



Radial Cement Bond  
Variable Density Log  
W/Gamma Ray/CCL

Company Noble Energy

Well Crow Creek State AC36-77-1HN

Field Wattenberg

County Weld State Colorado

Location: API #: 05-123-37133

BHL: 535' FNL & 1650' FWL

SEC 36 TWP 7N RGE 63W

Permanent Datum Ground Level Elevation 4789'  
Log Measured From Kelly Bushing 24' APD  
Drilling Measured From Kelly Bushing

Other Services  
None

Elevation  
K.B. 4813'  
D.F. 4812'  
G.L. 4789'

Date November 5, 2013

Run Number One

Depth Driller 11155'

Depth Logger 6852'

Bottom Logged Interval 6838'

Top Log Interval Surface

Open Hole Size 8 3/4"

Type Fluid Water

Density / Viscosity 8.34

Max. Recorded Temp. -

Estimated Cement Top 1250'

Time Well Ready 13:40

Time Logger on Bottom 14:32

Equipment Number 13034

Location Brighton, CO

Recorded By C. Rall

Witnessed By Bill Mansfield

Run Number

Bit From To Size Weight From To

Casing Record

Surface String 9 5/8" 36# Top Surface Bottom

Prot. String 7" 26# Surface 7039'

Production String 4.5" 11.6# Surface 6922' 11140'

Liner 4.5" 5728' 5742'

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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

Well Logged using 24' KB

Main Pass and Repeat Pass logged with zero Pressure on surface

Short Joint: 5728' to 5742'


Estimated Top of Cement: 1250'

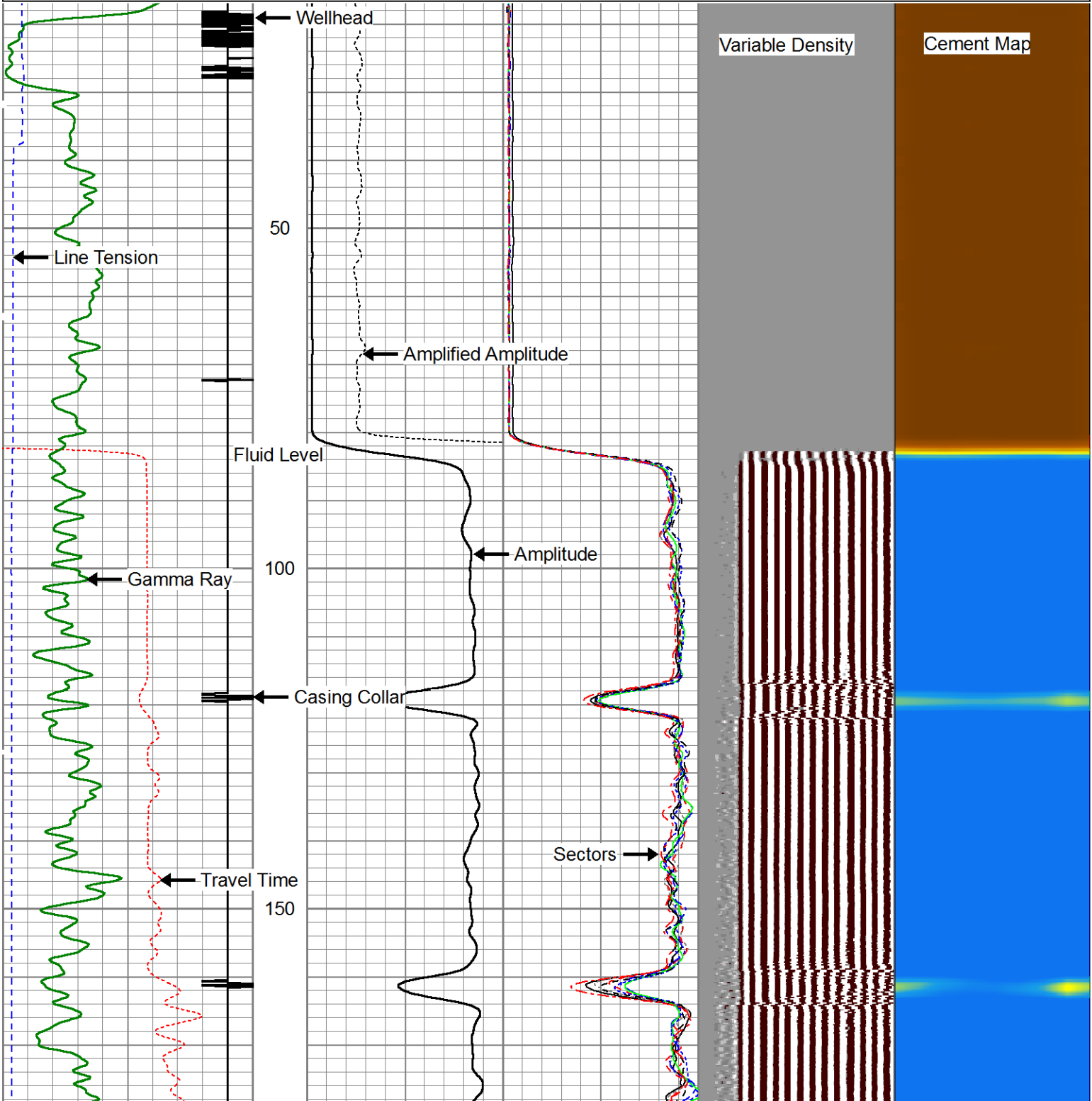
Thank You for using Allied Wireline

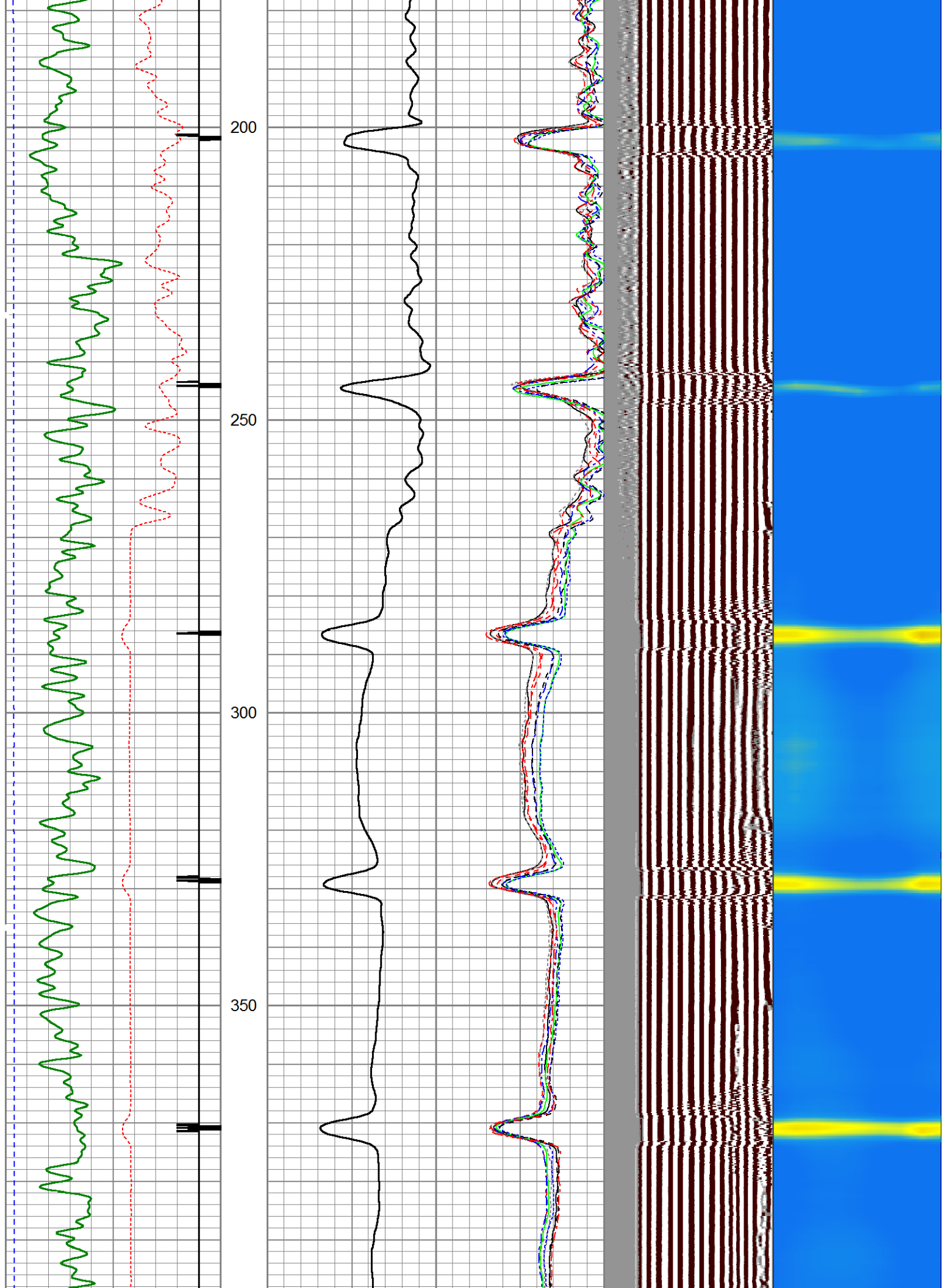
(303)659-4609

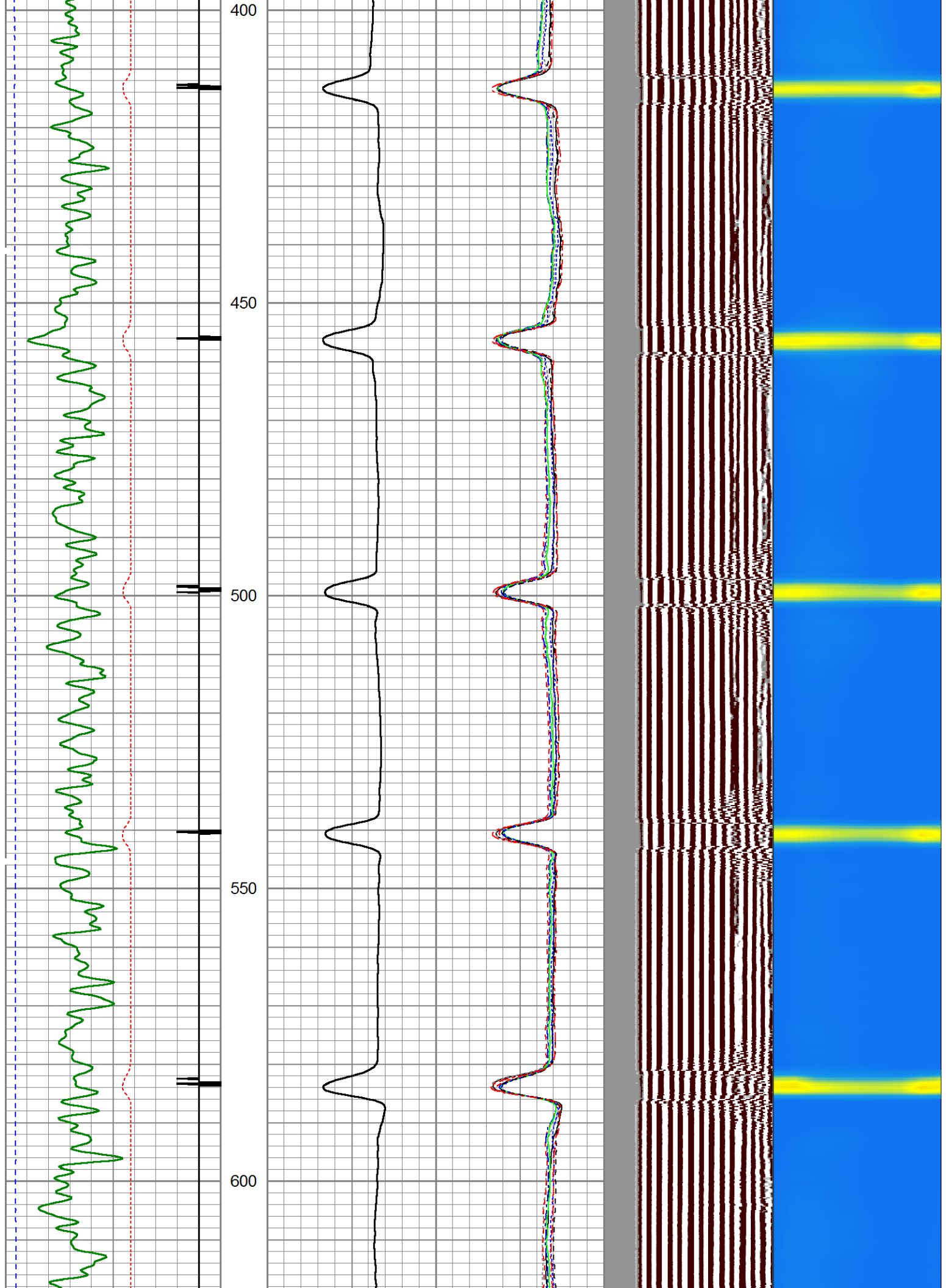


Main Pass ( 0 PSI )

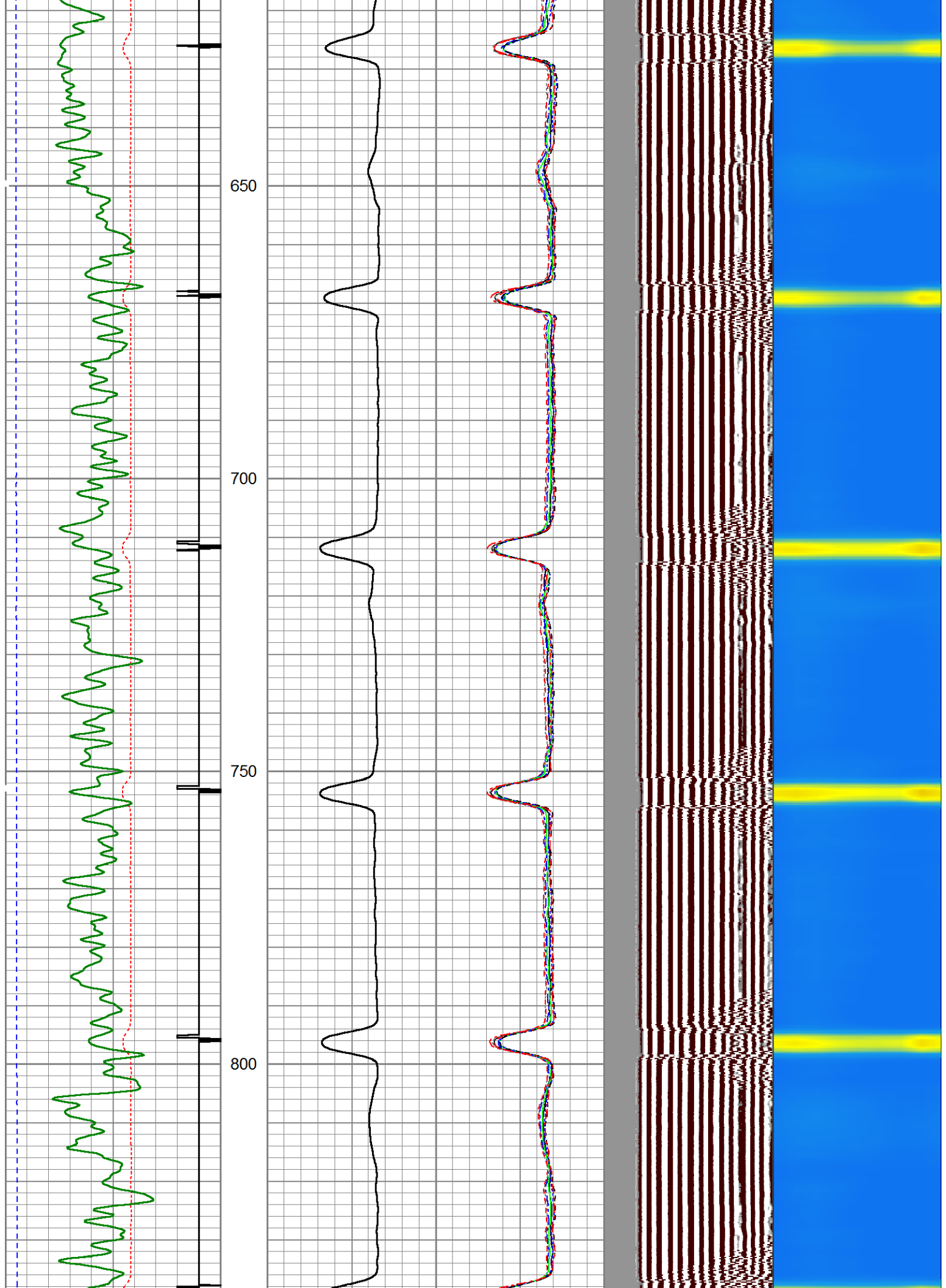
|     |                    |      |                     |                |     |    |       |     |   |      |   |            |   |
|-----|--------------------|------|---------------------|----------------|-----|----|-------|-----|---|------|---|------------|---|
| 400 | Travel Time (usec) | 200  | 0                   | Amplitude (mV) | 100 | -5 | AMPS1 | 150 | Variable Density  |      | 1 | Cement Map | 8 |
| 9   | Casing Collar      | -1   | Amplified Amplitude |                |     | -5 | AMPS2 | 150 | 200   | 1200 | 0 | 100        |   |
| 0   | Gamma Ray (GAPI)   | 150  | 0                   | (mV)           | 10  | -5 | AMPS3 | 150 |  |      |   |            |   |
| 0   | Line Tension (lb)  | 5000 |                     |                |     | -5 | AMPS4 | 150 |   |      |   |            |   |
|     |                    |      |                     |                |     | -5 | AMPS5 | 150 |   |      |   |            |   |
|     |                    |      |                     |                |     | -5 | AMPS6 | 150 |   |      |   |            |   |
|     |                    |      |                     |                |     | -5 | AMPS7 | 150 |   |      |   |            |   |
|     |                    |      |                     |                |     | -5 | AMPS8 | 150 |   |      |   |            |   |

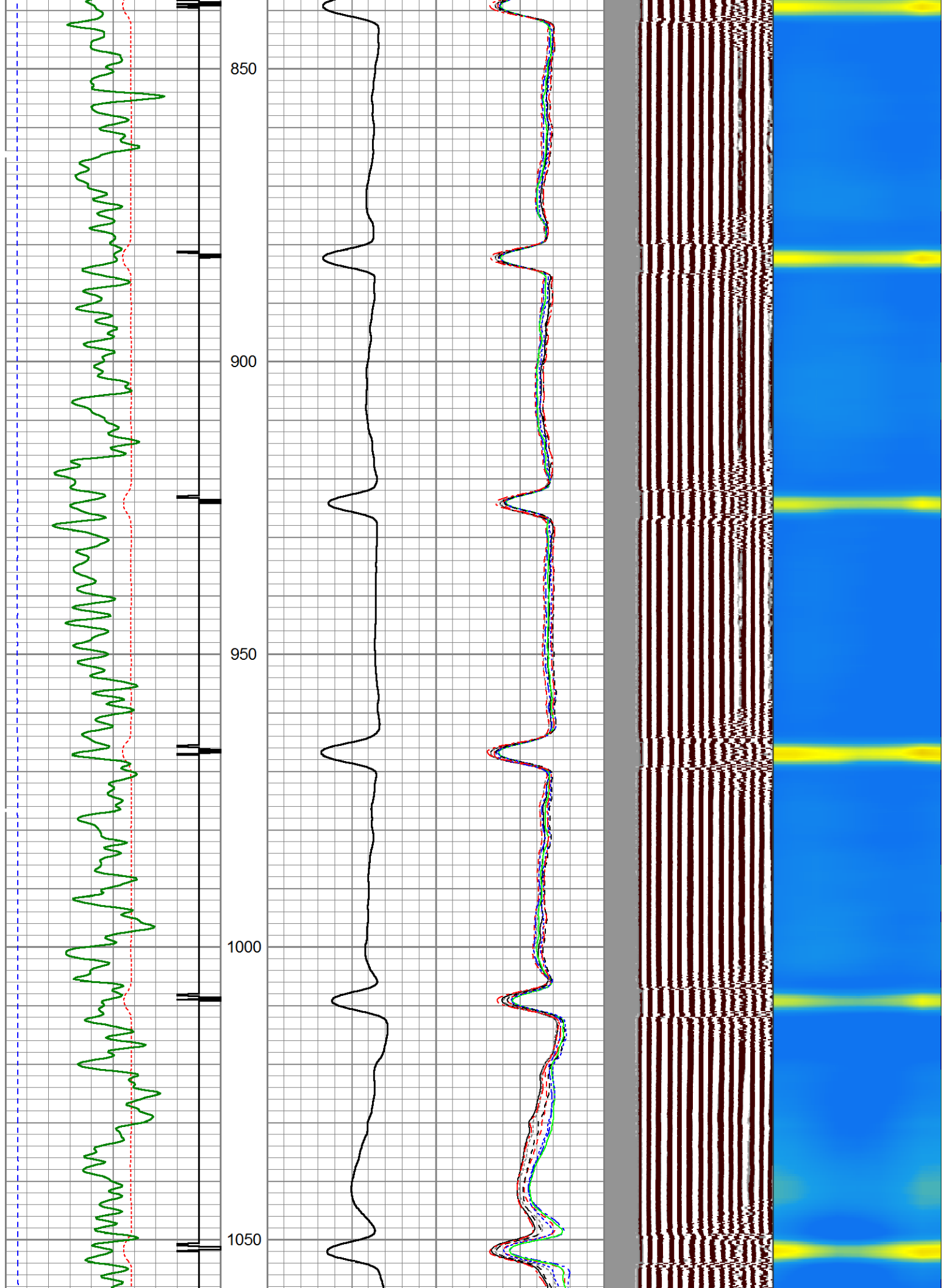


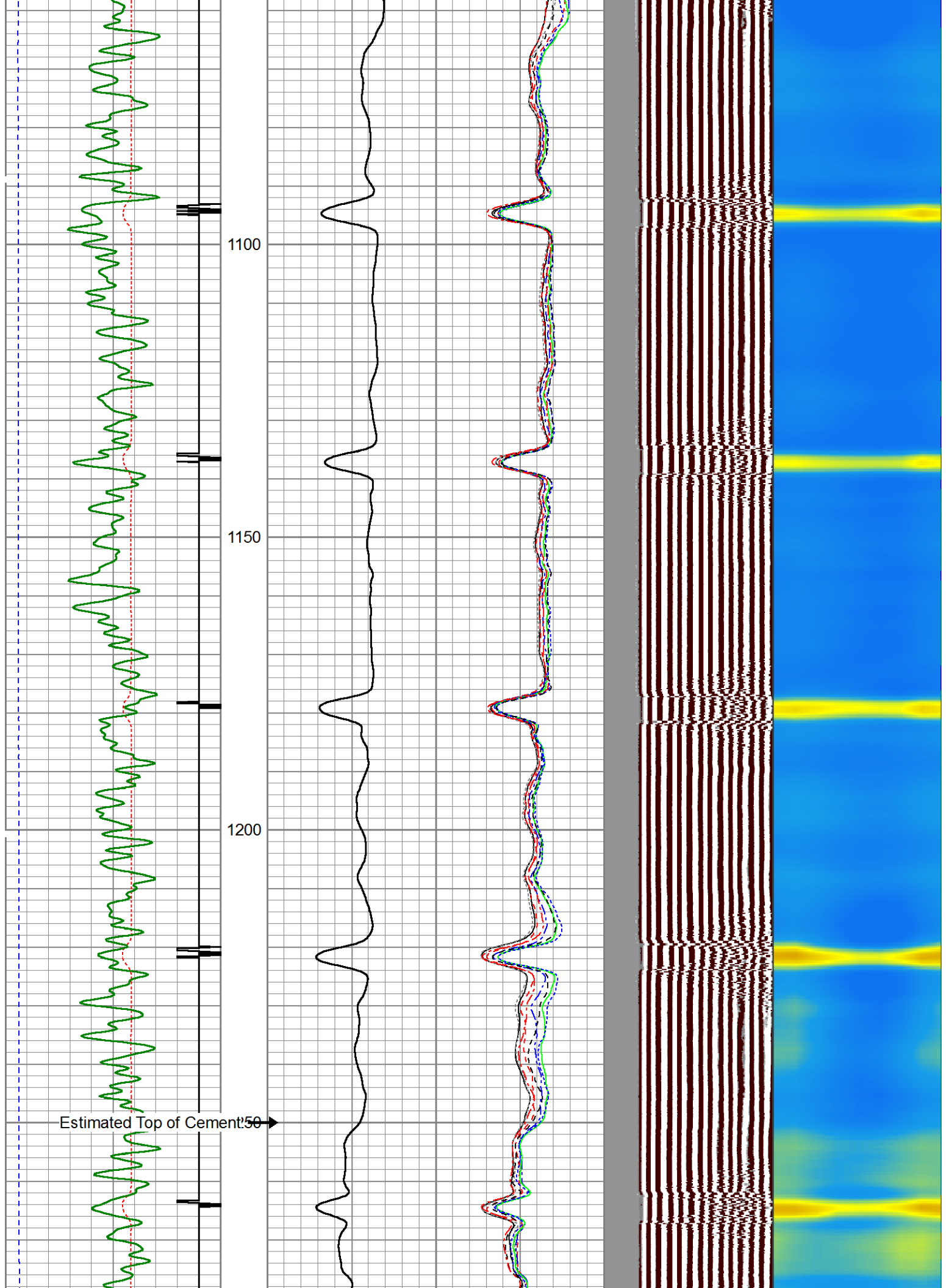


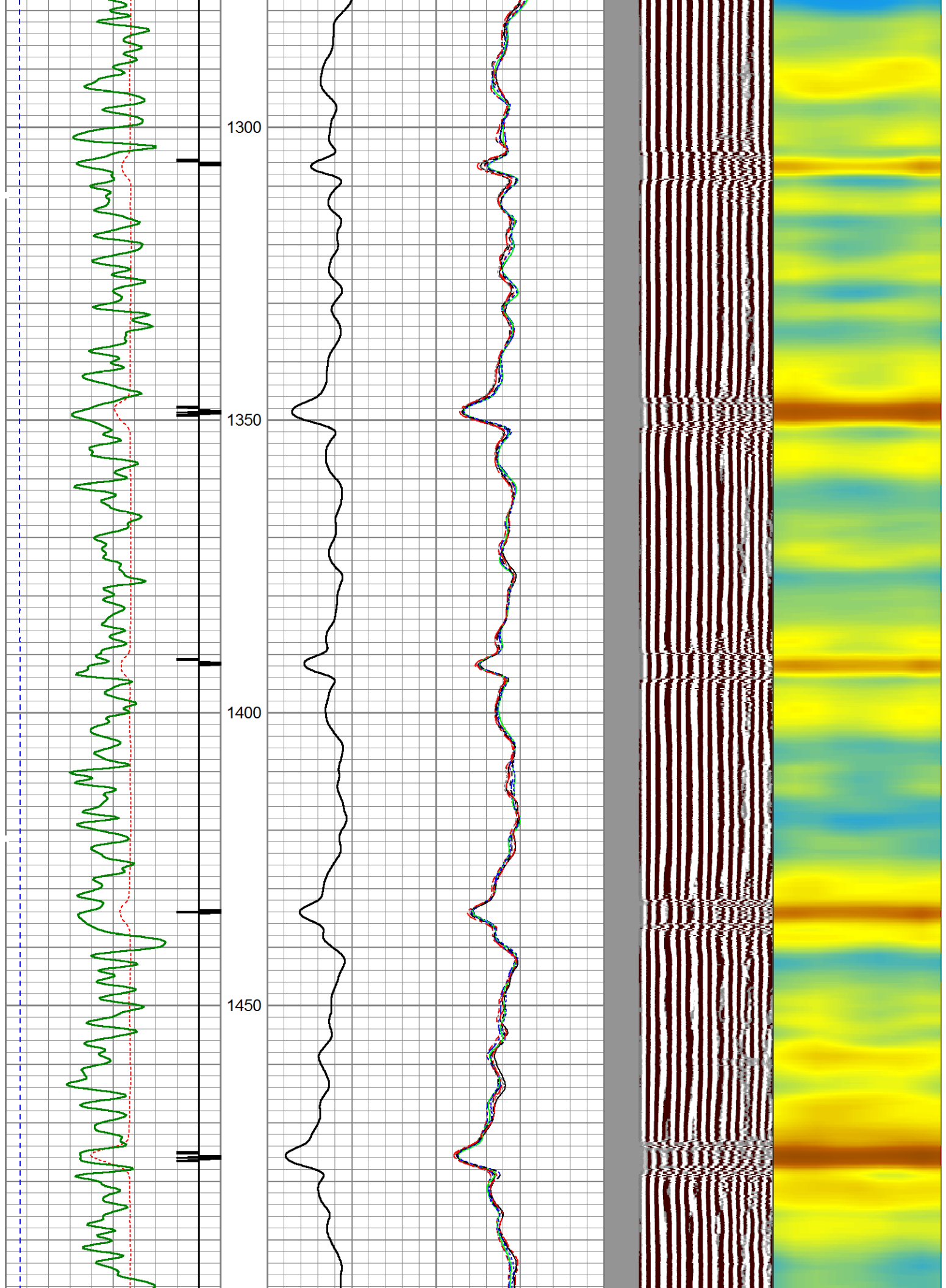


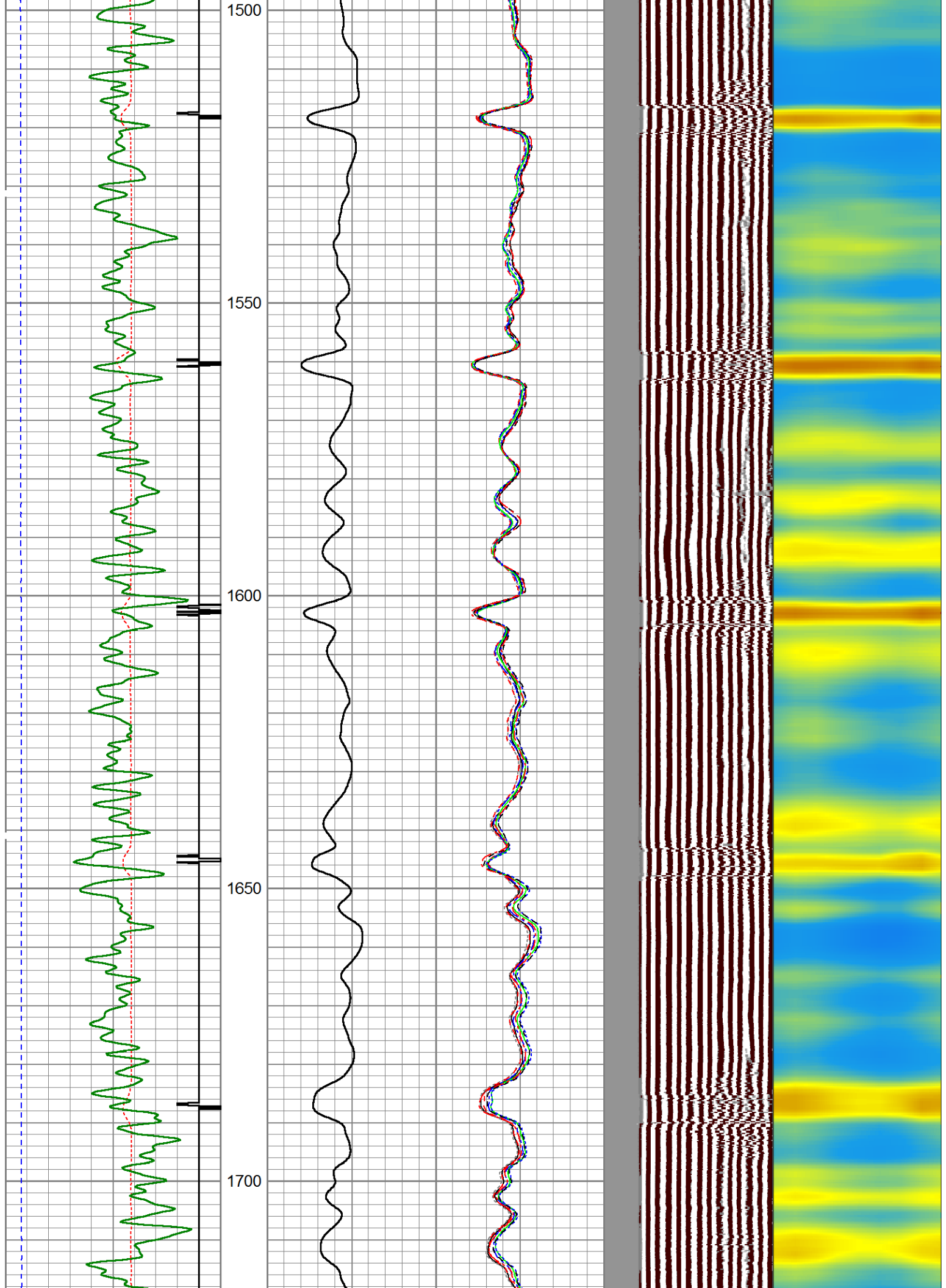




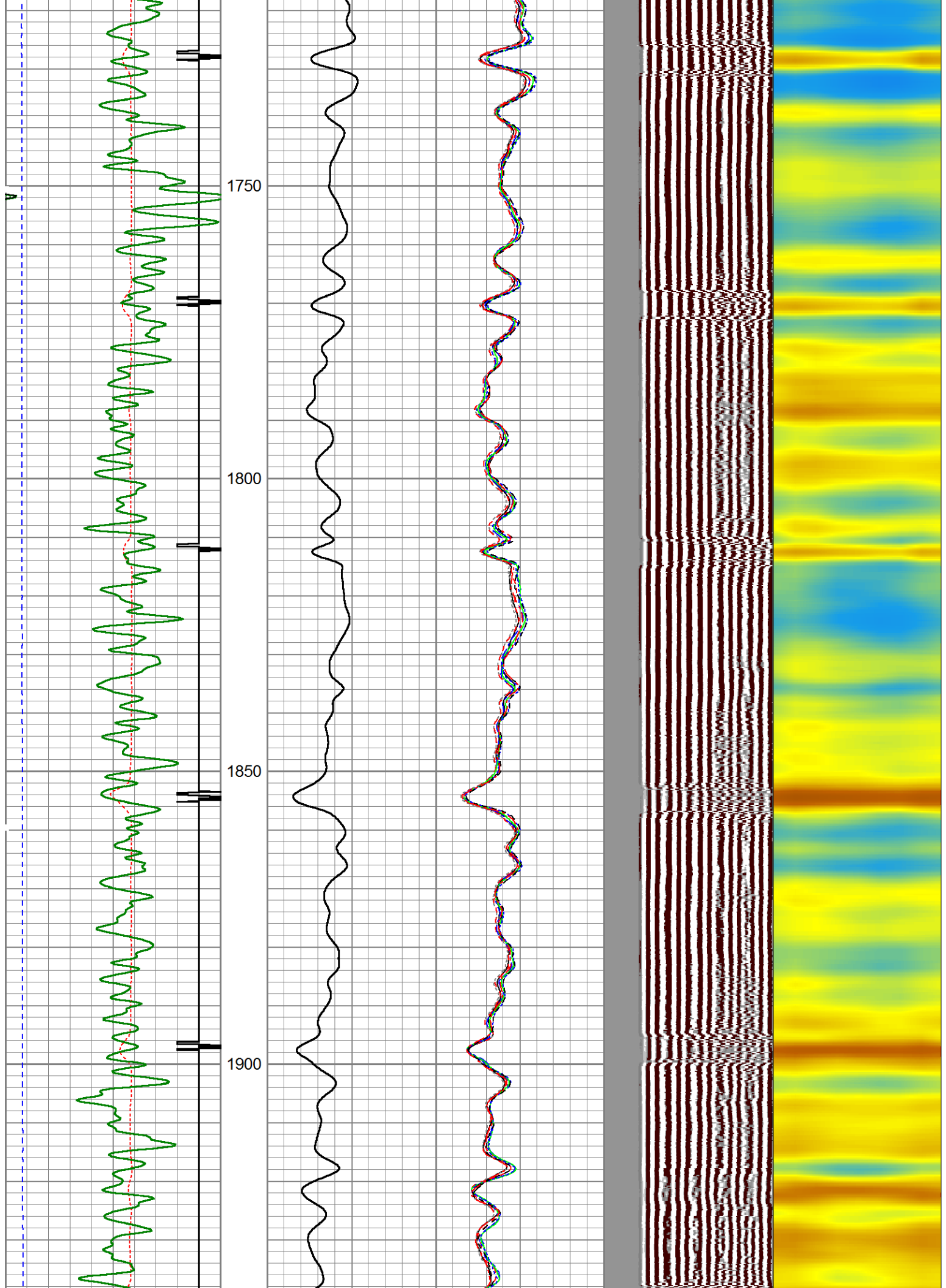




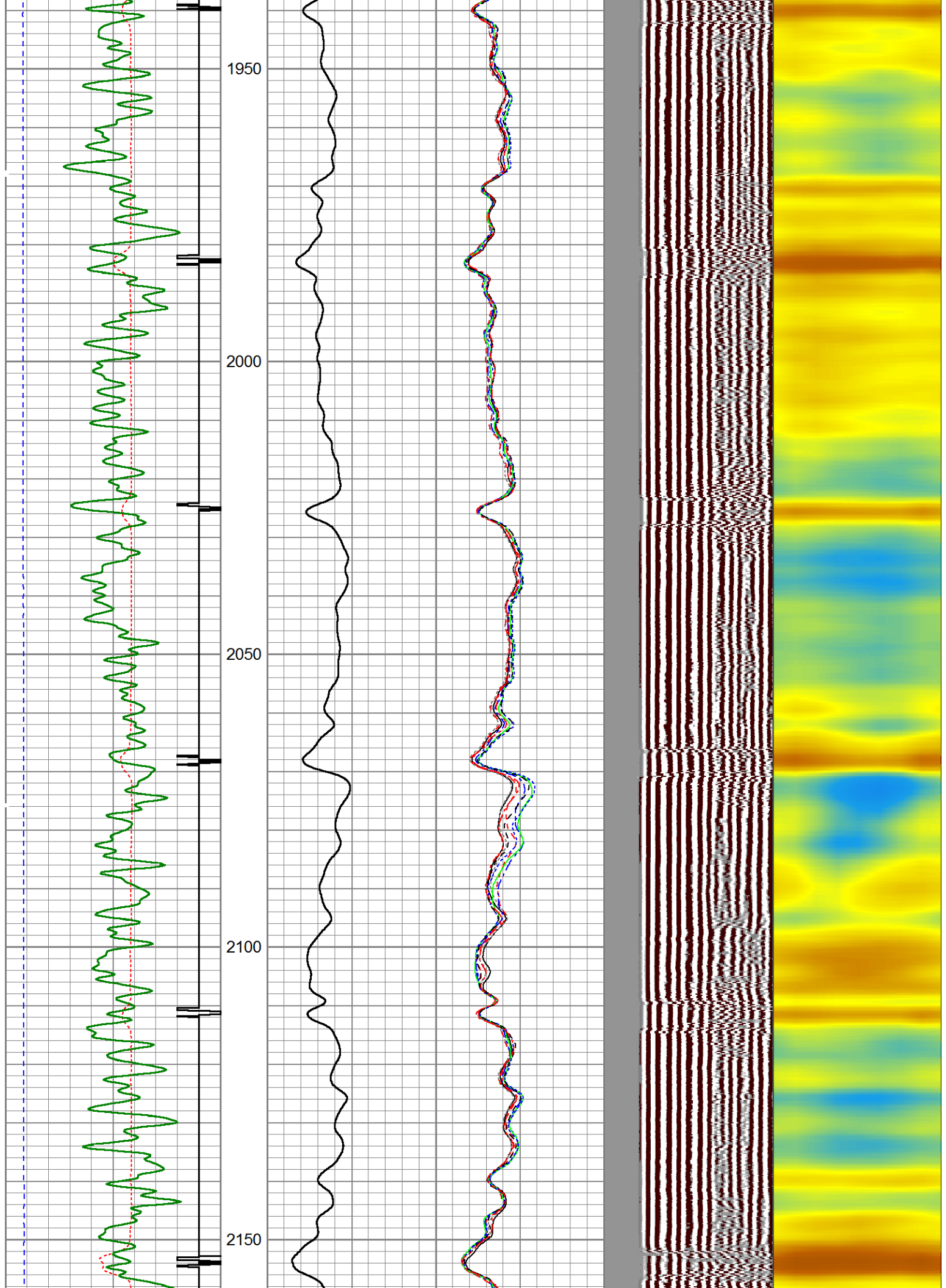


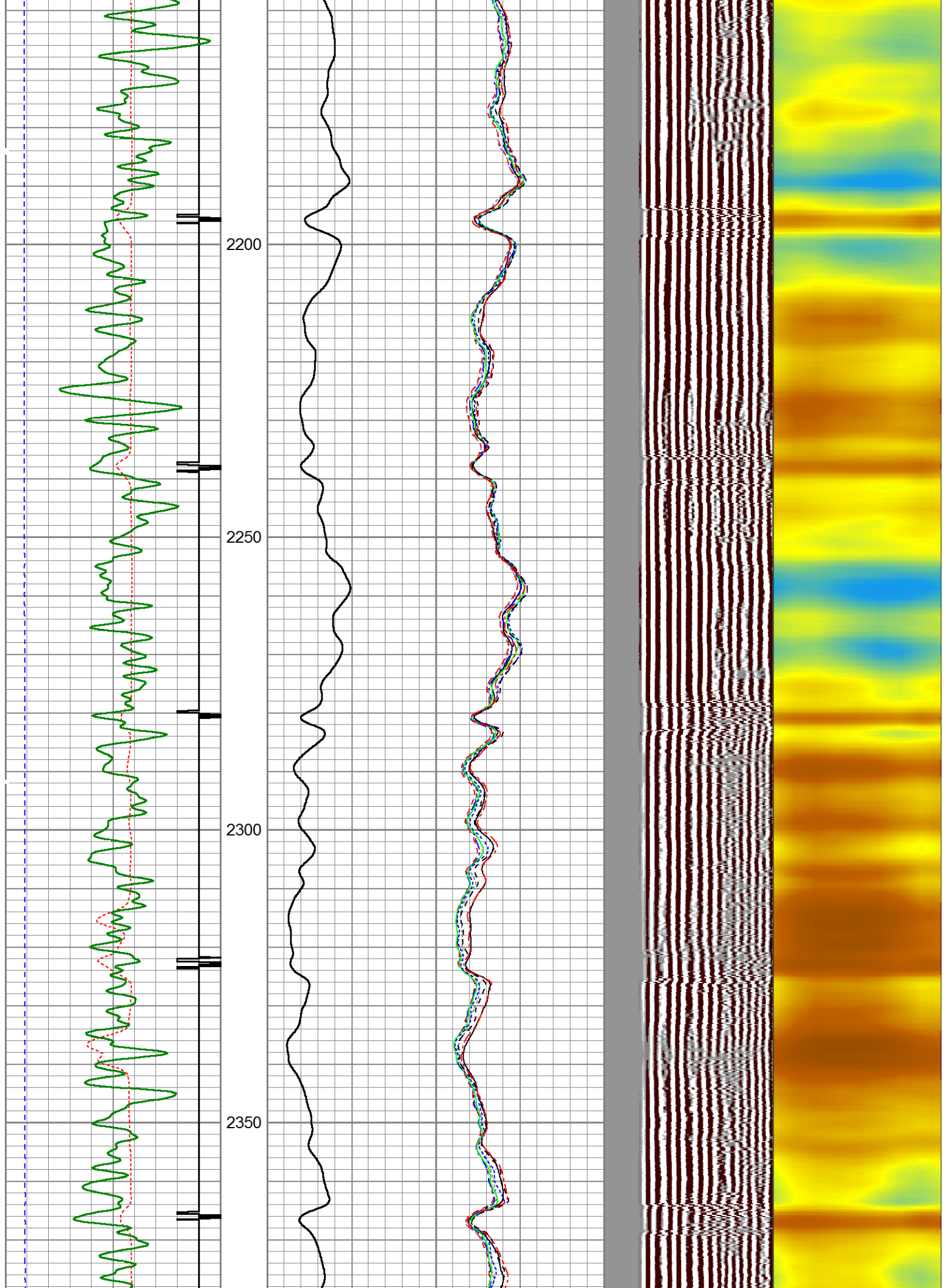


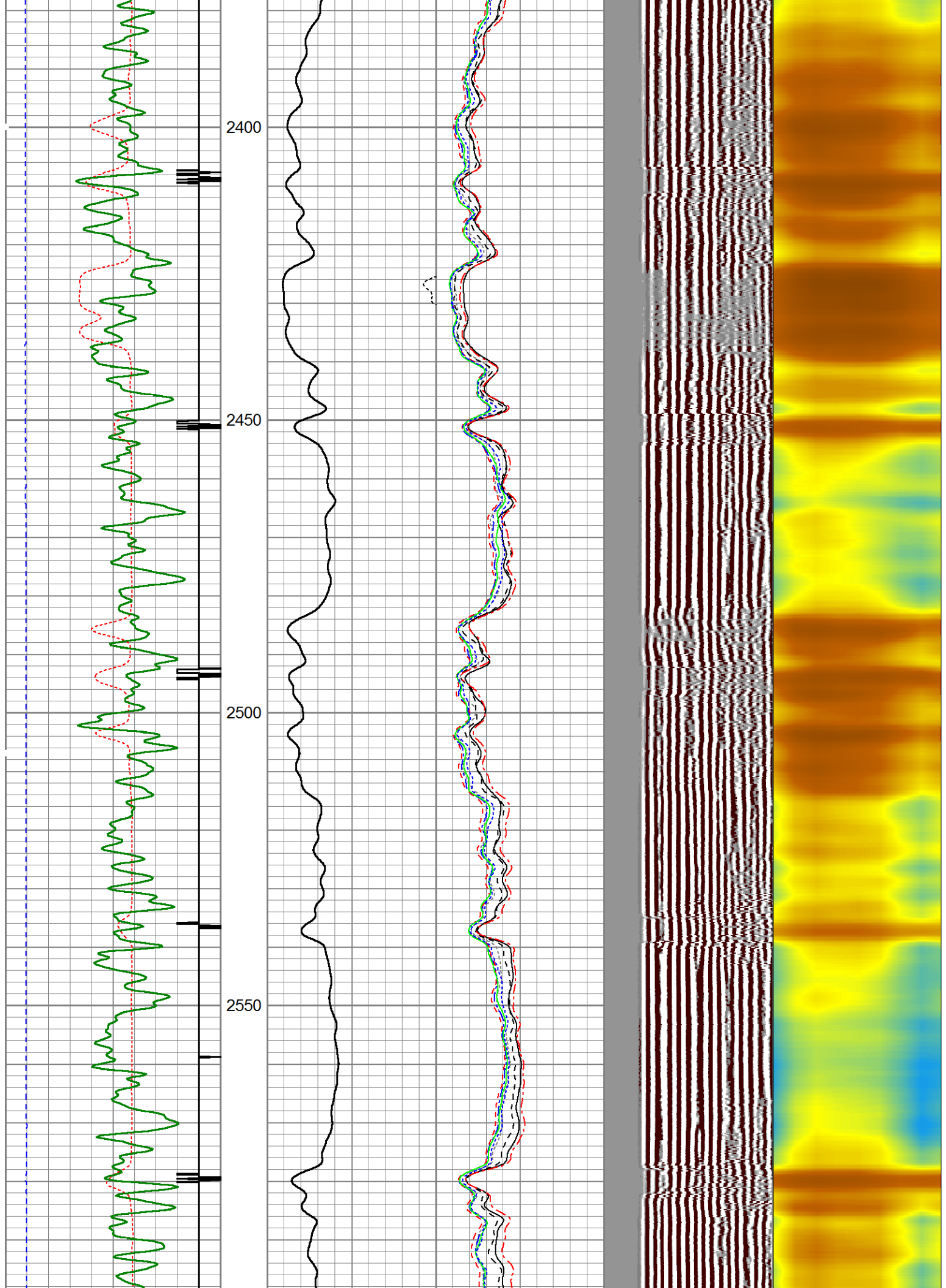


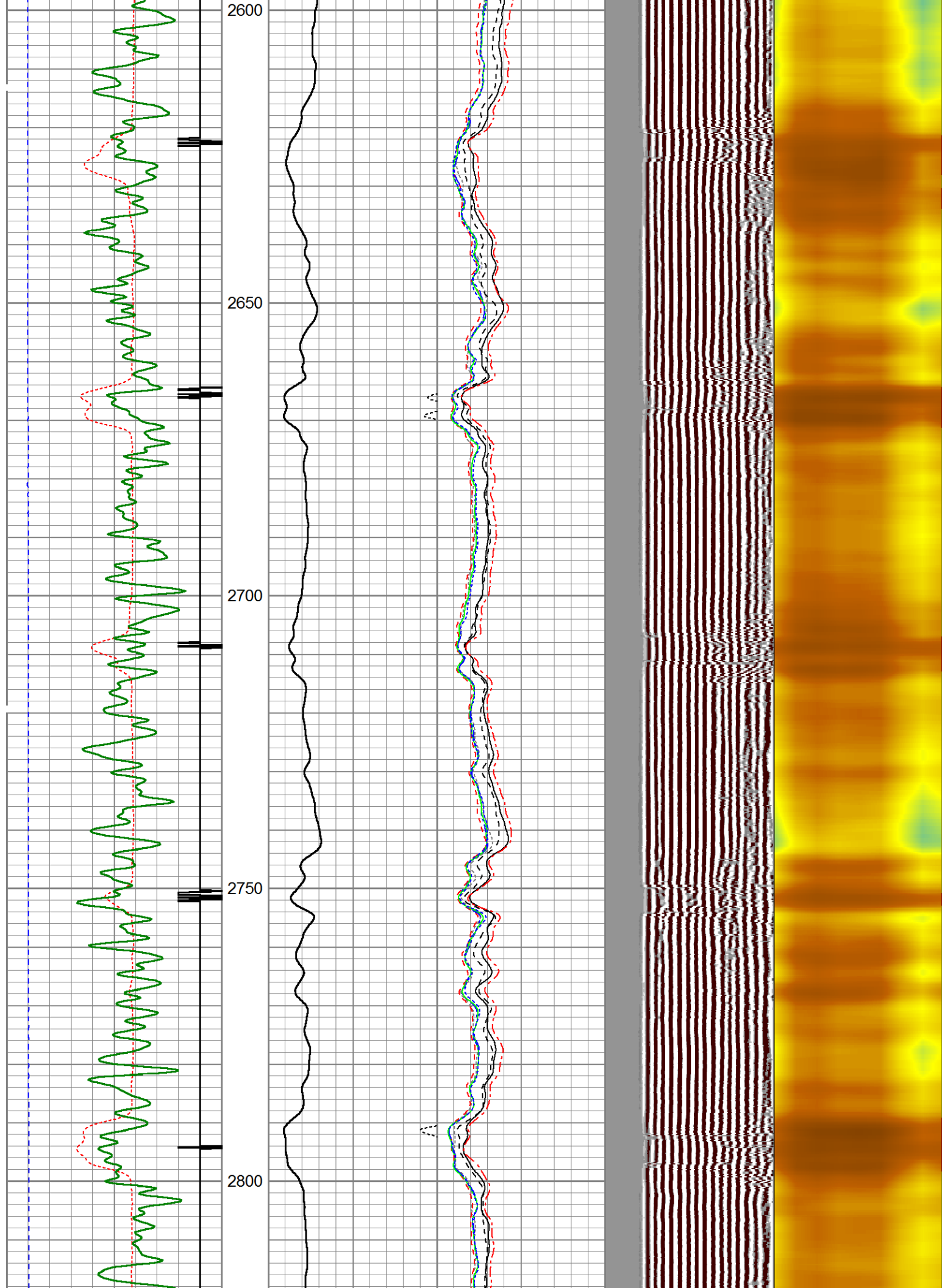




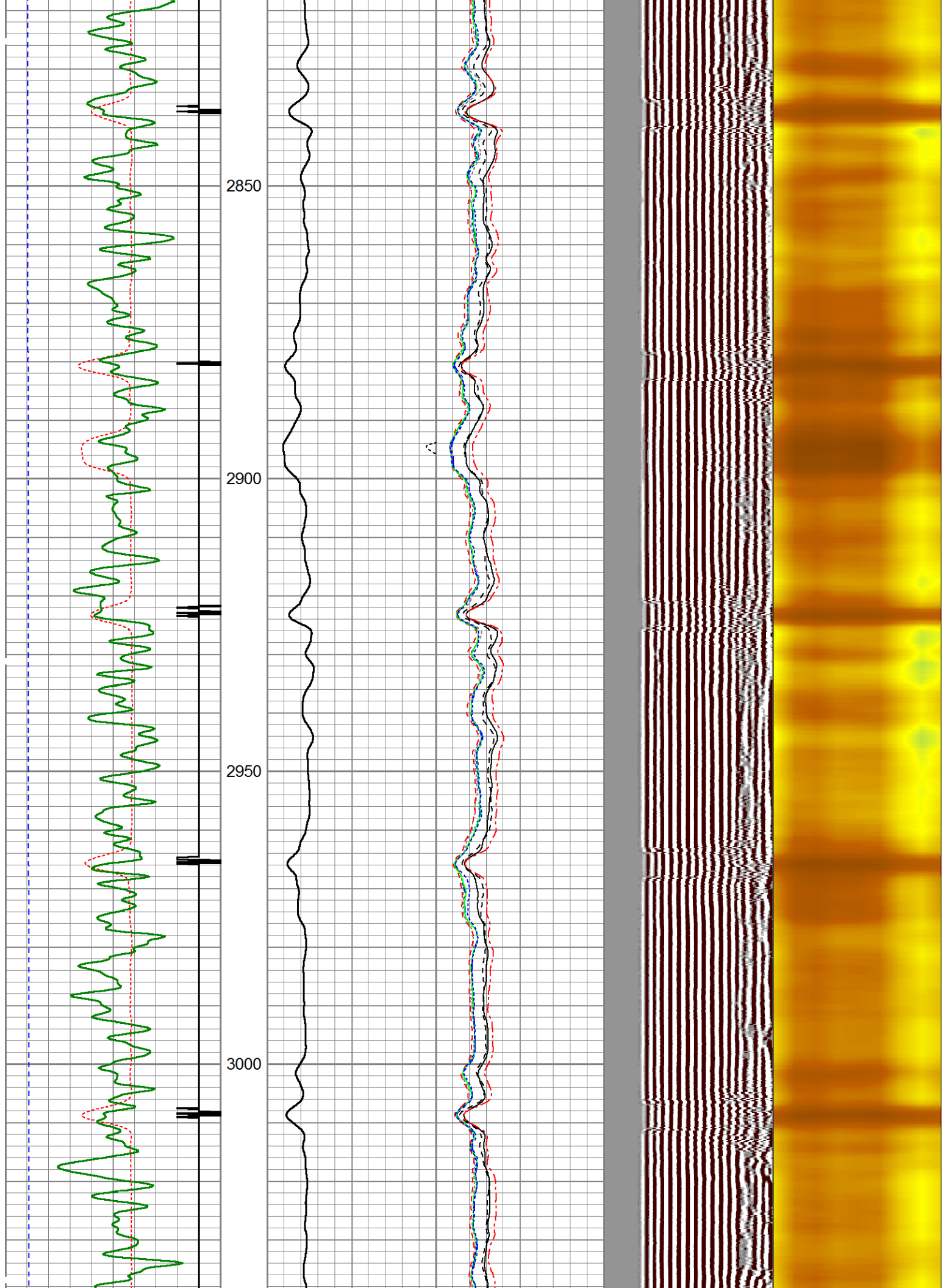


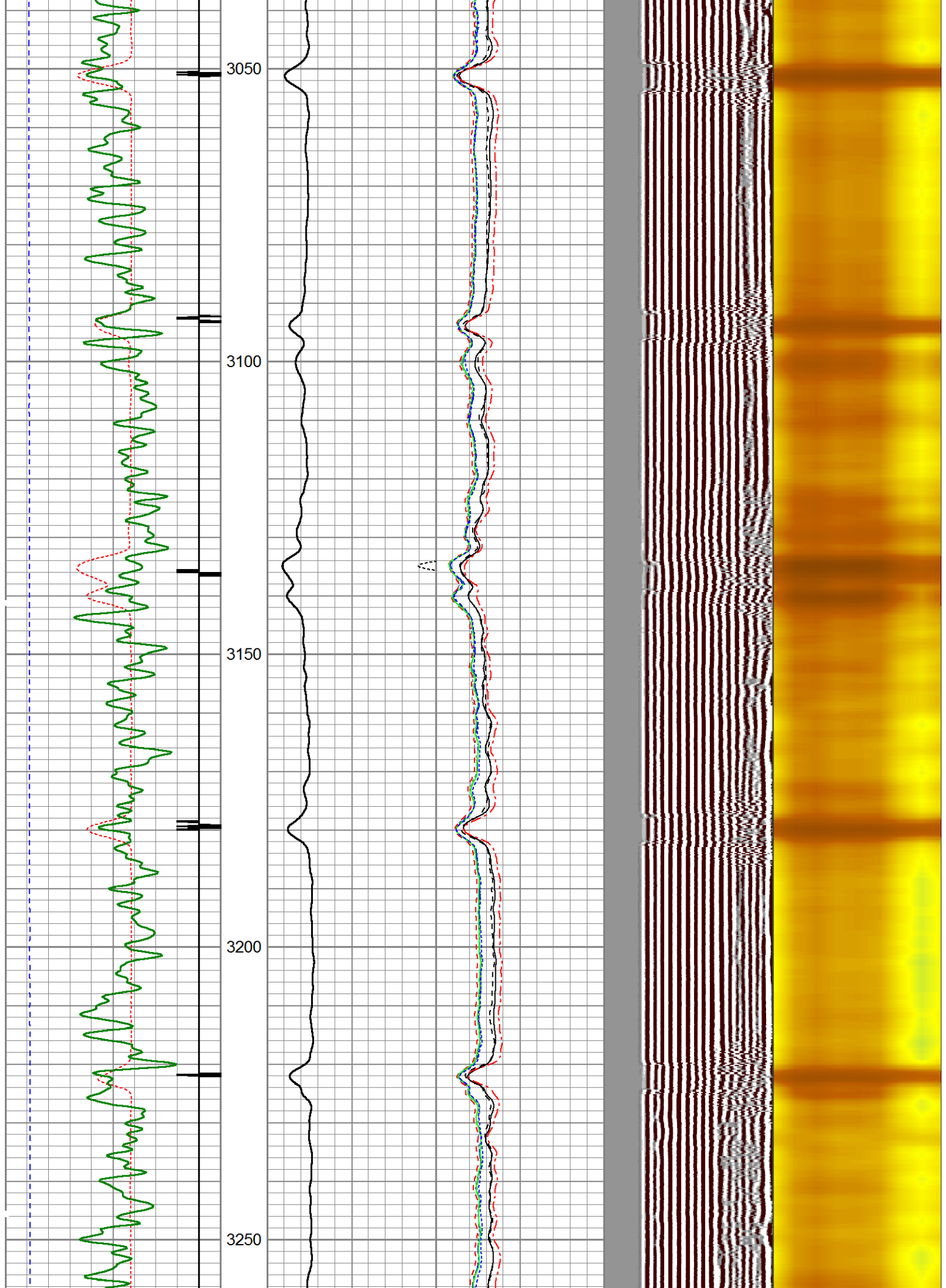




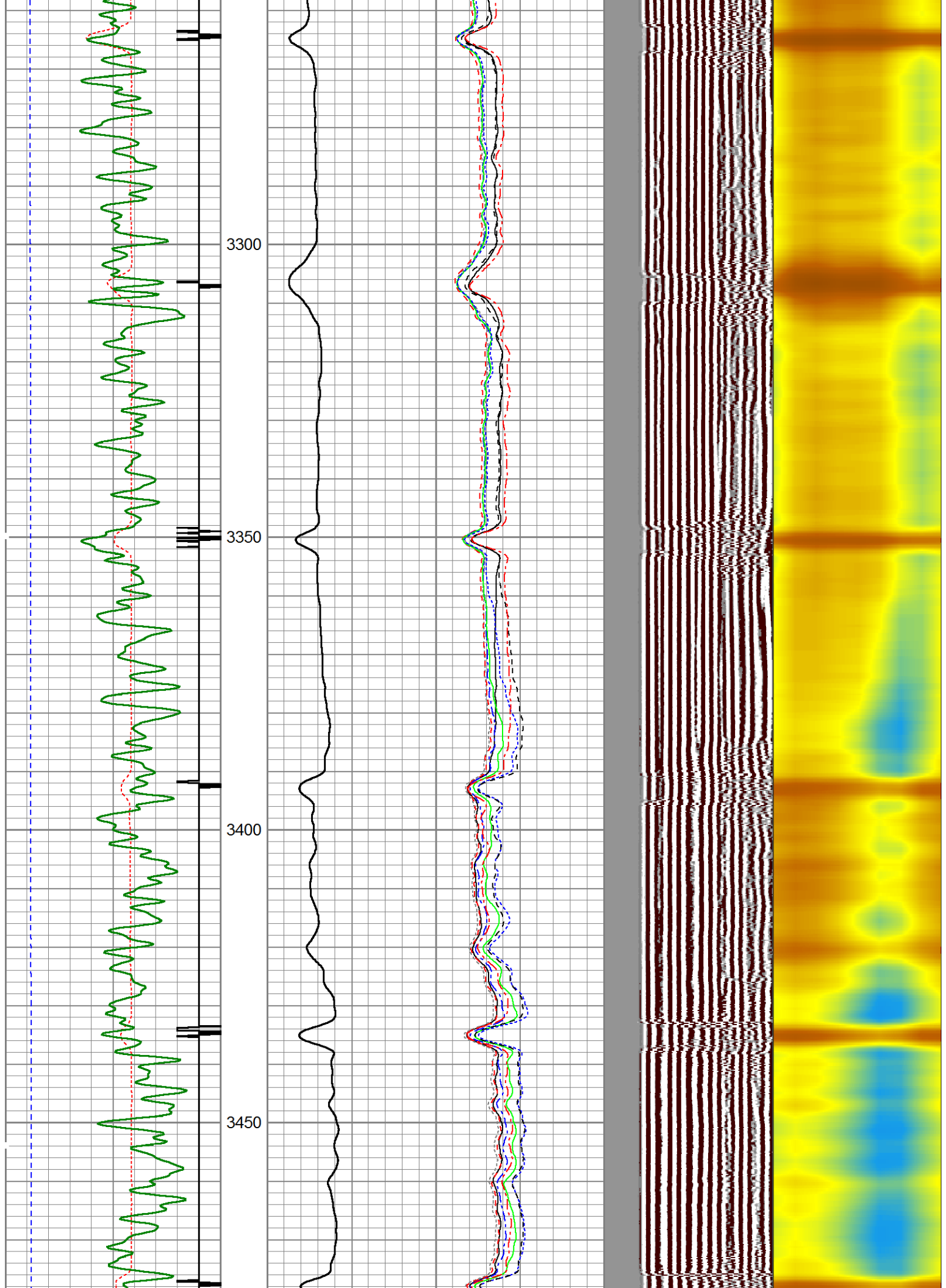


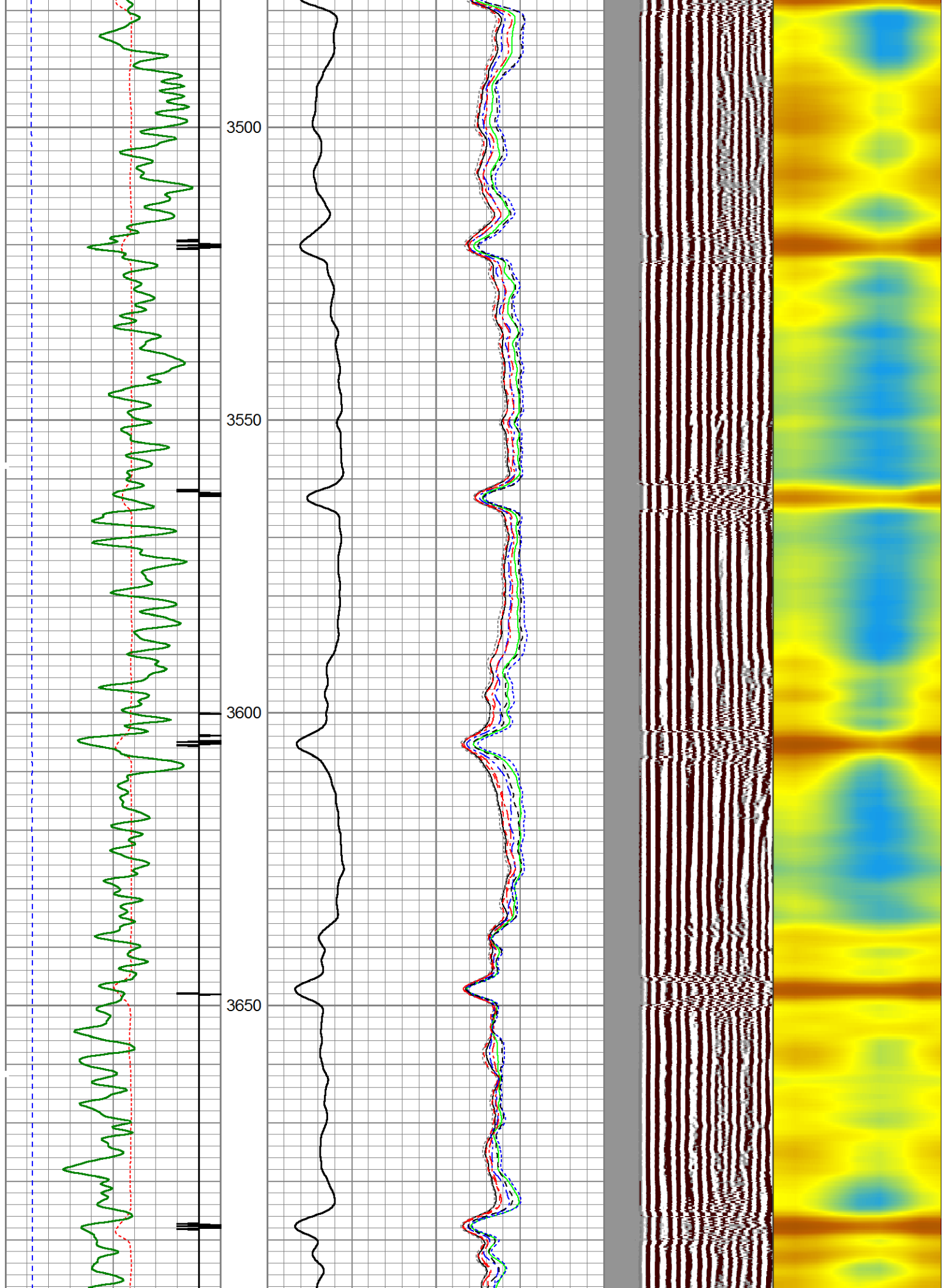


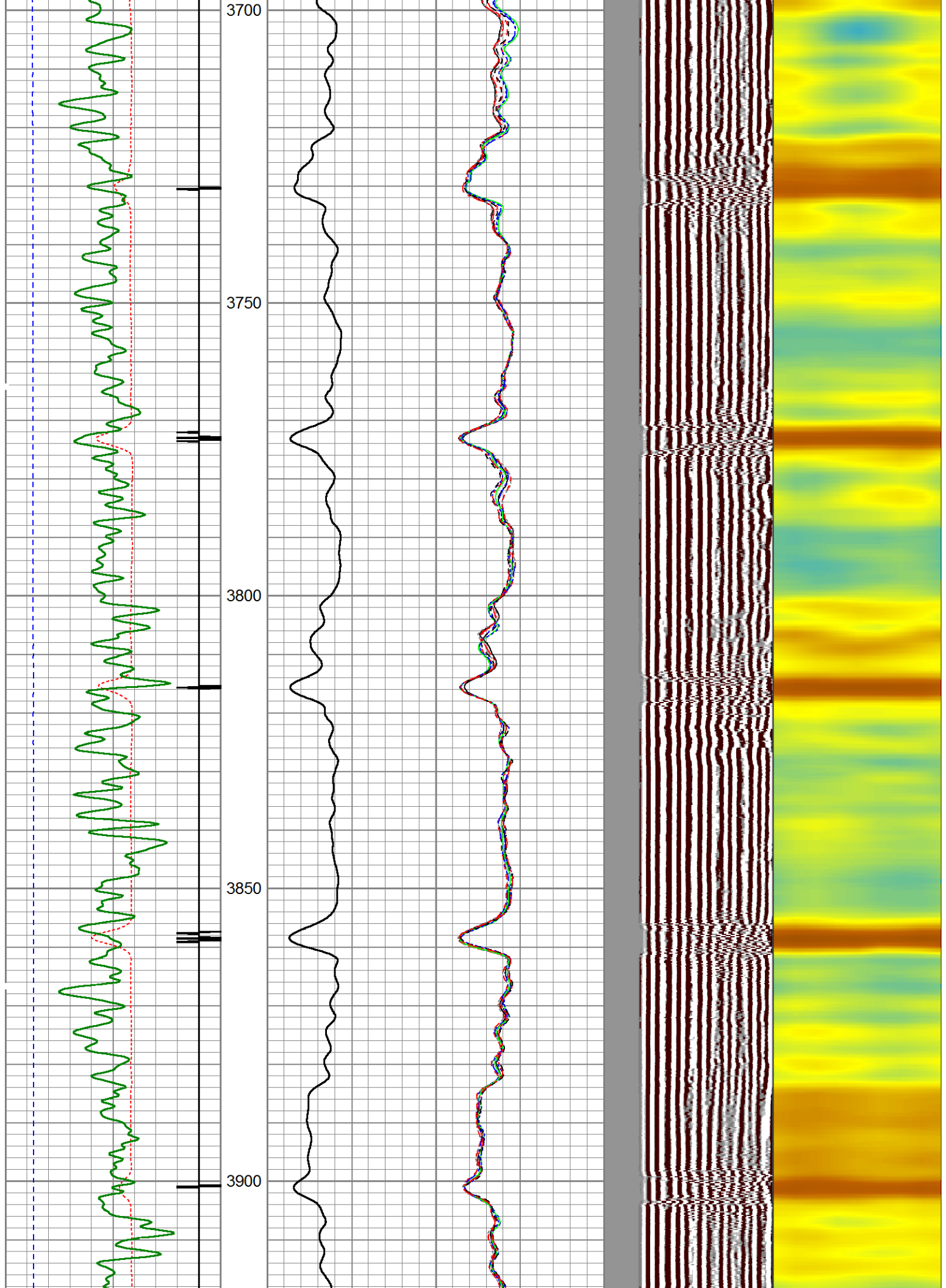


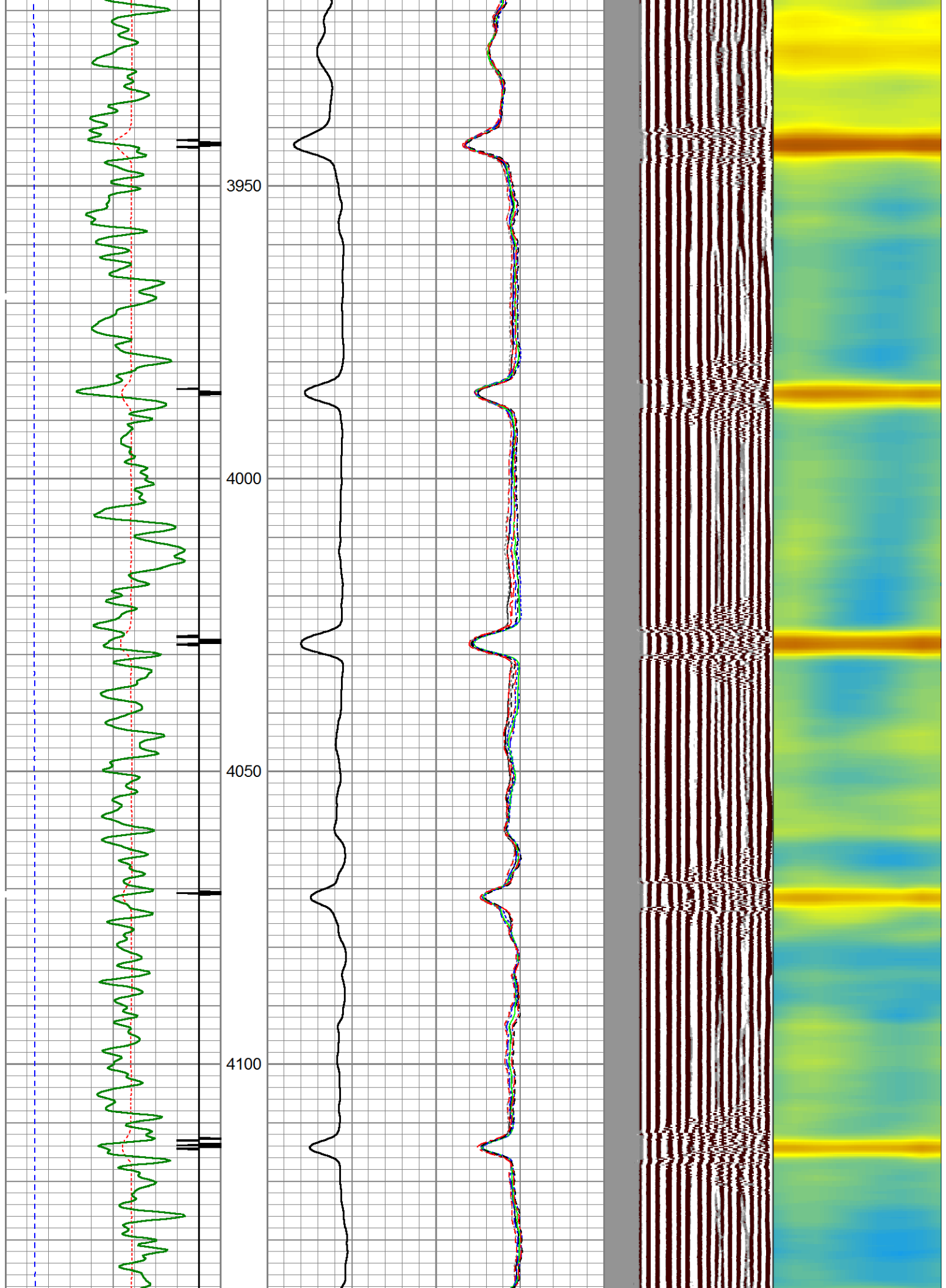




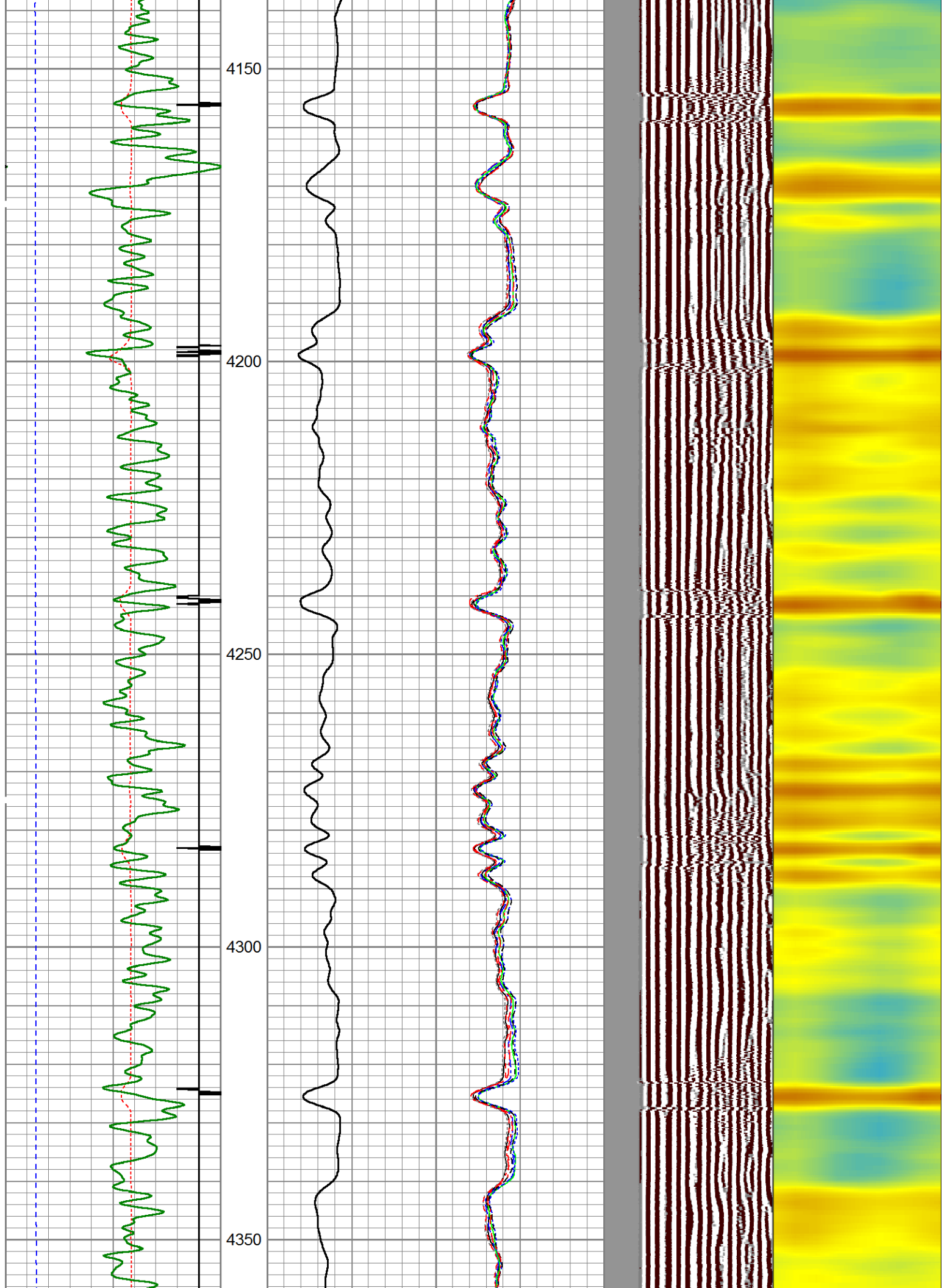


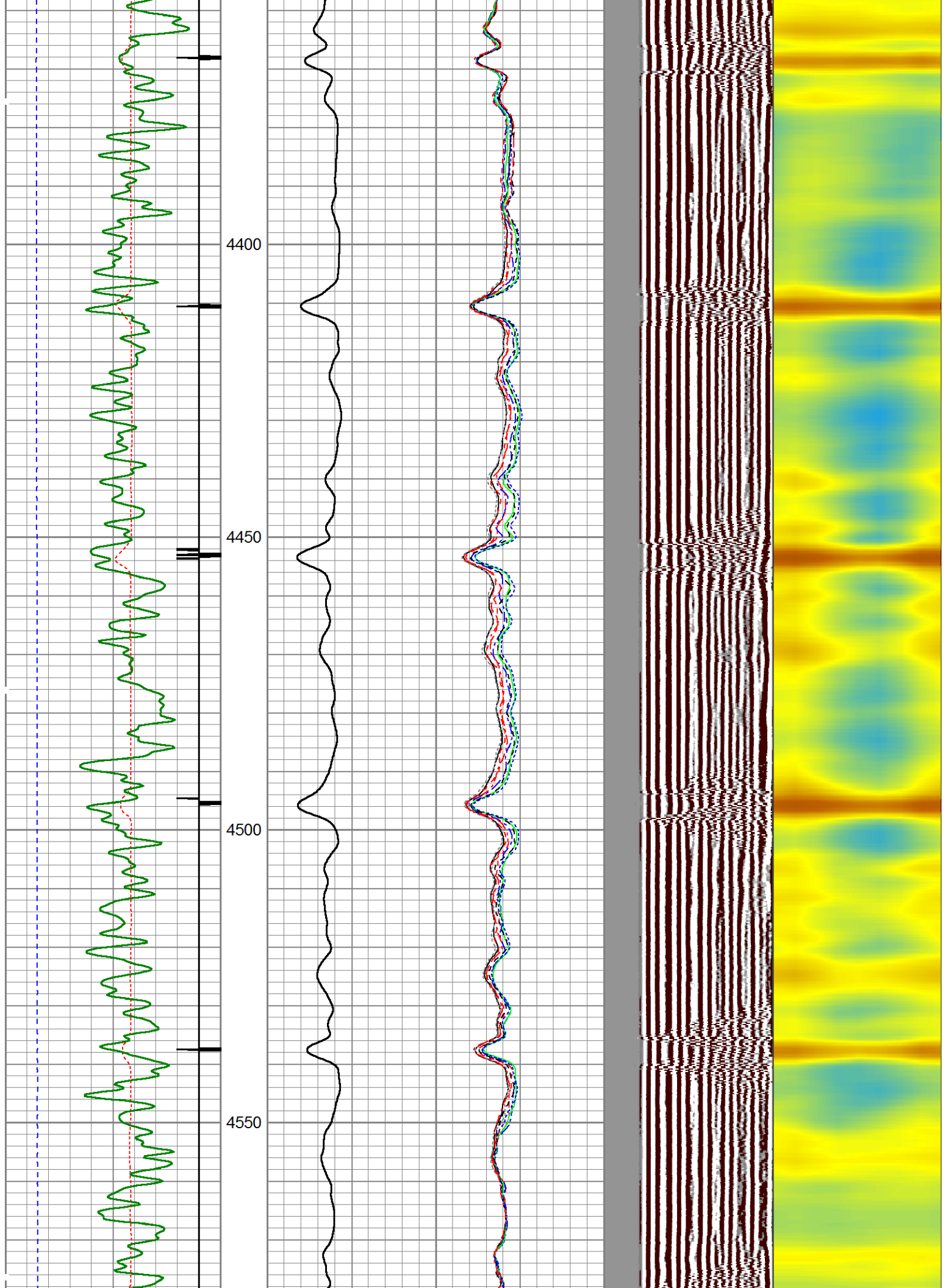




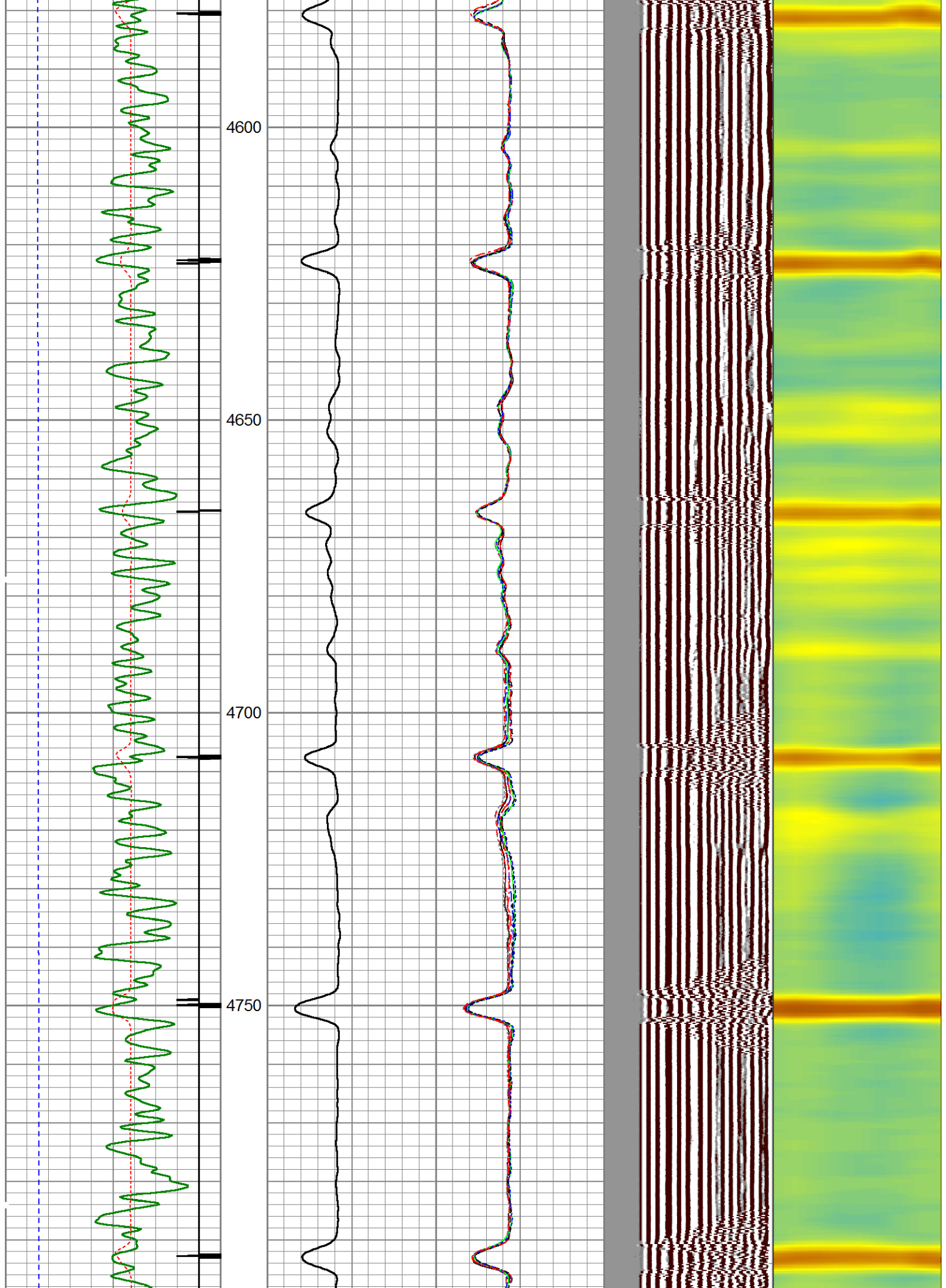


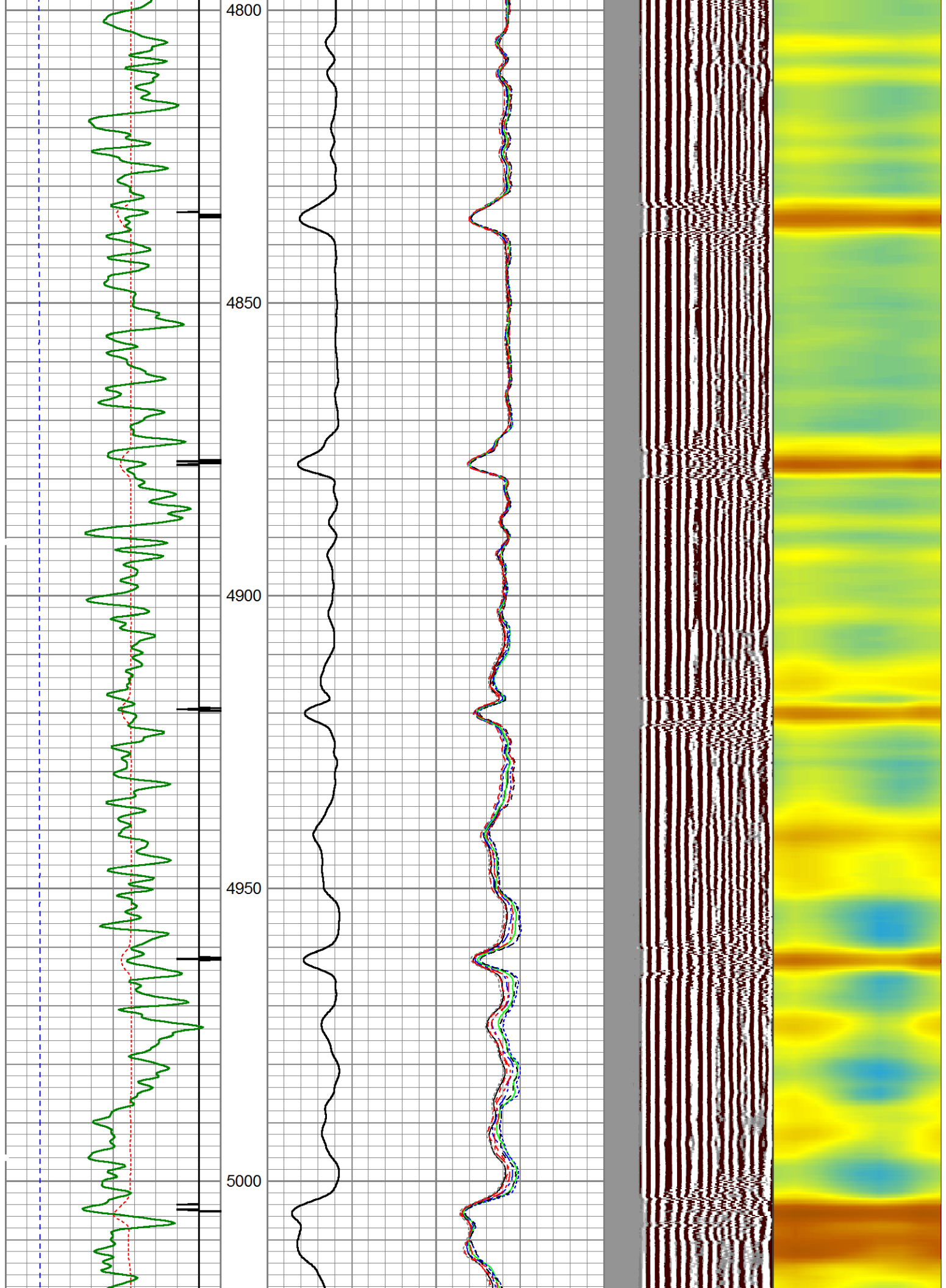


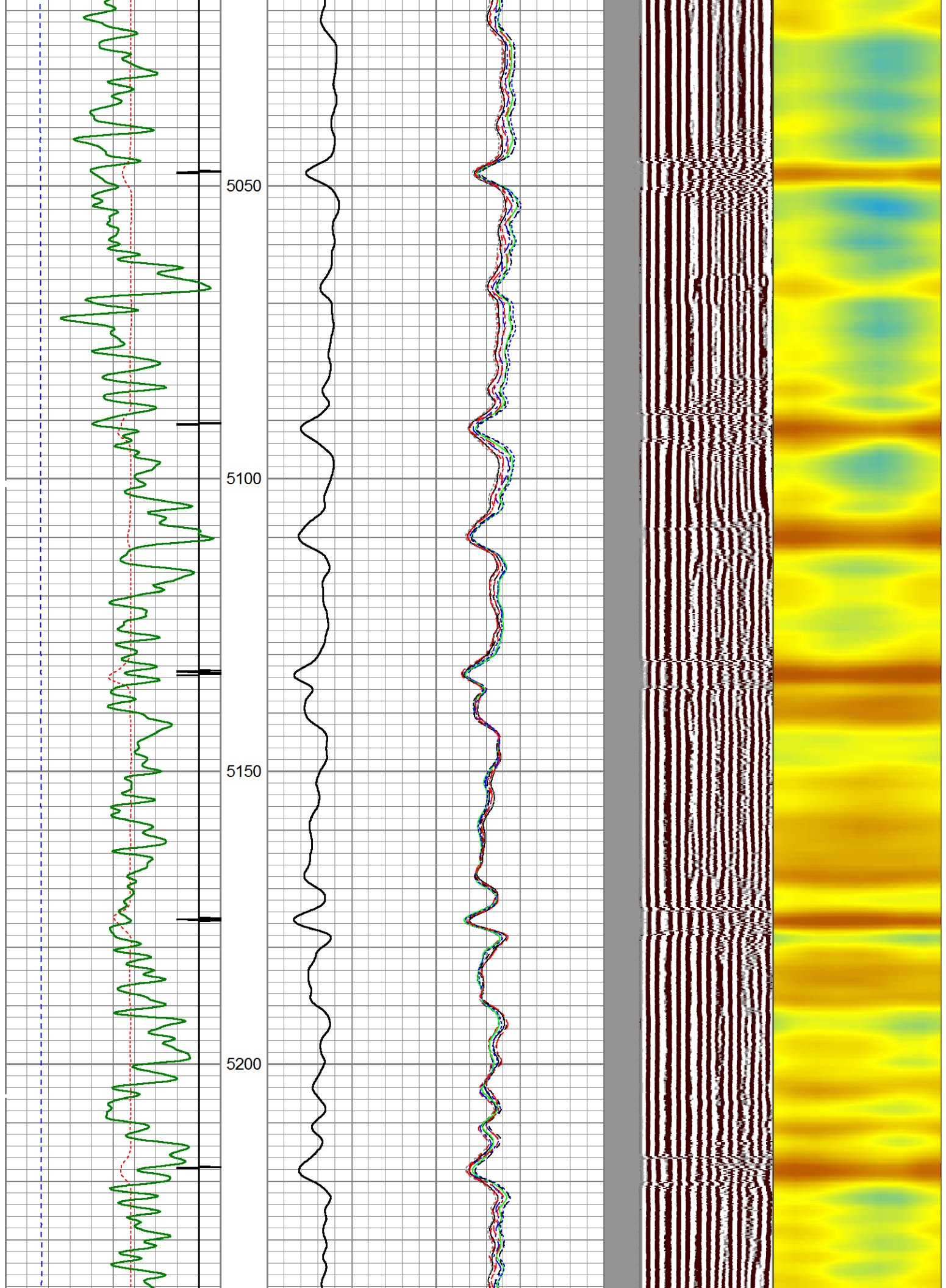


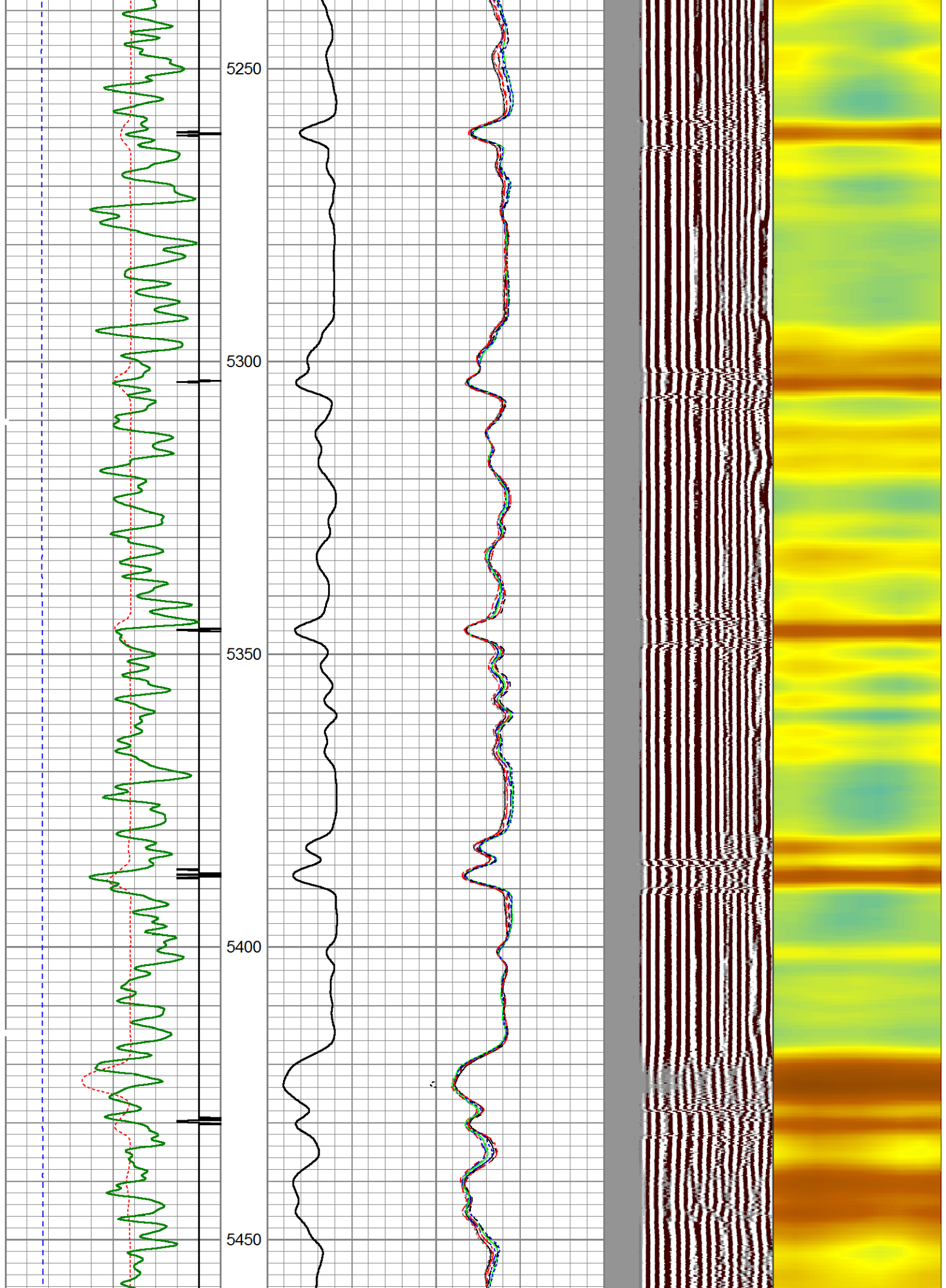




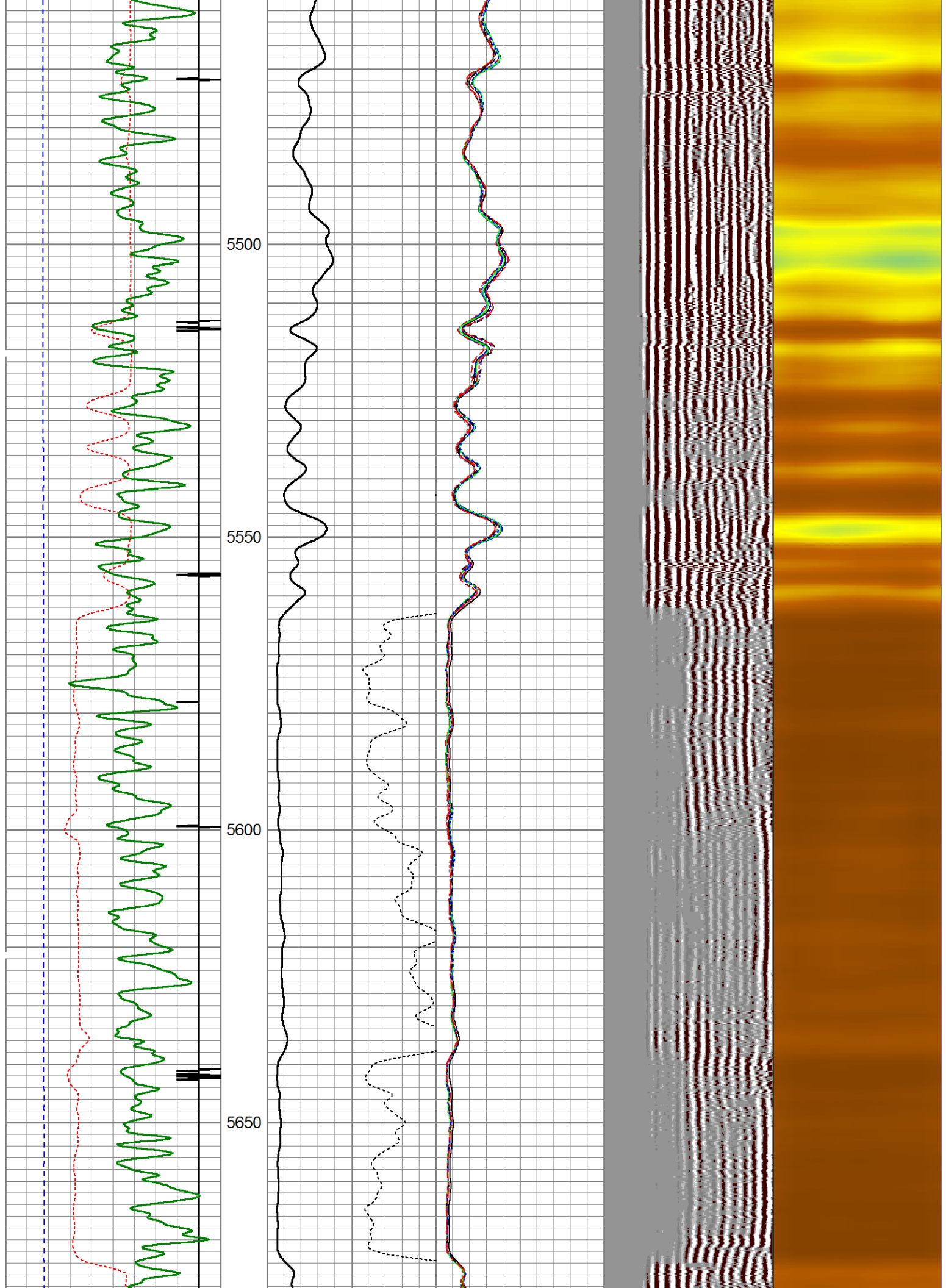


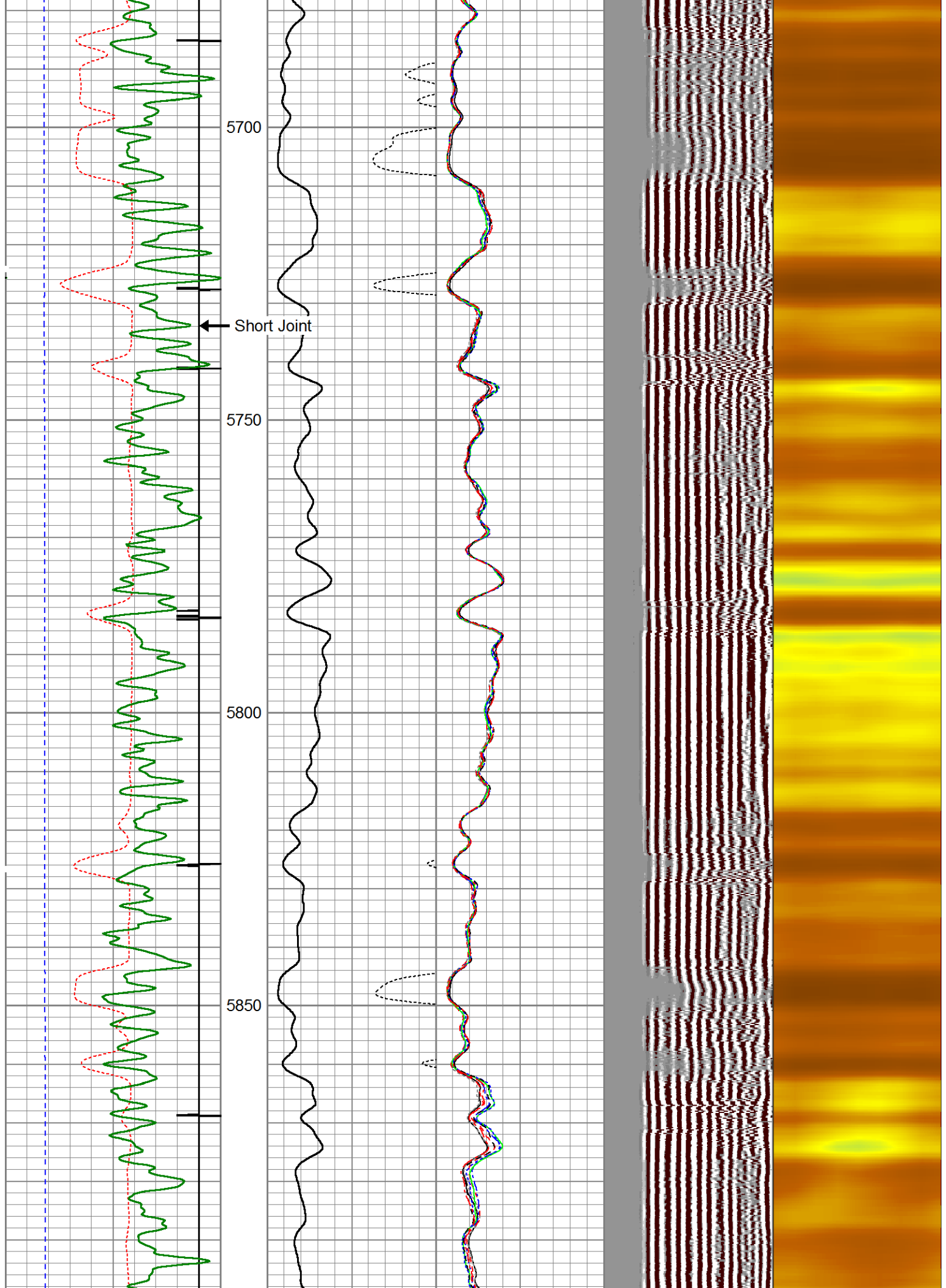




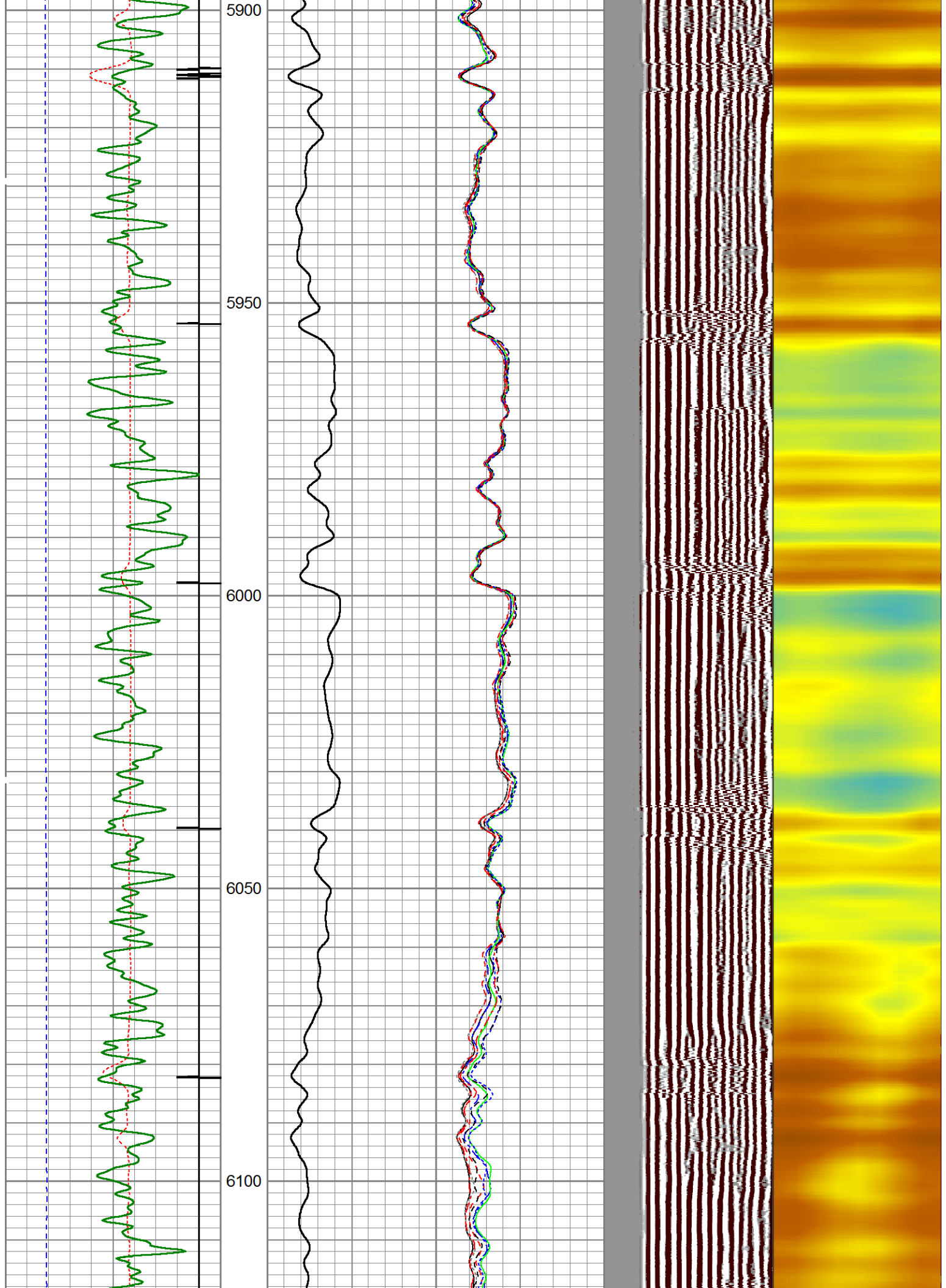


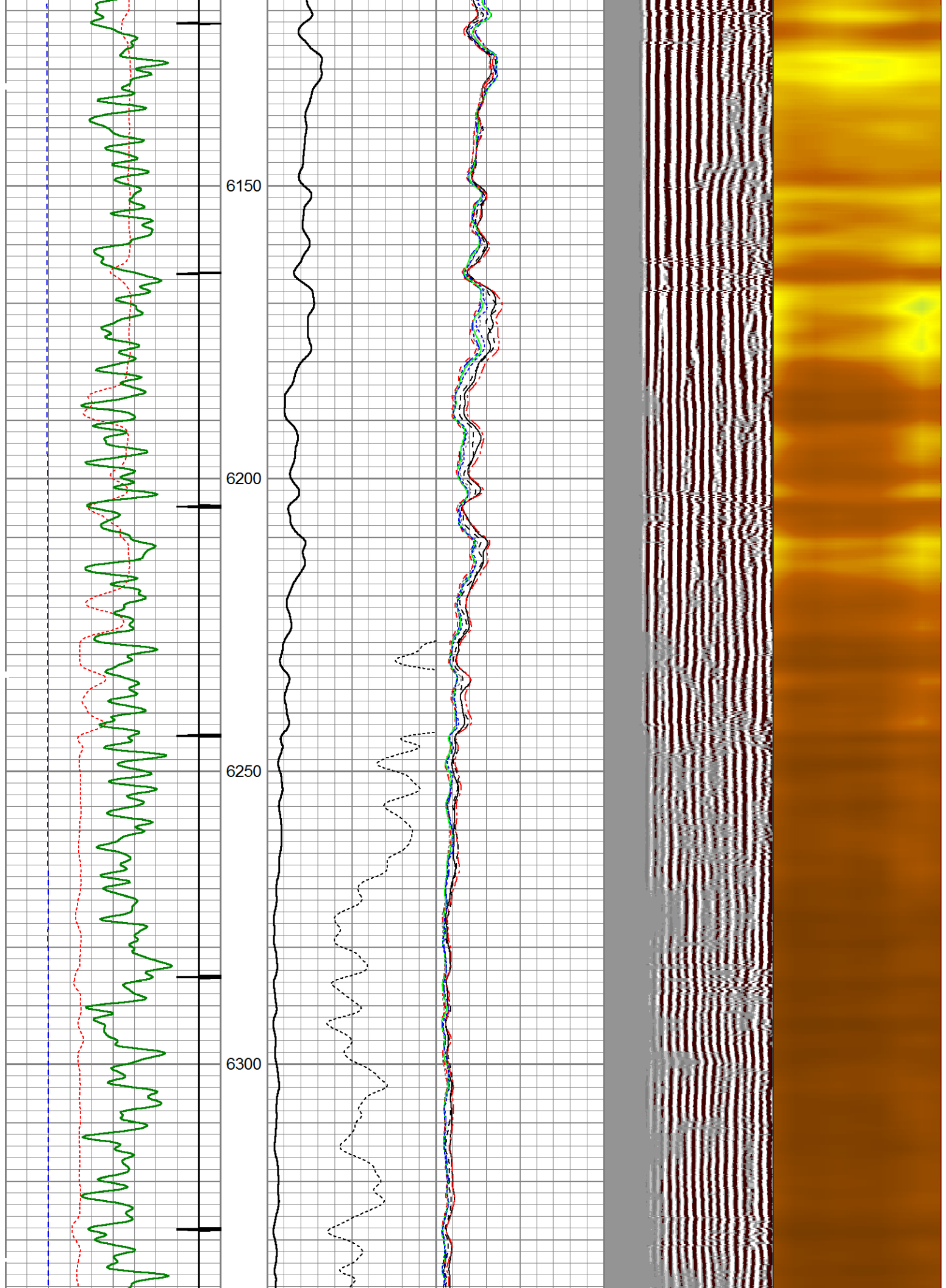


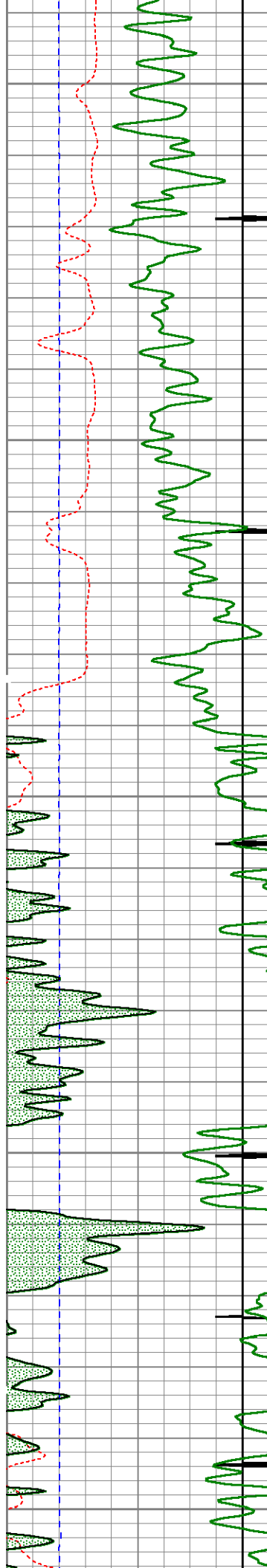












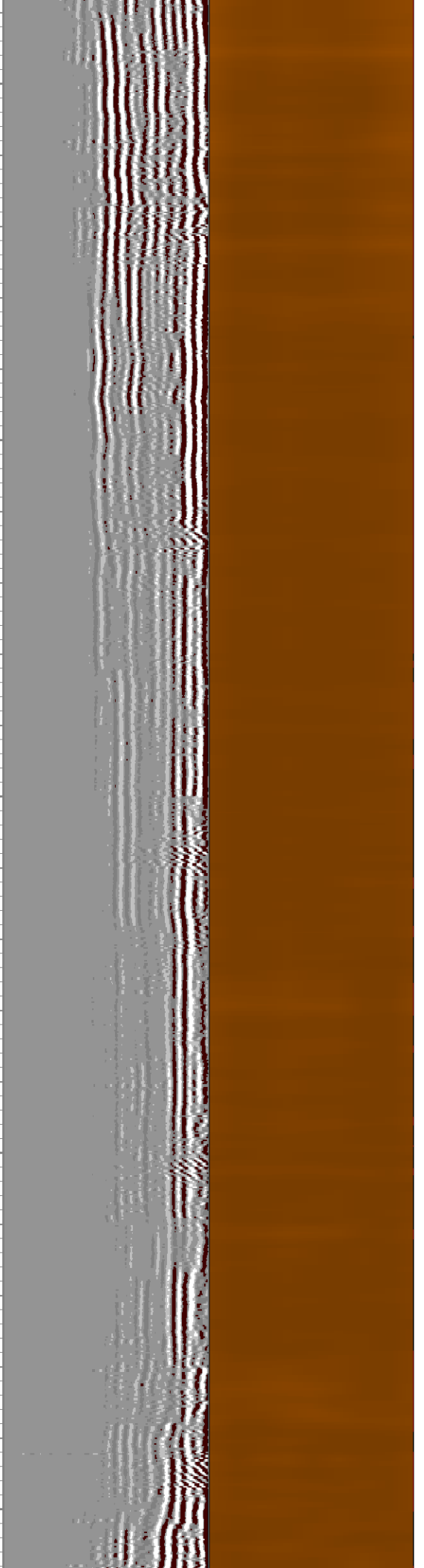
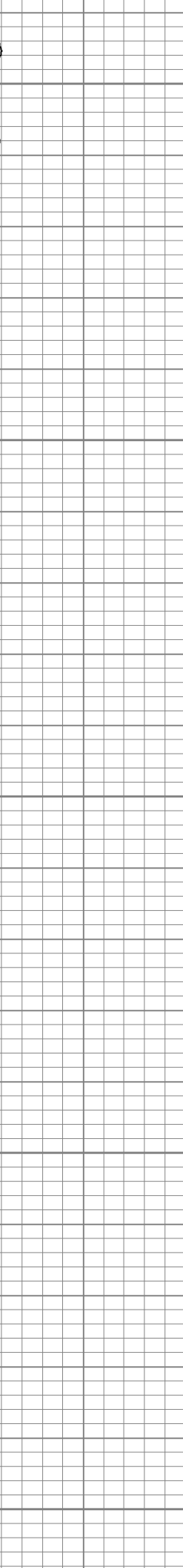
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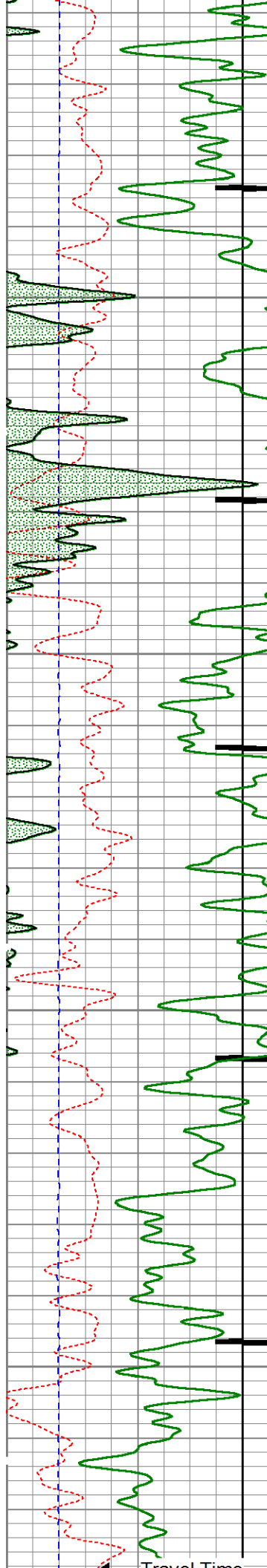
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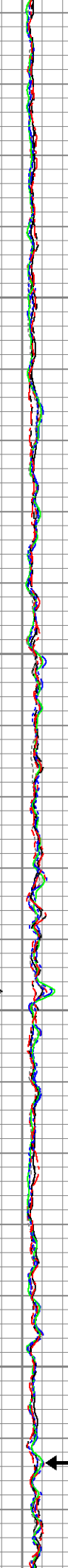
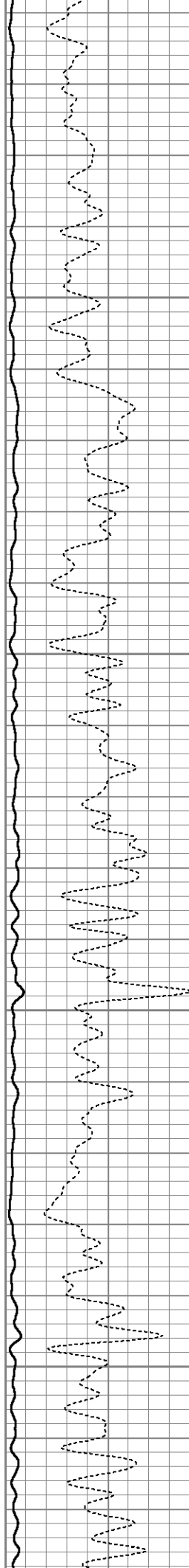


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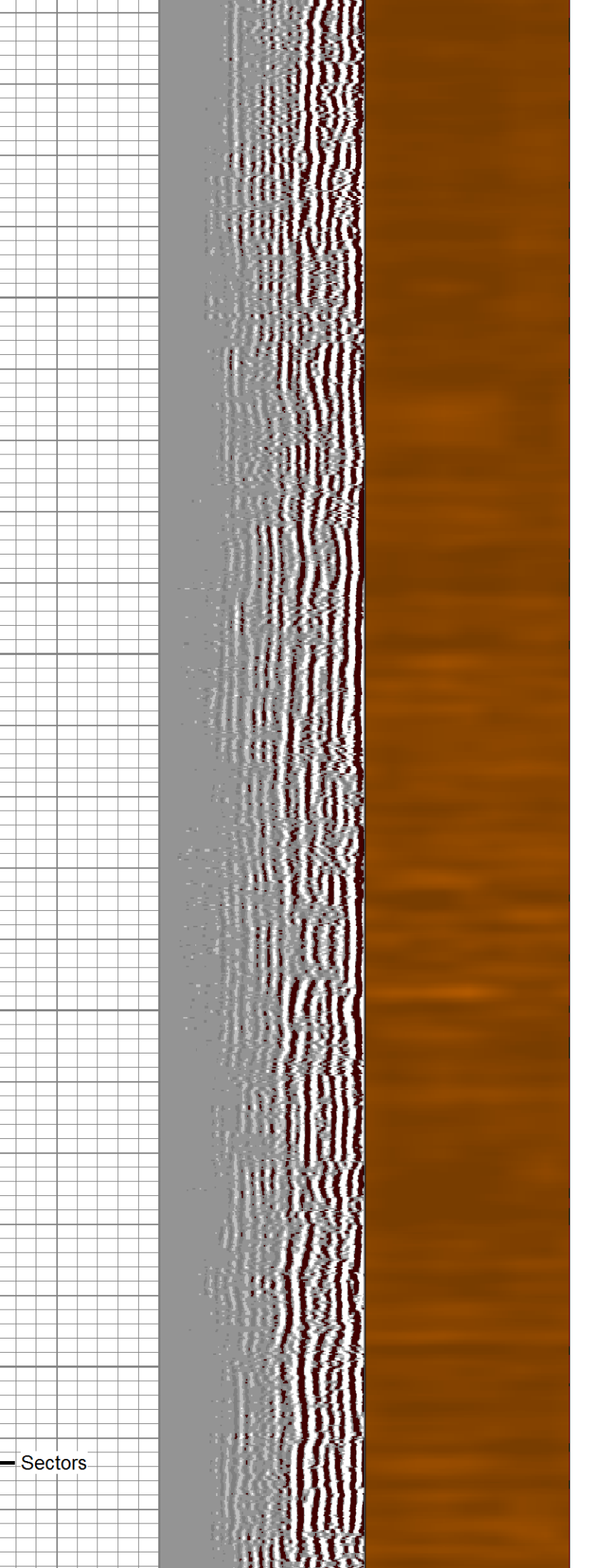
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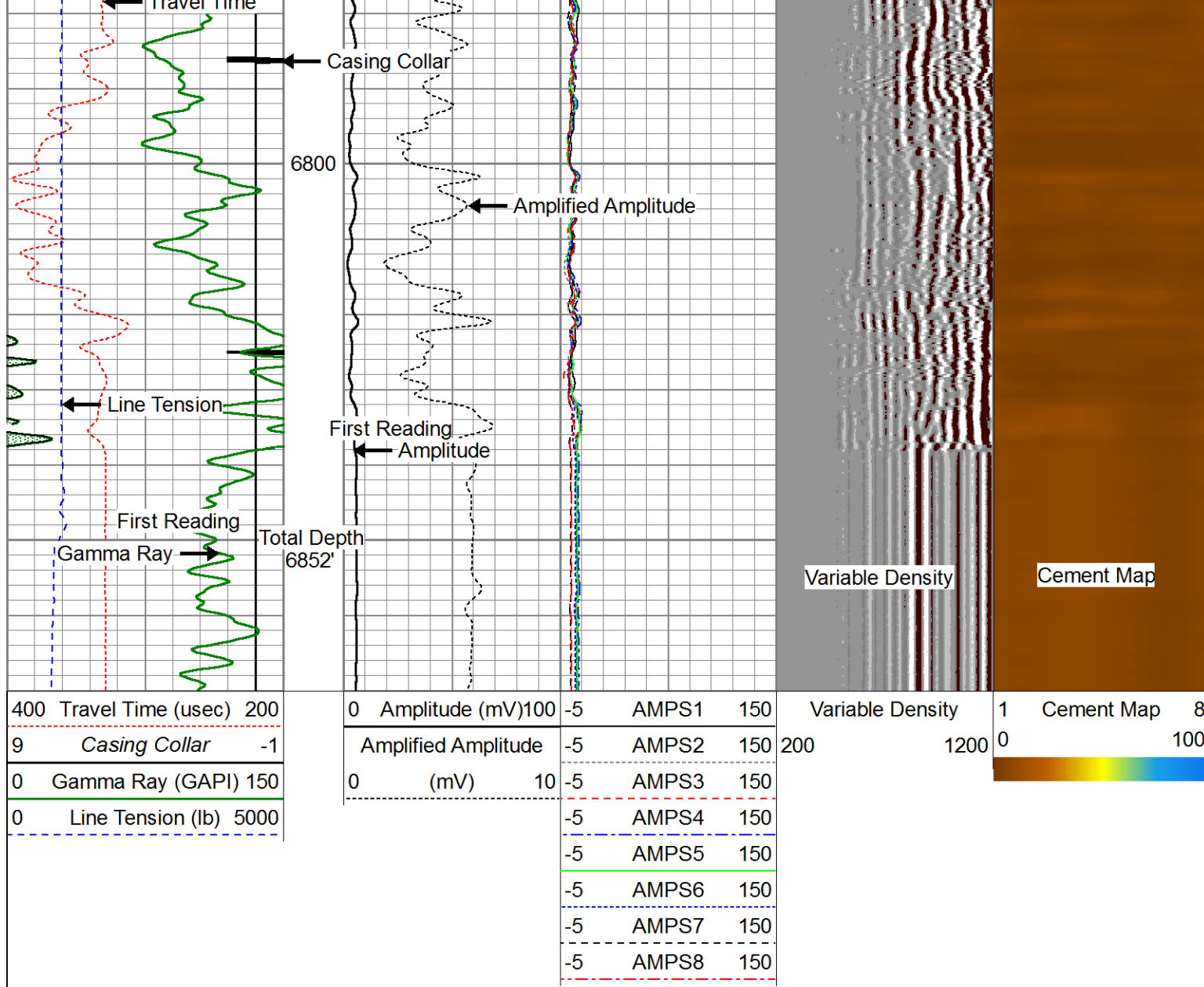
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6750



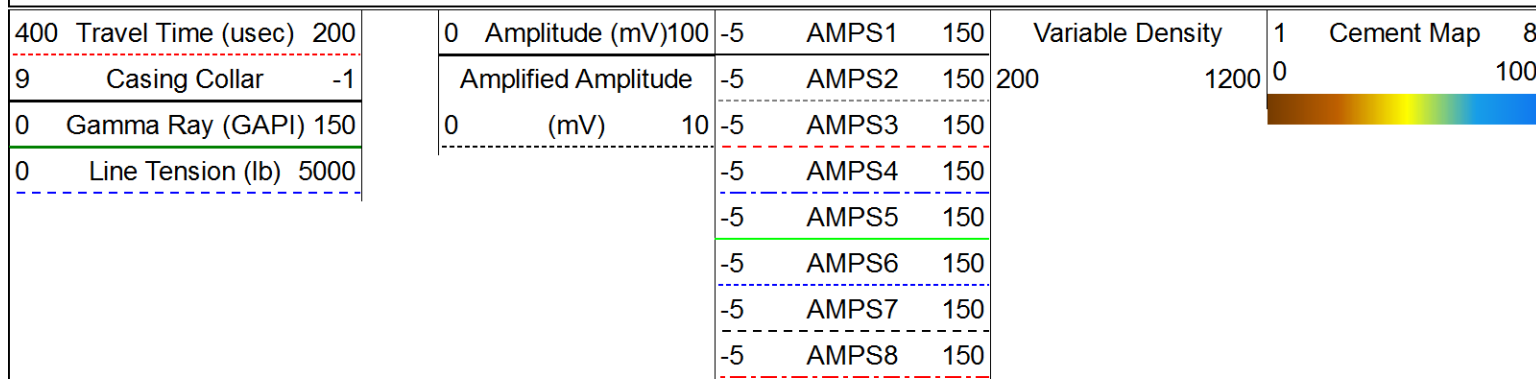
← Sectors



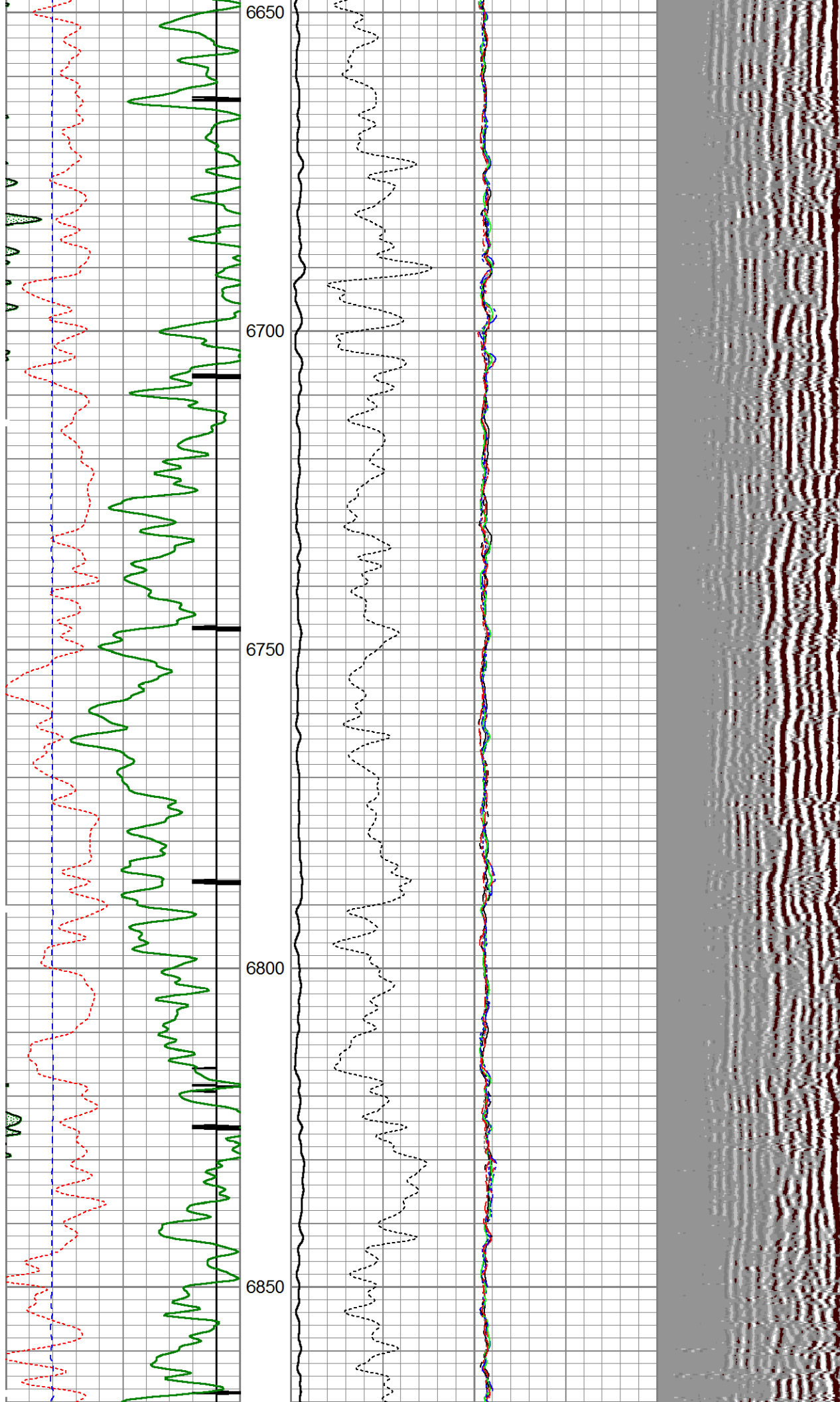


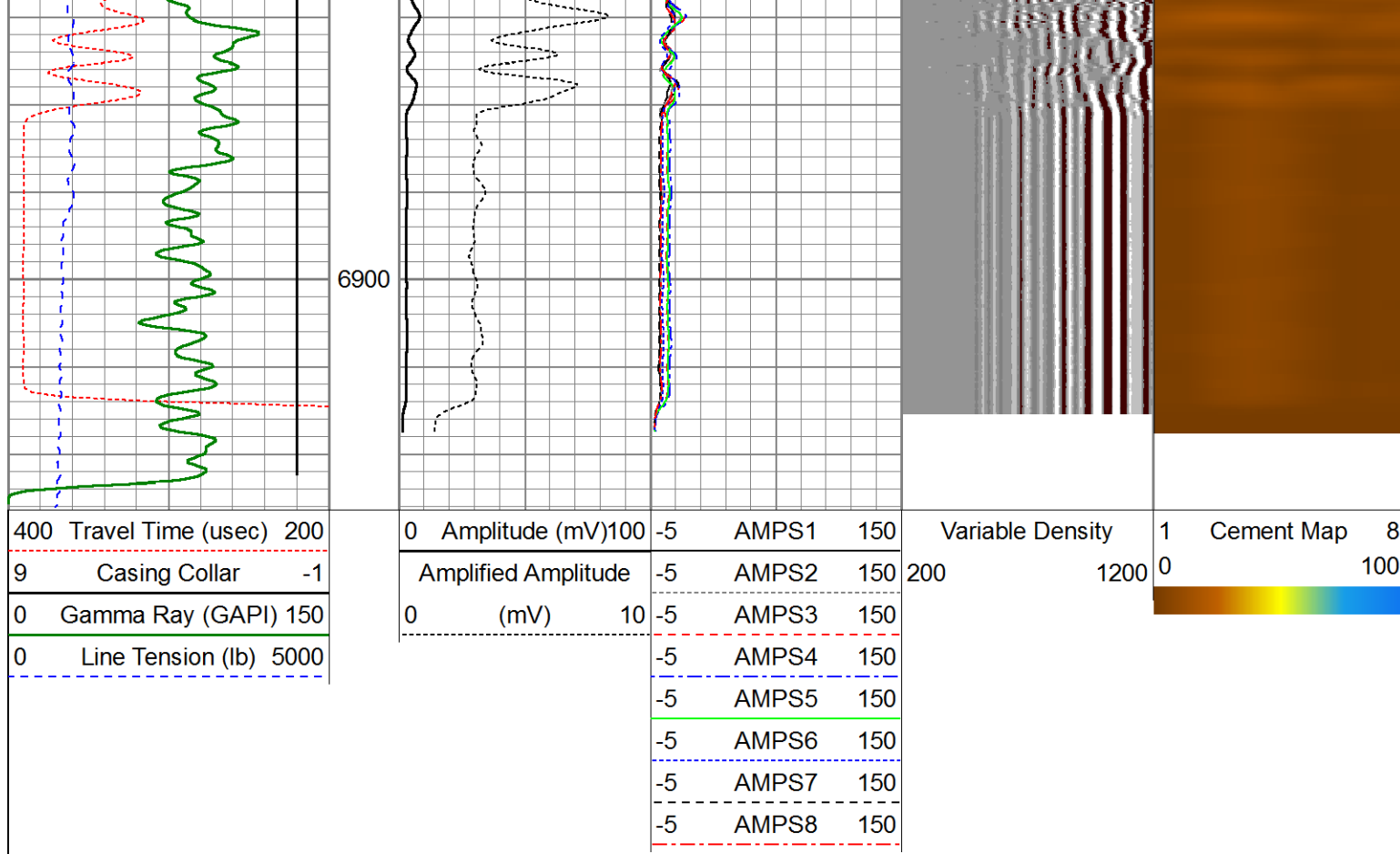
# Repeat Pass ( 0 PSI )

Database File: c:\users\engineers\desktop\brtn logs\noble\crow creek state ac36-77-1hn\_rcbl\noble energy crow creek st  
 Dataset Pathname: pass4  
 Presentation Format: scbl03  
 Dataset Creation: Tue Nov 05 14:30:11 2013 by Log 7.0 B1  
 Charted by: Depth in Feet scaled 1:240









| Calibration Report                           |   |                          |        |     |          |  |
|--|---|--------------------------|--------|-----|----------|--|
| Database File:                               | C:\Users\Engineers\Desktop\BRTN LOGS\Noble\Crow Creek State AC36-77-1HN_RCBL\noble energy cro |                          |        |     |          |  |
| Dataset Pathname:                            | pass6   |                          |        |     |          |  |
| Dataset Creation:                            | Tue Nov 05 14:36:09 2013 by Log 7.0 B1  |                          |        |     |          |  |
| Gamma Ray Calibration Report                 |   |                          |        |     |          |  |
| Type / Serial:                               |   | Probe275 / 110108-Dig    |        |     |          |  |
| SHOP CALIBRATION                             |   | Tue Nov 05 09:42:00 2013 |        |     |          |  |
|  | Counts/Sec.   | Gain                     | Offset | Jig | Units    |  |
| Background                                   | 0.0   |                          |        |     | cps      |  |
| Calibrator                                   | 1.0   |                          |        |     | cps      |  |
|  |   | 0.8500                   |        |     | GAPI/cps |  |
| PRIMARY VERIFICATION                         |   |                          |        |     |          |  |
| Background                                   | 0.0   |                          |        |     | cps      |  |
| Calibrator                                   | 0.0   |                          |        |     | cps      |  |
| Difference                                   |   |                          |        | 0.0 | GAPI     |  |
| BEFORE SURVEY VERIFICATION                   |   |                          |        |     |          |  |
| Background                                   | 0.0   |                          |        |     | cps      |  |
| Calibrator                                   | 0.0   |                          |        |     | cps      |  |
| Difference                                   |   |                          |        | 0.0 | GAPI     |  |
| AFTER SURVEY VERIFICATION                    |   |                          |        |     |          |  |
| Background                                   | 0.0   |                          |        |     | cps      |  |
| Calibrator                                   | 0.0   |                          |        |     | cps      |  |
| Difference                                   |   |                          |        | 0.0 | GAPI     |  |
| Segmented Cement Bond Log Calibration Report |   |                          |        |     |          |  |

Serial Number: 101224  
Tool Model: Probe

Calibration Casing Diameter: 7.000 in  
Calibration Depth: 702.267 ft

Master Calibration, performed Tue Nov 05 14:28:58 2013:

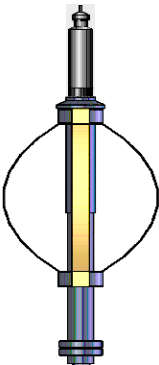
|     | Raw (v) |       | Calibrated (mv) |         | Results |        |
|-----|---------|-------|-----------------|---------|---------|--------|
|     | Zero    | Cal   | Zero            | Cal     | Gain    | Offset |
| 3'  | 0.014   | 0.619 | 1.000           | 62.165  | 101.225 | 1.456  |
| CAL | -0.003  | 0.712 |                 |         |         |        |
| 5'  | 0.008   | 0.605 | 1.000           | 62.165  | 102.469 | 0.138  |
| SUM |         |       |                 |         |         |        |
| S1  | 0.013   | 0.702 | 0.000           | 100.000 | 145.161 | -1.862 |
| S2  | 0.014   | 0.615 | 0.000           | 100.000 | 166.548 | -2.344 |
| S3  | 0.011   | 0.543 | 0.000           | 100.000 | 187.731 | -2.026 |
| S4  | 0.009   | 0.539 | 0.000           | 100.000 | 188.604 | -1.651 |
| S5  | 0.012   | 0.566 | 0.000           | 100.000 | 180.484 | -2.084 |
| S6  | 0.011   | 0.611 | 0.000           | 100.000 | 166.680 | -1.906 |
| S7  | 0.013   | 0.658 | 0.000           | 100.000 | 154.908 | -2.004 |
| S8  | 0.013   | 0.696 | 0.000           | 100.000 | 146.550 | -1.930 |

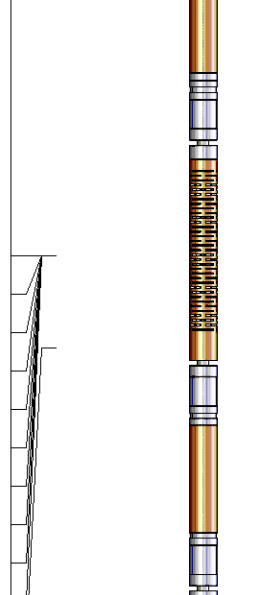
Internal Reference Calibration, performed Mon Oct 10 09:42:03 2005:

|     | Raw (v) |       | Calibrated (v) |       | Results |        |
|-----|---------|-------|----------------|-------|---------|--------|
|     | Zero    | Cal   | Zero           | Cal   | Gain    | Offset |
| CAL | 0.000   | 0.000 | -0.003         | 0.712 | 1.000   | 0.000  |

Air Zero Calibration, performed Mon Oct 10 09:41:05 2005:

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

| Sensor | Offset (ft) | Schematic   | Description                | Len (ft) | OD (in) | Wt (lb) |
|--------|-------------|---|----------------------------|----------|---------|---------|
|        |             |  | Titan Cable_head           | 1.00     | 1.44    | 10.00   |
|        |             |   | Probe275 2.75" Centralizer | 2.88     | 2.75    | 20.00   |

| Tool Joint   | Tool Joint Depth (ft) | Tool Joint Description  | Tool Joint Length (ft) | Tool Joint Weight (lb) | Tool Joint O.D. (in) |
|--|-----------------------|---|------------------------|------------------------|----------------------|
| WVF3FT   | 11.84                 | <br>RBT-Probe (101224)<br>Probe Radii Bond Tool with Digital Telemetry | 8.75                   | 2.75                   | 90.00                |
| WVFCAL   | 11.84                 |   |                        |                        |                      |
| WVFS1  | 11.84                 |   |                        |                        |                      |
| WVFS2  | 11.84                 |   |                        |                        |                      |
| WVFS3  | 11.84                 |   |                        |                        |                      |
| WVFS4  | 11.84                 |   |                        |                        |                      |
| WVFS5  | 11.84                 |   |                        |                        |                      |
| WVFS6  | 11.84                 |   |                        |                        |                      |
| WVFS7  | 11.84                 |   |                        |                        |                      |
| WVFS8  | 11.84                 |   |                        |                        |                      |
| WVF5FT   | 10.84                 |   |                        |                        |                      |
|  |                       | Probe275<br>2.75" Centralizer   | 2.88                   | 2.75                   | 20.00                |
| CCL  | 3.88                  |   |                        |                        |                      |
| GR   | 2.54                  | GR-Probe275 (110108-Dig)<br>Probe 2 3/4" Logging Gamma Ray  | 4.78                   | 2.75                   | 57.00                |
| Dataset: noble energy crow creek state ac36-77-1hn.db: field/well/run1/pass6<br>Total Length: 20.28 ft<br>Total Weight: 197.00 lb<br>O.D.: 2.75 in |                       |   |                        |                        |                      |