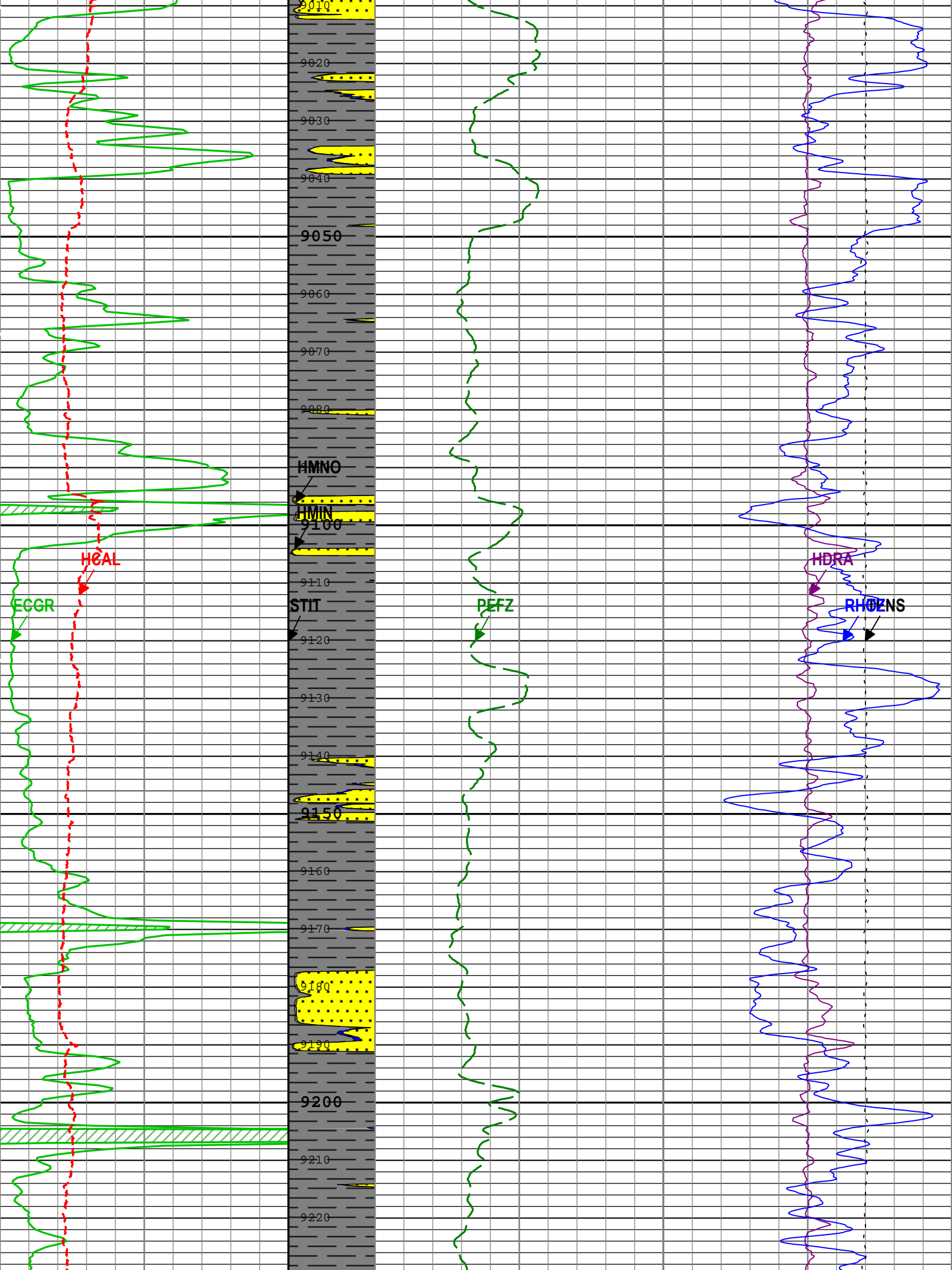


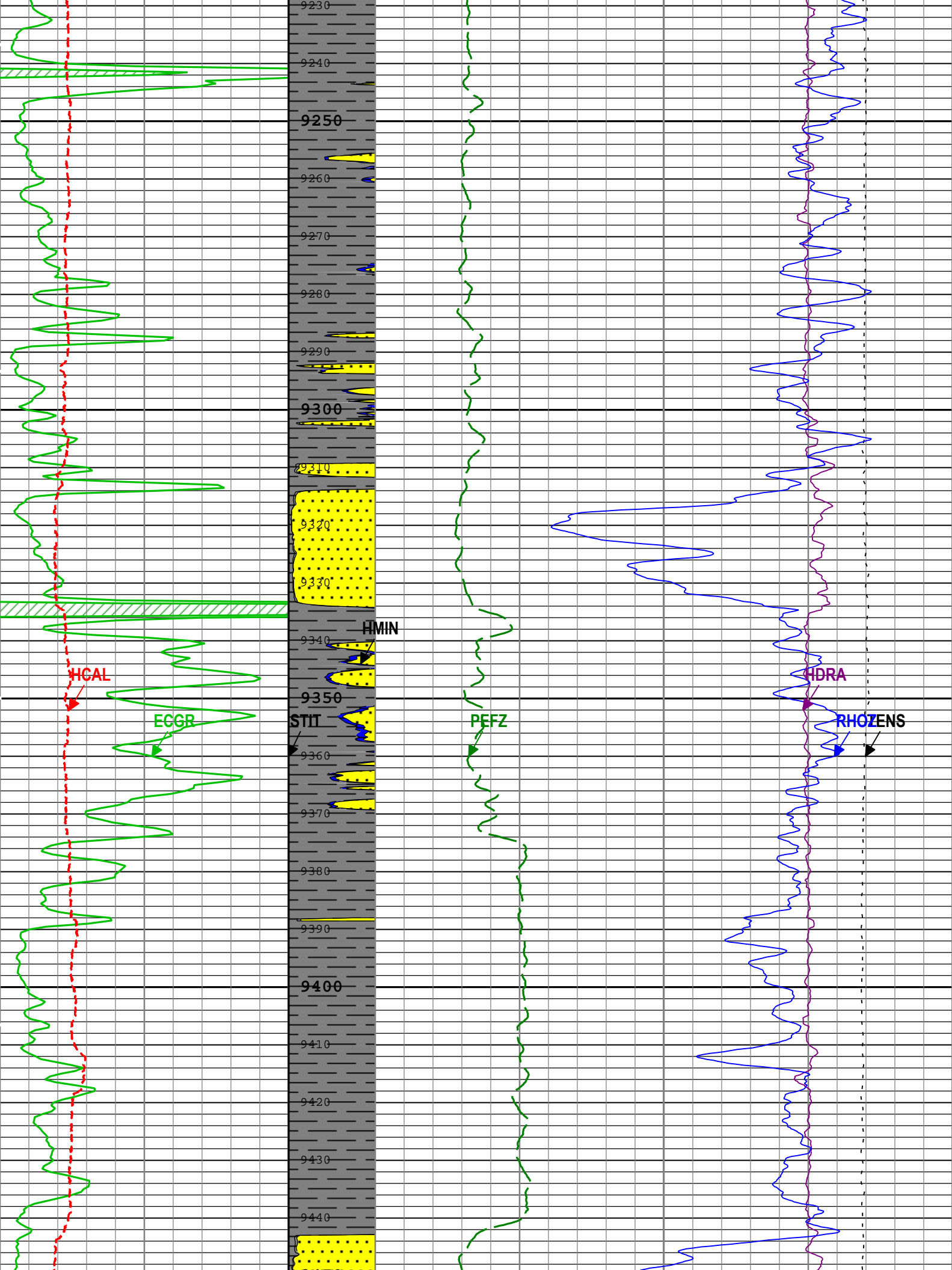




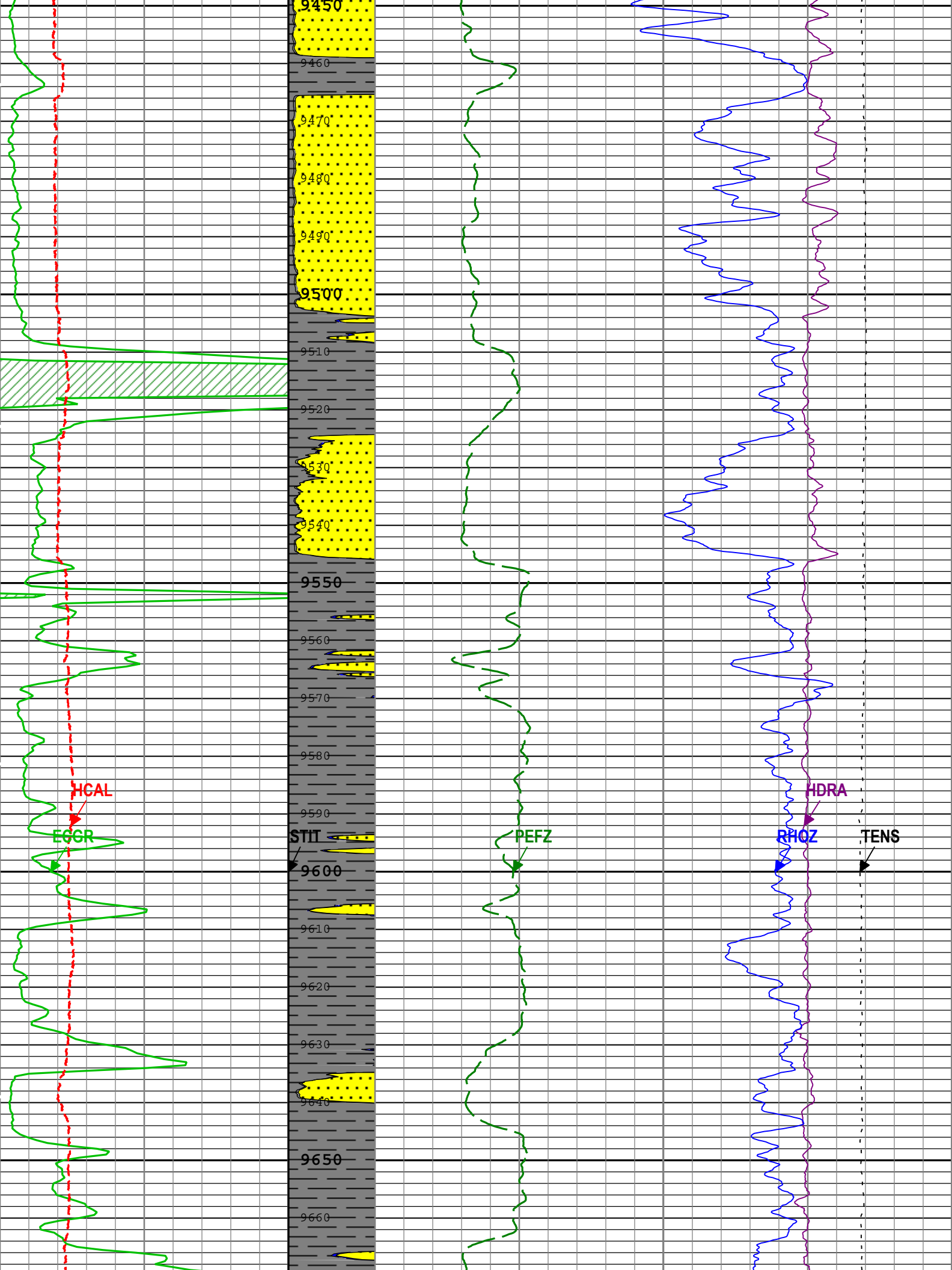


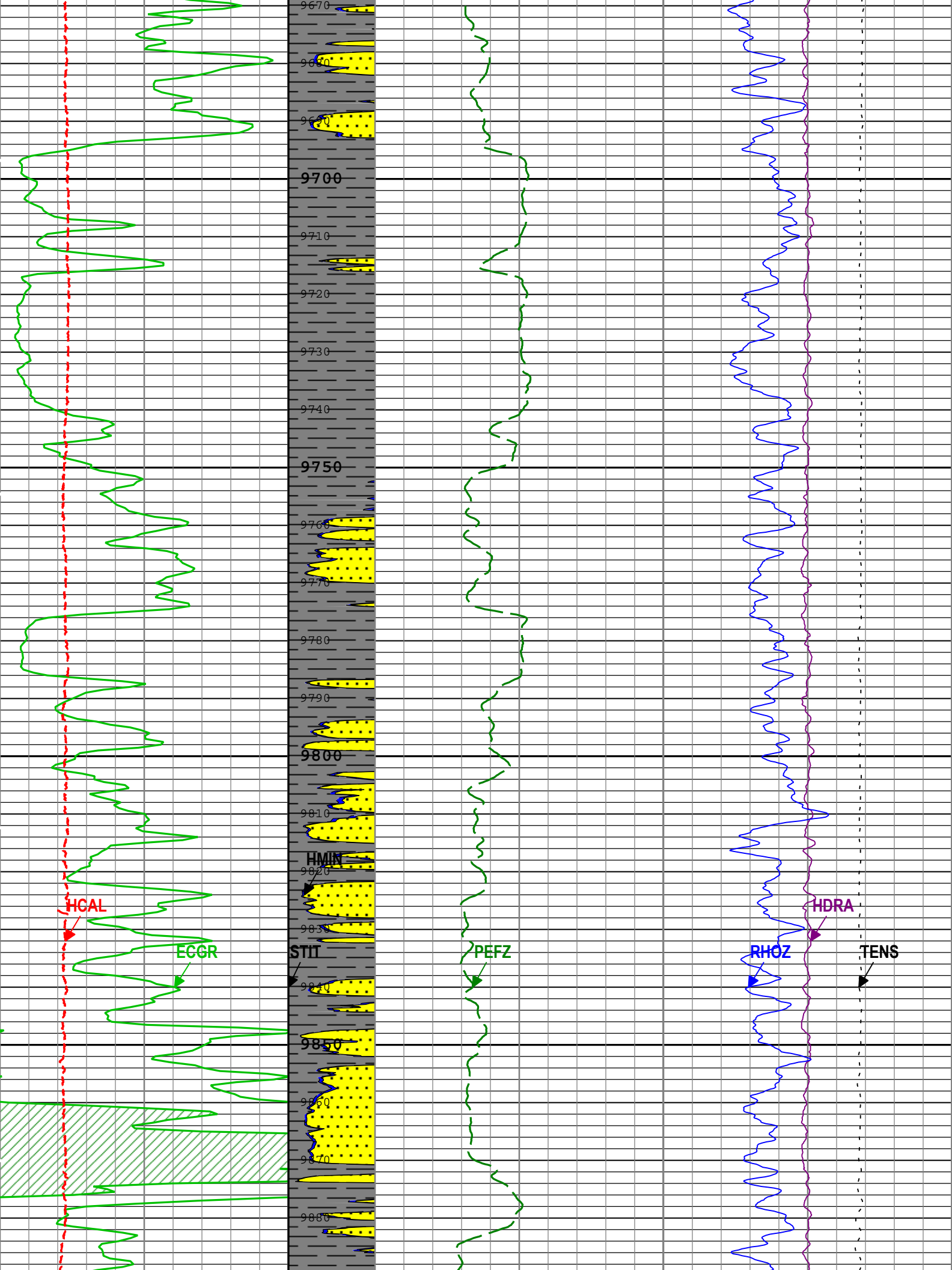


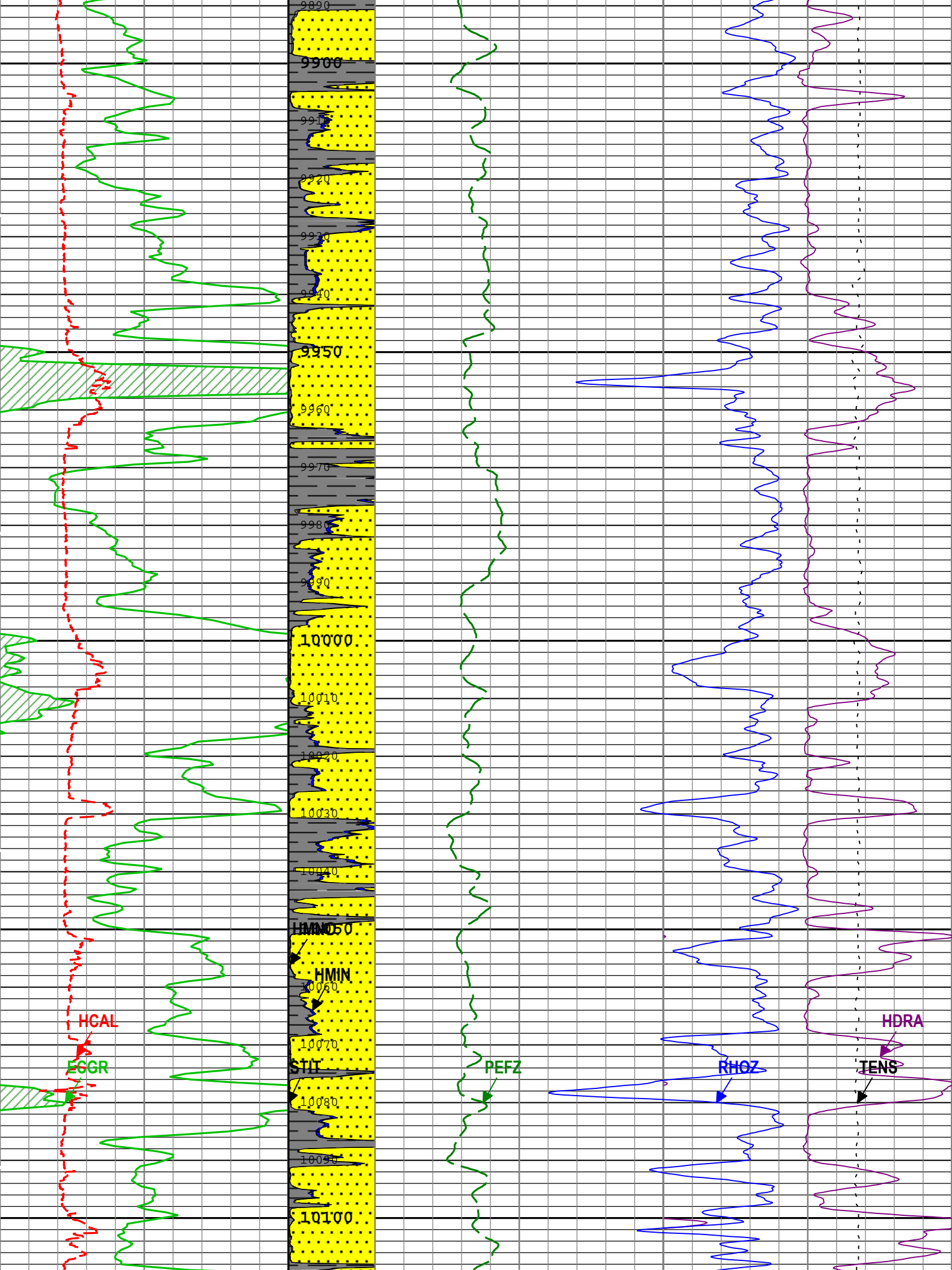


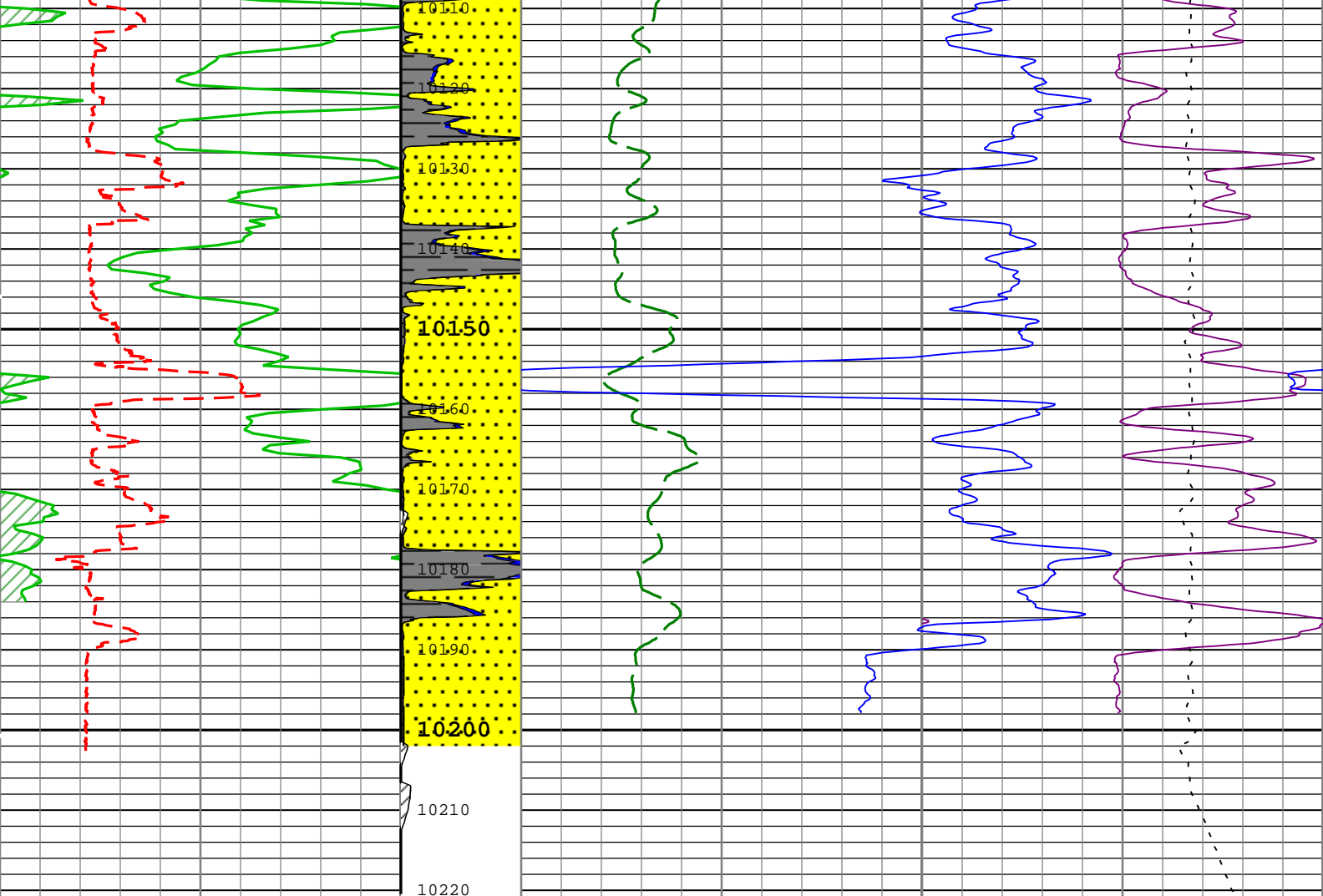












Gamma Ray Backup		Standard Resolution Formation Density (RHOZ) HDRS-H	
Gamma Ray (ECGR) HGNS-H		g/cm3	
gAPI		Cable Tension (TENS)	
Caliper (HCAL) HDRS-H		lb	
in		Density Standoff Correction (HDRA) HDRS-H	
ft		g/cm3	
Stuck Tool Indicator, Total (STIT)		0.25	
0 ft 50			

TIME\_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express    Format: Log ( Density-5 )    Index Scale: 5 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation Date: 24-Feb-2017 08:55:50

## 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	Open	
BS	Bit Size	WLSESSION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	-0.01	in
CBLO	Casing Bottom (Logger)	WLSESSION	8552	ft
CDEN	Cement Density	HGNS-H	1.58	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.1	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	

DHC	Density Hole Correction	HDRS-H	Bit Size	
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	CALI	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
MPOF	MCFL Processing Operation Mode	HDRS-H	On	
NPRM	HRDD Nuclear Processing Mode	HDRS-H	Standard Resolution	
SOCO	Standoff Correction Option	HGNS-H	Yes	
TD	Total Measured Depth	Borehole	10204	ft

Depth Zone Parameters				
Parameter	Value	Start ( ft )	Stop ( ft )	
BS	12.25	50	1009	
BS	8.75	1009	8552	
BS	6.125	8552	10201	
All depth are actual.				

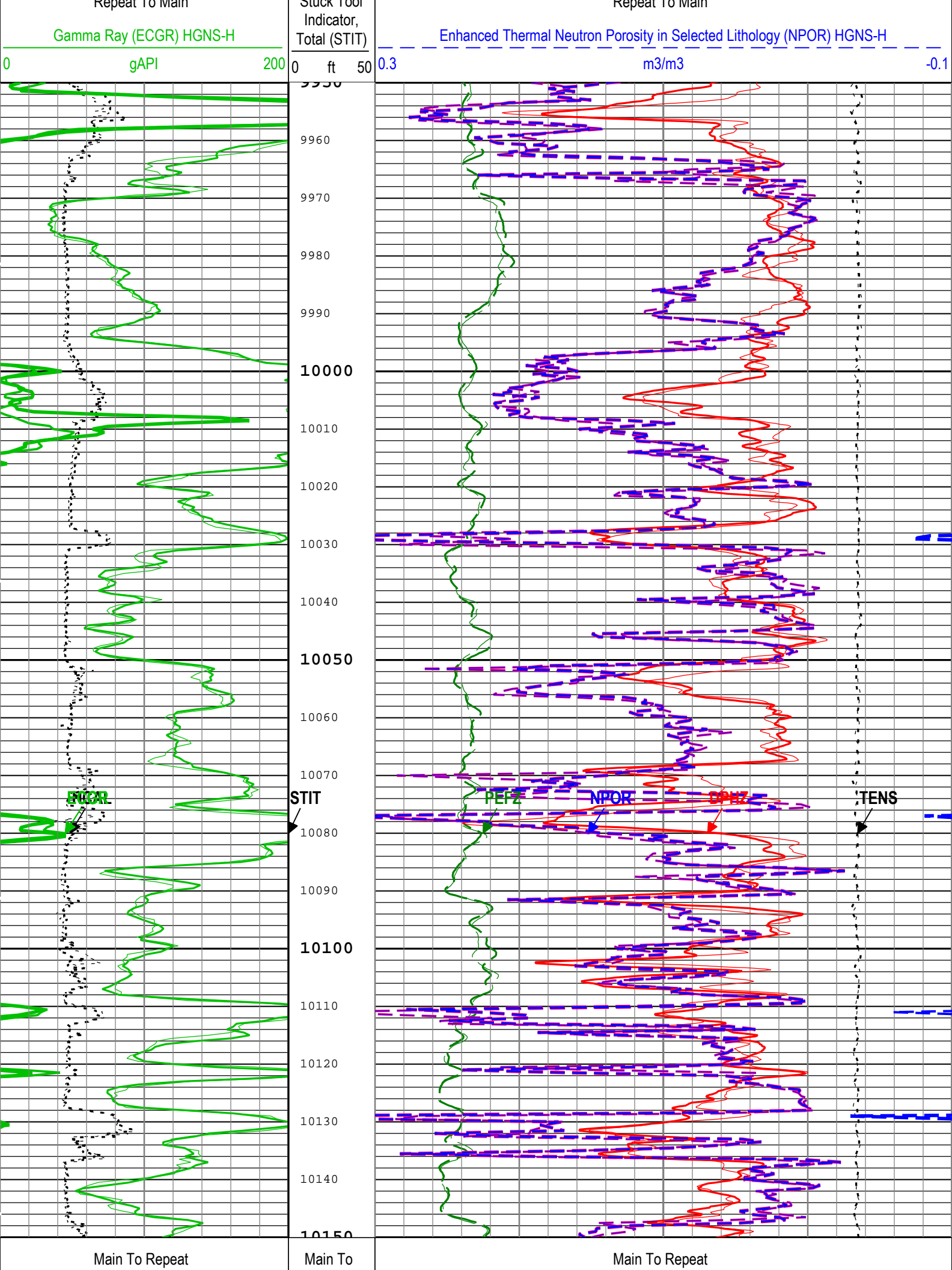
Tool Control Parameters				
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
HRGD_BOARD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
ONE				
5" Porosity				

Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[2]:Up	Up	9807.48 ft	10214.88 ft	22-Feb-2017 5:20:10 AM	22-Feb-2017 5:29:05 AM	ON	6.35 ft	Yes
ONE	Log[3]:Up	Up	13.94 ft	10220.98 ft	22-Feb-2017 5:31:59 AM	22-Feb-2017 8:02:44 AM	ON	-0.03 ft	Yes
All depths are referenced to toolstring zero									

Log	Company:Expedition Water Solutions LLC      Well:EWS 4 ONE: Log[3]:Up:S015
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Description: HGNS standard resolution porosities for Platform Express    Format: Log ( Porosity-5 RA )    Index Scale: 5 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation Date: 24-Feb-2017 08:56:01

TIME_1900 - Time Marked every 60.00 (s)				
<div> <div>Main To Repeat</div> <div>Repeat To Main</div> <div>Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H</div> <div>010</div> </div>		<div> <div>Main To Repeat</div> <div>Repeat To Main</div> <div>Cable Tension (TENS)</div> <div>10000lbf0</div> </div>		
		<div> <div>Main To Repeat</div> <div>Repeat To Main</div> <div>Standard Resolution Density Porosity (DPHZ) HDRS-H</div> <div>0.3ft3/ft3-0.1</div> </div>		
<div> <div>Main To Repeat</div> <div>Repeat To Main</div> <div>Caliper (HCAL) HDRS-H</div> <div>4in14</div> </div>		<div> <div>Main To Repeat</div> <div>Repeat To Main</div> <div>Stuck Tool</div> <div>Repeat To Main</div> </div>		



<div> <div>Repeat To Main</div> <div>Caliper (HCAL) HDRS-H</div> <div>4 in 14</div> </div> <div> <div>Main To Repeat</div> <div>Repeat To Main</div> <div>Gamma Ray (ECGR) HGNS-H</div> <div>0 gAPI 200</div> </div>	<div>Repeat</div> <div>Repeat To Main</div> <div>Stuck Tool Indicator, Total (STIT)</div> <div>0 ft 50</div>	<div>Repeat To Main</div> <div>Standard Resolution Density Porosity (DPHZ) HDRS-H</div> <div>0.3 ft3/ft3 -0.1</div> <div>Main To Repeat</div> <div>Repeat To Main</div> <div>Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H</div> <div>0.3 m3/m3 -0.1</div> <div> <div>Main To Repeat</div> <div>Repeat To Main</div> <div>Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H</div> <div>0 10</div> </div>		
		<div>Main To Repeat</div> <div>Repeat To Main</div> <div>Cable Tension (TENS)</div> <div>10000 lbf 0</div>		

TIME\_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express    Format: Log ( Porosity-5 RA )    Index Scale: 5 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation Date: 24-Feb-2017 08:56:01

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	Open	
BHT	Bottom Hole Temperature	Borehole	212	degF
BS	Bit Size	WLSESSION	6.125	in
BSAL	Borehole Salinity	Borehole	0	ppm
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	-0.01	in
CBLO	Casing Bottom (Logger)	WLSESSION	8552	ft
CCCO	Casing & Cement Thickness Correction Option	HGNS-H	Yes	
CDEN	Cement Density	HGNS-H	1.58	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.1	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DFT_WATER	Drilling Fluid Water Type	Borehole	Fresh Water	
DHC	Density Hole Correction	HDRS-H	Bit Size	
FD	Fluid Density	Borehole	1	g/cm3
FSAL	Formation Salinity	Borehole	0	ppm
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	CALI	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	CTEM	
HSCO	Hole Size Correction Option	HGNS-H	Yes	
MATR	Rock Matrix for Neutron Porosity Corrections	Borehole	LIMESTONE	
MDEN	Matrix Density for Density Porosity	Borehole	2.71	g/cm3
MFST	Mud Filtrate Sample Temperature	Borehole	68	degF
NPRM	HRDD Nuclear Processing Mode	HDRS-H	Standard Resolution	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	0.48	ohm.m
SOCO	Standoff Correction Option	HGNS-H	Yes	

TD	Total Measured Depth	Borehole	10204	ft
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Tool Control Parameters

ONE: Parameters

Parameter	Description	Tool	Value	Unit
HMCA_BOARD_TYPE	HMCA Board Type	HGNS-H	1	
HRGD_BOARD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h

Calibration Report

AIT-M (Array Induction Tool - M) Calibration - Run ONE

Primary Equipment :	File code for AIT-MA Sonde Tool Element	AMIS	1305
Auxiliary Equipment :	File code for AIT Bottom Nose Tool Element	AMRM	1305

AIT Sonde Calibration - Test Loop Gain

Master (EEPROM):		19:45:52 30-Aug-2016					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div></div>
Test Loop Gain - 0		Master	1.000	0.950	1.019	1.050	<div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 0	deg	Master	0	-3.000	0.457	3.000	<div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 1		Master	1.000	0.950	1.018	1.050	<div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 1	deg	Master	0	-3.000	0.485	3.000	<div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 2		Master	1.000	0.950	1.017	1.050	<div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 2	deg	Master	0	-3.000	-1.158	3.000	<div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 3		Master	1.000	0.950	1.014	1.050	<div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 3	deg	Master	0	-3.000	-0.716	3.000	<div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 4		Master	1.000	0.950	0.999	1.050	<div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 4	deg	Master	0	-3.000	-0.186	3.000	<div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 5		Master	1.000	0.950	0.997	1.050	<div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 5	deg	Master	0	-3.000	-0.244	3.000	<div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 6		Master	1.000	0.950	1.007	1.050	<div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 6	deg	Master	0	-3.000	0.209	3.000	<div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 7		Master	1.000	0.950	1.031	1.050	<div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 7	deg	Master	0	-3.000	0.072	3.000	<div><div></div><div></div><div></div><div></div></div>

AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM):		19:45:52 30-Aug-2016					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div></div>
Sonde Error Correction Real - 0	mS/m	Master	----	-231.000	-82.274	119.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 0		Master	----	-2250.000	-11.750	2250.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 1	mS/m	Master	----	114.000	189.132	204.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 1		Master	----	-625.000	-99.398	625.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 2	mS/m	Master	----	66.000	91.987	156.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 2		Master	----	-350.000	-163.766	350.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 3	mS/m	Master	----	39.000	56.787	89.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 3		Master	----	-250.000	10.774	250.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 4	mS/m	Master	----	15.000	27.318	35.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 4		Master	----	-63.000	-9.964	63.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 5	mS/m	Master	----	4.000	11.520	24.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 5		Master	----	-50.000	21.600	50.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 6	mS/m	Master	----	5.000	10.623	15.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 6		Master	----	-30.000	-5.057	30.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 7	mS/m	Master	----	-5.000	-1.679	5.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 7		Master	----	-30.000	3.884	30.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>

AIT Mud Calibration - Mud Calibration Gain

Master (EEPROM): 19:45:52 30-Aug-2016

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
Coarse Gain		Master	1.000	0.800	1.152	1.200		



Fine Gain		Master	1.000	0.800	1.147	1.200	<div><div></div><div></div><div></div><div></div><div></div></div>
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## AIT Electronics Check - Thru Calibration Check

Master (EEPROM): 19:45:52 30-Aug-2016 Expired by 85 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 0	V	Master	-----	0.366	0.608	0.854	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 0	deg	Master	-----	137.000	-172.932	-103.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 1	V	Master	-----	0.762	1.246	1.778	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 1	deg	Master	-----	136.000	-173.870	-104.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 2	V	Master	-----	0.372	0.617	0.868	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 2	deg	Master	-----	132.000	-177.254	-108.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 3	V	Master	-----	0.420	0.699	0.980	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 3	deg	Master	-----	131.000	-177.987	-109.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 4	V	Master	-----	0.804	1.309	1.876	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 4	deg	Master	-----	125.000	176.206	-115.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 5	V	Master	-----	1.176	1.906	2.744	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 5	deg	Master	-----	122.000	174.647	-118.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 6	V	Master	-----	1.176	1.904	2.744	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 6	deg	Master	-----	121.000	174.679	-119.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 7	V	Master	-----	0.846	1.375	1.974	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 7	deg	Master	-----	115.000	173.699	-125.000	<div><div></div><div></div><div></div><div></div><div></div></div>
SPA Zero	mV	Master		-50.000	-0.126	50.000	<div><div></div><div></div><div></div><div></div><div></div></div>
SPA Plus	mV	Master		941.000	1004.288	1040.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Temperature Zero	V	Master		-0.050	0.000	0.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Temperature Plus	V	Master		0.870	0.930	0.960	<div><div></div><div></div><div></div><div></div><div></div></div>

## HDRS-H (HILT Density and Rxo Sonde, 150 degC) Calibration - Run ONE

### Primary Equipment :

HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H	4899

### Auxiliary Equipment :

HRDD Backscatter Detector	Backscatter	
HRDD Long Spacing Detector	Long Spacing	
HRDD Short Spacing Detector	Short Spacing	27786
Cesium 137 Gamma-Ray Logging Source	GSR-J	5471
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	

### Calibration Parameter :

Small Ring Size (Caliper Calibration Small Ring)	8.00
Large Ring Size (Caliper Calibration Large Ring)	12.00

## HDRS Caliper Calibration - Caliper Accumulations

Before (Measured): 17:13:38 20-Feb-2017 Expired by 1 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
Small Ring	in	Before	8.00	6.00	7.25	10.00	<div><div></div><div></div><div></div><div></div><div></div></div>
Large Ring	in	Before	12.00	9.00	10.96	15.00	<div><div></div><div></div><div></div><div></div><div></div></div>

## HDRS Density Calibration - Inversion Results

Master (EEPROM): 15:35:40 17-Feb-2017

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
Rho Aluminum	g/cm3	Master	2.596	2.586	2.602	2.606	<div><div></div><div></div><div></div><div></div><div></div></div>
Rho Magnesium	g/cm3	Master	1.686	1.676	1.682	1.696	<div><div></div><div></div><div></div><div></div><div></div></div>
Pe Aluminum		Master	2.570	2.470	2.572	2.670	<div><div></div><div></div><div></div><div></div><div></div></div>
Pe Magnesium		Master	2.650	2.550	2.618	2.750	<div><div></div><div></div><div></div><div></div><div></div></div>

## HDRS Density Calibration - Deviation Summary

Master (EEPROM): 15:35:40 17-Feb-2017

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
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## HDRS Density Calibration - Background Summary

HDRS Density Calibration - Photo-multiplier High VoltagesHDRS Density Calibration - Crystal Quality Resolutions

## HDRS MCFL Calibration - MCFL Accumulations

## HGNS-H (HILT Gamma-Ray and Neutron Sonde, 150 degC) Calibration - Run ONE

Primary Equipment :

Primary Equipment :

HILT Gamma-Ray and Neutron Sonde, 150 degC

HGNS-H

Auxiliary Equipment :

AmBe Neutron Logging Source

NSR-F

5069

Calibration Parameter :

Water Temperature (Calibration Tank Water Temperature) 54.0

Housing Size (Thermal Housing Size) 3.38

JIG-BKG (Jig minus background reference) 165

## HGNS Accelerometer Calibration - Accelerometer Accumulations

Before:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
AZ Vertical Measurement - 0	ft/s2	Before	----	----	----	----		

## HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
Accelerometer Manufacturer		Master			NOT DONE			
Accelerometer Reference Temperature		Master		-1.0	NOT DONE	50.0		
Accelerometer Coefficients - 0		Master	----	----	NOT DONE	----		
Accelerometer Coefficients - 1		Master	----	----	NOT DONE	----		
Accelerometer Coefficients - 2		Master	----	----	NOT DONE	----		
Accelerometer Coefficients - 3		Master	----	----	NOT DONE	----		
Accelerometer Coefficients - 4		Master	----	----	NOT DONE	----		
Accelerometer Coefficients - 5		Master	----	----	NOT DONE	----		
Accelerometer Coefficients - 6		Master	----	----	NOT DONE	----		
Accelerometer Coefficients - 7		Master	----	----	NOT DONE	----		
Accelerometer Coefficients - 8		Master	----	----	NOT DONE	----		
Accelerometer Coefficients - 9		Master	----	----	NOT DONE	----		

## HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 16:09:48 04-Feb-2017

Before:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
Near Zero Measurement	1/s	Master	0	5.0	27.7	40.0		
		Before	----	----	----	----		
		Before-Master	----	----	----	----		
Far Zero Measurement	1/s	Master	0	5.0	27.4	40.0		
		Before	----	----	----	----		
		Before-Master	----	----	----	----		
Near Plus Measurement	1/s	Master	6031.0	4700.0	4965.0	6900.0		
		Before	----	----	----	----		
		Before-Master	----	----	----	----		
Far Plus Measurement	1/s	Master	2793.0	1900.0	2052.0	2900.0		
		Before	----	----	----	----		
		Before-Master	----	----	----	----		
Near Corrected Plus Measurement	1/s	Master		4700.0	5042.0	6900.0		
		Before	----	----	----	----		
		Before-Master	----	----	----	----		
Far Corrected Plus Measurement	1/s	Master		1900.0	2091.0	2900.0		
		Before	----	----	----	----		
		Before-Master	----	----	----	----		

## HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured): 17:13:52 20-Feb-2017 Expired by 1 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
RGR Zero Measurement	gAPI	Before	30.0	0	92.3	120.0		
RGR Plus Measurement	gAPI	Before	185.4	157.1	196.5	206.3		
GR Calibration Gain		Before	0.89	0.80	0.84	1.05		

Company:	Expedition Water Solutions LLC	<b>Schlumberger</b>
Well:	EWS 4	
Field:	Wattenburg	
County:	Weld	
State:	Colorado	
Platform Express		
Compensated Neutron		
Litho-Density		