Schlumberger

Company: North East Natural Energy LLC

Well: Boggess 17H

Field: Wildcat

County: Monongalia State: West Virginia

PLATFORM EXPRESS

HIRES LITHO-DENSITY / HIRES COMPENSATED NEUTRON

HIRES GAMMA RAY / CALIPER

County: Monongalia
Field: Wildcat
Location: Lat and Long:
Well: Boggess 17H
Company: North East Natural Energy LLC

Location:				
Lat and Long: 39:40:12.6 N 80:5:35.8 W			Elev.: K.B.	1293.00 ft
			G.L.	1268.00 ft
			D.F.	1293.00 ft
Permanent Datum:	Ground Level	Elev.:	1268.00 f	
Log Measured From:	Kelly Bushing	25.00 ft	above Perm.Datum	
Drilling Measured From:	Kelly Bushing			

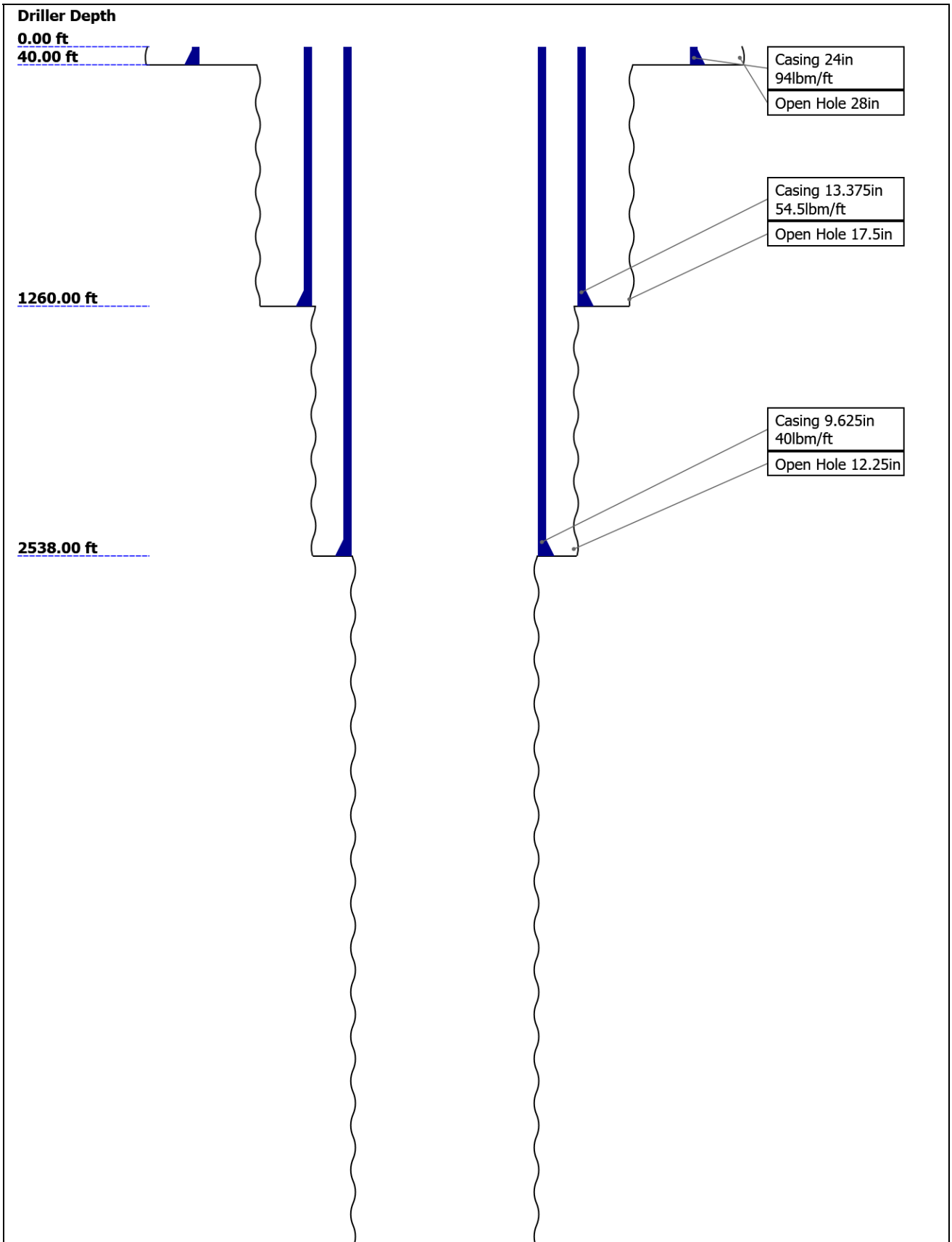
API Serial No.	District	Township:	Quad
47-061-01812-00-00	Clay	Core	Blacksville

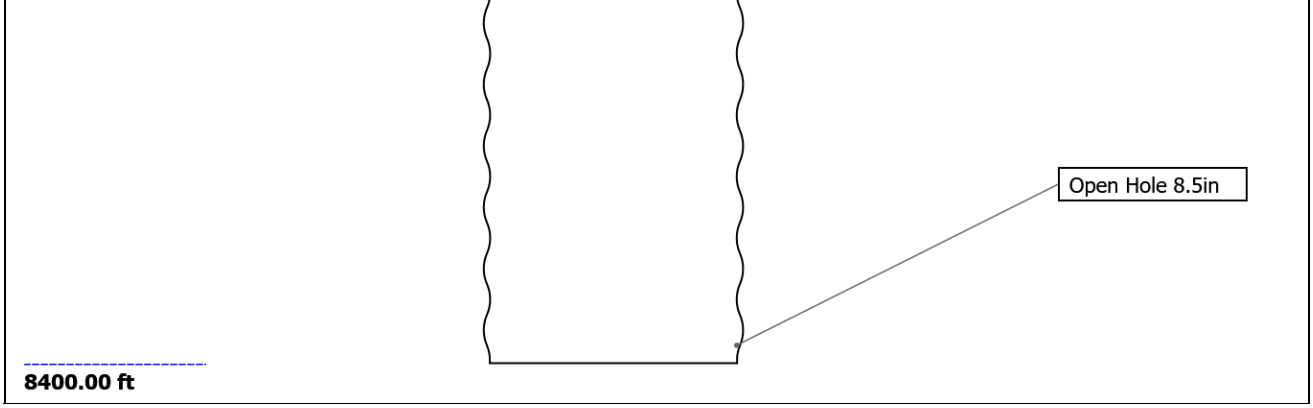
Logging Date			15-Apr-2019			
Run Number			1A			
Depth Driller			8400.00 ft			
Schlumberger Depth			8400.00 ft			
Bottom Log Interval			8400.00 ft			
Top Log Interval			2543.00 ft			
Casing Driller Size @ Depth			9.625 in @ 2538.00 ft			
Casing Schlumberger			2543 ft			
Bit Size			8.5 in			
Type Fluid In Hole			Water			
MUD	Density	Viscosity	9.5 lbm/gal			
	Fluid Loss	PH				
	Source of Sample		Active Tank			
RM @ Meas Temp			0.04 ohm.m @ 103 degF			
RMF @ Meas Temp			0.03 ohm.m @ 103 degF			
RMC @ Meas Temp			0.04 ohm.m @ 102 degF			
Source RMF	RMC			Pressed		
RM @ BHT	RMF @ BHT		0.04 @ 158	0.02 @ 158		
Max Recorded Temperatures			158 degF			
Circulation Stopped	Time		14-Apr-2019	23:00:00		
Logger on Bottom	Time		15-Apr-2019	09:04:00		
Unit Number	Location:		3703	Bradford, PA		
Recorded By			Elizabeth Morrone			
Witnessed By			BJ Varney			

Disclaimer

Contents

Well Sketch





Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	28	17.5	12.25	8.5		
Top Driller (ft)	0	40	1260	2538		
Top Logger (ft)	0	40	1260	2543		
Bottom Driller (ft)	40	1260	2538	8400		
Bottom Logger (ft)	40	1260	2543	8400		
Casing						
Size (in)	24	13.375	9.625			
Weight (lbm/ft)	94	54.5	40			
Inner Diameter (in)	23.272	12.615	8.835			
Grade	N/A	N/A	N/A			
Top Driller (ft)	0	0	0			
Top Logger (ft)	0	0	0			
Bottom Driller (ft)	40	1260	2538			
Bottom Logger (ft)	40	1260	2543			

Remarks and Equipment Summary

1A: Toolstring

Equip name	Length	MP name	Offset
LEH-MT	**99.63**		
LEH-MT			
		Mud Temperature	**97.69**
SAH-F	**96.48**		
AH-369	**91.63**		
EDTC-B:9231	**90.2**		
EDTH-B:9291			
EDTG-B:79427			
EDTC-B:9231			
		CTEM	**86.7**
		ACCZ	**0.00**
		HV	**0.00**
		Gamma Ray	**84.83**
		TelStatus	**83.7**
HNGS-BA:425	**83.7**		

1A: Remarks

Thank you for choosing Schlumberger!

Crew: Morrone, Kornacki, Shirley

Tool ran per tool sketch

Main pass recorded from TD to casing shoe for triple combo; repeat pass performed in HiRes from TD to 7700 ft

25
HEH-K:1070
HNGS-BA:4
25

GR 80.71

HNGC-B:108 75.51
HNGH-A:46
HNGC-B:108

Tel Status 73.76

HGNS-H:4951 72.01
HGNH:4803
NSR-F:5242
NPV-N
HMCA-H
HACCZ-H:7648
HGNS-H:4951

Temperature 71.98

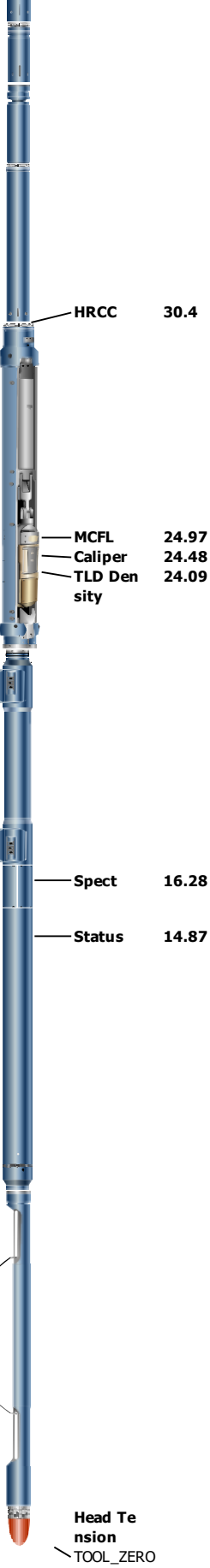
GR 71.27

CNL Porosity 64.93
HGNS 62.6
HMCA 62.6
Accelerometer 0.00

AH-184[2] 62.6

HRLT-B:953 60.6
HRUH-B:1892
HRUC-B:1889
HRLS-B:953
HRLH-B:1884
HRLC-B:900
AH-270

Resistivity 48.83



Lengths are in ft
Maximum Outer Diameter = 6.370 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

	1A		
Depth Measuring Device			

Type	IDW-JA		
Serial Number	7173		
Calibration Date	20-Mar-2018		
Calibrator Serial Number	IDWC-C-57		
Calibration Cable Type	7-46 AXS		
Wheel Correction 1	-5		
Wheel Correction 2	-3		

Tension Device

Type	CMTD-B/A		
Serial Number	5054		
Calibration Date	08-Jan-2019		
Calibrator Serial Number	232970A		
Number of Calibration Points	10		
Calibration Root Mean Square Error	13		
Calibration Peak Error	22		

Logging Cable

Type	7-46A-XS		
Serial Number	U715008		
Length	11750.00 ft		
Conveyance Type	Wireline		
Rig Type	Land		

1A:Depth Control Parameters		Depth Control Remarks
Log Sequence	First Log In the Well	All Schlumberger depth control procedures followed
Rig Up Length At Surface		IDW used as primary depth control
Rig Up Length At Bottom		Z-Chart used as secondary depth control
Rig Up Length Correction		
Stretch Correction		
Tool Zero Check At Surface		

Main Pass

MAIN PASS 2"=100'

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
IHV	Integrated Hole Volume	GCSE_UP_PASS, GCSE_DOWN_PASS:1A	2498.85	ft3
ICV	Integrated Cement Volume	GCSE_UP_PASS, GCSE_DOWN_PASS:1A, FCD	1533.39	ft3

Software Version

Acquisition System	Version
Maxwell 2019	9.0.106845.3100

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
1A	Log[2]:Up	Up	8266.17 ft	8396.38 ft	15-Apr-2019 7:56:45 AM	15-Apr-2019 8:17:05 AM	ON	2.60 ft	Yes
1A	Log[8]:Up	Up	8021.42 ft	8407.18 ft	15-Apr-2019 9:44:04 AM	15-Apr-2019 10:51:09 AM	ON	3.12 ft	Yes

1A	Log[9]:Up	Up	2500.63 ft	8126.68 ft	15-Apr-2019 10:57:49 AM	15-Apr-2019 4:11:56 PM	ON	4.17 ft	Yes

All depths are referenced to toolstring zero

Log

Company:North East Natural Energy LLC Well:Boggess 17H

Main Pass:S024

Description: Triple Combo standard resolution template for Platform Express Format: Log (BRADFORD NUC) Index Scale: 2 in per 100 ft Index Unit: ft
Index Type: TVD Creation Date: 18-Apr-2019 11:51:57

ICV - Integrated Cement Volume every 10.00 (ft3)

IHV - Integrated Hole Volume every 10.00 (ft3)

IHV - Integrated Hole Volume every 100.00 (ft3)

GR > 200 GAPI

GR > 400 GAPI

Caliper (HCAL) HDRS[1]
6 in 16

Cable Tension (TENS)
6000 lbf 0

Bit Size (BS) RT
6 in 16

Gamma Ray (ECGR_EDTC) EDTC-B[1]
0 gAPI 200

Density Standoff Correction (HDRA) HDRS[1]
-0.05 g/cm3 0.45

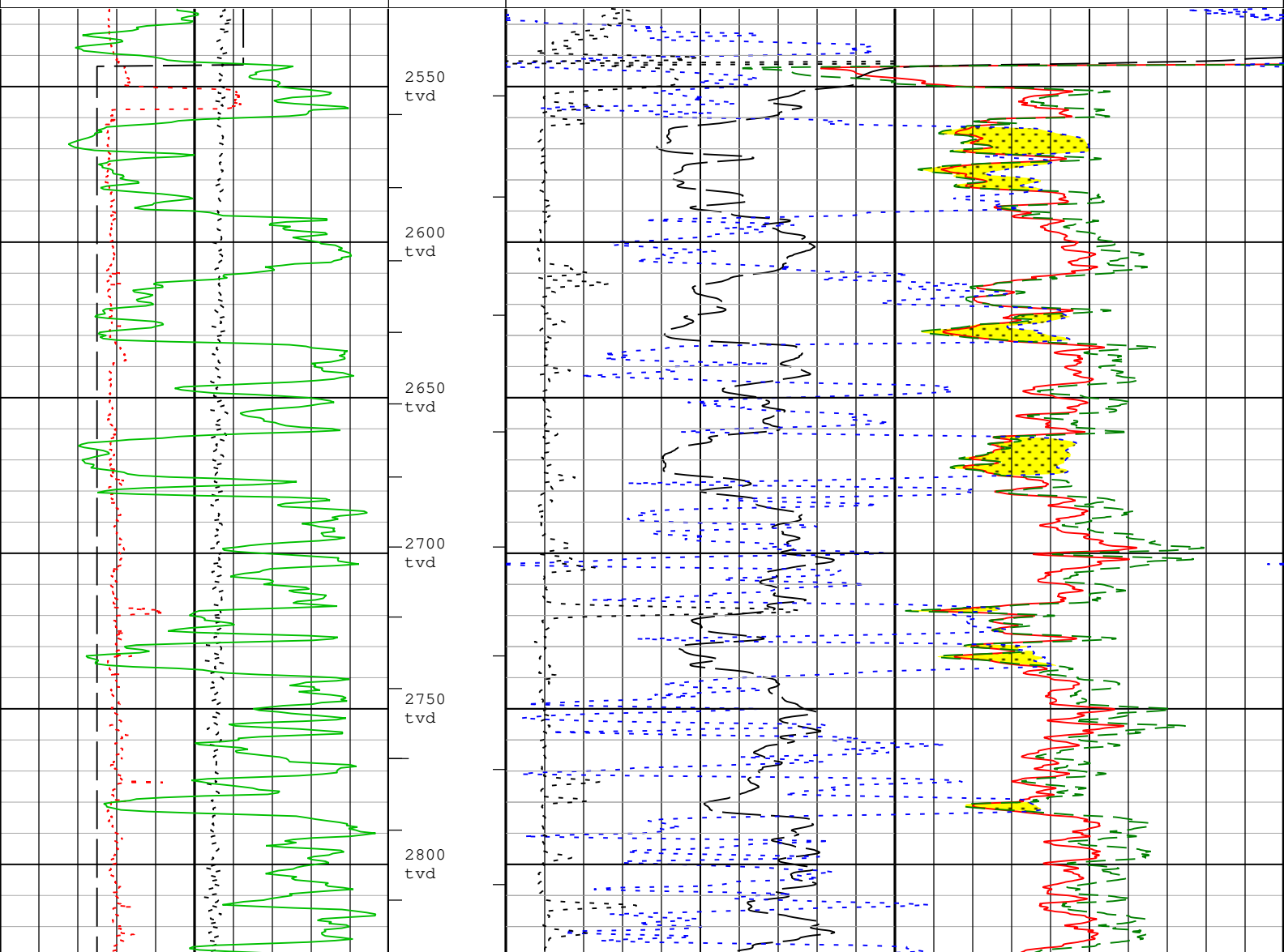
GAS EFFECT

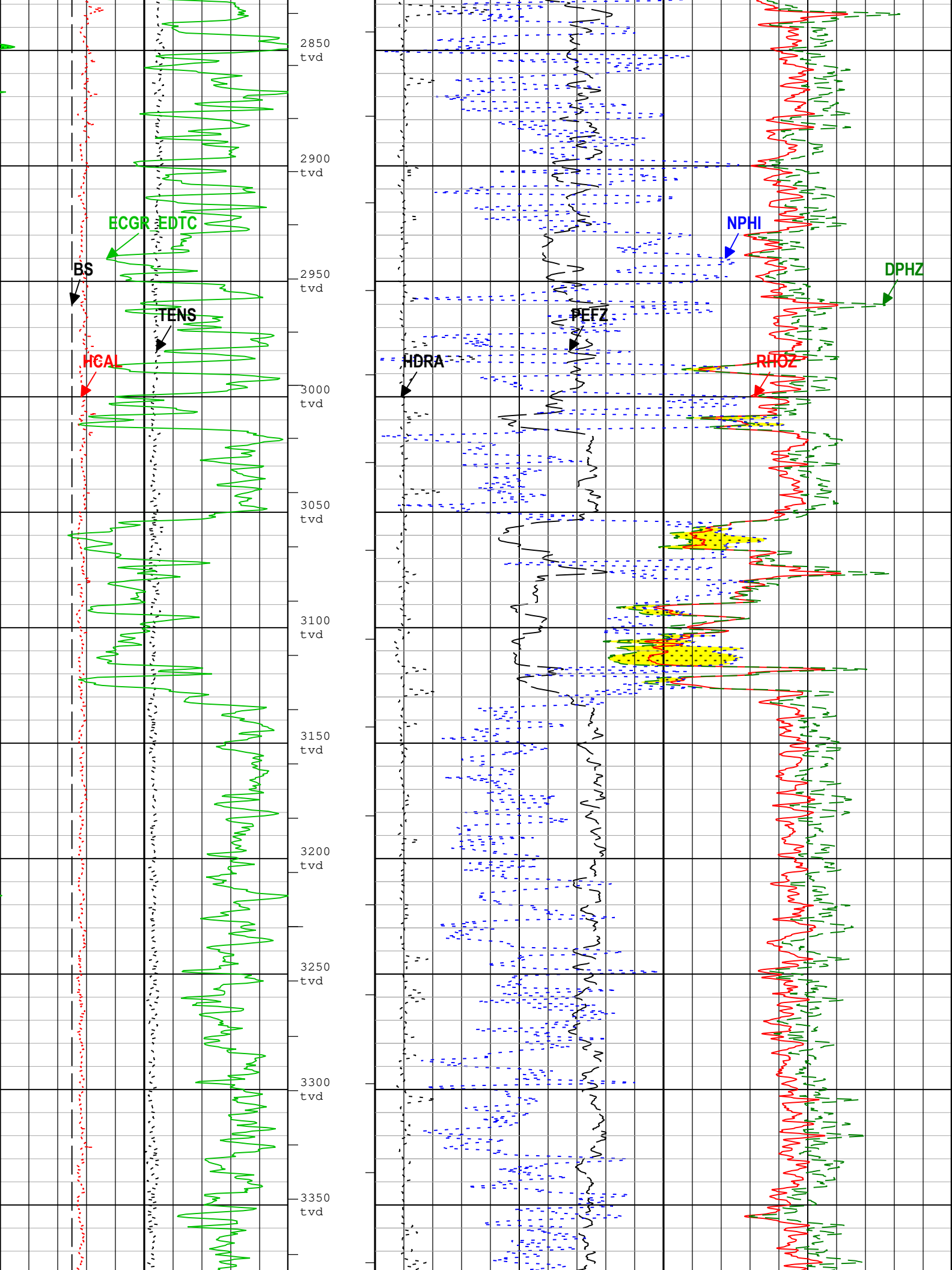
Standard Resolution Formation Density (RHOZ) HDRS[1]
2 g/cm3 3

Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS[1]
0 10

Standard Resolution Density Porosity (DPHZ) HDRS[1]
0.3 ft3/ft3 -0.1

Thermal Neutron Porosity (original Ratio Method) in Selected Lithology (NPHI) HGNS[1]
0.3 ft3/ft3 -0.1

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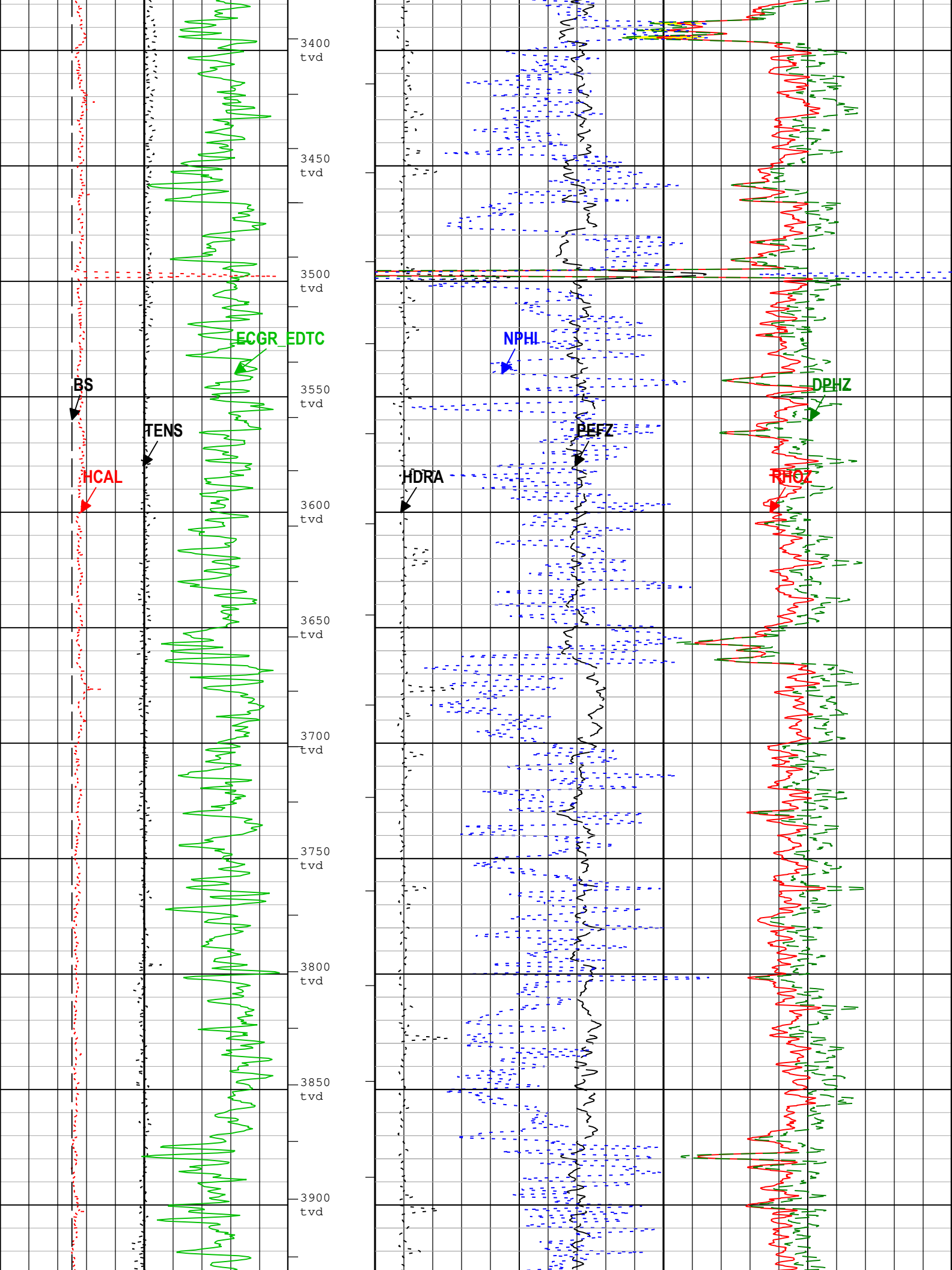
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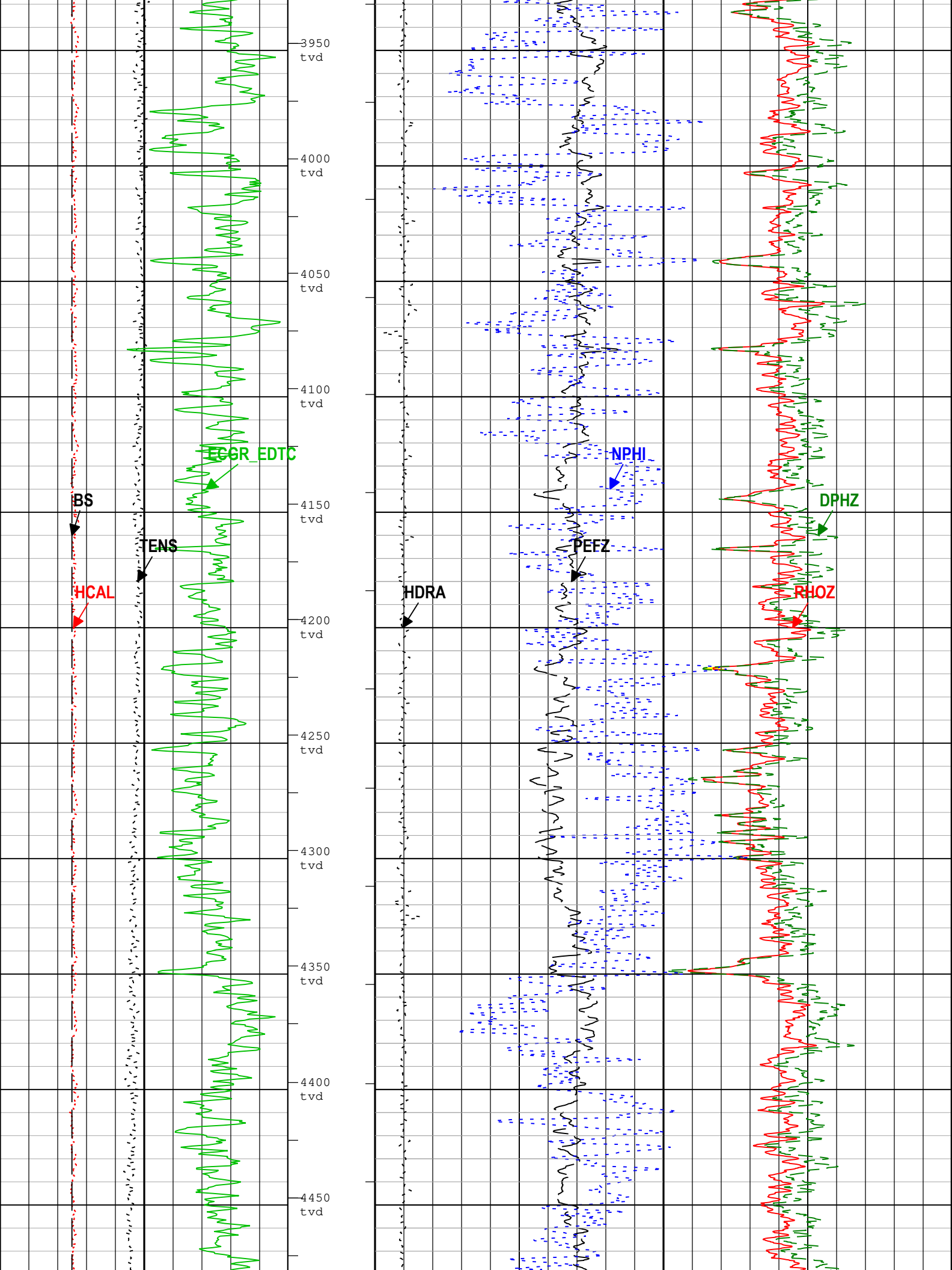
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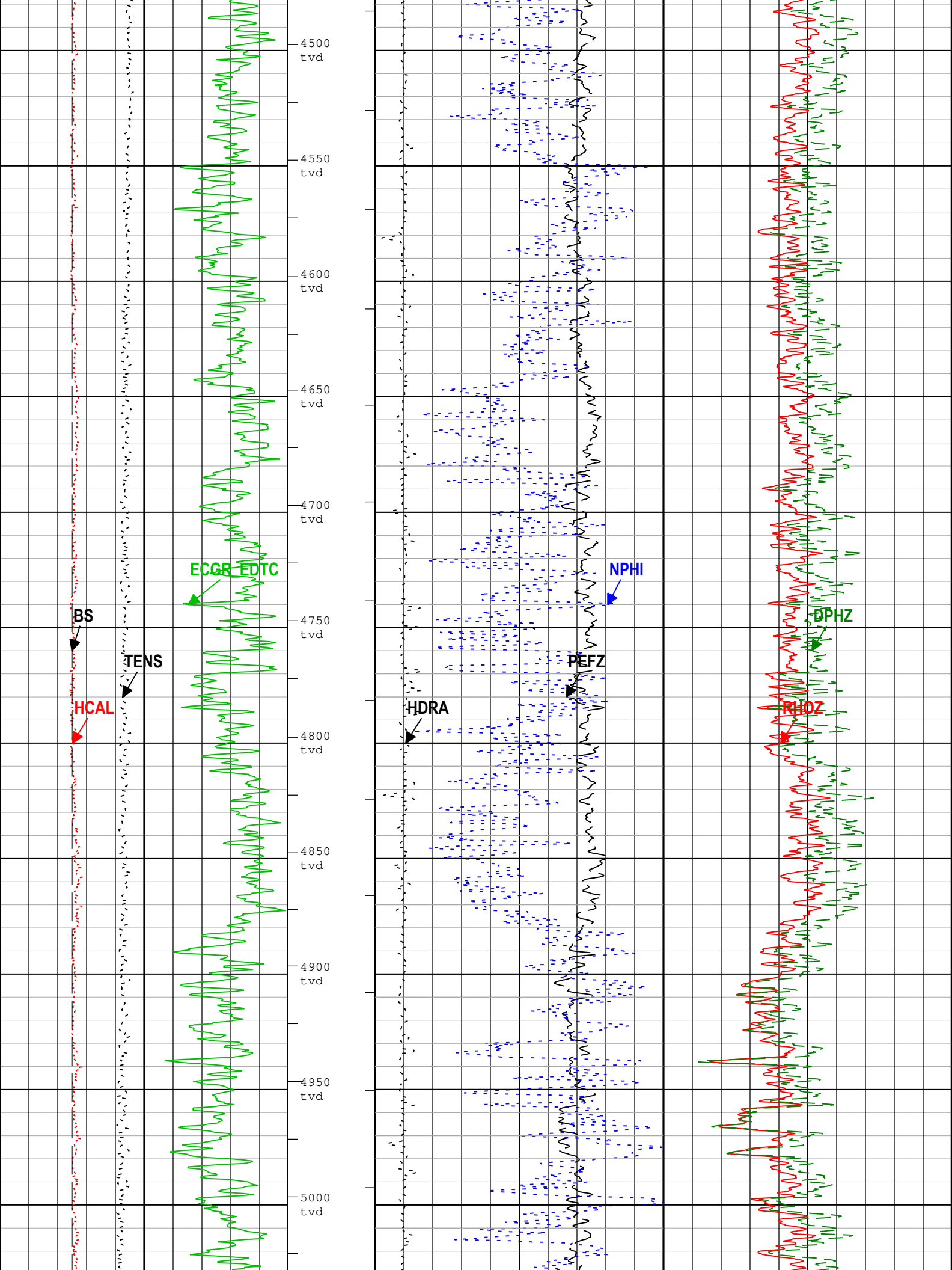
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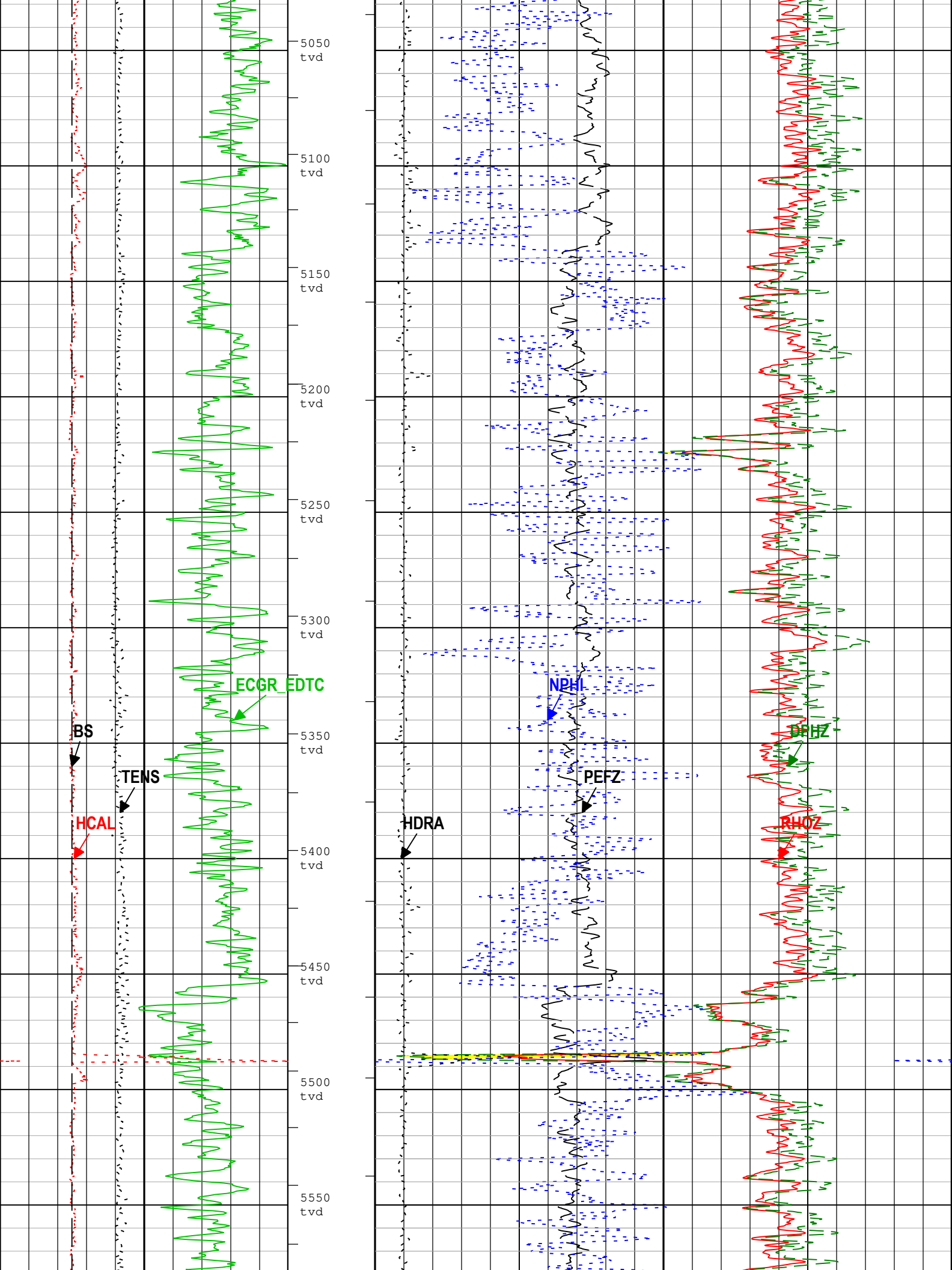
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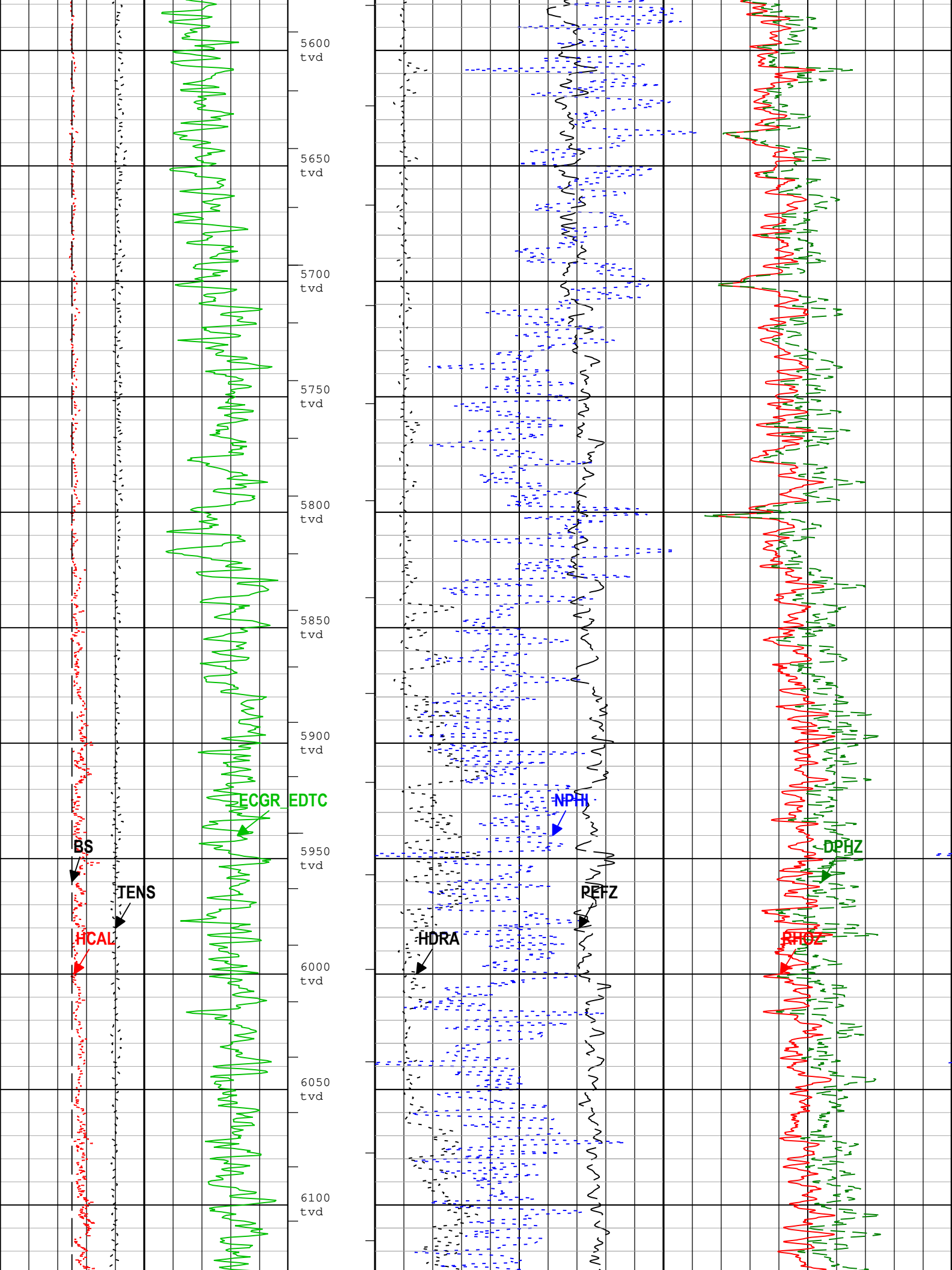
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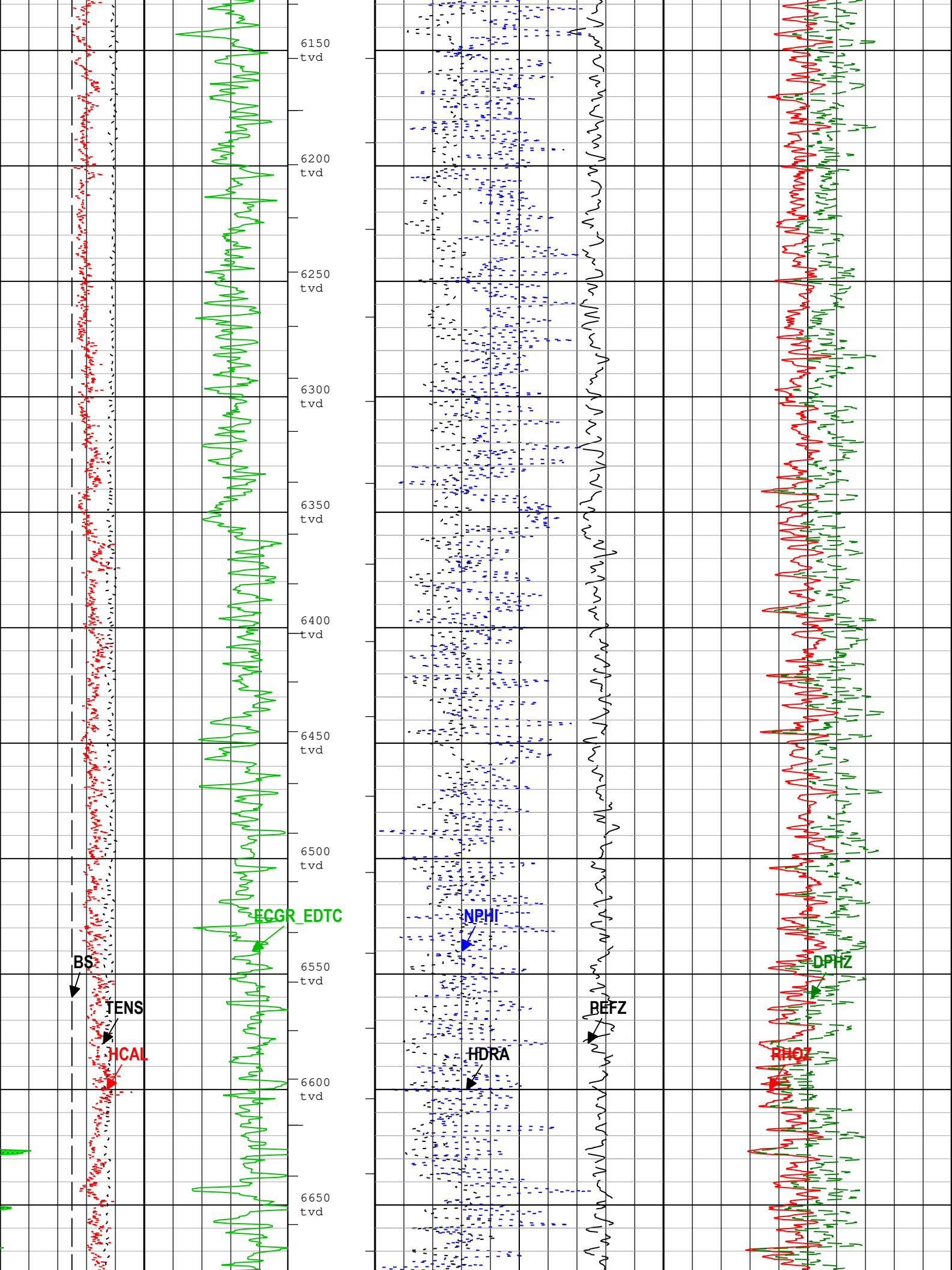
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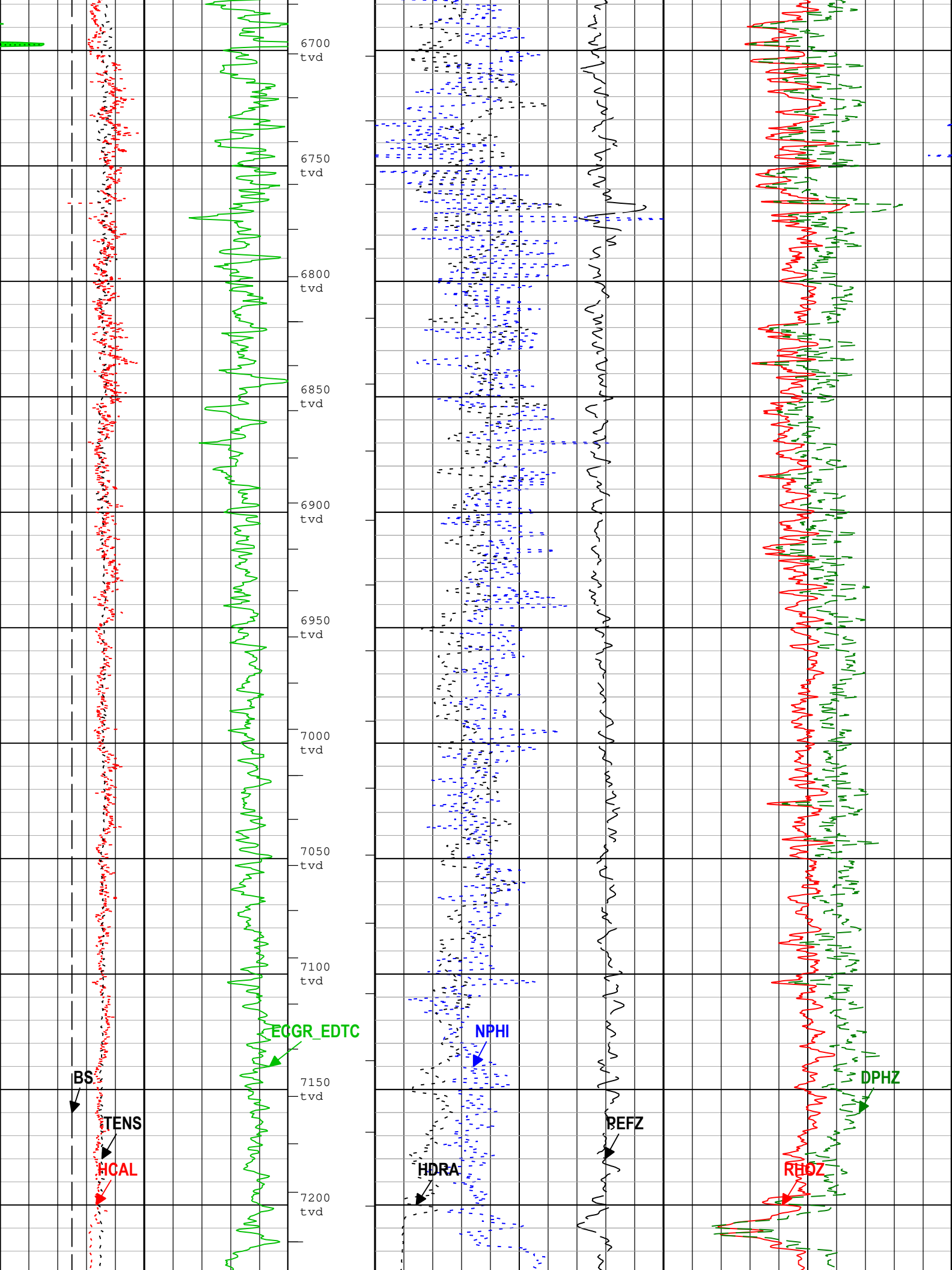
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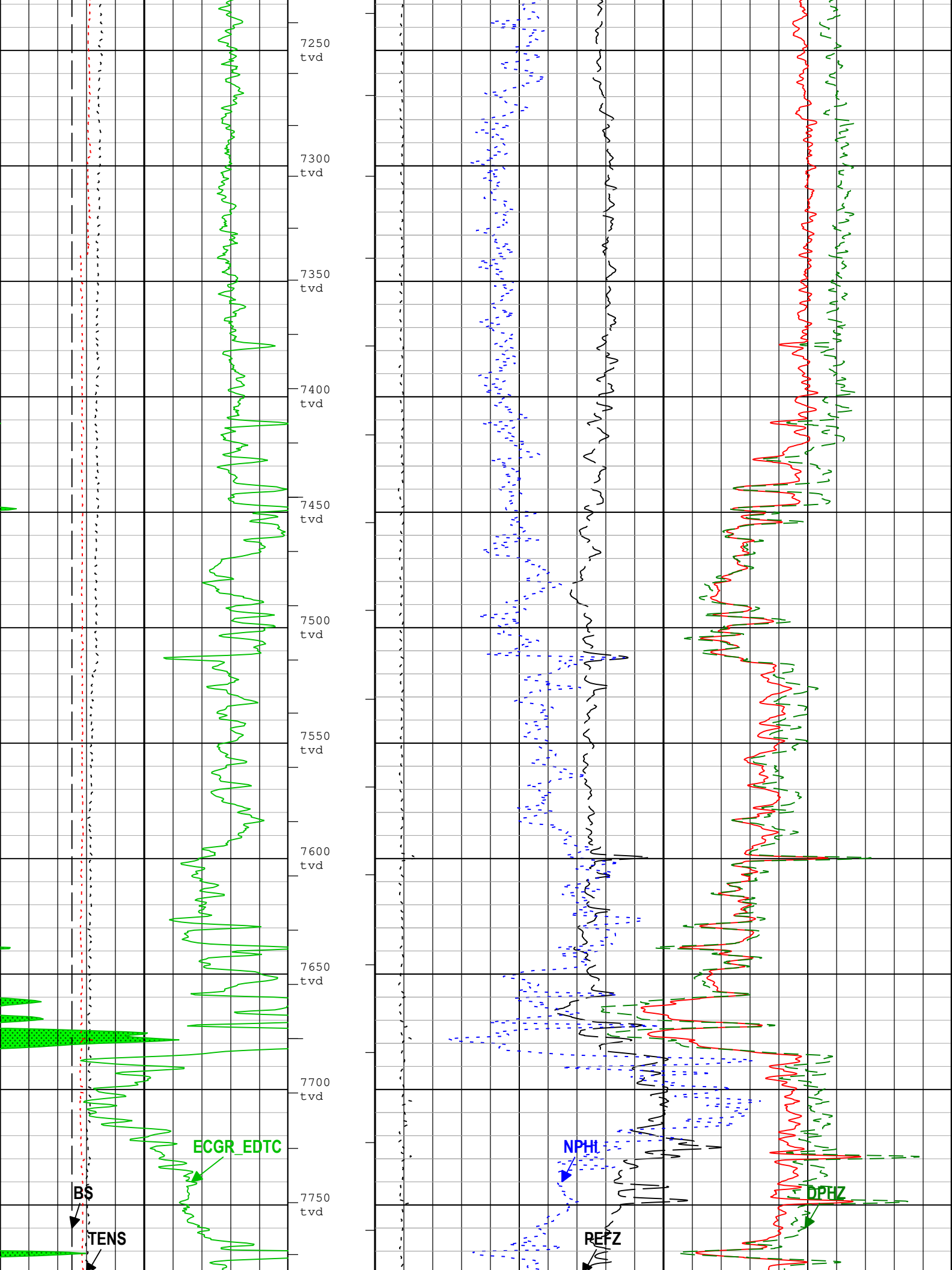
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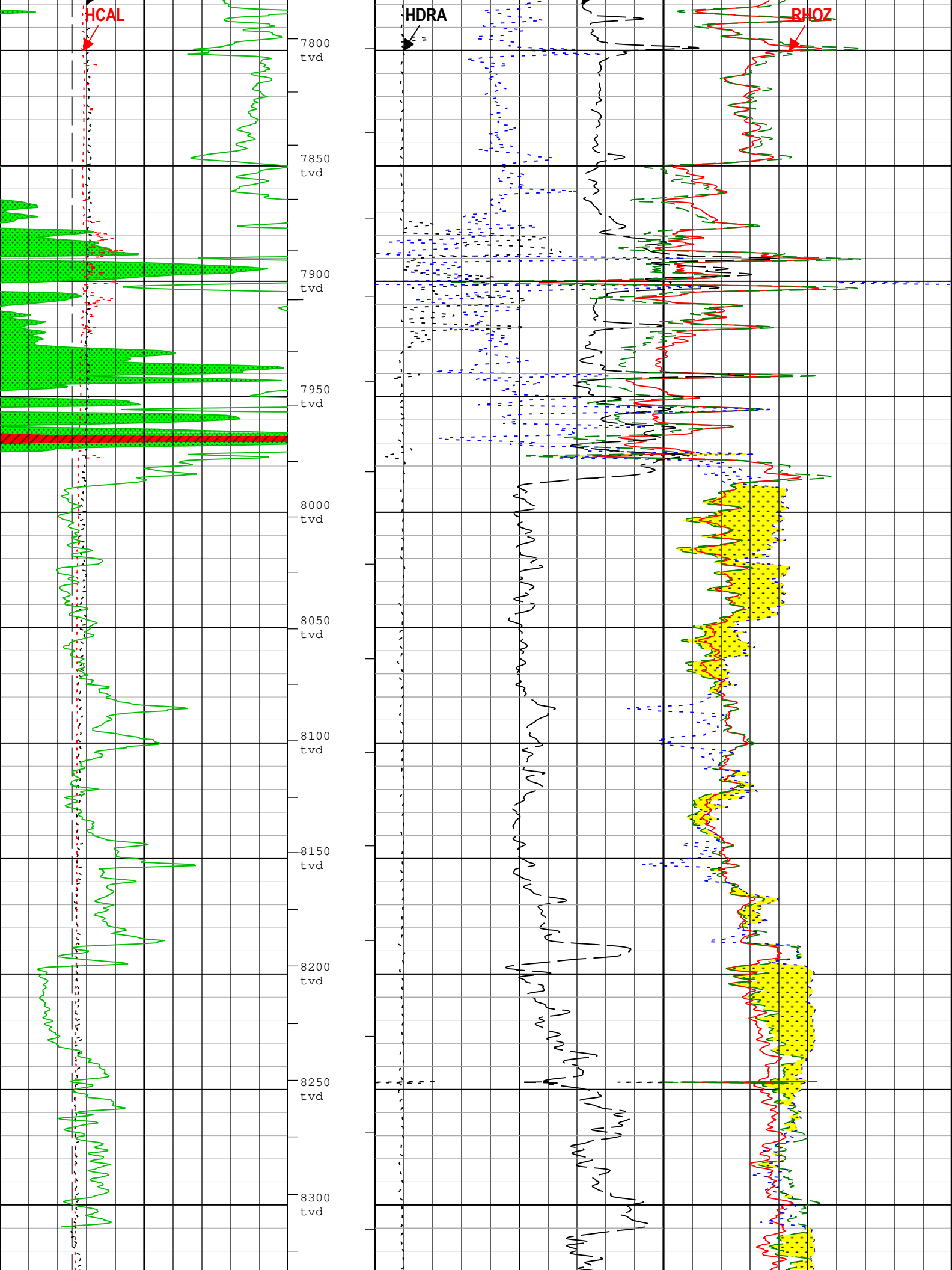
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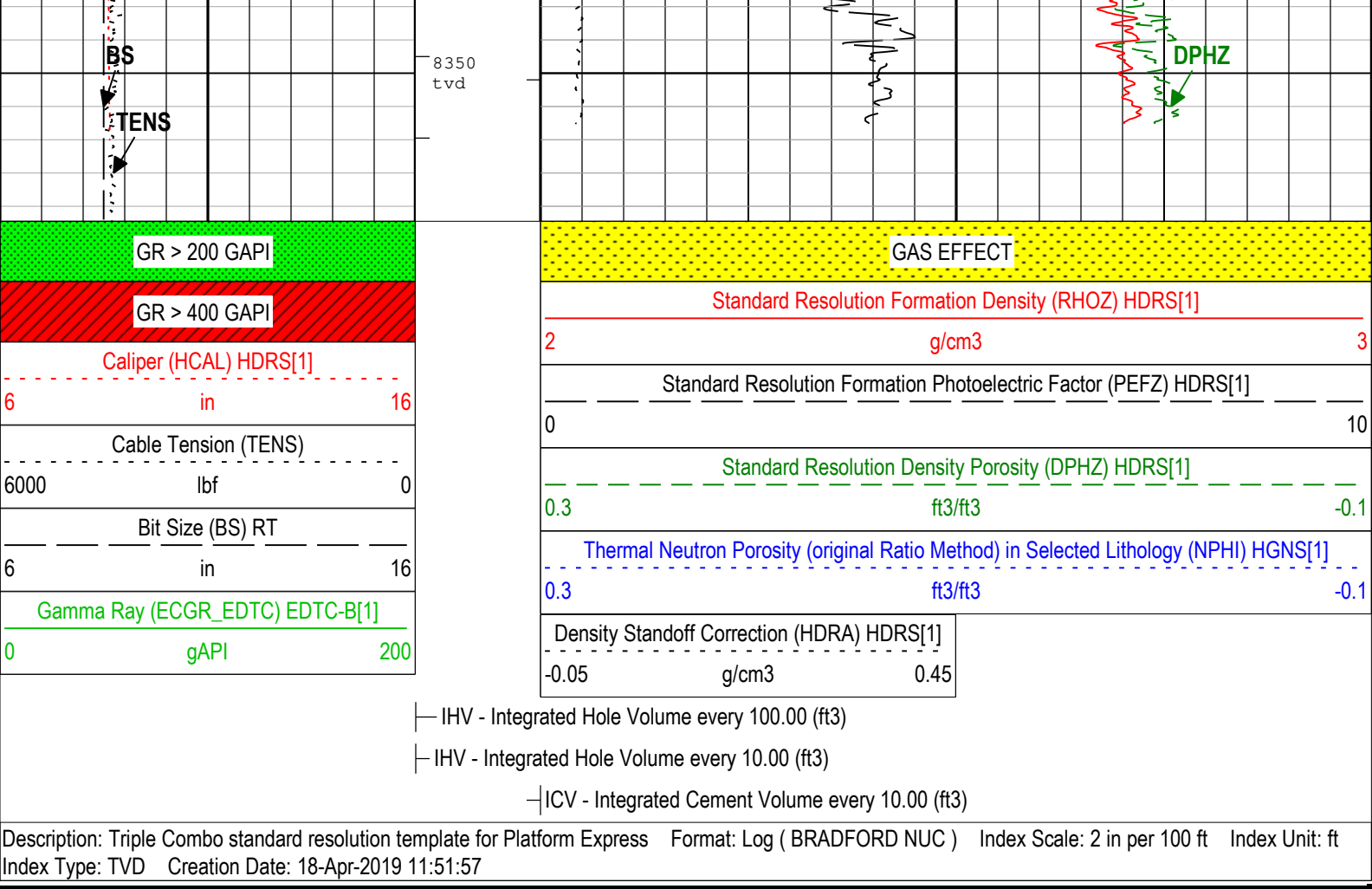


Description: Triple Combo standard resolution template for Platform Express Format: Log (BRADFORD NUC) Index Scale: 2 in per 100 ft Index Unit: ft
Index Type: TVD Creation Date: 18-Apr-2019 11:51:57

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	Open	
BS	Bit Size	WLSESSION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.446	in
CBLO	Casing Bottom (Logger)	WLSESSION	2543	ft
CDEN	Cement Density	EDTC-B	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	9.625	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.5	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DHC	Density Hole Correction	HDRS-H	Bit Size	
FCD	Future Casing (Outer) Diameter	WLSESSION	5.5	in
FD	Fluid Density	Borehole	1	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	CALI	
MATR	Rock Matrix for Neutron Porosity Corrections	Borehole	LIMESTONE	
MDEN	Matrix Density for Density Porosity	Borehole	2.71	g/cm3
NPRM	HRDD Nuclear Processing Mode	HDRS-H	Time Zoned	

1ADepth Zoned Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	12.25	2524.99	2542.91
BS	8.5	2542.91	8394.74

All depth are actual.

1ATime Zoned Parameters

Pass Log[2]:Up

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
NPRM	High Resolution	15-Apr-2019 07:56:46	15-Apr-2019 08:17:05	8396.33	8272.33

Pass Log[8]:Up

NPRM	Standard Resolution	15-Apr-2019 10:06:38	15-Apr-2019 10:51:09	8272.33	8084.83

Pass Log[9]:Up

NPRM	Standard Resolution	15-Apr-2019 11:04:41	15-Apr-2019 16:11:56	8084.83	2500.83

All depth are at tool zero.

Tool Control Parameters

1A: Parameters

Parameter	Description	Tool	Value	Unit
HRGD_BOARD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	1800	ft/h

Main Pass

MAIN PASS 5"=100'

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
IHV	Integrated Hole Volume	GCSE_UP_PASS, GCSE_DOWN_PASS:1A	2498.85	ft3
ICV	Integrated Cement Volume	GCSE_UP_PASS, GCSE_DOWN_PASS:1A, FCD	1533.39	ft3

Software Version

Acquisition System	Version
Maxwell 2019	9.0.106845.3100

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
1A	Log[2]:Up	Up	8266.17 ft	8396.38 ft	15-Apr-2019 7:56:45 AM	15-Apr-2019 8:17:05 AM	ON	2.60 ft	Yes
1A	Log[8]:Up	Up	8021.42 ft	8407.18 ft	15-Apr-2019 9:44:04 AM	15-Apr-2019 10:51:09 AM	ON	3.12 ft	Yes
1A	Log[9]:Up	Up	2500.63 ft	8126.68 ft	15-Apr-2019 10:57:49 AM	15-Apr-2019 4:11:56 PM	ON	4.17 ft	Yes

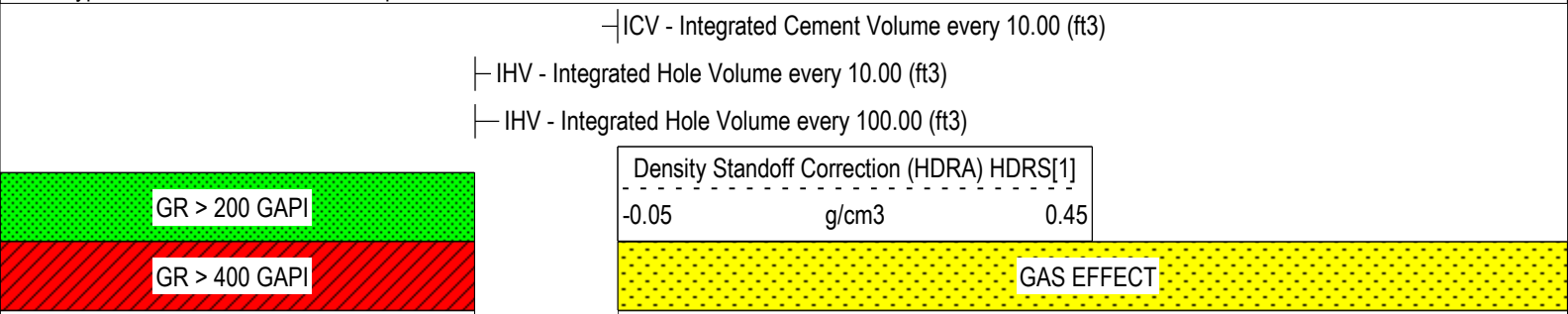
All depths are referenced to toolstring zero

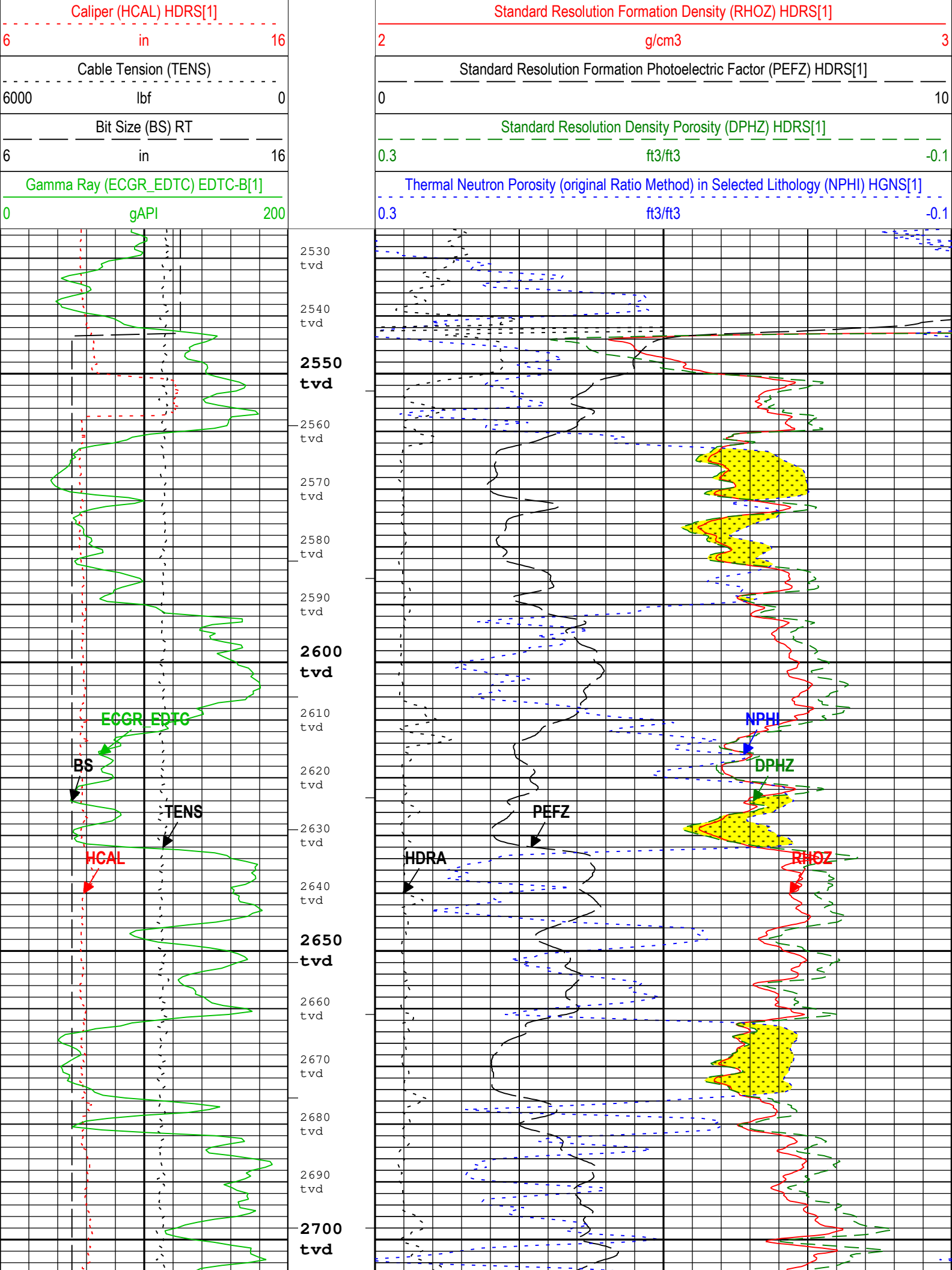
Log

Company:North East Natural Energy LLC Well:Boggess 17H

Main Pass:S024

Description: Triple Combo standard resolution template for Platform Express Format: Log (BRADFORD NUC) Index Scale: 5 in per 100 ft Index Unit: ft
Index Type: TVD Creation Date: 18-Apr-2019 11:52:12

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ft3/ft3
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Thermal Neutron Porosity (original Ratio Method) in Selected Lithology (NPHI) HGNS[1]
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ft3/ft3
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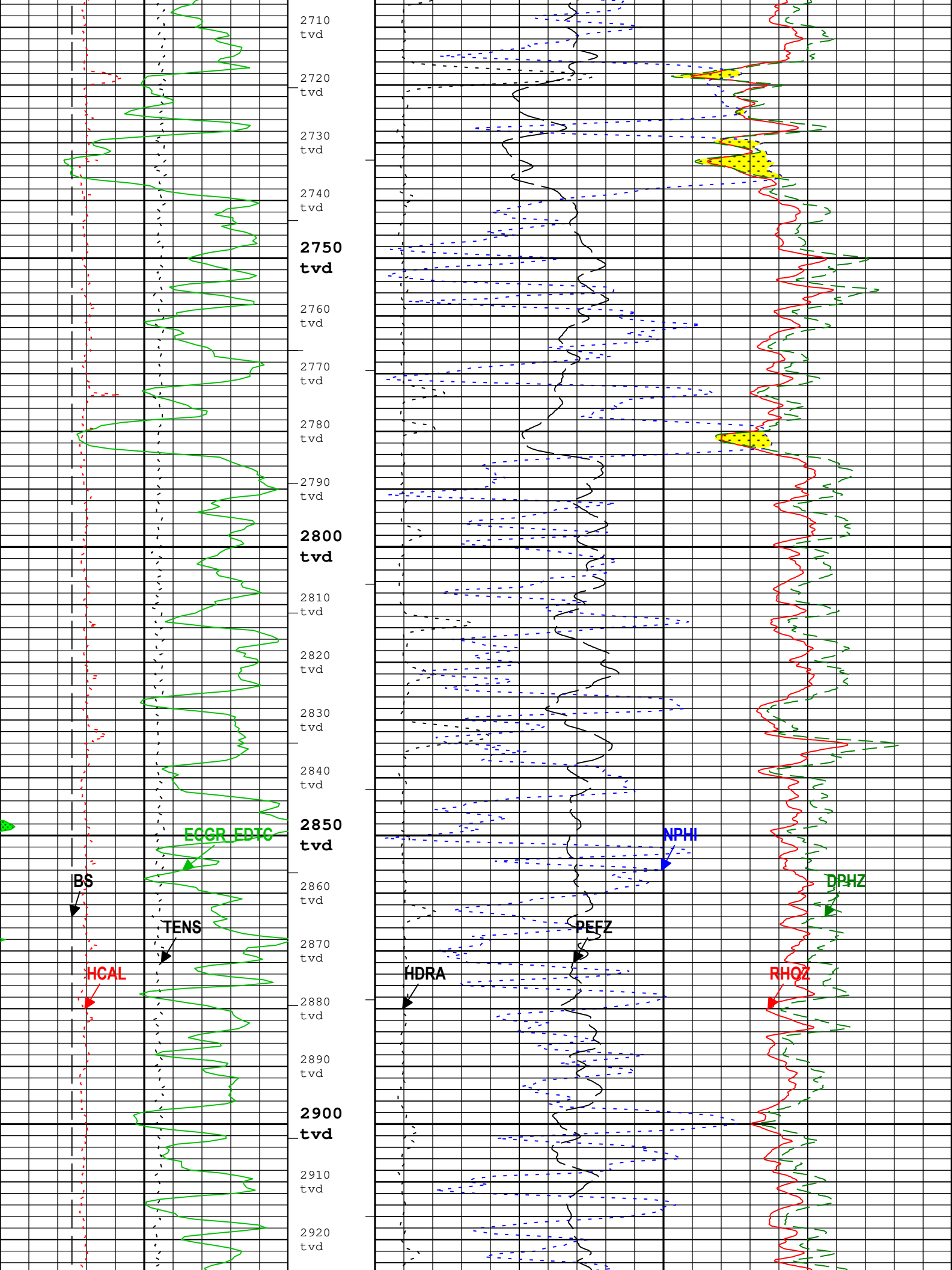
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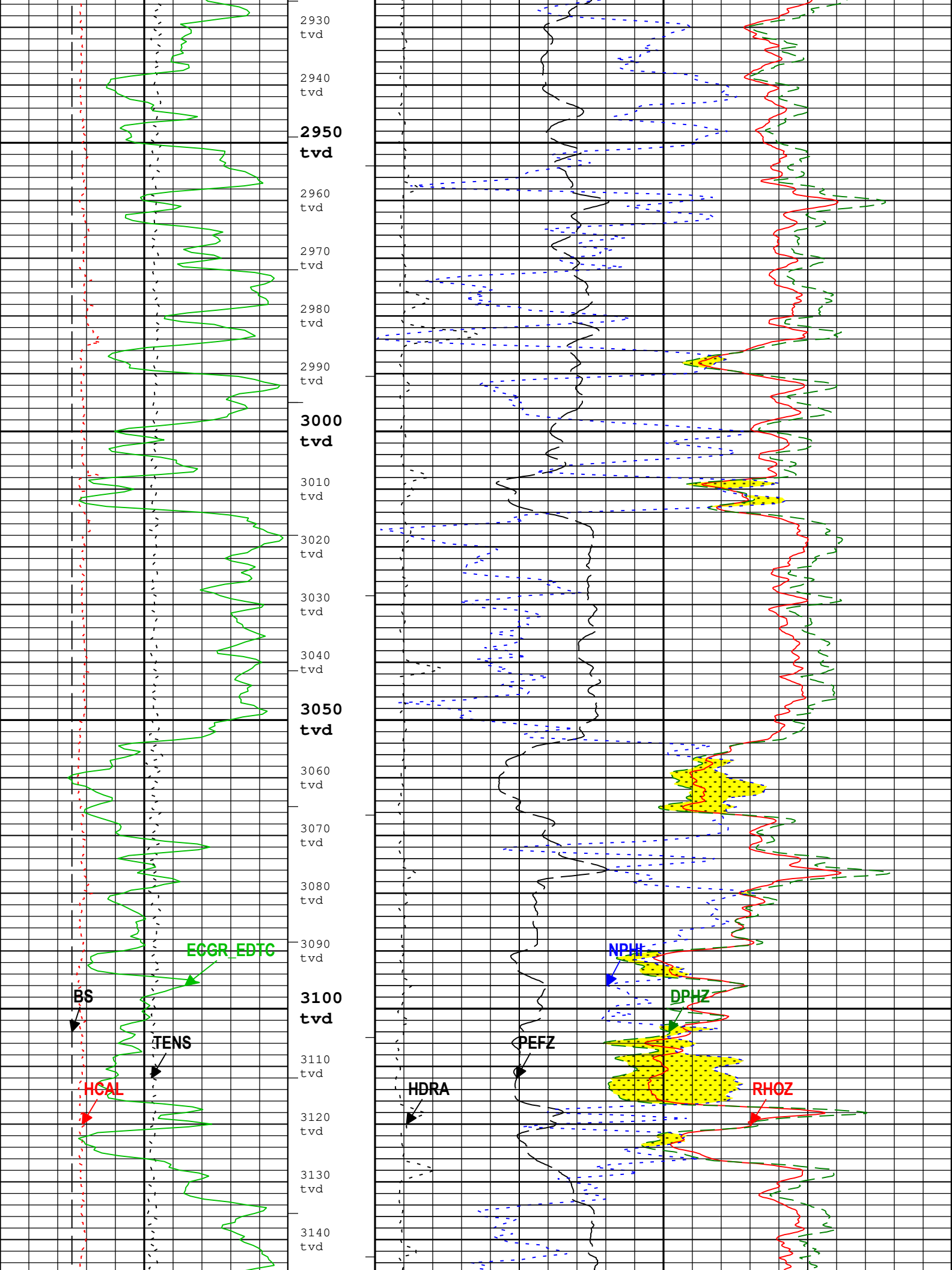
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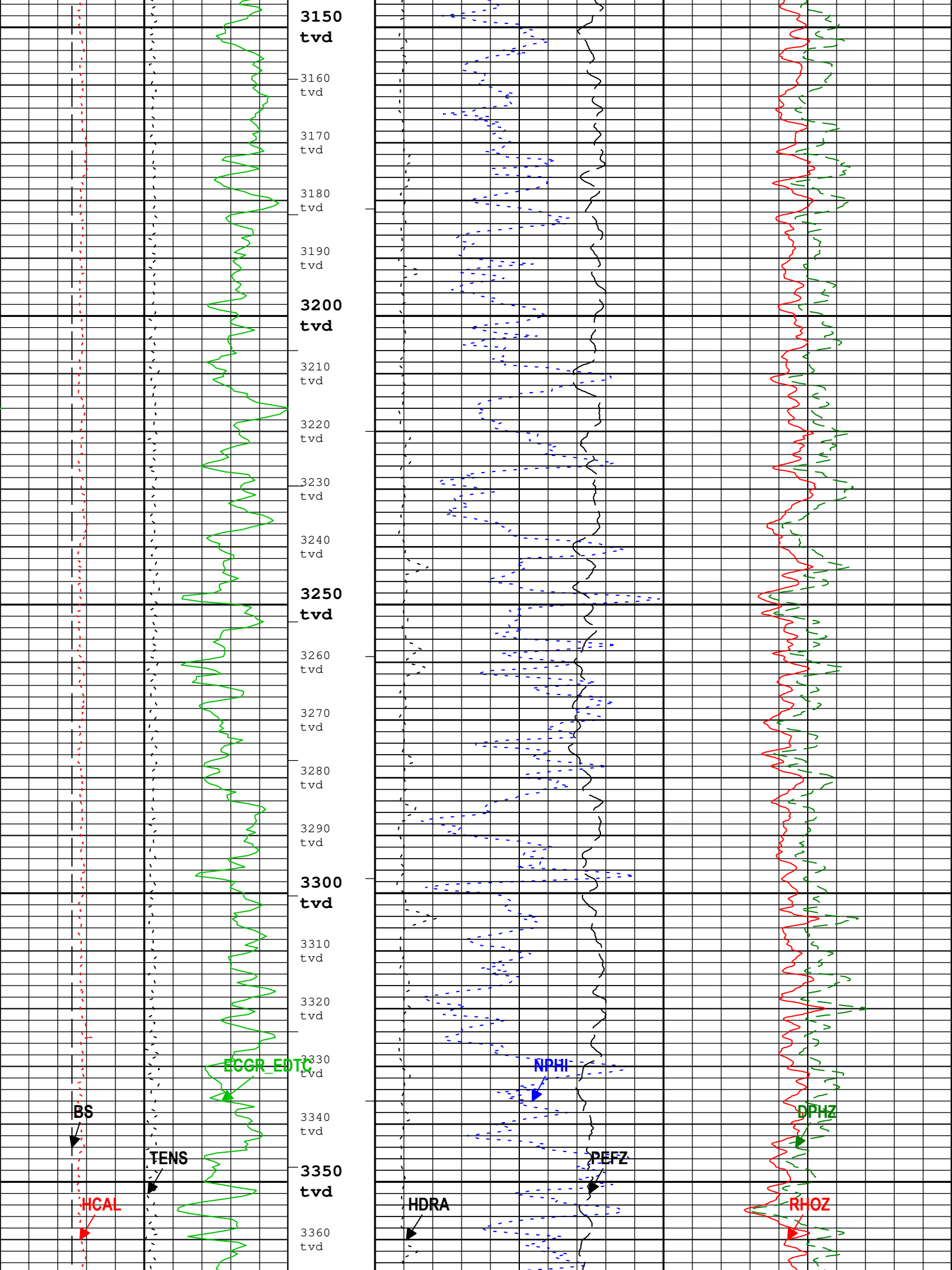
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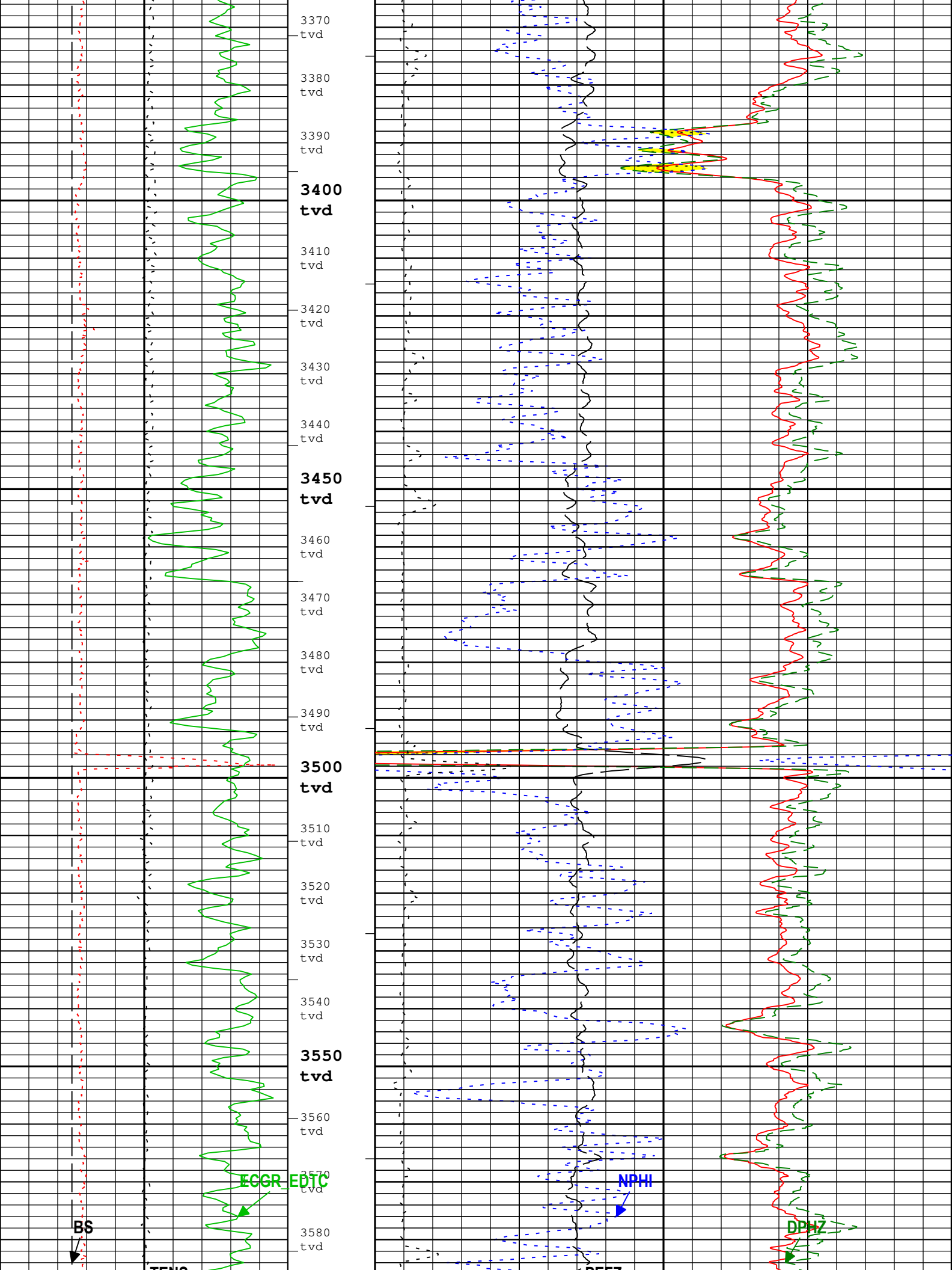
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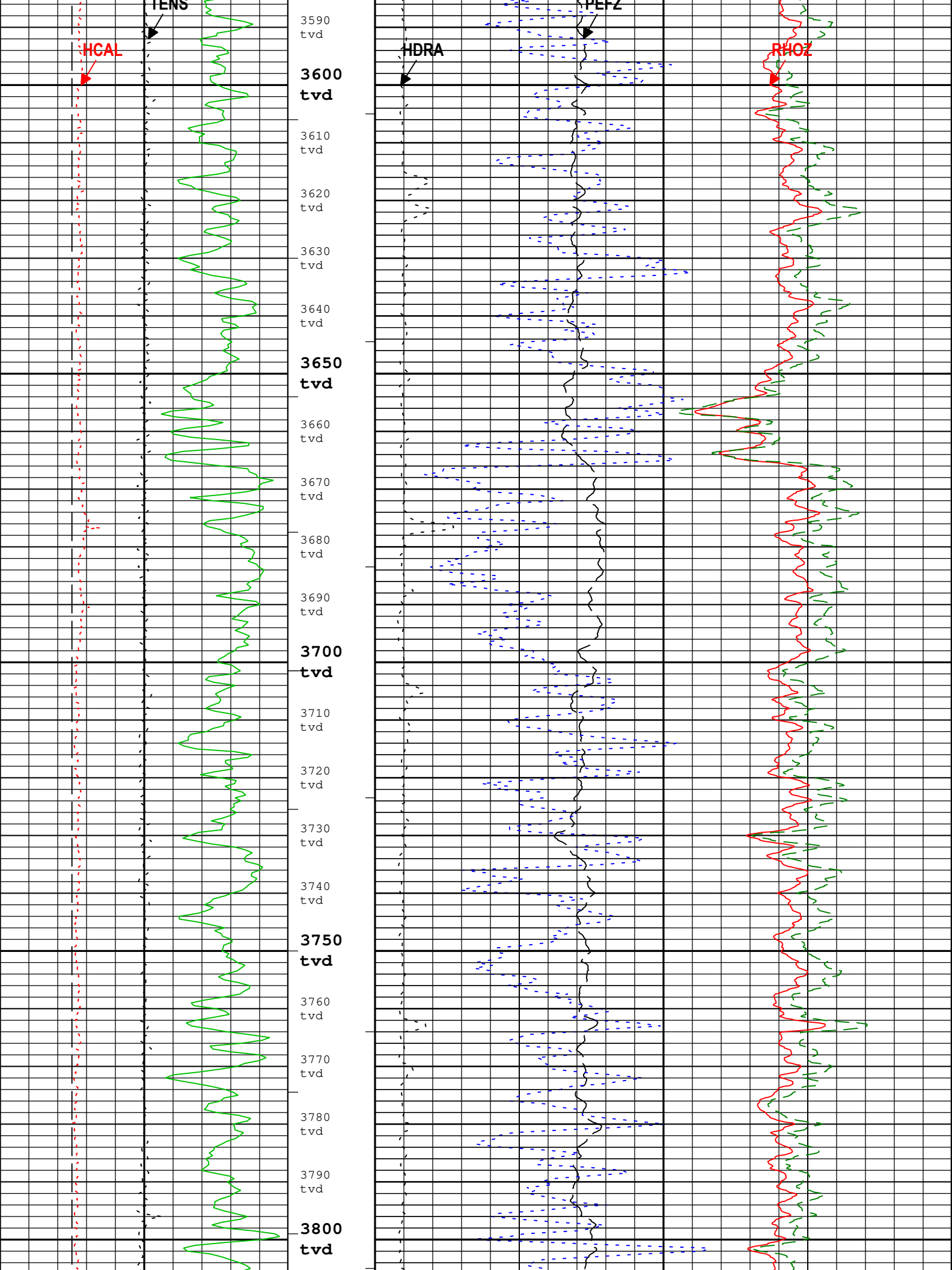
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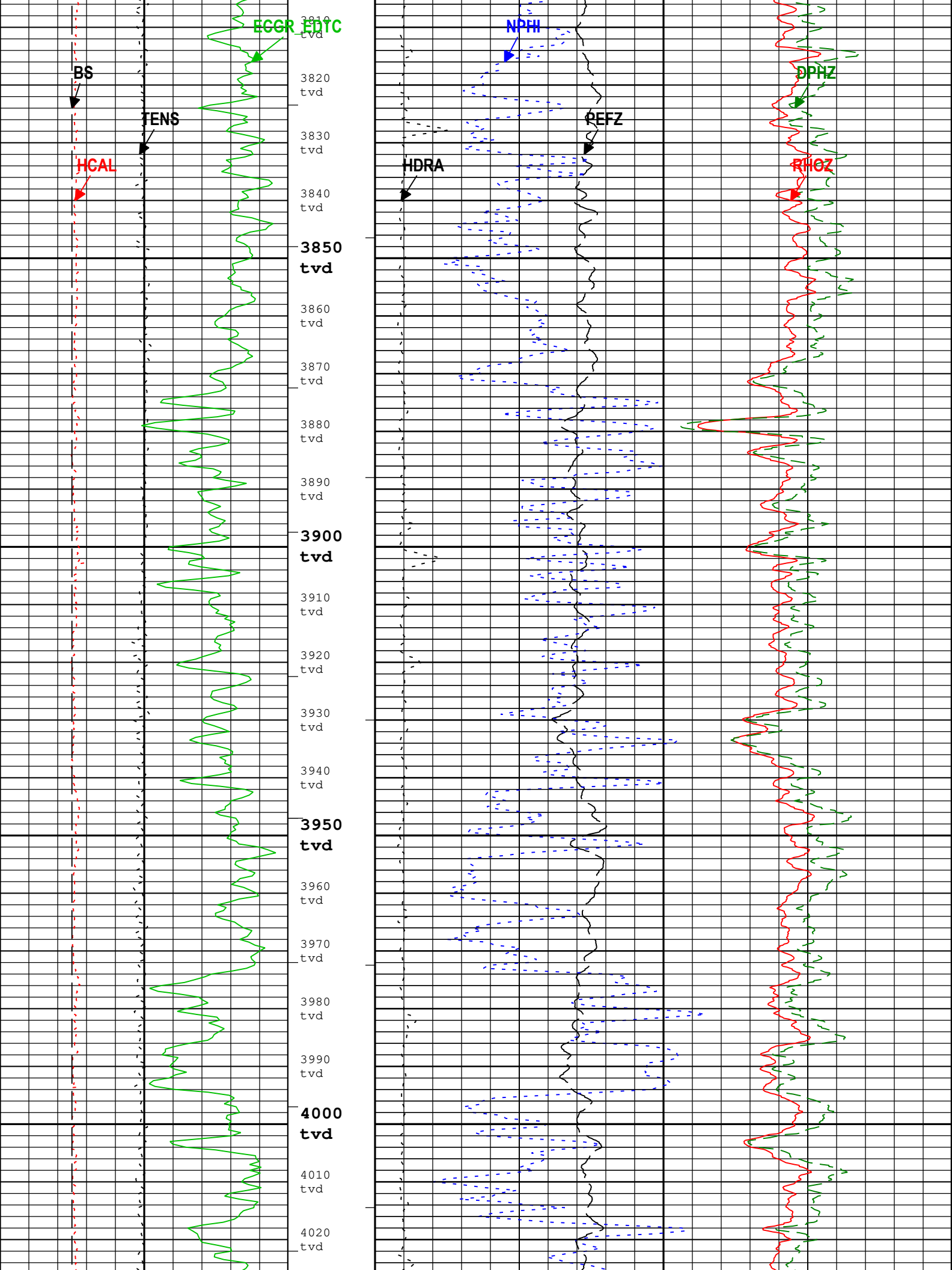
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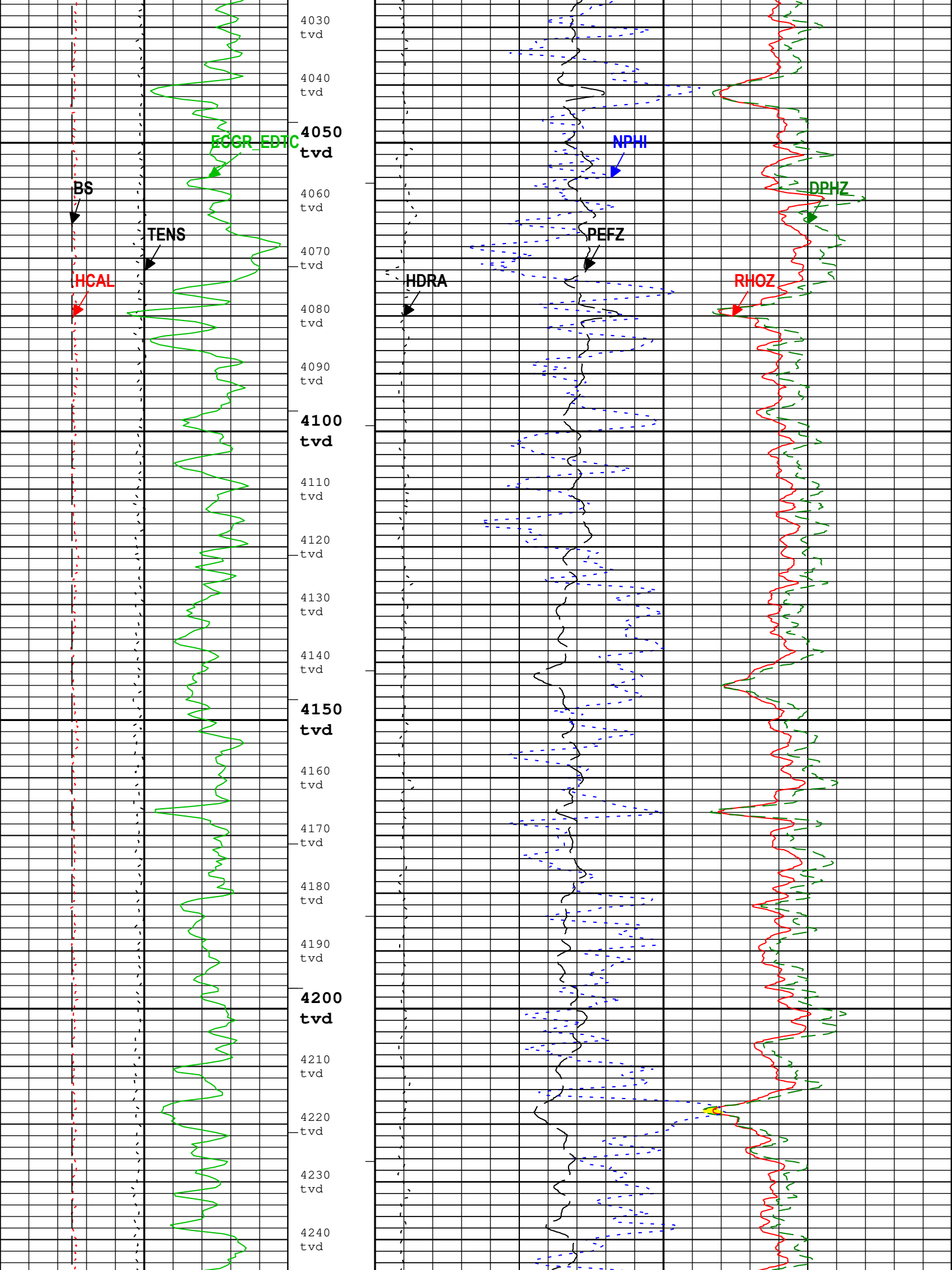
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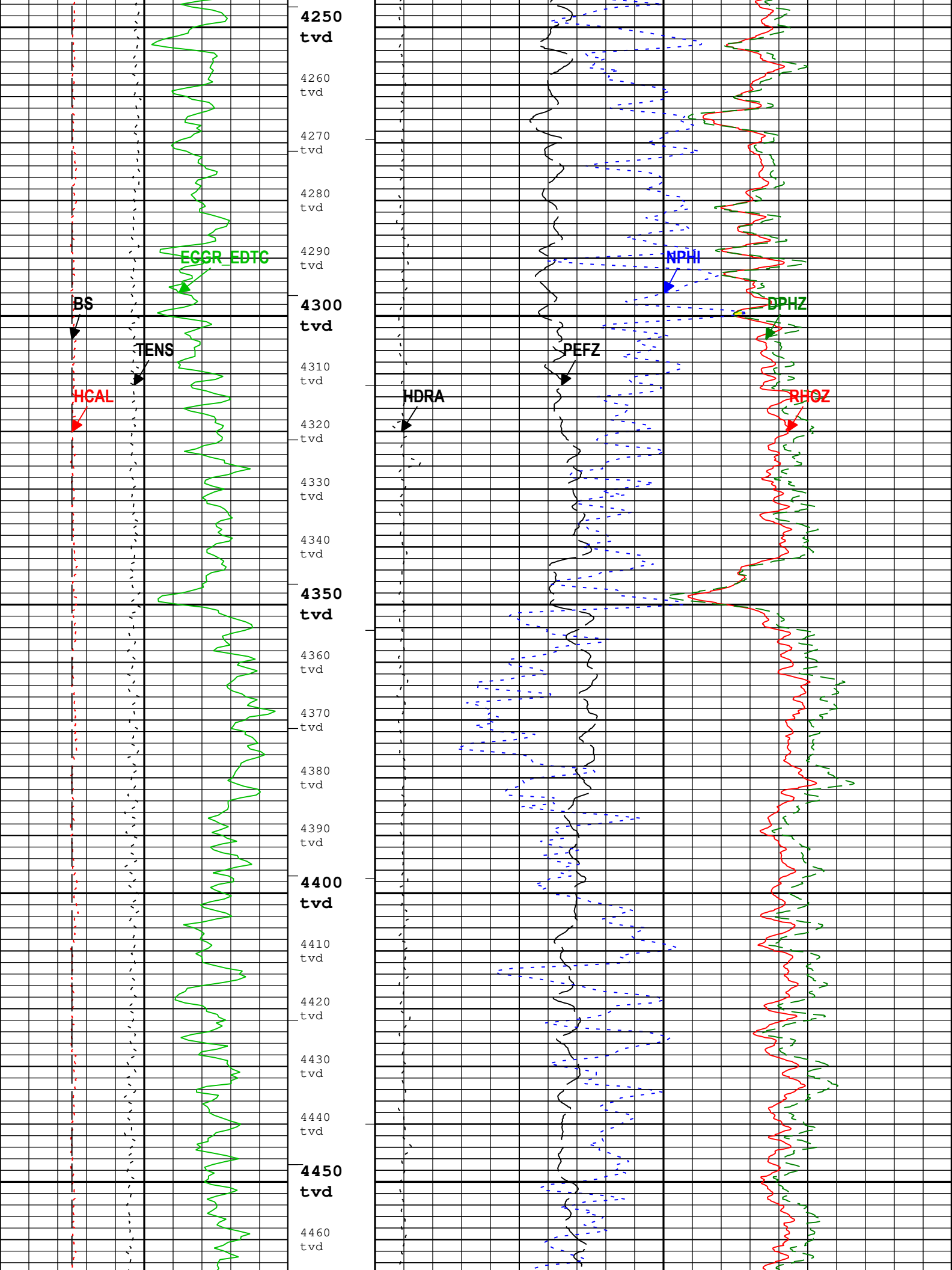
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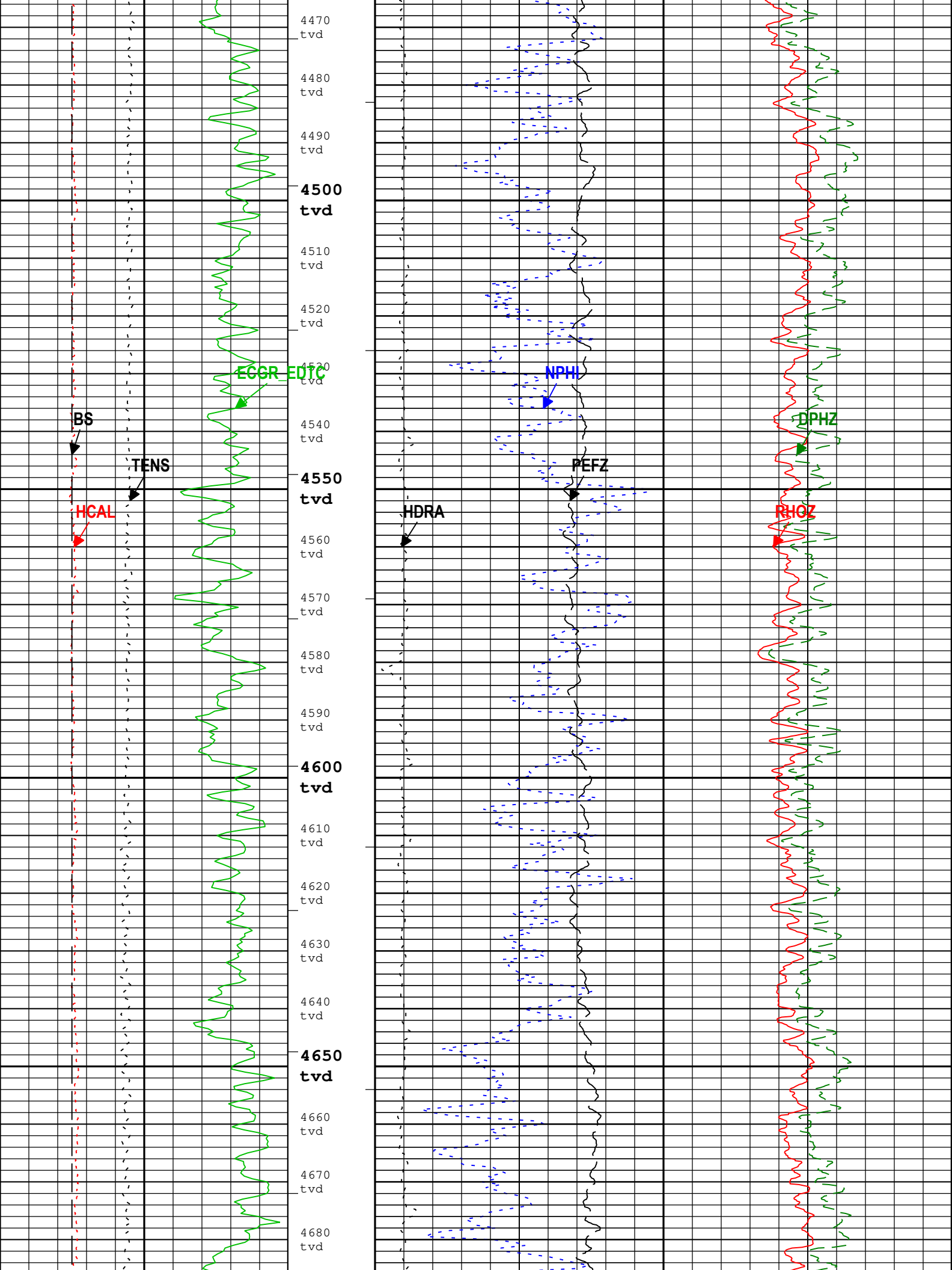
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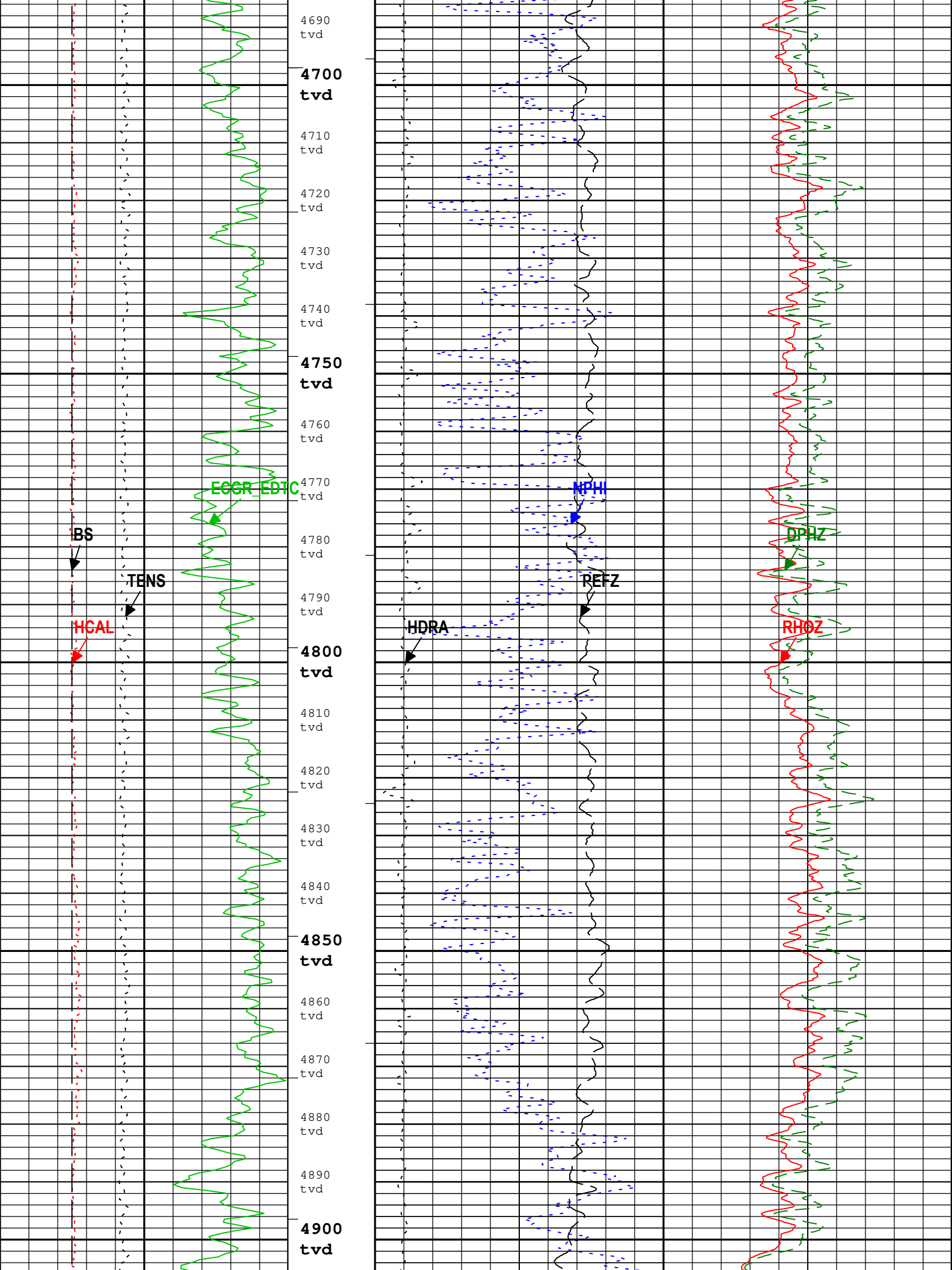
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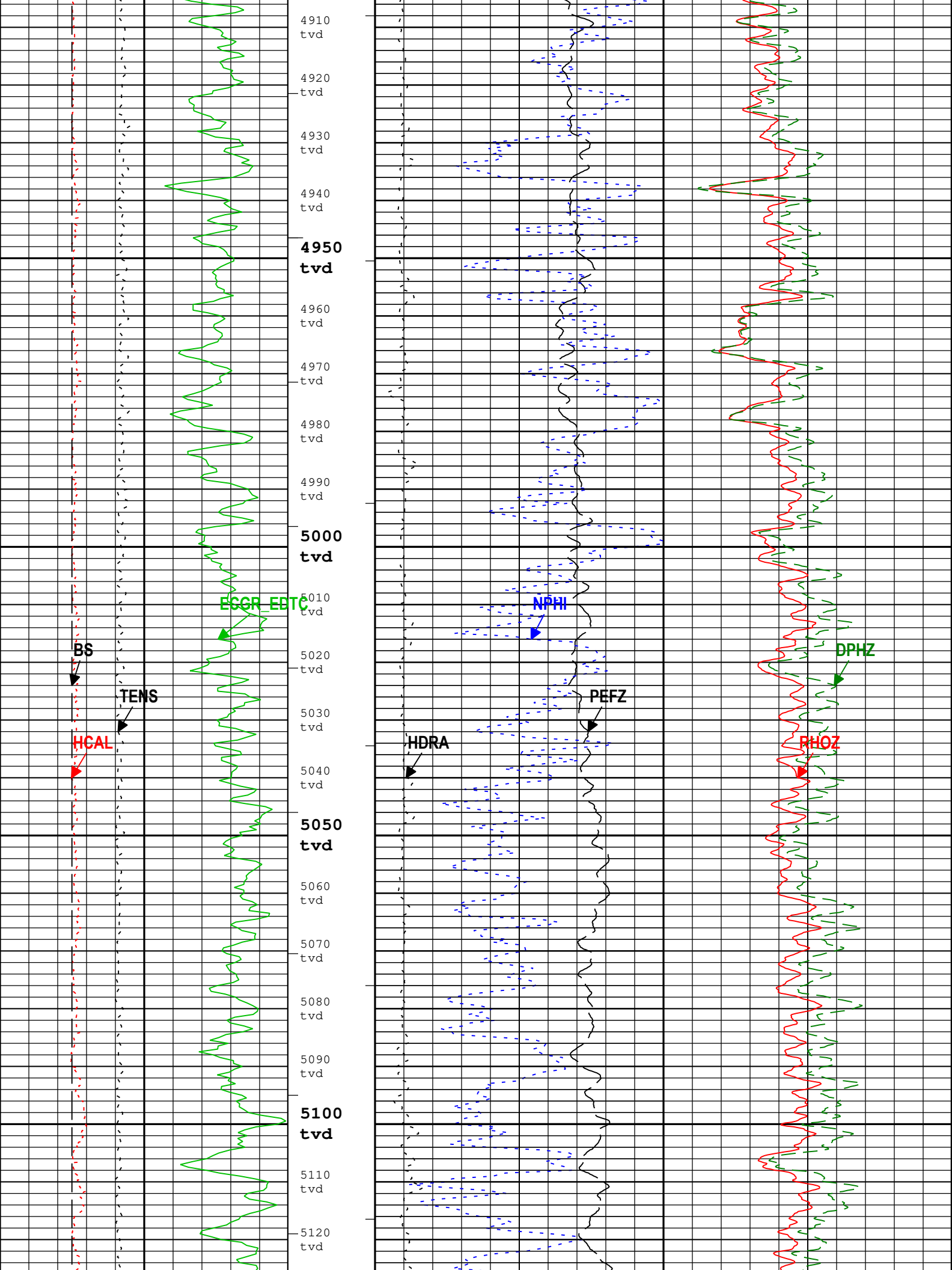
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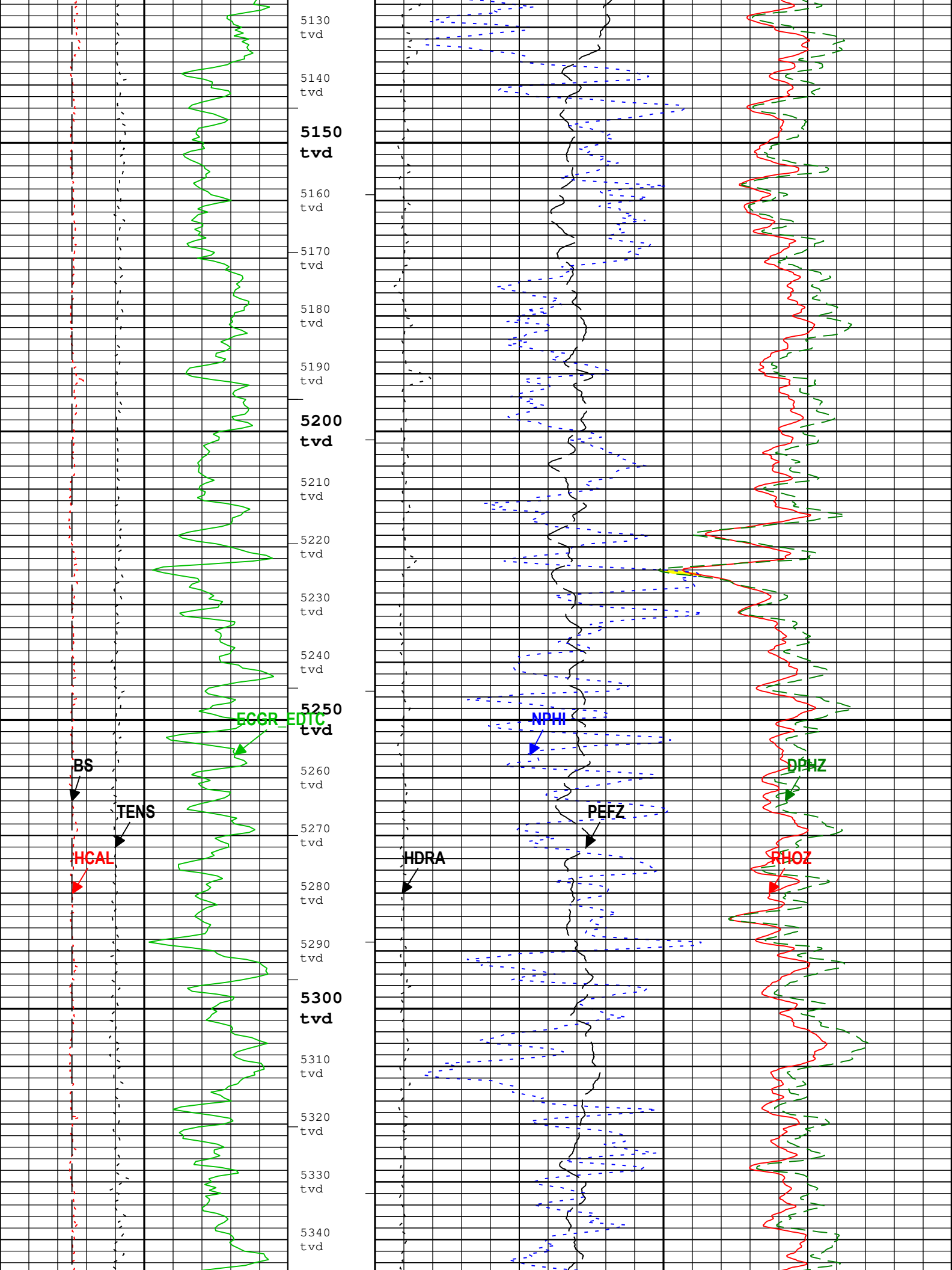
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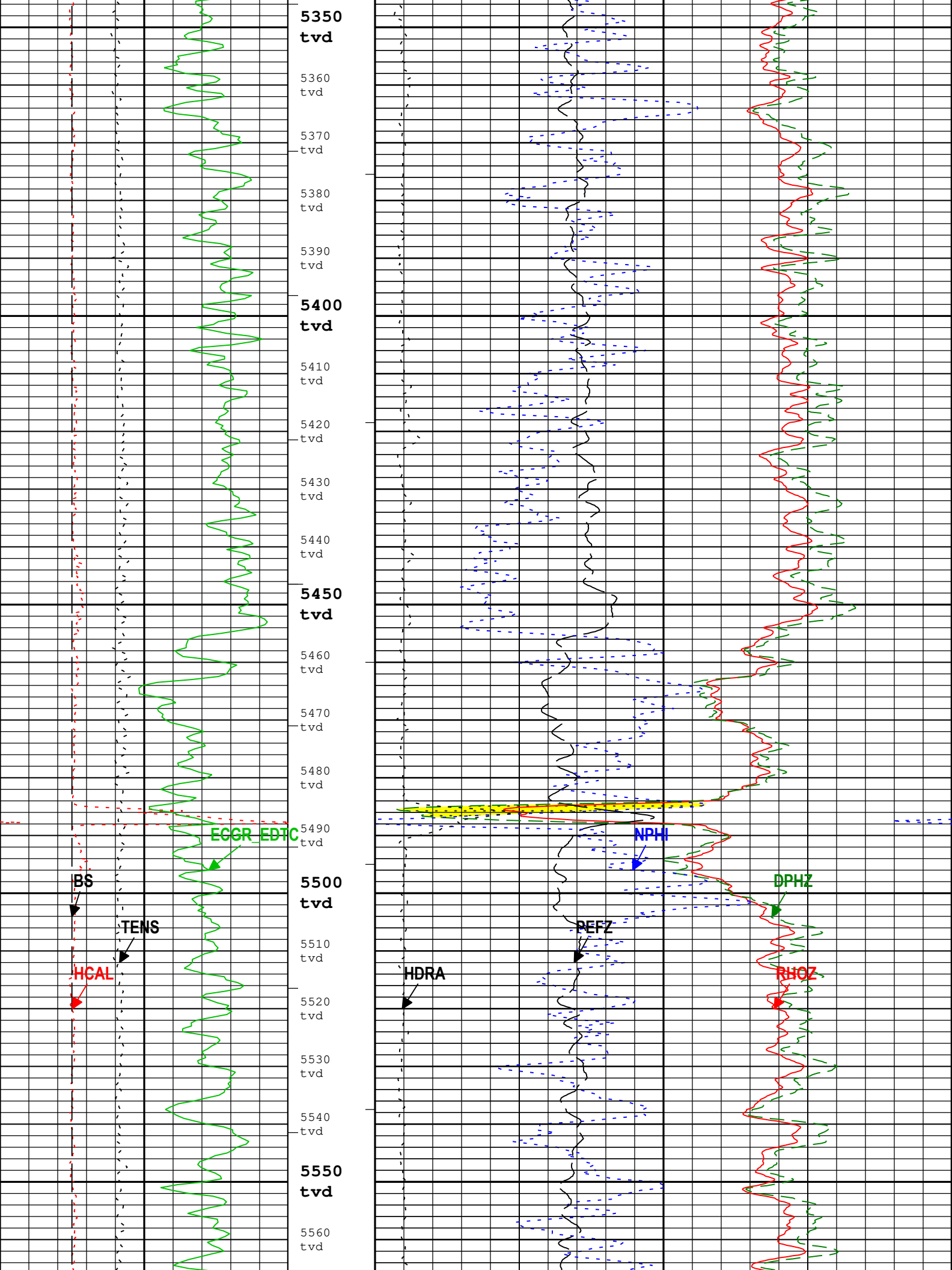
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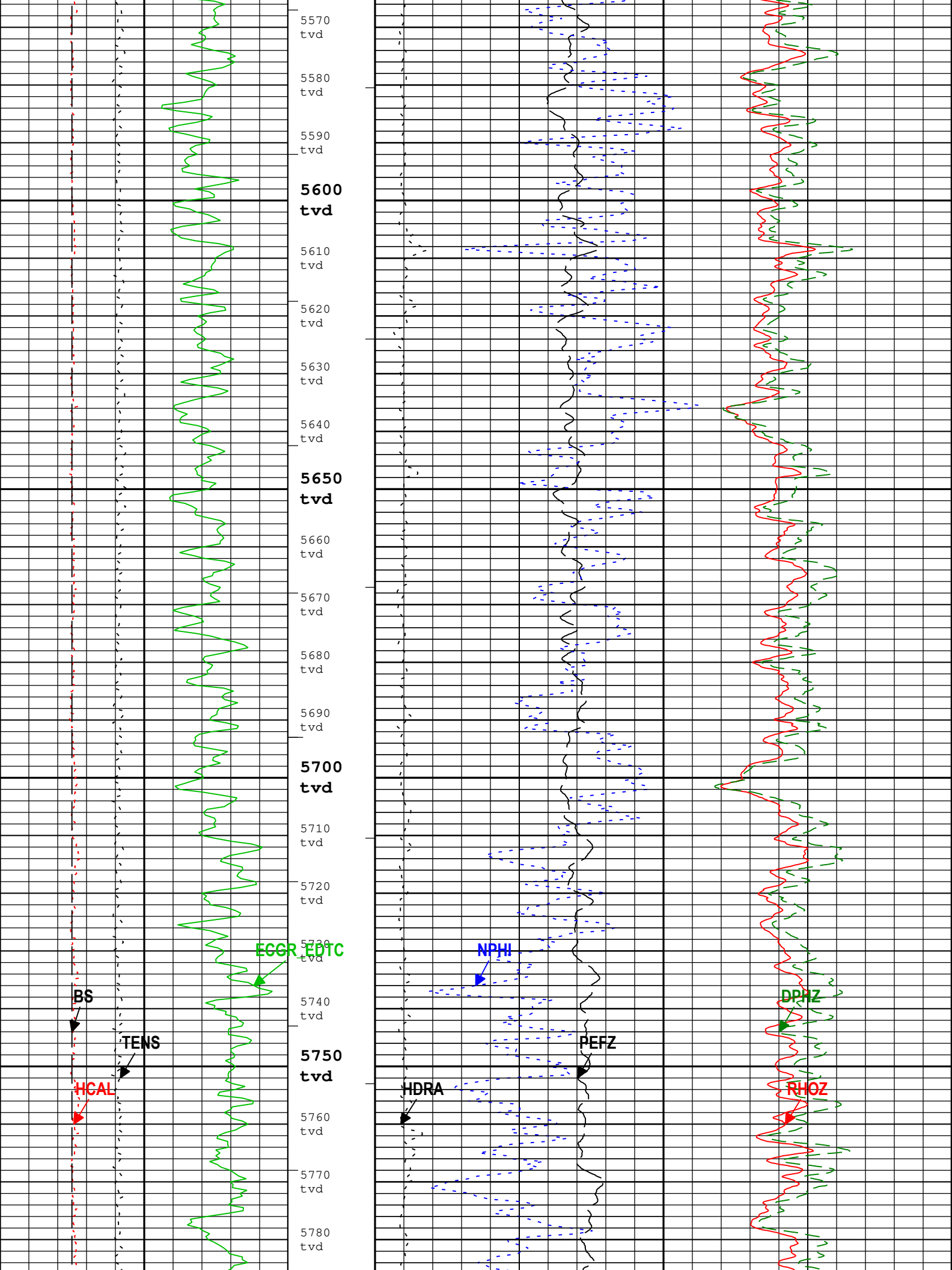
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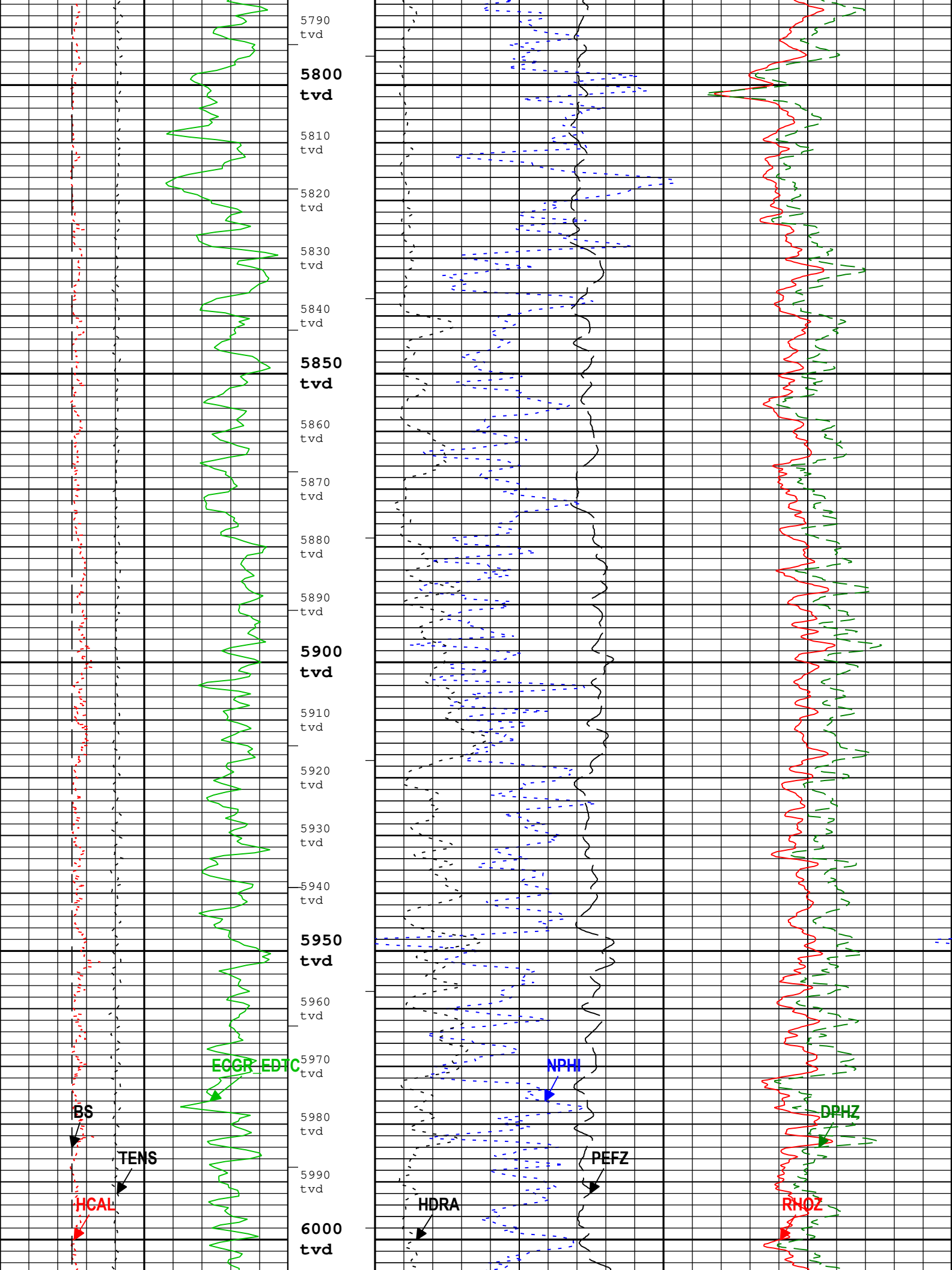
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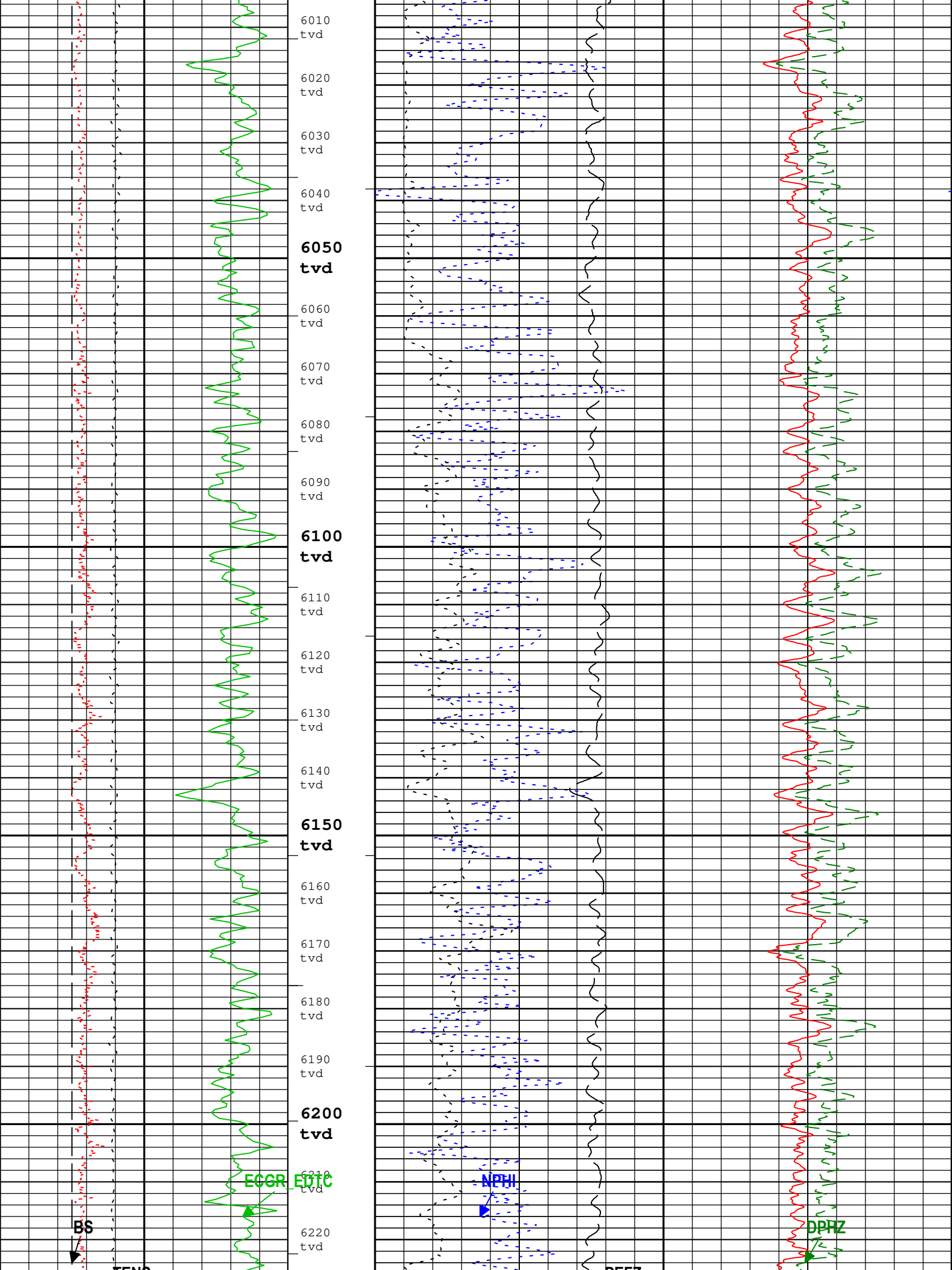
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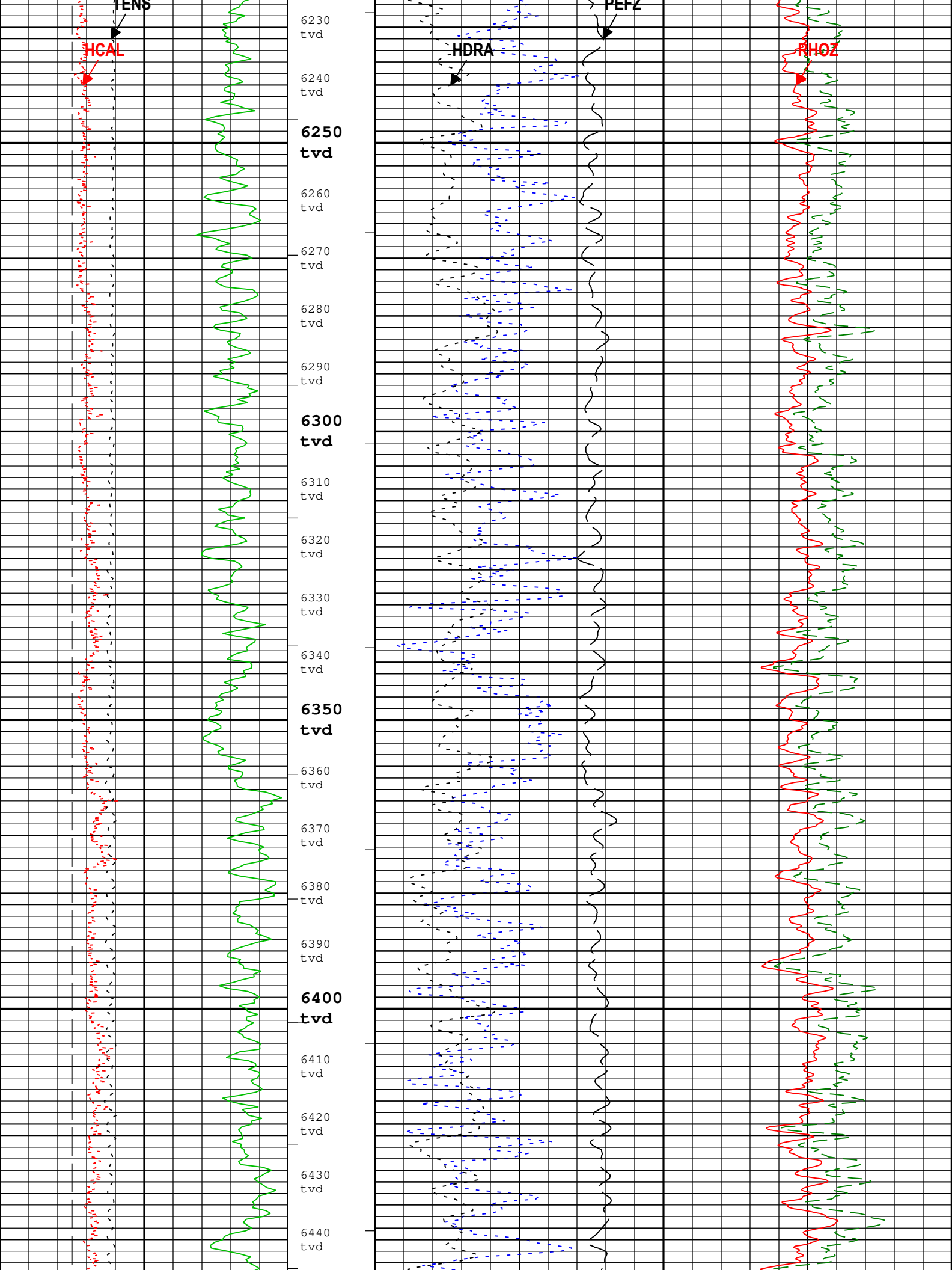
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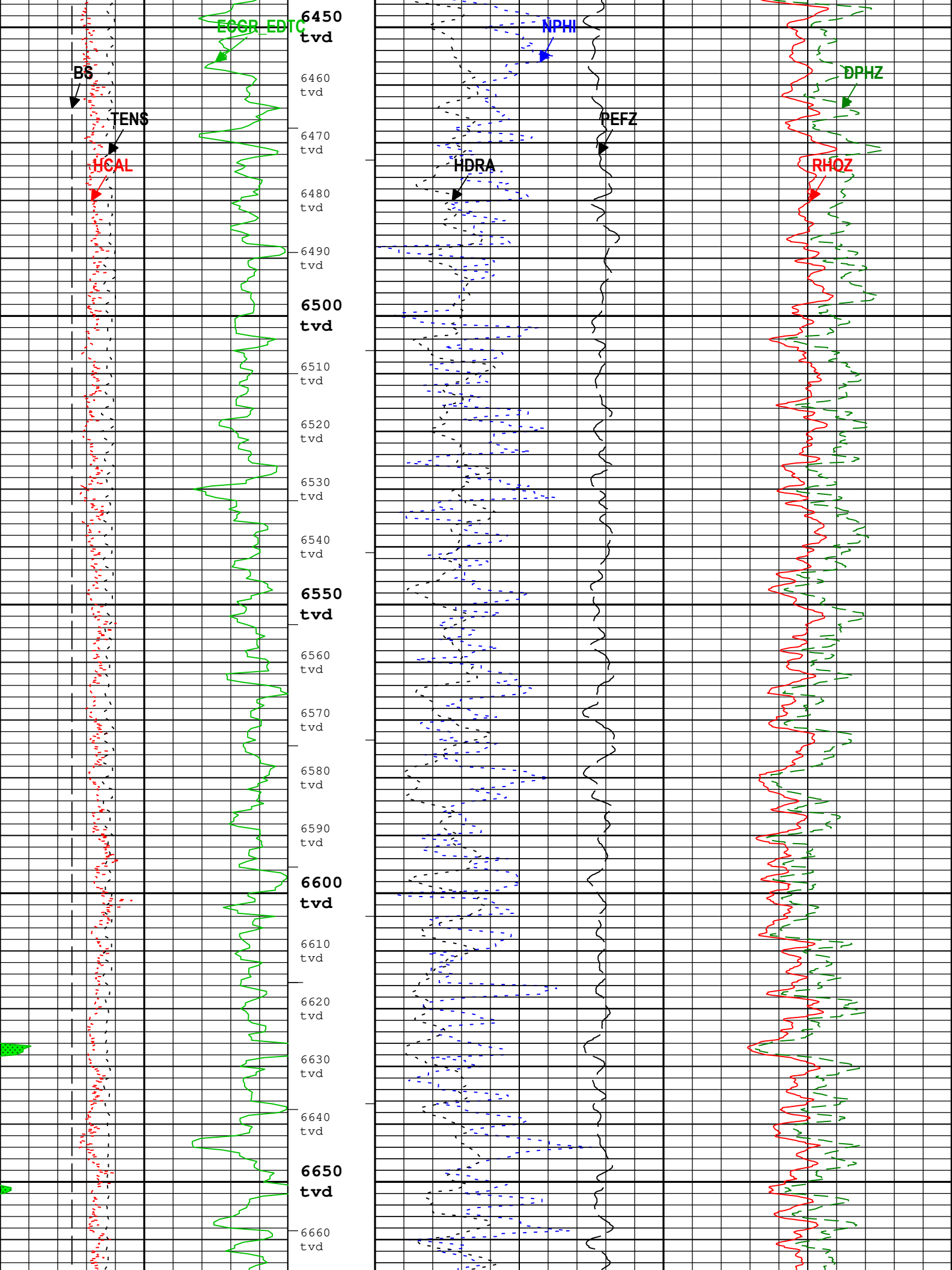
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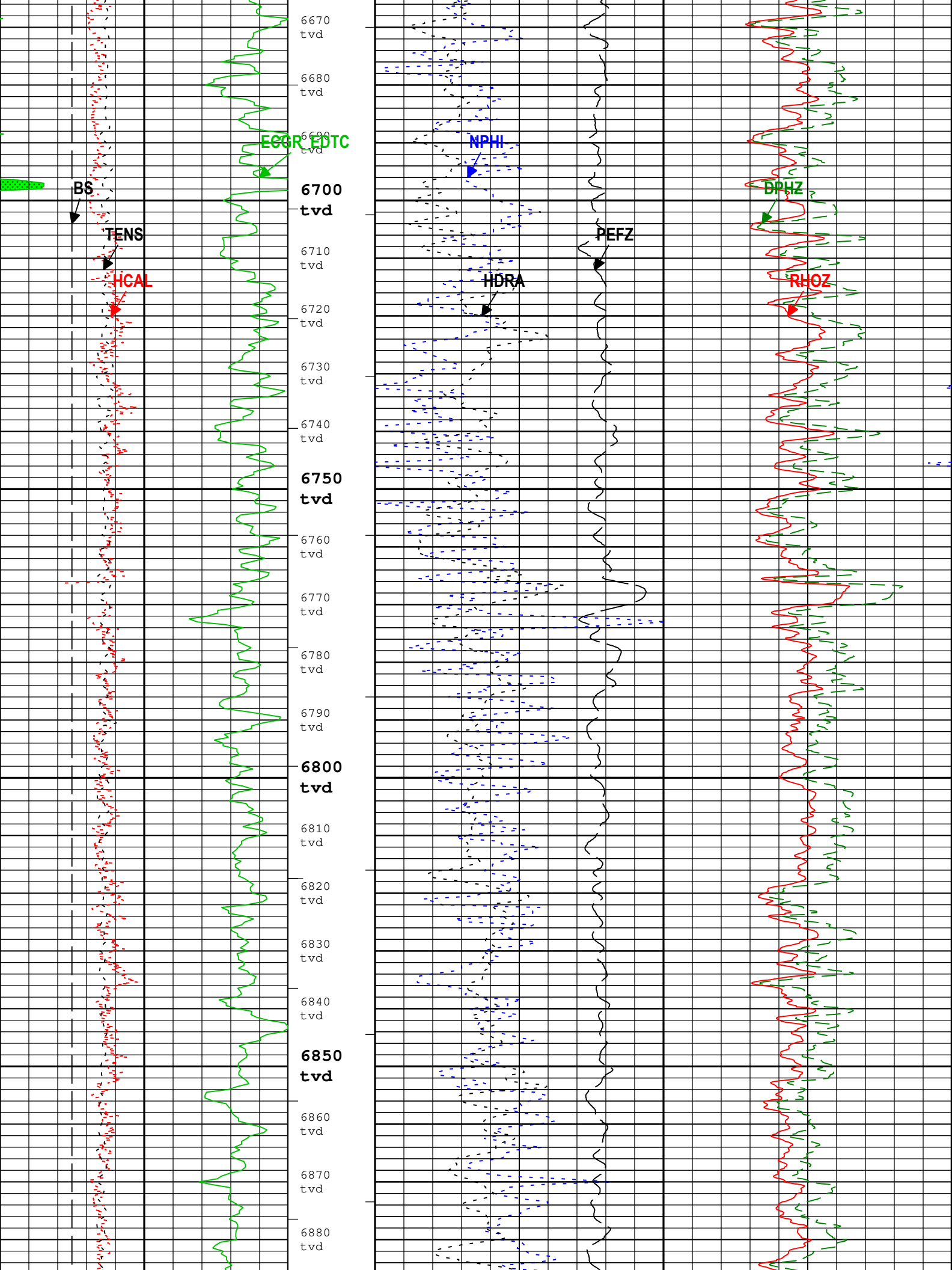
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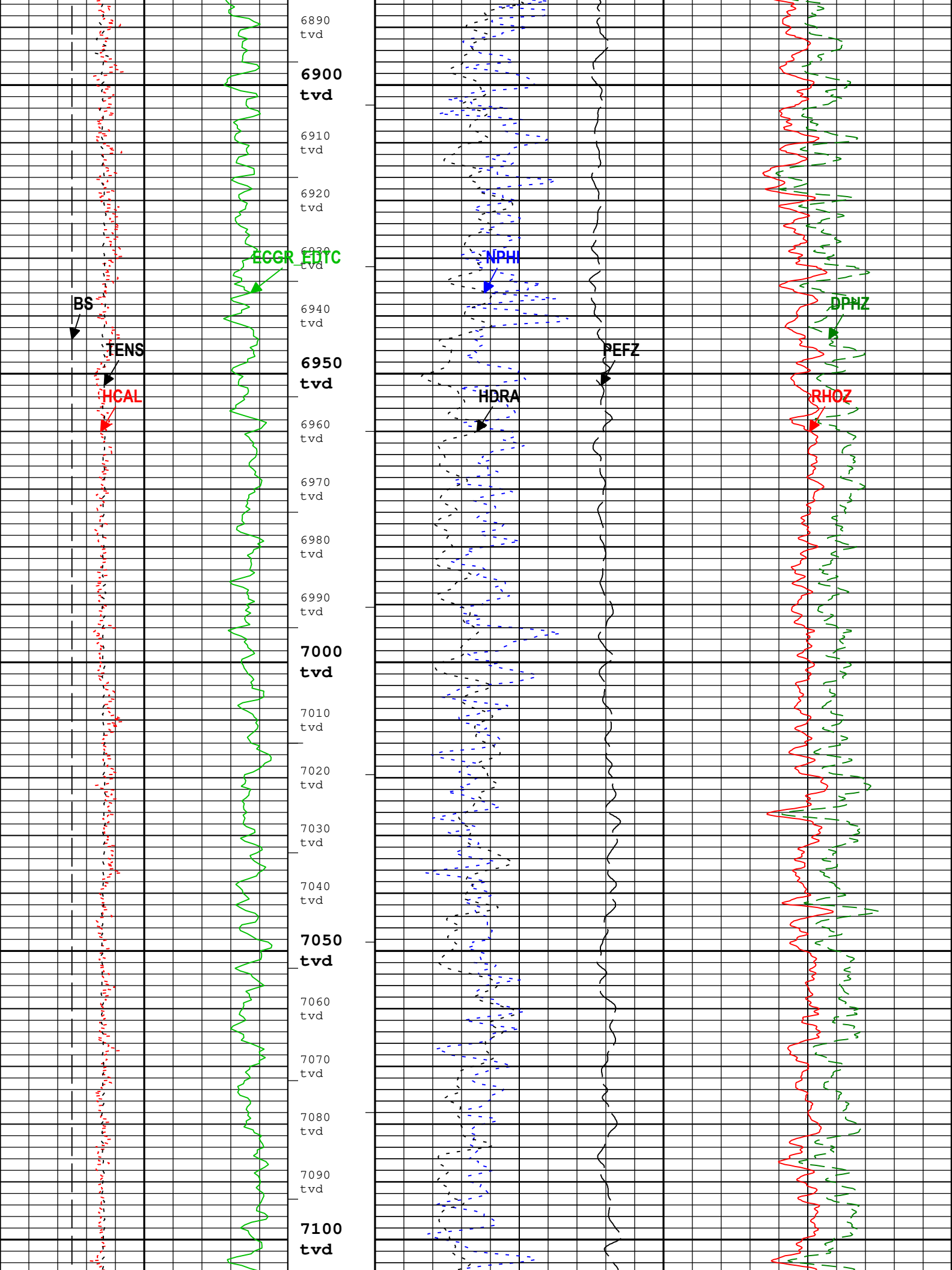
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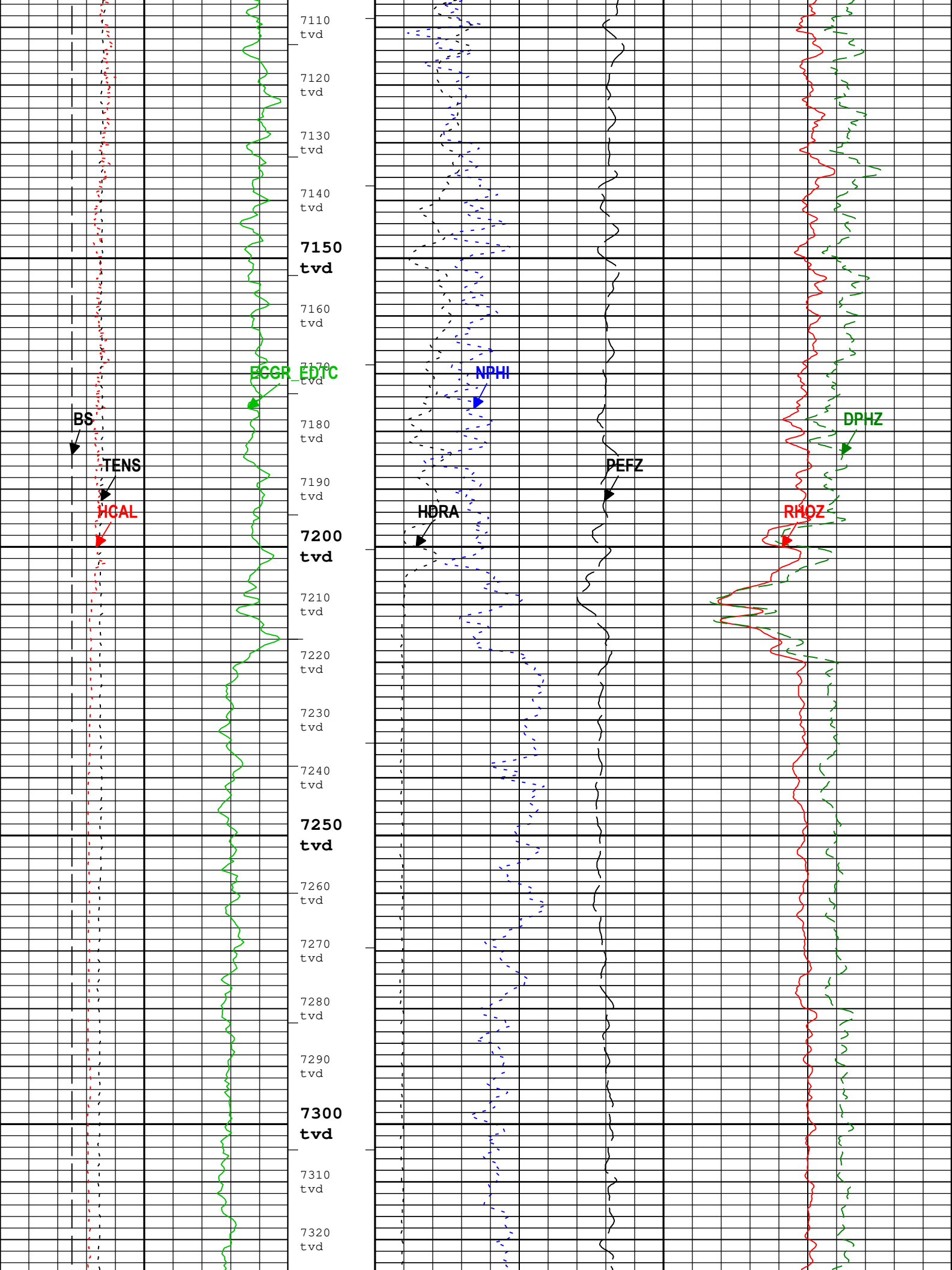
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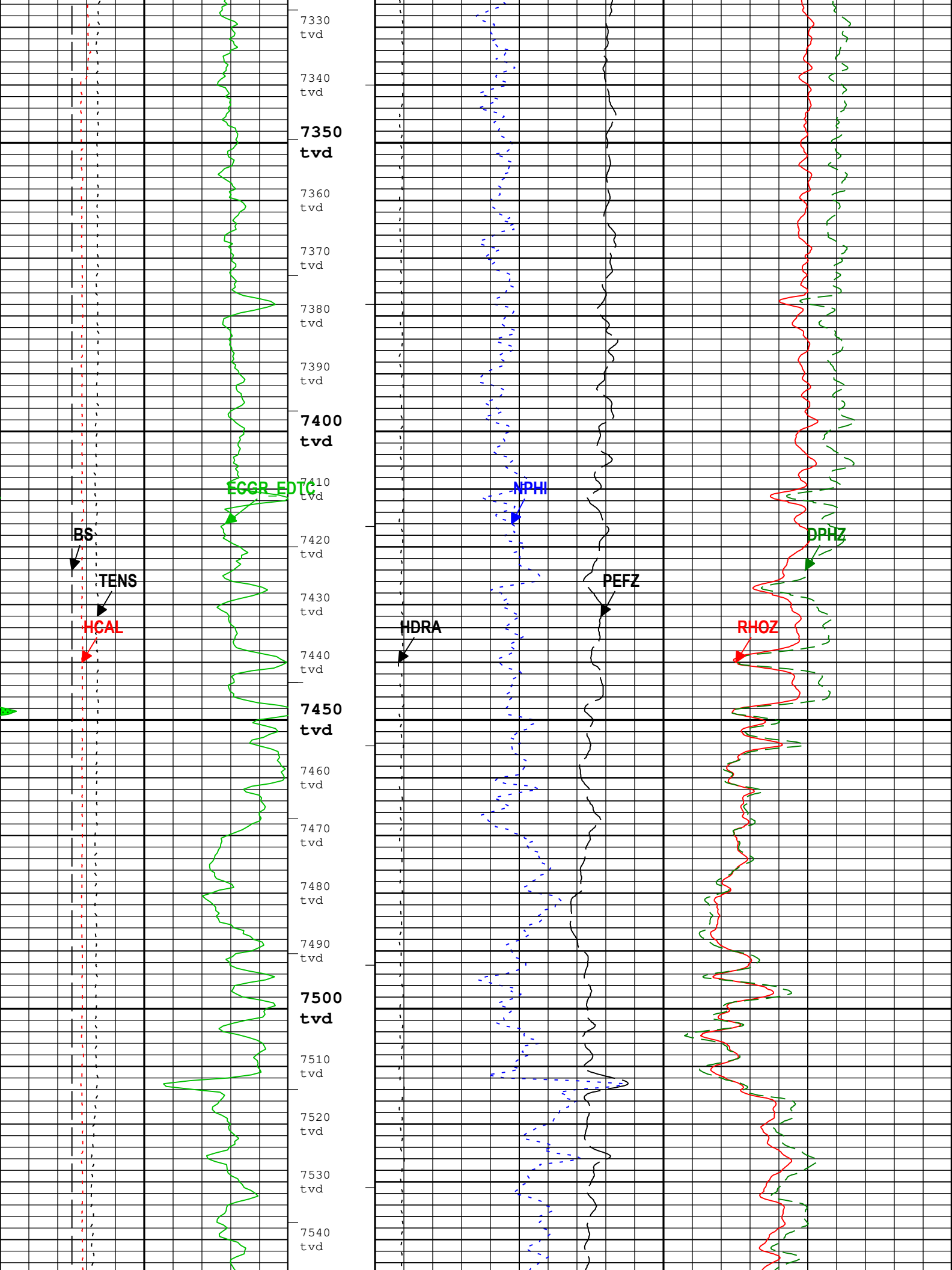
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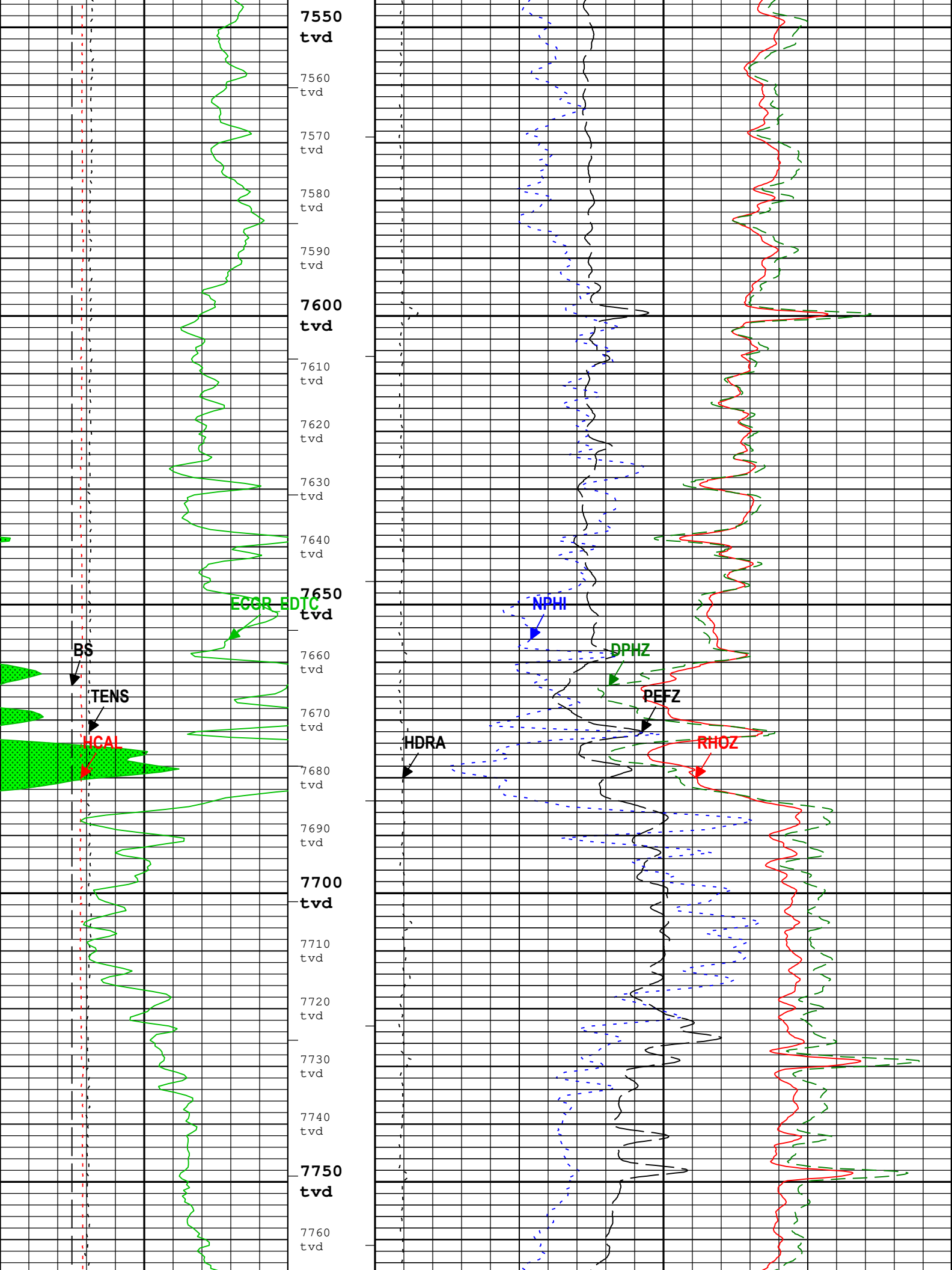
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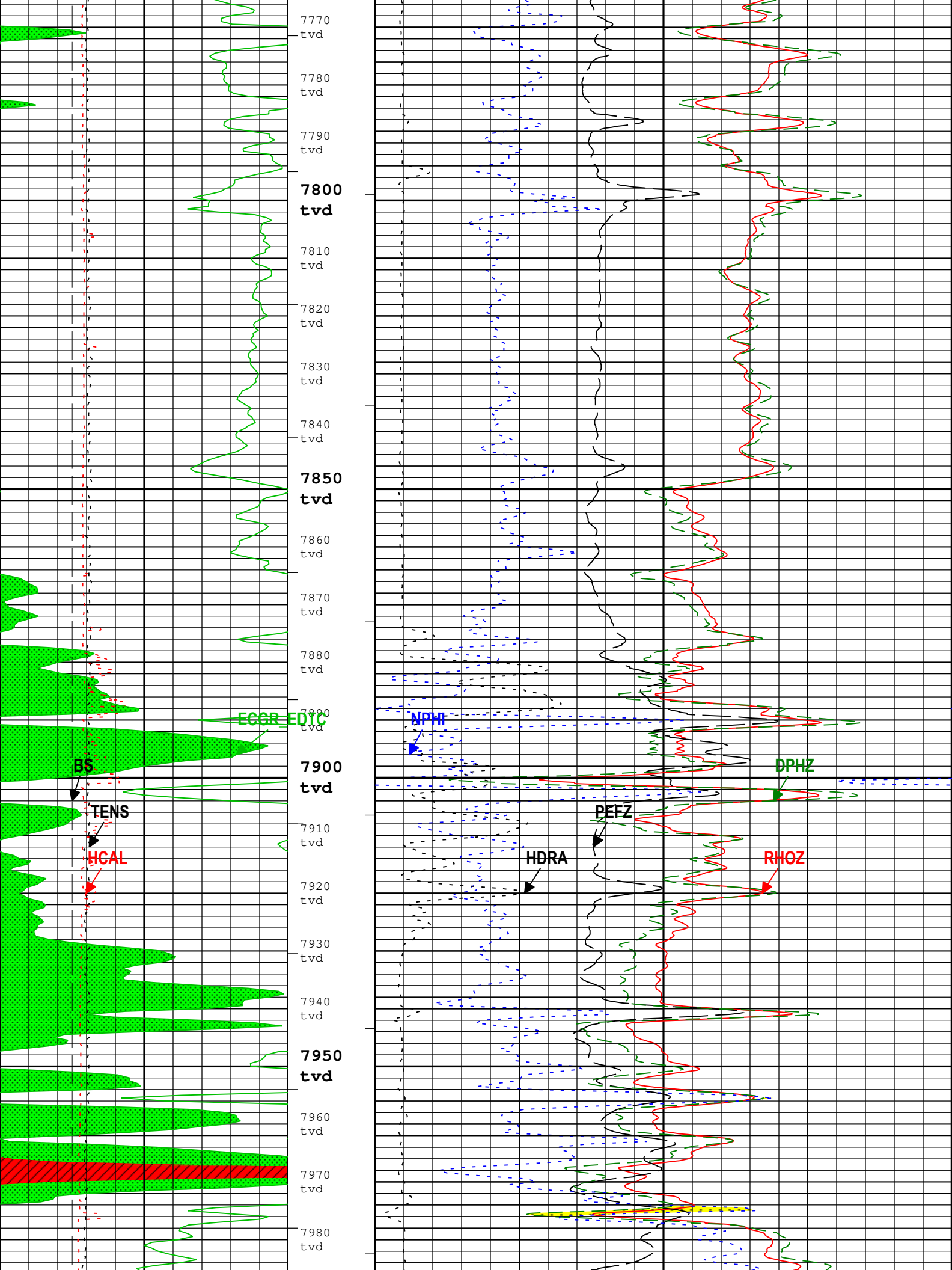
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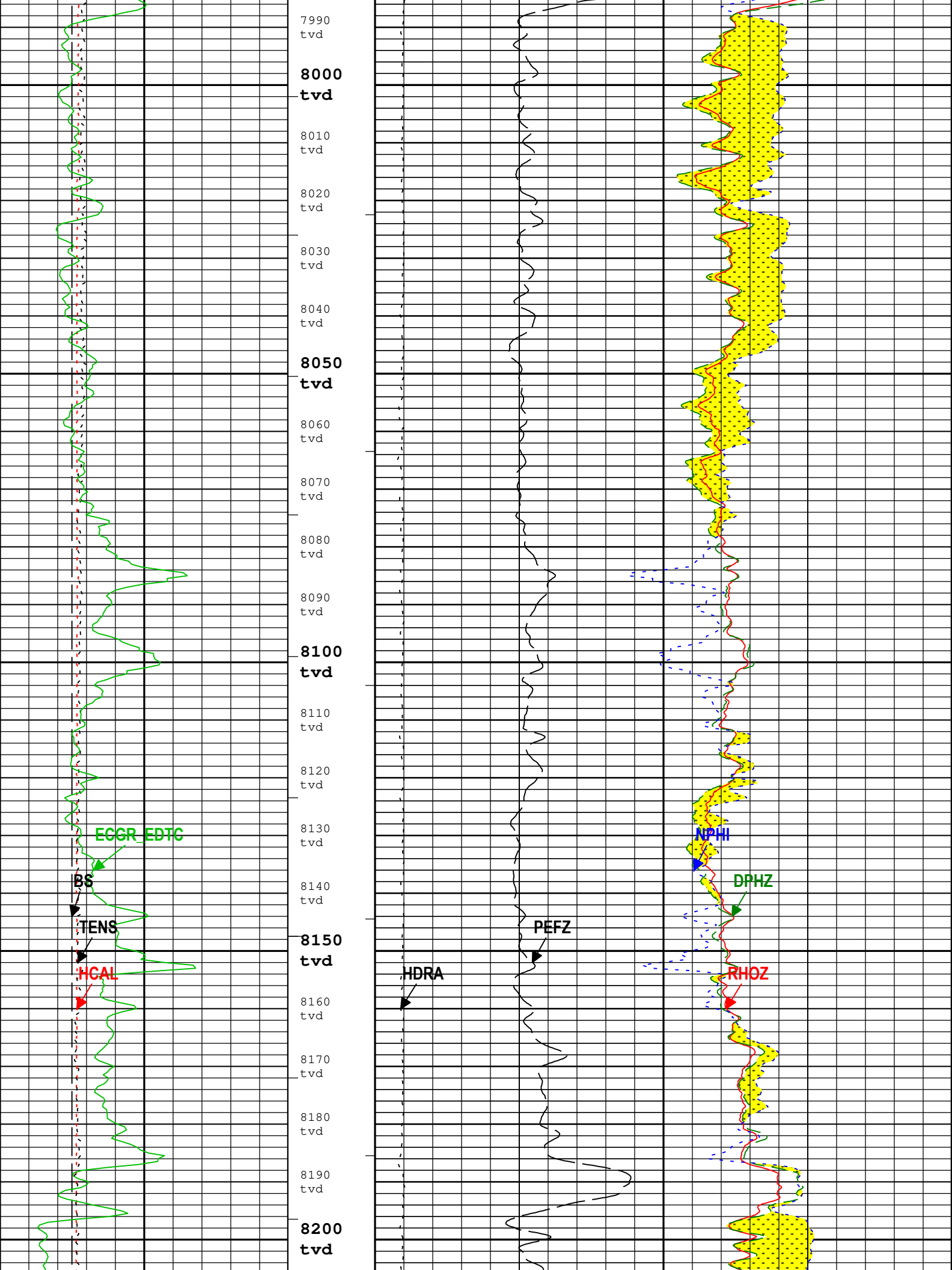
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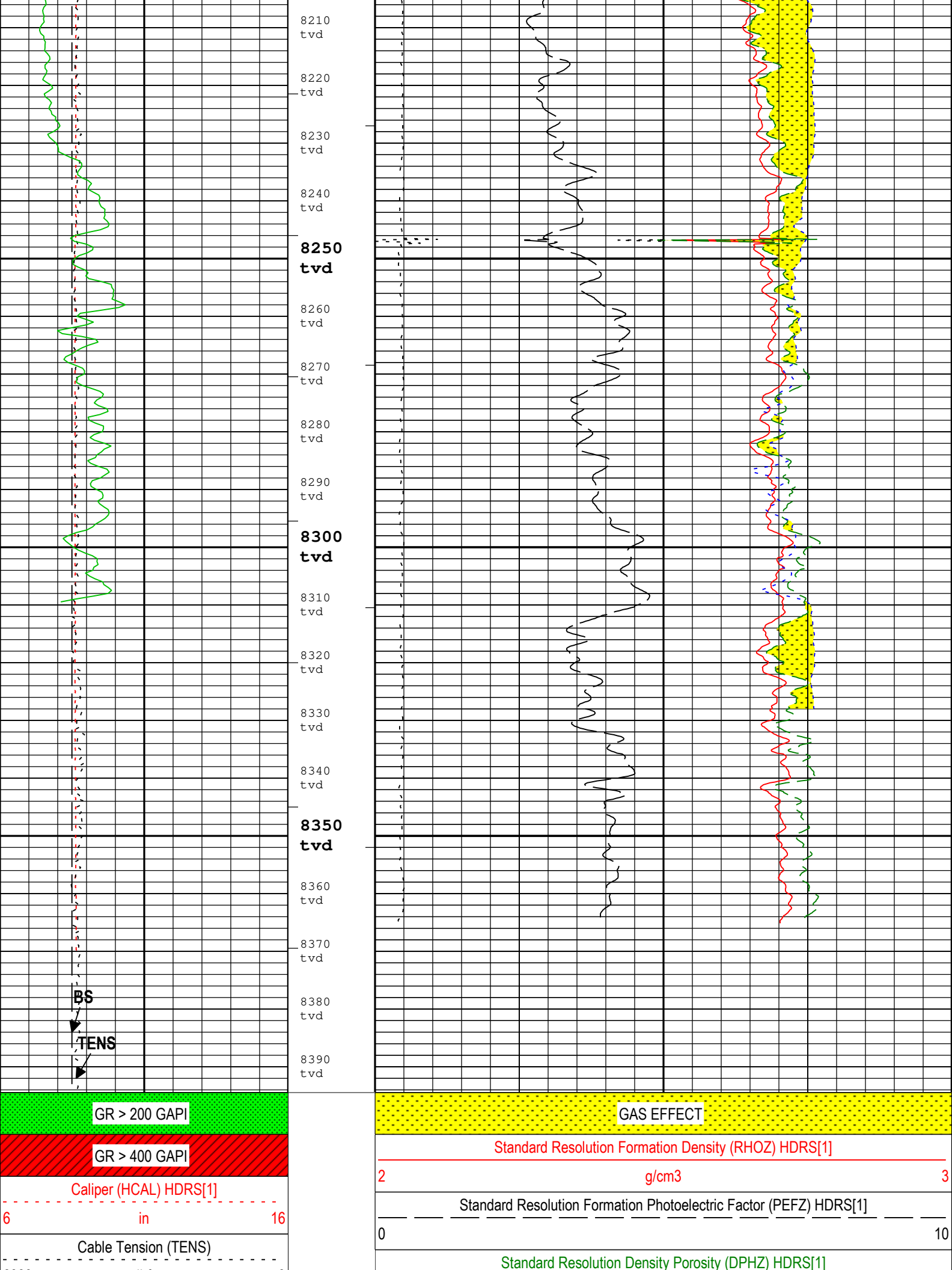
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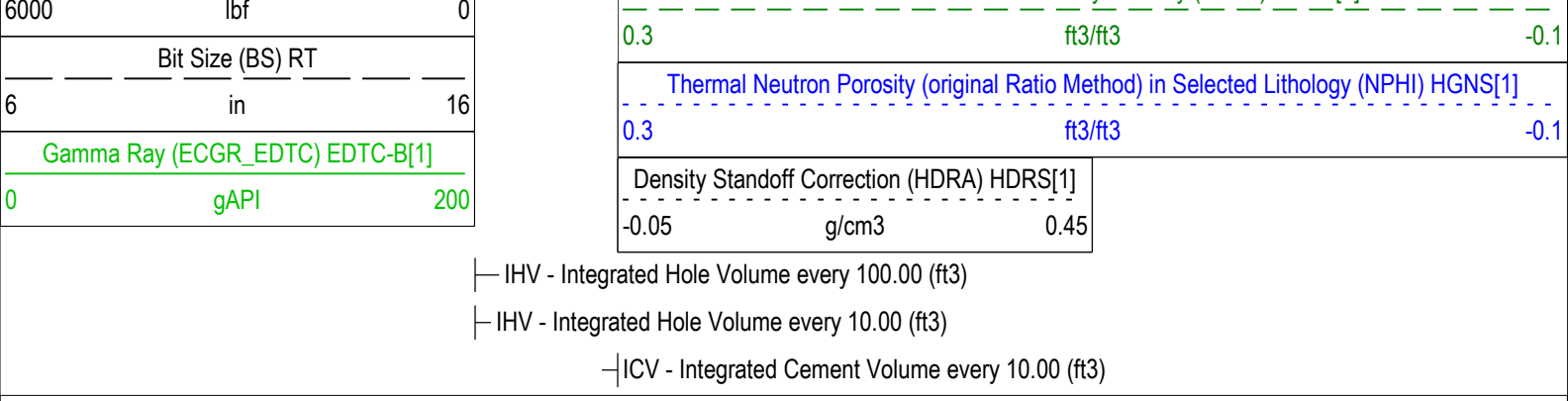


Description: Triple Combo standard resolution template for Platform Express Format: Log (BRADFORD NUC) Index Scale: 5 in per 100 ft Index Unit: ft
Index Type: TVD Creation Date: 18-Apr-2019 11:52:12

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	Open	
BS	Bit Size	WLSESSION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.446	in
CBLO	Casing Bottom (Logger)	WLSESSION	2543	ft
CDEN	Cement Density	EDTC-B	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	9.625	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.5	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DHC	Density Hole Correction	HDRS-H	Bit Size	
FCD	Future Casing (Outer) Diameter	WLSESSION	5.5	in
FD	Fluid Density	Borehole	1	g/cm3
GCLF	Coal-Like Formation	HDRS-H	No	
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	
GR_MULTIPLIER	Gamma Ray Multiplier	EDTC-B	1	
HVCS	Integrated Hole Volume Caliper Selection	Borehole	Compute Area from GHD	
IHVC	Integrated Hole Volume Control	Borehole	Start	
MATR	Rock Matrix for Neutron Porosity Corrections	Borehole	LIMESTONE	
MDEN	Matrix Density for Density Porosity	Borehole	2.71	g/cm3
NACO	Neutron Activation Correction	HDRS-H	Off	
NPRM	HRDD Nuclear Processing Mode	HDRS-H	Time Zoned	
NTCO	HRDD Nuclear Temperature Correction Option	HDRS-H	On	
SOCN	Standoff Distance	EDTC-B	0.125	in
SOCO	Standoff Correction Option	EDTC-B	No	
TPOS_EDTC	Tool Position: Centered or Eccentered	EDTC-B	Eccentered	

1ADepth Zoned Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	12.25	2524.99	2542.91
BS	8.5	2542.91	8394.74

All depth are actual.

1ATime Zoned Parameters

Pass Log[2]:Up

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
NPRM	High Resolution	15-Apr-2019 07:56:46	15-Apr-2019 08:17:05	8396.33	8272.33

Pass Log[8]:Up

NPRM	Standard Resolution	15-Apr-2019 10:06:38	15-Apr-2019 10:51:09	8272.33	8084.83

Pass Log[9]:Up

NPRM	Standard Resolution	15-Apr-2019 11:04:41	15-Apr-2019 16:11:56	8084.83	2500.83

All depth are at tool zero.

Tool Control Parameters

1A: Parameters

Parameter	Description	Tool	Value	Unit
HRGD_BOARD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	1800	ft/h
NDTC	Nuclear Dead Time Correction	HDRS-H	On	
NPUC	Nuclear Pile-Up Correction	HDRS-H	Off	
STSO_HRDD	Temporary Source for the Density Algorithm	HDRS-H	HET data channel	

1A

REPEAT PASS 5"=100'

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
IHV	Integrated Hole Volume	GCSE_UP_PASS	280.61	ft3
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	163.64	ft3

Software Version

Acquisition System	Version
Maxwell 2019	9.0.106845.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
1A	Log[10]:Up	Up	7693.14 ft	8410.89 ft	15-Apr-2019 4:41:25 PM	15-Apr-2019 5:26:23 PM	ON	10.94 ft	Yes

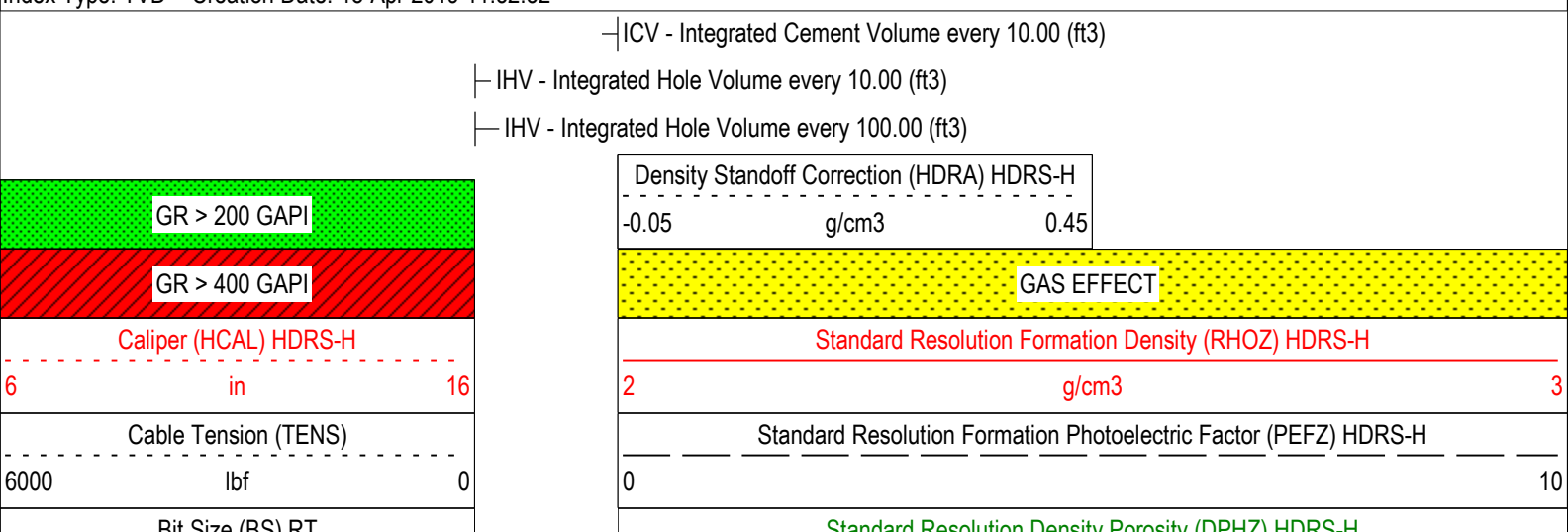
All depths are referenced to toolstring zero

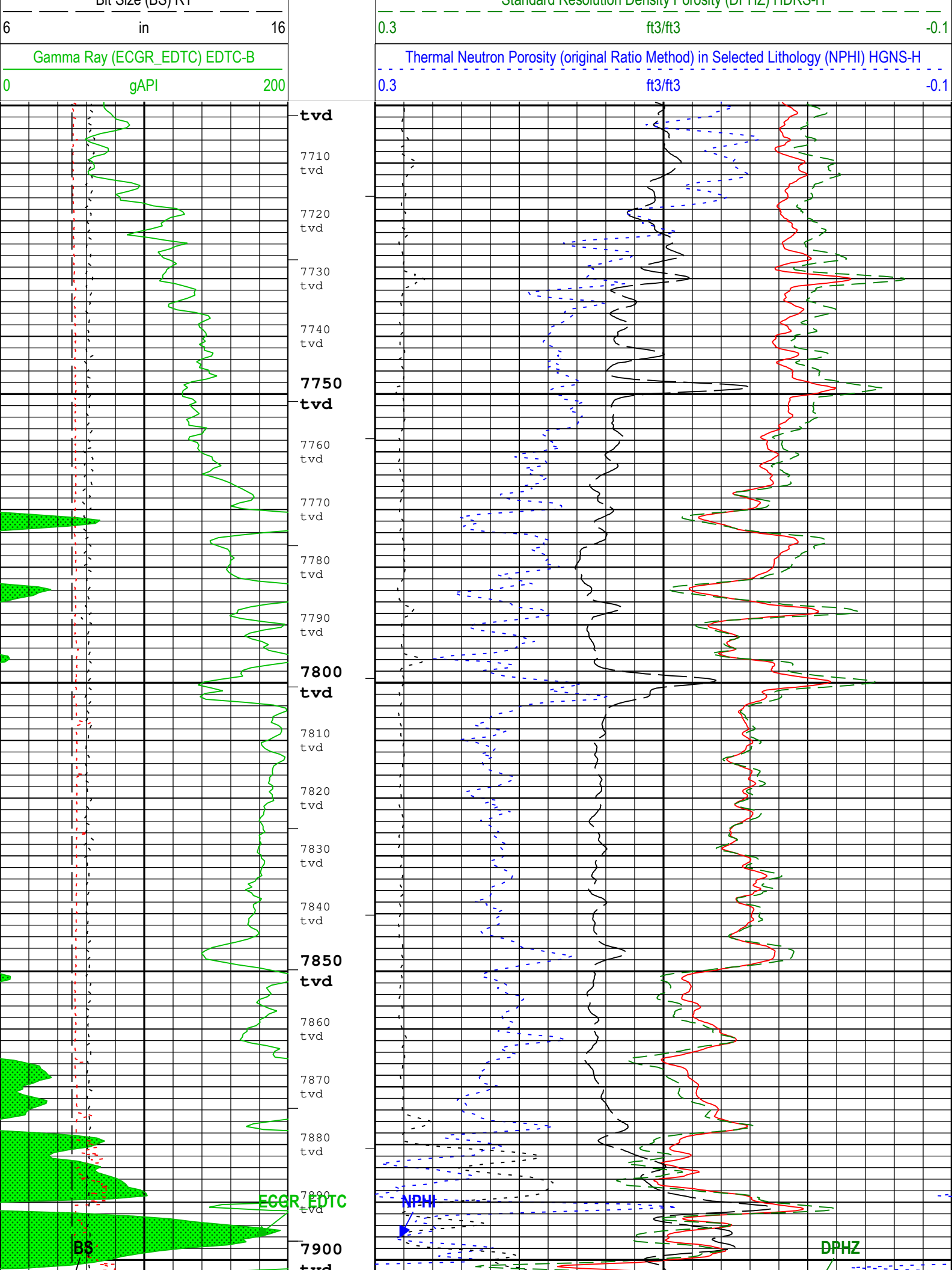
Log

Company:North East Natural Energy LLC Well:Boggess 17H

1A: Log[10]:Up:S024

Description: Triple Combo standard resolution template for Platform Express Format: Log (BRADFORD NUC) Index Scale: 5 in per 100 ft Index Unit: ft
Index Type: TVD Creation Date: 18-Apr-2019 11:52:32




Bit Size (BS) R1
6
in
16
Standard Resolution Density Porosity (DPHZ) HDRS-H
0.3
ft3/ft3
-0.1
Gamma Ray (ECGR_EDTC) EDTC-B
0
gAPI
200
Thermal Neutron Porosity (original Ratio Method) in Selected Lithology (NPHI) HGNS-H
0.3
ft3/ft3
-0.1
tvd
7710 tvd
7720 tvd
7730 tvd
7740 tvd
7750 tvd
7760 tvd
7770 tvd
7780 tvd
7790 tvd
7800 tvd
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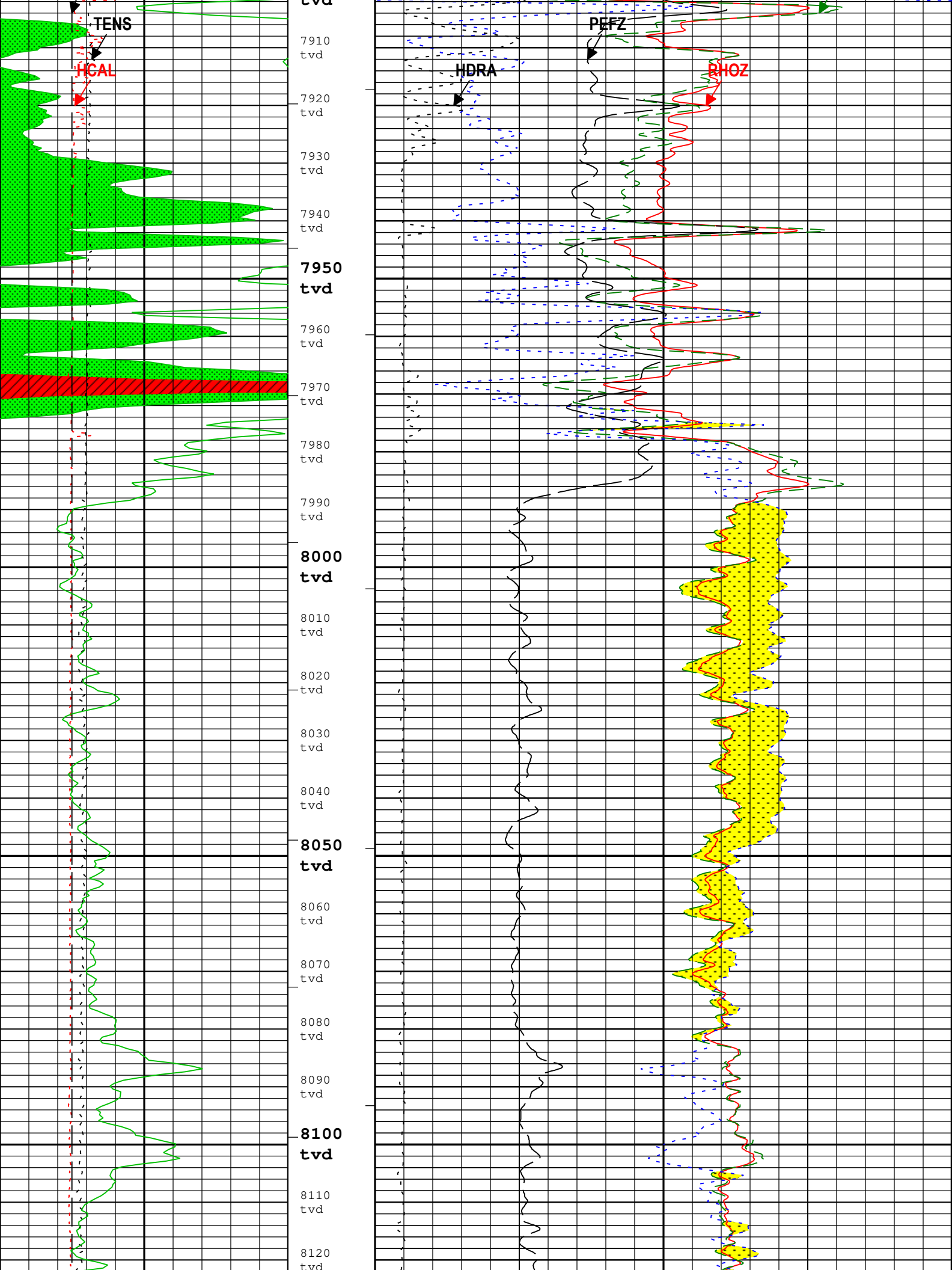
DPHZ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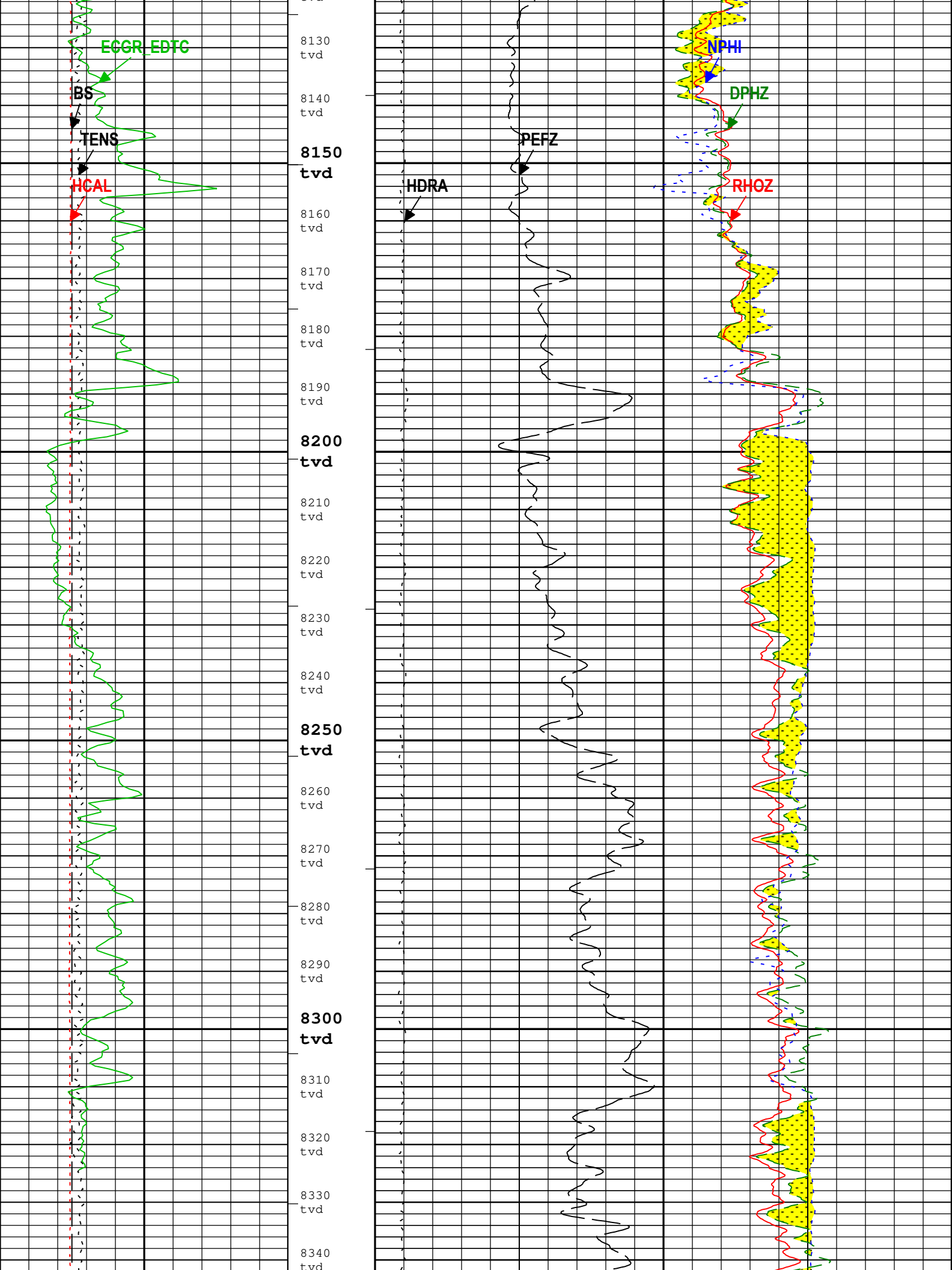
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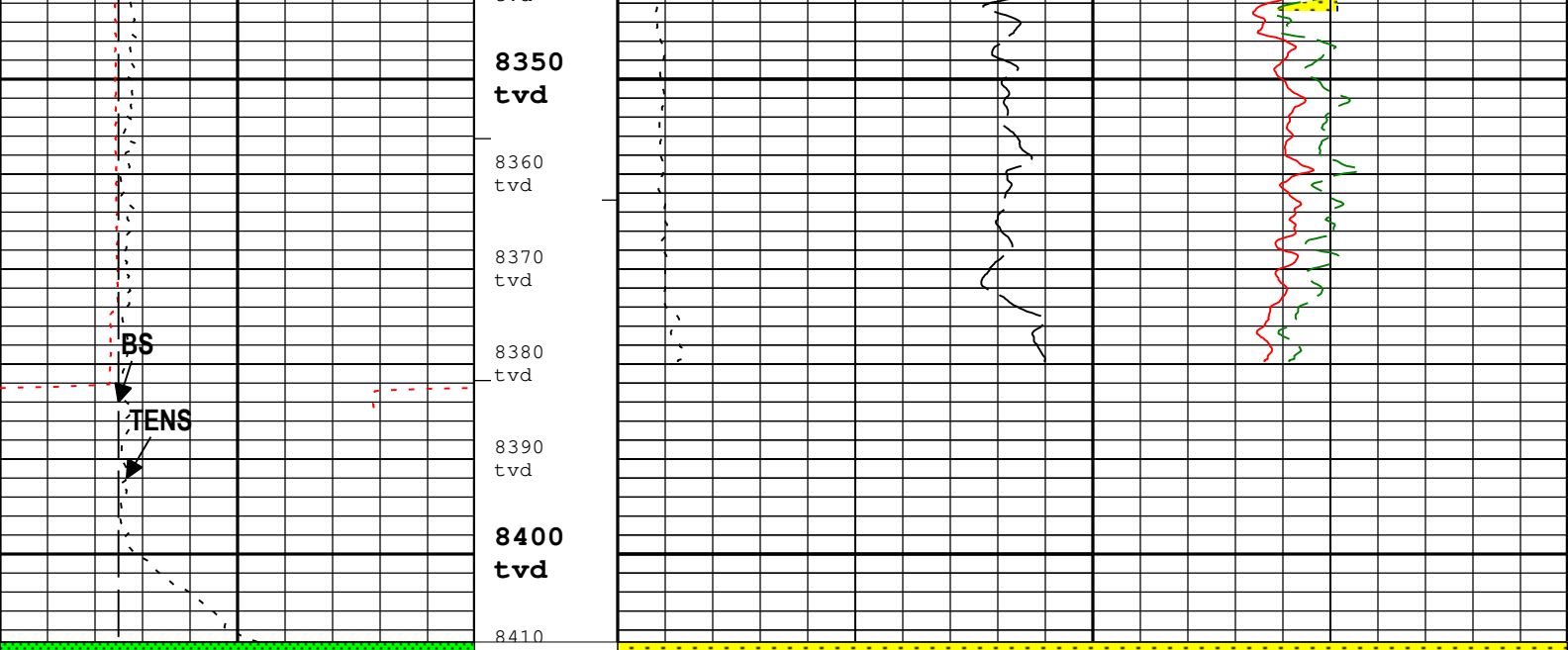


GR > 200 GAPI

GR > 400 GAPI

Caliper (HCAL) HDRS-H

6 in 16

Cable Tension (TENS)

6000 lbf 0

Bit Size (BS) RT

6 in 16

Gamma Ray (ECGR_EDTC) EDTC-B

0 gAPI 200

GAS EFFECT

Standard Resolution Formation Density (RHOZ) HDRS-H

2 g/cm3 3

Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H

0 10

Standard Resolution Density Porosity (DPHZ) HDRS-H

0.3 ft3/ft3 -0.1

Thermal Neutron Porosity (original Ratio Method) in Selected Lithology (NPHI) HGNS-H

0.3 ft3/ft3 -0.1

Density Standoff Correction (HDRA) HDRS-H

-0.05 g/cm3 0.45

IHV - Integrated Hole Volume every 100.00 (ft3)

IHV - Integrated Hole Volume every 10.00 (ft3)

ICV - Integrated Cement Volume every 10.00 (ft3)

Description: Triple Combo standard resolution template for Platform Express Format: Log (BRADFORD NUC) Index Scale: 5 in per 100 ft Index Unit: ft
Index Type: TVD Creation Date: 18-Apr-2019 11:52:32

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	Open	
BS	Bit Size	WLSESSION	8.5	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.446	in
CBLO	Casing Bottom (Logger)	WLSESSION	2543	ft
CDEN	Cement Density	EDTC-B	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.5	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DHC	Density Hole Correction	HDRS-H	Bit Size	
FCD	Future Casing (Outer) Diameter	WLSESSION	5.5	in
FD	Fluid Density	Borehole	1	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	CALI	
MATR	Rock Matrix for Neutron Porosity Corrections	Borehole	LIMESTONE	
MDEN	Matrix Density for Density Porosity	Borehole	2.71	g/cm3
NPRM	HRDD Nuclear Processing Mode	HDRS-H	High Resolution	

Tool Control Parameters

1A: Parameters

Parameter	Description	Tool	Value	Unit
HRGD_BOARD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	1800	ft/h

1A

MAIN PASS 20"=100'

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
IHV	Integrated Hole Volume	GCSE_UP_PASS	280.61	ft3
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	163.64	ft3

Software Version

Acquisition System	Version
Maxwell 2019	9.0.106845.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
1A	Log[10]:Up	Up	7693.14 ft	8410.89 ft	15-Apr-2019 4:41:25 PM	15-Apr-2019 5:26:23 PM	ON	10.94 ft	Yes

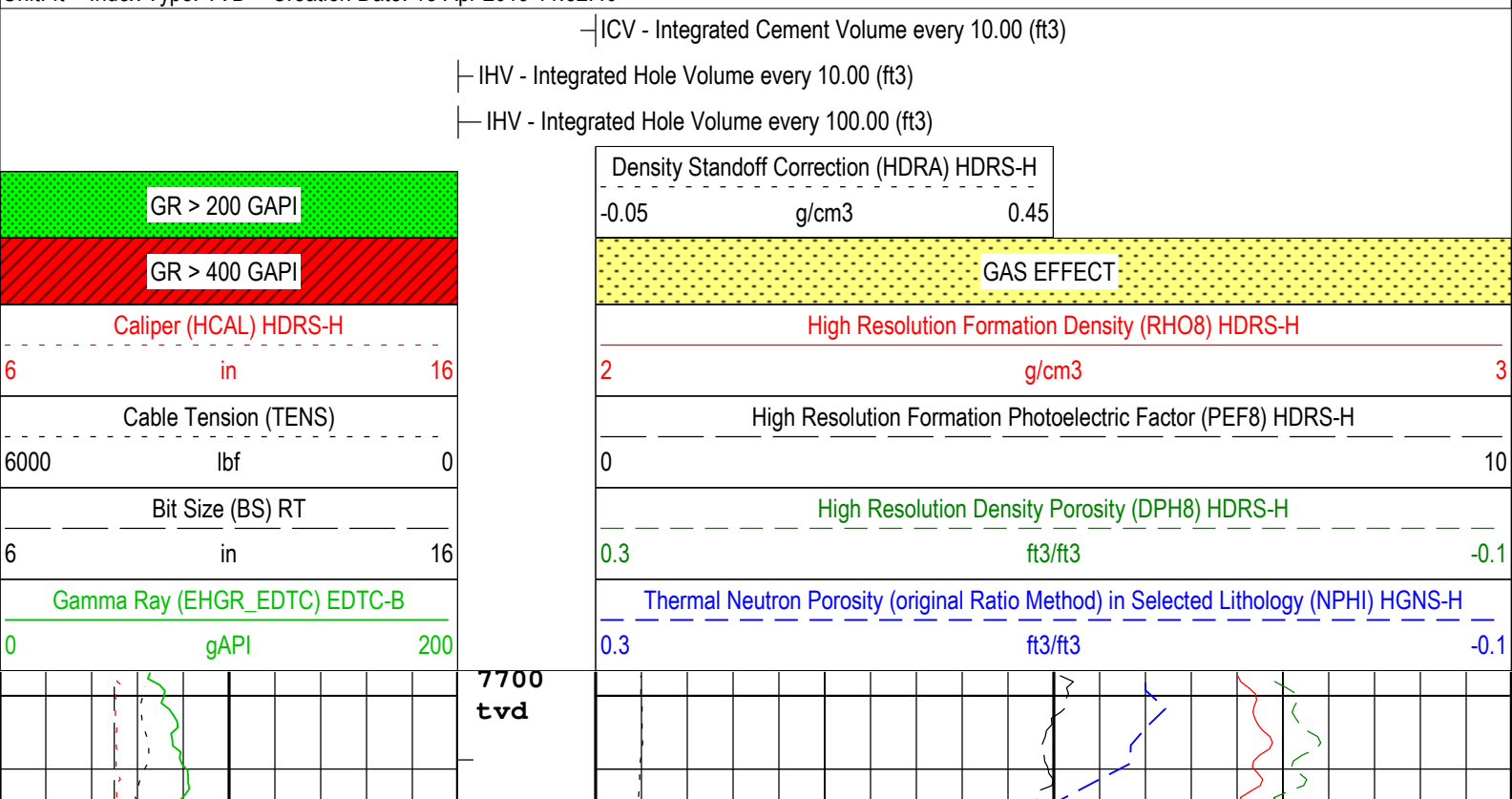
All depths are referenced to toolstring zero

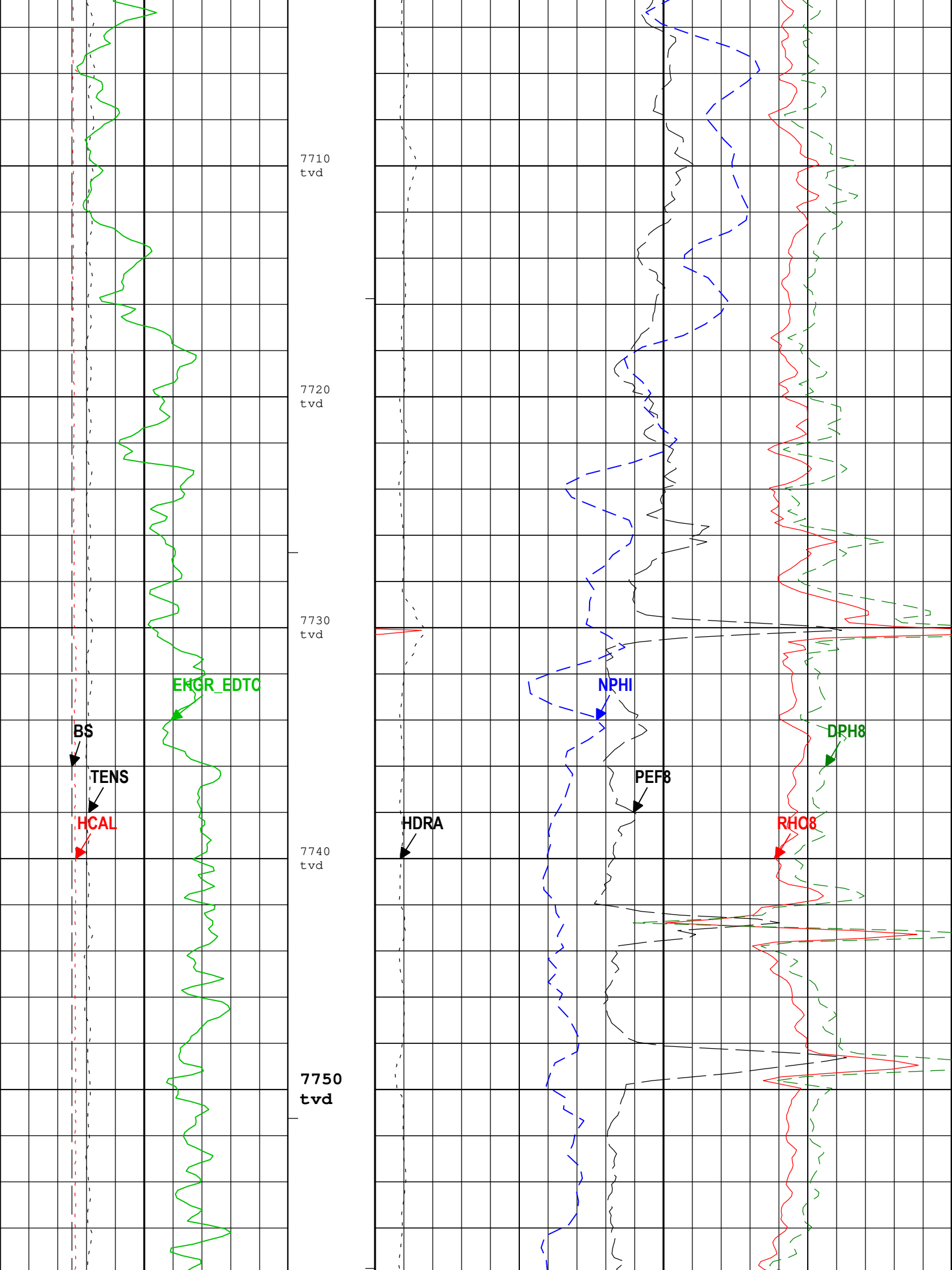
Log

Company:North East Natural Energy LLC Well:Boggess 17H

1A: Log[10]:Up:S024

Description: Triple Combo standard resolution template for Platform Express Format: Log (BRADFORD NUC HIRES) Index Scale: 20 in per 100 ft Index Unit: ft Index Type: TVD Creation Date: 18-Apr-2019 11:52:40

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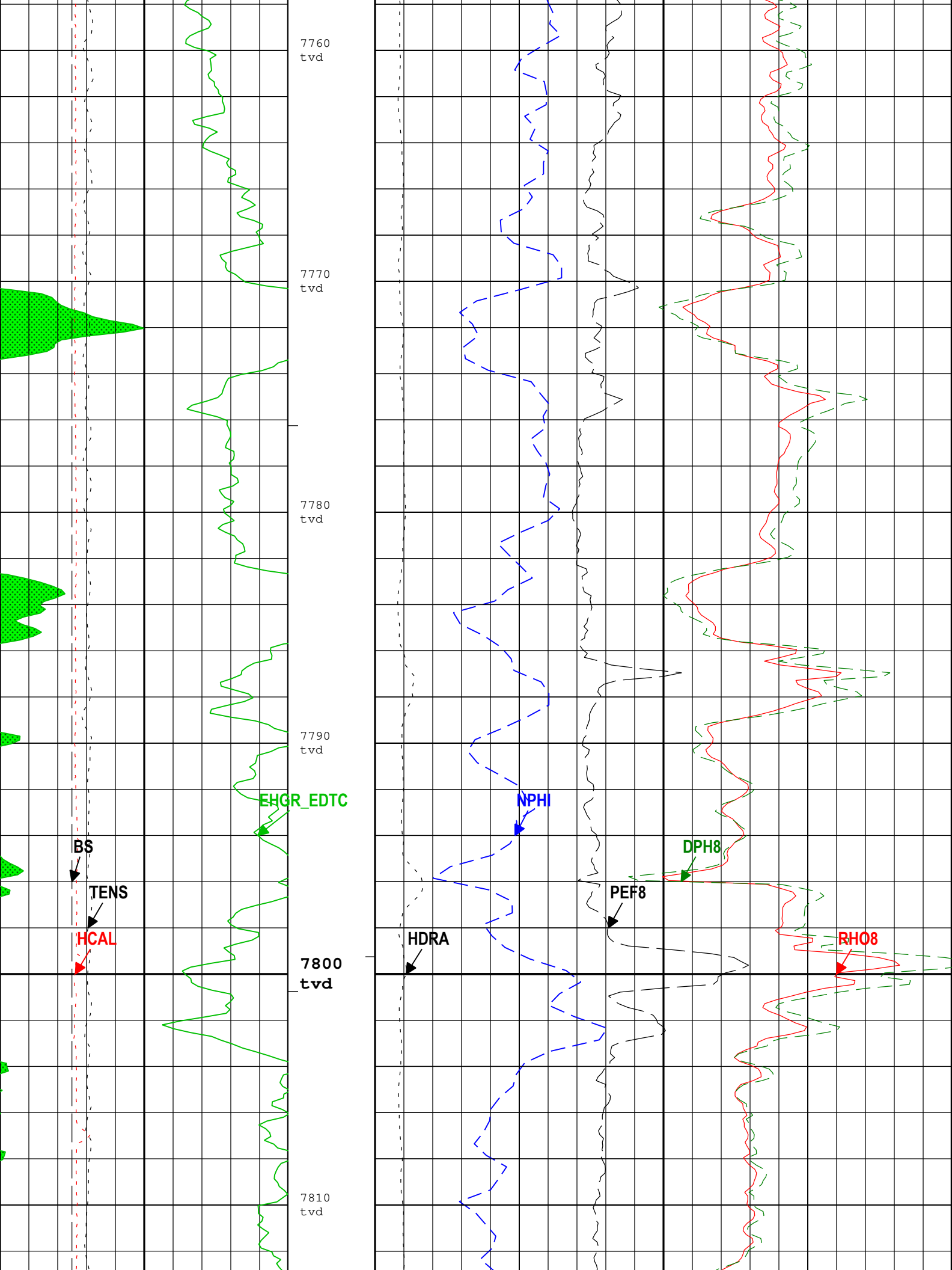
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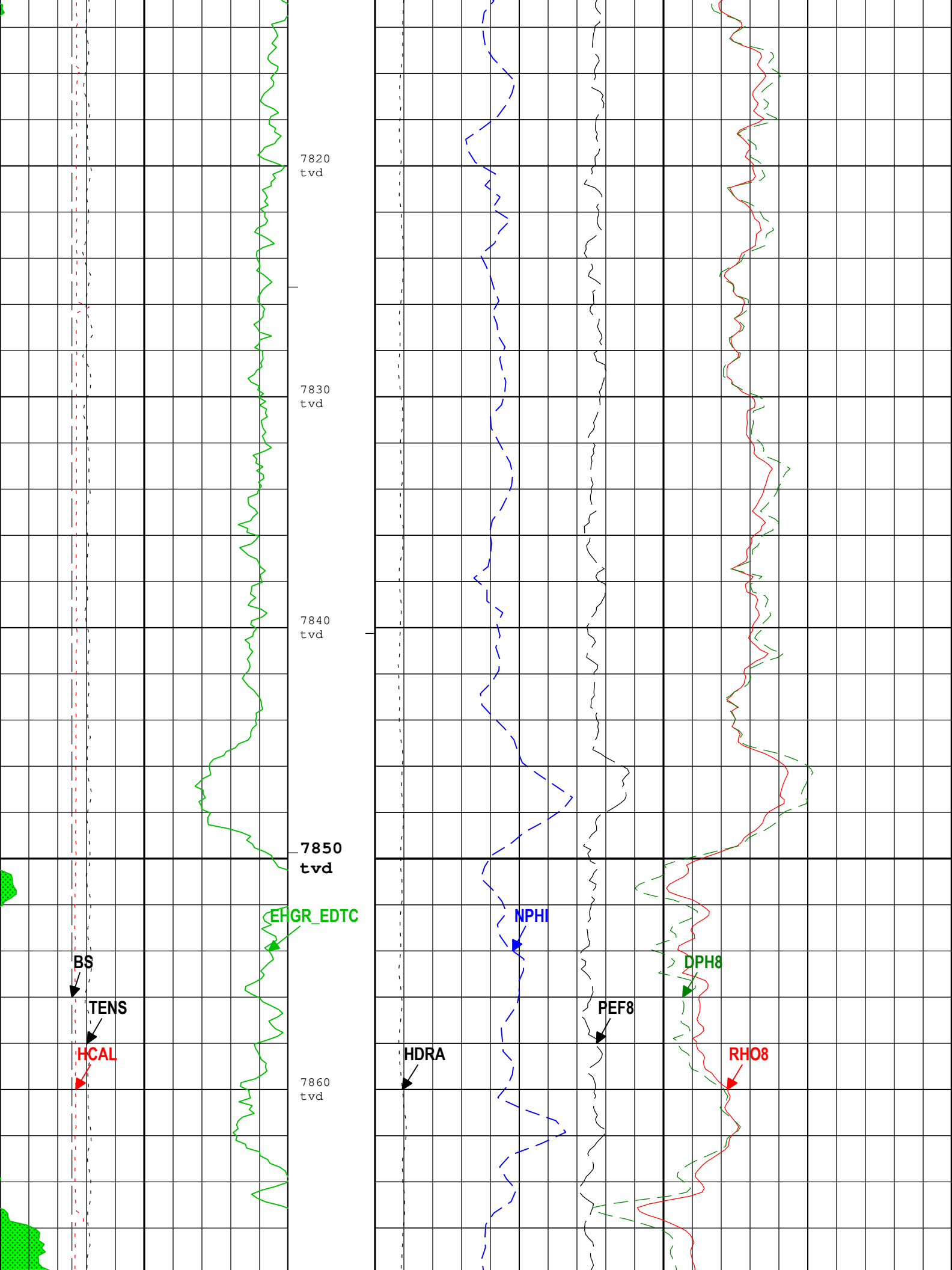
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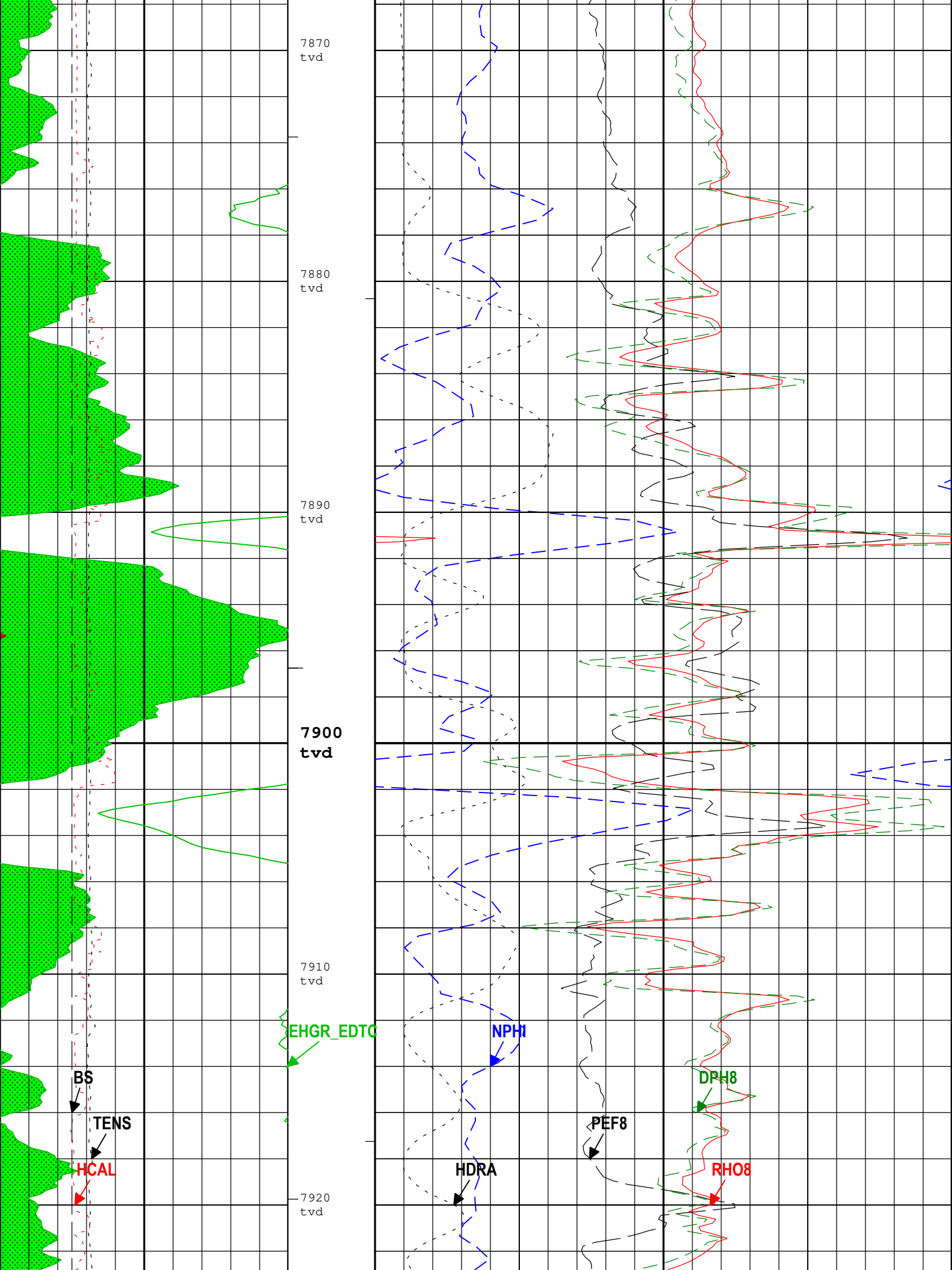
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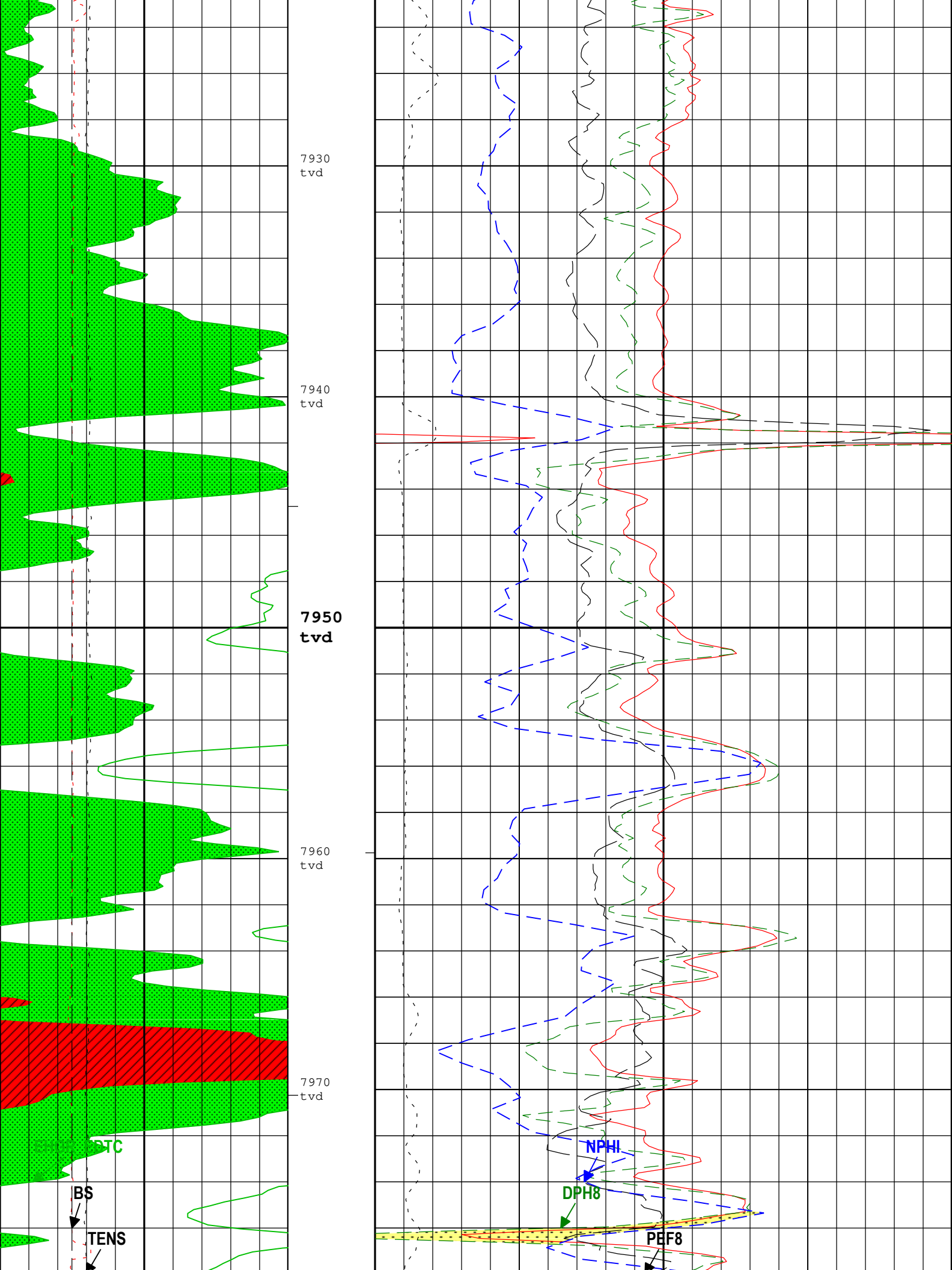
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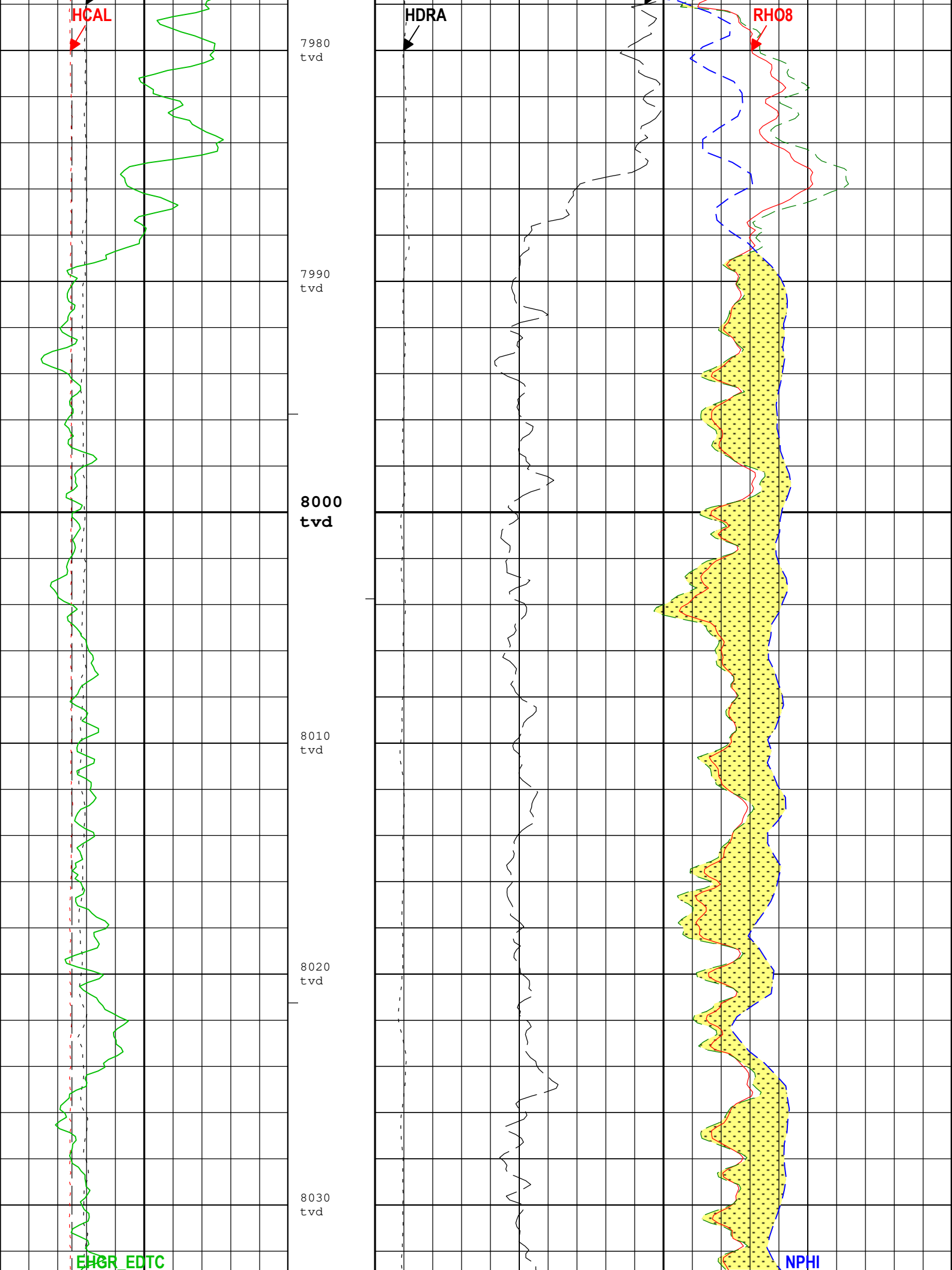
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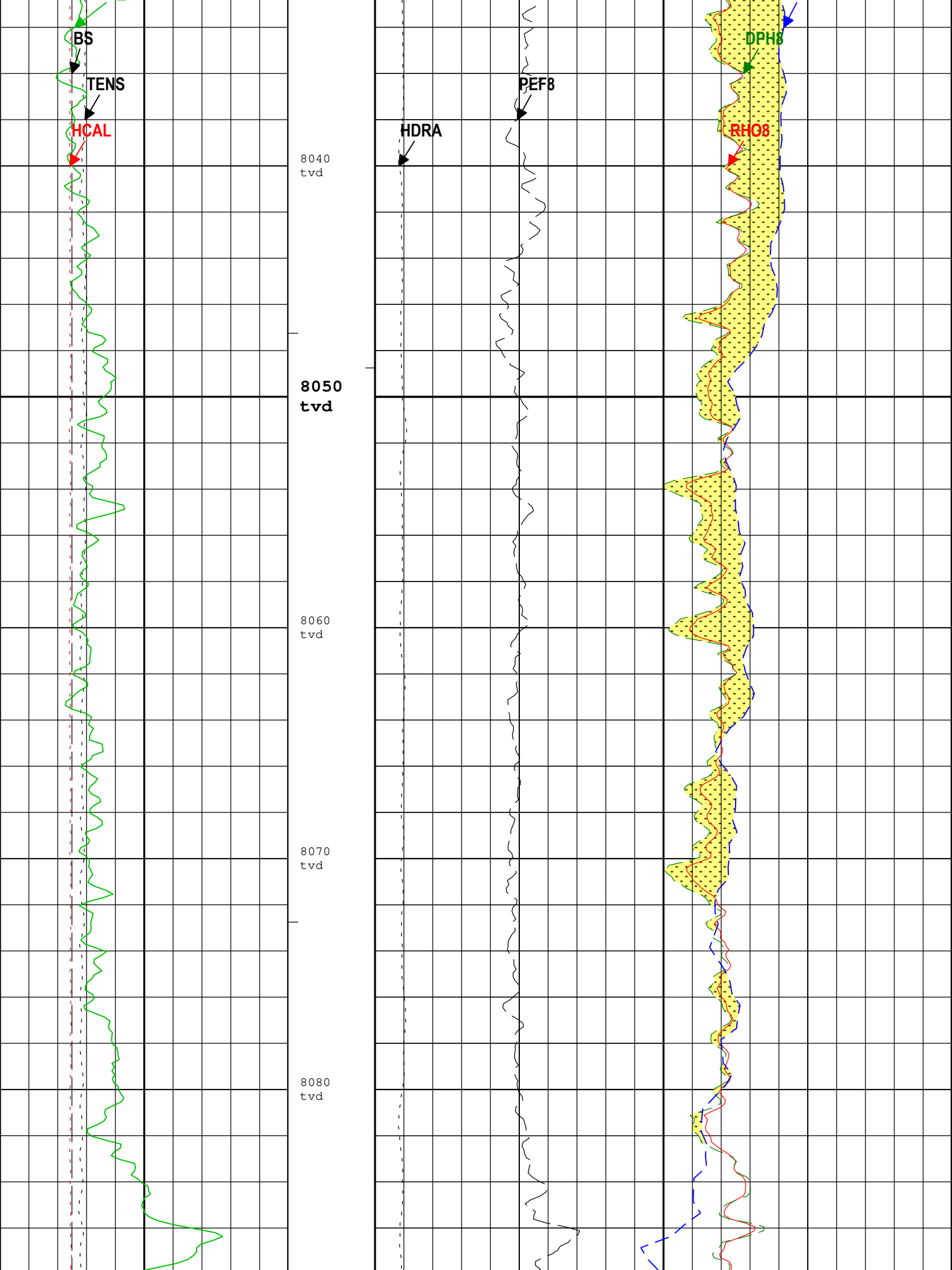
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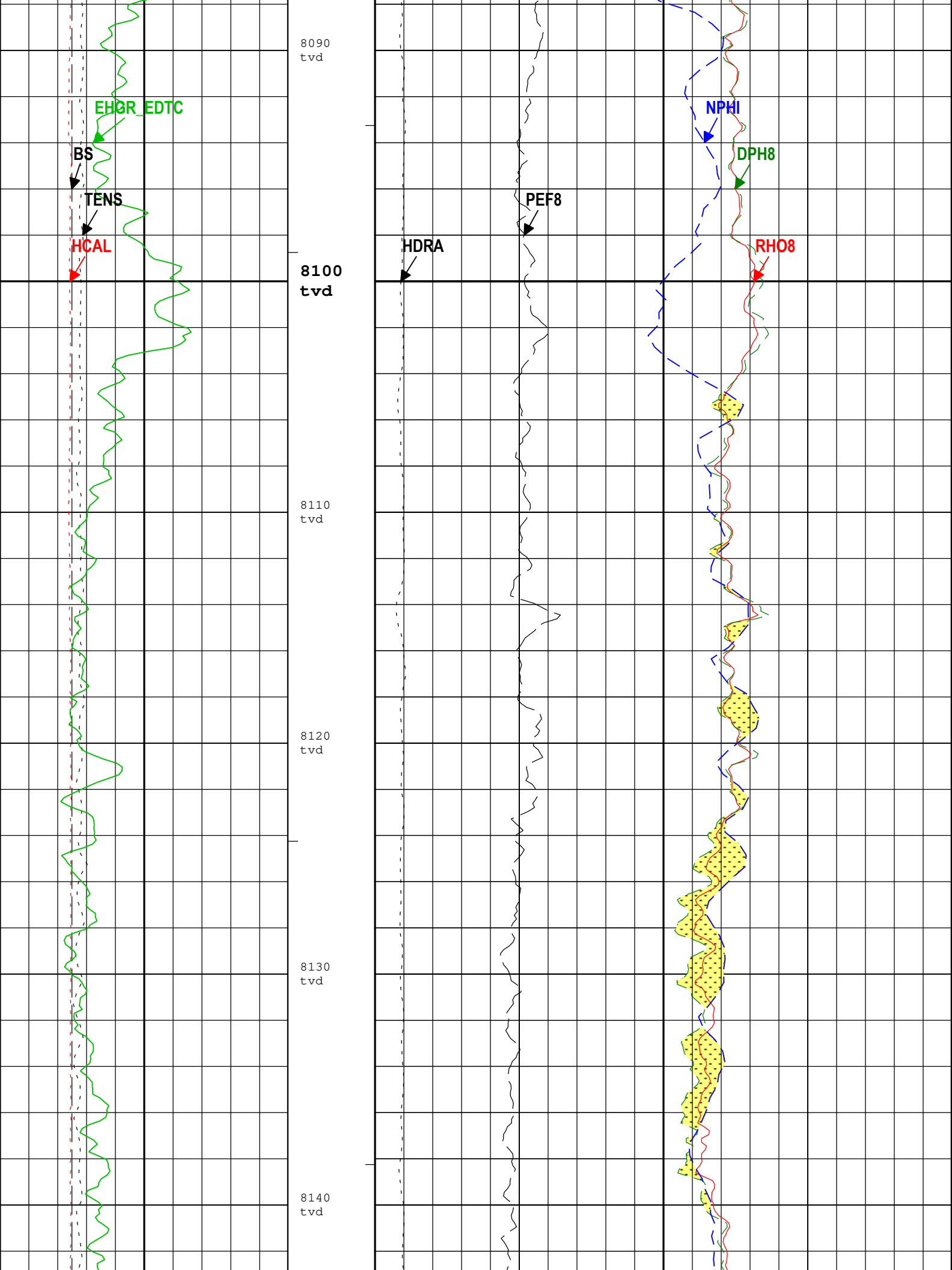
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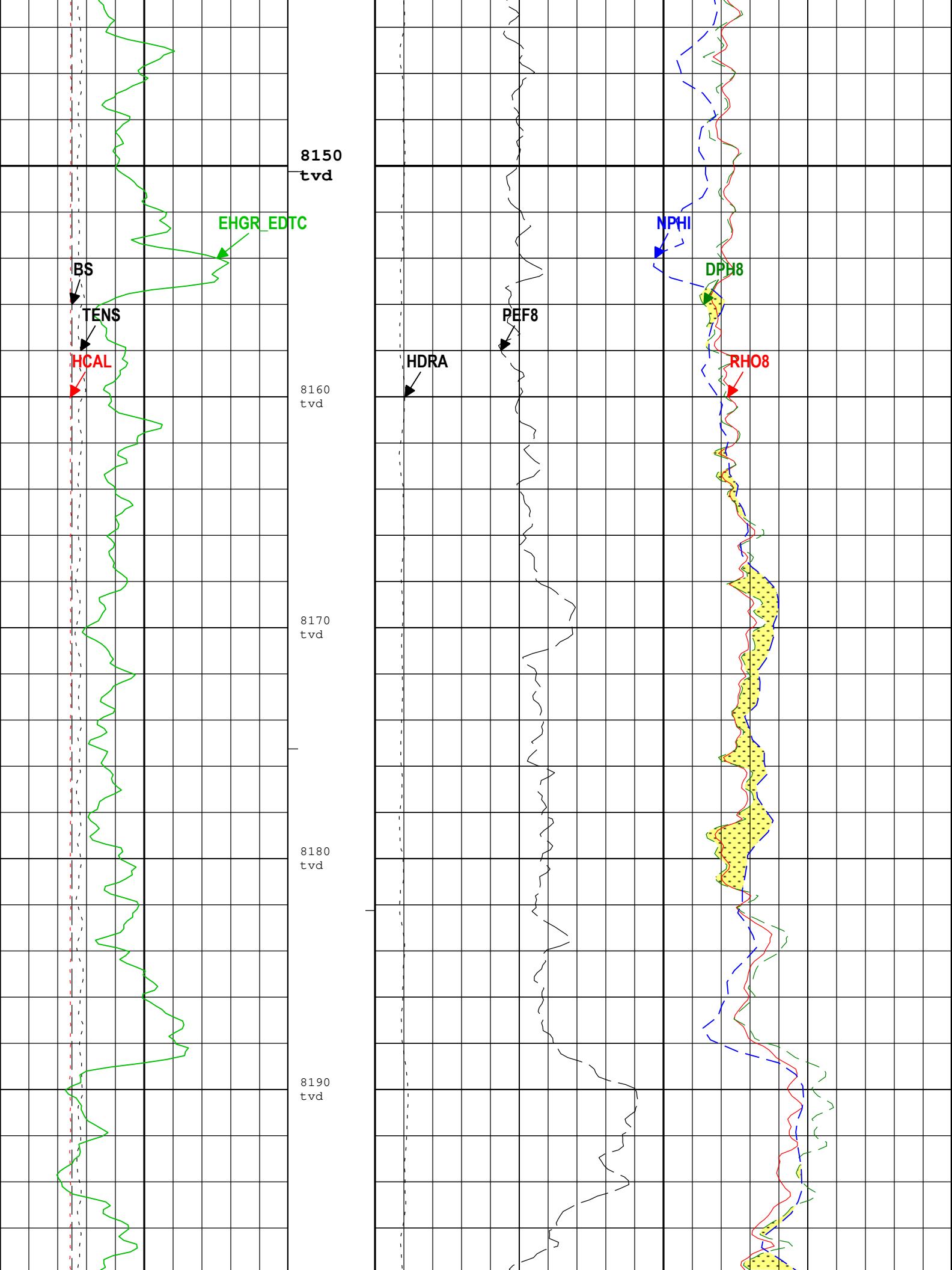
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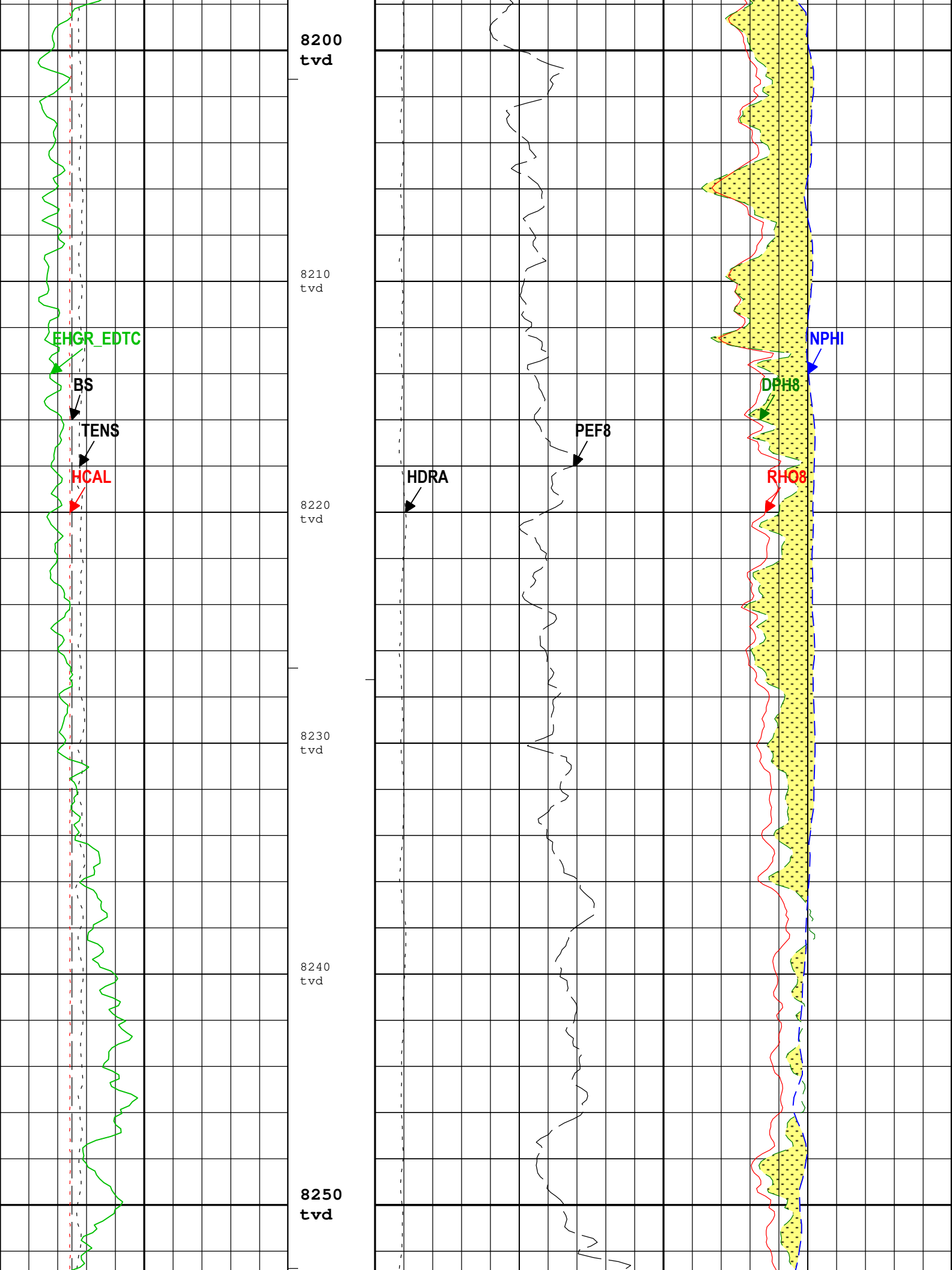
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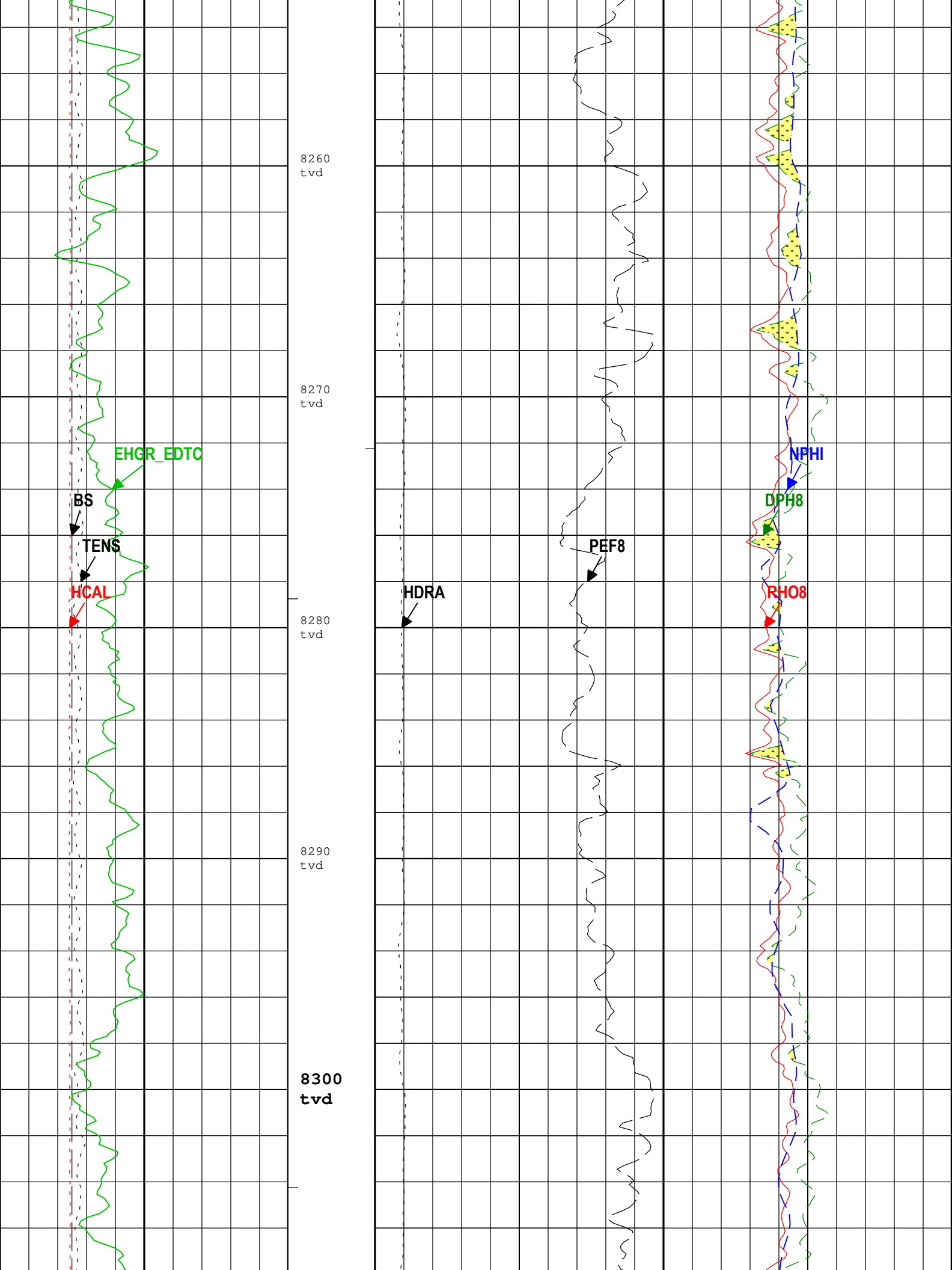
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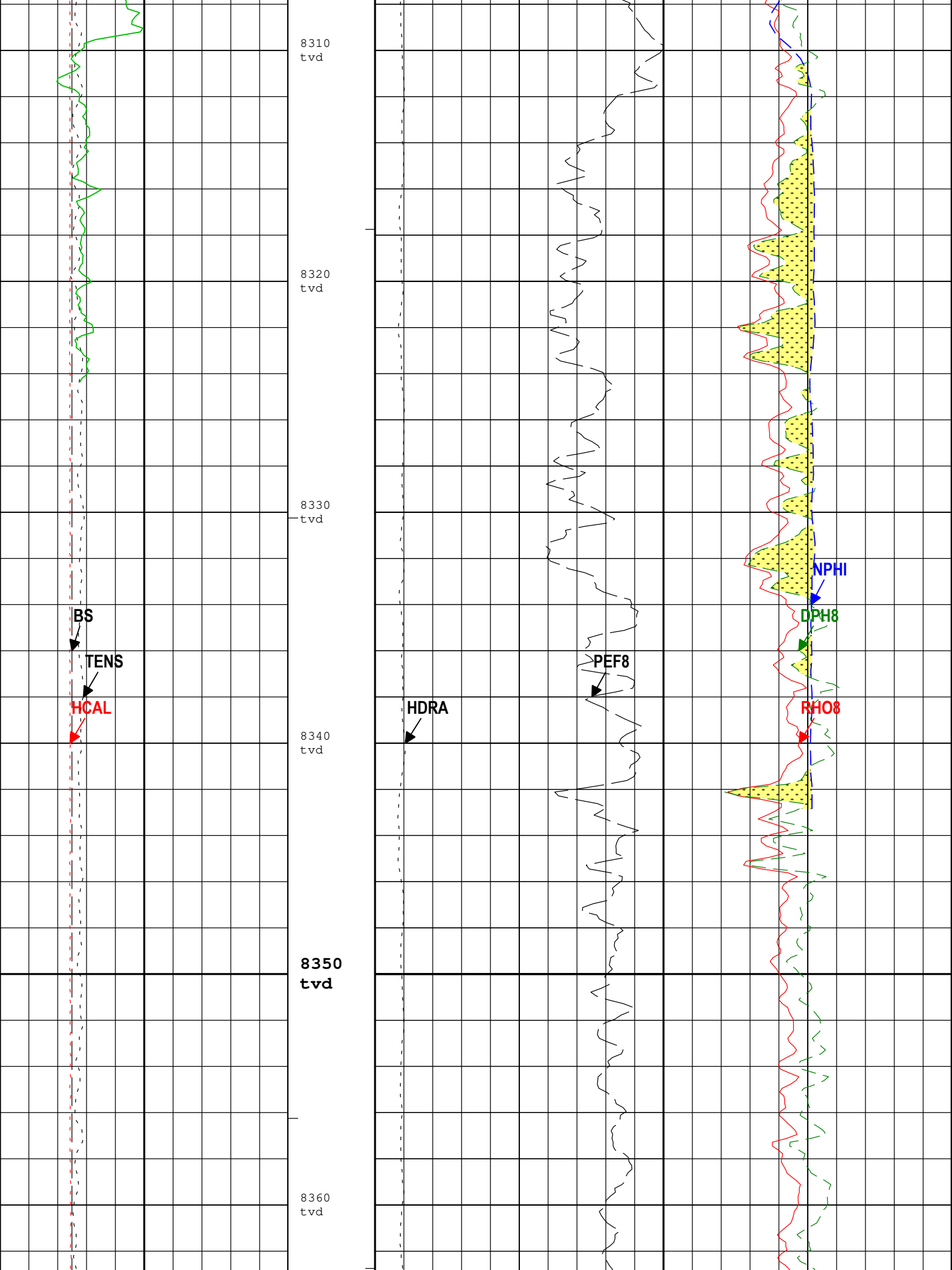
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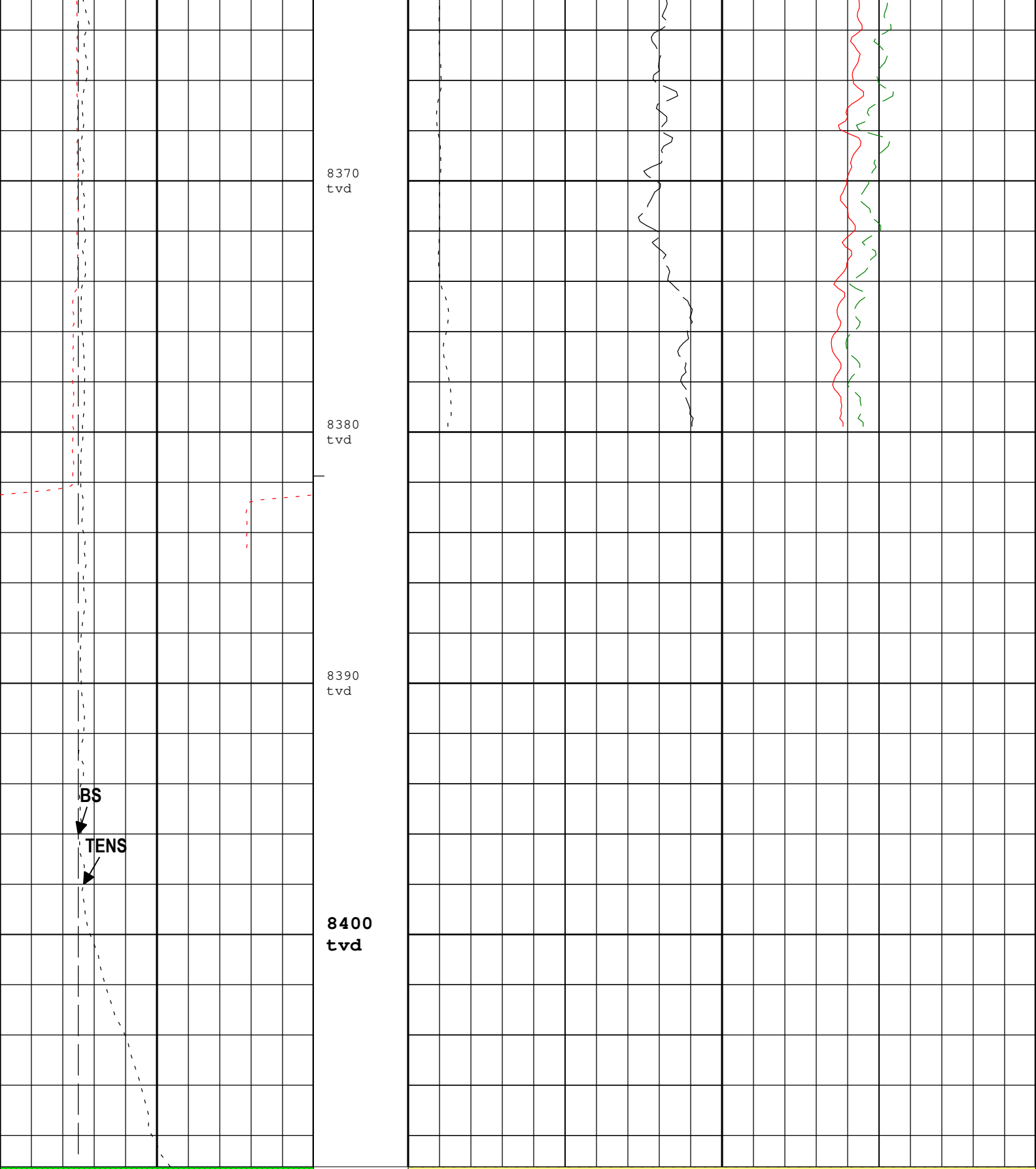
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in
16
Cable Tension (TENS)
6000
lbf
0
GAS EFFECT
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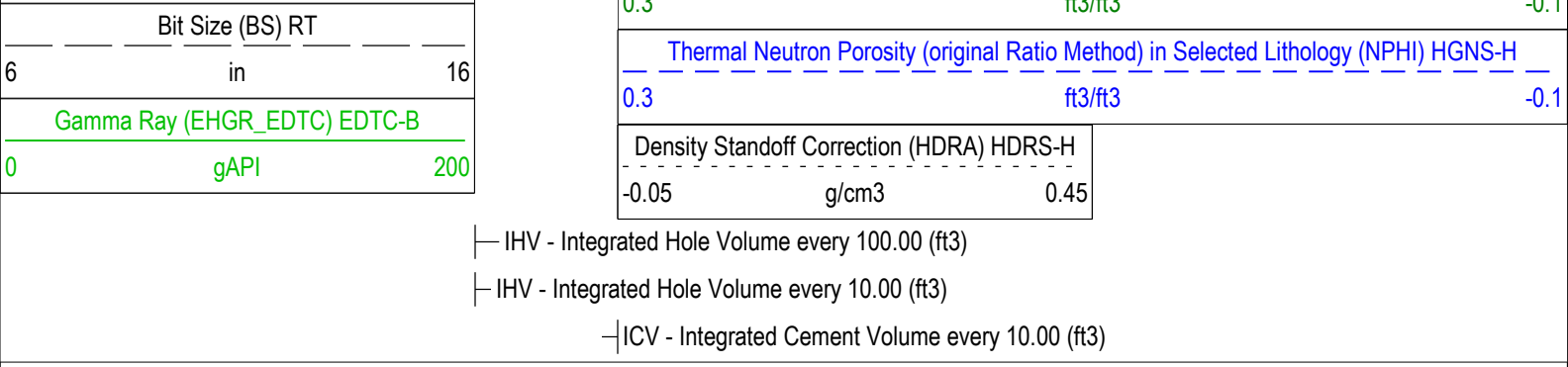

Description: Triple Combo standard resolution template for Platform Express Format: Log (BRADFORD NUC HIRES) Index Scale: 20 in per 100 ft Index Unit: ft Index Type: TVD Creation Date: 18-Apr-2019 11:52:40

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	Open	
BS	Bit Size	WLSESSION	8.5	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.446	in
CBLO	Casing Bottom (Logger)	WLSESSION	2543	ft
CDEN	Cement Density	EDTC-B	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.5	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DHC	Density Hole Correction	HDRS-H	Bit Size	
FCD	Future Casing (Outer) Diameter	WLSESSION	5.5	in
FD	Fluid Density	Borehole	1	g/cm3
GCLF	Coal-Like Formation	HDRS-H	No	
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	
GR_MULTIPLIER	Gamma Ray Multiplier	EDTC-B	1	
HVCS	Integrated Hole Volume Caliper Selection	Borehole	Compute Area from GHD	
IHVC	Integrated Hole Volume Control	Borehole	Start	
MATR	Rock Matrix for Neutron Porosity Corrections	Borehole	LIMESTONE	
MDEN	Matrix Density for Density Porosity	Borehole	2.71	g/cm3
NACO	Neutron Activation Correction	HDRS-H	Off	
NPRM	HRDD Nuclear Processing Mode	HDRS-H	High Resolution	
NTCO	HRDD Nuclear Temperature Correction Option	HDRS-H	On	
SOCN	Standoff Distance	EDTC-B	0.125	in
SOCO	Standoff Correction Option	EDTC-B	No	
TPOS_EDTC	Tool Position: Centered or Eccentered	EDTC-B	Eccentered	

Tool Control Parameters

1A: Parameters

Parameter	Description	Tool	Value	Unit
HRGD_BOARD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	1800	ft/h
NDTC	Nuclear Dead Time Correction	HDRS-H	On	
NPUC	Nuclear Pile-Up Correction	HDRS-H	Off	
STSO_HRDD	Temperature Source for the Density Algorithm	HDRS-H	HET data channel	

Calibration Report

HRLT-B (High Resolution Laterolog Array) Calibration - Run 1A

Primary Equipment :

HRLT-B Sonde	HRLS-B	953

HRLT-B Calibration - HRLT M0-M1 Voltage Plus

Before (Measured): 10:59:26 10-Apr-2019

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
HRLT M01 - 0	uV	Before	-322.7	-379.6	-318.8	-280.6
HRLT M01 - 1	uV	Before	-322.7	-379.6	-374.0	-280.6
HRLT M01 - 2	uV	Before	-322.7	-379.6	-357.8	-280.6
HRLT M01 - 3	uV	Before	-322.7	-379.6	-322.0	-280.6
HRLT M01 - 4	uV	Before	-322.7	-379.6	-316.7	-280.6
HRLT M01 - 5	uV	Before	-322.7	-379.6	-327.0	-280.6
HRLT M01 - 6	uV	Before	322.7	280.6	337.1	379.6

HRLT-B Calibration - HRLT M1-M2 Voltage Plus

Before (Measured): 10:59:26 10-Apr-2019

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
HRLT M12 - 0	uV	Before	1781.0	1548.7	1748.4	2095.3
HRLT M12 - 1	uV	Before	1781.0	1548.7	2054.1	2095.3
HRLT M12 - 2	uV	Before	1781.0	1548.7	1959.1	2095.3
HRLT M12 - 3	uV	Before	1781.0	1548.7	1763.3	2095.3
HRLT M12 - 4	uV	Before	1781.0	1548.7	1734.5	2095.3
HRLT M12 - 5	uV	Before	1781.0	1548.7	1792.1	2095.3
HRLT M12 - 6	uV	Before	-1781.0	-2095.3	-1859.5	-1548.7

HRLT-B Calibration - HRLT M2-M3 Voltage Plus

Before (Measured): 10:59:26 10-Apr-2019

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
HRLT M23 - 0	uV	Before	1781.0	1548.7	1732.1	2095.3
HRLT M23 - 1	uV	Before	1781.0	1548.7	2048.6	2095.3
HRLT M23 - 2	uV	Before	1781.0	1548.7	1955.1	2095.3
HRLT M23 - 3	uV	Before	1781.0	1548.7	1762.7	2095.3
HRLT M23 - 4	uV	Before	1781.0	1548.7	1728.0	2095.3
HRLT M23 - 5	uV	Before	1781.0	1548.7	1786.4	2095.3
HRLT M23 - 6	uV	Before	-1781.0	-2095.3	-1842.4	-1548.7

HRLT-B Calibration - HRLT A3-A4 Voltage Plus

Before (Measured): 10:59:26 10-Apr-2019

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
HRLT V34 - 0	uV	Before	70000.0	60869.6	68873.9	82352.9
HRLT V34 - 1	uV	Before	70000.0	60869.6	81622.0	82352.9
HRLT V34 - 2	uV	Before	70000.0	60869.6	78130.2	82352.9
HRLT V34 - 3	uV	Before	70000.0	60869.6	70598.3	82352.9
HRLT V34 - 4	uV	Before	70000.0	60869.6	69081.6	82352.9
HRLT V34 - 5	uV	Before	70000.0	60869.6	71368.4	82352.9
HRLT V34 - 6	uV	Before	-70000.0	-82352.9	-72369.0	-60869.6

HRLT-B Calibration - HRLT A4-A5 Voltage Plus

Before (Measured): 10:59:26 10-Apr-2019

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
HRLT V45 - 0	uV	Before	70000.0	60869.6	68726.6	82352.9
HRLT V45 - 1	uV	Before	70000.0	60869.6	81383.8	82352.9
HRLT V45 - 2	uV	Before	70000.0	60869.6	77904.8	82352.9
HRLT V45 - 3	uV	Before	70000.0	60869.6	70423.0	82352.9
HRLT V45 - 4	uV	Before	70000.0	60869.6	68925.2	82352.9
HRLT V45 - 5	uV	Before	70000.0	60869.6	71216.4	82352.9
HRLT V45 - 6	uV	Before	-70000.0	-82352.9	-72138.0	-60869.6

HRLT-B Calibration - HRLT A5-A6 Voltage Plus

Before (Measured): 10:59:26 10-Apr-2019

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
HRLT V56 - 0	uV	Before	70000.0	60869.6	68875.1	82352.9

HRLT V56 - 1	uV	Before	70000.0	60869.6	81863.8	82352.9
HRLT V56 - 2	uV	Before	70000.0	60869.6	78315.0	82352.9
HRLT V56 - 3	uV	Before	70000.0	60869.6	70712.1	82352.9
HRLT V56 - 4	uV	Before	70000.0	60869.6	69124.4	82352.9
HRLT V56 - 5	uV	Before	70000.0	60869.6	71393.3	82352.9
HRLT V56 - 6	uV	Before	-70000.0	-82352.9	-72588.8	-60869.6

HRLT-B Calibration - HRLT Torpedo-M0 Voltage

Before (Measured): 10:59:26 10-Apr-2019

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
HRLT VTP - 0	uV	Before	-70000.0	-82352.9	-68225.6	-60869.6
HRLT VTP - 1	uV	Before	-70000.0	-82352.9	-81150.6	-60869.6
HRLT VTP - 2	uV	Before	-70000.0	-82352.9	-77724.9	-60869.6
HRLT VTP - 3	uV	Before	-70000.0	-82352.9	-70310.4	-60869.6
HRLT VTP - 4	uV	Before	-70000.0	-82352.9	-68869.0	-60869.6
HRLT VTP - 5	uV	Before	-70000.0	-82352.9	-71153.2	-60869.6
HRLT VTP - 6	uV	Before	70000.0	60869.6	71885.7	82352.9

HRLT-B Calibration - HRLT Bridle#9-M0 Voltage

Before (Measured): 10:59:26 10-Apr-2019

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
HRLT VBD - 0	uV	Before	-70000.0	-82352.9	-68239.8	-60869.6
HRLT VBD - 1	uV	Before	-70000.0	-82352.9	-81160.0	-60869.6
HRLT VBD - 2	uV	Before	-70000.0	-82352.9	-77729.5	-60869.6
HRLT VBD - 3	uV	Before	-70000.0	-82352.9	-70321.1	-60869.6
HRLT VBD - 4	uV	Before	-70000.0	-82352.9	-68877.8	-60869.6
HRLT VBD - 5	uV	Before	-70000.0	-82352.9	-71163.6	-60869.6
HRLT VBD - 6	uV	Before	70000.0	60869.6	71897.9	82352.9

HRLT-B Calibration - HRLT Source Current Plus

Before (Measured): 10:59:26 10-Apr-2019

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
HRLT ISO - 0	uA	Before	284.0	247.0	285.1	334.1
HRLT ISO - 1	uA	Before	281.1	244.4	281.1	330.7
HRLT ISO - 2	uA	Before	281.1	244.4	281.1	330.7
HRLT ISO - 3	uA	Before	281.1	244.4	281.1	330.7
HRLT ISO - 4	uA	Before	281.1	244.4	281.1	330.7
HRLT ISO - 5	uA	Before	281.1	244.4	281.1	330.7
HRLT ISO - 6	uA	Before	281.1	244.4	281.1	330.7

HRLT-B Calibration - HRLT Vertical Voltage PI

Before (Measured): 10:59:26 10-Apr-2019

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
HRLT MV - 0	uV	Before	-322.7	-379.6	-321.2	-280.6
HRLT MV - 1	uV	Before	-322.7	-379.6	-369.9	-280.6
HRLT MV - 2	uV	Before	-322.7	-379.6	-352.4	-280.6
HRLT MV - 3	uV	Before	-322.7	-379.6	-315.3	-280.6
HRLT MV - 4	uV	Before	-322.7	-379.6	-306.7	-280.6
HRLT MV - 5	uV	Before	-322.7	-379.6	-331.8	-280.6
HRLT MV - 6	uV	Before	322.7	280.6	347.3	379.6

HRLT-B Calibration - HRLT Calibration Temperature

Before (Measured): 10:59:26 10-Apr-2019

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
CTEM_HRLT	degF	Before			63.7	

HGNS-H (HILT Gamma-Ray and Neutron Sonde, 150 degC) Calibration - Run 1A

Primary Equipment :

HILT Gamma-Ray and Neutron Sonde, 150 degC	HGNS-H	4951

Auxiliary Equipment :

HGNS Accelerometer, 150 degC	HACCZ-H	7648
AmBe Neutron Logging Source	NSR-F	5242

Calibration Parameter :

Water Temperature (Calibration Tank Water Temperature)	76.0
Housing Size (Thermal Housing Size)	3.38
JIG-BKG (Jig minus background reference)	165

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM): 19:00:00 14-Jan-2008

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Accelerometer Manufacturer		Master			QAT_160	
Accelerometer Reference Temperature	degF	Master		30.2	77.0	122.0
Accelerometer Coefficients - 0		Master	-----	-----	-1672.000	-----
Accelerometer Coefficients - 1		Master	-----	-----	16.298	-----
Accelerometer Coefficients - 2		Master	-----	-----	-0.016	-----
Accelerometer Coefficients - 3		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 4		Master	-----	-----	2.745	-----
Accelerometer Coefficients - 5		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 6		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 7		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 8		Master	-----	-----	298.600	-----
Accelerometer Coefficients - 9		Master	-----	-----	1.005	-----

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 13:14:24 17-Feb-2019

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Near Zero Measurement	1/s	Master	0	5.0	28.7	40.0
Far Zero Measurement	1/s	Master	0	5.0	28.6	40.0
Near Plus Measurement	1/s	Master	6031.0	4700.0	4861.0	6900.0
Far Plus Measurement	1/s	Master	2793.0	1900.0	2083.0	2900.0
Near Corrected Plus Measurement	1/s	Master		4700.0	4828.0	6900.0
Far Corrected Plus Measurement	1/s	Master		1900.0	2051.0	2900.0

EDTC-B (Enhanced Digital Telemetry Cartridge - Version B) Calibration - Run 1A

Primary Equipment :

EDTC-B	EDTC-B	9231

Calibration Parameter :

Plus Reference (Jig minus background reference)	165

EDTC-B Memory Data - EDTC-B Memory Data

Master (EEPROM): 09:57:01 15-Apr-2019

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Initial PMT HV	V	Master			1395.000	
Accelerometer Serial Number		Master			144	
Accelerometer Coefficients - 0		Master	-----	-----	2.938E+000	-----
Accelerometer Coefficients - 1		Master	-----	-----	2.077E-004	-----
Accelerometer Coefficients - 2		Master	-----	-----	7.563E-007	-----
Accelerometer Coefficients - 3		Master	-----	-----	-2.103E-008	-----
Accelerometer Coefficients - 4		Master	-----	-----	5.623E-010	-----
Accelerometer Coefficients - 5		Master	-----	-----	-4.367E-012	-----
Accelerometer Coefficients - 6		Master	-----	-----	1.152E-014	-----
Accelerometer Coefficients - 7		Master	-----	-----	-1.113E-003	-----
Accelerometer Coefficients - 8		Master	-----	-----	2.612E-005	-----
Accelerometer Coefficients - 9		Master	-----	-----	1.450E-007	-----
Accelerometer Coefficients - 10		Master	-----	-----	-1.743E-009	-----
Accelerometer Coefficients - 11		Master	-----	-----	3.857E-012	-----
Gamma-Ray Detector Serial Number		Master			79427	

Company:	North East Natural Energy LLC
Well:	Boggess 17H
Field:	Wildcat
County:	Monongalia
State:	West Virginia

Schlumberger

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