



Weatherford

**COMPENSATED SONIC
WITH INTEGRATED TRANSIT TIME**

COMPANY			MURFIN DRILLING COMPANY INC.		
WELL			ROGUE #10-25		
FIELD			WILDCAT		
PROVINCE/COUNTY			LINCOLN		
COUNTRY/STATE			U.S.A. / COLORADO		
LOCATION			2299' FSL & 1647' FEL		
SEC 25	TWP 9S	RGE 56W	Other Services		MPD/MDN
Latitude			MAI/MFE		
Longitude			MML		
API Number	05-073-06736				
Permanent Datum GL, Elevation 5303 feet					
Log Measured From KB, 13.00 feet above Permanent Datum					
Drilling Measured From KB					
Date	07-FEB-2018				
Run Number	ONE				
Service Order	4558-205041941				
Depth Driller	8187.00		feet		
Depth Logger	7776.00		feet		
First Reading	7763.00		feet		
Last Reading	478.00		feet		
Casing Driller	475.00		feet		
Casing Logger	478.00		feet		
Bit Size	7.875		inches		
Hole Fluid Type	CHEMICAL				
Density / Viscosity	9.20	lb/USg	80.00	CP	
PH / Fluid Loss	8.50		8.50	ml/30Min	
Sample Source	FLOWLINE				
Rm @ Measured Temp	1.39 @ 75.0		ohm-m		
Rmf @ Measured Temp	1.11 @ 75.0		ohm-m		
Rmc @ Measured Temp	1.67 @ 75.0		ohm-m		
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.62 @168.0		ohm-m		
Time Since Circulation	6 HOURS				
Max Recorded Temp	168.00		deg F		
Equipment / Base	13244		LIB		
Recorded By	ADAM SILL				
Witnessed By	GREGG SMITH				

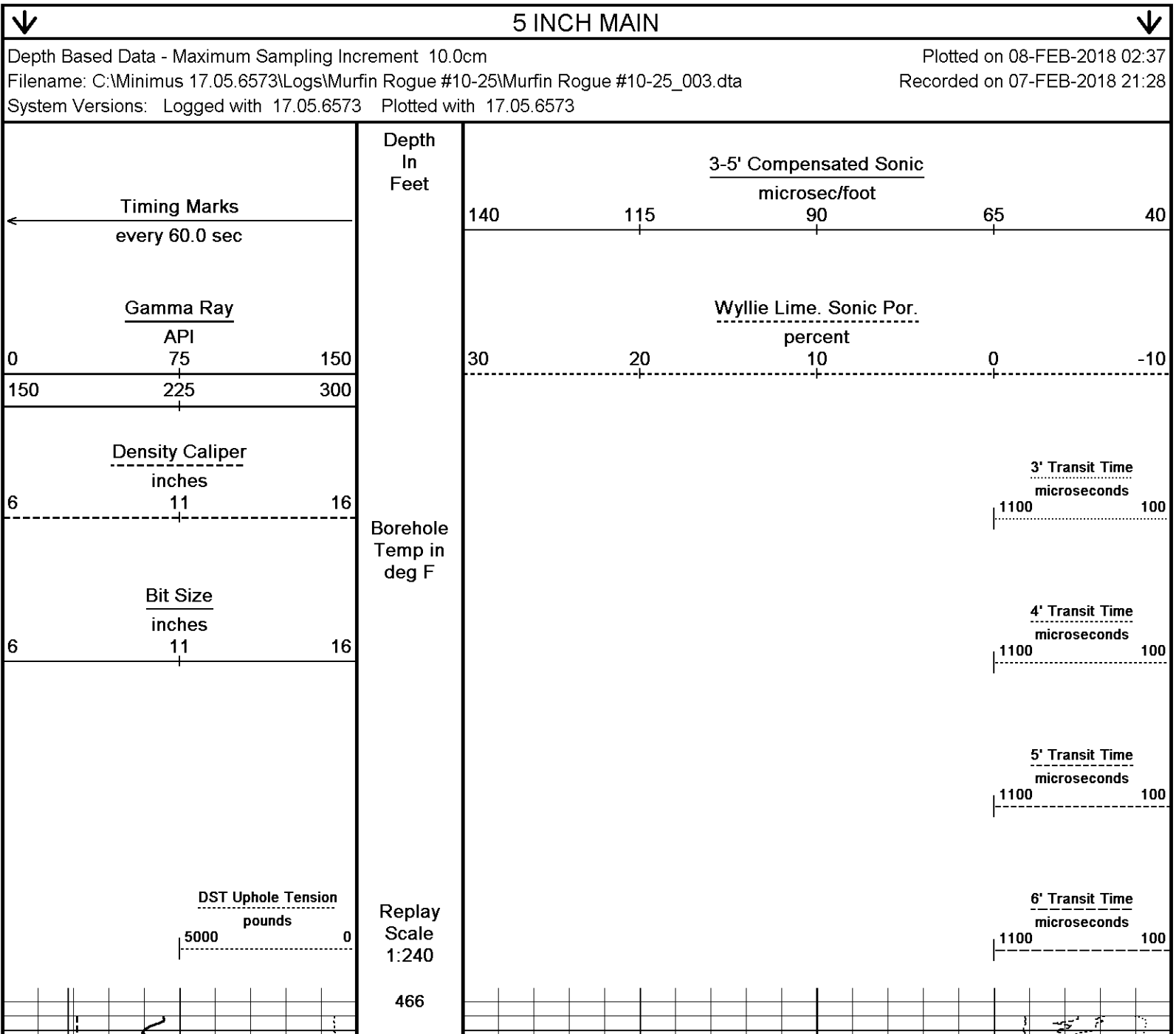
BOREHOLE RECORD					Last Edited: 07-FEB-2018 12:40
Bit Size inches		Depth From feet		Depth To feet	
7.875		475.00		8187.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	475.00	24.00	

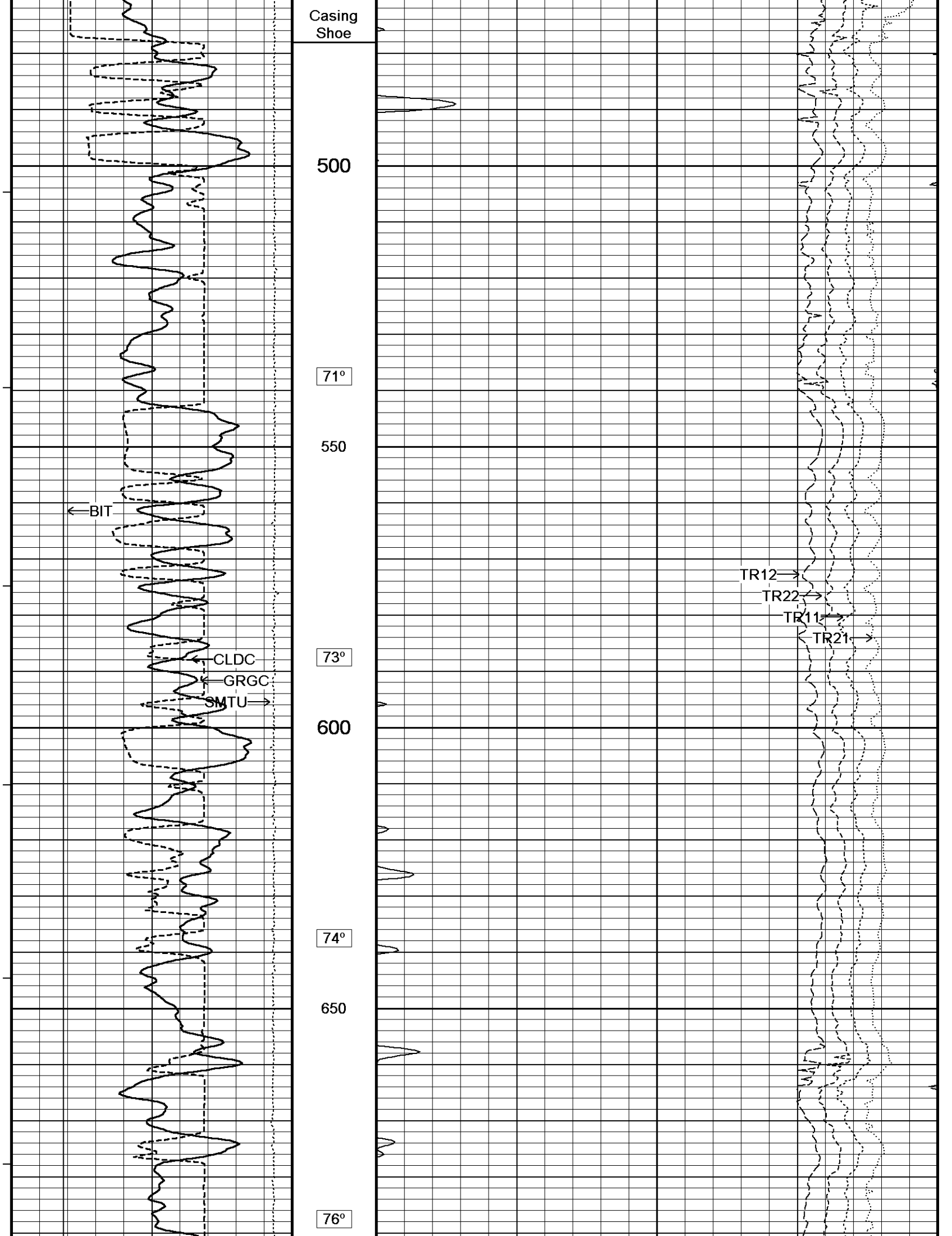
REMARKS
- SOFTWARE ISSUE: WLS 17.05.6573.
- RUN ONE: MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. TWO 0.5 INCH STANDOFFS USED ON MSS. 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 3682 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO 4200 FEET: 685 CU.FT.

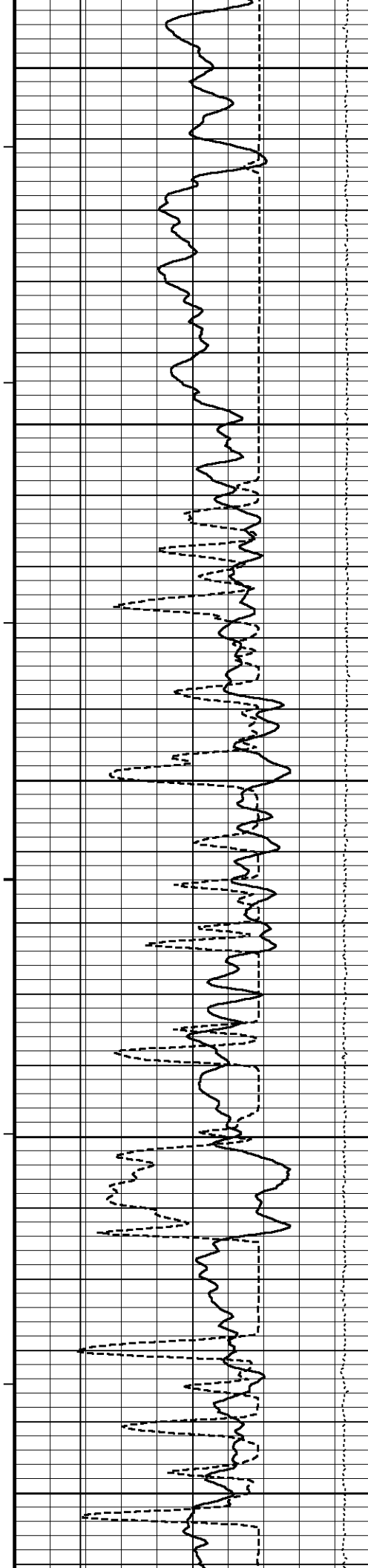
- RIG: MURFIN #25.
- ENGINEER: A. SILL.
- OPERATOR: B. TOVAR.

**** BRIDGED OFF AT 7776 FEET AND WAS INSTRUCTED TO LOG OUT FROM THERE WITHOUT A REPEAT SECTION. ****

In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.







700

77°

750

78°

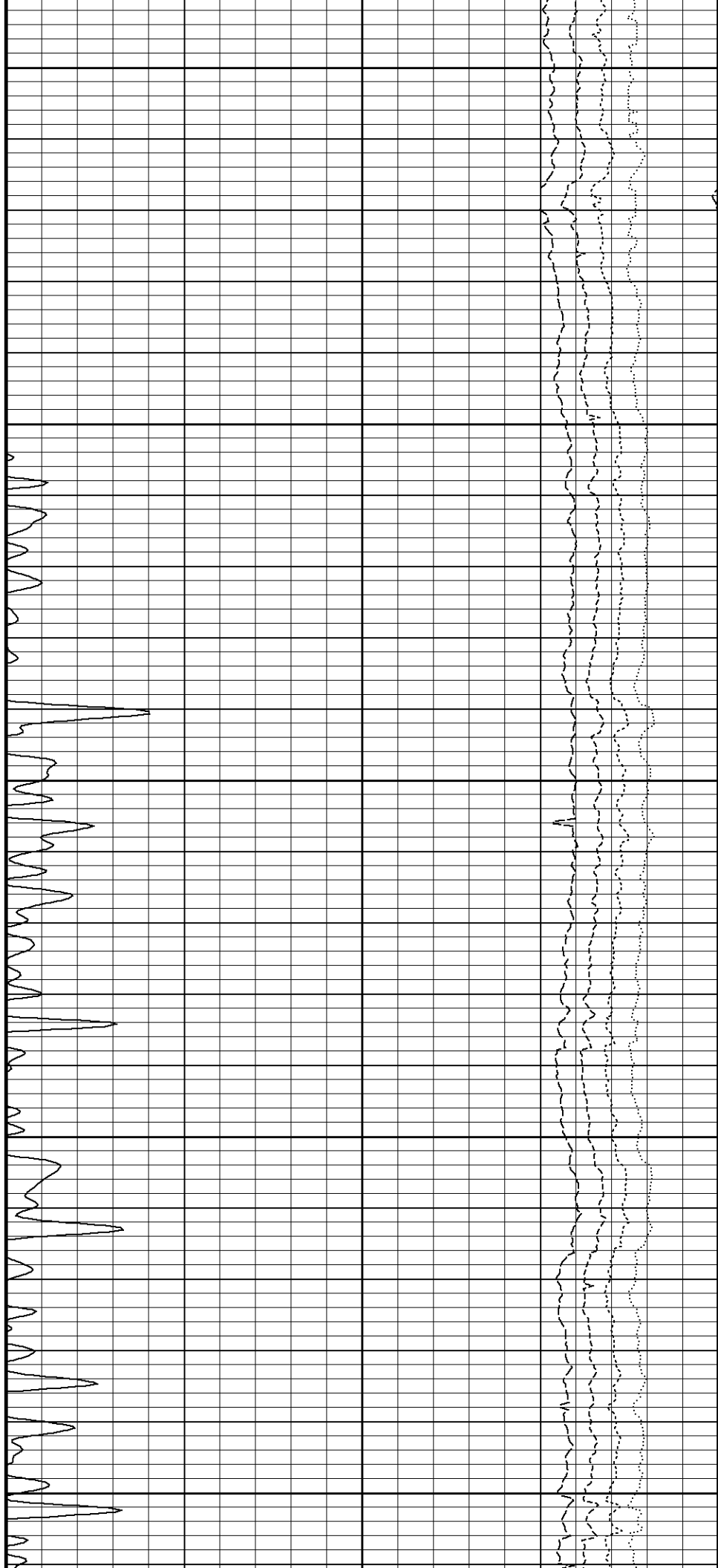
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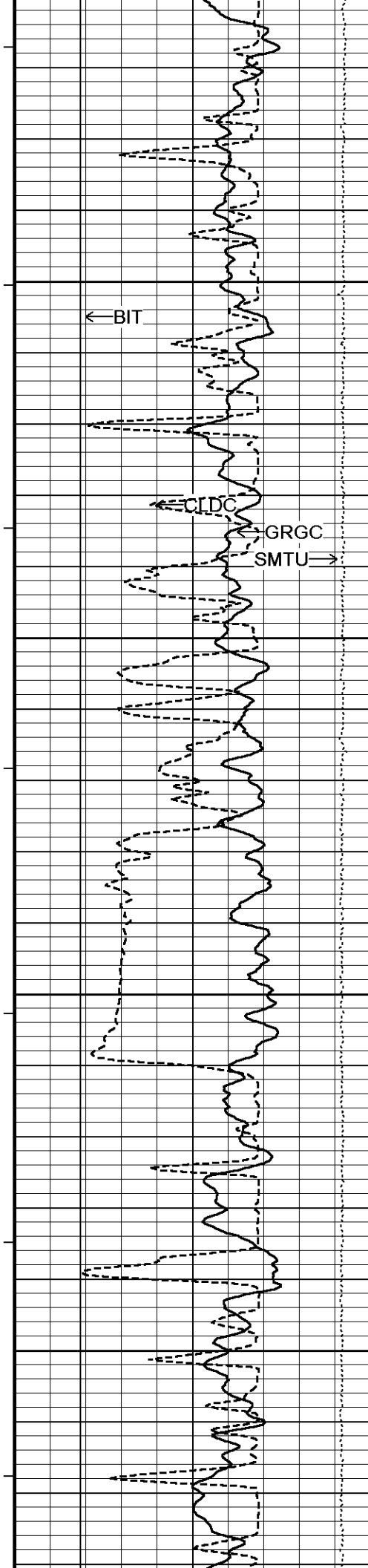
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850

80°

900





81°

950

DT35

83°

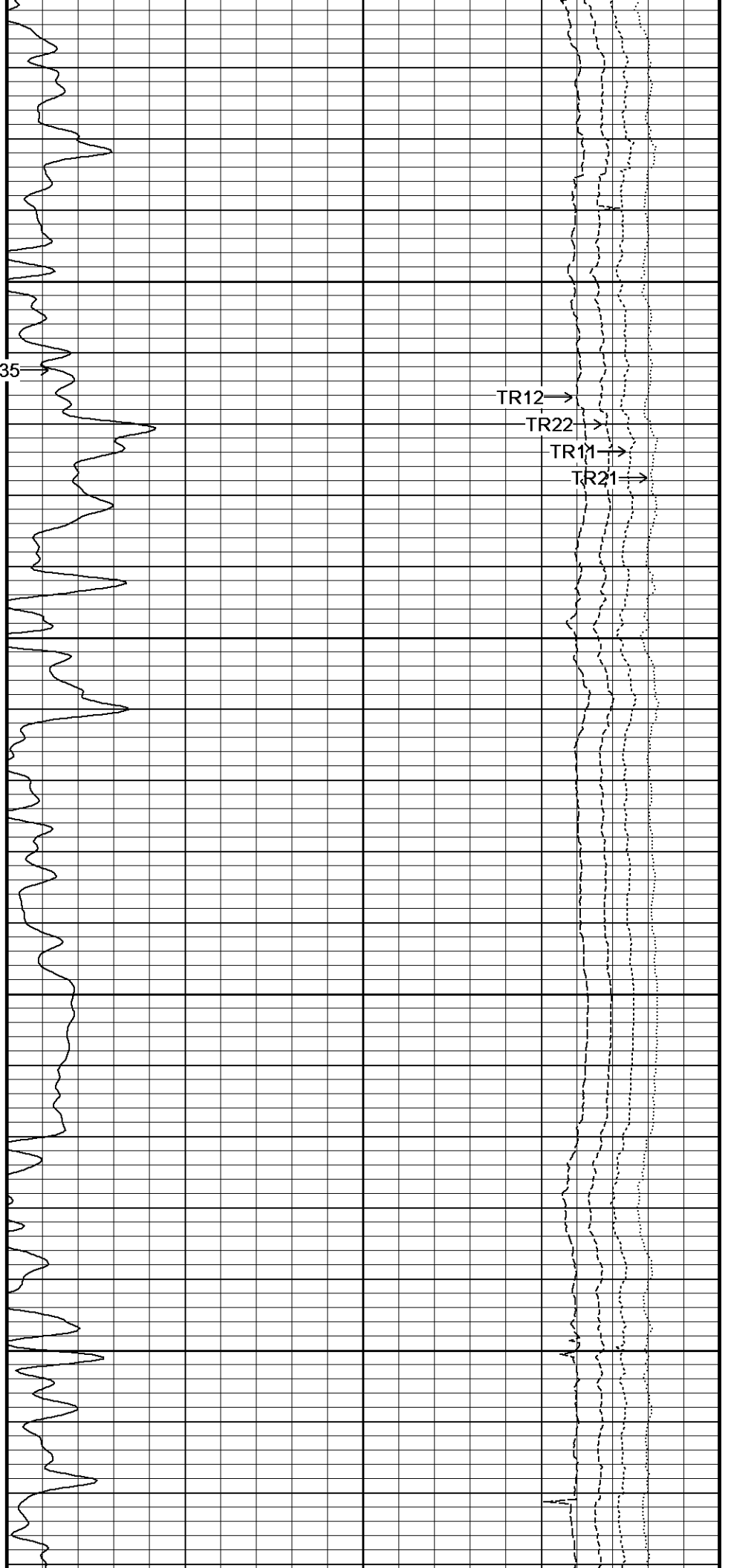
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83°

1050

83°

1100

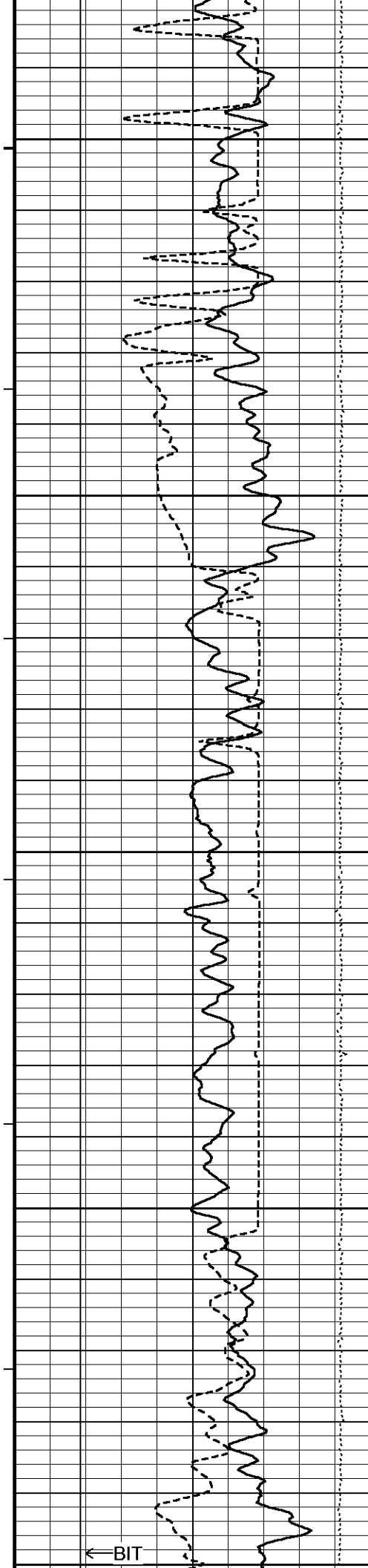


TR12

TR22

TR11

TR21



84°

1150

85°

1200

84°

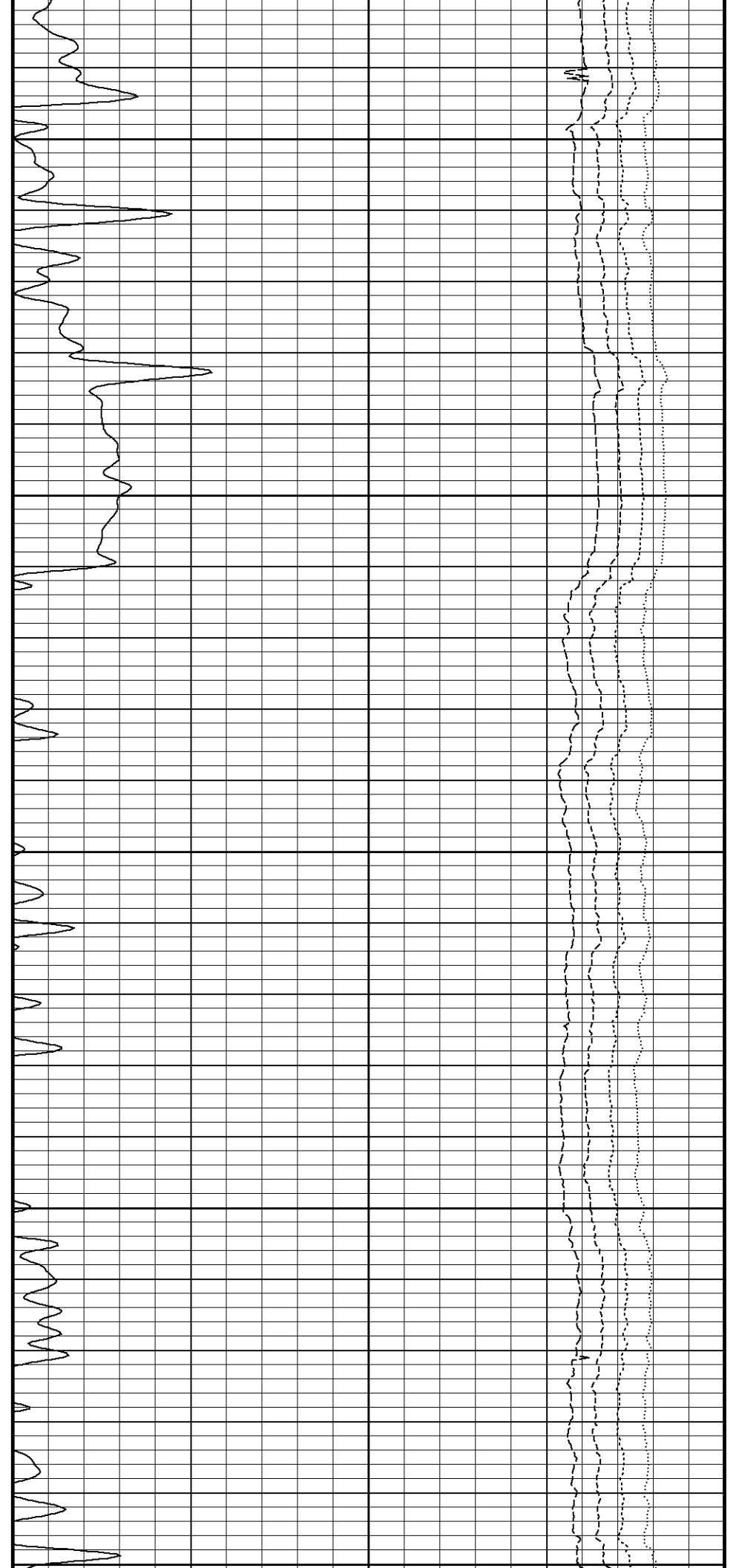
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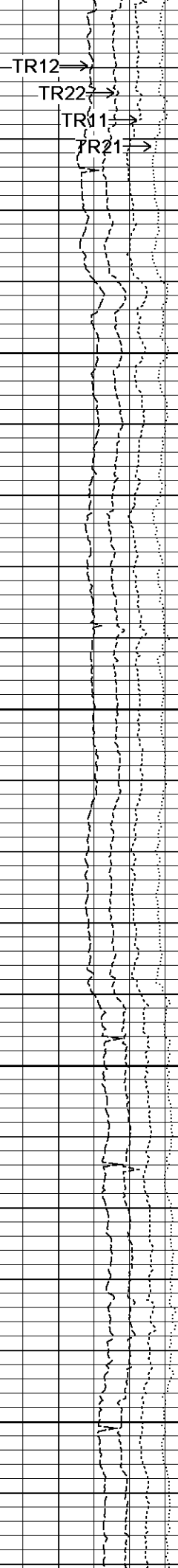
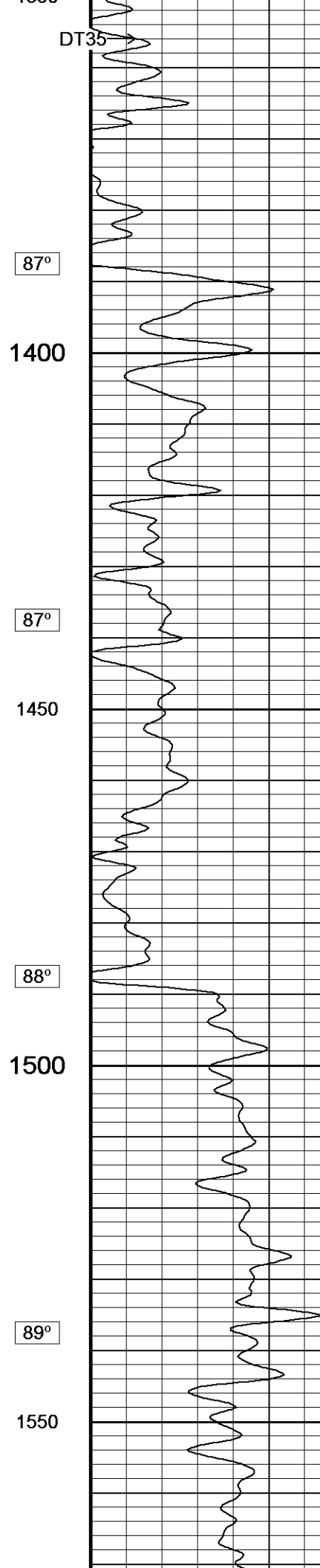
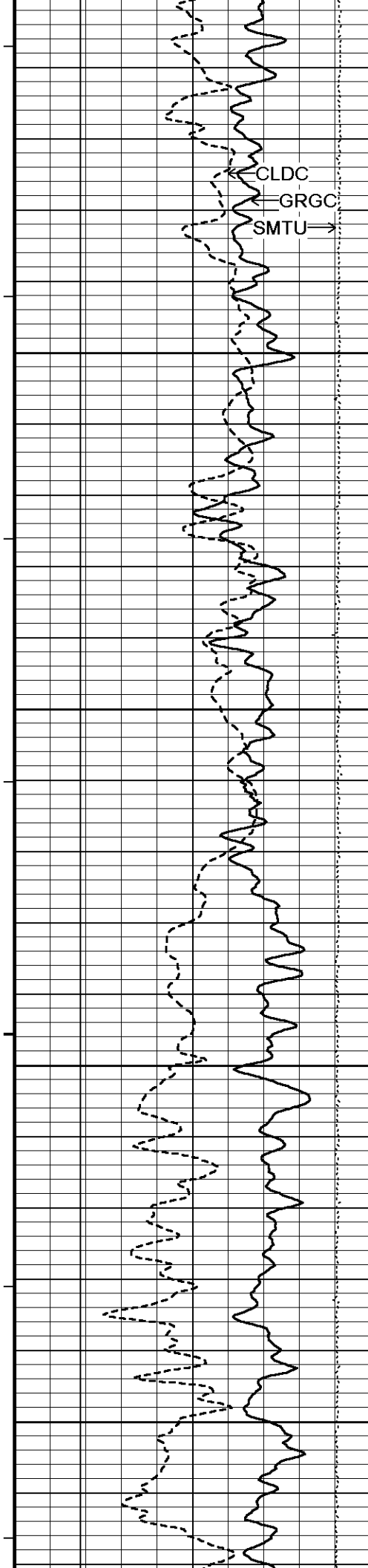
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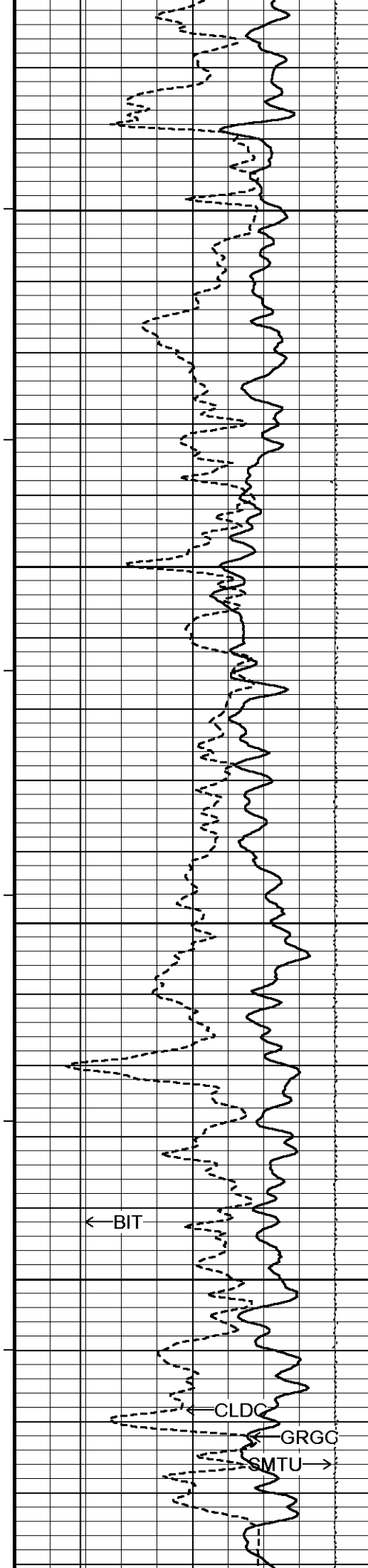
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86°

1350







90°

1600

90°

1650

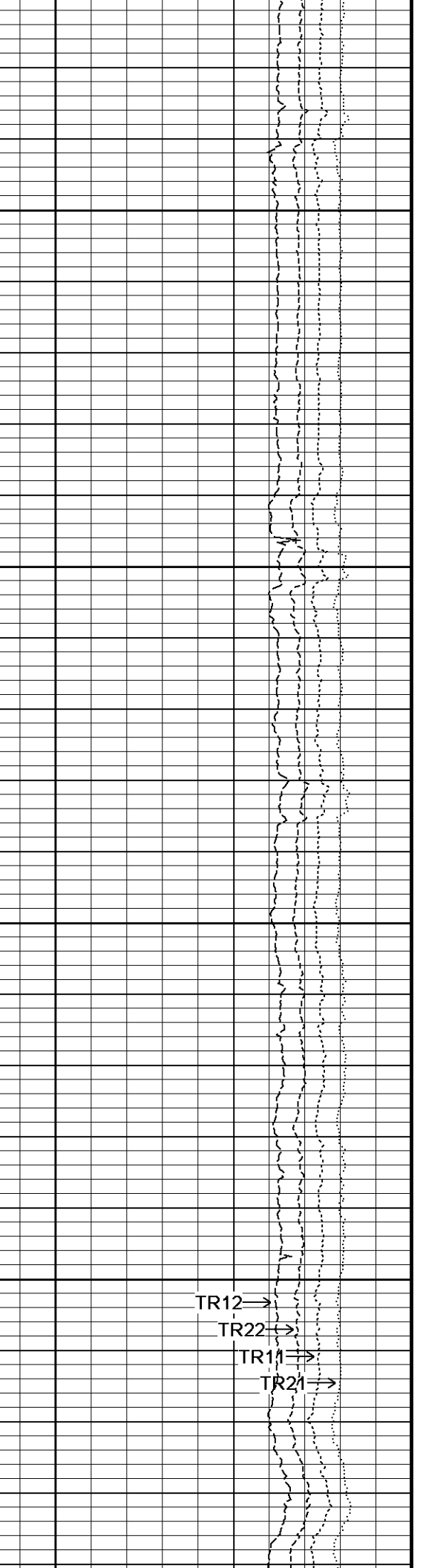
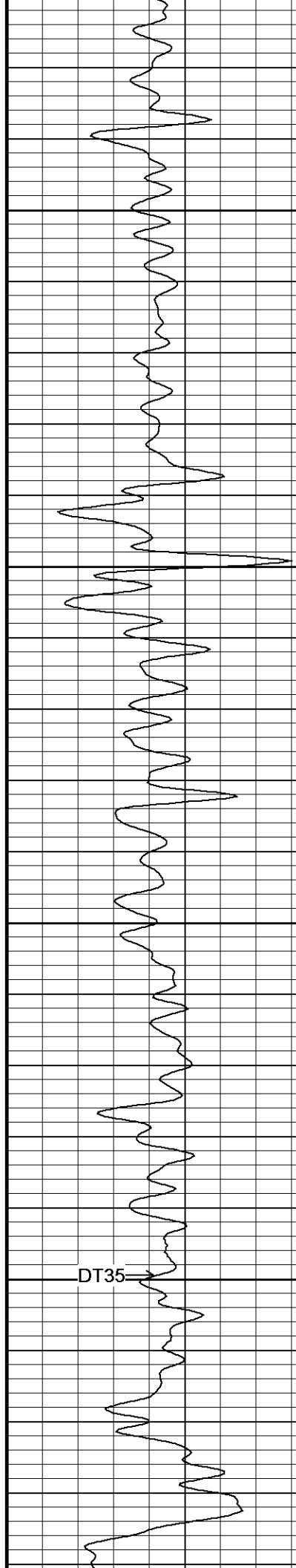
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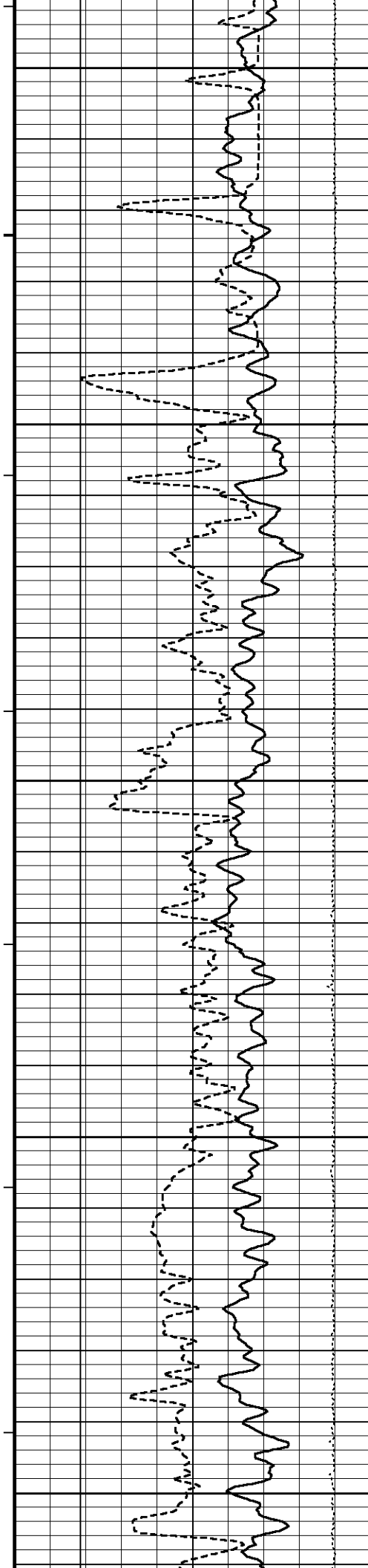
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91°

1750

92°





1800

93°

1850

94°

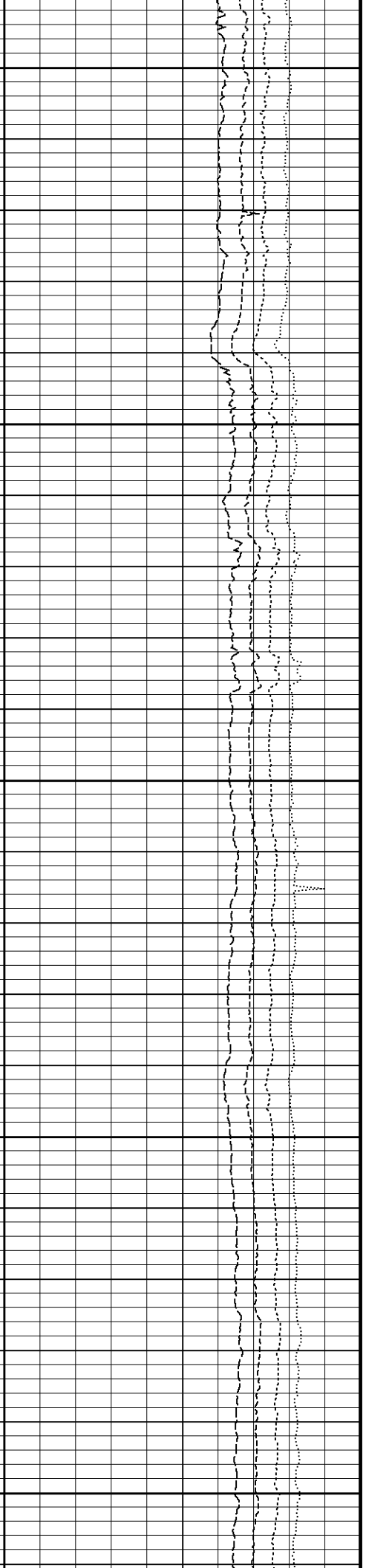
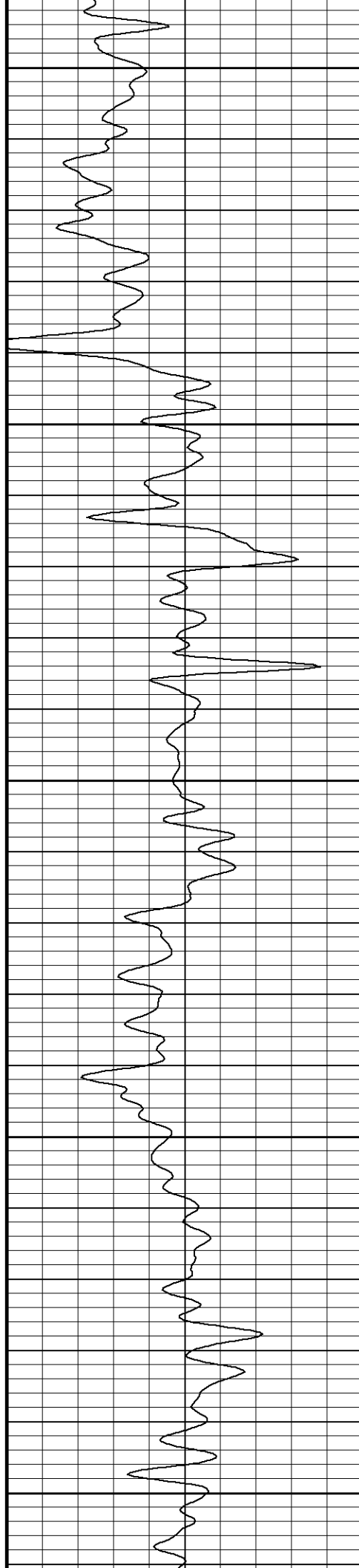
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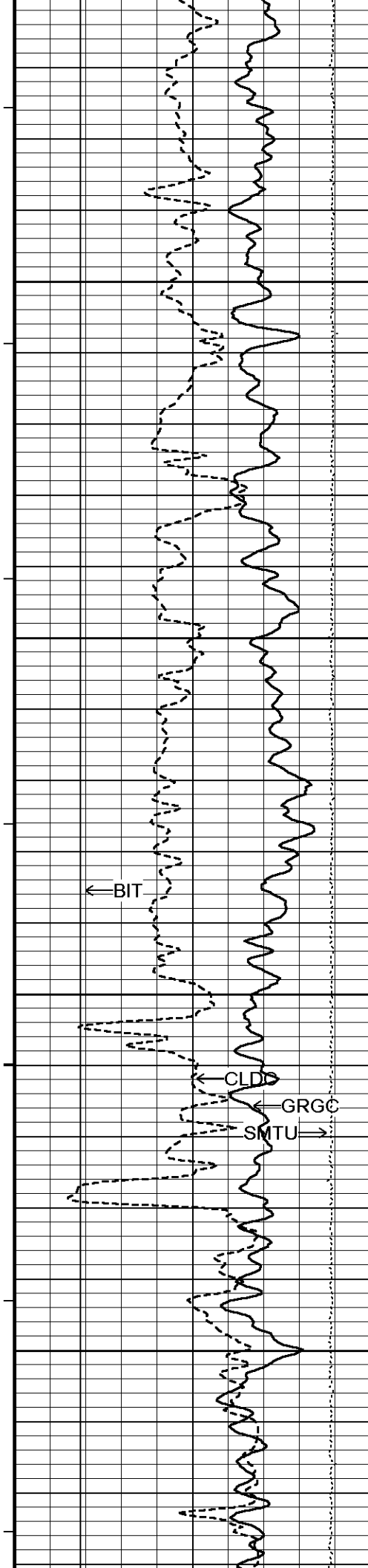
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1950

95°

2000





96°

2050

96°

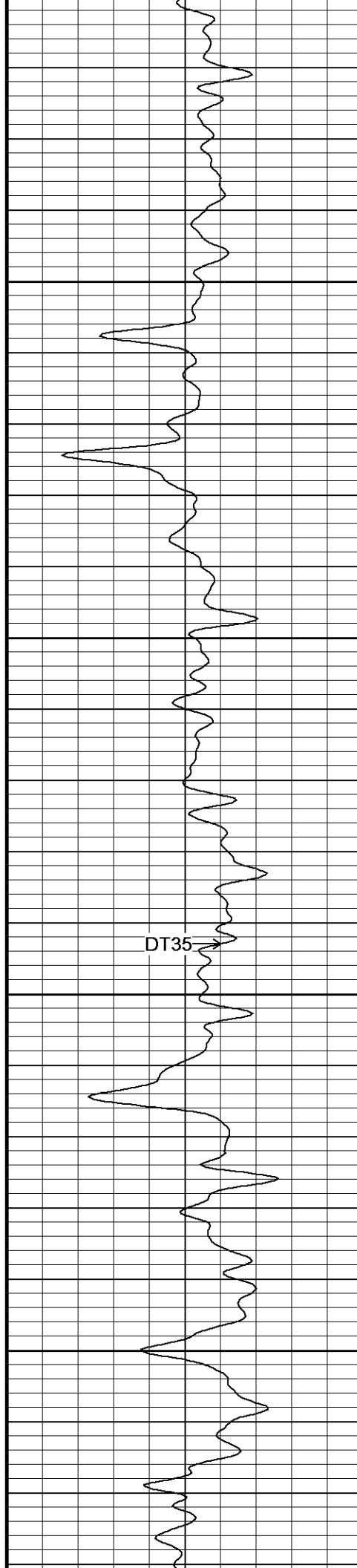
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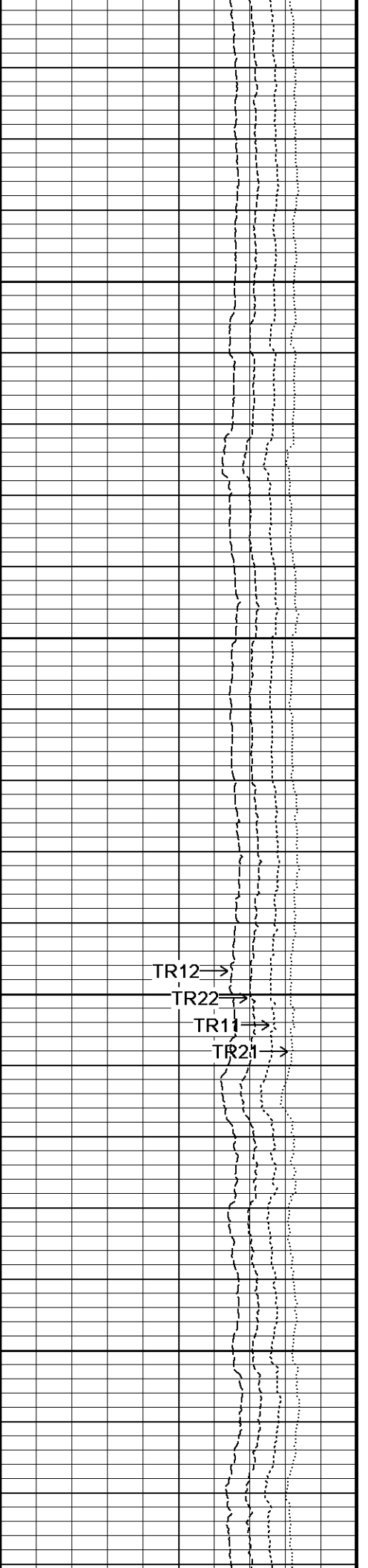
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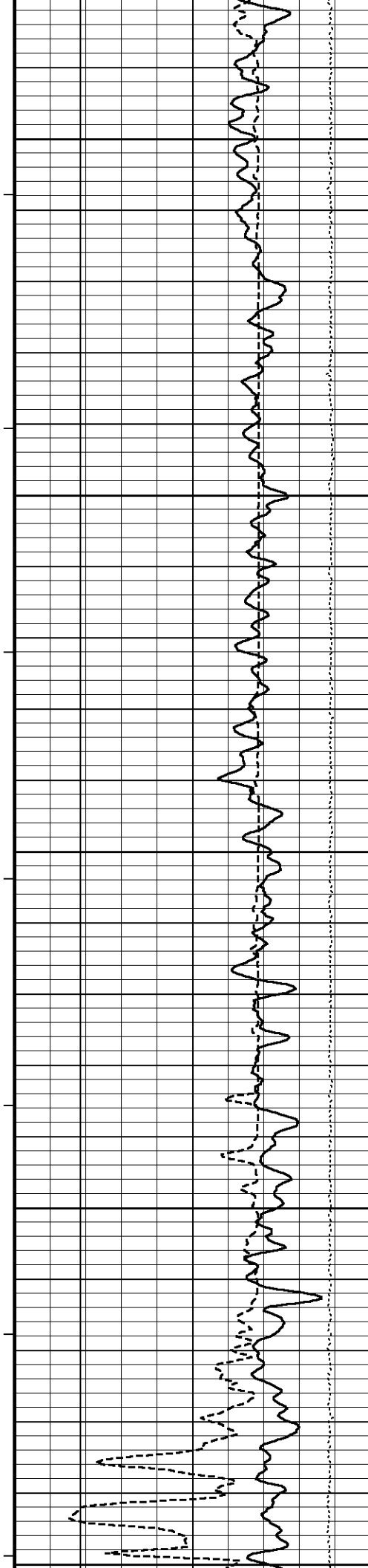
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DT35



TR12
TR22
TR11
TR21



99°

2250

99°

2300

99°

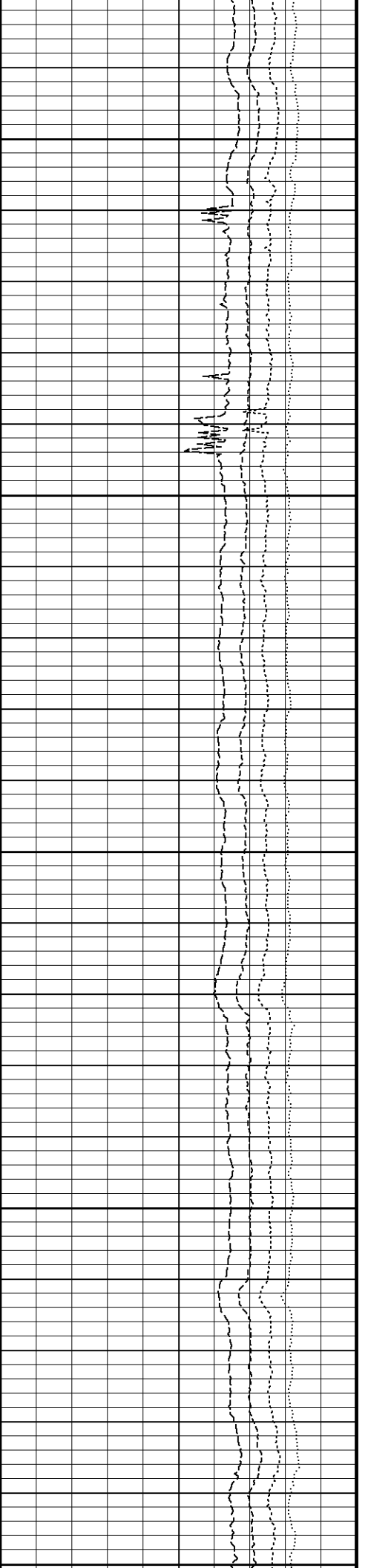
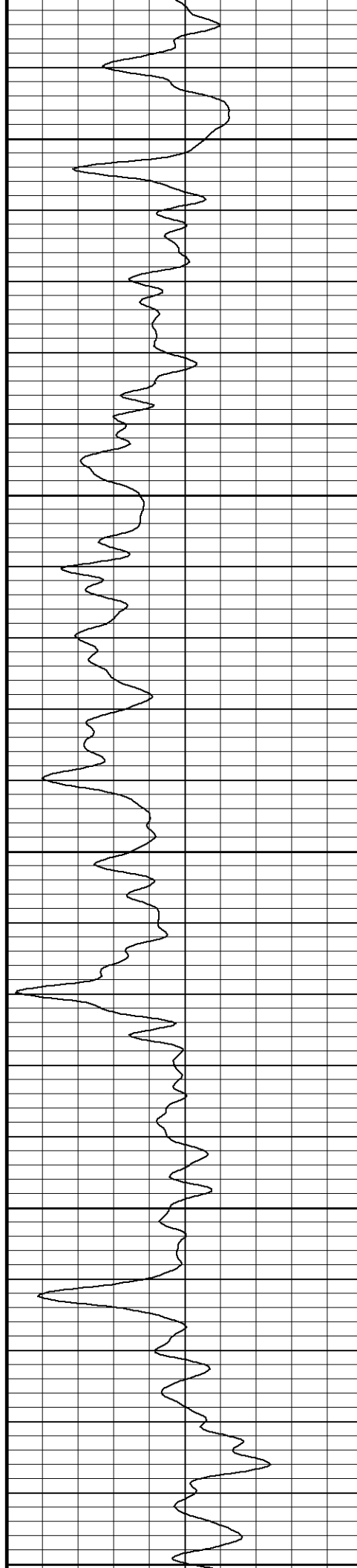
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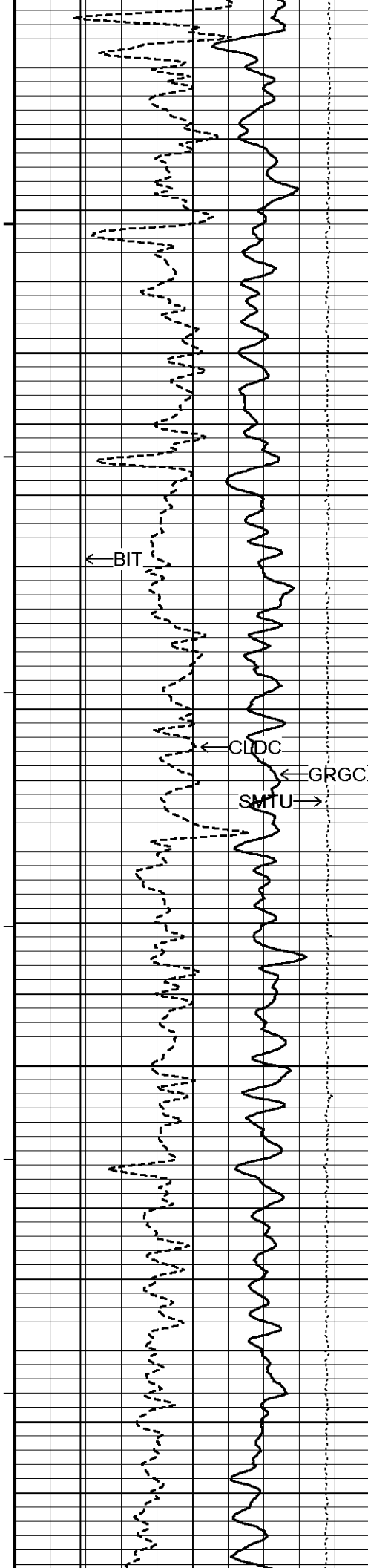
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2400

101°

2450





101°

2500

102°

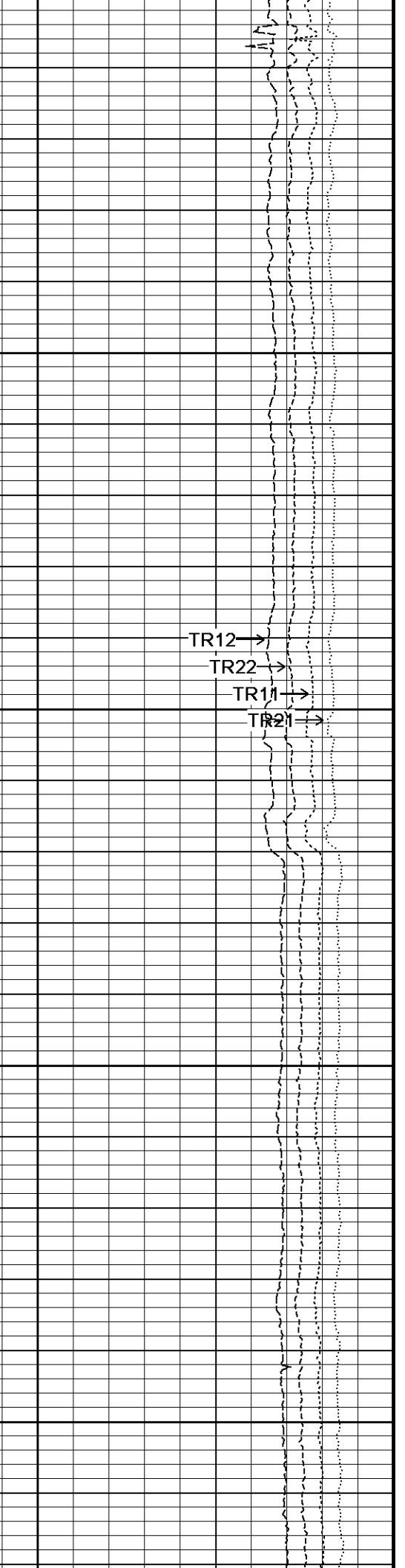
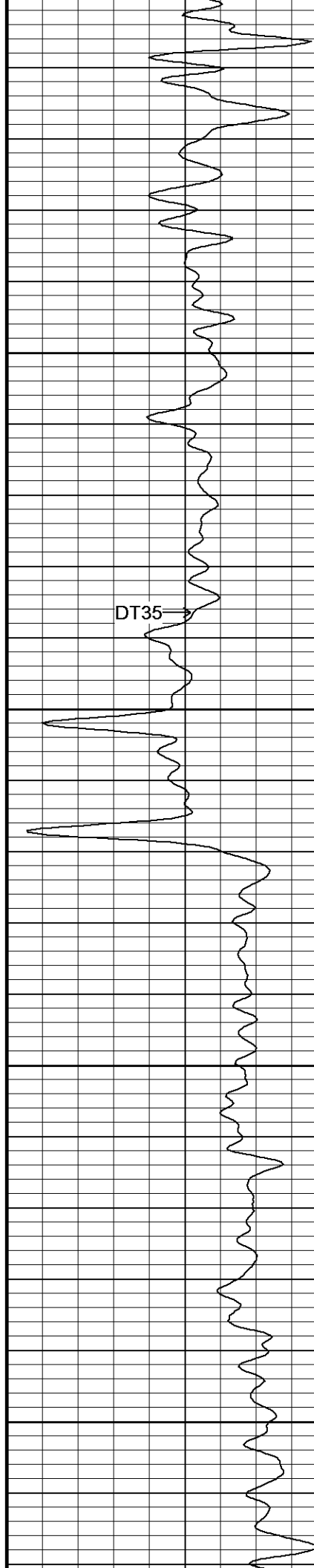
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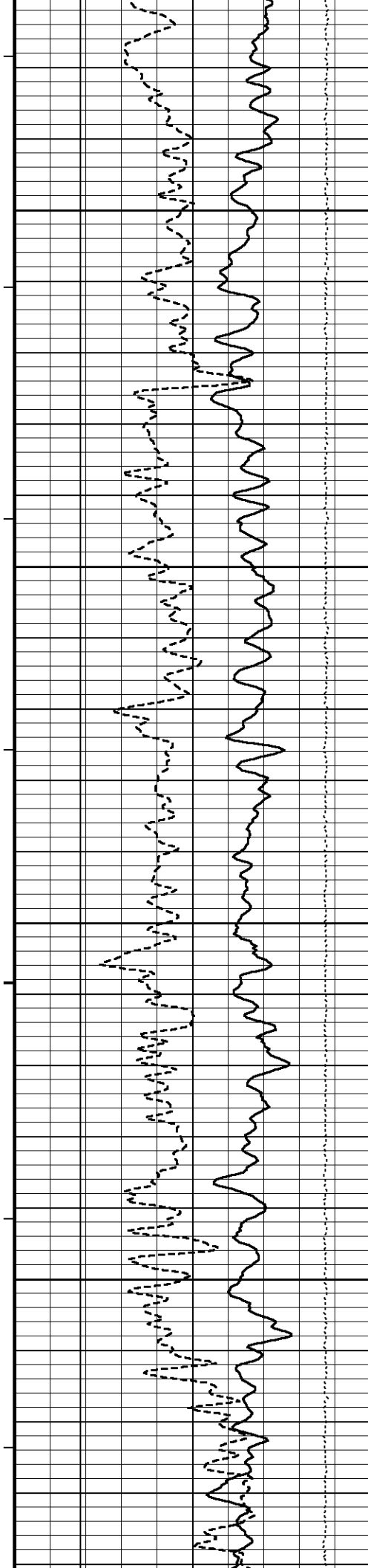
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2600

103°

2650





104°

2700

104°

2750

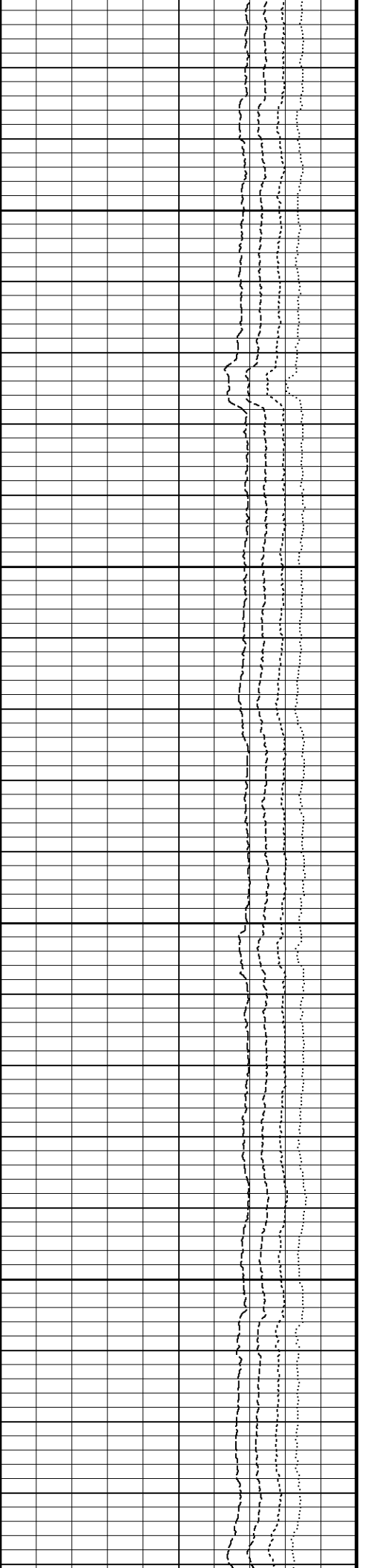
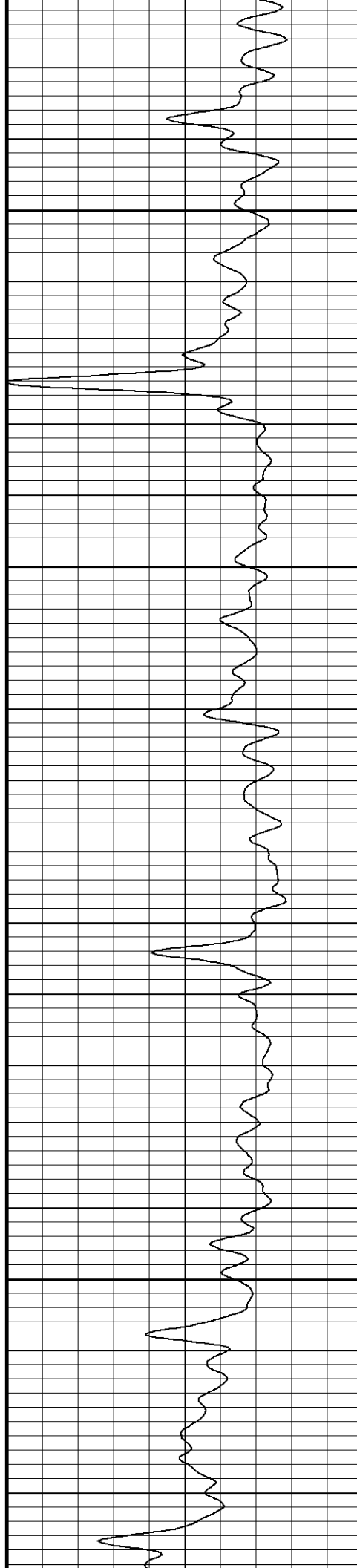
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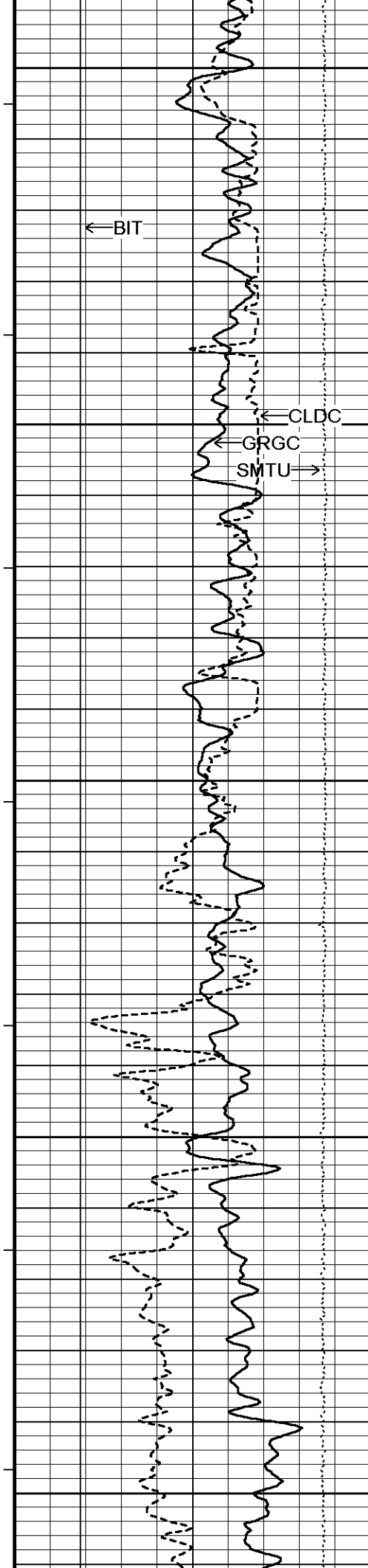
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105°

2850

105°





2900

106°

2950

105°

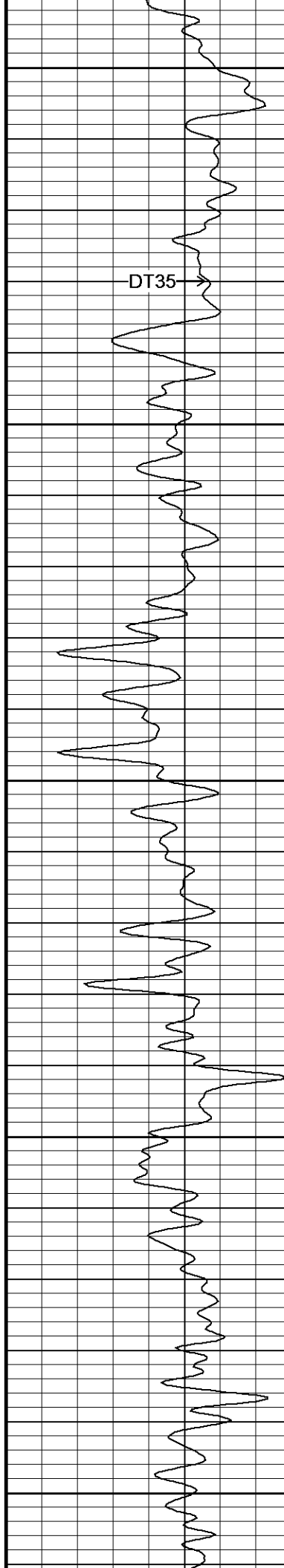
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106°

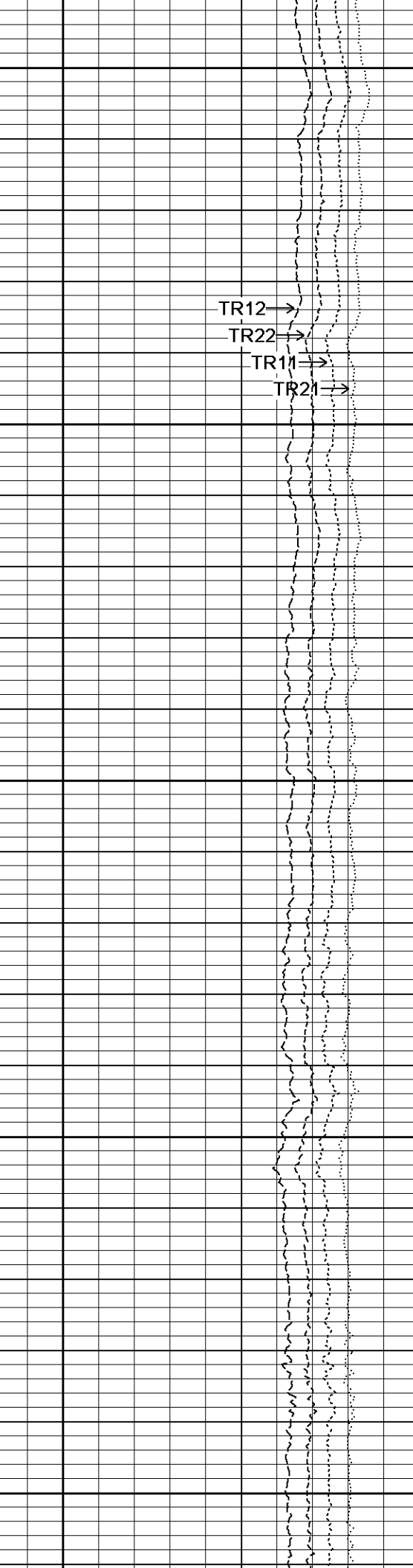
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107°

3100



DT35

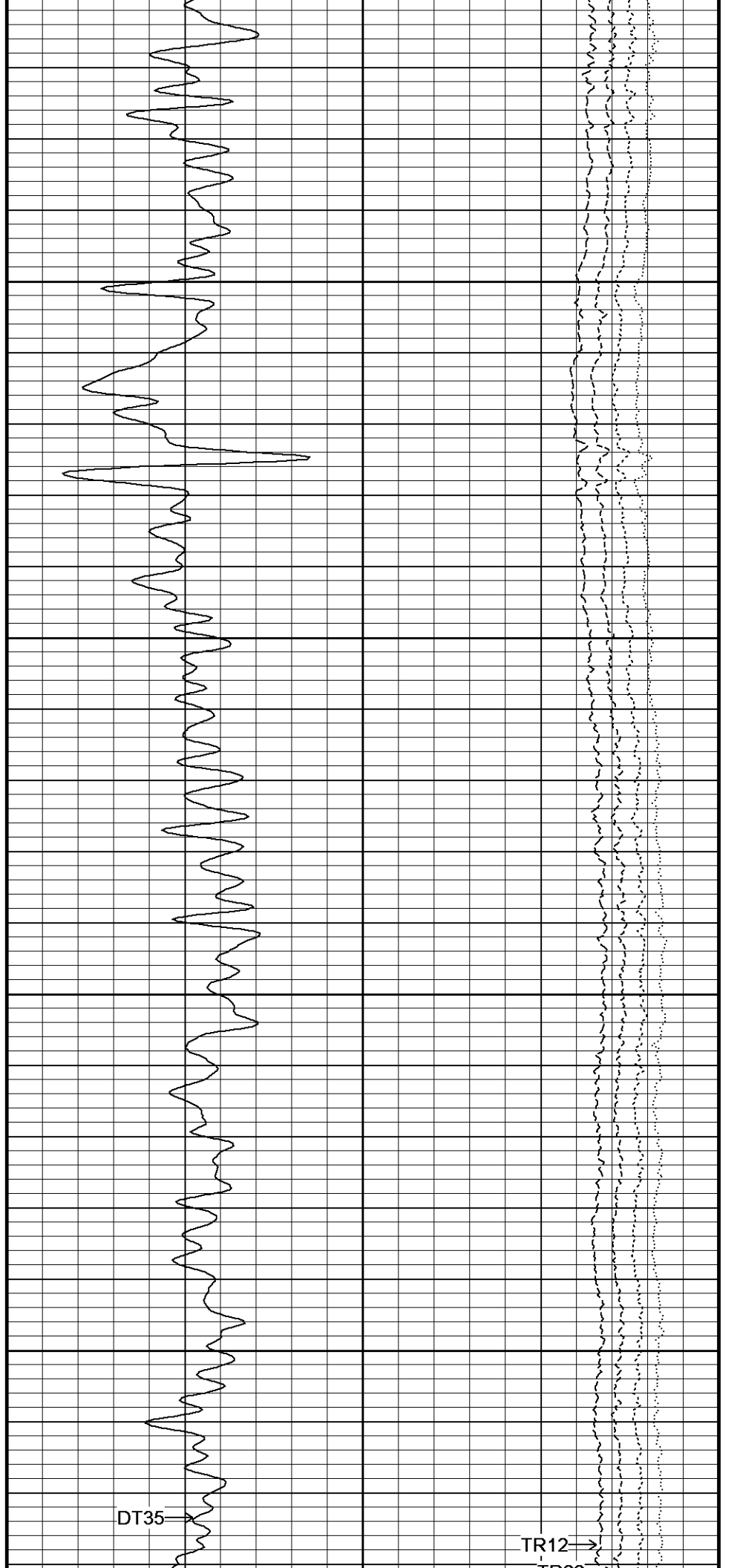
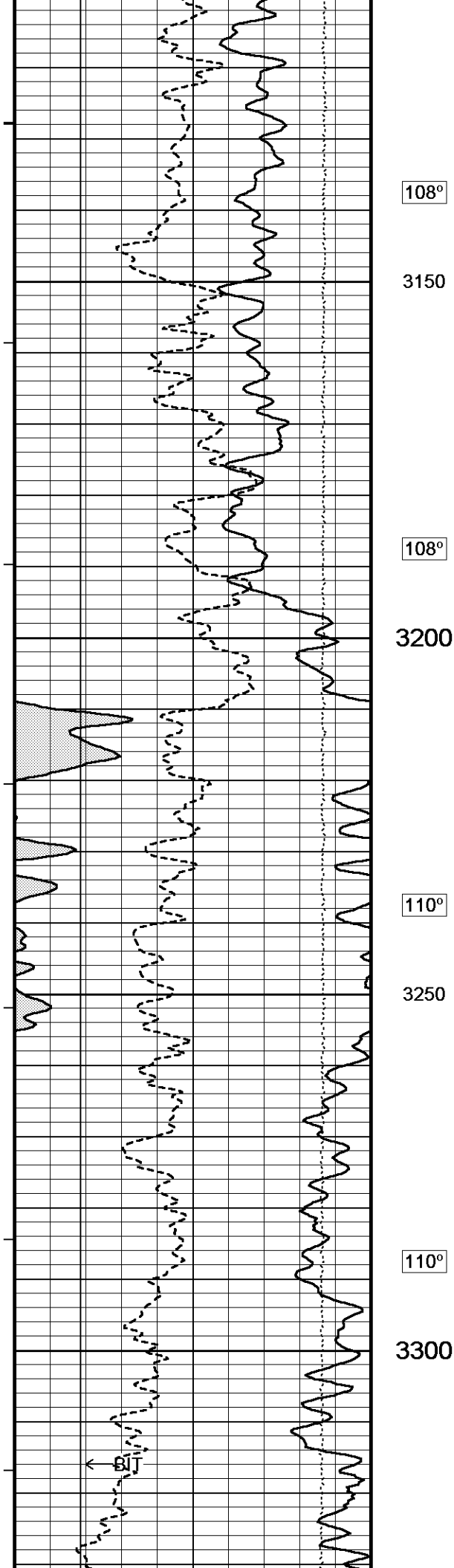


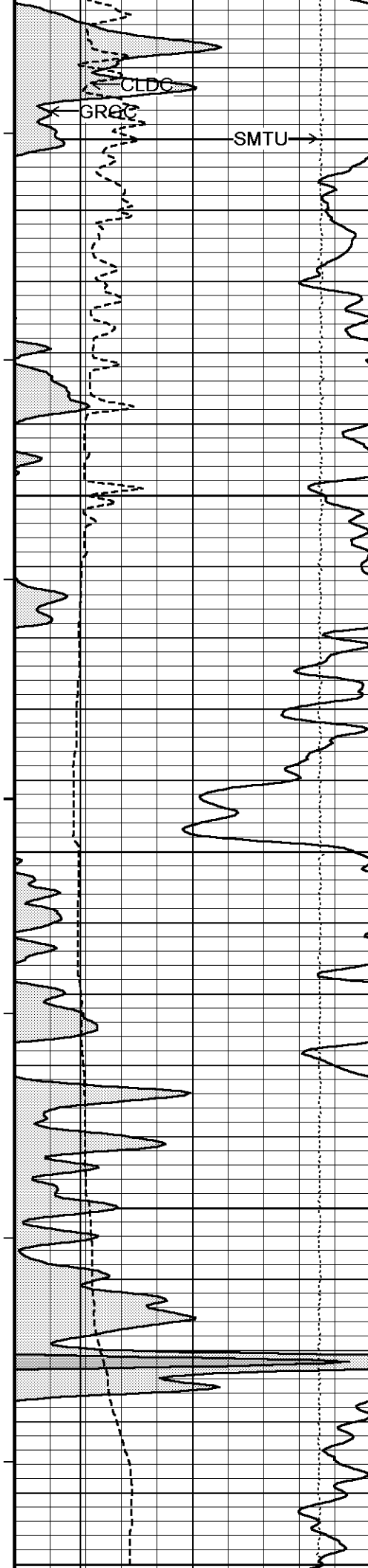
TR12

TR22

TR11

TR21





111°

3350

112°

3400

112°

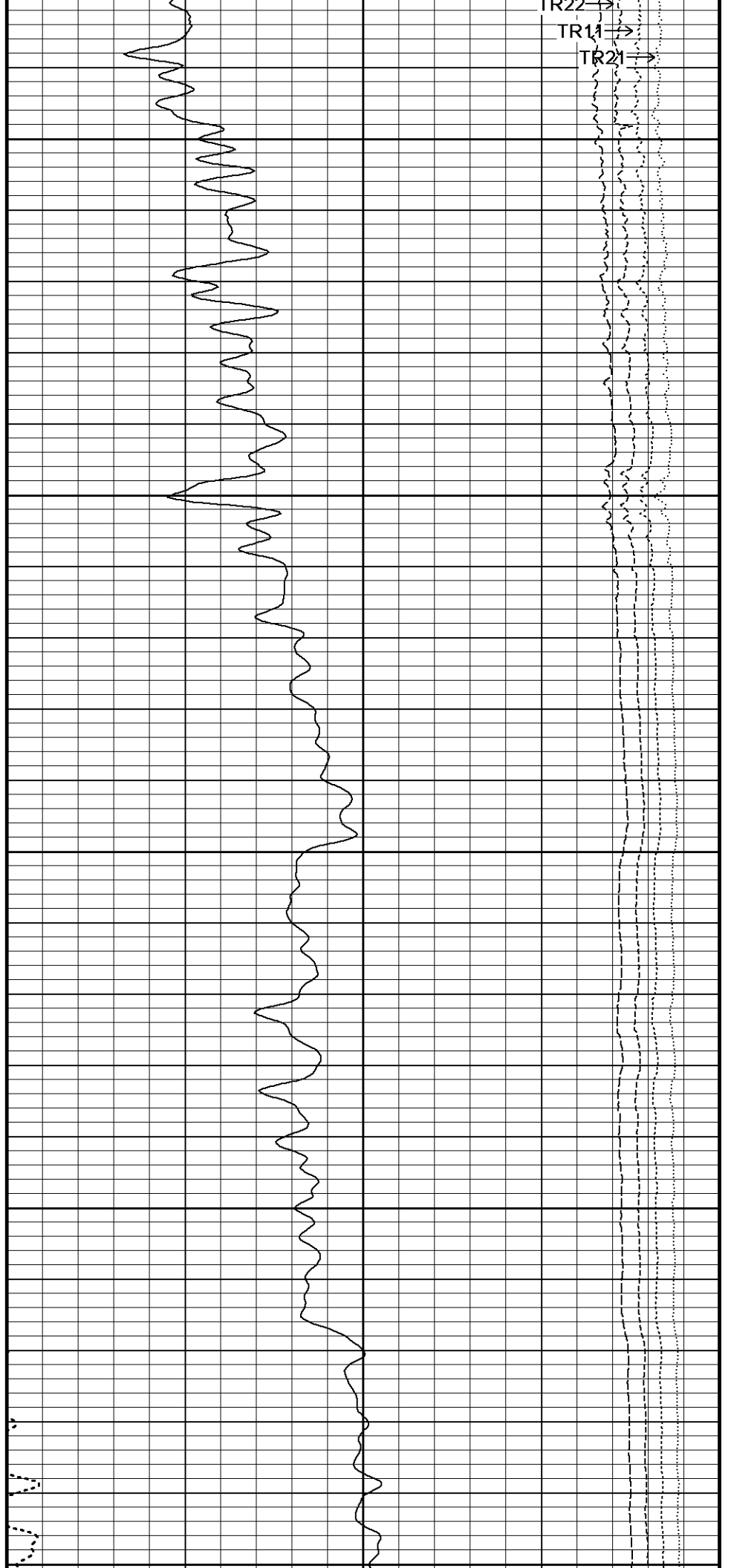
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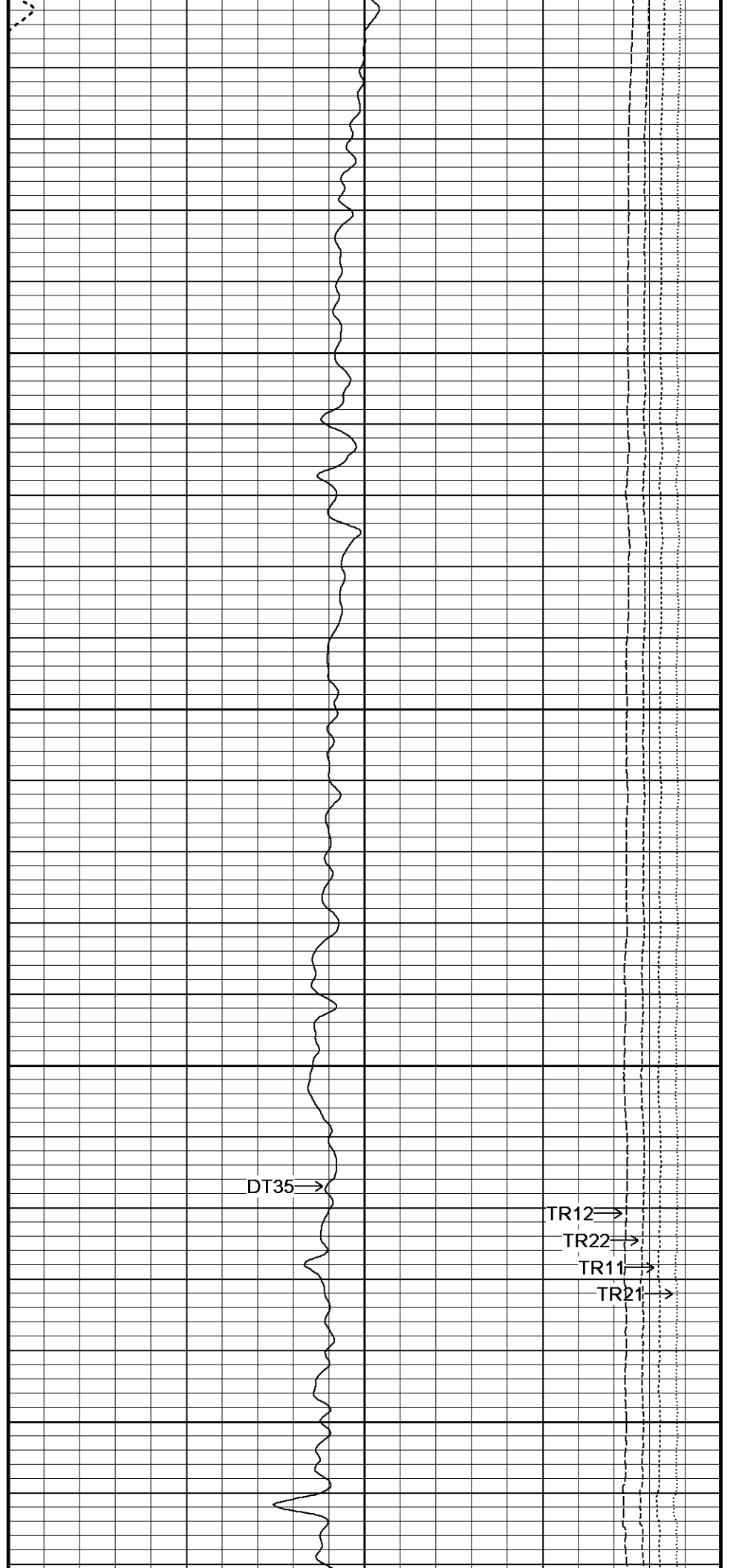
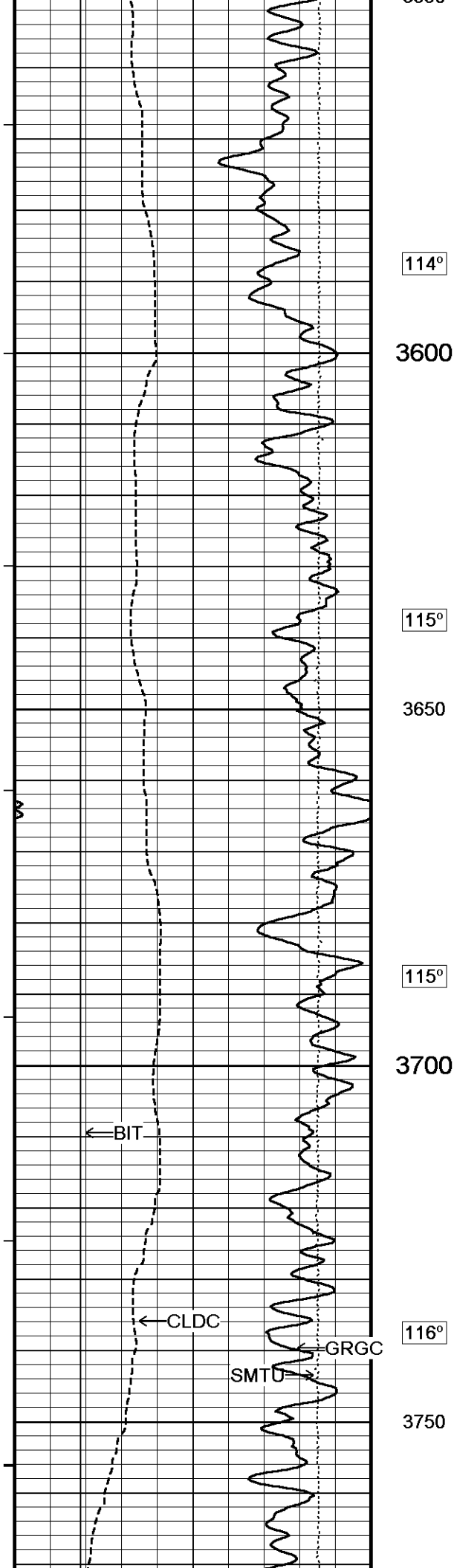
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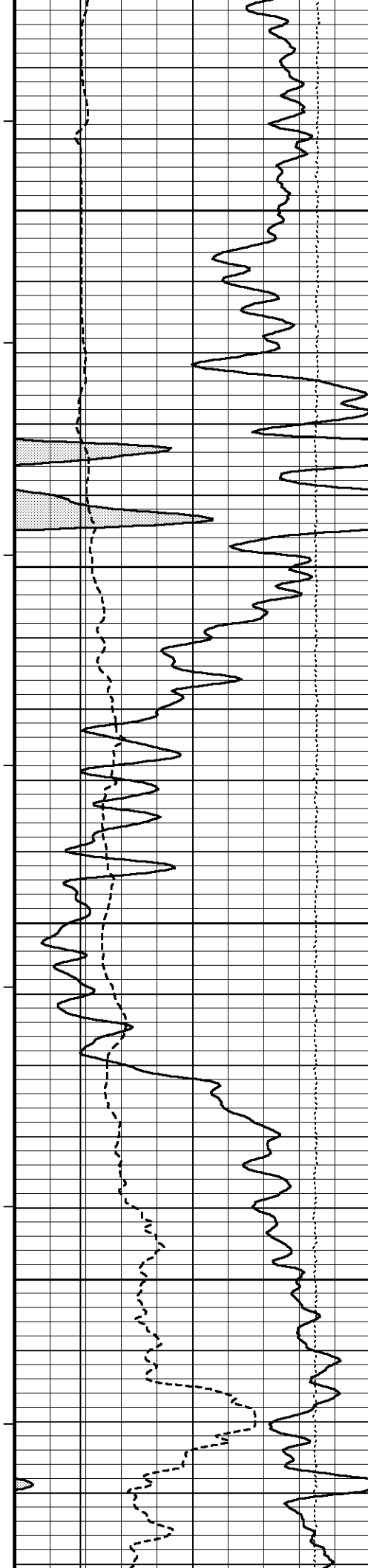
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114°

3550







119°

3800

120°

3850

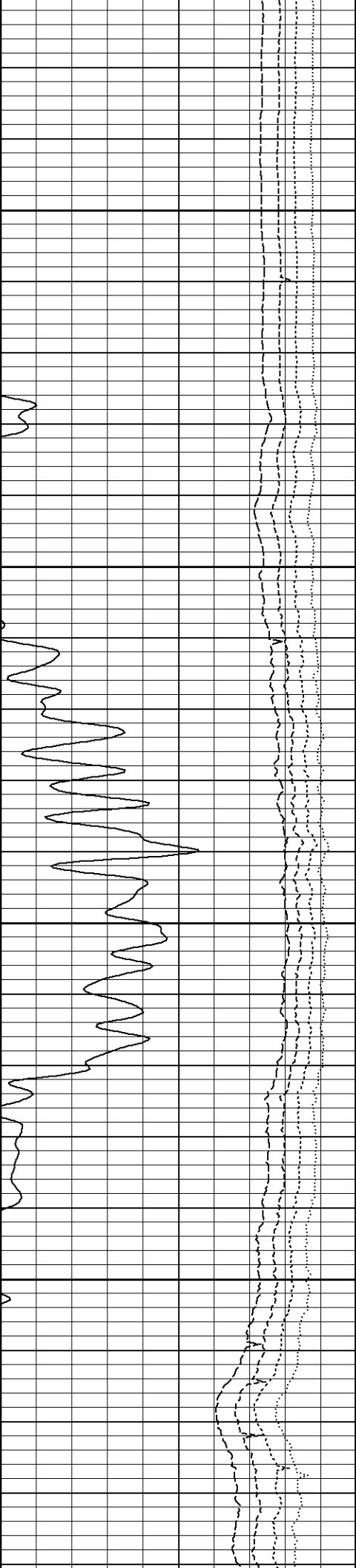
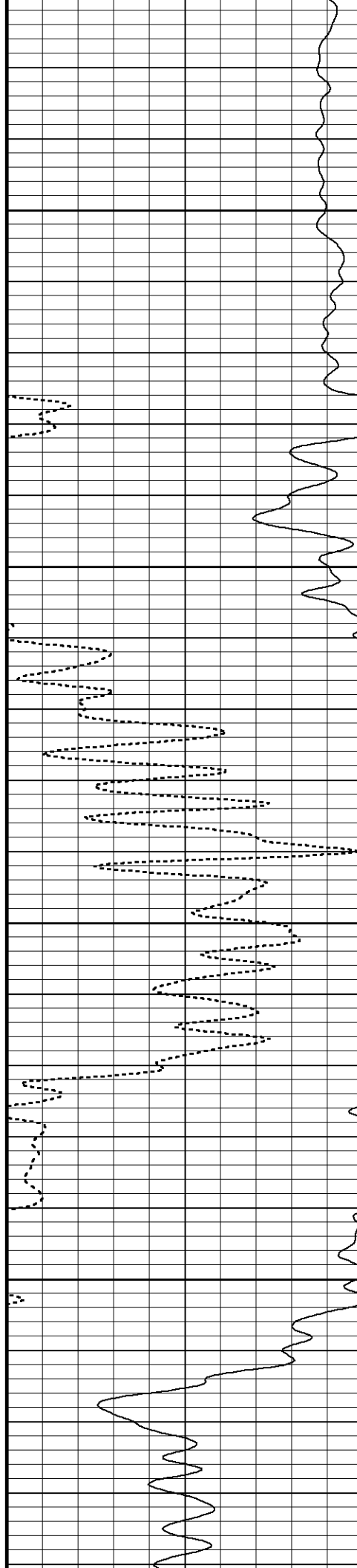
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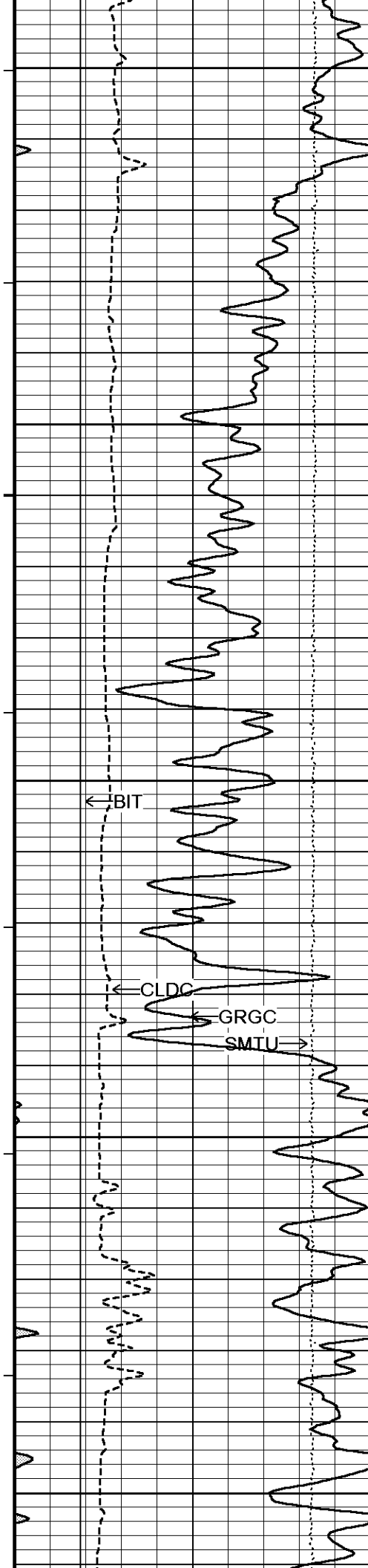
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120°

3950

120°





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121°

4050

122°

4100

SPRL →

DT35 →

TR12 →

TR22 →

TR11 →

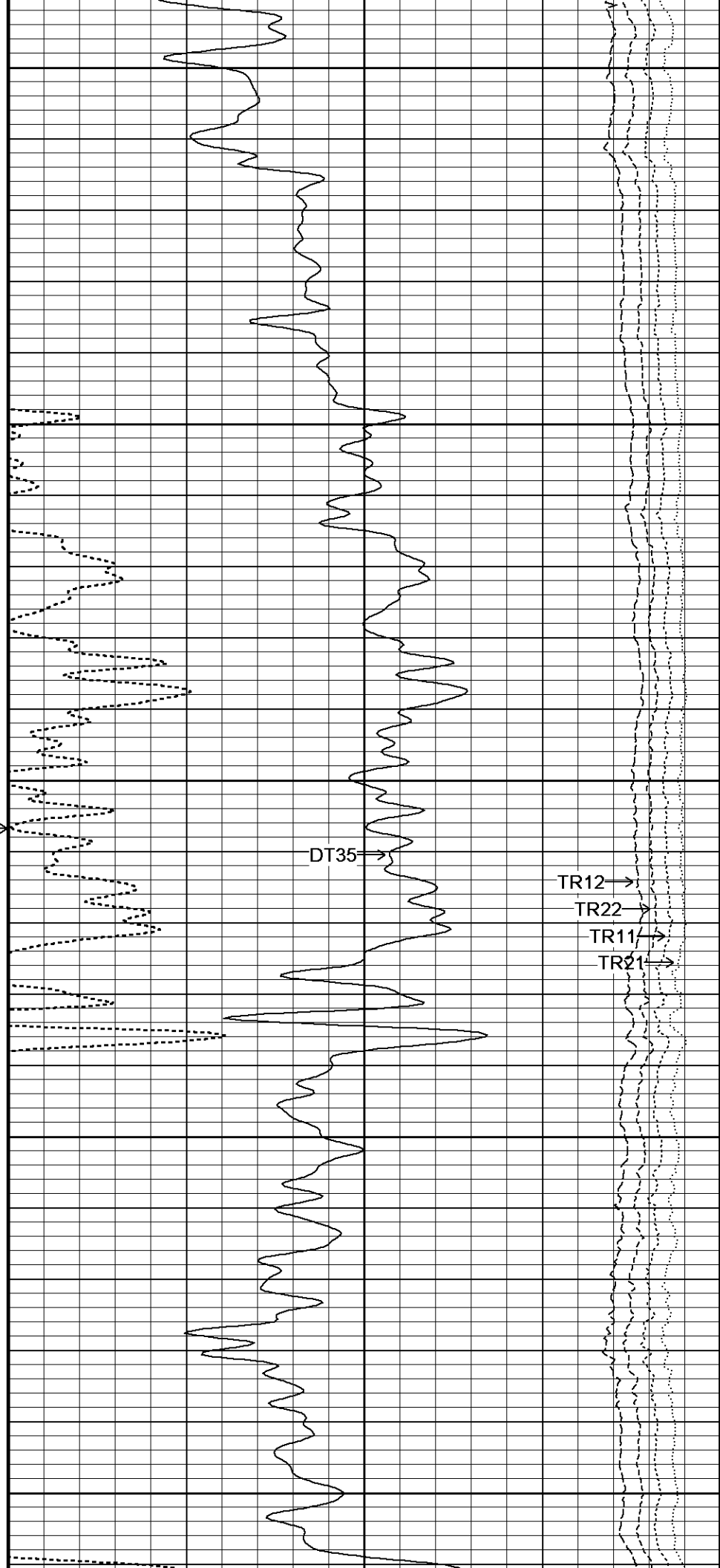
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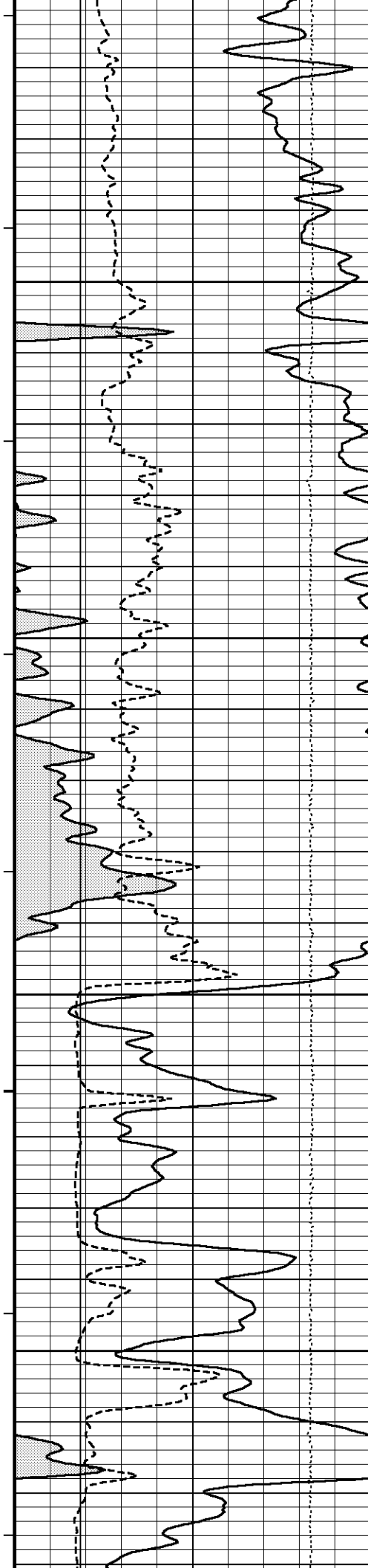
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4150

122°

4200





123°

4250

124°

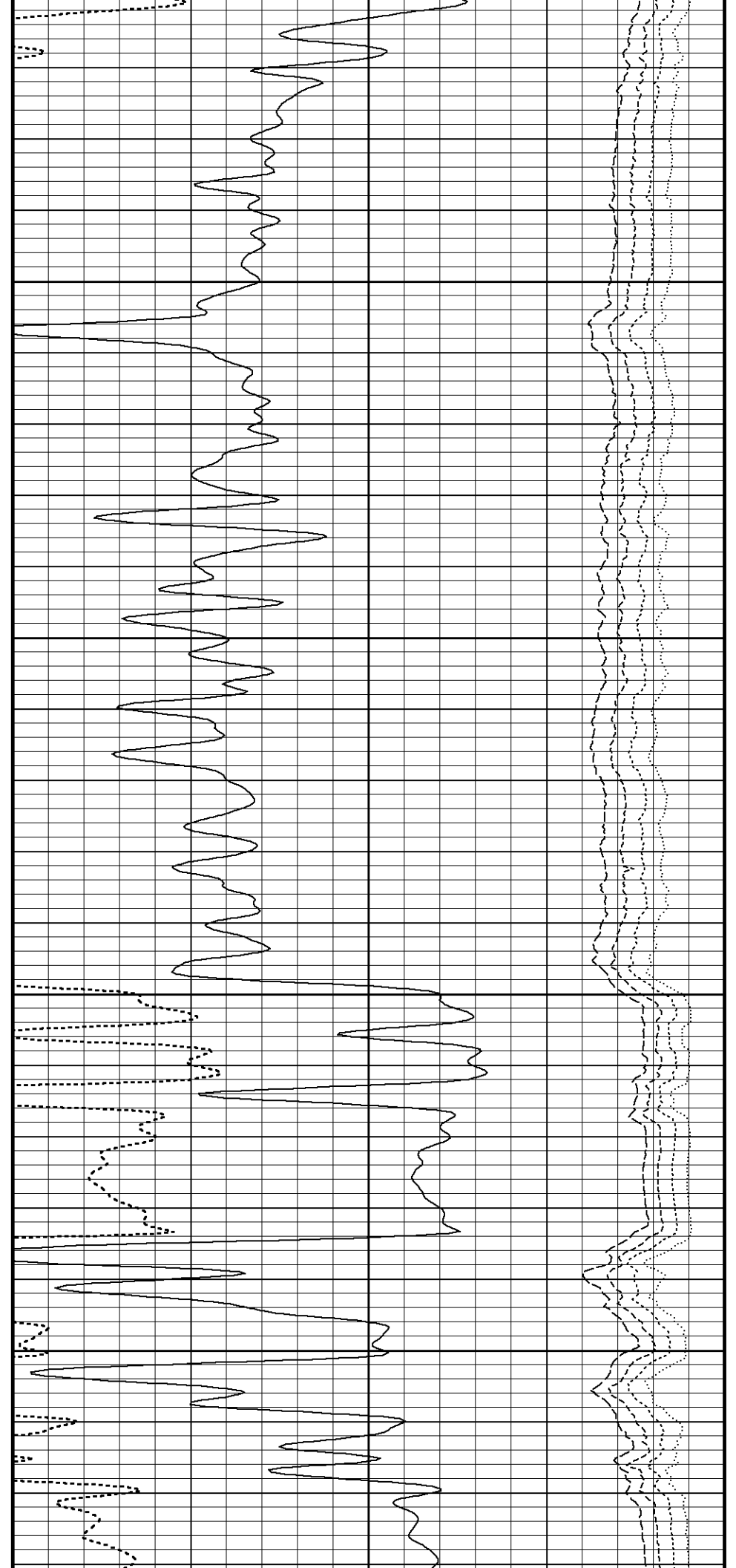
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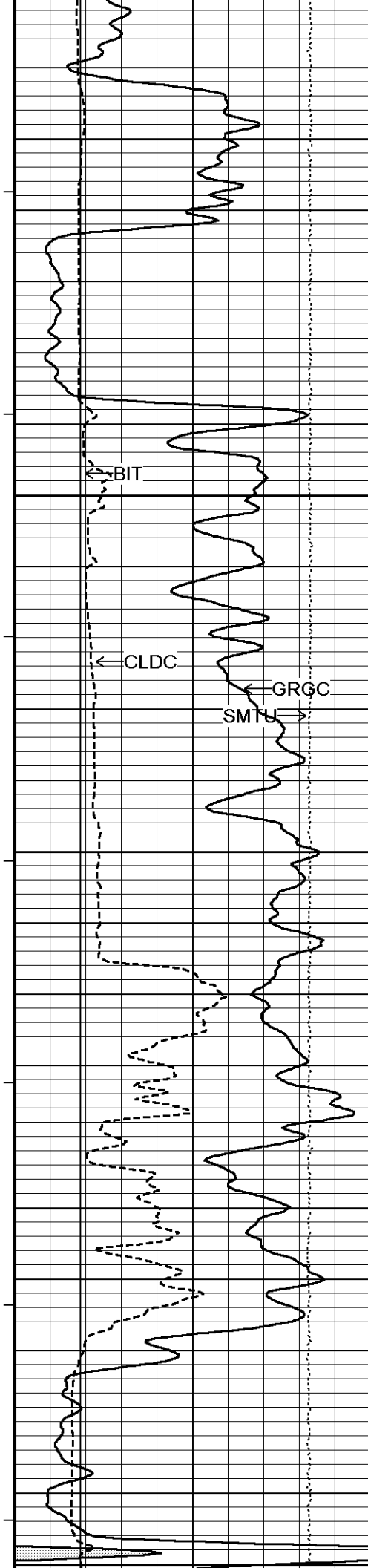
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4350

127°

4400





129°

4450

129°

4500

129°

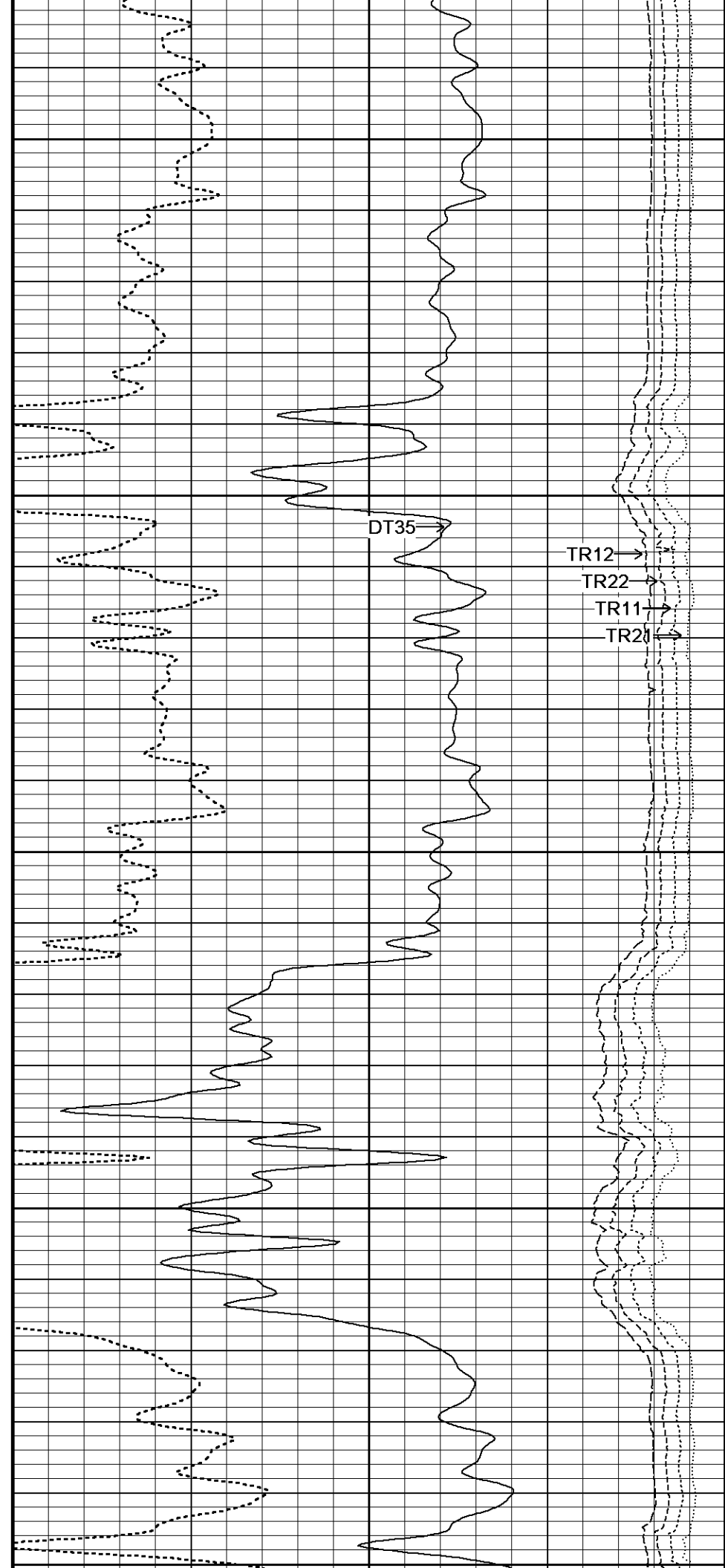
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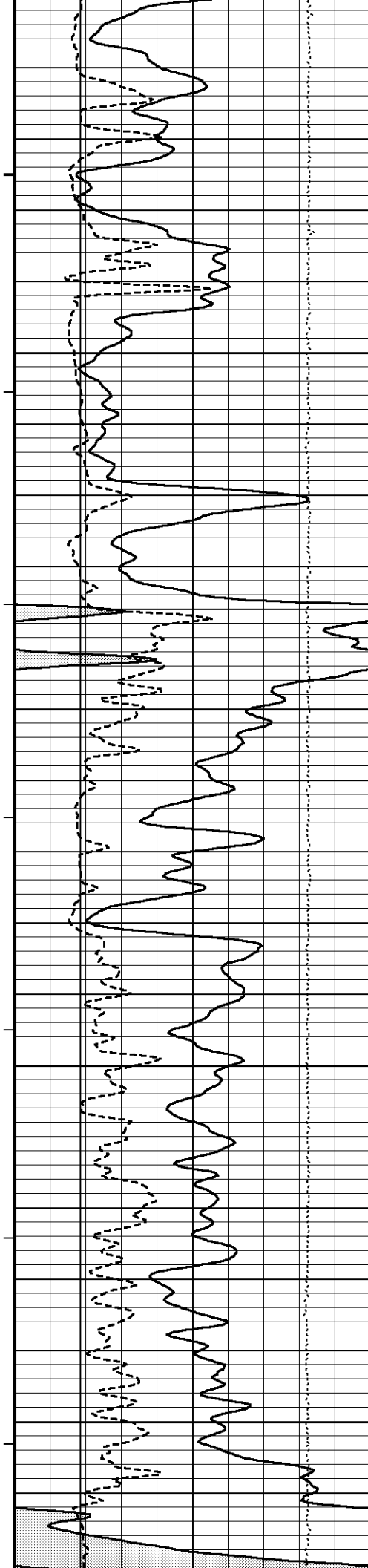
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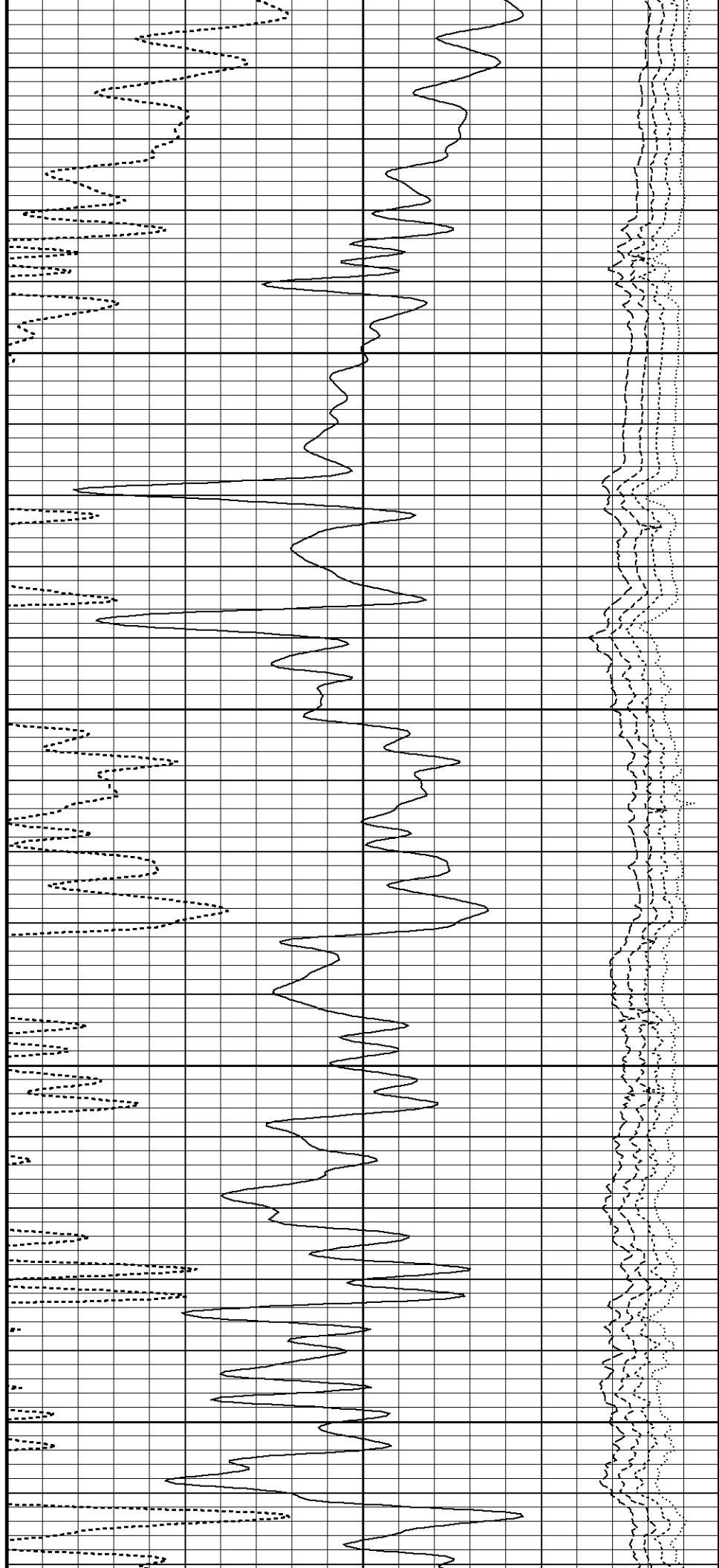
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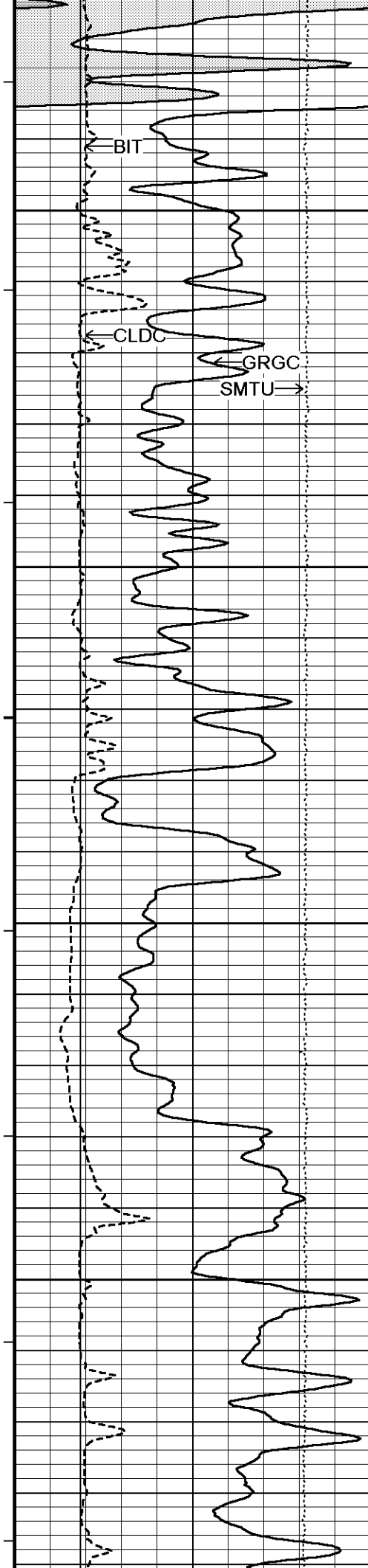
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1330
132°
4700
131°
4750
132°
4800
132°
4850





133°

4900

135°

4950

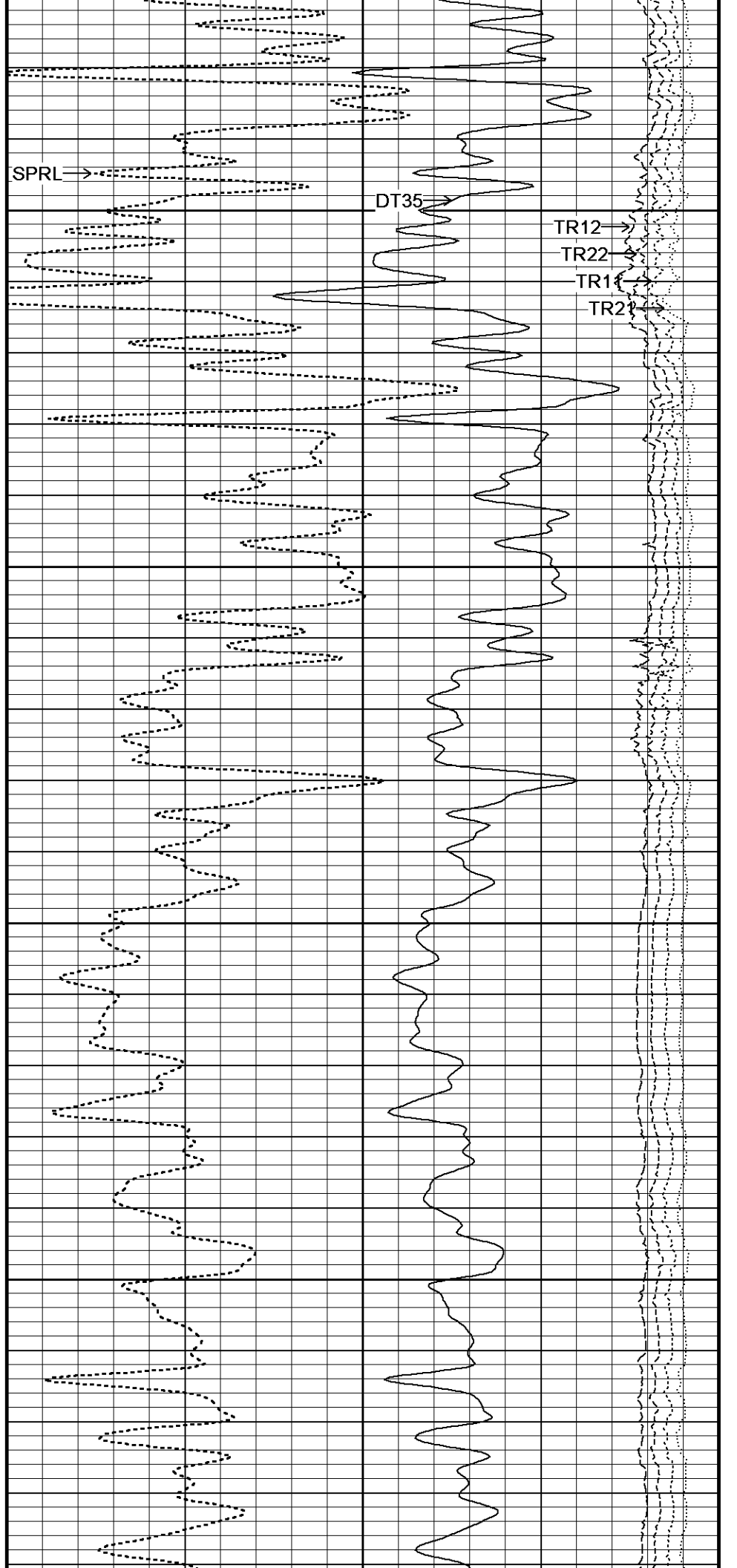
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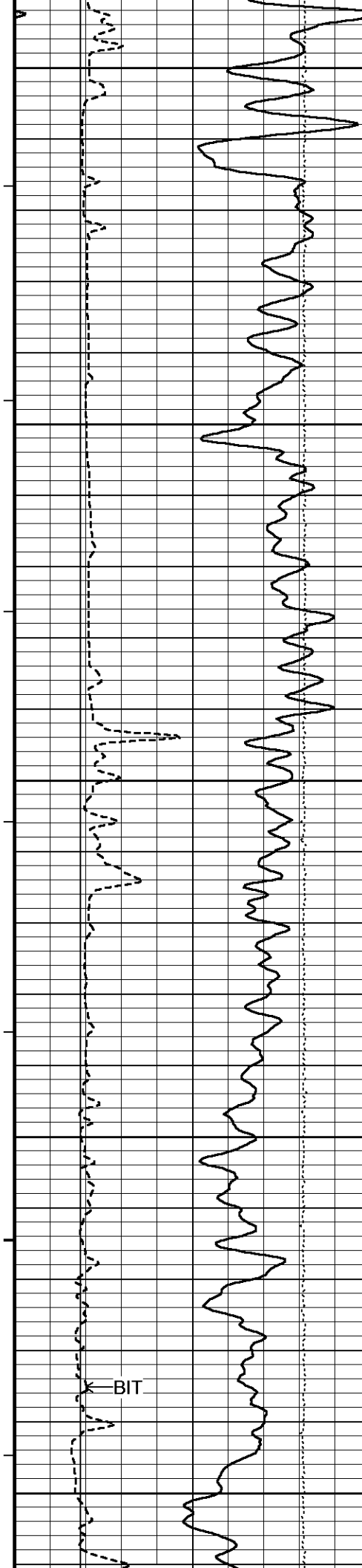
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136°

5050

137°





5100

138°

5150

139°

5200

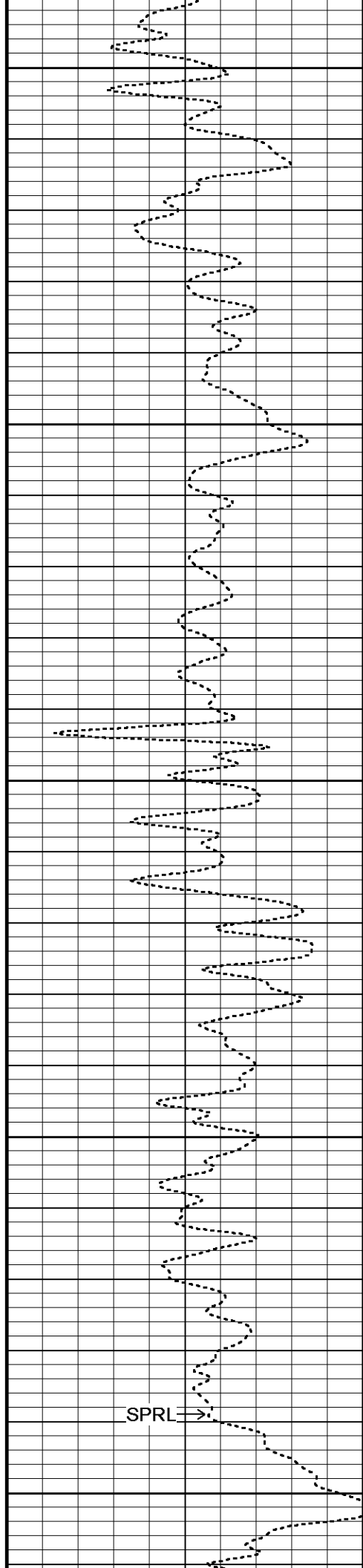
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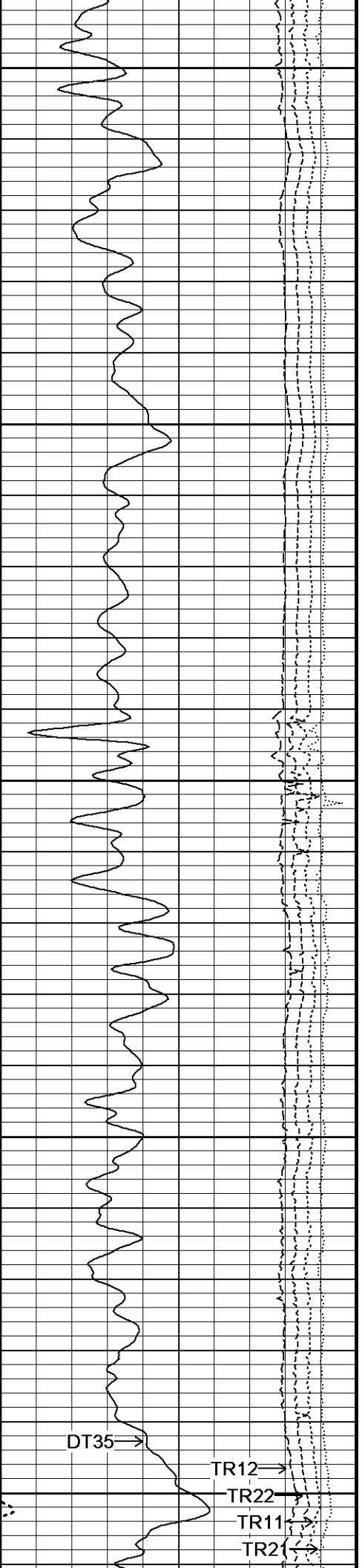
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5300

BIT



SPRL



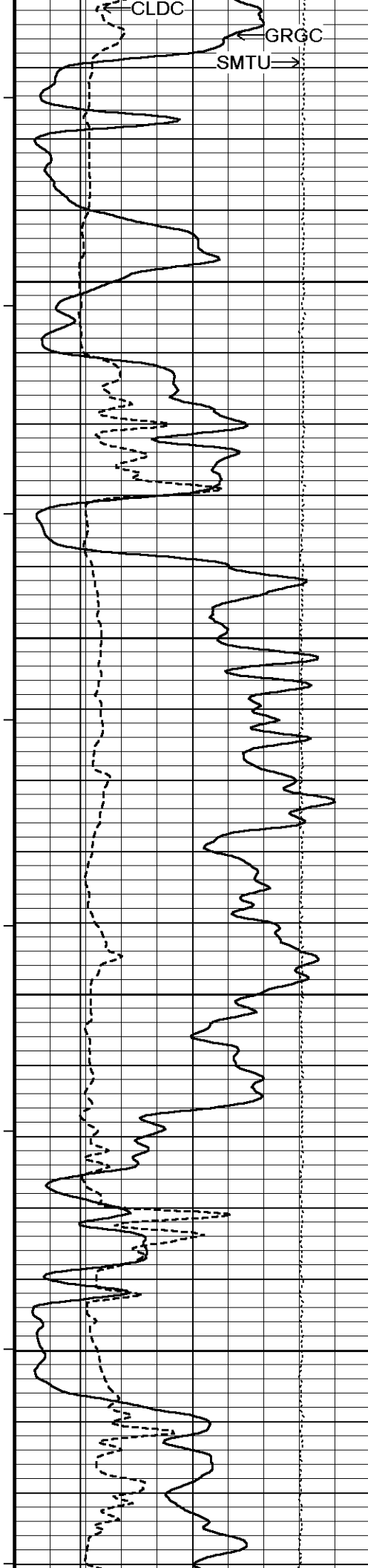
DT35

TR12

TR22

TR11

TR21



144°

5350

144°

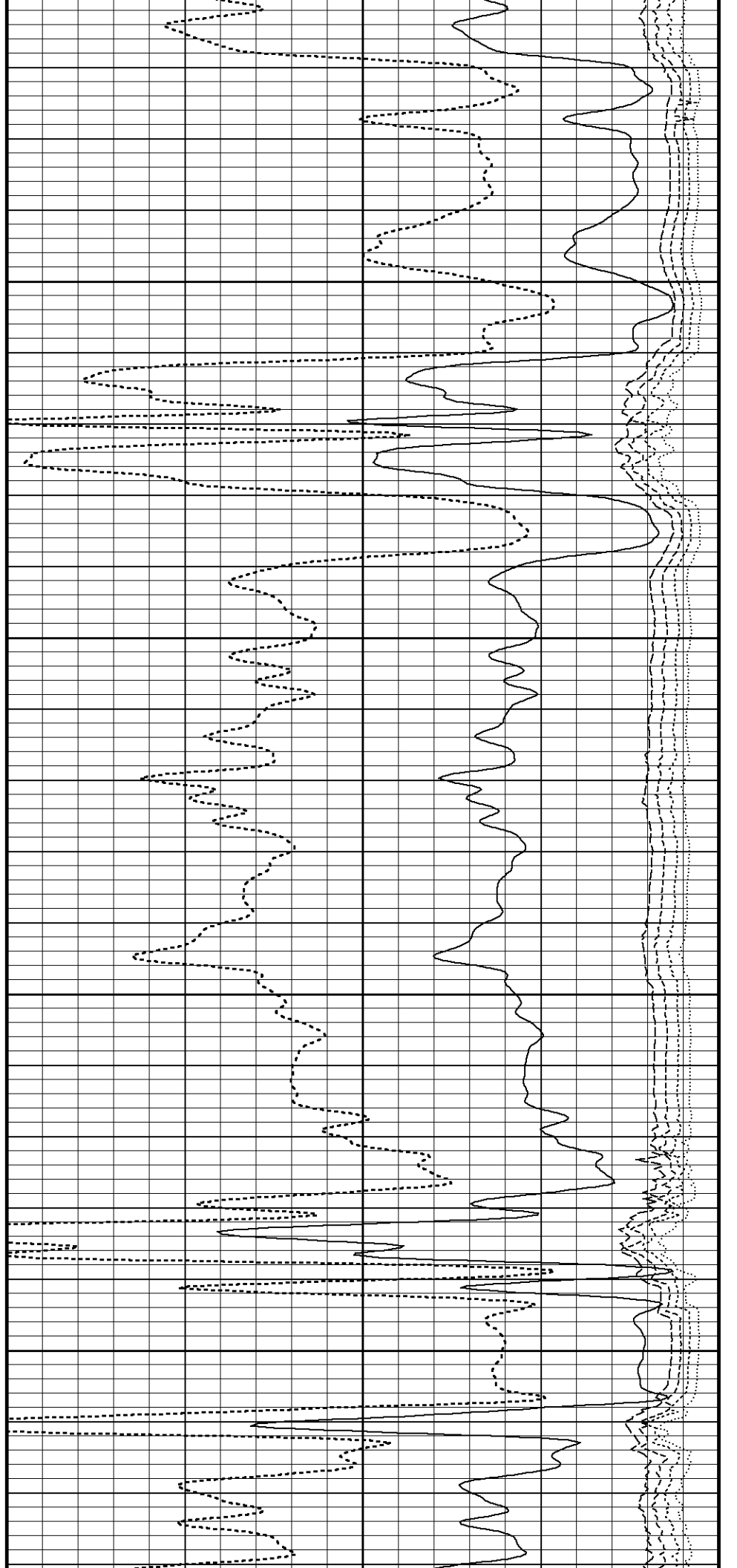
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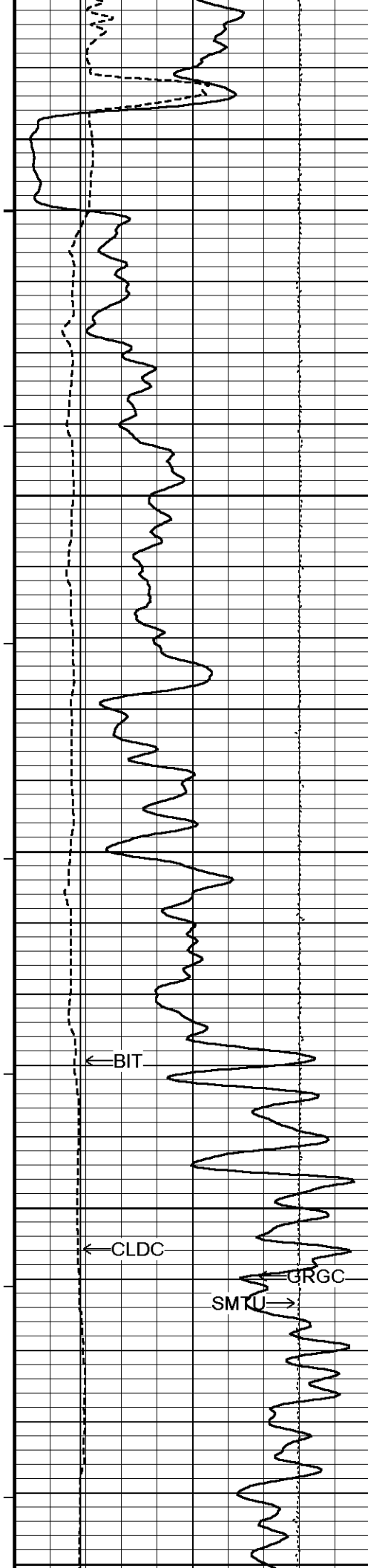
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5600

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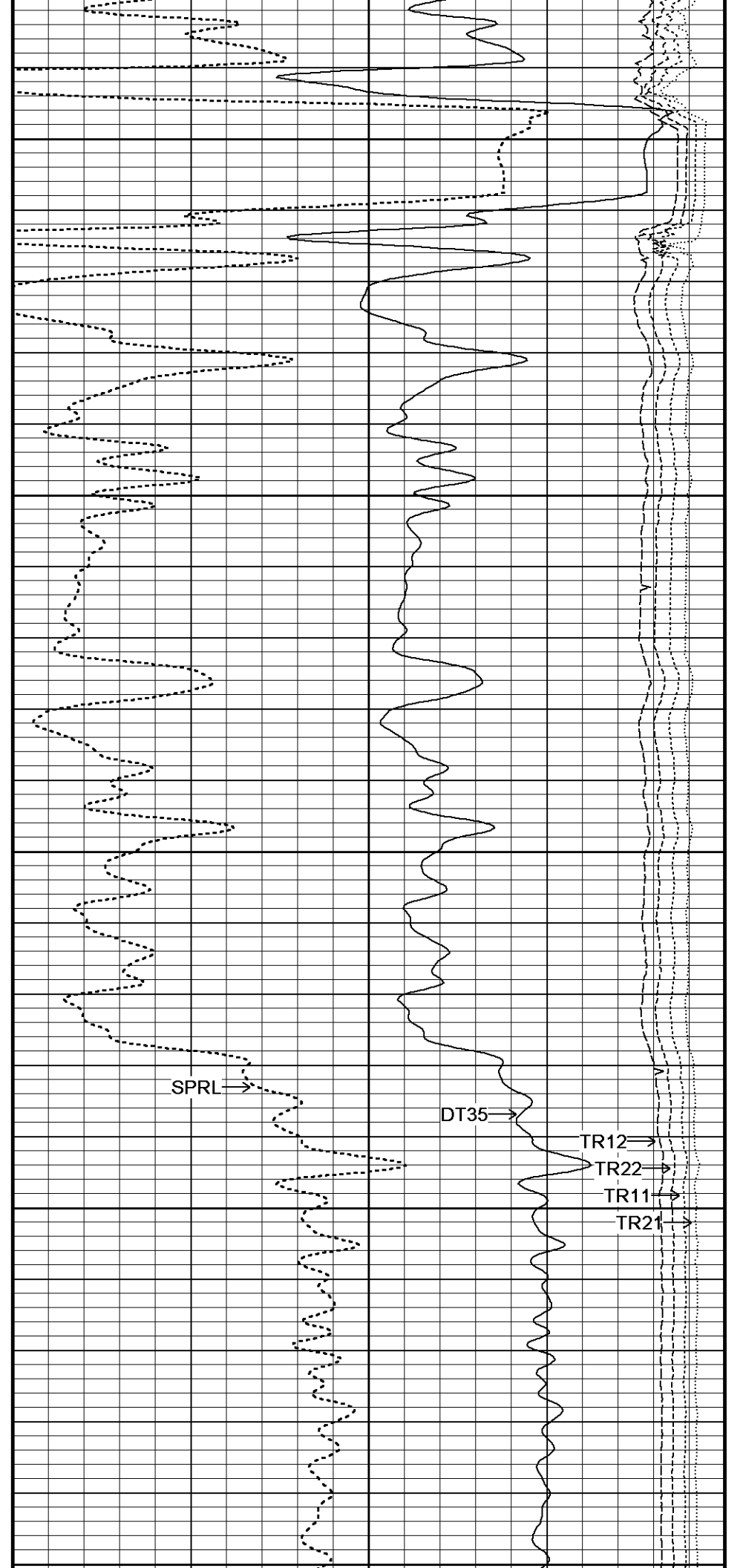
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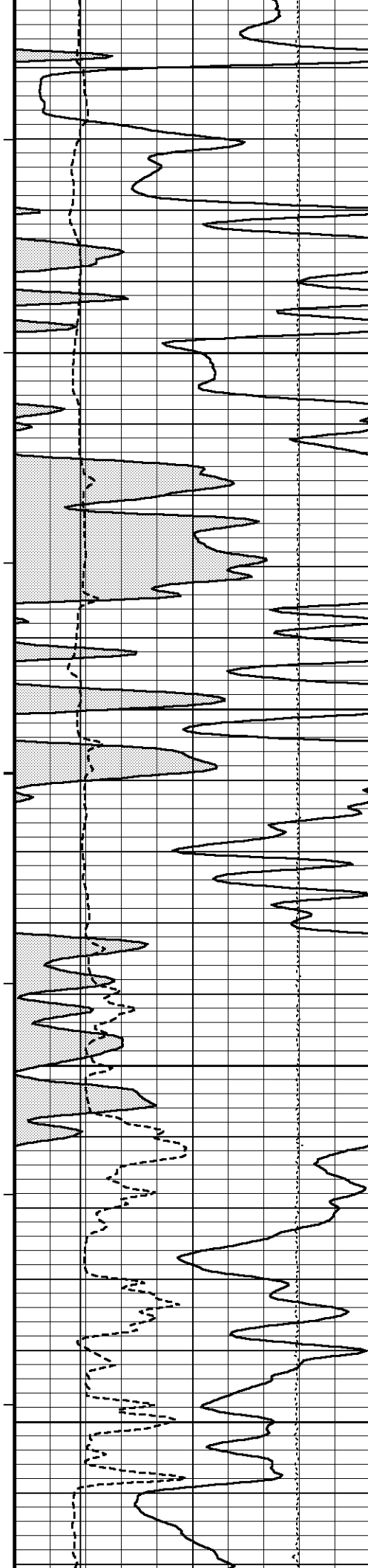
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5830

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5800

149°

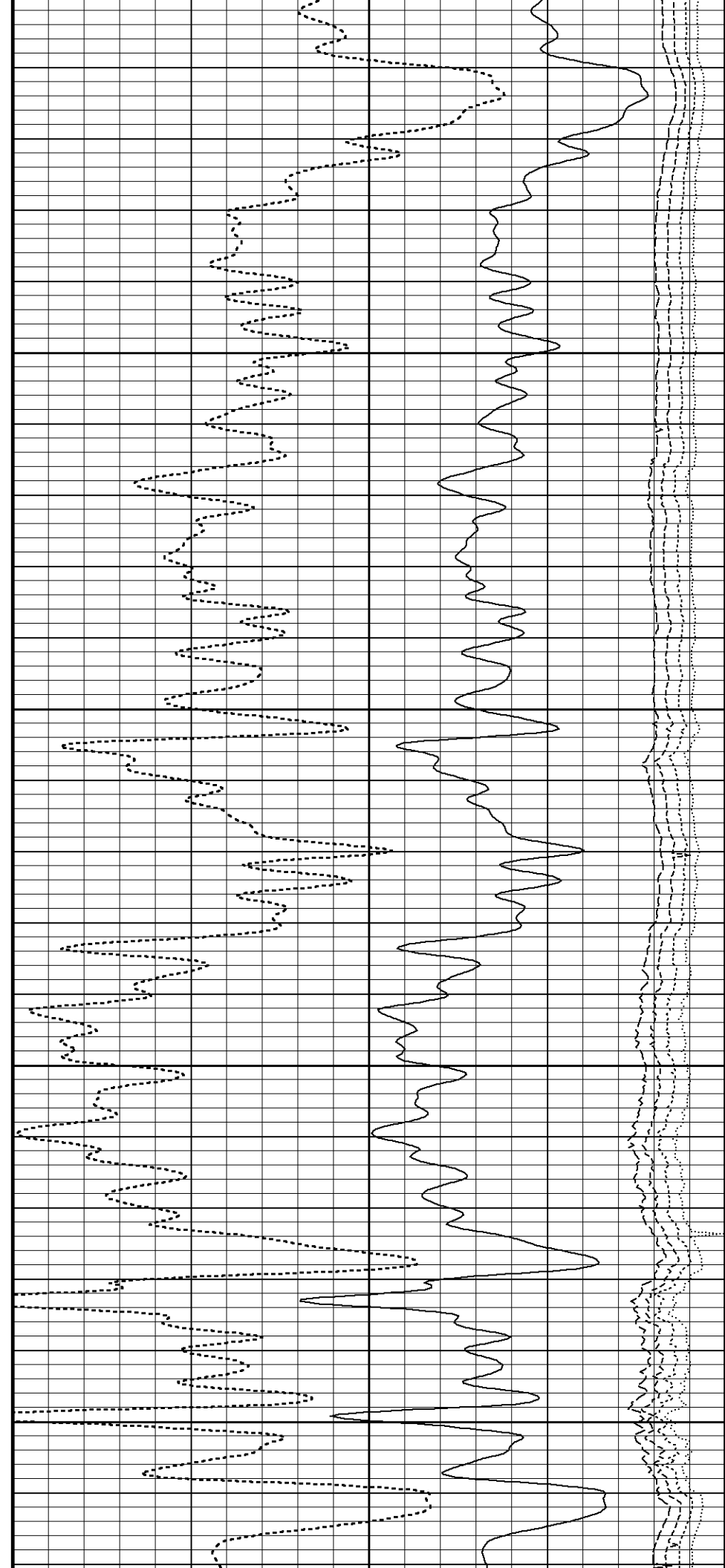
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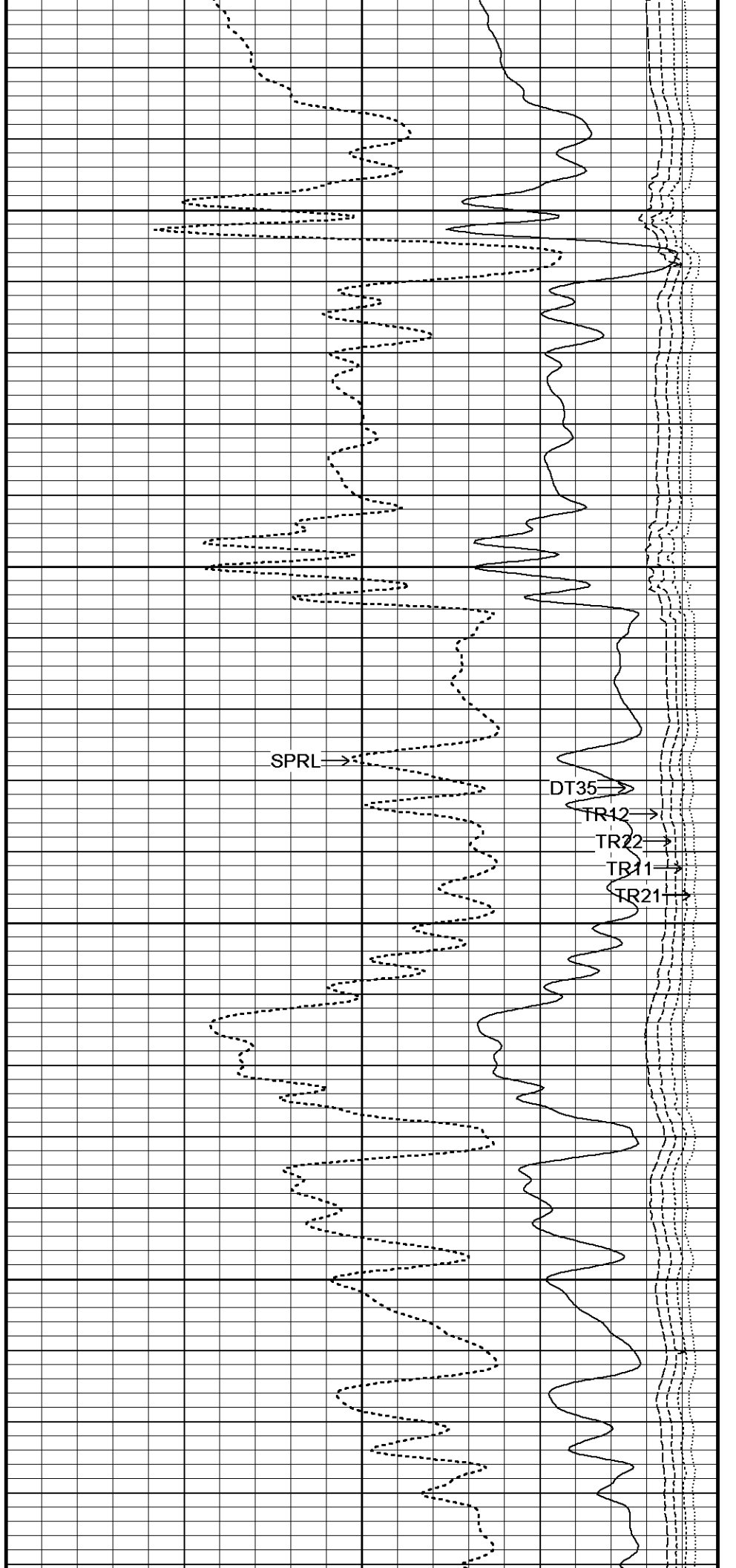
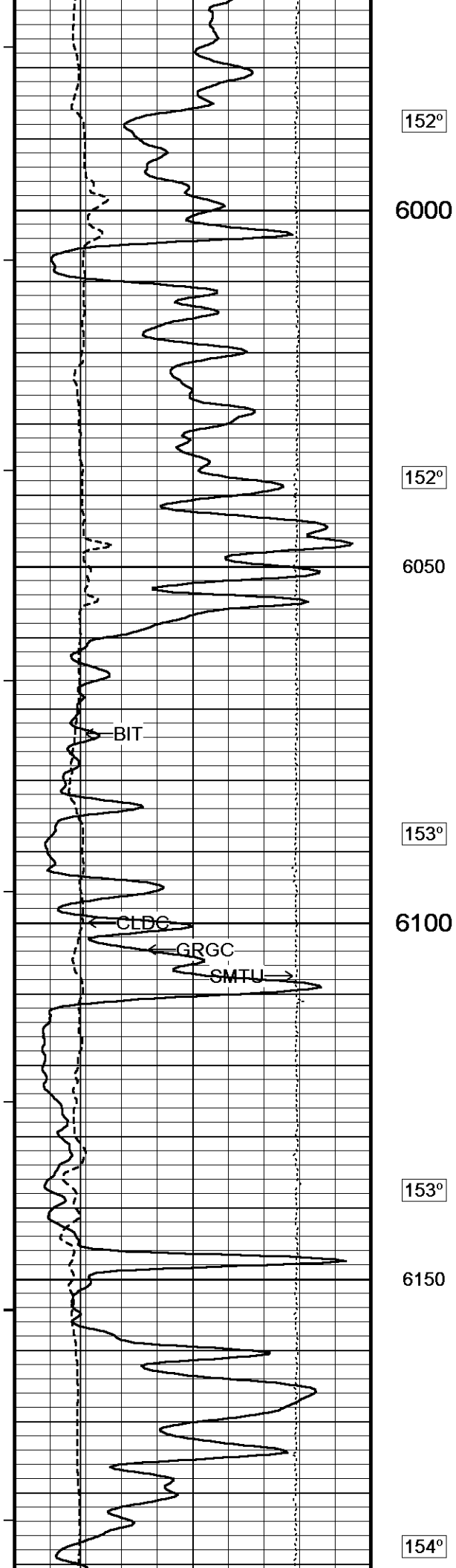
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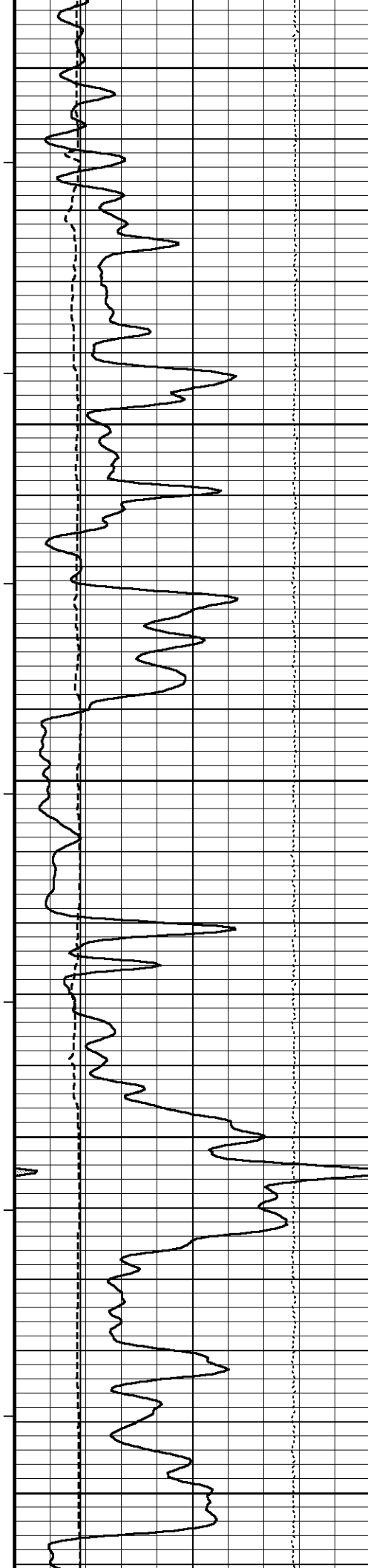
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6200

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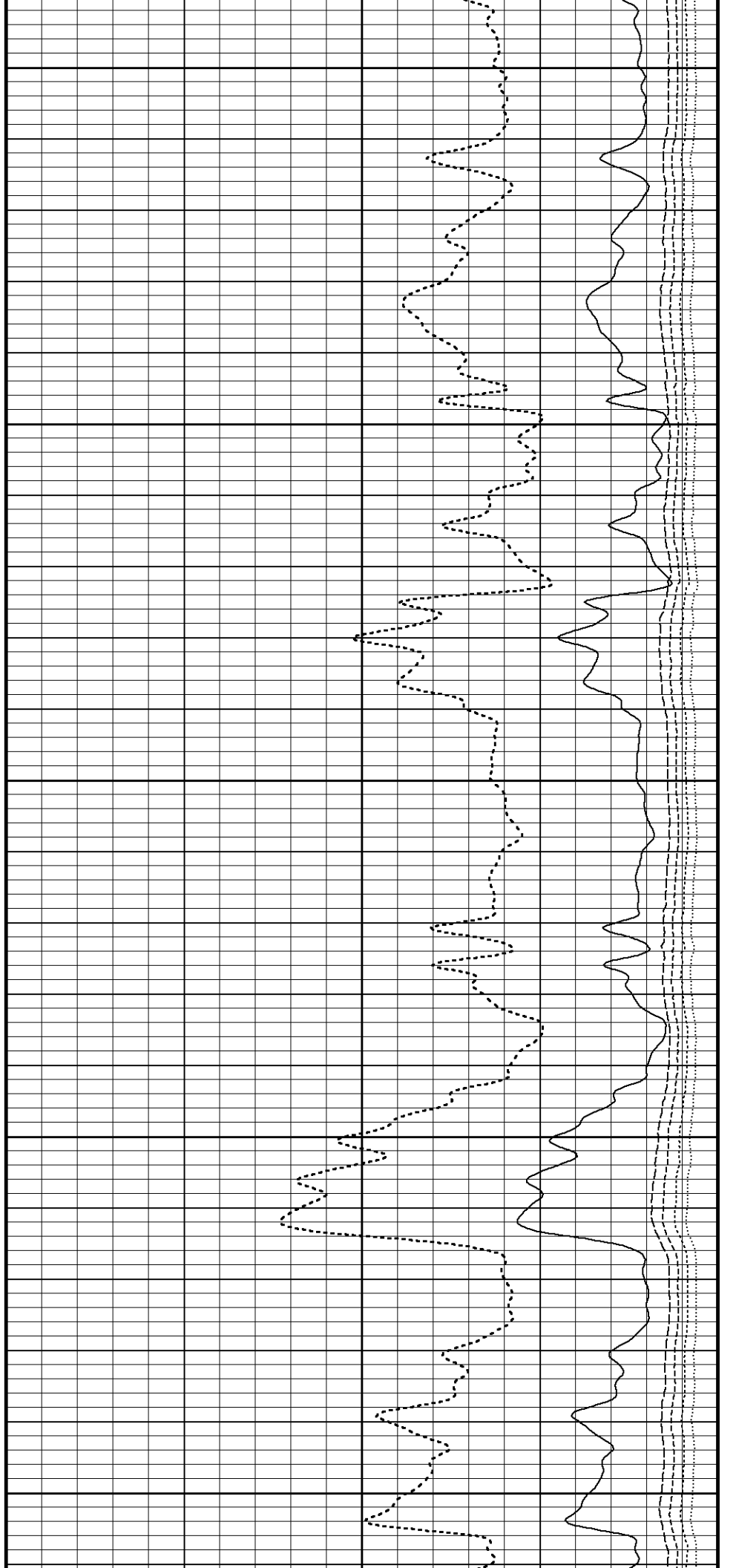
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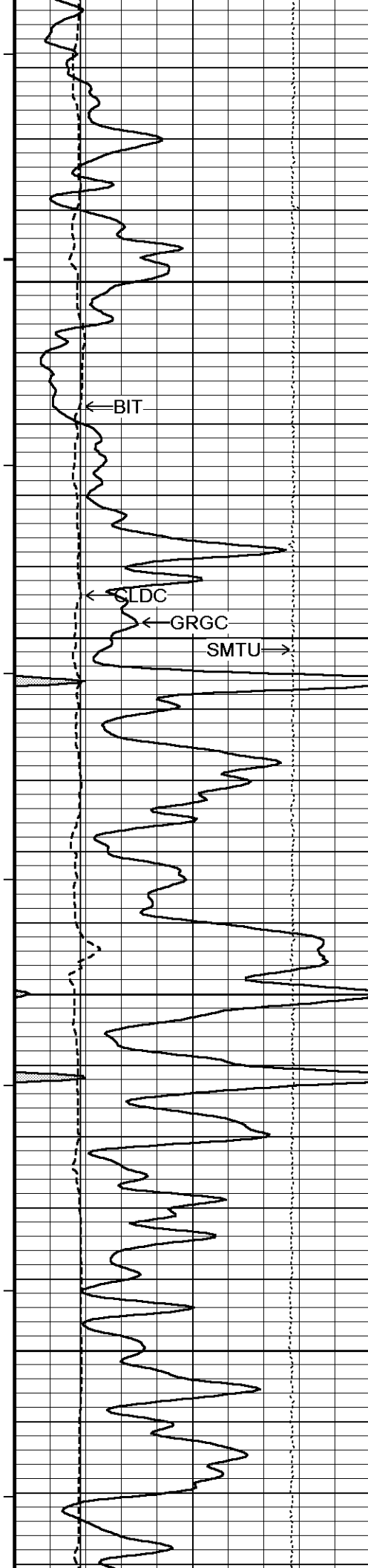
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155°

6400





156°

6450

156°

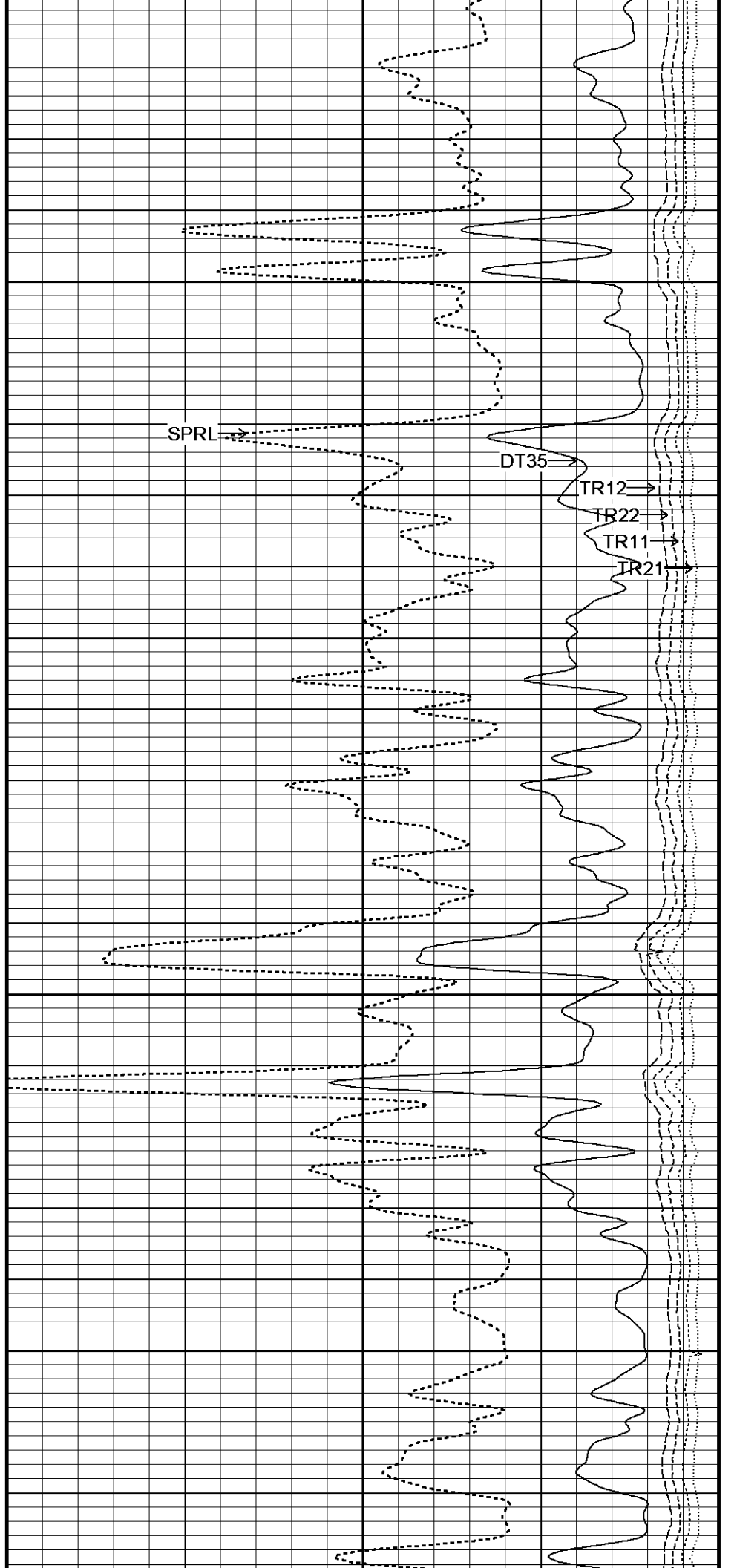
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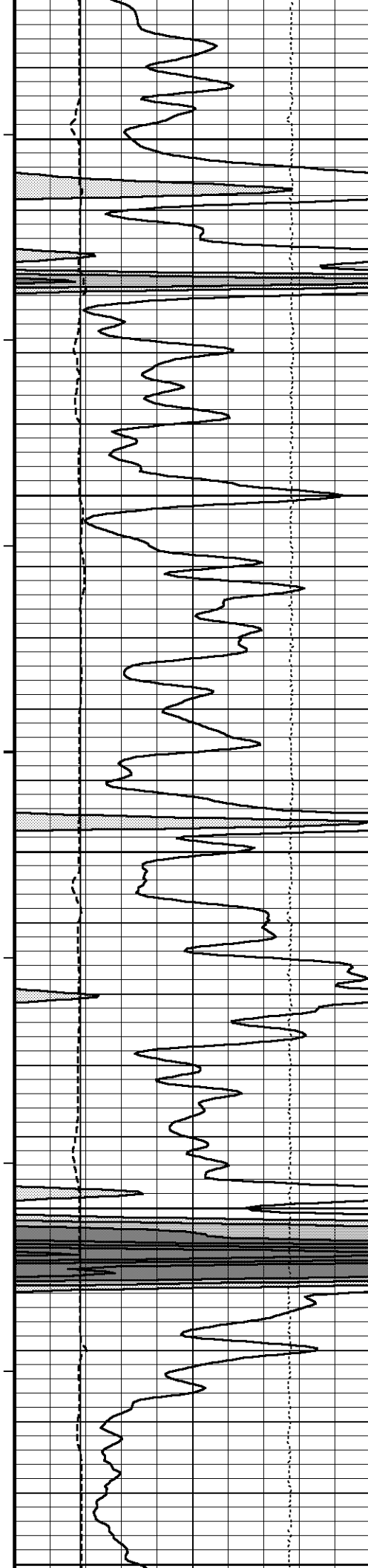
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156°

6600





157°

6650

158°

6700

158°

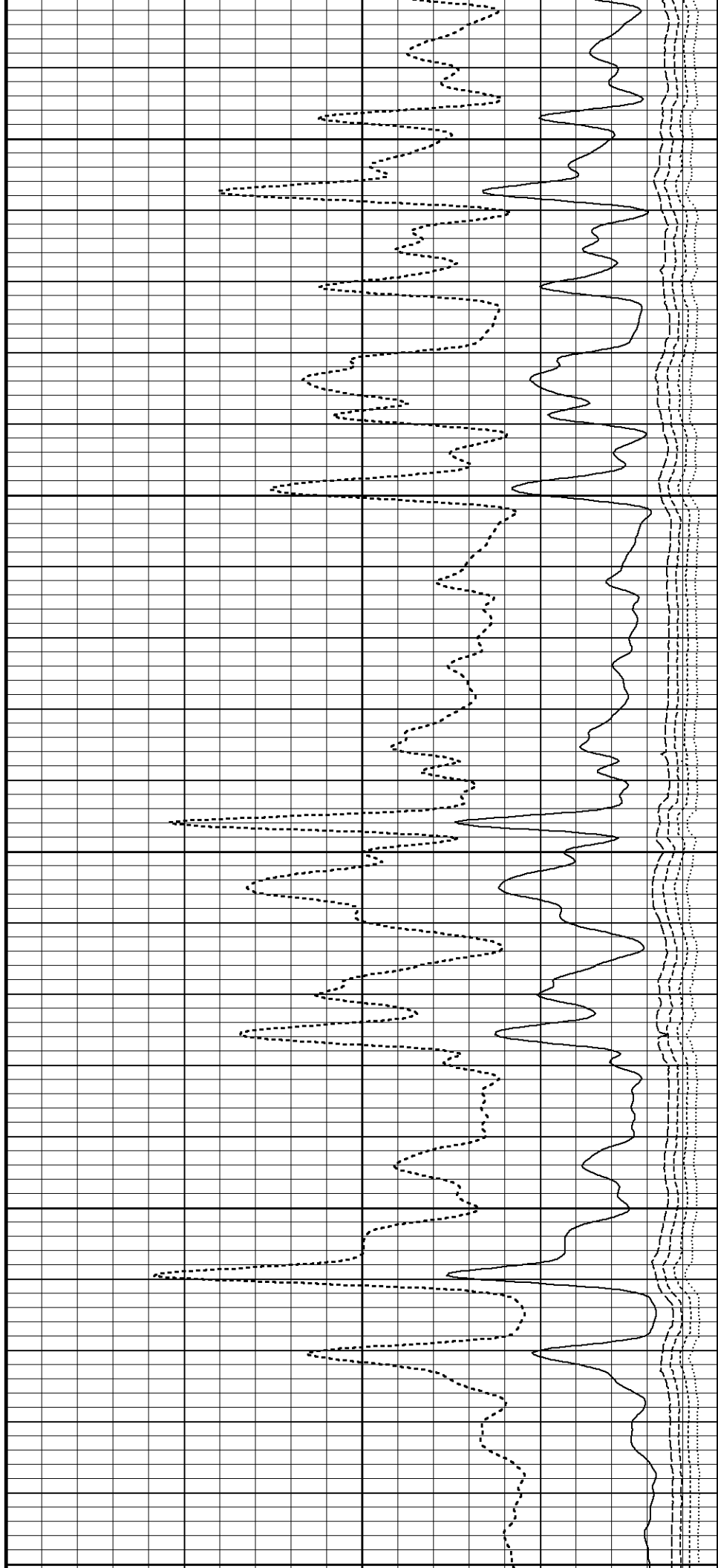
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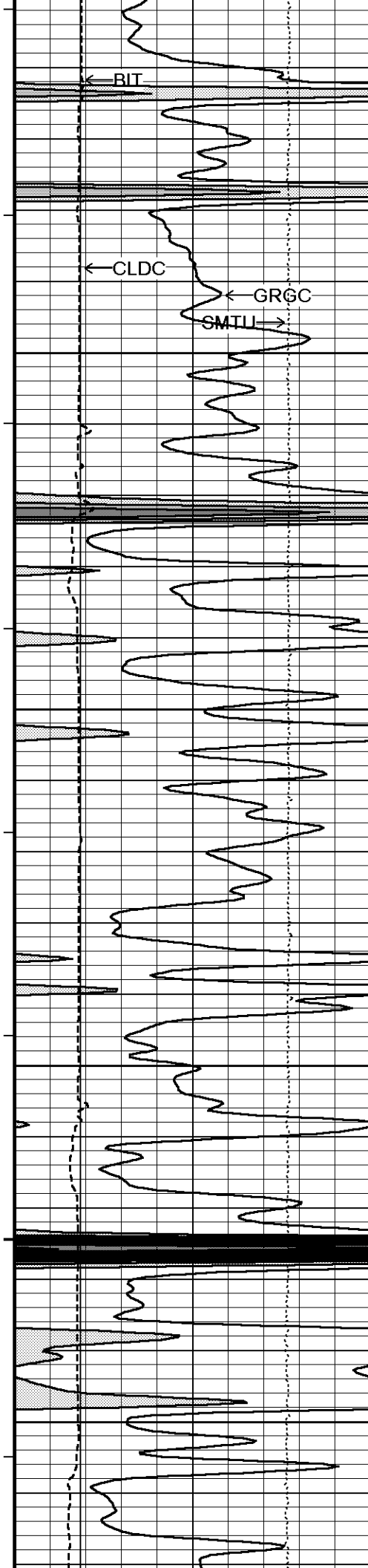
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6800

158°

6850





6900

159°

6900

159°

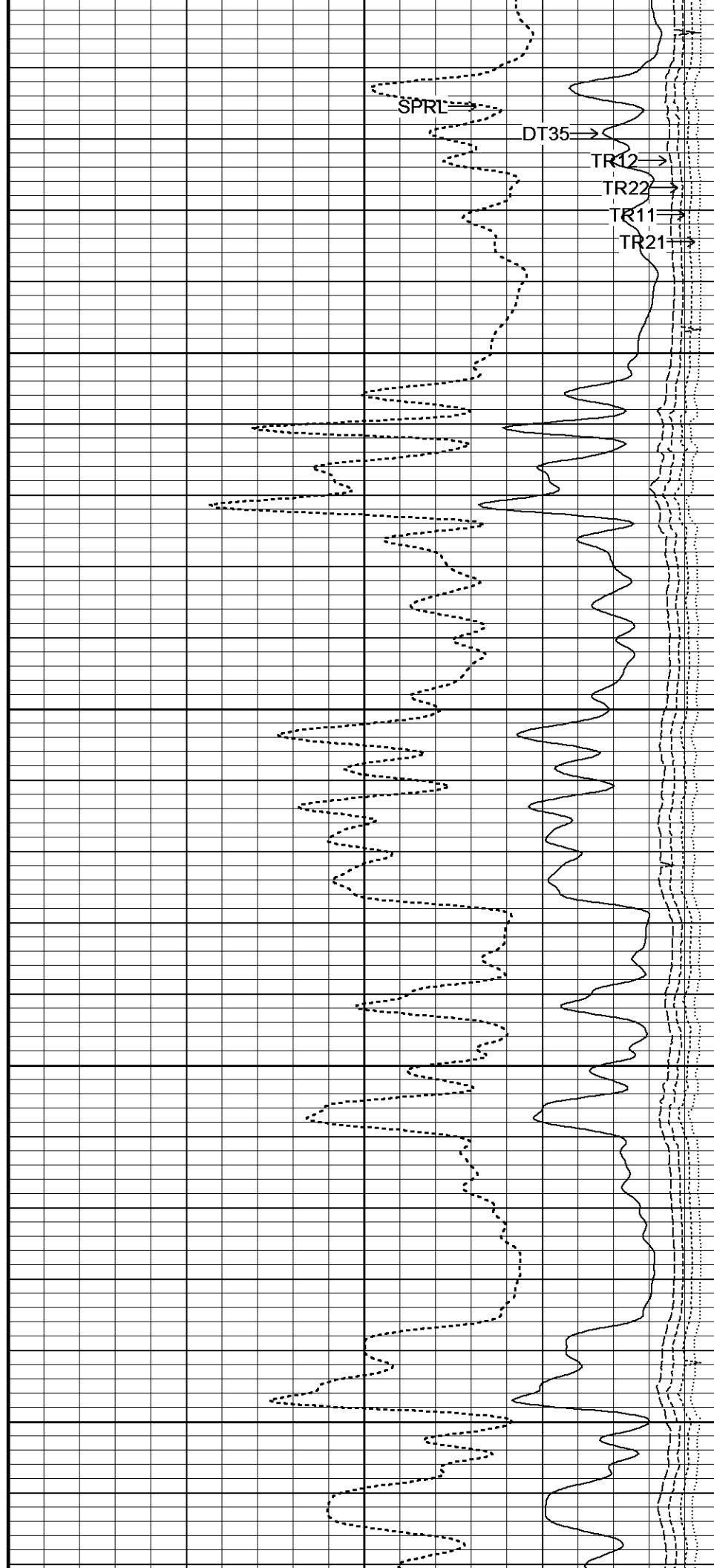
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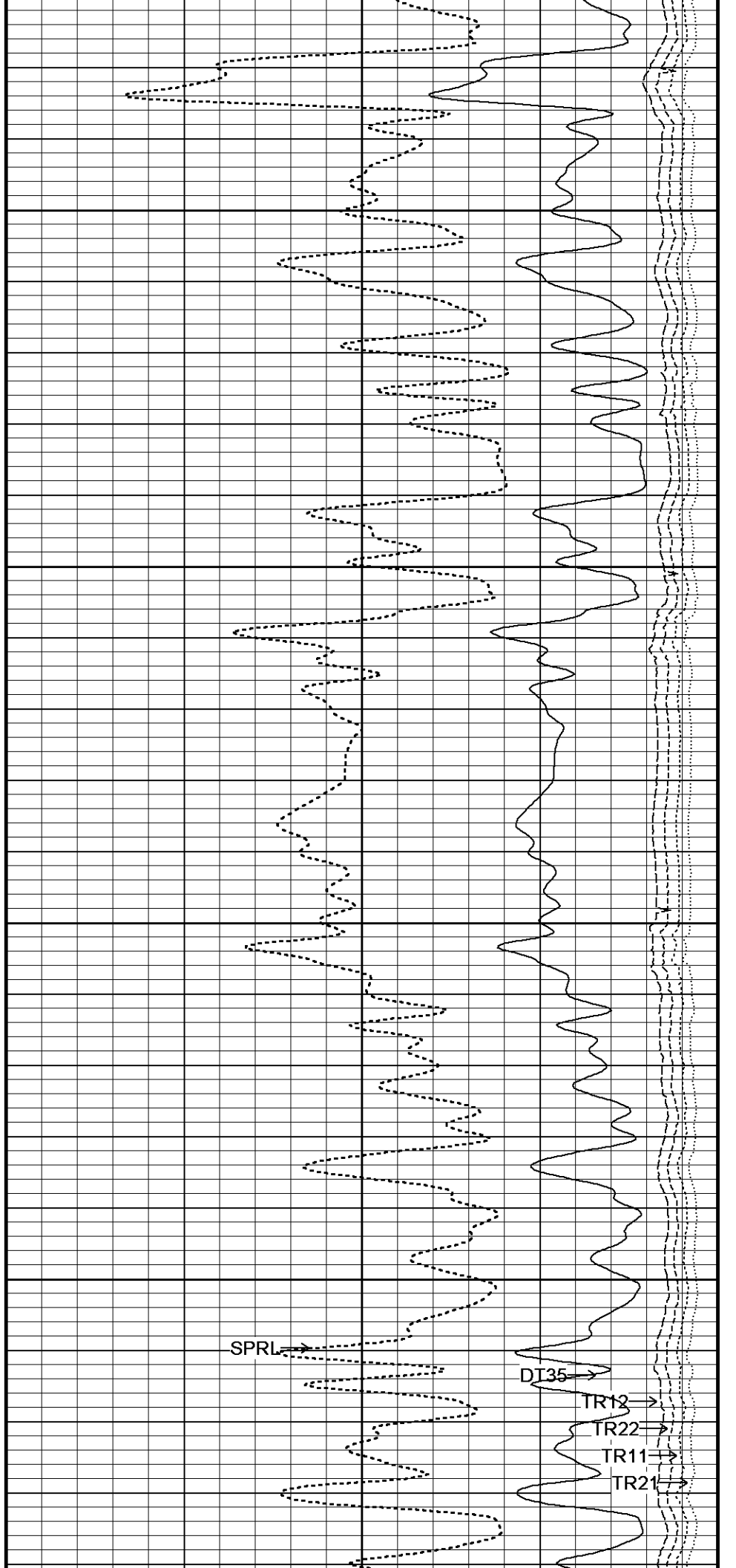
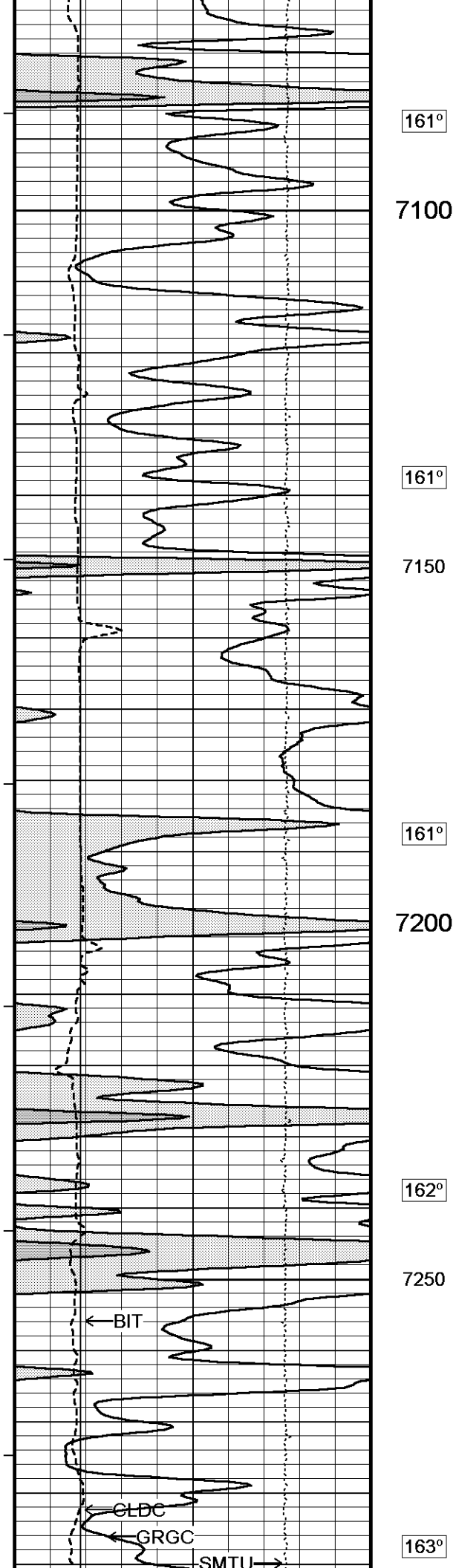
160°

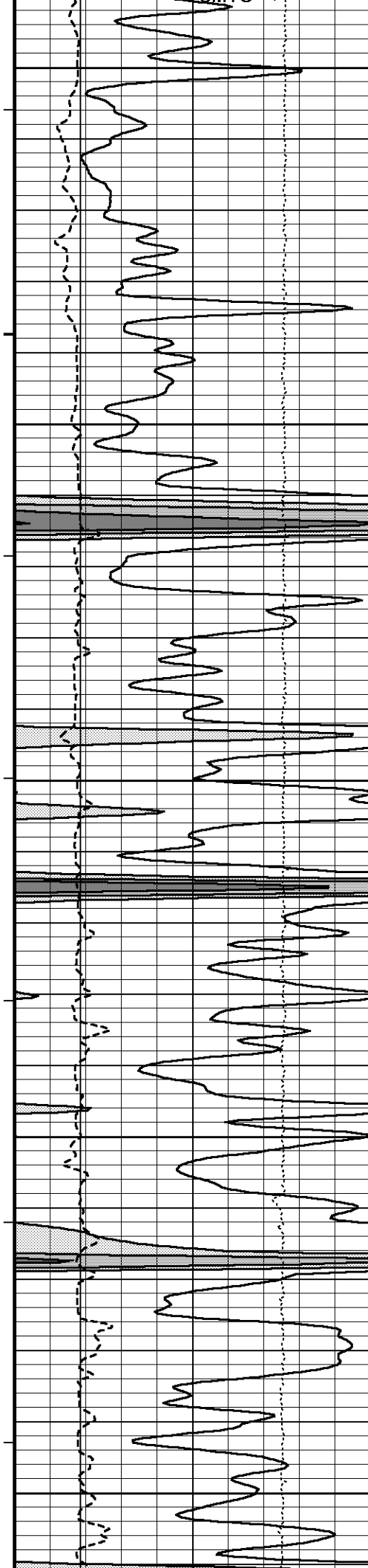
7000

160°

7050







7300

164°

7350

164°

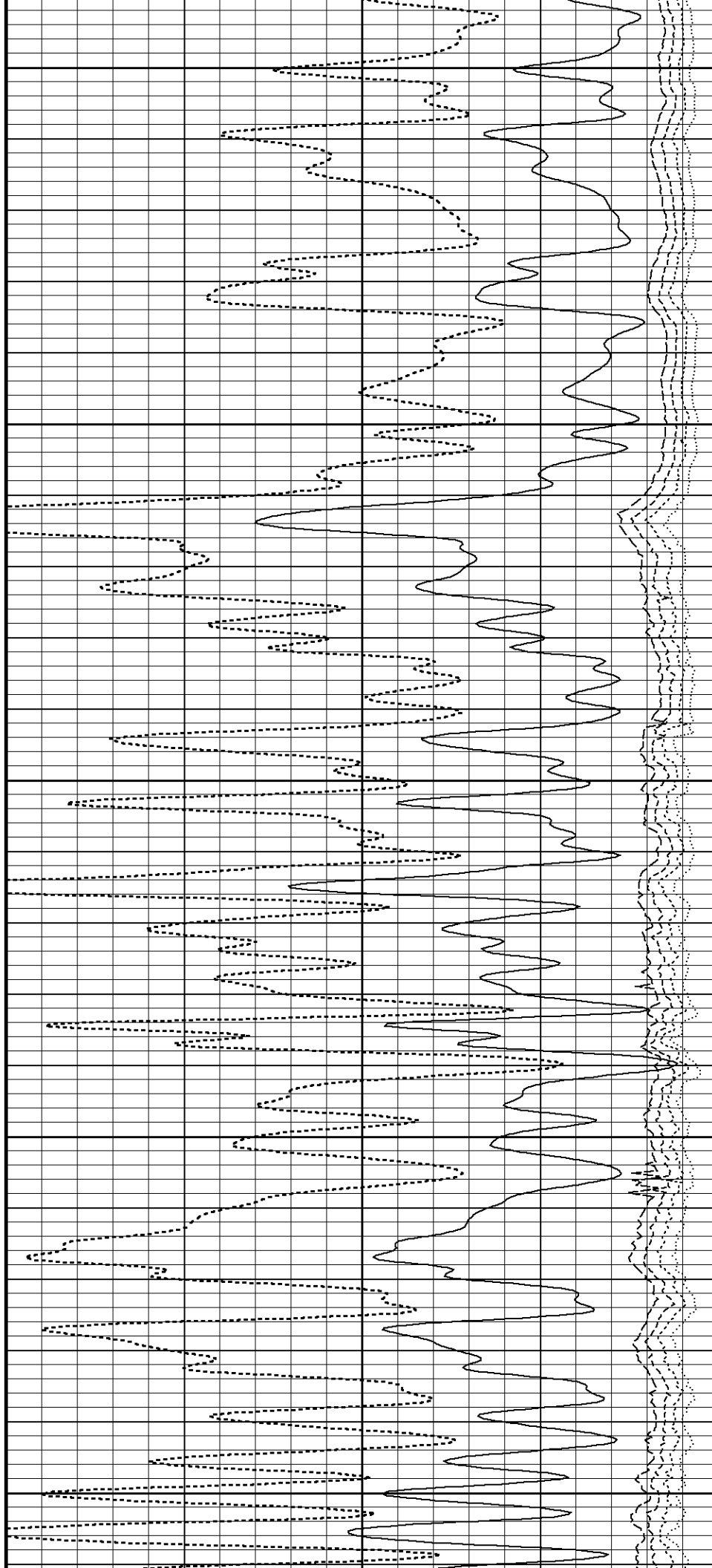
7400

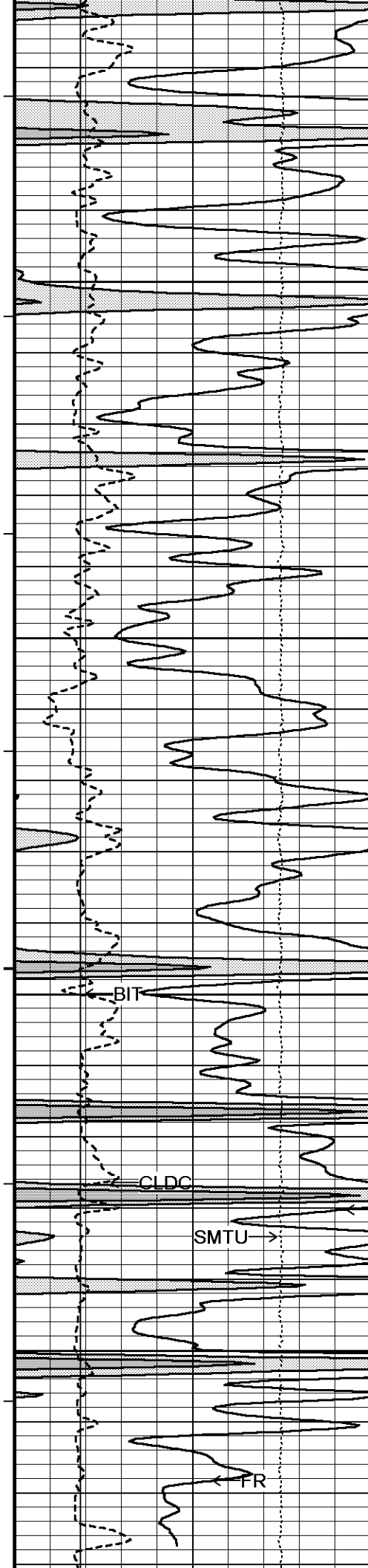
166°

7450

166°

7500





167°

7550

167°

7600

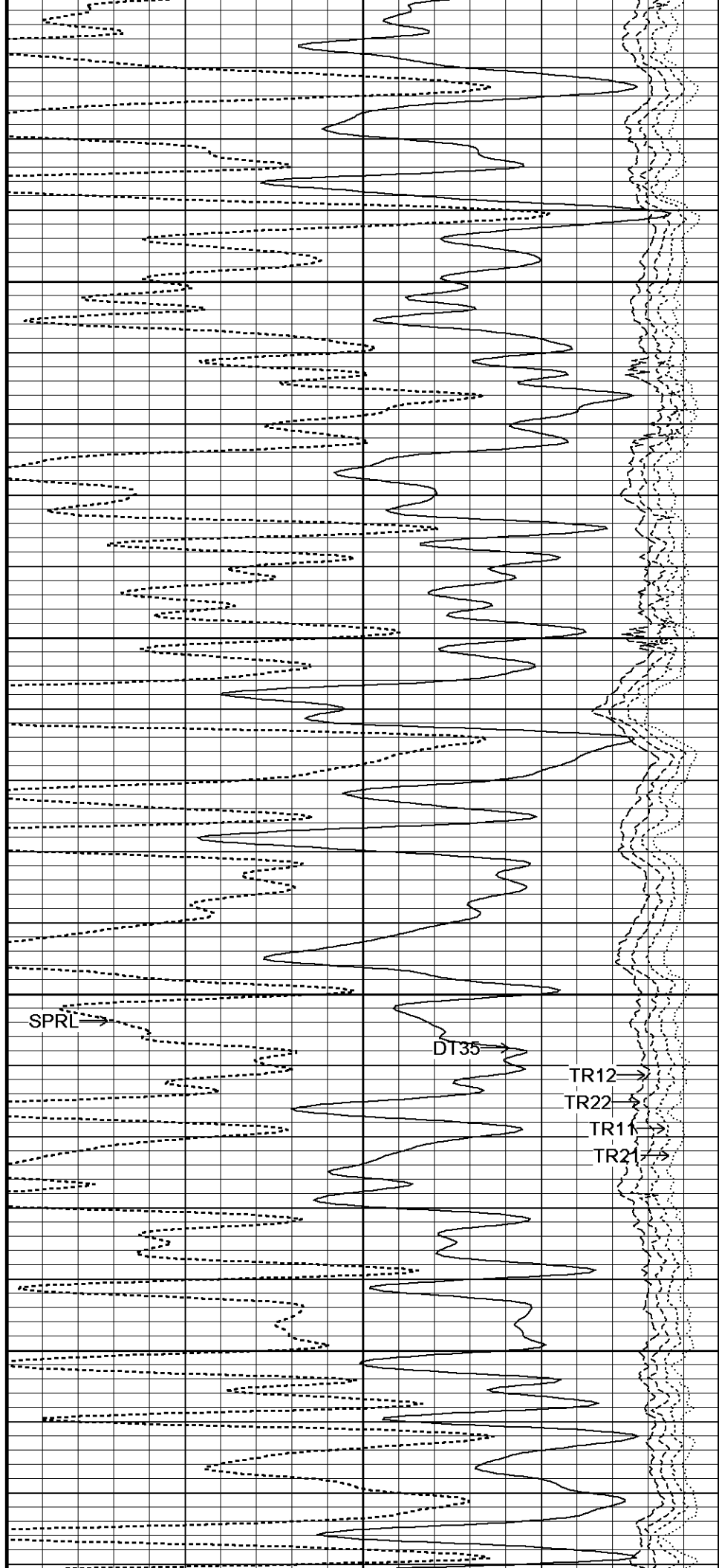
168°

7650

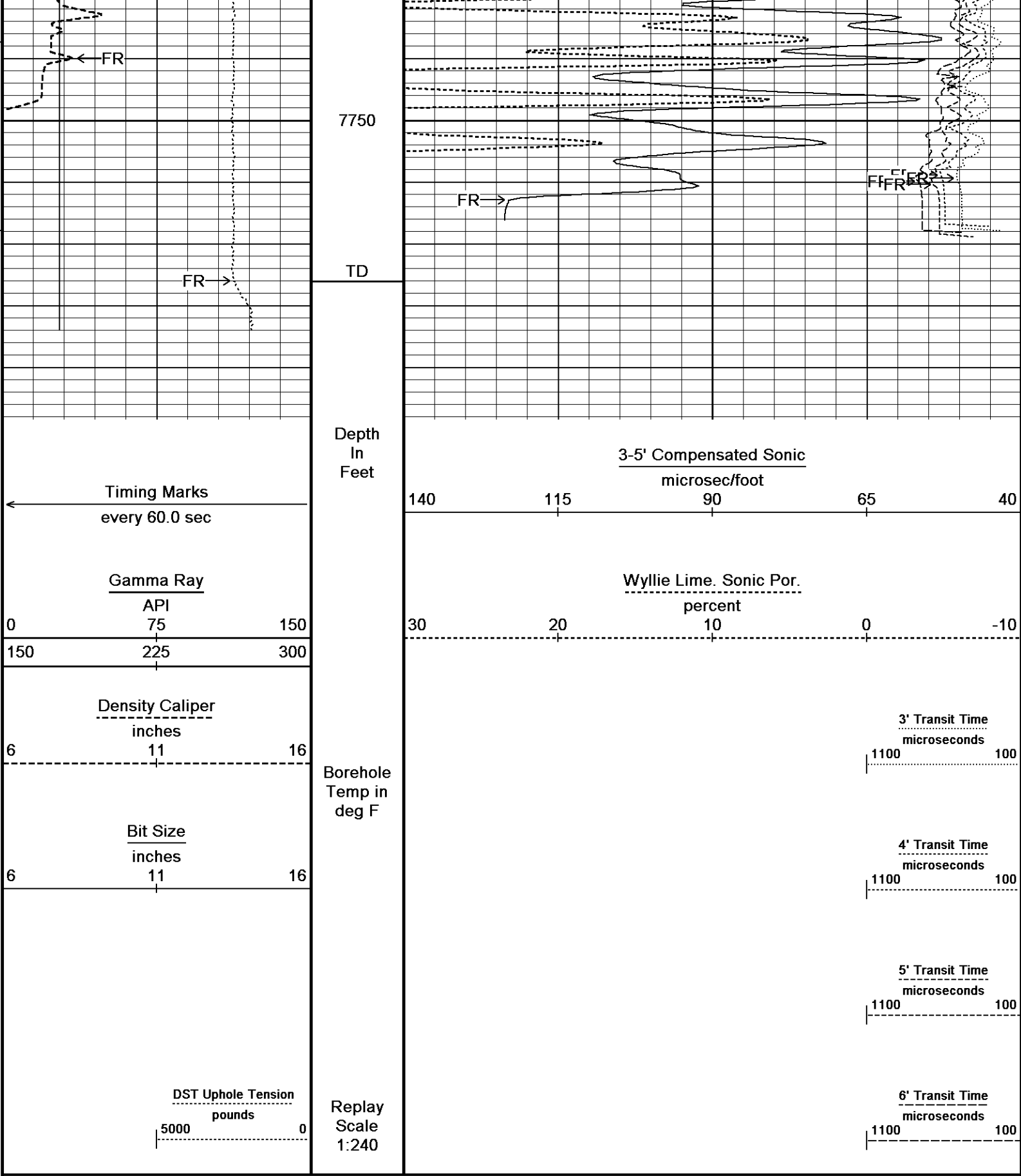
168°

7700

GRGC



TR12
TR22
TR11
TR21



Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 08-FEB-2018 02:37

Filename: C:\Minimus 17.05.6573\Logs\Murfin Rogue #10-25\Murfin Rogue #10-25_003.dta

Recorded on 07-FEB-2018 21:28

System Versions: Logged with 17.05.6573 Plotted with 17.05.6573

General Parameters

Mud Resistivity	1.390	ohm-metres
Mud Resistivity Temperature	75.000	degrees F
Water Level	0.000	feet
Borehole Fluid 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	5.500	inches
Caliper for Differential Caliper	Density Caliper	

Rwa Parameters


Porosity used	Crossplot Porosity	
Resistivity used	Array Ind. One Res Rt	
RWA Constant A	0.620	
RWA Constant M	2.150	
SW/APOR Tool Source	0.000	

Gamma Calibration MCG-C 123

Field Calibration on 06-FEB-2018,21:03

	Measured	Calibrated (API)
Background	90	64
Calibrator (Gross)	737	520
Calibrator (Net)	646	456

Gamma Calibration Tolerances MCG-C 123

Ratio	1.417		Counts/API
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Gamma Constants MCG-C 123

Last Edited on 07-FEB-2018,10:21

Gamma Calibrator Number	MCGGRCC141	
GRC-M Calibrator Jig in Use?	NO	
Inactive Background Jig in Use?	NO	
Mud Density	1.10	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Potassium Equivalence	Chloride	
K Mud Concentration	0.00	%

High Resolution Temperature Calibration MCG-C 123

Field Calibration on 22-JAN-2018,19:40

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	100.00	100.00

High Resolution Temperature Constants MCG-C 123

Last Edited on 22-SEP-2015,11:43

Pre-filter Length	11
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Sonic Constants MSS-A.A 126

Maximum Boundary Contrast	70.00	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	
Correction for Sonde Skew	Applied	
Cycle Stretch Algorithm	Applied	
MN3FT	0.00	micro-sec
MX3FT	1500.00	micro-sec
Hunt-Raymer Constant	83.13	micro-sec/ft

Sonde Mode	Compensated
Hole Type	Open Hole

Sonde Parameters

Sonde Parameters

	Measured	Calibrated
Offset		0.0000
Free Pipe	0.0000	

Peak Amplitude Source

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	N/A			
Start Time (micro-sec)	End Time (micro-sec)	Discriminator (mV)	Depth (m)	
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	0.00	

Full Waveform Parameters

Use 3' Waveform to derive TR	No	
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
Waveform Discriminator Filter	Not Applied	
Semblance Window Width	150.00	micro-sec
Semblance Processing Enabled	Yes	
Tracking Boxes Enabled In Processing	Yes	

Caliper Calibration MPD-C.A 271

Base Calibration on 22-JAN-2018 20:14
Field Calibration on 06-FEB-2018 20:57

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	13926	3.99
2	23856	5.98
3	33858	7.97
4	43568	9.86
5	54687	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.97	7.97

Caliper Calibration Tolerances MPD-C.A 271

Short Arm Field Cal. 7.97

7.77	7.97	8.17
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 in

DOWNHOLE EQUIPMENT

C:\Minimus 17.05.6573\Logs\Murfin Rogue #10-25\Murfin Rogue #10-25_003.dta

Cablehead, 11 pin
CBH-C 0 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

Compact Swivel Head Adaptor
SHA-F 48 LG: 2.74 ft WT: 26.5 lb OD: 2.244 in

Compact Comms Gamma
MCG-C 123 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in



57.56 ft GRGC - MCG Gamma Ray

Compact Micro-log
MML-A 2 LG: 7.97 ft WT: 81.6 lb OD: 2.244 in

Compact Neutron
MDN-A.B 114 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-C.A 271 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

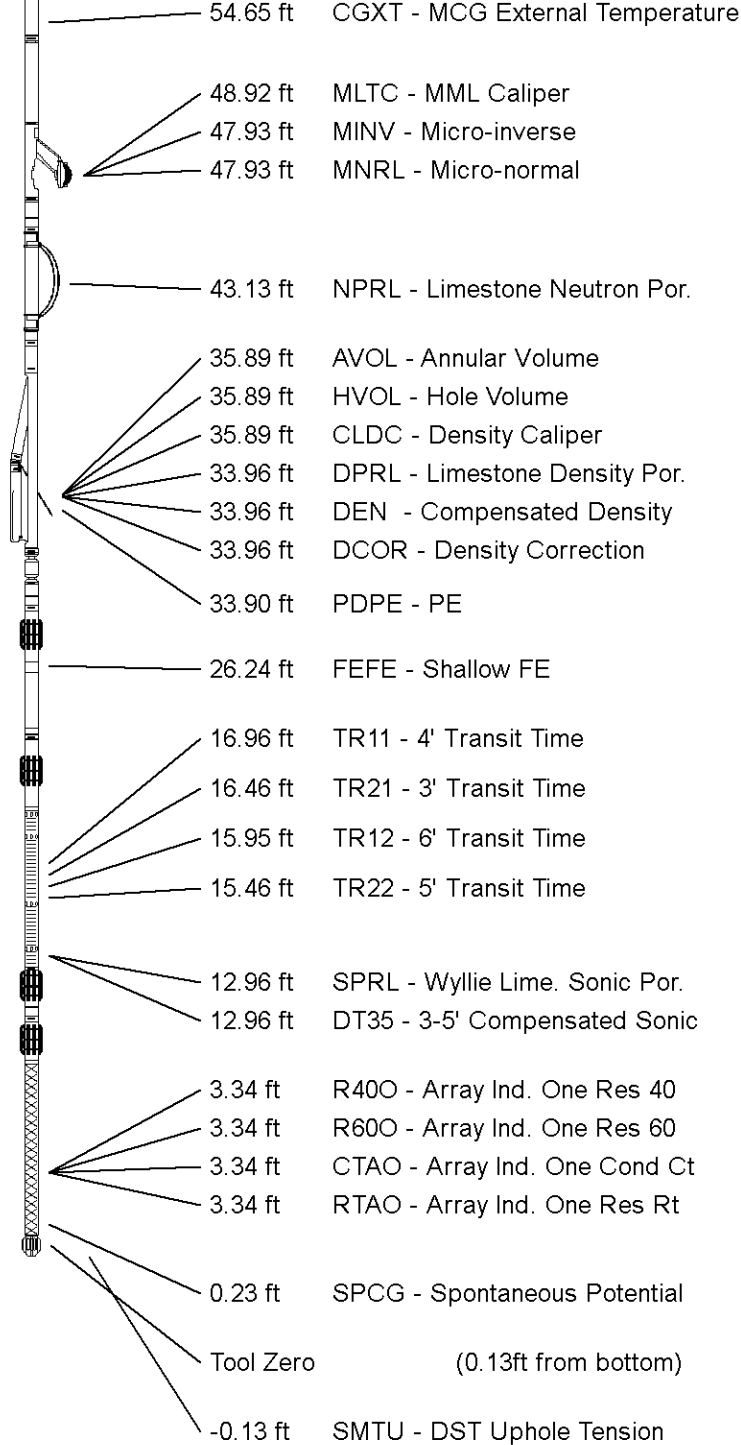
Compact Knuckle Joint
SKJ-E.B 732 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

Compact Focussed Electric
MFE-A.A 135 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Sonic
MSS-A.A 126 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in

Compact Induction
MAI-A.A 45 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 67.98 ft Weight: 531.3 lb



All measurements relative to tool zero.

COMPANY MURFIN DRILLING COMPANY INC.
WELL ROGUE #10-25
FIELD WILDCAT
PROVINCE/COUNTY LINCOLN
COUNTRY/STATE U.S.A. / COLORADO

Elevation Kelly Bushing	5316	feet	First Reading	7763.00	feet
Elevation Drill Floor	5314	feet	Depth Driller	8187.00	feet
Elevation Ground Level	5303	feet	Depth Logger	7776.00	feet



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