Schlumberger

Company: **ENCANA OIL & GAS (USA) INC.**

Well: **WIEBEN 2-13 (M2SW)**
Field: **MAMM CREEK**
County: **GARFIELD** State: **COLORADO**

County: GARFIELD
Field: MAMM CREEK
Location: SHL: 871' FSL X 728' FWL
Well: WIEBEN 2-13 (M2SW)
Company: ENCANA OIL & GAS (USA) INC.

PLATFORM EXPRESS
ARRAY INDUCTION
GAMMA RAY

LOCATION

SHL: 871' FSL X 728' FWL

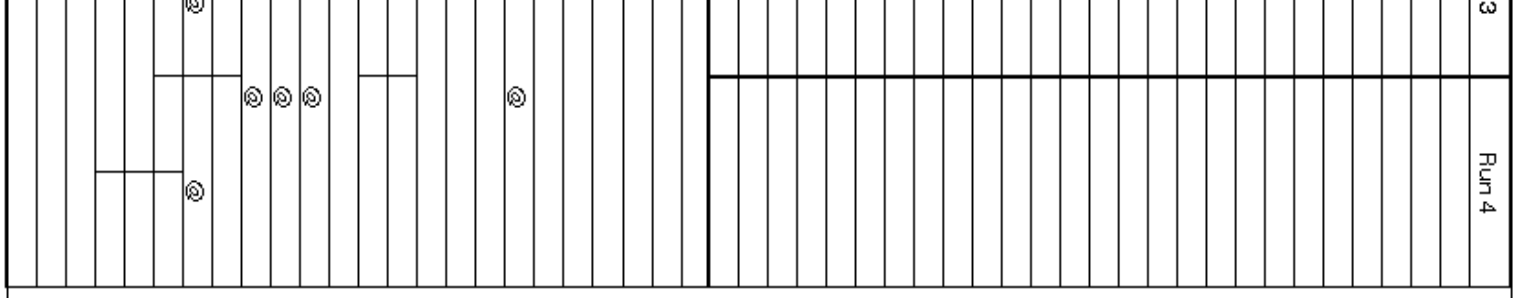
Elev.: K.B. 7779 ft
G.L. 7763 ft
D.F. 7778 ft

Permanent Datum: GROUND LEVEL Elev.: 7763 ft
Log Measured From: KELLY BUSHING 16.0 ft above Perm. Datum
Drilling Measured From: KELLY BUSHING

API Serial No.	Section	Township	Range
05 045 09363 0000	2	8S	93W

	Run 1	Run 2	Run
Logging Date	7-Dec-2003		
Run Number	1		
Depth Driller	9508 ft		
Schlumberger Depth	9508 ft		
Bottom Log Interval	9508 ft		
Top Log Interval	1193 ft		
Casing Driller Size @ Depth	9.625 in @ 1193 ft	@	
Casing Schlumberger	1193 ft		
Bit Size	7.875 in		
Type Fluid In Hole	PAC-R / CARBONX		
MUD Density / Viscosity	9.6 lbm/gal / 48 s		
MUD Fluid Loss / PH	6.4 cm3 / 9.5		
MUD Source Of Sample	AITH MEASURED		
RM @ Measured Temperature	1.088 ohm.m @ 125 degF	@	
RMF @ Measured Temperature	0.816 ohm.m @ 125 degF	@	
RMC @ Measured Temperature	1.632 ohm.m @ 125 degF	@	
Source RMF / RMC	CALCULATED / CALCULATED		
RM @ MRT / RMF @ MRT	0.646 @ 215 / 0.485 @ 215	@ / @	
Maximum Recorded Temperatures	215 degF		
Circulation Stopped / Time	7-Dec-2003 / 9:00		
Logger On Bottom / Time	7-Dec-2003 / 19:49		
Unit Number / Location	3031 / GRAND JUNCTION		
Recorded By	JOHN BYARS		
Witnessed By	CRAIG REIDT		

	Run 1	Run 2	Run
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: 8-DEC-2003 0:05:13

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW-B	Type:	CMTD-B/A	Type:	7-39P
Serial Number:	3775	Serial Number:	2563	Serial Number:	3093
Calibration Date:	18-06-2003	Calibration Date:	16-07-2003	Length:	13000.00 FT
Calibrator Serial Number:	1	Calibrator Serial Number:	1	Conveyance Method:	Wireline
Calibration Cable Type:	7-39P	Calibration Gain:	0.86	Rig Type:	LAND
Wheel Correction 1:	-2	Calibration Offset:	352.00		
Wheel Correction 2:	-5				

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	0.00 FT
Rig Up Length At Bottom:	0.00 FT
Rig Up Length Correction:	0.00 FT
Stretch Correction:	13.00 FT
Tool Zero Check At Surface:	0.80 FT

Depth Control Remarks

1. Log serves as Primary Depth Reference.
2. Washouts affect log
3.
4.
5.
6.

DISCLAIMER
THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE OF AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

OTHER SERVICES1	OTHER SERVICES2
OS1:	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
1. Log serves as Primary Depth Reference.	
2. Logging intervals as per Client Request.	
3. Tool run as per Toolsketch. Including Standoffs.	
4. Top of Gas @ 7900'	
5. Open Hole Volume = 7333 ft3	

6. Annular Cement Volume = 5962 ft3	
from TD to Surface Casing assuming 5.5" Future Casing.	
Repeat Pass made directly out of casing, due to hole conditions.	
Numerous Washouts affect Neutron, Density, PEF and Sonic Data	
Pulled Tight in numerous locations throughout well, due to washouts.	
Rig: SST 3	
SLB Crew: R. Watts, A. White	
Thank You for choosing Schlumberger !	

RUN 1			RUN 2		
SERVICE ORDER #:		10657387	SERVICE ORDER #:		
PROGRAM VERSION:		11C0-305	PROGRAM VERSION:		
FLUID LEVEL:		16 ft	FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

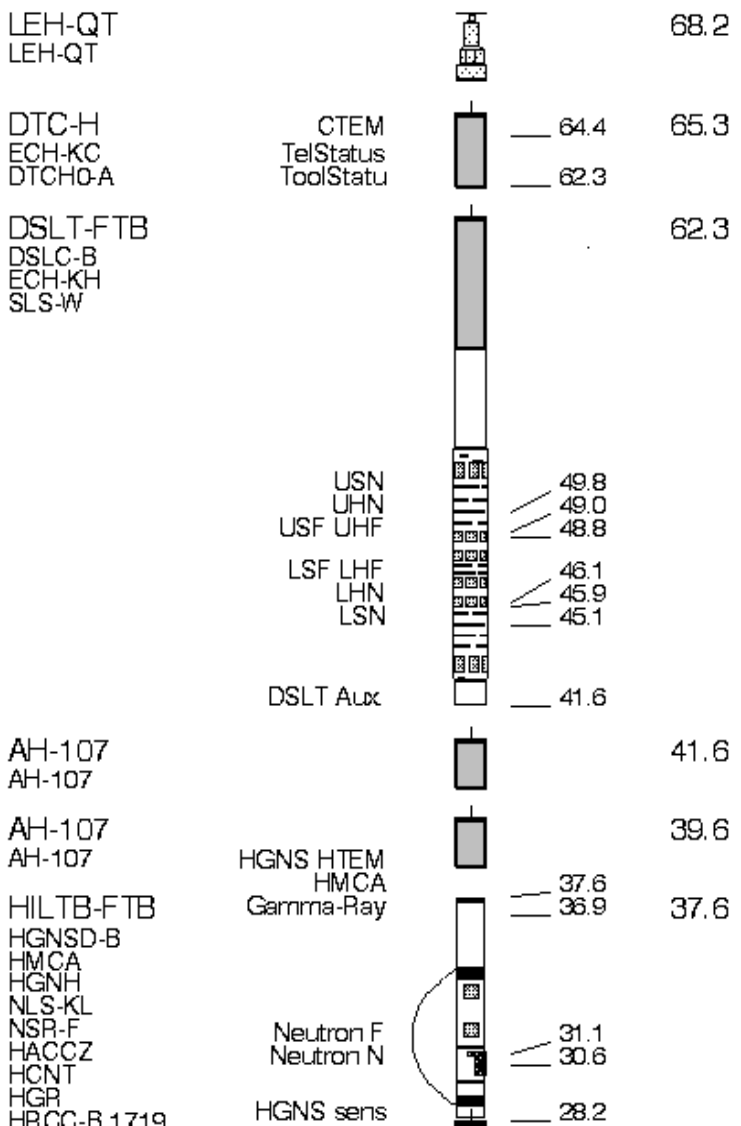
RUN 1 | RUN 2

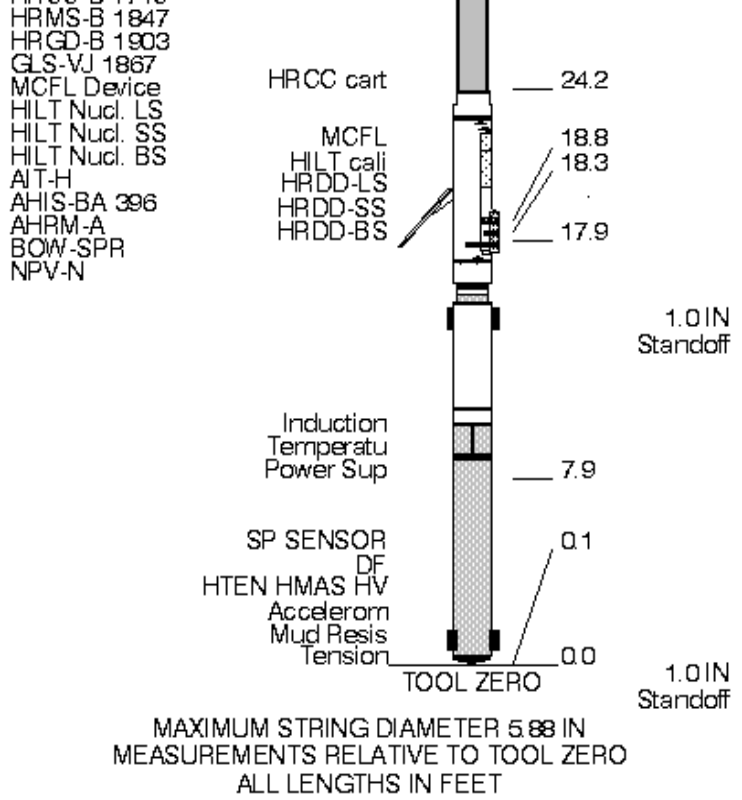
SURFACE EQUIPMENT

GSR-U/Y
NCT-B
CNB-AB
NCS-VB

WITM (DTS)-A

DOWNHOLE EQUIPMENT



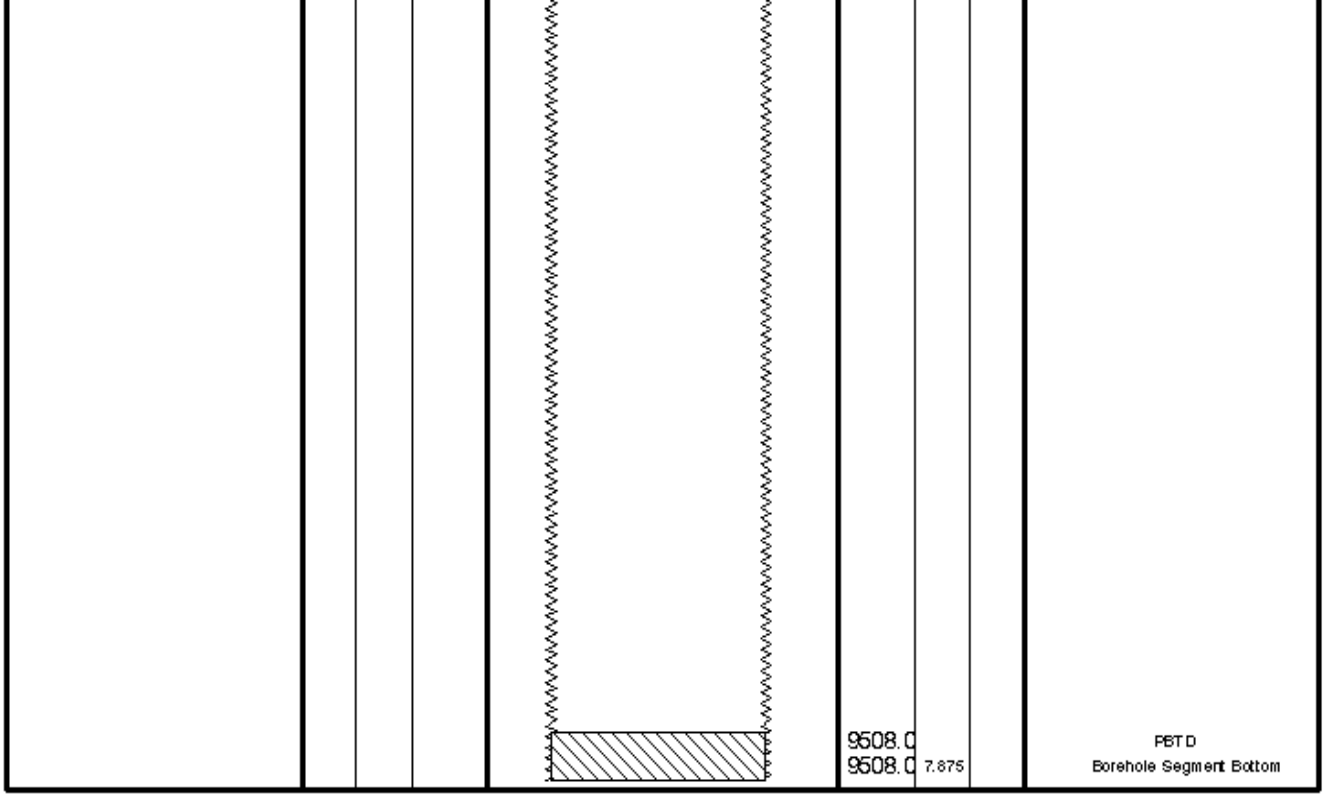


Client: EnCana Oil & Gas (USA) Inc.
Well: Weiben 2-13 (M2SW)
Field: Mamm Creek
State: CO
Country: USA

Drawing Date: 2/8/2003
API #: 05 045 09363 0000

Rig Name: SST 3
Reference Datum: Kelly Bushing
Elevation: 7779.0 ft

Production String	(in) OD	(in) ID	(ft) MD	Well Schematic	(ft) MD	(in) OD	(in) ID	Casing String
					16.0	9.625	8.921	Casing String, 36.0 lbm/ft
					1193.0	9.625	8.921	Casing Shoe
					1193.0	7.875		Borehole Segment



Schlumberger

MAIN LOG 5"=100'

MAXIS Field Log

Company: ENCANA OIL & GAS (USA) INC.						Well: WIEBEN 2-13 (M2SW)

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_005PUP	FN:4	PRODUCER	07-Dec-2003 23:42	9523.0 FT	1182.5 FT

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_009PUP	FN:8	PRODUCER	08-Dec-2003 00:49	9523.0 FT	1187.0 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 7333.93 F3

Cement Volume = 5962.04 F3 (assuming 5.50 IN casing O.D.)

Computed from 9508.0 FT to 1193.0 FT using data channel(s) HCAL

OP System Version: 11C0-305

MCM

HILTB-FTB 11C0-305 DSLT-FTB 11C0-305
DTC-H 11C0-305

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

GAMMA RAY < 90 From GR to SpareConstant

2.68 G/CC SANDSTONE MATRIX

Tool/Tot. Drag From STIA to T1

GR Backup From LHT1 to GR_1

HILT Caliper (HCAL) 6 (IN) 16

Gamma Ray (GR) 0 (GAPI) 150

Tension (TENS) 10000 (LBF) 0

SP (AHSCA) -80 (MV) 20

Std. Res. Invaded Zone Resistivity (RXOZ) 2 (OHMM) 2000

AIT-H 90 Inch Investigation (AHT90) 2 (OHMM) 2000

AIT-H 60 Inch Investigation (AHT60) 2 (OHMM) 2000

AIT-H 30 Inch Investigation (AHT30) 2 (OHMM) 2000

AIT-H 20 Inch Investigation (AHT20) 2 (OHMM) 2000

AIT-H 10 Inch Investigation (AHT10) 2 (OHMM) 2000

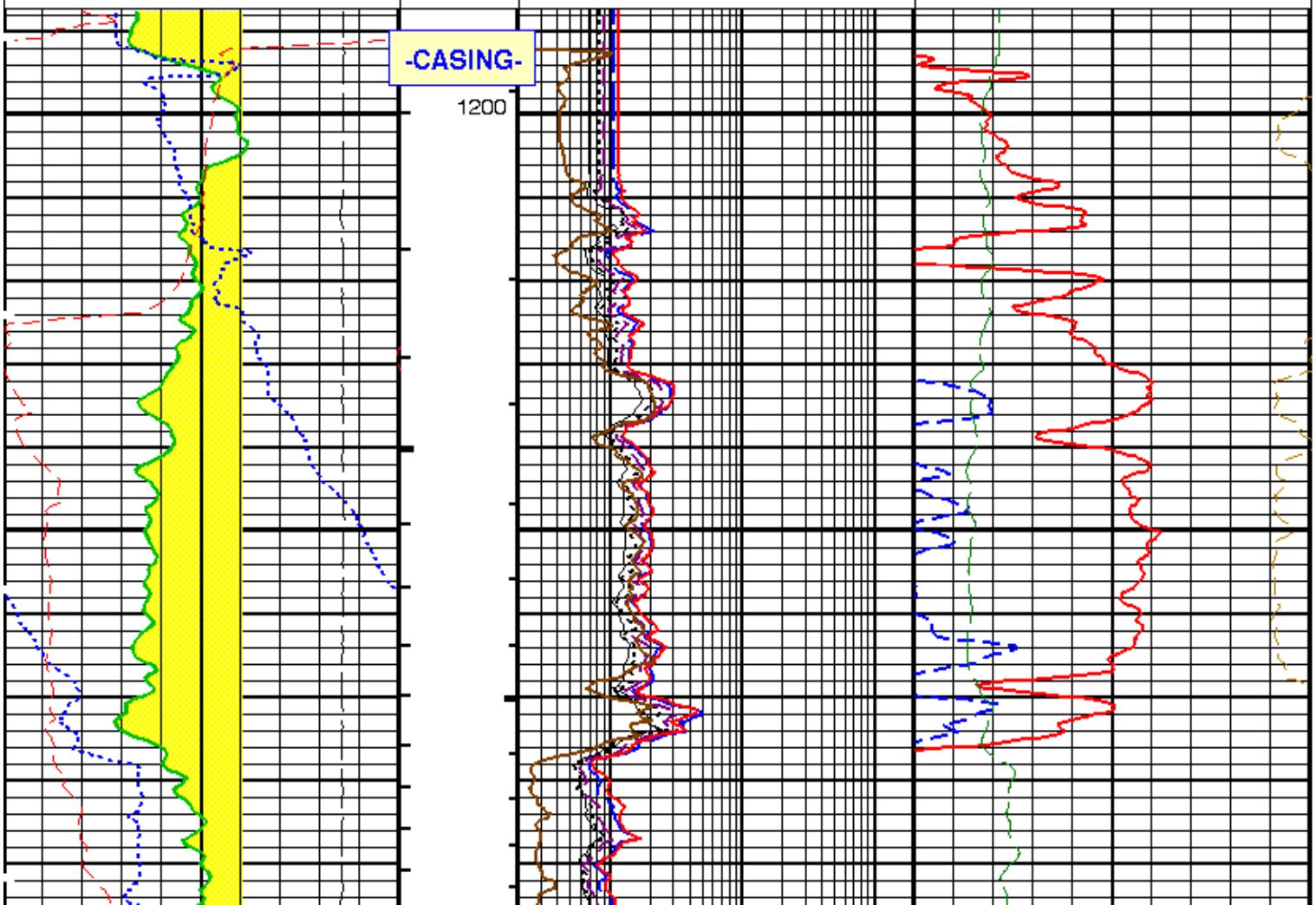
Alpha Processed Neutron Porosity (NPOR) 0.3 (V/V) -0.1

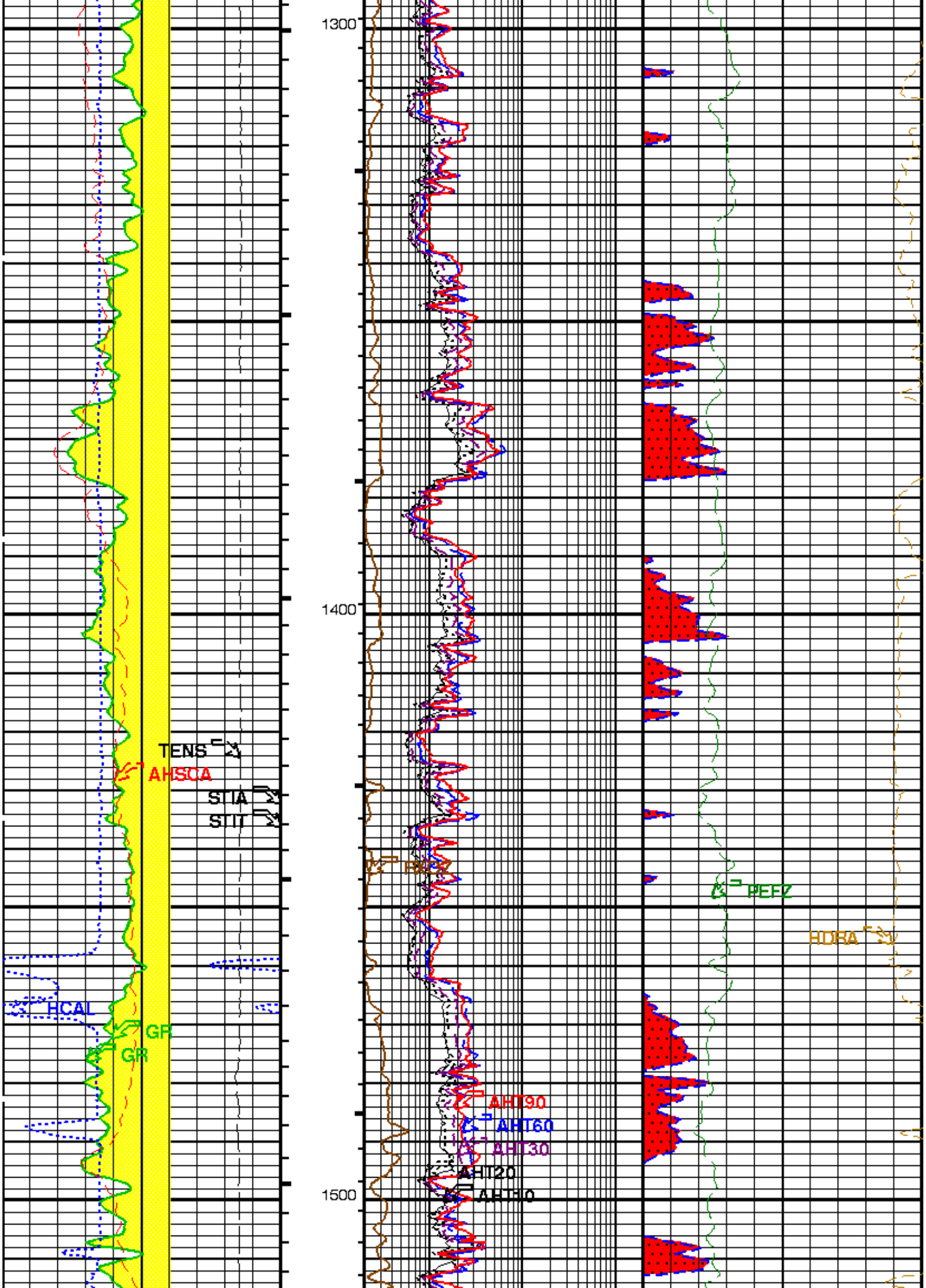
Std. Res. Formation Pe (PEFZ) 0 (----) 10

Density Correction (HDRA) -0.2 (G/C3) 0.05

Gas From DPHZ to NPOR

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

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GR
GR
AHT90
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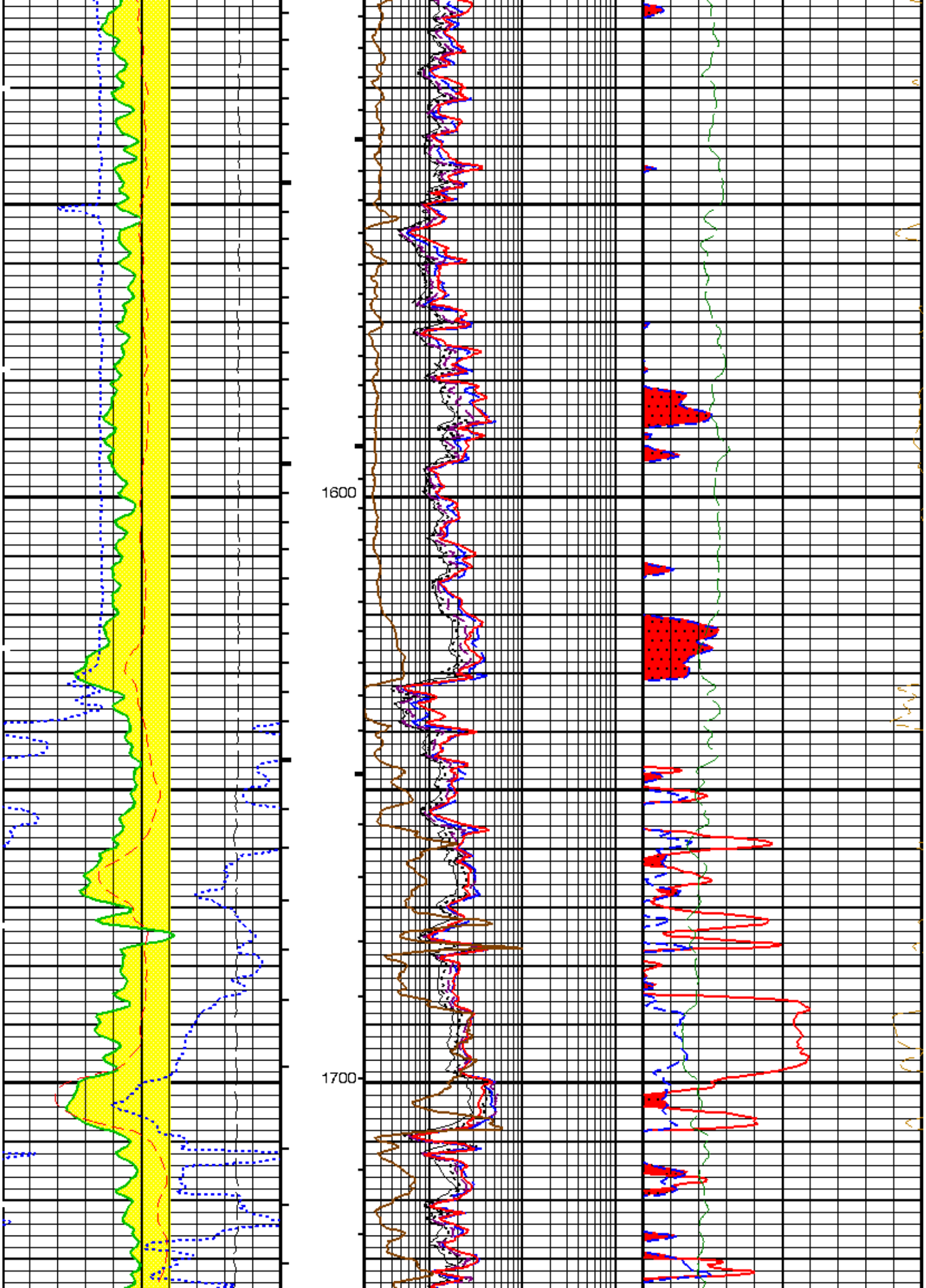
AHT30
AHT20
AHT10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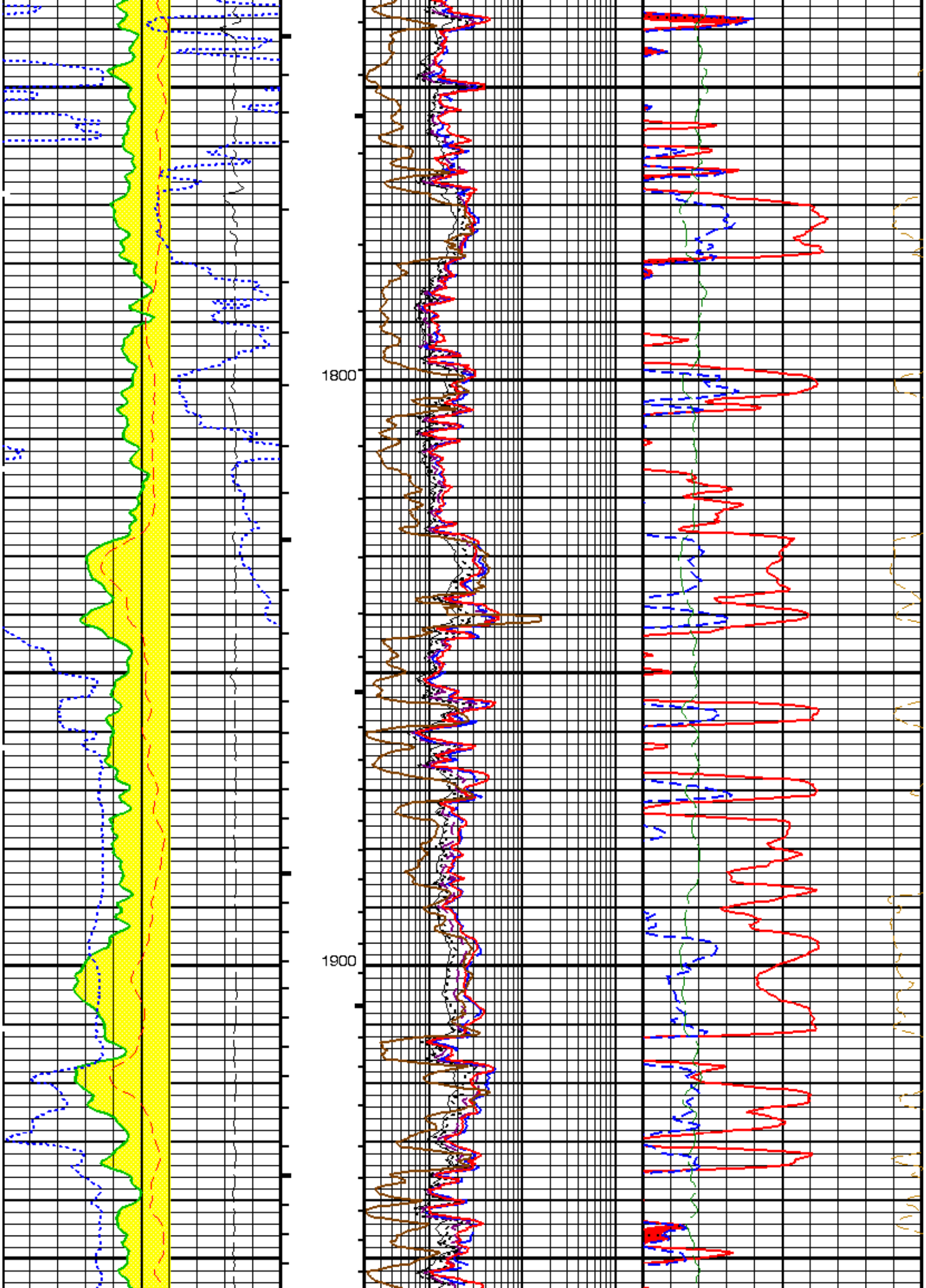
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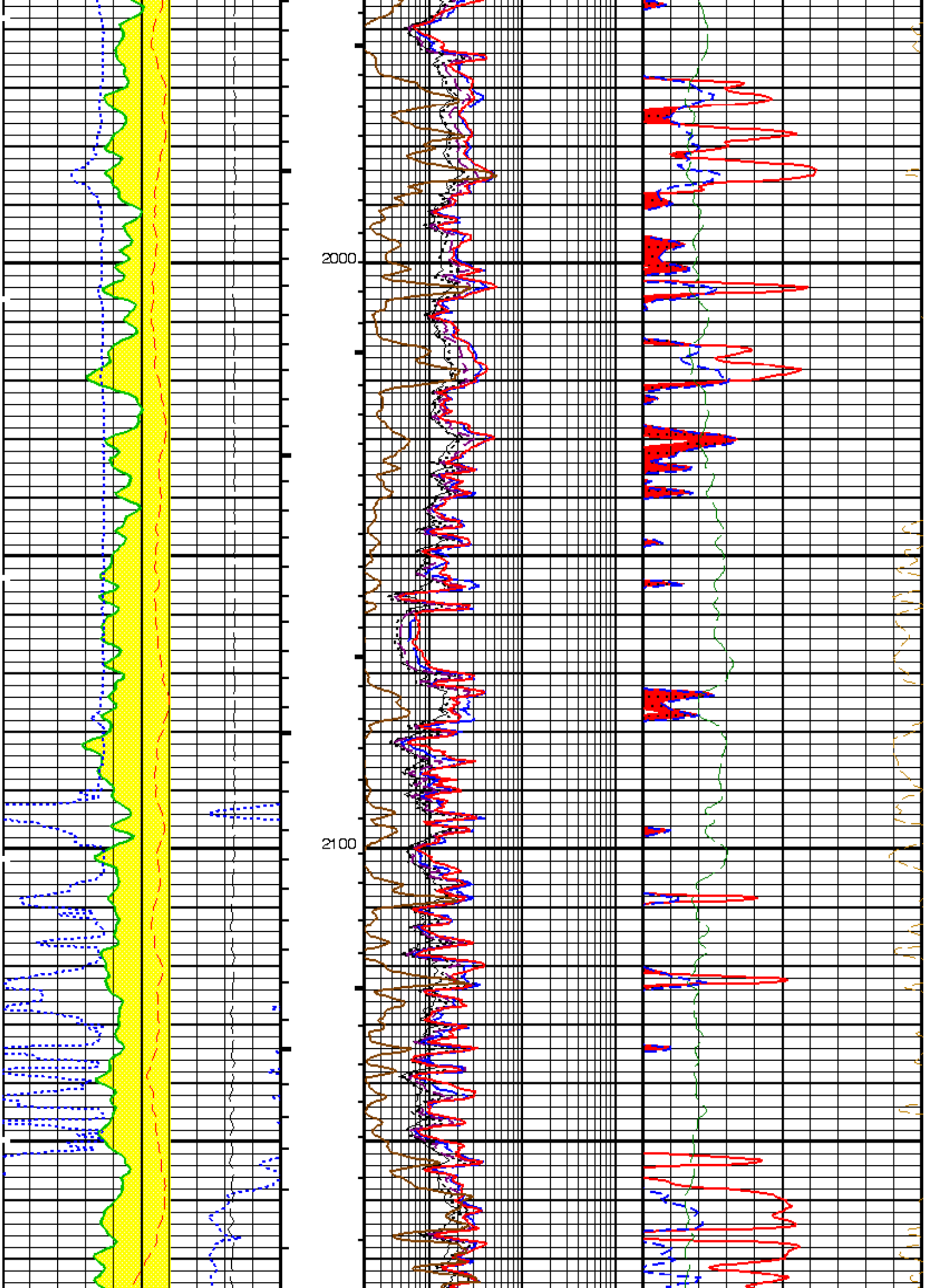
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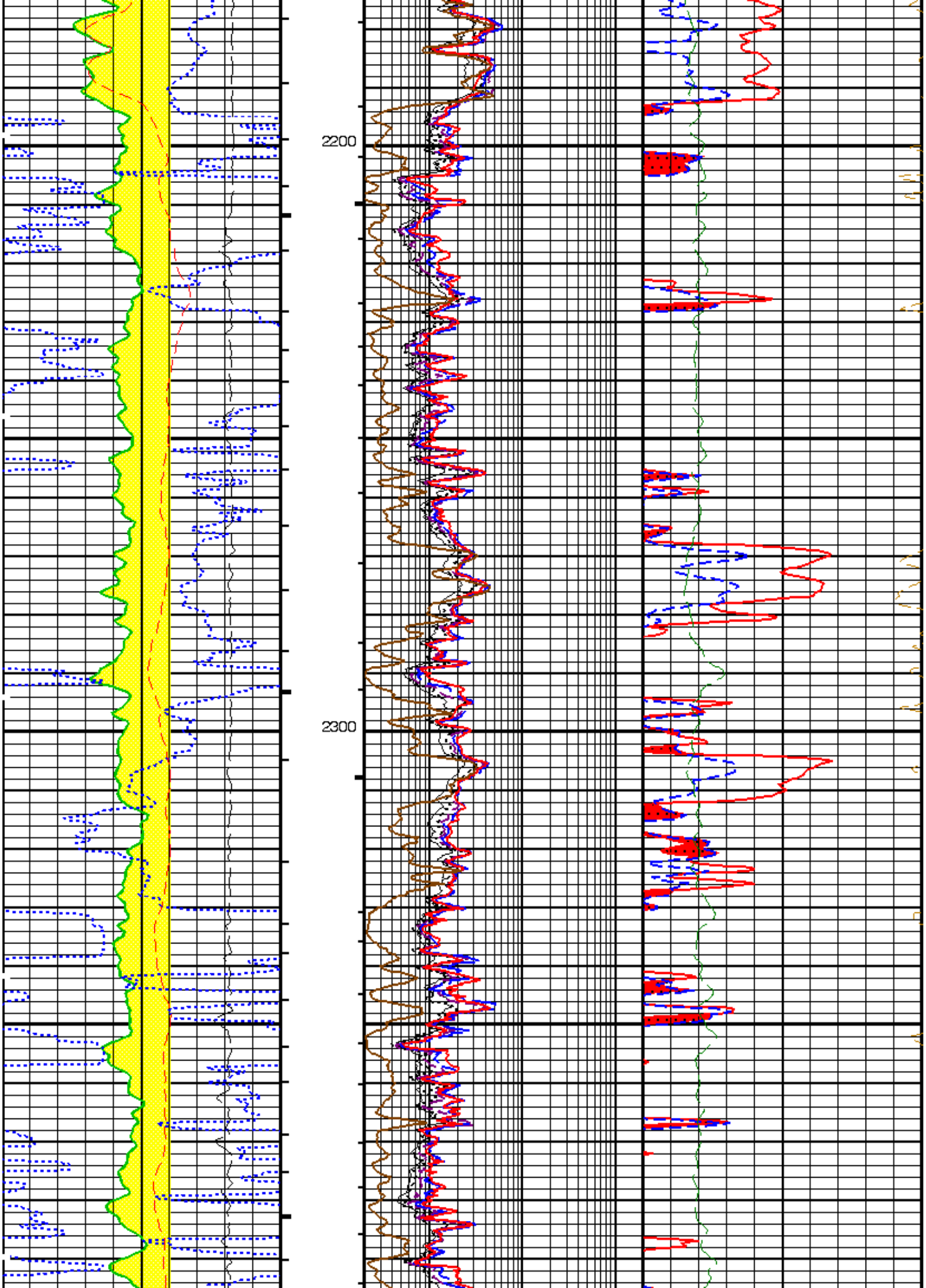
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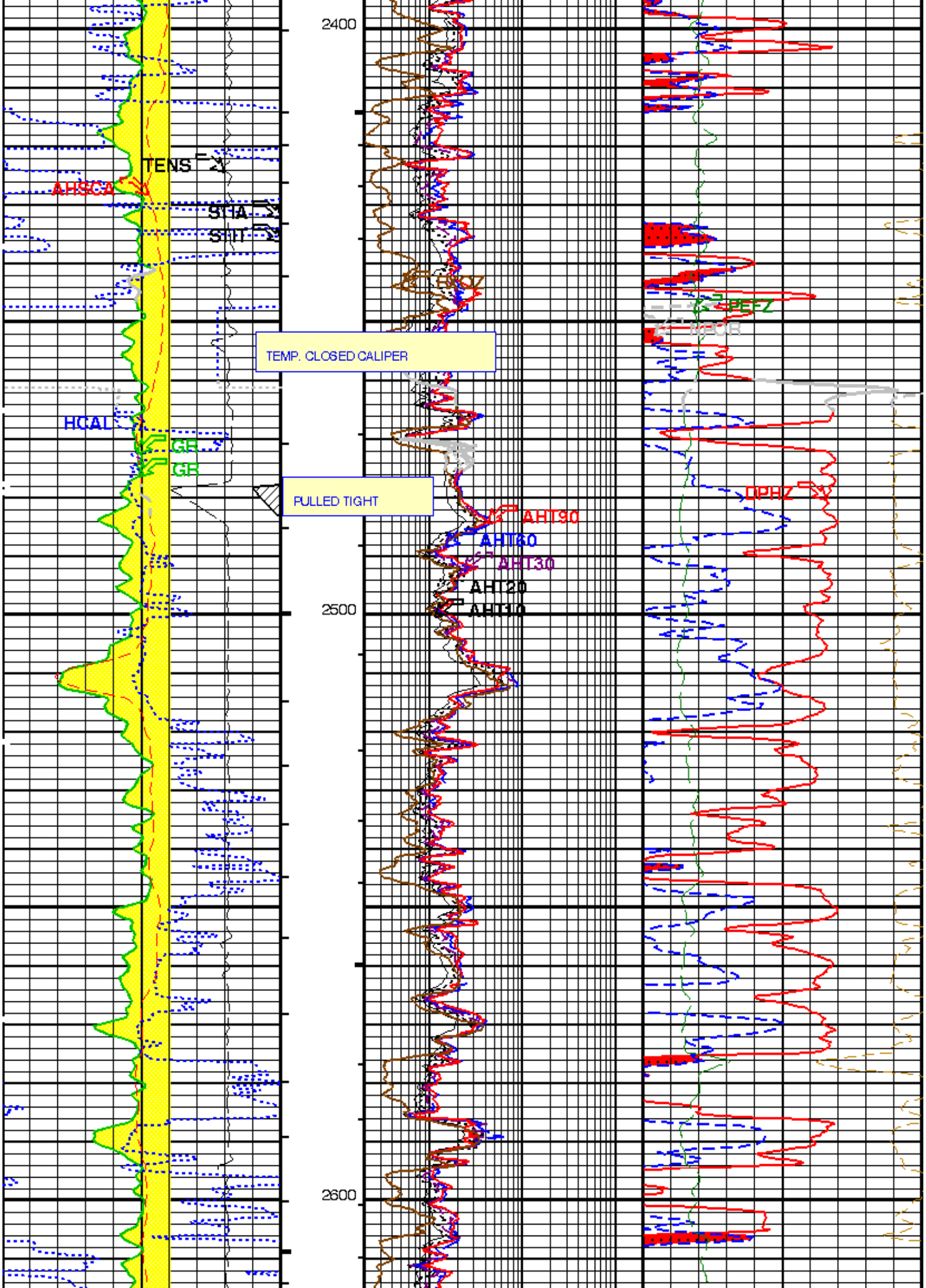
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HRDZ
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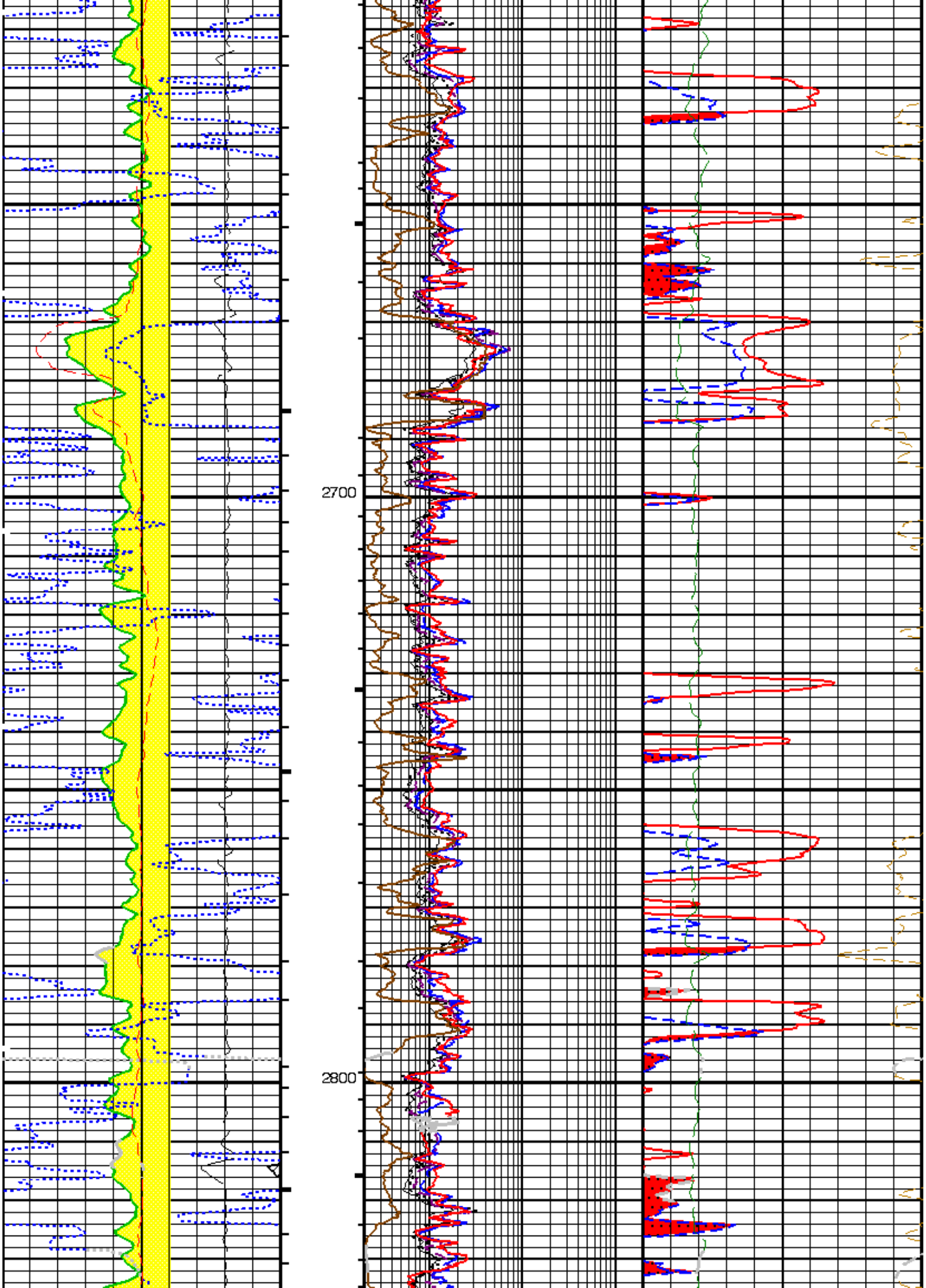
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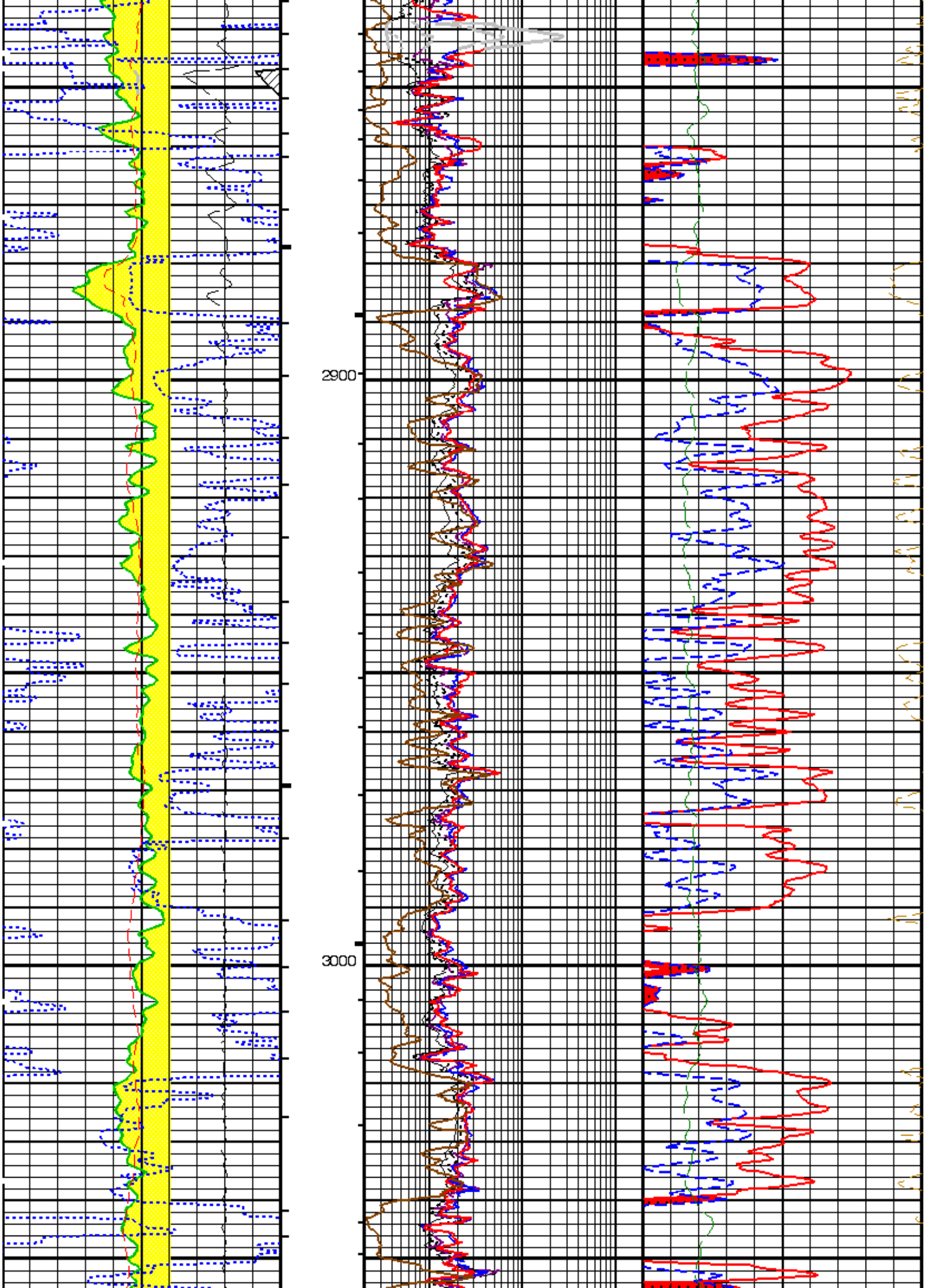
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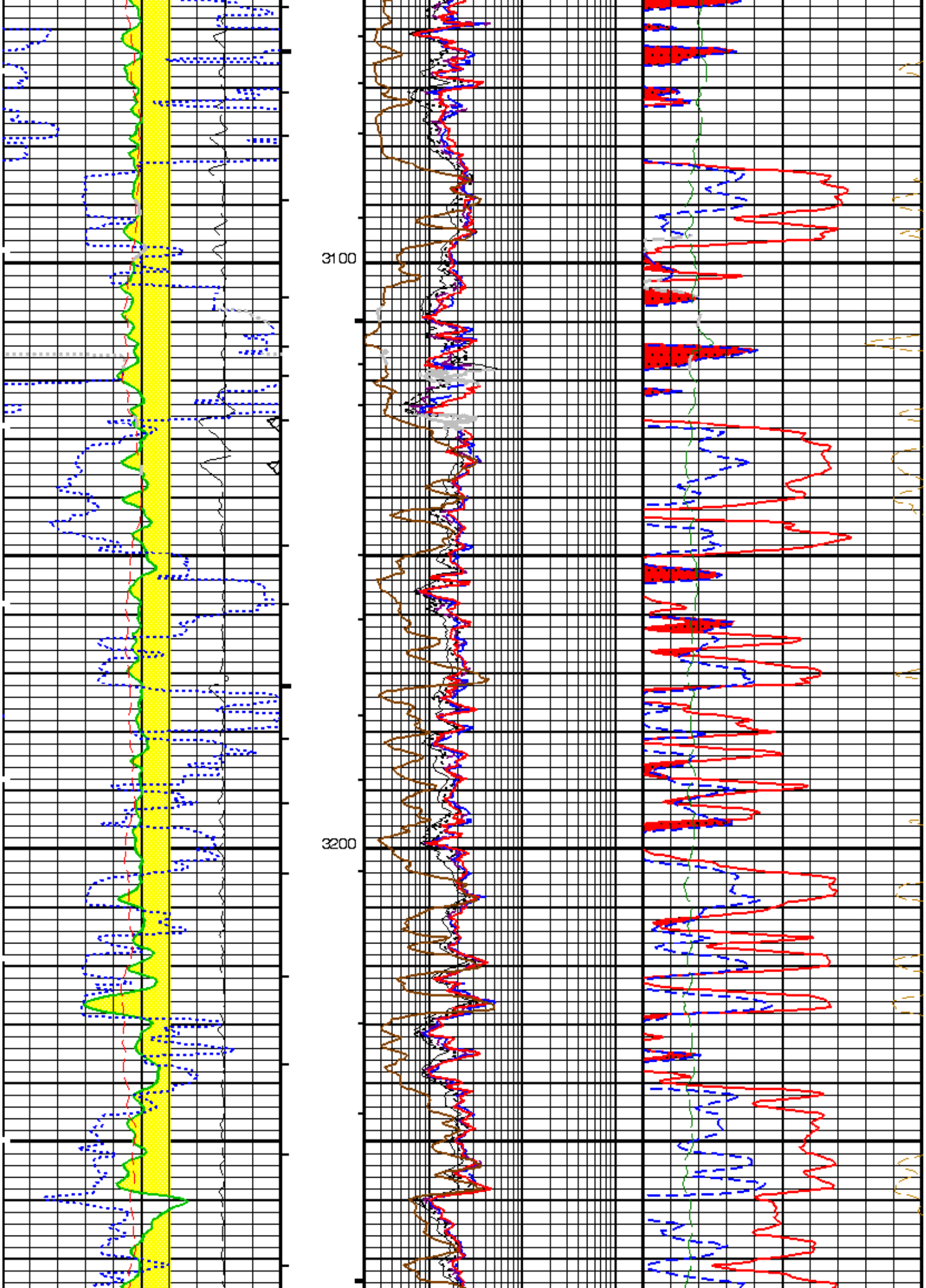
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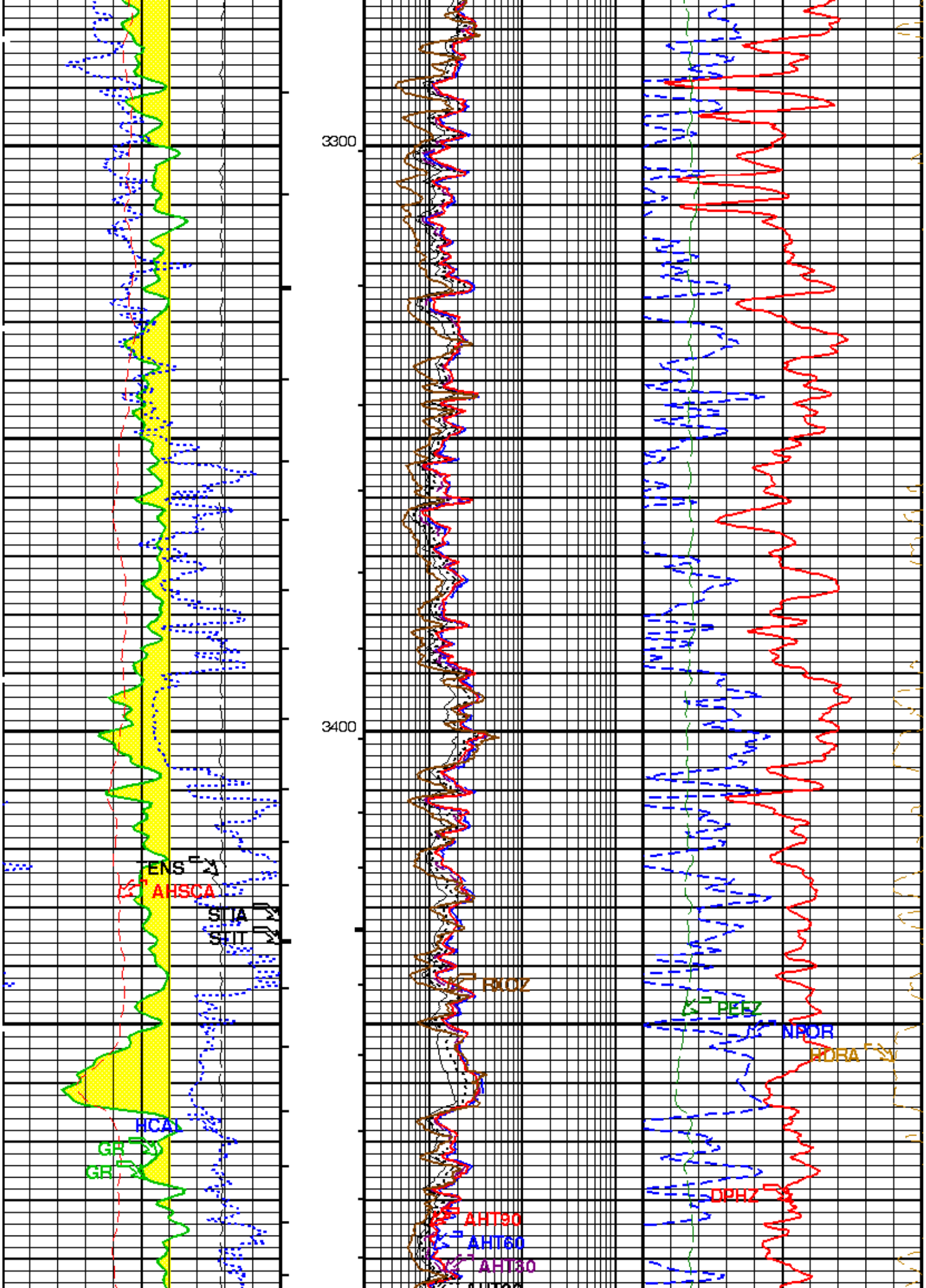
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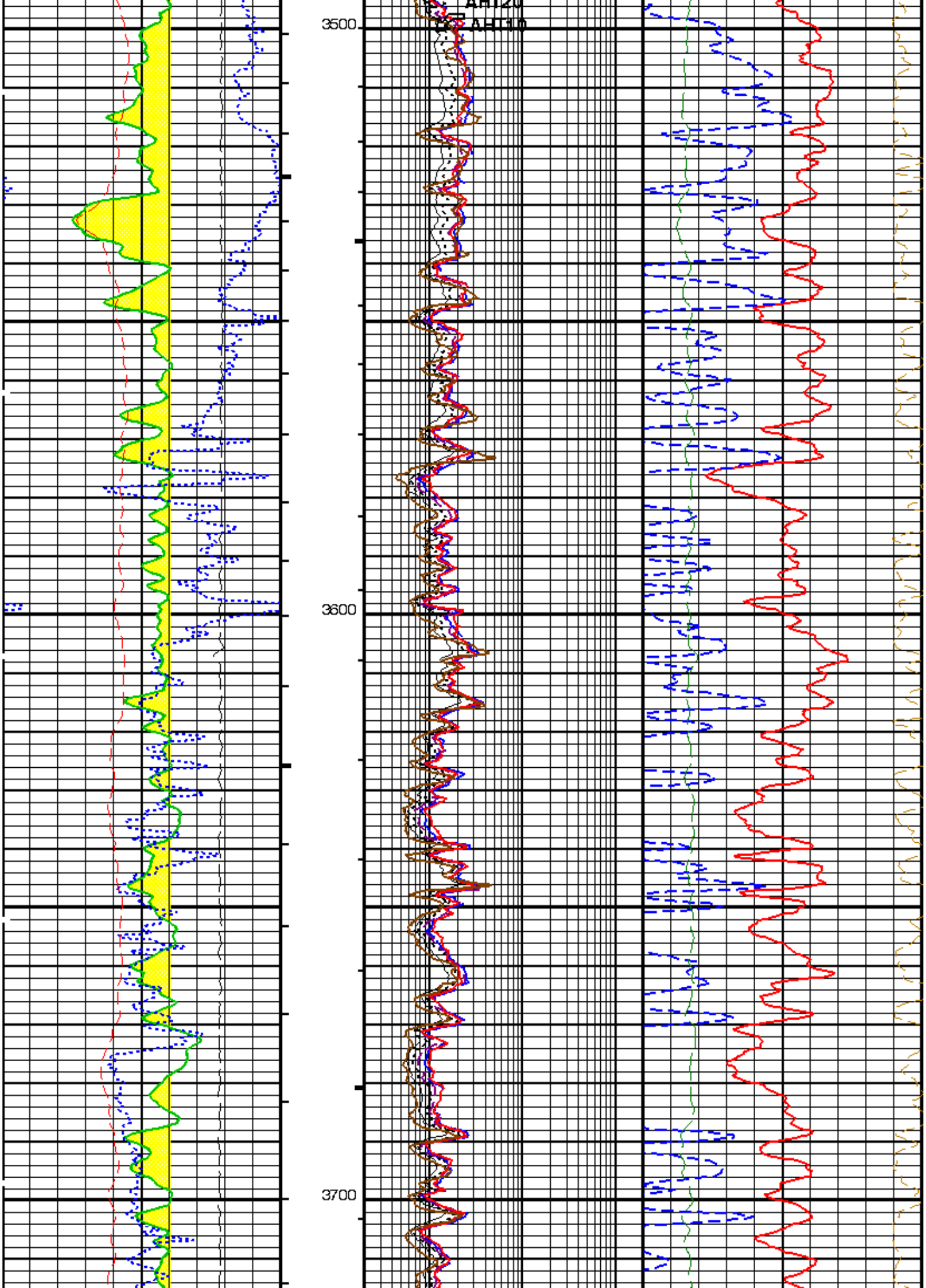
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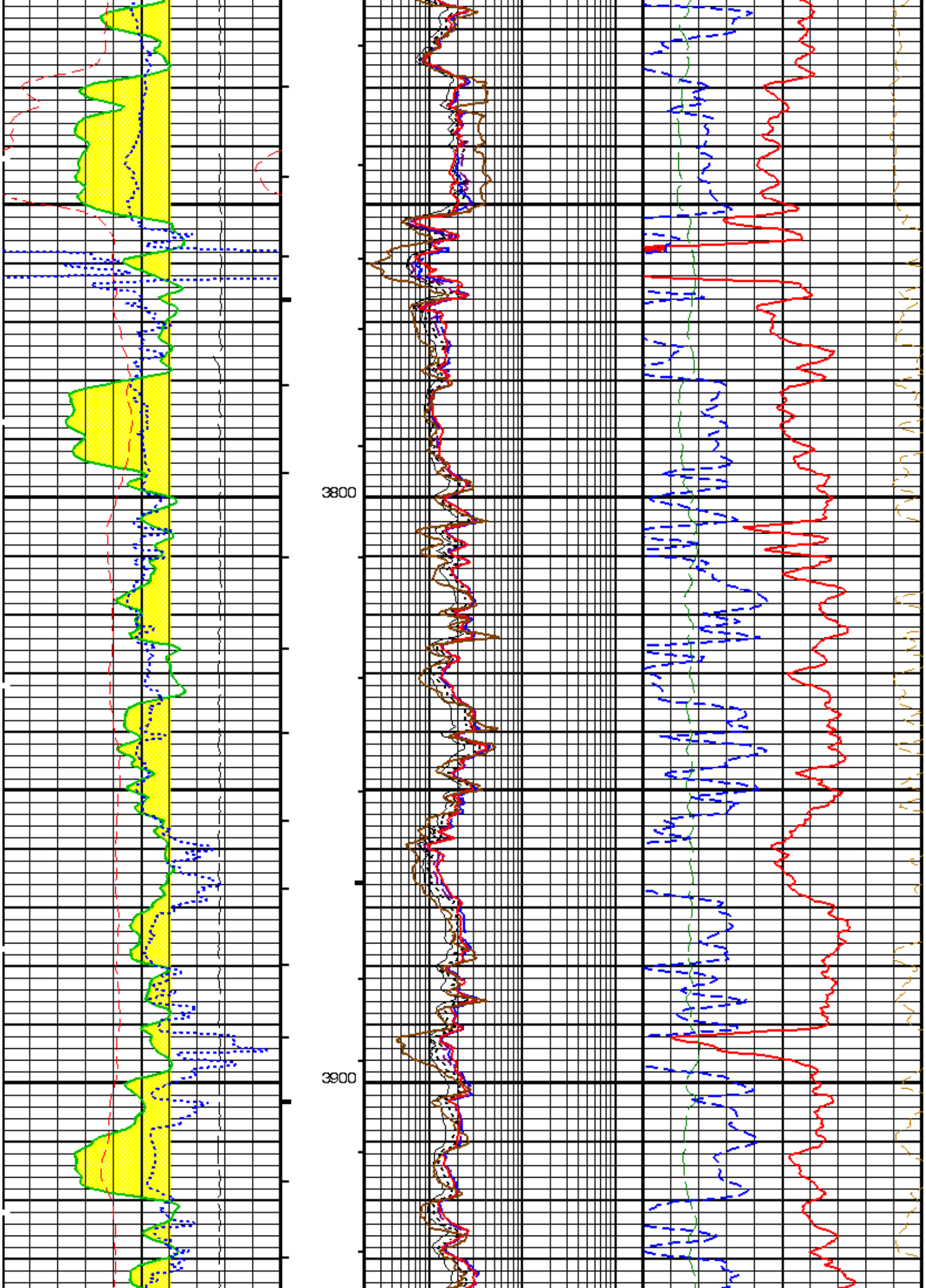
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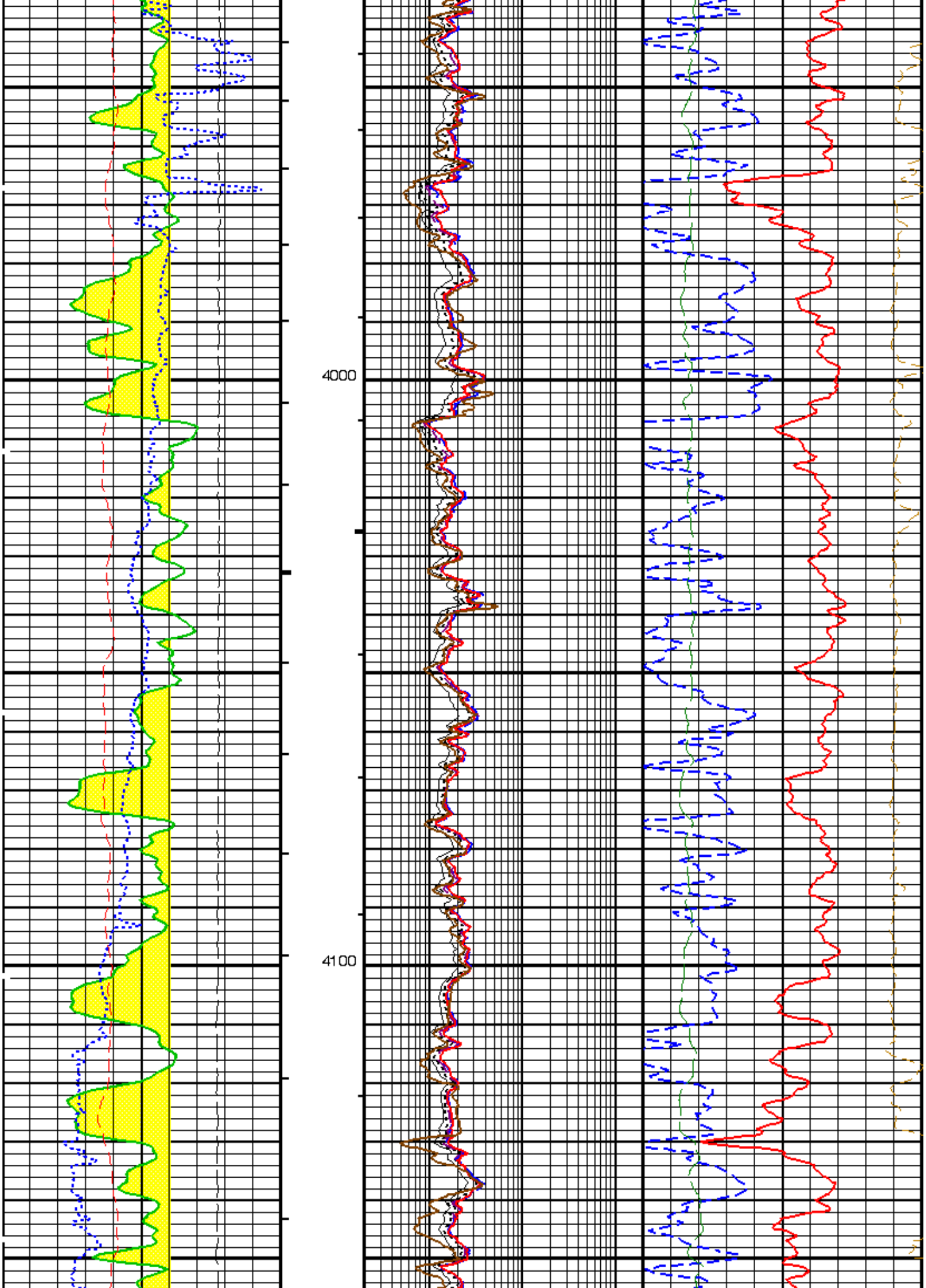
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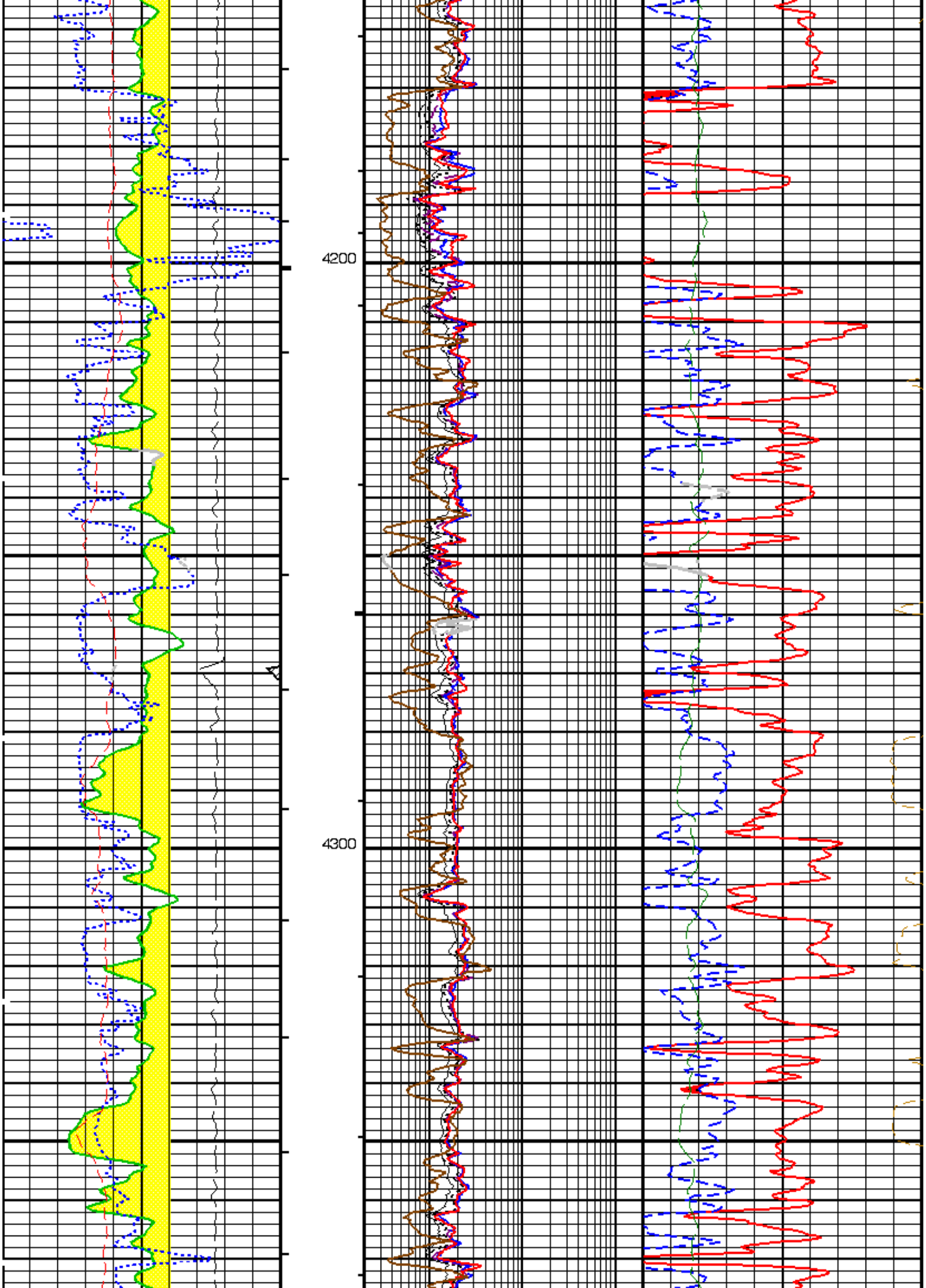
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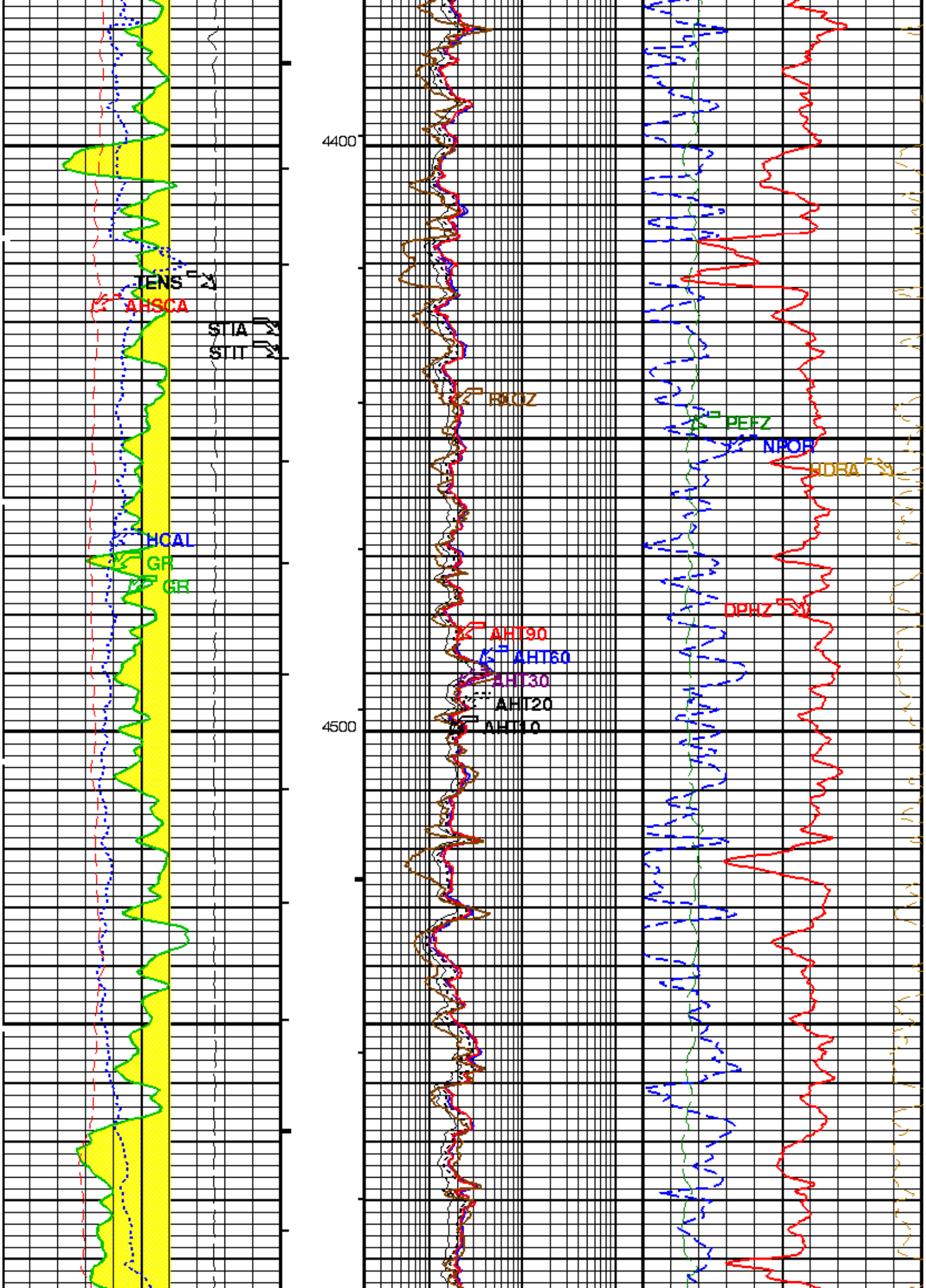
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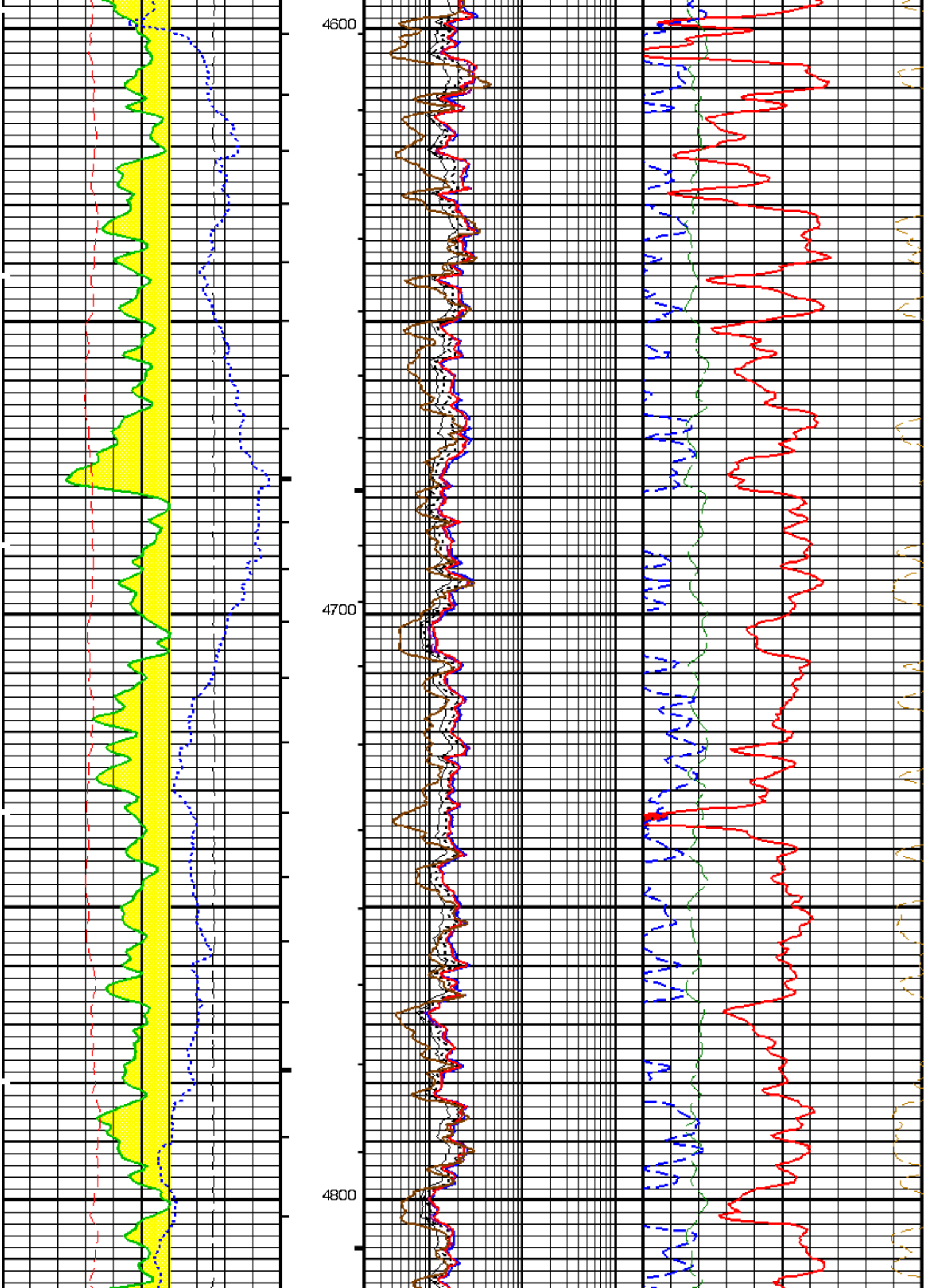
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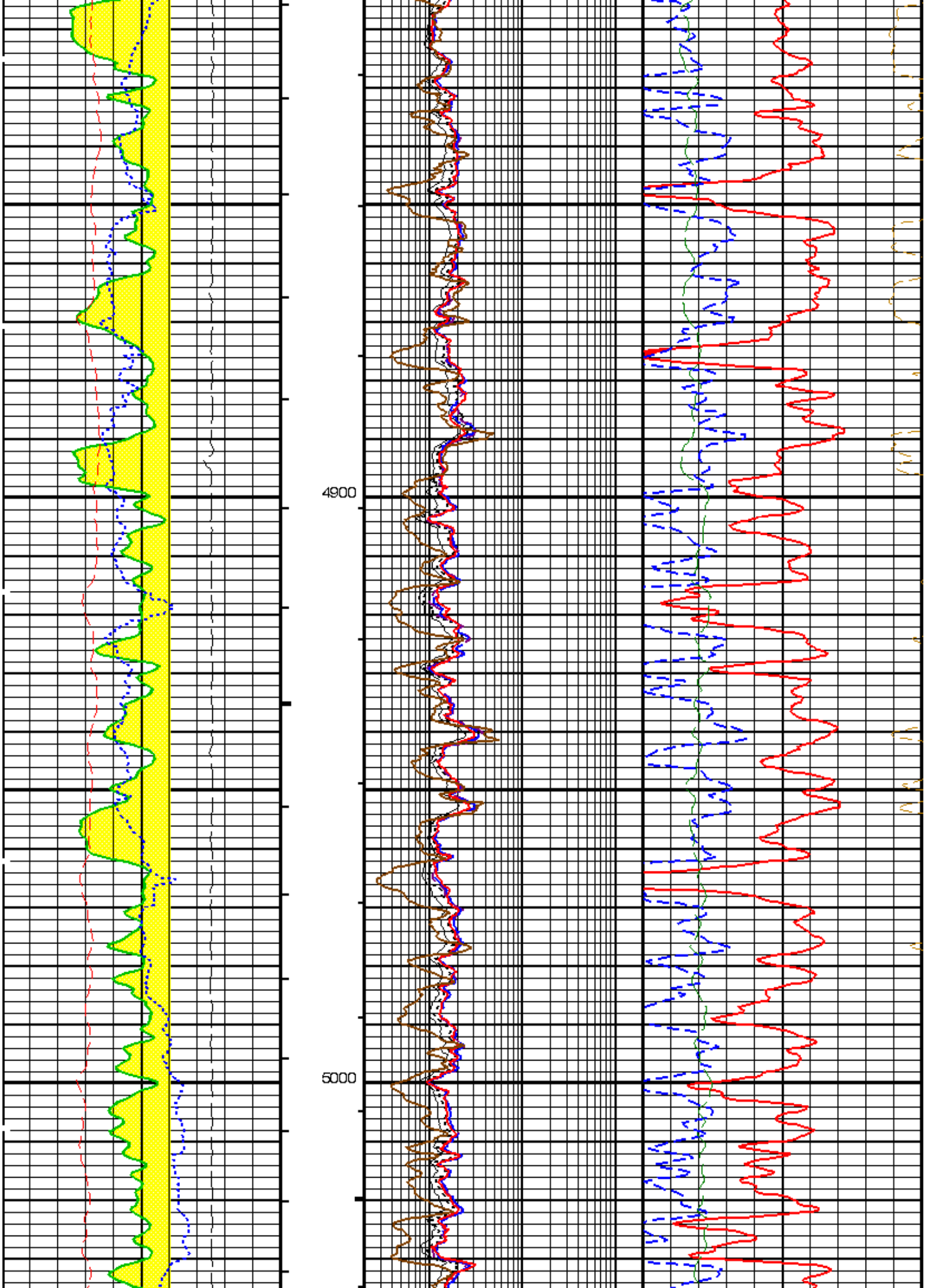
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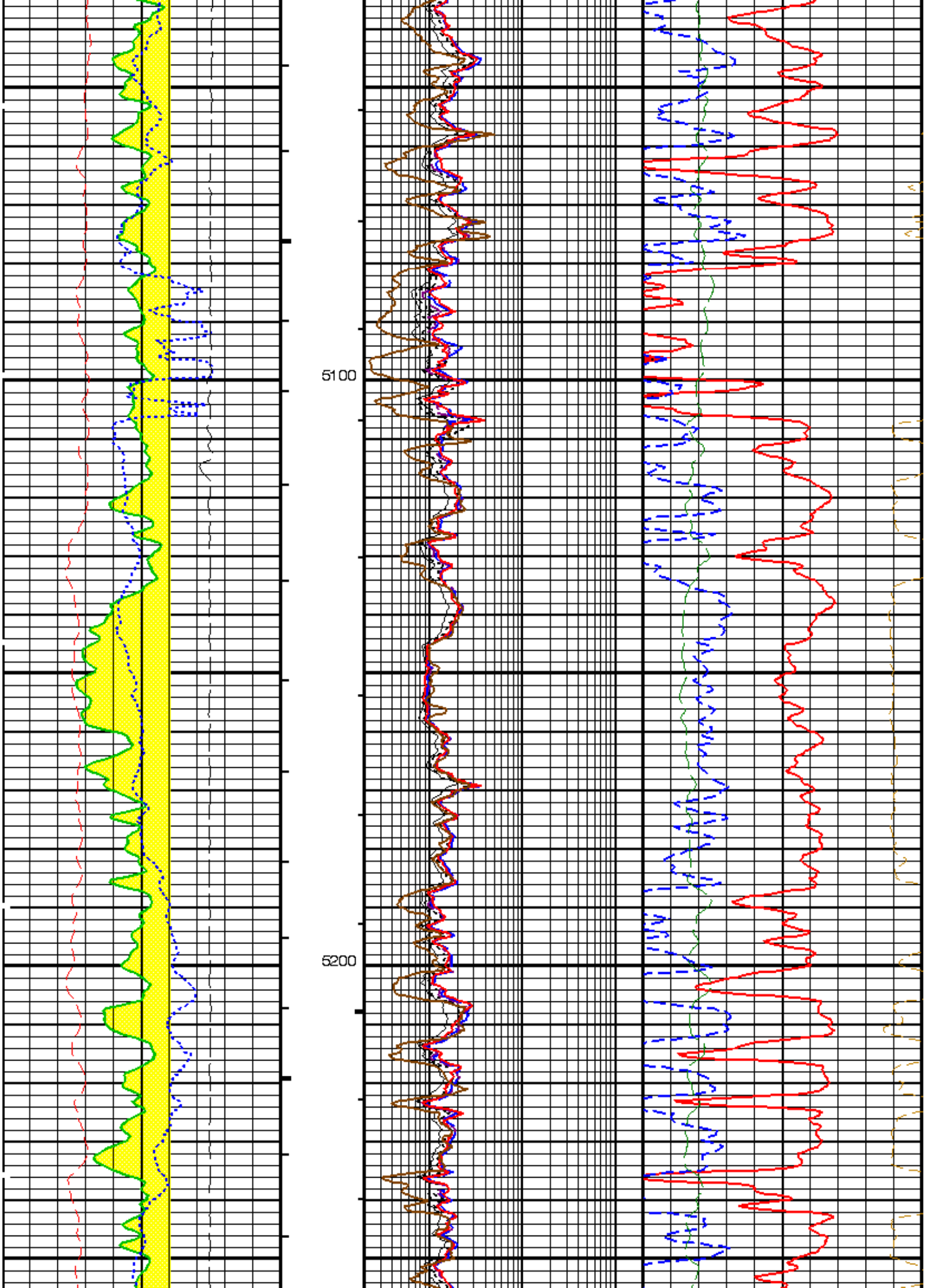
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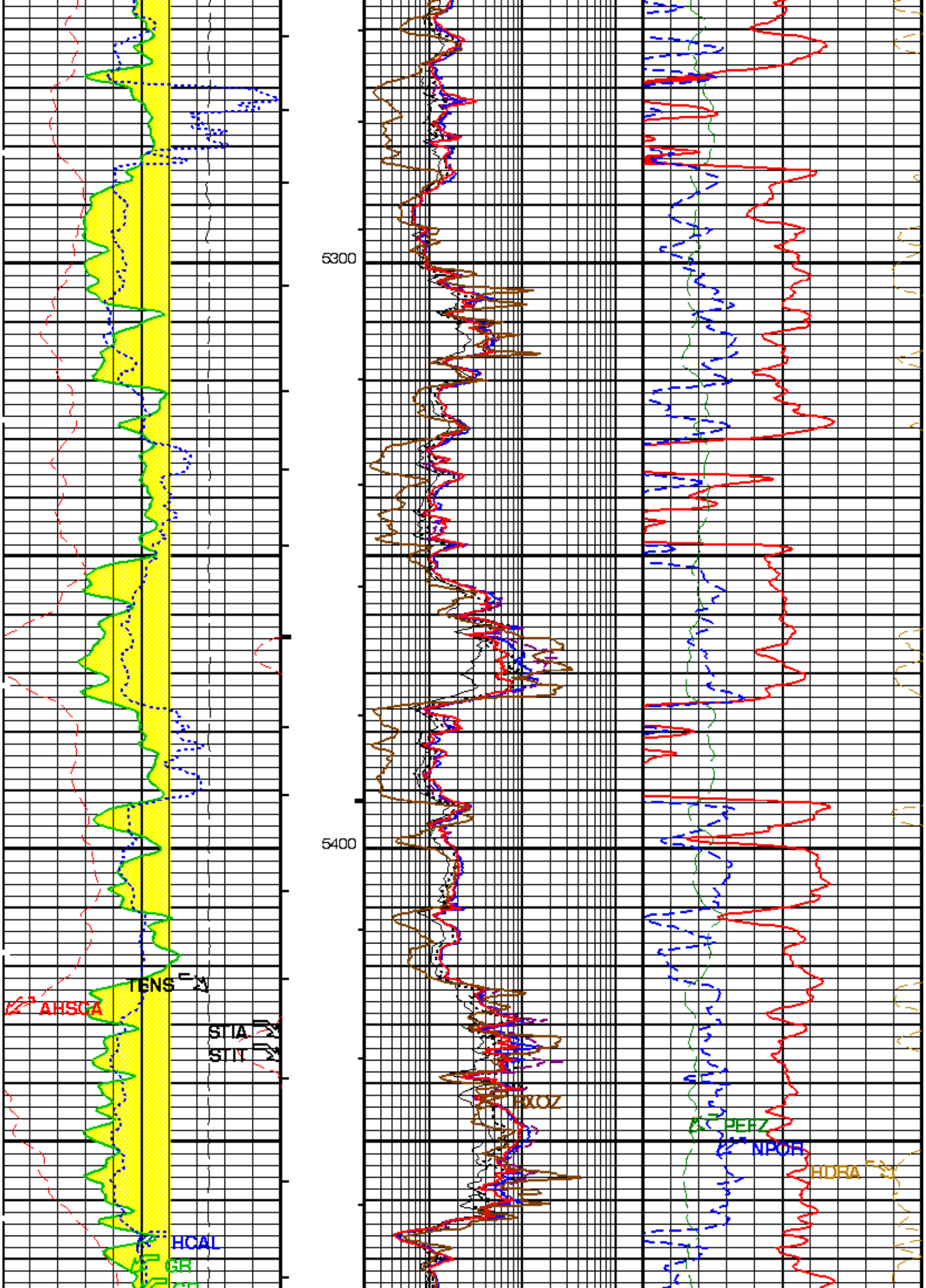
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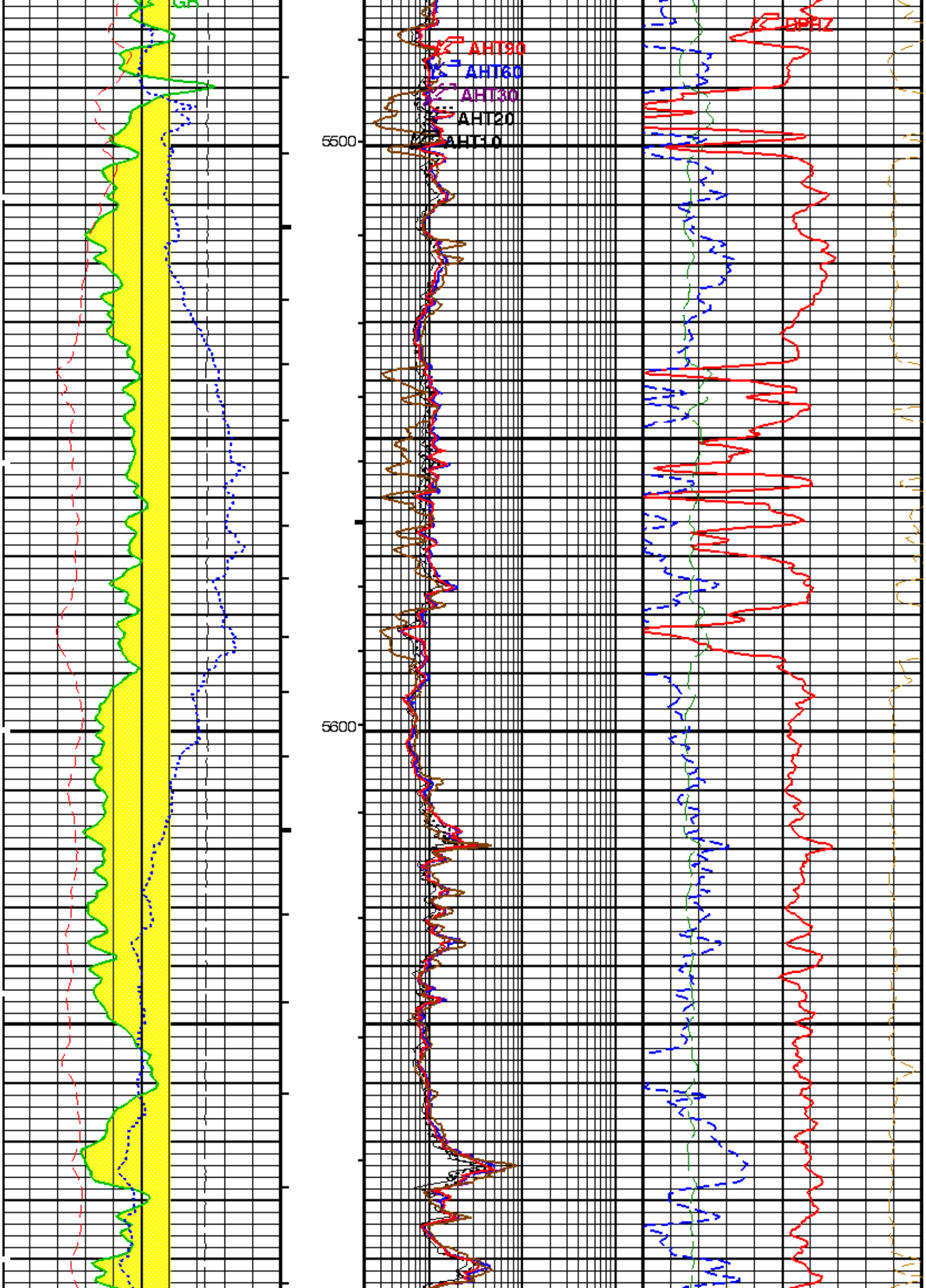
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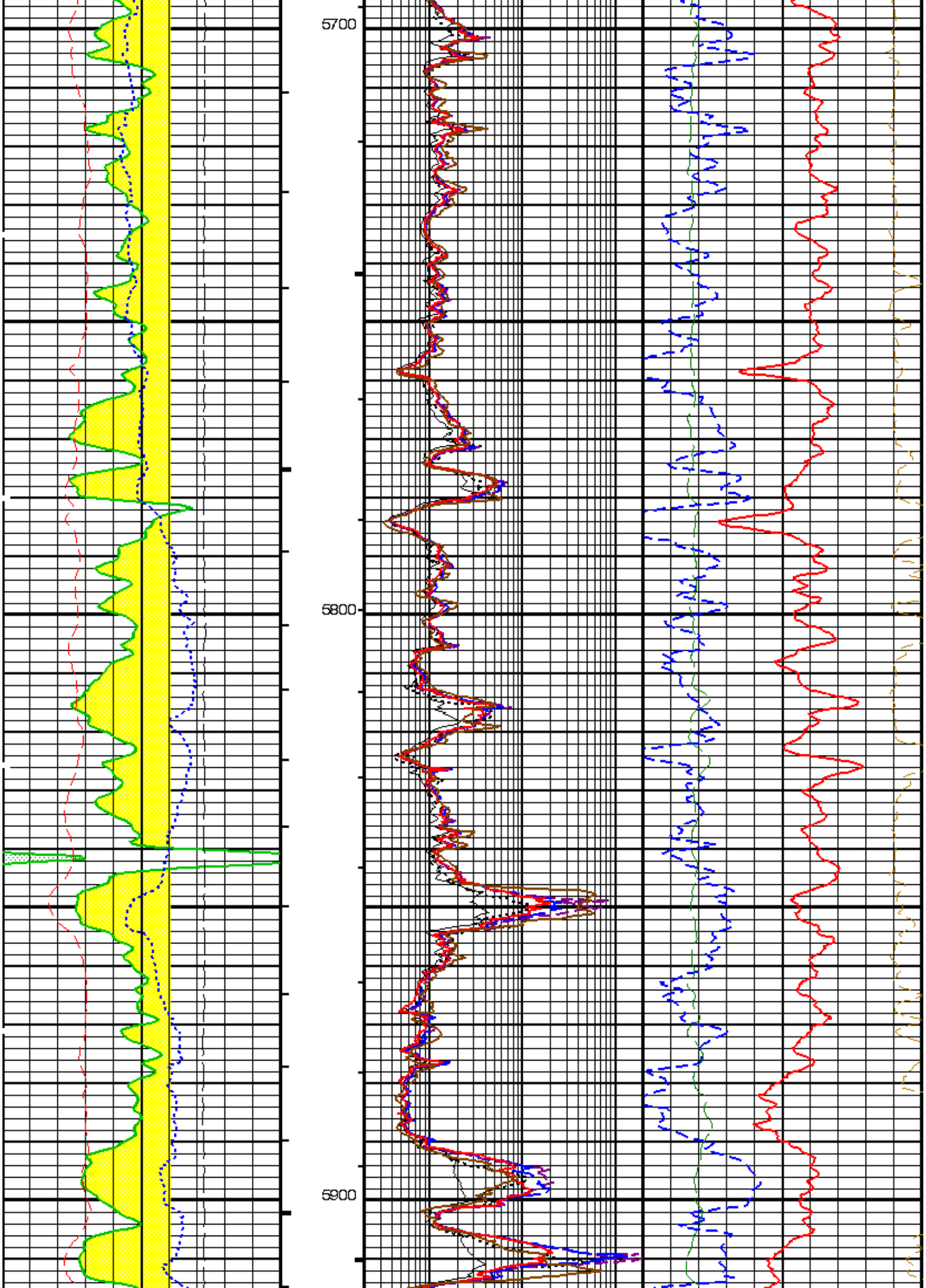
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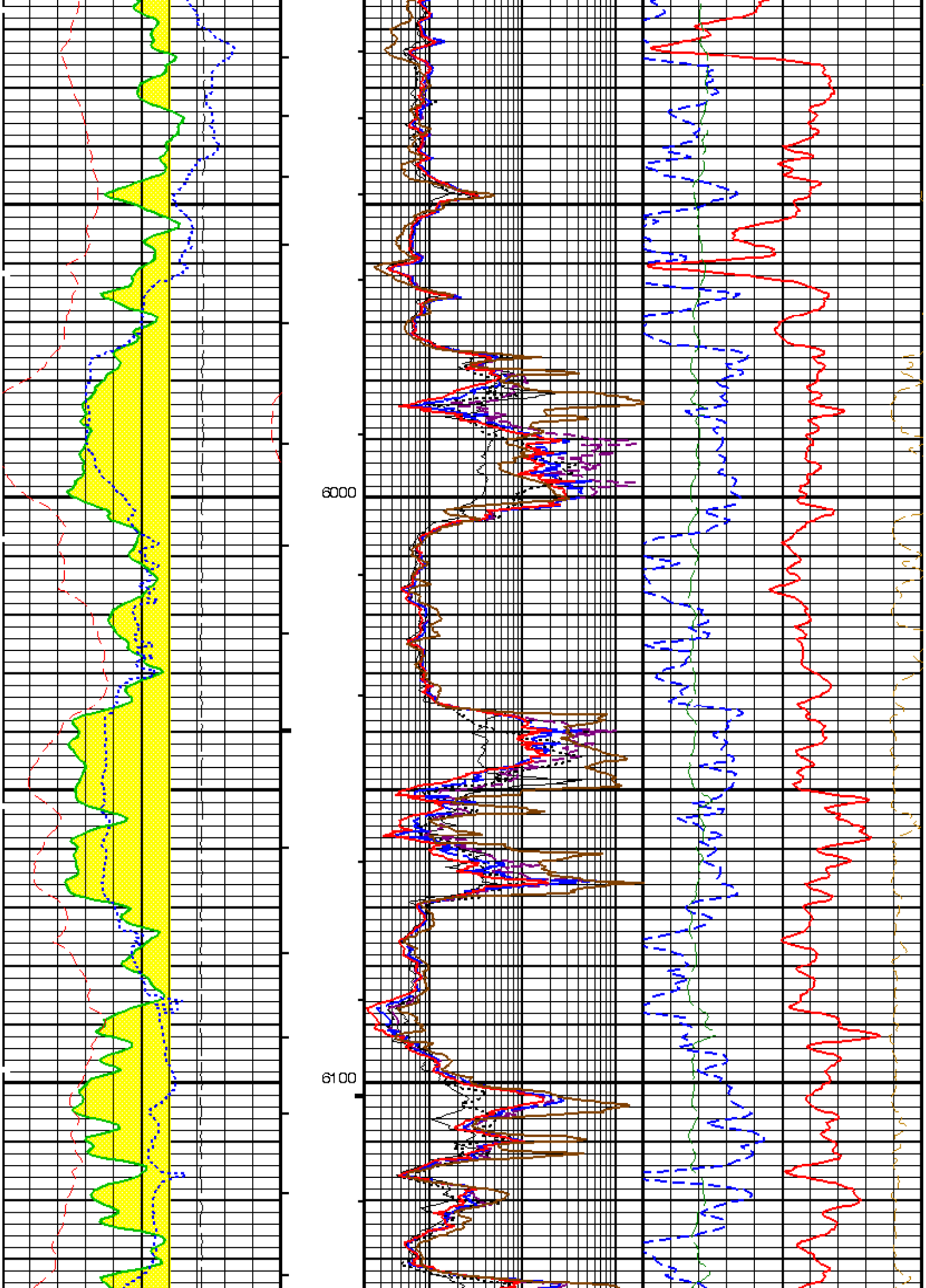
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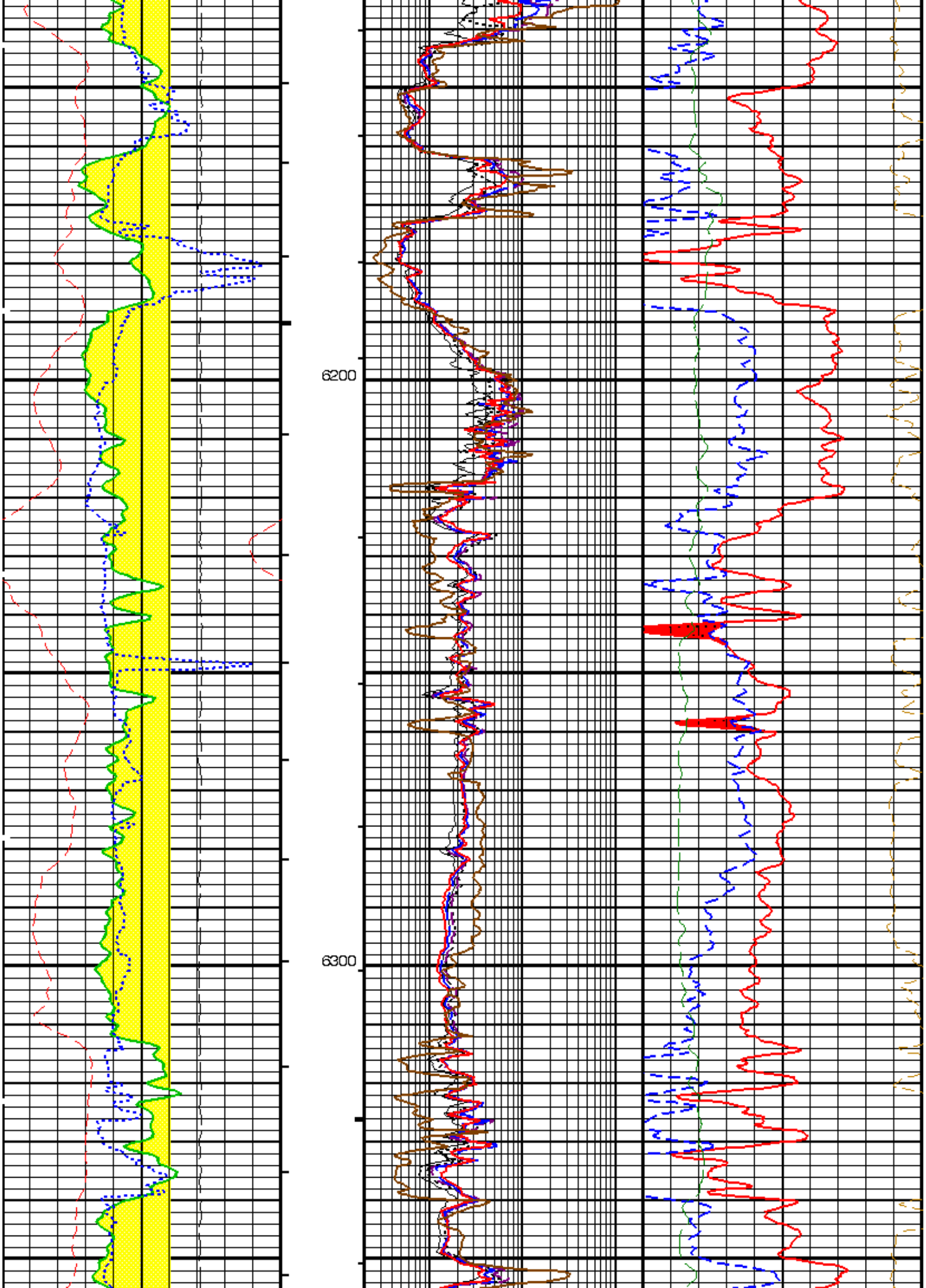
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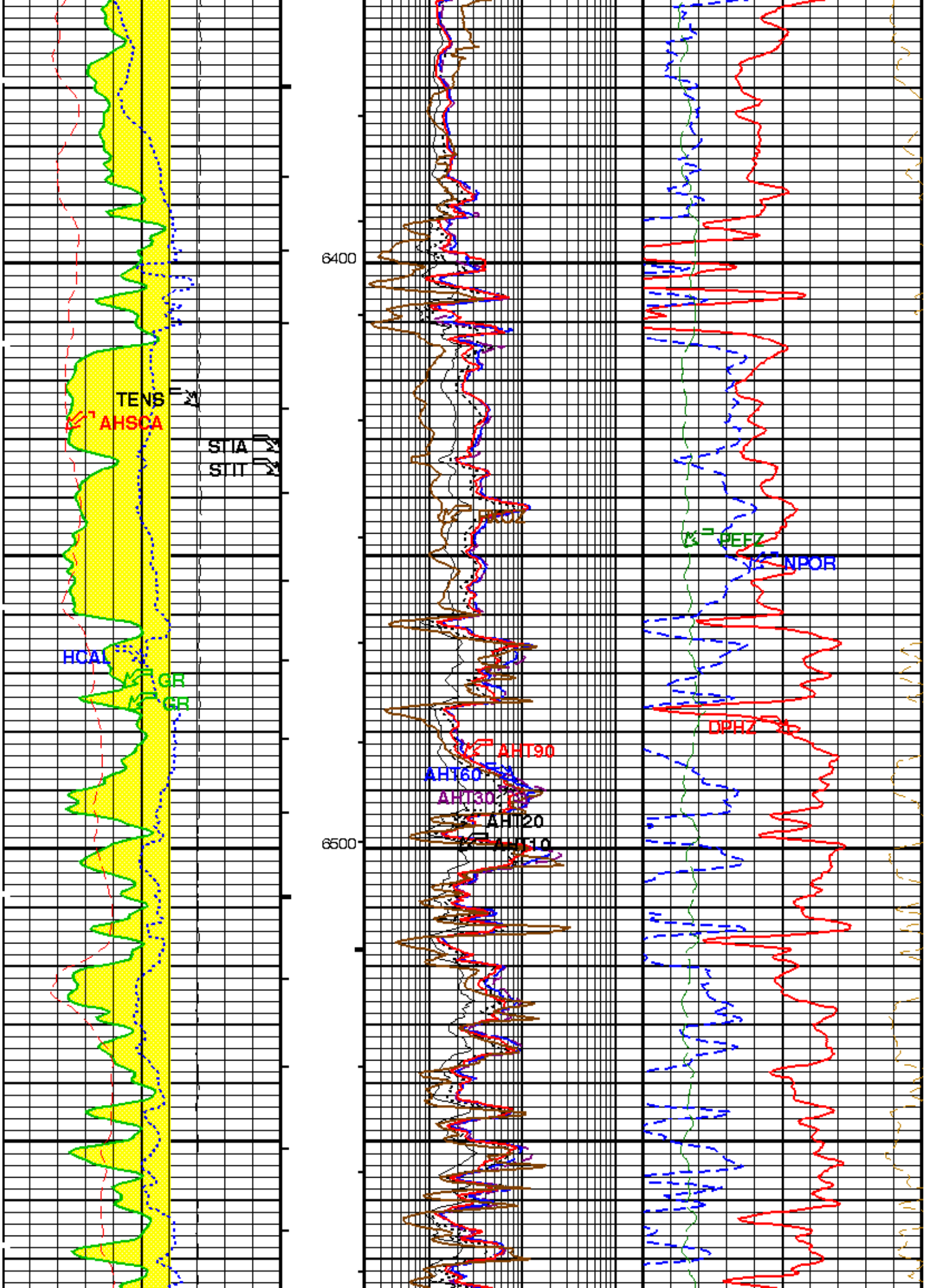
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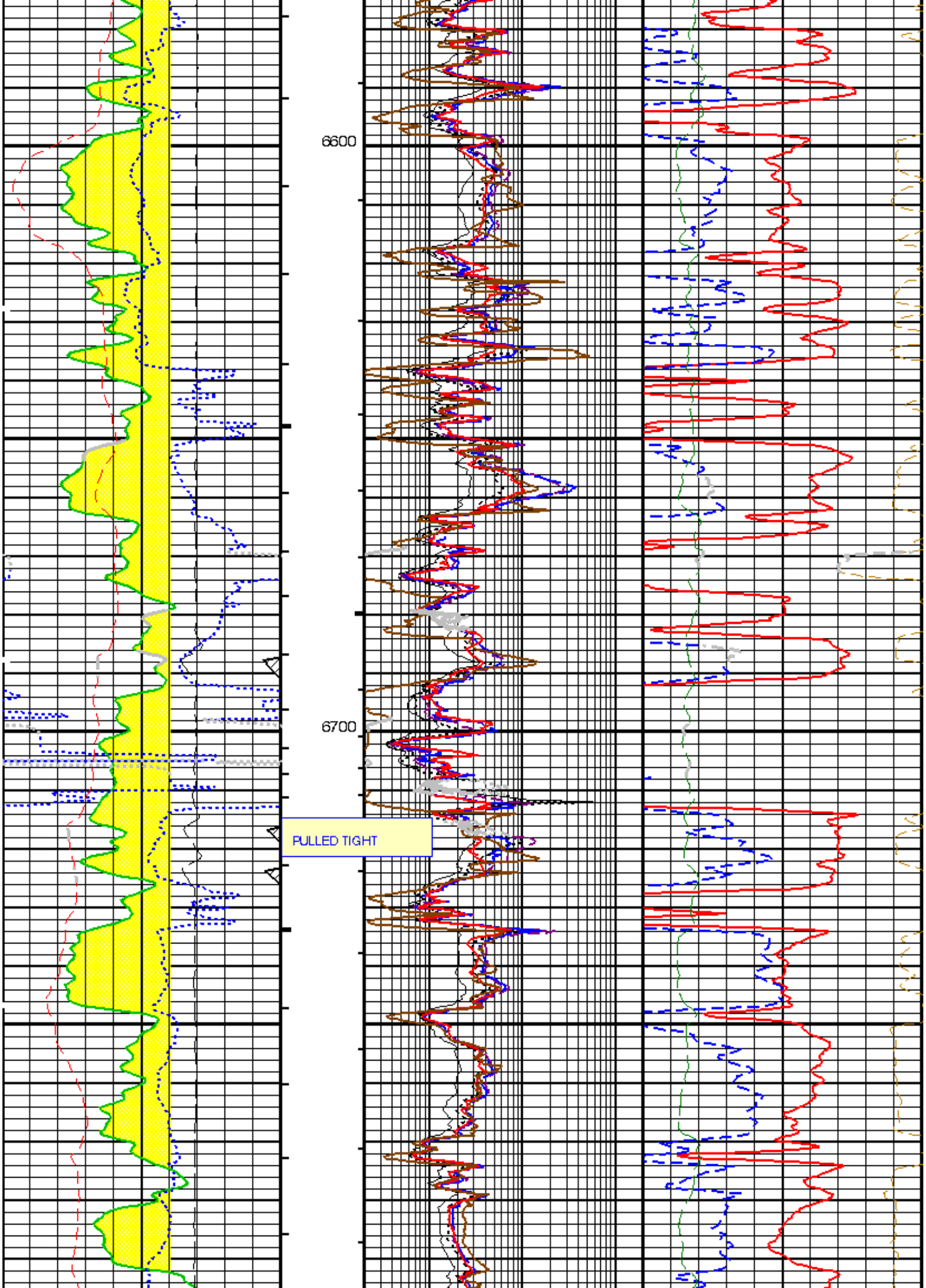
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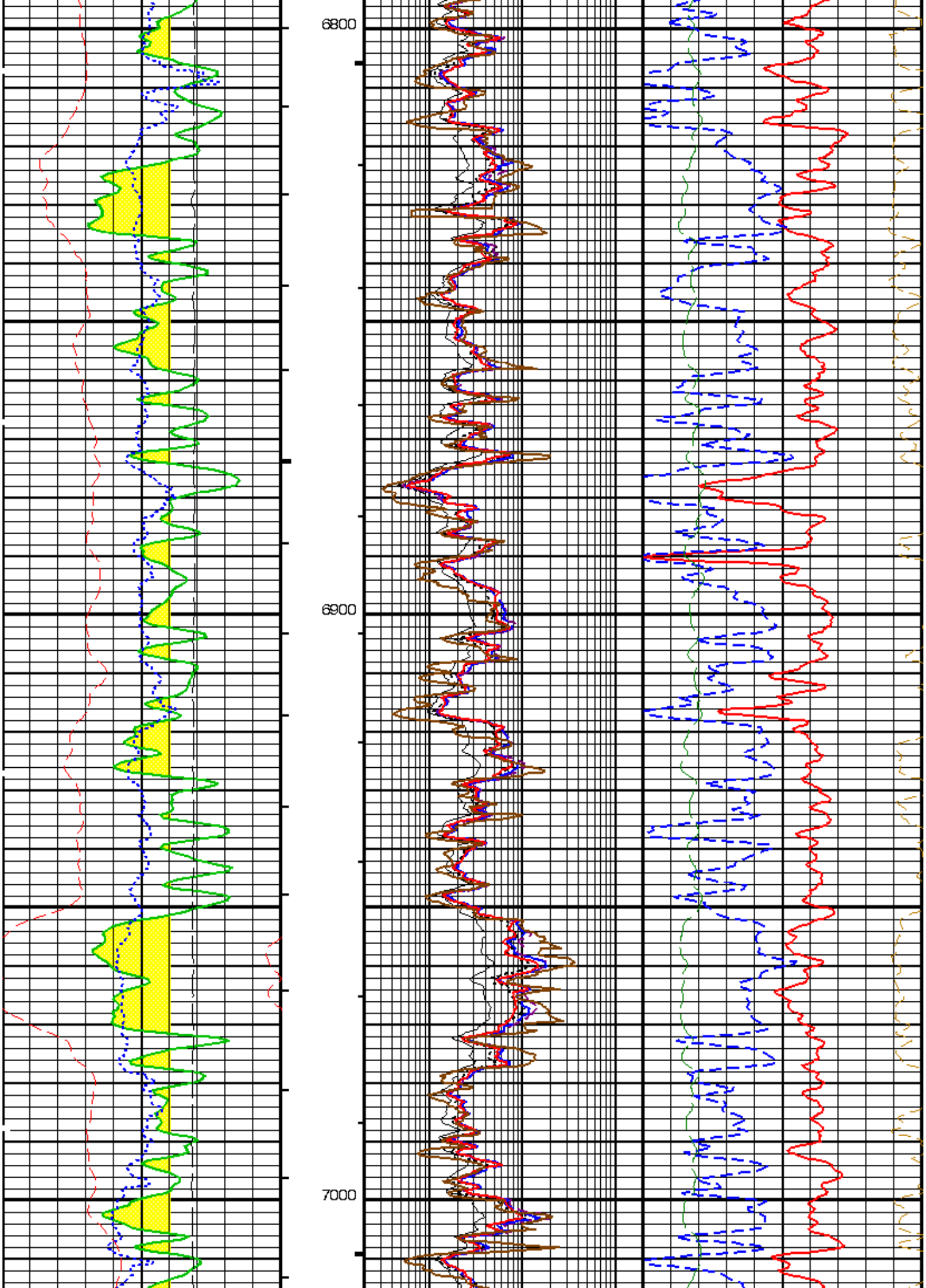
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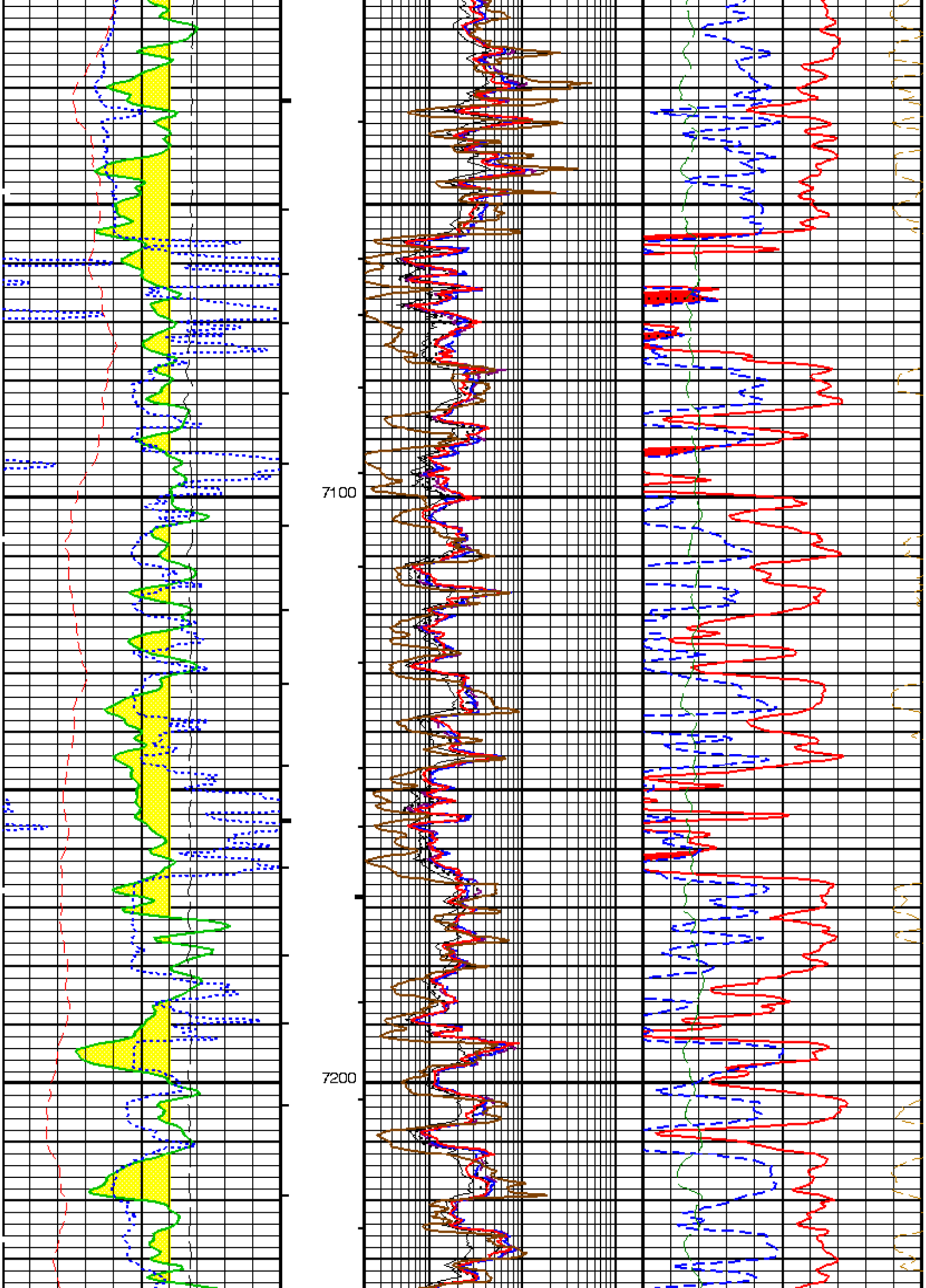
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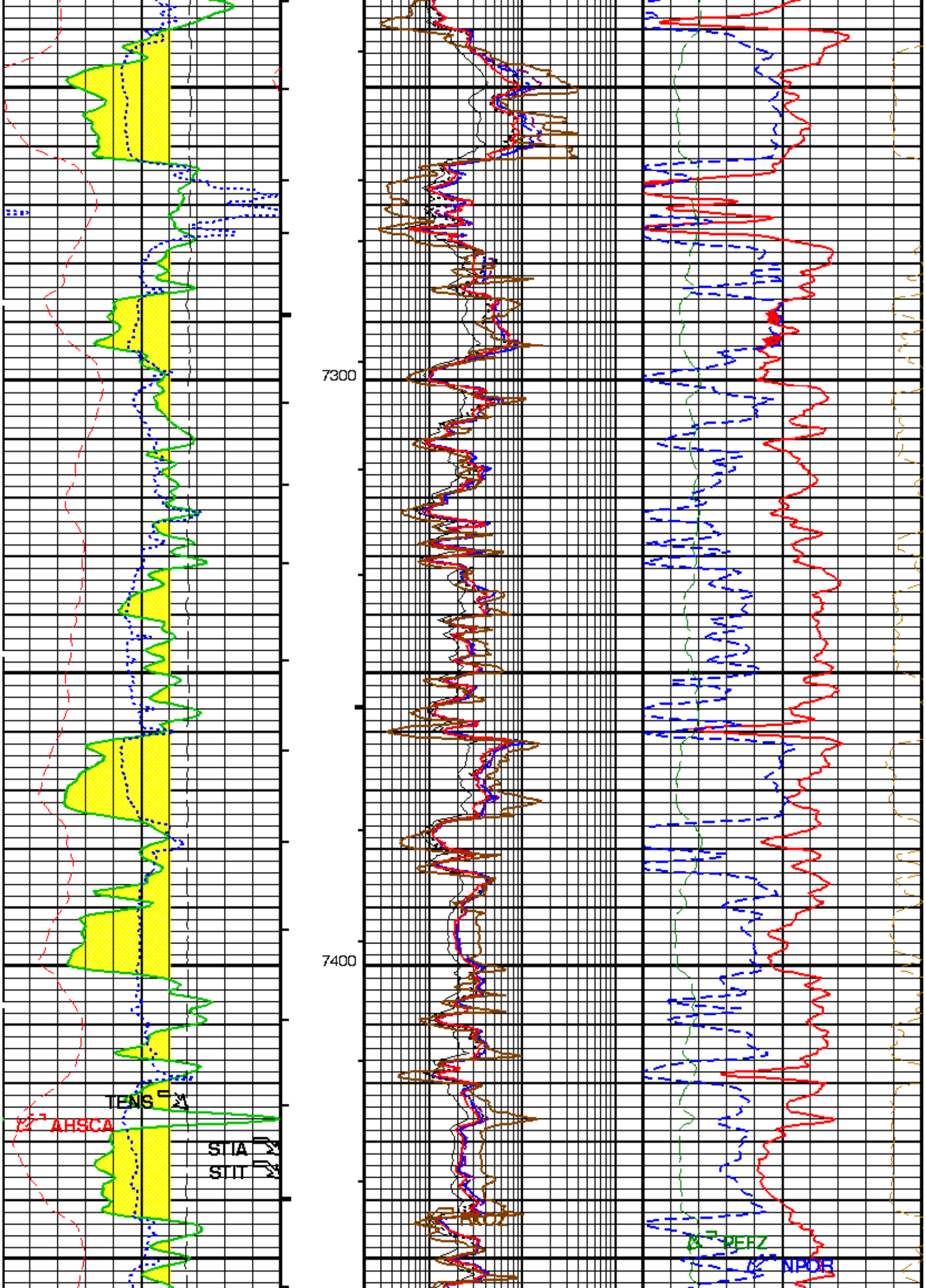
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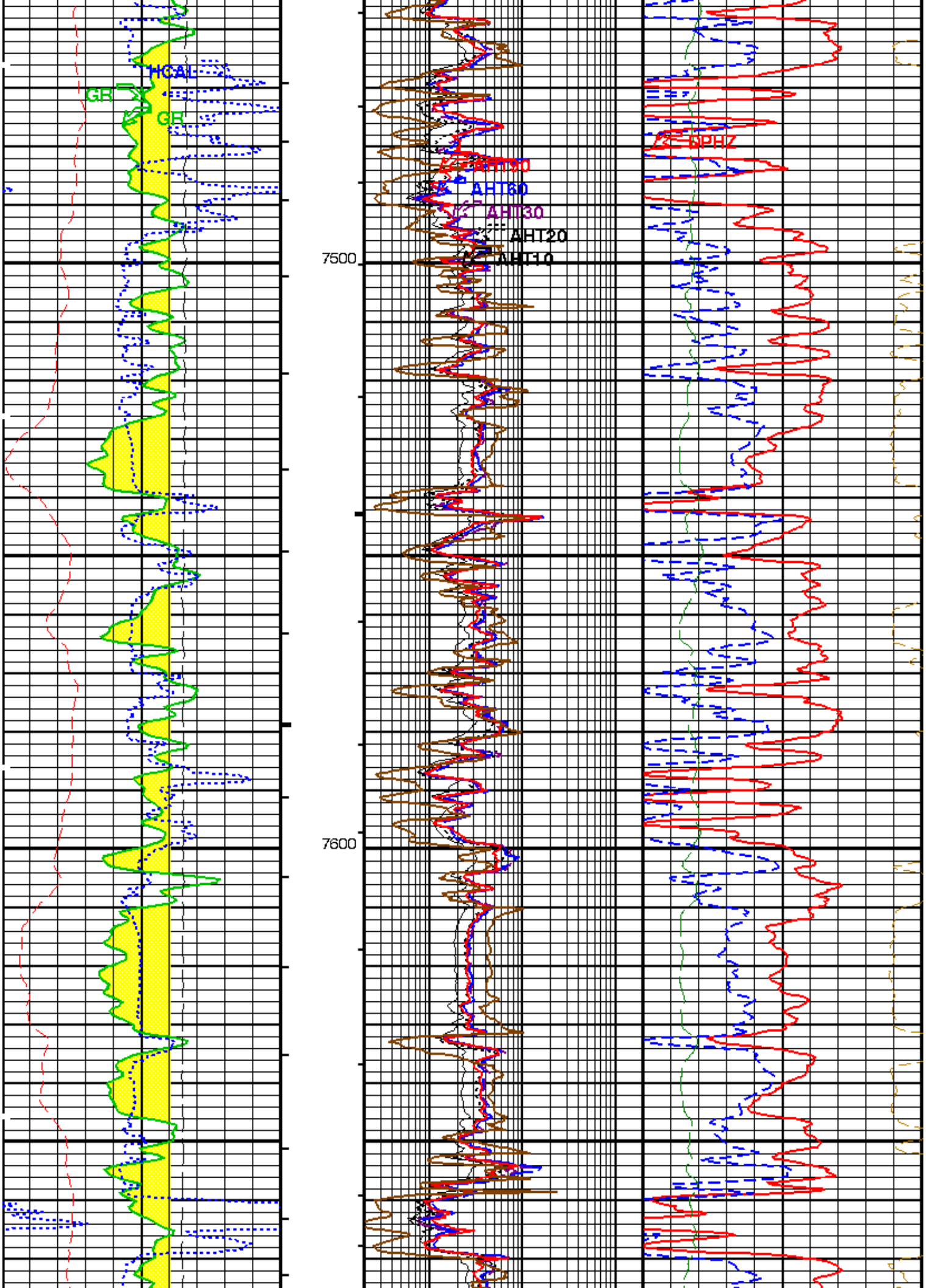
RXOZ
PEFZ
NPOR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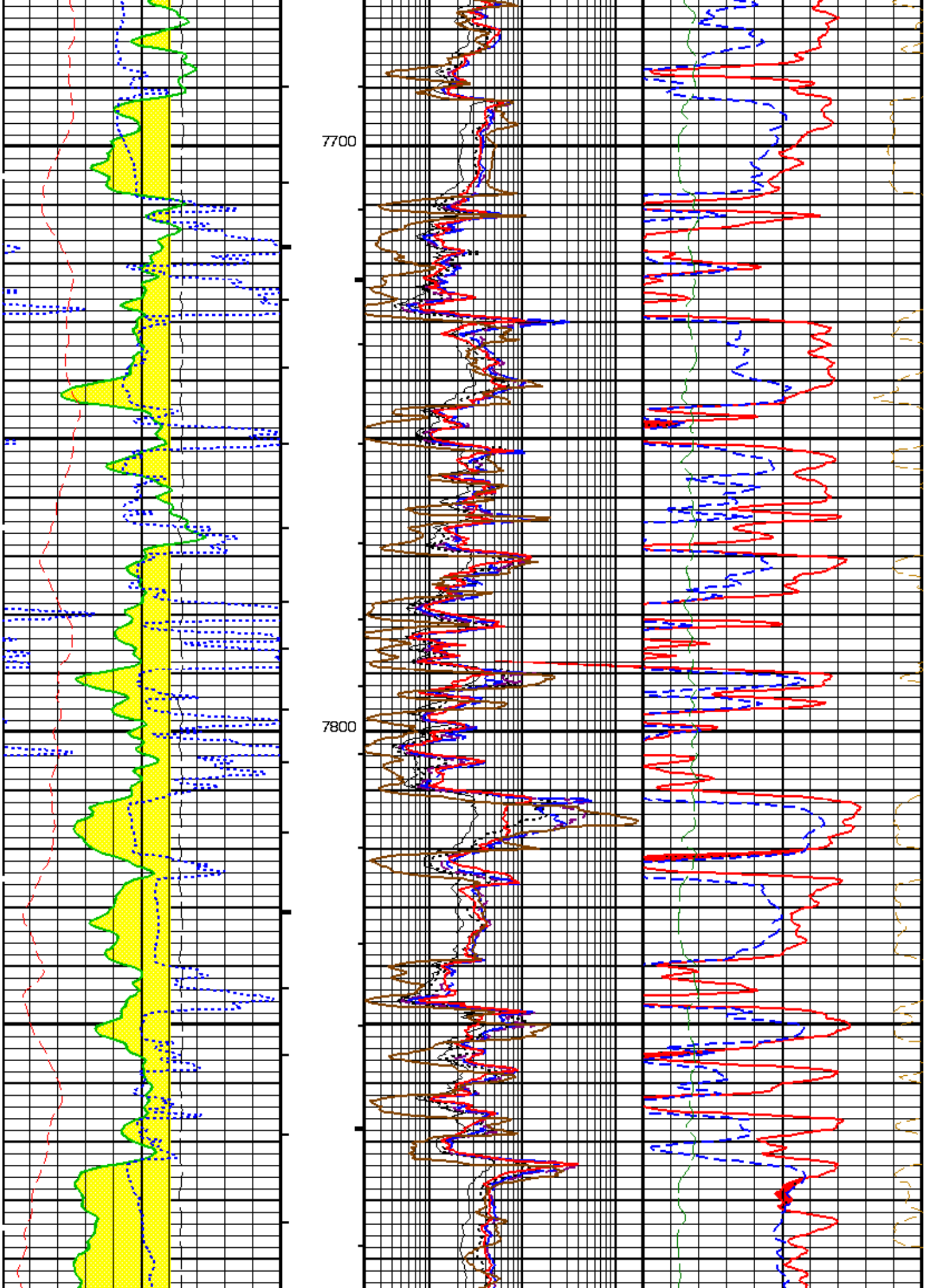
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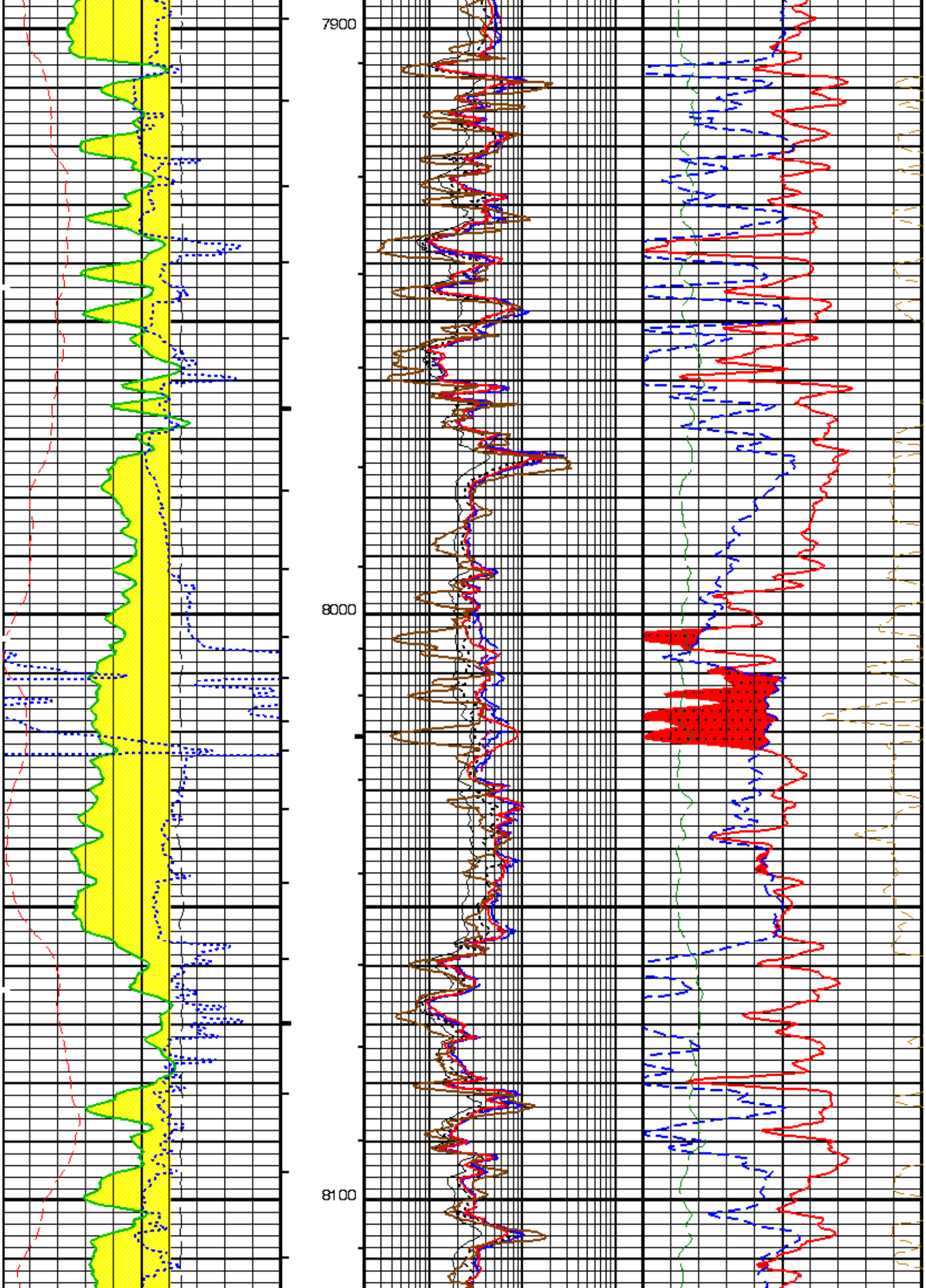
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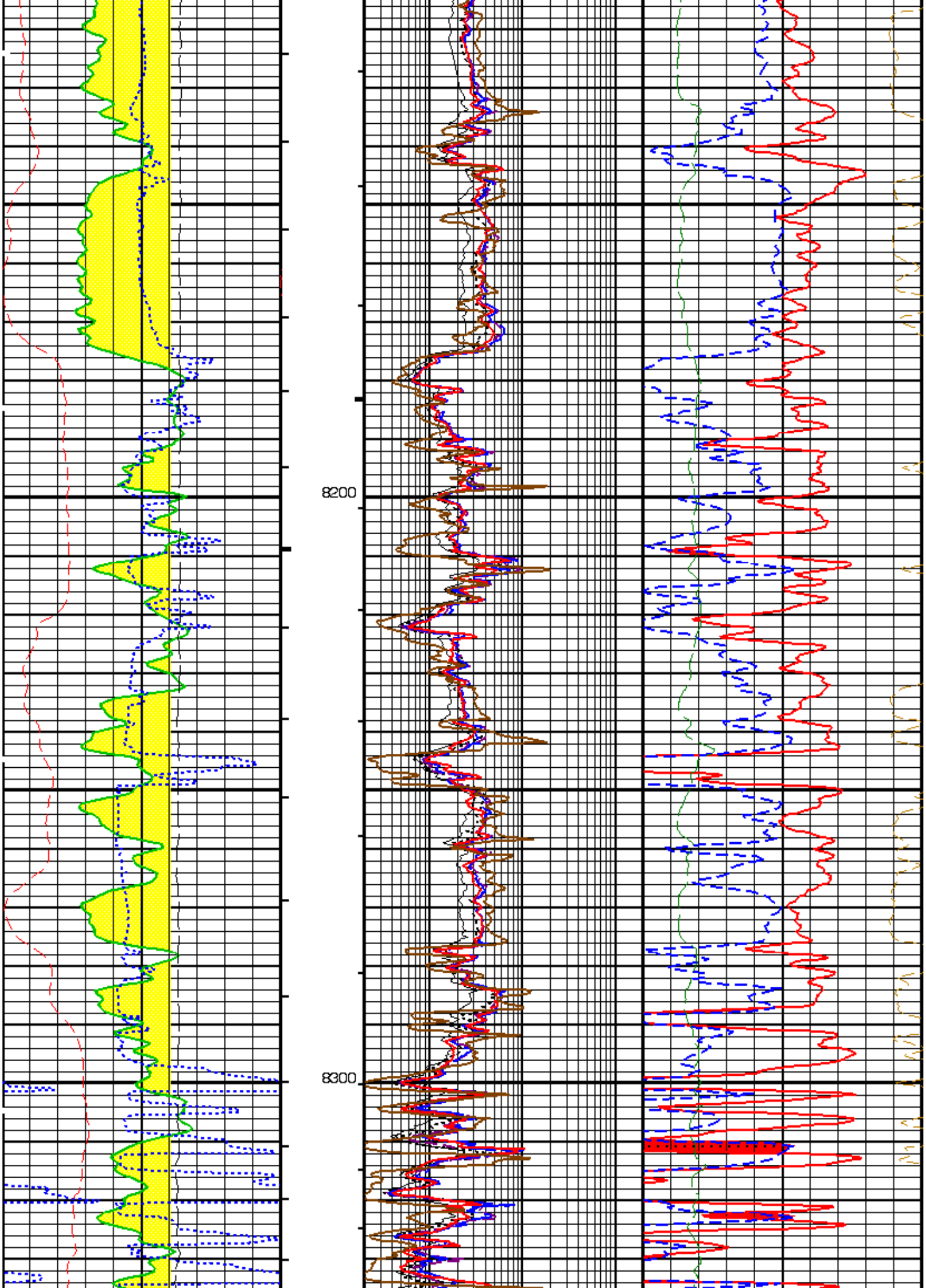
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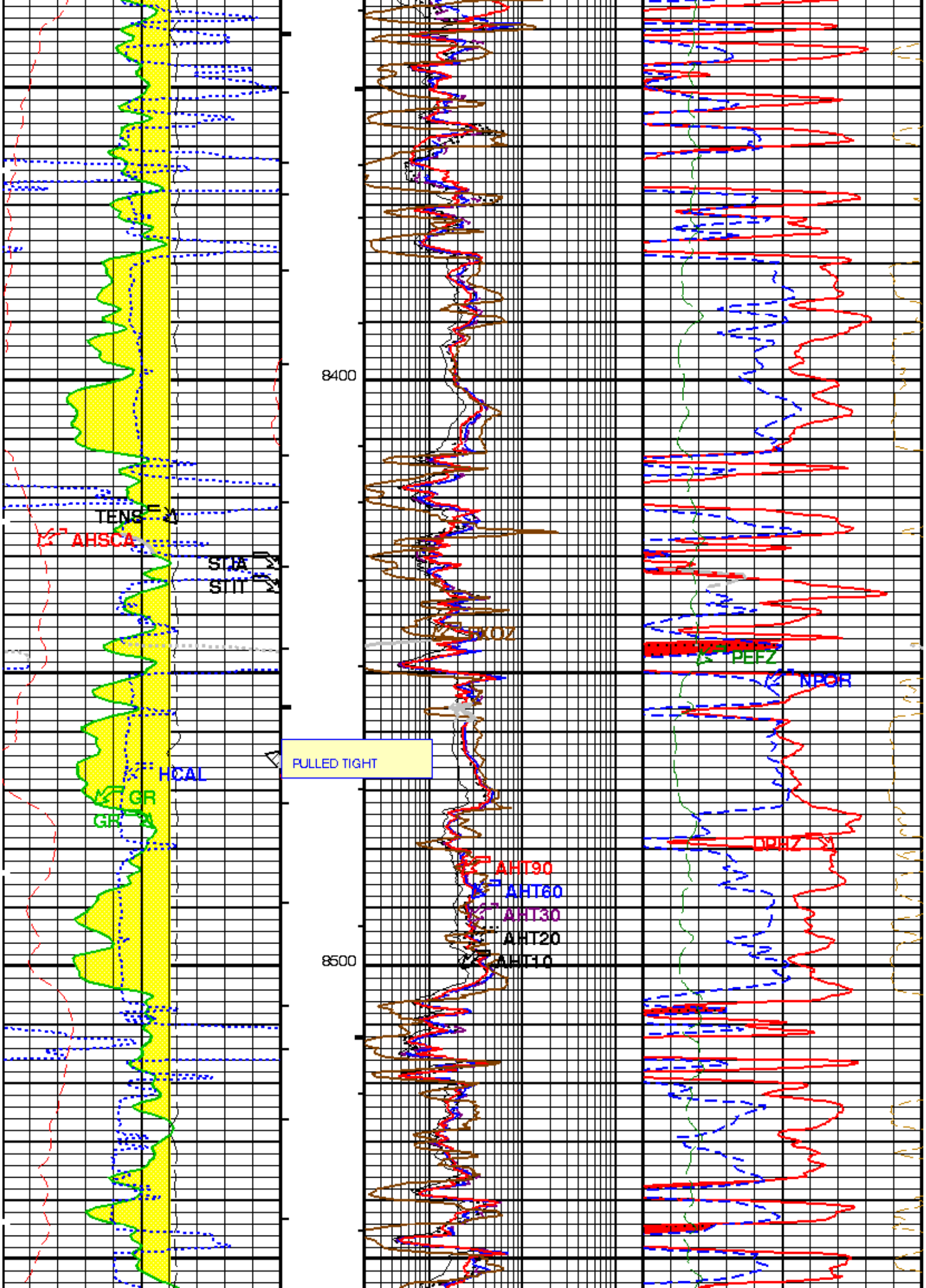
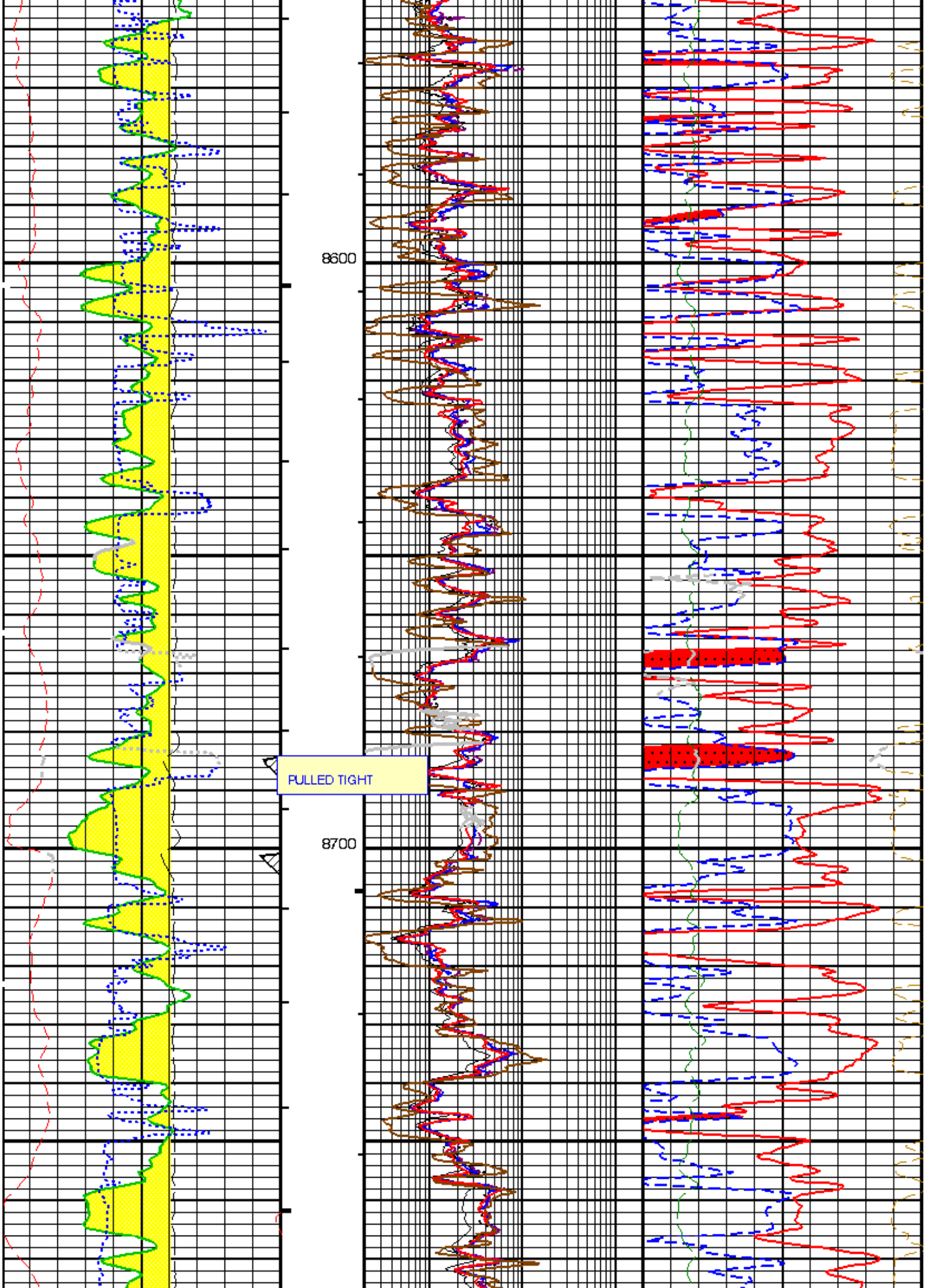
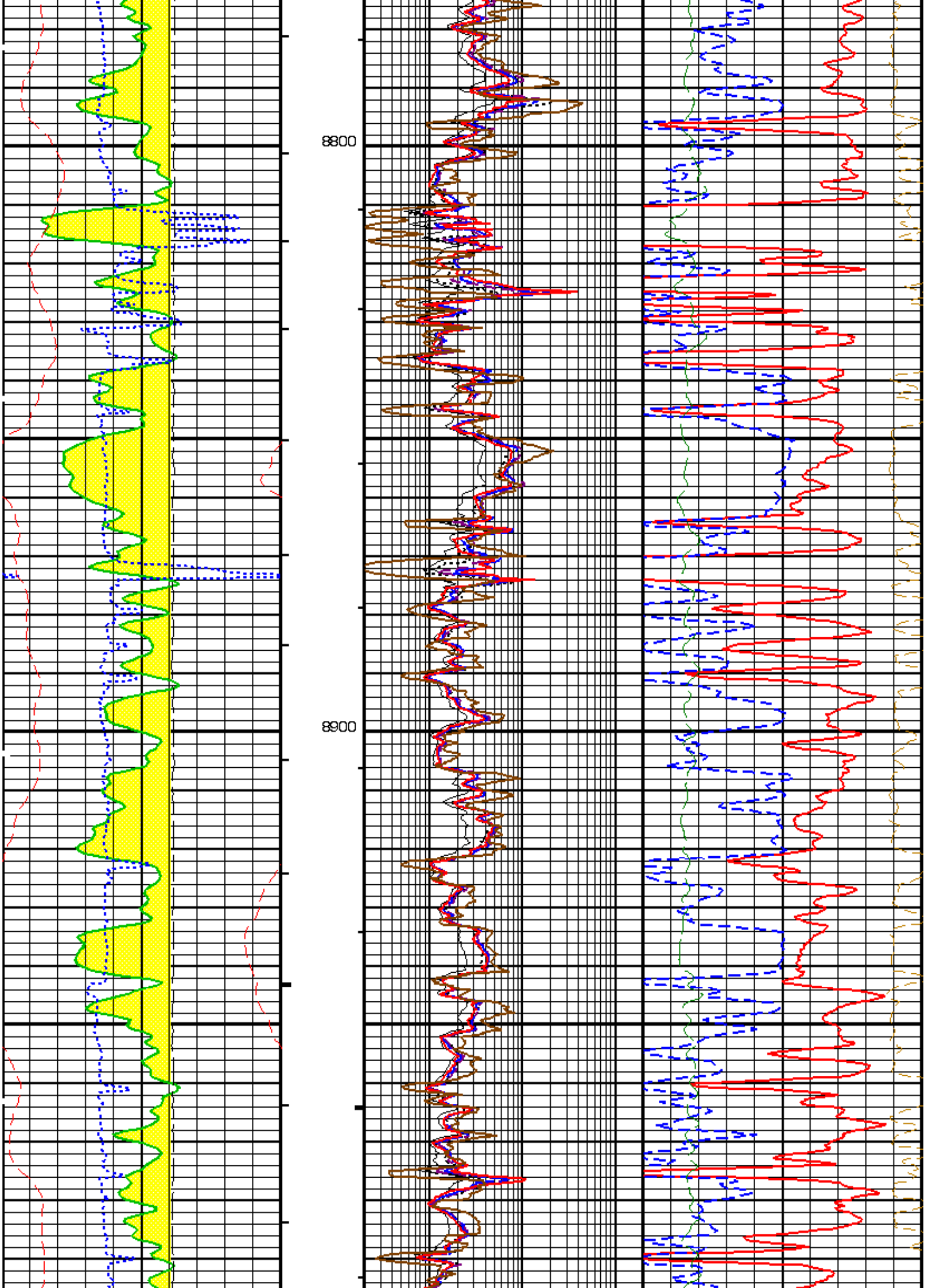
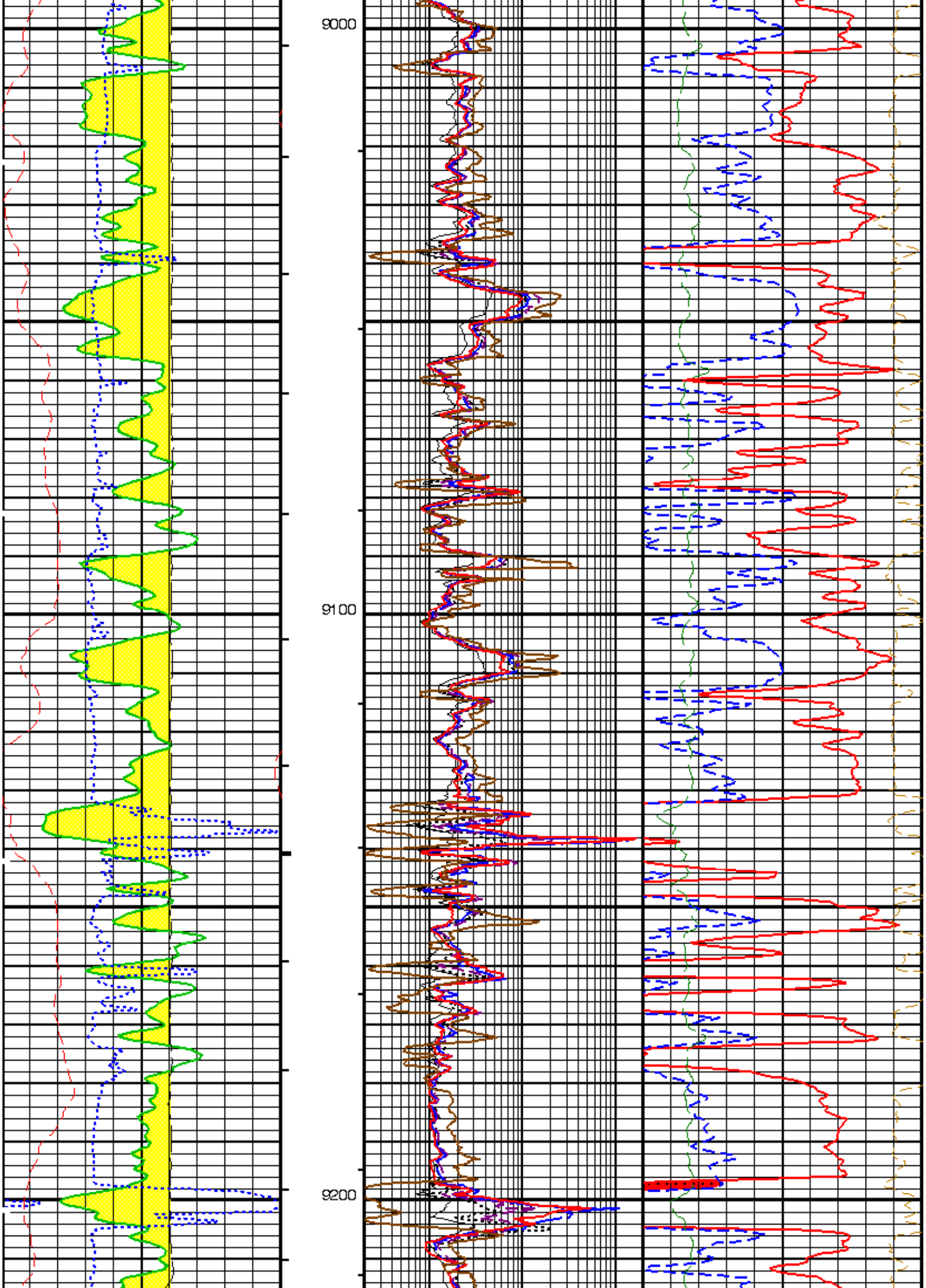
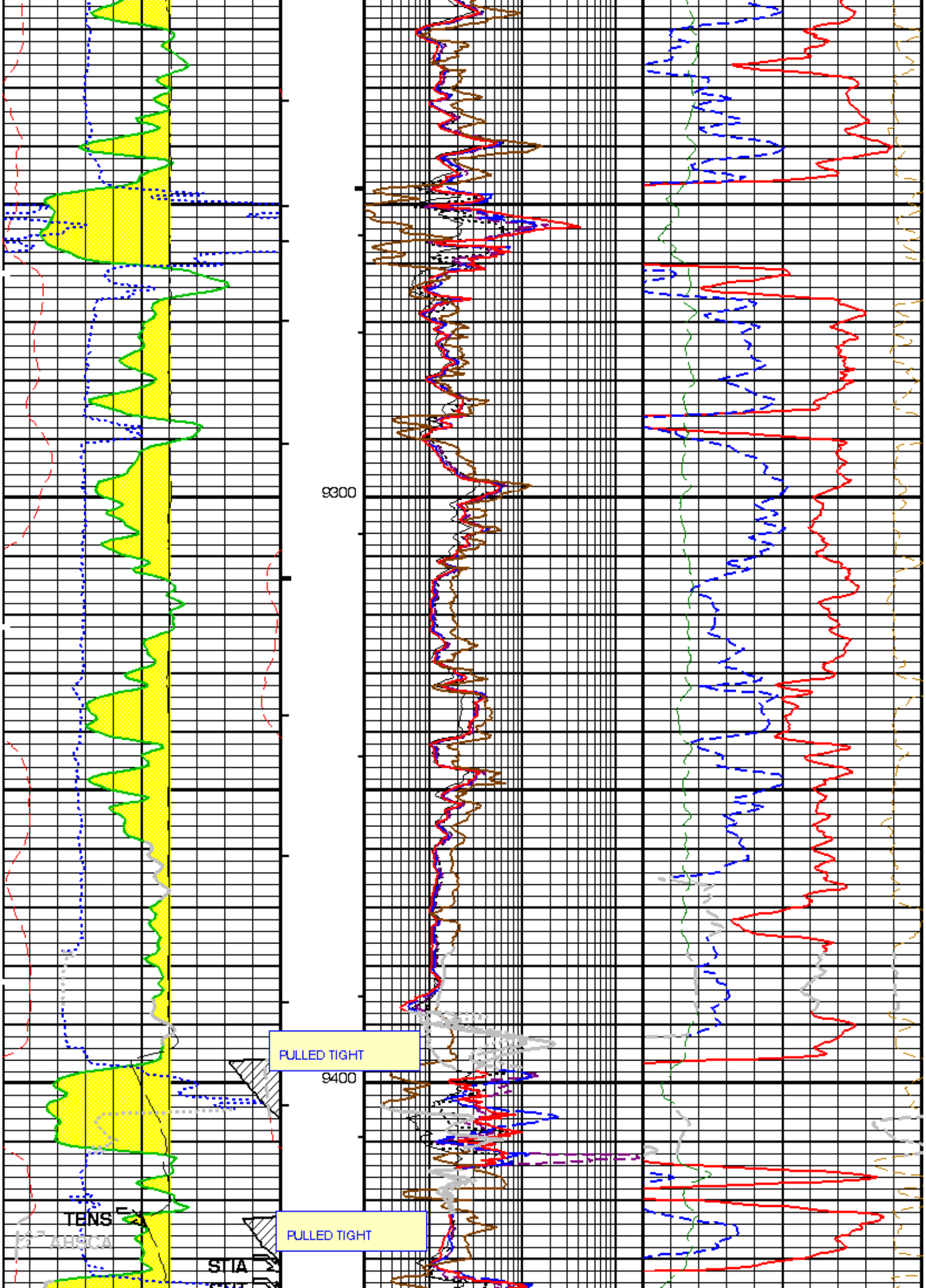
8300

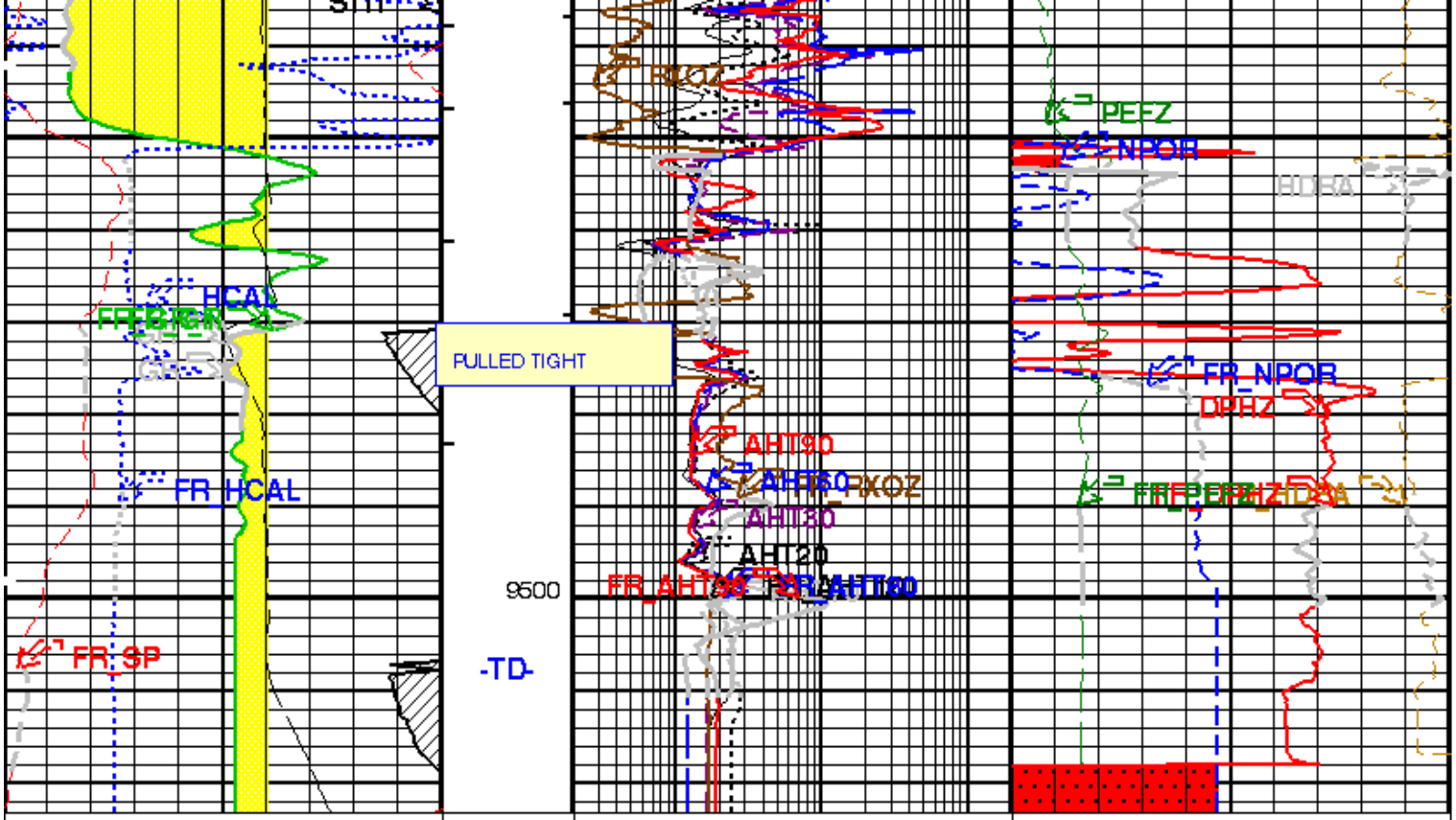

8400
8500
TENS
AHSCA
STIA
STIT
KOZ
PEFZ
NPOR
PULLED TIGHT
HCAL
GR
GR
DPHZ
AHT90
AHT60
AHT30
AHT20
AHT10


8600
PULLED TIGHT
8700


8800
8900


9000
9100
9200


9300
PULLED TIGHT
9400
PULLED TIGHT
TENS
STIA



SP (AHSCA) -80 (MV) 20	AIT-H 10 Inch Investigation (AHT10) 2 (OHMM) 2000	Std. Res. Density Porosity (DPHZ) 0.3 (V/V) -0.1
Tension (TENS) 10000 (LBF) 0	AIT-H 20 Inch Investigation (AHT20) 2 (OHMM) 2000	Gas From DPHZ to NPOR
Gamma Ray (GR) 0 (GAPI) 150	AIT-H 30 Inch Investigation (AHT30) 2 (OHMM) 2000	Std. Res. Formation Pe (PEFZ) 0 (----) 10 / Density Correction (HDRA) -0.2 (G/C3) 0.05
HILT Caliper (HCAL) 6 (IN) 16	AIT-H 60 Inch Investigation (AHT60) 2 (OHMM) 2000	Alpha Processed Neutron Porosity (NPOR) 0.3 (V/V) -0.1
GR Backup From LHT1 to GR_1	AIT-H 90 Inch Investigation (AHT90) 2 (OHMM) 2000	
Tool/Tot. Drag From STIA to T1	Std. Res. Invaded Zone Resistivity (RXOZ) 2 (OHMM) 2000	
GAMMA RAY < 90 From GR to SpareConstant	2.68 G/CC SANDSTONE MATRIX	

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

AIT-H Answer Product Processing Summary. Data taken with Tool # 396 (AHTNO)

...Acquired data from HILT/HAIT

***** Borehole Correction *****

Effective Tool Standoff computed. Borehole diameter and mud res. taken as input (see GCSE and GRSE parameters)

Tool is run in ECCENTERED mode with a tool stand-off of 1.00 IN. Bit Size is 7.88 IN.

***** Input Selections to AIT-H Answer Product Processing *****

Caliper (GCSE): HCAL Mud Resistivity (GRSE): AHMF Temperature (GTSE): LINEAR_ESTIMATE Porosity (FPHI): DPHZ

***** Other Parameters used by AIT-H Answer Product Processing *****

Surface Hole Temperature (SHT)	68.000 DEGF	Bottom Temperature (BHT)	215.000 DEGF
Total Depth (TD)	9508.000 FT		
Form Factor Exponent (FEXP)	2.000	Form Factor Numerator (FNUM)	1.000
Mud Filtrate Sample Resistivity (RMFS)	0.816 OHMM	Mud Filtrate Sample Temperature (MFST)	125.000 DEGF
Resitivity Connate Water (RW)	1.000 OHMM		

***** AIT-H Answer Product Processing Control Parameters *****

Playback Mode: RECOMPUTE

(AHEBC) : Yes (AHEBL) : Yes (AHERP) : Yes

(AHBHM): 2_ComputeStandoff (AHBLM): 6_One_Two_and_Four (AHRPM): 1_Two

Parameters

DLIS Name	Description	Value	
HILTB-FTB: High resolution Integrated Logging Tool-DTS			
AHBHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
AHBHV	Array Induction Borehole Correction Code Version Number	880	
AHBLM	Array Induction Basic Logs Mode	6_One_Two_and_Four	
AHBLV	Array Induction Basic Logs Code Version Number	108	
AHCDE	Array Induction Casing Detection Enable	Yes	
AHCEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
AHFRSV	Array Induction Response Set Version for Four ft Resolution	40.70.24.21	
AHMRF	Array Induction Mud Resistivity Factor	1	
AHORSV	Array Induction Response Set Version for One ft Resolution	40.70.24.21	
AHRFV	Array Induction Radial Profiling Code Version Number	700	
AHRPV	Array Induction Radial Parametrization Code Version Number	223	
AHSTA	Array Induction Tool Standoff	1	IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	40.70.24.21	
BHFL	Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	215	DEGF
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
DHC	Density Hole Correction	BS	
FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
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
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCO	Hole Size Correction Option	YES	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.68	G/C3
MPOF	MCFL Processing Operation Mode	ON	
MWCO	Mud Weight Correction Option	NO	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	NO	
STI: Stuck Tool Indicator			
LBFR	Trigger for MAXIS First Reading Label	STI	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth - Driller	9508.00	FT
TDL	Total Depth - Logger	9508.00	FT
PERT: Preliminary Evaluation - Real Time			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	215	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	

SHT	Surface Hole Temperature	68	DEGF
HOLEV: Integrated Hole/Cement Volume			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	215	DEGF
FCD	Future Casing (Outer) Diameter	5.5	IN
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	68	DEGF
System and Miscellaneous			
BS	Bit Size	7.875	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	9.625	IN
CWEI	Casing Weight	36.00	LB/F
DFD	Drilling Fluid Density	9.60	LB/G
DO	Depth Offset for Playback	0.0	FT
MST	Mud Sample Temperature	125.00	DEGF
PP	Playback Processing	RECOMPUTE	
RMFS	Resistivity of Mud Filtrate Sample	0.8160	OHMM
TD	Total Depth	9508	FT

Format: TCOMBO_AIT Vertical Scale: 5" per 100' Graphics File Created: 08-Dec-2003 00:49

OP System Version: 11C0-305

MCM

HILTB-FTB	11C0-305	DSLT-FTB	11C0-305
DTC-H	11C0-305		

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_005PUP	FN:4	PRODUCER	07-Dec-2003 23:42	9523.0 FT	1182.5 FT

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_009PUP	FN:8	PRODUCER	08-Dec-2003 00:49

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REPEAT ANALYSIS

MAXIS Field Log

Company: ENCANA OIL & GAS (USA) INC. Well: WIEBEN 2-13 (M2SW)

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_005PUP	FN:4	PRODUCER	07-Dec-2003 23:42	9523.0 FT	1182.5 FT

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_006LUP	FN:5	PRODUCER	07-Dec-2003 23:48	1518.0 FT	1173.5 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 784.44 F3

Cement Volume = 748.49 F3 (assuming 4.50 IN casing O.D.)

Computed from 1518.0 FT to 1193.0 FT using data channel(s) HCAL

OP System Version: 11C0-305

MCM

HILTB-FTB	11C0-305	DSLT-FTB	11C0-305
DTC-H	11C0-305		

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

GAMMA RAY < 90
From GR to
SpareConstant

GR Backup
From LHT1 to GR_1

TENS_REP Curve (TENS_REP)
10000 (LBF) 0

SP_REP Curve (AHSCA_REP)
-80 (MV) 20

HCAL_REP Curve (HCAL_REP)
6 (IN) 16

GR_1_REP Curve (GR_REP)
150 (GAPI) 300

GR_REP Curve (GR_REP)
0 (GAPI) 150

RXOZ_REP Curve (RXOZ_REP)
2 (OHMM) 2000

AHT90_REP Curve (AHT90_REP)
2 (OHMM) 2000

AHT60_REP Curve (AHT60_REP)
2 (OHMM) 2000

AHT30_REP Curve (AHT30_REP)
2 (OHMM) 2000

AHT20_REP Curve (AHT20_REP)
2 (OHMM) 2000

AHT10_REP Curve (AHT10_REP)
2 (OHMM) 2000

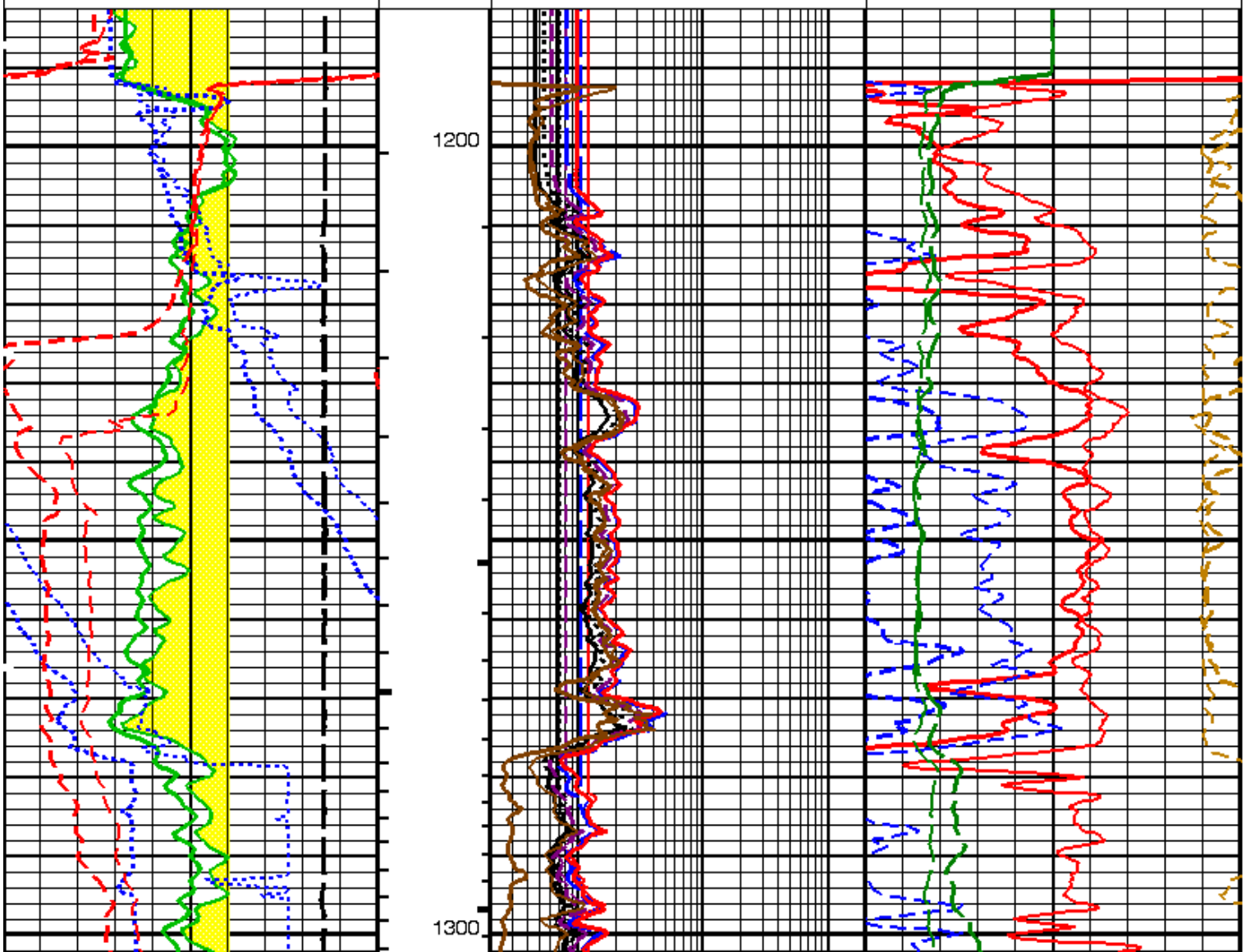
PEFZ_REP Curve (PEFZ_REP)
0 (----) 10

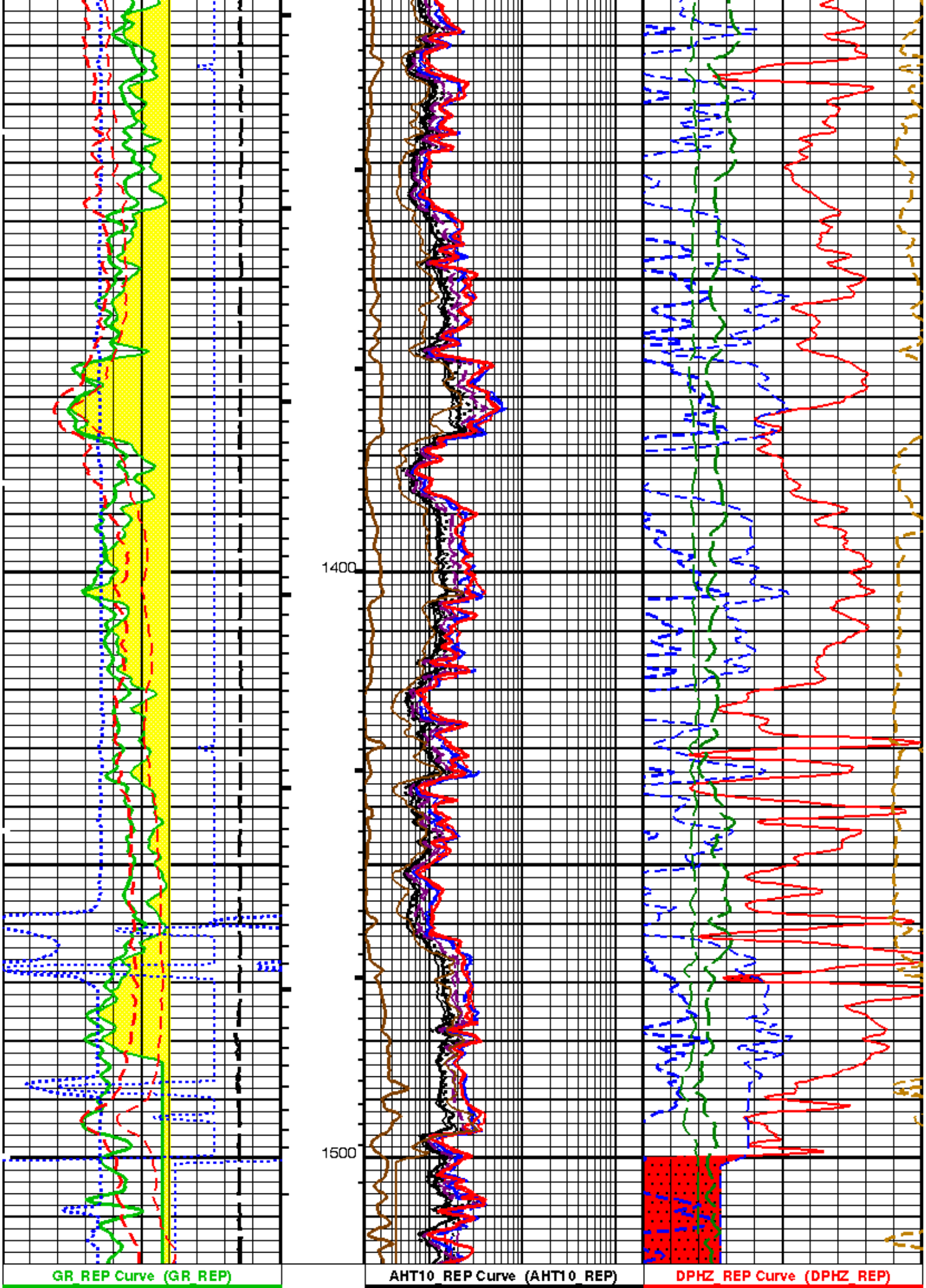
HDRA_REP Curve (HDRA_REP)
-0.2 (G/C3) 0.05

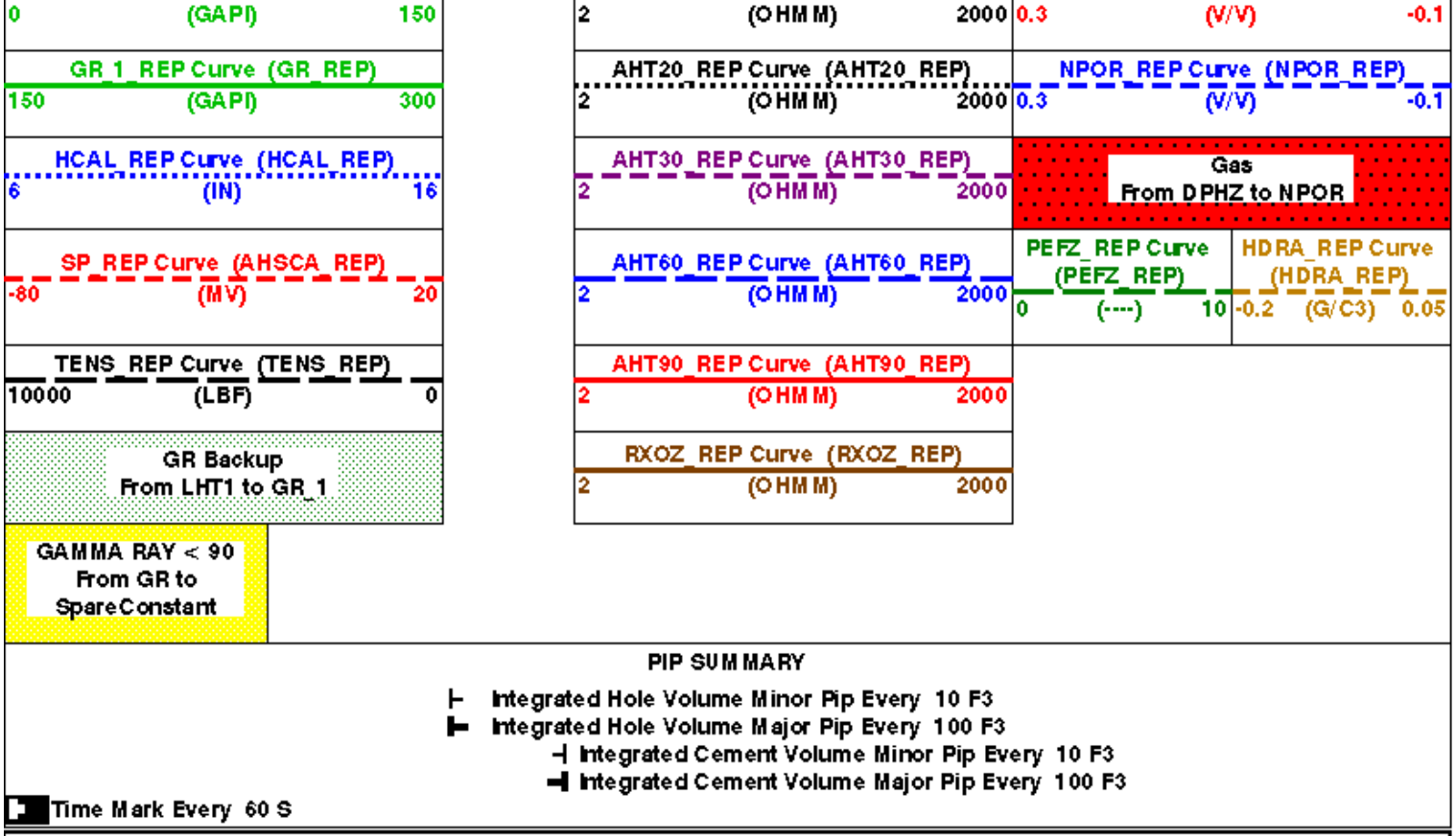
Gas
From DPHZ to NPOR

NPOR_REP Curve (NPOR_REP)
0.3 (V/V) -0.1

DPHZ_REP Curve (DPHZ_REP)
0.3 (V/V) -0.1




1400
1500
GR_REP Curve (GR_REP)
AHT10_REP Curve (AHT10_REP)
DPHZ_REP Curve (DPHZ_REP)



AIT-H Answer Product Processing Summary. Data taken with Tool # 396 (AHTNO)

...Acquired data from HILT/HAIT

***** Borehole Correction *****

Effective Tool Standoff computed. Borehole diameter and mud res. taken as input (see GCSE and GRSE parameters)

Tool is run in ECCENTERED mode with a tool stand-off of 1.00 IN. Bit Size is 7.88 IN.

***** Input Selections to AIT-H Answer Product Processing *****

Caliper (GCSE): HCAL Mud Resistivity (GRSE): AHMF Temperature (GTSE): LINEAR_ESTIMATE Porosity (FPHI): DPHZ

***** Other Parameters used by AIT-H Answer Product Processing *****

Surface Hole Temperature (SHT)	68.000 DEGF	Bottom Temperature (BHT)	215.000 DEGF
Total Depth (TD)	9508.000 FT		
Form Factor Exponent (FEXP)	2.000	Form Factor Numerator (FNUM)	1.000
Mud Filtrate Sample Resistivity (RMFS)	0.816 OHMM	Mud Filtrate Sample Temperature (MFST)	125.000 DEGF
Resitivity Connate Water (RW)	1.000 OHMM		

***** AIT-H Answer Product Processing Control Parameters *****

Playback Mode: RECOMPUTE

(AHEBC) : Yes (AHEBL) : Yes (AHERP) : Yes

(AHBHM): 2_ComputeStandoff (AHBLM): 6_One_Two_and_Four (AHRPM): 1_Two

Parameters

DLIS Name	Description	Value	
HILTB-FTB: High resolution Integrated Logging Tool-DTS			
AHBHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
AHBHV	Array Induction Borehole Correction Code Version Number	880	
AHBLM	Array Induction Basic Logs Mode	6_One_Two_and_Four	
AHBLV	Array Induction Basic Logs Code Version Number	108	
AHCDE	Array Induction Casing Detection Enable	Yes	
AHCEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
AHFRSV	Array Induction Response Set Version for Four ft Resolution	40.70.24.21	
AHMRF	Array Induction Mud Resistivity Factor	1	
AHORSV	Array Induction Response Set Version for One ft Resolution	40.70.24.21	
AHRFV	Array Induction Radial Profiling Code Version Number	700	
AHRPV	Array Induction Radial Parametrization Code Version Number	223	
AHSTA	Array Induction Tool Standoff	1	IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	40.70.24.21	
BHFL	Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	215	DEGF
BSCO	Borehole Salinity Correction Option	NO	

CCCO	Casing & Cement Thickness Correction Option	NO	
DHC	Density Hole Correction	BS	
FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
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
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCO	Hole Size Correction Option	YES	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.68	G/C3
MPOF	MCFL Processing Operation Mode	ON	
MWCO	Mud Weight Correction Option	NO	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	NO	
STI: Stuck Tool Indicator			
TDL	Total Depth - Logger	9508.00	FT
PERT: Preliminary Evaluation - Real Time			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	215	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	68	DEGF
HOLEV: Integrated Hole/Cement Volume			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	215	DEGF
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
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	68	DEGF
System and Miscellaneous			
BS	Bit Size	7.875	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	9.625	IN
CWEI	Casing Weight	36.00	LB/F
DFD	Drilling Fluid Density	9.60	LB/G
DORL	Depth Offset for Repeat Analysis	0.0	FT
MST	Mud Sample Temperature	125.00	DEGF
RMFS	Resistivity of Mud Filtrate Sample	0.8160	OHMM
TD	Total Depth	9508	FT

Format: TCOMBO_AIT_REP Vertical Scale: 5" per 100' Graphics File Created: 07-Dec-2003 23:48

OP System Version: 11C0-305

MCM

HILTB-FTB	11C0-305	DSLT-FTB	11C0-305
DTC-H	11C0-305		

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_005PUP	FN:4	PRODUCER	07-Dec-2003 23:42	9523.0 FT	1182.5 FT

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_006LUP	FN:5	PRODUCER	07-Dec-2003 23:48

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CALIBRATIONS

MAXIS Field Log

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool-DTS Wellsite Calibration - Electronics Calibration Check - Thru Cal Mag. & Phase							
Master: 12-Nov-2003 15:00 Before: 7-Dec-2003 19:22							
Thru Cal Magnitude - 0	0	0.6223	0.6294	N/A	N/A	N/A	V
Thru Cal Magnitude - 1	0	1.279	1.293	N/A	N/A	N/A	V
Thru Cal Magnitude - 2	0	0.6324	0.6394	N/A	N/A	N/A	V
Thru Cal Magnitude - 3	0	0.7162	0.7244	N/A	N/A	N/A	V
Thru Cal Magnitude - 4	0	1.331	1.347	N/A	N/A	N/A	V
Thru Cal Magnitude - 5	0	1.930	1.953	N/A	N/A	N/A	V
Thru Cal Magnitude - 6	0	1.934	1.957	N/A	N/A	N/A	V
Thru Cal Magnitude - 7	0	1.363	1.383	N/A	N/A	N/A	V
Phase - 0	0	58.74	59.97	N/A	N/A	N/A	DEG
Phase - 1	0	57.72	58.97	N/A	N/A	N/A	DEG
Phase - 2	0	53.49	54.77	N/A	N/A	N/A	DEG
Phase - 3	0	52.61	53.89	N/A	N/A	N/A	DEG
Phase - 4	0	45.67	47.01	N/A	N/A	N/A	DEG
Phase - 5	0	43.42	44.82	N/A	N/A	N/A	DEG
Phase - 6	0	43.41	44.81	N/A	N/A	N/A	DEG
Phase - 7	0	37.33	39.13	N/A	N/A	N/A	DEG
High resolution Integrated Logging Tool-DTS Wellsite Calibration - Electronics Calibration Check - Auxilliary							
Master: 12-Nov-2003 15:00 Before: 7-Dec-2003 19:22							
Array Induction SPA Plus	990.5	990.1	990.8	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	-0.02682	-0.01694	N/A	N/A	N/A	MV
Array Induction Temperature Pl	0.9150	0.9170	0.9176	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	-0.00002107	-9.680E-006	N/A	N/A	N/A	V
High resolution Integrated Logging Tool-DTS Wellsite Calibration - Test Loop Gain Correction							
Master: 12-Nov-2003 15:00							
Test Loop Gain Magnitude - 0	0	1.008	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 1	0	1.008	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 2	0	1.012	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 3	0	1.012	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 4	0	0.9956	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 5	0	0.9857	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 6	0	0.9910	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 7	0	1.002	N/A	N/A	N/A	N/A	V
Phase - 0	0	0.1371	N/A	N/A	N/A	N/A	DEG
Phase - 1	0	0.3856	N/A	N/A	N/A	N/A	DEG
Phase - 2	0	-0.3698	N/A	N/A	N/A	N/A	DEG
Phase - 3	0	-0.2008	N/A	N/A	N/A	N/A	DEG
Phase - 4	0	-0.2419	N/A	N/A	N/A	N/A	DEG
Phase - 5	0	-0.1175	N/A	N/A	N/A	N/A	DEG
Phase - 6	0	0.2751	N/A	N/A	N/A	N/A	DEG
Phase - 7	0	-0.1432	N/A	N/A	N/A	N/A	DEG
High resolution Integrated Logging Tool-DTS Wellsite Calibration - Sonde Error Correction							
Master: 12-Nov-2003 15:00							
R Sonde Error Correction - 0	0	-127.4	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 1	0	165.5	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 2	0	111.3	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 3	0	55.28	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 4	0	25.15	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 5	0	11.86	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 6	0	9.437	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 7	0	-0.1316	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 0	0	-230.8	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 1	0	-17.86	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 2	0	0.2345	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 3	0	-17.73	N/A	N/A	N/A	N/A	MM/M

X Sonde Error Correction - 4	0	-2.045	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 5	0	0.1998	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 6	0	7.648	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 7	0	7.101	N/A	N/A	N/A	N/A	MM/M

High resolution Integrated Logging Tool-DTS Wellsite Calibration - Mud Gain Correction
Master: 12-Nov-2003 15:00

Coarse - Mag, Real, Imag - 0	0	1.000	N/A	N/A	N/A	N/A	
Coarse - Mag, Real, Imag - 1	0	1.001	N/A	N/A	N/A	N/A	
Coarse - Mag, Real, Imag - 2	0	1.001	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 0	0	1.001	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 1	0	1.001	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 2	0	1.001	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool-DTS Wellsite Calibration - Stab Measurement Summary
Before: 7-Dec-2003 19:27

BS Window Ratio	0.7283	N/A	0.7313	N/A	N/A	N/A	
BS Window Sum	12290	N/A	12290	N/A	N/A	N/A	CPS
SS Window Ratio	0.4705	N/A	0.4710	N/A	N/A	N/A	
SS Window Sum	11480	N/A	11460	N/A	N/A	N/A	CPS
LS Window Ratio	0.2952	N/A	0.3010	N/A	N/A	N/A	
LS Window Sum	1156	N/A	1146	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool-DTS Wellsite Calibration - Photo-multiplier High Voltages Calibrations
Before: 7-Dec-2003 19:27

BS PM High Voltage (Command)	1659	N/A	1659	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1492	N/A	1489	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1755	N/A	1756	N/A	N/A	N/A	V

High resolution Integrated Logging Tool-DTS Wellsite Calibration - Crystal Quality Resolutions Calibration
Before: 7-Dec-2003 19:27

BS Crystal Resolution	11.69	N/A	11.57	N/A	N/A	N/A	%
SS Crystal Resolution	8.849	N/A	8.939	N/A	N/A	N/A	%
LS Crystal Resolution	9.340	N/A	9.281	N/A	N/A	N/A	%

High resolution Integrated Logging Tool-DTS Wellsite Calibration - MCFL Calibration
Before: 7-Dec-2003 19:19

Raw B0 Resistivity	3875	N/A	3865	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3809	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3794	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool-DTS Wellsite Calibration - HILT Caliper Calibration
Before: 7-Dec-2003 19:19

HILT Caliper Zero Measurement	8.000	N/A	8.756	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	13.08	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool-DTS Wellsite Calibration - Detector Calibration
Before: 7-Dec-2003 19:21

Gamma Ray Background	30.00	N/A	69.59	N/A	N/A	N/A	GAPI
Gamma Ray (Jig - Bkg)	258.7	N/A	258.7	N/A	N/A	23.52	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool-DTS Wellsite Calibration - Zero Measurement
Master: 2-Dec-2003 22:41 Before: 7-Dec-2003 19:29

CNTC Background	27.94	27.94	29.00	N/A	N/A	4.191	CPS
CFTC Background	29.06	29.06	32.63	N/A	N/A	4.359	CPS

High resolution Integrated Logging Tool-DTS Wellsite Calibration - Accelerometer Calibration
Before: 7-Dec-2003 19:22

Z-Axis Acceleration	32.19	N/A	32.12	N/A	N/A	N/A	F/S2

High resolution Integrated Logging Tool-DTS Master Calibration - Inversion results
Master: 21-Nov-2003 14:03

Rho Aluminum	2.596	2.596	–	–	–	–	G/C3
Rho Magnesium	1.686	1.687	–	–	–	–	G/C3
Pe Aluminum	2.570	2.563	–	–	–	–	
Pe Magnesium	2.650	2.605	–	–	–	–	

High resolution Integrated Logging Tool-DTS Master Calibration - Deviation Summary
Master: 21-Nov-2003 14:03

BS Average Deviation	0	0.4355	–	–	–	–	%
BS Max Deviation	0	1.208	–	–	–	–	%
SS Average Deviation	0	0.2902	–	–	–	–	%
SS Max Deviation	0	1.125	–	–	–	–	%
LS Average Deviation	0	0.7775	–	–	–	–	%
LS Max Deviation	0	2.571	–	–	–	–	%

High resolution Integrated Logging Tool-DTS Master Calibration - Tank Measurement
Master: 2-Dec-2003 22:41

Thermal Near Corr. (Tank)	6031	5606	–	–	–	–	CPS
Thermal Far Corr. (Tank)	2793	2377	–	–	–	–	CPS
CNTC/CFTC (Tank)	0.158	0.358					

CNTC/CFTC (Tank)	2.159	2.358	–	–	–	–	

High resolution Integrated Logging Tool-DTS Master Calibration - Tank Measurement
Master: 2-Dec-2003 22:41

Thermal Near Corr. (Tank)	6031	5606	–	–	–	–	CPS
Thermal Far Corr. (Tank)	2793	2377	–	–	–	–	CPS
CNTC/CFTC (Tank)	2.159	2.358	–	–	–	–	

The GLS-VJ source activity is acceptable.

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

NCT-B Water Temperature 60.4 DEGF.
Thermal Housing Size 3.376 IN.

High resolution Integrated Logging Tool-DTS / Equipment Identification

Primary Equipment:

Array Induction Tool - H	AIT - H	
Pm/SP Bottom Nose	AHRM - A	
Array Induction Sonde	AHIS - BA	396
HILT high-Resolution Mechanical Sonde	HRMS - B	1847
HILT Pxo Gamma-ray Device	HRGD - B	1903
HILT Nuclear Back-Scatter Detector	HILT -	
HILT Nuclear Short-Spacing Detector	HILT -	
HILT Nuclear Long-Spacing Detector	HILT -	

Auxiliary Equipment:

High resolution Integrated Logging Tool-DTS Wellsite Calibration
Electronics Calibration Check - Thru Cal Mag. & Phase

Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6223		0.6050	58.74		71.00
	Before	0.6294			59.97		
1	Master	1.279		1.270	57.72		70.00
	Before	1.293			58.97		
2	Master	0.6324		0.6230	53.49		66.00
	Before	0.6394			54.77		
3	Master	0.7162		0.7040	52.61		65.00
	Before	0.7244			53.89		
4	Master	1.331		1.337	45.67		59.00
	Before	1.347			47.01		
5	Master	1.930		1.955	43.42		57.00
	Before	1.953			44.82		
6	Master	1.934		1.955	43.41		57.00
	Before	1.957			44.81		
7	Master	1.363		1.415	37.33		53.00
	Before	1.383			39.13		
		60.00 % (Minimum)	(Nominal) 140.0 % (Maximum)		Nom -60.00 (Minimum)	(Nominal) Nom + 60.00 (Maximum)	

Master: 12-Nov-2003 15:00 Before: 7-Dec-2003 19:22

High resolution Integrated Logging Tool-DTS Wellsite Calibration
Electronics Calibration Check - Auxilliary

Phase	Array Induction SPA Plus MV	Value	Phase	Array Induction SPA Zero MV	Value
Master		990.1	Master		-0.02682
Before		990.8	Before		-0.01694
	941.0 990.5 1040			-50.00 0 50.00	

	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	
Phase Array Induction Temperature Plus V				Value	Phase Array Induction Temperature Zero V				Value
Master				0.9170	Master				-2.107E-00
Before				0.9176	Before				-9.680E-00
	0.8700 (Minimum)	0.9150 (Nominal)	0.9600 (Maximum)			-0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)	

Master: 12-Nov-2003 15:00 Before: 7-Dec-2003 19:22

High resolution Integrated Logging Tool-DTS Wellsite Calibration

Test Loop Gain Correction

Idx	Value	Test Loop Gain Magnitude V			Value	Phase DEG		
0	1.008				0.1371			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
1	1.008				0.3856			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
2	1.012				-0.3698			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
3	1.012				-0.2008			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
4	0.9956				-0.2419			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
5	0.9857				-0.1175			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
6	0.9910				0.2751			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
7	1.002				-0.1432			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)

Master: 12-Nov-2003 15:00

High resolution Integrated Logging Tool-DTS Wellsite Calibration

Sonde Error Correction

Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M		
0	-127.4				-230.8			
		-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)		-2250 (Minimum)	0 (Nominal)	2250 (Maximum)
1	165.5				-17.86			
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		-625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)
2	111.3				0.2345			
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		-350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	55.28				-17.73			
		39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)		-250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	25.15				-2.045			
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		-63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	11.86				0.1998			
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	9.437				7.648			
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	-0.1316				7.101			
		-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)

Master: 12-Nov-2003 15:00

High resolution Integrated Logging Tool-DTS Wellsite Calibration

Mud Gain Correction

Idx	Value	Coarse - Mag, Real, Imag			Value	Fine - Mag, Real, Imag		
0	1.000	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	1.001	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
1	1.001	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	1.001	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
2	1.001	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	1.001	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)

Master: 12-Nov-2003 15:00

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	0.6919 (Minimum)	0.7283 (Nominal)	0.7647 (Maximum)	0.7313	Before	0.4470 (Minimum)	0.4705 (Nominal)	0.4940 (Maximum)	0.4710	Before	0.2805 (Minimum)	0.2952 (Nominal)	0.3100 (Maximum)	0.3010
Phase	BS Window Sum CPS			Value	Phase	SS Window Sum CPS			Value	Phase	LS Window Sum CPS			Value
Before	11670 (Minimum)	12290 (Nominal)	12900 (Maximum)	12290	Before	10910 (Minimum)	11480 (Nominal)	12060 (Maximum)	11460	Before	1098 (Minimum)	1156 (Nominal)	1214 (Maximum)	1146

Before: 7-Dec-2003 19:27

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	1559 (Minimum)	1659 (Nominal)	1759 (Maximum)	1659	Before	1392 (Minimum)	1492 (Nominal)	1592 (Maximum)	1489	Before	1655 (Minimum)	1755 (Nominal)	1855 (Maximum)	1756

Before: 7-Dec-2003 19:27

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	10.69 (Minimum)	11.69 (Nominal)	12.69 (Maximum)	11.57	Before	7.849 (Minimum)	8.849 (Nominal)	9.849 (Maximum)	8.939	Before	8.340 (Minimum)	9.340 (Nominal)	10.34 (Maximum)	9.281

Before: 7-Dec-2003 19:27

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	3565 (Minimum)	3875 (Nominal)	4185 (Maximum)	3865	Before	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	3809	Before	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	3794

Before: 7-Dec-2003 19:19

High resolution Integrated Logging Tool-DTS Wellsite Calibration

HLT Caliper Calibration

Phase	HLT Caliper Zero Measurement IN			Value	Phase	HLT Caliper Plus Measurement IN			Value
Before	6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)	8.756	Before	9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)	13.08

Before: 7-Dec-2003 19:19

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	0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)	69.59	Before	235.2 (Minimum)	258.7 (Nominal)	282.3 (Maximum)	258.7	Before	150.0 (Minimum)	165.0 (Nominal)	180.0 (Maximum)	165.0

Before: 7-Dec-2003 19:01

Before: 7-Dec-2003 19:21

High resolution Integrated Logging Tool-DTS Wellsite Calibration					
Zero Measurement					
Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		27.94	Master		29.06
Before		29.00	Before		32.63
5.000 (Minimum)	27.94 (Nominal)	40.00 (Maximum)	5.000 (Minimum)	29.06 (Nominal)	40.00 (Maximum)
Master: 2-Dec-2003 22:41			Before: 7-Dec-2003 19:29		

High resolution Integrated Logging Tool-DTS Wellsite Calibration		
Accelerometer Calibration		
Phase	Z-Axis Acceleration F/S2	Value
Before		32.12
31.53 (Minimum)	32.19 (Nominal)	32.84 (Maximum)
Before: 7-Dec-2003 19:22		

High resolution Integrated Logging Tool-DTS Master Calibration							
Electronics Calibration Check - Thru Cal Mag. & Phase							
Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6223		0.6050	58.74		71.00
1	Master	1.279		1.270	57.72		70.00
2	Master	0.6324		0.6230	53.49		66.00
3	Master	0.7162		0.7040	52.61		65.00
4	Master	1.331		1.337	45.67		59.00
5	Master	1.930		1.955	43.42		57.00
6	Master	1.934		1.955	43.41		57.00
7	Master	1.363		1.415	37.33		53.00
		60.00 % (Minimum)	(Nominal)	140.0 % (Maximum)	Nom -60.00 (Minimum)	(Nominal)	Nom + 60.00 (Maximum)
Master: 12-Nov-2003 15:00							

High resolution Integrated Logging Tool-DTS Master Calibration					
Electronics Calibration Check - Auxilliary					
Phase	Array Induction SPA Plus MV	Value	Phase	Array Induction SPA Zero MV	Value
Master		990.1	Master		-0.02682
941.0 (Minimum)	990.5 (Nominal)	1040 (Maximum)	-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
Phase	Array Induction Temperature Plus V	Value	Phase	Array Induction Temperature Zero V	Value
Master		0.9170	Master		-2.107E-00
0.8700 (Minimum)	0.9150 (Nominal)	0.9600 (Maximum)	-0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)
Master: 12-Nov-2003 15:00					

High resolution Integrated Logging Tool-DTS Master Calibration					
Test Loop Gain Correction					
Idx	Value	Test Loop Gain Magnitude V	Value	Phase DEG	
0	1.008		0.1371		
	0.9500 (Minimum)	1.000 (Nominal) 1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
1	1.008		0.3856		
	0.9500 (Minimum)	1.000 (Nominal) 1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
2	1.012		-0.3698		
	0.9500 (Minimum)	1.000 (Nominal) 1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
3	1.012		-0.2008		
	0.9500 (Minimum)	1.000 (Nominal) 1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)

4	0.9956	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-0.2419	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
5	0.9857	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-0.1175	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
6	0.9910	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	0.2751	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
7	1.002	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-0.1432	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)

Master: 12-Nov-2003 15:00

High resolution Integrated Logging Tool-DTS Master Calibration

Sonde Error Correction

Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M		
0	-127.4	-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)	-230.8	-2250 (Minimum)	0 (Nominal)	2250 (Maximum)
1	165.5	114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)	-17.86	-625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)
2	111.3	66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)	0.2345	-350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	55.28	39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)	-17.73	-250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	25.15	15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)	-2.045	-63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	11.86	4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)	0.1998	-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	9.437	5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)	7.648	-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	-0.1316	-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)	7.101	-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)

Master: 12-Nov-2003 15:00

High resolution Integrated Logging Tool-DTS Master Calibration

Mud Gain Correction

Idx	Value	Coarse - Mag, Real, Imag			Value	Fine - Mag, Real, Imag		
0	1.000	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	1.001	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
1	1.001	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	1.001	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
2	1.001	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	1.001	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)

Master: 12-Nov-2003 15:00

High resolution Integrated Logging Tool-DTS Master Calibration

Inversion results

Phase	Rho Aluminum G/C3			Value	Phase	Rho Magnesium G/C3			Value
Master	2.586 (Minimum)	2.596 (Nominal)	2.606 (Maximum)	2.596	Master	1.676 (Minimum)	1.686 (Nominal)	1.696 (Maximum)	1.687
Phase	**Pe Aluminum**			**Value**	**Phase**	**Pe Magnesium**			**Value**
Master				2.563	Master				2.605

2.470 (Minimum)	2.570 (Nominal)	2.670 (Maximum)	2.550 (Minimum)	2.650 (Nominal)	2.750 (Maximum)

Master: 21-Nov-2003 14:03

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		0.4355	Master		0.2902	Master		0.7775
-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		1.208	Master		1.125	Master		2.571
-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: 21-Nov-2003 14:03

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		5606	Master		2377	Master		2.358
5000 (Minimum)	6031 (Nominal)	7200 (Maximum)	2075 (Minimum)	2793 (Nominal)	3125 (Maximum)	2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)

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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		5606	Master		2377	Master		2.358
5000 (Minimum)	6031 (Nominal)	7200 (Maximum)	2075 (Minimum)	2793 (Nominal)	3125 (Maximum)	2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)

Master: 2-Dec-2003 22:41

Company: **ENCANA OIL & GAS (USA) INC.**

Schlumberger

Well: **WIEBEN 2-13 (M2SW)**
Field: **MAMM CREEK**
County: **GARFIELD**
State: **COLORADO**

PLATFORM EXPRESS
ARRAY INDUCTION
GAMMA RAY