



LWD MEMORY LOG

Gamma Ray

Scale:		Company: Verdad Oil & Gas				
1:1200 MD		Well: BRNAK 01N-64W-10-3H				
Depth Reference:		Field: Weld County		Country: United States		
Driller's Depth		County: Weld County		Block: BRNAK 01N-64W		
Status:	Surface Location:			Other Services:		
Final Print		Latitude:		Directional		
API No: 05-123-44997		Longitude:				
Job ID: 8704561						
Permanent Datum (P.D.): Ground Level		Elevation: 5104.00 ft		Elev. KB: N/A		
Log Measured From: Rig Floor		Above P.D. 16.00 ft		Elev. DF: 5120.00 ft		
				Elev. GL: 5104.00 ft		
Dates	Interval Logged		Magnetic Field Reference			
Date From: 2017-08-11	Top: (ft) 1734.00		Azi Reference North: True			
Date To: 2017-09-01	Bottom: (ft) 17396.00		Total Magnetic Field Strength: (nT) 52213			
Spud Date: 2017-08-10			Mag to Reference North Correction: (deg) 8.22 E			
Borehole Record			Casing Record			
Hole Size (in)	From (ft)	To (ft)	Size (in)	Weight (lb/ft)	From (ft)	To (ft)
13.500	16.00	1763.00	9.625	36.00	16.00	1734.00
8.500	1763.00	17396.00				
Mud Record						
Type	From (ft)	To (ft)	Hole Size (in)	Interval (ft)	Inc Az (Start)	Inc Az (End)
Diesel-Oil Based Mud	0.00	17397.20	13.500	1683.22	0.44 266.41	9.44 327.84
			8.500	15663.20	9.11 326.89	90.83 183.40
Acquisition System						
Baker Hughes Cadence	Software Version RT4.1		Rig: Xtreme 20	Other		
Plot Studio	4.1.7763.3		Contractor: Xtreme Drilling	Unit: D&E		
			District: RMA			

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Log Run Summary

Run No	Bit Run No.	Bit Size (in)	Bit Type	Bit Gauge Length (in)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time		Circ. Hours (h)
						Top	Bottom	From	To	Start Logging	End Logging	
						(ft)	(ft)	(ft)	(ft)			
2	2	8.500	PDC	3.00	AutoTrak Curve	17.00	6861.00	1734.00	6874.00	2017-08-29 10:55	2017-08-30 03:44	16.00
3	2	8.500	PDC	3.00	AutoTrak Curve	6861.00	17383.00	6874.00	17396.00	2017-08-30 14:31	2017-09-02 03:59	59.94

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Eugene Igwe	2017-08-30	2017-09-02	Garrett Gerdson	2017-08-30	2017-09-02			

Mud Properties Record

Date / Time	Run No.	Measured Depth (ft)	Mud Type	Density (ppg)	Viscosity (cP)	pH	Fluid Loss (cm3)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
2017-08-29 05:30	2	1763.00	Diesel-Oil Based Mud	9.7	76	N/A	8.0	62/38	Active Pit	40000	0.00
2017-08-29 17:30	2	3670.00	Diesel-Oil Based Mud	9.5	62	N/A	7.5	63/37	Active Pit	39500	0.00
2017-08-30 05:30	2	6874.00	Diesel-Oil Based Mud	9.9	65	N/A	7.5	63/37	Active Pit	40000	0.00
2017-08-30 17:30	3	7079.00	Diesel-Oil Based Mud	9.9	68	N/A	7.5	63/37	Active Pit	39000	0.00
2017-08-31 05:30	3	9023.00	Diesel-Oil Based Mud	10.1	68	N/A	7.5	63/37	Active Pit	42000	0.00
2017-08-31 17:30	3	11060.00	Diesel-Oil Based Mud	10.1	75	N/A	8.0	61/39	Active Pit	41500	0.00
2017-09-01 05:30	3	13460.00	Diesel-Oil Based Mud	10.1	76	N/A	8.0	61/39	Active Pit	45000	0.00
2017-09-02 05:30	3	17396.00	Diesel-Oil Based Mud	10.1	74	N/A	7.0	61/39	Active Pit	43500	0.00

Equipment and Service Data

Run No.	Tool	Serial Number	Measurement	Sensor Offset (ft)	Bit Offset (ft)	Max O.D. (in)	Min I.D. (in)
2	ATC_SU	14236914	Near Bit VSS	5.93	6.70	6.750	4.330
2	ATC_SU	14236914	Near Bit Inclination	5.93	6.70	6.750	4.330
2	ATC_MWD	14146739	Gamma (single)	2.73	12.84	6.750	3.250
2	ATC_MWD	14146739	Directional (mag)	12.26	22.37	6.750	3.250
3	ATC_SU	14236914	Near Bit VSS	5.93	6.70	6.750	4.330
3	ATC_SU	14236914	Near Bit Inclination	5.93	6.70	6.750	4.330
3	ATC_MWD	14146739	Gamma (single)	2.73	12.84	6.750	3.250
3	ATC_MWD	14146739	Directional (mag)	12.26	22.37	6.750	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
ATC_SU	ATC_SU	Auto Trak Curve Steering Unit
ATC_MWD	ATC_MWD	Auto Trak Curve MWD
ATC_LCPM	ATC_LCPM	Auto Trak Curve LCPM

Comments


1	Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.
2	Baker Hughes LWD Runs 2 and 3 utilized 6 3/4 inch Navigamma services (Gamma Ray and Directional) behind an 8 1/2 inch bit and rotary steerable assembly from 1734 to 17396 feet MD (1721 to 7265 feet TVD).

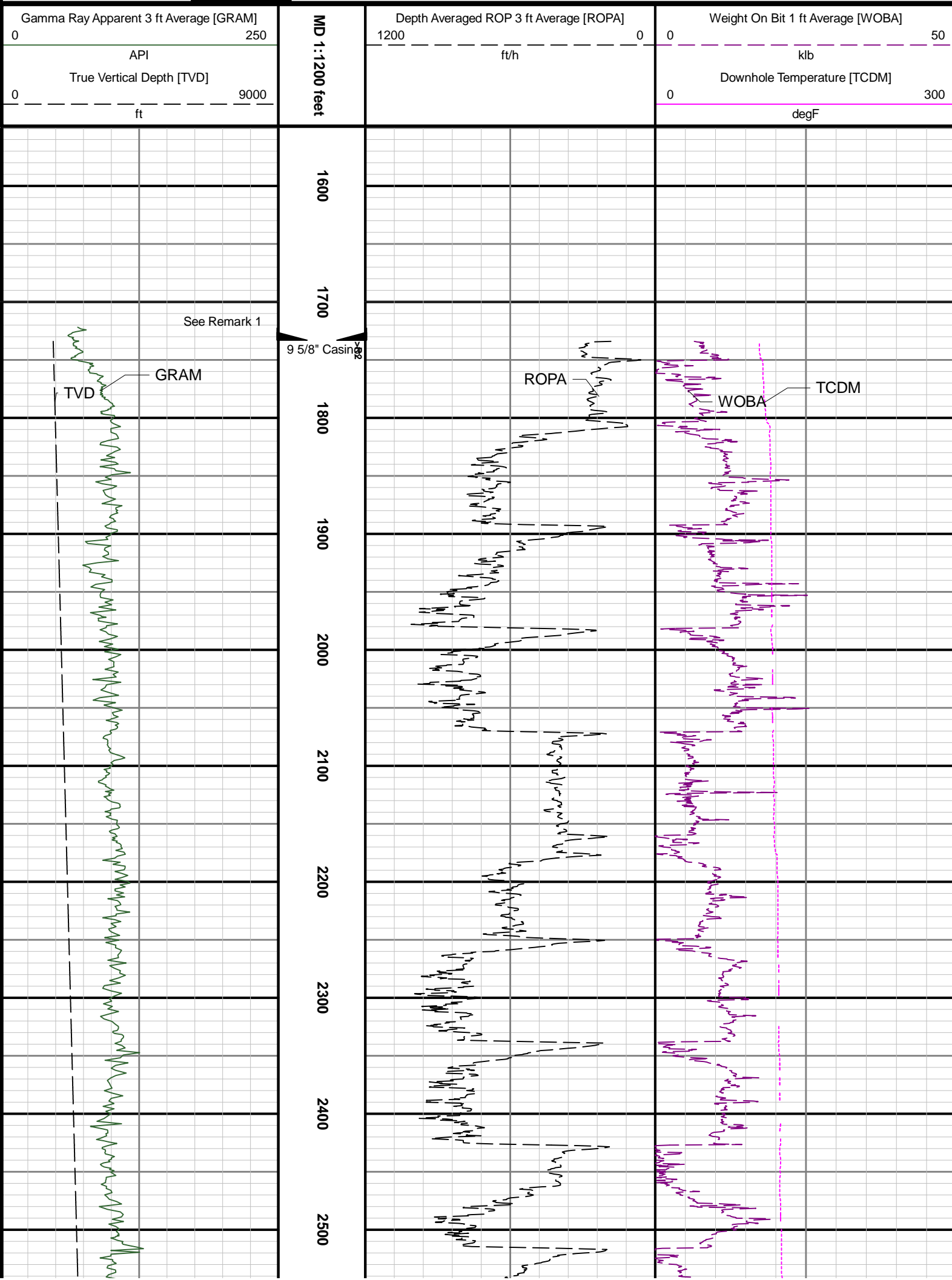
Remarks

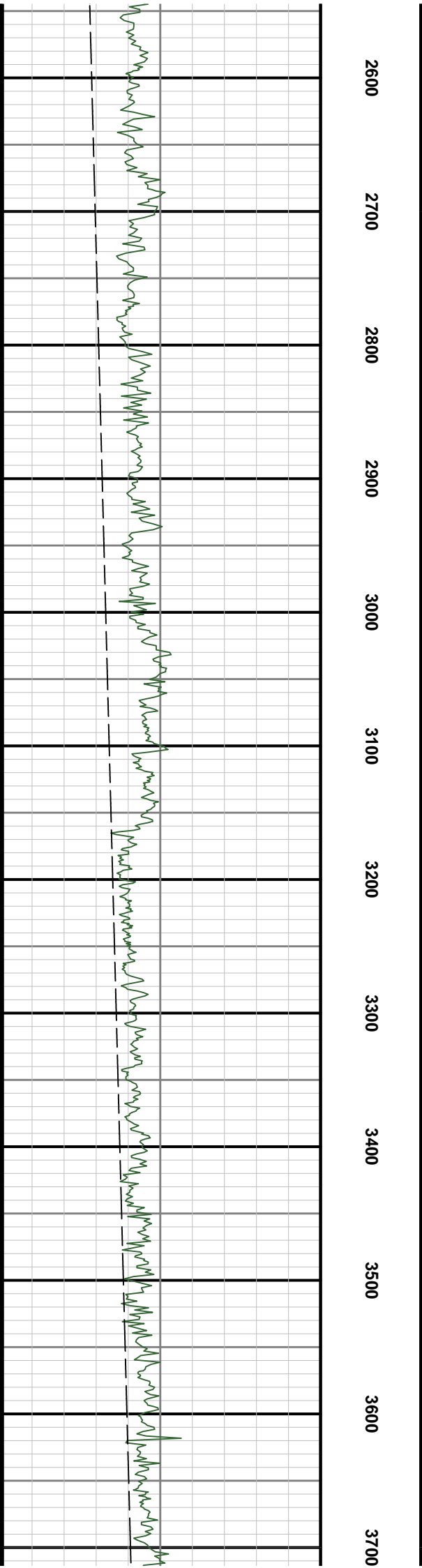
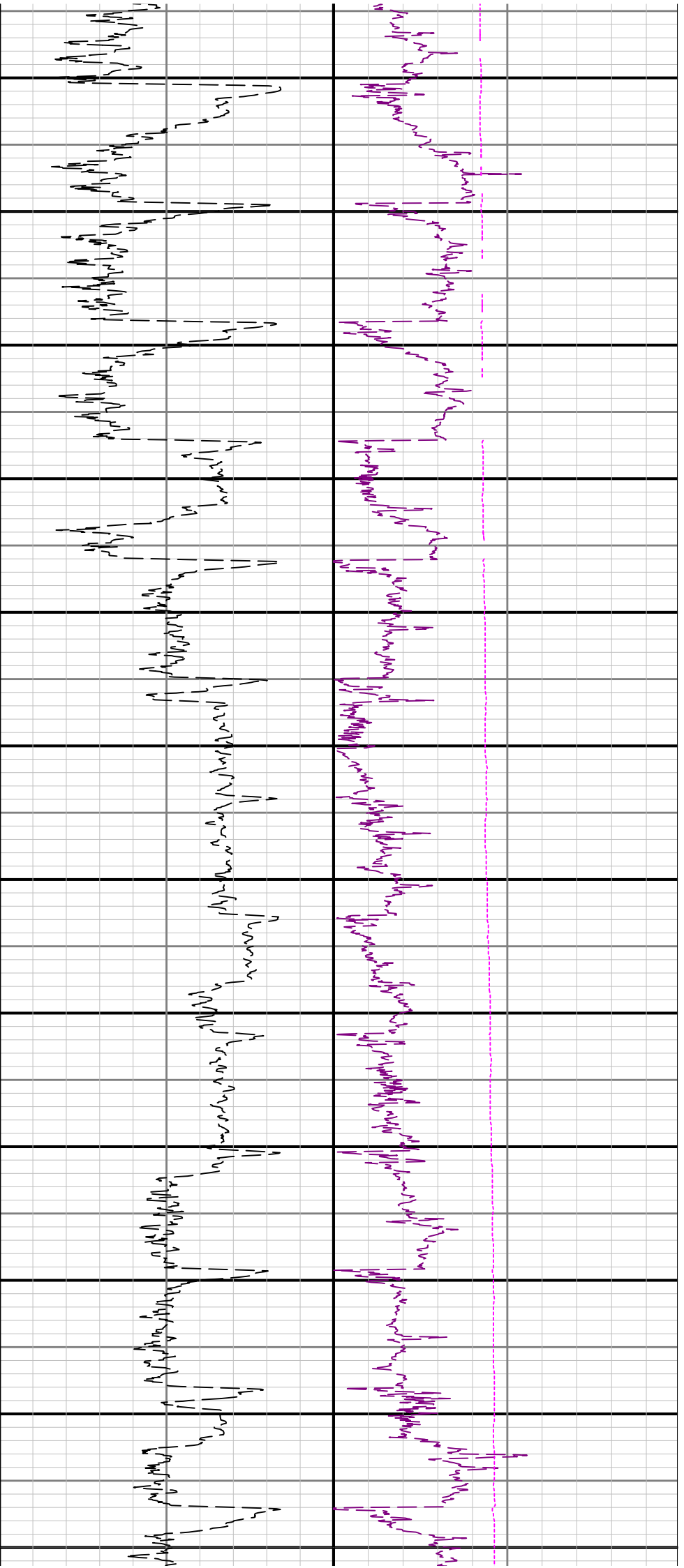
Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	1734.00	8.500	2	Baker Hughes LWD began logging services at 1734 feet MD (1721 feet TVD) per client request.
2	6865.00	8.500	3	The interval from 6861 to 6874 feet MD (6821 to 6833 feet TVD) was logged up to 11 hours after drilling due to tripping for a new AutoTrak Curve tool failure.
3	17385.00	8.500	3	The interval from 17383 to 17396 feet MD (7265 feet TVD) was not logged due to sensor to bit offset at well TD.

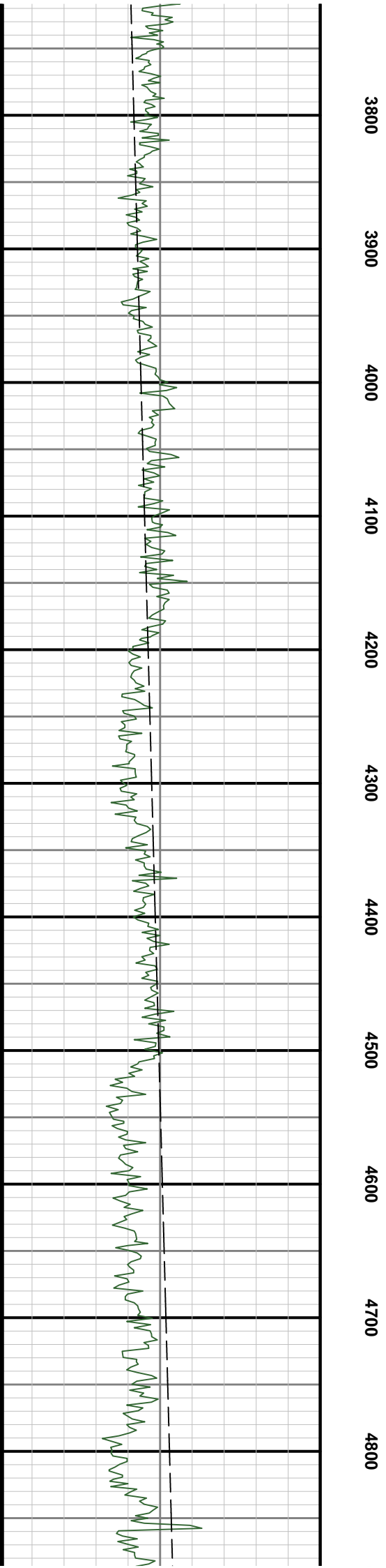
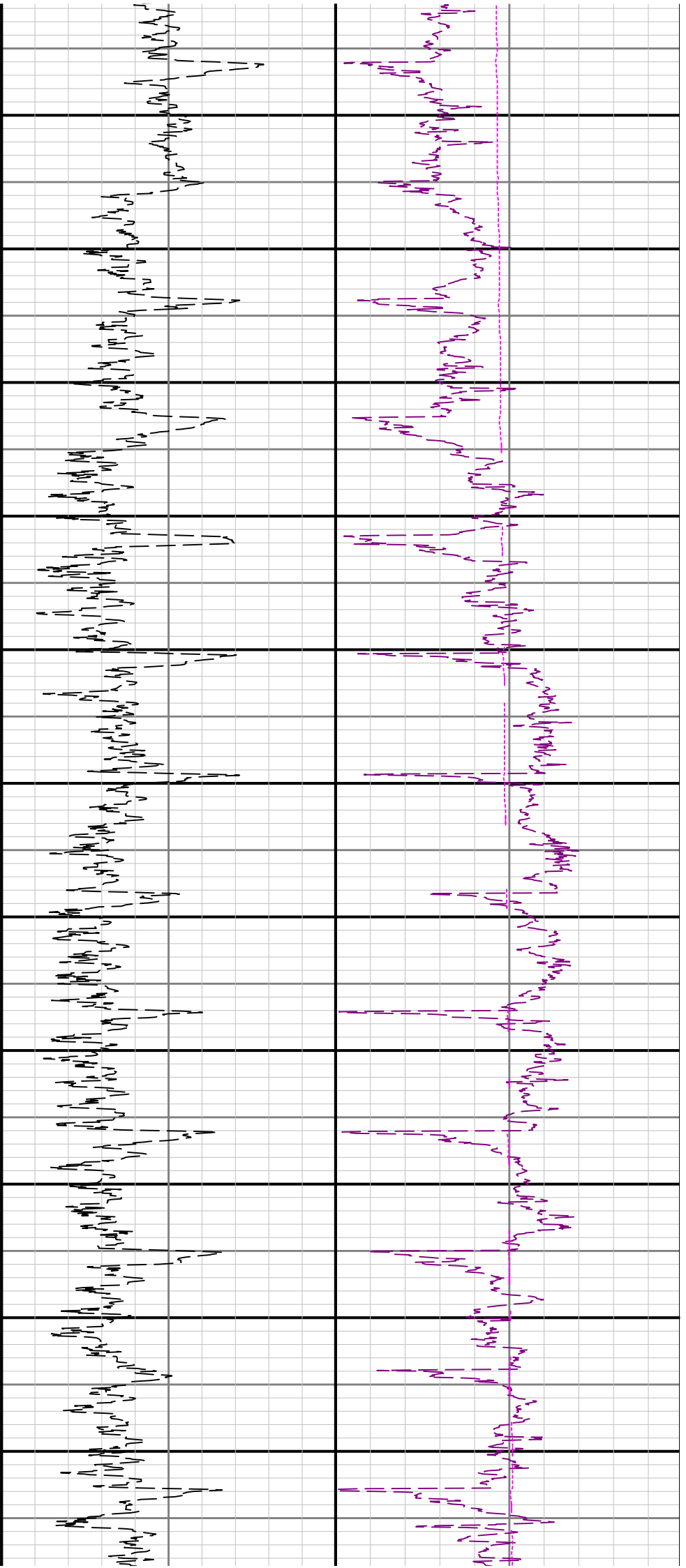
Curve Mnemonics

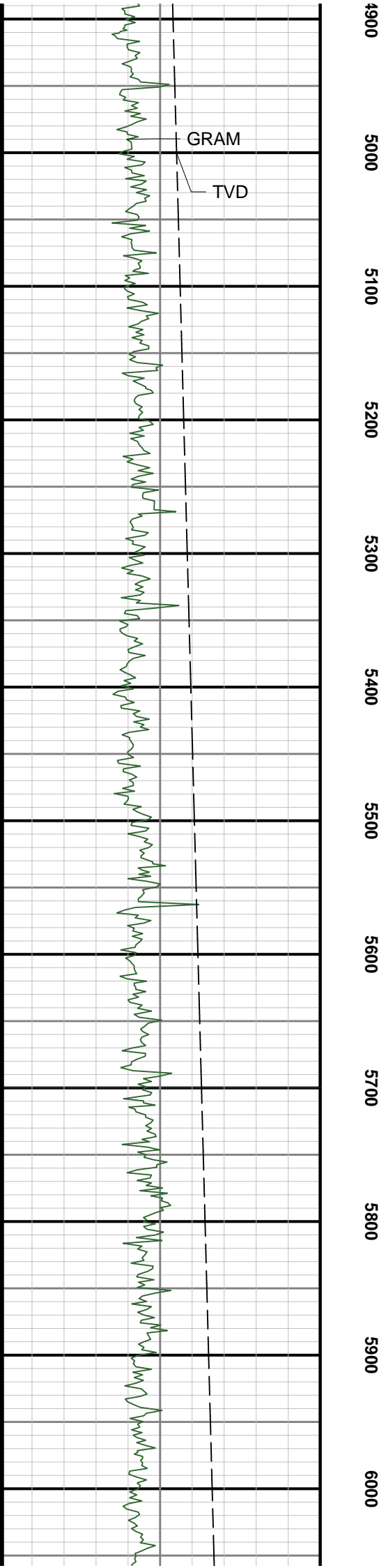
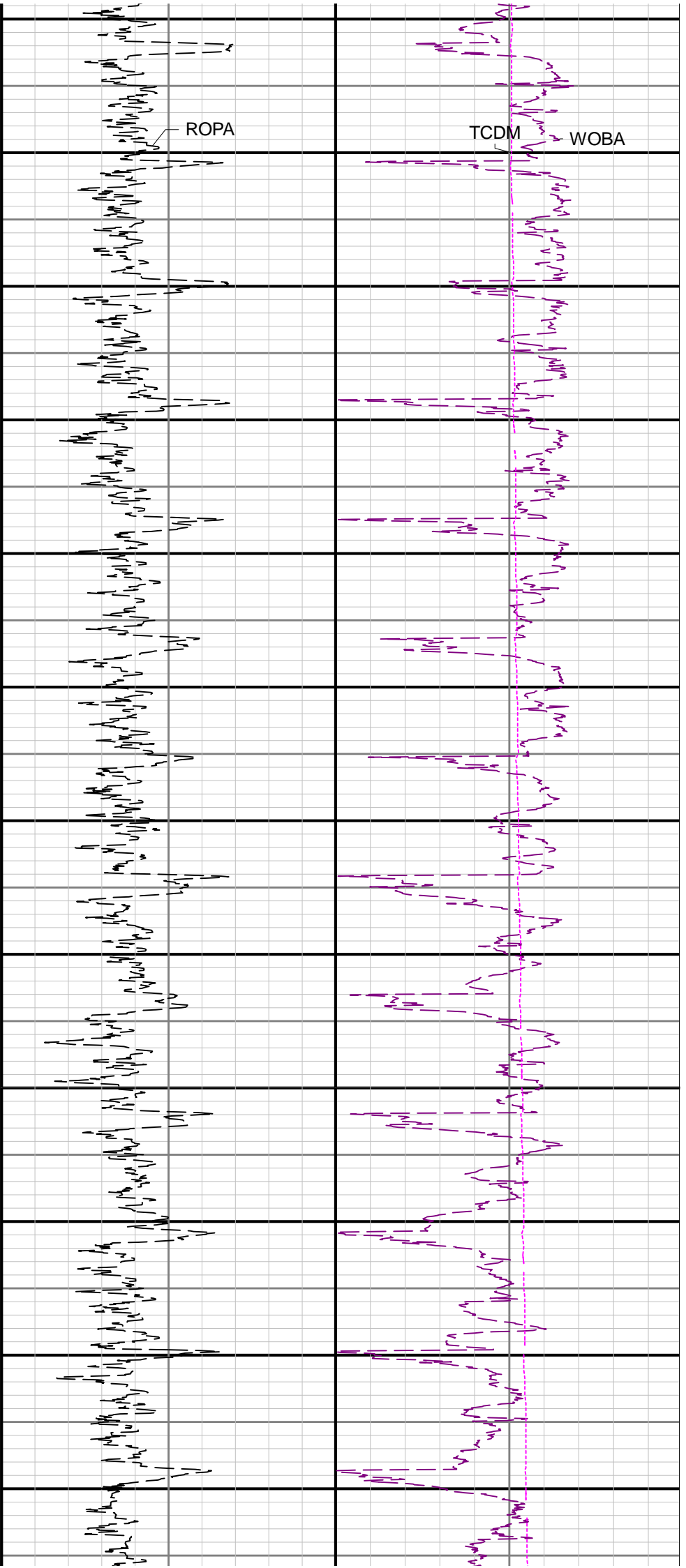
Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	True Vertical Depth	ft
WOBA	Weight On Bit, Average 1 ft Average	klb
GRAM	OnTrak - Gamma Ray - Apparent - Memory 3 ft Average	API
TCDM	Downhole Temperature	degF

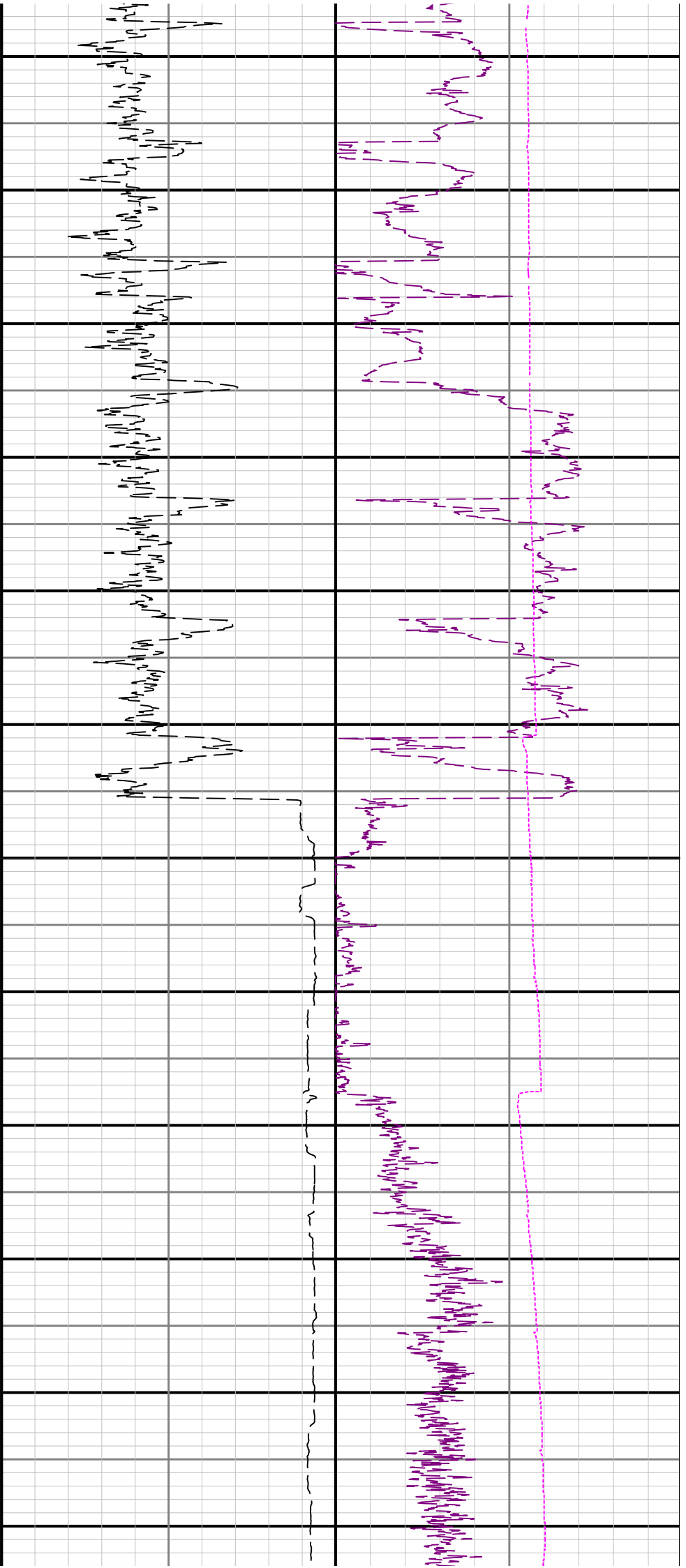
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	Well BRNAK 01N-64W-10-3H







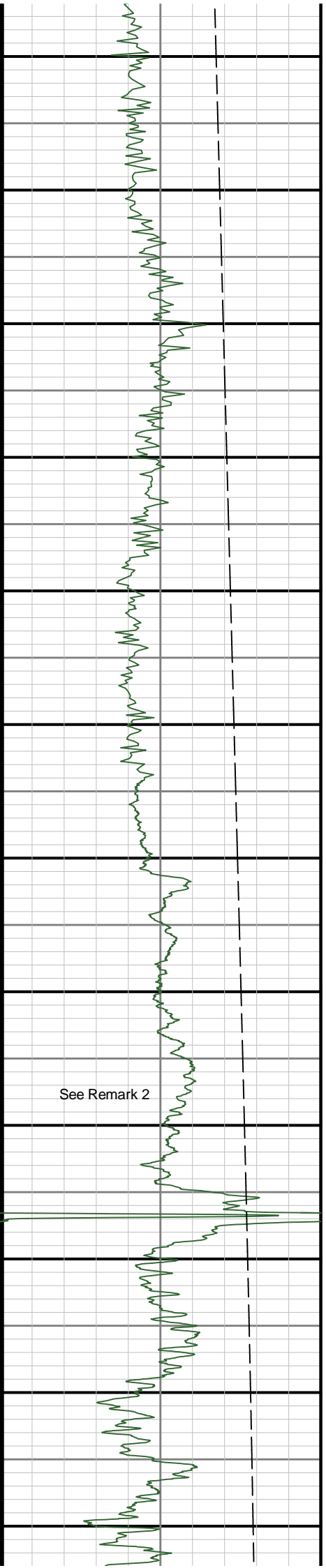


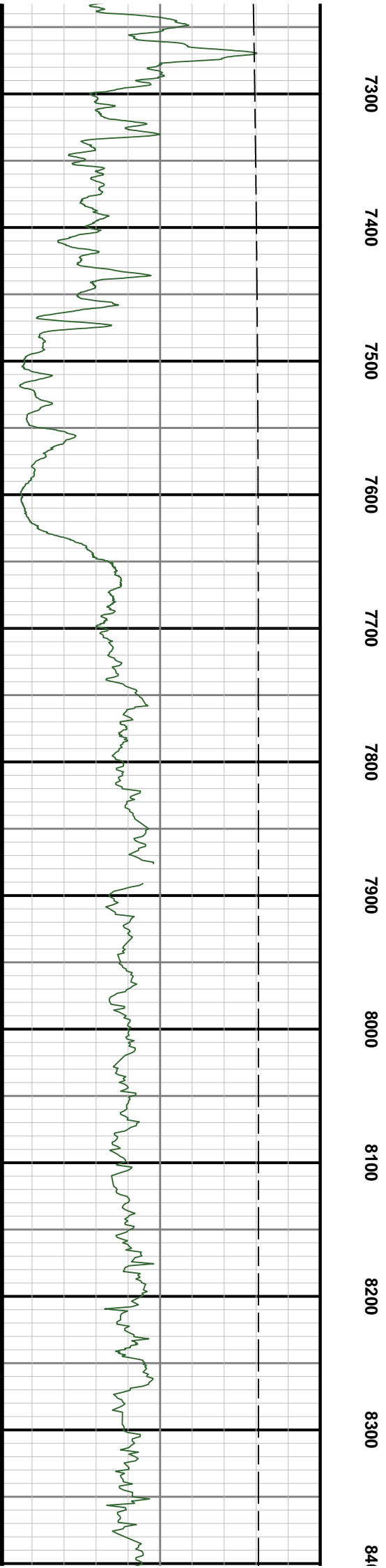
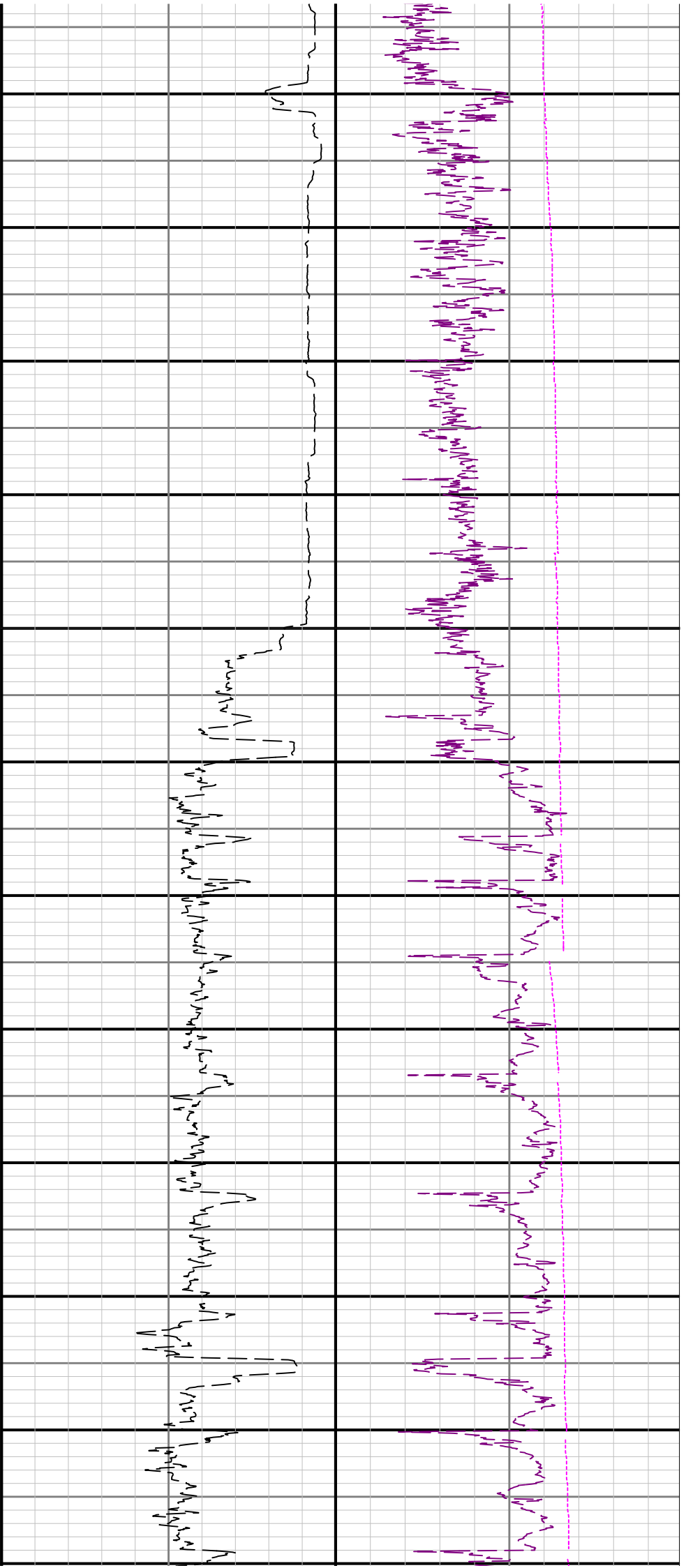


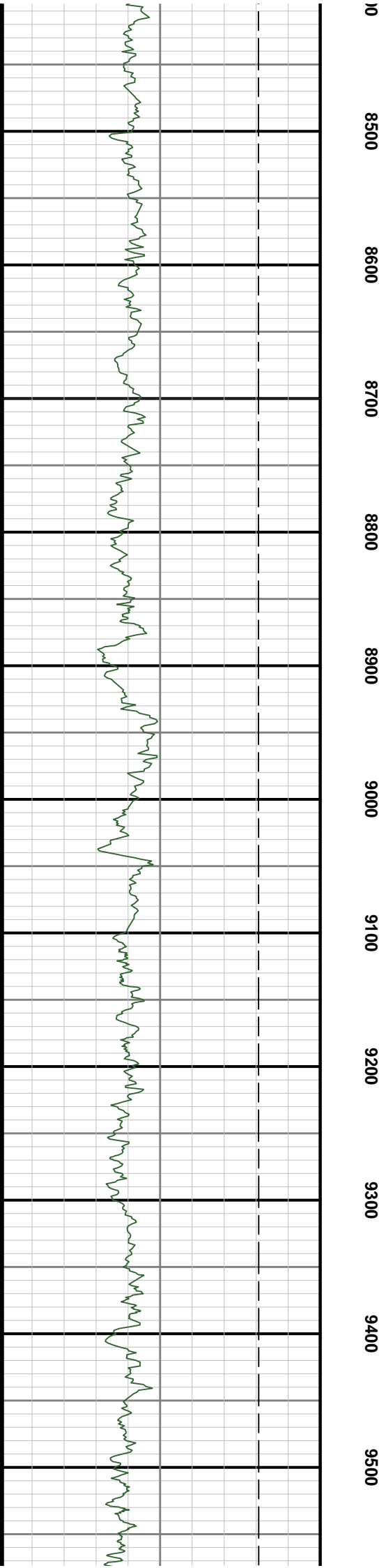
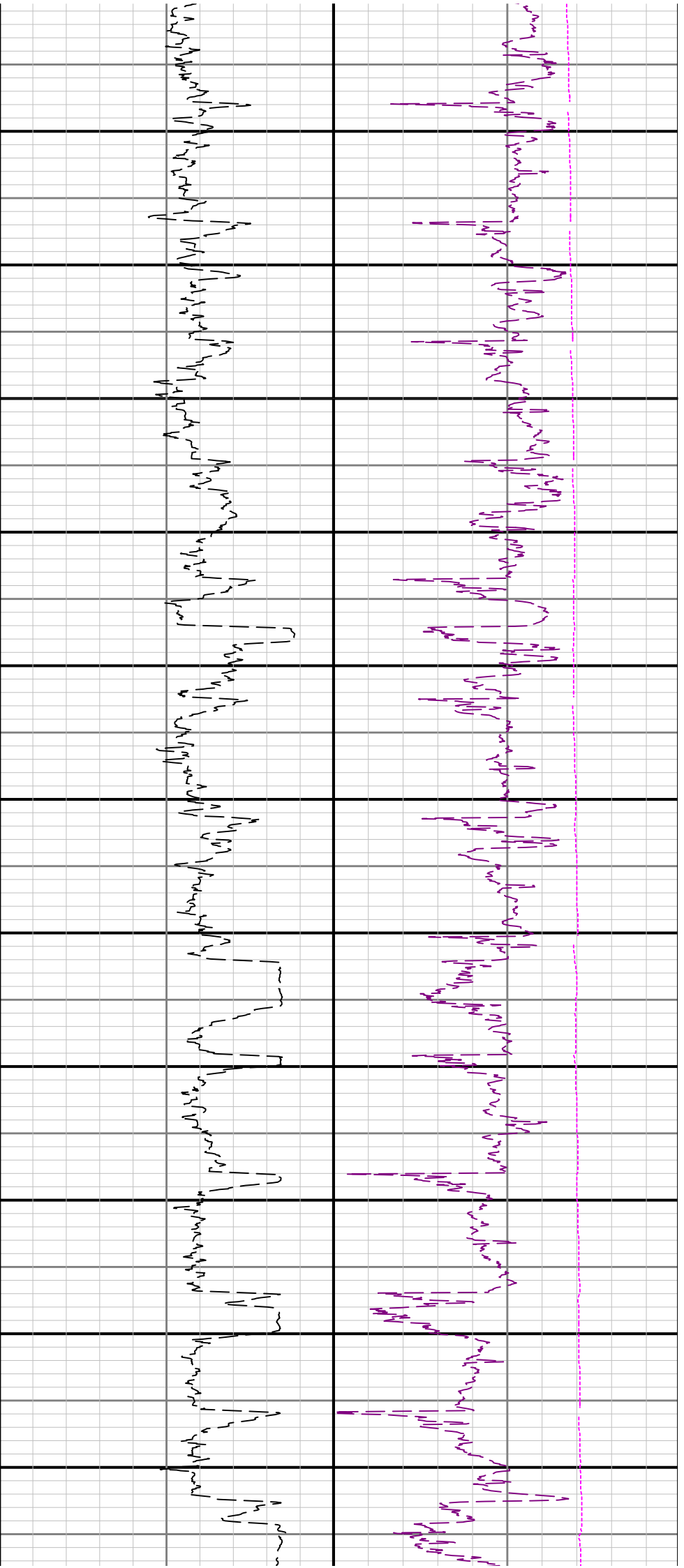
R2 > R3

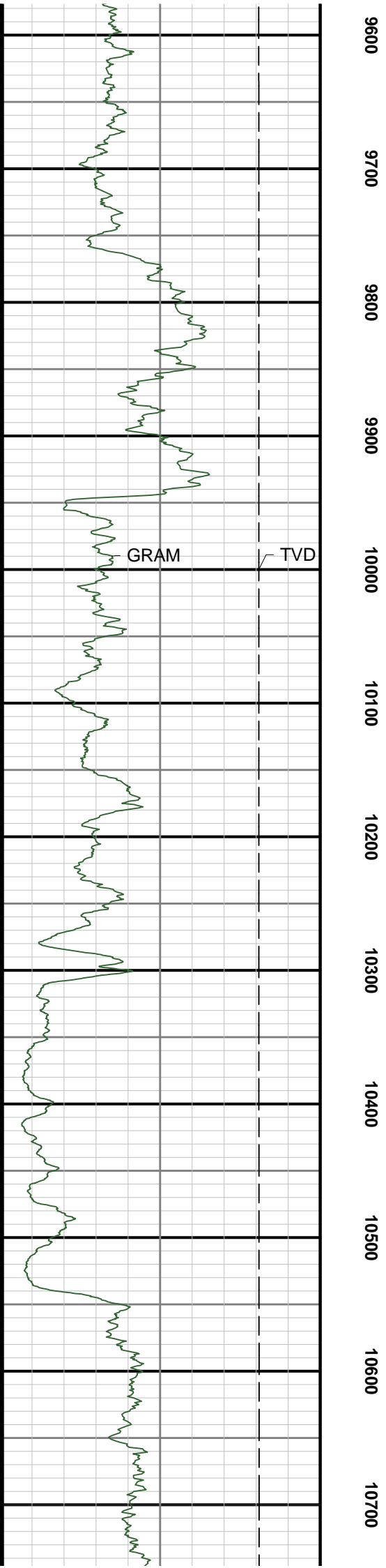
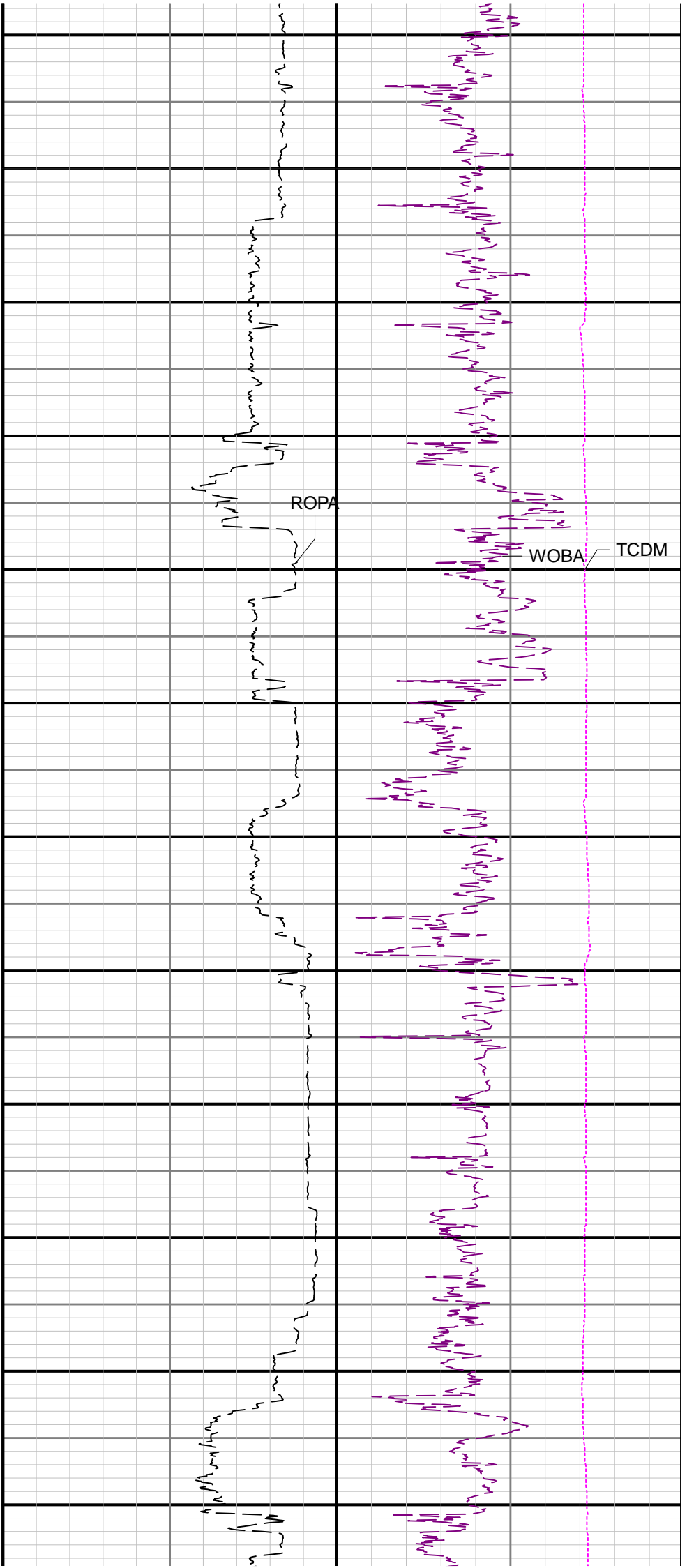
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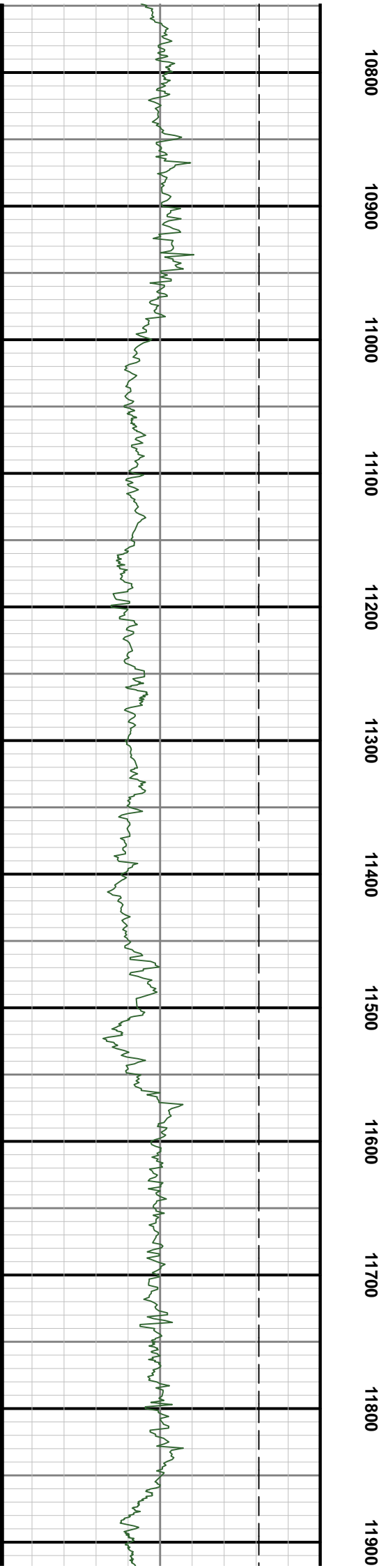
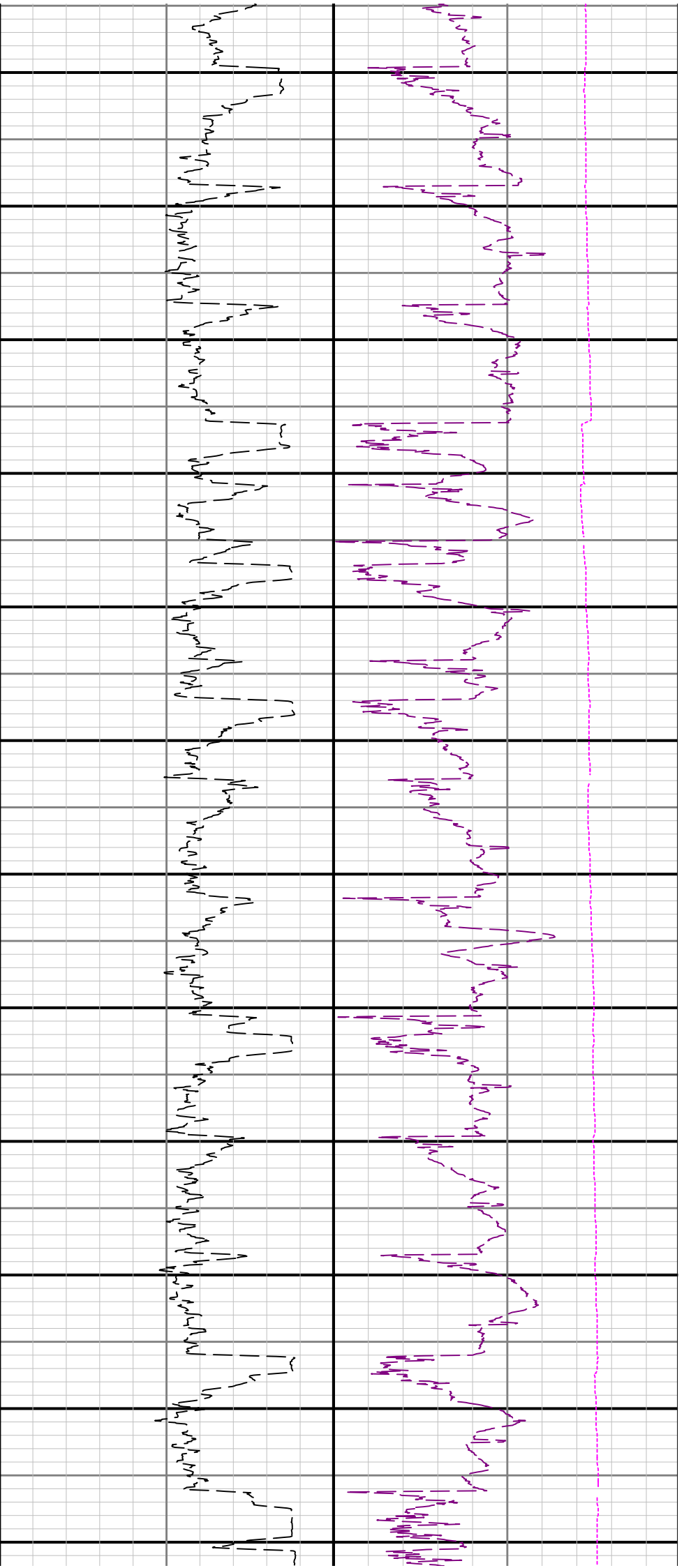
See Remark 2

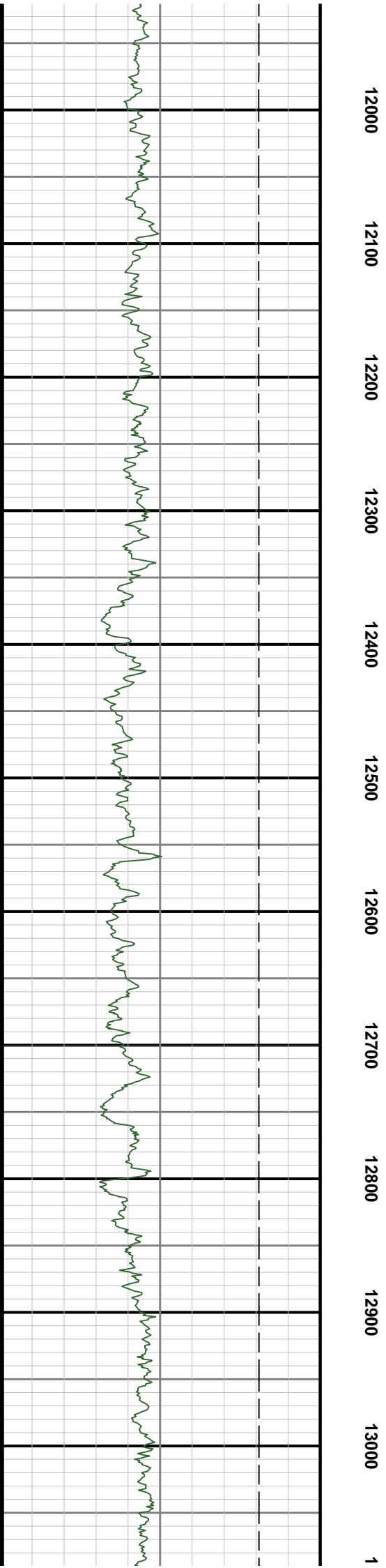
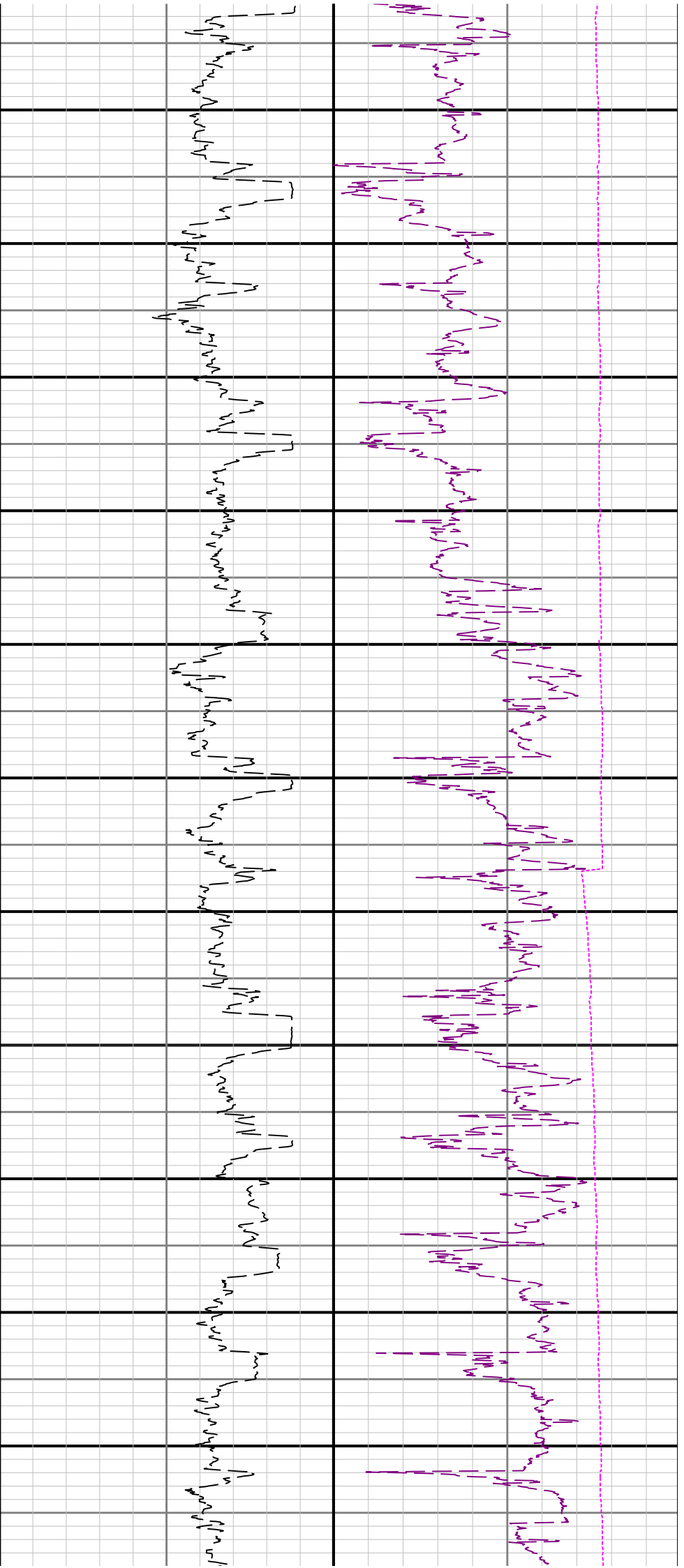


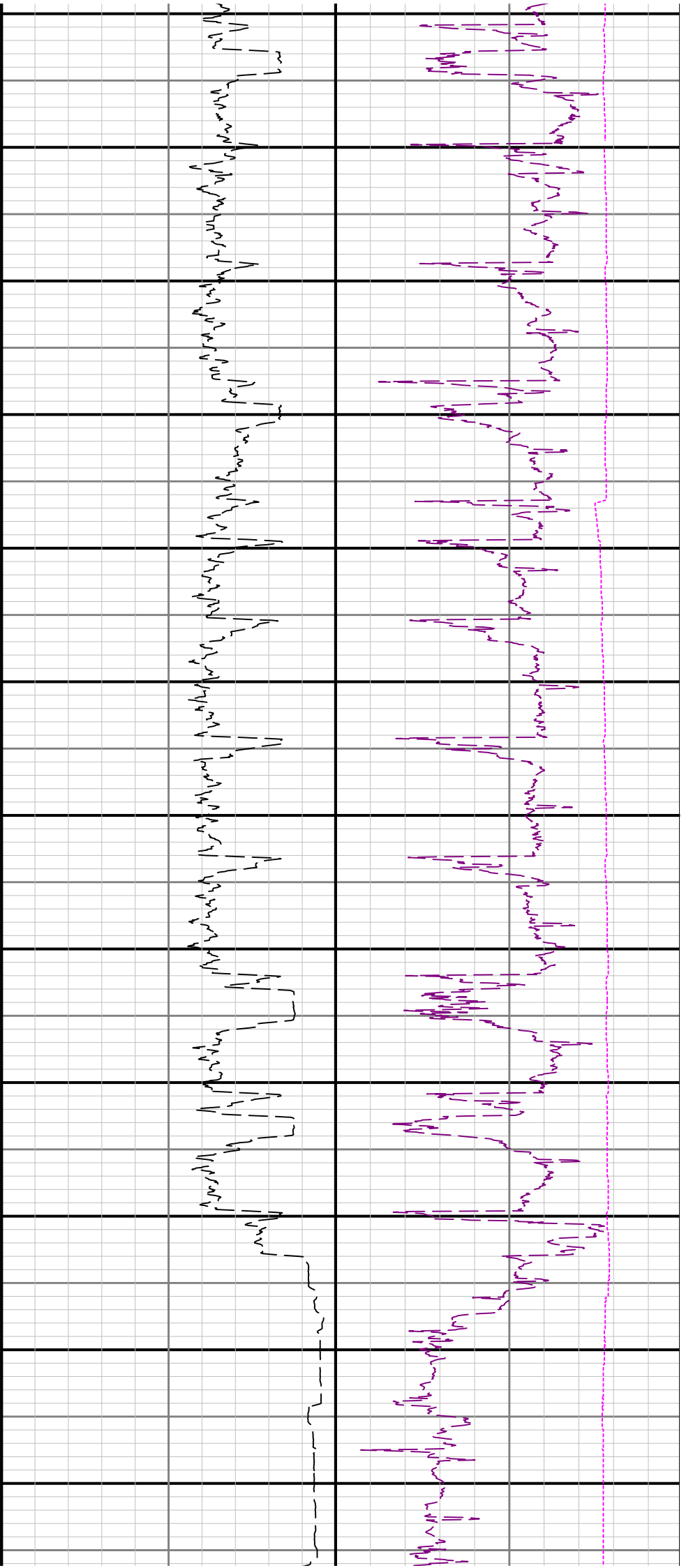




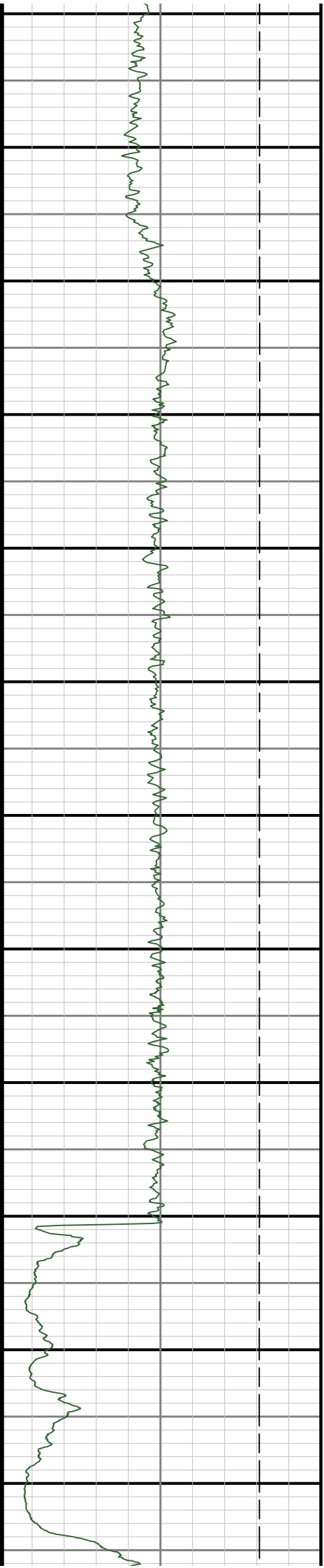


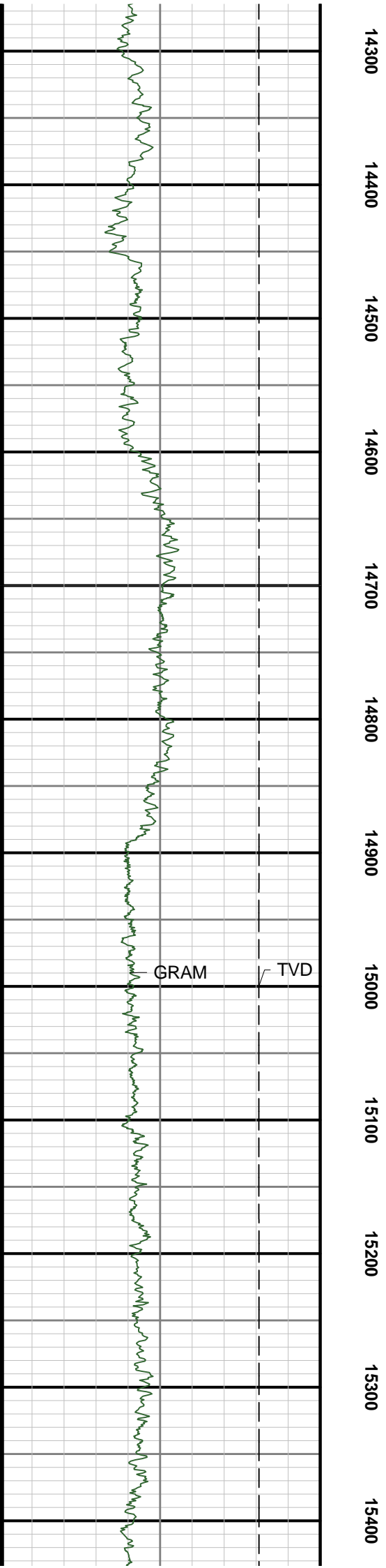
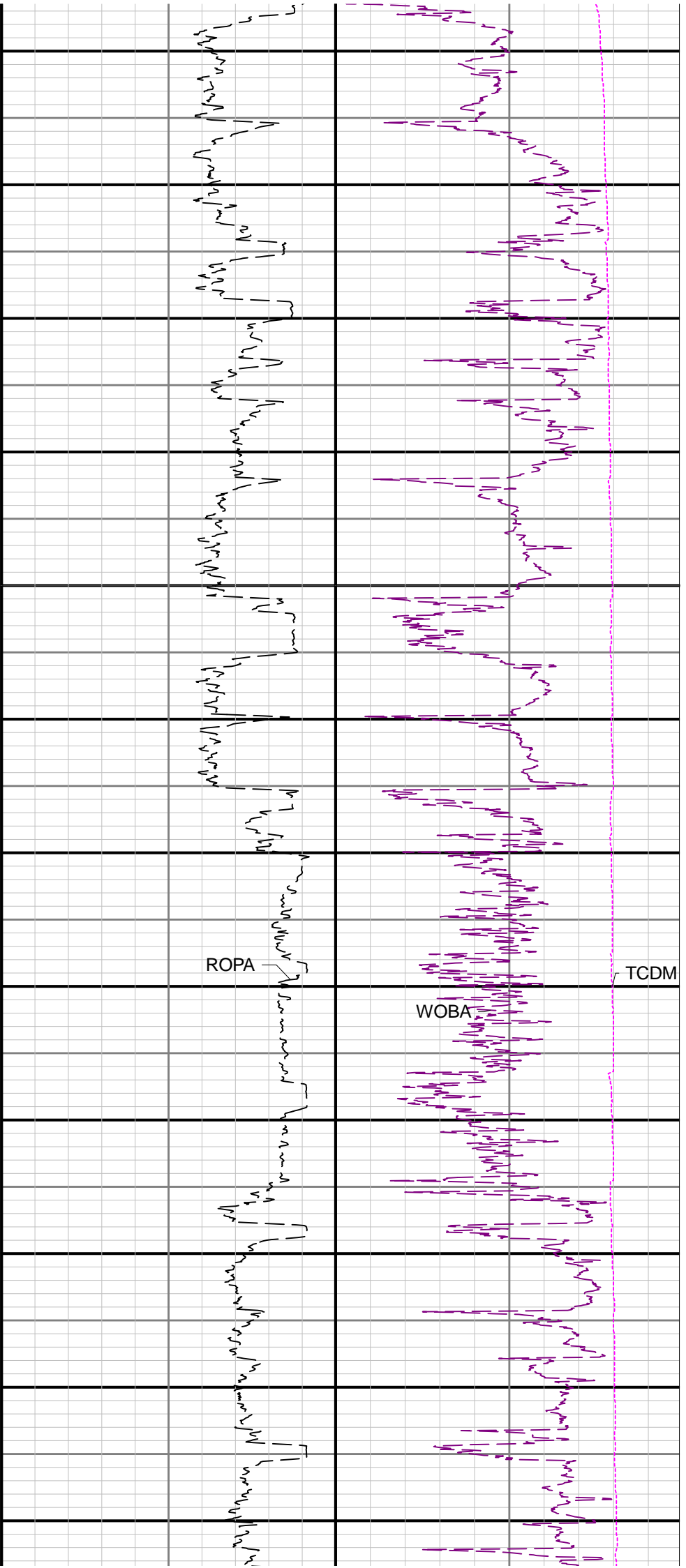


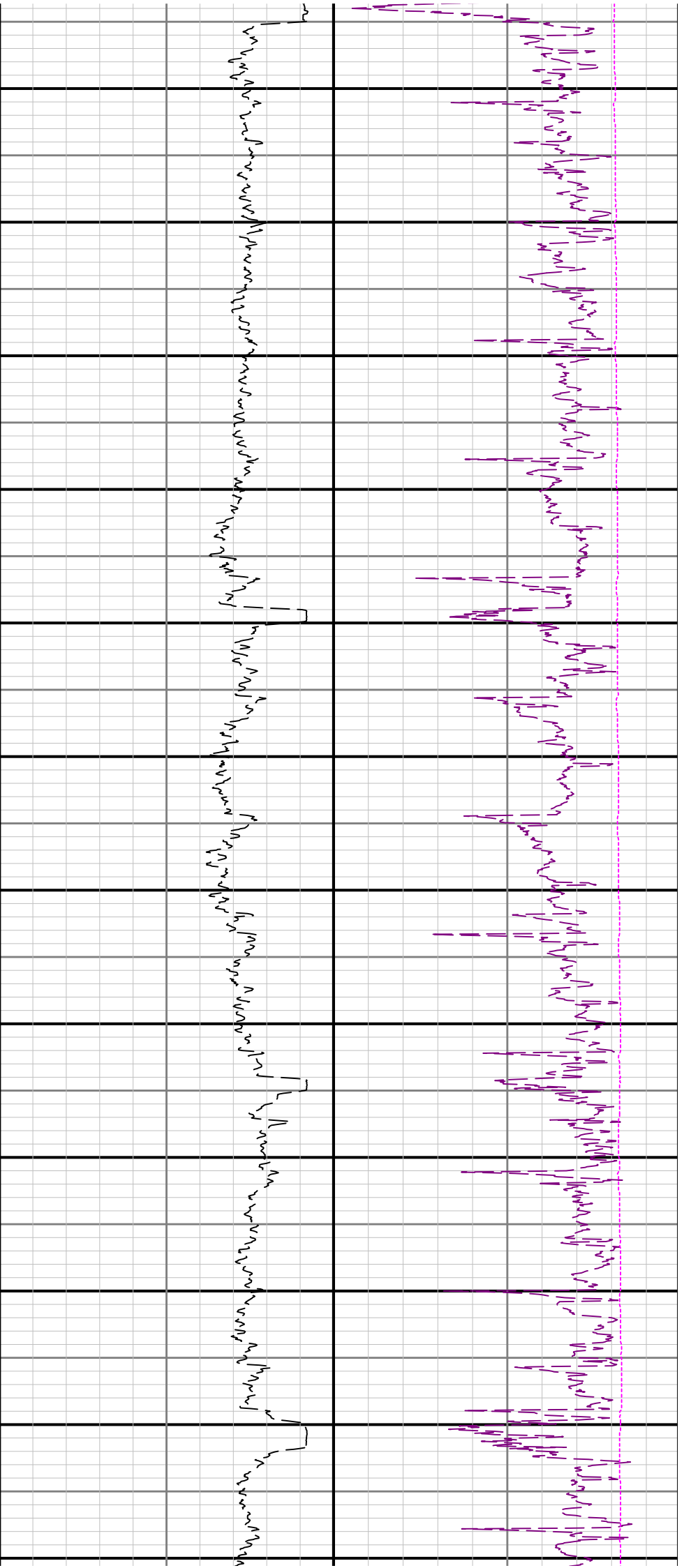




3100 13200 13300 13400 13500 13600 13700 13800 13900 14000 14100 14200







15500 15600 15700 15800 15900 16000 16100 16200 16300 16400 16500 16600

