Schlumberger

Company: **Lakes Oil N.L.**

Well: **Wombat−4**
Field: **Wombat**
Rig: **Hunt #2** Country: **Australia**

HALS−BHC−PEX
Field Print
1:200 Scale

Rig: Hunt #2
Field: Wombat
Location: GIPPSLAND BASIN
Well: Wombat−4
Company: Lakes Oil N.L.

LOCATION

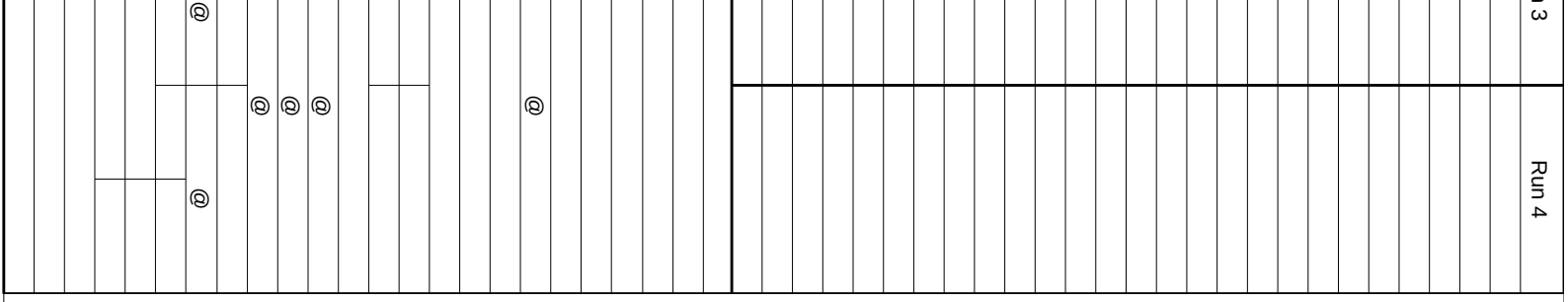
GIPPSLAND BASIN
557511051 E
5753093 N

Elev.: K.B. 26.65 m
G.L. 23.00 m
D.F. 26.65 m

Permanent Datum: Mean Sea Level Elev.: 0.00 m
Log Measured From: Kelly Bushing 26.65 m above Perm. Datum
Drilling Measured From: Kelly Bushing

State:	Max. Well Deviation	Longitude	Latitude
Victoria	0 deg	147*7'35.531 S	38*22'13.069 E

	Run 1	Run 2	Run 1	Run 2
Logging Date	28−Oct−2009			
Run Number	1			
Depth Driller	1366 m			
Schlumberger Depth	1361.3 m			
Bottom Log Interval	1354 m			
Top Log Interval	299 m			
Casing Driller Size @ Depth	9.625 in @ 299 m	@	@	
Casing Schlumberger	299 m			
Bit Size	8.500 in			
Type Fluid In Hole	KCL Polymer			
MUD Density / Viscosity	1.26416 g/cm3 / 50 s			
MUD Fluid Loss / PH	7 cm3 / 8.3			
MUD Source Of Sample	Flowline			
RM @ Measured Temperature	0.320 ohm.m @ 17 degC	@	@	
RMF @ Measured Temperature	0.240 ohm.m @ 17 degC	@	@	
RMC @ Measured Temperature	0.357 ohm.m @ 17 degC	@	@	
Source RMF / RMC	Flowline / Press			
RM @ MRT / RMF @ MRT	0.163 @ 54 / 0.122 @ 54	@ / @	@ / @	
Maximum Recorded Temperatures	54 degC			
Circulation Stopped / Time	27−Oct−2009 / 22:10			
Logger On Bottom / Time	28−Oct−2009 / 7:30			
Unit Number / Location	3061 / Roma			
Recorded By	Danielle Cox			
Witnessed By	Tim O'Brien			



DEPTH SUMMARY LISTING

Date Created: 28−OCT−2009 8:43:15

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW−B	Type:	CMTD−B/A	Type:	7−42ZV XS
Serial Number:	3718	Serial Number:	1050	Serial Number:	6284
Calibration Date:	01−MAY−2009	Calibration Date:	20−OCT−2009	Length:	3390 M
Calibrator Serial Number:	30	Calibrator Serial Number:			
Calibration Cable Type:	7−42ZV XS	Number of Calibration Points:	10	Conveyance Method:	Wireline
Wheel Correction 1:	−4	Calibration RMS:	12	Rig Type:	LAND
Wheel Correction 2:	−4	Calibration Peak Error:	27		

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	60.12 M
Rig Up Length At Bottom:	60.19 M
Rig Up Length Correction:	−0.07 M
Stretch Correction:	0.30 M
Tool Zero Check At Surface:	0.10 M

Depth Control Remarks

1. All Schlumberger Depth Control Policies Followed
2. IDW used as primary depth reference
3. Z−chart used as secondary depth reference
4.
5.
6.

OTHER SERVICES1	OTHER SERVICES2
OS1: HALS−BHC−TLD−HGNS−GR	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:

REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
ALL LOGGING INTERVALS, TOOLSTRING CONFIGURATION AND PRESENTATIONS AS PER	
CLIENT REQUEST	
THIS IS THE FIRST RUN IN HOLE	
HALS RUN WITH TWO 1.5IN STANDOFFS	
BHC RUN WITH THREE 1.5IN STANDOFFS FOR CENTRALIZATION	
HGNS RUN WITH ECCENTRALIZING BOWSPRING	
CEMENT VOLUME CALCULATED USING HCAL, CALIPER CHECKED IN CASING AT 8.92IN	

CEMENT VOLUME CALCULATED USING HCAL CALIPER CHECKED IN CASING AT 8.92IN

MAXIMUM RECORDED TEMPERATURE FROM HEAD THERMOMETERS AND HGNS

NEUTRON−POROSITY CORRECTED FOR HOLESIZE, BOREHOLE SALINITY

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NO HIRES REQUESTED AT WELLSITE

TWO ZONES ON REPEAT PASS DID NOT REPEAT BECAUSE TOOL ROTATED AT 1228−34M AND 1267−74M

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RUN 1			RUN 2		
SERVICE ORDER #:			SERVICE ORDER #:		
PROGRAM VERSION:		17C0−154	PROGRAM VERSION:		
FLUID LEVEL:		0 m	FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

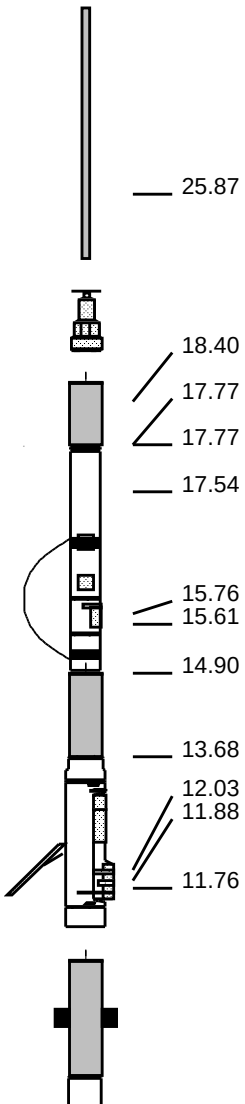
EQUIPMENT DESCRIPTION

RUN 1 RUN 2

SURFACE EQUIPMENT

LCM−AA 2726
GSR−U 2001
NCT−B
CNB−AB
NCS−VB
WITM (DTS)−A 60162

DOWNHOLE EQUIPMENT



BSP 43.96
BRT−S

SP SPARC — 25.87

LEH−QT 19.57
LEH−QT 1188

CTEM — 18.40
HGNS HTEM

DTC−H 18.68
ECH−KC 10265
DTCH0−A 9190

HMCA — 17.77
TelStatus
ToolStatu — 17.77

HILTB−FTB 17.77
HGNSD−B 856
HMCA
HGNH 3915
NLS−KL
NSR−F 5050
HACCZ 379
HCNT
HGR
HRCC−B 868
HRMS−B 788
HRGD−B 1806
GLS−J 5374
MCFL Device
HILT Nucl. LS 28356
HILT Nucl. SS 14120
HILT Nucl. BS 26468
BOW−SPR
NPV−N

HGNS Gamm — 17.54

HGNS Neut — 15.76
HGNS Neut — 15.61

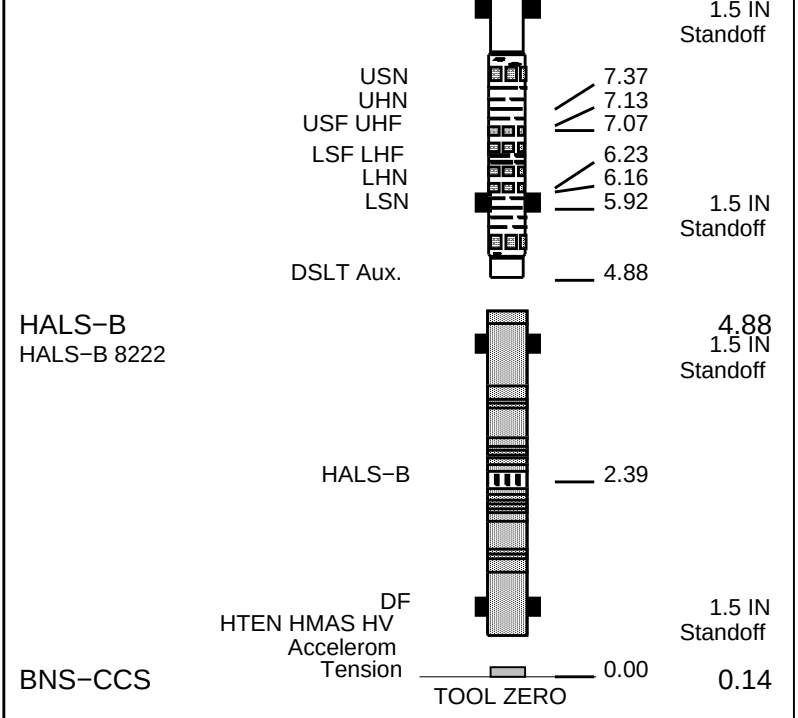
HGNS sens — 14.90

HRCC cart — 13.68

MCFL — 12.03
HILT cali — 11.88
HRDD−LS
HRDD−SS
HRDD−BS — 11.76

DSLT−H 11.17
DSLC−H 8222
ECH−KH 8272
SLS−W 1093

1.5 IN Standoff



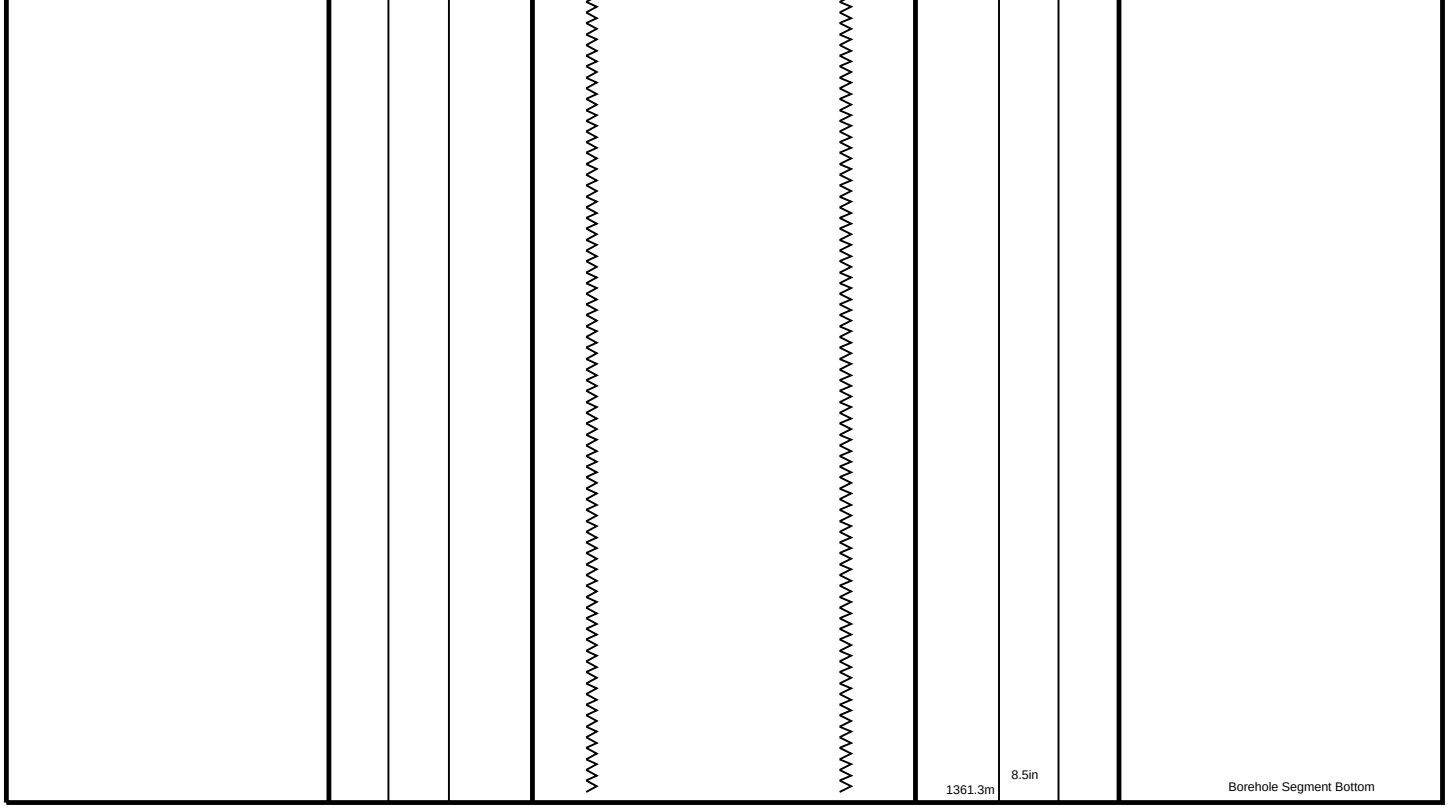
MAXIMUM STRING DIAMETER 6.63 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN METERS

Client: Lakes Oil
Well: Wombat−4
Field: Wombat
State: Victoria
Country: Australia

Drawing Date: 10/28/2009
API #:

Rig Name: Hunt #2
Reference Datum: Kelly Bushing
Elevation: 26.6 m

Production String	(in) OD	(in) ID	(m) MD	Well Schematic	(m) MD	(in) OD	(in) ID	Casing String
					0.0	9.625		Casing String
					299.0	9.625		Casing Shoe
					299.0	8.500		Borehole Segment



Schlumberger

Main Log 1:200 Scale
Standard Resolution

MAXIS Field Log

Company: Lakes Oil N.L. **Well: Wombat−4**

Output DLIS Files

DEFAULT	HALS_SONIC_TLD_MCFL_012LUP	FN:18	PRODUCER	28−Oct−2009 07:30	1362.8 M	−4.9 M
REALTIME	HALS_SONIC_TLD_MCFL_012LUP	FN:19	PRODUCER	28−Oct−2009 06:30	1362.8 M	−4.9 M

Integrated Hole/Cement Volume Summary

Hole Volume = 41.25 M3

Cement Volume = 14.87 M3 (assuming 7.00 IN casing O.D.)

Computed from 1361.2 M to 299.0 M using data channel(s) HCAL

OP System Version: 17C0−154

HALS−B	SRPC−3821−O2_2009_OP17	DSLT−H	17C0−154

HILTB−FTB	SRPC−3821−Q2_2009_OP17	DTC−H	17C0−154
BSP	17C0−154		

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 0.1 M3
- Integrated Hole Volume Major Pip Every 1 M3
- Integrated Cement Volume Minor Pip Every 0.1 M3
- Integrated Cement Volume Major Pip Every 1 M3
- Integrated Transit Time Minor Pip Every 1 MS
- Integrated Transit Time Major Pip Every 10 MS
- Time Mark Every 60 S

Washout
From BS to HCAL

Mudcake
From HCAL to BS

SP (SP)
−50 (MV) 50

HILT Caliper (HCAL)
6 (IN) 16

HGNS Deviation (GDEV)
−10 (DEG) 90

Gamma Ray (GR)
0 (GAPI) 200

Bit Size (BS)
6 (IN) 16

Computed Micro Normal (HMNO)
20 (OHMM) 0

Computed Micro Inverse (HMIN)
20 (OHMM) 0

Calibrated Downhole Force (CDF) (LBF)
0 2000

Tension (TENS) (LBF)
0 4000

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

Laterolog Shallow Resistivity (HLLS)
0.2 (OHMM) 2000

Laterolog Deep Resistivity (HLLD)
0.2 (OHMM) 2000

Env.Corr.Thermal Neutron Porosity (TNPH)
0.45 (V/V) −0.15

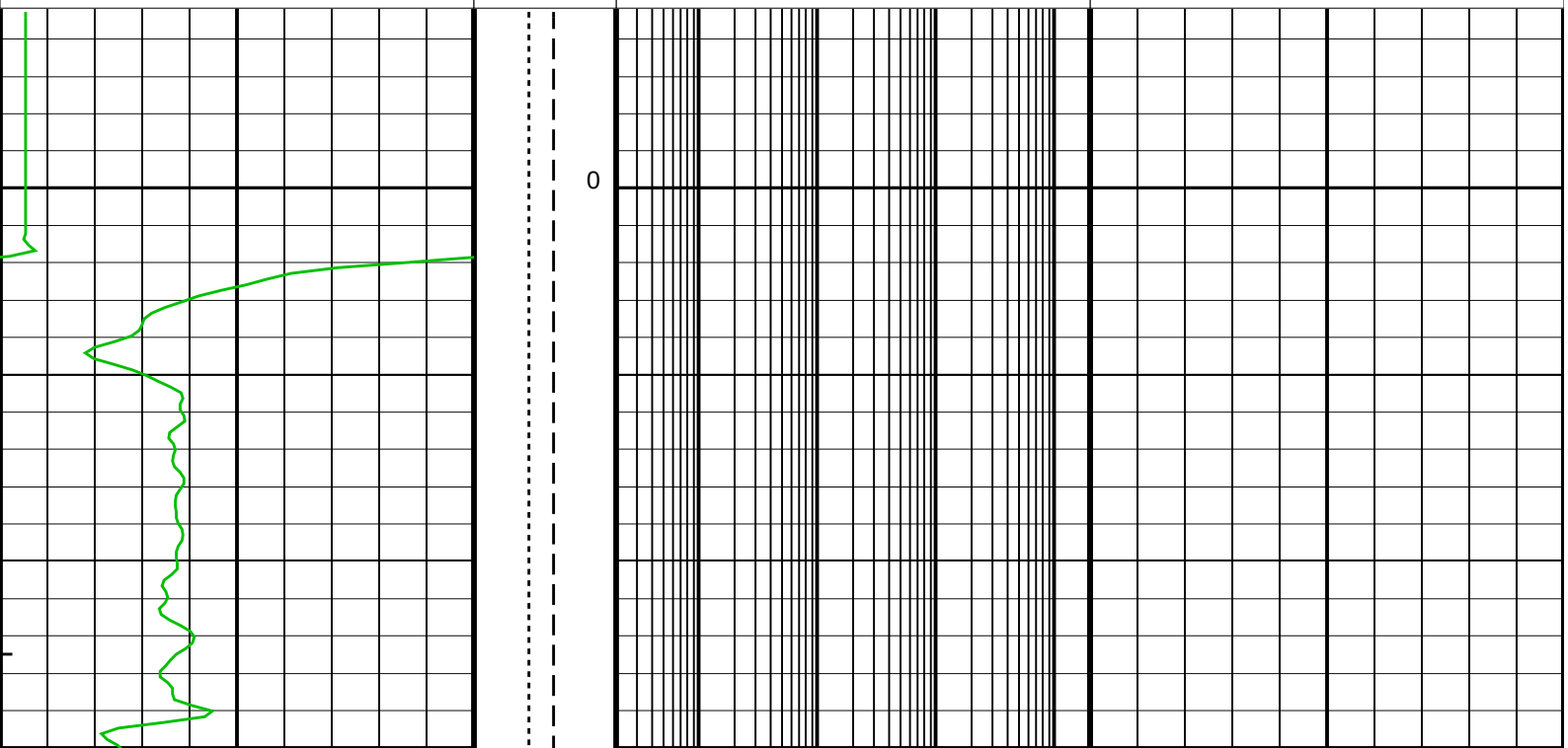
Density/Porosity Cross Over
From RHOZ to TNPH

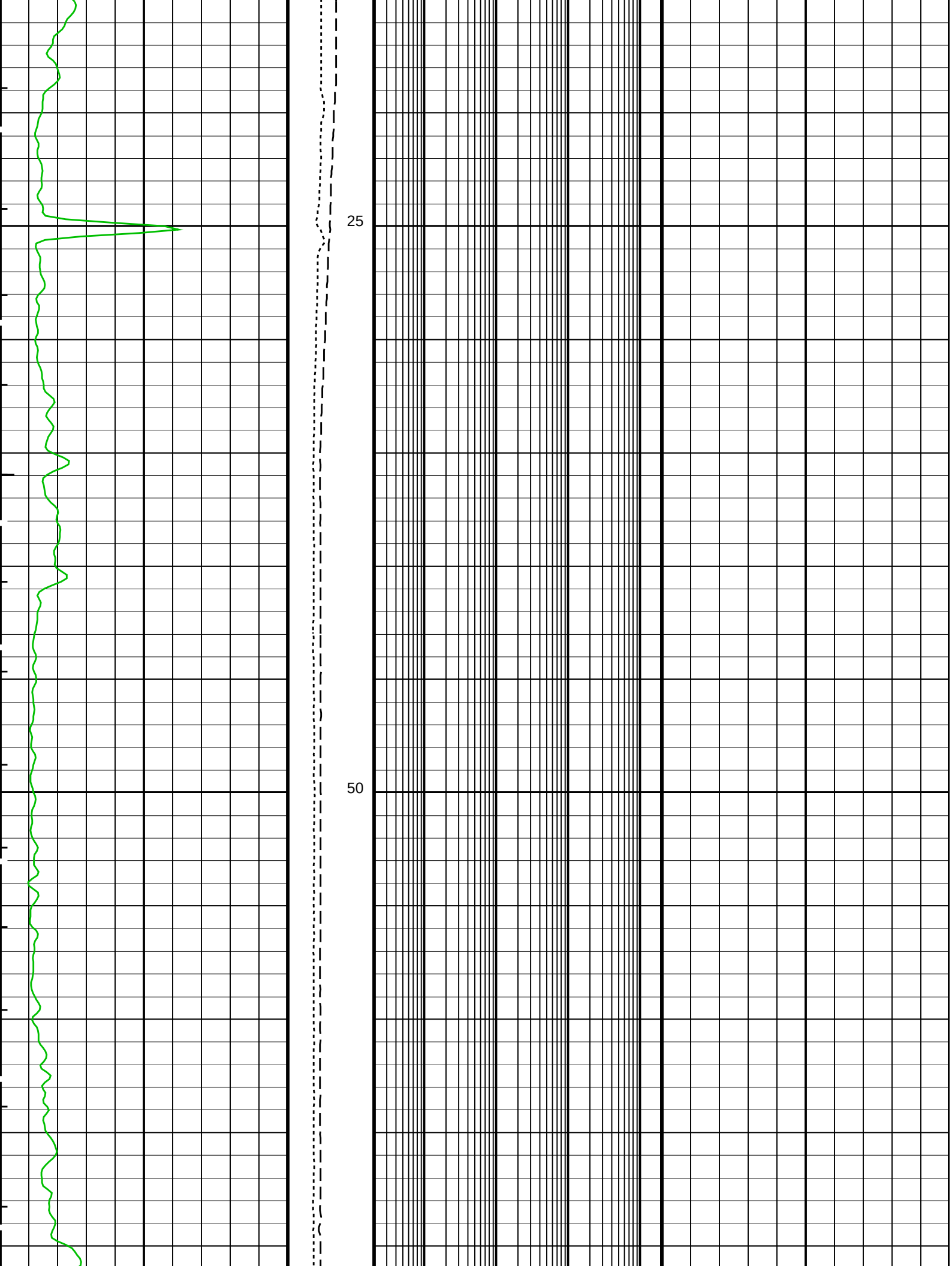
Std. Res. Formation Density (RHOZ)
1.95 (G/C3) 2.95

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

Density Correction (HDRA)
−0.25 (G/C3) 0.25

Delta−T (DT)
140 (US/F) 40

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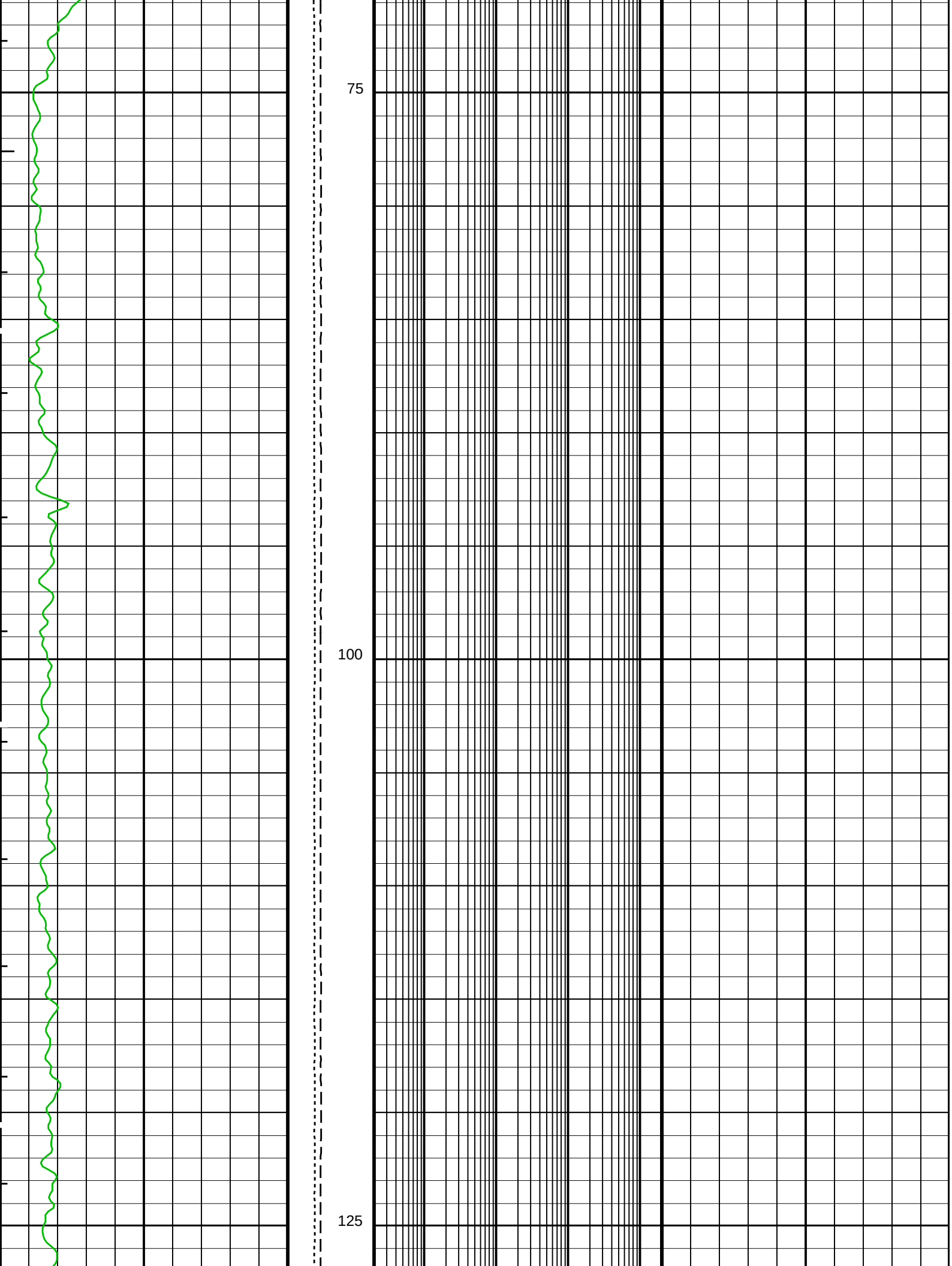
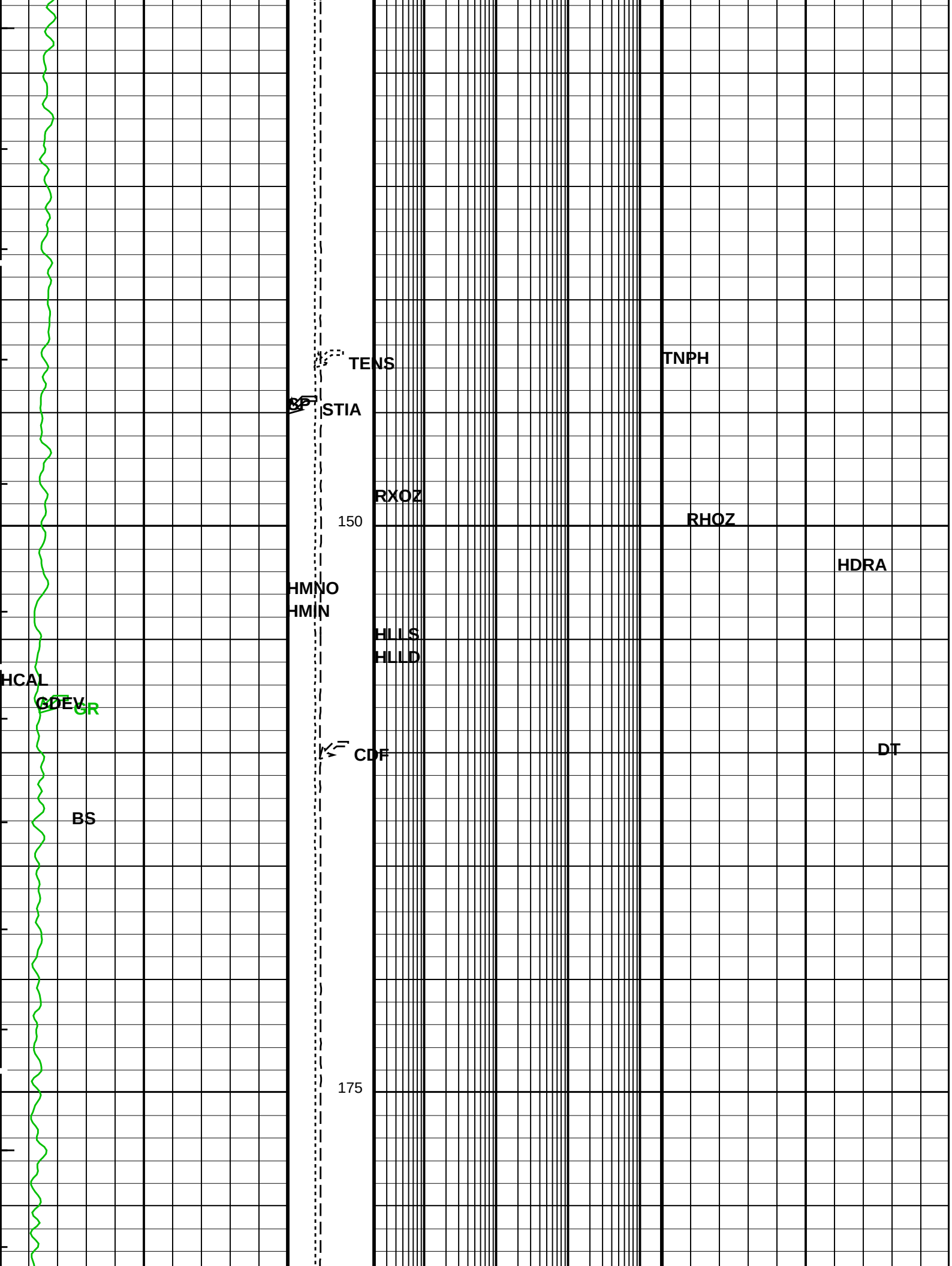

75
100
125


TENS
TNPH
SP
STIA
RXOZ
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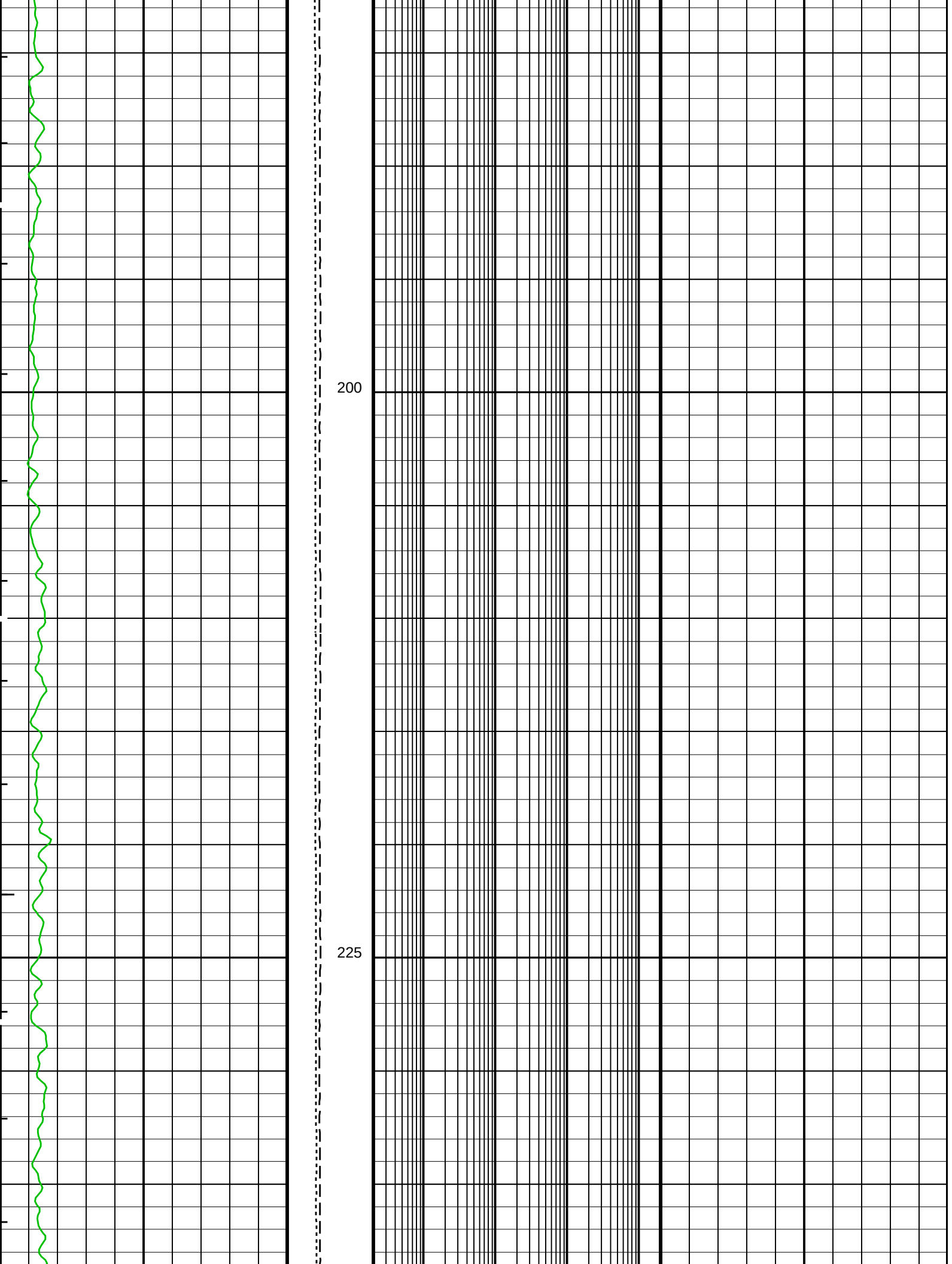
RHOZ
HDRA
HMNO
HMIN
HLLS
HLLD
HCAL
GDEV
GR
CDF
DT
BS
175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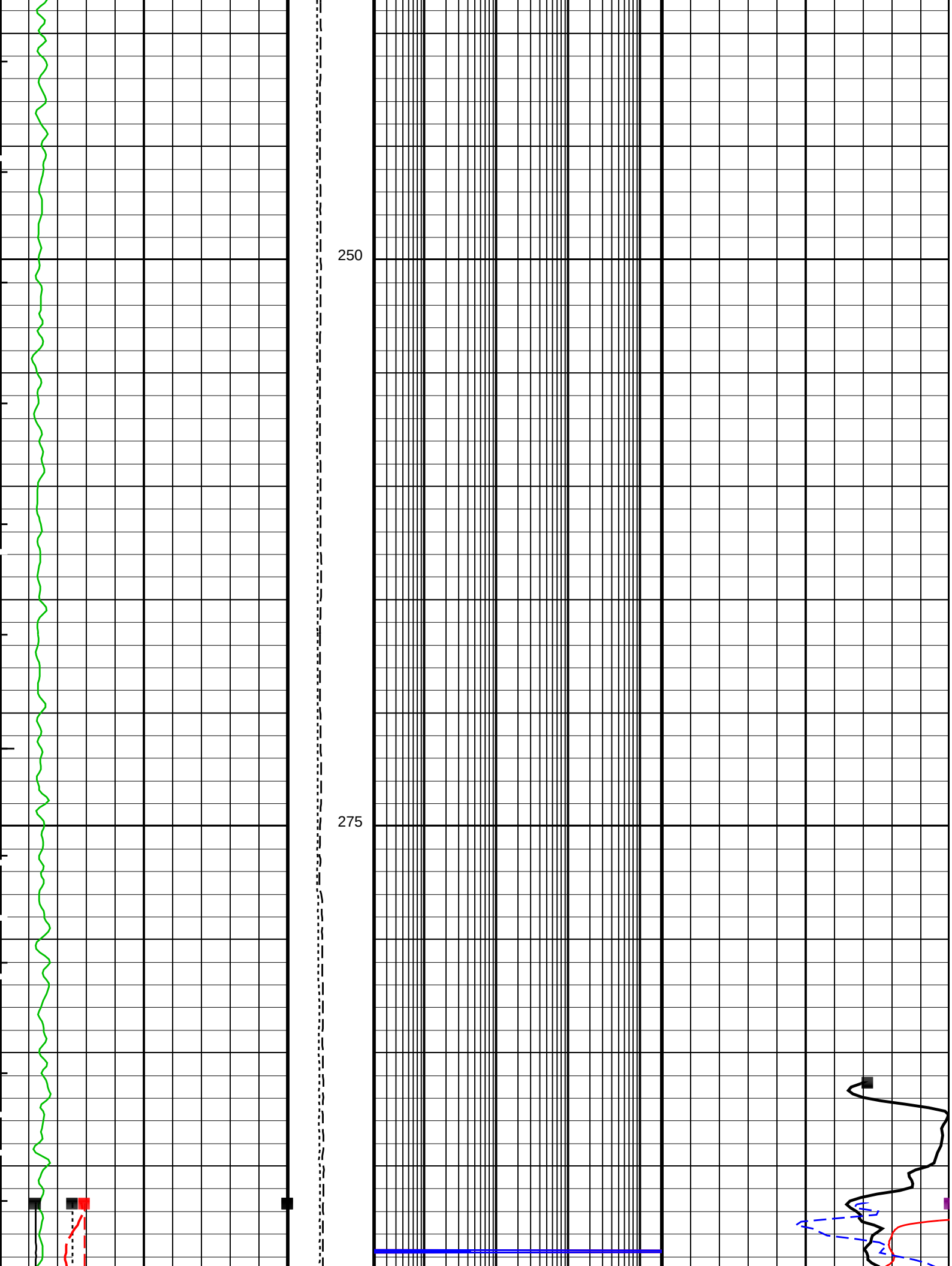
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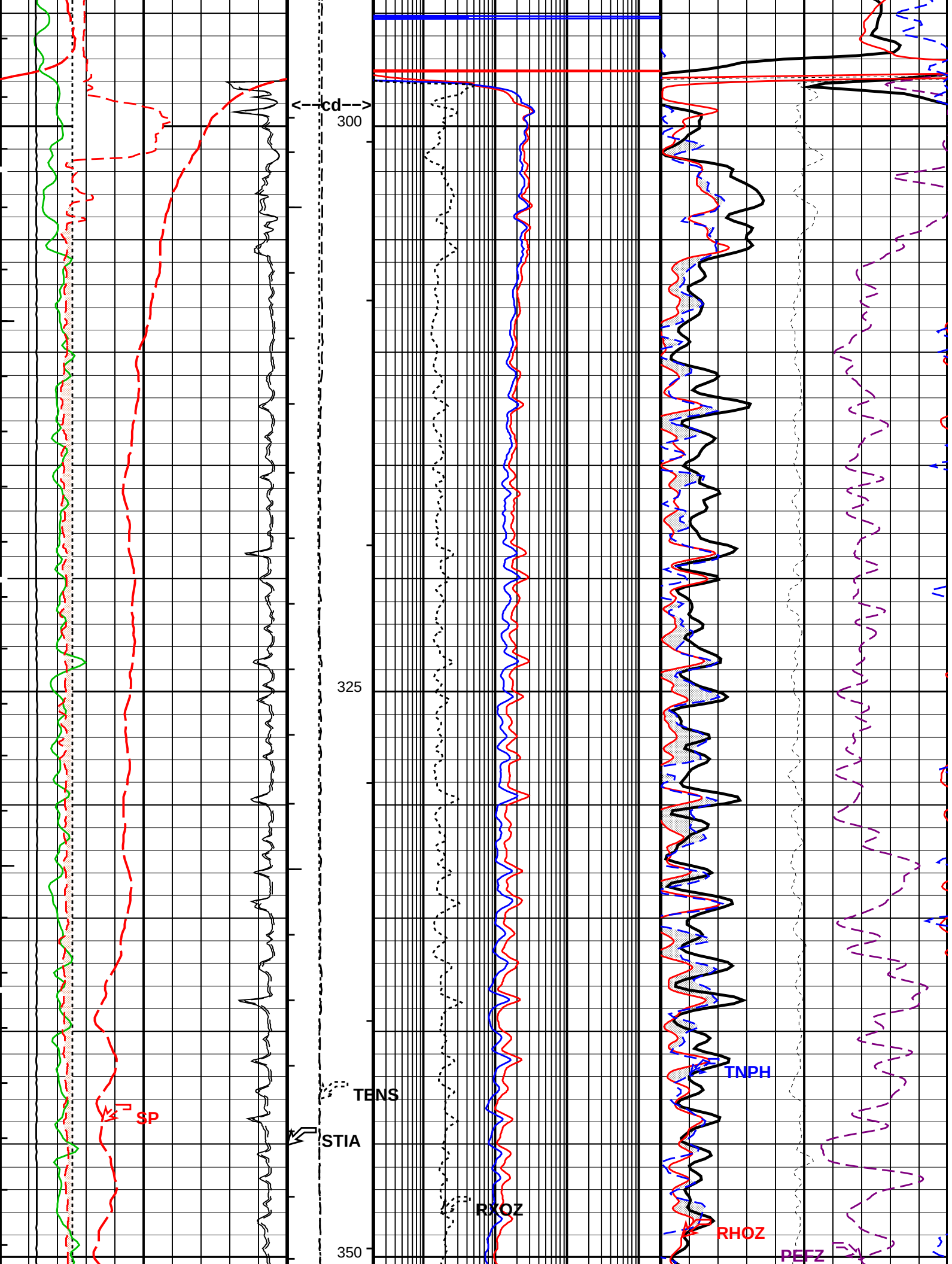
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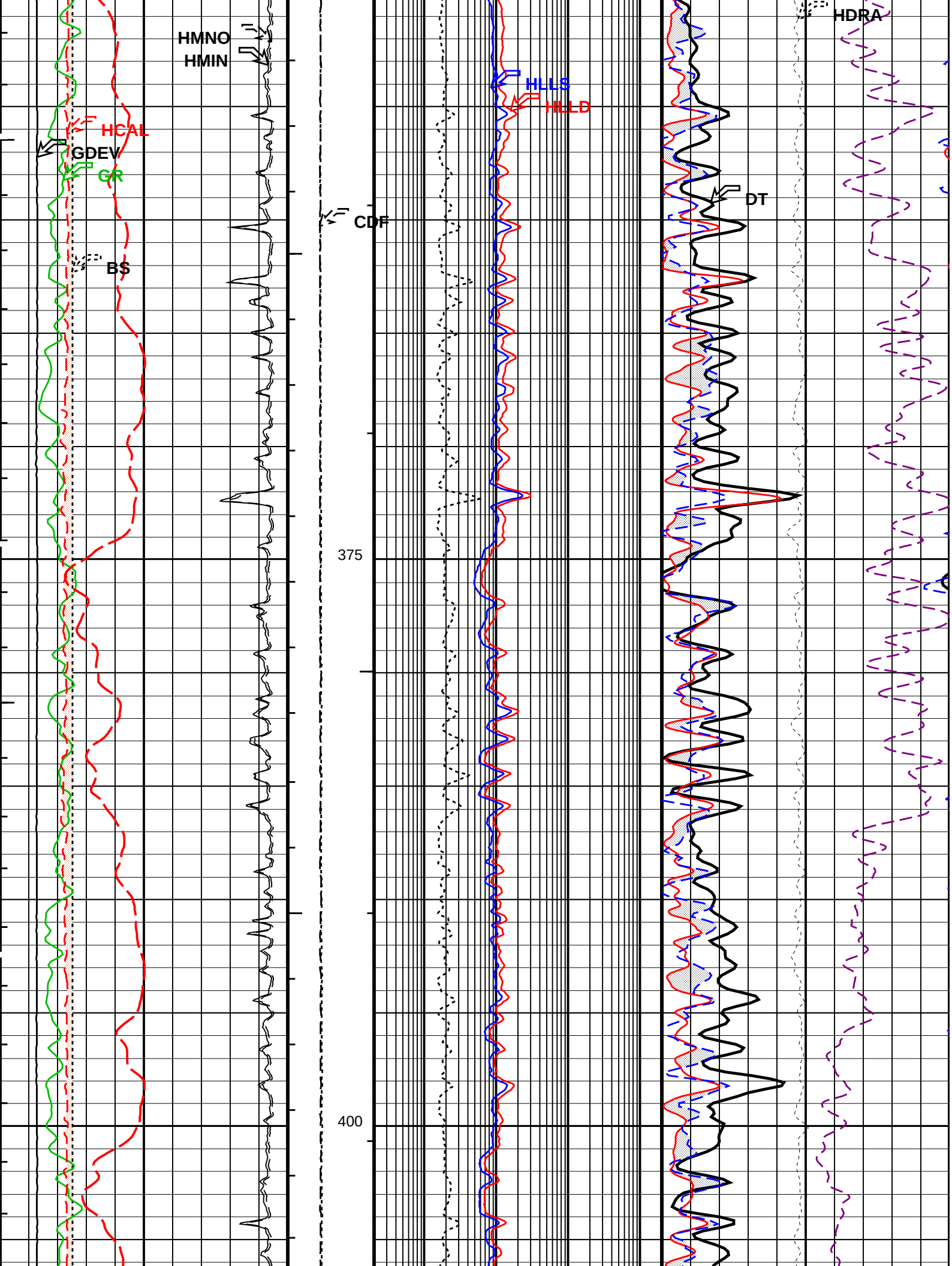
STIA
RXOZ
TNPH
RHOZ
PEFZ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HLLD
DT
HDRA
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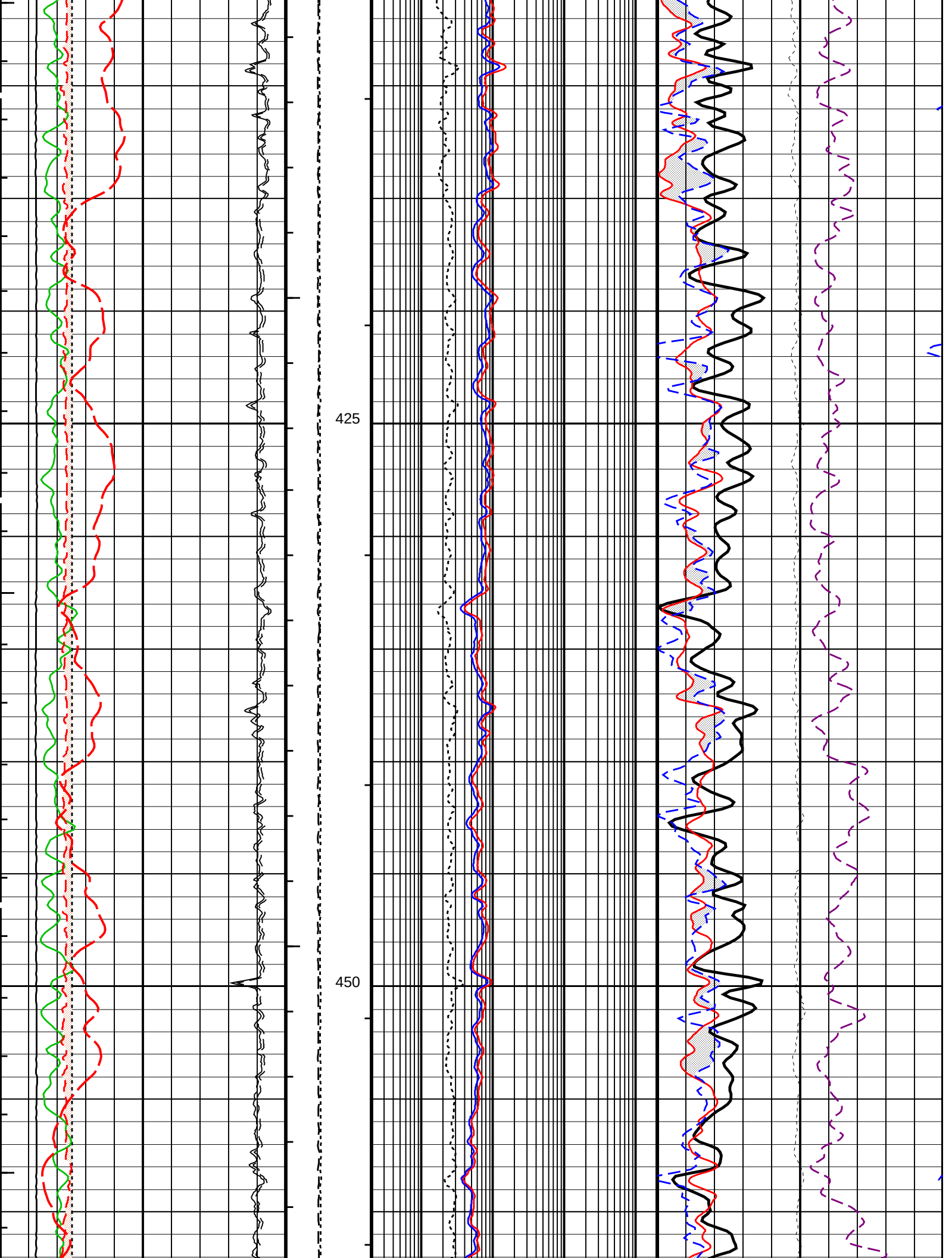
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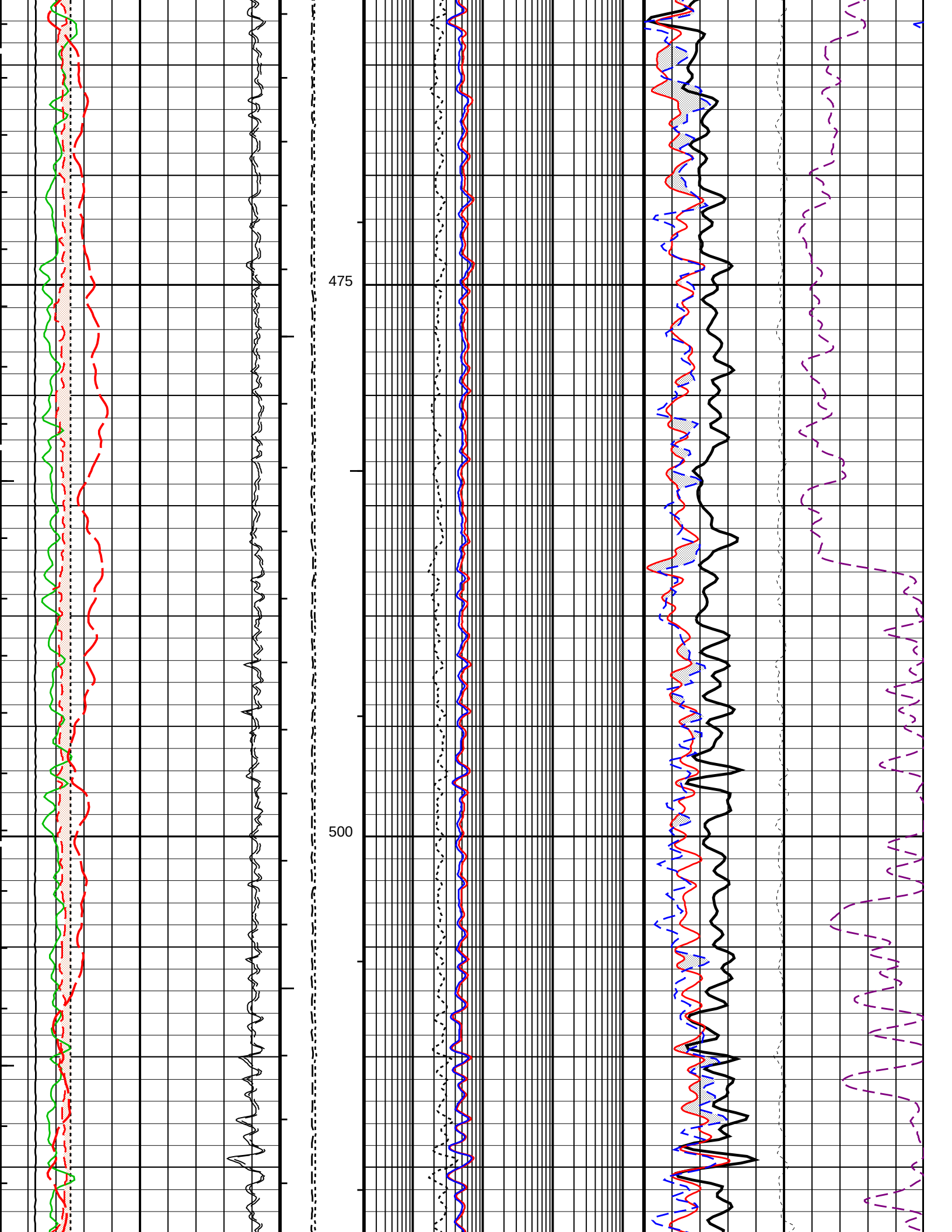
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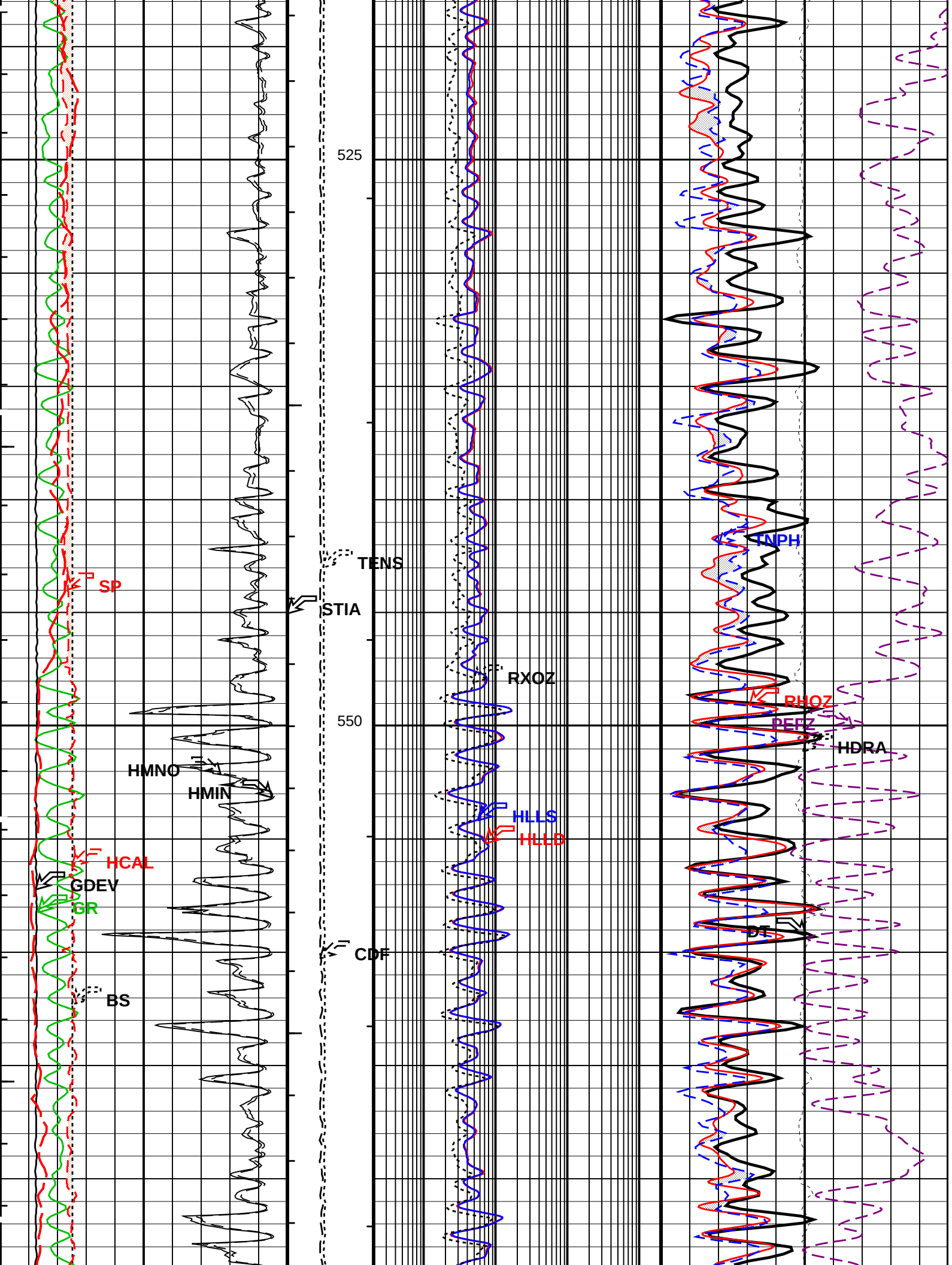
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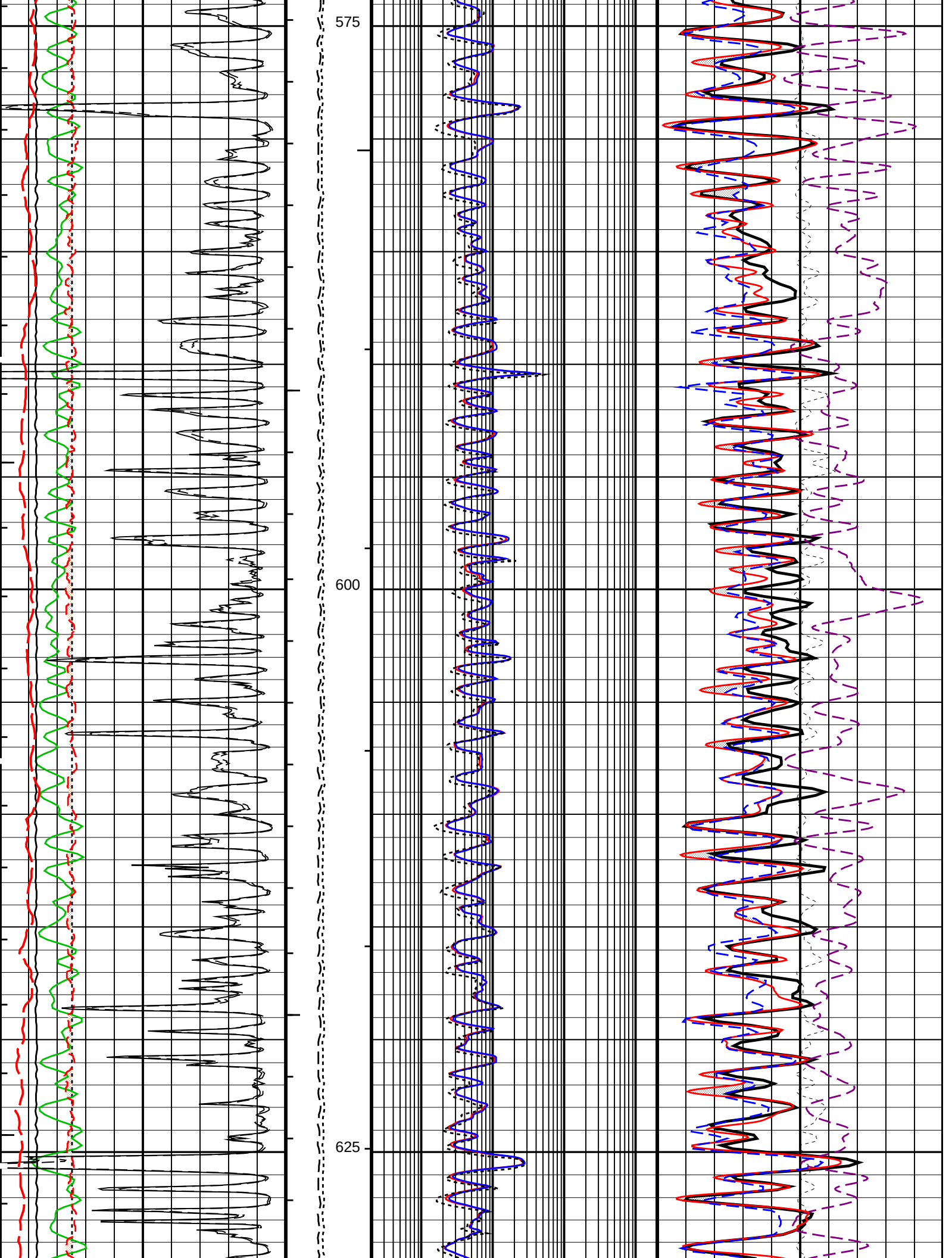
GDEV
GR
DT
CDF
BS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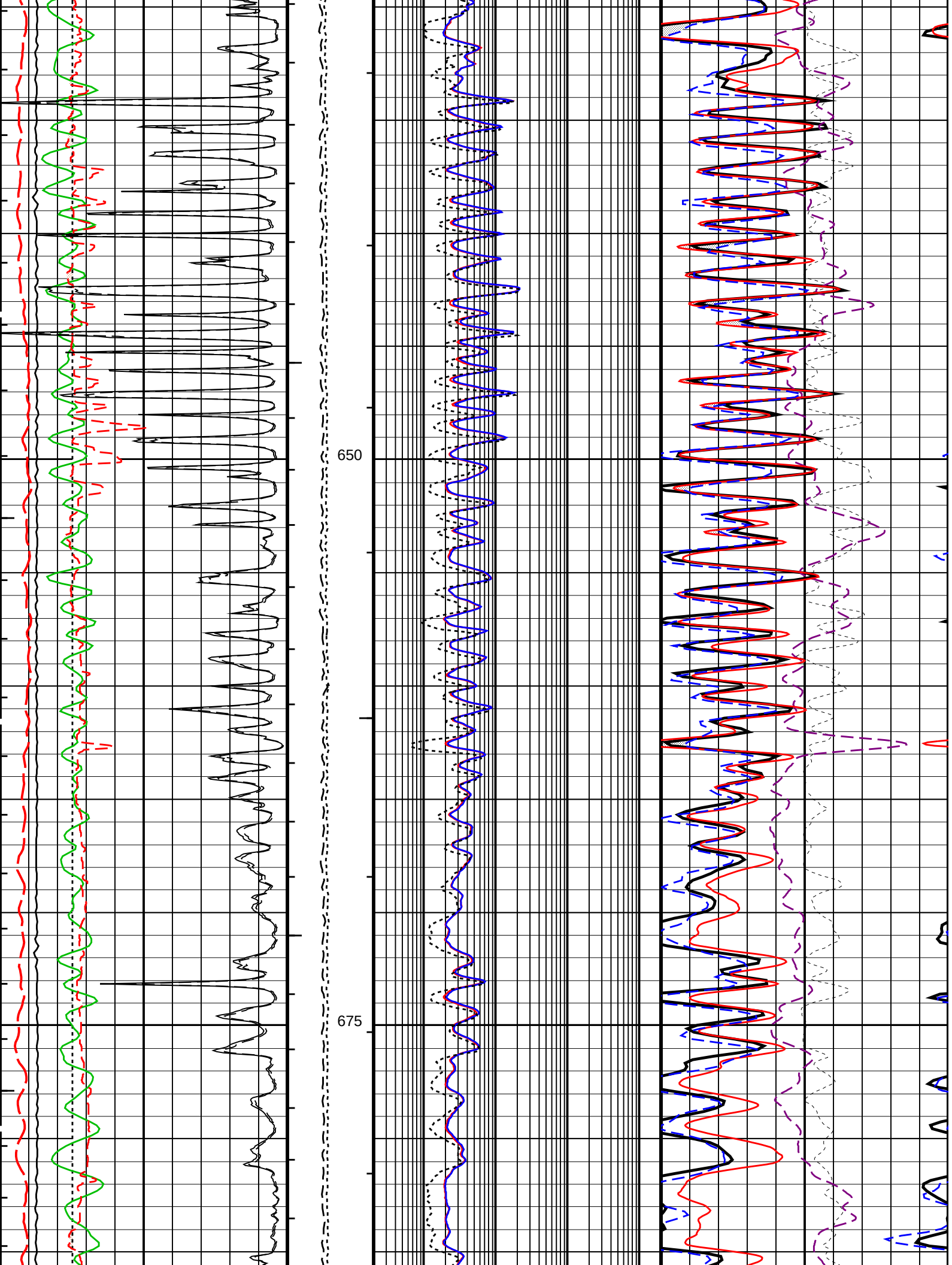
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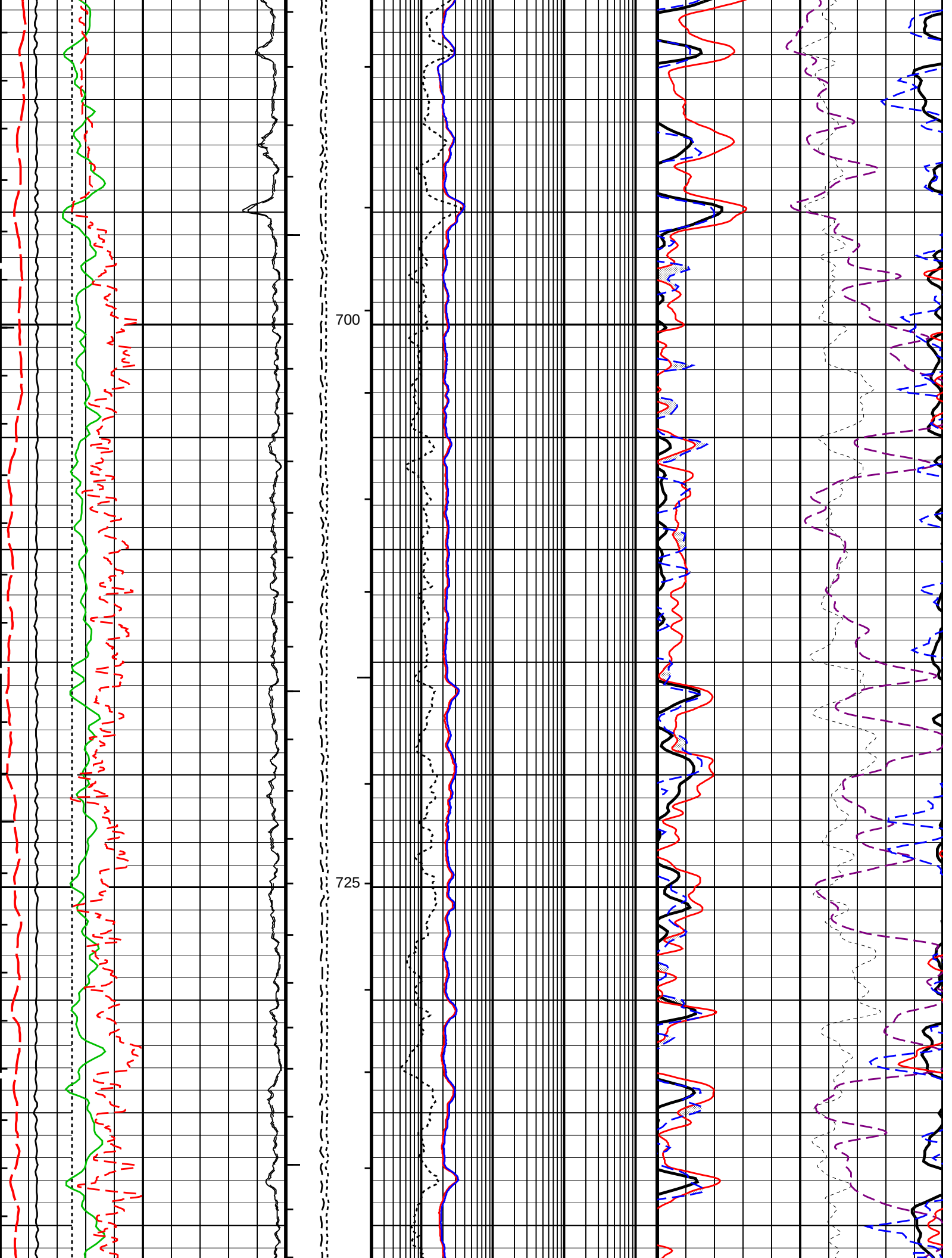
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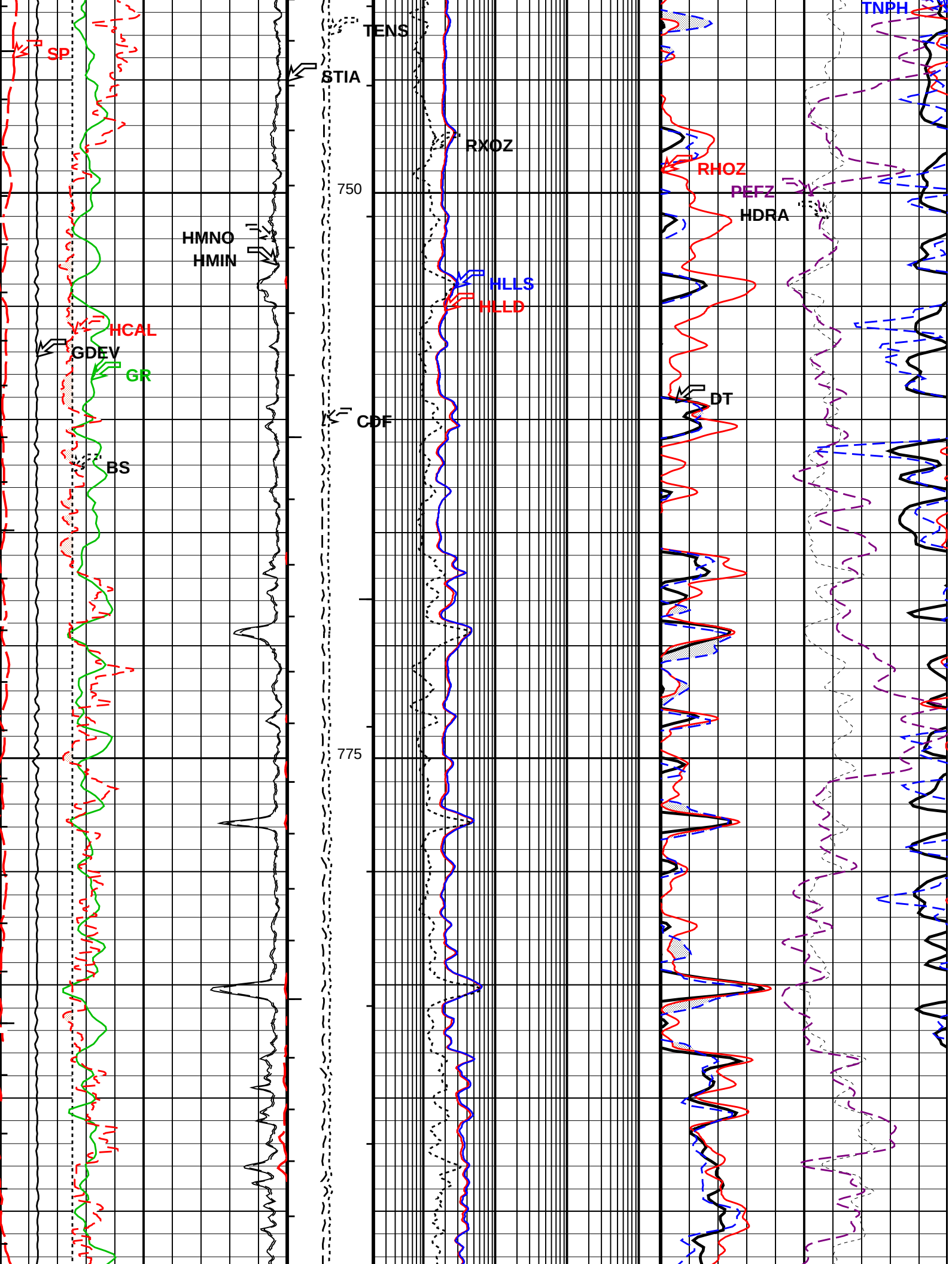
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BS
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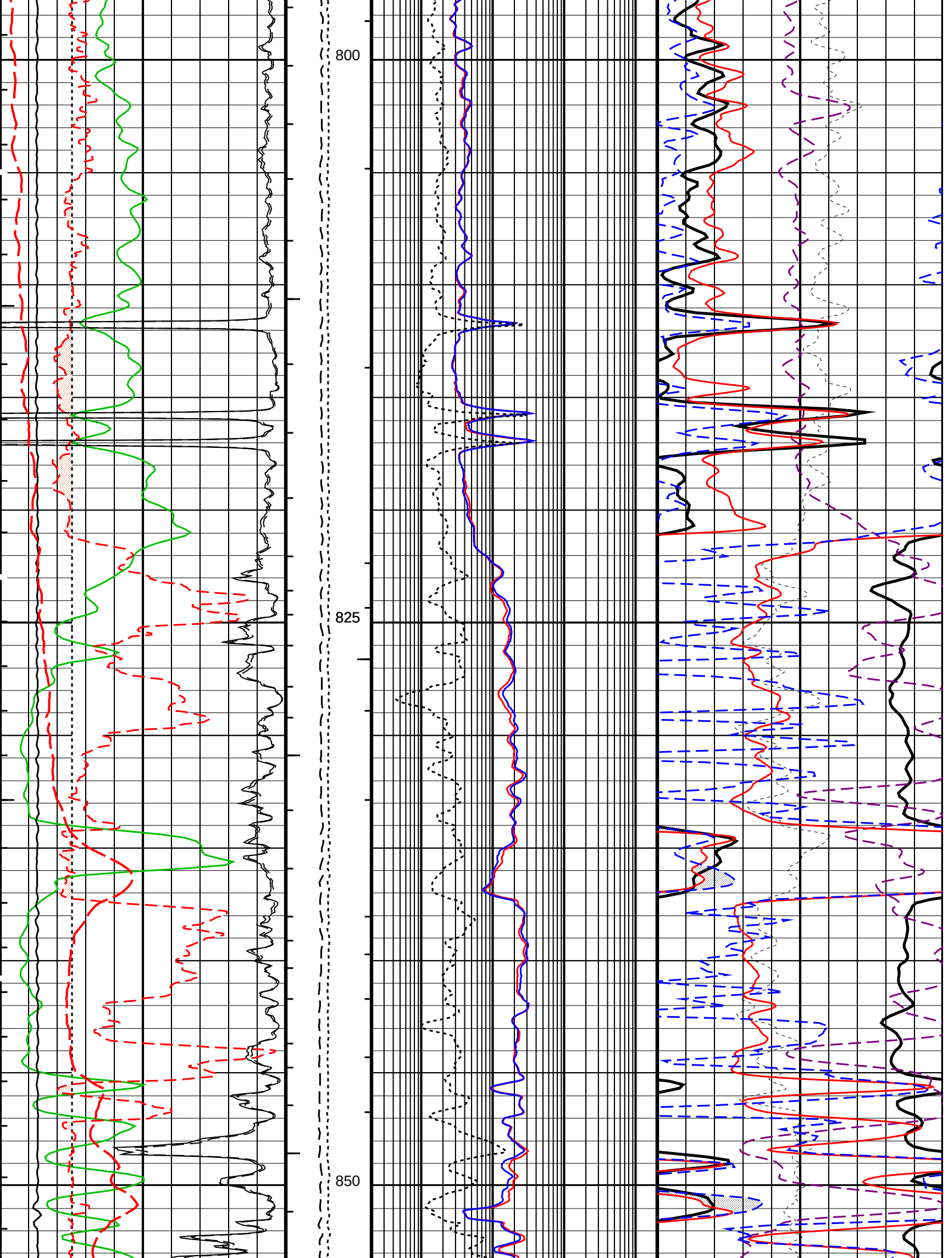
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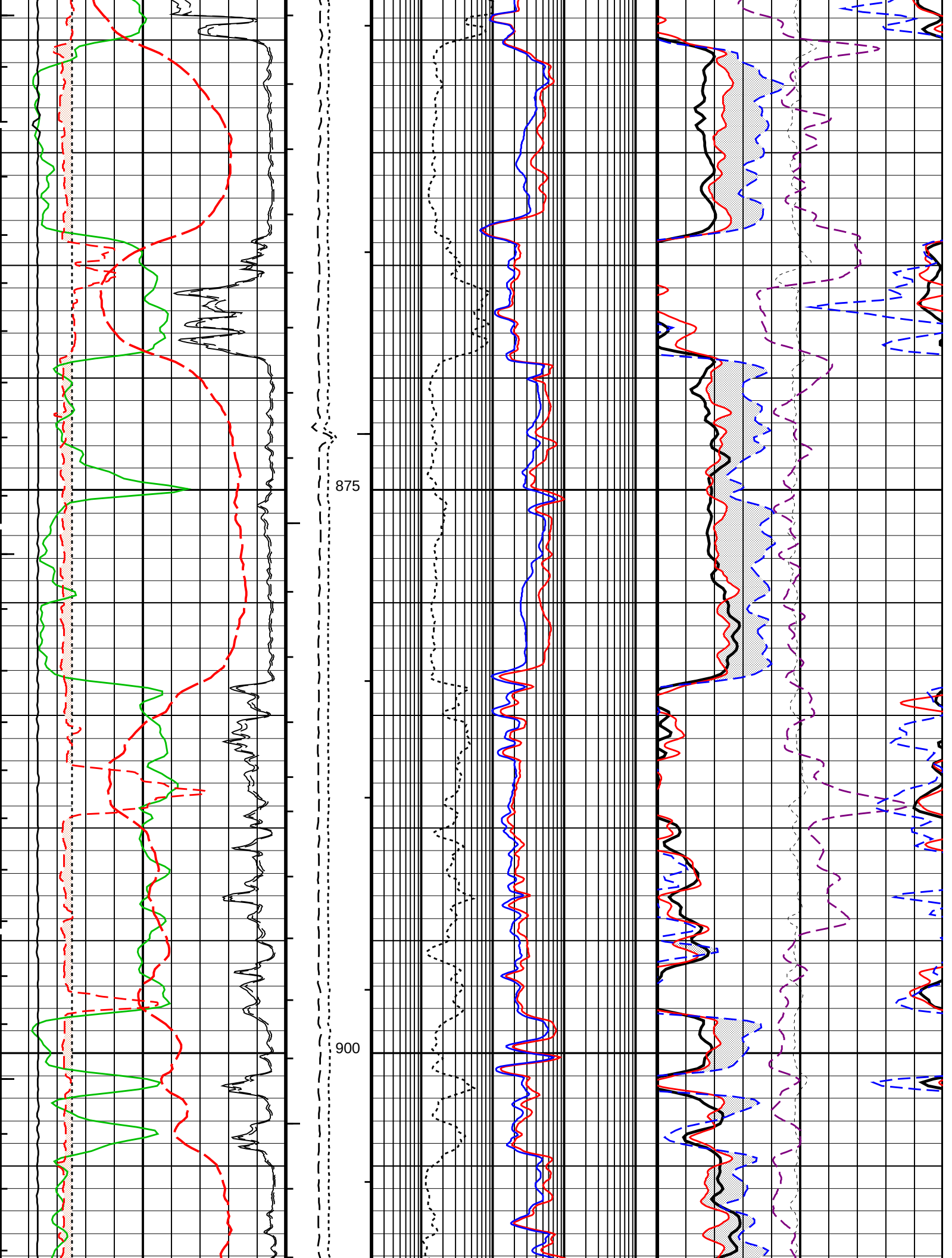
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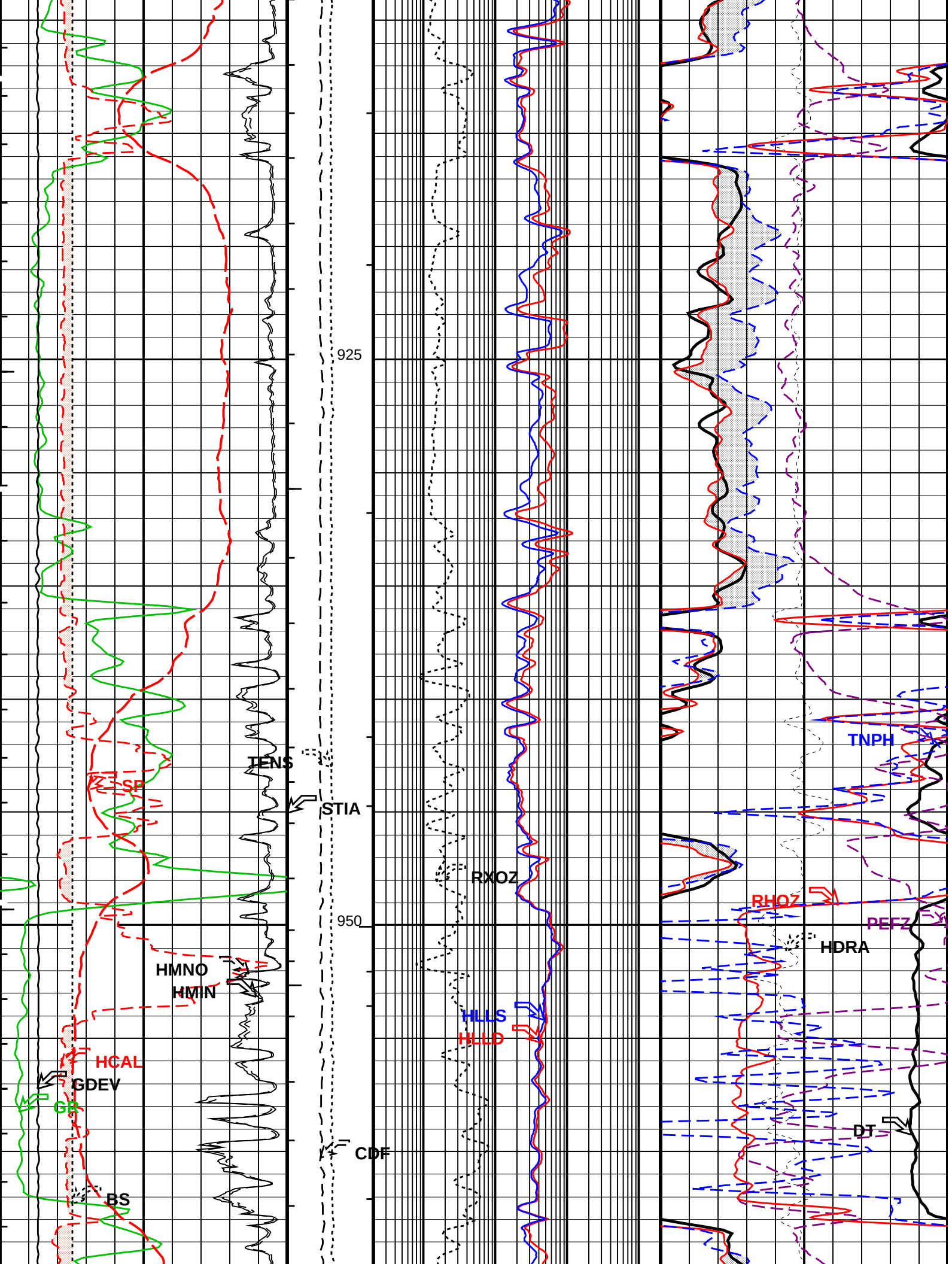
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PEFZ
HDRA
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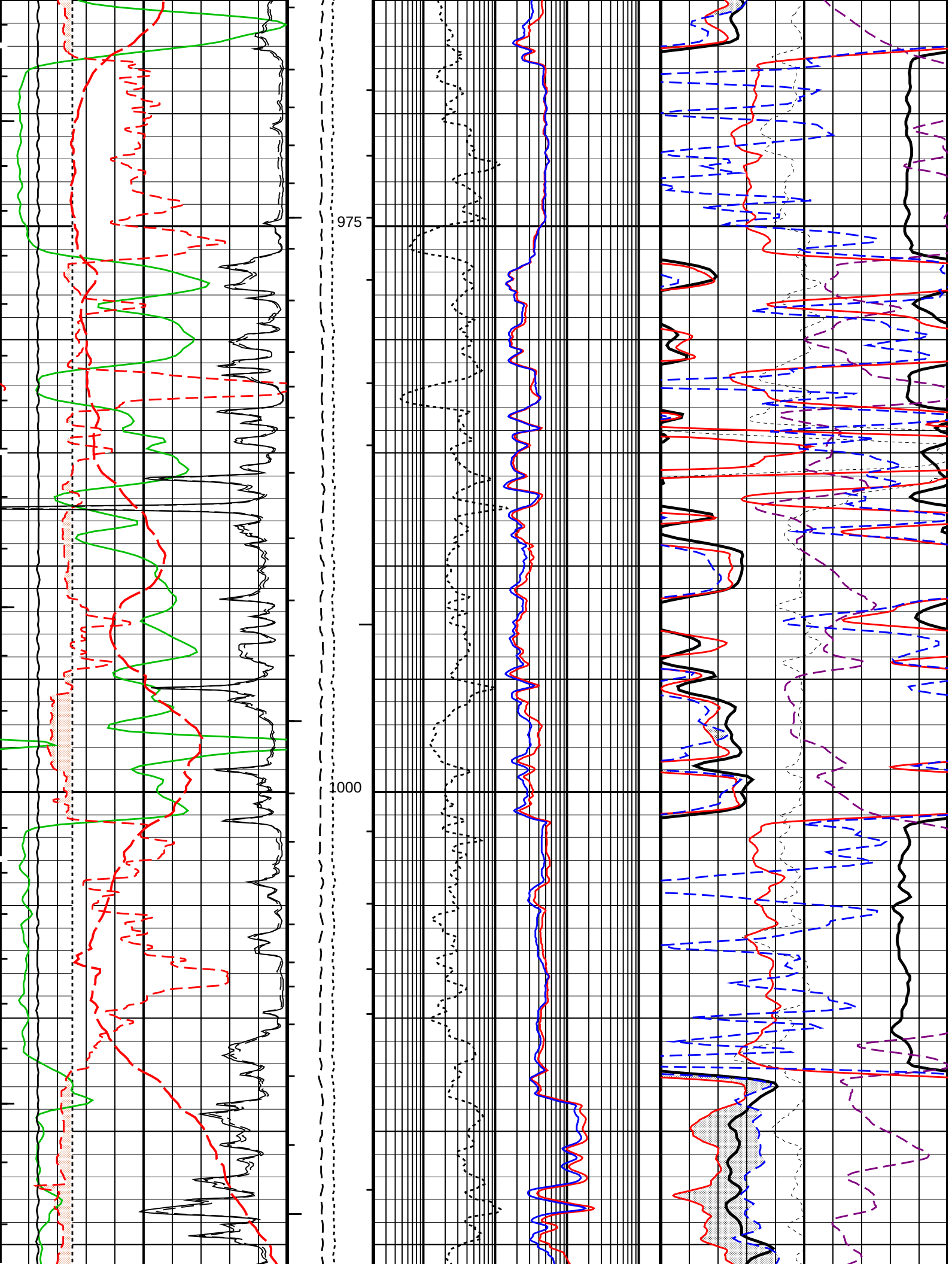
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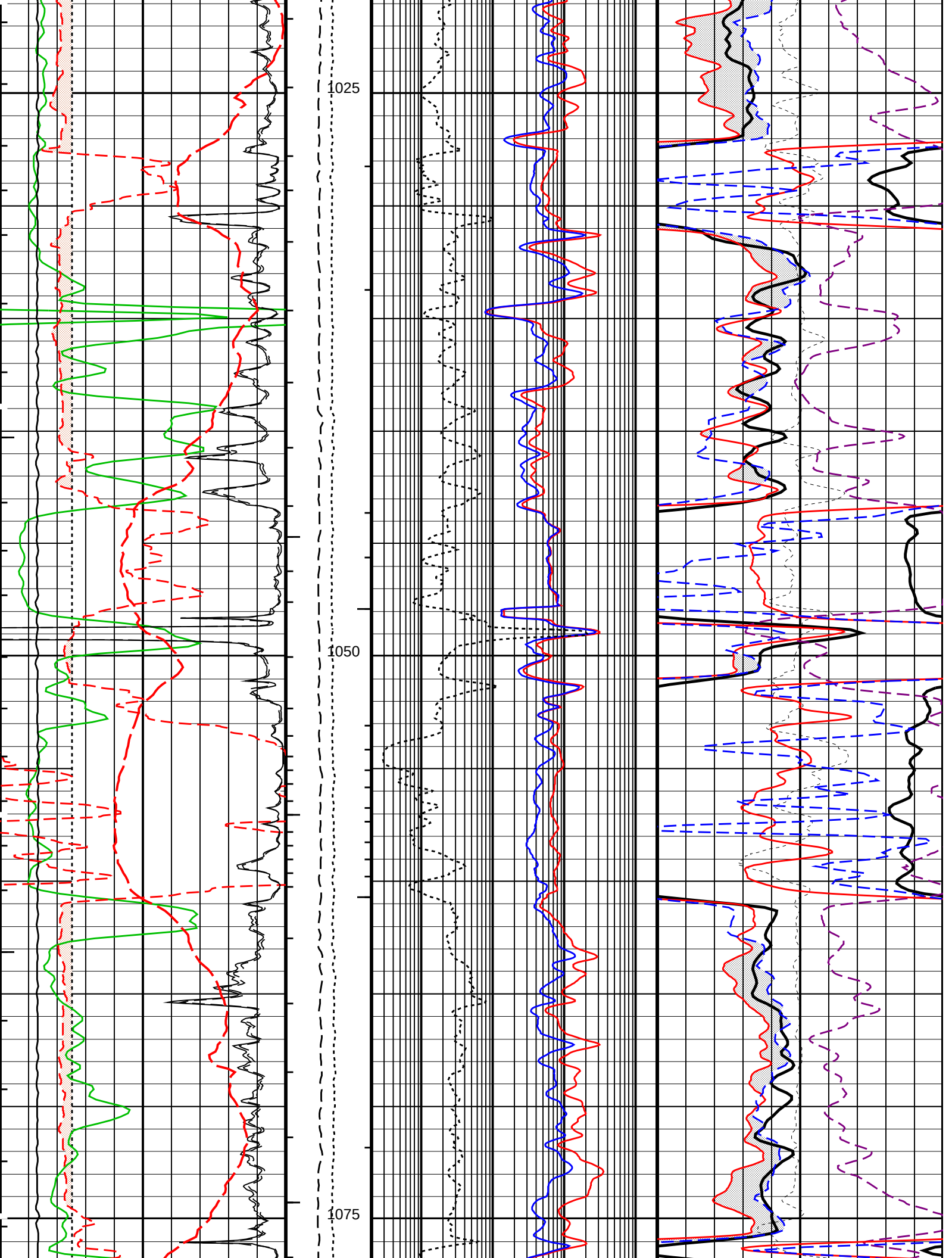
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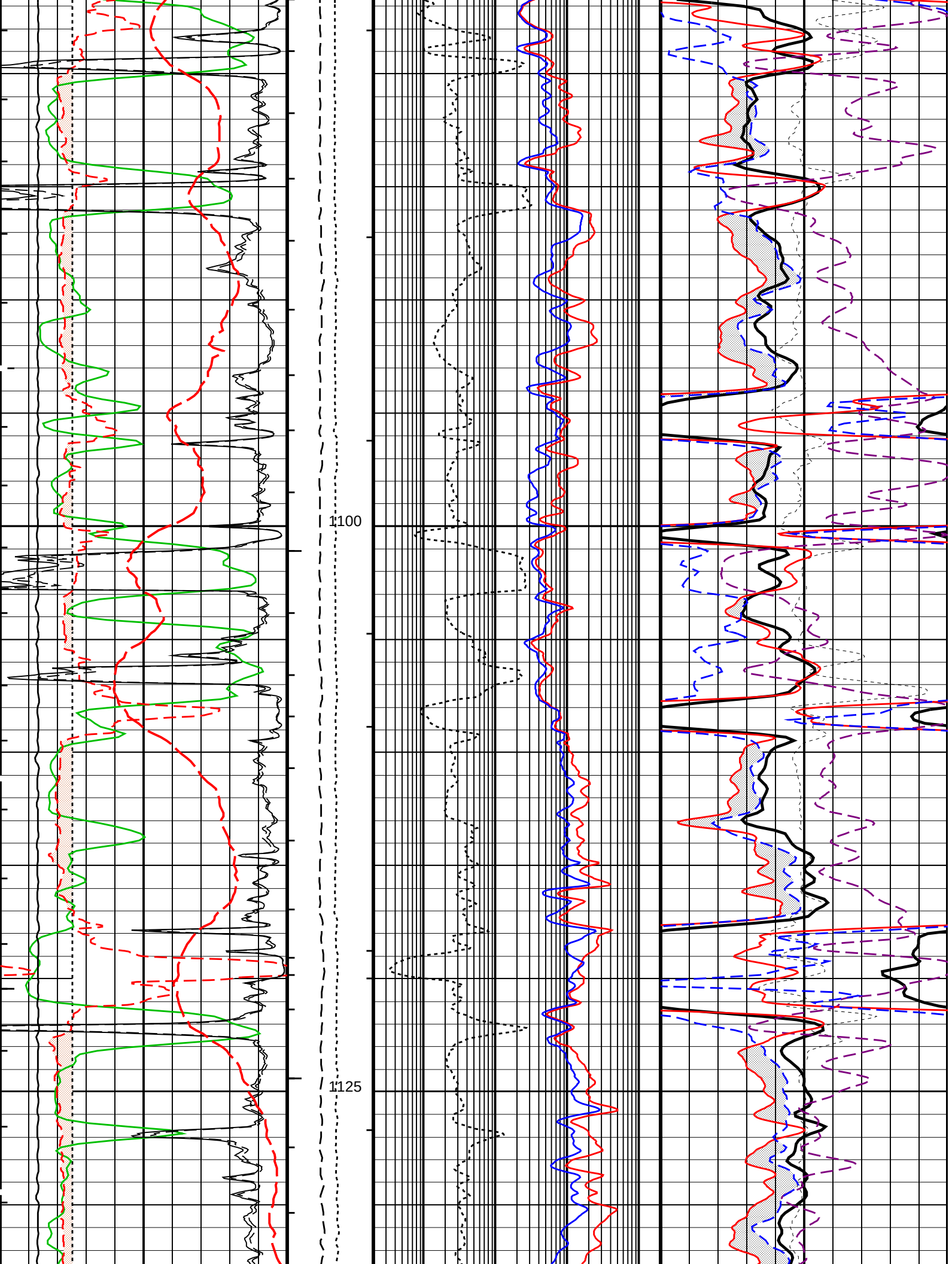
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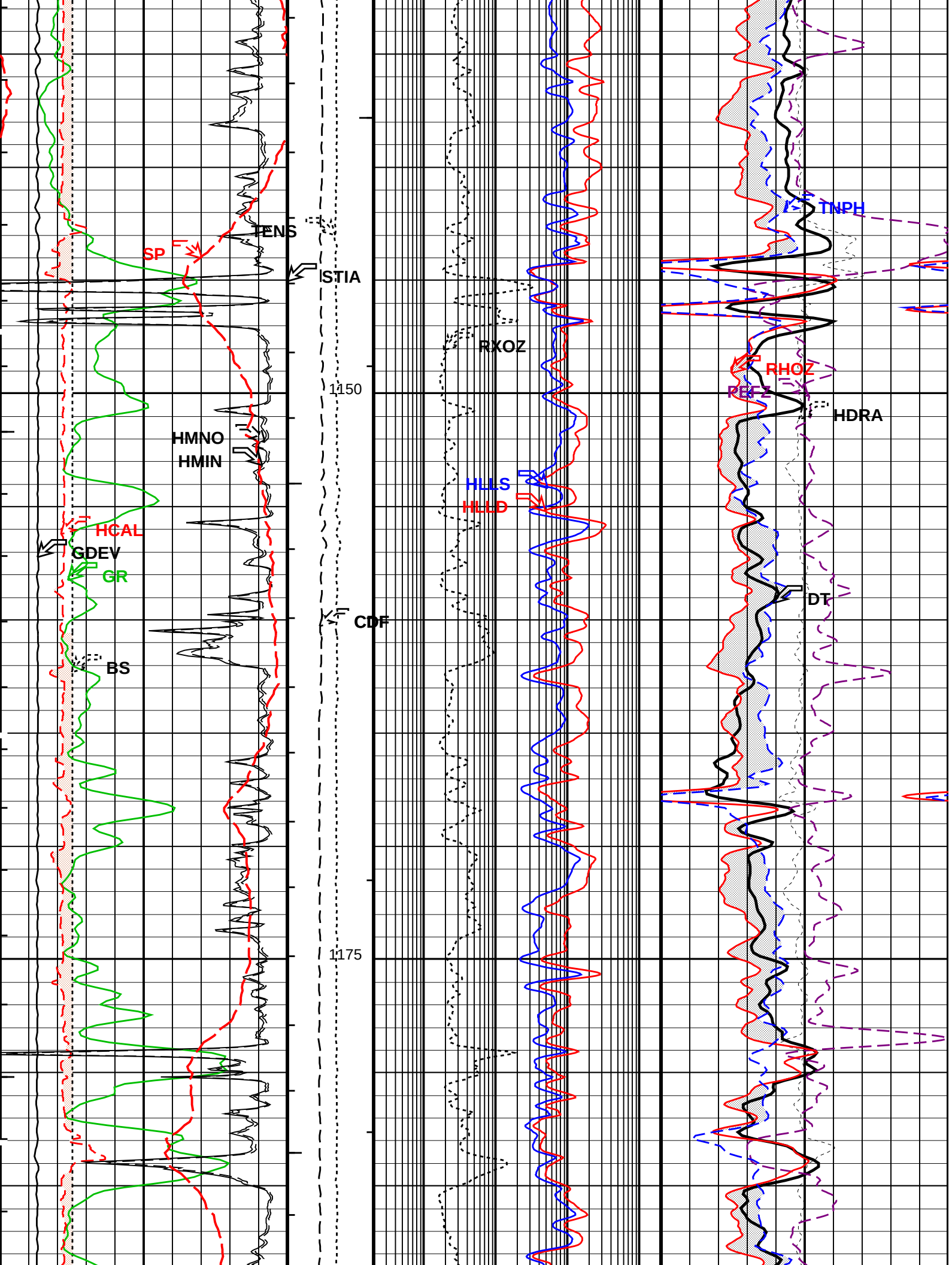
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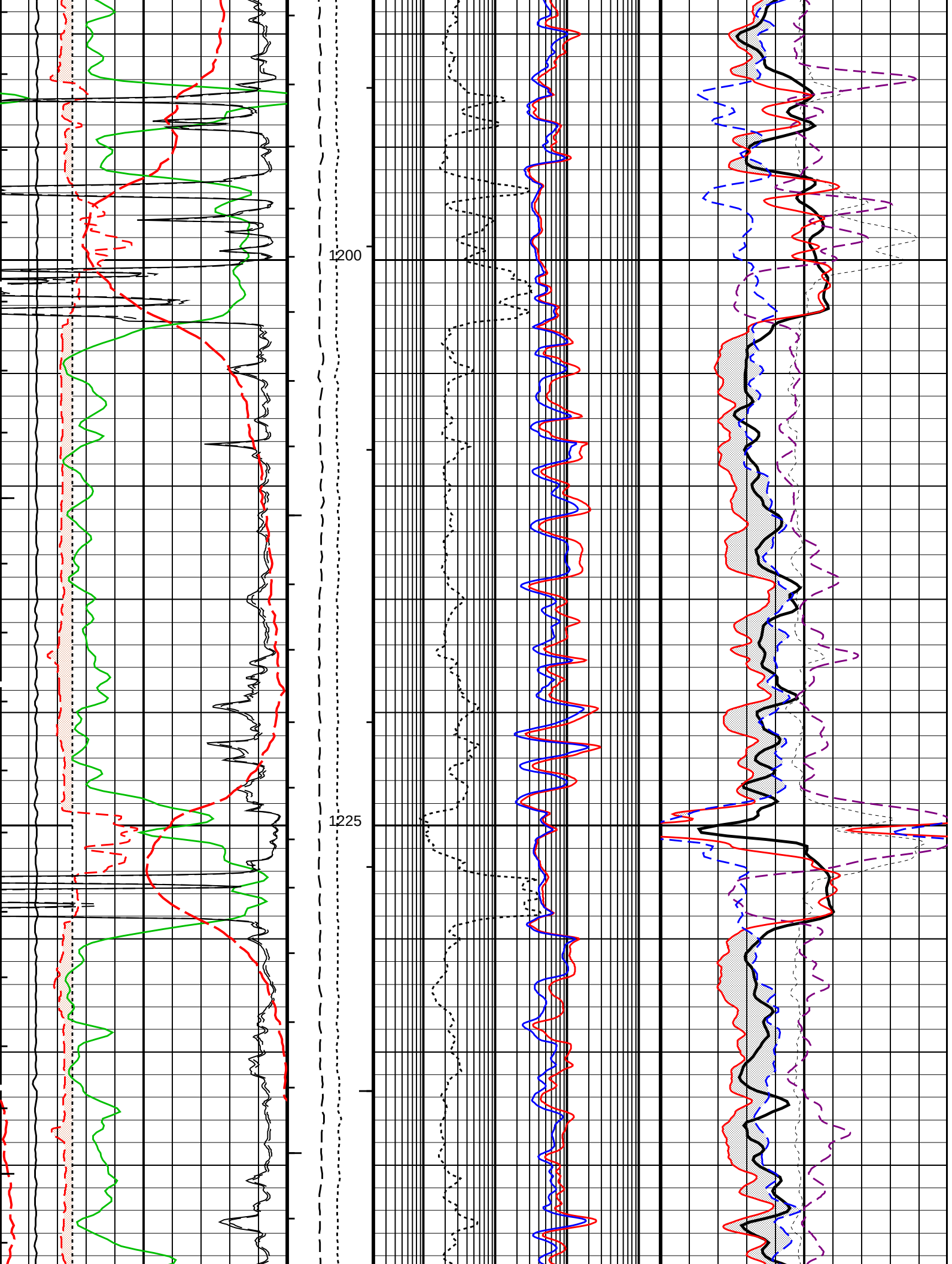
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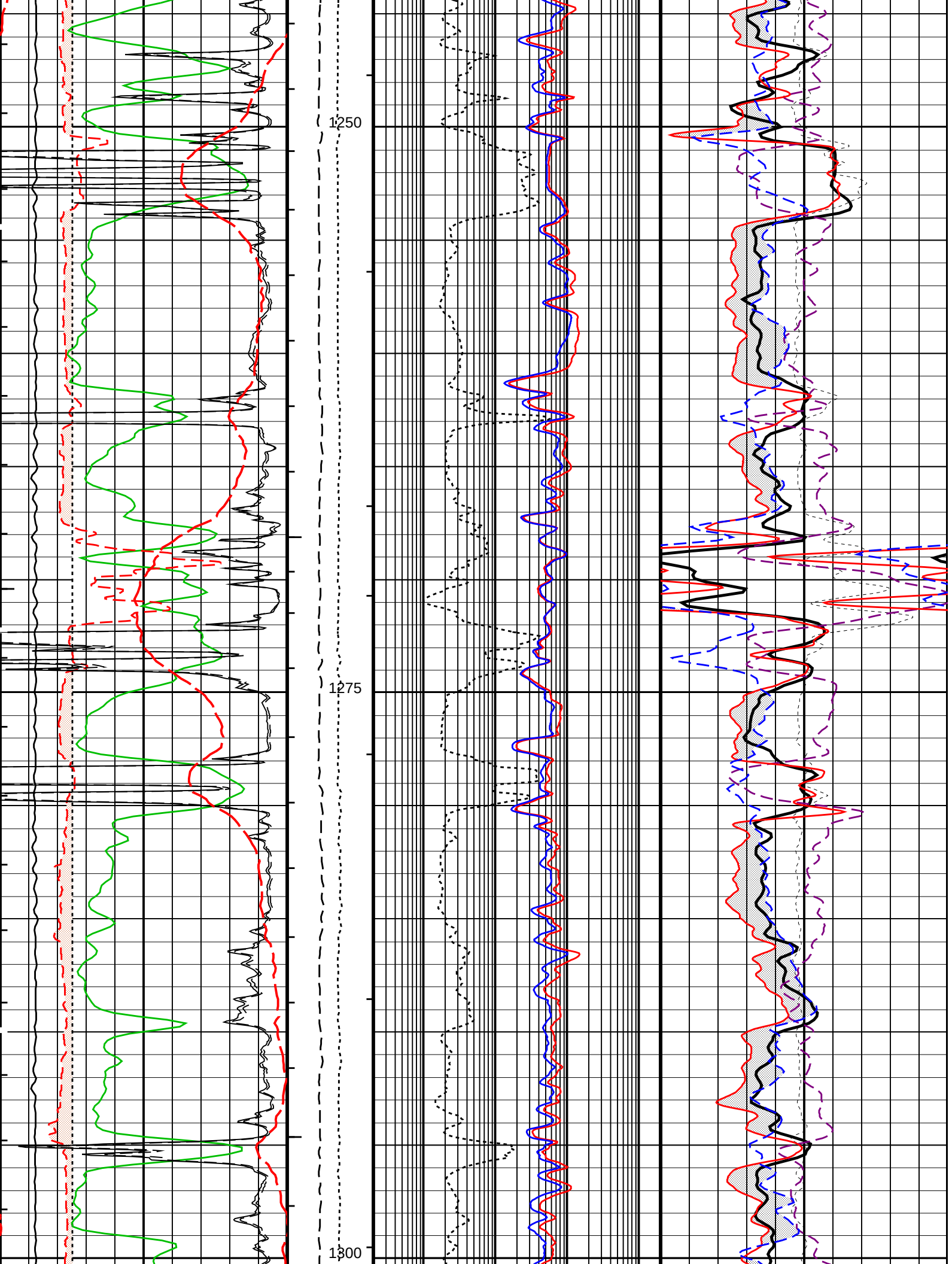
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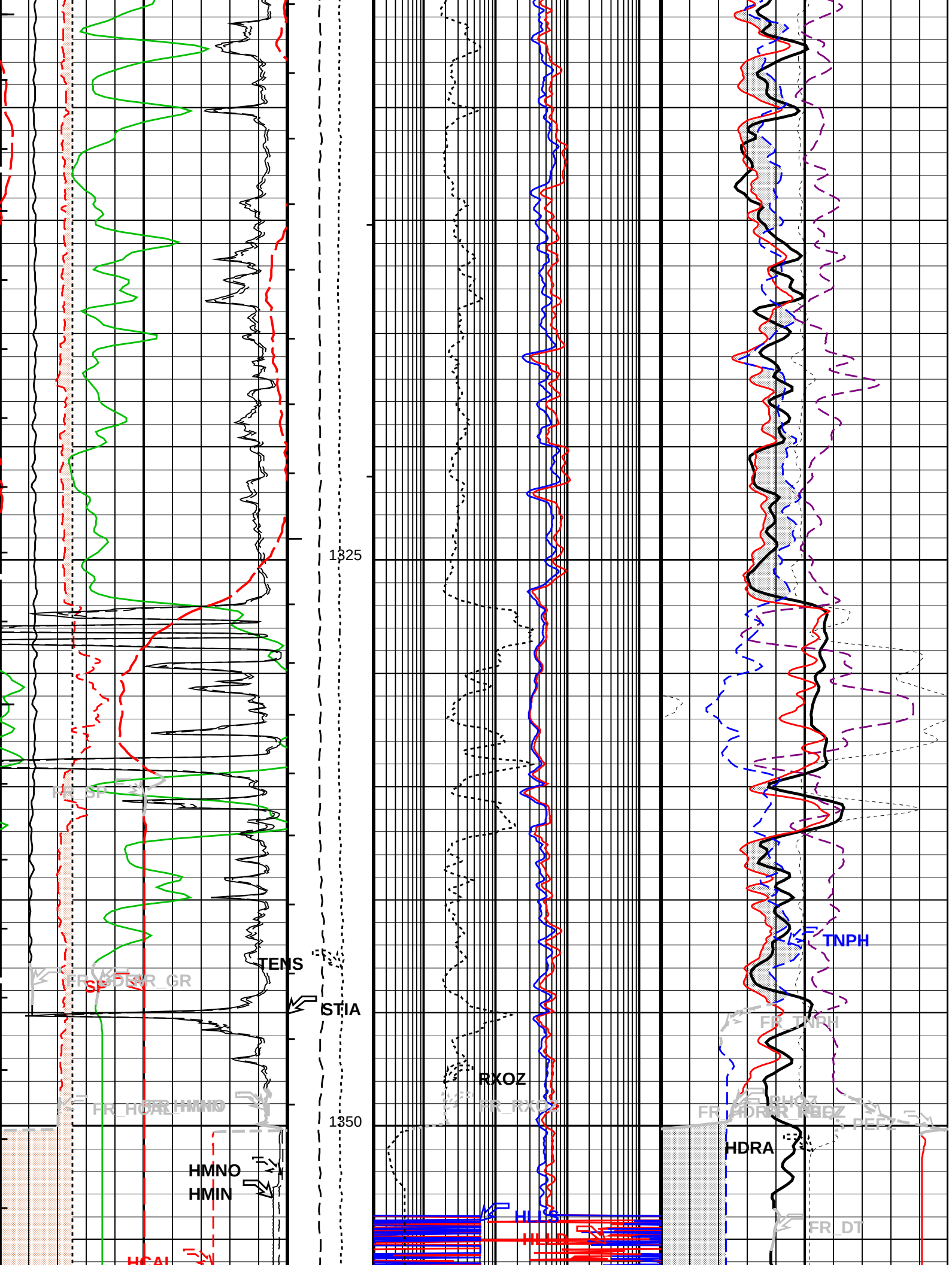
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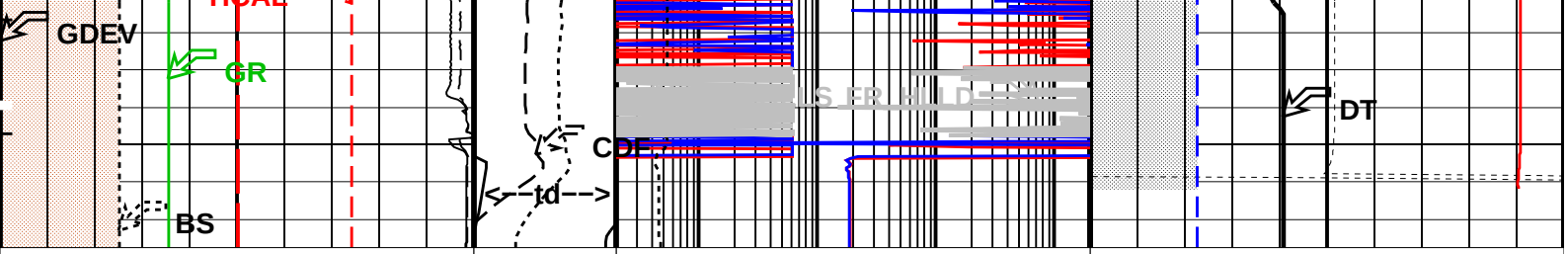

Computed Micro Inverse (HMIN)	Tension (TENS)	Laterolog Deep Resistivity (HLLD)	Delta−T (DT)
20 (OHMM) 0	(LBF) 0 4000	0.2 (OHMM) 2000	140 (US/F) 40
Computed Micro Normal (HMNO)	**Calibrated Downhole Force (CDF)**	**Laterolog Shallow Resistivity (HLLS)**	**Density Correction (HDRA)**
20 (OHMM) 0	(LBF) 0 2000	0.2 (OHMM) 2000	−0.25 (G/C3) 0.25
Bit Size (BS)		**Std. Res. Invaded Zone Resistivity (RXOZ)**	**Std. Res. Formation Pe (PEFZ)**
6 (IN) 16		0.2 (OHMM) 2000	0 (−−−−) 10
Gamma Ray (GR)			**Std. Res. Formation Density (RHOZ)**
0 (GAPI) 200			1.95 (G/C3) 2.95
HGNS Deviation (GDEV)			**Density/Porosity Cross Over From RHOZ to TNPH**
−10 (DEG) 90			
HILT Caliper (HCAL)			**Env.Corr.Thermal Neutron Porosity (TNPH)**
6 (IN) 16			0.45 (V/V) −0.15
SP (SP)			
−50 (MV) 50			
Mudcake From HCAL to BS			
Washout From BS to HCAL			

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 0.1 M3
- Integrated Hole Volume Major Pip Every 1 M3
- Integrated Cement Volume Minor Pip Every 0.1 M3
- Integrated Cement Volume Major Pip Every 1 M3
- Integrated Transit Time Minor Pip Every 1 MS
- Integrated Transit Time Major Pip Every 10 MS
- Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
	HALS−B: HILT Azimuthal Laterolog Sonde B		
	HALS Type of Image	Conductivities	
A2EX	HALS−B A2 Extended (Groningen effect)	OFF	
AGOS	HALS−GPIT OFFSET	−94	IN
ARIP_LTS	HALS Long Tool String Correction	OFF	
ARIP_SHOULDER	HALS Shoulder Correction	OFF	
BHCC	HALS Borehole Correction	ON	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	53.8	DEGC
DHOP	Diameter & Eccentering used in HALS Borehole Corrections	Caliper_Eccentered	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRCC	HALS Groningen Correction	OFF	
GRSE	Generalized Mud Resistivity Selection	HALS_RESIST	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	

HLAC	HALS−B Loop A Coefficient	LOW	
HLMO	HALS Logging Mode	STAN	
HMSO	HALS Mechanical Standoff	1.5	IN
HRUN	HALS−B Record Uncalibrated Channels	NO	
IMOS	HALS Image Orientation	OFF	
ISSBAR	Barite Mud Switch	NOBARITE	
LIMP	HALS Left Image Processing	DeepRaw	
LOP1	HALS−B Mode 1 Loop Mode	OFF	
LOP2	HALS−B Mode 2 Loop Mode	OFF	
LOP3	HALS−B Mode 3 Loop Mode	OFF	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
RIMP	HALS Right Image Processing	ShallowRaw	
RTCOMP	HALS Rt Computation	Hals_LowRes	
RTRE	HALS Resistivity Threshold	100000	OHMM
SHT	Surface Hole Temperature	15	DEGC
SPCO	HALS−B Special Power Connection	ON	
TCOR	HALS TLC Correction	OFF	
UNSPK	HALS Despiking Filter Option	OFF	
UNSPK_THOLD	HALS Despiking Filter Threshold (in %)	20	%
UNSPK_WINDOW	HALS Despiking Filter Window (inches)	6	IN
DSLT−H: Digitizing Sonic Logging Tool			
	DSLT Firing Mode	BHC	
	Telemetry Mode	DSLC_FTB	
AGC	Automatic Gain Control Status	ON	
AMSG	Auxiliary Minimum Sliding Gate	140	US
CBAF	CBL Adjustment Factor	1	
CBLG	CBL Gate Width	45	US
CDTS	C−Delta−T Shale	100	US/F
DDEL	Digitizing Delay	90	US
DETE	Delta−T Detection	E2	
DFAD	Digital First Arrival Detection Switch	DSP	
DIVL	DSLT Depth Sampling Interval	20	
DRCS	DSLT DLIS Recording Size	100	
DSIN	Digitizing Sample Interval	10	
DTCM	Delta−T Computation Mode	FULL	
DTF	Delta−T Fluid	189	US/F
DTFS	DSLC Telemetry Frame Size	236	
DTM	Delta−T Matrix	56	US/F
DWCO	Digitizing Word Count	100	
GAI	Manual Gain	40	
HRSP	High Resolution Spacing	5.118	IN
ITTS	Integrated Transit Time Source	DT	
LTUT	Lower to Upper Transmitter Spacing Ratio	1	
MAHTR	Manual High Threshold Reference	120	
MGAI	Maximum Gain	60	
MIGA	Minimum Gain	1	
MNHTR	Minimum High Threshold Reference	100	
MODE	Sonic Firing Mode	BHC	
NMSG	Near Minimum Sliding Gate	150	US
NMXG	Near Maximum Sliding Gate	750	US
NUMP	Number of Detection Passes	2	
RATE	Firing Rate	R15	
RDFA	Reset DFAD	OFF	
SDTH	Switch Down Threshold	20000	
SFAF	Sonic Formation Attenuation Factor	0	DB/M
SGAD	Sliding Gate Status	ON	
SGAI	Selectable Acquisition Gain	AUTO	
SGCL	Sliding Gate Closing Delta−T	250	US/F
SGCW	Sliding Gate Closing Width	25	US
SGDT	Sliding Gate Delta−T	50	US/F
SGW	Sliding Gate Width	80	US
SLEV	Signal Level for AGC	5000	
SPFS	Sonic Porosity Formula	RAYMER_HUNT	
SPSO	Sonic Porosity Source	DT	
SUTH	Switch Up Threshold	1000	
VDLG	VDL Manual Gain	40	
WAGC	Waveform AGC Allow/Disallow	OFF	
WGAI	Waveform Manual Gain	20	
WGDT	Waveform Gain Delta−T	240	US/F
WGIN	Waveform Gain Interval	2540	US
WMOD	Waveform Firing Mode	FULL	
HILTB−FTB: High resolution Integrated Logging Tool−DTS			
BHFL	Borehole Fluid Type	WATER	
BHFL_TLD	HILT Nuclear Mud Base	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	53.8	DEGC
BSCO	Borehole Salinity Correction Option	YES	
CCCO	Casing & Cement Thickness Correction Option	NO	
DHC	Density Hole Correction	BS	
DPPM	Density Porosity Processing Mode	HIRS	
EXSICL	External Shale Indicator Clean Value	20	
EXSISH	External Shale Indicator Shale Value	150	
FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	

FPHI	Form Factor Porosity Source	DPHZ	
FSAL	Formation Salinity	−50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCLF	Germany Coal−like Formation Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	HALS_RESIST	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HACPP	Accelerometer PROM Presence	PRESENT_DOWNHOLE	
HART	Accelerometer Reference Temperature	20	DEGC
HDCOD	HILT Density Coal detection	2	G/C3
HDSAD	HILT Density Salt detection	2.1	G/C3
HILT_GAS_DENSITY	HILT Gas Downhole Density	0	G/C3
HILT_GAS_OPTION	HILT Gas Computation Option	OFF	
HNCOD	HILT Neutron Coal detection	45	PU
HNSAD	HILT Neutron Salt detection	5	PU
HPHIECUT	HILT effective Porosity Cutoff	5	PU
HSCO	Hole Size Correction Option	YES	
HSIS	HILT Shale Indicator Selection	GR	
HSSO	HRDD Nuclear Source Strength Option	NORMAL	
HSWCUT	HILT Water Saturation from AITH cutoff	50	%
ISSBAR	Barite Mud Switch	NOBARITE	
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
MHC0	MCFL B0 Contrast Correction Coefficient	2.2e−005	OHMS
MHC1	MCFL B1 Contrast Correction Coefficient	3.2e−005	OHMS
MHCC	MCFL High Contrast Correction Switch	NO	
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	HiRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PEA_FILTER	PEA Filter	NO_FILTER	
PEFC_FILTER	PEFC Filter	NO_FILTER	
PHIMAX	HILT max porosity	35	PU
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SEXP_HILT	HILT Saturation Exponent	2	
SHT	Surface Hole Temperature	15	DEGC
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	YES	
BSP: Bridle SP			
SPNV	SP Next Value	0	MV
HOLEV: Integrated Hole/Cement Volume			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	53.8	DEGC
FCD	Future Casing (Outer) Diameter	7	IN
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	HALS_RESIST	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
SHT	Surface Hole Temperature	15	DEGC
STI: Stuck Tool Indicator			
LBFR	Trigger for MAXIS First Reading Label	TDL	
STKT	STI Stuck Threshold	0.762	M
TDD	Total Depth − Driller	1366.00	M
TDL	Total Depth − Logger	1361.30	M
System and Miscellaneous			
ALTDPCHAN	Name of alternate depth channel	SpeedCorrectedDepth	
BS	Bit Size	8.500	IN
BSAL	Borehole Salinity	18000.00	PPM
CSIZ	Current Casing Size	9.625	IN
CWEI	Casing Weight	36.00	LB/F
DFD	Drilling Fluid Density	1.26	G/C3
DORL	Depth Offset for Repeat Analysis	0.0	M
FLEV	Fluid Level	0.00	M
MST	Mud Sample Temperature	16.80	DEGC
PBVSADP	Use alternate depth channel for playback	NO	
RMFS	Resistivity of Mud Filtrate Sample	0.2400	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	1361.3	M
TWS	Temperature of Connate Water Sample	37.78	DEGC

Format: StdRes_HALS_PEX_SONIC_200 Vertical Scale: 1:200 Graphics File Created: 28−Oct−2009 07:30

OP System Version: 17C0−154

HALS−B	SRPC−3821−Q2_2009_OP17	DSLT−H	17C0−154
HILTB−FTB	SRPC−3821−Q2_2009_OP17	DTC−H	17C0−154
BSP	17C0−154		

Output DLIS Files

DEFAULT	HALS_SONIC_TLD_MCFL_012LUP	FN:18	PRODUCER	28−Oct−2009 07:30	
REALTIME	HALS_SONIC_TLD_MCFL_012LUP	FN:19	PRODUCER	28−Oct−2009 06:30	

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Repeat Analysis 1:200 Scale Standard Resolution

MAXIS Field Log

Company: Lakes Oil N.L. **Well: Wombat−4**

Input DLIS Files

DEFAULT	HALS_SONIC_TLD_MCFL_011PUP	FN:16	PRODUCER	28−Oct−2009 07:25	1363.8 M	1195.1 M

Output DLIS Files

DEFAULT	HALS_SONIC_TLD_MCFL_012LUP	FN:18	PRODUCER	28−Oct−2009 07:30	
REALTIME	HALS_SONIC_TLD_MCFL_012LUP	FN:19	PRODUCER	28−Oct−2009 06:30	

OP System Version: 17C0−154

HALS−B	SRPC−3821−Q2_2009_OP17	DSLT−H	17C0−154
HILTB−FTB	SRPC−3821−Q2_2009_OP17	DTC−H	17C0−154
BSP	17C0−154		

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 0.1 M3
- Integrated Hole Volume Major Pip Every 1 M3
- Integrated Cement Volume Minor Pip Every 0.1 M3
- Integrated Cement Volume Major Pip Every 1 M3
- Integrated Transit Time Minor Pip Every 1 MS
- Integrated Transit Time Major Pip Every 10 MS
- Time Mark Every 60 S

Washout
From BS to HCAL

Mudcake
From HCAL to BS

SP_REP Curve (SP_REP)
−50 (MV) 50

HMNO_REP Curve (HMNO_REP)
20 (OHMM) 0

HMIN_REP Curve (HMIN_REP)
20 (OHMM) 0

HCAL_REP Curve (HCAL_REP)
6 (IN) 16

GDEV_REP Curve (GDEV_REP)

RXOZ_REP Curve (RXOZ_REP)

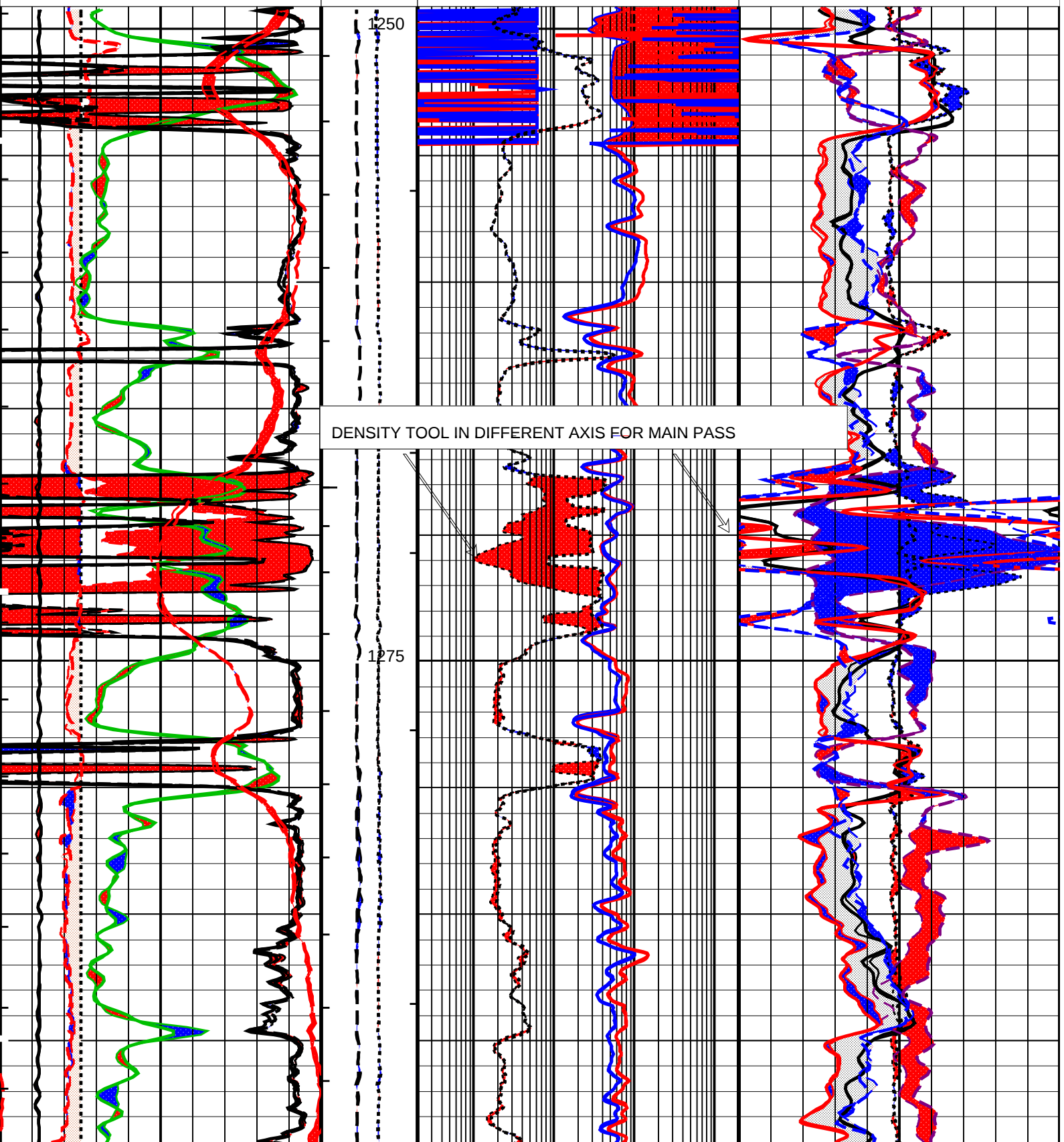
Density/Porosity Cross Over
From RHOZ to TNPH

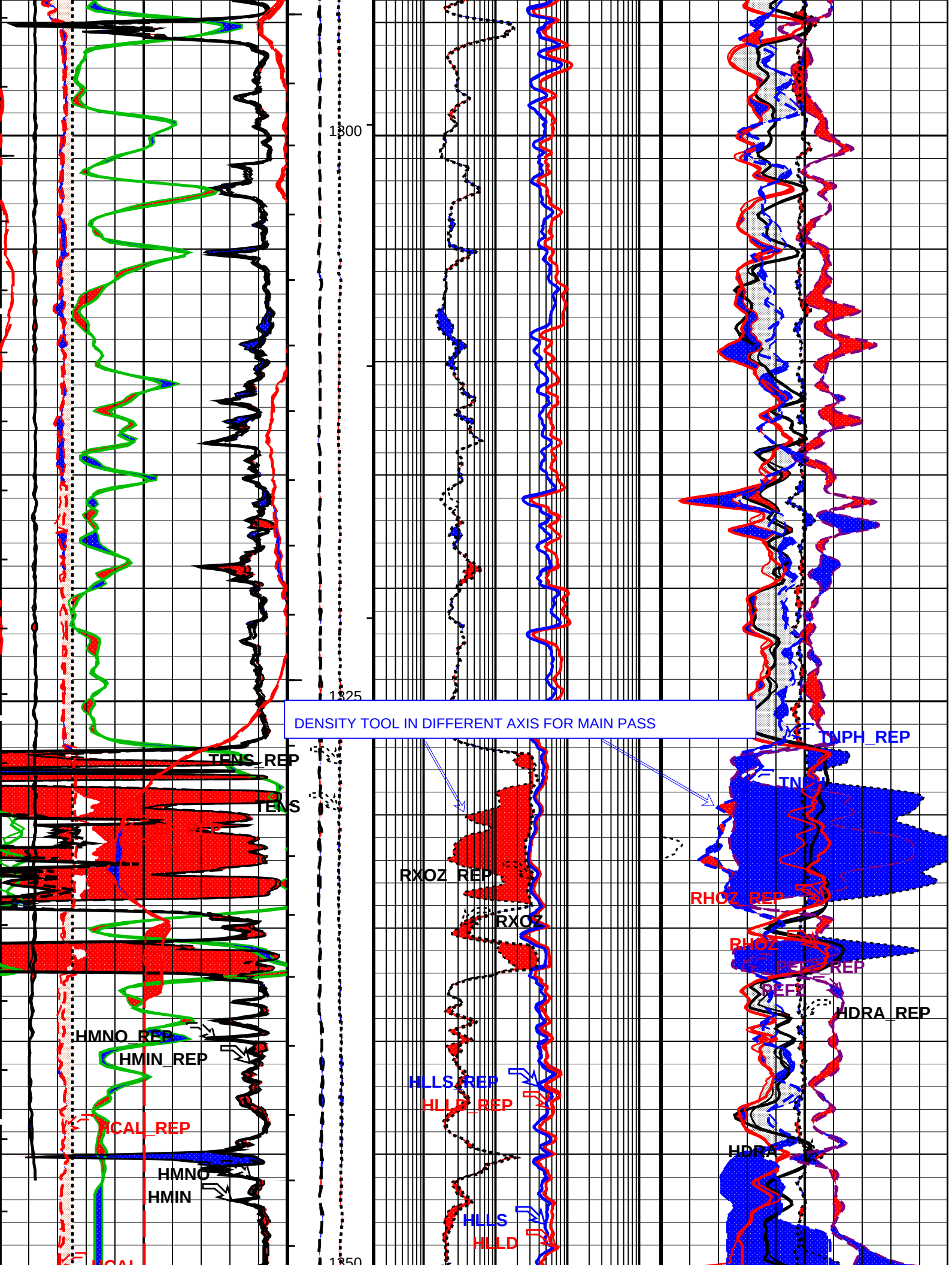
TNPH_REP Curve (TNPH_REP)
0.45 (V/V) −0.15

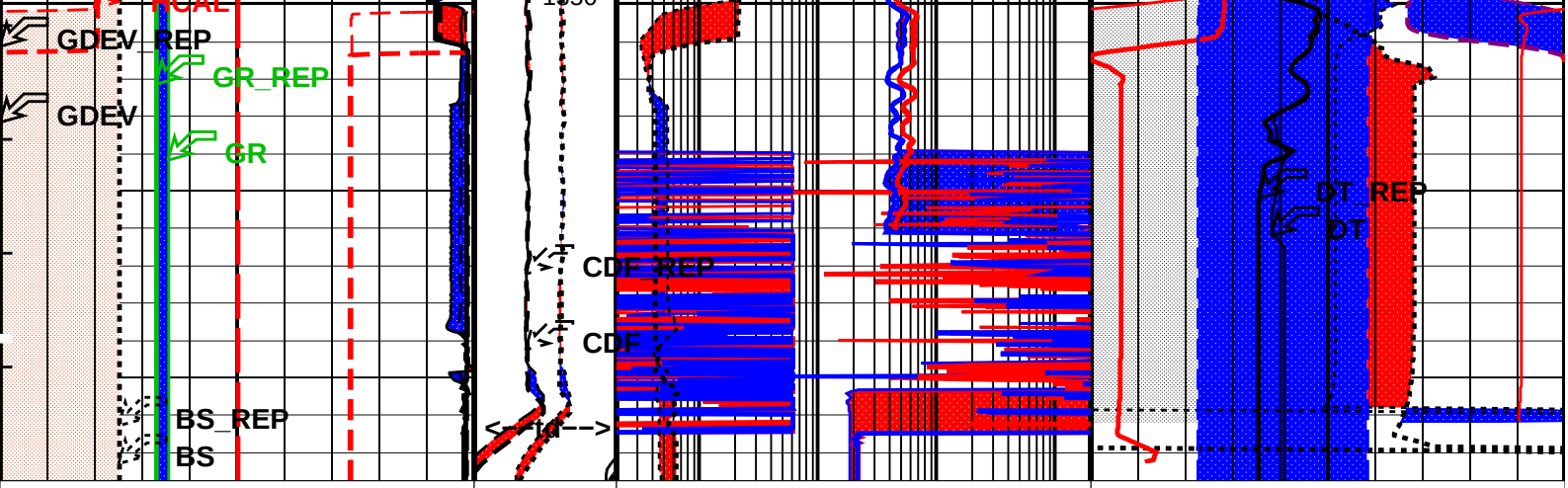
RHOZ_REP Curve (RHOZ_REP)
1.95 (G/C3) 2.95

PEFZ_REP Curve (PEFZ_REP)

−10 (DEG) 90		0.2 (OHMM) 2000	0 (----) 10
GR_REP Curve (GR_REP) 0 (GAPI) 200	TENS_REP Curve (TENS_REP) (LBF) 0 4000	HLLS_REP Curve (HLLS_REP) 0.2 (OHMM) 2000	HDRA_REP Curve (HDRA_REP) −0.25 (G/C3) 0.25
BS_REP Curve (BS_REP) 6 (IN) 16	CDF_REP Curve (CDF_REP) (LBF) 0 2000	HLLD_REP Curve (HLLD_REP) 0.2 (OHMM) 2000	DT_REP Curve (DT_REP) 140 (US/F) 40




1300
1325
1350
DENSITY TOOL IN DIFFERENT AXIS FOR MAIN PASS
TENS_REP
TENS
RXOZ_REP
RXOZ
HMNO_REP
HMIN_REP
HCAL_REP
HMNO
HMIN
HLLS_REP
HLLD_REP
HLLS
HLLD
TNPH_REP
RHOZ_REP
HDRA_REP
HDRA



BS_REP Curve (BS_REP) 6 (IN) 16	CDF_REP Curve (CDF_REP) (LBF) 0 2000	HLLD_REP Curve (HLLD_REP) 0.2 (OHMM) 2000
GR_REP Curve (GR_REP) 0 (GAPI) 200	TENS_REP Curve (TENS_REP) (LBF) 0 4000	HLLS_REP Curve (HLLS_REP) 0.2 (OHMM) 2000
GDEV_REP Curve (GDEV_REP) −10 (DEG) 90		RXOZ_REP Curve (RXOZ_REP) 0.2 (OHMM) 2000
HCAL_REP Curve (HCAL_REP) 6 (IN) 16		
HMIN_REP Curve (HMIN_REP) 20 (OHMM) 0		
HMNO_REP Curve (HMNO_REP) 20 (OHMM) 0		
SP_REP Curve (SP_REP) −50 (MV) 50		
Mudcake From HCAL to BS		
Washout From BS to HCAL		

DT_REP Curve (DT_REP) 140 (US/F) 40	
HDRA_REP Curve (HDRA_REP) −0.25 (G/C3) 0.25	
PEFZ_REP Curve (PEFZ_REP) 0 (−−−−) 10	
RHOZ_REP Curve (RHOZ_REP) 1.95 (G/C3) 2.95	
TNPH_REP Curve (TNPH_REP) 0.45 (V/V) −0.15	
Density/Porosity Cross Over From RHOZ to TNPH	

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 0.1 M3
- Integrated Hole Volume Major Pip Every 1 M3
- Integrated Cement Volume Minor Pip Every 0.1 M3
- Integrated Cement Volume Major Pip Every 1 M3
- Integrated Transit Time Minor Pip Every 1 MS
- Integrated Transit Time Major Pip Every 10 MS
- Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
	HALS−B: HILT Azimuthal Laterolog Sonde B	
	HALS Type of Image	Conductivities
A2EX	HALS−B A2 Extended (Groningen effect)	OFF
AGOS	HALS−GPIT OFFSET	−94 IN
ARIP_LTS	HALS Long Tool String Correction	OFF
ARIP_SHOULDER	HALS Shoulder Correction	OFF
BHCC	HALS Borehole Correction	ON
BHS	Borehole Status	OPEN
BHT	Bottom Hole Temperature (used in calculations)	53.8 DEGC

BHT	Bottom Hole Temperature (used in calculations)	53.8	DEGC
DHOP	Diameter & Eccentering used in HALS Borehole Corrections	Caliper_Eccentered	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRCC	HALS Groningen Correction	OFF	
GRSE	Generalized Mud Resistivity Selection	HALS_RESIST	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HLAC	HALS−B Loop A Coefficient	LOW	
HLMO	HALS Logging Mode	STAN	
HMSO	HALS Mechanical Standoff	1.5	IN
HRUN	HALS−B Record Uncalibrated Channels	NO	
IMOS	HALS Image Orientation	OFF	
ISSBAR	Barite Mud Switch	NOBARITE	
LIMP	HALS Left Image Processing	DeepRaw	
LOP1	HALS−B Mode 1 Loop Mode	OFF	
LOP2	HALS−B Mode 2 Loop Mode	OFF	
LOP3	HALS−B Mode 3 Loop Mode	OFF	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
RIMP	HALS Right Image Processing	ShallowRaw	
RTCOMP	HALS Rt Computation	Hals_LowRes	
RTRE	HALS Resistivity Threshold	100000	OHMM
SHT	Surface Hole Temperature	15	DEGC
SPCO	HALS−B Special Power Connection	ON	
TCOR	HALS TLC Correction	OFF	
UNSPK	HALS Despiking Filter Option	OFF	
UNSPK_THOLD	HALS Despiking Filter Threshold (in %)	20	%
UNSPK_WINDOW	HALS Despiking Filter Window (inches)	6	IN
DSLT−H: Digitizing Sonic Logging Tool			
	DSLT Firing Mode	BHC	
	Telemetry Mode	DSLC_FTB	
AGC	Automatic Gain Control Status	ON	
AMSG	Auxiliary Minimum Sliding Gate	140	US
CBAF	CBL Adjustment Factor	1	
CBLG	CBL Gate Width	45	US
CDTS	C−Delta−T Shale	100	US/F
DDEL	Digitizing Delay	90	US
DETE	Delta−T Detection	E2	
DFAD	Digital First Arrival Detection Switch	DSP	
DIVL	DSLT Depth Sampling Interval	20	
DRCS	DSLT DLIS Recording Size	100	
DSIN	Digitizing Sample Interval	10	
DTCM	Delta−T Computation Mode	FULL	
DTF	Delta−T Fluid	189	US/F
DTFS	DSLC Telemetry Frame Size	236	
DTM	Delta−T Matrix	56	US/F
DWCO	Digitizing Word Count	100	
GAI	Manual Gain	40	
HRSP	High Resolution Spacing	5.118	IN
ITTS	Integrated Transit Time Source	DT	
LTUT	Lower to Upper Transmitter Spacing Ratio	1	
MAHTR	Manual High Threshold Reference	120	
MGAI	Maximum Gain	60	
MIGA	Minimum Gain	1	
MNHTR	Minimum High Threshold Reference	100	
MODE	Sonic Firing Mode	BHC	
NMSG	Near Minimum Sliding Gate	150	US
NMXG	Near Maximum Sliding Gate	750	US
NUMP	Number of Detection Passes	2	
RATE	Firing Rate	R15	
RDFA	Reset DFAD	OFF	
SDTH	Switch Down Threshold	20000	
SFAF	Sonic Formation Attenuation Factor	0	DB/M
SGAD	Sliding Gate Status	ON	
SGAI	Selectable Acquisition Gain	AUTO	
SGCL	Sliding Gate Closing Delta−T	250	US/F
SGCW	Sliding Gate Closing Width	25	US
SGDT	Sliding Gate Delta−T	50	US/F
SGW	Sliding Gate Width	80	US
SLEV	Signal Level for AGC	5000	
SPFS	Sonic Porosity Formula	RAYMER_HUNT	
SPSO	Sonic Porosity Source	DT	
SUTH	Switch Up Threshold	1000	
VDLG	VDL Manual Gain	40	
WAGC	Waveform AGC Allow/Disallow	OFF	
WGAI	Waveform Manual Gain	20	
WGDT	Waveform Gain Delta−T	240	US/F
WGIN	Waveform Gain Interval	2540	US
WMOD	Waveform Firing Mode	FULL	
HILTB−FTB: High resolution Integrated Logging Tool−DTS			
BHFL	Borehole Fluid Type	WATER	
BHFL_TLD	HILT Nuclear Mud Base	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	53.8	DEGC

BSCO	Borehole Salinity Correction Option	YES	
CCCO	Casing & Cement Thickness Correction Option	NO	
DHC	Density Hole Correction	BS	
DPPM	Density Porosity Processing Mode	HIRS	
EXSICL	External Shale Indicator Clean Value	20	
EXSISH	External Shale Indicator Shale Value	150	
FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
FSAL	Formation Salinity	−50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCLF	Germany Coal−like Formation Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	HALS_RESIST	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HACPP	Accelerometer PROM Presence	PRESENT_DOWNHOLE	
HART	Accelerometer Reference Temperature	20	DEGC
HDCOD	HILT Density Coal detection	2	G/C3
HDSAD	HILT Density Salt detection	2.1	G/C3
HILT_GAS_DENSITY	HILT Gas Downhole Density	0	G/C3
HILT_GAS_OPTION	HILT Gas Computation Option	OFF	
HNCOD	HILT Neutron Coal detection	45	PU
HNSAD	HILT Neutron Salt detection	5	PU
HPHIECUT	HILT effective Porosity Cutoff	5	PU
HSCO	Hole Size Correction Option	YES	
HSIS	HILT Shale Indicator Selection	GR	
HSSO	HRDD Nuclear Source Strength Option	NORMAL	
HSWCUT	HILT Water Saturation from AITH cutoff	50	%
ISSBAR	Barite Mud Switch	NOBARITE	
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
MHC0	MCFL B0 Contrast Correction Coefficient	2.2e−005	OHMS
MHC1	MCFL B1 Contrast Correction Coefficient	3.2e−005	OHMS
MHCC	MCFL High Contrast Correction Switch	NO	
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	HiRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PEA_FILTER	PEA Filter	NO_FILTER	
PEFC_FILTER	PEFC Filter	NO_FILTER	
PHIMAX	HILT max porosity	35	PU
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SEXP_HILT	HILT Saturation Exponent	2	
SHT	Surface Hole Temperature	15	DEGC
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	YES	
BSP: Bridle SP			
SPNV	SP Next Value	0	MV
HOLEV: Integrated Hole/Cement Volume			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	53.8	DEGC
FCD	Future Casing (Outer) Diameter	7	IN
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	HALS_RESIST	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
SHT	Surface Hole Temperature	15	DEGC
STI: Stuck Tool Indicator			
LBFR	Trigger for MAXIS First Reading Label	TDL	
STKT	STI Stuck Threshold	0.762	M
TDD	Total Depth − Driller	1366.00	M
TDL	Total Depth − Logger	1361.30	M
System and Miscellaneous			
ALTDPCHAN	Name of alternate depth channel	SpeedCorrectedDepth	
BS	Bit Size	8.500	IN
BSAL	Borehole Salinity	18000.00	PPM
CSIZ	Current Casing Size	9.625	IN
CWEI	Casing Weight	36.00	LB/F
DFD	Drilling Fluid Density	1.26	G/C3
DORL	Depth Offset for Repeat Analysis	0.0	M
FLEV	Fluid Level	0.00	M
MST	Mud Sample Temperature	16.80	DEGC
PBVSADP	Use alternate depth channel for playback	NO	

RMFS	Resistivity of Mud Filtrate Sample	0.2400	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	1361.3	M
TWS	Temperature of Connate Water Sample	37.78	DEGC

Format: StdRes_HALS_PEX_SONIC_200_REP **Vertical Scale: 1:200** **Graphics File Created: 28−Oct−2009 07:30**

OP System Version: 17C0−154

HALS−B	SRPC−3821−Q2_2009_OP17	DSLT−H	17C0−154
HILTB−FTB	SRPC−3821−Q2_2009_OP17	DTC−H	17C0−154
BSP	17C0−154		

Input DLIS Files

DEFAULT	HALS_SONIC_TLD_MCFL_011PUP	FN:16	PRODUCER	28−Oct−2009 07:25	1363.8 M	1195.1 M

Output DLIS Files

DEFAULT	HALS_SONIC_TLD_MCFL_012LUP	FN:18	PRODUCER	28−Oct−2009 07:30
REALTIME	HALS_SONIC_TLD_MCFL_012LUP	FN:19	PRODUCER	28−Oct−2009 06:30

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Calibrations

MAXIS Field Log

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB Total current mode 1							
Before: 28−Oct−2009 6:08							
Itot 1 Gain	1.000	N/A	0.996	N/A	N/A	0.026	MA
Itot 1 Phase	0.000	N/A	0.000	N/A	N/A	0.100	DEG
HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB Aux current mode 1							
Before: 28−Oct−2009 6:08							
Iaux 1 Gain	1.000	N/A	0.991	N/A	N/A	0.035	MA
Iaux 1 Phase	0.000	N/A	0.138	N/A	N/A	1.900	DEG
HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB Aux current mode 2							
Before: 28−Oct−2009 6:08							
Iaux 2 Gain	1.000	N/A	0.980	N/A	N/A	0.048	MA
Iaux 2 Phase	0.000	N/A	−0.000	N/A	N/A	0.100	DEG
HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB A0 current mode 3A							
Before: 28−Oct−2009 6:08							
I0 3A Gain	1.000	N/A	0.984	N/A	N/A	0.036	UA
I0 3A Phase	0.000	N/A	−0.000	N/A	N/A	0.100	DEG
HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB A0 current mode 3B							
Before: 28−Oct−2009 6:08							
I0 3B Gain	1.000	N/A	0.975	N/A	N/A	0.036	UA
I0 3B Phase	0.000	N/A	−0.000	N/A	N/A	0.100	DEG
HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB Torpedo Voltage gains							
Before: 28−Oct−2009 6:08							
Zvt 1 Gain	1.000	N/A	0.991	N/A	N/A	0.025	MV
Zvt 2 Gain	1.000	N/A	0.990	N/A	N/A	0.045	MV
Zvt 3 Gain	1.000	N/A	0.992	N/A	N/A	0.045	MV
HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB Torpedo Voltage Phases							

Before: 28−Oct−2009 6:08

Zvt 1 Phase	0.000	N/A	0.127	N/A	N/A	2.300	DEG
Zvt 2 Phase	0.000	N/A	−0.172	N/A	N/A	0.800	DEG
Zvt 3 Phase	0.000	N/A	−0.113	N/A	N/A	0.500	DEG

HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB Upper Bridle Voltage mode 1
Before: 28−Oct−2009 6:08

Zvb 1 Gain	1.000	N/A	0.991	N/A	N/A	0.025	MV
Zvb 1 Phase	0.000	N/A	0.141	N/A	N/A	2.300	DEG

HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB M1−M2 Voltage gains
Before: 28−Oct−2009 6:08

ZVM 1 Gain	1.000	N/A	0.995	N/A	N/A	0.039	UV
ZVM 2 Gain	1.000	N/A	0.991	N/A	N/A	0.019	UV
ZVM 3 Gain	1.000	N/A	0.990	N/A	N/A	0.019	UV

HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB M1−M2 Voltage Phases
Before: 28−Oct−2009 6:08

ZVM 1 Phase	0.000	N/A	0.325	N/A	N/A	3.800	DEG
ZVM 2 Phase	0.000	N/A	1.376	N/A	N/A	1.300	DEG
ZVM 3 Phase	0.000	N/A	0.799	N/A	N/A	1.000	DEG

HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB M1−A0* Voltage gains
Before: 28−Oct−2009 6:08

ZVH 1 Gain	1.000	N/A	0.999	N/A	N/A	0.013	UV
ZVH 2 Gain	1.000	N/A	0.998	N/A	N/A	0.046	UV
ZVH 3 Gain	1.000	N/A	0.995	N/A	N/A	0.046	UV

HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB M1−A0* Voltage Phases
Before: 28−Oct−2009 6:08

ZVH 1 Phase	0.000	N/A	0.432	N/A	N/A	3.800	DEG
ZVH 2 Phase	0.000	N/A	1.975	N/A	N/A	1.300	DEG
ZVH 3 Phase	0.000	N/A	1.199	N/A	N/A	1.000	DEG

HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB Aux Voltage gains
Before: 28−Oct−2009 6:08

ZVA 1 Gain	1.000	N/A	1.075	N/A	N/A	0.032	MV
ZVA 2 Gain	1.000	N/A	1.066	N/A	N/A	0.045	MV
ZVA 3 Gain	1.000	N/A	1.003	N/A	N/A	0.045	MV

HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB Aux Voltage Phases
Before: 28−Oct−2009 6:08

ZVA 1 Phase	0.000	N/A	1.084	N/A	N/A	2.300	DEG
ZVA 2 Phase	0.000	N/A	−0.330	N/A	N/A	0.800	DEG
ZVA 3 Phase	0.000	N/A	0.308	N/A	N/A	0.500	DEG

HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB A0*−A0*' Diff. Voltage mode 1
Before: 28−Oct−2009 6:08

ZVD 1 Gain	1.000	N/A	0.992	N/A	N/A	0.047	UV
ZVD 1 Phase	0.000	N/A	0.243	N/A	N/A	3.800	DEG

HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB A0*−A0*' Diff. Voltage mode 2
Before: 28−Oct−2009 6:08

ZVD 2 Gain	1.000	N/A	0.982	N/A	N/A	0.056	UV
ZVD 2 Phase	0.000	N/A	1.114	N/A	N/A	1.300	DEG

HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB A0*−A0*' Diff. Voltage mode 3A
Before: 28−Oct−2009 6:08

ZVD 3A Gain	1.000	N/A	0.984	N/A	N/A	0.056	UV
ZVD 3A Phase	0.000	N/A	0.544	N/A	N/A	1.000	DEG

HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB A0*−A0*' Diff. Voltage mode 3B
Before: 28−Oct−2009 6:08

ZVD 3B Gain	1.000	N/A	1.000	N/A	N/A	0.054	UV
ZVD 3B Phase	0.000	N/A	−0.105	N/A	N/A	1.000	DEG

HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB vertical Voltage mode 1
Before: 28−Oct−2009 6:08

ZVV 1 Gain	1.000	N/A	0.995	N/A	N/A	0.022	UV
ZVV 1 Phase	0.000	N/A	0.374	N/A	N/A	2.800	DEG

HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB vertical Voltage mode 2
Before: 28−Oct−2009 6:08

ZVV 2 Gain	1.000	N/A	0.987	N/A	N/A	0.036	UV
ZVV 2 Phase	0.000	N/A	2.397	N/A	N/A	1.300	DEG

HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB Azimuthal Voltages mode 1
Before: 28−Oct−2009 6:08

Az 1 Gain − 0	1.000	N/A	0.997	N/A	N/A	0.047	UV
Az 1 Gain − 1	1.000	N/A	0.997	N/A	N/A	0.047	UV
Az 1 Gain − 2	1.000	N/A	0.992	N/A	N/A	0.047	UV
Az 1 Gain − 3	1.000	N/A	0.999	N/A	N/A	0.047	UV

Az 1 Gain − 4	1.000	N/A	0.999	N/A	N/A	0.047	UV
Az 1 Gain − 5	1.000	N/A	0.994	N/A	N/A	0.047	UV
Az 1 Gain − 6	1.000	N/A	0.993	N/A	N/A	0.047	UV
Az 1 Gain − 7	1.000	N/A	0.990	N/A	N/A	0.047	UV
Az 1 Gain − 8	1.000	N/A	0.994	N/A	N/A	0.047	UV
Az 1 Gain − 9	1.000	N/A	0.994	N/A	N/A	0.047	UV
Az 1 Gain − 10	1.000	N/A	0.992	N/A	N/A	0.047	UV
Az 1 Gain − 11	1.000	N/A	0.998	N/A	N/A	0.047	UV
AZ 1 Phase − 0	0.000	N/A	0.001	N/A	N/A	3.800	DEG
AZ 1 Phase − 1	0.000	N/A	0.079	N/A	N/A	3.800	DEG
AZ 1 Phase − 2	0.000	N/A	0.222	N/A	N/A	3.800	DEG
AZ 1 Phase − 3	0.000	N/A	0.126	N/A	N/A	3.800	DEG
AZ 1 Phase − 4	0.000	N/A	0.049	N/A	N/A	3.800	DEG
AZ 1 Phase − 5	0.000	N/A	0.193	N/A	N/A	3.800	DEG
AZ 1 Phase − 6	0.000	N/A	0.216	N/A	N/A	3.800	DEG
AZ 1 Phase − 7	0.000	N/A	0.011	N/A	N/A	3.800	DEG
AZ 1 Phase − 8	0.000	N/A	0.212	N/A	N/A	3.800	DEG
AZ 1 Phase − 9	0.000	N/A	0.128	N/A	N/A	3.800	DEG
AZ 1 Phase − 10	0.000	N/A	0.153	N/A	N/A	3.800	DEG
AZ 1 Phase − 11	0.000	N/A	0.085	N/A	N/A	3.800	DEG

HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB Azimuthal Voltages mode 2
Before: 28−Oct−2009 6:08

Az 2 Gain − 0	1.000	N/A	0.985	N/A	N/A	0.056	UV
Az 2 Gain − 1	1.000	N/A	0.986	N/A	N/A	0.056	UV
Az 2 Gain − 2	1.000	N/A	0.982	N/A	N/A	0.056	UV
Az 2 Gain − 3	1.000	N/A	0.988	N/A	N/A	0.056	UV
Az 2 Gain − 4	1.000	N/A	0.989	N/A	N/A	0.056	UV
Az 2 Gain − 5	1.000	N/A	0.984	N/A	N/A	0.056	UV
Az 2 Gain − 6	1.000	N/A	0.983	N/A	N/A	0.056	UV
Az 2 Gain − 7	1.000	N/A	0.979	N/A	N/A	0.056	UV
Az 2 Gain − 8	1.000	N/A	0.984	N/A	N/A	0.056	UV
Az 2 Gain − 9	1.000	N/A	0.984	N/A	N/A	0.056	UV
Az 2 Gain − 10	1.000	N/A	0.982	N/A	N/A	0.056	UV
Az 2 Gain − 11	1.000	N/A	0.987	N/A	N/A	0.056	UV
Az 2 Phase − 0	0.000	N/A	1.013	N/A	N/A	1.300	DEG
Az 2 Phase − 1	0.000	N/A	1.141	N/A	N/A	1.300	DEG
Az 2 Phase − 2	0.000	N/A	1.107	N/A	N/A	1.300	DEG
Az 2 Phase − 3	0.000	N/A	1.120	N/A	N/A	1.300	DEG
Az 2 Phase − 4	0.000	N/A	1.141	N/A	N/A	1.300	DEG
Az 2 Phase − 5	0.000	N/A	1.088	N/A	N/A	1.300	DEG
Az 2 Phase − 6	0.000	N/A	1.134	N/A	N/A	1.300	DEG
Az 2 Phase − 7	0.000	N/A	1.053	N/A	N/A	1.300	DEG
Az 2 Phase − 8	0.000	N/A	1.131	N/A	N/A	1.300	DEG
Az 2 Phase − 9	0.000	N/A	1.078	N/A	N/A	1.300	DEG
Az 2 Phase − 10	0.000	N/A	1.106	N/A	N/A	1.300	DEG
Az 2 Phase − 11	0.000	N/A	1.071	N/A	N/A	1.300	DEG

HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB Azimuthal Voltages mode 3A
Before: 28−Oct−2009 6:08

Az 3A Gain − 0	1.000	N/A	0.989	N/A	N/A	0.056	UV
Az 3A Gain − 1	1.000	N/A	0.989	N/A	N/A	0.056	UV
Az 3A Gain − 2	1.000	N/A	0.984	N/A	N/A	0.056	UV
Az 3A Gain − 3	1.000	N/A	0.991	N/A	N/A	0.056	UV
Az 3A Gain − 4	1.000	N/A	0.991	N/A	N/A	0.056	UV
Az 3A Gain − 5	1.000	N/A	0.986	N/A	N/A	0.056	UV
Az 3A Gain − 6	1.000	N/A	0.986	N/A	N/A	0.056	UV
Az 3A Gain − 7	1.000	N/A	0.982	N/A	N/A	0.056	UV
Az 3A Gain − 8	1.000	N/A	0.986	N/A	N/A	0.056	UV
Az 3A Gain − 9	1.000	N/A	0.987	N/A	N/A	0.056	UV
Az 3A Gain − 10	1.000	N/A	0.984	N/A	N/A	0.056	UV
Az 3A Gain − 11	1.000	N/A	0.989	N/A	N/A	0.056	UV
Az 3A Phase − 0	0.000	N/A	0.456	N/A	N/A	1.000	DEG
Az 3A Phase − 1	0.000	N/A	0.512	N/A	N/A	1.000	DEG
Az 3A Phase − 2	0.000	N/A	0.517	N/A	N/A	1.000	DEG
Az 3A Phase − 3	0.000	N/A	0.522	N/A	N/A	1.000	DEG
Az 3A Phase − 4	0.000	N/A	0.527	N/A	N/A	1.000	DEG
Az 3A Phase − 5	0.000	N/A	0.519	N/A	N/A	1.000	DEG
Az 3A Phase − 6	0.000	N/A	0.557	N/A	N/A	1.000	DEG
Az 3A Phase − 7	0.000	N/A	0.485	N/A	N/A	1.000	DEG
Az 3A Phase − 8	0.000	N/A	0.568	N/A	N/A	1.000	DEG
Az 3A Phase − 9	0.000	N/A	0.519	N/A	N/A	1.000	DEG
Az 3A Phase − 10	0.000	N/A	0.541	N/A	N/A	1.000	DEG
Az 3A Phase − 11	0.000	N/A	0.500	N/A	N/A	1.000	DEG

HILT Azimuthal Laterolog Sonde B Wellsite Calibration − HALSB Azimuthal Voltages mode 3B
Before: 28−Oct−2009 6:08

Az 3B Gain − 0	1.000	N/A	0.999	N/A	N/A	0.054	UV
Az 3B Gain − 1	1.000	N/A	1.006	N/A	N/A	0.054	UV
Az 3B Gain − 2	1.000	N/A	1.002	N/A	N/A	0.054	UV
Az 3B Gain − 3	1.000	N/A	1.011	N/A	N/A	0.054	UV

Az 3B Gain − 4	1.000	N/A	1.009	N/A	N/A	0.054	UV
Az 3B Gain − 5	1.000	N/A	0.999	N/A	N/A	0.054	UV
Az 3B Gain − 6	1.000	N/A	1.003	N/A	N/A	0.054	UV
Az 3B Gain − 7	1.000	N/A	0.996	N/A	N/A	0.054	UV
Az 3B Gain − 8	1.000	N/A	1.004	N/A	N/A	0.054	UV
Az 3B Gain − 9	1.000	N/A	1.002	N/A	N/A	0.054	UV
Az 3B Gain − 10	1.000	N/A	1.000	N/A	N/A	0.054	UV
Az 3B Gain − 11	1.000	N/A	1.004	N/A	N/A	0.054	UV
Az 3B Phase − 0	0.000	N/A	−0.356	N/A	N/A	1.000	DEG
Az 3B Phase − 1	0.000	N/A	0.190	N/A	N/A	1.000	DEG
Az 3B Phase − 2	0.000	N/A	0.137	N/A	N/A	1.000	DEG
Az 3B Phase − 3	0.000	N/A	−0.106	N/A	N/A	1.000	DEG
Az 3B Phase − 4	0.000	N/A	−0.061	N/A	N/A	1.000	DEG
Az 3B Phase − 5	0.000	N/A	−0.232	N/A	N/A	1.000	DEG
Az 3B Phase − 6	0.000	N/A	0.007	N/A	N/A	1.000	DEG
Az 3B Phase − 7	0.000	N/A	−0.229	N/A	N/A	1.000	DEG
Az 3B Phase − 8	0.000	N/A	−0.074	N/A	N/A	1.000	DEG
Az 3B Phase − 9	0.000	N/A	−0.300	N/A	N/A	1.000	DEG
Az 3B Phase − 10	0.000	N/A	−0.101	N/A	N/A	1.000	DEG
Az 3B Phase − 11	0.000	N/A	−0.238	N/A	N/A	1.000	DEG

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Stab Measurement Summary
Before: 23−Oct−2009 10:10

BS Window Ratio	0.7617	N/A	0.7616	N/A	N/A	N/A	
BS Window Sum	10210	N/A	10560	N/A	N/A	N/A	CPS
SS Window Ratio	0.4866	N/A	0.4883	N/A	N/A	N/A	
SS Window Sum	9971	N/A	9969	N/A	N/A	N/A	CPS
LS Window Ratio	0.2985	N/A	0.2970	N/A	N/A	N/A	
LS Window Sum	1112	N/A	1115	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Photo−multiplier High Voltages Calibrations
Before: 23−Oct−2009 10:10

BS PM High Voltage (Command)	1277	N/A	1281	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1936	N/A	1935	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1403	N/A	1411	N/A	N/A	N/A	V

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Crystal Quality Resolutions Calibration
Before: 23−Oct−2009 10:10

BS Crystal Resolution	9.831	N/A	9.895	N/A	N/A	N/A	%
SS Crystal Resolution	10.59	N/A	10.54	N/A	N/A	N/A	%
LS Crystal Resolution	9.541	N/A	9.511	N/A	N/A	N/A	%

High resolution Integrated Logging Tool−DTS Wellsite Calibration − MCFL Calibration
Before: 23−Oct−2009 10:12

Raw B0 Resistivity	3875	N/A	3877	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3834	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3836	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool−DTS Wellsite Calibration − HILT Caliper Calibration
Before: 23−Oct−2009 10:09

HILT Caliper Zero Measurement	8.000	N/A	8.206	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	12.42	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Detector Calibration
Before: 23−Oct−2009 10:07

Gamma Ray Background	30.00	N/A	22.00	N/A	N/A	N/A	GAPI
Gamma Ray (Jig − Bkgd)	165.0	N/A	175.6	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Zero Measurement
Master: 23−Oct−2009 18:00 Before: 23−Oct−2009 10:08

CNTC Background	29.65	29.65	27.64	N/A	N/A	4.448	CPS
CFTC Background	29.60	29.60	29.60	N/A	N/A	4.440	CPS

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Ratio Measurement
Master: 23−Oct−2009 18:00

Thermal Near Corr. (Tank)	5800	4877	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	2026	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.407	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Accelerometer Calibration
Before: 28−Oct−2009 6:08

Z−Axis Acceleration	9.810	N/A	9.798	N/A	N/A	N/A	M/S2

High resolution Integrated Logging Tool−DTS Master Calibration − Inversion results
Master: 23−Oct−2009 16:55

Rho Aluminum	2.596	2.601	−−	−−	−−	−−	G/C3
Rho Magnesium	1.686	1.688	−−	−−	−−	−−	G/C3
Pe Aluminum	2.570	2.574	−−	−−	−−	−−	
Pe Magnesium	2.650	2.619	−−	−−	−−	−−	

High resolution Integrated Logging Tool−DTS Master Calibration − Deviation Summary
Master: 23−Oct−2009 16:55

BS Average Deviation	0	0.5258	--	--	--	--	%
BS Max Deviation	0	1.011	--	--	--	--	%
SS Average Deviation	0	0.2976	--	--	--	--	%
SS Max Deviation	0	0.9804	--	--	--	--	%
LS Average Deviation	0	0.7594	--	--	--	--	%
LS Max Deviation	0	1.860	--	--	--	--	%

Density Master Calibration is obsolete !

The GLS−VJ source activity is acceptable.

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

NCT−B Water Temperature 22.8 DEGC.
Thermal Housing Size 3.372 IN.
NSR−F serial number 5050

HILT Azimuthal Laterolog Sonde B / Equipment Identification

Primary Equipment:

Auxiliary Equipment:
Laterolog Control Module LCM − AA

HILT Azimuthal Laterolog Sonde B Wellsite Calibration
HALSB Total current mode 1

Itot 1 Gain MA	Value	Itot 1 Phase DEG	Value
	0.996		0.000
0.926 (Minimum) 1.000 (Nominal) 1.081 (Maximum)		−0.100 (Minimum) 0.000 (Nominal) 0.100 (Maximum)	

Before: 28−Oct−2009 6:08

HILT Azimuthal Laterolog Sonde B Wellsite Calibration
HALSB Aux current mode 1

Iaux 1 Gain MA	Value	Iaux 1 Phase DEG	Value
	0.991		0.138
0.854 (Minimum) 1.000 (Nominal) 1.180 (Maximum)		−4.600 (Minimum) 0.000 (Nominal) 4.600 (Maximum)	

Before: 28−Oct−2009 6:08

HILT Azimuthal Laterolog Sonde B Wellsite Calibration
HALSB Aux current mode 2

Iaux 2 Gain MA	Value	Iaux 2 Phase DEG	Value
	0.980		−0.000
0.816 (Minimum) 1.000 (Nominal) 1.232 (Maximum)		−1.000 (Minimum) 0.000 (Nominal) 0.100 (Maximum)	

Before: 28−Oct−2009 6:08

HILT Azimuthal Laterolog Sonde B Wellsite Calibration
HALSB A0 current mode 3A

I0 3A Gain UA	Value	I0 3A Phase DEG	Value
	0.984		−0.000
0.893 (Minimum) 1.000 (Nominal) 1.114 (Maximum)		−1.000 (Minimum) 0.000 (Nominal) 0.100 (Maximum)	

Before: 28−Oct−2009 6:08

HILT Azimuthal Laterolog Sonde B Wellsite Calibration
HALSB A0 current mode 3B

I0 3B Gain UA	Value	I0 3B Phase DEG	Value
	0.975		−0.000
0.893 (Minimum) 1.000 (Nominal) 1.114 (Maximum)		−1.000 (Minimum) 0.000 (Nominal) 0.100 (Maximum)	

Before: 28−Oct−2009 6:08

HILT Azimuthal Laterolog Sonde B Wellsite Calibration
HALSB Torpedo Voltage gains

Zvt 1 Gain MV	Value	Zvt 2 Gain MV	Value	Zvt 3 Gain MV	Value
	0.991		0.990		0.992
0.925 (Minimum) 1.000 (Nominal) 1.078 (Maximum)		0.865 (Minimum) 1.000 (Nominal) 1.153 (Maximum)		0.865 (Minimum) 1.000 (Nominal) 1.153 (Maximum)	

Before: 28−Oct−2009 6:08

HILT Azimuthal Laterolog Sonde B Wellsite Calibration
HALSB Torpedo Voltage Phases

Zvt 1 Phase DEG	Value	Zvt 2 Phase DEG	Value	Zvt 3 Phase DEG	Value
	0.127		−0.172		−0.113
−4.400 (Minimum) 0.000 (Nominal) 4.400 (Maximum)		−2.800 (Minimum) 0.000 (Nominal) 2.800 (Maximum)		−1.400 (Minimum) 0.000 (Nominal) 1.400 (Maximum)	

Before: 28−Oct−2009 6:08

HILT Azimuthal Laterolog Sonde B Wellsite Calibration
HALSB Upper Bridle Voltage mode 1

Zvb 1 Gain MV	Value	Zvb 1 Phase DEG	Value

		0.991					0.141	
0.925 (Minimum)	1.000 (Nominal)	1.078 (Maximum)		−4.400 (Minimum)	0.000 (Nominal)	4.400 (Maximum)		

Before: 28−Oct−2009 6:08

HILT Azimuthal Laterolog Sonde B Wellsite Calibration

HALSB M1−M2 Voltage gains

ZVM 1 Gain UV	Value	ZVM 2 Gain UV	Value	ZVM 3 Gain UV	Value
	0.995		0.991		0.990
0.895 (Minimum) 1.000 (Nominal) 1.117 (Maximum)		0.943 (Minimum) 1.000 (Nominal) 1.056 (Maximum)		0.943 (Minimum) 1.000 (Nominal) 1.056 (Maximum)	

Before: 28−Oct−2009 6:08

HILT Azimuthal Laterolog Sonde B Wellsite Calibration

HALSB M1−M2 Voltage Phases

ZVM 1 Phase DEG	Value	ZVM 2 Phase DEG	Value	ZVM 3 Phase DEG	Value
	0.325		1.376		0.799
−6.500 (Minimum) 0.000 (Nominal) 6.500 (Maximum)		−3.300 (Minimum) 0.000 (Nominal) 3.300 (Maximum)		−2.000 (Minimum) 0.000 (Nominal) 2.000 (Maximum)	

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HILT Azimuthal Laterolog Sonde B Wellsite Calibration

HALSB M1−A0* Voltage gains

ZVH 1 Gain UV	Value	ZVH 2 Gain UV	Value	ZVH 3 Gain UV	Value
	0.999		0.998		0.995
0.962 (Minimum) 1.000 (Nominal) 1.039 (Maximum)		0.864 (Minimum) 1.000 (Nominal) 1.154 (Maximum)		0.864 (Minimum) 1.000 (Nominal) 1.154 (Maximum)	

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HILT Azimuthal Laterolog Sonde B Wellsite Calibration

HALSB M1−A0* Voltage Phases

ZVH 1 Phase DEG	Value	ZVH 2 Phase DEG	Value	ZVH 3 Phase DEG	Value
	0.432		1.975		1.199
−6.500 (Minimum) 0.000 (Nominal) 6.500 (Maximum)		−3.300 (Minimum) 0.000 (Nominal) 3.300 (Maximum)		−2.000 (Minimum) 0.000 (Nominal) 2.000 (Maximum)	

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HILT Azimuthal Laterolog Sonde B Wellsite Calibration

HALSB Aux Voltage gains

ZVA 1 Gain MV	Value	ZVA 2 Gain MV	Value	ZVA 3 Gain MV	Value
	1.075		1.066		1.003
0.905 (Minimum) 1.000 (Nominal) 1.103 (Maximum)		0.866 (Minimum) 1.000 (Nominal) 1.151 (Maximum)		0.866 (Minimum) 1.000 (Nominal) 1.151 (Maximum)	

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HILT Azimuthal Laterolog Sonde B Wellsite Calibration

HALSB Aux Voltage Phases

ZVA 1 Phase DEG	Value	ZVA 2 Phase DEG	Value	ZVA 3 Phase DEG	Value
	1.084		−0.330		0.308
−4.100 (Minimum) 0.000 (Nominal) 4.100 (Maximum)		−2.300 (Minimum) 0.000 (Nominal) 2.300 (Maximum)		−1.000 (Minimum) 0.000 (Nominal) 1.000 (Maximum)	

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HILT Azimuthal Laterolog Sonde B Wellsite Calibration

HALSB A0*−A0*' Diff. Voltage mode 1

ZVD 1 Gain UV	Value	ZVD 1 Phase DEG	Value
	0.992		0.243
0.874 (Minimum) 1.000 (Nominal) 1.147 (Maximum)		−6.300 (Minimum) 0.000 (Nominal) 6.300 (Maximum)	

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HILT Azimuthal Laterolog Sonde B Wellsite Calibration

HALSB A0*−A0*' Diff. Voltage mode 2

ZVD 2 Gain UV	Value	ZVD 2 Phase DEG	Value
	0.982		1.114
0.842 (Minimum) 1.000 (Nominal) 1.187 (Maximum)		−3.300 (Minimum) 0.000 (Nominal) 3.300 (Maximum)	

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HILT Azimuthal Laterolog Sonde B Wellsite Calibration

HALSB A0*−A0*' Diff. Voltage mode 3A

ZVD 3A Gain UV	Value	ZVD 3A Phase DEG	Value
	0.984		0.544
0.842 (Minimum) 1.000 (Nominal) 1.187 (Maximum)		−2.000 (Minimum) 0.000 (Nominal) 2.000 (Maximum)	

Before: 28−Oct−2009 6:08

HILT Azimuthal Laterolog Sonde B Wellsite Calibration

HALSB A0*−A0*' Diff. Voltage mode 3B

ZVD 3B Gain UV	Value	ZVD 3B Phase DEG	Value
	1.000		−0.105
0.845 (Minimum) 1.000 (Nominal) 1.183 (Maximum)		−2.000 (Minimum) 0.000 (Nominal) 2.000 (Maximum)	

Before: 28−Oct−2009 6:08

HILT Azimuthal Laterolog Sonde B Wellsite Calibration

HILT Azimuthal Laterolog Sonde B Wellsite Calibration

HALSB vertical Voltage mode 1

ZVV 1 Gain UV	Value	ZVV 1 Phase DEG	Value
	0.995		0.374
0.936 (Minimum) 1.000 (Nominal) 1.065 (Maximum)		−4.600 (Minimum) 0.000 (Nominal) 4.600 (Maximum)	

Before: 28−Oct−2009 6:08

HILT Azimuthal Laterolog Sonde B Wellsite Calibration

HALSB vertical Voltage mode 2

ZVV 2 Gain UV	Value	ZVV 2 Phase DEG	Value
	0.987		2.397
0.895 (Minimum) 1.000 (Nominal) 1.112 (Maximum)		−2.800 (Minimum) 0.000 (Nominal) 2.800 (Maximum)	

Before: 28−Oct−2009 6:08

HILT Azimuthal Laterolog Sonde B Wellsite Calibration

HALSB Azimuthal Voltages mode 1

Idx	Az 1 Gain UV	Value	Idx	AZ 1 Phase DEG	Value
0		0.997	0		0.001
1		0.997	1		0.079
2		0.992	2		0.222
3		0.999	3		0.126
4		0.999	4		0.049
5		0.994	5		0.193
6		0.993	6		0.216
7		0.990	7		0.011
8		0.994	8		0.212
9		0.994	9		0.128
10		0.992	10		0.153
11		0.998	11		0.085
0.874 (Minimum) 1.000 (Nominal) 1.147 (Maximum)			−6.300 (Minimum) 0.000 (Nominal) 6.300 (Maximum)		

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HILT Azimuthal Laterolog Sonde B Wellsite Calibration

HALSB Azimuthal Voltages mode 2

Idx	Az 2 Gain UV	Value	Idx	Az 2 Phase DEG	Value
0		0.985	0		1.013
1		0.986	1		1.141
2		0.982	2		1.107
3		0.988	3		1.120
4		0.989	4		1.141
5		0.984	5		1.088
6		0.983	6		1.134
7		0.979	7		1.053
8		0.984	8		1.131
9		0.984	9		1.078
10		0.982	10		1.106
11		0.987	11		1.071
0.842 (Minimum) 1.000 (Nominal) 1.187 (Maximum)			−3.300 (Minimum) 0.000 (Nominal) 3.300 (Maximum)		

Before: 28−Oct−2009 6:08

HILT Azimuthal Laterolog Sonde B Wellsite Calibration

HALSB Azimuthal Voltages mode 3A

Idx	Az 3A Gain UV	Value	Idx	Az 3A Phase DEG	Value
0		0.989	0		0.456
1		0.989	1		0.512
2		0.984	2		0.517
3		0.991	3		0.522
4		0.991	4		0.527
5		0.986	5		0.519
6		0.986	6		0.557
7		0.982	7		0.485
8		0.986	8		0.568
9		0.987	9		0.519
10		0.984	10		0.541
11		0.989	11		0.500
0.842 (Minimum) 1.000 (Nominal) 1.187 (Maximum)			−2.000 (Minimum) 0.000 (Nominal) 2.000 (Maximum)		

Before: 28−Oct−2009 6:08

HILT Azimuthal Laterolog Sonde B Wellsite Calibration

HALSB Azimuthal Voltages mode 3B

Idx	Az 3B Gain UV	Value	Idx	Az 3B Phase DEG	Value
0		0.999	0		−0.356
1		1.006	1		0.190
2		1.002	2		0.137
3		1.011	3		−0.106
4		1.009	4		−0.061
5		0.999	5		−0.232
6		1.003	6		0.007
7		0.996	7		−0.229
8		1.004	8		−0.074
9		1.002	9		−0.300
10		1.000	10		−0.101
11		1.004	11		−0.238
0.845 (Minimum) 1.000 (Nominal) 1.183 (Maximum)			−2.000 (Minimum) 0.000 (Nominal) 2.000 (Maximum)		

Before: 28−Oct−2009 6:08

High resolution Integrated Logging Tool−DTS / Equipment Identification

Primary Equipment:

HILT high−Resolution Mechanical Sonde	HRMS − B	788
HILT Rxo Gamma−ray Device	HRGD − B	1806
HILT Micro Cylindrically Focused Log Dev	MCFL −	
GR Logging Source	GLS − VJ	5374
HILT High Res. Control Cartridge	HRCC − B	868
HILT Gamma−Ray Neutron Sonde−DTS	HGNS − B	
HGNS Gamma−Ray Device	HGR −	

HGNS Neutron Detector with Alpha Source	HCNT −
Auxiliary Equipment:	
Neutron Calibration Tank	NCT − B
Gamma Source Radioactive	GSR − U/Y
HGNS Housing	HGNH −

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Stab Measurement Summary

Phase	BS Window Ratio			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	0.7236	0.7617	0.7997	0.7616

Phase	SS Window Ratio			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	0.4622	0.4866	0.5109	0.4883

Phase	LS Window Ratio			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	0.2835	0.2985	0.3134	0.2970

Phase	BS Window Sum CPS			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	9699	10210	10720	10560

Phase	SS Window Sum CPS			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	9473	9971	10470	9969

Phase	LS Window Sum CPS			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	1057	1112	1168	1115

Before: 23−Oct−2009 10:10

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Photo−multiplier High Voltages Calibrations

Phase	BS PM High Voltage (Command) V			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	1177	1277	1377	1281

Phase	SS PM High Voltage (Command) V			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	1836	1936	2036	1935

Phase	LS PM High Voltage (Command) V			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	1303	1403	1503	1411

Before: 23−Oct−2009 10:10

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Crystal Quality Resolutions Calibration

Phase	BS Crystal Resolution %			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	8.831	9.831	10.83	9.895

Phase	SS Crystal Resolution %			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	9.592	10.59	11.59	10.54

Phase	LS Crystal Resolution %			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	8.541	9.541	10.54	9.511

Before: 23−Oct−2009 10:10

High resolution Integrated Logging Tool−DTS Wellsite Calibration

MCFL Calibration

Phase	Raw B0 Resistivity OHMM			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	3565	3875	4185	3877

Phase	Raw B1 Resistivity OHMM			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	3524	3830	4136	3834

Phase	Raw B2 Resistivity OHMM			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	3524	3830	4136	3836

Before: 23−Oct−2009 10:12

High resolution Integrated Logging Tool−DTS Wellsite Calibration

HILT Caliper Calibration

Phase	HILT Caliper Zero Measurement IN			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	6.000	8.000	10.00	8.206

Phase	HILT Caliper Plus Measurement IN			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	9.000	12.00	15.00	12.42

Before: 23−Oct−2009 10:09

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	0	30.00	120.0	22.00

Phase	Gamma Ray (Jig − Bkgd) GAPI			Value
	(Minimum)	(Nominal)	(Maximum)	
Before	157.1	165.0	206.3	175.6

Before: 23−Oct−2009 10:07

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS			Value
	(Minimum)	(Nominal)	(Maximum)	
Master	5.000	29.65	40.00	29.65
Before	5.000	29.65	40.00	27.64

Phase	CFTC Background CPS			Value
	(Minimum)	(Nominal)	(Maximum)	
Master	5.000	29.60	40.00	29.60
Before	5.000	29.60	40.00	29.60

(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)

Master: 23−Oct−2009 18:00 Before: 23−Oct−2009 10:08

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Ratio Measurement

Phase	Thermal Near Corr. (Tank) CPS	Value	Phase	Thermal Far Corr. (Tank) CPS	Value	Phase	CNTC/CFTC (Tank)	Value
Master		4877	Master		2026	Master		2.407
4700 (Minimum)	5800 (Nominal)	6900 (Maximum)	1900 (Minimum)	2400 (Nominal)	2900 (Maximum)	2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)

Master: 23−Oct−2009 18:00

High resolution Integrated Logging Tool−DTS
Wellsite Calibration

Accelerometer Calibration

Phase	Z−Axis Acceleration M/S2	Value
Before		9.798
9.610 (Minimum)	9.810 (Nominal)	10.01 (Maximum)

Before: 28−Oct−2009 6:08

High resolution Integrated Logging Tool−DTS Master Calibration

Inversion results

Phase	Rho Aluminum G/C3	Value	Phase	Rho Magnesium G/C3	Value
Master		2.601	Master		1.688
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		2.574	Master		2.619
2.470 (Minimum)	2.570 (Nominal)	2.670 (Maximum)	2.550 (Minimum)	2.650 (Nominal)	2.750 (Maximum)

Master: 23−Oct−2009 16:55

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		0.5258	Master		0.2976	Master		0.7594
−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		1.011	Master		0.9804	Master		1.860
−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: 23−Oct−2009 16:55

High resolution Integrated Logging Tool−DTS Master Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		29.65	Master		29.60
5.000 (Minimum)	29.65 (Nominal)	40.00 (Maximum)	5.000 (Minimum)	29.60 (Nominal)	40.00 (Maximum)

Master: 23−Oct−2009 18:00

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		4877	Master		2026	Master		2.407
4700 (Minimum)	5800 (Nominal)	6900 (Maximum)	1900 (Minimum)	2400 (Nominal)	2900 (Maximum)	2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)

Master: 23−Oct−2009 18:00

DTS Telemetry Tool / Equipment Identification

Primary Equipment:

DTC−H Auxiliary Cartridge	DTCH − A
DTC−H Telemetry Cartridge	DTCH − A

Auxiliary Equipment:
DTCH Telemetry Cartridge Housing ECH − KC

Company:	**Lakes Oil N.L.**
Well:	**Wombat−4**
Field:	**Wombat**
Rig:	**Hunt #2**
Country:	**Australia**

Schlumberger

HALS−BHC−PEX
Field Print
1:200 Scale