



Compensated Neutron Gamma Ray Casing Collar Log

Company	Noble Energy Inc.	Company	Noble Energy Inc.
Well	70 Ranch State BB18-675	Well	70 Ranch State BB18-675
Field	Wattenberg	Field	Wattenberg
County	Weld	County	Weld
State	Colorado	State	Colorado
Location:		API # : 05-123-41532	
Permanent Datum		SEC 17 TWP 5N RGE 63W	
Log Measured From		Ground Level Elevation 4680'	
Drilling Measured From		Kelly Bushing 30 FT	
		Other Services	
		JBGR	
		RBP	
		RBL/MIT	
		Elevation	
		K.B. 4710'	
		D.F. 4709'	
		G.L. 4680'	

Date	20-AUG-2015
Run Number	Four
Depth Driller	15,870 FT
Depth Logger	6859 FT
Bottom Logged Interval	6854 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Water
Density / Viscosity	8.34 lbm/gal
Max. Recorded Temp.	230°F
Estimated Cement Top	Surface
Time Well Ready	ROA
Time Logger on Bottom	3:30 PM
Equipment Number	HD-0255
Location	Ft. Lupton, CO
Recorded By	B. Kalkwarf
Witnessed By	Bill Mansfield

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
Casing Record	Size (in)	Wgt (lbs/ft)	Grade	Top	Bottom		
Surface Casing	9 5/8	36	J-55	30 FT	765 FT		
Intermediate #1	7	26	P-110IC	30 FT	6975 FT		
Intermediate #2							
Liner	4 1/2	11.6	P-110IC	6867 FT	15,855 FT		

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

Log ran as per customer request
Depth referenced to Kelly Bushing 30 FT
Log was Correlated to FMC Radial Bond Log
Depth Corrected -1FT to correlate
Log ran from just above Liner Top to Surface
Log ran with 0 PSI surface induced pressure
Logging tools were clean and free of any debris upon completion of operations

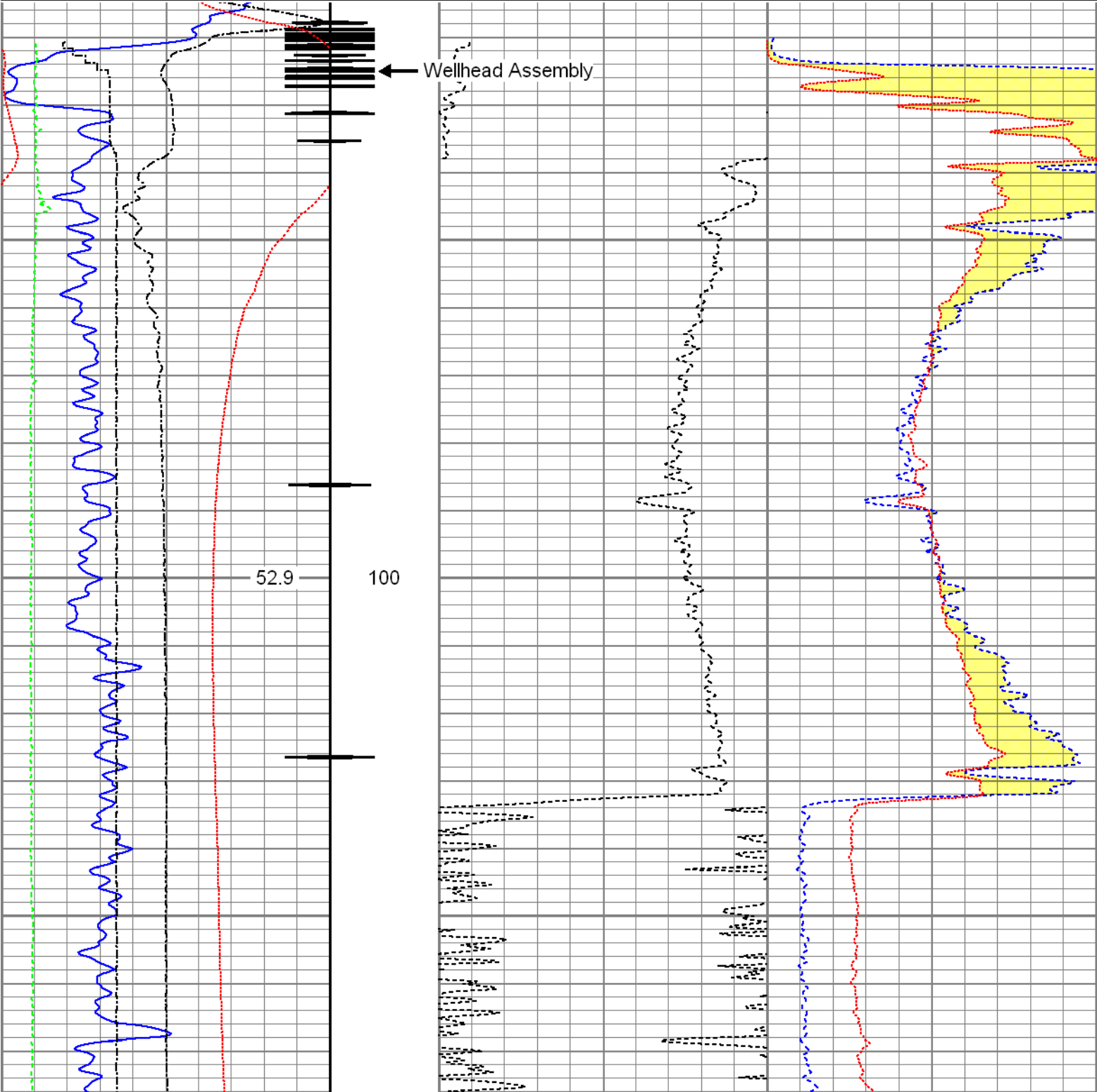
Thank you for choosing FMC Technologies Completion Services, Inc.!!

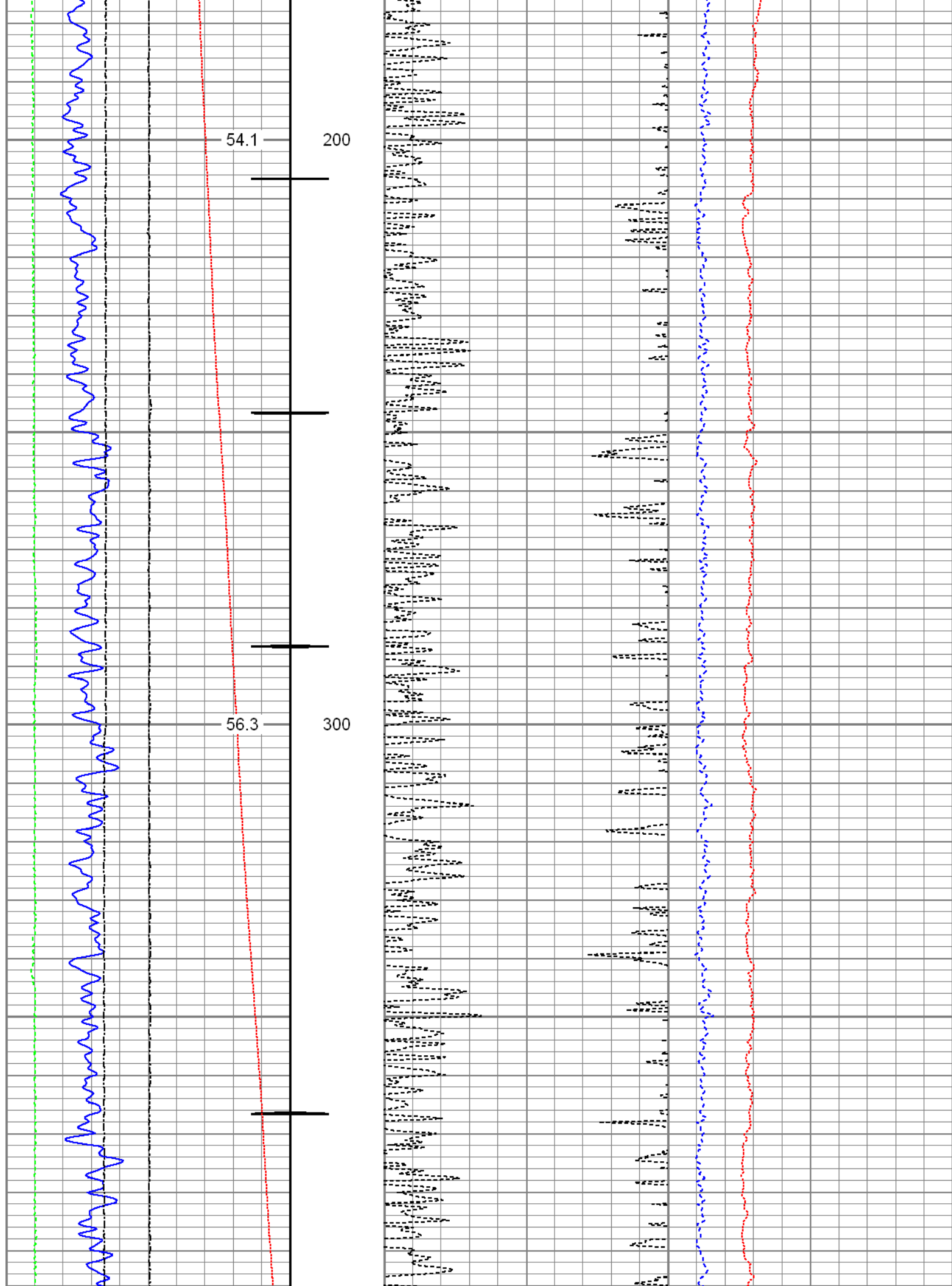


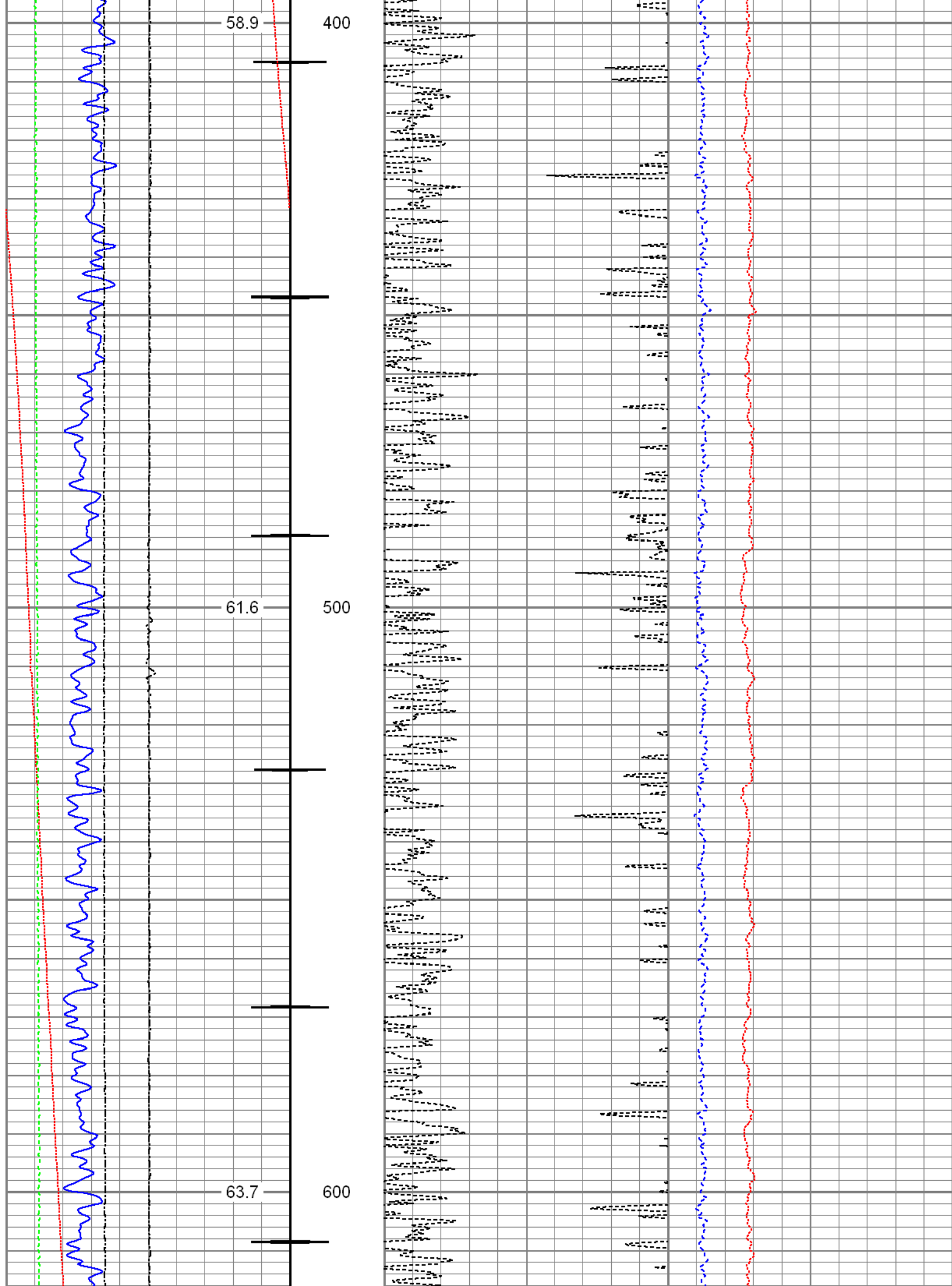
Main Pass

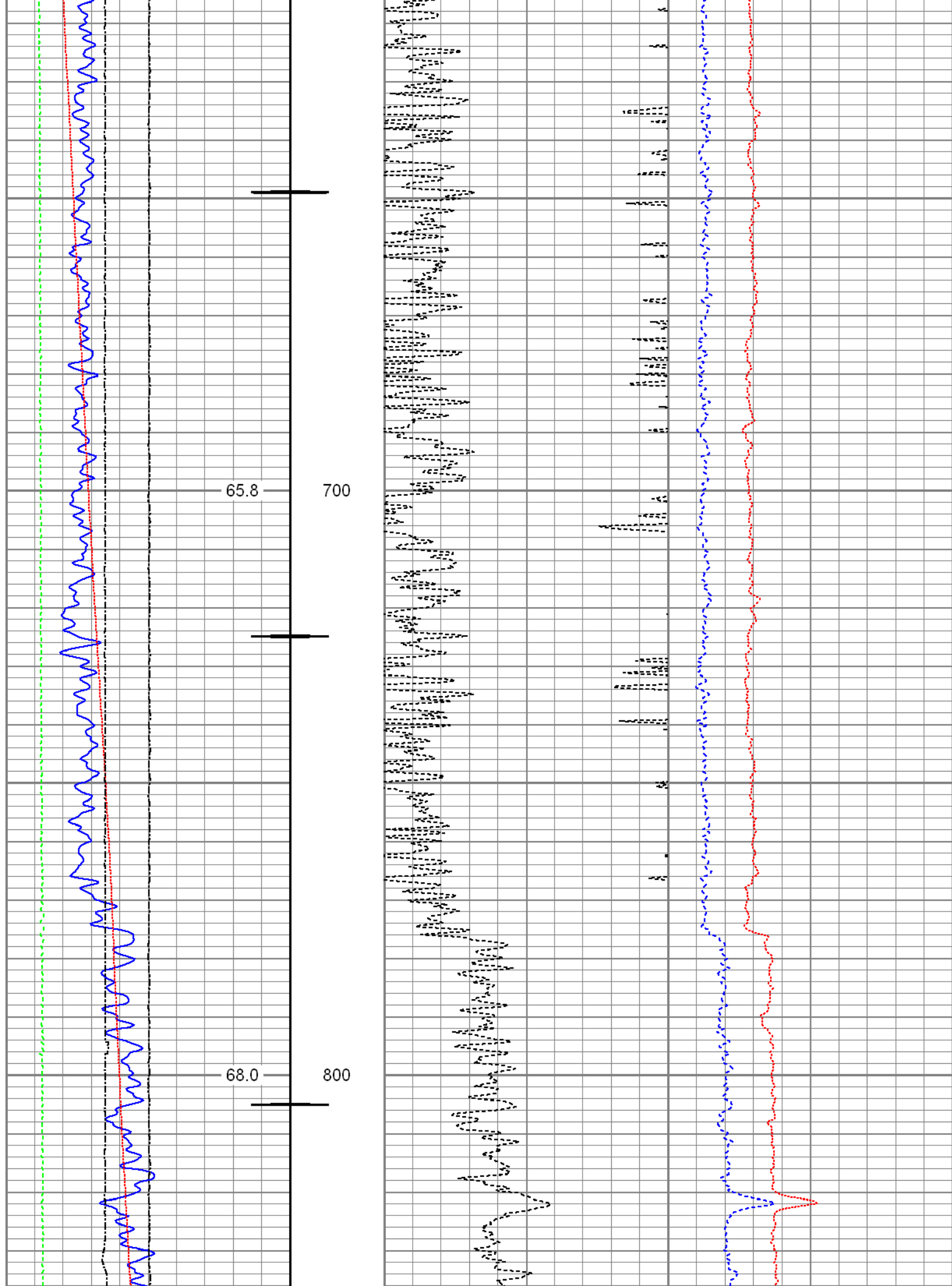
Recorded With 0 PSI Surface Induced Pressure

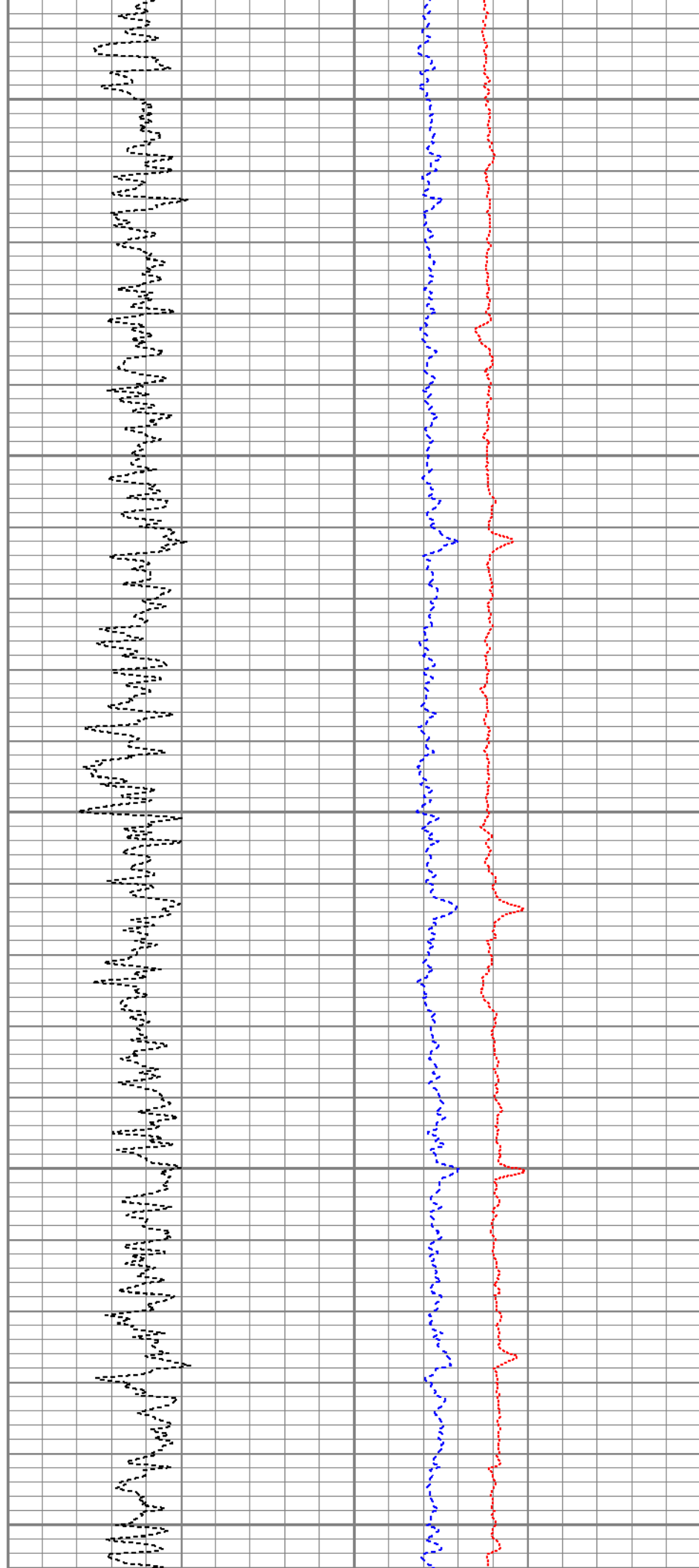
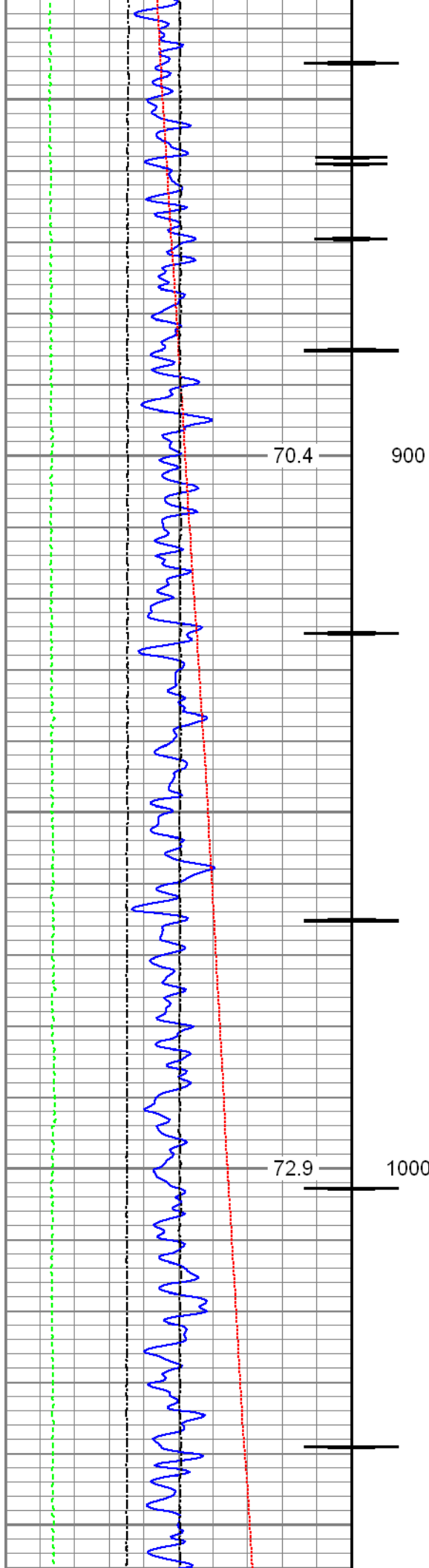
0	Gamma Ray (GAPI)	120	60	Neutron Porosity (pu)	0	0	Far Neutron (cps)	1000
Casing Collar Locator						0	Near Neutron (cps)	10000
0	Temperature (degF)	20						
-100	Line Speed (ft/min)	100						
0	Line Tension (lb)	2000						
-2	Differential Temperature (degF)	2						

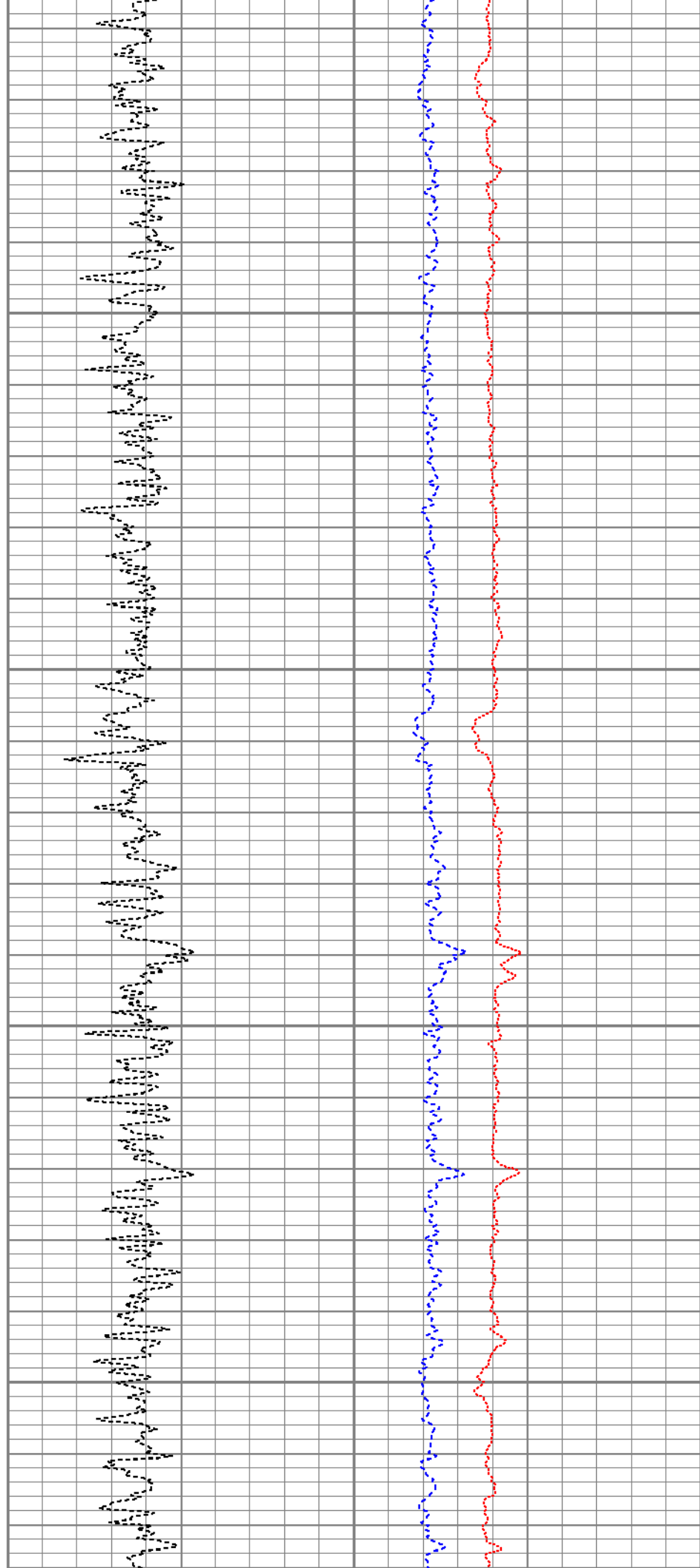
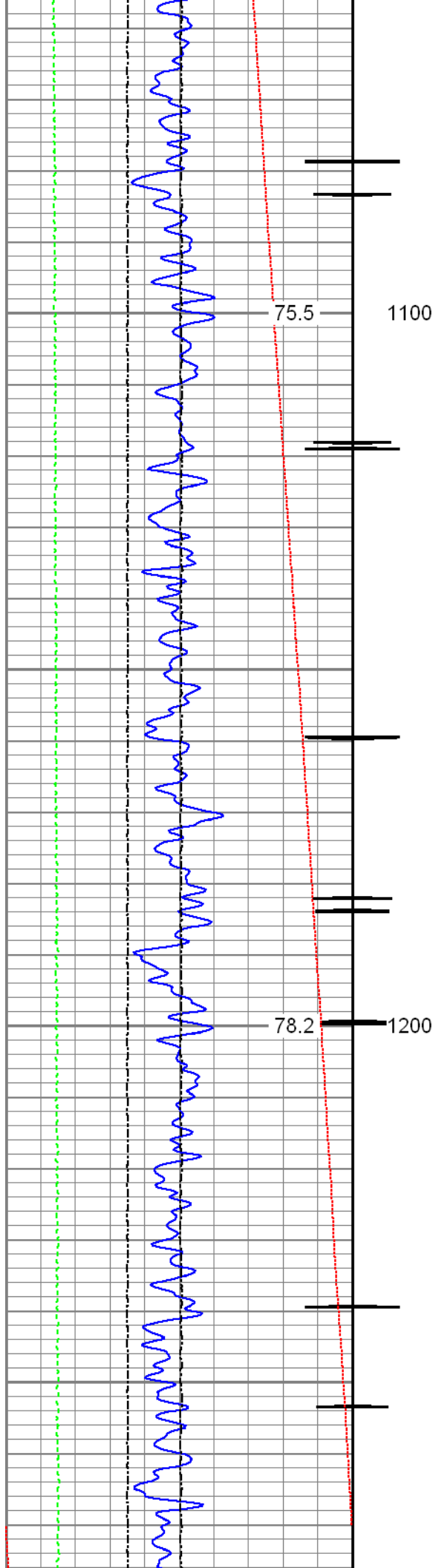


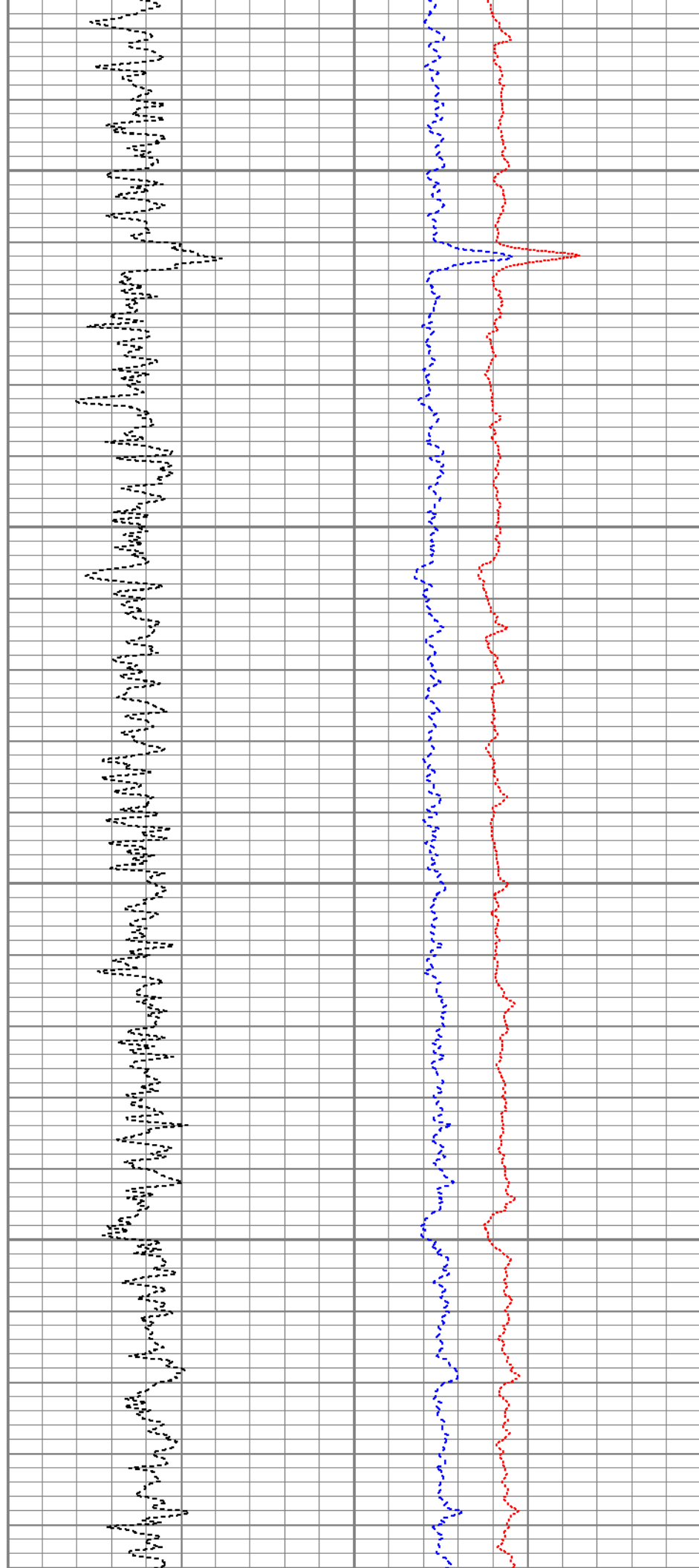
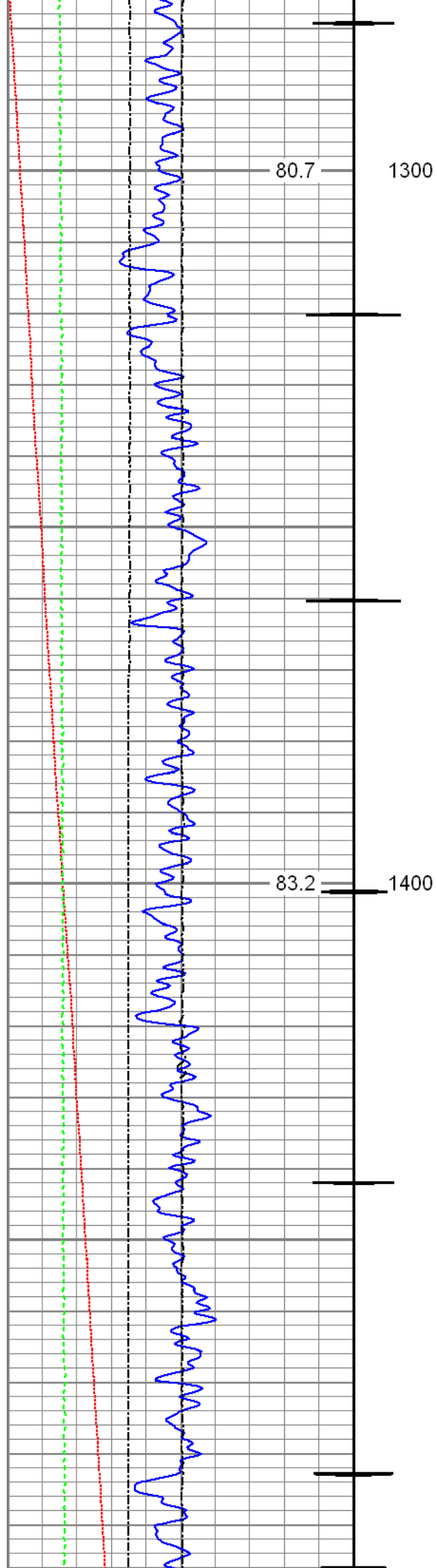


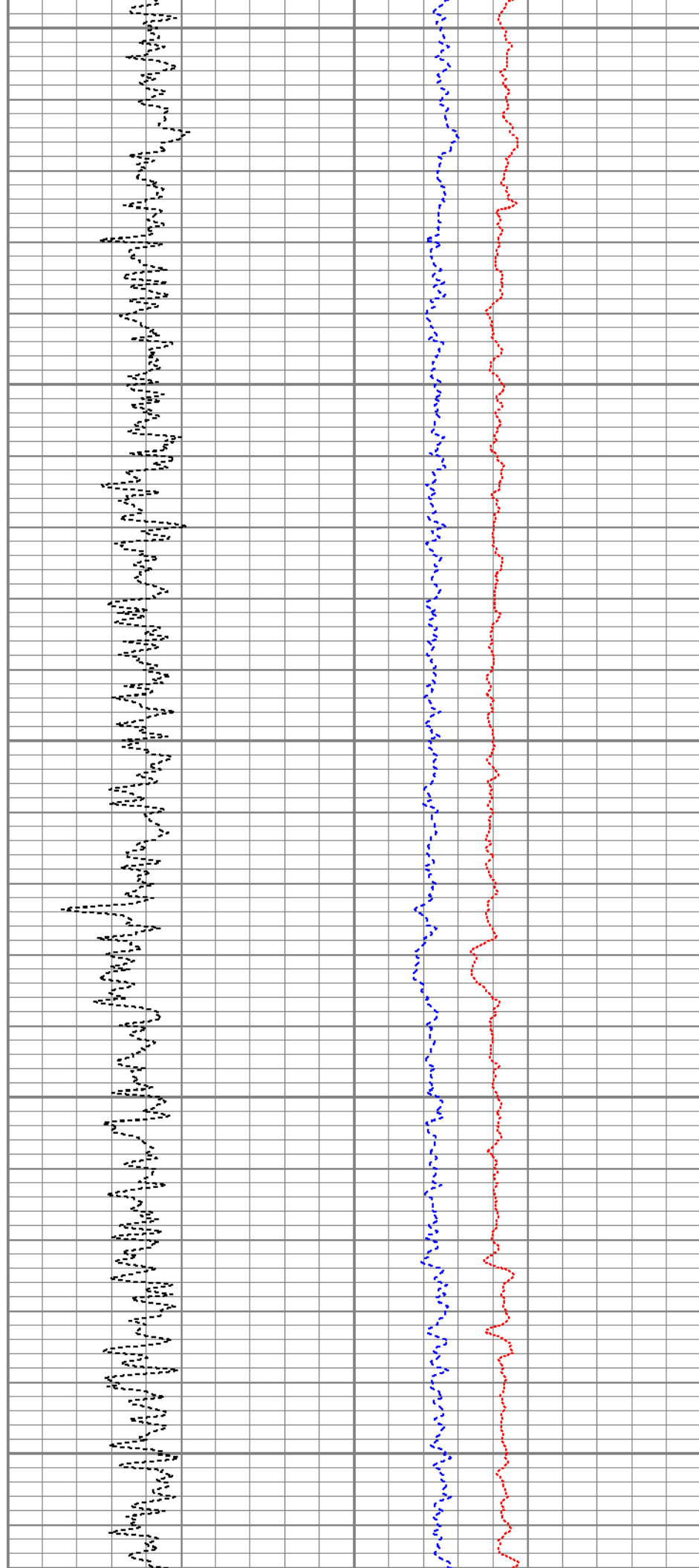
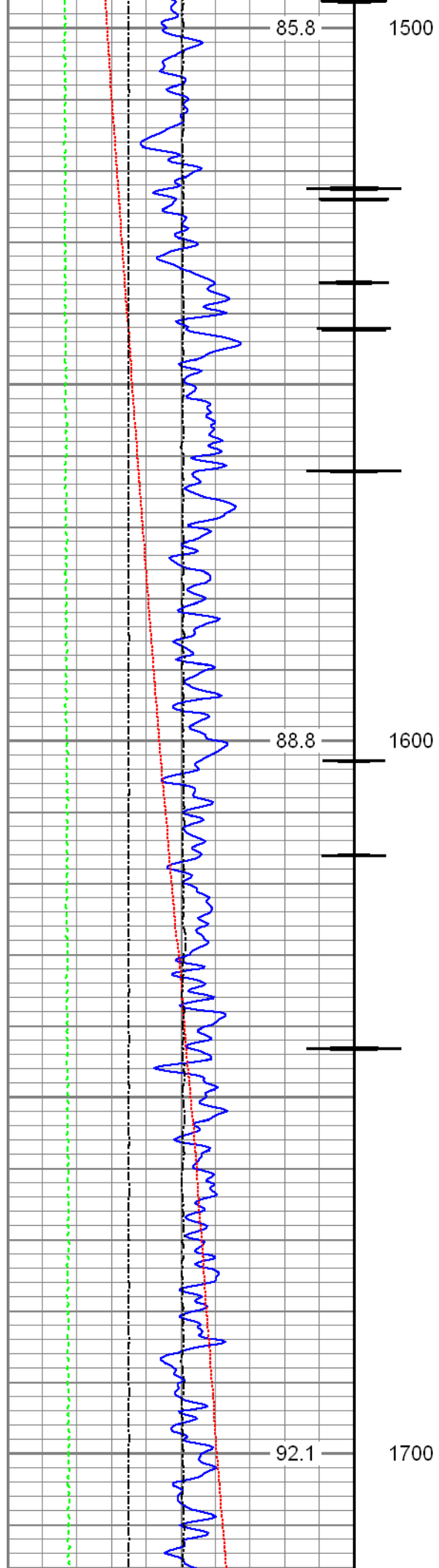


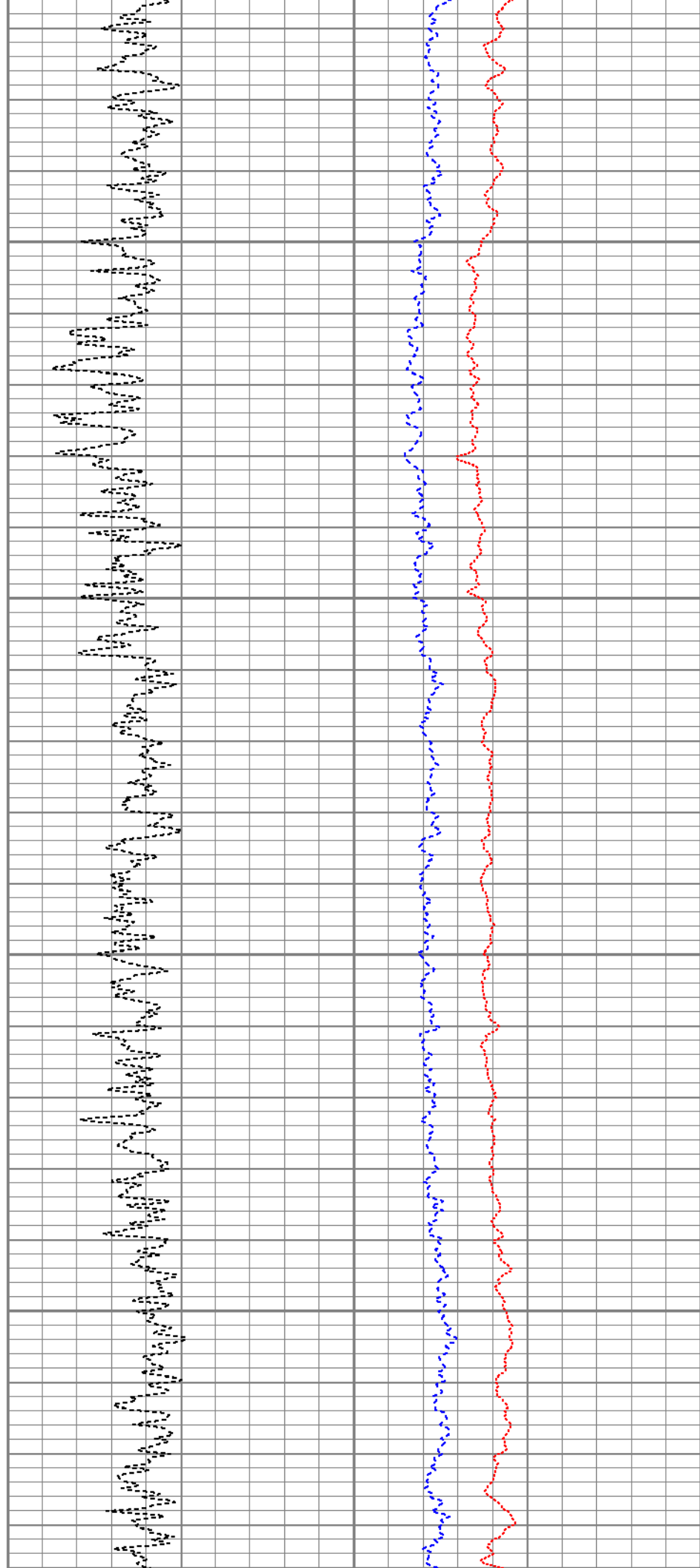
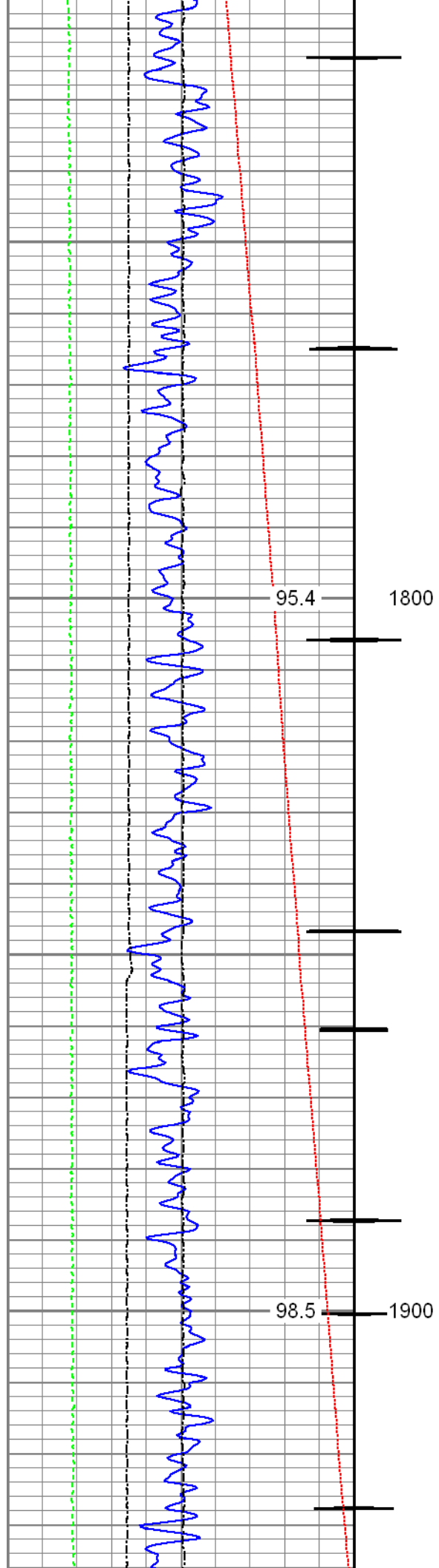


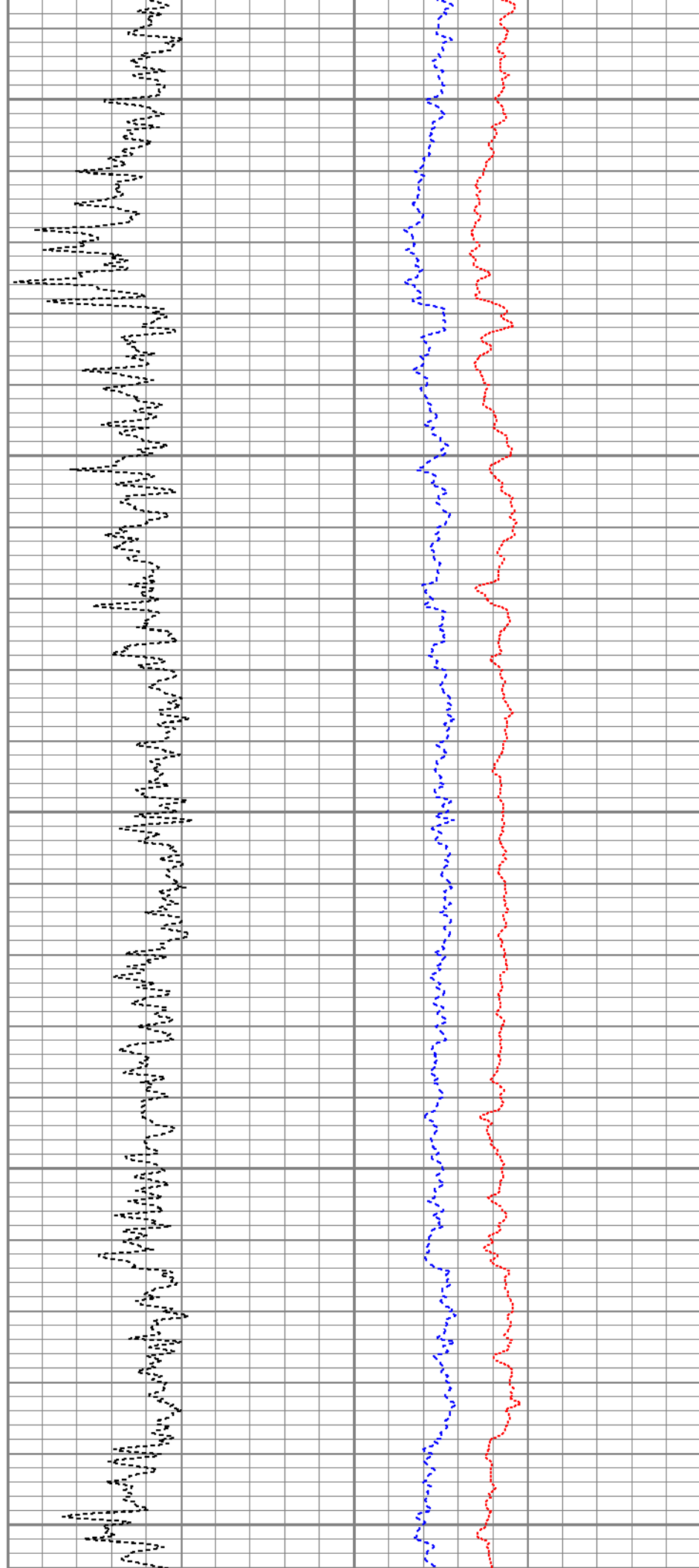
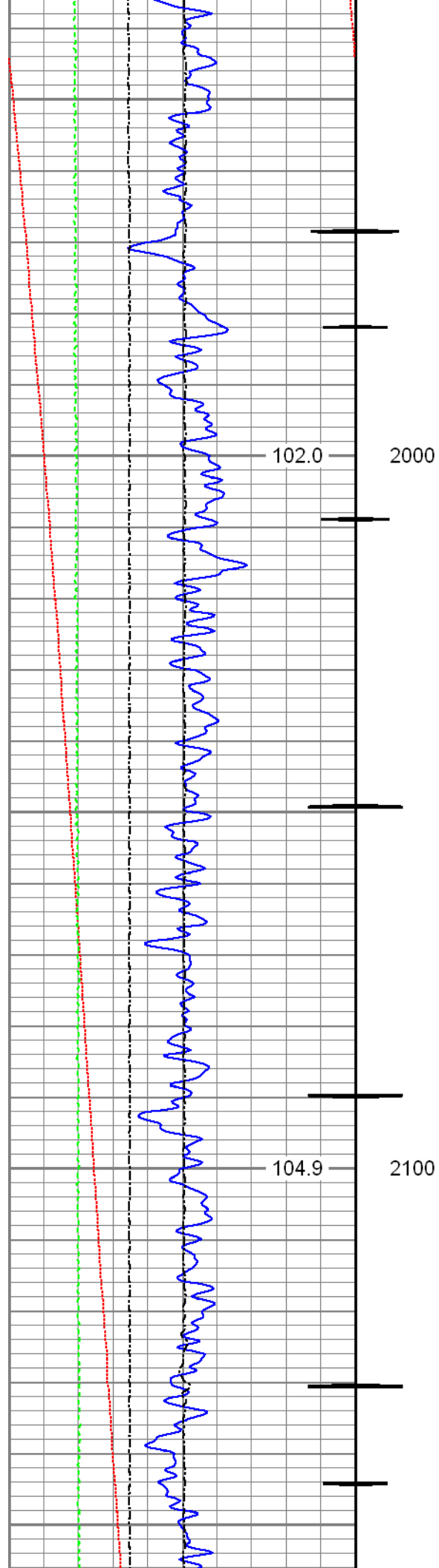


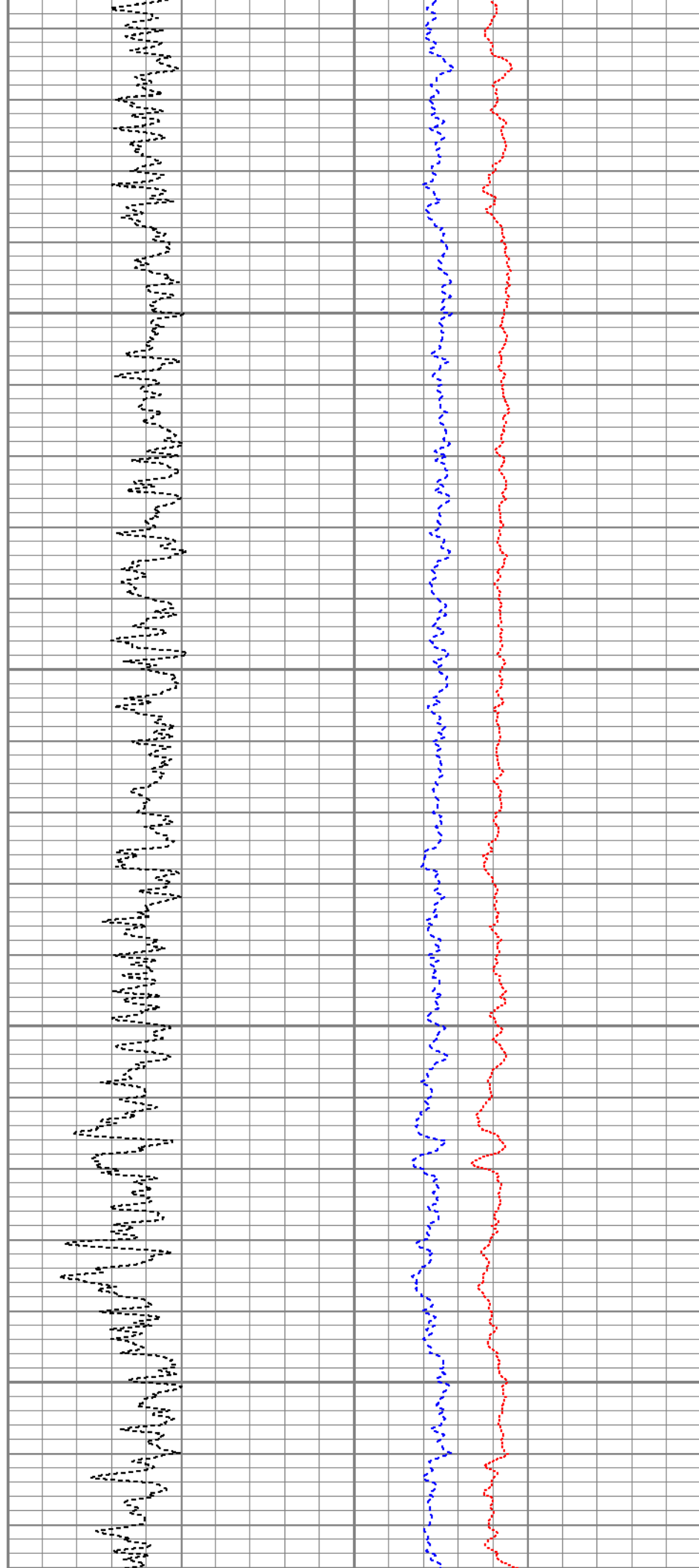
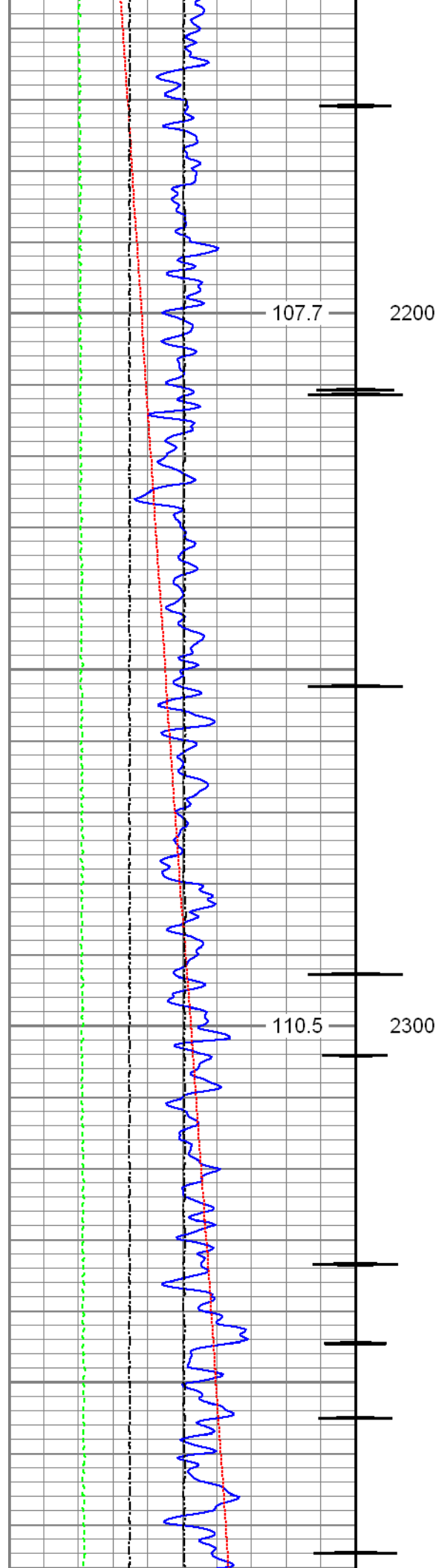


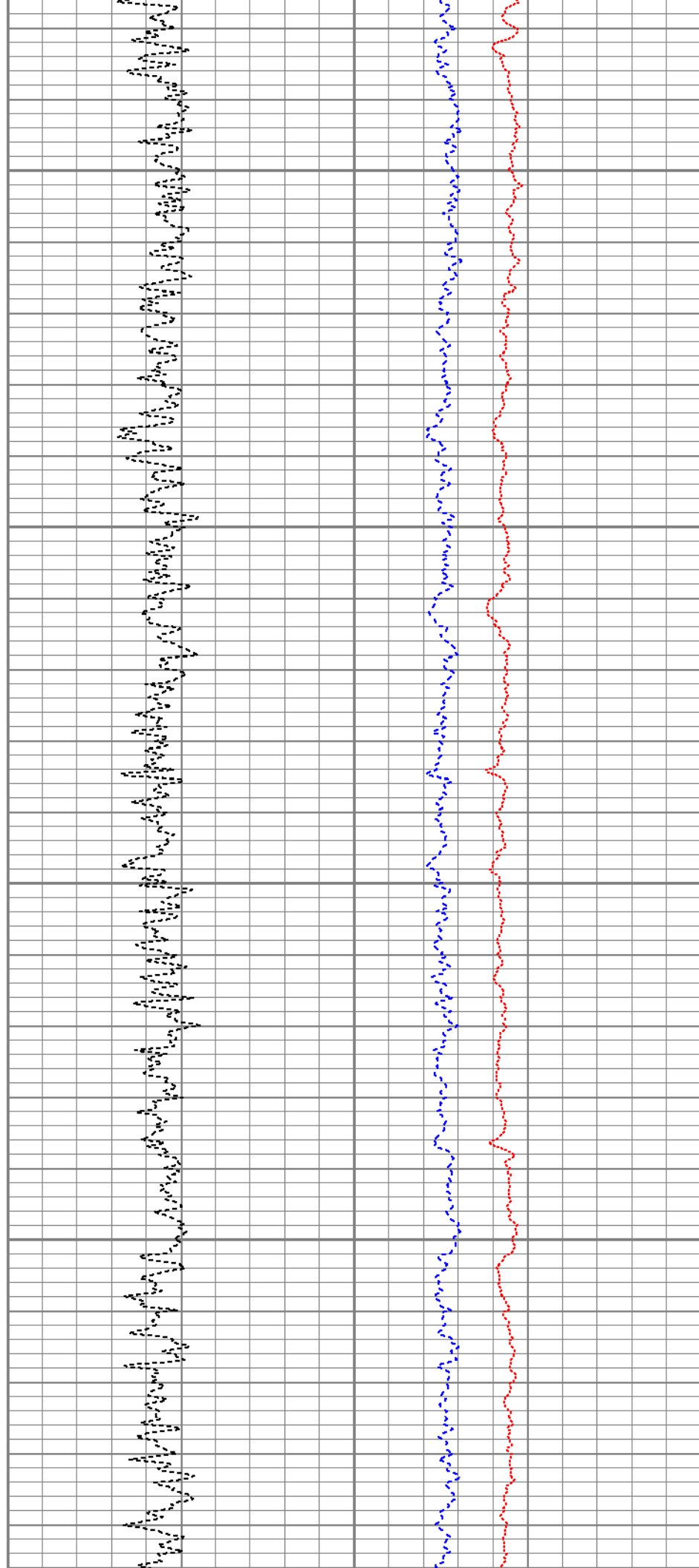
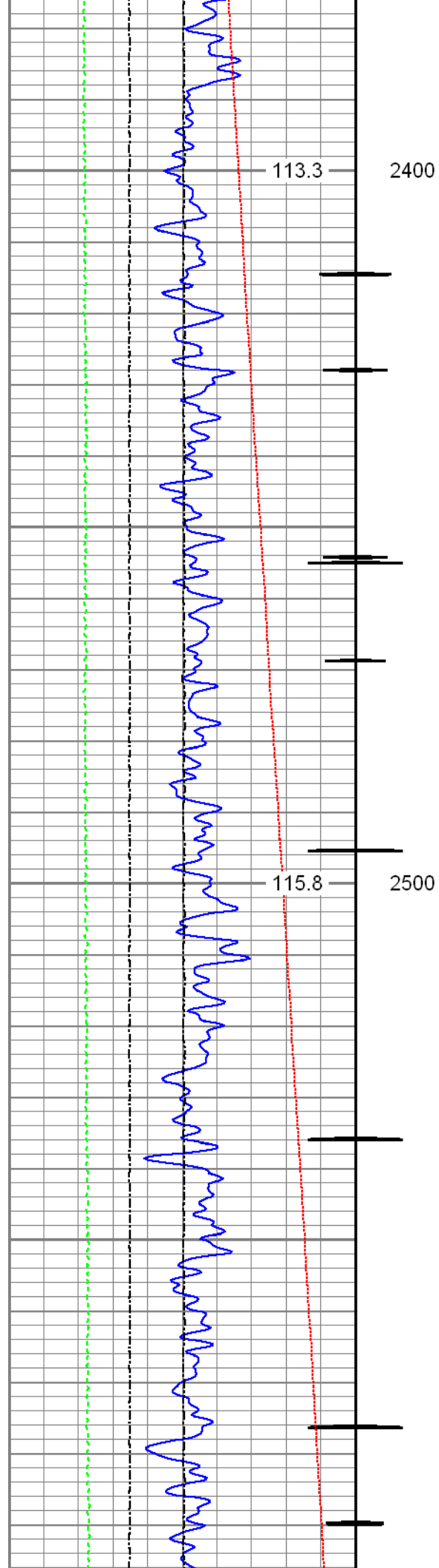


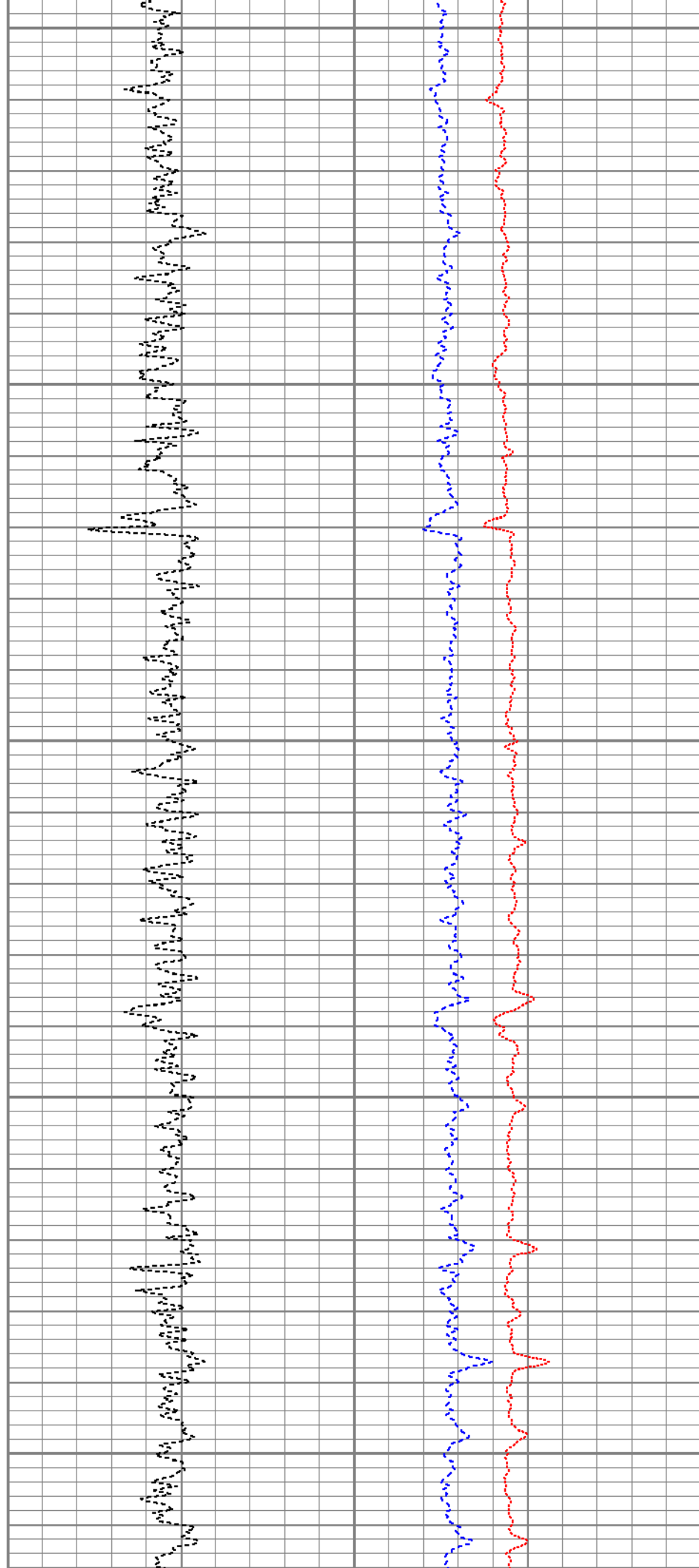
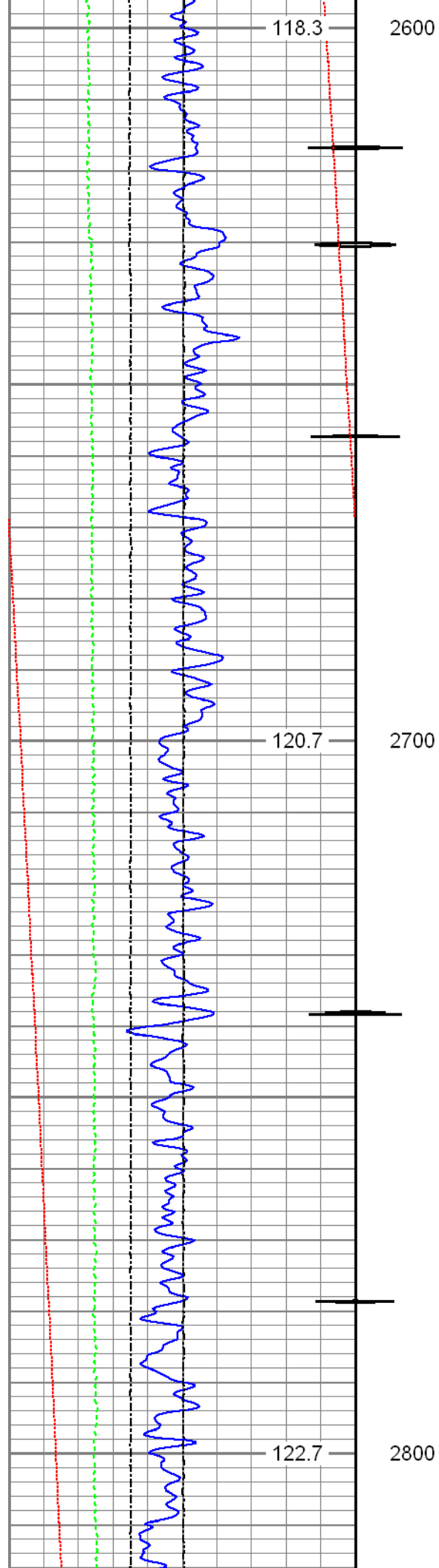


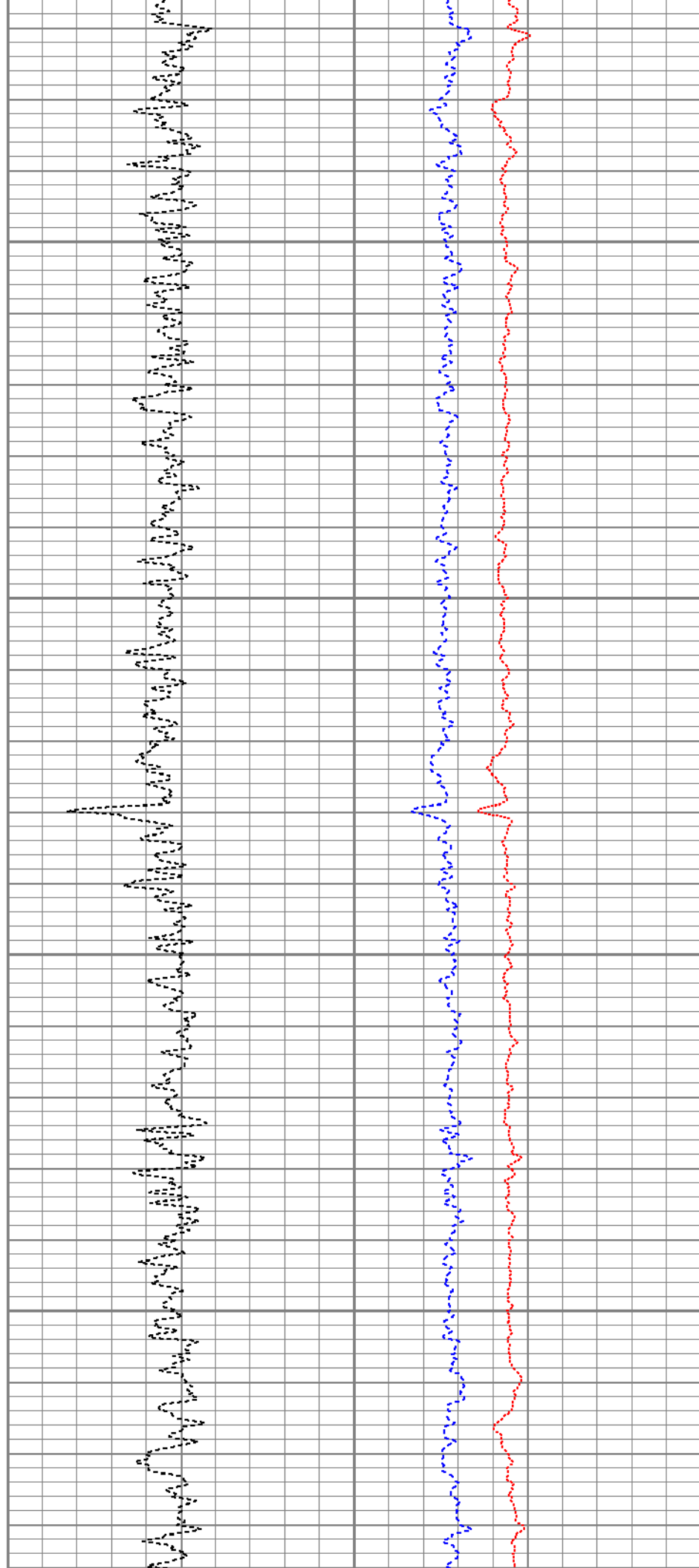
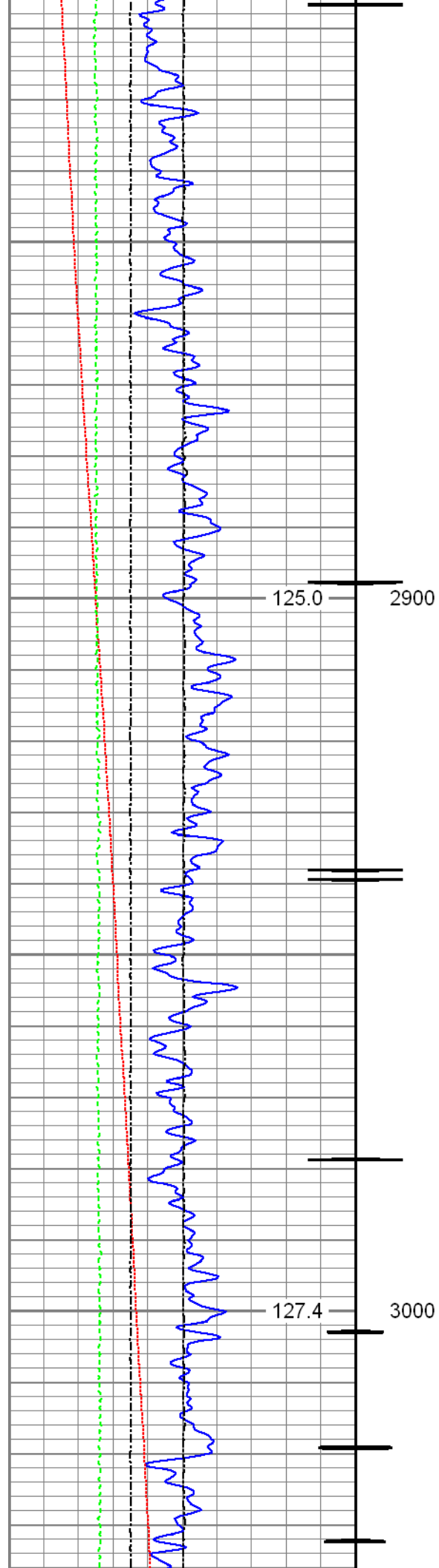


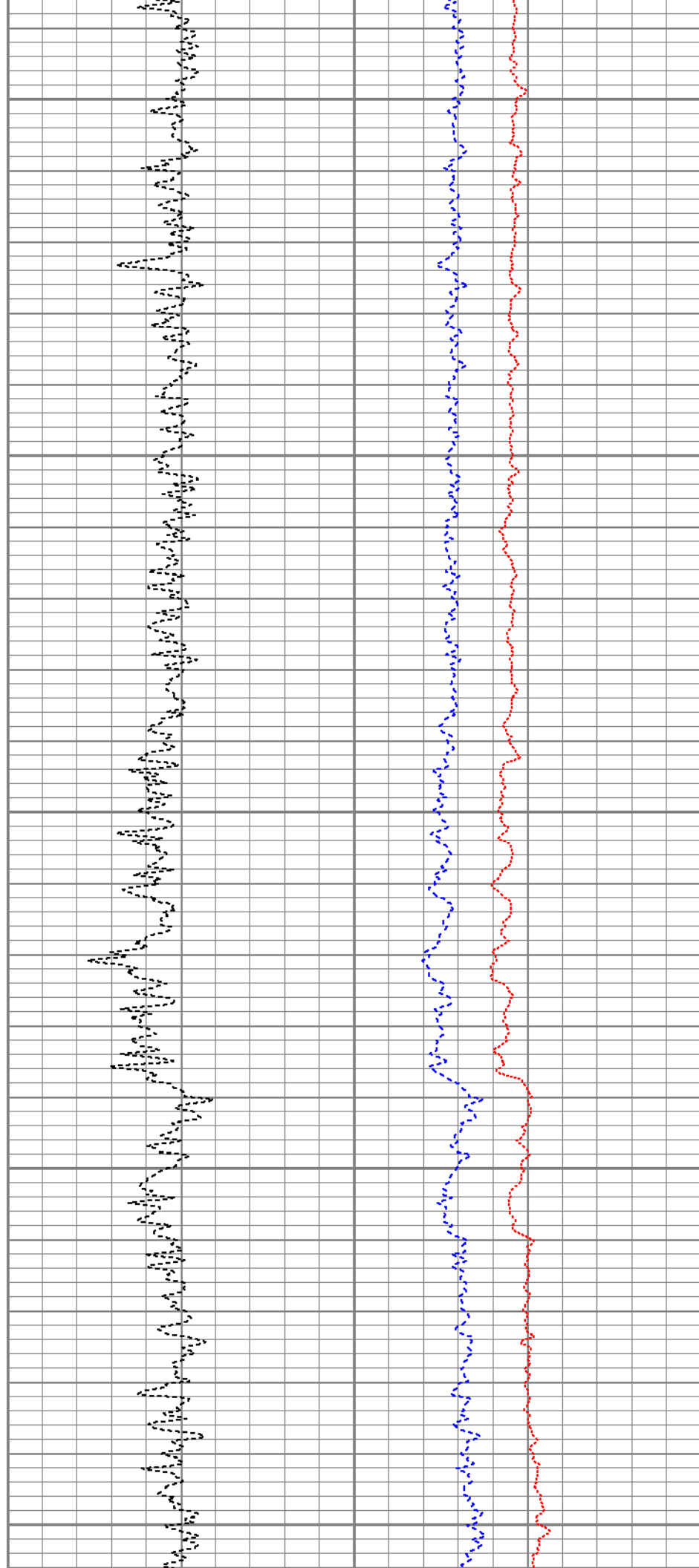
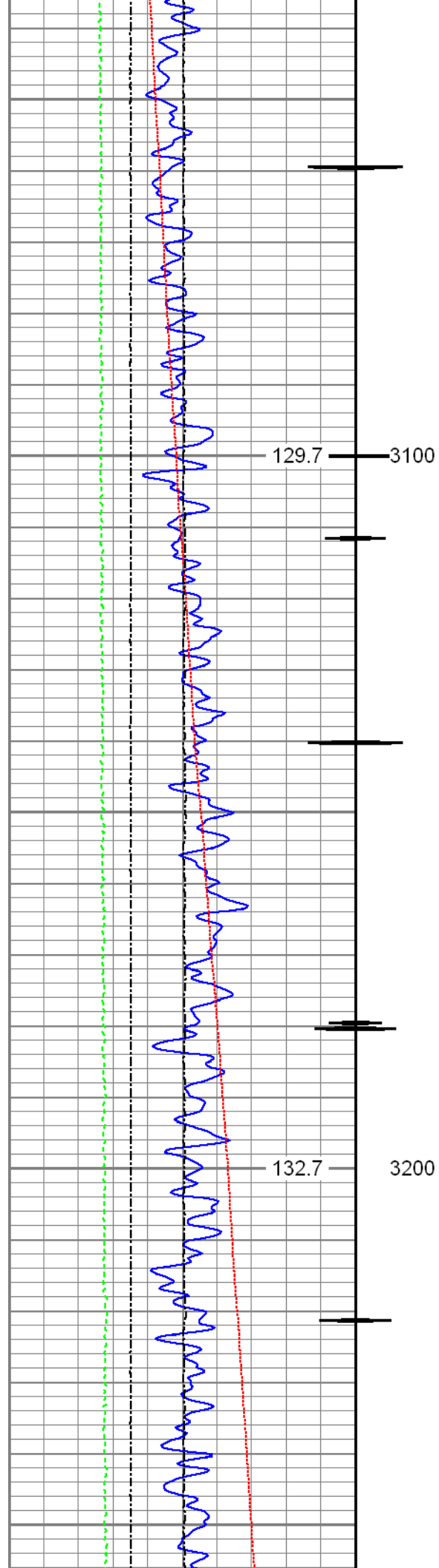


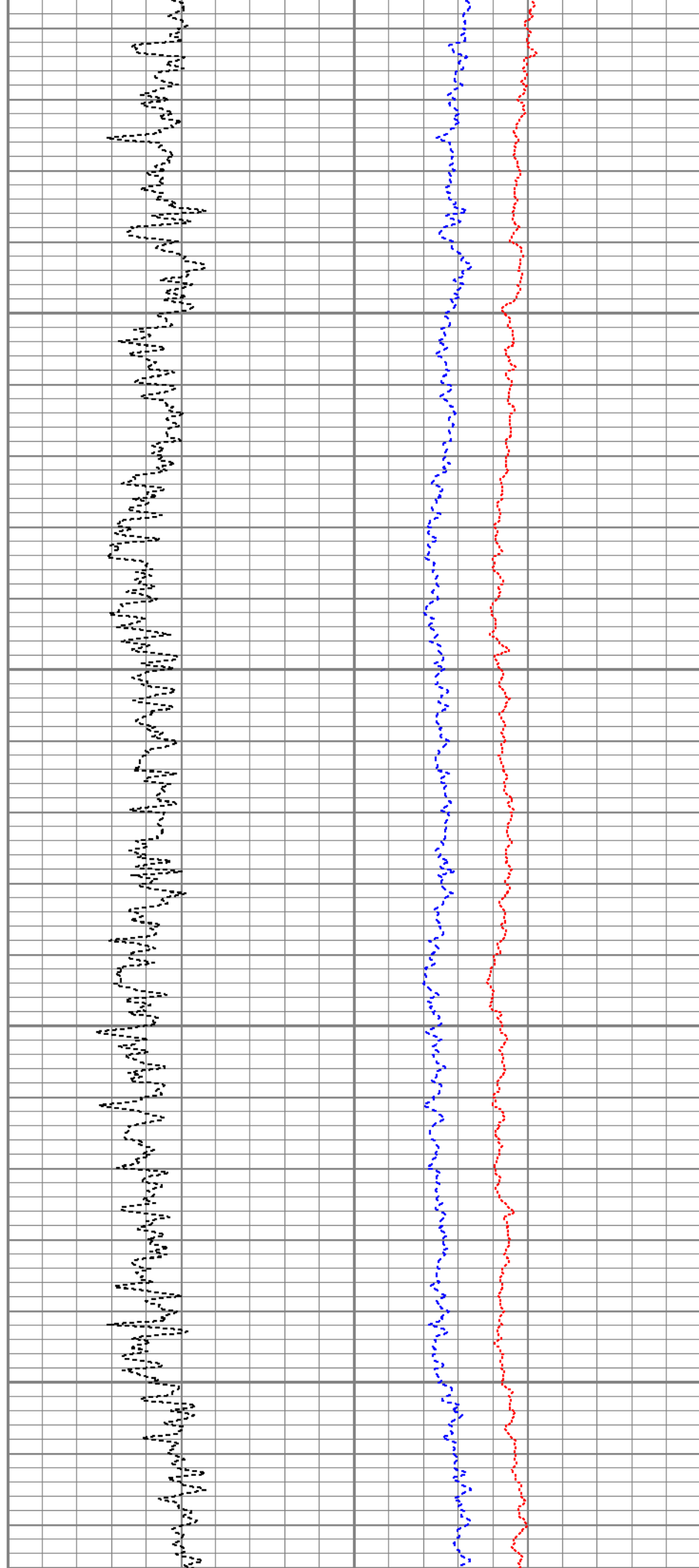
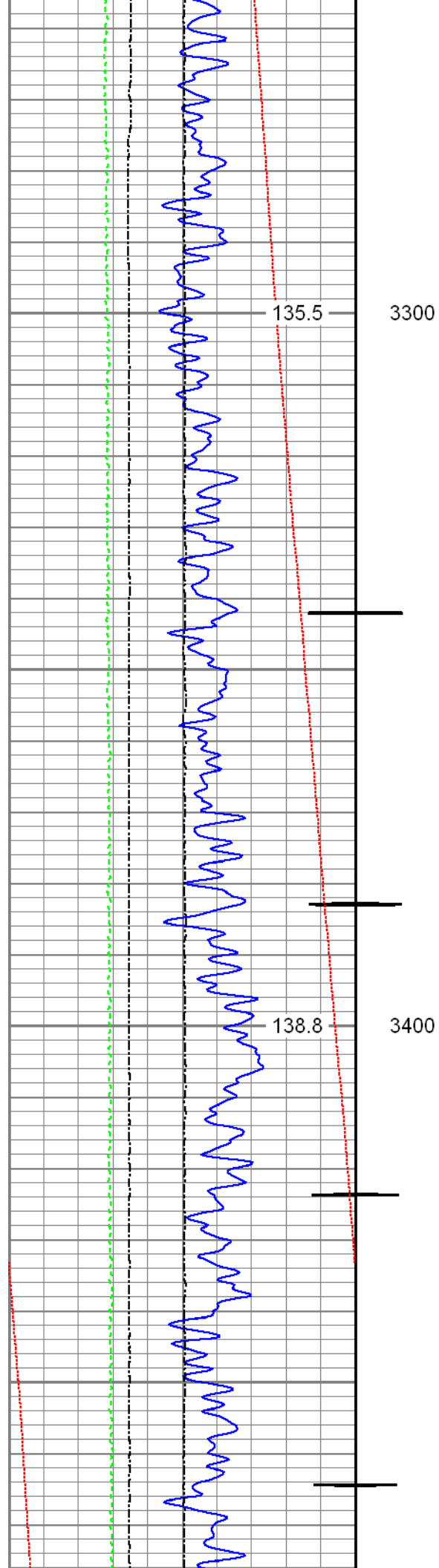


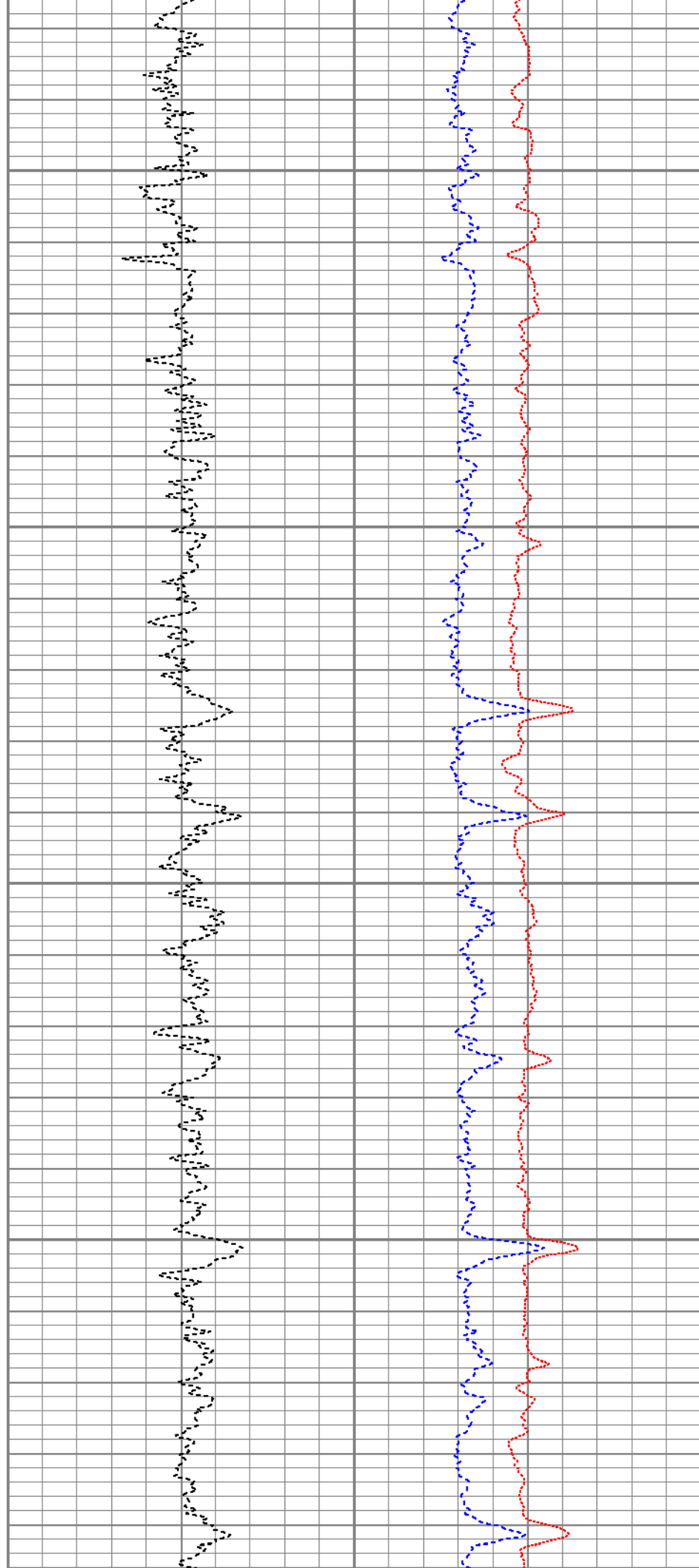
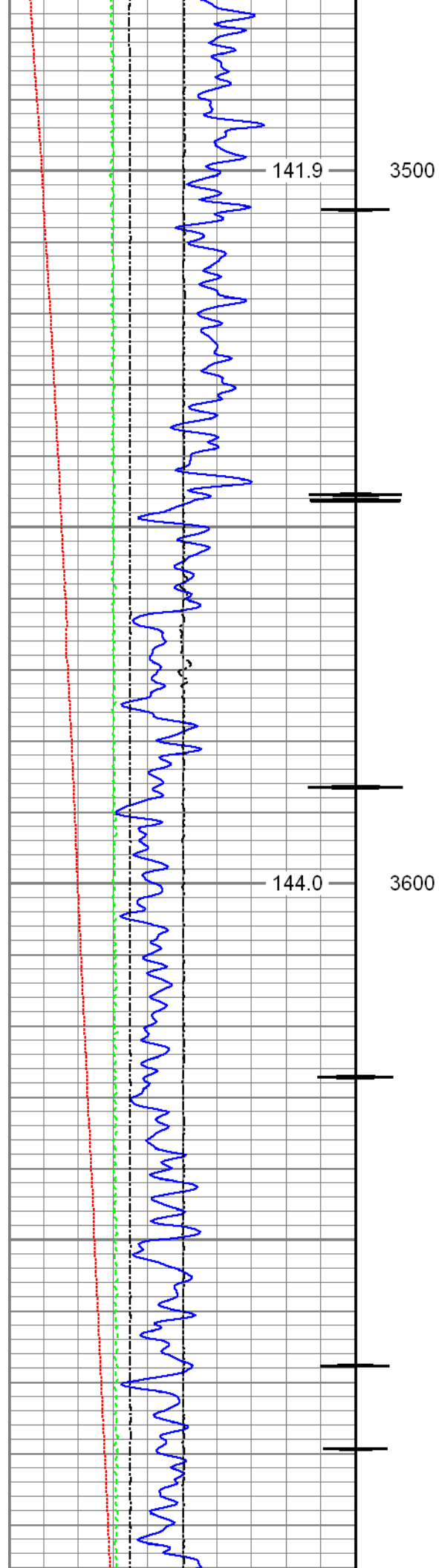


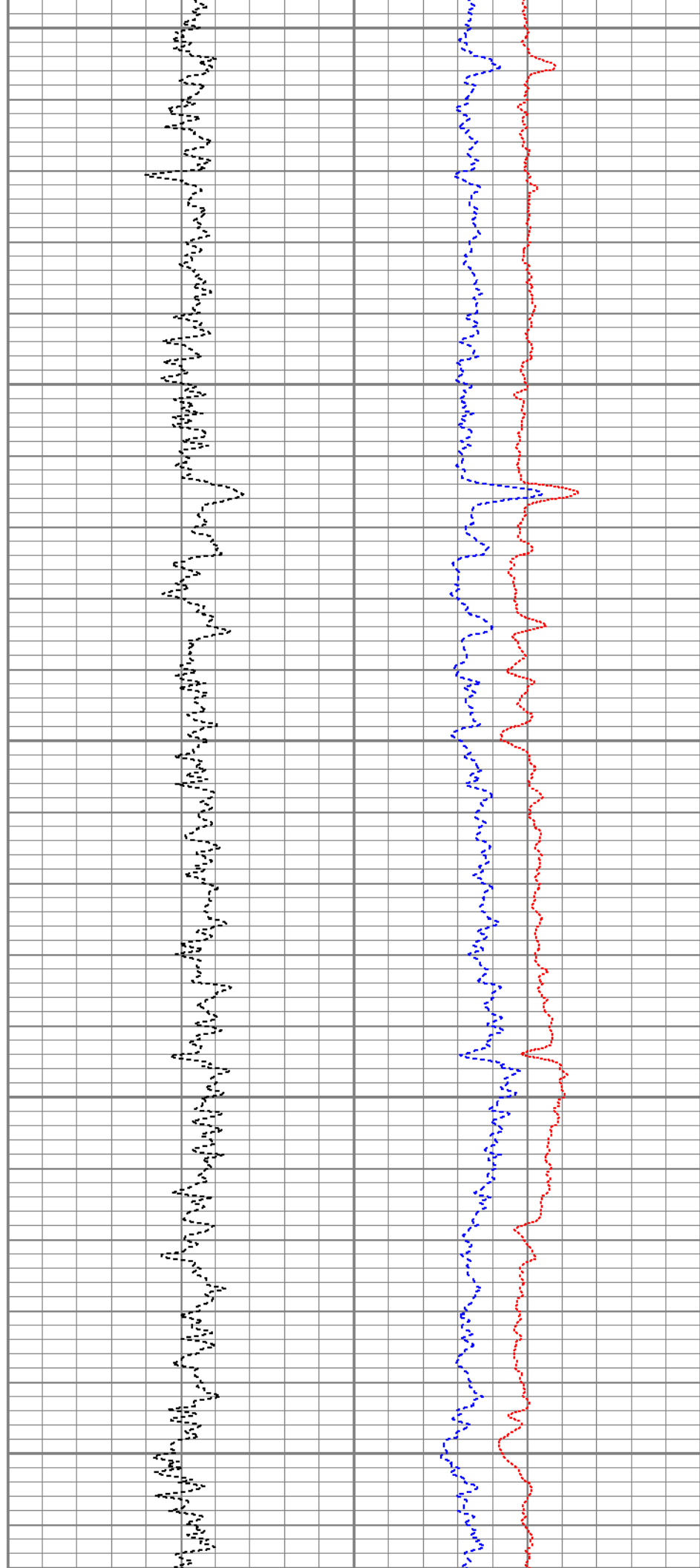
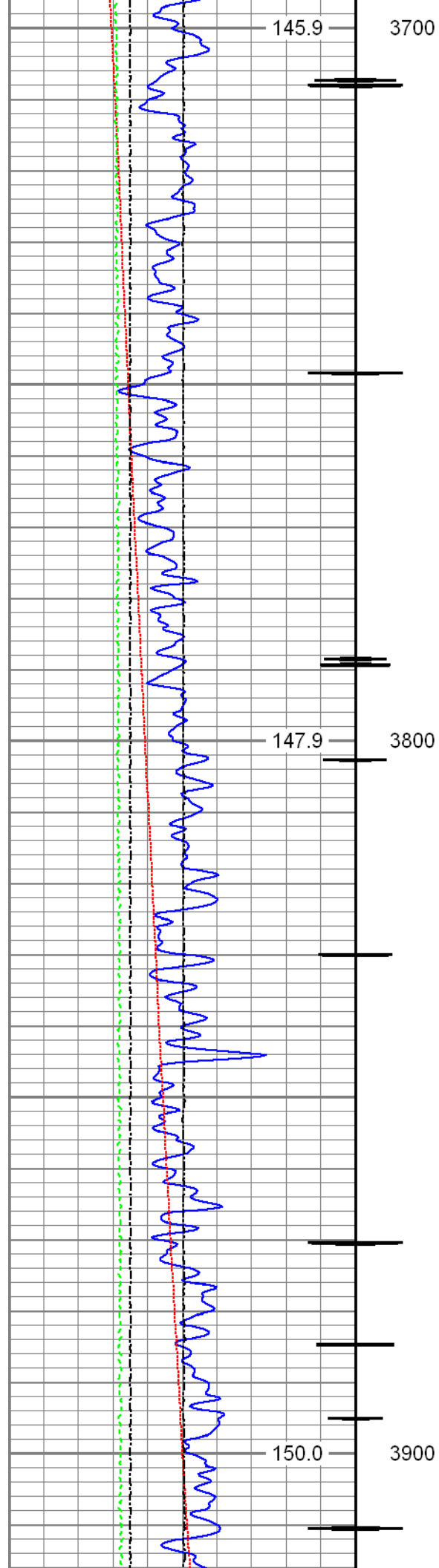


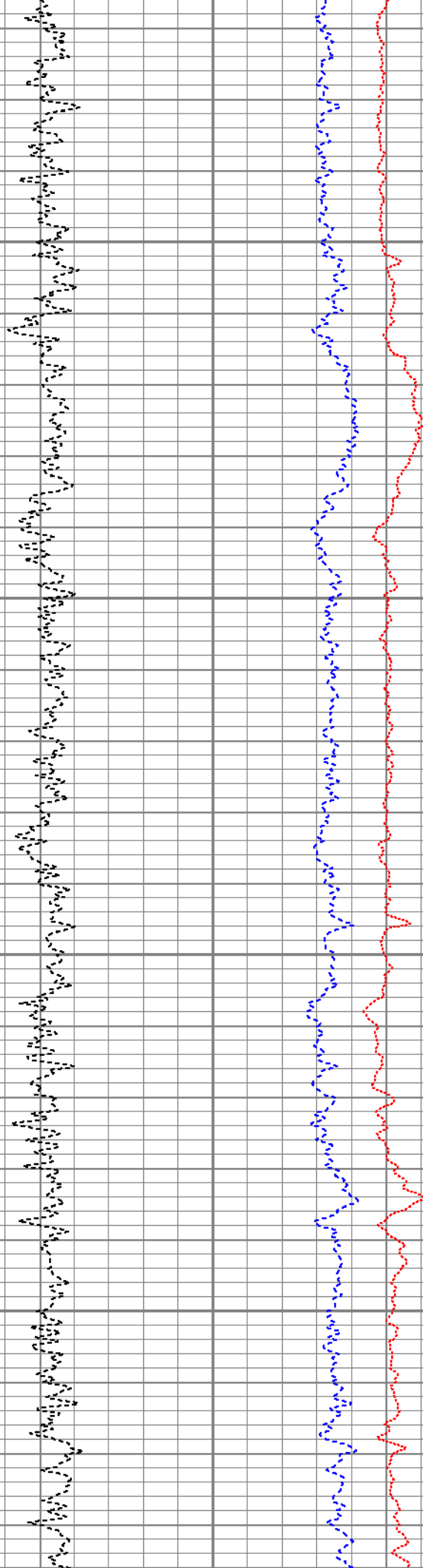
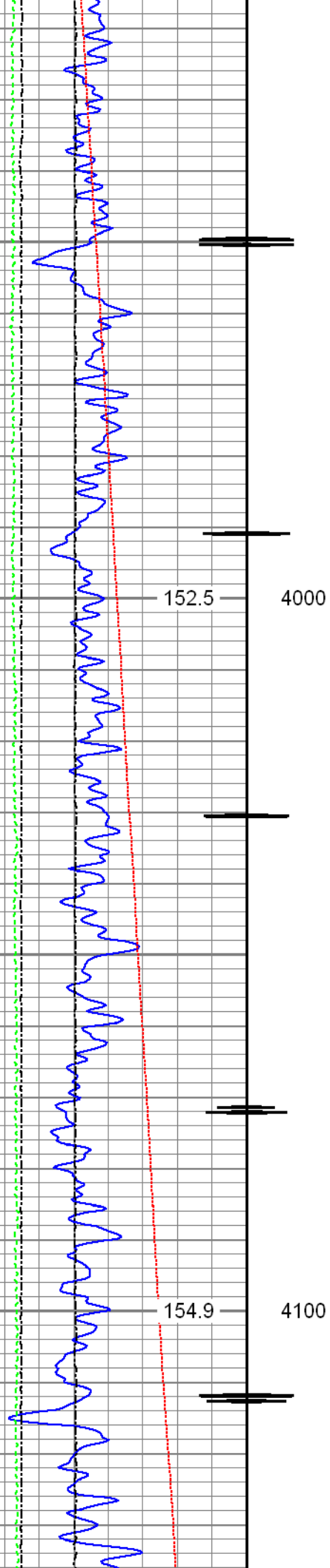


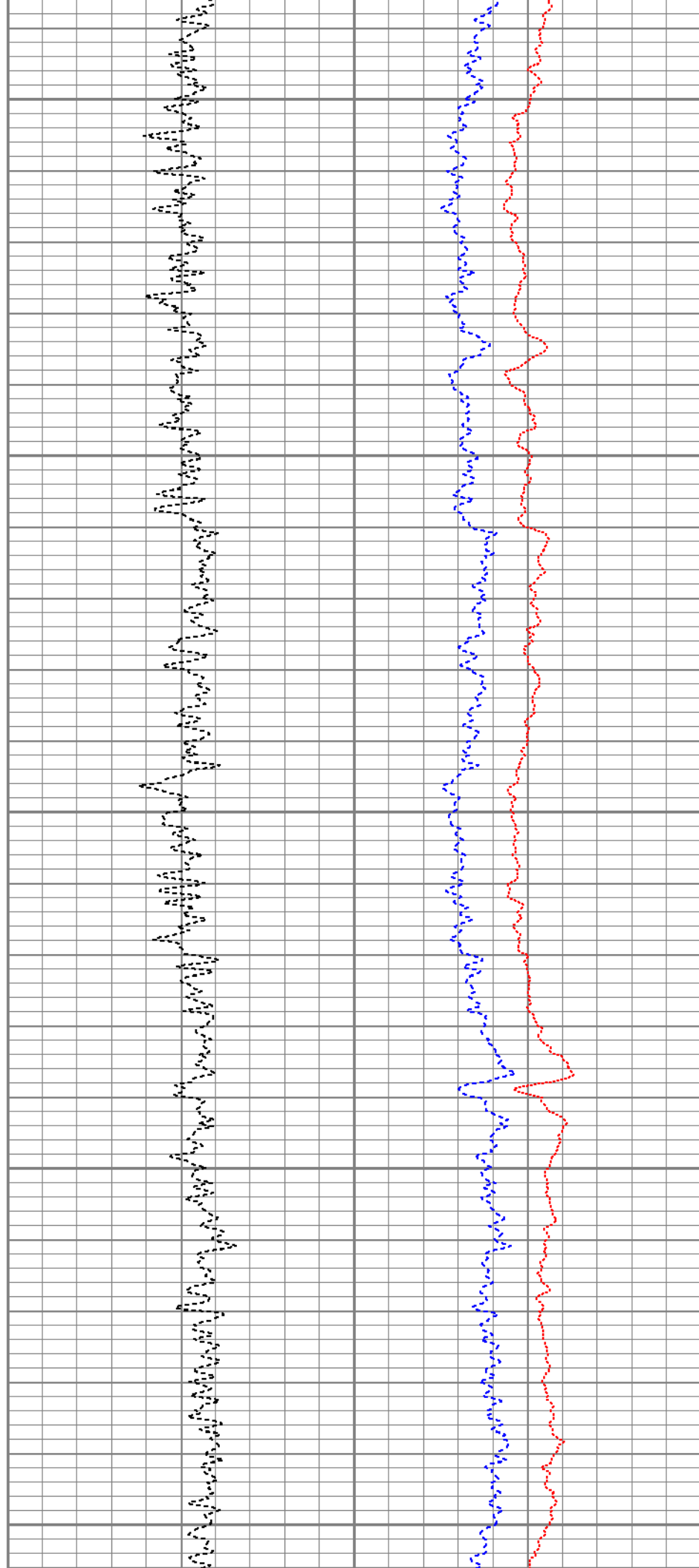
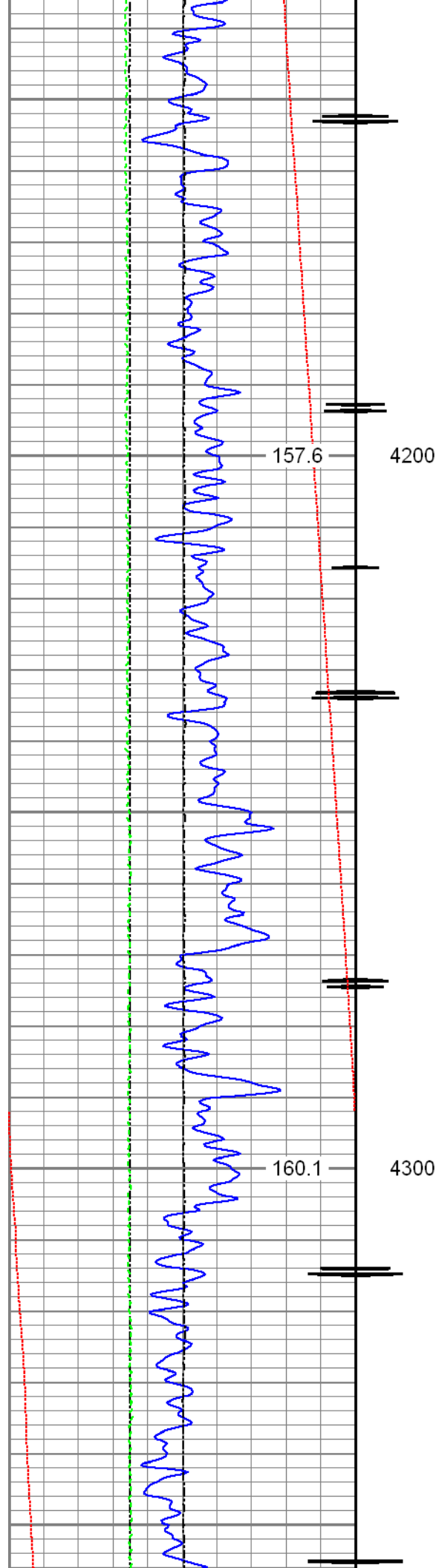


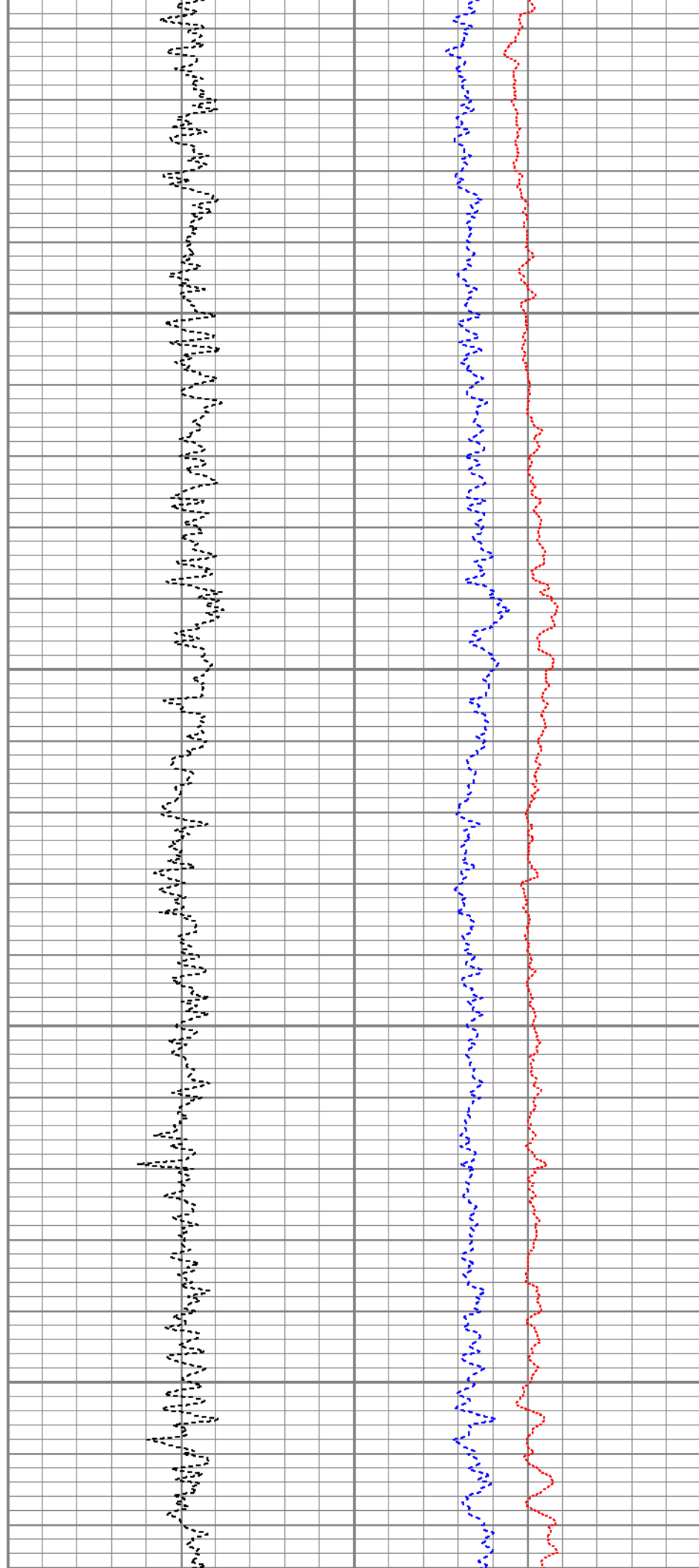
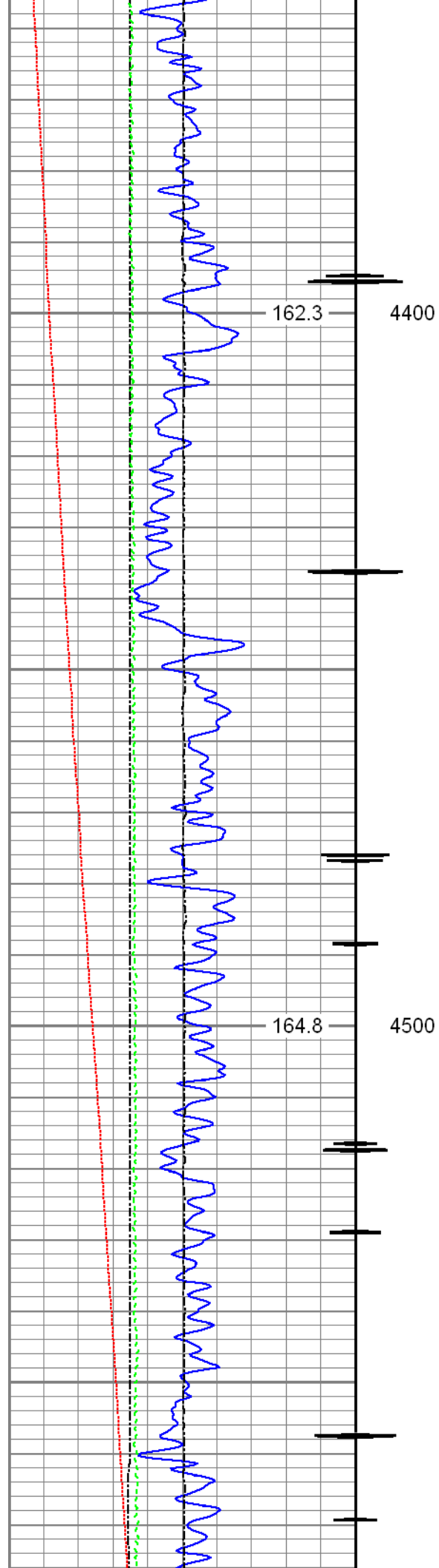


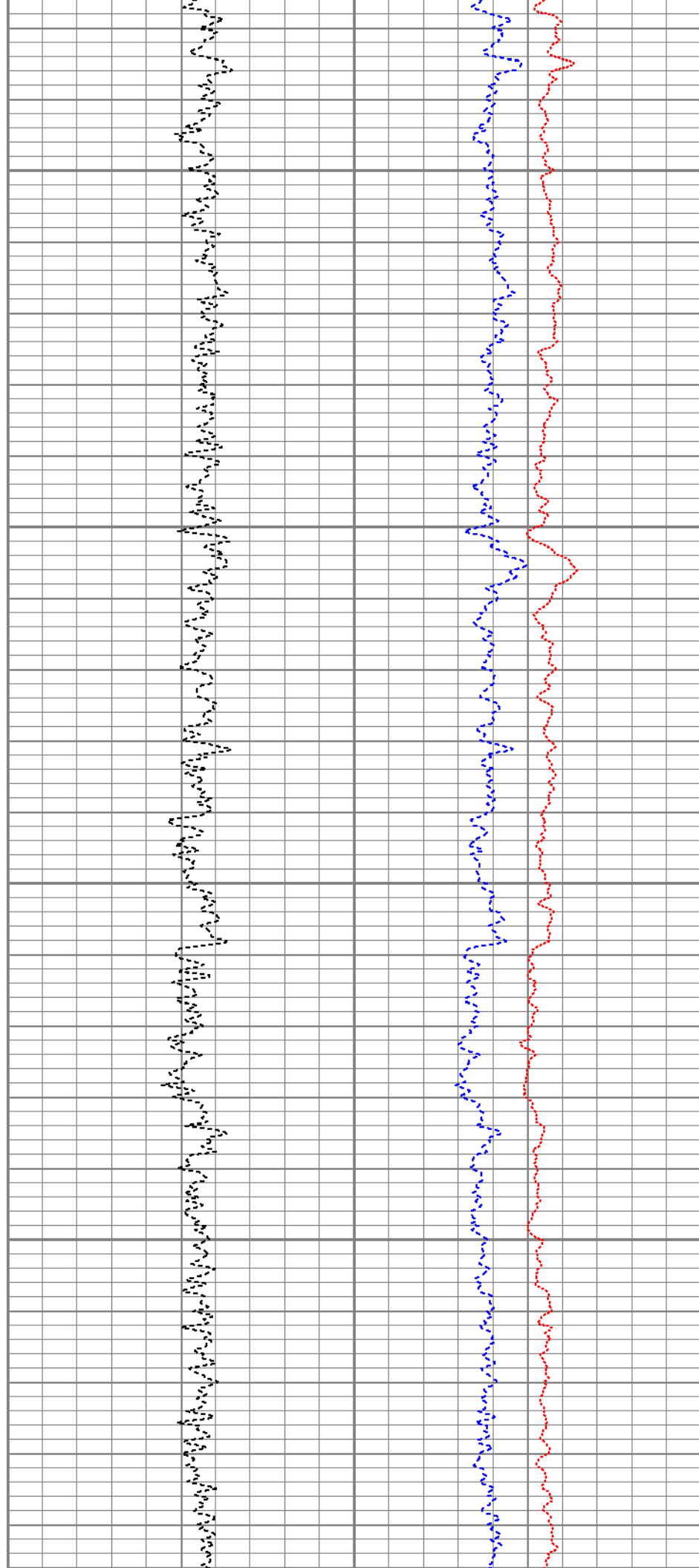
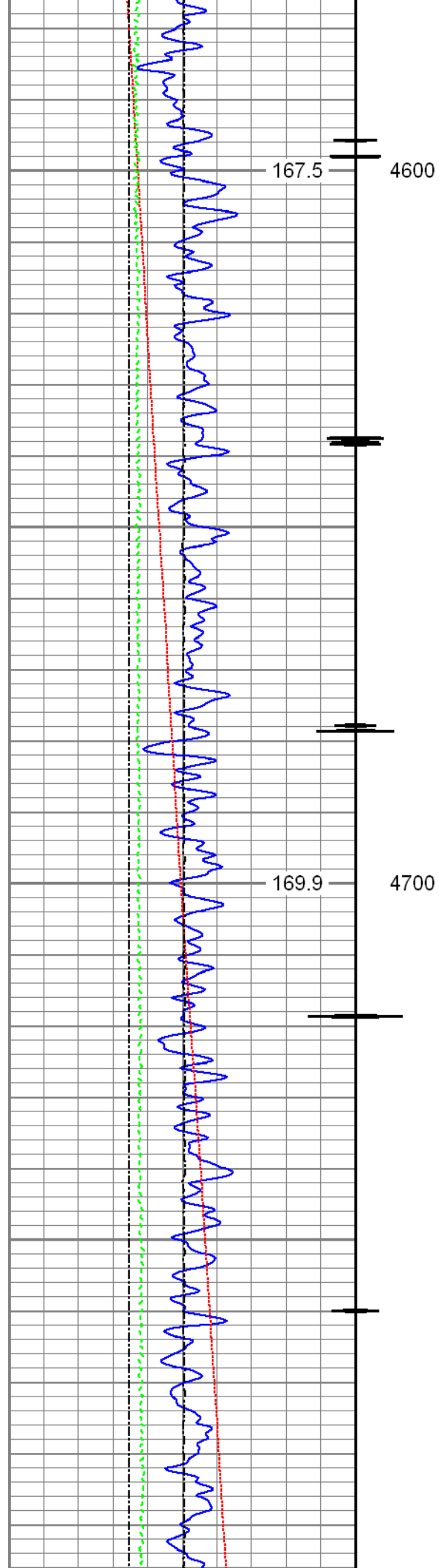


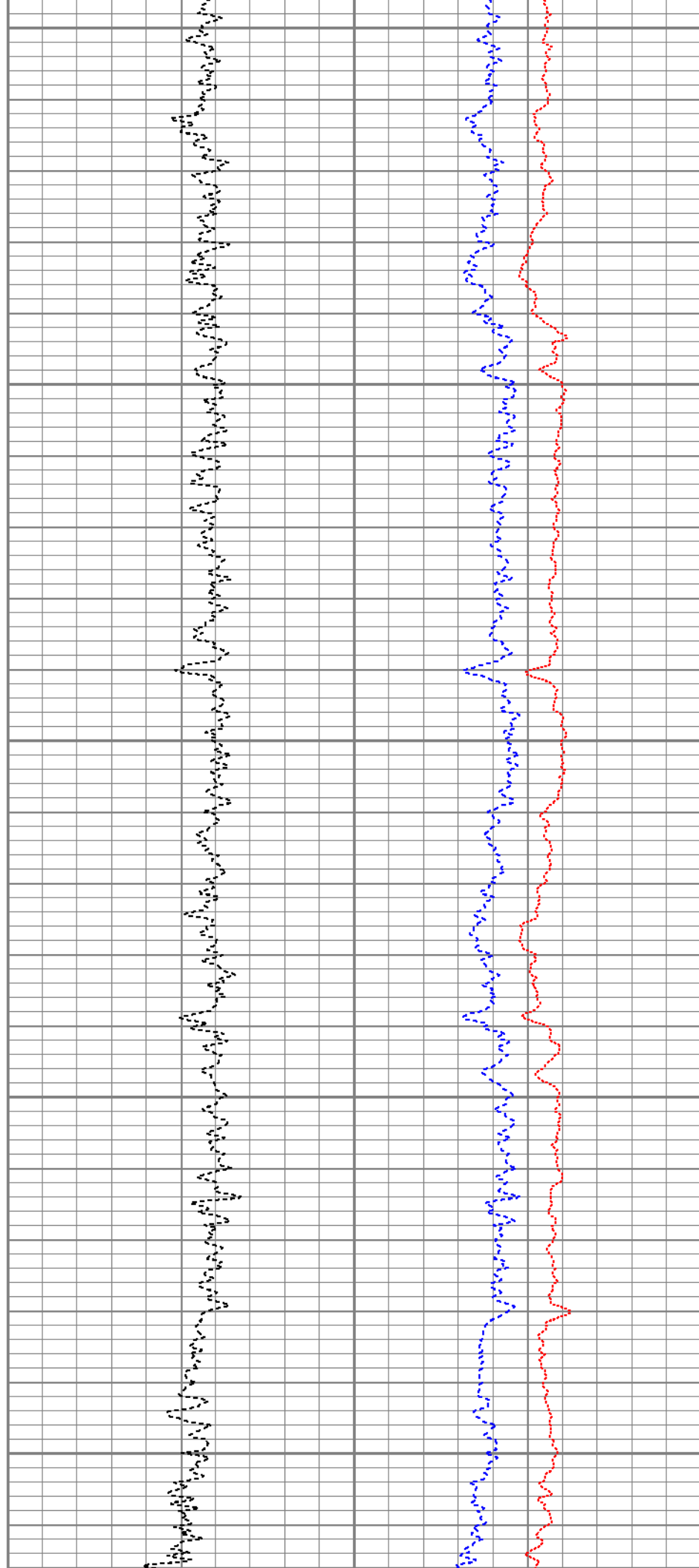
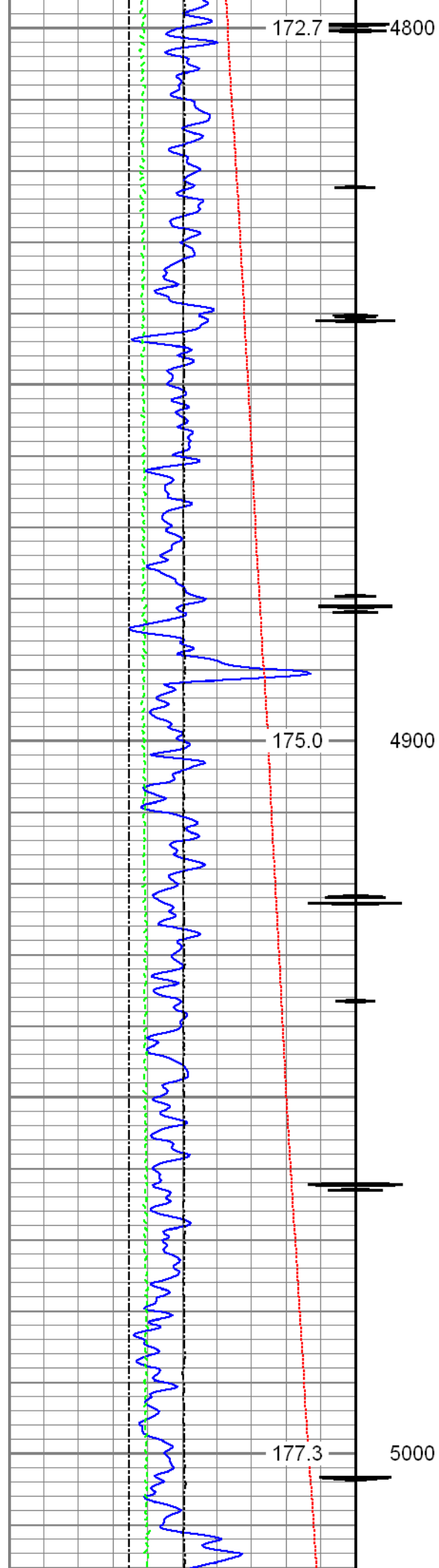


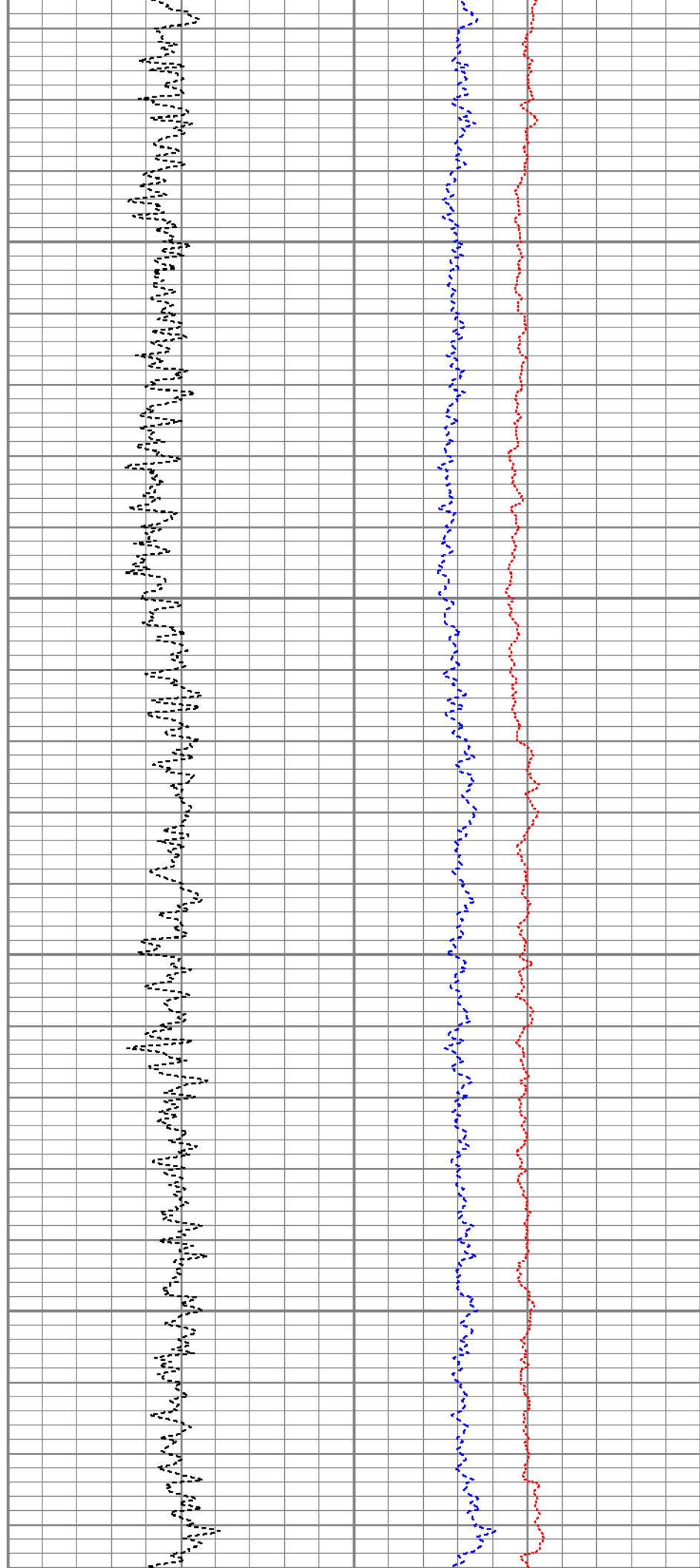
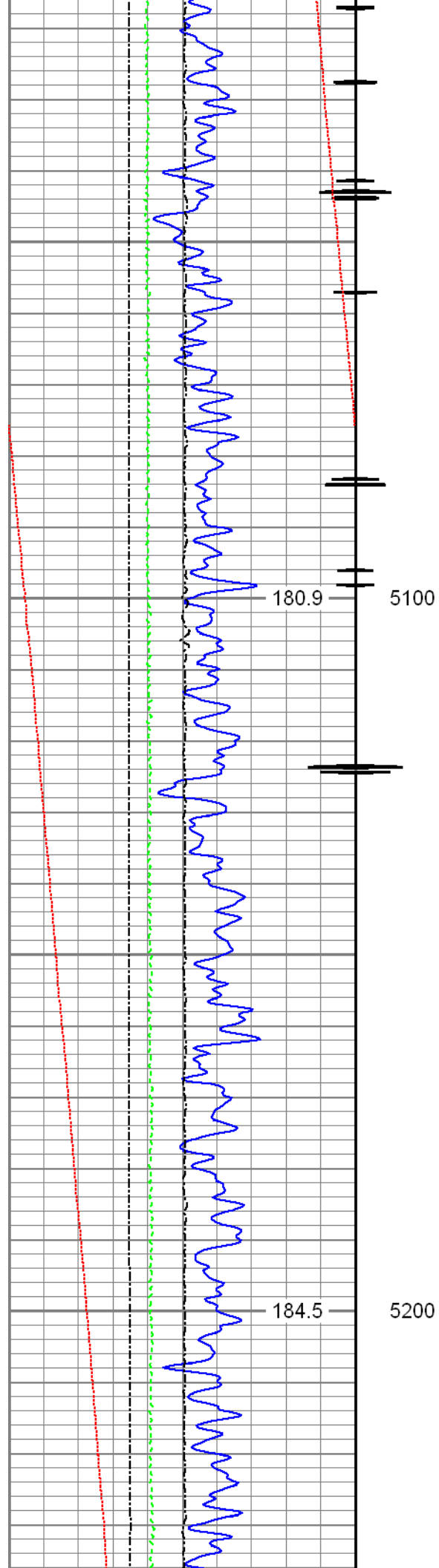


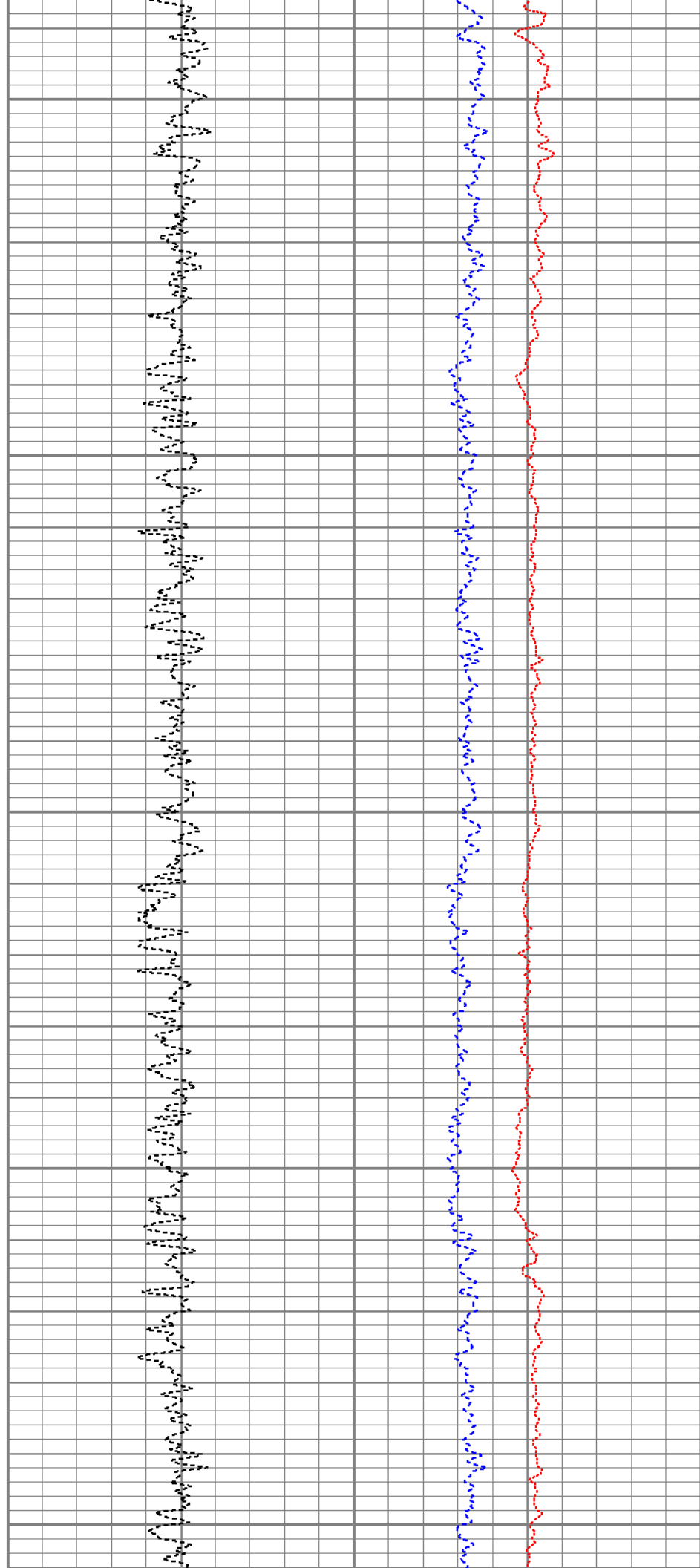
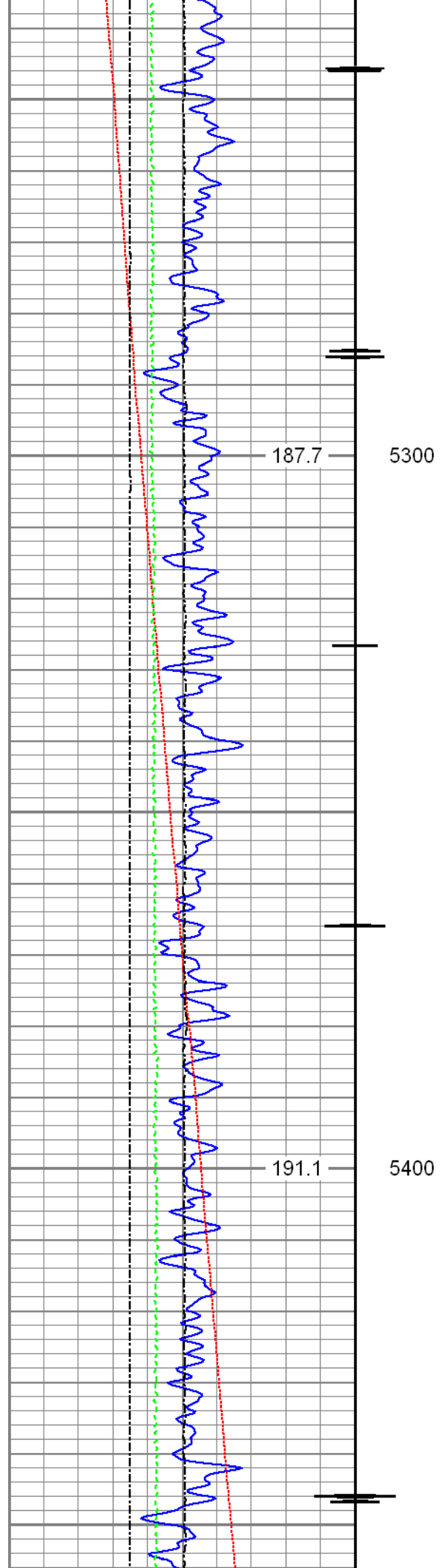


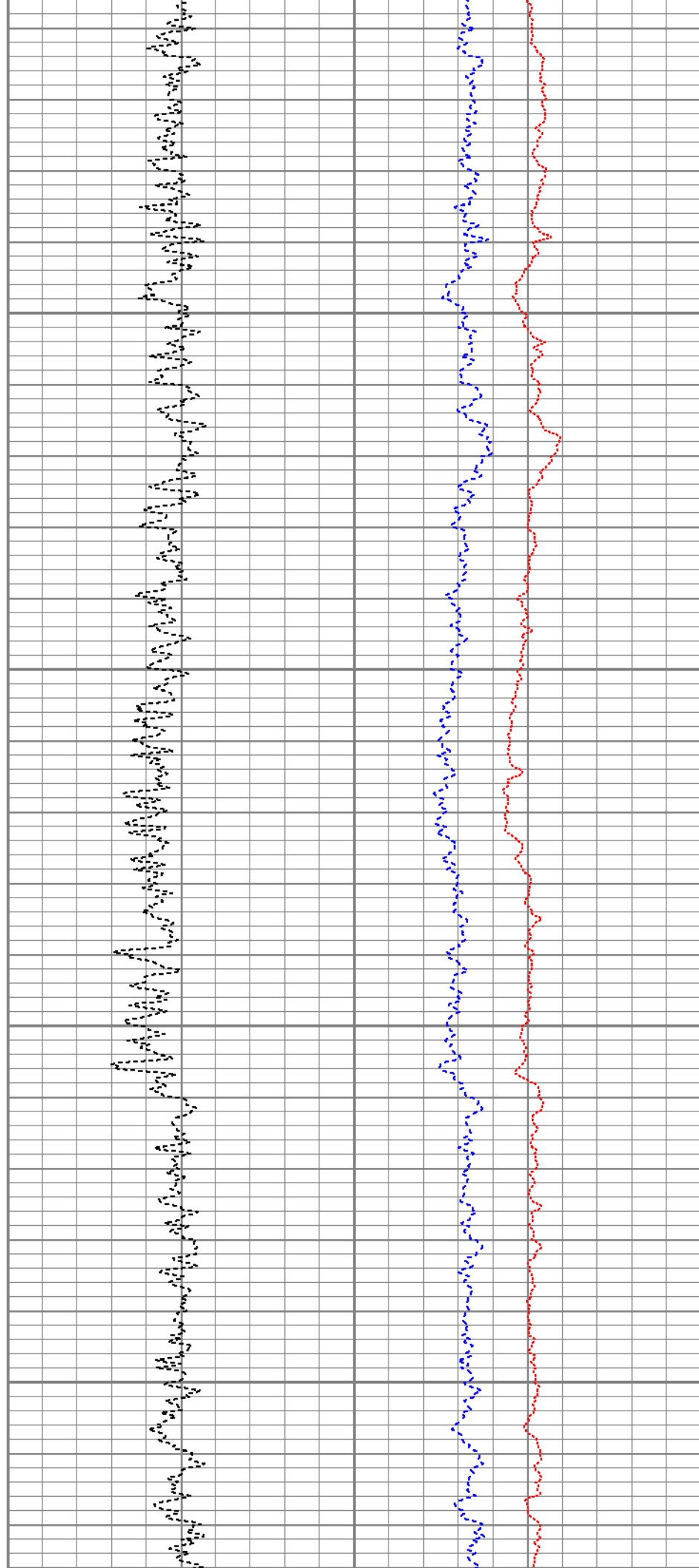
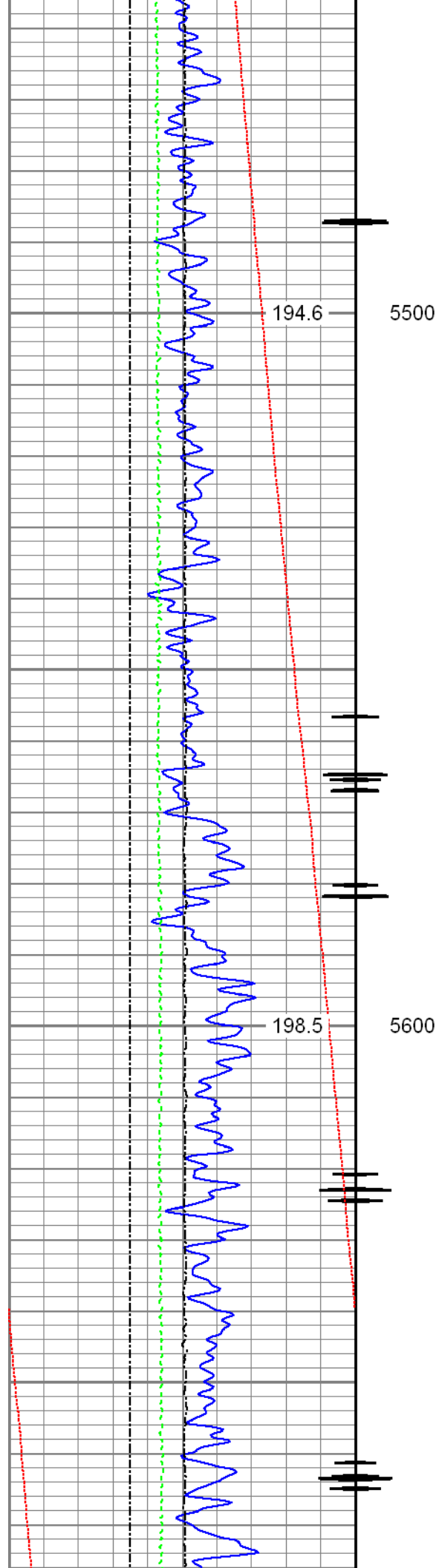


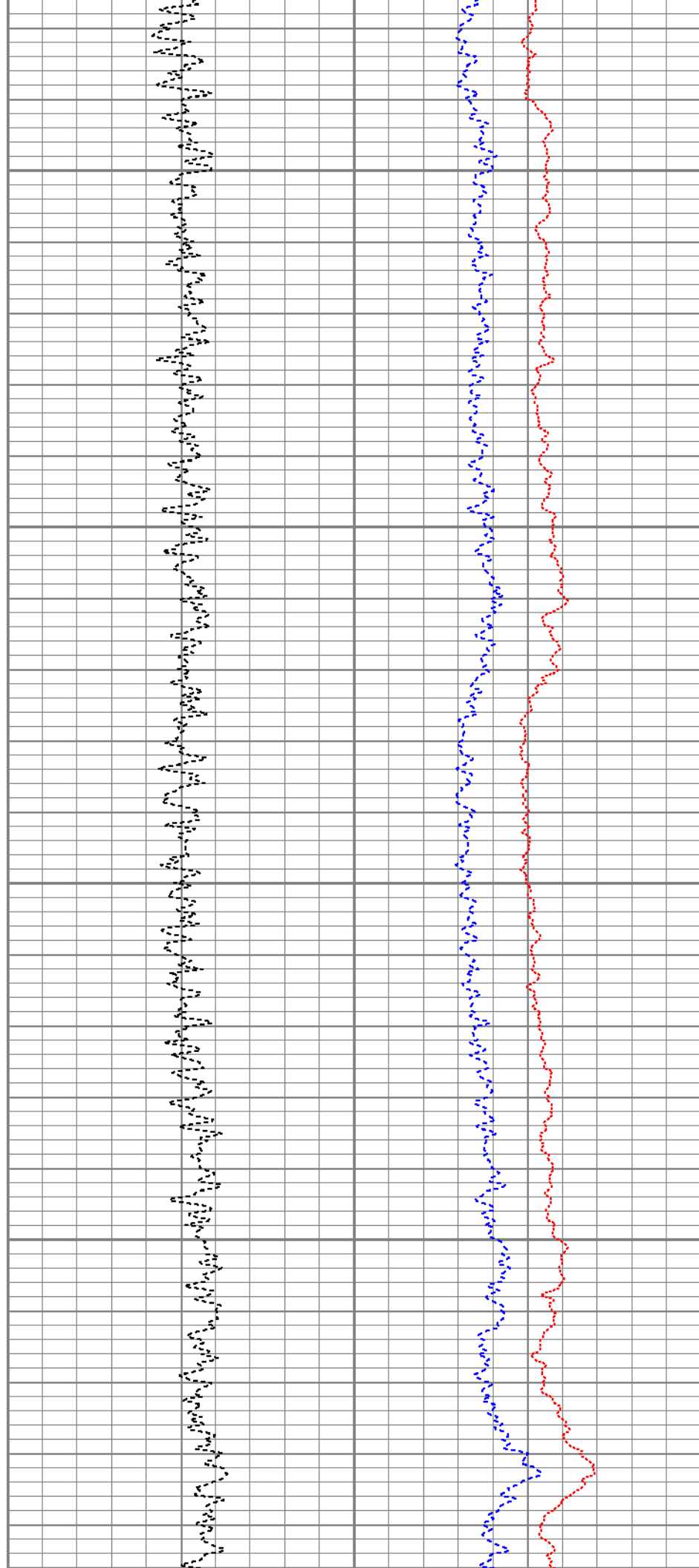
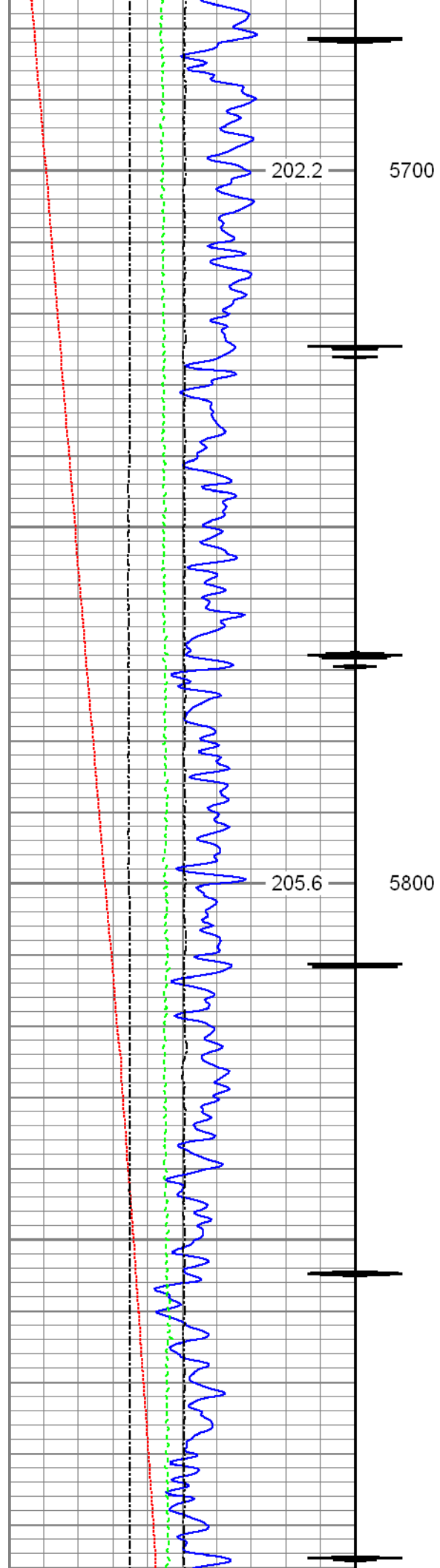


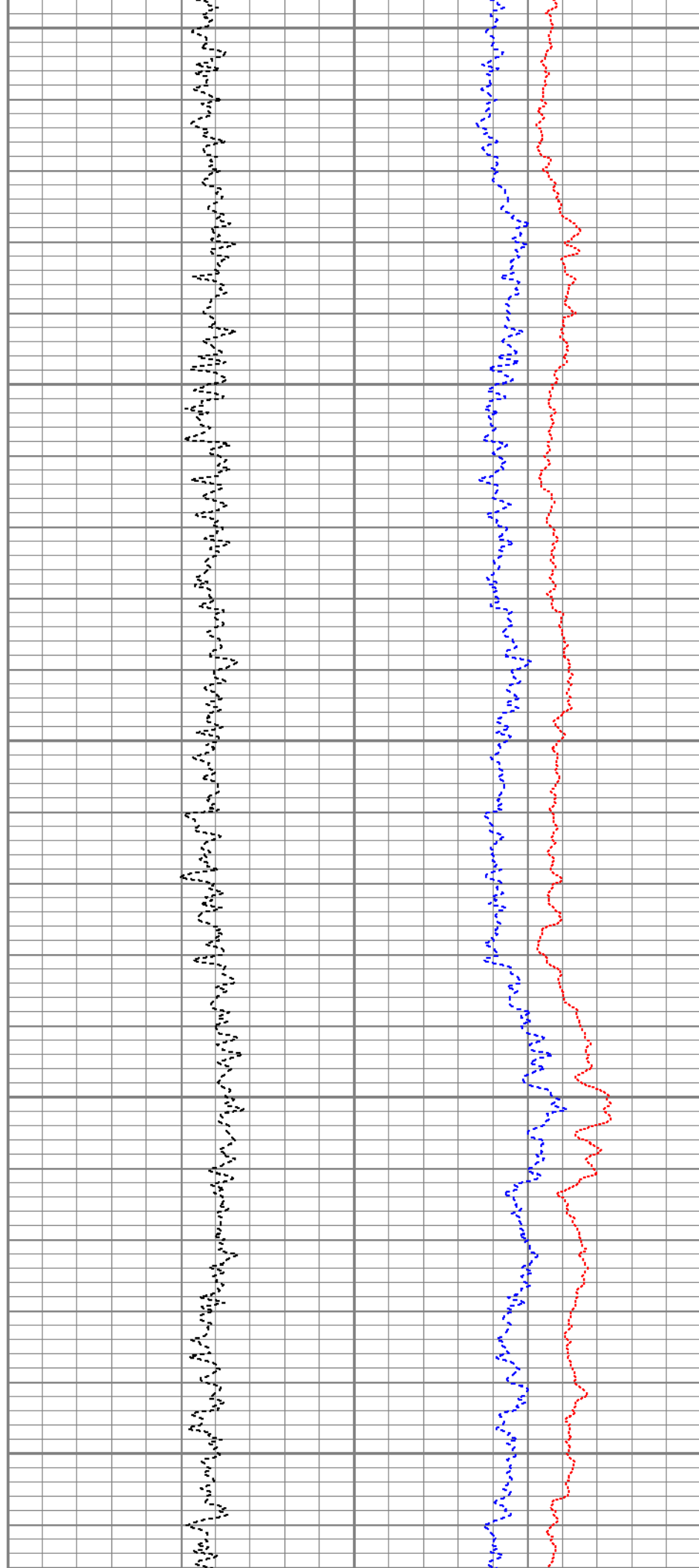
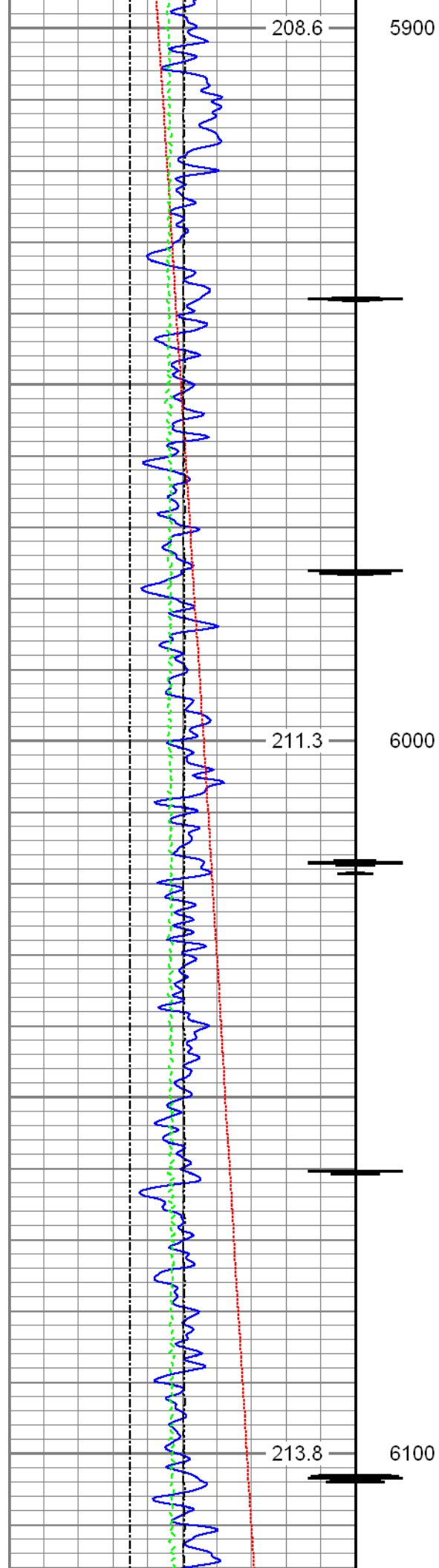


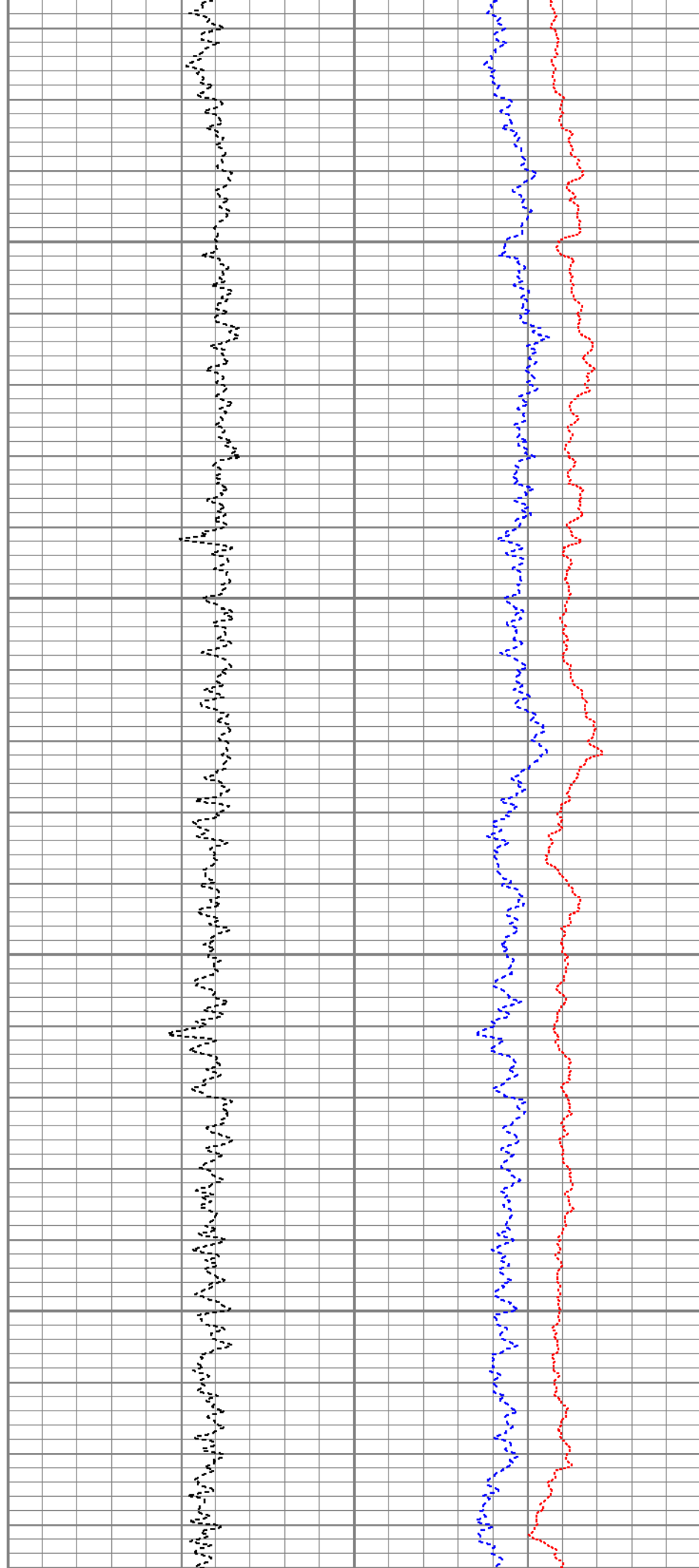
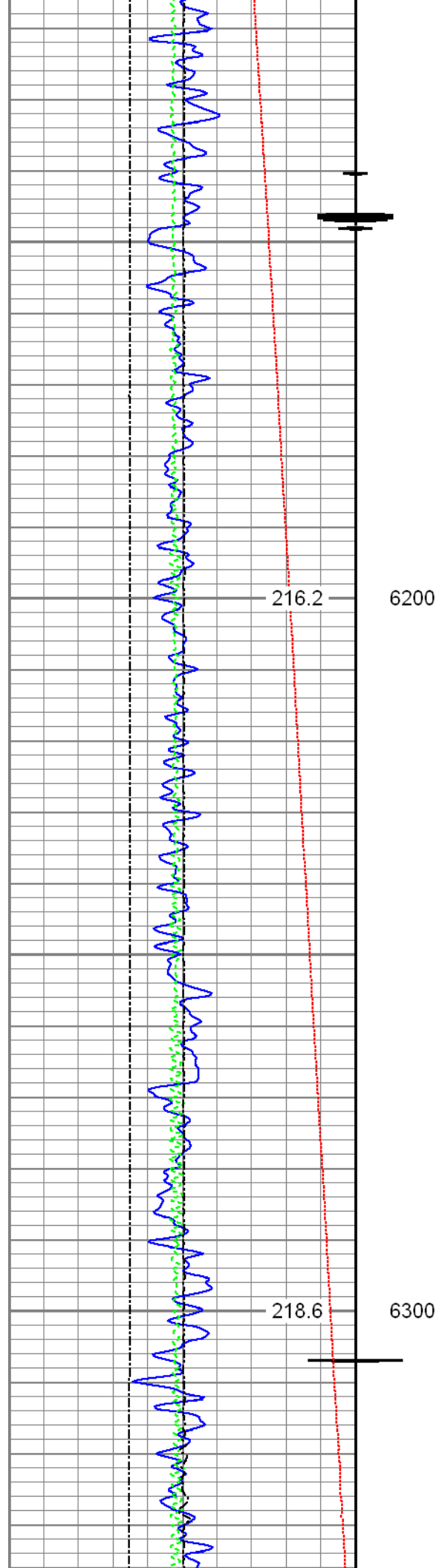


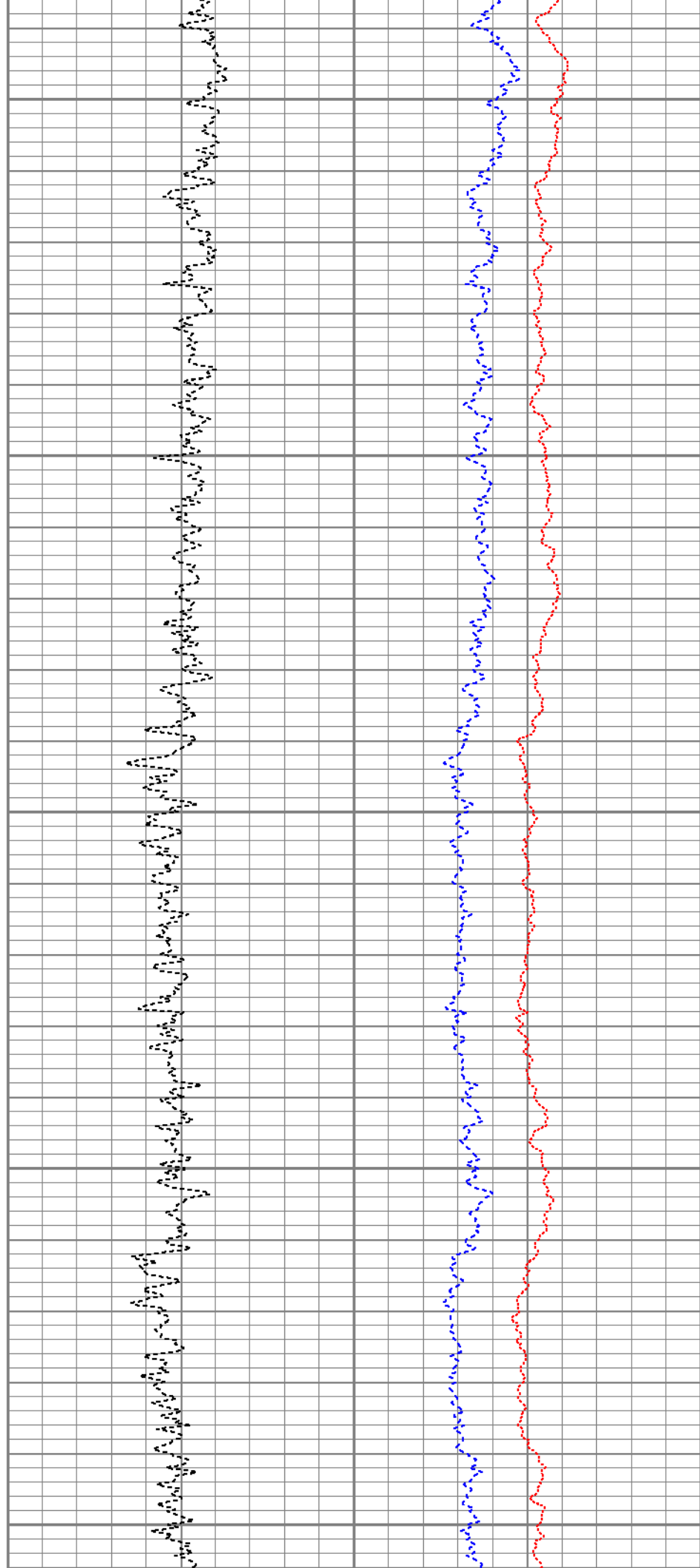
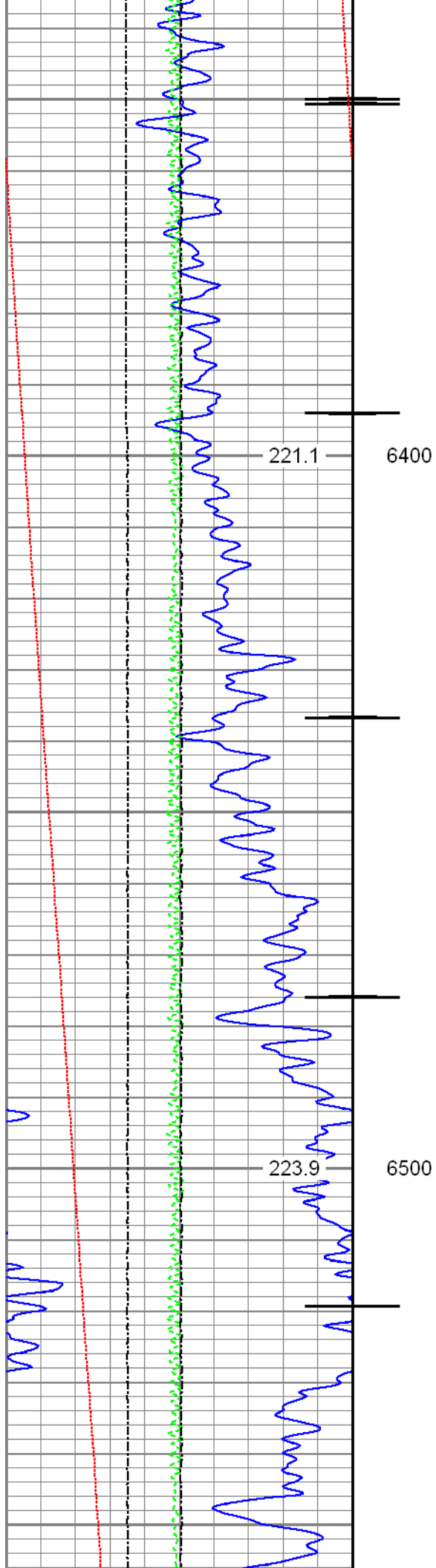


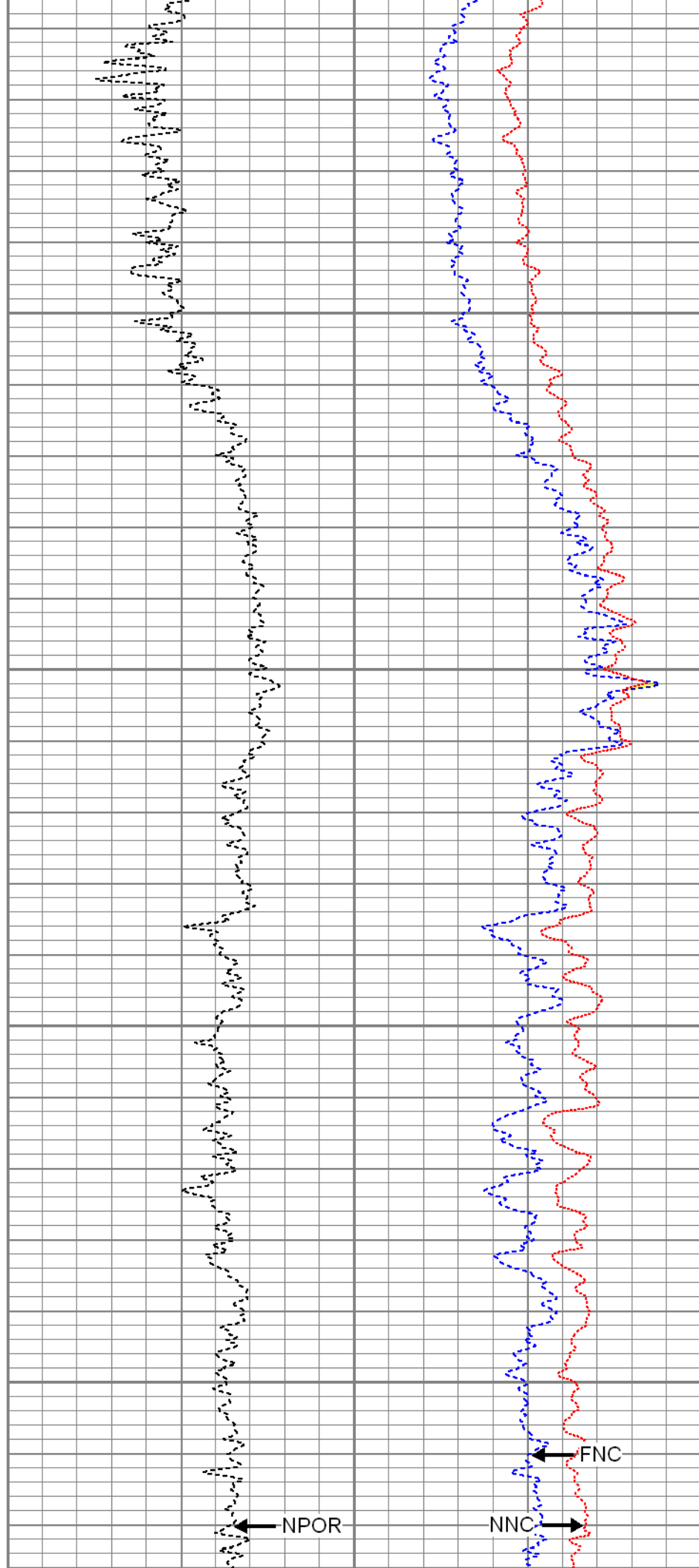
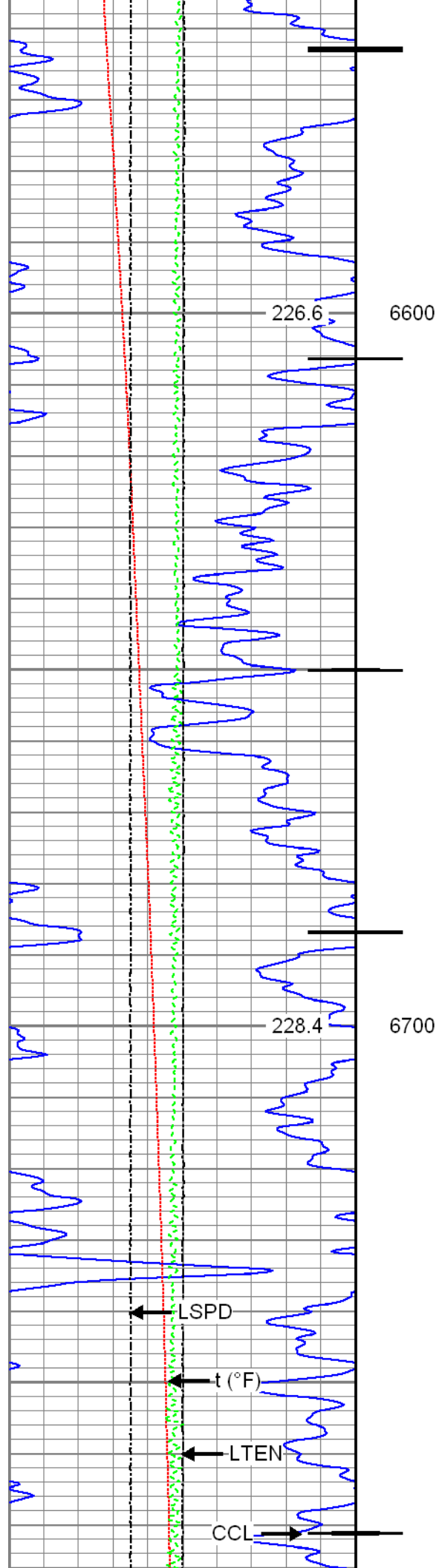




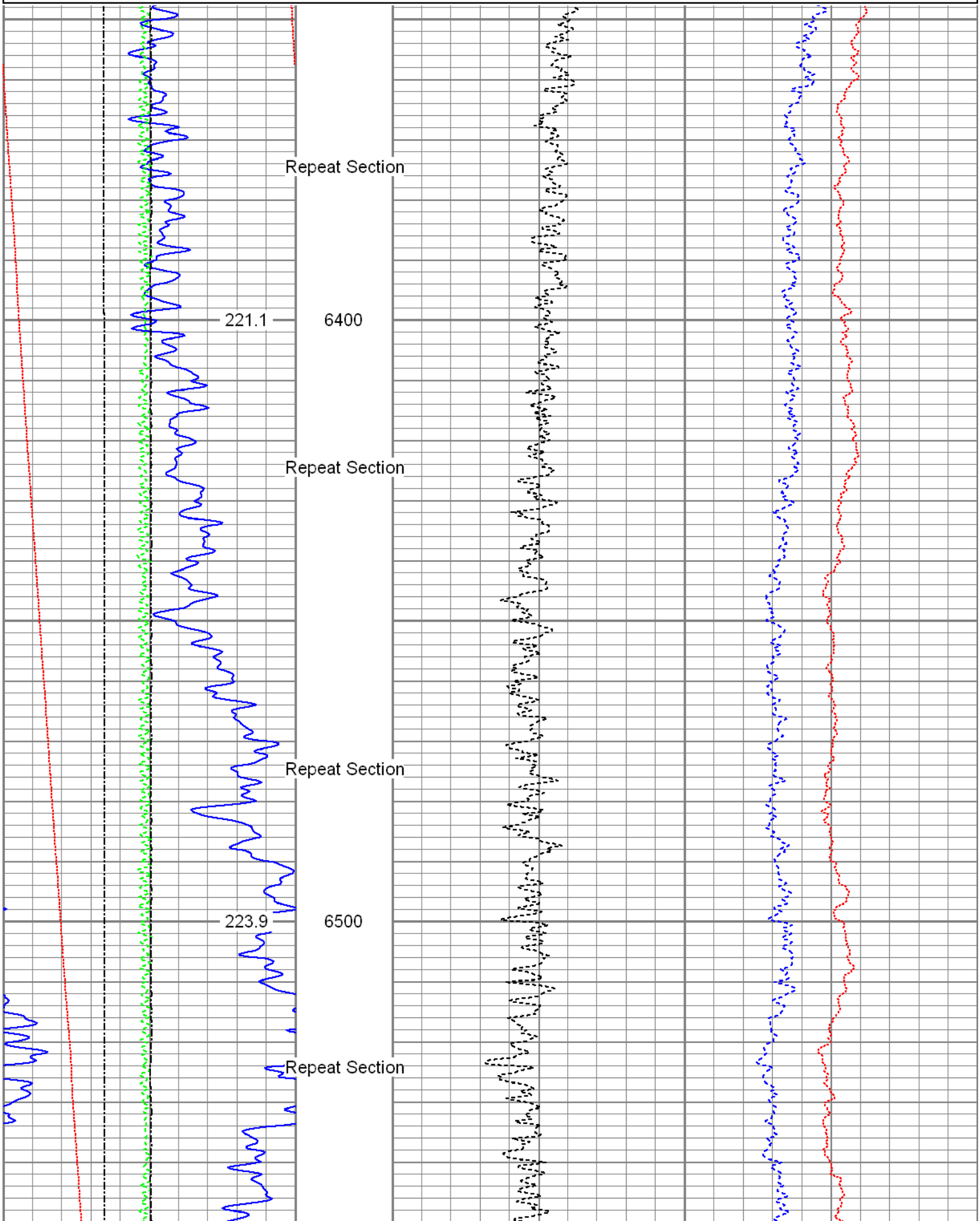


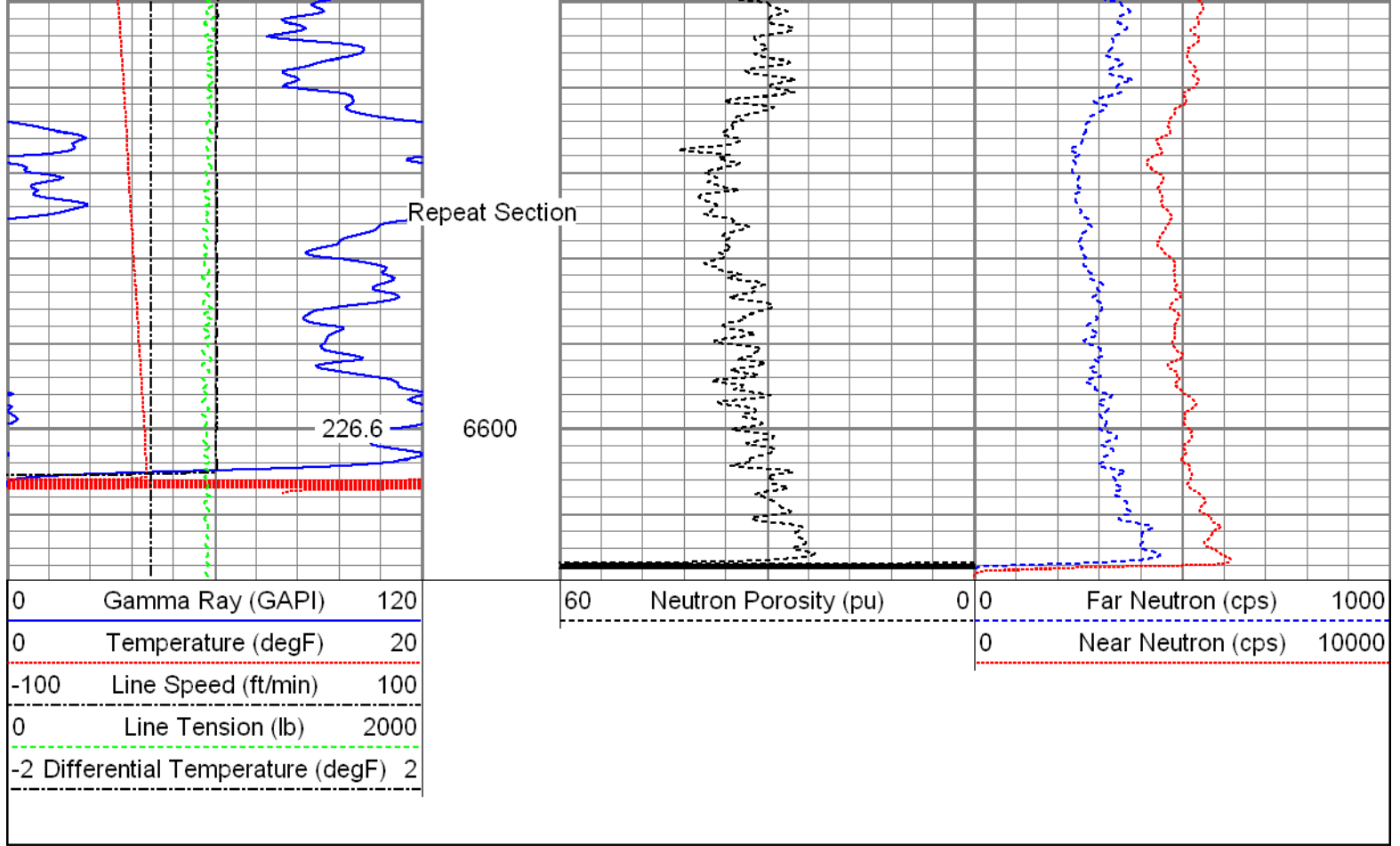




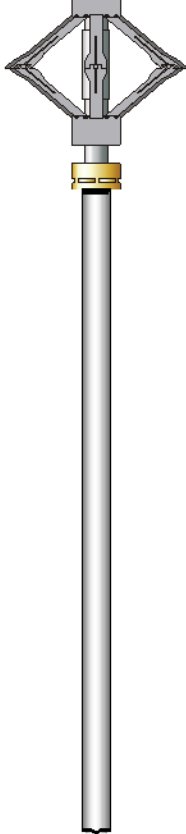


0	Line Tension (lb)	2000
-2	Differential Temperature (degF)	2





Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
GR	12.31		T_CH14375_1_GO Titan 1-7/16" Assembled Electric Cable Head with 1" Fishing Neck	1.03	1.44	4.00
			Probe_IL_BS_Cent Probe 2-3/4" Inline Electrical Inline Bowspring Centralizer	2.88	2.75	10.00
			UW_AGS-UW_AGS_001 (215017) Sondex Adapter - GO Box to Sondex Pin	0.21	1.69	1.00
			UW_XTU-UW_XTU_002 (218874) Crossover Ultrawire Toolbus to Ultralink	1.58	1.69	6.50
			UW_PGR-UW_PGR_020 (10013899) Production Gamma Ray	1.93	1.69	9.50
			UW_PRT-UW_PRT_016 (10025097) Platinum Resistance Thermometer	1.04	1.69	5.20
TEMP	10.91		UW_CCL-UW_CCL_028 (10009470) Ultrawire 3-1/8" CCL	1.61	3.13	36.00
CCL	9.67					

			UW_PRC #3 -DSSRAC (082) 2-3/4" DSS 5 Arm Roller Centralizer	2.55	2.75	32.00
			CNL-007 (1004) Compensated Neutron Logging Tool	6.61	1.69	30.00
	CNLSC		1.53			
	CNSSC		1.12			
TSTAMP	0.00					
Dataset: 08-20-15_Noble Energy_70 Ranch State BB18-675_CNL.db: field/well/run1/pass19 Total Length: 19.44 ft Total Weight: 134.20 lb O.D. 3.13 in						

Calibration Report			
Database File:	C:\Warrior\Data\New Folder\08-20-15_Noble Energy_70 Ranch State BB18-675_CNL.db		
Dataset Pathname:	pass19		
Dataset Creation:	Thu Aug 20 16:13:36 2015 by Log 7.0 B1		
Compensated Neutron Calibration Report			
Serial Number:	1004		
Tool Model:	007		
Master Calibration	Tue Jun 03 14:35:57 2014		
Detector	Readings		
Short Space	241.46	cps	
Long Space	300.95	cps	
Ratio	Measured	Reference	
CNRAT Gain K	0.8150	Sleeve: 1.0000	
	1.0158		
Before Survey			
Detector	Readings		
Short Space		cps	
Long Space		cps	
	Measured	Reference	
Ratio			
After Survey			


Detector	Readings	
Short Space		cps
Long Space		cps
	Measured	Reference
Ratio		

Temperature Calibration Report

Serial Number:		10025097	
Tool Model:		UW_PRT_016	
Performed:		Wed Feb 11 13:44:44 2015	
Point #	Reading		Reference
1	13053.00	cps	68.00 degF
2	18014.00	cps	104.00 degF
3	29668.00	cps	176.00 degF
4	41181.00	cps	248.00 degF
5	52983.00	cps	320.00 degF
6	58931.00	cps	356.00 degF
7		cps	degF
8		cps	degF
9		cps	degF
10		cps	degF

Gamma Ray Calibration Report

Serial Number:	10013899	
Tool Model:	UW_PGR_020	
Performed:	Sun Jun 13 13:33:21 1993	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.0	cps
Sensitivity:	1.0000	GAPI/cps

	Company	Noble Energy Inc.
	Well	70 Ranch State BB18-675
	Field	Wattenberg
	County	Weld
	State	Colorado