Realtime Log

BAKER HUGHES

Natural Formation Evaluation
Gamma Ray

Scale: 1:240 Measured Depth

Company: Anadrako

Well: Spurling 13C-34HZ

Field: Weld County

County: Weld **State:** Colorado

Status: **Final Print**

API Number: 05-123-38949-00

Surface Location:
Latitude: 40° 6' 3.589" N
Longitude: 104° 52' 57.497" W
SEC: 34 TWP: 2N RNG: 67W

Other Services:
Directional
VSS

Permanent Datum (P.D.):	Ground Level	Elevation:	5013.00 ft.
Log Measured From:	Rig Floor	5029.00 ft.	Above P.D.
Depth Reference:	Driller's Depth		

Elevations:
KB: N/A
DF: 5029.00 ft.
GL: 5013.00 ft.

Interval Logged		Dates		Magnetic Field Reference			
Top:	7000.0 ft.	Date From:	22/May/14	Dip Angle:	66.67 °	Azi Reference North:	True
Bottom:	12219.0 ft.	Date To:	29/May/14	Total		Mag to Reference	
		Spud Date:	21/May/14	Field Strength:	52842.0 nT	North Correction:	8.60 °

Borehole Record			Casing Record			
Hole Size	From	To	Size	Weight	From	To
13.500 in.	Surface	1075.0 ft.	9.625 in.	36.00 lb/ft	Surface	1065.0 ft.
8.750 in.	1065.0 ft.	8029.0 ft.	7.000 in.	26.00 lb/ft	Surface	8023.0 ft.
6.125 in.	8023.0 ft.	12219.0 ft.				

Mud Record			Deviation Record			
Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Fresh Water	Surface	5100.0 ft.	13.500 in.	1075.0 ft.	0.0 ° / 0.0 °	0.5 ° / 321.4 °
Water Based Mud	5100.0 ft.	12219.0 ft.	8.750 in.	6964.0 ft.	0.4 ° / 327.6 °	89.9 ° / 178.6 °
			6.125 in.	7196.0 ft.	89.6 ° / 178.6 °	89.7 ° / 177.3 °
					/	/
					/	/
					/	/

Acquisition System	Software Version		Other	
Advantage	2.20U4	Rig:	Xtreme 6	/ Xtreme Coil Drilling Corp.
PATS	6.4.1.34	Job No:	6325292	
		District: / Unit:	RMD	/ D&E

Log Run Summary

LWD Run No.	BHA Run No.	Bit Run No.	Bit Size (in.)	Bit Type	Bit Gauge Length (in.)	Assembly Type	Logged Interval Top (ft.)	Logged Interval Bottom (ft.)	Bit Depth Interval From (ft.)	Bit Depth Interval To (ft.)	Date / Time Start	Date / Time End	Circ. Time (hrs.)
1	1	2	8.750	PDC	6.000	Steerable	7000.0	7352.0	1075.0	7352.0	22/May/2014 06:30	24/May/2014 08:30	29.7
2	2	3	8.750	PDC	4.800	Steerable	7316.0	8029.0	7352.0	8029.0	24/May/2014 09:30	25/May/2014 15:00	16.6
3	3	4	6.125	PDC	3.000	Steerable	7982.0	12219.0	8029.0	12219.0	26/May/2014 13:15	29/May/2014 03:00	35.4

Crew

Name	Arrive	Depart
	Wellsite	Wellsite
Matthew Delmore	21/May/14	29/May/14

Name	Arrive	Depart
	Wellsite	Wellsite
Jake Miller	21/May/14	29/May/14

Name	Arrive	Depart
	Wellsite	Wellsite

Witness

Name	LWD Run Number
David Cornett	1, 2, 3
Joe Wallem	1, 2, 3

Mud Properties Record

Date / Time	LWD Run No.	Measured Depth (ft.)	Mud Type	Density (ppg)	Viscosity (cp)	pH	Fluid Loss (cc)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
22/May/14 22:00	1	1050.0	Fresh Water	8.5	28	9.4	N/A	0/100	Active Pits	1000	N/A
23/May/14 08:00	1	5000.0	Fresh Water	8.7	30	9.4	N/A	0/97	Active Pits	1000	N/A
23/May/14 22:00	1	7215.0	Water Based Mud	10.5	44	9.7	4.6	0/90	Active Pits	1100	N/A
24/May/14 15:00	2	7215.0	Water Based Mud	10.5	54	9.7	5.2	0/89	Active Pits	1100	N/A
24/May/14 22:00	2	7731.0	Water Based Mud	10.5	46	9.4	4.8	1/89	Active Pits	1200	N/A
25/May/14 08:00	2	8029.0	Water Based Mud	10.5	44	9.5	4.6	3/87	Active Pits	1200	N/A
26/May/14 22:00	3	8186.0	Water Based Mud	9.2	37	9.7	4.7	3/92	Active Pits	1100	N/A
27/May/14 08:00	3	9598.0	Water Based Mud	9.4	44	9.4	4.6	3/91	Active Pits	1000	N/A
27/May/14 22:00	3	11671.0	Water Based Mud	9.4	44	9.5	4.8	3/91	Active Pits	1000	N/A
28/May/14 16:00	3	12219.0	Water Based Mud	9.6	43	9.3	4.6	4/89	Active Pits	1100	N/A

Mnemonics

Curve	Description	Units
GRAX	Gamma Ray Apparent, 0.5 ft. Avg.	API
GRIX	Gamma Ray Data Density	points
GRSI	Gamma Ray Sliding Indicator	unitless
GRTX	Gamma Ray Time Since Drilled	min
ROPA	Rate of Penetration, 3.0 ft. Avg.	ft/hr
TCDX	Downhole Temperature	degF
TVD	True Vertical Depth	ft.
WOBA	Surface Weight on Bit, 1.0 ft. Avg.	klbs

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (ft)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	12546339	Directional	46.46	6.750	3.250
1	SRIG	12578114	Gamma	43.09	6.750	3.250
2	DIR	12546339	Directional	39.80	6.750	3.250
2	SRIG	12578114	Gamma	36.43	6.750	3.250
3	DIR	12592567	Directional	50.61	4.750	2.750
3	SRIG	10242199	Gamma	47.23	4.750	2.750

Service and Tool Mnemonics

Mnemonic	Name	Description

DIR	Directional	Wellbore directional survey
SRIG	Inclination and Gamma	Probe based gamma ray and inclination module

Comments

1.) Baker Hughes LWD run 1 utilized 6 3/4 inch NaviTrak Services (VSS, Directional) from 1075 to 7055 ft. MD (1074.97 to 7008.95 ft. TVD) and NaviGamma Services (VSS, Directional, Gamma Ray) from 7055 to 7352 ft. MD (7008.95 to 7299.43 ft. TVD) behind an 8 3/4 inch bit and steerable assembly.

2.) Baker Hughes LWD run 2 utilized 6 3/4 inch NaviGamma Services (VSS, Directional, Gamma Ray) from 7352 to 8029 ft. MD (7299.43 to 7642.61 ft. TVD) behind an 8 3/4 inch bit and steerable assembly.

3.) Baker Hughes LWD run 3 utilized 4 3/4 inch NaviGamma Services (VSS, Directional, Gamma Ray) from 8029 to 12219 ft. MD (7642.61 ft. to 7657.63 TVD) behind an 6 1/8 inch bit and steerable assembly.

4.) A sliding indicator is shown on the left edge of track 1 as a heavy line. This indicator has been depth-shifted to the gamma ray sensor offset to correspond with gamma ray data.

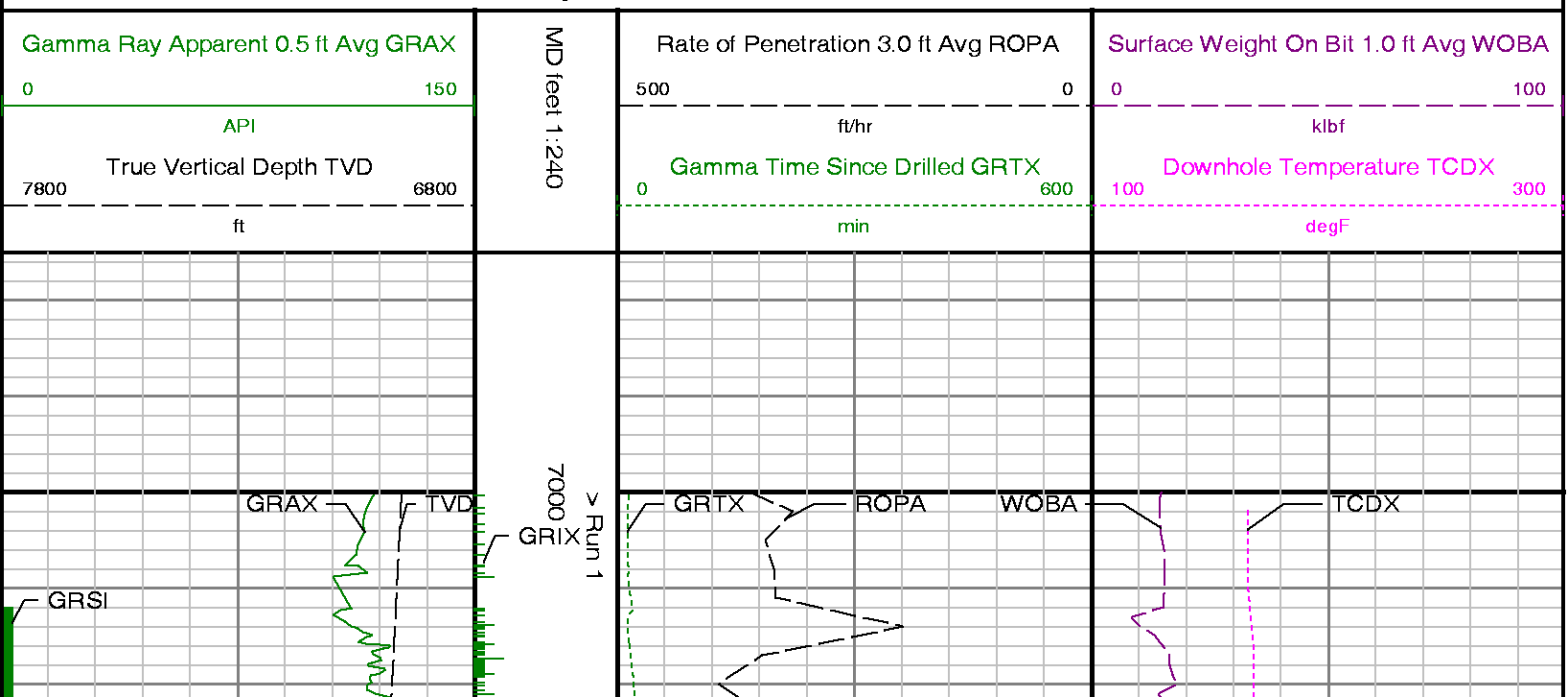
5.) Depth measurements obtained from a depth control system not supplied or operated by Baker Hughes. Due to the lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.

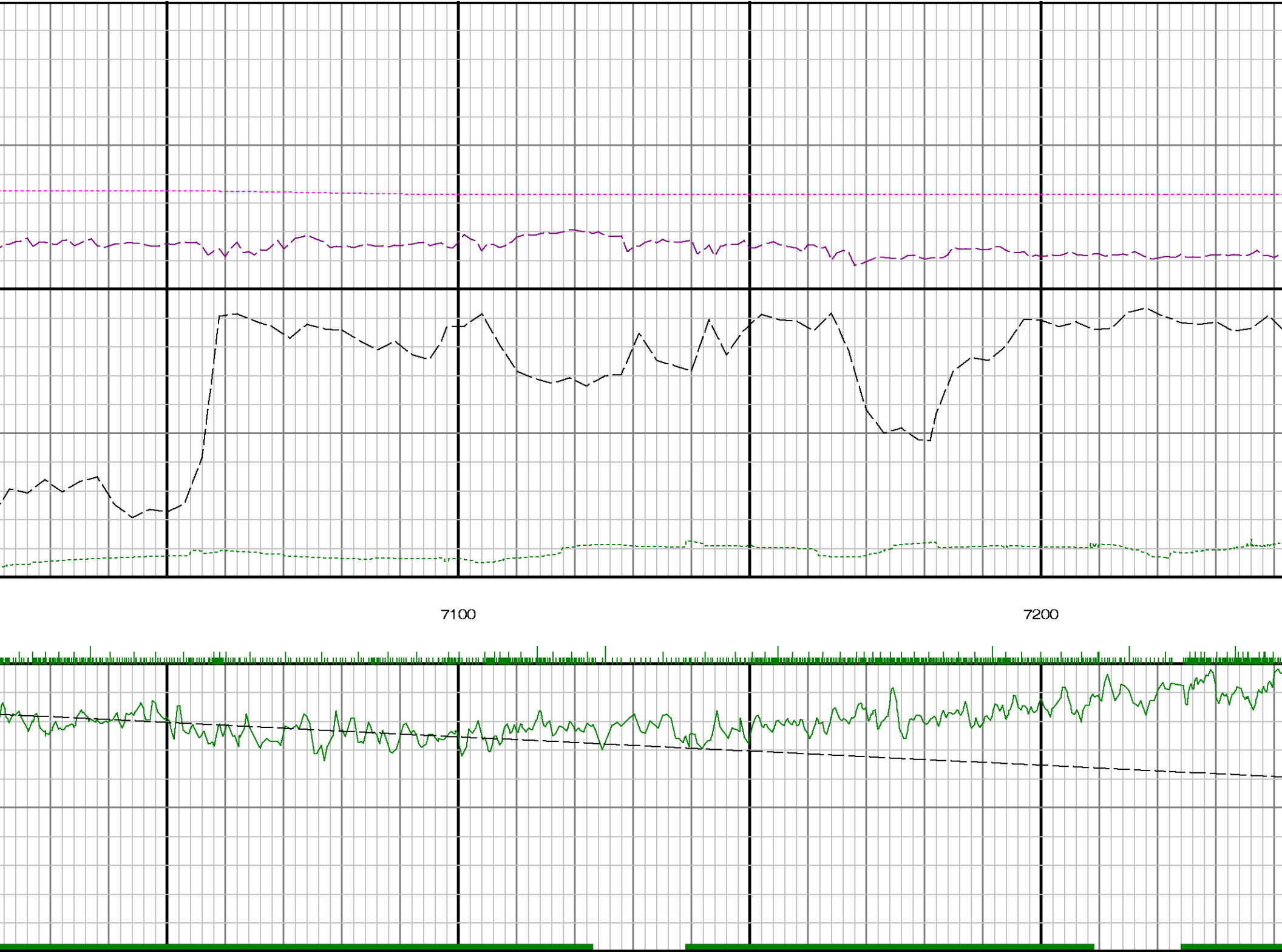
Remarks

Number	Measured Depth (ft)	Hole Section (in.)	LWD Run No.	Remark
1	7330	8.750	2	The interval from 7308 to 7352 ft. MD (7257.28 to 7299.78 ft. TVD) was logged up to 15.2 hours after being drilled due to a trip out of the hole to lay down the vertical curve assembly and to pick up a new curve assembly.
2	8010	6.125	3	The interval from 7993 to 8029 ft. MD (7641.96 to 7642.62 ft. TVD) was logged up to 38.6 hours after being drilled due to a trip out of the hole to lay down the curve assembly, run intermediate casing, cementing operations, and to pick up the lateral assembly.
3	12195	6.125	3	The interval from 12172 to 12219 ft. MD (7657.38 to 7657.68 ft. TVD) does not contain GRAX, GRIX or GRTX due to the bit to sensor offset.

BAKER HUGHES

Company : Anadrako
Well : Spurling 13C-34HZ
Interval : 6975.00 - 12245.00 feet
Created : 28/May/2014 11:08:59 AM

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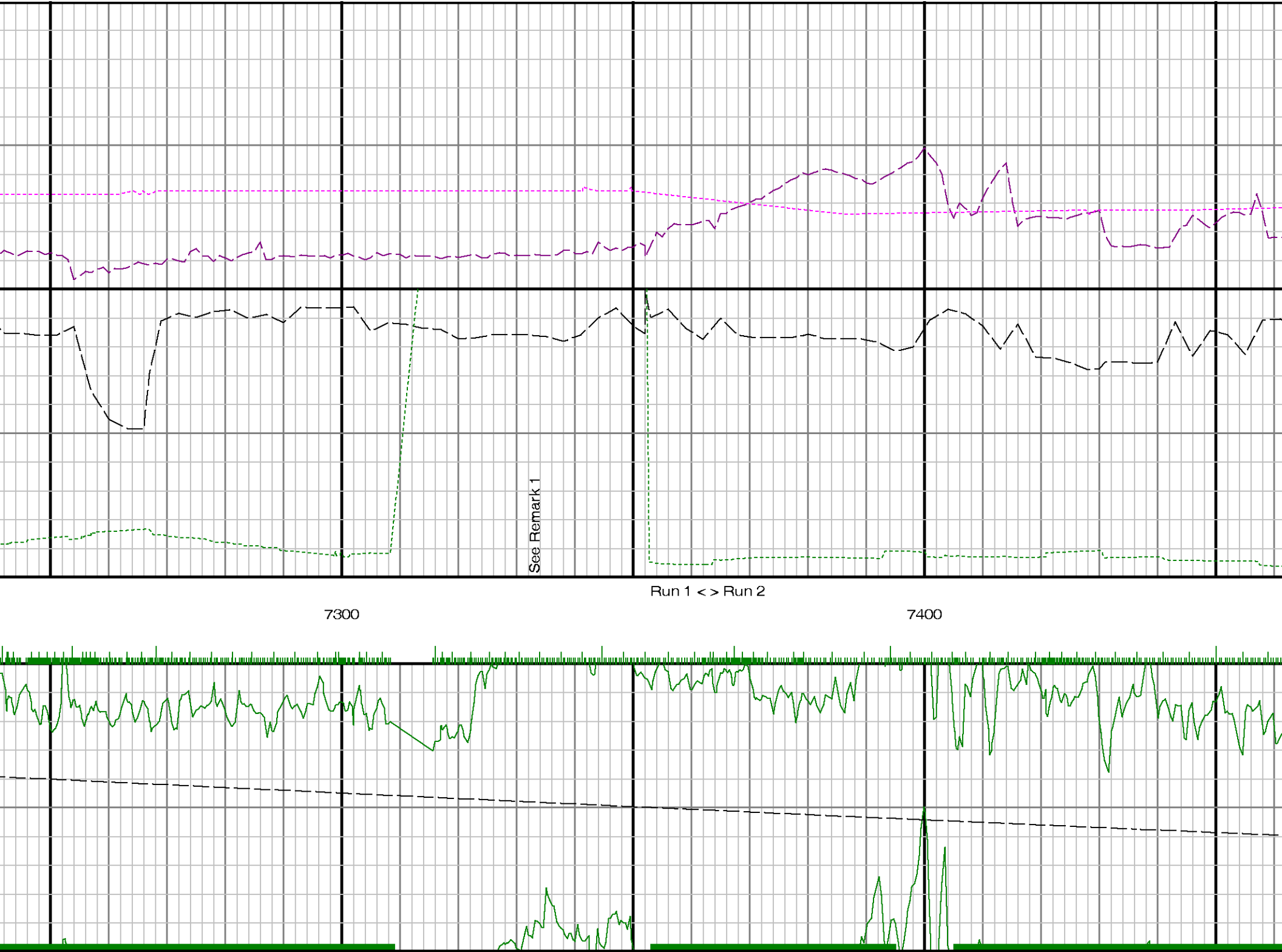
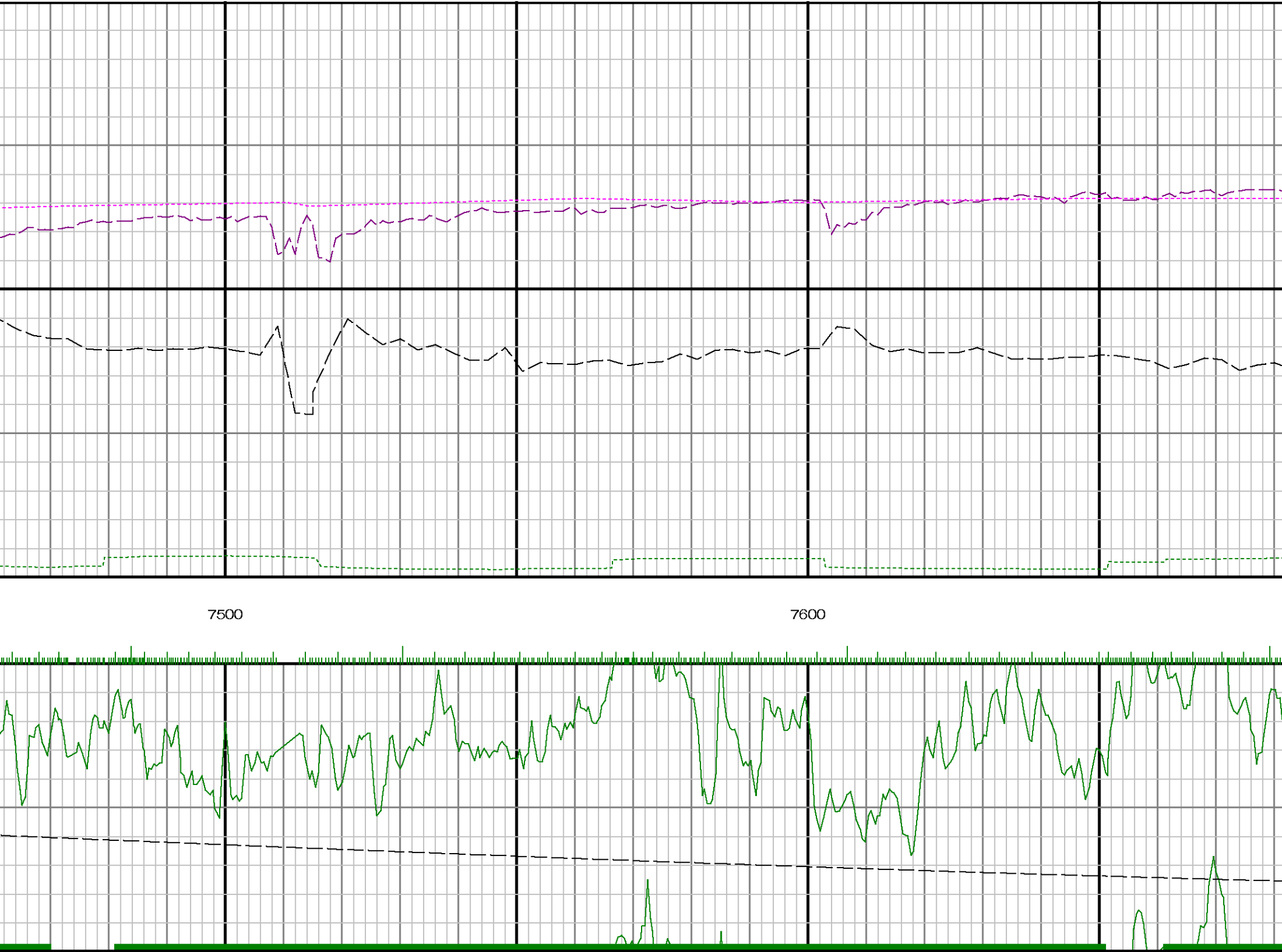
7200


See Remark 1
Run 1 < > Run 2
7300
7400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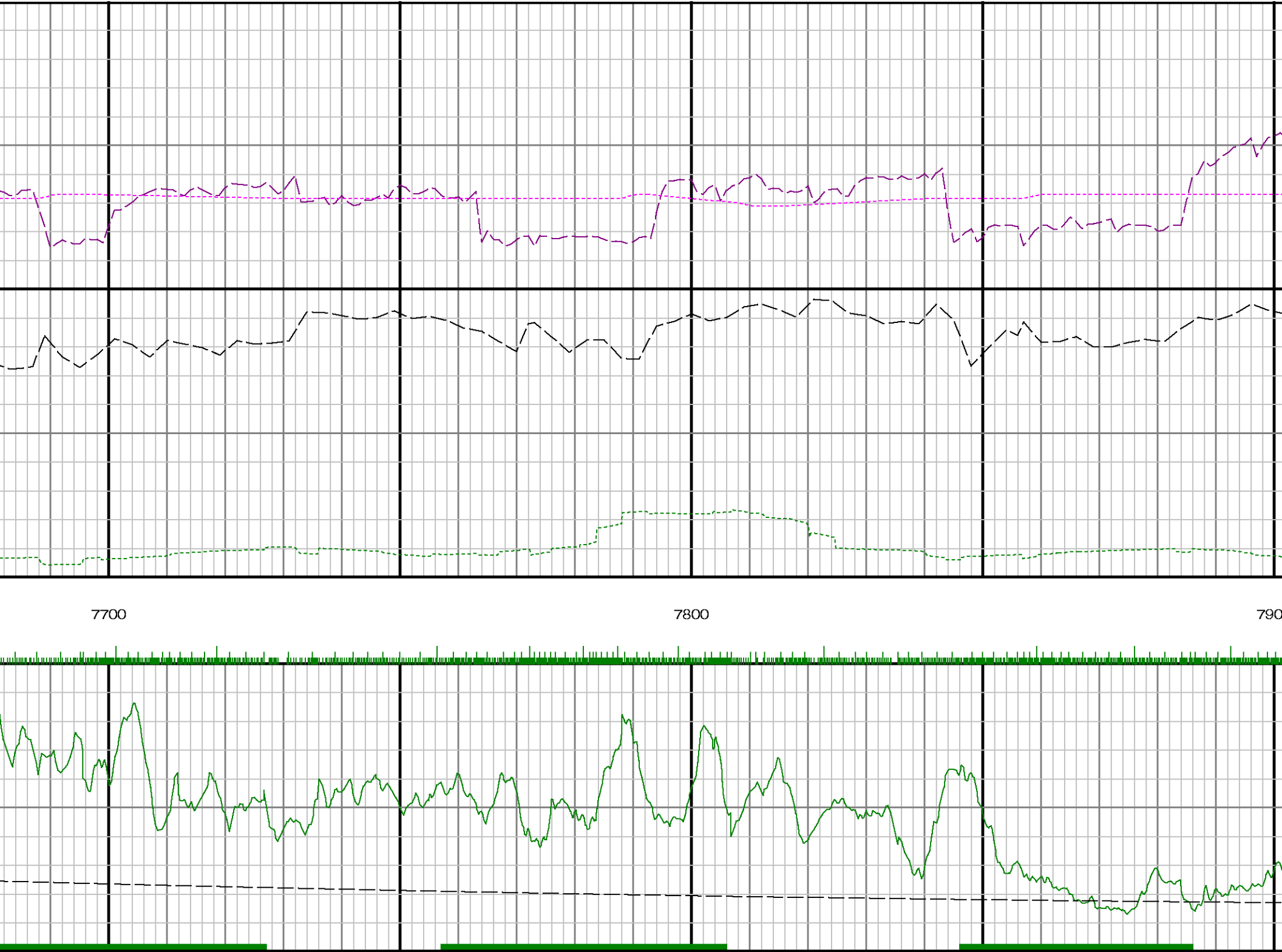
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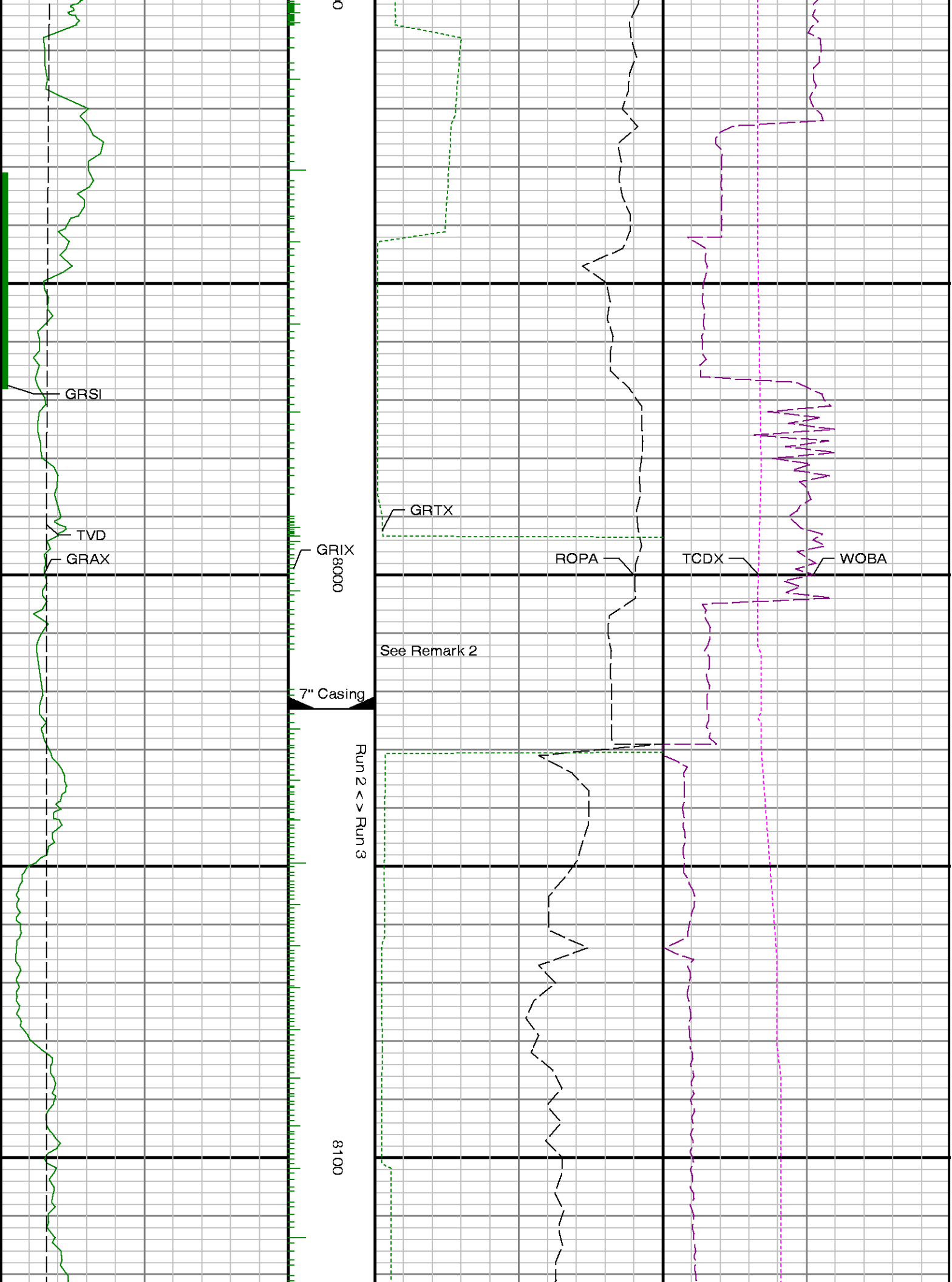
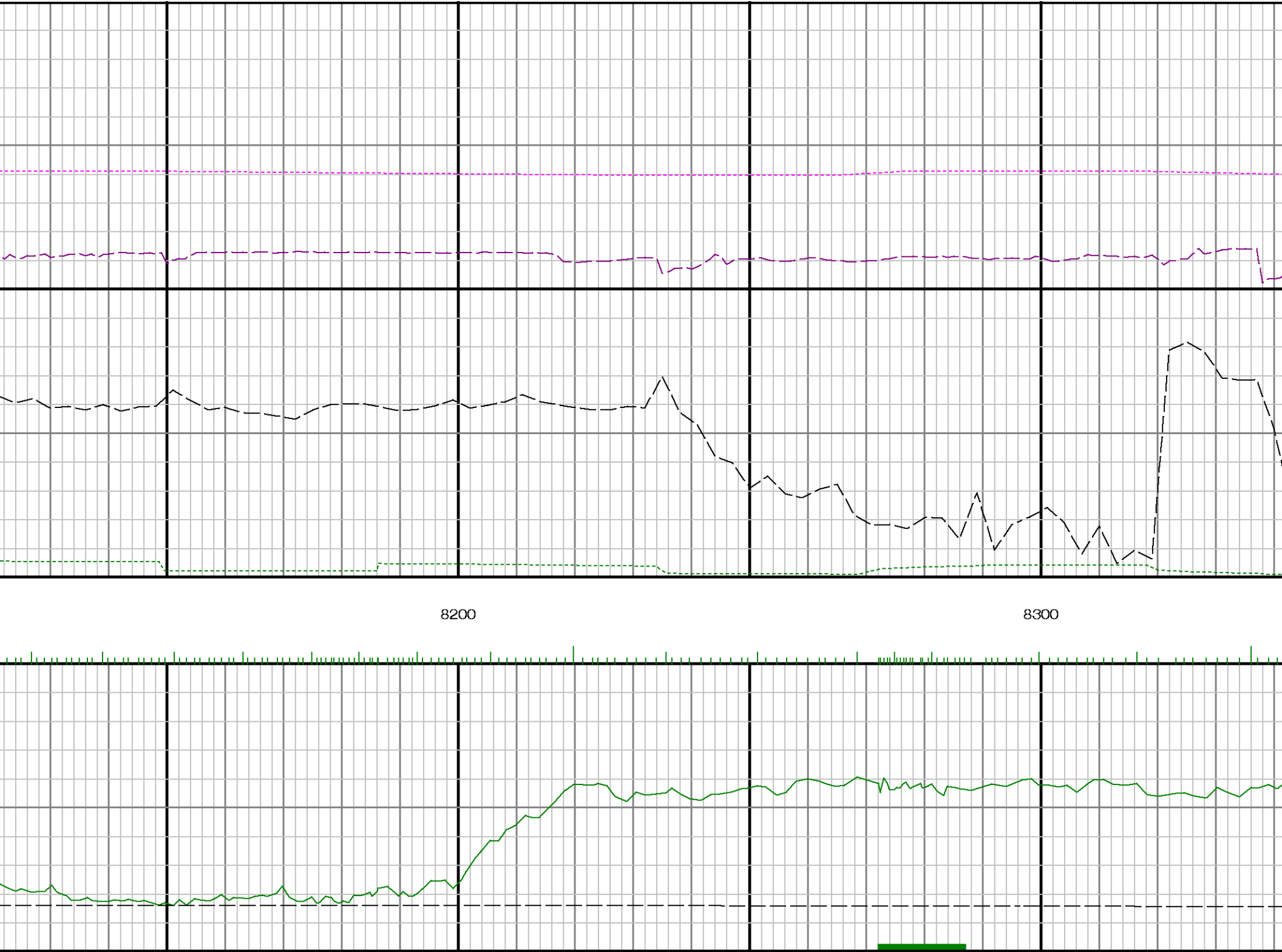

GRSI
TVD
GRAX
GRIX
8000
GRTX
ROPA
TCDX
WOBA
See Remark 2
7" Casing
Run 2 < > Run 3
8100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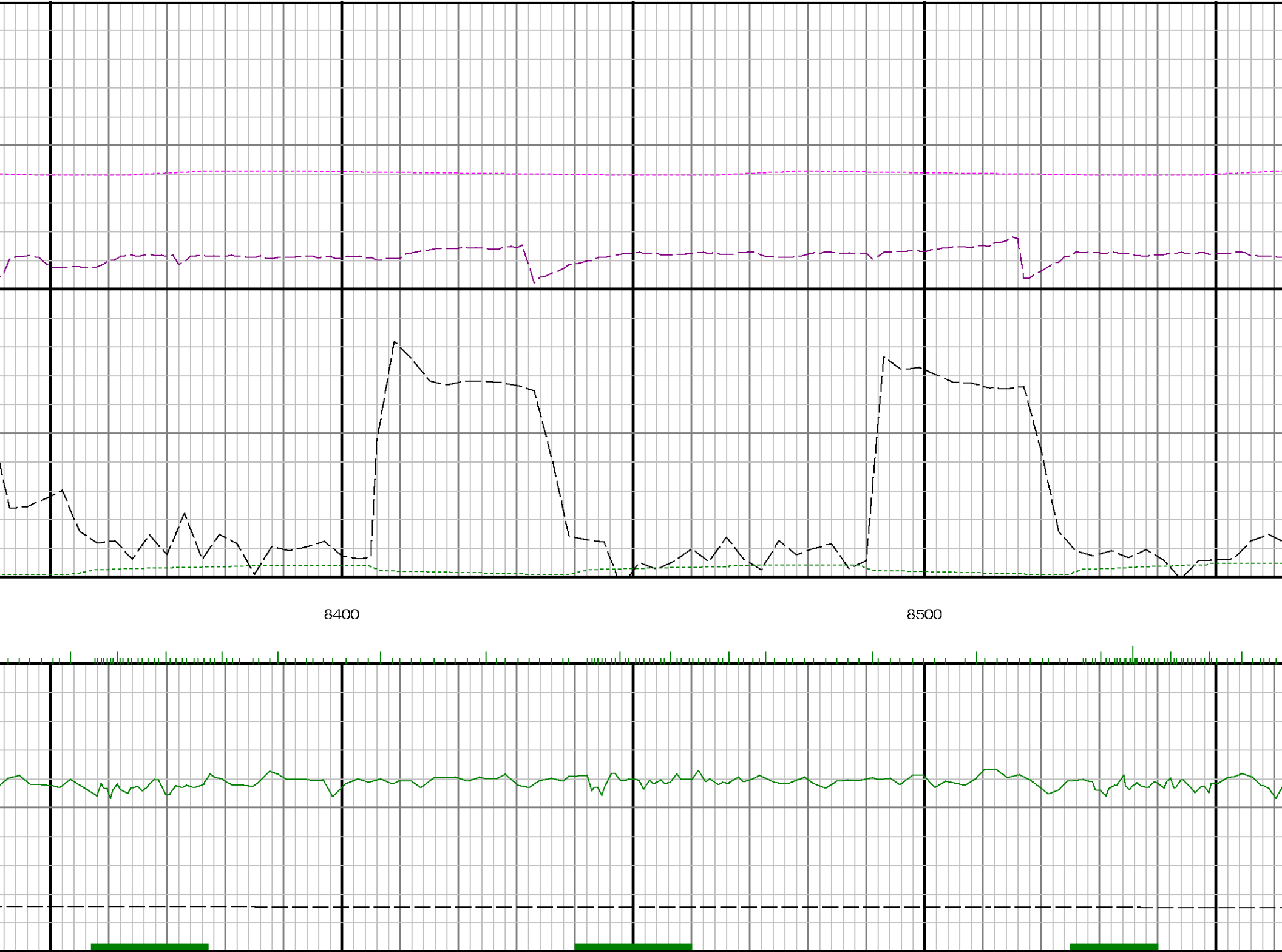
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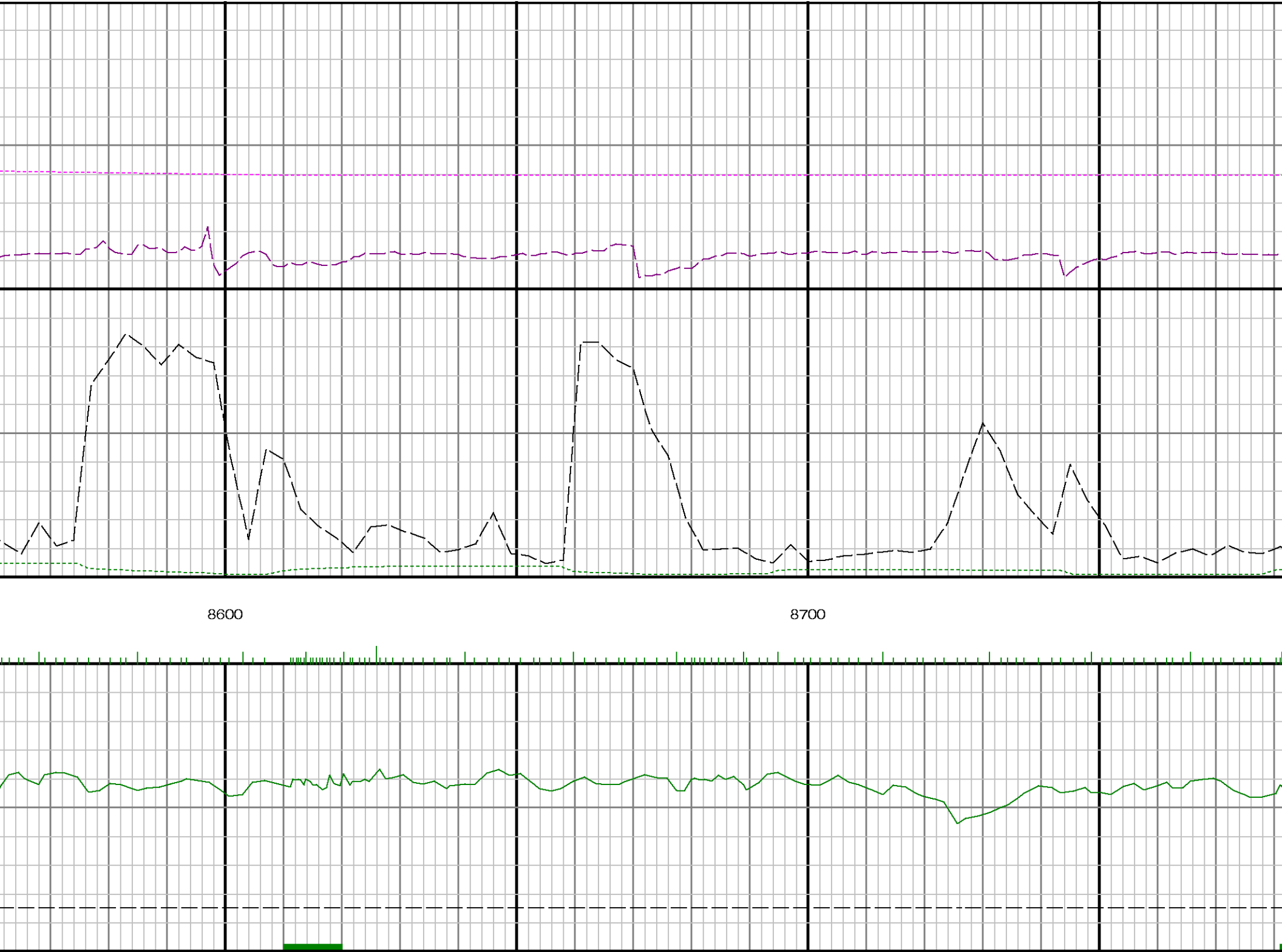
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8800
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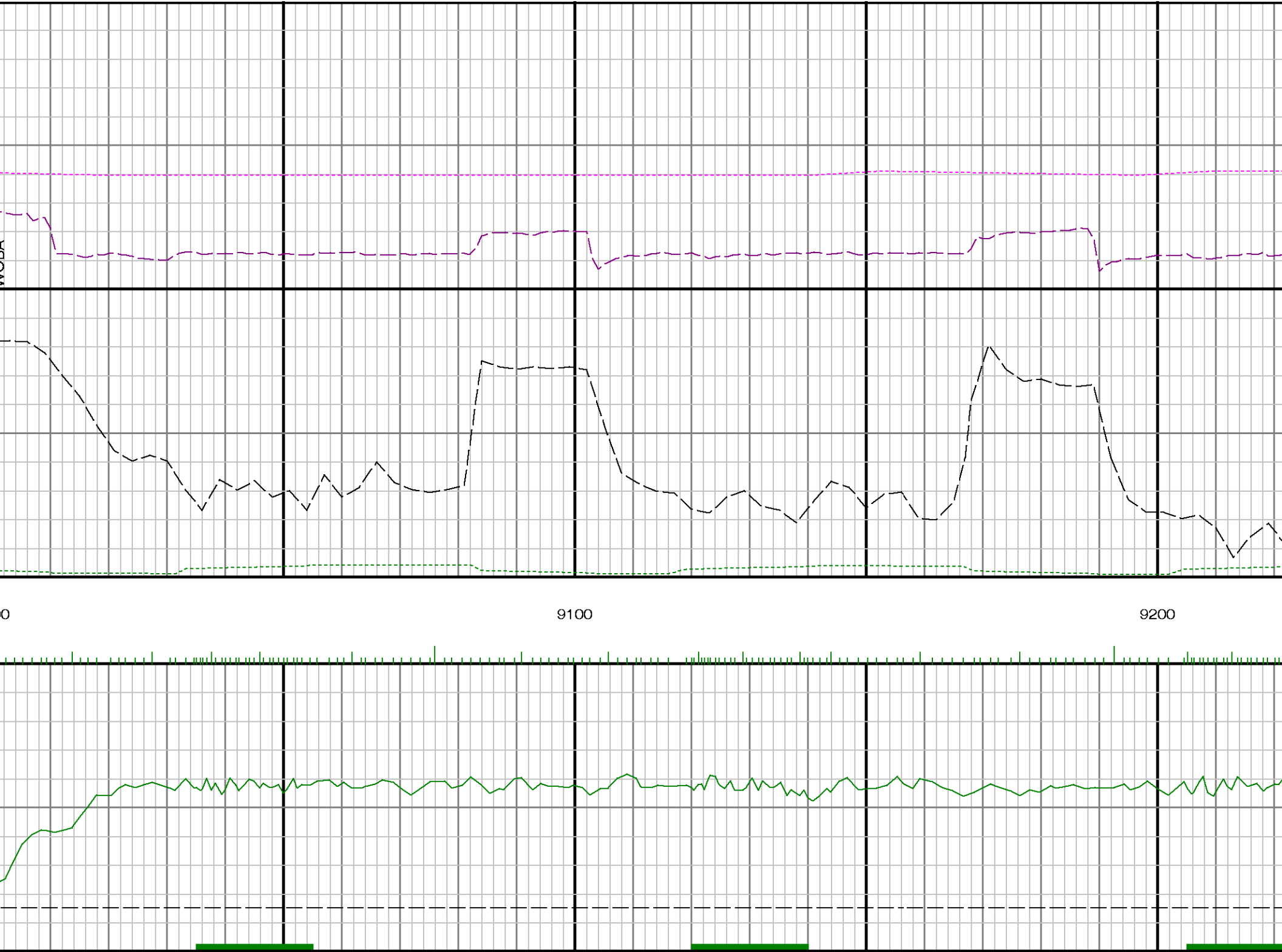
GRAX
GRIX
GRTX
ROPA
TCDX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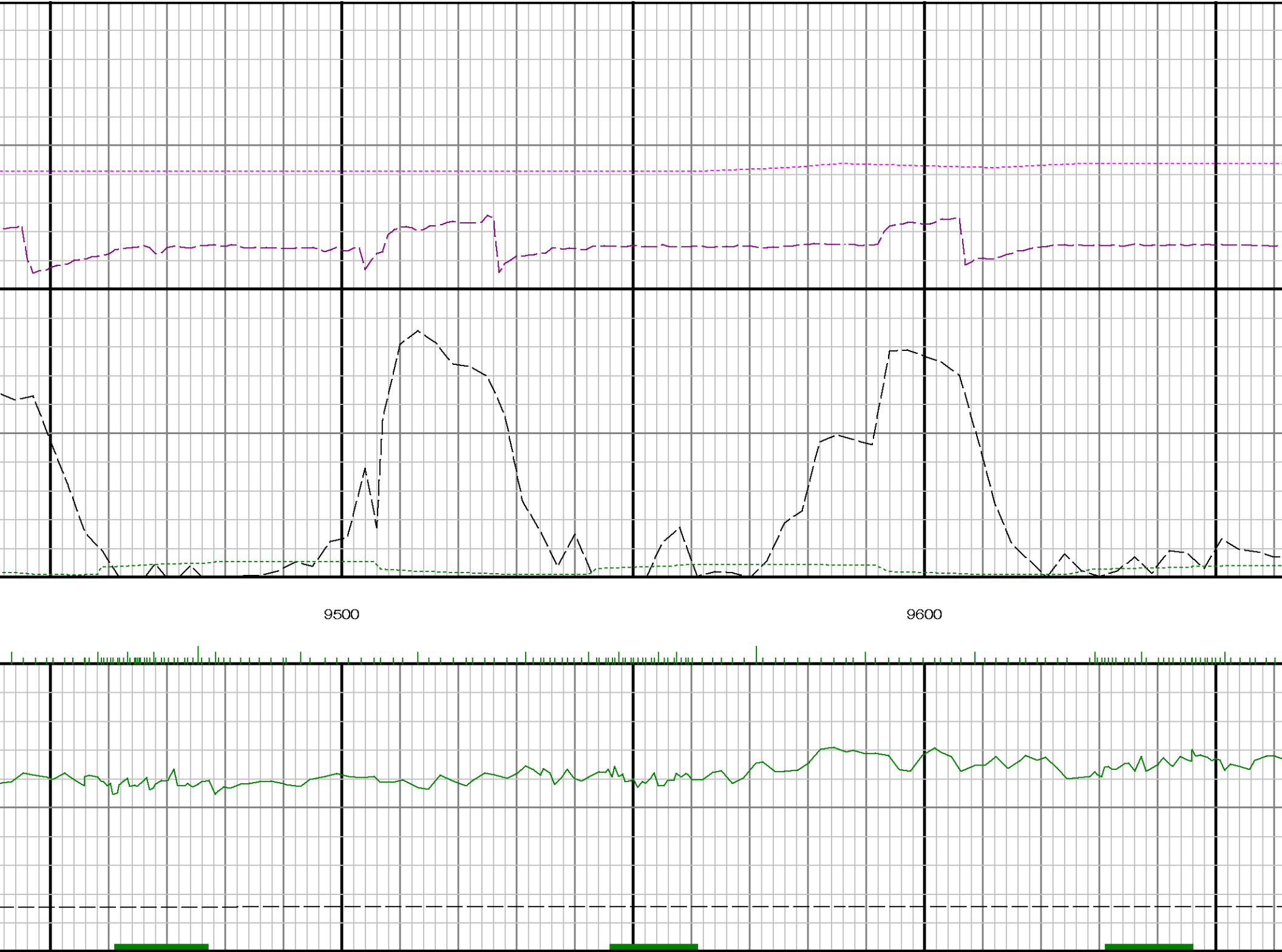
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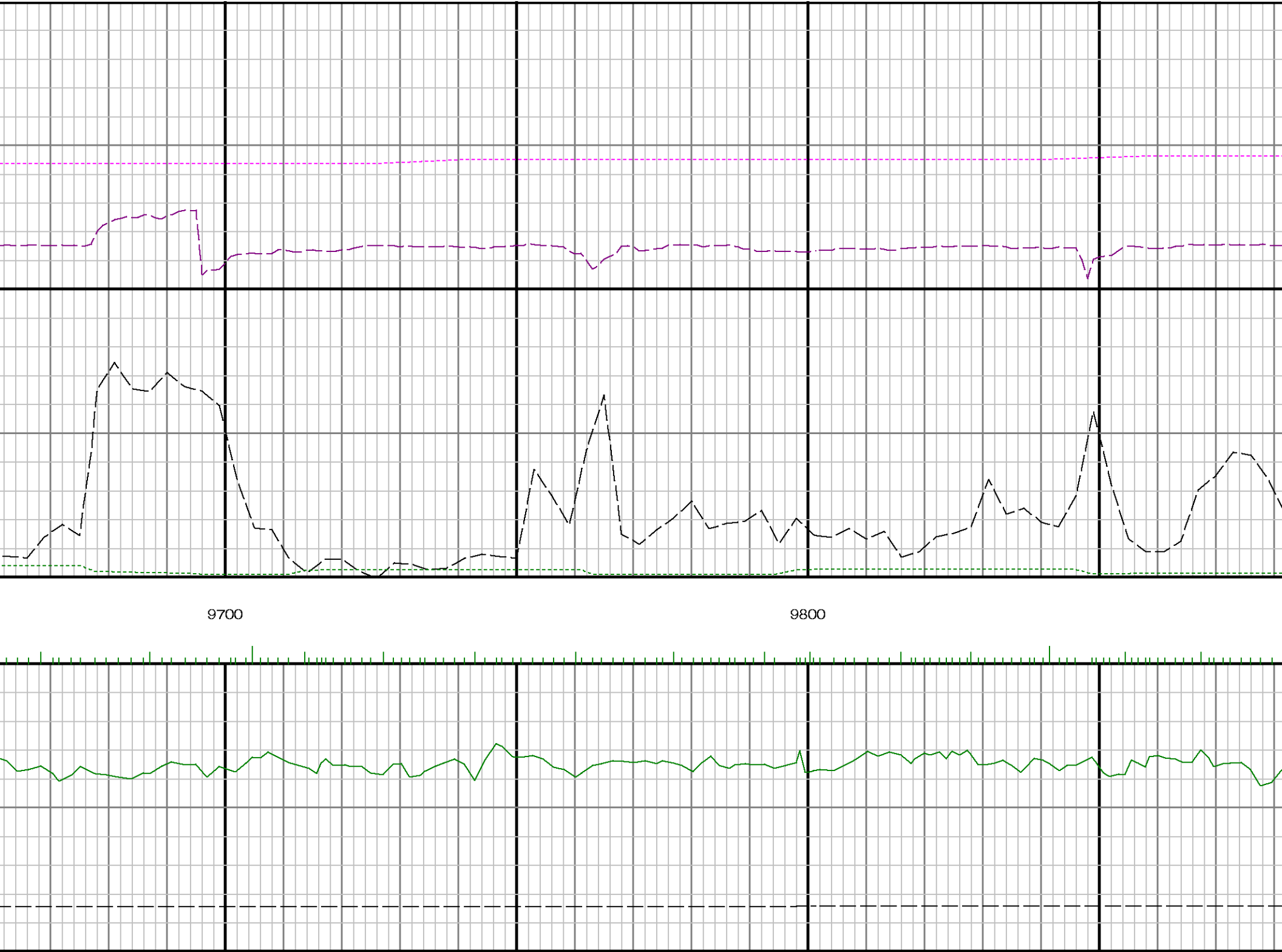
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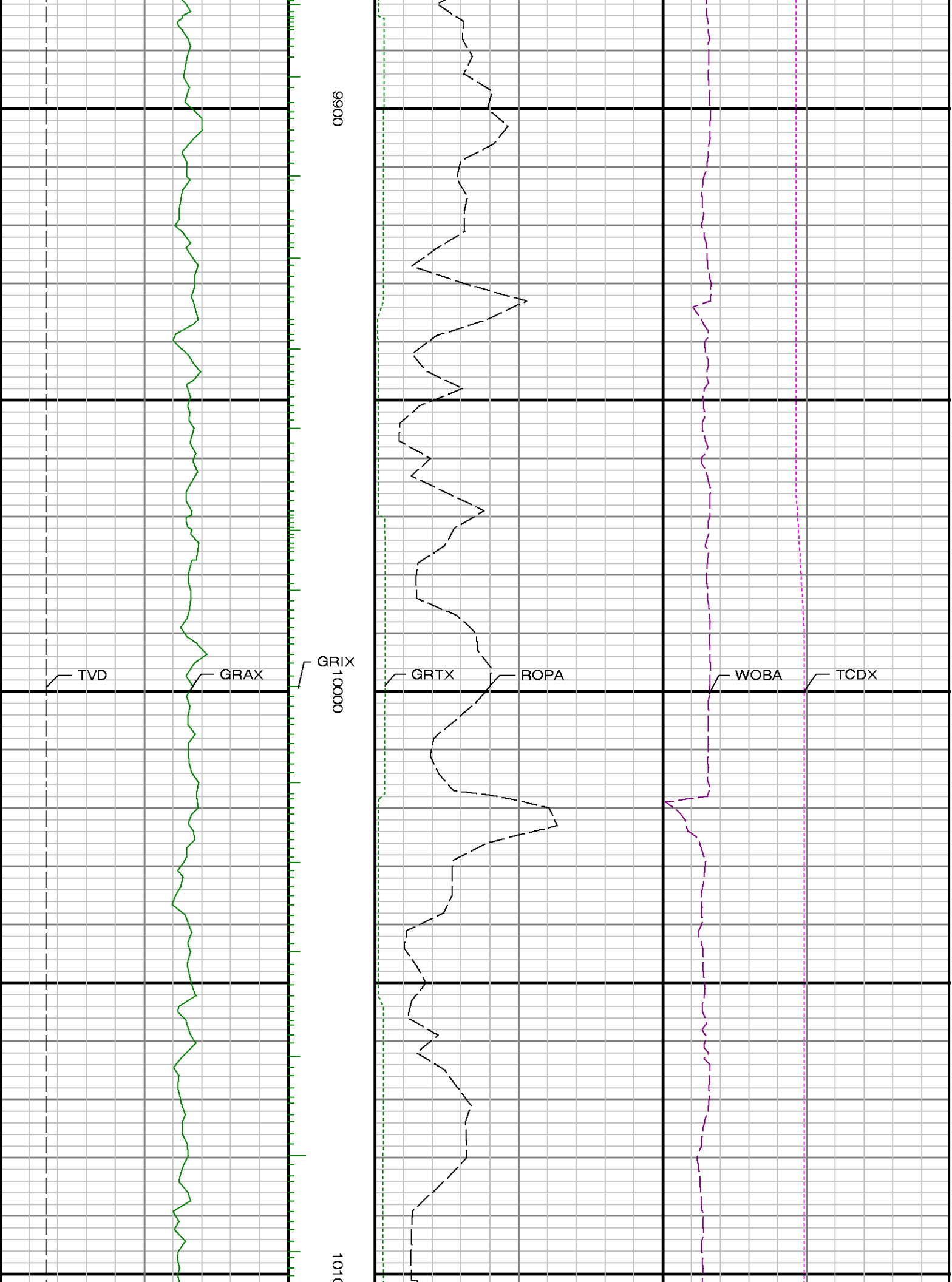
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GRIX
GRTX
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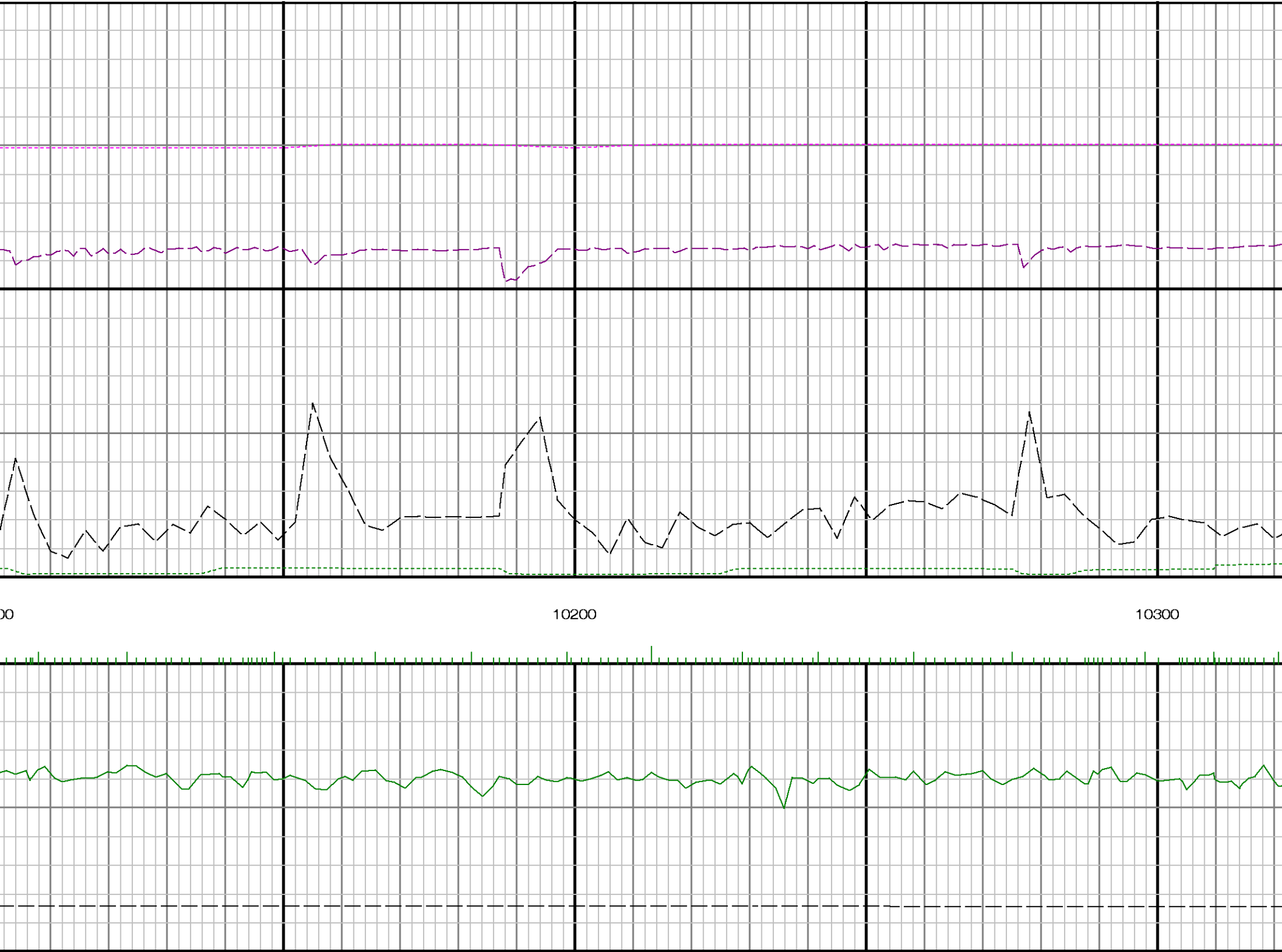
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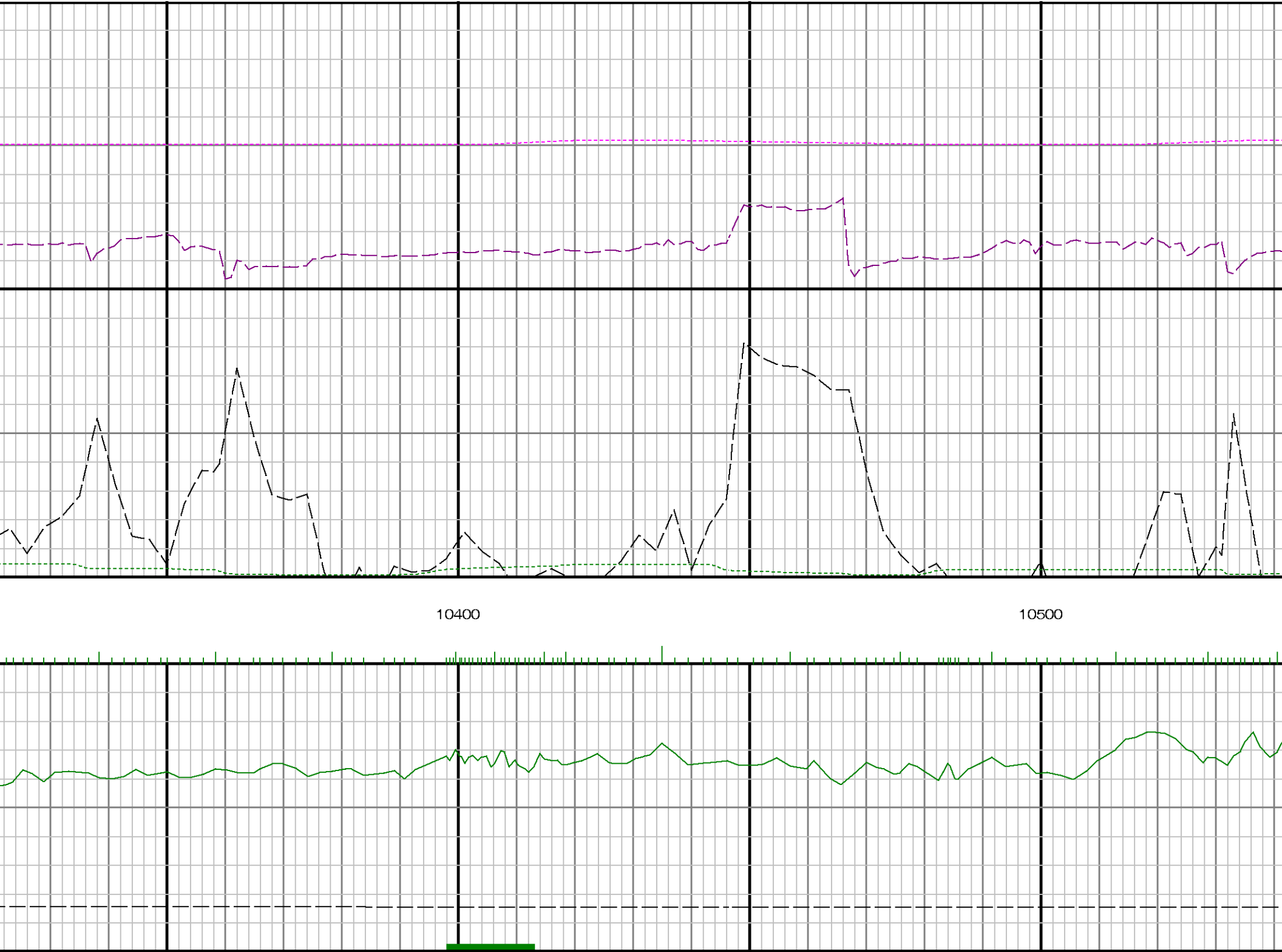
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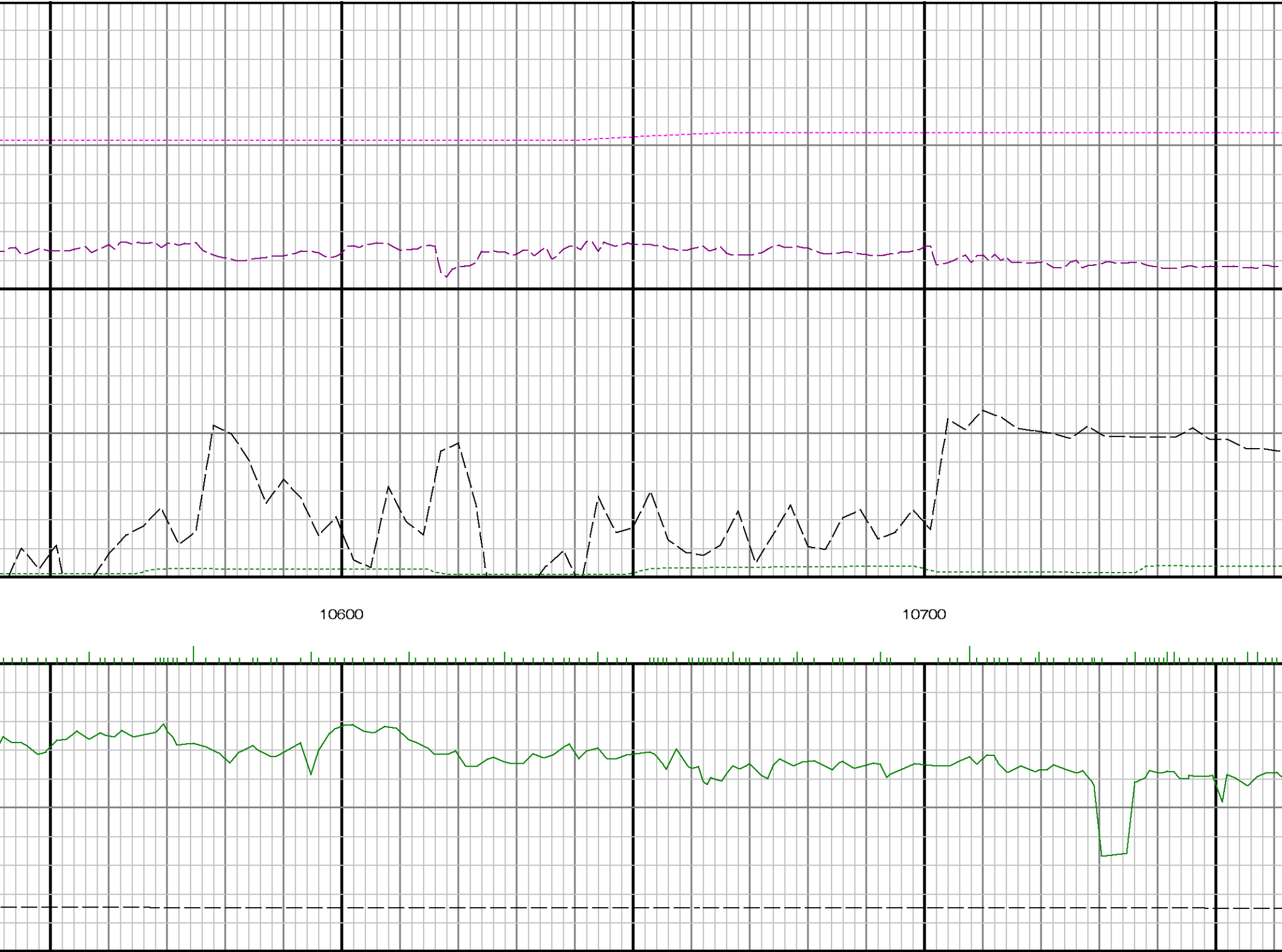
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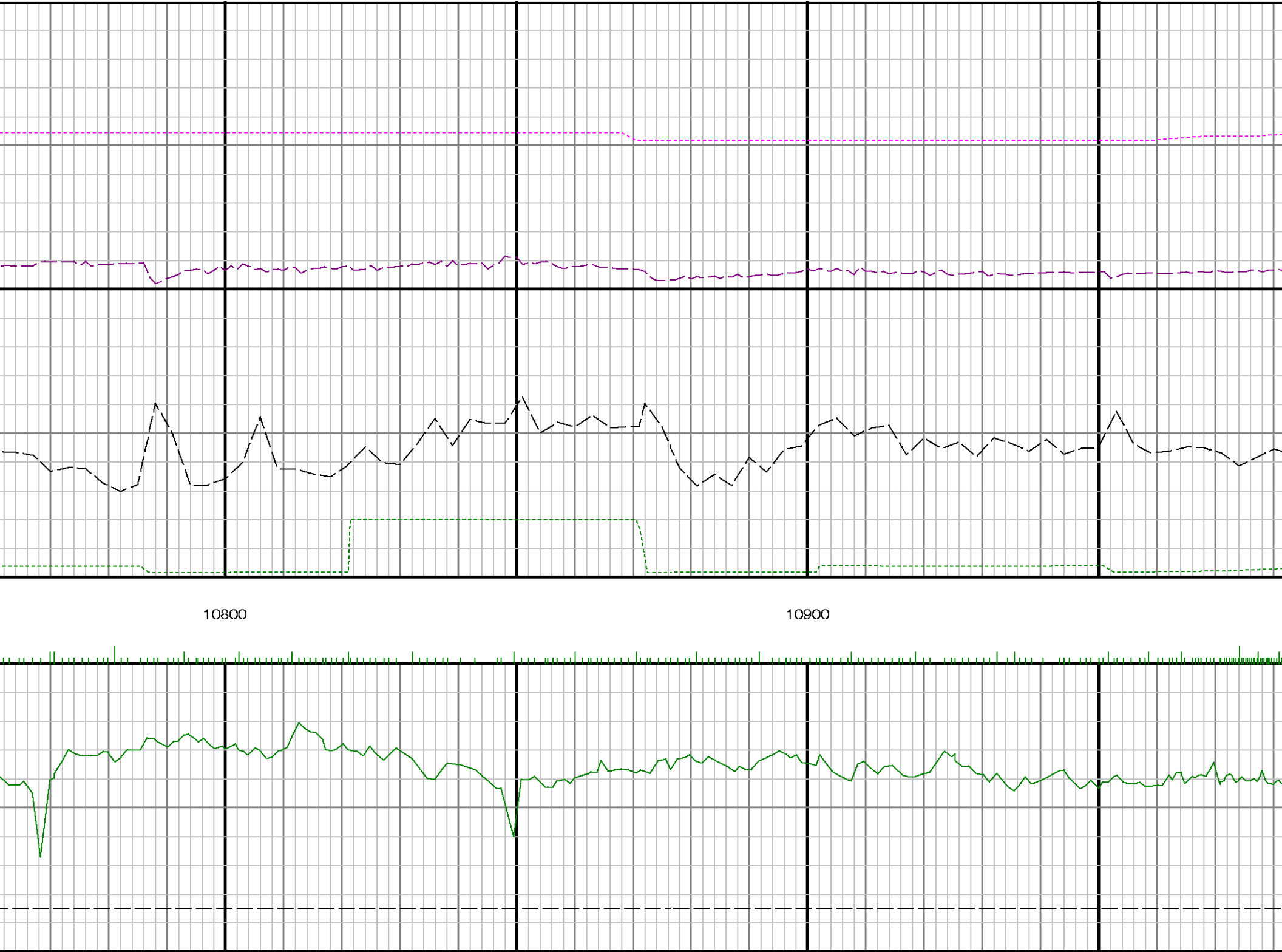
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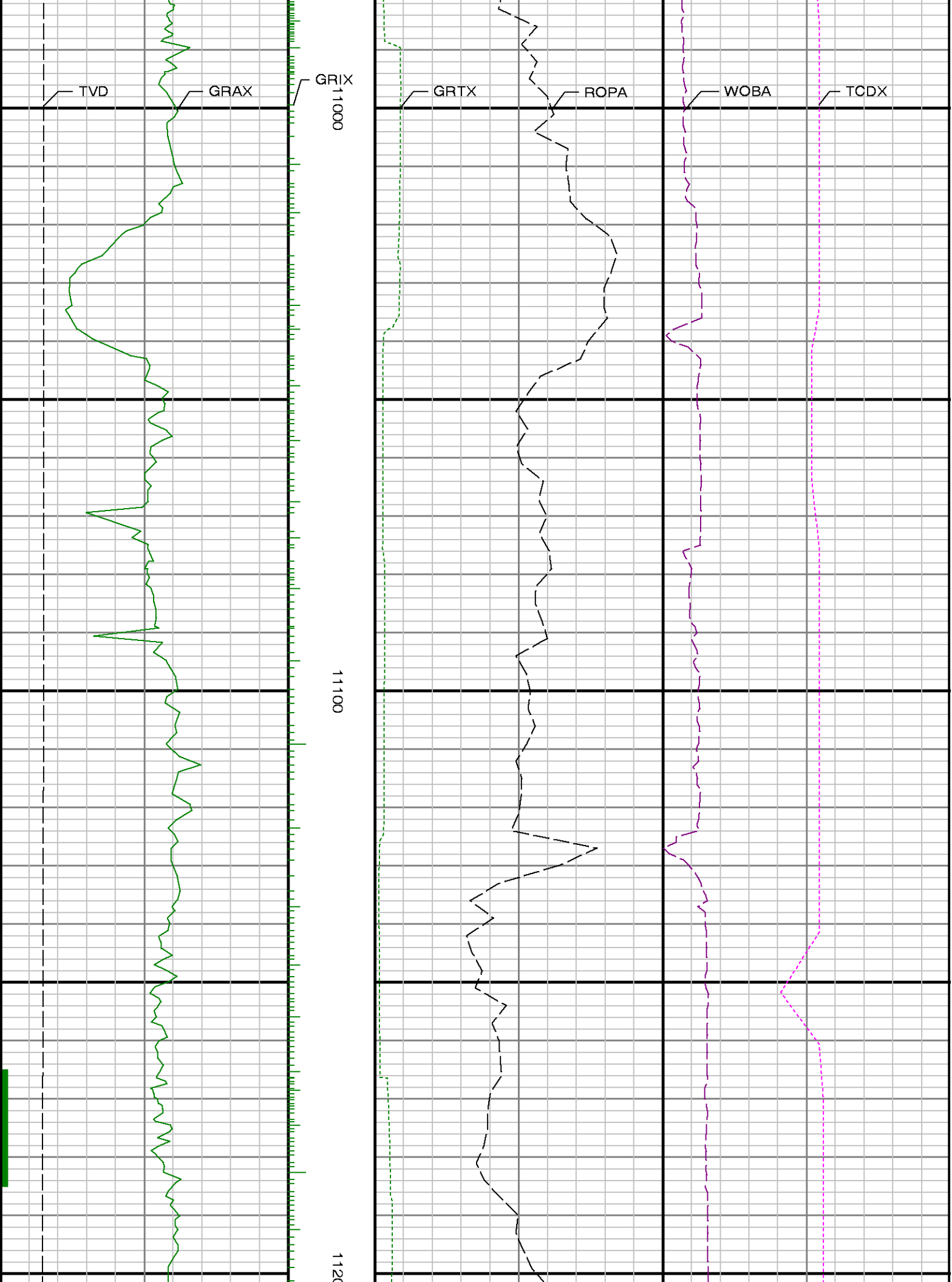
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GRAX
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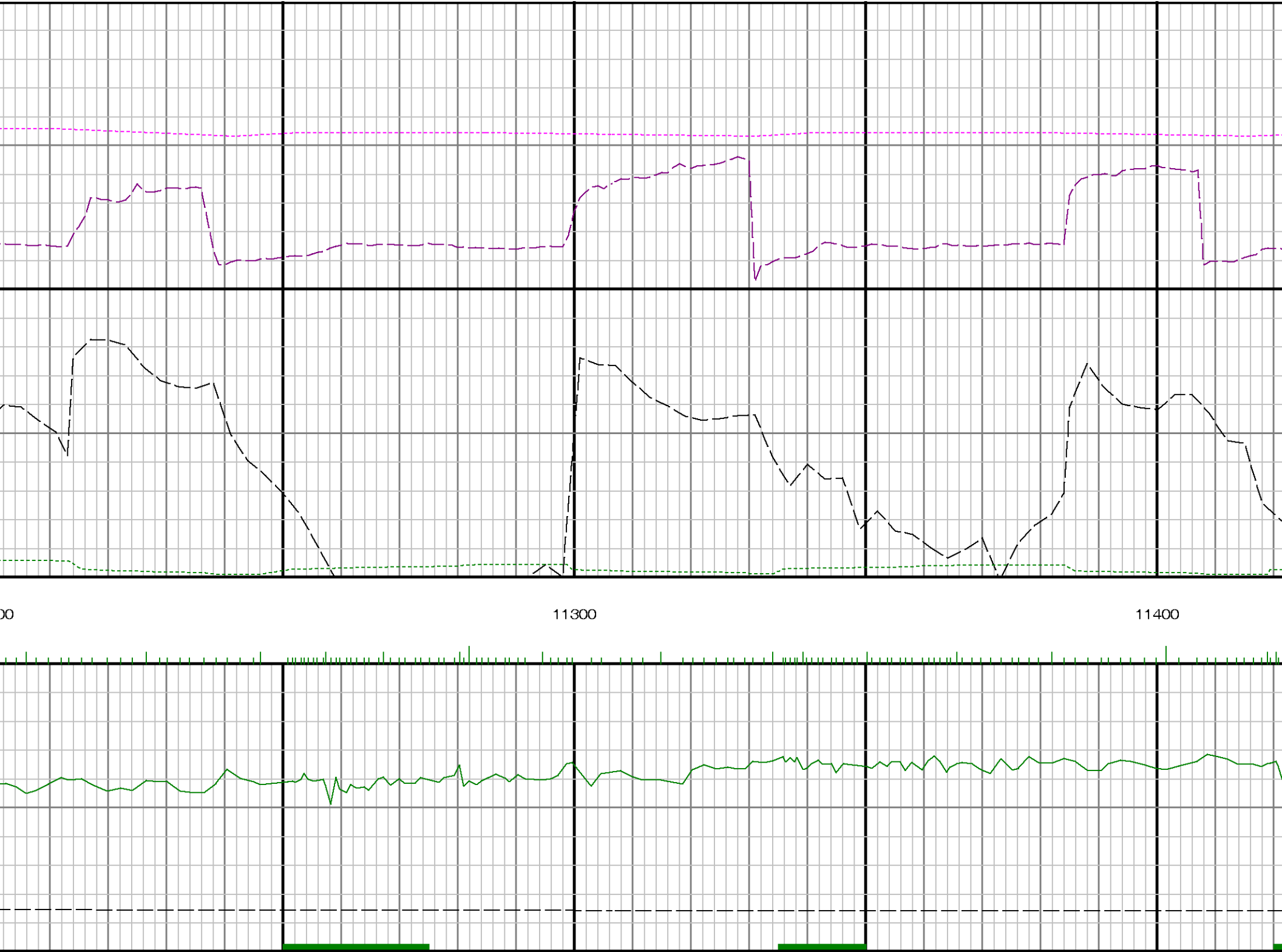
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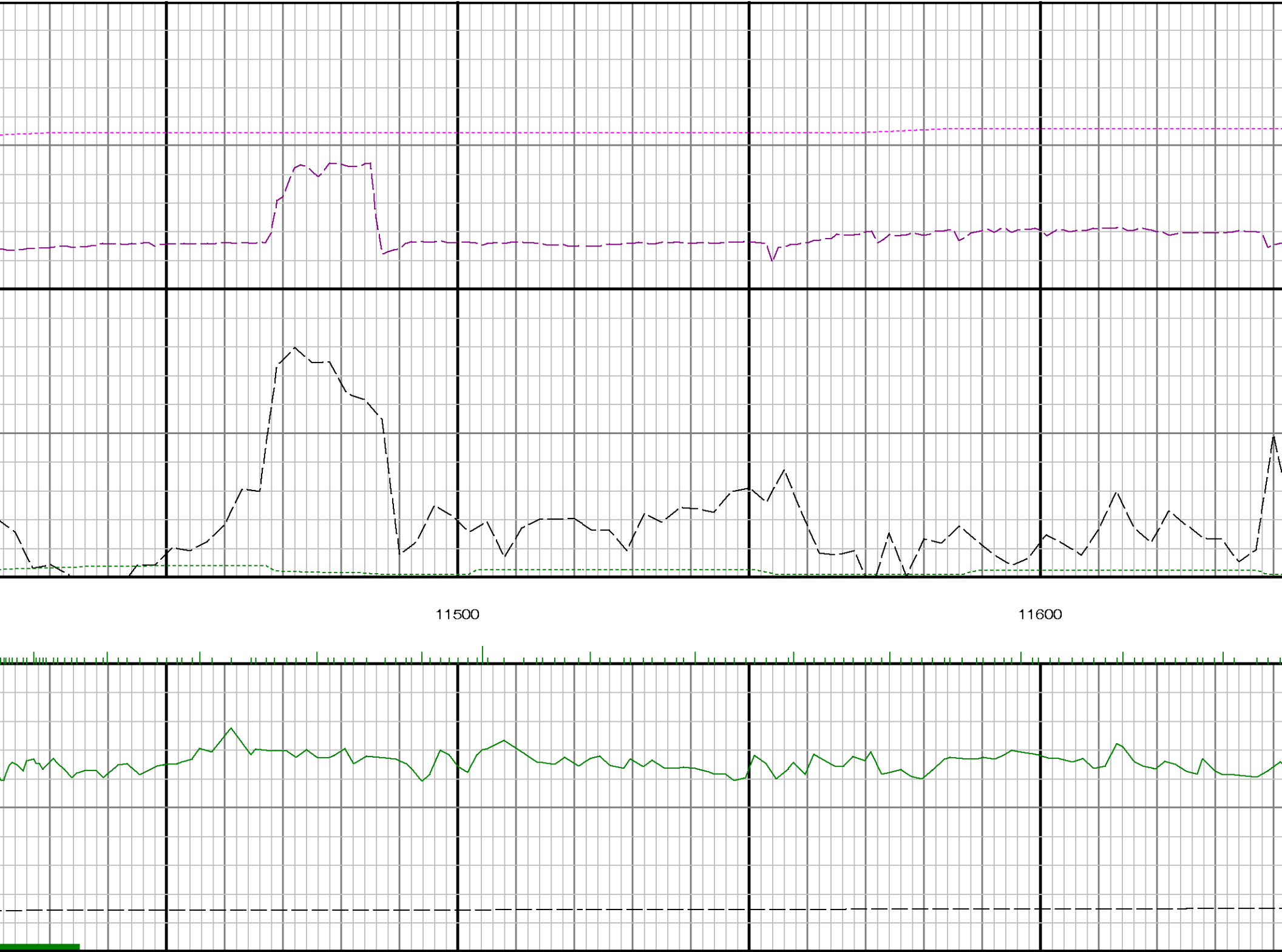
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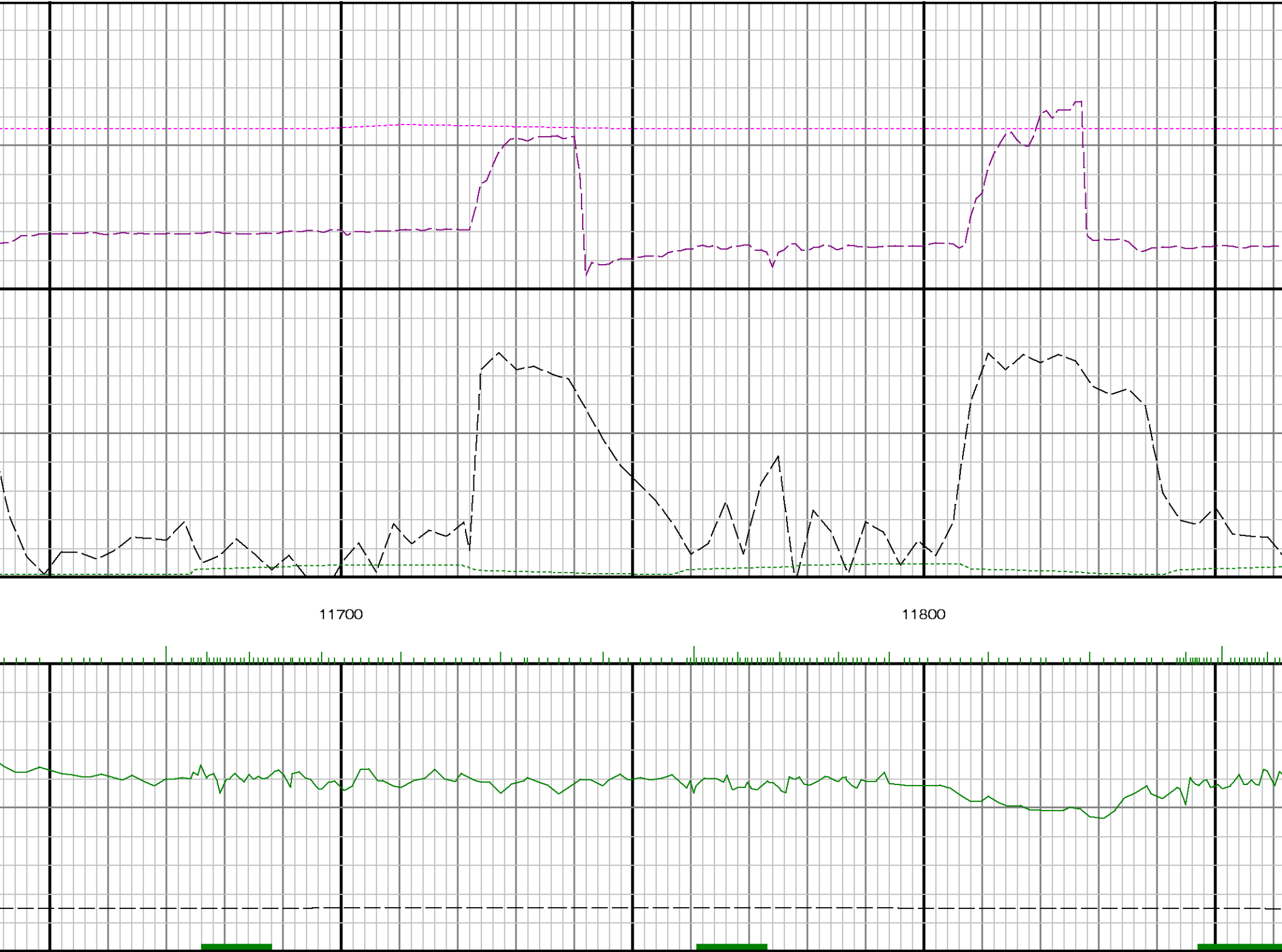
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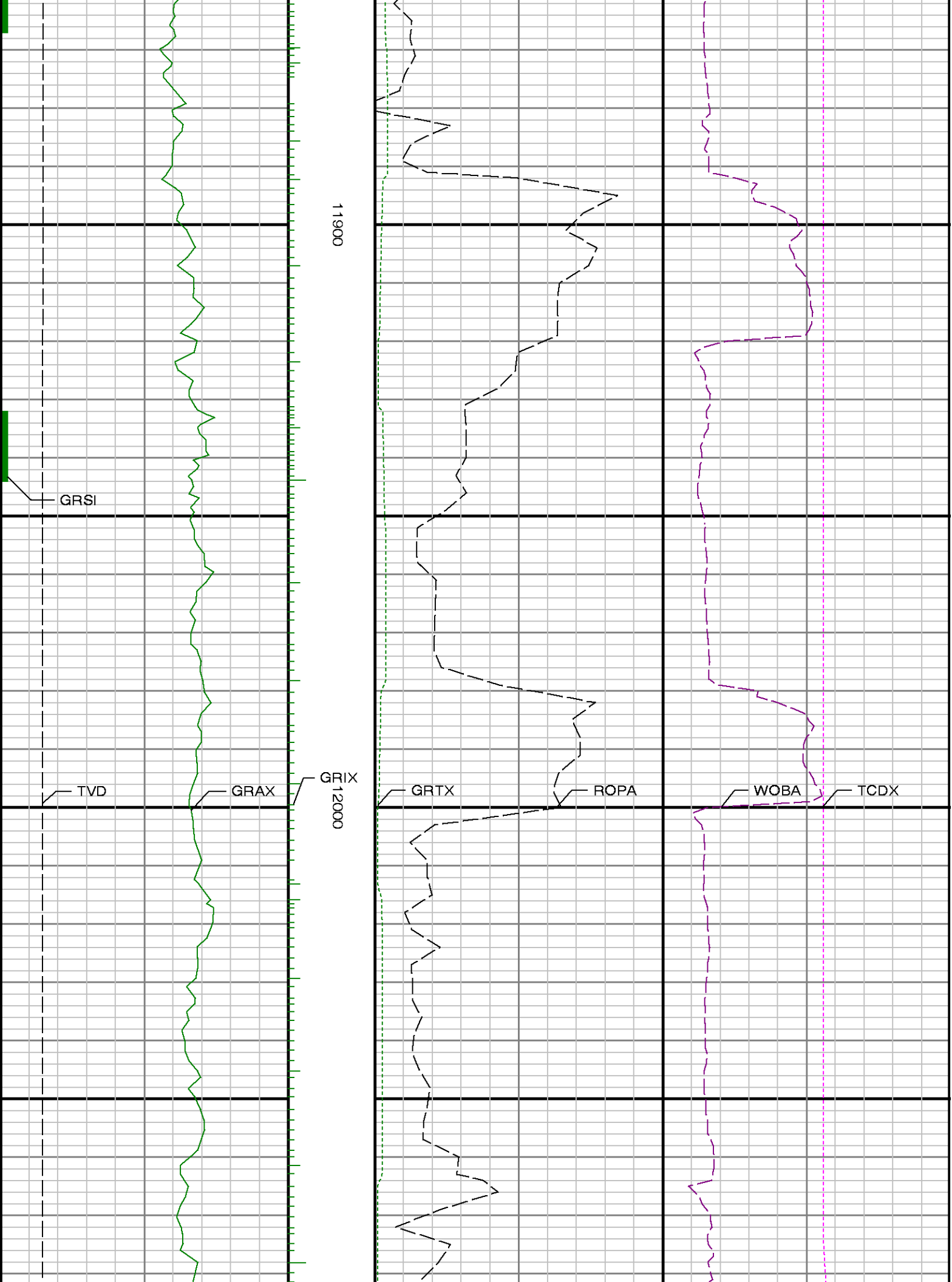
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GRAX
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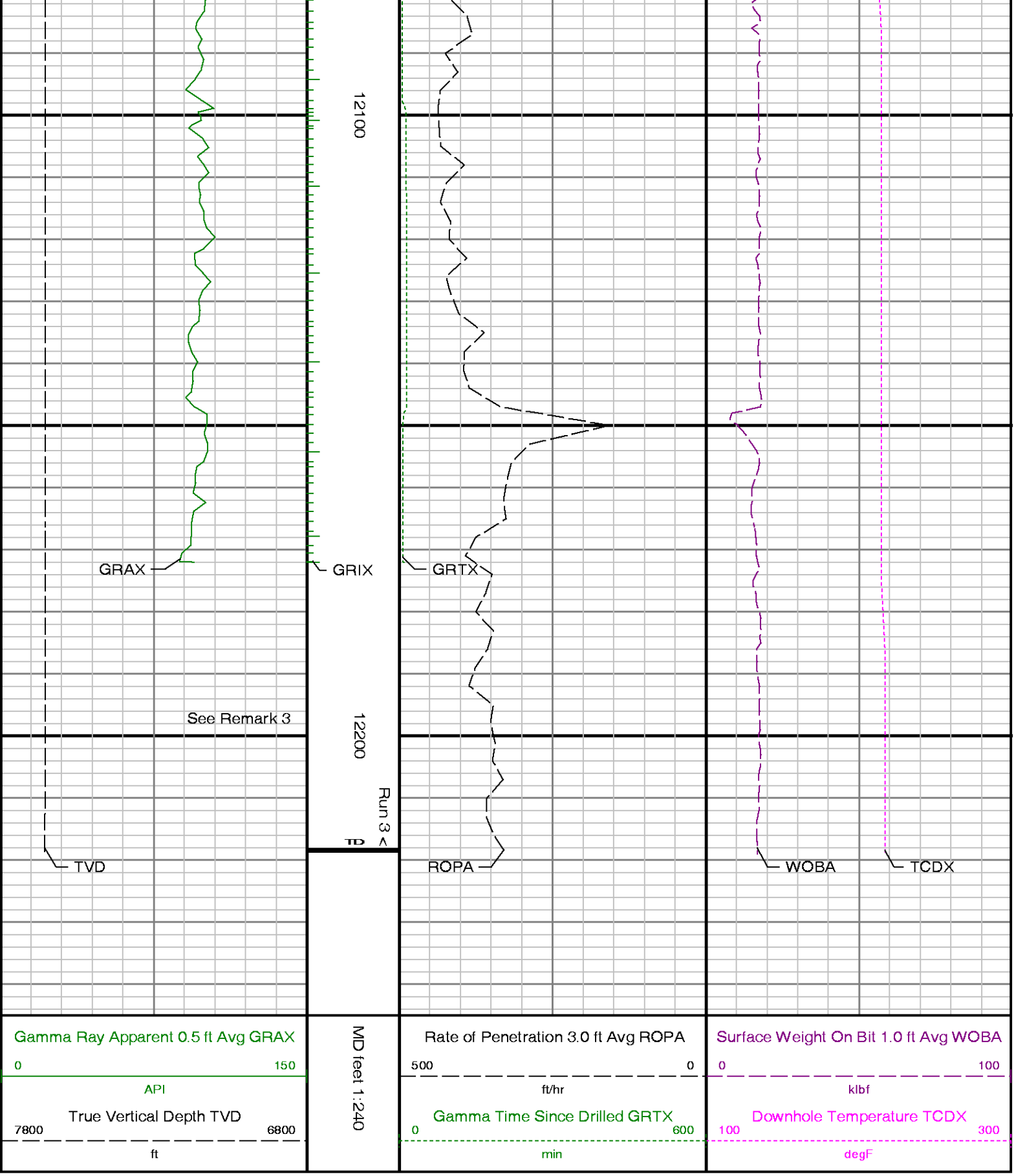

Gamma Ray Apparent 0.5 ft Avg GRAX
0 150
API

True Vertical Depth TVD
7800 6800
ft

MD feet 1:240

Rate of Penetration 3.0 ft Avg ROPA
500 0
ft/hr

Gamma Time Since Drilled GRTX
0 600
min

Surface Weight On Bit 1.0 ft Avg WOBA
0 100
klbf

Downhole Temperature TCDX
100 300
degF