

Company: Noble Energy, Inc.

Well: Wells Ranch State AA33-790

Field: Wattenberg

County: Weld State: Colorado

UltraSonic Summary Print

| | | | | | |
|--------------|----------------------------|--|---------------|-----------|------------------|
| County: | Weld | | | | |
| Field: | Wattenberg | | | | |
| Location: | SWSW Sec 21 T6N R63W | | | | |
| Well: | Wells Ranch State AA33-790 | | | | |
| Company: | Noble Energy, Inc. | | | | |
| | | Location: | | | |
| | | SWSW Sec 21 T6N R63W | Elev.: | K.B. | 4738.00 ft |
| | | SHL: 255 FSL 847 FWL | | G.L. | 4708.00 ft |
| | | Latitude: 40.46553 Longitude: -104.44816 | | D.F. | 4737.00 ft |
| | | Permanent Datum: | Ground Level | Elev.: | 4708.00 f |
| | | Log Measured From: | Kelly Bushing | 30.00 ft | above Perm.Datum |
| | | Drilling Measured From: | Kelly Bushing | | |
| | | API Serial No. | Section: | Township: | Range: |
| | | 05-123-43876 | 21 | 6N | 63W |
| Logging Date | 09-Apr-2017 | | | | |

| | | |
|---------------------------|----------------|-------------|
| Run Number | One | |
| Depth Driller | 16763.00 ft | |
| Schlumberger Depth | 16763.00 ft | |
| Bottom Log Interval | 6500.00 ft | |
| Top Log Interval | 0.00 ft | |
| Casing Fluid Type | Brine | |
| Salinity | | |
| Density | 9.3 lbm/gal | |
| Fluid Level | 8.00 ft | |
| BIT/CASING/TUBING STRING | | |
| Bit Size | 8.50 in | |
| From | 1930.00 ft | |
| To | 16763.00 ft | |
| Casing/Tubing Size | 5.5 in | |
| Weight | 20 lbm/ft | |
| Grade | N/A | |
| From | 0.00 ft | |
| To | 16753.90 ft | |
| Max Recorded Temperatures | 218 degF | |
| Logger on Bottom | 09-Apr-2017 | 16:16:00 |
| Unit Number | 9115 | Fort Morgan |
| Recorded By | Stephen Tang | |
| Witnessed By | Bill Mansfield | |

Disclaimer

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

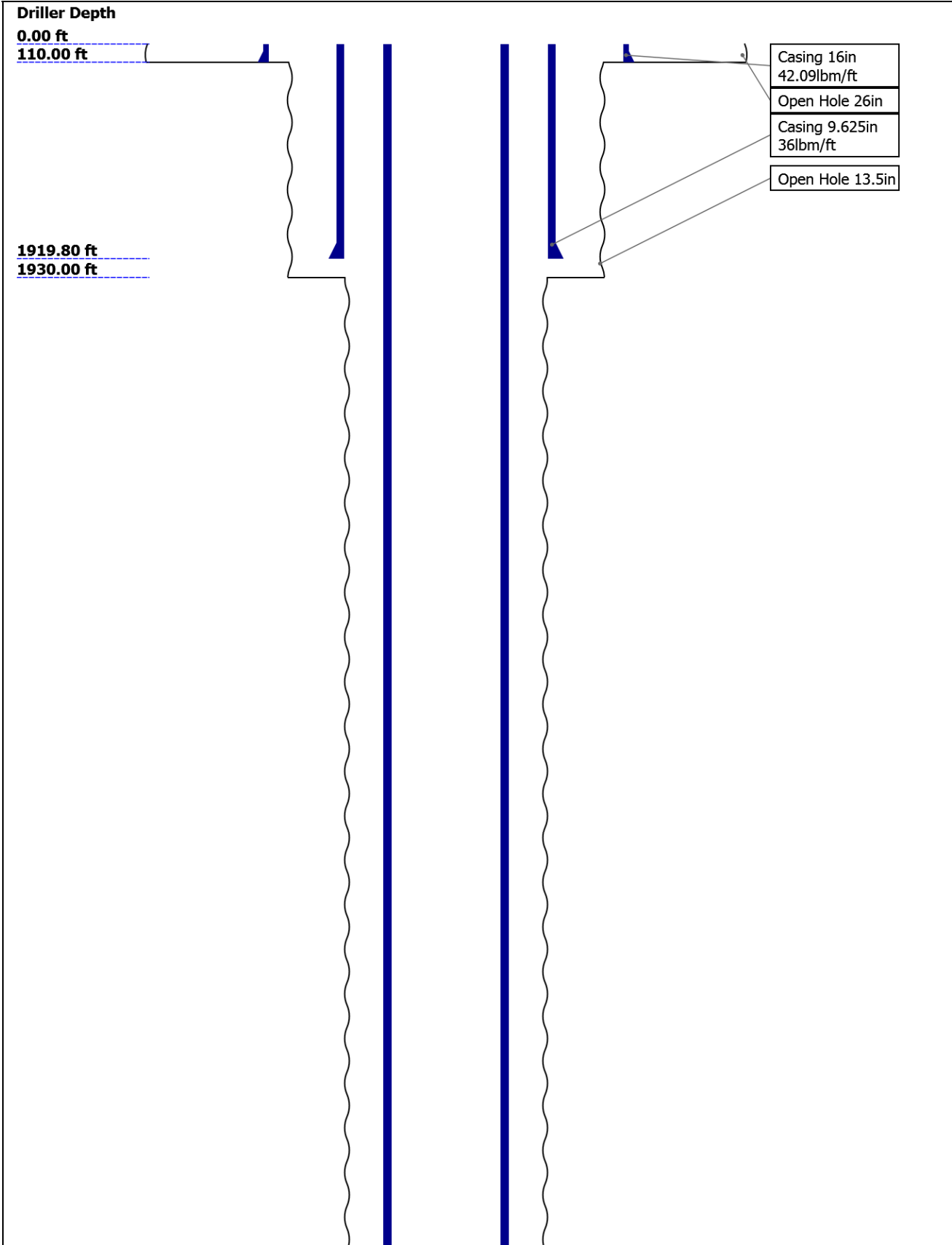
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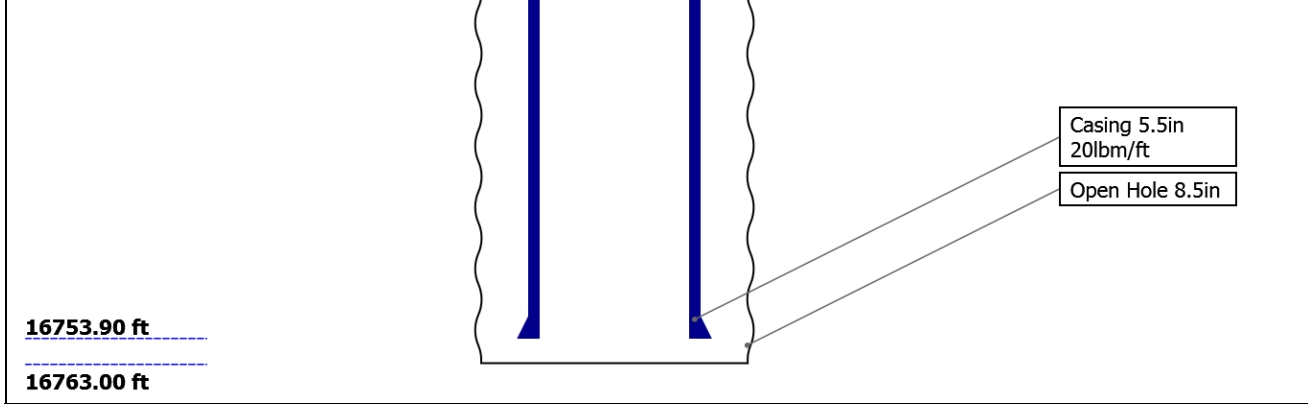
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Well Sketch



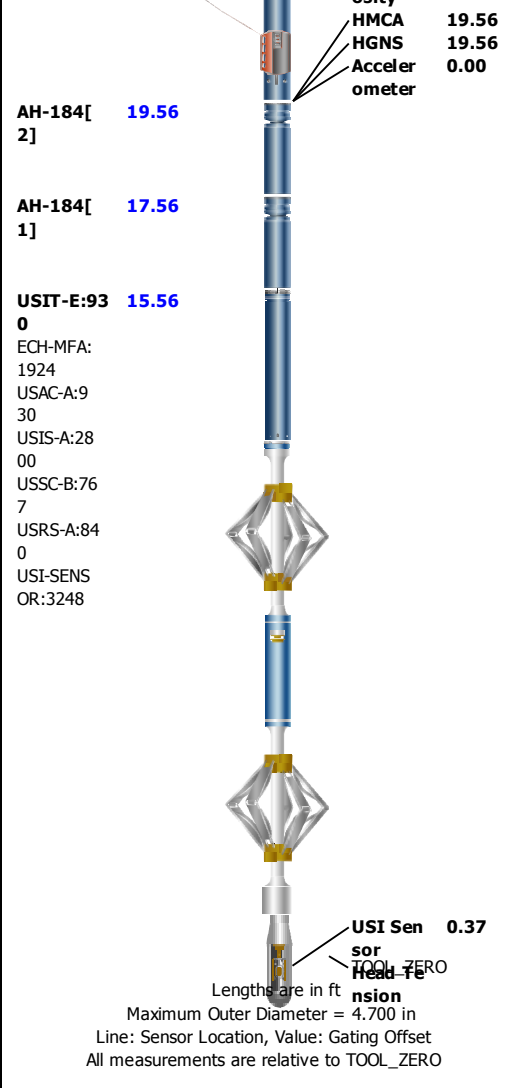


Borehole Size/Casing/Tubing Record

| | | | | | | |
|-----------------------|--------|--------|---------|--|--|--|
| Bit | | | | | | |
| Bit Size (in) | 26 | 13.5 | 8.5 | | | |
| Top Driller (ft) | 0 | 110 | 1930 | | | |
| Top Logger (ft) | 0 | 110 | 1930 | | | |
| Bottom Driller (ft) | 110 | 1930 | 16763 | | | |
| Bottom Logger (ft) | 110 | 1930 | 16763 | | | |
| Casing | | | | | | |
| Size (in) | 16 | 9.625 | 5.5 | | | |
| Weight (lbm/ft) | 42.09 | 36 | 20 | | | |
| Inner Diameter (in) | 15.511 | 8.921 | 4.778 | | | |
| Grade | N/A | N/A | N/A | | | |
| Top Driller (ft) | 0 | 0 | 0 | | | |
| Top Logger (ft) | 0 | 0 | 0 | | | |
| Bottom Driller (ft) | 110 | 1919.8 | 16753.9 | | | |
| Bottom Logger (ft) | 110 | 1919.8 | 16753.9 | | | |

Remarks and Equipment Summary

| One: Toolstring | | | | One: Remarks | |
|---|--------------------------------------|--|--|--------------|--|
| <div><div><div>Equip nameLengthMP nameOffset</div><div>LEH-QT38.38LEH-QT</div><div>EDTC-B35.47EDTH-BEDTG-AEDTC-B</div><div>HGNS-H28.97HGNHNSR-F:5068NPV-NHGNS-HHACCZ-H:5736HMCA-H</div></div><div><div>CTEM31.97ACCZ0.00HV0.00Gamma30.1RayTelStatu28.97sTemper28.94atureGR28.23</div><div>CNL Por21.89osity</div></div></div> | Toolstring ran as per tool sketch. | | | | |
| | Well logged at 10 degree 6 inch. | | | | |
| | Main pass logged with 2500 psi. | | | | |
| | Repeat pass logged with 0 psi. | | | | |
| | Thank you for choosing Schlumberger! | | | | |



| Depth Summary | | | |
|------------------------------|-------------|--|--|
| | One | | |
| Depth Measuring Device | | | |
| Type | IDW-B | | |
| Serial Number | | | |
| Calibration Date | | | |
| Calibrator Serial Number | | | |
| Calibration Cable Type | | | |
| Wheel Correction 1 | 0 | | |
| Wheel Correction 2 | 0 | | |
| Tension Device | | | |
| Type | CMTD-B/A | | |
| Serial Number | | | |
| Calibration Date | | | |
| Calibrator Serial Number | | | |
| Number of Calibration Points | 0 | | |
| Logging Cable | | | |
| Type | 7-46NT-XS | | |
| Serial Number | | | |
| Length | 24000.00 ft | | |
| Conveyance Type | Wireline | | |

| | | |
|------------------------------|-----------------------|---|
| Rig Type | | |
| One:Depth Control Parameters | | Depth Control Remarks |
| Log Sequence | First Log In the Well | All Schlumberger depth procedures followed. |
| Rig Up Length At Surface | | IDW used as primary depth device. |
| Rig Up Length At Bottom | | Z-Chart used as secondary depth device. |
| Rig Up Length Correction | | |
| Stretch Correction | | |
| Tool Zero Check At Surface | | |

Composite 1

2500 PSI Main Pass

Software Version

| | |
|--------------------|----------------|
| Acquisition System | Version |
| Maxwell 2016 SP2 | 6.2.68624.3100 |

Composite Summary

| Run Name | Pass Objective | Direction | Top | Bottom | Start | Stop | DSC Mode | Depth Shift | Include Parallel Data |
|----------|----------------|-----------|-----------|------------|------------------------|------------------------|----------|-------------|-----------------------|
| One | Log[4]:Up | Up | 791.70 ft | 6508.80 ft | 09-Apr-2017 4:54:40 PM | 09-Apr-2017 6:44:47 PM | ON | 4.17 ft | Yes |
| One | Log[5]:Up | Up | 63.99 ft | 917.43 ft | 09-Apr-2017 6:45:25 PM | 09-Apr-2017 7:02:35 PM | ON | 4.17 ft | Yes |

All depths are referenced to toolstring zero

Log

Company:Noble Energy, Inc.

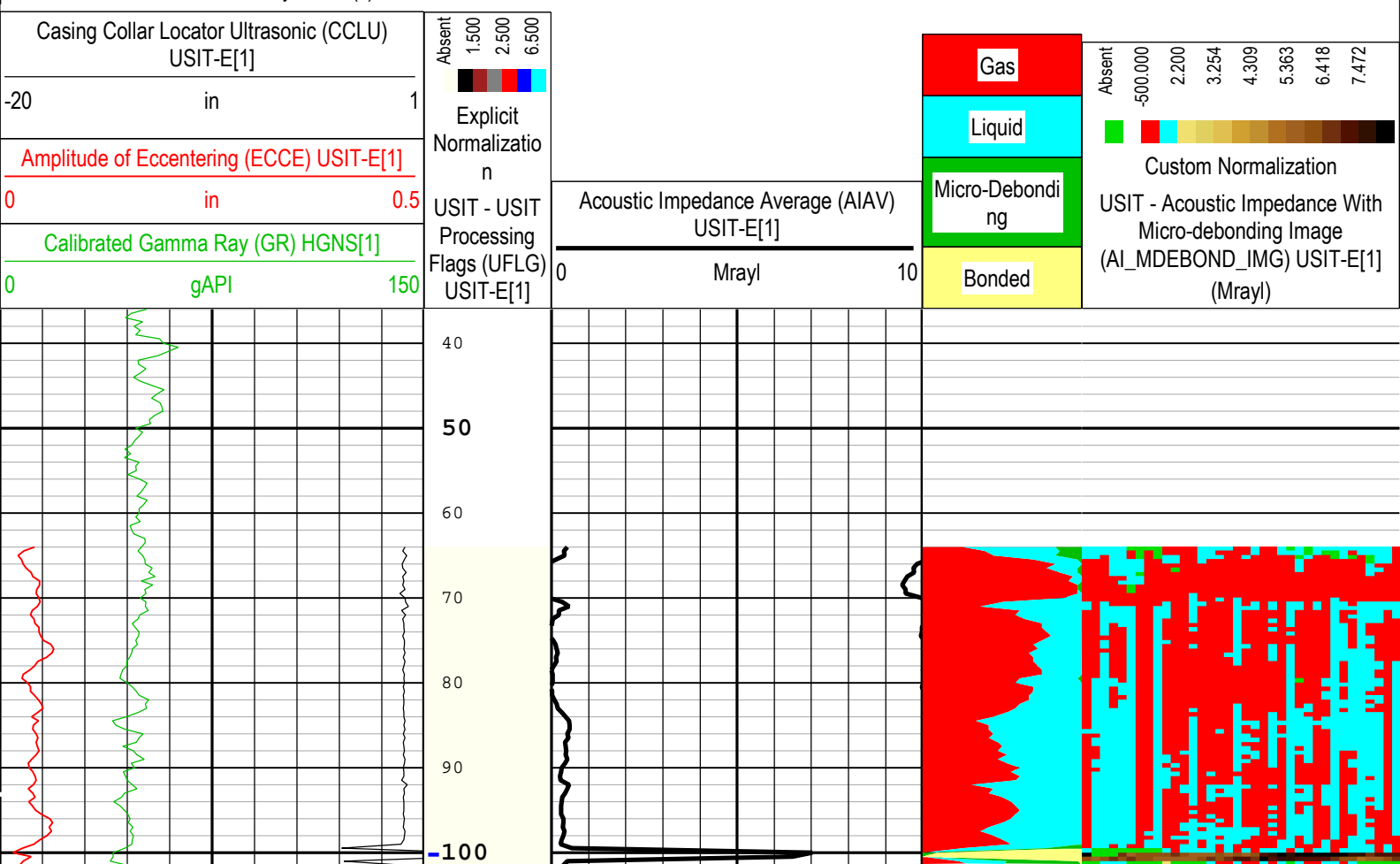
Well:Wells Ranch State AA33-790

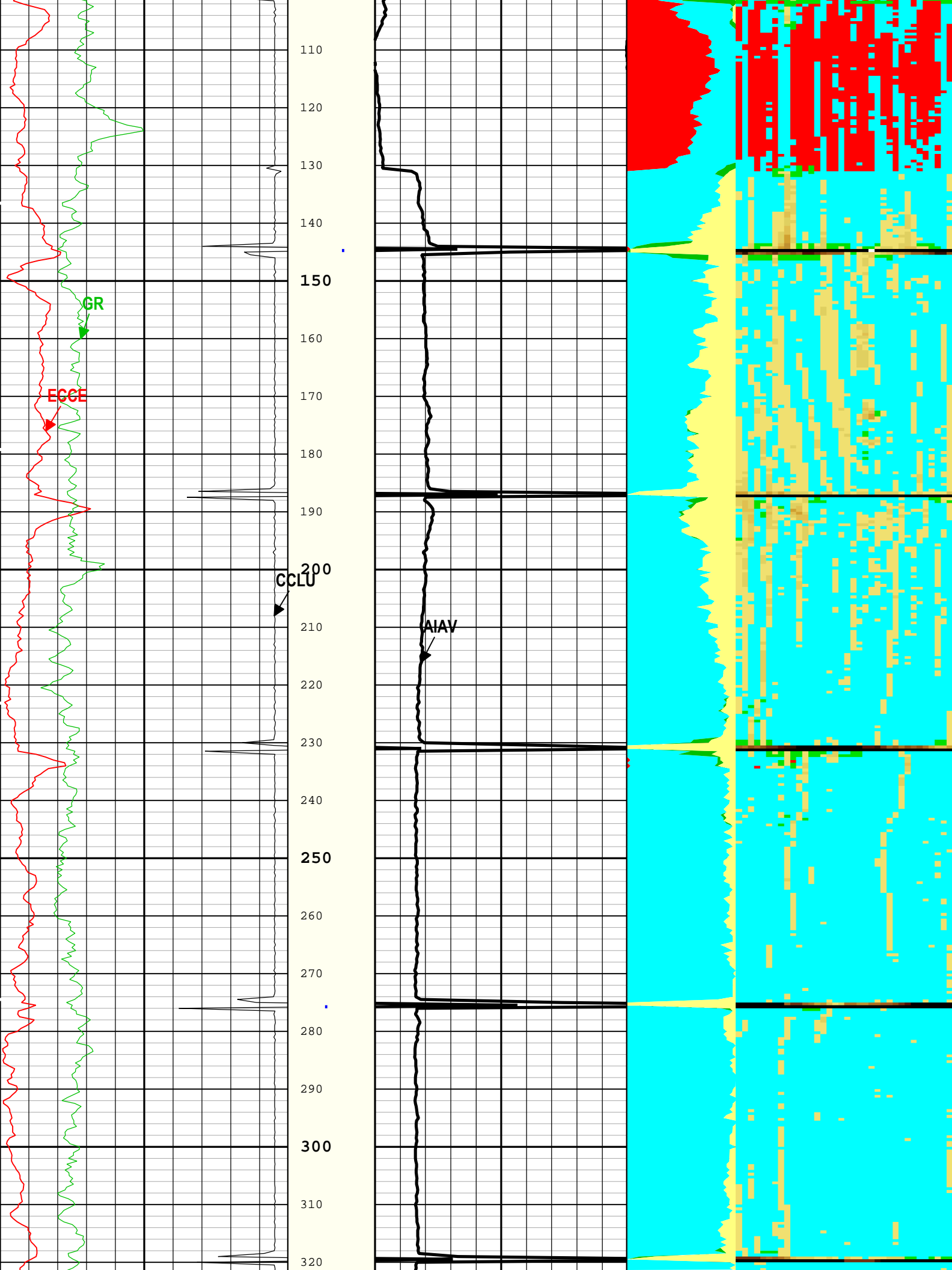
Composite 1:S006

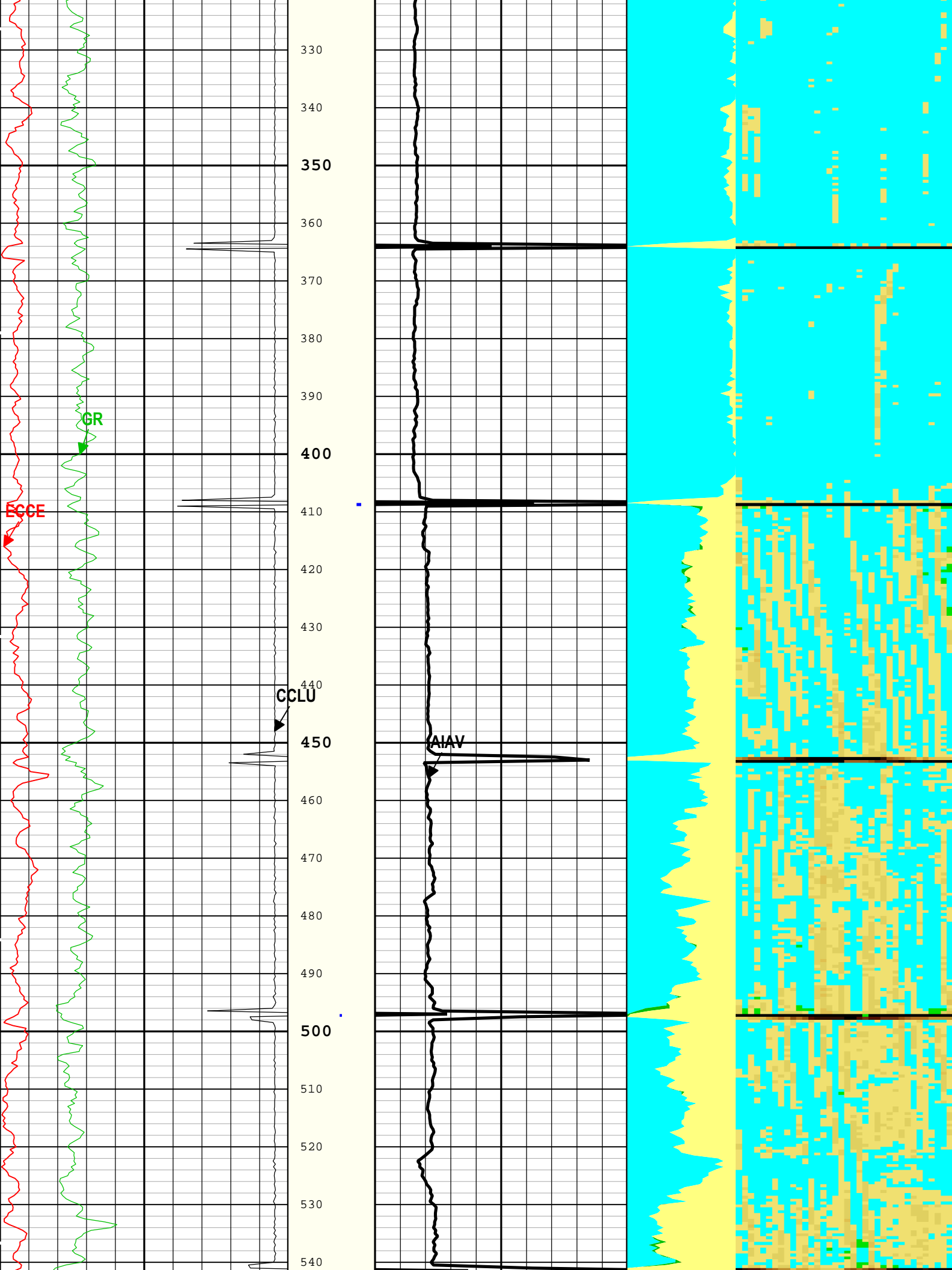
Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth

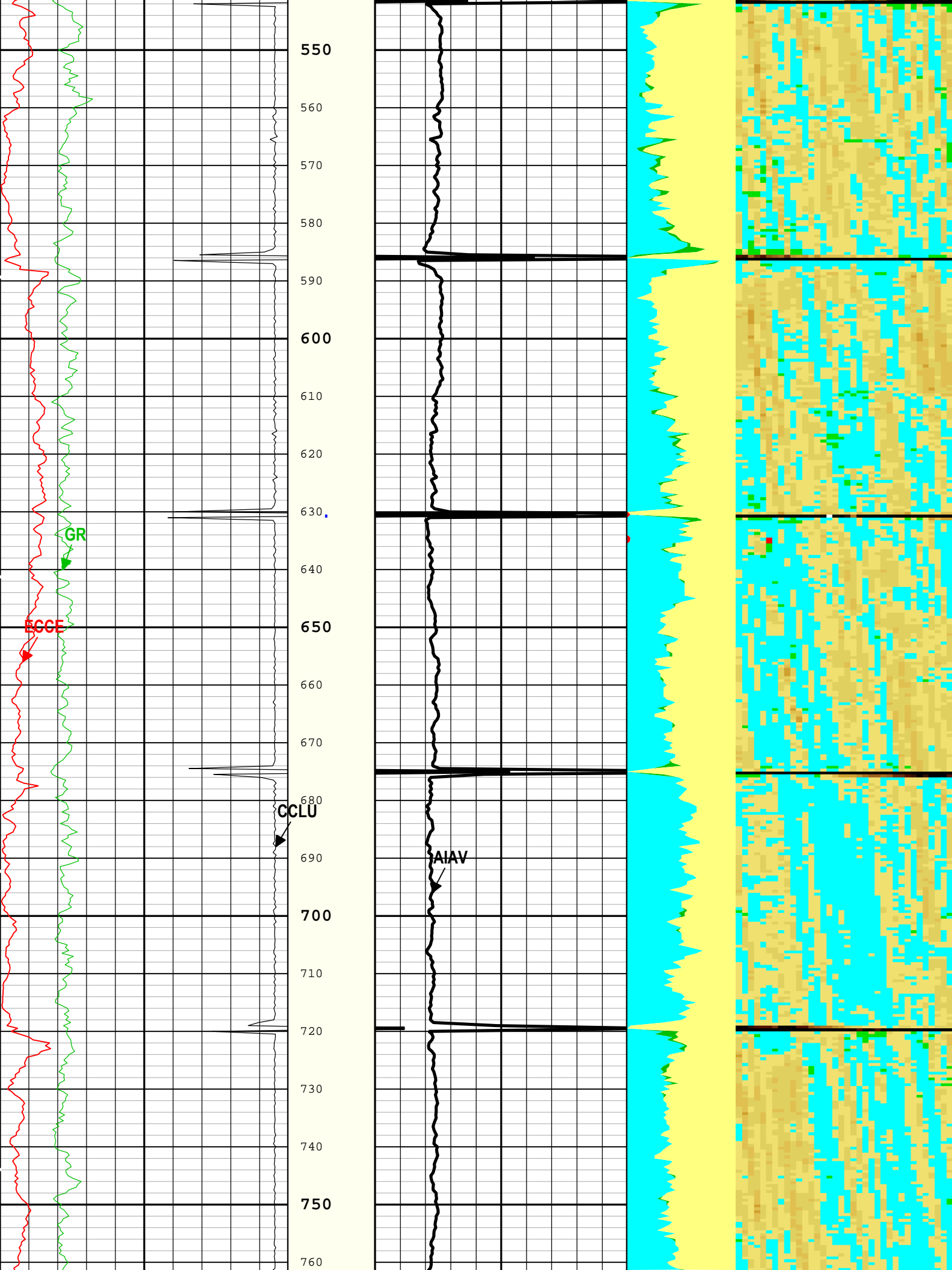
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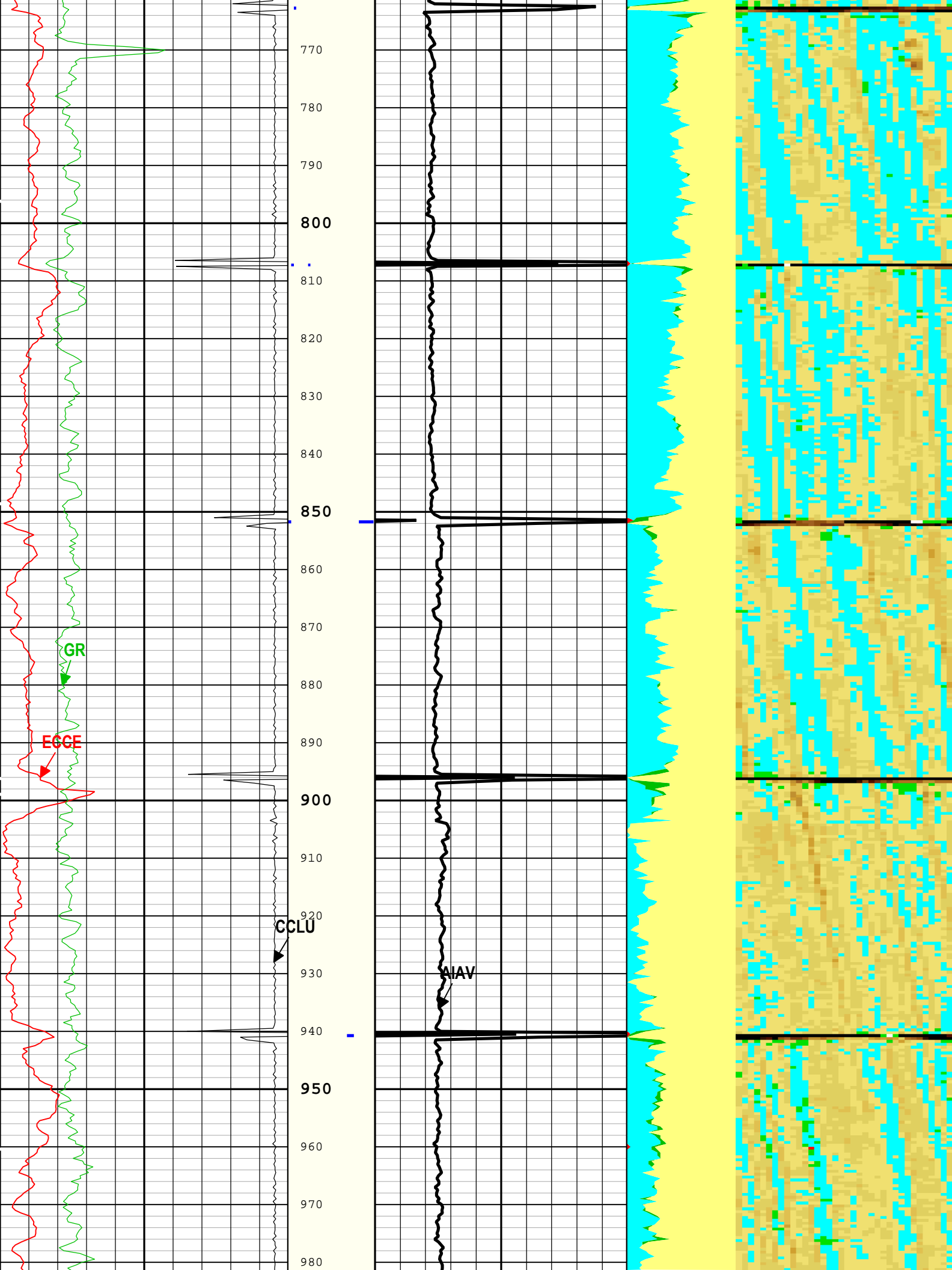
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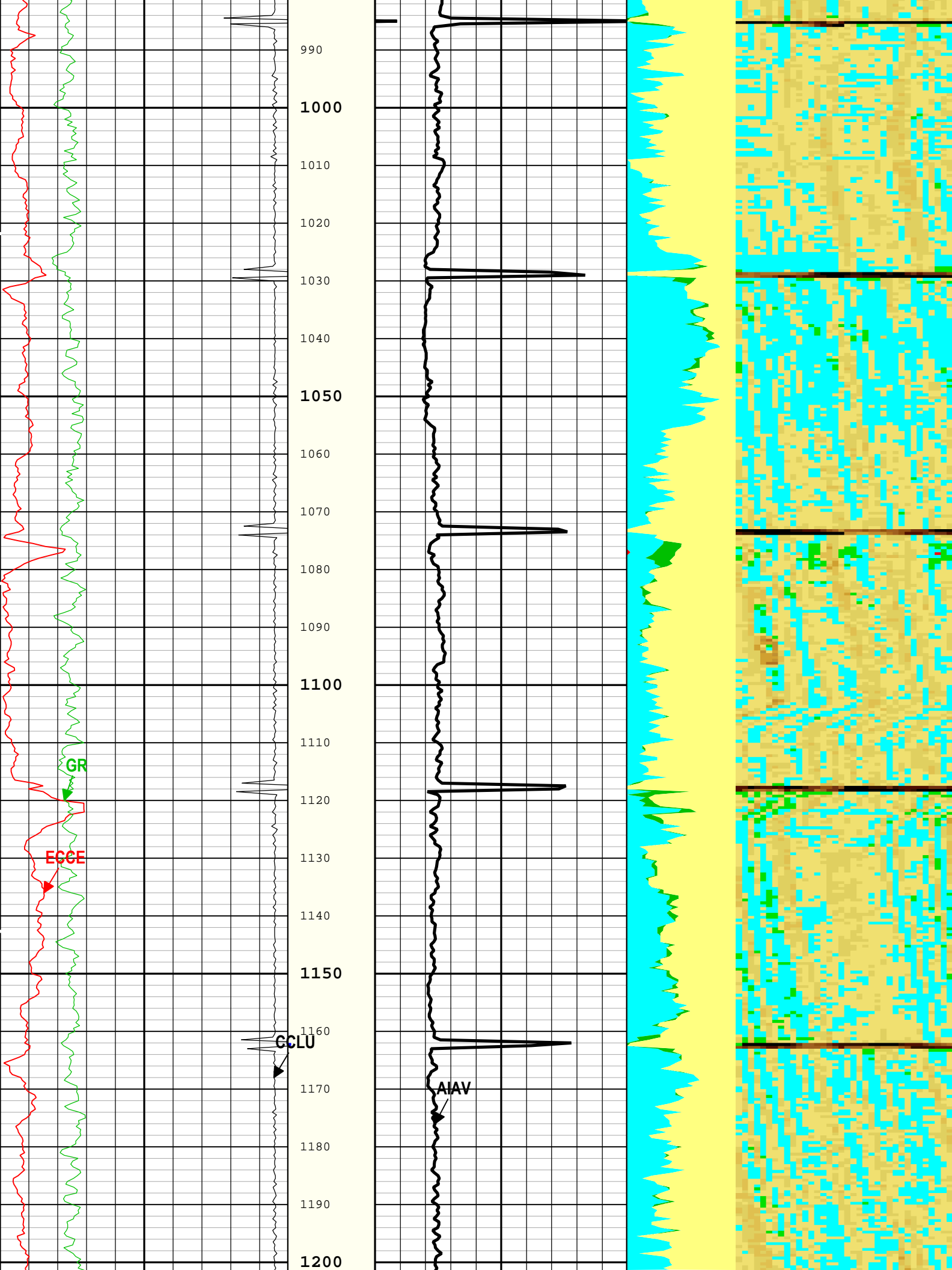


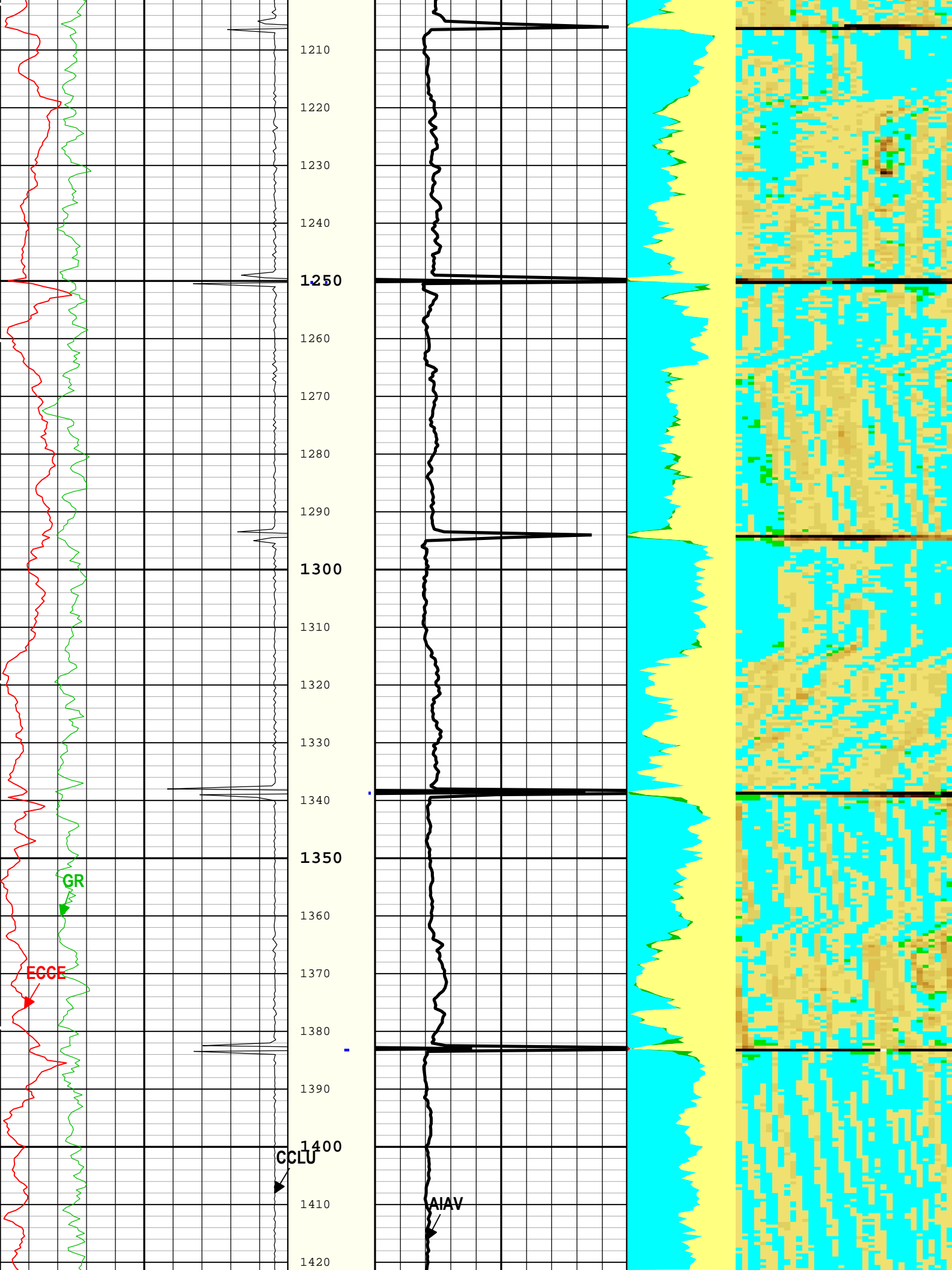


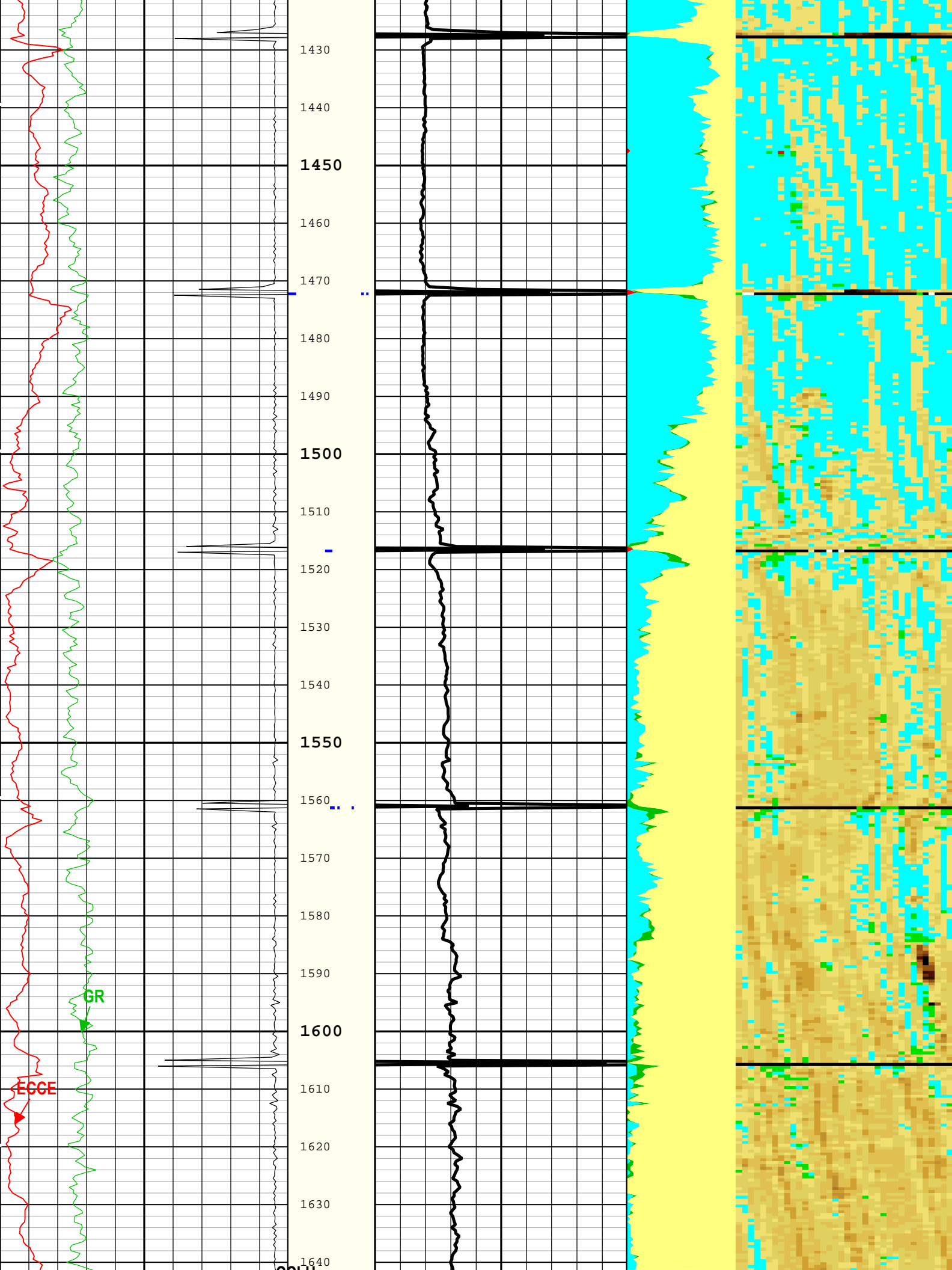


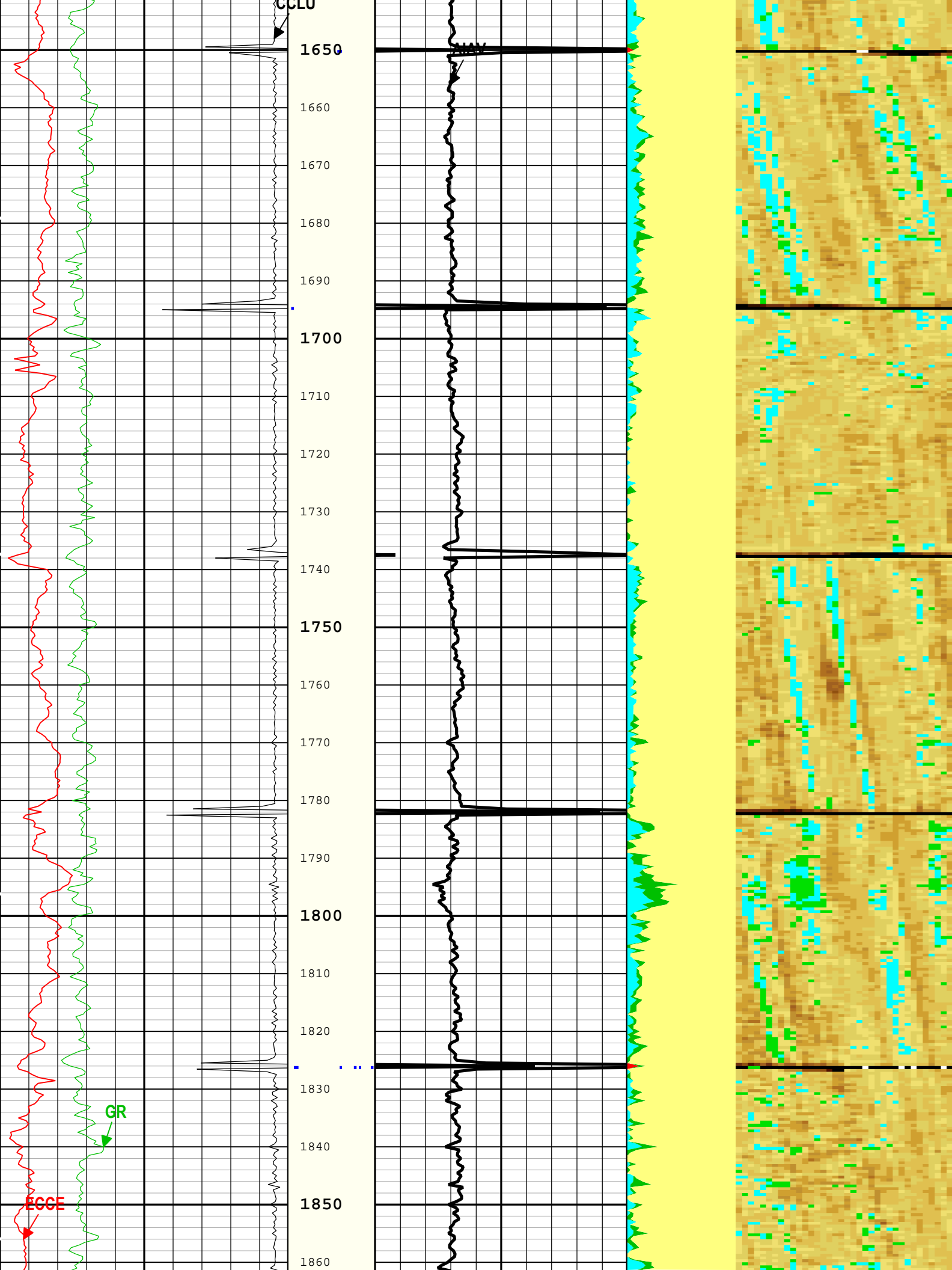


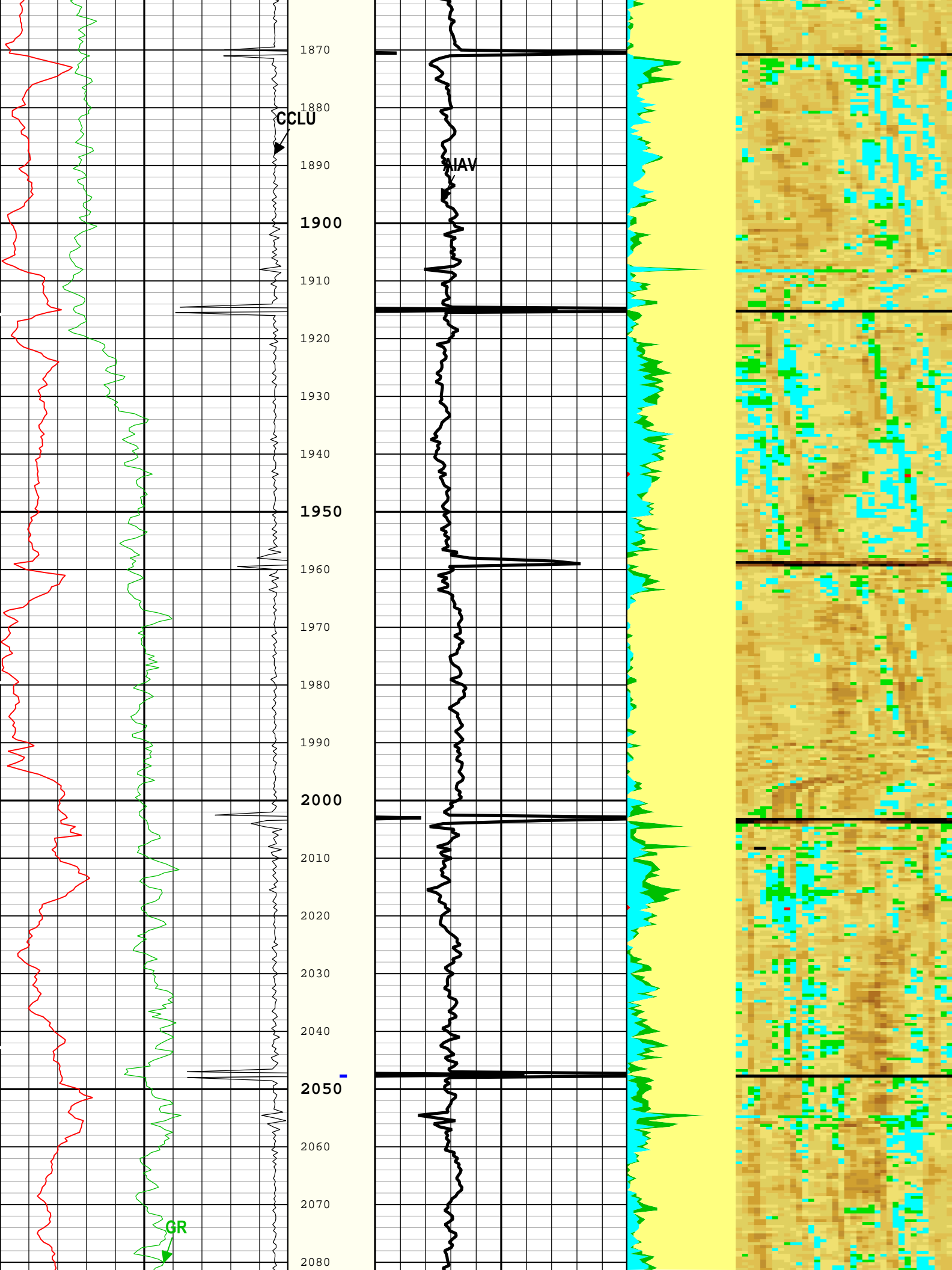


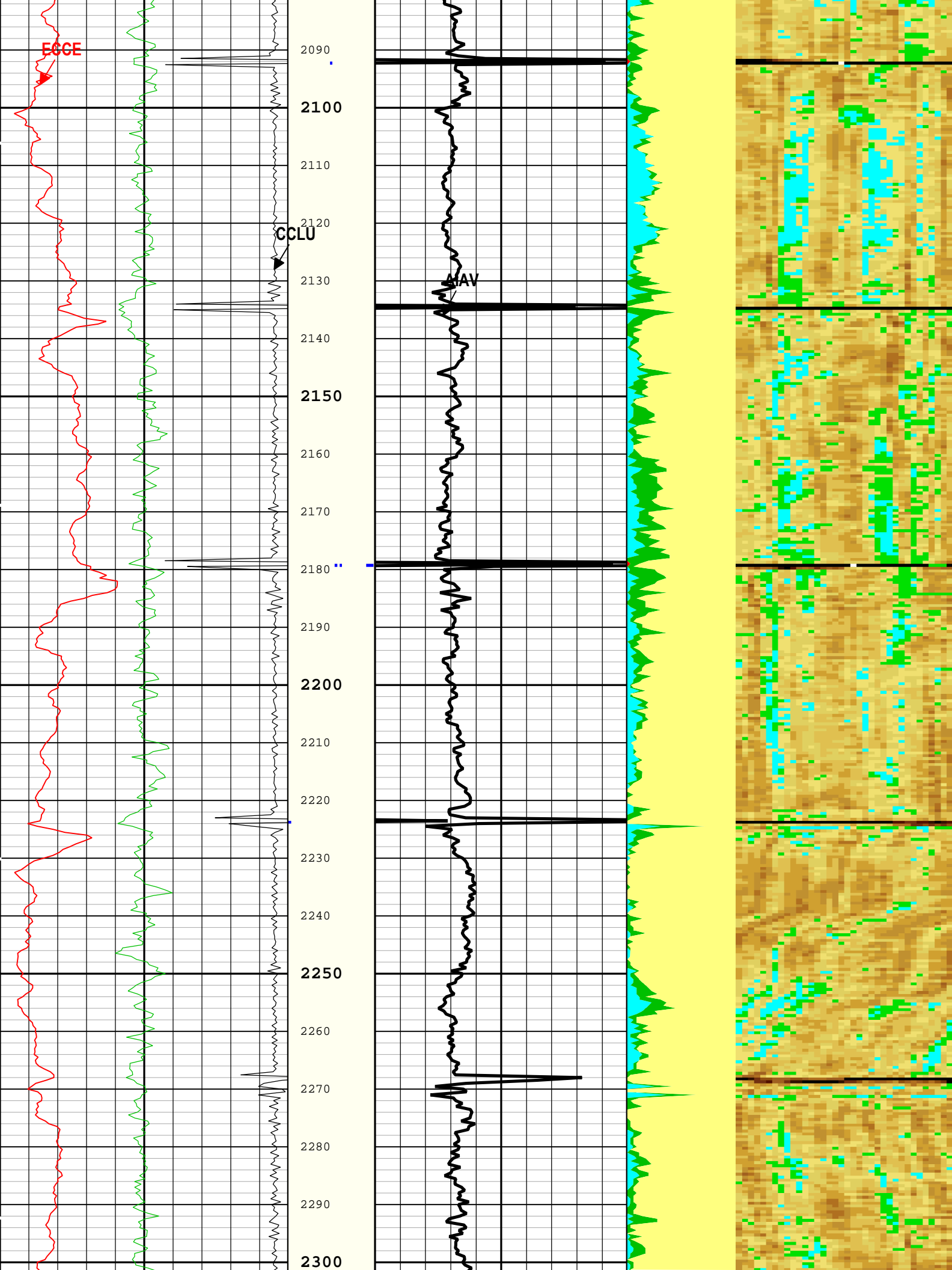


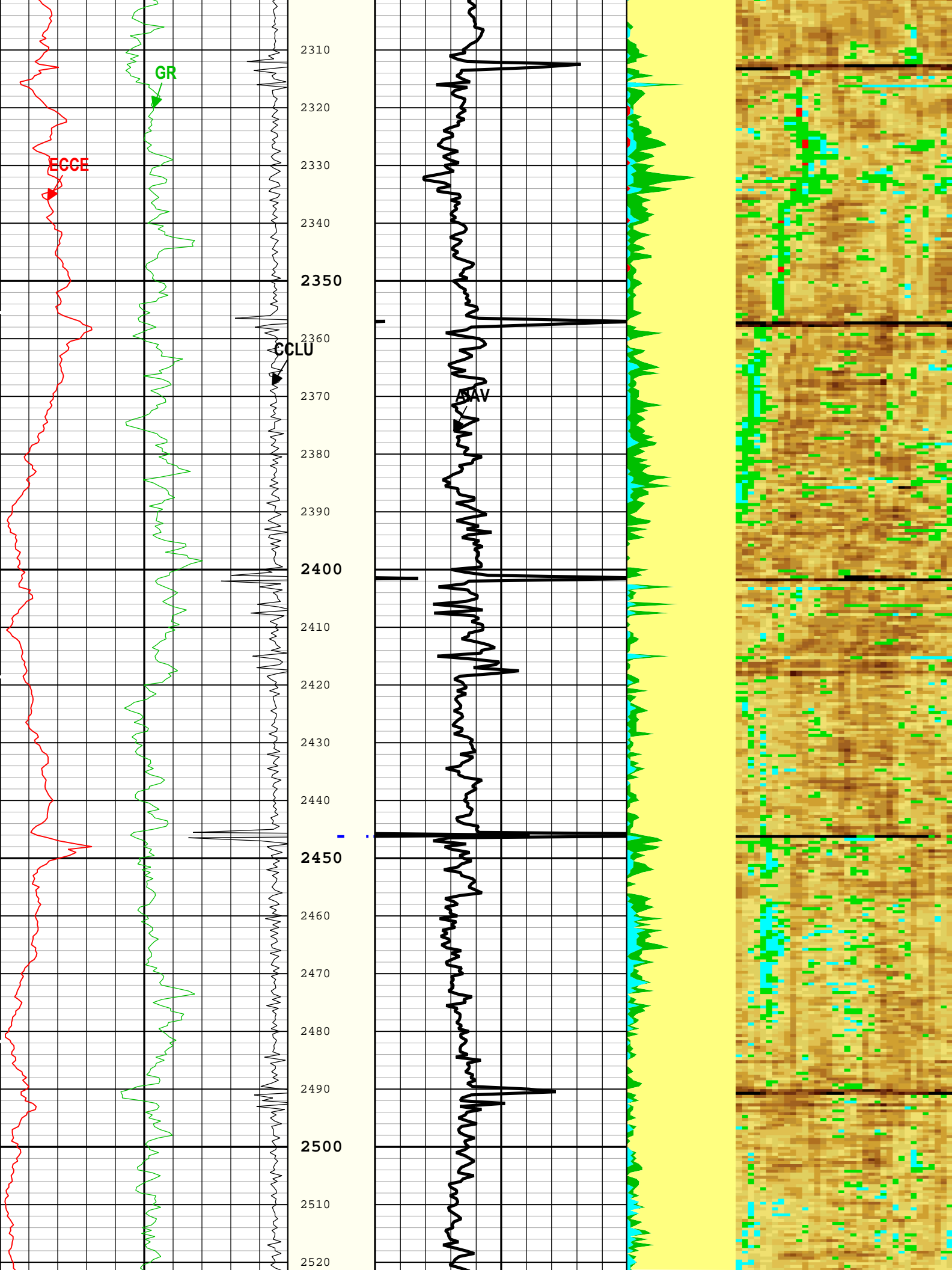


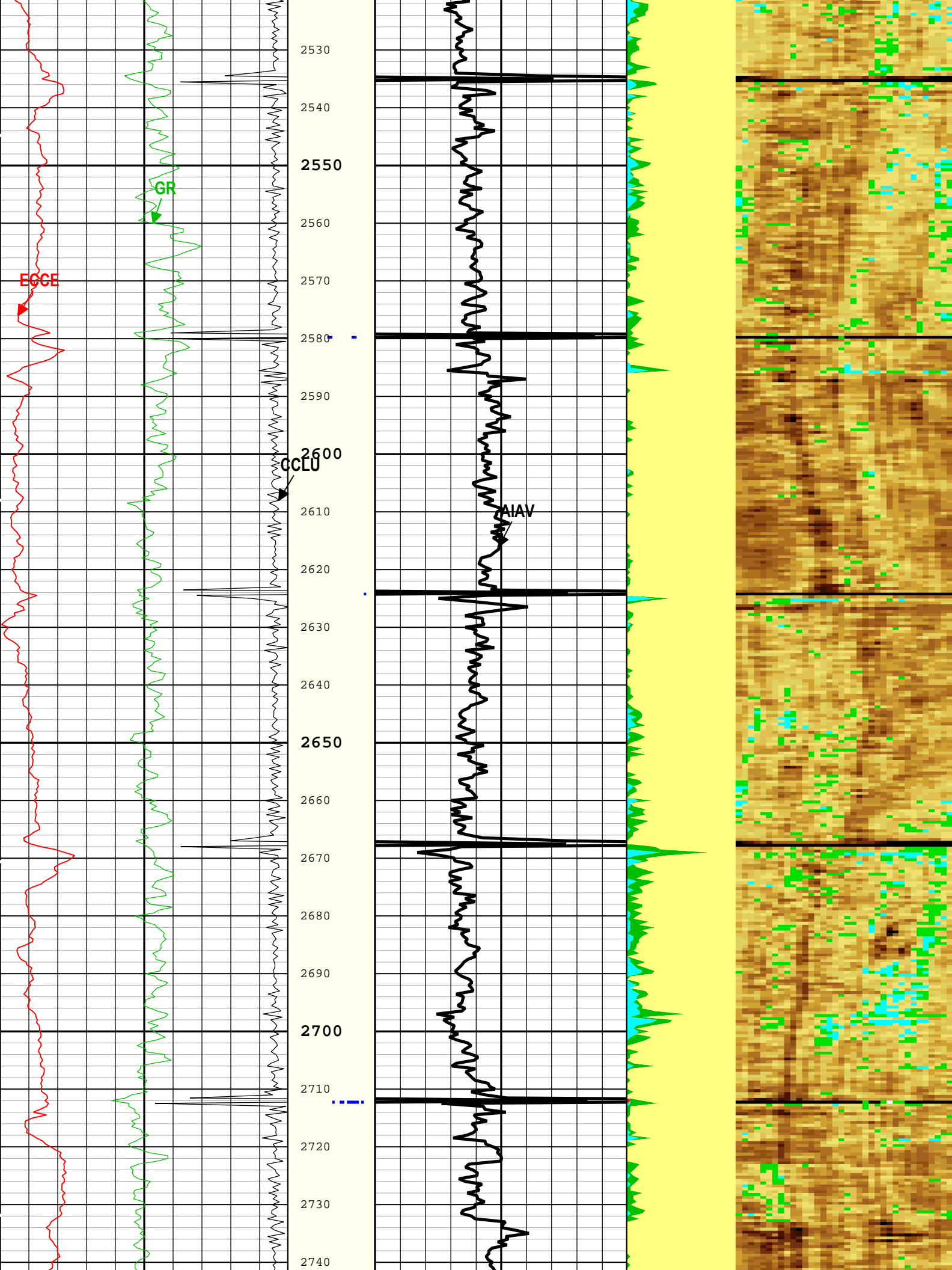


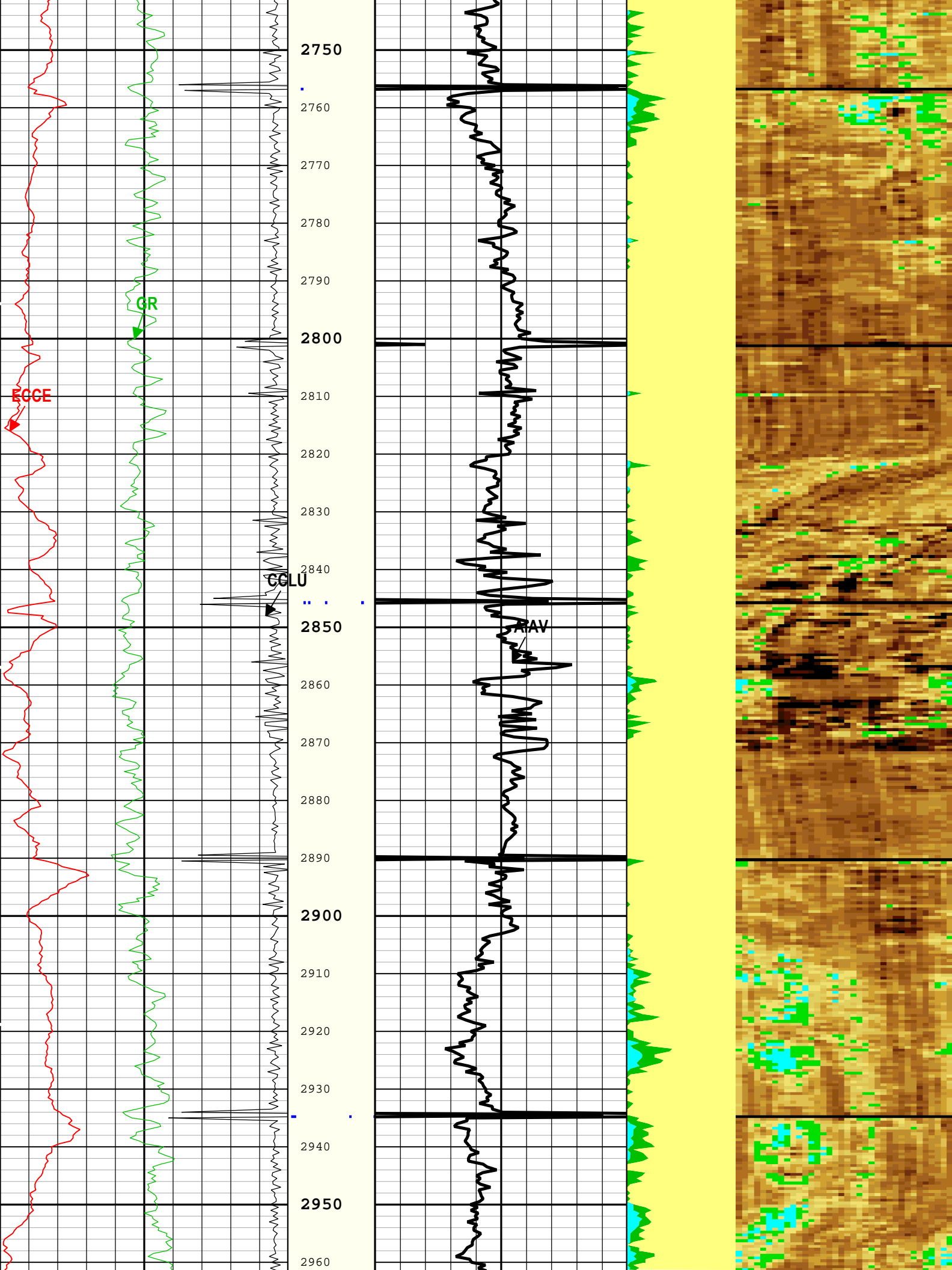


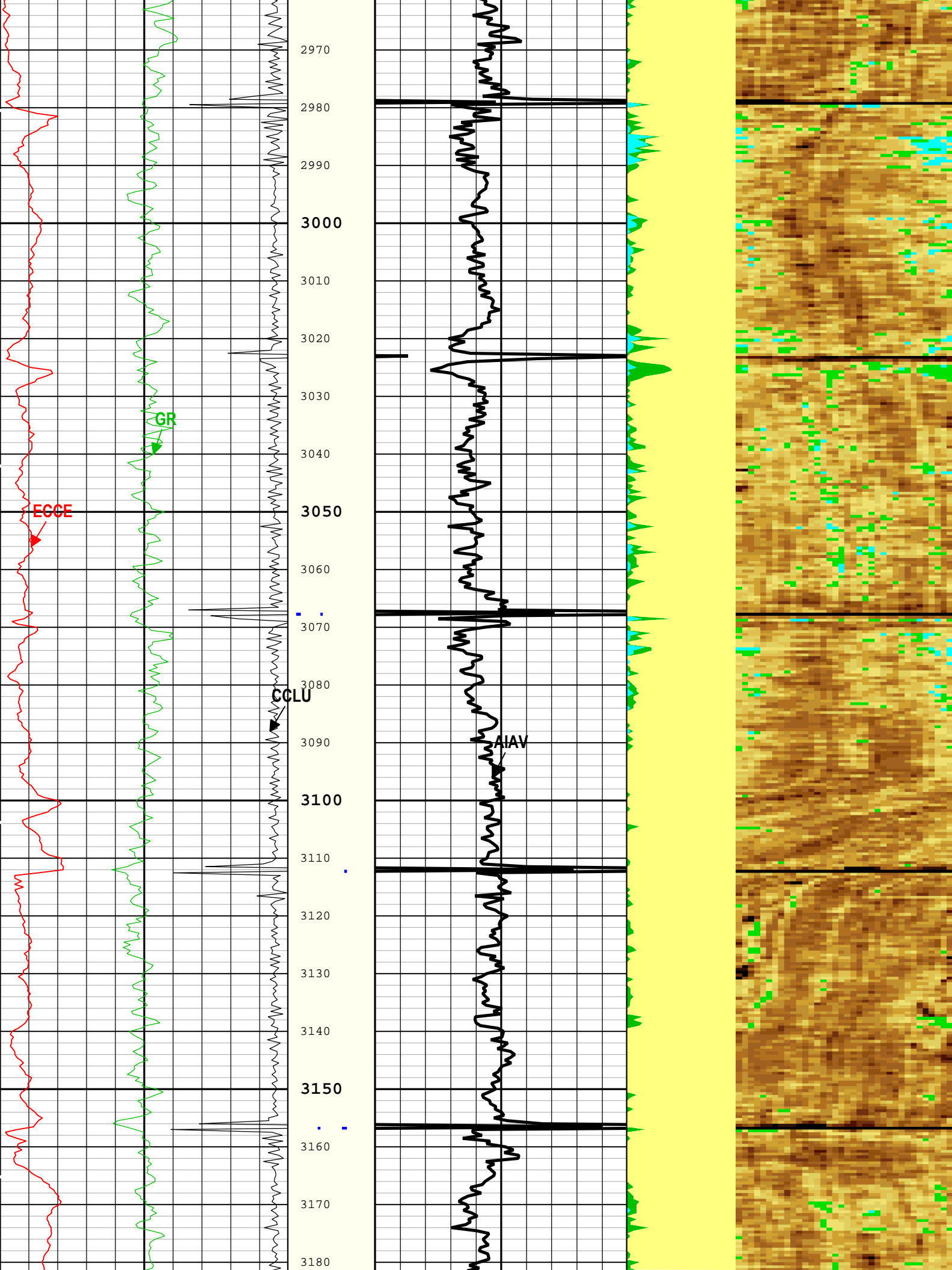


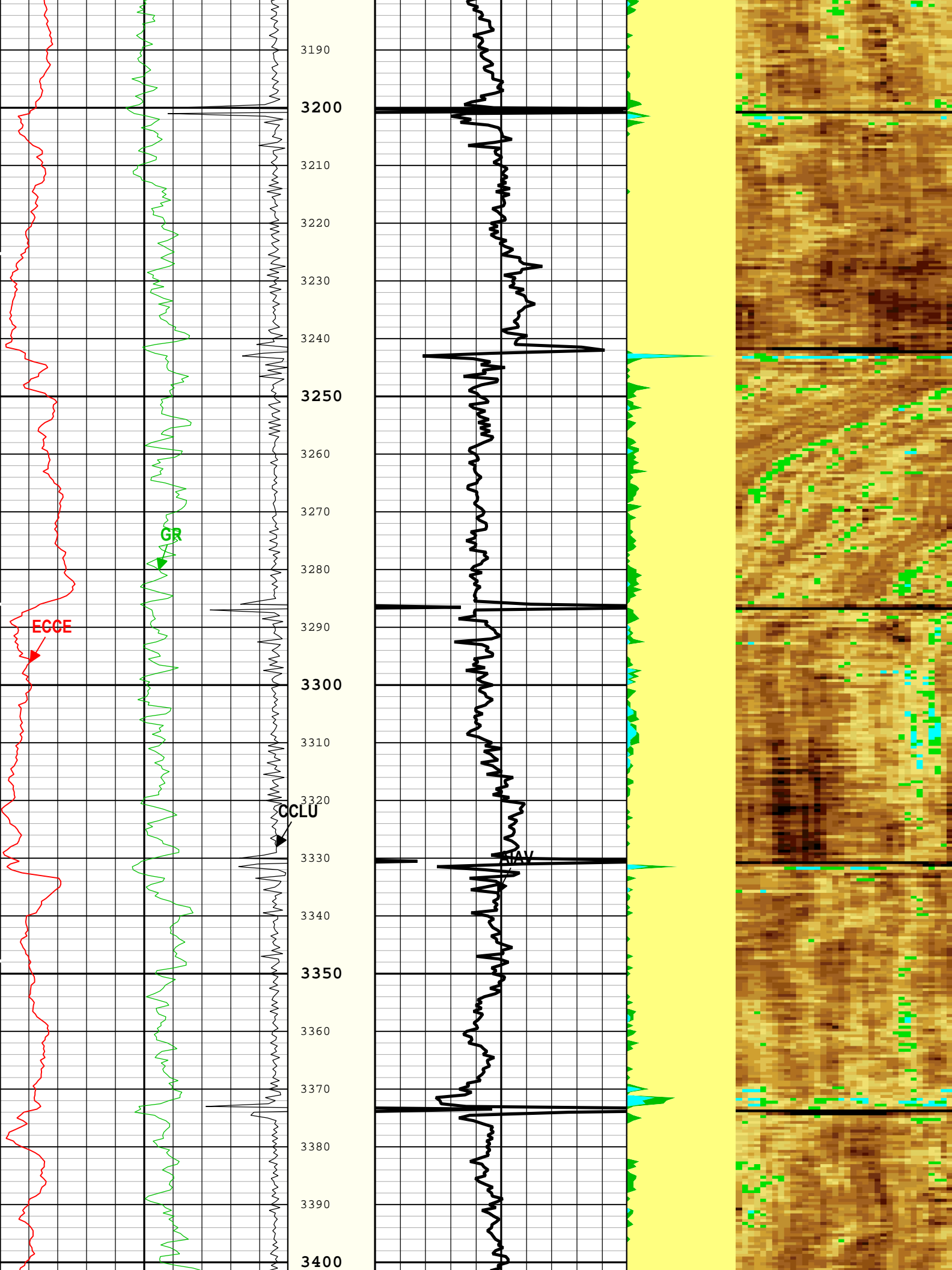


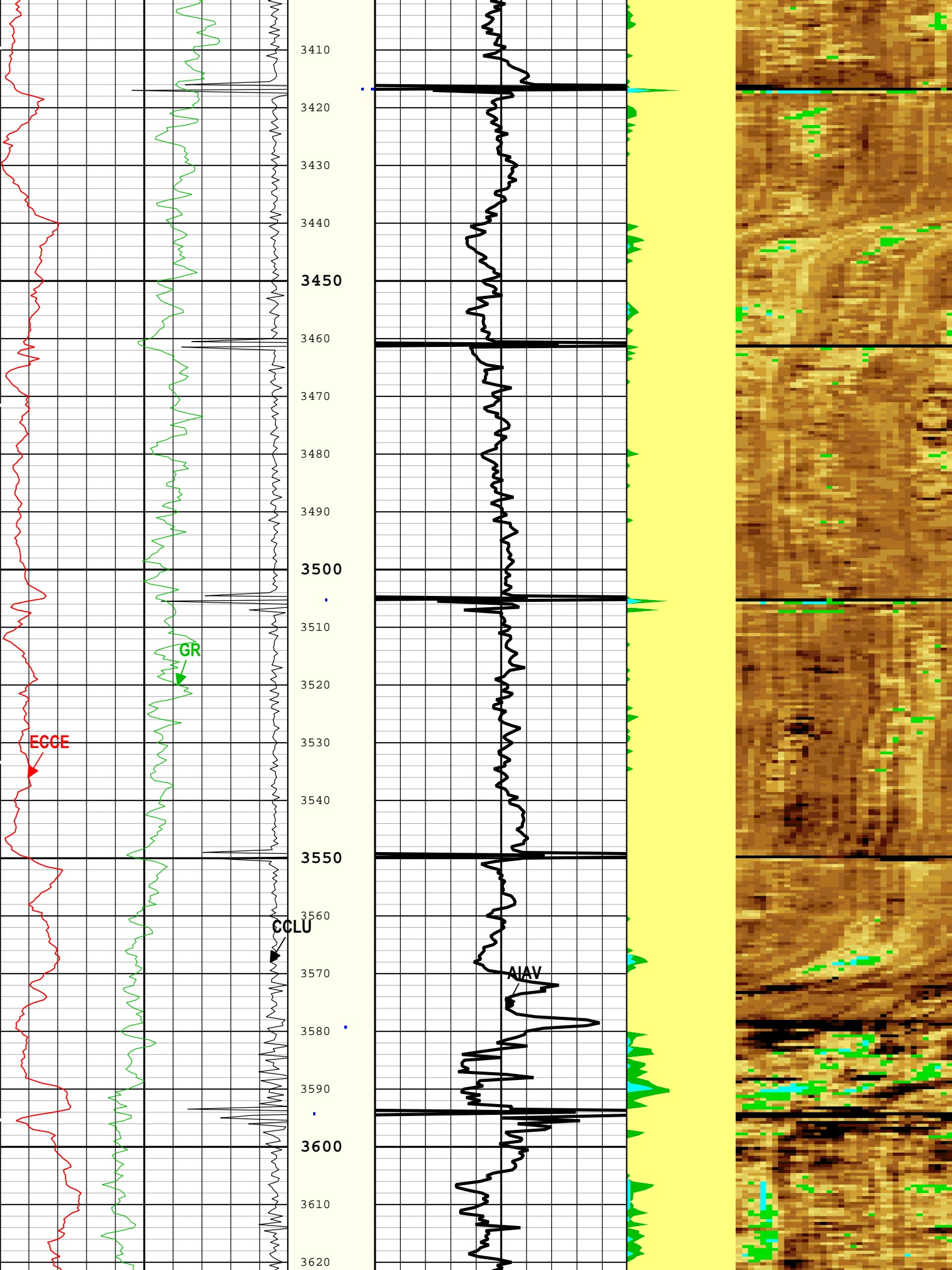


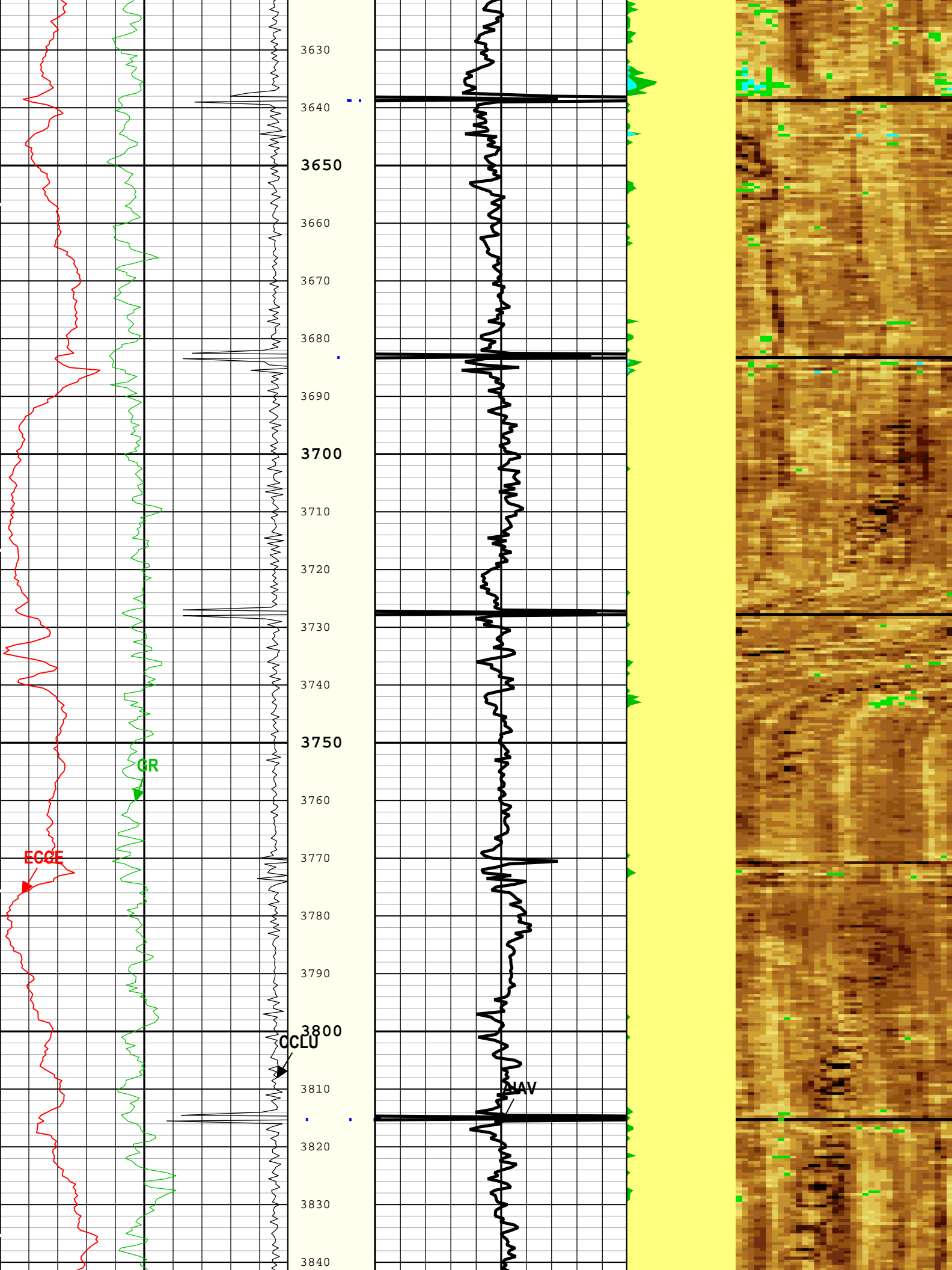


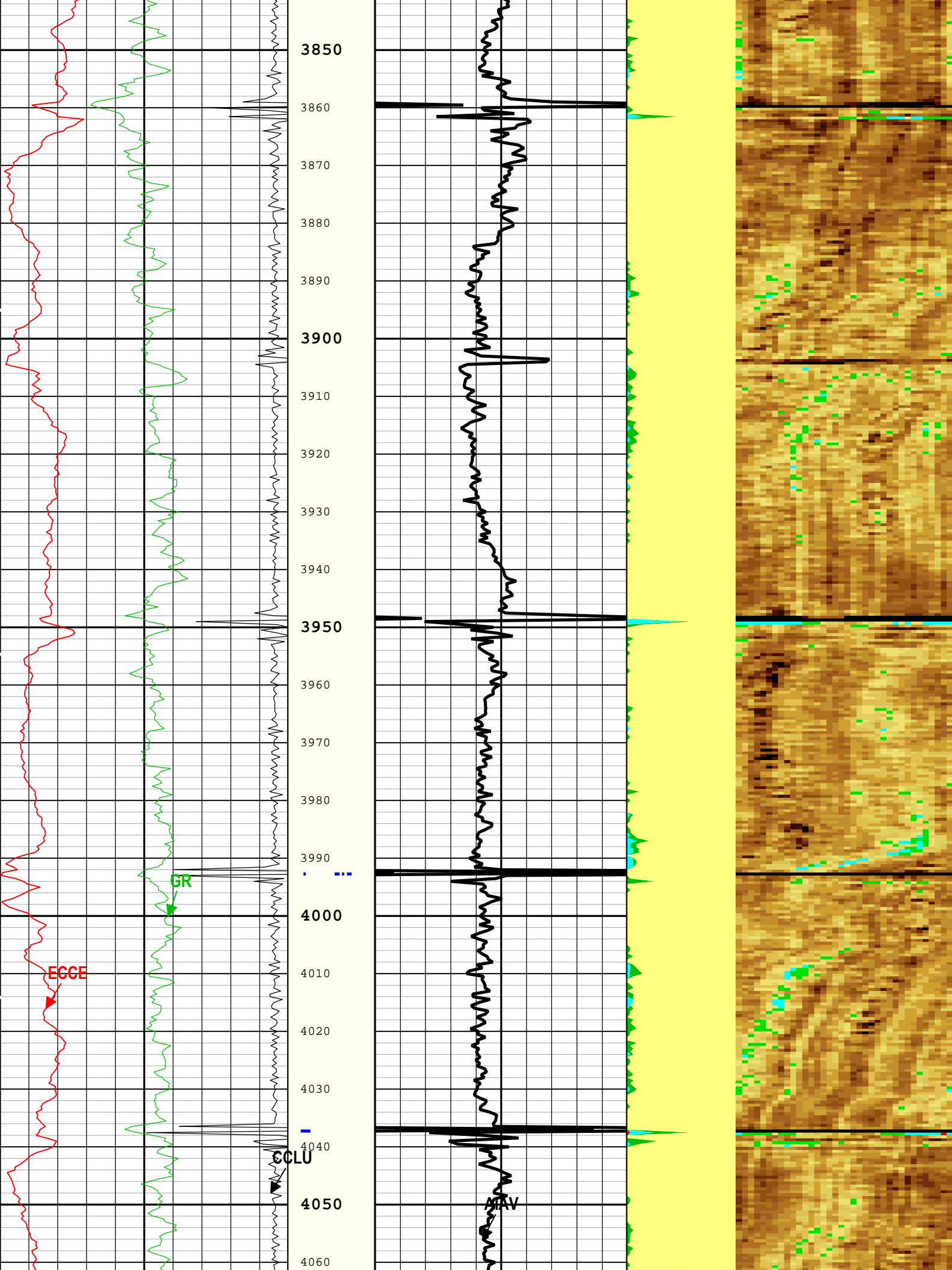


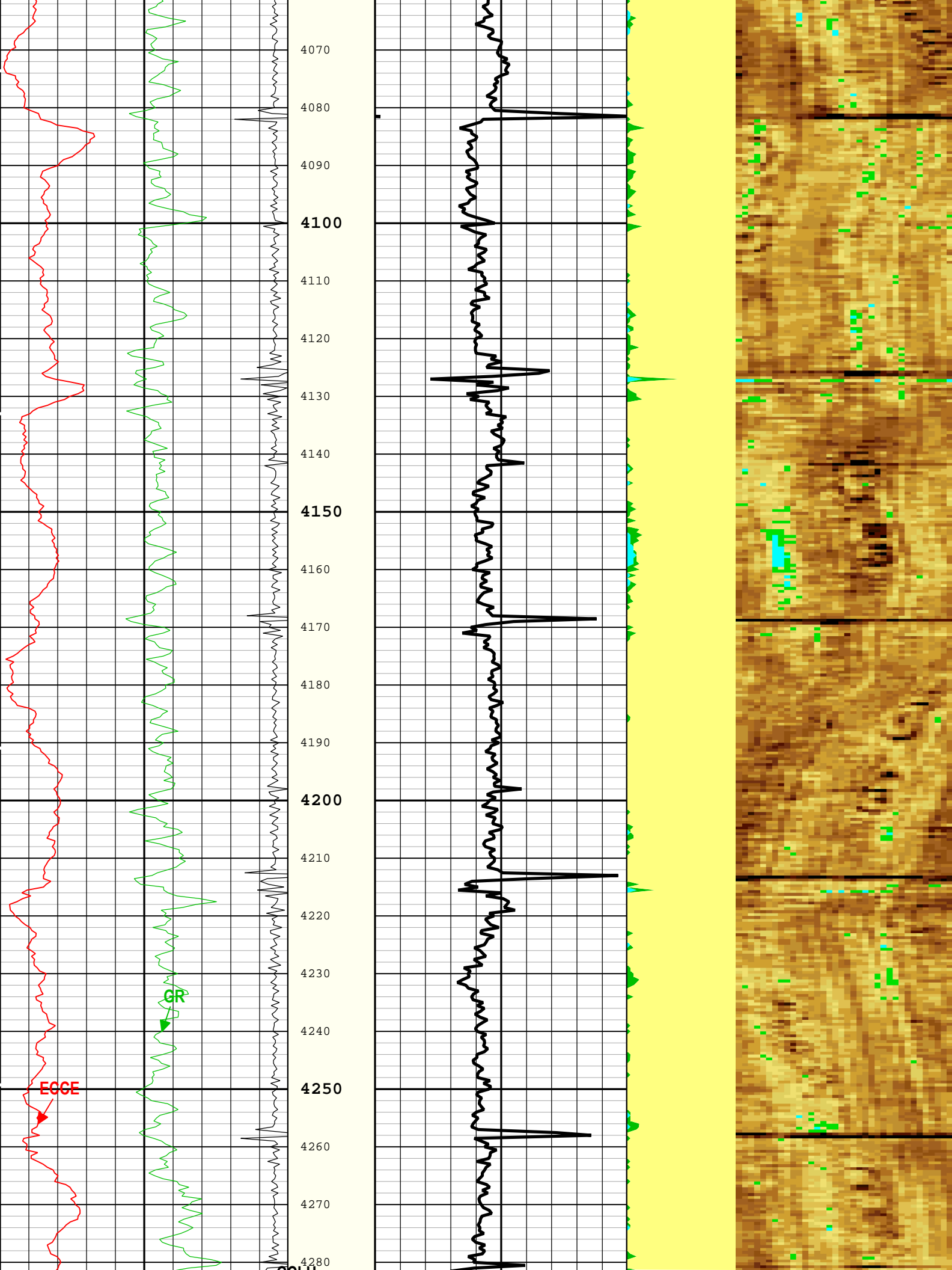


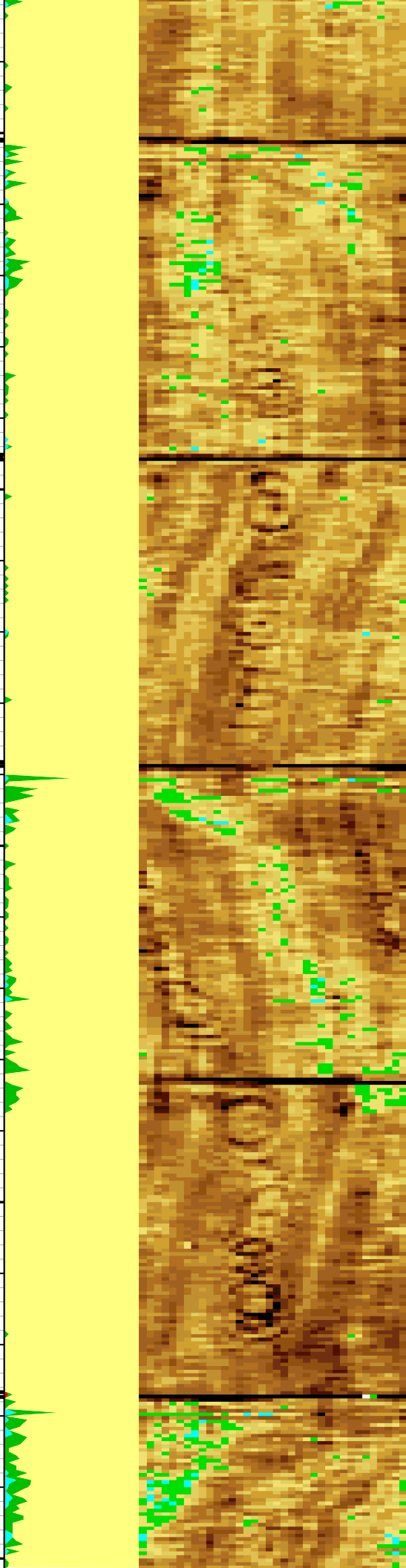
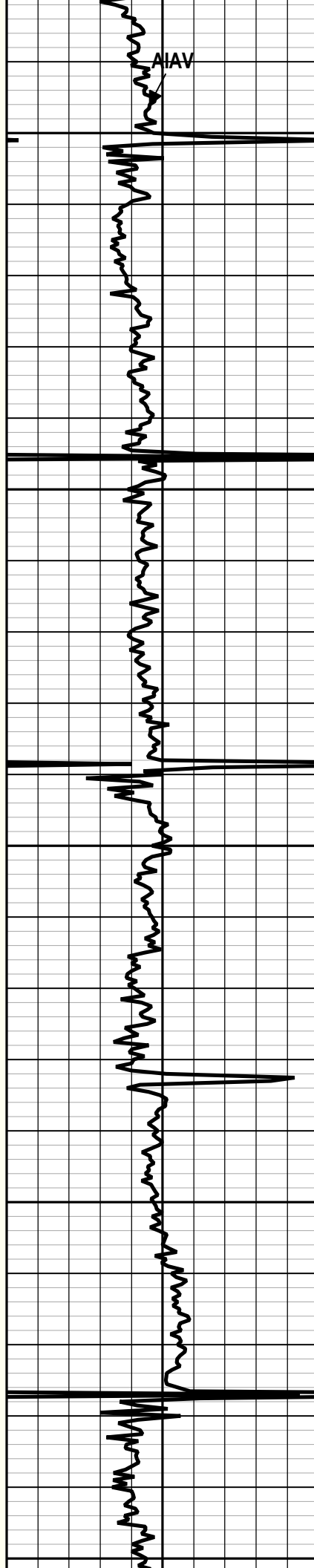
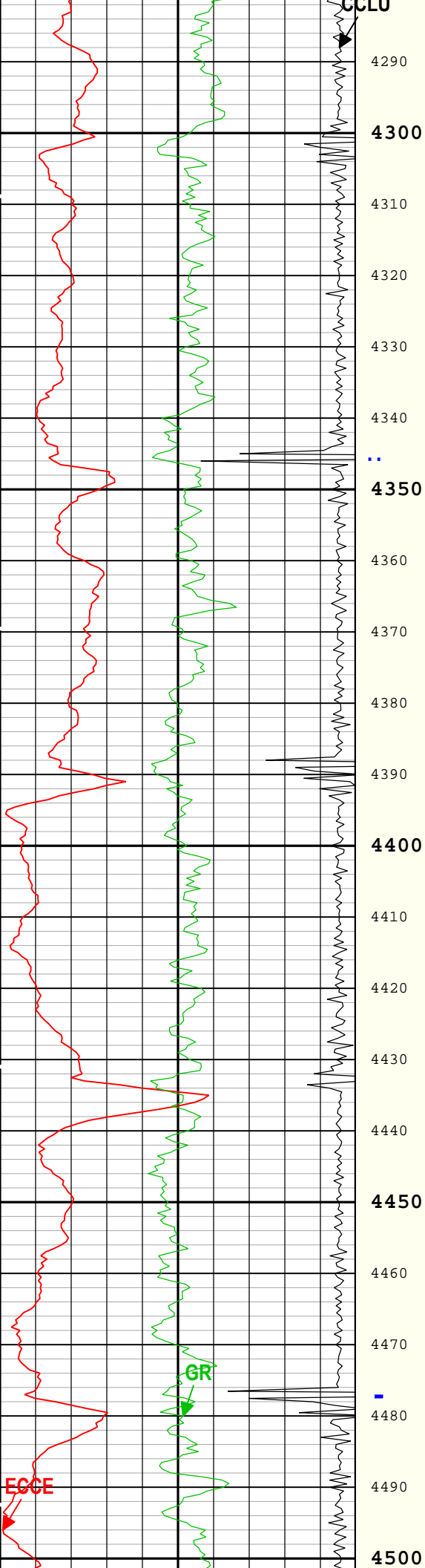


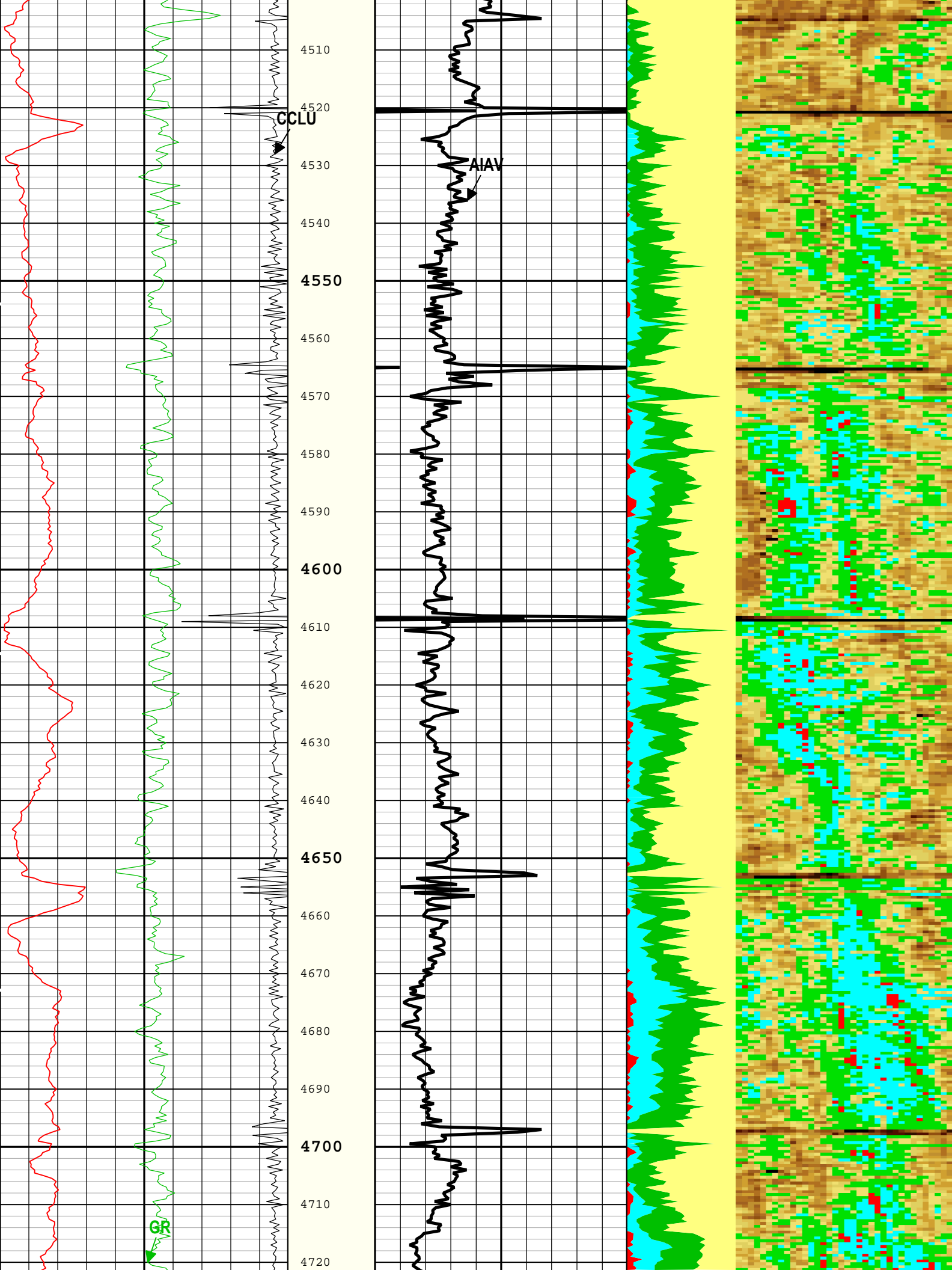


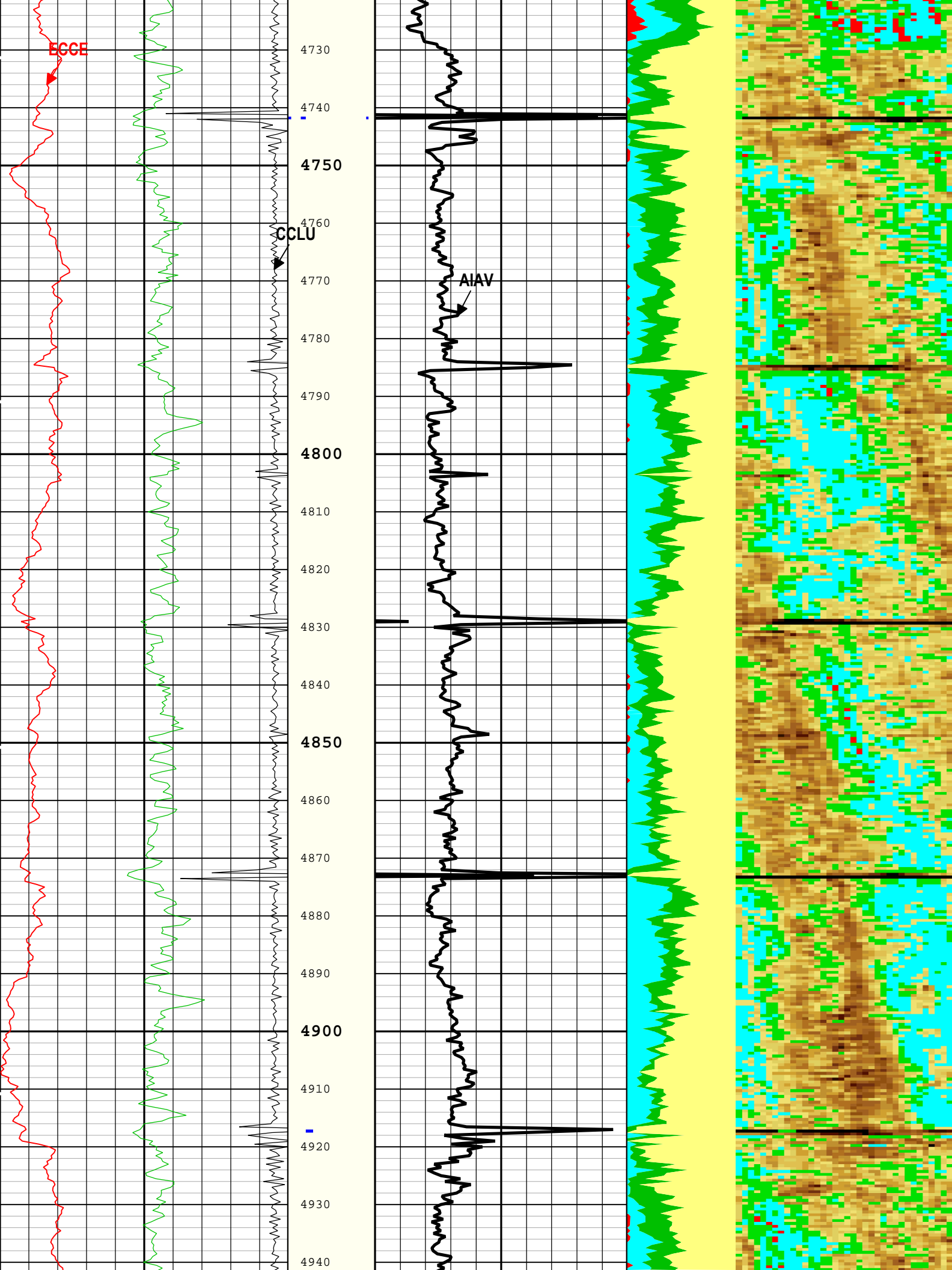


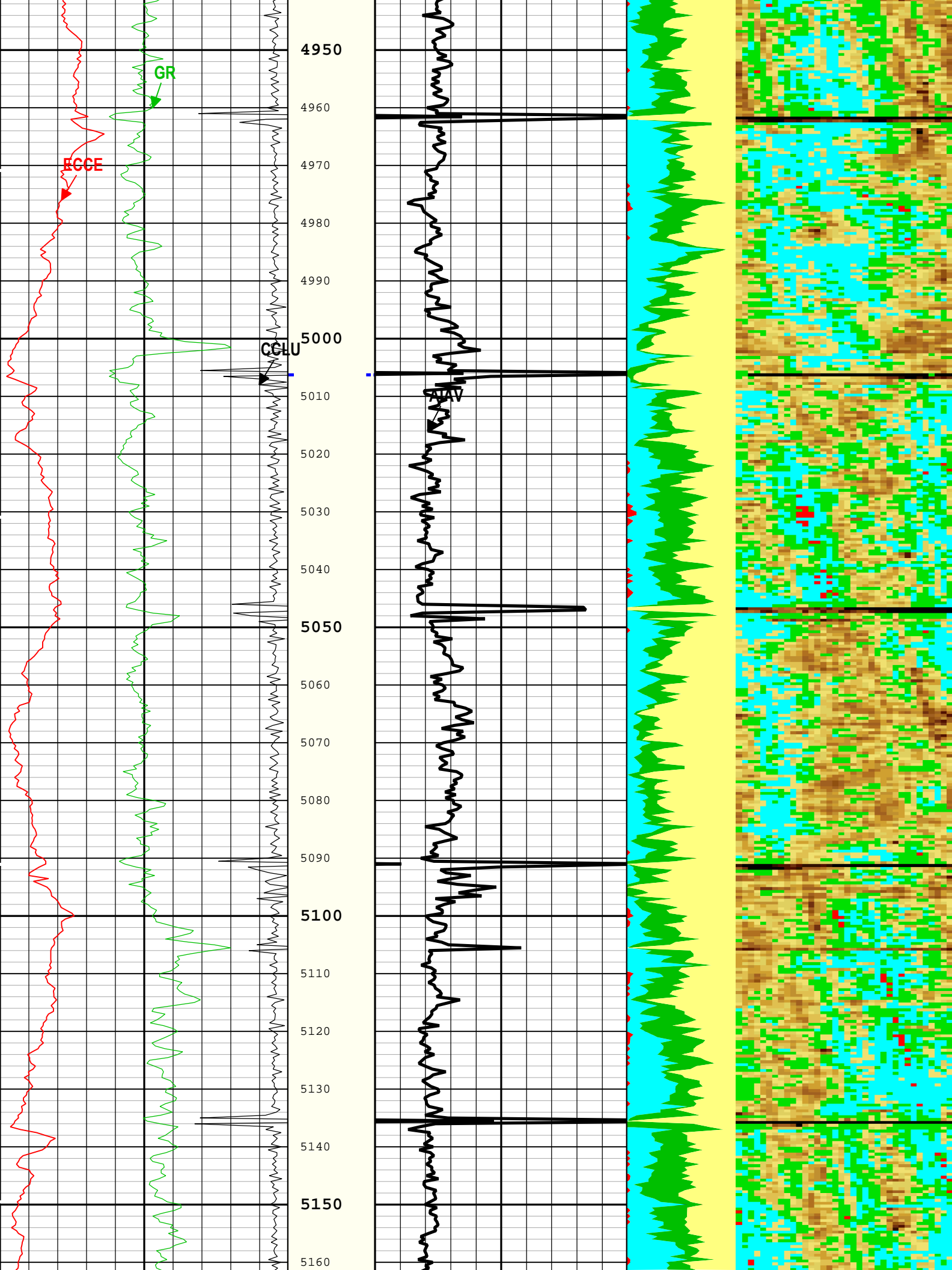


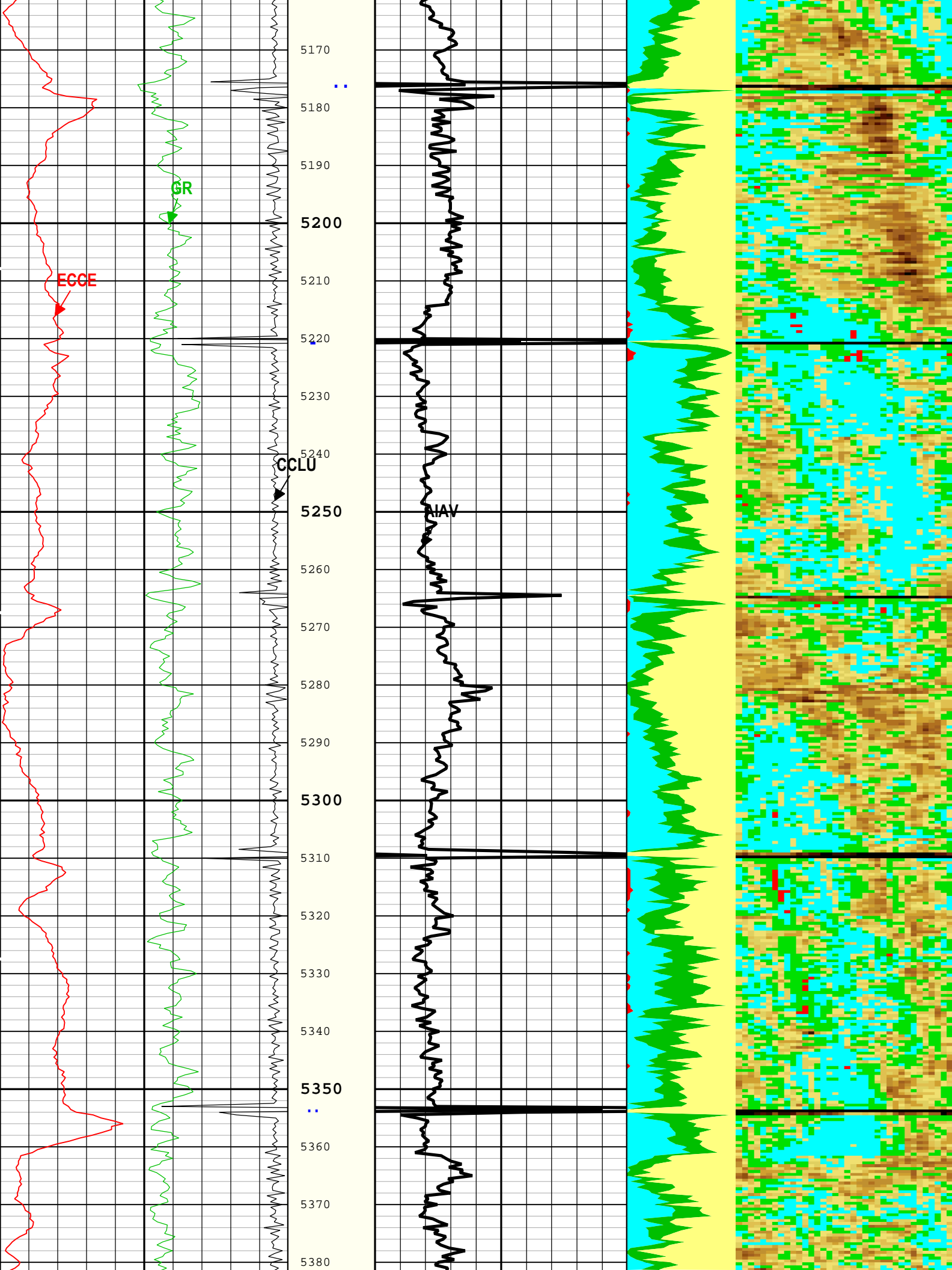


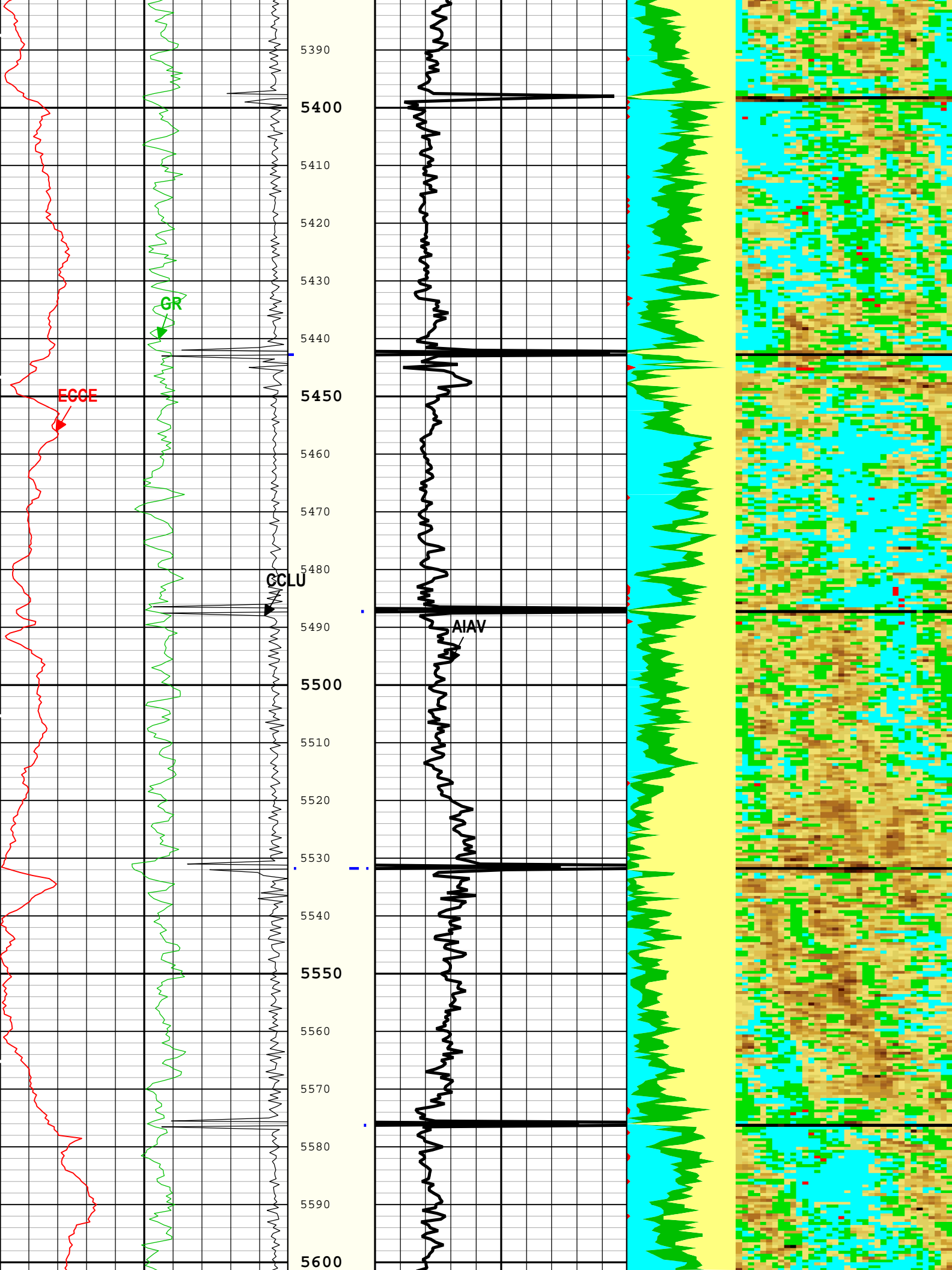


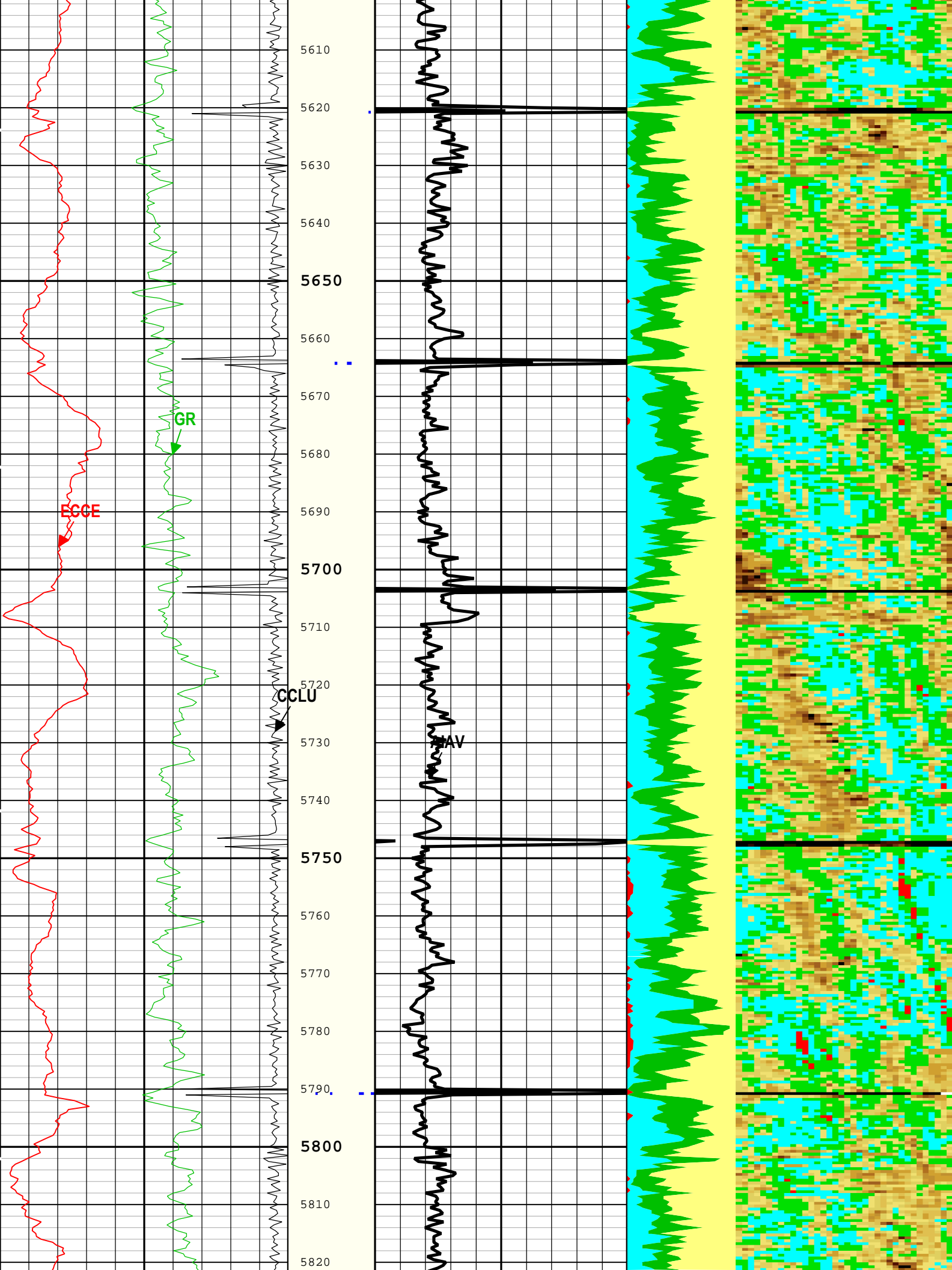


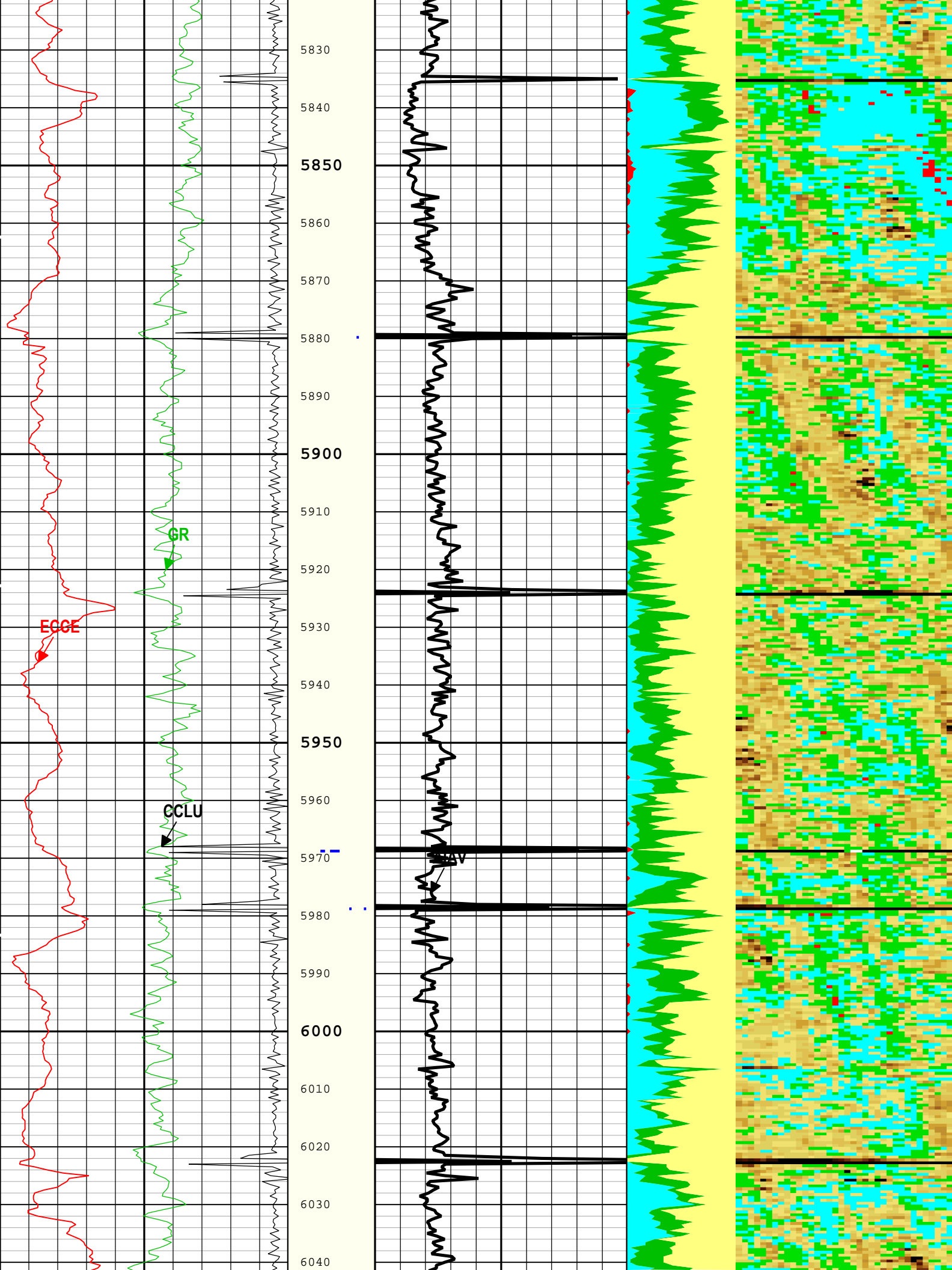


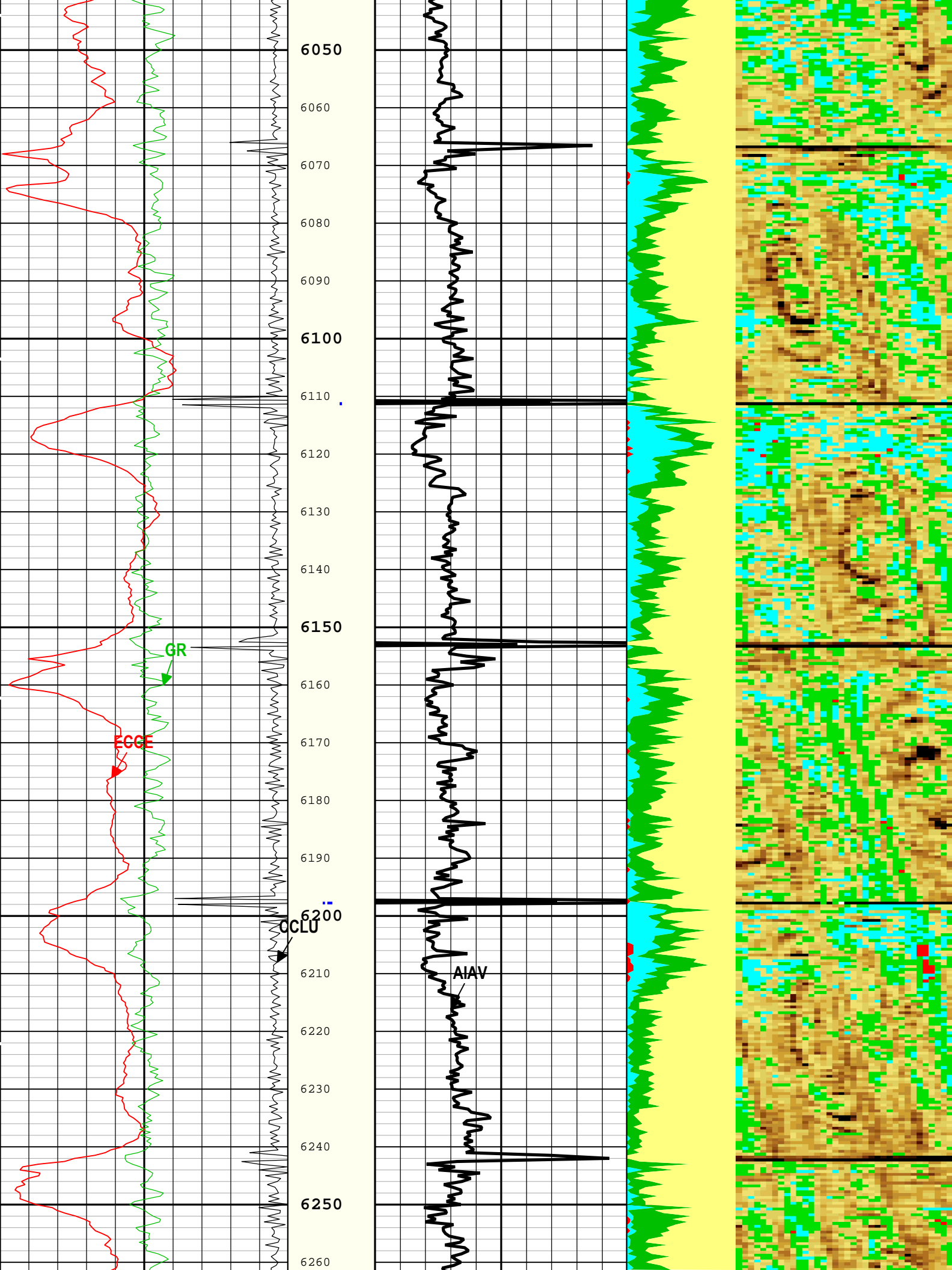


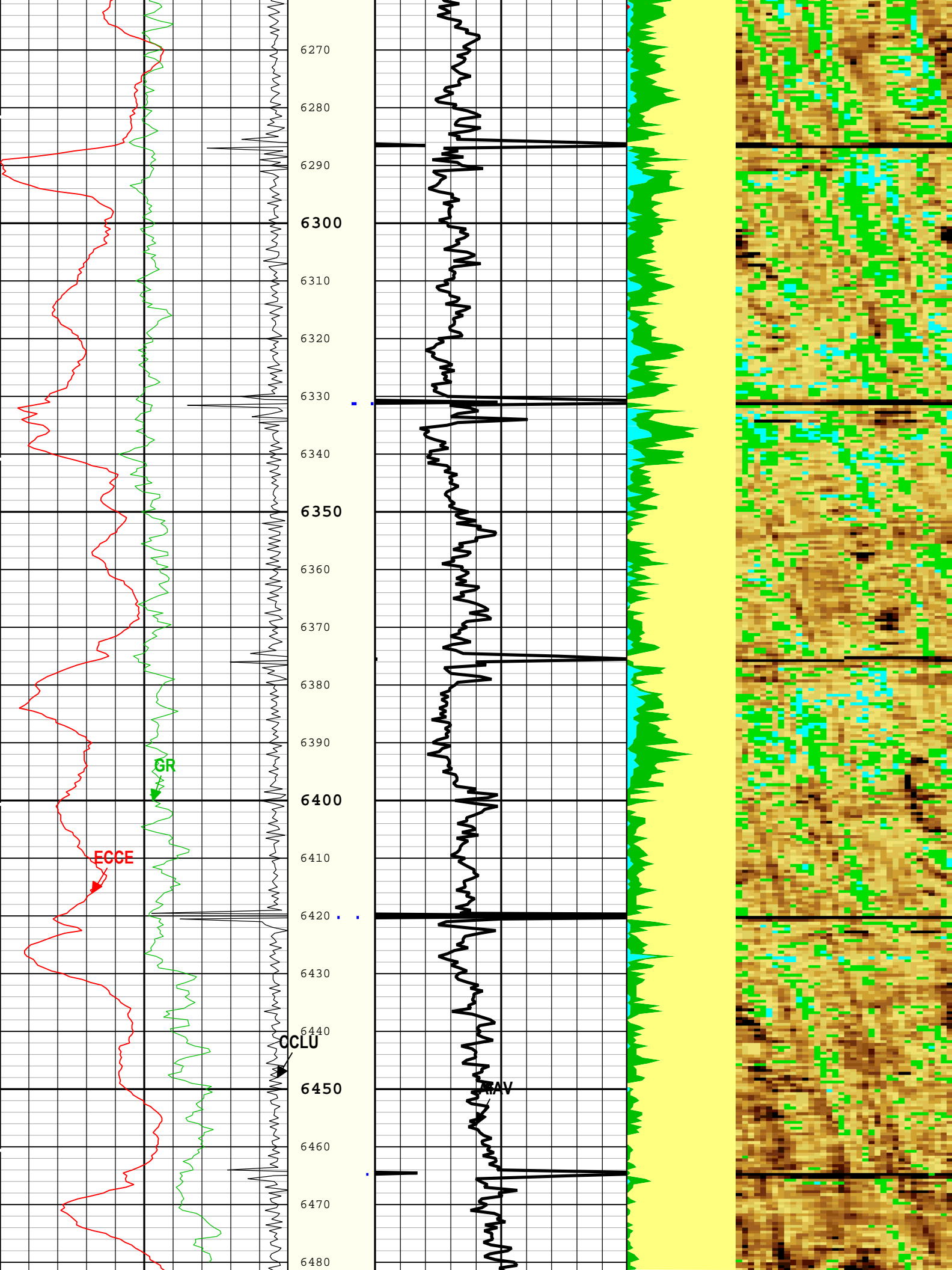












All depth are actual.

| Tool Control Parameters | |
|-------------------------|--|
| | |

Tool Control Parameters

One: Parameters

| Parameter | Description | Tool | Value | Unit |
|---------------|--------------------------------------|--------|----------------------------------|------|
| AGMN | Minimum Gain of Cartridge | USIT-E | -12 | dB |
| AGMX | Maximum Gain of Cartridge | USIT-E | 18 | dB |
| U-USIT_DDT5 | USIC Downhole Decimation for T5 only | USIT-E | 0_NONE | |
| EMXV | EMEX Voltage | USIT-E | Time Zoned | V |
| HRES | Horizontal Resolution | USIT-E | 10 deg | |
| TMUC | Type of Mud | USIT-E | BRI | |
| ULOG | Logging Objective | USIT-E | MEASUREMENT | |
| UMFR | Modulation Frequency | USIT-E | 333333 | Hz |
| USFR | Ultrasonic Sampling Frequency | USIT-E | 500000 | Hz |
| UPAT | USIT Emission Pattern | USIT-E | Pattern 375 KHz | |
| UWKM | USIT Working Mode | USIT-E | Uncompressed 10 deg at 6.0 in LF | |
| USIT_DEPTHLOG | Starting Depth Log for Ultrasonics | USIT-E | 6500 | ft |
| WINB | Window Begin Time | USIT-E | 31.88 | us |
| WINE | Window End Time | USIT-E | 71.88 | us |

OneTime Zoned Parameters

Pass Log[4]:Up

| Parameter | Value | Start Time | Stop Time | Start Depth (ft) | Stop Depth (ft) |
|-----------|-------|----------------------|----------------------|--------------------|-------------------|
| EMXV | 45 | 09-Apr-2017 16:54:40 | 09-Apr-2017 17:07:38 | 6508.37 | 6480.38 |
| EMXV | 55 | 09-Apr-2017 17:07:38 | 09-Apr-2017 17:31:23 | 6480.38 | 5067.37 |
| EMXV | 45 | 09-Apr-2017 17:31:23 | 09-Apr-2017 17:31:30 | 5067.37 | 5060.4 |
| EMXV | 40 | 09-Apr-2017 17:31:30 | 09-Apr-2017 17:31:38 | 5060.4 | 5052.48 |
| EMXV | 35 | 09-Apr-2017 17:31:38 | 09-Apr-2017 17:31:56 | 5052.48 | 5034.74 |
| EMXV | 30 | 09-Apr-2017 17:31:56 | 09-Apr-2017 18:44:47 | 5034.74 | 829.52 |

Pass Log[5]:Up

| | | | | | |
|------|----|----------------------|----------------------|--------|-------|
| EMXV | 30 | 09-Apr-2017 18:46:02 | 09-Apr-2017 19:02:35 | 896.18 | 64.37 |
|------|----|----------------------|----------------------|--------|-------|

All depth are at tool zero.

One

0 PSI Repeat Pass

Software Version

| Acquisition System | Version |
|--------------------|----------------|
| Maxwell 2016 SP2 | 6.2.68624.3100 |

Pass Summary

| Run Name | Pass Objective | Direction | Top | Bottom | Start | Stop | DSC Mode | Depth Shift | Include Parallel Data |
|----------|----------------|-----------|------------|------------|------------------------|------------------------|----------|-------------|-----------------------|
| One | Log[2]:Up | Up | 3065.94 ft | 3426.25 ft | 09-Apr-2017 4:23:21 PM | 09-Apr-2017 4:29:50 PM | ON | 1.56 ft | Yes |

All depths are referenced to toolstring zero

Log

Company:Noble Energy, Inc.

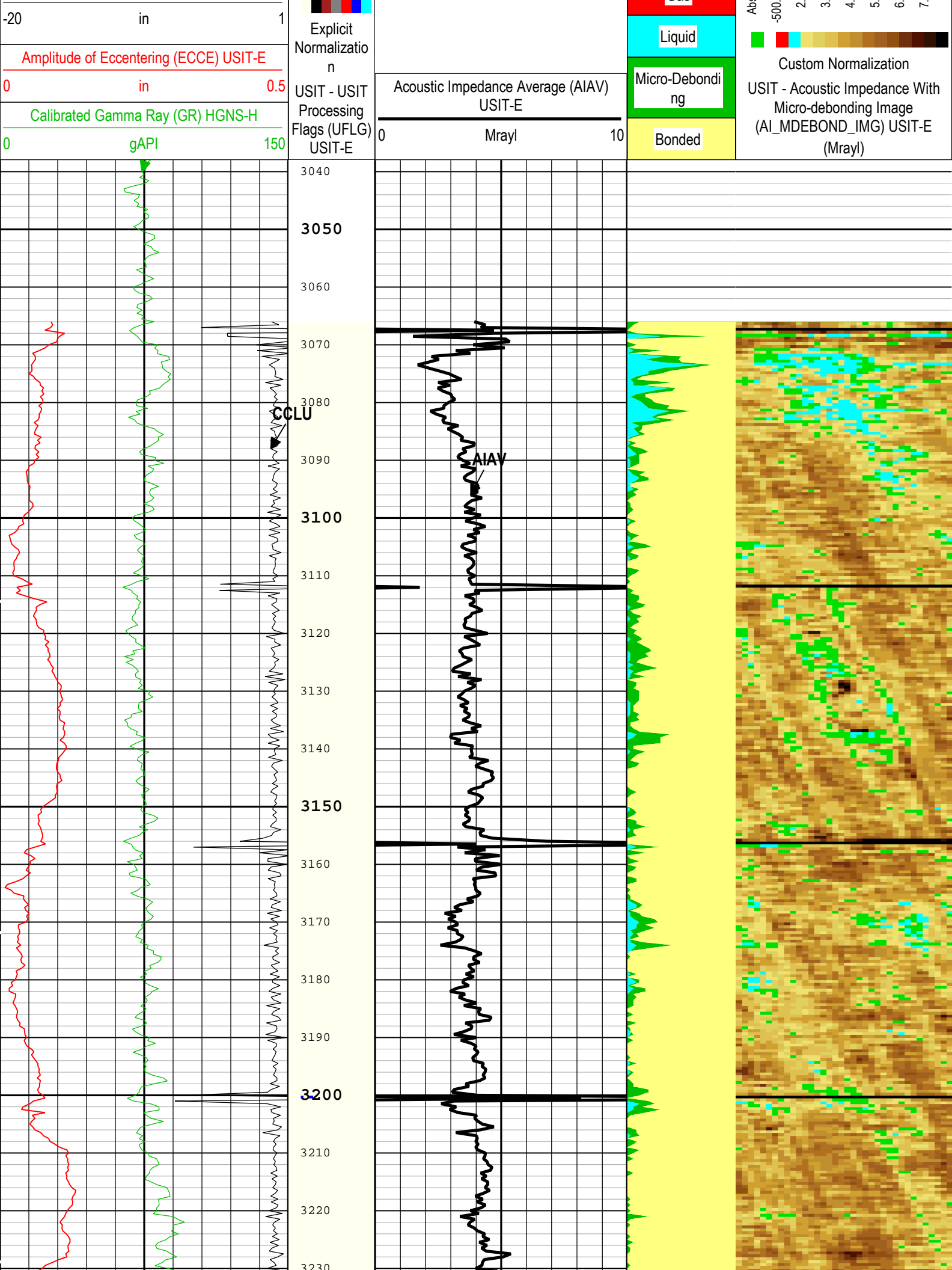
Well:Wells Ranch State AA33-790

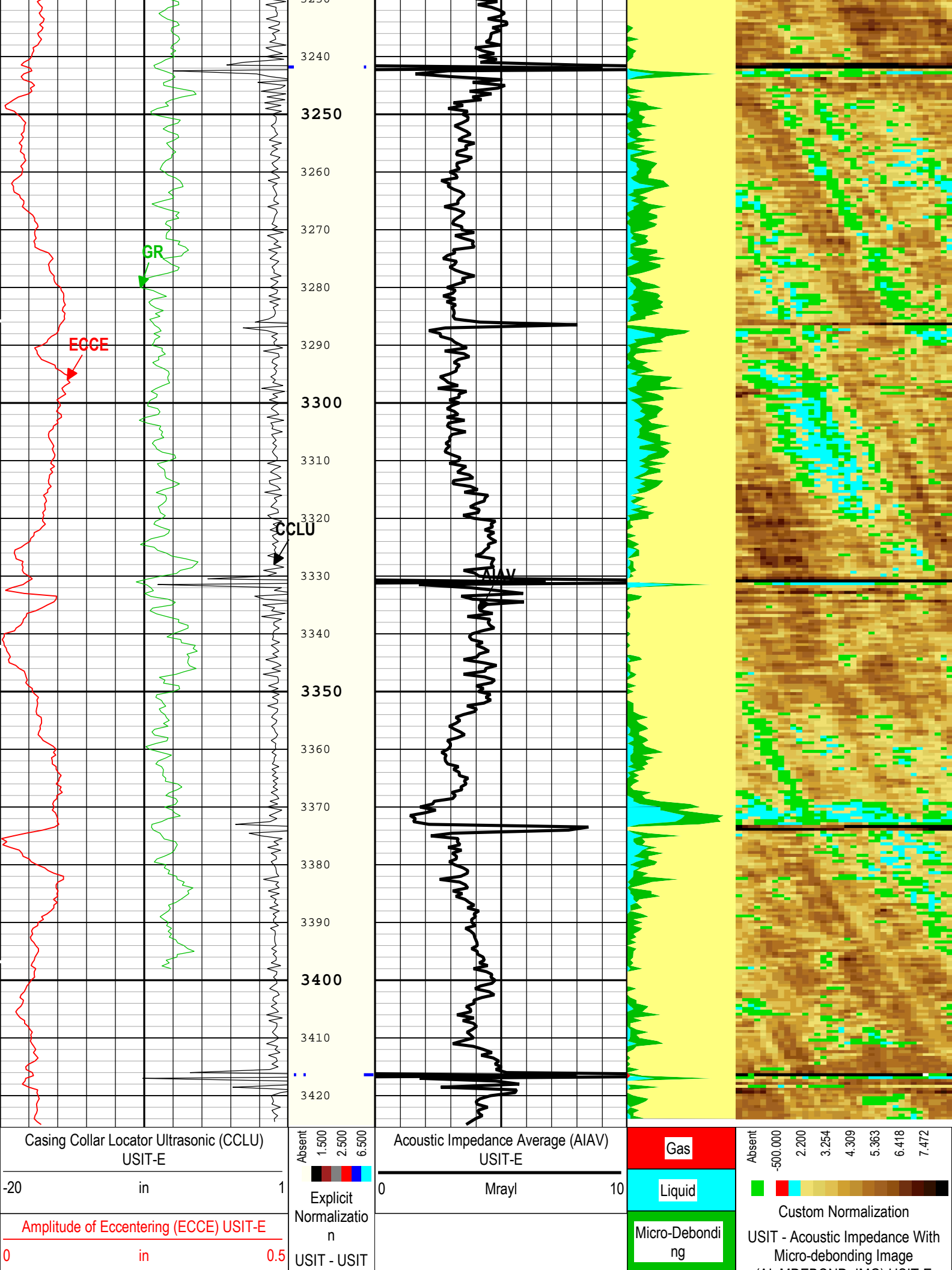
One: Log[2]:Up:S006

Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 10-Apr-2017 21:14:33

TIME_1900 - Time Marked every 60.00 (s)

| | | | |
|---|-----------------------------------|-----|---|
| Casing Collar Locator Ultrasonic (CCLU) USIT-E | Absent 1.500 2.500 6.500 | Gas | sent 000 200 254 309 363 418 472 |
|---|-----------------------------------|-----|---|



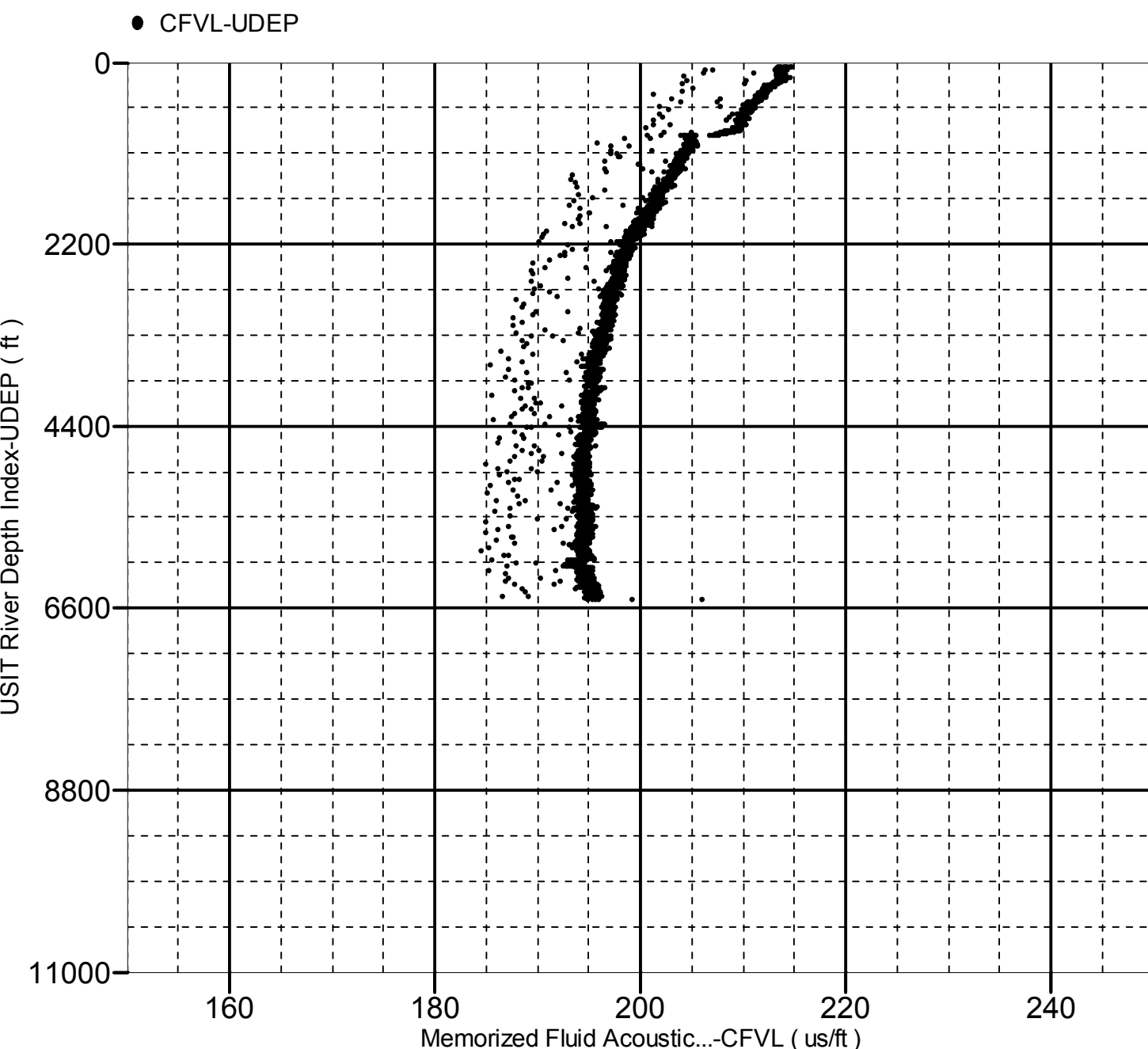


| | | | | | | | | |
|--|--|-----------|--------------------------------------|---------|------------------------------------|--|--|--|
| Calibrated Gamma Ray (GR) HGNS-H | | | Processing Flags (UFLG) USIT-E | Bonded | (AI_MDEBOND_IMG) USIT-E (Mrayl) | | | |
| 0 | gAPI | 150 | | | | | | |
| TIME_1900 - Time Marked every 60.00 (s) | | | | | | | | |
| Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-Apr-2017 21:14:33 | | | | | | | | |
| Channel Processing Parameters | | | | | | | | |
| One: Parameters | | | | | | | | |
| Parameter | Description | Tool | Value | Unit | | | | |
| ISSBAR | Barite Mud Presence Flag | Borehole | No | | | | | |
| BS | Bit Size | WLSESSION | 8.5 | in | | | | |
| CMTY(U-USIT_CEMT) | Cement Type | USIT-E | Regular Cement | | | | | |
| DFD | Drilling Fluid Density | Borehole | 9.3 | lbm/gal | | | | |
| DFT | Drilling Fluid Type | Borehole | Water | | | | | |
| DTMD | Borehole Fluid Slowness | Borehole | 206 | us/ft | | | | |
| FDII | FPM Data Interpolation Interval | USIT-E | 0 | ft | | | | |
| HEMA | Hematite Presence Flag | Borehole | No | | | | | |
| ICE_PROCESS | ICE Processing | USIT-E | Yes | | | | | |
| IMAR | Image Rotation | USIT-E | Off | | | | | |
| MEAS_WLEN | Tcube Processing Window Length in Measurement Mode | USIT-E | 22.44 | us | | | | |
| MUD_N_FRP | Free Pipe Mud Normalization Factor | USIT-E | 1.09 | | | | | |
| U-USIT_DFSZ | Drilling Fluid Specific Acoustic Impedance | USIT-E | 0.1 | Mrayl | | | | |
| UFGDE | Fiberglass Density | USIT-E | 16.27 | lbm/gal | | | | |
| UFGPS | Fiberglass Processing Selection | USIT-E | No | | | | | |
| UFGVL | Fiberglass Velocity | USIT-E | 9678.48 | ft/s | | | | |
| USI_FSOD | USIT USI Fluid Slowness Fits Casing Outer Diameter | USIT-E | 0_OFF | | | | | |
| USI_FVEL_SEL | USI Fluid Velocity Selection | USIT-E | Automatic | | | | | |
| USI_ZMUD_SEL | USI Mud Impedance Selection | USIT-E | FreePipe Norm. | | | | | |
| ZMUD | Acoustic Impedance of Mud | Borehole | 1.48 | Mrayl | | | | |
| ZTCM | Acoustic Impedance Threshold for Cement | USIT-E | 2.2 | Mrayl | | | | |
| ZTGS | Acoustic Impedance Threshold for Gas | USIT-E | 0.3 | Mrayl | | | | |
| Tool Control Parameters | | | | | | | | |
| One: Parameters | | | | | | | | |
| Parameter | Description | Tool | Value | Unit | | | | |
| AGMN | Minimum Gain of Cartridge | USIT-E | -12 | dB | | | | |
| AGMX | Maximum Gain of Cartridge | USIT-E | 18 | dB | | | | |
| U-USIT_DDT5 | USIC Downhole Decimation for T5 only | USIT-E | 0_NONE | | | | | |
| EMXV | EMEX Voltage | USIT-E | 45 | V | | | | |
| HRES | Horizontal Resolution | USIT-E | 10 deg | | | | | |
| TMUC | Type of Mud | USIT-E | BRI | | | | | |
| ULOG | Logging Objective | USIT-E | MEASUREMENT | | | | | |
| UMFR | Modulation Frequency | USIT-E | 333333 | Hz | | | | |
| USFR | Ultrasonic Sampling Frequency | USIT-E | 500000 | Hz | | | | |
| UPAT | USIT Emission Pattern | USIT-E | Pattern 375 KHz | | | | | |
| UWKM | USIT Working Mode | USIT-E | Uncompressed 10 deg at 6.0 in LF | | | | | |
| USIT_DEPTHLOG | Starting Depth Log for Ultrasonics | USIT-E | 3424 | ft | | | | |
| WINB | Window Begin Time | USIT-E | 31.88 | us | | | | |
| WINE | Window End Time | USIT-E | 71.88 | us | | | | |
| Company:Noble Energy, Inc. Well:Wells Ranch State AA33-790 | | | | | | | | |

Fluid Acoustic Slowness vs Depth

2D Cross Plot

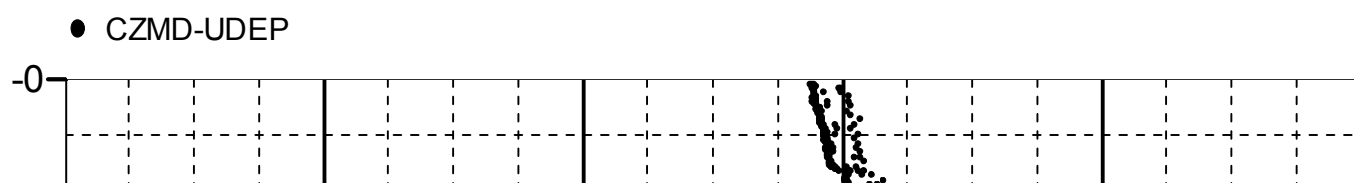
Index Range: From 64.00 to 6508.00 ft

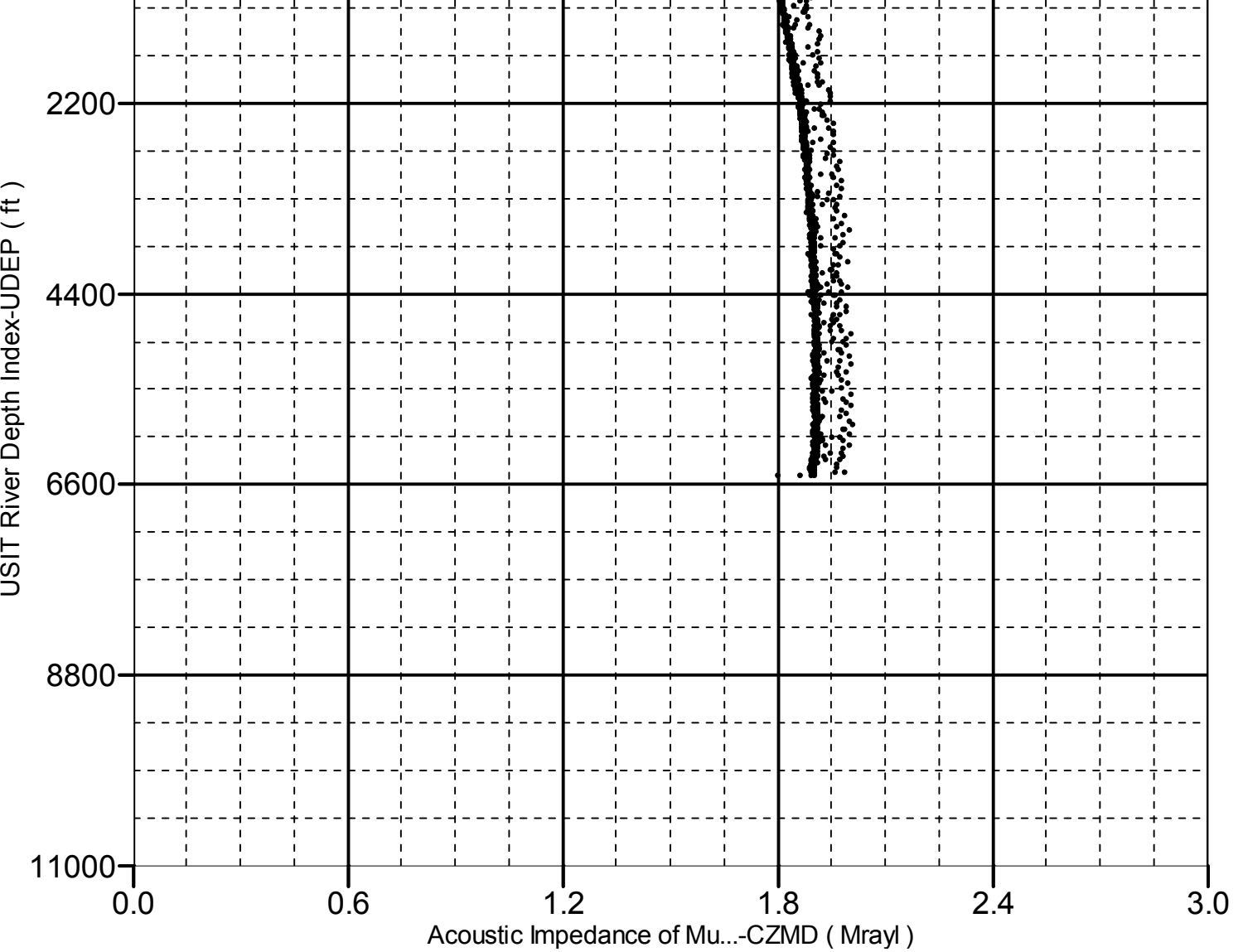


Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 64.00 to 6508.00 ft





Company: Noble Energy, Inc.

Schlumberger

Well: Wells Ranch State AA33-790

Field: Wattenberg

County: Weld

State: Colorado

UltraSonic Summary Print