Schlumberger

Company: **BATTELLE MEMORIAL INSTITUTE**

Well: **AEP #1**

Field: **APPALACHIAN POWER CO.**

COUNTY: **MASON** STATE: **WEST VIRGINIA**

COUNTY: MASON
Field: APPALACHIAN POWER CO.
Location: 6044 FEET W OF LONG 81 DEG 55"
Well: AEP #1
Company: BATTELLE MEMORIAL INSTITUTE

PLATFORM EXPRESS
THREE DETECTOR LITHO DENSITY
COMPENSATED NEUTRON

LOCATION

6044 FEET W OF LONG 81 DEG 55"
8118 FEET S OF LAT 39 DEG 00"

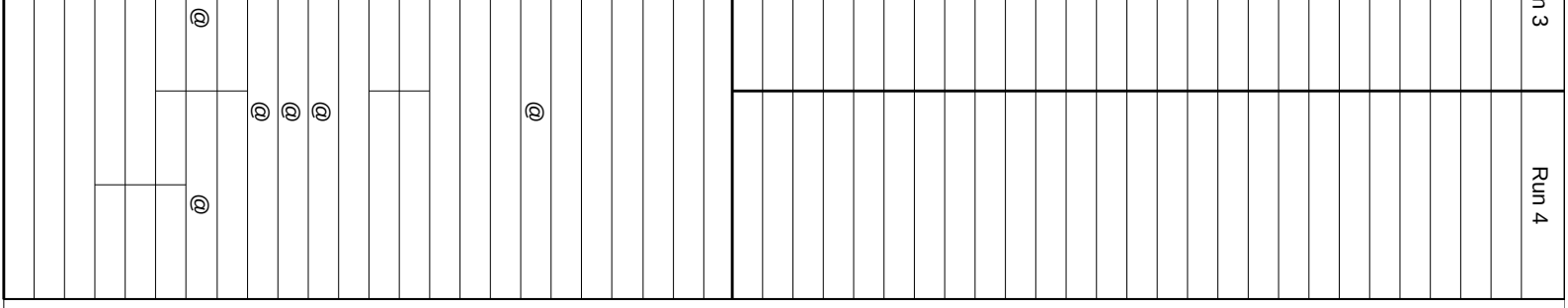
Elev.: K.B. 608 ft
G.L. 590 ft
D.F. 603 ft

Permanent Datum: GROUND LEVEL Elev.: 590 ft
Log Measured From: KELLY BUSHING 18.0 ft above Perm. Datum
Drilling Measured From: KELLY BUSHING

API Serial No.	WATERSHED	QUADRANGLE	DISTRICT
47−053−0423	MIDDLE OHIO #2	NEW HAVEN WV−OH	GRAHAM

	Run 1	Run 2	Run 3
Logging Date	29−Jul−2003		
Run Number	THREE		
Depth Driller	9190 ft		
Schlumberger Depth	9192 ft		
Bottom Log Interval	9188 ft		
Top Log Interval	6277 ft		
Casing Driller Size @ Depth	7.000 in @ 6285 ft	@	@
Casing Schlumberger	6277 ft		
Bit Size	6.125 in		
Type Fluid In Hole	BRINE WATER		
MUD Density / Viscosity	9.35 lbm/gal / 27 s		
MUD Fluid Loss / PH	/ 10		
MUD Source Of Sample	BOREHOLE		
RM @ Measured Temperature	0.026 ohm.m @ 145 degF	@	@
RMF @ Measured Temperature	0.022 ohm.m @ 145 degF	@	@
RMC @ Measured Temperature	0.030 ohm.m @ 145 degF	@	@
Source RMF / RMC	CALCULATED / CALCURATED		
RM @ MRT / RMF @ MRT	0.026 @ 145 / 0.022 @ 145	@ / @	@ / @
Maximum Recorded Temperatures	145 degF		
Circulation Stopped / Time	29−Jul−2003		
Logger On Bottom / Time	29−Jul−2003 / 20:20		
Unit Number / Location	3046 / CHARLESTON,WV		
Recorded By	JUNICHI TAMURA		
Witnessed By	BILL RIKE & JOHN T.		

	Run 1	Run 2	Run 3
Logging Date			
Run Number			
Depth Driller			
Schlumberger Depth			
Bottom Log Interval			
Top Log Interval			
Casing Driller Size @ Depth	@		
Casing Schlumberger			
Bit Size			
Type Fluid In Hole			
MUD Density / Viscosity	/		
MUD Fluid Loss / PH	/		
MUD Source Of Sample			
RM @ Measured Temperature	@		
RMF @ Measured Temperature	@		
RMC @ Measured Temperature	@		
Source RMF / RMC	/		
RM @ MRT / RMF @ MRT	@ / @		
Maximum Recorded Temperatures			
Circulation Stopped / Time			
Logger On Bottom / Time			
Unit Number / Location	/		
Recorded By			
Witnessed By			



DEPTH SUMMARY LISTING

Date Created: 29−JUL−2003 21:09:44

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW−B	Type:	CMTD−B/A	Type:	7−39P
Serial Number:	1755	Serial Number:	1374	Serial Number:	2138
Calibration Date:	15−APR−2003	Calibration Date:	12−MAY−2003	Length:	16400.00 FT
Calibrator Serial Number:	1	Calibrator Serial Number:	1		
Calibration Cable Type:	7−39P	Calibration Gain:	0.93	Conveyance Method:	Wireline
Wheel Correction 1:	−5	Calibration Offset:	−2952.00	Rig Type:	LAND
Wheel Correction 2:	−3				

Depth Control Parameters

Log Sequence:	Subsequent Log In the Well
Reference Log Name:	GAMMA RAY
Reference Log Run Number:	TWO
Reference Log Date:	03−JUL−2003

Depth Control Remarks

1. THIS IS THE THIRD RUN IN THE HOLE
2. PRIMARY DEPTH CONTROLLED BY CALIBRATED IDW
3.
4.
5.
6.

OTHER SERVICES1	OTHER SERVICES2
OS1: HRLA	OS1:
OS2: FMI	OS2:
OS3: SSLT	OS3:
OS4: CMR	OS4:
OS5: MSCT	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
IDW USED AS PRIMARY DEPTH CONTROL	
THIS IS THE THIRD RUN IN THE HOLE	
DEPTH CORRELATED TO THE GAMMA RAY LOG AT 3−JUL−2003	
MATRIX DENSITY AS NOTED ON LOG	
NEUTRON MATRIX IS LIMESTONE	

NEUTRON MATRIX IS LIMESTONE

THANK YOU FOR CHOOSING SCHLUMBERGER!!

YOUR CREW TODAY: DON BROWN & TOMMY NEFF

RUN 1	
SERVICE ORDER #:	10608297
PROGRAM VERSION:	11C0−305
FLUID LEVEL:	0 ft

LOGGED INTERVAL	START	STOP

RUN 2	
SERVICE ORDER #:	
PROGRAM VERSION:	
FLUID LEVEL:	

LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

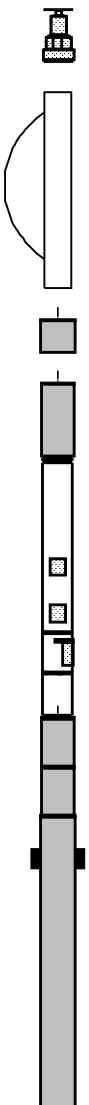
RUN 1

RUN 2

SURFACE EQUIPMENT

GSR−U/Y
NCT−B
CNB−AB
NCS−VB
WITM (DTS)−A

DOWNHOLE EQUIPMENT



LEH−Q
LEH−Q 8510
66.4

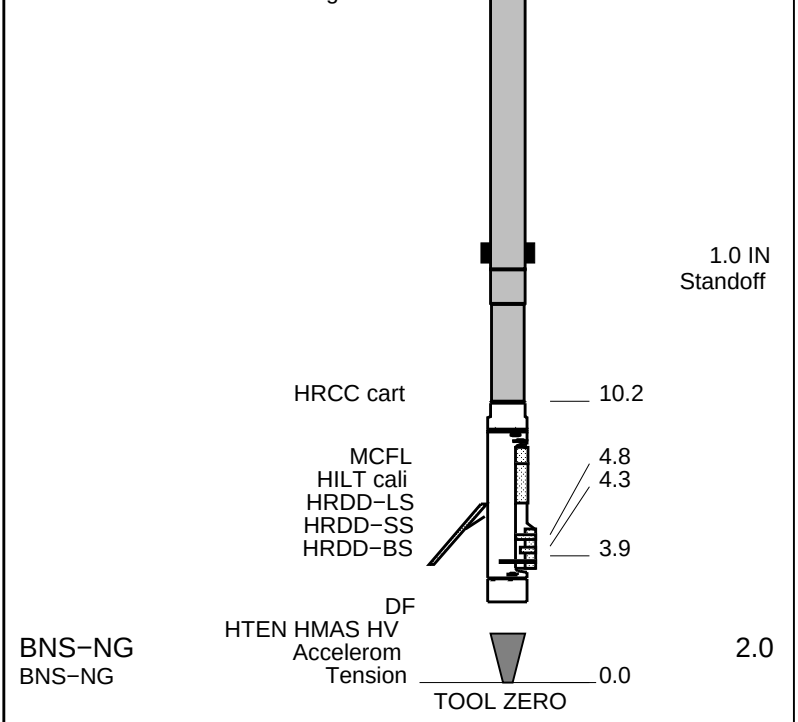
ILE−E
ILE−E 66
64.2

AH−169
56.2

DTC−H
ECH−KC 9616
DTCH0−A
54.8

HILTB−FTB
HGNSD−B 827
HMCA
HGNH
NLS−KL
NSR−F 2179
HACCZ
HCNT
HGR
AH−107
AH−107
HRLT−B 828
DUMMY−A
AH−270 832
HRCC−B 829
HRMS−B 879
HRGD 899
GLS−VJ 5109
MCFL Device
HILT Nucl. LS
HILT Nucl. SS
HILT Nucl. BS
NPV−N
51.8

1.0 IN
Standoff



Input DLIS Files

DEFAULT	**TLD_MCFL_CNL_017LUP**	**FN:16**	**PRODUCER**	**29−Jul−2003 20:30**	**9215.5 FT**	**6022.1 FT**

Output DLIS Files

DEFAULT	**TLD_MCFL_CNL_022PUP**	**FN:21**	**PRODUCER**	**29−Jul−2003 22:25**	**9211.5 FT**	**6020.0 FT**

Integrated Hole/Cement Volume Summary

Hole Volume = 725.34 F3

Cement Volume = 375.01 F3 (assuming 4.50 IN casing O.D.)

Computed from 9192.0 FT to 6020.5 FT using data channel(s) HCAL

OP System Version: 11C0−305

MCM

HILTB−FTB	**11C0−305**	**DTC−H**	**11C0−305**

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
MDEN	**2.83 G/C3**	**2.71 G/C3**	**8946.5 22:26:00**
	2.75 G/C3	**2.83 G/C3**	**8626.5 22:27:15**
	2.83 G/C3	**2.75 G/C3**	**8516.5 22:28:50**
	2.71 G/C3	**2.83 G/C3**	**7896.5 22:30:38**
	2.83 G/C3	**2.71 G/C3**	**7756.5 22:31:37**
	2.71 G/C3	**2.83 G/C3**	**7106.5 22:33:21**

PIP SUMMARY

Integrated Hole Volume Minor Pip Every 10 F3

Integrated Hole Volume Major Pip Every 100 F3

Integrated Cement Volume Minor Pip Every 10 F3

Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

GAS EFFECT
From DPHZ to NPHI

GR > 200
From LHT1 to GR1

Tension (TENS)
10000 (LBF) 0

Caliper (HCAL)
6 (IN) 16

HGNS Deviation (GDEV)
−1 (DEG) 9

Gamma Ray (GR)
0 (GAPI) 200

Tool/Tot. Drag From D3T to STIA

Cable Drag From STIA to STIT

Stuck Stretch (STIT)
0 (F) 50

Std. Res. Formation Density (RHOZ)
2 (G/C3) 3

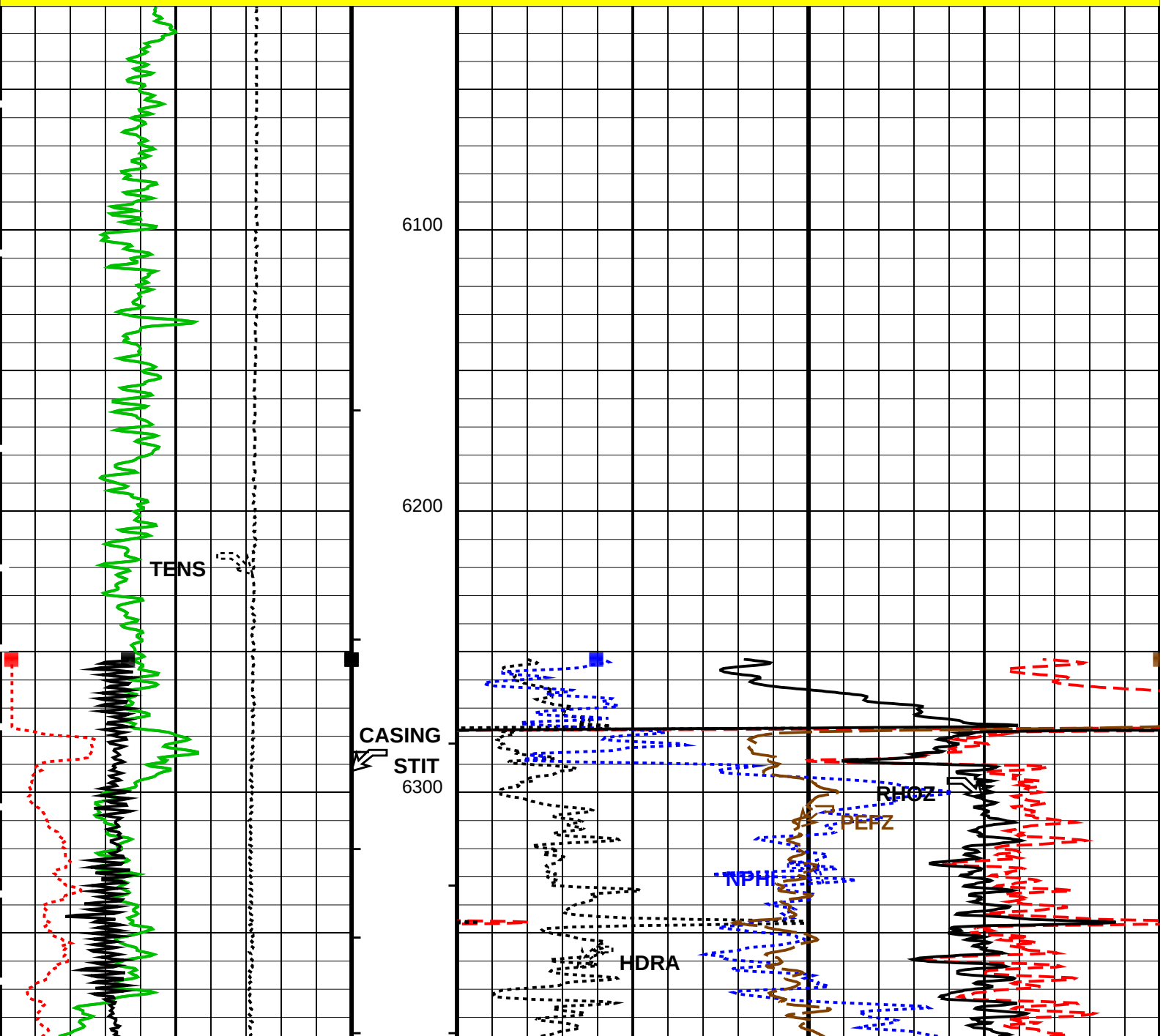
Std. Res. Formation Pe (PEFZ)
0 (----) 10

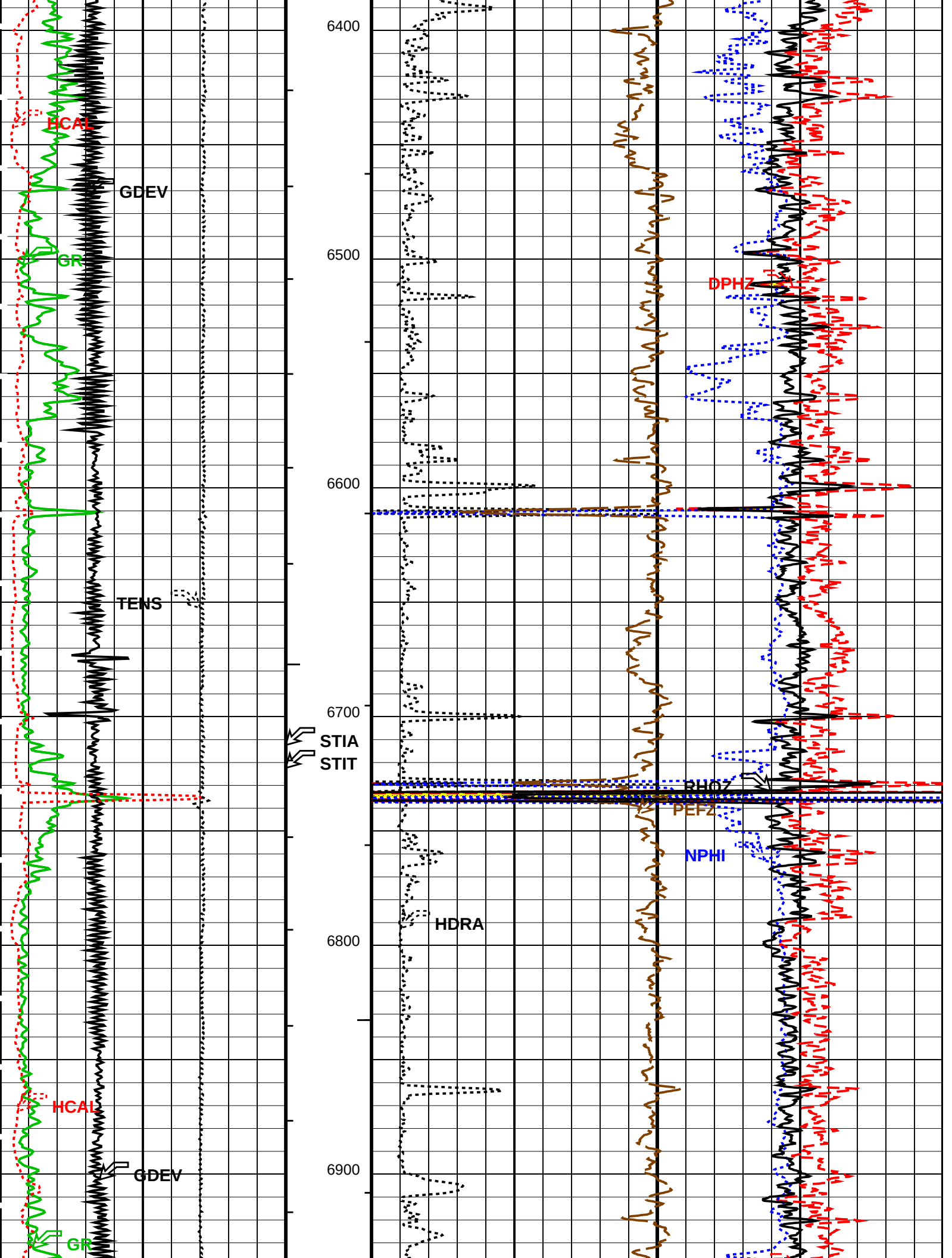
Neutron Porosity (NPHI)
0.3 (V/V) −0.1

Density Correction (HDRA)
−0.05 (G/C3) 0.45

Std. Res. Density Porosity (DPHZ)
0.3 (V/V) −0.1

MANI PASS 2 INCH = 100 FEET NEUTRON MATRIX = LIMESTONE

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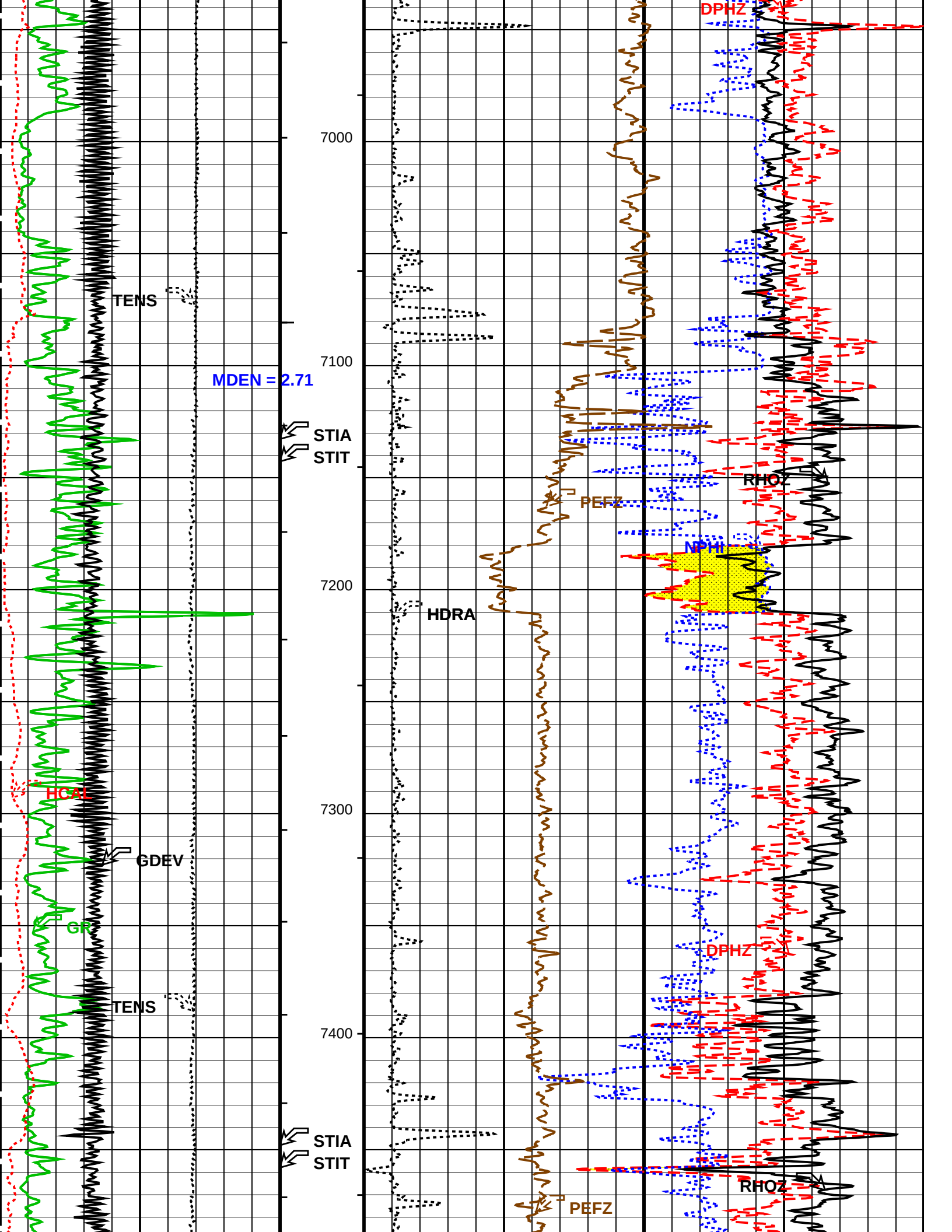
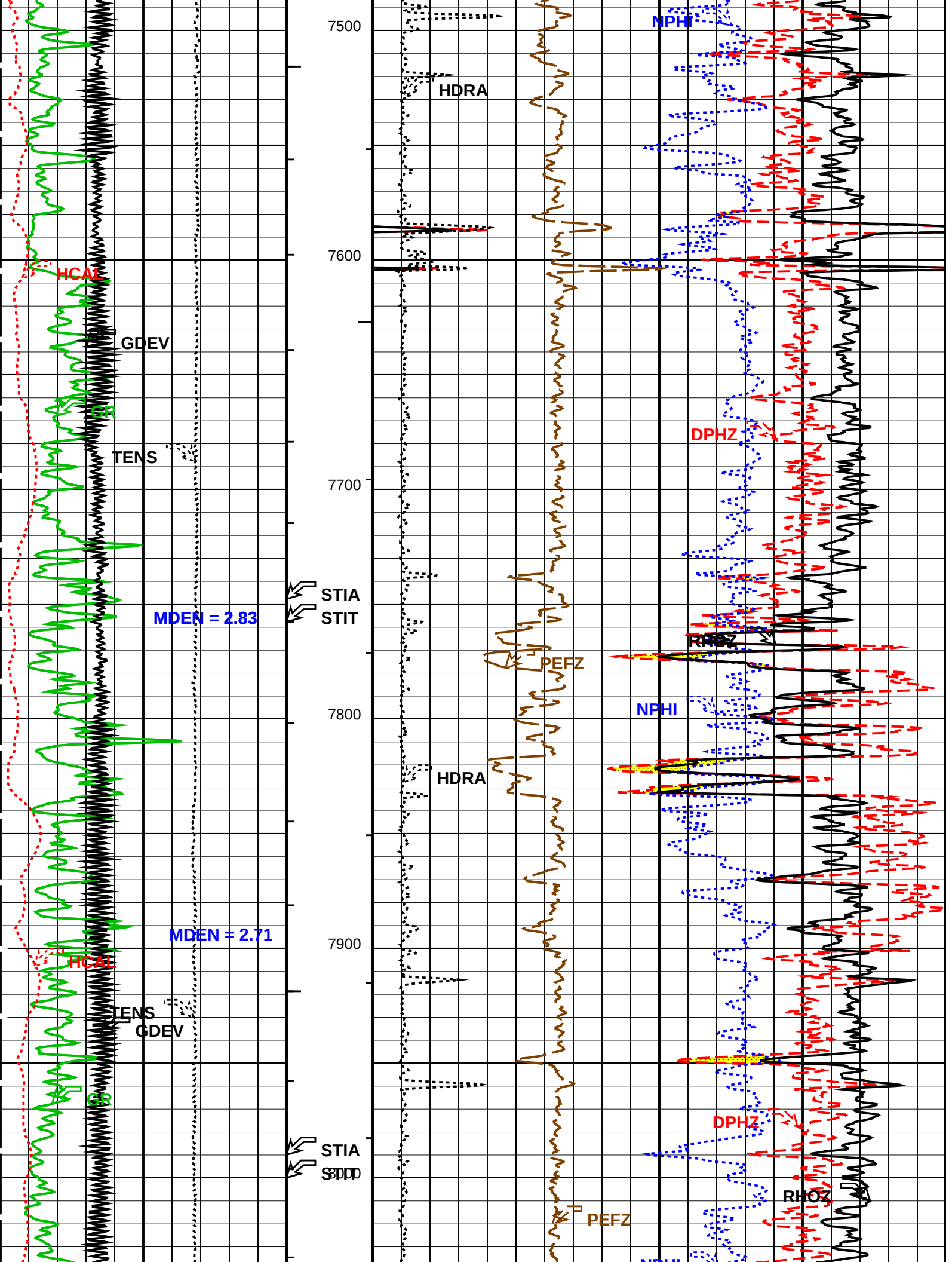
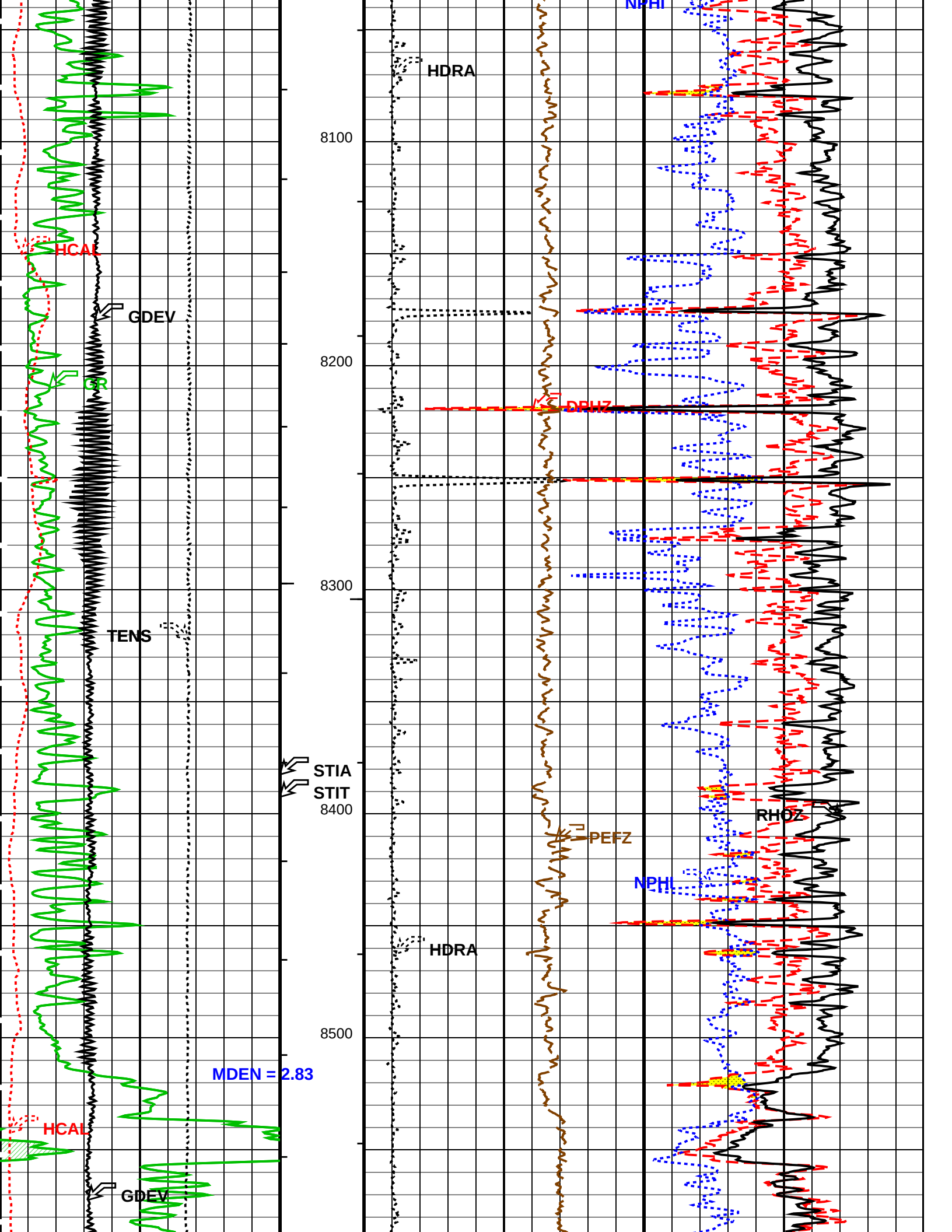
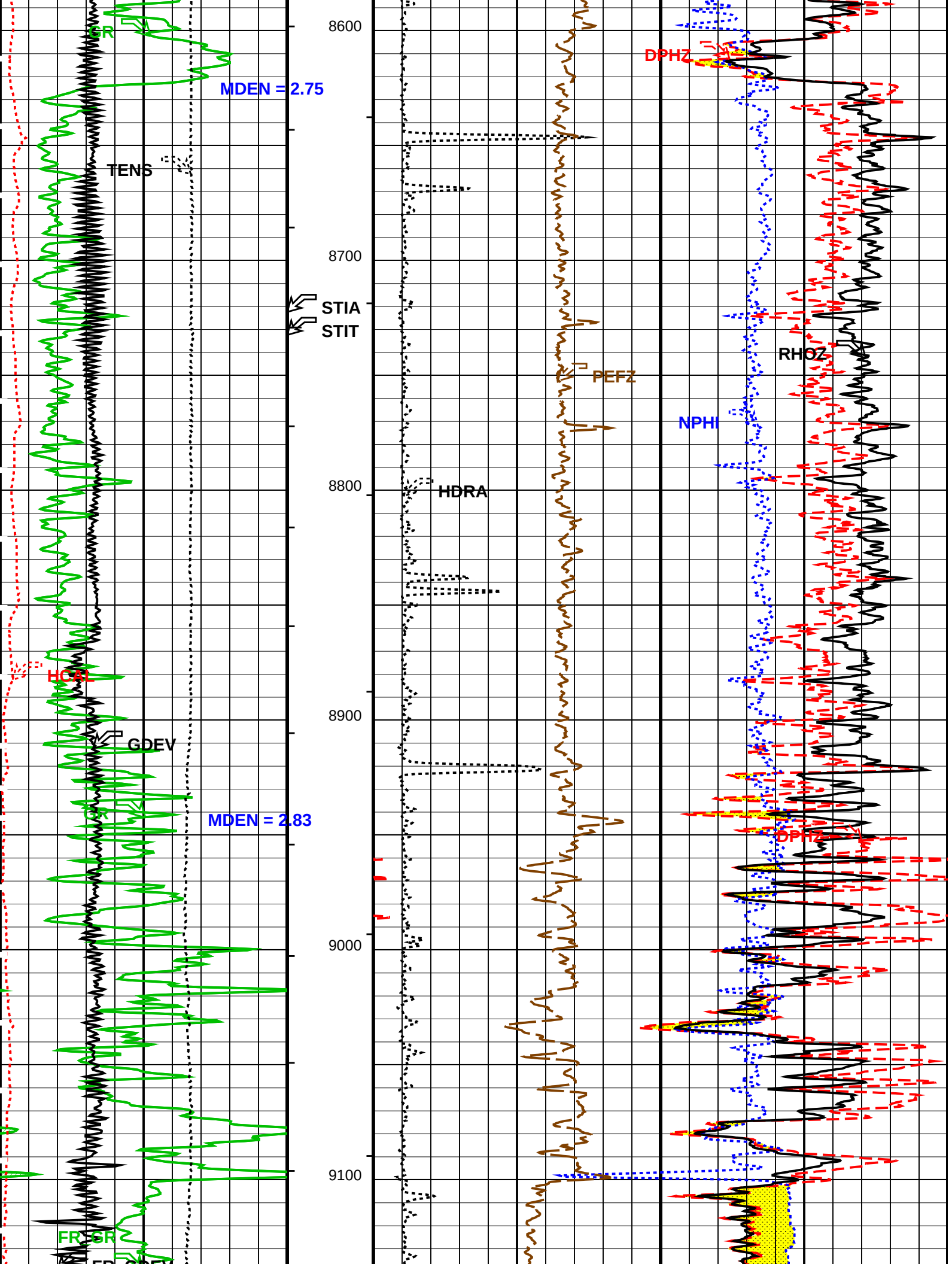
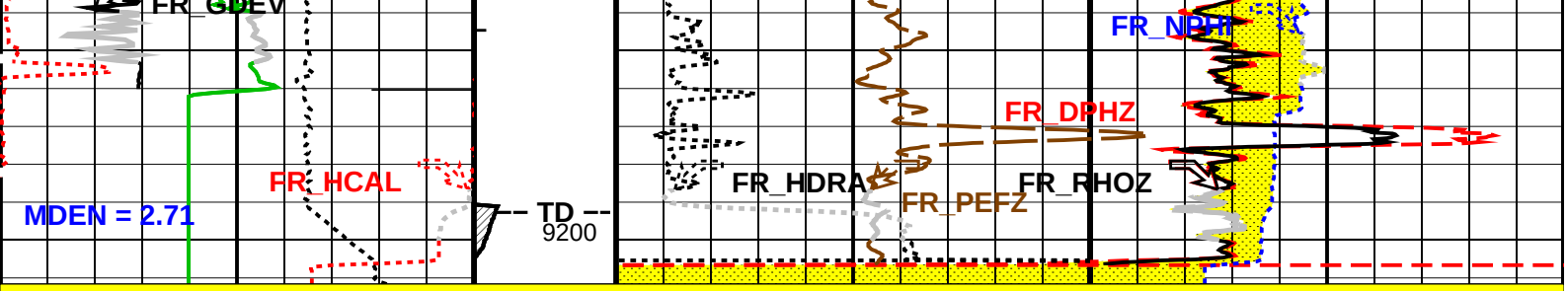
GDEV
GR
TENS
HCAL
GDEV
GR
6400
6500
6600
6700
6800
6900
STIA
STIT
DPHZ
RHOZ
PEFZ
NPHI
HDRA


DPHZ
TENS
MDEN = 2.71
STIA
STIT
RHOZ
PEFZ
NPHI
HDRA
HCAL
GDEV
GR
DPHZ
TENS
STIA
STIT
RHOZ
PEFZ
7000
7100
7200
7300
7400


7500
7600
7700
7800
7900
8000
HCAL
GDEV
GR
TENS
MDEN = 2.83
MDEN = 2.71
STIA
STIT
HDRA
NPHI
DPHZ
RHOZ
PEFZ


HCAL
GDEV
GR
TENS
STIA
STIT
MDEN = 2.83
HCAL
GDEV
HDRA
8100
8200
DPHZ
8300
8400
PEFZ
NPHI
RHOZ
HDRA
8500
NPHI


GR
MDEN = 2.75
TENS
8600
8700
STIA
STIT
DPHZ
RHOZ
PEFZ
NPHI
8800
HDRA
HCAL
8900
GDEV
GR
MDEN = 2.83
DPHZ
9000
9100
FR_GR



MANI PASS 2 INCH = 100 FEET NEUTRON MATRIX = LIMESTONE

Gamma Ray (GR) 0 (GAPI) 200	Stuck Stretch (STIT) 0 (F) 50	Std. Res. Density Porosity (DPHZ) 0.3 (V/V) −0.1
HGNS Deviation (GDEV) −1 (DEG) 9	Cable Drag From STIA to STIT	Density Correction (HDRA) −0.05 (G/C3) 0.45
Caliper (HCAL) 6 (IN) 16	Tool/Tot. Drag From D3T to STIA	Neutron Porosity (NPHI) 0.3 (V/V) −0.1
Tension (TENS) 10000 (LBF) 0		Std. Res. Formation Pe (PEFZ) 0 (−−−−) 10
GR > 200 From LHT1 to GR1		Std. Res. Formation Density (RHOZ) 2 (G/C3) 3
		GAS EFFECT From DPHZ to NPHI

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
	HILTB−FTB: High resolution Integrated Logging Tool−DTS		
BHS	Borehole Status	OPEN	
DHC	Density Hole Correction	BS	
FD	Fluid Density	1.1	G/C3
GCSE	Generalized Caliper Selection	HCAL	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MDEN	Matrix Density	2.71	G/C3
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	HiRes	
NSAR	HRDD Depth Sampling Rate	1	IN
	PERT: Preliminary Evaluation − Real Time		
BHS	Borehole Status	OPEN	
GCSE	Generalized Caliper Selection	HCAL	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
	STI: Stuck Tool Indicator		
LBFR	Trigger for MAXIS First Reading Label	STI	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth − Driller	9190.00	FT
TDL	Total Depth − Logger	9192.00	FT
	HOLEV: Integrated Hole/Cement Volume		
BHS	Borehole Status	OPEN	
FCD	Future Casing (Outer) Diameter	4.5	IN
GCSE	Generalized Caliper Selection	HCAL	
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
	System and Miscellaneous		
BS	Bit Size	6.125	IN

BS	Bit Size	6.125	IN
DFD	Drilling Fluid Density	9.35	LB/G
DO	Depth Offset for Playback	−4.0	FT
PP	Playback Processing	RECOMPUTE	
TD	Total Depth	9192	FT

Format: PEX_NUC2_MAIN Vertical Scale: 2" per 100' Graphics File Created: 29−Jul−2003 22:25

OP System Version: 11C0−305

MCM

HILTB−FTB	11C0−305	DTC−H	11C0−305

Input DLIS Files

DEFAULT	TLD_MCFL_CNL_017LUP	FN:16	PRODUCER	29−Jul−2003 20:30	9215.5 FT	6022.1 FT

Output DLIS Files

DEFAULT	TLD_MCFL_CNL_022PUP	FN:21	PRODUCER	29−Jul−2003 22:25		

Input DLIS Files

DEFAULT	TLD_MCFL_CNL_017LUP	FN:16	PRODUCER	29−Jul−2003 20:30	9215.5 FT	6022.1 FT

Output DLIS Files

DEFAULT	TLD_MCFL_CNL_022PUP	FN:21	PRODUCER	29−Jul−2003 22:25	9211.5 FT	6020.0 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 725.34 F3

Cement Volume = 375.01 F3 (assuming 4.50 IN casing O.D.)

Computed from 9192.0 FT to 6020.5 FT using data channel(s) HCAL

OP System Version: 11C0−305

MCM

HILTB−FTB	11C0−305	DTC−H	11C0−305

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
MDEN	2.83 G/C3	2.71 G/C3	8946.5 22:26:00
	2.75 G/C3	2.83 G/C3	8626.5 22:27:15
	2.83 G/C3	2.75 G/C3	8516.5 22:28:50
	2.71 G/C3	2.83 G/C3	7896.5 22:30:38
	2.83 G/C3	2.71 G/C3	7756.5 22:31:37
	2.71 G/C3	2.83 G/C3	7106.5 22:33:21

PIP SUMMARY

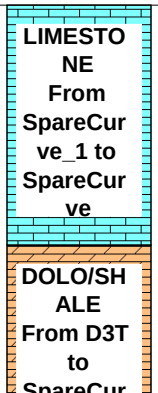
Integrated Hole Volume Minor Pip Every 10 F3

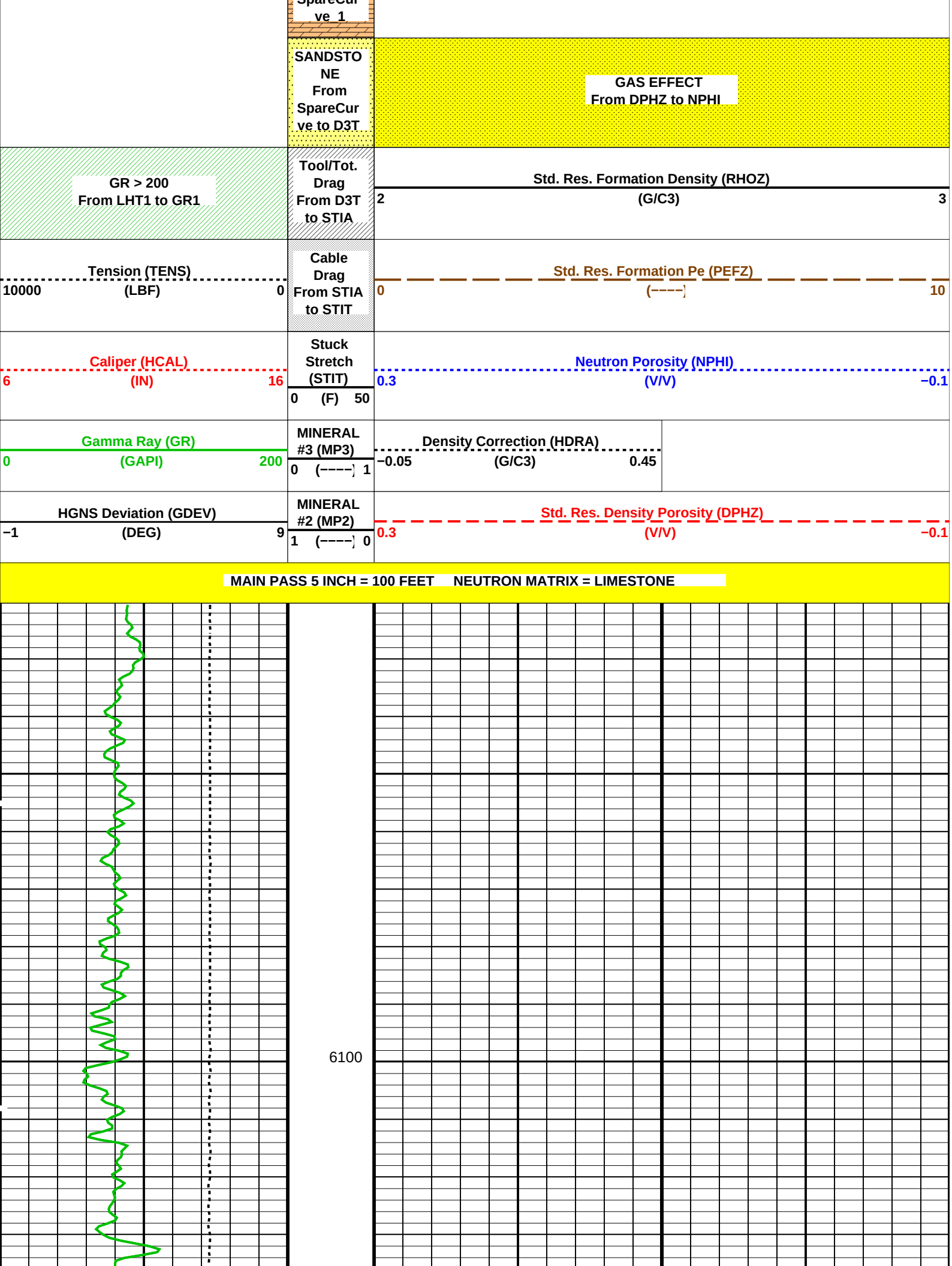
Integrated Hole Volume Major Pip Every 100 F3

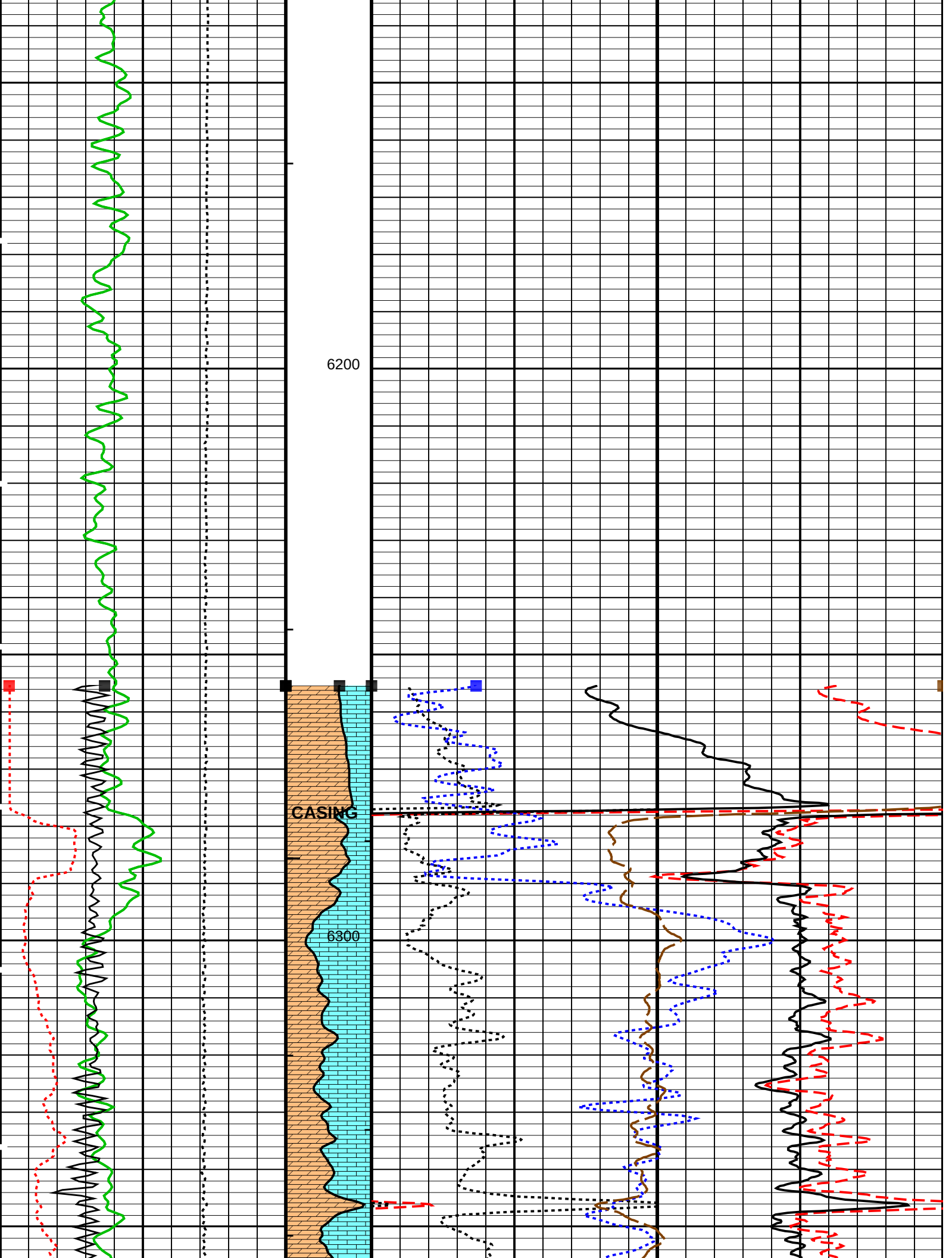
Integrated Cement Volume Minor Pip Every 10 F3

Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S




SpareCur ve_1
SANDSTO NE From SpareCur ve to D3T
GAS EFFECT From DPHZ to NPHI
GR > 200 From LHT1 to GR1
Tool/Tot. Drag From D3T to STIA
Std. Res. Formation Density (RHOZ)
2
(G/C3)
3
Tension (TENS)
10000
(LBF)
0
Cable Drag From STIA to STIT
Std. Res. Formation Pe (PEFZ)
0
(----)
10
Caliper (HCAL)
6
(IN)
16
Stuck Stretch (STIT)
0
(F)
50
Neutron Porosity (NPHI)
0.3
(V/V)
-0.1
Gamma Ray (GR)
0
(GAPI)
200
MINERAL #3 (MP3)
0
(----)
1
Density Correction (HDRA)
-0.05
(G/C3)
0.45
HGNS Deviation (GDEV)
-1
(DEG)
9
MINERAL #2 (MP2)
1
(----)
0
Std. Res. Density Porosity (DPHZ)
0.3
(V/V)
-0.1
MAIN PASS 5 INCH = 100 FEET NEUTRON MATRIX = LIMESTONE
6100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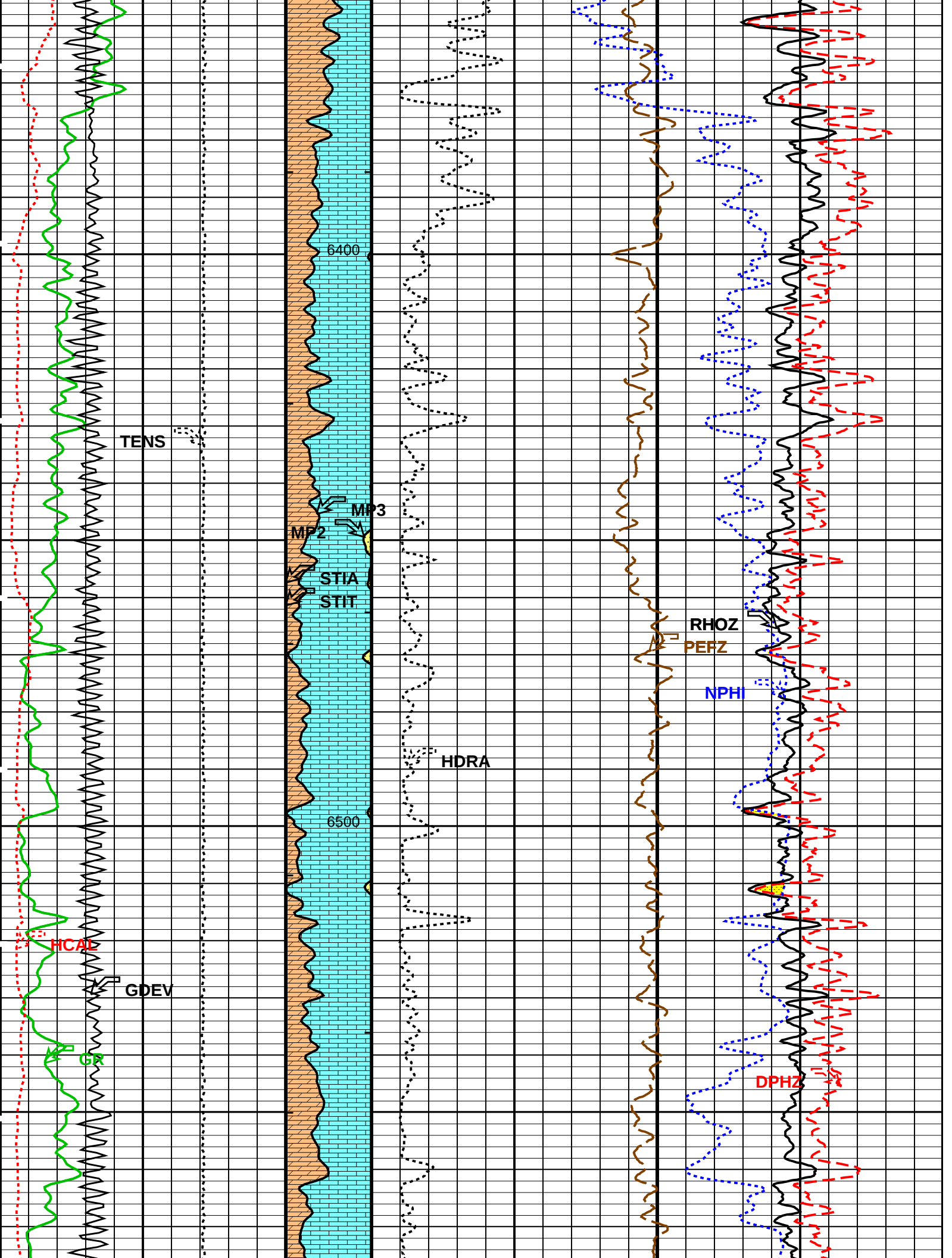
TENS
MP3
MP2
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STIT
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PEFZ
NPHI
HCAL
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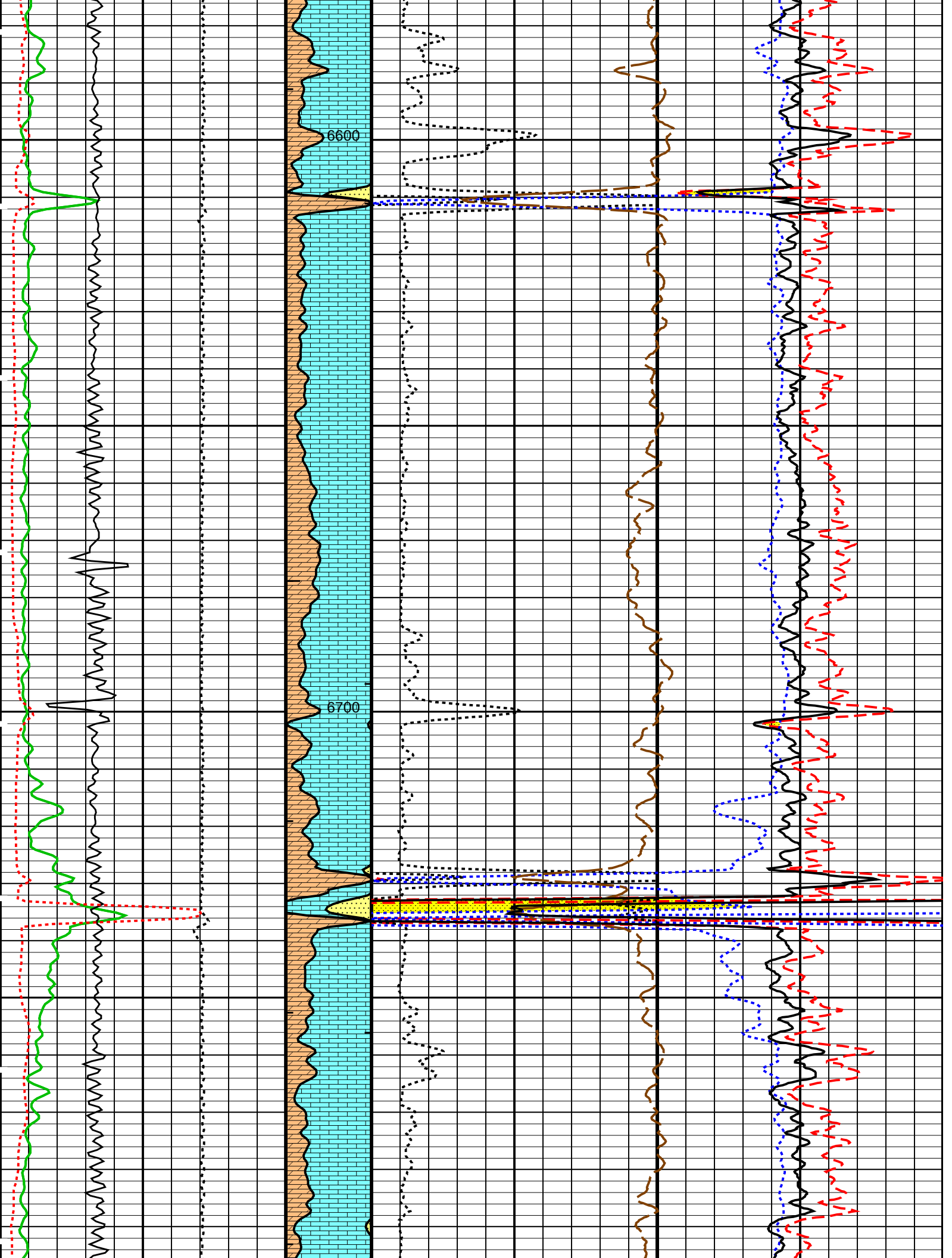
GR
DPHZ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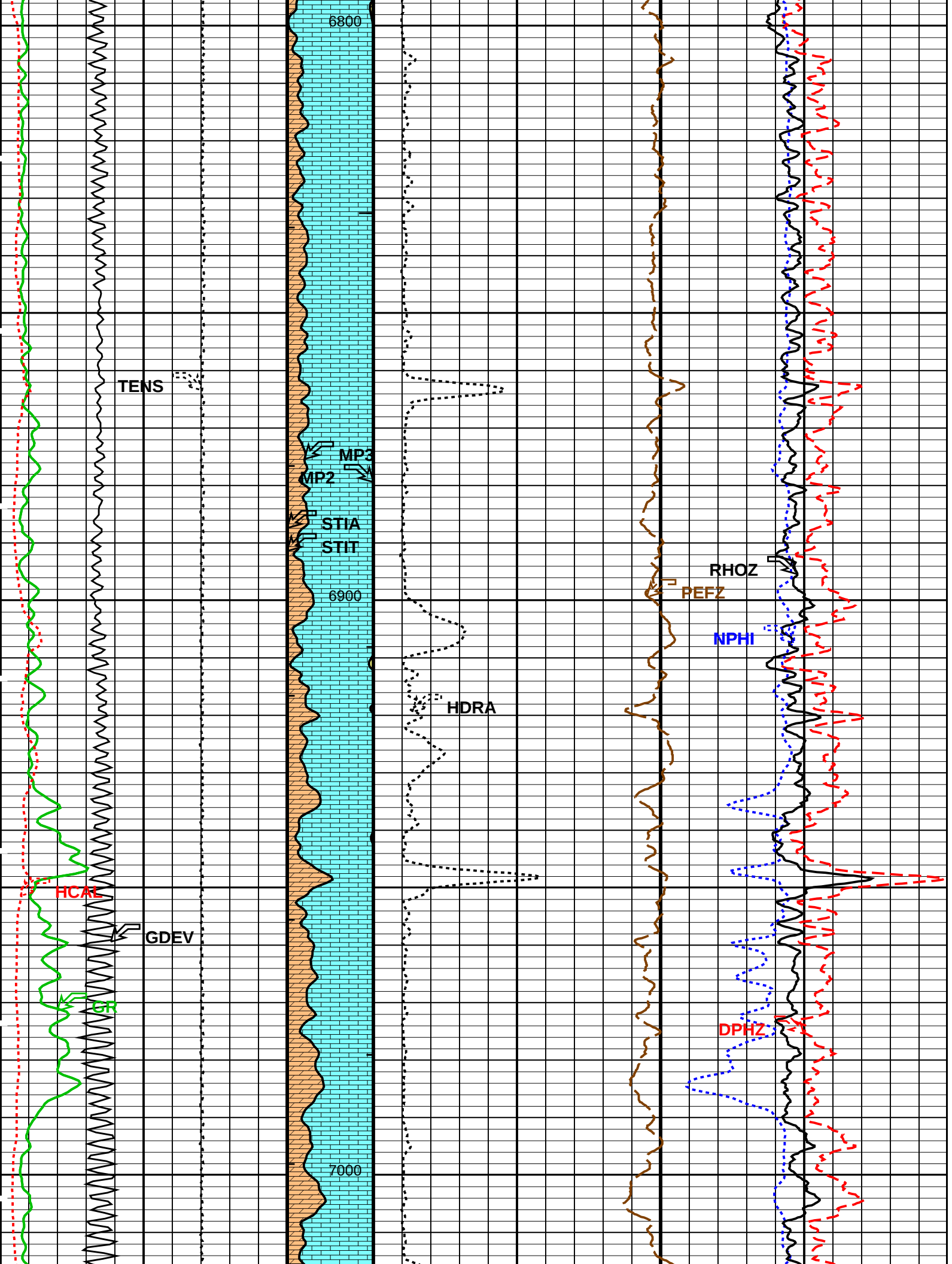
6700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MP3
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STIT
6900
RHOZ
PEFZ
NPHI
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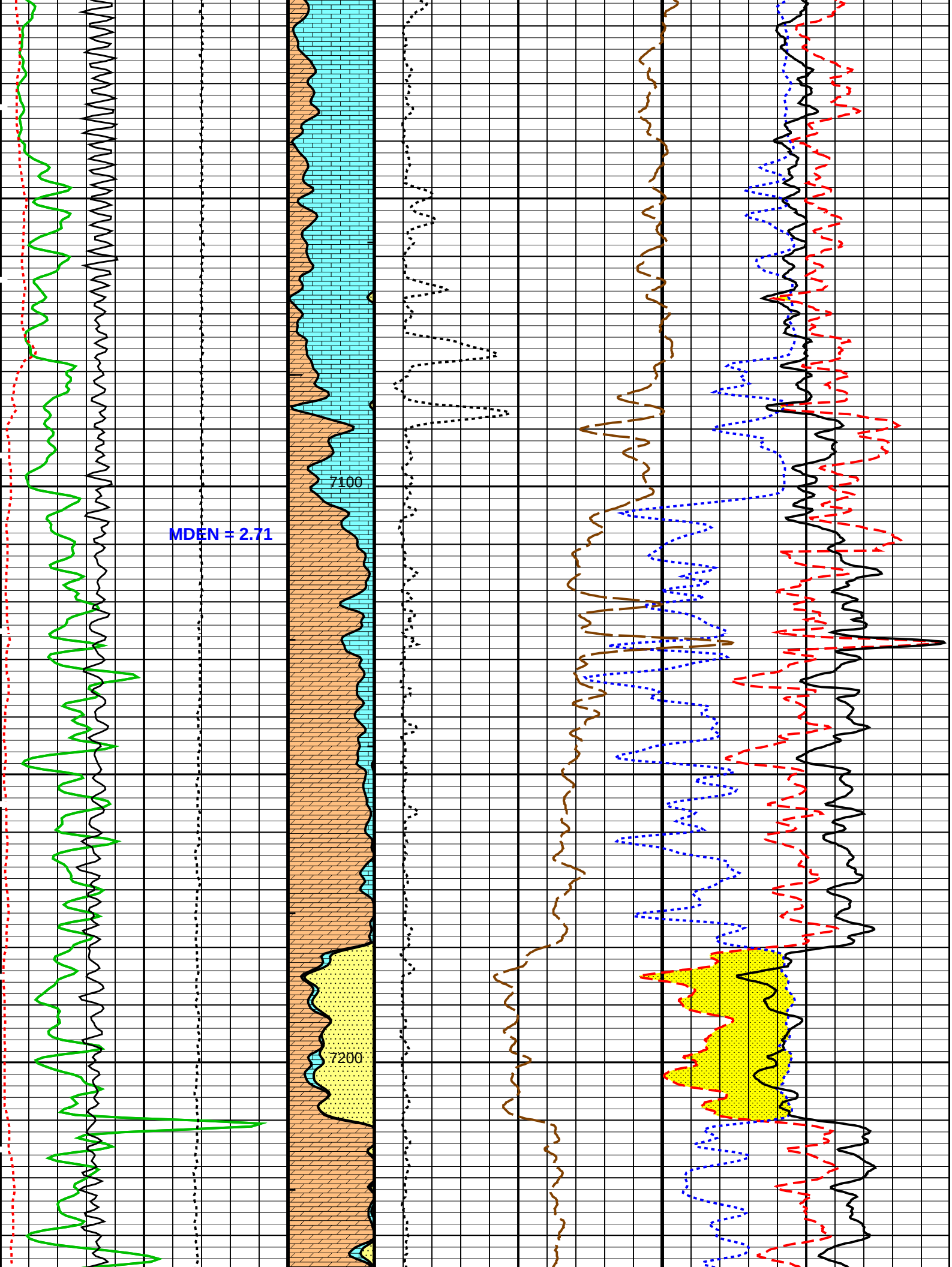
GR
DPHZ
7000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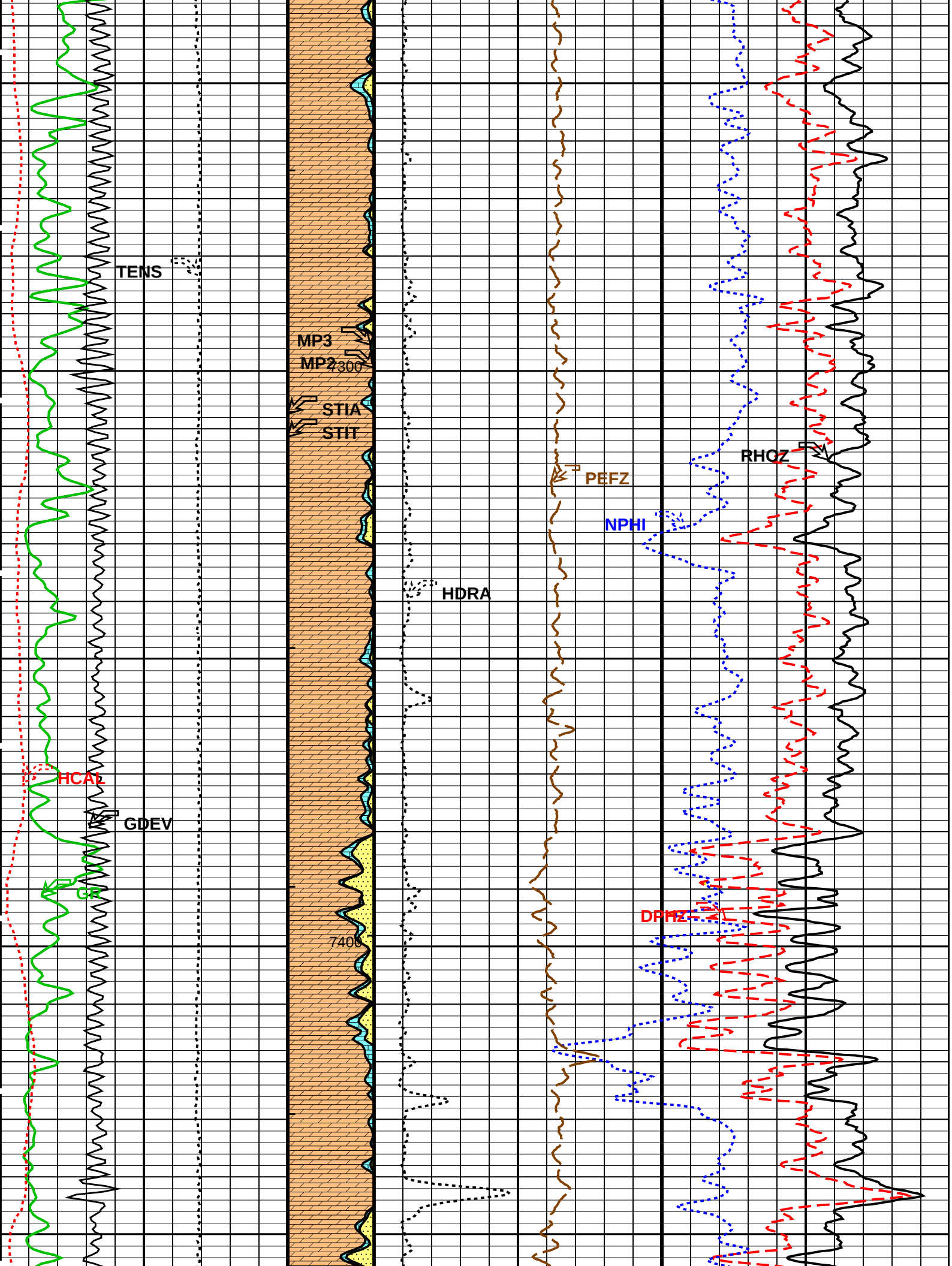
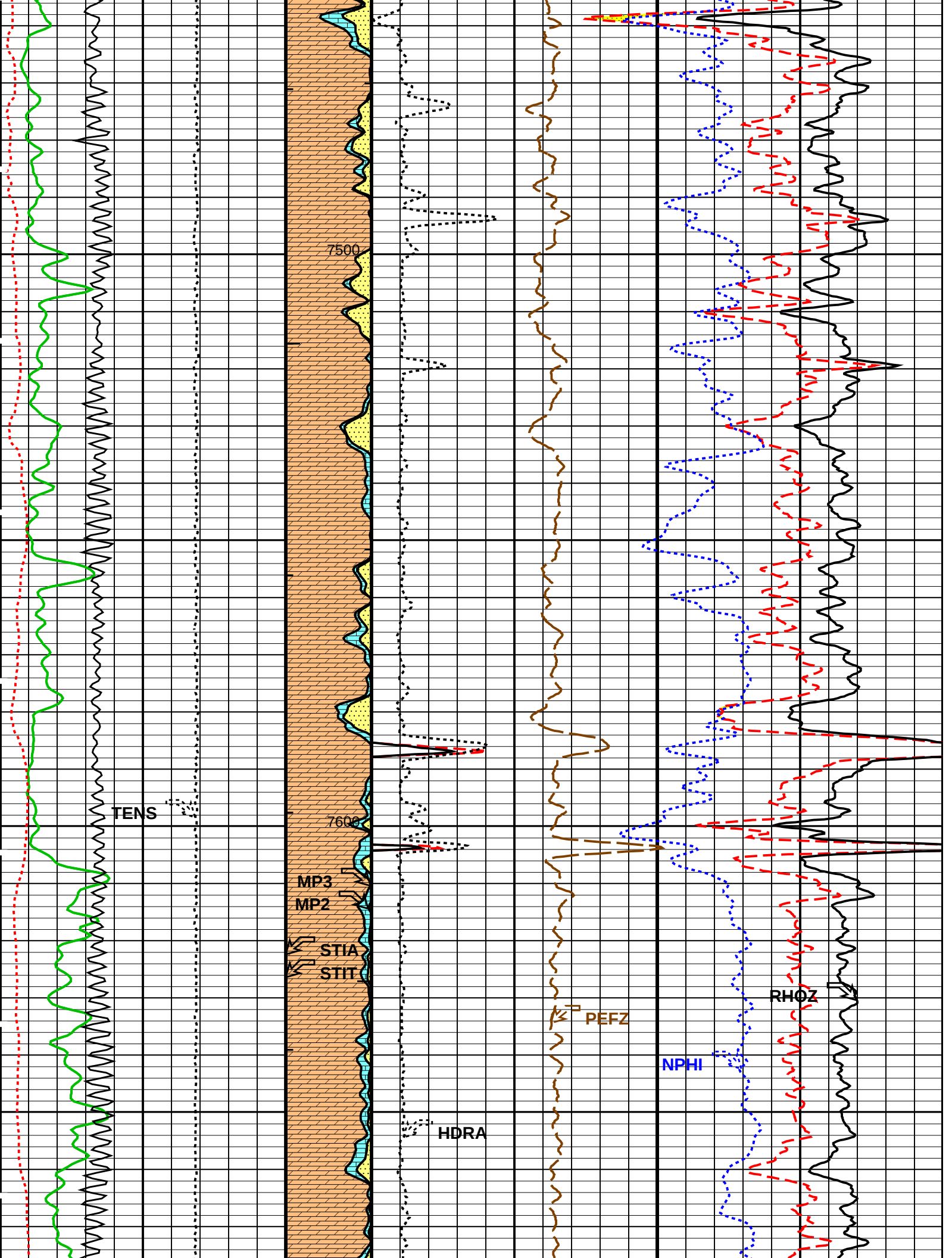
7200


TENS
MP3
MP2
7300
STIA
STIT
HDRA
PEFZ
RHOZ
NPHI
HCAL
GDEV
GR
DPHZ
7400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TENS
MP3
MP2
STIA
STIT
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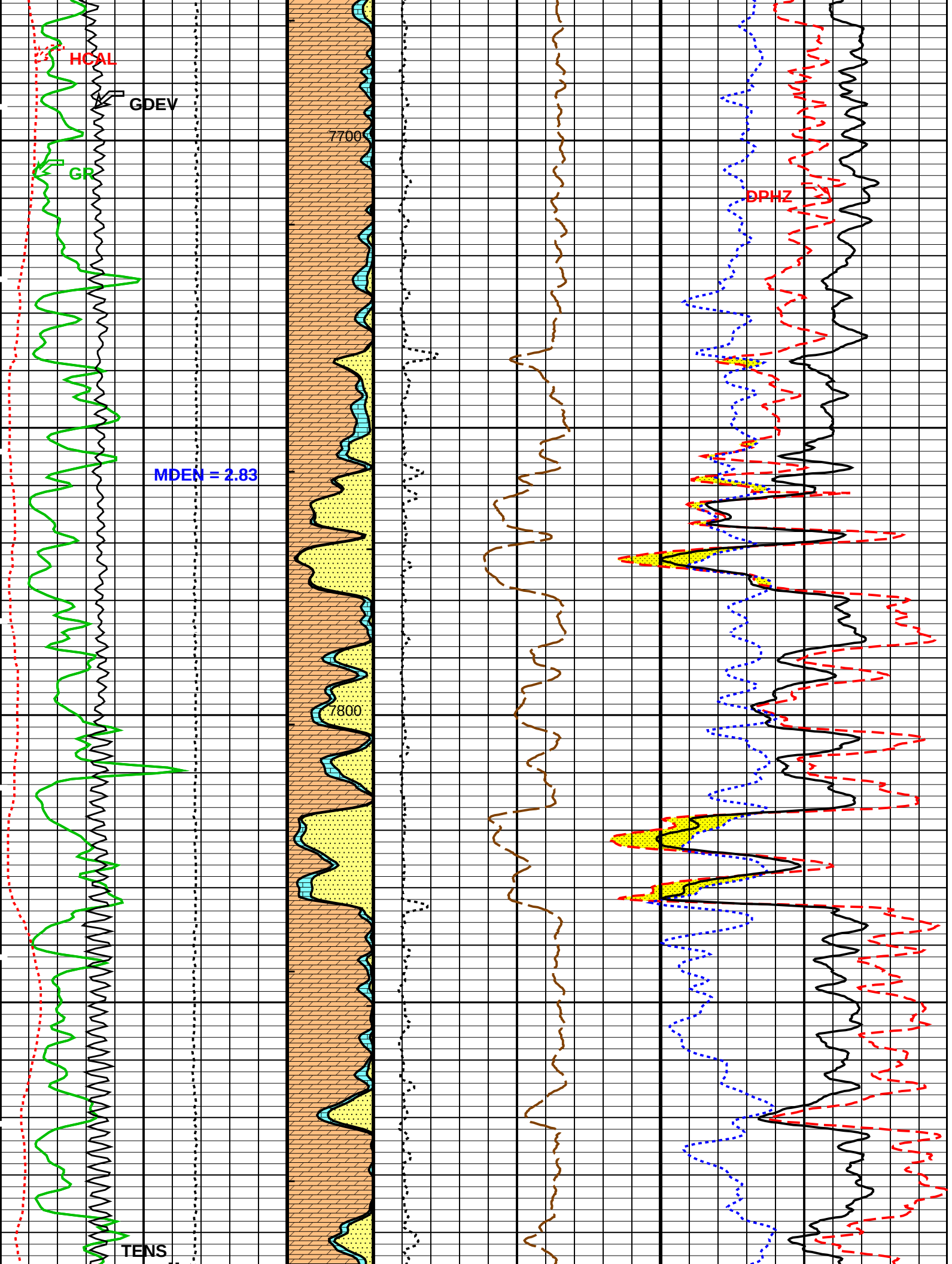
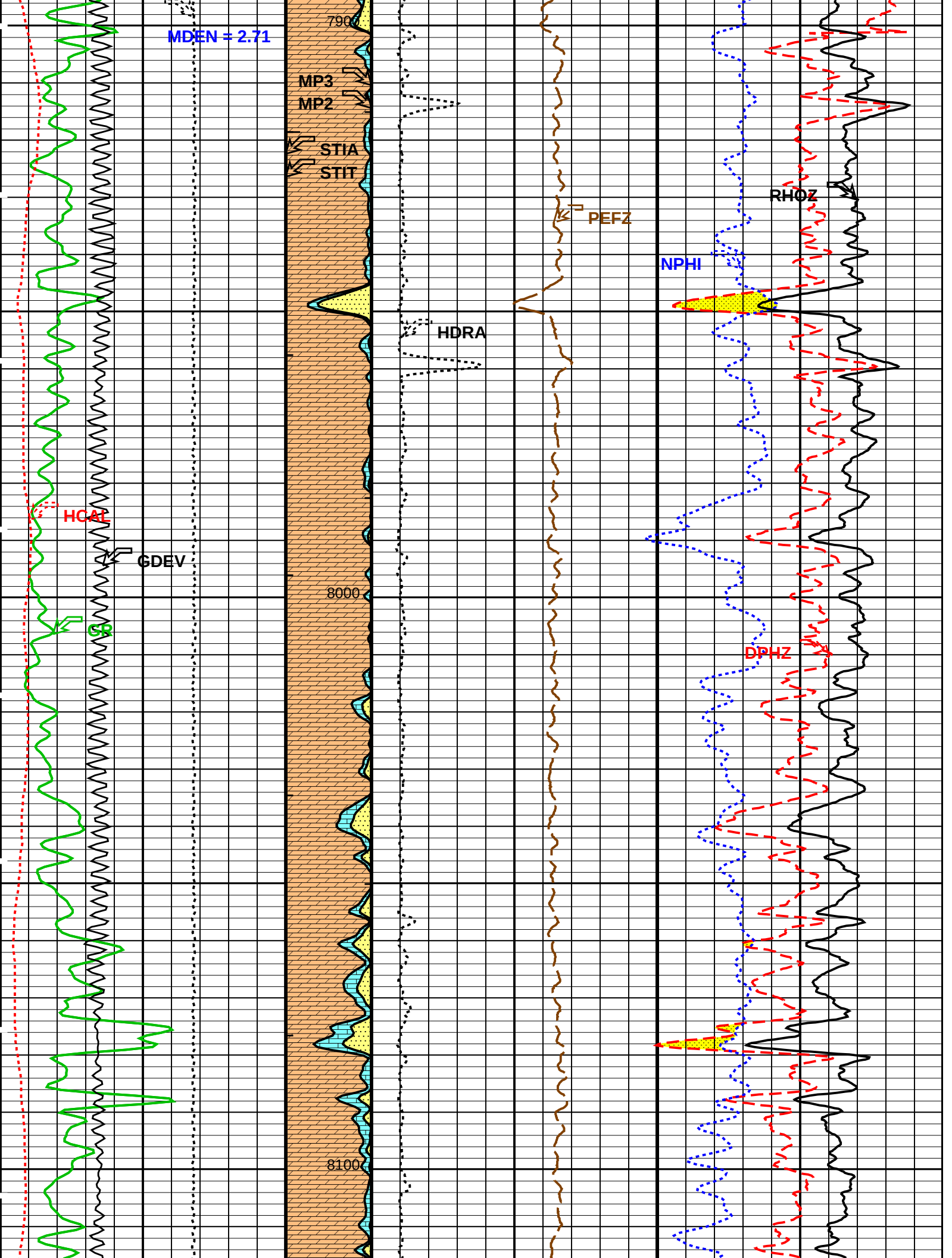
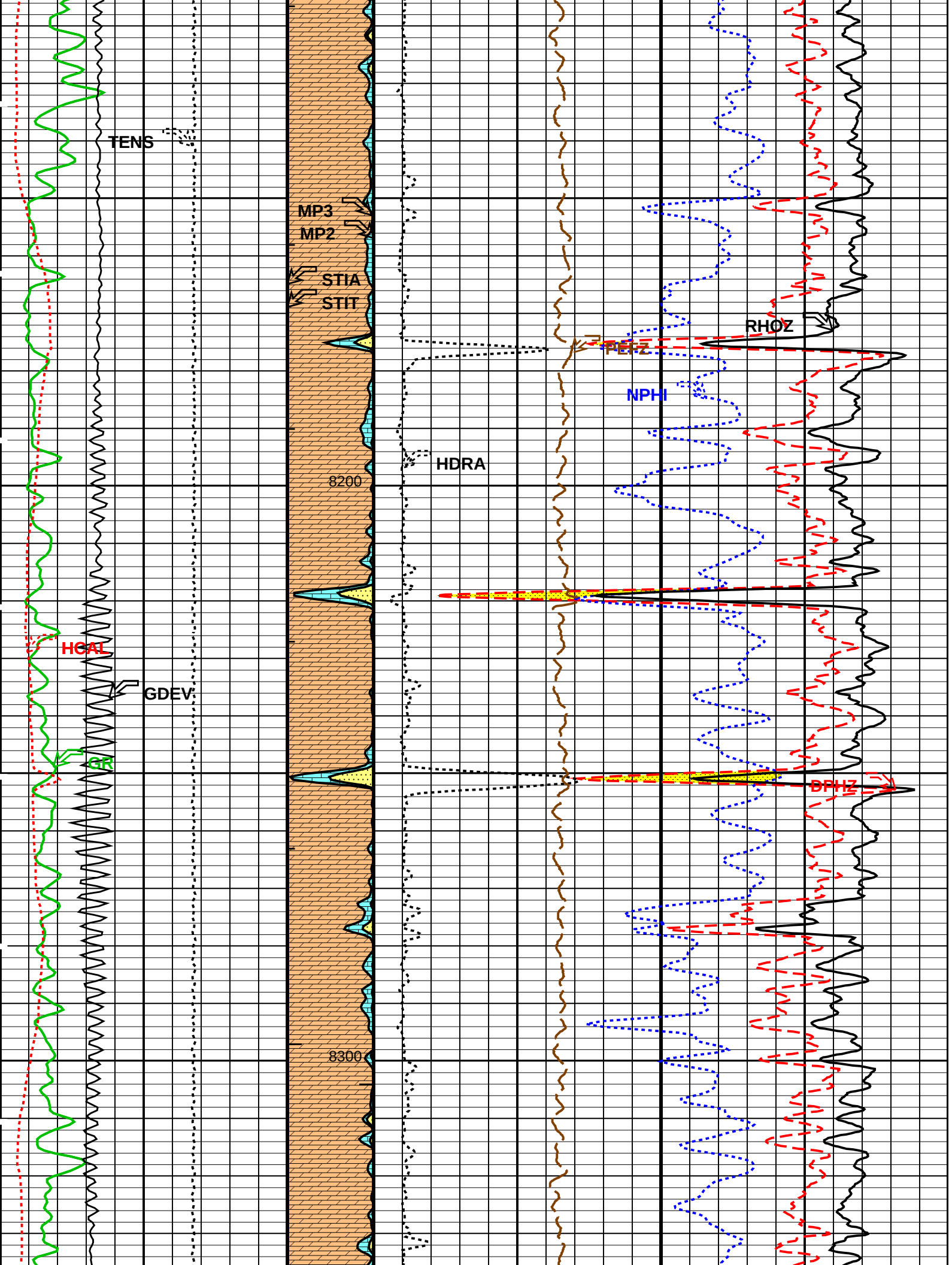
PEFZ
NPHI
RHOZ


HCAL
GDEV
GR
7700
DPHZ
MDEN = 2.83
7800
TENS


MDEN = 2.71
7900
MP3
MP2
STIA
STIT
PEFZ
RHOZ
NPHI
HDRA
HCAL
GDEV
8000
SP
DPHZ
8100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MP2
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PEFZ
NPHI
HDRA
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HCAL
GDEV
GR
DPHZ
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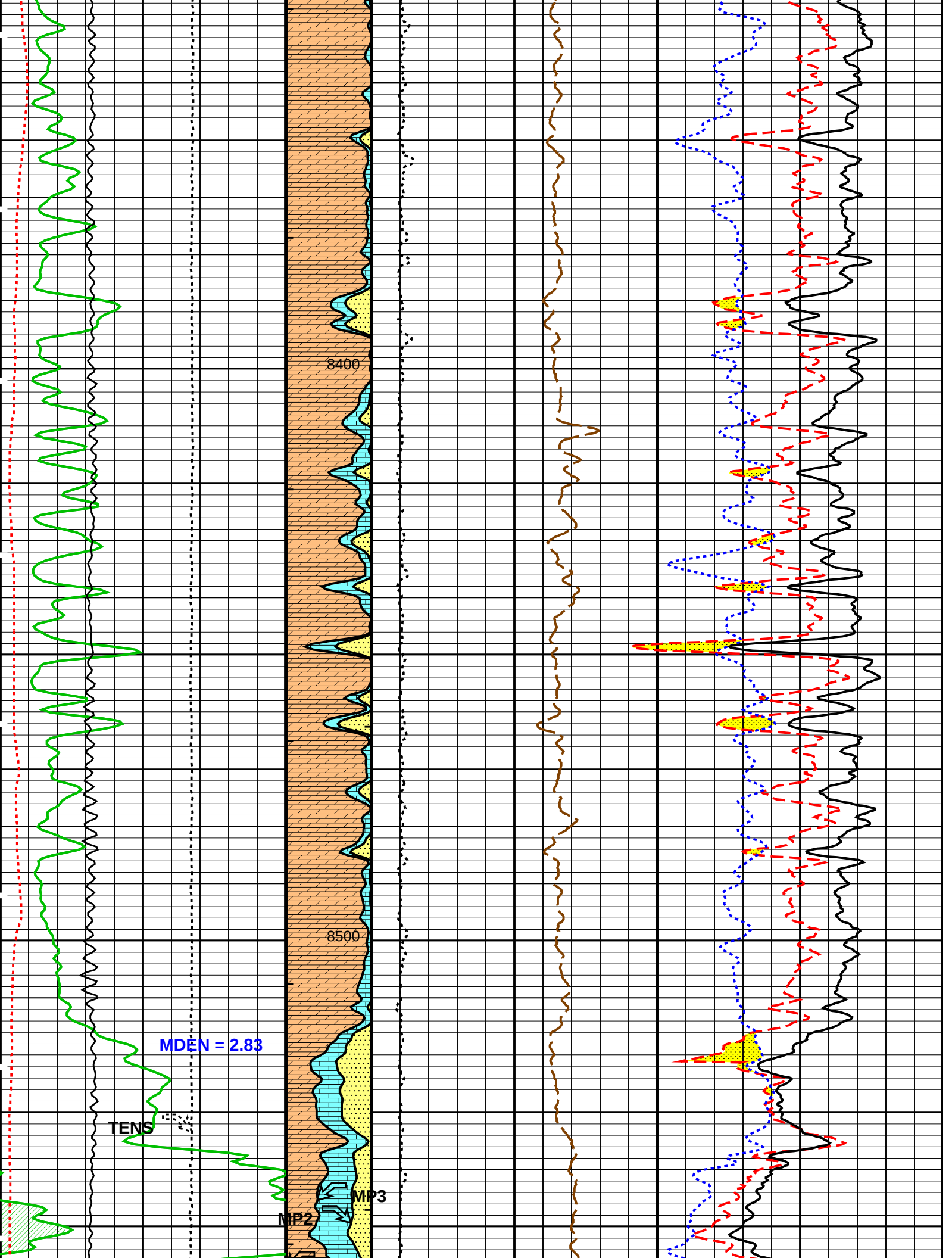
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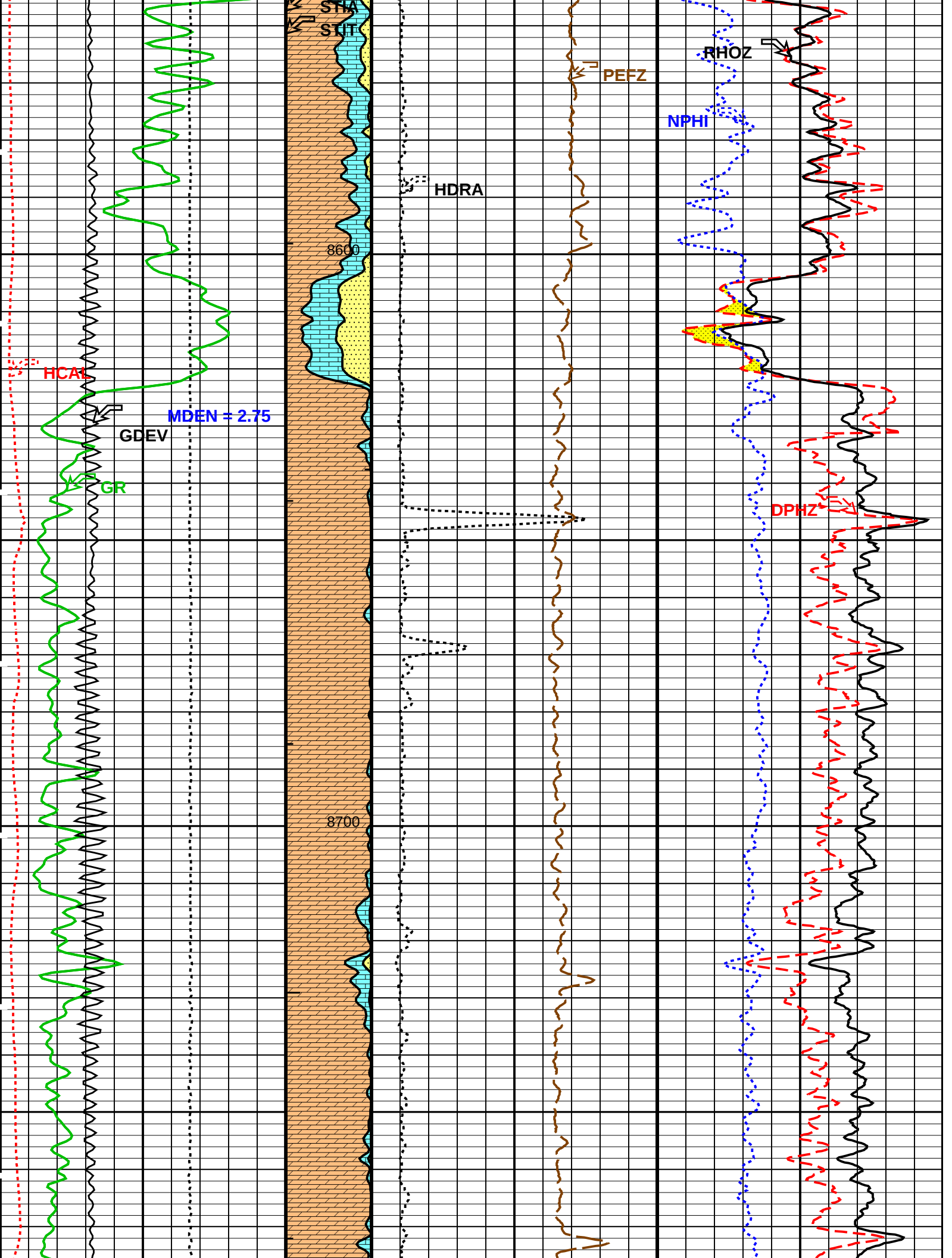
MP3
MP2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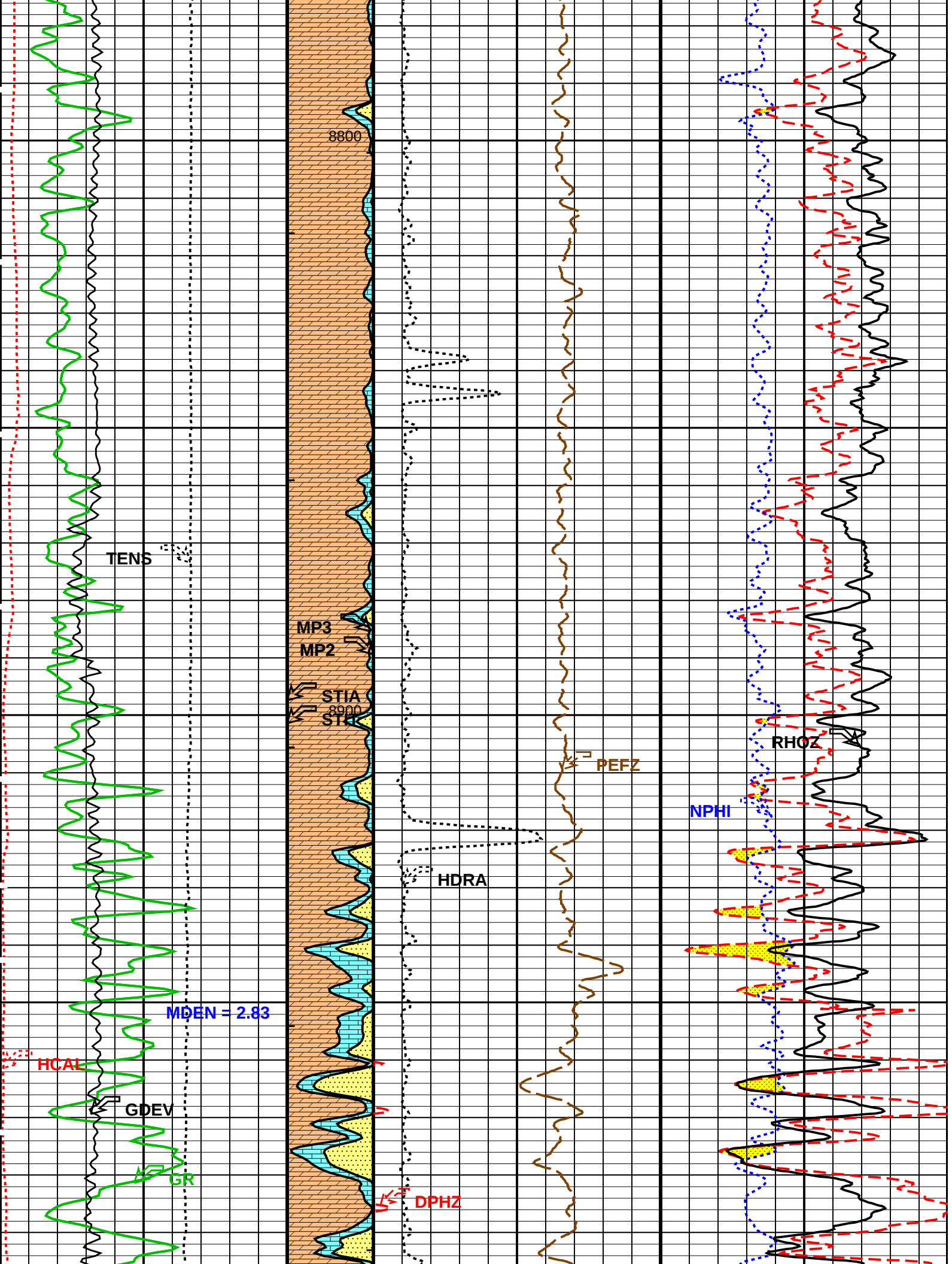
GDEV
GR
DPHZ
8700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MP2
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STIB
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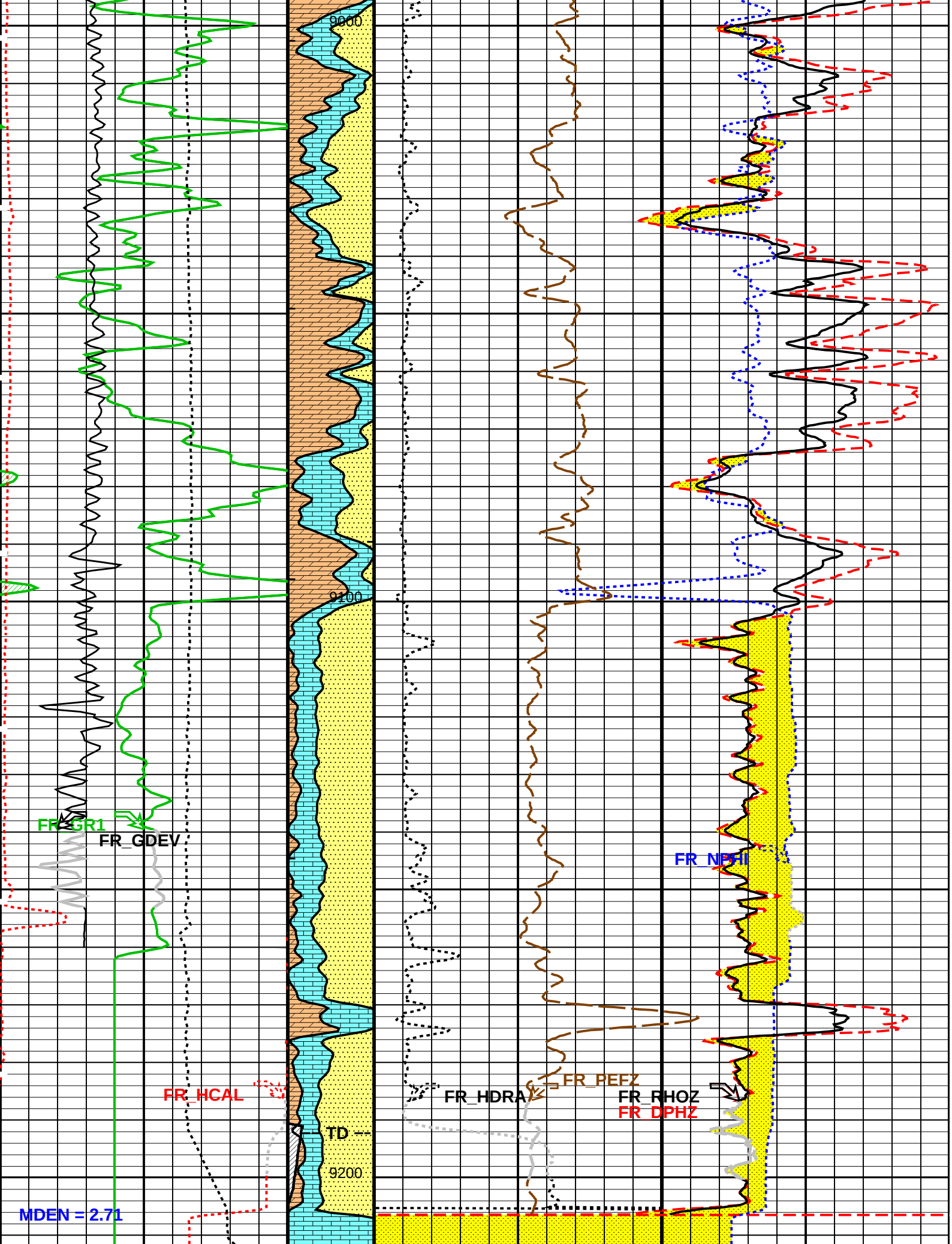
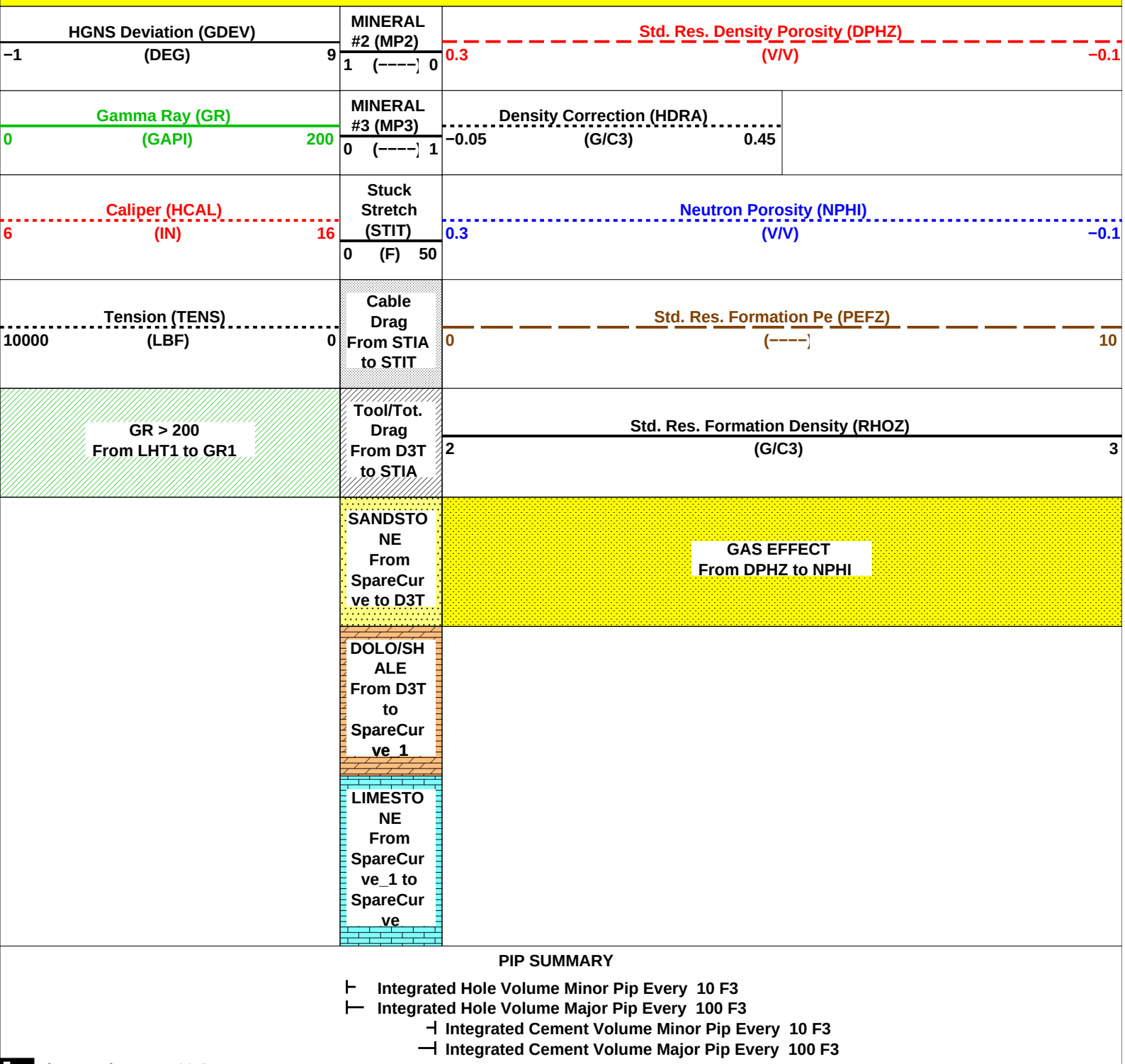
HDRA
MDEN = 2.83
HCAL
GDEV
GR
DPHZ



MAIN PASS 5 INCH = 100 FEET NEUTRON MATRIX = LIMESTONE



PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
	HILTB−FTB: High resolution Integrated Logging Tool−DTS		
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	142	DEGF
DHC	Density Hole Correction	BS	
FD	Fluid Density	1.1	G/C3
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GGRD	Geothermal Gradient	0.01	DF/F
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MDEN	Matrix Density	2.71	G/C3
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	HiRes	
NSAR	HRDD Depth Sampling Rate	1	IN
SHT	Surface Hole Temperature	50	DEGF

	FEQL: Formation Evaluation Quick Look		
FEXP	**Form Factor Exponent**	**2**	
FNUM	**Form Factor Numerator**	**1**	
	PERT: Preliminary Evaluation − Real Time		
BDPS	**Bulk Density Processing Selector**	**Standard**	
BHS	**Borehole Status**	**OPEN**	
BHT	**Bottom Hole Temperature (used in calculations)**	**142**	**DEGF**
CLIM	**Caliper Limit for Bad Hole**	**999**	**IN**
CNPS	**Corrected Neutron Porosity Selector**	**NPHI**	
DRUL	**DRHO Upper Limit**	**999**	**G/C3**
FCAL	**Caliper Presence Flag**	**PRESENT**	
FCGR	**CGR Presence Flag**	**ABSENT**	
FEXP	**Form Factor Exponent**	**2**	
FLDT	**Bulk Density Presence Flag**	**PRESENT**	
FNUM	**Form Factor Numerator**	**1**	
FSON	**Sonic Presence Flag**	**ABSENT**	
GCSE	**Generalized Caliper Selection**	**HCAL**	
GGRD	**Geothermal Gradient**	**0.01**	**DF/F**
GTSE	**Generalized Temperature Selection**	**HSTS_HTEM**	
MATR	**Rock Matrix for Neutron Porosity Corrections**	**LIMESTONE**	
PMAX	**PHI Maximum**	**0.5**	**CFCF**
POUT	**Porosity Output Lithology**	**LIMESTONE**	
RG21	**RHO Grain (2−Mineral Model, Min−1)**	**2.71**	**G/C3**
RG22	**RHO Grain (2−Mineral Model, Min−2)**	**2.644**	**G/C3**
RG23	**RHO Grain (2−Mineral Model, Min−3)**	**2.877**	**G/C3**
RG31	**RHO Grain (3−Mineral Model, Min−1)**	**2.71**	**G/C3**
RG32	**RHO Grain (3−Mineral Model, Min−2)**	**2.644**	**G/C3**
RG33	**RHO Grain (3−Mineral Model, Min−3)**	**2.877**	**G/C3**
RTLF	**RT Limit Flag**	**NO_LIMIT**	
RWF	**Resistivity of Free Water**	**0.01**	**OHMM**
SHT	**Surface Hole Temperature**	**50**	**DEGF**
UF	**U Fluid**	**0.398**	
UM21	**U Matrix (2−Mineral Model, Min−1)**	**13.77**	
UM22	**U Matrix (2−Mineral Model, Min−2)**	**4.779**	
UM23	**U Matrix (2−Mineral Model, Min−3)**	**8.997**	
UM31	**U Matrix (3−Mineral Model, Min−1)**	**13.77**	
UM32	**U Matrix (3−Mineral Model, Min−2)**	**4.779**	
UM33	**U Matrix (3−Mineral Model, Min−3)**	**8.997**	
	STI: Stuck Tool Indicator		
LBFR	**Trigger for MAXIS First Reading Label**	**STI**	
STKT	**STI Stuck Threshold**	**2.5**	**FT**
TDD	**Total Depth − Driller**	**9190.00**	**FT**
TDL	**Total Depth − Logger**	**9192.00**	**FT**
	HOLEV: Integrated Hole/Cement Volume		
BHS	**Borehole Status**	**OPEN**	
BHT	**Bottom Hole Temperature (used in calculations)**	**142**	**DEGF**
FCD	**Future Casing (Outer) Diameter**	**4.5**	**IN**
GCSE	**Generalized Caliper Selection**	**HCAL**	
GGRD	**Geothermal Gradient**	**0.01**	**DF/F**
GTSE	**Generalized Temperature Selection**	**HSTS_HTEM**	
HVCS	**Integrated Hole Volume Caliper Selection**	**HCAL**	
MATR	**Rock Matrix for Neutron Porosity Corrections**	**LIMESTONE**	
SHT	**Surface Hole Temperature**	**50**	**DEGF**
	System and Miscellaneous		
BS	**Bit Size**	**6.125**	**IN**
DFD	**Drilling Fluid Density**	**9.35**	**LB/G**
DO	**Depth Offset for Playback**	**−4.0**	**FT**
PP	**Playback Processing**	**RECOMPUTE**	
RMFS	**Resistivity of Mud Filtrate Sample**	**0.0220**	**OHMM**
TD	**Total Depth**	**9192**	**FT**
TWS	**Temperature of Connate Water Sample**	**100.00**	**DEGF**

Format: PEX_NUC5_MAIN **Vertical Scale: 5" per 100'** **Graphics File Created: 29−Jul−2003 22:25**

OP System Version: 11C0−305

MCM

HILTB−FTB	**11C0−305**	**DTC−H**	**11C0−305**

Input DLIS Files

DEFAULT	**TLD_MCFL_CNL_017LUP**	**FN:16**	**PRODUCER**	**29−Jul−2003 20:30**	**9215.5 FT**	**6022.1 FT**

Output DLIS Files

DEFAULT	**TLD_MCFL_CNL_022PUP**	**FN:21**	**PRODUCER**	**29−Jul−2003 22:25**

Input DLIS Files

DEFAULT	TLD_MCFL_CNL_017LUP	FN:16	PRODUCER	29−Jul−2003 20:30	9215.5 FT	6022.1 FT

Output DLIS Files

DEFAULT	TLD_MCFL_CNL_022PUP	FN:21	PRODUCER	29−Jul−2003 22:25	9211.5 FT	6020.0 FT

OP System Version: 11C0−305

MCM

HILTB−FTB	11C0−305	DTC−H	11C0−305

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
MDEN	2.83 G/C3	2.71 G/C3	8946.5 22:26:00
	2.75 G/C3	2.83 G/C3	8626.5 22:27:15
	2.83 G/C3	2.75 G/C3	8516.5 22:28:50
	2.71 G/C3	2.83 G/C3	7896.5 22:30:38
	2.83 G/C3	2.71 G/C3	7756.5 22:31:37
	2.71 G/C3	2.83 G/C3	7106.5 22:33:21

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

GAS EFFECT
From DPH8 to HNPO

H. Res. Formation Density (RHO8)
2 (G/C3) 3

GR > 200
From LHT1 to GR1

H. Res. Formation Pe (PEF8)
0 (−−−−) 10

Tension (TENS)
10000 (LBF) 0

Tool/Tot. Drag From D3T to STIA

Density Correction (HDRA)
−0.05 (G/C3) 0.45

Caliper (HCAL)
6 (IN) 16

Cable Drag From STIA to STIT

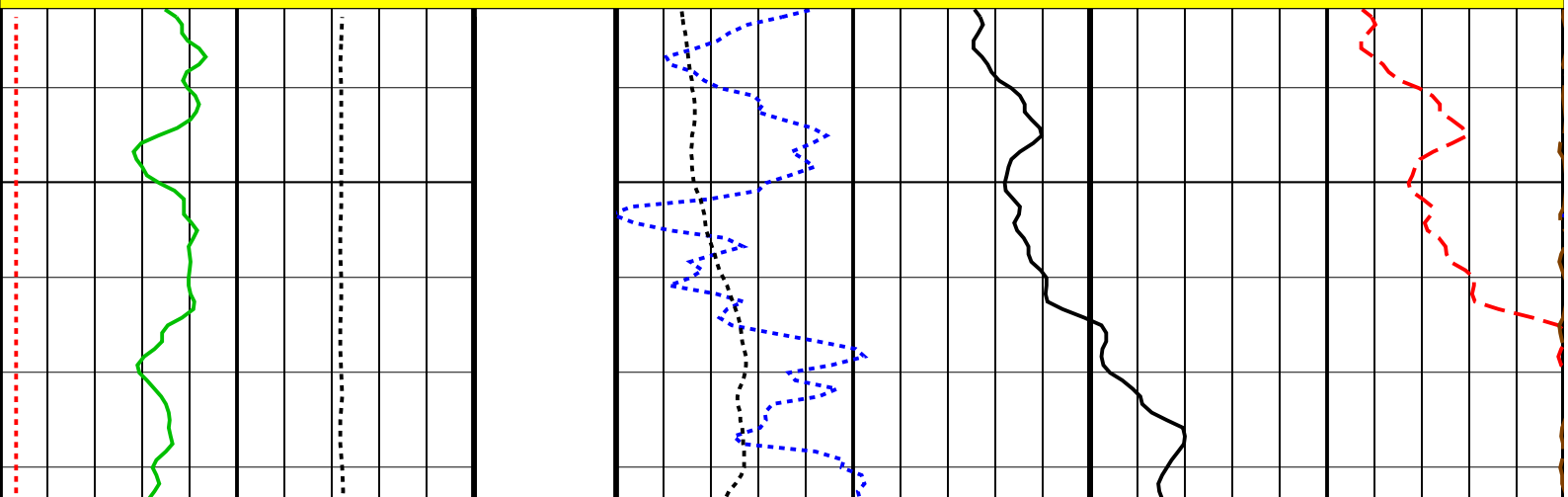
HiRes NPOR (HNPO)
0.3 (V/V) −0.1

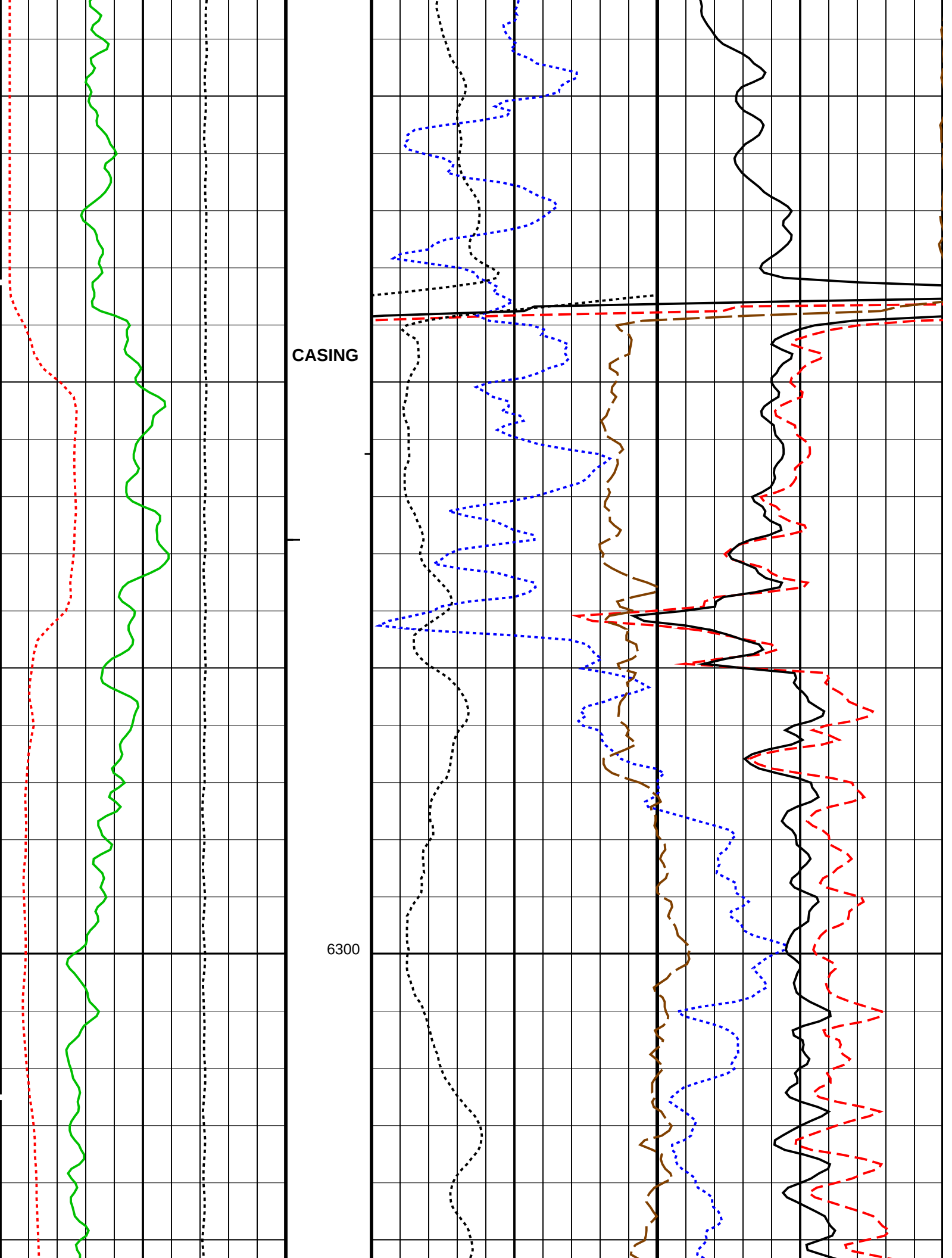
Gamma Ray (EHGR)
0 (GAPI) 200

Stuck Stretch (STIT)
0 (F) 50

H. Res. Density Porosity (DPH8)
0.3 (V/V) −0.1

MAIN PASS 25 INCH = 100 FEET HIRES LOG

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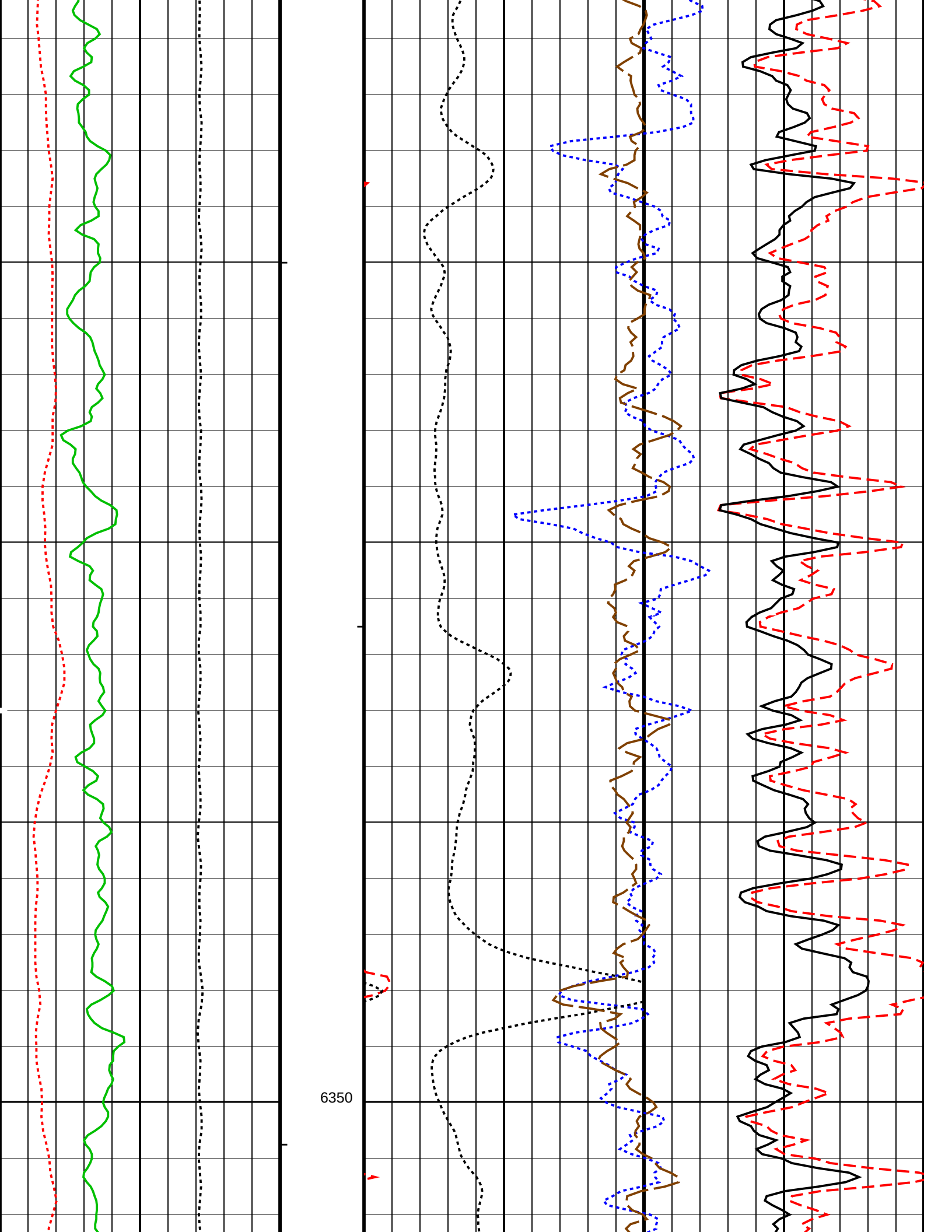
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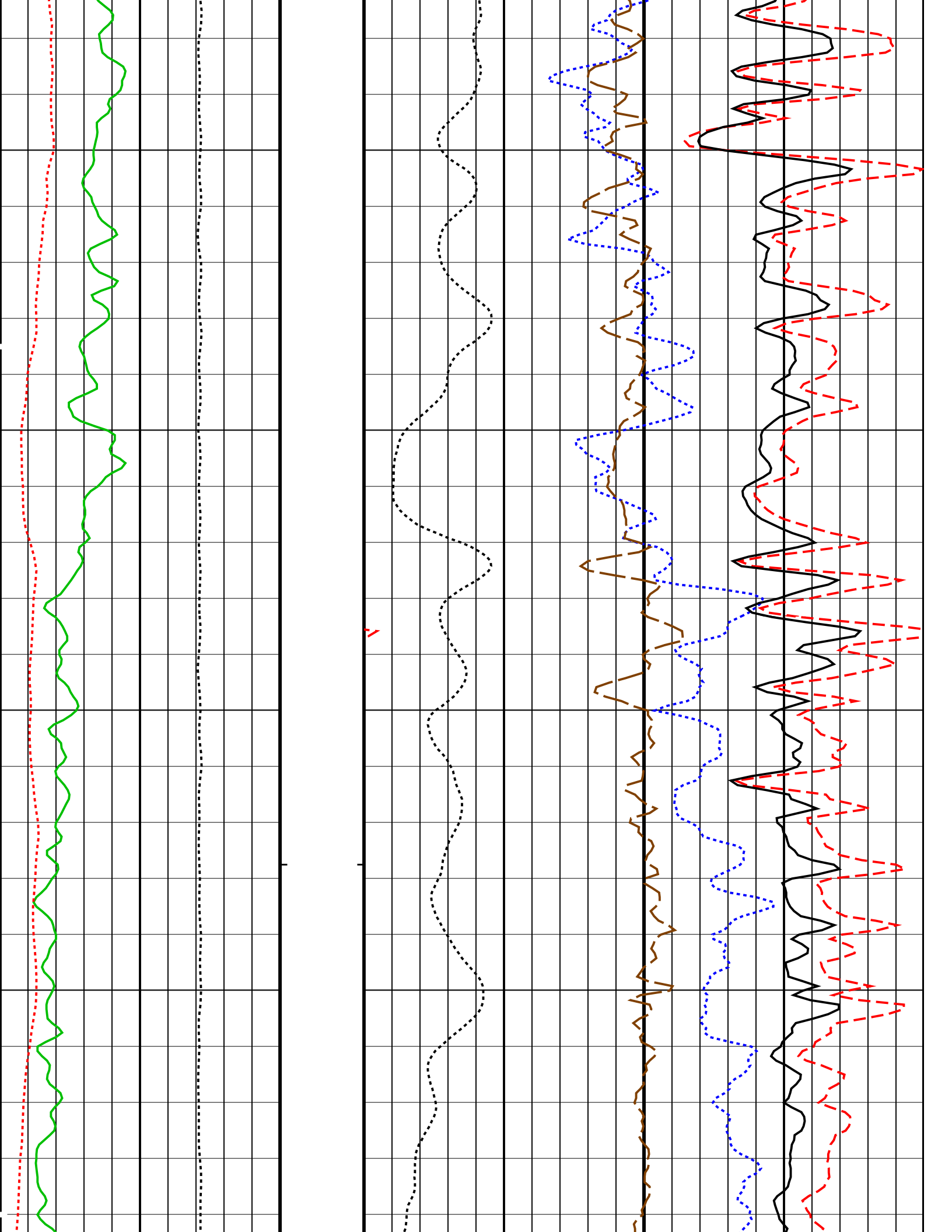

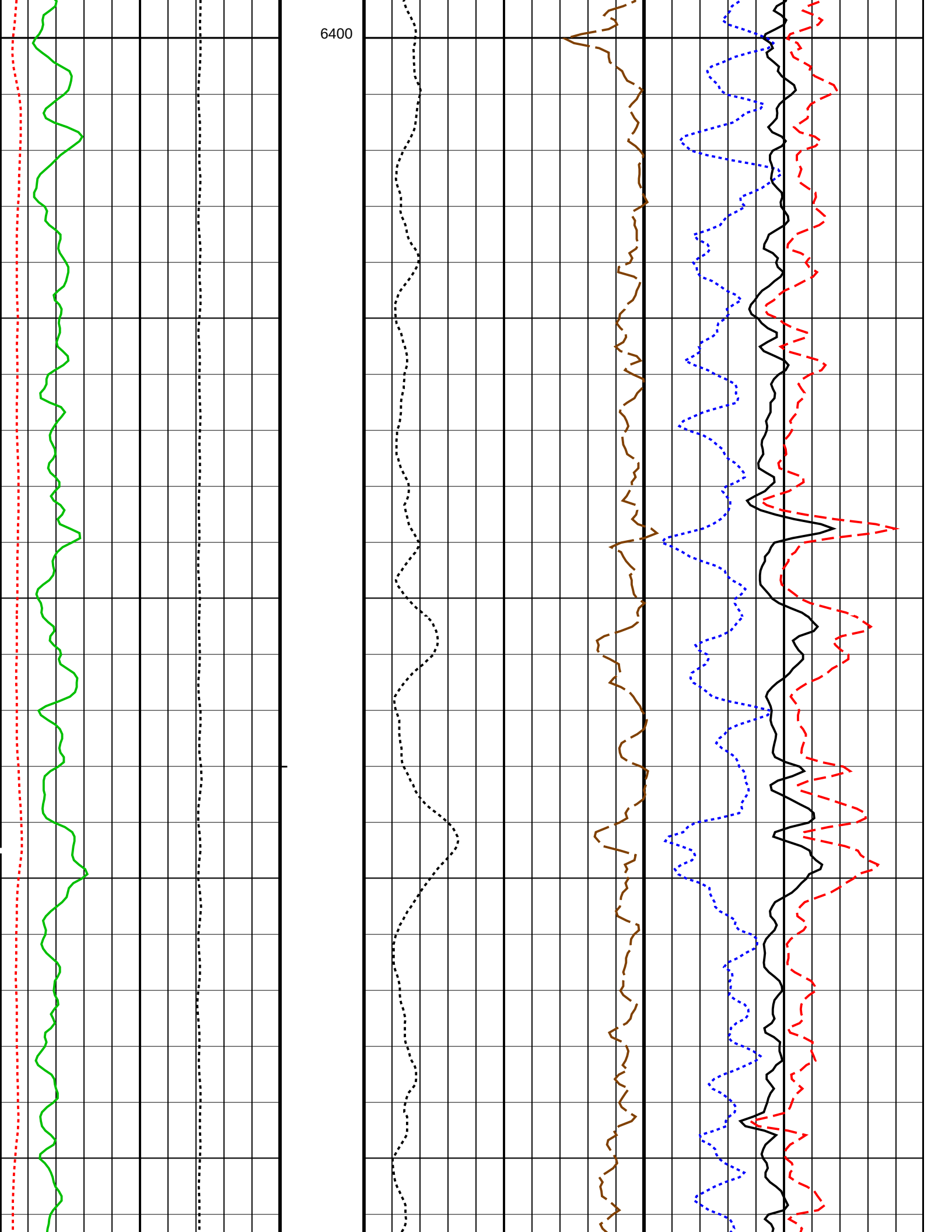
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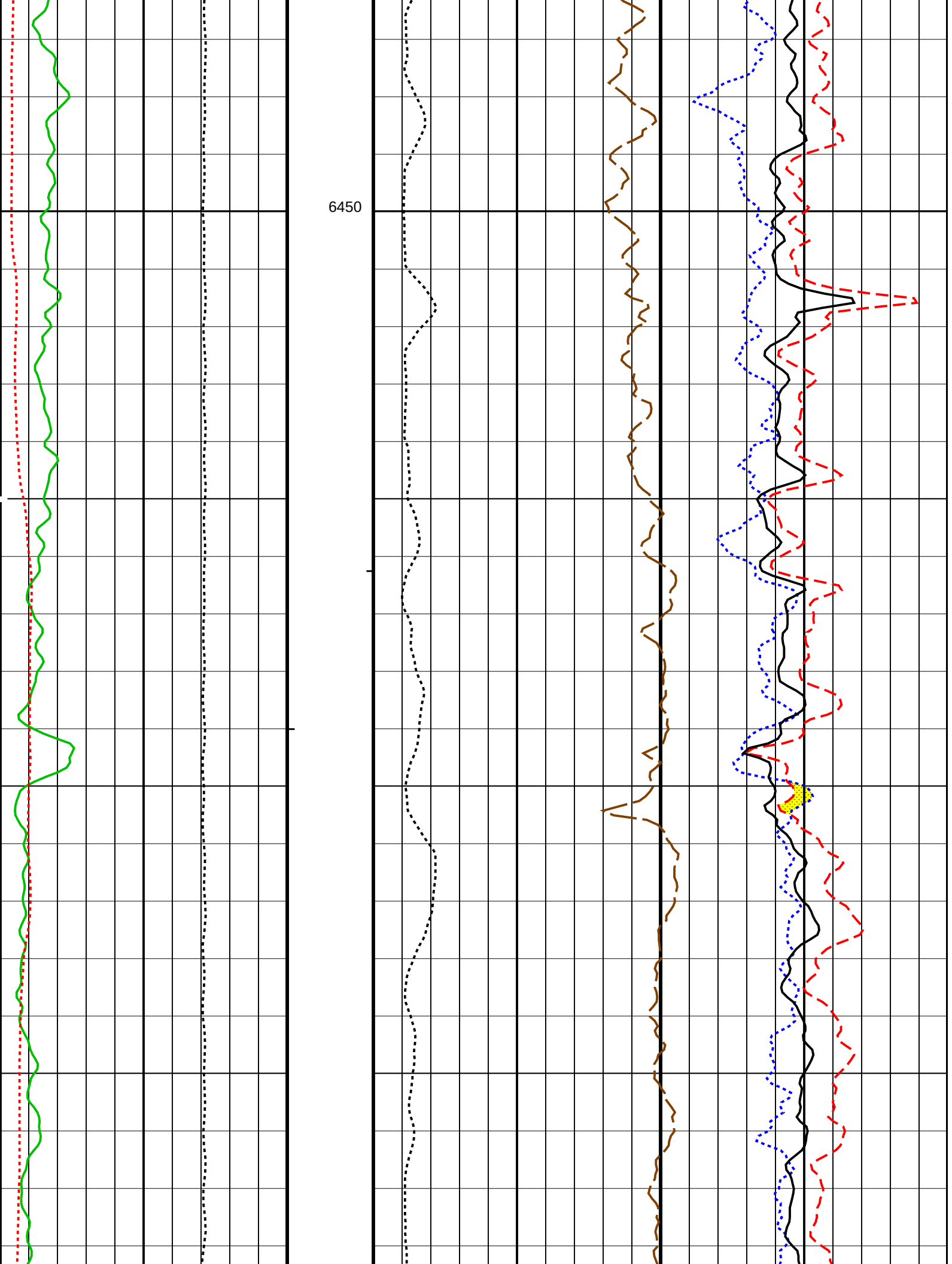
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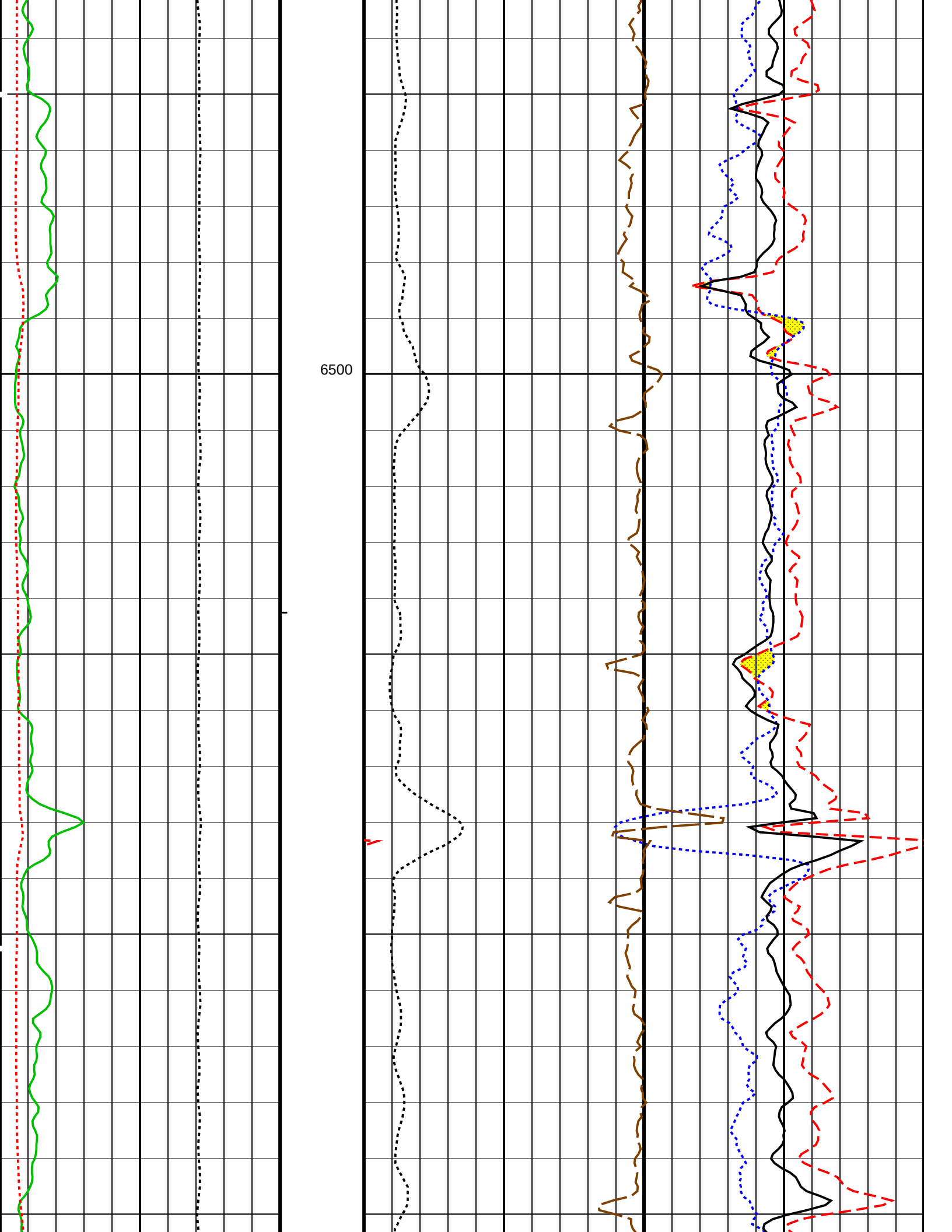
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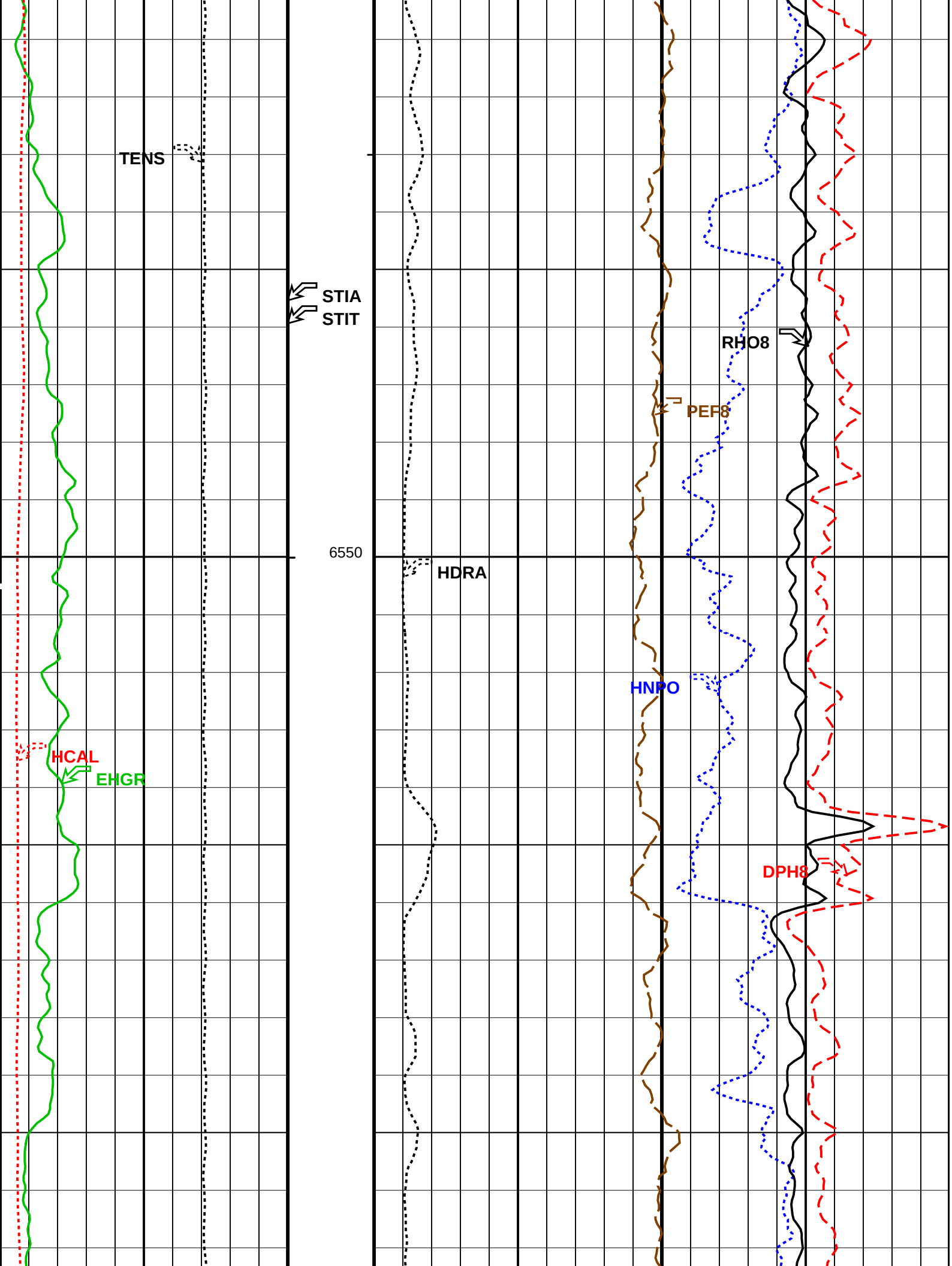
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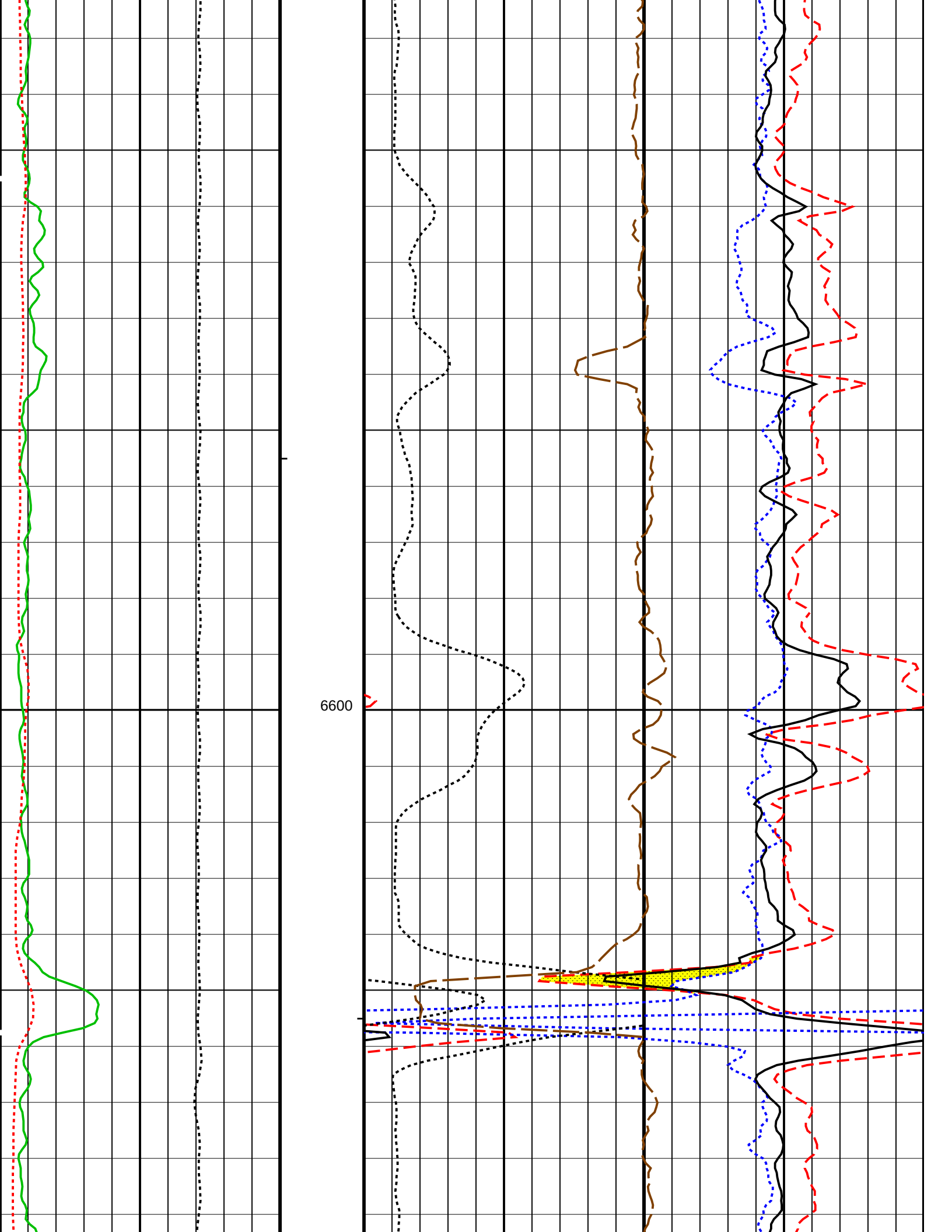
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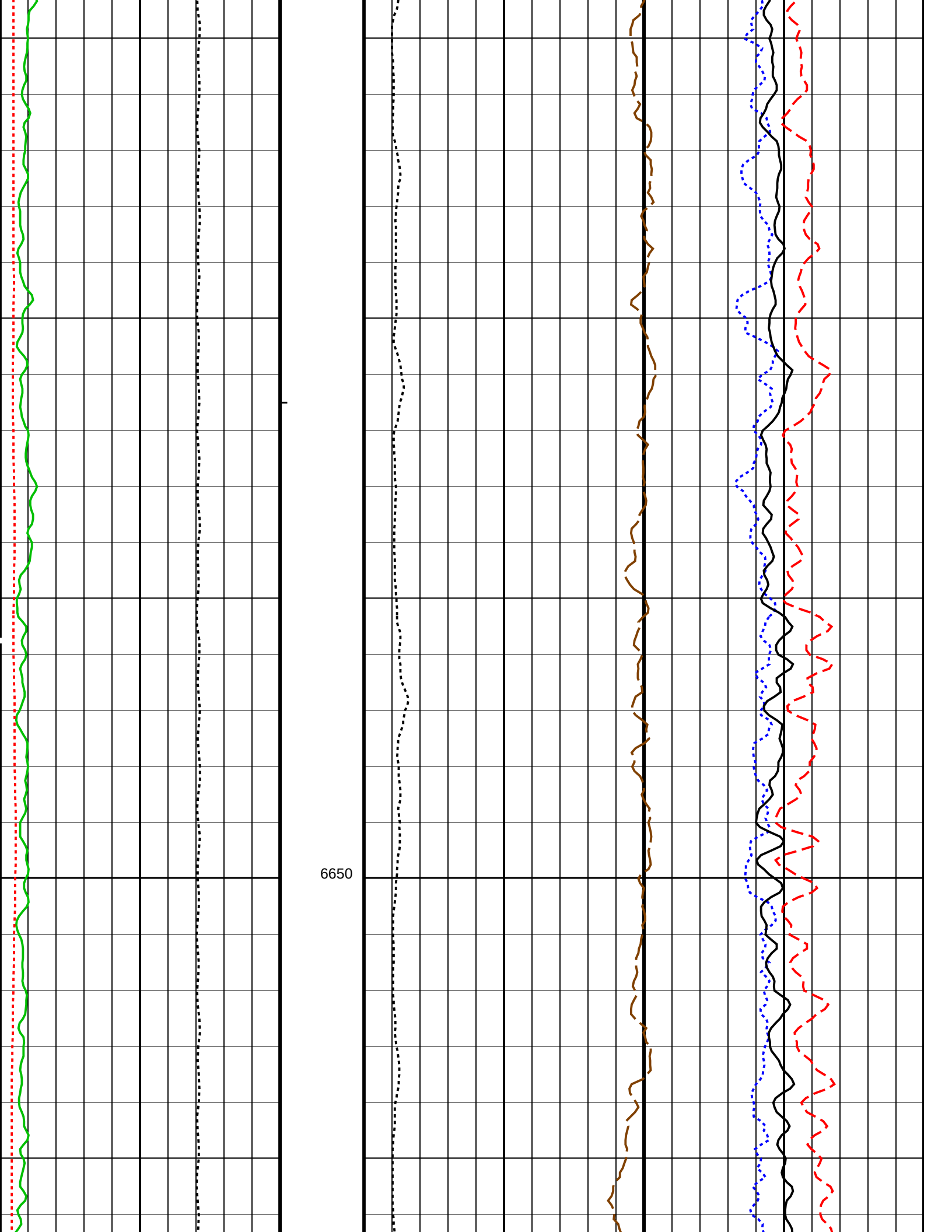
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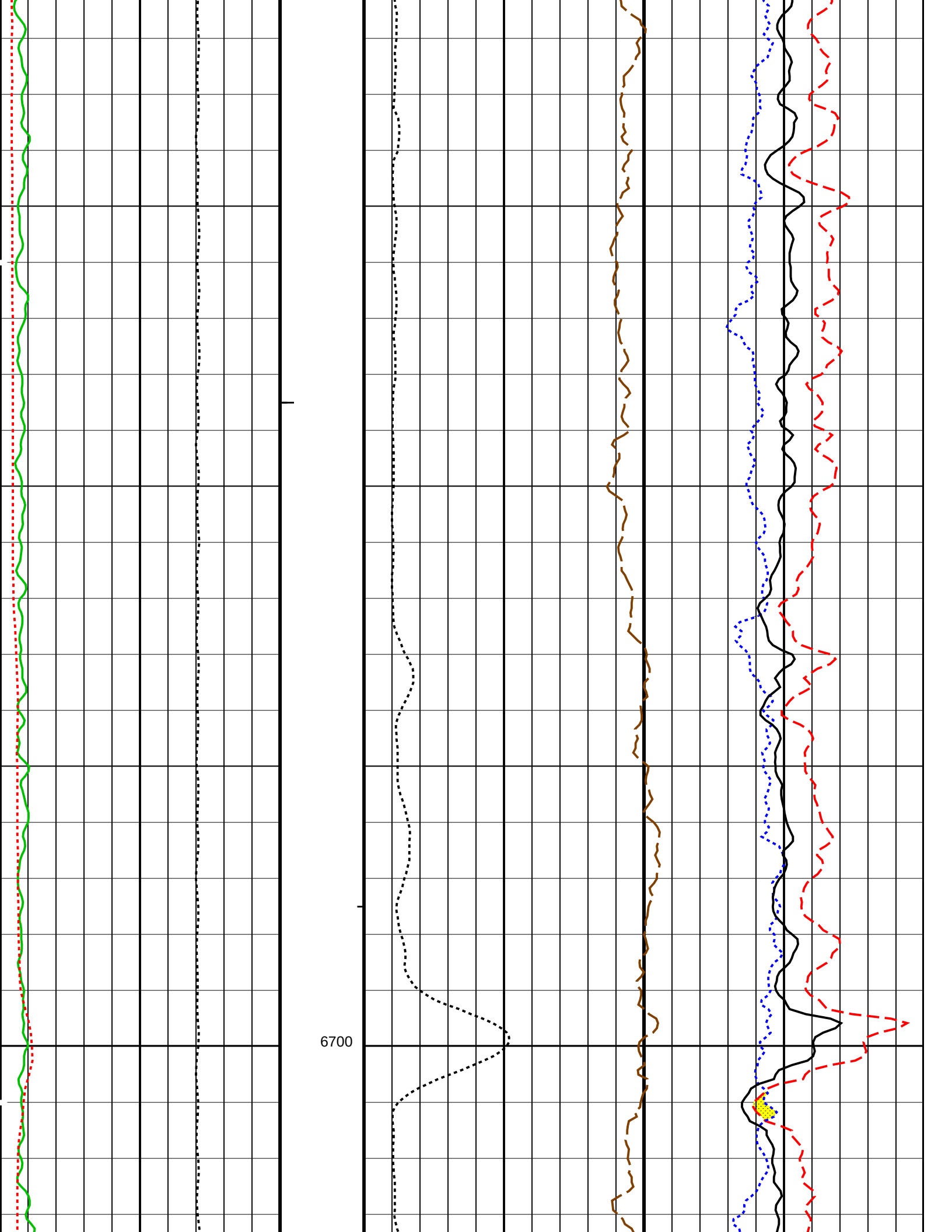
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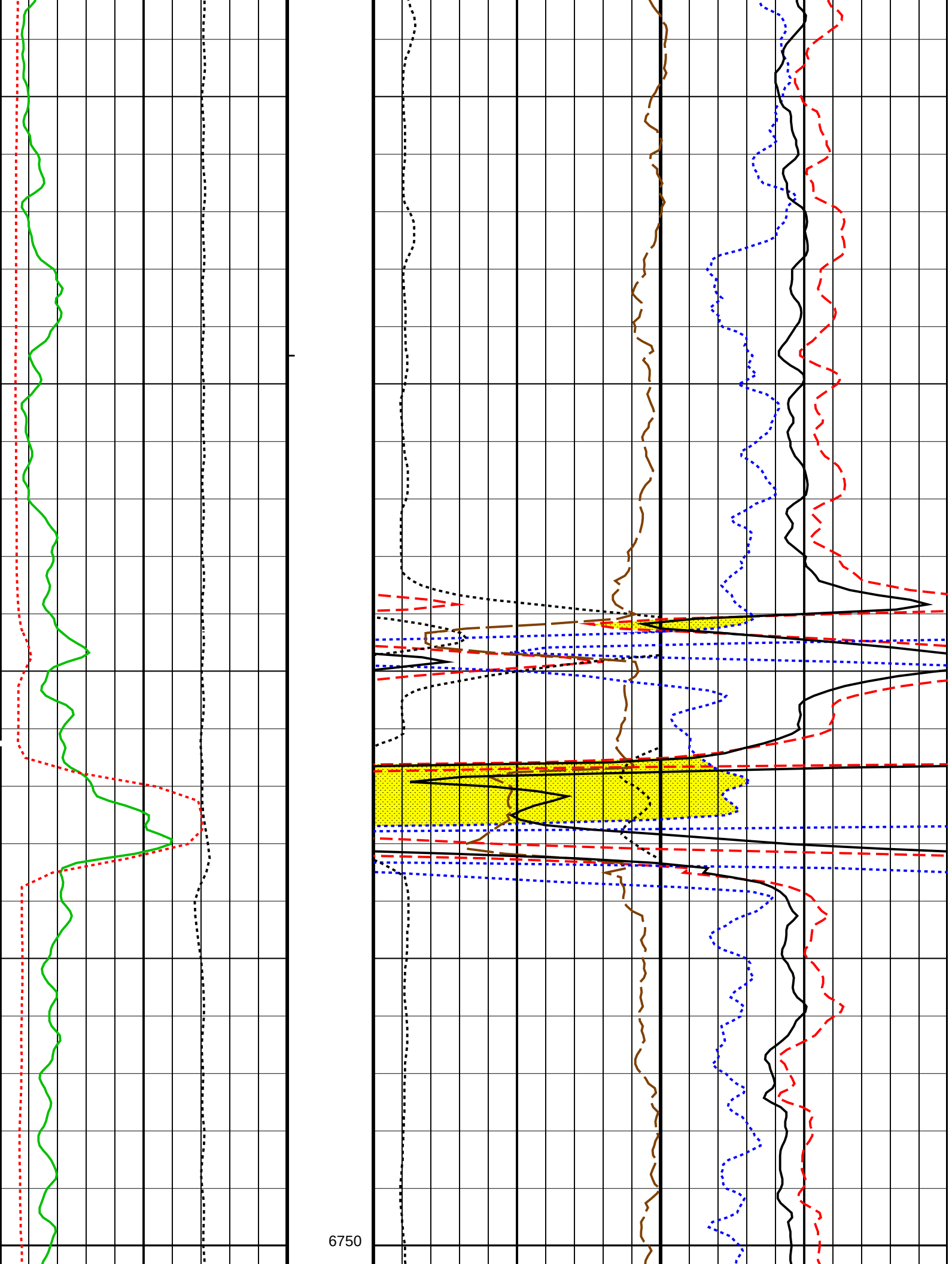
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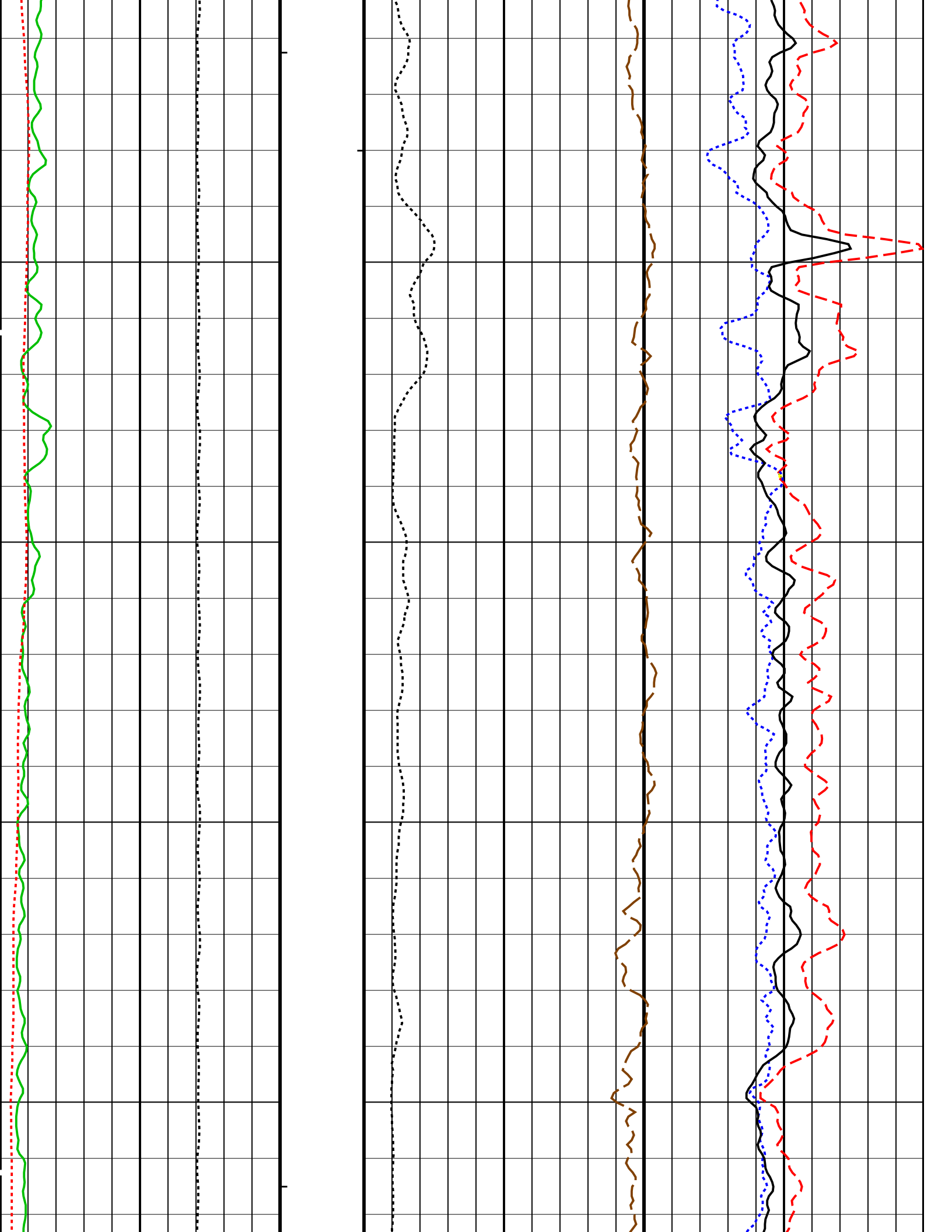

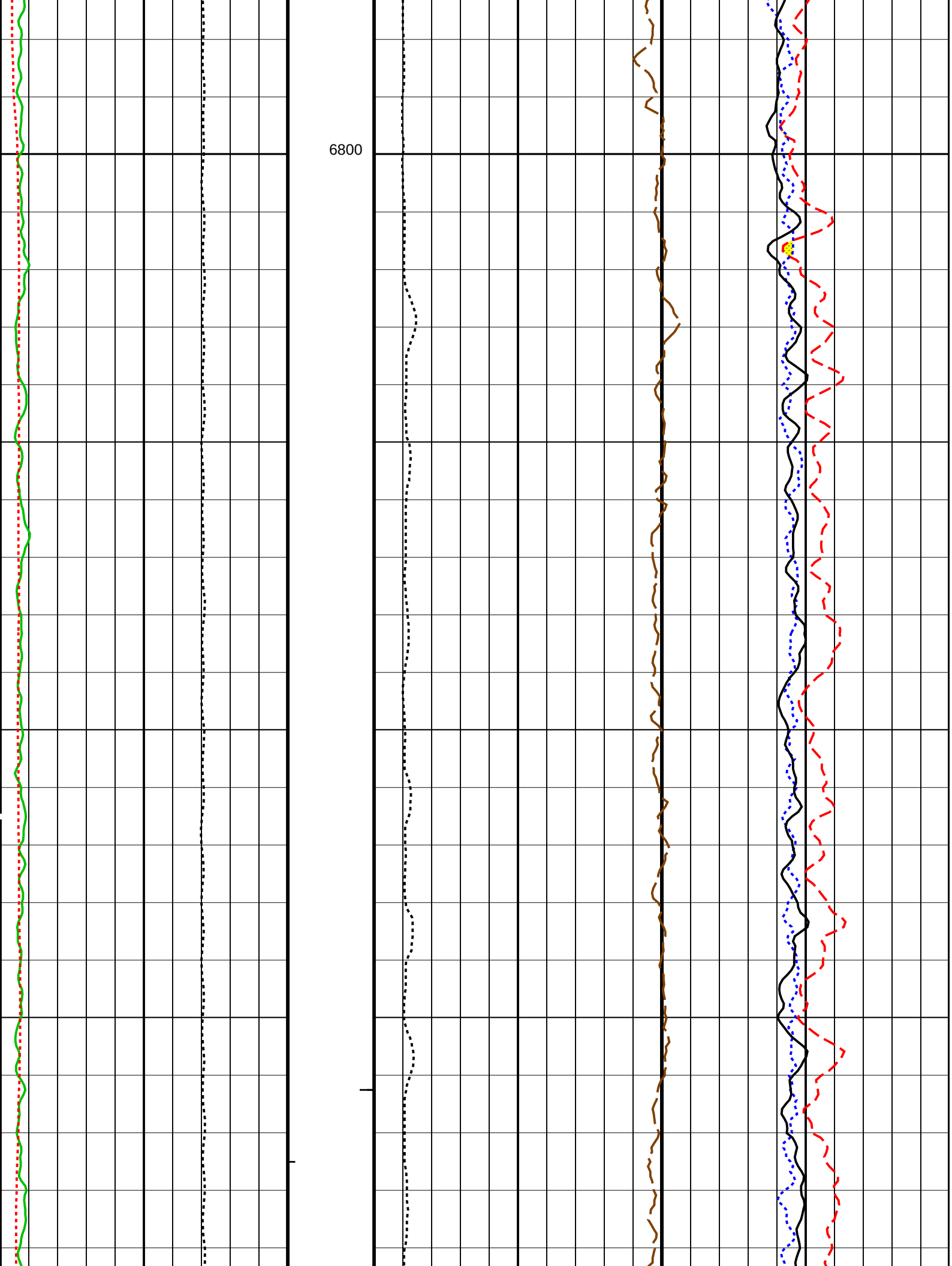
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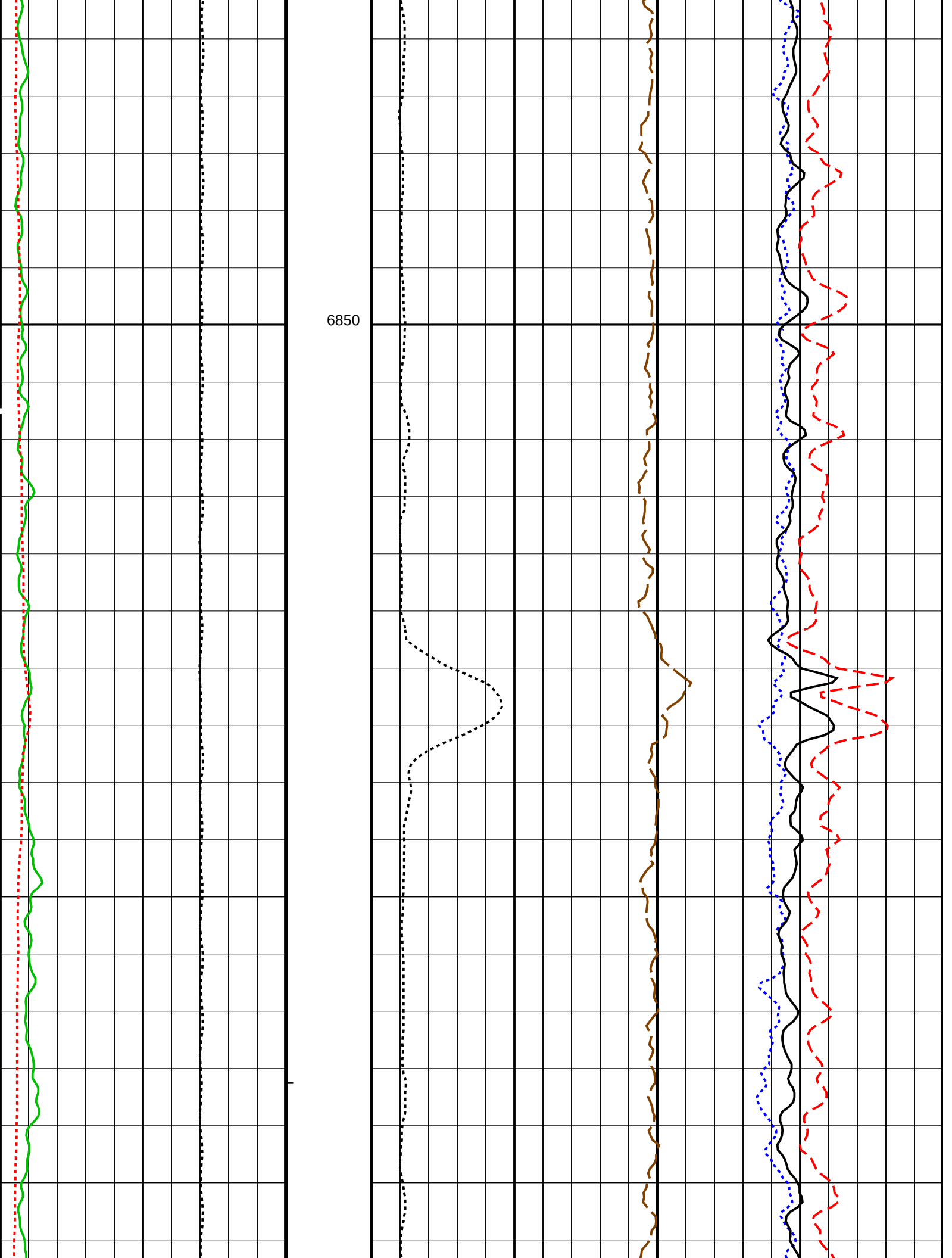
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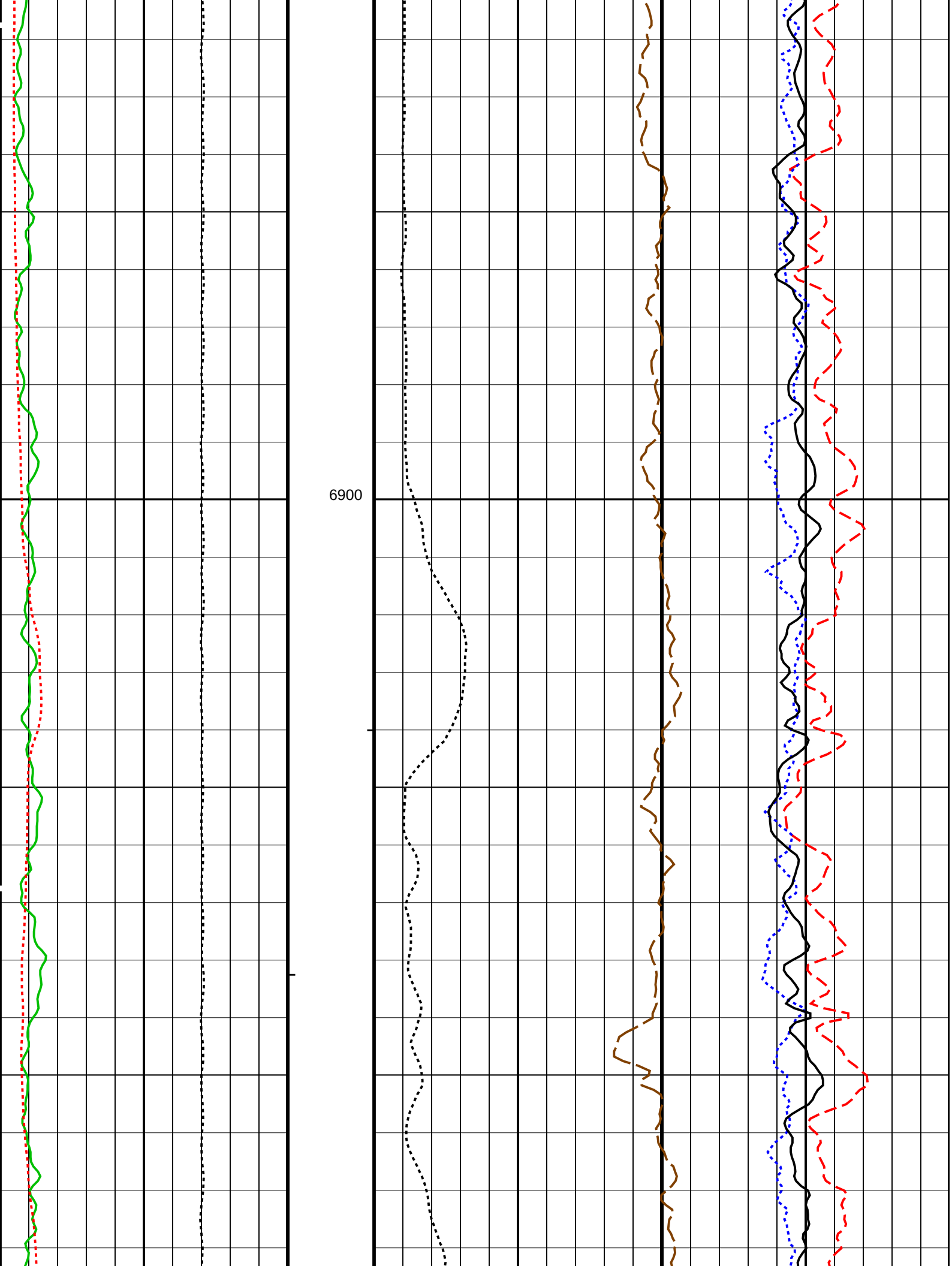
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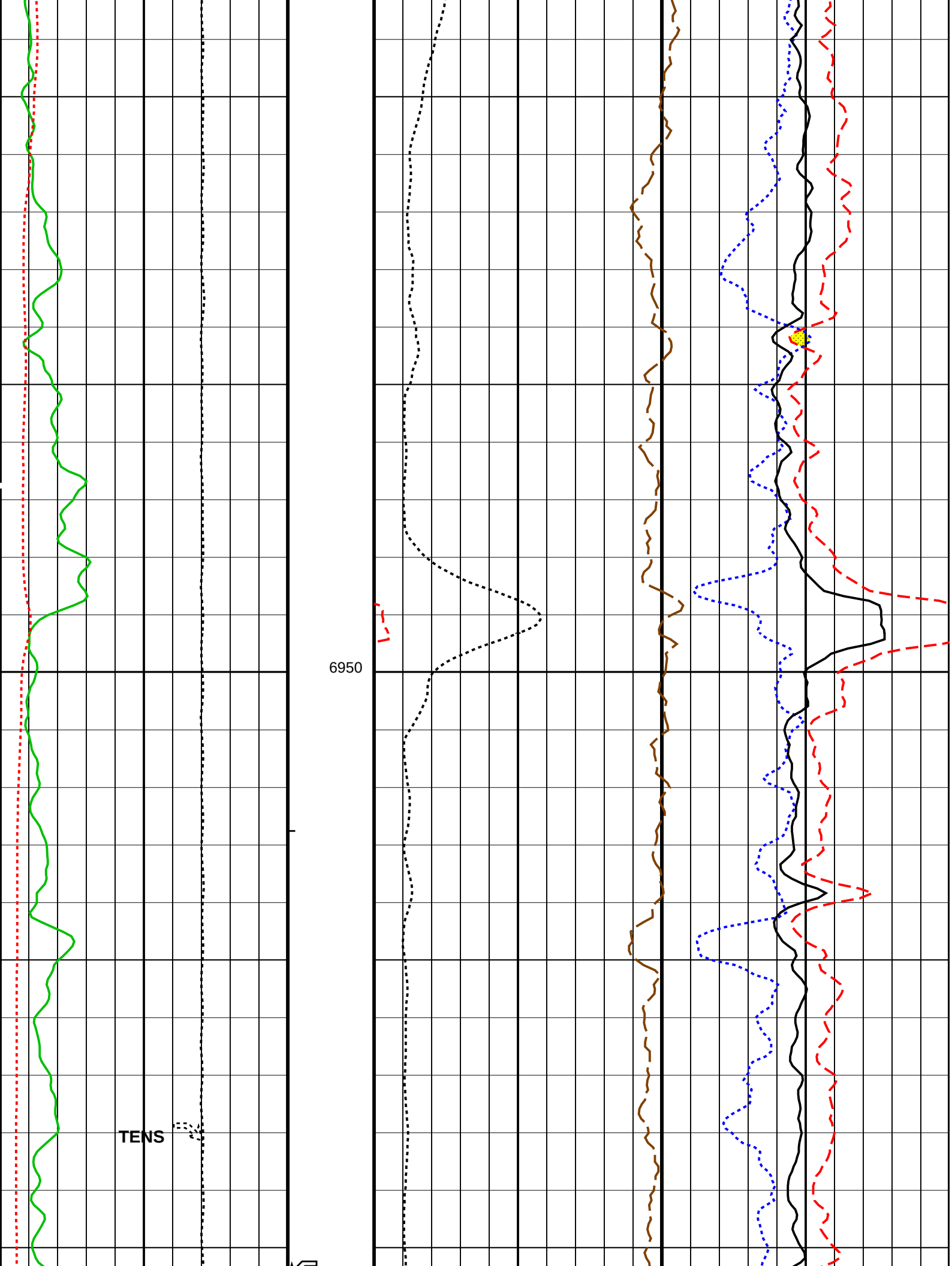
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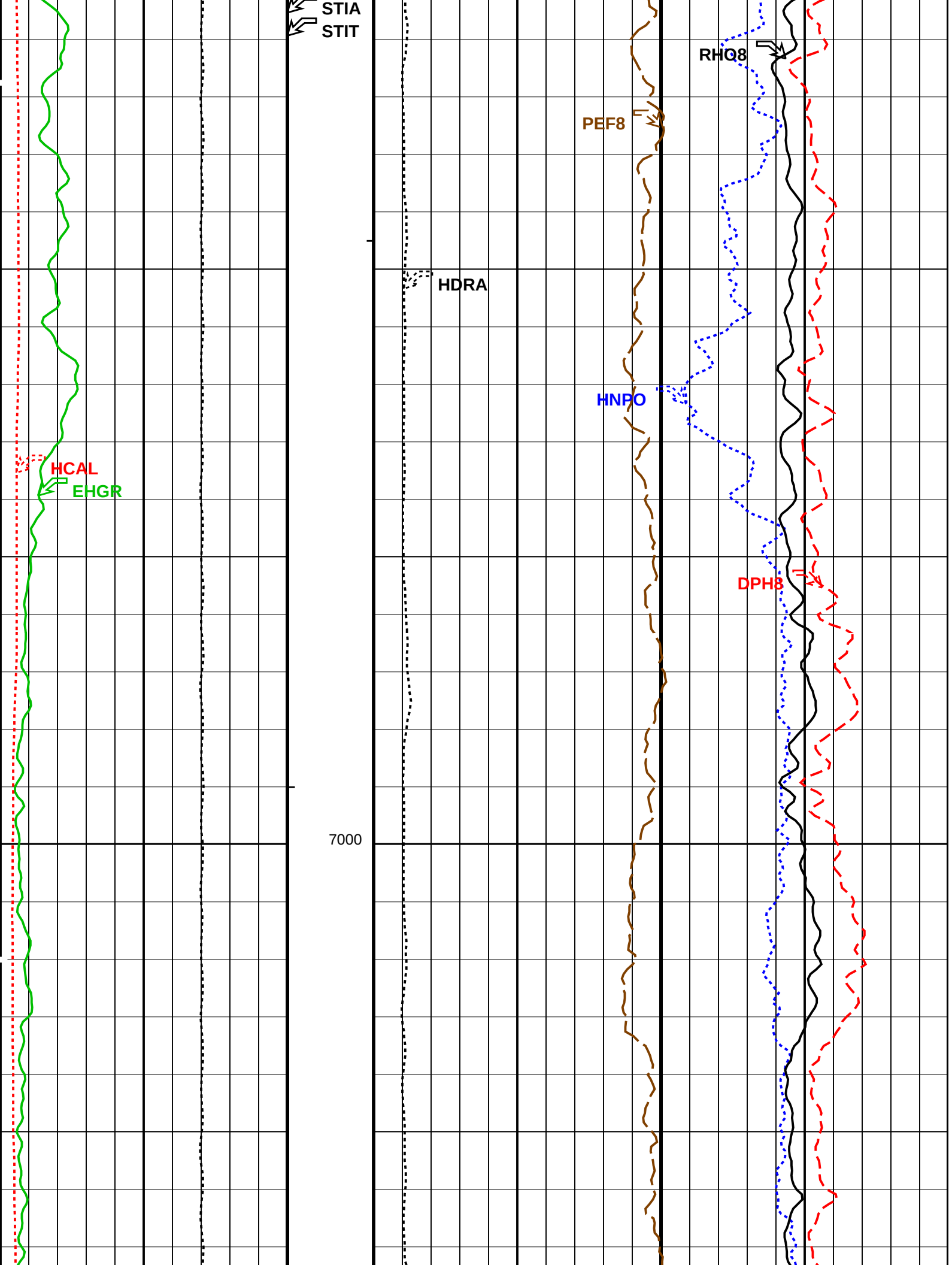
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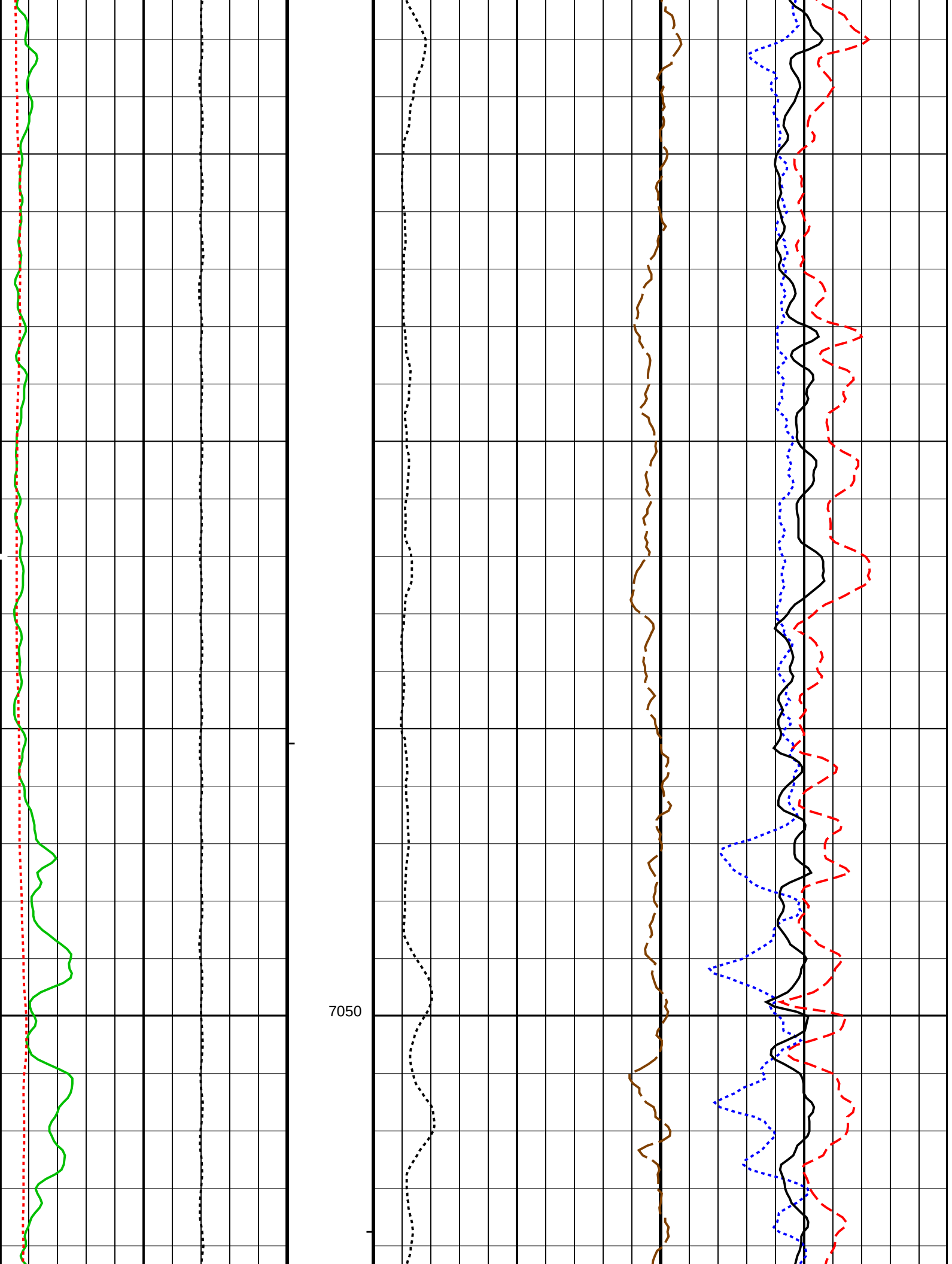
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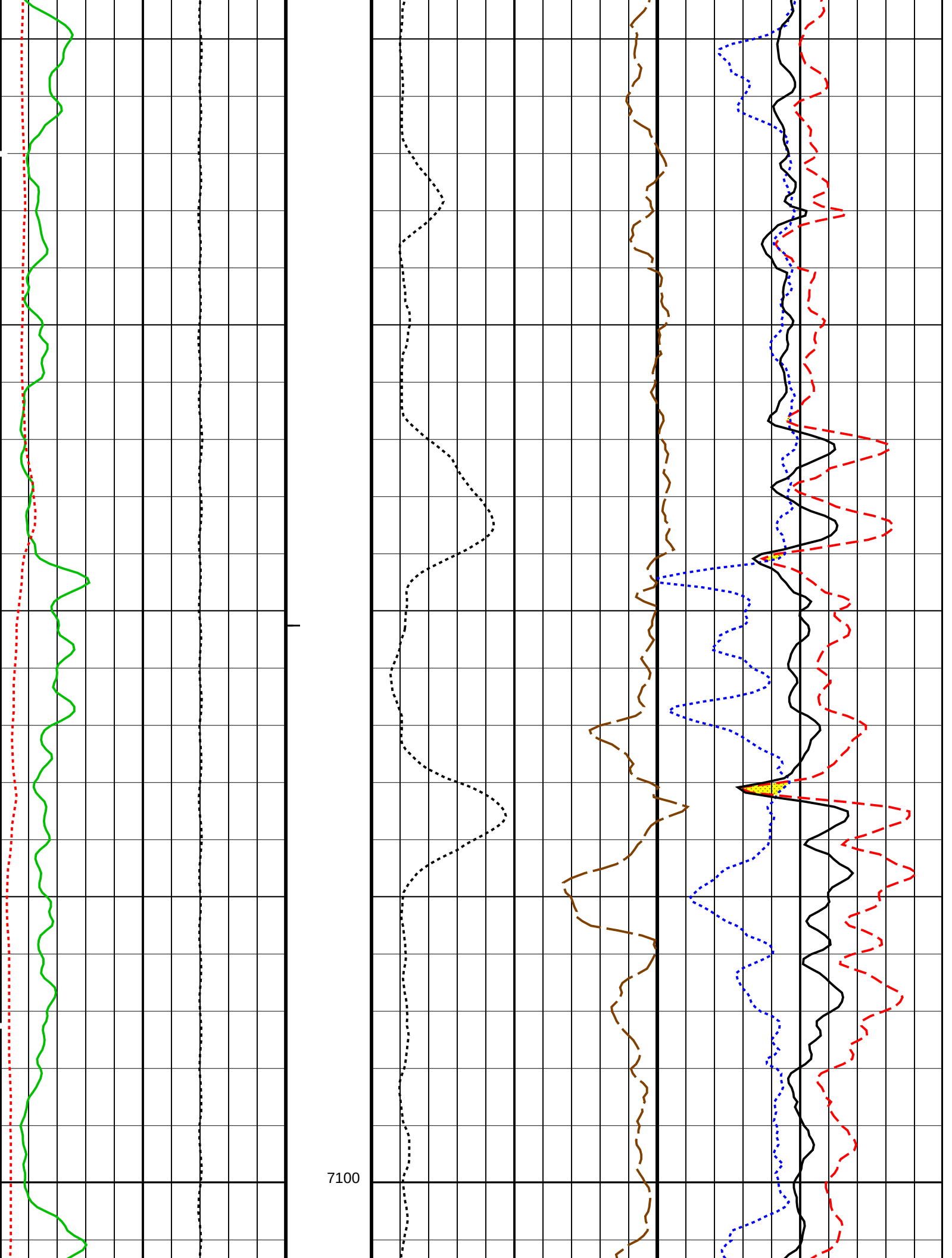
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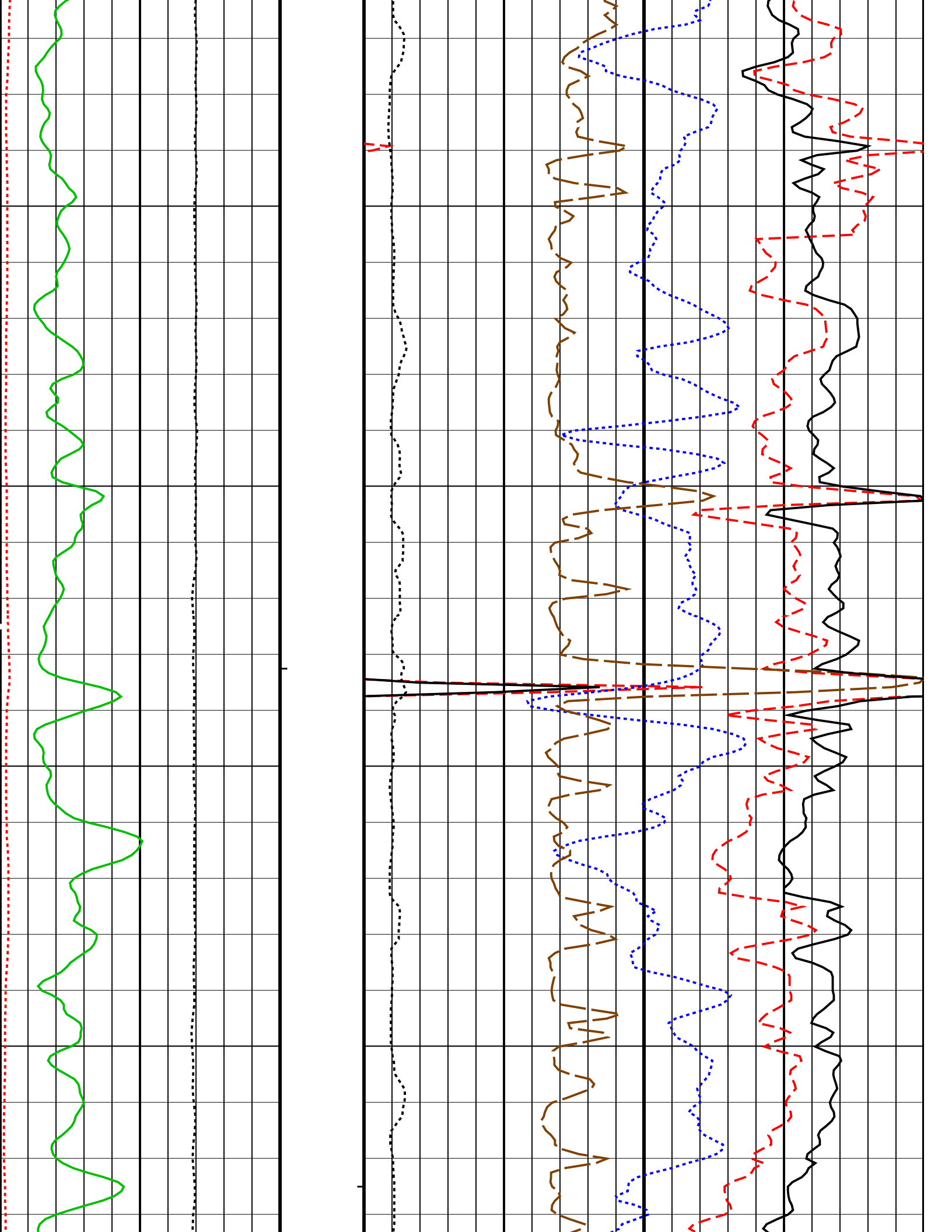

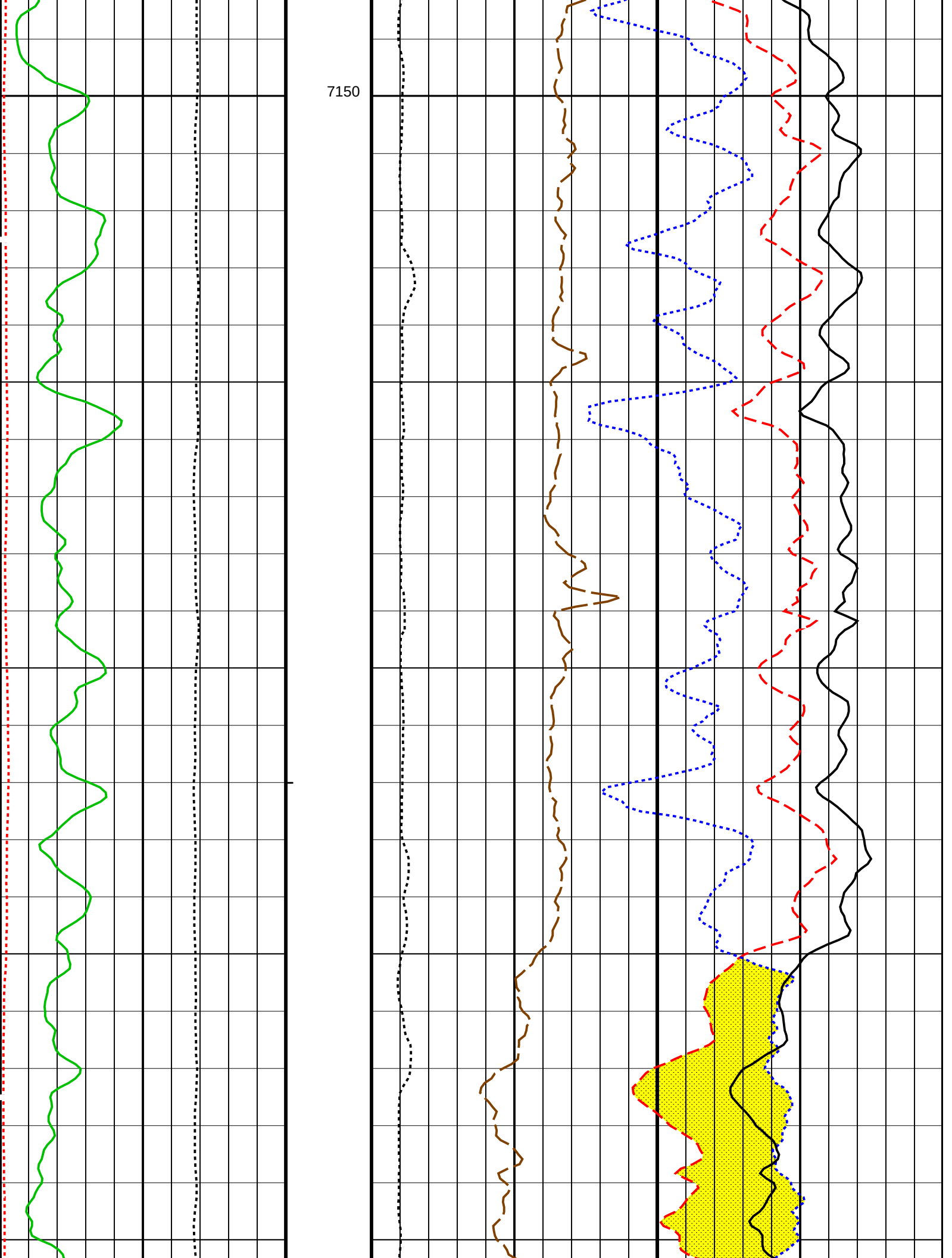
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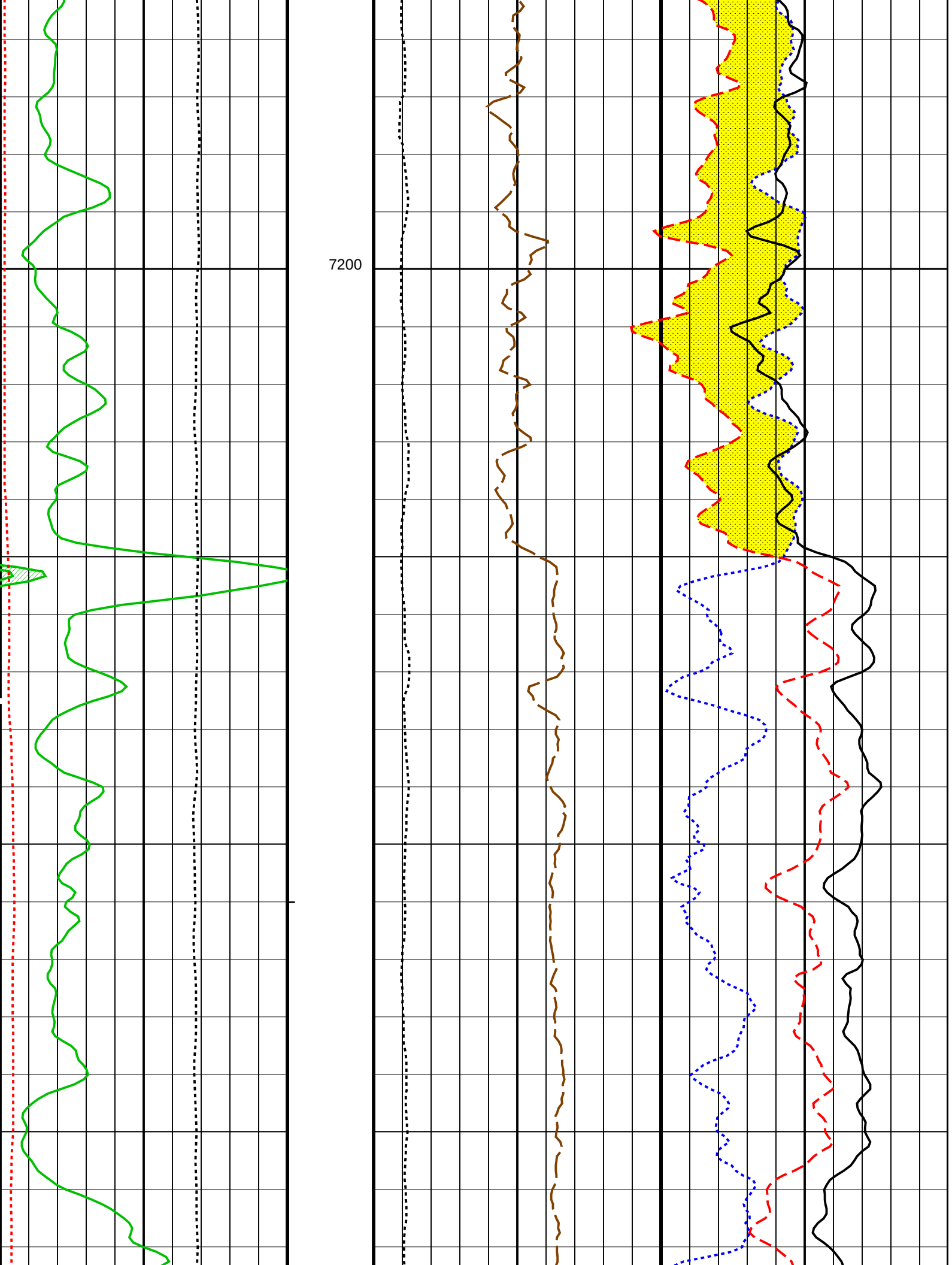
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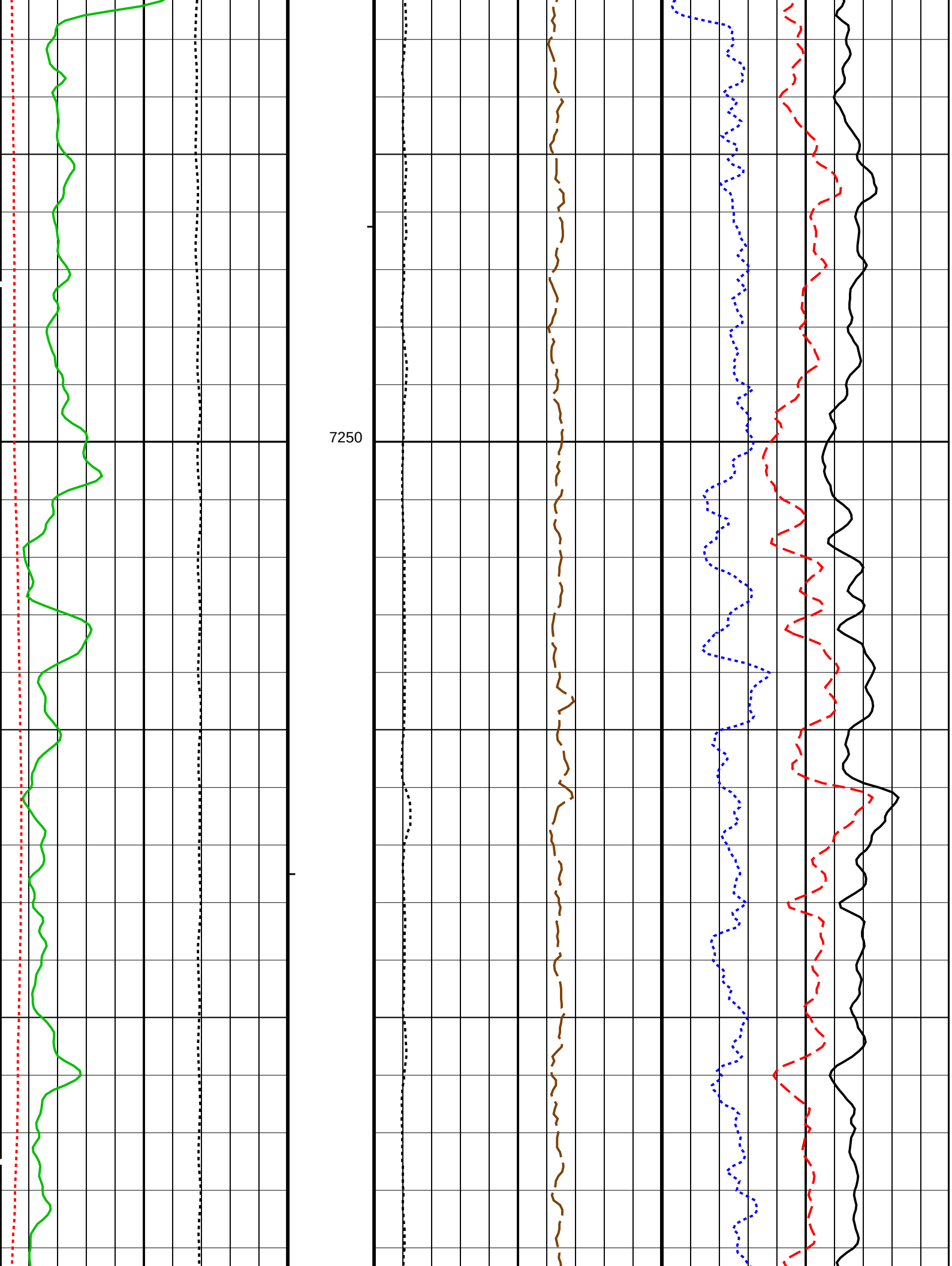
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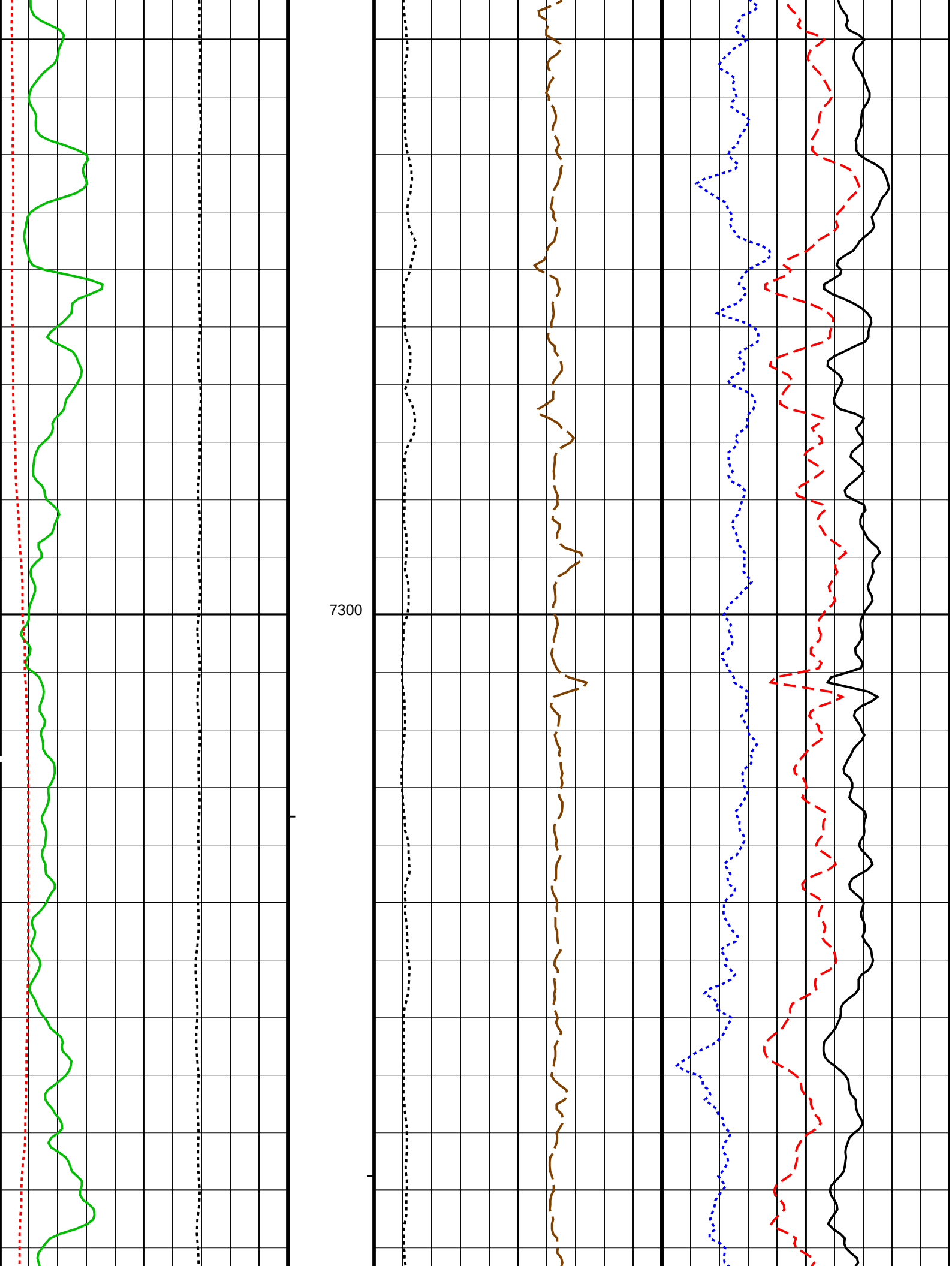
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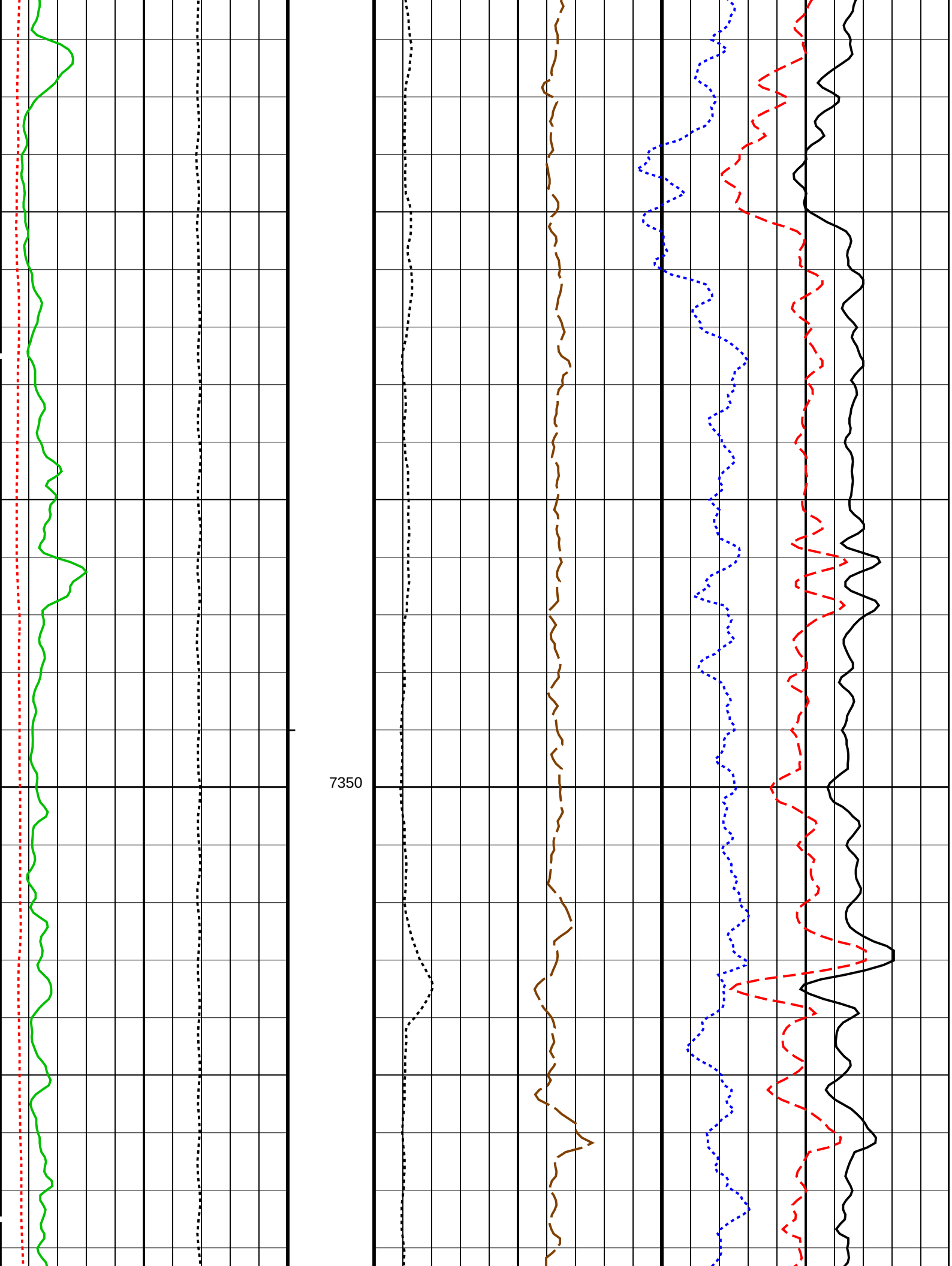
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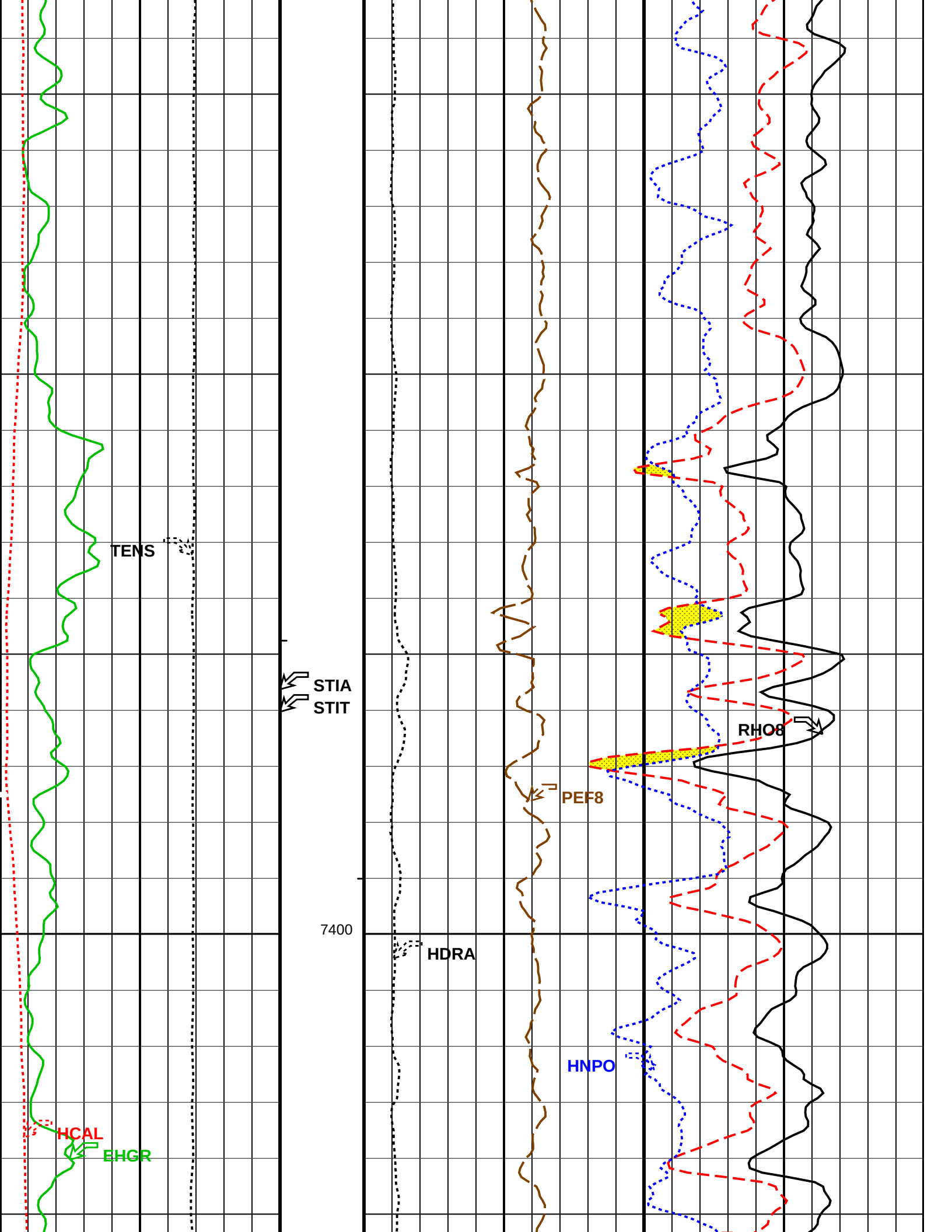
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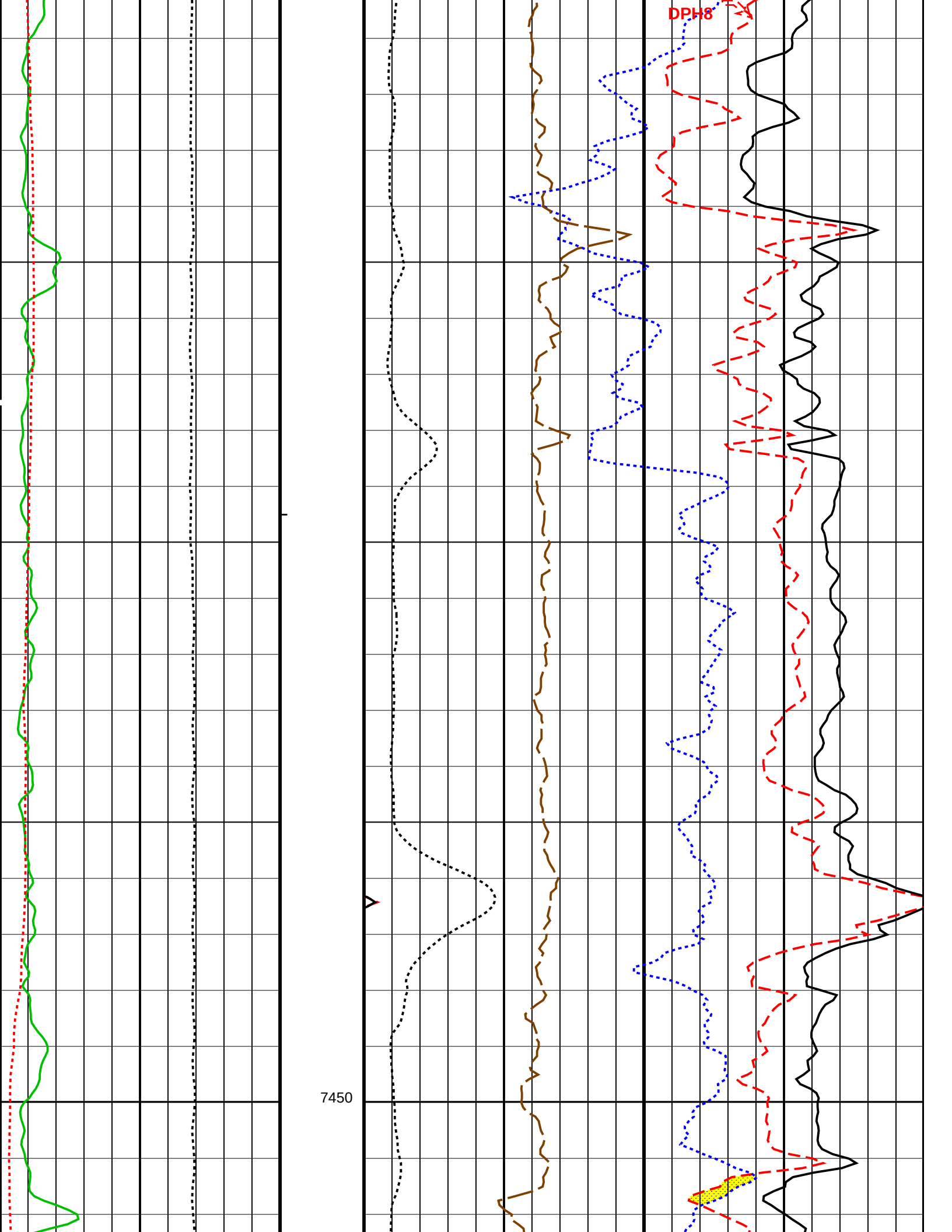
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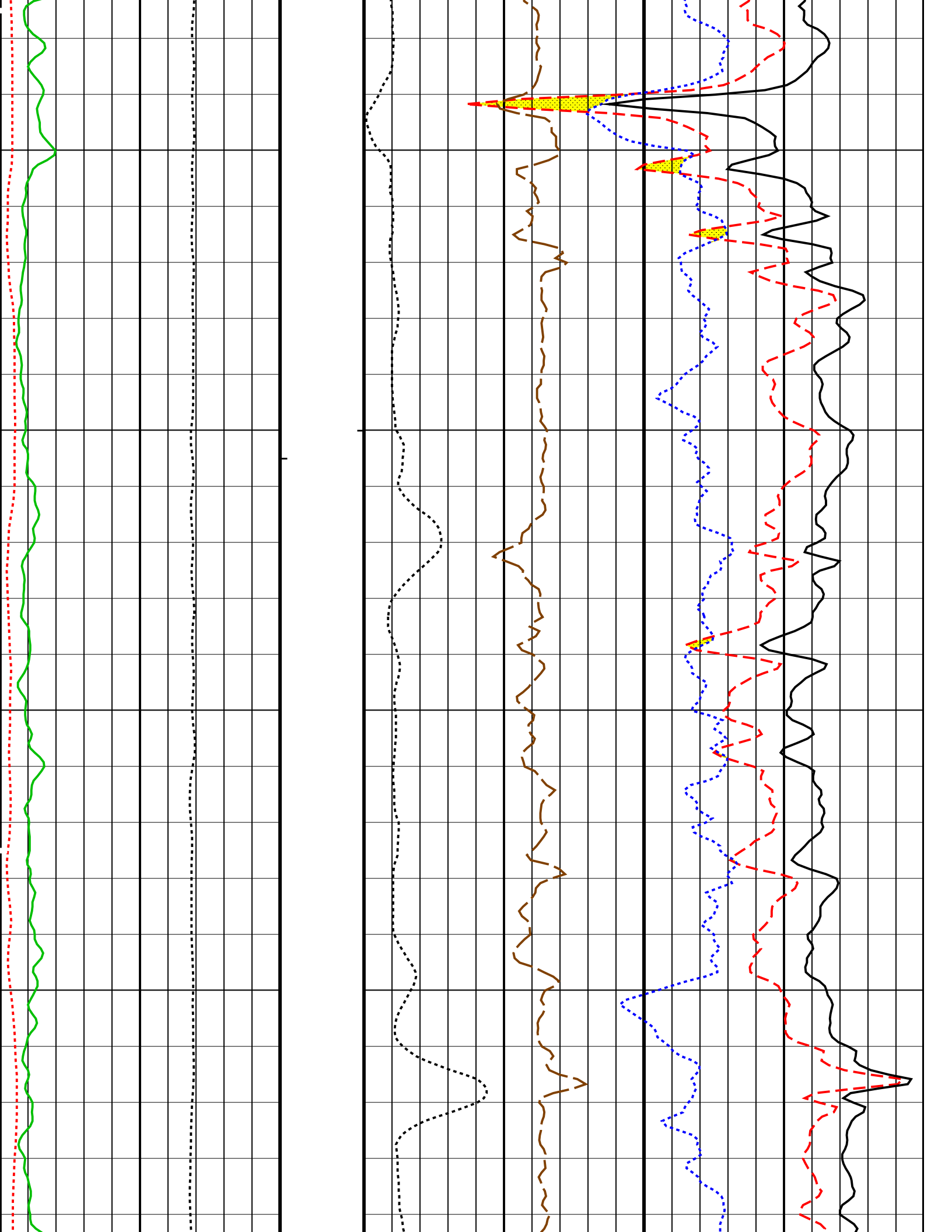

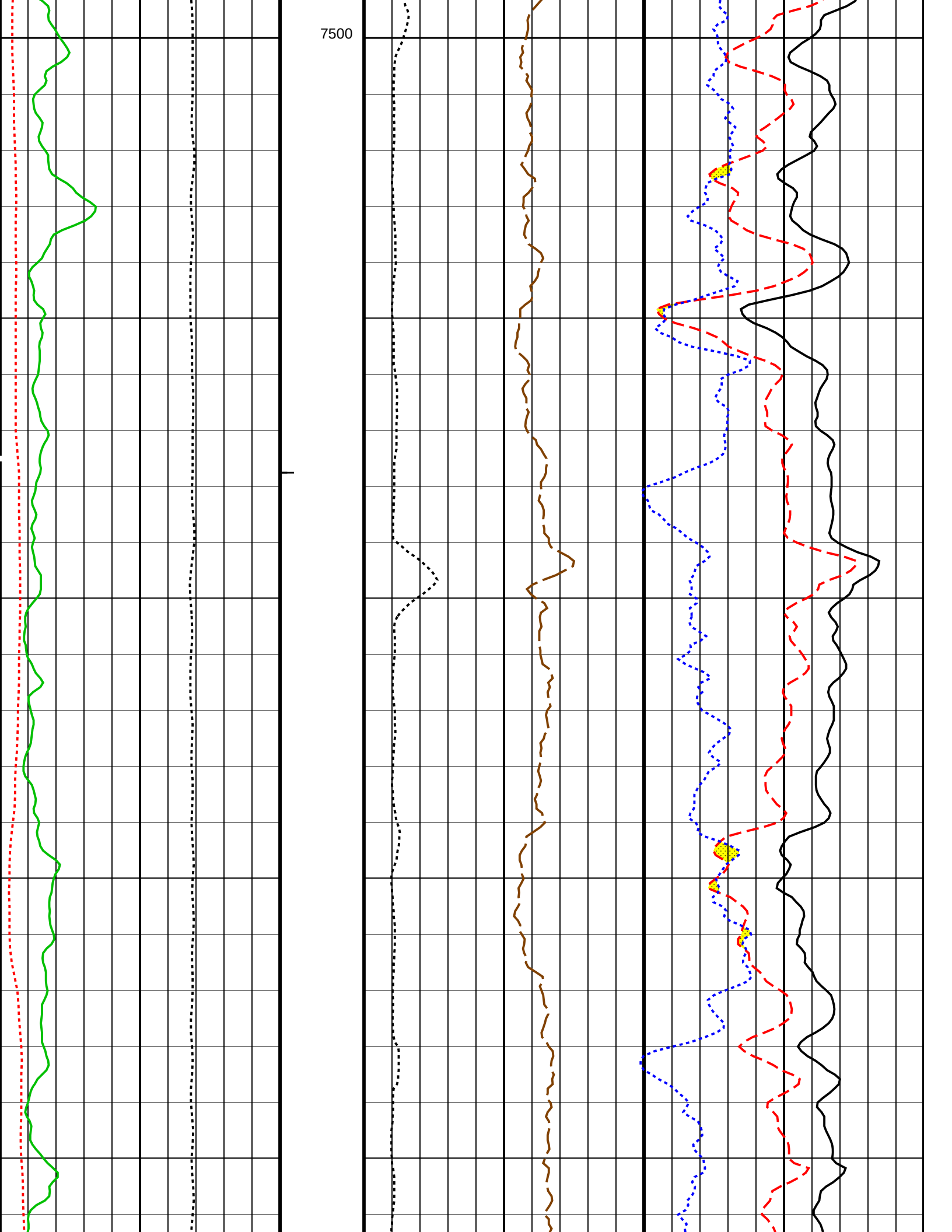
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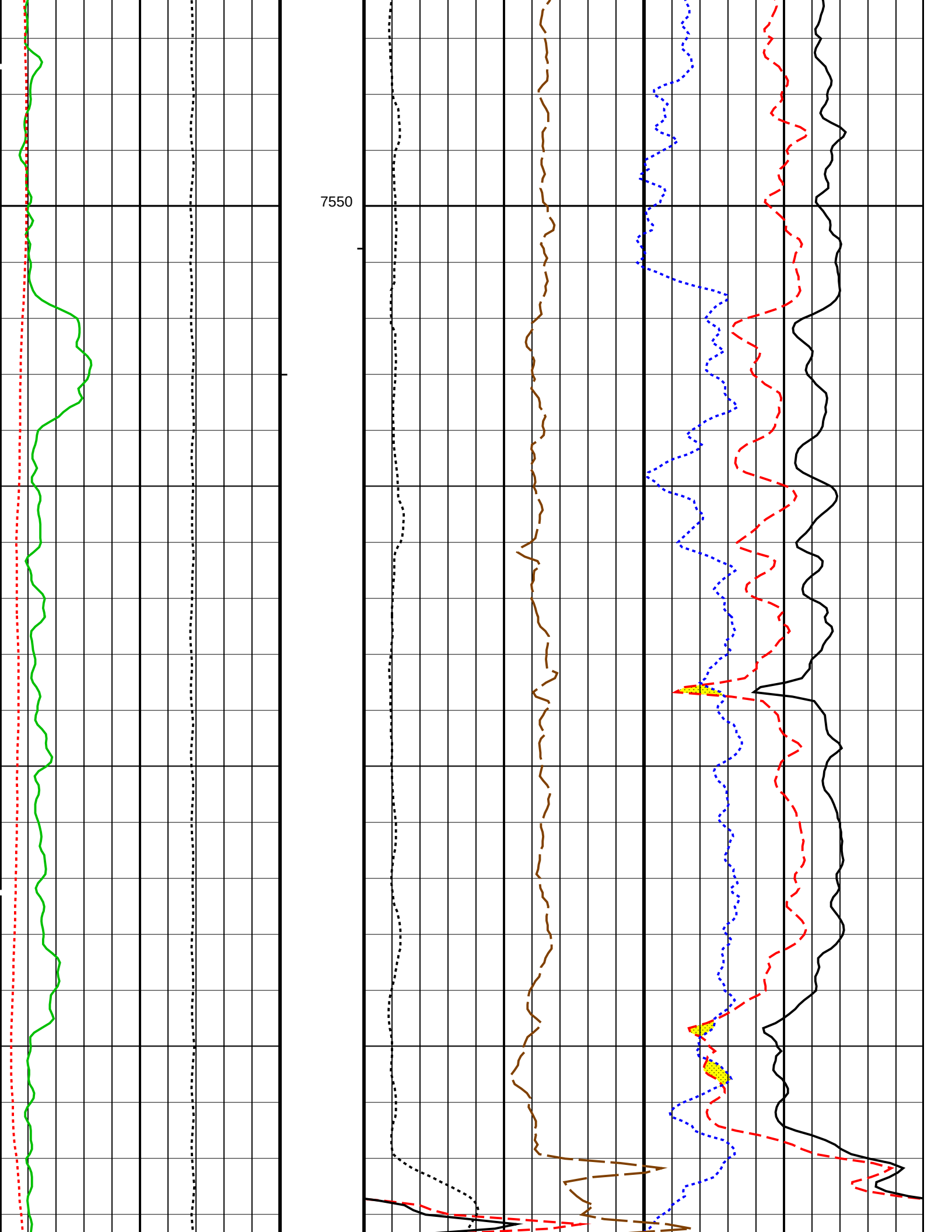
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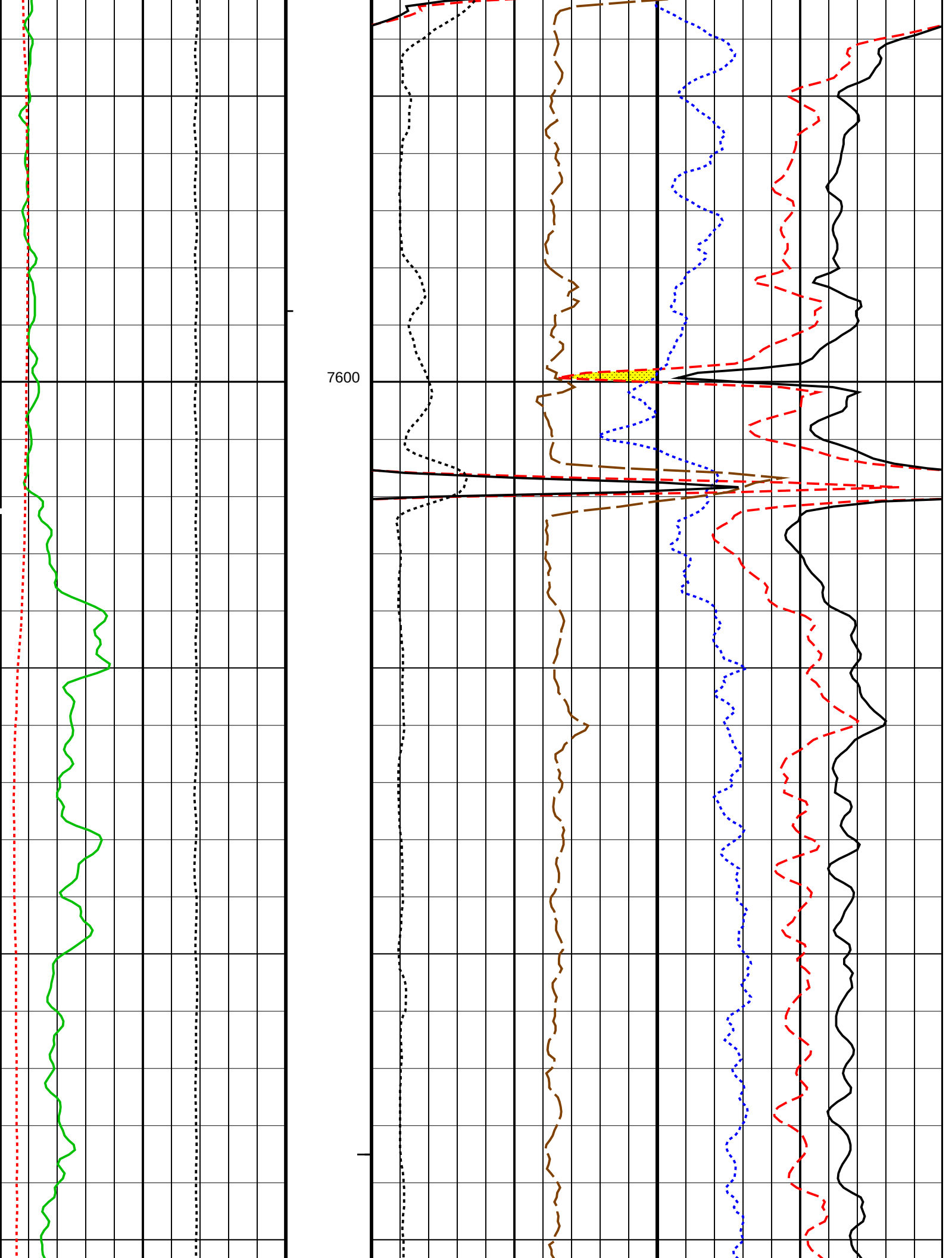
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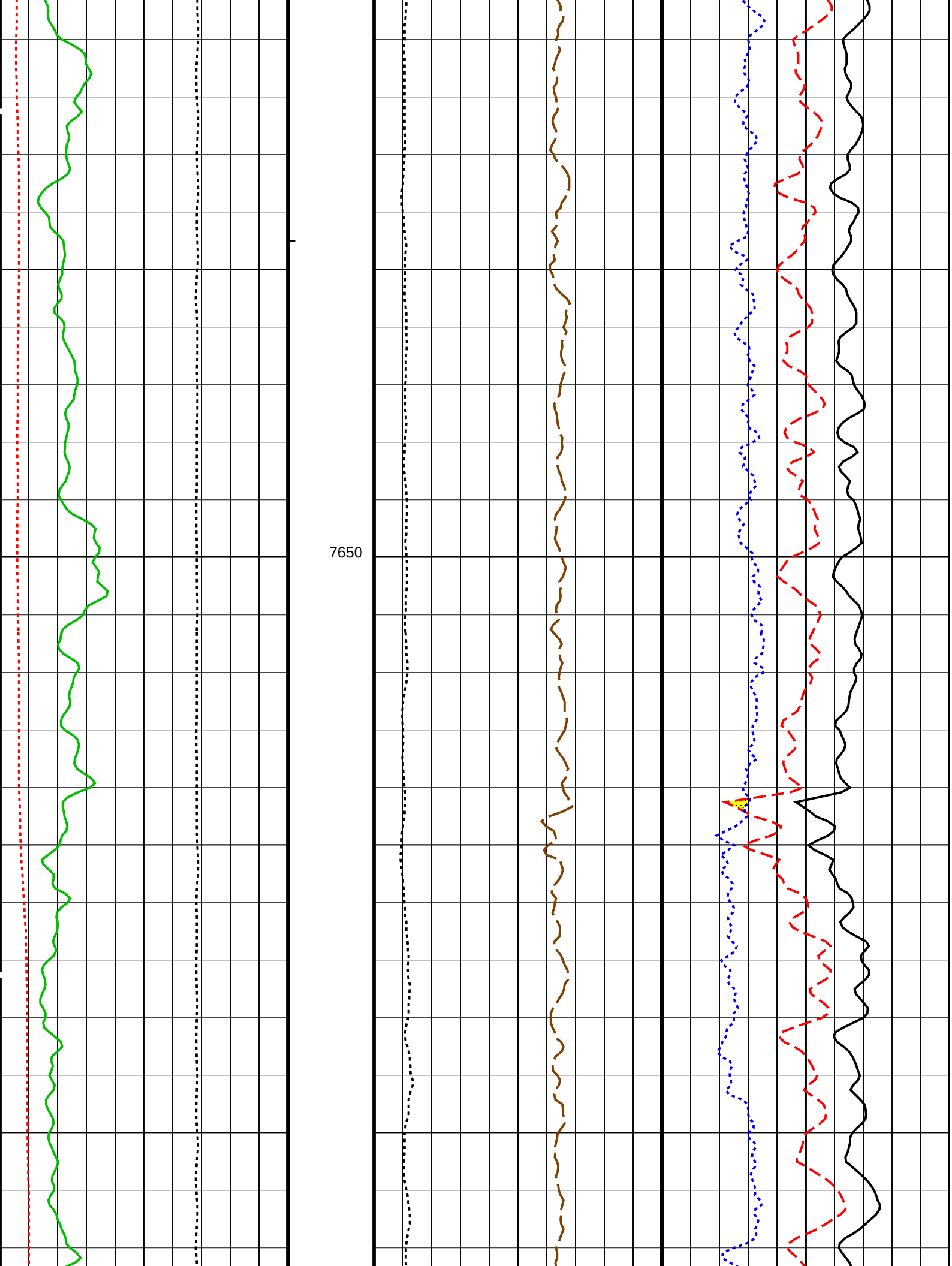
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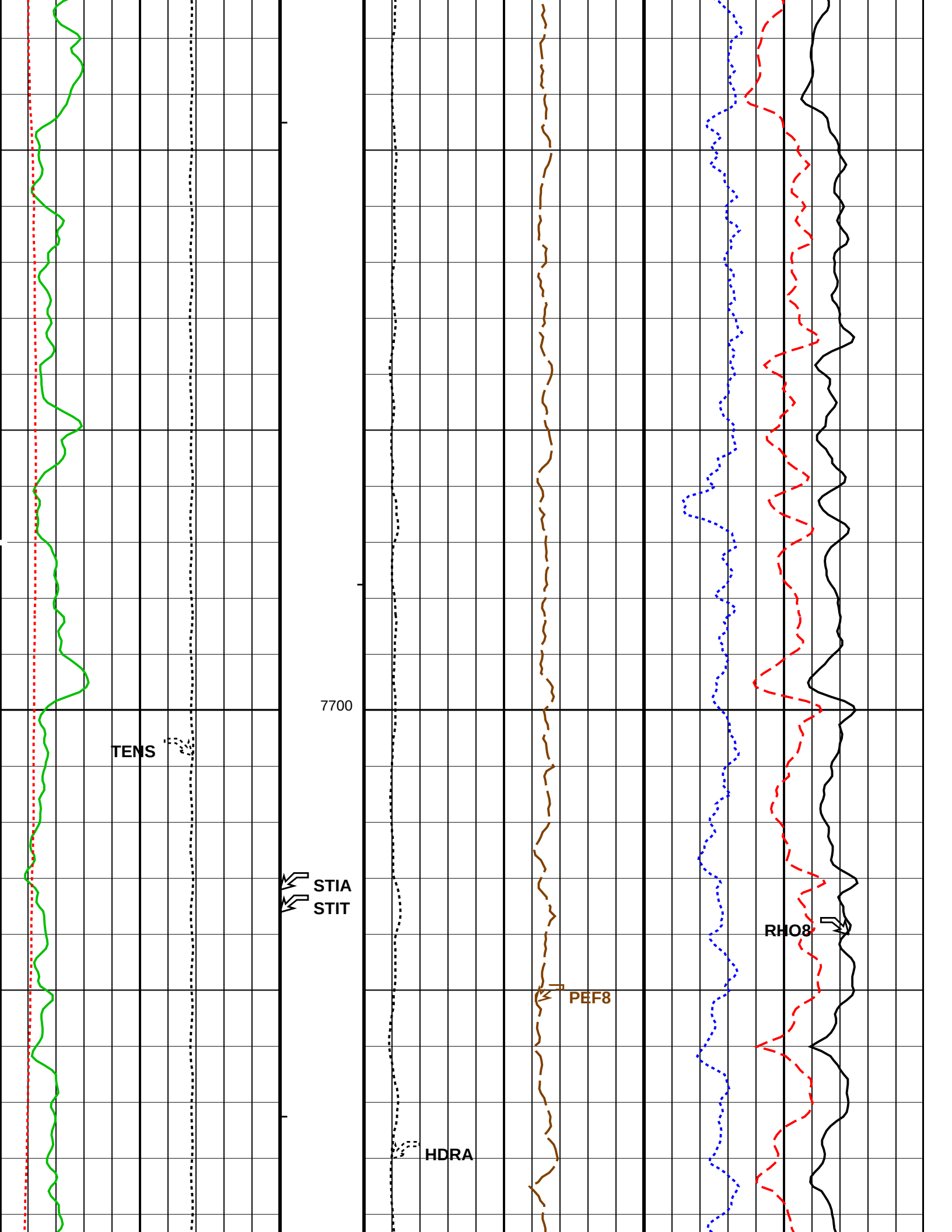
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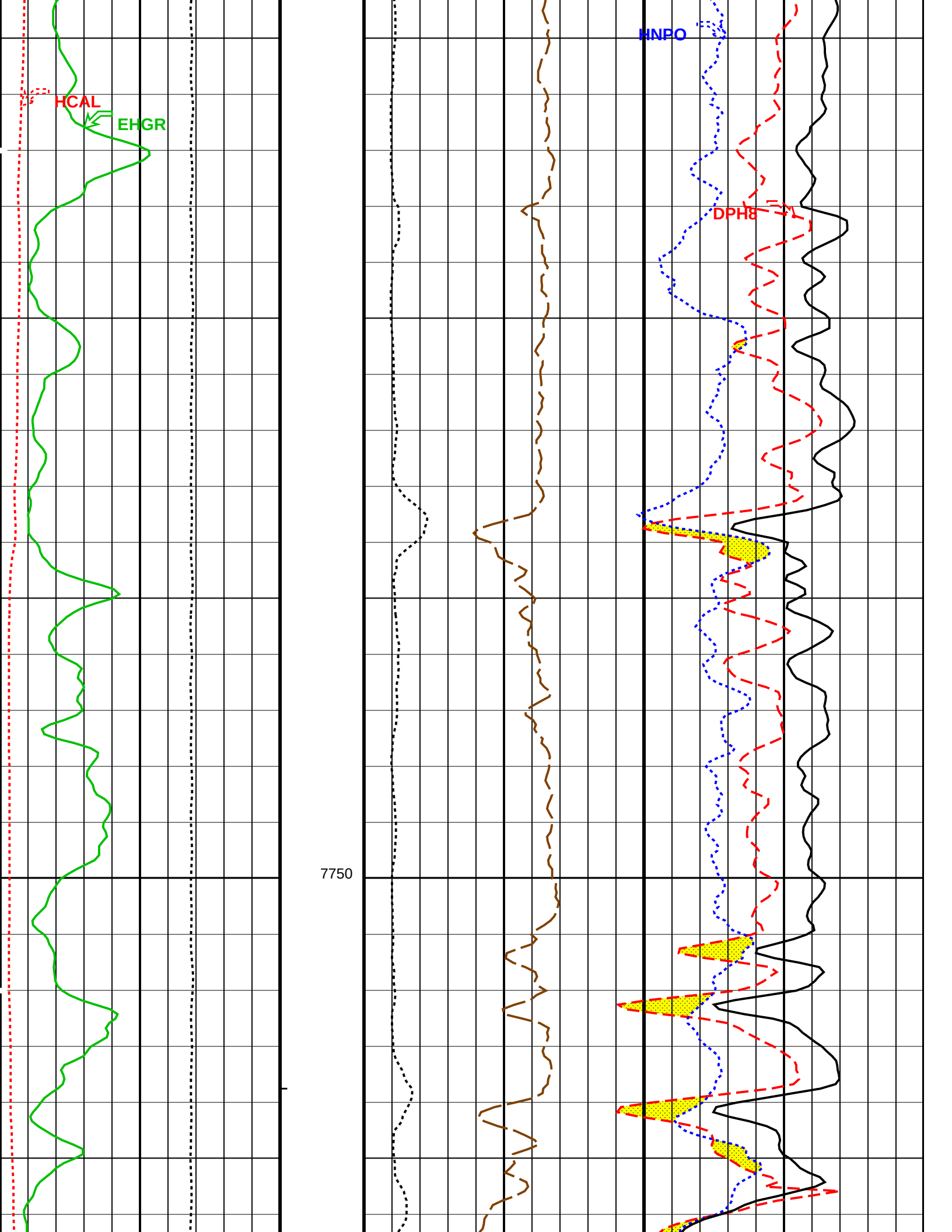
TENS
STIA
STIT
HDRA
PEF8
RHO8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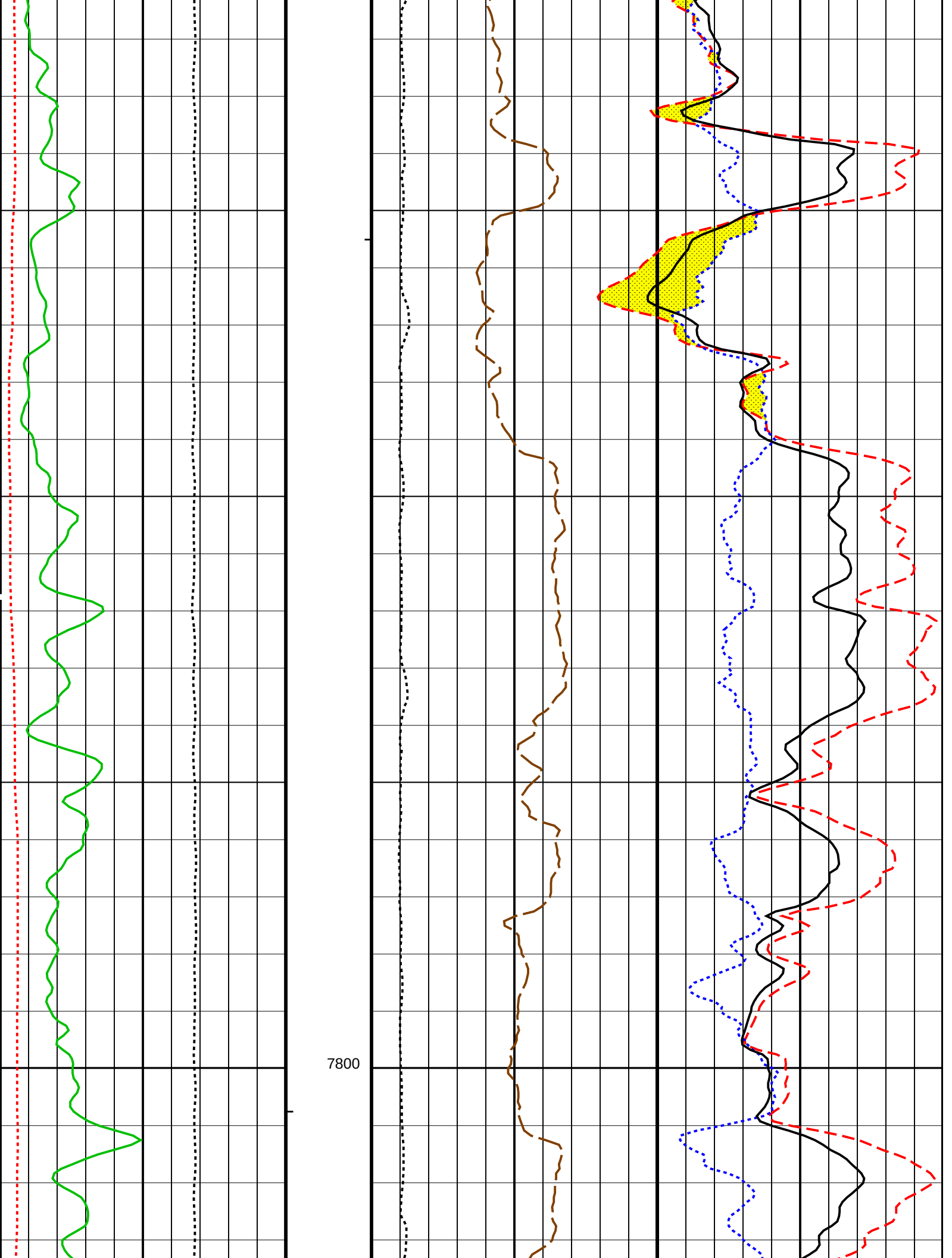
EHGR
HNPO
DPH8
7750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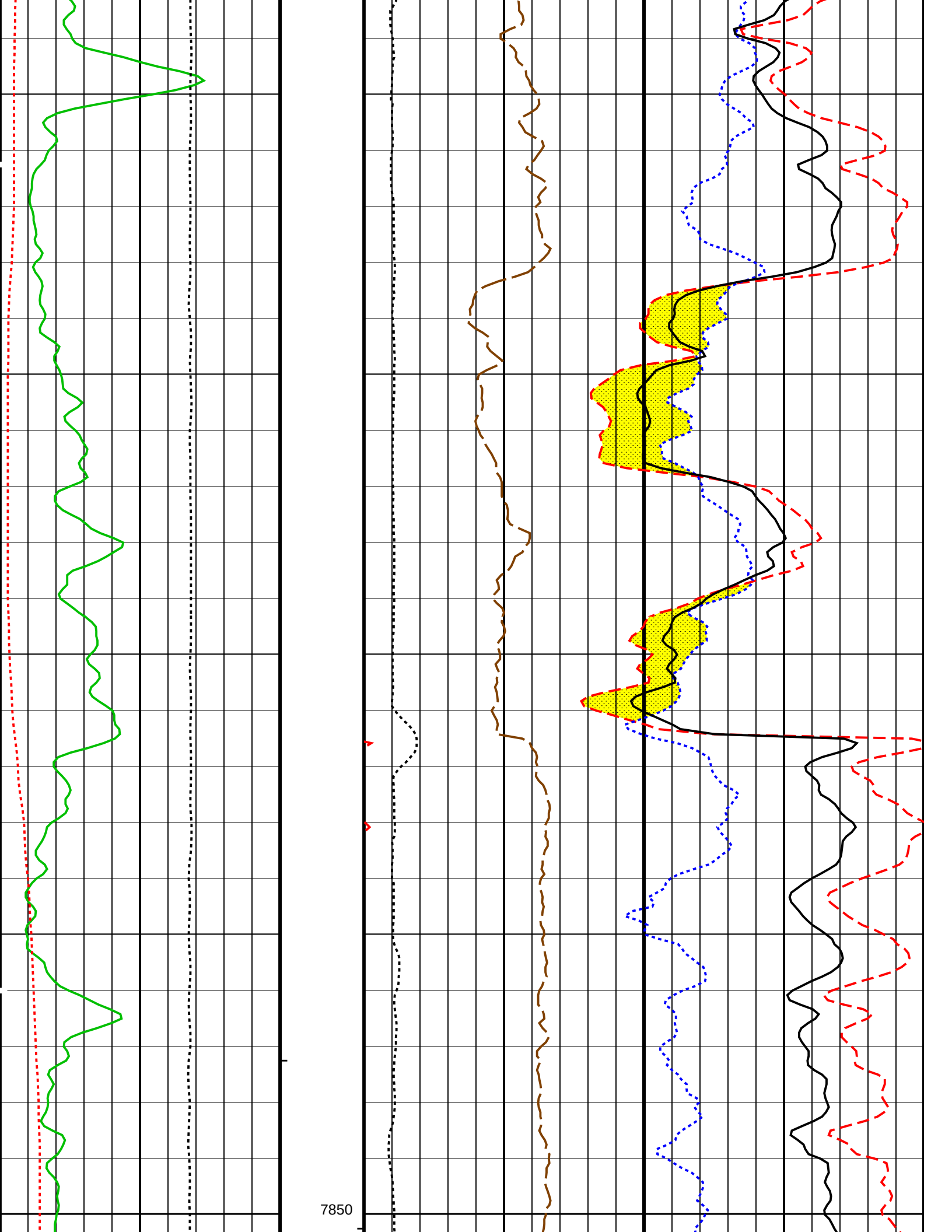
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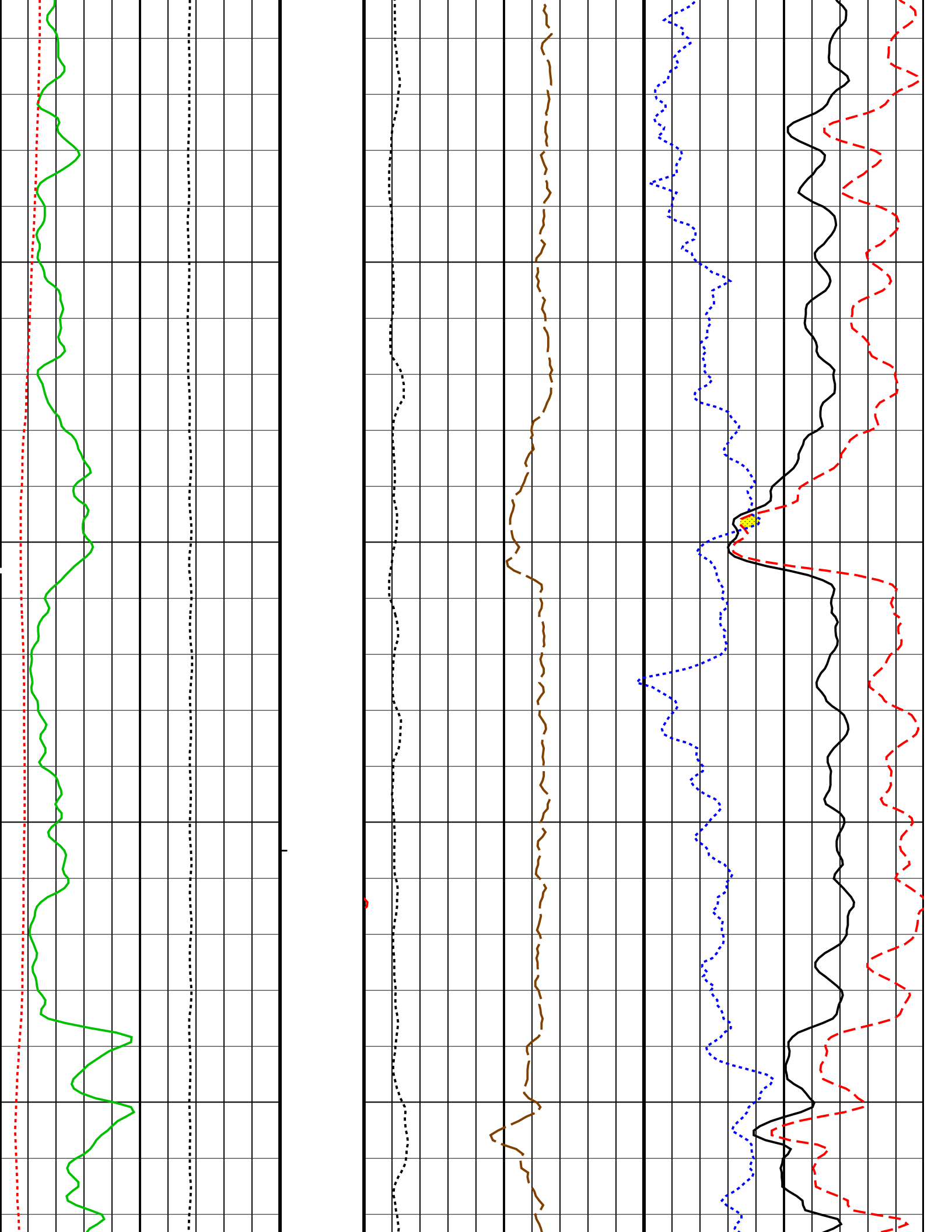

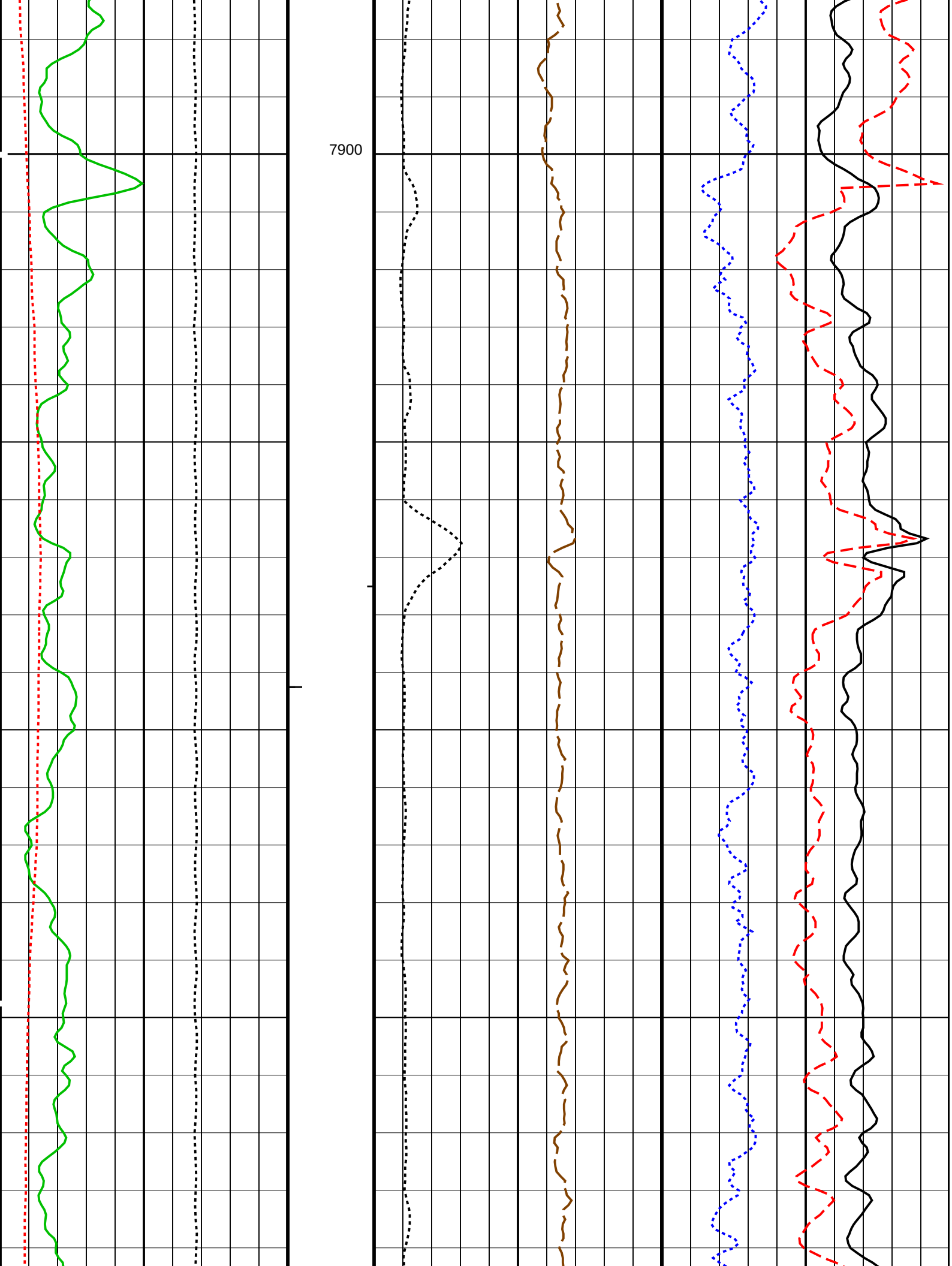
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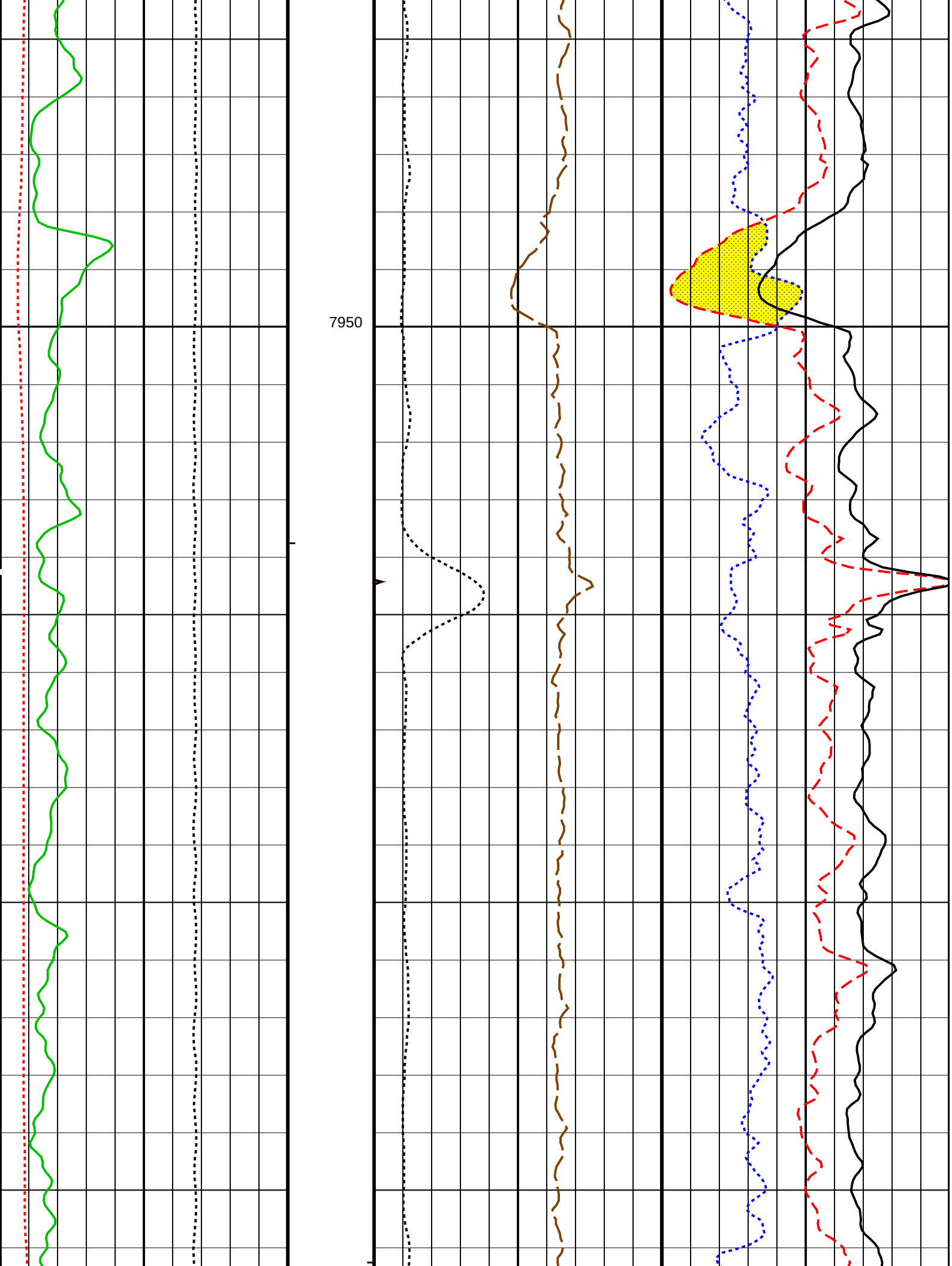
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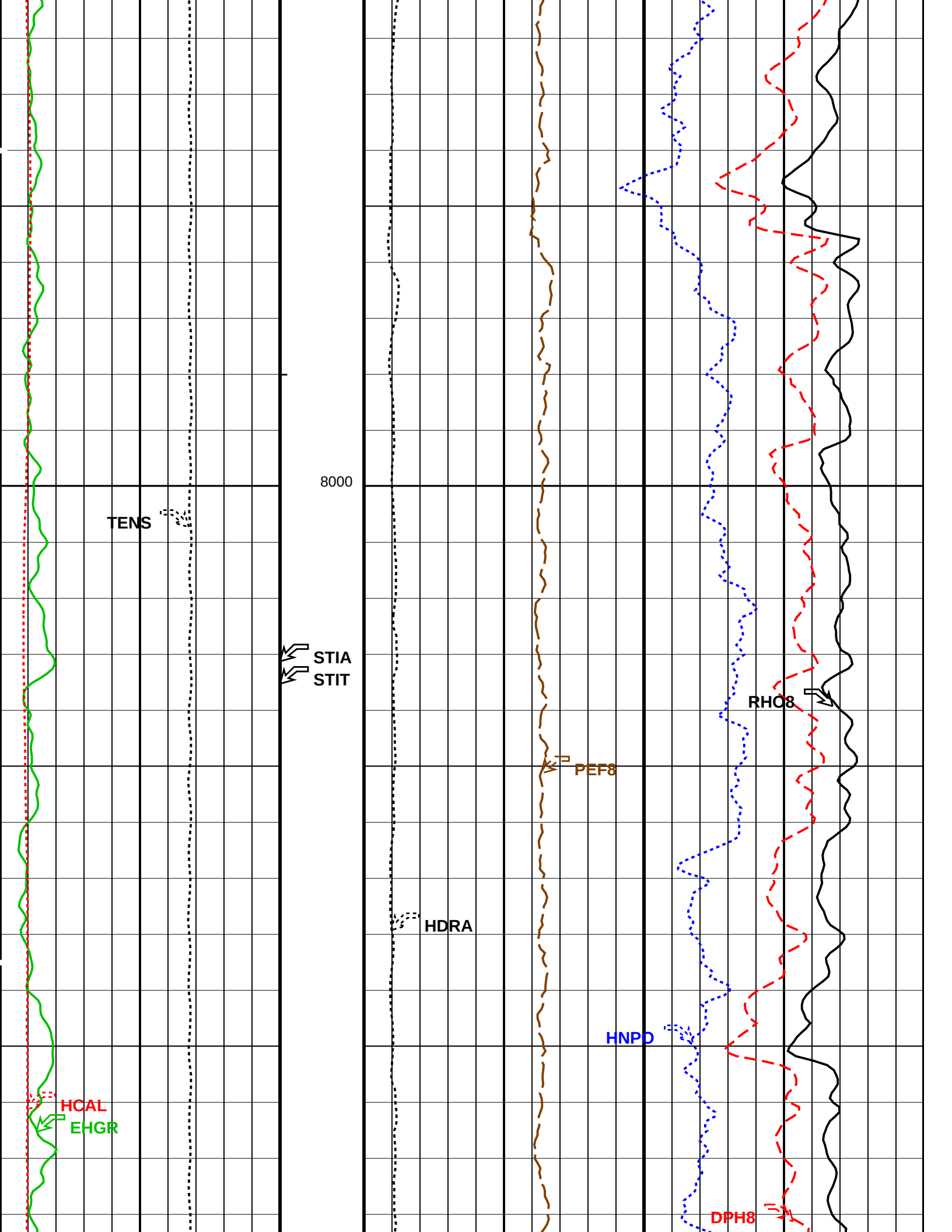
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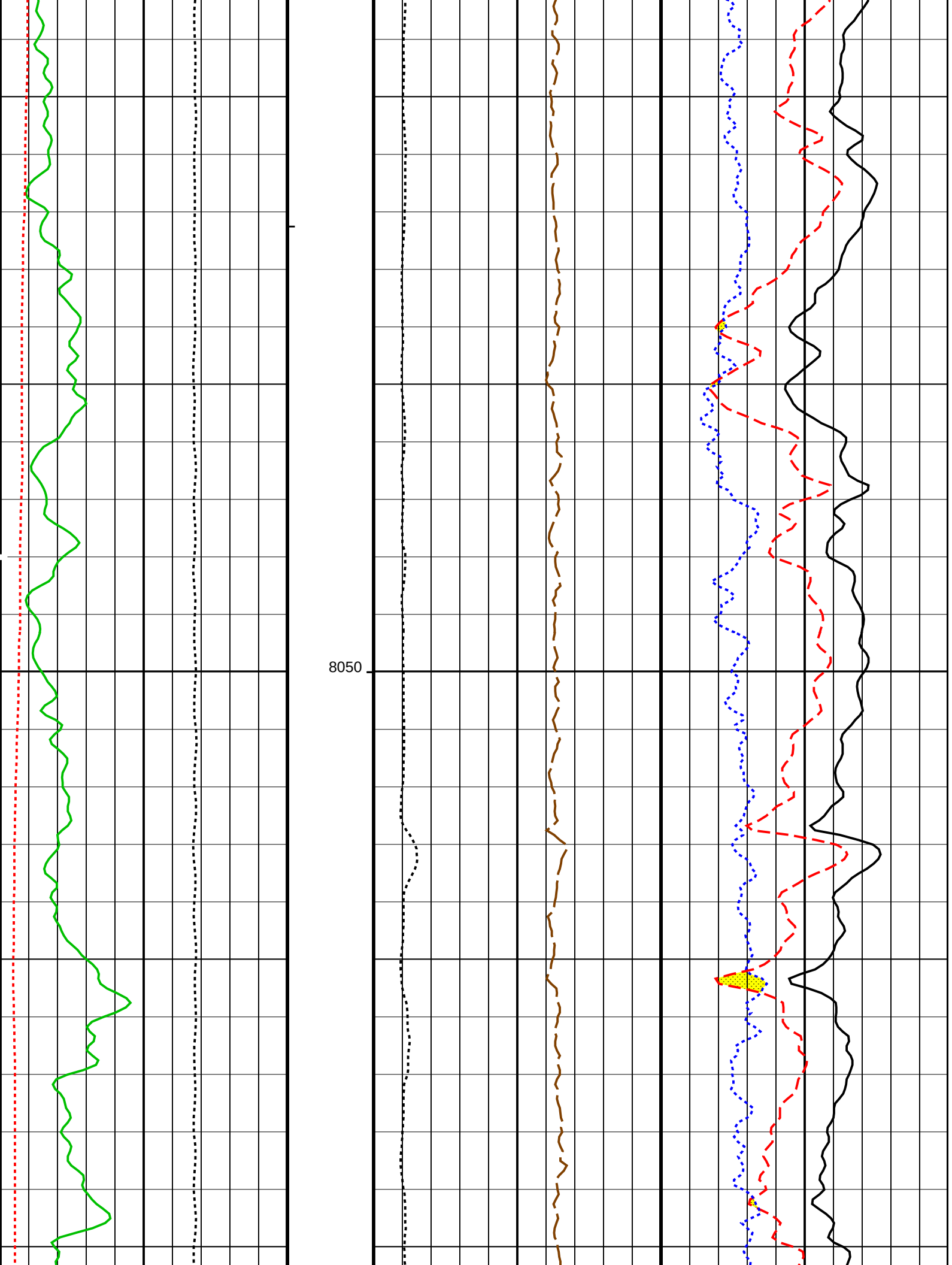
STIT
HDRA
PEF8
RHO8
HNPO
DPH8
HCAL
EHGR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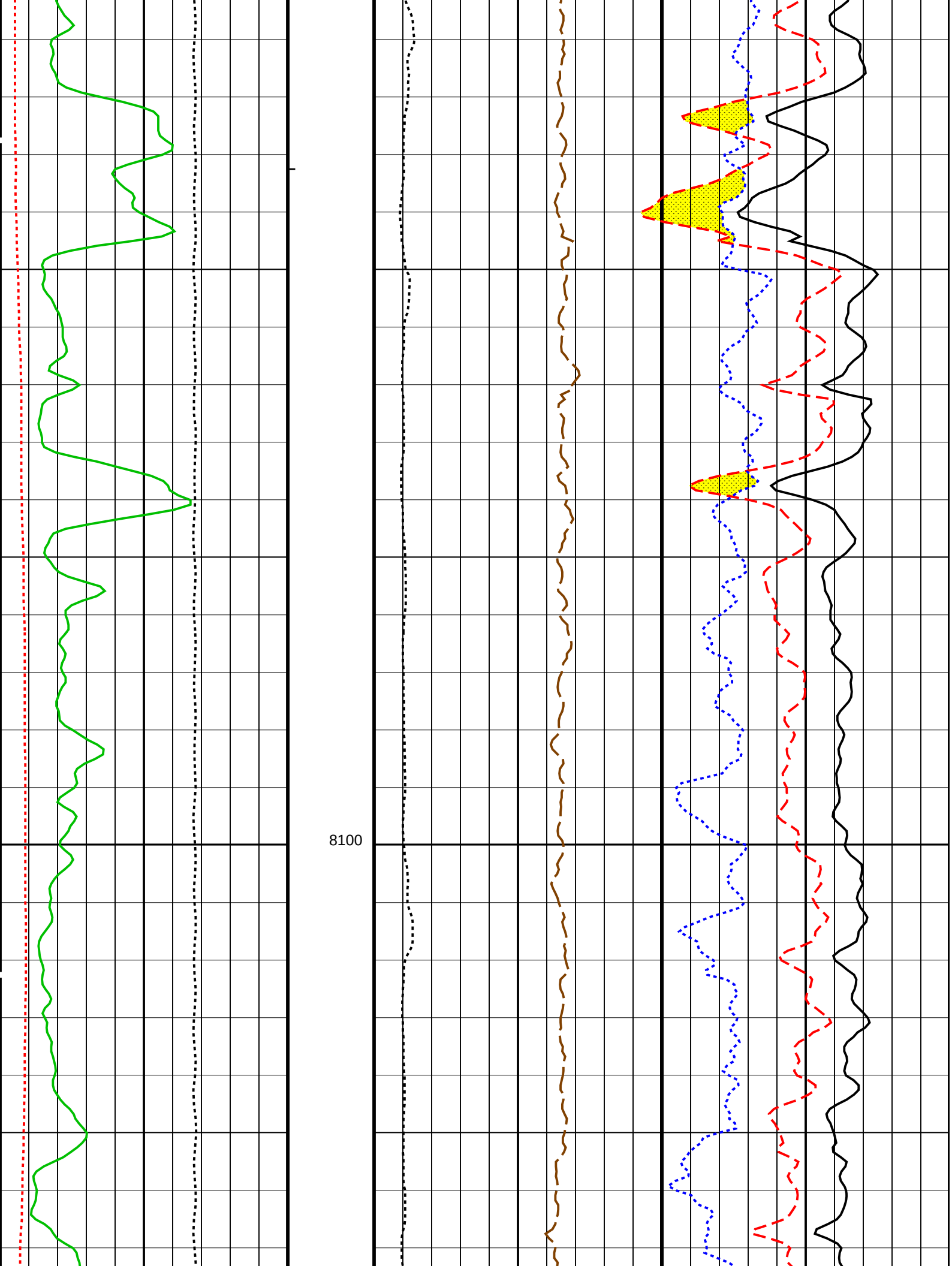
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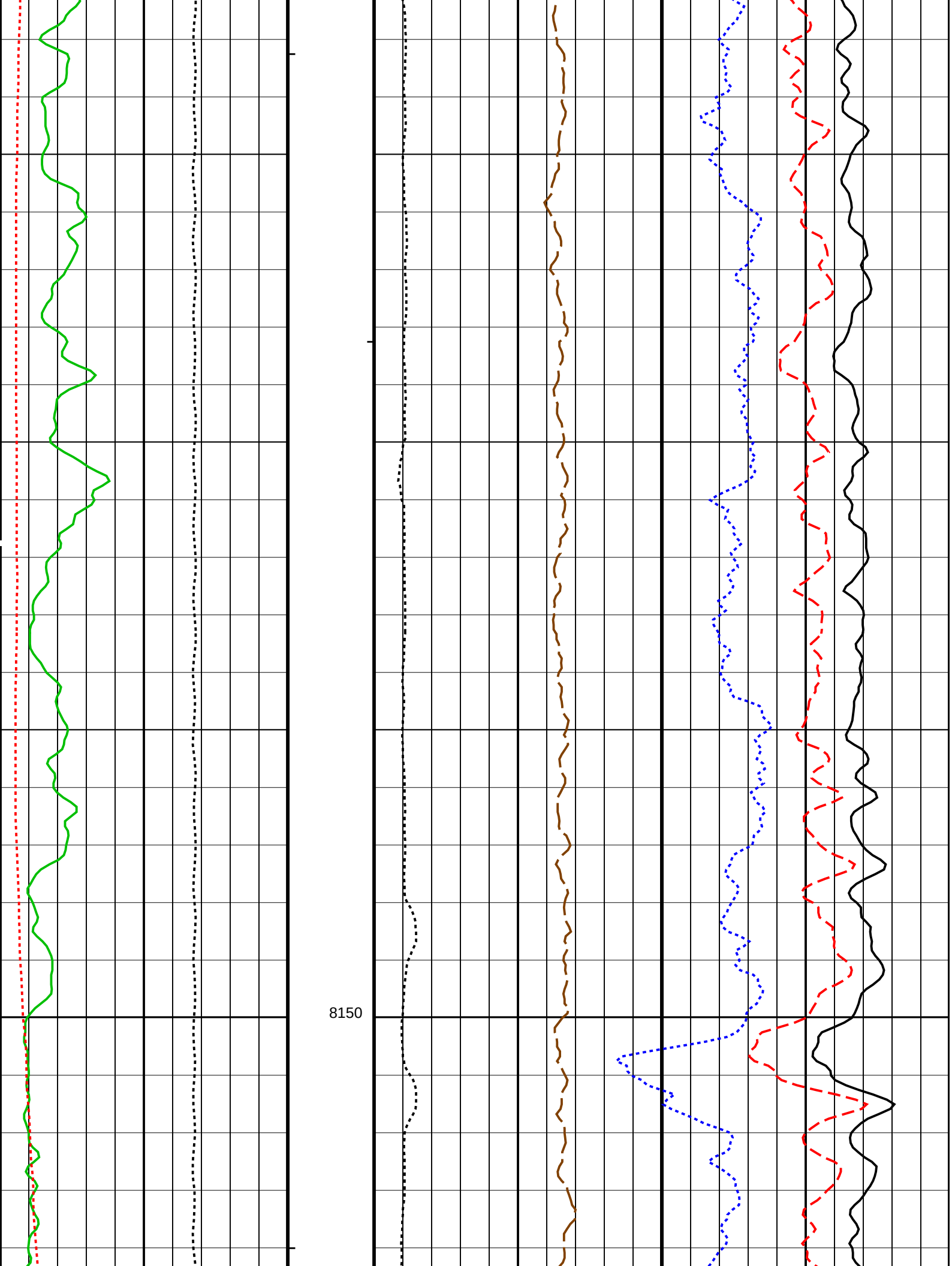
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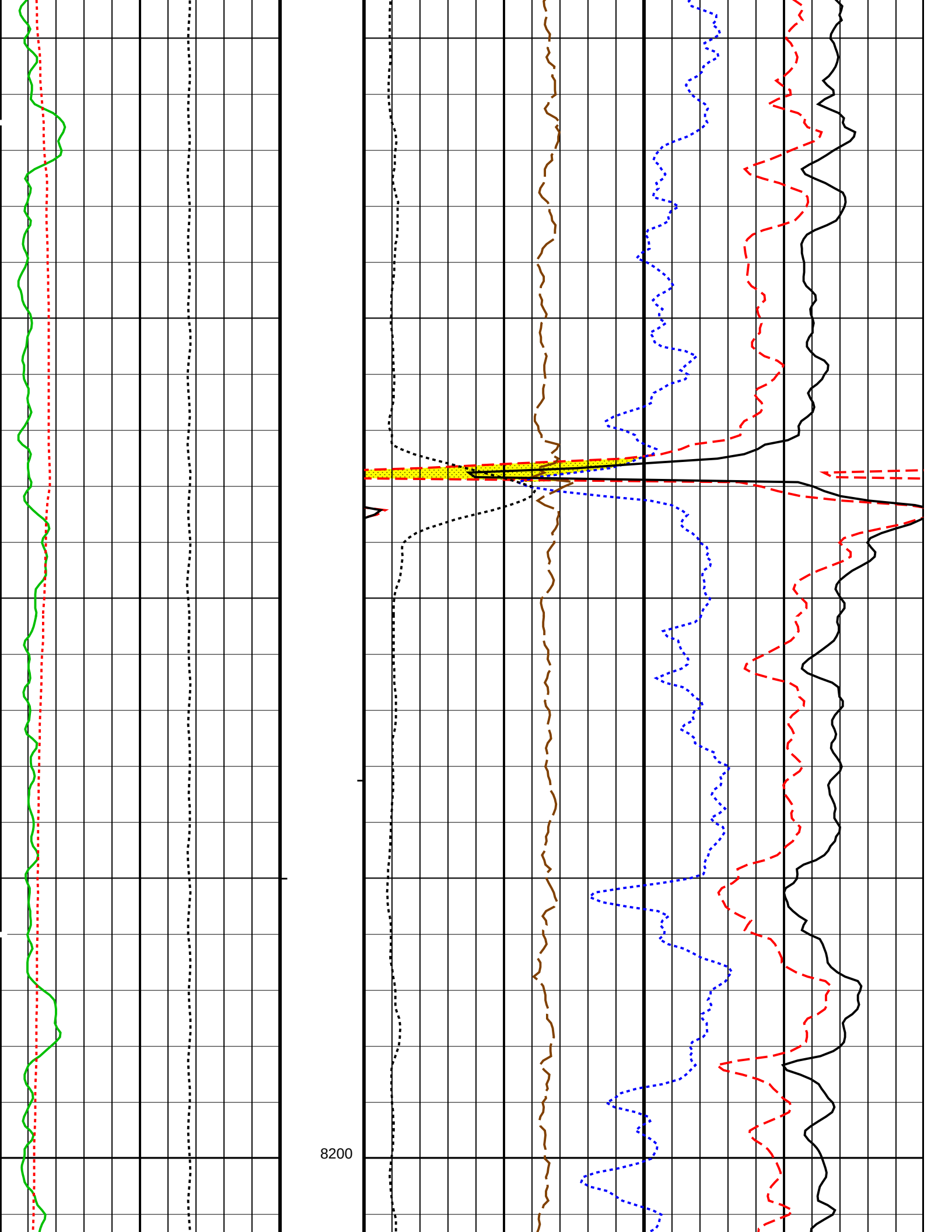
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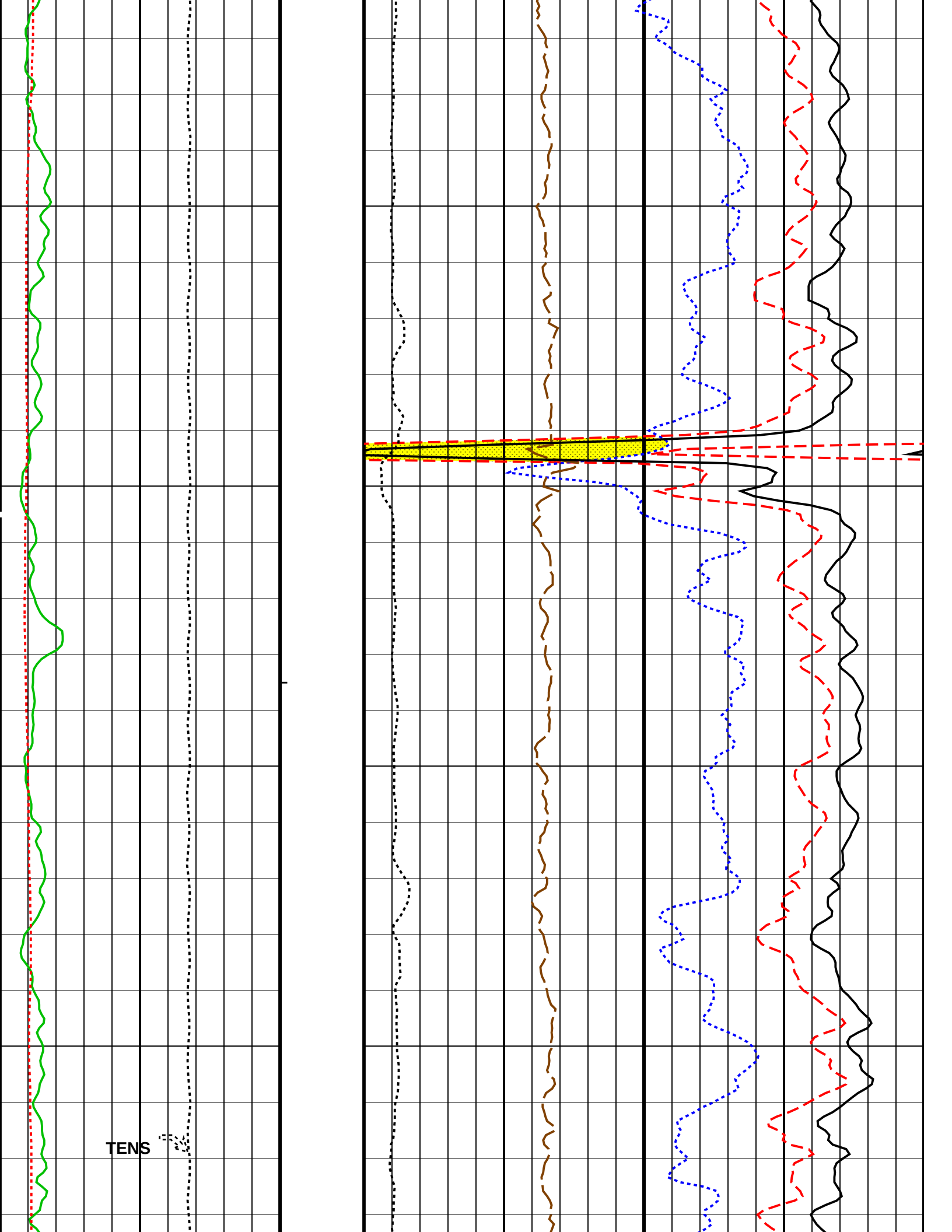
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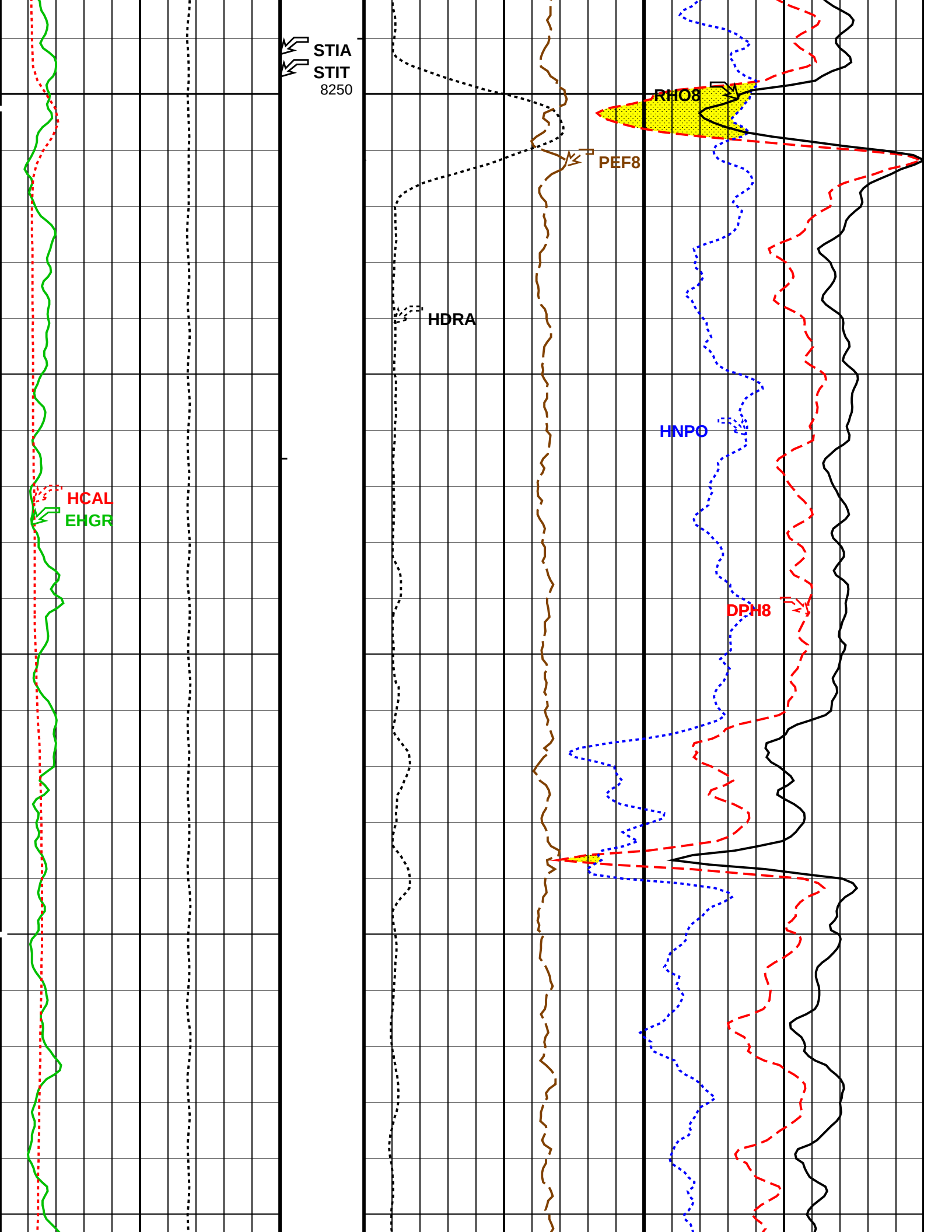
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STIT
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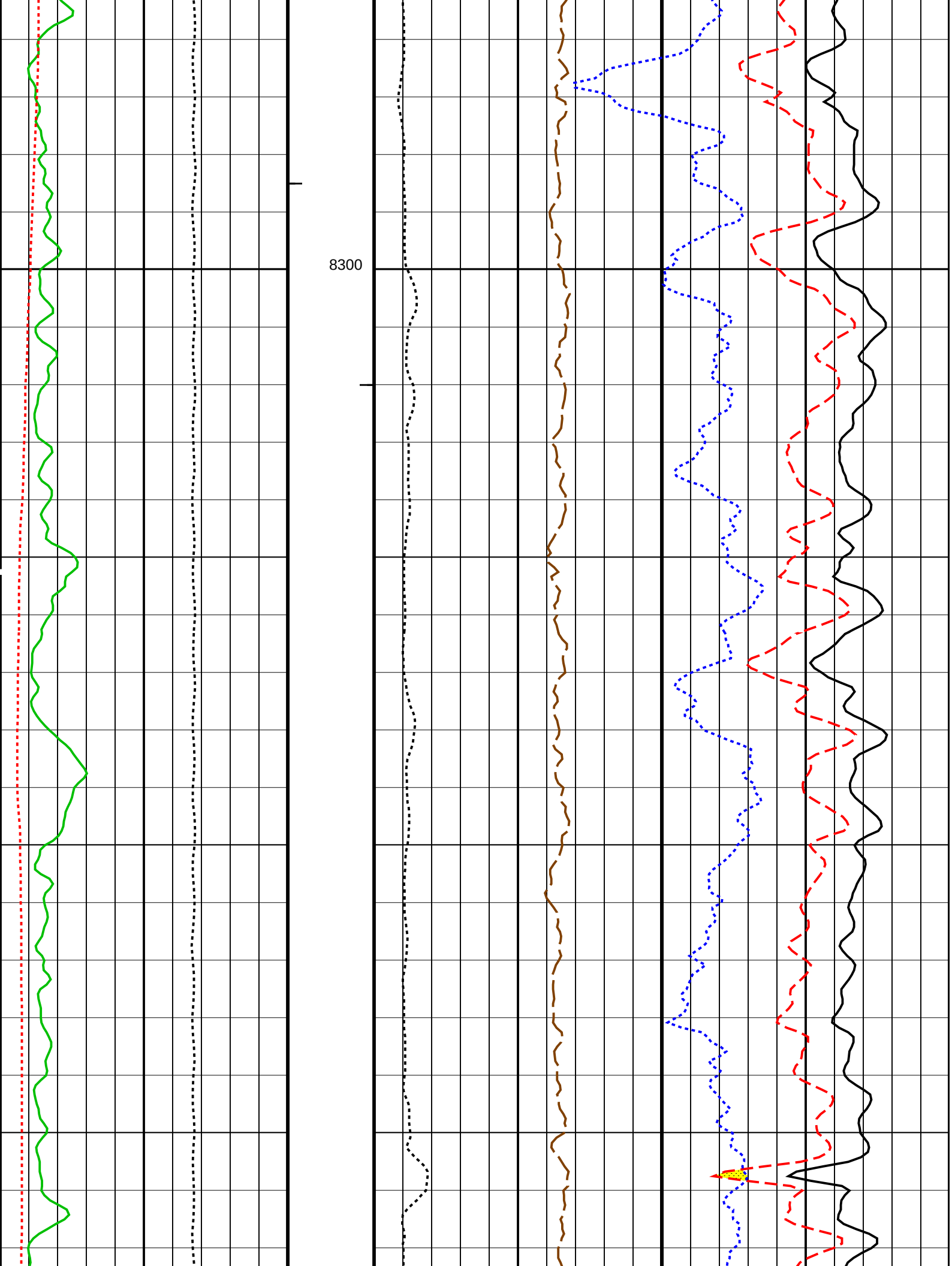
RHO8
PEF8
HDRA
HNPO
HCAL
EHGR
DPH8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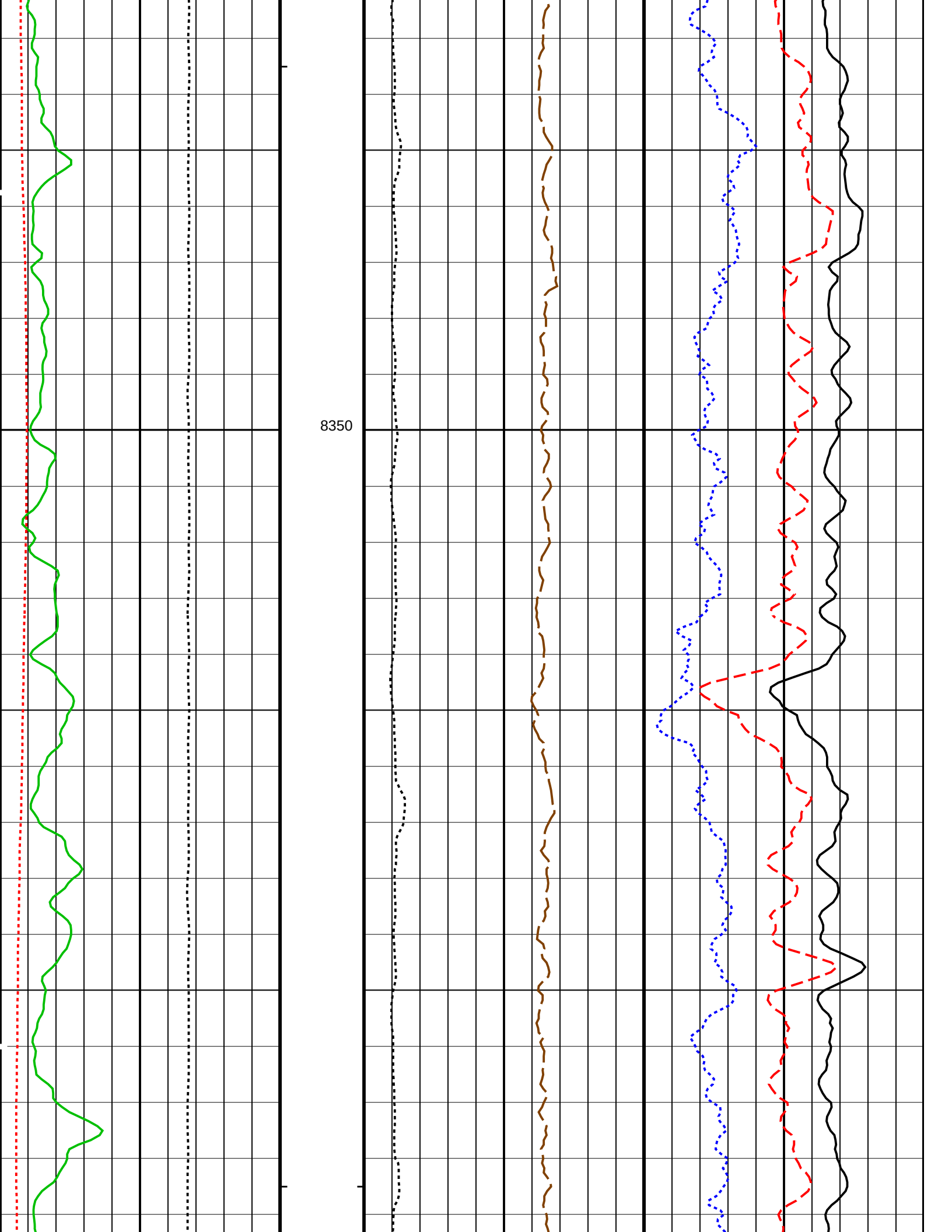
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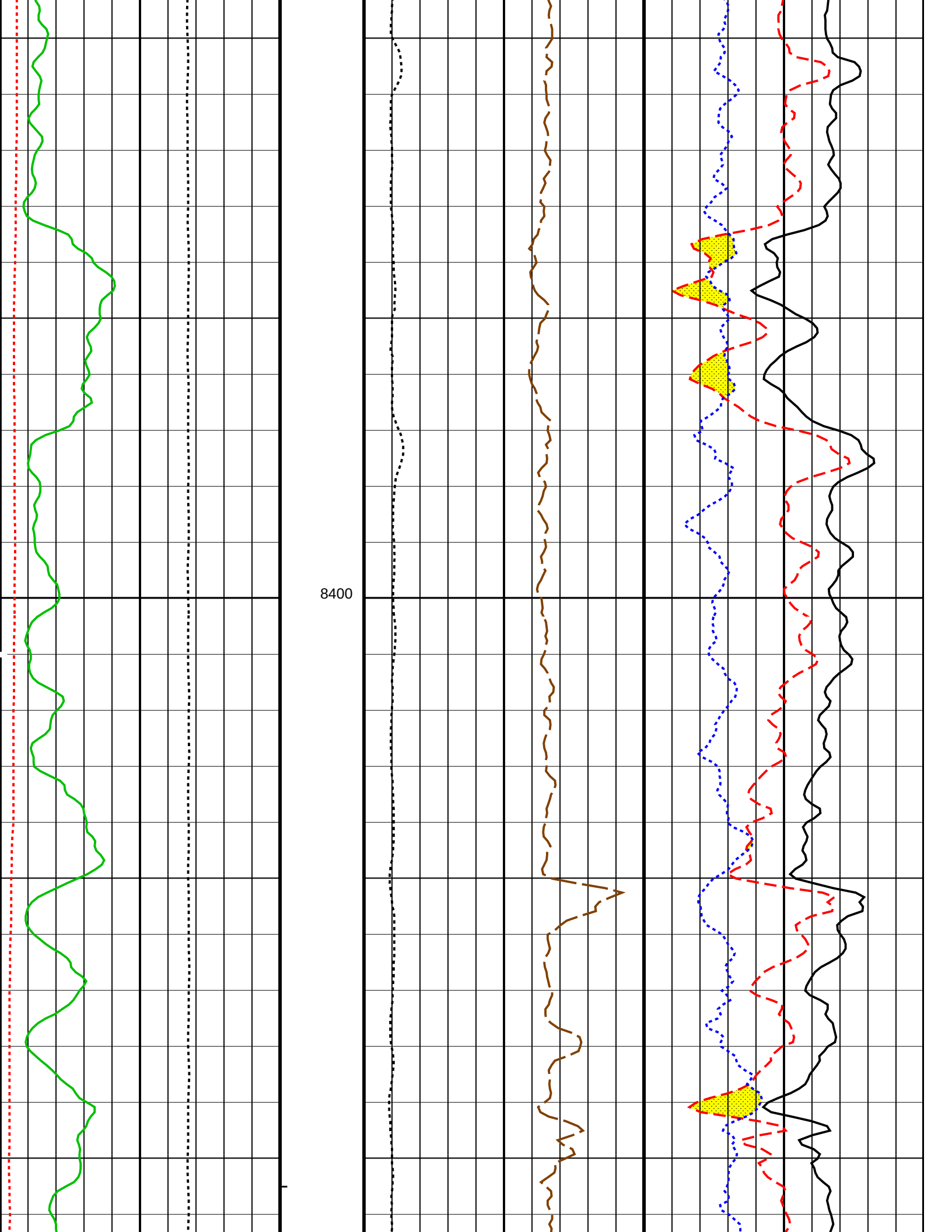
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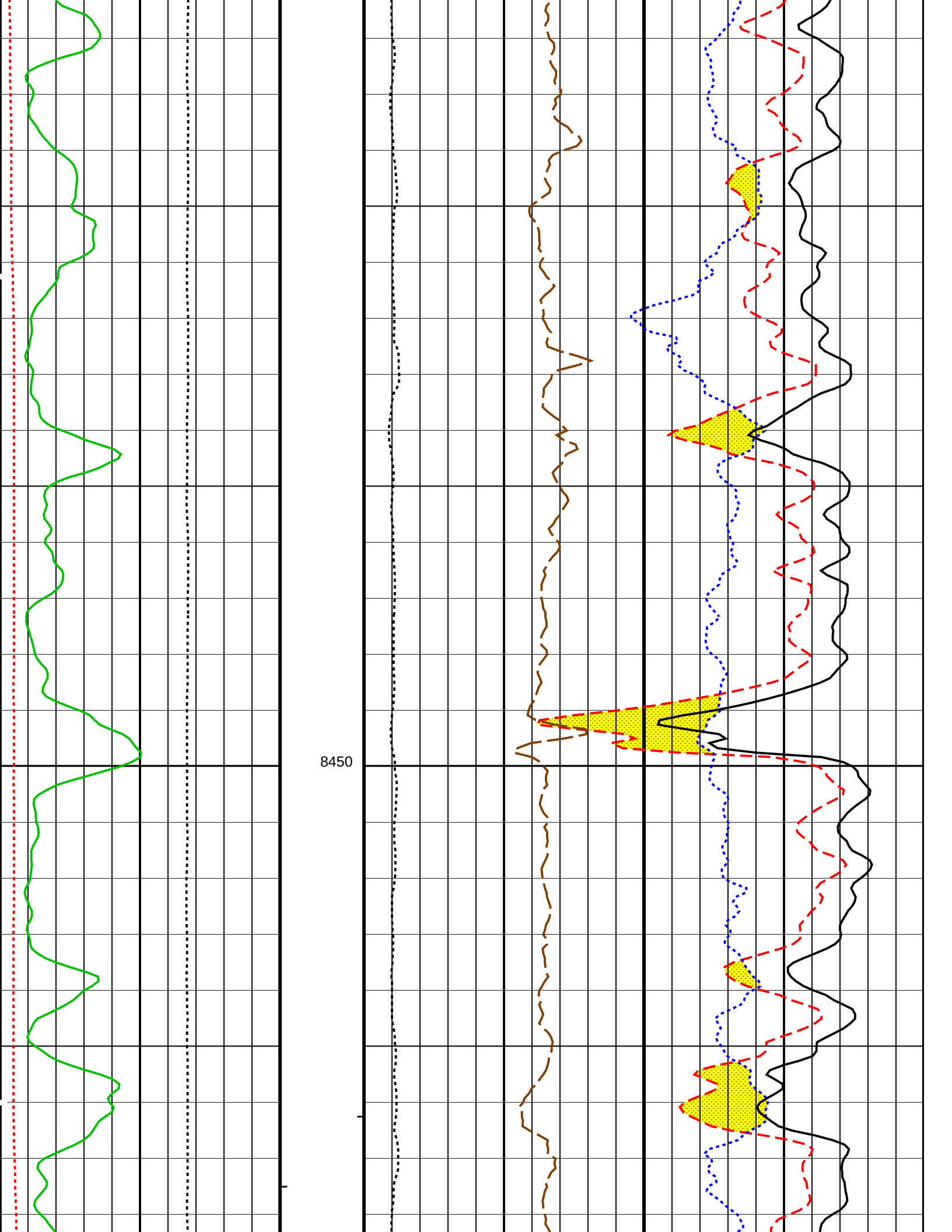
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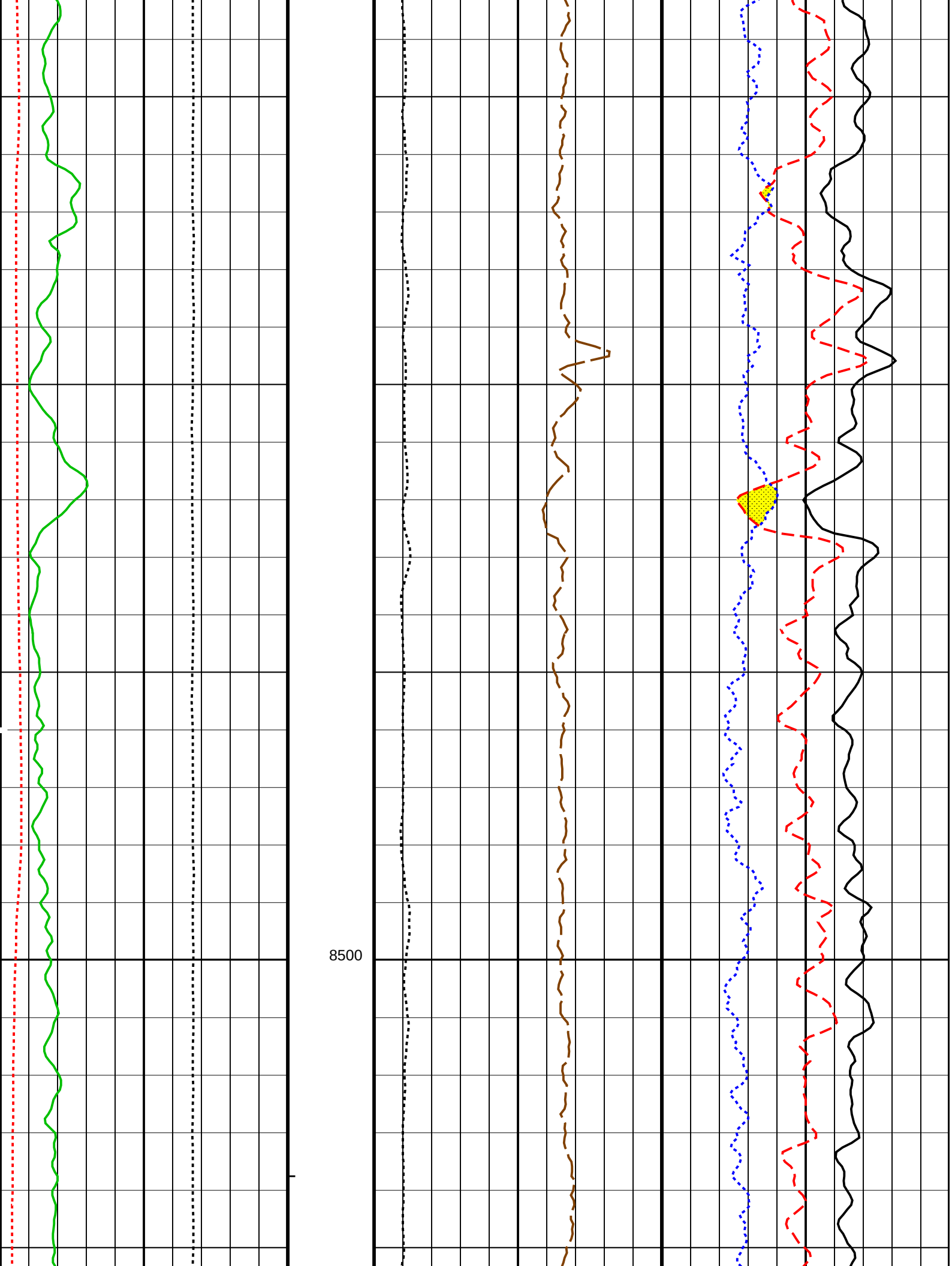
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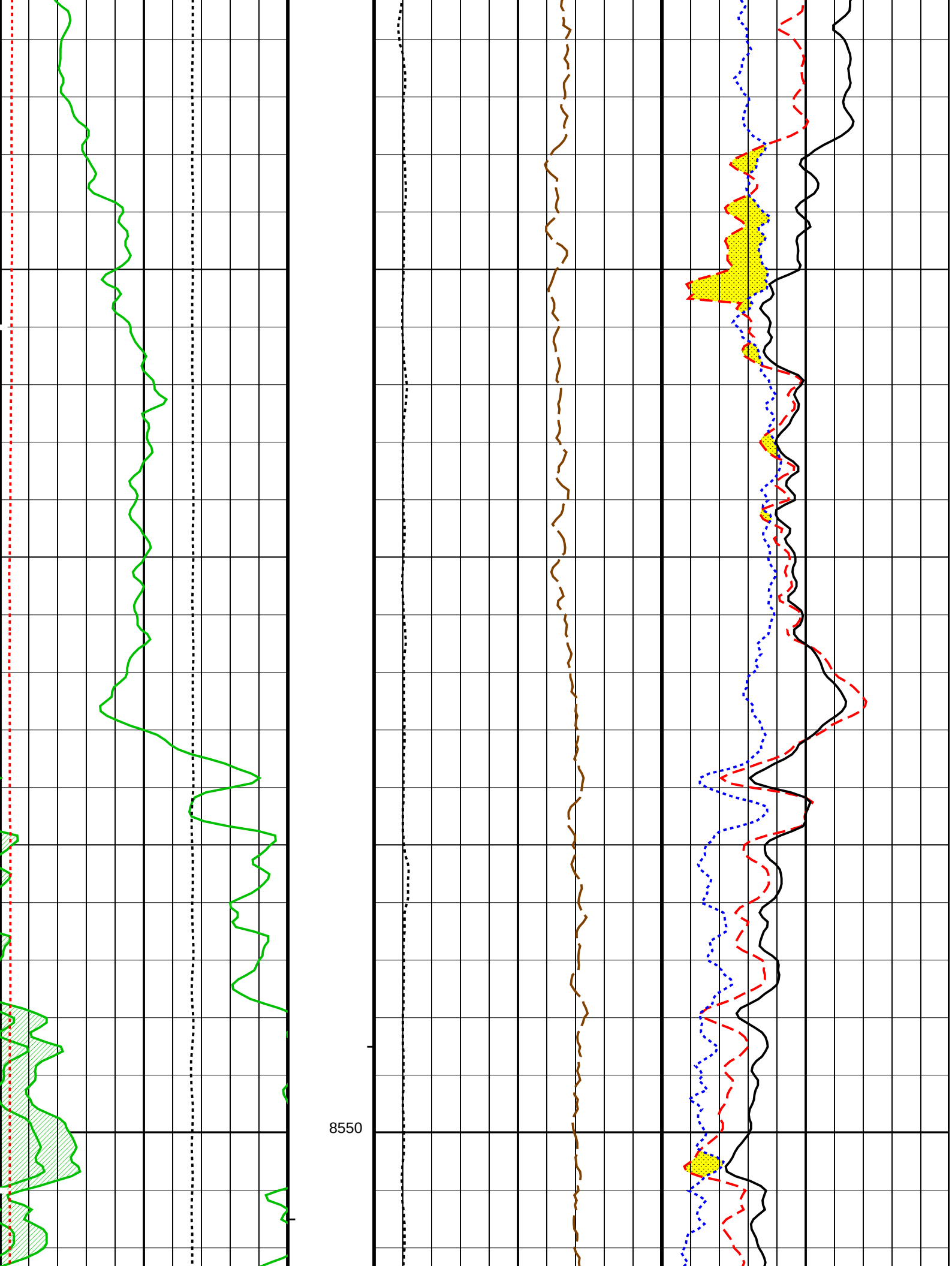
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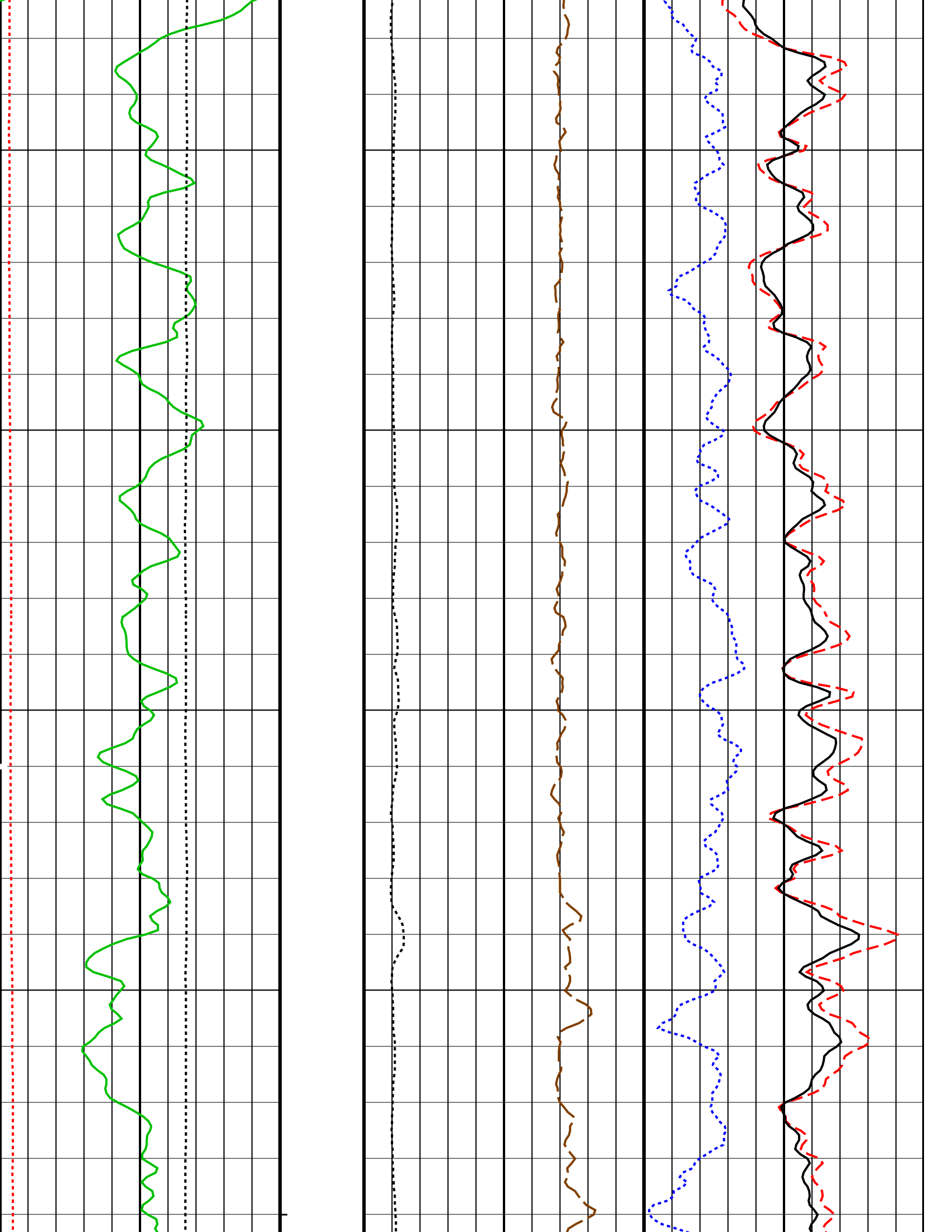
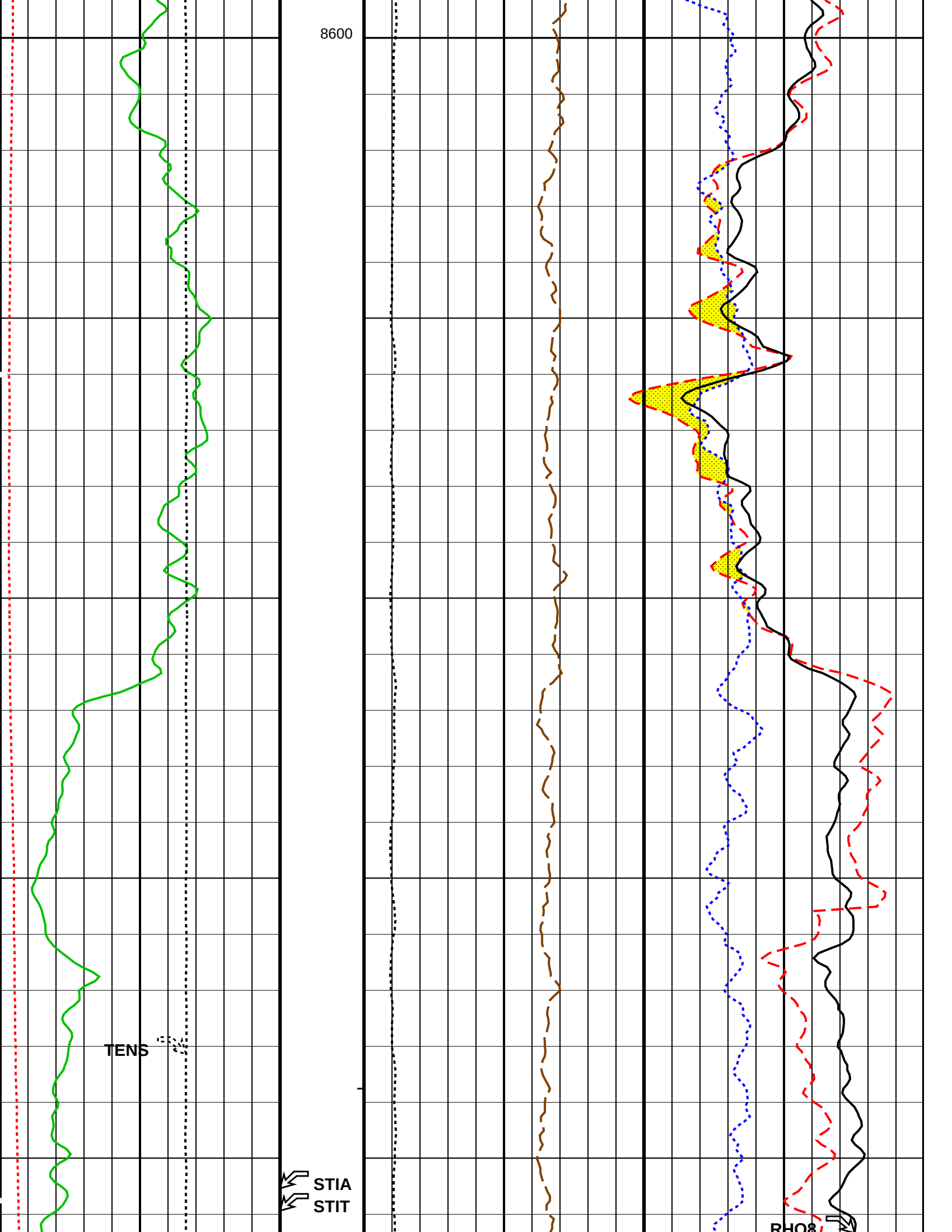
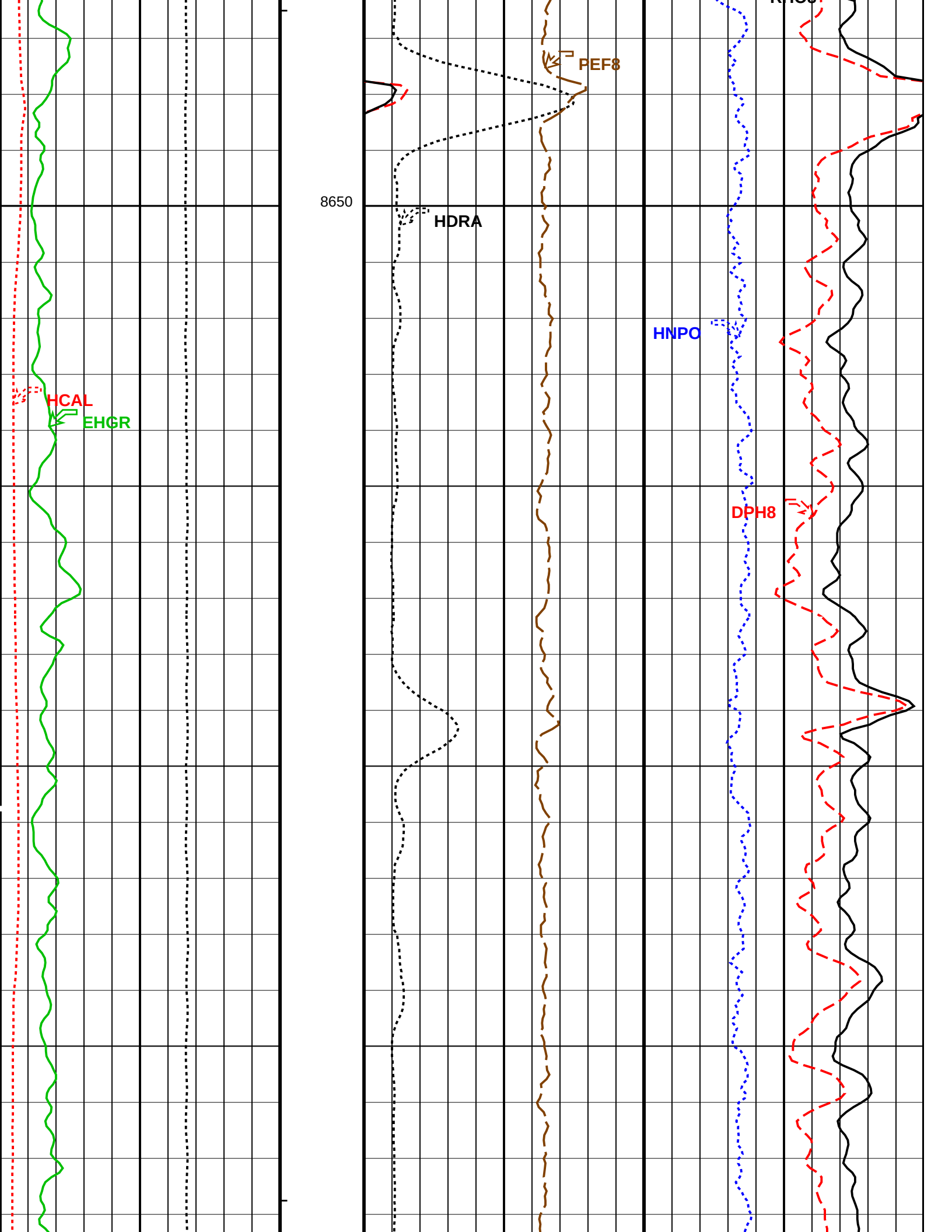
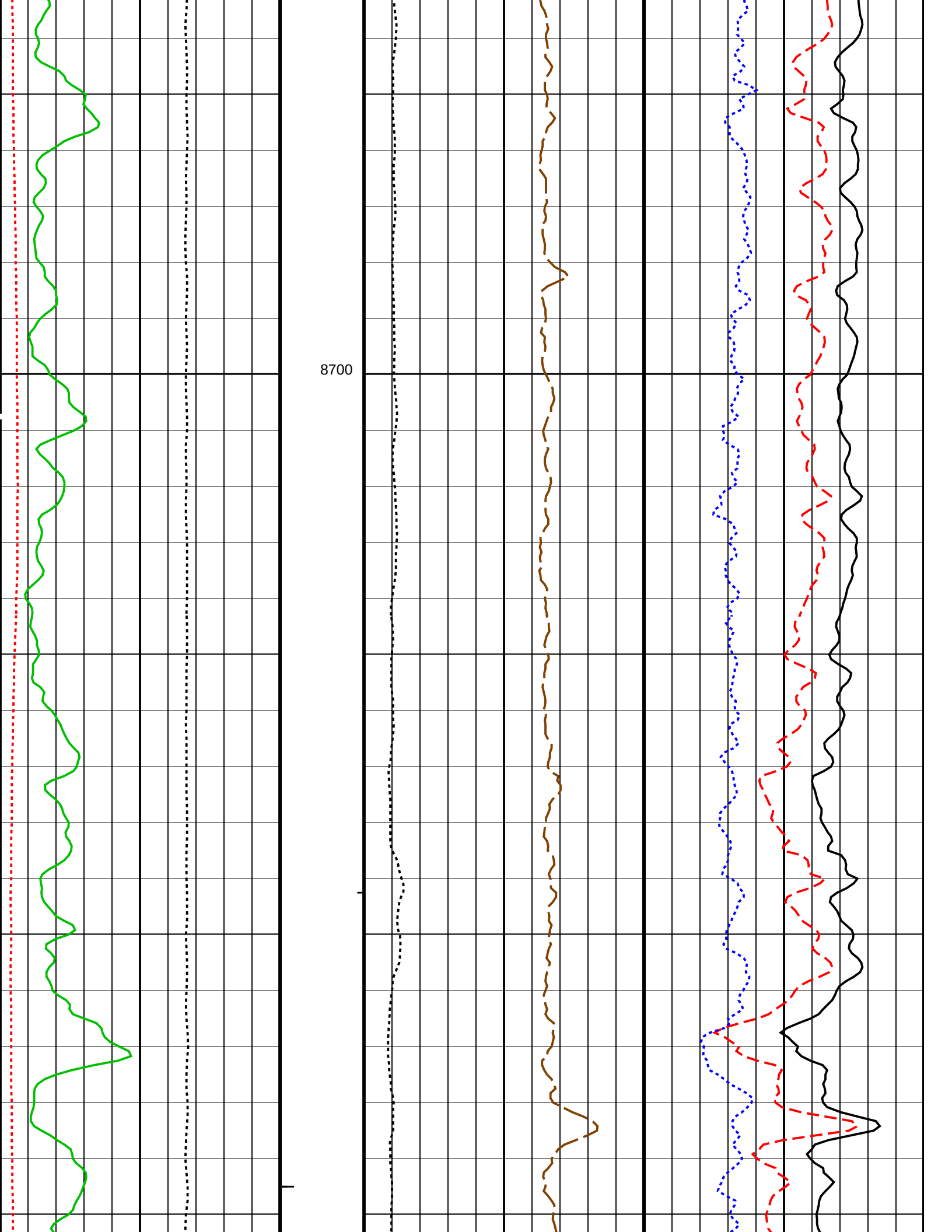



8600
TENS
STIA
STIT
RHOB


PEF8
8650
HDRA
HNPO
HCAL
EHGR
DPH8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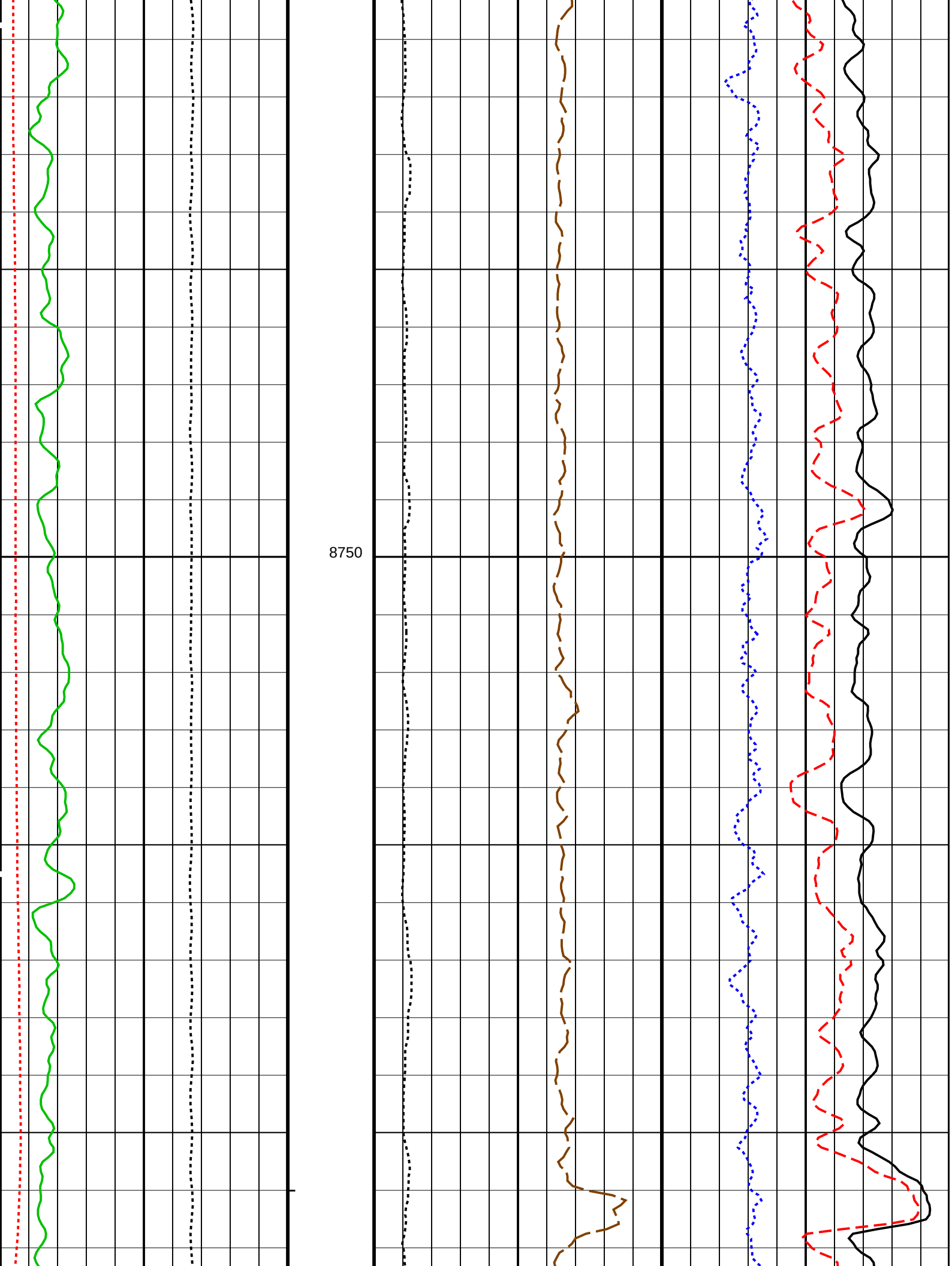
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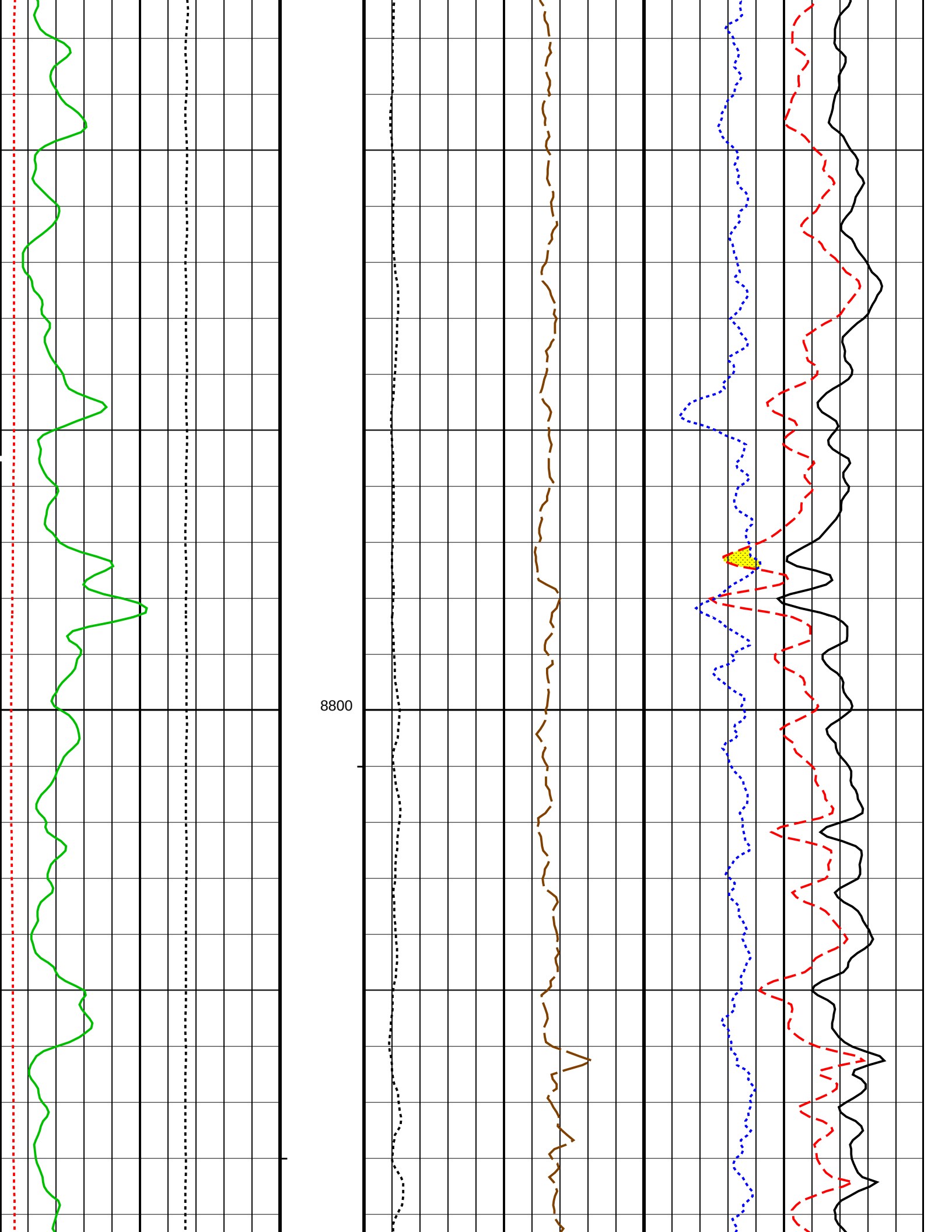
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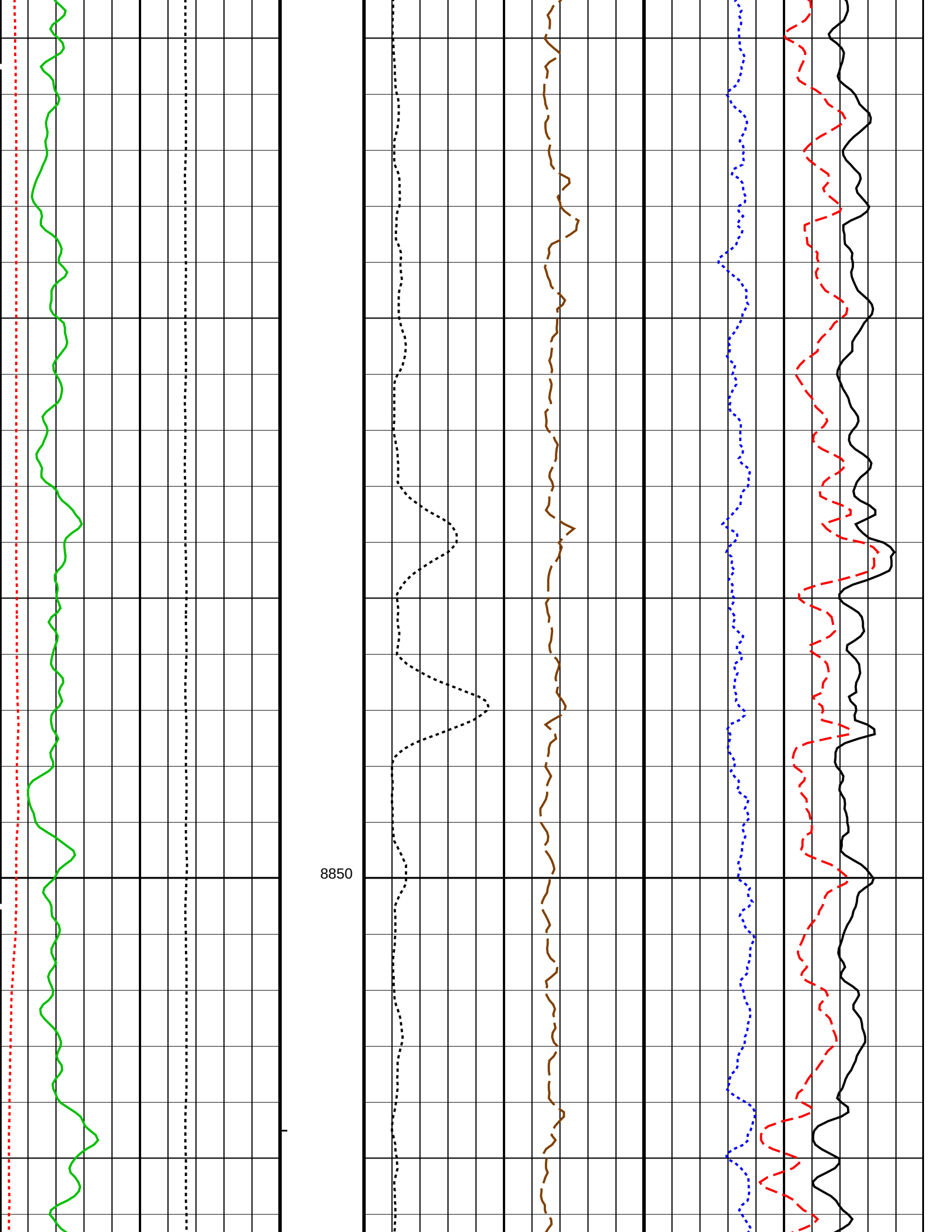
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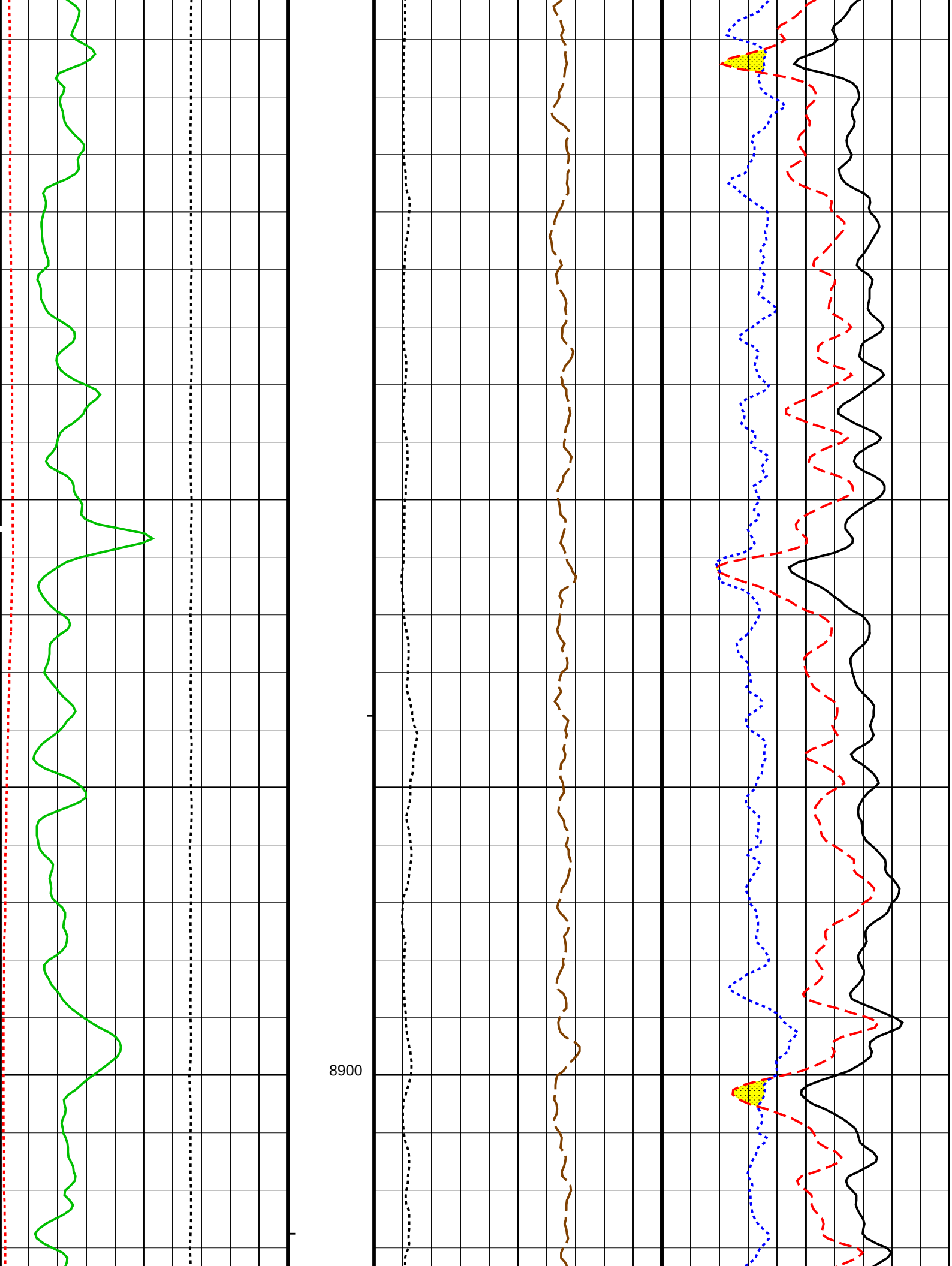
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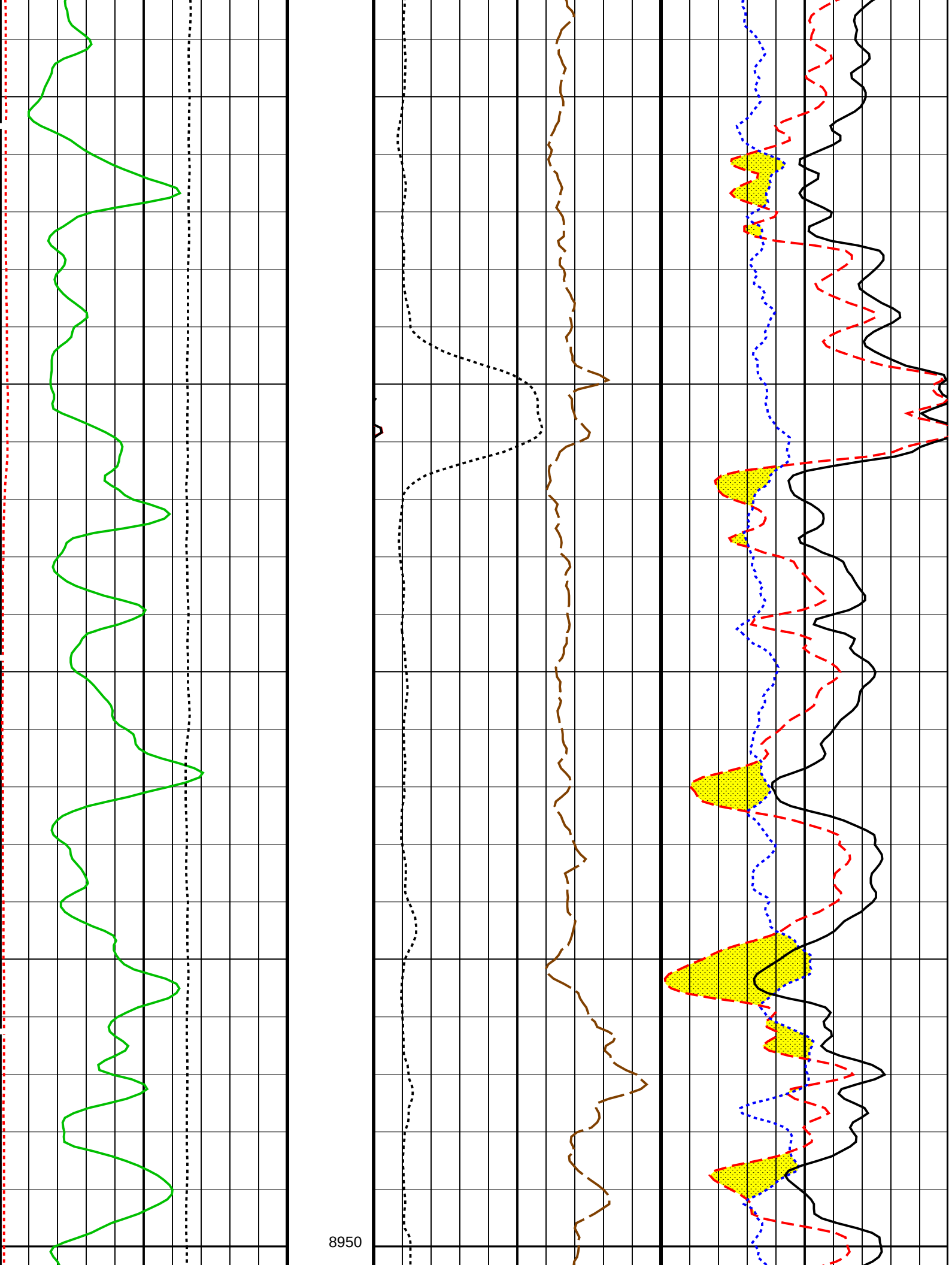
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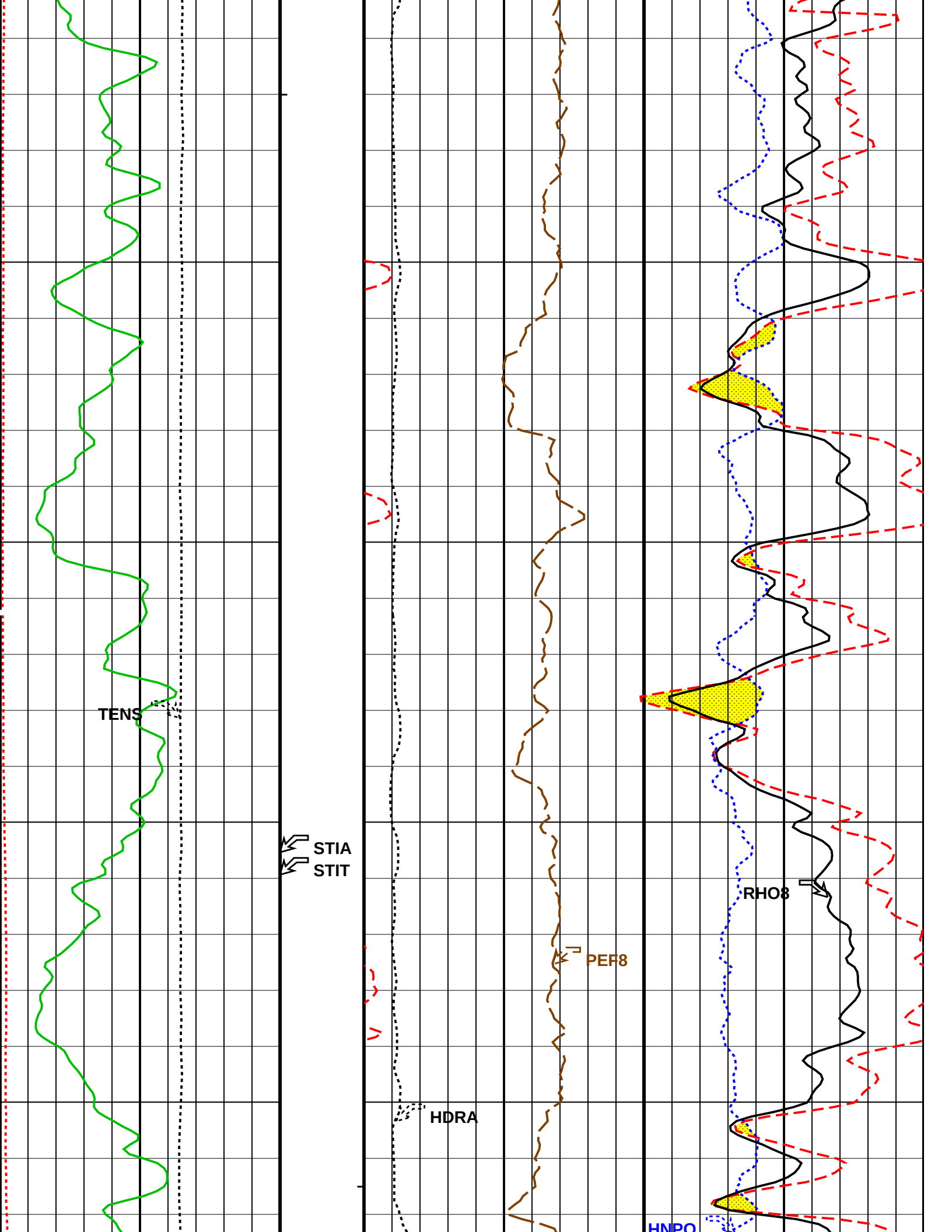
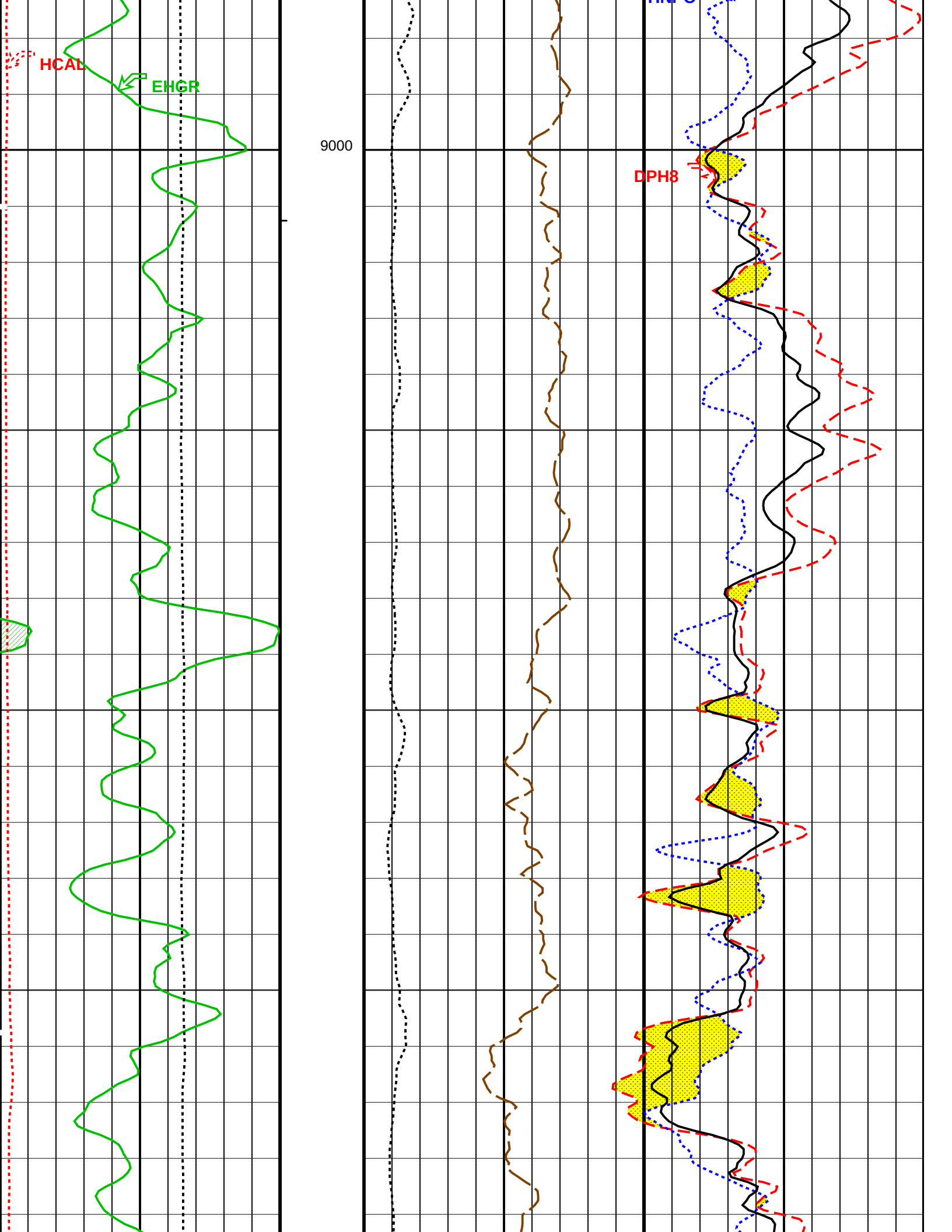
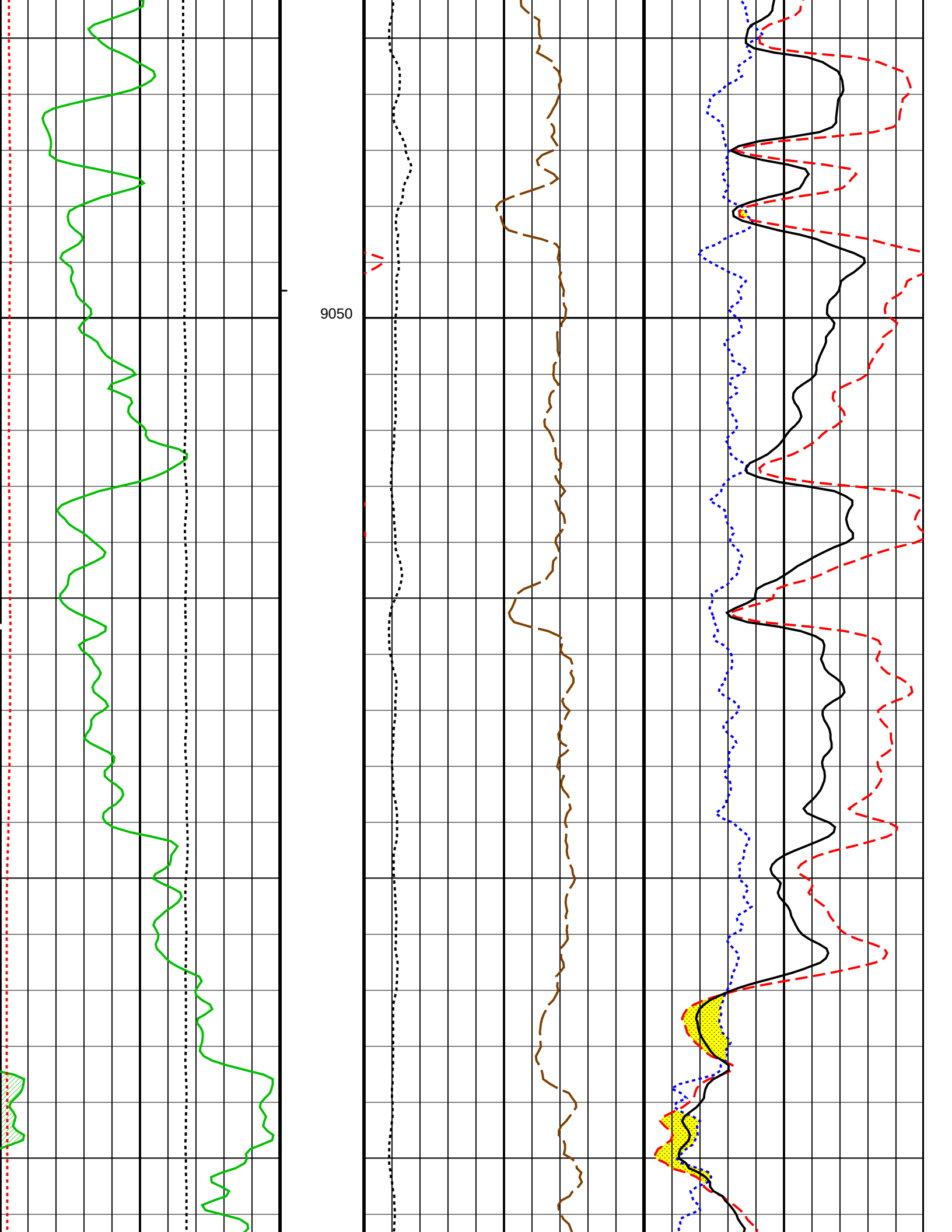

TENS
STIA
STIT
PEF8
RHO8
HDRA
HNPO


HCAL
EHGR
9000
DPH8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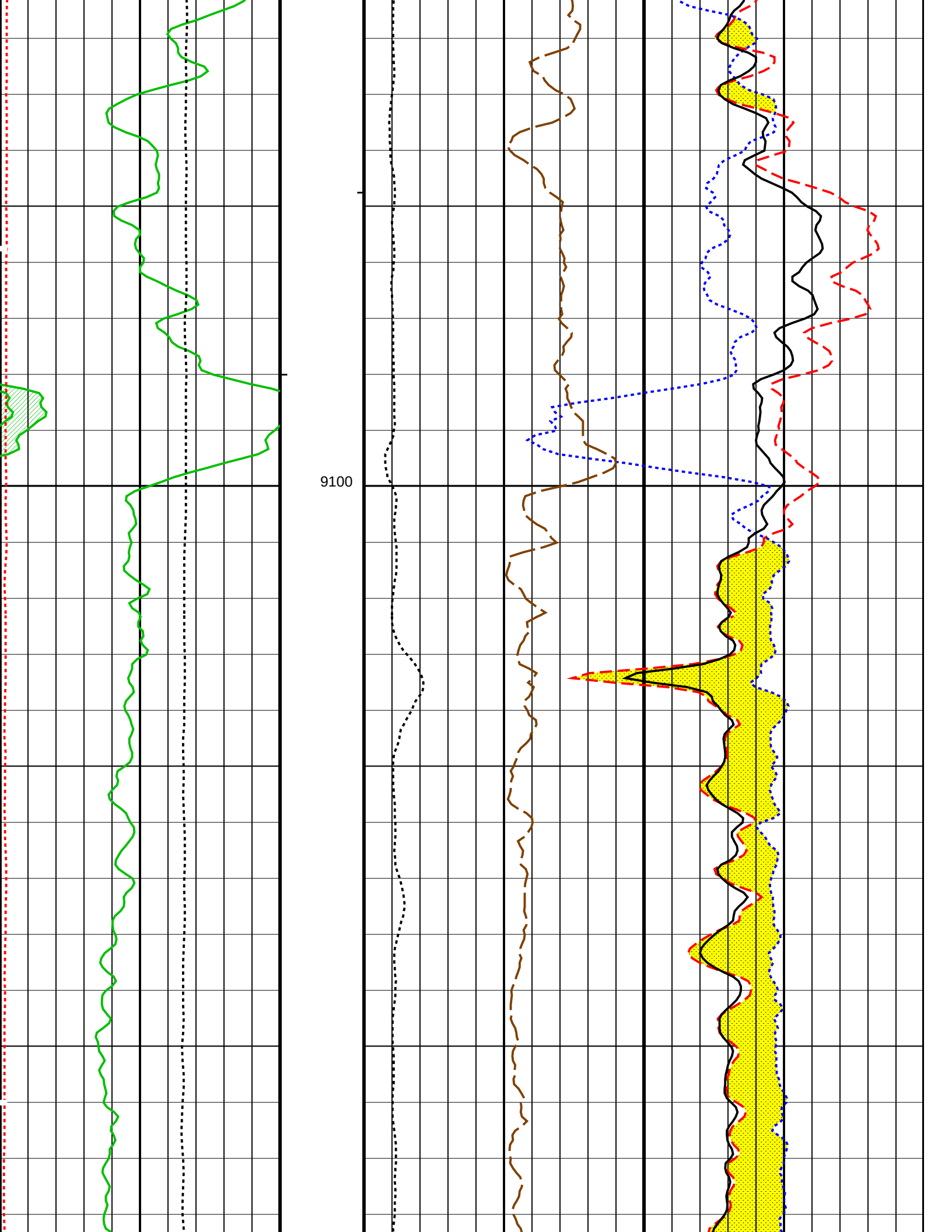
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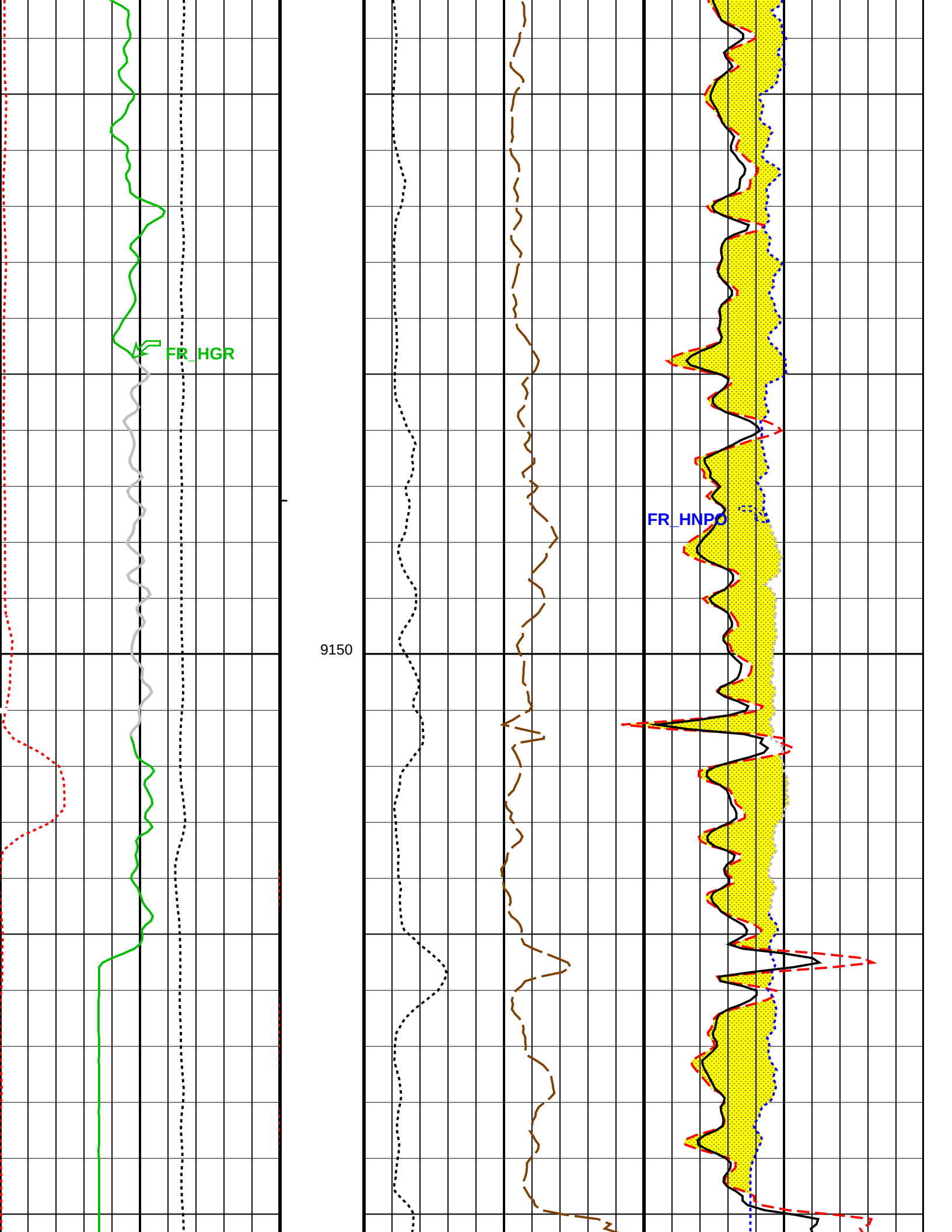
FR_HGR
FR_HNPO
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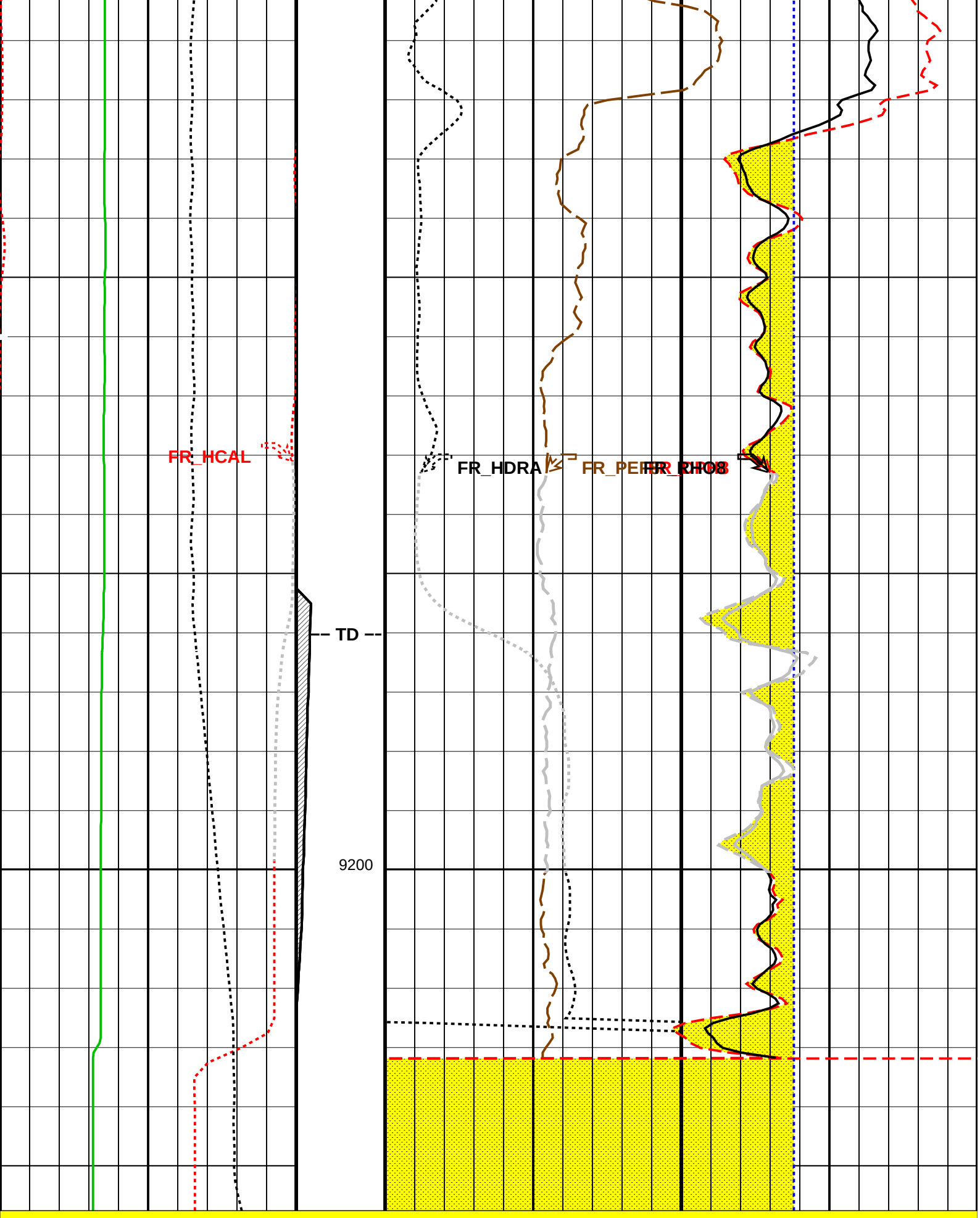
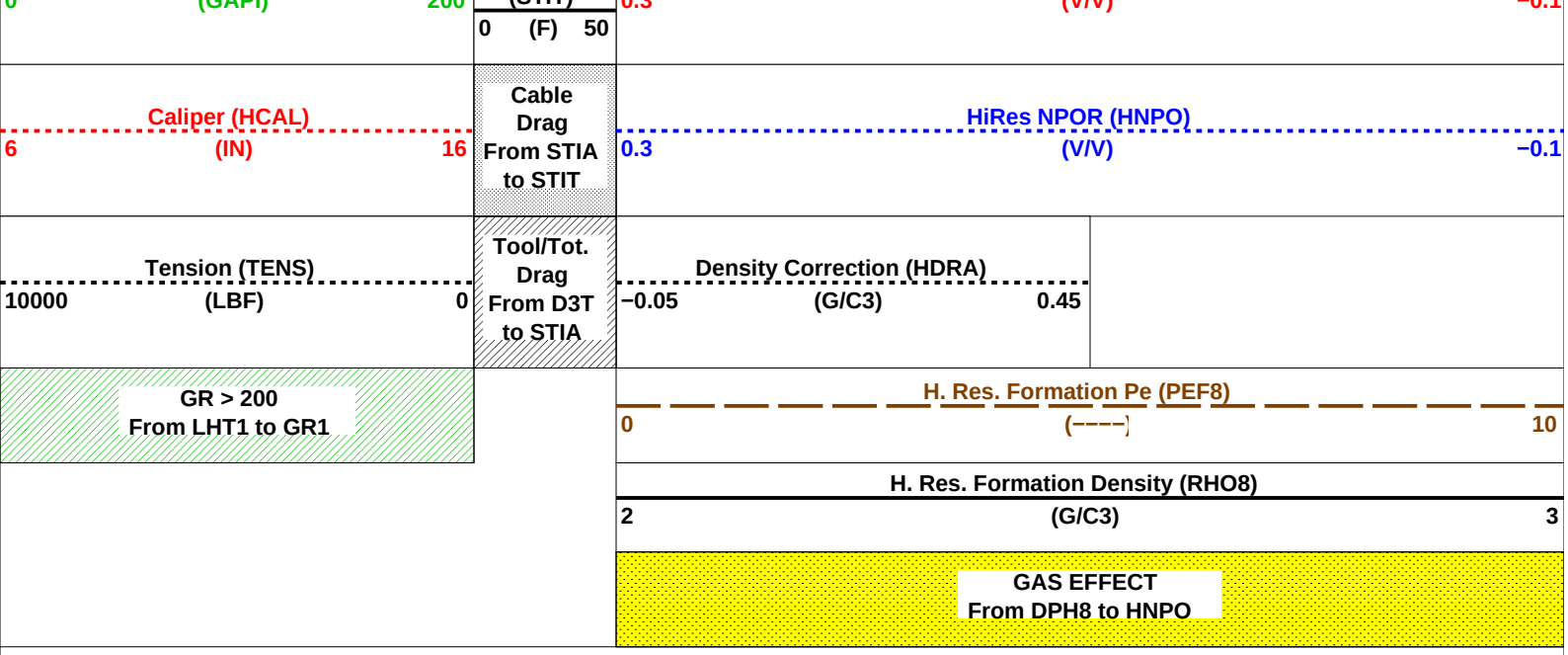


MAIN PASS 25 INCH = 100 FEET HIRES LOG

Gamma Ray (EHGR)	Stuck Stretch (STIT)	H. Res. Density Porosity (DPH8)
0 (GAPI) 300		0.3 (V/V) -0.1



PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
	HILTB−FTB: High resolution Integrated Logging Tool−DTS		
BHFL	Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
DHC	Density Hole Correction	BS	
FD	Fluid Density	1.1	G/C3
FSAL	Formation Salinity	−50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
HSCO	Hole Size Correction Option	YES	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.71	G/C3
MWCO	Mud Weight Correction Option	NO	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	HiRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	50	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	NO	
	PERT: Preliminary Evaluation − Real Time		
BHS	Borehole Status	OPEN	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
SHT	Surface Hole Temperature	50	DEGF
	STI: Stuck Tool Indicator		
LBFR	Trigger for MAXIS First Reading Label	STI	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth − Driller	9190.00	FT
TDL	Total Depth − Logger	9192.00	FT
	HOLEV: Integrated Hole/Cement Volume		
BHS	Borehole Status	OPEN	
FCD	Future Casing (Outer) Diameter	4.5	IN
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F

HVCS	Integrated Hole Volume Caliper Selection	HCAL	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
SHT	Surface Hole Temperature	50	DEGF
System and Miscellaneous			
BS	Bit Size	6.125	IN
BSAL	Borehole Salinity	92000.00	PPM
CSIZ	Current Casing Size	7.000	IN
CWEI	Casing Weight	20.00	LB/F
DFD	Drilling Fluid Density	9.35	LB/G
DO	Depth Offset for Playback	−4.0	FT
MST	Mud Sample Temperature	145.00	DEGF
PP	Playback Processing	RECOMPUTE	
RMFS	Resistivity of Mud Filtrate Sample	0.0220	OHMM
TD	Total Depth	9192	FT

Format: PEX_HIRES25 Vertical Scale: 25" per 100’ Graphics File Created: 29−Jul−2003 22:25

OP System Version: 11C0−305

MCM

HILTB−FTB	11C0−305	DTC−H	11C0−305

Input DLIS Files

DEFAULT	TLD_MCFL_CNL_017LUP	FN:16	PRODUCER	29−Jul−2003 20:30	9215.5 FT	6022.1 FT

Output DLIS Files

DEFAULT	TLD_MCFL_CNL_022PUP	FN:21	PRODUCER	29−Jul−2003 22:25		

Input DLIS Files

DEFAULT	TLD_MCFL_CNL_015LUP	FN:14	PRODUCER	29−Jul−2003 20:14	9220.5 FT	8881.0 FT

Output DLIS Files

DEFAULT	TLD_MCFL_CNL_025PUP	FN:24	PRODUCER	29−Jul−2003 23:00	9224.5 FT	8886.5 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 63.91 F3

Cement Volume = 30.17 F3 (assuming 4.50 IN casing O.D.)

Computed from 9192.0 FT to 8887.0 FT using data channel(s) HCAL

OP System Version: 11C0−305

MCM

HILTB−FTB	11C0−305	DTC−H	11C0−305

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
MDEN	2.83 G/C3	2.71 G/C3	8946.5 23:01:01

PIP SUMMARY

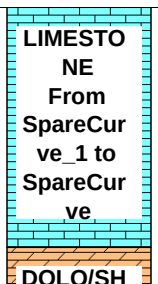
Integrated Hole Volume Minor Pip Every 10 F3

Integrated Hole Volume Major Pip Every 100 F3

Integrated Cement Volume Minor Pip Every 10 F3

Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S



ALE From D3T to SpareCurve_1

SANDSTONE From SpareCurve to D3T

GAS EFFECT From DPHZ to NPHI

GR > 200 From LHT1 to GR1

Tool/Tot. Drag From D3T to STIA

Std. Res. Formation Density (RHOZ)
2 (G/C3) 3

Tension (TENS)
10000 (LBF) 0

Cable Drag From STIA to STIT

Std. Res. Formation Pe (PEFZ)
0 (----) 10

Caliper (HCAL)
6 (IN) 16

Stuck Stretch (STIT)
0 (F) 50

Neutron Porosity (NPHI)
0.3 (V/V) -0.1

Gamma Ray (GR)
0 (GAPI) 200

MINERAL #3 (MP3)
0 (----) 1

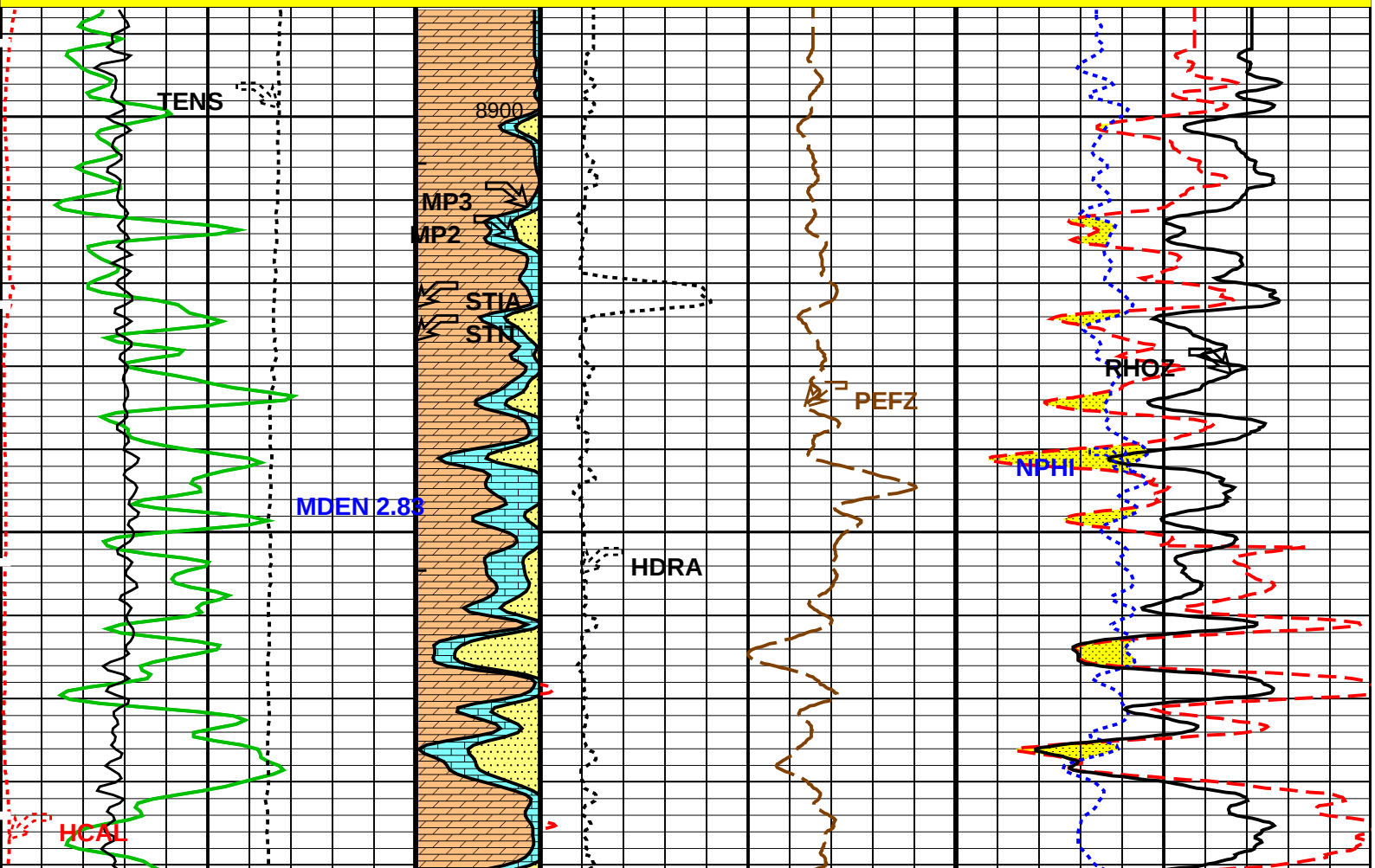
Density Correction (HDRA)
-0.05 (G/C3) 0.45

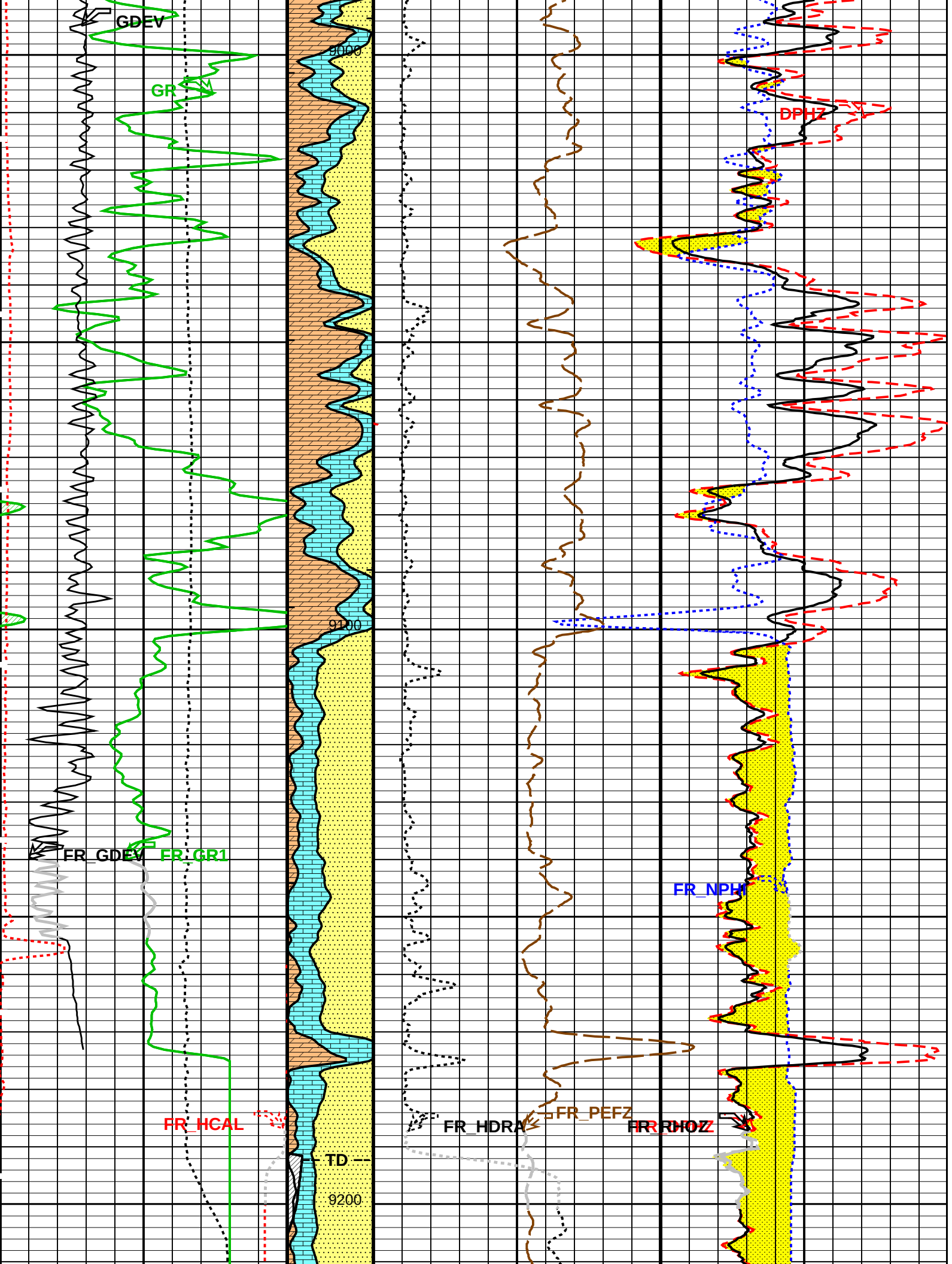
HGNS Deviation (GDEV)
-1 (DEG) 9

MINERAL #2 (MP2)
1 (----) 0

Std. Res. Density Porosity (DPHZ)
0.3 (V/V) -0.1

REPEAT SECTION 5 INCH = 100 FEET NEUTRON MATRIX = LIMESTONE




GDEV
GR
9000
DPHZ
9100
FR_GDEV
FR_GR1
FR_NPHI
FR_HCAL
FR_HDRA
FR_PEFZ
FR_RHOZ
TD
9200

REPEAT SECTION 5 INCH = 100 FEET NEUTRON MATRIX = LIMESTONE

HGNS Deviation (GDEV) −1 (DEG) 9	MINERAL #2 (MP2) 1 (−−−−) 0	Std. Res. Density Porosity (DPHZ) 0.3 (V/V) −0.1
Gamma Ray (GR) 0 (GAPI) 200	MINERAL #3 (MP3) 0 (−−−−) 1	Density Correction (HDRA) −0.05 (G/C3) 0.45
Caliper (HCAL) 6 (IN) 16	Stuck Stretch (STIT) 0 (F) 50	Neutron Porosity (NPHI) 0.3 (V/V) −0.1
Tension (TENS) 10000 (LBF) 0	Cable Drag From STIA to STIT	Std. Res. Formation Pe (PEFZ) 0 (−−−−) 10
GR > 200 From LHT1 to GR1	Tool/Tot. Drag From D3T to STIA	Std. Res. Formation Density (RHOZ) 2 (G/C3) 3
	SANDSTONE From SpareCurve to D3T	GAS EFFECT From DPHZ to NPHI
	DOLO/SHALE From D3T to SpareCurve_1	
	LIMESTONE From SpareCurve_1 to SpareCurve	

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

HILTB−FTB: High resolution Integrated Logging Tool−DTS

DLIS Name	Description	Value	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	142	DEGF
DHC	Density Hole Correction	BS	
FD	Fluid Density	1.1	G/C3
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GGRD	Geothermal Gradient	0.01	DF/F
GTSE	Generalized Temperature Selection	HSTS_HTEM	

MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MDEN	Matrix Density	2.71	G/C3
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	HiRes	
NSAR	HRDD Depth Sampling Rate	1	IN
SHT	Surface Hole Temperature	50	DEGF
FEQL: Formation Evaluation Quick Look			
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
PERT: Preliminary Evaluation − Real Time			
BDPS	Bulk Density Processing Selector	Standard	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	142	DEGF
CLIM	Caliper Limit for Bad Hole	999	IN
CNPS	Corrected Neutron Porosity Selector	NPHI	
DRUL	DRHO Upper Limit	999	G/C3
FCAL	Caliper Presence Flag	PRESENT	
FCGR	CGR Presence Flag	ABSENT	
FEXP	Form Factor Exponent	2	
FLDT	Bulk Density Presence Flag	PRESENT	
FNUM	Form Factor Numerator	1	
FSON	Sonic Presence Flag	ABSENT	
GCSE	Generalized Caliper Selection	HCAL	
GGRD	Geothermal Gradient	0.01	DF/F
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
PMAX	PHI Maximum	0.5	CFCF
POUT	Porosity Output Lithology	LIMESTONE	
RG21	RHO Grain (2−Mineral Model, Min−1)	2.71	G/C3
RG22	RHO Grain (2−Mineral Model, Min−2)	2.644	G/C3
RG23	RHO Grain (2−Mineral Model, Min−3)	2.877	G/C3
RG31	RHO Grain (3−Mineral Model, Min−1)	2.71	G/C3
RG32	RHO Grain (3−Mineral Model, Min−2)	2.644	G/C3
RG33	RHO Grain (3−Mineral Model, Min−3)	2.877	G/C3
RTLF	RT Limit Flag	NO_LIMIT	
RWF	Resistivity of Free Water	0.01	OHMM
SHT	Surface Hole Temperature	50	DEGF
UF	U Fluid	0.398	
UM21	U Matrix (2−Mineral Model, Min−1)	13.77	
UM22	U Matrix (2−Mineral Model, Min−2)	4.779	
UM23	U Matrix (2−Mineral Model, Min−3)	8.997	
UM31	U Matrix (3−Mineral Model, Min−1)	13.77	
UM32	U Matrix (3−Mineral Model, Min−2)	4.779	
UM33	U Matrix (3−Mineral Model, Min−3)	8.997	
STI: Stuck Tool Indicator			
LBFR	Trigger for MAXIS First Reading Label	STI	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth − Driller	9190.00	FT
TDL	Total Depth − Logger	9192.00	FT
HOLEV: Integrated Hole/Cement Volume			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	142	DEGF
FCD	Future Casing (Outer) Diameter	4.5	IN
GCSE	Generalized Caliper Selection	HCAL	
GGRD	Geothermal Gradient	0.01	DF/F
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
SHT	Surface Hole Temperature	50	DEGF
System and Miscellaneous			
BS	Bit Size	6.125	IN
DFD	Drilling Fluid Density	9.35	LB/G
DO	Depth Offset for Playback	4.0	FT
PP	Playback Processing	RECOMPUTE	
RMFS	Resistivity of Mud Filtrate Sample	0.0220	OHMM
TD	Total Depth	9192	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF

Format: PEX_NUC5_REP Vertical Scale: 5" per 100' Graphics File Created: 29−Jul−2003 23:00

OP System Version: 11C0−305

MCM

HILTB−FTB	11C0−305	DTC−H	11C0−305

Input DLIS Files

DEFAULT	TLD_MCFL_CNL_015LUP	FN:14	PRODUCER	29−Jul−2003 20:14	9220.5 FT	8881.0 FT

Output DLIS Files

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Stab Measurement Summary							
Before: 28−Jul−2003 22:47							
BS Window Ratio	0.7466	N/A	0.7484	N/A	N/A	N/A	
BS Window Sum	12150	N/A	12140	N/A	N/A	N/A	CPS
SS Window Ratio	0.4848	N/A	0.4875	N/A	N/A	N/A	
SS Window Sum	11920	N/A	11910	N/A	N/A	N/A	CPS
LS Window Ratio	0.2937	N/A	0.2957	N/A	N/A	N/A	
LS Window Sum	1307	N/A	1301	N/A	N/A	N/A	CPS
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Photo−multiplier High Voltages Calibrations							
Before: 28−Jul−2003 22:47							
BS PM High Voltage (Command)	1520	N/A	1530	N/A	N/A	N/A	V
SS PM High Voltage (Command)	2277	N/A	2285	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1834	N/A	1835	N/A	N/A	N/A	V
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Crystal Quality Resolutions Calibration							
Before: 28−Jul−2003 22:47							
BS Crystal Resolution	12.88	N/A	12.83	N/A	N/A	N/A	%
SS Crystal Resolution	10.80	N/A	10.83	N/A	N/A	N/A	%
LS Crystal Resolution	9.842	N/A	9.895	N/A	N/A	N/A	%
High resolution Integrated Logging Tool−DTS Wellsite Calibration − MCFL Calibration							
Before: 28−Jul−2003 22:43							
Raw B0 Resistivity	3875	N/A	3894	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3853	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3861	N/A	N/A	N/A	OHMM
High resolution Integrated Logging Tool−DTS Wellsite Calibration − HILT Caliper Calibration							
Before: 28−Jul−2003 22:43							
HILT Caliper Zero Measurement	8.000	N/A	8.652	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	12.72	N/A	N/A	N/A	IN
High resolution Integrated Logging Tool−DTS Wellsite Calibration − HRLT M01							
Before: 29−Jul−2003 19:57							
HRLT M0−M1 Voltage Plus − 0	0	N/A	−314.3	N/A	N/A	9.681	UV
HRLT M0−M1 Voltage Plus − 1	0	N/A	−332.2	N/A	N/A	9.681	UV
HRLT M0−M1 Voltage Plus − 2	0	N/A	−321.0	N/A	N/A	9.681	UV
HRLT M0−M1 Voltage Plus − 3	0	N/A	−332.7	N/A	N/A	9.681	UV
HRLT M0−M1 Voltage Plus − 4	0	N/A	−315.1	N/A	N/A	9.681	UV
HRLT M0−M1 Voltage Plus − 5	0	N/A	−318.2	N/A	N/A	9.681	UV
HRLT M0−M1 Voltage Plus − 6	0	N/A	318.7	N/A	N/A	9.681	UV
HRLT M0−M1 Voltage Plus − 7	0	N/A	−322.7	N/A	N/A	9.681	UV
High resolution Integrated Logging Tool−DTS Wellsite Calibration − HRLT M12							
Before: 29−Jul−2003 19:57							
HRLT M1−M2 Voltage Plus − 0	0	N/A	1724	N/A	N/A	53.42	UV
HRLT M1−M2 Voltage Plus − 1	0	N/A	1810	N/A	N/A	53.42	UV
HRLT M1−M2 Voltage Plus − 2	0	N/A	1748	N/A	N/A	53.42	UV
HRLT M1−M2 Voltage Plus − 3	0	N/A	1816	N/A	N/A	53.42	UV
HRLT M1−M2 Voltage Plus − 4	0	N/A	1724	N/A	N/A	53.42	UV
HRLT M1−M2 Voltage Plus − 5	0	N/A	1744	N/A	N/A	53.42	UV
HRLT M1−M2 Voltage Plus − 6	0	N/A	−1743	N/A	N/A	53.42	UV
HRLT M1−M2 Voltage Plus − 7	0	N/A	1781	N/A	N/A	53.42	UV
High resolution Integrated Logging Tool−DTS Wellsite Calibration − HRLT M23							
Before: 29−Jul−2003 19:57							
HRLT M2−M3 Voltage Plus − 0	0	N/A	1732	N/A	N/A	53.42	UV
HRLT M2−M3 Voltage Plus − 1	0	N/A	1825	N/A	N/A	53.42	UV
HRLT M2−M3 Voltage Plus − 2	0	N/A	1765	N/A	N/A	53.42	UV
HRLT M2−M3 Voltage Plus − 3	0	N/A	1837	N/A	N/A	53.42	UV
HRLT M2−M3 Voltage Plus − 4	0	N/A	1741	N/A	N/A	53.42	UV
HRLT M2−M3 Voltage Plus − 5	0	N/A	1763	N/A	N/A	53.42	UV
HRLT M2−M3 Voltage Plus − 6	0	N/A	−1745	N/A	N/A	53.42	UV
HRLT M2−M3 Voltage Plus − 7	0	N/A	1781	N/A	N/A	53.42	UV
High resolution Integrated Logging Tool−DTS Wellsite Calibration − HRLT V34							
Before: 29−Jul−2003 19:57							
HRLT A3−A4 Voltage Plus − 0	0	N/A	67740	N/A	N/A	2100	UV
HRLT A3−A4 Voltage Plus − 1	0	N/A	71530	N/A	N/A	2100	UV
HRLT A3−A4 Voltage Plus − 2	0	N/A	69400	N/A	N/A	2100	UV

HRLT A3−A4 Voltage Plus − 3	0	N/A	72420	N/A	N/A	2100	UV
HRLT A3−A4 Voltage Plus − 4	0	N/A	68480	N/A	N/A	2100	UV
HRLT A3−A4 Voltage Plus − 5	0	N/A	69290	N/A	N/A	2100	UV
HRLT A3−A4 Voltage Plus − 6	0	N/A	−67430	N/A	N/A	2100	UV
HRLT A3−A4 Voltage Plus − 7	0	N/A	70000	N/A	N/A	2100	UV

High resolution Integrated Logging Tool−DTS Wellsite Calibration − HRLT V45
Before: 29−Jul−2003 19:57

HRLT A4−A5 Voltage Plus − 0	0	N/A	67400	N/A	N/A	2100	UV
HRLT A4−A5 Voltage Plus − 1	0	N/A	71120	N/A	N/A	2100	UV
HRLT A4−A5 Voltage Plus − 2	0	N/A	69010	N/A	N/A	2100	UV
HRLT A4−A5 Voltage Plus − 3	0	N/A	72040	N/A	N/A	2100	UV
HRLT A4−A5 Voltage Plus − 4	0	N/A	68130	N/A	N/A	2100	UV
HRLT A4−A5 Voltage Plus − 5	0	N/A	68930	N/A	N/A	2100	UV
HRLT A4−A5 Voltage Plus − 6	0	N/A	−67030	N/A	N/A	2100	UV
HRLT A4−A5 Voltage Plus − 7	0	N/A	70000	N/A	N/A	2100	UV

High resolution Integrated Logging Tool−DTS Wellsite Calibration − HRLT V56
Before: 29−Jul−2003 19:57

HRLT A5−A6 Voltage Plus − 0	0	N/A	67710	N/A	N/A	2100	UV
HRLT A5−A6 Voltage Plus − 1	0	N/A	71760	N/A	N/A	2100	UV
HRLT A5−A6 Voltage Plus − 2	0	N/A	69560	N/A	N/A	2100	UV
HRLT A5−A6 Voltage Plus − 3	0	N/A	72520	N/A	N/A	2100	UV
HRLT A5−A6 Voltage Plus − 4	0	N/A	68490	N/A	N/A	2100	UV
HRLT A5−A6 Voltage Plus − 5	0	N/A	69270	N/A	N/A	2100	UV
HRLT A5−A6 Voltage Plus − 6	0	N/A	−67680	N/A	N/A	2100	UV
HRLT A5−A6 Voltage Plus − 7	0	N/A	70000	N/A	N/A	2100	UV

High resolution Integrated Logging Tool−DTS Wellsite Calibration − HRLT VTP
Before: 29−Jul−2003 19:57

HRLT Torpedo−M0 Voltage − 0	0	N/A	−67370	N/A	N/A	2100	UV
HRLT Torpedo−M0 Voltage − 1	0	N/A	−71580	N/A	N/A	2100	UV
HRLT Torpedo−M0 Voltage − 2	0	N/A	−69440	N/A	N/A	2100	UV
HRLT Torpedo−M0 Voltage − 3	0	N/A	−72480	N/A	N/A	2100	UV
HRLT Torpedo−M0 Voltage − 4	0	N/A	−68530	N/A	N/A	2100	UV
HRLT Torpedo−M0 Voltage − 5	0	N/A	−69340	N/A	N/A	2100	UV
HRLT Torpedo−M0 Voltage − 6	0	N/A	67450	N/A	N/A	2100	UV
HRLT Torpedo−M0 Voltage − 7	0	N/A	−70000	N/A	N/A	2100	UV

High resolution Integrated Logging Tool−DTS Wellsite Calibration − HRLT VBD
Before: 29−Jul−2003 19:57

HRLT Bridle#9−M0 Voltage − 0	0	N/A	−67390	N/A	N/A	2100	UV
HRLT Bridle#9−M0 Voltage − 1	0	N/A	−71650	N/A	N/A	2100	UV
HRLT Bridle#9−M0 Voltage − 2	0	N/A	−69510	N/A	N/A	2100	UV
HRLT Bridle#9−M0 Voltage − 3	0	N/A	−72540	N/A	N/A	2100	UV
HRLT Bridle#9−M0 Voltage − 4	0	N/A	−68570	N/A	N/A	2100	UV
HRLT Bridle#9−M0 Voltage − 5	0	N/A	−69360	N/A	N/A	2100	UV
HRLT Bridle#9−M0 Voltage − 6	0	N/A	67530	N/A	N/A	2100	UV
HRLT Bridle#9−M0 Voltage − 7	0	N/A	−70000	N/A	N/A	2100	UV

High resolution Integrated Logging Tool−DTS Wellsite Calibration − HRLT ISO
Before: 29−Jul−2003 19:57

HRLT Source Current Plus − 0	0	N/A	281.5	N/A	N/A	8.520	UA
HRLT Source Current Plus − 1	0	N/A	281.1	N/A	N/A	8.520	UA
HRLT Source Current Plus − 2	0	N/A	281.1	N/A	N/A	8.520	UA
HRLT Source Current Plus − 3	0	N/A	281.1	N/A	N/A	8.520	UA
HRLT Source Current Plus − 4	0	N/A	281.1	N/A	N/A	8.520	UA
HRLT Source Current Plus − 5	0	N/A	281.1	N/A	N/A	8.520	UA
HRLT Source Current Plus − 6	0	N/A	281.1	N/A	N/A	8.520	UA
HRLT Source Current Plus − 7	0	N/A	281.1	N/A	N/A	8.520	UA

High resolution Integrated Logging Tool−DTS Wellsite Calibration − HRLT MV
Before: 29−Jul−2003 19:57

HRLT Vertical Voltage Pl − 0	0	N/A	−316.9	N/A	N/A	9.681	UV
HRLT Vertical Voltage Pl − 1	0	N/A	−325.0	N/A	N/A	9.681	UV
HRLT Vertical Voltage Pl − 2	0	N/A	−313.4	N/A	N/A	9.681	UV
HRLT Vertical Voltage Pl − 3	0	N/A	−324.3	N/A	N/A	9.681	UV
HRLT Vertical Voltage Pl − 4	0	N/A	−305.0	N/A	N/A	9.681	UV
HRLT Vertical Voltage Pl − 5	0	N/A	−323.2	N/A	N/A	9.681	UV
HRLT Vertical Voltage Pl − 6	0	N/A	324.4	N/A	N/A	9.681	UV
HRLT Vertical Voltage Pl − 7	0	N/A	−322.7	N/A	N/A	9.681	UV

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Detector Calibration
Before: 28−Jul−2003 22:45

Gamma Ray Background	30.00	N/A	46.31	N/A	N/A	N/A	GAPI
Gamma Ray (Jig − Bkg)	171.1	N/A	171.1	N/A	N/A	15.56	GAPI
Gamma Ray (Calibrated)	168.0	N/A	168.0	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Zero Measurement
Master: 12−Jul−2003 15:49 Before: 28−Jul−2003 22:46

CNTC Background	28.54	28.54	30.07	N/A	N/A	4.281	CPS
CFTC Background	30.59	30.59	31.58	N/A	N/A	4.589	CPS

CPTC Background				N/A	N/A		CPS

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Accelerometer Calibration
Before: 29−Jul−2003 19:22

Z−Axis Acceleration	32.19	N/A	32.13	N/A	N/A	N/A	F/S2

High resolution Integrated Logging Tool−DTS Master Calibration − Inversion results
Master: 18−Jul−2003 20:23

Rho Aluminum	2.596	2.599	−−	−−	−−	−−	G/C3
Rho Magnesium	1.686	1.687	−−	−−	−−	−−	G/C3
Pe Aluminum	2.570	2.583	−−	−−	−−	−−	
Pe Magnesium	2.650	2.629	−−	−−	−−	−−	

High resolution Integrated Logging Tool−DTS Master Calibration − Deviation Summary
Master: 18−Jul−2003 20:23

BS Average Deviation	0	0.2123	−−	−−	−−	−−	%
BS Max Deviation	0	0.6850	−−	−−	−−	−−	%
SS Average Deviation	0	0.2002	−−	−−	−−	−−	%
SS Max Deviation	0	0.6461	−−	−−	−−	−−	%
LS Average Deviation	0	0.4515	−−	−−	−−	−−	%
LS Max Deviation	0	1.547	−−	−−	−−	−−	%

High resolution Integrated Logging Tool−DTS Master Calibration − Tank Measurement
Master: 12−Jul−2003 16:06

Thermal Near Corr. (Tank)	6031	5835	−−	−−	−−	−−	CPS
Thermal Far Corr. (Tank)	2793	2520	−−	−−	−−	−−	CPS
CNTC/CFTC (Tank)	2.159	2.315	−−	−−	−−	−−	

High resolution Integrated Logging Tool−DTS Master Calibration − Tank Measurement
Master: 12−Jul−2003 16:06

Thermal Near Corr. (Tank)	6031	5835	−−	−−	−−	−−	CPS
Thermal Far Corr. (Tank)	2793	2520	−−	−−	−−	−−	CPS
CNTC/CFTC (Tank)	2.159	2.315	−−	−−	−−	−−	

The GLS−VJ source activity is acceptable.

The HGNS Neutron Master Calibration was done with the following parameters :

NCT−B Water Temperature	76.0	DEGF.
Thermal Housing Size	3.372	IN.

High resolution Integrated Logging Tool−DTS / Equipment Identification

Primary Equipment:

HILT high−Resolution Mechanical Sonde	HRMS − B	879
HILT Rxo Gamma−ray Device	HRGD −	899
HILT Nuclear Back−Scatter Detector	HILT −	
HILT Nuclear Short−Spacing Detector	HILT −	
HILT Nuclear Long−Spacing Detector	HILT −	
Micro Cylindrically Focused Log Device	MCFL −	
GR Logging Source	GLS − VJ	5109
HILT High Res. Control Cartridge	HRCC − B	829

Auxiliary Equipment:

High resolution Integrated Logging Tool−DTS Wellsite Calibration
Stab Measurement Summary

Phase	BS Window Ratio	Value	Phase	SS Window Ratio	Value	Phase	LS Window Ratio	Value
Before		0.7484	Before		0.4875	Before		0.2957
	0.7093 (Minimum) 0.7466 (Nominal) 0.7840 (Maximum)			0.4606 (Minimum) 0.4848 (Nominal) 0.5090 (Maximum)			0.2790 (Minimum) 0.2937 (Nominal) 0.3084 (Maximum)	

Phase	BS Window Sum CPS	Value	Phase	SS Window Sum CPS	Value	Phase	LS Window Sum CPS	Value
Before		12140	Before		11910	Before		1301
	11550 (Minimum) 12150 (Nominal) 12760 (Maximum)			11330 (Minimum) 11920 (Nominal) 12520 (Maximum)			1241 (Minimum) 1307 (Nominal) 1372 (Maximum)	

Before: 28−Jul−2003 22:47

High resolution Integrated Logging Tool−DTS Wellsite Calibration
Photo−multiplier High Voltages Calibrations

Phase	BS PM High Voltage (Command) V	Value	Phase	SS PM High Voltage (Command) V	Value	Phase	LS PM High Voltage (Command) V	Value
Before		1530	Before		2285	Before		1835

1420 (Minimum)	1520 (Nominal)	1620 (Maximum)	2177 (Minimum)	2277 (Nominal)	2377 (Maximum)	1734 (Minimum)	1834 (Nominal)	1934 (Maximum)

Before: 28−Jul−2003 22:47

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Crystal Quality Resolutions Calibration

Phase	BS Crystal Resolution %	Value	Phase	SS Crystal Resolution %	Value	Phase	LS Crystal Resolution %	Value
Before		12.83	Before		10.83	Before		9.895
11.88 (Minimum)	12.88 (Nominal)	13.88 (Maximum)	9.802 (Minimum)	10.80 (Nominal)	11.80 (Maximum)	8.842 (Minimum)	9.842 (Nominal)	10.84 (Maximum)

Before: 28−Jul−2003 22:47

High resolution Integrated Logging Tool−DTS Wellsite Calibration

MCFL Calibration

Phase	Raw B0 Resistivity OHMM	Value	Phase	Raw B1 Resistivity OHMM	Value	Phase	Raw B2 Resistivity OHMM	Value
Before		3894	Before		3853	Before		3861
3565 (Minimum)	3875 (Nominal)	4185 (Maximum)	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)

Before: 28−Jul−2003 22:43

High resolution Integrated Logging Tool−DTS Wellsite Calibration

HILT Caliper Calibration

Phase	HILT Caliper Zero Measurement IN	Value	Phase	HILT Caliper Plus Measurement IN	Value
Before		8.652	Before		12.72
6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)	9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)

Before: 28−Jul−2003 22:43

High resolution Integrated Logging Tool−DTS Wellsite Calibration

HRLT M01

Idx	Phase	HRLT M0−M1 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		−314.3	−322.7	−274.3	−371.1
1	Before		−332.2	−322.7	−274.3	−371.1
2	Before		−321.0	−322.7	−274.3	−371.1
3	Before		−332.7	−322.7	−274.3	−371.1
4	Before		−315.1	−322.7	−274.3	−371.1
5	Before		−318.2	−322.7	−274.3	−371.1
6	Before		318.7	322.7	371.1	274.3
7	Before		−322.7	−322.7	−274.3	−371.1
		(Minimum) (Nominal) (Maximum)				

Before: 29−Jul−2003 19:57

High resolution Integrated Logging Tool−DTS Wellsite Calibration

HRLT M12

Idx	Phase	HRLT M1−M2 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		1724	1781	2048	1514
1	Before		1810	1781	2048	1514
2	Before		1748	1781	2048	1514
3	Before		1816	1781	2048	1514
4	Before		1724	1781	2048	1514
5	Before		1744	1781	2048	1514
6	Before		−1743	−1781	−1514	−2048
7	Before		1781	1781	2048	1514
		(Minimum) (Nominal) (Maximum)				

Before: 29−Jul−2003 19:57

High resolution Integrated Logging Tool−DTS Wellsite Calibration

High resolution Integrated Logging Tool−DTS Wellsite Calibration

HRLT M23

Idx	Phase	HRLT M2−M3 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		1732	1781	2048	1514
1	Before		1825	1781	2048	1514
2	Before		1765	1781	2048	1514
3	Before		1837	1781	2048	1514
4	Before		1741	1781	2048	1514
5	Before		1763	1781	2048	1514
6	Before		−1745	−1781	−1514	−2048
7	Before		1781	1781	2048	1514
		(Minimum) (Nominal) (Maximum)				

Before: 29−Jul−2003 19:57

High resolution Integrated Logging Tool−DTS Wellsite Calibration

HRLT V34

Idx	Phase	HRLT A3−A4 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		67740	70000	80500	59500
1	Before		71530	70000	80500	59500
2	Before		69400	70000	80500	59500
3	Before		72420	70000	80500	59500
4	Before		68480	70000	80500	59500
5	Before		69290	70000	80500	59500
6	Before		−67430	−70000	−59500	−80500
7	Before		70000	70000	80500	59500
		(Minimum) (Nominal) (Maximum)				

Before: 29−Jul−2003 19:57

High resolution Integrated Logging Tool−DTS Wellsite Calibration

HRLT V45

Idx	Phase	HRLT A4−A5 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		67400	70000	80500	59500
1	Before		71120	70000	80500	59500
2	Before		69010	70000	80500	59500
3	Before		72040	70000	80500	59500
4	Before		68130	70000	80500	59500
5	Before		68930	70000	80500	59500
6	Before		−67030	−70000	−59500	−80500
7	Before		70000	70000	80500	59500
		(Minimum) (Nominal) (Maximum)				

Before: 29−Jul−2003 19:57

High resolution Integrated Logging Tool−DTS Wellsite Calibration

HRLT V56

Idx	Phase	HRLT A5−A6 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		67710	70000	80500	59500
1	Before		71760	70000	80500	59500
2	Before		69560	70000	80500	59500
3	Before		72520	70000	80500	59500
4	Before		68490	70000	80500	59500

5	Before		69270	70000	80500	59500
6	Before		−67680	−70000	−59500	−80500
7	Before		70000	70000	80500	59500
		(Minimum) (Nominal) (Maximum)				

Before: 29−Jul−2003 19:57

High resolution Integrated Logging Tool−DTS Wellsite Calibration

HRLT VTP

Idx	Phase	HRLT Torpedo−M0 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		−67370	−70000	−59500	−80500
1	Before		−71580	−70000	−59500	−80500
2	Before		−69440	−70000	−59500	−80500
3	Before		−72480	−70000	−59500	−80500
4	Before		−68530	−70000	−59500	−80500
5	Before		−69340	−70000	−59500	−80500
6	Before		67450	70000	80500	59500
7	Before		−70000	−70000	−59500	−80500
		(Minimum) (Nominal) (Maximum)				

Before: 29−Jul−2003 19:57

High resolution Integrated Logging Tool−DTS Wellsite Calibration

HRLT VBD

Idx	Phase	HRLT Bridle#9−M0 Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		−67390	−70000	−59500	−80500
1	Before		−71650	−70000	−59500	−80500
2	Before		−69510	−70000	−59500	−80500
3	Before		−72540	−70000	−59500	−80500
4	Before		−68570	−70000	−59500	−80500
5	Before		−69360	−70000	−59500	−80500
6	Before		67530	70000	80500	59500
7	Before		−70000	−70000	−59500	−80500
		(Minimum) (Nominal) (Maximum)				

Before: 29−Jul−2003 19:57

High resolution Integrated Logging Tool−DTS Wellsite Calibration

HRLT ISO

Idx	Phase	HRLT Source Current Plus UA	Value	Nominal	Maximum	Minimum
0	Before		281.5	284.0	326.6	241.4
1	Before		281.1	281.1	323.3	238.9
2	Before		281.1	281.1	323.3	238.9
3	Before		281.1	281.1	323.3	238.9
4	Before		281.1	281.1	323.3	238.9
5	Before		281.1	281.1	323.3	238.9
6	Before		281.1	281.1	323.3	238.9
7	Before		281.1	281.1	323.3	238.9
		(Minimum) (Nominal) (Maximum)				

Before: 29−Jul−2003 19:57

High resolution Integrated Logging Tool−DTS Wellsite Calibration

HRLT MV

Idx	Phase	HRLT Vertical Voltage Plus UV	Value	Nominal	Maximum	Minimum

Idx	Phase	HRLT Vertical Voltage Plus UV	Value	Nominal	Maximum	Minimum
0	Before		−316.9	−322.7	−274.3	−371.1
1	Before		−325.0	−322.7	−274.3	−371.1
2	Before		−313.4	−322.7	−274.3	−371.1
3	Before		−324.3	−322.7	−274.3	−371.1
4	Before		−305.0	−322.7	−274.3	−371.1
5	Before		−323.2	−322.7	−274.3	−371.1
6	Before		324.4	322.7	371.1	274.3
7	Before		−322.7	−322.7	−274.3	−371.1
		(Minimum) (Nominal) (Maximum)				

Before: 29−Jul−2003 19:57

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig − Bkg) GAPI	Value	Phase	Gamma Ray (Calibrated) GAPI	Value
Before		46.31	Before		171.1	Before		168.0
	0 (Minimum) 30.00 (Nominal) 120.0 (Maximum)			155.6 (Minimum) 171.1 (Nominal) 186.7 (Maximum)			153.0 (Minimum) 168.0 (Nominal) 183.0 (Maximum)	

Before: 28−Jul−2003 22:45

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		28.54	Master		30.59
Before		30.07	Before		31.58
	5.000 (Minimum) 28.54 (Nominal) 40.00 (Maximum)			5.000 (Minimum) 30.59 (Nominal) 40.00 (Maximum)	

Master: 12−Jul−2003 15:49 Before: 28−Jul−2003 22:46

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Accelerometer Calibration

Phase	Z−Axis Acceleration F/S2	Value
Before		32.13
	31.53 (Minimum) 32.19 (Nominal) 32.84 (Maximum)	

Before: 29−Jul−2003 19:22

High resolution Integrated Logging Tool−DTS Master Calibration

Inversion results

Phase	Rho Aluminum G/C3	Value	Phase	Rho Magnesium G/C3	Value
Master		2.599	Master		1.687
	2.586 (Minimum) 2.596 (Nominal) 2.606 (Maximum)			1.676 (Minimum) 1.686 (Nominal) 1.696 (Maximum)	
Phase	Pe Aluminum	Value	Phase	Pe Magnesium	Value
Master		2.583	Master		2.629
	2.470 (Minimum) 2.570 (Nominal) 2.670 (Maximum)			2.550 (Minimum) 2.650 (Nominal) 2.750 (Maximum)	

Master: 18−Jul−2003 20:23

High resolution Integrated Logging Tool−DTS Master Calibration

Deviation Summary

Phase	BS Average Deviation %	Value	Phase	SS Average Deviation %	Value	Phase	LS Average Deviation %	Value
Master		0.2123	Master		0.2002	Master		0.4515
	−0.6000 (Minimum) 0 (Nominal) 0.6000 (Maximum)			−1.000 (Minimum) 0 (Nominal) 1.000 (Maximum)			−1.500 (Minimum) 0 (Nominal) 1.500 (Maximum)	
Phase	BS Max Deviation %	Value	Phase	SS Max Deviation %	Value	Phase	LS Max Deviation %	Value
Master		0.6850	Master		0.6461	Master		1.547
	−1.600 (Minimum) 0 (Nominal) 1.600 (Maximum)			−2.500 (Minimum) 0 (Nominal) 2.500 (Maximum)			−3.500 (Minimum) 0 (Nominal) 3.500 (Maximum)	

Master: 18−Jul−2003 20:23

High resolution Integrated Logging Tool−DTS Master Calibration											
Tank Measurement											
Phase	Thermal Near Corr. (Tank) CPS			Value	Phase	Thermal Far Corr. (Tank) CPS			Value	Phase	CNTC/CFTC (Tank)			Value
Master				5835	Master				2520	Master				2.315
5000 (Minimum)	6031 (Nominal)	7200 (Maximum)			2075 (Minimum)	2793 (Nominal)	3125 (Maximum)			2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)		
Master: 12−Jul−2003 16:06														

High resolution Integrated Logging Tool−DTS Master Calibration											
Tank Measurement											
Phase	Thermal Near Corr. (Tank) CPS			Value	Phase	Thermal Far Corr. (Tank) CPS			Value	Phase	CNTC/CFTC (Tank)			Value
Master				5835	Master				2520	Master				2.315
5000 (Minimum)	6031 (Nominal)	7200 (Maximum)			2075 (Minimum)	2793 (Nominal)	3125 (Maximum)			2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)		
Master: 12−Jul−2003 16:06														

Company: **BATTELLE MEMORIAL INSTITUTE**

Schlumberger

Well: **AEP #1**
Field: **APPALACHIAN POWER CO.**
COUNTY: **MASON**
STATE: **WEST VIRGINIA**

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