



Memory and Realtime Log

Natural Formation Evaluation
Multiple Propagation Resistivity
Gamma Ray

Scale:

1:240

Measured Depth

Company: Anadarko

Well: Nichols 37C-31HZ

Field: Weld County (Kerr McGee)

Region: Rocky Mountains State: United States

Status:

Field Print

Surface Location:

Latitude: 40° 9' 40.925" N

Longitude: 104° 42' 6.498" W

Other Services:

SEC: 6 TWP: 2N RNG: 6SE

API Number:
5123357390000

Permanent Datum (P.D.): Mean Sea Level

Elevation: 16.00 ft.

Elevations:

Log Measured From:

Drill Floor

4881.00 ft.

Above P.D.

KB:

DF:

GL:

N/A

Depth Reference:

Driller's Depth

4881.00 ft.

GL:

4881.00 ft.

Interval Logged

Dates

Magnetic Field Reference

Top: 6710.0 ft. Date From: 20/Dec/12 Dip Angle: 66.96° Azi Reference North: True

Bottom: 12322.0 ft. Date To: 23/Jan/13 Total Mag to Reference

Spud Date: 19/Dec/12 Field Strength: 52844.0 nT North Correction: 8.66°

Borehole Record

Casing Record

Hole Size From To Size Weight From To

8.750 in. 945.0 ft. 7717.0 ft. 9.625 in. 36.00 lb/ft Surface 916.0 ft.

6.125 in. 7717.0 ft. 12369.0 ft. 7.000 in. 20.00 lb/ft Surface 7707.0 ft.

Mud Record

Deviation Record

Type From To Hole Size Interval Inc / Az (Start) Inc / Az (End)

Water Based Mud 945.0 ft. 8.750 in. Intermediate 0.4° / 210.1° 85.6° / 0.3°

6.125 in. 6.125 in. Lateral 85.6° / 0.3° 90.1° / 0.9°

Acquisition System Software Version

Other

Advantage 2.20U3 Rig: Xtreme 24 / Xtreme Coil Drilling

PATS 6.4.1.34 Job No: 5158930 / D&E

District: / Unit:

RMD

/ D&E

INTEQ does not guarantee the accuracy or correctness of interpretations provided in or from this log. Since all interpretations are opinions based on measurements, INTEQ shall under no circumstances be responsible for consequential damages or any other loss, costs, damages or expenses incurred or sustained in connection with the use of any such interpretations. INTEQ disclaims all expressed and implied warranties related to this service. INTEQ's liabilities and obligations shall be governed by INTEQ's Standard Terms and Conditions.

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 (ft.)	Bottom (ft.)	From (ft.)	To (ft.)	Start	End	
2	2	2	8.750	PDC	2.000	Steerable	6710.0	7671.0	6760.0	7717.0	22/Dec/2012 10:24	14/Feb/2013 05:24	21.5
3	3	3	6.125	PDC	2.000	Steerable	7671.0	11864.0	7717.0	11908.0	24/Dec/2012 21:24	27/Dec/2012 21:24	36.7
4	4	4	6.125	PDC	2.000	Steerable	11864.0	12322.0	11909.0	12369.0	29/Dec/2012 04:53	31/Dec/2013 04:53	20.1

Crew

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
Marcus Boucher	19/Dec/2012	31/Dec/2012	David Belek	21/Dec/2012	31/Dec/2012			
Austin Small	19/Dec/2012	21/Dec/2012						

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+ (%)
26/Dec/2012	12:11	2	7454.0	Water Based Mud	9.4	42	9.8	N/A	0 / 95	Active Mud Pit	1200	N/A
27/Dec/2012	11:17	3	7511.0	Water Based Mud	9.8	44	9.5	N/A	0 / 92	Active Mud Pit	1200	N/A
28/Dec/2012	05:05	4	9254.0	Water Based Mud	9.8	44	9.5	N/A	0 / 92	Active Mud Pit	1200	N/A
29/Dec/2012	18:00	4	10266.0	Water Based Mud	9.8	39	9.6	N/A	0 / 92	Active Mud Pit	1100	N/A
30/Dec/2012	13:35	4	11500.0	Water Based Mud	10.0	38	9.1	N/A	0/ 91	Active Mud Pit	1000	N/A
31/Dec/2012	13:35	4	11500.0	Water Based Mud	10.0	38	9.1	N/A	0/ 91	Active Mud Pit	1000	N/A

Mud Resistivity Record

				Surface				Downhole			
Date / Time		LWD Run No.	Measured Depth (ft.)	Surface Temp (deg F)	Rm (ohm.m)	Rmf (ohm.m)	Rmc (ohm.m)	BHCT (deg F)	Rm ⊗ BHCT (ohm.m)	Rmf ⊗ BHCT (ohm.m)	Rmc ⊗ BHCT (ohm.m)
25/Dec/2012	14:02	3	7721.0	70	1.20	N/A	N/A	180	0.48	N/A	N/A
27/Dec/2012	13:07	3	10496.0	69	1.25	N/A	N/A	212	0.42	N/A	N/A
28/Dec/2012	05:14	3	11556.0	70	1.25	N/A	N/A	212	0.43	N/A	N/A
29/Dec/2012	09:52	4	11556.0	70	1.25	N/A	N/A	212	0.43	N/A	N/A
30/Dec/2012	19:31	4	12215.0	70	1.34	N/A	N/A	245	0.40	N/A	N/A

Mnemonics

Curve	Description	Units
ROPA	Rate of Penetration, 3.0 ft. Avg.	ft/hr
GRAX	Gamma Ray Apparent, 0.5 ft Avg.	API
GRAM	Gamma Ray Apparent, 0.5 ft. Avg.	API
GRIX	Gamma Ray Data Density	points
GRIM	Gamma Ray Data Density	points
RACLM	Resistivity (AT) (LS) 400kHz – Compensated Borehole Corrected	ohm.m
RACHM	Resistivity (AT) (LS) 2MHz – Compensated Borehole Corrected	ohm.m
RPCLM	Resistivity (PD) (LS) 400kHz – Compensated Borehole Corrected	ohm.m
RPCHM	Resistivity (PD) (LS) 2MHz – Compensated Borehole Corrected	ohm.m
CACHM	Conductivity (AT) (LS) 2MHz – Compensated Borehole Corrected	mho/m
RPTHM	Time Since Drilled [RPCHM]	mins
RPSHIM	Resistivity Slide Indicator	unitless
WOBA	Weight on Bit, 1.0 ft. Avg.	kLbs
TCDX	Downhole Temperature	degF
TCDM	Downhole Temperature	degF

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (ft)	Max O.D. (in.)	Min I.D. (in.)
6	D/D	11006077	Directional	50.77	6.750	6.000

2	DIR	11906077	Directional	32.77	6.750	0.000
2	SRIG	12604925	Gamma	49.40	6.750	3.250
3	CS	11770223	-	74.11	5.070	1.750
3	BCPM	12079981	Telemetry	63.01	5.070	1.750
3	STAB	10497478	-	59.96	0.000	1.750
3	OTK	10451084	Directional	55.50	5.070	1.750
3	OTK	10451084	Resistivity	49.53	5.070	1.750
3	OTK	10451084	Gamma	42.34	5.070	1.750
3	OTK	10451084	Pressure	44.97	5.070	1.750
3	CS	10518116	-	38.12	5.070	1.750
4	CS	11770223	-	74.05	5.070	1.750
4	BCPM	12079981	Telemetry	62.95	5.070	1.750
4	STAB	10497478	-	59.90	0.000	1.750
4	OTK	10451084	Directional	55.44	5.070	1.750
4	OTK	10451084	Resistivity	49.47	5.070	1.750
4	OTK	10451084	Gamma	42.28	5.070	1.750
4	OTK	10451084	Pressure	44.91	5.070	1.750
4	CS	10518116	-	38.06	5.070	1.750

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

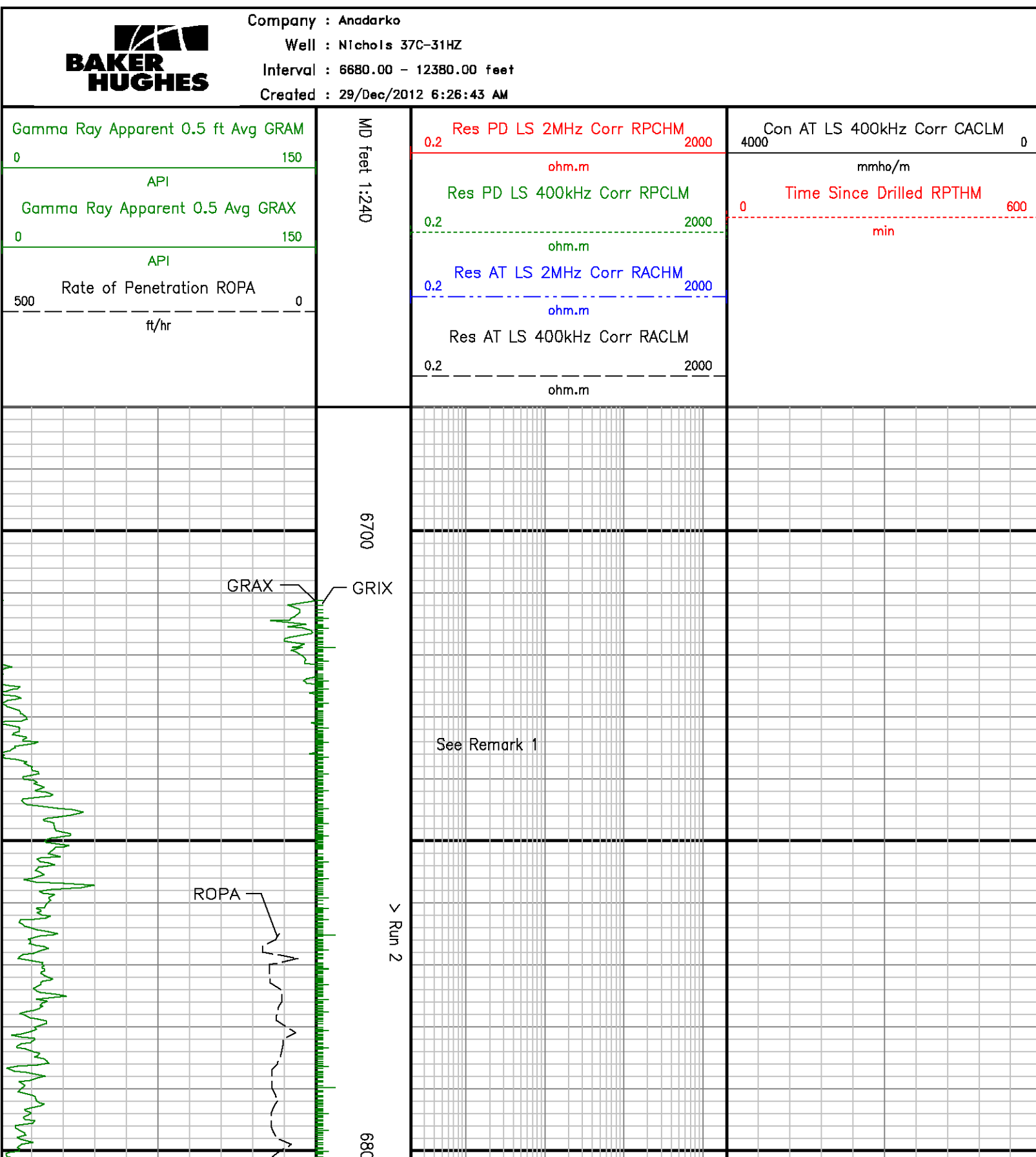
Comments

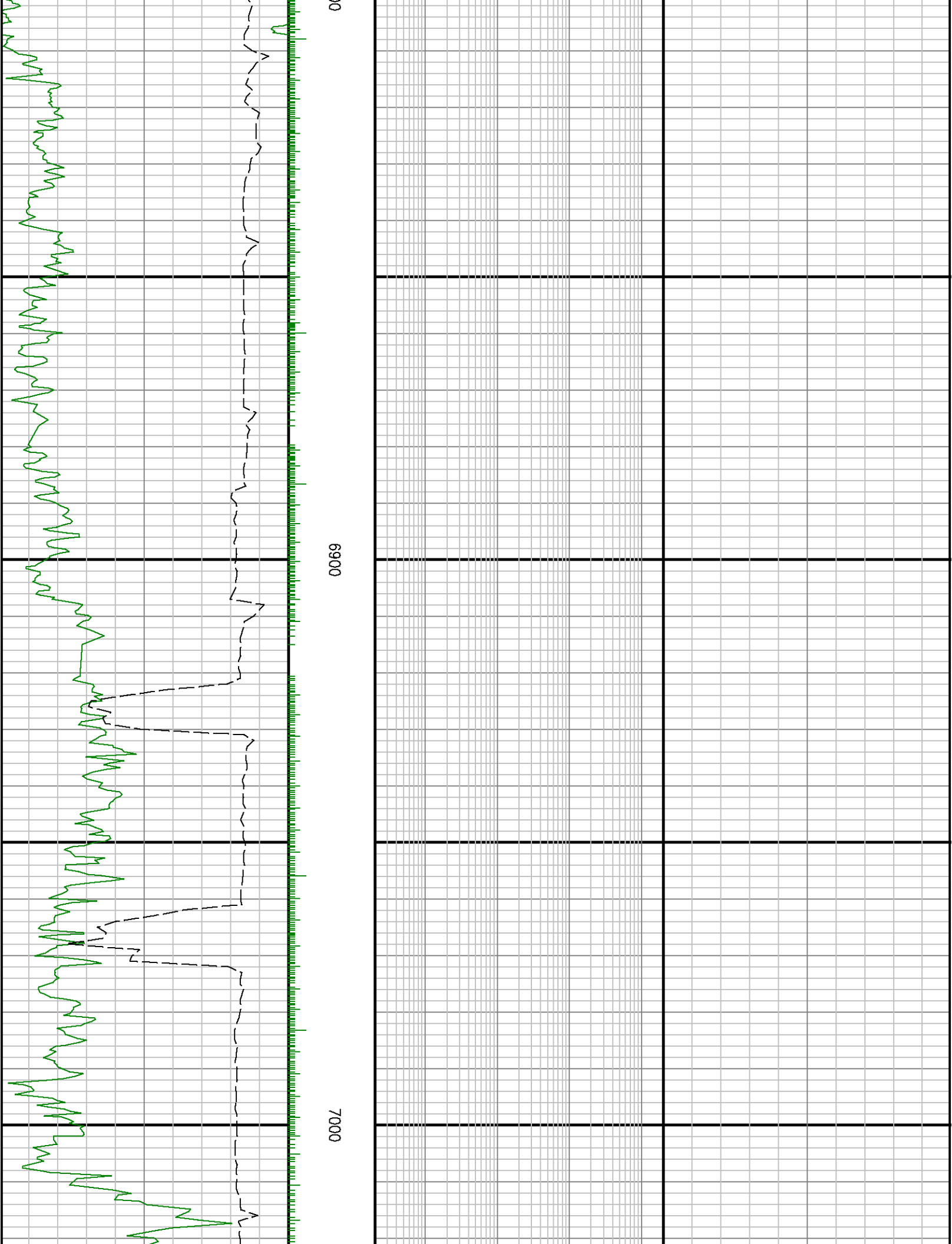
<p>(1) Baker Hughes INTEQ run 2 utilized 6 3/4 NaviGamma services (Gamma Ray and Directional) behind a 8 3/4 inch bit and steerable assembly from 6760 to 7717 feet MD (6717 to 7304 feet TVD).</p> <p>(2) Baker Hughes INTEQ runs 3 & 4 utilized 4 3/4 inch OnTrak services (Multiple Propagation Resistivity, Gamma Ray, and Directional) behind a 6 1/8 inch bit and steerable assembly from 7717 feet to 12369 feet MD (7304 to 7311 feet TVD).</p> <p>(3) A sliding indicator is shown on the right edge of track 2 as a heavy line. The indicator has been depth-shifted to the resistivity sensor offset to correspond with resistivity data acquired while sliding.</p>

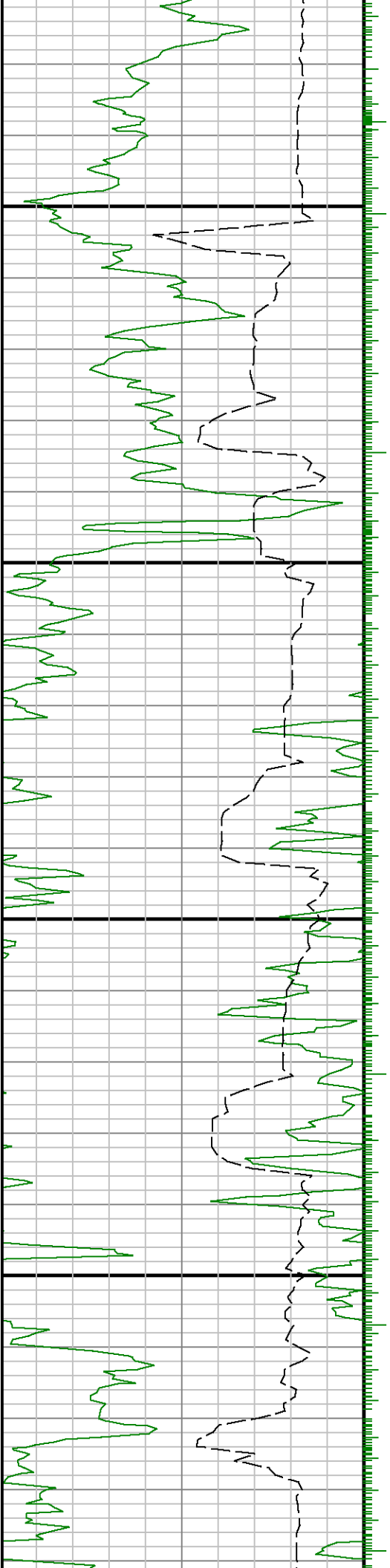
Remarks

Number	Measured	Hole	LWD	Remark
	Depth	Section	Run No.	
	(ft)	(in.)		
1	6760	8.750	2	The interval from surface to 6760 feet MD (6717 feet TVD) was not logged since logging services began with the start of drilling with the curve assembly for run 2.
2	7717	6.125	3	The interval from 7667 to 7717 feet MD (7301 to 7304 feet TVD) was logged up to 71 hours after being drilled due to trip out of the hole for casing and cementing operations and picking up the lateral assembly.

3	11907	6.125	4	The interval from 11857 to 11907 feet MD (7306 to 7307 feet TVD) was logged up to 43 hours after being drilled due to trip out of the hole to change out motor and ream BHA through the lateral to bottom.
4	12369	6.125	4	The interval from 12319 to 12369 feet MD (7312 to 7311 feet TVD) was not logged due to bit sensor offset at TD.

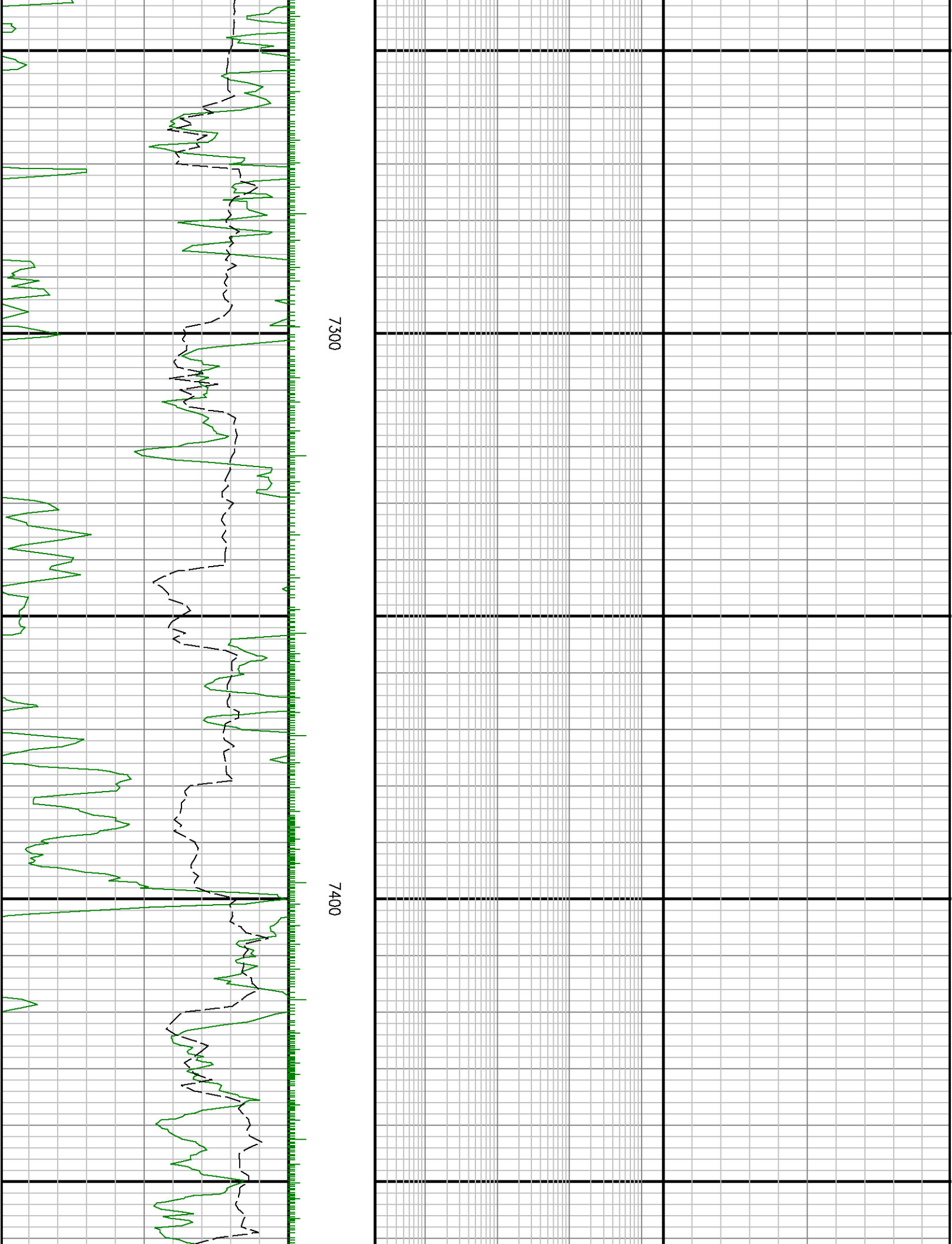


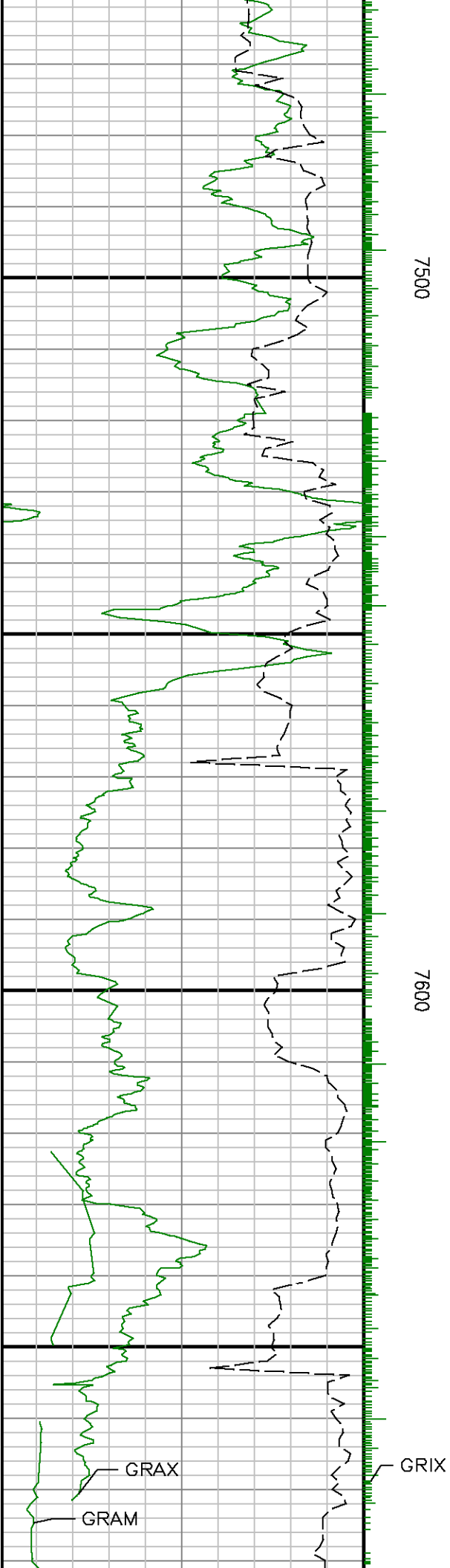


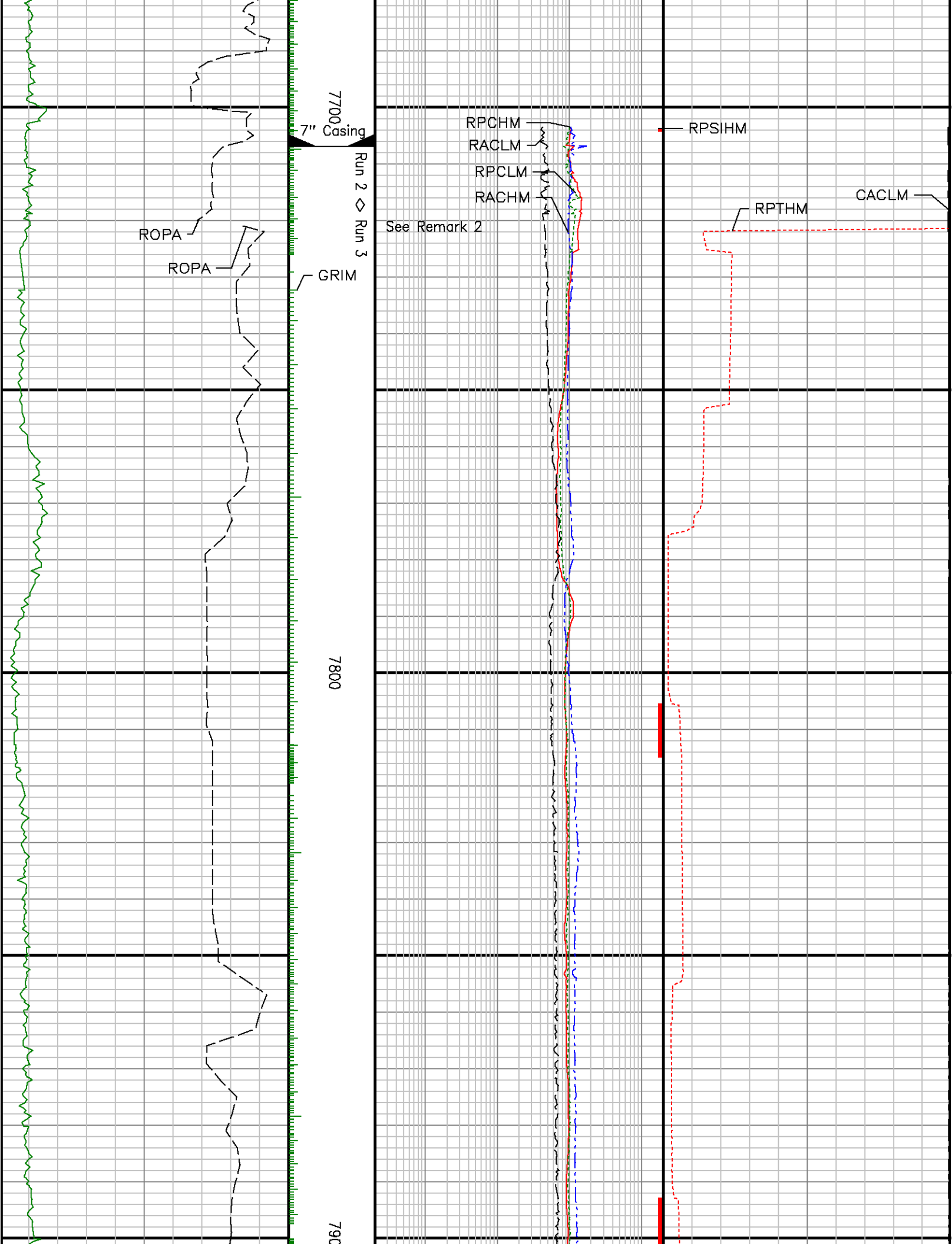


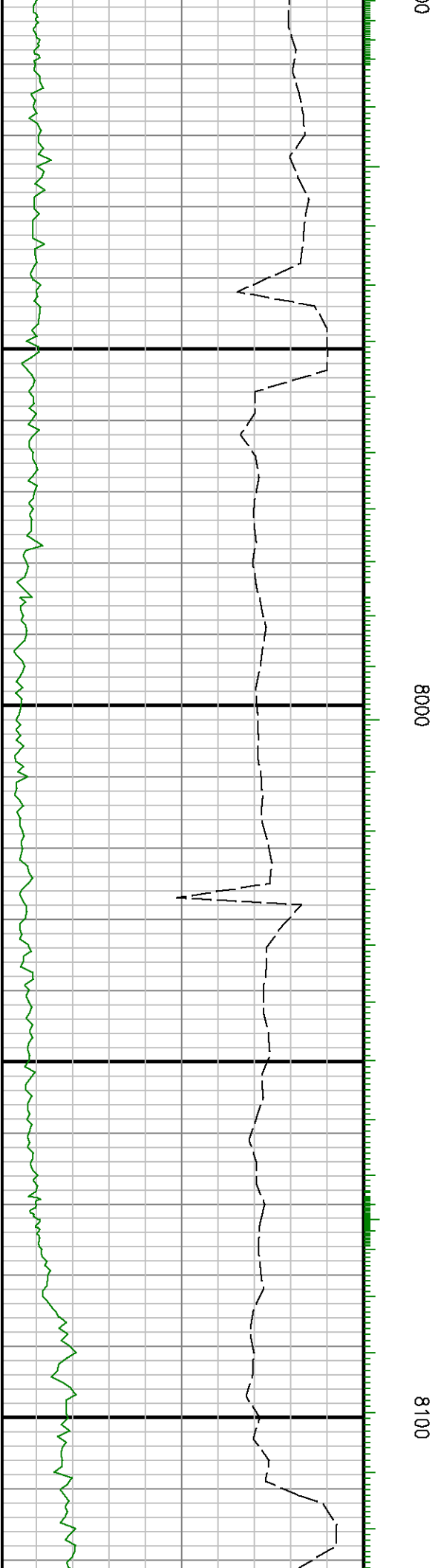
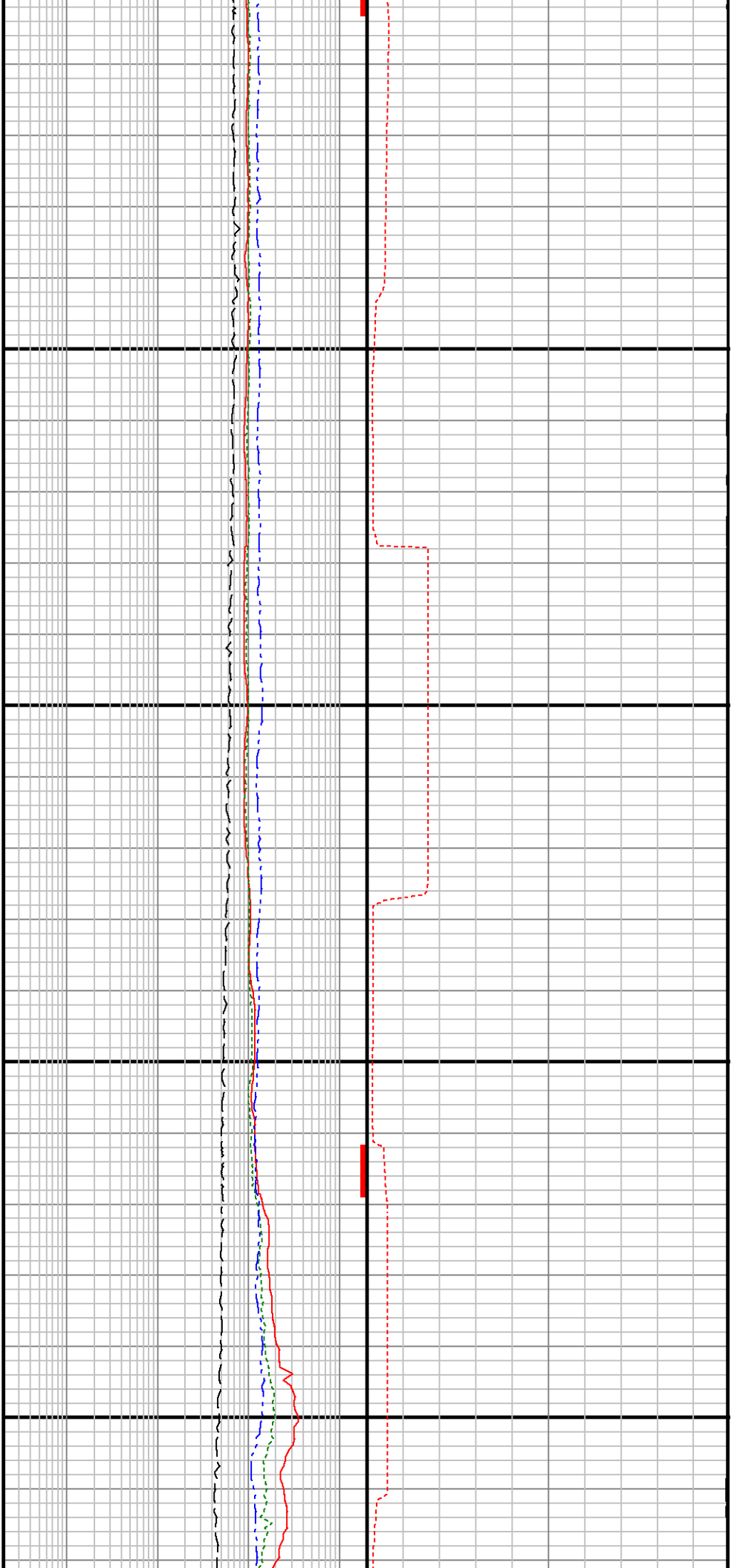
7100

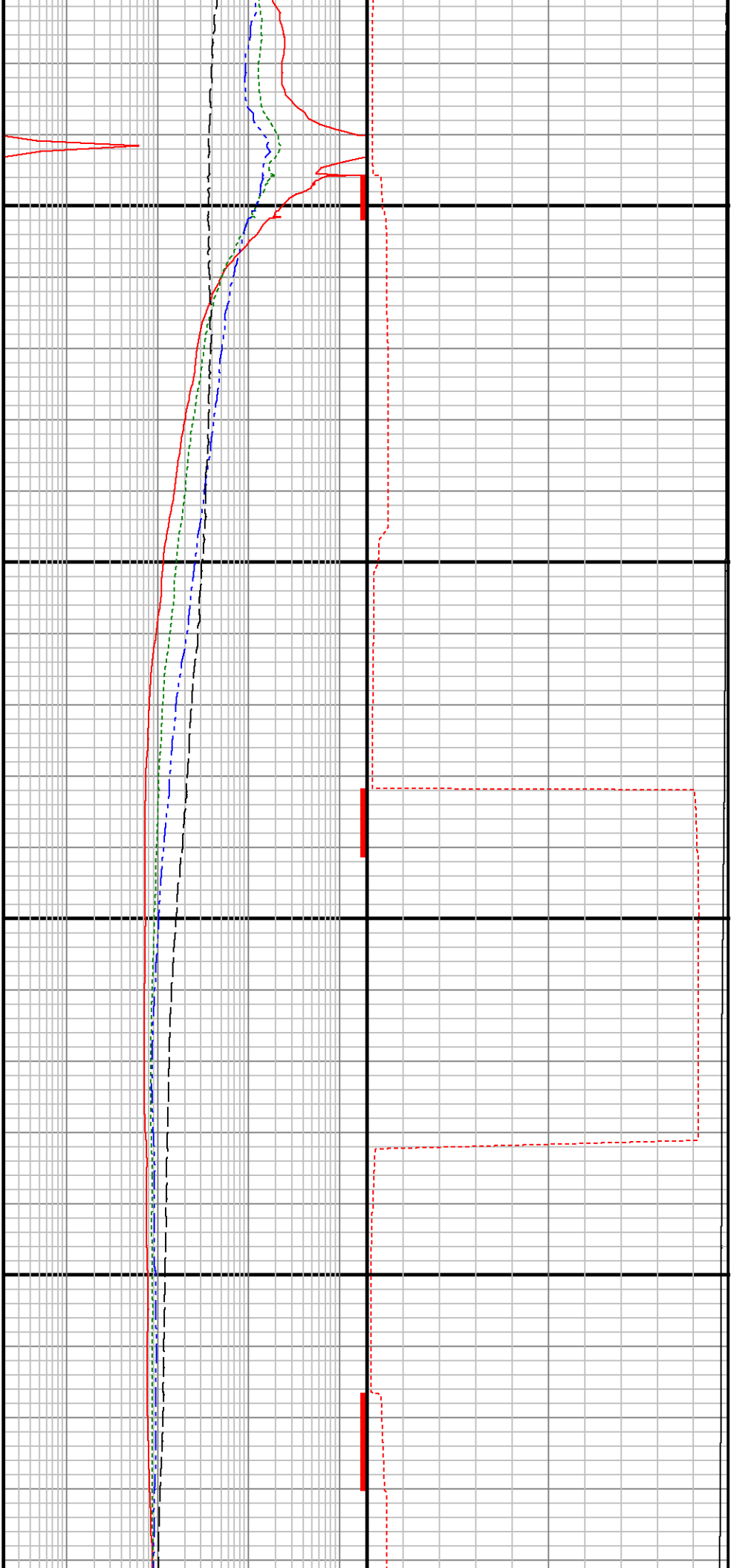
7200





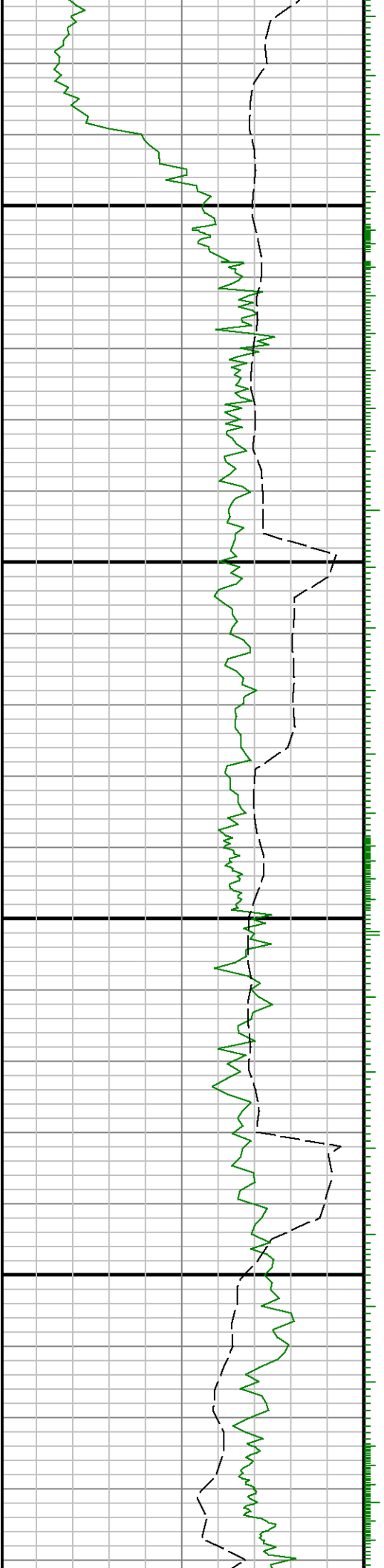


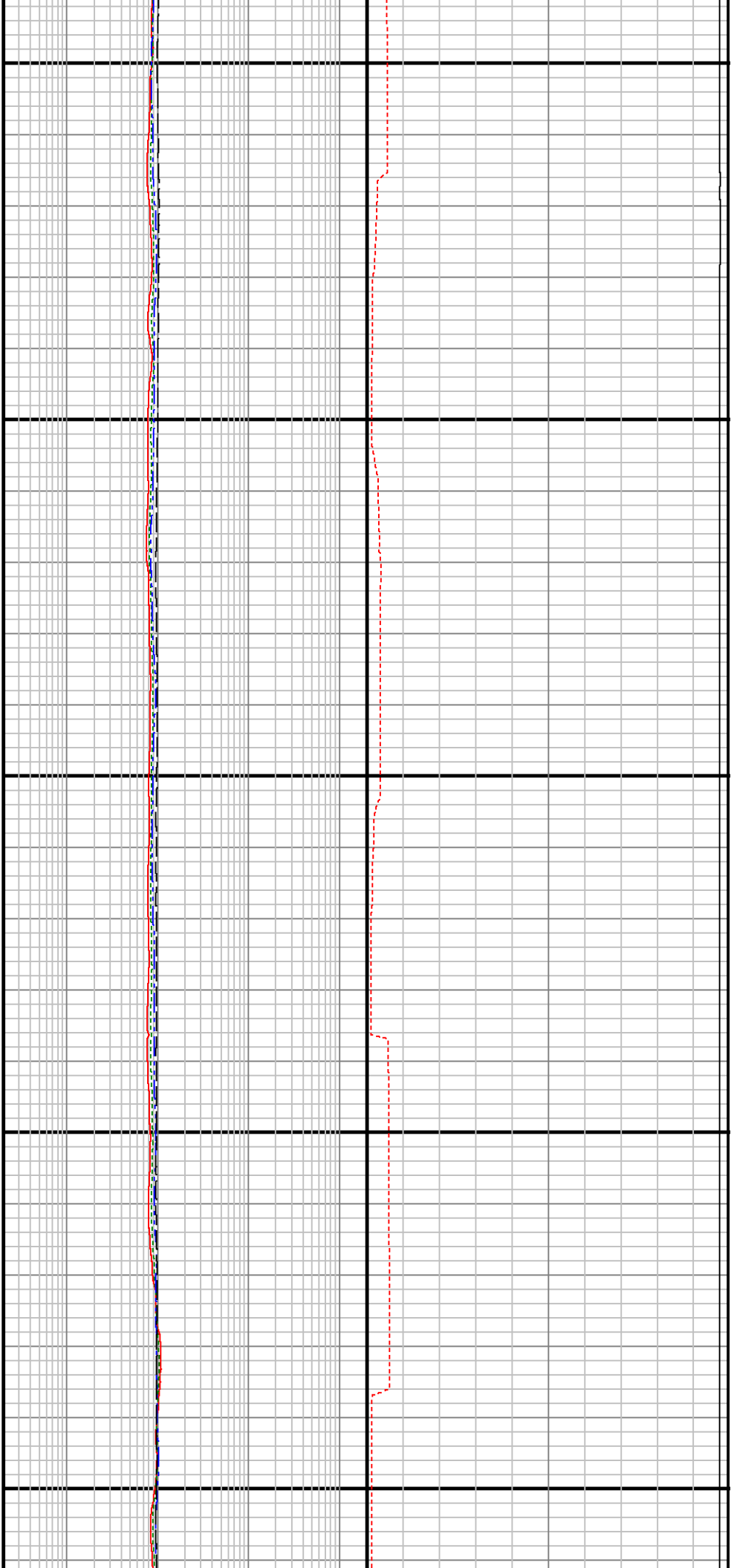




8200

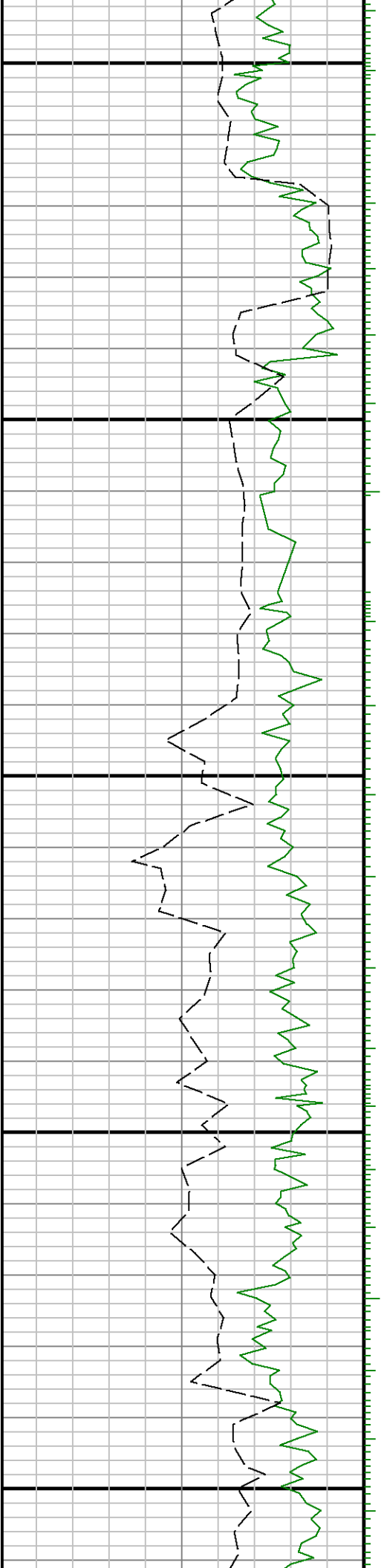
8300

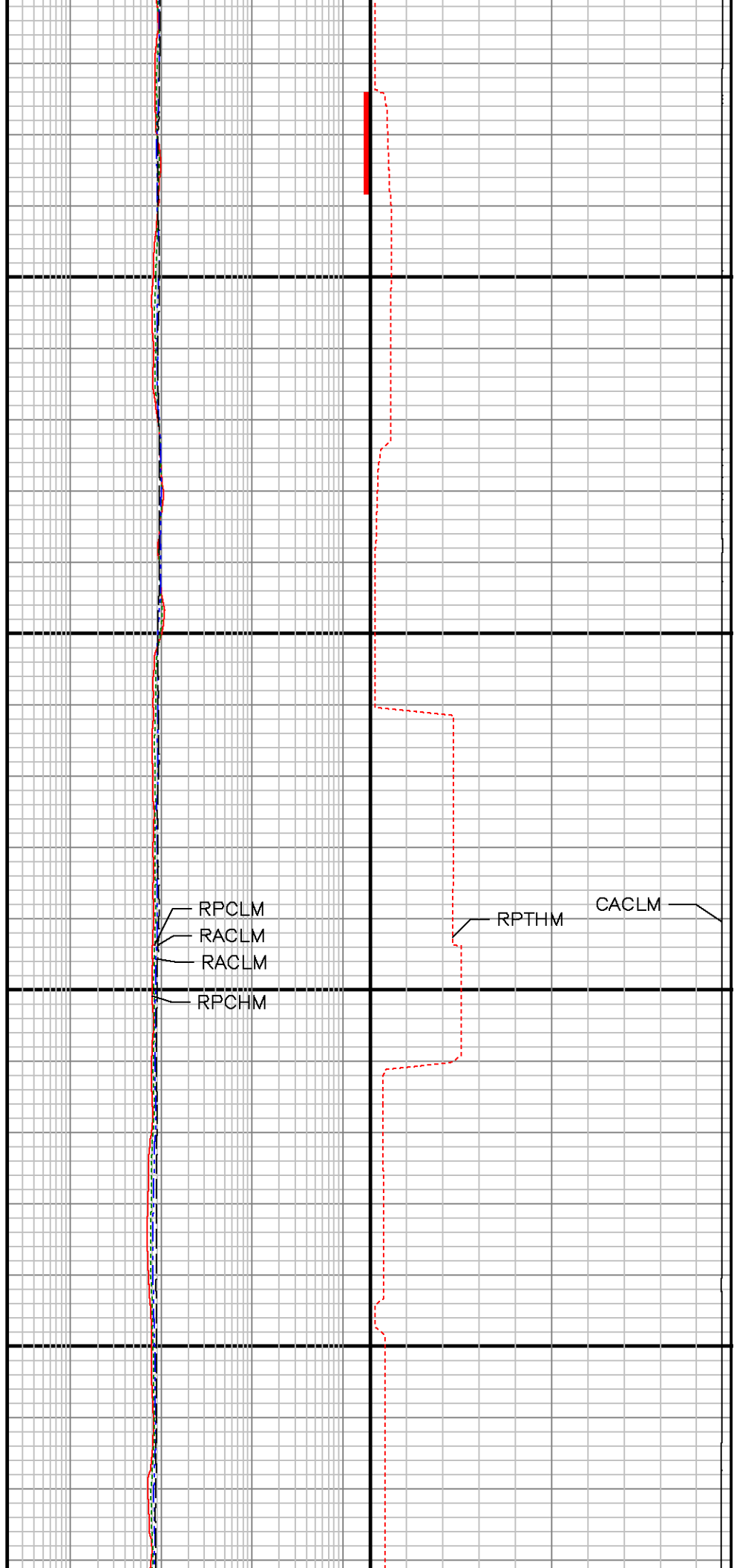
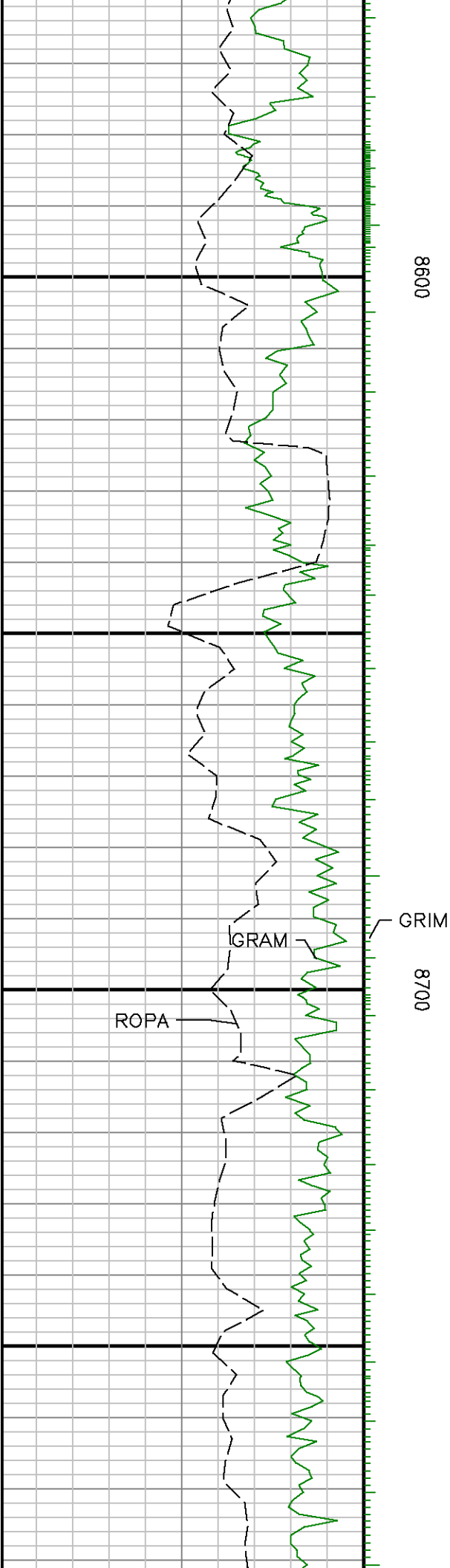


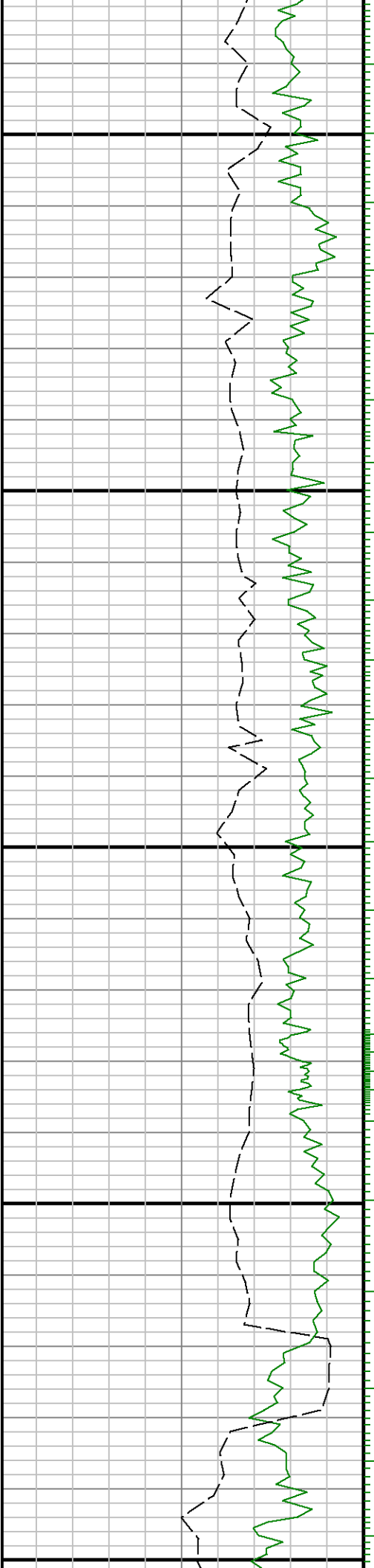


8400

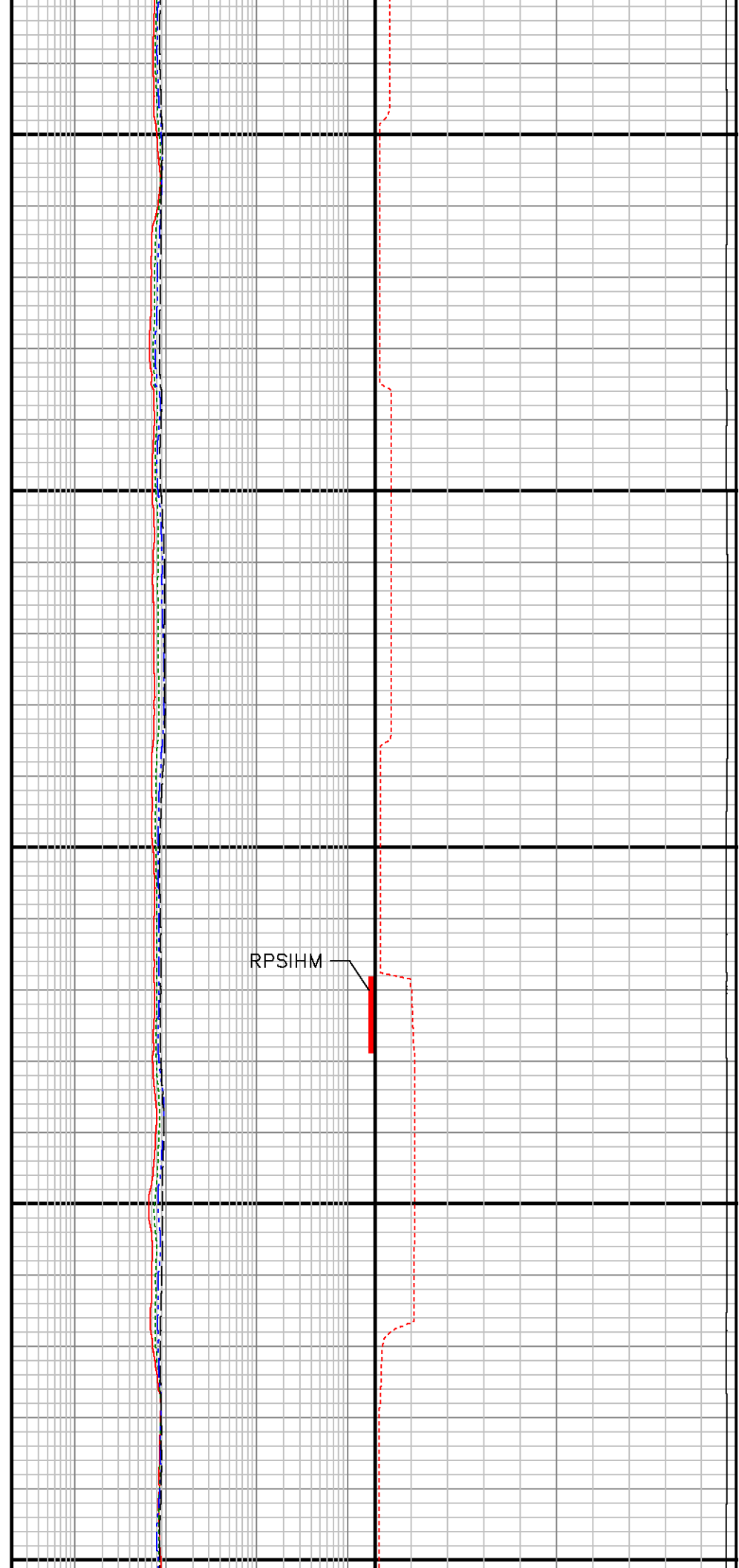
8500



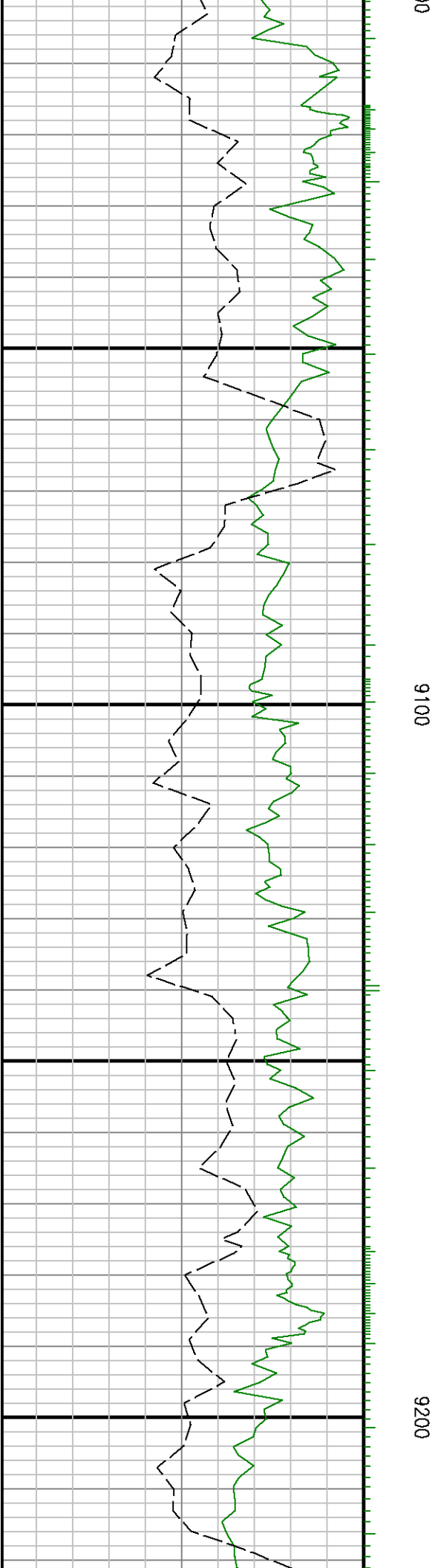
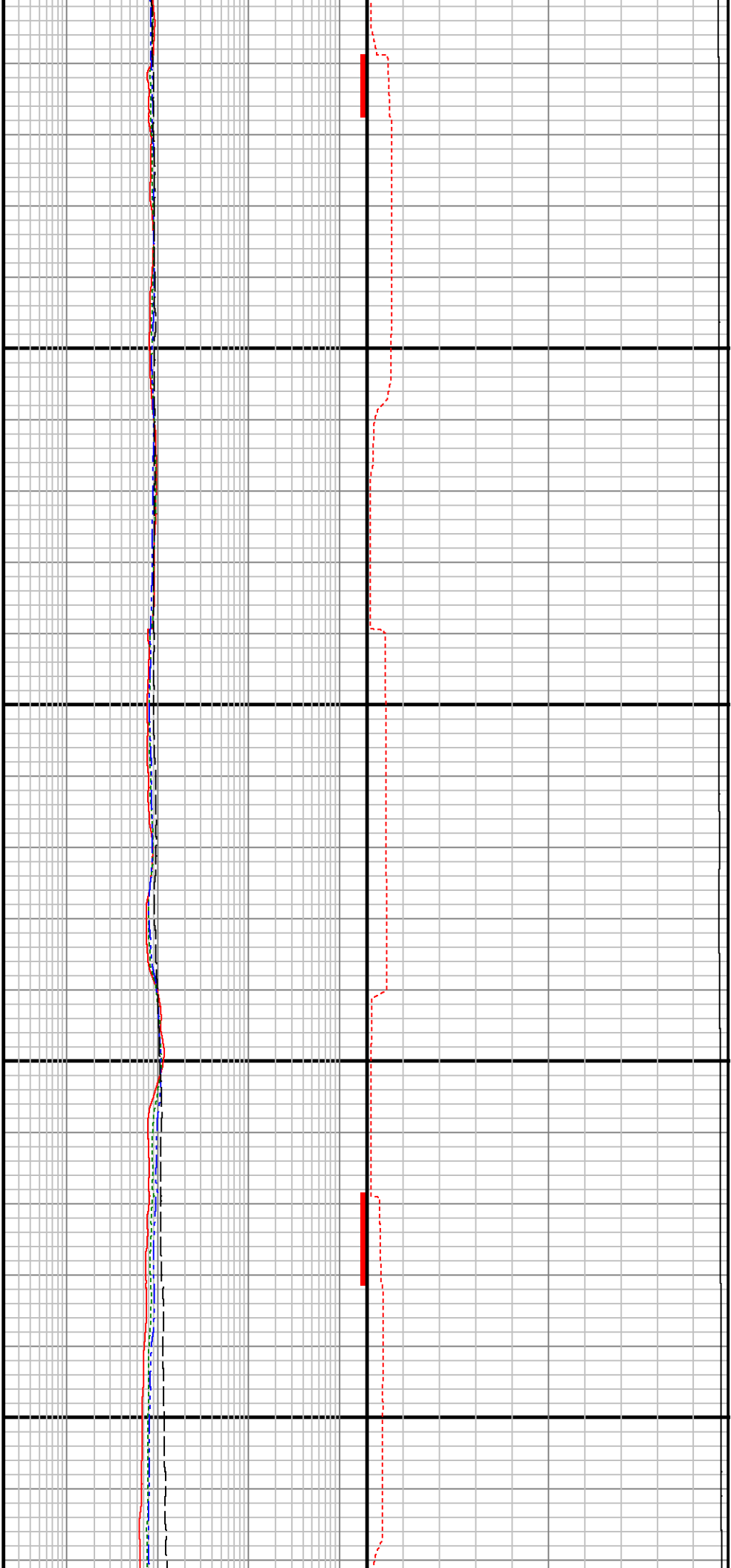


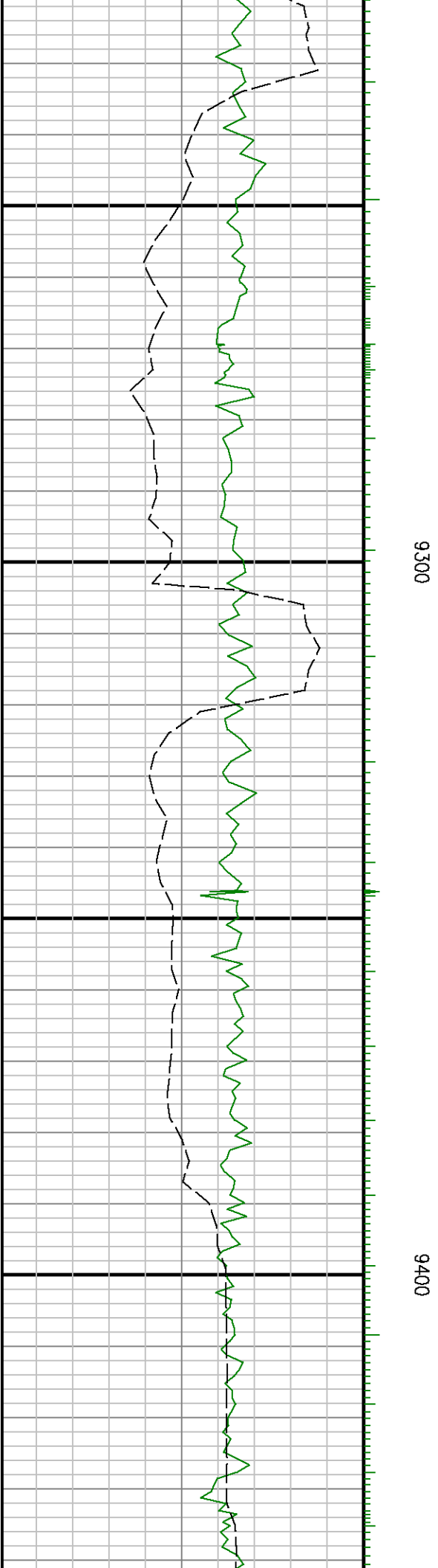
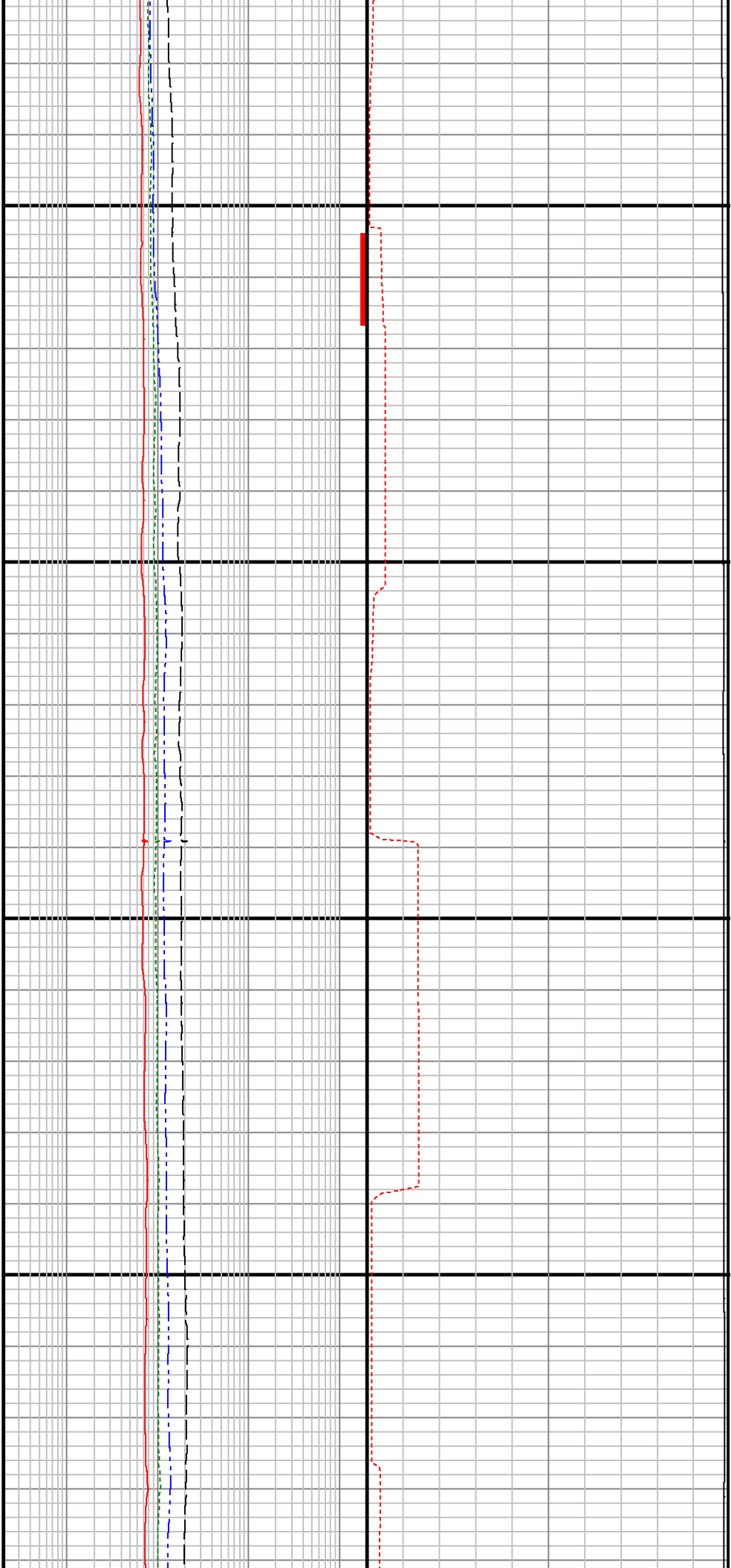


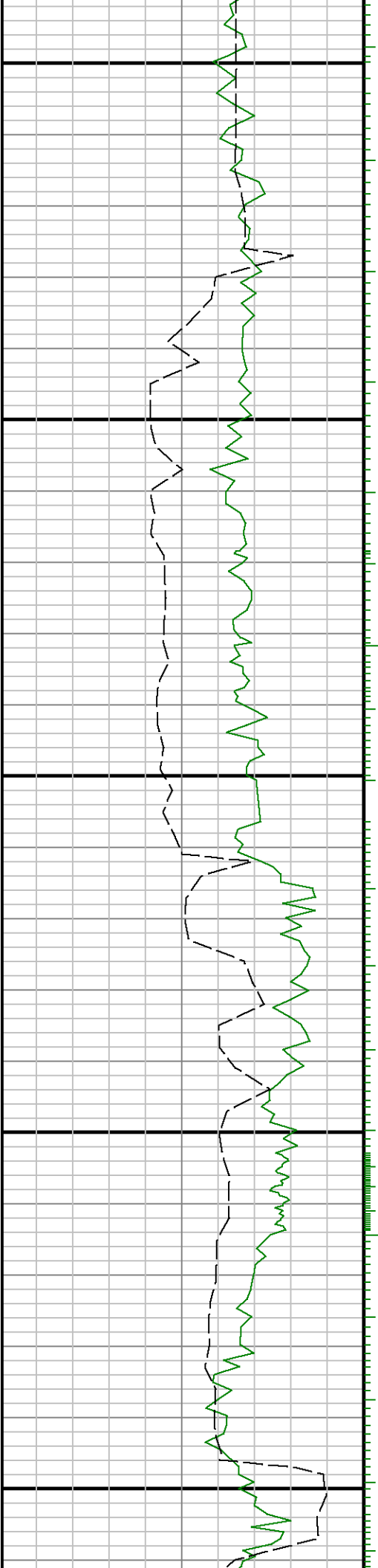
006 0080



RPSIHM

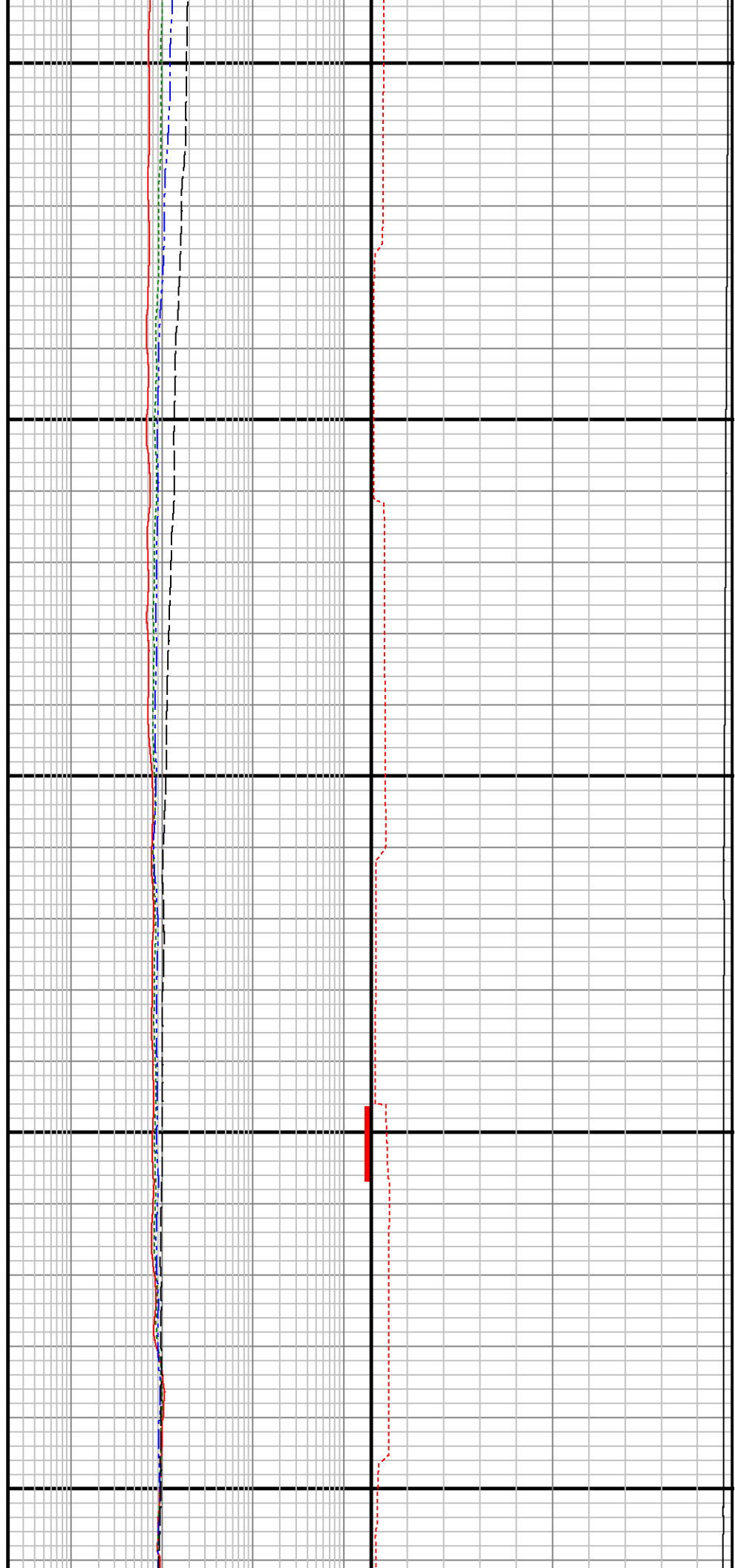


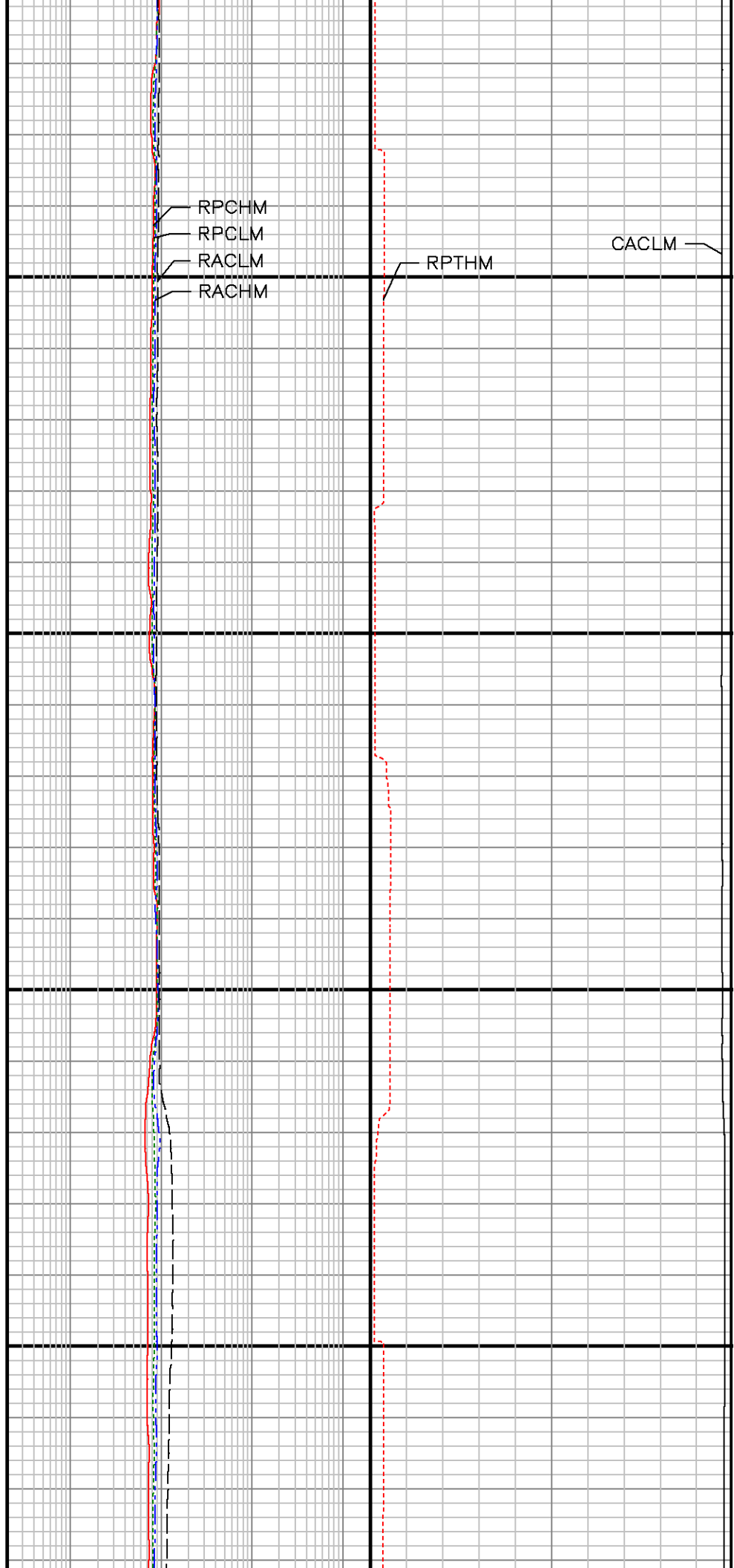
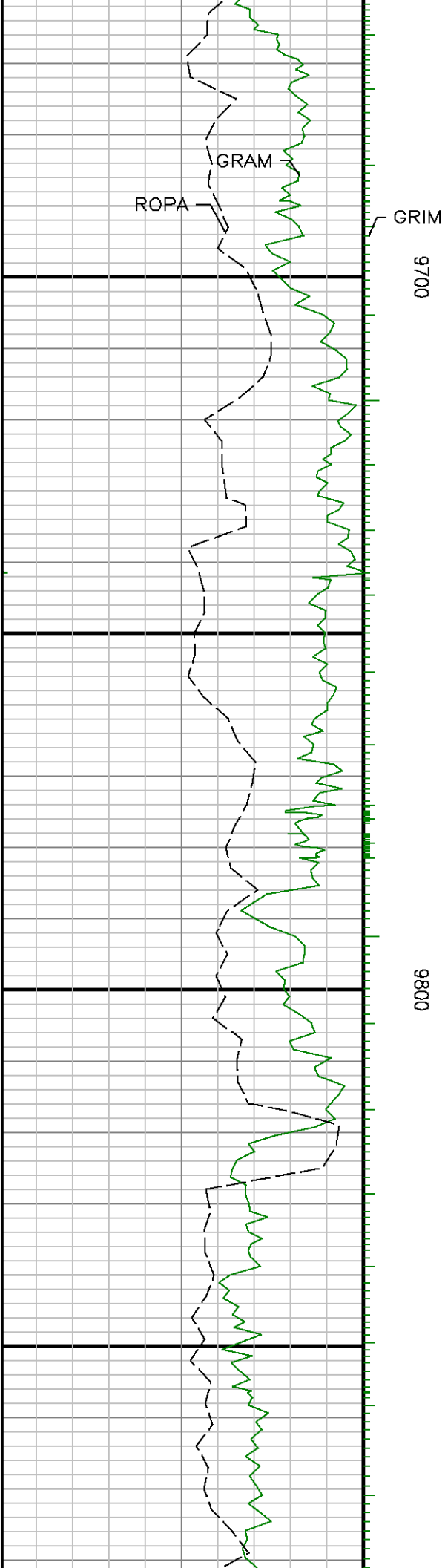


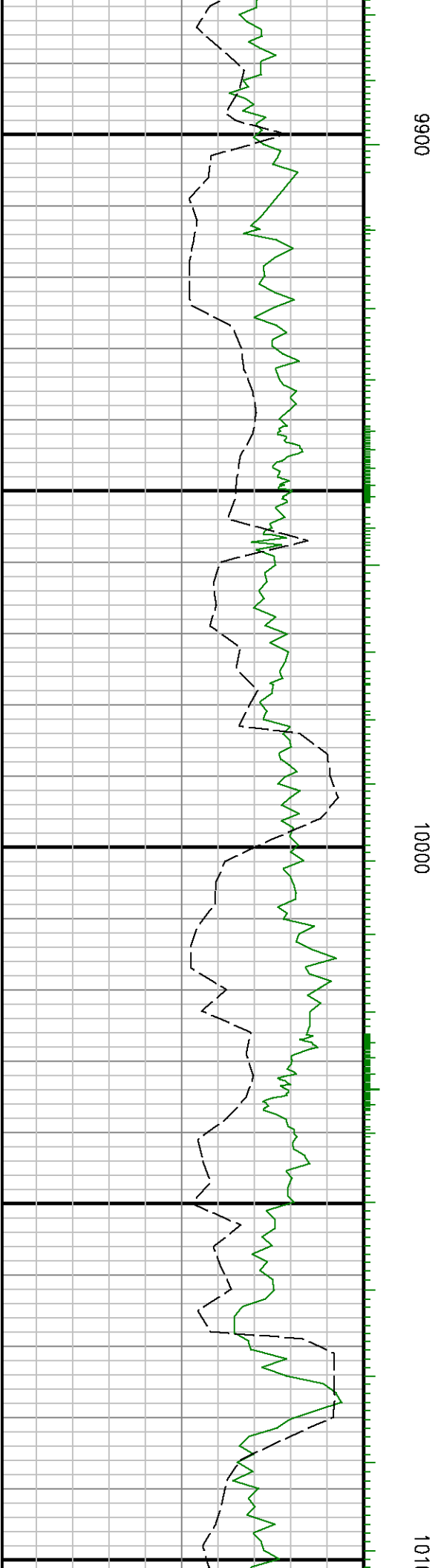
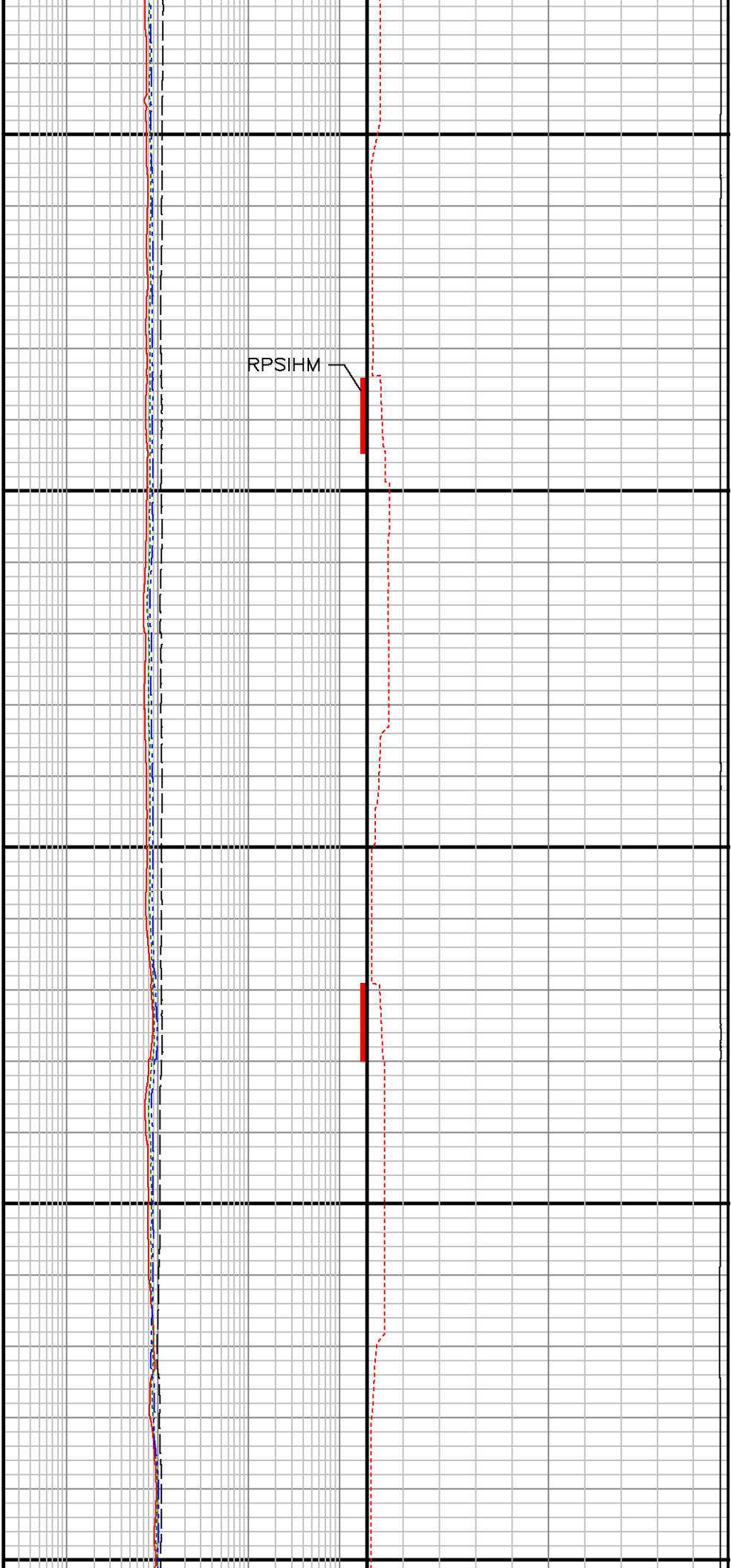


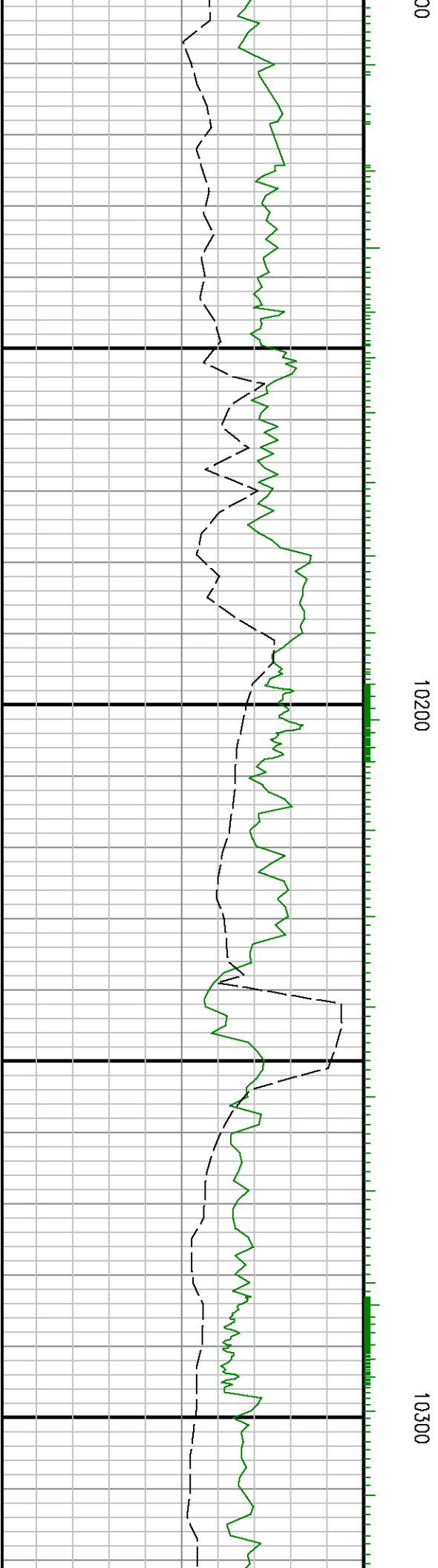
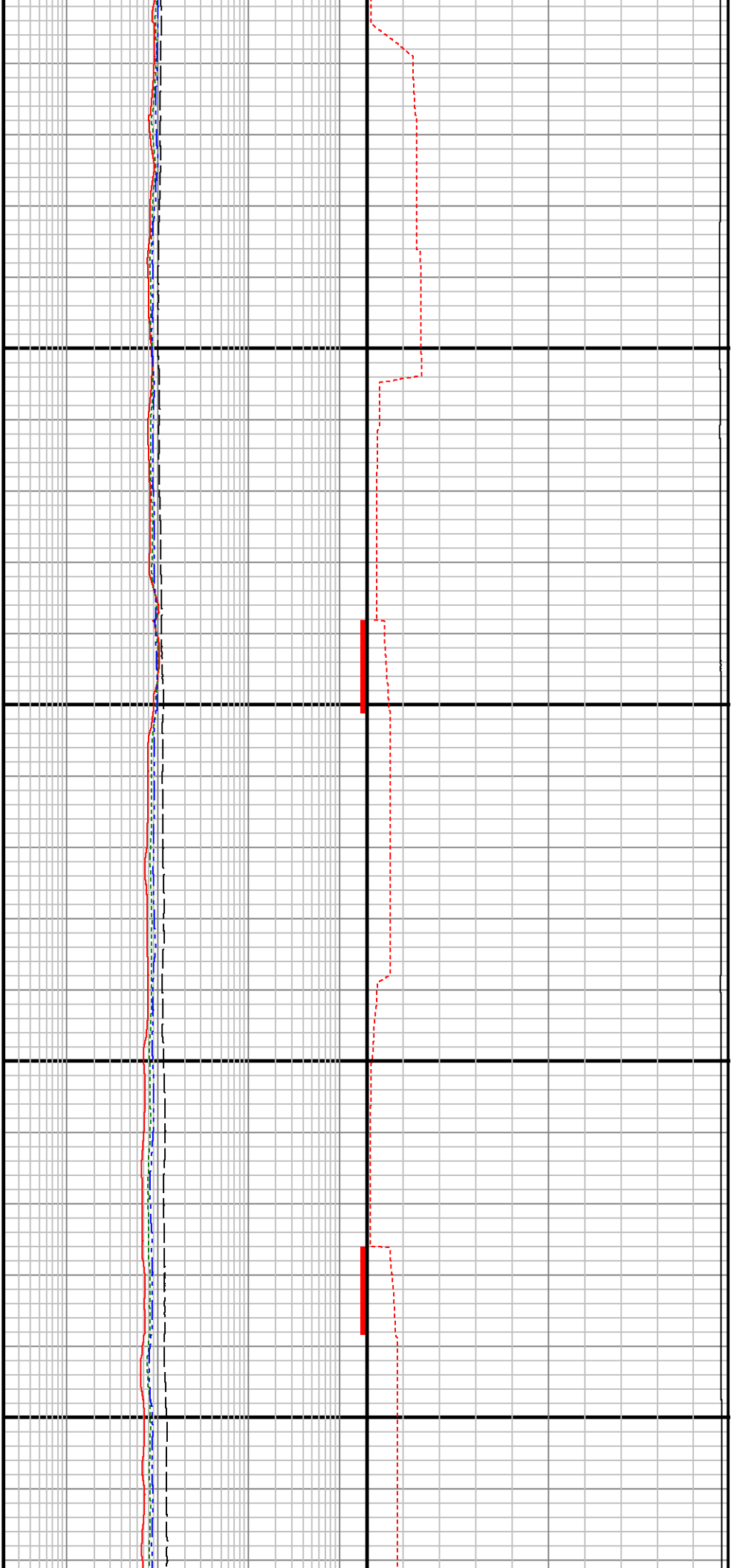
9500

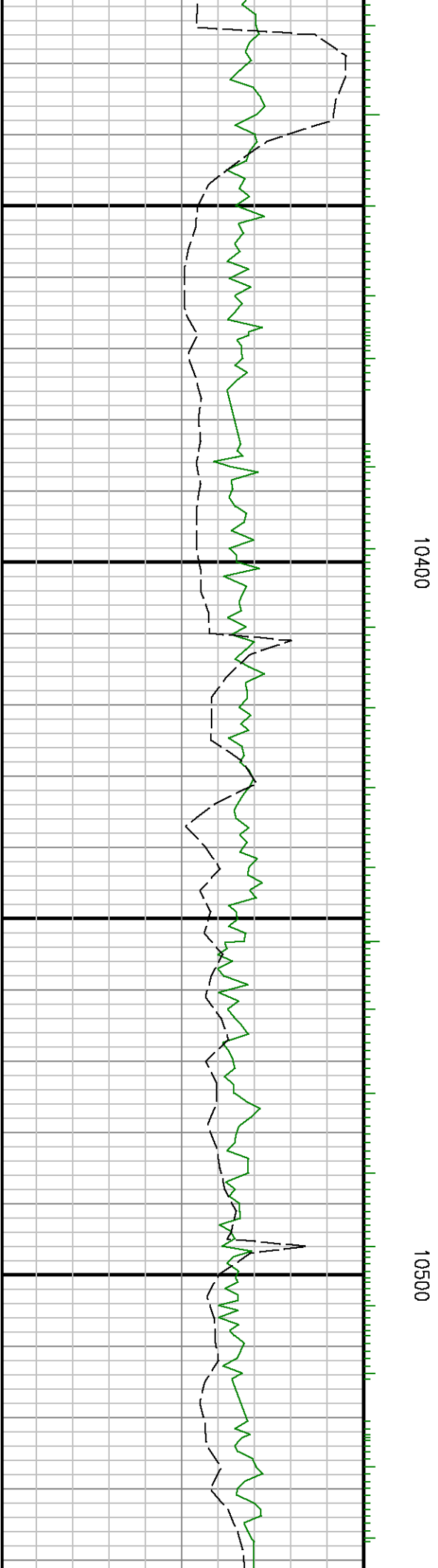
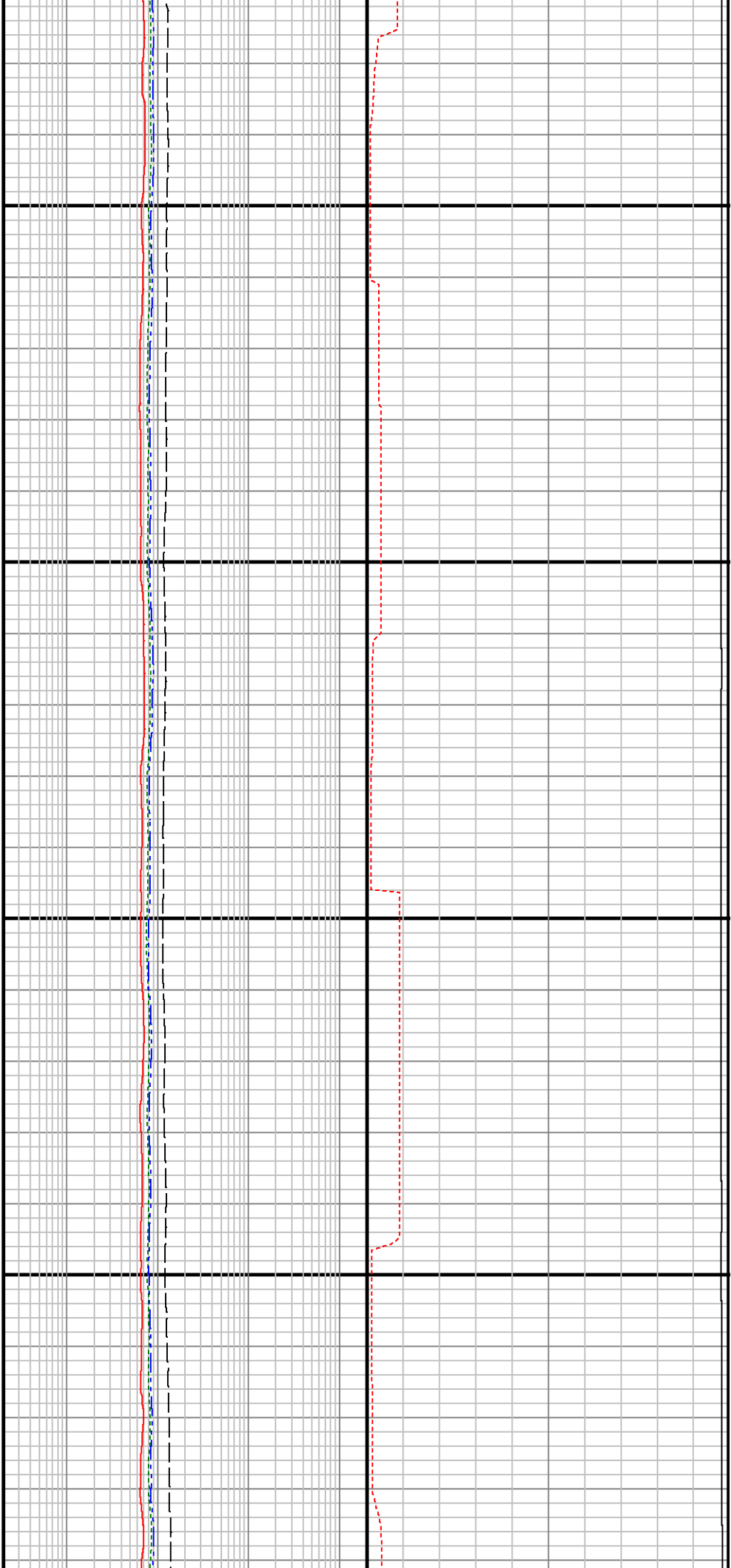
0096

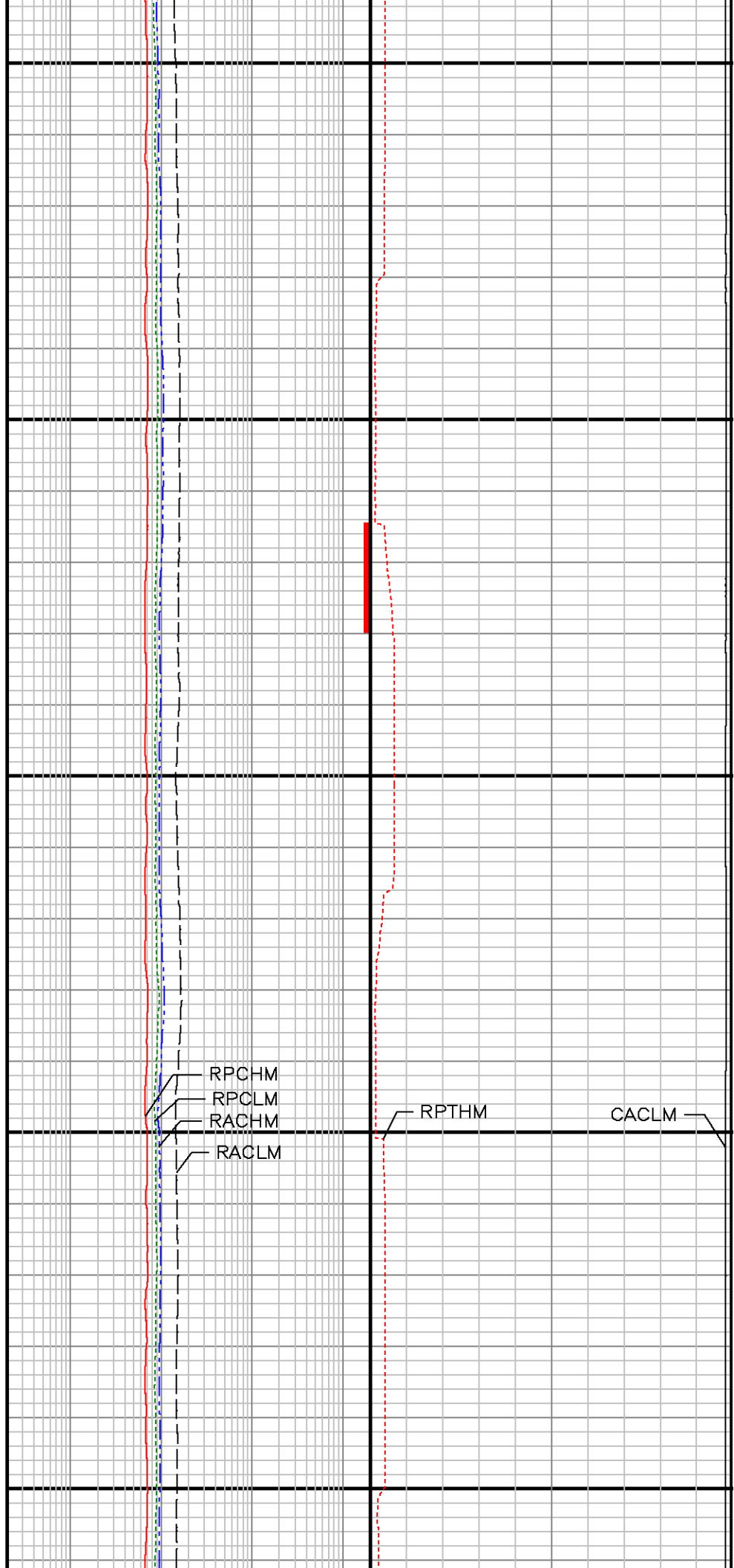
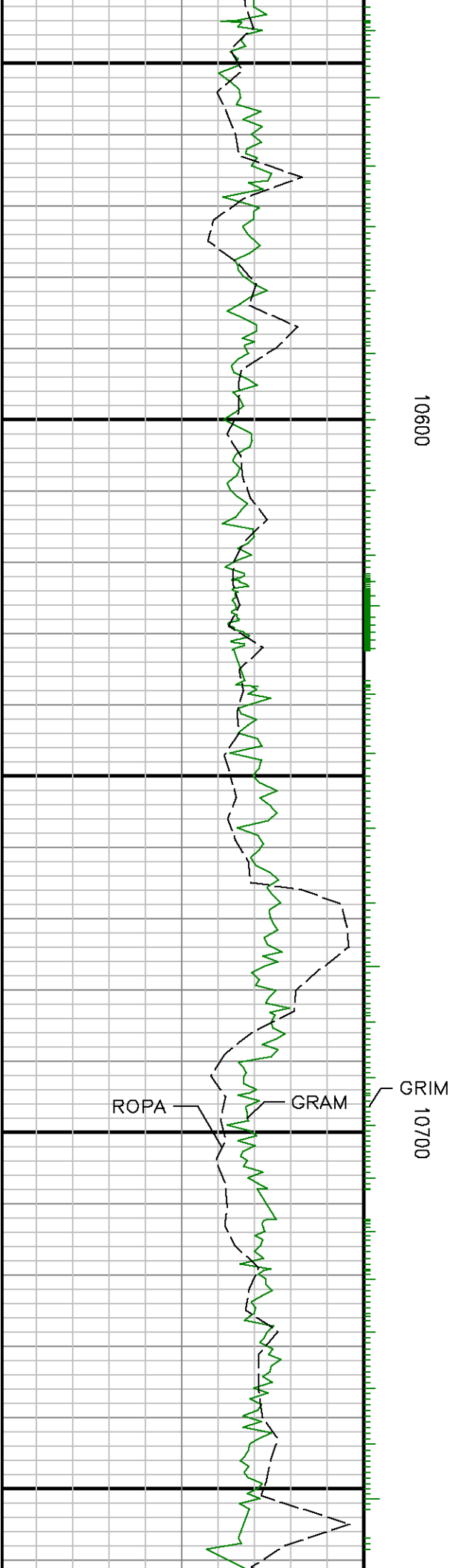


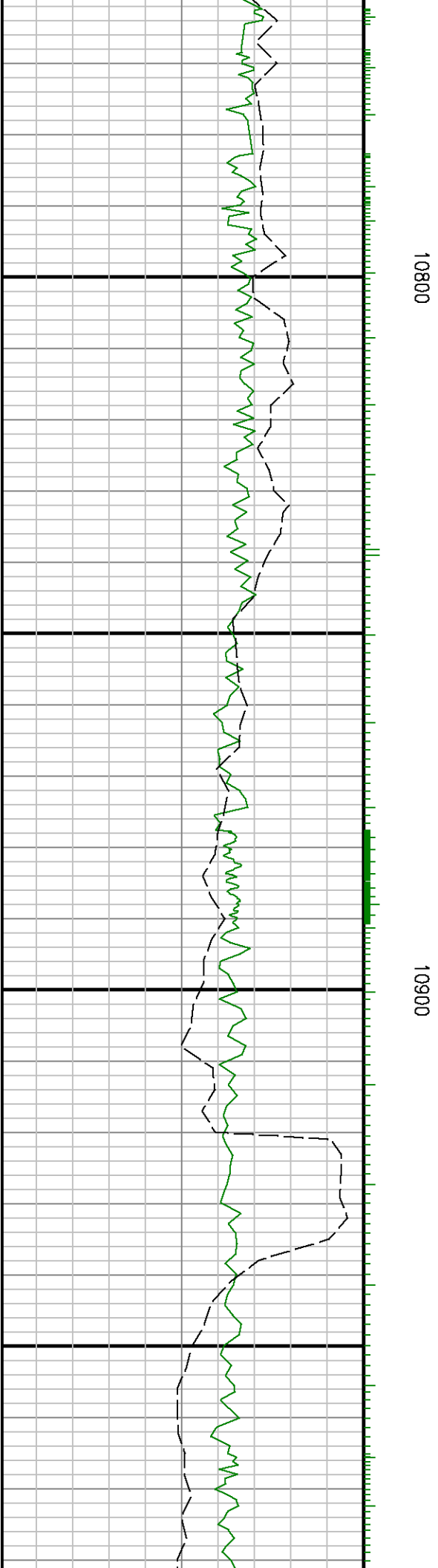
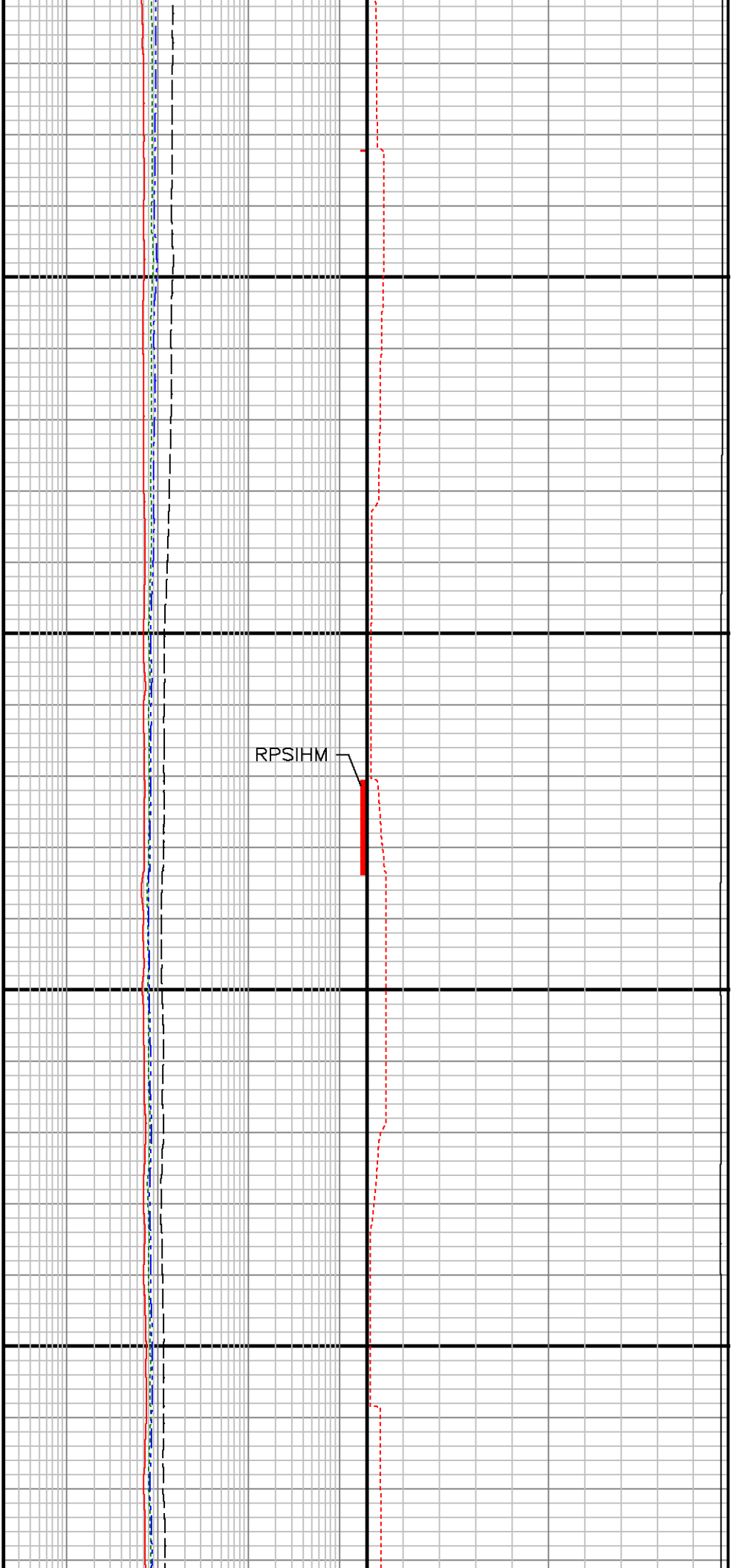


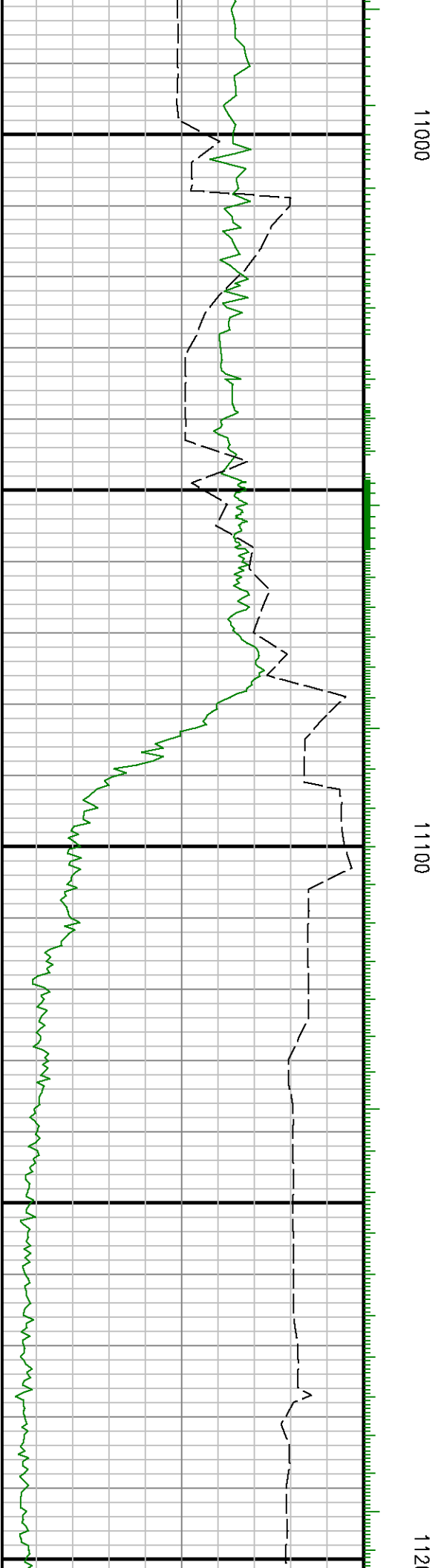


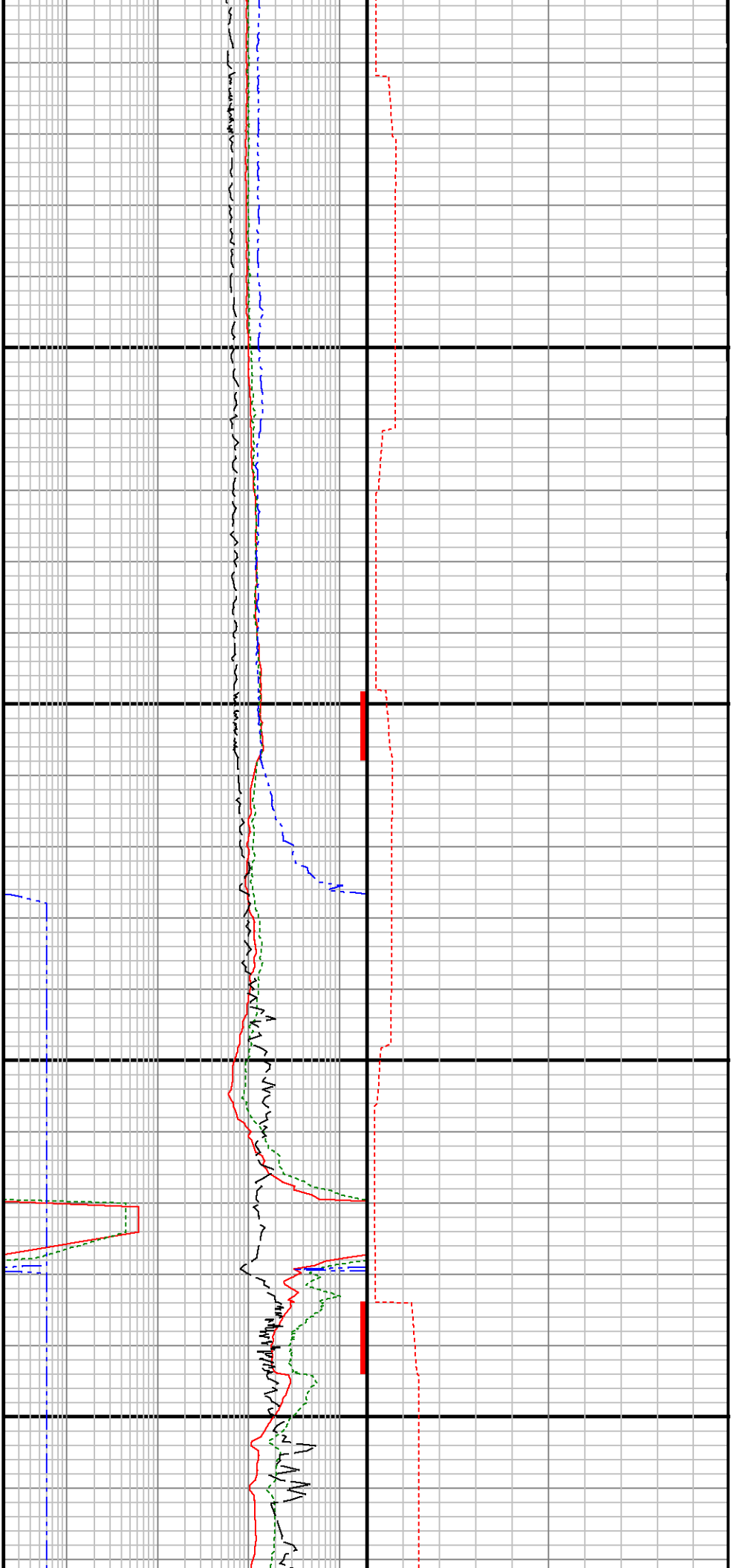








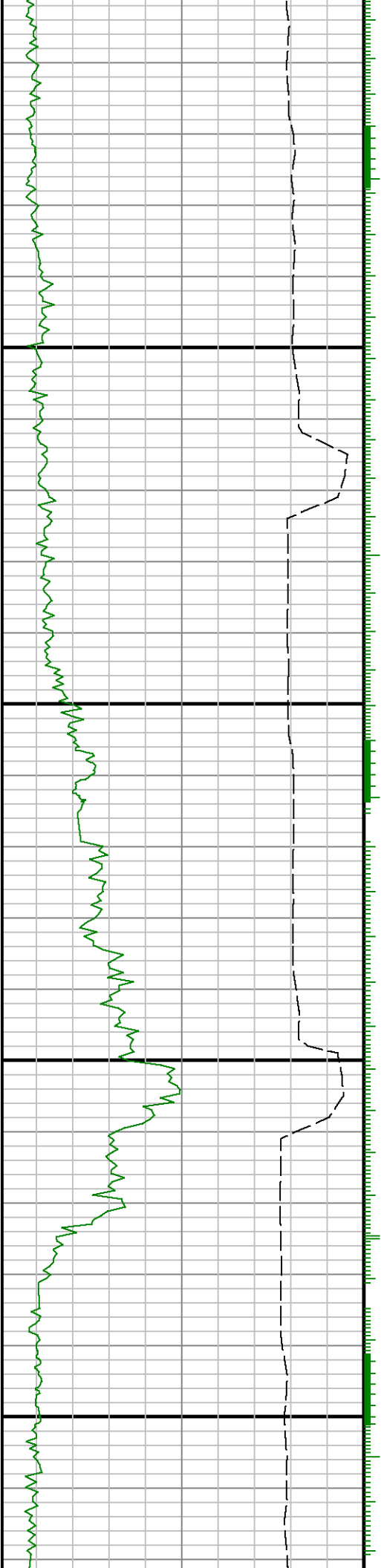


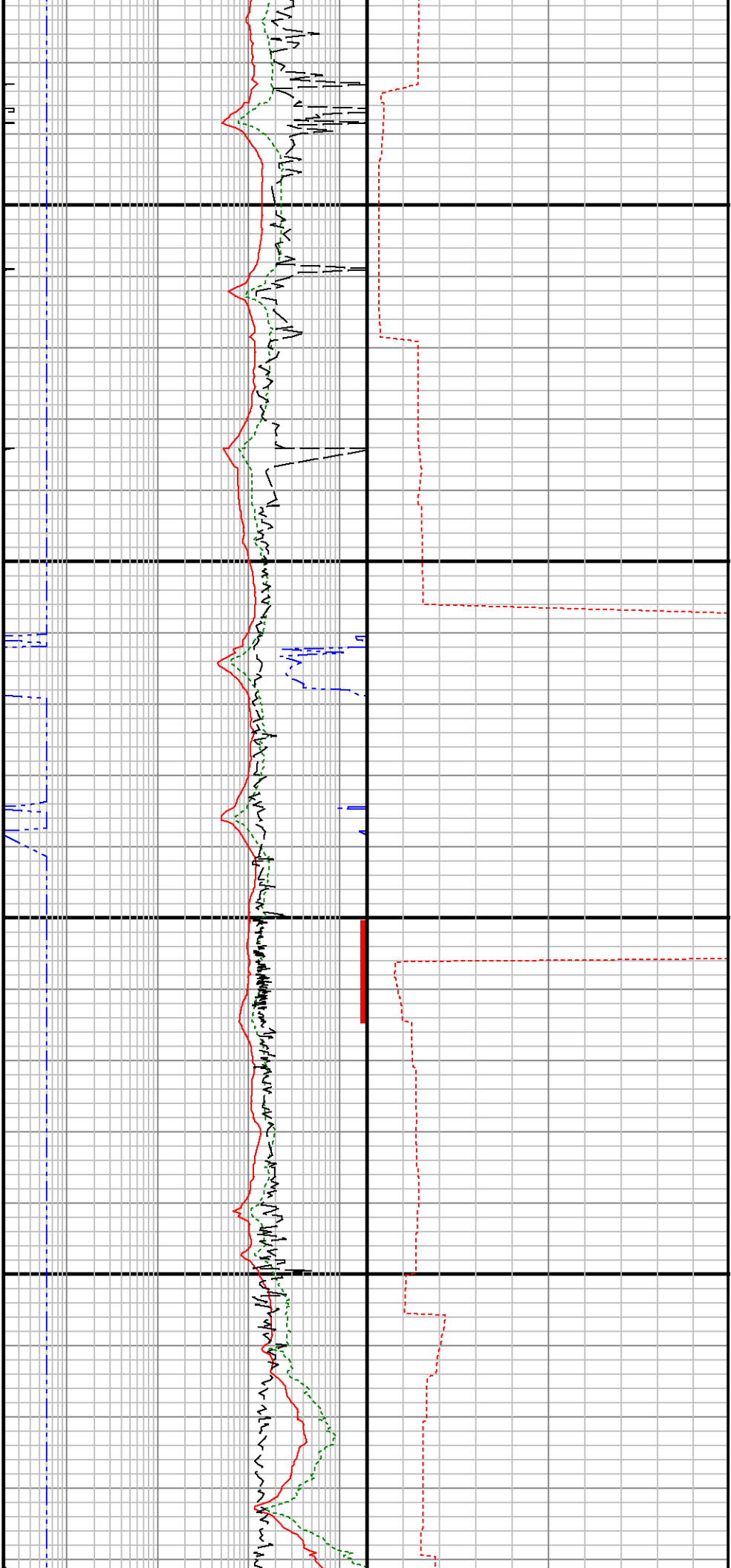


00

11300

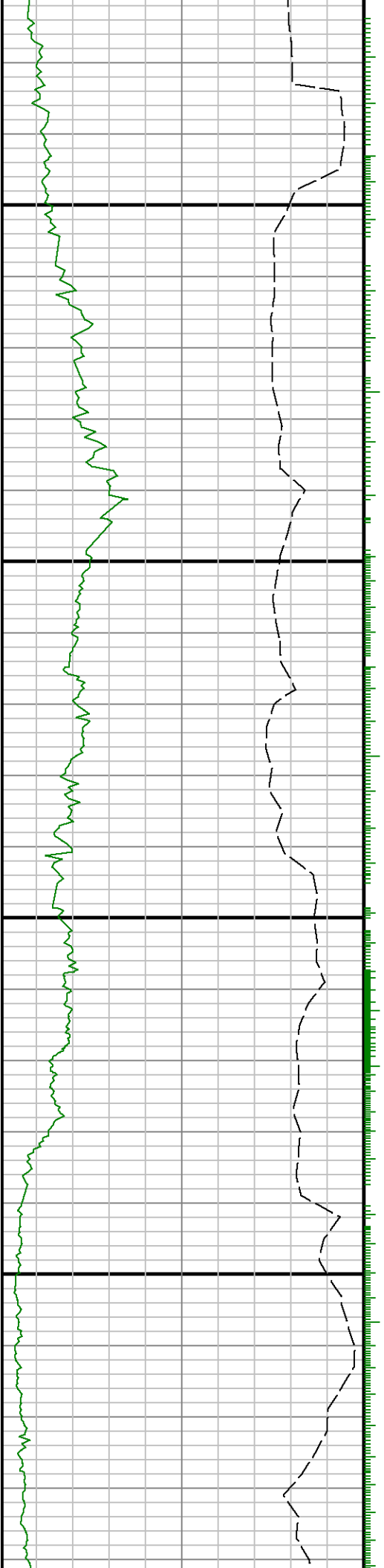
11400

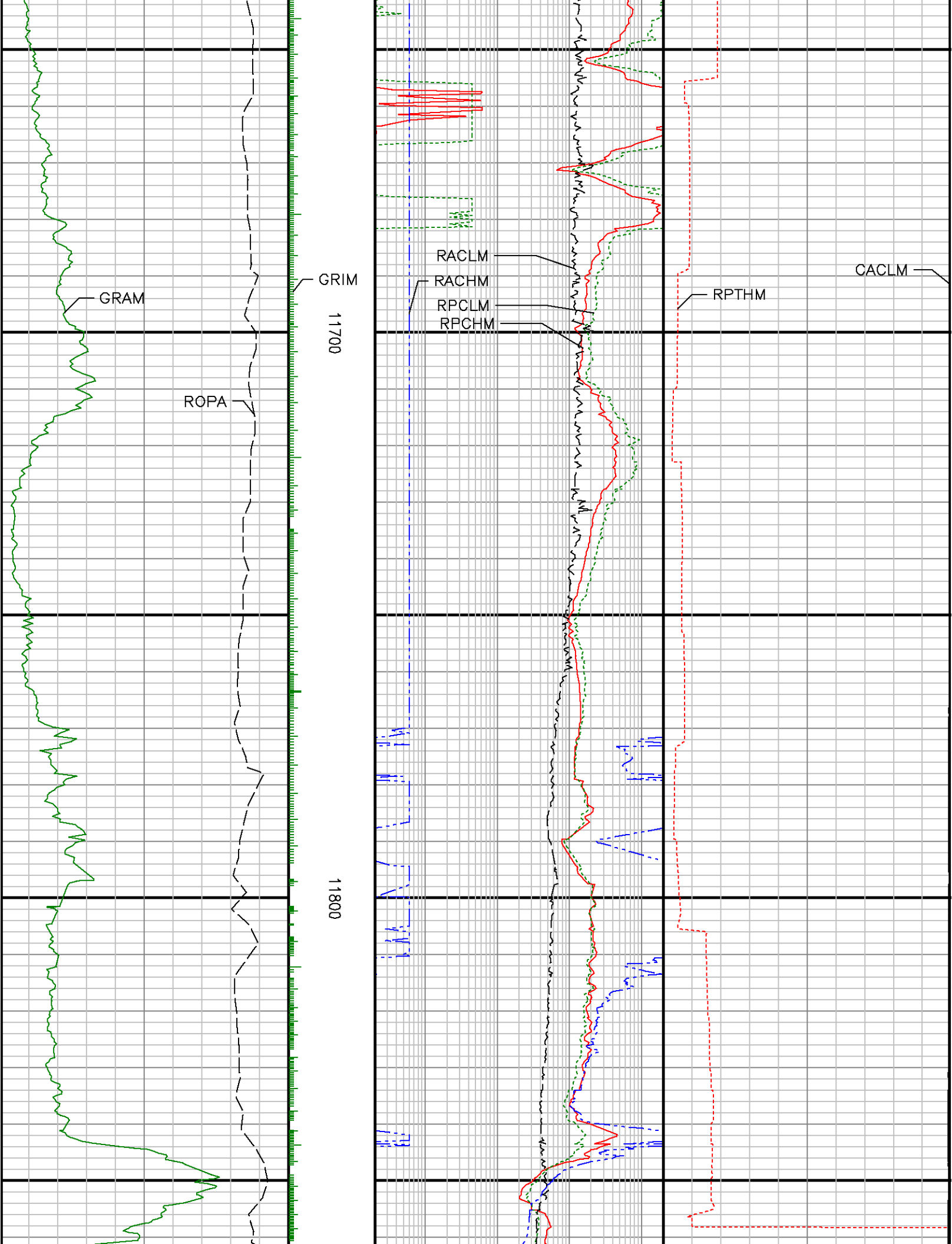


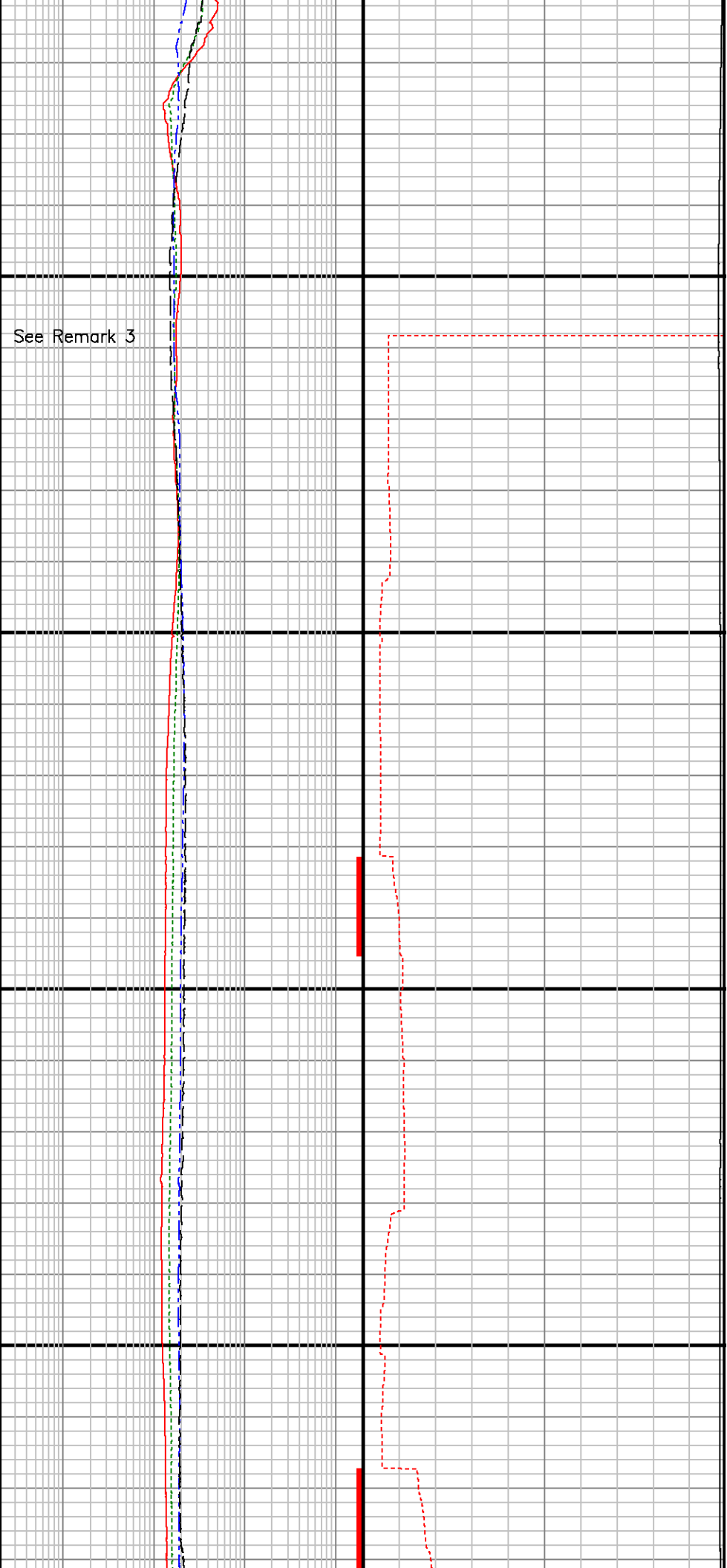


11500

11600





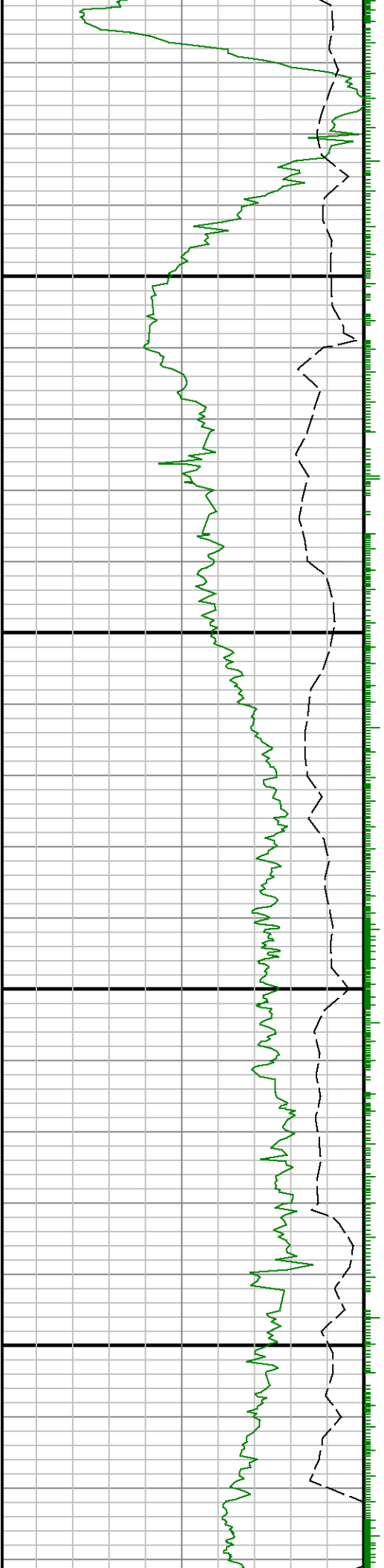


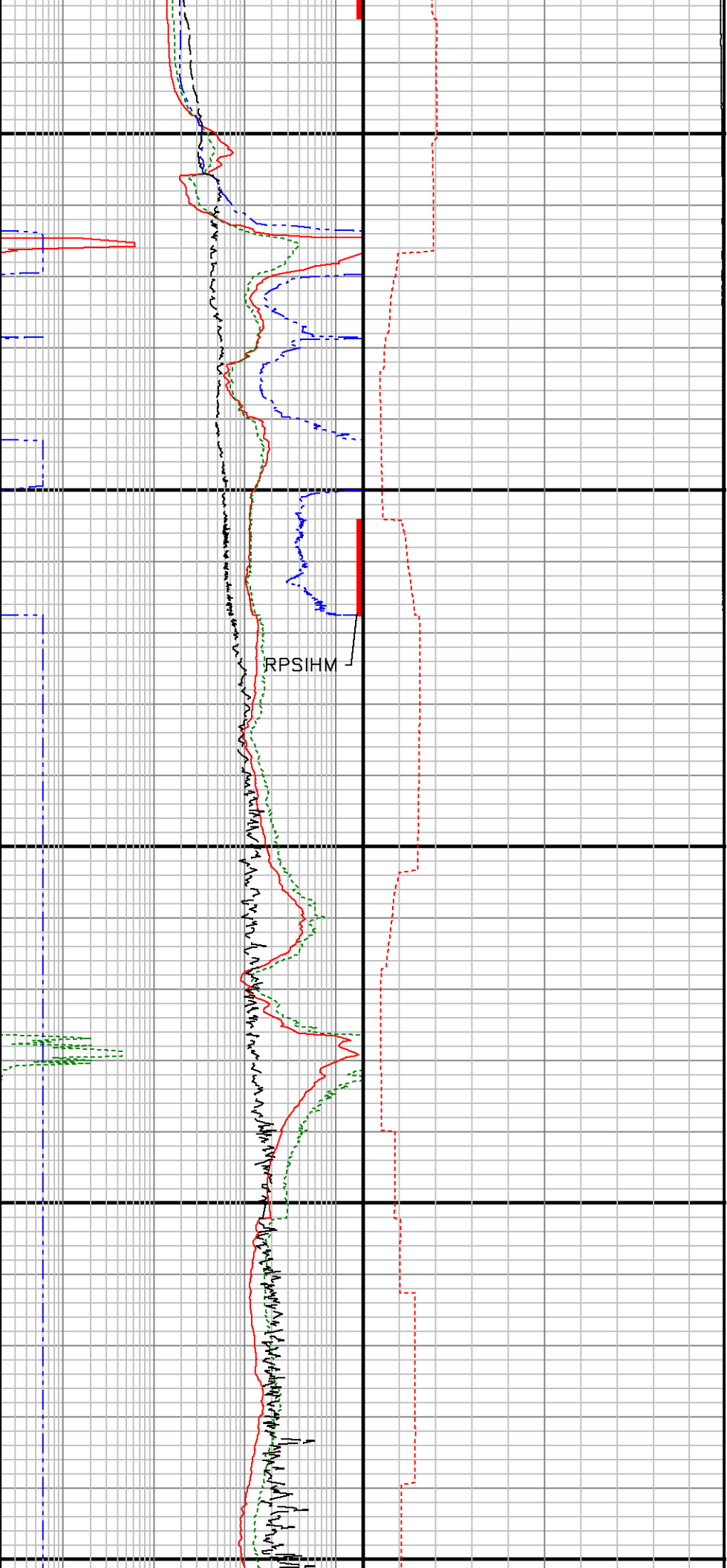
See Remark 3

Run 3 \diamond Run 4

11900

12000





12100

12200

12300

