



Radial Cement Bond
Gamma Ray
Casing Collar Log

| | | | |
|------------------------|--|----------------------|--|
| Company | | Noble Energy Inc. | |
| Well | | Wells Ranch AF05-665 | |
| Field | | Wattenberg | |
| County | | Weld | |
| State | | Colorado | |
| Location: | | API #: 05-123-42134 | |
| SEC 5 | | TWP 5N | |
| Log Measured From | | Ground Level | |
| Drilling Measured From | | Kelly Bushing | |
| Elevation | | 4682' | |
| Other Services | | --- | |
| Permanent Datum | | Ground Level | |
| Log Measured From | | Kelly Bushing | |
| Drilling Measured From | | Kelly Bushing | |
| Elevation | | 4682' | |
| Other Services | | --- | |
| Date | | 03-Mar-2016 | |
| Run Number | | One | |
| Depth Driller | | 16079.7 FT | |
| Depth Logger | | 6749 FT | |
| Bottom Logged Interval | | 6745 FT | |
| Top Log Interval | | Surface | |
| Open Hole Size | | 8.50" | |
| Type Fluid | | Water | |
| Density / Viscosity | | 8.34 lbm/gal | |
| Max. Recorded Temp. | | 220°F | |
| Estimated Cement Top | | 55 FT | |
| Time Well Ready | | ROA | |
| Time Logger on Bottom | | 11:15 | |
| Equipment Number | | HD-0361 | |
| Location | | Fort Lupton, CO | |
| Recorded By | | Sam Hopper | |
| Witnessed By | | Bill Mansfield | |
| Borehole Record | | Tubing Record | |
| Run Number | | Bit | |
| From | | To | |
| Size | | Weight | |
| From | | To | |
| Casing Record | | Size (in) | |
| Surface Casing | | 9 5/8 | |
| Intermediate #1 | | 5 1/2 | |
| Intermediate #2 | | 20 | |
| Liner | | P110-1C | |
| Wgt (lbs/ft) | | 36 | |
| Grade | | J-55 | |
| Top | | 30 FT | |
| Bottom | | 1855.5 FT | |
| Top | | 30 FT | |
| Bottom | | 16079.7 FT | |

<<<< Fold Here >>>>

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 at 30 FT
Recorded Marker Joint at 5538-5550 FT
Log ran from as deep as possible in heel to surface
Recorded with 2200 PSI surface induced pressure
Logging tools were clean and free of any debris upon completion of operations

Thank you for choosing FMC Technologies Surface Integrated Services.

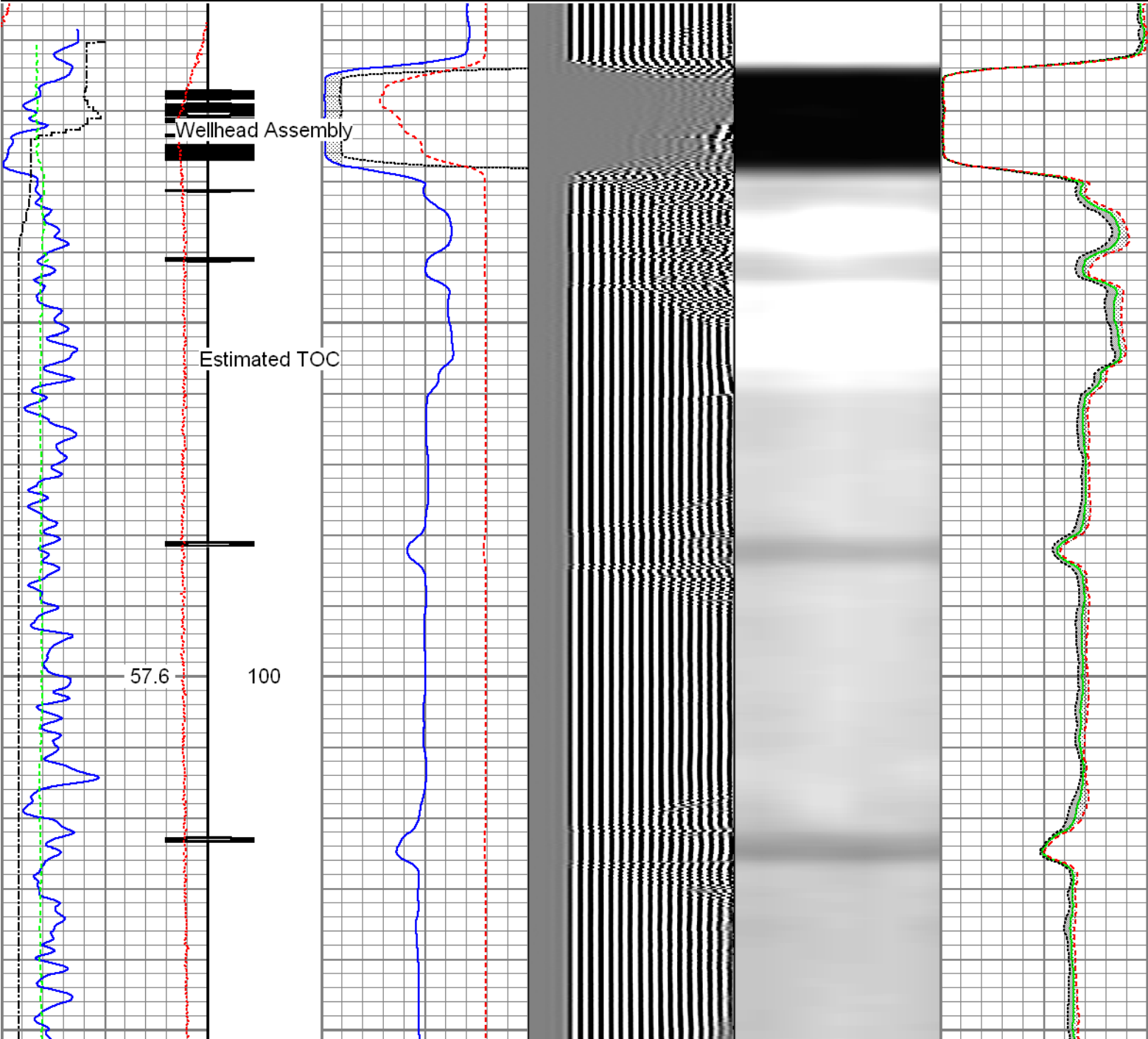


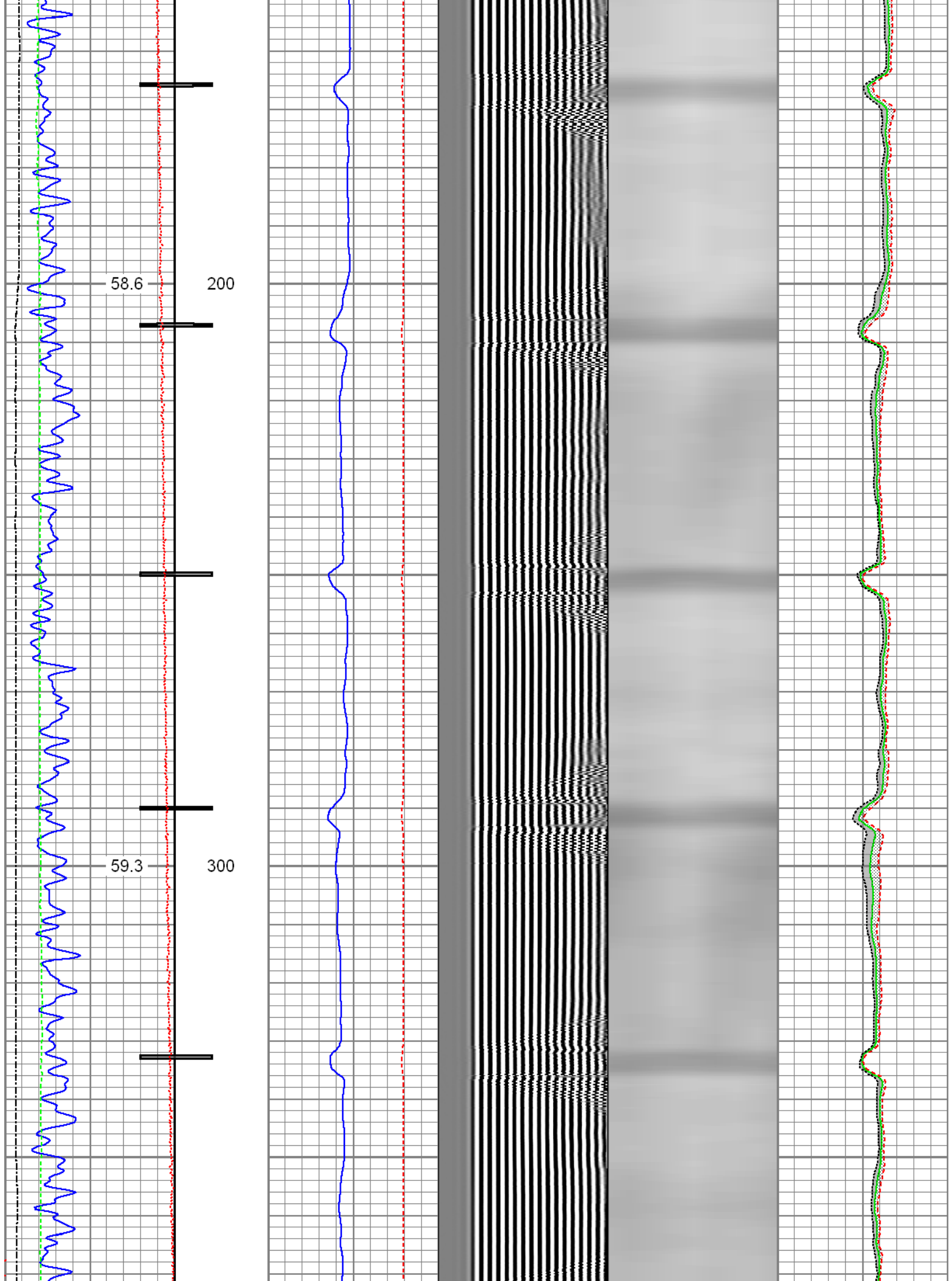
Main Pass

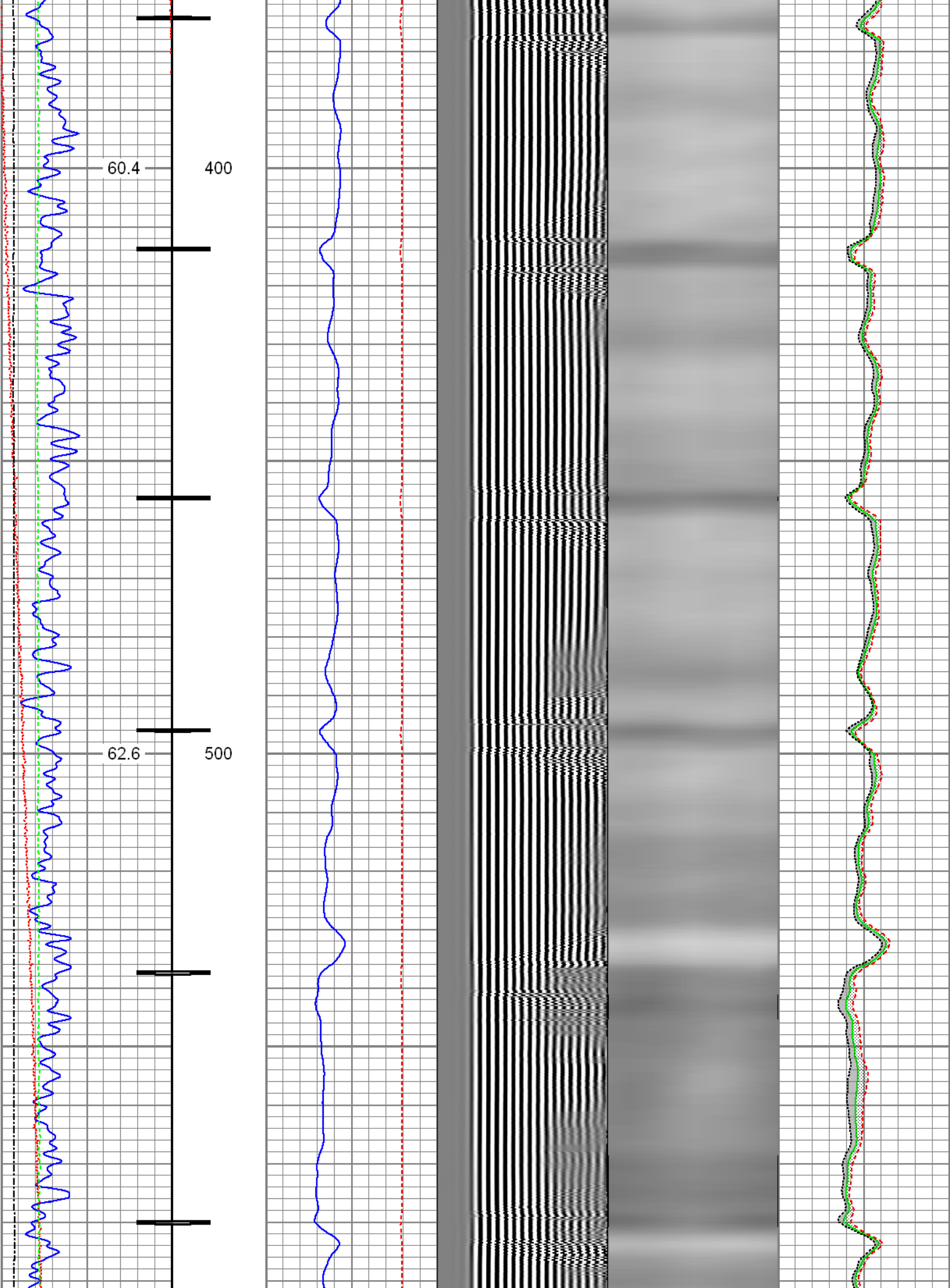
Recorded with 2200 PSI Surface Induced Pressure

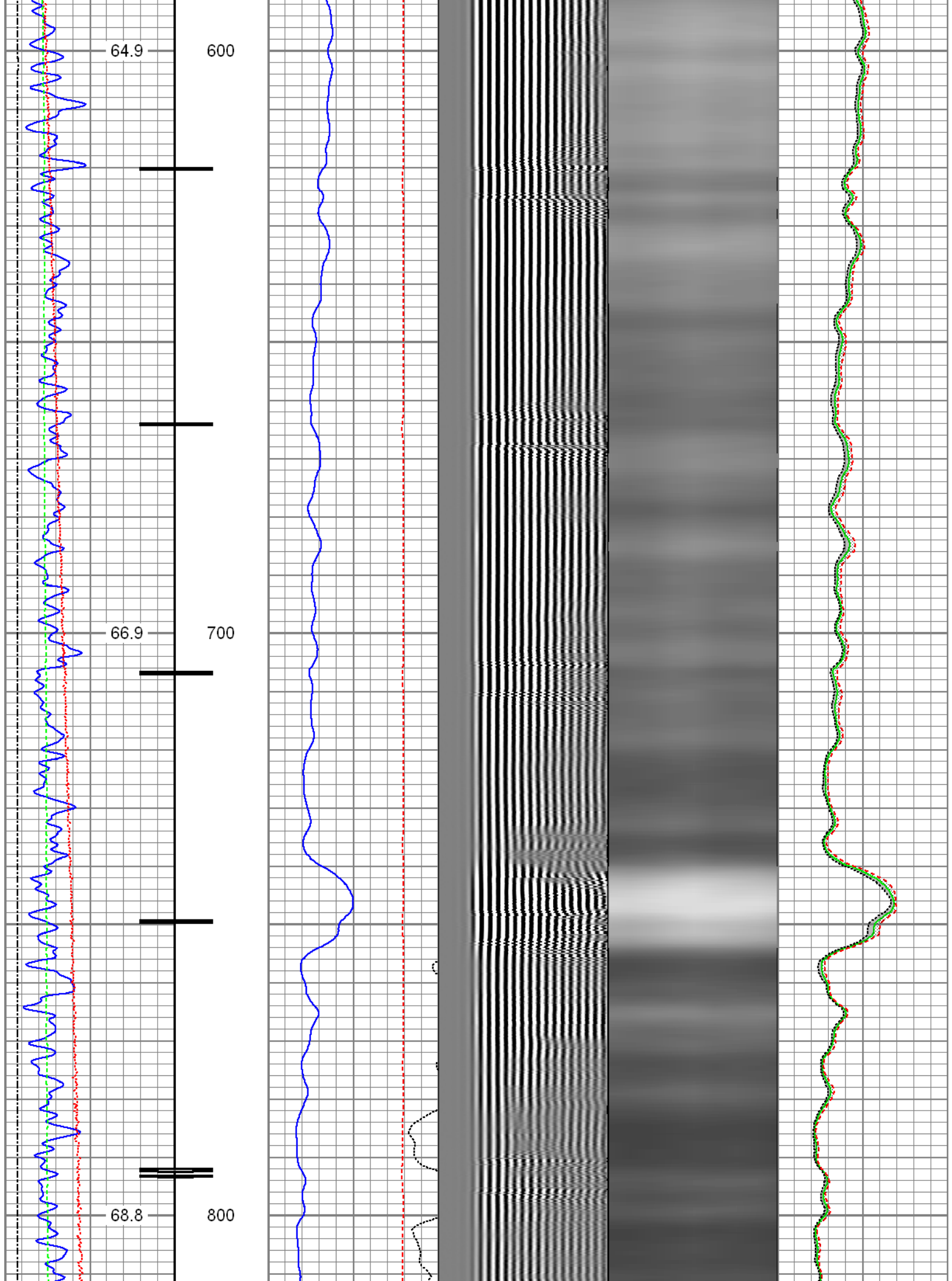
Database File: 03-03-16_noble energy_wells ranch af05-665_rbl.db
Dataset Pathname: pass4.1
Presentation Format: radii
Dataset Creation: Thu Mar 03 12:16:00 2016 by Calc 7.0 B1
Charted by: Depth in Feet scaled 1:240

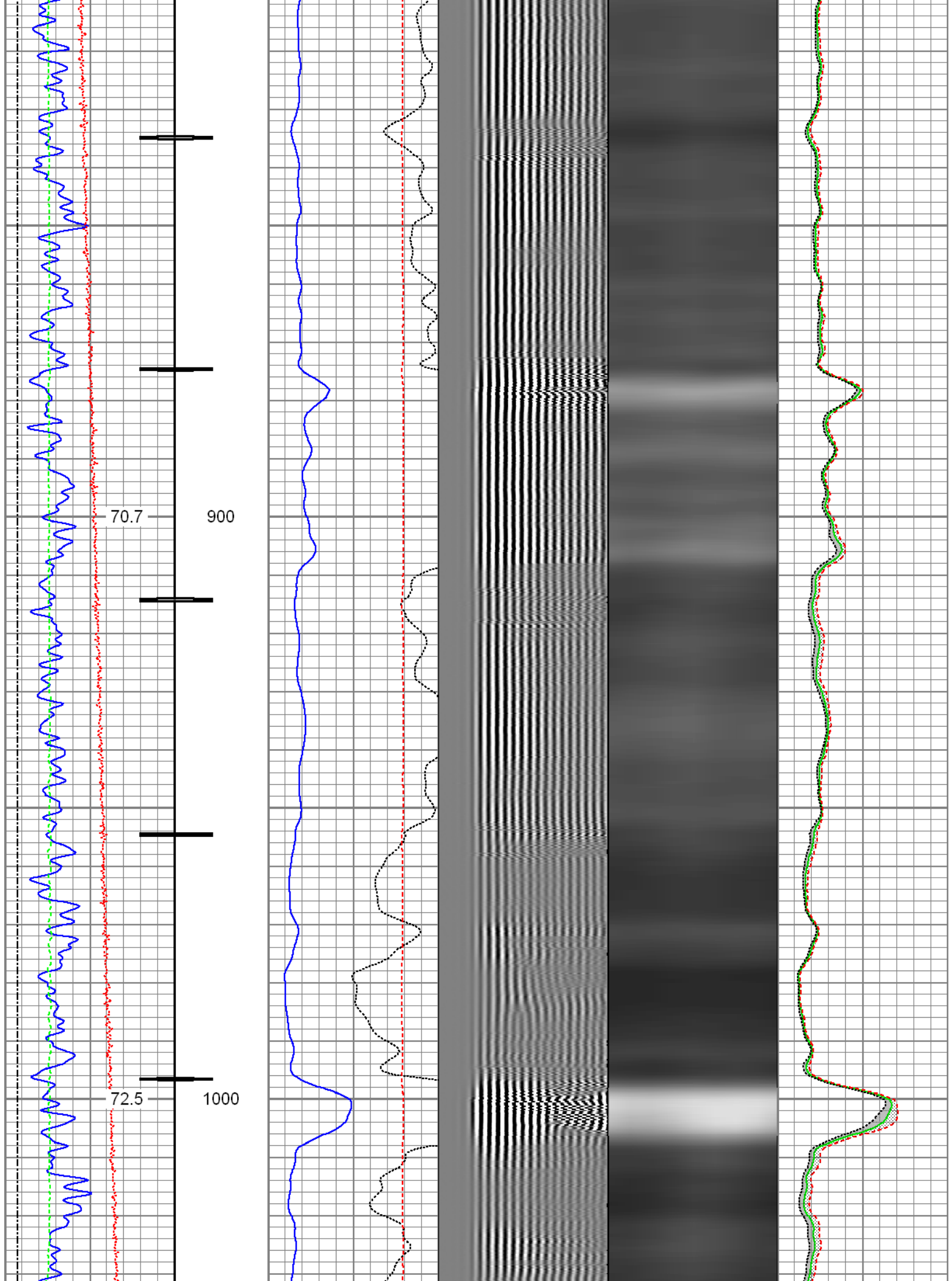
| | | | | |
|-----------------------|------------------|-------------------------|------------|-------------------|
| Gamma Ray | 3' Amplitude | 5' Variable Density Log | Sector Map | Average Amplitude |
| 0 (GAPI) 120 | 0 (mV) 100 | 200 1200 | | 0 100 |
| Casing Collar Locator | 3' Amplitude x 5 | | | Mimimum Amplitude |
| Temperature | 0 (mV) 20 | | | 0 100 |
| 0 (degF) 20 | 3' Travel Time | | | Maximum Amplitude |
| Line Speed | 650 (usec) 150 | | | 0 100 |
| -150 (ft/min) 150 | | | | |
| Line Tension | | | | |
| 0 (lb) 2000 | | | | |

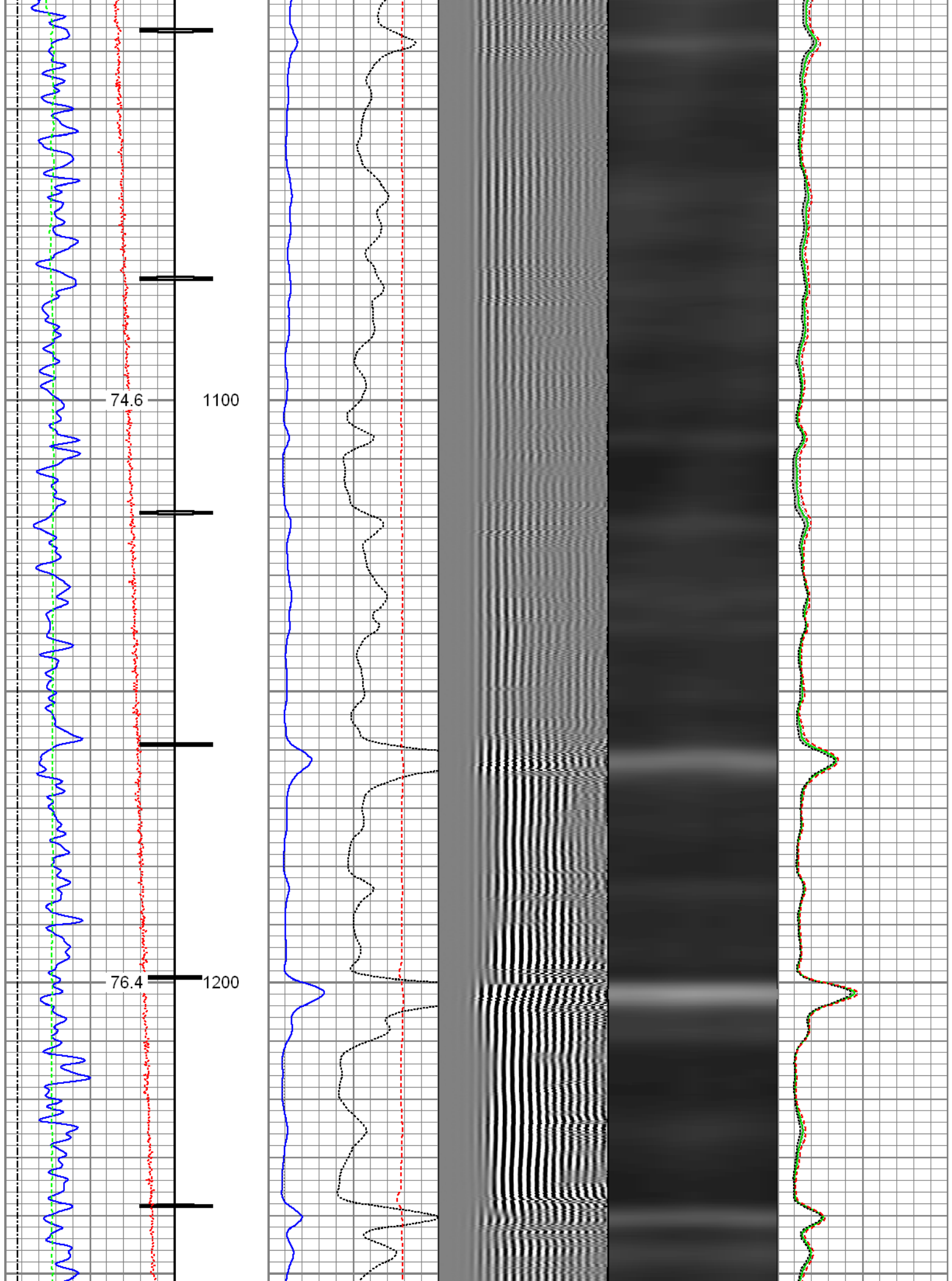


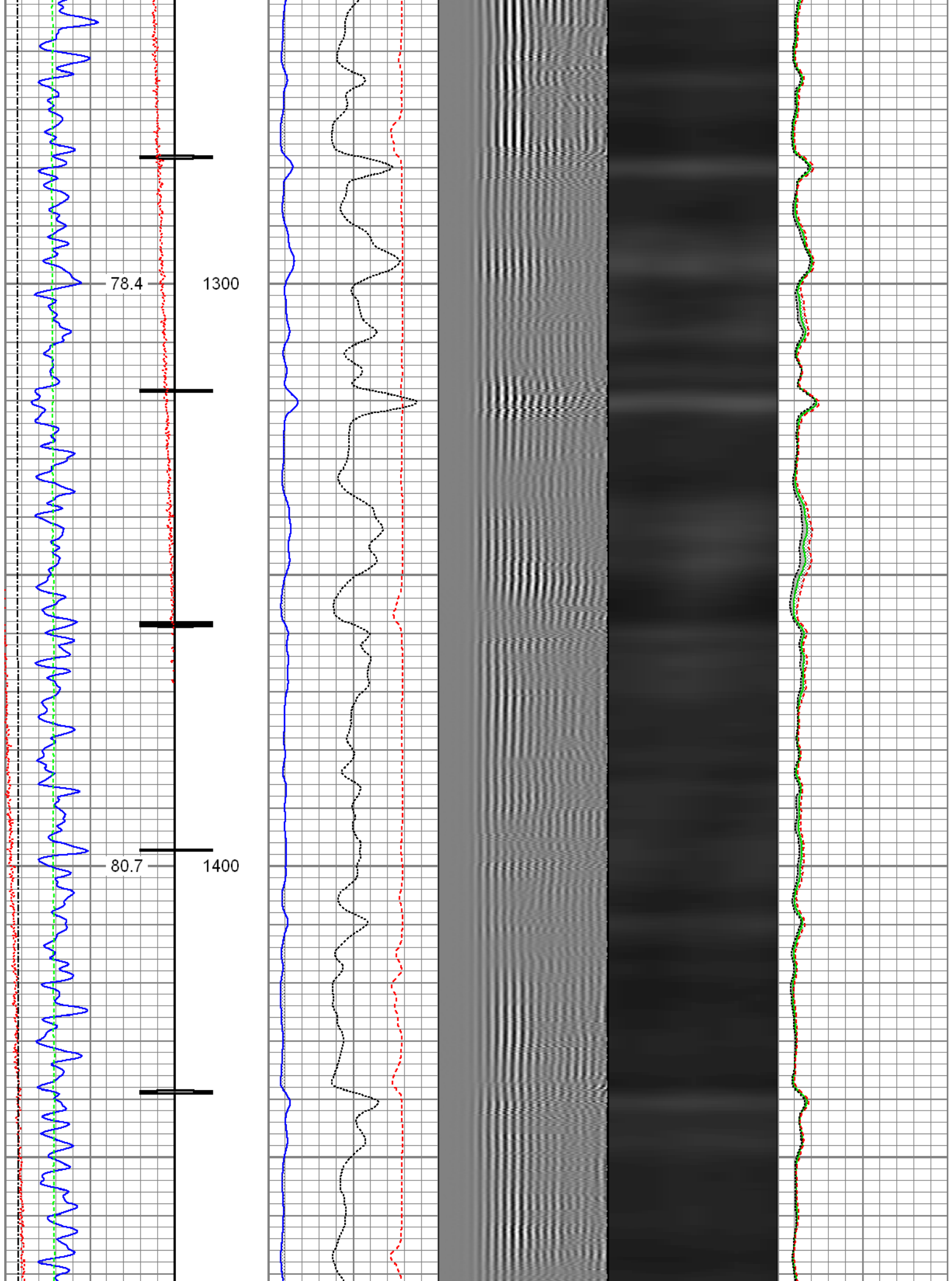


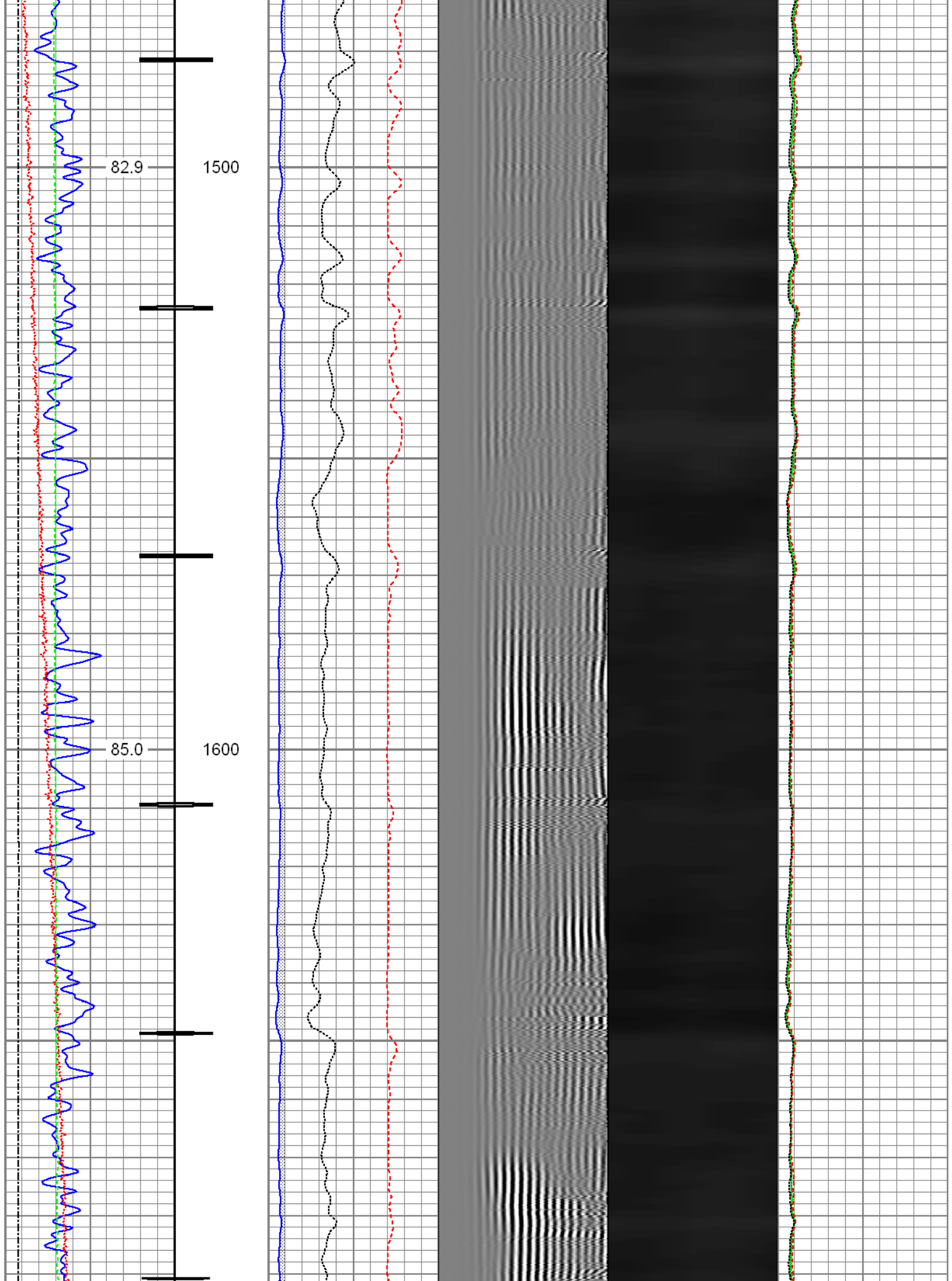


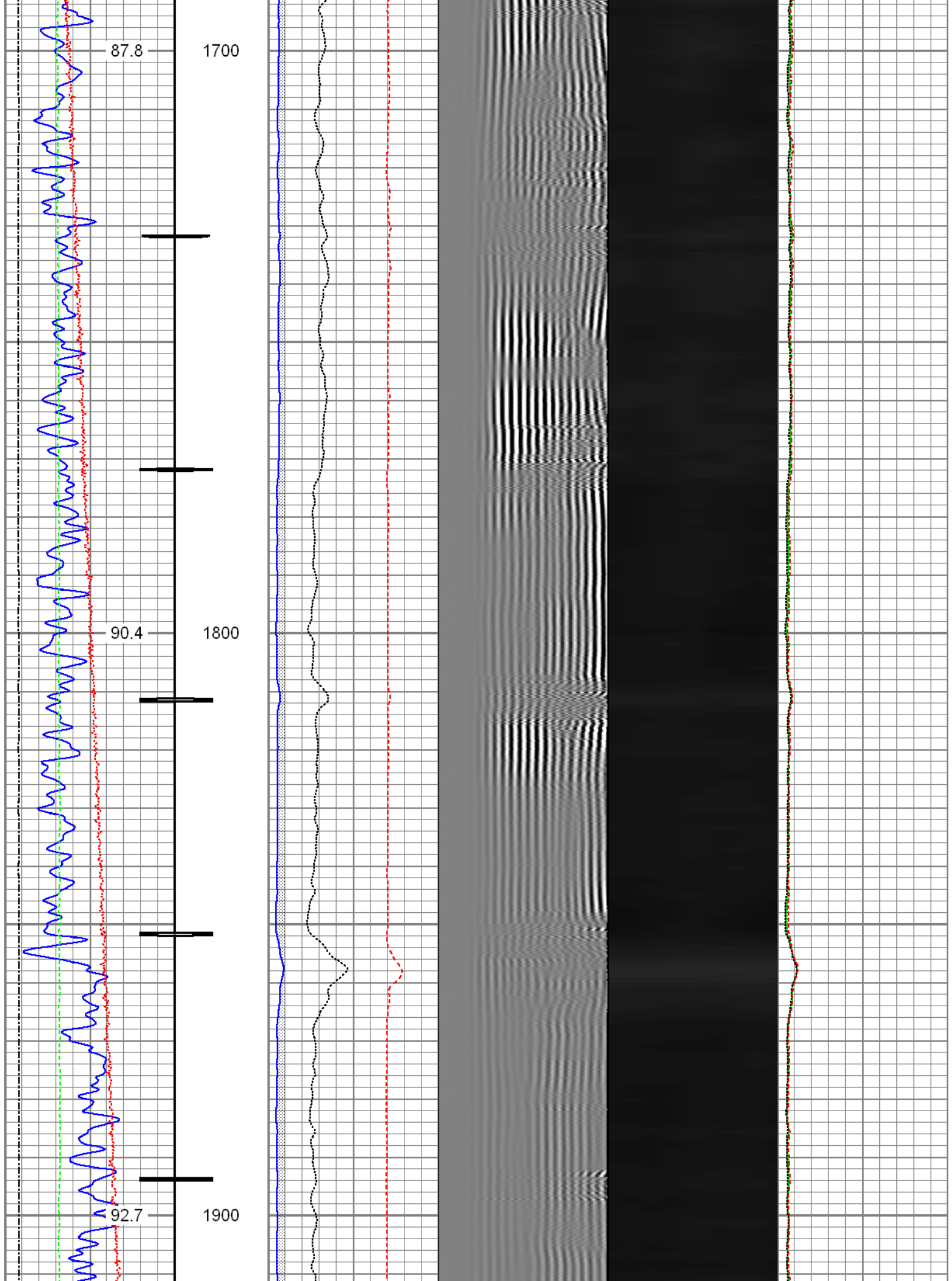


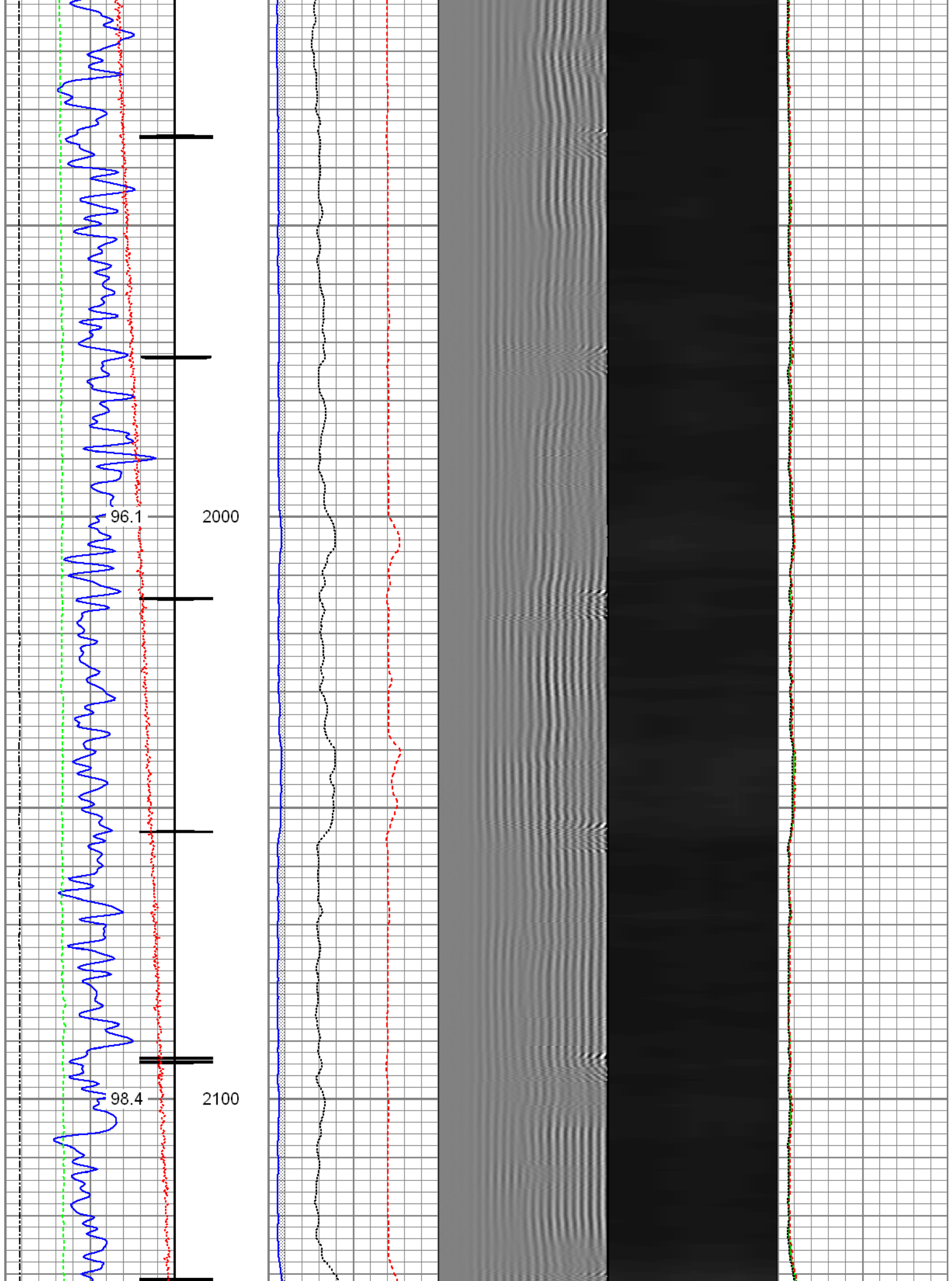


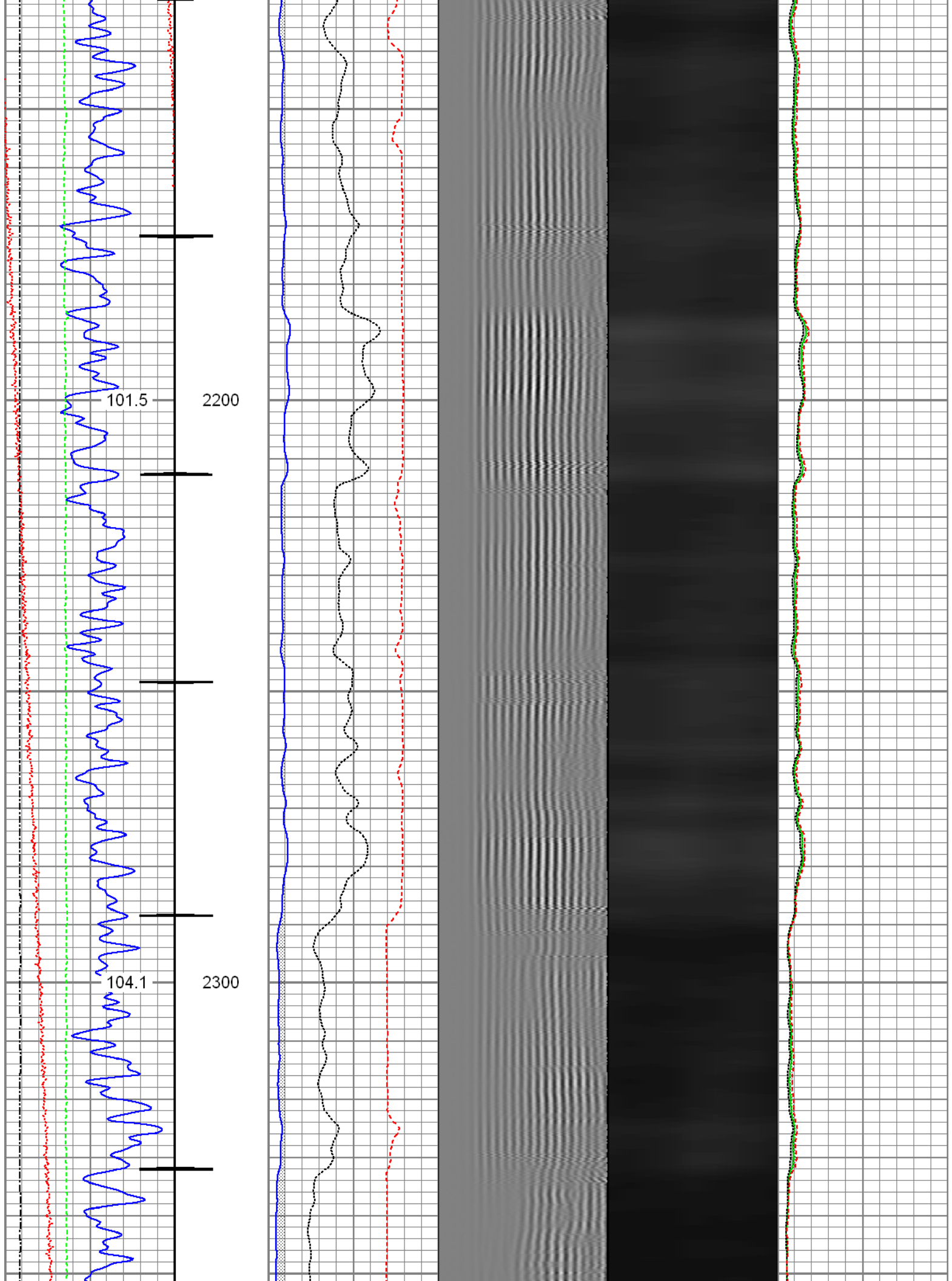


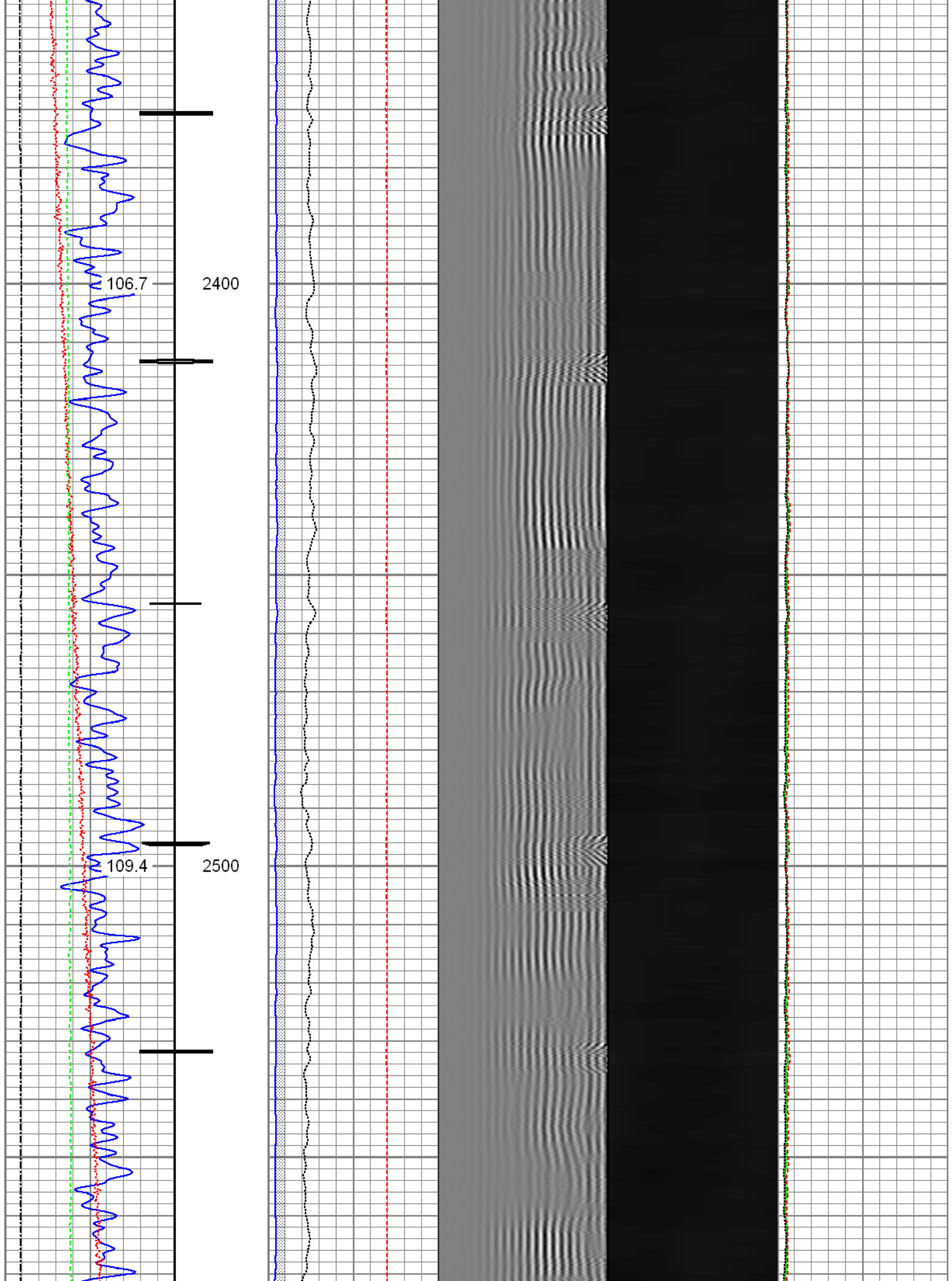


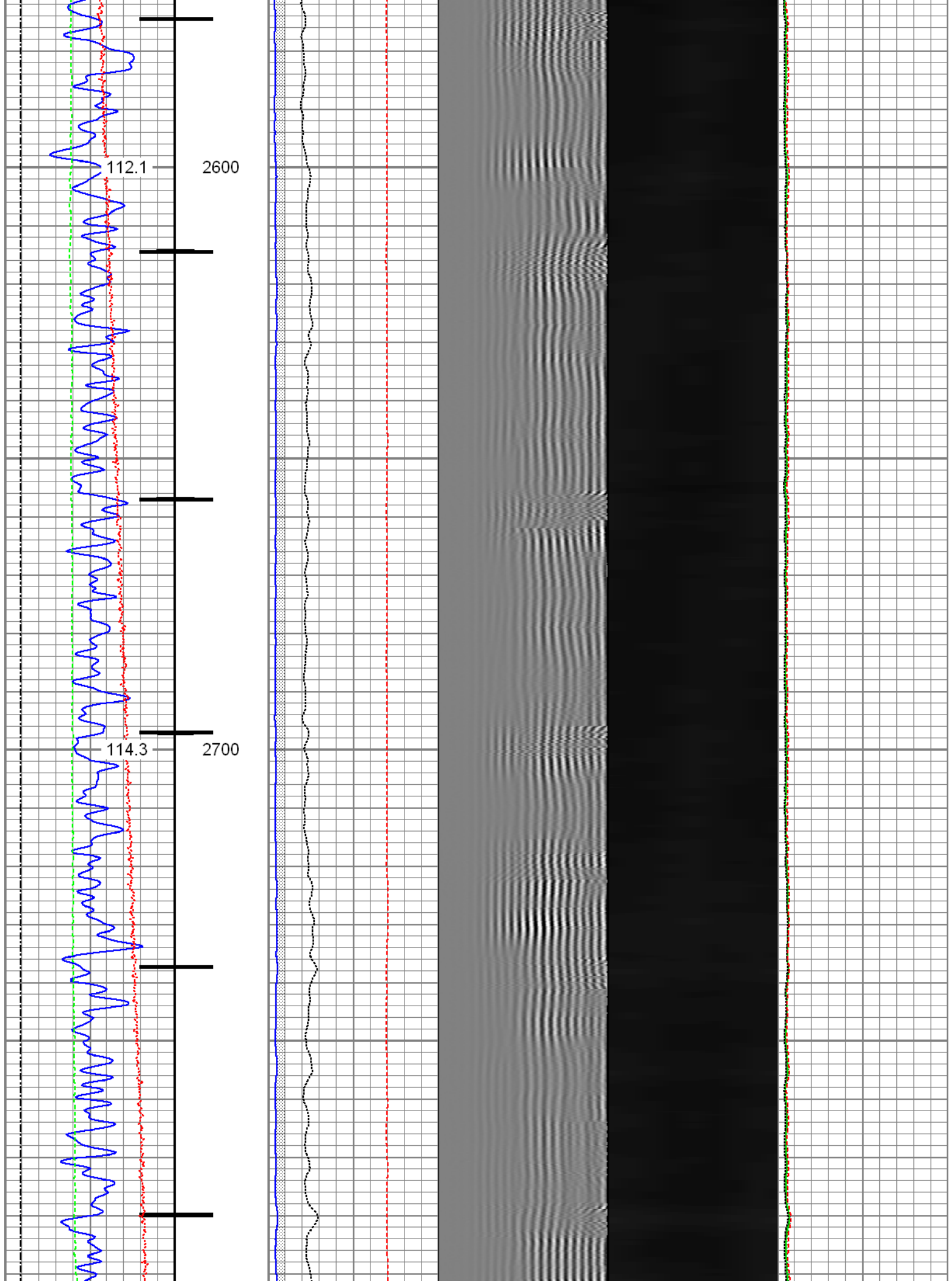


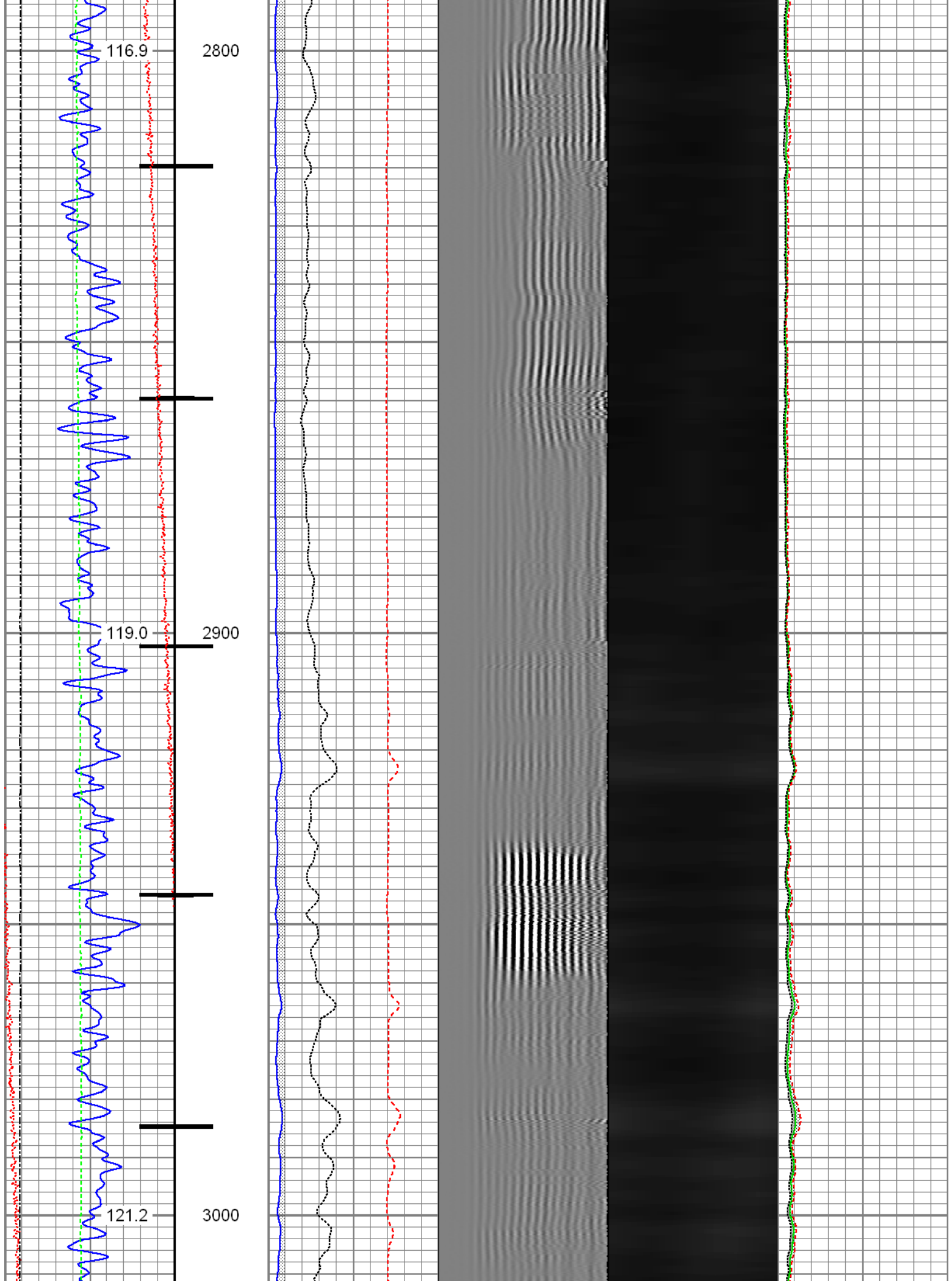


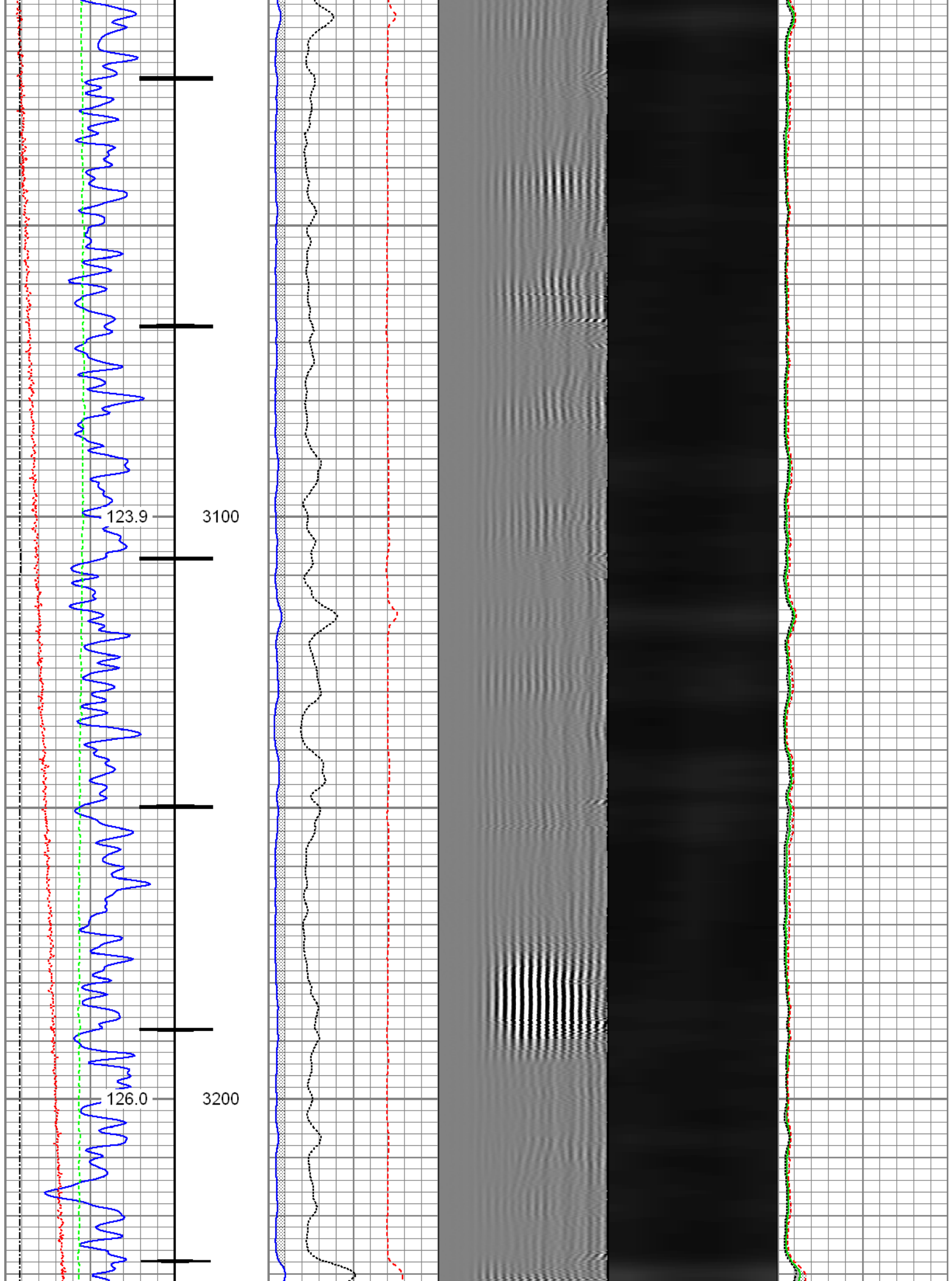


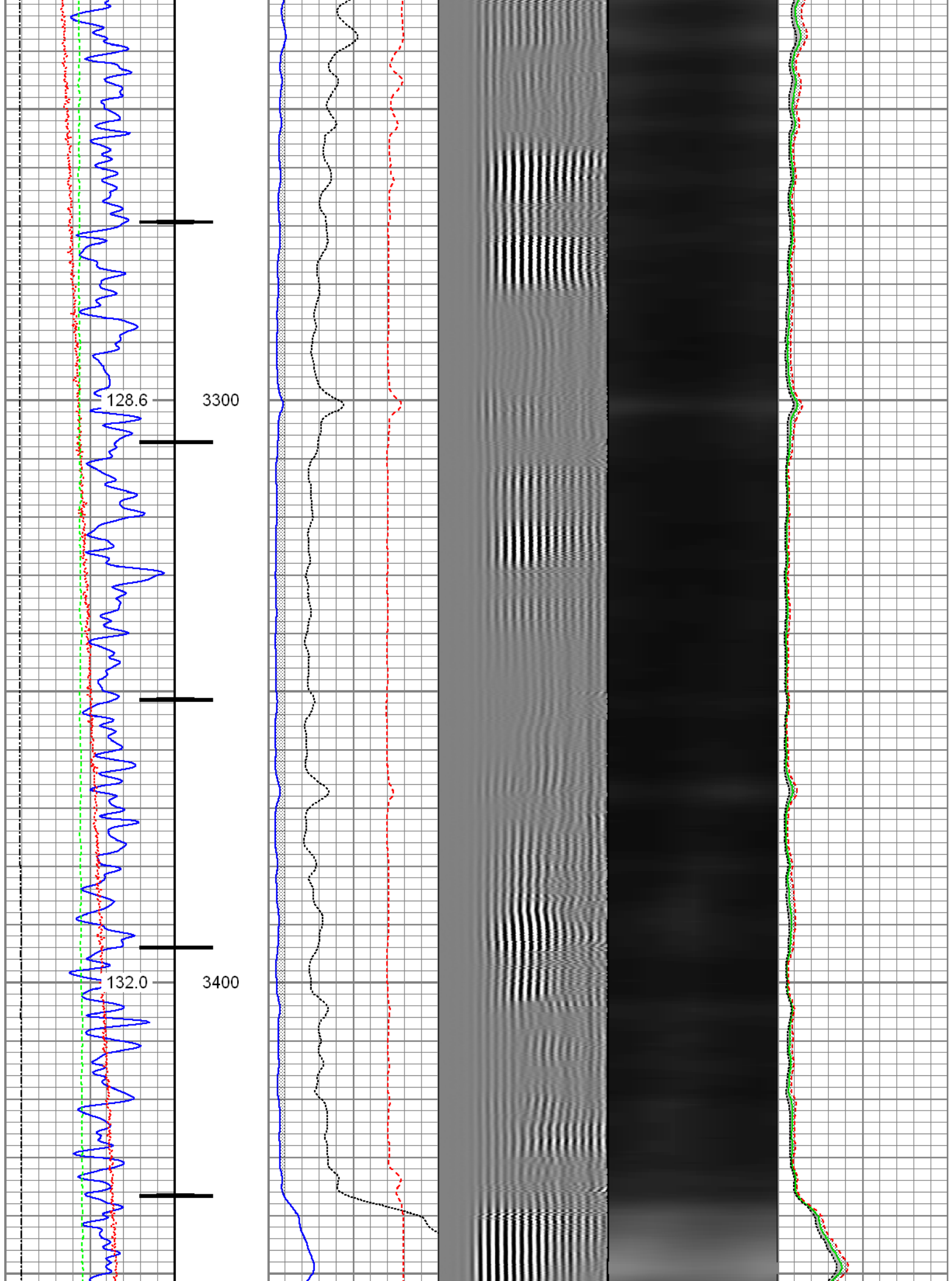


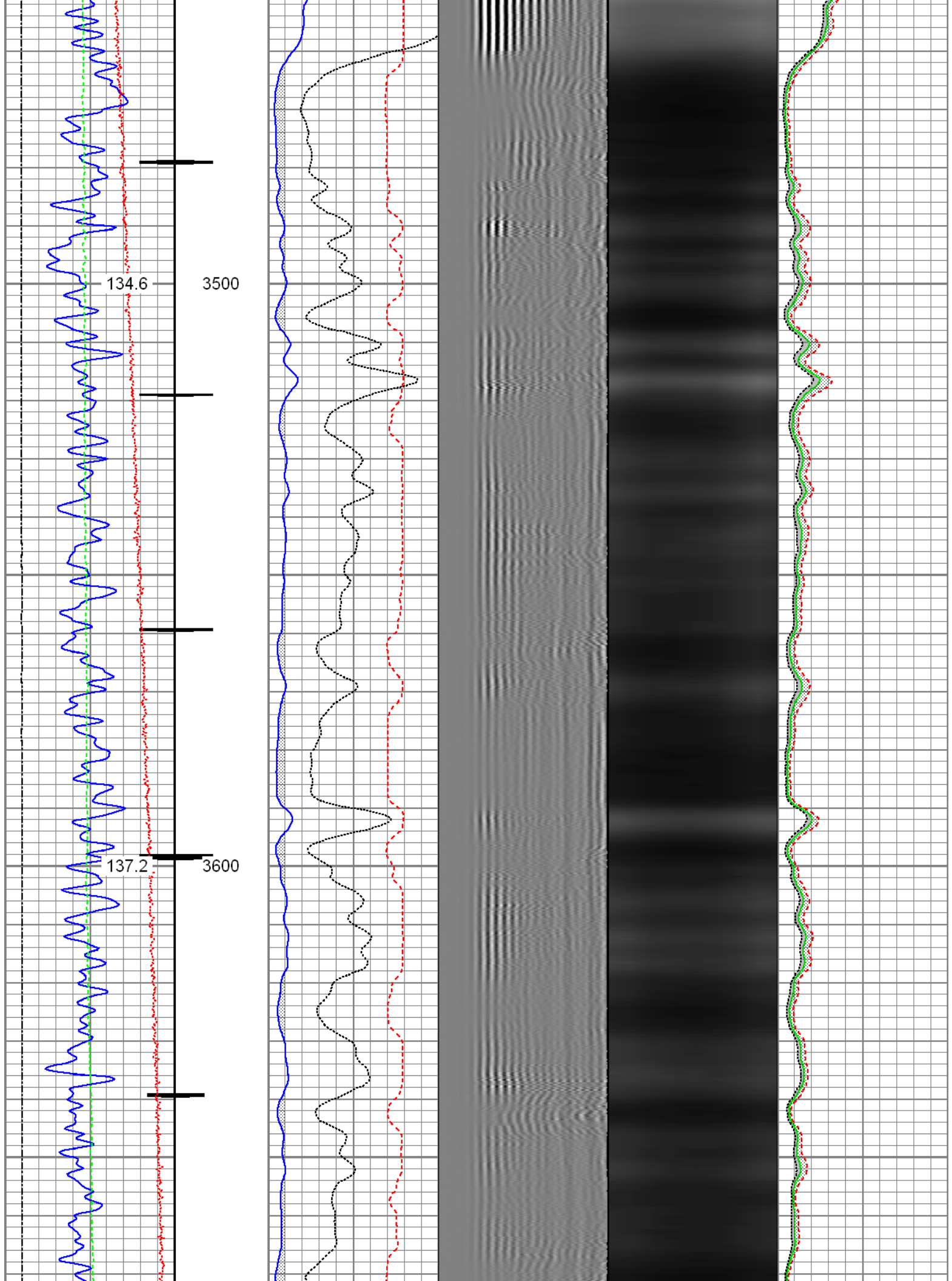


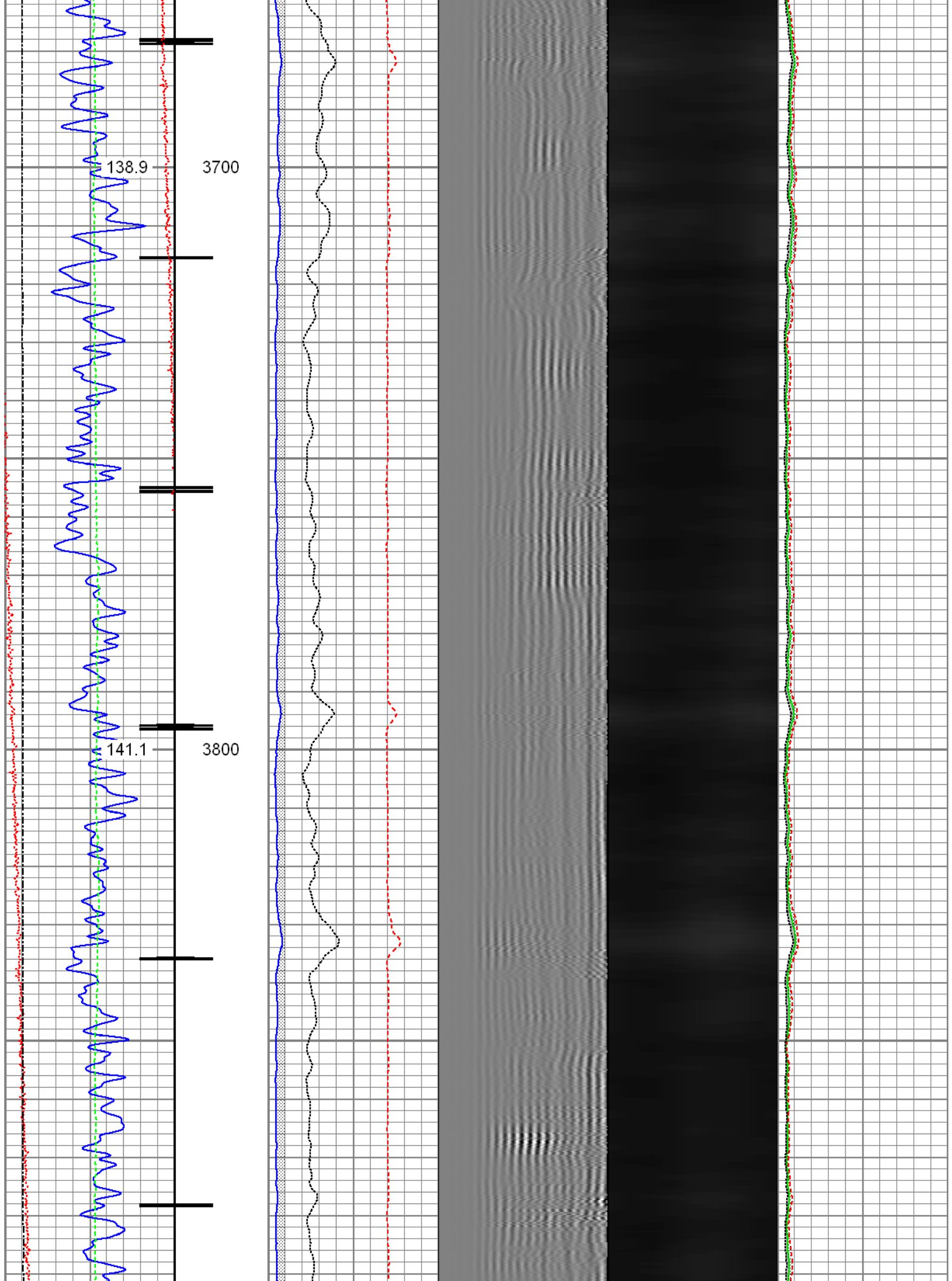


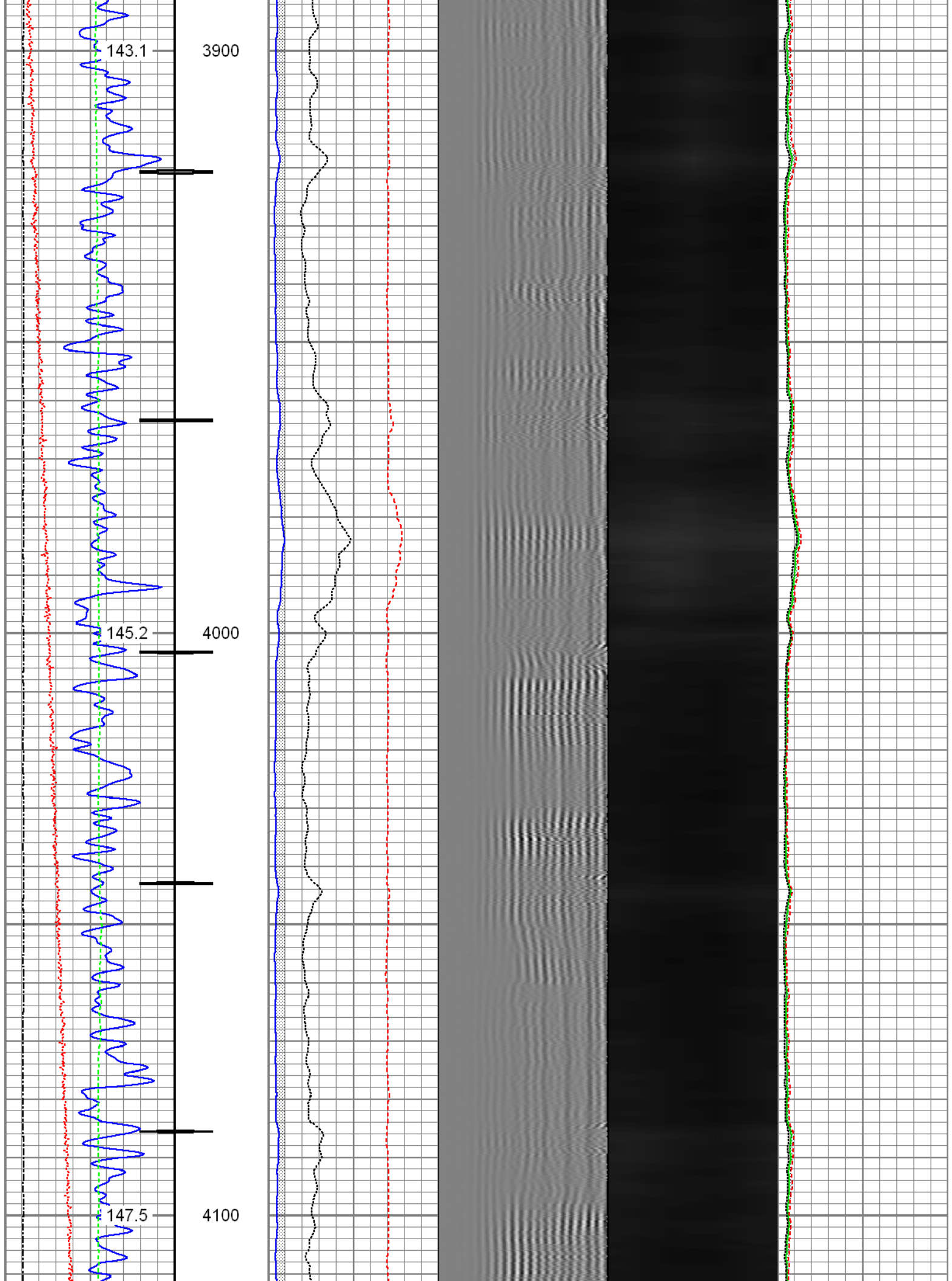


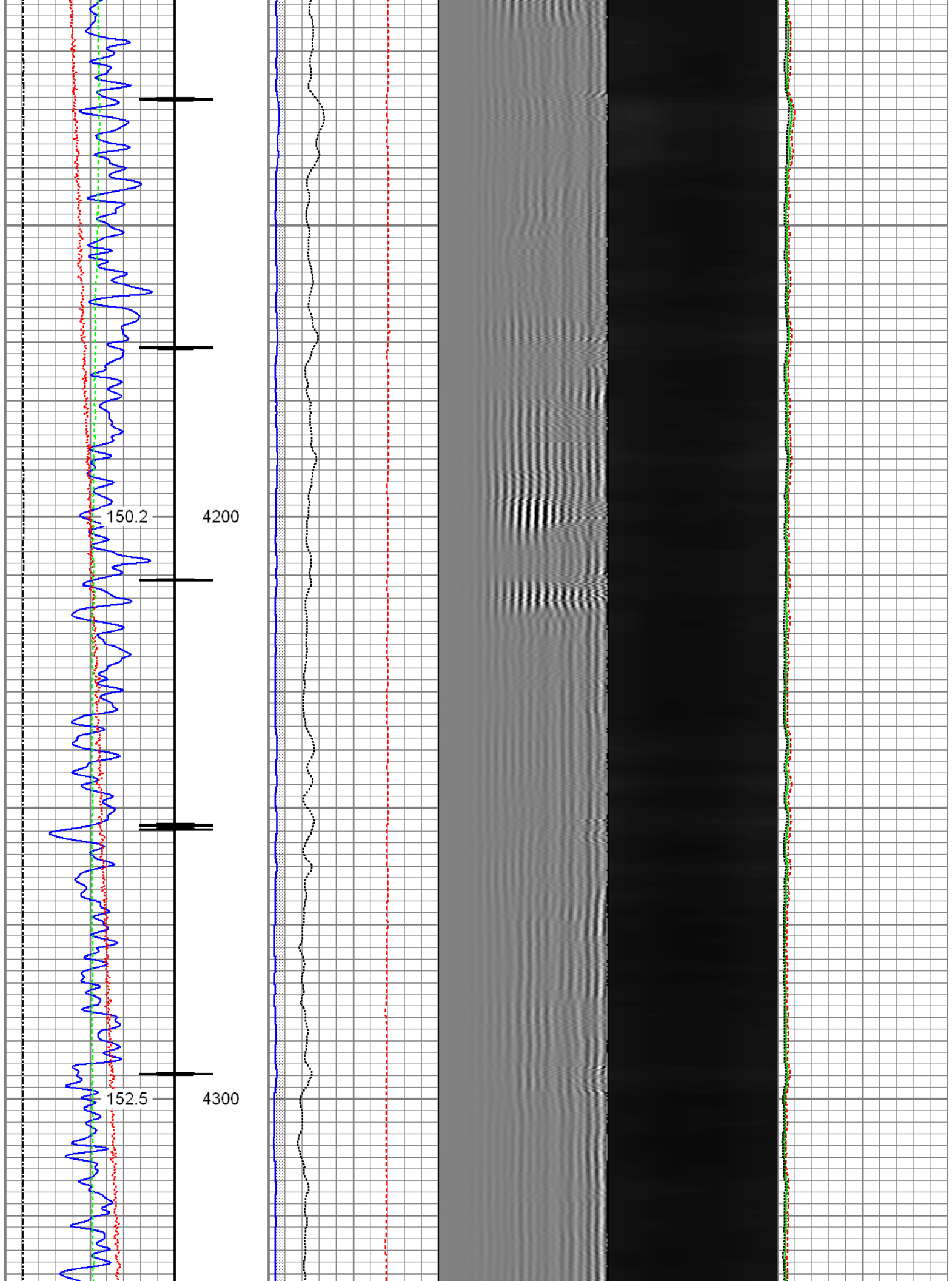


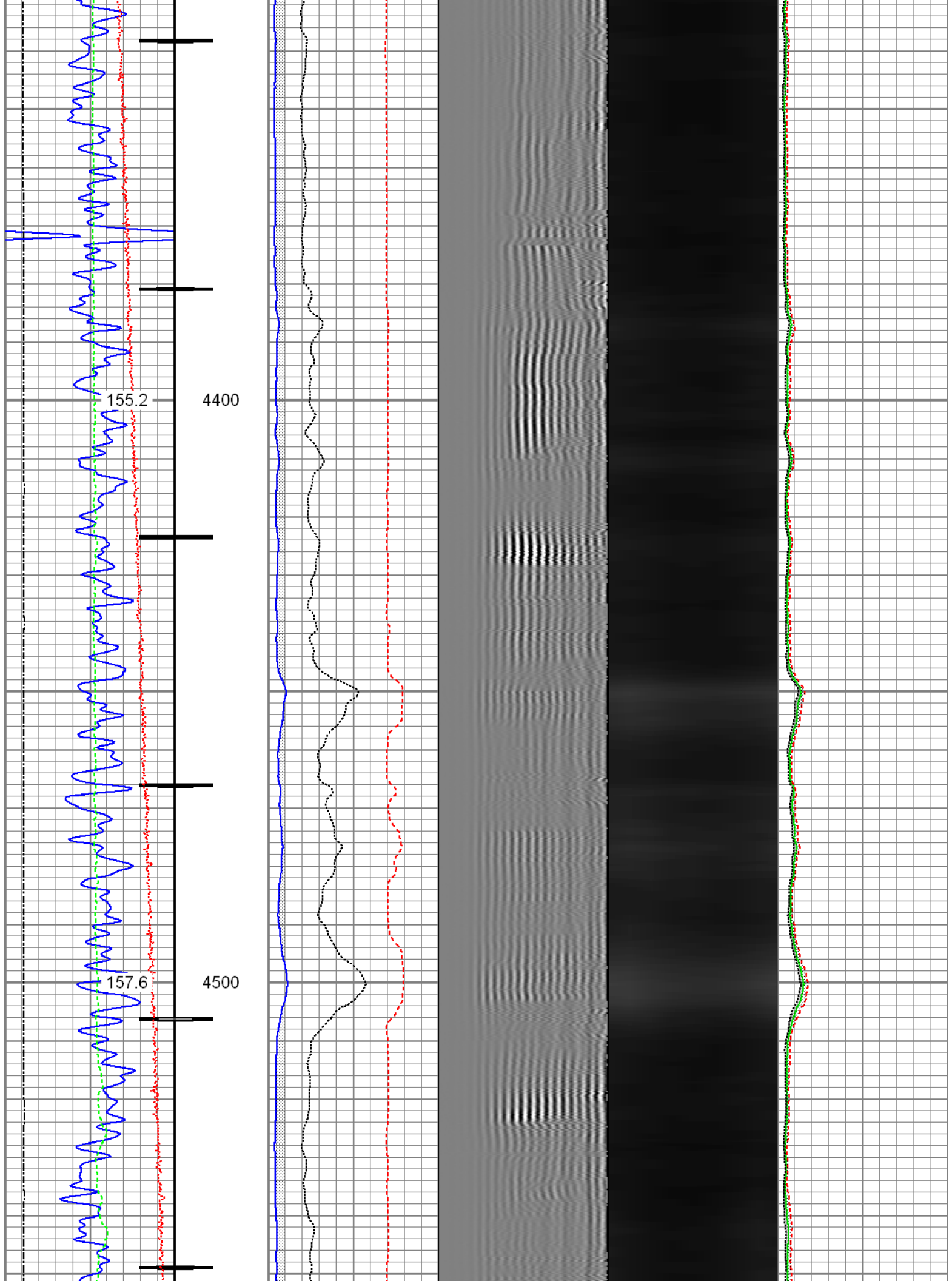


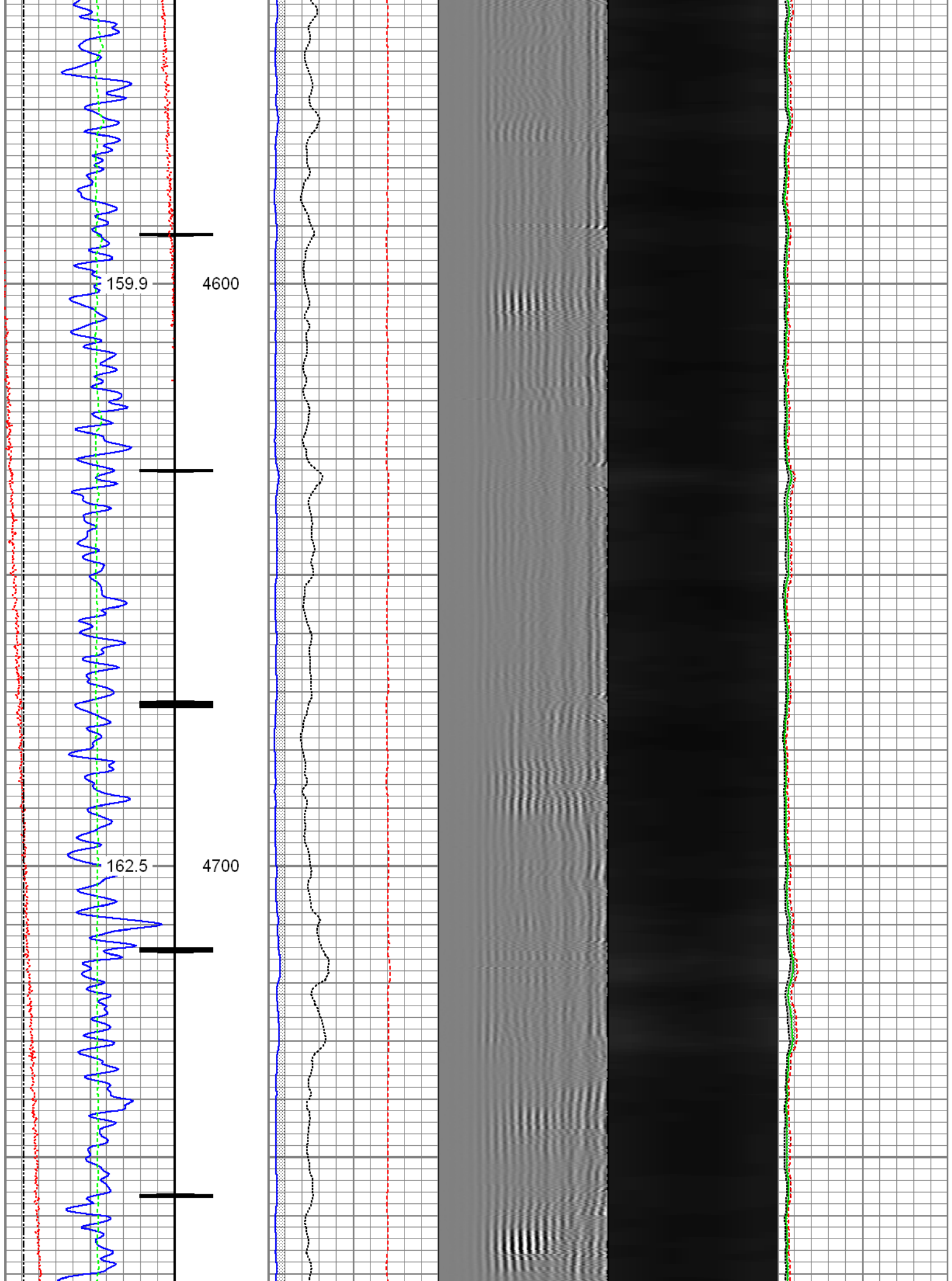


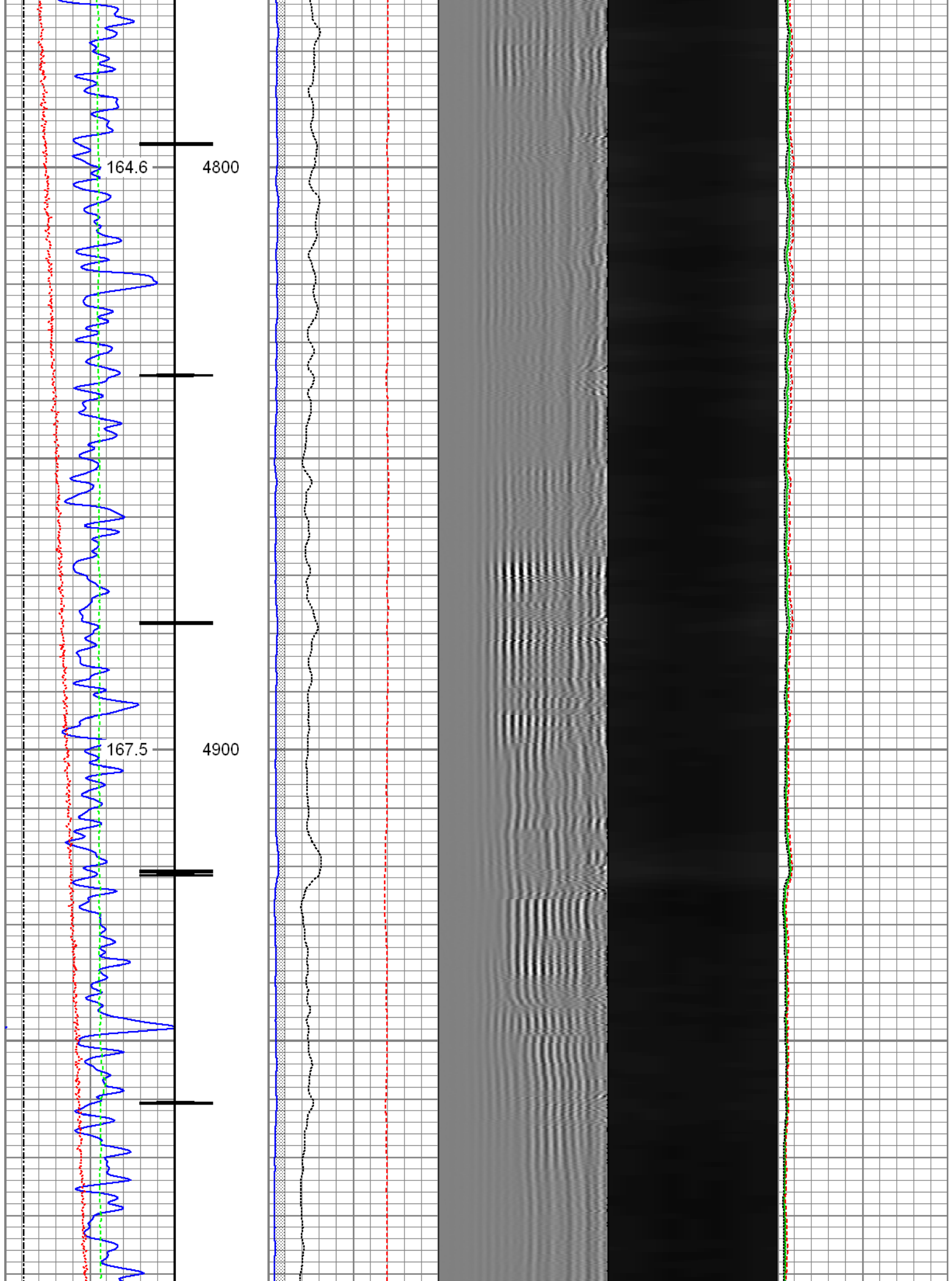


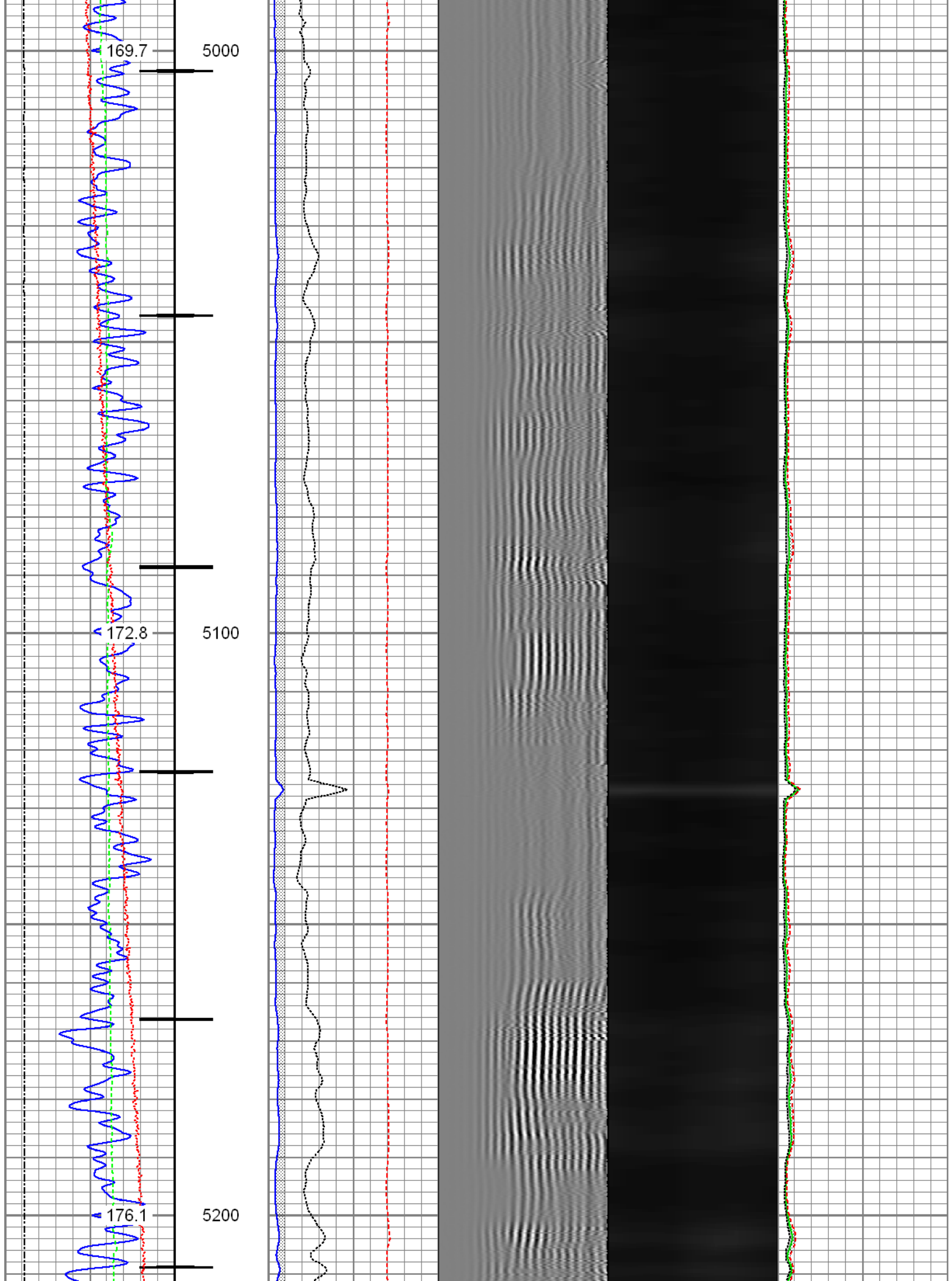


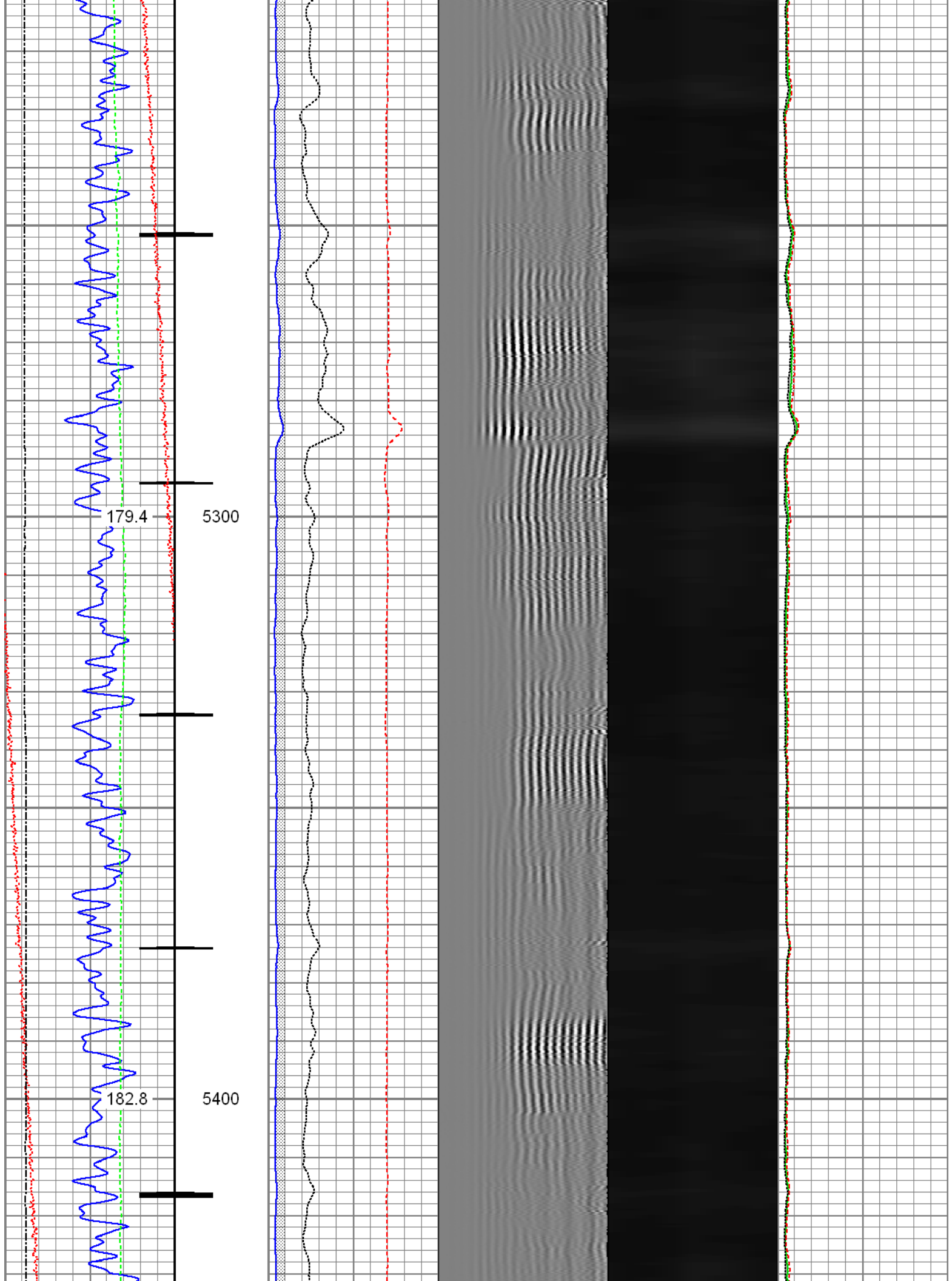


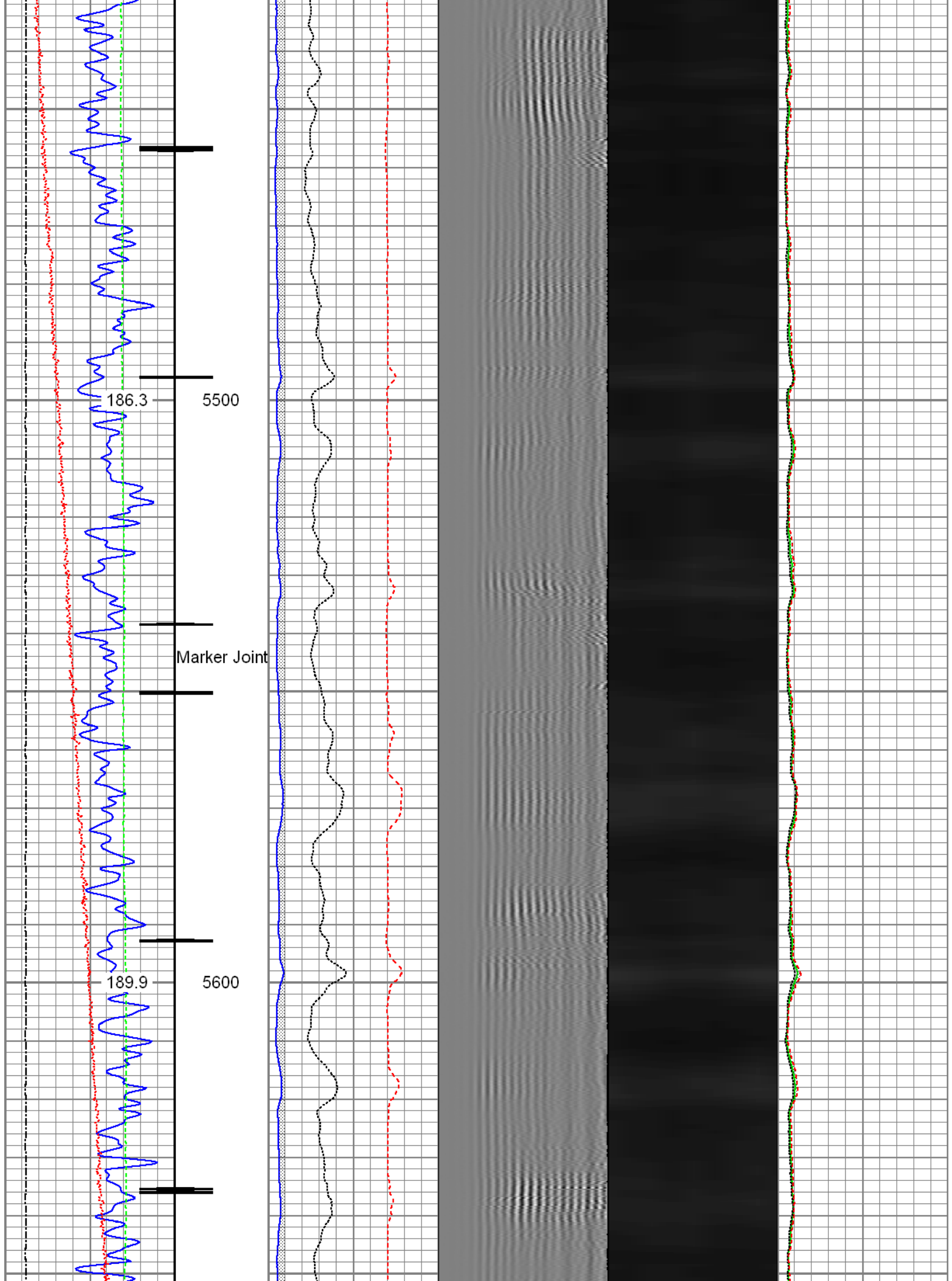


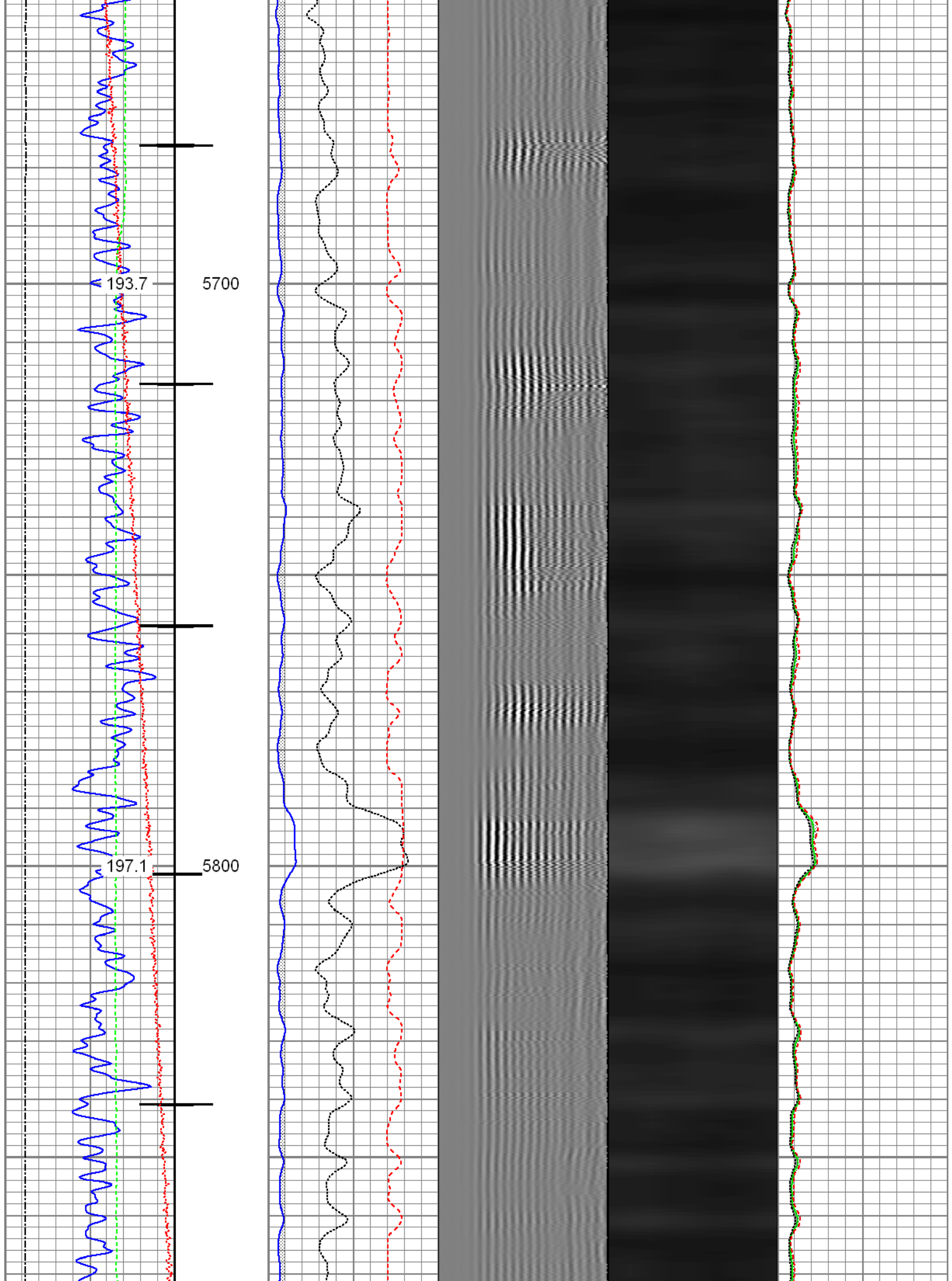


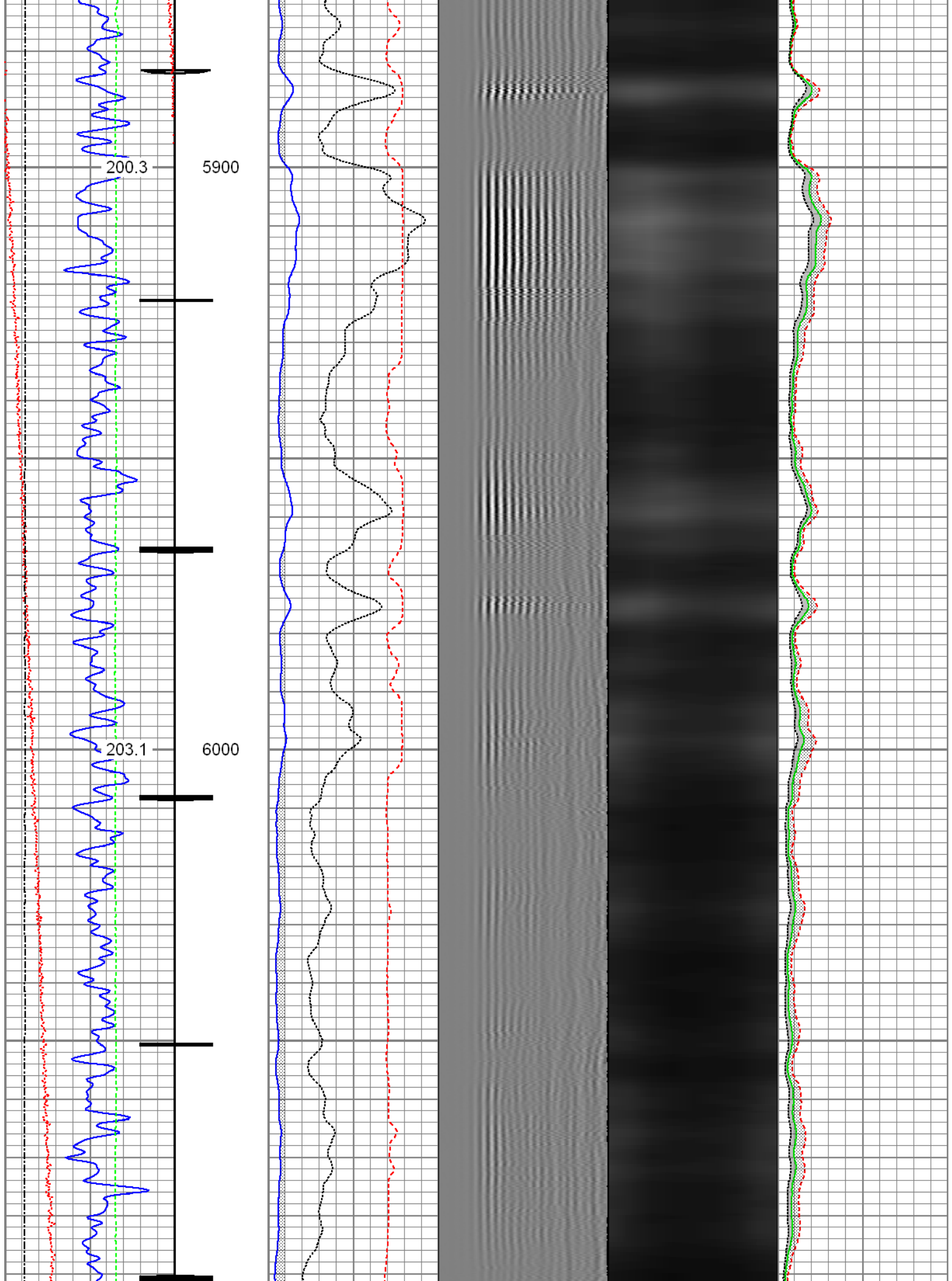


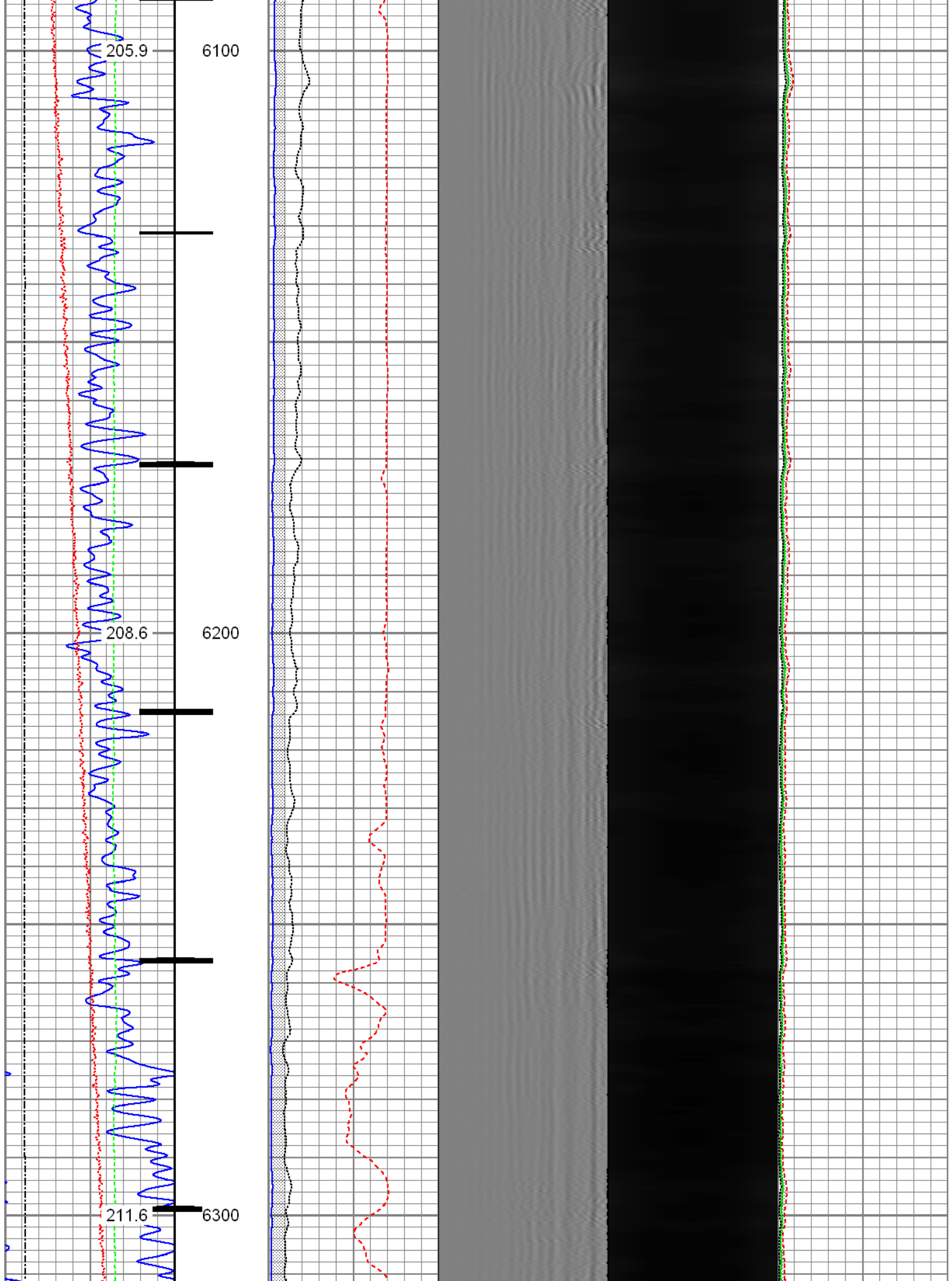


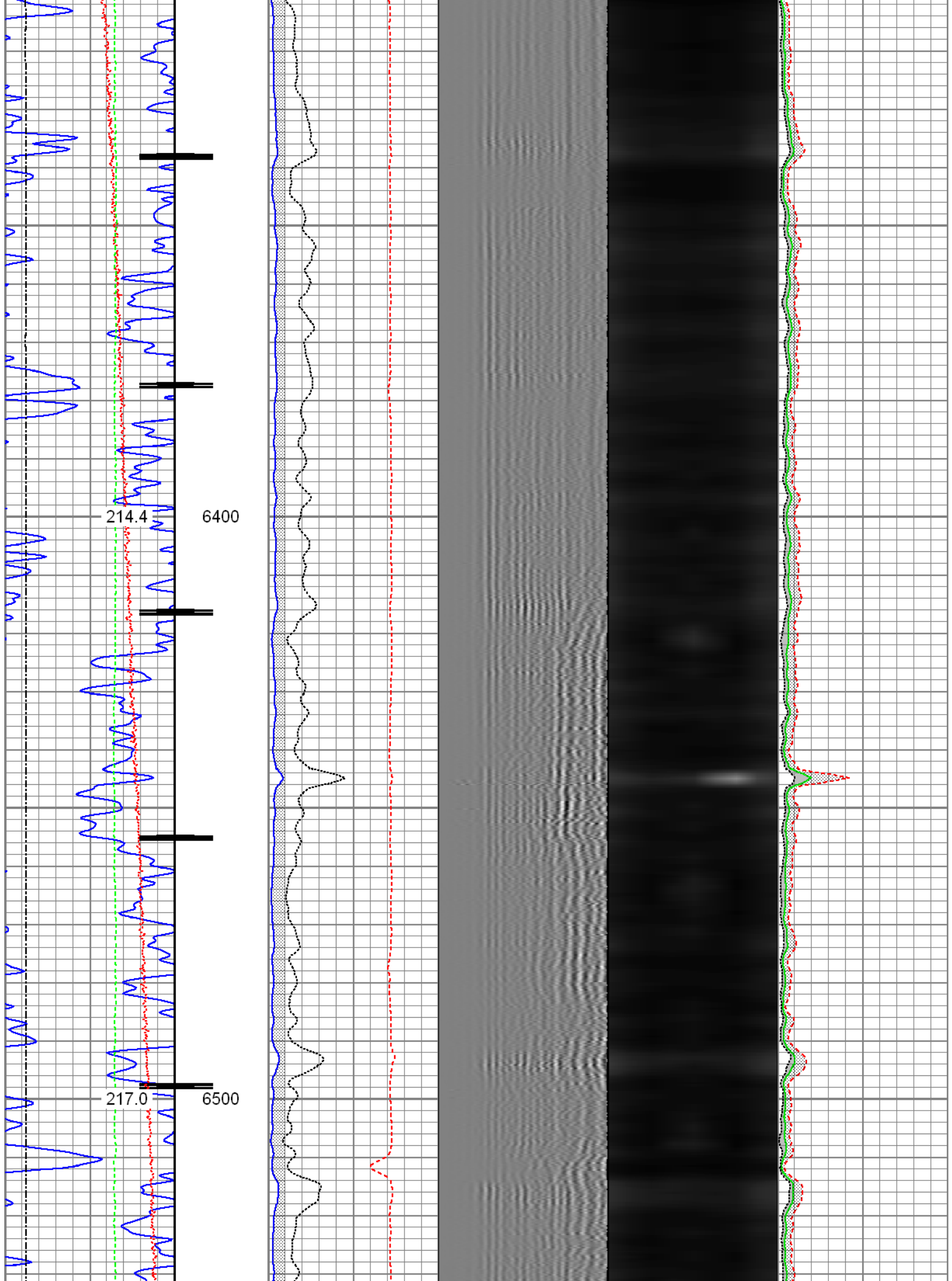


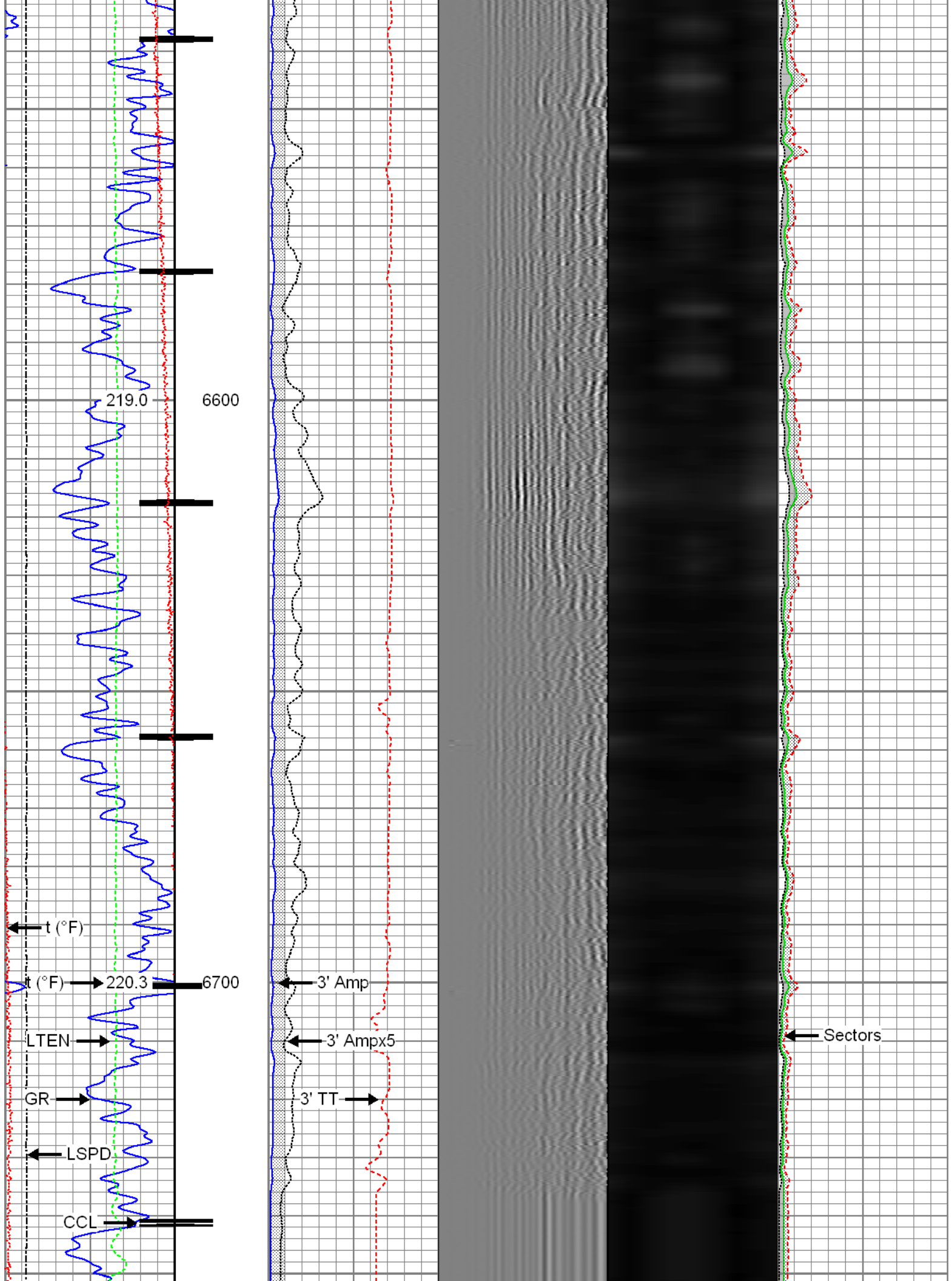


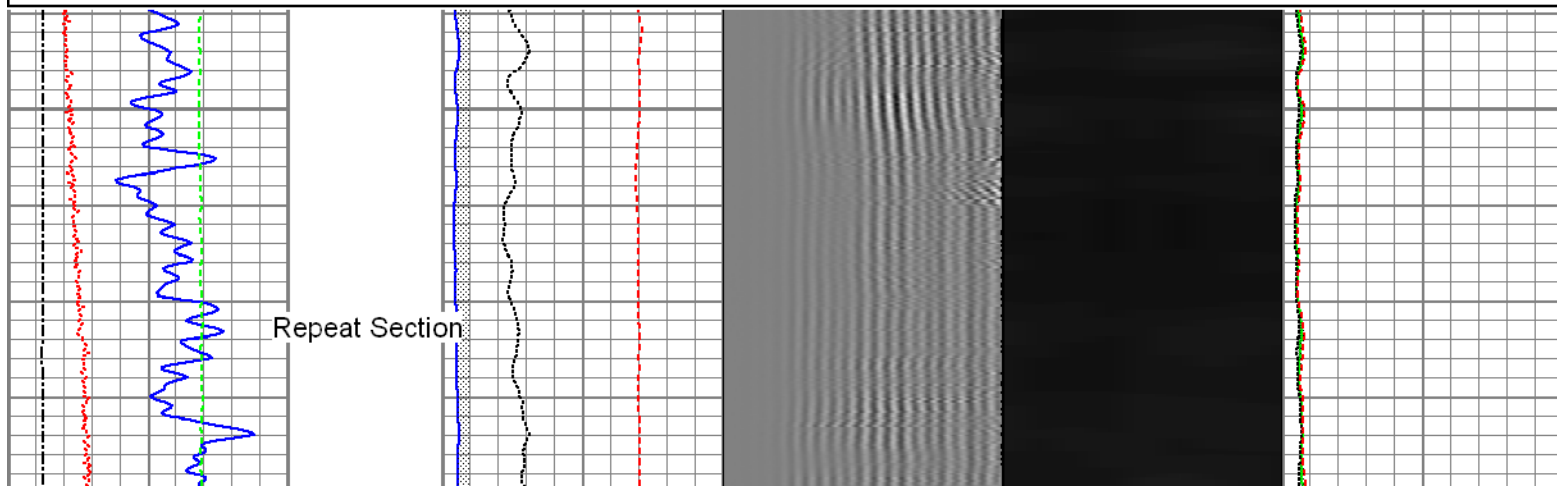
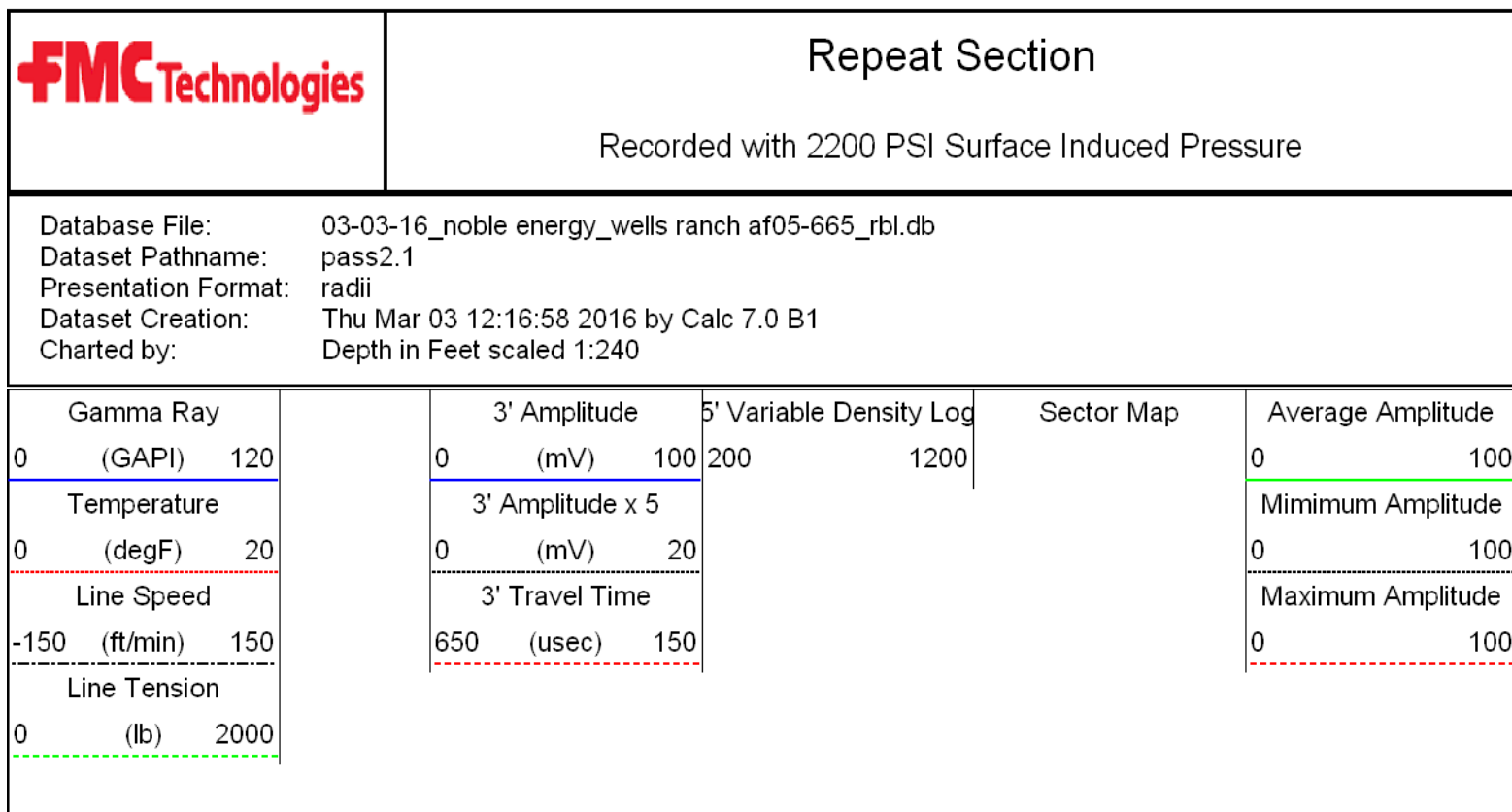
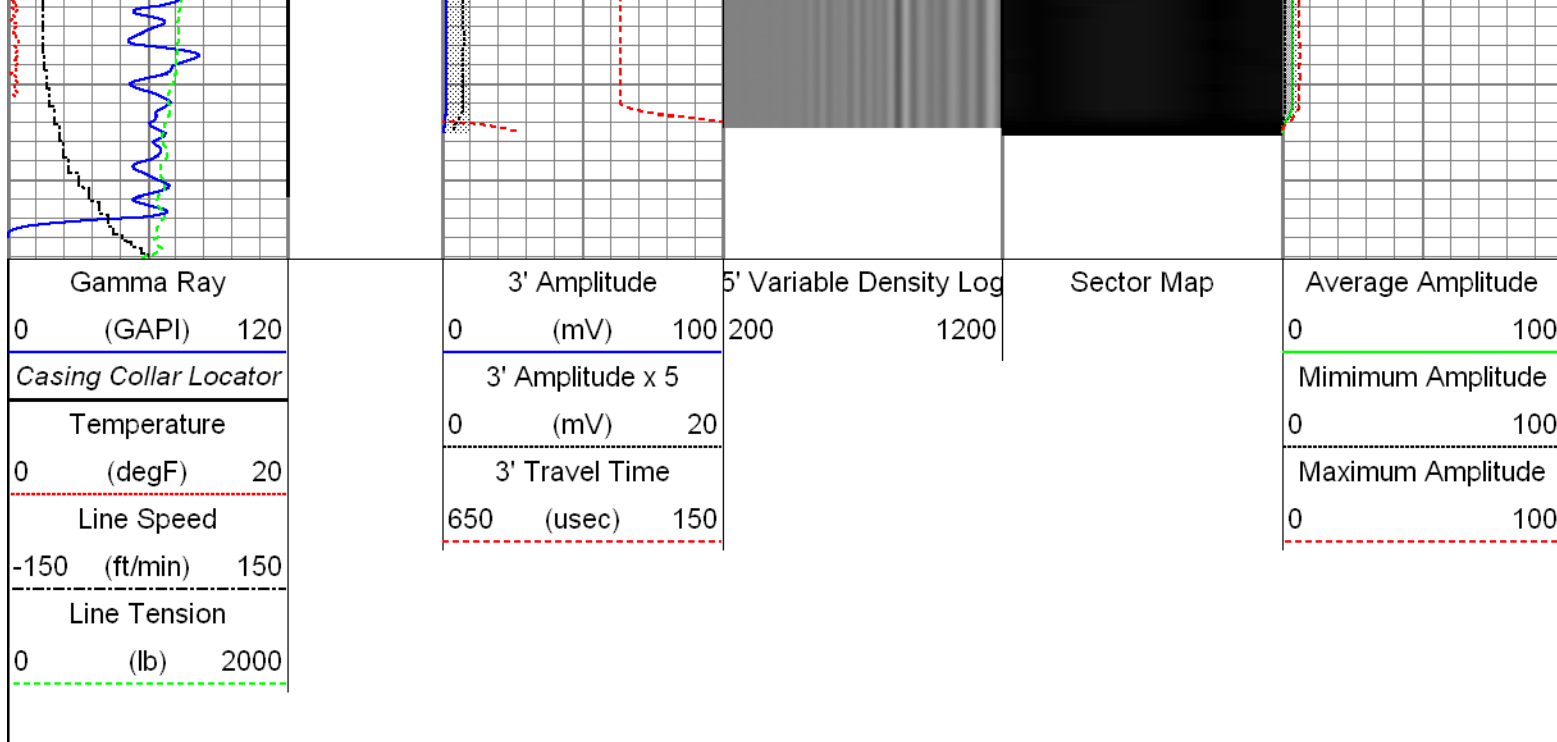










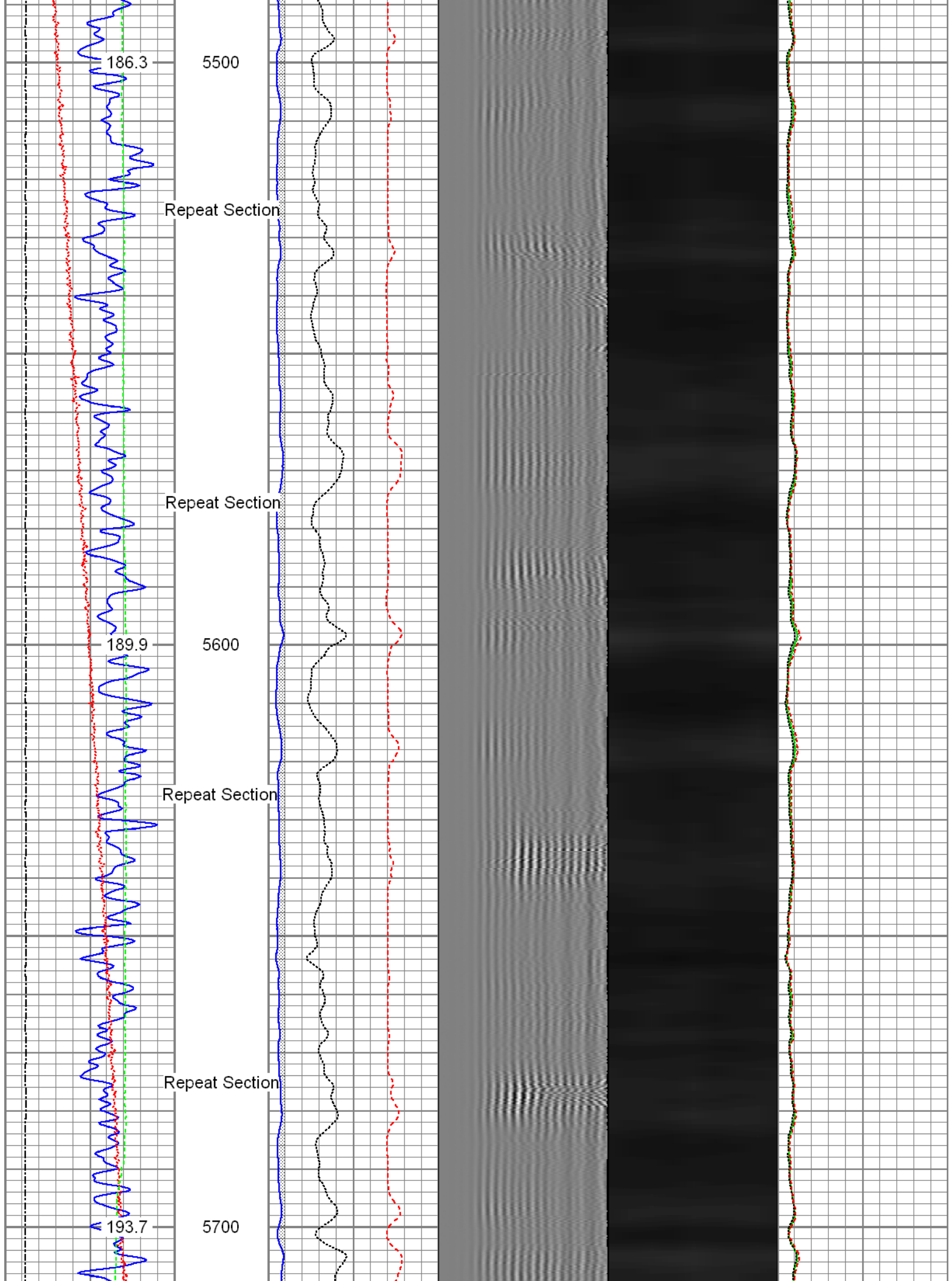


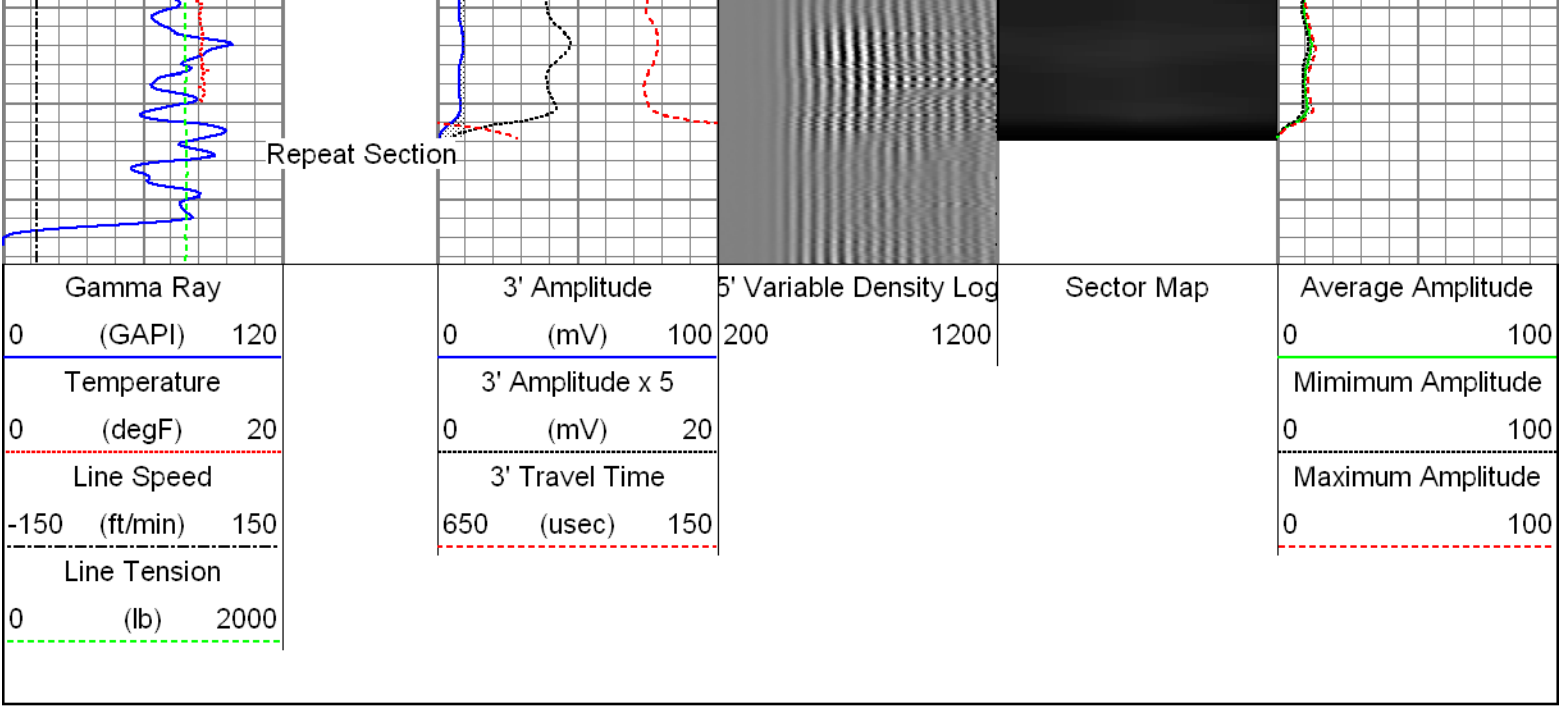
Repeat Section

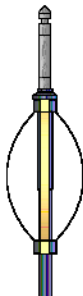

Recorded with 2200 PSI Surface Induced Pressure

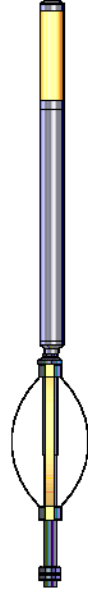
Database File: 03-03-16_noble energy_wells ranch af05-665_rbl.db
 Dataset Pathname: pass2.1
 Presentation Format: radii
 Dataset Creation: Thu Mar 03 12:16:58 2016 by Calc 7.0 B1
 Charted by: Depth in Feet scaled 1:240

Repeat Section





| Sensor | Offset (ft) | Schematic | Description | Len (ft) | OD (in) | Wt (lb) |
|-----------|-------------|---|--|----------|---------|---------|
| Head/Volt | 19.49 |  | 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 |
| Temp | 16.72 |  | Probe_RADII-C-2-3/4" (FW1302-002) Probe 2-3/4" Sector Cement Bond Tool with Temperature Probe | 9.19 | 2.75 | 105.00 |
| WVF3FT | 14.55 | | | | | |
| WVFCAL | 14.55 | | | | | |
| WVFS1 | 14.55 | | | | | |
| WVFS2 | 14.55 | | | | | |
| WVFS3 | 14.55 | | | | | |
| WVFS4 | 14.55 | | | | | |
| WVFS5 | 14.55 | | | | | |
| WVFS6 | 14.55 | | | | | |
| WVFS7 | 14.55 | | | | | |
| WVFS8 | 14.55 | | | | | |
| WVF5FT | 13.55 | | | | | |
| | | | Probe_IL_BS_Cent Probe 2-3/4" Inline Electrical Inline Bowspring Centralizer | 2.88 | 2.75 | 10.00 |

| | | | | | | |
|---|------|---|--|------|-------|-------|
| CCL | 6.51 |  | Probe_CCL_GR-2.75"Digital (FW1211-026) 4.54 Probe 2-3/4" Digital CCL / Gamma Ray Combined | 2.75 | 55.00 | |
| DCCL | 6.51 | | | | | |
| GR | 3.77 | | Probe_IL_BS_Cent Probe 2-3/4" Inline Electrical Inline Bowspring Centralizer | 2.88 | 2.75 | 10.00 |
| Dataset: 03-03-16_Noble Energy_Wells Ranch AF05-665_RBL.db: field/well/run1/pass4.1 Total Length: 23.40 ft Total Weight: 194.00 lb O.D.: 2.75 in | | | | | | |

| Calibration Report | |
|--------------------|---|
| Database File: | 03-03-16_Noble Energy_Wells Ranch AF05-665_RBL.db |
| Dataset Pathname: | pass4.1 |
| Dataset Creation: | Thu Mar 03 12:16:00 2016 by Calc 7.0 B1 |

| Gamma Ray Calibration Report | | |
|------------------------------|--------------------------|----------|
| Serial Number: | FW1211-026 | |
| Tool Model: | 2.75"Digital | |
| Performed: | Wed Feb 24 10:35:47 2016 | |
| Calibrator Value: | 1.0 | GAPI |
| Background Reading: | 0.0 | cps |
| Calibrator Reading: | 1.6 | cps |
| Sensitivity: | 0.6061 | GAPI/cps |

| Segmented Cement Bond Log Calibration Report | | |
|--|------------|----|
| Serial Number: | FW1302-002 | |
| Tool Model: | 2-3/4" | |
| Calibration Casing Diameter: | 5.500 | in |
| Calibration Depth: | 294.807 | ft |

| Master Calibration, performed Thu Mar 03 12:15:31 2016: | | | | | | |
|---|---------|-------|-----------------|---------|---------|--------|
| | Raw (v) | | Calibrated (mv) | | Results | |
| | Zero | Cal | Zero | Cal | Gain | Offset |
| 3' | 0.000 | 0.559 | 0.800 | 71.921 | 127.237 | 0.797 |
| CAL | 0.007 | 0.657 | | | | |
| 5' | 0.000 | 0.486 | 0.800 | 71.921 | 146.399 | 0.751 |
| SUM | | | | | | |
| S1 | 0.000 | 0.556 | 0.000 | 100.000 | 179.860 | -0.090 |
| S2 | 0.000 | 0.557 | 0.000 | 100.000 | 179.722 | -0.047 |
| S3 | 0.000 | 0.557 | 0.000 | 100.000 | 179.658 | -0.070 |
| S4 | 0.000 | 0.557 | 0.000 | 100.000 | 179.722 | -0.070 |

| | | | | | | |
|----|--------|-------|-------|---------|---------|--------|
| S4 | 0.001 | 0.561 | 0.000 | 100.000 | 178.568 | -0.178 |
| S5 | 0.001 | 0.582 | 0.000 | 100.000 | 172.058 | -0.138 |
| S6 | 0.001 | 0.592 | 0.000 | 100.000 | 169.178 | -0.103 |
| S7 | -0.000 | 0.573 | 0.000 | 100.000 | 174.633 | 0.010 |
| S8 | 0.000 | 0.562 | 0.000 | 100.000 | 177.957 | -0.014 |

Internal Reference Calibration, performed Thu Mar 03 10:39:41 2016:

| | Raw (v) | | Calibrated (v) | | Results | |
|-----|---------|-------|----------------|-------|---------|--------|
| | Zero | Cal | Zero | Cal | Gain | Offset |
| CAL | 0.006 | 0.655 | 0.007 | 0.657 | 1.003 | 0.000 |

Air Zero Calibration, performed Thu Mar 03 10:39:08 2016:

| | Raw (v) | | Calibrated (v) | | Results | |
|-----|---------|--|----------------|--|---------|--|
| | Zero | | Zero | | Offset | |
| 3' | 0.006 | | 0.000 | | -0.000 | |
| 5' | 0.007 | | 0.000 | | 0.000 | |
| SUM | | | | | | |
| S1 | 0.007 | | 0.000 | | 0.000 | |
| S2 | 0.006 | | 0.000 | | 0.000 | |
| S3 | 0.007 | | 0.000 | | -0.000 | |
| S4 | 0.006 | | 0.000 | | 0.000 | |
| S5 | 0.007 | | 0.000 | | 0.000 | |
| S6 | 0.006 | | 0.000 | | 0.000 | |
| S7 | 0.006 | | 0.000 | | -0.000 | |
| S8 | 0.007 | | 0.000 | | -0.000 | |



Company Noble Energy Inc.
Well Wells Ranch AF05-665
Field Wattenberg
County Weld
State Colorado