

**Weatherford****COMPENSATED SONIC
WITH INTEGRATED TRANSIT TIME**

COMPANY										GRAND MESA OPERATING COMPANY									
WELL										K-M #1-2									
FIELD										WILDCAT									
PROVINCE/COUNTY										WASHINGTON									
COUNTRY/STATE										UNITED STATES / COLORADO									
LOCATION										2384' FNL & 2540' FWL									
SEC		TWP		RGE		Other Services													
2		2S		52W		MPD/MDN													
API Number				05-121-11033				MAI/MFE											
Permit Number								MML											
Permanent Datum G.L., Elevation 4672 feet																			
Log Measured From KB																			
Drilling Measured From K.B. @ 10 FEET																			
Date		07-OCT-2013								02-NOV-2013						Elevations:			
Run Number		ONE								TWO						KB		4682.00	
Service Order		3541093								3541093						DF		4680.00	
Depth Driller		4485.00				feet				7720.00						feet			
Depth Logger		4482.00				feet				7718.00						feet			
First Reading		7708.00				feet													
Last Reading		396.00				feet													
Casing Driller		396.00				feet				396.00						feet			
Casing Logger		396.00				feet				396.00						feet			
Bit Size		7.880				inches				7.880						inches			
Hole Fluid Type		CHEMICAL								CHEMICAL									
Density / Viscosity		9.30		lb/USg		50.00		CP		9.30		lb/USg		67.00		CP			
PH / Fluid Loss		8.50				6.40		ml/30Min		9.00				10.80		ml/30Min			
Sample Source		MUDPIT								MUDPIT									
Rm @ Measured Temp		2.34 @ 75.0				ohm-m				2.34 @ 75.0		ohm-m							
Rmf @ Measured Temp		1.87 @ 75.0				ohm-m				1.87 @ 75.0		ohm-m							
Rmc @ Measured Temp		2.81 @ 75.0				ohm-m				2.81 @ 75.0		ohm-m							
Source Rmf / Rmc		CALC				CALC				CALC				CALC					
Rm @ BHT		1.34 @131.0				ohm-m				0.93 @189.0		ohm-m							
Time Since Circulation		4 HOURS								5 HOURS									
Max Recorded Temp		131.00				deg F				189.00		deg F							
Equipment / Base		13096		LIB				13244											
Recorded By		W. STAMBAUGH								W. STAMBAUGH									
Witnessed By		BOB SCHREIBER								BOB SCHREIBER									
JOB#		LB13-282								LB13-313									

BOREHOLE RECORD

Last Edited: 02-NOV-2013 19:47

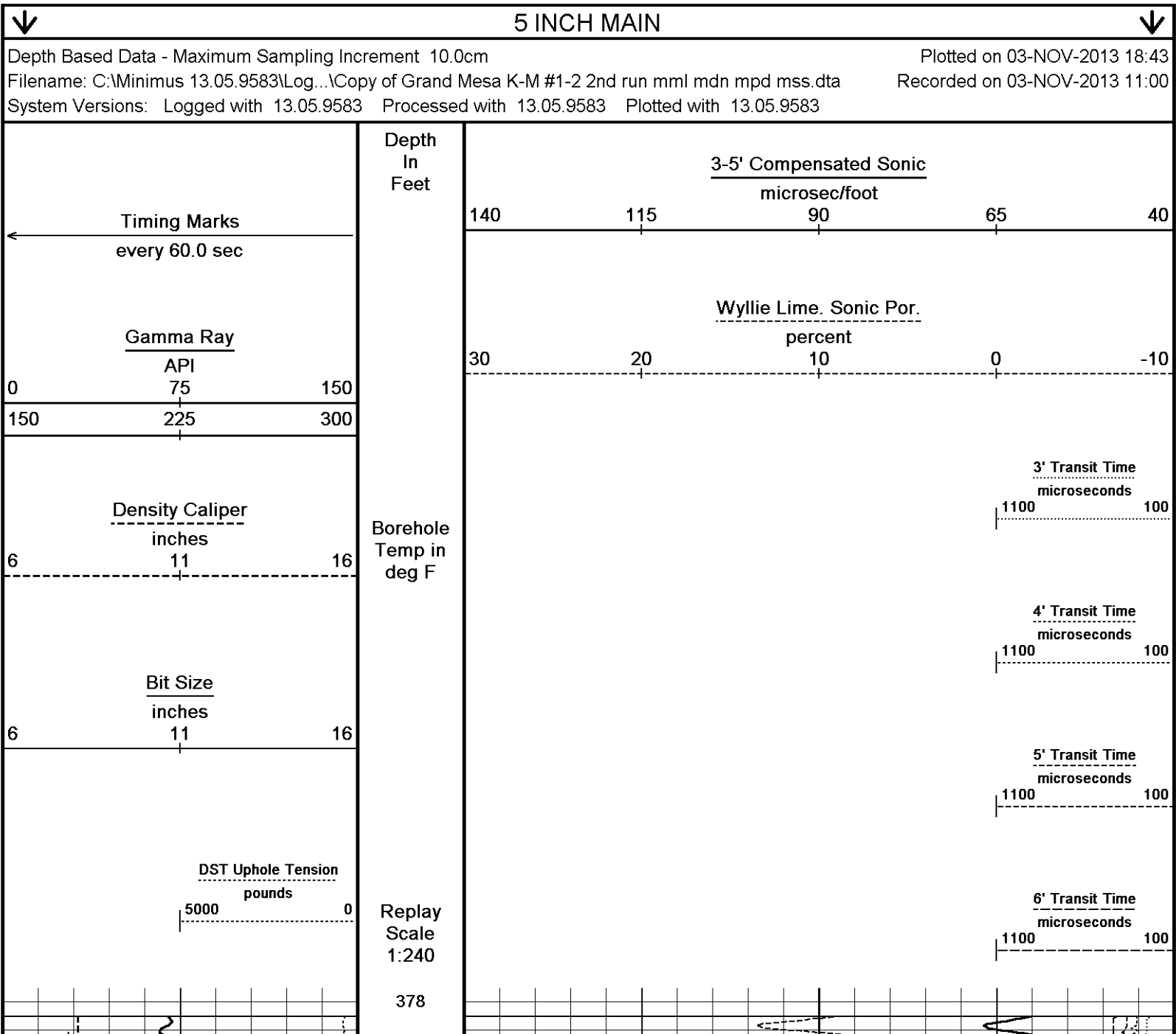
Bit Size inches	Depth From feet	Depth To feet
7.880	396.00	7270.00

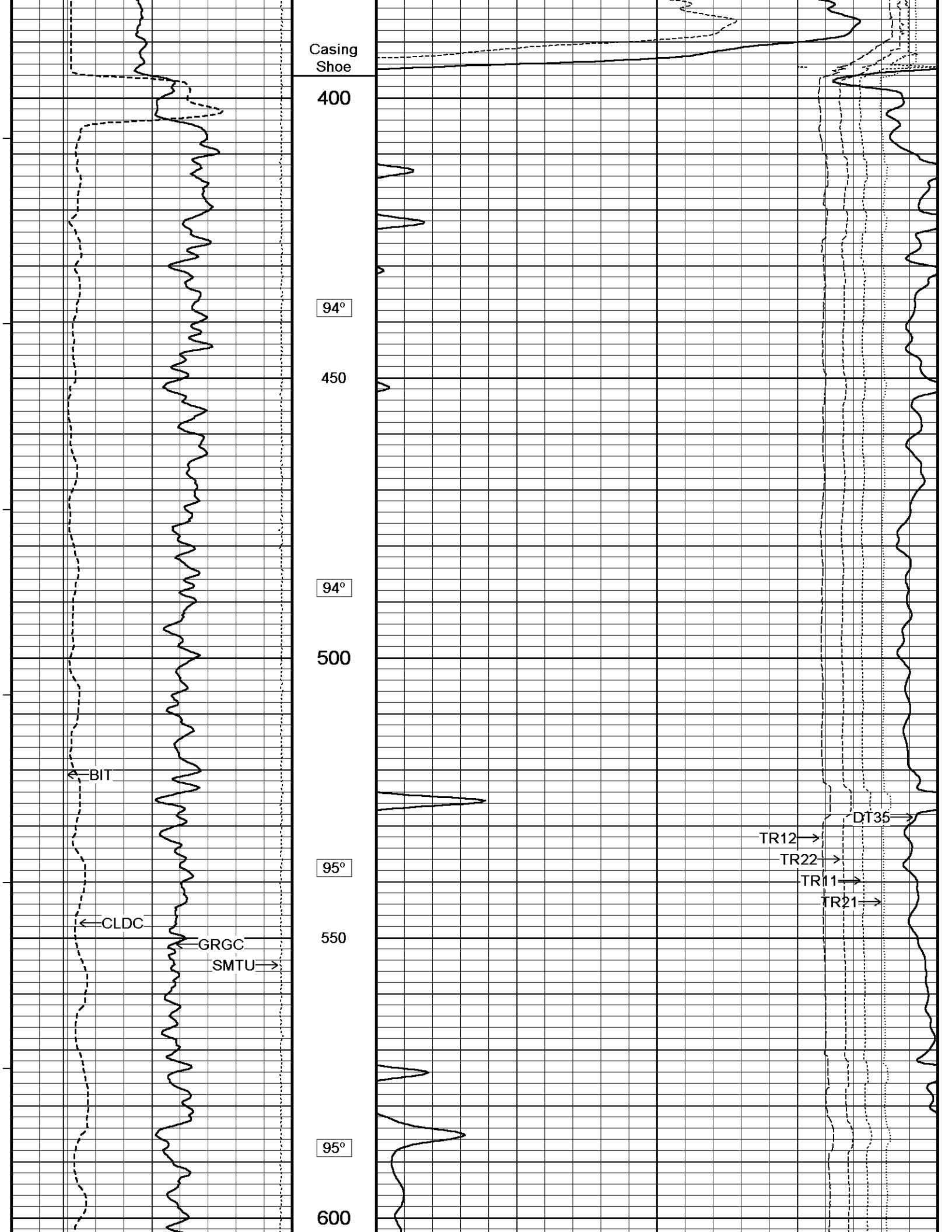
CASING RECORD

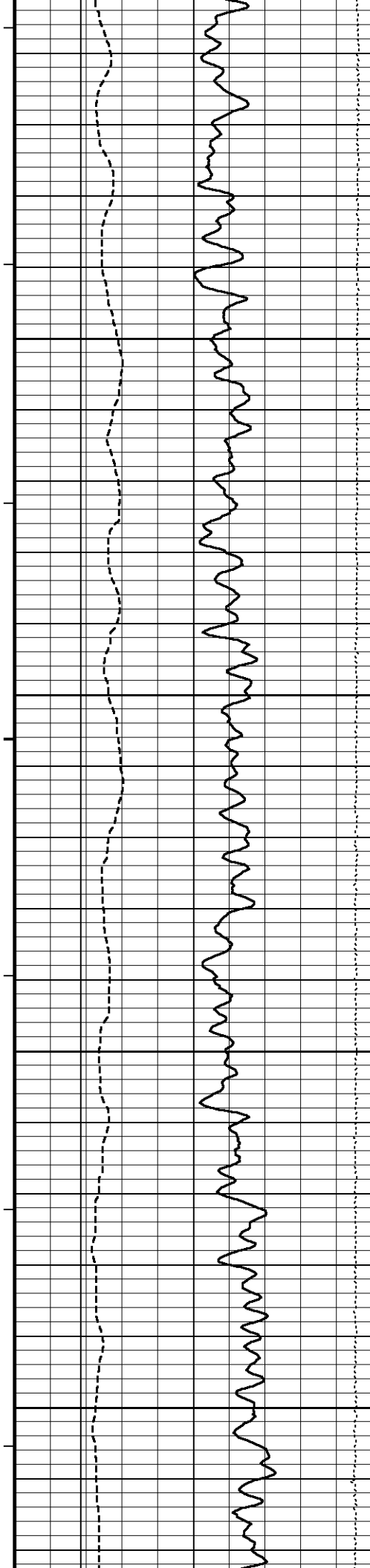
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	396.00	24.00

REMARKS

- SOFTWARE ISSUE: WLS 13.05.9583.
- RUN #1 07-OCT-2013
- MCG, MML, MDN, MPD, MFE, MAI RUN IN COMBINATION.
HARDWARE: DUAL BOWSPRING USED ON MDN.
0.5 INCH STANDOFF USED ON MFE.
0.5 INCH STANDOFF USED ON MAI.
- RUN #2 02-NOV-2013
- 4 DEGREE DEVIATION AT 4700' ANOTHER 4 DEGREE DEVIATION AT 6500' TO 6900' FEET.
- ORIGNAL TD WAS 7433' 530' OF COLLARS SET IN HOLE,
- WHIPSTOCK SET IN THE 6500' TO 6900' INTERVAL AND HOLE KICKED OFF AROUND 6600'.
- MCG, MFE, MAI RUN IN COMBINATION ON FIRST RUN OF RUN #2.
- MCG, MML, MDN, MPD, MSS RUN IN COMBINATION ON SECOND RUN OF RUN #2.
NO REPEAT SECTION ON FINAL ATTEMPT DUE TO CUSTOMER CONCERNS ABOUT HOLE CONDITONS,
AFTER BRIDGING OFF AT 5650' ON THE WAY IN THE HOLE.
HARDWARE: DUAL BOWSPRING USED ON MDN.
0.5 INCH STANDOFF USED ON MSS.







96°

650

96°

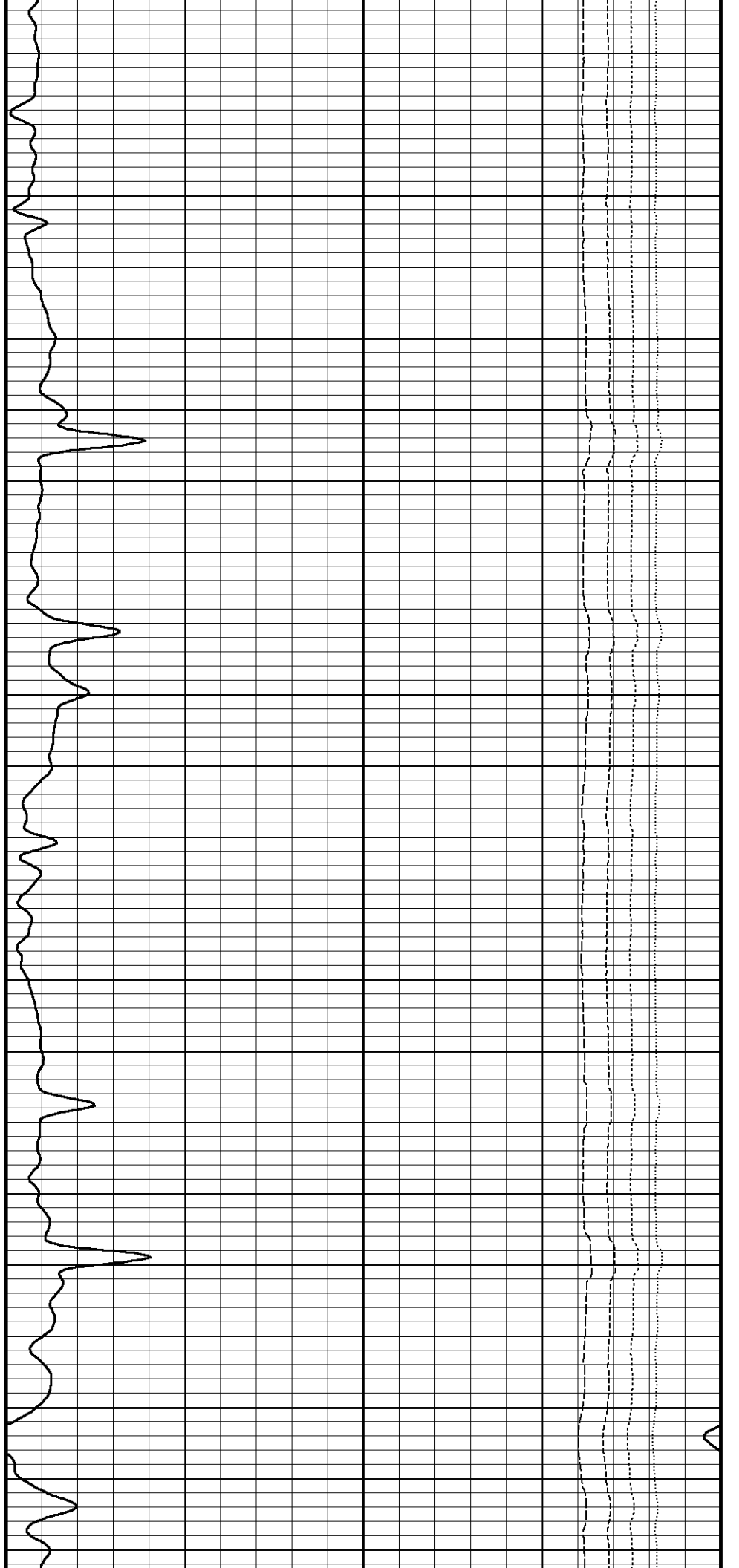
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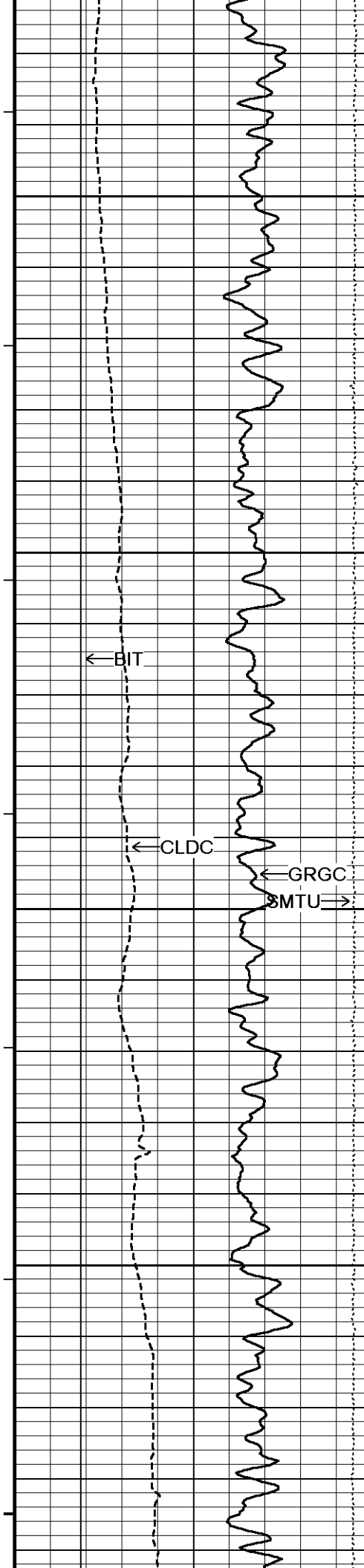
96°

750

97°

800





98°

850

99°

900

←BIT

←CLDC

←GRGC

←MTU→

100°

950

100°

1000

101°

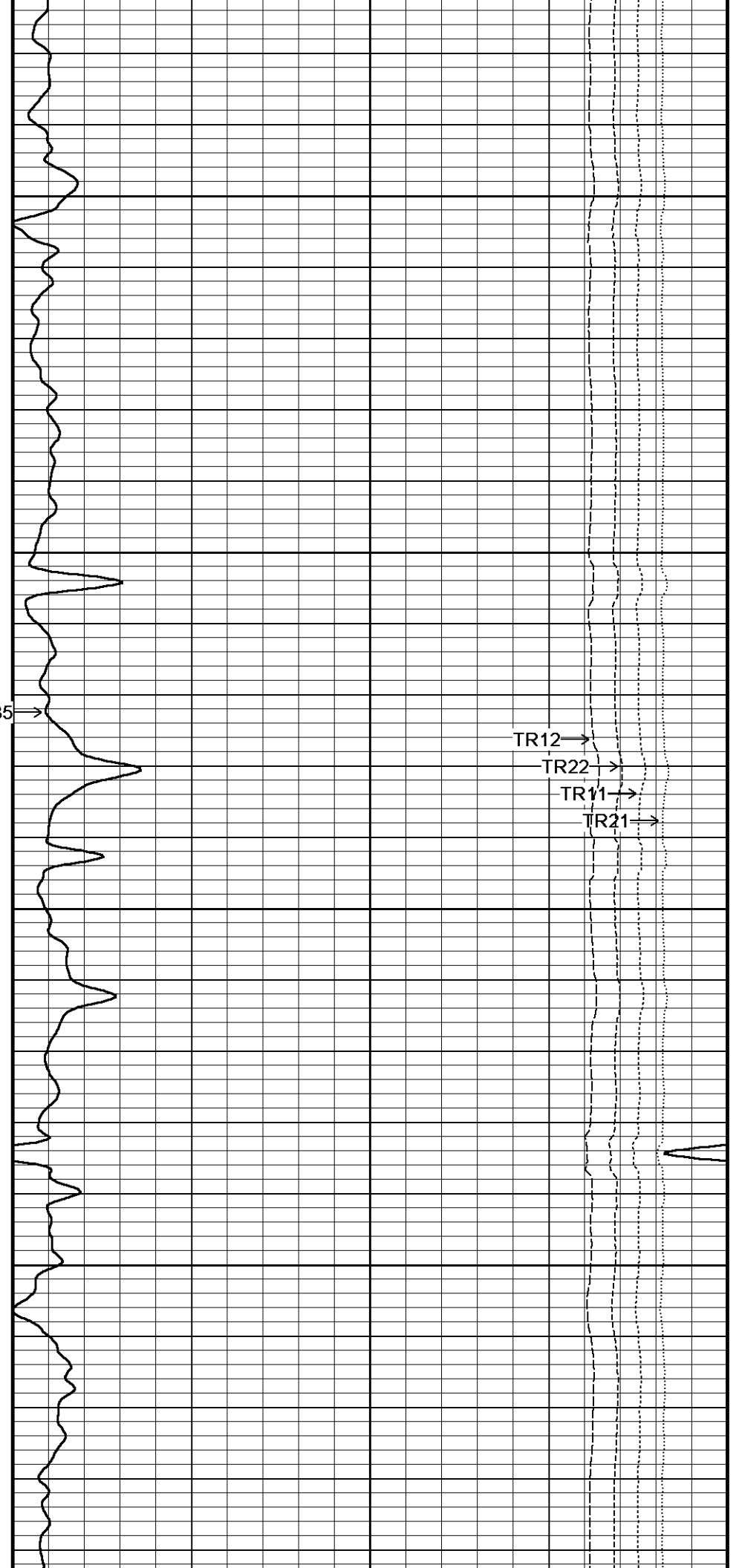
DT35→

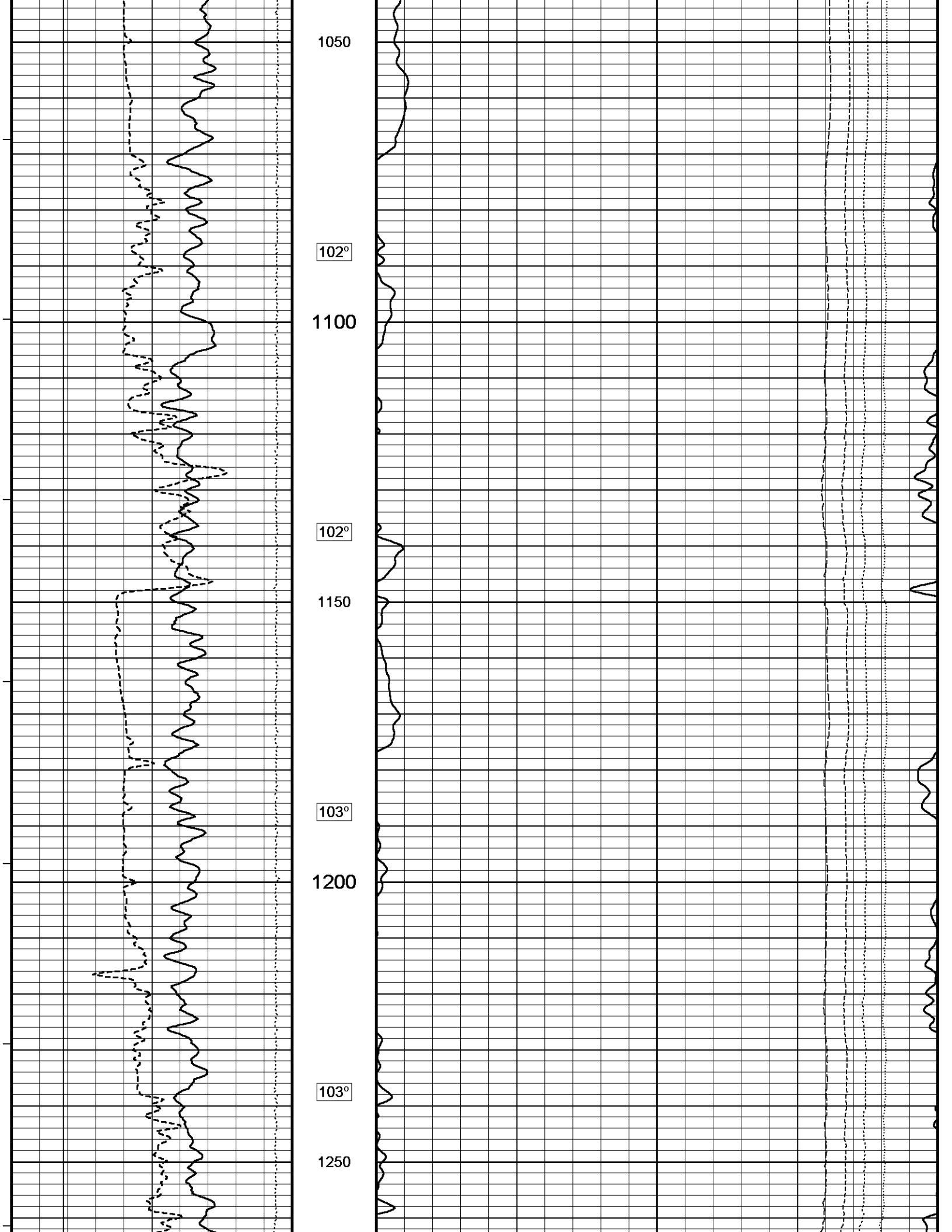
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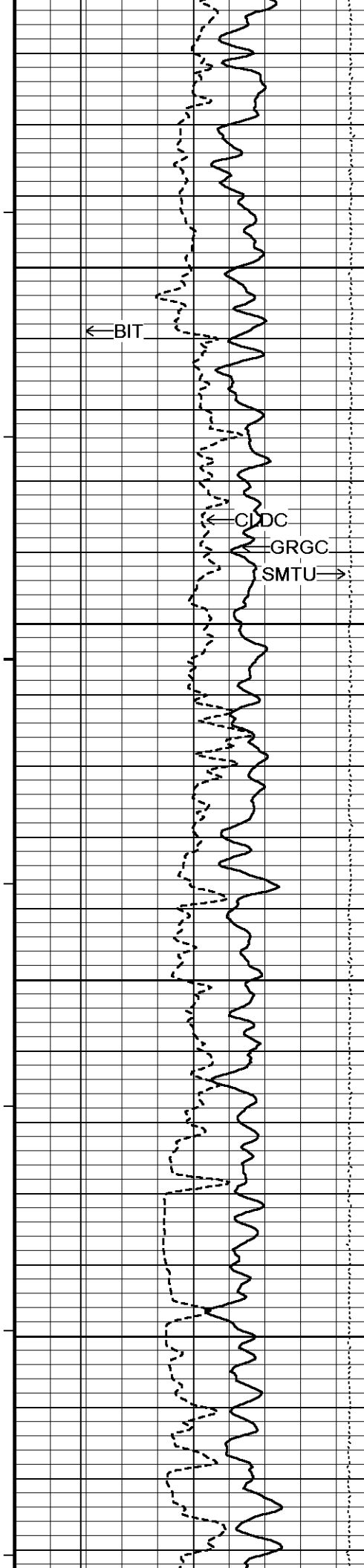
TR22→

TR11→

TR21→







104°

1300

105°

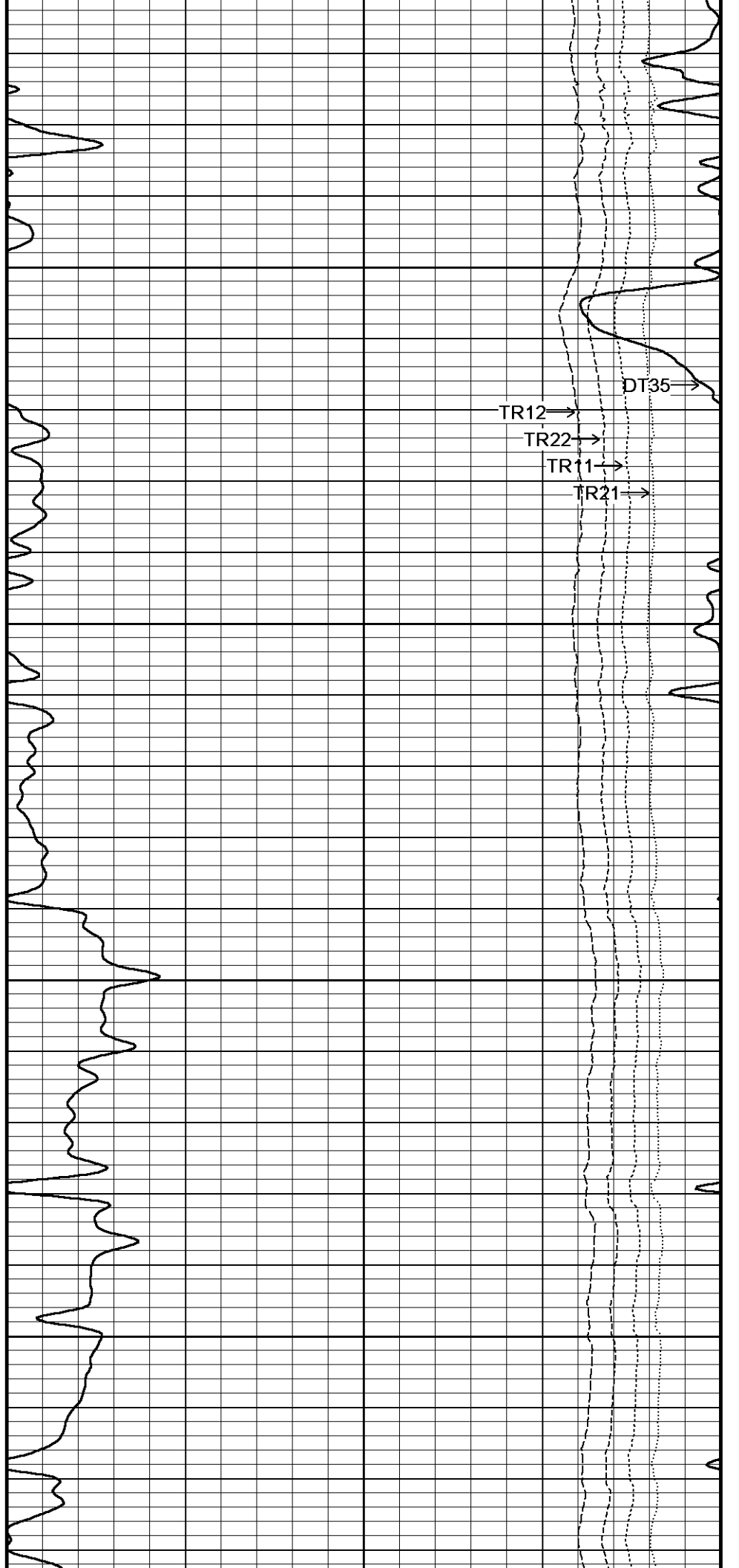
1350

105°

1400

106°

1450



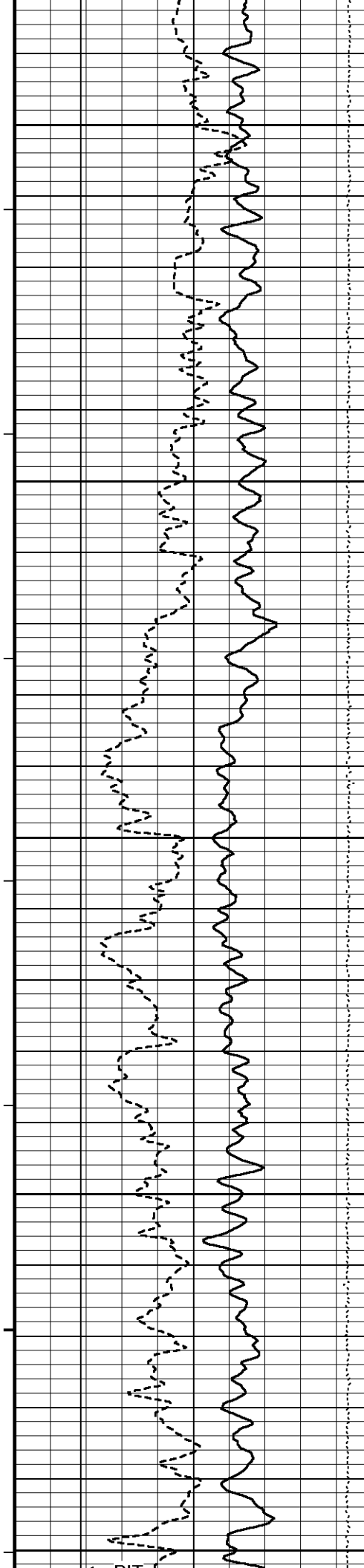
TR12

TR22

TR11

TR21

DT35



106°

1500

107°

1550

108°

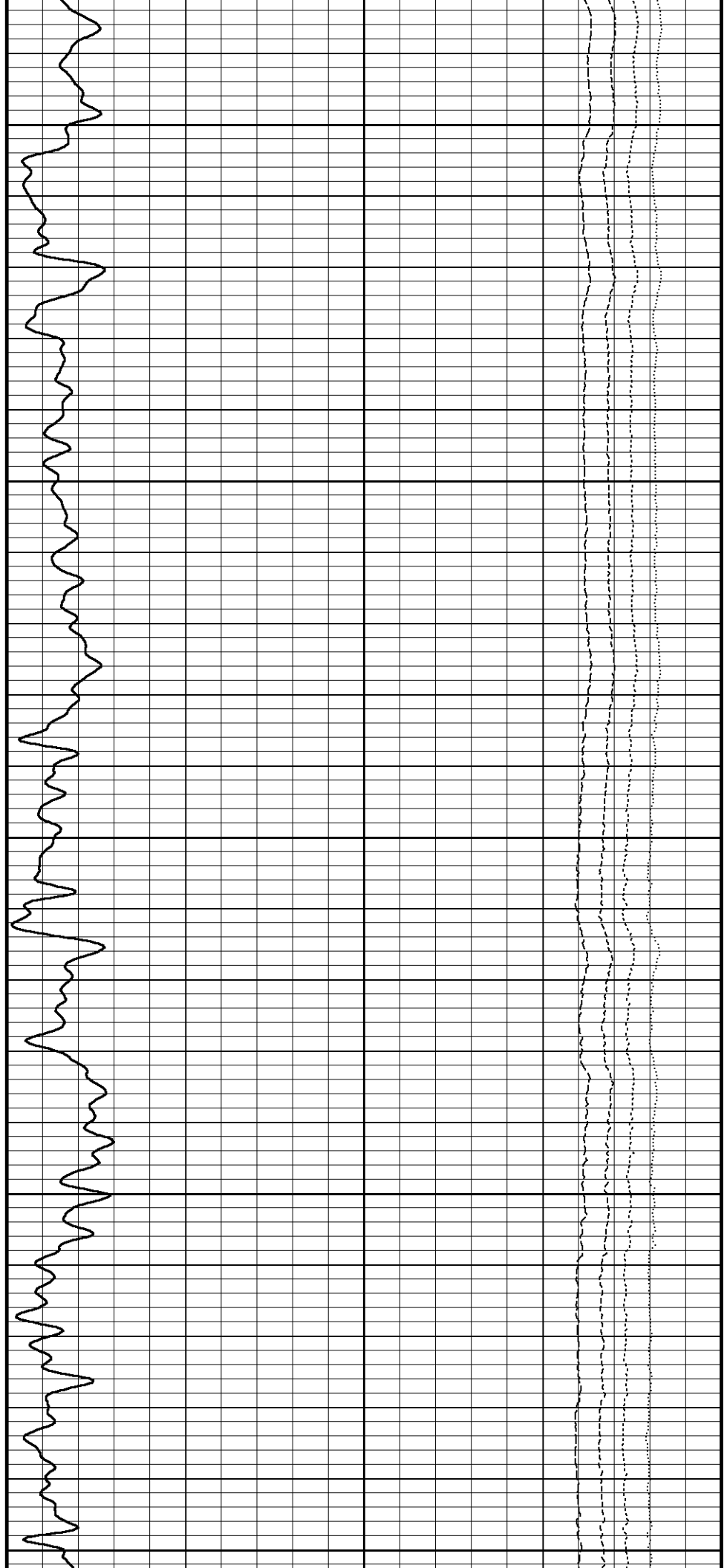
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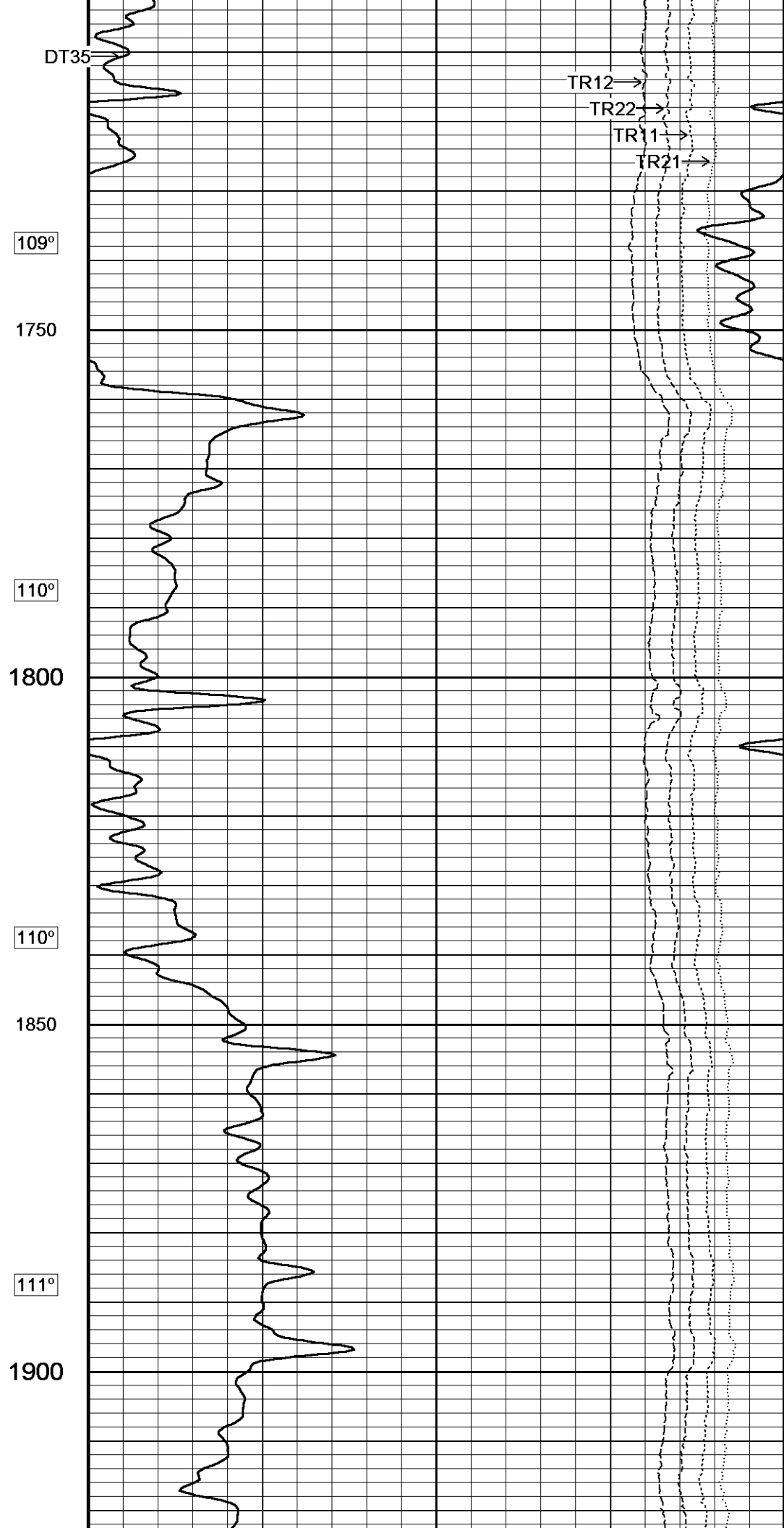
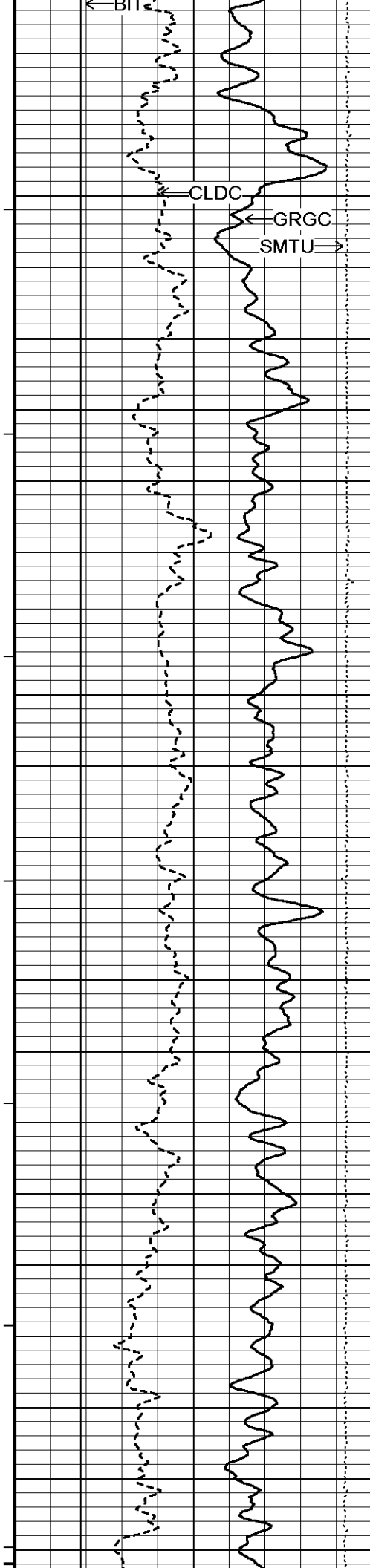
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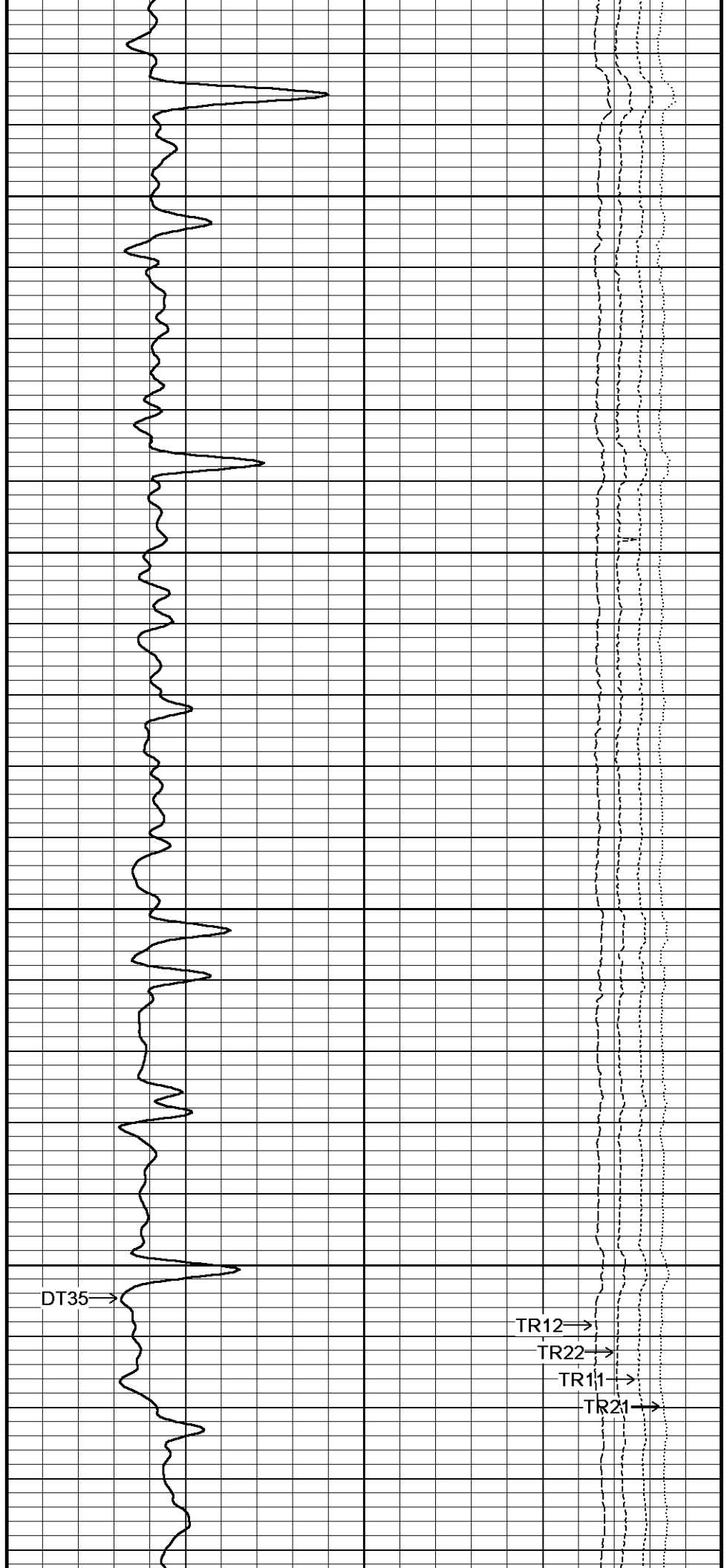
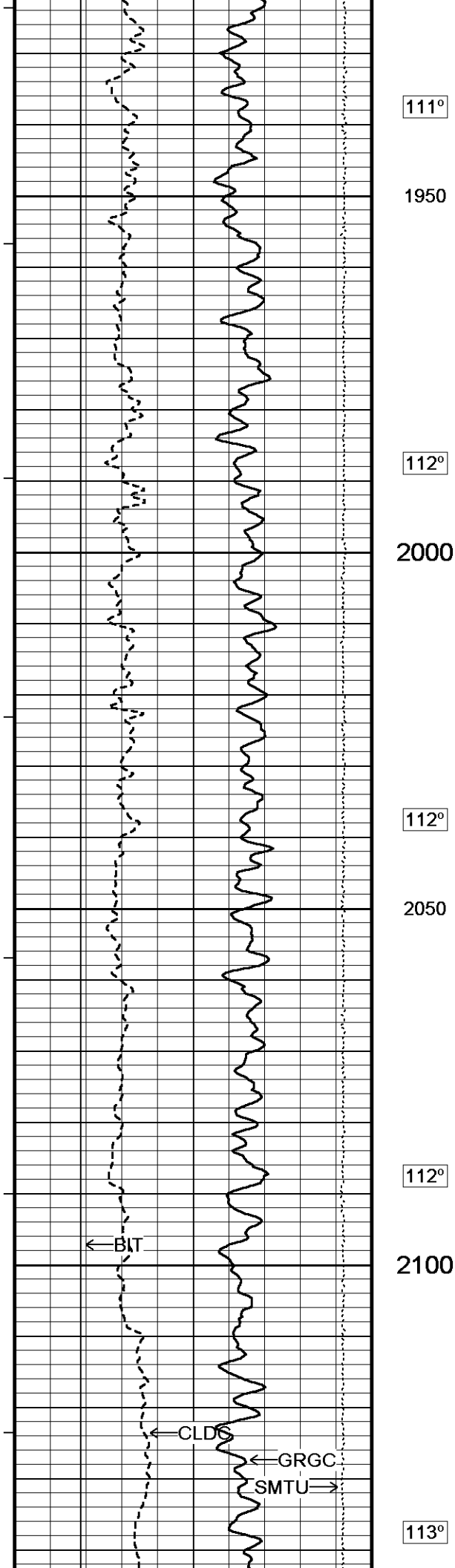
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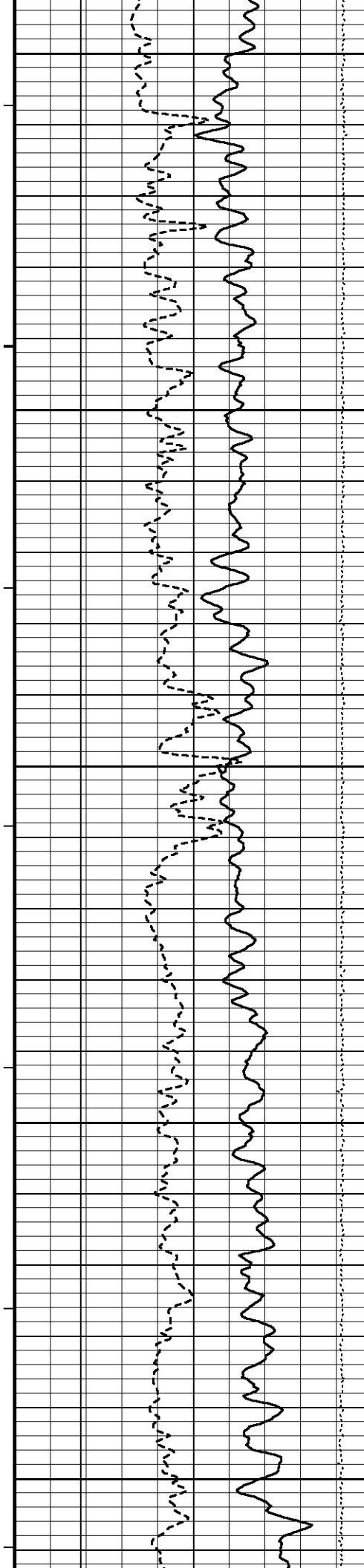
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1700









2150

114°

2200

114°

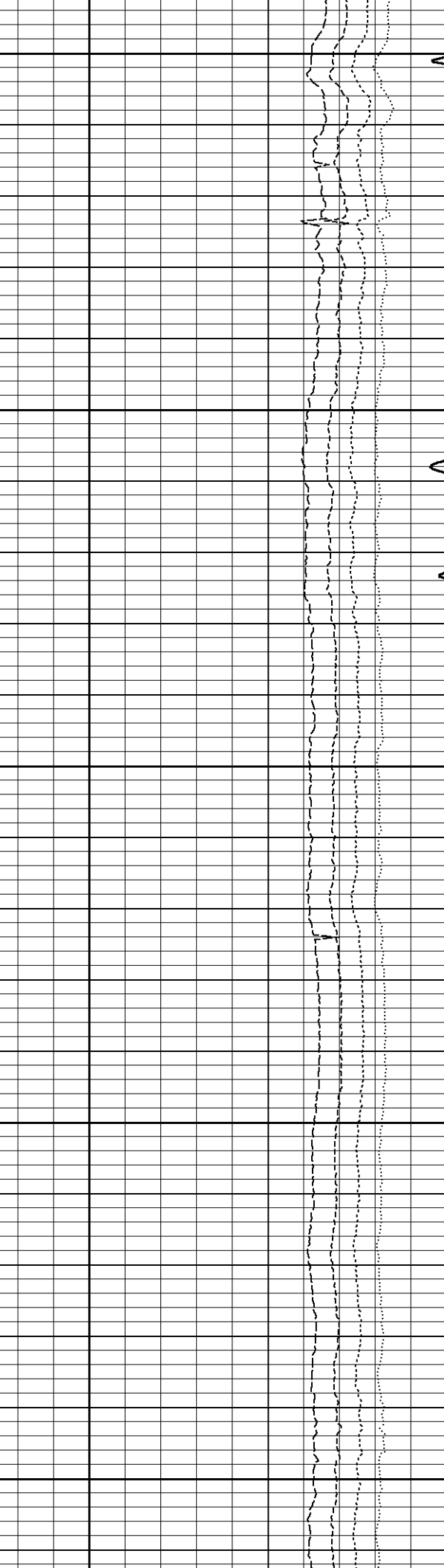
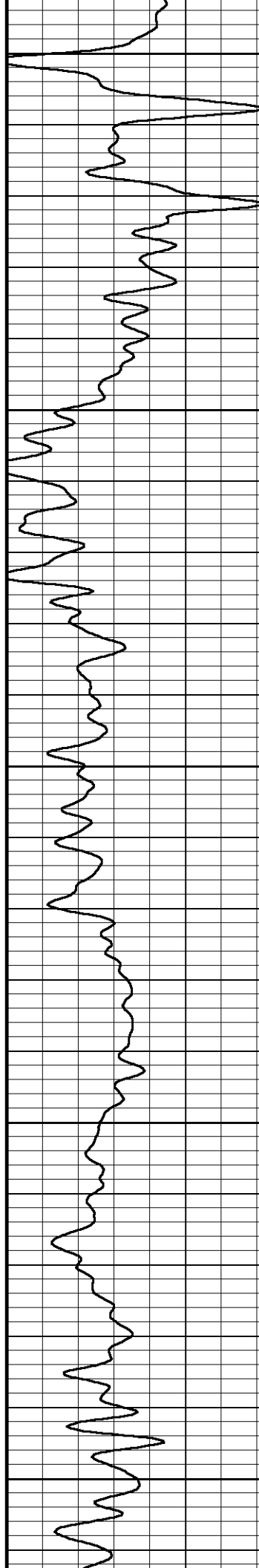
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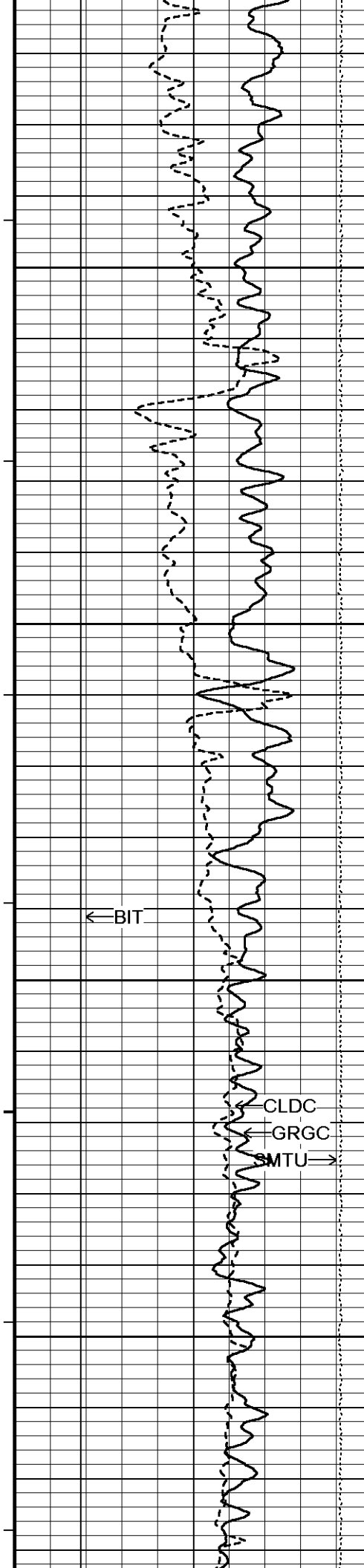
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2300

115°

2350





116°

2400

116°

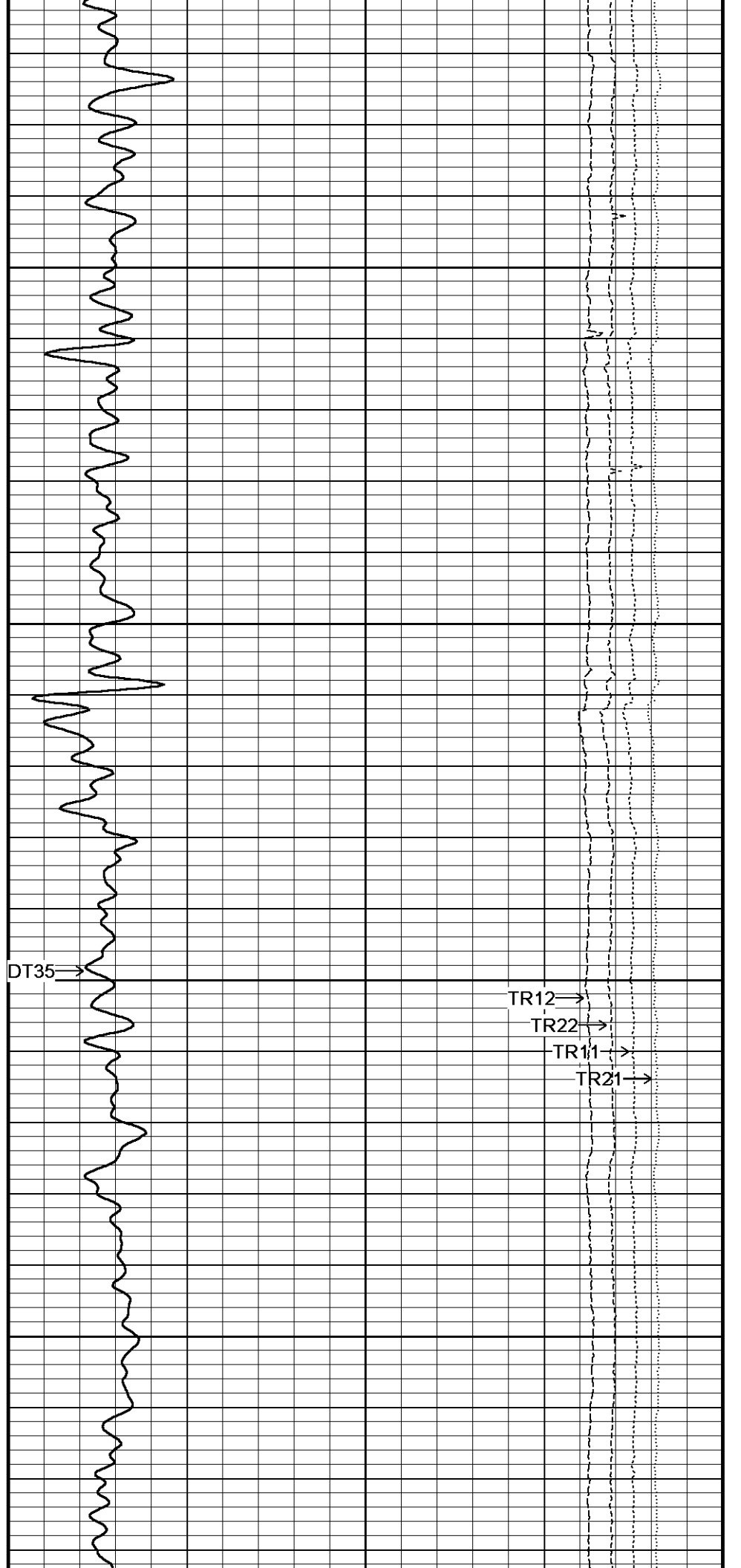
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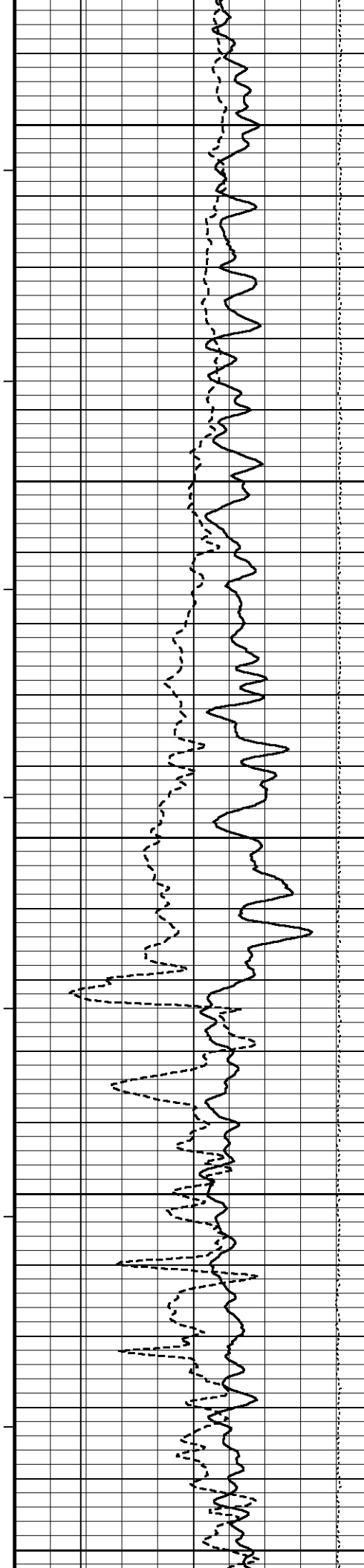
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2500

118°

2550





118°

2600

119°

2650

120°

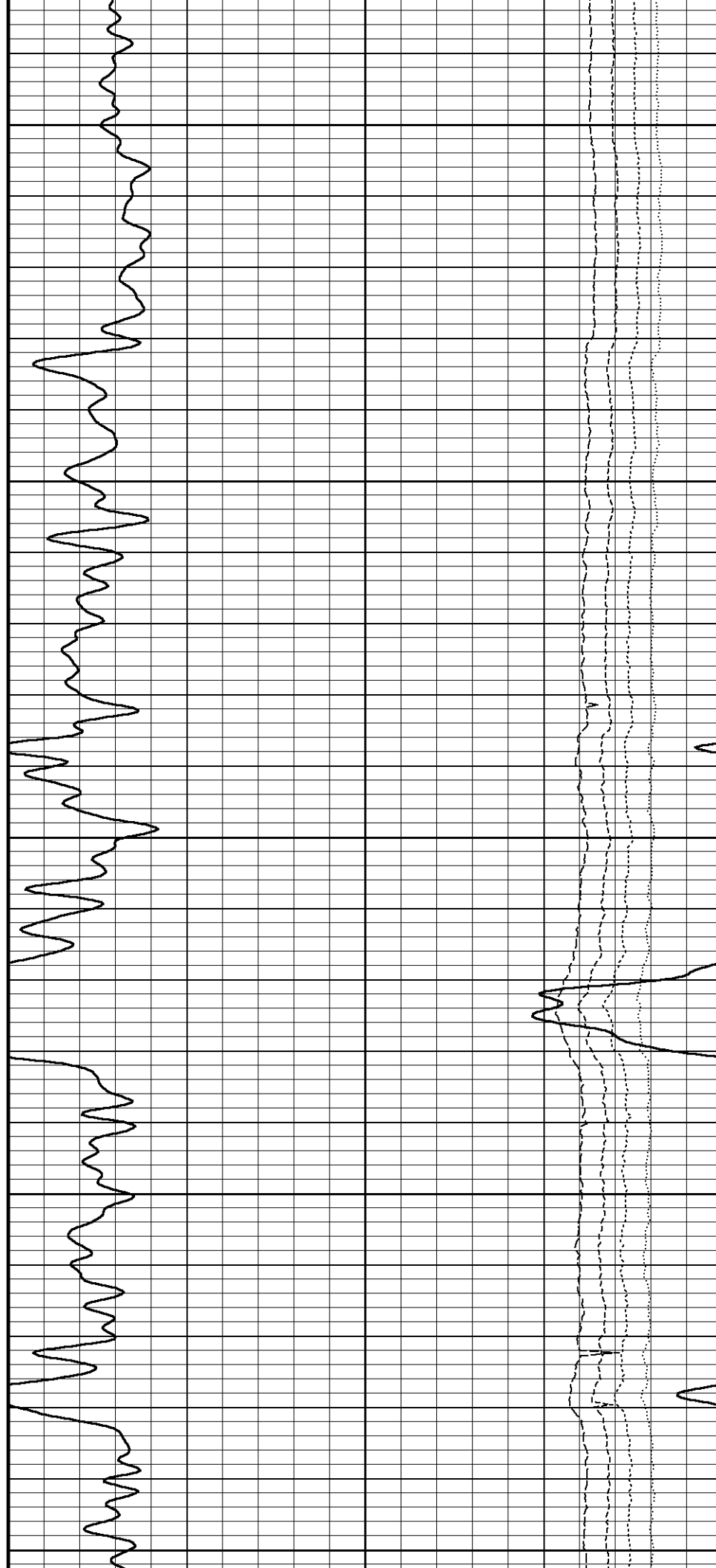
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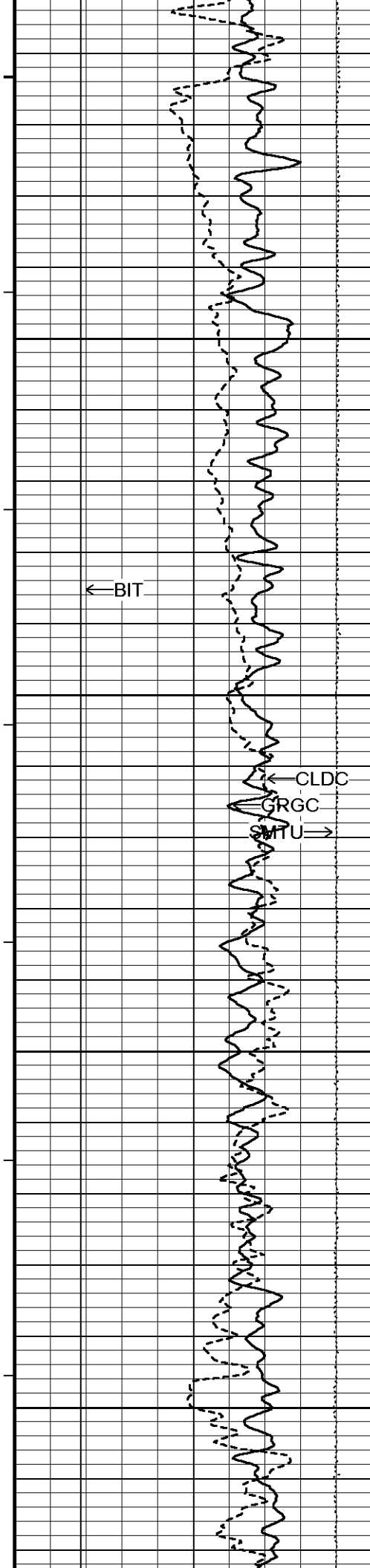
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2750

121°

2800





122°

2850

122°

2900

CLDC

GRGC

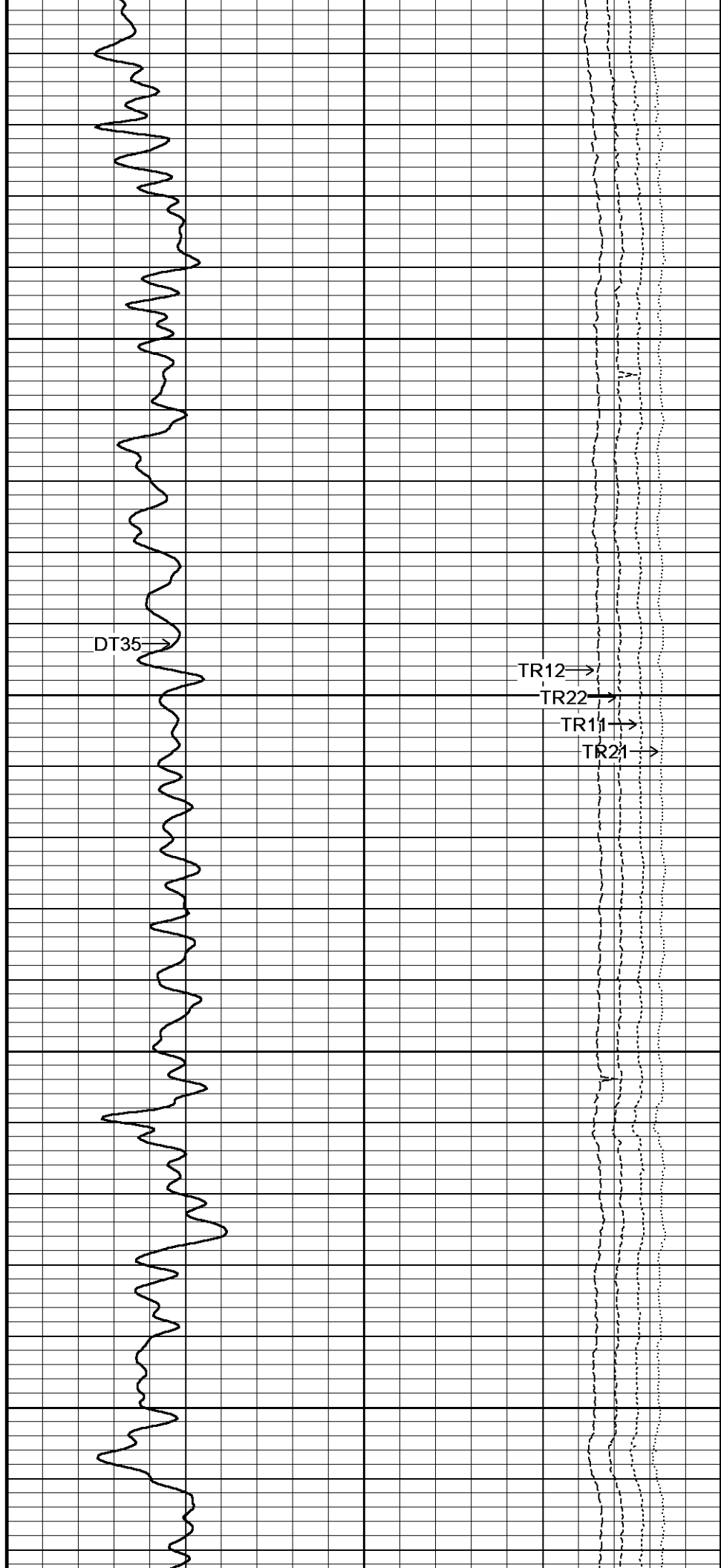
HTU

123°

2950

124°

3000



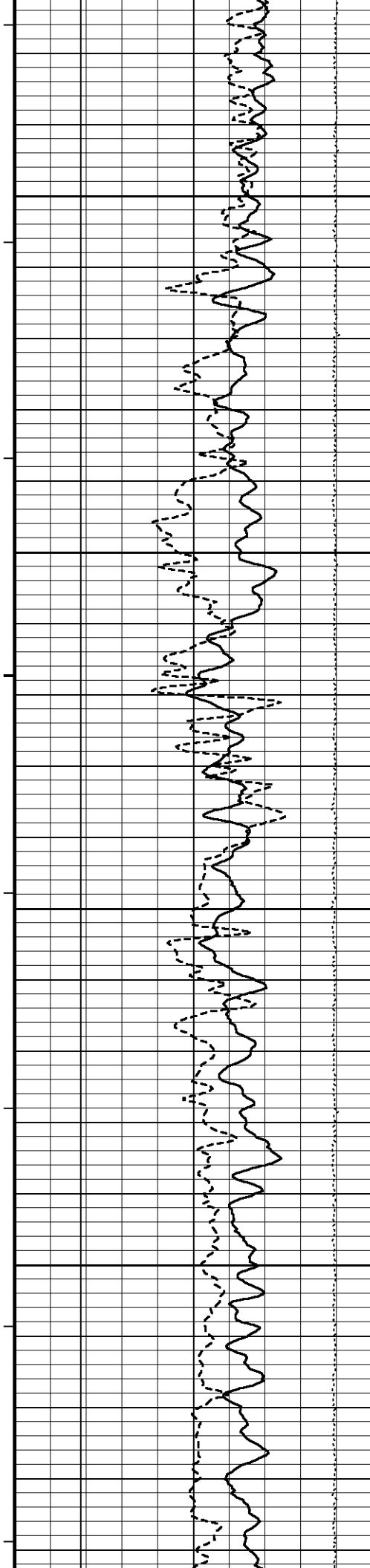
DT35

TR12

TR22

TR11

TR21



124°

3050

124°

3100

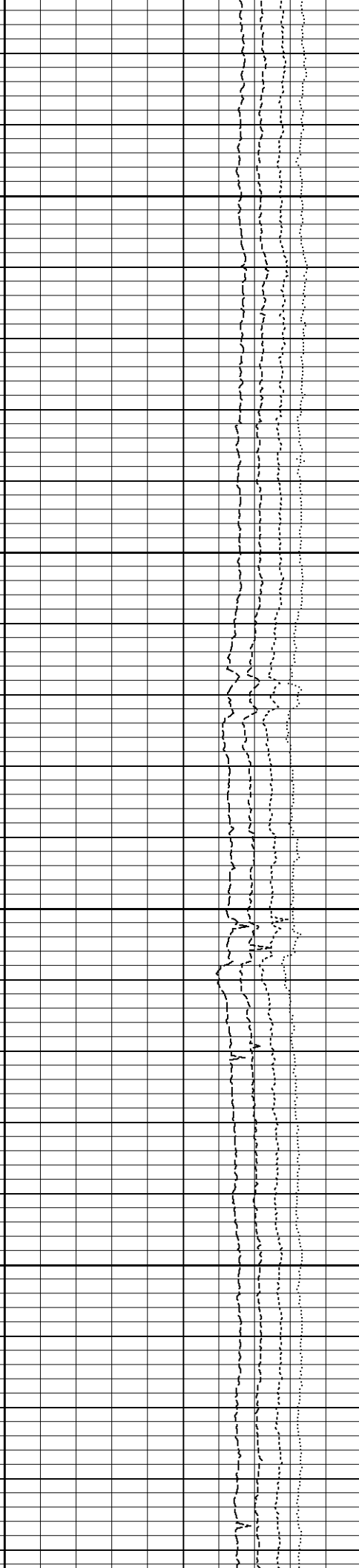
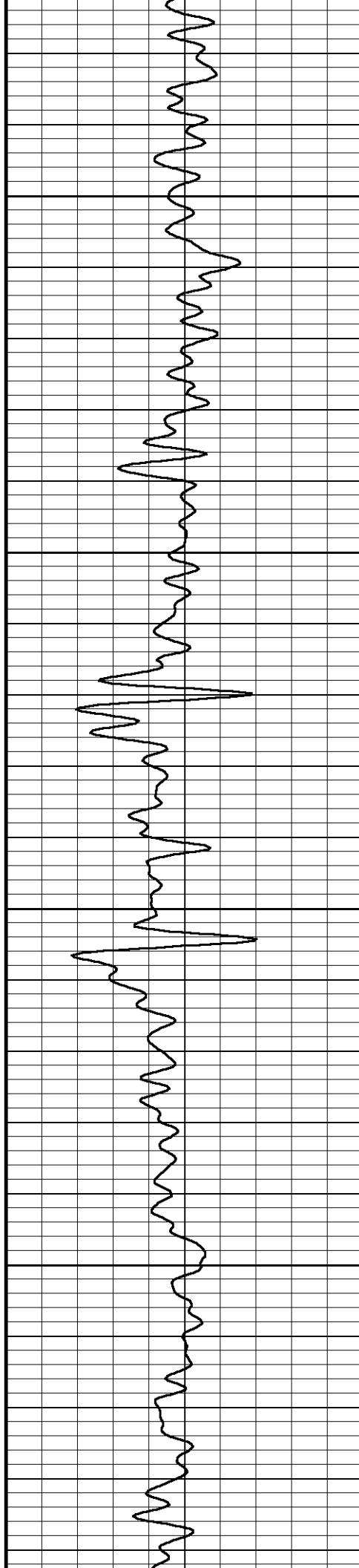
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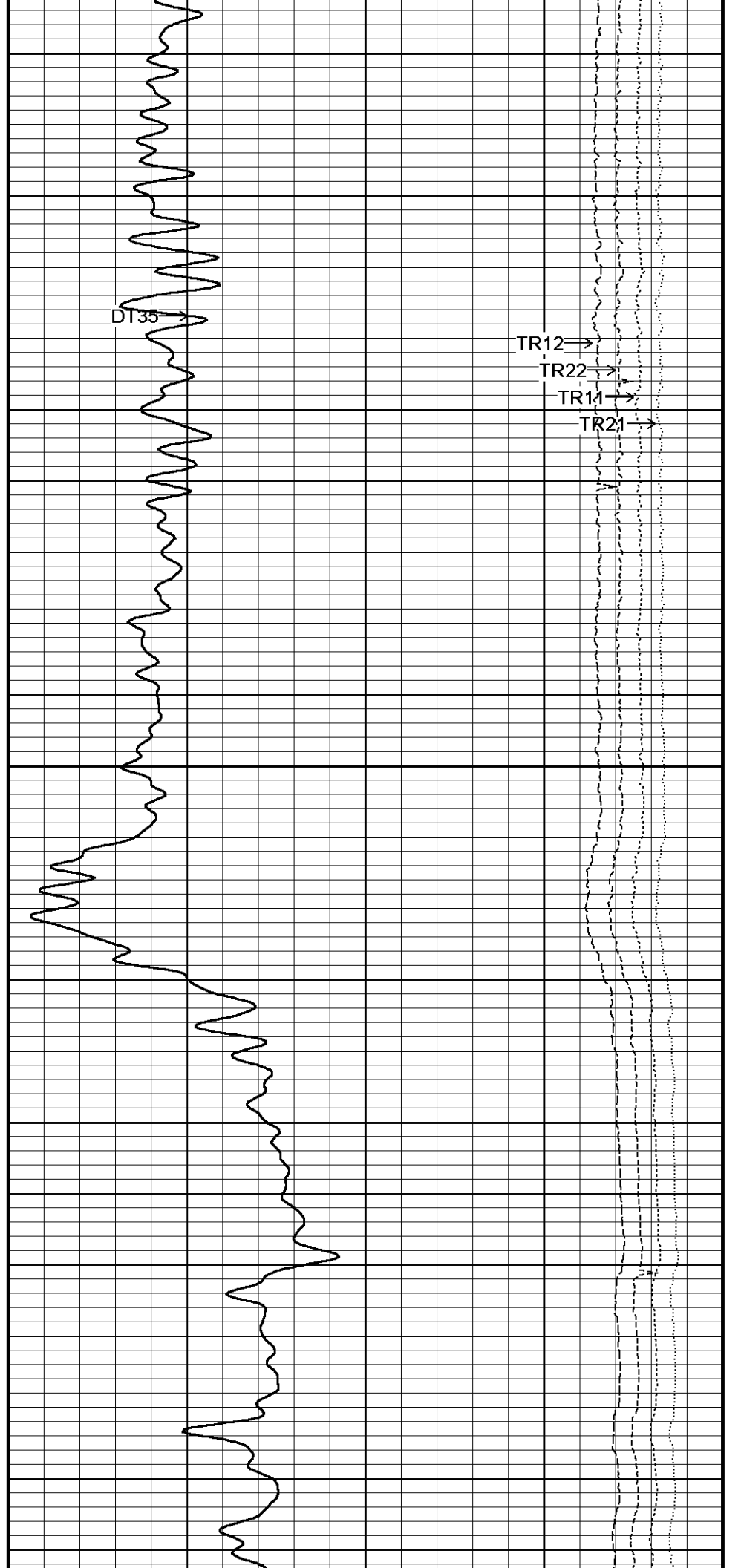
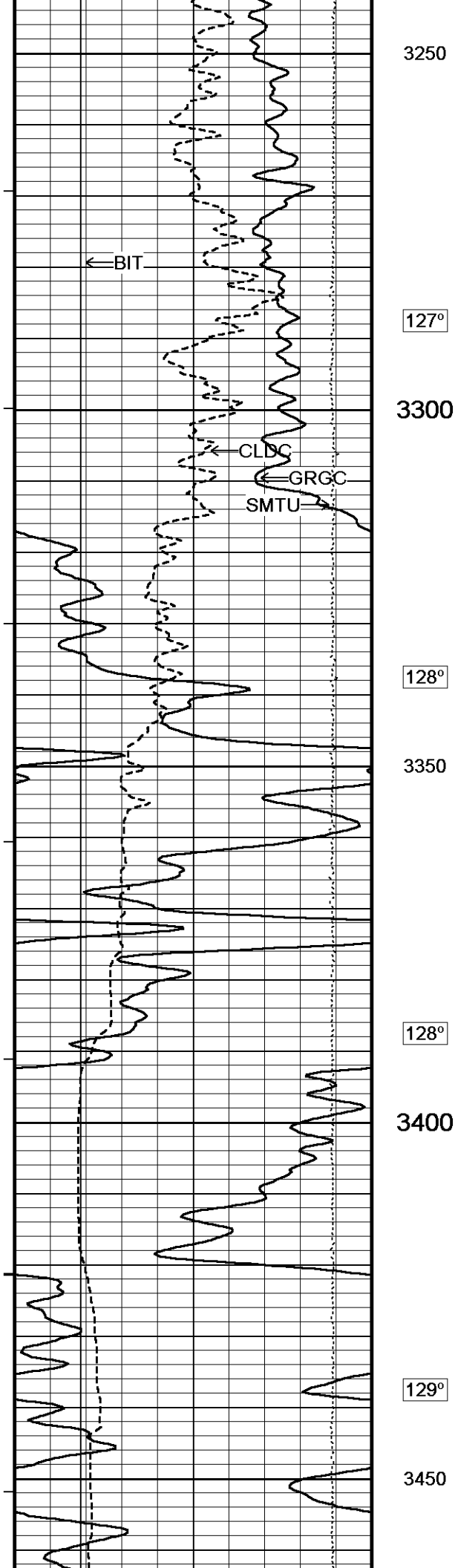
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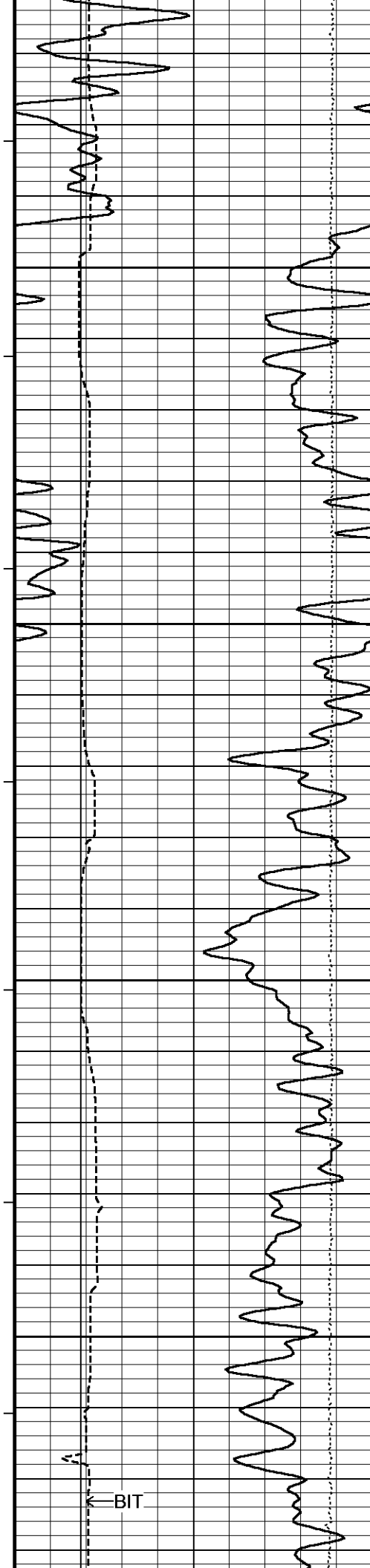
126°

3200

127°







130°

3500

130°

3550

131°

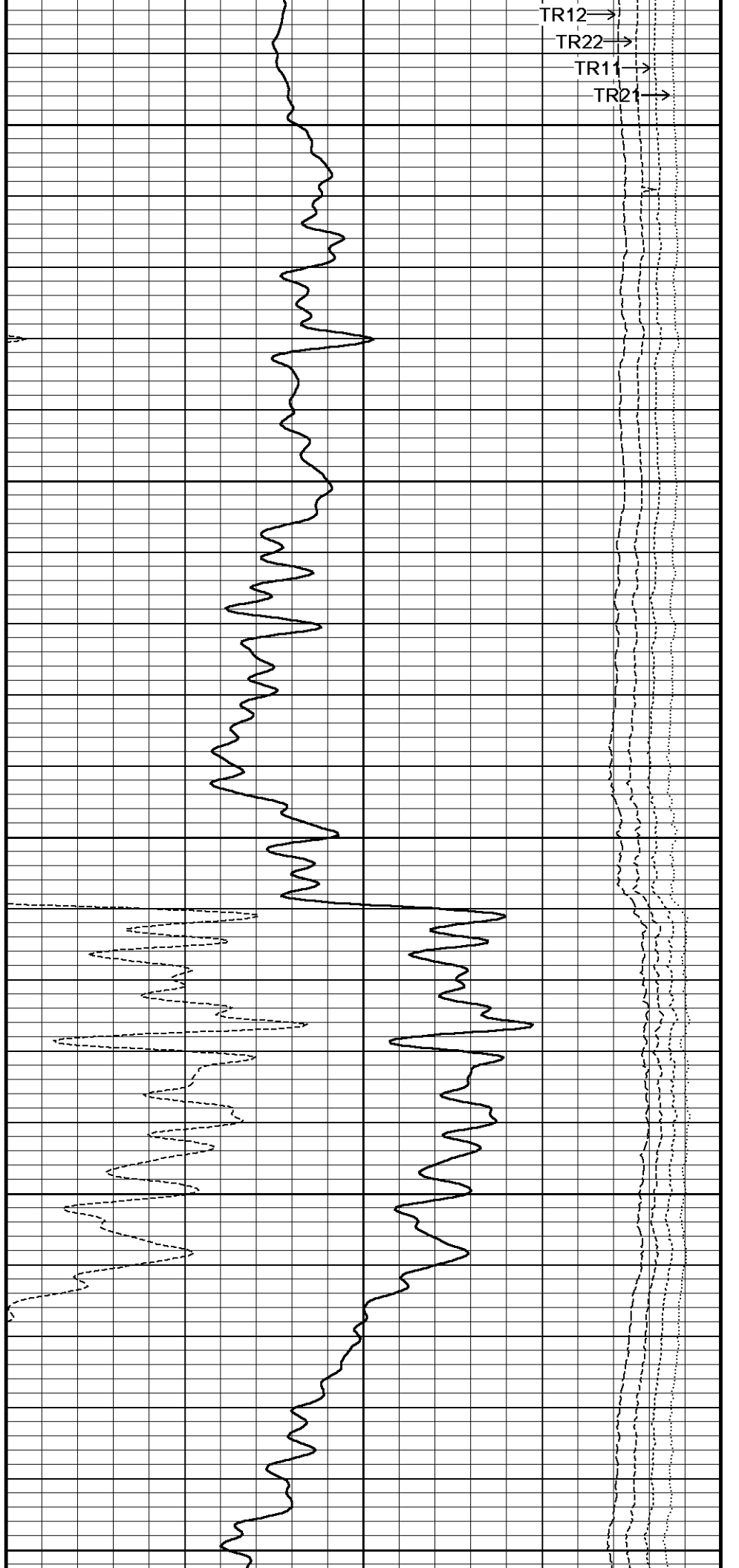
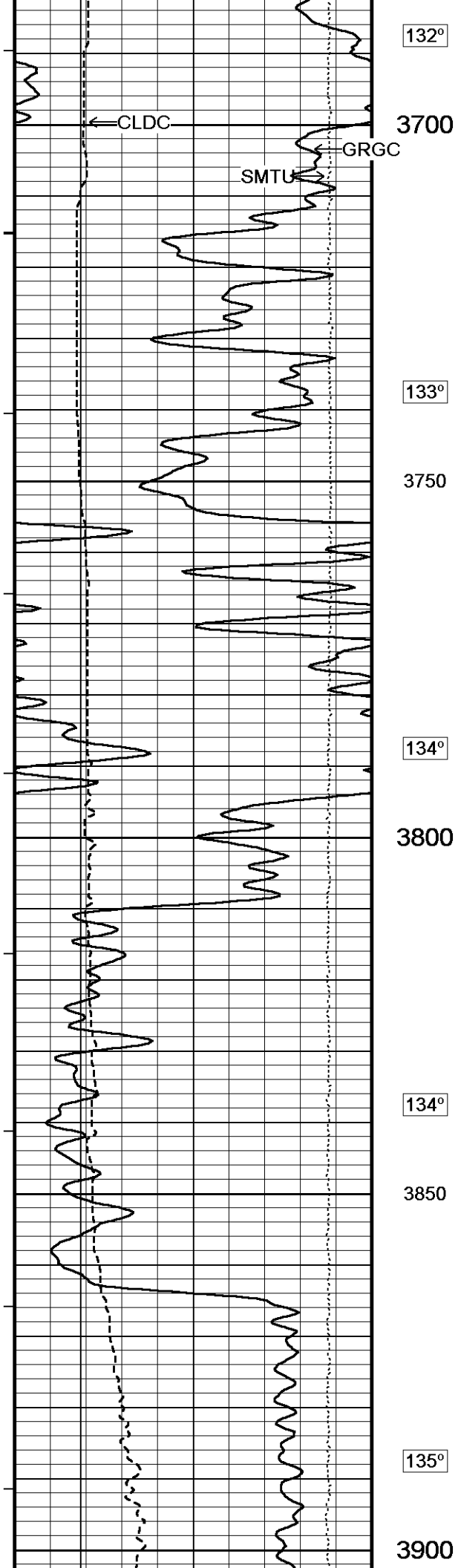
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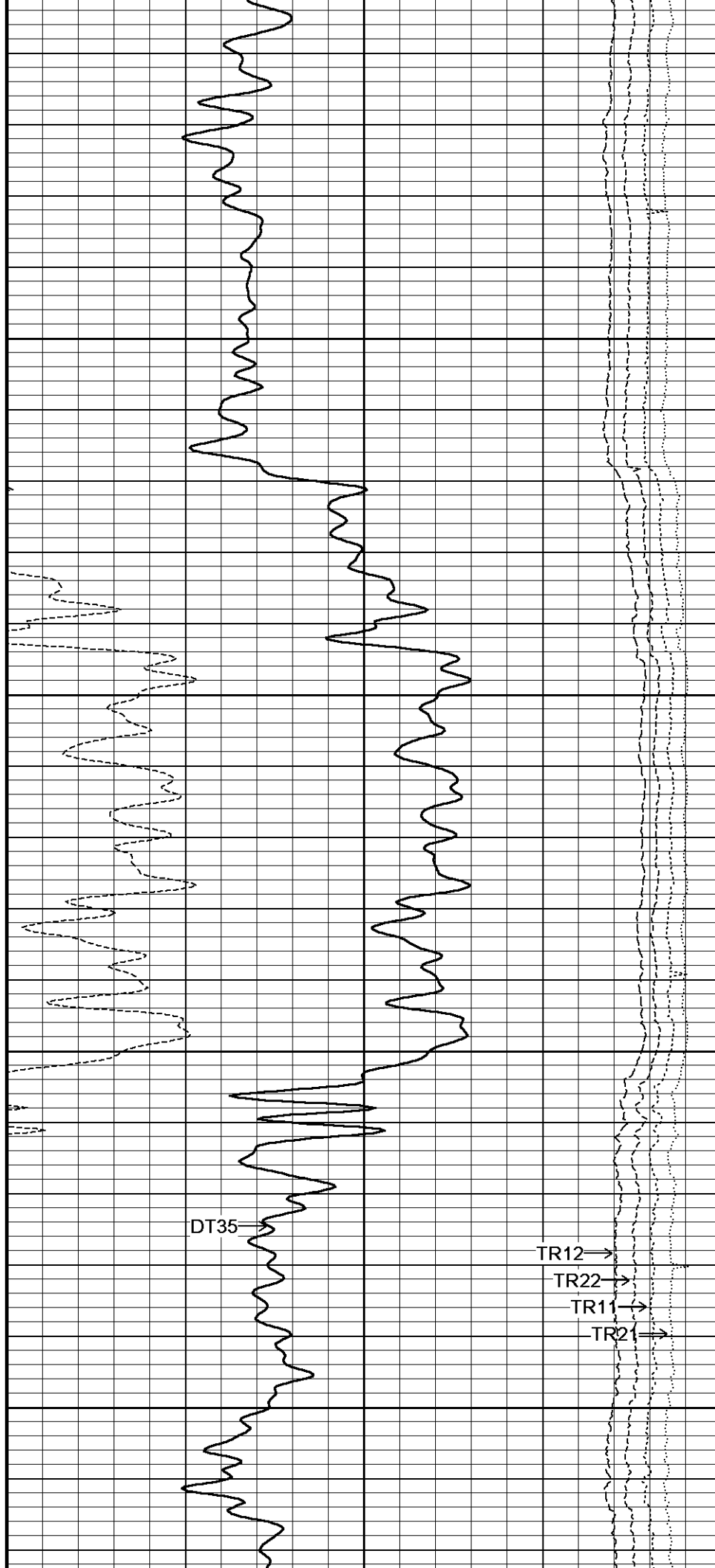
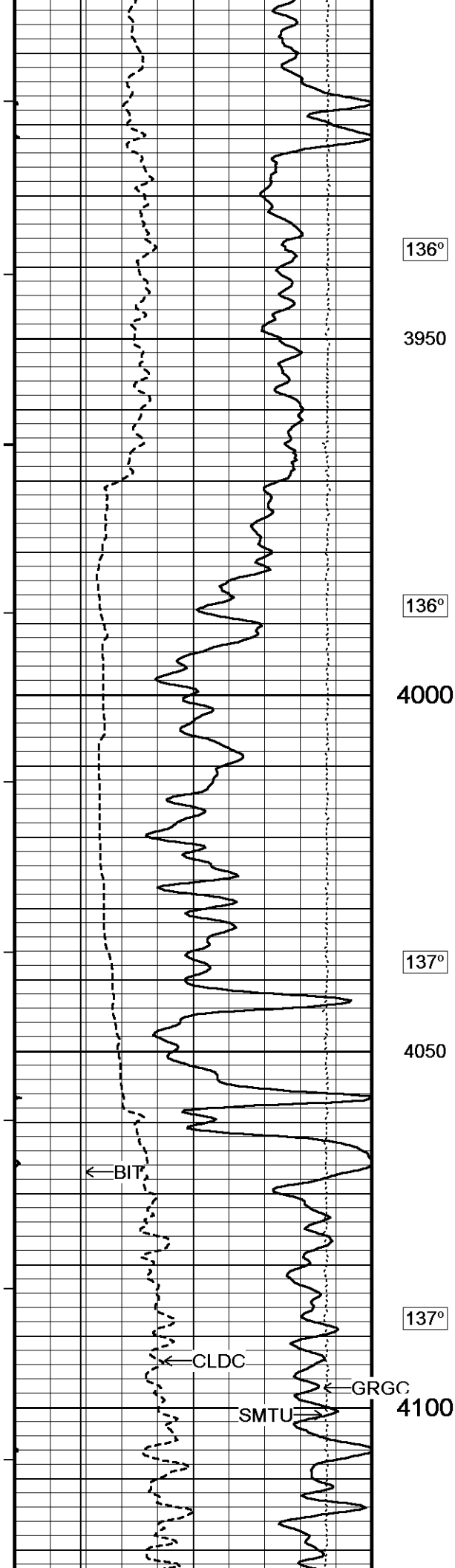
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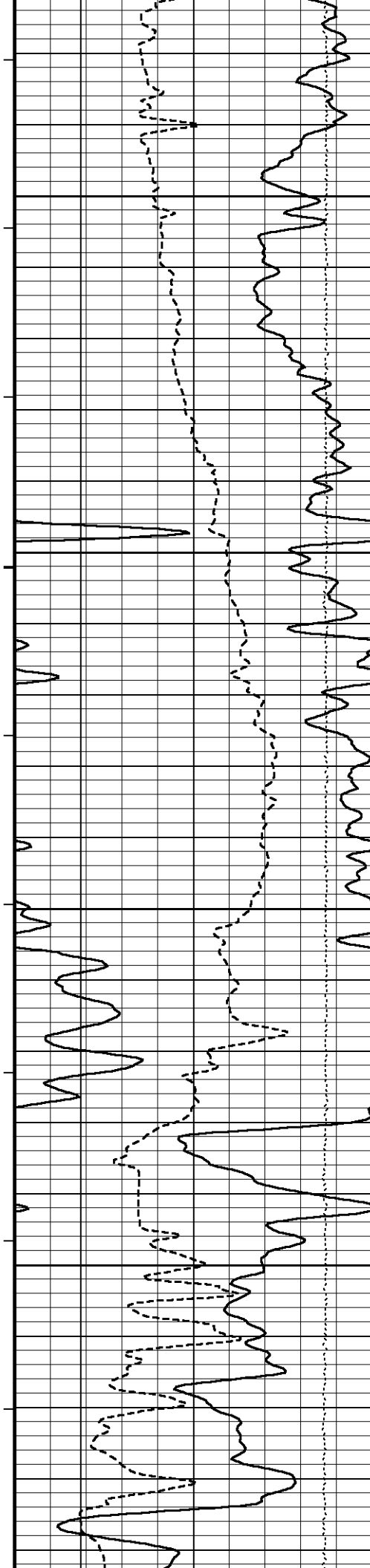
3650

← BIT

DT35 →







138°

4150

138°

4200

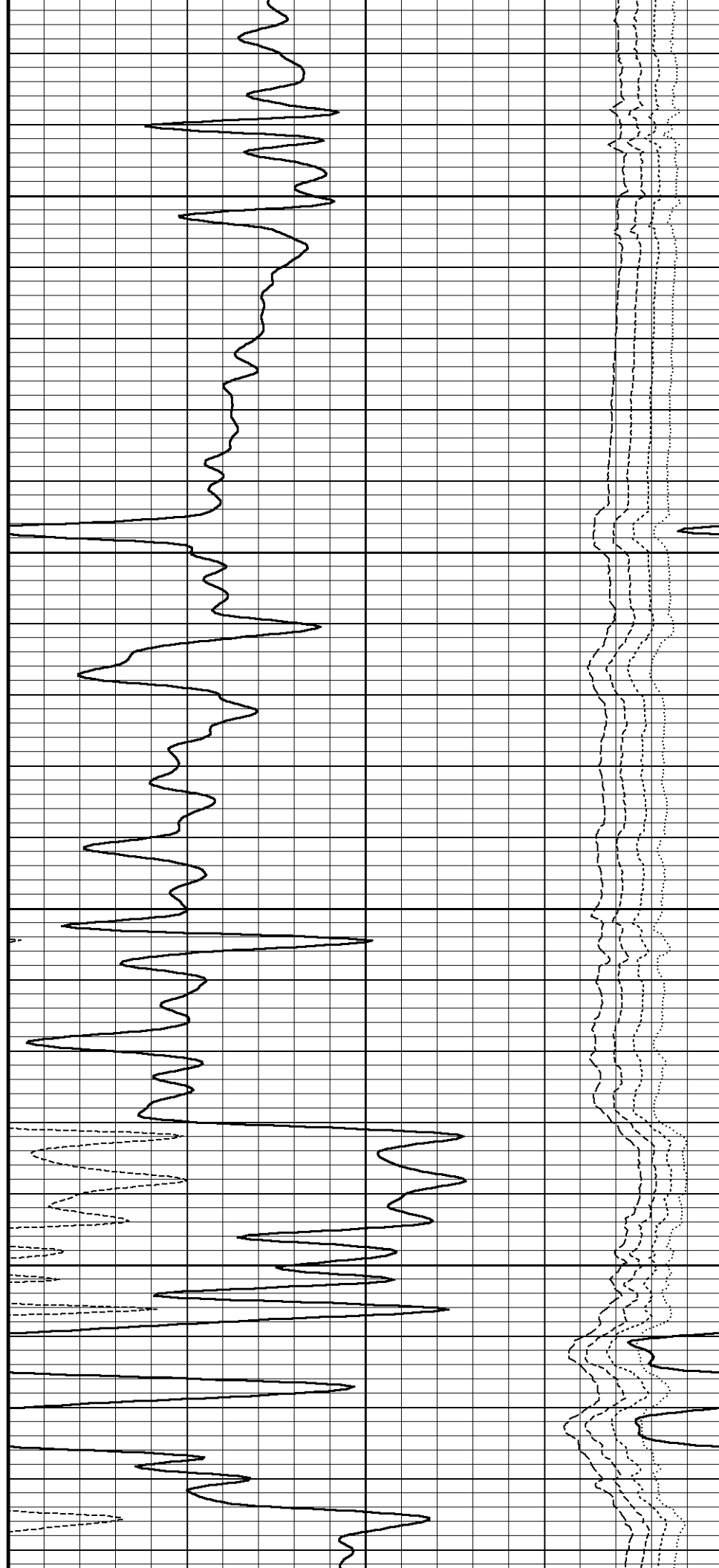
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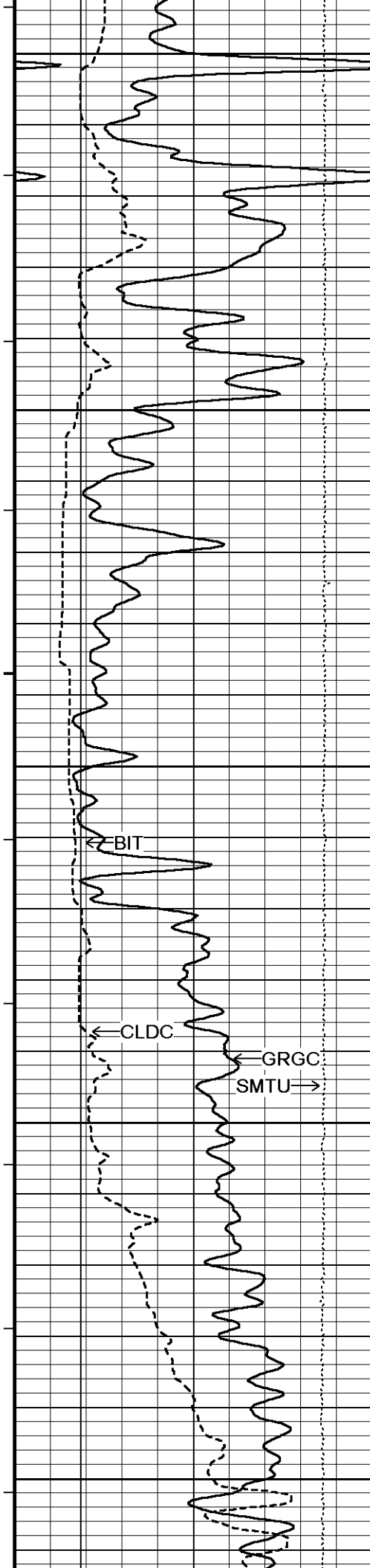
4250

140°

4300

141°





4350

142°

4400

142°

4450

SPRL

DT35

TR12

TR22

TR11

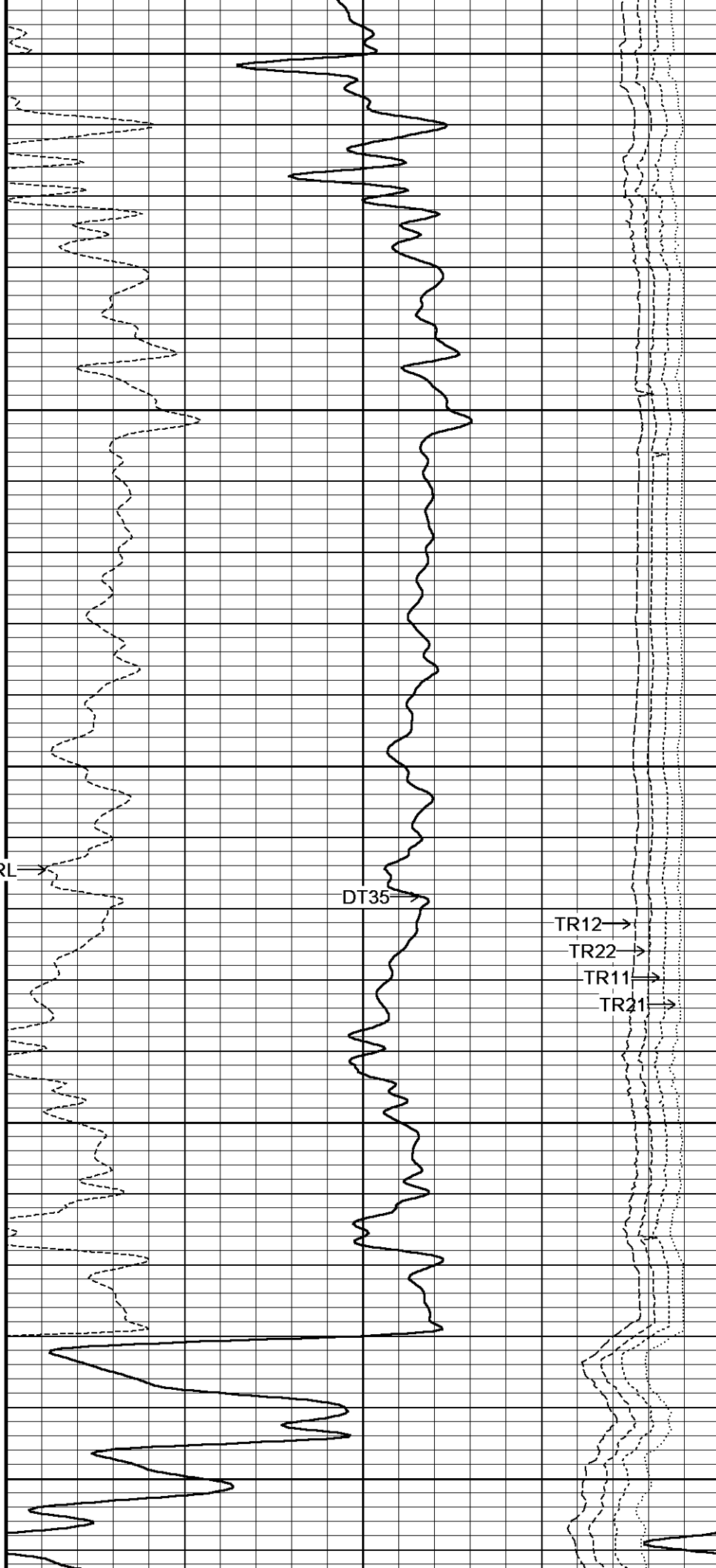
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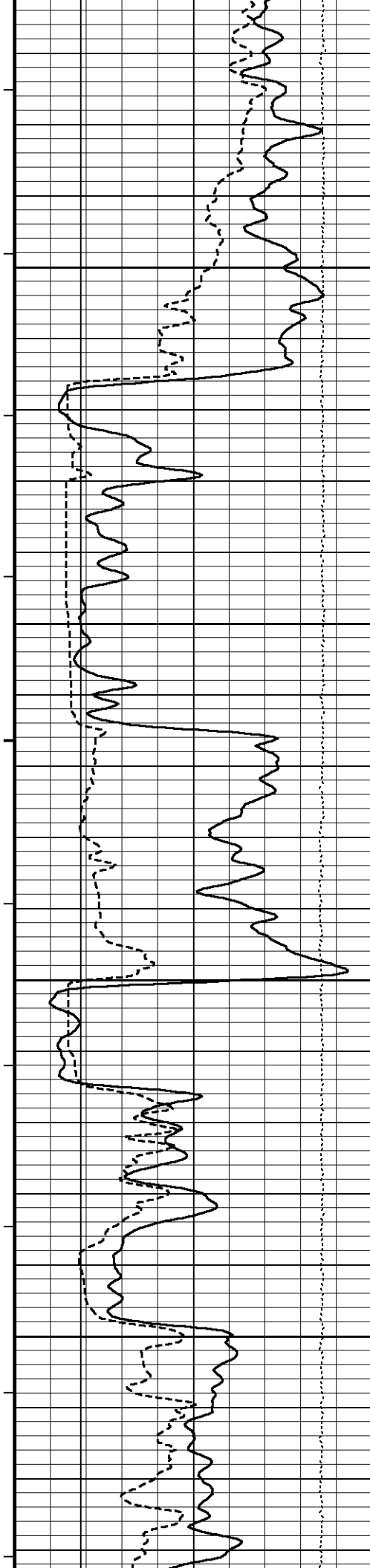
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4500

143°

4550





144°

4600

144°

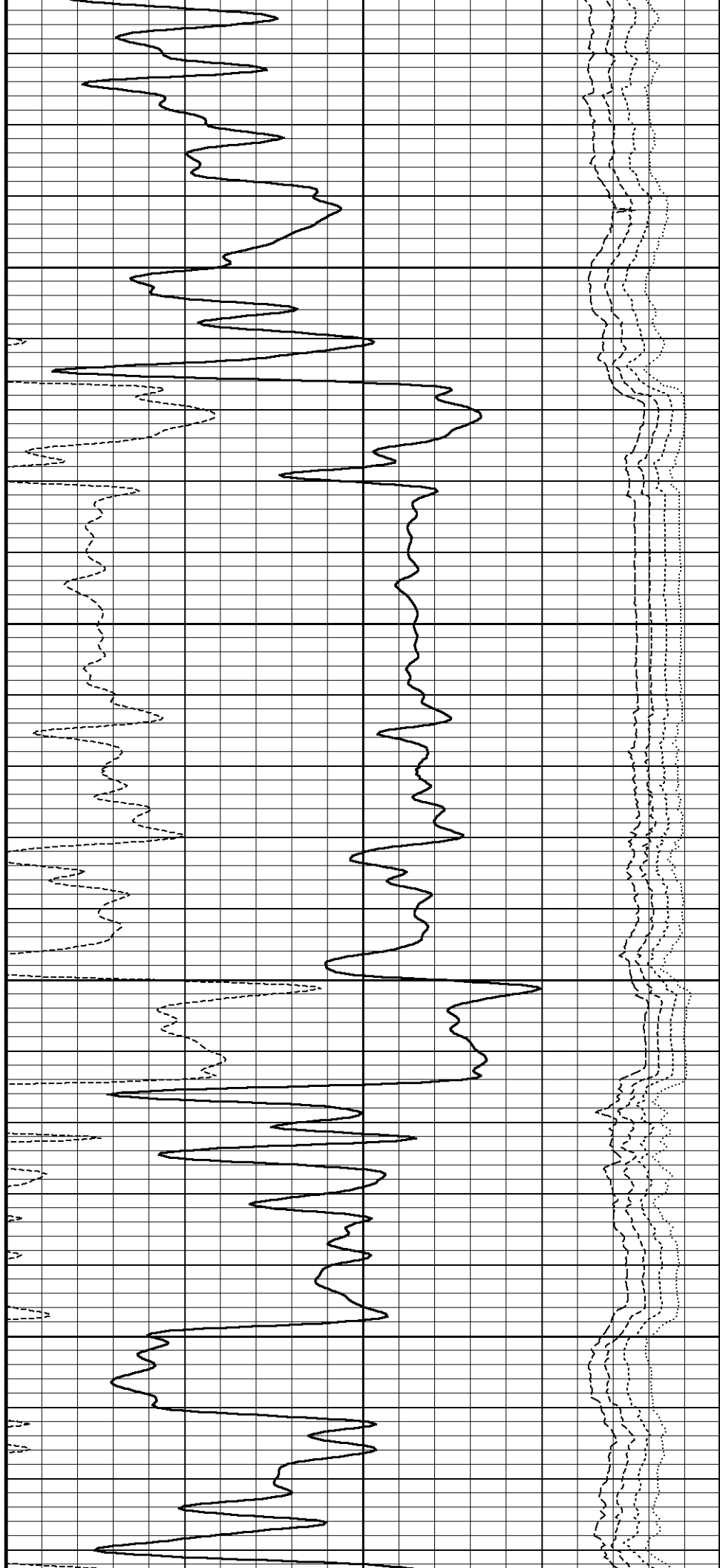
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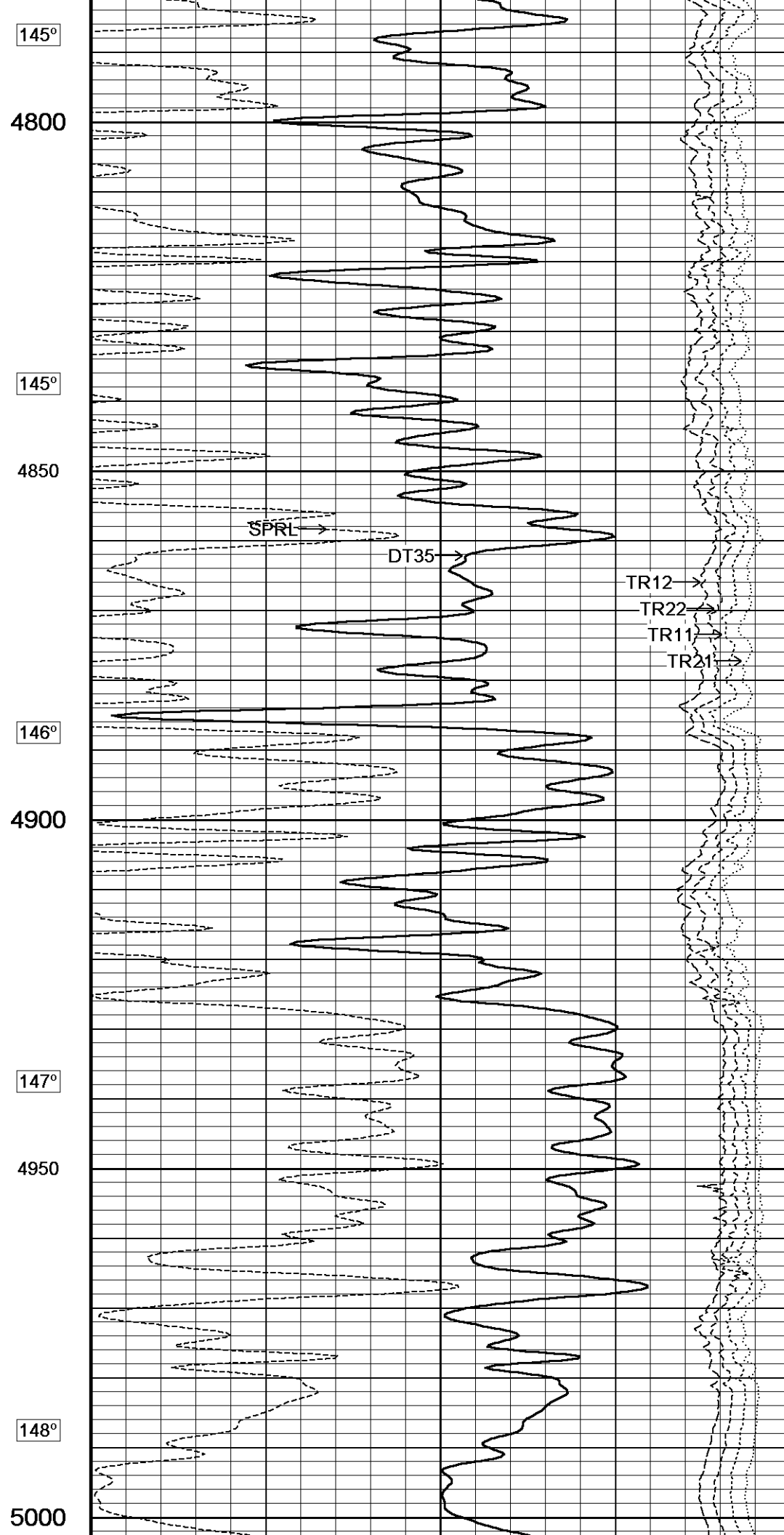
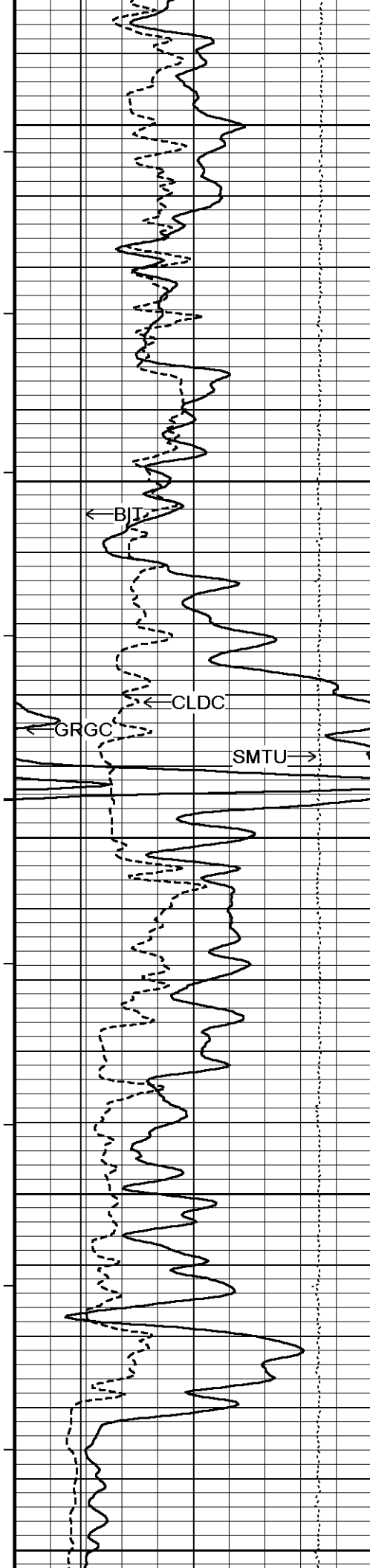
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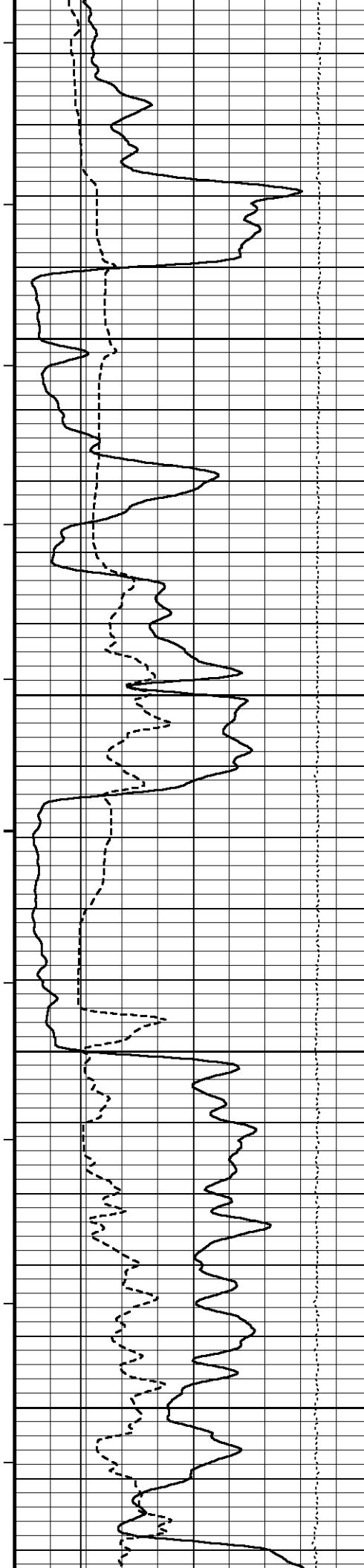
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145°

4750







149°

5050

149°

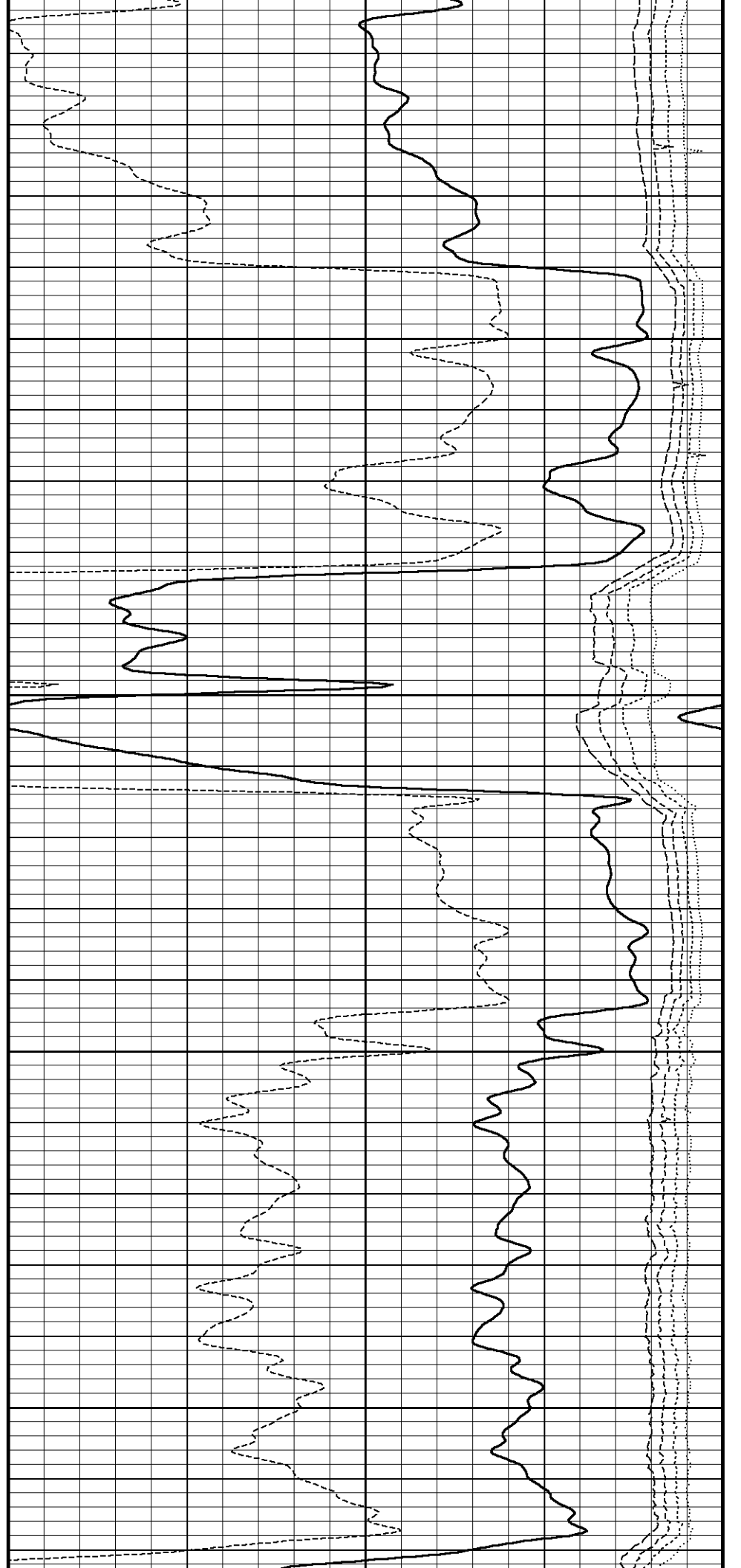
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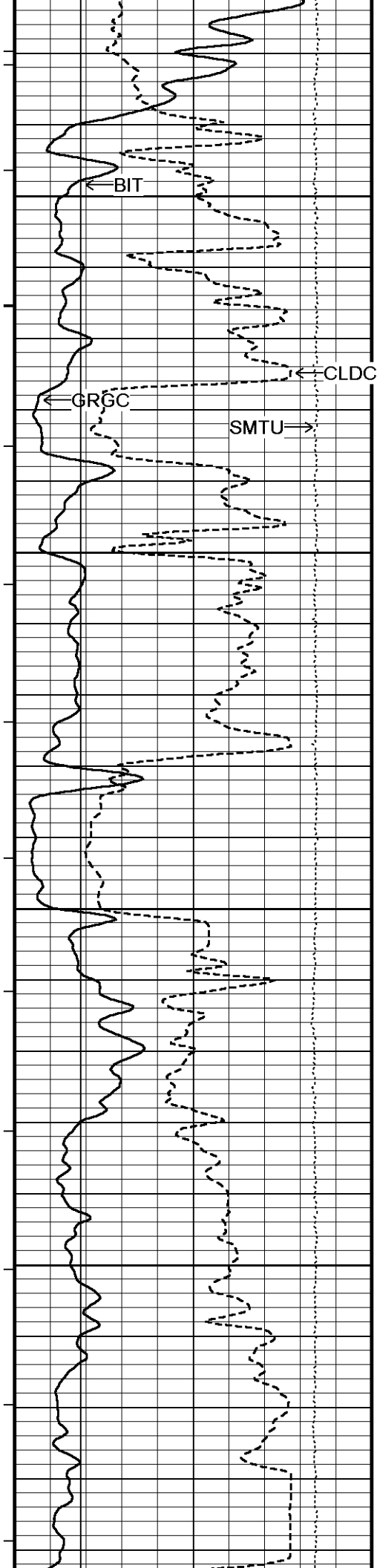
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5150

150°

5200





150°

5250

151°

5300

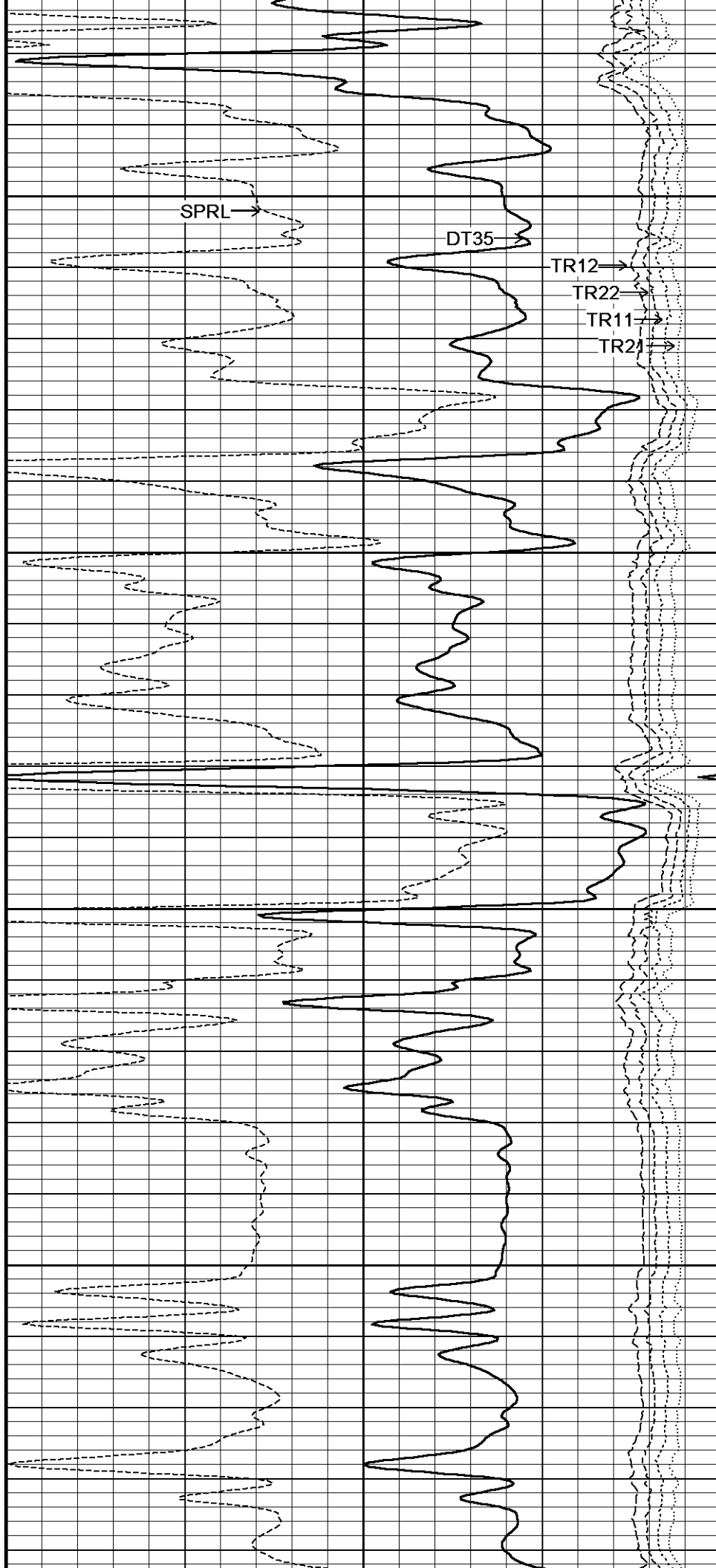
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151°

5400

150°





5450

151°

5500

151°

5550

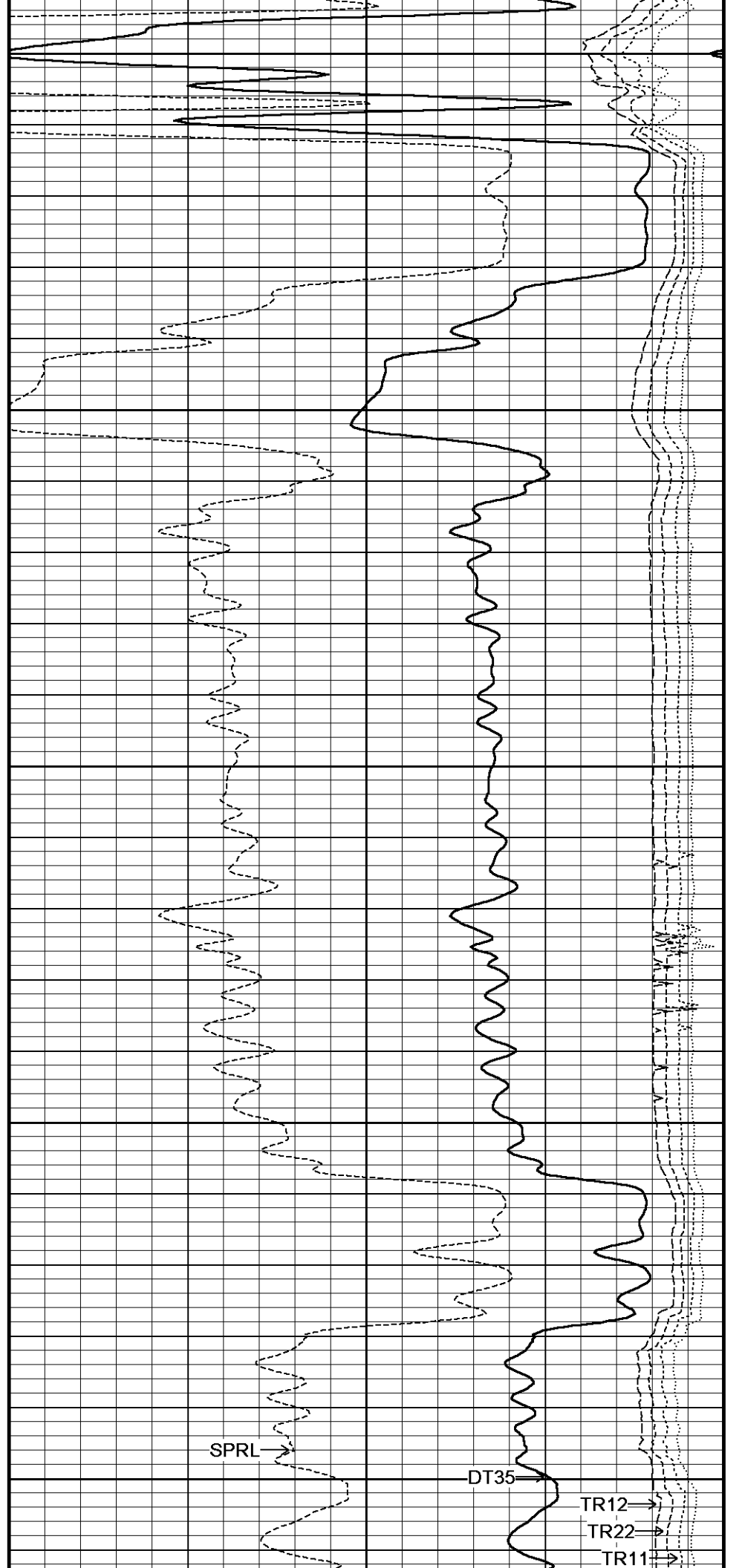
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5600

153°

5650

← BIT



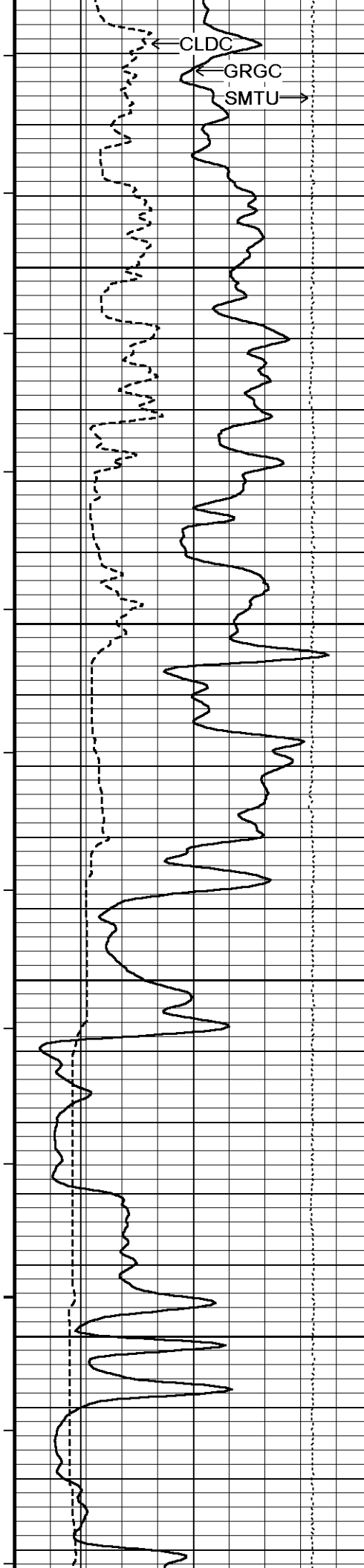
SPRL →

DT35 →

TR12 →

TR22 →

TR11 →



152°

5700

152°

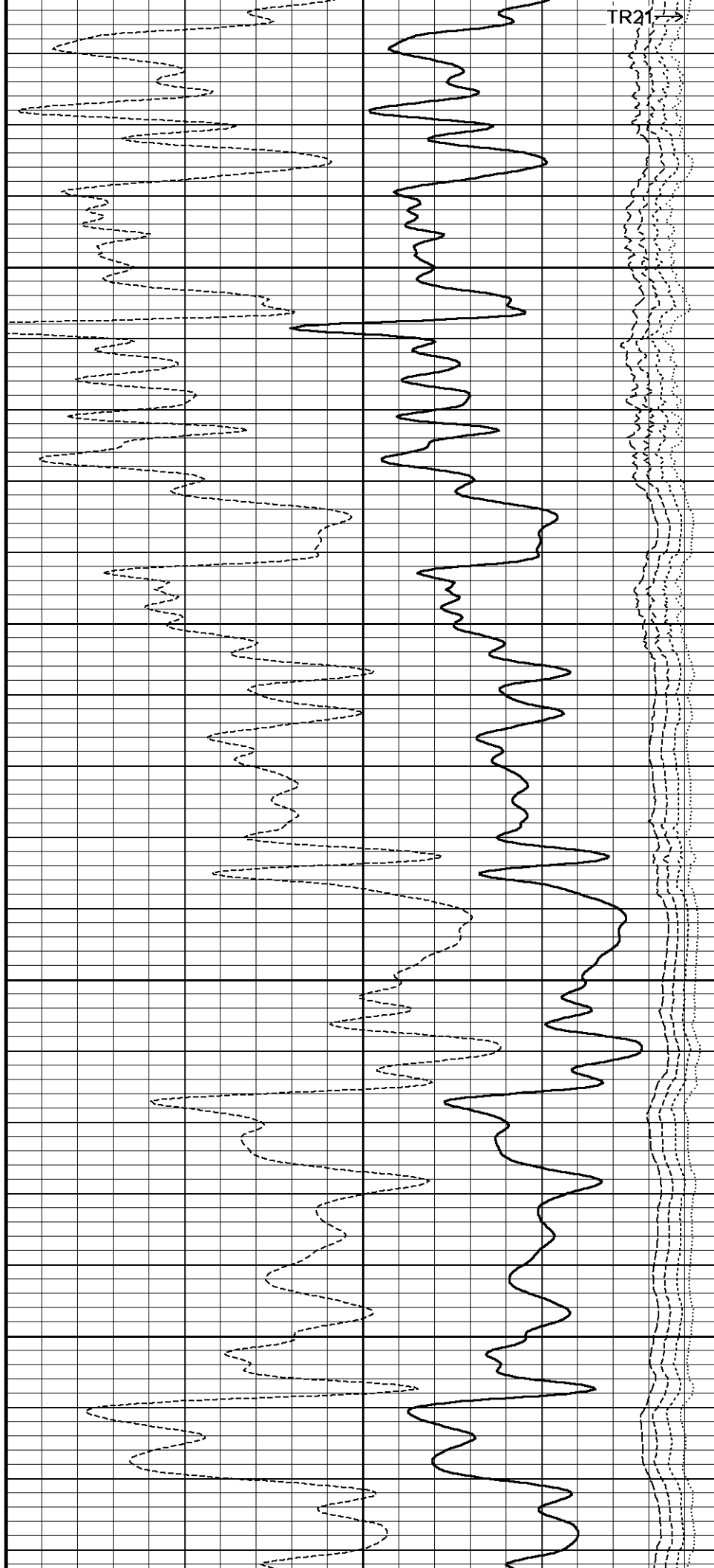
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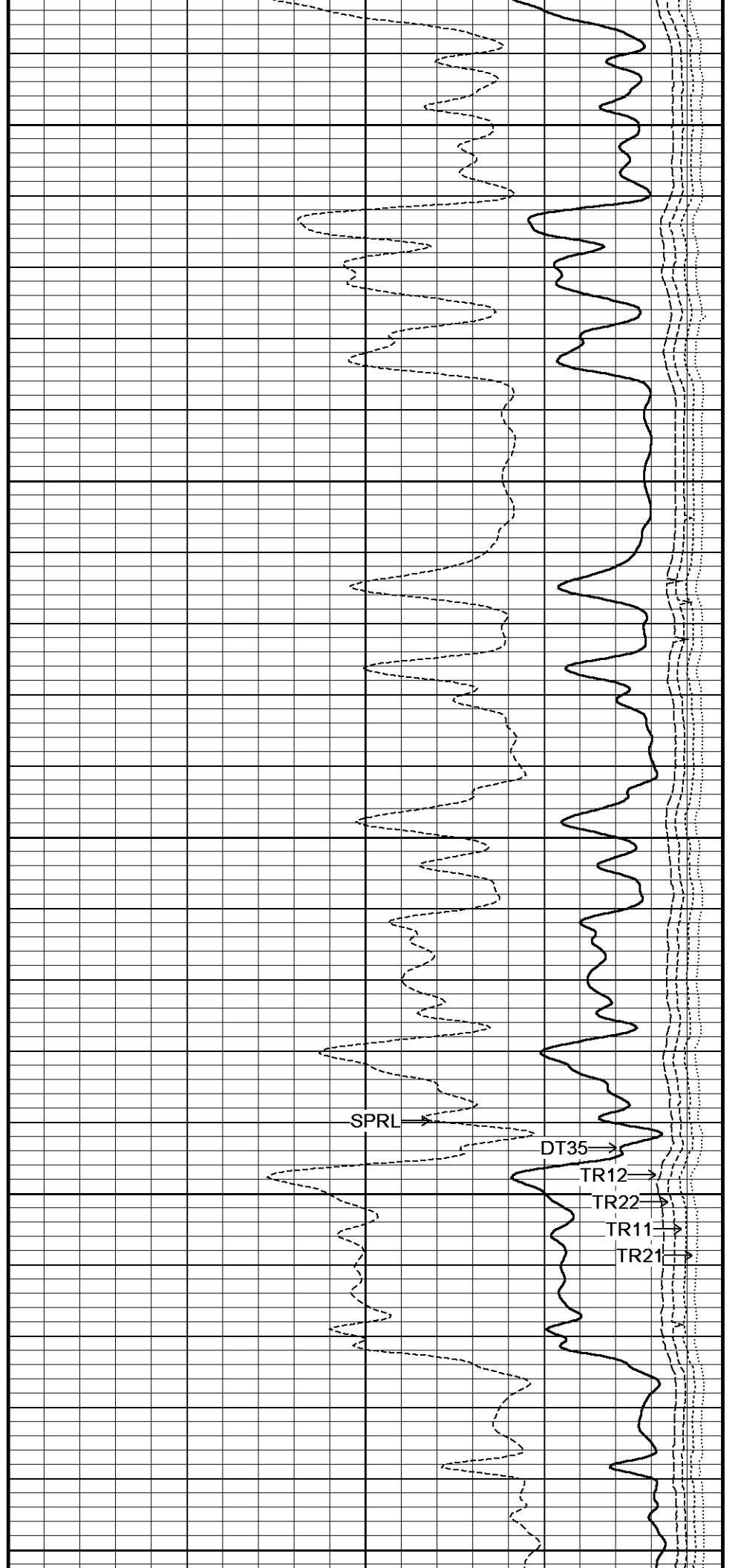
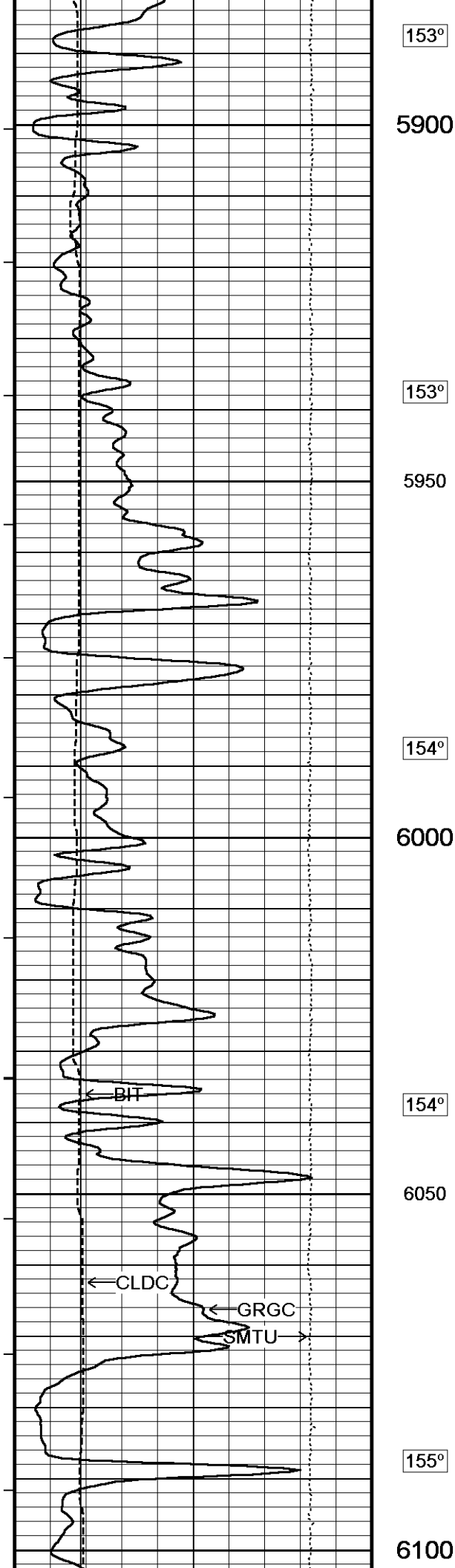
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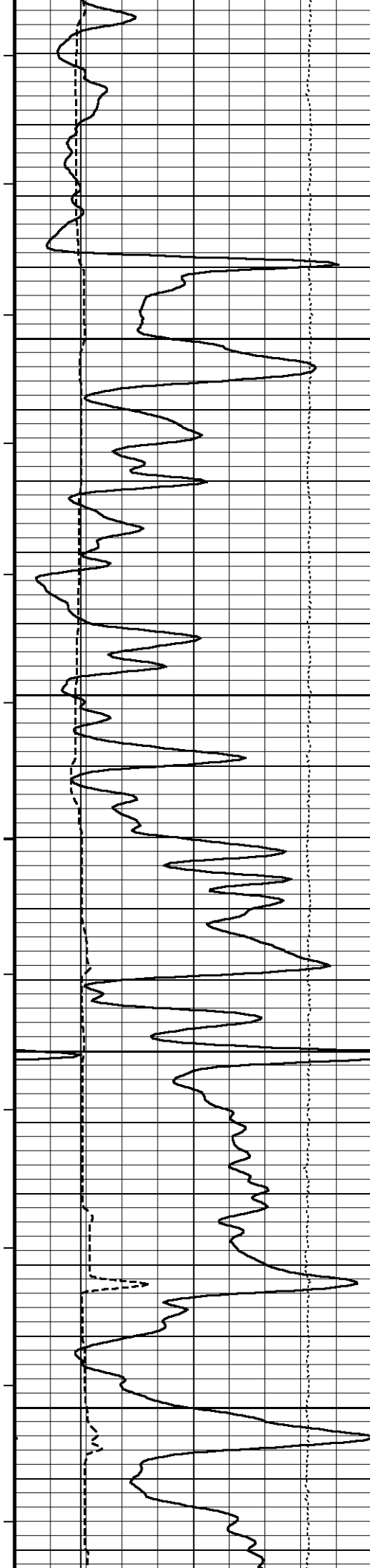
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153°

5850







154°

6150

154°

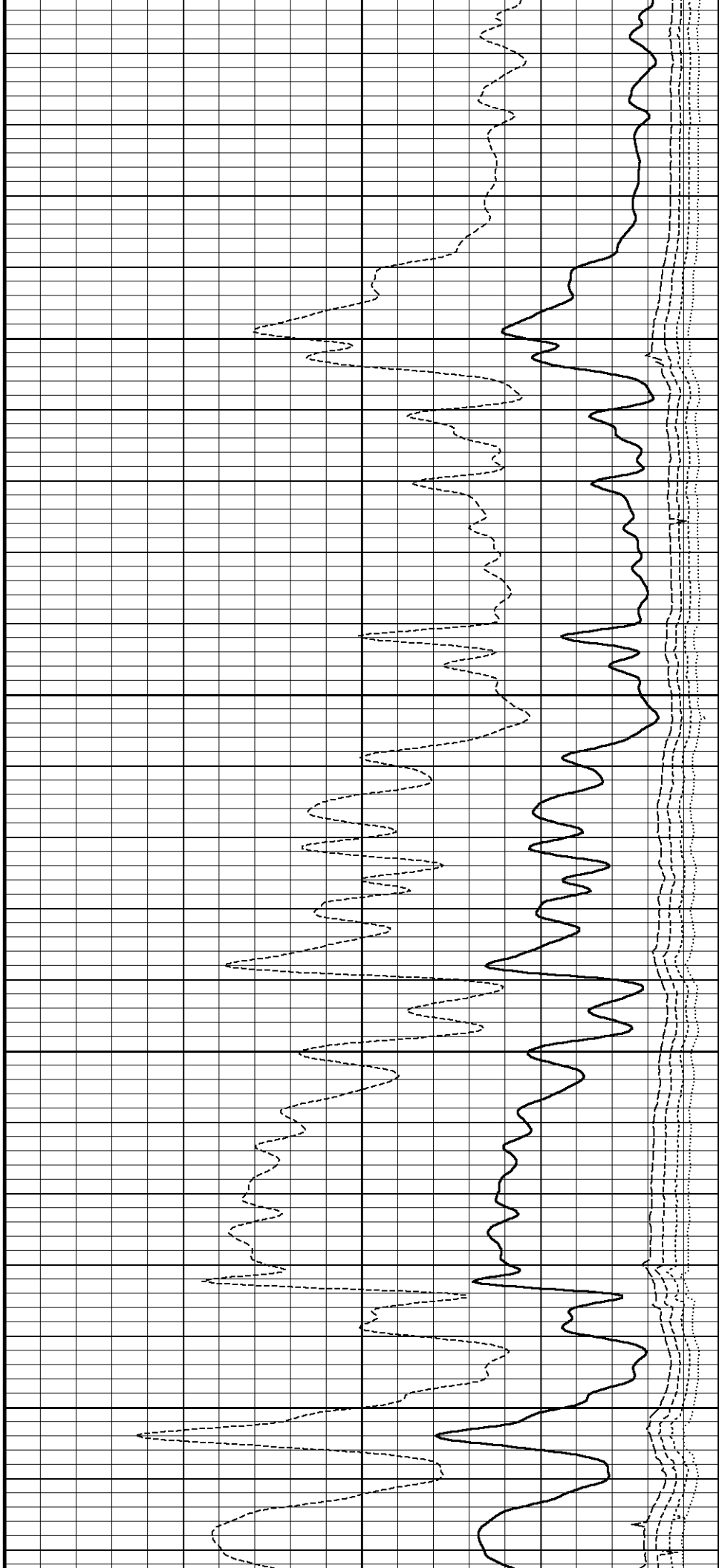
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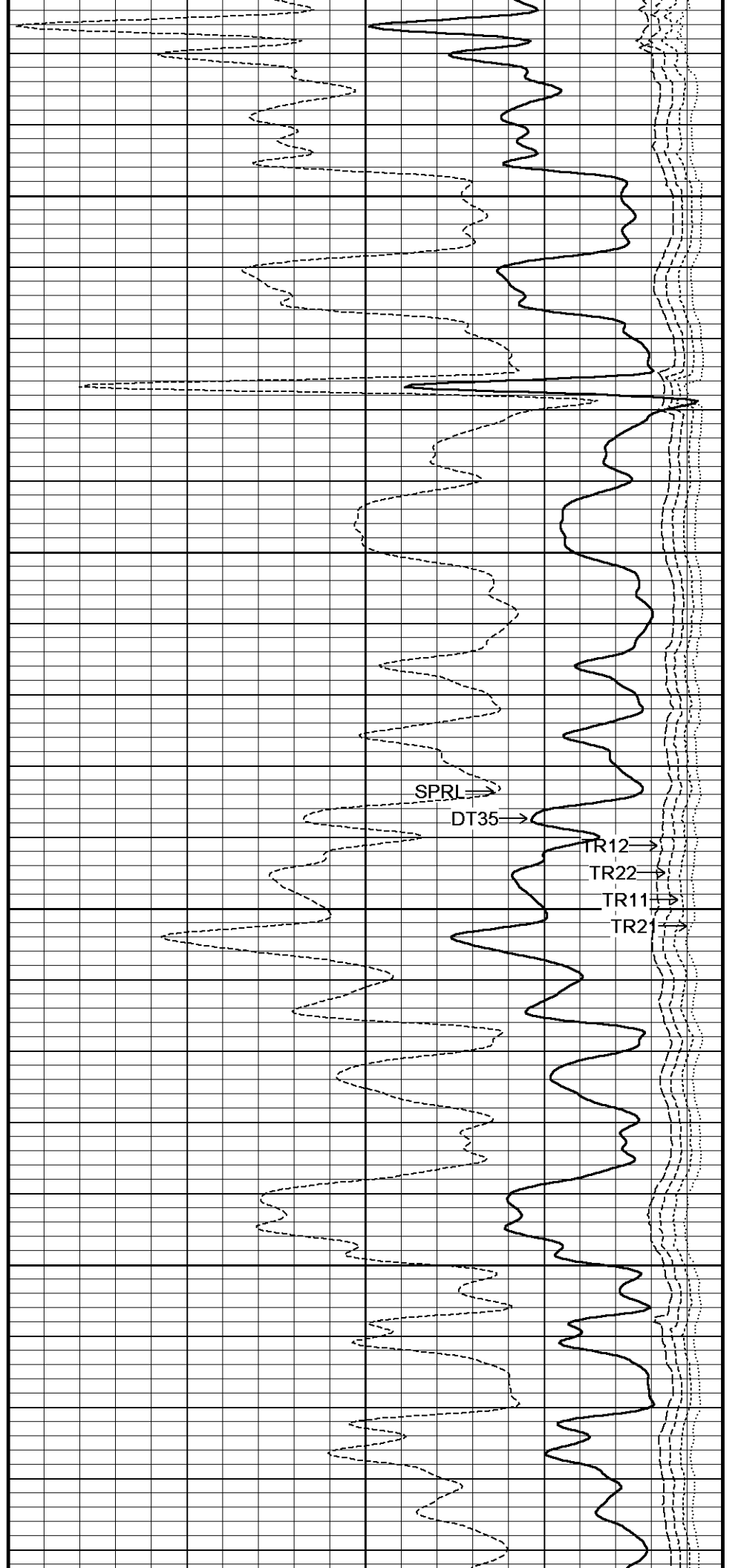
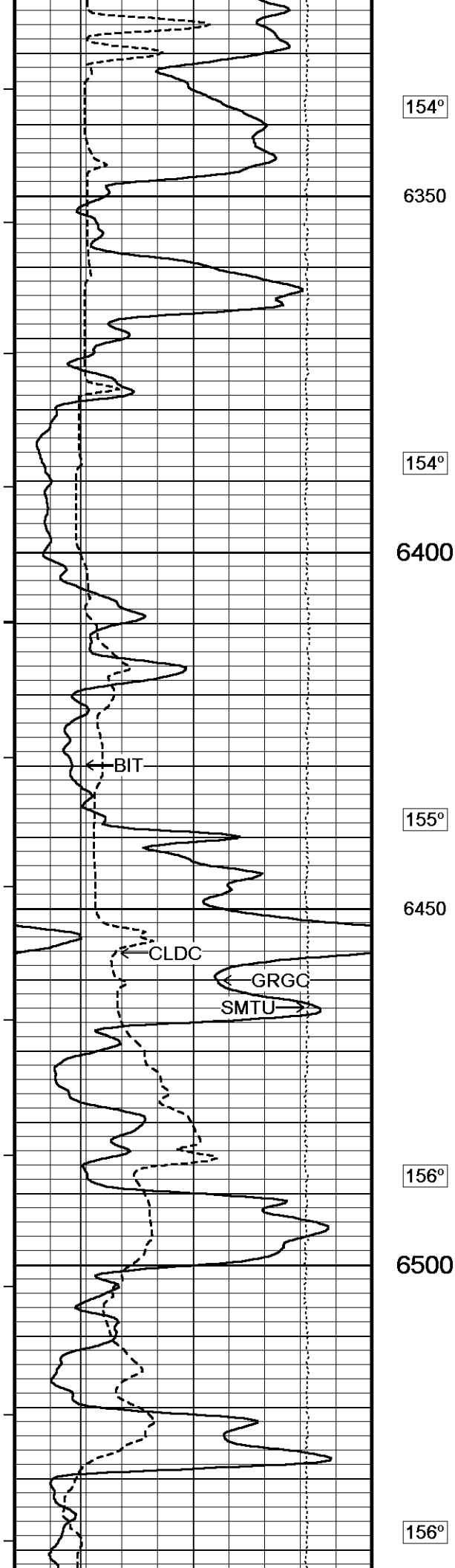
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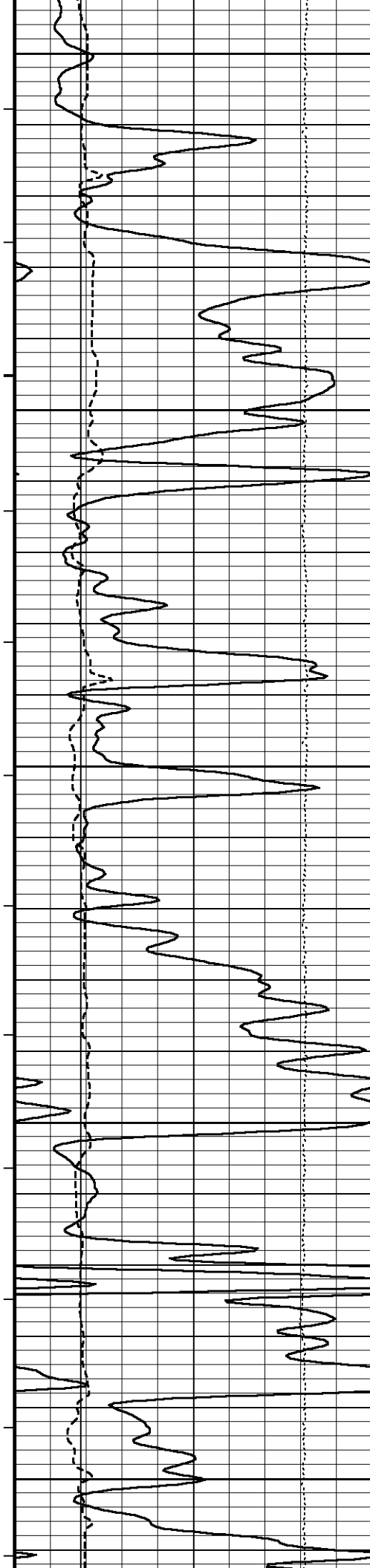
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6300







6550

158°

6600

160°

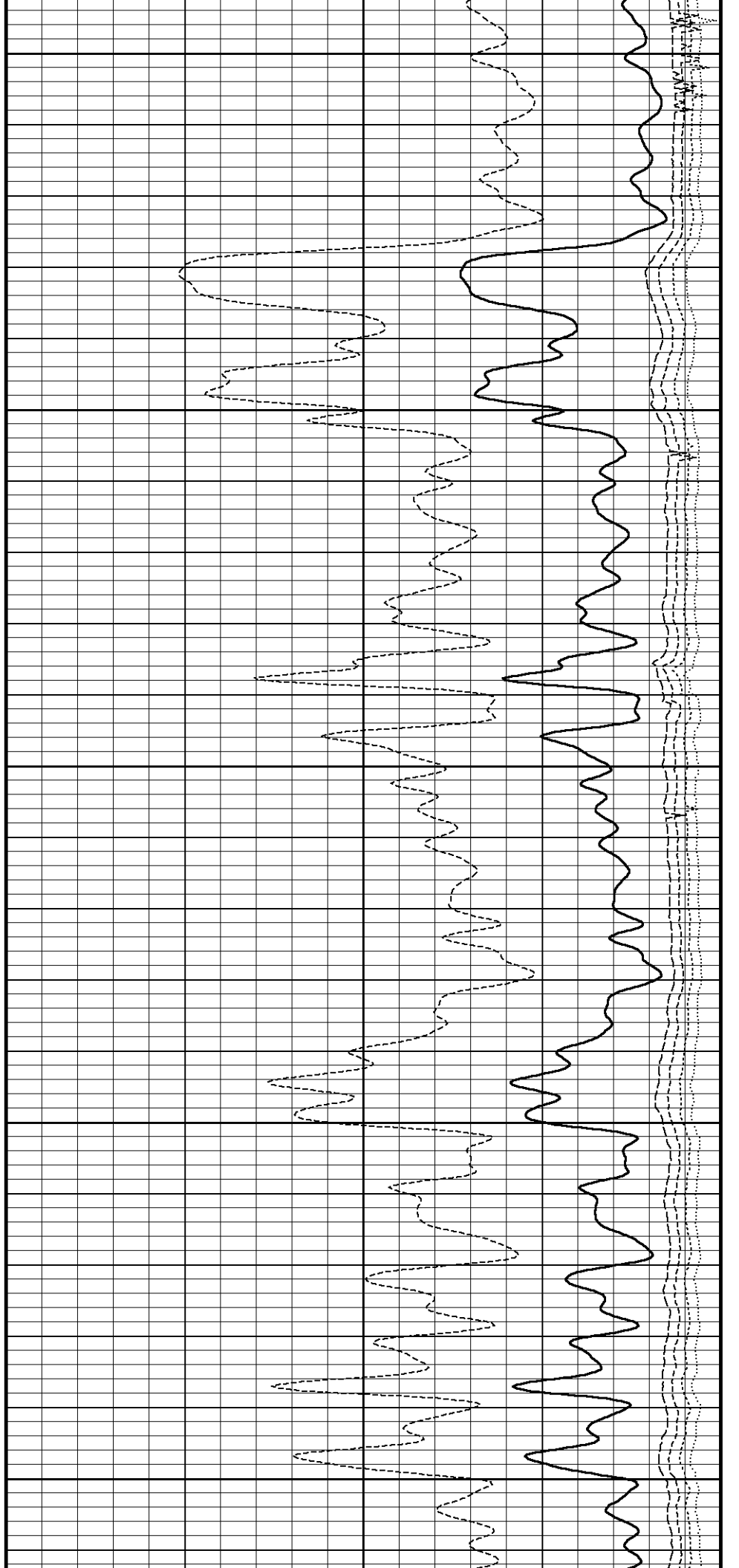
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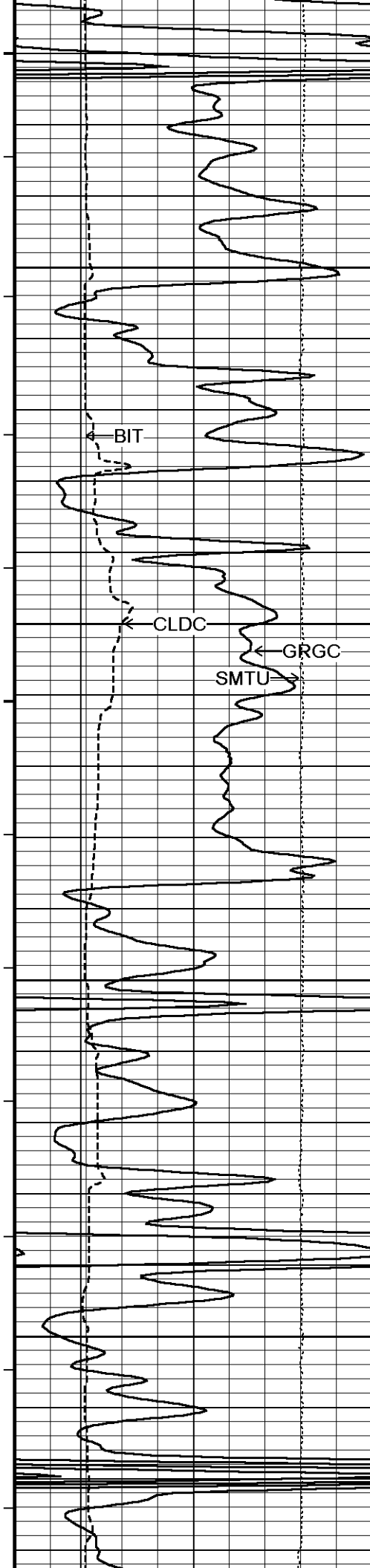
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6700

160°

6750





161°

6800

161°

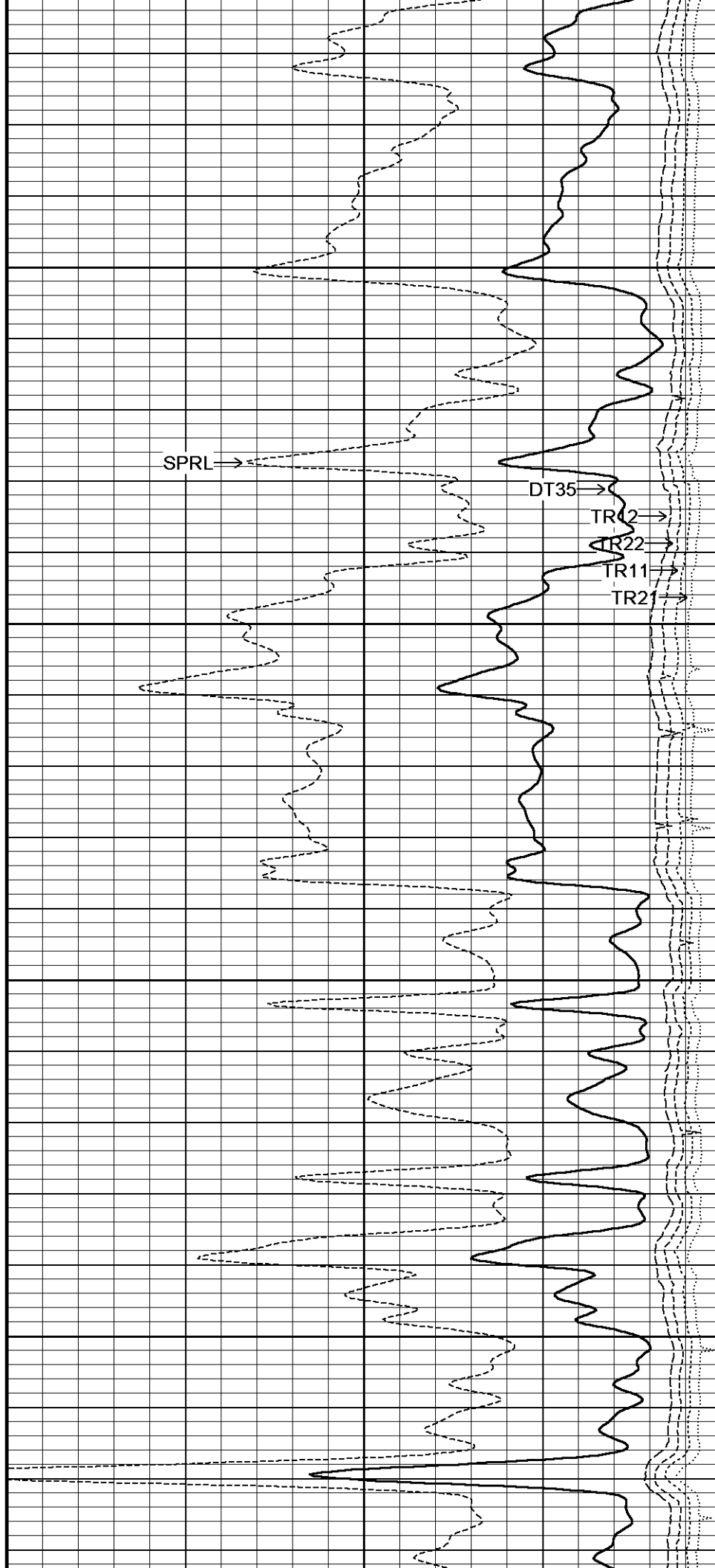
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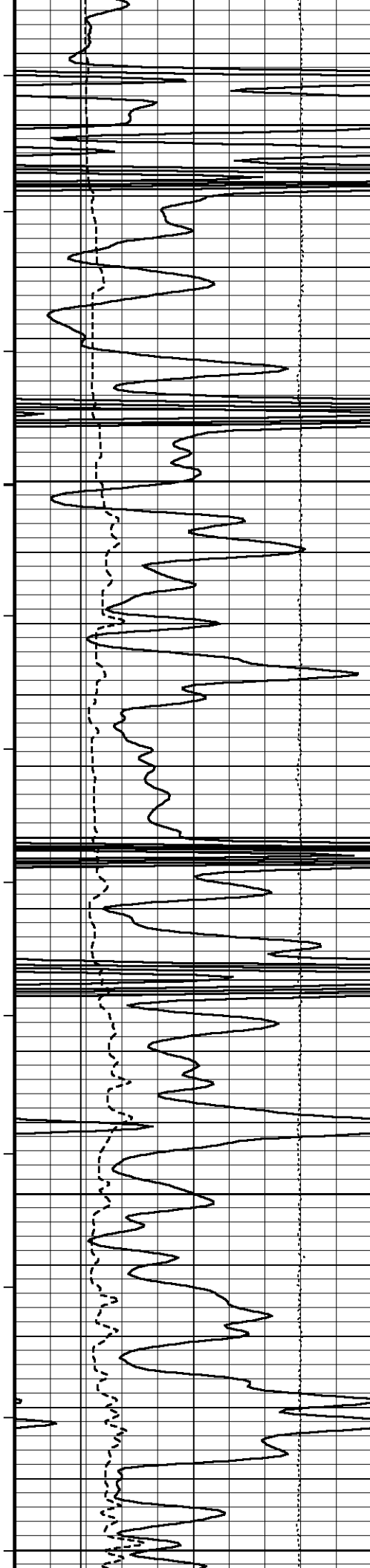
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6950





161°

7000

161°

7050

161°

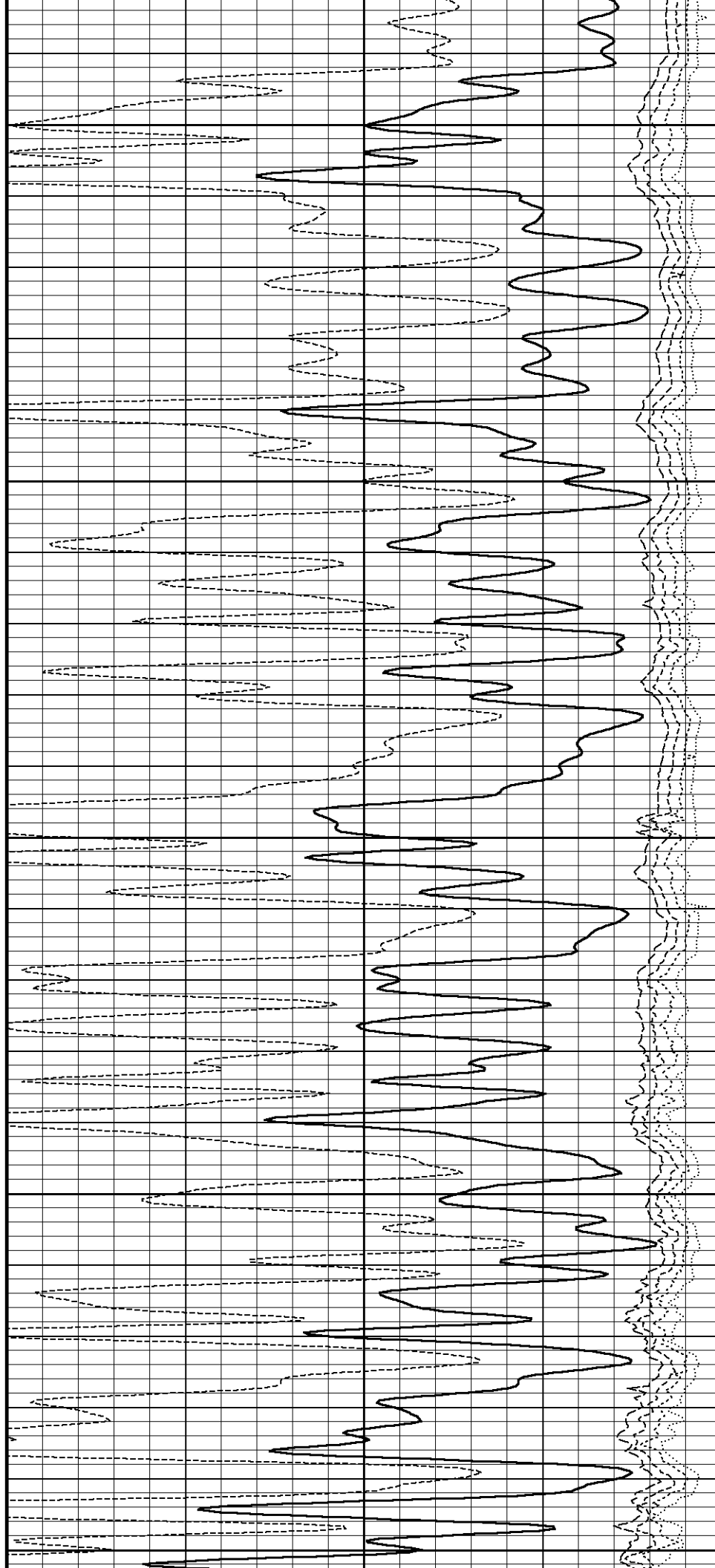
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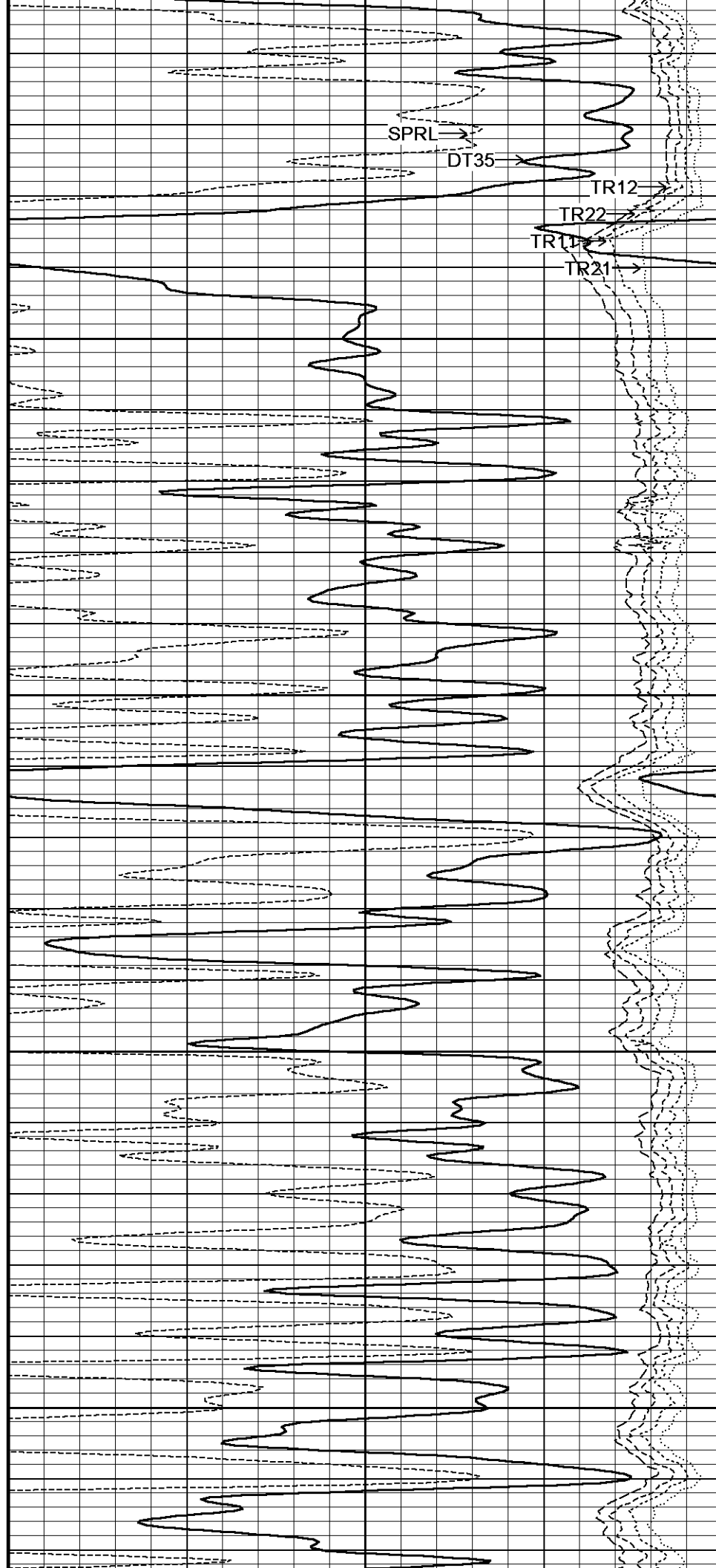
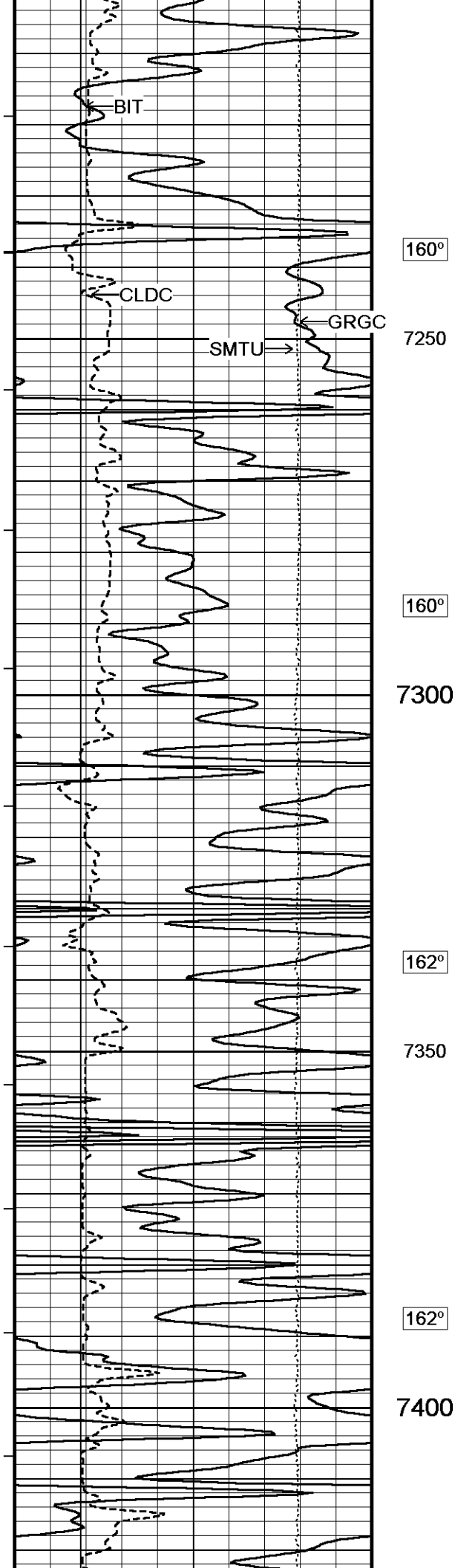
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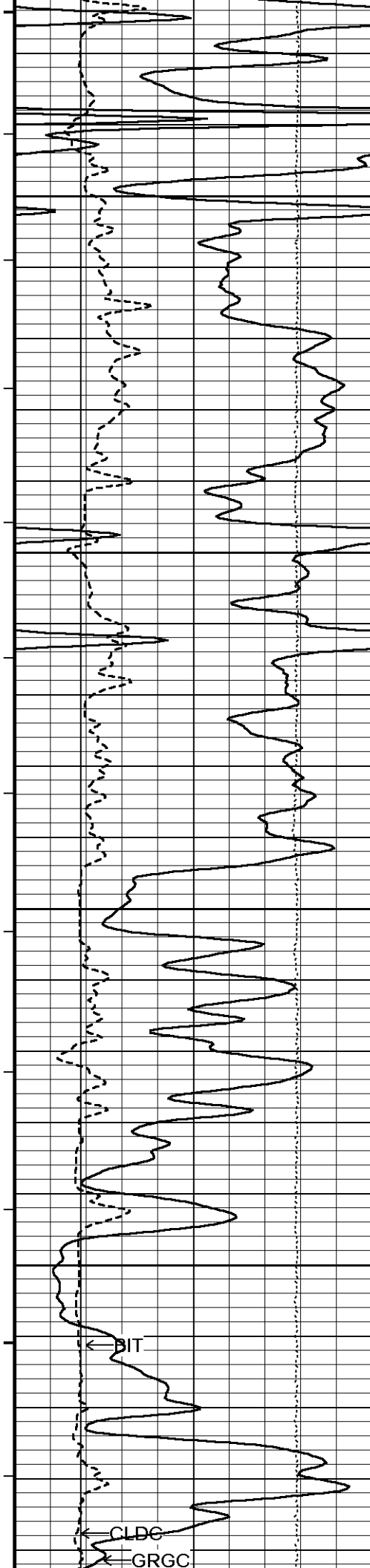
7150

160°

7200







164°

7450

165°

7500

166°

7550

166°

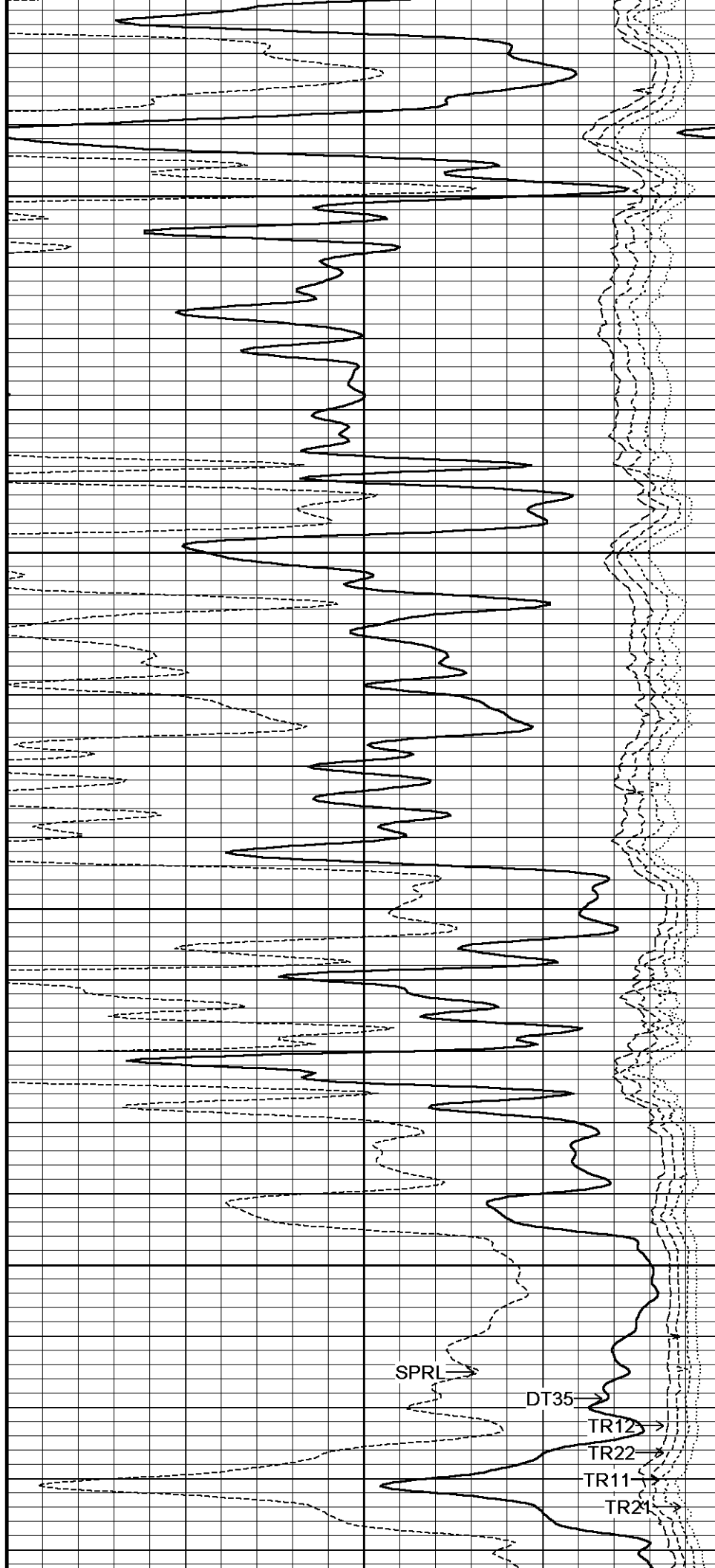
7600

167°

BIT

CLDC

GRGC



SPRL

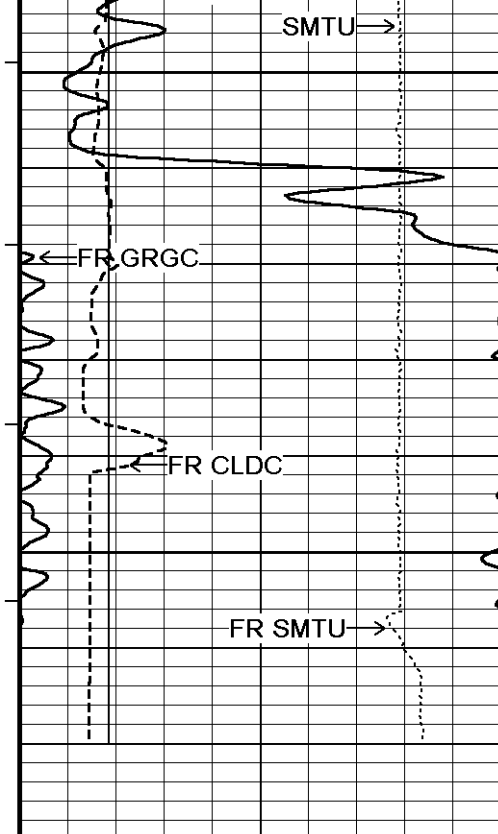
DT35

TR12

TR22

TR11

TR21

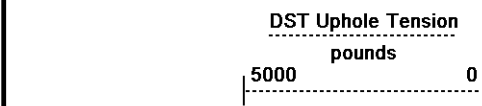
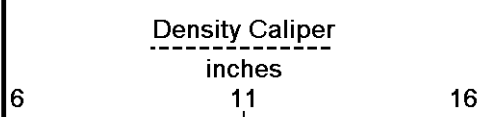
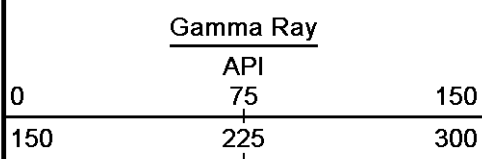


7650

168°

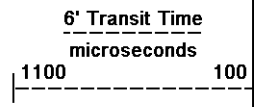
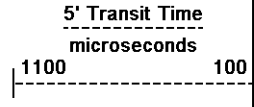
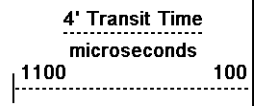
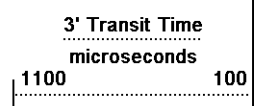
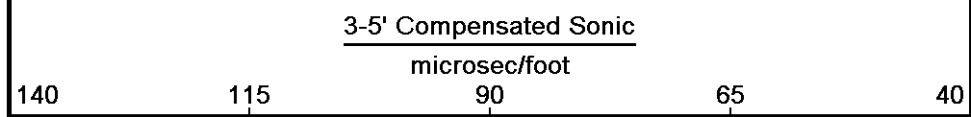
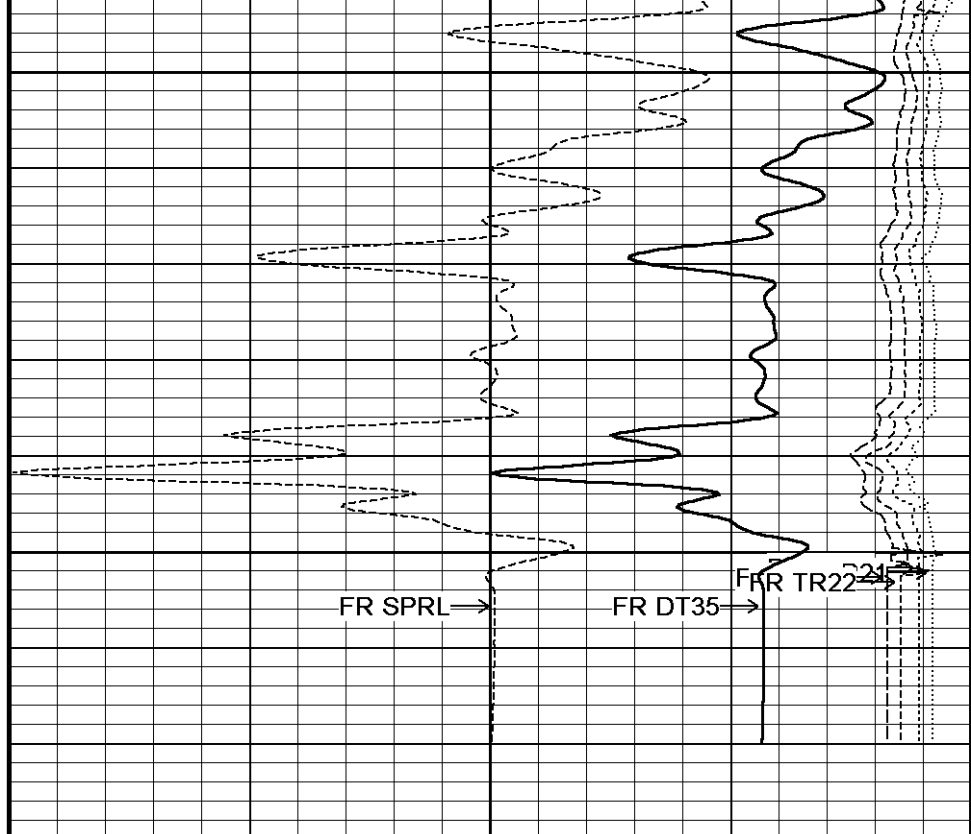
7700

7728
Depth
In
Feet



Borehole
Temp in
deg F

Replay
Scale
1:240





BEFORE SURVEY CALIBRATION

C:\Minimus 13.05.9583\Logs\Grand Mesa K-M #1-2 Second Run\K-...\Copy of Grand Mesa K-M #1-2 2nd run mml mdn mpd mss.dta

General Constants All 000

Last Edited on 03-NOV-2013,17:19

General Parameters

Mud Resistivity	2.340	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	None	

Rwa Parameters

Porosity used	N/A
Resistivity used	N/A
RWA Constant A	N/A
RWA Constant M	N/A
SW/APOR Tool Source	

Down-hole Tension Calibration SMS 0

Field Calibration on 03-NOV-2013 09:42

Reading No	Measured	Calibrated (lbs)
1	14752.95	0.00
2	15333.97	374.80

Gamma Calibration MCG-C 208

Field Calibration on 09-JUL-2013 07:32

	Measured	Calibrated (API)
Background	68	46
Calibrator (Gross)	1134	771
Calibrator (Net)	1066	725

Gamma Constants MCG-C 208

Last Edited on 09-JUL-2013,11:50

Gamma Calibrator Number	GRC038	
Mud Density	1.08	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%

SP Calibration MCG-C 208

Field Calibration on 12-JUN-2013,14:40

	Measured	Calibrated (mV)
Reference 1	100.1	100.0
Reference 2	-100.5	-100.0

High Resolution Temperature Calibration MCG-C 208

Field Calibration on 12-JUN-2013,14:22

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00

High Resolution Temperature Constants MCG-C 208

Last Edited on 23-AUG-2013,11:59

Pre-filter Length	11
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Caliper Calibration MML-A 16

Base Calibration on 11-OCT-2013 14:20

Field Calibration on 29-OCT-2013 10:14

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	13890	5.98
2	13810	7.07

2	17012	7.97
3	20232	9.86
4	24164	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.99	7.97

Micro Normal and Micro Inverse Calibration MML-A 16

Base Calibration on 11-OCT-2013 14:03

Field Check on 29-OCT-2013 10:15

Base Calibration

Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	12.2	60.2	5.0	25.0
Micro Inverse	15.6	78.3	5.0	25.0

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	62.9	62.9
Micro Inverse	48.3	48.3

Micro Normal and Micro Inverse Constants MML-A 16

Last Edited on 01-NOV-2013,18:35

Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159
Micro Normal K Factor	1.0000
Micro Inverse K Factor	1.0000
Standoff Offset	N/A inches

Neutron Calibration MDN-B.J 387

Base Calibration on 11-OCT-2013 11:56

Field Check on 29-OCT-2013 10:27

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	2939	89	3714	110
Ratio	32.951		33.764	

Field Calibrator at Base

	Calibrated (cps)
	1693 2506
Ratio	0.676

Field Check

	Calibrated (cps)
	0.664

Neutron Constants MDN-B.J 387

Last Edited on 01-NOV-2013,18:35

Neutron Source Id	P58125B
Neutron Jig Number	5824NE
Epithermal Neutron	No
Caliper Source for Processing	Density Caliper
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	None
Formation Pressure	N/A kpsi
Temperature Source	Constant Value
Temperature	68.00 degrees F
Mud Salinity	0.00 kppm
Salinity Correction	Not Applied
Formation Fluid Salinity Source	None
Formation Fluid Salinity	N/A kppm
Barite Mud Correction	Not Applied

Sonic Constants MSS-A.A 126

Last Edited on 16-SEP-2013,03:59

Maximum Boundary Contrast	100.00	micro-sec/ft
Fluid Transit Time	189.00	micro-sec/ft
Limestone Transit Time	47.60	micro-sec/ft
Sandstone Transit Time	55.50	micro-sec/ft
Dolomite Transit Time	43.50	micro-sec/ft

3-5' Compensated Sonic	40.00	micro-sec
Sonic used for Porosities	Applied	
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	Compensated
Hole Type	Open Hole

Sonde Parameters

	Measured	Calibrated
Offset	N/A	0.0000
Free Pipe	N/A	N/A
Peak Amplitude Source		N/A

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)
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

Full Waveform Parameters

Use 3' Waveform to derive TR	N/A
Use 4' Waveform to derive TR	N/A
Use 5' Waveform to derive TR	N/A
Use 6' Waveform to derive TR	N/A
3' Waveform Discriminator Level	N/A mV
4' Waveform Discriminator Level	N/A mV
5' Waveform Discriminator Level	N/A mV
6' Waveform Discriminator Level	N/A mV
3' Waveform Filter	N/A
4' Waveform Filter	N/A
5' Waveform Filter	N/A
6' Waveform Filter	N/A
Semblance Level	N/A
Semblance Window Width	N/A micro-sec
Sonic 1 Despiker	N/A
Sonic 2 Despiker	N/A

Photo Density Calibration MPD-B 64

Base Calibration on 03-NOV-2013 07:35
Field Check on 03-NOV-2013 07:42

Density Calibration				
Base Calibration		Measured	Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	55447	28796	59556	30836
Reference 2	22379	2604	24941	2541
Field Check at Base				
	1155.7	1343.0		
Field Check				
	1157.4	1343.6		

PE Calibration

Base Calibration		Measured	Calibrated	
	WS	WH	Ratio	Ratio
Background	209	1027		
Reference 1	21062	55250	0.385	0.371

Reference 1	21062	33230	0.383	0.371
Reference 2	6079	22238	0.277	0.272

Field Check at Base
209.3 1026.6

Field Check
208.2 1027.0

Density Constants MPD-B 64

Last Edited on 03-NOV-2013,06:43

Density Source Id	P50557B	
Nylon Calibrator Number	DNCE695	
Aluminium Calibrator Number	DACD698	
Density Shoe Profile	8 inch	
Caliper Source for Processing	MML Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.11	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-B 64

Base Calibration on 03-NOV-2013 07:13

Field Calibration on 03-NOV-2013 07:15

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	16258	3.99
2	25100	5.98
3	33840	7.97
4	42066	9.86
5	51536	11.92
6	N/A	N/A

Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	5.97	5.98

DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Logs\Grand Mesa K-M #1-2 Second Run\K-...\Copy of Grand Mesa K-M #1-2 2nd run mml mdn mpd mss.dta

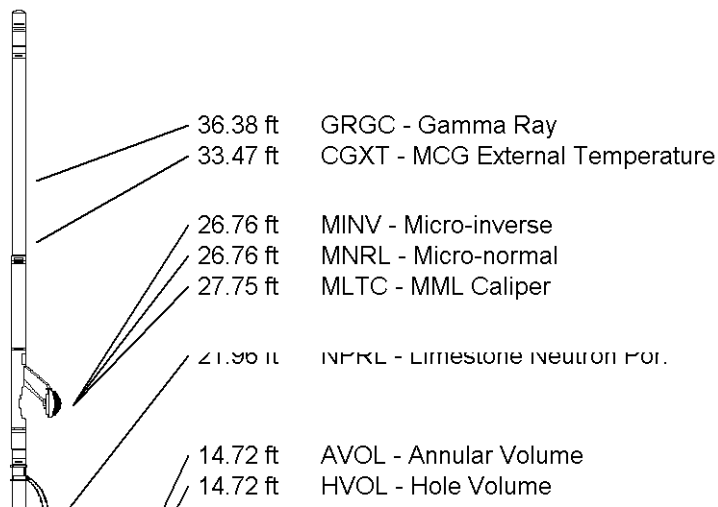
3/8" Triple Cone Cable Head (MCB F B)
MCB-F.B 9 LG: 1.58 ft WT: 15.4 lb OD: 2.24 in

Compact Comms Gamma
MCG-C 208 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log
MML-A 16 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

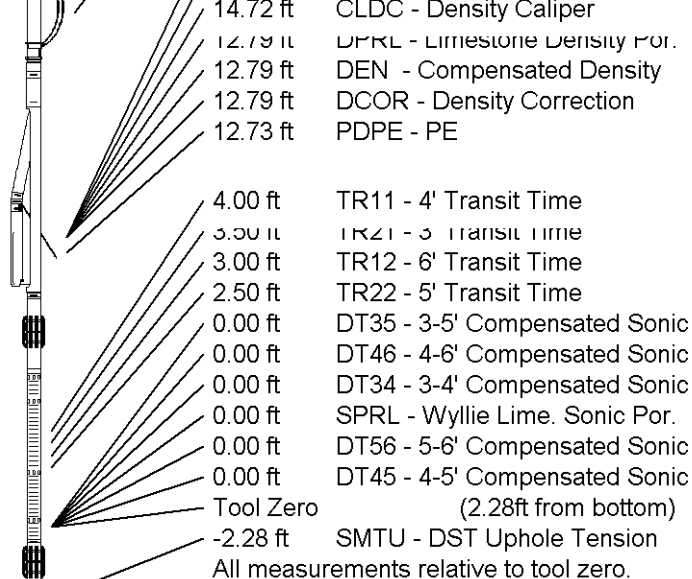
Compact Neutron
MDN-B.J 387 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in



Compact Sonic
MSS-A.A 126 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in

Total Length: 45.39 ft Weight: 374.8 lb



COMPANY	GRAND MESA OPERATING COMPANY
WELL	K-M #1-2
FIELD	WILDCAT
PROVINCE/COUNTY	WASHINGTON
COUNTRY/STATE	UNITED STATES / COLORADO

Elevation Kelly Bushing	4682.00	feet	First Reading	7708.00	feet
Elevation Drill Floor	4680.00	feet	Depth Driller	4485.00	feet
Elevation Ground Level	4672.00	feet	Depth Logger	4482.00	feet



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