



Memory/ Realtime Log

Multiple Propagation Resistivity
Gamma Ray

Scale: **Company: Kerr-McGee Oil & Gas Onshore LP**
Well: Cannon 15N-3HZ
Measured Depth 1:240
Field: Weld County

Region: Continental US **Country: United States**

Status: Surface Location:

Latitude: 40° 10' 22.858" N
Longitude: 104° 45' 25.252" W

Other Services:

2 Sector Gamma Ray
Directional
VSS

API Number: 05-123-36730-0

Section: 3 TWN: 2N Range 66W

Permanent Datum (P.D.): Ground Level

Elevation: 5048.00 ft.

Elevations:

Log Measured From: Rig Floor

13.00 ft. Above P.D.

KB: N/A
DF: 5061.00 ft.
GL: 5048.00 ft.

Depth Reference:

Driller's Depth

Interval Logged

Dates

Magnetic Field Reference

Top: 6730 ft. Date From: 16/Jun/13 Dip Angle: 67.01° Azi Reference North: True
Bottom: 11820 ft. Date To: 13/Jun/14 Total Mag to Reference
Spud Date: 16/Jun/13 Field Strength: 52794.0 nT North Correction: 8.54°

Borehole Record

Casing Record

Hole Size	From	To	Size	Weight	From	To
13,500 in.	Surface	816 ft.	9,250 in.	36.00 lb/ft	Surface	816 ft.
8,750 in.	813 ft.	7860 ft.	7,000 in.	26.00 lb/ft	Surface	7832 ft.
6,125 in.	7860 ft.	11878 ft.				

Mud Record

Deviation Record

Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Water Based	826 ft.	11878 ft.	13,500 in.	816 ft.	0.0° / 136.9°	0.2° / 8.2°
			8,750 in.	7044 ft.	0.2° / 8.2°	85.8° / 180.6°
			6,125 in.	4018 ft.	85.8° / 180.6°	80.2° / 178.0°
					/	/
					/	/
					/	/
					/	/

Acquisition System Software Version

Other

Advantage	2,20U4	Rig / Contractor:	Ensign 138	/ Ensign Drilling Co
PATS	6,4,1,34	Job No:	5546593	/ D & E
		District / Unit:	RMD	

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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		Bit Depth Interval		Date / Time		Circ. Time (hrs.)
							Top (m.)	Bottom (m.)	From (m.)	To (m.)	Start	End	
1	1	1	8.750	PDC	2,500	Steerable	6730	7806	816	7860	16/Jun/2013 07:37	19/Jun/2013 07:37	37.6
2	2	2	6.125	PDC	6,000	Steerable	7806	1120	7860	11787	19/Jun/2013 08:02	13/Jun/2013 08:02	44.6

Crew

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
Robert Bartlett	15/June/2013	24/June/2013	William Herbers	15/June/2013	24/June/2013	Tyler Wall	15/June/2013	24/June/2013
David Belek	15/June/2013	24/June/2013						

Mud Properties Record

Date / Time		LWD Run No.	Measured Depth (m.)	Mud Type	Density (sg)	Viscosity (cp)	pH	Fluid Loss (cc)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
18/Jun/2013	05:55	1	826	Water Based	8.4	29	8.6	N/A	0 / 99	Active Mud Pit	1500	0.0
19/Jun/2013	05:55	1	2660	Water Based	8.4	27	9.5	N/A	0 / 99	Active Mud Pit	1600	0.0
20/Jun/2013	05:55	2	7860	Water Based	9.3	33	8.8	N/A	0/93.8	Active Mud Pit	2100	0.0
21/Jun/2013	05:55	2	9015	Water Based	10.0	38	8.7	N/A	0.0/91	Active Mud Pit	2400	0.0
22/Jun/2013	05:55	2	10437	Water Based	10.0	38	8.7	N/A	0.0/91.5	Active Mud Pit	2400	0.0

Mud Resistivity Record

				Surface				Downhole			
Date / Time		LWD Run No.	Measured Depth (m.)	Surface Temp (deg C)	Rm (ohm.m)	Rmf (ohm.m)	Rmc (ohm.m)	BHCT (deg C)	Rm @ BHCT (ohm.m)	Rmf @ BHCT (ohm.m)	Rmc @ BHCT (ohm.m)
20/Jun/2013	18:45	2	7858	76	1.64	N/A	N/A	141	0.90	N/A	N/A
21/Jun/2013	20:24	2	8985	79	1.44	N/A	N/A	193	0.61	N/A	N/A
22/Jun/2013	05:44	2	10168	63	1.47	N/A	N/A	193	0.50	N/A	N/A
23/Jun/2013	05:52	2	11613	79	1.45	N/A	N/A	220	0.54	N/A	N/A

Mnemonics

Curve	Description	Units
CACLM	Conductivity Attenuation – Corrected – 400kHz	mmho/m
GRAM	Gamma Ray Apparent, 0.5 ft. Avg.	API
GRAX	Gamma Ray Apparent, 0.5 ft. Avg.	API
GRIM	Gamma Ray Data Density	point
GRIX	Gamma Ray Data Density	point
RACHM	Resistivity Attenuation – Corrected – 2MHz	ohm.m
RACLM	Resistivity Attenuation – Corrected – 400kHz	ohm.m
ROPA	Rate of Penetration, 3.0 ft. Avg.	ft/hr
RPCLM	Resistivity Phase – Corrected – 400kHz	ohm.m
RPCHM	Resistivity Phase – Corrected – 2MHz	ohm.m
RPSIHM	Resistivity Sliding Indicator	untilless
RPTHM	Resistivity Time Since Drilled	min

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (m.)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	12235770	Directional	55.05	6.750	2.938
1	SRIG	11932890	Gamma	51.67	6.750	0.000
2	CS	10160235	-	84.30	4.880	2.250
2	BCPM	10558314	Telemetry	73.19	5.040	2.250
2	STAB	11781609	-	70.08	5.625	2.250
2	STAB	10558315	Telemetry	73.19	5.040	2.250

2	OTK	10570217	Directional	65.06	4.843	2.569
2	OTK	10570217	Resistivity	59.09	4.843	2.569
2	OTK	10570217	Gamma	51.90	4.843	2.569
2	OTK	10570217	Pressure	54.53	4.843	2.569
2	CS	10160235	-	47.61	4.880	2.250

Service and Tool Mnemonics

Mnemonic	Name	Description
BCPM	BCPM	Mud pulse telemetry and downhole tool power module
DIR	Directional	Wellbore directional survey
OTK	OnTrak	Propagation resistivity, propagation conductivity, gamma ray, directional, annular pressure, system memory and VSS
SRIG	Inclination and Gamma	Probe based gamma ray and inclination module
STAB	Stabilizer	Stabilizer assembly
CS	Closure Sub	BHA power ring isolator allowing insertion of inert sub into electrically powered BHA

Comments

<p>1.) 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.</p> <p>2.) Baker Hughes runs 1 utilized a 6 3/4 inch NaviTrak service (Directional only) behind an 8 3/4 inch bit and steerable assembly from 816 to 6770 feet MD (816 to 6650 feet TVD).</p> <p>3.) Baker Hughes run 1 utilized 6 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 8 3/4 inch bit and steerable assembly from 6770 to 7860 feet MD (6650 to 7309 feet TVD).</p> <p>4.) Baker Hughes run 2 utilized 4 3/4 inch OnTrak services (Multiple Propagation Resistivity, 2 Sector Azimuthal Gamma Ray, Gamma Ray, and Directional) behind a 6 1/8 inch bit and steerable assembly from 7860 to 11878 feet MD (6650 to 7320 feet TVD).</p> <p>5.) The interval from 816 to 6770 feet MD (816 to 6650 feet TVD) was not logged due to directional only services being provided through the straight-hole and nudge section for Baker Hughes run 1.</p> <p>6.) A sliding indicator is shown on the right side of track 2 as a heavy line. This indicator has been depth shifted to the resistivity sensor offset to correspond with resistivity data acquired while sliding.</p> <p>7.) The interval from 7810 to 8079 feet MD (7320 to 7320 feet TVD) was not logged due to MWD tool issues.</p>
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Remarks

Number	Measured Depth (m.)	Hole Section (in.)	LWD Run No.	Remark
1	7860	6.125	2	The interval from 7860 to 7900 feet MD (7309 to 7309 feet TVD) was logged up to 45.8 hours after being drilled due to a trip out of the hole to lay down the curve assembly, intermediate casing and cement operations, and to pick up the lateral assembly.
2	11820	6.125	2	The interval from 11820 to 11878 feet MD (7320 to 7320 feet TVD) was not logged due to sensor to bit offsets at well TD.

Curve Mnemonics

Curve	Description	Units
CACLM	Conductivity Attenuation – Corrected – 400kHz	mmho/m

GRAM	Gamma Ray – Apparent	API
GRAX	Gamma Ray – Apparent	API
GRIM	Gamma Ray Data Point Indicator	unitless
RACHM	Resistivity Attenuation – Corrected – 2MHz	ohm.m
RACLM	Resistivity Attenuation – Corrected – 400kHz	ohm.m
ROPA	AVERAGE Instantaneous ROP – 5 second ROP	ft/hr
RPCHM	Resistivity Phase – Corrected – 2MHz	ohm.m
RPCLM	Resistivity Phase – Corrected – 400kHz	ohm.m
RPSIHM	Resistivity Phase Short Space Sliding Indicator – 2MHz	unitless
RPTHM	Resistivity Time Since Drilled	min
TCDX	Downhole Temperature	degF

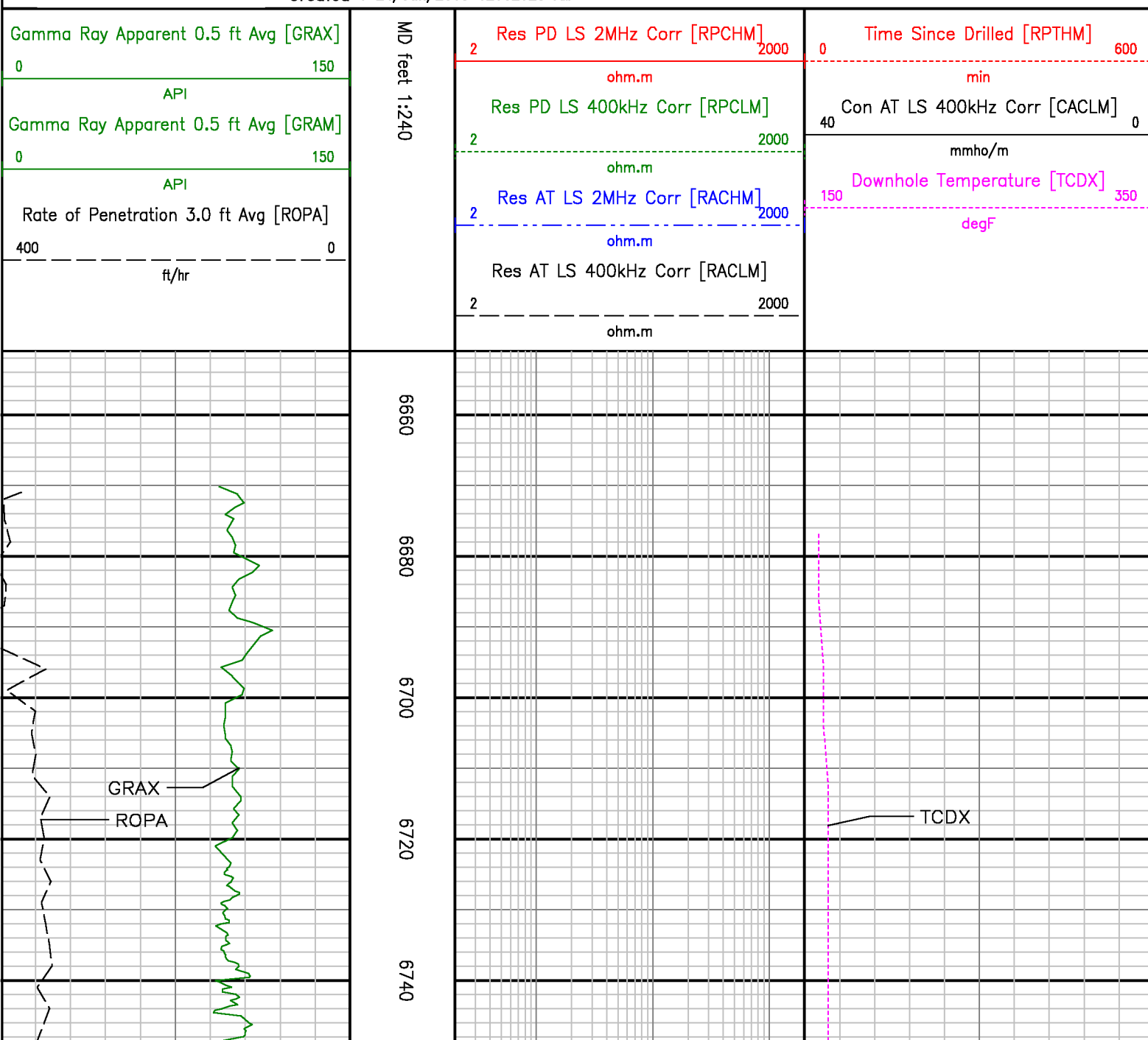


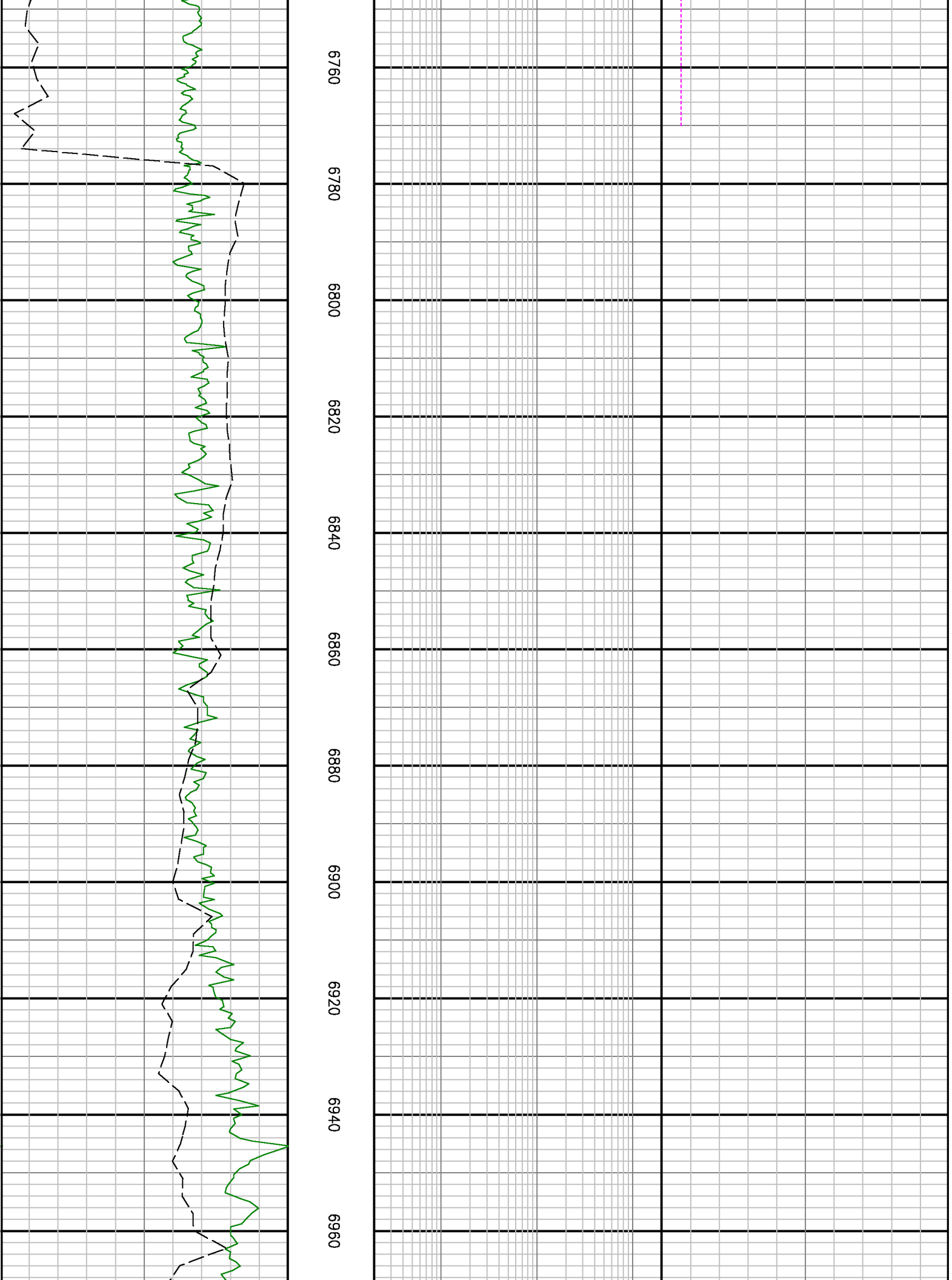
Company : Kerr-McGee Oil & Gas Onshore LP

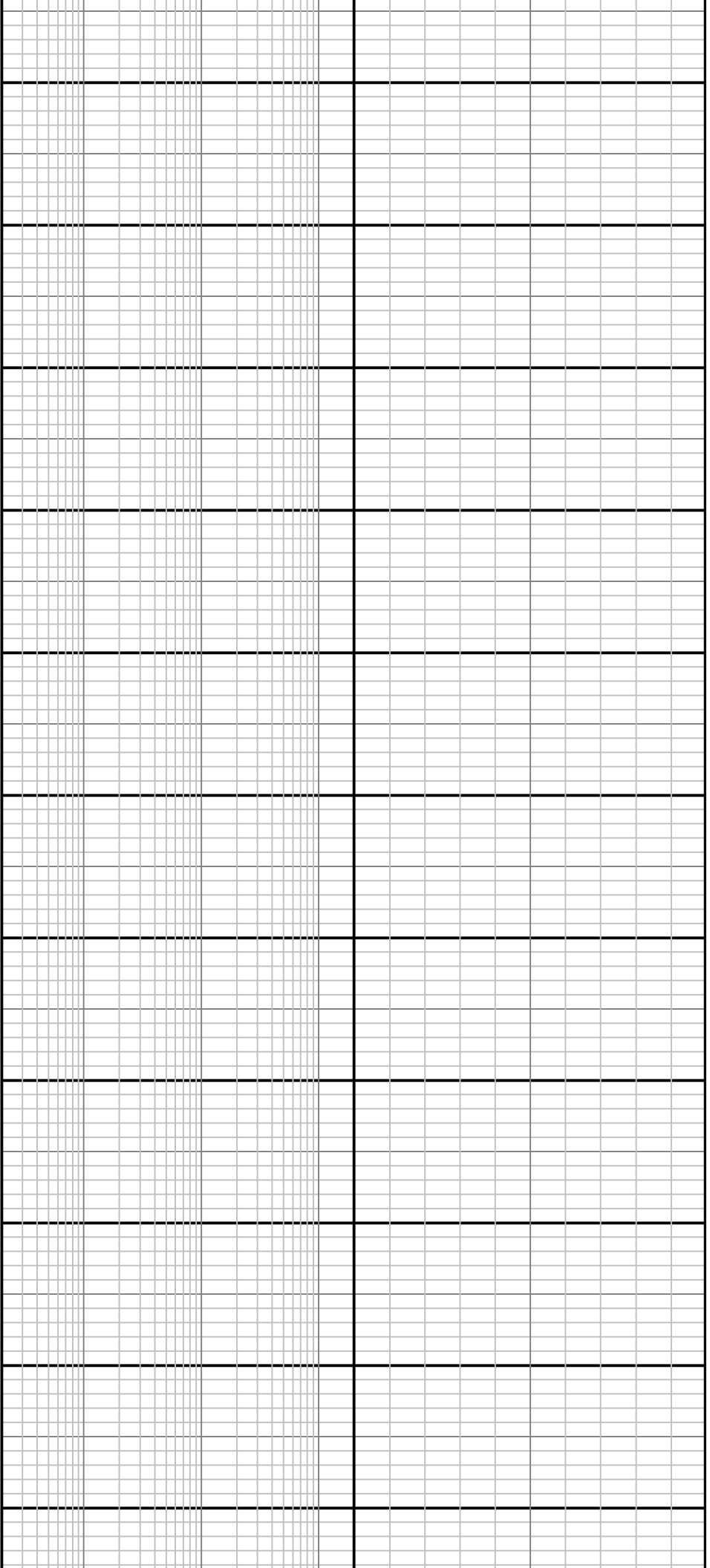
Well : Cannon 15N-3HZ

Interval : 6651.00 – 11910.00 feet

Created : 24/Jun/2013 12:02:25 AM







6980

7000

7020

7040

7060

7080

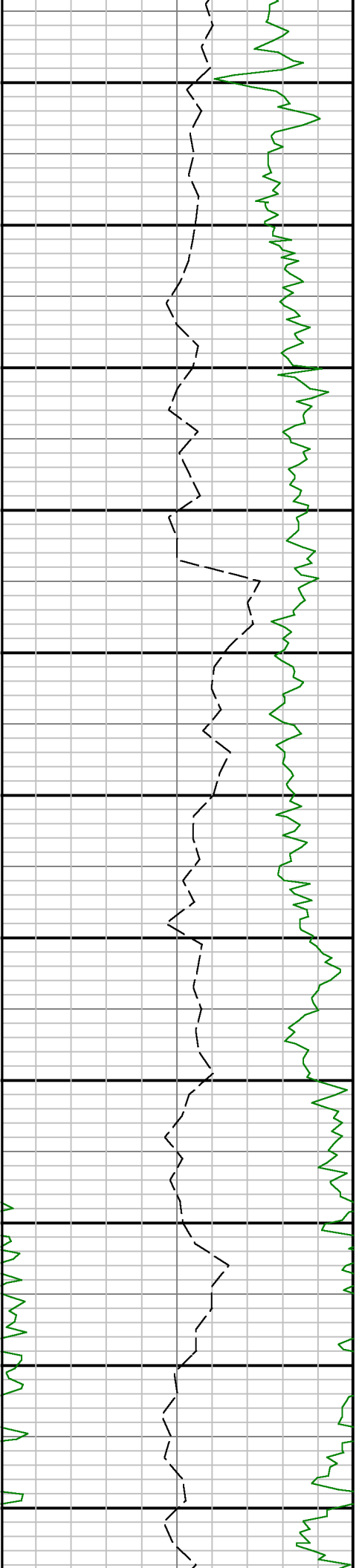
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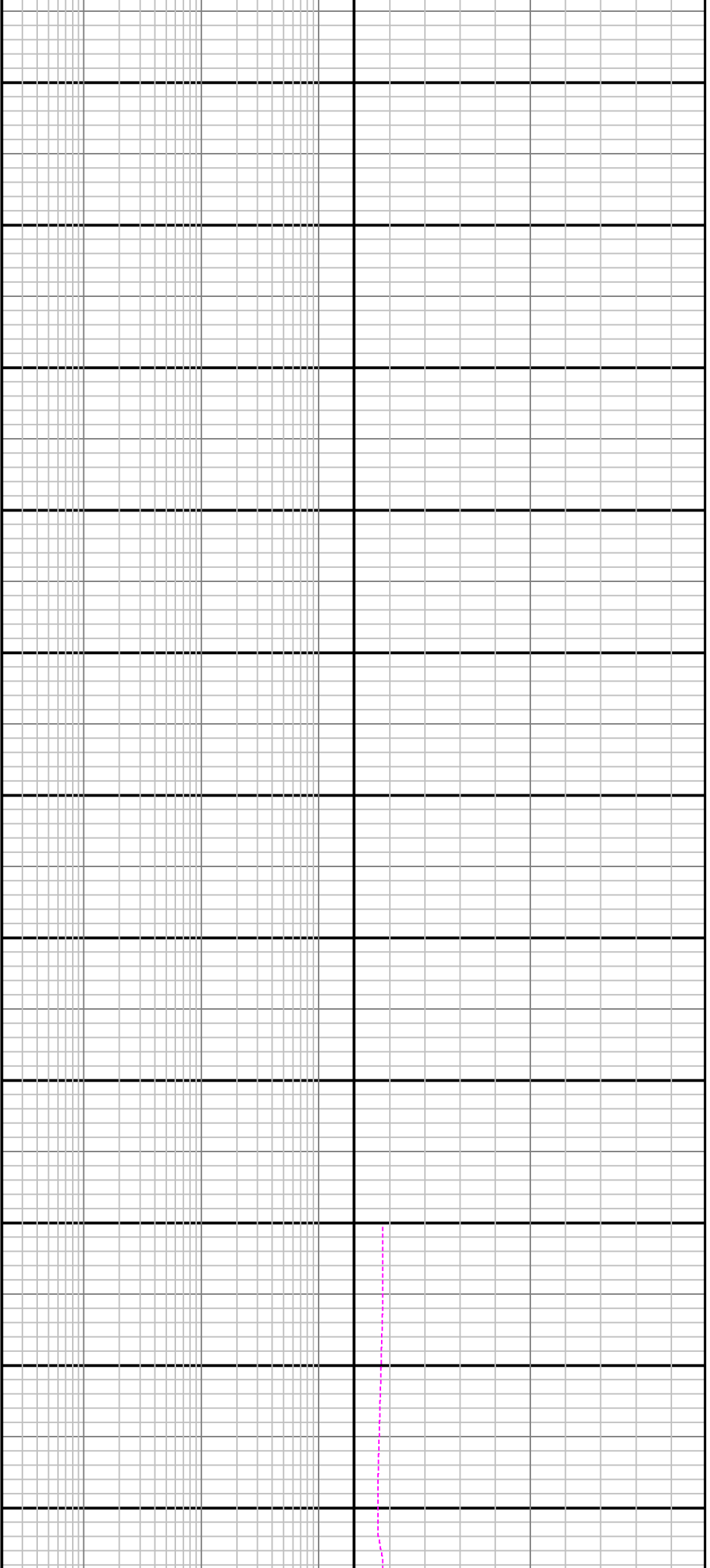
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7140

7160

7180





7200

7220

7240

7260

7280

7300

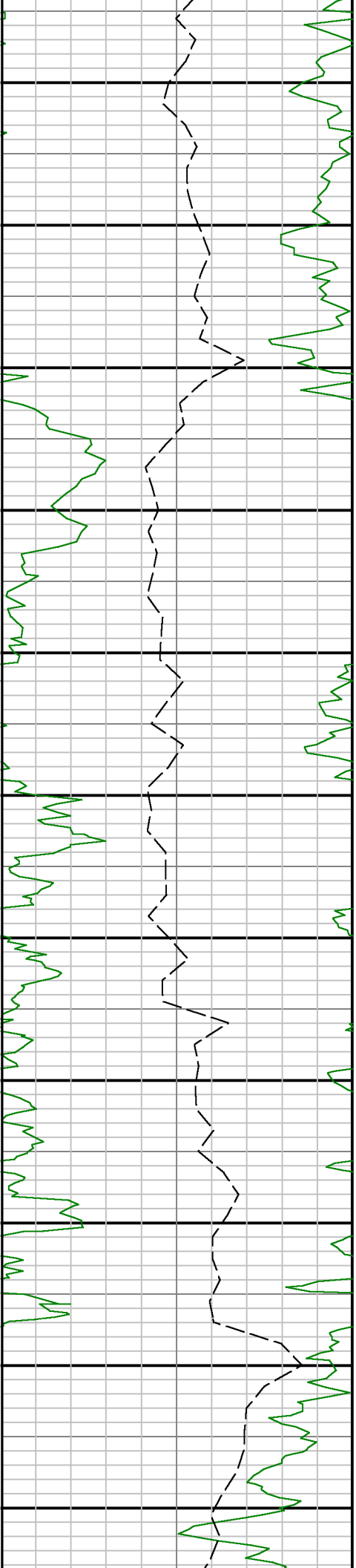
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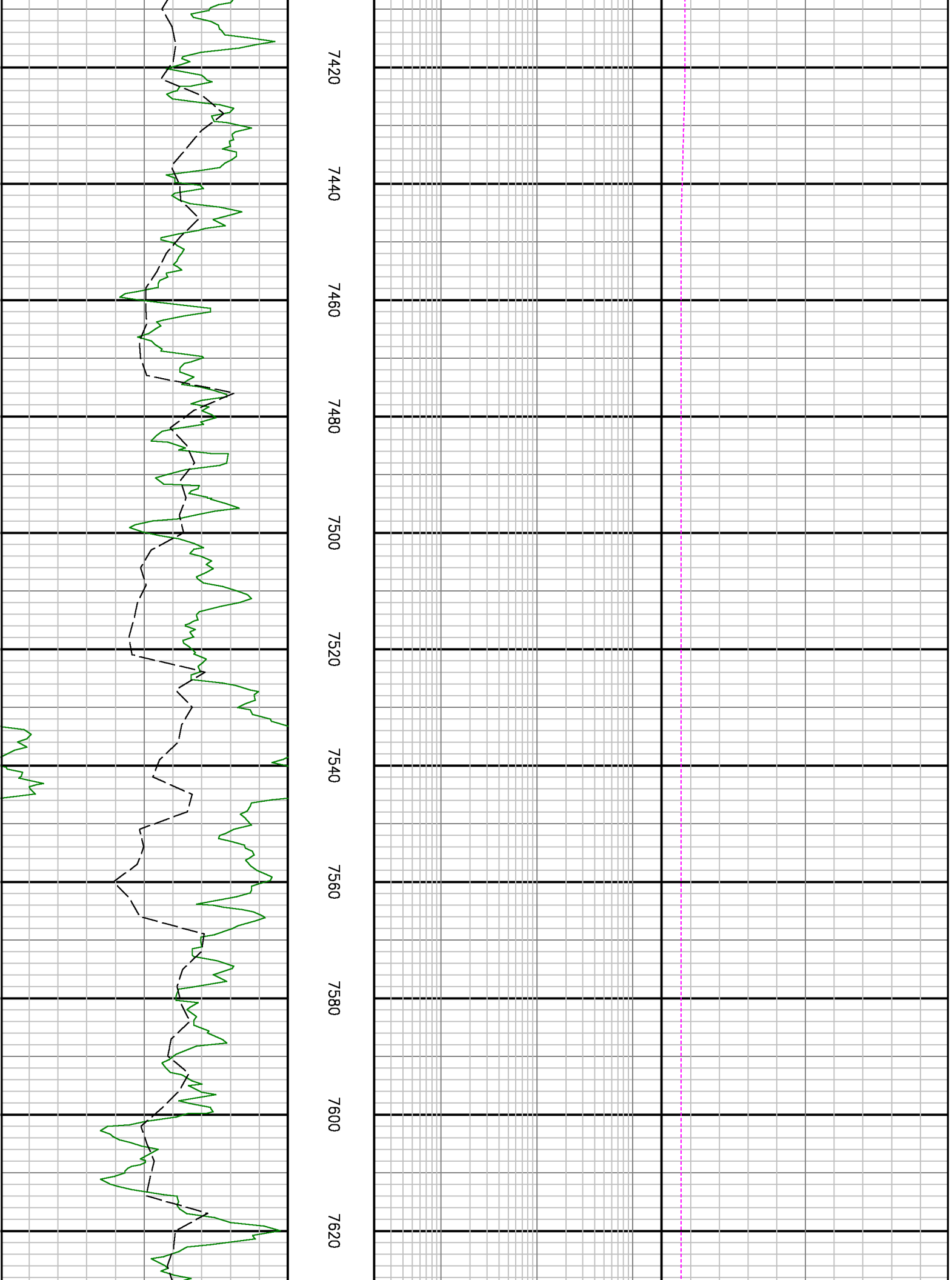
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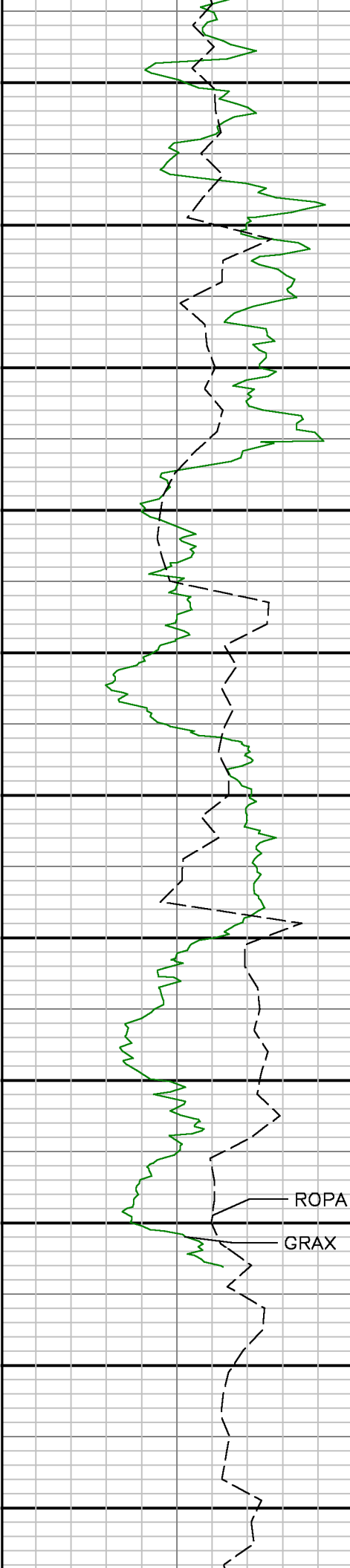
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7400







7640

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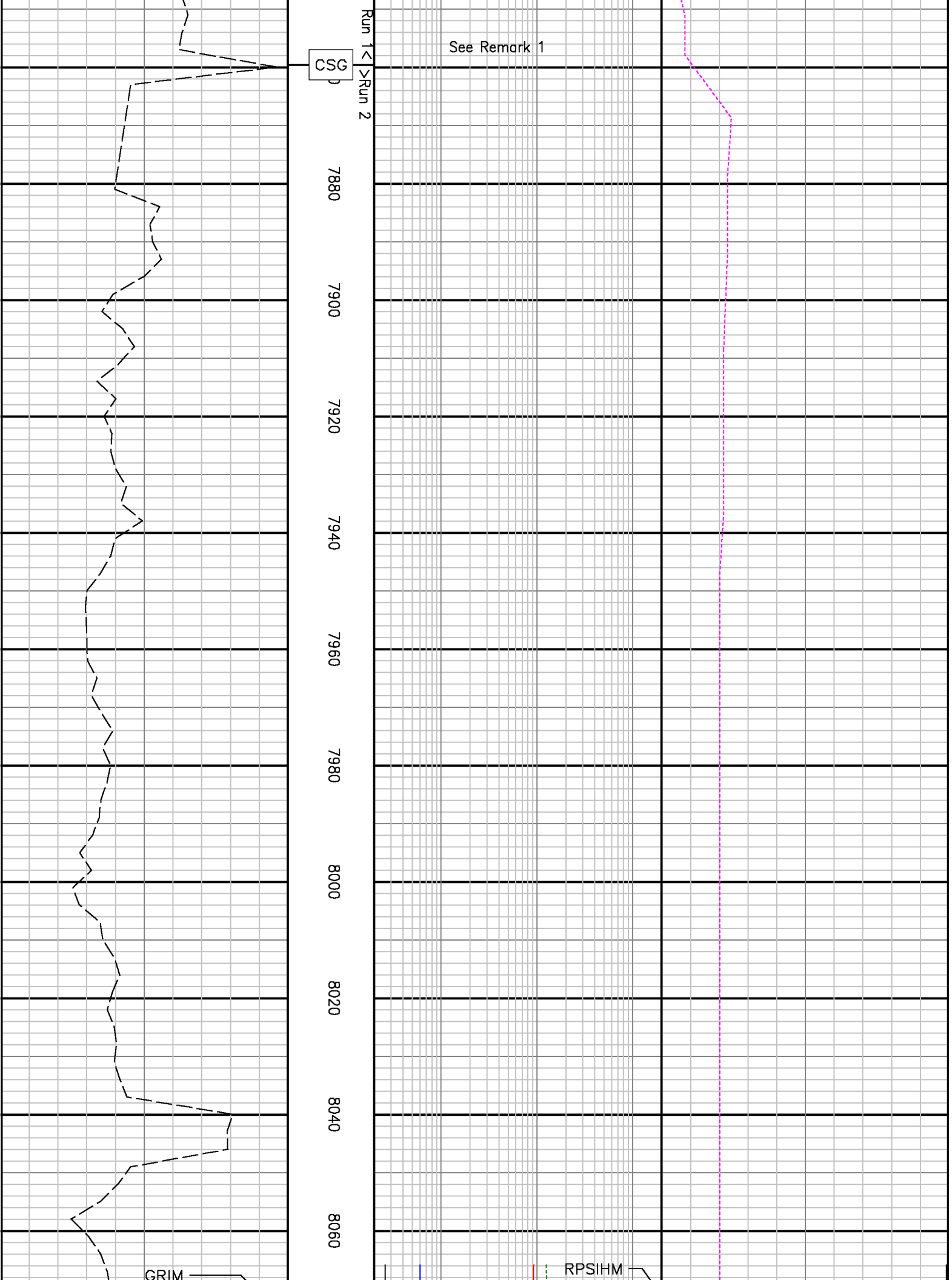
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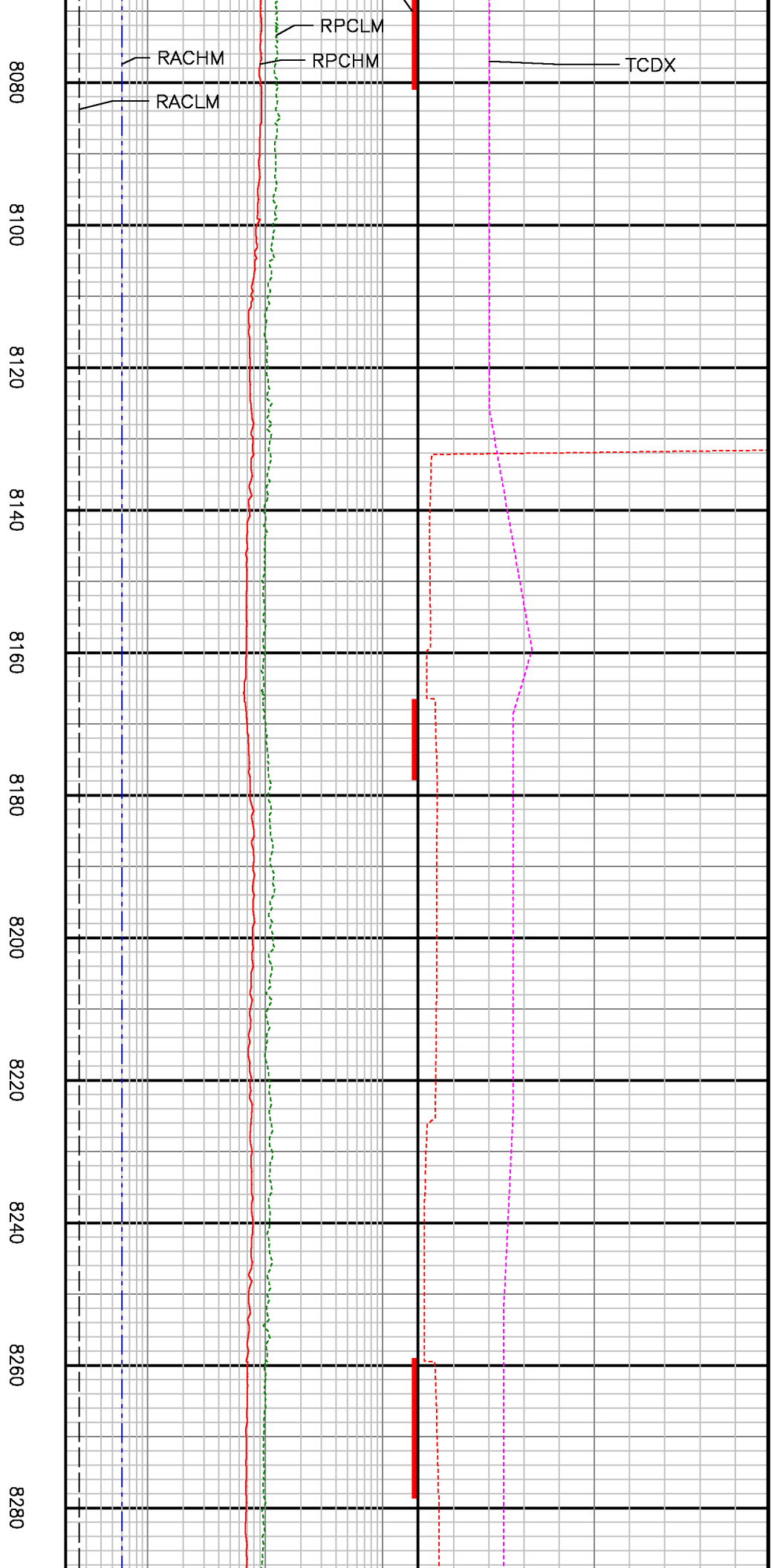
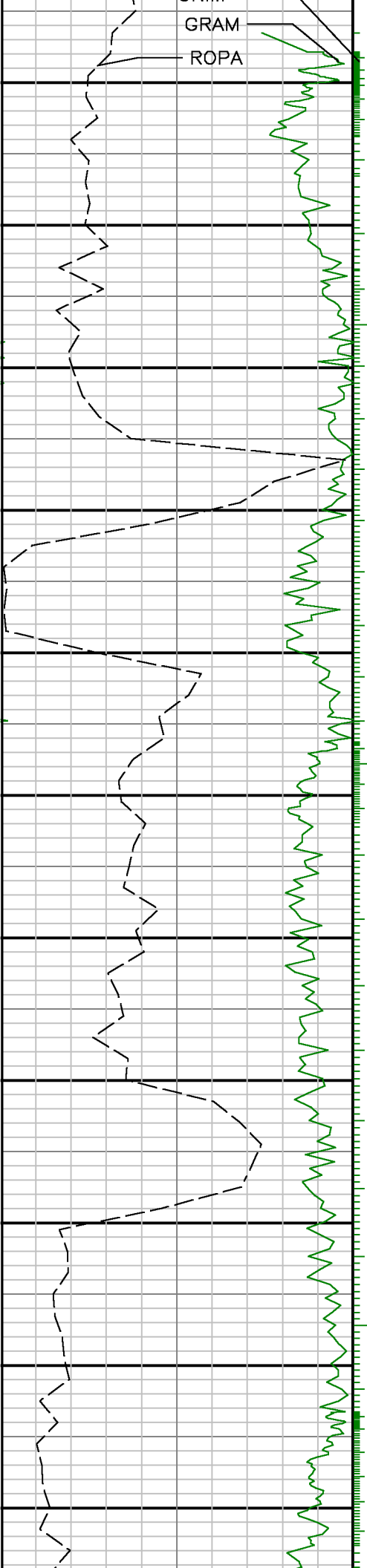
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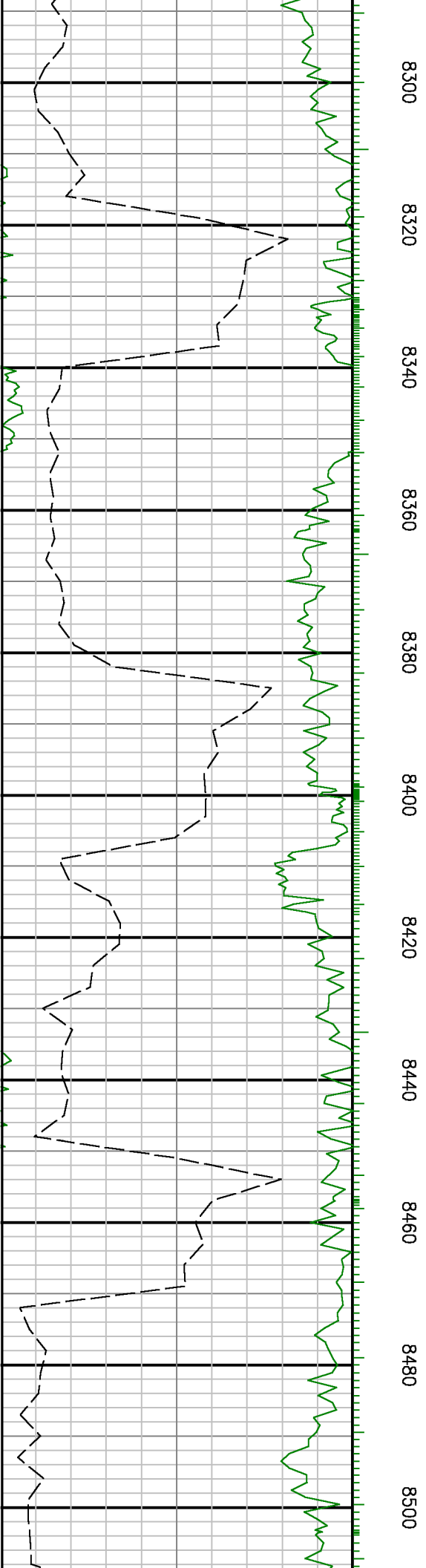
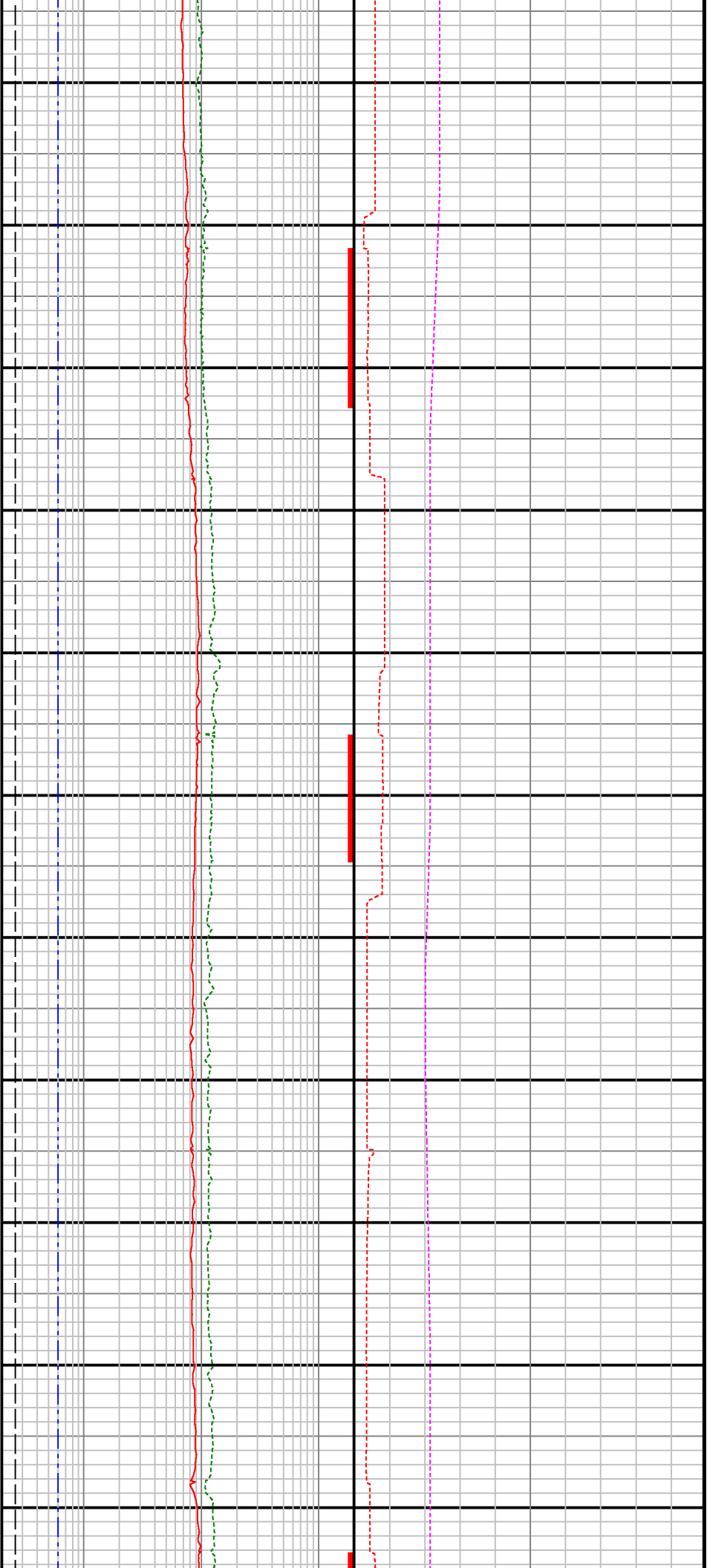
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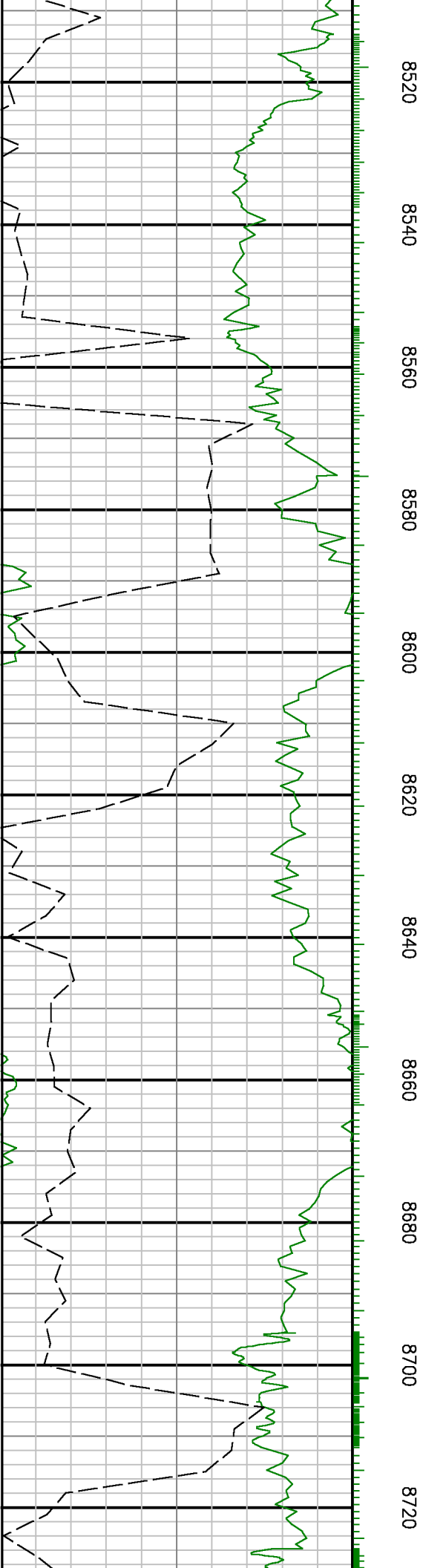
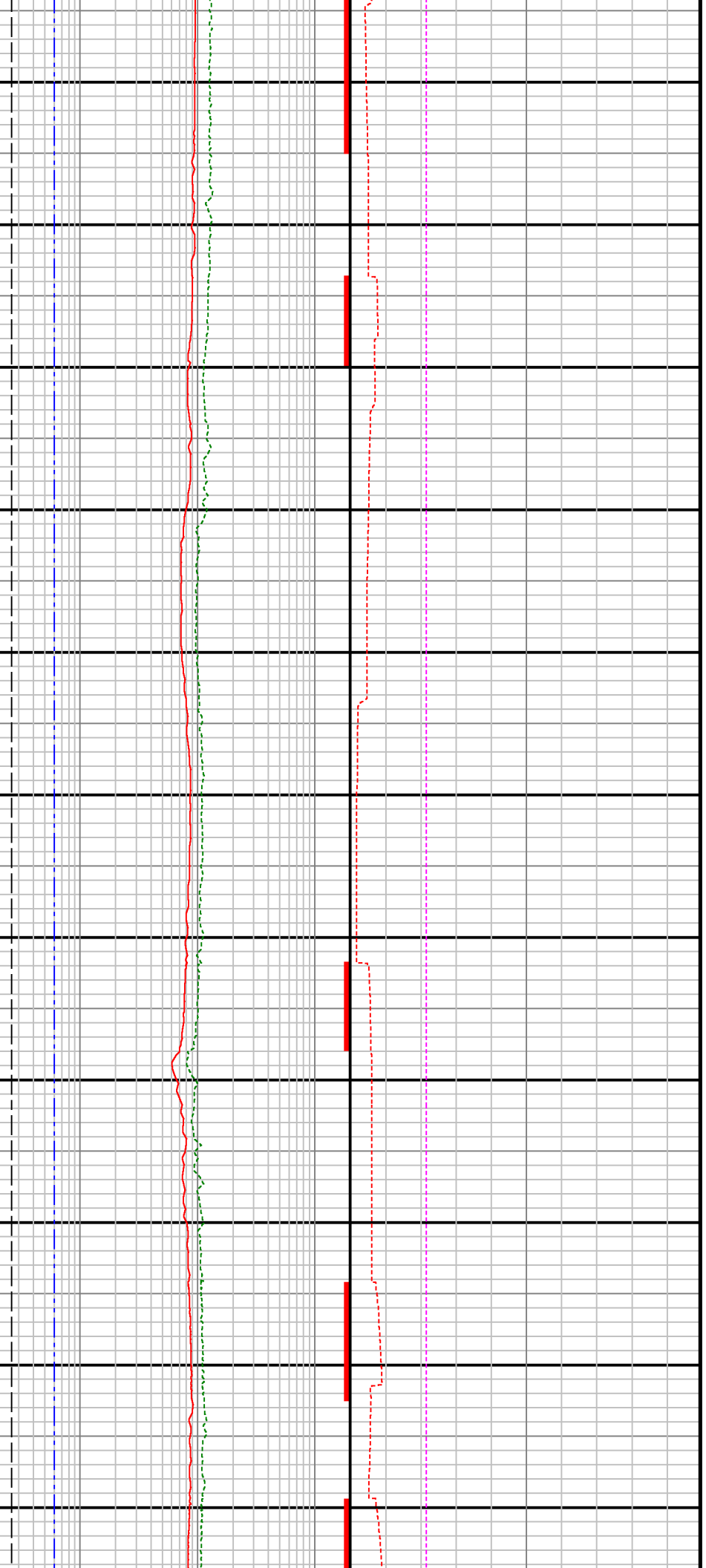
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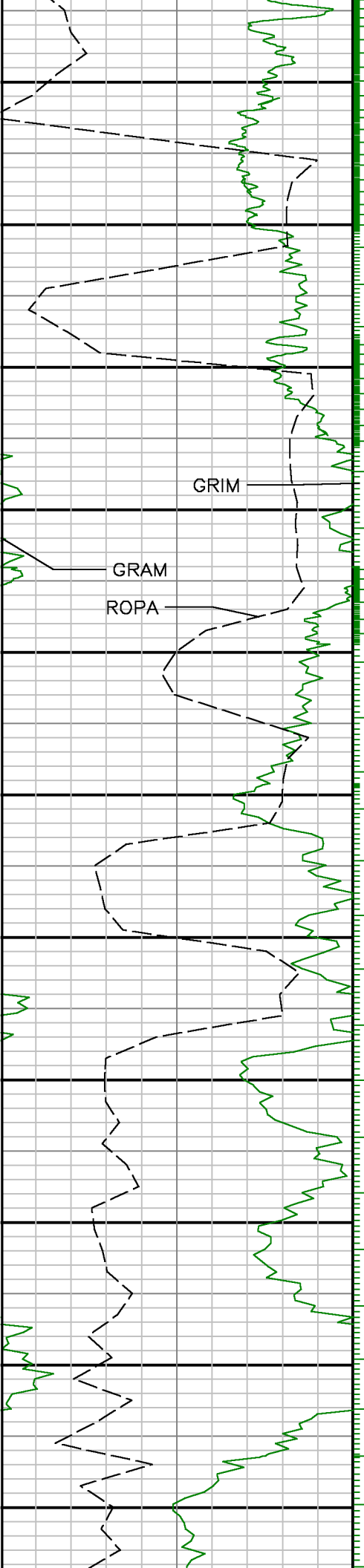
TCDX











8740 8760 8780 8800 8820 8840 8860 8880 8900 8920 8940

