Weatherford®

COMPACT WELL SHUTTLE
COMPACT ARRAY INDUCTION
ELECTRIC LOG

COMPANY	CMX INC.
WELL	SCROOGE 1-7H
FIELD	STRANATHAN
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	200' FSL & 330' FWL

40 Years of Wireline 1970 2010

SEC	TWP	RGE
7	35S	11W

Other Services
MDN/MPD
MSS

API Number 15007236630100
Permit Number

Permanent Datum G.L., Elevation 1372 feet
Log Measured From D.F. @ 15 FEET above Permanent Datum
Drilling Measured From D.F.

Elevations:	feet
KB	1389.00
DF	1389.00
GL	1372.00

Date	25-APR-2011		
Run Number	1		
Depth Driller	9402.00	feet	
Depth Logger	9136.00	feet	
First Reading	9128.00	feet	
Last Reading	5119.00	feet	
Casing Driller	5119.00	feet	
Casing Logger	5119.00	feet	
Bit Size	6.125	inches	
Hole Fluid Type	WATER BASED		
Density / Viscosity	8.35 g/c3	28.00 CP	
PH / Fluid Loss	8.00	56.00 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	2.0 @ 74.2	ohm-m	
Rmf @ Measured Temp	1.60 @ 74.2	ohm-m	
Rmc @ Measured Temp	2.40 @ 74.2	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	1.16 @133.0	ohm-m	
Time Since Circulation	2 HOURS		
Max Recorded Temp	133.00	deg F	
Equipment Name	COMPACT		
Equipment / Base	18064	OKC	
Recorded By	C. GRIFFIN		
Witnessed By	D. MCGINNESS		
S.O. #	3529834		

BOREHOLE RECORD

Last Edited: 25-APR-2011 12:00

Bit Size inches	Depth From feet	Depth To feet
6.125	5119.00	9402.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
INTERMED	7.000	0.00	5119.00	26.00

REMARKS

WLS SOFTWARE VERSION 11.01. USED.
TOOLS RUN ON DRILLPIPE USING COMPACT WELL SHUTTLE DEPLOYMENT TECHNIQUE.

DEPTH MEASURED USING ADVANTAGE RIG DEPTH CORRECTED TO PIPE TALLY.
LOG DEPTH AND CORRELATION WAS SET TO MWD GAMMA RAY IF AVAILABLE.

TOOLS DEPLOYED WITH MULE SHOE SITTING AT 9044 FT.
AFTER DEPLOYMENT LOGGING TOOL WAS AT 9136 FT.

4.5 " PRODUCTION CASING USED TO CALCULATE ANNULAR HOLE VOLUMES.

OPERATORS: R. ROLLANS, R. BRADSHAW
S.O. # 3529834
RIG: DAN D RIG 5

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for

any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions in our price schedule.

DSC

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 25-APR-2011 16:17
Filename: C:\Data\CMX\CMX Scrooge 1-7H\MMS160 Depthlog RTAP.dta
Recorded on 25-APR-2011 14:41
System Versions: Logged with 11.01.2198 Processed with 11.01.2198 Plotted with 11.01.2198

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Depth In Feet

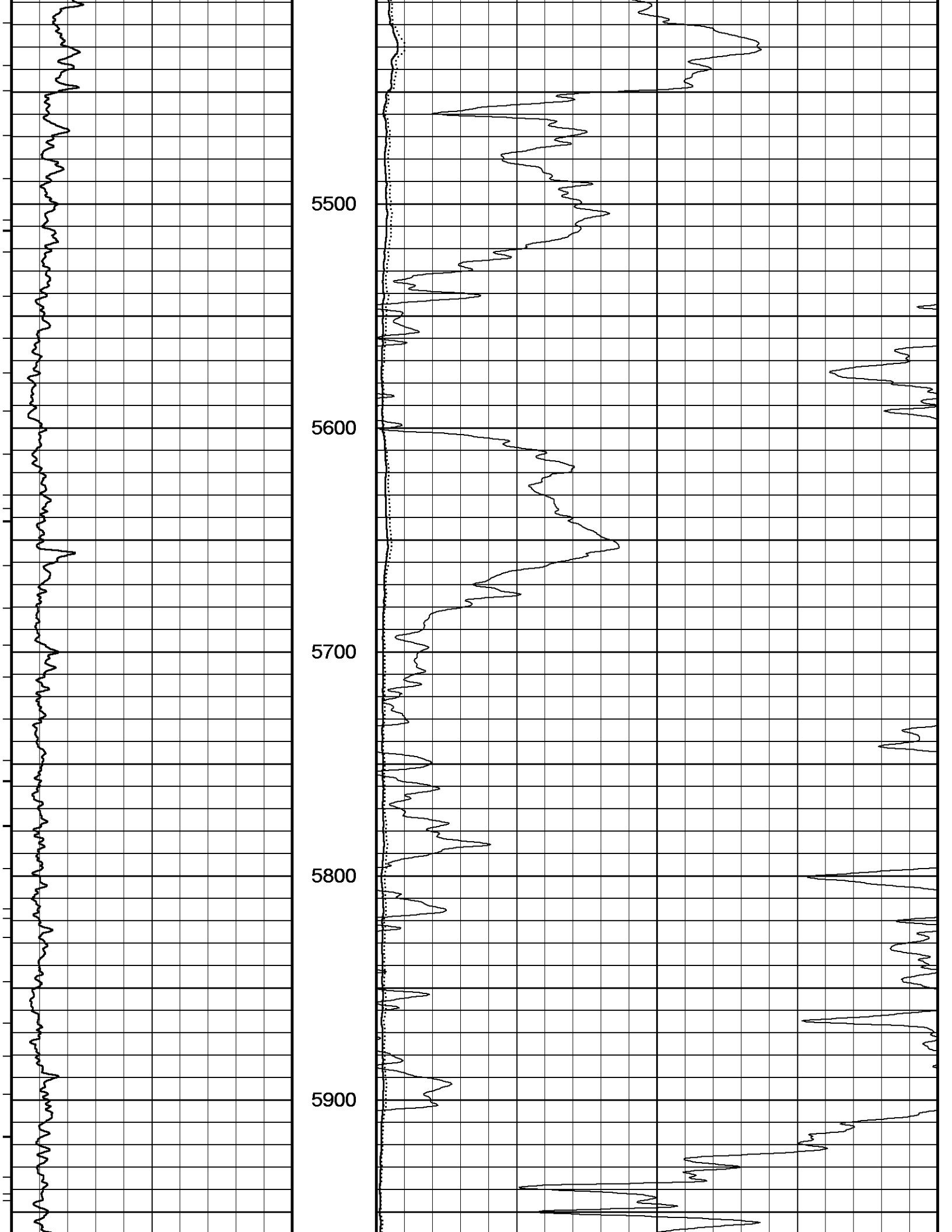
Replay Scale 1:600

Array Ind. Four Cond Ct
mmhos
400 300 200 100 0
800 700 600 500 400

Array Ind. Four Res 20
ohm metres
0 50 100
0 500 1000

Array Ind. Four Res Rt
ohm metres
0 50 100
0 500 1000

5100
5200
5300
5400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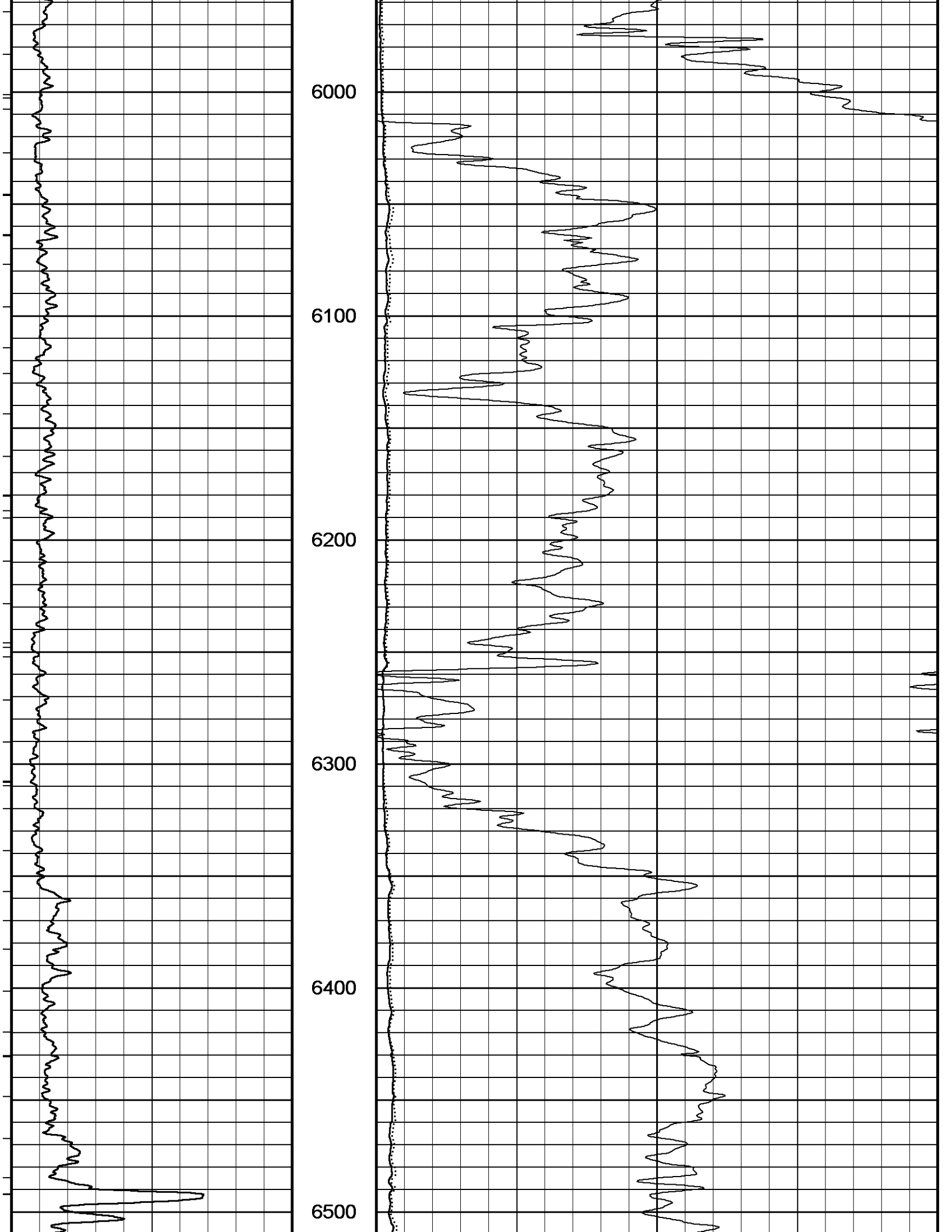
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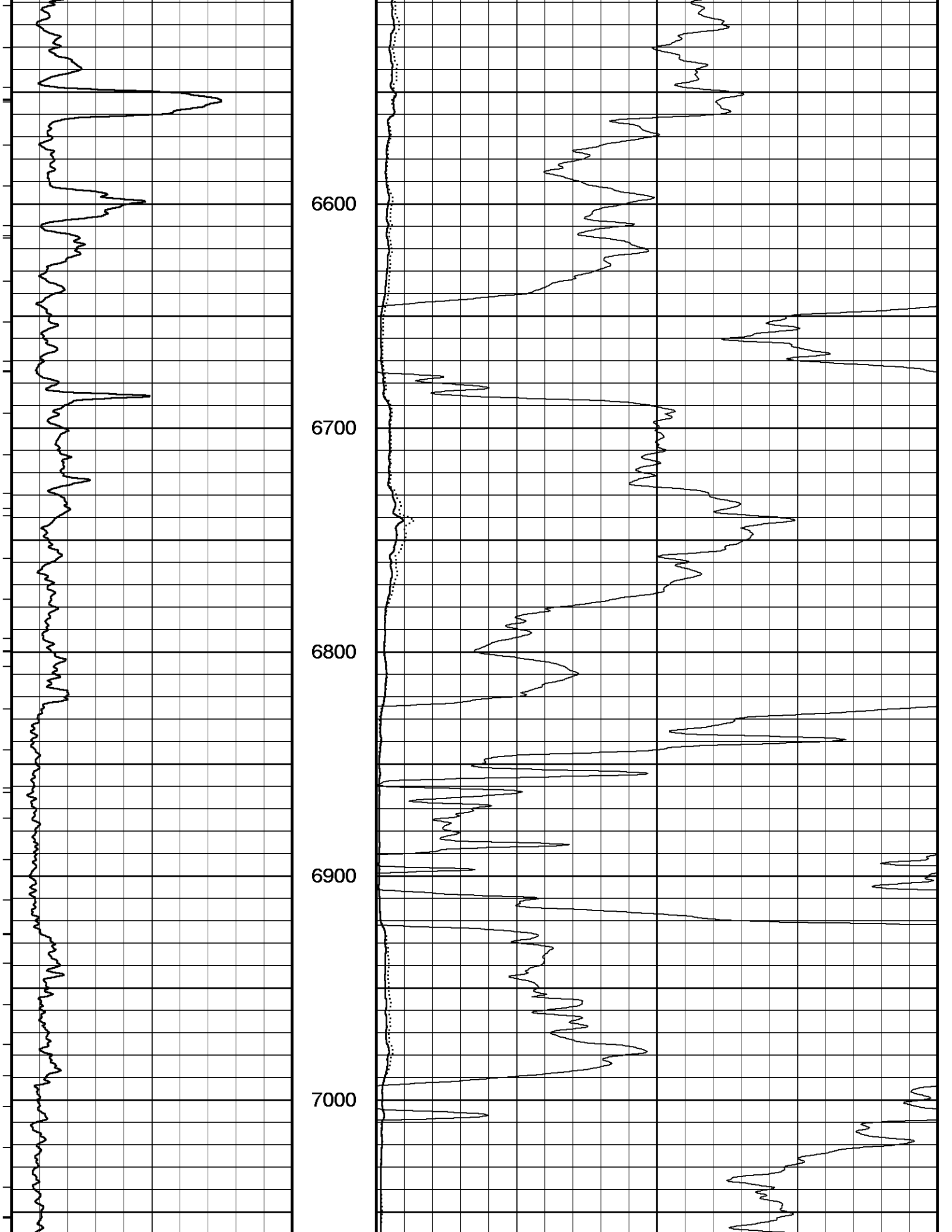
6500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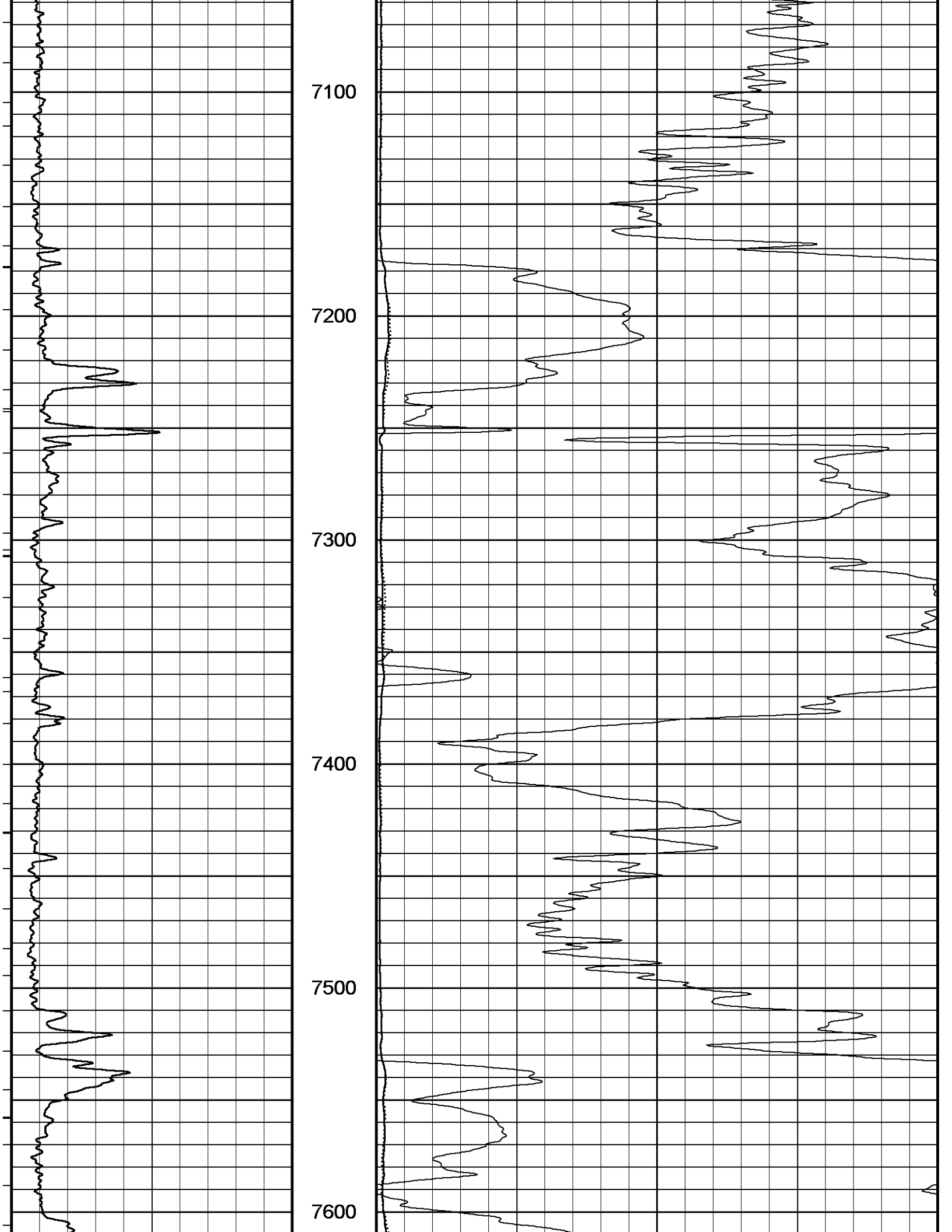
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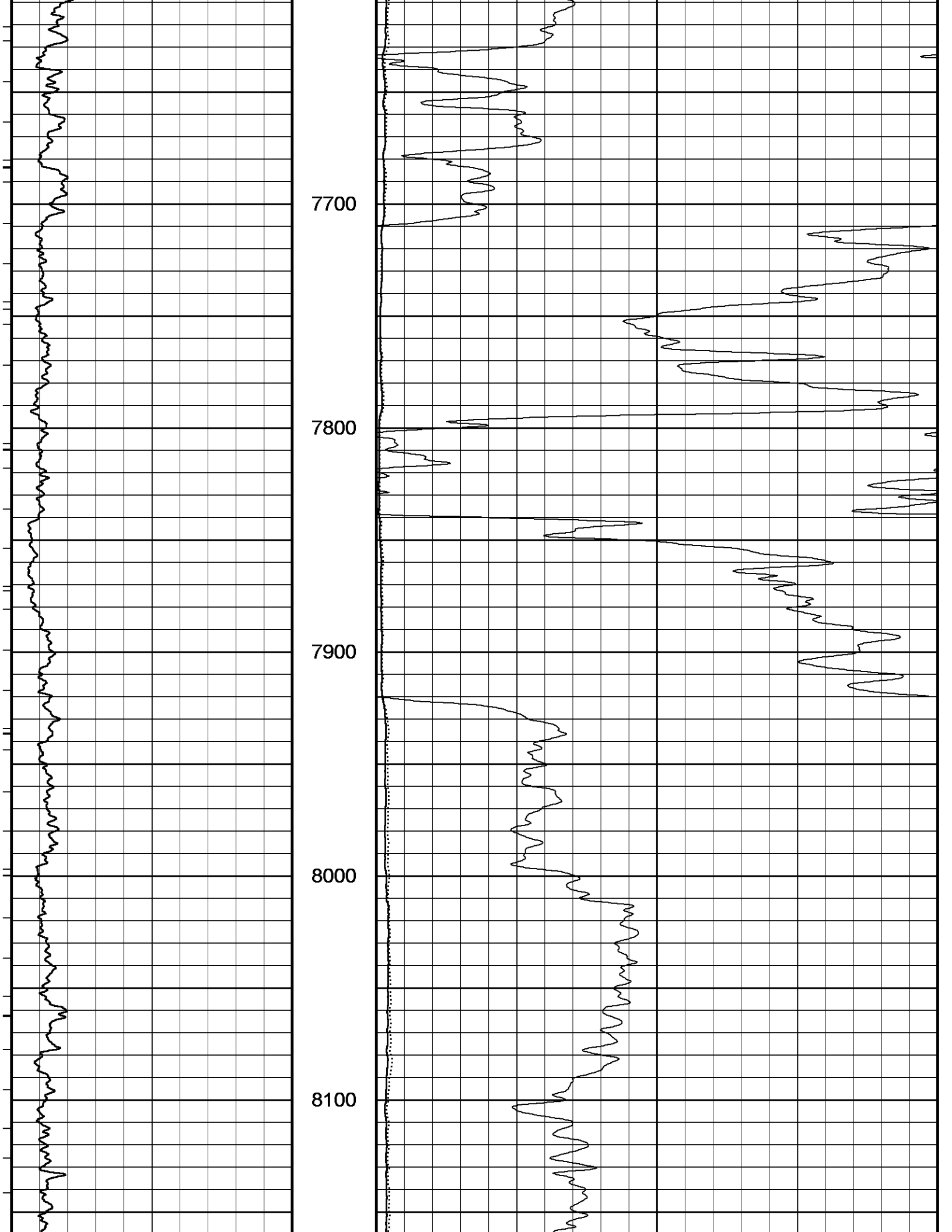
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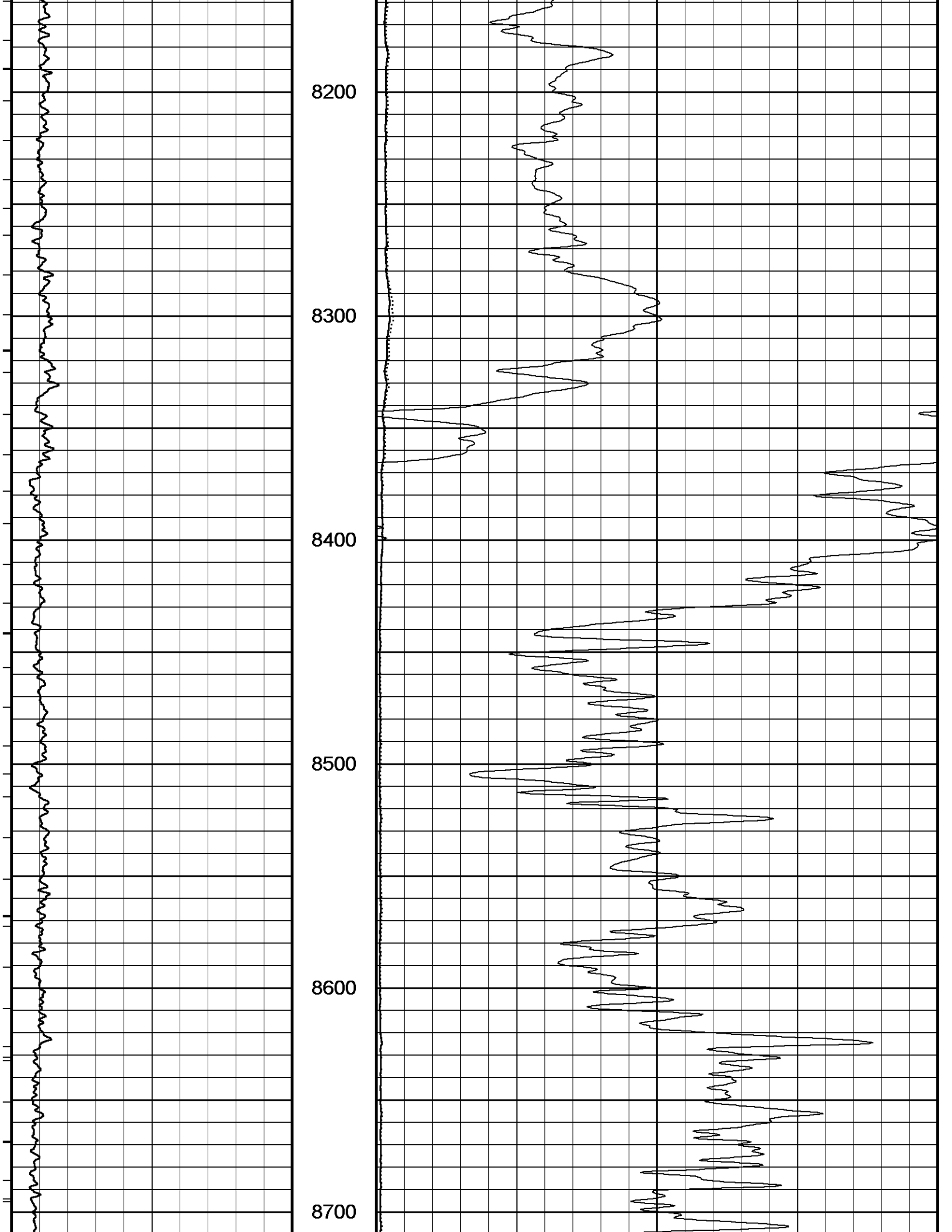
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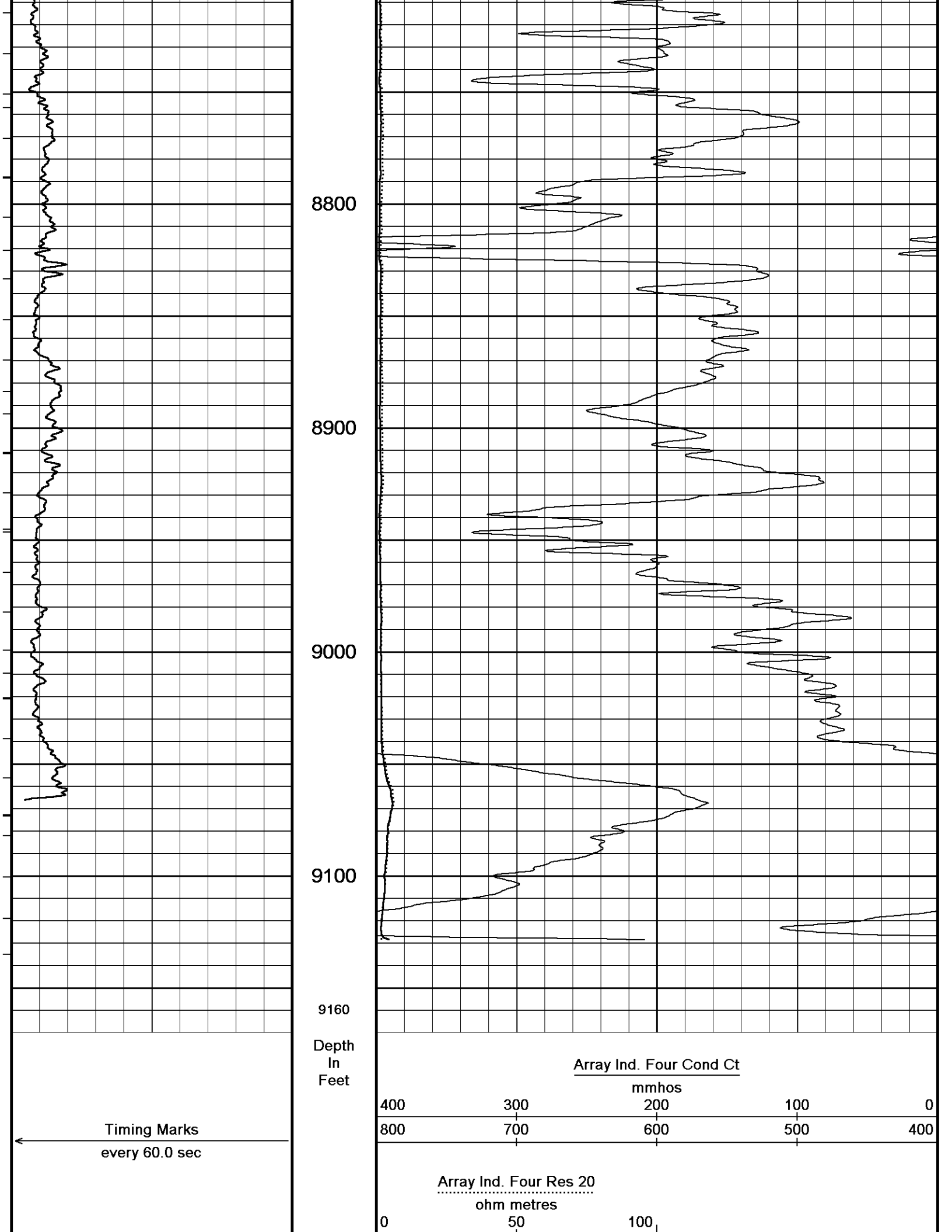
8800
8900
9000
9100
9160
Depth
In
Feet
Timing Marks
every 60.0 sec
Array Ind. Four Cond Ct
mmhos
400
300
200
100
0
800
700
600
500
400
Array Ind. Four Res 20
ohm metres
0
50
100

Gamma Ray
API
0 75 150
150 225 300

0 500 1000

Array Ind. Four Res Rt
ohm metres
0 50 100
0 500 1000

Replay Scale 1:600

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 25-APR-2011 16:17
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DSC

DSC

Depth Based Data - Maximum Sampling Increment 10.0cm
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Recorded on 25-APR-2011 14:41
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Depth In Feet

Timing Marks
every 60.0 sec

Borehole Temp in deg F

Gamma Ray
API
0 75 150
150 225 300

Array Ind. Four Res 20
ohm metres
0.20 2000
1 10 100 1000

Array Ind. Four Res 30
ohm metres
0.20 2000
1 10 100 1000

Array Ind. Four Res 40
ohm metres
0.20 2000
1 10 100 1000

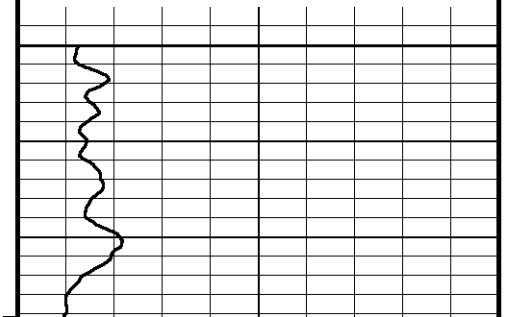
Array Ind. Four Res 60
ohm metres
0.20 2000
1 10 100 1000

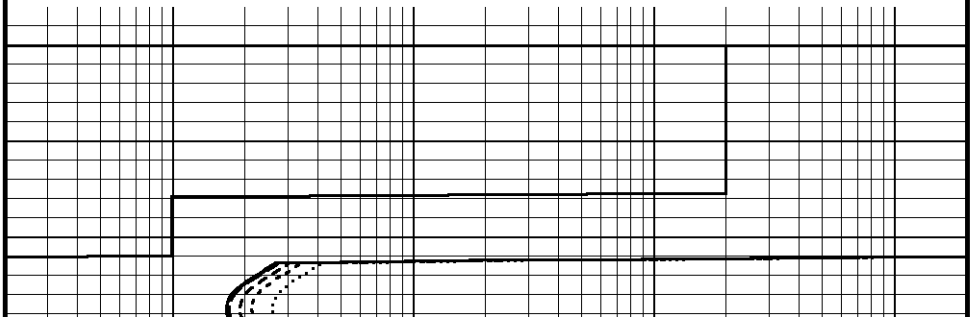
Array Ind. Four Res 85
ohm metres
0.20 2000
1 10 100 1000

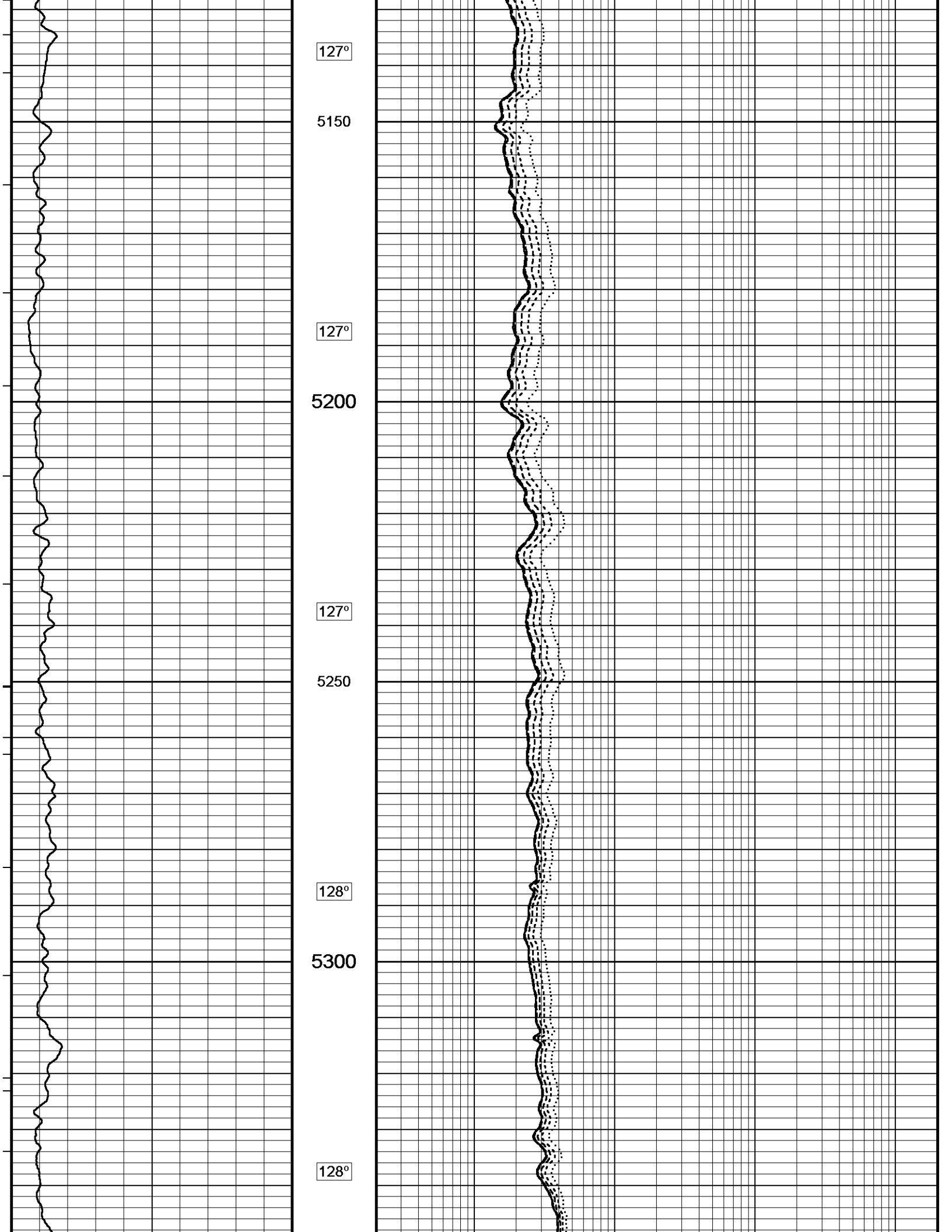
Array Ind. Four Res Rt
ohm metres
0.20 2000
1 10 100 1000

Replay Scale 1:240

5100



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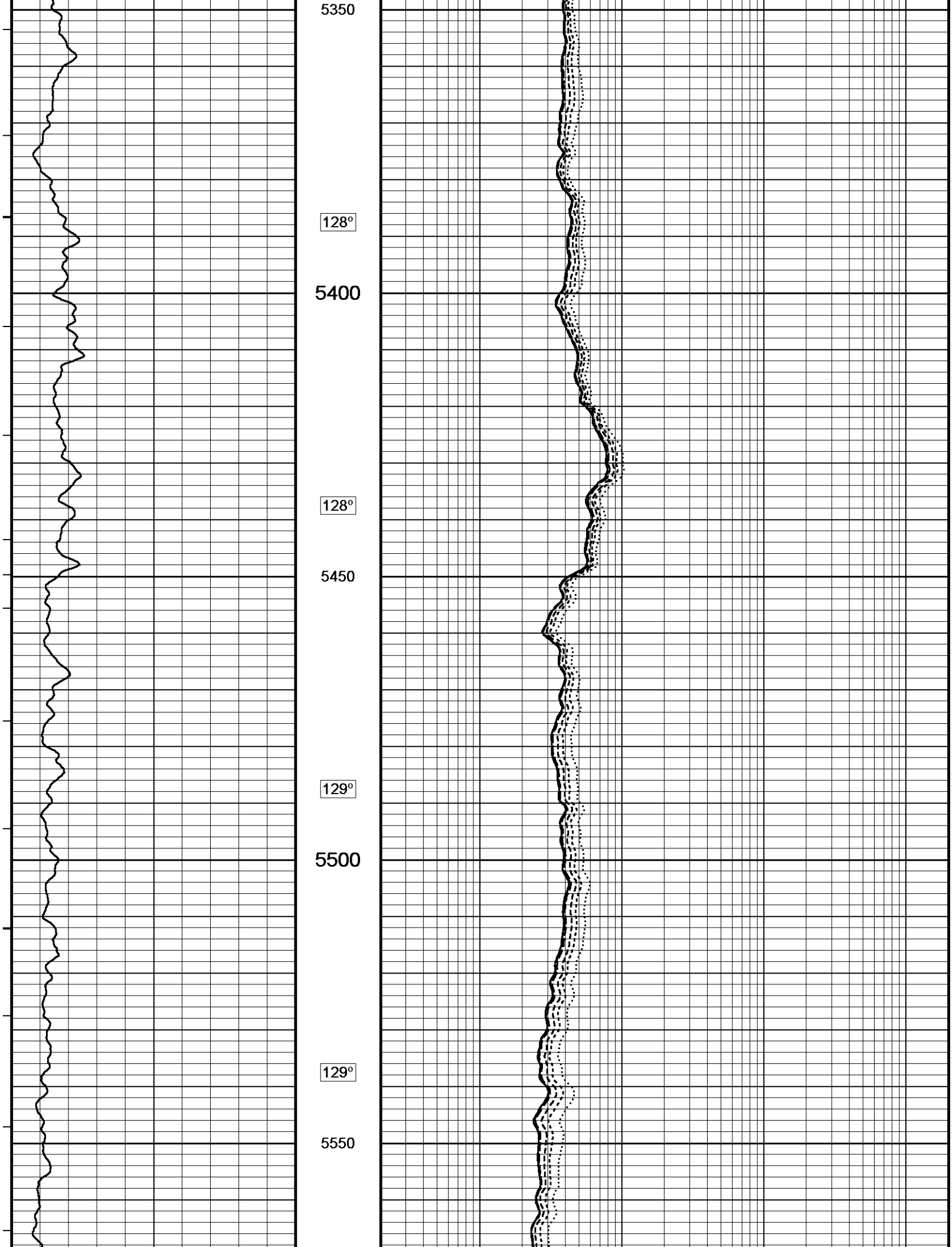
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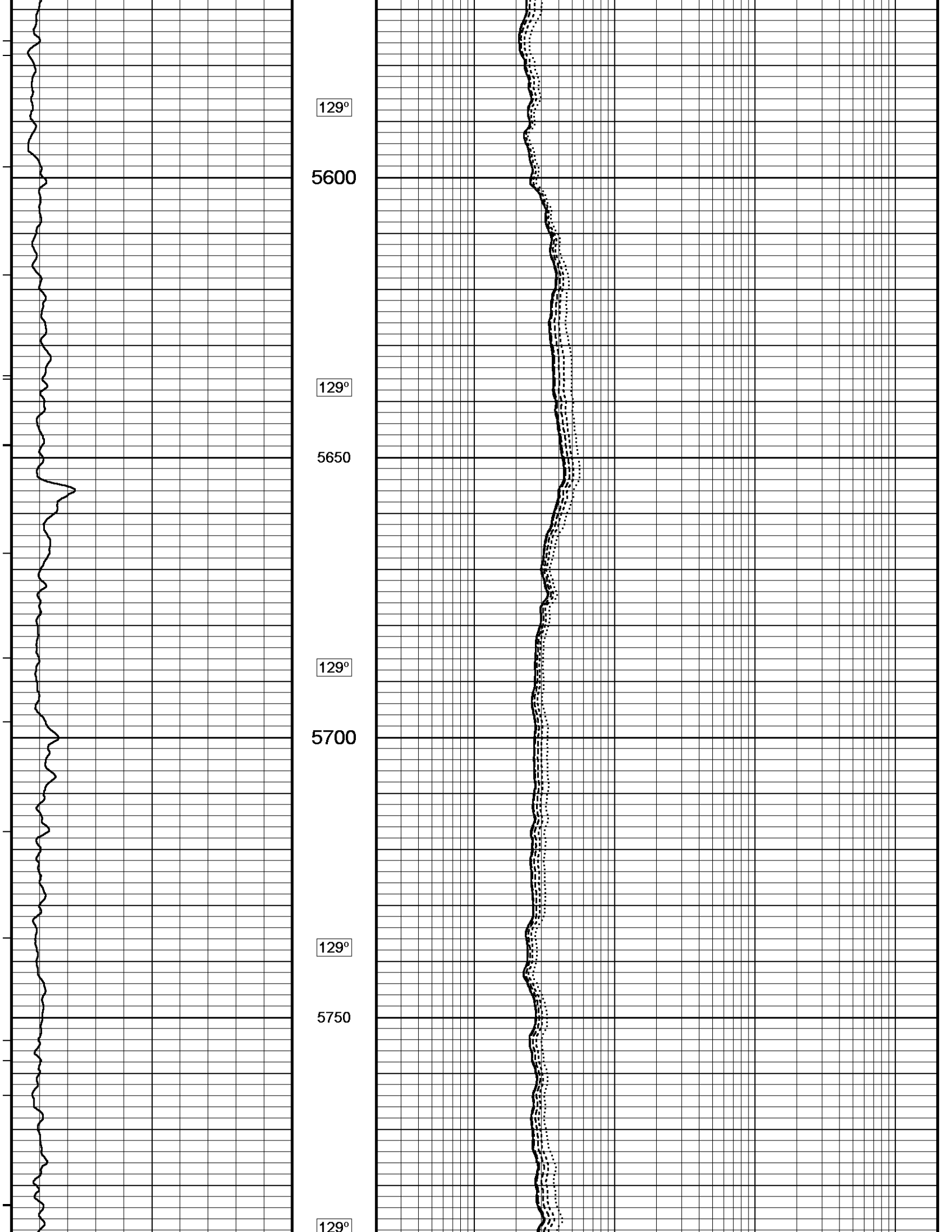
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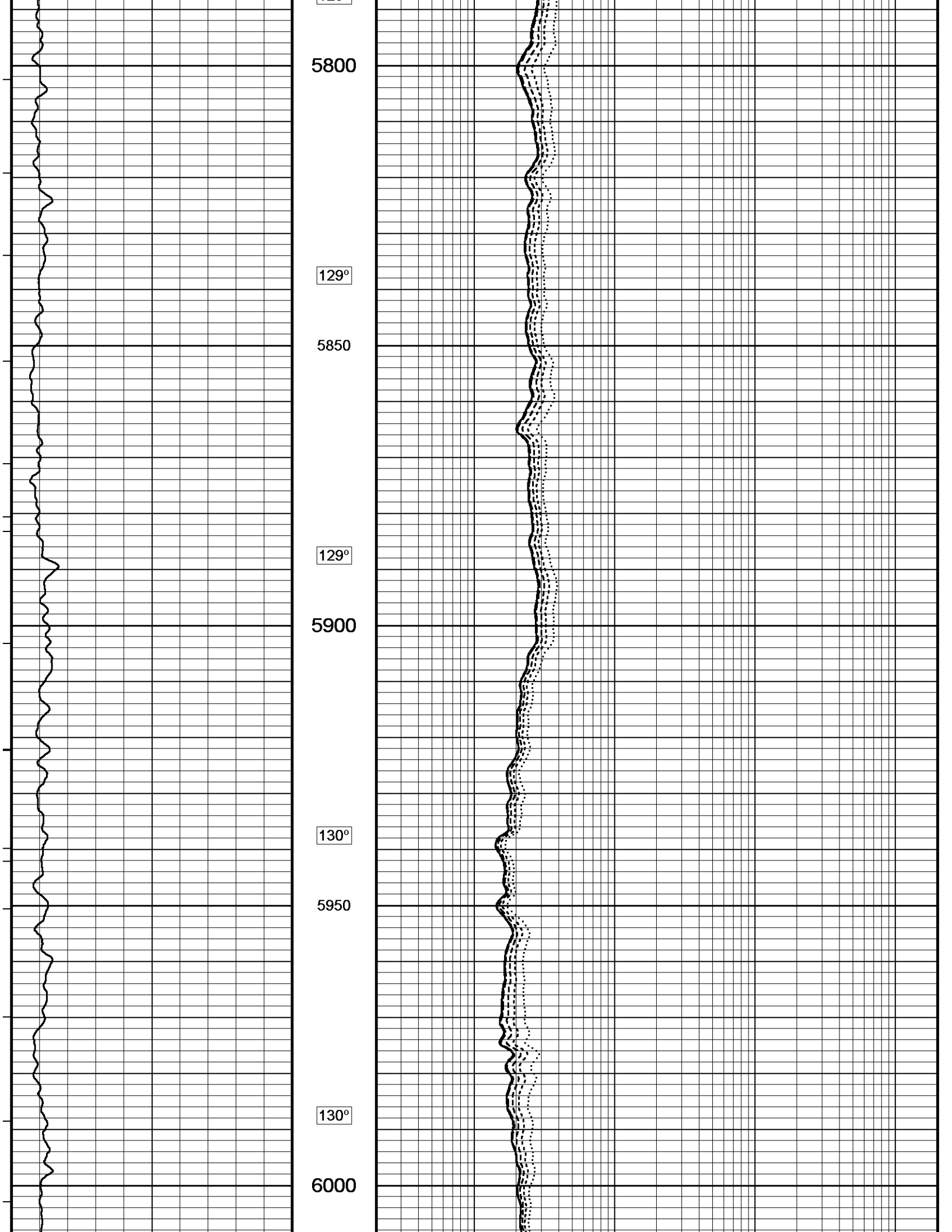
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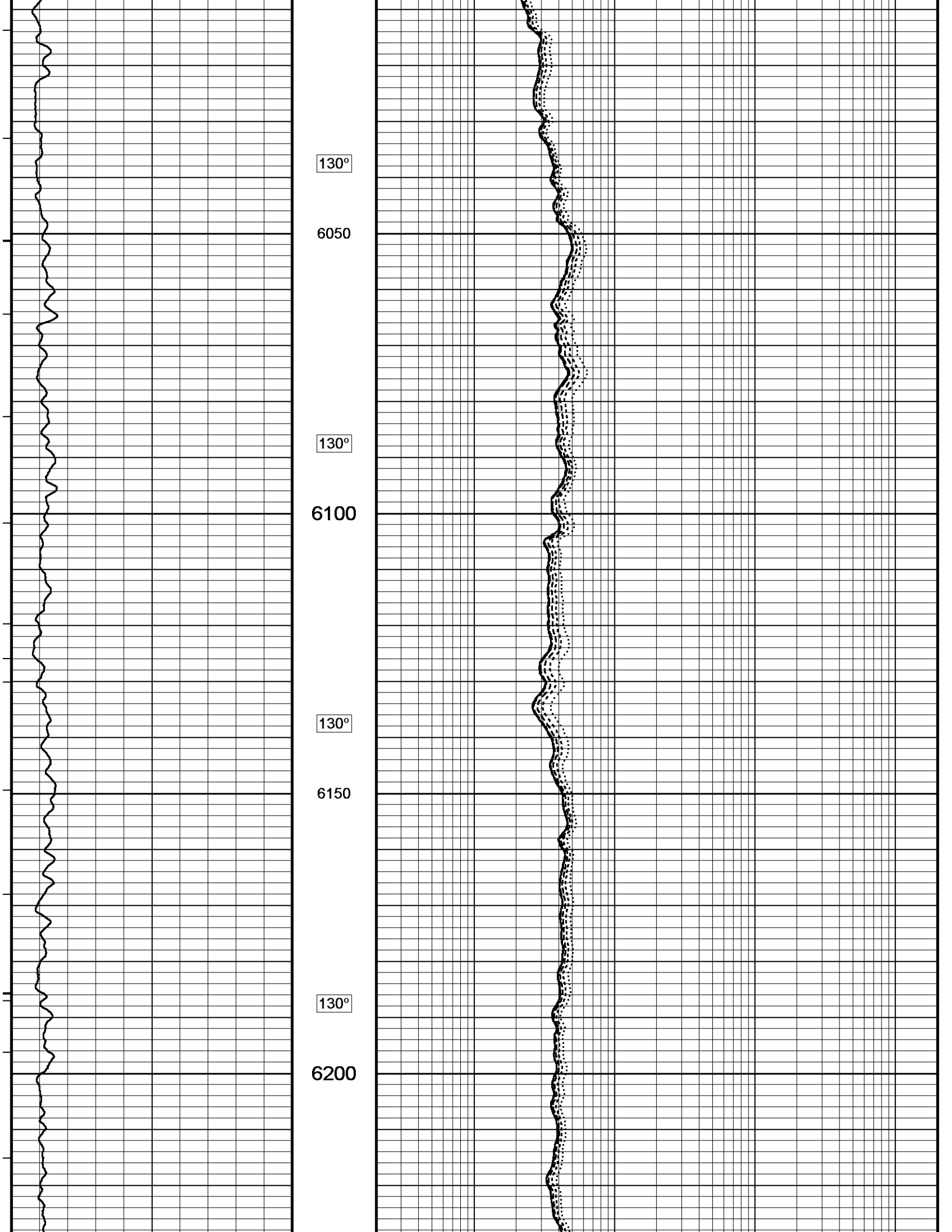
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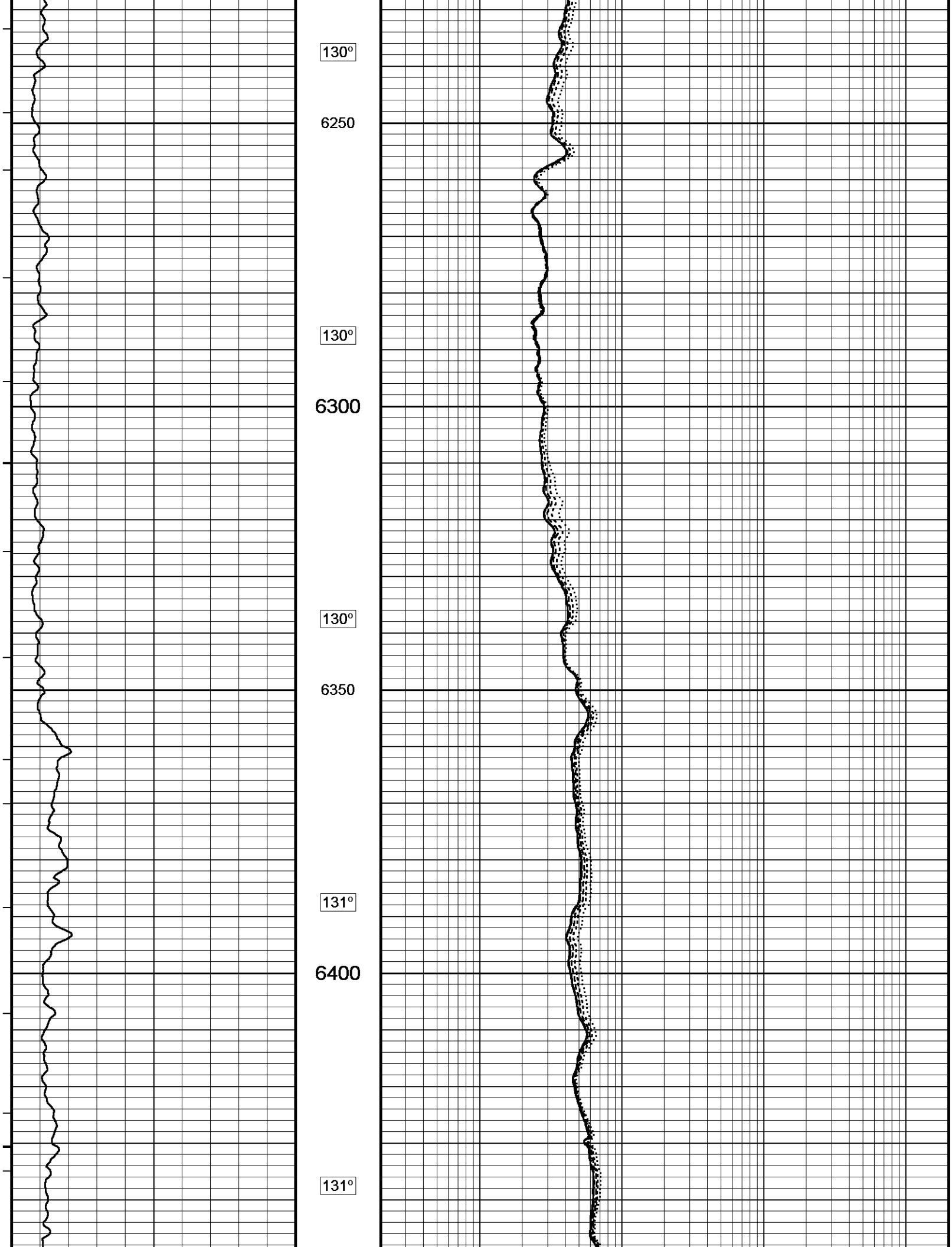
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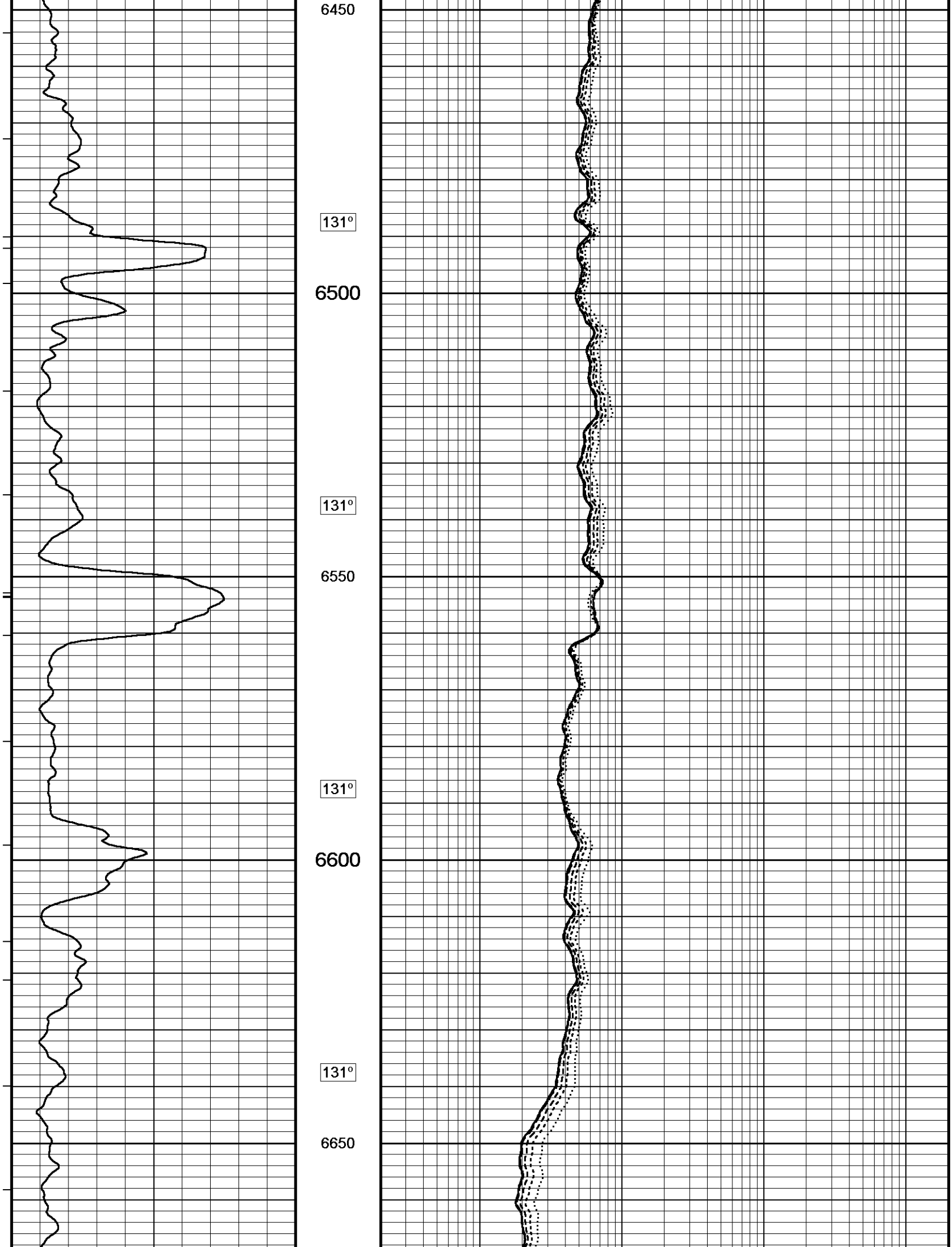
131°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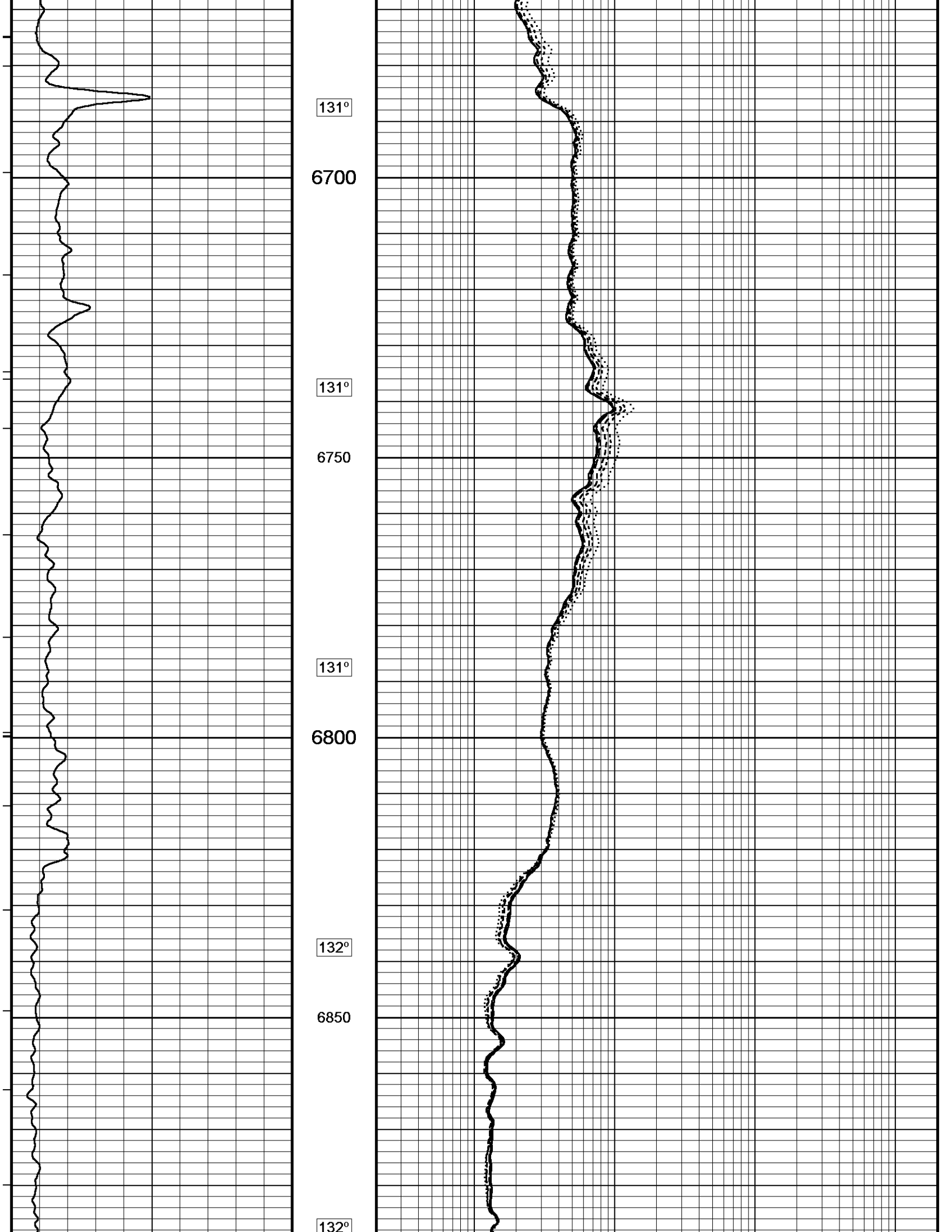
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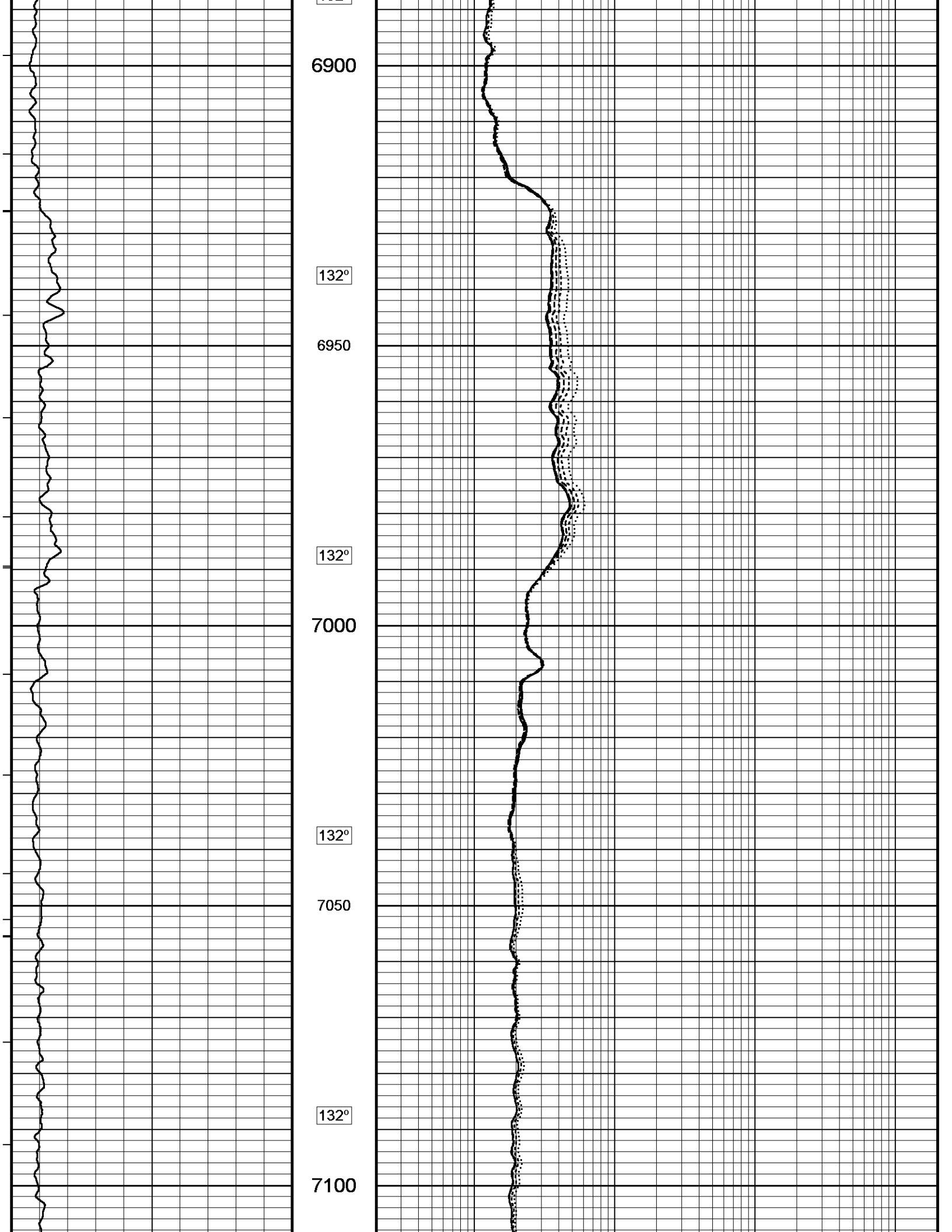
132°
6850
132°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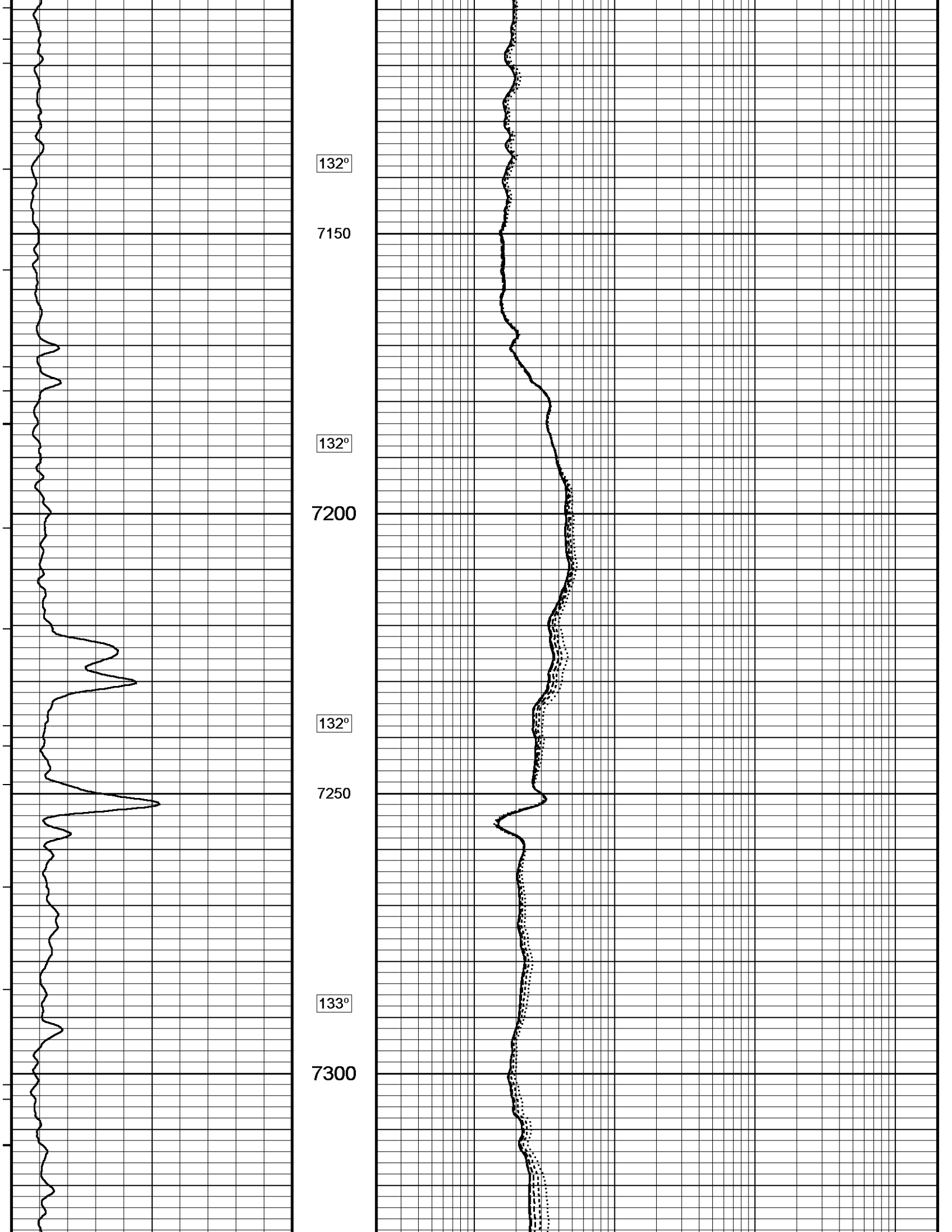
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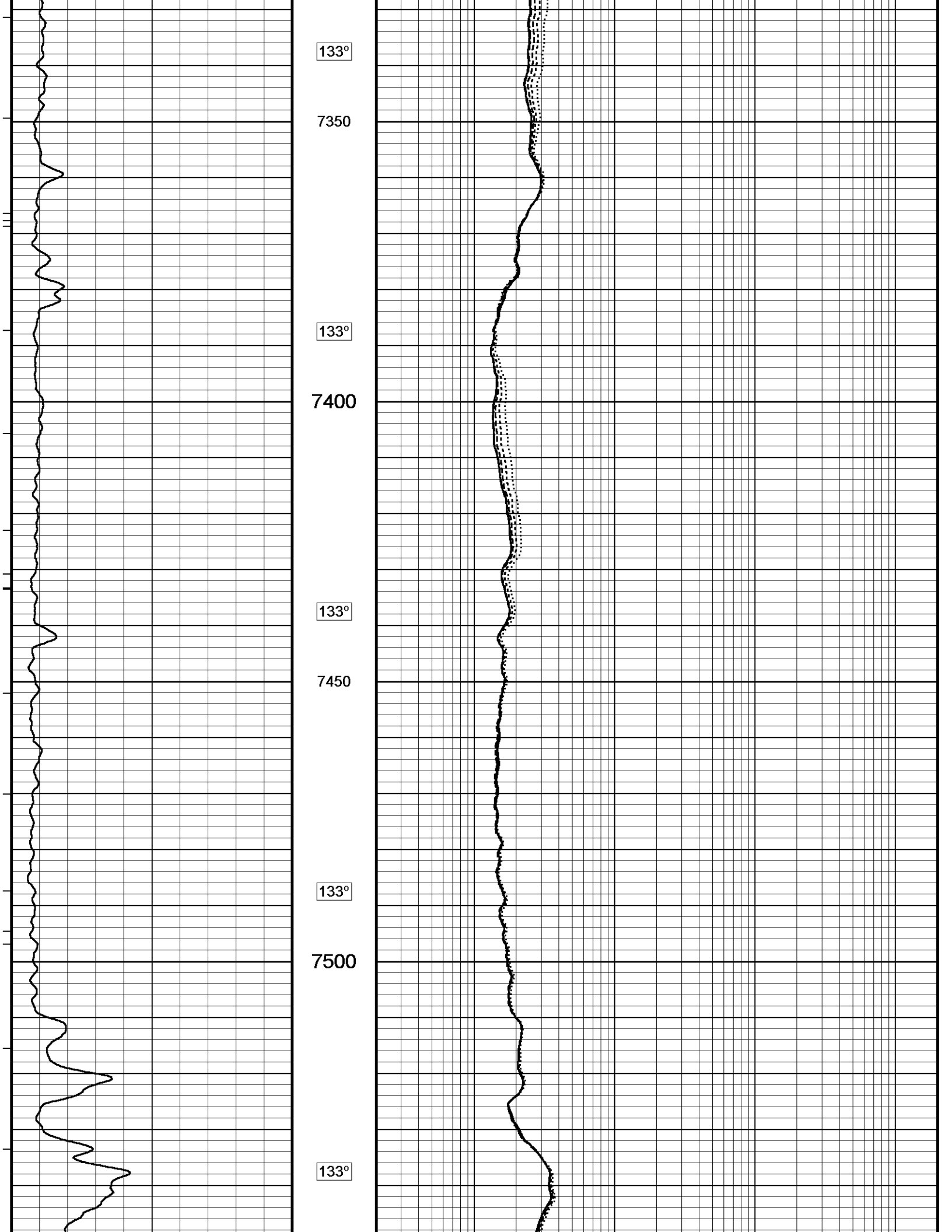
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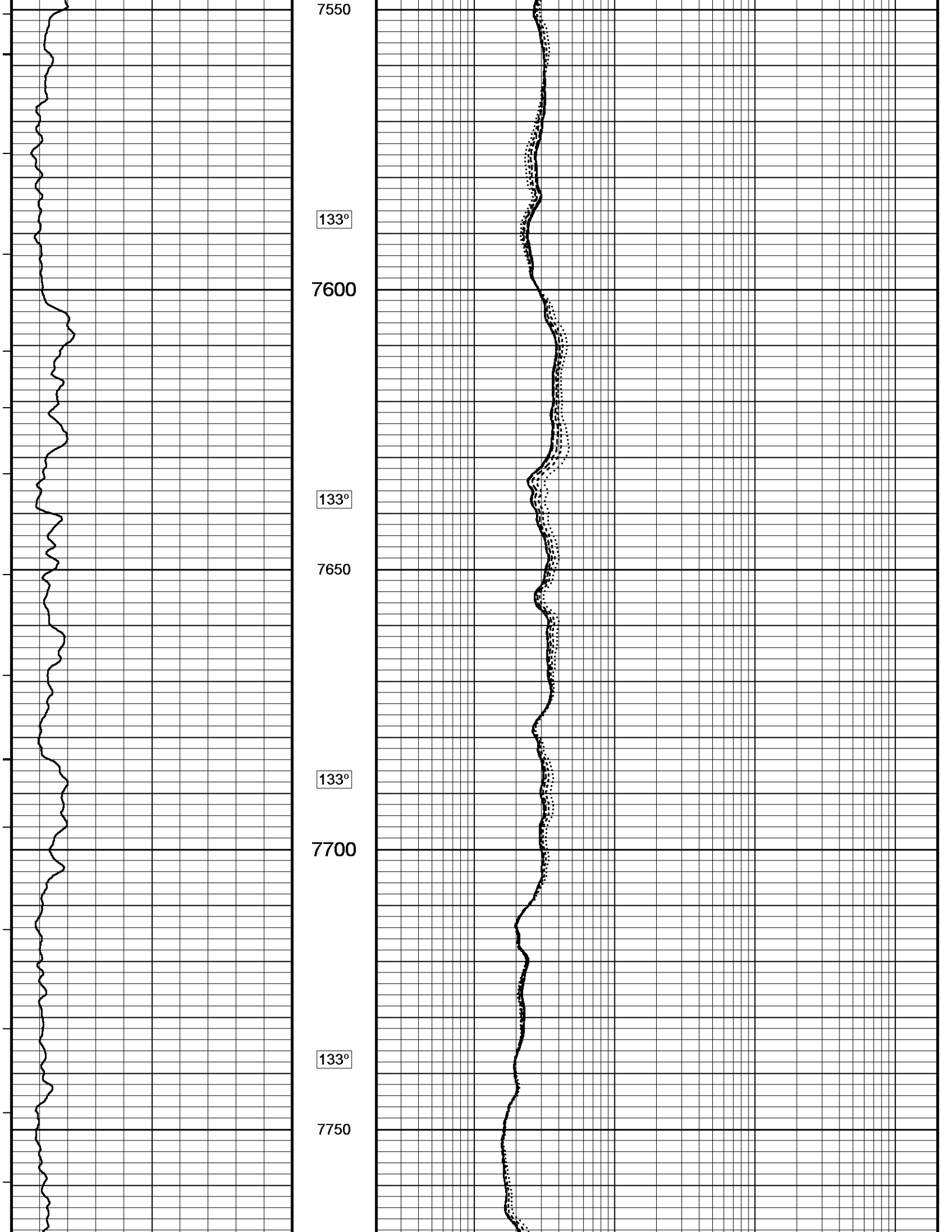
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7700
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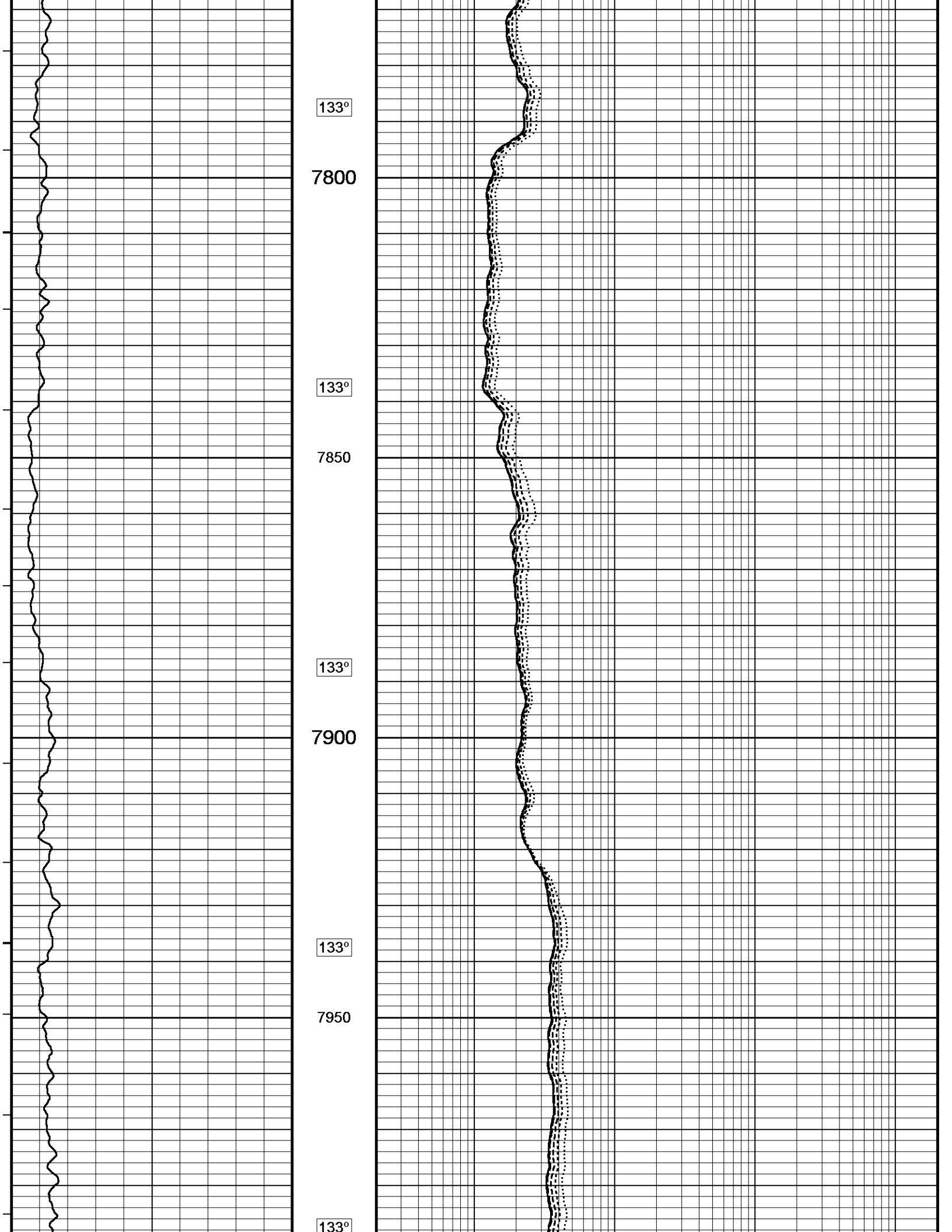
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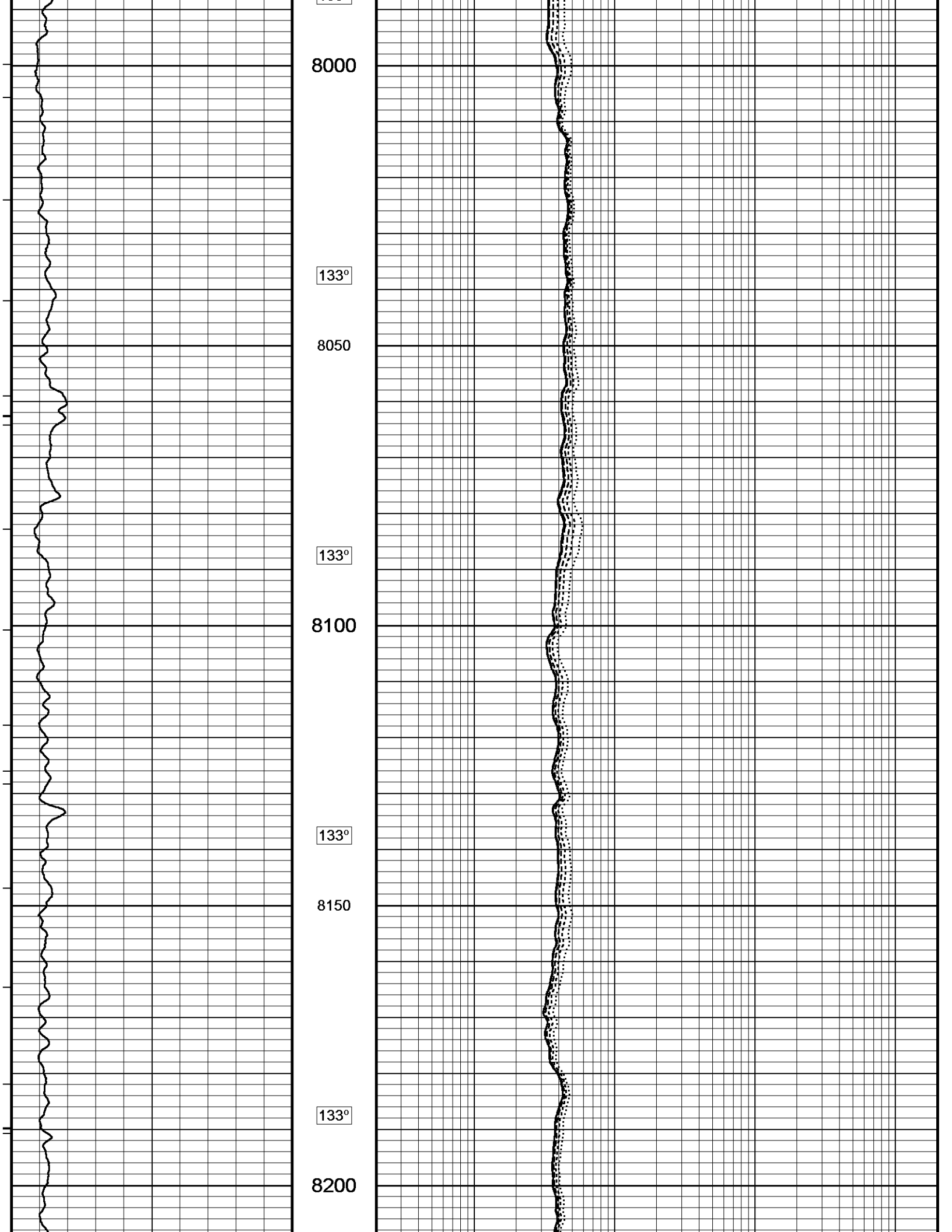
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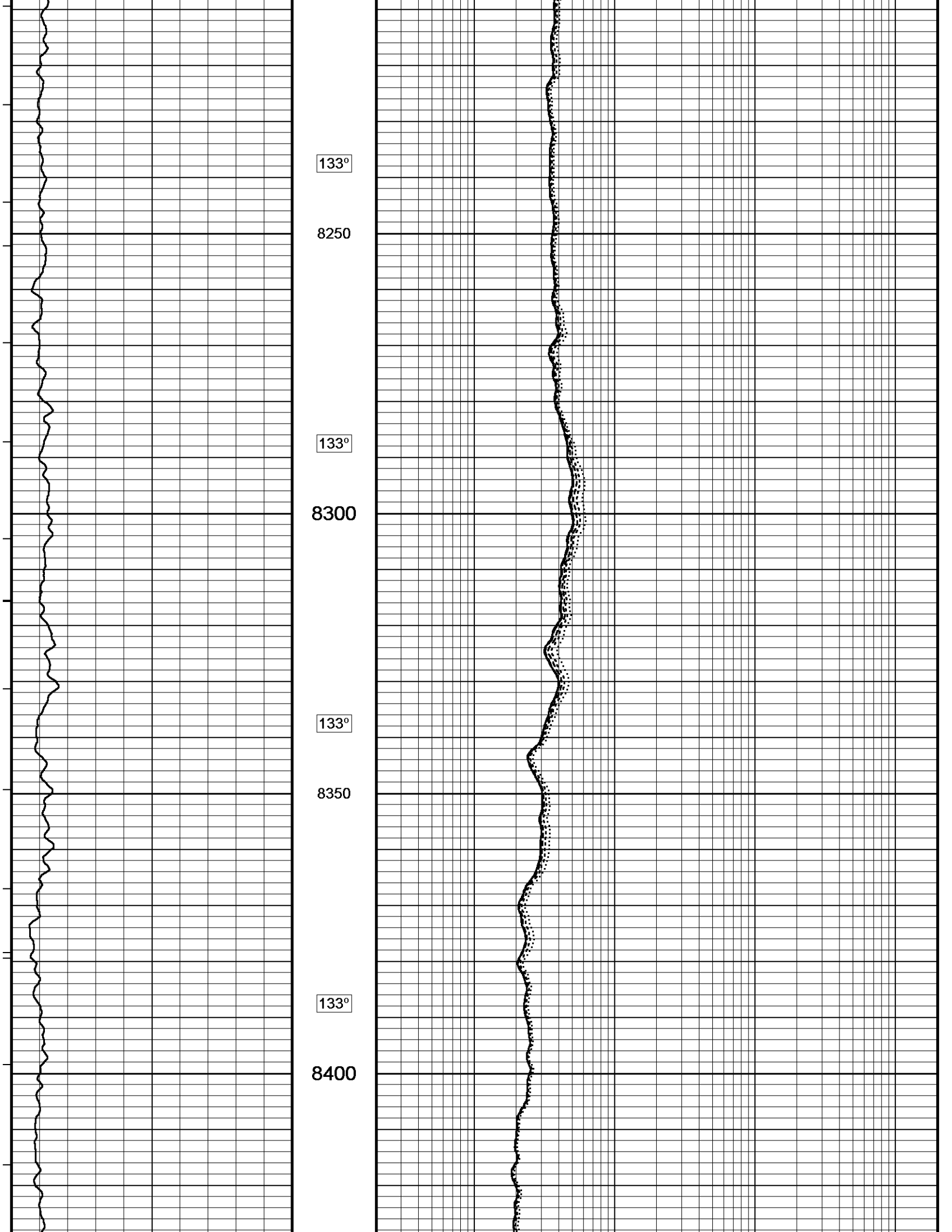
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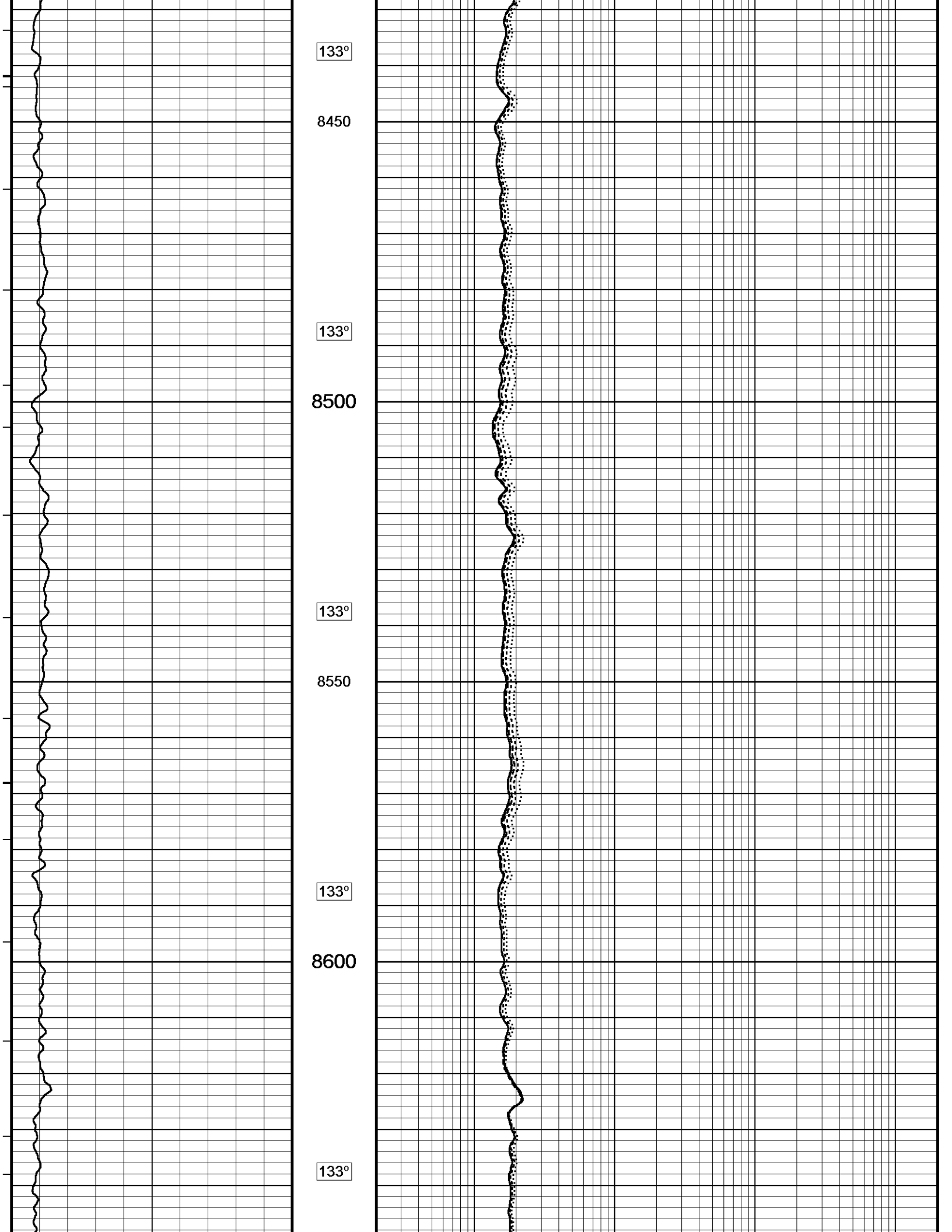
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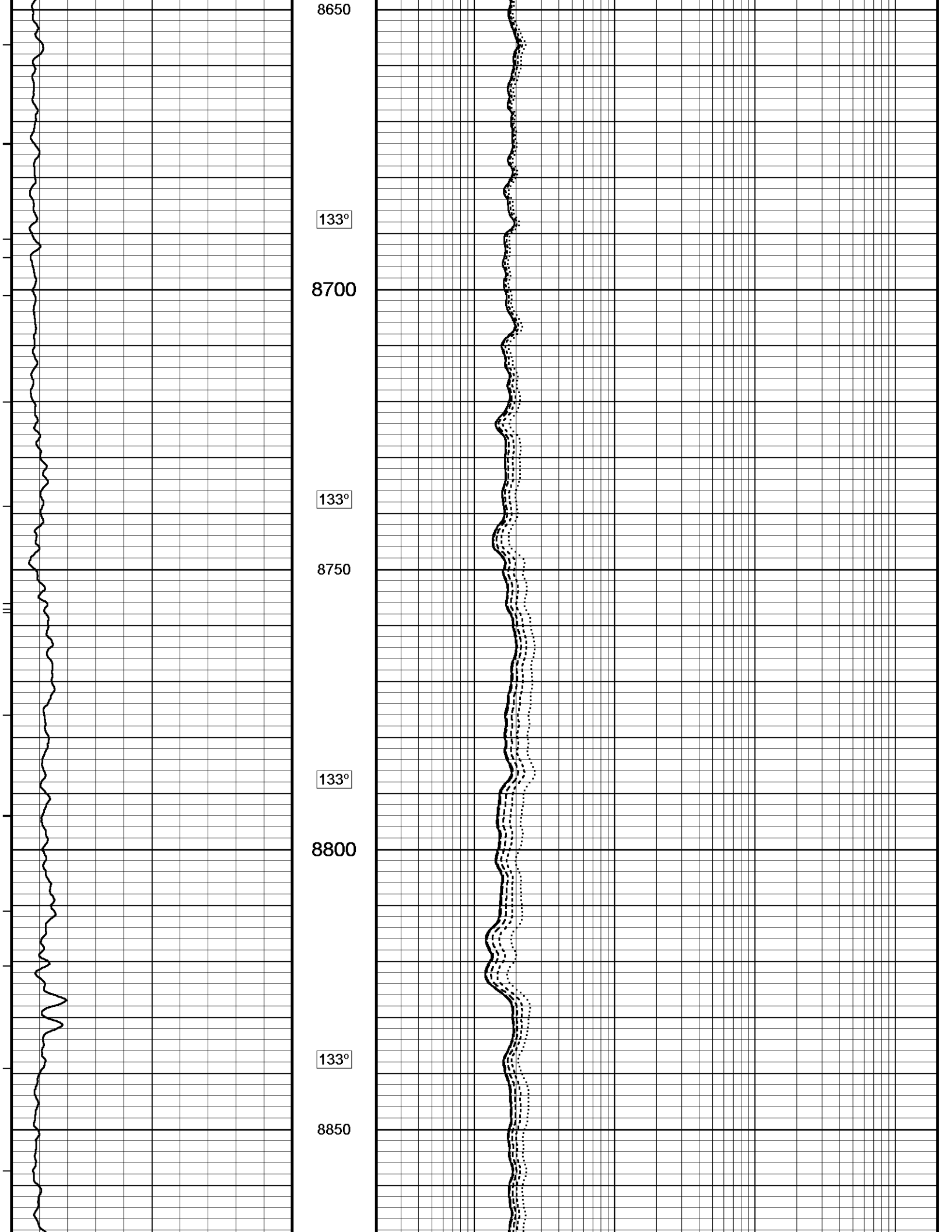
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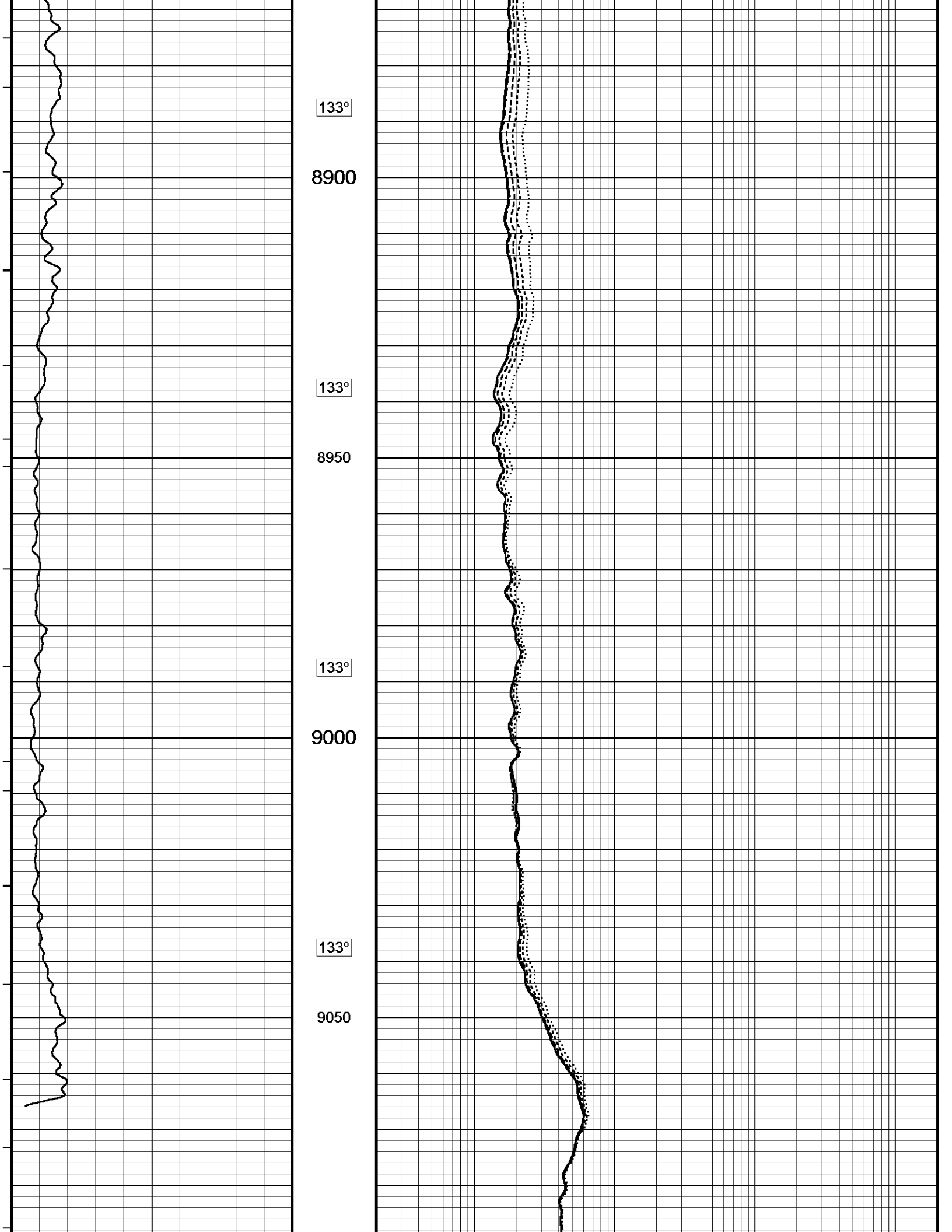
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8950
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9000
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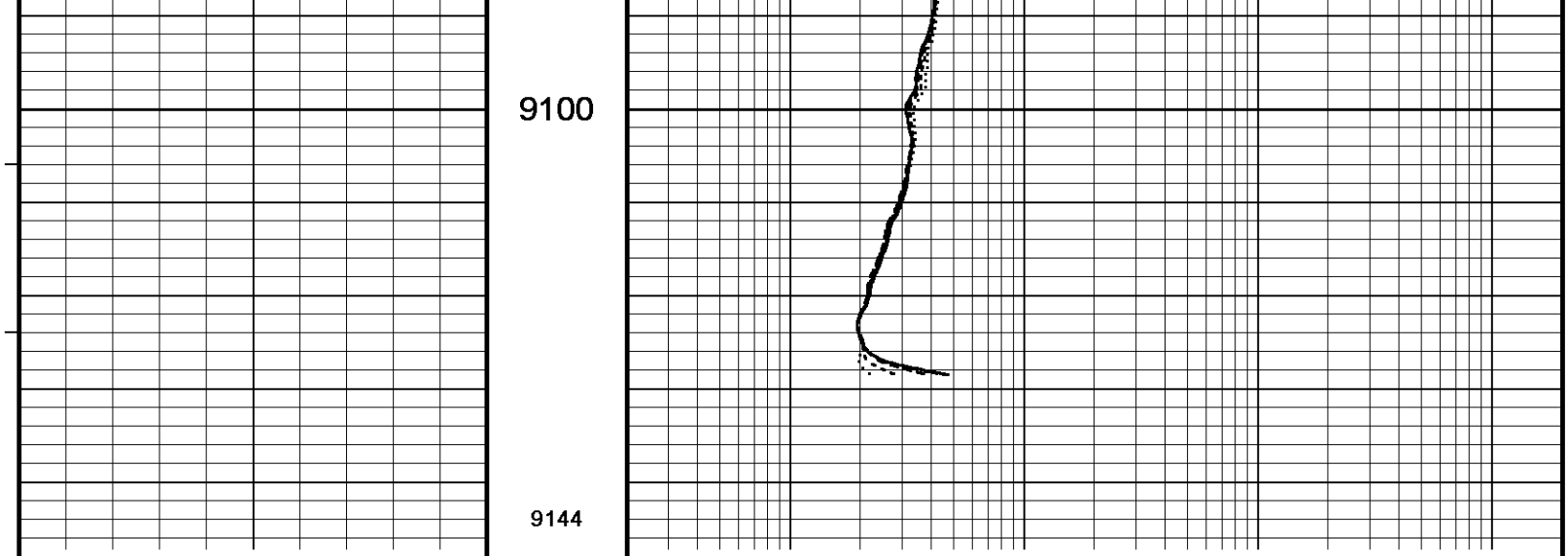

9144

Depth
In
Feet

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Borehole
Temp in
deg F

Array Ind. Four Res 20
ohm metres
0.20 2000
1 10 100 1000

Array Ind. Four Res 30
ohm metres
0.20 2000
1 10 100 1000

Array Ind. Four Res 40
ohm metres
0.20 2000
1 10 100 1000

Array Ind. Four Res 60
ohm metres
0.20 2000
1 10 100 1000

Array Ind. Four Res 85
ohm metres
0.20 2000
1 10 100 1000

Array Ind. Four Res Rt
ohm metres
0.20 2000
1 10 100 1000

Replay
Scale
1:240

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 25-APR-2011 16:17
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DSC

BEFORE SURVEY CALIBRATION
C:\Data\CMX\CMX Scrooge 1-7H\MMS160 Depthlog RTAP.dta

General Constants All 000
Last Edited on 25-APR-2011,14:52

General Parameters		
Mud Resistivity	2.000	ohm-metres
Mud Resistivity Temperature	74.200	degrees F
Water Level	0.000	feet
Density/Neutron Processing	Wet Hole	

Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	4.500	inches
Caliper for Differential Caliper	Density Caliper	

Rwa Parameters		
Porosity used	Limestone Density Por.	
Resistivity used	Array Ind. One Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	

Gamma Calibration MCG-D.A 329

Field Calibration on 24-APR-2011,08:03

	Measured	Calibrated (API)
Background	35	23
Calibrator (Gross)	1357	880
Calibrator (Net)	1321	857

Gamma Constants MCG-D.A 329

Last Edited on 24-APR-2011,08:04

Gamma Calibrator Number		
Mud Density	0.99	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Centred	
Concentration of KCl	0.00	kppm

High Resolution Temperature Constants MCG-D.A 329

Last Edited on

Pre-filter Length	11

Neutron Calibration MDN-A.B 29

Base Calibration on 06-OCT-2010 10:32
Field Check on 24-APR-2011,08:02

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3137	95	3714	110
Ratio	32.919		33.764	

Field Calibrator at Base

	Calibrated (cps)	
	2158	3193
Ratio	0.676	

Field Check

	Calibrated (cps)	
	2158	3193
Ratio	0.676	

Neutron Constants MDN-A.B 29

Last Edited on 28-JUL-2010,15:21

Neutron Source Id	712B	
Neutron Jig Number	N793	
Epithermal Neutron	No	
Caliper Source for Processing	Bit Size	
Stand-off	0.00	inches
Mud Density	1.00	gm/cc
Limestone Sigma	7.10	cu
Sandstone Sigma	4.26	cu
Dolomite Sigma	4.70	cu
Formation Pressure Source	Constant Value	
Formation Pressure	0.00	kpsi
Temperature Source	Constant Value	
Temperature	68.00	degrees F
Mud Salinity	0.00	kppm
Formation Fluid Salinity Source	Constant Value	
Formation Fluid Salinity	0.00	kppm
Resistivity Mud Correction	Not Applied	

Barite Mud Correction	Not Applied

Sonic Constants MSS-A.A 40

Last Edited on 24-APR-2011,08:46

Maximum Boundary Contrast	100.00	micro-sec/ft
Fluid Transit Time	189.00	micro-sec/ft
Limestone Transit Time	47.50	micro-sec/ft
Sandstone Transit Time	55.50	micro-sec/ft
Dolomite Transit Time	43.50	micro-sec/ft
Sonic used for Porosities	3-5' Compensated Sonic	
Correction for Sonde Skew	Applied	
Cycle Stretch Algorithm	Applied	
MN3FT	N/A	micro-sec
MX3FT	N/A	micro-sec
Hunt-Raymer Constant	83.13	micro-sec/ft

Sonde Mode	Full Waveform
Hole Type	Open Hole

Sonde Parameters

	Measured	Calibrated
Offset	0.0000	0.0000
Free Pipe	0.0000	0.0000

Peak Amplitude Source 0

Waveform	Start Time (micro-sec)	Width (micro-sec)	Pre Gain	Start Gain	Discriminator (mV)
3'	N/A	N/A	N/A	N/A	N/A
4'	N/A	N/A	N/A	N/A	N/A
5'	N/A	N/A	N/A	N/A	N/A
6'	N/A	N/A	N/A	N/A	N/A

Processed Fixed Gate Parameters

Waveform Used For Processing 3 foot

Start Time (micro-sec)	End Time (micro-sec)	Discriminator (mV)	Depth (ft)
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00
0.00	0.00	0.00	

Full Waveform Parameters

Use 3' Waveform to derive TR	Yes	
Use 4' Waveform to derive TR	No	
Use 5' Waveform to derive TR	No	
Use 6' Waveform to derive TR	No	
3' Waveform Discriminator Level	0.30	mV
4' Waveform Discriminator Level	0.30	mV
5' Waveform Discriminator Level	0.15	mV
6' Waveform Discriminator Level	0.15	mV
3' Waveform Filter	None	
4' Waveform Filter	None	
5' Waveform Filter	None	
6' Waveform Filter	None	
Semblance Level	0.50	
Semblance Window Width	120.00	micro-sec
Sonic 1 Despiker	100.00	micro-sec/ft
Sonic 2 Despiker	100.00	micro-sec/ft

Induction Calibration MAI-A.A 180

Base Calibration on 11-NOV-2010,13:50
Field Check on 24-APR-2011 07:59

Base Calibration

Test Loop Calibration Channel	Measured Low	Measured High	Calibrated (mmho/m) Low	Calibrated (mmho/m) High
1	17.0	486.5	9.3	966.2
2	5.7	390.0	7.6	821.4
3	3.3	264.7	5.2	566.0
4	2.2	137.6	2.6	279.2

Array Temperature 73.9 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)		
	Low	High	Low	High	
1	0.0	0.0	12.0	3738.9	
2	0.0	0.0	30.2	3462.3	
3	0.0	0.0	28.1	2994.7	
4	0.0	0.0	18.4	2015.8	
Deep	0.0	0.0	15.8	1938.9	
Medium	0.0	0.0	42.4	3972.3	
Shallow	0.0	0.0	46.9	5134.0	
Array Temperature		0.0		55.4	Deg F

Induction Constants MAI-A.A 180

Last Edited on 25-APR-2011,14:52

Induction Model	RtAP-WBM	
Caliper for Borehole Corr.	Density Caliper	
Hole Size for Borehole Correction	N/A	inches
Tool Centred	No	
Stand-off Type	Fins	
Stand-off	0.50	inches
Number of Fins on Stand-off	6.0000	
Stand-off Fin Angle	60.00	degrees
Stand-off Fin Width	0.5000	inches
Borehole Corr. Rm Source	Temperature Corr	
Temp. for Rm Corr.	MCG External Temperature	
Squasher Start	0.0050	mhos/metre
Squasher Offset	N/A	mhos/metre

Borehole Normalisation

DRM1	0.0000	DRC1	0.0000
DRM2	0.0000	DRC2	0.0000
MRM1	0.0000	MRC1	0.0000
MRM2	0.0000	MRC2	0.0000
SRM1	0.0000	SRC1	0.0000
SRM2	0.0000	SRC2	0.0000

Calibration Site Corrections

Channel 1	0.00	mmhos/metre
Channel 2	0.00	mmhos/metre
Channel 3	0.00	mmhos/metre
Channel 4	0.00	mmhos/metre

Apparent Porosity and Water Saturation Constants

Archie Constant (A)	1.00	
Cementation Exponent (M)	2.00	
Saturation Exponent (N)	2.00	
Saturation of Water for Apor	100.00	percent
Resistivity of Water for Apor and Sw	0.05	ohm-m
Resistivity of Mud Filtrate for Sw	0.00	ohm-m
Source for Rt	0.00	
Source for Rxo	0.00	

High Resolution Temperature Calibration MAI-A.A 180

Field Calibration on 09-JUL-2010,10:16

	Measured	Calibrated(Deg F)
Lower	1.00	33.80
Upper	11.00	51.80

High Resolution Temperature Constants MAI-A.A 180

Last Edited on

Pre-filter Length	11

Photo Density Calibration MPD-C.J 395

Base Calibration on 23-APR-2011,16:11
Field Check on 24-APR-2011 08:10

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	51280	25360	60364	31945
Reference 2	22085	2705	25079	2547

Field Check at Base

	1260.5	1507.3

Field Check

1286.3	1509.2

PE Calibration

Base Calibration

	WS	Measured WH	Ratio	Calibrated Ratio
Background	232	1132		
Reference 1	22282	51086	0.441	0.399
Reference 2	6205	21945	0.287	0.273

Field Check at Base

232.0	1132.1

Field Check

236.0	1158.3

Density Constants MPD-C.J 395

Last Edited on 24-APR-2011,08:04

Density Source Id	246	
Nylon Calibrator Number	DNCE603	
Aluminium Calibrator Number	DACA509	
Density Shoe Profile	4 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	0.99	gm/cc
Mud Density Z/A Multiplier	1.11	
Mud Filtrate Density	1.00	gm/cc
Dry Hole Mud Filtrate Density	1.00	gm/cc
DNCT	0.00	gm/cc
CRCT	0.00	gm/cc
Density Z/A Correction	Hybrid	

Matrix Density (gm/cc)	Depth (ft)
2.71	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00

Caliper Calibration MPD-C.J 395

Base Calibration on 23-APR-2011 16:36
Field Calibration on 24-APR-2011 08:17

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	15488	3.99
2	24960	5.97
3	34848	7.99
4	44224	9.86
5	55360	11.93
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.92	5.97

DOWNHOLE EQUIPMENT

C:\Data\CMX\CMX Scrooge 1-7H\MMS160 Depthlog RTAP.dta

SRT Post Deployment
MLK-A 1 LG: 4.87 ft WT: 30.9 lb OD: 2.24 in

MBS-D.A 400v Compact Battery Sub
MBS-D.A 138 LG: 14.24 ft WT: 105.8 lb OD: 2.24 in

Compact Comms Gamma
MCG-D.A 329 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Memory Sub D.A
MMS-D.A 160 LG: 3.12 ft WT: 30.9 lb OD: 2.24 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 212 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SHA-D Compact Swivel Head Adaptor
SHA-D 5 LG: 2.74 ft WT: 26.5 lb OD: 2.24 in

MIS-A.A Compact Inline Bowspring sub
MIS-A.A 41 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact Neutron
MDN-A.B 29 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-C.J 395 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in

MIS-A.A Compact Inline Bowspring sub
MIS-A.A 275 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SHA-H Compact Swivel Head Adaptor
SHA-H 167 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

SKJ-E.A Compact Knuckle Joint
SKJ-E.A 166 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

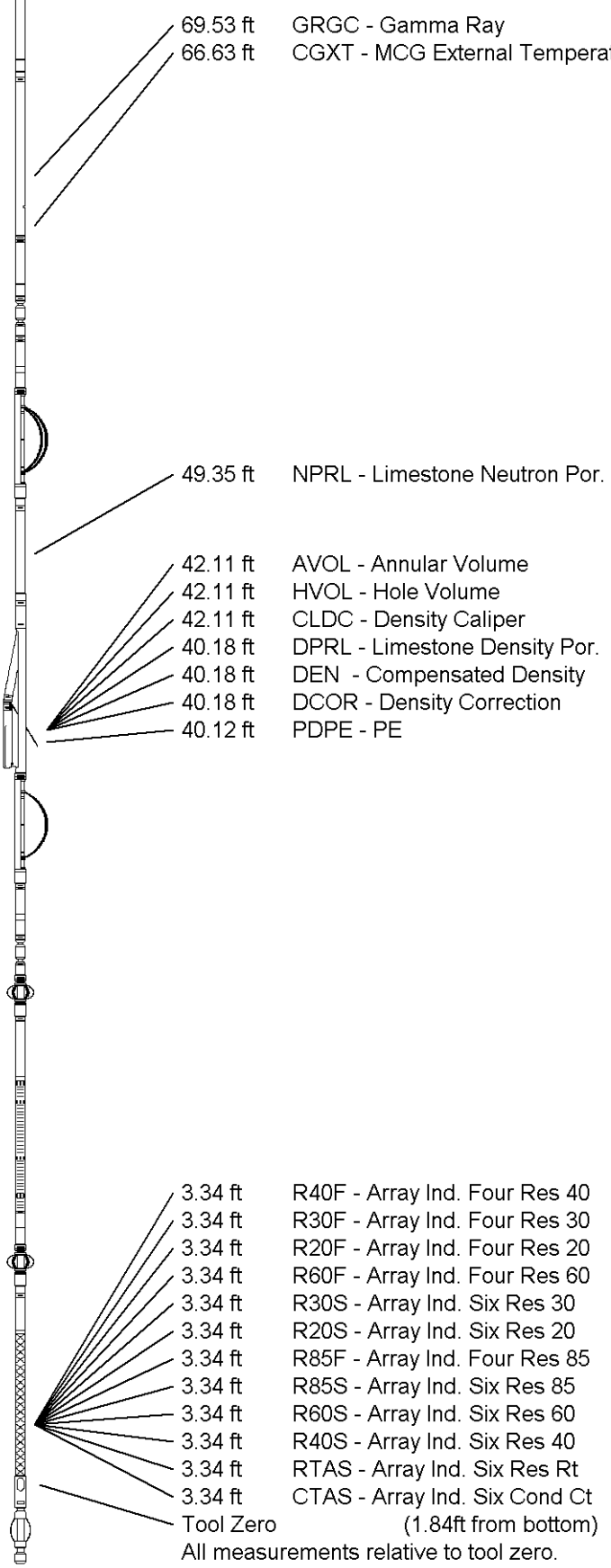
MIS-E.A Compact Inline Standoff sub
MIS-E.A 217 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Sonic
MSS-A.A 40 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in

MIS-E.A Compact Inline Standoff sub
MIS-E.A 336 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Induction
MAI-A.A 180 LG: 12.52 ft WT: 48.5 lb OD: 2.24 in

Total Length: 95.64 ft Weight: 687.8 lb



69.53 ft	GRGC - Gamma Ray
66.63 ft	CGXT - MCG External Temperature
49.35 ft	NPRL - Limestone Neutron Por.
42.11 ft	AVOL - Annular Volume
42.11 ft	HVOL - Hole Volume
42.11 ft	CLDC - Density Caliper
40.18 ft	DPRL - Limestone Density Por.
40.18 ft	DEN - Compensated Density
40.18 ft	DCOR - Density Correction
40.12 ft	PDPE - PE
3.34 ft	R40F - Array Ind. Four Res 40
3.34 ft	R30F - Array Ind. Four Res 30
3.34 ft	R20F - Array Ind. Four Res 20
3.34 ft	R60F - Array Ind. Four Res 60
3.34 ft	R30S - Array Ind. Six Res 30
3.34 ft	R20S - Array Ind. Six Res 20
3.34 ft	R85F - Array Ind. Four Res 85
3.34 ft	R85S - Array Ind. Six Res 85
3.34 ft	R60S - Array Ind. Six Res 60
3.34 ft	R40S - Array Ind. Six Res 40
3.34 ft	RTAS - Array Ind. Six Res Rt
3.34 ft	CTAS - Array Ind. Six Cond Ct
Tool Zero	(1.84ft from bottom)

All measurements relative to tool zero.

COMPANY	CMX INC.
WELL	SCROOGE 1-7H
FIELD	STRANATHAN
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS

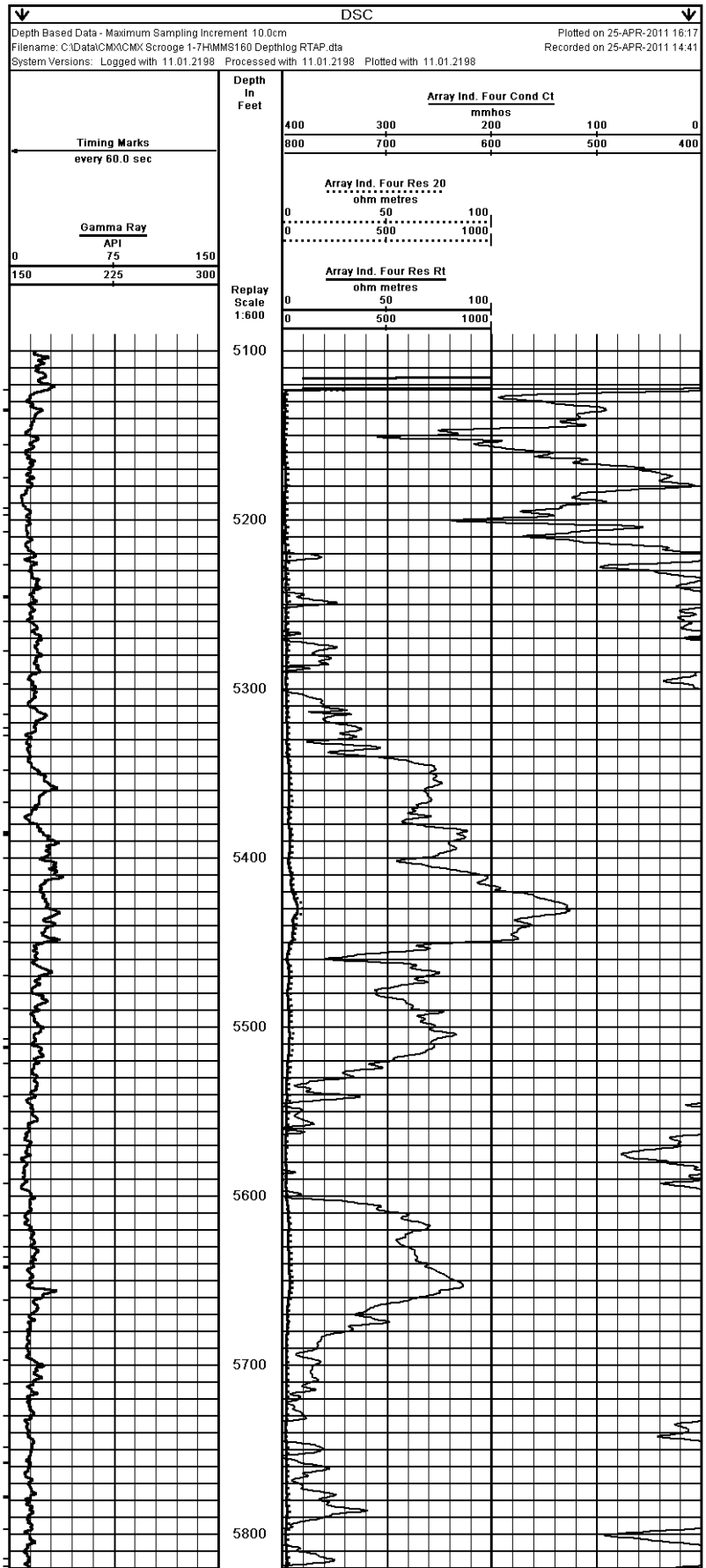
Elevation Kelly Bushing	1389.00	feet	First Reading	9128.00	feet

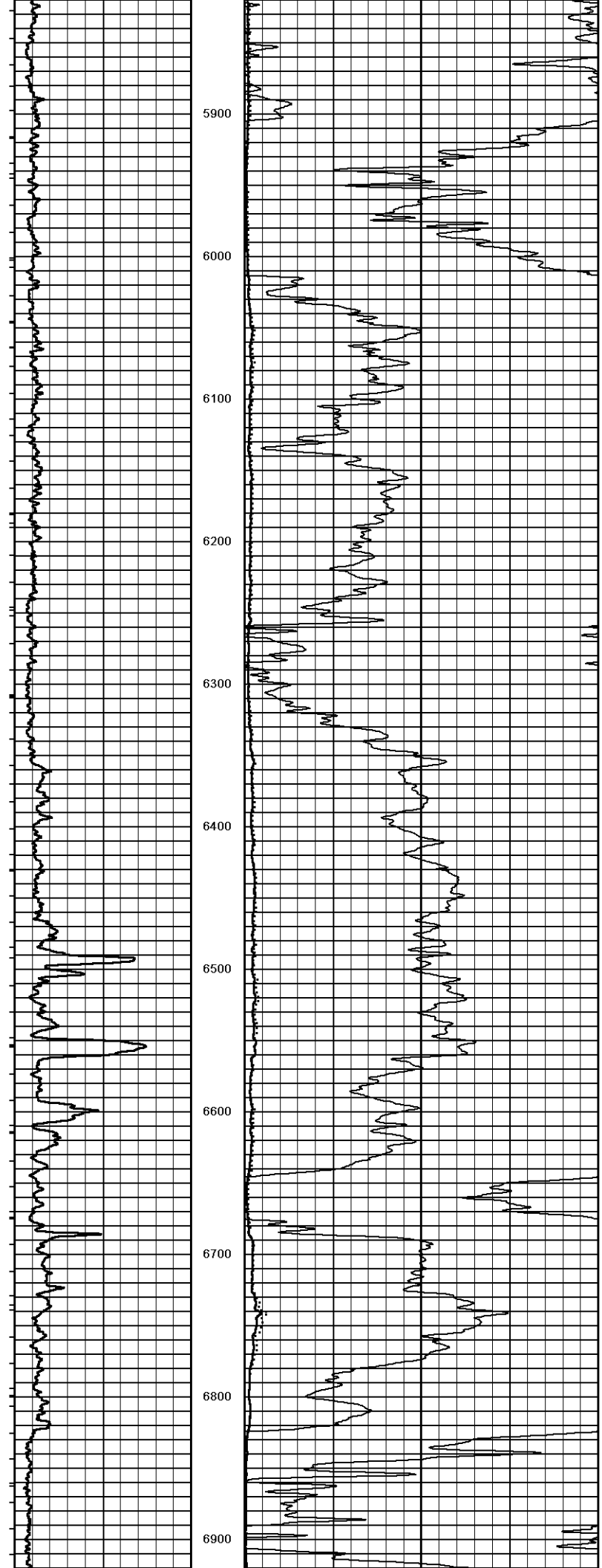
Elevation Kelly Bushing	1389.00	feet	First Reading	9128.00	feet
Elevation Drill Floor	1389.00	feet	Depth Driller	9402.00	feet
Elevation Ground Level	1372.00	feet	Depth Logger	9136.00	feet

Weatherford®

COMPACT WELL SHUTTLE
COMPACT ARRAY INDUCTION
ELECTRIC LOG

40 Years of Wireline 1970 2010

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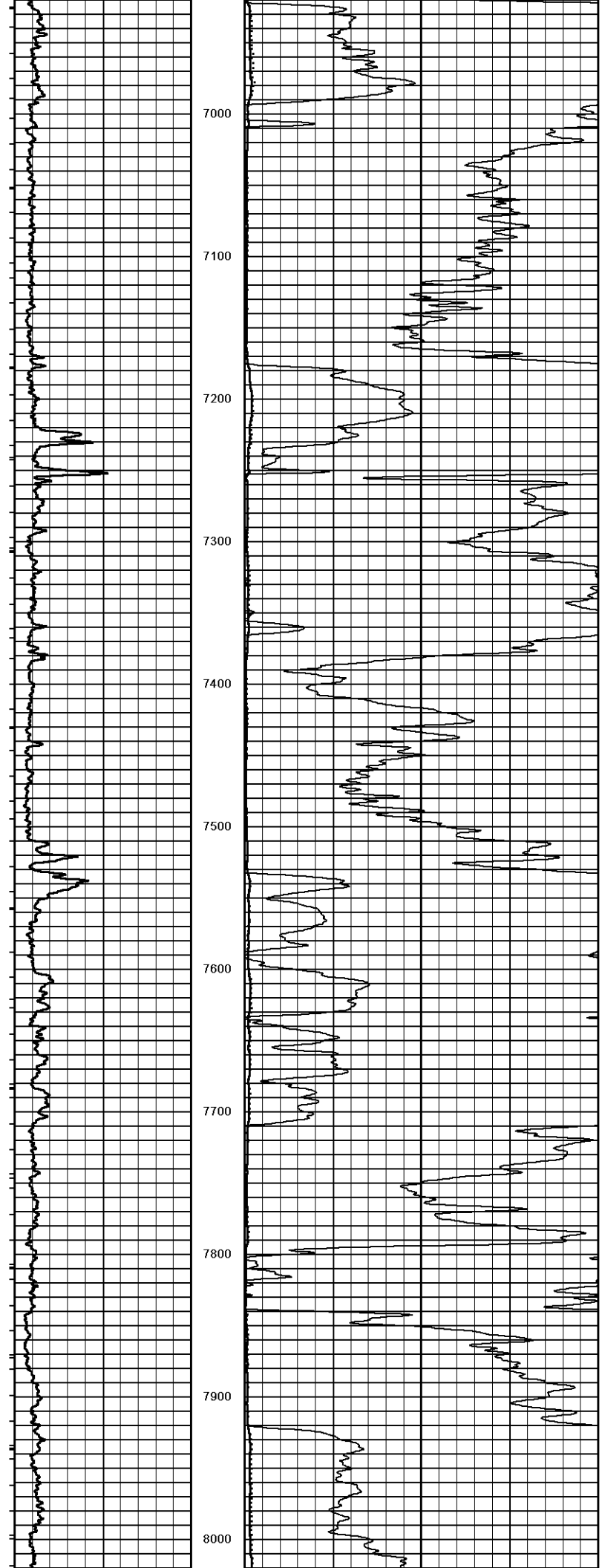
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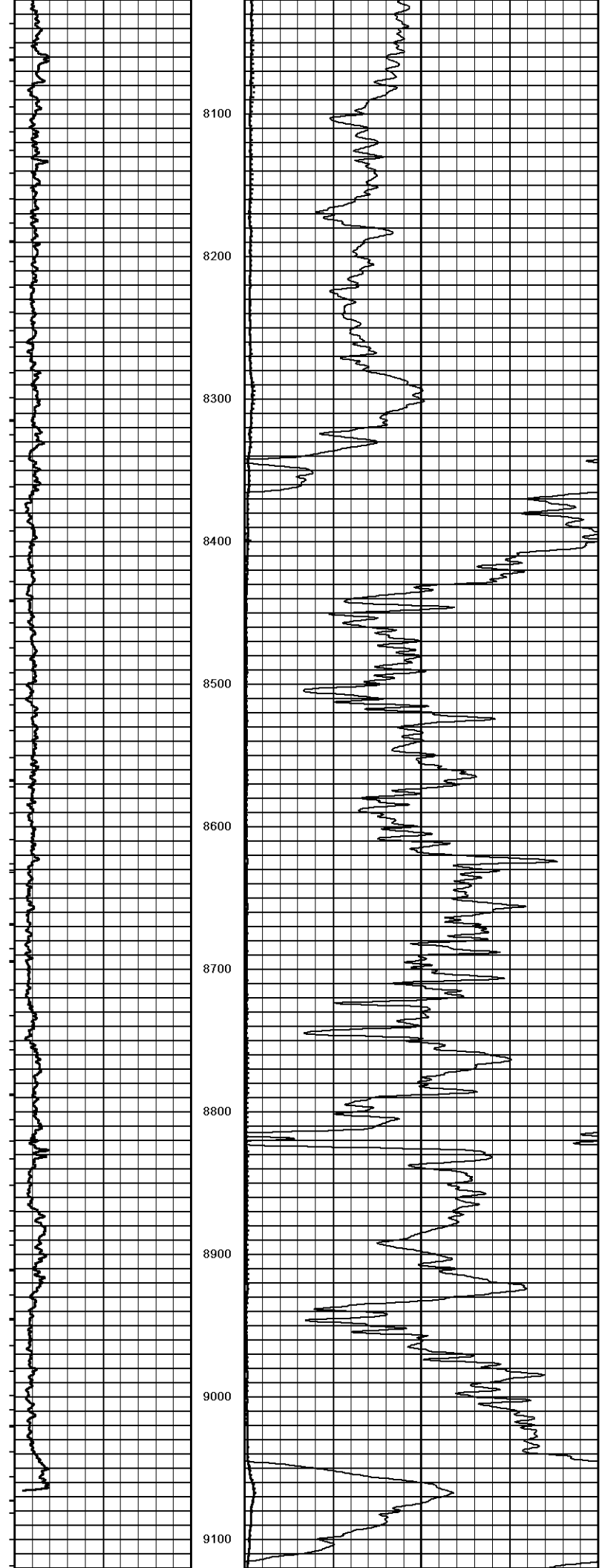
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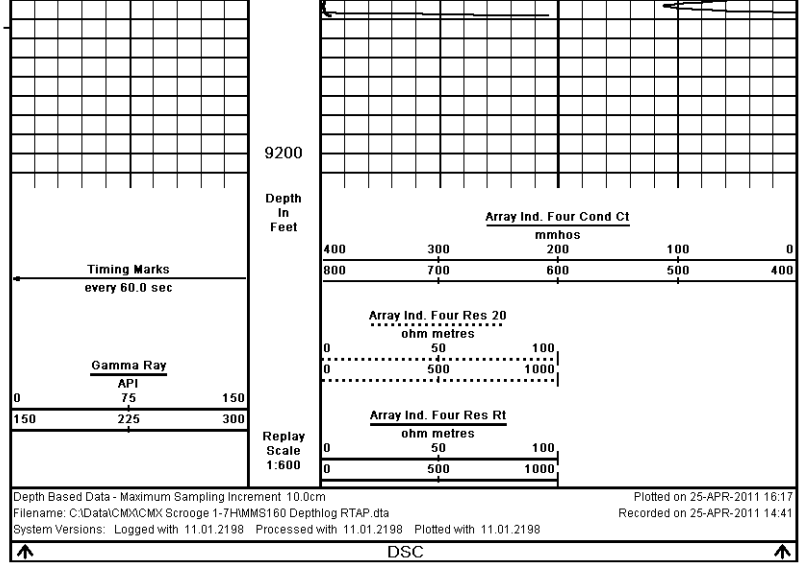

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 25-APR-2011 16:17
Filename: C:\Data\CMX\CMX Scrooge 1-7H\MMS160 Depthlog RTAP.dta — Recorded on 25-APR-2011 14:41
System Versions: Logged with 11.01.2198 Processed with 11.01.2198 Plotted with 11.01.2198

DSC

COMPANY	CMX INC.
WELL	SCROOGE 1-7H
FIELD	STRANATHAN
PROVINCE/COUNTY	BARBER
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	1389.00	feet	First Reading	9128.00	feet
Elevation Drill Floor	1389.00	feet	Depth Driller	9402.00	feet
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Weatherford

COMPACT WELL SHUTTLE
COMPACT ARRAY INDUCTION
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