HALLIBURTON

MICROLOG

COMPANY **SANDRIDGE ENERGY**

WELL **MILLY 3020 1-19**

FIELD/BLOCK **EXCEL SOUTHWEST**

COUNTY **KIOWA** STATE **KANSAS**

COMPANY	SANDRIDGE ENERGY
WELL	MILLY 3020 1-19
FIELD/BLOCK	EXCEL SOUTHWEST
COUNTY	KIOWA
STATE	KANSAS

API No. 15-097-21765-00-00

Location (SHL) 740' FSL & 1980' FWL
SE-NW-SE-SW

Sect. 19 Twp. 30S Rge. 20W

Other Services:
DSN / SDL
CSNG
MICROLOG
WSTT
ACRT
MRIL

Permanent Datum	GL	Elev. 2209.0 ft	Elev.: K.B. 2226.5 ft
Log measured from	KB	, 17.5 ft above perm. Datum	D.F. 2226.5 ft
Drilling measured from	KB		G.L. 2209.0 ft

Date		15-Aug-13					
Run No.		ONE					
Depth - Driller		6322.00 ft					
Depth - Logger		6324.0 ft					
Bottom - Logged Interval		6241					
Top - Logged Interval		738					
Casing - Driller		8.625 in @ 744.0 ft		@		@	
Casing - Logger		738.0 ft					
Bit Size		7.875 in		@		@	
Type Fluid in Hole		WATER BASED MUD					
Density	Viscosity	9.2 ppg	53.00 s/qt				
PH	Fluid Loss	10.50 pH	6.0 cptm				
Source of Sample		MUD PIT					
Rm @ Meas. Temperature		0.200 ohmm @ 85.00 degF		@		@	
Rmf @ Meas. Temperature		0.17 ohmm @ 85.00 degF		@		@	
Rmc @ Meas. Temperature		0.230 ohmm @ 85.00 degF		@		@	
Source Rmf	Rmc	CALCULATED	CALCULATED				
Rm @ BHT		0.13 ohmm @ 137.0 degF		@		@	
Time Since Circulation		6.5 hr					
Time on Bottom		16-Aug-13 01:11					
Max. Rec. Temperature		137.0 degF @ 6322.0 ft		@		@	
Equipment	Location	11230668	LIBERAL				
Recorded By		S. INGERSOLL					
Witnessed By		B. TOMLINSON					

Fold here

Service Ticket No.: 900661383 API Serial No.: 15-097-21765-00-00 PGM Version: WL INSITE R3.8.4 (Build 5)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE

RESISTIVITY SCALE CHANGES

	Sample No.			Type Log	Depth	Scale Up Hole	Scale Down Hole
Date							
Depth-Driller							
Type Fluid in Hole							
Density	Viscosity						
Ph	Fluid Loss						
Source of Sample							
Rm @ Meas. Temp		@	@				
Rmf @ Meas. Temp.		@	@				
Rmc @ Meas. Temp.		@	@				
Source Rmf	Rmc						
Rm @ BHT		@	@				
Rmf @ BHT		@	@				
Rmc @ BHT		@	@				

RESISTIVITY EQUIPMENT DATA

	Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other
	ONE	ACRT	N/A	1.5" S.O.	
		10929776			

EQUIPMENT DATA

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	10748374	Serial No.	10753396	Serial No.	10714945	Serial No.	11019641
Model No.	GTET	Model No.	WSTT	Model No.	SDLT	Model No.	DSNT
Diameter	3.625"	No. of Cent.	3	Diameter	5.3"	Diameter	3.625"
Detector Model No.	T-102	Spacing	.5'	Log Type	GAM-GAM	Log Type	NEU-NEU
Type	SCINT			Source Type	CS-137	Source Type	AM-241BE
Length	8"	LSA [Y/N]	YES	Serial No.	5073GW	Serial No.	DSN-436
Distance to Source	N/A	FWDA [Y/N]	YES	Strength	1.5 CI	Strength	15 CI

LOGGING DATA

GENERAL				GAMMA		ACOUSTIC			DENSITY			NEUTRON		
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	6324	738	REC	0	150	30	-10	47.6 us/ft	30	-10	2.71 gm/cc	30	-10	LIME

DIRECTIONAL INFORMATION

Maximum Deviation @	KOP @

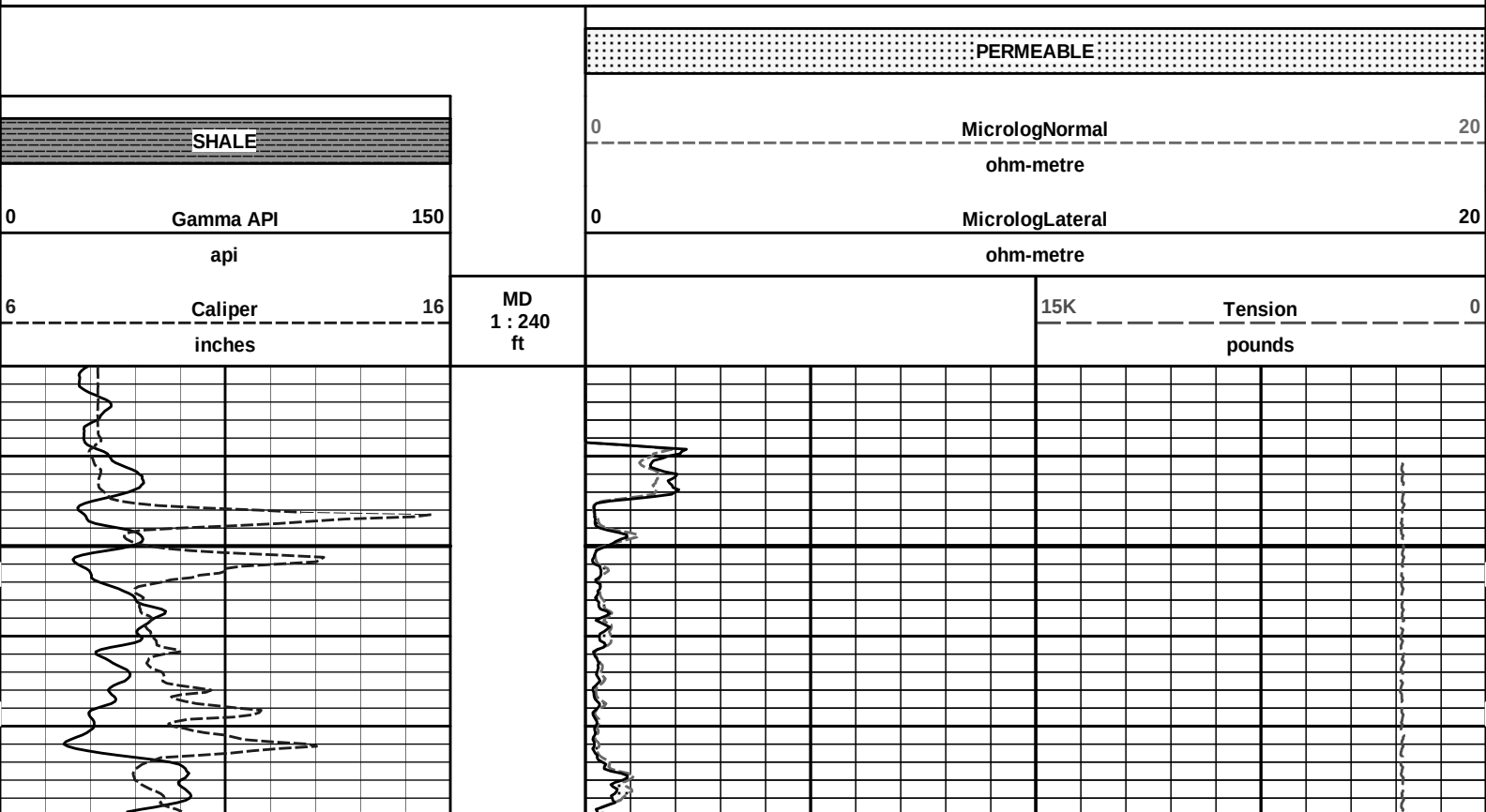
Remarks: ANNULAR HOLE VOLUME CACULATED FOR 5.5 INCH CASING.

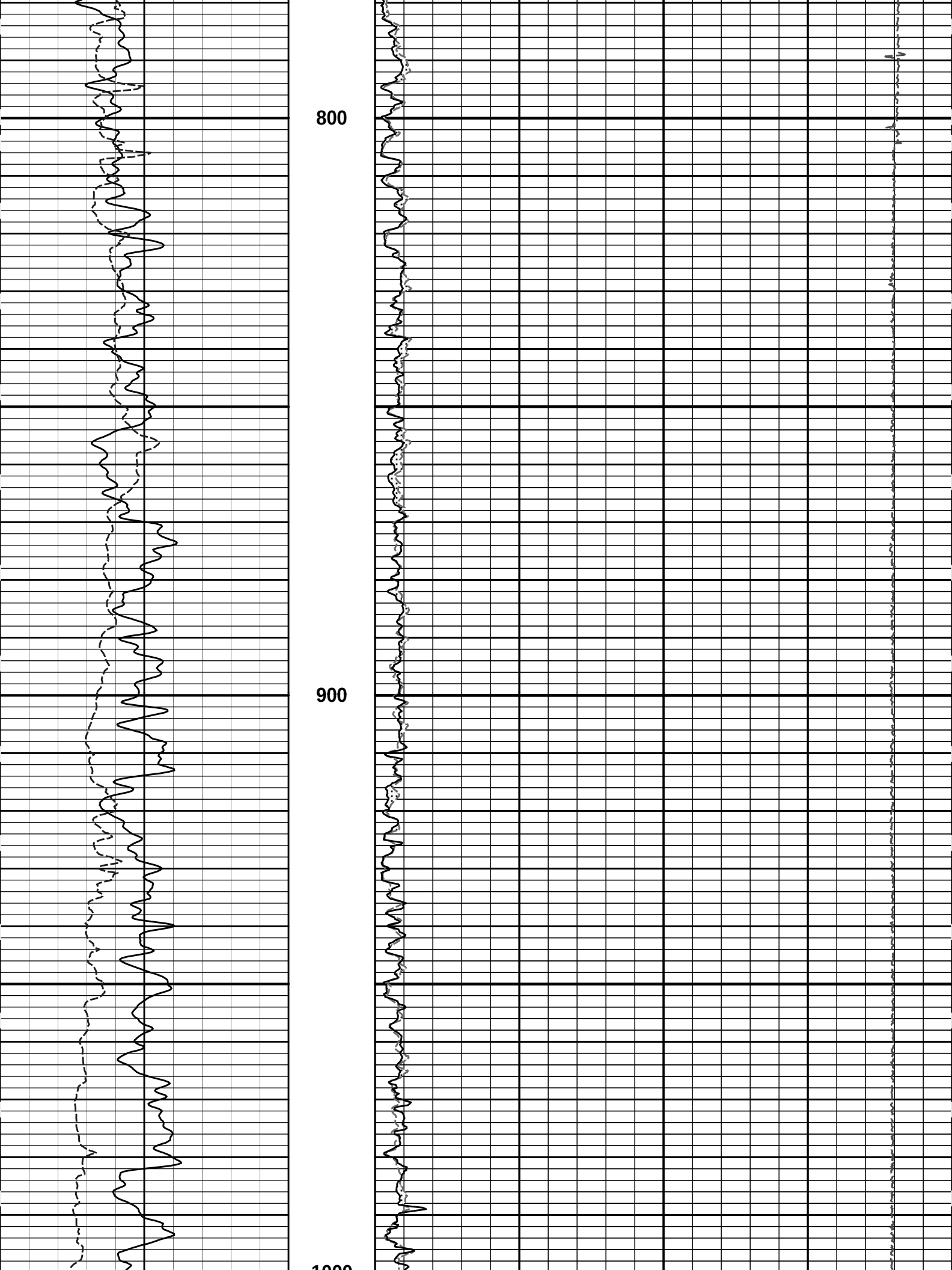
CHLORIDES REPORTED AT 22000 mg/L.

HALLIBURTON

Plot Time: 16-Aug-13 14:07:50
Plot Range: 730 ft to 6327.75 ft
Data: MILLY_3020_1-19\Well Based\R1 CASING
Plot File: \\-LOCAL-\MILLY_3020_1-19\Well Based\MICROLOG\Microlog_IQ_5_main_lib

5 INCH MAIN LOG

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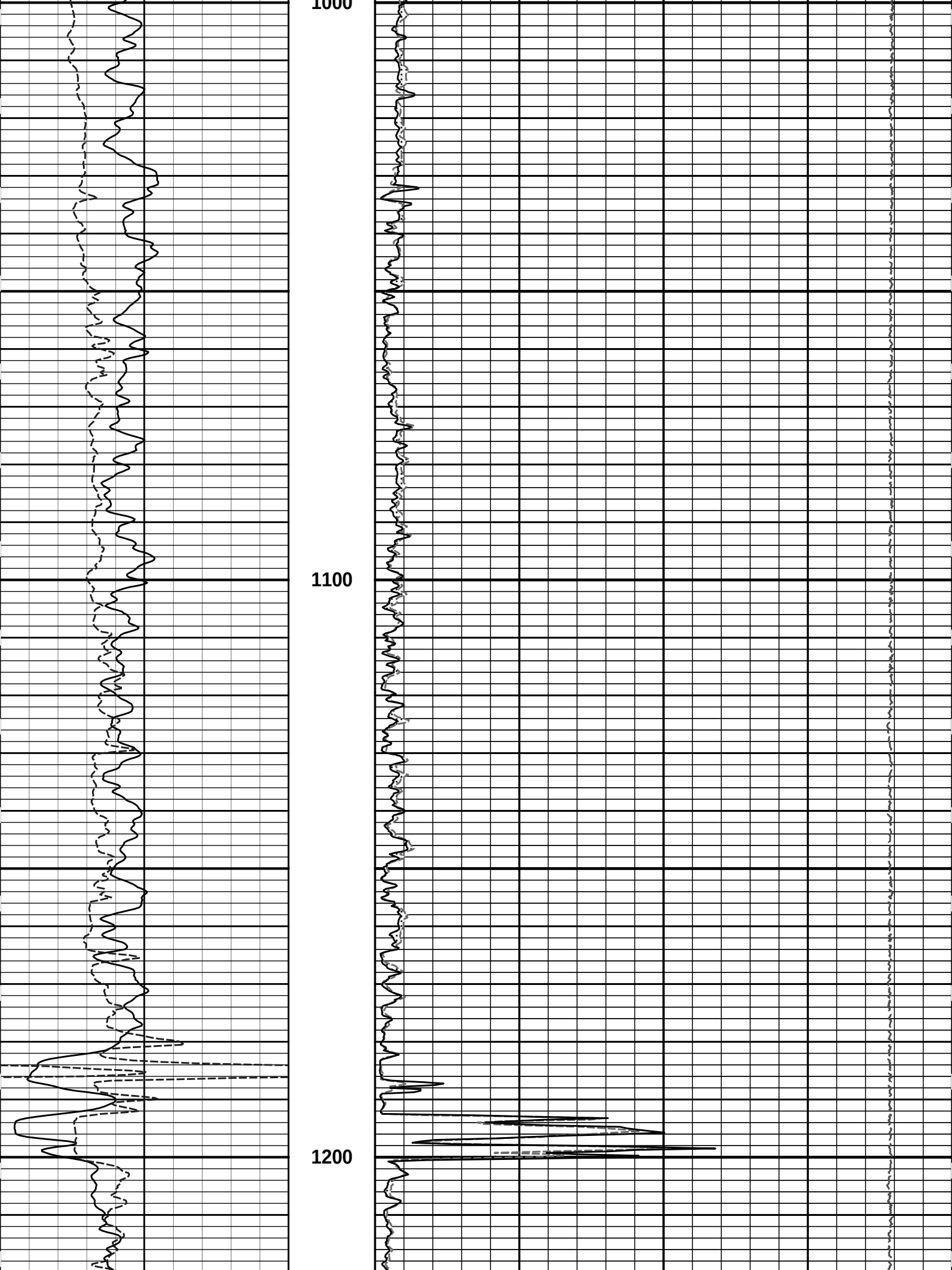
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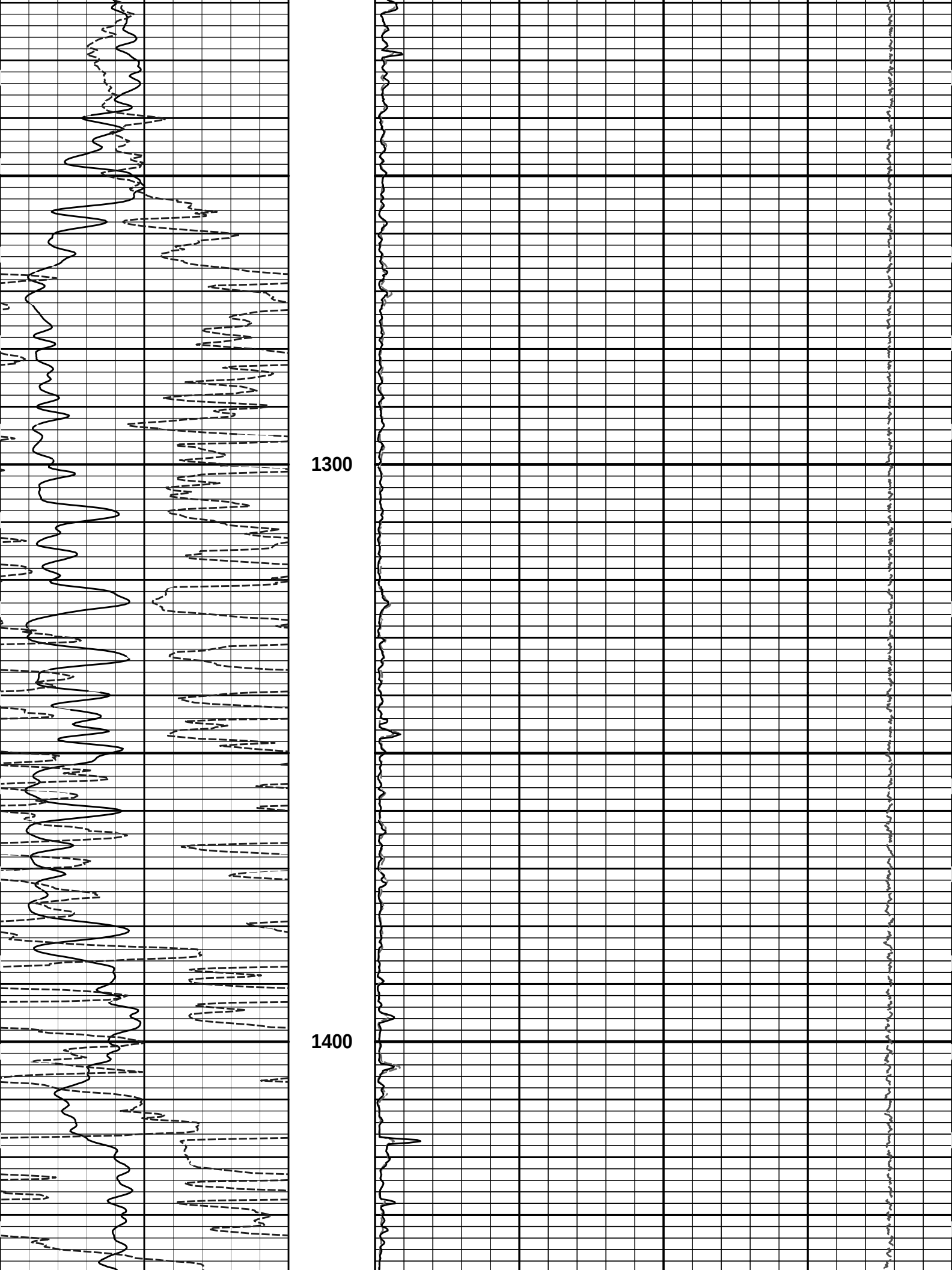
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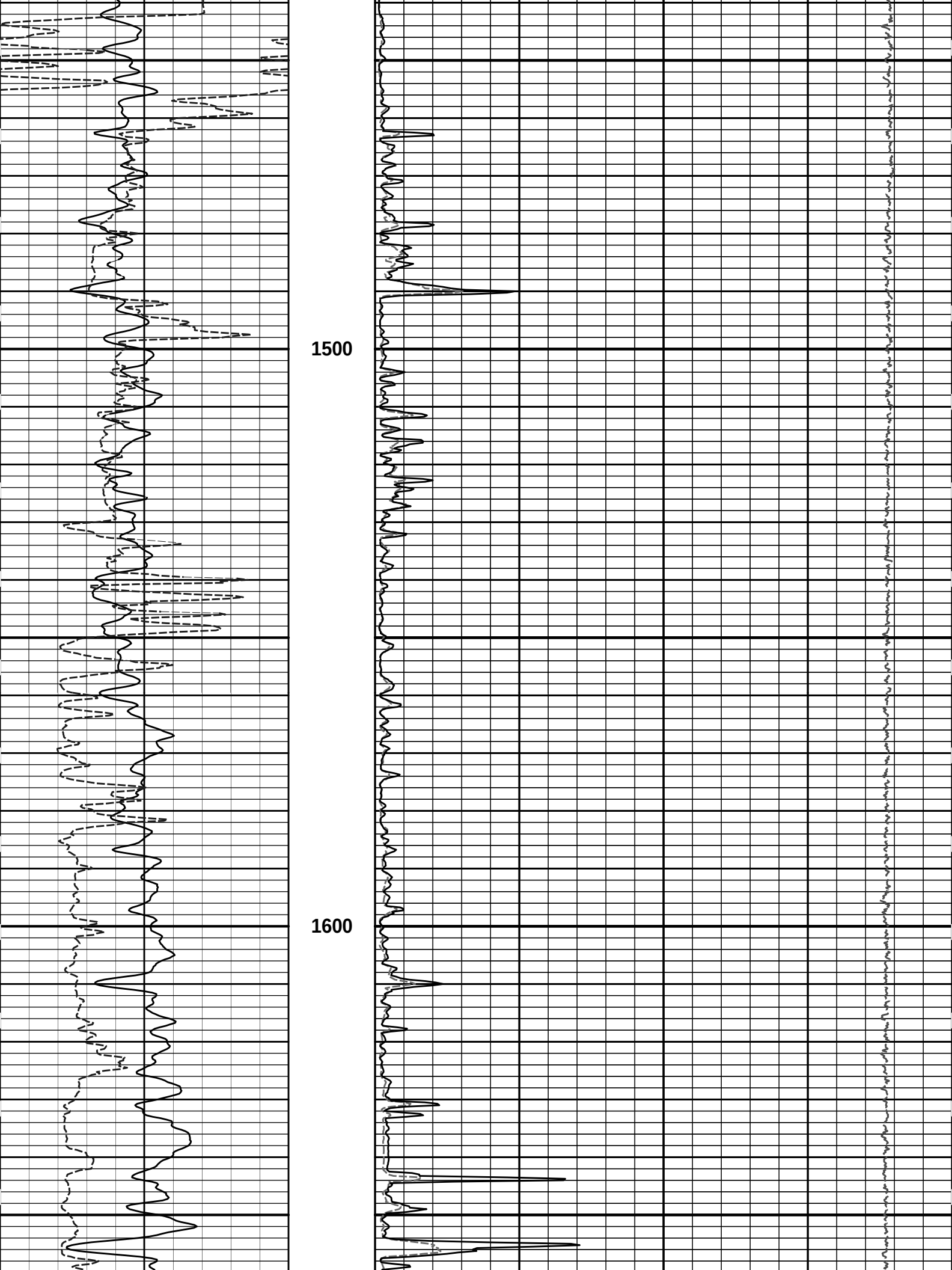
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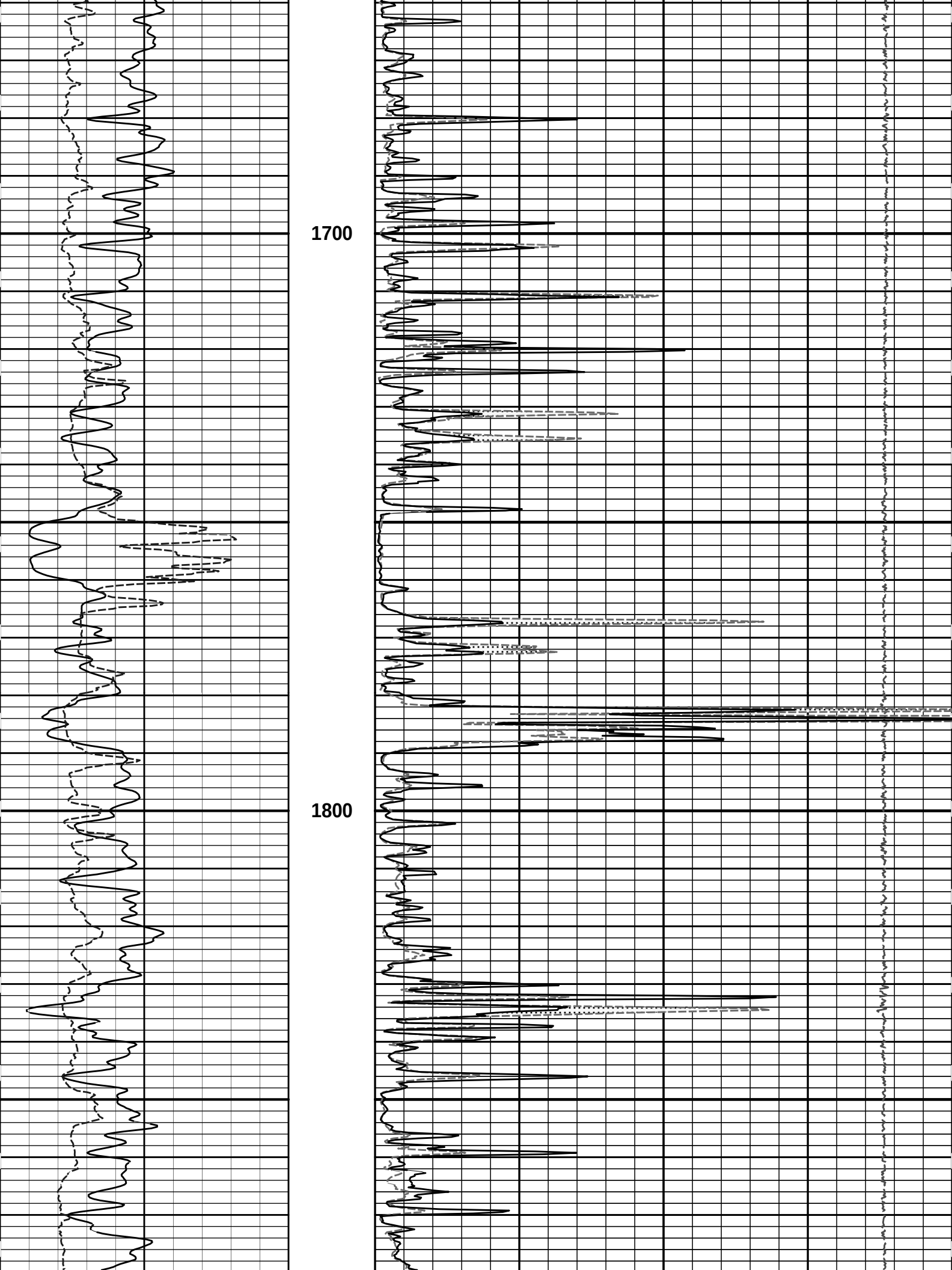
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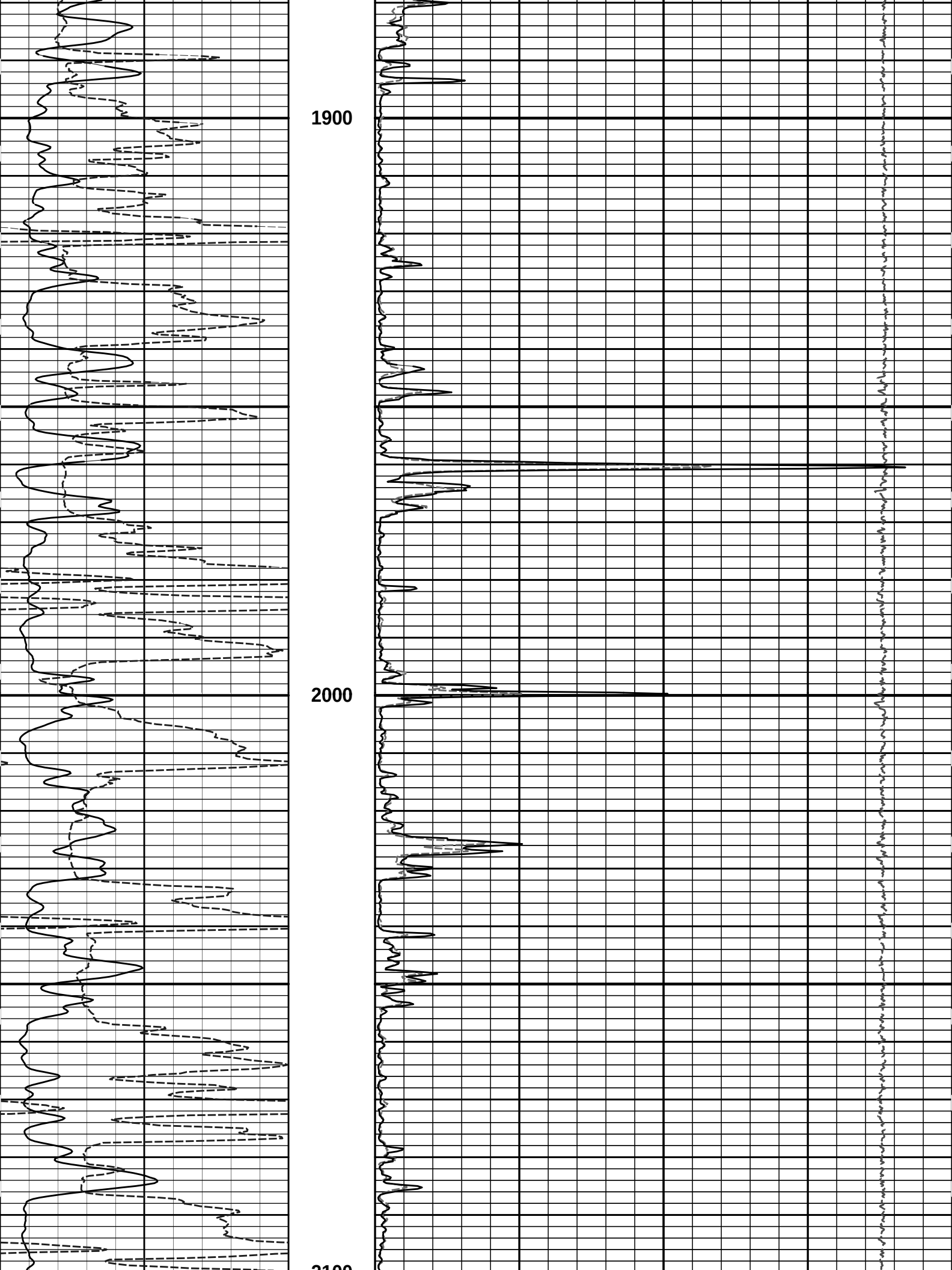
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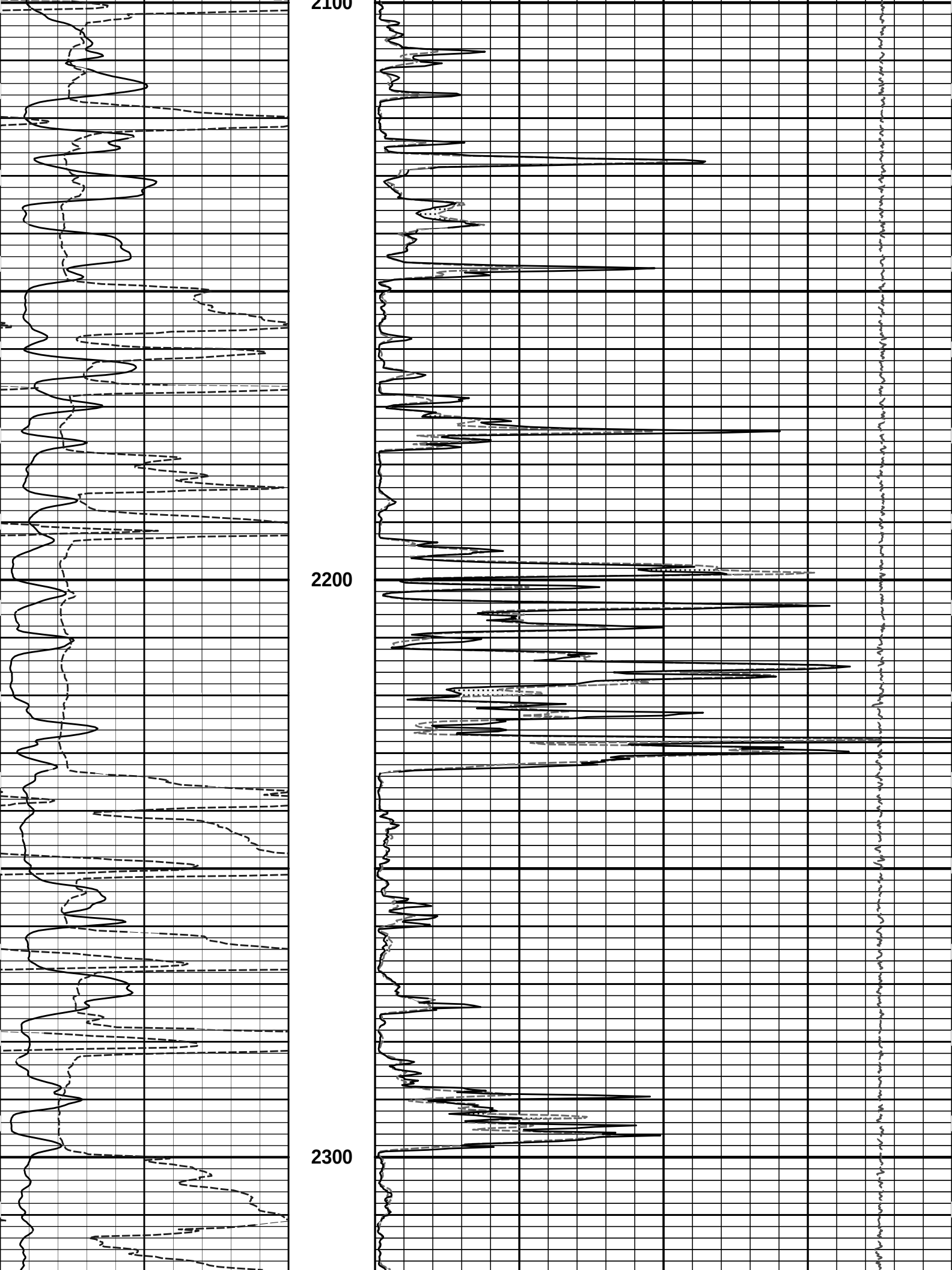
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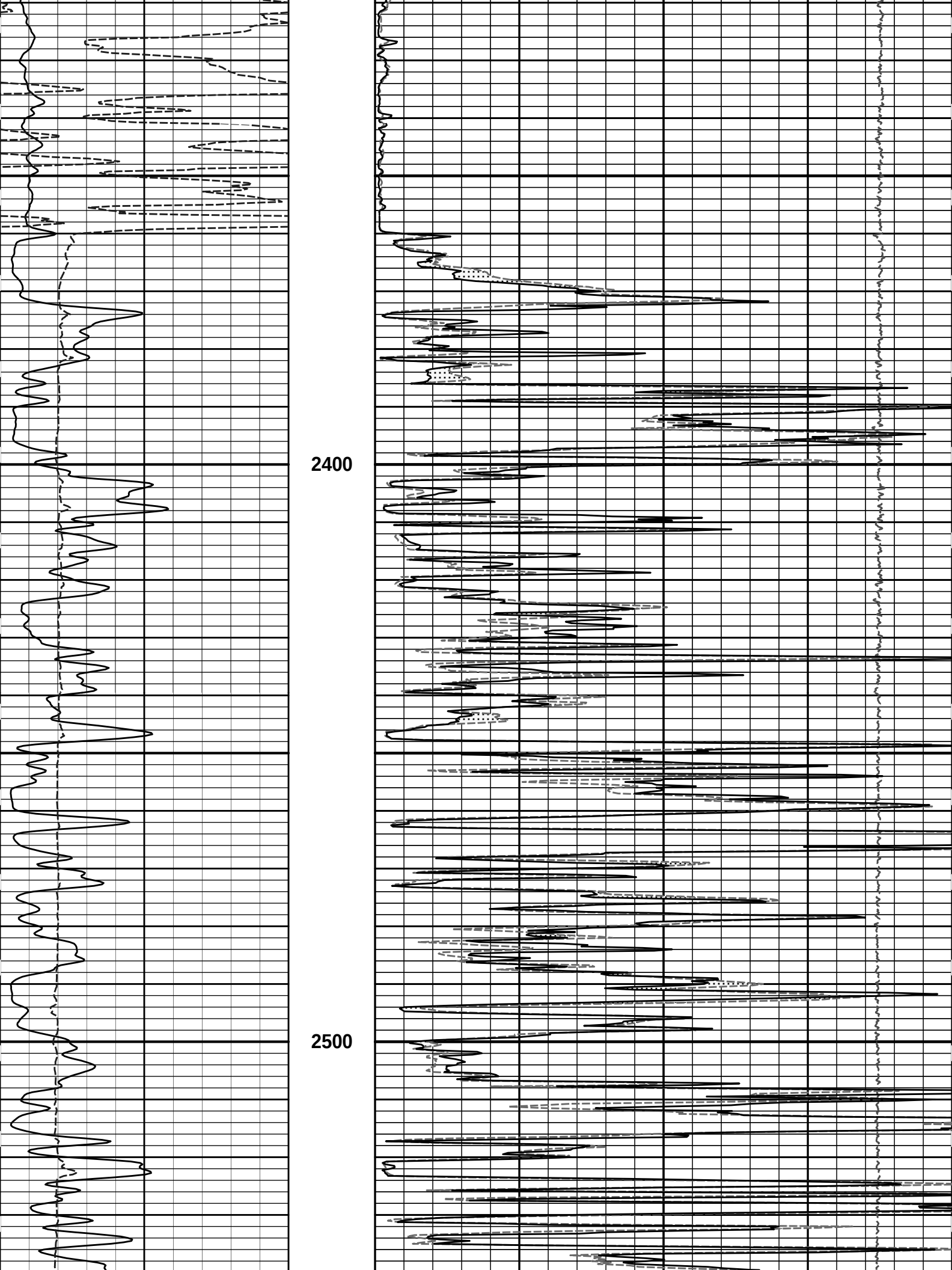
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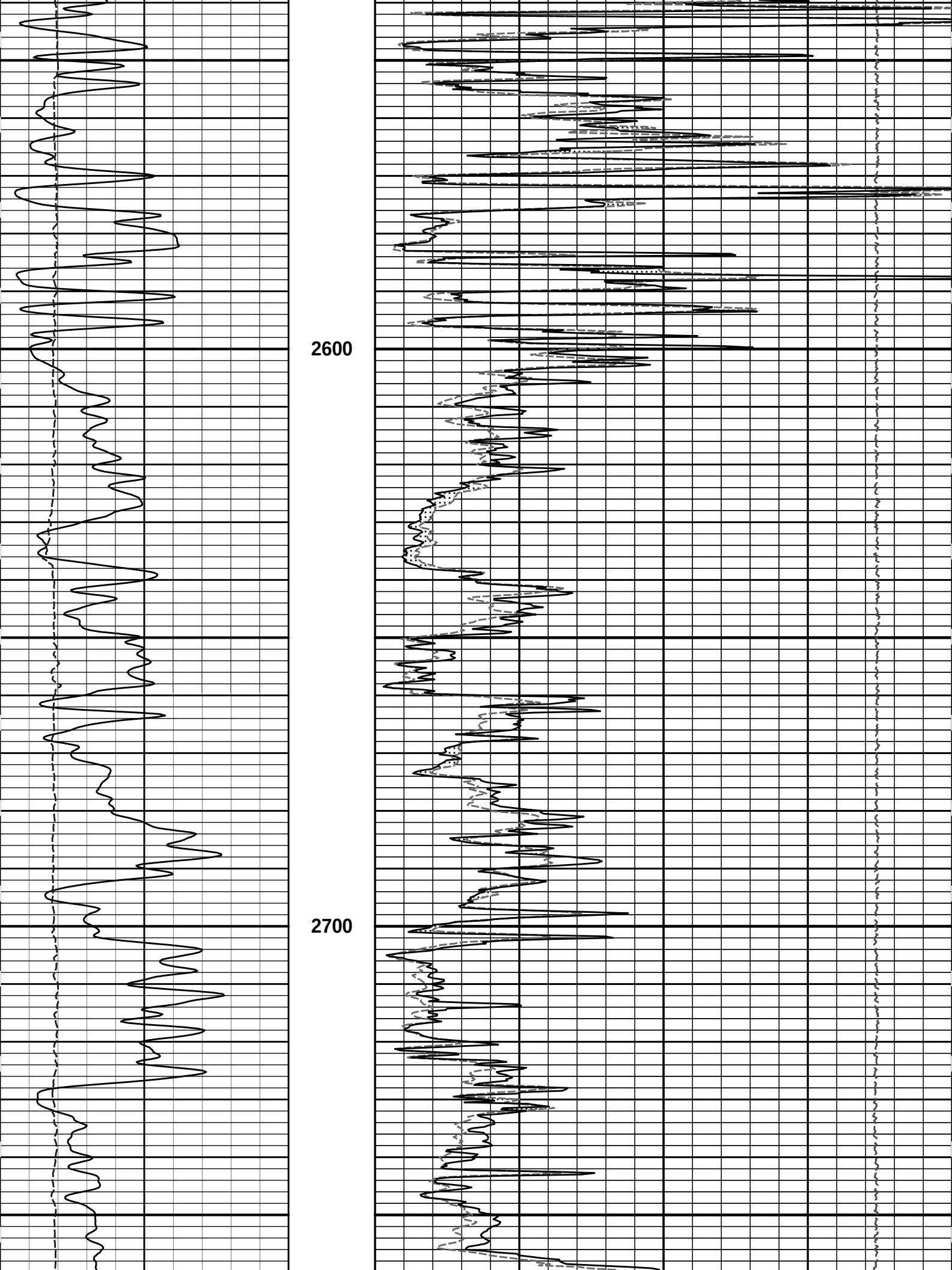
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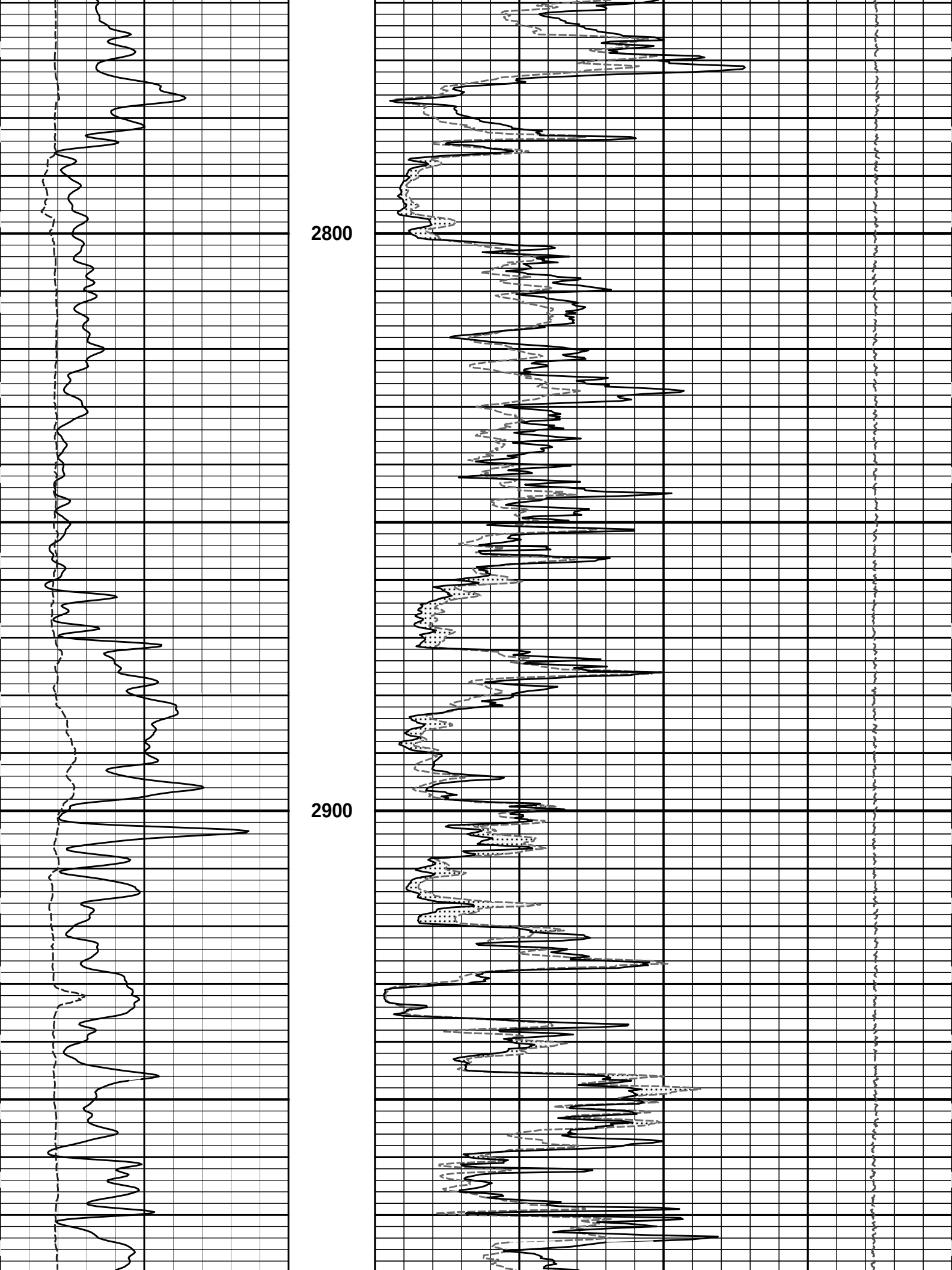
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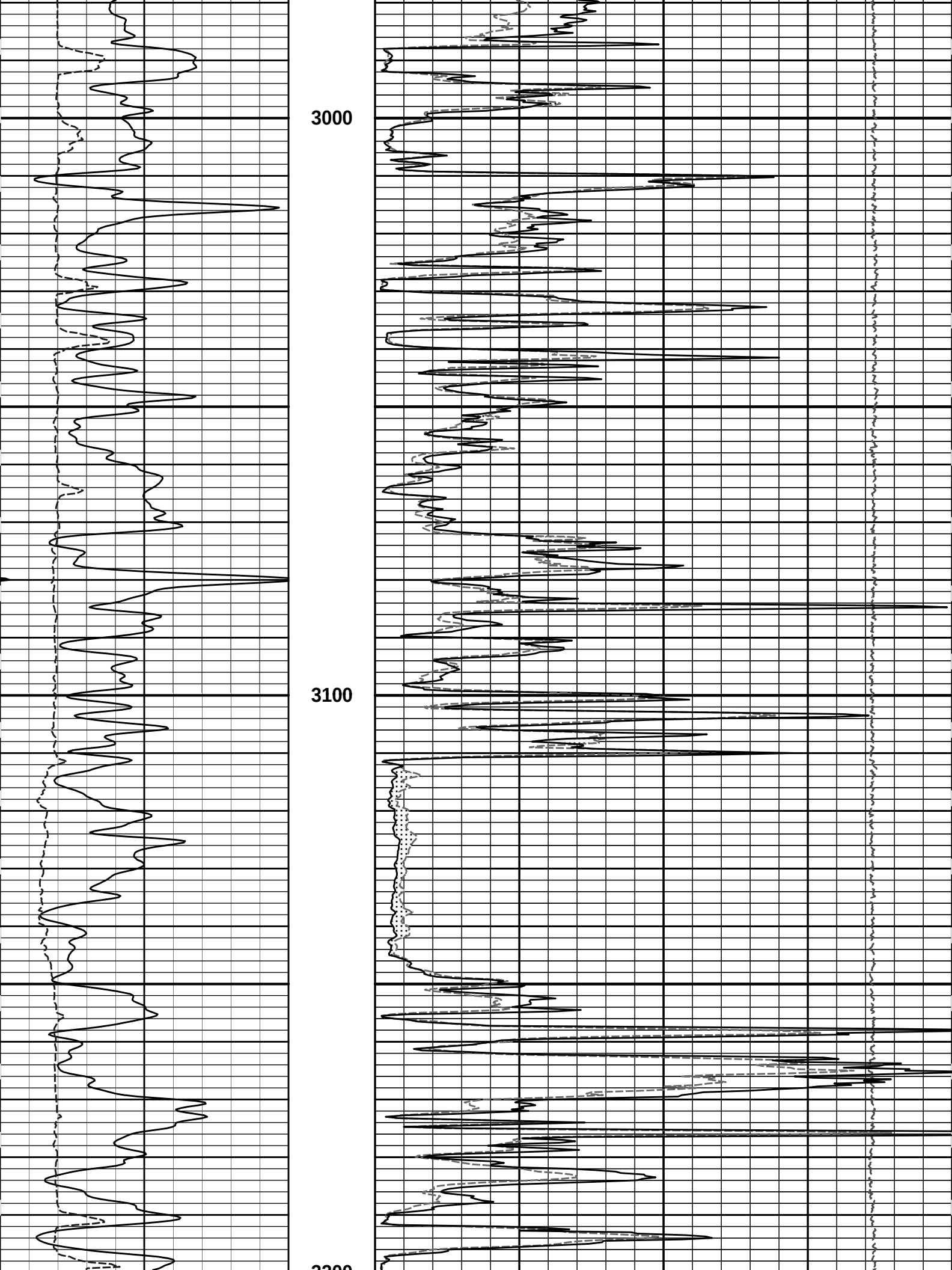
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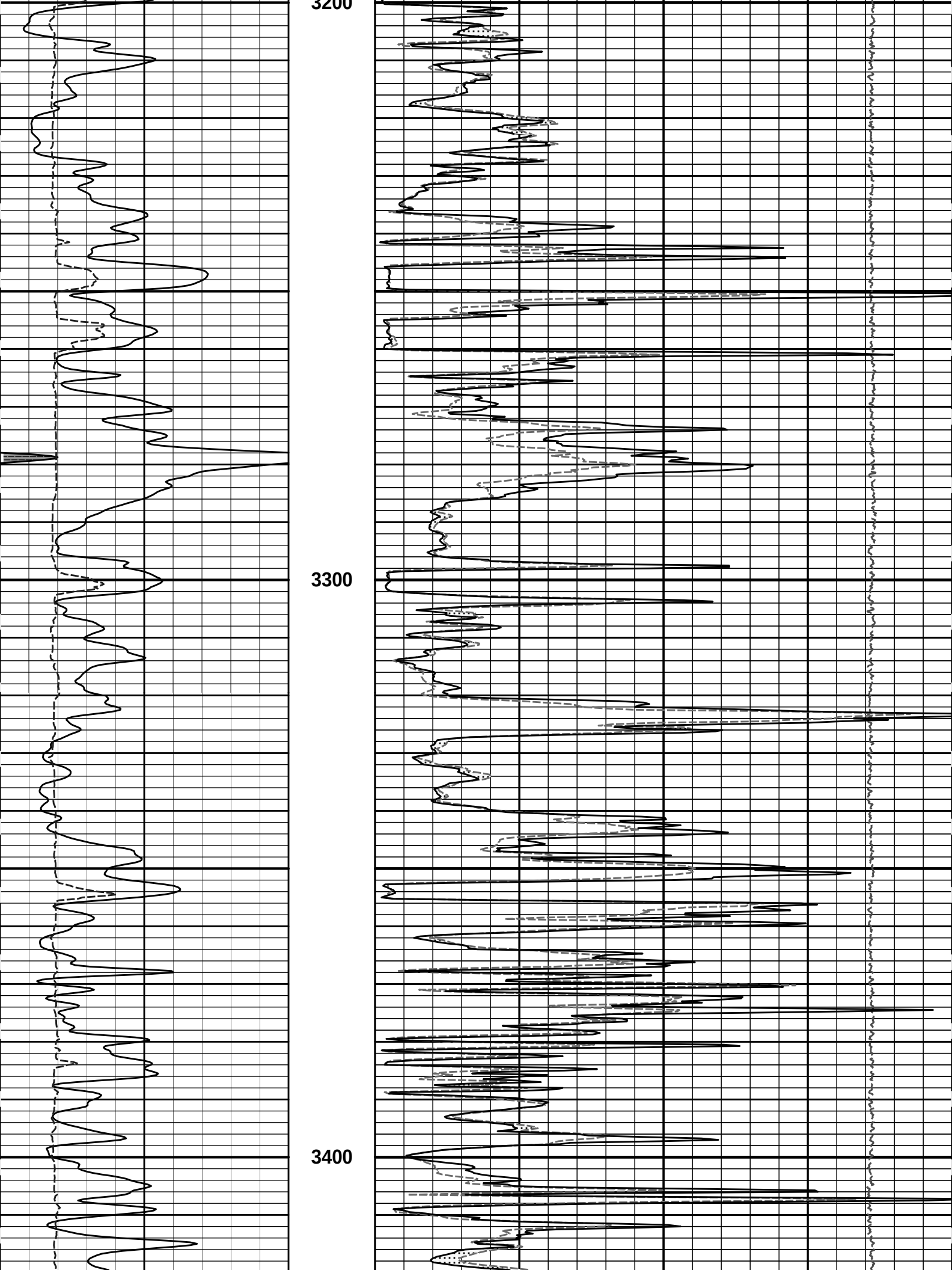
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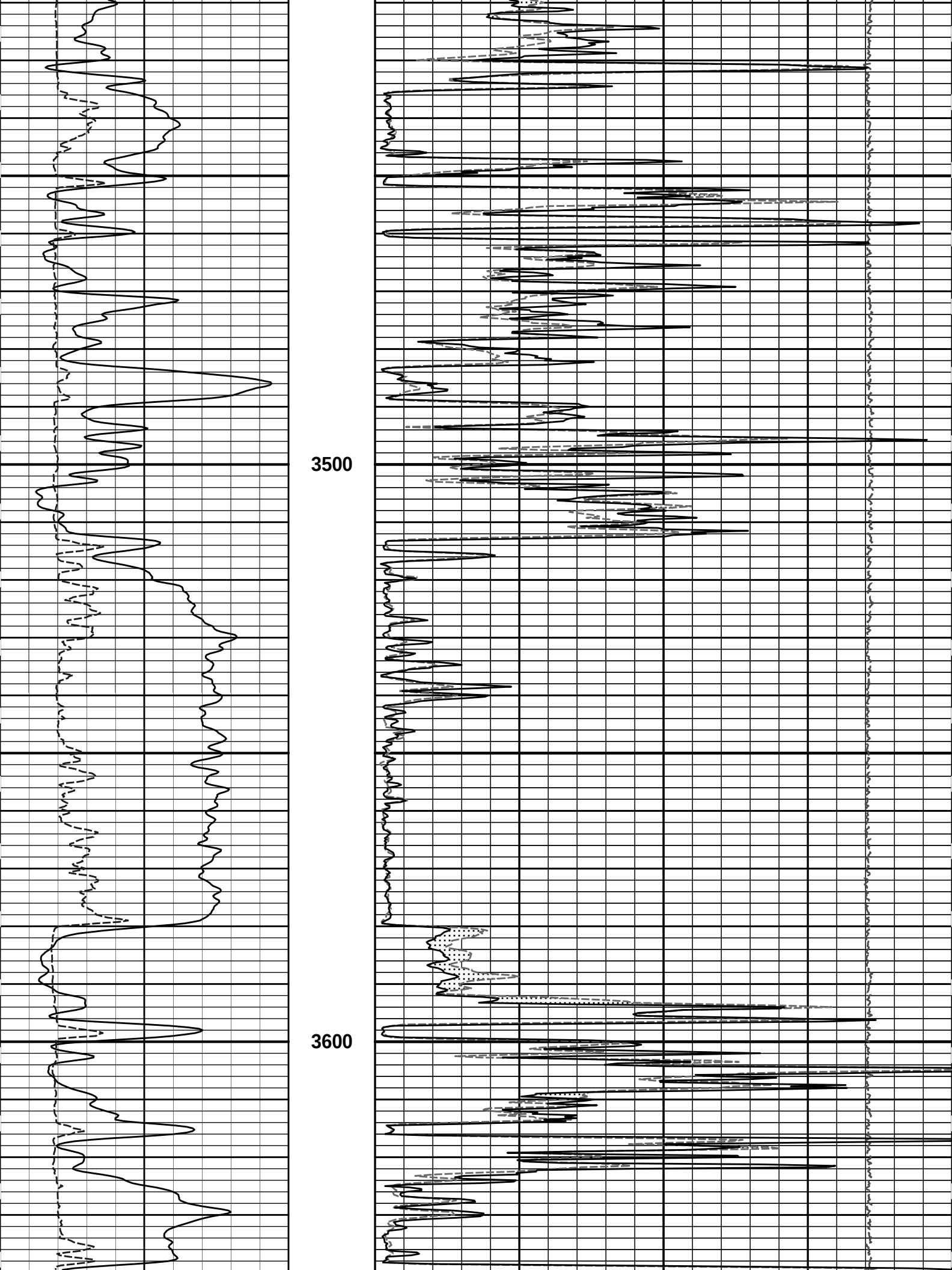
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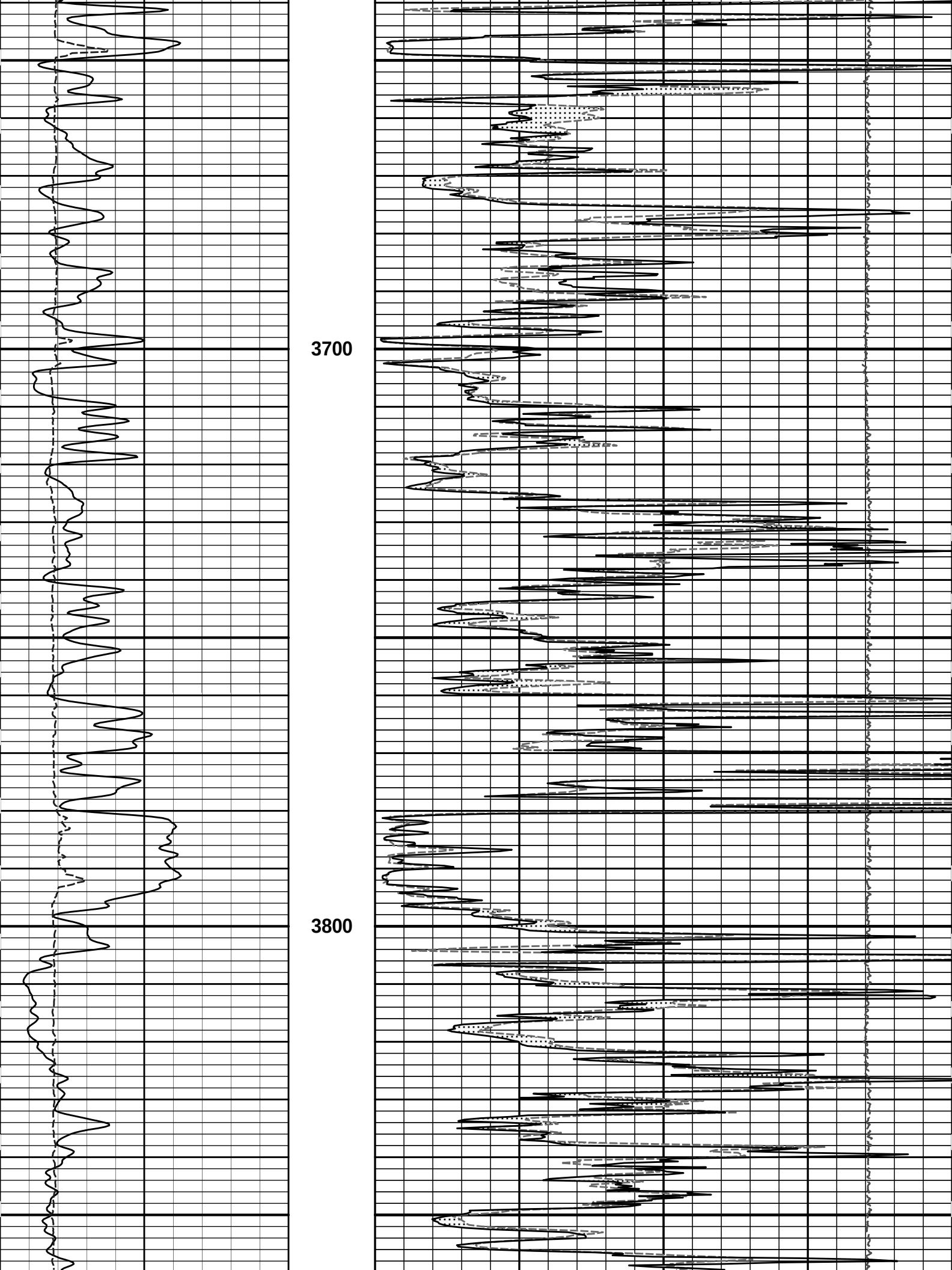
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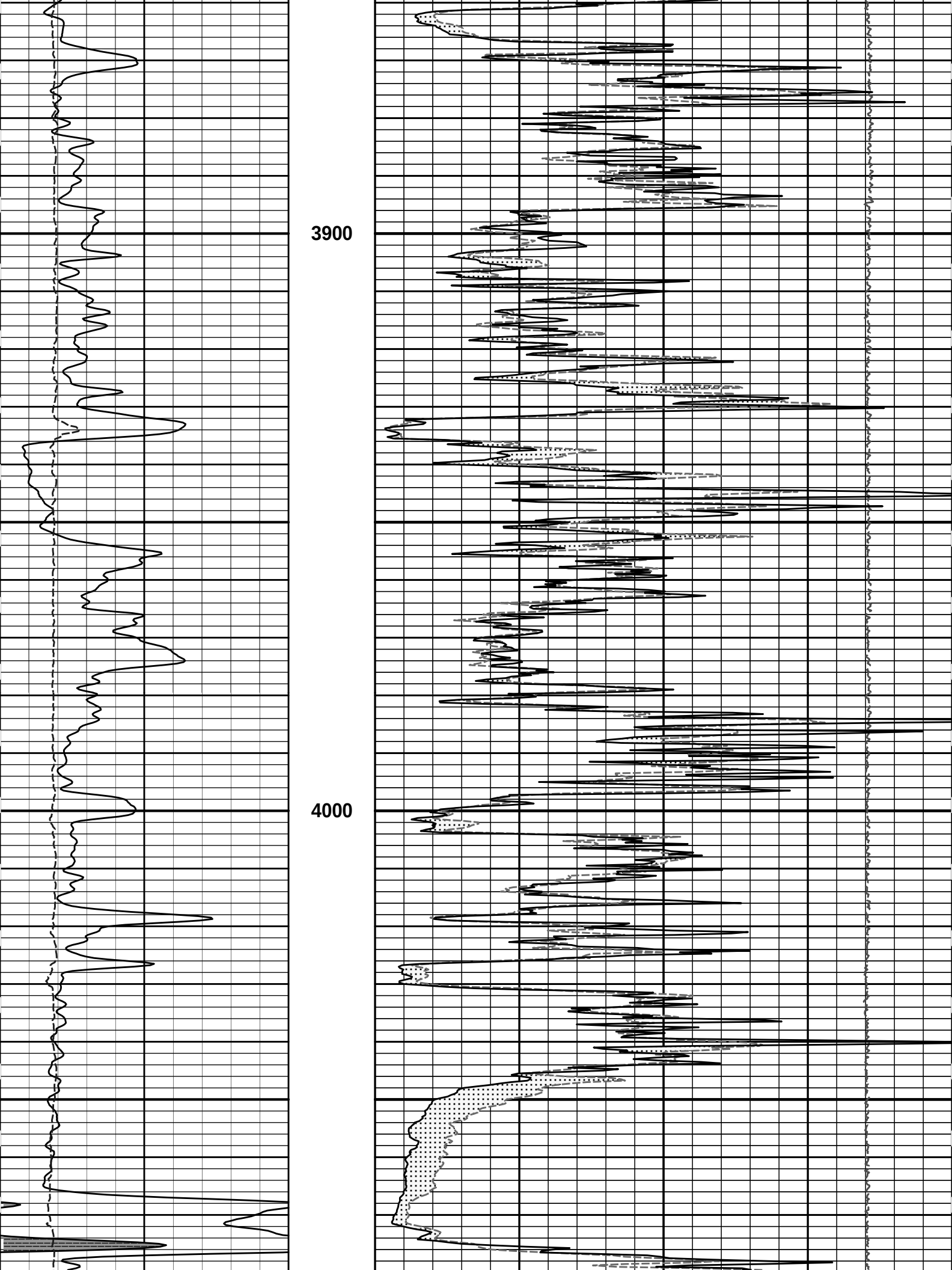
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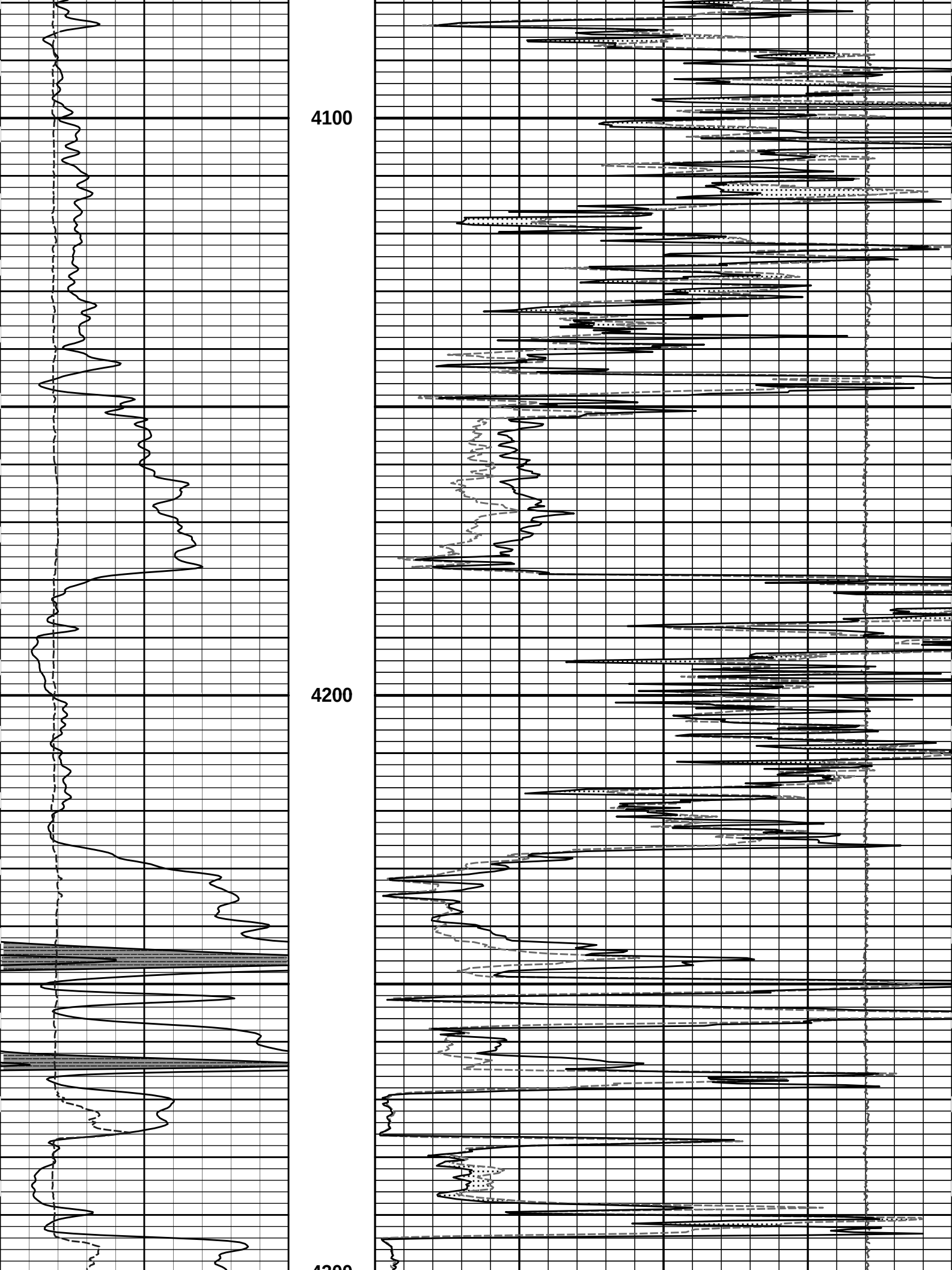
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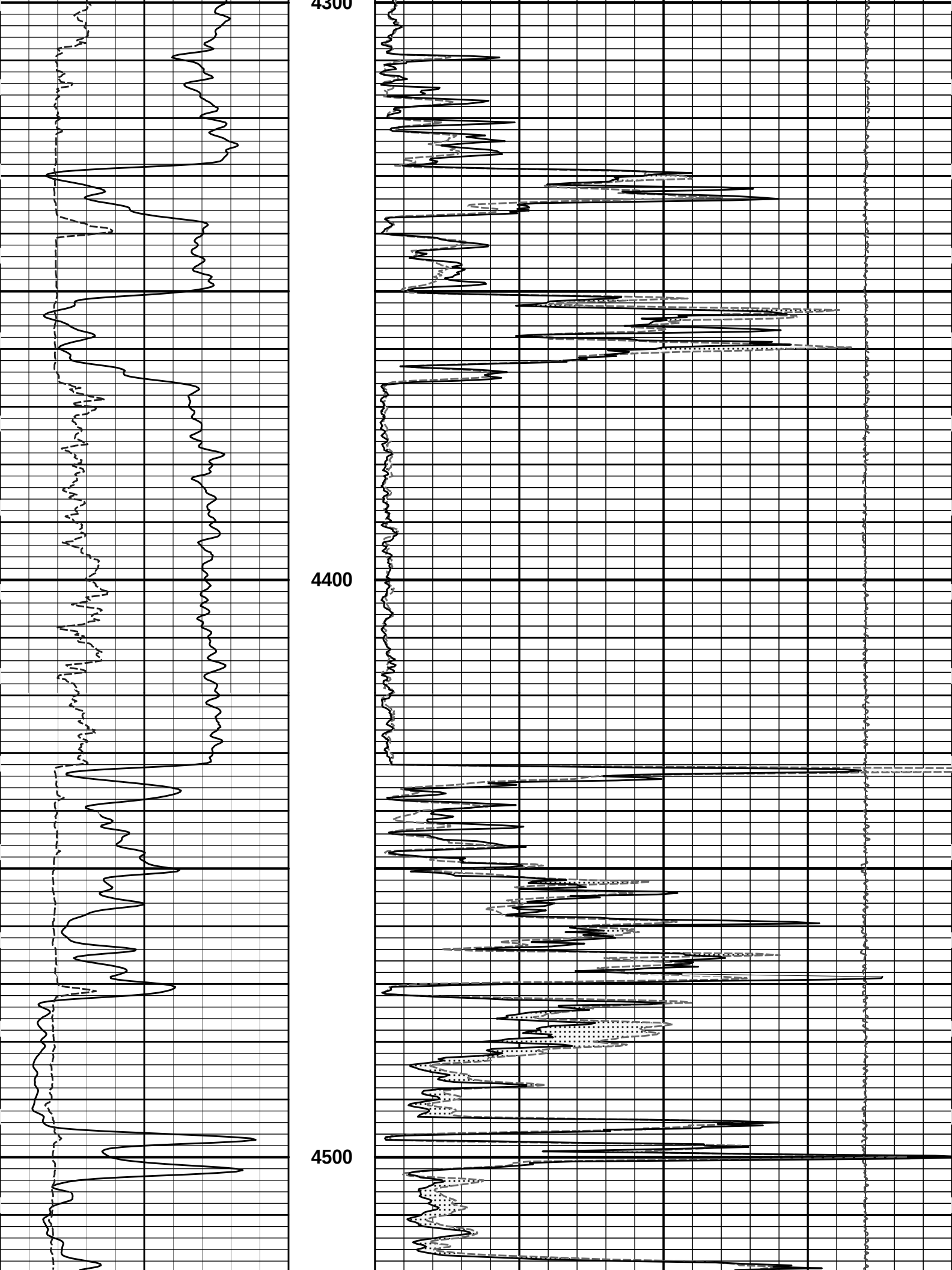
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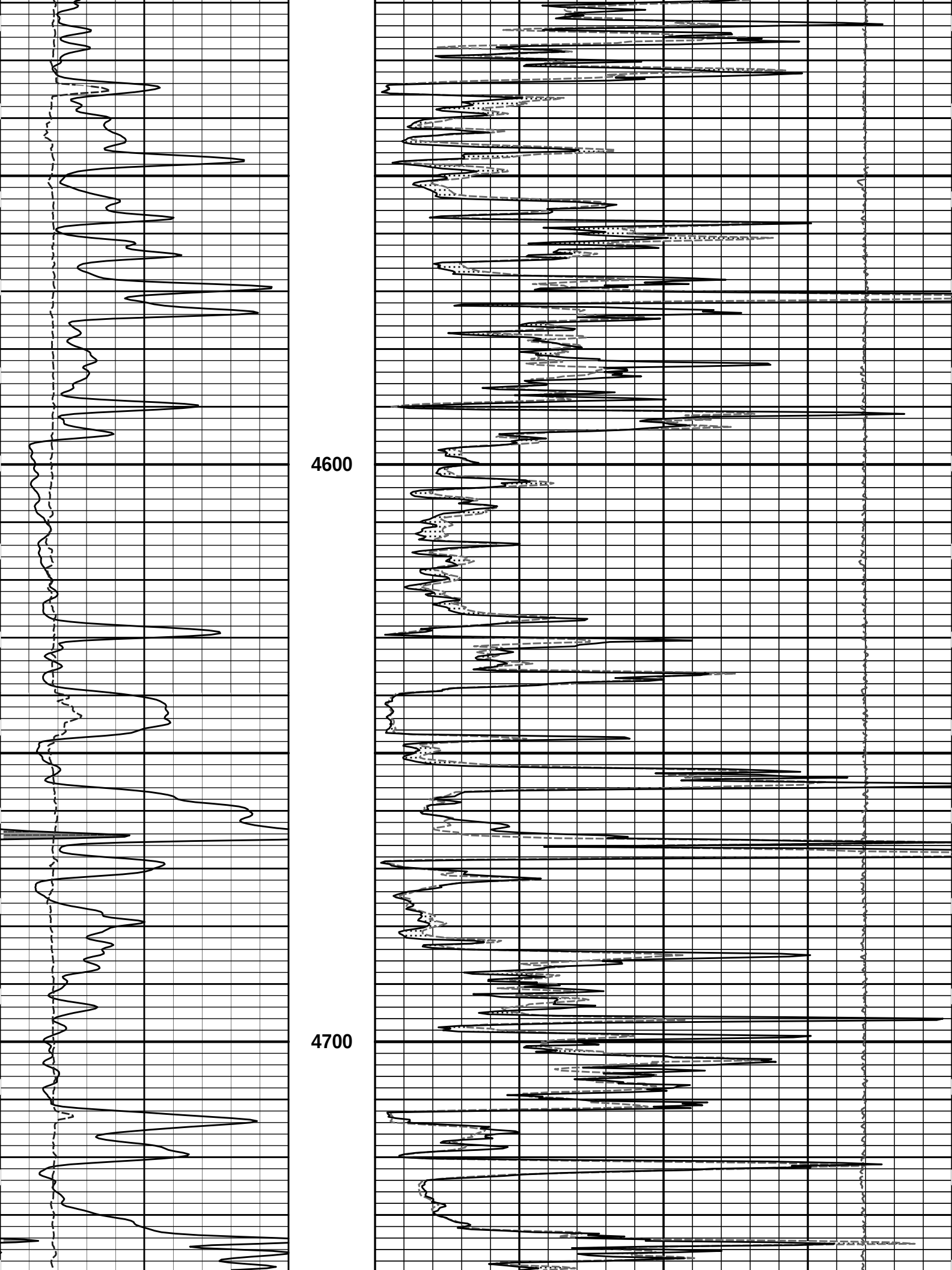
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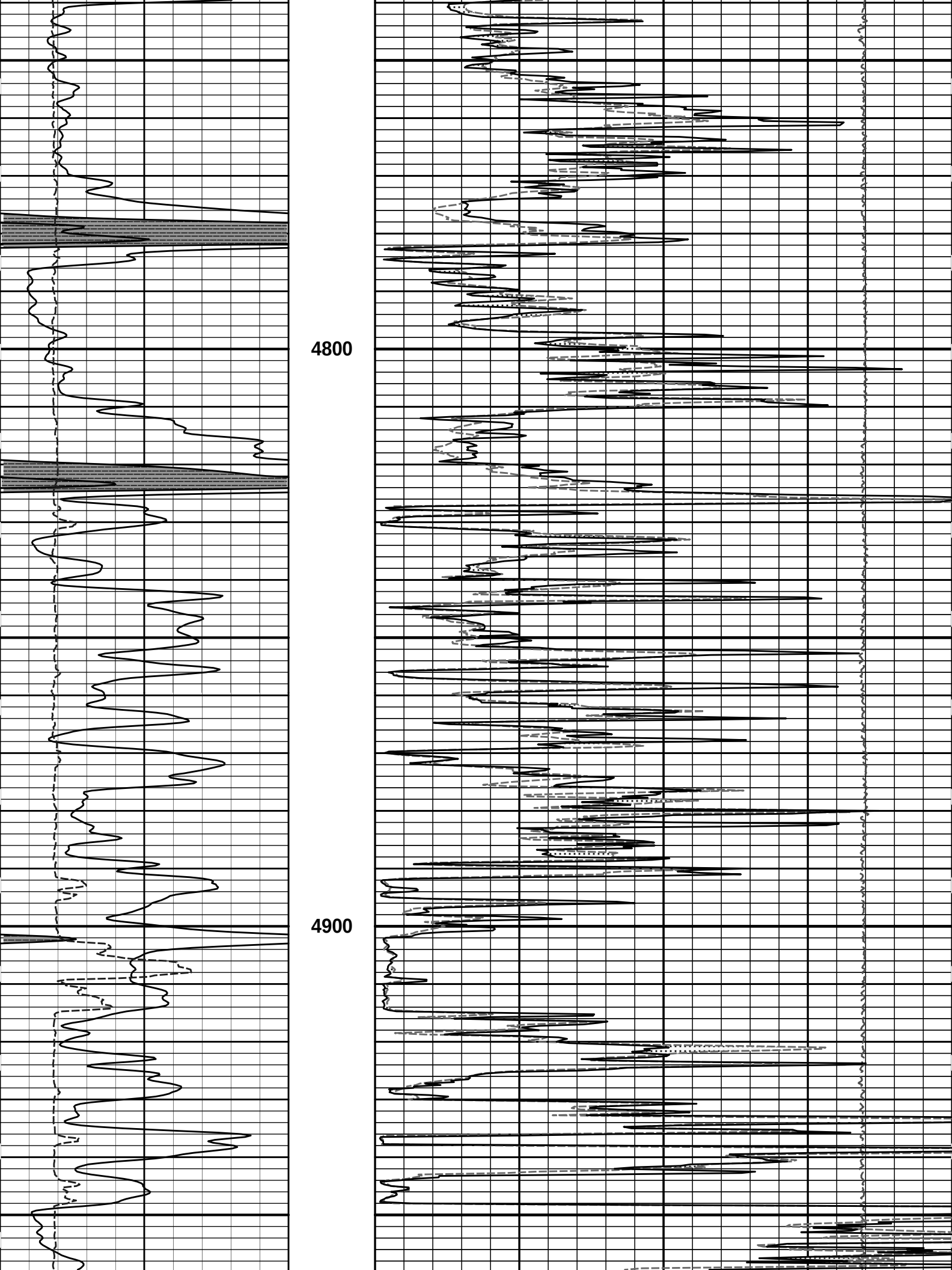
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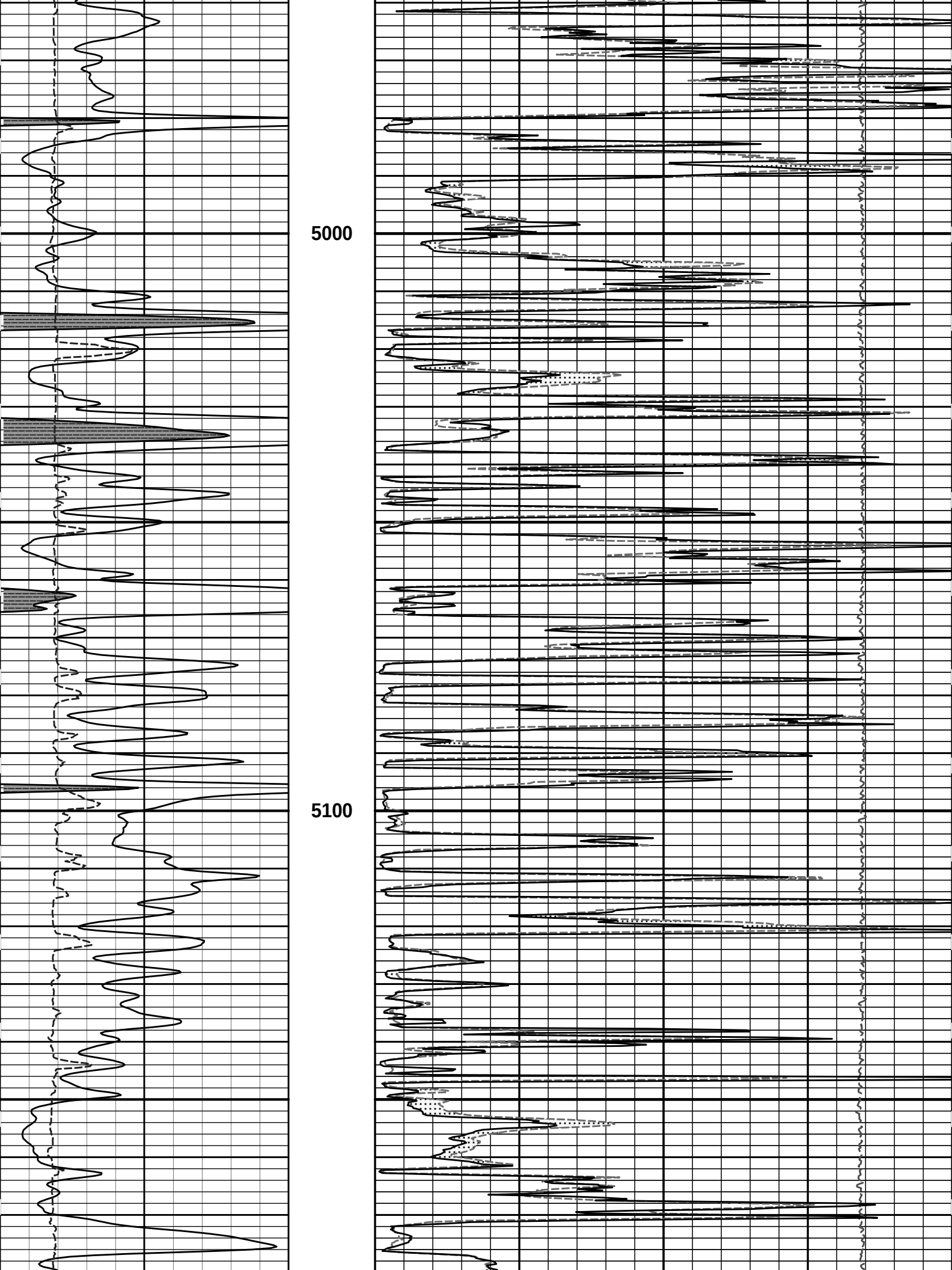
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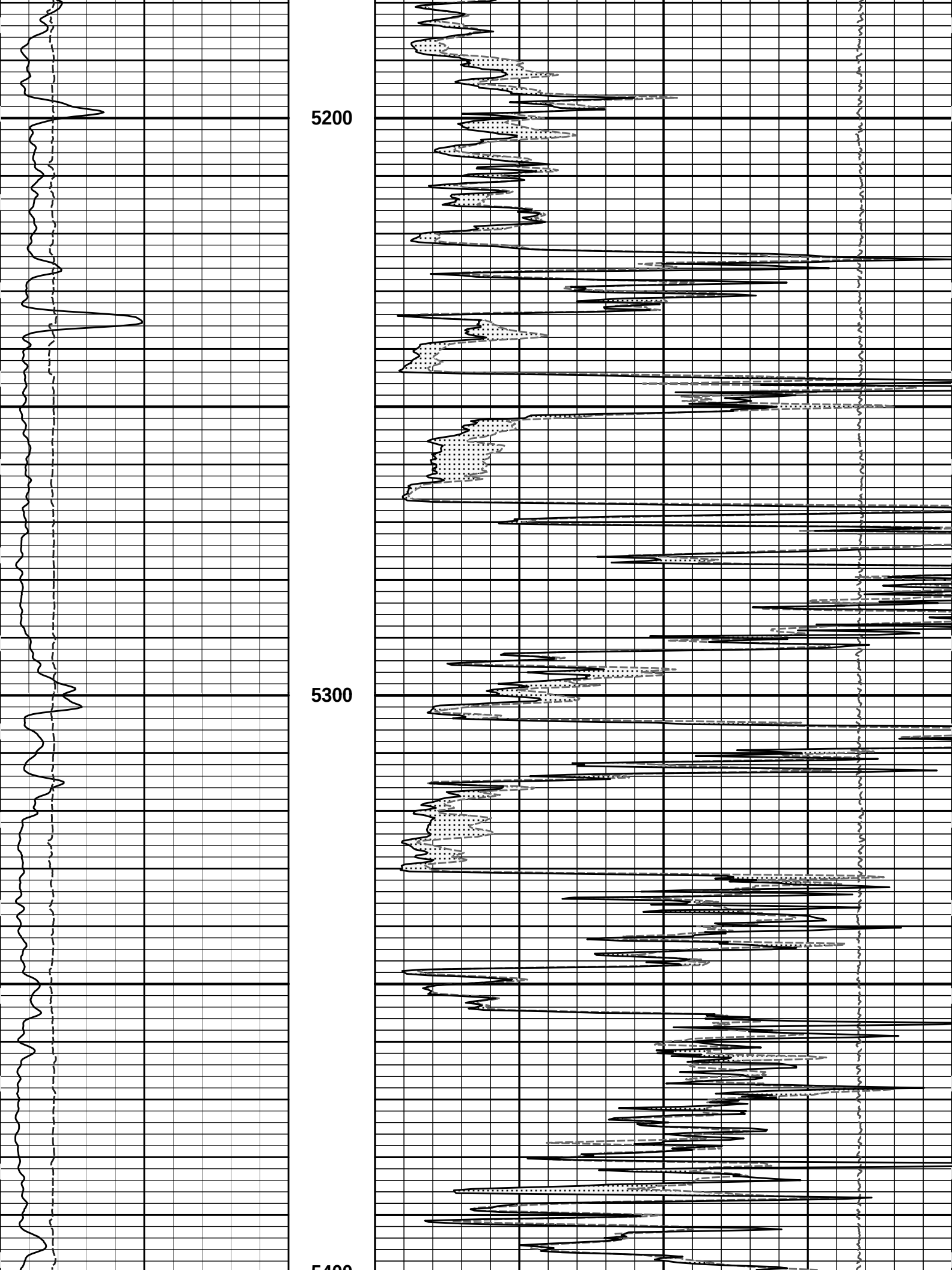
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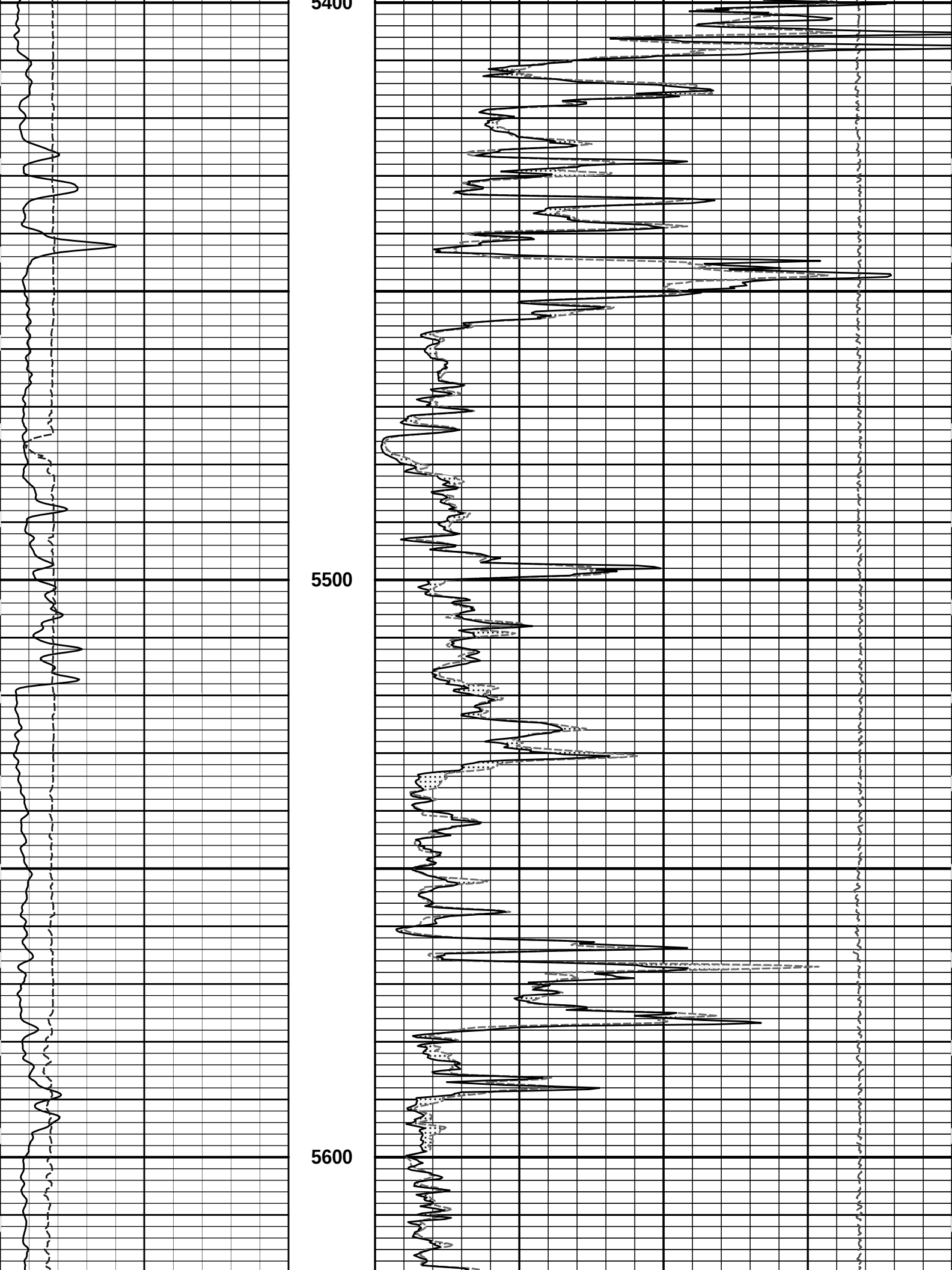
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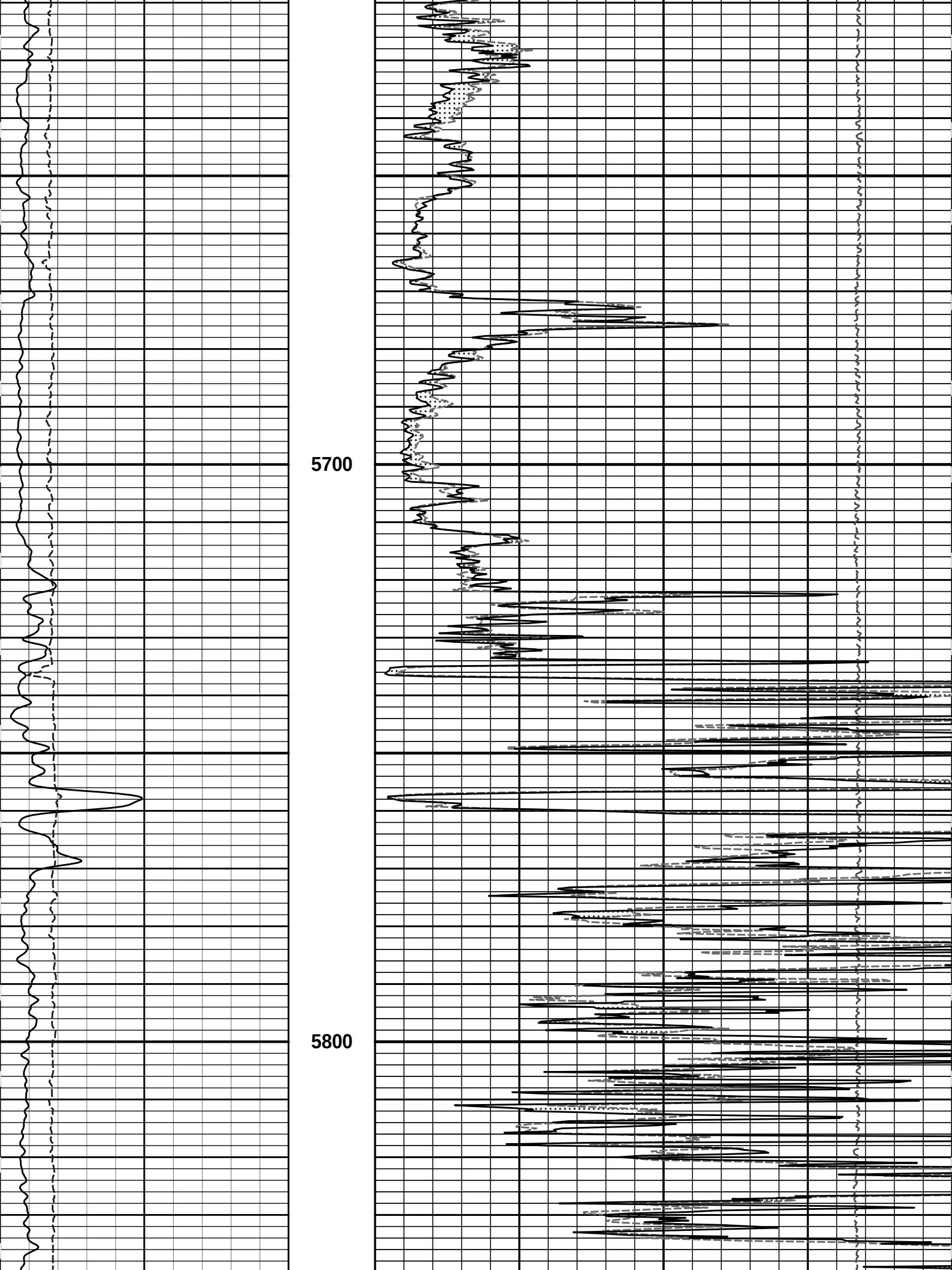
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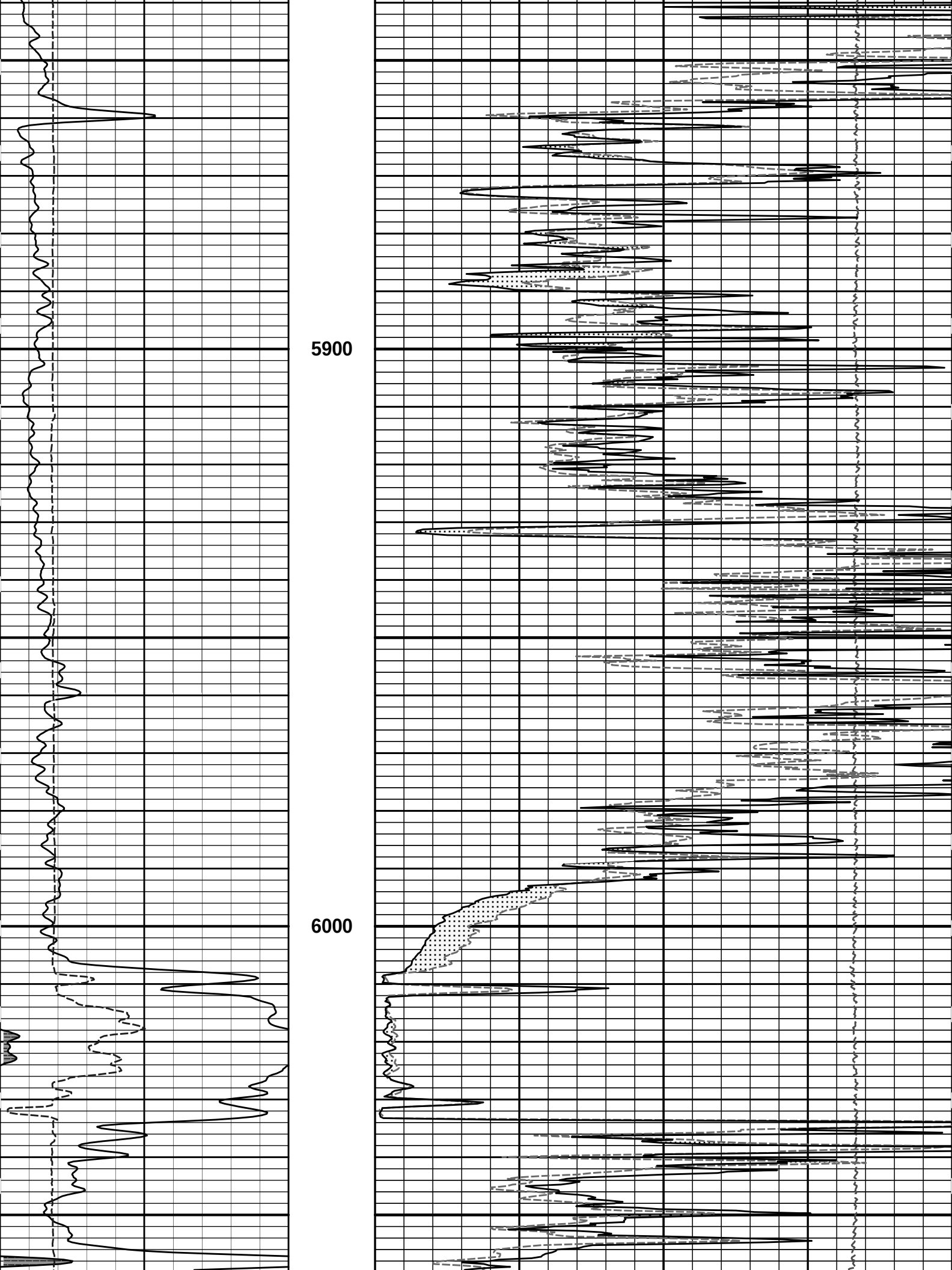
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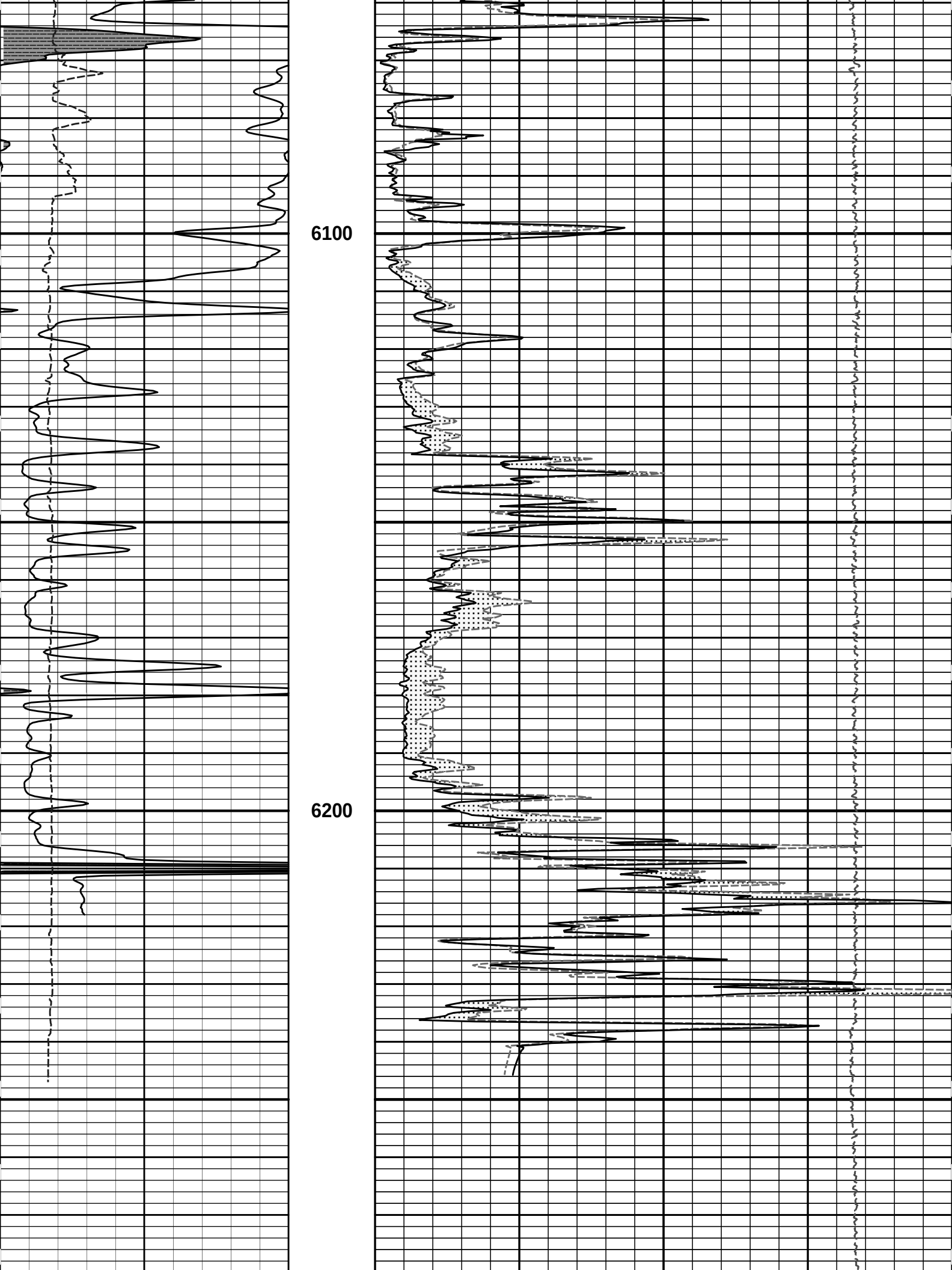
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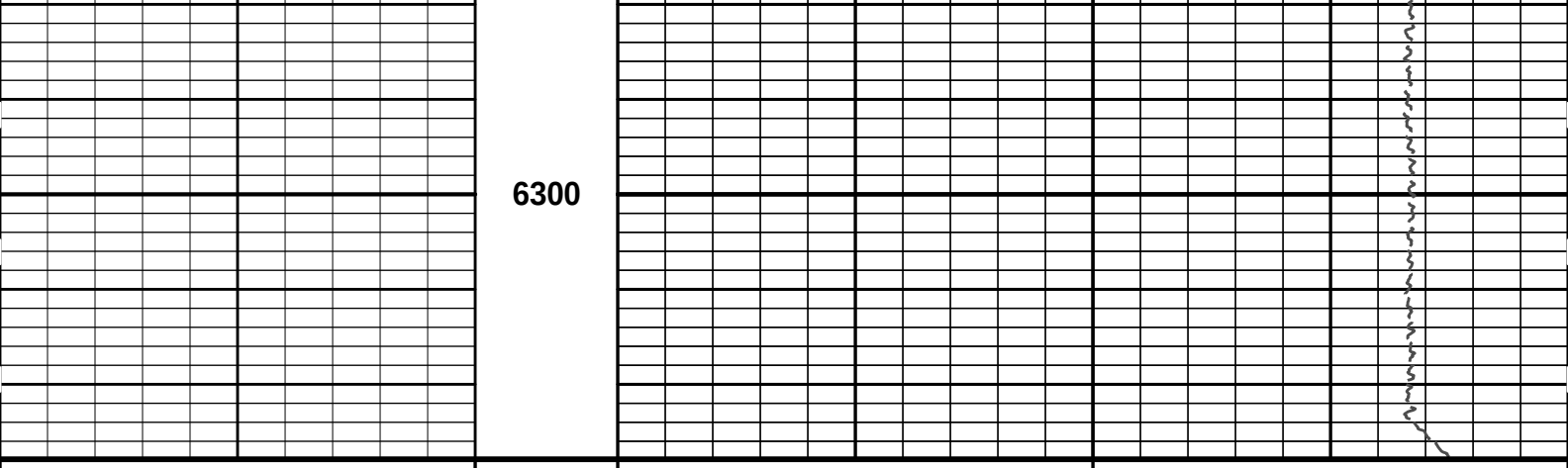

HALLIBURTON

Plot Time: 16-Aug-13 14:09:11
Plot Range: 730 ft to 6327.75 ft
Data: MILLY_3020_1-19\Well Based\R1 CASING\
Plot File: \\-LOCAL-\MILLY_3020_1-19\Well Based\MICROLOG\Microlog_IQ_5_main_lib

5 INCH MAIN LOG

HALLIBURTON

Plot Time: 16-Aug-13 14:09:11
Plot Range: 5995 ft to 6328.17 ft
Data: MILLY_3020_1-19\Well Based\R1 REPEAT\
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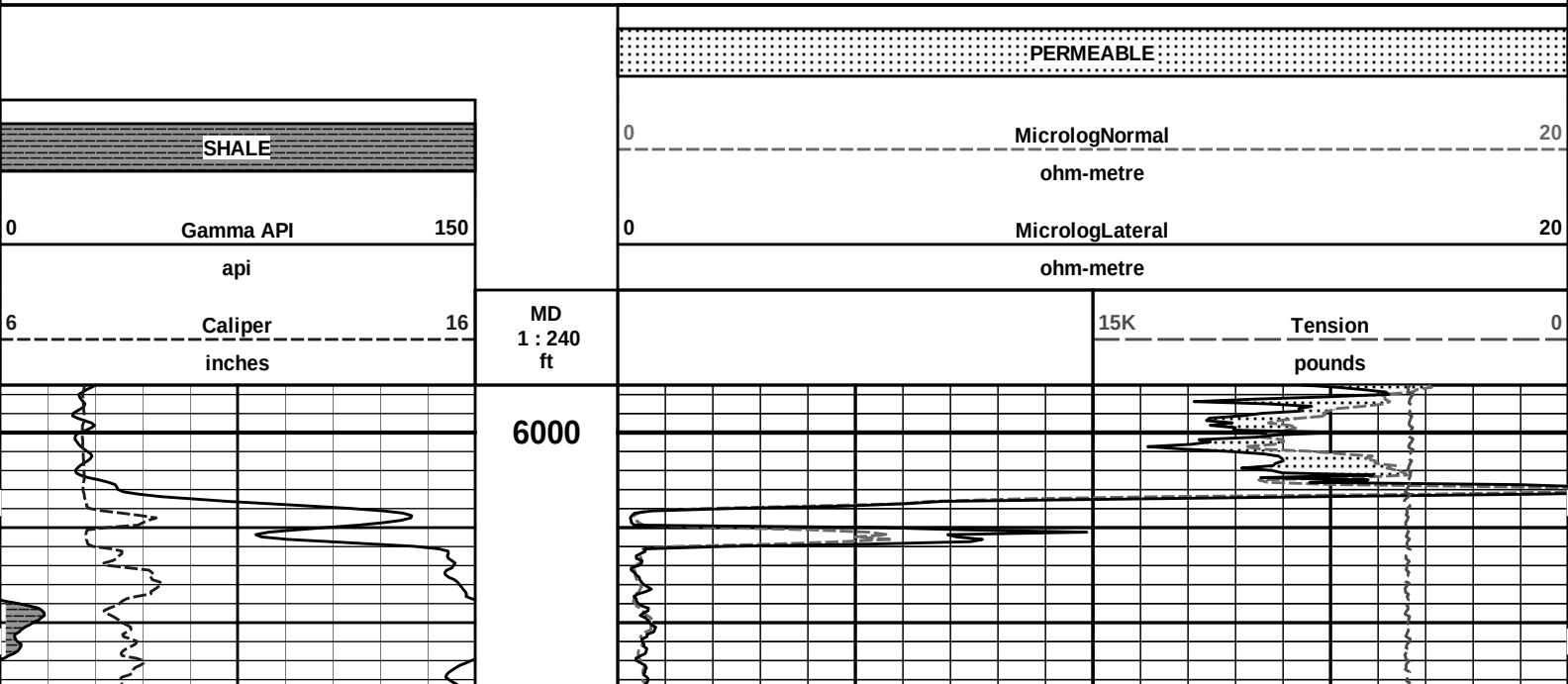
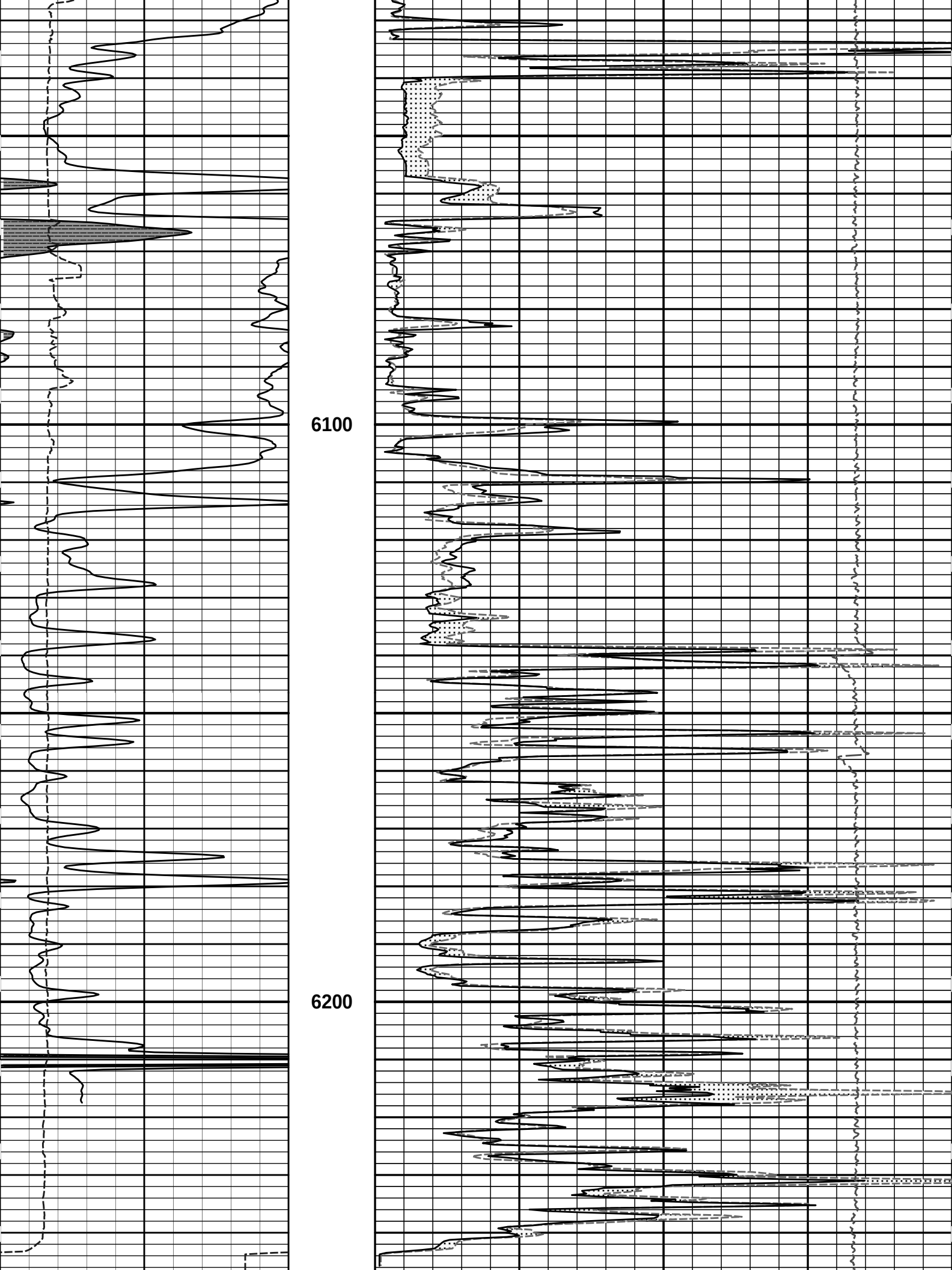
REPEAT SECTION

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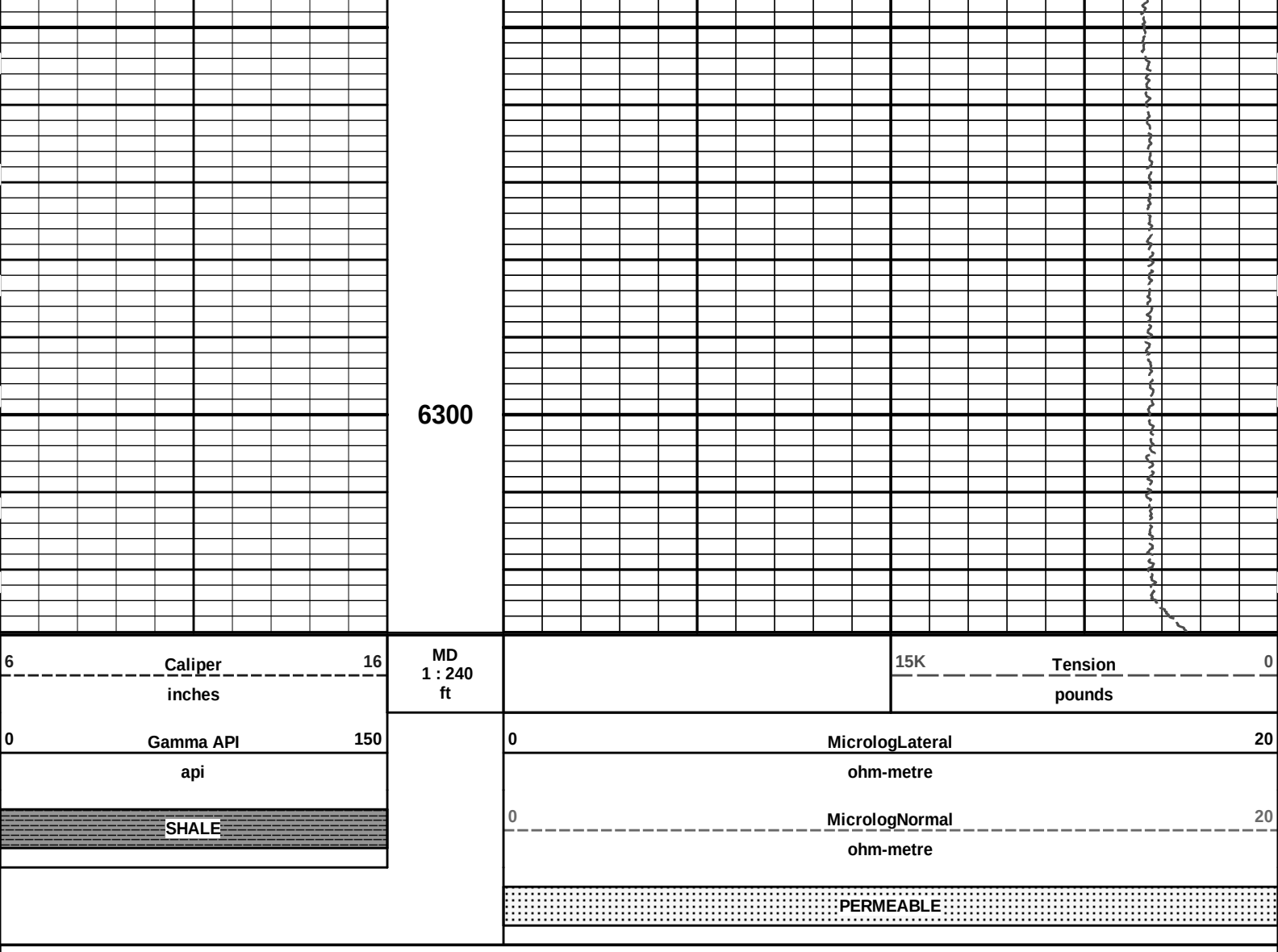

HALLIBURTON

Plot Time: 16-Aug-13 14:09:17
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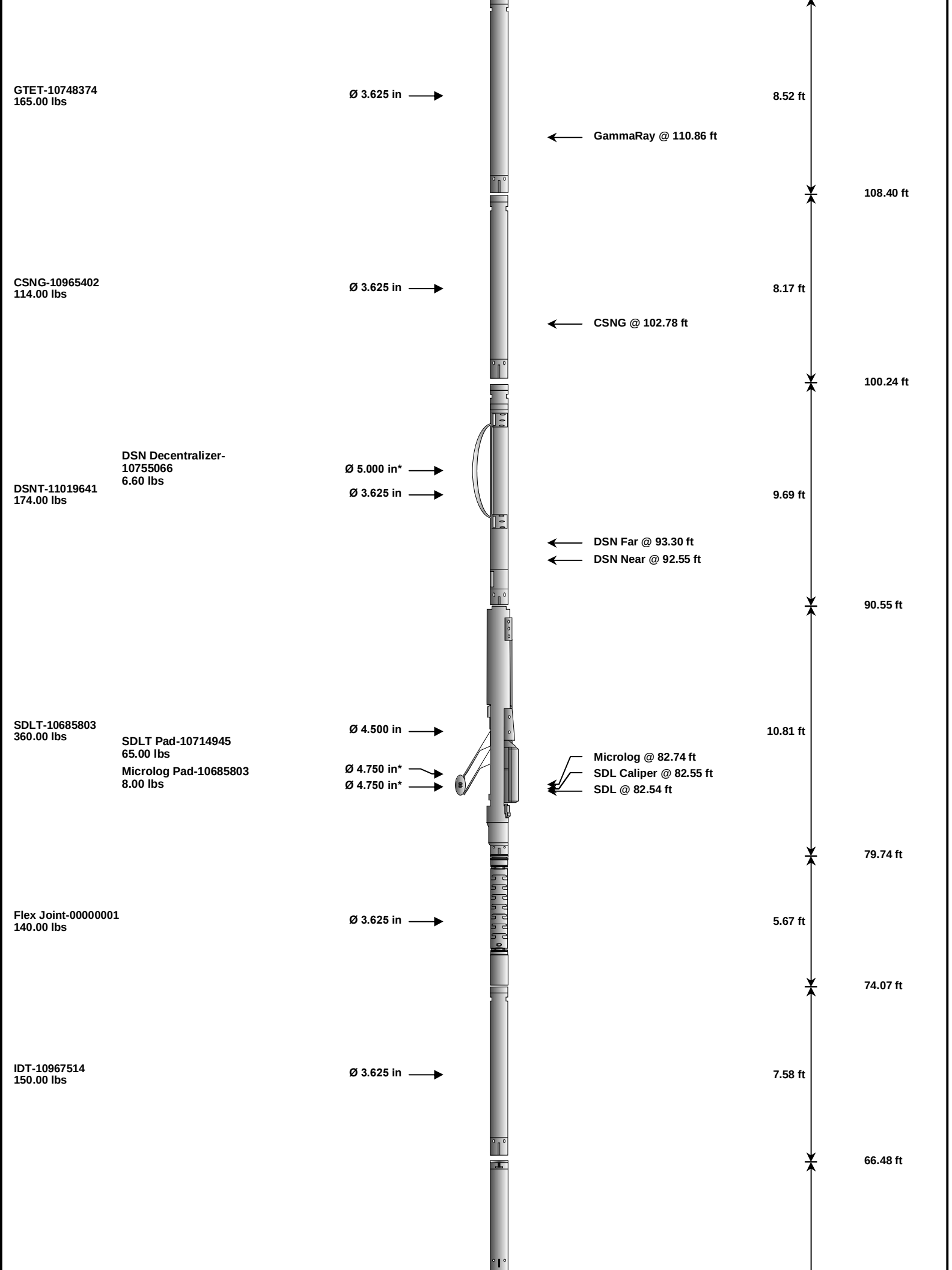
Plot File: \\-LOCAL-\MILLY_3020_1-19\Well Based\MICROLOG\Microlog_IQ_5_rep_lib

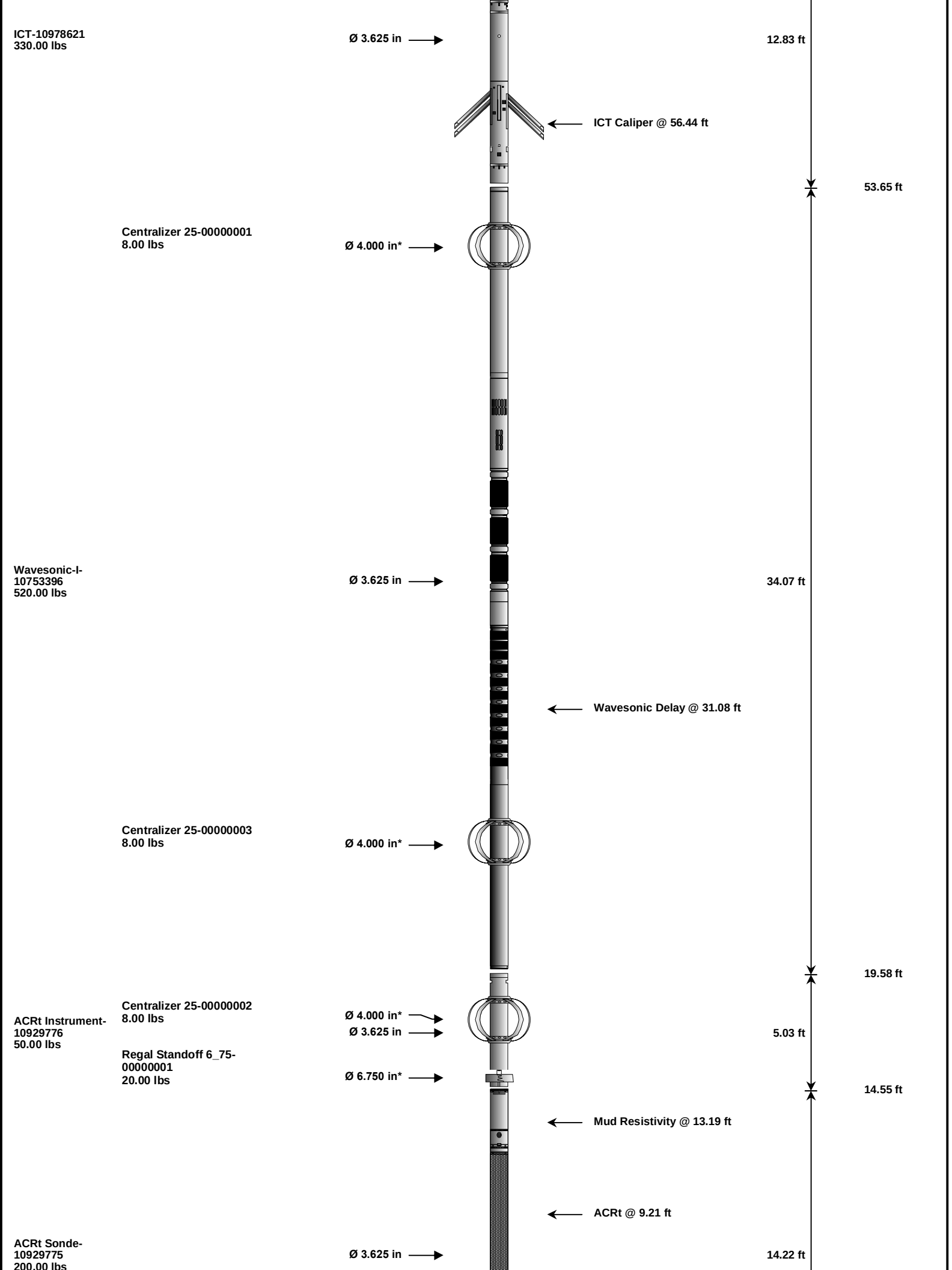
REPEAT SECTION

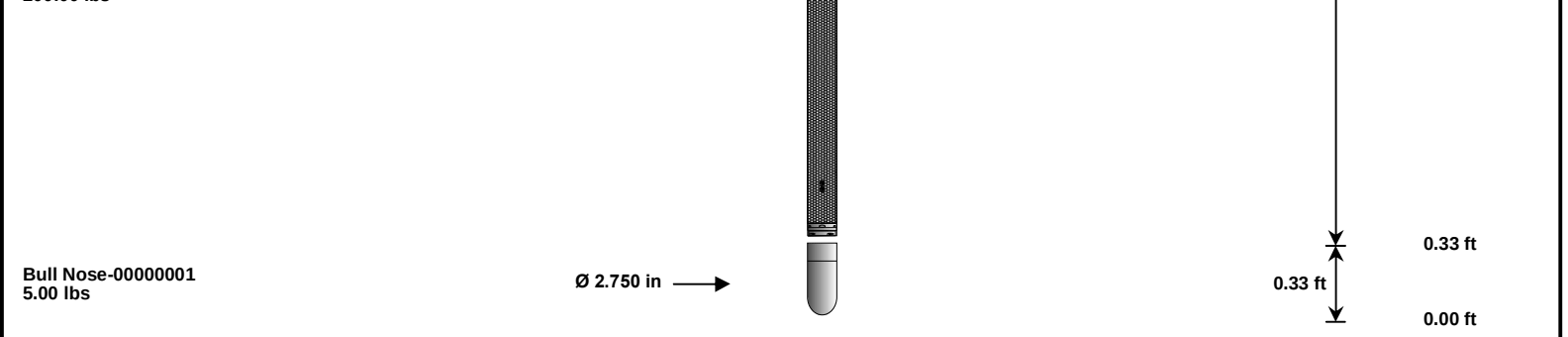
HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
						126.91 ft
RWCH-12027542 135.00 lbs		Ø 3.625 in		Load Cell @ 123.23 ft BH Temperature @ 122.66 ft	6.25 ft	
						120.66 ft
SP Sub-12345678 60.00 lbs		Ø 3.625 in		SP @ 118.88 ft	3.74 ft	
						116.92 ft


GTET-10748374
165.00 lbs
Ø 3.625 in
8.52 ft
GammaRay @ 110.86 ft
108.40 ft
CSNG-10965402
114.00 lbs
Ø 3.625 in
8.17 ft
CSNG @ 102.78 ft
100.24 ft
DSN Decentralizer-
10755066
6.60 lbs
Ø 5.000 in*
DSNT-11019641
174.00 lbs
Ø 3.625 in
9.69 ft
DSN Far @ 93.30 ft
DSN Near @ 92.55 ft
90.55 ft
SDLT-10685803
360.00 lbs
Ø 4.500 in
10.81 ft
SDLT Pad-10714945
65.00 lbs
Microlog Pad-10685803
8.00 lbs
Ø 4.750 in*
Ø 4.750 in*
Microlog @ 82.74 ft
SDL Caliper @ 82.55 ft
SDL @ 82.54 ft
79.74 ft
Flex Joint-00000001
140.00 lbs
Ø 3.625 in
5.67 ft
74.07 ft
IDT-10967514
150.00 lbs
Ø 3.625 in
7.58 ft
66.48 ft


ICT-10978621
330.00 lbs
Ø 3.625 in
12.83 ft
ICT Caliper @ 56.44 ft
53.65 ft
Centralizer 25-00000001
8.00 lbs
Ø 4.000 in*
Wavesonic-I-
10753396
520.00 lbs
Ø 3.625 in
34.07 ft
Wavesonic Delay @ 31.08 ft
Centralizer 25-00000003
8.00 lbs
Ø 4.000 in*
19.58 ft
Centralizer 25-00000002
8.00 lbs
Ø 4.000 in*
ACRt Instrument-
10929776
50.00 lbs
Ø 3.625 in
5.03 ft
Regal Standoff 6_75-
00000001
20.00 lbs
Ø 6.750 in*
14.55 ft
Mud Resistivity @ 13.19 ft
ACRt @ 9.21 ft
ACRt Sonde-
10929775
200.00 lbs
Ø 3.625 in
14.22 ft



Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)		Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head	12027542	135.00	6.25		120.66	300.00
SP	SP Sub	12345678	60.00	3.74		116.92	300.00
GTET	Gamma Telemetry Tool	10748374	165.00	8.52		108.40	60.00
CSNG	Compensated Spectral Natural Gamma	10965402	114.00	8.17		100.24	15.00
DSNT	Dual Spaced Neutron	11019641	174.00	9.69		90.55	60.00
DCNT	DSN Decentralizer	10755066	6.60	5.13	*	93.88	300.00
SDLT	Spectral Density Tool	10685803	360.00	10.81		79.74	60.00
MICP	Microlog Pad	10685803	8.00	1.00	*	82.24	60.00
SDLP	Density Insite Pad	10714945	65.00	2.55	*	81.95	60.00
FLEX	Flex Joint	00000001	140.00	5.67		74.07	300.00
IDT	Insite Directional Tool	10967514	150.00	7.58		66.48	30.00
ICT	Six Independent Arm Caliper	10978621	330.00	12.83		53.65	30.00
WSTT	WaveSonic Insite	10753396	520.00	34.07		19.58	30.00
OBCEN	Centralizer - 25 in. Overbody	00000001	8.00	2.08	*	50.05	300.00
OBCEN	Centralizer - 25 in. Overbody	00000003	8.00	2.08	*	24.17	300.00
ACRt	Array Compensated True Resistivity Instrument Section	10929776	50.00	5.03		14.55	300.00
RSOF	Regal Standoff 6.75in	00000001	20.00	0.52	*	14.87	300.00
OBCEN	Centralizer - 25 in. Overbody	00000002	8.00	2.08	*	16.55	300.00
ACRt	Array Compensated True Resistivity Sonde Section	10929775	200.00	14.22		0.33	300.00
BLNS	Bull Nose	00000001	5.00	0.33		0.00	300.00
Total			**2,526.60**	**126.91**			

* Not included in Total Length and Length Accumulation.

Data: MILLY_3020_1-19\0003 SP-GTET-CSNG-DSN-SDL-FLEX-IDT-ICT-WAVE-ACRT-BN\IDLE **Date: 15-Aug-13 20:02:16**

HALLIBURTON

PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	GTET	GEOK	Process Gamma Ray EVR?	No	
	DSNT	DEOK	Process DSN EVR?	No	
	SDLT Pad	DNOK	Process Density EVR?	No	
4200.00					
	SHARED	BS	Bit Size	7.875	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	9.200	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	0.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	0.200	ohmm
	SHARED	TRM	Temperature of Mud	75.0	degF

SHARED	CSD	Logging Interval is Cased?	No	
SHARED	ICOD	AHV Casing OD	5.500	in
SHARED	ST	Surface Temperature	75.0	degF
SHARED	TD	Total Well Depth	6322.00	ft
SHARED	BHT	Bottom Hole Temperature	150.0	degF
SHARED	SVTM	Navigation and Survey Master Tool	IDT	
SHARED	AZTM	High Res Z Accelerometer Master Tool	IDT	
SHARED	TEMM	Temperature Master Tool	NONE	
SHARED	BHSM	Borehole Size Master Tool	ICT	
Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
Rwa / CrossPlot	AFAC	Archie A factor	0.6200	
Rwa / CrossPlot	MFAC	Archie M factor	2.1500	
Rwa / CrossPlot	RMFR	Rmf Reference	0.10	ohmm
Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
Rwa / CrossPlot	ADP	Use Air Porosity to calculate CrossplotPhi	No	
GTET	GROK	Process Gamma Ray?	Yes	
GTET	GRSO	Gamma Tool Standoff	0.000	in
GTET	GEOK	Process Gamma Ray EVR?	Yes	
GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
CSNG	CGOK	Process CSNG Data?	Yes	
CSNG	CENT	Is Tool Centralized?	No	
CSNG	GBOK	Gamma Enviromental Corrections?	Yes	
CSNG	BARF	Barite Correction Factor	1.00	
CSNG	ORDG	Use Fixed Gain	No	
CSNG	ORDO	Use Fixed Offset	No	
CSNG	ORDR	Use Fixed Resolution Degradation Factor	No	
DSNT	DNOK	Process DSN?	Yes	
DSNT	DEOK	Process DSN EVR?	Yes	
DSNT	NLIT	Neutron Lithology	Limestone	
DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
DSNT	DNTP	Temperature Correction Type	None	
DSNT	DPRS	DSN Pressure Correction Type	None	
DSNT	SHCO	View More Correction Options	No	
DSNT	UTVD	Use TVD for Gradient Corrections?	No	
DSNT	LHWT	Logging Horizontal Water Tank?	No	
SDLT	CLOK	Process Caliper Outputs?	Yes	
SDLT Pad	DNOK	Process Density?	Yes	
SDLT Pad	DNOK	Process Density EVR?	Yes	
SDLT Pad	CB	Logging Calibration Blocks?	No	
SDLT Pad	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT Pad	DTWN	Disable temperature warning	No	
SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc
SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc
Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
IDT	WRTI	Survey Writing Interval	30	ft
IDT	SOPT	Smoothing Option	None	
ICT	CLOK	Process Caliper Outputs?	Yes	
ICT	DARM	Disable Caliper Arm	No	
ICT	ATDS	Arm To Disable	0	

ICT	REPM	Method to replace arm?	Caliper Average	
ICT	ARMV	Diameter to use for disabled arm	0.00	in
ICT	DARM	Disable Second Caliper Arm	No	
ICT	ATDS	Second Arm To Disable	0	
ICT	REPM	Method to replace second arm?	Caliper Average	
ICT	ARMV	Diameter to use for second disabled arm	0.00	in
ICT	NAVS	Navigation Source Tool	IDT	
ICT	CL1O	Radius 1 Offset	0.0	in
ICT	CL2O	Radius 2 Offset	0.0	in
ICT	CL3O	Radius 3 Offset	0.0	in
ICT	CL4O	Radius 4 Offset	0.0	in
ICT	CL5O	Radius 5 Offset	0.0	in
ICT	CL6O	Radius 6 Offset	0.0	in
ICT	BHVC	Radius type for borehole volume calcuations	Elliptical	
Wavesonic-I	WSOK	Process WSTT?	Yes	
Wavesonic-I	AFIL	Adaptive Filtering?	No	
Wavesonic-I	PINT	Process 1 Sample and Skip	0	
Wavesonic-I	PROM	Process Mode: M=1,MX=2,MY=3,MXY=4	4	
Wavesonic-I	DTSH	Delta -T Shale	100.00	uspf
Wavesonic-I	DTMT	Delta -T Matrix Type	User define	
Wavesonic-I	DTMA	Delta -T Matrix	47.60	uspf
Wavesonic-I	DTFL	Delta -T Fluid	189.00	uspf
Wavesonic-I	RHOM	Matrix Density	2.7100	g/cc
Wavesonic-I	RHOF	Fluid Density	1.0000	g/cc
Wavesonic-I	SMTH	Semblance Threshold	0.25	
Wavesonic-I	VPVS	VPVS Ratio for Porosity	1.40	
Wavesonic-I	APEQ	Acoustic Porosity Equation	Wylie	
Wavesonic-I	NAVS	Navigation Source Tool	IDT	
ACRt Sonde	RTOK	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Upr	
ACRt Sonde	TPOS	Tool Position	Free Hanging	
ACRt Sonde	RMOP	Rmud Source	Mud Cell	
ACRt Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt Sonde	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm

BOTTOM

Data: MILLY_3020_1-19\0003 SP-GTET-CSNG-DSN-SDL-FLEX-IDT-ICT-WAVE-ACRT-BN\004 15-Aug-13 22:31 Up @6330.0f **Date: 16-Aug-13 04:34:33**

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name: **GTET - 10748374** **Reference Calibration Date:** **25-Jul-13 22:09:38**

Engineer: **THOMAS HYDE** **Calibration Date:** **02-Aug-13 14:20:06**

Software Version: **WL INSITE R3.8.4 (Build 5)** **Calibration Version:** **1**

Calibrator Source S/N: TB-185

Calibrator API Reference:228.00 api

Equivalent Calibrator API Reference:232.0 api

Measurement	Measured	Calibrated	Units
Background	41.8	41.9	api

Background + Calibrator	273.2	273.9	api
Calibrator	231.4	232.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name: GTET - 10748374 **Reference Calibration Date:** 02-Aug-13 14:20:06

Engineer: S. INGERSOLL **Calibration Date:** 14-Aug-13 12:44:26

Software Version: WL INSITE R3.8.4 (Build 5) **Calibration Version:** 1

Calibrator Source S/N: TB-185

Calibrator API Reference:228.00 api

Equivalent Calibrator API Reference:232.0 api

Field Verification	Shop	Field	Units
Background	41.9	56.8	api
Background + Calibrator	273.9	290.3	api
Calibrator	232.0	233.5	api

Shop	Field	Difference	Tolerance
232.0	233.5	-1.5	+/- 9.00

DENSITY CALIPER SHOP CALIBRATION

Tool Name: SDLT - 10685803 **Reference Calibration Date:** 07-Aug-13 13:48:16

Engineer: S. INGERSOLL **Calibration Date:** 07-Aug-13 14:09:51

Software Version: WL INSITE R3.8.4 (Build 5) **Calibration Version:** 1

Host Tool Name: DSNT - 11019641

CALIBRATION COEFFICIENTS

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-4676.75	-4646.73	-7000.00 - -1000.00
Pad Gain	0.0003849	0.0003849	0.000200 - 0.000600
Arm Offset	-2740.75	-1909.26	-5000.00 - 3000.00
Arm Gain	0.0005601	0.0004592	0.000300 - 0.000700
Arm Power	-0.000007798	-0.000001398	-0.000010000 - 0.000010000

The ring diameter is computed from: DIAMETER = PAD EXTENSION + ARM EXTENSION + TOOL DIAMETER

Tool Diameter: 4.50 in

CALIBRATION RINGS

Measurement	Current Reading (Previous Coeff.)	Calibrated (New Coeff.)	Change	Control Limit On New Value
PAD EXTENSION:				
Small Ring (in)	1.99	2.00	0.01	+/- 0.20
Medium Ring (in)	3.74	3.75	0.01	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.43	6.50	0.07	+/- 0.20
Medium Ring (in)	8.40	8.25	-0.15	+/- 0.20
Large Ring (in)	15.00	15.00	0.00	+/- 0.20

PASS/FAIL SUMMARY	
Calibration-Coefficients Range Check:	Passed
Ring-Measurement Check:	Passed

PASS/FAIL SUMMARY	
Calibration-Coefficients Range Check:	Passed

SDLT CALIPER FIELD CALIBRATION

Tool Name: SDLT - 10685803 **Reference Calibration Date:** 07-Aug-13 14:09:51

Engineer:	**S. INGERSOLL**	**Calibration Date:**	**14-Aug-13 12:40:14**
Software Version:	**WL INSITE R3.8.4 (Build 5)**	**Calibration Version:**	**1**

MEASURED CALIPER VALUES

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.74	-0.01	+/- 0.10
Ring Diameter	8.25	8.24	-0.01	+/- 0.15

PASS/FAIL SUMMARY

Pad Extension Check:	Passed
Diameter Check:	Passed

MICRO LOG SHOP CALIBRATION

Tool Name:	**Microlog Pad - 10685803**	**Reference Calibration Date:**	**07-Aug-13 14:25:09**
Engineer:	**S. INGERSOLL**	**Calibration Date:**	**07-Aug-13 14:27:24**
Software Version:	**WL INSITE R3.8.4 (Build 5)**	**Calibration Version:**	**1**
Host Tool Name:	**DSNT - 11019641**		

CALIBRATION COEFFICIENT SUMMARY

Measurement	Micro Log Normal		Micro Log Lateral		
	Measured	Calibrated	Measured	Calibrated	Units
Tool Zero	-0.10	-0.10	0.00	0.00	ohmm
Calibration Point #1	-0.00	0.00	-0.00	0.00	ohmm
Calibration Point #2	20.00	20.00	20.00	20.00	ohmm
Internal Reference	19.88	19.88	19.99	19.99	ohmm

Measurement	Micro Log Normal Tool Value	Micro Log Lateral Tool Value	Units
Tool Zero	1.08	2.38	V
Calibration Point #1	27.48	1.58	V
Calibration Point #2	5451.39	7110.02	V
Internal Reference	5419.41	7105.70	V

MICRO LOG FIELD CHECK

Tool Name:	**Microlog Pad - 10685803**	**Reference Calibration Date:**	**07-Aug-13 14:27:24**
Engineer:	**S. INGERSOLL**	**Calibration Date:**	**14-Aug-13 12:25:55**
Software Version:	**WL INSITE R3.8.4 (Build 5)**	**Calibration Version:**	**1**

Measurement	Micro Log Normal		Micro Log Lateral		
	Shop	Field	Shop	Field	Units
Tool Zero	-0.10	-0.11	0.00	-0.00	ohmm
Internal Reference	19.88	19.82	19.99	19.92	ohmm

Summary

Signal	Shop	Field	Difference	Tolerence
Microlog Normal	19.88	19.82	0.06	+/- 0.80
Microlog Lateral	19.99	19.92	0.07	+/- 0.80

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-10748374						
Gamma Ray Calibrator	232.0	233.5	----------	-1.5	+/- 9.00	api
SDLT-10685803						

Pad Extension	3.75	3.74	----------	0.01	+/-0.10	in
Ring Diameter	8.25	8.24	----------	0.01	+/-0.15	in
Microlog Pad-10685803						
MicroLog Normal	19.88	19.82	----------	0.06	+/-0.80	ohmm
MicroLog Lateral	19.99	19.92	----------	0.07	+/-0.80	ohmm

Data: MILLY_3020_1-19\0003 SP-GTET-CSNG-DSN-SDL-FLEX-IDT-ICT-WAVE-ACRT-BN\004 15-Aug-13 22:31 Up @6330.0f **Date: 16-Aug-13 04:37:25**

HALLIBURTON

INPUTS, DELAYS AND FILTERS TABLE

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
Depth Panel				
TENS	Tension	0.00	NO	
RWCH				
DHTN	DownholeTension	0.00	BLK	0.000
SP Sub				
PLTC	Plot Control Mask	118.88	NO	
SP	Spontaneous Potential	118.88	BLK	1.250
SPR	Raw Spontaneous Potential	118.88	NO	
SPO	Spontaneous Potential Offset	118.88	NO	
GTET				
TPUL	Tension Pull	110.86	NO	
GR	Natural Gamma Ray API	110.86	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	110.86	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	110.86	W	1.416 , 0.750
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
CSNG				
TPUL	Tension Pull	102.78	NO	
STAT	Status	102.78	NO	
FRMC	Tool Frame Count	102.78	BLK	0.250
TFRM	Total Frames	102.78	NO	
LSPD	Line Speed	102.78	BLK	0.250
CTIM	Accumulation time for sample	102.78	BLK	0.250
NOIS	Spectral Noise	102.78	BLK	0.250
STAB	Stabilizer Voltage in mv	102.78	BLK	0.250
STBP	Stabilizer 60 KEV Peak	102.78	BLK	0.250
AMER	Americium	102.78	BLK	0.250
FTMP	Flask PCB Temperature	102.78	BLK	0.250
SPEL	Low Energy Spectrum	102.78	BLK	0.250
SPEH	High Energy Spectrum	102.78	BLK	0.250
SSP	Stabilization Energy Spectrum	102.78	BLK	0.250
CSPC	CSNG Lo Hi Spectrum Data	102.78	NO	
DSNT				
TPUL	Tension Pull	92.45	NO	
RNDS	Near Detector Telemetry Counts	92.55	BLK	1.417
RFDS	Far Detector Telemetry Counts	93.30	TRI	0.583
DNTT	DSN Tool Temperature	92.55	NO	
DSNS	DSN Tool Status	92.45	NO	

DSNS	DSN Tool Status	92.45	NO	
ERND	Near Detector Telemetry Counts EVR	92.55	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	93.30	BLK	0.000
ENTM	DSN Tool Temperature EVR	92.55	NO	
	SDLT			
TPUL	Tension Pull	82.55	NO	
PCAL	Pad Caliper	82.55	TRI	0.250
ACAL	Arm Caliper	82.55	TRI	0.250
	IDT			
TPUL	Tension Pull	67.48	NO	
ACCX	Accelerometer X	67.48	NO	
ACCY	Accelerometer Y	67.48	NO	
ACCZ	Accelerometer Z	67.48	NO	
MAGX	magnetometer x with unit	67.48	NO	
MAGY	Magnetometer Y with unit	67.48	NO	
MAGZ	magnetometer z with unit	67.48	NO	
IAMP	Accelerometer Temperature	67.48	NO	
MTMP	Magnetometer Temperature	67.48	NO	
	ICT			
TPUL	Tension Pull	56.44	NO	
	Arm Potentiometer excitation V	53.65	NO	
	Caliper 1 measurement	56.44	BLK	1.250
	Caliper 2 measurement	56.44	BLK	1.250
	Caliper 3 measurement	56.44	BLK	1.250
	Caliper 4 measurement	56.44	BLK	1.250
	Caliper 5 measurement	56.44	BLK	1.250
	Caliper 6 measurement	56.44	BLK	1.250
	Caliper Global measurement	56.44	BLK	1.250
MOTI	Motor Current	53.65	NO	
MOT1	Motor Voltage Monitor 1	53.65	NO	
STA1	Status word #1	53.65	NO	
STA2	Status word #2	53.65	NO	
PRES	Caliper percentage of total compression of the spring	53.65	NO	
HAZI	Hole Azimuth	56.44	NO	
RB	Relative Bearing	56.44	NO	
AZI1	PAD1 Azimuth	56.44	NO	
DEVI	Inclination	56.44	NO	
	Wavesonic-I			
TPUL	Tension Pull	31.08	NO	
DPSX	Dipole Source X Structurel	19.58	NO	
DPSY	Dipole Source Y Structurel	19.58	NO	
DPSM	Monopole Source Structure	19.58	NO	
WVST	Wavesonic Compressed Data	31.08	NO	
TPUL	Tension Pull	31.08	NO	
XMS1	Wave Sonic Status Word 1	19.58	NO	
XMS2	Wave Sonic Status Word 2	19.58	NO	
XMS1	Wave Sonic XMITStatus Word 1	19.58	NO	
XMS1	Wave Sonic XMITStatus Word 2	19.58	NO	
F1HA	Dipole 1 HV After	19.58	NO	
F1HB	Dipole 1 HV Before	19.58	NO	
F2HA	Dipole 2 HV After	19.58	NO	
F2HB	Dipole 2 HV Before	19.58	NO	

F3HA	Monopole HV After	19.58	NO
F3HB	Monopole HV Before	19.58	NO
INVT	Input Voltage	19.58	NO
5VOL	5 Volts	19.58	NO
MI5A	Minus 5 Volts Analog	19.58	NO
ITMP	Instrument Temperature	19.58	NO
PL5A	Plus 5 Volts Analog	19.58	NO
5VD	Plus 5 Volts Digital	19.58	NO
TCUR	Tool Current	19.58	NO
SUPV	Supply Voltage	19.58	NO
PRVT	Preregulated voltage	19.58	NO
PRVT	Pre-regulated voltage Xmter	19.58	NO
TEMP	Temperature	19.58	NO
ACQN	Acquisition Number	19.58	NO
XDP	Delay Reference	31.08	NO
MITM	MIT Mode	31.08	NO
VERS	Version	19.58	NO
D1CT	Dipole 1 Compressed Word Count	31.08	NO
D2CT	Dipole 2 Compressed Word Count	31.08	NO
MCNT	Monopole Compressed Word Count	31.08	NO
SEQN	Sequence Number	19.58	NO
FREV	Firmware Revision	19.58	NO
MSMP	Monopole Sample Rate	19.58	NO
MSMP	Dipole Sample Rate	19.58	NO
MFWF	Monopole Firing Waveform	19.58	NO
MFRQ	Monopole Frequency	19.58	NO
MDLY	Monopole Delay	19.58	NO
DXWF	Dipole X Firing Waveform	19.58	NO
XFRQ	Dipole X Frequency	19.58	NO
XDLY	Dipole X Delay	19.58	NO
DYWF	Dipole Y Firing Waveform	19.58	NO
YFRQ	Dipole Y Frequency	19.58	NO
YDLY	Dipole Y Delay	19.58	NO
DPSX	Dipole Source X Structurel	19.58	NO
DPSY	Dipole Source Y Structurel	19.58	NO
DPSM	Monopole Source Structure	19.58	NO
WVST	Wavesonic Compressed Data	31.08	NO
AUTM	Auto Mode	19.58	NO
SONM	tool mode for sonic - 0 for normal or 3 for calibration	19.58	NO
MSL	Monopole Lower Travel Time	31.08	NO
MSH	Monopole Upper Travel Time	31.08	NO
MLFC	Monopole-1 Lower Filter Bandpass Frequency Cut-off	19.58	NO
MUFC	Monopole-1 Upper Filter Bandpass Frequency Cut-off	19.58	NO
DLTT	Dipole Lower Travel Time	19.58	NO
DUTT	Dipole Upper Travel Time	19.58	NO
DLFC	Dipole Lower Filter Bandpass Frequency Cut-off	19.58	NO
DUFC	Dipole Upper Filter Bandpass Frequency Cut-off	19.58	NO
MUTE	WaveSonic Mute/Enable Channels and Sides map	19.58	NO
MUTS	Mute/Enable Sides	19.58	NO
WSRB	Relative Bearing	31.08	NO
WSAZ	WSX Azimuth Pad 1	31.08	NO
TPUL	Tension Pull	31.08	NO
WMP	Summed array of Monopole for SIDES - A,B,C,D	31.08	NO
WXX	Dipole X for SIDES - A-C	31.08	NO
WYY	Dipole Y for SIDES - B-D	31.08	NO

WXY	Dipole X for SIDES - B-D	31.08	NO
WYX	Dipole Y for SIDES - A-C	31.08	NO
TPUL	Tension Pull	31.08	NO
WMA	Monopole Waveform Side A - Channel 1 to Channel 8 Receivers	31.08	NO
WMB	Monopole Waveform Side B - Channel 1 to Channel 8 Receivers	31.08	NO
WMC	Monopole Waveform Side C - Channel 1 to Channel 8 Receivers	31.08	NO
WMD	Monopole Waveform Side D - Channel 1 to Channel 8 Receivers	31.08	NO
WXA	Dipole X Waveform Side A - Channel 1 to Channel 8 Receivers	31.08	NO
WXB	Dipole X Waveform Side B - Channel 1 to Channel 8 Receivers	31.08	NO
WXC	Dipole X Waveform Side C - Channel 1 to Channel 8 Receivers	31.08	NO
WXD	Dipole X Waveform Side D - Channel 1 to Channel 8 Receivers	31.08	NO
WYA	Dipole Y Waveform Side A - Channel 1 to Channel 8 Receivers	31.08	NO
WYB	Dipole Y Waveform Side B - Channel 1 to Channel 8 Receivers	31.08	NO
WYC	Dipole Y Waveform Side C - Channel 1 to Channel 8 Receivers	31.08	NO
WYD	Dipole Y Waveform Side D - Channel 1 to Channel 8 Receivers	31.08	NO
GAR1	Gain Side A Receiver 1	19.58	NO
GAR2	Gain Side A Receiver 2	19.58	NO
GAR3	Gain Side A Receiver 3	19.58	NO
GAR4	Gain Side A Receiver 4	19.58	NO
GAR5	Gain Side A Receiver 5	19.58	NO
GAR6	Gain Side A Receiver 6	19.58	NO
GAR7	Gain Side A Receiver 7	19.58	NO
GAR8	Gain Side A Receiver 8	19.58	NO
GBR1	Gain Side B Receiver 1	19.58	NO
GBR2	Gain Side B Receiver 2	19.58	NO
GBR3	Gain Side B Receiver 3	19.58	NO
GBR4	Gain Side B Receiver 4	19.58	NO
GBR5	Gain Side B Receiver 5	19.58	NO
GBR6	Gain Side B Receiver 6	19.58	NO
GBR7	Gain Side B Receiver 7	19.58	NO
GBR8	Gain Side B Receiver 8	19.58	NO
GCR1	Gain Side C Receiver 1	19.58	NO
GCR2	Gain Side C Receiver 2	19.58	NO
GCR3	Gain Side C Receiver 3	19.58	NO
GCR4	Gain Side C Receiver 4	19.58	NO
GCR5	Gain Side C Receiver 5	19.58	NO
GCR6	Gain Side C Receiver 6	19.58	NO
GCR7	Gain Side C Receiver 7	19.58	NO
GCR8	Gain Side C Receiver 8	19.58	NO
GDR1	Gain Side D Receiver 1	19.58	NO
GDR2	Gain Side D Receiver 2	19.58	NO
GDR3	Gain Side D Receiver 3	19.58	NO
GDR4	Gain Side D Receiver 4	19.58	NO
GDR5	Gain Side D Receiver 5	19.58	NO
GDR6	Gain Side D Receiver 6	19.58	NO
GDR7	Gain Side D Receiver 7	19.58	NO
GDR8	Gain Side D Receiver 8	19.58	NO

ACRt Sonde

TPUL	Tension Pull	2.73	NO

TPUL	Tension Pull	2.73	NO	
F1R1	ACRT 12KHz - 80in R value	8.98	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	8.98	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.48	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.48	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	4.98	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	4.98	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	3.98	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	3.98	BLK	0.000
F1R5	ACRT 12KHz - 10in R value	3.48	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.48	BLK	0.000
F1R6	ACRT 12KHz - 6in R value	3.23	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.23	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	8.98	BLK	0.000
F2X1	ACRT 36KHz - 80in X value	8.98	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.48	BLK	0.000
F2X2	ACRT 36KHz - 50in X value	6.48	BLK	0.000
F2R3	ACRT 36KHz - 29in R value	4.98	BLK	0.000
F2X3	ACRT 36KHz - 29in X value	4.98	BLK	0.000
F2R4	ACRT 36KHz - 17in R value	3.98	BLK	0.000
F2X4	ACRT 36KHz - 17in X value	3.98	BLK	0.000
F2R5	ACRT 36KHz - 10in R value	3.48	BLK	0.000
F2X5	ACRT 36KHz - 10in X value	3.48	BLK	0.000
F2R6	ACRT 36KHz - 6in R value	3.23	BLK	0.000
F2X6	ACRT 36KHz - 6in X value	3.23	BLK	0.000
F3R1	ACRT 72KHz - 80in R value	8.98	BLK	0.000
F3X1	ACRT 72KHz - 80in X value	8.98	BLK	0.000
F3R2	ACRT 72KHz - 50in R value	6.48	BLK	0.000
F3X2	ACRT 72KHz - 50in X value	6.48	BLK	0.000
F3R3	ACRT 72KHz - 29in R value	4.98	BLK	0.000
F3X3	ACRT 72KHz - 29in X value	4.98	BLK	0.000
F3R4	ACRT 72KHz - 17in R value	3.98	BLK	0.000
F3X4	ACRT 72KHz - 17in X value	3.98	BLK	0.000
F3R5	ACRT 72KHz - 10in R value	3.48	BLK	0.000
F3X5	ACRT 72KHz - 10in X value	3.48	BLK	0.000
F3R6	ACRT 72KHz - 6in R value	3.23	BLK	0.000
F3X6	ACRT 72KHz - 6in X value	3.23	BLK	0.000
RMUD	Mud Resistivity	12.52	BLK	0.000
F1RT	Transmitter Current Raw 12K X Receiver	2.73	BLK	0.000
F1XT	Transmitter Reference 12 KHz Imaginary Signal	2.73	BLK	0.000
F2RT	Transmitter Reference 36 KHz Real Signal	2.73	BLK	0.000
F2XT	Transmitter Reference 36 KHz Imaginary Signal	2.73	BLK	0.000
F3RT	Transmitter Reference 72 KHz Real Signal	2.73	BLK	0.000
F3XT	Transmitter Reference 72 KHz Imaginary Signal	2.73	BLK	0.000
TFPU	Upper Feedpipe Temperature Calculated	2.73	BLK	0.000
TFPL	Lower Feedpipe Temperature Calculated	2.73	BLK	0.000
ITMP	Instrument Temperature	2.73	BLK	0.000
TCVA	Temperature Correction Values Loop Off	2.73	NO	
TIDV	Instrument Temperature Derivative	2.73	NO	
TUDV	Upper Temperature Derivative	2.73	NO	
TLDV	Lower Temperature Derivative	2.73	NO	
TRBD	Receiver Board Temperature	2.73	NO	

SDLT Pad

TPUL	Tension Pull	82.54	NO	
NAB	Near Above	82.37	BLK	0.920

NHI	Near Cesium High	82.37	BLK	0.920
NLO	Near Cesium Low	82.37	BLK	0.920
NVA	Near Valley	82.37	BLK	0.920
NBA	Near Barite	82.37	BLK	0.920
NDE	Near Density	82.37	BLK	0.920
NPK	Near Peak	82.37	BLK	0.920
NLI	Near Lithology	82.37	BLK	0.920
NBAU	Near Barite Unfiltered	82.37	BLK	0.250
NLIU	Near Lithology Unfiltered	82.37	BLK	0.250
FAB	Far Above	82.72	BLK	0.250
FHI	Far Cesium High	82.72	BLK	0.250
FLO	Far Cesium Low	82.72	BLK	0.250
FVA	Far Valley	82.72	BLK	0.250
FBA	Far Barite	82.72	BLK	0.250
FDE	Far Density	82.72	BLK	0.250
FPK	Far Peak	82.72	BLK	0.250
FLI	Far Lithology	82.72	BLK	0.250
PTMP	Pad Temperature	82.55	BLK	0.920
NHV	Near Detector High Voltage	81.95	NO	
FHV	Far Detector High Voltage	81.95	NO	
ITMP	Instrument Temperature	81.95	NO	
DDHV	Detector High Voltage	81.95	NO	

Microlog Pad

TPUL	Tension Pull	82.74	NO	
MINV	Microlog Lateral	82.74	BLK	0.750
MNOR	Microlog Normal	82.74	BLK	0.750

Data: MILLY_3020_1-19\0003 SP-GTET-CSNG-DSN-SDL-FLEX-IDT-ICT-WAVE-ACRT-BN\004 15-Aug-13 22:31 Up @6330.0f **Date: 16-Aug-13 04:33:55**

COMPANY	**SANDRIDGE ENERGY**		
WELL	**MILLY 3020 1-19**		
FIELD	**EXCEL SOUTHWEST**		
COUNTY	**KIOWA**	STATE	**KANSAS**

HALLIBURTON

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