

ARRAY COMPENSATED
TRUE RESISTIVITY
LOG

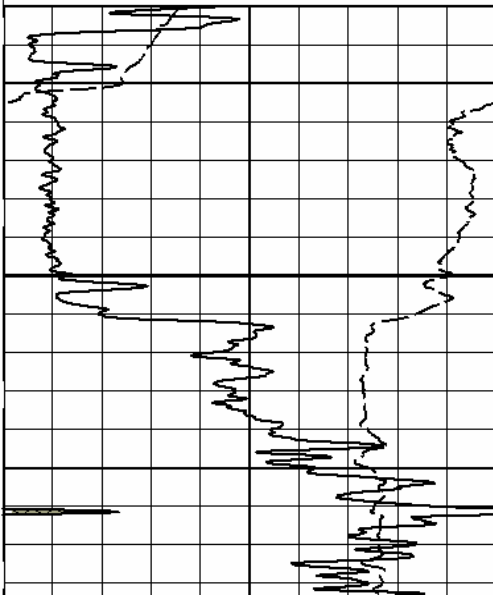
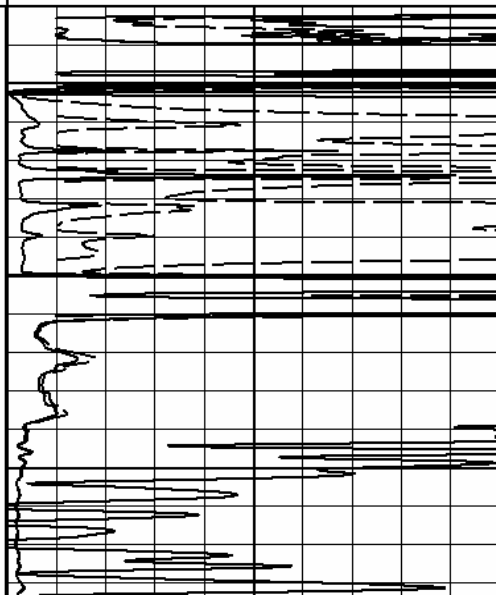
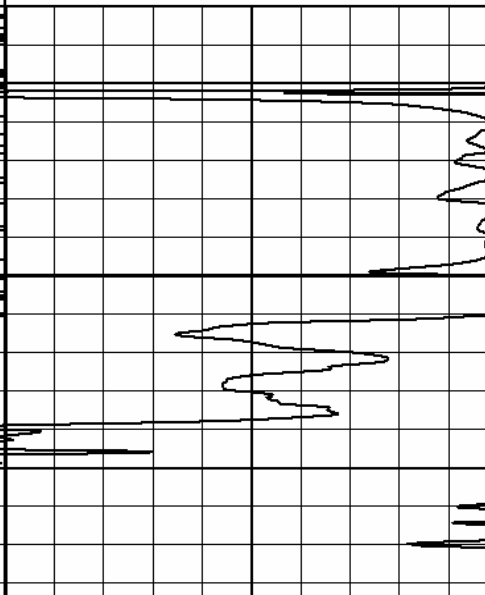
Service Ticket No.: 8205394 API Serial No.: 15-081-21937 PGM Version: WL INSITE R3.2.0 (Build 7)											
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE						RESISTIVITY SCALE CHANGES					
Date	Sample No.					Type Log	Depth	Scale Up Hole		Scale Down Hole	
Depth-Driller											
Type Fluid in Hole											
Density	Viscosity										
Ph	Fluid Loss										
Source of Sample						RESISTIVITY EQUIPMENT DATA					
Rm @ Meas. Temp		@		@		Run No.	Tool Type & No.	Pad Type	Tool Pos.		Other
Rmf @ Meas. Temp.		@		@		ONE	ACRT	N/A	1.5" S.O.		N/A
Rmc @ Meas. Temp.		@		@			1962 S909				
Source Rmf	Rmc										
Rm @ BHT		@		@							
Rmf @ BHT		@		@							
Rmc @ BHT		@		@							
EQUIPMENT DATA											
GAMMA		ACOUSTIC				DENSITY			NEUTRON		
Run No.	ONE	Run No.		Run No.		Run No.		Run No.			
Serial No.	11050378	Serial No.		Serial No.		Serial No.		Serial No.			
Model No.	GTET	Model No.		Model No.		Model No.		Model No.			
Diameter	3.625"	No. of Cent.		Diameter		Diameter		Diameter			
Detector Model No.	T-102	Spacing		Log Type		Log Type		Log Type			
Type	SCINT			Source Type		Source Type		Source Type			
Length	8"	LSA [Y/N]		Serial No.		Serial No.		Serial No.			
Distance to Source	10'	FWDA [Y/N]		Strength		Strength		Strength			
LOGGING DATA											

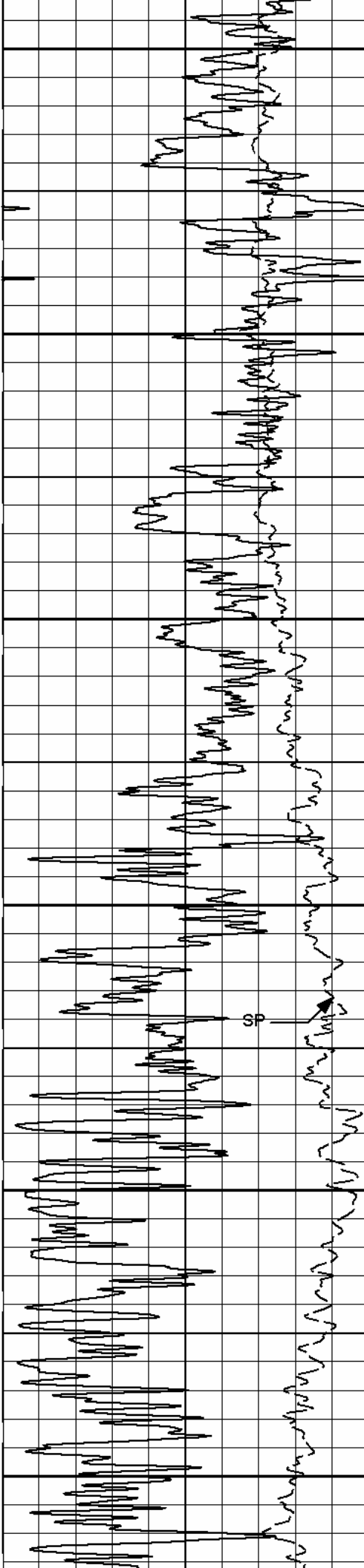
GENERAL			GAMMA		ACOUSTIC		DENSITY		NEUTRON					
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	5396'	1853'	REC	0	150	30	-10	47.6						
DIRECTIONAL INFORMATION														
Maximum Deviation @								KOP @						
Remarks SP-GTET-DSNT-SDLT-BSAT-ACRT RAN IN COMBINATION.														
ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING.														
CHLORIDES REPORTED AT 2000 MG/L . LCM REPORTED AT 2 LB/BBL.														
YOUR CREW: K. KELLY, R. SHANNON														
THANK YOU FOR USING HALLIBURTON ENERGY SERVICES. LIBERAL, KS 620-624-8123														
HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.														
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Plot Time: 28-May-11 13:52:52
 Plot Range: 1830 ft to 5400 ft
 Data: BERGER_A_3\Well Based\MAIN
 Plot File: \\LOCAL-1\BERGER_A_3\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\ACRT\ACRT_2.lib

2 INCH MAIN LOG

		1000	90in Conductivity 2ft Res		
			mmho per metre		
SP		0	90in Resistivity 2ft Res	50	
-]20[+			ohm-metre		
0	Gamma API	150	MD	20in Resistivity 2ft Res	50
api			1 : 600	ohm-metre	
			ft		
		1900			
					



2000

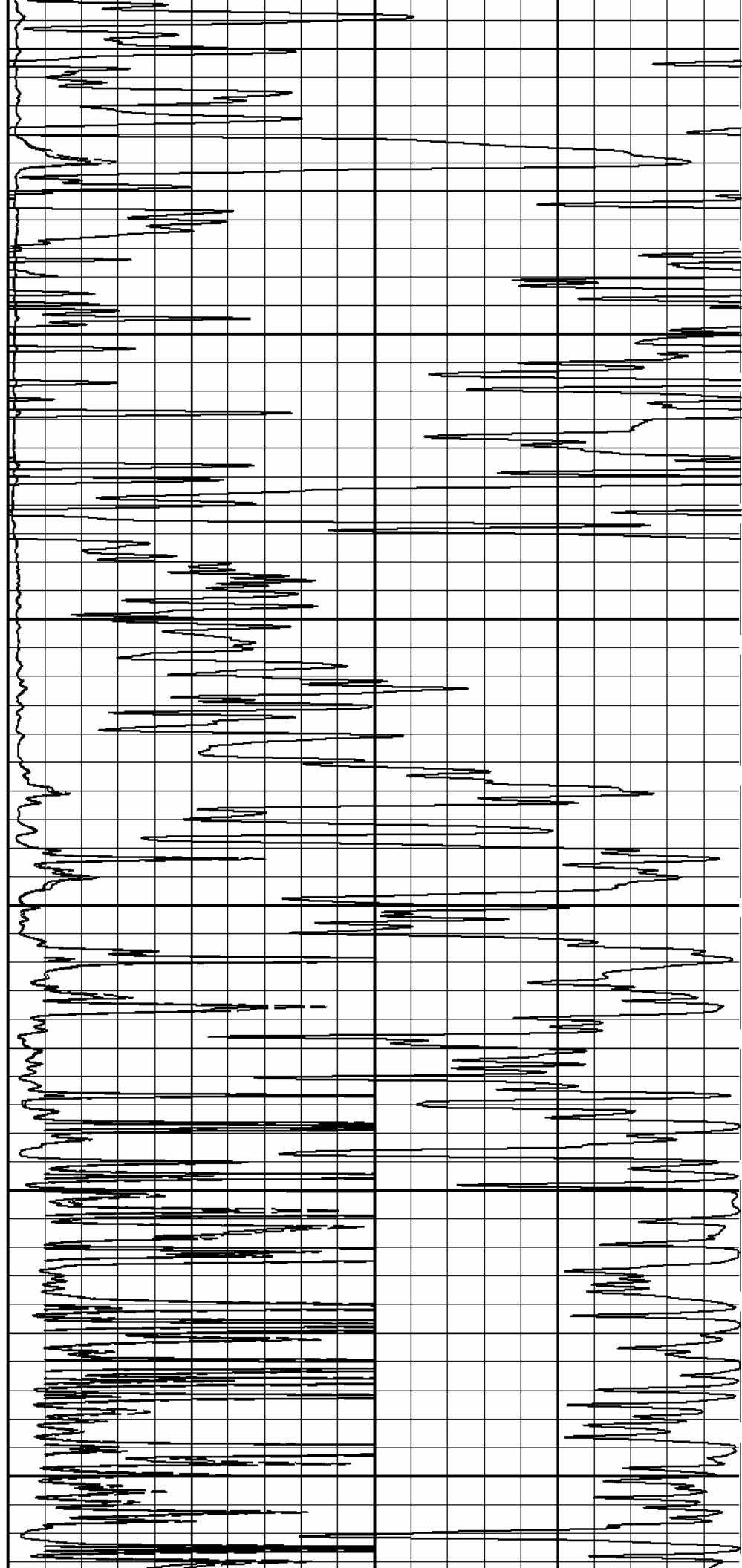
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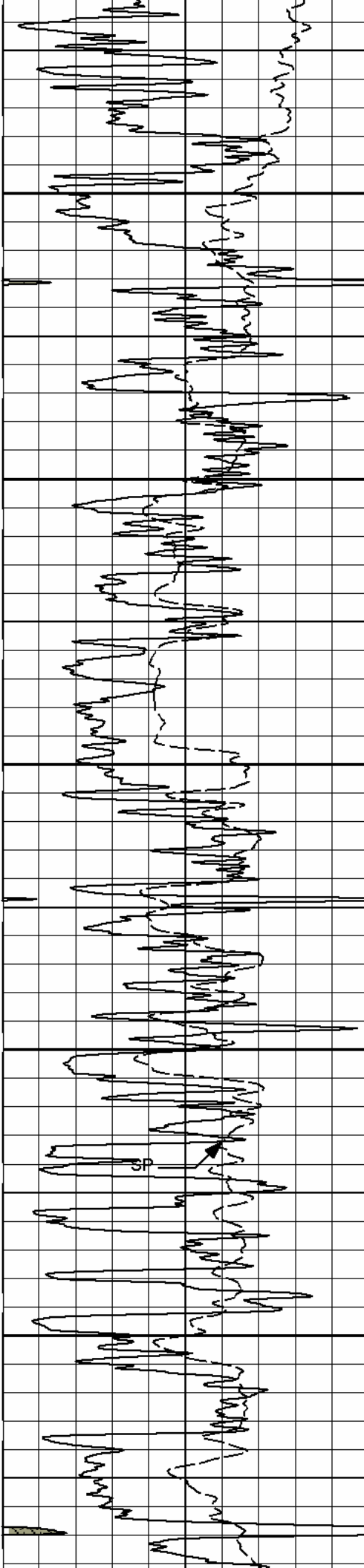
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2300

2400

2500





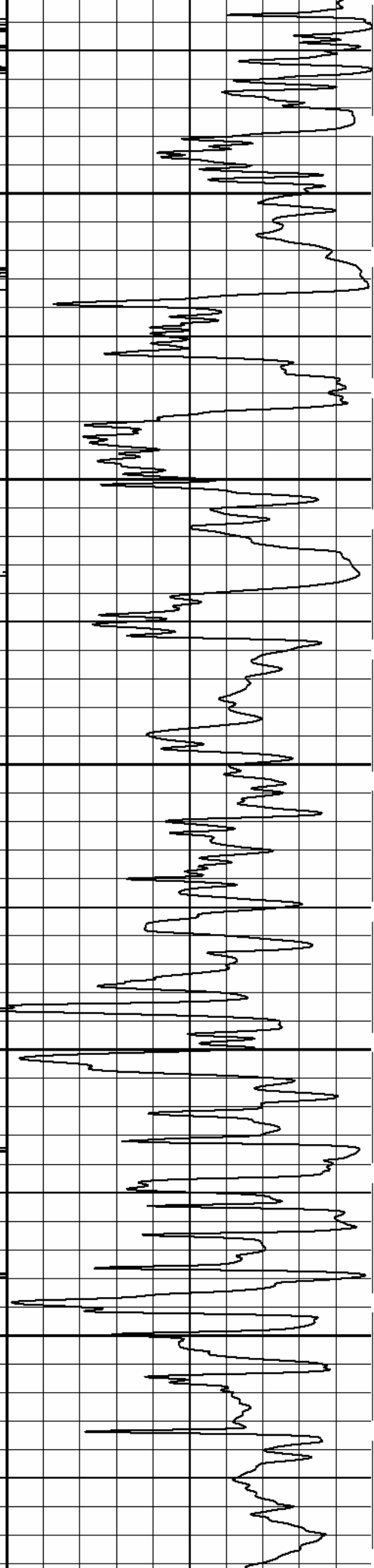
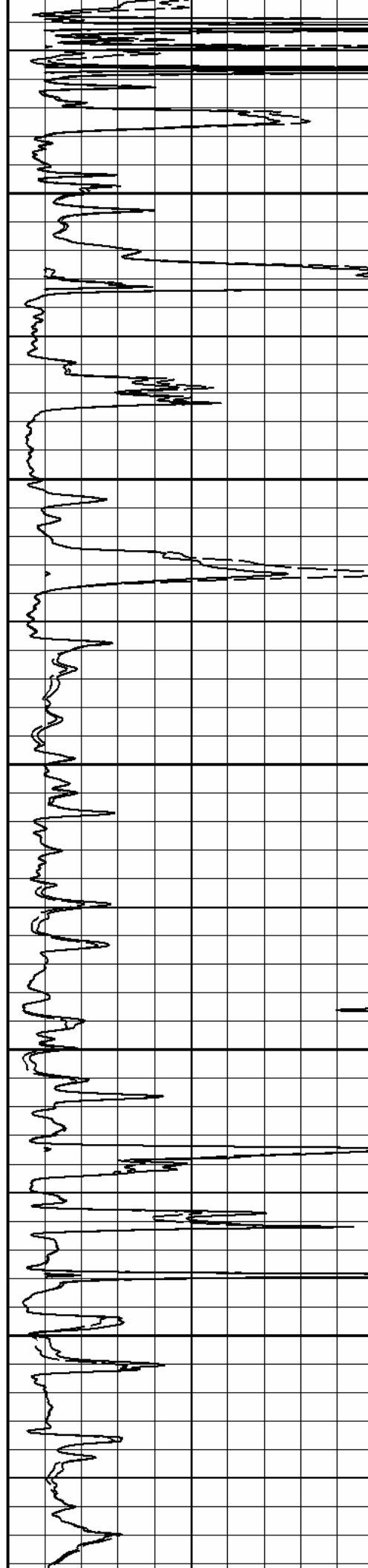
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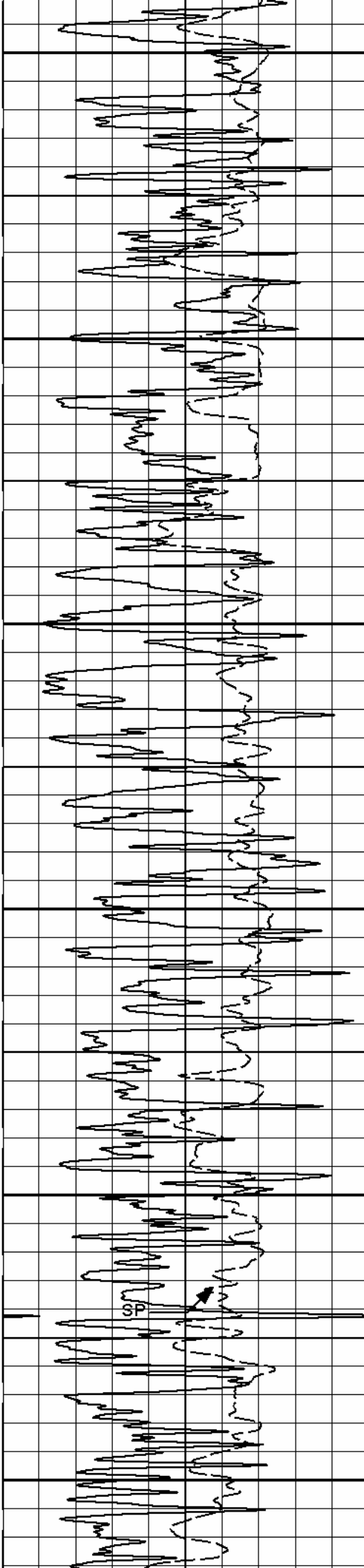
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2800

2900

3000





3100

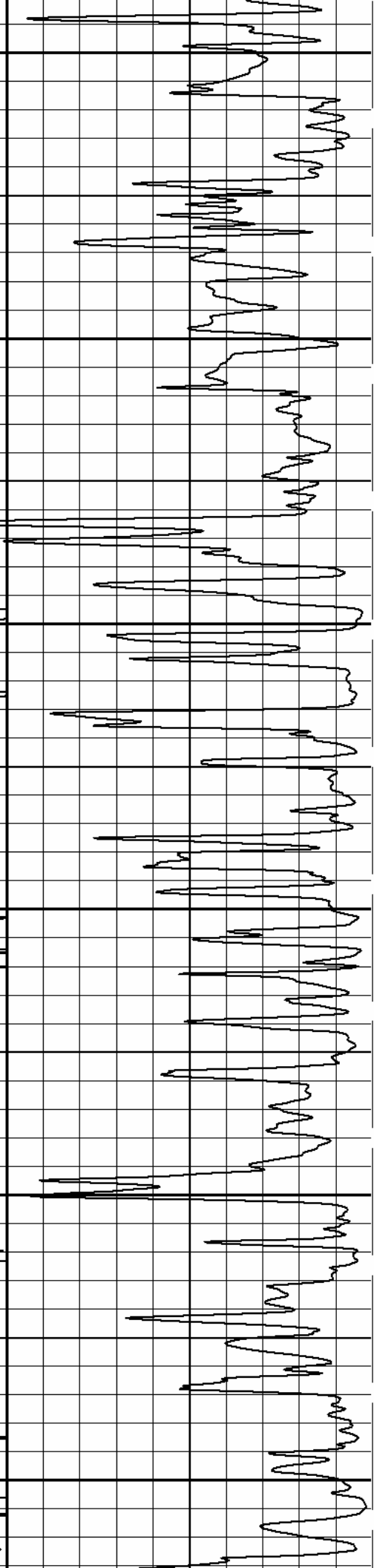
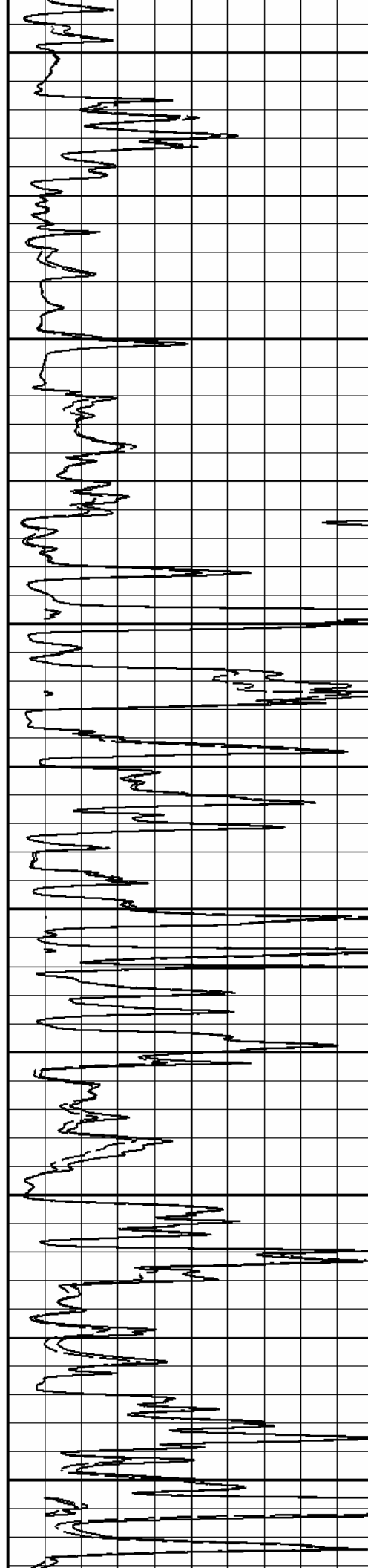
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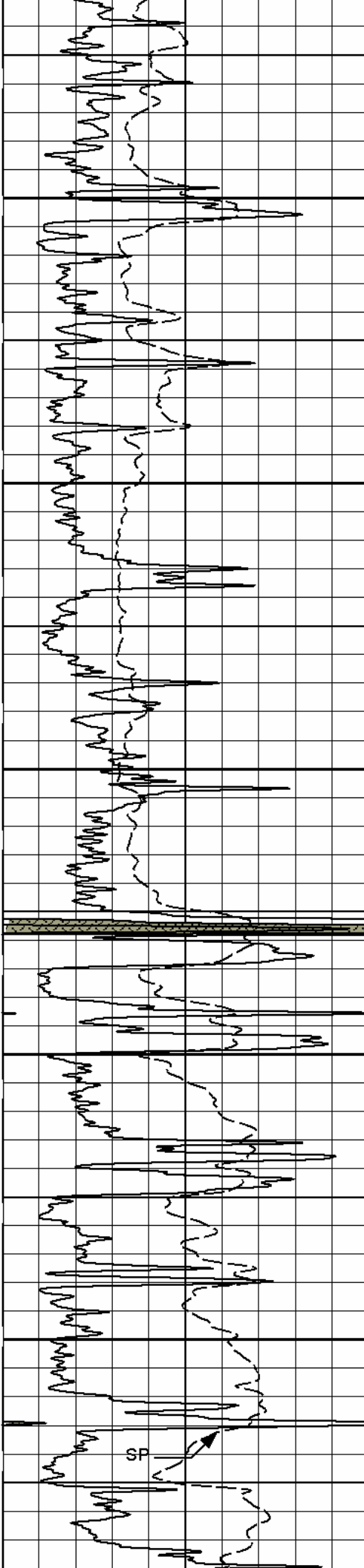
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3600





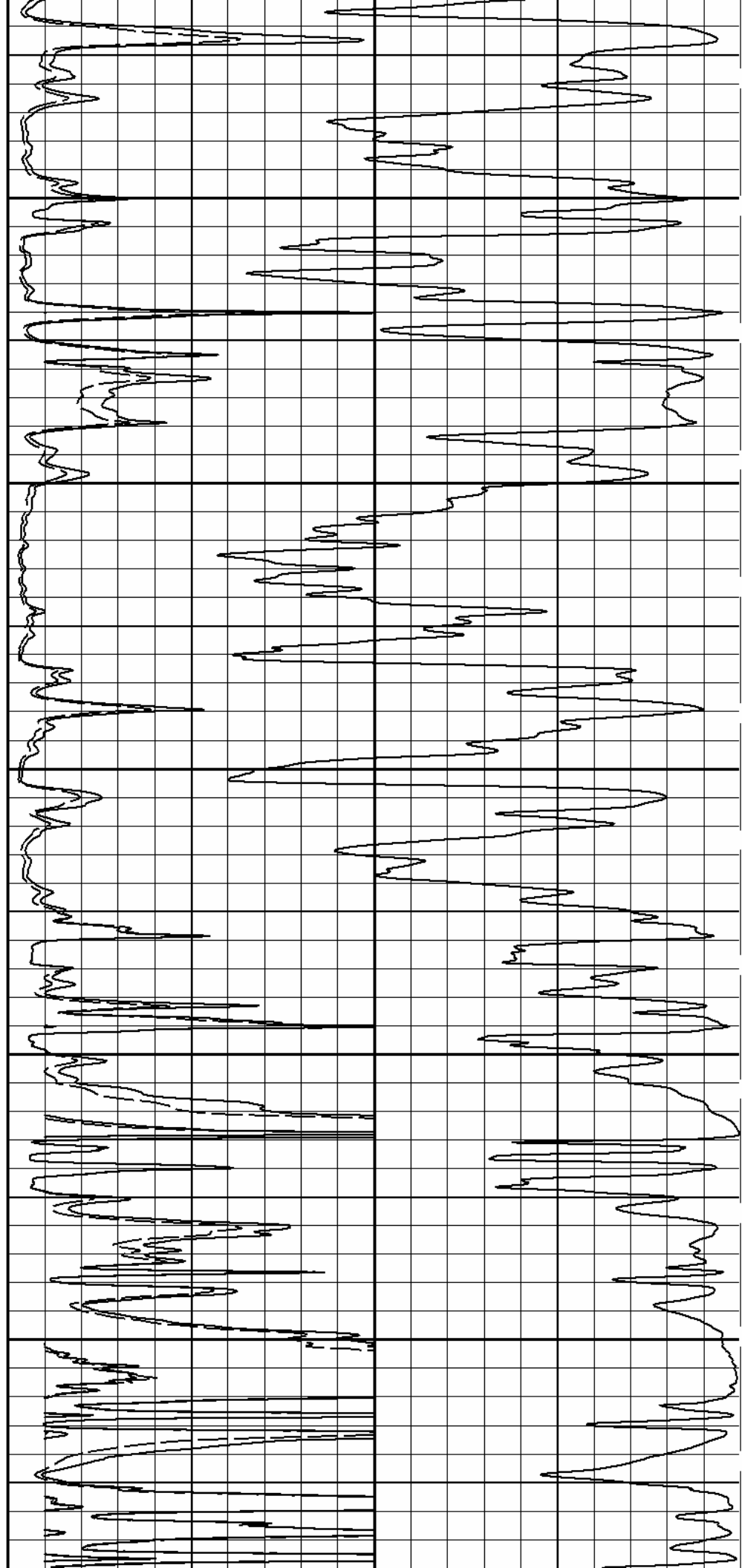
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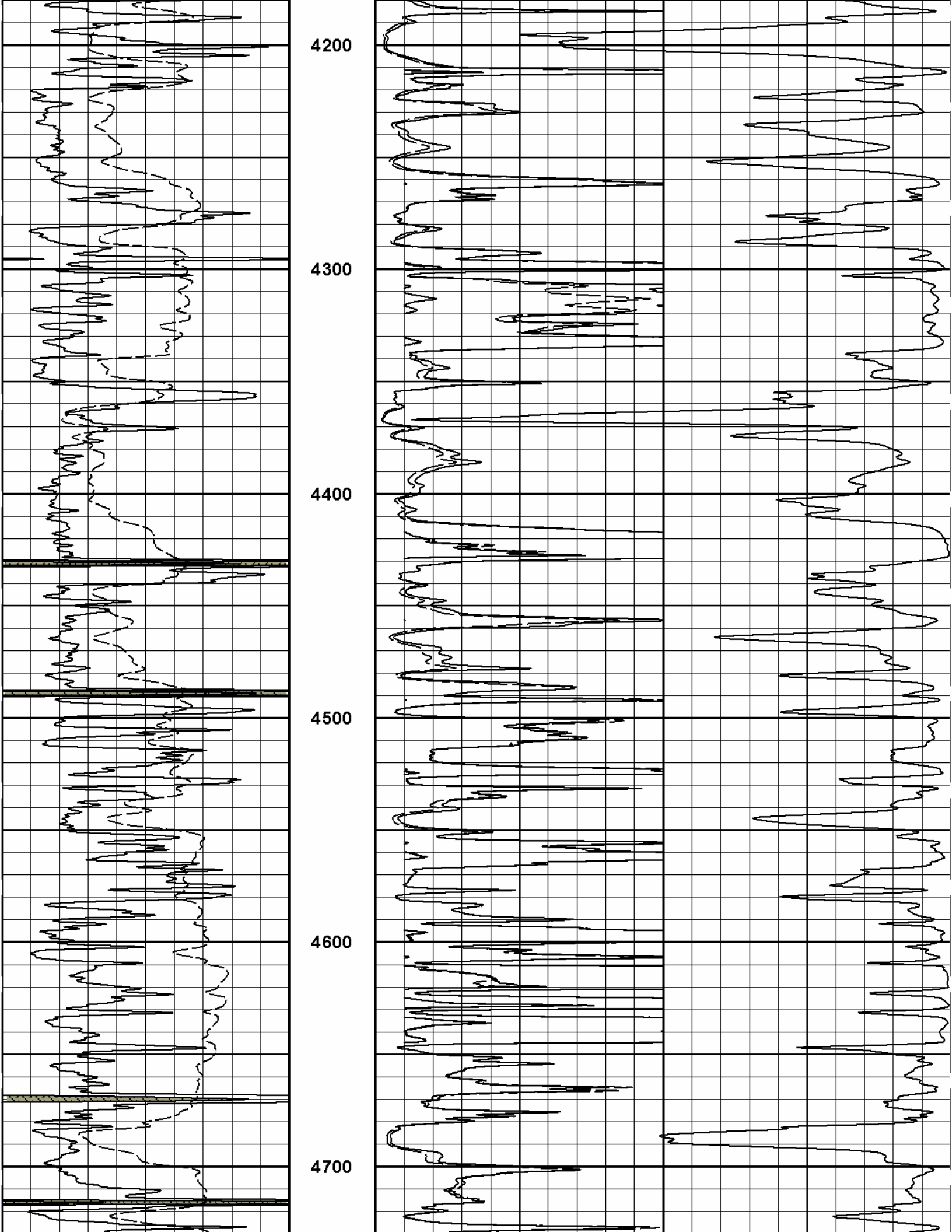
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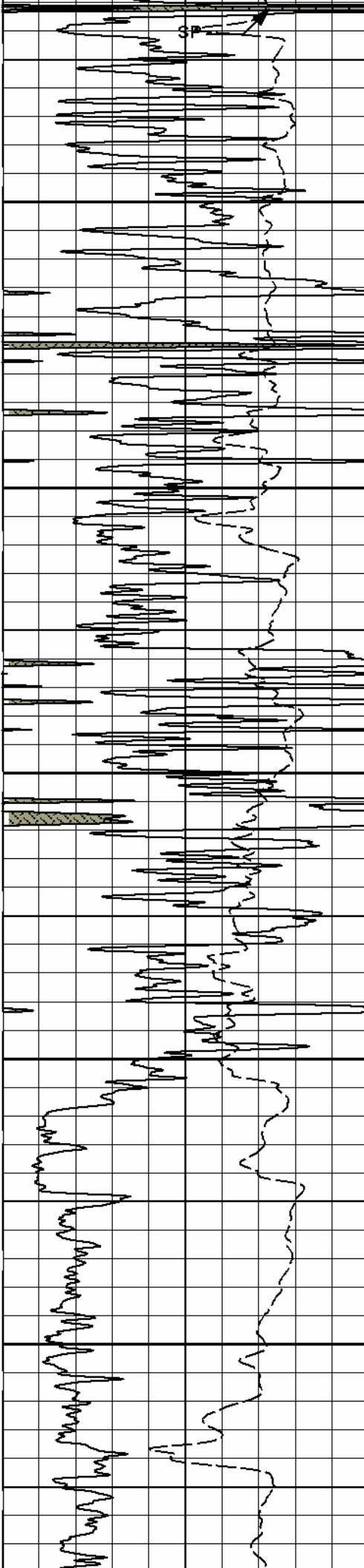
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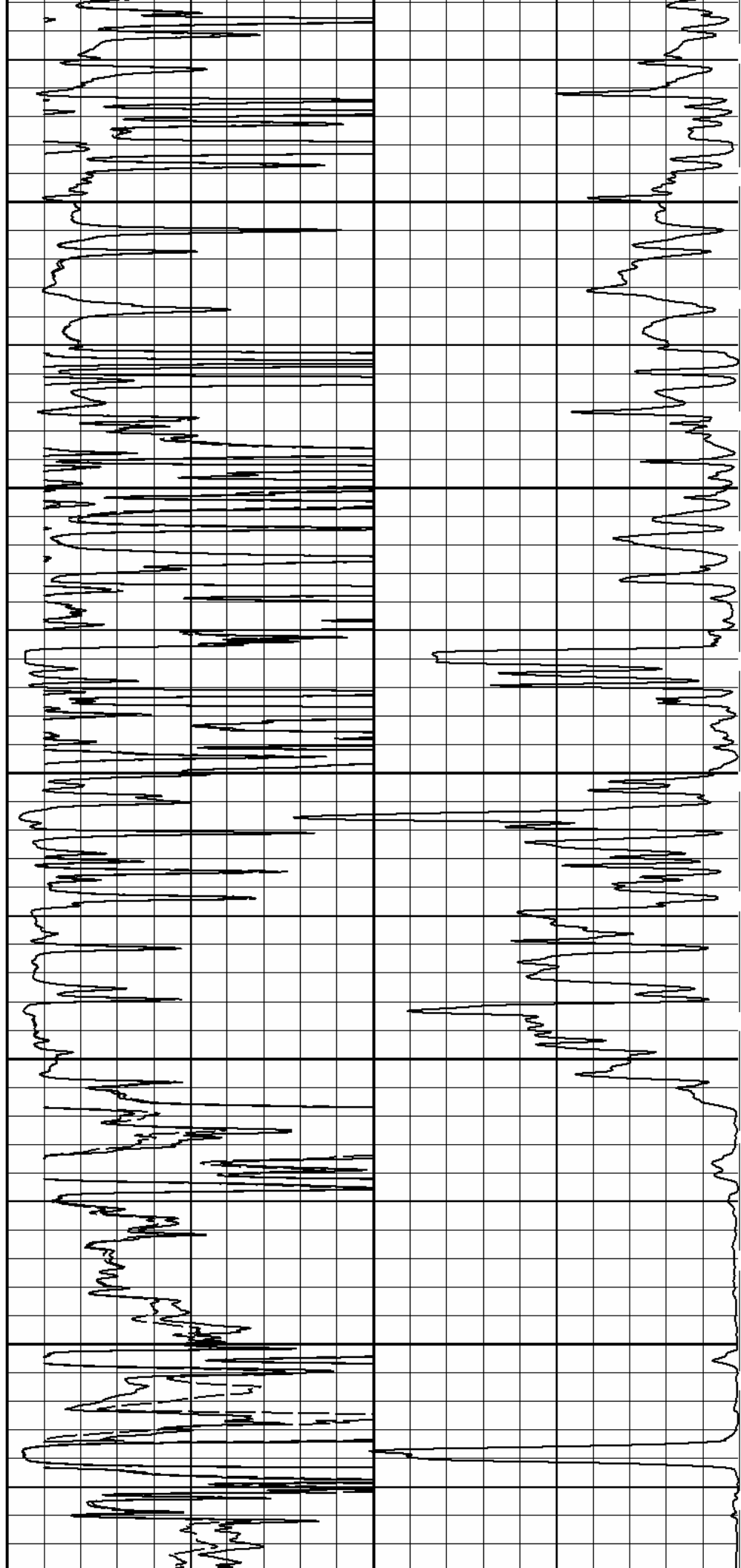
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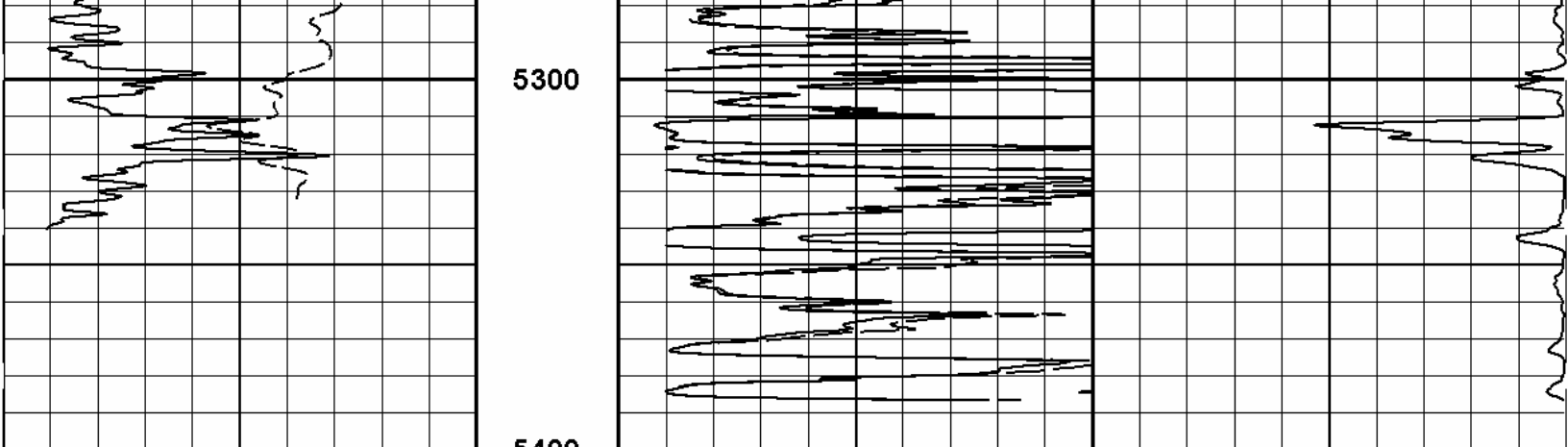
4900

5000

5100

5200





0	Gamma API	150	MD 1 : 600 ft	0	20in Resistivity 2ft Res	50	
api				ohm-metre			
SP			0	90in Resistivity 2ft Res	50		
-]20[+			ohm-metre				
				1000		90in Conductivity 2ft Res	0
				mmho per metre			

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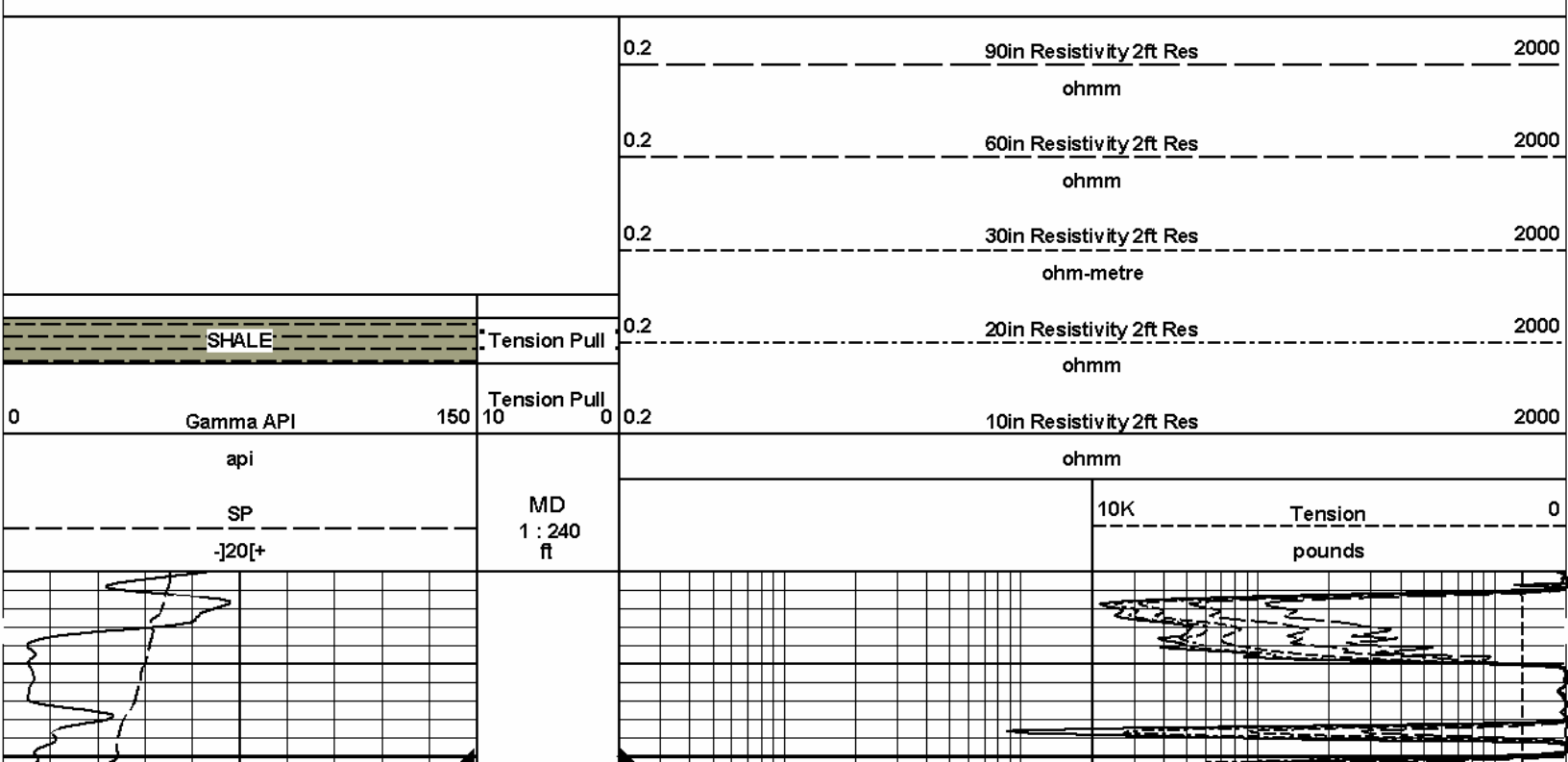
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Data: BERGER_A_3\Well Based\MAIN
Plot File: \\LOCAL-1\BERGER_A_3\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\ACRT\ACRT_2_lib

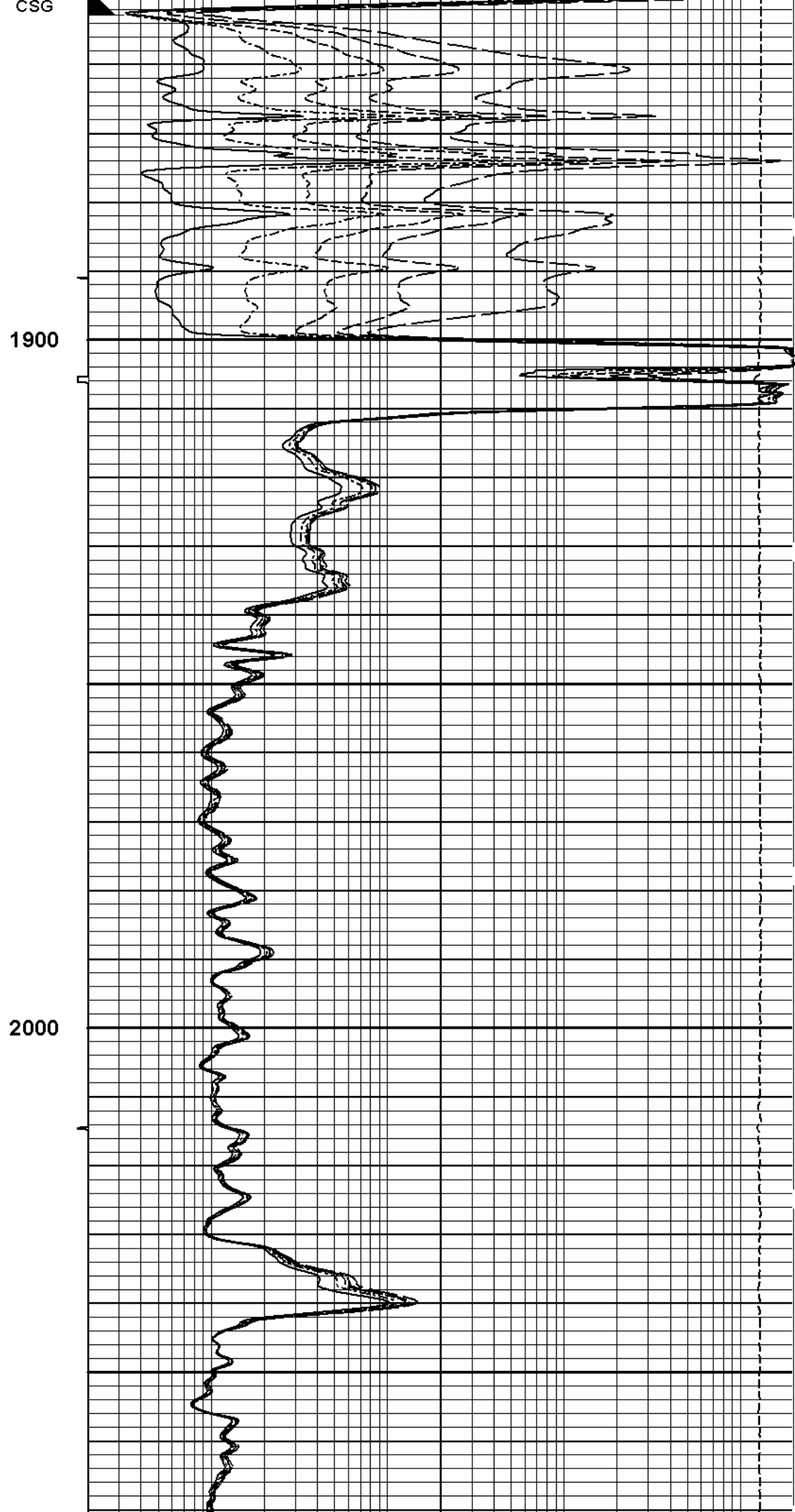
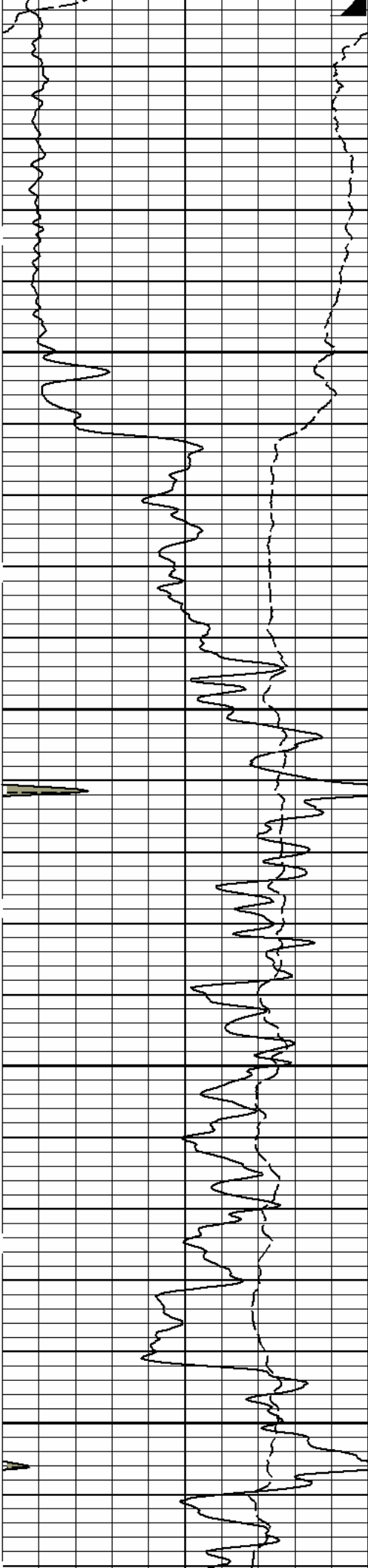
2 INCH MAIN LOG

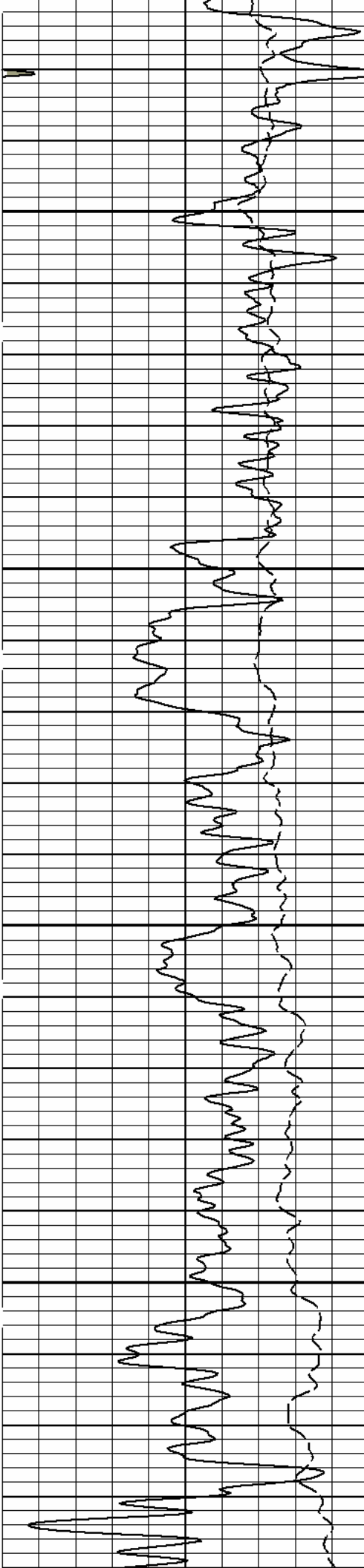
HALLIBURTON

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Data: BERGER_A_3\Well Based\MAIN
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5 INCH MAIN LOG

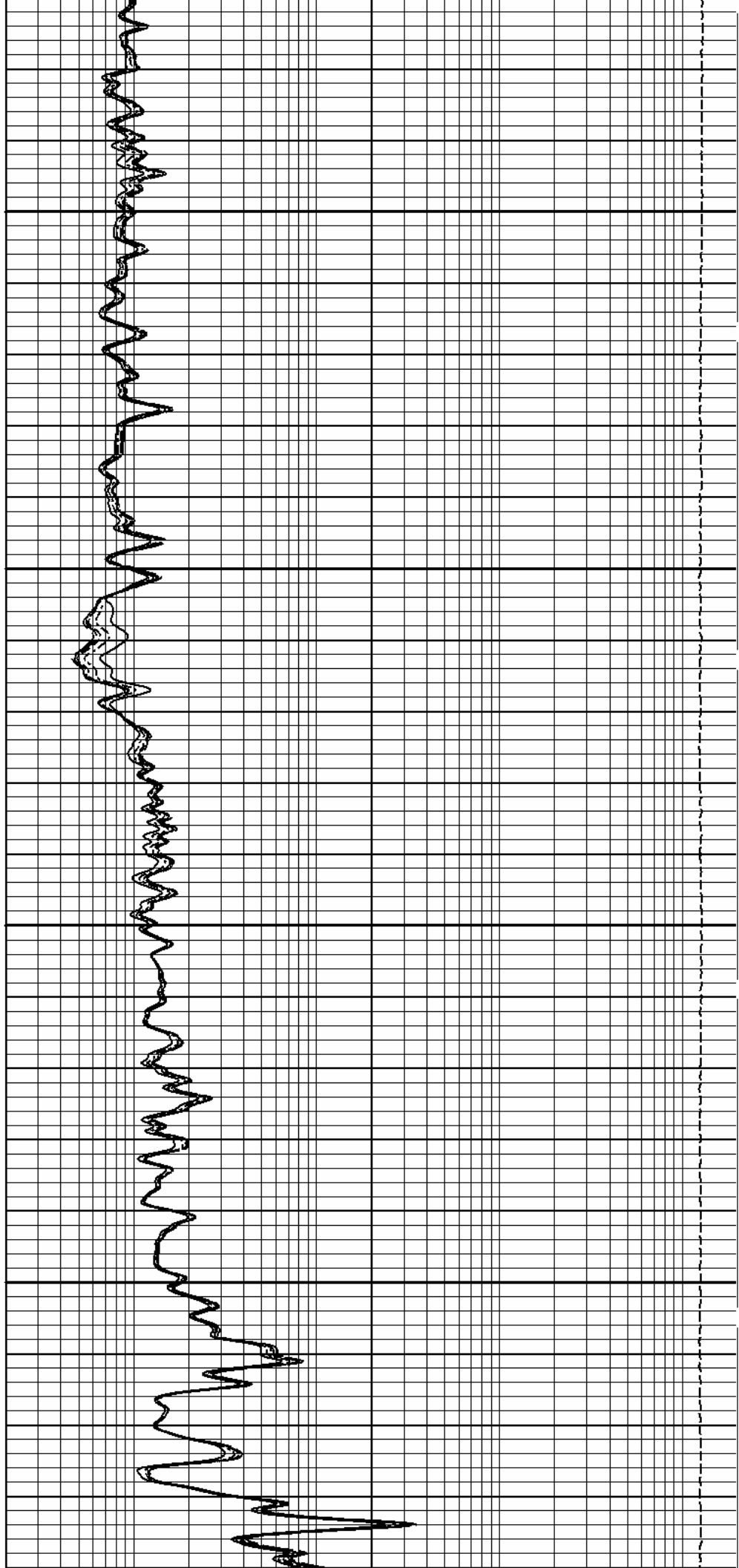


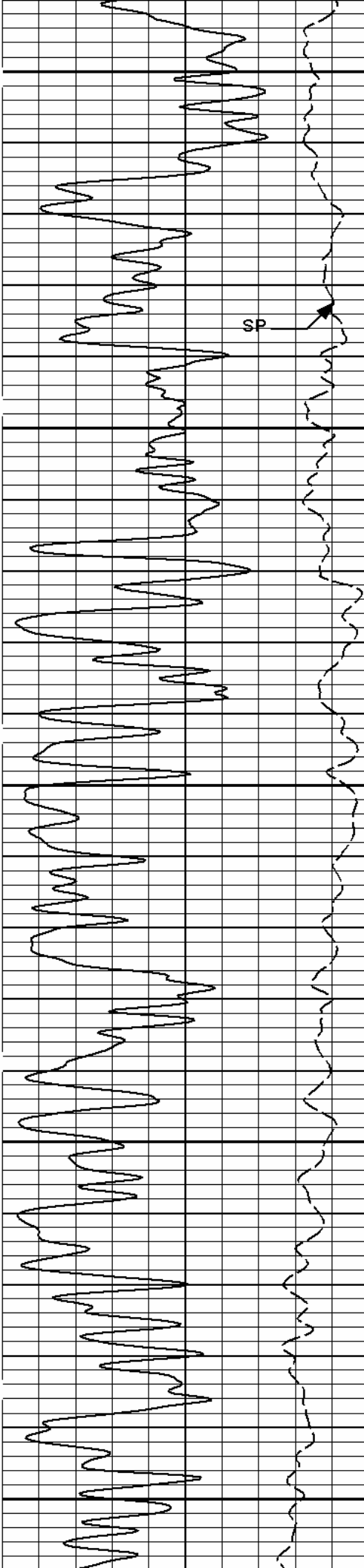




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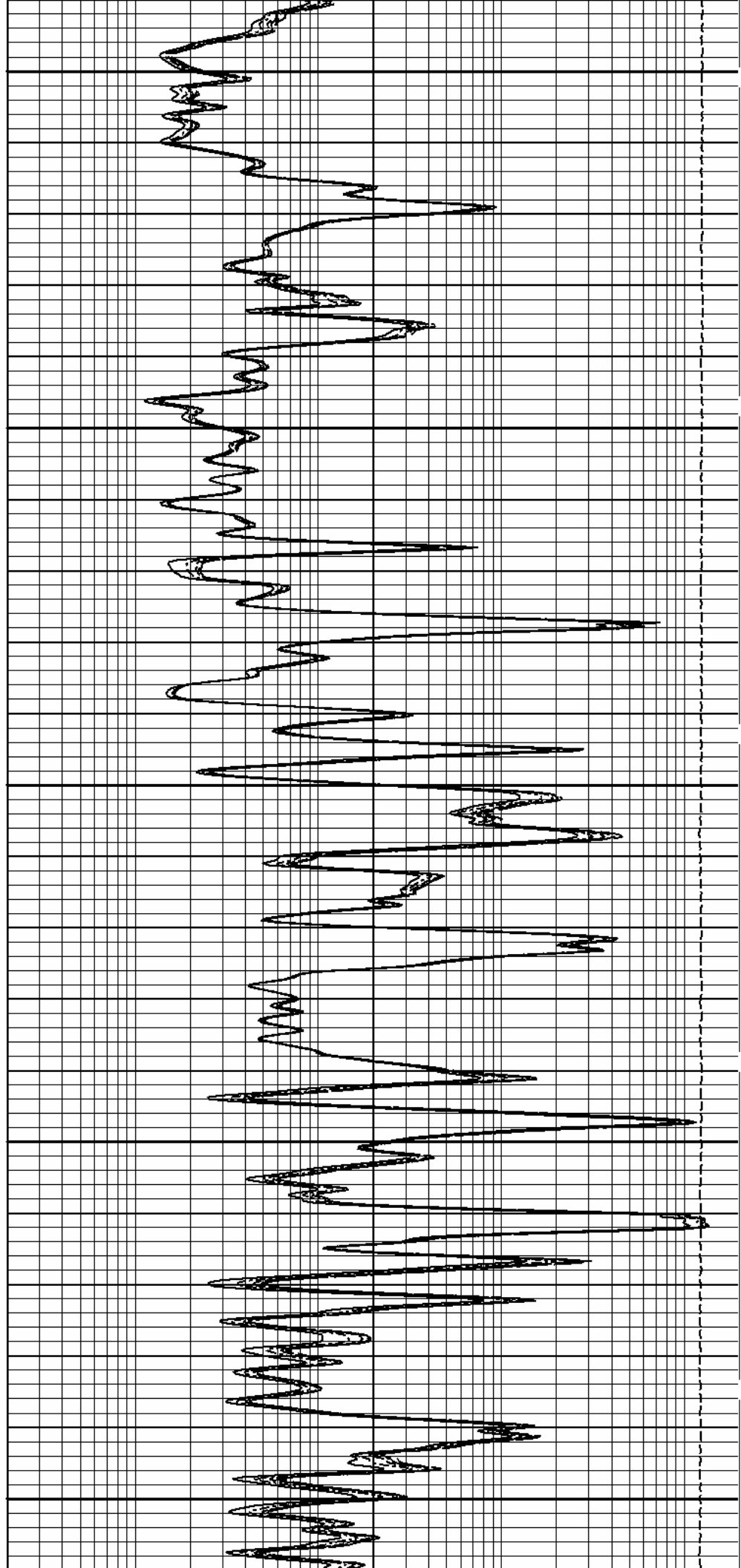


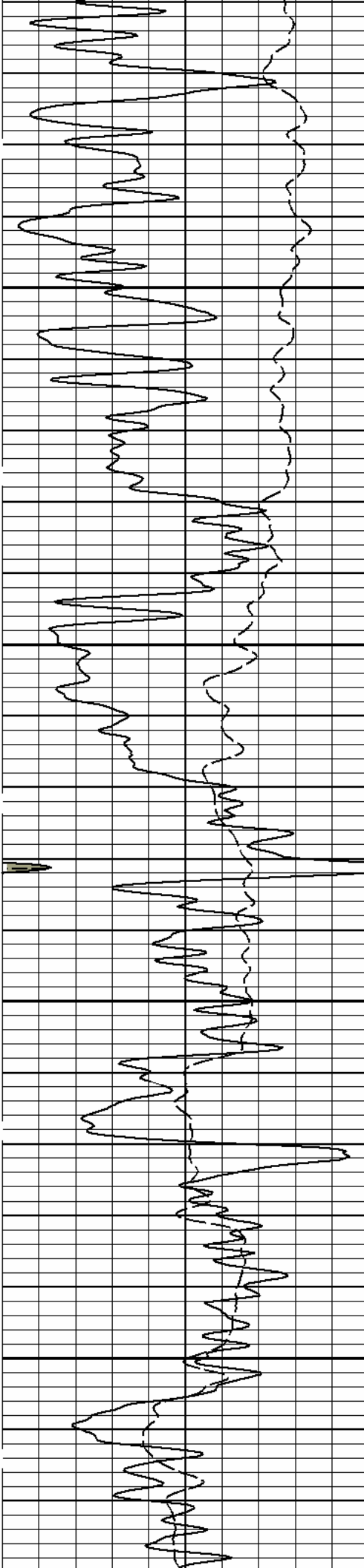
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SP

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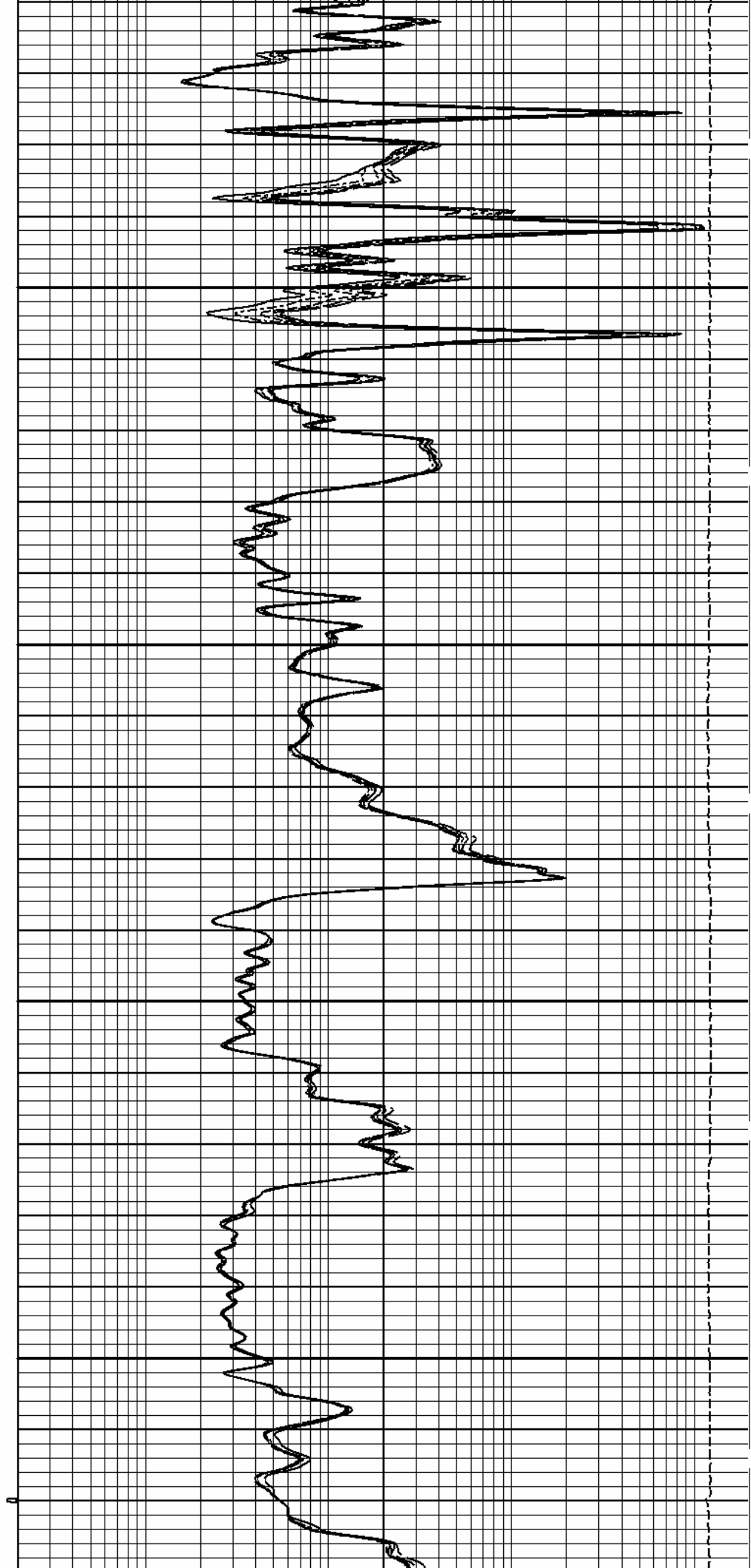
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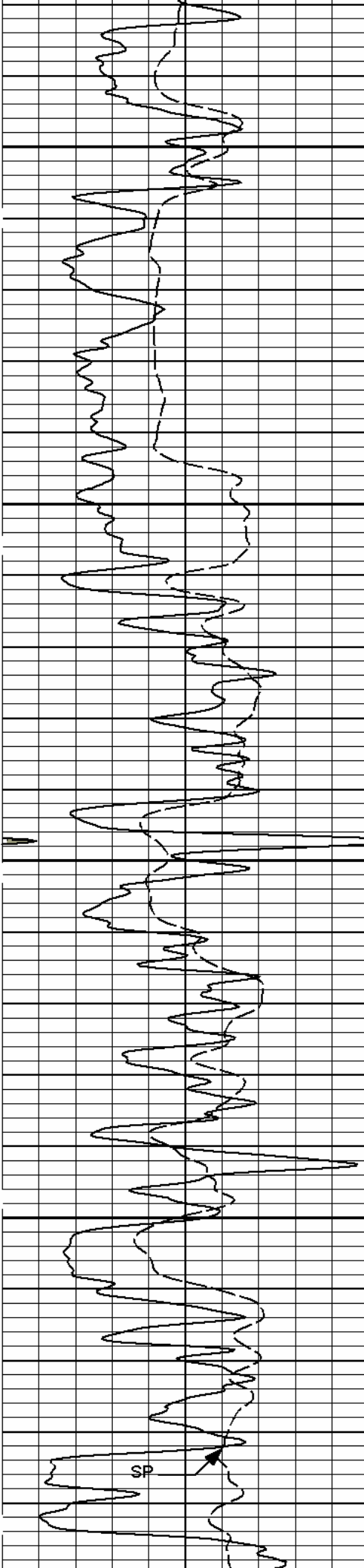




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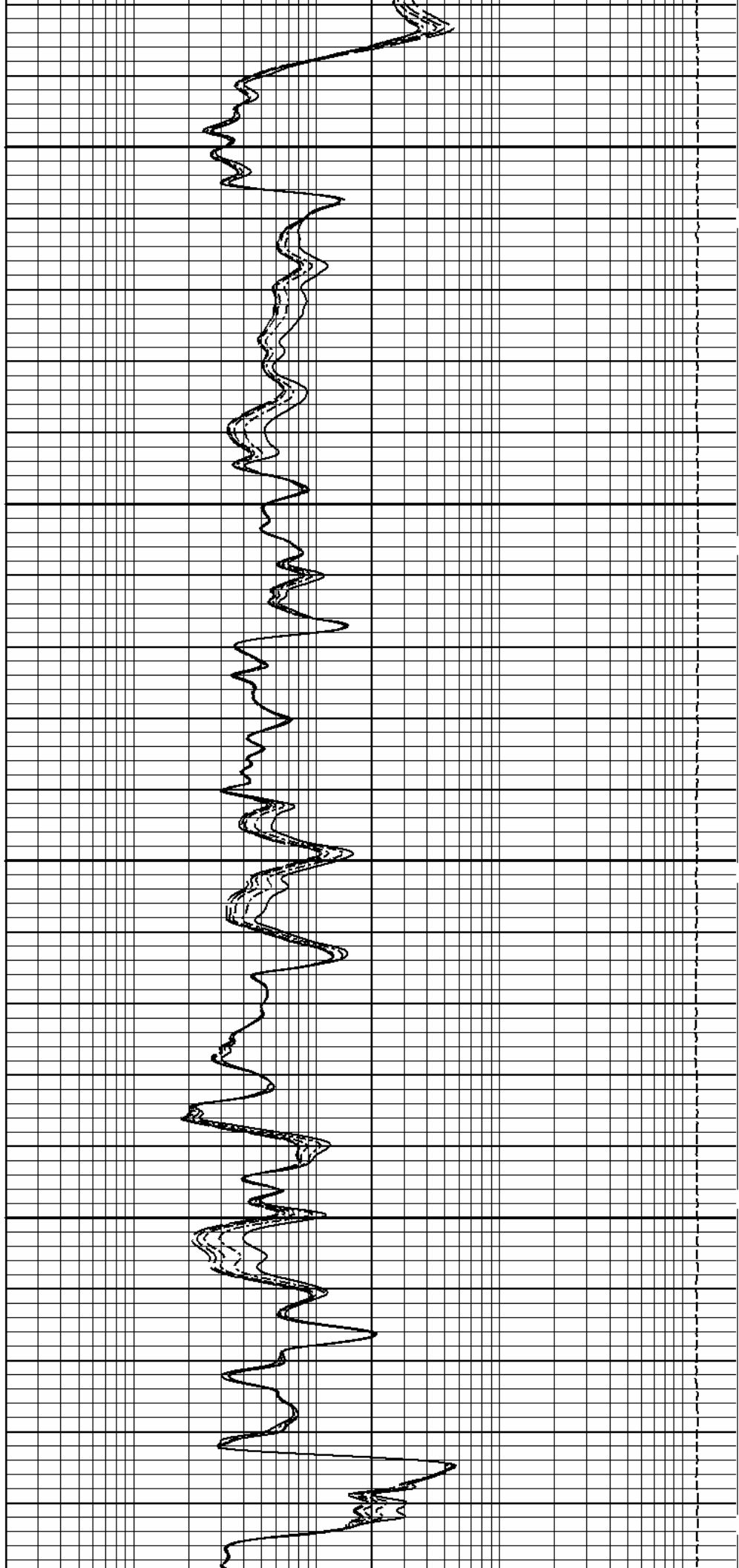
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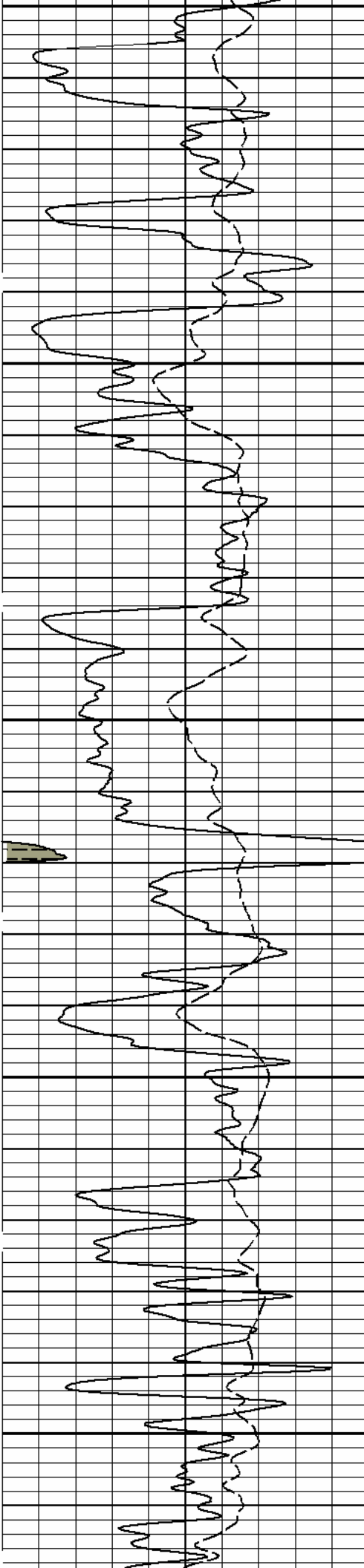




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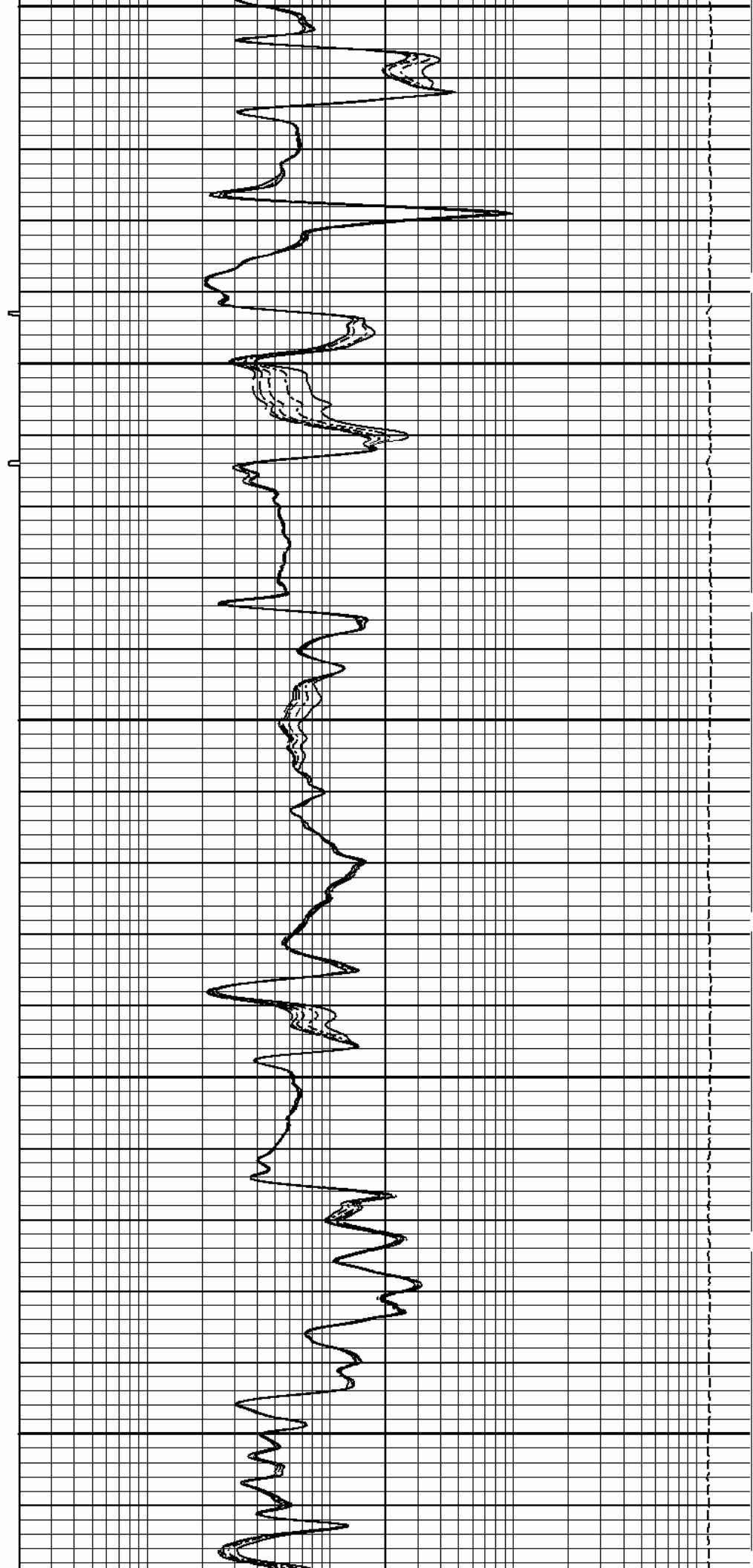
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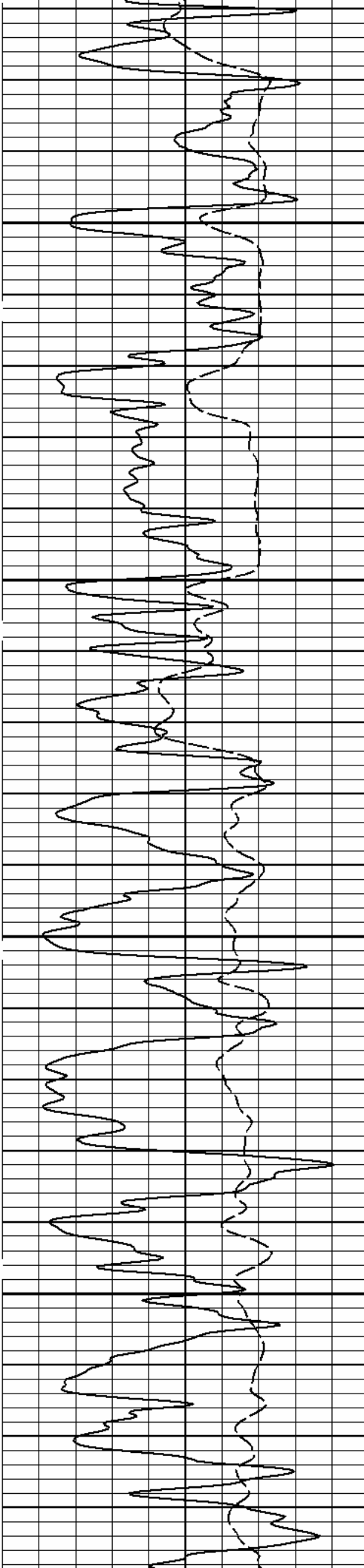




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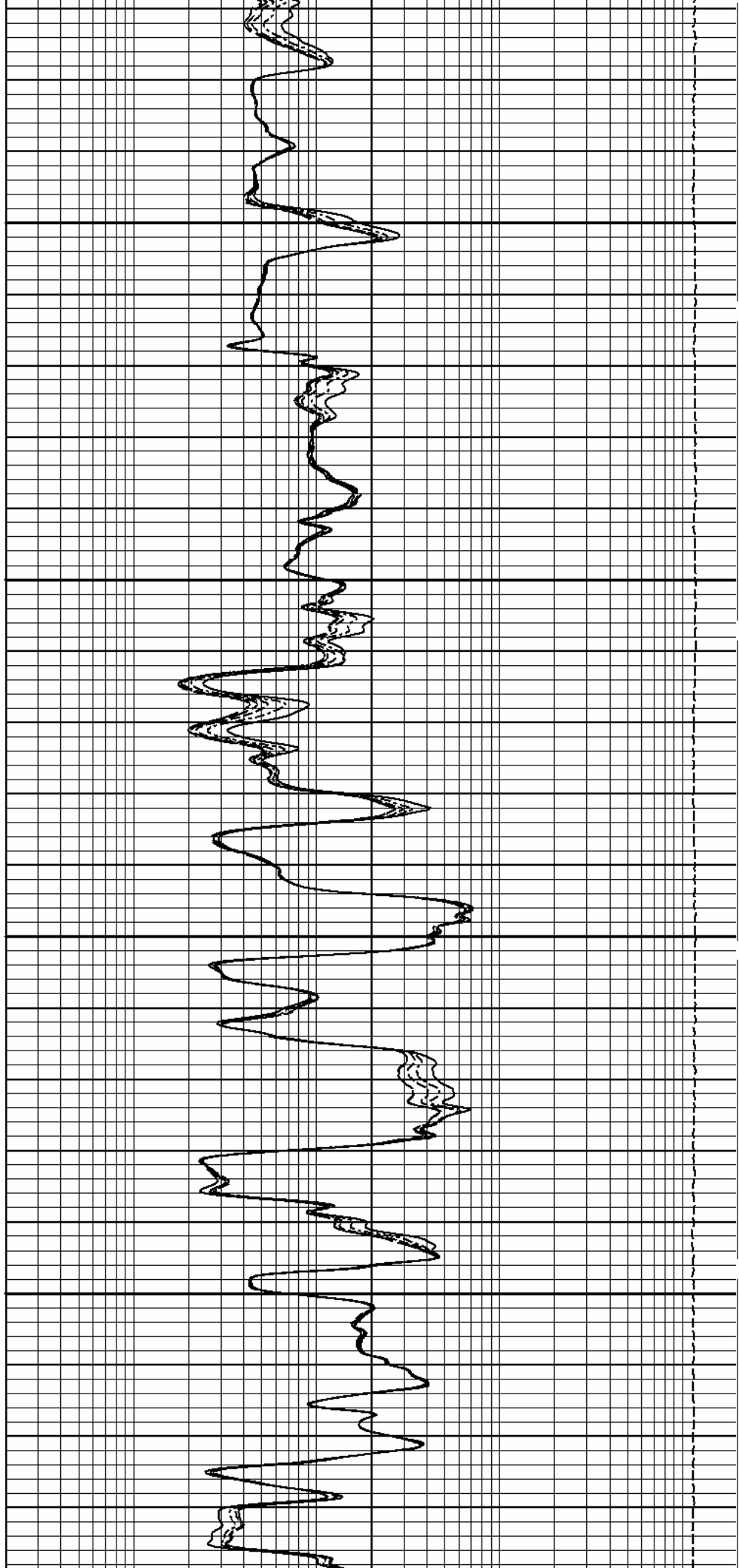
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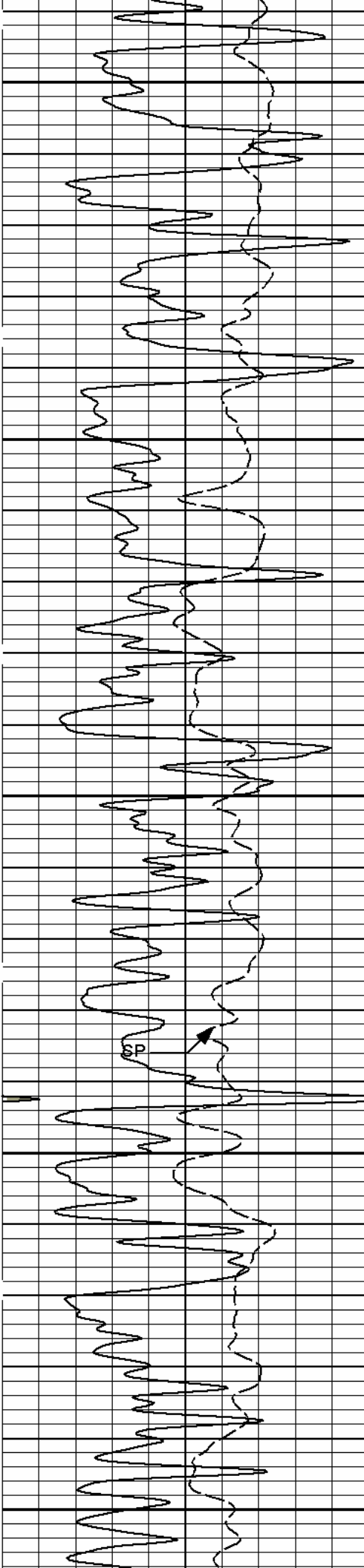




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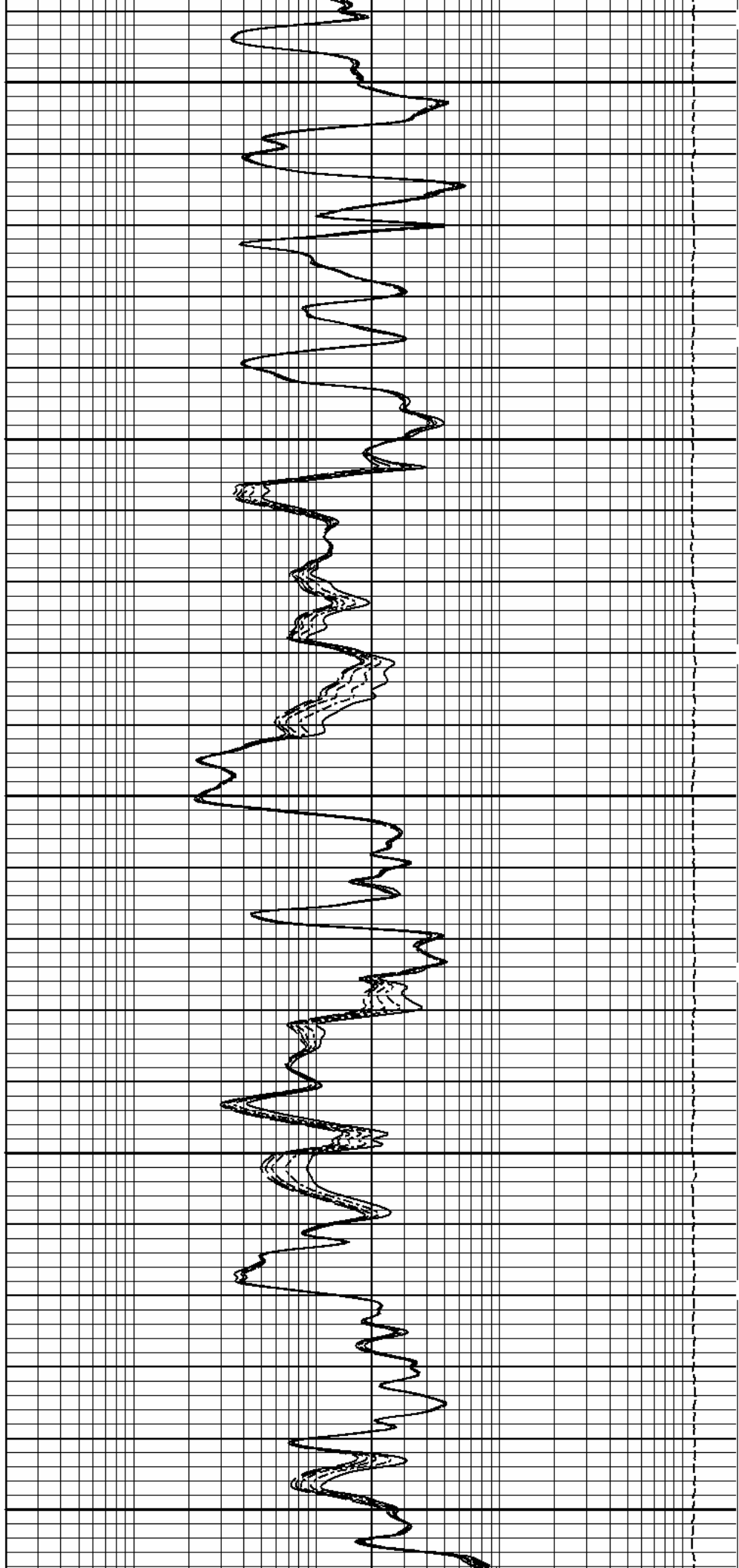


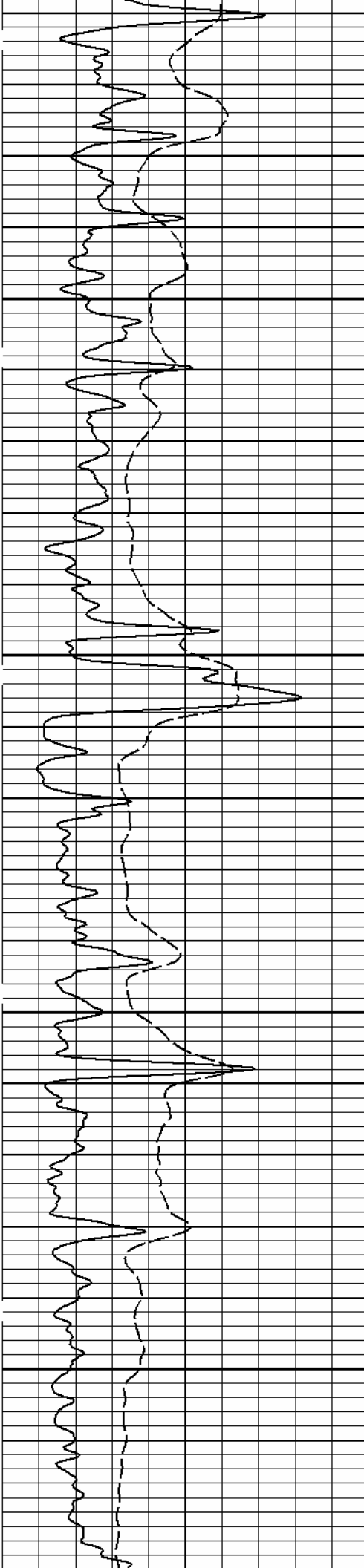


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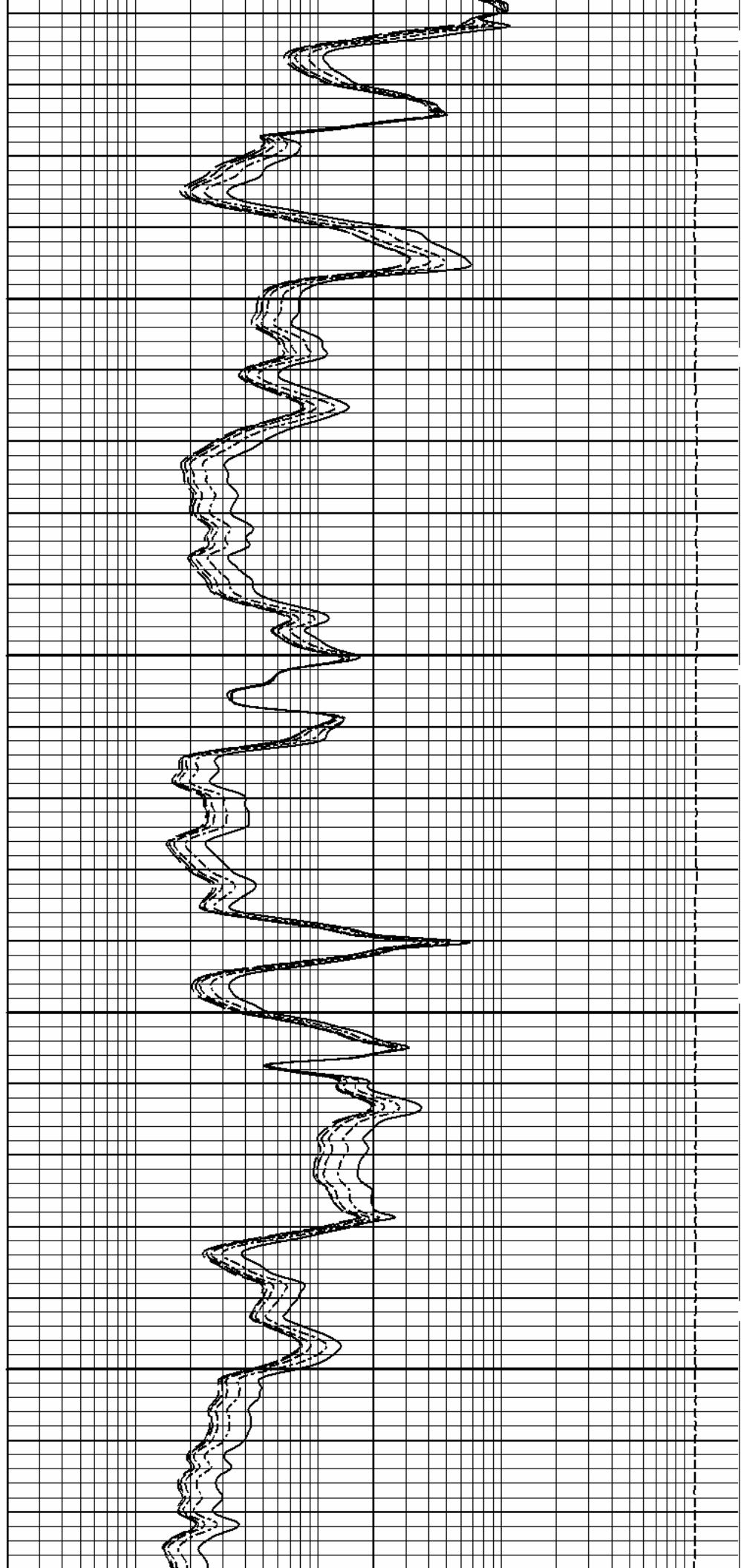
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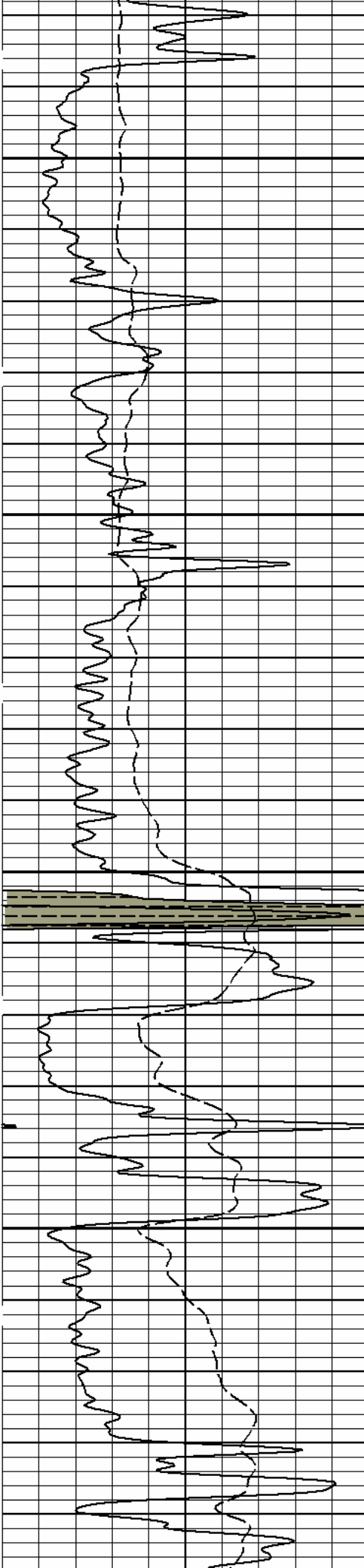




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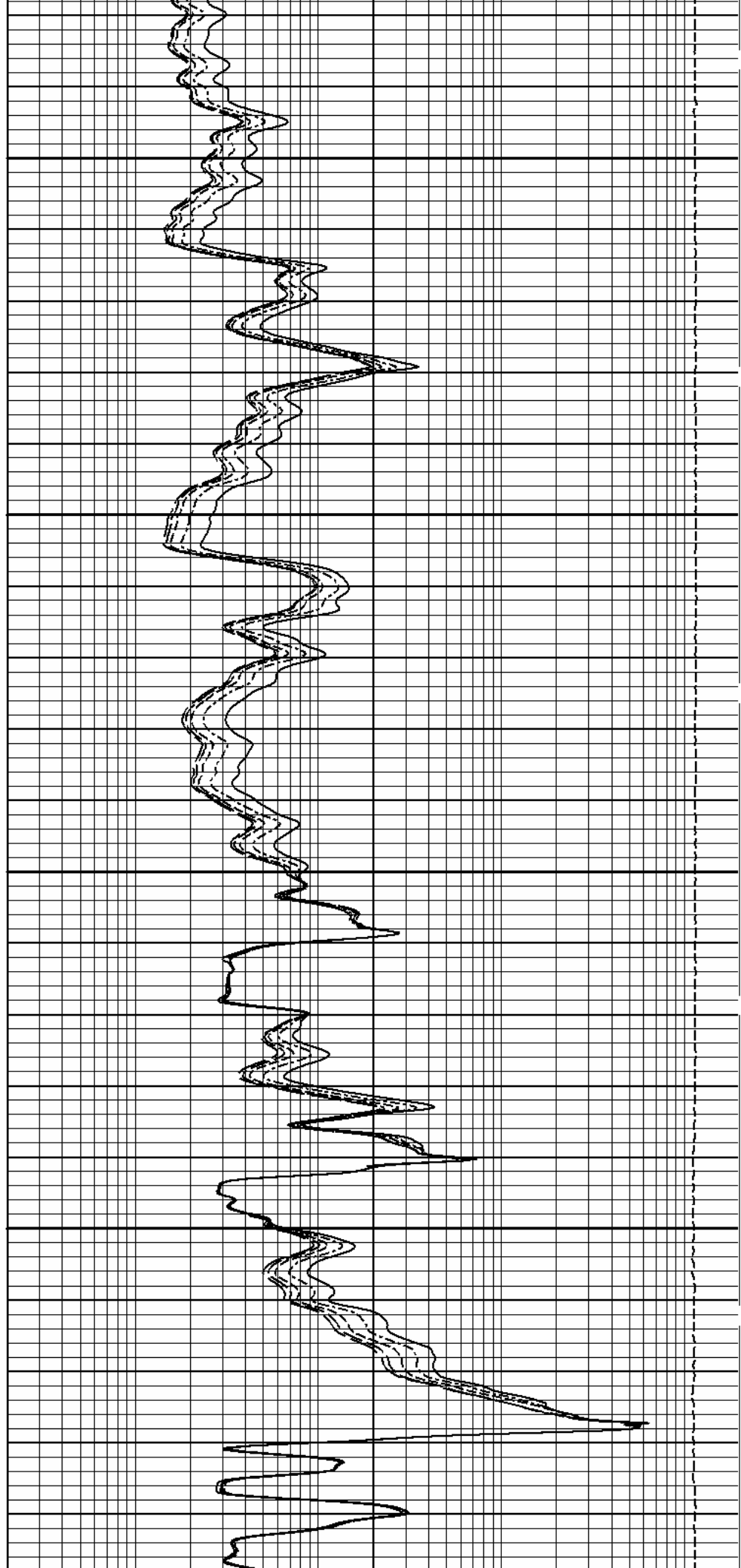
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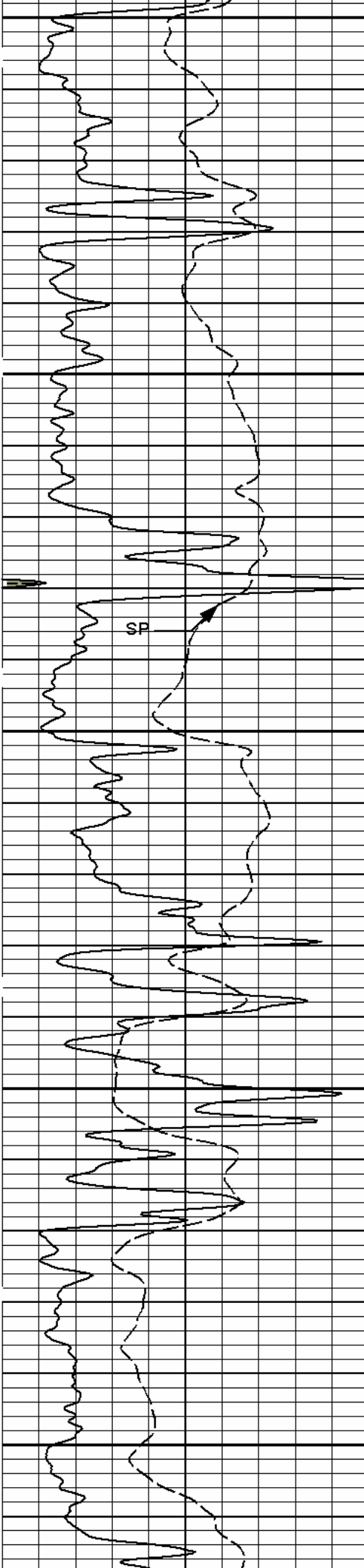




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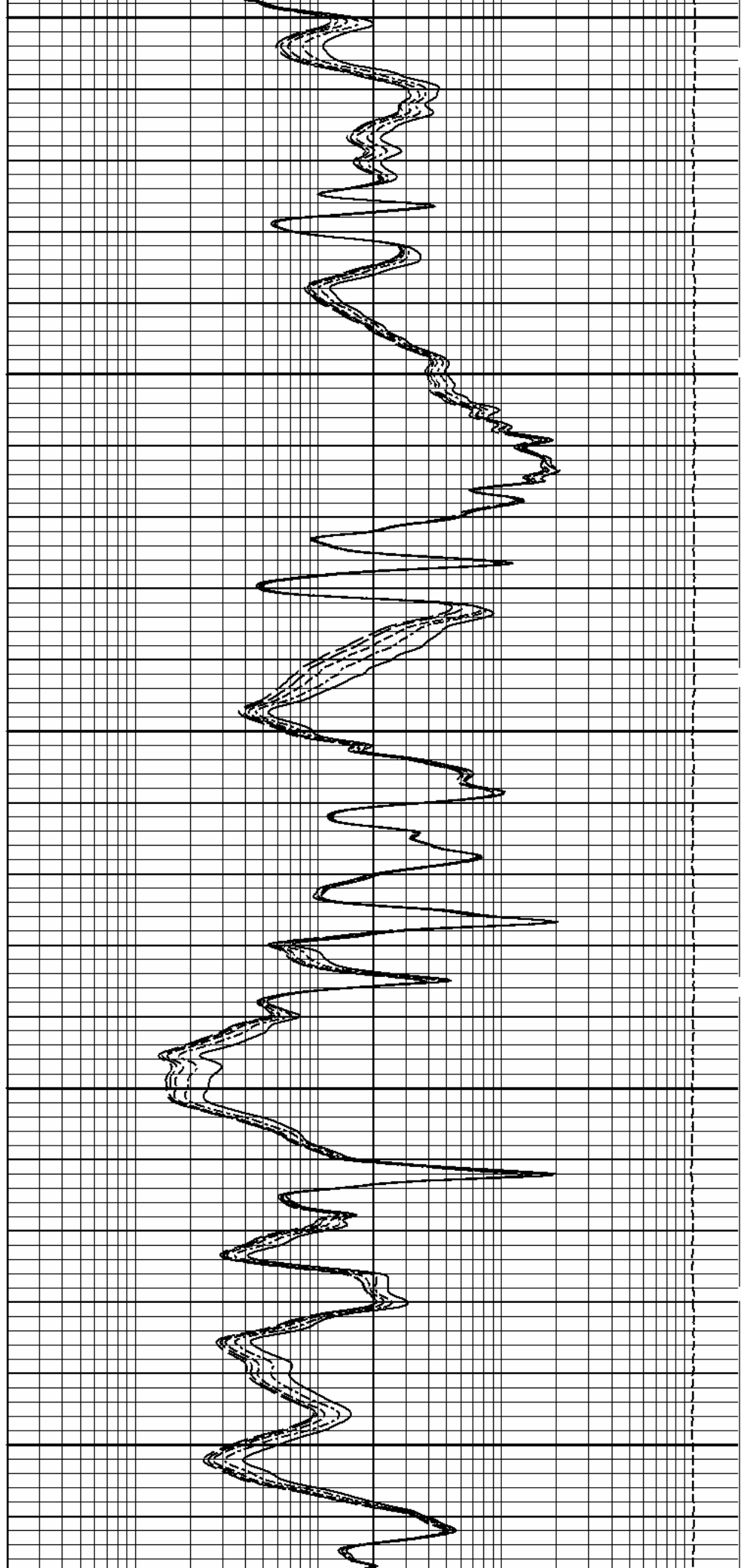
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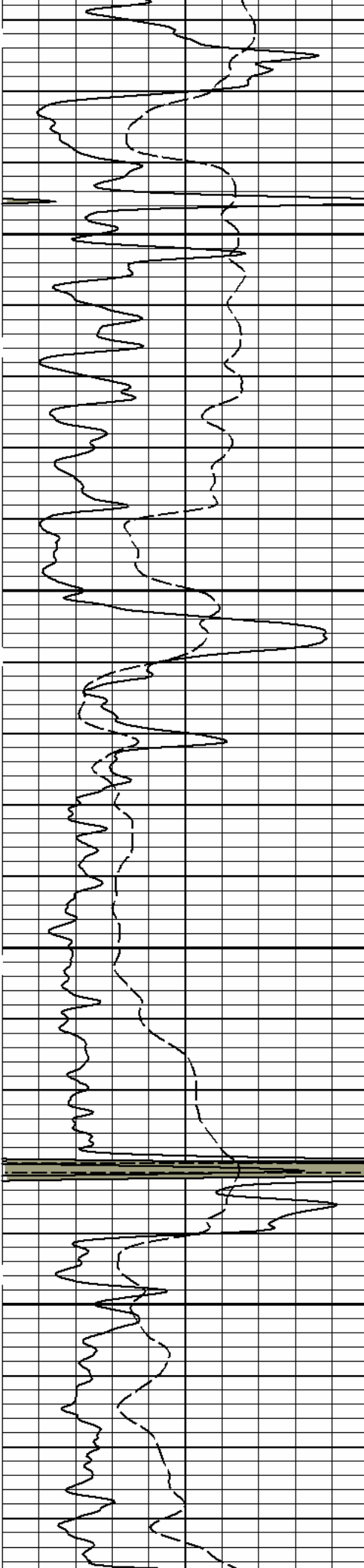




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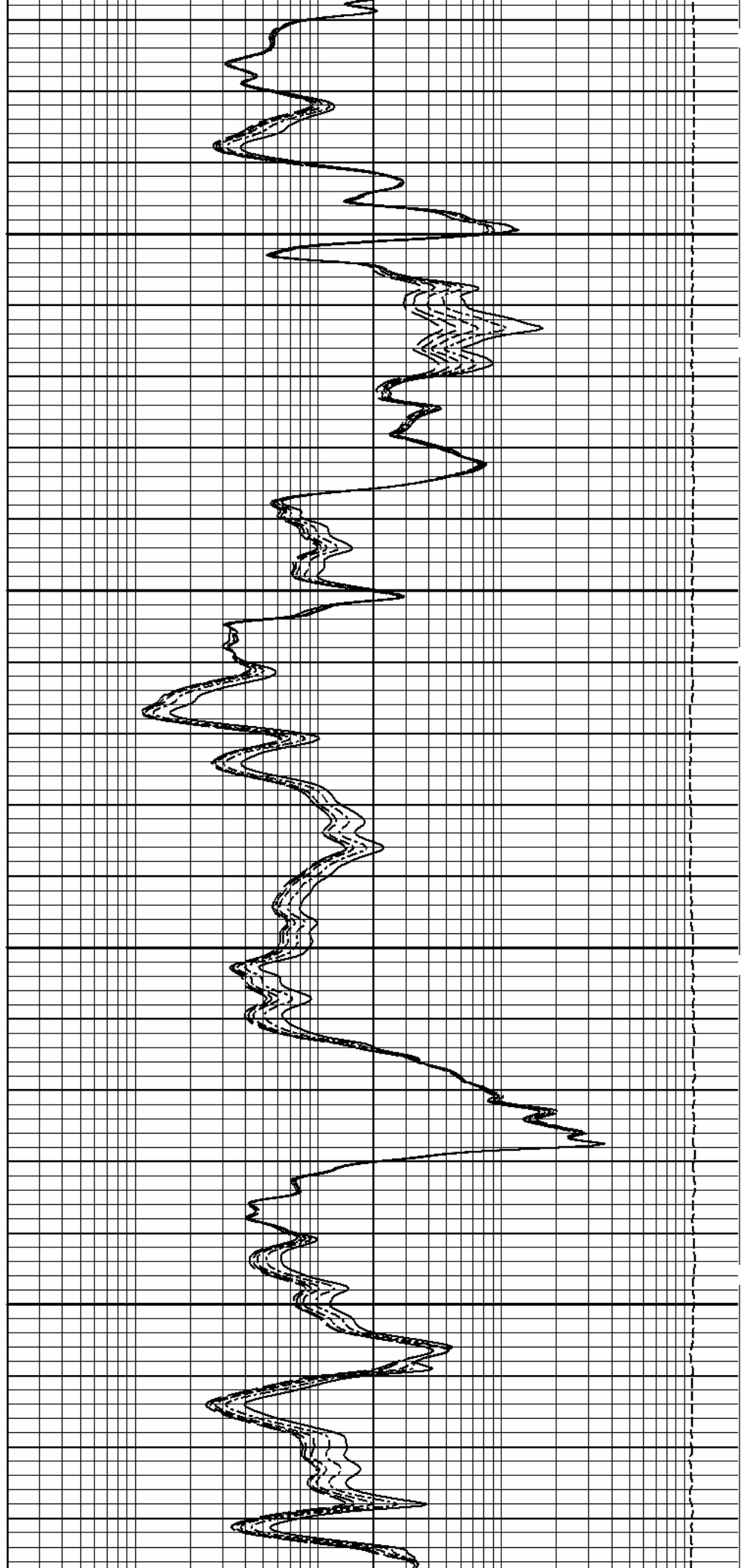
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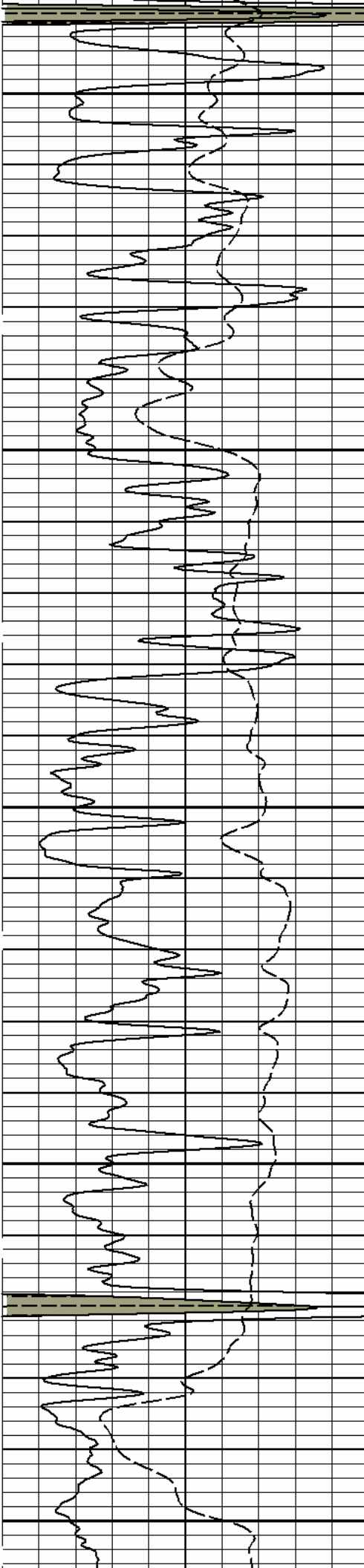




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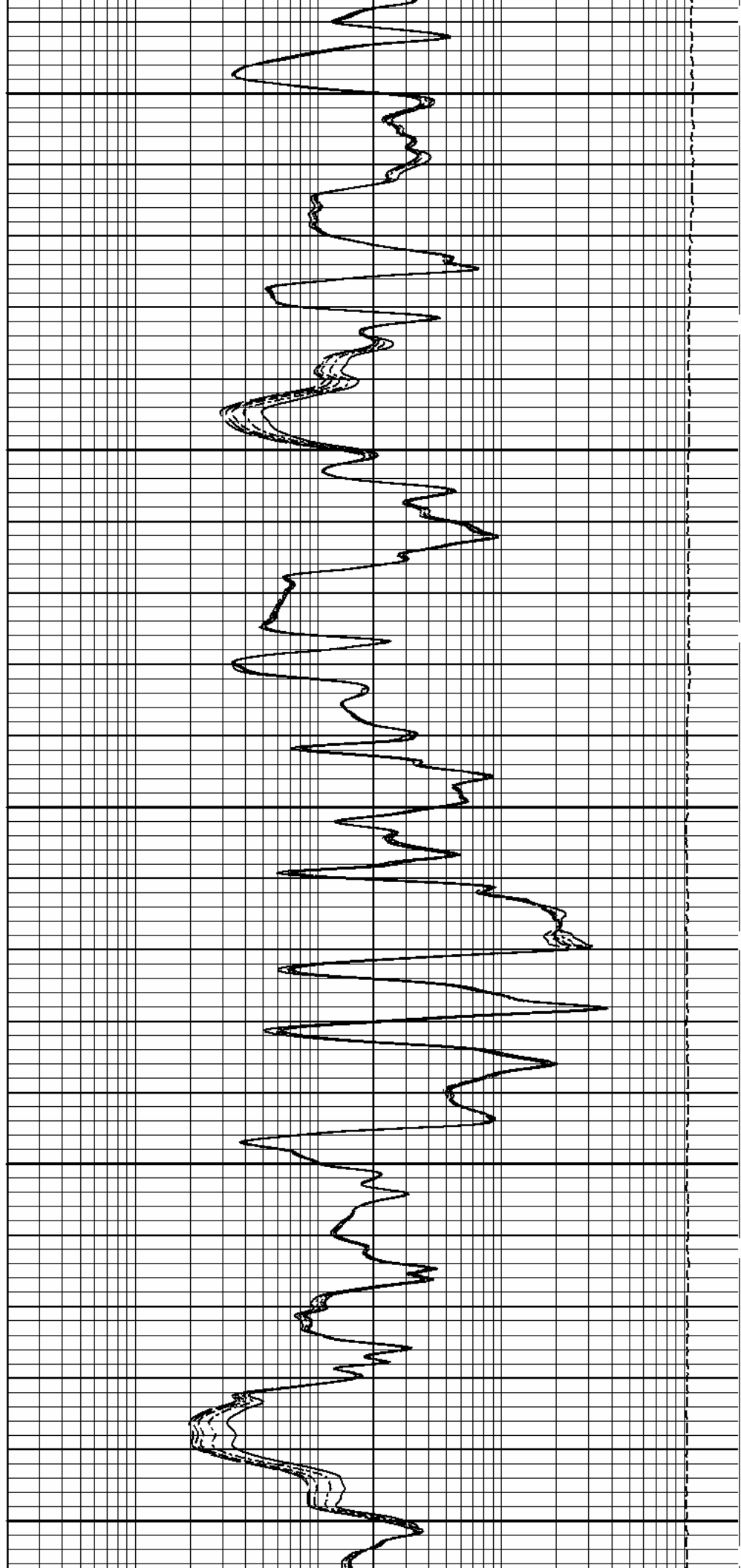


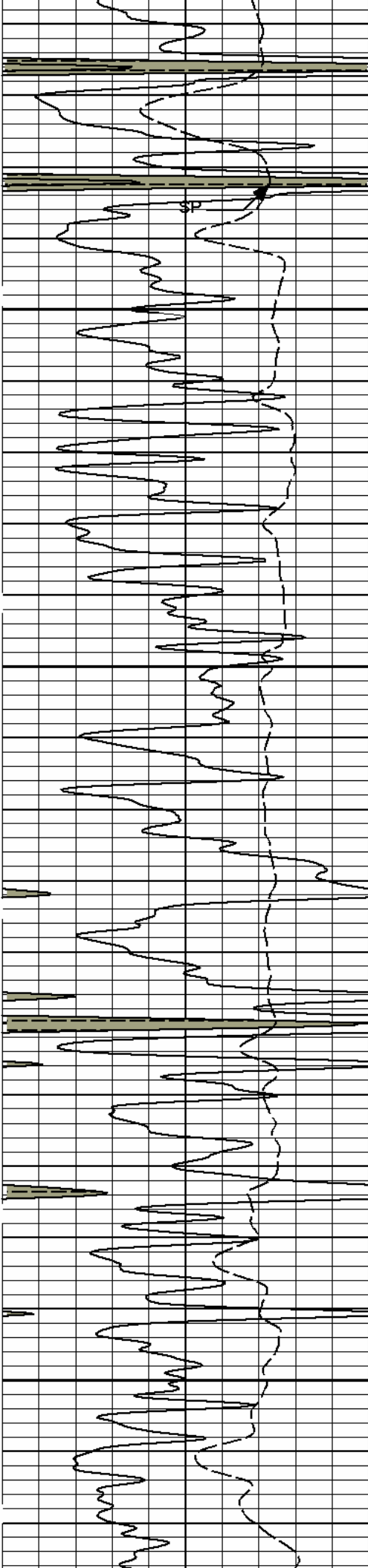


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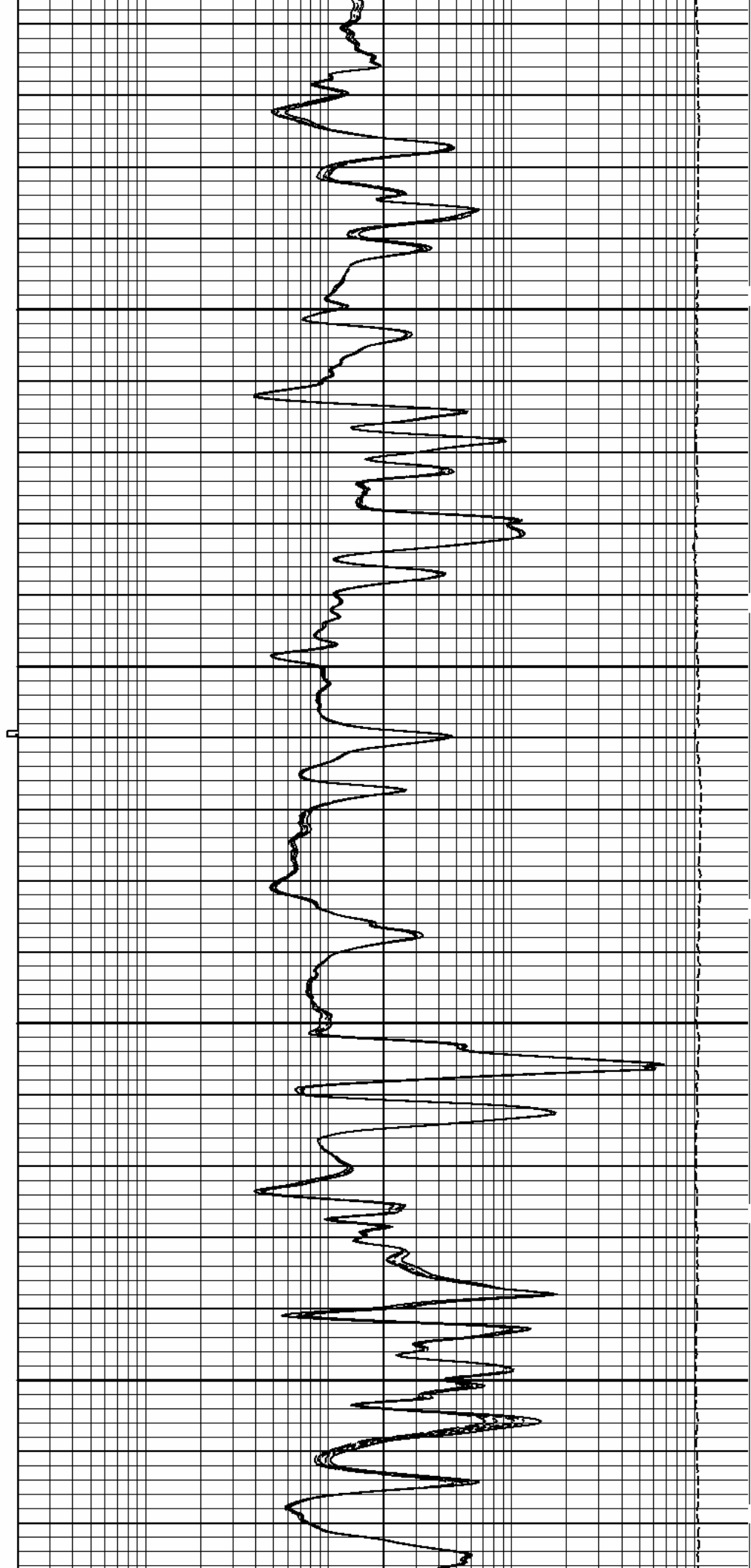
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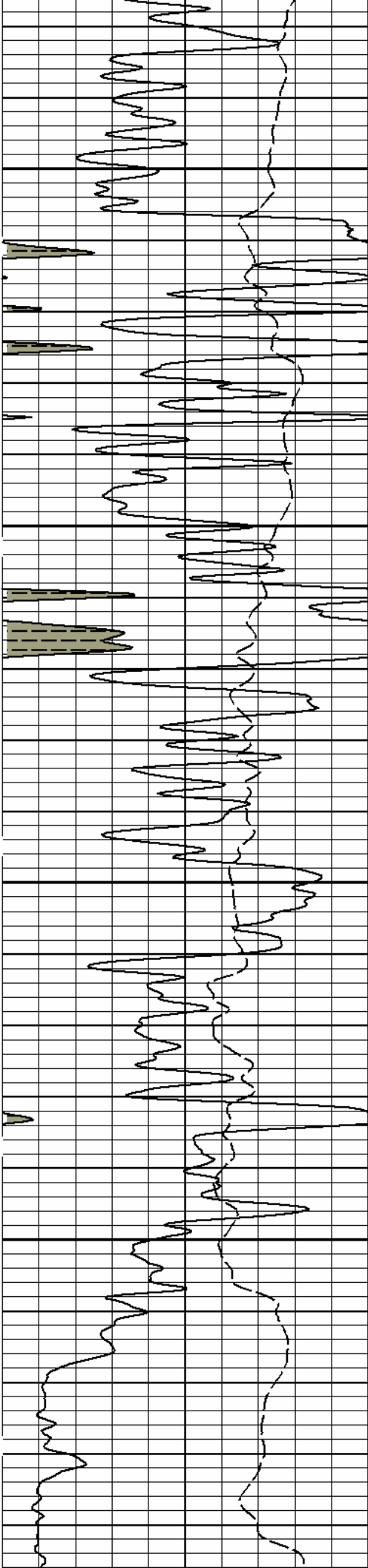




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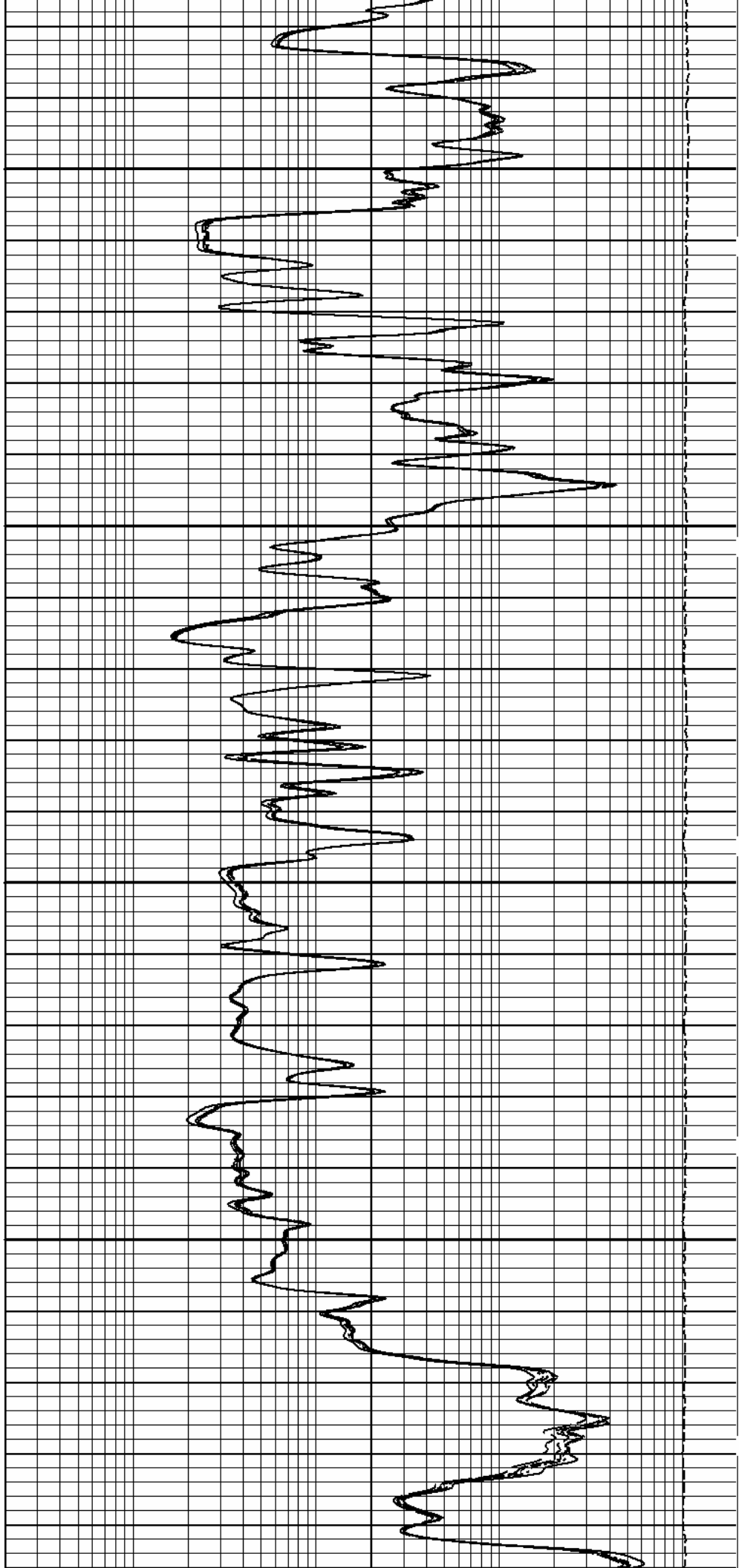
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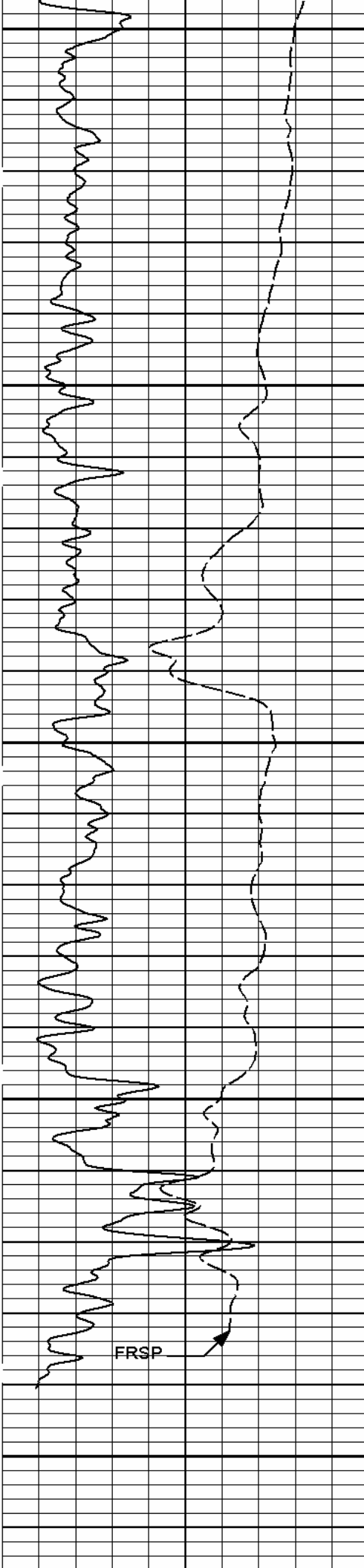




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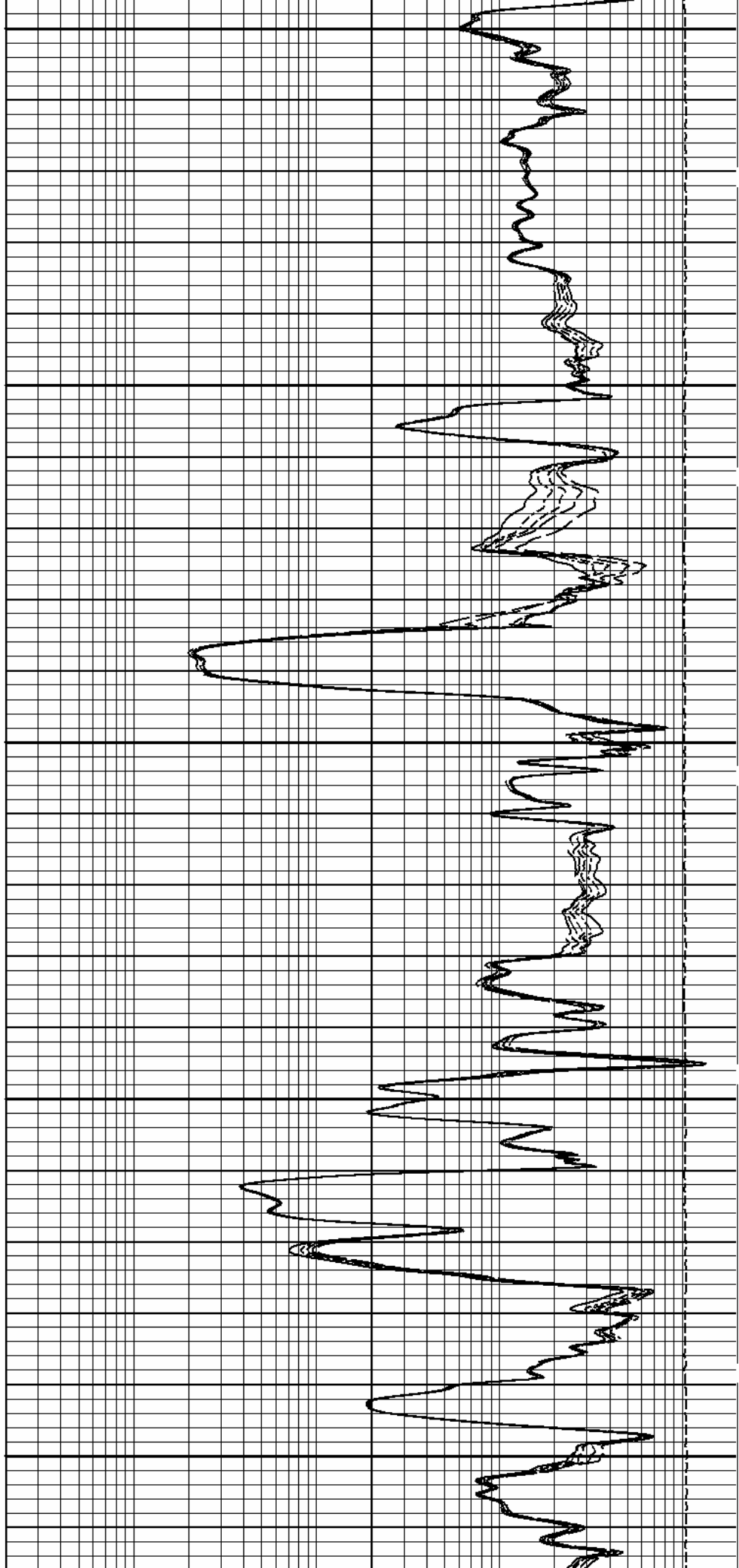
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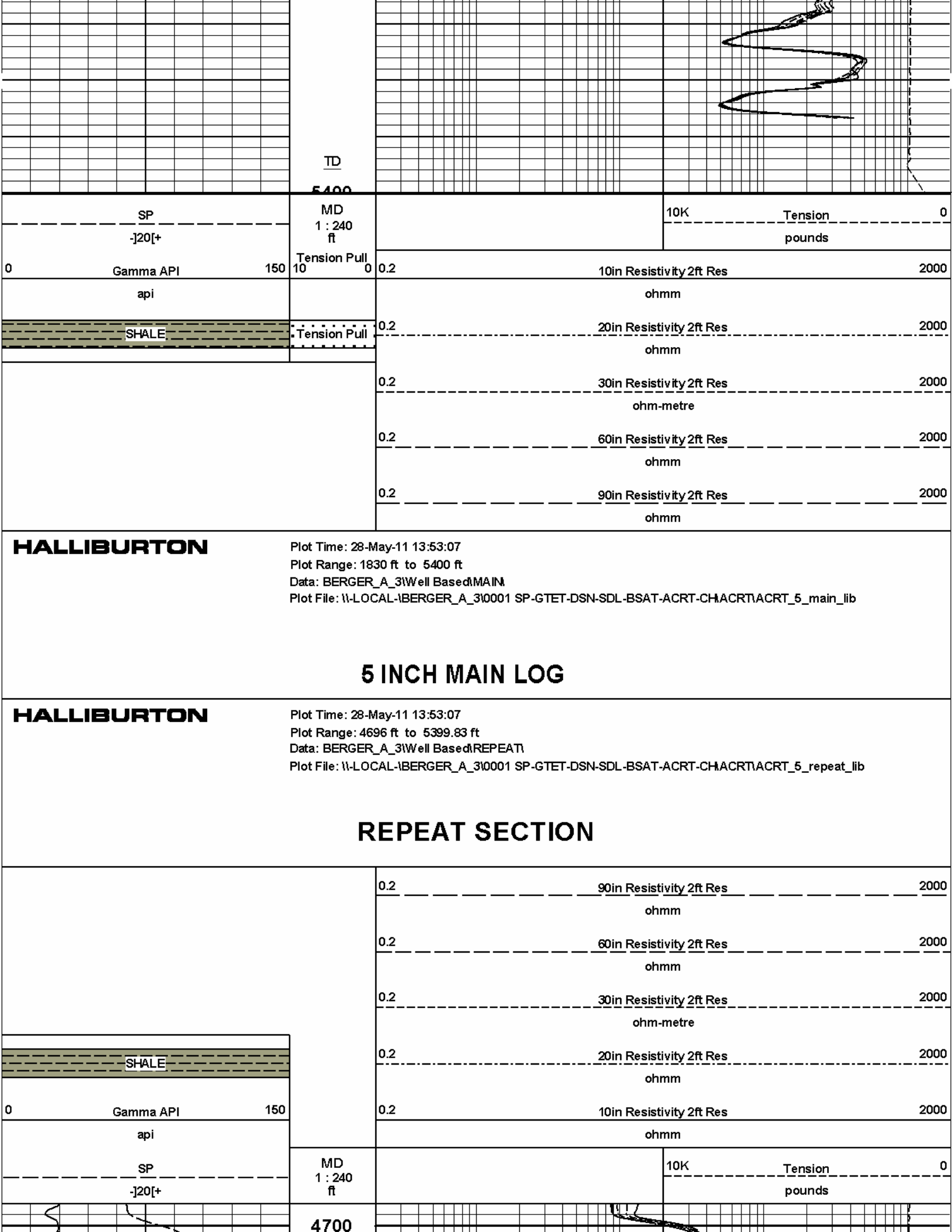


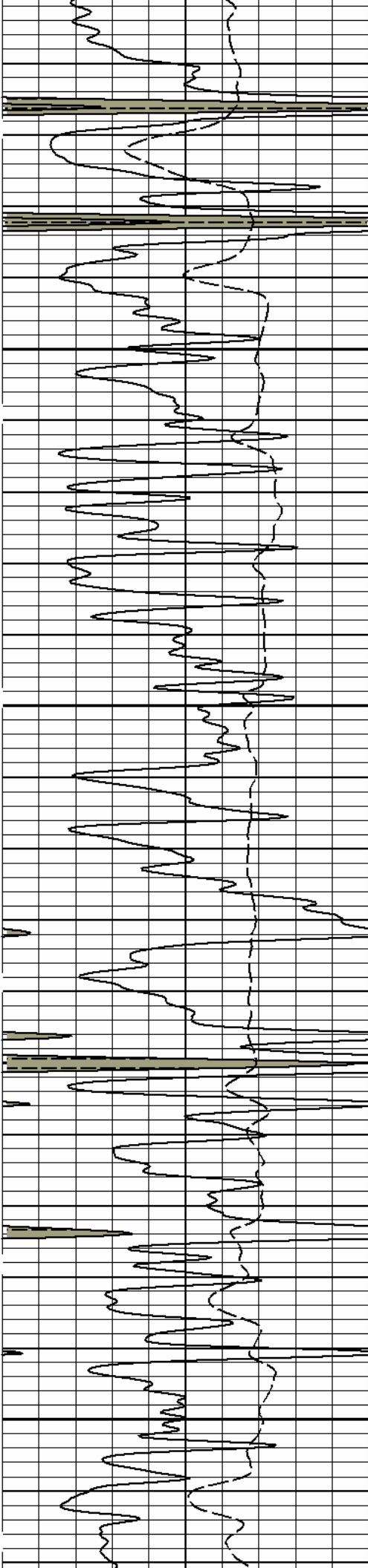


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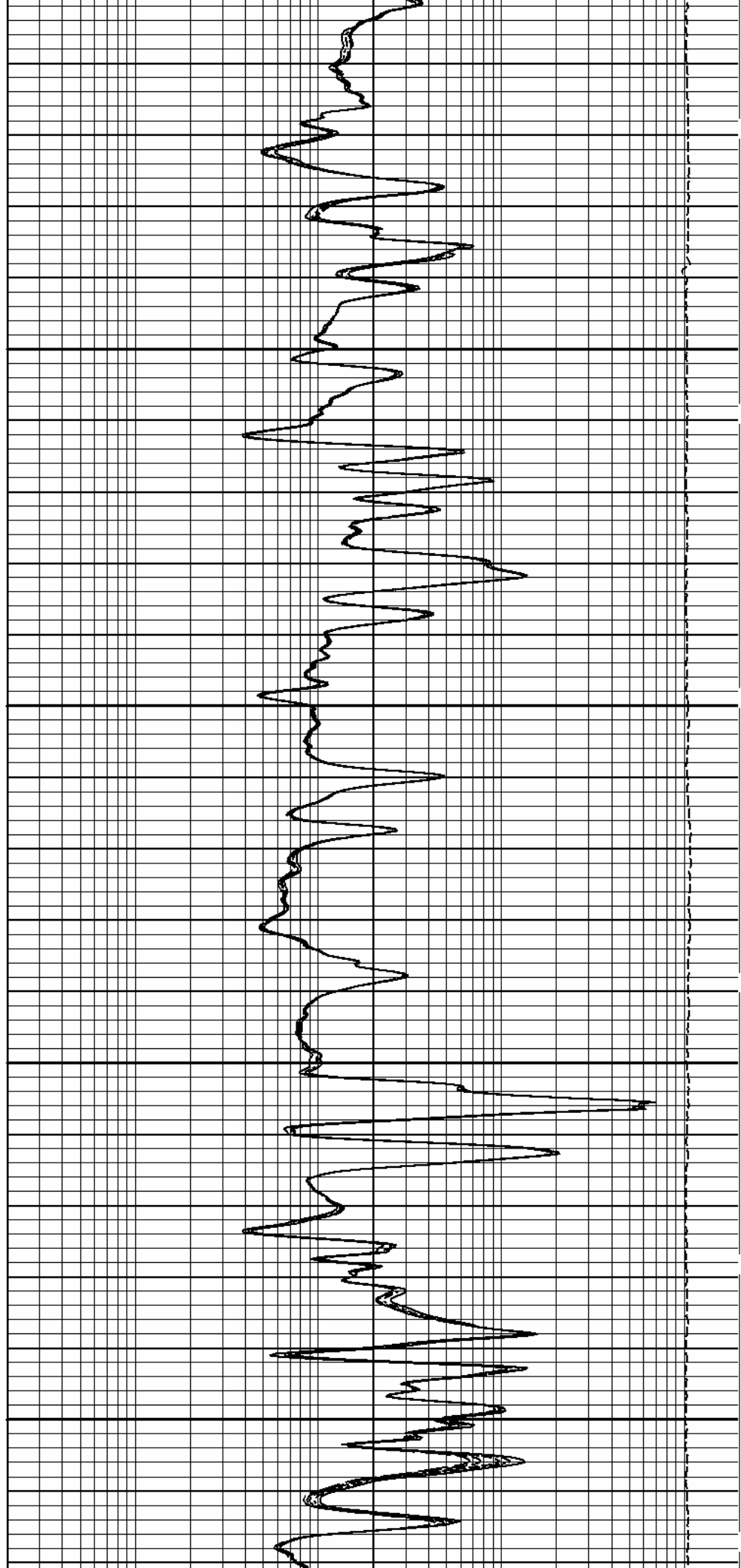


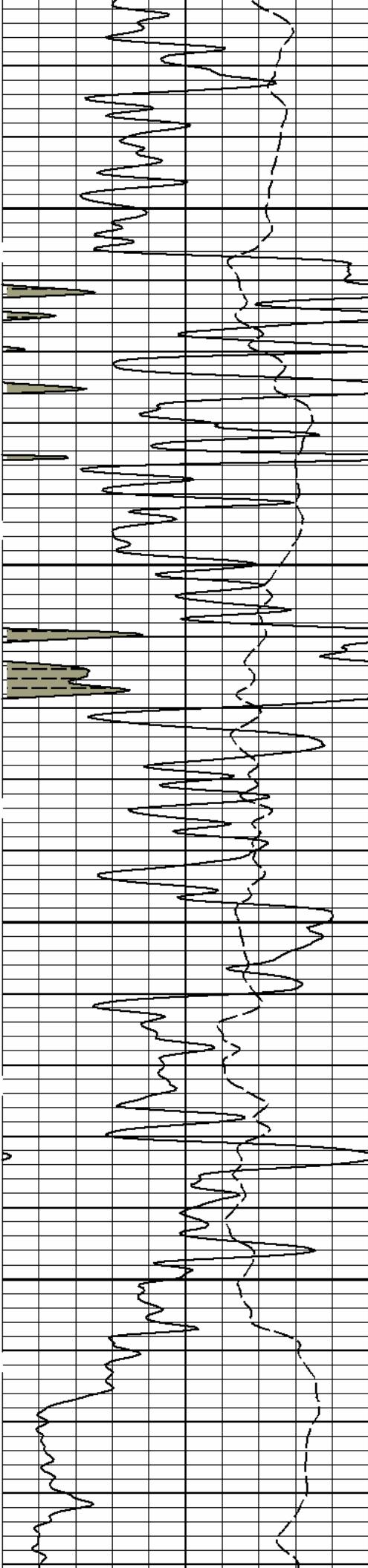




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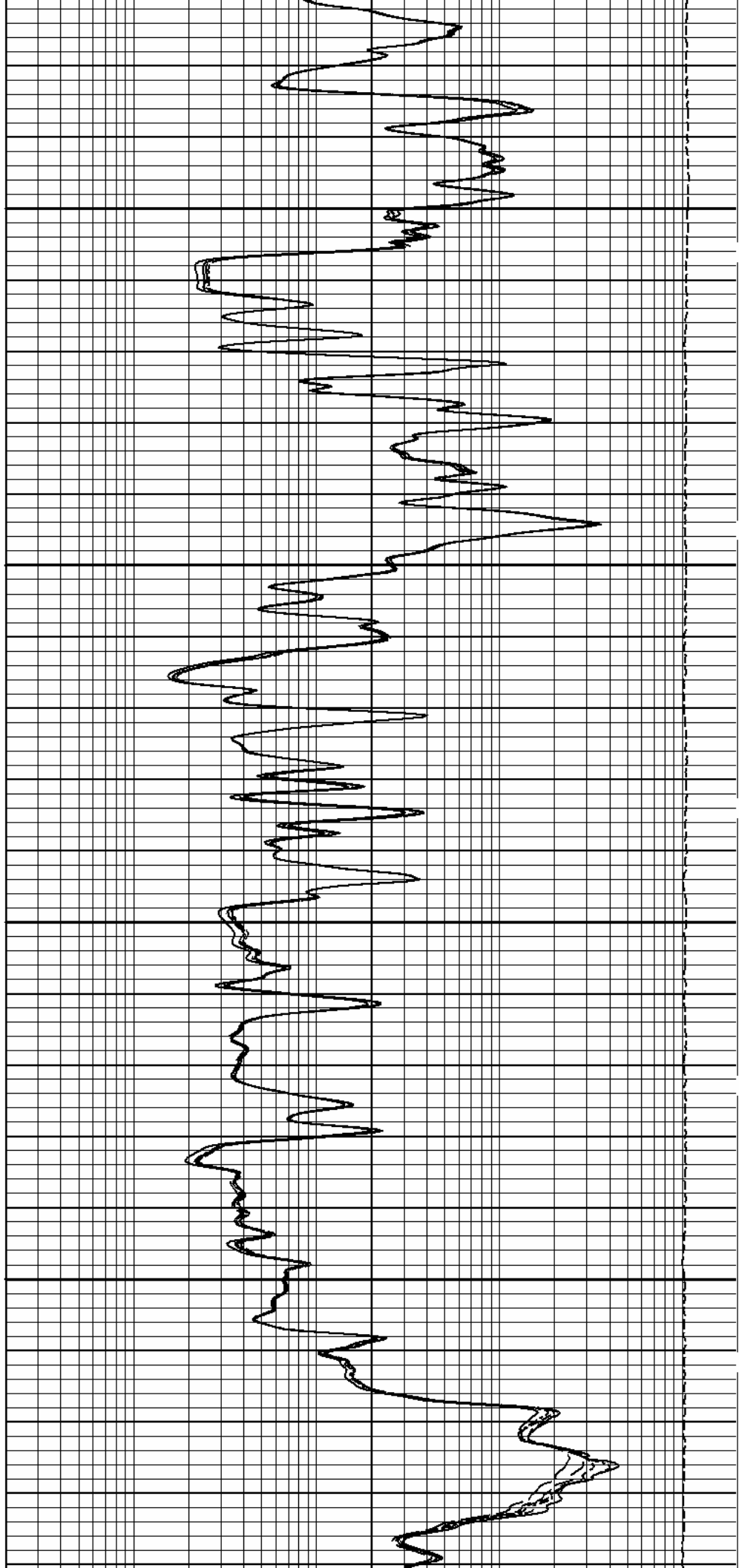
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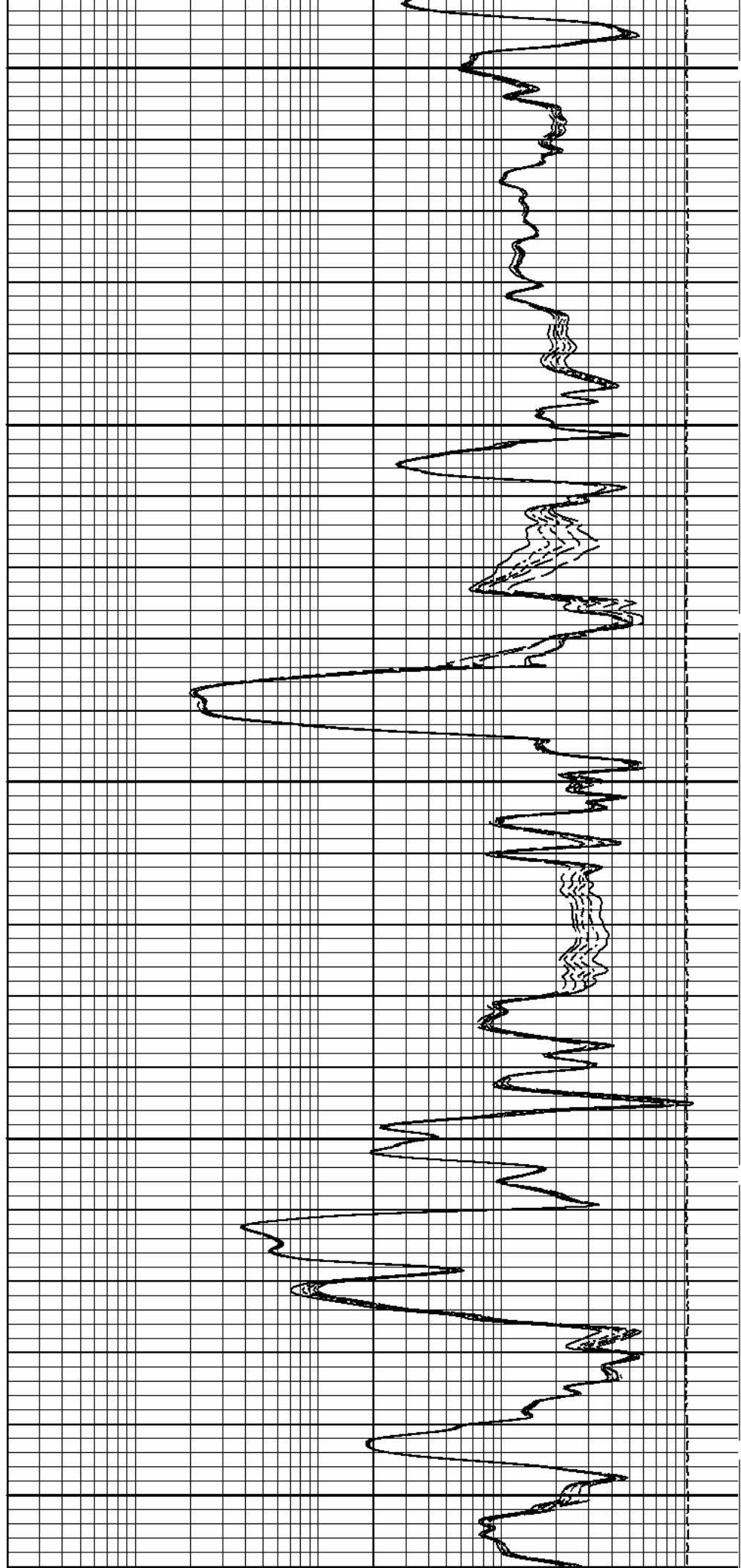
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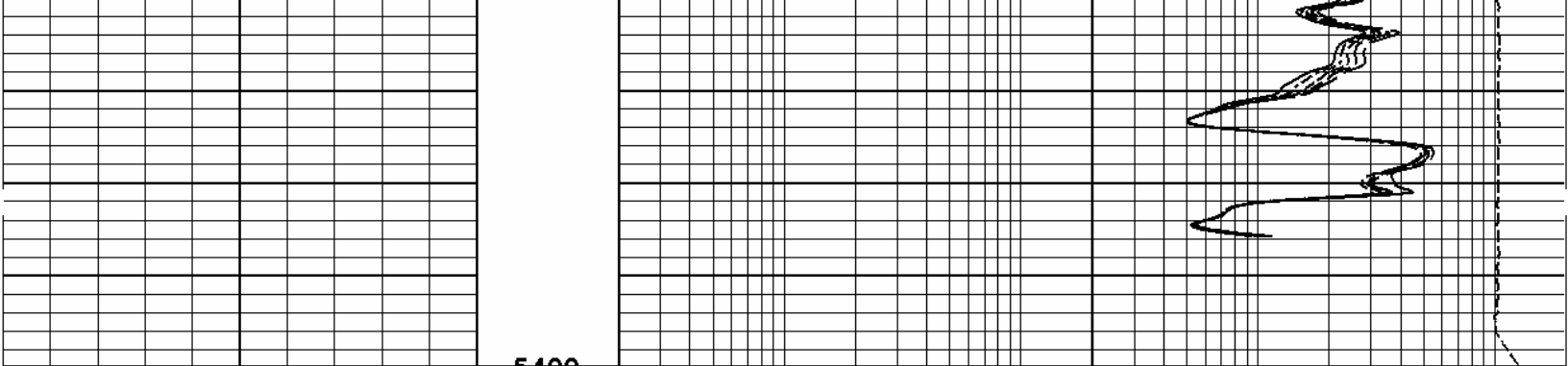




5200

5300





SP		MD 1 : 240 ft	10K Tension 0	
-]20[+			pounds	
0	Gamma API 150		0.2 10in Resistivity 2ft Res 2000	
api			ohmm	
SHALE			0.2 20in Resistivity 2ft Res 2000	
			ohmm	
			0.2 30in Resistivity 2ft Res 2000	
			ohm-metre	
			0.2 60in Resistivity 2ft Res 2000	
			ohmm	
			0.2 90in Resistivity 2ft Res 2000	
			ohmm	

HALLIBURTON

Plot Time: 28-May-11 13:53:10

Plot Range: 4696 ft to 5399.83 ft

Data: BERGER_A_3\Well Based\REPEAT\

Plot File: \\LOCAL\BERGER_A_3\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\ACRT\ACRT_5_repeat.lib

REPEAT SECTION

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TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
CH_HOS-CH_696 37.50 lbs		Ø 2.750 in →		← Temperature @ 71.31 ft	3.03 ft	72.34 ft
XOHD-TRK696 20.00 lbs		Ø 2.750 in → Ø 3.625 in →			0.95 ft	69.31 ft
SP Sub-PROT01 60.00 lbs		Ø 3.625 in →		← SP @ 66.59 ft	3.74 ft	68.36 ft
						64.63 ft
GTET-11050378 165.00 lbs		Ø 3.625 in →		← GammaRay @ 58.56 ft	8.52 ft	

DSNT-11055304
174.00 lbs

DSN Decentralizer-
10755066
6.60 lbs

Ø 3.625 in* →
Ø 3.625 in →

← DSN Far @ 49.17 ft
← DSN Near @ 48.42 ft

9.69 ft

56.10 ft

46.42 ft

SDLT-104_P84
360.00 lbs

Ø 4.500 in →
Ø 4.750 in →

← SDL Microlog @ 38.60 ft
← SDL Caliper @ 38.42 ft
← SDL @ 38.41 ft

10.81 ft

35.60 ft

BSAT-10747684
300.00 lbs

Ø 3.625 in →

← Sonic Receivers @ 27.09 ft

15.77 ft

19.83 ft

ACRt-1962_S909
250.00 lbs

Ø 3.625 in →

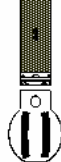
← Mud Resistivity @ 13.44 ft

← ACRt @ 9.46 ft

19.25 ft

Cabbage Head-
TRK696
5.00 lbs

Ø 3.625 in
Ø 6.000 in



0.58 ft
0.58 ft
0.00 ft

Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max. Log. Speed (fpm)
CH_HOS	Hostile Cable Head with Load Cell	CH_696	37.50	3.03	69.31	300.00
XOHD	Hostile to Dits Cross Over	TRK696	20.00	0.95	68.36	300.00
SP	SP Sub	PROT01	60.00	3.74	64.63	300.00
GTET	Gamma Telemetry Tool	11050378	165.00	8.52	56.10	60.00
DSNT	Dual Spaced Neutron	11055304	174.00	9.69	46.42	60.00
DCNT	DSN Decentralizer	10755066	6.60	5.13	* 49.75	300.00
SDLT	Spectral Density Tool	I04_P84	360.00	10.81	35.60	60.00
BSAT	Borehole Sonic Array Tool	10747684	300.00	15.77	19.83	60.00
ACRt	Array Compensated True Resistivity	I962_S909	250.00	19.25	0.58	300.00
CBHD	Cabbage Head	TRK696	5.00	0.58	0.00	300.00
Total			1,378.10	72.34		
						* Not included in Total Length and Length Accumulation.
Data: BERGER_A_3\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHNDLE						Date: 28-May-11 10:54:27

HALLIBURTON

CALIBRATION REPORT

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

Tool Name: ACRt - I962_S909

Reference Calibration Date: 11-Mar-11 11:34:39

Engineer: J. BOSH

Calibration Date: 03-May-11 14:28:43

Software Version: WL INSITE R3.2.0 (Build 7)

Calibration Version: 1

TYPICAL GAIN RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0070	1.05	0.95	1.0135	1.05	0.95	1.0116	1.05
A2 (50")	0.95	1.0142	1.05	0.95	1.0207	1.05	0.95	1.0200	1.05
A3 (29")	0.95	1.0002	1.05	0.95	1.0054	1.05	0.95	1.0025	1.05
A4 (17")	0.95	1.0154	1.05	0.95	1.0186	1.05	0.95	1.0185	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.0014	1.05	0.95	0.9993	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9915	1.05	0.95	0.9892	1.05

TYPICAL SONDE OFFSET RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	-5	-0.379	2	-6	-3.567	-2	-8	-4.476	-2
A2 (50")	-7	-1.215	-1	-6	-3.265	-2	-7	-4.141	-2
A3 (29")	-27	-14.722	-9	-9	-4.487	-3	-7	-2.504	-1
A4 (17")	-180	-102.056	-60	-45	-31.086	-15	-39	-25.940	-13
A5 (10")	N/A	N/A	N/A	-150	-98.114	-50	-80	-44.687	-10
A6 (6")	N/A	N/A	N/A	175	285.394	525	90	149.184	270

TRANSMITTER CURRENT GAIN

R-MUD VERIFICATION

Signal	Lower	R	Upper	Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
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12K	0.6	0.8865	1.3	Mud Cell	0.95	1.002	1.05
36K	1.0	1.3495	2.0				
72K	1.0	1.5711	2.0				

CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units
ACRt-I962_S909						
Mud Cell	1.002	-----	-----	0.000	-----	ohm-m
Data: BERGER_A_3\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHVDLE				Date: 28-May-11 10:56:27		

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PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	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	9.100	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	2000.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	2.000	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	5410.00	ft
	SHARED	BHT	Bottom Hole Temperature	120.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
	SHARED	TEMM	Temperature Master Tool	NONE	
	SHARED	BHSM	Borehole Size Master Tool	NONE	
	GTET	GROK	Process Gamma Ray?	Yes	
	GTET	GRSO	Gamma Tool Standoff	0.000	in
	GTET	GEOK	Process Gamma Ray EVR?	No	
	GTET	TPOS	Tool Position	Centered	
	DSNT	DNOK	Process DSN?	Yes	
	DSNT	DEOK	Process DSN EVR?	No	
	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	DNOK	Process Density?	Yes	
	SDLT	DNOK	Process Density EVR?	No	
	SDLT	CB	Logging Calibration Blocks?	No	
	SDLT	SPVT	SDLT Pad Temperature Valid?	Yes	
	SDLT	DTWN	Disable temperature warning	No	

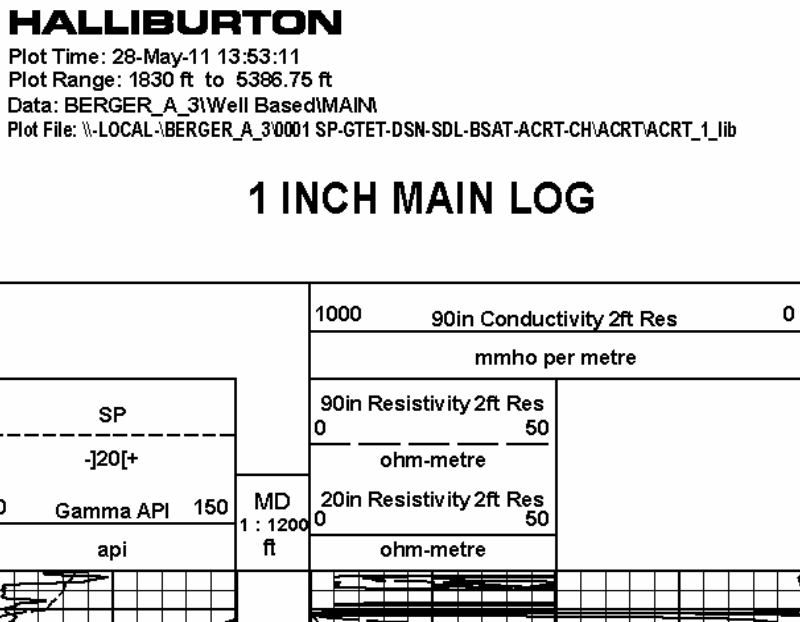
SDLT	DMA	Formation Density Matrix	2.710	g/cc
SDLT	DFL	Formation Density Fluid	1.000	g/cc
SDLT	CLOK	Process Caliper Outputs?	Yes	
SDLT	MLOK	Process MicroLog Outputs?	Yes	
BSAT	MBOK	Compute BCAS Results?	Yes	
BSAT	FLLO	Frequency Filter Low Pass Value?	7000	Hz
BSAT	FLHI	Frequency Filter High Pass Value?	27000	Hz
BSAT	DTFL	Delta -T Fluid	189.00	uspf
BSAT	DTMT	Delta -T Matrix Type	User define	
BSAT	DTMA	Delta -T Matrix	47.60	uspf
BSAT	DTSH	Delta -T Shale	100.00	uspf
BSAT	SPEQ	Acoustic Porosity Equation	Wyllie	
ACRt	RTOK	Process ACRt?	Yes	
ACRt	MNSO	Minimum Tool Standoff	1.50	in
ACRt	TCS1	Temperature Correction Source	FP Lwr & FP Up	
ACRt	TPOS	Tool Position	Free Hanging	
ACRt	RMOP	Rmud Source	Mud Cell	
ACRt	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt	THQY	Threshold Quality	0.50	

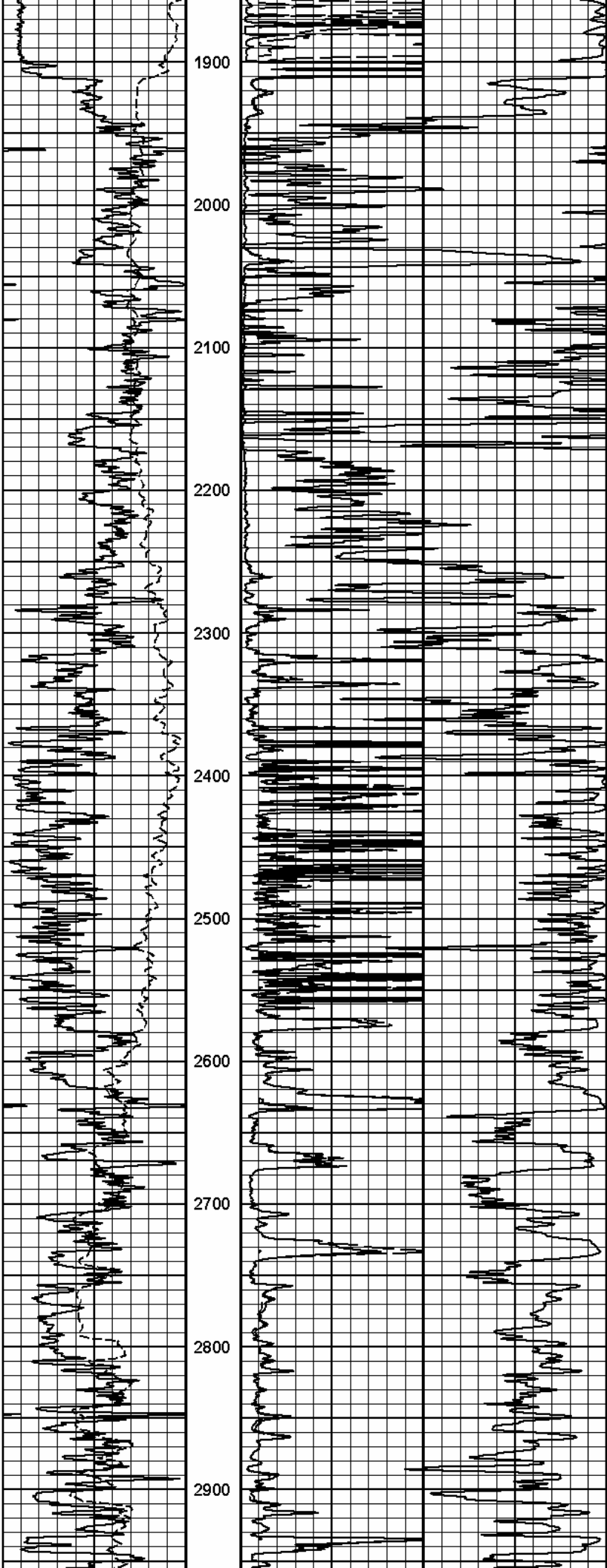
BOTTOM

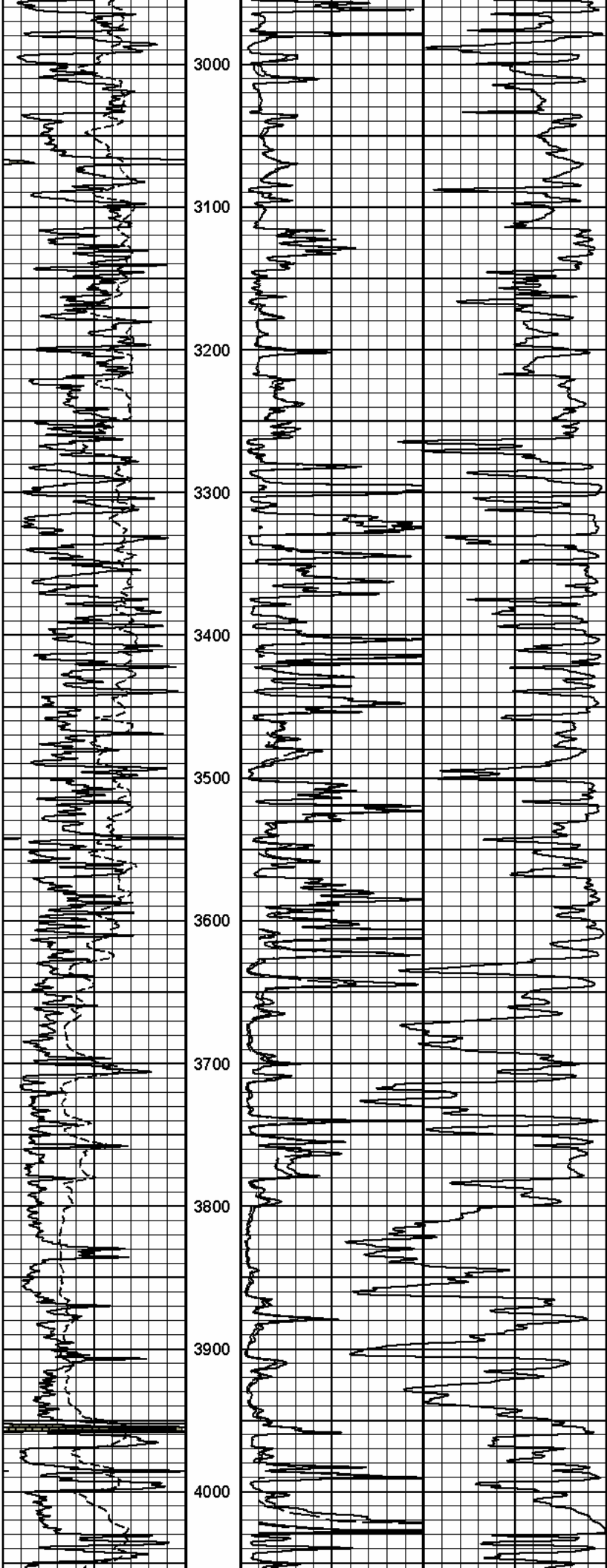
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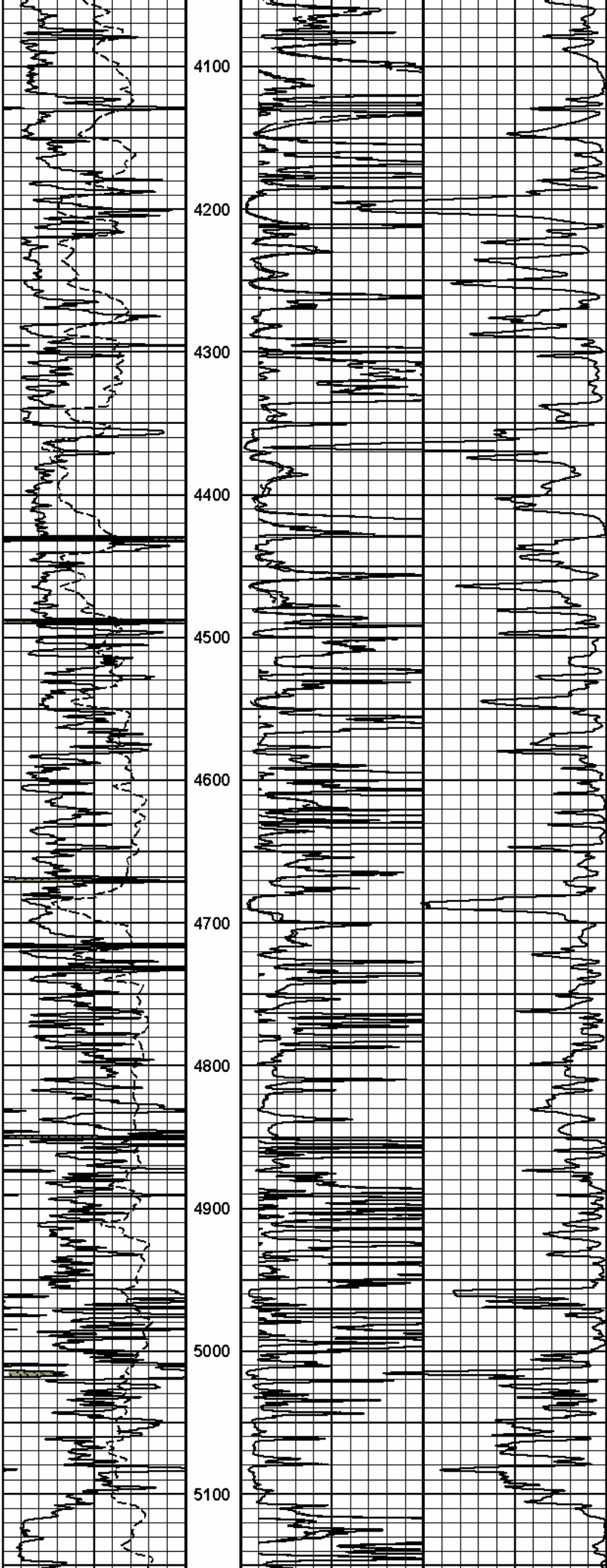
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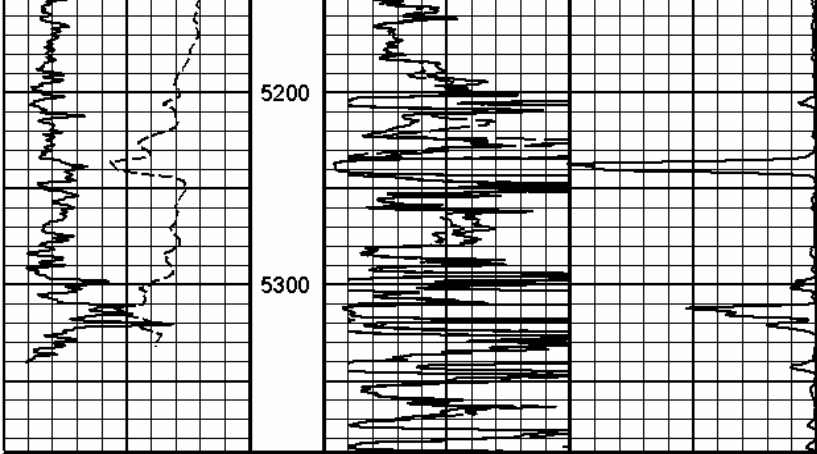
COMPANY	OXY USA, INC		
WELL	BERGER A-3		
FIELD	PLEASANT PRAIRIE		
COUNTY	HASKELL	STATE	KANSAS
HALLIBURTON		ARRAY COMPENSATED TRUE RESISTIVITY LOG	











0	Gamma API	150	MD	20in Resistivity 2ft Res	
	api		1 : 1200	0	50
			ft	ohm-metre	
	SP			90in Resistivity 2ft Res	
				0	50
				ohm-metre	
				1000	90in Conductivity 2ft Res
					0
					mmho per metre

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Plot Time: 28-May-11 13:53:13
Plot Range: 1830 ft to 5386.75 ft
Data: BERGER_A_3\Well Based\MAIN
Plot File: \\LOCAL\BERGER_A_3\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\ACRT\ACRT_1.lib

1 INCH MAIN LOG