



LWD MEMORY LOG

Gamma Ray
Azimuthal Gamma Ray

Company: Bonanza Creek Oil Company

Well: State Antelope T34-2-14XRLNB

Field: Weld County

County: Weld Country: United States

State: Colorado

Surface Location: Other Services:

Final Print

Latitude: 040° 25' 18.314" N

Longitude: 104° 17' 00.584" W

SEC: 11 TWN: 5N RGE: 62W

Directional

API No: 05-123-46745-00

Job ID: 1093332029

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

Elevation: 0.00 ft

Elev. KB: 4653.00 ft

Elev. DF: 4636.00 ft

Log Measured From: Rig Floor

Above P.D.

Elev. GL: 4636.00 ft

Dates Interval Drilled

Magnetic Field Reference

Date From: 2018-07-30 Top: (ft) 17.00

Azi Reference North: True Dip Angle: (deg) 66.90

Date To: 2018-08-18 Bottom: (ft) 17375.00

Total Magnetic Field Strength: (nT) 52383

Spud Date: 2018-07-30

Mag to Reference North Correction: (deg) 8.00

Borehole Record

Casing Record

Hole Size (in)	From (ft)	To (ft)	Size (in)	Weight (lb/ft)	From (ft)	To (ft)
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13.500	17.00	1634.00	9.625	36.00	17.00	1623.00
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8.500	1634.00	17375.00				
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Mud Record

Deviation Record

Type	From (ft)	To (ft)	Hole Size (in)	Interval (ft)	Inc Az (Start)	Inc Az (End)
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Water Based Mud	17.00	1634.00	13.500	1617.00	1.00 288.31	11.55 337.22
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Oil Based Mud	1634.00	17375.00	8.500	15741.00	11.55 337.22	89.91 181.37
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Acquisition System

Software Version

Other

Baker Hughes Cadence

RT 4.2

Plot Studio

4.2.8155.1

Rig: Xtreme 19

Contractor: Xtreme Drilling

District: RMA

Unit: D&E

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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 (ft)	Bottom (ft)	From (ft)	To (ft)	Start Logging	End Logging	
1	1	13.500	PDC	4.00	Steerable	0.00	0.00	17.00	1634.00	N/A	N/A	6.21
2	2	8.500	PDC	4.00	Rotary Steerable	5000.00	6054.00	1634.00	6067.00	2018-08-14 16:12	2018-08-14 23:25	21.40
3	3	8.500	PDC	4.00	Rotary Steerable	6054.00	17362.00	6067.00	17375.00	2018-08-15 08:42	2018-08-18 00:54	62.14

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Alex Robinson	2018-07-30	2018-07-31	Steve Bueghly	2018-08-12	2018-08-18			

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+ (%)
2018-07-30 11:33	1	17.00	Water Based Mud	8.8	1	8	0.0	0/100	Active Pit	900	0.00
2018-08-13 07:00	2	1634.00	Oil Based Mud	8.6	7	N/A	0.0	80/12	Active Pit	31000	0.00
2018-08-14 17:00	2	5139.00	Oil Based Mud	8.7	7	N/A	0.0	80/12	Active Pit	31000	0.00
2018-08-15 23:00	3	8519.00	Oil Based Mud	9.4	10	N/A	0.0	74/14	Active Pit	30000	0.00
2018-08-16 20:30	3	11924.00	Oil Based Mud	9.3	10	N/A	0.0	74/15	Active Pit	30000	0.00
2018-08-17 19:00	3	16442.00	Oil Based Mud	9.5	10	N/A	0.0	73/15	Active Pit	30000	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)
1	NaviTrak	10341483	VSS	14.98	50.96	8.000	0.000
1	NaviTrak	10341483	Directional (mag)	14.98	50.96	8.000	0.000
2	ATC_SU	14279932	Near Bit Inclination	5.93	6.93	7.000	4.330
2	ATC_SU	14279932	Near Bit VSS	5.93	6.93	7.000	4.330
2	ATC_MWD	14322612	Gamma (single)	2.73	13.10	7.000	3.250
2	ATC_MWD	14322612	Directional (mag)	12.27	22.64	7.000	3.250
3	ATC_SU	14178992	Near Bit Inclination	5.93	6.93	7.000	4.330
3	ATC_SU	14178992	Near Bit VSS	5.93	6.93	7.000	4.330
3	ATC_MWD	14452425	Gamma (single)	2.73	13.10	7.000	3.250
3	ATC_MWD	14452425	Directional (mag)	12.27	22.64	7.000	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
NTK	NaviTrak	Probe Based Directional Module, NaviTrak Platform
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

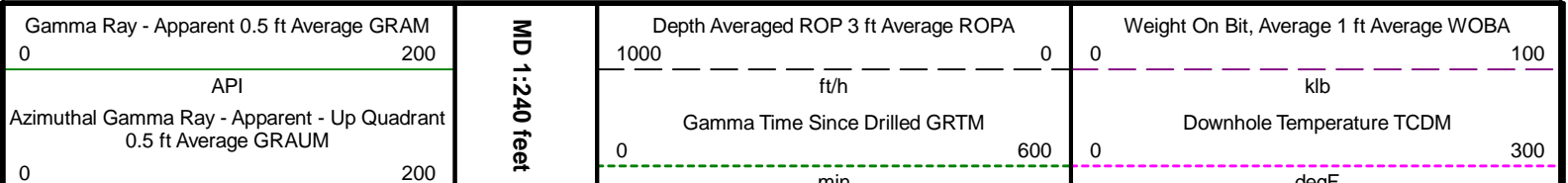
1	Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to the lack of control by Baker Hughes, depth calibrations and measurements could not be independently verified.
2	Baker Hughes LWD Run 1 used the 8 inch NaviTrak service (Directional) behind a 13 1/2 inch bit and steerable assembly to drill from 17 to 1634 feet MD (17 to 1619 feet TVD).
3	Baker Hughes LWD Run 2 used the 6 3/4 inch NaviGamma service (Gamma Ray, Azimuthal Gamma Ray and Directional) behind an 8 1/2 inch bit and rotary steerable assembly to drill from 1634 to 17375 feet MD (1619 to 6187 feet TVD).
4	The Gamma Ray Apparent (GRAM) data is presented from 0 to 200 API, per customer's request.

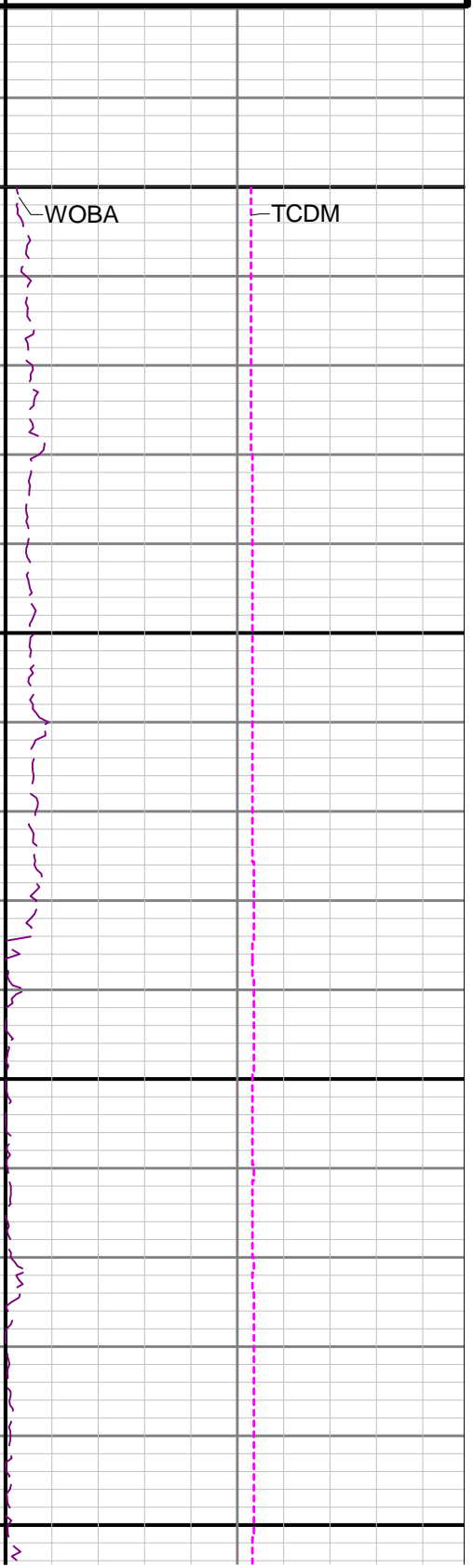
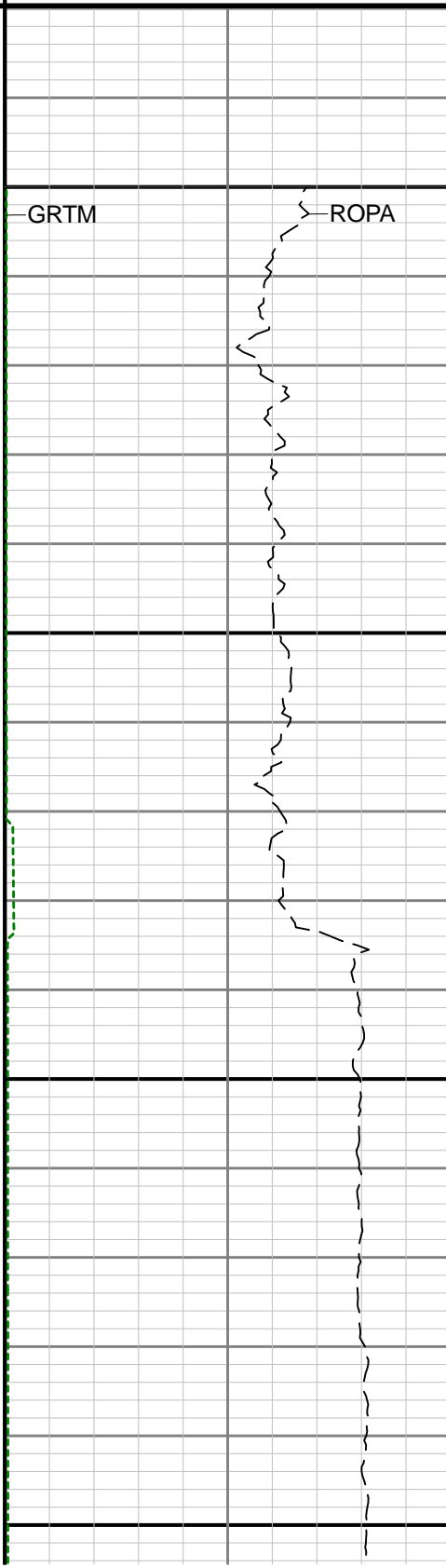
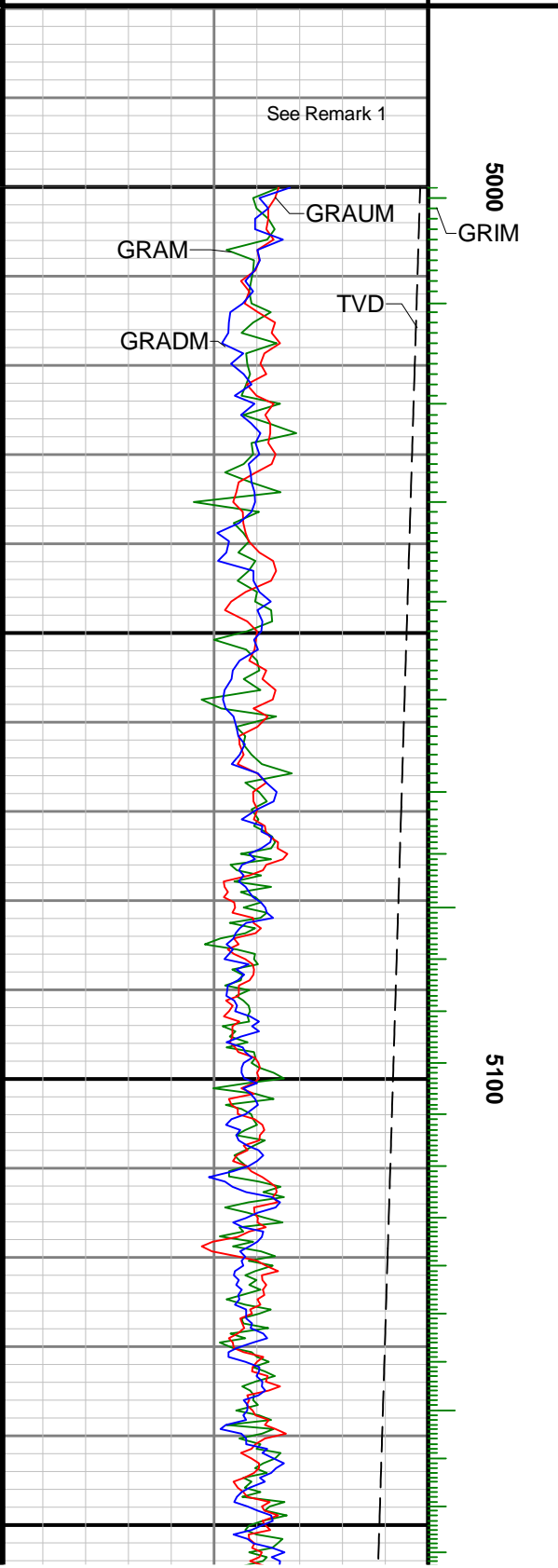
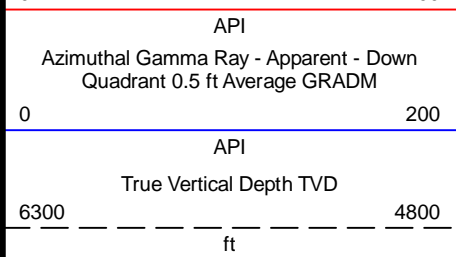
Remarks

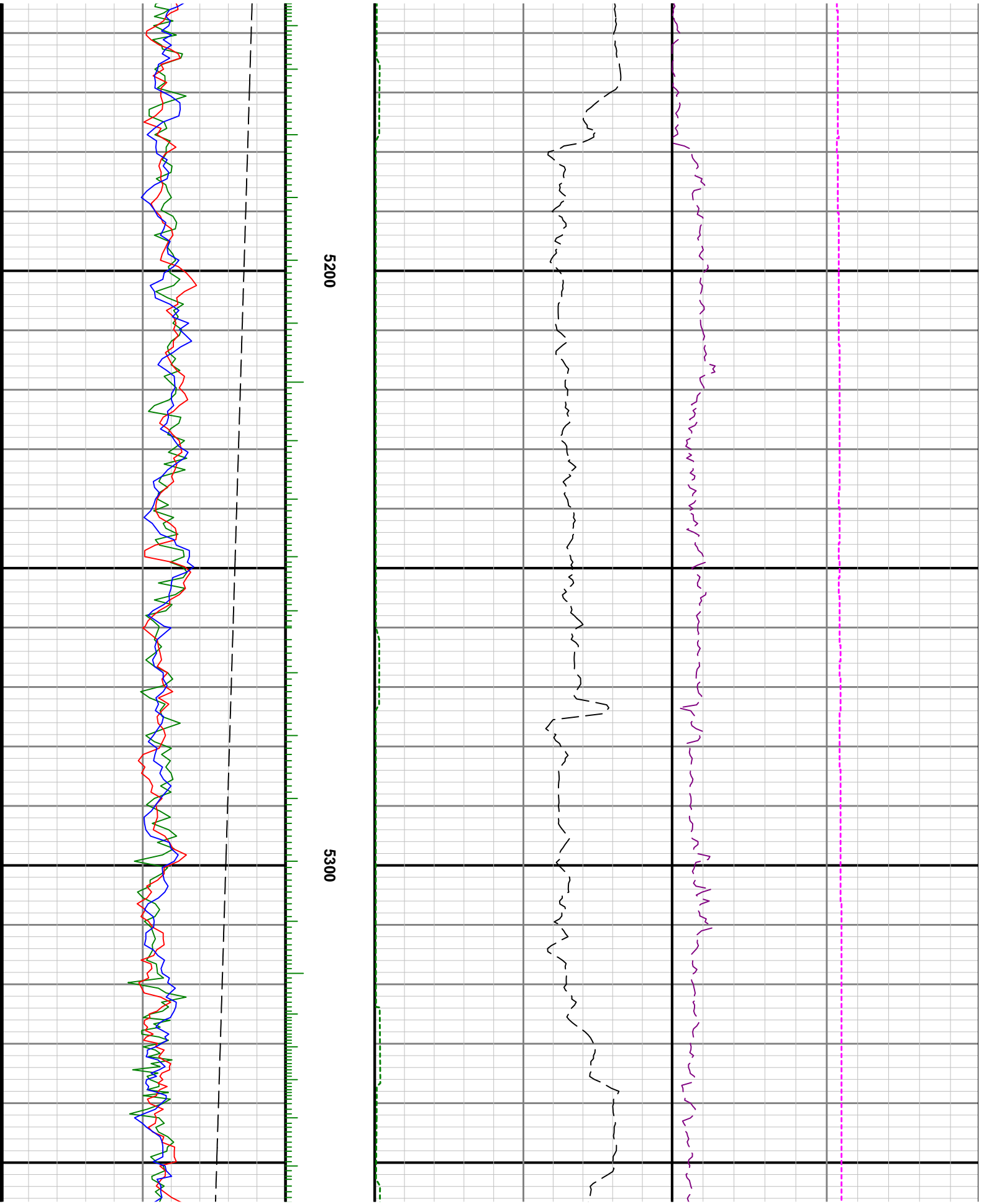
Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	5175.00	8.500	2	The Gamma Ray Apparent (GRAM) log starts at 5000 feet, per customer's request.
2	17352.00	8.500	3	The interval from 17362 to 17375 feet MD (6187 feet TVD) was not logged due to sensor to bit offset at well TD.

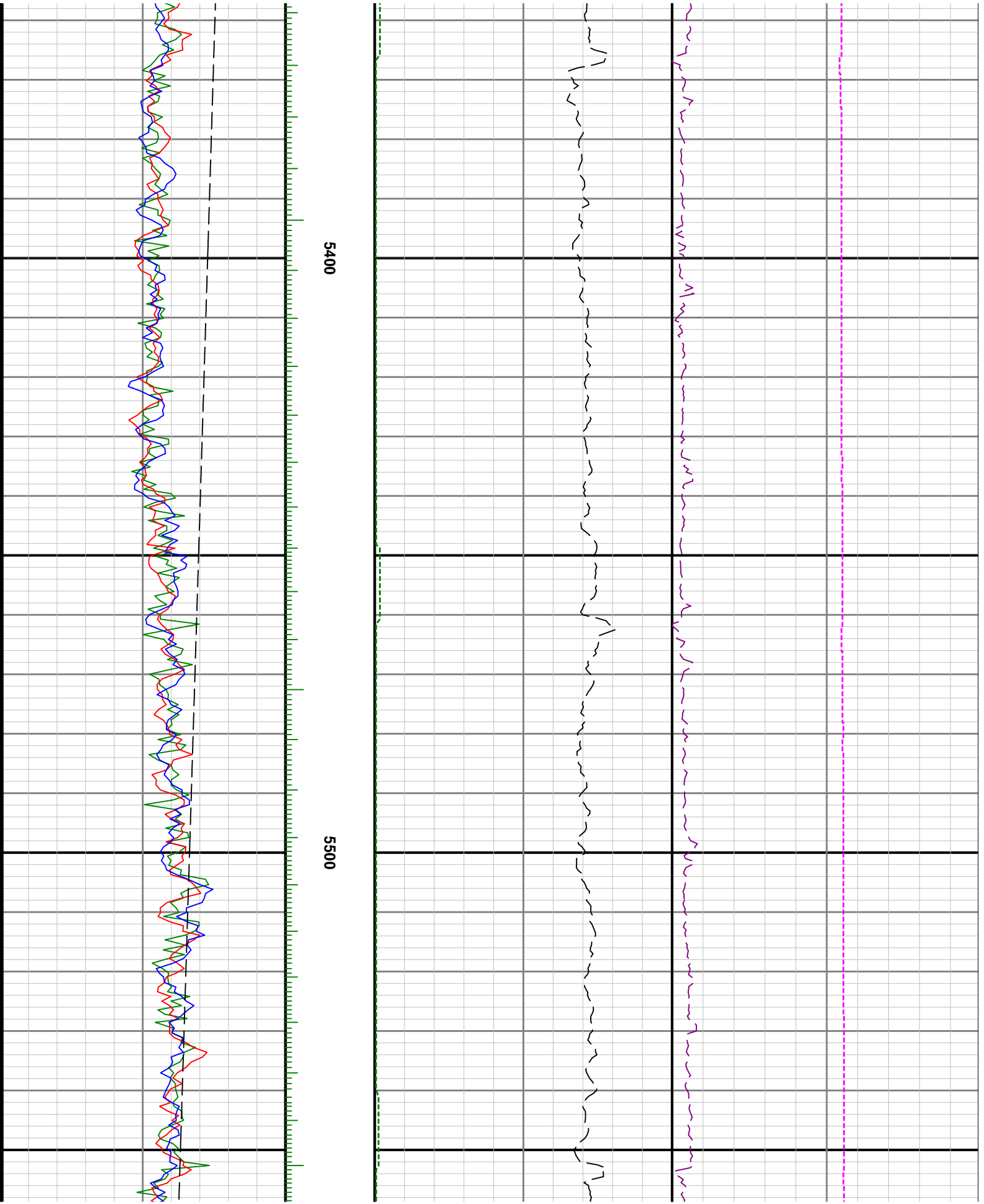
Curve Mnemonics

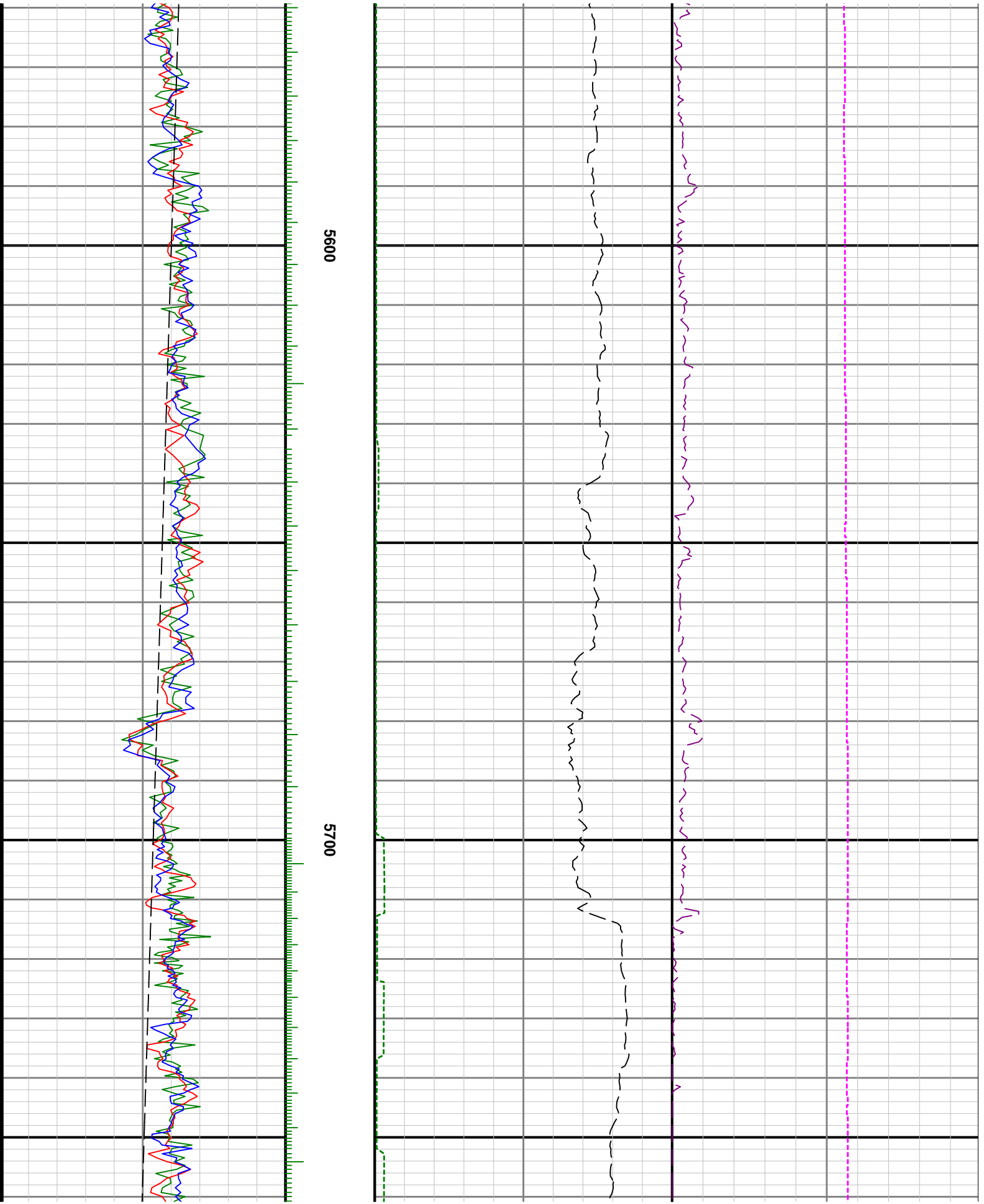
Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	True Vertical Depth	ft
WOBA	Weight On Bit, Average 1 ft Average	klb
GRAM	Gamma Ray - Apparent - Memory 0.5 ft Average	API
GRIM	Gamma Ray - Data Point Indicator - Memory	unitless
GRTM	Gamma Ray - Time Since Drilled - Memory	min
GRADM	Gamma Ray - Apparent - Down Quadrant - Memory 0.5 ft Average	API
GRAUM	Gamma Ray - Apparent - Up Quadrant - Memory 0.5 ft Average	API
TCDM	Directional Real-Time Survey Temperature	degF

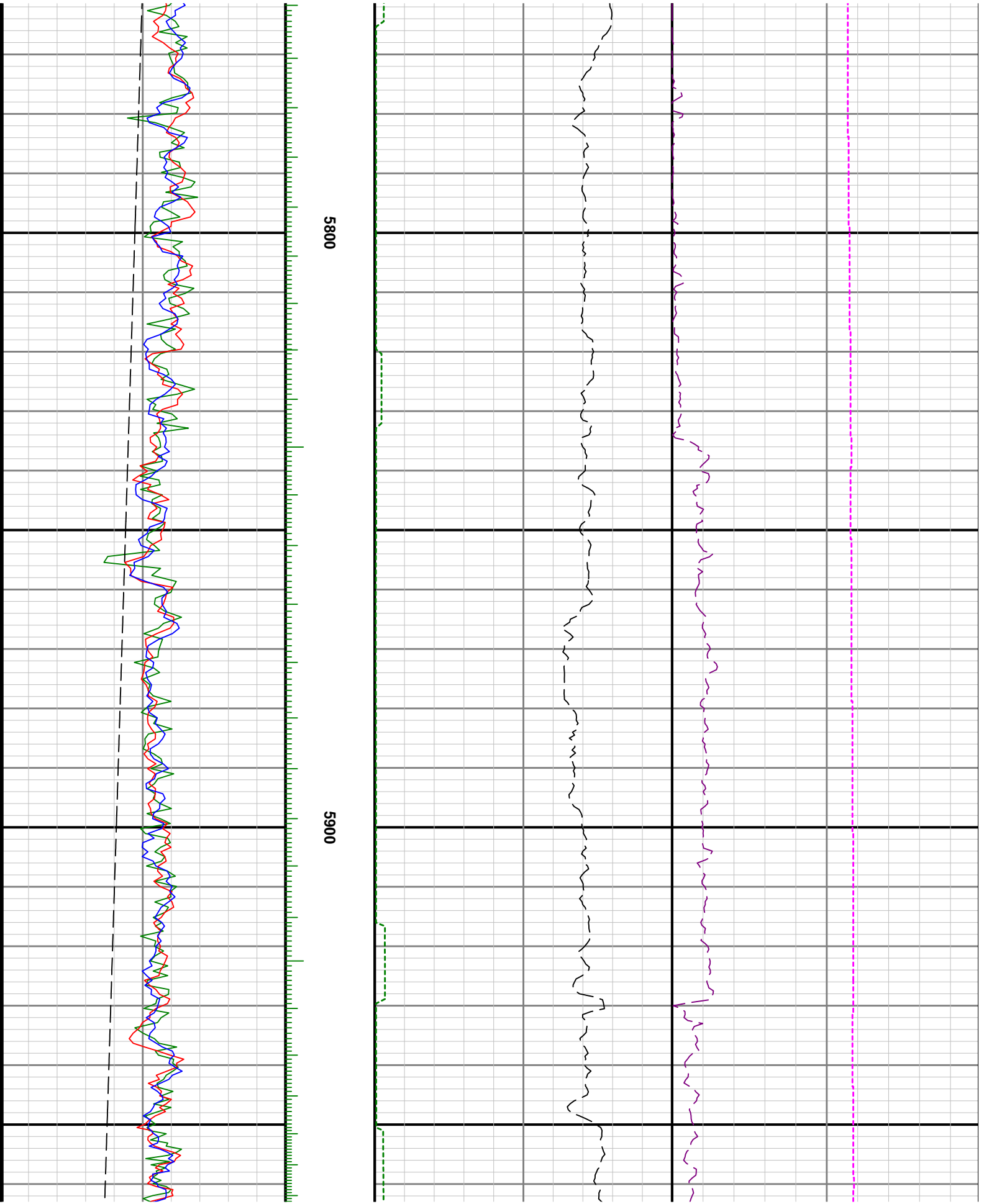


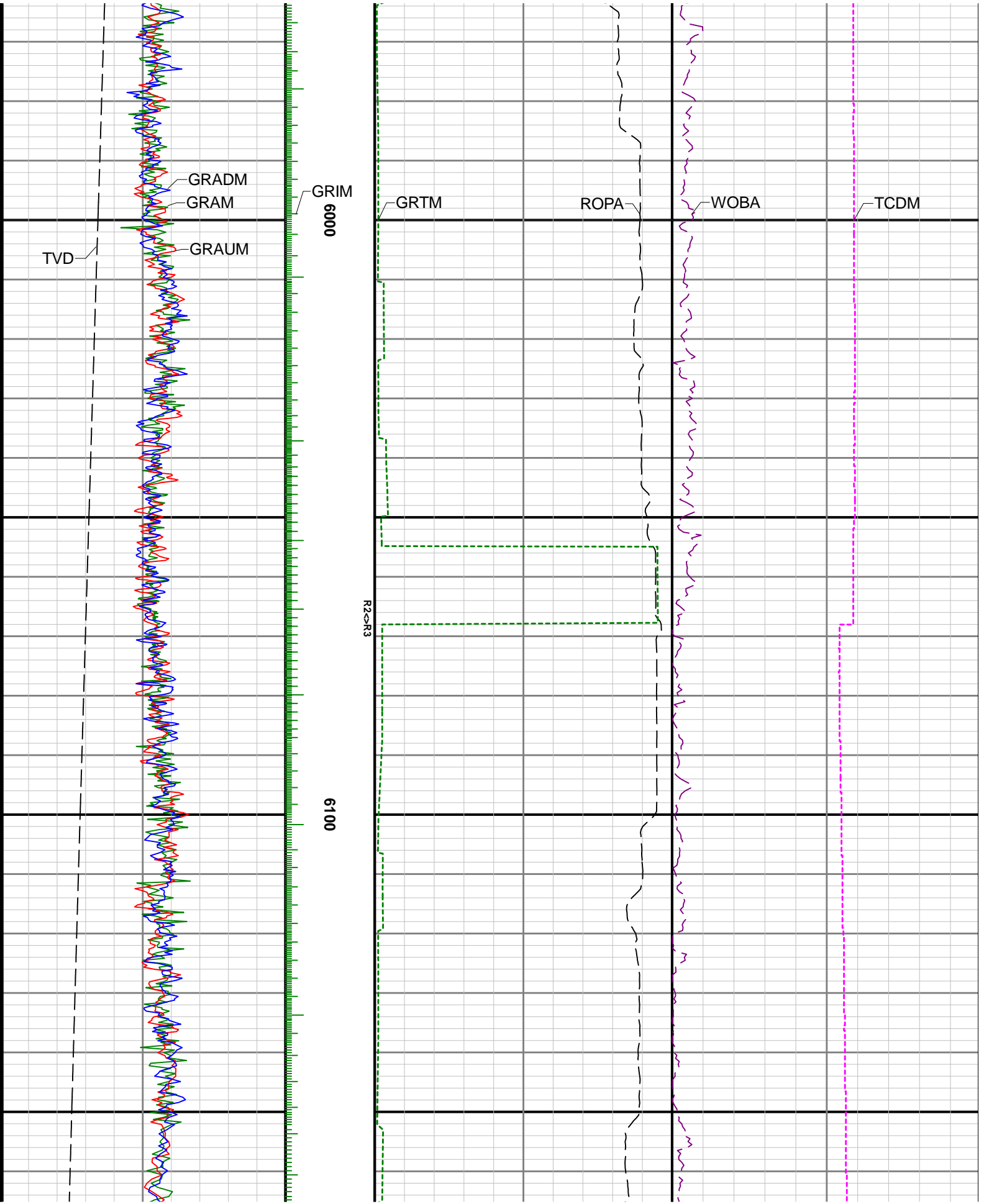


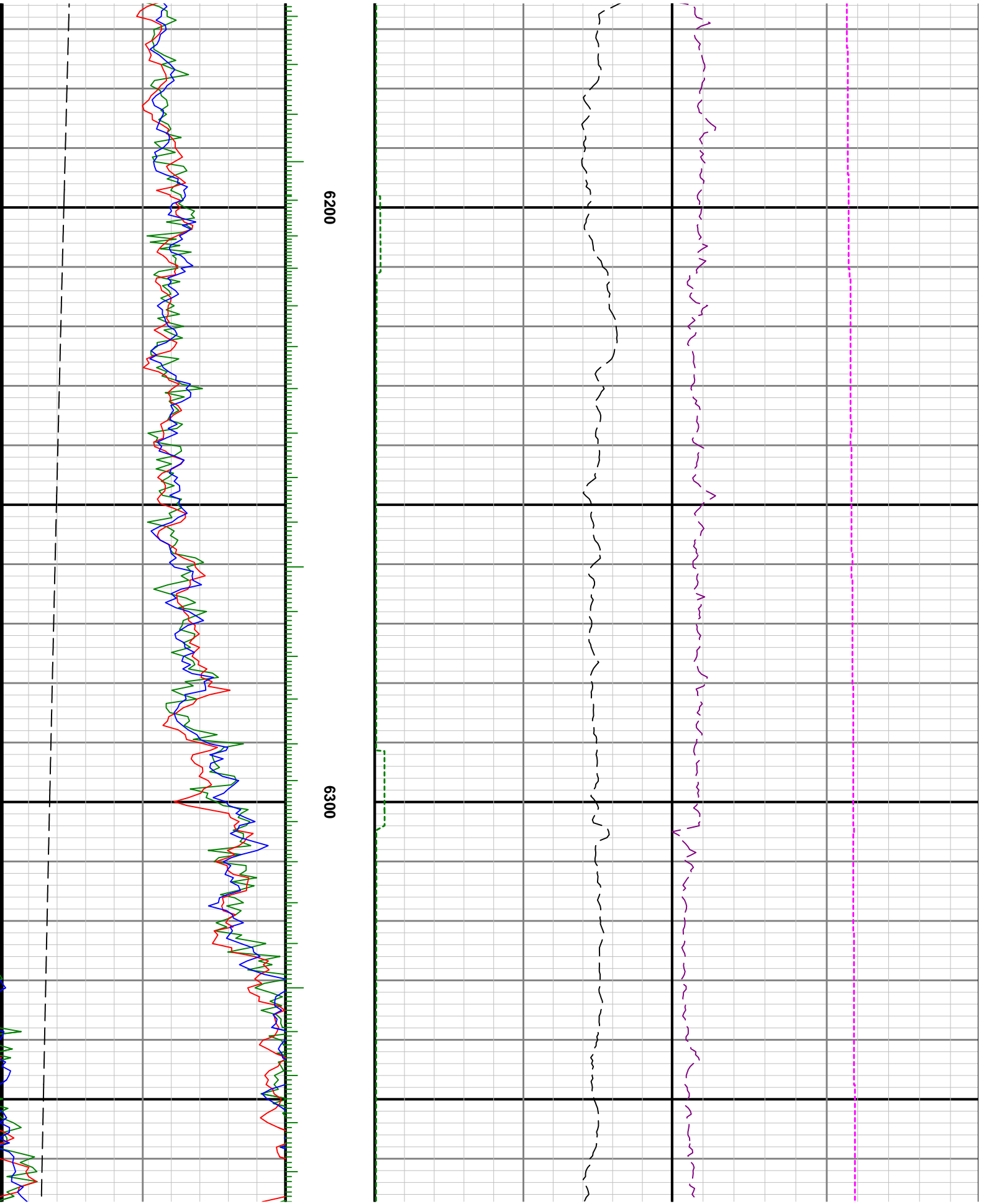


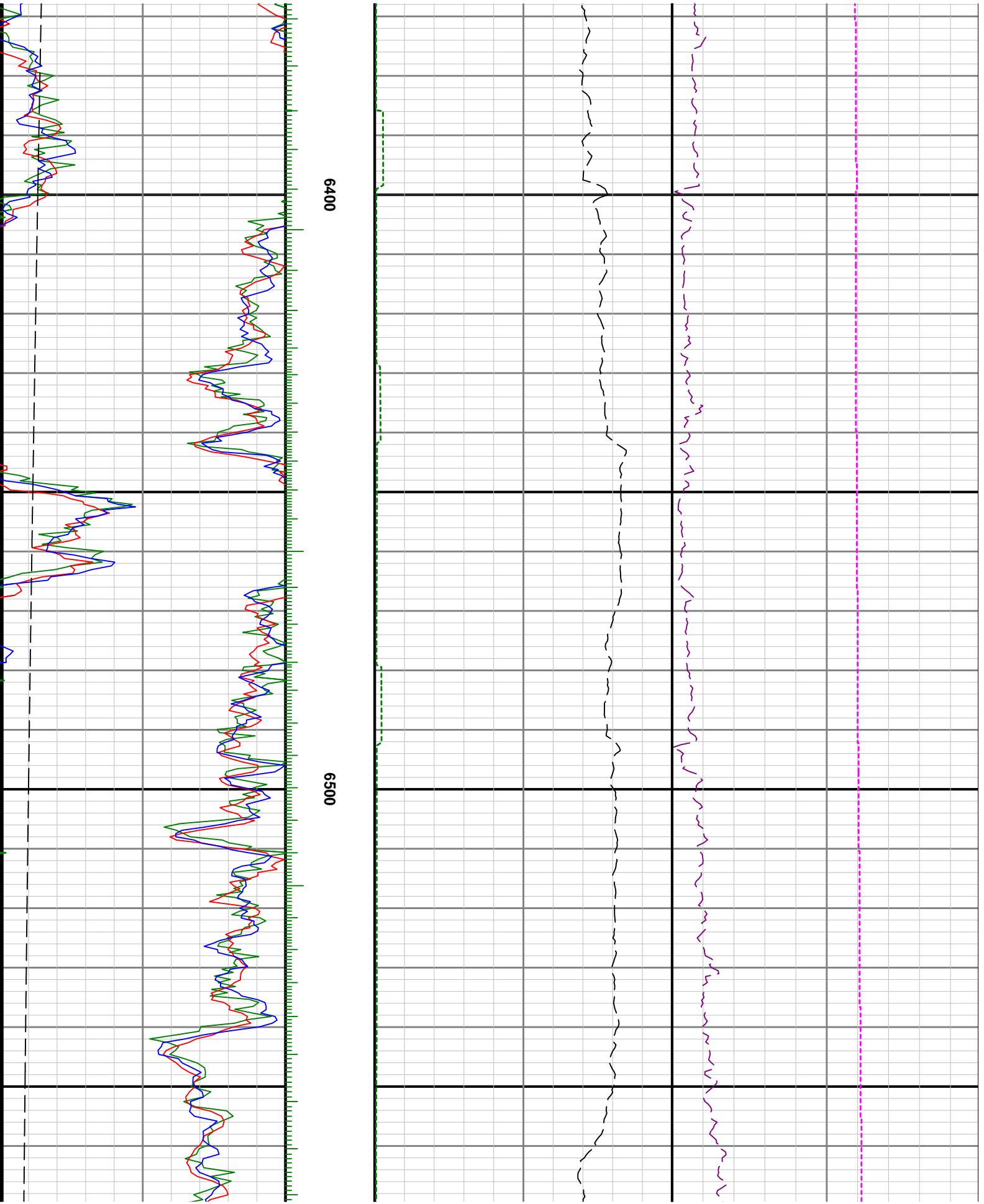


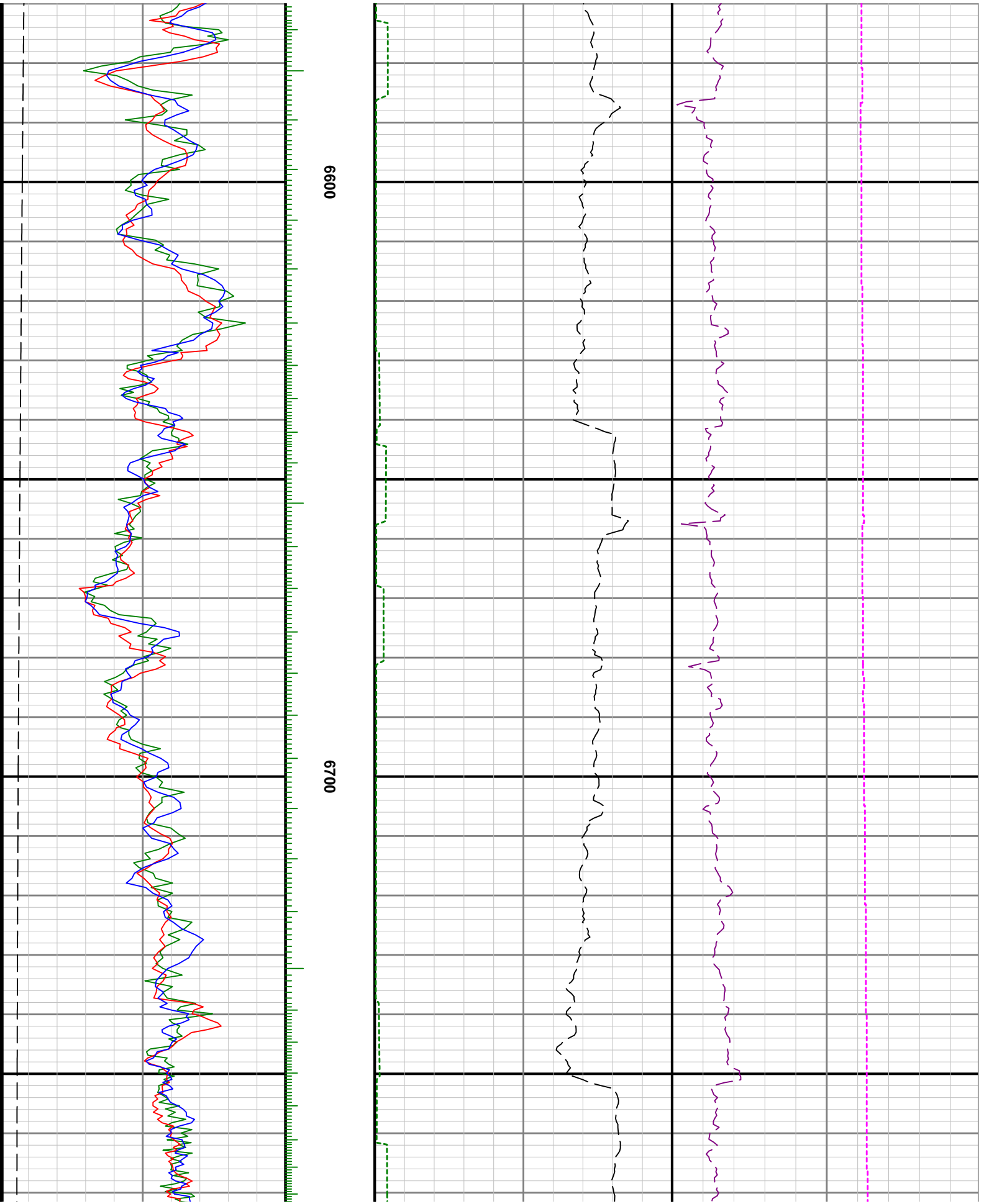


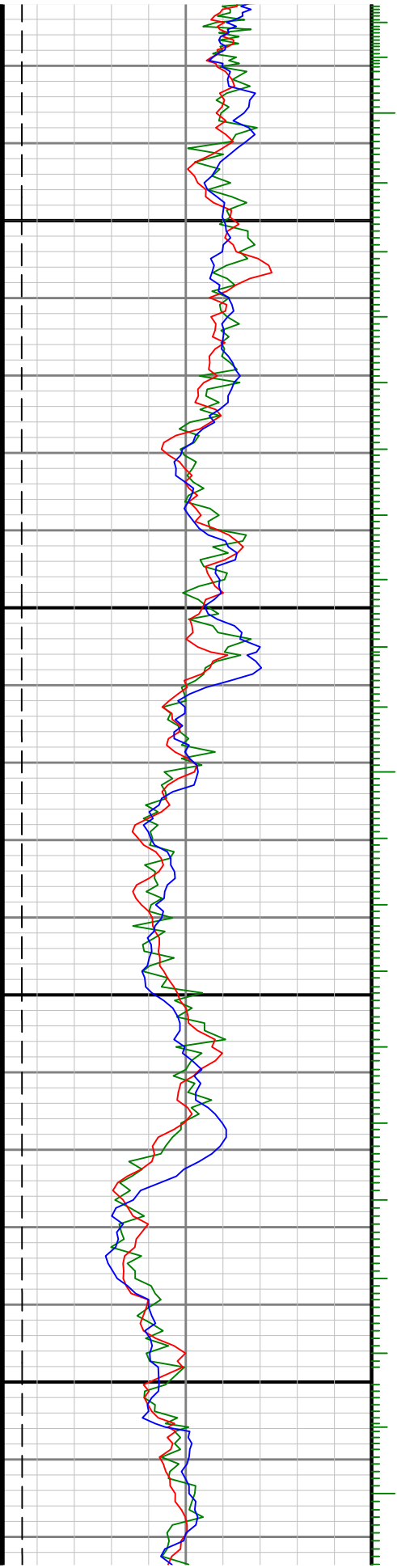












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