



**RADIAL CEMENT BOND
GAMMA RAY
VDL, CCL**

Company ANTERO RESOURCES CORPORATION
Well BILL UNIT 3H
Field MARCELLUS
County RITCHIE
State WV

Company ANTERO RESOURCES CORPORATION
Well BILL UNIT 3H
Field MARCELLUS
County RITCHIE State WV

Location: API #: 47085102570000 Other Services

| | | | | |
|------------------------|-----|-----|-----|-----------|
| Permanent Datum | SEC | TWP | RGE | Elevation |
| Log Measured From | | | | K.B. |
| Drilling Measured From | | | | D.F. |
| | | | | G.L. |

| | | | | |
|------------------------|---------------|--|------------|--|
| Date | 1-11-19 | | | |
| Run Number | 1 | | | |
| Depth Driller | 13348' | | | |
| Depth Logger | 6858' | | | |
| Bottom Logged Interval | 6858' | | | |
| Top Log Interval | SURFACE | | | |
| Open Hole Size | 5.5" CASING | | | |
| Type Fluid | WATER | | | |
| Density / Viscosity | N/A | | | |
| Max. Recorded Temp. | 137 DEG | | | |
| Estimated Cement Top | 406 | | | |
| Time Well Ready | N/A | | | |
| Time Logger on Bottom | 10:39 | | | |
| Equipment Number | 640 | | CREW | |
| Location | BRIDGEPORT WW | | K NICHOLAS | |
| Recorded By | PAT DAVIDSON | | J TATE | |
| Witnessed By | JOHN MAXWELL | | J AMAN | |

Borehole Record

| | | | | | | | |
|------------|-----|------|----|--------|--------|---------|--------|
| Run Number | Bit | From | To | Size | Weight | From | To |
| | | | | 13.375 | | SURFACE | 605' |
| | | | | 9.625 | | SURFACE | 2542' |
| | | | | 5.5 | 23# | SURFACE | 13348' |

Casing Record

| | | | | | | | |
|------------|-----|------|----|--------|--------|---------|--------|
| Run Number | Bit | From | To | Size | Weight | From | To |
| | | | | 13.375 | | SURFACE | 605' |
| | | | | 9.625 | | SURFACE | 2542' |
| | | | | 5.5 | 23# | SURFACE | 13348' |

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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

CBL IS CORRELATED TO PRODUCTION CASING TALLEY MARKER JOINT
DEPTH SHIFTED
+3' TO KB AFTER CORRELATION
MARKER JOINT RECORDED AT 6002 TO 6012'
BOTTOM HOLE TEMP 137 DEG
RAN UNDER PRESSURE @1500PSI

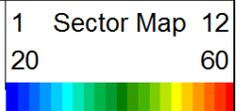


MAIN PASS UNDER 1500PSI

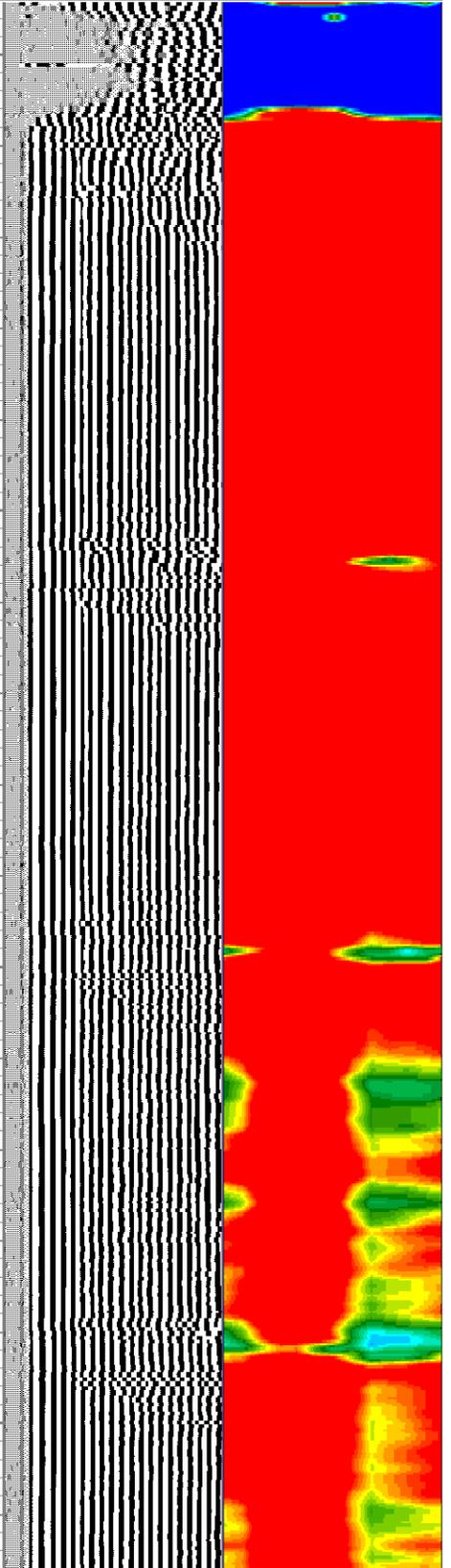
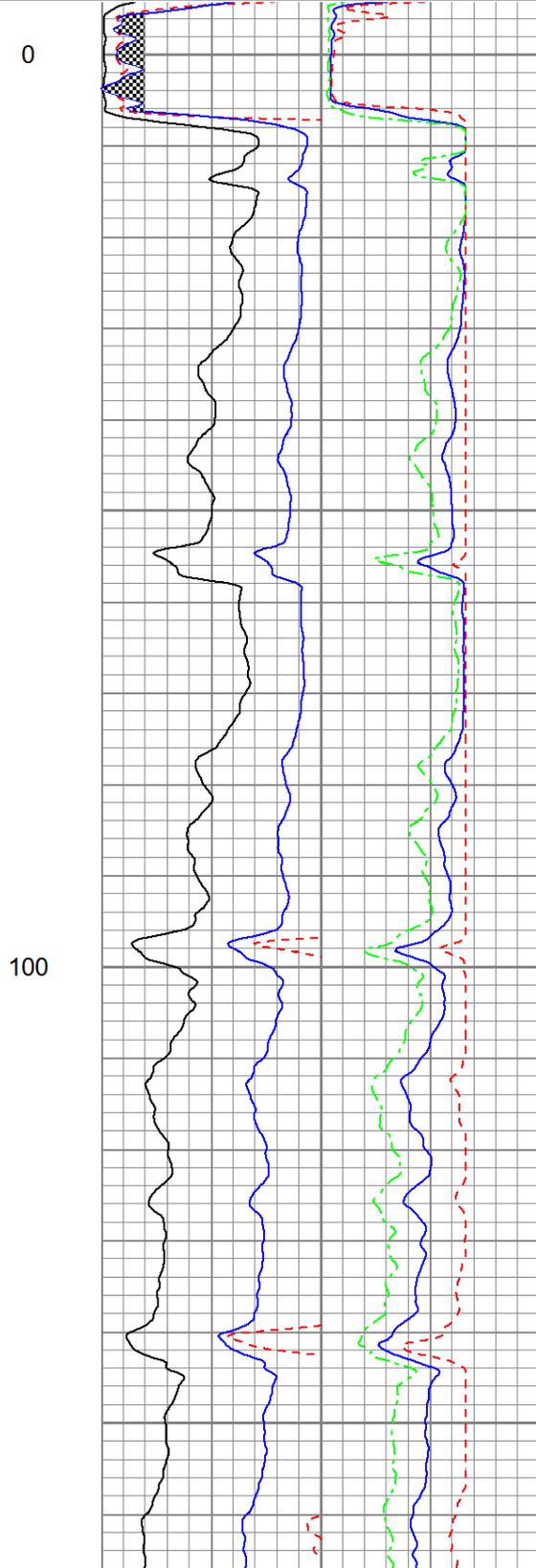
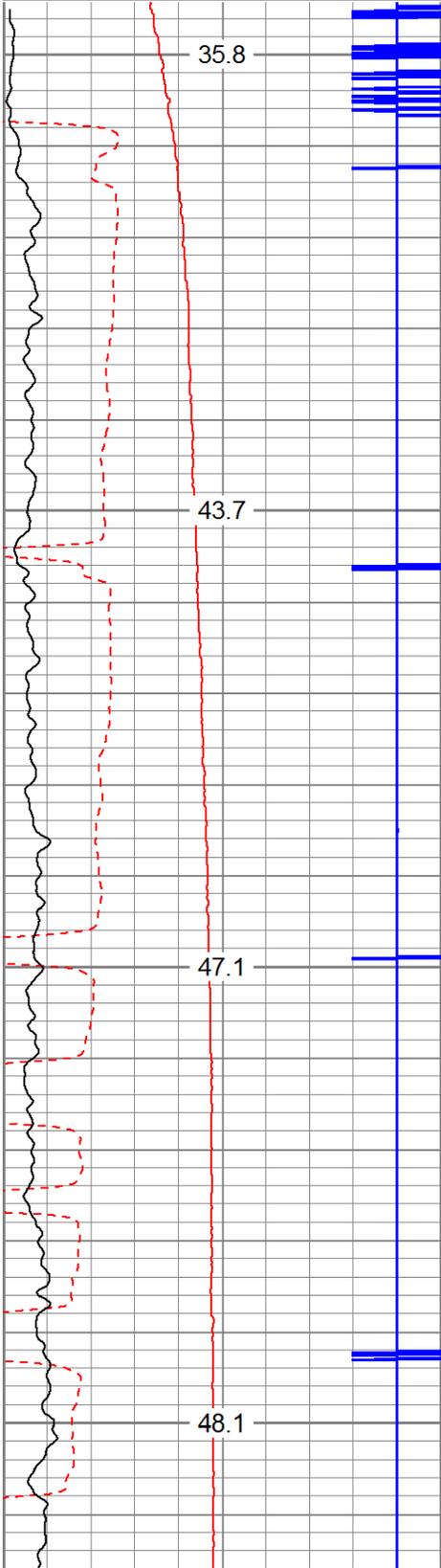
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 Dataset Pathname: pass9.1
 Presentation Format: antero
 Dataset Creation: Fri Jan 11 12:32:15 2019 by Calc 7.0 B1
 Charted by: Depth in Feet scaled 1:240

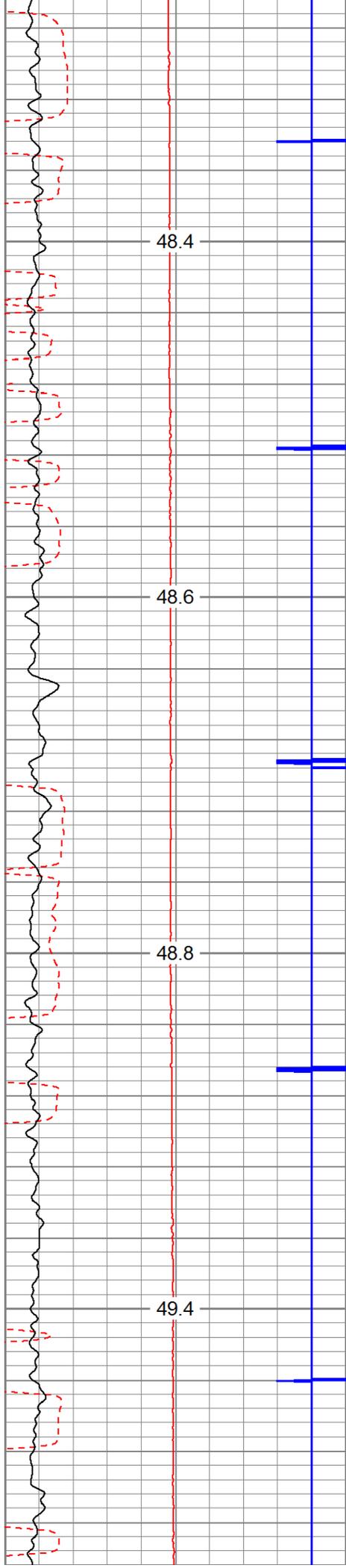
| | | |
|-----|--------------------|-----|
| 225 | Travel Time (usec) | 125 |
| 9 | Casing Collars | -1 |
| 0 | Gamma Ray | 180 |
| 0 | TEMP (degF) | 100 |

| | | | | | | |
|------------|-----|---------|-----|-----|-----|------|
| Amplitude | 0 | Amp Avg | 150 | 200 | VDL | 1200 |
| (mV) | 100 | Amp Max | 150 | | | |
| AmpX5 (mV) | 20 | Amp Min | 150 | | | |
| BONDIX | 0 | | | | | |



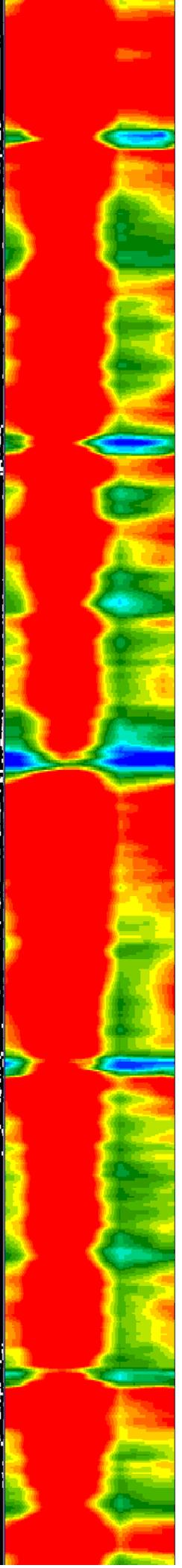
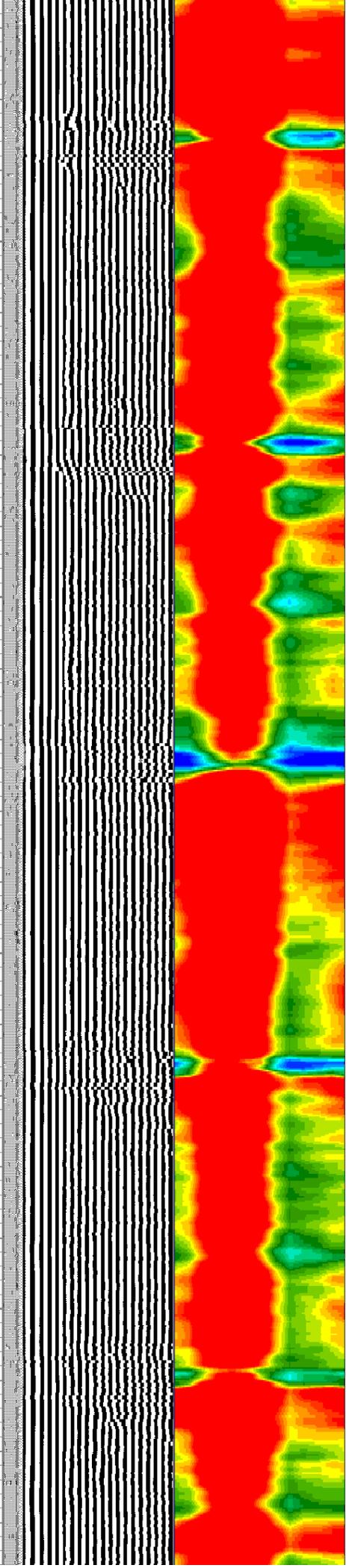
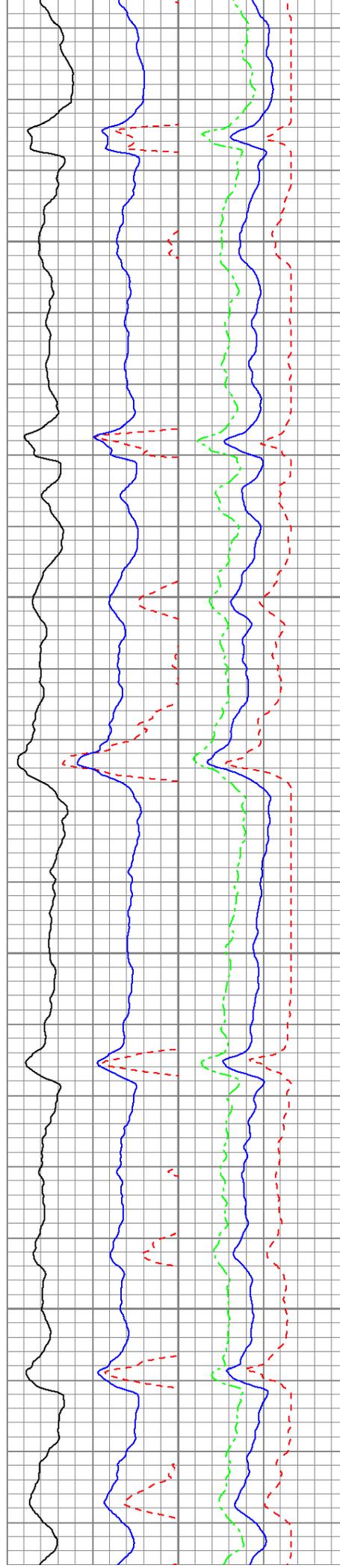
TEMP
(degF)

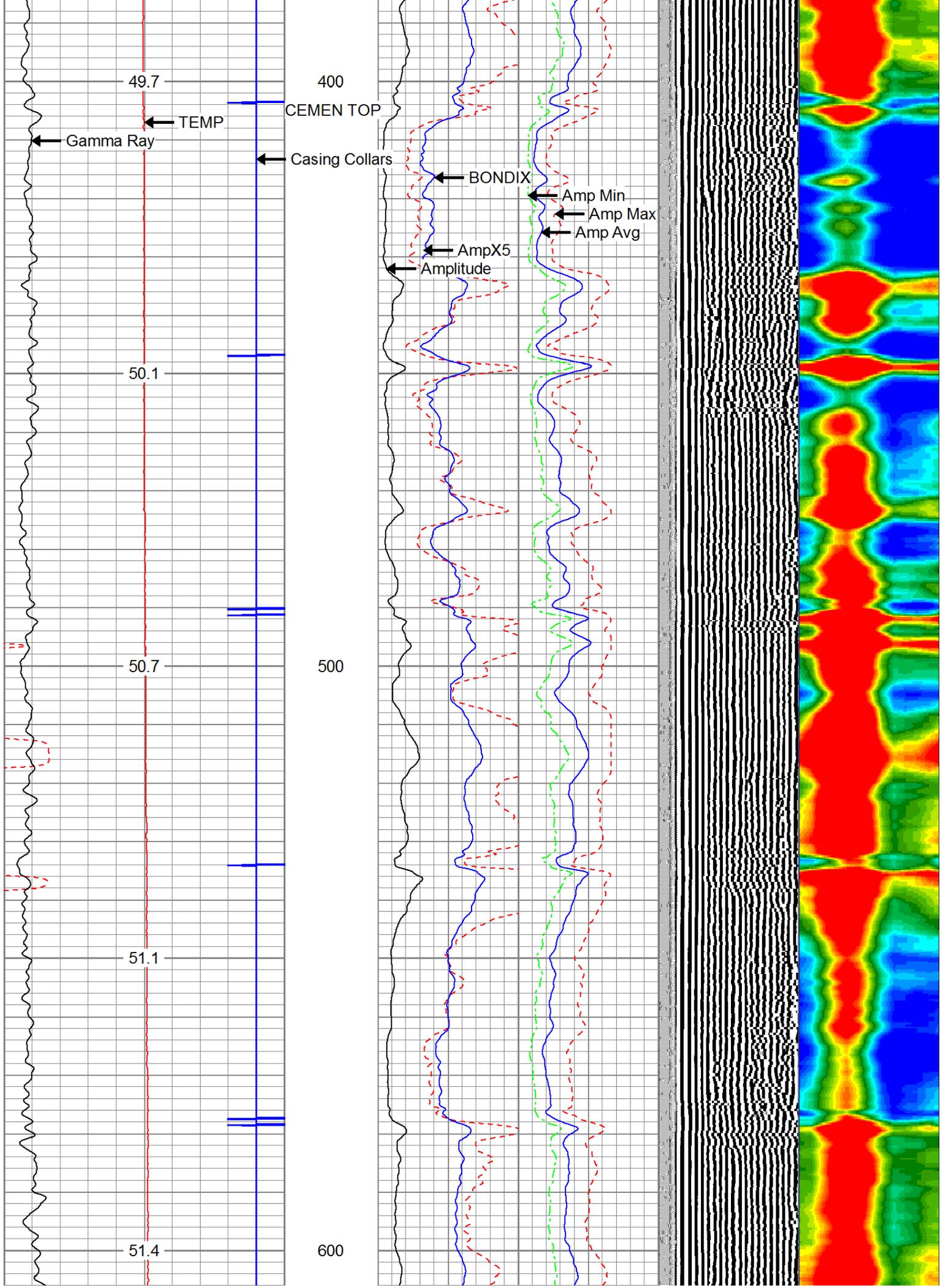


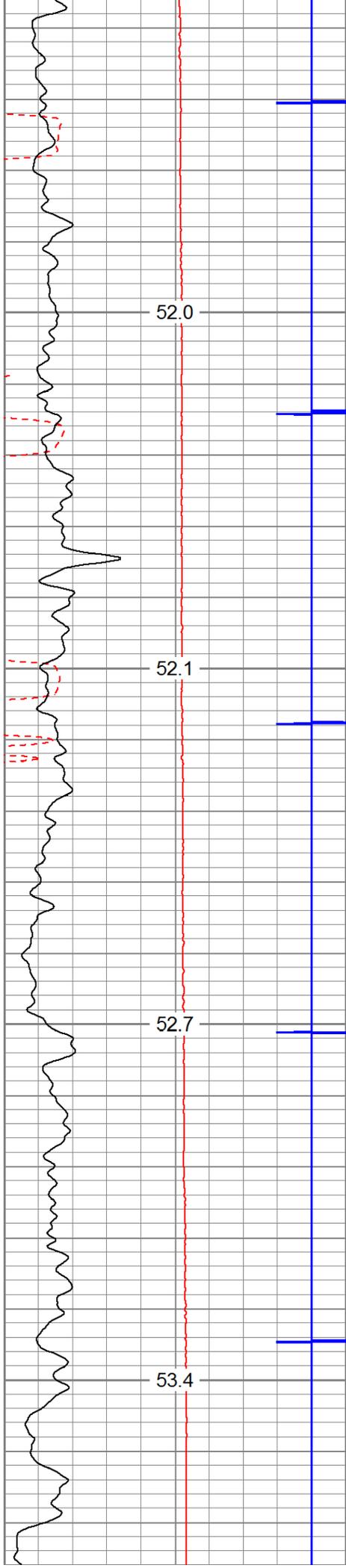


200

300

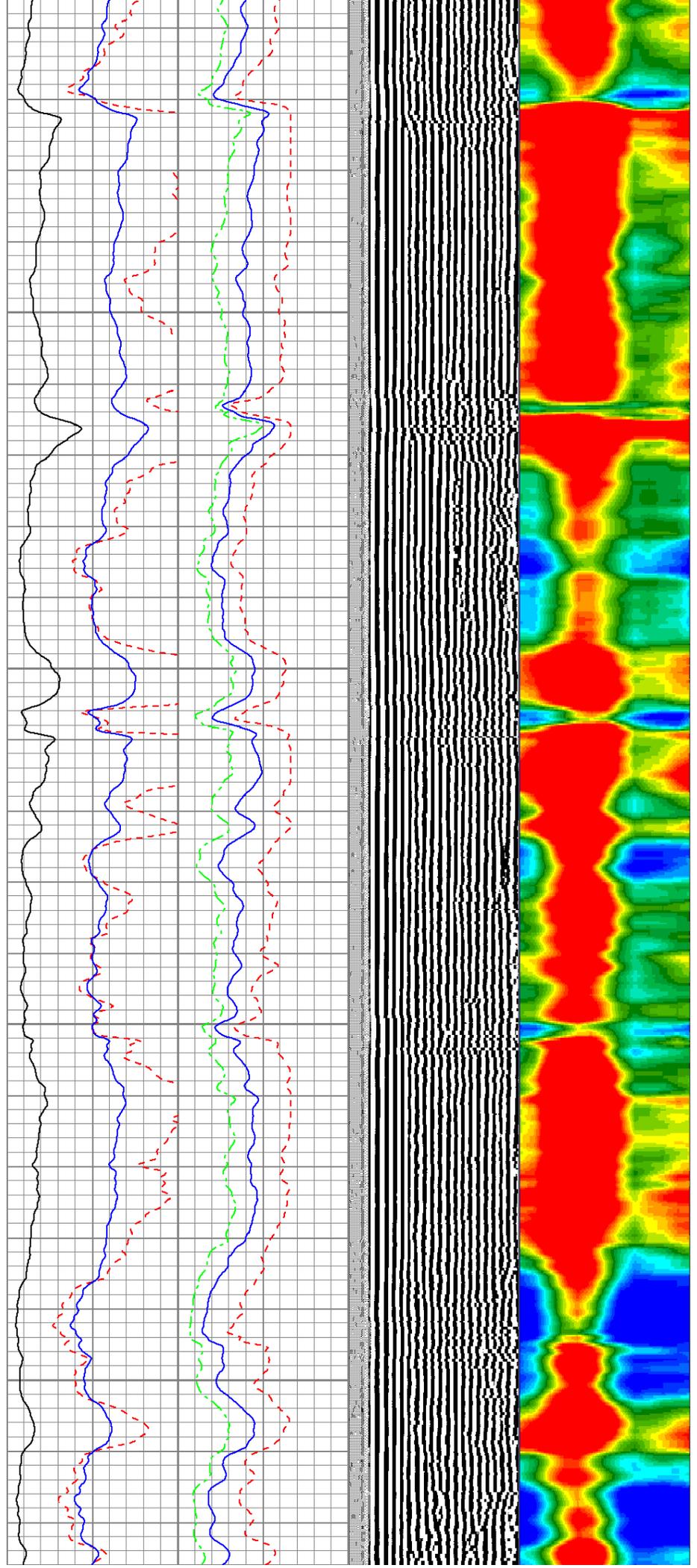


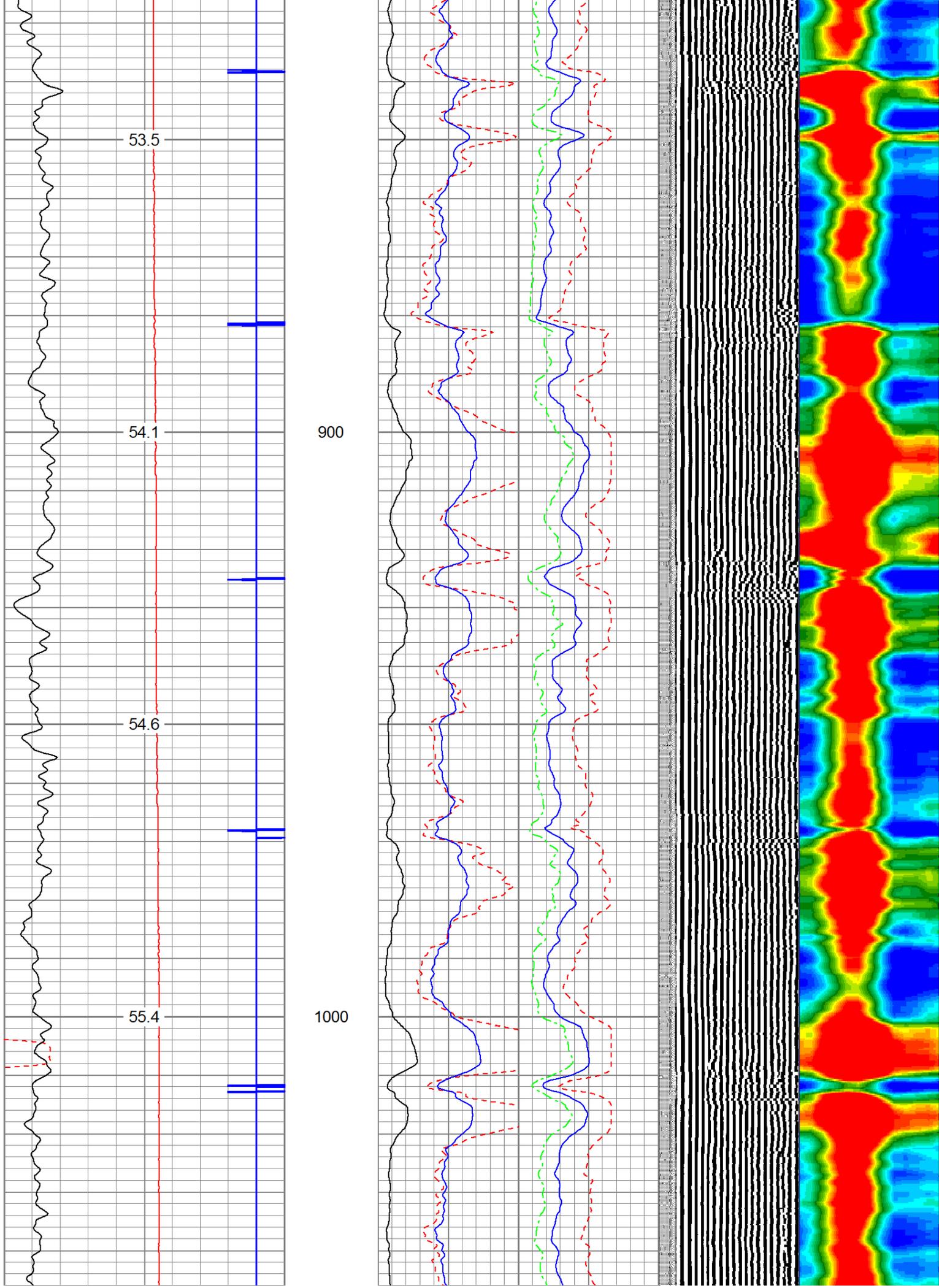


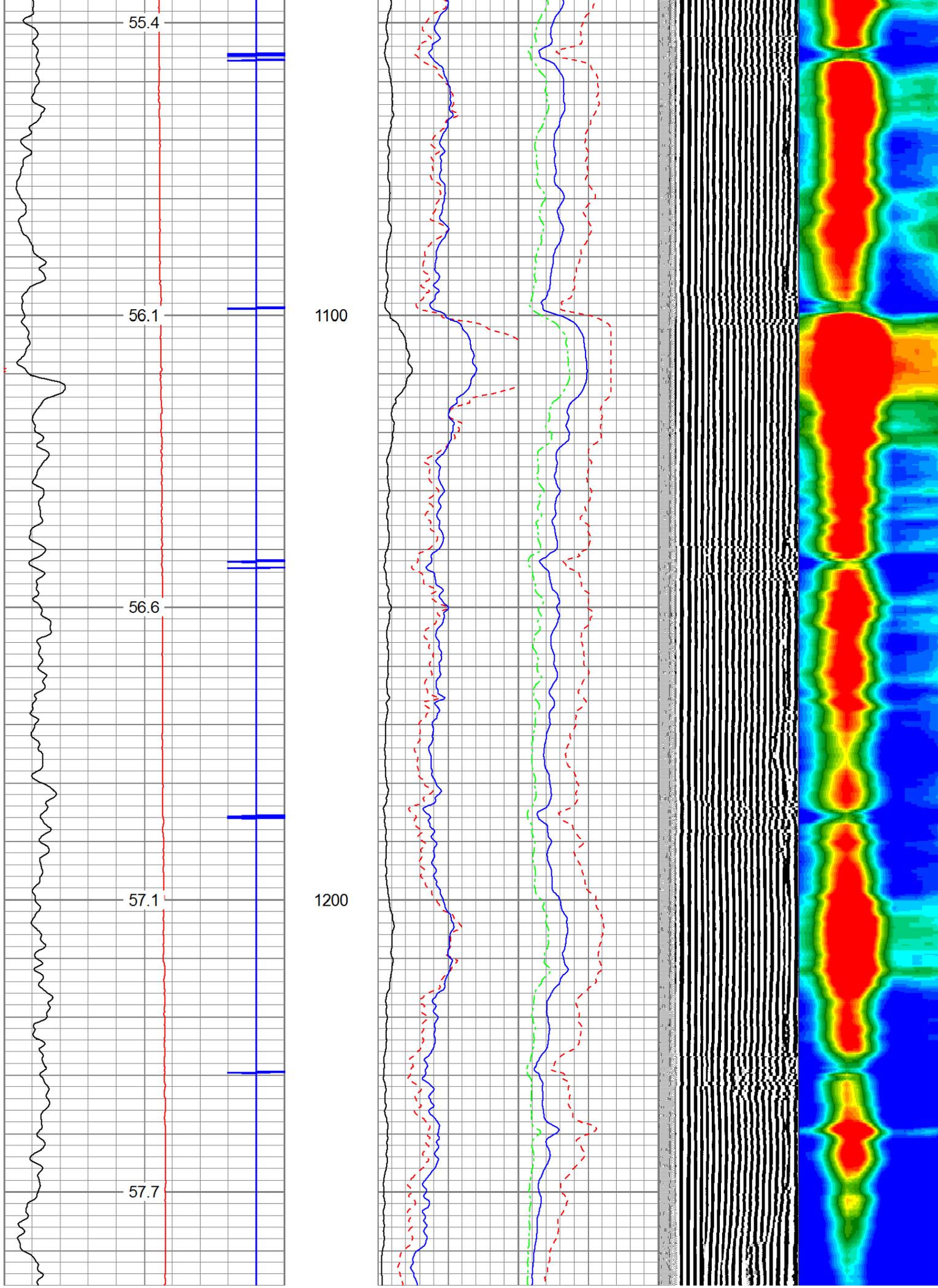


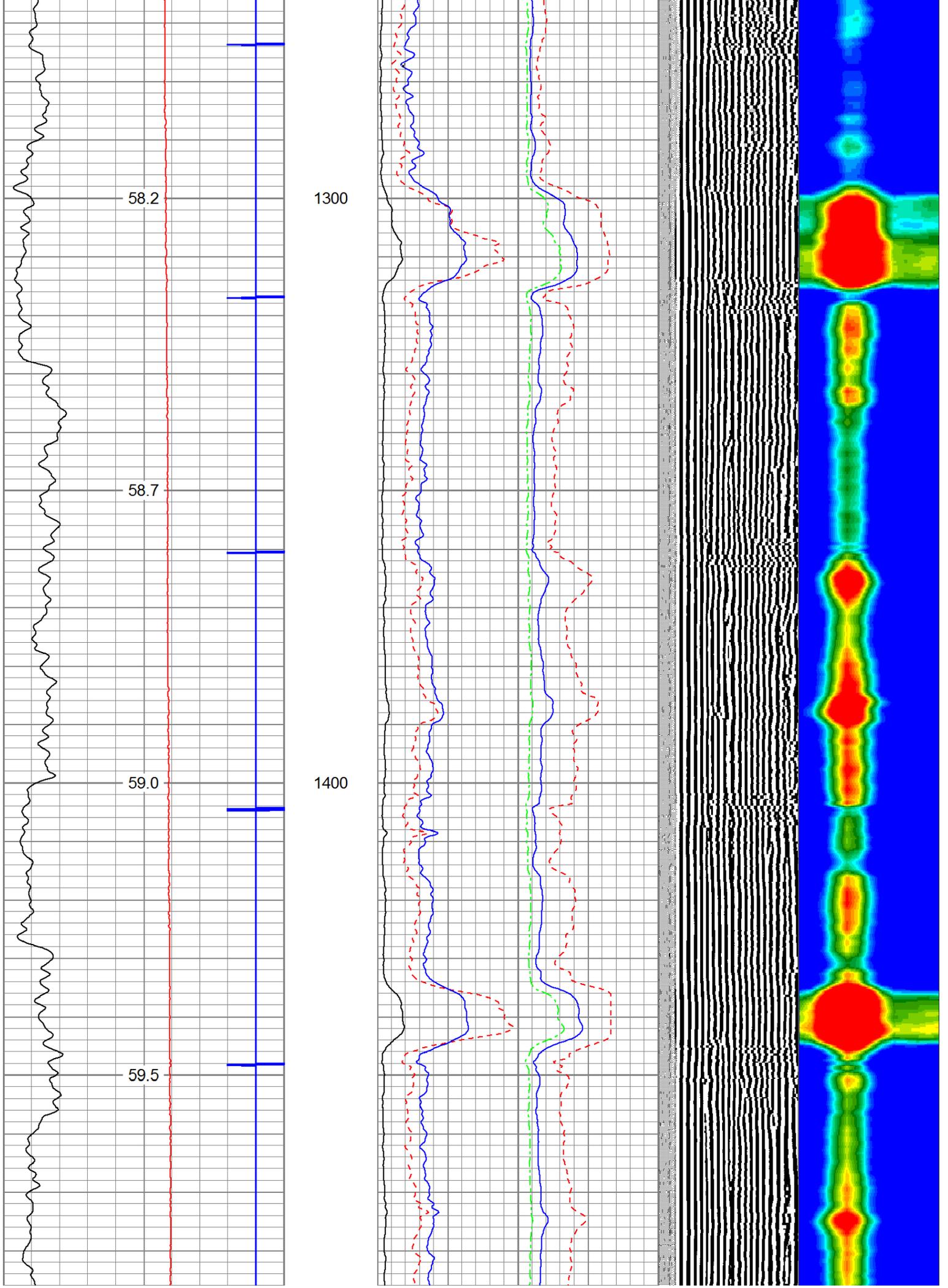
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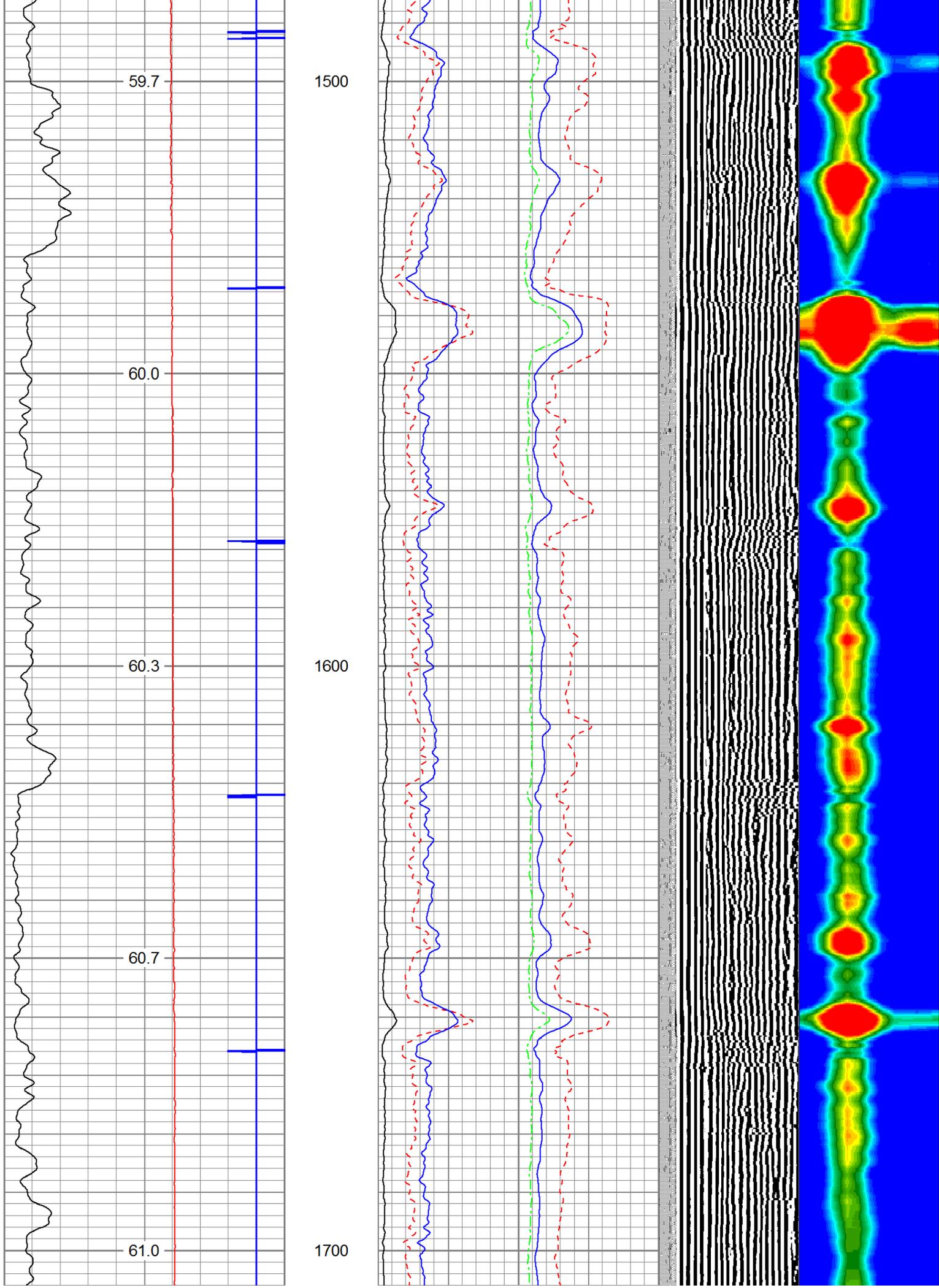
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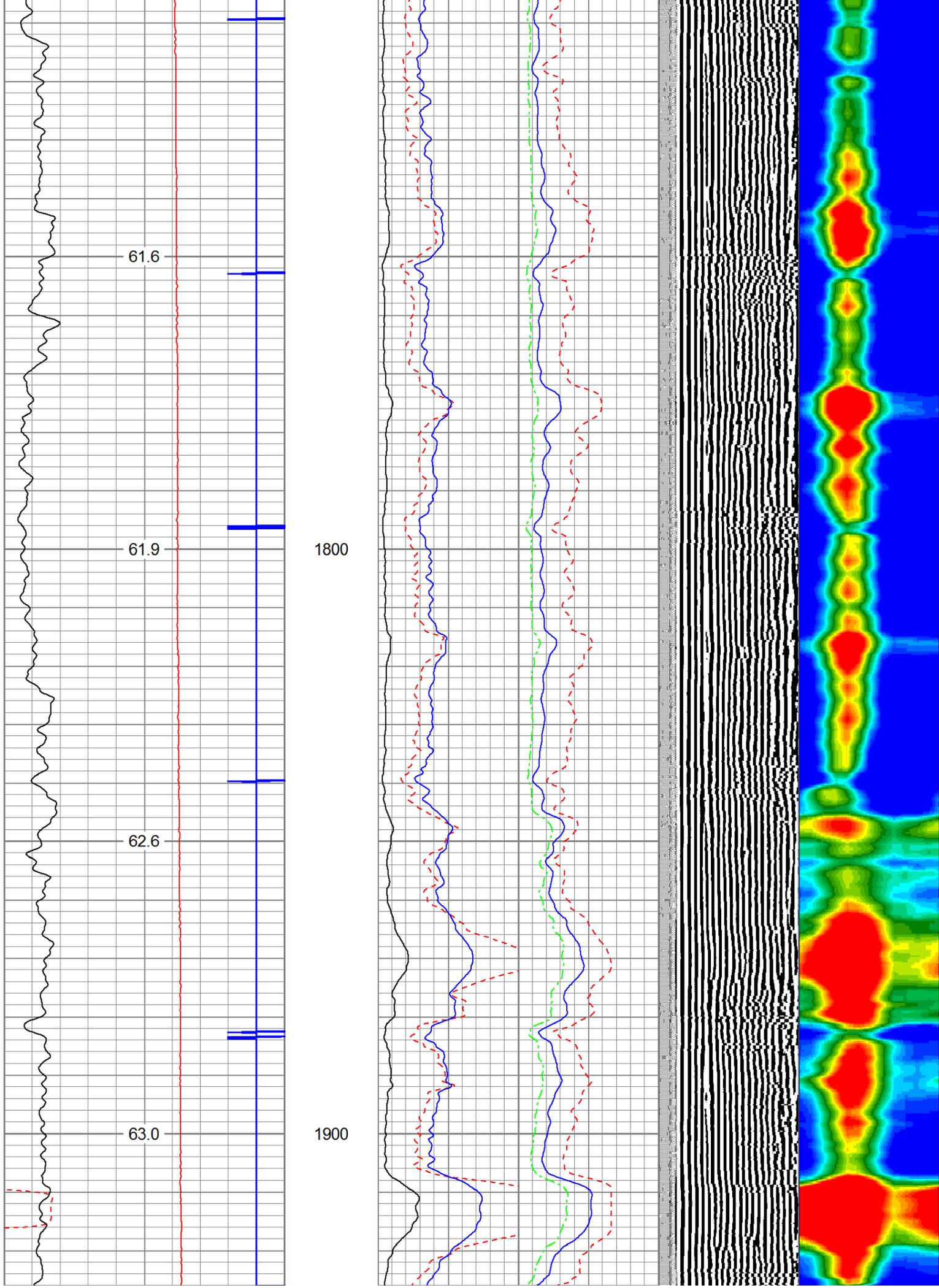


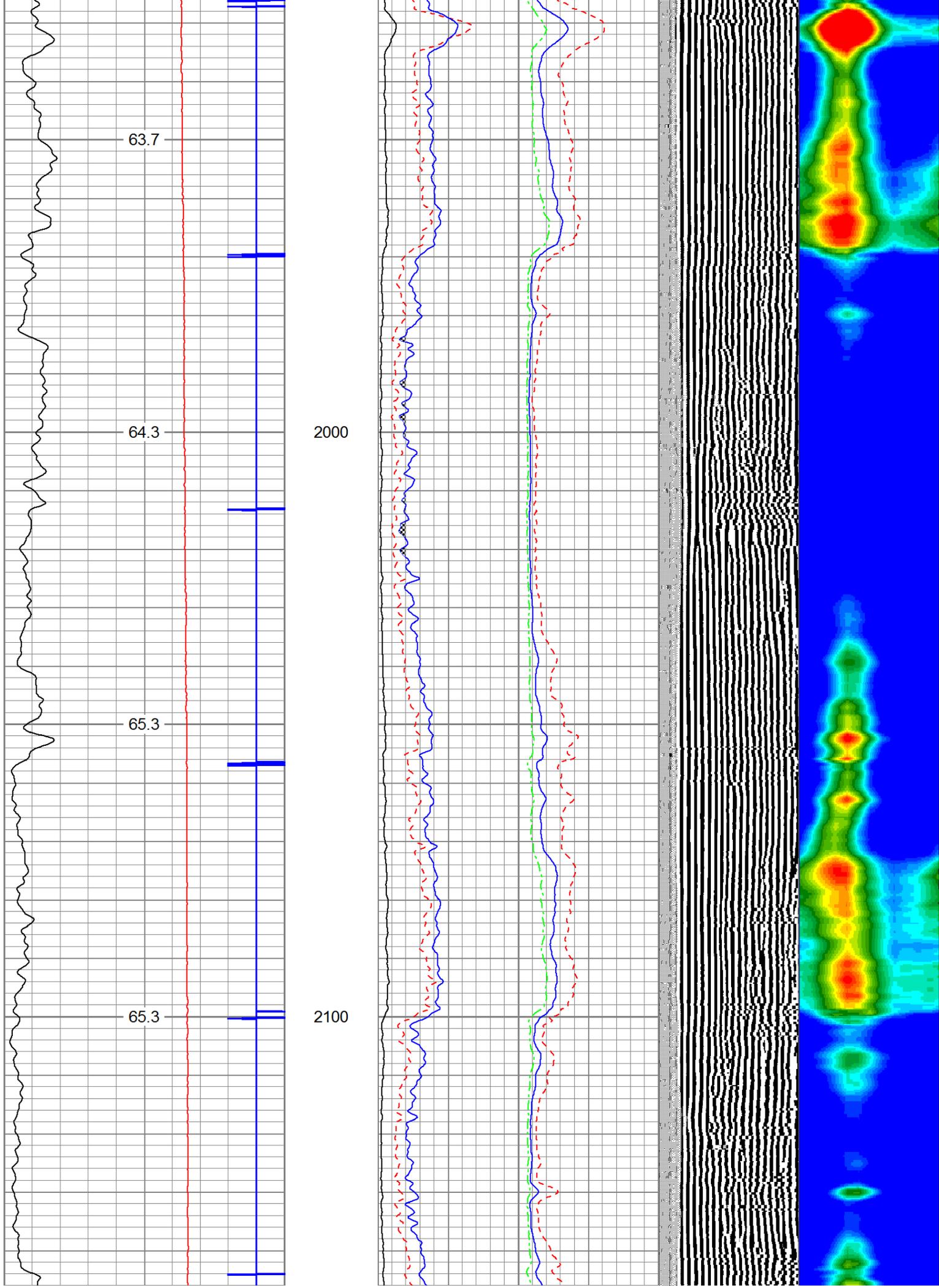


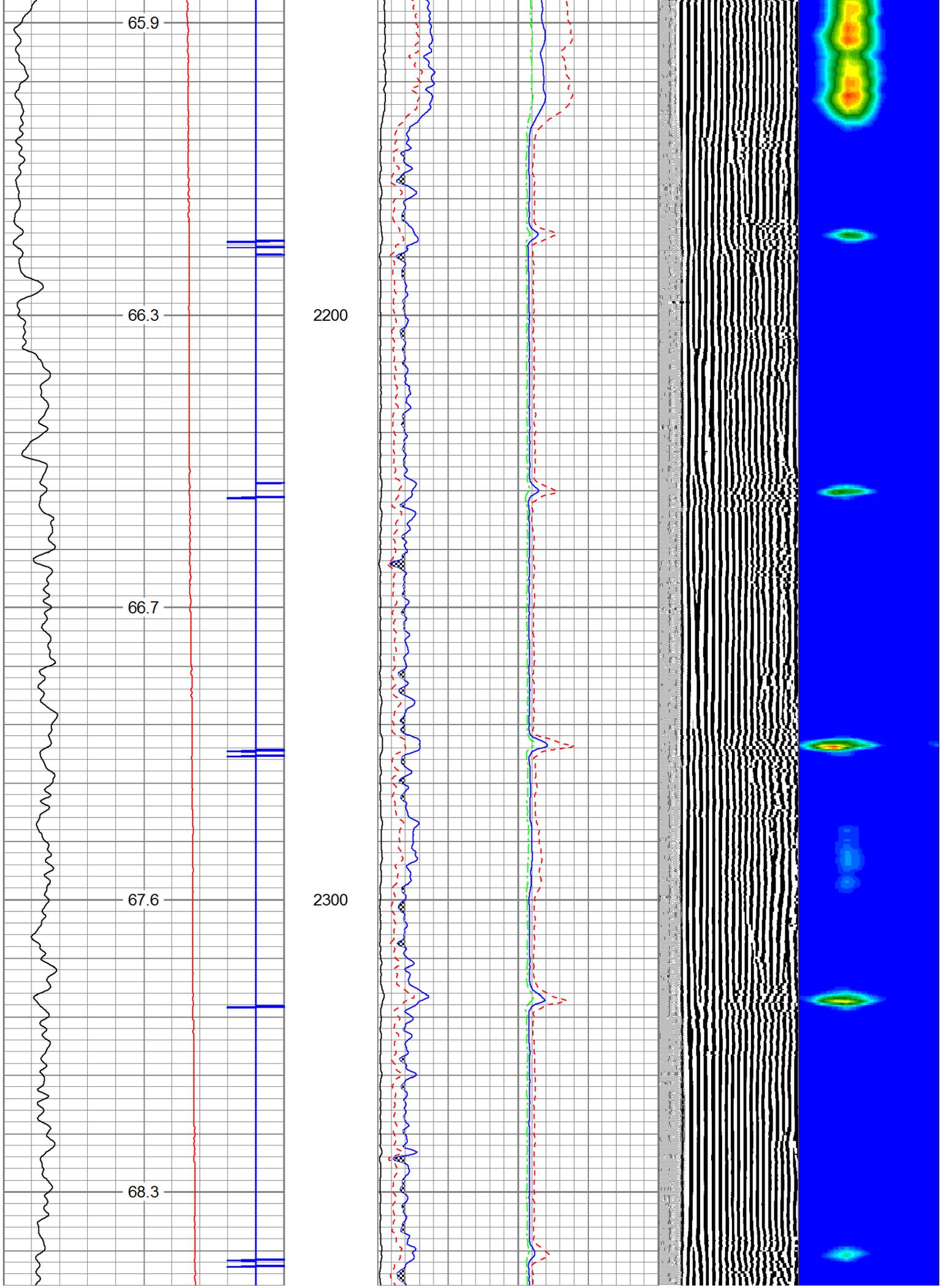


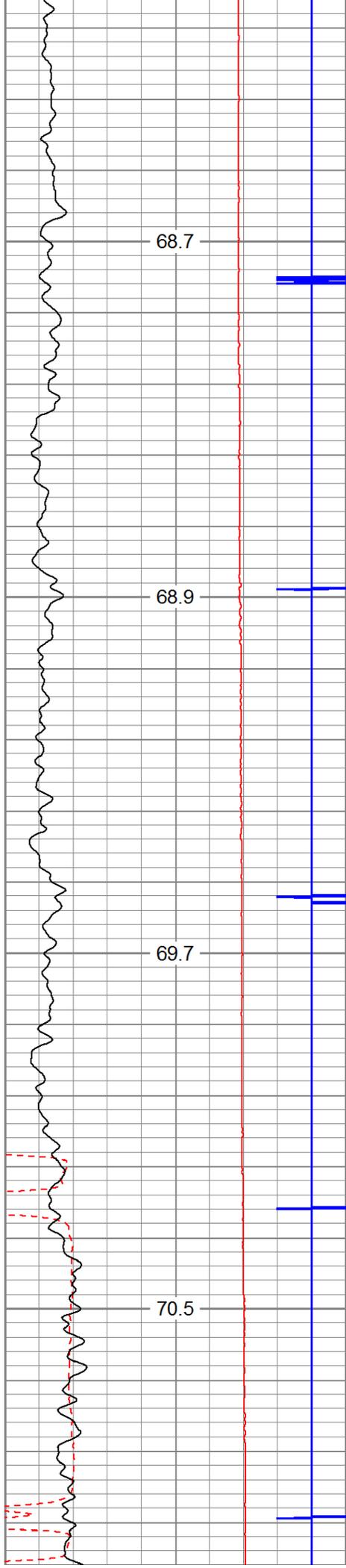






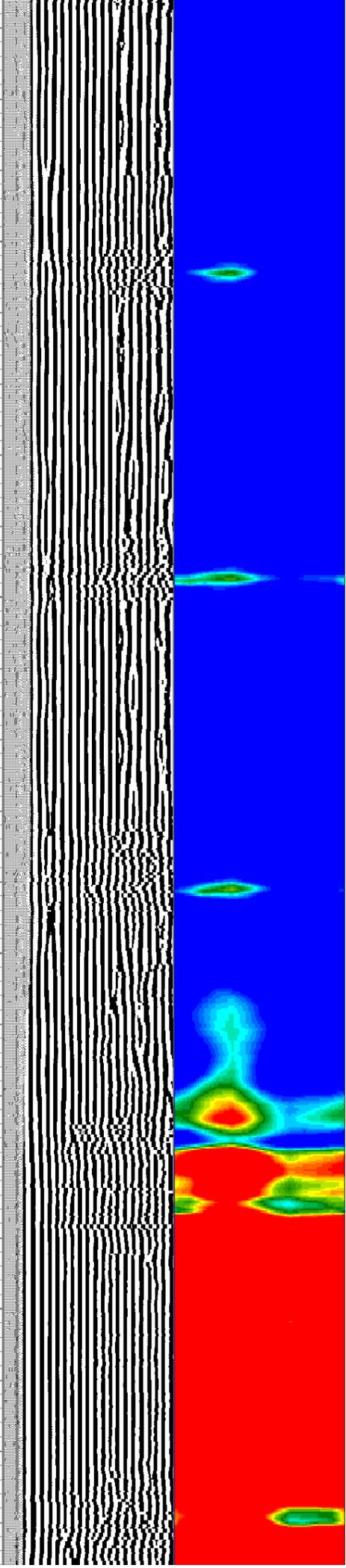
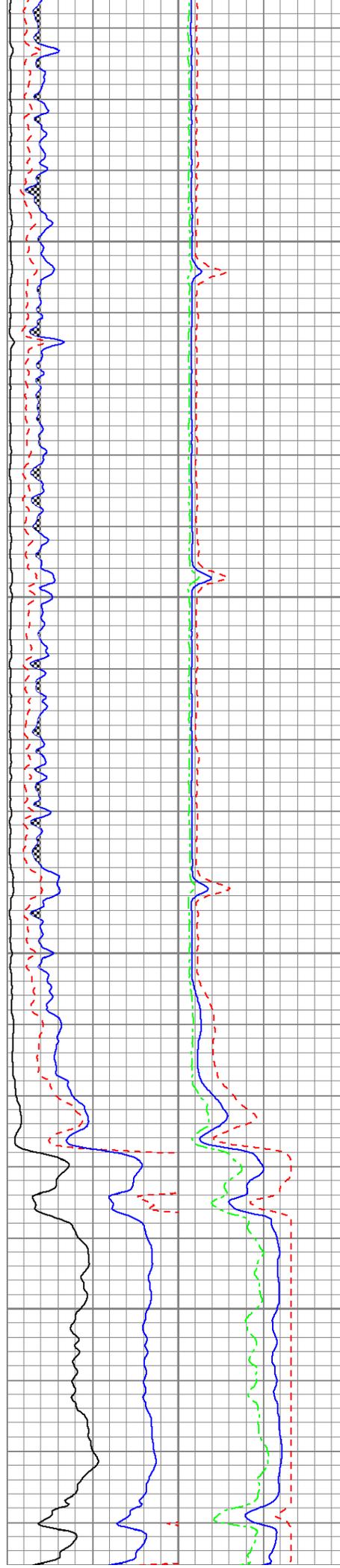


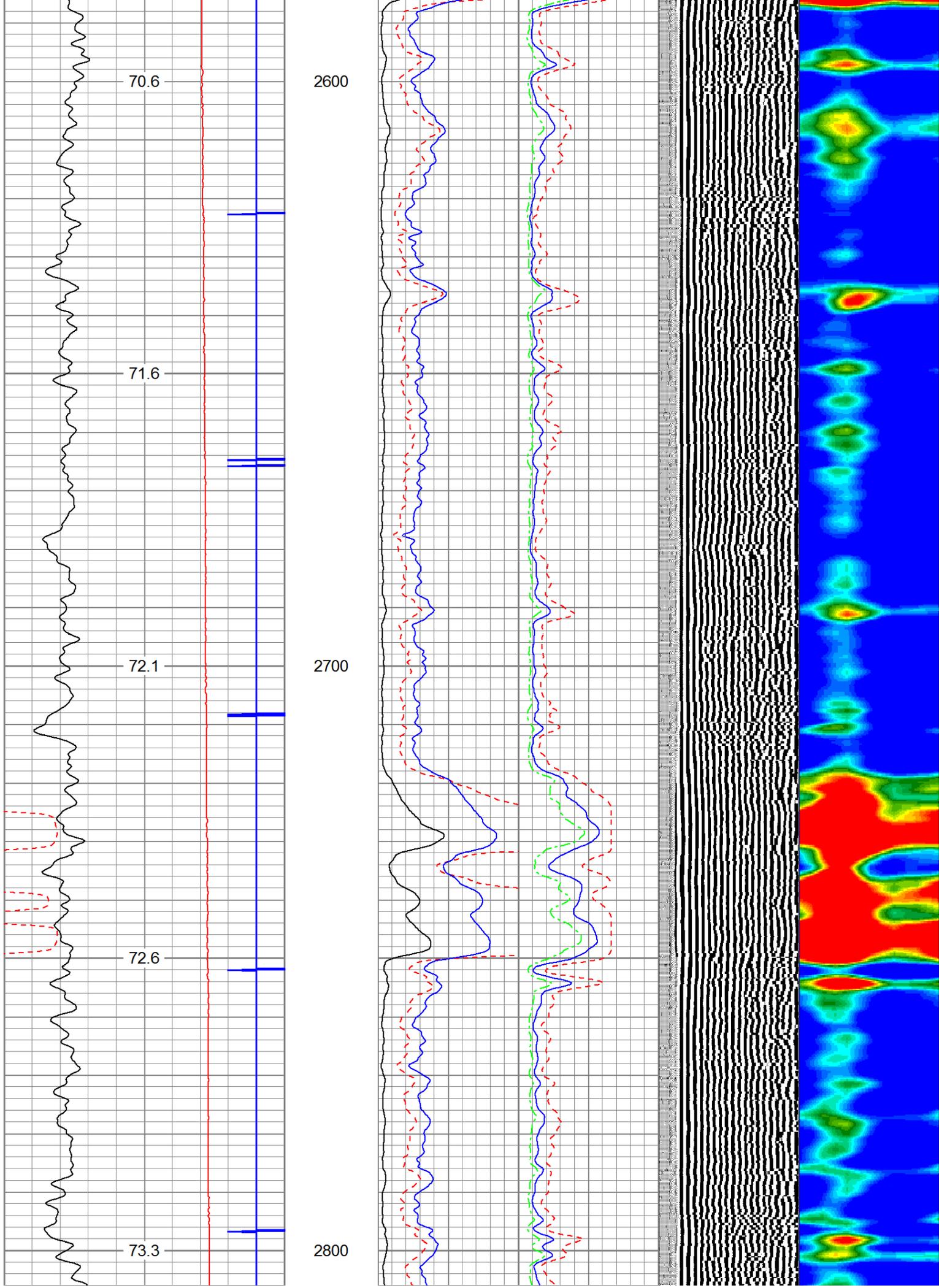


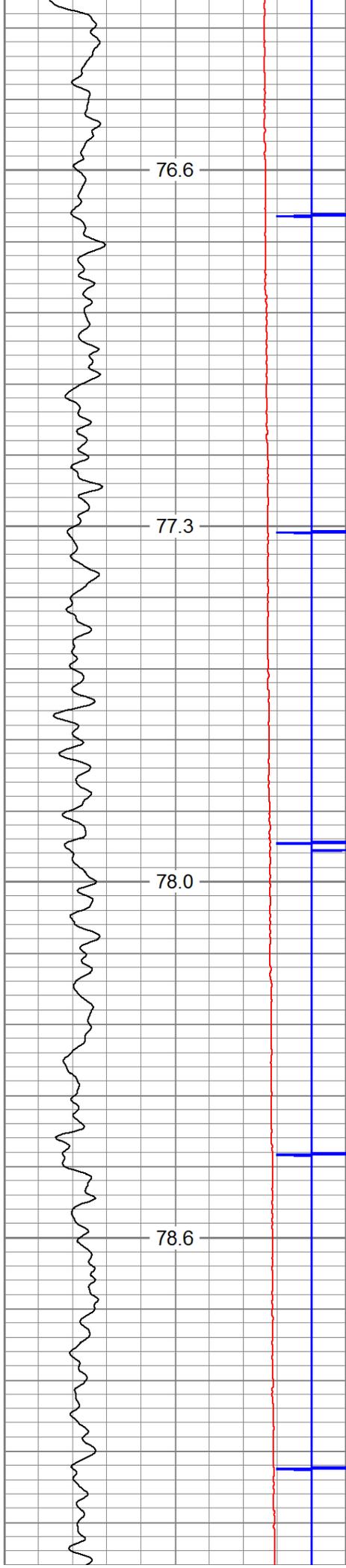


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2500

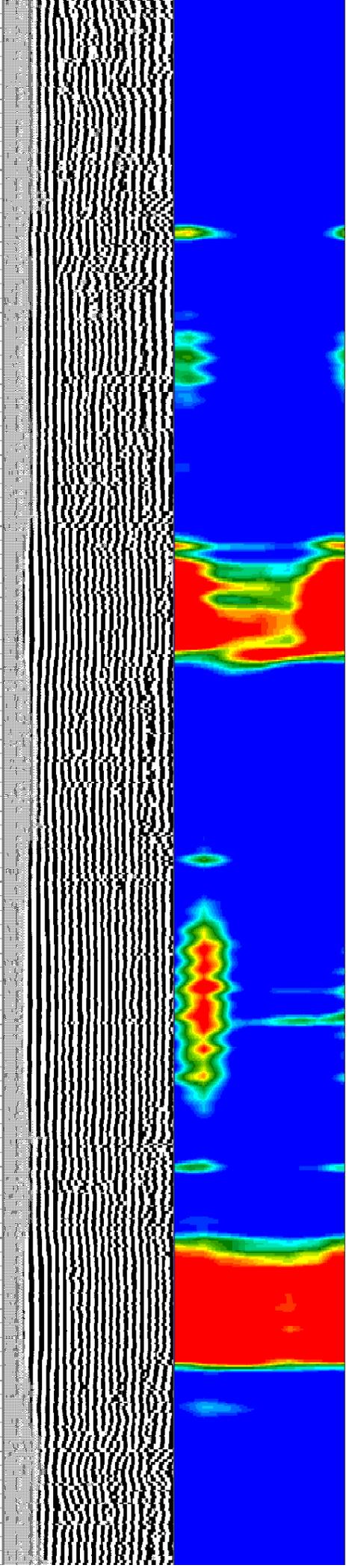
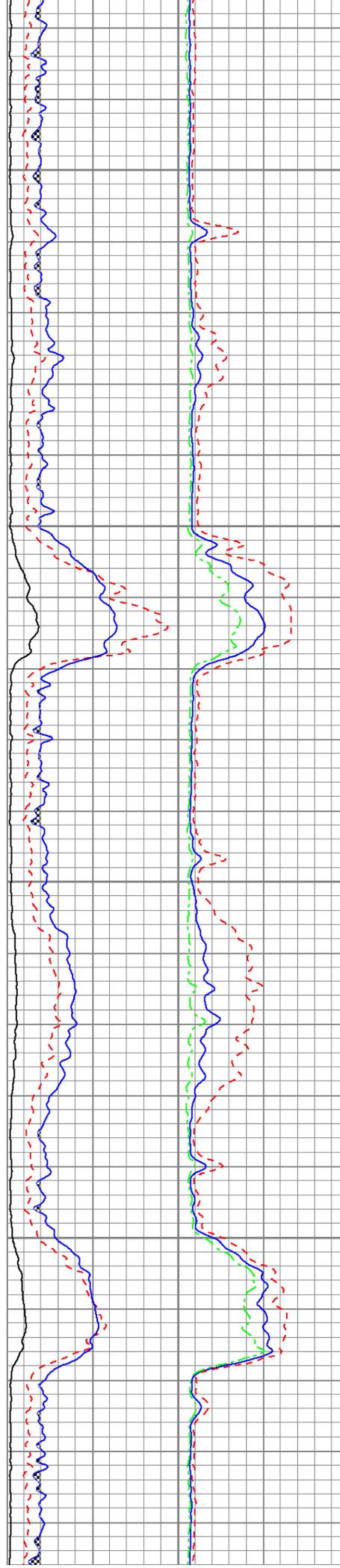


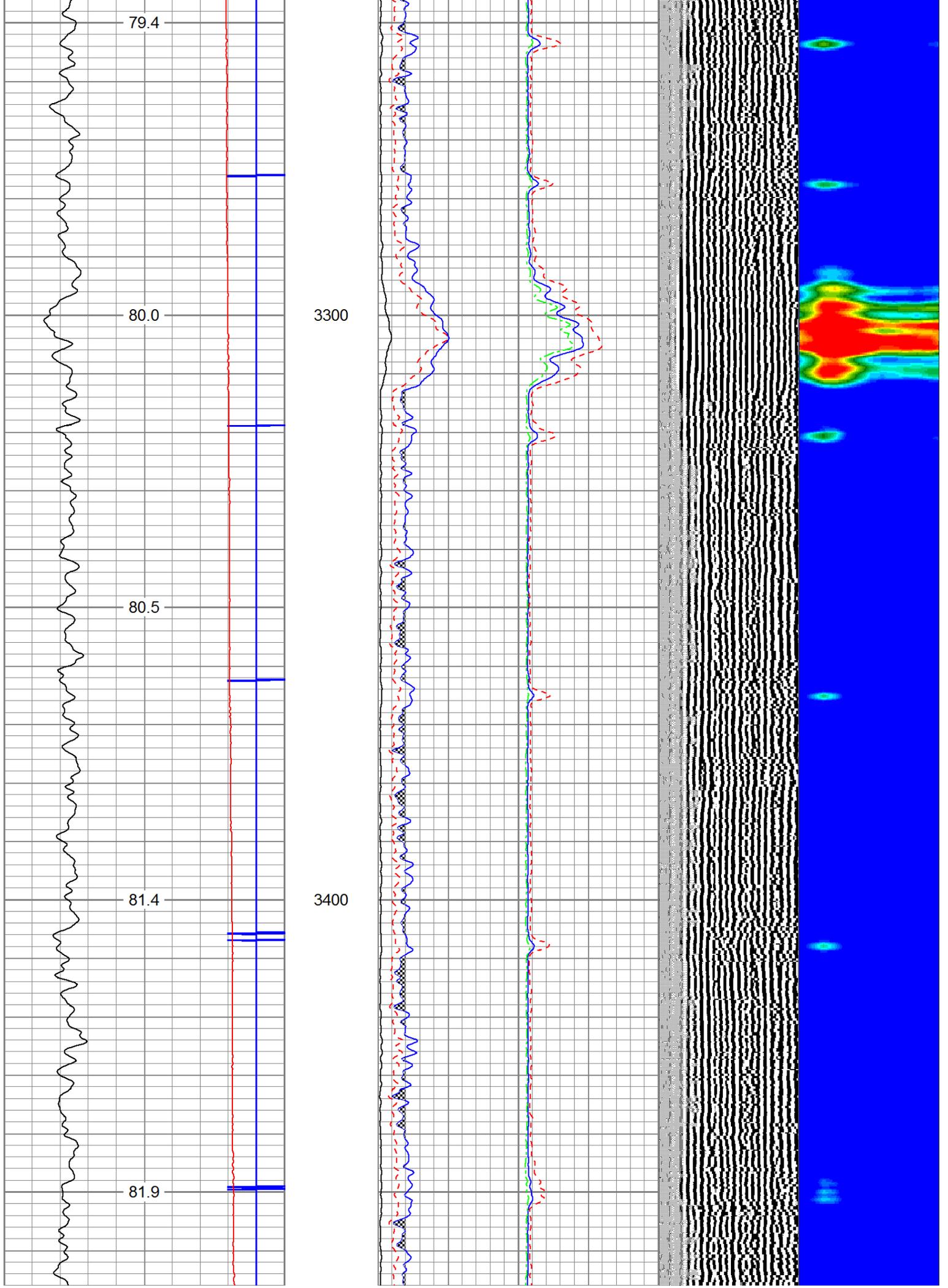


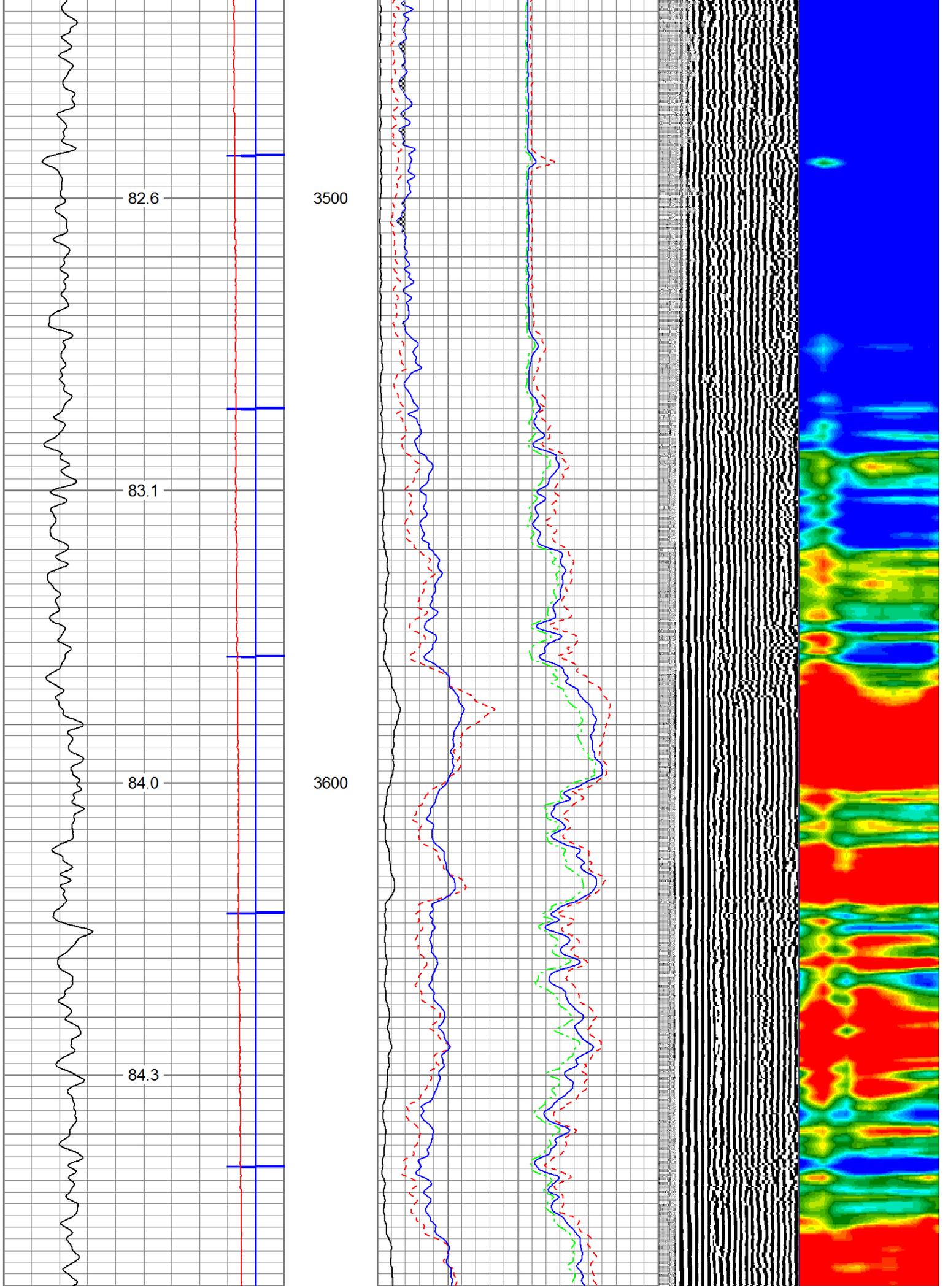


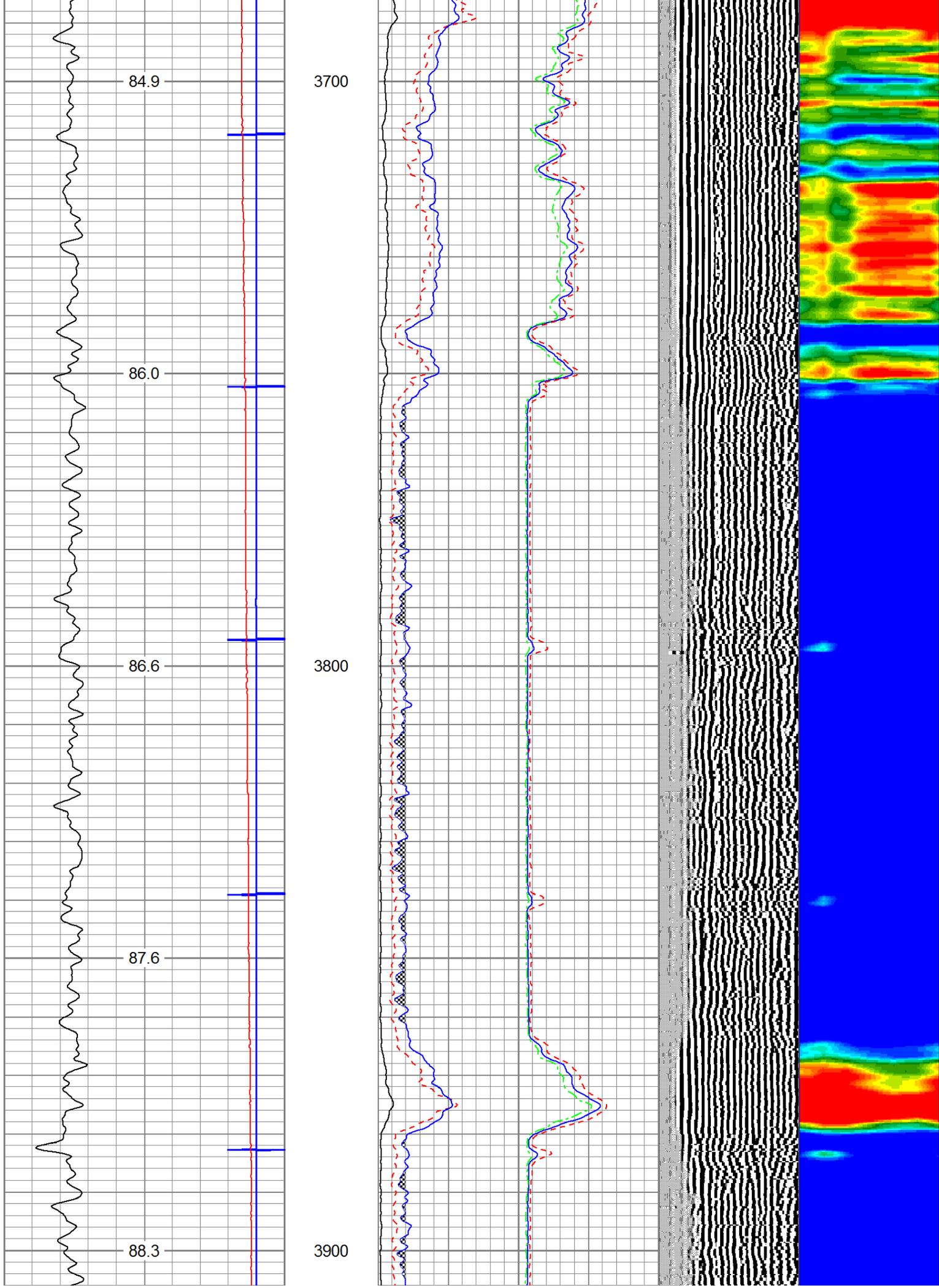
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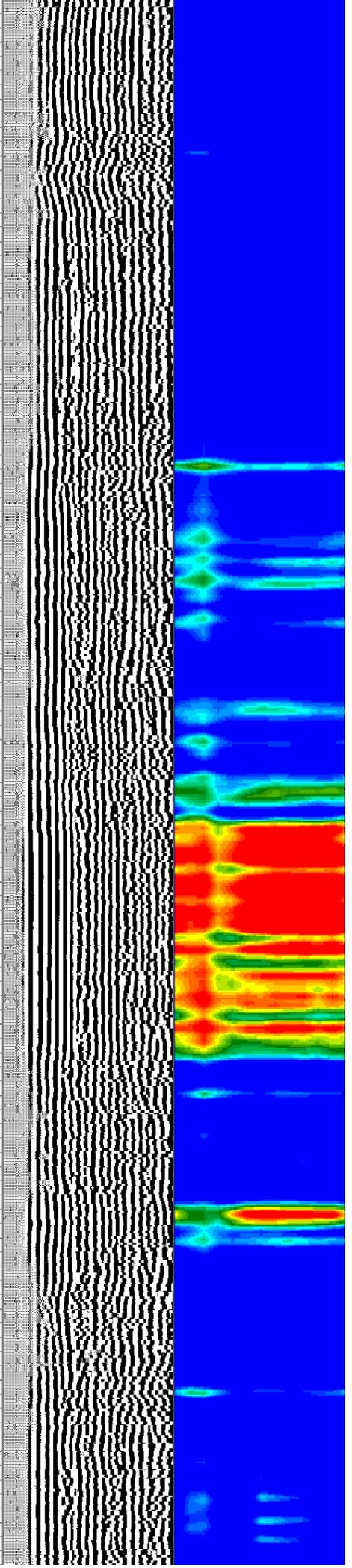
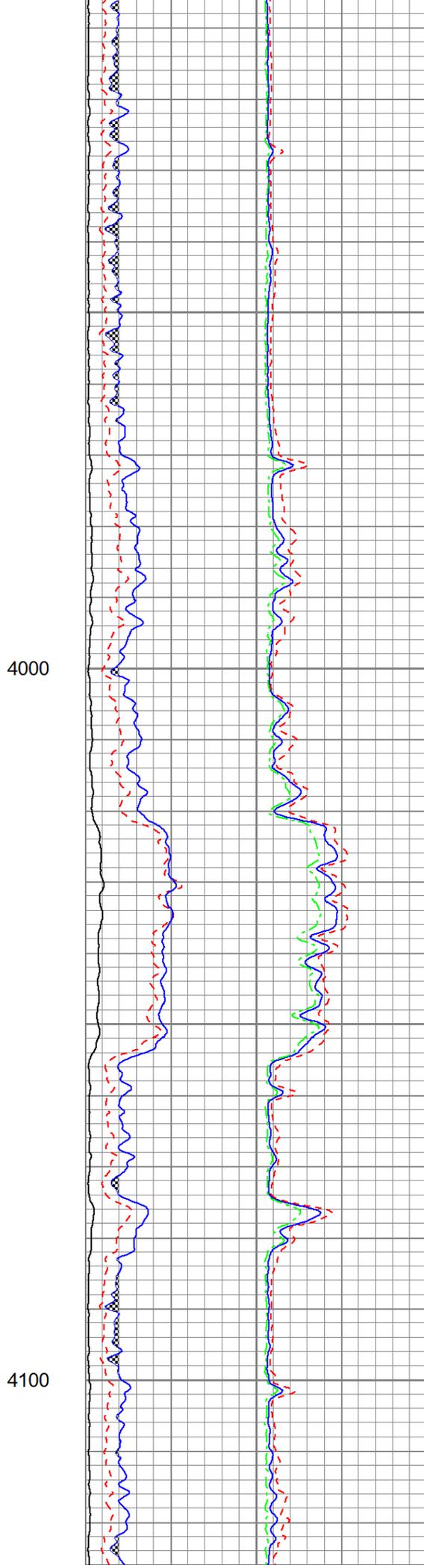
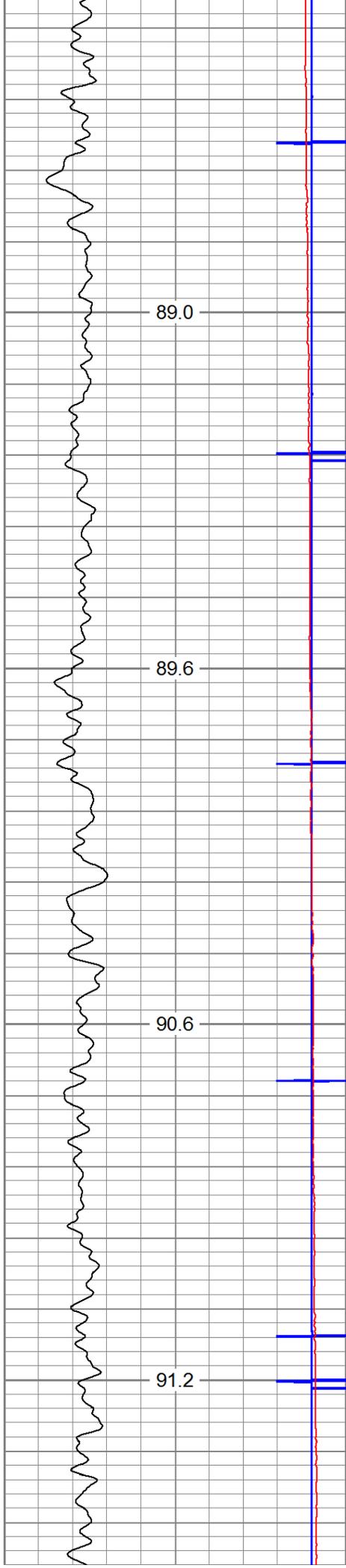
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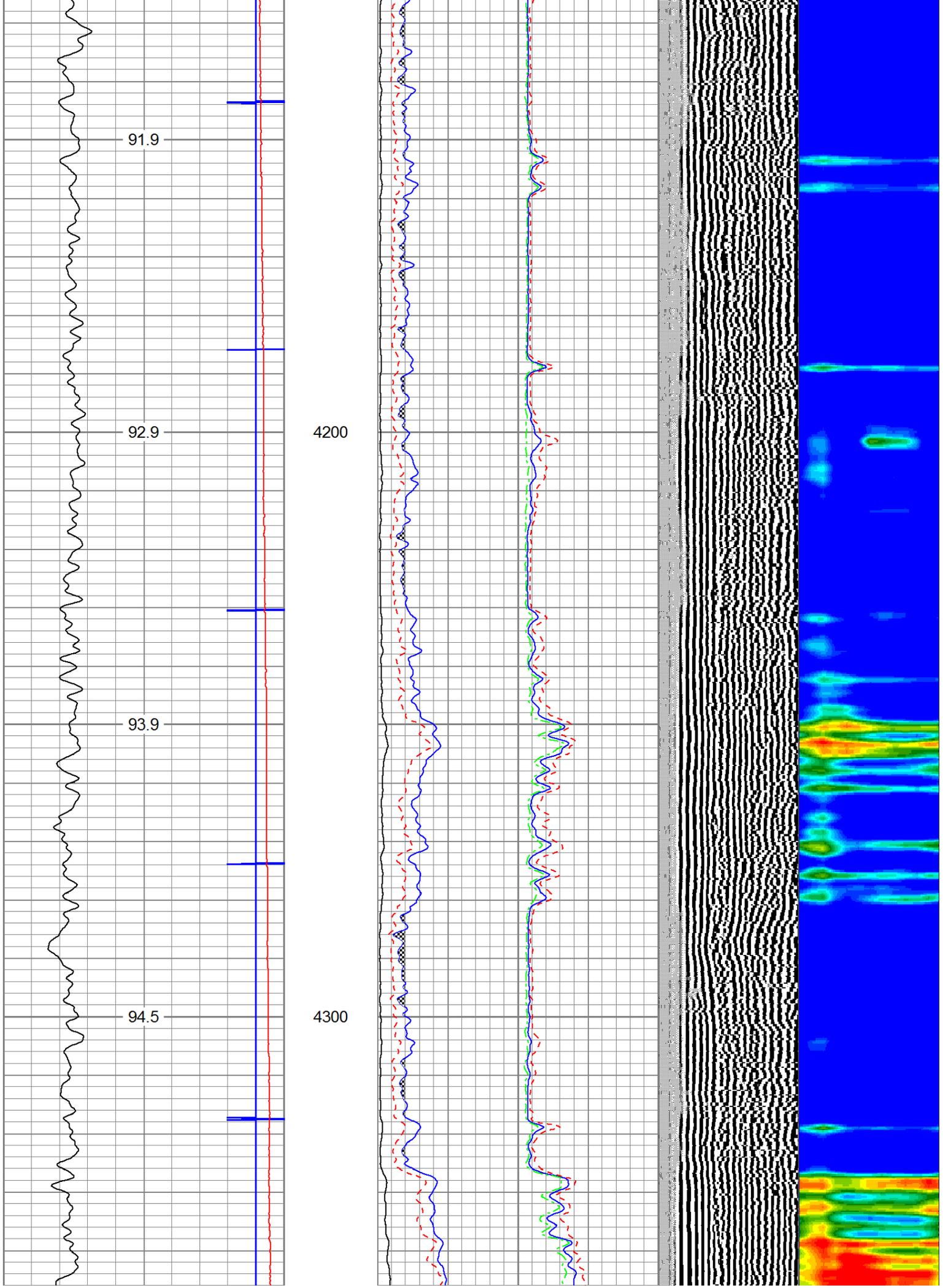


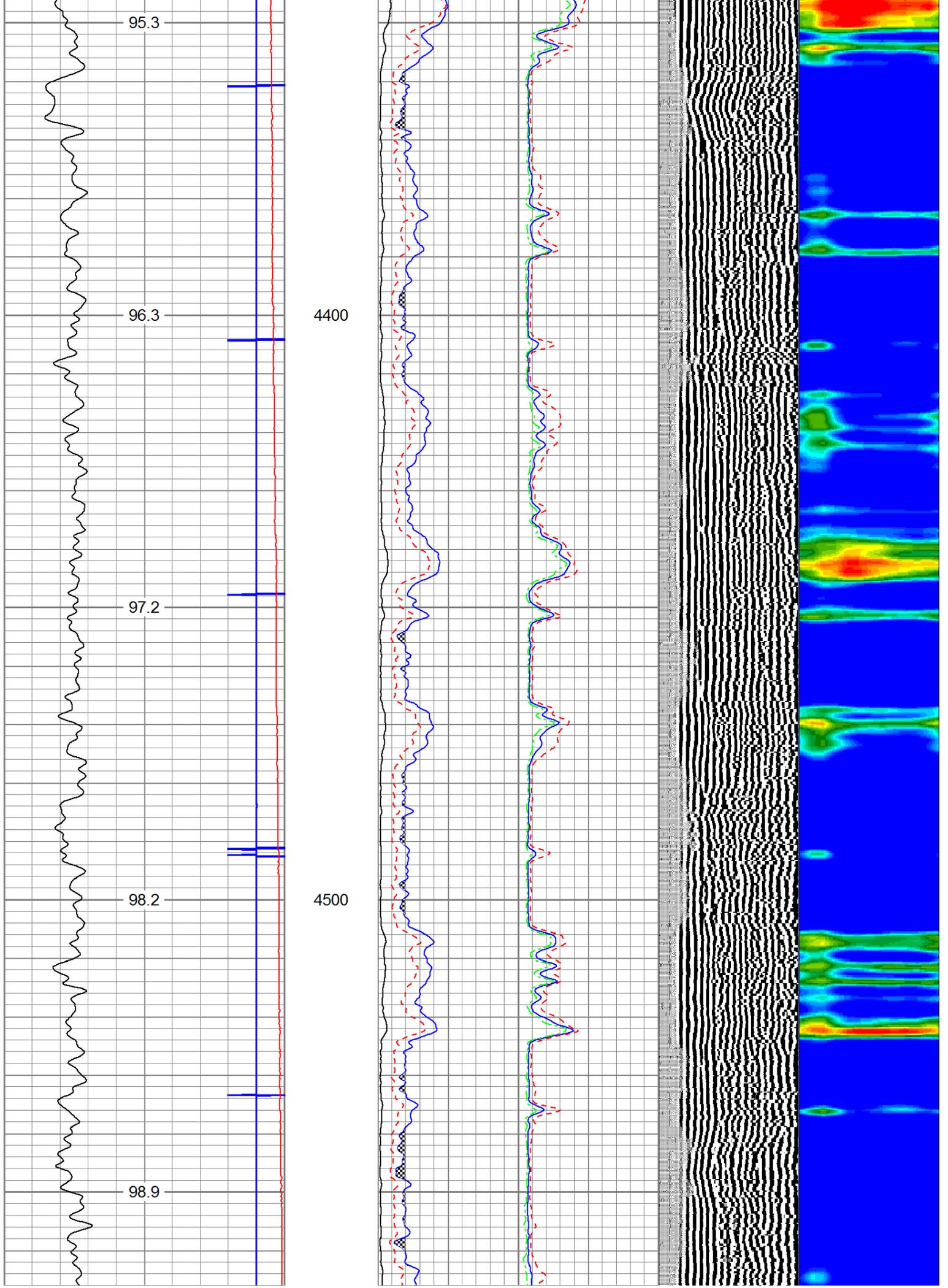


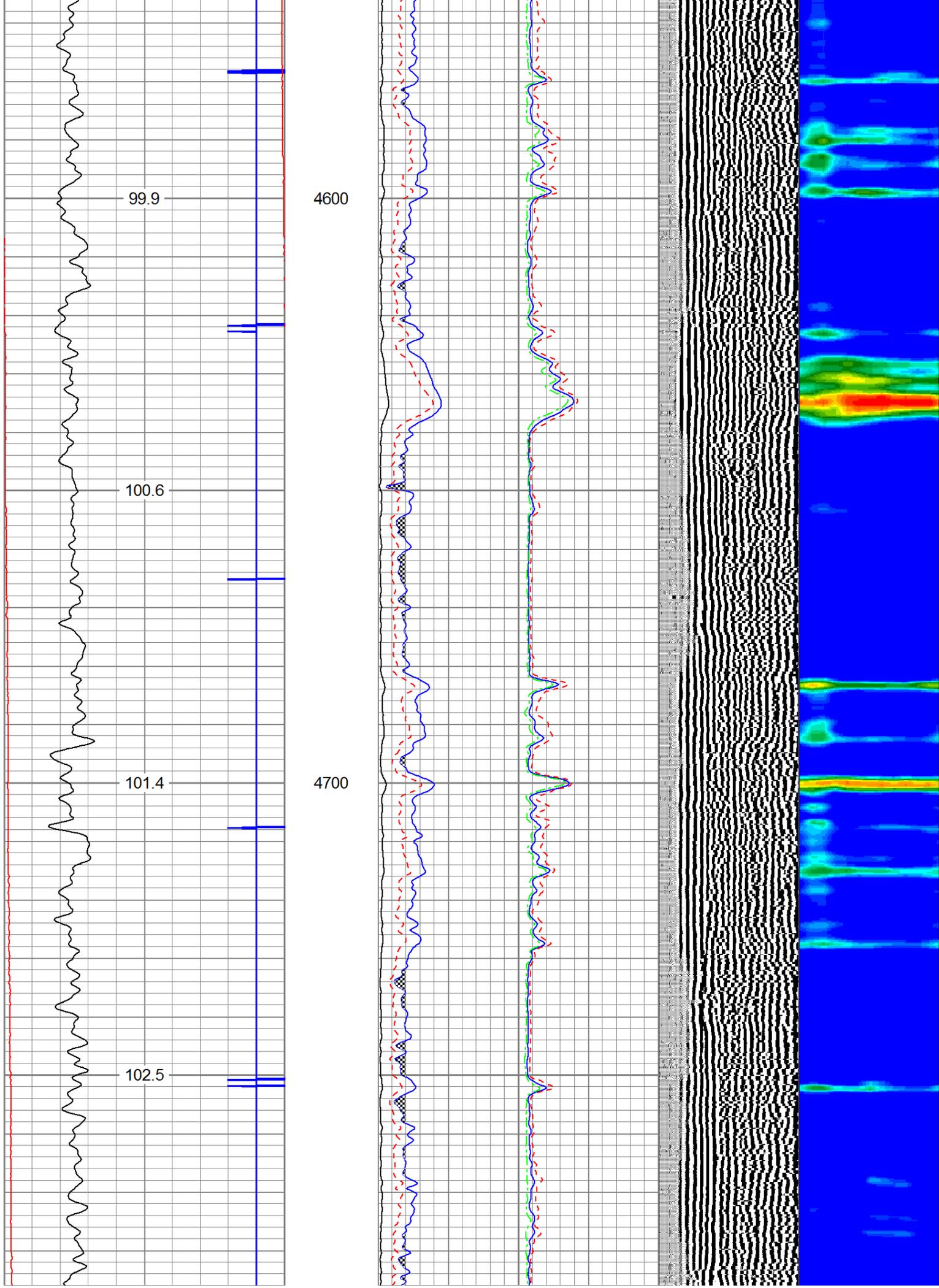


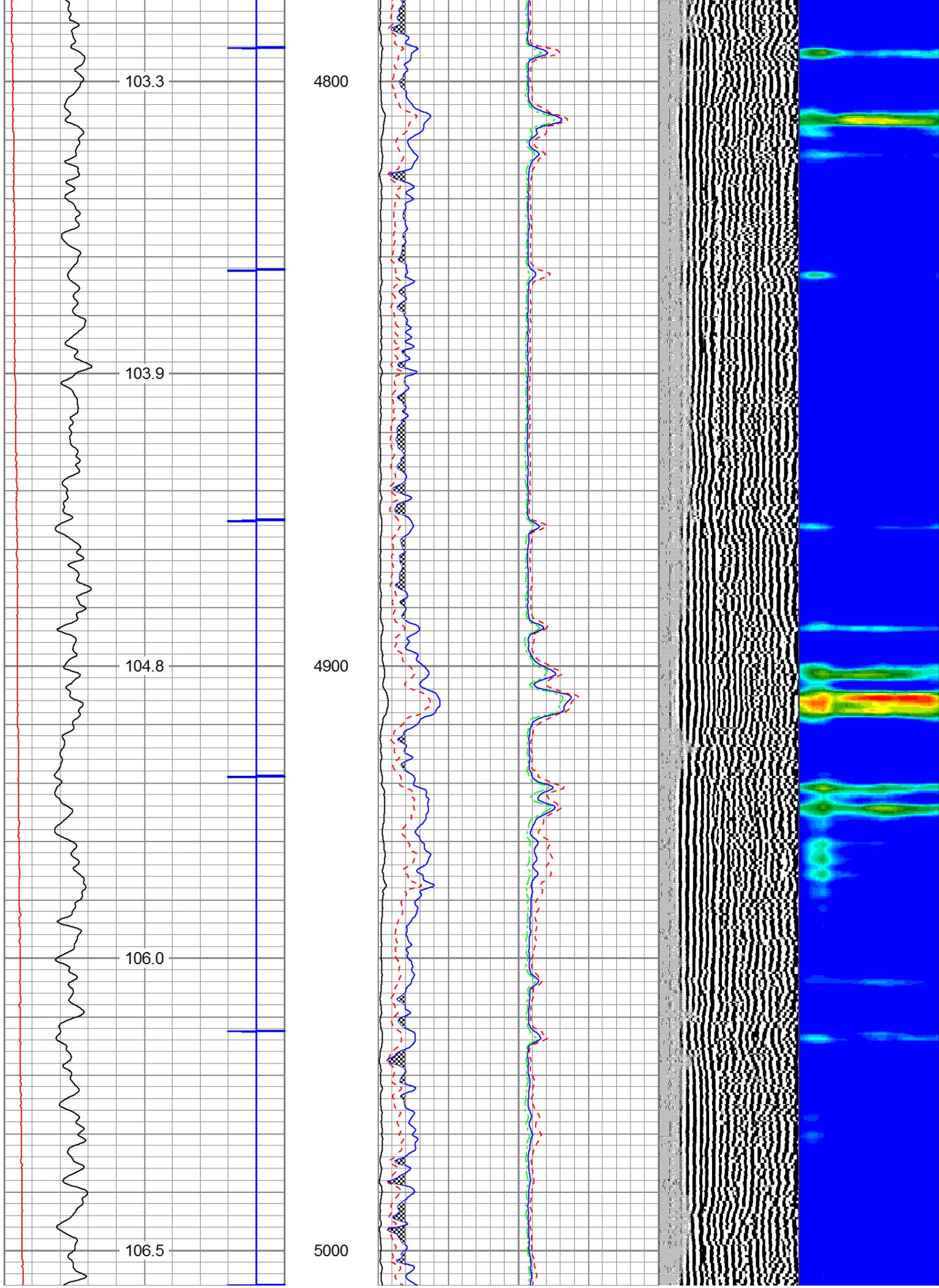


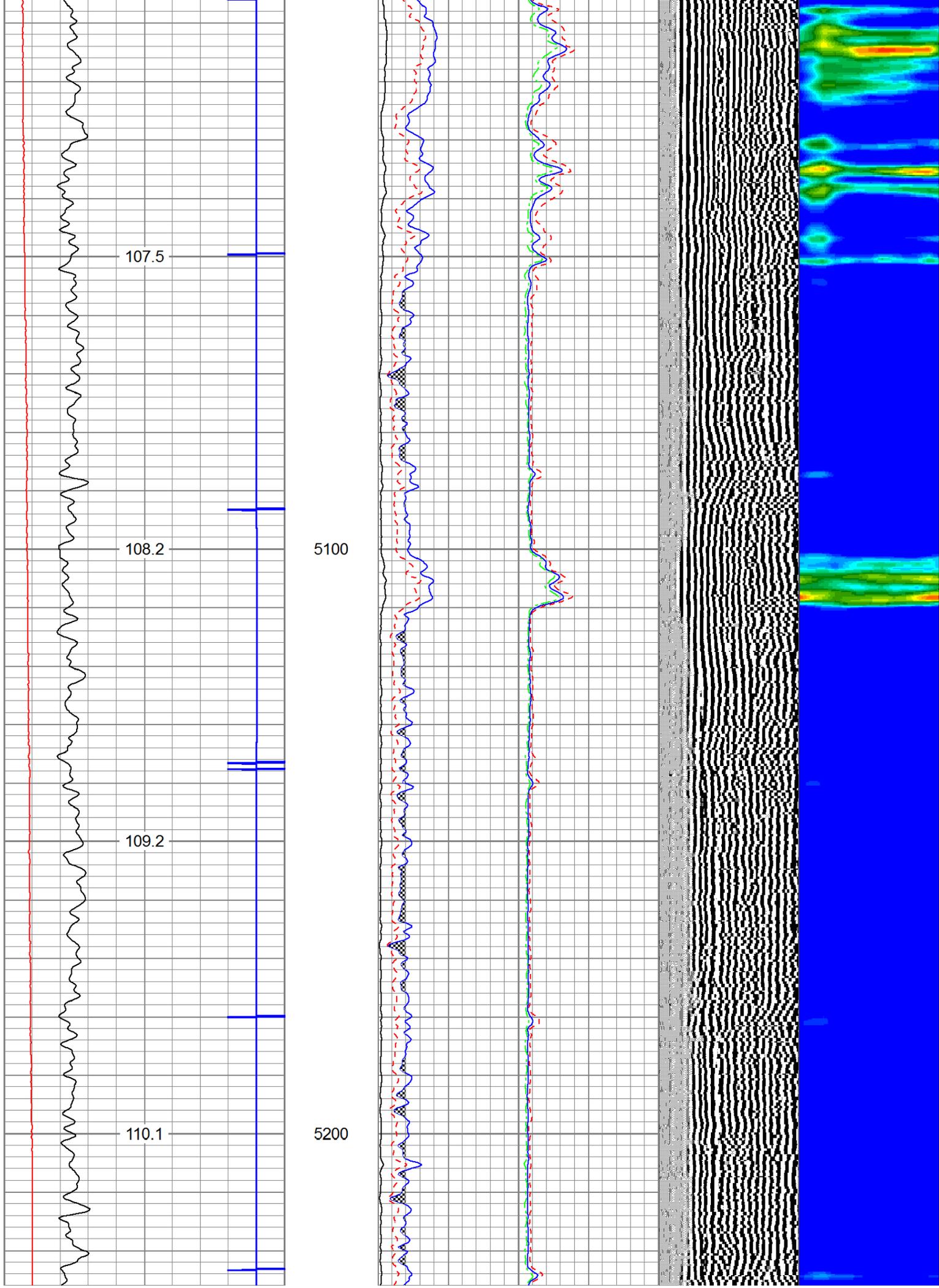


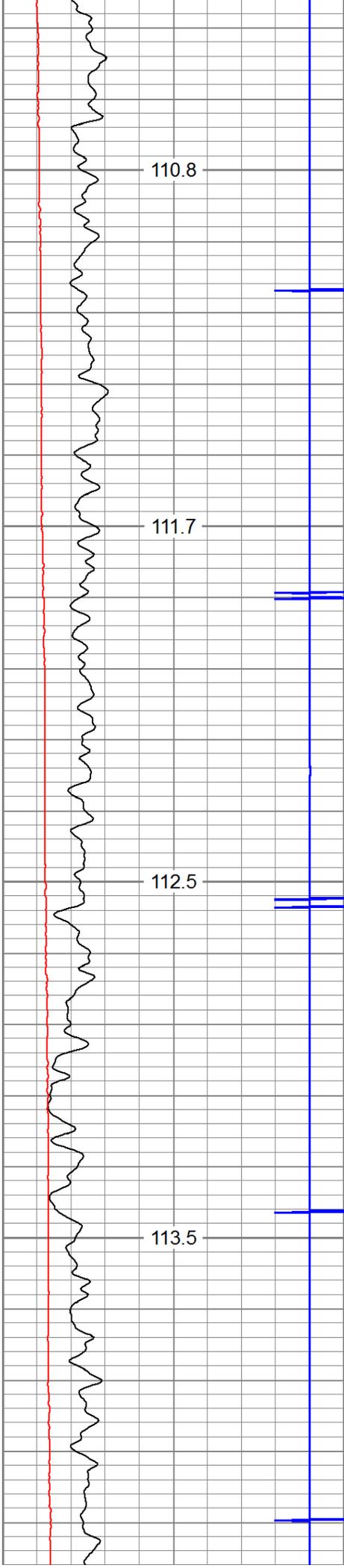






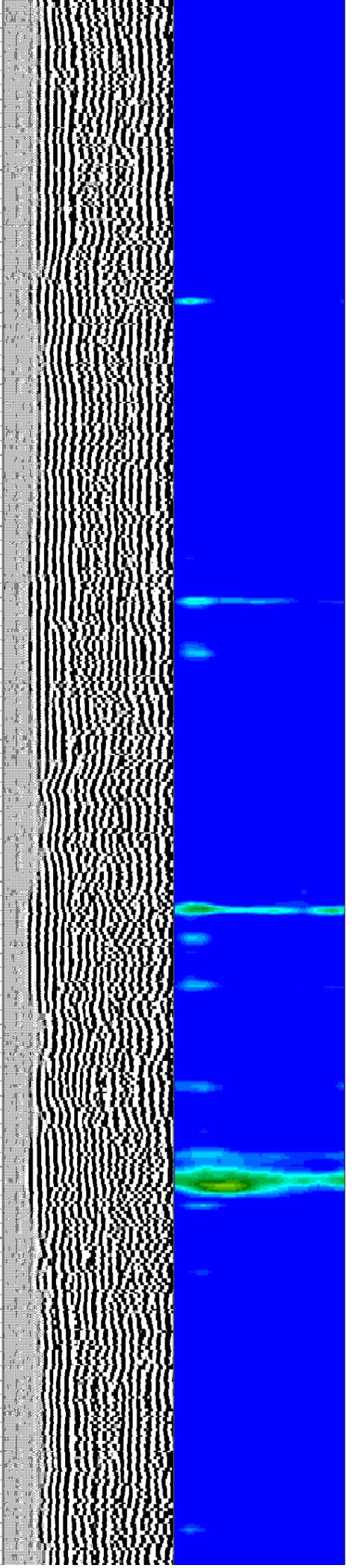
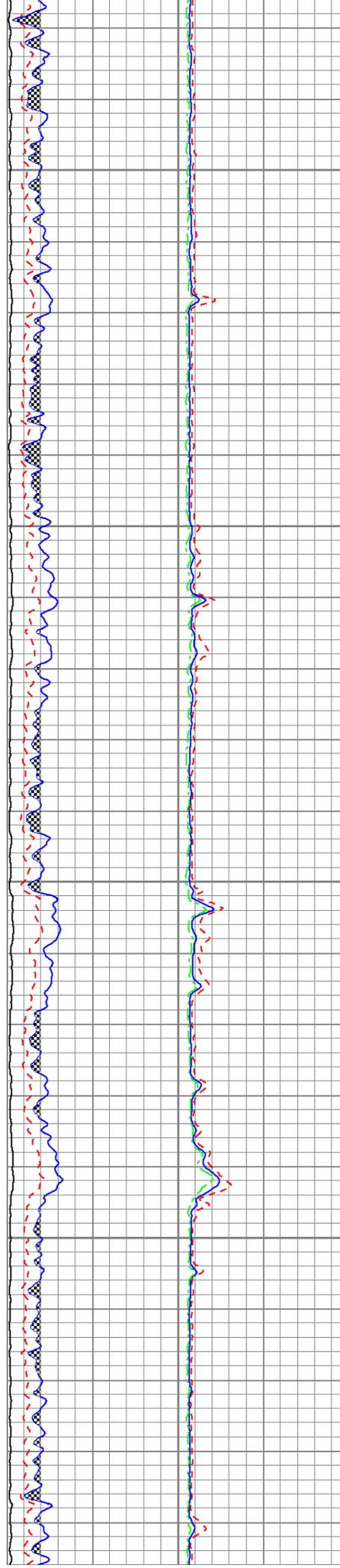






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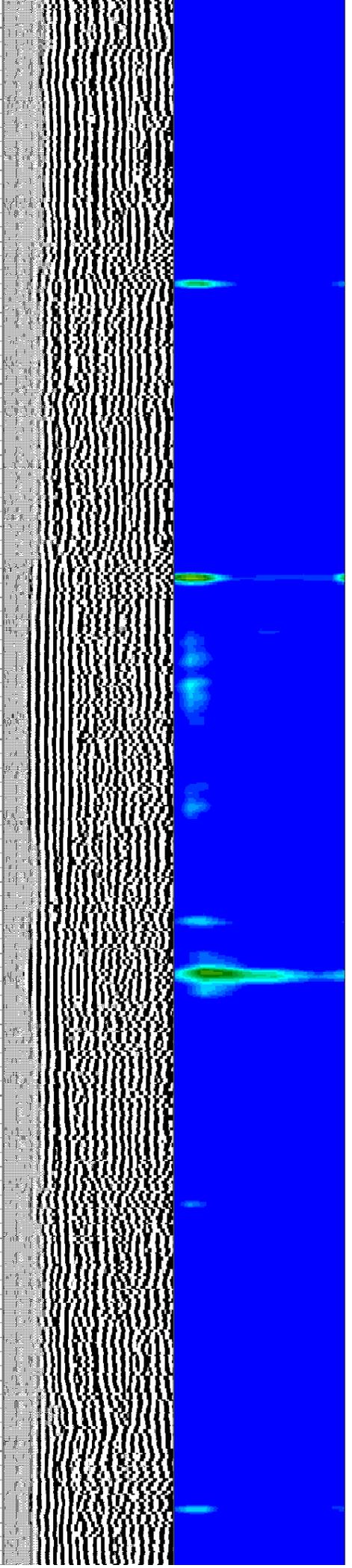
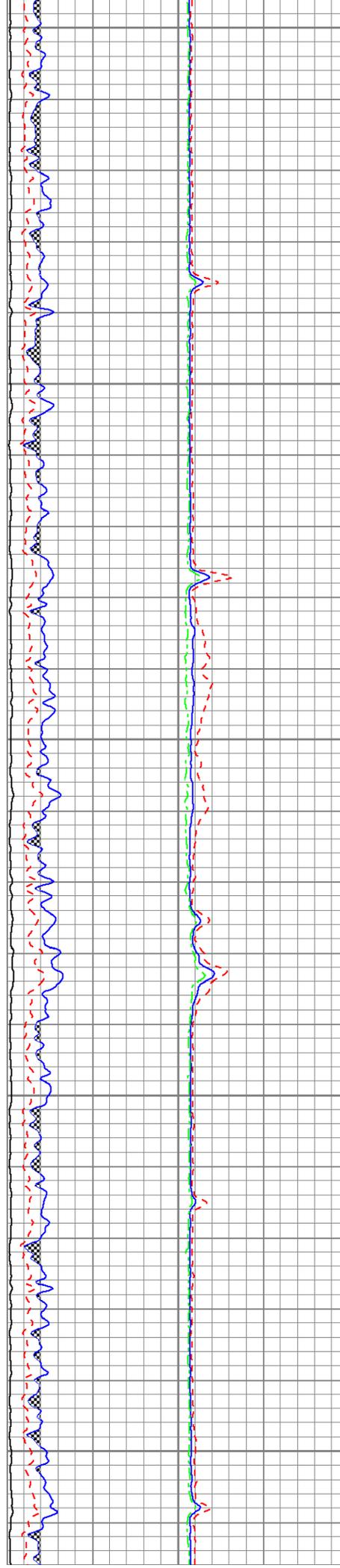
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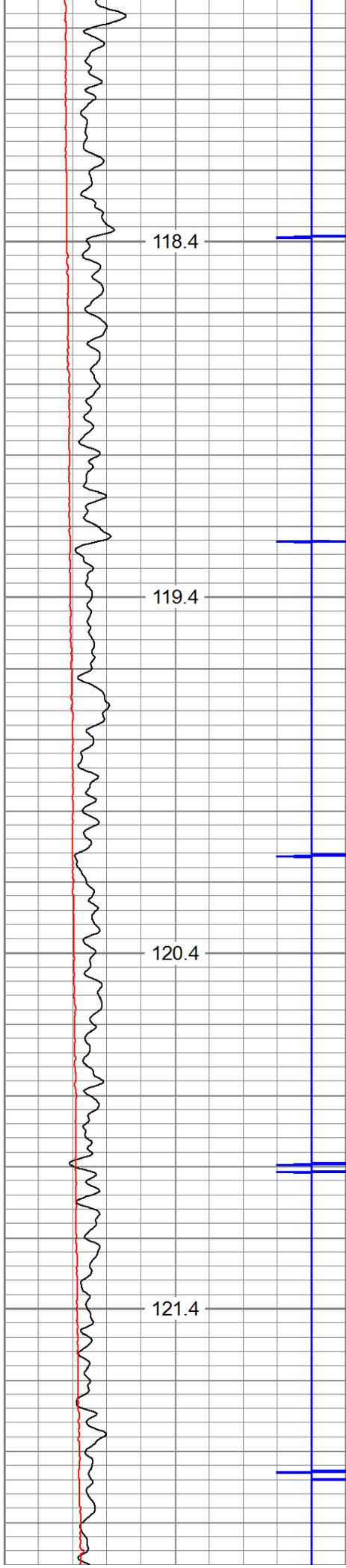




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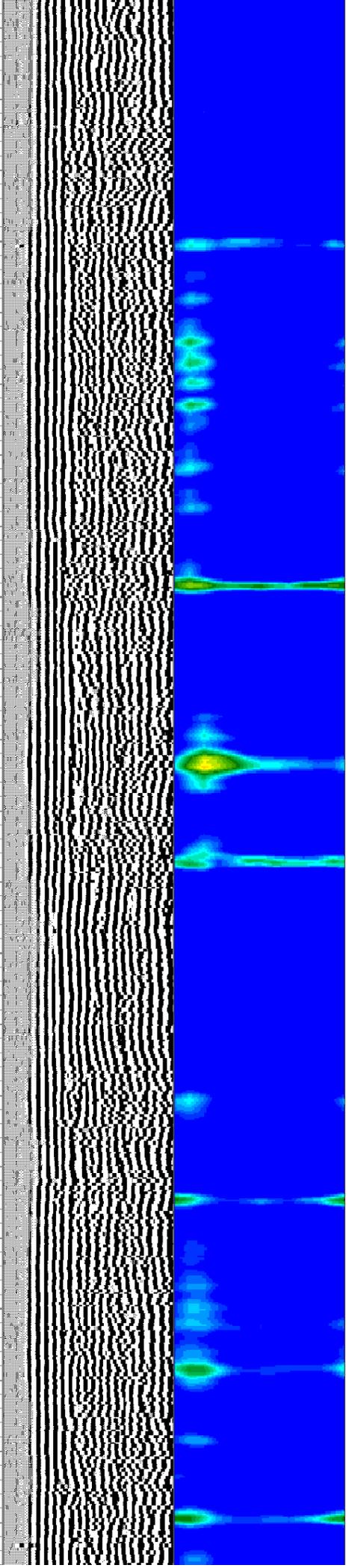
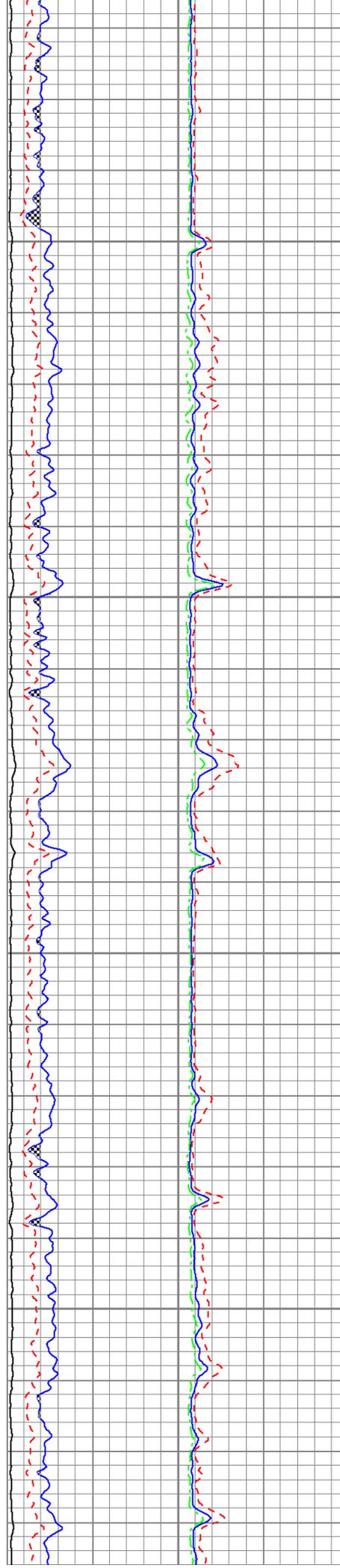
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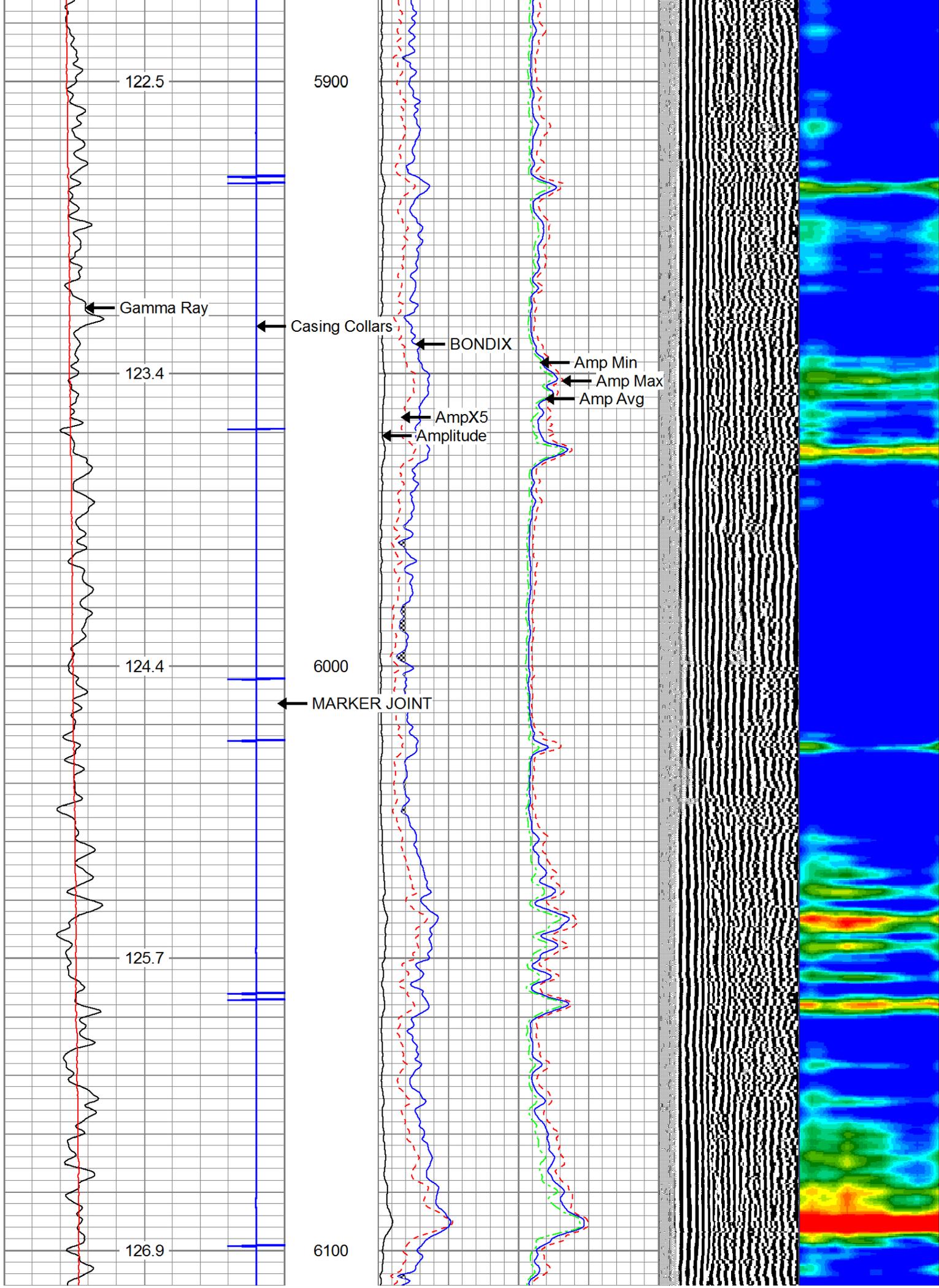


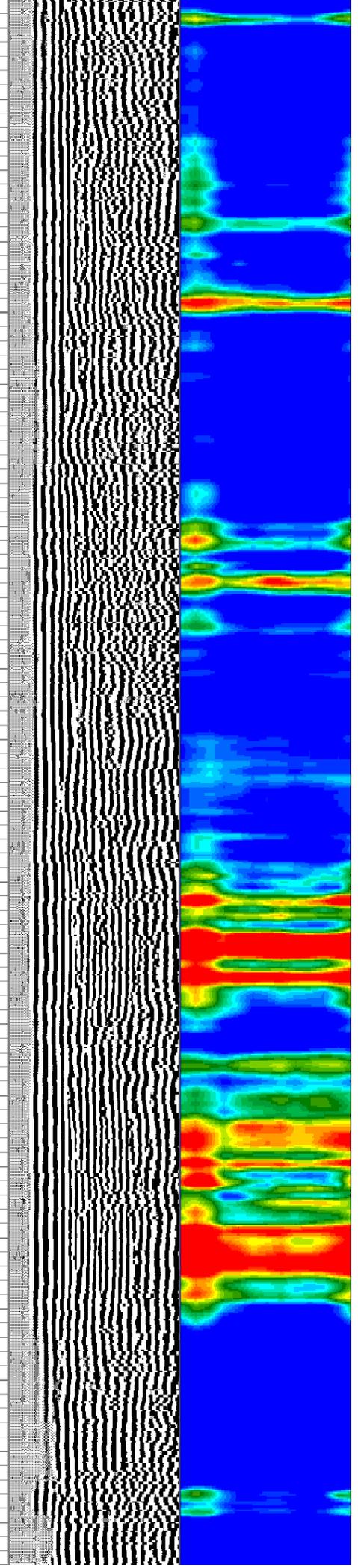
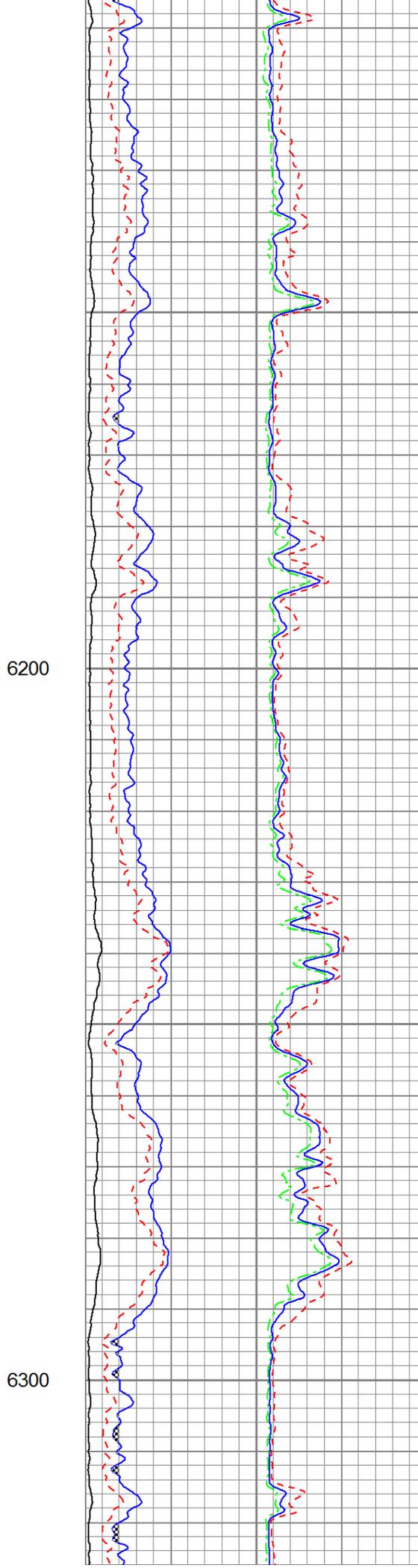
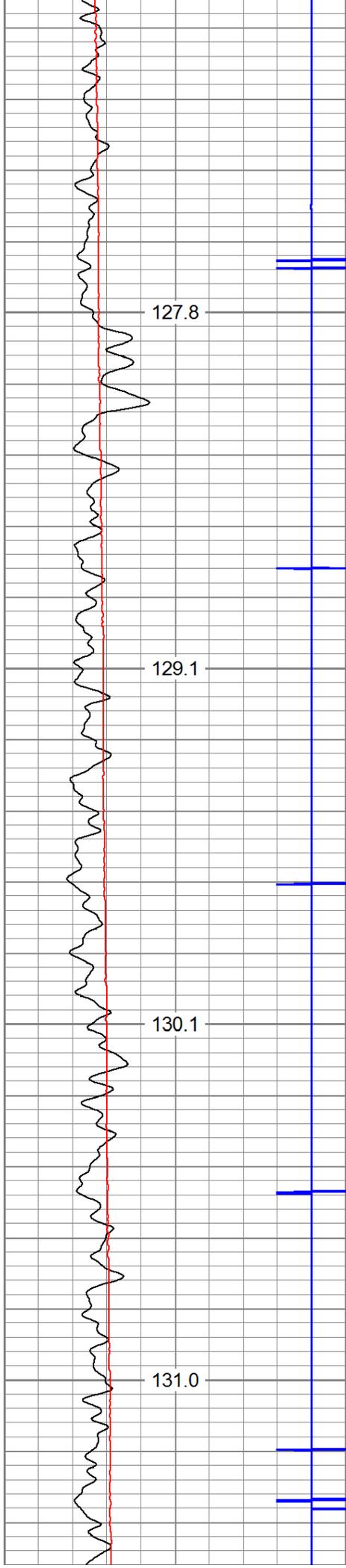


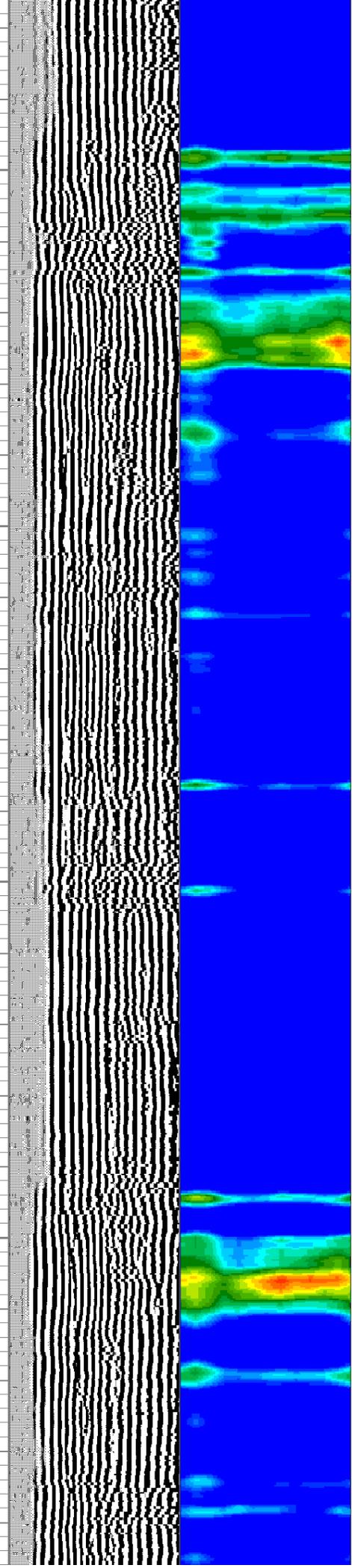
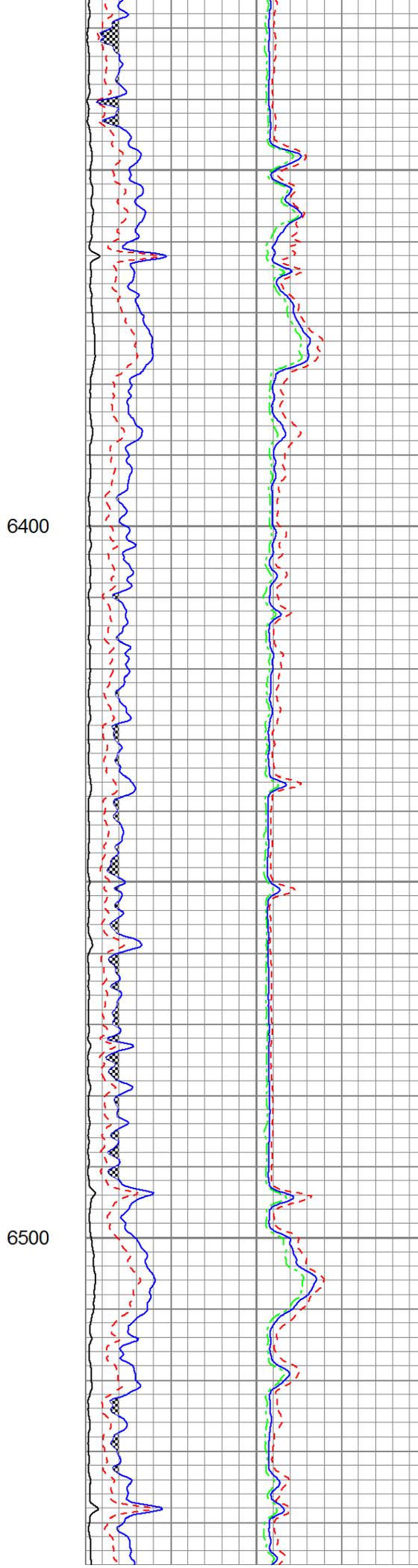
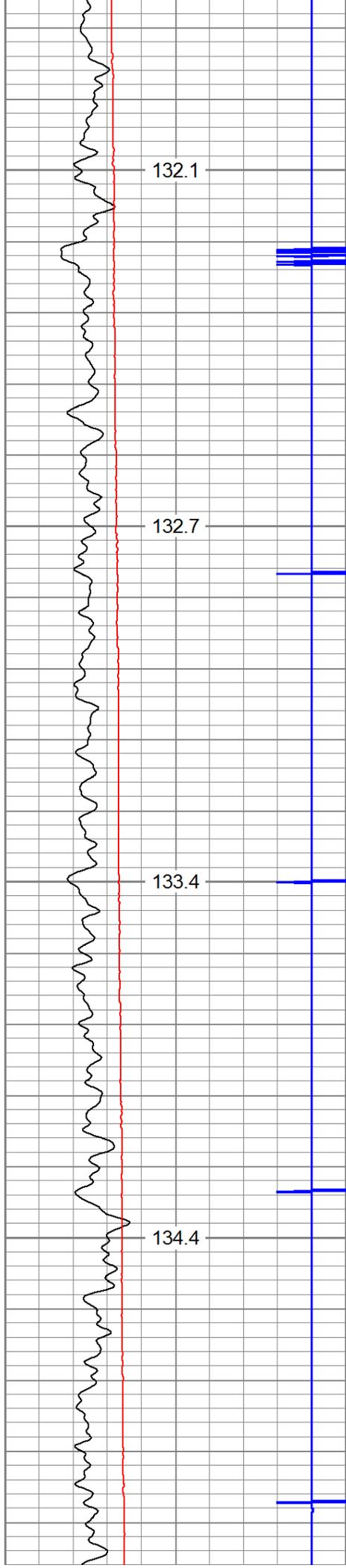
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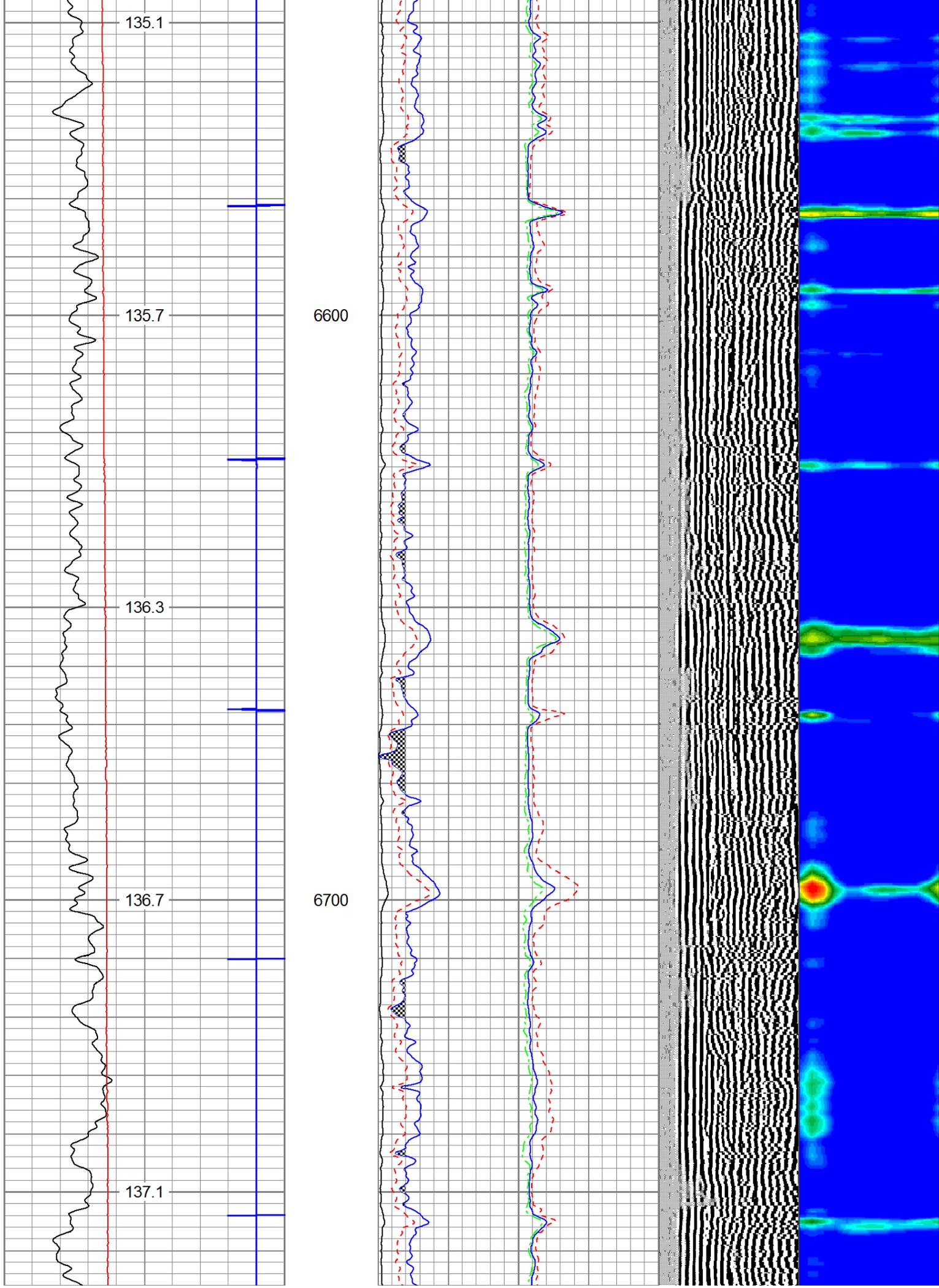
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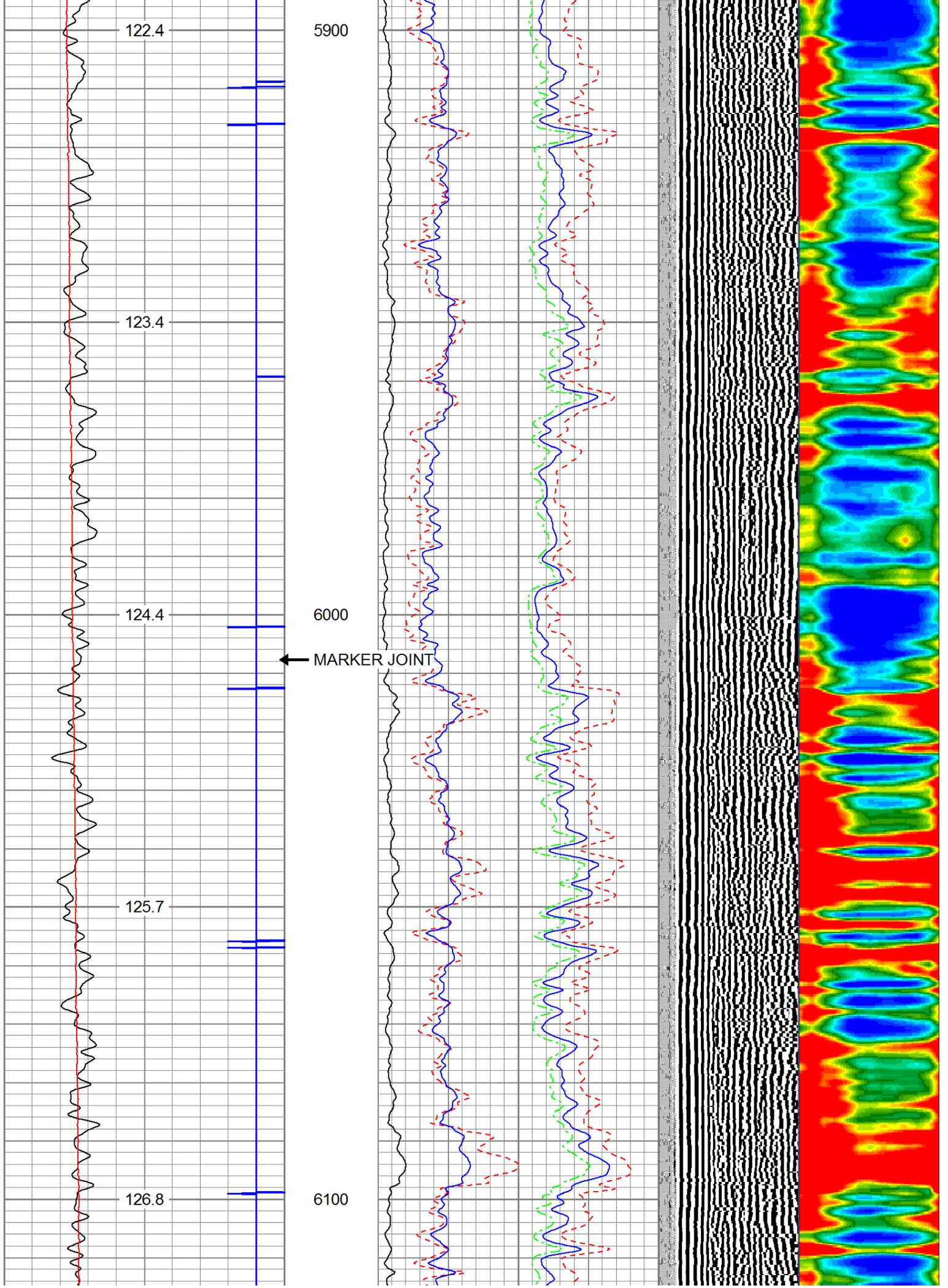


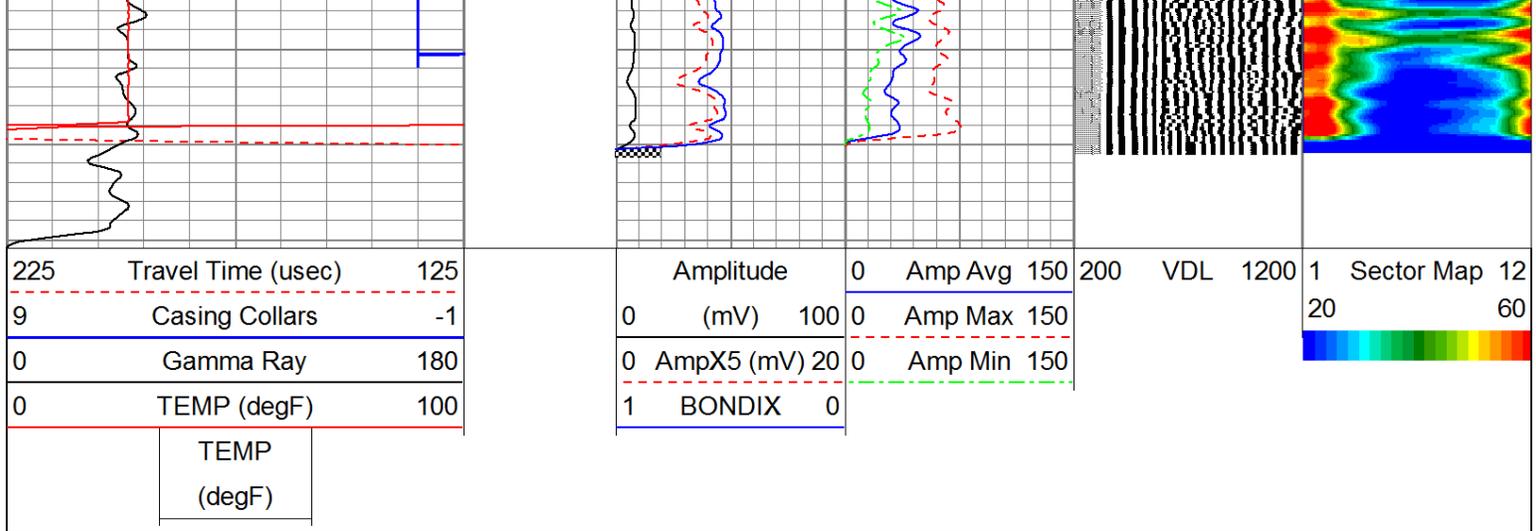












REPEAT PASS

Log Variables

Database: F:\Antero\antero BISON PAD\antero_bill3h.db
 Dataset: field/well/run1/pass9.1

Top - Bottom

| | | | | | | | |
|-------|-----------|----------------|------------|------------|---------------|--------------|-----------|
| XXXX | PPT usec | CASEWGHT lb/ft | MAXAMPL mV | MINAMPL mV | MINATTN db/ft | SRFTEMP degF | CASEOD in |
| 0 | 0 | 20 | 0 | 1 | 0.8 | 0 | 5.5 |
| PERFS | TDEPTH ft | BOTTEMP degF | BOREID in | | | | |
| 0 | 0 | 100 | 7.875 | | | | |

Calibration Report

Database File: F:\Antero\antero BISON PAD\antero_bill3h.db
 Dataset Pathname: pass9.1
 Dataset Creation: Fri Jan 11 12:32:15 2019 by Calc 7.0 B1

Gamma Ray Calibration Report

Serial Number: IPSNO-03
 Tool Model: Tek-Co 2 3/4
 Performed: Mon Nov 07 10:23:17 2016

Calibrator Value: 1.0

Background Reading: 0.0 cps
 Calibrator Reading: 1.0 cps

Sensitivity: 0.3000 /cps

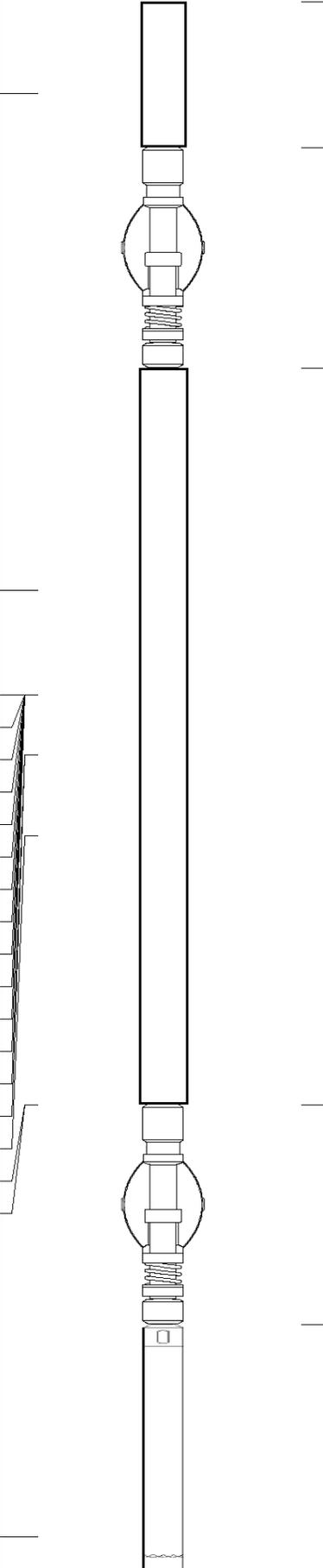
Temperature Calibration Report

Serial Number: IOL40-05
 Tool Model: Tek12
 Performed: Wed Jul 31 10:53:14 2013

| | Reference | Reading |
|----------------|-----------|-----------|
| Low Reference: | 0.00 degF | 0.00 usec |

High Reference: 1.00 degF 1.00 usec

Gain: 0.33
 Offset: 0.00
 Delta Spacing 2

| Sensor | Offset (ft) | Schematic | Description | Len (ft) | OD (in) | Wt (lb) | |
|---------|-------------|--|---|--|---------|---------|--------|
| CCL | 18.93 |  | CCL-312tekco (3.12TEKCO) Tekco 3 1/8" 450 Deg. "F" SmCo Logging CCL | 1.82 | 3.12 | 25.00 | |
| | | | 2.75 2 3/4" Tekco Adjustable Centralizer | 2.73 | 2.75 | 25.00 | |
| TEMP | 12.77 | | | | | | |
| WVFS1 | 11.48 | | | | | | |
| WVFS2 | 11.48 | | | | | | |
| WVFS3 | 11.48 | | | SCBL-Tek12 (IOL40-05) Tekco 400 Deg F 12 Sector RIB with Temp | 9.13 | 3.25 | 135.00 |
| WVFS4 | 11.48 | | | | | | |
| WVFS5 | 11.48 | | | | | | |
| WVFS6 | 11.48 | | | | | | |
| WVFS7 | 11.48 | | | | | | |
| WVFS8 | 11.48 | | | | | | |
| WVFS9 | 11.48 | | | | | | |
| WVFS10 | 11.48 | | | | | | |
| WVFS11 | 11.48 | | | | | | |
| WVFS12 | 11.48 | | | | | | |
| WVF3FT | 10.73 | | | | | | |
| WVFCAL | 10.73 | | | | | | |
| WVF5FT | 9.73 | | | | | | |
| WVFTEMP | 6.40 | | | 2.75 2 3/4" Tekco Adjustable Centralizer | 2.73 | 2.75 | 25.00 |
| WVFSYNC | 6.40 | | | | | | |
| | | | GR-Tek-Co 2 3/4 (IPSNO-03) Tekco 2 3/4" 400 Deg. F Logging Gamma Ray | 3.67 | 2.75 | 40.00 | |
| GR | 1.04 | | | | | | |

| | |
|---------------|---|
| Dataset: | antero_bill3h.db: field/well/run1/pass9.1 |
| Total Length: | 20.07 ft |
| Total Weight: | 250.00 lb |
| O.D. | 3.25 in |



| | |
|---------|------------------------------|
| Company | ANTERO RESOURCES CORPORATION |
| Well | BILL UNIT 3H |
| Field | MARCELLOUS |
| County | RITCHIE |
| State | WV |
| | Country |